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GARDENERS' CHRONICLE AND AGRICULTURAL GAZETTE

FOR 1870.

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THE GARDENERS' CHRONICLE

AND

AGRICULTURAL GAZETTE.

No. 1.—1870.] SATURDAY, JANUARY 1. { Price Fivepence. / Stamped Edition, 6d.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

IMPORTANT NOTICE.—The ROYAL BOTANIC SOCIETY having fixed on JULY 6 for one of their Exhibitions, after the same date had been advertised by the ROYAL HORTICULTURAL SOCIETY for their ROSE SHOW, the Council have altered the Meeting announced for that day to WEDNESDAY, June 29. There will be NO MEETING at South Kensington DURING JULY.

1870. SPALDING HORTICULTURAL FETE. FLOWER, FRUIT, &c., SHOW.—The Exhibition will be held on THURSDAY, June 23, 1870. Schedules in January
GEO. F. BARRELL, Hon. Sec.

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CARTER'S GENUINE SEEDS. See page 4.
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For description, see p. 5 of this week's Paper.

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H. AND F. SHARPE'S WHOLESALE LIST of all the new and best varieties of Early and Late POTATOS is now ready, and may be had on application. The quality is very fine, and prices low.
Seed-Growing Establishment, Wisbech.

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H. AND F. SHARPE have just imported a very true Stock of the above extraordinary prolific POTATO, direct from one of the best growers in America; and are prepared to offer it to the Trade at a reduced price
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KNAP HILL NURSERY,
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ABIES ALBERTIUS, 5 to 6 feet, 30s to 60s per dozen Transplanted April, 1869.
ABIES DOUGLASII, 6, 7, to 10 feet, 7s 6d to 10s 6d each Transplanted August, 1868.
ABIES NOBILIS, 5, 6, and 7 feet, 7s 6d to 21s Splendid plants, moved April, 1869, to 10 to 12 feet high, 15 and 20 feet in circumference.
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The dwarf varieties of Spruce, such as pumila, pygmæa, Greenii, Clanbrasiliana, &c., large breadths, many of them 20 and 30 years' growth
CEDRUS DEODARA, 5 to 6 feet, 60s per dozen; 7 to 8 feet, 84s per dozen; 9 to 12 feet, 10s 6d each; 15 to 18 feet, 21s each Moved several thousands of these large Deodars All have been removed since August, 1868, many since April, 1869
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CEDRUS LIBANON, 6, 7, to 10 feet Moved September, 1868
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" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s 6d to 10s 6d each
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HOLLY, SILVER QUEEN, 4, 5, and 6 feet.
WATERER'S HOLLY.—This variety originated in this Nursery; we have hundreds 4, 5, 6, 7, 8, 9, and 10 feet, of great beauty and perfection
PERRY'S WEEPING HOLLY.—Standards, 10s 6d to 21s each.
HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869.
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868.
HOLLIES in many hundreds of sorts and kinds An immense Stock of splendid plants, all transplanted in 1868-9 —
LAURIFOLIA and SCOTTICA, 4, 5, 6, to 10 feet high.
HODGINS, LANGUSTIFOLIA.
YELLOW BERRIED, MYTHOLIA, &c.
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RHODODENDRONS, the finer kinds, by name, from £7 10s to £12 10s per 100, and upwards
RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000
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AZALEAS, common kinds, £5 per 100
AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference
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ERICA MEDITERRANEA HYEMALIS, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.
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" excelsa, 3 to 4 feet
Arbor-vitæ, American, 5 to 6 feet
" Siberian, 3½ to 4 feet
Gorse, double, in pots, strong
Hartogia capensis (Cape Laurel), 1½ to 2 feet

At 18s per dozen.

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" excelsa, 4 to 5 feet
Alaternus, Hoeffleneed, 2 to 2½ ft
Arbor-vitæ, American, 6 to 7 feet
" Siberian, 4½ to 5 feet
Aucuba japonica, 18 to 21 inches
Box, green tree pyramids, very handsome, 3½ to 4½ feet
Hartogia capensis, 2 to 2½ feet
Laurel, narrow leaved, 2½ to 3 feet

At 24s per dozen.

Abies elegans, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet
Aucuba japonica, 21 to 24 inches
Cryptomeria Lobii, 5 to 6 feet
Cupressus Lawsoniana, 4 to 5 feet
Holly, screw leaved, green, 2 to 2½ feet

At 30s per dozen.

Abies canadensis, extra fine, 6 to 7 feet
" elegans, 2 to 2½ feet
Libocedrus chilensis, 3 to 3½ feet
Aucuba japonica, very bushy, 2 to 2½ feet
Cryptomeria Lobbii, 6 to 7 feet
" viridis, 6 to 7 feet

A

Abies inverta (Weeping Spruce), 2½ to 3 feet
Arbor-vitæ aurea, 2 to 3½ feet
" Siberian (very fine) 5 to 6 feet
Cupressus Lawsoniana, 5 to 6 feet
Juniperus chinensis, variegata, 3 to 4 feet
" densa, 3 to 4 feet
" Sabina, 3 to 4 feet
" Schottii, 3 to 4 feet

At 42s per dozen.

Abies morinda, fine specimens, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet
" Siberian (very fine), 7 feet
" glauca, 4 to 5 feet
" lutea, 5 to 6 feet
" pendula, 5 to 6 feet
" Sibirica, 4 to 5 feet
" Schottii, 4 to 5 feet

At 60s per dozen.

Abies Menziesii, 7 to 8 feet
" nordmanniana, 4 to 5 feet
Arbor-vitæ compacta, 4 to 5 feet
Juniperus chinensis, very fine, 5 to 6 feet
" densa, 5 to 6 feet
" glauca, 5 to 6 feet
" japonica, 5 to 6 feet
" Sabina, 5 to 6 feet
" Sibirica, 5 to 6 feet
" Smithiana, 4 to 5 feet
" thurifera, 6 to 7 feet

Abies Smithiana, 7 to 8 feet, 10s 6d each
" Douglasii, 6 to 10 feet, 7s 6d; 10 to 12 feet, 10s 6d; extra fine, 12 to 15 feet, 15s each
Arbor-vitæ, Hoveyi, 5 to 6 feet, 5s to 6 feet, 7s 6d; 6 to 7 feet, 10s 6d each
Araucaria imbricata, 5 to 6 feet, 21s; 6 to 7 feet, 42s 6d; 7 to 8 feet, 42s; 8 to 9 feet, 52s 6d; 9 to 10 feet, 63s, to 84s each
Juniperus recurva, 6 to 7 feet, 6s; 7 to 8 feet, 7s 6d each
" thurifera, very fine, 7 to 8 feet, 6s; 8 to 9 feet, 7s 6d each
Laurel, Portugal, pyramids, extra fine, 7s 6d; very large, 10s 6d each
Picea grandis, extra fine, 5 to 6 ft., 15s; 6 to 7 feet, 21s each

Laurel, narrow leaved, 2 to 2½ feet
" Portugal, 2½ to 3 feet
Picea balsamea, selected, 4 to 5 ft.
Quercus ilex (Evergreen Oak), 15 to 18 inches [24 inches
Rhododendron ponticum, 21 to
Holly, screw leaved, green, 2½ to
Phillyrea oleafolia, 2 to 2½ ft. [2 ft.

At 18s per dozen.

Phillyrea oleafolia, 2½ to 3 feet
Pinus balsamea, 5 to 6 feet
Pinus austriaca, 3 to 4 feet
Quercus ilex, 2 to 2½ feet
Rhododendron ponticum (very bushy), 2 to 2½ feet.
" hybrids, fine varieties, 18 to 21 inches
Taxus japonica (Japan Yew), 12 to 15 inches

At 24s per dozen.

Ivy, green tree, 18 to 24 inches
Laurel, Portugal, pyramids, 4 to 5 feet [feet
Phillyrea oleafolia, very fine, 3½ to 4
Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Taxus japonica, 15 to 18 inches

At 30s per dozen.

Ivy, green tree, extra fine and bushy, 2 to 2½ feet
Juniperus chinensis, 4 to 5 feet
" glauca, 4 to 5 feet
" glauca, 3 to 4 feet
" Lecana, 3 to 4 feet
Pinus austriaca, 4 to 5 feet
Thujopsis borealis, 3 to 5 feet

A pr dozen.

Juniperus Smithiana, 3 to 3½ feet
Laurel, Portugal, 3½ to 4 feet
" Portugal, pyramids, very bushy, 4½ to 5 feet
Pinus austriaca, 5 to 6 feet
" laricio, 6 to 7 feet
" Pinsapo, 5 to 6 feet
Thujopsis borealis, 5 to 6 feet

At 48s per dozen

Juniperus pharmacia, 3 to 4 feet
" Sabina, 3½ to 4 feet
" thurifera (true Juniper), 4 to 5 feet [5 feet
" virginiana, 4½ to 5 feet, to
Picea Nordmanniana, 18 to 24 ins.
Pinus austriaca, 6 to 7 feet
" laricio, 7 to 8 feet
Thujopsis borealis, 5 to 6 feet

At 60s per dozen

Juniperus Smithiana, 3½ to 4 feet
" thurifera (true Juniper), 5 to 6 feet
" virginiana, 7 to 8 feet
" viridis pendula, 4 to 5 feet
Pinus Cembra, 10 to 12 ft
Taxus, Irish, 6 to 7 feet
Wellingtonia gigantea, 2½ to 3 feet

At 72s per dozen.

Juniperus virginiana, 8 to 10 feet
" viridis pendula, 5 to 6 feet
Laurel, cochin, very large, 10 to 12 feet [5 to 6 feet
" Portugal, pyramids (very fine), 5 to 6 feet
Picea Nordmanniana, 2 to 2½ feet
Pinus Cembra, extra fine, 6 to 7 ft
" Pinsapo, very fine, 7 feet
Thujopsis borealis, 6 to 7 feet
Wellingtonia gigantea, 3 to 3½ feet

At 84s per dozen.

Juniperus recurva, 8 to 9 feet
" thurifera, 8 to 9 feet
Picea balsamea, 2½ to 3 feet, 15s; 3 to 3½ feet, 21s; 3½ to 4 feet, 31s 6d; 4 to 4½ feet, 42s; 4½ to 5 feet, 52s 6d each
" nobilis (best glaucous variety), 18 to 24 inches, 7s 6d; 2 feet, 10s 6d; 2½ to 2½ feet, 10s 6d; 2½ to 3 feet, 15s 6d
" Nordmanniana, 3 to 3½ feet, 15s; 5 to 6 feet, 21s; 6 to 7 feet, 31s 6d; 7 to 8 feet, 42s each
" Pinsapo, 3 to 4½ ft., 21s 6d; 4½ to 4½ ft., 25s; 4½ to 4½ ft., 28s; 5 to 5½ ft., 31s 6d.; 5½ to 6 ft., 42s 6d.
Pinus Cembra, 7 to 8 feet, 6s; 8 to 9 feet, 7s 6d each
Wellingtonia gigantea, 3½ to 4 feet, 7s 6d each
Yews, fine pendulous, about 12 feet high, 46 years old, recently transplanted, 31s 6d. each

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

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We offer this great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 10s.; second size, 3 to 4 feet, do., 10s.; third size, 2 to 3 feet, do., 7s.; fourth size, 1½ to 2 feet, do., 5s

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COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit Gardens of various sizes, 10s 6d., 21s., 42s., 63s., and 84s. each.

NEW and CHOICE VEGETABLE SEEDS.

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Williams' Alexandra BROCCOLI	1 6
Bellevue Early Red	1 0
Williams' matchless RED CELERY	1 0
Williams matchless WHITE CELERY (new)	1 6
Telegraph TURNIP (Woolley's improved variety)	1 0
Dupswell Prize ENDIVE	0 6
All the Year Round CABBAGE LETTUCE	0 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Less's immense hardy green CABBAGE LETTUCE (new)	1 0
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Williams' Paradise Gem MELON, Scarlet-flesh, excellent flavour, and 12 days earlier than any other known kind (new)	2 6
Nuneham Park MELON, quite distinct from any other variety	1 0
Earley's selected double curled PARSLEY (new)	1 0
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Rundell's, or the Cook's Favourite PEA (new)	2 0
Cullingford's Champion Marrow PEA, the finest-flavoured Winkled Marrow in cultivation (new) per quart	3 6
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Orangefield dwarf Prolific TOMATO	0 6

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Williams' superb strain of PRIMULA, Red, White, or Mixed 25 6d, 3s 6d, and	5 0
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Williams' Improved Hybrid SWEET ALYSSUM 2s 6d. and	3 6
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EAST INDIAN STOCKS. These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; they are of dwarf and compact habit, produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours	2 6
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VICIA CORNUTA ALBA This is an interesting and extremely useful variety, producing in great abundance pure white flowers, very robust and dwarf in habit, which renders it very effective in spring and summer, and invaluable during the late autumn months (new) 1s 6d. and	2 6
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Cedrus Deodara.

FINE SPECIMENS, 7, 8, 9, 10, 12, 15 feet, at 1s per foot

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150,000 2-yr. Silver Fir ..	4 0	40,000 Oak, undrill., 1½ to 2½ feet	20
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200,000 2-yr. Pinus austriaca	4 0	5,000 Spanish Chestnut, 2 to 3 feet	30 0
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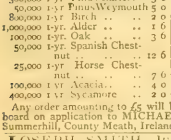

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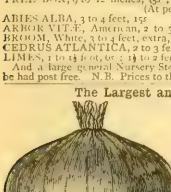

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TANNED GARDEN NETTING, for Preserving Seed Beds, Fruit, Strawberries, from Frost, Blight, Buds, &c., and as a Fence for Fowls, &c. One yard wide, 1*d*.; two yards, 2*d*.; three yards, 3*d*.; and four yards, 4*d*. per yard in any quantity. May be had of CHAS. WRIGHT AND CO., William Street, Newark on Trent, or their Agents, Messrs. HOOPER AND CO., Covent Garden Market, London, W.C.

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Engravings of Patterns, with PRICE LISTS, gratis on application
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GREEN'S PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, ROLLING, and COLLECTING MACHINES, for 1869.

Every Machine is warranted to give entire satisfaction, and if not approved of, can be returned at once unconditionally.

PRIZE MEDALS AWARDED to GREEN'S PATENT LAWN MOWERS.
First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lincoln Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.

GREEN'S Patent Lawn Mowers have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S Patent Lawn Mowers is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features:—1st. Simplicity of construction, every part being free of access. 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S Patent Lawn Mowers combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.

N.B.—All orders are executed on the day they are received

SHANKS'S PATENT LAWN MOWERS for 1869, The Patent Improvements recently introduced give SHANKS'S MACHINE

Several important advantages possessed by no other Lawn Mower.

PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.

The unprecedented Sale for 1868, notwithstanding the Dryness of the Season, forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

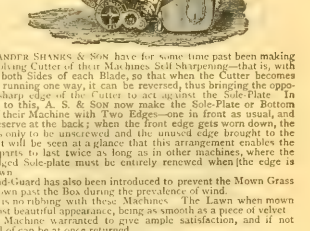

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machines with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at once that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when [the edge is worn down.

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Deans Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street

PORTABLE ENGINES, from 4 to 30-horse power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,
With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.
PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

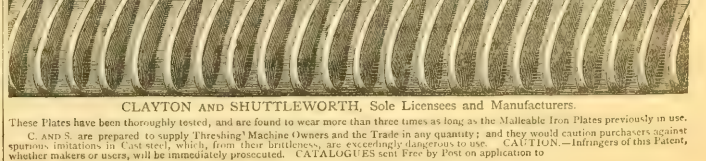

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.

These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

C. AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent free by Post on application to

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STAMP END WORKS, LINCOLN, or, 78, LOMBARD STREET, LONDON, E.C.

To the Trade.

DOBSONS' SUPERB BALSAM.—These are large and double, and the colours rich and decided.
DOBSONS' FINE CYCLAMEN.—A fine strain of this increasingly popular flower. [tion.
DOBSONS' SWEET WILLIAM.—Selected from a splendid collec-
DOBSONS' SCARLET INTERMEDIATE STOCK.—Saved from pot flowers; very double and rich in colour
DOBSONS' ANTIRRHINUM.—Produce a varied and beautiful collection
DOBSON AND SONS, Woodlands Nursery, Isleworth, W

Rose Prices, from Paris.

LÉVÊQUE ET FILS, NURSERYMEN, 132 and 134, Boulevard de l'Hôpital, Paris, begs to offer the following ROSE TREES, in first quality, as plants and sorts (their choice):—

100 Standards, strong heads, 100 sorts	£5	0 0
100 Half Standards, strong heads, 100 sorts	4	0 0
100 Dwarfs, strong heads, 100 sorts	2	0 0
1000 Dwarfs, strong heads, 200 sorts	16	0 0
100 Tea Roses, grafted, in pots, or on their own roots, p 100	3	0 0
New sorts, 1869 per dozen	0	12 0
New sorts, 1868 "	0	10 0
New sorts, 1870 (15 per cent discount)		

Genuine Choice Flower Seeds, Carriage Free.

JOHN H. LEY, St. John's Road Nursery, Croydon, S., can, with confidence, recommend the following, which cannot be surpassed, either for quality or cheapness; price only regulated by quantity.

FERN SPORES, saved from J. H. L.'s valuable collection of Exotic Ferns, sown now, as described with each packet, will produce many fine varieties during the summer: 2s. 6d. and 3s. 6d. per pkt. mixed; ditto, collection of 30 sorts, in separate packets, 10s. 6d.

LOBELIA SPECIOSA SUPERBA, now offered by J. H. L. for the first time; habit compactly, upright; colour sky-blue, highly commended wherever shown; 1s. and 1s. 6d. per pkt.

PRIMULA, finest strain in cultivation, 1s. 6d. and 2s. 6d. per pkt. CALCEOLARIA, herbaceous, prize strain, 1s. 6d. and 2s. 6d. per pkt. CINERARIA, from exhibition plants, 1s. and 2s. per pkt. BALSAM, Camellia and Rose-flowered, mixed, 1s. and 2s. per pkt. CYCLAMEN, Wiggins', 1s. and 2s. 6d. per pkt. CENTAUREA CANDIDISSIMA, 1s. per pkt. CINERARIA MARITIMA, 6d. per pkt. PYRETHRUM GOLDEN FEATHER, 6d. and 1s. per pkt.

All other Seeds at reasonable prices, quality guaranteed. Cash, or reference from strangers, is requested

Laurus latifolia.

L. PAILLET, NURSERYMAN, Chatenay les Sceaux, near Paris, France, is now filling the numerous orders received for this splendid Novelty. Persons wishing to secure good plants are requested to send their orders as soon as possible, for the plants are now getting very limited in number.

M. L. PAILLET offers also to the Trade a large quantity of FRUIT TREE STOCKS, at the following rates:—

	Per 1000—£ s d		Per 10,000—£ s d
Pears, extra choice	1 10 0	first choice	11 12 0
Quince, do.	1 10 0	"	8 12 0
Apples, do.	1 10 0	"	5 0 0
Doucin, do.	1 6 0	"	8 10 0
Paradis, do.	1 4 0	"	0 10 0
Plums (real St. Julien), do.	1 10 0	"	0 16 0
Cherries, do.	1 0 0	"	0 12 0
St. Lucie, do.	0 10 0	"	0 6 0

ROSES, our own best selections:—Standards, good, £3 per 100; Half Standards, £2 10s per 100; Low Budded Dwarfs, £10 per 1000; on their own roots, £12 per 1000; Bengals, three best sorts, £3 per 1000; Maréchal Niel, on Standards, 16s. per dozen.

Young Seedling FOREST TREES and SHRUBS, 1, 2, or 3 yr. old, such as Acacia, Alder, Ash, Beech, Birch, Quercus, Thorn, Maple, &c.; and EVERGREENS of all sorts, Ornamental Trees and Shrubs, at per 1000, 100,000, and 1,000,000.

DWARF ROSES.—SPECIAL OFFER TO THE TRADE.

M. L. PAILLET has several thousand fine Dwarf Roses he will send carriage free to London, packing included, at £16 10s. per 1000, best selection. Cash on delivery.

All orders must be sent to L. PAILLET, as above; or to his Agents, Messrs. SILVERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

NOW READY, POST FREE ON APPLICATION,

PETER LAWSON & SON'S

DESCRIPTIVE PRICED SEED CATALOGUE

OF KITCHEN GARDEN AND FLOWER SEEDS, GARDEN IMPLEMENTS, GLADIOLI, &c.

The True SANDRINGHAM CELERY, EMERALD CUCUMBER, DELL'S SUPERB BLACK BEET, SANDRINGHAM SPROUTING CABBAGE, INCOMPARABLE WHITE DUTCH CABBAGE LETTUCE, BANBURY IMPROVED WHITE SPANISH ONION, and other recently introduced VEGETABLES and FLOWER SEEDS, are fully described and are recommended.

20, BUDGE ROW, CANNON STREET, LONDON, E.C.; and EDINBURGH.

GENUINE SEEDS ONLY.

JAMES VEITCH & SONS

BEG TO ANNOUNCE THAT THEIR

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WITH LIST OF IMPLEMENTS AND OTHER GARDEN REQUISITES,

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ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.

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FERDINAND JÜHLKE'S SUCCESSORS,

SEED GROWERS AND MERCHANTS, ERFURT, PRUSSIA,

BEG TO INFORM THEIR CUSTOMERS THAT THEIR

ANNUAL CATALOGUE OF IMPORTED FLOWER SEEDS, &c.,

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PRIZE MEDALS: ERFURT and HAMBURGH. DICK RADCLYFFE AND CO., Managers.

THE ROYAL SEEDSMEN. "The advantages of procuring Seeds direct from the Growers cannot be over-estimated." THE ROYAL SEEDSMEN.

JAMES CARTER & CO.'S

NEW AND UNADULTERATED VEGETABLE, FLOWER, AND FARM SEEDS,

HARVESTED ON THEIR OWN SEED FARMS, AND SUPPLIED DIRECT TO THE CONSUMER.

CARTER'S COLLECTIONS OF VEGETABLE SEEDS

FOR LARGE AND SMALL GARDENS WILL PRODUCE A PLENTIFUL SUPPLY OF CHOICE VEGETABLES ALL THE YEAR ROUND.

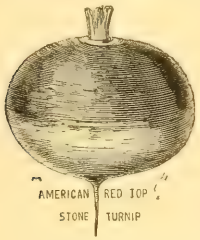

Carter's First Crop Pea,
The earliest in cultivation; price **2s.** per quart.

Hundredfold Pea, or the Cook's Favourite.
See p. 1280, *Gardeners' Chronicle*, December 11, 1869. **7s. 6d.** per qrt., **4s.** per pint, sealed packets.

Paterson's "Bovinia," or Cattle Feeder Potato.
The heaviest cropper known. Per lb., **1s. 6d.**; 7lb., **9s.**; per bushel (56lb.), **65s.**

Collection of Vegetable Seeds, No. 2.
Price **21s.** (packing included),
Suitable for a Small Garden, containing—

Beans, Non-pareil	1 qt	Endive, French curled	½ pkt
" Broad Windsor	"	Leek, Ayton Castle	"
" best French	½ pt	Lettuce, Carter's Giant White	"
" Scarlet Runners	"	" Drumhead	"
Beet, Red Dysth	½ pkt	" Victoria	"
Borecole or Kail, Cottagers'	"	Mustard, White	4 oz
Kail, new, Asparagus	"	Melon, Carter's Excelsior	1 pkt
" Dwarf Scotch	"	Onion, Giant Madeira	½ pkt
Brussels Sprouts, best	"	" Reading	"
Broccoli, Carter's Champion	"	Parsnip, Student	1 oz
" Snow's Winter	"	Parsley, Dunnett's Garnishing	½ pkt
" Adam's Early White	"	Peas, Carter's Early	1 qt
" Purple Sprouting	"	" Premier	1 pt.
Cabbage, Carter's Early	"	" Bishop's Long-pod	"
" Enfield Market	"	" Prietaker	"
" Dwarf Nonpareil	"	" Carter's Surprise	"
" Tom Thumb	"	" Champion of England	"
" Savoy, best curled	"	" Carter's Victoria	"
Carrot, Early Horn	1 oz	" Veitch's Perfection	"
" James's Green-top	"	Radish, Wood's Frame	2 oz.
" selected Scarlet	"	" Early scarlet Short-top	"
Cauliflower, Carter's Dwf. Mammoth	½ pkt	" Mixed Turnip	"
Celery, Incomparable Dwarf White	"	Spinach, Summer	½ pt
" Manchester Giant Red	"	" Winter	"
Cress, plain	4 oz	Turnip, Early Six-week	1 oz.
" Australian	1 oz	" Yellow Malta	"
Cucumber, Carter's Champion	pkt.	Tomato	½ pkt
		Vegetable Cream, Moore's	"
		Pot Herbs	4 pkt.

Laxton's "Alpha" Pea,
The earliest Wrinkled variety, **7s. 6d.** per half pint, sealed packets.

BROWN GLOBE ONION

Collection of Vegetable Seeds No. 1.
Price **12s. 6d.** (packing included). Suitable for a small Cottage Garden.

Collection of Vegetable Seeds No. 3.
Price **42s.** (packing included). Suitable for a Garden of half an acre.

Collection of Vegetable Seeds No. 4.
Price **63s.** (packing included). Suitable for larger Gardens.

Carter's Champion Forcing Potato,
The best for forcing. **5s.** per peck.

Laxton's Supreme Pea,
Described as "a Grand Pea." **2s. 6d.** per half pint, **4s. 6d.** per pint, **8s. 6d.** per quart, sealed packets.

For detailed Table of Contents of these Collections, see CARTER'S *Special Order Sheet for* 1870, *forwarded Gratis and Post Free.*

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM for 1870

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HOME-GROWN SEEDS.

CARRIAGE FREE.

SUTTON AND SONS are now prepared to receive Orders for their

COMPLETE COLLECTIONS OF SEEDS

For the VEGETABLE and FLOWER GARDEN, and which will produce a valuable supply during the whole year.

FOR THE KITCHEN GARDEN.

No. 1	COLLECTION, for a large Garden, Carriage Free	£3	3 0
No. 2	COLLECTION, for medium sized do , Carriage Free	2	2 0
No. 3	COLLECTION, for medium sized do., Carriage Free	1	11 6
No. 4	COLLECTION, for an ordinary sized do , Carriage Free	1	1 0
No. 5	COLLECTION, for a small do., Carriage Free.. ..	0	15 0
No. 6	COLLECTION, for a very small do	0	12 0

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No. 1	COLLECTION, Free by Post or Rail	£2	2 0
No. 2	COLLECTION, Free by Post or Rail	1	11 0
No. 3	COLLECTION, Free by Post or Rail	1	1 0
No. 4	COLLECTION, Free by Post or Rail	0	15 0
No. 5	COLLECTION, Free by Post or Rail	0	10 6

THE FORWARDEST PEA KNOWN IS

Suttons' Ringleader.

The Royal Horticultural Society tested carefully the merits of the leading kinds of Early Peas, and in the *Gardeners' Chronicle*, June 27, 1868, the following brief but emphatic statement appeared :—"The earliest form of all was Ringleader. Several of the Peas blossomed at the same time, but Ringleader was fit to gather first."

Price **2s.** per quart, cheaper in large quantities.

The best Potato for the Main Crop is

Suttons' Berkshire Kidney.

Raised and selected from among 40 Seedlings of the Fluke. Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed.

Price **5s.** per peck, cheaper by the bushel.

The best Potato for the Latest Crop is

Suttons' Red-skinned Flour-ball.

This Potato has the peculiar merit of producing tubers all of full size, and weighing from 12 to 20 ounces each. While most other red varieties boil yellow, this is white, and is most correctly described as Flour-ball. For supplying the London dining rooms especially, we feel confident it will supersede every other kind when sufficiently known. In a field where many other sorts were all more or less diseased, our Red-skinned Flour-ball was entirely free, which we can only attribute to its remarkably vigorous growth. It is a Seedling, and we offer it now for the first season.

Price **7s. 6d.** per peck, cheaper per bushel.

Suttons' £1 1s. Collection of Vegetable Seeds,

For an ordinary sized garden, forwarded carriage free by rail, contains the following new and excellent varieties :—

1 quart Suttons' Ringleader Pea	1 packet Savoy, Drumhead
1 do Early Warwick do	1 do Cauliflower, London
1 pint Princess Royal do.	1 do Celery, Superb White
1 do. Prizetaker do.	1 do do., superb Pink
1 do. Champion of England do.	1 do Cucumber, Stockwood
1 do. Veitch's Perfection do.	1 do do., Best Frame
1 do. Scimitar do.	1 oz Onion, Improved Reading
1 do. Victoria do	½ do. do., Brown Globe
1 do Taylor's Windsor Beans	½ do. do., Silver Skin
1 do. Early Longpod do	½ do. do., Blood Red
1 do Green Windsor do	1 packet Melon, best flavoured
½ do. Royal Cluster do	1 oz Carrot, Early Horn
½ do Beck's Green Gem do.	½ do do., Long Red Surrey
1 do Scarlet Runner do	1 do do., Intermediate
½ do. Longpodded Dwarf do	2 do Parsnip, Suttons' Student
½ oz Beet, Suttons' fine Dwarf Red	1 packet Endive, Green Curled
1 packet Kale, fine Curled Scotch	1 do Leek, Musselburgh
1 do do , Cottager's	1 do. Thyme
1 do Sprouts, Brussels	1 do. do., Savory Winter (White
1 do. Broccoli, Superb Early White	1 do Lettuce, Suttons' Superb
1 do do , Purple Sprouting	1 do. do , Black Seeded Bath Cos
1 do do , Dalmeny Park	1 do do , finest mixed
1 do do , Walcheren	1 do. Vegetable Marrow
½ oz Cabbage, Suttons' Imperial	1 oz Parsley, Extra Curled
½ do do , Wheeler's Early	1 oz Turnip, Suttons' Short-top
½ do do , Nonpareil	Six-weeks
1 packet do Hill's Incomparable Dwarf	1 do do , Green-top do
1 do Cuvee Tronchuda	1 do do , Orange Jelly
½ oz. Mustard, White	1 packet Tomato, mixed
2 do Cress, plain	2 oz Spinach, Round
1 do do , Curled	2 do do , Prickly
1 packet do , American	2 oz Radish, Beck's Short-top
1 do Savoy, Green Curled	1 do do , Scarlet Olive
	2 do do , Mixed Turnip

SUTTONS' NEW CATALOGUE FOR 1870

is now ready, and may be had gratis on application.

☞ *All Goods Carriage Free.*

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN, READING, BERKS

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.
L. W.'s system of packing saves nearly half the cost of carriage.
Munro Nursery, Sible Hedingham, Essex.

EXTRA STRONG FRUITING VINES.—Two Thousand close-jointed thoroughly ripened Canes can be supplied of Black Hamburgh, Golden Champion, Mrs. Pince, and other varieties, for fruiting in pots and for planting.
Descriptive CATALOGUE upon application.
JAMES DICKSON AND SONS, Newton Nurseries, Chester.

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.
Price 21s., 42s., and 63s. each
THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Vines, Extra Strong Fruiting.

FRANCIS & ARTHUR DICKSON & SONS have several thousand extra strong, thoroughly well-ripened, short-jointed VINES to offer, of the best known kinds, including the new ones of this season. Inspection invited. All who have seen them pronounce them to be as fine a lot of Vines as were ever grown. Price List free by post on application
The "Upton" Nurseries, Chester.

Vineries.

JOHN KEYNES has for several years grown some of the finest VINES in the Trade. He has not been in a position to offer any until this season. They are all of only one year's growth, from the eye, never having been cut down, as is often the case. These Vines will always prove a success; they are best adapted for planting, never having been checked in their growth.
They comprise all the leading varieties, and are now fit for immediate forcing, being well ripened at the top. LISTS will be forwarded on application.
Castle Street Nursery, Salisbury.

ORDERS respectfully solicited for PYRAMIDAL PEAR TREES, fine stuff, best sorts, 18s. per dozen
PYRAMIDAL APPLE TREES, fine stuff, best sorts, 12s. per dozen.
Dwarf-trained MARYDUCKE and MORELLO and BIGARREAU CHERRY TREES, very strong stuff, 20s. per dozen
Dwarf trained MOOR PARK APRICOT TREES, 30s. per dozen.
CHARLES SAUNDERS, Nurseryman, Jersey.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—Notice is hereby given that the ANNUAL GENERAL MEETING of the SUBSCRIBERS will take place at the Bedford Hotel, Covent Garden, on WEDNESDAY, January 12 next, for the purpose of RECEIVING the ACCOUNTS of the Society for the present year, and ELECTING OFFICERS for the ensuing year; also for the purpose of electing THREE PENSIONERS on the Funds
The Chair to be taken at 6 o'Clock precisely. The Ballot will close at 8 o'Clock precisely.—By Order, E. R. CUTLER, Secretary
13, Tavistock Row, Covent Garden
P.S. The Voting Papers have been delivered: any Subscriber not having received one is respectfully requested to make immediate application

The Gardeners' Chronicle

SATURDAY, JANUARY 1, 1870.

OF late years it has been our custom at the beginning of a new cycle to cast a parting glance over the EVENTS of the old YEAR, and thus in a measure to "be off with the old love, before we are on with the new." There is this great advantage attending such a revision, that it enables us as it were to take stock of the general condition of horticulture as reflected in our pages during the year, without entering so much into matters of detail, as a chronicler is bound to do at the time the events are in actual progress. At such a time, to borrow an illustration, it is often difficult to see the wood by reason of the trees of which it consists.

Of discussions on points of horticultural politics, if we may so call them, the most important has been that relating to the adulteration of seeds. Public attention was directed to this matter by the reports of the sub-Committee of the Royal Horticultural Society, and the comments made on them in our own columns, and in those of our contemporaries. A zealous band, comprising several of the leading provincial and metropolitan seed firms, set themselves to the disagreeable task of washing their own dirty linen, and of compelling others also to wash and be clean. Of course, there was considerable difficulty attending the task, and, as is usually the case, obstacles were thrown in the way. A Minister of the Crown deprecated any legislation on the matter. Others thought that no good result would accrue from it. The traditional coach-and-six would readily pass through the gaps. JOHN BULL would sit at home with whitened hands and empty till, while his less scrupulous fellow-trader across the herring pond would pile up his kiln fires all the higher, and mix all the more Rape-seed with his Turnip, if the "cookshops" of the Borough were closed. It was astonishing to see how these and sundry other obstacles were dispersed, like chaff before the wind, when the examination before the committee of the House of Commons revealed the extent to which the practices complained of were carried, even by the leading houses of the trade. After those revelations all opposition ceased: the Bill was enacted, and will become law in May next. Meanwhile, we may state, as one good result coming within our own knowledge, that it is no longer an easy matter to get any of the "000," or the "such as you use." We believe the trade themselves will form the best police to prevent the recurrence of these dishonourable transactions.

The scheme for the education of officers destined to serve in the forests of India has also been warmly discussed, which will, we have reason to think, be attended with the good result of causing some arrangements to be made whereby the necessity for any prolonged residence at the forest schools of Germany or France will be obviated.

The horticultural tourneys of the year have been as numerous as ever. The Tuesday meetings of the Royal Horticultural Society never lack interest or variety, as the numbers who attend them testify. The Scientific Committee has not been by any means idle, as our reports have borne witness. Of the great provincial shows, that held under the auspices of the Royal Horticultural Society at Manchester was in some respects a disappointment, owing mainly to the unsatisfactory local arrangements, brought about by the unfortunate want of harmony between the metropolitan and the Manchester societies. A novel and pleasant feature at this gathering, was the establishment of a "Congress" for the reading and discussion of papers, an institution that we hope to see continued on similar occasions, with the addition of some club-room, where the members may find a rendezvous for social converse. The Manchester National Show, and the Royal Caledonian Autumnal International, appear to have been eminently successful.

Abroad the event of the year in the matter of exhibitions has been the great International Horticultural Exhibition at St. Petersburgh, in May last, and fully reported in our columns at the time. Considering all the difficulties of time and place, this was a very successful exhibition, while the gracious hospitality and courtesy accorded to strangers by the Russian officials, from the EMPEROR downwards, will not soon be effaced from the memory. Equally successful as an exhibition with the Russian, the Hamburgh show did not partake so much of the prestige attaching to the series of "Internationals," of which the former made one. The selection of judges at the foreign exhibitions seems not to be regulated by our notions of the right man in the right place, and hence very considerable dissatisfaction arose among the British exhibitors when they saw their productions adjudicated upon by men who, while no doubt men of honour, were at the same time not always competent to fill the office of judge. If these exhibitions are really to be International, there must be no childish system of judging tolerated, but the most capable, as well as the most honest of jurors, must be appointed, and allowed to fulfil their office unswayed by patriotic or official prejudices.

Our foreign correspondence, as usual, has been of much interest. The special features and peculiarities of Russian gardening necessarily occupied a considerable share of attention. With the accounts of gardening in this vast northern empire may be contrasted the accounts given of matters of horticultural interest in Algiers, Spain, Hindostan, Australia, the West Indies, and North America. Vines and Potatos have occupied a very large share of attention in our Home Correspondence, and deservedly so, from their practical importance, as well as on account of the curious physiological problems, on the right solution of which successful culture so largely depends.

Our obituary record, always necessarily painful, is this year particularly so, from the loss of three men—chiefs in their several departments. All who know aught of the Royal Horticultural Society, or of the London International Horticultural Exhibition of 1866, will appreciate the magnitude of the loss sustained in the death of Sir CHARLES WENTWORTH DILKE, under particularly distressing circumstances. The death of ROBERT THOMPSON, of Chiswick, as well as that of JAMES VEITCH, of Chelsea, have been too recently commented on to render any further notice necessary at this time; while unfortunately our first number for the new year has to include a biographical notice of one of our foremost plantsmen, WILLIAM BARNES. We must defer till the ensuing number a review of the new flowers or fruits introduced during the past year, merely adding now that the prospects of the forthcoming season are such as promise full activity and interest to all concerned in horticulture.

To our readers and our contributors, through whose aid we have been enabled to chronicle the deeds of past years, we tender our hearty acknowledgments; and we solicit the favour of their continued help, that we may more perfectly

carry out our endeavour to render the incoming period to them, and to ourselves, "a happy new year."

It is gratifying to see that a taste for Palms is at last beginning to set in. More than one attempt has been made to bring about so desirable a result, and at one time we thought with but slight success, yet there can be no doubt that a movement to grow and use Palms is now on foot. Collections of respectable dimensions, in addition to our national one at Kew, are now to be met with in some of the large nurseries about London. Up to the present time there has been a disinclination to undertake the cultivation of this magnificent tribe of plants. It was thought that a natural order which contained the tallest monocotyledons, boasted the most extensive leaf expansion (Rhaphia), the largest spathes, the greatest number of flowers (Sagus), and the biggest tree-fruit known in the vegetable kingdom (Lodoicea), did not contain many members easily convertible into garden pets. But it was entirely overlooked, that if there are Palms which overtop some of the tallest trees, forming what St. Pierre poetically termed a forest above a forest, there are also a number of diminutive species, some scarcely a foot high (Malortiea), which even after they have attained their full dimensions, are admirably adapted for ordinary conservatories and greenhouses; that Palms, almost without exception, are striking objects of elegance and beauty, the moment they put forth a few leaves; and that it is not at all requisite, as with many other plants, to wait patiently for years before the eye can be gratified by a display of those qualities for which a species is cultivated.

On the Continent, where cultivators have to contend against a winter climate much less favourable to the growth of these plants than our own, Palms are, and have been for years, much greater favourites than with us. Several reasons are assigned for this. The taste has been fostered by their system of window gardening. Our mode of heating the room by means of open fireplaces, which allow the temperature to cool down towards morning to a prejudicial degree, and create dust and often smoke, and our plan of closing the shutters from within, has had the very opposite tendency. We don't hear of any young bachelors here, as on the Continent, devoting a corner of their room to the growth of choice foliage plants, amongst which Palms of various kinds occupy a prominent place. Such an arrangement, even if made in spite of all impediments, would soon end disastrously, and the traditional pots of Aucubas, Laurustinus, Box, and Deodars, outside the window, would speedily have to be resorted to again, in order to enjoy the sight of at least some green leaf or other during the winter. It is in consequence of such fundamental differences in the construction of Continental dwelling houses as compared with ours, that in England we do not find establishments where Palms are grown by the thousand, as Fuchsias, Calceolarias, and Pelargoniums are. The hitherto limited demand for the article, by the well-to-do middle class, affords a reason why Palms are with us higher in price than they are on the Continent, though for climatic and other reasons, we could grow them cheaper than our Continental competitors. Curiously enough, it is the comparatively high price which Palms still maintain in England that is assigned as a reason why their cultivation has not made more progress amongst us than it has. But this can relate only to some of the newer and rarer species; the older and commoner kinds may be had for almost the same price as on the Continent. Moreover, if Palms be compared in price with that of any other plants used for decorative purposes, it will be found that they are actually the cheapest in the end. Whilst Pelargoniums, Calceolarias, Cinerarias, and plants of a like description have to be renewed each time they are required, and the money paid for them is irrecoverably lost, a Palm, provided there be a place to keep it in, may be used year after year without losing any of its beauty or effectiveness.

Fortunately, although our sitting and drawing-rooms may not be so easily convertible into pseudo-conservatories, as are those of the Continent, we enjoy the great advantage of having more greenhouses and conservatories attached to our dwellings than our neighbours have, and, from our milder climate, we can keep them in order at less cost than they can. It is therefore only natural to assume that as soon as the Palmomania has once taken possession of us, we shall far outstrip them in the collections we accumulate. It is well known that a whole nation cannot pass through such a phase, as we think is now approaching, without conferring not only much and lasting benefit upon horticulture and all the branches of human art connected with it, but also solid results upon science. With the view of contributing to this end, we have in preparation a few notes, showing what material—thanks to enterprising travellers and plant merchants—is already in our gardens, and what remains yet to be done to convey to people who stay at home some faint notion of the tribe of plants which Linnæus designated as the princes of the vegetable kingdom.

— It is recorded in a recent number of the "Sud-Est," an agricultural and horticultural journal published at Grenoble, that a gardener near that place has contributed another interesting observation on the question of the Influence of the Stock on the Graft. He grafted the Pear called Deux Yeux and Poire de St. Pierre on the common Hawthorn, Cratægus Oxyacantha. In due time fruit was produced possessing the flavour of the Deux Yeux Pear, but resembling that of the Hawthorn in a certain amount of roughness, and especially in form. The Deux Yeux Pear is naturally elongated, slightly twisted, and rather pointed; the graft-hybrid is of shortened oval form, almost precisely like that of the Cratægus. The colour has also been changed, it is deeper; as to the flesh, it is firmer, and the fruit keeps better. In commenting on this case M. Verlot, confirming his own opinion by a reference to that of M. Paul Mortette, remarks that although the Pear succeeds for a time when grafted on the Hawthorn, it is not of long duration, because as the growth of the Pear is more vigorous that that of the Hawthorn, there is formed at the junction of the scion with the stock a large swelling. M. Verlot, while admitting that the nature of the stock may influence the flavour of the produce of the scion, is sceptical as to its producing any effect on the form of the fruit. Practically the use of the Hawthorn as a stock for the Pear is condemned, owing to the limited duration of the graft, and its use for this purpose should only be had recourse to in cases where the soils are unfavourable either for the free stock or the Quince. We cannot shut our eyes to the increasing number of cases of alleged graft-hybridisation. Very few of these cases have been submitted to the rigid scrutiny of competent observers; nevertheless, the number of the alleged cases is now so considerable, that the necessity for inquiry and direct experiment becomes urgent. So many interests are involved in this question, that it must not be pooh-poohed because it runs counter to general experience and belief. Admitting, for the sake of argument, that some of the recorded cases are what they pretend to be, it must still be granted that they are quite exceptional, but this very circumstance renders further investigation all the more desirable. In our search after the why and wherefore of the exception, we may perchance be able to light upon some of the "reasons why" for the general rule—itself greatly standing in need of further elucidation.

— The following extract from the annual report of the Horticultural Society of Victoria for 1869, is interesting commercially and practically, as well as scientifically. It appears that the Australian Society received from Chiswick, in April, 1868, some cuttings of fruit trees, taken in October, 1867. "There being no stocks in a condition for grafting when the cuttings were received (April), the scions were preserved until the following August, when they were grafted." It will thus be seen that a period of more than nine months elapsed from the time they were cut from the trees; nevertheless 66 Apples, 72 Pears, 24 Figs, 5 Vines, and 8 Plums have been saved of this consignment. The experiment is exceedingly interesting, as it proves conclusively that in the form of cutting, all the new varieties of fruit trees may be introduced with the certainty of success. The importance of this result will strike all who have experienced the losses and disappointments attending the importation of the trees. The introduction of new varieties is by this means rendered a very simple and inexpensive matter. A case of six cubic feet capacity will contain some thousands of cuttings, the trees of which would require a space equal to many hundreds of tons measurement. Another advantage with the cuttings is that the case may be hermetically sealed and stowed away like ordinary merchandise, whereas special instructions as to care (which is seldom exercised) have to be given as to the stowage of the cases containing trees.

— We learn from an announcement issued with the last number that the Editorship of the "Illustration Horticole"—one of the best of the Continental publications devoted to horticultural botany—is to be entrusted in future to M. E. André, well known in this country in connection with Sefton Park, Liverpool, an accomplished gardener and a practised writer, but with less claims as a botanist than his predecessor, M. Lemaire. The publications of M. Lemaire on garden botany have been very numerous, and his knowledge of Cactaceæ and of succulent plants has rarely, if ever, been equalled. In addition to his extensive acquirements as a botanist, M. Lemaire is a scholar. Many of his articles on plants mentioned in ancient literature are almost encyclopædic in their allusions to classical authors. In his zeal for accuracy of spelling in the case of names of plants derived from the Latin and Greek languages, M. Lemaire has occasionally displayed a little too much of the pedagogic spirit to be quite acceptable to some of his *confrères*. Nevertheless, though in some cases M. Lemaire's contest has been somewhat Quixotic, there can be no question as to the substantial value of his labours; and we trust that horticultural literature will long continue to be enriched by his learned dissertations.

— The following letter from an old rival of Mr. William Barnes', a notice of whose life appears in another page, does honour to the writer, and will, we doubt not, be well responded to:—

"You have no doubt heard of the death of our friend, William Barnes, and, like myself, with deep regret. He was one of a race of sound English gardeners, and something must be done to perpetuate his memory. What say you to a lithographic portrait, in the best style of art, a copy to be presented to each subscriber to the fund, the surplus copies to be sold, and the proceeds given to the funds of the Gardeners' Benevolent Society? The portrait of an honest man must be an ornament to every house, and I am sure it will always afford his friends pleasure to explain who and what he was. My contribution is ready at any time. Joseph Goold."

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Subscriptions may be forwarded to the Editors of the *Gardeners' Chronicle*, and of the *Notts Guardian*, Nottingham.

— We have been requested to publish the following statement of expenses incurred in promoting the Seeds Adulteration Bill of 1869. The subscribers whose names are given constituted the committee, of which Charles Sharpe, Esq., of Sleaford, was chairman; Thomas Thornton, Esq., of London, treasurer; and E. J. Beale, London (Carter & Co.), J. Robertson, Dublin, and R. Edgar, Esqs., Edinburgh, were honorary secretaries. It will be seen that after payment of all expenses there remains a balance of £2 13s. 8d., which has been handed over to the Editors of the *Gardeners' Chronicle*, by whom it has been presented to the funds of the Gardeners' Royal Benevolent Institution.

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— In a recent number of "Nature," Mr. Gwyn Jeffreys calls attention to the fact, that Plant Life appears to be absent from the Ocean, with the exception of a comparatively narrow fringe (known as the littoral and laminarian zones), which girds the coasts, and of the "Sargasso" tract in the Gulf of Mexico. "During the recent exploration in H.M.S. Porcupine of part of the North Atlantic," says the writer, "I could not detect the slightest trace of any vegetable organism at a greater depth than 15 fathoms. Animal organisms of all kinds and sizes, living and dead, were everywhere abundant, from the surface to the bottom; and it might at first be supposed that such constituted the only food of the oceanic animals which were observed, some of them being zoophagons, others sarcophagons, none phytophagons. But inasmuch as all animals are said to exhale carbonic acid gas, and on

their death the same gas is given out by their decomposition, whence do oceanic animals get that supply of carbon which terrestrial and littoral or shallow-water animals derive, directly or indirectly, from plants? Can any class of marine animals assimilate the carbon contained in the sea as plants assimilate the carbon contained in the air? The usual theory, that all animals ultimately depend for their nourishment on vegetable life, seems not to be applicable to the main ocean, and consequently not to one-half of the earth's surface."

—— One of the plans often effectual in resuscitating persons rescued from drowning, is to tickle the nostril either with a feather or by administering a pinch of snuff. Have the Chinese learnt this mode of treatment from us, or have we to learn something from them? At Hankow, it appears, they really treat their drowning people with something of the intelligence of Europeans, for when rescued they are provided with a change of clothing; and if other methods fail, a little of the burnt ashes of the pods of GLEDITSCHIA SINENSIS is placed in the nostril, which, it is said, causes the person to sneeze, when he speedily revives. Whether there is anything peculiar in the properties of these pods we are unable to say, but repeated pinches of the ash have failed in our case to produce even a single sneeze, though both snuff and pepper have an instantaneous effect; therefore it does not seem probable that these pods will ever be imported into this country in very considerable quantities for use by the Royal Humane Society, though we understand the Society has been making some inquiries about them.

—— Have any of our readers any experience of the AILANTUS as a TIMBER TREE? We see that, both in France and America, it is gaining ground in the estimation of practical men. Experiments made in France—we quote from the "American Agriculturist"—show the wood to have less density than that of the Oak, and greater than that of the Elm, while it is superior to either of the two in elasticity and tenacity. * * * Ailantus planks have been exposed to the weather for 27 years, without shelter or paint, and the wood is still perfectly preserved. The wood is useful for agricultural implements, and it neither warps nor cracks. It saws readily, and afterwards acquires great hardness under exposure to the air. The Ailantus grows so freely in this country, that it ought not to be a difficult matter to ascertain whether its timber is as serviceable here as it is said to be across the water. The flowers of the male plant (but not those of the female) are objectionable from their unpleasant odour.

—— We have received a long statement relating to the condition of the GARDENS at BICTON from Mr. ROBERT BEGBIE, who denies the accuracy of several of the particulars mentioned in our report of the condition of these gardens in the spring of last year. Mr. BEGBIE'S communication has been handed to our reporter, who in reply maintains that in all material points his report was substantially correct. This subject has been recently discussed in one of our law courts, when the verdict of the jury, from the evidence before them, was of such a nature as fully to confirm the favourable opinions published in our columns. Mr. BARNES' character as a man and a gardener is so thoroughly well appreciated by his compeers, and was so successfully vindicated in open court, that we must decline to insert Mr. BEGBIE'S communication, and confine ourselves to the general statement that he dissents alike from many of the statements of our reporter, as well as from much of the evidence by which the jury was guided in its decision.

—— Winter-time is the season of all others to show what SHRUBS do well by the SEASIDE. We have recently seen thriving on the Kentish coast, and making a great contrast to the now leafless and, in such situations, generally stunted, wind-bent, deciduous trees, Austrian Pines, Euonymus japonicus (in some cases covered with fruits), evergreen Oaks, common Bays, Veronica Andersoni (in bloom) Lavatera arborea, Tamarisk, Gorse, and other shrubs, as green and fresh as if there were no such things as "nor'-easters" or "sou'-westers." By the way, it is odd how certain plants are planted in certain places, and not in others apparently equally suitable. For instance, Atriplex Halimus, so common on the Dorset coast, is never seen in Kent; while the Tamarisk and Tree Mallow, so common in the latter county, are comparatively rarely seen further to the west.

—— The Société Royale de Flore of Brussels announces a great INTERNATIONAL EXHIBITION of ROSES, to take place on April 27, 1870. The Society undertakes to pay all the expenses of the transit of plants, &c., for this exhibition. Schedules may be obtained on application to the Secretary, M. LUBBERS, Rue du Berger, Ixelles (Brussels).

—— We perceive that the volume of the BOTANICAL MAGAZINE for 1869, just completed, is gracefully and appropriately dedicated by the Editor, Dr. HOOKER, to his artist-colleague, Mr. FITCH. The "Botanical Magazine," with its unbroken series of 5000 plates, is a work with which all connected may well be proud, and to whose conductors botanists and horticulturists owe a heavy debt of gratitude.

—— Our excellent American contemporary, the "Gardeners' Monthly," contains in a recent number the following announcement:—"Miss MARY HOVEY has been offered the HORTICULTURAL PROFESSORSHIP in the Kansas Agricultural College.

—— There is a vacancy in the PROFESSORSHIP of BOTANY in the ROYAL COLLEGE of SCIENCE in Dublin, owing to the resignation of Professor WYVILLE THOMSON. We believe that among the candidates for the vacant appointment are Dr. PERCEVAL WRIGHT, the newly-elected Professor of Botany in Trinity College; Dr. M'NAB, and Mr. DYER, of the Royal Agricultural College, Cirencester.

MEMORIAL TREES.

THE subject of memorials has in all times attracted the attention of men. The conqueror's column preserves for ages the fair fame of the hero in whose honour it was erected. Churches have been built to commemorate, with thankfulness, the success in the field of some one on whom the fortunes of war had been showered. The vast piles of the Egyptian pyramids encumber the plain with a breadth of base and height of apex that eclipses all other memorials, and tell clearly what ideas were predominant in those early days on this subject, while they show the magnitude of the resources of a people that could rear such monuments. We see in the Scottish cairn a very humble imitation of the same style of thing, where a cone or pyramid of field stones, has been flung together by friendly hands, to commemorate and honour a departed friend; hence the common phrase, "casting a stone to his cairn;" or the reverse, as in the following quotation,—"He hath nae coronach (funeral service), nae cairn, wha shamed the land that bore him." Cairns are also raised to mark the spot where an innocent party had suffered death, as we read in Burns—

> "Thro' the whins, and by the cairn
> Whaur hunters fand the murder'd bairn."

The cairn is pre-eminently the work of the people, each stone being an offering. The country people will pick up a round stone, and carry it a long way to lay it on the cairn of a friend; and in this way, after a time, the pyramid of unhewn stones gets to be a conspicuous memorial. Prince Albert is honoured in the Highlands by a cairn, the country people thereby paying their tribute of respect to the memory of a prince cut off in his prime.

At most of the old family seats in England there are certain trees which are held in especial veneration as belonging to periods marked and memorable on account of events occurring at the time such trees were planted, and I cannot do better than head the list with the following example of a memorial tree.

When "our good Queen" honoured the Earl of Ellesmere with a visit at Worsley Hall, her Majesty was pleased to commemorate the event by planting a fine evergreen tree on the lawn, which, to the credit of the illustrious planter be it said, is doing well. I saw it only a few days ago. Now, not only will "the Queen's tree" be shown by father to son, and marked in the local traditions, but hundreds of years hence it will record with accuracy the date of its planting, for its concentric rings will faithfully tell the number of winters that have gone over its head, every year being religiously wedded with a ring.

Events, such as births, marriages, or deaths, occurring in families of the "ancient line," are subjects for memorial trees. I have assisted illustrious persons to plant trees, and have deposited coins under the plant, as is done when the foundation stone of a building is laid with ceremony; and I recollect with what indignation a lady once answered me, when I named the removal of a certain tree that occupied a situation vastly too good for such a style of plant—"That tree," she said, "was planted to commemorate the birth of my sons (twins), and is therefore sacred." Byron has drawn with a masterly hand the lordly baron in his old baronial hall, with a kind of ministering angel, more properly guardian angel, under the garb of the Black Friar:—

> "Who still remained
> Unchased, unchained,
> And wouldn't be driven away.
> By the marriage bed of their lords, 'tis said,
> He flits at the bridal eve;
> And 'tis held as faith to their bed of death
> He comes but not grieve.
> When a child is born he is heard to mourn."

I need scarcely remark that such a ministering spirit adds much to the dignity of the illustrious house to which he is attached.

I was on one occasion shown some remarkable Oak trees in Staffordshire, the property of Lord Bagot, and the wood is marked in the county maps as Bagot's Park—part, no doubt, of the ancient forest. One majestic tree was measured by our party, and was about 20 feet in girth at 4 feet from the ground—a tree of great beauty, with a symmetrical mushroom-shaped head. Now, if such a tree were to be cut down before it decays in the centre, and the annual rings were counted, it would take us back to its sapling life—ay, to its rising from the acorn—say about the time when the English King Edward was exchanging blows with Bruce at Bannockburn (about 1314), for it must have been a goodly tree which Mary Queen of Scots was born, 200 years later. Unlike the random reasoning often resorted to in geological data, the Oak tells the truth in such a way that no one can dispute it. This is, indeed, the language of trees, "giving time a tongue." The sand runs down the glass, the shadow declines upon the sun-dial, and the seasons of summer and winter come round as if they taught us only the smaller lessons; but what are they to a living chronicler, waving his arms majestically before your hall door, recording on his oaken tablet some 20 or 30 generations of men, as if in scorn at the shortness of their lives when compared with his own. When a real lover of trees gets a view of some goodly Cedar of Lebanon for the first time, he can comprehend clearly the meaning of that fine passage in the Apocalypse where the destroying angel is directed to spare the trees—"Hurt not the earth, nor the sea, nor the trees."

Many trailing shrubs, when mounted on a tall stem, make excellent weeping shrubs for confined spaces, such as at the graves in the public cemeteries. The Cotoneasters belong to this class. The solemn, sad, sepulchral Yew, although a graceful ornament to the churchyard, is by no means a weeping tree; but the upright variety, Taxus baccata hibernica, the Irish Yew, when properly pruned to a single stem, and not allowed to form a bush, will do the Cypress style of cemetery work at the grave much better than the common Yew; and being not only a slow grower, but also a small tree, will keep within bounds for a long time.

I have before me long lists of weeping trees, but some, like the Weeping Ash, weep so clumsily that they are out of character in scenes where grief has power. The Weeping Willow (Salix babylonica) is by far the most characteristic of the whole group; it is unfortunately rather tender in the northern counties, but we see it on the banks of the clear streams in the south and west of England, at most of the paper manufactories, in perfection, waving its long slender branches gracefully over the water, and reminding every one by its trivial name of the Jewish captivity in Babylon, where Willows grew by the watercourses, and beauteous maidens wept their lives away under the shade of the trees, while sitting listlessly on the banks of the river. Weeping Willows are to be had at 1*s.* 6*d.* each, and therefore they are within the power of most persons to get and plant as memorials; and whatever other plants, such as the Weeping Elm and the like, may do, the Weeping Willow will always hold the first rank in illustrating unutterable woe, and that with a gracefulness peculiarly its own.

I would fain draw attention to the subject of living memorials, without saying a word against the humble cairn, the sandstone slab, the marble tomb, the monumental brass, or the effigy in armour or other mode whereby loving hands testify their respect—but these are all for deaths only. Such, however, is the great variety of trees, adorned with all sorts of attractions, that it is easy enough to find one suitable to be planted by a queen to commemorate a visit, or one to be planted on a "bridal eve," or "when a child is born." It has been said that the Dutchman plants a few Abele Poplars when he has a daughter born, to be a portion for her when she is married. The vast extent of waste land in this kingdom that, if planted, would produce good timber is something to be deplored. The quick growing trees produce an excellent return of profit in an ordinary lifetime, and as such plantations will shelter the arable land, and improve the climate, they are truly memorials of good landlords. Trees maintain a constant war with the winds: hence we read that the angel who held the four winds was instructed not to let the tempest loose to destroy the fair forests that had for ages adorned the landscape; and it is a happy and a consoling thought that the tree which you plant as a memorial, will certainly be counted worthy of heaven's protection to the last. *Alex. Forsyth, Salford.*

ARE ROOTS OR LEAVES THE FIRST PRODUCTION OF VEGETATION IN SPRING?

I HAVE no intention of entering minutely into the controversy which has been going on in your columns on this subject, especially as it refers to the case of the Vine. I think the leading article (p. 1329, 1869) is very much to the point, as far as Vines are concerned, for they are exceedingly plastic and bending in their ways, and will make roots or foliage first, just according as circumstances favour the development of these respective organs. This, however, is a very different thing from the ordinary rule of Nature, taking vegetation generally. So also are the freaks and efforts of transplanted trees and shrubs, when by such a process their ordinary modes of action and life are disturbed, and their system violently checked. It is not surprising that under circumstances like these Nature should move somewhat out of the ordinary routine, and make efforts to repair damage, and, so to speak, restore the balance of disturbed power. The action of roots or tops under such conditions does not, I should say, furnish us with facts which can be legitimately applied to settle the question, as to whether plants or trees make roots or tops first under their ordinary and more natural

conditions. Such action on the part of roots and tops furnish freaks and efforts interesting and instructive to the vegetable physiologist, in the same way as functional derangement furnishes the doctor with interesting details, which, however, cannot be adduced to determine the exact mode of action in the healthy subject.

Many a gardener has potted deciduous shrubs in late autumn, after the fall of the leaf, and plunged their roots in bottom-heat, keeping their tops cool, and the result of such treatment is the formation of a mass of young white roots, without any motion in bud or branch. The Vine so treated will act in the same way. But let anyone observe the rapidity of growth which takes place in many of our trees under ordinary circumstances in the end of May and June, and see how rapidly they push forth the whole length of the season's growth, and it will be found that in many instances the process extends over only what I think may be justly termed a few days. Some of these trees, if felled and left lying in early spring, would make similar growth. Doubtless the fountain of such a rush of organisable matter poured to every part of a tree is (as referred to at p. 1329, 1869) the stored-up material of the previous season. This, I think, has been regarded by all reliable physiologists as the ordinary course.

As to the Vine, it may be made to play the most fantastic tricks imaginable, and does play them without any intentional making on the part of the operator. Who that has struck Vine eyes in quantity has not observed that, out of a number cut from the same shoot, and placed in the same pot or pan, some will make 2 inches of top growth before they throw out a single root, and some will make long and strong roots before the bud even begins to swell or move. It has more than once or twice been incumbent on me to root out Vines from cold outside borders after they have made considerable top growth, and in none of these instances did I observe the slightest sign of movement on the part of the roots. In numerous cases I have added fresh instalments to the extremity of Vine borders in which young vigorous Vines were growing in dry and warm borders, and have found, particularly in the case of roots that had found their way down among the masses of open rubble below the soil, young white growing-looking roots, while the Vines were at rest. I have planted Vines in inside borders between the front walls of vineries and the hot-water pipes, laying a portion of the stems of the Vine in the border to such an extent as to throw the roots beyond the pipes more into the interior of the house, and have several years afterwards cut the portion of Vine layered away entirely, finding that but one of the roots had ever moved at all, but that the Vine had furnished itself with roots near where the stem emerged from the ground, and underneath the pipes where the heat had effect on the soil. I have planted Vines without layering any of the main stems, and no further back than last spring examined regularly when the young white roots began to bite the soil. In such cases, no bottom-heat being enjoyed by the roots, I found the tops grew considerably, and developed leaves for a time, till the shoots were a foot or so in length, and then came a halt, and they would flag under bright sun and air, and so continue for 10 or more days, till the old roots began to send out young crow-quill-like rootlets, and then they started to make rapid and vigorous top-growth. Why did such Vines make a growth, and why halt till young roots began to be formed? My own way of accounting for it has been that, the stored-up material being exhausted, they had to wait till roots were formed that could send up more in sufficient quantity to be manufactured into the elements of growth.

Vines do curious things sometimes under different circumstances. Old Vines have been sawn off at their junction with the soil—entirely separated from their roots, and made to grow vigorously that same year, and to bear a crop the following. I have forced one half of a Vine to break in December and ripen its crop in April, and the other branches of it to break in April and ripen in September, the whole of the roots being in an outside unheated border. The April part of it gave compact bunches, as black as jet, and with not a shanked berry, while those ripening in September did not colour well, and were more or less shanked. These facts may interest some of your physiological readers, and teach us who write not to be too dogmatical, while physiology as applied to horticulture is not much more than out of long clothes. *David Thomson, Drumlanrig.*

A CHAPTER ON AGAVES.

A. FILIFERA (Salm-Dyck) is a compact plant, belonging to the group with filiferous-margined leaves and spicate inflorescence, and exists in gardens under two or three tolerably distinct varieties. A. filifera v. densa has leaves about 1 foot long, with very sharp red points, and their breadth is about ¾ inch. What is generally acknowledged to be the true A. filifera (S. D.) has leaves 12 to 14 inches long, and 1½ inch broad, but extremely rigid; the whole plant presenting a remarkably symmetrical slightly hemispherical contour. Spike 6—8 feet high, with greenish flowers. Probably this is A. filifera v. latifolia of the Continental catalogues. A third plant has leaves from 1 foot to 20 inches long, and 1½ inch wide, but they are not so rigid as those of the two last-named plants; indeed, the lower leaves are recurved, and the plant is not so symmetrical. This plant is named A. filamentosa in the splendid collection of Agaveæ at Kew, on the authority of General Jacobi, a

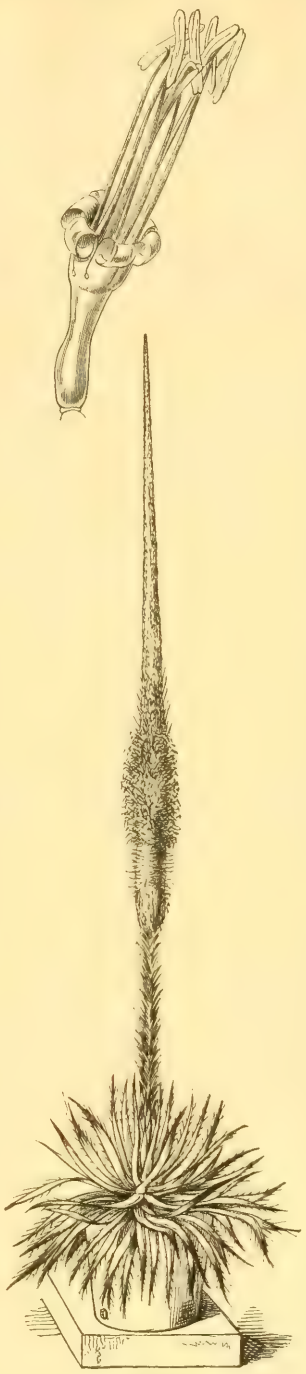

FIG. 1.

botanist who has paid particular attention to these noble plants.* In Continental catalogues mention is made of A. filifera v. longifolia, which is in all probability the same plant. This last has a spike of chocolate-coloured flowers, and has lately flowered in the Kew collection, where our illustration, (fig. 1) was taken. A few notes on this fine plant may be interesting to those interested in succulents.

When these flowers first expand the filaments are short, and folded back (replicate), the style also being shorter than the lobes of the perianth, but these organs eventually lengthen to 2 inches before the anthers shed their pollen. After the flower has been open for some time, the filaments shrivel, and hang loosely from the mouth of the tube; but the stigma, not being sufficiently advanced to be fertilised with the pollen from its own flower, the style remains for a day or two longer in a horizontal position, in order that it may catch the pollen as it falls from the flowers that open in succession immediately above it. The perianth tubes secrete large quantities of nectar, which attract numerous insects, as wasps, flies, &c., and which no doubt assist in the fertilising process, as they struggle through the dense mass of filaments that impede their progress from flower to flower.

Another beautiful plant belonging to the filiferous group is A. schidigera (Lemaire), Bot. Mag., t. 5641 (A. filifera v. pannosa, Schiede), with leaves 1 foot long and ¼-inch broad, of a bright green colour, marked with white longitudinal bars. It has also white margins to its leaves, from which are given off recurved and rather woolly filamentary appendages. Flower spike 6 feet high. Flowers pale green. A variety with longer leaves is known on the Continent as A. schidigera v. longifolia.

A. geminiflora (Gawl.), syn. Bonapartea juncea (Wild.), Littæa geminiflora (Tagl.), is a neat and very ornamental species, representing the "spicate juncifform" group. Seedlings of this species vary considerably, some having the margins of their bright green, rush-like leaves, filiferous, and others being entirely destitute of these thread-like appendages. Amongst the larger-growing species, there are many admirably adapted for ornamental purposes; their bold, striking forms harmonise well with classical architecture, indeed, nothing can equal them for the decoration of massive terraces, &c., and other architectural features.

The old A. americana, and its variety variegata, to which we may add A. Hookeri, A. Jacquiniana, A. Karatto, A. univittata, and A. fourcroides are amongst the best for this purpose.

A. glaucescens is a splendid caulescent species, with large, thick and glaucous leaves, 2 feet long, and is one of the most distinct species we have.

These plants require for cultivation a good fibrous loam with a little sand, and a few crocks intermixed; they are partial to an abundance of water during their growing season, but care must be taken during the dull winter months, as they are rather apt to rot if water lodge in the centre of the plant.

It is not supposed that every one has convenience for a complete collection, but a few of the best species may be grown in nearly every establishment, and will prove extremely useful for outdoor decoration during the summer months, whilst they may ornament the conservatory during the winter. *F. W. B.*

THE CHARM OF A KITCHEN GARDEN.

IT has often been said that "Order is Heaven's first law." With much truth it may be affirmed that it constitutes the chief charm of successful kitchen gardening. There can be no pleasure in the mess and muddle of a disorderly garden. Doubtless, too, these things are less common than they once were. Still they are far from extinct, and some cultivators even seem to think order incompatible with good crops. They put things in anyhow—anywhere—regardless of everything but a good yield. They act as if things did better by chance than design. They seem to have a vague foreboding that a "place for everything, and everything in its place," would in some mysterious manner lessen the amount of produce. Their gardens are a meaningless medley—a labyrinthine maze of monotonous patches, a dreary entanglement of Onions and sweet herbs, Parsley and Peas, Turnips and Beans, Carrots and Globe Artichokes, Celery and Cabbages, bush fruits and French Beans, fruit trees and Beet-root, Leeks and Borage, Broccoli and Strawberries, Kale and Potatos.

In some such gardens I have seen as many as six plots of Onions, a dozen patches of herbs, Strawberry plots by the score, and everything everywhere, and no quantity of anything anywhere. The excuse that I once heard offered for this patch cropping was rather remarkable. The gardener gravely affirmed that it enabled him to find out where everything did best. It was justly observed that he did not seem to have profited much by his experience, as he grew about the same quantity upon the genial as the ungenial spots. Patch

* A. filifera var. = A. filamentosa in Hort Kew. Plant sub-hemispherical, stemless. Leaves 12—20 inches long, 1½ inch broad, ensiform, with dark pungent apices, dilated, and swollen at the base, slightly contracted immediately above it; edges of the leaves entire, with the exception of a few slender, flexuose filaments 2—3 inches long. Scapes rigid, erect, 10—12 feet high, the lower portion covered with protuberances arranged spirally (½), each bearing a sub-erect bract 3—4 inches long. Spike many flowered, cylindrical. Flowers, including the exserted stamens, 3 inches long; tube green, lobes of the perianth dull purple, borne in pairs (geminate), each pair being subtended by a flexuose, tapering bract. Pedicels very short, with minute bracteoles. Ovary glabrous, somewhat hexagonal in section. Perianth tube as long as the ovary, slightly funnel-shaped. Lobes as long as the tube, oblong, acute, revolute. Filaments subulate, about 2 inches long. Anthers linear, elongate. Style 2½ inches long, linear. Stigma obtusely trilobed.

cropping might be justifiable one year as an experiment, but scarcely for more, as the very result of the test should lead to the accumulation of the crops into masses around the centres that best suited them.

But such a mode of testing is scarcely needed. The practised eye can tell where each crop is likely to do best. Besides, the whole kitchen garden ought to be suitable, or capable of being made so, by the help of manure, for any crop we grow, so as to admit of a system of systematic rotation.

The latter becomes much more practicable when the whole of each crop is grown together. The only exception I make to this rule is in the case of tall crops, such as Peas and Scarlet Runners. The former are grown wide asunder, among such crops as Cauliflower, Broccoli, and sometimes Potatos, so as to have the light and air all around them; and the latter as ornamental boundary lines to plantations of other vegetables. These are grown in blocks or masses, saladings on borders, herbs in a garden to themselves, Parsley as garnishing lines to secondary walks; and the effect is pleasing, and the result abundance. This massing of sweet, crisp, succulent, healthy vegetation, is as pleasing in its way as the massing of flowers by the thousand in another place. We have, in fact, many visitors who seem to prefer the kitchen garden to any other portion of the grounds. But then I must add that most of the main walks have narrow lines of floral beauty, and that all of them are cut off from the main fruit or vegetable quarters by 6 or more feet of fruit borders, furnished with pyramidal Apple or Pear trees, which, whether in leaf, flower, or fruit, are things of real beauty, symmetry, and order; and that they fill the fruit-basket so well that we have just taken in a 3 acre orchard into the lawn or rosary, and trust to those trees and a few lines of cordons and espaliers for our full supply.

With the exception of one Mulberry tree we have no others in the garden, consequently we have no contest between fruit tree and vegetable roots, a condition which I heartly condemn not only on the ground of maintaining order—a place for everything, and everything in its place—but with the view of reaching the highest success in both fruit and vegetable culture. The wants of the two classes of crops are very different. What would be wholesome food for vegetables is rank poison or sheer injury for fruit trees, and it is a positive reflection upon the science and practice of our times, that so many cultivators will still insist upon attempting the impossible feat of growing both to the highest perfection, upon the same ground, at the same time, and by means of the same appliances. Instead of this waste of power and expenditure of talent in attempting the impossible, let these be directed to the orderly arrangement of the ground at our disposal, and then every kitchen garden will be divided into fruit and vegetable compartments —the former constituting a garden by itself, or skirting the vegetables with well furnished borders of conical trees or bushes. Thus the charm of order and beauty will be thrown around the garden devoted to utility, and the quarters be left free at all times for the spade of the trencher, the drainer, the digger, the manurer, and the hand of the planter and harvester of their perfectly developed, abundant produce. *D. T. Fish.*

Home Correspondence.

The Castle Kennedy Vines.—"According to Mr. Fowler, 10 years may be considered the life of a Vine as grown upon the Castle Kennedy plan; and if such is the fact, we must confess that the light is not worth the candle." In reading the above paragraph I was somewhat startled, more particularly as it appeared in a leading article of the *Gardeners' Chronicle* (Dec. 11, 1869, p. 1277), but in turning over the leaf I felt greatly relieved when I found that it was not Editorial, but signed "P." As 10 years have now passed since many of the Castle Kennedy Vines were planted, my first impression was to run down to the vineries, and see whether any life yet remained in the Vines, or whether they were all as dead as "P." makes them appear. From the little I can gather of "P." in the above paragraph, I have come to the conclusion that he must be a thorough-going liberal, seeing that he generously, if not very justly, puts words into my mouth which I never gave expression to, and then takes for granted that these events have come to pass; and thus, within the compass of one short paragraph, tries to destroy not only the Vines at Castle Kennedy, but also the prestige of aërated Vine borders. But notwithstanding, there must be considerable vitality in the principle of aërated borders, for what "P." calls in another part of the same article, "the now fashionable aërated borders," must be greatly on the increase, otherwise the designation is misapplied. This increase may reasonably be expected, because the principle of aërated Vine borders is in harmony with sound practice; is a means of raising the temperature of the soil around the roots—and thus greatly increasing the root action; and is an aid in balancing the artificial heat, which in all glass structures, to a lesser or greater extent, is made to surround the stem, branches, leaves, and fruit of the Vine during the growing season. I have now for nearly a quarter of a century been experimenting on this subject, and have occasionally advocated it in the pages of the *Gardeners' Chronicle* and other horticultural periodicals; I have also practically, and somewhat successfully carried it out at Castle Kennedy, and been the means of introducing it to many other places. And now that aërated Vine borders are so unmercifully condemned by "P.," and my practice in regard thereto put on its defence, I think that I cannot do better than refer "P." to two places where it has been judiciously and successfully carried out. A few years ago, when called upon by the Earl of Strathmore to prepare plans for his princely gardens at Glamis Castle, Forfar, I had an opportunity of introducing aërated borders in all the fruit houses of the principal range of forcing houses, which is 400 feet in length. These gardens while being formed, and since, have been under the able management of Mr. Johnston, whose reputation as a successful Grape grower is already well known in Scotland. The fruit grown and shown by him at the late great International Show at Edinburgh, requires only to be named to remind those who saw it of its great superiority. It was grown on aërated borders, and carried off nearly all the principal prizes at that exhibition. There were also some magnificent Grapes shown, particularly Golden Hamburghs, which were grown at Cairnwynn House, the property of Sir William Wallace, Bart., which also competed successfully, and created much interest: these also were grown on aërated borders, the construction of which I had the honour to superintend. I am not one of those who believe, or would wish others to believe, that aërated borders alone will produce fine Grapes; it is only one point in good management, and, as far as I am able to form an opinion, I believe it to be an important one, but, like most other things, there is a right and a wrong way of doing it. It is quite possible, and not an uncommon occurrence to overdo it, and then condemn the system. Another common mistake in connection with aërated Vine borders is to make the borders too shallow; they should be from 2½ to 4 feet, deepest in the dryest and shallowest in the wettest climates. If "P.," who probably lives in a dryer climate than I do, would judiciously aërate his Vine borders, and make them sufficiently deep, I will answer for it that no evil consequence will follow to his Vines, but the reverse; whether he adopts the ordinary system of pruning, if it does not cramp them too much, or prefers the "extension system of Vine management," against which I have not one word to say. So long as his Vine borders remain unexhausted, so long will his Vines remain in perfect health (all other conditions being favourable), and no longer, the length of time depending on the quality of the soil, which, if favourable to the growth of the Vine, and in sufficient quantity, may continue for many years, and if not, may require to be partially or wholly renewed every 10 or 12 years. When the borders are properly constructed, this can be done without losing a crop of fruit, or otherwise seriously injuring the Vines. *Archibald Fowler, Castle Kennedy, Stranraer.*

Vine Budding.—There was no doubt at all about the Vine budding case which I mentioned at Manchester. It was real honest bark-budding, such as one performs upon a Brier stock on a fine summer evening in the "leafy month of June"—not grafting bewitched. The bark of the Vine will "run" as completely as that of any other plant, if the portion of the shoot operated upon be sufficiently ripened. I may add that my practical result was a magnificent rod, and good subsequent crop. *R. T. Clarke, Welton Place, Daventry.*

Sambucus racemosa.—A tin canister full of berries of this shrub was sent here from Switzerland in September, 1863. The seeds were immediately sown in a drill in the corner of the kitchen garden, and soon came up thickly enough. The following summer many of the plants made shoots from 4 to 5 feet high. They were then dug up and transplanted, merely to give them more room, and 12 months afterwards they were transferred to the shrubbery borders, where they grew amazingly, and in 1866 had a nice crop of berries on. In 1867 the bushes were literally loaded with fruit, which the blackbirds, after they had once tasted them, took great pains to destroy in as short a time as possible. The trees were now too big for the places they occupied; moreover, we seemed to be in some danger of being overrun with them, so they were once more dug up, a lot of them thrown away, and the remainder planted as permanent bushes. They stood all this knocking about with impunity, and in 1868 were again covered with fruit; but, strange to say, during the past summer there has not been a berry to be seen on any of them. This hardly bears out the idea that the plant requires a hot summer. *F. H., Osmaston Manor, Derby.*

—— In the park here is a plant of this shrub about 6 feet high. It blossoms freely every year, but the fruit rarely remains long enough on the racemes to make any marked display. Rough winds and sudden changes of temperature appear to be mainly influential in causing the premature falling of the fruit. It may be inferred that it would do best in situations that are high, dry, and sheltered. Loudon says that it makes a fine display in Paris gardens. *Bath.*

The Deodar. — Nothing has surprised me more than to find some of your correspondents recommending this tree to be largely planted as a timber tree. Even if its timber were known to be valuable when produced in this country, I think it would only be in very favourable localities that it could be so planted with a hope of profit. In my nurseries the Deodar was killed in 1837, and again in 1860, and what has happened twice may happen again. Looking upon the Cedrus Deodara merely as an ornamental tree, I know no tree, unless it be the Araucaria imbricata, which has so disappointed people's expectations. As a young plant it is a beautiful and graceful object, but as it gets older its shoots, in place of being long and pendulous, become short and stiff in most situations, and, what is worse, are often unhealthy looking. I have seen no old Deodar that bids fair to at all equal the Cedar of Lebanon in appearance. I do not think it is equal in hardiness to this grand old tree, but even if it were, it has the habit of putting out its young shoots earlier in the spring; and in the midland counties these are so often cut by late frosts, that I think the unhealthy and stunted appearance of the trees may be thus accounted for. Were compensation offered for the loss sustained by nurserymen in the year 1860 for Deodars alone, I wonder what would be the sum at which it would be assessed. Surely it cannot be right to recommend such a tree to be planted for timber? *J. R. Pearson, Chilwell.*

—— I cannot altogether agree with Mr. Barnes' letter on the Deodar (see p. 1279, 1869). We are here 12 miles from the sea and with the South Down Hills between us, yet notwithstanding that some Deodars are tolerably sheltered from the south and south-west, the chances are that if we have a heavy gale of wind blowing from either of those quarters they suffer in the loss of branches. Instead of affording shelter to exposed tracts of country, I believe it to be a tree that requires great shelter if it is ever to attain any size. *Geo. Grantham.*

Cyperus alternifolius variegatus.—When this plant was first sent out, one of your correspondents, having been to Kew, was told [by whom?] that the only way to produce variegation was to grow the plant in pure silver sand. At that time I was living on the borders of the New Forest, Hants. Poor peat being plentiful, I got some, and put about a sixth part of sand. Having a small plant in a thumb-pot, I repotted it into a 32-inch pot, and nothing could have been more beautiful than the foliage was. The late Mr. Barnes, of Camberwell, also wrote, having grown his in hungry peat with the same success. I believe the plant to be an aquatic; if kept in a small pot, and placed in something to hold water, the plant enjoys it, and the variegation is much better than otherwise. If Mr. Bennett gives his plants a liberal shift once a year, I am bound to say he will have to use his scissors to cut out the non-variegated parts. In regard to resting the plant during the winter season, I think it is the most useful then for any purpose; but that is a matter of taste. I have two plants growing in stiff loam and sand, and the foliage is almost white. They are in 6-inch pots, and have not been repotted for two years. I think most probably that Mr. Bennett, like myself, uses the scissors occasionally to keep his plants true to their colours. *T. C., Warwick.*

Chimonanthus fragrans.—I have been interested with the information respecting the fruiting of Chimonanthus fragrans, elicited by the reference to it in my paper in "Nature," having been assured by one of our leading nurserymen that it never fruited in this country. Can any of your correspondents furnish instances of the fruiting of Jasminum nudiflorum, and under what conditions? *Alfred W. Bennett, 3, Park Village East, Regent's Park, December 27.*

Eupatorium gracile odoratum is in flower here now, and I am much pleased with it, as it does well in a warm greenhouse. Before the first lot of flowers is open there is a second lot showing on the same plant. It will be very useful for bouquets, coat flowers, and general decoration. Strike in February and March; pot in any ordinary good soil, and plant out-of-doors in June. Take up early in September, and with the ordinary care of a Verbena it may be had in flower all the year round. I should think, from what I have seen of it, it will be everybody's plant when better known. *W. Howard, Balham, S.W.*

Bouvardia jasminiflora and longiflora are very useful, sweet-scented, winter-flowering plants, much neglected by gardeners in general, in consequence of their not having a proper place for them. They require a warm, light, airy house, close to the glass during the autumn, winter, and spring months, and during the summer to be planted out in the open garden, in good soil, repotting again in September. They may be increased by cuttings or seedlings, as they seed very freely. Place the plants in a warm moist house six weeks before you take the cuttings, then they strike very freely in the spring; pot in good rich fibry peat and loam, adding coarse sand; syringe the plants daily. In case red spider appears, syringe with clear soot or sulphur water, and if green-fly shows itself, smoke with tobacco-paper. B. jasminiflora is the freest of the two, but longiflora has the largest flowers, and is the sweetest scented. When the pots are full of roots, water with liquid manure frequently. All kinds of Bouvardias like the same treatment, with the exception of the rough-leaved one, which will not stand the syringe so much. *W. Howard, Bedford Hill, Balham, S.W.*

Bulb Potting.—Your correspondent, "M.," incidentally alludes (see p. 1310, 1869) to my not being explicit enough in speaking of the potting of bulbs of

Nerine. I am one of those who think that bulbs may be potted at any time under certain conditions. If they be growing, both root and top, they must be exchanged from a lesser to a greater size of pot, with no attempt to disturb the roots at all, further than to pick out the loose potsherds that have been used as draining material. This remark applies to all bulbs, Nerines, Liliums, &c. Root formation is going on in Liliums when the tops are apparently at rest. It is therefore good practice to pot rather too early than too late; in other words, October is better than February. The latter month is the preferable month if extension of pot room without meddling with the roots is the intention. In most places the Lilium bulb balls are somewhat reduced, so that new food may be presented in less pot space. Upon the whole this seems to me to be the correct cultural plan. Any month later than November is not suitable for interference with the ball, because the breaking of it up means the destruction of root fibrils to a greater or less degree. L. auratum, for instance, is a much more gross rooting plant than its compeer Lilies, and I would much rather deal with the potting of bulbs of that species immediately after stems showed symptoms of decay, than in the dead of winter or in early spring. All depends, however, upon the care of the operative gardener. Lilium bulbs, as a rule, are very impatient of drought, and require to live over the resting season in a moist medium, unaccompanied with heat. Like the Hyacinth, the Lilies make their roots best in a state of quiescence, or even in total darkness; and like them the stems burst away with increasing vigour in proportion to the kind of attention they receive, if attention it might be called, in the so-called quiet or dormant season. *A.*

Picea Nordmanniana.—In the report of the "Proceedings of the Botanical Society of Edinburgh" for November, published lately in the *Gardeners' Chronicle* (p. 1284, 1869), an error occurs, for which, I believe, I am to blame, having drawn up that report for the newspapers. The cones exhibited at that meeting by Mr. Bissett, and which had been produced this season at Moncreiffe House, Perthshire, were not those of Picea cephalonica, as stated, but of P. Nordmanniana. I am not aware of the cones of this species having arrived at maturity in Scotland before. The tree produced 18 cones, from which a small quantity of fully ripened seed has been obtained. *John Sadler, Vice-Secretary and Curator, Botanical Society.*

Yellow Bedding Plants.—I agree with your correspondent, "T. P. T.," in stating that Mr. Bennett has suggested a very poor substitute for the Calceolaria. I have had as much experience in both spring and summer bedding as any man. For many years I have grown the Pansy very extensively for the decoration of the flower garden in spring, at which time of course they make a grand display, associated with the Myosotis, Silene, Wallflowers, and other plants. But to recommend it as a summer bedding plant would be quite contrary to my experience, and I think it would be fighting against reason. Admitting everything in favour of the Pansy as a spring bedder, I also venture to assert that ninety-nine out of every hundred gardeners will recognise it as not eligible for a place in the summer garden, much more to take the place of the Calceolaria—a plant which, if properly treated, will be the source of very little disappointment. *C. H.*

Aquilegia eximia.—An Aquilegia from California is in the gardens, or was so a year or two ago, under the name of A. eximia, Van Houtte ("Flore des Serres," Jan. 1857, with a coloured figure). Mr. Thompson, of Ipswich, who knows so well most herbaceous cultivated plants, ascertained that the same species had been published by Lindley in the *Gardeners' Chronicle*, in 1854, as A. californica. Accordingly I called attention to it under that name in the "Proceedings" of the American Academy, 7, p. 328. But I find since that there is a still earlier and characteristic name, and a good description and figure of the species, *i. e.*, A. truncata, of Fischer and Meyer, in "Index Sem. Petrop.," suppl. 1843, which is copied into the 18th volume of the "Linnæa," also in "Walpers' Repert." 5, p. 6 (1845), and finally, the second fasciculus of the huge "Sertum Petropolitanum," which purports to be issued in 1846, contains a good figure. The species is perfectly recognisable by its reflexed spreading sepals and truncate petals, these reduced to a spur, with hardly a vestige of lamina. *A. Gray, Cambridge, Mass., U. S.*

Misrepresentation. — Though our neighbours across the Channel absorb much parliamentary time in the verification of powers, we can hardly expect you to waste space or impose upon the time of your readers by allowing us to verify quotations. For this reason I content myself with a simple denial of any misrepresentation of Mr. McMillan, and in proof of my exactness in stating the names of others I confidently appeal to his letter at p. 1161 (1869), and to the three sentences in which I advert to it near the bottom of column *c*, p. 1279. To those who believe with Mr. McMillan that pumps raise water by drawing it up with their valves or suction, I commend the perusal of any elementary work upon natural philosophy. *D. T. Fish.* [We can insert no more on this topic. Eds.]

The Cherimoyer (Anona Cherimolia).—May I ask if you know any example of the Cherimoyer having set fruit in this country? It blooms abundantly, but I have never heard of its producing fruit. In the tropics, both the Cherimoyer and its near ally, the Custard Apple, ripen without difficulty; and from the structure of the organs of the genus Anona, there seems no reason why we should fail in England. *S. B.* [We do not. Eds.]

Storing Ice.—I should be glad of any information as to the cheapest and most effectual mode of storing ice, which is not intended to be opened for use till August or September. Would a stack thatched with leaves and branches of Fir be as good as one thatched with straw? *H. O.* [The cheapest mode of storing ice is undoubtedly by stacking it in heaps, and under proper conditions the plan is thoroughly effectual. We reproduce from our volume for 1848, an illustration showing a section of an ice stack, accompanied by the remarks thereupon of Mr. W. Ingram. The full particulars will be found at p. 812 of the volume referred to:—"Wherever the choice of situation, &c., is commanded, the economical and effectual plan of building stacks on the surface of the ground should be pursued. Those unacquainted with the last-mentioned plan may find the subjoined description of the system which is practised here (Hatfield) with unvarying success, useful. The position chosen for the ice stacks is peculiarly suitable, being the north side of a considerable embankment or dam, which stretches across a hollow, and causes on the south side, by intercepting the drainage from surrounding slopes, a large piece of water, which supplies the ice. The embankment has the further advantage of being clothed with timber trees. The stacks are built on the dry side of this bank, which slopes gradually to the bottom, and is made hard and smooth to receive the ice. No drains are permitted, the angle of the slope being sufficient to carry off the drainage from the ice. The body of ice is supported by a wall of Fern and leaves, 4 to 5 feet in thickness, which is built up in the first instance, and subsequently hored up and secured by hurdles. The ice is thrown

Fig. 2.

within this circular wall, and well pulverised. It is built in a conical form, or perhaps it takes rather the shape of the common haystack. The ice is rammed as closely as possible in a compact mass. A little clean straw is first strewn over the top; a covering of Fern at least 18 inches in thickness follows, after which its complete security from rain or the action of the atmosphere is ensured by a thatch of straw, made so that on the decrease of the ice its simultaneous fall may not be prevented by the sides of the stack. As this cannot always be exactly done, the roof should be examined occasionally in the course of the season, and its gradual descent provided for. In the woodcut (Fig. 2) A represents the ice, B the wall of Fern, and C the thatch. The size of the enclosed space for ice was in one case 24 feet by 20 feet, and in another 21 feet by 16 feet, the extreme height being 15 feet."—Another economical plan, practised in Herefordshire, is described at p. 838, 1856, by Mr. Maxton. He digs in a dry bank with a north exposure and shaded by trees, a circular hole 12 feet diameter at top, 2 feet at bottom, and 8 feet deep, with a common drain, the outlet of which is covered with loose rubbish, to prevent the ingress of air. Faggots to the depth of 1 foot are put over the bottom, then clean dry straw over the faggots and round the sides 6 inches thick. The ice is well broken, and rammed in till the hole is full, and is then piled up in the shape of a cone, covered with a layer of straw, then with Fern 2 feet thick, and finally thatched with Laurel boughs. This plan does not fail to keep a supply during summer and autumn, or until fresh ice is obtainable. Eds.]

Eucharis amazonica.—This is a plant which will amply repay every care that is bestowed upon it. With judicious management, and a moderate stock of plants, it may be had in bloom at almost any period of the year. I prefer it through the winter months, and if hardened off gradually it will stand for a long time in the conservatory or in the drawing-room. I have a plant now in bloom with thirteen spikes, each bearing from five to seven beautiful white blooms. This plant has flowered three times this year (1869). I grow it in a mixture of peat and leaf-mould, with the addition of a little silver sand and broken charcoal. After the plants have done flowering I place them in a cool house for a short time, and keep them a little drier than before, after which I place them in a good moist temperature, giving plenty of water at the roots until the plant shows flower, when a little liquid manure water is given. Though not equal to the above, the pretty Eucharis candida is well worth growing, being smaller in size. *A. Wright, Sunnyside, Regent's Park.*

Arbutus procera.—I enclose a photograph taken of an Arbutus procera, which had not fewer than 150 bunches of fruit-berries, resembling Grapes in growth, some measuring quite 10 inches in length. The berries are scarlet in colour, and somewhat smaller than those of the common Arbutus. *J. H. Vivian, Singleton, Swansea.* [A very fine specimen. Eds.]

Chilian Beet.—"Tap" seems to have been very unlucky with his Chilian Beet last summer, and, as he asks for the experience of others on this subject, I write to say that my plants were beautiful, and I intend to have some for bedding purposes every year. They grew 2½ feet high, and the colour of the leaf-stalks was wonderfully rich; in some of the plants crimson, in others scarlet, and in one of them bright orange. We lifted the plants a few weeks ago, to pot them for conservatory decoration, as we consider them very useful for that purpose in the winter, and they are very ornamental mixed with other plants. *J. Doneraile, Doneraile Court.*

—— We think your correspondent, "Tap, Dublin," must have got seed of a very inferior kind of B. chilensis, from the description he gives of it, if, indeed, the right thing at all. The variety, adapted for ornamental and subtropical bedding, differs in one or two important particulars from the common Beet. It never makes any bulb whatever, and the midrib of the leaf, which forms one-third of its entire width, is perfectly flat, and of a most brilliant colour. If your correspondent would like to give it another trial, we shall be most happy to present him with a few seeds of the right kind. *Butler, M'Culloch & Co., Covent Garden Market.* [It is a variety of Beta Cycla. Eds.]

Vine Growing.—At p. 1277, 1869, is a paper on this subject, signed "P." which stands as a leading article. It is illustrated by a figure of a Vine trained according to the writer's ideas of what is desirable, and he says his experience and physiological knowledge are both at fault if certain good results are not obtained by this mode of pruning and training. It strikes me, most wonderful results will be obtained wherever a Vine is seen thus trained. Did any Vine grower ever see side shoots opposite to each other, as in that figure? In the little book I published on the Vine, I believe will be found the first attempt to prove the evil of shanking to be the result, oftentimes, of close pruning and stopping growing Vines. To the persistent stopping of a Vine and removal of green foliage from it during the greater part of the season when it would naturally be making both shoots and foliage, may, I think, be attributed most of the evils with which Vines are afflicted, and also their premature decay. What can be more absurd and unnatural than to say to a Vine, when one-third of the season of growth has passed, "If you make another leaf I will cut it off?" The origin of this system of over-stopping is not difficult to discover. When the old long-rod system was generally followed, one cane was carrying the fruit whilst one or more strong canes were carrying nothing but leaves, and were growing vigorously all the season. Close stopping of the fruiting cane was a necessity on this system, it was advantageous to the fruit and was not injurious to the Vine. But on the single-rod system how very different are the circumstances. A young Vine growing in a rich border, allowed the first season to ramble at will, makes plenty of healthy foliage, and, as a consequence, plenty of healthy roots: cut to a single short rod the following season, fine fruit is the natural result. The side shoots being stopped one or two leaves above the bunches, the sap is concentrated, and the fruit is improved in size and appearance. The leading shoot continuing to grow all the season carries a large amount of well-developed foliage, and so everything is satisfactory for several years; but when the whole Vine is carrying fruit, then the evils of over-stopping make their appearance; the unnatural restriction of a Vine's growth to a few weeks, and the removal of large numbers of green leaves, begin to tell upon its health, and shanking, want of colour, red spider, mildew, &c., make their appearance. Now I contend that if Vines are not planted too closely, if every time the shoots grow they are allowed to make two leaves, and if green foliage is never removed, a Vine may continue to grow or extend all the season, an uniform growth may be obtained, and nothing will occur as far as training is concerned to injure its health or shorten its life. The so-called extension plan of growing Vines appears to me a most clumsy way of getting out of the difficulty so many feel, and so few acknowledge. Of course if my reasoning be correct, every new rod carried up the house in place of a Vine destroyed, will give health and vigour to an over-stopped Vine. But even if Vine after Vine be destroyed, till a whole house is furnished with one variety only, there must come a time when this Vine will be expected to carry fruit on every rod, and then if close stopping is

practised, it will be found that the evils arising from the practice have only been postponed. It is more than 20 years since I saw the Cole Orton Vines. I see "P." says that for more than that period no old bark has been removed from their stems. Does he intend to convey the idea that loose old bark is ornamental or useful? Having been always led to believe such bark useless, indeed, that its removal was caused by an effort of Nature to get rid of what was injurious, or might become so, I cannot see any reason why it should not be annually removed; if "P." sees any good reason for its retention, I should be glad to hear it. It strikes me that, as a possible harbour for insects, it must be undesirable. I really do pity the poor amateur desiring to commence the culture of the Grape Vine, and fancy the more he hears and reads the more he must despair of learning. A multitude of questions present themselves to his mind to perplex his judgment. If, in spite of all the differences of opinion, our unfortunate amateur determines to make a commencement, his troubles have only begun. When his house is built, and his Vines are growing, every person who enters his vinery has something to object to. His house is badly constructed; the materials, or form, or position of his borders are faulty; his mode of training is quite wrong; the heat he employs excessive or inadequate; the amount of moisture insufficient, or in excess of what is requisite; his Vines are quite wild, or too much restricted in their growth; in fact, it is difficult to believe anything is as it should be after hearing the remarks of his visitors. And what is worse, if he changes all this he will still, in the opinion of most of his critics, be quite as far from correct practice as ever, for what one recommends three will condemn. To such an one I would say, fix upon one person whom you know is successful, take his instructions in every particular as gospel till you have proved them. Listen to what others say, and think about it, but follow your selected guide till success or failure is the result. If you believe from what you have heard or seen that you can improve on his practice, make the attempt with due caution, and do not blame him if you fail; but till you feel sure you understand something about Grape growing have only one teacher. Above all, commence the culture of the Grape with the conviction that cultivation of any fruit is a far more easy and simple affair than quacks and over-clever people would lead you to suppose; yet that though everything is easy to those who know how to do it, a certain amount of knowledge is necessary even to grow a good bunch of Grapes. *J. R. Pearson, Chiswell.*

—— Professor Mapes, an American chemist, tells us that 1 lb. of potash in the manure of the farmyard is worth more to the land than 100 lb. taken from a felspar rock, though the chemist cannot detect any difference in the two articles. And he adds: "No chemist living can tell the difference between carbonate of lime taken from a piece of Westchester limestone, and that taken from a chalk cliff in England. Yet, 1000 bushels of the former spread on an acre of land makes it barren for years, while the chalk fields of England are fertile." Hence, I presume that Mr. Cramb has been unfortunate, and met with a lime possessing those destructive properties contained in Westchester limestone, and which no chemist can describe. *Vitis Vulpes.*

Garden Ivies.—It would have been gratifying to find the results of any independent researches on Ivies coincide with my own; and after seeing Mr. S. Hibberd's remarks (*Gardeners' Chronicle*, 1869, p. 1308) I carefully read his "Sketch of the Affinities, Forms, Uses, and Cultivation of Garden Hederæ," ("Gardeners' Weekly Magazine," 1863, p. 396, *sq.*), but did not meet there any successful attempt either to reduce the genus Hedera to intelligible limits, or to work out those microscopic characters upon which, in my opinion, the specific distinctions of true Ivies depend. As between the writing of Mr. Hibberd's first and second paper on Ivies, my labours were published, not only in their original place, but in several others, including the *Gardeners' Chronicle*, it may be allowed to be a pardonable conceit if I regard as my own those parts of Mr. S. Hibberd's communications to the Linnean Society which relate to the specific characters of Hedera. I may state that to my knowledge there is no satisfactory or complete account of garden Araliaceæ extant, that of Decaisne and Planchon in the "Revue Horticole" having never been completed, and that of C. Koch in his "Wochenschrift," though completed, being antiquated. It would therefore be desirable, now that these plants are becoming appreciated, to publish some well-digested papers on them. *Berthold Seemann.*

—— Dr. Seemann's temperate but firm letter is likely to be of public benefit, as it will in a measure tend to arrest the custom of giving long unmeaning Latin names to varieties of garden shrubs with but few distinguishing qualities. We may ask with justice—What's in a leaf, to demand such grand-sounding names as marmorata, and elegans, and aurea, and pallida? Surely some appropriate English names could be found to mark the leaf variation of one of our most common English plants. I am inclined to believe, after all, that, in our Northern hemisphere at least, there is but one species of Hedera, our old friend H. Helix. H. canariensis (the Irish Ivy), with its scaly pedicels, and H. chrysocarpa, with its yellow berries, would seem to be species, but Wallich made the latter H. Helix, although found in the Himalayas; and it is probable that the former, under cultivation, would lose, or, perhaps, has lost, its characteristic. Species making among modern botanists is happily not so flourishing as in the old times,—much more care is taken. There are two or three Ivies which at first sight would seem to be species. H. taurica, with its very small leaves, and H. "Ragusiana," the H. Rœgneriana of many catalogues, with its enormous thick leathery leaves, are very distinct; but I have observed a fine plant of the former growing on the wall of a village church, showing a tendency at the extremities of its shoots to put forth the leaves of our old friend, H. Helix; in the latter I have seen no change. On the walls of the same church are fine specimens of H. "algeriensis," evidently very nearly related to the Irish Ivy: its leaves are larger, with a thinner texture; it may probably grow on the lower Atlas, as reported, hence its name. The best position for Ragusiana is a wall, exposed to the south or south-west, its leaves then become monstrous, measuring 6 to 7 inches in diameter, and at this season are really beautiful. It is asserted by some that it is from the Caucasus. I am induced to point out a charming use of the Irish Ivy, viz., as a covering for the borders of shrubberies. I happen to know of a very old and large plantation of evergreens and deciduous trees, the surface of the soil covered with a dense carpet of Irish Ivy; the effect in winter, when the sun shines, is very bright and cheery. With submission to the author of the paper on Ivies, read before the Linnean Society, it was at least a strange production to place before a learned society, for it was merely concerning the leaf variation of one species of shrub—a subject interesting and important enough, if it had been treated in a manner worthy of the learned body before whom the paper was read. *Hedera.*

Calceolarias.—I quite agree with the advice given by Mr. Hutchison, at p. 1136, 1869, as to securing a cool and rich bottom on which to grow this charming tribe of plants, but their success does not so much depend on the nature of the soil, provided the medium in which they are grown is not too heavy, but made tolerably rich and sufficiently fine and firm, and, above all, that the roots are screened, by a rich surface dressing, from the direct rays of the sun. In the spring of 1867 I had a rectangular bed of some considerable size formed in front of my sitting-room window; it is raised 7 inches above the general level of the garden, and is surrounded by a handsome edging of artificial stone. The soil and clay were removed from this bed to the depth of 3 feet, and a drain laid in the bottom, over which 9 inches of old mortar and brick rubbish were placed, in order that the drainage might be more perfect; the remaining portion was then filled up with good sound marly loam. In the bed thus prepared Calceolarias and other bedding plants grew and flowered exceedingly well. In the following season the bed was again filled with the same description of plants as before. The Calceolarias, however, refused to grow, and might be described as almost a total failure. This last season I determined to have another trial, and, if possible, to secure success. With this view I had the portion of the bed intended for Calceolarias dug out pretty much as Mr. Hutchison describes, and had plenty of good well-rotted manure put in, and mixed well up with the soil to within a few inches of the surface. The other plants grew strongly enough, and required no such aid, as the whole bed was then prepared and planted on May 17, and arranged as follows:—The centre of the bed was filled with a double row of Stella Pelargonium, and belted with a broad band of Aurea floribunda Calceolaria, which was margined with a wide edging of purple Verbenas, along the centre of which, little compact plants of Mrs. Pollock were inserted at intervals, and as a protection alike from the ill effects of frost and wind, small branches of Yew a foot long were stuck thickly over the whole bed. These were removed on June 1, and the bed well trodden down; 10 days afterwards the surface of the bed was stirred over, and a plentiful supply of tepid manure-water poured over it. The whole surface was then covered over an inch in thickness, with a mixture of charred turf and superphosphate of lime, in such proportions and in such conditions as the farmers use for drilling with their Turnip seeds. The plants were then pegged down closely over the surface of the bed, the Calceolarias having their tops pinched out; they were a most unpromising lot, being of attenuated growth, and fully 9 inches in length, but notwithstanding this they grew admirably, and produced flowers in great profusion. I had the satisfaction, too, of seeing the best results arise from a surface dressing of the same material applied on a line of Cerastium, planted on a hungry bank of clayey soil, as an edging to a broad band of different Ivies; the surface was well stirred, and a heavy watering given before the application, soon after which the plants started into healthy and robust growth. At p. 1160, 1869, mention is made by Mr. Bennett of the ill-success attending the cultivation of Calceolarias in the "Dukeries," and their vicinity. I have a vivid recollection of nearly all the grand gardens there enumerated, and they are certainly much more favourably situated than this place, which is 600 feet above the level of the sea, unsheltered alike from the south, east, and west, and over which the gales from the English Channel spend their force with unmitigated fury. Yet, notwithstanding all these disadvantages, the bed I have attempted to describe would have compared very favourably with any bedding-out gardening I saw in the public gardens or parks about London during the summer. *N.*

Tricks of the Trade.—"An Old Nurseryman" suggests I was rather "disappointed than deceived;" and, as I think it important that nurserymen should accurately describe the plants which they have to sell, I return to the subject of my Picea amabilis. The first firm, to whom I applied, treated me honestly. They told me they had no seedling plants of the true P. amabilis, and, of course, as I was making a collection, I did not want a doubtful one. The two other firms told me they had seedling plants of P. amabilis, and I was deceived till I saw the letter they wrote to the nurserymen who had supplied me with a graft, in which they state that they could not send the true variety from seed. Whether or not there are other varieties called in the trade P. amabilis does not alter the matter. The customer who wants P. amabilis should know this, and not be induced to buy what may turn out something else. As far as regards myself, I think it very likely the heads of the firms who misinformed me, did not think much about the matter, but handed it over to a subordinate, who acted in what he considered the usual way of business. Richard Smith, of Worcester, in his catalogue, says—"Not one of this noble tree has been raised from seed since Douglas first imported it. It is readily distinguished by its leaves, which are more divided at the tip than any other kind." I believe this statement to be true, and that the P. amabilis is in reality, when genuine, perfectly distinct, not only in its leaves but in its general character. This is seen in the grafted plant I have, which, surrounded by trees of the same order, stands out vividly amongst them. The cultivation of plants and trees is to my mind so noble a profession, and so proper to raise the mind above mean or ignoble motives, that I am sorry when I see any inclination amongst nurserymen to resort to the subterfuges which are beginning to cast disgrace upon English dealing, to sap away the commercial honour and welfare of this country. *E. M.*

Tobacco Smoke.—I notice that your correspondent, Mr. William Smythe (p. 1283, 1869), adverts to the necessity for a good and cheap mixture for fumigating purposes. A short time ago we used a mixture, powdered very fine, and apparently containing a large quantity of saltpetre, or some such ingredient; but that did not answer. In our houses we generally put the paper (obtained retail at 1*od.* a lb.) into a flower-pot, with a hole at the side near the bottom, having first put in a few live coals. Then the operator, or rather the fumigator, must with a pair of bellows puff away for dear life, that is, for the death of the obnoxious insects, he meanwhile being in the centre of the smoke, to enable him to continue blowing. Now, it is not everyone that can stand being "smoked;" so that, as the job must be done, cannot some of your correspondents suggest a better and pleasanter method of fumigating? As Mr. Smythe suggests, we want a better and cheaper material; and I for one want to see some one "bring it out," and with it a good and healthful manner of using it. *Youngster.* [Dean's Patent Fumigator is an excellent one; and we have also formed a good opinion of Drechsler's, about which we shall have more to say shortly. The latter is the most convenient we have seen for fumigating without going inside the house. Eds.]

Primula farinosa.—Having read Mr Bennett's paper on the Primrose (see p. 1307, 1869), also at various times descriptions of the same family by other writers, I often wonder that the Bird's-eye Primrose is not named, as this species is considered by some to be the prettiest of all the Primroses. I presume that as the plant is wild and very rare in most localities, and said only to be found wild in the north of England and Scotland, it is not commonly cultivated. This species grows on the sea banks in this locality (Seaham) commonly. I have seen it growing by the thousand. I consider it one of the prettiest species, if not the best. I have had specimens under cultivation 1 foot or more across, much superior to those in a wild state. It is a species much admired. The corolla becomes rather deeper rose-coloured by cultivation. The plants, when in flower, are very conspicuous, the corolla rose-coloured and the mouth surrounded with a yellow-notched glandular border; the umbels are few flowered; the leaves are powdery beneath, in some specimens on both sides. If any person would like to try a plant I will send him one or two in spring, as the plants are difficult to find at this season. *Robert Draper, Seaham.* [A real gem, but we fear not likely to grow freely enough for general flower garden purposes, besides requiring special conditions for its growth. Eds.]

What does "marmorata" mean?—Mr. Shirley Hibberd informs us (p. 1309, 1869) that it "does not mean veined or coloured like marble, but hard and cold like marble." I have looked in vain for any authority for such a translation of the word, and must therefore beg leave to dispute it. It comes from the obsolete Latin verb "marmoro," to make of marble, and was originally used to indicate anything cased or covered with, or made of, marble. The word used by Pliny, when meaning "like marble for hardness" is

"marmorosus." Besides this, there is another Latin adjective, "marmoreus," which primarily meant "made of marble," and was used in that sense by Cicero and Ovid; on the other hand, it will be found to have been used metaphorically by various authors, Virgil using it as descriptive of a lady's neck, Lucretius of colour, Ovid of ice. From ancient I turn to modern authorities. Dr. Lindley says that marmoratus means "marbled; traversed by irregular veins of colour, as a block of marble often is." And as in botany, so in entomology—Dr. Burmeister explaining that it means "when the markings are variegated like marble." Upon what authority does Mr. Hibberd assert that the word has not this meaning? I have shown that the idea of "hard and cold like marble," should be rendered by marmoreus, or marmorosus. *W. T.*

Vine Roots.—The discussion now going on about Vine roots moving with the leaves or without them is very interesting. If your readers will turn back to p. 125 of your volume for 1863, they will find a very practical paragraph on the subject. I have tried both the plans there mentioned. The Vines with the roots excited are really splendid, with shoots as thick as a good walking-stick, and which will bear a good crop next year. The others will not be fit to bear until 1871. I should like to thank the writer of that article, if I only knew his name. *S. B.*

Berberis nepalensis.—I do not think that this plant is nearly so well known as it deserves to be. In autumn and winter it is one of the prettiest of berry-bearing shrubs. It is well adapted for ornamental purposes, and few possess a more pleasing harmony of colour in the combination of their leaves and fruit. The latter, though not so numerously produced as they usually are on the common B. microphylla, are of a much brighter red, slightly drooping and the eye quickly rests on them owing to their clear shining appearance. The plant, in style of growth, is not unlike our native Berberis, and its leaves are larger than those of the other species referred to, being of an ovate shape and a glossy dark green colour. It is an ornamental shrub, quite worthy of general adoption; and those of your readers who wish to procure a choice selection of hardy plants to embellish villa gardens with, or for the purpose of adorning slopes or other raised banks, would find in it a very valuable addition to kinds that are better known. *R. A. C.*

Vines and Vine Leaves.—If we are to believe everything that is said of the Vine, we must consider it one of the most useful plants under the sun; the root, the old stems, the leaves and young shoots, the fruit and tendrils, all have their respective qualities. I once saw a remark made by a horticultural writer, "that Vine leaves made a capital manure for the Vine itself, and improved the fruit both in quantity and quality." What a brilliant idea! We all know the qualities of the fruit; do we all know to what purposes the leaves may be applied? J. Hall, Esq., in the "Philosophical Magazine," says, "I find that on being dried (which must be done in the shade) and infused in a teapot, the leaves of the Vine make an excellent substitute for tea. I have also found, on being cut small, bruised, and placed into a vat or mashing-tub, and boiling water poured on them, in the same way as malt, the prunings of the Vine produce a liquor of a fine vinous quality, which, on being fermented, makes a very good beverage; and, if distilled, produces an excellent spirit of the nature of brandy. I found also that the fermented liquor from the prunings, especially the tendrils, when allowed to pass the vinous, and to run into the acetous fermentation, makes exceedingly useful vinegar. I once tasted some wine in Derbyshire made from the summer clippings of the Vine, which was far superior to the ordinary wine made from Grapes in this country, and nearly equal to the English Champagne made from the Gooseberry. Vine leaves, as well as the tendrils, have an astringent taste, and were formerly used in cases of diarrhœa, hæmorrhage, and other disorders requiring refrigerant and styptic medicines. The sap of the Vine is called lachryma, and is recommended for calculous disorders, and is still used for weak eyes. The tendrils of the Vine were extensively pickled by the ancient Romans, and considered a great delicacy. The old stems of the Vine can be used in the following manner, with a very pretty effect:—Mark out an oval upon the lawn, say 6 feet by 3, and drive in stakes all round, about a foot apart. Twist several Vines together in the form of a rope, so as to form the handles of the basket, and insert the ends firmly in the ground at each end of the oval. Now weave the Vines into the spaces between the stakes, until the side of the basket is 12 or 15 inches in height; then saw off the stakes level, and fill the basket with good soil, and plant what you think fit. At each end a good climber should be planted, and trained to the handle of the basket. If this is done nicely, nothing can equal this rustic basket, especially if the colours blend harmoniously together. *A. J. P., Tottenham.*

Chlorophyll.—"When Doctors differ who shall decide?" In your last number is a notice of Professor Lawson's paper, read before the Ashmolean Society, Oxford, on chlorophyll. It is therein stated, in speaking of the optical properties of chlorophyll, that particular attention was called (by Professor Lawson) "to the observation made by Professor Stokes, which had disproved the old theory that chlorophyll could be separated into two primary substances of a yellow and blue colour. He (Professor Lawson) dwelt also upon the fact that Mr. H. L. Smith's careful comparison of the spectrum of the endochrome of diatoms with that of chlorophyll, went far to prove the two substances to be identical. Chlorophyll had been formerly supposed to be a product of the vegetable kingdom only; but more recently a green colouring matter closely allied to chlorophyll, if not identical with it, had been detected in many of the lower forms of animal life. These discoveries, in the opinion of the author of the paper, illustrated in a striking manner how the supposed gap between the two kingdoms was filled up." On comparing these statements with those given by another eminent professor, quite recently, I find a totally different conclusion drawn from apparently identical experiments. In the July number of the "Microscopical Journal" (p. 59), I find it stated that Professor Stokes "has succeeded in extracting two distinct green bodies from ordinary plant chlorophyll." In the November number, 1869, of the "Journal of Anatomy and Physiology," the same writer, Mr. Ray Lankester, enlarges upon his former statement, and it is there stated (p. 127) that chlorophyll "is a highly complex and protean body, splitting up into, and containing normally even more than the two green and two yellow bodies assigned to it by Professor Stokes." Perhaps the writer forgot to add the two yellow bodies to the two green in the "Microscopical Journal." He further observes:—"When plant green in its many forms has been further studied (and I hope soon to give some time to it), the nature of chondriochlor (a name given to the green colouring matter of Spongilla and Hydra), and other chlorophylloids, may be expected to receive some explanation; at present there is a tendency to confuse them all together, under the name of chlorophyll." Then follows a strange contradiction of Professor Lawson's statement regarding Mr. H. L. Smith's diatomin:—"An example of this has come to my notice while this abstract has been going through the press. Mr. H. L. Smith declares, in 'Silliman's Journal,' that diatomin is identical with chlorophyll, because it gives a band in the extreme red. I do not consider that the band proves this at all, it merely tends to associate the brown endochrome of diatoms with the chlorophyll group. Plant green does not give simply a band in the extreme red; and great care will be required to prove the identity of the diatomin band with any chlorophyll band. Mr. Smith's observation assuredly does not tie the Diatomaceæ any closer to the vegetable kingdom, as he appears to think, since chlorophyll-like green substance is known in many of the lower animals." It would be very desirable if more light could be thrown on this subject, so as to reconcile these discordant statements. It would also be desirable to have a fuller explanation, supposing it to be true, of Professor Lawson's statement—"That these discoveries illustrate in a striking manner how the supposed gap between the two kingdoms were filled up?" *A Student.* P.S. As the authorities quoted appear to differ in the spelling of the word chlorophyll, one giving "ll," and the other a single "l," may I ask you to say which is correct? [The double l is the more correct, but there is a general tendency to clip off redundant letters, especially in compound words. Eds.]

Foreign Correspondence.

Mount Etna: the "Hundred Horse Chestnut Tree" (Castagno dei Cento Cavalli).—Among the gigantic trees of which mention is made in botanical works, this extraordinary Chestnut tree holds a conspicuous place; and in books of travel its name is always coupled with that of Mount Etna. Strange to say that in modern books no recent or detailed account of it can be found, as far as I know. Sicily, and especially Mount Etna, are yearly visited by hundreds of tourists, mostly English; but I dare say that very few of them have ever thought of looking for this old inhabitant of the wonderful volcano.

I must however admit that many of them would have been perhaps disappointed in finding only the hardly recognisable remains of what they wished to admire. The different writers, who, generally speaking, have copied one another, give to this ancient trunk a circumference of about 150 feet, and relate that in the 15th century a Queen Giovanna d'Aragana, on her way from Spain to Naples, stopped at Catania, and visiting Mount Etna was surprised by a tremendous storm, against which efficient shelter was found under the dense foliage of this tree for herself and a hundred cavaliers in her suite. Hence the name, say the authors, but no really historical proof exists of such a royal visit. After that time, according to the same authors, a small house and a chapel were erected in the interior of the hollow trunk, and later a *seccatoio* was built there. This *seccatoio* is a kind of closed room, intended to smoke and dry the Chestnuts gathered in the surrounding forest, to which purpose the trunk itself was compelled to afford the necessary fuel for self consumption and ruin.

Giving to these notices whatever value they may deserve, here is what I have seen myself of this old tree, while making a tour in Sicily during the summer of 1868. The spot is easily reached in an hour, by walking from Giarre, a railway station on the line between Catania and Messina. The road, of course, is somewhat steep, and rapidly passing through the successive lanes of Cactus, Orange trees, and Vines, before entering the forest of Chestnut trees at about 2500 feet above the level of the sea, suddenly the ancient tree stood before me, before I was aware that I was even approaching it. Nothing indeed made it distinguishable among the crowd of the surrounding trees. The path I followed sank 5 feet below the surface of the adjacent ground. Passing through the very trunk, on my right was a moderate-sized and thriving young trunk; on my left two more, looking quite independent one from another, and these are all that remain of the gigantic tree.

It was only after a closer inspection that I was able to perceive that, in fact, these three distinct-looking trees sprang out of three different points of the circumference of the decayed parent tree, which was still to be traced on the ground, notwithstanding the crossing path, and the dense vegetation of Ferns and Brambles. This is indeed no unusual occurrence in this kind of tree, where a portion of the trunk decays off, whilst young layers spring out vigorously, to be destroyed in their turn, but still maintaining the individual existence of the parent tree. Admitting that such is the case, and that the old trunk might have been in possession of nearly a circular base, I found that the diameter of the latter ought to be calculated at about 50 feet, giving to the whole trunk when in its full glory the enormous circumference of more than 150 feet; and I must add that this statement agrees with formerly published descriptions. The height of the three trunks does not exceed that of the surrounding trees, and their branches afford only a moderate spreading, cut as they have been again and again with great irreverence by the ignorant people of the neighbourhood for fuel. The branches were abundantly covered with unripe fruits, belonging to the small wild variety of Chestnut.

Not far from this historical tree stood another, smaller in size and fame, called the Ship Chestnut Tree (Castagno della nave), on account of three branches vertically springing to a great height from the same trunk, and bearing some resemblance to the masts of a ship: it was, however, entirely consumed by a fire accidentally lighted in the preceding year. Beautiful forests, chiefly composed of Chestnut trees, formerly covered to a large extent the flanks of Mount Etna, but the fire of the volcano, and, more than all, the depredations of the inhabitants, have greatly ruined them. Much to their praise the intelligent proprietors have lately commenced to make extensive plantations of Chestnut, Pine, and other trees which are best suited for the dried up volcanic soil. *E. O. Fenzi, Florence.*

Calcutta.—The following extracts, from a letter from Mr. Scott, of the Botanic Gardens, to Dr. Hooker, may interest some of our readers:—"I have already mentioned that we are getting up an avenue of Amherstias in the line of road from the main entrance to Kyd's monument; these are now looking remarkably well. I have them all surrounded with trellises, covered alternately with Antigonon leptopus and Jacquemontia violacea. By the way, the former is a truly magnificent climber, flowering more or less for nearly nine months in the year. In the end of the cold season, and at the beginning of the hot, it quite rivals the Bougainvillea, presenting quite a sheet of bloom. It is admired by all visitors, and many are the applications which I have for 'that pretty mauve climber.'

"The collection of Orchids is now really very fine and rich in Indian species; but we are still poor in American. The main house is 80 feet long, 68 feet broad, and 7 feet in height, flat-roofed and covered all through with grass.* A side table, 6 feet in breadth, surrounds the house, and in the centre are four others 12 feet in breadth. This, you will see, gives me large accommodation, yet I have nearly all full. With the exception of the Phalænopsis and such like, which I grow on Teak blocks, all the other epiphytal species are in my open-sided pots, and growing in a mixture of lumpy charcoal and pieces of brick. I find them to thrive better in this mixture than in anything else. Peaty or heating soils simply murder them wholesale in the rainy season. I tried them also in cocoa-nut fibre, but this got quite mouldy in the rains, and furthermore in the hot season, when we were watering them from our tanks, we got a small Gasteropod introduced, and which increased so rapidly amongst the cocoa-nut fibre, and preyed so largely on the rootlets of the Orchids, that I really thought we should get our collection destroyed, and furthermore have the bother in future to filter all our water. I thought, however, of trying the plants in charcoal and brick, and had them all turned out from the cocoa-nut fibre. This has proved effectual; never do I see one of the gasteropods now, and it is pleasing to see the strong vigorous roots so freely ramifying in the above mixture. The Ferns in our little glass conservatory are doing splendidly, the house has quite the appearance, and all the plants are as healthy as in any of the houses at Kew. Ferns, however, also do well

* A grass thatch is so formed as to maintain evaporation, which keeps the house cool.

in the Pepper houses. In one of these, a house 50 feet long by 15 feet broad and 21 feet in height, I have a group of the Sikkim Tree Ferns, 50 in number, planted in the centre bed. Their stems vary in size from 4 to 7 feet in height. These are much admired by the Calcutta folks, many of whom of course never saw a Tree Fern before. In another portion of this house I have the Mangosteen, Durian, and others of the Strait fruits, with various spices, in a thriving state. There are one or two other similar houses I have full of specimen plants of the larger but non-arborescent Ferns, Aroids, and dwarfer and less hardy Palms, both of which put in a very effective appearance."

Societies.

LINNEAN: *Dec.* 2.—G. Bentham, Esq., President, in the chair. W. R. Guilfoyle, Esq., was elected a Fellow. Mr. Flower exhibited specimens of Draba aizoides, from Pennard Castle, near Swansea, the station where it was originally found by Dr. Turton in 1803; also, from St. Vincent's Rocks, specimens of the depauperated state of Allium sphærocephalum, described by Boreau as A. Deseglisii. The following papers were read:—I. *Flora of Newfoundland*, by H. Reeks, Esq. This flora consisted of a list of 372 species of flowering plants and Ferns, besides varieties, compiled during an ornithological trip to Newfoundland, from August, 1866, to August, 1868. Six species besides Calluna vulgaris and Botrychium Lunaria (?) were noted as new to the flora of North America, while three of them, to which provisional names were given, appear not to have been previously described, namely, Viola Burtoni, Euphrasia purpurea, and Iris biflora. Prof. C. Deway, D.D., gives 186 species of Carex for North America, but Mr. Reeks had only identified 29 in Newfoundland, and but 38 Grasses out of the 258 said to grow in the United States and in Canada. The classification and nomenclature adopted were taken from Prof. A. Wood's Class-book of Botany, published in 1866 by A. S. Barnes & Co., New York.——II. *Note on Capparis divaricata, and C. Heyneana*, by Dr. Cleghorn. Of the 20 species of Capparis enumerated by Wight and Arnott, several are involved in obscurity, and the C. divaricata of Lamarck is included amongst the "species scarcely known." This plant the author believes he has gathered at distant points of Southern India—as Dharwar, Mysore, Coimbatore, since Lamarck's description accords well with his plant. The fruit agrees in character with that of C. stylosa. Lamarck's description was made from the linear-leaved form, which, according to Wight, is peculiar to young shoots, and does not flower, but it is now known that this form bears fruit. Having examined Wight's and Wallich's specimens, the author concluded that C. divaricata, Lam.; C. diversifolia, W. and A.; and C. stylosa are all forms, perhaps permanent varieties, referrible to one species, to which Lamarck's name must be given. The true C. divaricata, the narrow-leaved form, is abundant in very dry districts, while the variety with ovate-lanceolate leaves occurs generally nearer the ghats, where the climate is more moist. The beautiful C. Heyneana, which is the C. formosa, Dalzell, but not the C. formosa, Wall., the author had collected in Canara and Cochin. The colour of the large flowers is pale blue or lilac, with a yellow spot at the base of the petals; and the plant was considered to be well worthy of introduction to our hothouses.

December 19.—G. Bentham, Esq., President, in the chair. It was announced that a new part of the "Transactions," containing Dr. Welwitsch's Flora of Angola and Benguela, with numerous plates, was just ready for distribution. The following papers were read:—I. *On a Species of Ipomœa, affording Tampico Jalap*, by D. Hanbury, Esq. In this paper the author gave some account of a species of jalap recently imported from Tampico, and distinguished in commerce as Tampico jalap. This drug he stated to be derived from a new species of Ipomœa, for which he proposed the specific name of simulans, in allusion to the resemblance which it bears to the true Jalap plant (Ipomœa Purga).——II. *On the necessity of a reform in the Generic Nomenclature of Diurnal Lepidoptera, by a review of the genera proposed from the time of Linnæus to the year* 1816. By W. F. Kirby, Esq.; communicated by H. T. Stainton, Esq.——III. *A Catalogue of the aculeate Hymenoptera and Ichneumonidæ of India and the Eastern Archipelago, with Introductory remarks by A. R. Wallace, Esq.* By F. Smith, Esq.; communicated by W. Wilson Saunders, Esq.

Notices of Books.

Brittany and its Byways: *some Account of its Inhabitants and its Antiquities, during a residence in that Country.* By Mrs. Bury Palliser. London: John Murray. 8vo, pp. 314.

The name of Brittany is very suggestive. The country is full of interest to the student and antiquarian, as well as to the mere tourist or pedestrian, on account of its history and numerous legends, its relics of mediæval architecture, and still more ancient dolmen, and its picturesque coast-scenery. Much, too, of the interest attaching to Brittany centres in its quaint inhabitants and their singular manners and customs.

Mrs. Palliser's volume consists of a condensed account of the history of Brittany, and a description of the principal towns she passed through, and the chief abbeys, castles, and cathedrals she saw during a tour through the country—apparently enlarged "jottings" from a note-book added to and assisted by some popular guide-book.

The author is so much more to our taste when she describes the abodes and the domestic manners and customs of the country and its inhabitants, than when, in somewhat didactic style, she gives an account of battles, conspiracies, and murders, that we cannot help wishing she had told us more about the people, even at the expense of some of the legends and historical details with which the book is plentifully besprinkled. Take, for instance, the following account of the "interior" of a Breton dwelling—"By the side of the fire, in the one room of which most of these cottages consist, fixed against the wall like the berth of a ship, stands the bedstead or 'lit clos' of old oak, shut in by carved and well-wadded sliding panels, often inscribed with the sacred monogram. The two mattresses, paillasse, and 'cossette de plume,' are piled up to such a height as barely to admit of its tenants creeping into the bed. In front is the customary chest, containing the family wardrobe, answering the double purpose of a seat and the means of ascending into the bed. Often we have seen cupboards on each side of the large chimney, with two shelves, which served as beds for the juvenile members of the family. Forms and a polished table complete the furniture; the last has frequently little wells hollowed in the top, used, instead of plates, to hold the soup. Over the table, suspended by pulleys, are two indispensable articles in a Breton dwelling—a large circular basket to cover the bread, and a kind of wooden frame or rack, round which the spoons are ranged. Forks they do not use. Festoons of sausages, with hams, bacon, candles, skins of lard, onions, horse-shoes, harness, all hang suspended from the ceiling, which consists of fagots of hazel suspended by cross-poles. The floor is of beaten earth. One narrow window admits the light, and there are no outhouses. The manure-heap is generally at the house-door, and the pigs and poultry seem on an equally intimate footing as they are in our Irish cabins. The Breton's cottage has often no garden to occupy his leisure hours; and the men, after their daily work, resort to the cabaret to spend their time and their earnings." Mrs. Palliser tells us "that agriculture is very backward in Brittany, but the land produces abundance of corn. It is threshed out direct from the field, on a clay floor (*aire*). Beet-root and Clover grow luxuriantly, and in some fields the pretty Red Clover (Trifolium incarnatum) carpets the country with its crimson flowers."

The volume is nicely printed and embellished with numerous beautiful illustrations. As a specimen of these we subjoin a cut (fig. 3) of the beautiful rood screen of St. Fiacre, as likely to interest some of our readers—St. Fiacre being the patron saint of gardeners. For the use of the block we are indebted to Mr. Murray. Of his history Mrs. Palliser gives the following particulars:—

"St. Fiacre, or Fiaker, was an Irish monk of the seventh century, who, according to tradition, obtained from the Bishop of Meaux a grant of as much ground out of the forest as he could dig a trench round in one day's labour, for the purpose of making a garden and cultivating vegetables for travellers. Long time after the peasants would show the ditch ten times larger than was expected, and relate how, when the Irishman took his stick to trace a line upon the soil, the earth dug itself under the point of the stick, while the forest trees fell right and left to save him the trouble of cutting them down."

Altogether we can recommend the volume as an interesting compendium for those who are contemplating a tour in Brittany.

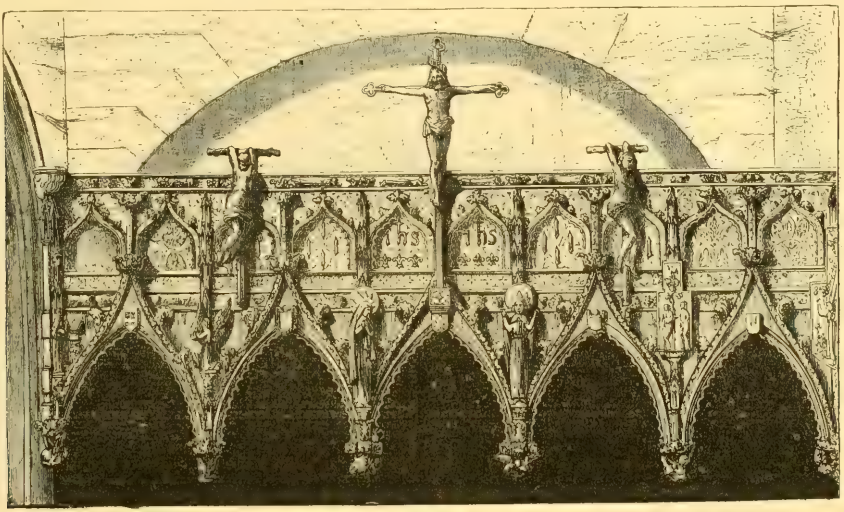

FIGURE 3.

—— Among RECENT PUBLICATIONS, to some of which we shall have to refer at greater length at another time, are The Amateur Gardener's Calendar, by Mrs. Loudon; revised by W. Robinson—The Parks, Open Spaces, and Thoroughfares of London, by Alexander M'Kenzie—Flora sylvatica, being Figures and Descriptions of the Timber Trees of the Madras Presidency, by Major Beddome — Les Chênes de l'Amérique Tropicale, etc., par F. M. Liebmann, achevé et augmenté par A. S. Oersted (Oaks of Tropical America)—Nouveau Dictionnaire de Botanique, par E. Germain de Saint Pierre (New Dictionary of Botany) — Bulletin de la Fédération des Sociétés d'Horticulture de Belgique, 1868 (Report of the Federation of the Horticultural Societies of Belgium)—De Cinchonæ speciebus quibusdam, scripsit F. A. G. Miquel (Description of some species of Cinchona, including those grown in Java)—Indian Works and English Engineers, by John Bourne, C.E.—How to Use the Barometer, &c., by Rev. R. Tyas—Vegetable Physiology, in a series of easy lessons, by Edwin Lankester, M.D., F.R.S.—Prodromus Systematis Naturalis

regni vegetabilis, &c., editore et pro parte auctore Alphonse De Candolle, pars decima sexta: this contains the systematic description of the following orders: Daphniphyllaceæ and Buxaceæ, by J. Müller. of Argau; Empetraceæ and Cannabineæ, by Alphonse De Candolle; Urticaceæ, by H. A. Weddell; Piperaceæ, by Casimir De Candolle; Chloranthaceæ, by Count Solms, of Laubach; and Garryaceæ, by Alphonse De Candolle—The Useful Weather Guide for the first Six Months of the Year 1870, by Eleanor Rugg Byrne.

Garden Memoranda.

CADLAND, THE SEAT OF E. A. E. DRUMMOND, Esq.—"If you want to see Cadland at its best, now is the time to come." Such was the emphatic invite I had the pleasure of receiving some months since from Mr. Harnett, the worthy gardener, and to which I made in person a very speedy response. A neat little steamer ferried me across the Southampton Water to Hythe, and from thence a walk of about three miles brought me to the London Lodge entrance, which, I was informed, was about a mile from the gardens through the park.

Just in front of the gardener's house is a prettily arranged flower garden upon turf, consisting of a series of round beds, with a double edging of box to each, the latter being about 9 inches apart, and between them nice white sand is laid, producing a very neat effect. The majority of these beds were filled with Stocks, chiefly for the purpose of testing their bedding qualities, and if what I saw of them then is to be taken as a fair sample of their fitness, I can say at once that whilst some are for that purpose nearly useless, others answer admirably. Here I was first introduced to those beautiful East Lothian Stocks, which Mr. B. S. Williams has sent out, the colours of which are white, scarlet and violet-purple. Anything finer than this last for bedding I never saw, the colour is so unusual in our parterres and so effective. All of them are of good habit, from 10 to 12 inches in height, and producing about 90 per cent. of double flowers. My opinion of these Stocks is, that they are the sult of a carefully selected strain of home-grown pyramidal kinds. The notion that we must go to Germany for good summer Stocks, is now quite exploded. Then there were some other pyramidal kinds, the best of which is the blood-red, a very effective kind, of a rich colour. The canary-yellow comes very double, but the yellow is so indistinct as to produce the appearance of a dirty white. There can be no doubt but that good strains of these pyramidal Stocks, of distinct colour, would make grand beds.

Close by are the plant houses, which are chiefly devoted to the rearing of furnishing materials of all kinds for the house and conservatory. Here Mr. Harnett showed me some seedling Coleus, which he had raised from Marshallii, one of which, named Drummondii, was a decided improvement on Her Majesty, which was growing close by, both in colour and size of foliage. In a long range of pits I noticed some capital Petunias growing for exhibition; and, further on, a span-roofed house devoted to Melons and Cucumbers, growing in rich profusion. Close by is a range of vineries, to which a large new lean-to for late work had recently been added. The Vines and the crops they produce afford evidence of great skill and attention on the part of the gardener, as well as being a source of pleasure to his employer. The new vinery is fitted both in front and behind with a simple apparatus for ventilating it, to work inside the house. By the raising or lowering of a handle, air in any quantity is given or reduced instantly along the whole length. This was fitted up by the estate smith, under Mr. Harnett's personal supervision, and it is most efficient in its working. Along the front of the house young Vines, mostly new kinds, are planted, and are doing well. To the iron pillars that support the centre some Black Hamburgh Vines are planted, and trained to fill the top of the house for the present. The growth one of these had made deserves special mention, it being planted in May of last year (1868), and cut back nearly to the ground. It made a strong growth last season of about 24 feet, which was this year cut back to 12 feet. When I saw it, it was carrying 20 bunches of fruit, that bid fair, when ripe, to weigh 18 lb.

Leaving the houses, we next look at the kitchen garden, which is about 6 acres in extent, surrounded by fine walls, well covered with trees, that are here, as elsewhere last season, produced but a poor crop of fruit. Vegetables, however, are grown well, and in large quantities. Of Peas alone about 4 pecks are sown yearly, affording a continuous supply, almost without intermission, every season from the middle of May to the middle of October. The ground here slopes to the south, and at the bottom of the garden are a couple of fine ornamental fish ponds, surrounded by a sloping surface of green turf. On the north side the useful and ornamental is well combined in a long row of Scarlet Runner Beans, about 100 yards in length, that quite shuts off the kitchen garden, and along its base is a border filled with a variety of flowers. On the south side extends a row of shrubs, and at intervals some luxuriantly-growing specimens of Magnolia grandiflora, full of enormous flowers at the time of my visit. At the western end is situated a delightful arbour, embossed in a mass of Ferns and climbers, amidst which the Japanese Honeysuckle grows and flowers in rich profusion. Just in front of this stands (as I am informed) one of the finest specimens of the deciduous Cypress in the kingdom. The girth of its stem, 4 feet from the ground, is 10 feet 7 inches, and it is about 85 feet in height. It is a fine timber tree, and the picture of health and vigour.

Returning to our starting-point, the gardener's house, a broad well-kept walk, with a border on either side filled with hardy and tender flowering plants, runs along the upper side of the kitchen garden towards the house. Here I noticed that all along the front of these borders a double row of Pelargonium cuttings had been put in, in a careless sort of way, all of which were growing, and promised to look gay shortly, as well as make fine plants for lifting in the autumn. Close by the mansion stands the conservatory—a large and lofty house, that would make a fine orangery, but is unfitted for the growth of soft-wooded plants. It is, however, made to look gay with a profusion of subjects admirably adapted for the purpose; and now to the flower garden. That I should get a quiet walk round, and take notes of what seemed to be specially worthy of observation, I thought to be all the treat in store for me; but it seemed to have struck Mr. Harnett otherwise; for, proceeding to the top of the mansion, we could see, if not all the world, at least a considerable portion of it, as well as the whole effect of his magnificent floral display. From this position, and right before us, was to be seen the glorious expanse of the Southampton Water. On the opposite bank of the river the most prominent object is that immense pile of buildings known as the Royal Victoria Hospital, at Netley, a noble asylum for invalid soldiers. To its right is the pretty little marine villa belonging to the Earl of Hardwicke, whilst for miles inland the country, even as far as Portsdown Hill at Portsmouth, lies open to view. Still more to the right is the old pile of Calshot Castle, and beyond that, as far as the eye can reach, are the waters of Spithead. Turning to the south the Isle of Wight is distinctly seen, and all around to the west extends the New Forest, rich in woodland scenery. Turning once more directly to the front is seen the ancient town of Southampton, with its splendid docks, filled with some of the finest steamships in the world; and far beyond this, right up to Red Lodge and Basset, all the country is distinctly visible, and the entire view forms one of the grandest and most picturesque that the plodding workers in life can often gaze upon.

There is no mistake about one thing, this is the place to see the flower garden. One might imagine that the whole had been laid out from here, so admirably does it all fit to each other. Right in under us runs a very broad terrace-walk, the whole length of the mansion, and beyond this is margined with vases filled with flowering plants, and at its extremity is a small enclosed parterre garden called the Temple Garden, after a building of that character situated within it. This is filled with a variety of plants producing flowers convenient for cutting from; then, coming more to the front, are in close conjunction two large beds resembling Prince's Feathers, one being made up with a base of Viola cornuta, flowering freely, with lines of Cerastium, yellow Calceolaria, Tom Thumb Pelargonium, Purple King Verbena, and Bijou Pelargonium to form the feathers. The other had a base of Golden Feather, and in addition to some of the above were also lines of Iresine Herbstii, Christine Pelargonium, and blue Lobelia. A small oval bed looked very pretty with a centre of scarlet, and alternating triangles of blue Lobelias and Cerastiums. Some serpentine beds were filled with centres of Iresine Herbstii, bordered with Christine Pelargonium and edged with Gnaphalium, whilst others had centres of Ageratum and margins of Rubens Pelargonium, a bright rosy scarlet kind, that is most effective for beds. Just off the righthand corner of the mansion was a large bed resembling a St. Catherine Wheel, having a centre of Dent's Heliotrope, margined with Mons. Martin Pelargonium, two wings being filled with Christine, and the others with Stella and Cerise Unique, the whole edged alternately with Viola cornuta and Lobelia. A perfect gem was a round bed, having in the centre a star of Centaurea ragusina, the angles being filled with Coleus, and edged with blue Lobelia and Cerastium, whilst in another bed a very pleasing effect was produced by a centre of Coleus from which radiated narrow, sweeping scrolls of Cerastium, blue Lobelia, and yellow Pansy. At Cadland the Pansy always does well, and is wonderfully effective; it should be struck from cuttings in the autumn, to make strong plants for the spring, and it will flower profusely all the summer. The descriptions of the beds noticed here are given because they appeared the most striking; but they form but a small part of the whole.

Mention must, however, be made of two small enclosed gardens that are seen on either side of the front, and farthest removed from the house; these resemble parterres, and are filled with much care and taste. Very effective was a bed in the centre of one, filled with subtropical plants; and others, having diamond centres of the Rev. Mr. Radclyffe golden zonal Pelargonium (what a capital dwarf bedder this variety is) and Purple King, margined with blue Lobelia and Mrs. Pollock, were very beautiful; in some of the beds Rubens and Excellent look ed fine, but all were good. On an outside border of each of these gardens, fronting to the house, what would have been a very effective arrangement of triangles of Coleus and Golden Pyrethrum was marred by the poor growth of the latter, which here for summer work was a comparative failure. The pleasure grounds extend over several acres, and the very neat and excellent order in which all is kept, merits special commendation. *A. D.*

Obituary.

IN our last we had the painful duty of briefly recording the death of Mr. WILLIAM BARNES, of Camberwell, concerning whose career we are now enabled to add some interesting particulars. Mr. Barnes was born on October 23, 1809, in the county of Surrey, in which county his father lived as a gardener. At the age of nine or ten years the son also commenced the career of a gardener, being even then an enthusiastic collector and admirer of British plants. About three years later he left home and came to London, where he was employed by Mr. Moore, the then great early fruit, plant, and vegetable grower, of the King's Road, Chelsea. At this time Mr. Moore's foreman and manager was William Barnes' brother James, late of Bicton. In the year 1824, William Barnes was under gardener at the Earl of Onslow's in Surrey, from which place he went to the Messrs. Young's nurseries at Epsom, and from thence to Plastow Lodge, Bromley, where horticulture was then in its zenith. Some three years later he was engaged as gardener to George Warde Norman, Esq., of Bromley Common, Kent, where he soon began to carry out his ideas in plant growing. Although the place was small, with very little glass or other convenience, he grew stove and greenhouse plants, Heaths, Azaleas, and New Holland plants in general, to such perfection as never before had been seen, surpassing all the great plant growers of the day, as may be seen recorded in the "Proceedings" of the Horticultural Society of London, before the *Gardeners' Chronicle* came into existence. The story of his triumphs in this department is thus recorded in the *Nottingham Guardian*:—"The first time Mr. Barnes ever exhibited was at Chiswick, when he came out with a collection of 50 stove and greenhouse plants, and took the 1st prize, the first gold Knightian Medal, value £10, ever awarded by the Society. As a contrast to the enormous plants exhibited at the present time, we may say that Mr. Barnes conveyed his 50 plants in one van with one horse! but, as an example of the progress he made in plant-growing, we may state we have seen his collection when he required eight vans and 16 horses to convey the same quantity of plants. Cramped for means, having only five small houses (two of them filled with Vines—one, which filled the larger house, the finest Muscat of Alexandria Vine perhaps in Europe, being nearly 200 years old, and still in vigorous health)—the wonder was how Mr. Barnes could produce such gorgeous collections, especially as his excellent employer did not care about exhibiting, but would rather have kept the plants at home. Thus the expenses of conveyance to shows, and also of replenishing the collection with novelties, fell mainly upon Mr. Barnes. To go to Bromley Common in the exhibition season, say a few days before one of the great shows, and from what you could see in the glass-houses you would return with the conviction that 'Barnes could not show at all.' Such has been the avowal of scores, but they did not go into the back sheds and Mushroom-houses, neither did they explore the barns nor look under the Cedar trees upon the lawn, where plants of rare excellence would be set out in the full light to colour. These things, unless they were intimate friends, they did not see, and hence concluded that Barnes had nothing to show. On one occasion, and the last time Mr. Barnes showed a large collection at Chiswick; he had staged a superb group of 50 stove or greenhouse plants in flower, not having a duplicate plant of any kind. The 1st prize was given to his rival, because she had two plants of this, two of that, and two of the other thing—facts which, with discriminating judges, would have placed the collection incontestably second. Mr. Barnes returned home disgusted. On the following morning (Sunday) Mr. Norman went to him in the garden, and condoling with him for the wrong to which he had been subjected, gave him, as a *solatium*, a cheque for £50. We see the tears in our honest friend's eyes as he told us a few days afterwards of this act of considerate kindness, and we mention it now, perhaps, for the first time as a public fact. Never afterwards did Mr. Barnes show the large collection at Chiswick, remarking to us, 'I can take my own van, and clear £10 and my expenses; while by showing the large collection, if I gain the 1st prize, I am frequently a loser by the expenses.'. Shortly after this, when the want of the Bromley collections made a sad gap in the shows at Chiswick, it was tauntingly asserted that those only abstained from showing there who were sure of being beaten, pronouncing at the same time a grand eulogium upon the Ealing Park plants. On the following Wednesday was the great show at the Royal Botanic Gardens, and Mr. Barnes, to resent the taunt, took up the gems of his collection, and they were gems, and beat the Chiswick prize collection with ease,—caustically retorting upon Dr. Lindley, 'They are not good enough for Chiswick, but they are good enough to beat the best you can get there.'

No one but those who, like Mr. Barnes, have had the cost and anxiety of exhibiting, can have any idea of the labour involved. On more than one occasion we have known Mr. Barnes pay more than £60 for horse-hire alone for six shows. Add to this the hire of vans, wages of men, payments at toll-bars, and incidental expenses, and it will be easy to see that plant exhibitors may purchase their whistle at too great a price." For some years William Barnes continued in the employment of Mr. Norman, in whom he found an excellent master and true friend. Finding, however, that this place did not afford sufficient scope for his abilities, he left for the service of Robert Hanbury, Esq., of The Poles, near Ware, in Hertfordshire, in which position he continued until the Camden Nursery, Camberwell, passed into his hands, and became under his management, in some respects, a model nursery. Here he continued to carry on his favourite pursuit of specimen plant growing until his death, much respected by all who knew him. He was one of the originators and first members of the Gardeners' Royal Benevolent Institution, and also one of five brothers, all of whom were brought up to and followed the profession of gardening. Four of them are now dead, the oldest, Mr. James Barnes, gardener for many years to Lord and Lady Rolle at Bicton, being the only survivor. Mr. William Barnes will be buried, in accordance with his expressed wishes, at the Forest Hill Cemetery, which he laid out and planted some years ago.

—— Died on the 23d ult., at Newtown, Bromley, Kent, in his 71st year, Mr. JOHN BROWN, many years gardener to the late Lord Herbert of Lea, at Wilton House. He was much respected by his lordship, so much so that in 1860, when, owing to impaired health, he retired, his lordship considerately settled £100 per annum upon him for his life. He was a good practical gardener, and much respected by his brother gardeners.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

WITH the new year let those who are troubled with the presence of that detestable pest, the *Mealy-bug*, in any of their stoves commence such an onslaught upon them as will thoroughly rout them out. This is the proper season to undertake the operation, the plants being partially at rest, and there is perhaps rather more time for such work than there will be by-and-by. To say that it is not possible to destroy this pest where it has thoroughly established itself, seems feasible to those who know its endurance and reproductive powers. I nevertheless assert that, with a thorough determination to be free of it, it is to be overcome even in the worst of structures, and under very adverse circumstances. I believe there is nothing better towards attaining this end than crushing each one between the finger and thumb; at least, so I have experienced in more than one successful undertaking of this kind. Each infested plant should first have every vestige of the insect or its mealy covering crushed out with the forefinger and thumb, and afterwards should have a good dressing with some mixture, such as Gishurst compound or Fowler's insecticide. The roof of the house and every other part should be properly cleansed, even to whitewashing with fresh slacked lime, or otherwise painting, as varied surfaces require. Then the surface soil of all borders should be taken far away, and fresh soil substituted in its place. But the operator must not rest here, for now the real fight for mastership will commence. From out of the minutest interstices the pest will ever and anon creep forth: let these intruders be crushed one by one. The males are more slender than the females, and hence a quicker eye is necessary to detect them. By destroying them before they are permitted to form fresh nests, good and sure work will be done; and it is only in so far as this part of the business is unflinchingly carried out that a successful end is to be looked for. I may here mention that the Mealy-bug has been known to form a lodgment upon Vines. If such an instance is now to be met with, the same remarks will apply, but a stronger solution should be used—say, equal parts of either of the above preparations, soft-soap, sulphur, and tobacco liquor; and if the bark upon the rods has not been stripped too closely, a tablespoonful or so of spirits of turpentine or paraffin may be added. Then, again, Pines are sometimes attacked, and it has been asserted by some authorities that if Pines so infested are shut up over a bed of heating horse-dung, the Mealy-bug is forthwith destroyed. But my advice is to burn them, cleanse the structure, and procure a fresh batch of plants. This wretched pest is often introduced by the careless admission of plants which are infested with it from other collections. A remark which the late Dr. Lindley made to me at one of the Kensington meetings may not inaptly be quoted here, viz., "Like all suspected plants those near that specimen (speaking of one perceptibly infested) should be placed in quarantine as 'suspected,' until a clean bill of health, free of suspicion, can be obtained." So I would advise a certain quarantine for all fresh introductions into large plant establishments. I have little to add in the way of routine this week. Damp is the main enemy the gardener has to contend against. Give as much air as possible, even a little by night, if it can be given without the risk of lowering the temperature too much, and keep the pipes or heating media just as warm as the hand, to aid the sluggish air in attaining a little more buoyancy.

FORCING HOUSES.

The shortest day is past, and with the advent of increased light and, let us hope, warmth, those who have charge of forcing operations will begin to "look up," for it is very slow and hard work to force successfully against days constantly decreasing in length. This, however, must not cause the operator to change his routine very materially at first, though the rigid formula previously prescribed may be somewhat relaxed, and with the increase of light a slightly more liberal treatment may be afforded. Those *Vineries* which were shut up for the purpose of forcing a month or five weeks ago, will now begin to show the effects of the confined warmth. The buds will be swelling, therefore a larger amount of moisture may be permitted in the structure commensurate with the increase of heat which may now safely be given. Do not, however, be too liberal in the admission of atmospheric humidity, when once the young leaves are pushed beyond the scaly coverings which protected them in the first instance; otherwise some danger will exist of their damping, or, as it is generally termed by the craft, "fogging" off. Attend to the bottom-heat of all *Pine pits*, &c., bearing in mind, in the case of old flues, that these may cause the tan contiguous thereto to become over dry, and that, as a consequence, the heat therein may have materially decreased; hence a moderate soaking with warmed water will be necessary. With the first signs of blossoms expanding in the *Peach* or *Nectarine houses* let the heat be increased to a mean of about 61° by day, with a decline of 10° or 12° by night. Keep the atmosphere as dry as possible; this will be the more easily done if former suggestions have been attended to. In regard to *Figs*, which are being pushed into growth, I say start steadily, and do not by any means afford too high a temperature at first. A mean of from 50° to 53° by night, with an increase of 8° or 10° by day, will be ample for the present. The weather which I have anticipated in the past Calendar or two has come, and put us all more or less on the *qui vive*. All know that snow is a non-conductor of heat or cold, and is of all things the worst thing to mix with fermenting matter, or even to be permitted to lie thereon for any length of time. No snow should be permitted to rest longer than is absolutely necessary upon such materials, or even in too close communication therewith. No trouble should be spared to separate any which may have fallen upon heaps of litter or leaves which are undergoing the sweetening process. Sow *Cucumber seeds* for early frame work; if proper convenience does not exist, court the good offices of a neighbouring friend to sow them for you.

HARDY FLOWER GARDEN.

Should the weather which prevails whilst I write (frost and snow) continue, attend to the necessary daily covering and uncovering of all *cold frames*, where the subjects they contain are in a leafy growing state. Keep all snow swept away, so that what light there is may not be impeded in its passage. According to the duration or continued intensity of the frost continue to place additional layers of litter around the roots of *Roses*, *Fuchsias*, *Wall Climbers*, *Bulbs*, and other plants which are likely to require an additional supply. Even the tops of *Roses* may need protection of some sort.

KITCHEN GARDEN.

Proceed with all *trenching operations*. Advantage should also be taken of inclement weather to get out of hand all those necessary little odds and ends which occasionally absorb a certain amount of time in all gardens. I refer to making and otherwise preparing small *flower stakes* for pot plants, *labels* of various sizes, and *pegs* with which to peg down Verbenas, &c., in the ensuing summer. Besides these the stock of *Onions* will require looking carefully through, sorting out such as have "started" to be early planted out into the open borders for use as "Scallions," &c. Sort and wash all pots requiring either operation, and attend to the soil bins or heaps, turning the latter so that the frost may exert its beneficial influence on all parts alike. *W. E.*

TOWN GARDENING.

THE principal operations to be carried out in the garden at this season consist in getting manure on to the beds and borders, and preparing suitable composts for pot plants. There is also another little job which should be done now during bad weather, that is, to thoroughly clean out the tool-house, and have all the tools sharpened and put into good working condition. This will save much trouble and time at the busy season. To give some idea of the tools required for a single-handed garden, I append the following list, which will be found amply sufficient:—One No. 2 steel-plated spade, one 5-pronged Parkes' patent fork, one of the most useful digging tools; one edging iron, a line reel and spindle, one pair of short and of long shears, one Dutch hoe and draft hoe, a 12 and 6-toothed iron rake; and also a wooden rake, which comes in very useful at the fall of the leaf; an iron roller, a trowel and dibble, one hand-saw and bill-hook, a nail-bag, hammer, and pruning-knife; one scythe and rubbers, and a Green's Patent Silens Messor mowing machine; two large and one small watering pots, with coarse and fine roses to each; and a wheelbarrow, with movable top for leaves. The garden mats, as imported, have loose rough ends, which should be re-tied into knots, before using them, to keep them from coming to pieces. *J. D.*

STATE OF THE WEATHER AT CHISWICK (LONDON),
For the eight days ending Dec. 29, 1869, as observed at the Horticultural Gardens.

Dec.	Moon's age	Barometer. Max	Barometer. Min.	Temperature. Of the Air. Max	Of the Air. Min	Of the Air. Mean	Of the Earth. 1 foot deep	Of the Earth. 2 feet deep.	Wind	Rain
Wed 22	19	29.909	29.490	42	32	37.0	43	43	N.W.	0.03
Thursday 23	20	29.834	29.251	47	36	41.5	43	43	N.	0.00
Friday 24	21	29.911	29.622	42	36	38.0	43	42	N.	0.00
Saturday 25	22	29.760	29.013	38	17	27.5	41	41	N.E.	0.00
Sunday 26	23	29.497	29.436	31	18	24.5	40	40	N.E.	0.00
Monday 27	24	29.701	29.586	37	17	27.0	37	39	N.	0.00
Tuesday 28	25	29.681	29.850	38	11	24.5	37	38	N.W.	0.00
Wed ... 29	26	29.998	29.850	30	23	31.0	39	38		
Average.		29.803	29.679	39.5	22.7	31.1	40.0	40.5		0.03

Dec. 22—Densely overcast throughout.
" 23—Foggy; very fine; densely overcast
" 24—Overcast and cold; very fine; starlight
" 25—Overcast; fine and frosty; clear and fine.
" 26—Sharp frost; clear and fine; cold wind.
" 27—Frosty, fog; overcast, snow; clear and frosty.
" 28—Sharp frost; very fine; severe frost
" 29—Clear and very frosty; very fine; overcast
Mean temperature of the week, 6 deg. below the average

STATE OF THE WEATHER AT CHISWICK
During the last 44 years, for the ensuing week, ending Jan 8, 1870.

January	Average Highest Temp.	Average Lowest Temp.	Mean	No. of Years in which it Rained	Greatest Quantity of Rain	Prevailing Winds. N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
Sunday 2	47.2	28.9	38.5	18	0.21 in.	2	2	2	2	5	11	7	7
Mon 3	42.8	30.1	36.5	20	0.56	2	7	1	1	3	5	6	9
Tues 4	42.2	30.1	36.2	18	0.89	1	8	6	5	3	2	4	2
Wed 5	44.7	29.7	35.7	17	0.54	4	9	4	4	5	11	5	1
Thurs 6	41.4	28.7	35.1	15	0.33	3	4	5	5	1	11	6	1
Friday 7	41.0	29.4	35.0	17	0.46	4	7	5	3	2	11	7	5
Satur 8	41.9	30.5	36.0	14	0.29	4	6	7	4	1	17	3	2

The highest temperature during the above period occurred on the 3d, 1800—therm 67 deg.; and the lowest on the 4th, 1867—therm 11 deg. below zero

Notices to Correspondents.

ANNUALS: *J. P. J.* For a selection of the best and most distinct hardy annuals, that is to say, annuals that do not require rearing in a hotbed, take the following:—Brachycome iberidifolia, Calliopsis tinctoria, and Drummondii, Candytuft (white and purple), Clarkia pulchella (several varieties, especially integripetala and its double forms), Collinsia bicolor and candidissima, Convolvulus minor, Dianthus chinensis (a good strain), Erysimum Peroffskianum, Eschscholtzia californica, Gilia capitata and laciniata, Linum grandiflorum, Malope grandiflora, Mignonette, Nemophila insignis, Sweet Pea (Invincible Scarlet), Sanvitalia procumbens (double), Silene pendula and pseudo-atocion (integripetala), Sphærogyne speciosa, Tagetes signata pumila, Viscaria cardinalis, Zinnia elegans flore-pleno. To these may be added any number of varieties of choice Asters, Stocks, Larkspurs, &c.

BLACK-HEARTED PINE-APPLES: *An Old Sub.* This is said to be caused by want of sun in winter. Some kinds, as the Cayenne, are much more subject to it than others.

EXOGONIUM: *Ficus.* The Exogonium Purga is not an annual, and so far as we know will not flower the following summer, even if sown very early in spring in heat. Indeed, old roots do not flower freely until well established. It is not very well suited for a greenhouse rafter, unless it can be planted out, and even then its stems die back annually.

FIRE IN GREENHOUSES: *X. X.* A fire is not necessary, except during frost, and a little in damp weather, in conjunction with air to dispel damp.

HORTICULTURE: *J. R. G.* The word means literally "culture of a garden." Those, therefore, who tell you that "anything with roots (!), such as Carrots, Turnips, Parsnips, &c., is agricultural, not horticultural produce," don't know what they are talking about. Such roots may belong to either.

INSECTS: *I. P. G.* The scales on your Vine twigs are young females of the common Coccus Vitis. Wash, or rather scrub the branches with a hot mixture of soft soap-suds, lime, and sulphur, leaving a coat of the mixture upon the shoots.

MIRABILIS: *Ficus.* Yes; sown in spring they flower freely enough either indoors or out, if well fed.

MIMULUS: *Ficus.* Yes; sow in heat in early spring, and grow on under glass; when once fairly started in growth they make rapid progress. To your question about Manettias—No.

MYROBELLA: *Stopgap.* The Myrobella, which you see "mentioned in a nurseryman's catalogue as the best stuff for making new and mending old fences," is probably a misprint for Myrobalan, the name of the Cherry Plum, a sort sometimes used as a stock for grafting purposes. Several kinds of Plums bear the name of Mirabelle, but it is scarcely likely to be one of these. Ask the nurseryman himself what he means.

NAMES OF FRUITS: *W. S. D.* 1, Dumelow's Seedling; 2, Wormsley Pippin; 3, Gloria Mundi; 4, not known, too much decayed; 5, Old Nonpareil; 6, Green Balsam; 7, Pear, Beurré Diel.

NAMES OF PLANTS: *E. G., Manchester.* Xylophylla falcata, Physalis angulata. Fraxinus australis (or the F. chinensis of some).—*Fungi: J. Vine, Shrewsbury.* 1, Agaricus velutipes; 2, Agaricus furfuraceus; Praxillus panuoides; 4, Agaricus grammopodius (small

specimen).—*D.* Thuja pendula.—*P.* Nicotiana longiflora.—*A. F. B.* Centrosternma acuminatum, frequently known as Cyrtoceras reflexum.—*J. G., Beaumaris.* A small-leaved form of the Sweet Bay Tree (Laurus nobilis).—*D. S.* Hypnum (Thuidium) tamariscinum.—*A. P.* Lupinus arboreus.

UNFRUITFUL FRUIT TREES: *Monte Christo.* It is difficult to tell exactly what you had better do to your trees without inspection. If the wood is very thick and crowded we would recommend you to thin it out considerably, so as to allow free access of the air and light to all parts of the tree. If they are growing very vigorously try the effect of shortening some of the stronger roots. In either case thin out—not shorten the branches a good deal.

PEACHES AND NECTARINES: *J. P.* Early York, or, better still, Early Grosse Mignonne Peaches; and Roman Nectarine.

VINE-ROOTS: *S. B.* There will not be much, if any, cause for anxiety if you take care to search out and remove all the principal ones, which can readily be done without risk of injury to those of the plants which remain.

VINES: *Learner.* In your comparison with Peaches, you overlook the different natural habits of the two. Undoubtedly there should be extensive leafage, but when there is something like a balance between this and the roots, that suffices. In the case of potted Peaches there are fewer roots, and therefore the balance is kept up by fewer leaves. As you put it, the question is not fairly stated. Assuredly the one-Vine system would not give you better crops, and at the same time relieve you altogether of cultural care; neither would it be wise to jump from one extreme to the other. The gradual extension of a vigorous Vine, which shows itself to be at home in its position, is a very different course to that.

ERRATA.—In Dr. Spruce's paper, p. 1332, par. 7, for "heat or moisture," read "heat or motion;" in par. 10, for "unlikely," read "likely."

COMMUNICATIONS RECEIVED.—A. P.—J. D.—W. P.—G. W.—T. C.—K. B.—P. W. M.—W. M.—A Foreign Nurseryman.—F. G. W.—E. B.—J. B. Somerset.—Prof. Decaisne.—H. T.—E. M.—T. T.—J. T.—Robin.—A. F.

Markets.

COVENT GARDEN.—January 1.

The closing period of the year is usually a dull one in general business, and especially is this so at the present time, as there is great depression of trade, and an unwillingness to embark in anything requiring additional capital; at the same time, stocks are heavy. The foreign consignments are unusually large. Home produce is also plentiful, especially in the case of Grapes and Pines. The late frost has had no perceptible influence in retarding the supply of outdoor produce. The Potato market continues dull, at former quotations. Flowers chiefly consist of Pelargoniums, Mignonette, Fuchsias, Chrysanthemums, Primulas, Poinsettias, Heaths, Tulips, and Hyacinths.

FRUIT.	s. d.	s. d.	VEGETABLES.	s. d.	s. d.
Apples, p. ½ sieve	3 0 to 5 0		Lemons, per 100	5 0 to 12 0	
Cobs, per lb.	0 9 — 1 0		Melons, each	1 6 — 3 0	
Chestnuts, p. bush.	5 0 — 14 0		Oranges, per 100	6 0 — 12 0	
Filberts, per lb.	0 0 — 0 0		Pears, per doz.	3 0 — 6 0	
Grapes, per lb.	3 0 — 6 0		Pineapples, per lb.	3 0 — 5 0	
Artichokes, p. doz	3 0 to 6 0		HorseRadish, p bun.	3 0	3 0
Beet, per doz.	1 0 — 3 0		Leeks, per bunch	0 2 — 0 4	
Broccoli, per doz.	1 0 — 2 6		Lettuce, p. score	1 0 — 2 0	
Brussels Sprouts, p. ½ sieve	2 0 — 3 0		Mint, per bunch	0 4 — 0 6	
Cabbages, p. doz.	1 0 — 1 6		Mushrooms, p. pottl.	1 0 — 1 6	
Capsicums, p. 100	2 0 — 2 6		Onions, per bunch	0 4 — 0 9	
Carrots, p. bunch	0 4 — 0 8		Parsley, per bunch	0 2 — 0 4	
Cauliflowers, p. doz.	1 6 — 3 0		Salsafy, per bundle	1 0 — 1 3	
Celery, p. bund	1 0 — 1 6		Scorzonera, do.	1 0 — 1 3	
Cucumbers, each	1 6 — 1 0		Sea Kale, p. punnet	1 0 — 2 6	
Endive, per doz.	1 6 — 2 0		Shallots, per lb.	0 8 — 0 0	
French Beans, p. 100	2 6 — 3 0		Spinach, p. bushel	2 0 — 3 0	
Garlic, per lb.	0 8 — 0 0		Radishes, per doz.	1 0 — 1 6	
Herbs, per bunch	0 2 — 0 4		Tomatos, per doz.	0 9 — 1 6	
			Turnips, per bunch	0 4 — 0 6	

Potatoes, York Regents, per ton, 80s. to 105s.; Flukes, do., 80s. to 120s.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds of Culinary Vegetables, and novelties can be recommended.
Highgate Nurseries, London, N.

To the Trade.

DOBSONS' CELEBRATED PRIZE CALCEOLARIA New Seed 1869, now ready, of this unequalled strain; only sent out in sealed packets. The principal Prizes have been awarded for Collections whenever exhibited at the Crystal Palace, Royal Horticultural and Botanic Society's Flower Shows, besides numerous Prizes at Provincial Exhibitions. A very liberal discount allowed to the Trade.
DOBSON AND SONS, Woodlands Nursery, Isleworth, W.

JOSEPH MAY begs to offer selections of KITCHEN GARDEN SEEDS of the best quality, according to size of Garden, at 10*s.*, 21*s.*, and upwards.
LISTS forwarded on application.
(Many years with Mr. Kernan, when in Russell Street.)
35, Brydges Street, Covent Garden, W.C.

CALCEOLARIAS, Herbaceous, of our choice strain, nice, well-rooted healthy plants, free by post, at 2*s.* 6*d.* per dozen, and 12*s.* 6*d.* per 100.
AZALEA INDICA, blooming plants, in 50 varieties, at 18 each; not less than 6 varieties.
FUCHSIAS, in 40 choice named, at 18 each.
ERICAS, in 40 choice named, at 9*s.* per dozen.
GREENHOUSE CLIMBERS, in 24 varieties, at 9*s.* and 12*s.* per dozen.
CRANSTIAS, in 10 choice named, for 2*s.* 6*d.*
ACACIA, in 6 varieties, blooming plants, for 6*s.*
CYTISSUS, fragrant, 12 blooming plants for 6*s.*
ROSES, in pots, 12 choice varieties of Tea, Noisette, Bourbon, and China, for 3*s.*; 24 varieties, 10*s.*; 36 varieties, 27*s.*; Hybrid Perpetuals in pots, 12 varieties, 8*s.*; 24 for 15*s.*; 50 for 25*s.*
STOCK, Night-scented, 12 for 6*s.*
PIMELEA HISPIDA, blooming plants, 12*s.* per dozen.
DESFONTAINEA SPINOSA, good plants, 12*s.* per dozen.
H. AND R. STIRZAKER, Stourton Nurseries, Lancaster

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 30 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1; 25 Pairs ditto, for 6*d.*; 25 Pairs POMPONS, for 10*d.*; 12 Pairs best JAPANESE CHRYSANTHEMUMS, for 1*s.* Any of the above forwarded free on receipt of Post Office order or stamps for the amount
Brunswick Nursery, Stoke Newington, N.

JAMES CARTER AND CO. have a beautiful Stock of Seedlings, in excellent condition, of their choicest Strains of CALCEOLARIA, CINERARIA, and PRIMULA, in 60 sorts, fit for potting-on immediately for early Spring Blooming. Worthy the attention of those who have omitted to sow at proper time. Price, 21*s.* per 100, 3*s.* per 1000.
JAMES CARTER AND CO., 237 and 238, High Holborn, W.C.; and Crystal Palace Nurseries, Forest Hill, S.E.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7*s.*; per 1000, £5
100 Gladioli, by name, 10 sorts .. .. .. 8*s.*
100 " " 50 sorts .. .. .. 14*s.*
100 " " 50 sorts .. .. .. 10*s.* to 40*s.*
All in good flowering bulbs
LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris

Seeds Direct from the Growers the best means of Preventing Disappointment.

SUTTONS' PRICED CATALOGUE of GENUINE HOME-GROWN SEEDS is now ready, and may be had gratis and post free on application.
SUTTON AND SONS, Seed Growers, Reading.

New and Unadulterated Seeds.

PRIZE MEDALS 1851 and 1862
BUTLER, McCULLOCH, AND CO.'S SPRING CATALOGUE of above is in the Press, and will be ready the first week in January. It contains every Novelty deserving of merit in Flower and Vegetable Seeds. Seed Warehouse, 65, Leadenhall Market, W.C.
Established upwards of a Century.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part 1 (British Ferns and their varieties, 36 pages, including Supplement of Hardy Exotic Ferns), his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No 7
Foot's Cray Nursery, Sidcup Hill, Kent.

New Catalogue of Dutch Bulbs, Plants, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing Select Descriptive and Priced Lists of Amaryllis, Crocuses, Gladioli, Hyacinths, Liliums, Narcissus, Tulips, and other bulbs, Miscellaneous Plants, Fruit Trees, Sweet Violets, &c., is now published, and will be forwarded to applicants.—Nursery, Tooting, Surrey, S.W.

WANTED, one good Standard BRUGMANSIA ARBOREA, 5 to 6 feet stem; one ditto SANGUINEA, 2 to 4 feet stem; one ditto FLAVA, 3 to 4 feet stem; also LILY OF THE VALLEY roots by the bushel; Double PRIMROSES and HEPATICAS, of sorts, by the 100. Send prices and full particulars to
T. JACKSON AND SON, Nursery, Kingston, Surrey.

To the Trade.

GEORGE R. DAVIDSON, The Nurseries, Newry, Ireland, offers Two Acres of THORNS, 2-yr. old, 20 to 18 inches; 1,000,000 SEEDLING THORNS; 200 COMMON LAUREL, transplanted, bushy plants, 1½ to 3 feet; large lot PORTUGAL LAURELS, 2 to 3 feet. Samples sent on application.

EVERGREEN HEDGES. AMERICAN ARBOR VITÆ, 4 to 5 feet, at 40*s.* per 100; 5 to 6 feet, at 60*s.* per 100.
SIBERIAN ARBOR VITÆ, 2 to 2½ feet, 40*s.* per 100; 2½ to 3 feet, 50*s.* per 100; 3 to 4 feet, 60*s.* per 100; 4 to 5 feet, 85*s.* per 100.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.
RICHARD SMITH, Nurseryman and Seedsman, Worcester

Autumn Planting.

PETER LAWSON AND SON will be glad to send their CATALOGUE of FOREST and ORNAMENTAL TREES and SHRUBS, free on application.
The stock of LARCHES, SCOTCH FIRS, AUSTRIAN and CORSICAN PINES, &c., comprises some millions of healthy, well-grown plants, and special quotations will be made for large quantities when personal inspection is not convenient.
Edinburgh and London

Forest Trees, Fruit Trees, Evergreens,

PLANTS for GREENHOUSE, CONSERVATORY, ROSES, &c.
FRANCIS & ARTHUR DICKSON & SONS invite the attention of Planters to their very large stock of the above, which in extent and variety is not excelled by any Nursery in the Kingdom. Their Nurseries, which are very bleak and exposed, extend over some hundreds of acres, and are found to be unusually hardy, as well as in the most perfect health and condition in every respect; and are found to thrive admirably when removed to other parts of the country.
PRICED CATALOGUES post free upon application. Estimates and special prices for large quantities.
The "Highest Nurseries and Old" Established Seed Warehouse, 106, Eastgate Street, Chester

THORNTON begs to intimate to the Trade that the Stock offered below cannot be surpassed for health and fibrous roots. All been grown in maiden soil, and the stock, very extensive, is offered in the prime:—

Pinus austriaca, 9 to 15 inches	Spruce Fir, 1 to 2, and 2 to 2½ feet
P. Laricio, 9 to 15 inches	Laurel, 1 to 2 feet
P. rigida, 1 foot	Portugal, Hy.-zfeet
P. Pinea, 1 to 1½ foot	Crypt. mera Japonica, 12 to 15 inches
P. Pinaster, 2 to 3, and 3 to 4 feet	Chinese Arbor-vitæ, 9 to 15 inches
Scotch, 9 to 15 inches	

THOMAS THORNTON, Heathcote, Bagshot, Surrey

Wandsworth Common Nursery.

Ten minutes' walk from Clapham Junction
MR. ROBERT NEAL begs to invite the attention of the Nobility, Gentry, and the Trade in general to his very extensive and healthy stock of PLANTS, consisting of a large collection of Standard, Pyramidal, and Dwarf-trained FRUIT TREES, of all sizes; Standard and Dwarf ROSES, Coniferous and other Evergreens, Forest and Ornamental TREES and SHRUBS; also a large collection of RHODODENDRONS, all the very best in cultivation, and are of endless variety, from deep crimson and dark purple (nearly black) to every shade, and variegated sorts, and all the leading kinds of Scarlet, both Standard and Dwarf, set with Bloom-buds, which he can supply in large quantities at a very low price.
CATALOGUES will be sent on application

Special Trade Offer.

S. NAIRN AND SONS, SEEDSMEN and FLORISTS, 62, Pilgrim Street, Newcastle-on-Tyne, have the following to offer, all pure, prices on application:—
BALSAM (SMITH'S), in separate colours.
BROCCOLI, NE PLUS ULTRA, the best April Broccoli in cultivation
CELERY, SANDRINGHAM, well known as being the best White Celery in cultivation
LEEK, HENRY'S AYTON GIANT, Scotch: saved

WANTED, a PARTNER in a NURSERY (sleeping or otherwise), for a few Years in Surrey. A good residence on the Premises and Cottage for a Man in a Nursery Town, about an hour's ride from London.—G. P., Codgers' Hall Tavern, Bride Lane, Fleet Street, E.C.

WANTED, a HEAD GARDENER.—A married Scotchman. Two years' personal character from last place indispensable. Address full particulars to A. W., care of Messrs. Gibbs & Co., Seedsmen, Down Street, Piccadilly, London, W.

Borough of Bradford.

WANTED, as PARK GARDENER, by the Corporation of Bradford, a thoroughly competent person to fill the Situation of HEAD GARDENER at Peel Park. Wages 30*s.* per week, with Lodge rent free. The person appointed will not be allowed to engage in any other occupation.—Applications, with testimonials, endorsed "Park Gardener," and addressed "Chairman of Park Committee," to be sent to the undersigned Officers, on or before Saturday, January 8 next.—By Order, W. T. McGOWEN, Town Clerk.
Corporation Offices, Bradford, Dec. 22, 1869.

WANTED, a HEAD WORKING GARDENER; must be married, without children. Wife will have to take charge of a lodge, and must be a good Laundress.—Apply, by letter, with full particulars of previous employment, to N., care of Messrs. Charles Barker & Sons, 8, Birchin Lane, London, E.C.

WANTED, as FOREMAN and PROPAGATOR, a Young Man, expert in every branch of the Trade.—V. M., *Gardners' Chronicle* Office, W.C.

WANTED, as PROPAGATOR and GROWER of SOFT-WOODED PLANTS, a middle-aged sober Man. Wages £1 per week. Apply, by letter only, stating age and where last employed, to JOHN MORSE, Nurseryman, Dursley.

WANTED, a Person possessing a knowledge of GARDENING. Wages 20*s.* per week.—Applications to be made personally, to Mr. SEATON, Registrar, at the Borough Cemetery, Ocholever.

WANTED, in a Small Nursery, near London, a steady, persevering, Married Man.—One that understands Growing Plants for Market and General Nursery Work. Must have a good character for honesty and sobriety.—Apply personally to Mr. T. SURMAN, Lavender Hill Nursery, Wandsworth Road, Surrey.

To Bailiffs, Gardeners, &c.

WANTED, on February next, on a Farm of about 230 Acres, a MAN and WIFE (without incumbrance preferred), to take charge of a small Dairy for family, attend Poultry, &c. The Man must understand the usual course of Husbandry, the Feeding of Stock, Cultivation of Crops, &c. Wife must understand Gardening and could take charge of Glass, Propagating, and Growing Fruit for Sale would be preferred.—Apply, stating salary, age, reference, &c., to M. M., Box No. 18, Post Office, Hereford.

WANTED, a well-educated YOUTH, or a YOUNG MAN who has some knowledge of Book-keeping, &c., as an Assistant in the Nursery and Seed Business, to live at the Proprietor's.—Apply, in own hand-writing, to KELWAY AND SON, Langport

To the Seed Trade.

WANTED, an energetic competent SHOPMAN, who understands the Seed Trade in all its branches. The strictest investigation as to character and ability will be made; and a suitable Man will find a good and permanent situation Address, stating age, salary required, and whether married or single, to H. M. M., *Gardeners' Chronicle* Office, W.C.

WANTED a thorough COOK, in a Gentleman's Family, in the country; a kitchen maid is kept. Must be steady and respectable, and able to Bake Bread, Cure Hams, and Make Good Butter, as there is a small dairy.—Address, stating wages required, where and with whom she has lived, and age, to P. R., Messrs. C. & E. Layton, 150, Fleet Street, London, E.C.

WANT PLACES.—Letters to be Post Paid.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, Head GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. The fullest particulars as to services required and wages given should be forwarded with application.—PAUL'S Nurseries, Waltham Cross, London, N.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Gentleman requiring GARDENERS or BAILIFFS may rely upon CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of VARIED qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (HEAD).—Age 30, married; experienced in the Cultivation of Stove and Greenhouse Plants, Ferns, Exotic Fruits, &c. Four years present situation, leaving from expiry of lease.—E. HOSKIN, Farquhar House, Highgate, N.

GARDENER (HEAD), Age 45, married, no family; thoroughly understands every branch of the profession. First-class testimonials from last employers.—T. P., 12, Eleanor Road, Waltham Cross, London, N.

GARDENER (HEAD). Age 25, married, no incumbrance; has a practical knowledge of his profession. Good references as to character and abilities.—Messrs. ROLLISSON AND SONS, Nurserymen, Tooting.

GARDENER (HEAD), where two or more Men are kept).—Age 28; understands the general routine of Gardening. Four years' good character from present employer.—B. B., Post Office, Bracknell, Berks.

GARDENER (HEAD), where two or more are kept.—Age 36, single; understands Gardening in all its branches. Reference from last employer.—H. H., Post Office, East Peckham, near Tonbridge, Kent.

GARDENER (SECOND), or FOREMAN, in a Nobleman's or Gentleman's Garden.—Age 25, single; understands the management of Fruits, Flowers, and Vegetables. Good reference.—J. WILSON, Cambridge House Gardens, Twickenham.

FARM BAILIFF; married.—First-class references.—C., 19, Chestnut Street, Worcester

FARM BAILIFF, on a Nobleman's or Gentleman's Estate (under an Agent or otherwise).—Age 28; thoroughly practical in all branches of Farming. Satisfactory references.—W. O., Messrs. Peter Lawson & Son, 20, Budge Row, Cannon Street, E.C.

FARM or ESTATE BAILIFF.—Middle-aged, married, respectable, of energetic habits, and thoroughly practical in Modern Farming, Steam Cultivation, Draining, &c. Good Judge and Manager of all kinds of Stock; Breeding, Feeding, Buying, Selling, Management of Woods, Plantations, &c. Good Accountant. Can be highly recommended.—F. B., Post Office, Harlaxton, Grantham

To Seedsmen.

ASSISTANT, or otherwise.—Has a knowledge of the Nursery Trade. Good references.—J. W., 6, Allington Street, Pimlico, London, S.W.

SHOPMAN.—Age 24; six years' experience, both Wholesale and Retail. First-class references; character unexceptionable.—R. J., Messrs. A. Henderson & Co., Maida Vale, London, W.

ASSISTANT SHOPMAN. Age 21; six years' experience. Good references.—G. S. M., 96, Westminster Bridge Road, London, S.W.

DAIRYMAID.—Can manage a Dairy of 12 Cows, and can Bake well.—Mrs. HARDY, Post Office, Foot's Cray, Kent.

Suttons' Selected Stocks of Farm Seeds.

SUTTON AND SONS are now prepared to make quotations for their selected stocks of FARM SEEDS, which have given such satisfaction the past season, and which were so much admired at the recent Smithfield Club Cattle Show.—Apply, stating quantities required, to
SUTTON AND SONS, Seed Growers, Reading.

Farm Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks

Suttons' New and Clean Grass Seeds.

SUTTON AND SONS, having completed the cleaning of their NATURAL GRASS SEEDS, will be pleased to send samples and lowest quotations. They are of unusual fine quality this season, and can be relied on as perfectly free from weeds.
SUTTON AND SONS, Seed Merchants, Reading, Berks.

DELL'S JET BLACK-LEAVED BEET surpasses the Perilla as a decorative plant, and is decidedly the best Beet in cultivation, being uniform in height and colour, also fine for culinary purposes Price 1s. 6d per oz. The Trade supplied. To be had genuine from
DAVID MITCHELL, Nurseryman and Seedsman, Edinburgh.

MUSHROOM SPAWN, 4s. per bushel; printed directions if required.
MYATT'S ASHLEAVED KIDNEY POTATOS.
PHEASANTS EYE EARLY REGENT POTATOS.
A quantity to be disposed of.
JOSEPH MAY, Seedsman, &c., 35, Brydges Street, Covent Garden.

PEAS.—Maclean's fine Wrinkled Marrows,
Premier, | Early Emerald,
Little Gem, | Advancer.
For full description see CHARLES TURNER'S DESCRIPTIVE CATALOGUE, now ready.
The Royal Nurseries, Slough.

Notice to the Trade.

JAS. FAIRHEAD AND SON, 7, Borough Market, London, S.E., beg to offer the following PEAS.—Sangster's No. 1, Dillistone's First Early, Champion of England, McLean's Advancer, and Fritetaker. All from select stocks, and of Crop 1869. Prices on application.

SPECIAL OFFER to the TRADE.
SANGSTER'S No. 1 PEA .. .. 10s. per bushel
BENHAM'S IMPERIAL PEA .. .. 10s. per bushel
ALTRINGHAM CARROT .. .. 50s. per cwt.
LONG RED SURREY CARROT .. 50s. per cwt.
EARLY SCARLET HORN CARROT 80s. per cwt.
DRUMHEAD CABBAGE .. .. 75s. per cwt.
Special prices will be gladly sent for any other description of Seeds upon application. Any quantities may be had, either large or small.
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London.

Potatos.

CHARLES TURNER'S SEED CATALOGUE contains a Select List of Kidney and Round varieties, including two new kinds, now offered for the first time,
UNION, a Round variety, and BEACONSFIELD, Kidney.
The latter received a First-class Certificate at the Royal Horticultural Society. The Royal Nurseries, Slough.

Seed Potatos.

JOHN AND GEORGE BELL, Covent Garden Market, London, W. C., beg to call attention to the prices of the undermentioned SEED POTATOES:
PATERSON'S VICTORIAS, £6 10s. per ton.
EARLY SHAWS, £8 per ton.
MYATT'S EARLY PROLIFIC, £8 per ton.
RED PLOUGHBALLS, large croppers, £10 per ton.
In ton lots and upwards.

To the Wholesale Trade.

HERBERT H. NICHOLSON, SEEDGROWER, Great Clacton (near St. Osyth), Essex, has the following SEEDS to offer, for cash only:—
ROBINSON'S PRIZE CHAMPION OX CABBAGE, 80z. per cwt.
NONPAREIL CABBAGE .. .. 112s. ,,
WHITE CELERY (Leviathan) .. .. .. 95s. ,,
SELECTED RED BEET .. .. 150s. ,,
STUDENT PARSNIP .. .. 80s. ,,
MYATT'S CURLED PARSLEY .. .. .. 28s. per bush.
STUBBLE TURNIP .. .. 8s. ,,
&c. Also all the Annual FLOWER SEEDS, at low prices.

THE SHIPLEY PROLIFIC FRAME CUCUMBER.—This is a new Cucumber, of most extraordinary productiveness, having had as many as 19 Cucumbers on two young plants ready for cutting at the same time, with many more coming on. It has a very smooth skin, of a rich deep green colour, and grows from 18 to 20 inches long. It has also the advantage of being a first-rate variety for winter work. Price 1s. 6d. and 2s. 6d. per packet.
GEORGE JOHN CHILD, Seed Merchant and Nurseryman, 49, Darley Street, Bradford, and Bracford Nurseries, Shipley.
It can also be obtained of
London .. .. Messrs. Beck, Henderson & Child.
,, ... ,, Hurst & Son.
,, ... ,, Nutting & Sons.
Norwich .. .. ,, Ewing & Child
Other Names to follow as received

Genuine Seeds of Superior Stocks.

SEEDSMEN TO THE QUEEN.
FRANCIS & ARTHUR DICKSON & SONS, the "Old" Established Seed Warehouse, 106, Eastgate Street, and the Upton Nurseries, Chester.
Complete Assortments of Choice VEGETABLE SEEDS, for A Year's Supply.

No 1	£3	3	0	No 4	£1	1	0
No 2	2	2	0	No 5	0	12	6
No 3	1	11	6	No 6	0	5	0

Complete Assortments of Choice Continental and English FLOWER SEEDS

No 1	£2	2	0	No 4	£0	15	6
No 2	1	10	0	No 5	0	10	0
No 3	1	1	0				

Also Smaller Collections, from 5s. to 7s. 6d., free by post
CATALOGUE of New and Select Vegetable and Flower Seeds, Potatos, &c., for 1870, with practical Cultural Directions, will be sent Post Free upon application.
Their Seeds are all of the most select character, each variety being saved from the best stock known of its kind
All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Potatos, &c., excepted.
Flower Seeds free by Post or Rail.

BROCCOLI, ELLETSON'S NEW SURPRISE. Large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, T. & J. Ellotson, of Thorngumbald, who have for many years so successful in the cultivation of Broccolis, and who by great industry have so far improved upon the old kind as to produce the above variety, which possesses the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.
CUCUMBER, FOSTER'S XL, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet. Trade supplied
EDMND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited), CORN, SEED, MANURE, and OILCAKE MERCHANTS
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

GARDEN SEEDS; the countries from whence they come. See WHEELERS' LITTLE BOOK for 1870, price 6d., post free; gratis to Customers.
J. C. WHEELER AND SON, Seed Merchants, 59, Mark Lane, London, E.C.

WHEELERS' FIRST EARLY PEA is as early as any, and a better cropper; 2s. per qt. See WHEELERS' LITTLE BOOK for 1870, price 6d.; gratis to Customers.
J. C. WHEELER AND SON, Seed Merchants, 59, Mark Lane London, E.C.

BEANS, HARLINGTON WINDSOR.—A new and superior variety.
J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

BEET, EGYPTIAN TURNIP-ROOTED, quite new, fine rich colour, good flavour; 1s. per packet. Illustrated in WHEELERS' LITTLE BOOK for 1870, price 6d., post free; gratis to Customers.
J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

COCOA-NUT CABBAGE—A new and very early variety, 1s. per packet. Illustrated in WHEELERS' LITTLE BOOK for 1870, price 6d., post free; gratis to Customers.
J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

PATERSONS' SUPERB MELON. This extraordinary Melon was raised last summer by Mr. Paterson, gardener to Mrs. Hanbury Leigh, at Pontypool Park. It weighed 24 lb., and measured 42 inches in circumference. It is illustrated from a photograph in WHEELERS' LITTLE BOOK for 1870.
J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Forest Trees, Fruit Trees, Evergreens, &c.

CHIVAS AND WEAVER respectfully invite the especial attention of Planters to their very extensive, healthy, and well-grown Stock of the above.
Their Nurseries are the most exposed in the North-Western Counties, and free from all artificial shelter, render the safe removal of plants almost a certainty.
PRICED CATALOGUES post free on application; estimates and special prices for large quantities.
The Eaton Road Nurseries having been largely extended, an entrance is now obtained immediately on reaching Queen's Park by the Suspension Bridge.
Eaton Road Nurseries, and 108, Eastgate Street, Chester

Forest, Fruit, and other Trees.

JAMES DICKSON AND SONS' NURSERY STOCK is not surpassed in Britain; therefore, they have every confidence in recommending it, and inviting intending planters to visit their EXTENSIVE NURSERIES, which can now be reached, on foot, in seven minutes, from the Chester Railway Station, by their new private road from the Hoole Brook Railway Bridge.
PRICE LISTS on application.
(Old Established Nurseries and Seed Business.)
"Newton" Nurseries, Chester.

Prunus Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 12 feet; Half-standards, 5 and 6 feet; and Bushes, 5 feet high; also very fine Trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist, Market Gardener, and Fruit Seller," sent to England, price 1s. 6d. in stamps. A priced List of Index sent gratis.
J. S. describes a splendid stock of DWARF TREES, DECIDUOUS SHRUBS and EVERGREENS.
CATALOGUE free on application

THE LONDON MANURE COMPANY (ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES OF LIME
PREPARED GRANO
MANGEL and POTATO MANURES.
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, EMLERY SALT, &c.
F. PURSER, Secretary
Offices, 116, Fenchurch Street, E.C.

OXFORD MEETING, 1870.
FARM PRIZES.
A PRIZE of a PIECE of PLATE, value 100 Guineas, offered by JAMES MASON, Esq., and a SECOND PRIZE of FIFTY POUNDS offered by the Society, will be given to the Occupiers of the two best managed Holdings which shall be entered for competition) in the district comprised within a line drawn through the Towns of Reading, Great Marlow, Aylesbury, Buckingham, Banbury, Stow-on-the-Wold, Lechlade, and back to Reading.
The Competition is limited to Tenant-Farmers, and the LAST DAY of ENTRY is SATURDAY, February 26.
Further particulars and Forms of Entry may be obtained on application to
12, Hanover Square, London, W. H. M. JENKINS, Secretary.

WM. DILLISTONE, HORTICULTURAL AUCTIONEER AND VALUER, Noble Heddingham, Essex

Lilium auratum and Deodara Seed.

MR. J. C. STEVENS will SELL by AUCTION at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, January 17, at 1 past 12 o'Clock precisely, 6,000 BULBS of LILIUM AURATUM, just arrived from Japan, and a quantity of DEODARA SEED, from India
On view the morning of Sale, and Catalogues had

The Agricultural Gazette.

SATURDAY, JANUARY 1, 1870.

MEETING FOR THE ENSUING WEEK.
January 4 { North of England Chamber of Agriculture, at Newcastle upon-Tyne

NEVER perhaps in this century has THE NEW YEAR been launched with a freight so rich in promise, with such assurance of deep and manifold interest to the agriculturist, as that whose birthday now appears upon our pages. To those who can look back to the early decades of this nineteenth century the history of British husbandry presents a succession of phases that becomes more strikingly instructive as each fresh chapter opens out, and throws the light of after knowledge upon the past.

The collapse of farming prospects which followed upon the feverish stimulant of a protracted war,—a war which had pressed upon the home resources of the soil, and, coupled with short harvests, had driven up the prices of produce, and with them the rent of land to a height which made the return of Peace a word of fear to Agriculture, inverting natural order, and prayer,—that collapse when it took place found the country with an area forced under tillage that seemed to threaten the strangest of human ills—the curse of *plenty*—and drove the Rent-payer and the Rent-receiver as joint petitioners to the Legislature for Protection,—protection from a food invasion that was looked upon as ruin to the British plough and a scourge of British acres more to be dreaded than the passage of a foreign army, or a plague of locusts. Strange is the retrospect now of those years when 'distressed agriculture' assailed the ears of Parliament, session after session, asking for legislative relief, demanding a remedy—against itself! Since the very scale of import duties that should bar the *outer* door, opened the inner door of home-competition; and production seemed to have overtaken population.

Who amongst the wisest of that day could have foreseen the time when, with open ports that receive from foreign soils half the bread that we consume, the husbandry of Great Britain would be offering a lesson to the world, and that not less in the chemistry and mechanics of the soil than in those industrial and social combinations which beginning from ploughing-matches and local farmers' clubs, have now reached the organised form of Chambers of Agriculture, one for each county of the kingdom, all converging to a common centre in the Metropolis, proposing and discussing with a general voice, at once provincial and central, the questions that belong to every branch of rural industry.

It would be a task worthy of no ordinary pen to write in detail the annals of this remarkable period, to describe the progress that has taken place from that faltering and fitful infancy whose cry was so familiar to the ear during the early part of the century that has now struck 'threescore years-and-ten;' through the various stages of adolescence that led to the stature and condition in which the year 1870 finds the agriculture of this Island, independent, self reliant, no longer asking for extrinsic aid; nay, rather, hearing with mute surprise the palinode of 'Protection' chanted from those very quarters that once cried out upon the tax-favoured owners and cultivators of the Land!

But if strength comes with manhood so also does responsibility. No sooner have some of the problems of British agriculture found partial solution than there comes the cry from the Sister Island, a cry to be attended to, and dealt with, and that speedily too; yet not with haste, or passion like its own, but with the judicial courage of experience that can afford to be calm, and is determined to be just; that hopes all things, and believes, too, with that patient faith that can look through the mist and tempest of the "ignorant present time" to that certain though deferred harvest that never fails, to those who have studied well the conditions, and the soil, and sow with the hand of care in the furrow of truth and justice.

Let us not imagine for a moment that we are not concerned in that cry. The maxim is many a century old that says "Your neighbour's house cannot burn but your's is in danger." It is not so long ago that 'Tenant-right' was an English cry: nor has it entirely ceased to be so, though happily its tone and character must ever be different, according as the circumstances vary. But amongst all the features of the Irish land question there is no phrase that has so bristled with conflicting opinion and discussion as this. It seems the very Sphinx of the agrarian problem, and each writer in turn believes himself the Ædipus. It is a good thing, it is a bad thing; it is the right thing, it is the wrong thing; it is the salvation of Ulster, and it is the pest, not to be followed by any means: it is everything in turn, provided only that that may mean the opposite and contradictory in turn of everything else. *Nihil sic impar sibi!*

Is not the very word itself an instance of those pregnant phrases which, on Plato's principle of the generation of contraries, imply their own opposite? a sort of concrete self-betraying patronymic that unconsciously lets out, with its name, its parentage and pedigree. Might one venture

(while the fire of Christmas fun is not yet quite extinct upon the hearth,) to address it in Pindaric vein, as the ill-requited poet did that doubtful animal that bore the palm of speed at the Olympic games,—

"O successful Mule!
Victorious offspring of the Ass,"

for surely the word itself suggests most questionable origin.

Could Tenant-right have ever been coined where Tenant-*wrong* had not had pre-existence? Some plants contain the poison, and the antidote growing upon the same stalk, some are even said to produce them in succession. Is this a specimen analogous with the latter tribe? Do men commonly give name and speciality to 'Rights' except where the negation of them is the general experience? Does not the exception presuppose the rule?

This would be the fair presumption. Be it a good thing, or be it a bad thing in itself, it presents the spontaneously developed remedy for a general complaint affecting the land-tenure of a particular country. So far, it is, relatively, a good thing. But do we find it elsewhere established, where agricultural tenures are at their best? If not, it would *there* be pronounced, relatively, a bad thing: and in legislative dealing with the subject, the attempt to make it general (if it be indeed possible to crystallise a Custom into Law) would be to extend a bad thing because it is better than a worse thing. No wise legislator would be content with this.

It has been, not inappropriately, compared, amongst other comparisons, to the sum paid, on purchase of a commission, beyond the regulation Horse-Guards price. If the profession of the Army became unpopular, this *bonus* would disappear: and so would tenant-right if the demand for farms in Ireland were less than the supply of farms vacant. And here is its unwholesome mark: for, if it be the comprehensive expression not merely of tenant-improvements but of every advance of land-value from other causes, even the purchase of it would not extinguish it; for, the elements that produced it would survive. And, of those, the worst is the want of other callings, of other investments of capital far more productive than this profitless depositary of funds locked up on entry, to reappear at exit, with little gain to any, except as 'caution-money' for the landlord's guaranty.

It would appear then that if tenant-right be a good thing, it is for want of *a better*: and as physicians tell us that counter-irritants will often remove a disease that no direct remedy will touch, so perhaps the laws that could give trading, mining, manufacturing activity to the latent resources and industry of the sister island would do more than direct agricultural legislation can effect, to draw away the land-locked virus that has had too much to do with tenant-wrong, and something too with tenant-right.

Happy indeed will it be for both countries if, by the opening of another year, the causes shall be at work—we can hardly look for more—that may bring into healthy working order the land system of our fellow-subjects in Ireland, which has already received a far greater share of study here than has ever been bestowed upon our own.

—— Our Market Reports will for the future be found after the last page of the *Agricultural Gazette*, immediately following Notices to Correspondents; but a short statement on the tendency of prices during the week will be given as heretofore in this place.—The Corn market on Monday exhibited a tendency to greater activity, and prices advanced: the tendency has continued in most country markets during the week, to the extent of 1*s.* or thereabouts per qr. ——The Metropolitan Cattle Market, brisker than usual on Monday, was again active on Thursday, though prices were barely maintained. A change in the weather, which has tended during the past week to confidence in the meat market, is again unfavourable, and may injuriously affect coming prices.——In the Seed market stock are held firmly, and a brisk trade is expected.——A fair amount of business has been done in the Wool market, and the state of things is pronounced hopeful.

—— Messrs. Dobell & Co., whose manure figured as a Spurious Guano in the English Agricultural Society's recent list of published analyses, write to say that they sold the material in exactly the condition in which they received it, merely putting it into bags; that they sold it (five tons) at £4 10*s.* per ton in bags, delivering it to the carrier, and paying the cartage; that when the sale was made, the following analysis was shown, and the purchaser was distinctly told that in the case of such low-priced guanos (as to which there was great uncertainty), they invariably declined to guarantee the analysis:—

Sample of Peruvian Guano ex Magdaline and Sophie, received from Messrs. G. C. Dobell & Co.

	Analysis.
Azotized organic matter with fixed salts of ammonia	6.39 = 1.60
Phosphate of lime	38.49
Fixed alkaline phosphates	—
Ditto and sulphates and muriates	1.69
Sulphate of lime	1.59
Carbonate of lime	—
Water	21.59
Sand and other earthy matter	31.49
	100.00

(Signed) Hughes & Arbuthnot.

5, York Buildings, Liverpool, April 8, 1869.

—that though, to suit the wants of some customers, they occasionally, but rarely, deal to a small degree in inferior guanos, the great bulk of their sales is of the Government Peruvian guano, which is forwarded to the purchasers by the Mersey Dock and Harbour Board from the ship or stores without coming into their hands; that the purchaser was perfectly aware, both from the low price and the analysis, that he was purchasing an inferior article; and that Dr. Voelcker's analysis is in some respects more favourable than that on which they sold.

—— An excellent report of the serviceableness of Co-operative Stores in country places was lately published by the Earl of Ducie. The store at Tortworth, Gloucestershire, which his lordship described, has lately undertaken the daily sale of milk in the neighbourhood. The district being principally one of dairy farming may be said to flow with milk, but hitherto, strange to say, milk has been almost impossible to procure. Daily purchasing a large quantity, however, and thus taking it in a way in which the farmer is willing to dispose of it, the store now undertakes the work of distributing it retail, to the very great advantage of all classes in the locality. The following are some of the details recorded in Lord Ducie's published report:—

"In March, 1867, some 20 of the most intelligent persons in my employ met and agreed to attempt a co-operative store for groceries. Nearly £50 was subscribed by them on the spot as share capital, and a committee was elected. Suitable accommodation was easily provided, rough shop-fittings were extemporised, stores were purchased, and in a few days sales commenced. Ready-money payment was established, and has ever since been rigidly enforced.

"The committee was composed of persons of various grades, including day-labourers. A carpenter working half-time at his trade, and giving his afternoons and Saturdays to the store, with the occasional help of a schoolboy as clerk, was found sufficient to carry on the business. Beginning with but a moderate amount of skill, he has improved with practice, and has kept himself fairly on a level with the increasing custom.

"The store is conducted on the principle of the northern co-operative societies; the goods are sold at the ordinary shop prices, and at the end of every quarter a division of profits is made among the purchasers. Shareholders receive double the profit of non-shareholding customers, and receive in addition 5 per cent. per annum interest on their paid-up share capital.

"The system of quarterly dividends insures at least a quarter's saving, and the store operates to some extent as a savings-bank; labourers who had always been behind the world find themselves at the end of a quarter in the novel position of capitalists, and are astonished to learn that while they have been receiving their goods at the usual prices, and of better quality than formerly, a fund has been mysteriously accumulating which is their own, and which is large or small in proportion to the extent of their purchases. A man with a large family, and whose expenditure on the necessaries of life is consequently large, thus finds a new light thrown upon the text which assures him that happiness is among the possessions of him whose quiver is full of young children.

"The majority of the poor are deeply, almost hopelessly, in debt at the village shops. Some, however, roused by the advantages to be derived by dealing at the store, have already freed themselves, and others are for the first time stimulated to forethought and economy in order to rid themselves of their liabilities and to avail themselves of the benefits which their more prudent or more prosperous neighbours enjoy. The moral action of the store thus becomes of great value, encouraging a virtue which precept alone has long failed to promote.

"The shareholders at the end of the first year are as follows:—Labourers, 25; carpenters and masons, 11; tradesmen, 9; farmers, 6; gardeners, 6; clergy, gentlemen, and domestic servants, and various occupations, 10. Large purchases have been made by non-shareholders, receiving only half profits.

"The sales have been—for the first quarter, £320; second, £349; third, £468; fourth, £511. The dividends to shareholders have been, in the pound expended—for the first quarter, 3*s.* 4*d.*; second, 2*s.* 9*d.*; third, 3*s.* 2*d.*; fourth, 3*s.* 6*d.* For various reasons, which I need not discuss now, it is not probable that the dividends will in future range higher than 3*s.* in the pound. These are the general results; but I think that the following statistics of individuals will prove of greater interest. I take as typical cases the accounts at the end of the year of three labourers who joined at the commencement—

	Paid-up Capital	Dividend on Money Expended.
A	£1 0 0 ..	£5 0 0
B	1 14 10 ..	2 10 0
C	0 11 3 ..	0 17 3

These men earn 12*s.* each per week; the difference in the amount of their dividends arises from the different amounts expended by each. A, for instance, has a large family, some of whom add to the family income; his purchases have been large, and the result is a dividend which much more than pays the rent of his house and garden. These men have also received 5 per cent. upon their paid-up capital.

"The total sales for year ending June 30, 1869, amounted to £2694.

"The dividend was £203, and the interest paid on capital £20.

"The number of shareholders is now 120, against 73 in 1868.

"The capital embarked amounts to £525.

"The total results since the opening of the store in 1867 are as follows:—Sales, £5124 16*s.*; dividends, £429 18*s.*; interest on capital, £31 13*s.*

"As there are now but few non-shareholding customers, receiving only half dividends, the receipts of the shareholding customers, no longer swelled by the profits made upon the former, are much smaller than they were at first."

—— A circular on the subject of Gaml has been addressed to Chambers of Agriculture throughout the country by Mr. G. F. Muntz, in which he says:—

"The great source of grievance between landlord and tenant concerning game arises from an increase in the quantity preserved after the commencement of a tenancy.

"An effectual remedy against such disputes would be, that the food to be provided for feeding game by the tenant, and the cost of the damage done by it to his crops, which he agrees to bear, should be clearly defined in value, and stated in the lease or agreement of tenancy."

Mr. Muntz, believing that injury by game is capable of accurate valuation, submits that—

"if a tenant agreed to keep sheep or other stock for his landlord's convenience or pleasure, he would assuredly require that the number of sheep should be defined; and if the landlord doubled the number after the agreement for the tenancy had been signed, the tenant would doubtless require, and be entitled to have, a corresponding amount allowed off the rent to be paid for the farm."

The proposal, therefore, is that the following conditions be inserted in all agreements of tenancy:—

"The tenant shall provide, from the produce of the said farm, keep for game, and shall be subject to damage to crops by game to the value of £ per annum, and the landlord and the tenant shall each one appoint a professional valuer to value the amount of keep consumed, and of damage done by game every year, who shall make a valuation accordingly, on any day to be agreed upon, between the 1st day of July and the 14th day of August, having first agreed upon an umpire; but in case such valuers do not agree in the amount of their respective valuations, then they shall refer to the umpire, whose award shall be final; and in case the amount of such valuation for keep and damage shall exceed the sum agreed upon, stated in the lease or agreement of tenancy, then the landlord shall allow such excess to the tenant as a deduction off the rent to be paid for the farm."

The real difficulty is not much removed, we think, by this; nevertheless it has the advantage, as Mr. Muntz points out, that thus—

"The figures representing the cost agreed upon, and also the actual cost, must appear annually before both parties.

"If such an arrangement were carried into force, landlords would see the amount they are willing to pay for game, and what it really costs: besides which, the usual cost of preserving, that is, the food consumed annually in the country by it, could be ascertained.

"The working of the plan suggested would be this:—Mr. Blank takes a farm, say of 300 acres, for which he agrees to pay £600 a-year rent, and also to find keep for game, reserved for Mr. A., his landlord, and to bear all damage done by it to his crops to the value of £30 per annum. In July, the appointed valuers view the crops, and make a valuation of £45 for keep and damage to tenant's crops, of which a copy is sent to landlord and to tenant. The amount agreed upon when entering a tenancy being £30, the landlord has to allow the tenant the difference, viz., £15 on the rent to be paid for the farm."

—— Mr. Reid, of Granton, the patentee of an improved Cattle Truck, sends for publication a report by Mr. A. Cherry, the police veterinary surgeon for the City of London, stating the result of his examination of 12 animals conveyed from Aberdeenshire to London in two trucks, one of which was the patent waggon, and the other an ordinary railway cattle truck having a roof and spring buffers. Mr. Cherry awaited the arrival of the waggons at midnight, December 11—12, at Holloway, and the following are the points of his report:—

"The atmosphere in the closed 'patent waggon' was the most pure, though the beasts (six) had been put in 56 hours before; the other six had only been in the truck 40 hours. This was owing to the state of the excretions; in the first they were healthy, in the latter deranged, therefore the more prone to be decomposed. But the most remarkable point was the different appearance of and the manner of the beasts themselves—in the 'patent waggon' quietness and repose (one was lying down), and all were ruminating; in the other (open) truck there was a look of anxiousness and uneasiness. Of the cattle from the 'patent waggon,' the first that got out appeared to slip, and for a few steps went stiffly; the others got out readily, but leisurely, and went into the cattle-pen, where there was an abundant supply of water; one only looked at it, but none drank. From the open waggon the cattle were eager to get out, and as soon as they reached their pen they drank most greedily. The cattle from the 'patent waggon' looked healthy, and handled as if they had just come out of a well-managed byre. The others were also examined. Their skins were clammy, the horns hot, and their appearance starved-like. The

former were in a condition to be at once taken to be slaughtered; the latter would require several days before they would be fit."—Mr. CHERRY adds, in praise of the new mode of transit, "whatever produces derangement of the ordinary healthy functions, whether by privation or any other cause, the flesh of such animals when slaughtered will not what the butchers call 'set,' *i.e.*, will not become 'firm,' but remain 'flabby,' in which state it is more liable to become decomposed or putrid, hence the advisability of bringing cattle to market in as near an approximation to health as possible. Any one at all acquainted with the meat in the London markets and butchers' shops in the early part of July and August will at once detect the difference between that which has been killed at and sent from Aberdeen from the London killed meat. This difference does not depend upon the better quality of the beast, but upon the state in which the animals were at the time of slaughtering; the one 'sets' firm and hard, and therefore resists for a longer period decomposition, whilst the other, not 'setting' properly, is not in a condition to resist for so long a time; indeed, I have known flesh putrid of an animal slaughtered but some 30 hours before."

OUR LIVE STOCK.

CATTLE.

ON glancing at the following table, and especially on comparing it with the similar one published last season, the following interesting facts will be brought to light. The table contains a register of 42 sales, nine of which were held in Scotland and Ireland, against 31 English sales of importance last year. Although, including the greater number of British Shorthorn sales, the total number of animals sold in 1869 does not far exceed that of the English sales last season, when 1423 cattle were brought to the hammer, the average price over the entire number of sales published in these columns during the past two years is closely accordant: thus we have in 1868—

1423 Shorthorns, realising an average of 35*l.* 7*s.* each;

and in 1869—

1535 Shorthorns, realising an average of 35*l.* 5*s.* each.

This year we cannot boast such an average over a considerable number of high-bred stock as in 1868, when 30 cows and heifers sold at an average of 187*l.* 15*s.* 6*d.* each, but the sale of three *Princess* cows for an average of 341*l.* 5*s.* each last year, is fairly eclipsed by that of three Siddington (Kirklevington) cows for 460*l.* each. It will be seen that prices have been well maintained: 650 gs. for 2D DUKE OF COLLINGHAM, and 500 gs. for Mr. F. Leney's GRAND DUKE OF KENT, being higher figures than any given around a sale ring the previous year. With regard to the averages obtained, Mr. Bowly and Mr. Stiles Rich, so long associated together as breeders, head the list. The former, with his average of £72 16*s.* over 39 animals, excels the latter by a few shillings only in his wonderful average over 56 head, and this fact undoubtedly gives Mr. Rich's sale the precedence as the most successful of the season.

SHORTHORN SALES, 1869.

Name.	Date.	Number sold.	Highest Price.	Lowest Price.	Total.	Average.
			Gs.	Gs.	£ s. d.	£ s. d.
Mr. J. Armstrong	Mar. 9	23	40	11	752 0 0	32 14 2
Mr. Stiles Rich	,, 23	56	53	11	4046 0 0	72 5 8
Mr. Chaloner	,, 30	50	150	7	2479 0 0	49 11 7
Thelate A. Turriff	,, 30	53	53	7	1340 7 0	25 1 3
Mr. E. Bowly	April 22	39	400	10	2829 4 0	72 16 0
F. Leney & Son	May 4	43	360	12	2755 4 0	64 1 6
Lord Penrhyn	,, 7	24	160	16	1745 16 0	69 10 6
Mr. Wortley	,, 13	62	65	4	1981 7 0	31 19 1
Mr Anslie	,, 18	27	70	9	951 6 0	35 4 8
G. W. Roberts	,, 25	37	56	13	1685 14 0	29 6 8
W. A. Wooler	June 9	14	59	6	337 11 6	24 2 1
Mr. C. Leney	,, 10	24	110	10	892 7 0	37 3 0
Mr. Gebhart	Aug. 4	42	40	9	1079 8 0	25 14 0
Messrs. Angus	,, 11	55	150	10	2444 8 0	44 8 10
Late Earl Radnor	,, 20	55	71	16	1803 18 0	32 16 0
H. J. Sheldon	Sept. 17	35	155	14	1641 3 0	46 17 9
Rev. M. Holbeach	,, 17	40	100	6	1153 8 0	28 18 5
Mr. R. Barclay	,, 21	27	165	17	1568 13 0	58 16 9
Barth Cotham	,, 27	42	128	—	933 0 0	19 16 7
Mr. E. J. Shollick	Oct. 5	47	62	12	830 10 0	30 15 3
Mr. J. Gamble	,, 6	52	100	13	2121 0 0	49 15 7
The late Mr. R. Wilson	,, 8	24	56	4	544 0 0	22 13 3
P. J. Kearney	,, 13	56	200	7	1483 13 0	26 9 10
Mr. J. K. Fowler	,, 19	47	210	13	1690 10 0	45 13 6
Lord Braybrooke	,, 2	2	110	70	180 0 0	194 10 0
Mr. A. Stables	,, 8	24	353	14	70 0 0	123 5 6
Mr. J. H. Jones	,, 21	40	171	9	1153 0 0	28 4 0
Wm. Woodward	,, 27	82	56	33	1355 0 0	16 7 2
Rowland Wood	Nov. 3	58	49	10	1763 0 0	30 3 6
Rev. Mr. Staniforth	Nov. 1	21	72	—	684 10 0	32 12 0
Belmont	,, 18	40	150	—	647 16 8	32 7 10
Various properties	,, 9	57	82	—	1662 6 0	29 3 5
Mr. Meakin	,, —	36	210	8	1412 15 6	37 7 7
Mr. T. Chrisp	July 14	74	38	—	1413 8 0	19 2 6
Duke of Richmond	Sept. 1	19	44	—	541 1 6	28 9 6
Major Barton	,, 2	30	39	—	660 18 0	22 0 0
Col. Fisher	,, 27	30	52	—	735 0 0	24 10 0
Mr. W. S. Marr	,, 30	24	38	—	560 8 0	23 7 0
Mr. J. Innes	Oct. 14	39	40	—	804 3 6	22 3 2
Sir W. S. Maxwell	,, 22	12	65	—	483 0 0	40 5 0
Messrs. Gill	,, 29	25	343	—	502 18 4	20 2 4
Mr. C. H. Abbot	Nov. 2	57	43	—	1194 18 0	21 6 7
		1585	650	3½	56011 2 9	35 6 8

The results of sales both at home and abroad during the past season indicate a continued and increasing demand for pure-bred Shorthorns. Never before in the annals of Shorthorn history have such prices been given for a number of pedigreed cattle as those obtained by Mr. Sheldon, of Geneva, U. S., for six *Duchesses*, sold to Messrs. Wallcott & Campbell, for the unprecedented sum of 1100 gs. each! Neither must we omit to mention *Bride of the Vale*, sold to the above-named firm for 1000 gs. Such prices as these must be particularly encouraging to English breeders, as indicative of the high value attached to British stock on the other side of the Atlantic.

—— Devon and Sussex cattle closely resemble each other. It is interesting, therefore, to hear the opinion of Sussex men, interested in the improvement of their famous breed, as to whether any cross has been made between the two varieties. This is especially important, since the statement has recently been advanced that the improvement of Sussex cattle is due to the introduction of Devon blood. Mr. Darby, of Marklye, at the public dinner of the Hustpierpoint Fat Stock Show, flatly contradicts this statement, and many succeeding speakers bore out his remarks by their own experience. That on certain occasions the experiment of crossing the two breeds has been made is not disputed; but that the Sussex breed, as a breed, has been admixed with Devon blood, is stoutly denied.

—— Thirty very prime Shorthorn beasts, and 150 Down and half-bred sheep, were sold at Windsor on Friday, the 17th ult. The prices realised were very excellent, fully equaling former prices at sales of Royal stock. The sale realised 1200*l.* The highest price for beasts was 45*l.* 10*s.*, and the lowest, 21*l.* 15*s.* The highest price for sheep was 7*os.*, and the lowest, 36*s.* The average for the beasts was 30*l.* 6*s.*, and of the sheep, 40*s.*

POULTRY.

Mr. TEGETMIER in his "Poultry Book," after a careful description of the Jungle Fowl (R. Gallus Ferrugineus), by common consent looked upon as the wild prototype of our domestic breeds of fowls, thus speaks of it in terms which at once enable us, as it were, to see the bird before us:—If the tail of a small game cock of the black-breasted red variety were depressed so as to be carried horizontally, it would be difficult to distinguish the bird, provided it had not been dubbed from the descendants of its wild progenitors, and now roaming at large in the Indian jungle. The jungle fowl is found all over continental India, wherever jungle exists. In favourable situations, such as the narrow strips of cultivated land in the woods, I have, after the crops have been reaped, seen as many as 20 or 30 together gleaning about in the stubble; and where the country is thinly inhabited they will in twos and threes advance pretty boldly into the open. Excessively timid and wary when approached in open spots, they take wing as readily as partridges, flying rapidly to the jungle, with rapid beats and alternate sailings of their wings. Alighting generally within the edge of the covert, they run so long and swiftly as to render it hopeless to follow them. There is no bird more difficult to approach, or even to see, in the jungle. The cocks may be heard of a morning or evening crowing all around, but the utmost precaution scarcely enables the sportsman to creep within shot or sight of the bird. The hen, too, announces the important fact of having laid an egg with the same vociferation as in the domestic state, but is silent ere the stealthiest footstep can approach her hiding-place; and, gliding with stealthy feet under the dense foliage, is soon far away in the deep recesses of the jungle. To a stranger it is not a little curious to hear the familiar sounds of our farmyards issuing from the depth of the wild forests. The crowing of the cocks, the cackling of the hens, the chirruping of the chickens, are precisely the same as we have been accustomed to hear since the earliest dawnings of our intelligence; and, associated as the homely sounds are with civilisation and domestication, they appear out of place in the solitude of the jungle!

—— If there be a subject on which men are, or should be, of one mind in a house, it is the institution of turkey on Christmas Day. The railroad, penny post, and other dangerous innovations, destroyed many traditions that had been generally received, and, in default of contradiction, believed in by every one. No picture of a mail coach, changing horses at the appointed inn, on a frosty Christmas night, was ever considered complete unless barrels of oysters, and one or two hampers, each containing a turkey, were in the foreground, and on the lamp-irons. The whole is changed. Breeding, feeding, and consumption, all take other phases as the world wags on. It is no longer the tradition of the family that the Christmas cheer should pass unrivalled, although there be still some houses in which olden custom retains its prestige. In the present day, the keenest buyers and the largest are generally wholesale houses in divers trades, who give away large numbers, both of turkeys and geese, at Christmas, to their different clients, doubtless on the principle of giving the sprat for the salmon. A great writer once said that the man who made two ears of corn to grow on ground that had hitherto produced but one, was a public benefactor. What then, may we say to the men who bring up young fowls, weighing 10 lb., and young turkeys, weighing 20 lb. and more, when 5 or 10 had been the former figures. Surely, this will be called progress, and may ultimately be deemed worthy the attention of the British agriculturist. That there are men in the country who do appreciate such produce, and do their best to develop it, may be conceded, when Cambridgeshire farmers take for their Christmas turkey sales in London from £1200 to £1500. French dealers find it answer to buy up the geese in the north and north-western districts of France, and then send them here to sell. As Christmas Day was on Saturday, opinions in the country were divided as to which would be the best days for the sale of the big birds; the consequence was a broken market extending over a whole week, with unequal supply and demand, and fluctuating prices. Monday, Tuesday, and Wednesday things sold well, and in bulk; Thursday buyers became more shy; and on Friday, after the early morning, they were scarce. The average of the turkeys was not equal to that of last year, either in size or quality; and with the exception of the flocks of a few of the best feeders, the crooked breasts were terribly frequent. The increasing numbers of the black Norfolks, as compared with the grey Cambridgeshires, speaks much for the former breed, and we predict for it still further patronage. The handling of the Cambridgeshire birds was perfect; they were picked, put into shape, and hung up without tear or scratch. Farmhouse turkeys, although perfect in many instances as regards quality, had suffered terribly in the killing, and were consequently damaged as regarded their sale at top price. Irish turkeys were inferior in every way to those of last year, as were the geese. French geese and turkeys make great progress and good prices, and as the French are now learning our modes of killing, picking, and packing for sale, the produce sells freely. Large sums of money find this week their way into the Pas de Calais, the environs of Cherbourg, and the department of Sarthe, in payment of geese and turkeys. English geese in the Christmas market varied much, and the really home-bred and farm-fed birds made great prices, while the feeders' birds, Irish or Dutch by birth, and fed on anything that would make flesh at a small cost, were looked at with distrust, and made but small prices. A novel feature in the London market was the presence of country buyers for the best turkeys, and the principal firms of Manchester, Liverpool, &c., were well represented. The average prices may be taken about as follows:—

Cambridge cock turkeys, first quality, £20 to £30 the score; do. do., good but smaller, £15 to £19. Norfolk and Suffolk cock turkeys, best, £20 to £26; do., smaller, £14 to £18. Cambridgeshire hen turkeys, best, £12 to £15 the score; do., smaller, £9 to £11. Norfolk and Suffolk hens, £7 10*s.* to £12. Country turkeys (cocks), £10 to £16; do. hens, £7 to £10. French turkeys (cocks), 12*s.* to 17*s.* each by the case; hens, 9*s.* to 10*s.* by the case. Largest French geese, by the case, 8*s.* to 10*s.* each; smaller do., 5*s.* 6*d.* to 7*s.* 6*d.* Best English geese, £11 to £12 the score; smaller do., £8 10*s.* to £9 10*s.*; feeders' geese, £6 10*s.* to £8 10*s.* per score. The large Surrey and Sussex fowls were unusually good in quality and remarkable in size, many of the best of them realized easily £6 per dozen, and some ruled as high as £8 per dozen.

—— In reply to the question of a correspondent on ill health in her poultry yard, we advise, if her fowls have at present full liberty, that they be penned up for a short time, and fed carefully, so that they may have nothing of an irritant or stimulating nature. When the symptoms are first perceived in any bird, give at once a tablespoonful of castor oil. If the dung next day be green and loose, repeat the dose. Let the birds have but little water, and that clean. If they be at liberty on a farm homestead, the only plan will be to go round at night and catch off their perches the birds that are affected, and shut them up by themselves. Encourage them by feeding to get away from the building and dungyards, where they drink the drippings and drainings from manure heaps, &c.

CONTINENTAL FARMING.

IT is evident, from his speech at the late general meeting of the Royal Agricultural Society of England, that Mr. Read, M.P., expects that something very interesting upon the above subject will appear in the next issue of the Journal of the Royal Agricultural Society. Let us hope that he may not be disappointed, and that we may find therein what will prove useful in an "agricultural as well as political sense."

As I strongly suspect Mr. Read's allusion to the political usefulness of the late and coming criticisms on foreign agriculture concerns their bearing upon what will be a very absorbing question during the coming year, I hope that something tangible may be laid before us, wherewith we may be armed with such facts and data as will contribute somewhat towards settling the *questio vexata* hinted at.

Regarding the recent contribution to our stock of information upon Continental agriculture, by Mr. Howard, M.P., I must say that I cannot reckon myself amongst those who are satisfied with the production; and I was puzzled to know whether Mr. Read's remark, that "John Bull is apt to be very conceited and stupid," is not likely to be perpetuated to a proverb, through the paper read before the Central Farmers' Club on November 1.

It struck me that Mr. Howard, in his paper, looked at everything agricultural from a stand-point rather

English, and I consider that in giving us his experiences and opinions on Continental farming he ought also to have glanced at the circumstances which may have given existence to such systems, especially when he contrasts foreign agriculture with our own.

Mr. Howard's description of Belgian farming was not, to my thinking, by any means satisfactory; perhaps I may have been misled by those who hold that "Belgium had the reputation of being the best farmed country on the Continent." If it were so, I must say that a late visit to the country was not calculated to dissipate what I had previously gathered from repute. My impressions were that the Belgians are an industrious, thrifty race, not wanting in intelligence, and that they are a happy and contented people. Their fare may not be luxurious, they may wear *sabots* and coarse garments, but they perhaps may belong to that happy class of economical philosophers who think that "man wants but little here below," and that men's riches are measured as much by their desires as by their possessions. Certainly the "landlady of the village inn," no matter how much her sympathetic commiseration may endear her to us, is not the most trustworthy witness as to the contentment of a people.

When we look at what has been done in land reclamation, and consider the elements with which the Belgian has to deal, I think we must concede that great progress has been made in that country. A large quantity of land has been reclaimed from tidal influences. A considerable extent of sandy land, which in a state of Nature was covered by an unprofitable vegetation, has been brought into cultivation, and it is well known that the strong and willing arms of the Belgian peasantry must be credited with the largest share of those works, as of implements, machinery, or the capital wherewith to procure such, they had little.

It must not be forgotten, too, that the quality of the major portion of the country is not of the best. Analyses show that the Belgian soil is generally inferior to ours, and the remarks of a recent writer are worthy of notice:—"With only equal manuring, the soil of Belgium would be exhausted sooner than ours. Indeed, if the Belgian farmers did not preserve the manure producing products of their farms with the greatest care, their light soil would long since have shown signs of deterioration." Mr. Howard might have described the peculiarly careful and successful utilisation of liquid manure and night-soil, as well as the way in which the refuse of the Rape and Flax products is sedulously returned to the soil.

Taking these matters into consideration, I maintain that Belgian farming has not received its due share of consideration from the farmers' club. The question should have been, have the farmers of that country adopted that system which is best calculated to promote their material interests? I hold that there is no parallelism between the objects of English and Belgian farming.

Here we have a large manufacturing population which must have its beef, and, according to the views of many members of the farmers' club, its beer. We have a soil moderately fertile, and our social state is altogether different from that of Belgium. There we find a population engaged in, and dependant mainly upon, agriculture. If it should occur, or if it be desirable, that Belgium should alter her present state, by which she will become more of a manufacturing country, and like to ours, then, I say, let her import "Ye manners and customs of ye English"—let her turn her attention to the production of such articles as are desirable in a manufacturing country; but so long as she is almost purely agricultural my idea is that she is doing pretty well.

Mr. Howard, in conclusion, makes a rather awkward statement, and asks a not very logical question upon it. He says—"I have arrived at the conclusion that with the land cut up into small farms, a greater number of people can manage to live or exist upon it. The question then arises—Which is the more desirable state of things, a system under which the greatest population can subsist upon a given area, or a system under which the greatest amount of food can be raised?"

If the subdivision of land is followed by an increase in its capability of supporting human beings, what object is gained by increasing the size of the farms, although such change might be the system "under which the largest amount of food can be raised at the least cost?" The object of agriculture is the production of food and the irresistible laws of supply and demand have a wonderful effect upon agriculture, although the bucolic mind does not always recognise their workings. What would be the result of producing the "largest amount of food" if we had not people to consume it? A very large quantity of meat is produced in South America, but its price is very much below that of London markets. It may be that a small cultivator of either his own or a rented property works harder, and fares no better than an English labourer, but most of our lecturers forget that he keeps and increases a small property in his land, that he has something to fall back upon in time of sickness, and that labour is always sweeter when given for one's-self rather than a stranger. The pride of ownership, too, is as strong in the small occupier as in the squire of a thousand acres.

It seems to me that Belgium is now one of those ideal countries upon which writers on political economy dilate when treating the question of production and population. There we find population increasing: the lower classes of soils are being rendered productive; the available soils are being better cultivated; emigration is going on.

It is all very well to give a glowing account of rich prairies, &c.; these places will be found out and populated in time; but the tenacity with which a people holds to the land of their birth cannot be very easily overcome: and it seems an almost immutable law that people will not emigrate unless driven to do so by force of circumstances.

I cannot conclude this already over-long letter better than by giving an extract from Mr. Baldwin's pamphlet on "Belgian Agriculture." I need scarcely remind some of your readers that Mr. Baldwin is no mean authority on such matters.

"The great landlords live upon their properties for 10 or 11 months of the year, and spend the remaining month or two in their town residences, which, as a rule, are situated in the capitals of the several provinces.

"Their expenditure circulates in the country, distributes employment among the trading and labouring classes, enriches the country, and creates a bond of sympathy and good feeling among all classes. * * The cultivators of the soil in Belgium are divisible into two classes—namely, those who cultivate their own land, and tenants. It is needless for me to advance any argument to show that the men who cultivate their own land are more prosperous and happy than the mere tenant. The proprietor has for his income both the tenant's profit and the landlord's rent. He has all the elements of self-respect, and is, in a social point of view, better off than the mere tenant.

"The tenant-farmers of Belgium appear to be contented and happy, they have acquired much skill in the culture of the soil, they are most continuous in their industry, they are exceedingly thrifty, they live temperately and frugally, and they pay high rents, but they are willing and able to pay their rents, and they do not appear dissatisfied with their lot, or disaffected towards their rulers.

"All the landlords whom I met assured me the properties which were most subdivided gave the highest rentals. In other words, small farmers paid higher rents than large farmers for the same class of land."

T. C.

STEAM CULTIVATION: WOOLSTON.

I HAVE been much amused by the controversy between Mr. Smith and "G. A. H.," and as lookers-on oftentimes take less excited views, and see more of the game than the players, I venture to trouble you with a few observations which have occurred to me on the subject matter of this spirited encounter.

"G. A. H." charges Mr. Smith with being "so cozy,"—a charge which, in my opinion, rebounds upon himself, for he exhibits very marked symptoms of the same complaint. Nothing could well exceed the jaunty style of his letters, the last of which begins with a jeer, and ends with a delicious bit of swagger. He boasts of his extensive knowledge of mechanics and accounts. What he may know of mechanics it is impossible to say, as he vouchsafes no information on the point; with his figures I shall presently deal.

I will endeavour to follow "G. A. H." from beginning to end. After his criticism on figures and estimates he says—"What have we to do with horses?" and further tells us, that horses have nothing to do with the question. I say that they have a great deal to do with it, in the opinion of all practical men. Such persons, when contemplating the introduction of steam ploughing or cultivating on their farms will, as a matter of course, calculate whether they can dispense with any horses, or how many; or, if the number cannot be reduced, how much less the cost of maintenance of the team will be owing to the aid afforded by steam. I can readily understand cases where, owing to peculiar circumstances, the number cannot be conveniently reduced, but they may in such cases be kept at one-third or one-half less expense. In other cases the number usually dispensed with varies from a third to one-half.

In making these statements I am not, like that eminent mechanic and accountant, "G. A. H.," fortified by the "best authorities," but I personally know the men by whom these calculations have been not only made but practically carried out. I repeat, then, that horses have a great deal to do with the question.

Notwithstanding what the "best authorities" may tell "G. A. H.," the number of horses required to cultivate a given quantity of land will depend on its situation and character. It is an easier task for four horses to cultivate and do the general work of 100 acres of land lying compact round the homestead and all flat or level land, than for six to do the same number of acres where one part of the farm is situated half a mile away at one end of the parish and the other a mile and a-half away at the opposite end, and of so hilly a character that for a horse to draw an empty waggon up the steeps was hard labour. I would remind "G. A. H." that there is other work to be done on the farm besides making seed-beds, and this is materially increased under a set of circumstances such as I have last described. "G. A. H." must also remember that his horses must be of the best quality, and of an age when their physical qualities are at their highest pitch, they must also be highly kept and well tended; and even then he will, in ordinary seasons, before his four horses have finished their 100 acres, be puddling and treading the life out of the land, while the "smasher" man has done weeks or months ago in the best part of the season, and his horses are quietly grazing in the meadow, feeding at little expense, and grooming themselves. I would recommend "G. A. H." to rub his glasses and consult "the best authorities" a little further.

"G. A. H." next comes out with a tremendous flourish about the small farmers, whom he tells us Mr. Smith wants to bamboozle into buying "steam smashers." I have read, I believe, every letter which Mr. Smith has written on the subject, and state most unequivocally that his invariable advice to men of this description has been to join together in the purchase of a set of apparatus. I know men who have done so. I also know other small holders who have purchased sets, and, after completing their own work, have gone out for hire, with satisfaction to themselves and their customers. I further know that Mr. Smith might, had he been so inclined, have annually broken up some hundreds of acres on this plan. He has frequently given a neighbour a good turn by smashing up a field or two for nothing, but he never would descend to what he calls "haggle cart." If Mr. Smith had seen fit to do as some of his followers have done, even "G. A. H." would have allowed 1*s.* 6*d.* per acre for interest, depreciation, &c., to pass unchallenged. As he has not done so, he is in all common fairness and honesty entitled, in making a calculation for public guidance, to claim that which neither the Royal Agricultural Society, nor any other body or person, until the advent of this clever "mechanic and accountant," has ever publicly disputed.

"G. A. H." complains that Mr. Smith's figures do not represent facts. Let us put his own to the test, and see what they represent. He comes out bold ly and states, that the Woolston seed-beds, instead of costing 6*s.* 8*d.* per acre, really cost 17*s.* 2*d.*, and that the actual sum chargeable for interest, depreciation &c., is 12*s.* per acre. If these figures represent a fact, Mr. Smith has, since his commencement of steam cultivation, used up a couple of sets of apparatus, and made a hole in the third.

I have departed a little from the order of "G. A. H.'s" letter for the sake of perspicuity, but I hope to leave no portion of it unnoticed.

To return. "G. A. H." finds fault with Mr. Smith for saying that, in comparing the cost of steam work with that done by horses, and the implements they drew, it has not been usual to charge interest on the latter. I assert that Mr. Smith is right. At all events, I have never seen it so. The writer turns in triumph to Mr. Morton for confirmation: so far from this, however, if he will open his eyes and look again at his own quotation, he will see that that gentleman says not a word about interest. In comparing the cost of two different forces of the farm, it is absurd to talk of what the best farmers do when they make up their annual balance-sheets.

Another of "G. A. H.'s" facts is, that "every good farmer at the end of each year makes up an annual balance-sheet." This I utterly deny. I think that 99 out of every 100 good farmers never think of wasting their time for any such stupid purpose. A farmer who is so far master of his business as to know how to rent land and how to manage it when he has got it—whose eye and hand will teach him how to select a bullock which will grow and feed—whose experience tells how much labour of every kind he ought reasonably to have for his money, and whose skill enables him to direct that labour with the most telling effect, need not trouble his head about balance-sheets. Given the conditions of success, and success will inevitably follow. The essentials I have enumerated being wanting, no fanciful array of figures will convert failure into prosperity.

In the business of farming balance-sheets are mere fallacies. I will put a case by way of illustration. A farmer of the "G. A. H." type takes it into his head at the end of the year to make a balance-sheet. On entering the stackyard, for the purpose of stock taking, he finds a number of stacks. He cannot tell within a long way how many quarters they contain, and it is impossible to know what they will fetch when threshed and sold. He must estimate.

He next visits the bullock-yard, and in the sheds finds a number of beasts he does not know within 4*d.* to 1*s.* a stone what they will fetch when realised. He must estimate again. So with his sheep, pigs, &c., which, owing to a fluctuating market, may vary in value between the time of estimating and selling.

When he comes to the implements he is quite as far at sea, for at public autions I have oftentimes seen second-hand tools sold for more than they cost when new, and implements for a larger sum than they cost when brought second-hand on to the farm five or 10 years previously. Hence what is the good of making a balance-sheet which six months, or possibly as many weeks will show to have been not worth the paper on which it was written?

"G. A. H." tells us that many of the farmers about him trade on borrowed capital. I am sorry for them, and hope that such is not his own case. I find that I have quite enough to do to pay rent with one hand; and if he has, especially as he is advanced in life, to pay with both, I would give him a friendly hint to pay more attention to the field and the fold, and less to

letter writing, especially on subjects which he evidently knows but little about. If, as I hope, he is in better case, and he is not too busy just now making up his accounts, and feels anxious for a little further discussion, I will, as my balance-sheet does not trouble me, pay him the most polite and prompt attention. *Looker-on.*

THE CENTRAL COTTAGE IMPROVEMENT SOCIETY.

THE improvement of the dwellings of the working classes, whether agricultural labourers or artisans, is one of the most desirable ends to which any Society can devote itself. It is the task which has long been set before itself by this Society, which has attempted to accomplish its purpose both by improving cottages already in existence, and by inducing proprietors to erect new ones constructed with greater attention to the health, convenience, and comfort of the inmates than formerly. The latter being the most promising and permanently useful part of the design, the Society has directed its chief efforts to the construction of cottages. To this end it has devised and published plans, which being erected in all parts of England have proved the practicability of producing greatly improved dwellings at a cost upon which the rent will return a fair rate of interest. In these plans special attention has been paid to the importance of providing separate sleeping rooms for the parents and the different sexes of children; and of surrounding homes with accommodations which allow of the observances of the decencies and proprieties of life.

The above is for the most part quoted from a circular advertisement issued by the Society: and having before us a number of the reports, plans, placards, and prospectuses issued by it during the last 10 years, it appears to us that we can hardly do a greater service than let our readers know what this Society and its energetic secretary, Mr. H. Martin, have been doing during that period.

Taking as their motto, "As the home so the people," a number of gentlemen, among whom may be mentioned the Rev. H. Killick, of the Strand; Mr. W. G. Habershon, architect; Mr. G. H. Whalley, M.P., and others, directed their attention so long ago as 1861 to the best means of concentrating the efforts of the benevolent on this question. An architectural museum was opened at 37, Arundel Street, Strand, where information of all kinds connected with the subject, including models, plans, records of actual experience, and specimens of every kind of material and equipment involved in cottage-building could be inspected and obtained.

Plans of cottages were designed, discussed, improved, and published; and in 1862 a pair of model cottages on one of these plans were erected near the Eastern Dome of the Great Exhibition Building, and they were visited by many thousand persons, including many English landowners and foreigners of distinction. At the annual meeting in 1862 it was announced that 700 copies of the Society's plans and specifications had been issued, and that no fewer than 171 cottages had been, or were being, erected on these plans in different parts of the country.

In the report for 1866 the Council of the Society point out that various local associations for cottage improvement are successfully at work: thus the Maidstone Cottage Improvement Company has a capital of £2900, and pays a dividend of 5 per cent., and the Hertford Building Company has a paid-up capital of £3000, and have long paid a dividend of 4 per cent. In this year's report it is also announced that the Exhibition model cottages had been removed and reerected at Lewisham, close to the Manor Pound, on the high road to the Crystal Palace, and that every facility for viewing them will at all times be readily given. The report also announces the award of Mr. Bailey Denton's £25 prize for the best labourer's cottage to Mr. John Birch.

In 1867 an exhibition of cottage plans, sent in by no fewer than 150 architects and others competing for the Society's prizes, was held in the public room of the Society of Arts. The prize plan, however, it turned out, could not be erected for the sum specified as the limit of cost, viz., £105.

A plan of triple cottages was that year published, comprising in one building three unequally-sized dwellings, so as to accommodate families of different numbers and requirements.

In 1868 the report of the Council announced that 90 cottages on their No. 3 plan were erected at Penge, and let at prices varying from 6*s.* to 7*s.* a-week—that 18 pairs of cottages on No. 4 plan were erected by Mr. Rowbottom in Linden Street, Windmill Road, Croydon—that 18 cottages on the same plan were erected at Walthamstow by Mr. Clarke, an old friend of the Society; and that the triple plan above alluded to had been adopted in cottages built by the Rev. T. H. Murray, at Stowe; Dr. Hare, at Turweston, Brackley; and the Rev. J. Tooke, at Washbrook.

The President of the Society is, this year, his Grace the Duke of Marlborough, and Lord Sondes is Vice-President. The Council includes the names of Mr. E. Chadwick, C.B.; Mr. Habershon, Dr. Hawkesley, Captain Dashwood, of Kirtlington, and others; and Mr. H. Martin continues its secretary. We hope we have stated enough to claim for it the interest of the reader. Ladies as well as gentlemen may very well be invited to interest themselves in the doings of the Society. We may add that the annual subscription of £1 constitutes membership, and that the Society's address is 37, Arundel Street, Strand. Members receive copies of all the plans and publications issued by the Society.

As a material auxiliary in carrying out its important objects, the Society has formed a museum, which it is hoped, when complete, will exhibit by means of models, plans, books, or papers, a collection of the best designs, not only for the dwellings themselves, but of improvements in heating, lighting, and ventilating which may be applicable to them; and a vast amount of information on cognate subjects. One of the main points of usefulness of the museum will be the fact of its forming a central point where persons may find the acts, thoughts, and doings of country and local societies; and thus profit by their experience, their errors, and their successes.

The following designs for cottages have been (up to December 1st, 1869) published by the Society:—

No. 1.—A pair of cottages, each of which has a kitchen and second room, to be used either as a sitting or extra bedroom, with two good bedrooms on second floor.

No. 2.—Has two bedrooms upstairs, one room having a moveable partition, for the better separation of children, if desired.

No. 3.—Has three bedrooms, with the addition of a convenient scullery or wash-house, &c.

No. 4.—Model cottages, as erected near the International Exhibition, 1862, contain superior accommodation to meet the requirements of the artisan class, while, at the same time, a very moderate rent will give a fair return on the outlay to the landlord.

No. 5.—Triple plan; the centre cottage has one bedroom upstairs, and two rooms below; the left-hand cottage two bedrooms; right-hand cottage, three bedrooms upstairs, and each two rooms below, with wash-house.

No. 6.—A single cottage, one storey high, with three bedrooms.

No. 7.—(Prize plan) new design (with three sleeping rooms in each cottage) arranged so as to be built singly or in pairs, or in rows. To this plan was awarded a prize of £10 by the Royal Agricultural Society, at their meeting in July, 1869, at Manchester; and also the highest dfploma of honour at the International Exhibition of Amsterdam.

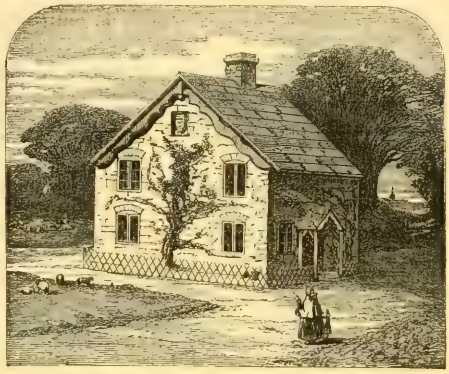

THE CENTRAL COTTAGE SOCIETY'S PLAN No. 4.

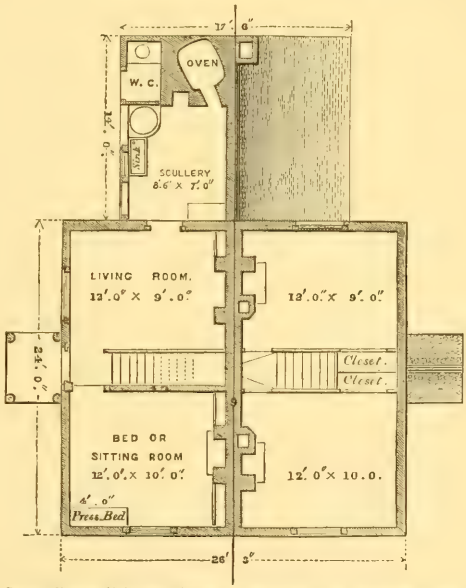

GROUND FLOOR.—Sitting-room, bedroom, or work-room, as may be required, 12 feet by 10 feet, containing a press-bed and two cupboards. Kitchen, 12 feet by 9 feet: fitted up with oven and boiler range. Pantry and store-closet under staircase. Wash-house, 8½ by 7 feet 9 inches, with fireplace, fire-clay oven, copper, sink, and dresser.

UPSTAIRS.—Two convenient bedrooms, 12 feet by 10 feet and 12 feet by 9 feet, with fireplace, stoves, and store-closets. All the rooms are well ventilated.

The question of cost is one which presents great difficulties, and is liable to much variation from trade fluctuations in wages as affecting the expense of building and the price of bricks, &c., and to these must be added great differences in the economy of builders and employers. Thus the Alexandra Cottages at Penge (Plan No. 3) although built in large numbers together, which is in itself an element of cheapness, are stated to have cost £280 the pair, while equally substantial pairs have been put up by Major Munn, at Faversham, for £175; and by Mr. Kibble, at Hadlow, for £200. Again, Mr. Rowbottom's No. 4 cottages at Croydon, cost £265 the pair; while Mr. Clarke's, at Walthamstow, cost but £225; and the pair put up by this Society at the Great Exhibition of 1862, by contract, cost only £216.

The experience of the Council has convincd them that it is unwise to sacrifice stability and convenience to an overweening desire for cheapness, and that the only direction in which any further reduction of cost can be made must be in the outlay required for materials. To this end they have, in Plan 4, and in the triple plan, substituted, by way of experiment, concrete for brick, with the result of a saving of at least 20 per cent. These concrete cottages are situate at New Hampton, on the South-Western line of railway, and are well worthy a visit from all those who feel an interest in the improvement of the dwellings of the working classes. Twelve different systems of applying concrete may be seen at the museum.

In the month of January last year, the Council received a communication from the Royal Commissioners on the Employment of Women and Children in Agriculture, on the subject of cottage building, in which appeared the following passages:—"In reference to the question of designs for cottages, the Commissioners desire to direct attention to a point which has come before them very prominently. A great preference appears very generally to be given by the wives of agricultural labourers to cottages having all the rooms on the ground floor. They say they are better able to look after the children or the sick where they are in rooms adjoining the living room; when the mother is upstairs for any domestic purpose the younger children cannot be so safely left alone, and other obvious risks and inconveniences are likely to ensue. Some influential landowners are therefore returning to the plan of having all the rooms on the same floor, although at increased cost to themselves. The designs for improved cottages published by the various societies are for the most part on the plan of the upper storey."

The plan No. 4 upon the Society's list, being the one erected as a model pair of cottages near the Exhibition Building in 1862, is represented in the annexed drawings. It will be seen that the views of the Commissioners are so far anticipated that one bedroom at any rate is provided on the lower floor, thus adapting the house more especially to the frequent case of an invalid or aged inmate, and otherwise making it better fitted to the tastes and habits of the class for whom it is intended. It will also be seen that space is economised in this plan by the short central staircase connected

directly with the doorway; that material is economised by having the bedroom windows in the gable, and putting the bedroom itself more in the roof than would otherwise be possible; that fuel and warmth are saved by the central position of the fires and chimneys; that strength and safety are secured by the central wall from floor to ridge; and that ample scullery and outhouse accommodation is given in an attached building of one storey.

Altogether the plan has been well considered, and is very good. The principal fault is that the doorways, being on opposite sides of the house, cannot both have good aspects; and although the windows of the living-room, being on one side, can both receive the sun, yet the aspect of the front door is certainly important. It is considered so important, that in the Kirtlington cottages, designed and erected by Captain Dashwood, the cottages No. 4 are placed, not back to back, but in a continuous row, all facing one way.

To this and other farm cottage buildings we shall refer in future numbers of the *Agricultural Gazette*, and we shall be very much obliged for any information any of our readers can give us on the cost and plan of cottage building of which they have had experience.

Home Correspondence.

Mr. Neville's Cottages.—In the *Agricultural Gazette* of Dec. 18, 1869, you notice the Rev. C. Neville's plan of cottages. I have examined the plan, which appears to be a fair one, if each cottage had only two bedrooms, and a solid wall were carried up between the two dwellings; but in the attempt to provide one cottage with a third bedroom (which is urged as the strong point of the plan) I foresee the destruction of privacy (which cottagers appreciate), as the one bedroom being over part of the other cottage would necessitate divisions upstairs that cannot effectually deaden sound. The having downstairs only one door and no second fireplace cannot be recommended. As agent to an estate I have had great experience in the building of cottages; and I feel confident that by the erection of cottages on such a plan I should give satisfaction to neither the cottagers nor to my employer. I trust some of your readers may give us the advantage of their experience. *D.*

Steam Cultivation: Fowler's System.—I have been much interested of late in reading letters on steam cultivation. Much as I am averse to public letter writing, I do not like to let these discussions pass without venturing to offer to my brother farmers a little of my experience on the subject. With regard to what is termed the roundabout system, I consider it to have been a very useful thing in its way, more especially where a person happened to have a 10-horse power engine. Eight years and a half ago a neighbour of mine started a set of roundabout tackle, with a cultivator. Six months afterwards I set up a Fowler's 14-horse power double cylinder traction engine, with clip-drum, &c., a four-furrow plough with digging breasts, and a seven-tine balance cultivator; and for three or four years I entertained doubts whether in so doing I had acted wisely, my farm lying principally in high-backed lands and small irregular enclosures. But through the kindness of my landlords, who have allowed me to remove fences almost *ad libitum*, and the purchase of a second 14-horse engine, and working upon the double-engine system, I have at length dispelled all my fears, and satisfied myself that I have now arrived at a simple and perfect system. The only implement that had not given me perfect satisfaction was the "balance cultivator," which, from the weight of the suspended portion in front, was apt to jump and slip its work when crossing uneven ground. I accordingly this summer procured one of Fowler's turnround cultivators, the operation of which I consider perfect, and I now believe that I am master of everything in connection with the steam plough—the principle of the double engine being the only practical one, and the several processes of ploughing, digging, and cultivating going on to my heart's content, with the implements I now possess for such purposes. Since I commenced work in April last my tackle has earned for work done for myself and neighbours (estimating my own at the price they willingly pay me) 600*l*. This has all been done by the aid of three young men taken off my farm within the last three years, being the only hands required for working, with the exception of a lad for carting the water. My first staff turned out badly, under the supposition I could not dispense with their services. I now think very little more of starting off my two engines with their gear, than I do in starting a team of horses. A neighbour of mine was observing to me the other day, that when I was at work for him in the summer, after finishing one field, the whole apparatus was out of it and into another as quickly as his own plough teams. The advice that I would submit to my brother farmers, who may be contemplating steam cultivation, would be this, you may order a double-engine set with safety, but be satisfied with nothing less. If the steam plough has not hurt me in the embryo state it was in when I commenced, and I assure them it has not, there can be no doubt whatever of its success under its full and improved development. In furtherance of these views I should recommend a set of Fowler's double-engine apparatus for about 1000 acres of arable land, and as so much is seldom in one man's hands it seems practicable that farmers having land adjacent, or nearly so, should combine in the purchase, form rules to work week and week in turn, making the engines in the winter do the other heavy work of the farm, such as threshing, chaff-cutting, grinding, &c. For my own part, I would willingly join in such a partnership, or advance money upon it if required, testifying thereby my full confidence in such a concern. What a good introduction to business the management of it might be to many a farmer's son, or other respectable person in a parish, keeping the accounts. I have neither time nor inclination to reply to any discussion that may arise on the contents of this letter. Eight years' experience has satisfied me of the successful results of this system. I feel that experience to be of great value to myself and others, and such as might save future steam cultivators a great weight of anxiety and great needless expense. I should be happy to impart its fruits, as far as in my power, to any one hesitating about this serious outlay. I repeat, it can not only be done in safety, but so as to form a remunerative investment. A farmer can have a set of his own, share it with others, or do as I am doing—work his own land, and let it out the remainder of the time. But great caution is necessary in the first instance in deciding whether the system is applicable under any circumstances to the peculiarities of the desired locality, what would be the requisite power of the engines, and what the size of the different implements suitable to the nature of the soil, &c. If all this is not understood at first, it is an experience dearly purchased afterwards in the expense attending any change of such costly implements. It is only at the end of eight years I have been enabled to hit on such as in the utility and construction of which I believe improvement can no further go. Some idea of the saving of horse-labour may be formed from the fact that I now work about 550 acres of nearly all heavy clay land, with an average of about 12 horses, and have sown this autumn 280 acres, and finished by the middle of November. *John Walker Watts, Orlingbury, Wellingborough.*

Double-Furrow Ploughs.—The following is my report of double-furrow ploughing in Scotland:—While the steam-plough, from its elaborate accessories in the shape of machine, engine, gearing, &c., makes first cost an important consideration with the farmers of our country, this double-furrow is within the reach of every farmer. First cost with the dearest makers is 15 gs.; and I observed one of the prize implements in a competition field yesterday, on the lands of Nether South Bar, near Bishopton, priced at 9*l*. 10*s*. It will be observed that each of these ploughs turns two furrows at a time; they are drawn by three horses, and can be guided in all cases by one man. The agriculturist, therefore, saves the labour of one man and a horse, while on light soils two good Clydesdale horses is sufficient to drag the implement. The economy is obvious to every observer; for, taking a moderate estimate of labour, first cost is recouped in from three to six weeks' work of the implement. As an instance of this, farmers in every county are on the alert, and local societies are getting up competitions to bring forward ploughs to meet their special requirements. Coming to the more immediate trial of yesterday, I do not remember to have seen either stubble or lea ploughing in general so well handled. The well-known plough-makers, John Gray & Co., had a wonderful success, being placed 1st in stubble and lea ploughing, with the same implement, priced at 13 gs., and taking 2d prize with the cheapest implement in the field, price £9 10*s*. Mr. Murray's plough was also a capital implement, and commanded general attention—the competition on stubble, in fact, being between the two firms. Mr. M'Raith took 3d position in lea, but nothing could approach the splendid work of the man guiding the premier plough: the "twilling," or burying of the sward was as perfect as could be done by the best single-furrow plough. The following are the decisions, in their order of merit:—

Stubble Ploughing.—1st, Messrs. Gray, Uddingston, price £13 13*s*.; 2d, Messrs. G. W. Murray & Co., Banff; Messrs. Duff & Son, Orkney, agents; 3d, Mr. Pirie, Aberdeen (exhibited by Mr. John Gibb), price £12 10*s*.

Lea Ploughing.—1st, Messrs. Gray, Uddingston, price £13 13*s*.; 2d, Messrs. Gray, Uddingston, price £9 10*s*.; 3d, Mr. M'Raith, Cadder, price £14.

We have had competitions in Stirlingshire, Wigtonshire, Aberdeenshire, Mid-Lothian, Morayshire, Lanarkshire, Forfarshire, and Renfrewshire. At these competitions we notice Pirie, of Aberdeen; Fowler, of Leeds; Mitchell, of Peterhead; Murray, of Banff; Guthrie, of Montrose; Montrose Foundry Company; Ransomes, Sims & Head, of Ipswich; Howard, of Bedford; Gray & Co., of Uddingston; Ponton, of Linlithgow; Sellar & Son, of Huntly; Shivas, of Kenmundy; and M'Raith, of Cadder—a formidable list of names, tending to show the absorbing claims of this so-called new implement. It really had its origin last century; in truth, the efforts of Lord Sommerville to introduce a double-furrow wooden plough are well known in agricultural circles, and were met at the time with that obstructive indifference which characterised the age. *James Anderson, Meadowbank, Uddingston, N.B., Dec. 22.*

Dairy Farming.—I do not think Mr. C. F. Brinklow injures my estimate of "dairy farming." I was comparing a large "breeding" farm with the same farm worked as a "dairy" farm. He speaks of buying in heifers in May, and selling them out in October at a profit of £8 per head, rather a large profit to make on a heifer by five months' feeding on grass; and if he has land that will do it, all I can say is, it is worth much more than 50*s*. per acre. The only part of my estimate which he attacks is that wherein I say that 40 young beasts, 6 to 12 months old, eat as much food as 20 full-grown cows. Will he tell me how many cows he considers these young beasts are equal to? Surely he will allow they eat as much as 10 cows—40 against 10; well, then, 10 cows less would only reduce my estimated surplus £120. Mr. Brinklow's estimate, however, is really no guide when he takes so small a number of cows as four. He puts down 5*s*. per week as the expense of milking and foddering his four cows. At the same rate my 140 would come to £8 15*s*., which is pure nonsense. He puts down, again, another 5*s*. per week for composting, heating, chaining, rolling, and a lot of other things; but those expenses are the same, whether I work a dairy or a breeding farm. If Mr. Brinckow would pick my figures to pieces, I would feel obliged to him, for I want to see if there be any fallacy in them. There is one point he might have fastened upon, but he has not, viz., the cost of dairymaids; but, in my opinion, the trouble of rearing calves, if brought up by hand, is quite as great as the trouble of making butter and cheese: and if the calves are not brought up by hand, then each cow must bring up her own calf, and the breeding farm would lose the £360 dairy profit which I put down to its credit. My estimate, observe, refers to a farm suitable for breeding purposes, and I set out by saying that the same sort of land which suits for breeding also suits for dairy farming. If a man had a farm, equal to Mr. Brinckow's 9½ acres, all in Grass and capable of fattening eight beasts to each 9½ acres in five months of summer, so as to leave a profit of £8 per head, he would be a great fool to turn it into a breeding farm. He had much better buy in beasts to fatten during summer, and then take in sheep to winter; the wintering alone on such land would pay the rent of 50*s*., or very nearly. *G. A. H.*

Prize Farms.—You recently referred to the noble prize offered by the High Sheriff of Oxfordshire for the best cultivated farm in the district of the Society's annual shows, and you made some comments thereon. In my opinion, the cost of cultivation ought to have considerable weight with the judges. A and B may farm side by side, the land be in both cases capitally managed, and the crops abundant. Judged externally it would be difficult to award the palm, but if, on inquiry, it turns out that the expenses of B are annually £100 or £200 a-year less than those of A—why, B is clearly the best farmer. This is no fancy theory, but what every farmer with good observing powers must meet with in many instances. In fact there is the difference of a good living between the good and bad management of the forces of the farm. In the one case, every blow dealt is well-directed, well-timed, and tells accordingly. In the other case, for the sake of routine, or to please the eye, a large amount of mischief is done, which will, if not before, be apparent at harvest. It is a constant habit of mine, with a view to testing my own practice, when I walk over any friend's farm which shows signs of good management, to inquire first how many working horses are kept, and next, how much the annual labour bill comes to per acre. I will make a comparison. One farmer still clings with affection to his dear old turn-over plough. He has a good ploughman, hence the furrows are beautifully straight, and the harrow and roll have been unsparingly applied. Four or five great hulking fellows have gone over the field to level it, by breaking down every clod which was as large as a Walnut, and roll every little tussock of Grass into the furrow. A liberal amount of seed has been used, and when it first appears aboveground it may present a beautiful appearance. Another farmer prefers the cultivating system, either by steam, or horses, or both. After his operations the soil is in many cases left more rugged and uneven; in other words, somewhat cloddy. Some of the stubble or surface refuse may lie about it, and give to the field a somewhat untidy appearance; probably, too, only a moderate quantity of seed has been sown, and on its first appearance the plant may look thin. Up to a certain point the first field I have described will look the best, but in the long run the other will generally beat it. The threshing-machine will reveal the secret, if it be not apparent before. In the one case the rain, after passing through these beautiful furrows, finds its way over the glazed surface underneath to the water-furrow, and thence to the nearest brook, carrying with it a great part of the essence of the manure which the soil may contain. In the other every drop of water, owing to the land being torn apart like a yeast dumpling, and hence open and porous, descends where it falls, enriching the subsoil with fertilising ingredients, admitting also of its thorough aëration. In awarding such an important prize, I think that more than one hurried visit should be paid to each competing farm. I have no desire unduly to exalt one system of cultivation over another, but I am desirous of expressing an opinion that showy farming, which may be done regardless of expense by an opulent man, may not necessarily be profitable farming. An example farm, however

nice it may look, which is carried on with insufficient profit, not to say loss, is clearly not an example farm for the farmers of this country to follow. Farming, like any other business or profession, should be conducted on commercial principles; and he is undoubtedly the best farmer, as well as the greater benefactor of the community, who produces the greatest result at the least cost. *F. W. Bignall, Loughton, Bucks.*

Land-fast Stones and Steam Ploughing.—"H. H." must know that if a steam-plough meets a land-fast stone, either the engine must be pulled up by the obstruction, or something must break. Theoretically, the steam on the piston ought to be weaker than any other part of the machinery, but it very seldom is so. If a Smith's smasher were to meet a land-fast stone it would most likely cease to be the smasher, and become the smashed. If a Fowler's plough or cultivator were to meet one, I am inclined to think the rope would break before the implement. There is, however, one system of steam cultivation in which land-fast stones would simply result in stopping the plough, and that is "Fiskin's Flying Rope." In Fisken's plan there are two windlasses, which move themselves along each headland and pull the plough between them, somewhat as in the double-engine system. Each windlass has an ordinary winding-drum (set horizontal), and this drum is put in motion by a "friction clutch." When the plough is to be started on its journey, the windlass-man screws down the "friction clutch" until the friction is just enough to overcome the resistance of the plough, and off the implement goes. Of course if the implement meets with a stone or other obstruction, the clutch slips, and then the implement and the winding-drum simply stand still, while all the rest of the machinery goes on, no breakage of any sort taking place. Why this "friction clutch" should not be applied to all other systems of steam-ploughing I really do not know. I am afraid "H. H." will hardly find a steam-plough pay him on an occupation of 180 acres arable. This represents 135 acres of actual plough each year. Now a round-about tackle will cost £500, and 15 per cent. on that, for wear and tear, interest, and depreciation, would amount to £75, or 11*s. 1d.* per acre. To this he must add about 5*s. 6d.* per acre for wages, oil, coals, and water; making the total cost about 16*s. 7d.* per acre, or thereabouts. If, however, "H. H." already has an engine powerful enough to drive a roundabout tackle (a nominal 10-horse will do it), then his "extra" outlay would only be £250, and the item of 11*s. 1d.* would come down to 5*s. 6d.*, and the total cost of steam ploughing would be 11*s.* per acre, because he need reckon nothing for the wear and depreciation of his engine, which he already has, and no doubt provides for. *G. A. H.*

—— To "H. H., Leicestershire," I may say that a Lothian farmer of 500 acres, yesterday told me that although during the last four months he had removed a large number of stones, some of them weighing 15 cwt., he had never broken any part of the machinery, except occasionally a point from the diggers. He attributes this to the slow and careful working of the engine. It is evident that he has been moving soil that had never been previously disturbed. He uses Fowler's 12-horse engines, which with tackle, &c., cost nearly £1000. *J. J. Mechi, Dec. 28, 1869.*

Foreign Correspondence.

BOLOGNA: *Italian Agriculture.**—In this district there are no large properties or farms as in England, nor the very small ones of Ireland, but instead of these we have medium farms. There are a few larger holdings, not conducted as in England, but rather several small farms united. Each farm is of a size to be cultivated by one family of labourers; the number of persons in a family will be about 12. In this district a farm such as above alluded to will be about 25 to 50 acres in extent. The average rent is about 32*s.* per acre. It is all good land, and varies little in quality. The farms are nearly all let out to the labourers on the *métayer* system, the proprietors residing in the adjacent towns. The general opinion in this country is, that so far as the labourers or their families are concerned, the *métayer* is the best system. The length of the contracts is nine years, but sometimes as short as three years. The general opinion is that it would be better if leases were of longer duration. Leases are in writing, some even are printed, and explain all that the farmer has to observe, not only for the rotation of crops, but the manner in which the work is to be done; and also as to the management of the beasts or cattle. Large farms can be bought at about £20 per acre, and small ones at about £22 10*s.* The principal products are: Hemp, Wheat, Indian corn, and green crops. The rotations are, in lands good enough for growing Hemp, Wheat after Hemp; and on the lands not good enough for Hemp, Indian corn after Wheat, and sometimes Trefoil, Wheat, and Hemp. Wheat yields about 14 bushels per acre; Indian corn yields about 21⅓ bushels per acre; Hemp yields about 10¾ cwt. per acre. They are beginning now to use bones and other artificial manures, but for the Hemp lands it has long been the practice to employ crushed linseed-cake at the rate of about 12 cwt. per acre, costing about £4 16*s.* per acre. The medium depth of cultivation for cereals is 18 inches (?), for the Hemp crop even deeper culture is resorted to. Roots are not grown. As the system of *métayage* prevails, little work is done by the day. When it is, the wages are from 8*d.* to 10*d.* per day in winter and spring, and 1*s.* 2*d.* in summer. For extra work, such as cutting Wheat, Grass, and threshing, the wages are 1*s.* 6*d.* to 1*s.* 10*d.* The women belonging to the families on the *métayer* farms work in some way or other. Hired women are paid about one-fourth less than the wages paid to men. In this district (Bologna) there are plenty of labourers to be had, but it is not so in other districts. Within the last 10 years day labour has increased in cost more than double. There is no special tax for the poor; the destitute are supported by charitable societies dependent upon voluntary contributions and legacies. In the sense understood in England, there is no Game Law here. There has lately been one passed prohibiting the destruction of birds during the hatching season, and no man can shoot on the land of another without leave. *Mr. Whitmore, Agricultural Engineer, Bologna.*

* Mr J. Howard, M.P., has published, as an Appendix to his recent paper on Continental Agriculture, the answers received from correspondents in various parts of Europe to a circular inquiry, intended to ascertain the leading features of local agriculture. Some of them we shall collate and present under this section of our Paper from time to time.

Societies.

ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

THE HALF-YEARLY MEETING OF THE SOCIETY was held lately in the Society's rooms, Dublin, Lord DE VESCI in the chair. Captain THORNHILL, secretary, read the half-yearly report, as follows:—

In laying before this general meeting the usual half-yearly report of the Society's transactions, your Council are enabled to state that the financial arrangements have not been affected by the determination to hold the annual exhibition of the Society for 1869 in a remote district of the province of Munster. The meeting at Tralee, in August last, may be considered as a success, having regard to the advantages likely to be derived from the operations of the Society in a locality hitherto unvisited. Generally, the classes were fairly represented. The display of implements was particularly good, and the extensive sales effected must, doubtless, have proved remunerative to the exhibitors. The thanks of the Society are eminently due to the gentlemen comprising the local committee, by whose untiring energy the arrangements of the showyard were efficiently carried out. The province of Connaught being, according to your charter, the next in rotation in which the exhibition of 1870 ought properly to be held, it was confidently expected that, as is usual on such occasions, the President of the Society might have been enabled, at the banquet at Tralee, to announce the locality in that district which had been selected for the purpose. No proposal having at that time been received, the Council, anxious that the province should avail itself of the opportunity thus offered, decided upon extending the period for receiving applications beyond the usual time, and, on October 28th last, at their monthly meeting, your Council, failing any application being so received, proceeded to take into consideration the claims of Dublin, in respect of which a guarantee had been lodged, and also those of the town of Drogheda, from which a highly influential deputation attended, prepared to qualify in the usual manner. On a division, the invitation of Dublin was accepted. Subsequently, however, considerable anxiety was shown by the inhabitants of Ballinasloe and the adjoining locality that their province should participate in the advantage of having the exhibition held within it; and the guarantors from Dublin having consented to waive the right already conceded to them, the necessary guarantee from Ballinasloe was prepared and forwarded to the Council, by whom, at their meeting on November 25, it was accepted. The national exhibition of the Society for 1870 will, therefore, take place in the province of Connaught in proper rotation; the guarantee from Dublin remaining, by kind permission of Messrs. Purdon, Walshe, and Robertson, in the hands of Council, for consideration at a future period. Your Council have adopted the suggestion of a committee appointed to arrange an equitable scale of premiums to be paid to local farming societies, by which they will in future receive 15*s.* in the pound on the amount subscribed by their members to this Society. Since your last half-yearly meeting, two prizes have been offered for essays—one for Thorough Drainage and the Improvement of Reclaimed Lands, and the second for Dairy Management. The former was awarded to the essay by Mr. Thomas Weldon Trench; the latter to Mr. James Byrne. These essays will appear among the published transactions of your Society for the current year. In May last a letter was received by the Council from the Right Hon. Lord Digby, to the effect that, on the occasion of his lordship having become the possessor of "The Hall Challenge Cup," as the most successful competitor for works of drainage in three several years, it was his intention to place at the disposal of the Society a valuable piece of plate to be competed for under similar rules and conditions. This cup has since been received, and your Council trust that this liberality on the part of his lordship may have the effect of continuing competition in this most important branch of husbandry in Ireland. It is customary that the election of president of the Society for the ensuing year should be arranged at the December meeting, and your Council recommend that Sir Arthur Knox Gore, Bart, be appointed to fill that office for 1870. Annexed is a statement of receipts and expenditure of the national cattle show at Tralee.

Balance Sheet, Trale Show, 1869.

Cr.	£	s.	d.
To amount received from Local Committee	500	0	0
,, Balance of debit	420	13	7
	£919	13	7
Dr.	£	s.	d.
By expenses of secretary and deputation to Tralee at sundry times	7	13	0
,, secretary's and account's expenses at the show	20	10	0
,, clerk of the yard's expenses £11 15 0			
,, do., do., gratuity 10 0 0			
	21	15	0
,, judges' travelling expenses and stewards' beds ..	113	2	10
,, veterinary surgeons	12	2	10
,, printing, advertising, and sundries	53	19	3
,, money premiums awarded £677 15 0			
,, medals do. 12 10 0			
	710	14	6
	£919	13	7

GEORGE HODSON, Baronet, Chairman.

Mr. MACFARLANE said he regretted very much that there had been a departure from the rule usually adopted by the Society—that of considering and deciding at the annual show of the Society where the following one should be held. It would be very well worth while considering whether they should not go back to that rule, so as to have it carried out, and make arrangements to have it determined where the subsequent show should be held. What had occurred this year had been attended with much inconvenience and great unpleasantness.

The motion for the adoption of the report was then put and carried.

WARWICKSHIRE.

TURNPIKE ROADS: *Warwick, December 18.*—Mr. F. WILMOT, of Moseley, read a paper on the future maintenance of turnpike roads. He made the following suggestions:—(1). That all tolls be abolished. (2). Trust debts to be valued at their fair price, and apportioned to counties, and paid by loan raised on the security of county rates, such loan to be repaid by equal instalments for 40 years. Trust property to vest in County Roads Board, and turnpike officers to be compensated. (3). All roads within a county, except streets, to be, as to expenditure and general management, under the control of a board to be called "The County Roads Board." (4). All roads to be divided by the County Roads Board into two classes. The first to comprise the present turnpike roads, except those which have become disused as main roads, and these shall be called "the County Roads." All other roads to be comprised in a second class to be called "the Parish Roads." (5). All roads comprised within a highway district, or within the jurisdiction of boards established by 5 and 6 Will. IV., cap. 50, to be maintained and repaired by the machinery of such respective boards, and roads not so included shall be maintained, if county roads, by the County Roads Board; and if parish roads, by the authorities of the separate parishes liable for their repair. (6). The funds for the repairs of the county roads, repayment of loan raised by discharge of turnpike debts, and interest thereon, and the salaries of the officers of the county boards, to be provided—half by a uniform county rate, and the other half by a subsidy from the national exchequer, to be wholly reimbursed, partly by a charge upon trade-horses and carriages (which now claim exemption from tax, but contribute largely to toll), and partly by a slight increase in the rates of the assessed taxes at present levied upon other classes of horses and vehicles. The funds for the repairs of parish roads to be raised as at present by separate parish rating. And (7), the County Roads Boards to appoint, besides a clerk and treasurer to the board, a properly qualified officer to act as chief surveyor, whose duties shall be similar to those comprehended in the office of "general superintendent" created by the South Wales Roads' Act, 7 and 8 Vict., cap. 91.

Mr. WILMOT said two objections would be raised to this plan. In the first place it would be stated that the imposition of increased assessed duties would tax the class of road users who paid them beyond the benefit they would receive by the remission of tolls. Another objection would be that the area of county ratal includes towns of considerable size which keep their own highways in repair free of cost to the general public, and such towns would be entitled either to exemption from the general rate for repair of the county roads, or their streets should be maintained at the cost of the common fund. In answer to the first point, Mr. Wilmot said it had been ascertained that not more than half of all the tolls in the kingdom was being paid by county ratepayers. Comparing the tolls paid by any large manufacturer with the actual use made of the roads, it would be admitted that the proportion of both which was attributed to the ratepayers, was really less than one-half on which his suggestions were based. As to the second objection, he said that the use and necessity of streets in the county ratepaying towns

was of the same nature as that of the second-class highways in parishes, and although in their character they differed widely, still their maintenance might fairly be placed on the same footing of separate parochial rating. The annual cost of maintenance of turnpike roads in England was in round numbers £590,000, to which must be added £125,000, being the estimated instalment for liquidation of trust debts in a term of 40 years. If the scheme he had propounded were adopted the rates necessary to raise one-half of the annual charges would be be 1¾*d.* in Warwickshire, 1¾*d.* in Staffordshire, 2½*d.* in Worcestershire, 1½*d.* in Leicestershire, 2*d.* in Northamptonshire, 2½*d.* in Oxfordshire, and 2¾*d.* in Derbyshire. To raise the other moiety of the annual cost he proposed increased duties as follow, which would be found sufficient to recoup the exchequer to the full extent of its aid: Carriages with four wheels, drawn by two or more horses, an increased charge of 10*s.* would realise an additional duty of £15,000; and 10*s.* on ditto, drawn by one horse only, would give £36,000 extra. Then £40,750 might be realised by a further charge of 5*s.* upon two-wheeled carriages; and £8000 by increasing the duty upon carriers from £2 6*s.* 8*d.* to £4, and from £1 6*s.* 8*d.* to £2 10*s.* By raising the duty upon horses paying full duty 5*s.*, another amount of £43,750 would be obtained; and an extra charge of 6*s.* upon other horses would yield £120,000. Horses used for trade purposes (but not to include horses kept for agricultural uses), now exempt, to be charged £1 1*s.*, from which source £31,500 can be obtained; and finally a new tax of £3 and £2 to be imposed upon vans, waggons, carts, drays, used for trade, which would give £50,000. The total amount of revenue to be derived from these increased duties will be £345,500 per annum.

Mr. G. F. Muntz moved that the best thanks of the meeting be given Mr. Wilmot for his valuable paper, and that a committee be appointed to consider his proposals, together with any other suggestions offered for the best mode of providing for the future maintenance of turnpike roads; also that such committee be instructed to frame a plan, if practicable, for the purpose named, which could be approved and adopted by this Chamber, as the basis of a Bill to be introduced into Parliament.

Lord Leigh seconded the motion, which was put and carried.

Farmers' Clubs.

LAVENHAM.

Cart Horses.—At the late monthly meeting of this Club, Mr. Colson read a paper, giving an estimate of the cheapest way of feeding cart horses. He knew of one gentleman whose horses had been kept on Mangel and hay since he got his Mangel off the ground. A horse would eat 10 or 12 bushels of Mangel a week, and if they estimated the value of that at 16*s.* a ton, there being 40 bushels in a ton, the cost for Mangel was between 4*s.* and 5*s.* a week. That was as much as corn, and when the cost of hay was added he thought it would come to as much as the corn and hay which he used. A horse would eat about 1½ cwt. of hay per week, which, taken at 2*s.* 3*d.* a cwt., would come to 3*s.* 4½*d.* He put the hay at 2*s.* 3*d.* a cwt., because he considered that was its value to consume on the farm, and if they were to put it at the selling price, 4*s.* 6*d.*, he thought that would not be fair. He knew another gentleman who fed his horses with 5 stone of bean-meal at 1*s.* a stone, and two stone of Maize at 11*d.*, making a total of 6*s.* 10*d.* a week. He should take this statement from September 1 to June 1 (40 weeks), which amounted to £13 13*s.* 4*d.*; add to that 1½ cwt. of hay per week at 2*s.* 3*d.* per cwt., £6 15*s.*; and supposing the gentleman had Vetches for his horses, 12 weeks, at 7 rods per horse per week, that at 6*d.* a rod would be £2 2*s.* If they had to buy Vetches, he believed they would have to give a shilling a rod, but for a farmer to consume on the land he thought 6*d.* was a fair price. The total cost for a year upon this system was £22 10*s.* 4*d.* Another gentleman kept his horses on five stone of bean-meal per week, with a bushel of bran, the meal and bran being worth 5*s.* 9*d.*, which for 40 weeks would be £11 10*s.*, to which the hay must be added as before, £6 15*s.*, and the cost of sending the horses out to grass 12 weeks, at 3*s.* per week; and this brought the total cost under that system to £20 1*s.* He, however, thought horses in a meadow did more harm than good.

He next came to his own system, which he had adopted for 30 years, with very satisfactory results. During the 17 weeks of October, November, December, and January, he gave them oats value 5*s.* per week, £4 1*s.*; hay during the same period, 1½ cwt. per week, £2 11*s.* In February and March, eight weeks, he gave them oats as before, 5*s.* per week, £2; and instead of hay he gave them half a peck of meal at night, because he had not hay enough, at a cost of 4*s.* a week, £1 12*s.* April and May, oats 5*s.* a week for nine weeks, £2 5*s.*; hay in the same period, £1 7*s.* June, July, and August, Vetches night and day for 13 weeks, 7 rods per week, at 6*d.* a rod, 3*s.* 6*d.* a week, £2 5*s.* 6*d.* September, four weeks, 3 bushels of bran per week, 11*s.*; clover and grass, 2*s.* per week, 8*s.* This made a total cost for the year of £17 4*s.* 6*d.* He always gave his horses a month on bran at harvest time, which was as good as medicine, and a plan that kept the doctor out of the yard. He had not had the veterinary in his yard for his horses since harvest, nor for several months before, and he believed his way of feeding them would keep them in health. He considered oats and hay the best things to feed horses upon. He had now completed his task. He hoped there would be plenty of opposition, so that they might arrive at the point they all wished to reach, viz., how they could keep their horses in the cheapest way. During the 12 years he was at Icklingham he never lost but one horse, and that was from inflammation of the lungs. He was at the house of a gentleman the other day who had a great deal of tail Barley which he would not sell, because the price was low; he had it ground and gave it to his horses, and lost three valuable animals. If they had been fed with oats, he (Mr. Colson) did not believe one of them would have died. His horses cost him £17 4*s.* 6*d.* for every item during the year.

Mr. Hustler: Will you tell us why you put your hay at 2*s.* 3*d.* per cwt., when it is worth 4*s.* 6*d.*?

Mr. Colson said he did not think that hay was worth that to a farmer who was not allowed to sell it. As to the use of Mangel, he did not think farmers wanted to do that when they could make 9*s.* a stone of beef, and 10*s.* of mutton.

Mr. Wright observed that Mr. Colson had put the Mangel at the full price, and why should he not also allow a fair market price for the hay? Beef and mutton paid well, it was true, but surely hay was worth something for bullocks. If the market value was put on one article, it ought also to be placed on the other, in comparing two systems.

Mr. Gayford said that his shorter experience somewhat bore out the plan which had been laid before the meeting. It was to give a little bran in the harvest time. His horses were regularly worked, fed, and watered, and it was very essential to give them food easy of digestion. It was also in his opinion highly important for farmers to look after the horses themselves. As to the use of Beet, he thought in the Spring time when the weather was a little warmer a few Beet might be advantageously given as a kind of corrective. He believed that these roots acted in much the same manner as did the early Grass. He believed it right to give the horses a few, putting roots in the manger whole with a little chaff, letting the animals crush them for themselves. To give horses a good number of Beet at this season of the year, before they were ripe, must have undoubtedly a bad effect.

Mr. Thomas King said he always selected the best animal he could purchase, an animal with a good constitution. He fed his horses according to the work. During harvest he gave them a fair quantity of corn, and directly after harvest he gave them what he thought they really required to go through the work. He had been in the habit of giving them a bushel of oats, and of Maize and beans broken together, and all the hay and stover they liked, and he worked them as harder hard as he could. In fact, nobody worked horses than he did. In regard to the use of Mangel he thought a few were useful in the spring time. He considered that Mr. Colson was quite justified in not putting the hay at the price it would fetch if they were allowed to sell it. Very few were allowed to sell the hay, and, therefore, it ought not to be estimated at the market prices; but the same ought to be said of Mangel also. As to the use of bran in the harvest time, it might be all very well, but for his own part he never gave his any. He did not know that they required it, for he was in the habit of turning his horses out at night. During the summer he had Vetches for them, or green Clover. He liked the old system of keeping and attending to horses, with a manger and rack in the stable. He had been told that there was no better way than having horses baited in the stable, and having a bit of stover put into the rack to keep them in health. He liked to have good sheds for the horses to go into; sheds well sheltered; but let the animals be first baited in the stable and then turned into this shed. When they went into the stable from the yard they relished the food much better than they otherwise did. By turning them into the yard they would stand the weather much better. He did not think there was anybody who lost fewer horses than he had: and his father lived until he was 75 years of age, and he lost only one horse whilst he was in business. In conclusion, Mr. King said his advice was to keep horses well, and work them hard, and that in his judgment was the way to keep them in health.

Mr. Robert Hawkins was sure it cost him on the average nearly 12*s.* a week to keep his horses. He had put figures together on several occasions, and he found that the amount came to considerably over 10*s.* a week. He thought a farmer should put his hay and stover at what he would have to pay on a fair valuation. This, in his opinion, was the soundest principle to go upon; and, putting all things together, he could not keep his horses for anything like the amount named by Mr. Colson. He did not believe in giving bran in harvest, and after harvest, for, particularly on heavy land farms, that was a very important time, and horses ought to be kept well. The horses were pushed about in carting, they had late hours, and there could not be that attention given to them in the morning they required before they commenced work again. It was highly important that horses should be well fed with corn at such times. If horses were let down before Michaelmas on heavy land, it was impossible to get the work into a right condition. He believed Mr. King was nearer the mark in giving his horses two bushels of corn, and all the hay and stover they liked. As to the use of Mangel, he had been in the habit for years of using certain quantities. An instance had been referred to in which a farmer had given his horses as many as 12 bushels a-week; he should not think a horse could eat that quantity for long. The horses in Essex were kept very much on Mangels, and they never gave them more than 6 bushels per week; and that was too much. He was in the habit of putting the roots through the mincer, and mixing it with chaff, and he found that the horses licked it up, and they did very well upon it. He did not find this food relaxed the horses, and it was useful in preserving the hay and stover.

Dr. White also addressed the meeting, referring to the question of mincing the Mangels, and he remarked that eating and drinking was the only pleasure the poor animals had, and he thought it was a cruelty to shorten it. If they had Mangels, let them have them after they had done their corn.

Mr. Wright: Whole?

Dr. White: Yes, if they have got any teeth.

The Chairman: The question appears to me to be between Mangels and no Mangels, and pulp or whole Beet.

Mr. Baker did not think a farmer could keep his horses under from 10*s.* 6*d.* to 11*s.* 6*d.* per head per week. He agreed with what had been said, that to keep a horse in good working condition it must have from 6 to 8 pecks of corn a week, as well as hay, and as for the latter article, and in fact for all, he thought a fair value should be set upon them in estimating the cost of the keep of horses. He concurred in Mr. Colson's observations as to giving horses bran during the harvest, but at the same time it was not the period of the year at which horses generally were lost. The loss took place at the change of the season, when the weather was changing from hot to cold. October or thereabouts was the time when horses for the most part were lost, and that, too, frequently through want of care and forethought. In his opinion, many horses were lost through too much cut chaff. If a horse had much cut chaff for a length of time he thought the services of the veterinary surgeon would have to be called in. Many farmers, too, were fond of feeding the animals with pea straw. He believed that this was the most indigestible stuff horses could be fed on.

Dr. Barkway said he had kept horses for 20 years, and he gave them cut hay and straw. He did not lose his horses, and he thought he might say they would bear comparison with many people's. Many farmers studied the number of acres they had, and kept a certain number of horses, but he considered that if there was an extra horse it would be much better in the end.

Mr. Talbott remarked that about 30 years ago it was a saying that a man and a horse cost much about the same each, but a great alteration had taken place since that period. That rule did not hold good in the present day. He found that manual labour far exceeded the cost of keeping a horse. Not that horse keep was cheaper than it was at that time, but manual labour had increased in value. He knew that it cost many shillings an acre more to cultivate now than it did at the period he was speaking of. Many gentlemen were of opinion that it was advisable to let horses have as much hay as they pleased. In that he could not agree. He thought there was no dearer food than that of hay, unless it was at the prices named by Mr. Colson. With regard to crushing the corn, he must say he thought that the most economical plan; and he must also give his adhesion to the cutting of hay. But it was impossible to carry out one universal rule, and no rule could be applicable in all cases, times, and seasons.

Mr. W. Biddell said his experience was that a half-fed horse would only do half work, and in the long run would be found to be a much dearer animal than the full-fed and the full-worked. He did not act up to quite Mr. King's quantity of corn, but if horses had hay, he (Mr. Biddell) thought a bushel and a half, or 6 or 7 stones, would be found enough. Last year he had little or no hay, and he never saw his horses look so well, but he substituted half a bushel of corn for the deficiency in the hay. The prices named by Mr. Colson were far below what he could keep his horses for; and the prices of the hay were below what it could be grown for. Taking into consideration the weight per acre, it would be found that in the majority of years farmers, at those prices, would lose by their meadows. His opinion was, that in the majority of cases they over-valued hay. As to the question of breeding, his advice was that if they could buy a horse four years old for £30 to do so, and let other people turn their attention to the subject of breeding. He was convinced that horses could not be bred and kept for the money. He believed in what Dr. White said, that mastication was necessary for an animal. He came to the conclusion that his bullocks did not do so well with prepared food as they did when they had to chew a little. He had no doubt but that they did much better than they did when the food was converted into a pulp and required little or no mastication. As for Tares, for his own part he thought but little of them. If they were worth only £4 an acre and the seed cost £2 he thought they became dear, but there were many seasons in which he could not do without them, and

he looked upon them as necessary evils. With reference to the kind of corn to be given to horses he was particularly struck with the practice of a large firm, the Messrs. Pickford. Their practice was to give their horses whichever corn was the cheapest per ton.

Mr. GAYFORD said he would not put Beet into an empty manger, but if there was a certain quantity of chaff, the horses in eating the Beet in the natural way would bruise them, and would lick up sufficient chaff. He was an advocate for giving the Beet whole.

A desultory conversation ensued, in the course of which it was suggested whether it was judicious to allow horses to work so long as they were now in the habit of doing without stopping to bait. An opinion was also expressed that by a different arrangement more ploughing might be done in one day.

Notices of Books.

A Treatise on the Land Tenure of Ireland, *and on the Influences which Retard Irish Progress.* By G. A. Dean, author of works relating to the Tenure, Value, Management, and Cultivation of Land, &c. Longmans, Green, Reader & Dyer. Pp. 86.

Mr. Dean has long been known as a land agent and agricultural writer, and his experience in both England and Ireland fits him for the discussion of the difficult subject to which this work relates. His pamphlet is, however, too diffuse and verbose, and his recommendations too hazy and indefinite to exert the influence which one imagines to belong to the conclusions of so experienced a man. What can we make, for instance, of the following :—

"A tenant right for Ireland should, as far as practicable, apply to the Irish system of husbandry (where there is one !) and partake of the character of that established in England, by "the custom of the country ;" but even this varies in different counties, and must do so, where various modes of cultivation are practised, and where there are various descriptions of soil under cultivation.

"Leases at rack-rents we strongly advocate ; but, with an equitable tenant-right, many farmers would probably prefer yearly hiring to leases for a stipulated number of years."

Mr. Dean believes that "the benighted condition of Ireland arises from the circumstance of a large majority of the people professing the Roman Catholic religion, and their instruction, such as it is, being left to Roman Catholic priests."

He believes, nevertheless, that "the future peace and prosperity of Ireland are in the hands of the present Government."

He is also of opinion that Ireland was never in so prosperous a state as now. His suggestions begin with —(1). "Power for tenants upon quitting their holdings to recover from their landlords all moneys expended by themselves in permanent improvements, provided such improvements have been made with the written sanction of the landlord or his agent ; a fair deduction being made therefrom for the benefit already derived by the tenant ; such benefit, if the parties do not agree, to be ascertained by reference to an umpire to be appointed under this Act.

"The Act to apply to all improvements made within five years of passing the same, provided one of the said umpires shall certify that such improvements are of a permanent benefit to the property."

It appears to us that an enactment providing repayment to an outgoing tenant of all permanent improvements, for which he has not already received a full reward, provided he has the written sanction of the landlord for them, would be simply worthless. How many instances are there in which the required circumstances exist ? So of No. 3 :— "Where a tenancy is determined by the landlord on account of the non-payment of rent, or breach of covenants, or for any cause whatever, the tenant shall be entitled to recover all the compensation he would have been entitled to, had his lease expired, or his yearly tenancy been determined by notice ; less rent due, and depreciation of the farm from improper cultivation and dilapidation." By how much will outgoing tenants benefit by such a provision as this more than the law allows them now ?

The most striking passages in the pamphlet are those quoted from the late Professor Skilling :—

"Here is the character he gives of his countrymen, in his work on the 'Science and Practice of Agriculture.' He writes—'It is the conduct and character of the people, rather than the soil and climate of a country, that confers comfort and happiness ; their energy, perseverance, industry, and economy, combined with knowledge.'

"'These incontrovertible facts can never be sufficiently impressed upon the people of Ireland. Man ought, from infancy, to be taught to stand and look upright ; to depend upon himself for a character and station among his fellow-men, and that his future welfare and success in life are best achieved by his own exertions.'

"'Without knowledge and discipline man is an indolent animal, and his sagacity is perpetually on the rack to find out plausible excuses for his neglect. With our Irish farmer this is particularly the case ; procrastination is his great enemy ; he has always some difficulty to contend with, or insurmountable obstacle in his way —these difficulties and obstacles, in a majority of cases, his own creation.'

"'He is rack-rented ; he wants capital ; his land is poor ; the seasons unpropitious ; his crops fail ; the laws are adverse, or not sufficiently protective ; the Government is hostile to his interests ; he blames everybody and everything but himself, and his grievances are magnified and trumpeted forth on all occasions ; but it is our duty to pause, and if possible, determine where the blame rests, and whether these complaints are well founded. His land is highly rented, and yet he will take more of the same quality, and at the same price if he can get it ; and he will injure or persecute a neighbour should he offer to take a portion of his trouble off his hands. He wants capital ; yet he will not put in requisition the parents of all capital—his hands and his soil. His land is poor ; yet he will not take the proper means of swelling his dungheap, nor house-feed his cattle. The seasons are adverse, and his crops fail ; yet he will not take proper steps to counteract bad seasons—drain and deepen his land. He calls for, and waits on new laws ; like the waggoner in the fable, he lies in the slough, and calls upon Jupiter.'

"'Thus then, it will be found, that all this formidable list of grievances—these crying evils, with a host of auxiliaries which we have not yet mentioned—arise from two simple causes—the man's own 'ignorance and indolence.'"

We are persuaded that the remedy for Ireland's troubles is just what Professor Skilling said, "industry and education." The less the idea is fostered that any influence *ab extra* is to be brought to bear upon the case, the more the Irish tenant-farmer is left to the conviction that fate depends simply on the man himself, just as it does in England, the better for him will it be. If Government offer facilities and advantages with a view to meet evils due to artificial circumstances not easy now to set right, it may make its offer contingent on conditions of its own requirement—and thus urge conditions which it believes to be wholesome and beneficial on the acceptance of both landlord and tenant in Ireland —but the idea of its power to interfere in however slight a degree for the direct redistribution of property, which has been fostered by interested agitators, is the wildest delusion. To do Mr. Dean justice, no such delusion is fostered by his pages, but we fail to gather from them any definite idea of how he would have the Irish difficulty treated.

A Treatise on Land Surveying in Theory and Practice, *giving the best Methods of Surveying and Levelling for Statistical, Estate, and Engineering Purposes : together with full explanations, &c.* By John A. Smith, C.E. Longmans, Green & Co.

In this treatise, to quote its modest and candid preface, "the author has aimed at bringing before the reader the best methods for practice in the art of land surveying, and the most convenient formula for computations in working out the required results. As the subject embraces surveys for statistical, estate, colonial, and engineering purposes, it has been a leading object to attain practical excellence in the field and office work required of surveyors and engineers of skill and ability. This object will be best secured by holding practice subject to theory, properly applied, so that sufficient verifications may be readily had and the degree of accuracy easily ascertained. The operations requiring attention for securing these essentials of a good survey are concisely, yet fully, described, without specially directing the attention of the reader to a different faulty practice, in order to condem it, except in some cases where practice has been apparently, but not properly, based on theory. In describing surveys in which theory has been much disregarded, and the instruments used not suitable for the service, the author has drawn attention to, and thrown out suggestions for, improvements in the means and on the modes for making these surveys. Although land surveying is by no means a new subject, still, until a comparatively recent period, the art was not skilfully practised. Even at the present time authors of works on the subject do not sufficiently realise the existence and extent of the obstacles the surveyor encounters in the field—particularly in extensive surveys."

The work is very full and explicit, well illustrated by examples, diagrams, and figures ; and exhaustive of the whole subject of surveying and levelling. We can thoroughly recommend it to the student or apprentice.

Farm Memoranda.

DAIRY FARMS OF STAFFORDSHIRE.—Dairying, or cheese-farming, is carried on more or less in almost every part of Staffordshire. It is the mainstay of its farming, except on the small extent of land which is too light for Grass, and it is pursued even on the tops of the hills which are too lofty for Wheat-growing and too exposed for the growth of trees, or for ordinary cultivation. First-rate pasture land is worth £80 or £90 an acre, and the same land, in arable, would be worth only £50 or £60. Dairy farmers breed their own stock and keep up their herds by drafting in the young animals in succession. They sell all old, barren, or draught cows in the autumn clearing fairs. In ordinary seasons, when the root crop is good, these cast cows, in fair order, fetch about £14, to fatten in other districts, where provender is abundant ; and it is more profitable to sell than to finish them at home. But on farms where the quantity of ploughed land is considerable, or where there is some good feeding turf, the practice is different. Cows from a superior dairy are brought to market sufficiently fat for summer beef about July, and in late years they have sold at £24 or £25. Heavy high-bred cows are seldom sacrificed in this way, their owners preferring to keep them on to December, when the little mountain of beef, called by courtesy a heifer, is generally worth £40 or £45. Cast cows, condemned to become beef on next summer's pasture, are wintered moderately on about 3 lb. to 5 lb. of cake, with roots and "chop" (straw chaff), and in the neighbourhood of Burton-on-Trent three-quarters of a bushel of grains instead of roots, which are reserved for the milking stock. Store animals are wintered on "chop" and roots (or grains), and are turned out to Grass hardy, and with the rough hair of their coats unshed. Milking-cows are tied up in sheds during the winter months, from November till early in May, when the Grass-fields are again ready for them. A dairy-farmer regards his ploughed land as merely subordinate to the requirements of the dairy—yielding food and litter for the winter months. By tying the cows in sheds, one-half the litter that would be required in open yards is saved. In the neighbourhood of Burton spent Hops are used for litter, at 3*s*. 4*d*. a ton. Hops absorb the urine and are fit for immediate use ; they have the best effect when applied fresh. The long straw from horse stable is picked over for littering calves. Large herds—50 or 60—should be divided into two lots, as they do better, and do not trample the pastures so much on coming up to be milked ; a weak cow is less driven, and the danger of infection reduced. The usual time of calving is early in April ; for breeding purposes, February would be preferred, as early calves get strong, and are more easily wintered ; but April is the period most desirable on cheese-farms, because the cows are then in full profit at the best time of year, when the best cheese is made, and when the natural supply of food is greatest. Cows receive no artificial food during the summer, except in bad seasons, when the best farmers allow cake. In large dairies, where there must always be a certain number of cows that calve irregularly, the process of cheese-making is continued all the year, but superior cheese can only be made on Grass. A first-rate cow will yield £14 worth of cheese, at 6*o*s. a cwt. of 120 lb., and the year's produce of the cow will be :—

Cheese	£14 0 0
Whey butter	2 0 0
Calf	1 0 0
Whey for pigs	1 10 0
	£18 10 0

Cheese-making is occasionally continued all the year round ; but in general the winter's milk is disposed of by suckling or butter-making. An eminent cheese-farmer informs me that his average price in the past 10 years has been 74*s*. per 120 lb. ; his highest and lowest prices of the year's make have been 80*s*. in 1866 and 1868, and 65*s*. in 1861. His average yield of cheese in the same period has been 2 cwt. (120 lb.) per acre of land summer-grazed, and 4 cwt. per cow. The sales are made three times a-year—in August, November, and April. Cheese loses weight rapidly. Another farmer, who makes cheese all through the winter, gives 4½ cwt. per cow as his average. The average yield of Wheat on these two farms is rather under 4 quarters per acre. Cows are not generally milked for 10 or 12 weeks previous to calving. The best cheese from regular good pasture is made after the middle of May. The common size of cheeses is from four to six to the cwt. of 120 lb. ; the large cheeses of 50 lb. to 150 lb. are made chiefly on the Cheshire side of the county. The size is to a great extent a matter of fancy and custom on the part of masters and servants ; at the same time cheese on strong soils is liable to "heave" (ferment) during the process of drying, and in some cases it is considered necessary to remove a portion of cream, instead of using "whole" milk. The flavour of cheese is affected by artificial food. Over-stocking is a temptation and a mistake, which has given occasion to a saying, "If you want more milk, sell a cow !" The only stock allowed to pasture with the cows are a few horses ; they eat close, and are not objectionable. Sheep feed with the young stock on the inferior pasture ; and should never mix with the dairy. One ewe, with her progeny, to three acres of Grass is considered a sufficient stock of sheep. Ewes wintered on the best system are fed on hay and straw-chaff, malt-dust, oats, &c., and run on the store pasture in the day-time ; the dry food keeps them in health, and is necessary to their well-doing even when Grass is plentiful. On rich land, near Barton, where grains for winter feeding can easily be obtained, a liberal feeding is practised ; the head of stock kept on a farm of 120 acres of arable and 180 of good Grass is as follows, during the summer : 50 cows, 20 2-year-old heifers, to calve next spring, 20 yearlings, 20 calves, 60 ewes. About 27 acres of hay are mown. Mr. Meakin, the tenant, fattens his cast cows in July and August, giving them cake on the pastures. During the drought of last summer all his neat stock had about three-quarters of a bushel of grains a-day. For the year ending April 5, 1869, his outlay

on food was £500. The price of grains varies, 2*d*., 3*d*., and 4*d*. to even 7*d*. per bushel, according to demand and season. The usual system of wintering young stock is to give them 1 bushel of Mangel a-day, with straw-chaff and no corn. This food is said to come off the farm. But on the heavier clays meal is cheaper than roots. On the poor heavy clays, worth only 20*s*. an acre to rent, bare fallow is considered a safe and inexpensive system. On such land a common rotation is—Bare fallow, Wheat, seeds for two or three years; Wheat or Oats. Or Tares are eaten off on the fallow, or removed for horses, cows, and pigs. The strong-land farmer, on good subsoils, begins the fallow with a 10-inch furrow before winter with three or four horses. As the horse and manual labour on dairy farms can be concentrated, when desired, on the limited extent of ploughed land, a rotation of crops need not be adhered to so carefully as on arable farms, where a little irregularity disturbs the adjustment of labour; the cropping is often very irregular and severe. Good deep marls, into which the plough may go any depth without change in the character of the soil turned up, may, with good treatment, be cropped successively with corn, without apparent exhaustion. Deep ploughing is then essential, and helps to prevent corn from becoming laid. Heavy clays with inferior subsoils are seldom ploughed more than 6 inches deep. The first ploughing is given in spring; three ploughings follow during the summer: it is considered necessary to plough very heavy land five times. The width of the lands is 9 feet to 12 feet; these are drilled at one bout, and in some instances the Wheat is sown and ploughed in: 2 bushels is a common seeding for fallow Wheat. The fallows are seldom touched with the harrow till the time of Wheat sowing. When roots are grown, the heavy-land farmer ploughs in autumn, having first broadshared the land and made every effort to clean it. Seeds, after lying several years, are often followed by Oats, Wheat, Beans, Wheat; or fallow is followed by Wheat, Barley, Beans, Wheat. Stubbles, to be followed by spring corn, are ploughed early in autumn, worked and cleaned, dunged and ploughed again late in winter or in spring. Wheat after Oats is dressed with 3 tons to 4 tons of lime, which costs 10*s*. 6*d*. per ton at the kiln. Lime is applied on fallows in April and May previous to sowing Turnips, or in the autumn after Tares, or on seeds previous to sowing Wheat. The usual dressing is 3 to 5 tons. The universal use of lime may be partly attributed to the necessity of a corrective after several years' seeds. It acts as a medicine, not as a manure; it checks slugs, and prevents club in Cabbages. Land is found to lie better for Wheat on the 9-foot ridges than on the flat, however well the land is drained and tilled. When Wheat follows Oats, the stubble is broadshared—the land cleaned before ploughing; a three years' lea followed by Wheat receives a half-fallow, and should be ploughed before midsummer, in which case an outgoing tenant is entitled to two-thirds of the crop of Wheat, as in the case of bare fallow. With a good seedsman, corn is often sown broadcast by choice. Horse-hoeing corn is not practised. Seven quarters of Oats are a large crop, only obtained when artificial manure is used, and perhaps the general average does not exceed five quarters. Many farmers look too much to their cheese for profit, and to their corn-crops as merely supplying food and litter for cows. Leas are ploughed once only for Oats. In case of an old lea, the land is ploughed about Christmas, so that it may settle and the Grass rot; a one-year-old lea is ploughed and sown as wanted. The principal root-crops are Swedes and Mangel. They are cleaned and hoed by the milkers and odd hands, working by the day. The scarifier used in spring is usually drawn by four horses, walking in the furrows. The cultivation of the Cabbage is greatly extending. It comes into use when other things begin to fail, and it is by far the best succulent vegetable for milking-cows—keeping up the yield of milk and preserving better than any other food some portion of the quality which cheese loses when the cows quit their natural pasturage. Cows fed on Cabbages are always quiet and satisfied, while on Turnips they often scour and are restless. Cabbages are given whole on the pastures, and later in the season are either pulped or placed in the trough whole. When frosted they are liable to produce hoven, unless kept in a warm shed to thaw before being used; 56 lb. given at two meals are as much as a large cow should have in a day. Frequent cases of abortion are caused by an over-supply of green food. Cabbages are excellent for young animals, keep them in health and preventing "black leg." A calf of seven months may have 20 lb. a day. The seeds, sown in corn to lie three years, are a mixture, costing about 28*s*. an acre, and containing some of the perennial Grasses as well as the Clovers. For permanent pasture, sow in June without a crop, after spring fallow and 3 tons of lime; the seeds used are 1 quarter per acre of purchased Yorkshire hay seeds, to which are added about 6 lb. White Clover, 3 lb. Alsike, 2 lb. Trefoil, 1 lb. Cow-grass, 2 lb. Rib-grass, and 1 peck Italian Rye-grass. The application of bones to pastures, exhausted by years of depasturing with dairy cattle, has been generally resorted to; and in the case of worn-out pastures, the effects upon the herbage have been marvellous. They are not found to answer on dry light land, but they seldom fail on the moister heavier soils which have been underdrained; 3 or 4 cwt. per acre are applied, and occasionally heavier dressings for more permanent improvement. Rough pastures are greatly improved by grazing them close with ewes in winter when they are receiving dry food. By giving grazing animals corn, the herbage is gradually improved, and made to yield good crops of hay. Old turf-fields of poor cold wet clay, producing but little Grass, and that of an inferior description, may by this means, after draining, be made to yield sweet Grass, thick at bottom, and full of good herbage. *H. Evershed, in R. A. S. Journal.*

Obituary.

The late Mr. Foljambe.—We regret to see the death announced of Mr. G. S. Foljambe, of Osberton, long known as an exhibitor at the meetings of the Royal Agricultural Society and the Smithfield Club. For several years he had suffered the severe affliction of blindness, nevertheless (we quote from the *Mark Lane Express*) nothing escaped him; and Mr. Jonas Webb was wont to say that he wished he could be made judge at the Royal and Smithfield Club for the term of his natural life. He had a flock of both Southdowns and Leicesters on his park. The former were his favourites; but the latter for five years, in the teeth of very strong competition, took the gold medal or silver cup at the Smithfield Club. London and Birmingham were his Christmas fields, and this year he was not pleased when he heard that he had "split" Lord Walsingham and Lord Sondes in the light-weight class of Southdowns. Of late years, he had done a great deal with Shorthorns, and began his Booth blood by hiring bulls from Mr. Carr. Robin opened the ball for him by beating, solely by his very superior handling, Mr. Fauke's Friar Tuck, the 1st prize Royal bull-calf, when they met at Doncaster; and Knights of the Bath and the Garter have made their names known since then in still wider fields. His white cow *Cherry Blossom* won a 1st prize at Smithfield last year, and proved to be in calf with a white heifer. About three months after calving she died very suddenly, and we believe that "The Squire's" last walk to his farm was to learn the particulars. This was about a month before his death, and he was soon afterwards seized with bronchitis, from which he could never wholly rally. Still, he retained his interest in all that was going on, and he saw both Mr. Woods and his herdsman shortly before his white ox and the Southdowns went to London, and inquired with much of his old zest if they seemed up to the mark. To those who had not seen him for some time he seemed to be gradually failing; but no great change took place until 42 hours before his death, when he fell into a state of strange listlessness. Dr. Gull was consulted; but the strong man was bowed at last. He was buried at the church which he erected in his own park to the memory of his first wife; and on Thursday a large and sorrowful crowd—rich and poor commingled—from all the country round stood by "The Squire's" grave.

Miscellaneous.

The best Time to Skim Milk.—When milk is allowed to sour before it is skimmed, the layer of cream appears more bulky and of greater consistency, but it does not produce so much nor so good a quality of butter as cream properly raised and skimmed from milk before it sours. On this point we possess some interesting experiments by Sannet, who put aside two equal quantities of milk, of which the first, skimmed after 30 hours, yielded 30 lb. of butter, and the second, skimmed after a lapse of 60 hours, only 27 lb. of butter. In another experiment, two equal quantities of milk yielded—the one when skimmed after 30 hours, 31 lb. of butter; and the other, after 60 hours, 29 lb. of butter. In both experiments in which the milk was skimmed after 30 hours' standing, the skim-milk was still sweet, and the cream not so thick and less in bulk than that thrown up after 60 hours' standing. The cream which rises first is always richer in butter than that which is thrown up later, and it also possesses more of that peculiar aroma which gives to butter that rich nutty flavour and smell which impart so high a degree of pleasure in eating it. Of one thing we may all be assured—the quicker cream can be made to rise the better the quality; for cream, like all perishable substances, does not preserve its original properties for any great length of time. Choice keepable butter can only result when the milk has been kept sweet, as the souring develops curds. But while the cream should be taken from the milk before it is sour, the cream, on the contrary, is allowed to have a pleasant acid taste before churning. *Western Rural.*

The Week's Work.

January 1, 1870.—*Lea Ploughing*, in the few places not frozen out, should now be finished. It frequently occurs that ploughing may be done during the afternoon, but not in the morning, owing to the frost overnight; and however short the yoking may be, it should now be embraced, so as to get the land turned up to the weather. In northern and more elevated districts, when once frost sets in, the mid-day sun has little effect; consequently, ploughing must be deferred to open weather. In some places the plough is seldom "frozen out," and farmers are thankful for a degree of frost that will enable them to do the work of carting.

Old Grass-lands, with much moss or matted surface, keep out frost, and may therefore be broken up when the plough is frozen out elsewhere. Some plough broad, shallow, and flat, purposely to have few seams, more especially when the subsoil is bad; others, when the bottom is sound, skim-plough and cover the sod with a shallow furrow of 2 or 3 inches from below. Very great caution, however, is necessary in turning up the subsoil of old grass-lands, more especially in the case of ferruginous clays or inert soils of any kind into which the roots of the Grass have not penetrated. But in sound, healthy soils, full of vegetable matter, the best plan is to cover the skim sod with a furrow-slice from below, well loosening the bottom with a subsoil plough, as this not only promotes the drainage below but the rotting of the effete vegetable matter above, thereby forming a healthy seed-bed.

Draining operations, where required, should now be concluded on grass and other lands intended for the plough. Meadow or pasture stubble lands intended for stifle burning, and old grass-lands for paring and burning, may be reserved for drainage next month. Unreclaimed lands may be drained at any time, but when to be hand-trenched or ploughed up for green cropping during the ensuing season, then the draining should have been done during the previous summer or autumn months, so as to get them ploughed or trenched up to mellow in the frosts of winter. But this rule cannot always be observed, for the want of hands to do the work; and, therefore, when the drainage cannot be done before now, the work of ploughing or trenching should follow as closely as practicable.

Frozen Out.—In the present frosty weather, where the plough and spade are both frozen out, carting is the rule. When the land for Turnips is near the homestead, and the roads good, some farmers object to carting out manure at this season, preferring to turn it in the yards before seed time. If cattle boxes require to be emptied in mid-winter, this may be done just now. Wheel the manure from the boxes, and spread it evenly over the yard, trample it down and litter it over; or a layer of earth from a headland or hill, previously collected, may be carted in and spread over the manure from the boxes. This will furnish employment for the odd hands upon the farm, and the horsemen and teams may be employed carting marl, &c., as directed last month.

Snowfalls.—Never plough in or trench down snow; but a covering of snow often keeps out frost, so as to permit the works of drainage and trenching to be successfully carried on in frosty weather, when otherwise they would both be at a standstill. No greater length of drain should be opened in such a case than can be finished before night; and if the weather is stormy and unsettled, the opening and closing should go on together, so that the hands can leave off at any time. Thus, if the drain is fourspit deep, four spades follow each other as close as the men can work, clearing out the drain to its depth. A fifth puts in the pipes and covers in, laying down the green sod carefully if intended to remain in Grass. A few bundles of straw will protect the drain until next morning. In trenching, the snow should be thrown upon the surface of the newly trenched land, clearing no more than one trench at a time, and in very frosty weather we have seen the men cover the edge of the last trench with snow at night, to save the trouble of picking in the morning. In this way the labourers may be employed in draining and trenching when without the snow they would be idle.

Old crooked stone fences remove, and build new straight ones, enlarging fields when necessary. The carting of the stones may be done in frosty weather, the stones being thrown from the old fence into the carts. Dry stone dykes or walls may be built at any time when the stones can be handled; but we should commend stone and lime walls, as they occupy less space, make the best fences, and are, upon the whole, the cheapest in the long run.

Stub up crooked and worn-out Thorn and other hedges, and plant new ones, when the thaw comes, as directed last month. The work should be done at the expense of the landlord, or accounted for to the tenant; and now that the demands of steam tillage implements and mowing and reaping machines are imperative, the work should be done without delay—so much yearly, if it cannot all be done in one season. Some huge old hedges supply an amount of firing sufficient to pay for stubbing them out, while the ground recovered for cropping will do more than pay for the planting of the new hedges, the landlord furnishing the Quicks, and draining pipes for the old hedge ditches.

Live stock.—Carting Turnips for the cattle at the homestead forms a very important work at this season on farms where storing in pits or barns is not practised. Some keep a horse or two horses carting daily, and in some cases the harm done to the land in wet weather is not easily calculated, the fields towards the gateways being rutted up to the cart axle. The use of broad wheels obviates some of this harm, but in wet weather the Turnips are exceedingly dirty, while in frosty weather they are hard. In the former case the cattle

scour from the quantity of earth consumed, and in the latter may be seen shivering all the time they are feeding. An extra allowance of corn may check the scouring and keep the cattle fattening, but the loss in both cases is serious. The better plan is to store the roots in the field in dry weather, if they cannot be carted home. But most Turnip soils will permit of carting in dry weather if the carts have broad wheels, and in storing for stormy weather it is better to top and tail the roots and put them neatly up in bins or barns than to heap together large quantities as they are pulled, for the tops soon decompose and become worse than physic to the cattle. *W. B.*

Notices to Correspondents.

BARK ASHES : *Inquirer.* It will prove useful as a dressing for coarse pastures. The spent bark, or "tan," as it is called, may be used as a sponge for liquid manure, and applied to stiff clay plough-lands, with some chance of doing good.

BOOKS. We know no work specifically on artificial manures.

GAS-WATER : *Inquirer.* In may be put on grass-land with advantage. You had better apply it in wet weather—300 or 400 gallons per acre—and you need not add sulphuric acid beforehand. Gas lime is a mixture of caustic lime, carbonate of lime, and sulphuret of calcium. It may be made into compost with ditch clearings, &c., and turned over several times before use, when its sulphuret of calcium becomes gypsum; and it is a useful top-dressing, not, however, of very much value.

KOHL RABI : *Y. L.* We are unable from personal knowledge to say whether Kohl Rabi will cross with the Swedish Turnip; but from analogy we should say it would, if conditions were favourable—as, for instance, if they are in bloom at the same time.

TANNER'S WASTE : *Inquirer.* It is a strong and good manure, containing hair and fleshings; it will yield ammonia on decomposition, and may be applied to Bean stubble before Wheat sowing, or before white corn crop of any kind with advantage.

Markets.

ENGLISH WOOL.

Markets, though wearing the holiday character of the season, have been firm, with a very fair amount of business, and general hopes and expectations are entertained that the new year will show a more hopeful state of things than has been the case for some time past.

CURRENT PRICES OF ENGLISH WOOL. Per lb.—*s. d. s. d.*

FLEECES—Southdown Sluggets	.. ..	1 1 to 1 2
Half-bred ditto	.. ..	1 2 — 1 3
Kent Fleeces	.. ..	1 3 1 4
Southdown ewes and wethers	.. ..	0 6½ 1 1
Leicester ditto	.. ..	1 2 — 1 3
SORTS—Clothing	.. ..	0 10 — 1 6
Combing	.. ..	1 0 — 1 8

HAY. per Load of 36 Trusses.

SMITHFIELD, Thursday, December 30.

Prime Meadow Hay	78*s.* to 84*s.*	Clover, old	..120*s.* to 126*s.*
Inferior do.	.. .. 60 70	Inferior do.	.. 90 110
Rowen	.. .. — —	Prime 2d cut	..100 108
Inferior do.	.. .. — —	Inferior do.	.. 80 90
Straw	.. .. 26 30	CARIES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, December 30.

Sup. Meadow Hay	84*s.* to 92*s.*	Inferior Clover	.. 95*s.* to 110*s.*
Inferior do.	.. .. 72 77	New do.	.. .. — —
New do.	.. .. — —	Straw	.. .. 33 38
Superior Clover	..128 130	JOSHUA BAKER.	

HOPS.

BOROUGH MARKET, December 28.

Messrs, Pattenden and Smith report the market in a healthy state. Stocks of new English are almost exhausted. Prices rule very firm.

METROPOLITAN CATTLE MARKET.

MONDAY, December 27.

We have a fair supply of Beasts for the day; trade is active for choice kinds, but on the average prices are little altered. The number of Sheep is small, so also is the demand; indeed, our late quotations cannot be maintained throughout. Calf trade is scarcely as good as on Thursday. Our foreign supply consists of 665 Beasts, 2730 Sheep, and 111 Calves; from Scotland, 120 Beasts; from Ireland, 300; from Norfolk and Suffolk, 110; and 520 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Hereford, &c.	.. 5 6to5 8		Best Long-wools	5 4to5 6	
Best Shorthorns	.. 5 2—5 6		Do. Shorn	.. —— ..	
2d quality Beasts	3 4—4 4		Ewes & 2d quality	4 0—5 0	
Best Downs and Half-breds	.. 5 6—5 10		Do. Shorn	.. —— ..	
Do. Shorn	.. ..		Lambs	.. —— ..	
			Calves	.. 4 0—6 0	
			Pigs	.. 4 0—6 0	

Beasts, 1718; Sheep and Lambs, 9345; Calves, 114; Pigs, 60.

THURSDAY, December 30.

The supply of Beasts is good, and there is a fair demand for them, although prices on the average are scarcely as good as on Monday. The number of Sheep is not very large, yet it exceeds the demand; prices are rather lower, and a clearance cannot be effected. Calves are selling about the same as of late. Our foreign supply consists of 97 Beasts, 1770 Sheep, and 169 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Hereford, &c.	.. 5 6to5 8		Best Long-wools	5 4to5 6	
Best Shorthorns	.. 5 2—5 6		Do. Shorn	.. —— ..	
2d quality Beasts	3 4—4 4		Ewes & 2d quality	4 0—5 0	
Best Downs and Half-breds	.. 5 6—5 8		Do. Shorn	.. —— ..	
Do. Shorn	.. ..		Lambs	.. —— ..	
			Calves	.. 4 0—6 0	
			Pigs	.. 4 0—6 0	

Beasts, 1180; Sheep and Lambs, 5810; Calves, 186; Pigs, 10.

METROPOLITAN MEAT MARKET.—Dec 31.

Best Fresh Butter .. .. .. 19*s.* per dozen lb.
Second do. do. .. .. .. 17*s.* ,,
Small Pork, 5*s.* 4*d.* to 5*s.* 8*d.*; Large Pork, 4*s.* 2*d.* to 4*s.* 8*d.* per 8 lb.

MARK LANE.

MONDAY, December 27.

There was a very short supply of English Wheat to this morning's market, which brought an advance of 1*s.* per qr. upon the prices of this day se'nnight. The attendance was poor, but the business transacted in foreign was at a similar improvement. Barley, Beans, and Peas were unchanged in value. Oats were 6*d.* to 1*s.* per qr. dearer. Flour firm at extreme rates.

	s. s.		*s. s.*
PRICE PER IMPERIAL QUARTER.			
WHEAT, Essex, Kent, Suffolk. White	40—49	Red.....	37—45
— — fine selected runs...do.	42—53	Red.....	40—50
— — Talavera	56—58		
— — Norfolk		Red.....	—
— — Foreign	40—53		
BARLEY, grind. & dist.,29*s* to 31*s*..Chev.	39—42	Malting ..	34—38
— Foreign .. grinding and distilling	22—25	Malting ..	30 40
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire..Potato	24—26	Feed	—
— Irish	22—23	Feed	21—24
— Foreign .....Poland and Brew	22—25	Feed	19—21
RYE	32—38	Foreign ..	33—36
RYE-MEAL, Foreign	—		
BEANS, Mazagan.....35*s.* to 37*s.*..Tick	36—39	Harrow ..	36—49
— Pigeon .....29*s.* to 36*s.*..Winds..	—	Longpod. ..	—
— Foreign.....Small	41—43	Egyptian .	38—40
PEAS, White, Essex, and Kent..Boilers	37—42	Suffolk ..	39—43
Maple, 41*s.* to 45*s.* .....Grey	40—42	Foreign ..	35—38
MAIZE	—	Foreign ..	29—31
FLOUR, best marks delivered.. per sack	39—43		
— 2d ditto ..... ditto	28—40	Country ..	28—40
— Foreign ..... per barrel	22—25	Per sack..	29—35

FRIDAY, December 31.

The weather from the 24th to the 29th inst. has been frosty, and in the northern districts much snow has fallen. Business throughout the markets of the kingdom has gradually improved under the influence of cold weather, and the better tone noticed in our last having gained strength we can now report a general advance of 1*s.* to 2*s.* per qr. on Wheat from the late lowest rates. The trade, however, has not been extensive, owing to an absence of speculation caused probably by the nearness of the expected large arrivals from the Black Sea, and the circumstance that our farmers are supposed to hold more than their average quantity of this year's crop, their deliveries so far having been very moderate. Excepting a decline of 6*d.* to 1*s.* per qr. on home-grown Oats in the Scotch markets, Spring Corn of all sorts met a fair inquiry at hardening rates, the recovery in the value of Oats being fully 1*s.* per qr. here. Flour moved off rather slowly, but the extreme rates of the preceding week were paid on the business done. The supplies off the coast consisted this week of 13 cargoes, of which, with those left over from last week, there remained for sale last night 22 cargoes. Throughout the week the floating trade has hardened, Barley alone being neglected. Wheat has recovered 1*s.* per qr. from the late decline; Maize was in better demand at an improvement of 6*d.* per qr.; of Rye one cargo was disposed of at previous rates; Linseed, Rapeseed and Cotton-seed were steady. There was no disposition to enter into transactions for forward shipment.

The arrivals of English and foreign grain are short, with the exception of foreign Oats, which are liberal. The attendance at this morning's market was poor, the business done in all descriptions of grain was limited in extent, and prices remain nominally as on Monday.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	900	2680	—	—
Irish ..	—	—	—	—
Foreign ..	1650	7430	40,470	1390 890 brls.
	2550	10,110	40,470	

LIVERPOOL, December 28.—There was a good business in Wheat, at 2*d.* to 3*d.* advance since this day week on both descriptions. For Flour there was a fair demand, and prices favoured sellers. Beans, Oats, and Oatmeal were held for extreme rates. Indian Corn was in better request, at an advance of 6*d.* per qr.; round yellow, 29*s.* 6*d.*

AVERAGES.

	Wheat.	Barley.	Oats.
	*4*6*s 8*d*	*3*8*s 4*d*	*2*3*s 5*d*
Nov. 20 ..	45 6	38 1	23 5
— 27 ..	44 3	37 0	22 6
Dec. 4 ..	43 8	36 2	22 5
— 11 ..	43 10	36 0	22 3
— 18 ..	43 5	35 11	21 6
— 25 ..	45 8	37 10	23 3
Average ..			

SEED MARKET.

Our markets during the week have been quite of a holiday character, with almost a complete absence of business. All descriptions of agricultural seeds are held with great firmness, and a brisk trade early in the new year is confidently anticipated. There has this year been very little of the ordinary autumn speculation in Clovers, &c., the provincial merchants not having as yet bought to any extent. We have a good inquiry for white Mustard seed, and prices are on the rise. English Rape seed has become very scarce, and must be noted fully 2*s.* per qr. dearer. Haricot Beans, on account of the cold weather, are in improved request. Bird seeds are without alteration; Canary seed is just now very cheap.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

Caution to Gardeners.—When you ask for

SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S & C regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of knives which were not of their make all of which are warranted both by sellers and Makers

SAYNOR'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market

Paxton Works, Sheffield Established upwards of 125 years

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows.—

PROPAGATING GLASSES.

Each.—*s d.*			Each.—*s d*
2 inches in diameter ..	0 3½	12 inches in diameter ..	1 9
3 ,, ,, ..	0 5½	14 ,, ,, ..	2 0
4 ,, ,, ..	0 5½	14 ,, ,, ..	2 6
6 ,, ,, ..	0 6½	15 ,, ,, ..	3 0
7 ,, ,, ..	0 9	16 ,, ,, ..	3 0
7 ,, ,, ..	0 10	17 ,, ,, ..	3 6
8 ,, ,, ..	1 0	18 ,, ,, ..	4 0
9 ,, ,, ..	1 2	18 ,, ,, ..	5 0
10 ,, ,, ..	1 4	20 ,, ,, ..	6 0
11 ,, ,, ..	1 6	,, ,, ..	7 0

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter ..	0*s.* 6*d.*	9 inches in diameter ..	1*s* 8*d*
6 ,, ,, ..	0 8	10 ,, ,, ..	2 0
7 ,, ,, ..	0 10	11 ,, ,, ..	2 6
8 ,, ,, ..	1 1	12 ,, ,, ..	3 0
,, ,, ..	1 4		

Either flat or conical tops.

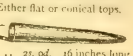

CUCUMBER GLASSES

24 inches long ..	2*s.* 0*d.*	16 inches long ..	1*s.* 4*d.*
22 ,, ..	1 10	14 ,, ..	1 2
20 ,, ..	1 8	12 ,, ..	1 0
18 ,, ..	1 6		

HAND GLASSES, WITH OPEN TOPS.

Each.—*s d.*			Each.—*s d.*
12 inches ..	6 6	20 inches ..	10 6
14 ,, ..	7 6	22 ,, ..	11 6
16 ,, ..	8 6	24 ,, ..	12 6
18 ,, ..	9 0		

London Agents for HARTLEY'S IMPROVED PATENT ROLLED PLATE.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in	in		4ths	3ds	2nds.	Best.
20	by 12	Per 100 feet	15*s* 0*d*	12*s* 3*d*	15*s* 6*d*	16*s* 9*d* 18*s* 0*d*
20	by 13					
20	by 14					
20	by 15		21 0*d*	18*s* 0*d*	20*s* 0*d*	22*s* 0*d* 24*s* 0*d*
20	by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in.	in.	in.	in.	in.	in.	4ths.	3ds.	2nds.	Best.
6	by 4	7	by 5	8	by 6	9	by 7	11*s* 3*d*	12*s* 6*d*	14*s* 0*d*	15*s* 6*d*
6½	by 4½	7½	by 5½	8½	by 6½	9½	by 7½				

Per 100 feet.

10	by 8	12	by 9	13	by 10	14	by 10	11*s* 9*d*	14*s* 9*d*	15*s* 3*d*	17*s* 6*d*
10½	by 8½	12½	by 9½	13	by 10	15	by 10				
11	by 9	13	by 9	13½	by 10	13	by 11				
11½	by 9½	12	by 10	14	by 10	14	by 11				

LARGE SHEET SQUARES, 15 oz., per 100 feet

in	in.	in.	in.	in.	in.	4ths	3ds	2nds	Best.
13½	by 10½	14	by 12	22	by 12	22	by 10				
10	by 10	14½	by 12½	17	by 12	20	by 17				
14½	by 11½	15	by 12	23	by 13	20	by 17				
15	by 11	15½	by 12½	18	by 14	22	by 17	12*s* 3*d*	15*s* 6*d*	16*s* 9*d*	18*s* 0*d*
15½	by 11½	16	by 12	22	by 14	24	by 17				
16	by 11	16½	by 12½	24	by 14	20	by 18				
21	by 11	17	by 12	22	by 15	22	by 18				
13	by 12	18	by 12	24	by 15	24	by 18				

The above Prices are only for the Sizes stated; if a quantity of any other Size be required, a Special Price will be given.

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.			21 oz.		
4ths quality, per 300 feet case, 36*s.*			4ths quality, per 200 feet case, 36*s.*		
3ds ,, ,,	42*s.*		3ds ,, ,,	42*s.*	
2ds ,, ,,	52*s.*		2ds ,, ,,	62*s.*	
Best ,, ,,	75*s.*		Best ,, ,,	75*s.*	

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., 42 oz., and 45 oz.

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 3-8th in. substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 24*s.* per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is mixed with rain or pure river water.

WHITE ZINC PAINT, 42*s.* per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a-half of White Lead and six gallons of Linseed Oil. Special Dryers for this Paint

IMPROVED ANTI-CORROSION PAINT, 28*s.* to 34*s.* per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Brick, Stone, Compo, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 4*s.* per gallon.

Per cwt.	*s d.*		Per gallon.—*s. d.*
GENUINE WHITE LEAD	28*s.* to 36*s.* 0	LINSEED OIL	.. 3 2
SECONDS WHITE LEAD	28 0	BOILED OIL	.. 3 2
GROUND PATENT DRY-		TURPENTINE	.. 2 9
ING, 32*s.* to 34*s.* per cwt.		LINSEED OIL PUTTY,	
,, OXFORD OCHRE, 3*d* to 4½*d.* per lb.		8*s.* per cwt.	
,, RAW UMBER, 3½*d.* to 6*d.* per lb.		Fine OAK VARNISH, 10*s* to 12	0
,, BURNT do., 6*d.* to 9*d.*		,, TURPENTINE do., 12*s.* to 14	0
GREEN PAINT, all shades,	28*s.* to 60 0	,, PALE do., 20*s.* to 24	0
		,, PAPER do. 10*s.* to 12	0
BLACK PAINT	24*s.* to 36 0	,, COPAL ,, .. 10	0
RED PAINT ..	28*s.* to 36 0	KNOTTING ,, .. 12	0
		Patent GOLD SIZE .. 10	0
GROUND BRUSHES.		,, BLACK JAPAN .. 12	0
DUSTERS. SASH TOOLS.		GLAZIER'S DIAMONDS and TOOLS.	
DISTEMPER BRUSHES.		MILLED LEAD and PIPES.	
		OLD LEAD bought or taken in Exchange.	

The above are Nett, for Cash, and as such cannot be booked

Lists of any of the above on application

BY HER MAJESTY'S ROYAL LETTERS PATENT.

ORMSON'S PATENT ECONOMIC BOILERS.

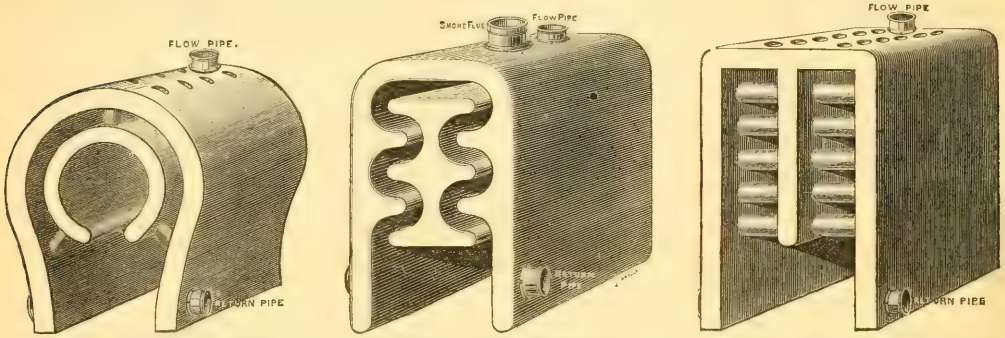

ORMSON'S PATENT CONCENTRIC SADDLE BOILER. | ORMSON'S PATENT CONVOLUTED BOILER. | ORMSON'S PATENT TUBULAR BOILER.

From the Construction of these Boilers, it will be at once seen that the object of the inventor is to economise fuel, by concentrating its entire force and vertical action on the surfaces of the Boiler, and not wasting it by Heating Brickwork and Chimneys, a fault common to the great majority of Boilers now in use.

These Boilers are made of the best Welded Wrought-iron, of good substance, having no overlapping plates, holes, or rivets, and are therefore perfectly secure against failure from expansion and contraction of the metal, an occurrence so frequent and fatal to all forms of Cast-iron Boilers.

Please to state diameter and length of Pipe to be Heated.

HENRY ORMSON, Horticultural Builder to Her Majesty,

AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.

STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

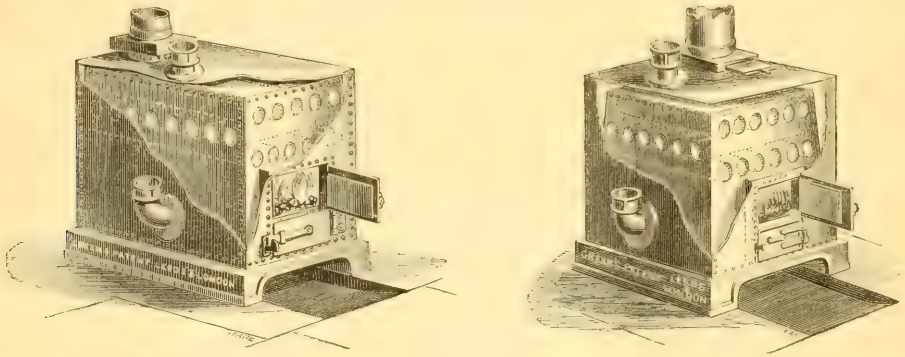

OBLONG BOILER. SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

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	2 inch	3 inch	4 inch
HOT-WATER PIPES, Nos 6 & 7 on illustrated sheet .. .. per yard	0 11	1 5	1 11
ELBOWS .. .. No. 22 on do each	1 4	2 1	2 9
TEE PIPES .. .. No 33 on do ,,	2 0	3 0	4 0
SYPHONS .. .. No 23 on do ,,	1 0	3 0	4 0
VALVES .. .. ,,	10 0	11 0	12 0

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Each
6 ft. by 4 ft. Lights, 2 in. thick, unglazed .. £0 5 0
,, ,, Primed and Glazed with 10 oz. Sheet 0 11 0
,, ,, with stout portable Box, not Painted 1 3 0
,, ,, Painted four coats, and Handles on 1 8 0
,, ,, Packed and Delivered in Railway Van 1 10 0
6 ft. by 3 ft, Double Lights, do 2 15 0

GREENHOUSES Per ft. super.
Woodwork only Prepared and Fitted 0 0 6
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,, Delivered, and Fixed with Ironwork 0 1 0
,, Painted four coats, two sides, ready for use .. 0 1 3
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PORTABLE AND FIXED HOT-WATER APPARATUS,
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T. S. TRUSS

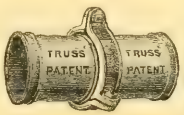

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Two Four-inch Pipes along One Side and One End of House.

Size of House	Apparatus Complete.	Erection.	Size of House	Apparatus Complete	Erection.
20 feet by 10 feet ...	£9 0 0 ...	£2 0 0	50 feet by 15 feet ..	£17 10 0 ..	£3 0 0
30 feet by 12 feet ...	11 15 0 ..	2 10 0	75 feet by 15 feet ..	20 0 0	3 0 0
40 feet by 15 feet ...	15 0 0 ..	2 15 0	100 feet by 15 feet ..	20 0 0 ..	3 5 0

Bath and Gas Work Erected in Town or Country. The TRADE SUPPLIED.
Price Lists, Plans, and Estimates forwarded on application to
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GRAY'S OVAL TUBULAR BOILER.
INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his
NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

They are made of all sizes, which, with prices, may be had on application.

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

OBSERVE.
THE PATENT A 1 HORIZONTAL TUBULAR BOILER,
MANUFACTURED BY THE PATENTEES,
T. H. P. DENNIS & COMPANY,
POSSESSES ADVANTAGES PRESENTED BY NO OTHER TUBULAR, CONICAL, OR SADDLE BOILER AT PRESENT PRODUCED.

Its heating surface exceeds all others, its efficacy exceeds all others, its economy exceeds all others, and its durability and simplicity are unequalled. Several have been in use for some time, and many are now being fixed in various parts of the country. They have been severely tested and compared with other Boilers, and in all cases have proved themselves to be what they are designated, viz., A 1.

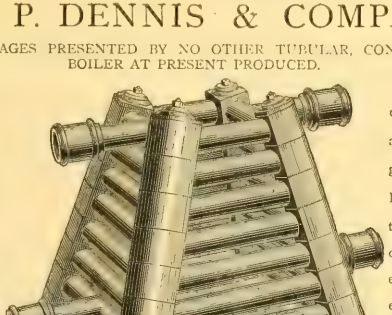

Hot-water Heating in connection with the above is carried out with great success by the Firm, who are prepared to give Estimates for carrying out the most extensive, as well as elaborate systems of heating—satisfactory results being guaranteed in every instance.

T. H. P. DENNIS AND COMPANY, HORTICULTURAL BUILDERS and ENGINEERS,
ANCHOR IRON WORKS, CHELMSFORD.

National Flower Show June, 1867.

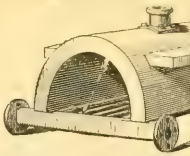

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A PAMPHLET and PRICE LIST, &c, with 15 illustrations, description, and testimonials, will be sent post free on receipt of two stamps.

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Vases and Fountains, for the Garden and Conservatory.

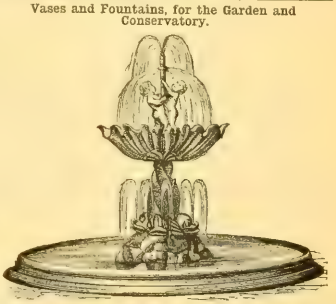

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A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom

Rosher's Garden Edging Tiles.

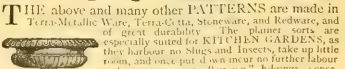

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GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post. The Trade supplied

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c, as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.

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'Quicquid agunt homines, votum, timor, ira, voluptas,
Gaudia, discursus, nostri est farrago libelli.'

We may add that this is the very last volume of the productions of Leech's fertile pencil which will appear, at all events in this shape."—*Times*, December 10.

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Miniature Edition, in 13 vols., 32mo. size, printed on a slightly toned paper of fine quality, with a new, clear, and readable type, on a page free from notes—the Text arranged from a close comparison of the most trustworthy editions. In cloth, with case, 21*s.* Or in more expensive bindings, viz.: the Guinea and a-Half Edition, in crimson French morocco, gilt edges, with case; and the Three-Guinea Edition, in best morocco or russia, gilt edges, with case and lock.

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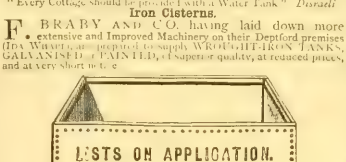

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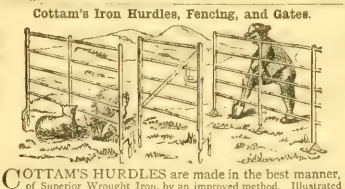

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The most practical answer ever given to this all-absorbing question is, the New Apparatus in operation at the above.

It is considered the "largest" and "most perfect" ever erected, being a "wonder" in heating.

It works like a model, and is unequalled in Great Britain.

NOTE THE CONTENTS.

Reference No.	Name.	Quantity of Piping.	Reference No.	Name.	Quantity of Piping.
1	Hall	260 feet.	29	Orchid House	230 feet.
2	Corridor	90 ,,	30	Gymnogramma House	210 ,,
3	Closet	30 ,,	31	Plant Hospital	180 ,,
4	Picture Gallery	760 ,,	32	Gleichenia House	436 ,,
5	Sculpture Gallery	110 ,,	33	East India House	240 ,,
6	Conservatory 1st series of pipes	720 ,,	34	West India House	240 ,,
7	Conservatory (2d ,, ,, ,,) ...	440 ,,	35	Span-roofed Plant House	260 ,,
8	Conservatory (3d ,, ,, ,,) ...	570 ,,	36	Heath House	260 ,,
9	Store Room	60 ,,	37	Late Vinery	280 ,,
10	Fernery (1st series of pipes) ...	500 ,,	38	Late Vinery	295 ,,
11	Fernery (2d ,, ,, ,,)	310 ,,	39	Peach House	310 ,,
12	Fernery 3d ,, ,, ,, ...	300 ,,	40	Pit with Top Heat	150 ,,
13	Coach House	120 ,,	41	Croton House	360 ,,
14	Drying Room	60 ,,	42	Bottom Heat Tank in same	158 ,,
15	Harness Room	50 ,,	43	Forcing House	360 ,,
16	Coachmen's Rooms	30 ,,	44	Bottom Heat Tank in same	158 ,,
17	Living Rooms	75 ,,	45	Pit with Top Heat	160 ,,
18	Stables	500 ,,	46	Foliage Plant House	255 ,,
19	Passage	40 ,,	47	Bottom Heat Tank in same	110 ,,
20	Carriage Washing House	30 ,,	48	Lean House	260 ,,
21	Entrance to Stable Department ...	60 ,,	49	Bottom Heat Tank in same	108 ,,
22	Fine Foliage Plant House ...	344 ,,	50	Flowering Stove...	270 ,,
23	Bottom Heat Tank in same	80 ,,	51	Bottom Heat Tank in same	108 ,,
24	Palm Stove	324 ,,	52	Pit with Top Heat	160 ,,
25	Bottom Heat Tank in same	80 ,,	53	Rose House	360 ,,
26	Orchid House	345 ,,	54	Mushroom House	96 ,,
27	Orchid House	364 ,,	...	Mains, various	1800 ,,
28	Orchid House	225 ,,			

Total, 54 Compartments, containing 14,471 feet of Piping, equal to nearly 3 miles, all heated on

WEEKS'S ONE-BOILER SYSTEM.

No other but WEEKS'S UPRIGHT TUBULAR BOILER has ever approached such an extraordinary achievement.

A limited number of COLOURED LITHOGRAPH PLANS and SECTIONS, with Reference Notes and Explanations, giving full particulars of this masterpiece of heating, are in preparation. They will be mounted in the form of a Map, and forwarded post free on application to

JOHN WEEKS AND CO.,

HORTICULTURAL BUILDERS AND HOT-WATER APPARATUS MANUFACTURERS.

KING'S ROAD, CHELSEA, LONDON, S.W.

☞ J. WEEKS' AND CO.'S "BOOK of DESIGNS" (12th Edition) free by post.

John Weeks & Comp.ʸ

Editorial Communications should be addressed to "The Editor," Advertisements and Business Letters to "The Publisher," at the Office, 11, Wellington-street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 2.—1870.] SATURDAY, JANUARY 8. Price Fivepence. Stamped Edition 6d.

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LEEDS SPRING FLOWER SHOW will be held on Tuesday, Wednesday, and Thursday in EASTER WEEK. The Spring Show held in Leeds, I doubt not, will be equal to any exhibition as to contents, number of prizes, &c., that the Show may be satisfactory in every respect. Schedules will not be issued until the end of January.
Leeds Town Hall, Park. THOMAS CLAPHAM, Secretary.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870. FIVE HUNDRED AND FORTY PRIZES, £1,000. THE GRAND MAIN HALL, 250 feet long, will be devoted to the Exhibition of
Belmont Nurseries, Manchester. EDWARD FINDLAY.

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Canada Horticultural Depot, Union Passage, Birmingham.

SUTTONS £3 3s. COLLECTION of GARDEN SEEDS, carriage free. For contents see outside page of this week's paper.

SUTTONS £2 2s. COLLECTION of GARDEN SEEDS, carriage free. For contents see outside page of this week's paper.

SUTTONS £1 1s. COLLECTION of GARDEN SEEDS, carriage free. For contents see outside page of this week's paper.

SUTTONS £1 1s. COLLECTION of GARDEN SEEDS, carriage free. For contents see outside page of this week's paper.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

DOBSON AND SONS' PRIZE FLOWER SEEDS are splendid. Packets of 12 varieties, 1s. 6d. and 2s. 6d.

CALCEOLARIA.—Seedling packets, 1s. 6d., 2s. 6d., 5s. 6d., and 5s. First Prizes, Crystal Palace, Horticultural Society, and Reading, &c.

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SCARLET INTERMEDIATE STOCK, very double, and splendid colours, 6d. per doz.

SUPPLIED by 1500 Leading Seedsmen and Florists.—DOBSON AND SONS, Wholesale Nurserymen, Longford, W.

DOBSON AND SONS' SEED CATALOGUE, for 1870, post free.—Wholesale Nursery, Longford, W.

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JAMES CARTER, DUNNETT and BEALE have a fine stock of these fine Bulbs. Lowest prices on receipt of application.
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CARTER'S GENUINE SEEDS. See pages 56 and 58.—237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See pages 56 and 58.—237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See pages 56 and 58.—237 and 238, High Holborn, London, W.C.

CARTER'S NEW PEAS for 1870. See pages 56 and 58.—237 and 238, High Holborn, London, W.C.

CARTER'S SELECTED SEED POTATOS. See pages 56 and 58.—237 and 238, High Holborn, London, W.C.

CARTER'S GENUINE SEEDS. See pages 56 and 58.—237 and 238, High Holborn, London, W.C.

Rose Catalogue.

JOHN CRANSTON'S ROSE CATALOGUE for 1870, is now ready, and will be sent on receipt of three postage stamps.

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For immediate sale, per 1000.
For autumn and spring planting, per 1000.
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To the Trade Only.

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Apply to Mr. ROBERTSON, Gardener to
WILLIAM DILLISTONE, Sible Hedingham, Essex.

Larch, Scotch, and Spruce.

WITTY AND SON have a large quantity of the above to offer. Prices and samples may be had on application.
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WANTED, Transplanted LARCH, 2 to 3 feet.
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HOLLIES WANTED.—THREE THOUSAND GREEN HOLLIES, moderately Handsome Plants—Address stating Price and Particulars, to
Mr. ROBERT BELL, Nurseryman, Chase Farm, near Wolverhampton.

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J. A. WALKER, Nurseryman, Ledgware.

SCARLET DOGWOOD, so valuable for Game Covers, as Hares or Rabbits do not eat it, may be had in quantity at 20s. per 1000.
J. T. FISH, Nurseryman, Newport, Isle of Wight.

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RICHARD SMITH, Nurseryman, Seed Merchant, Worcester.

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OSBORN AND SONS can supply good CANES of the above, grown in pots, at 2s. 6d. each. This fruit has again been exhibited, and very much admired for maintaining the high character previously formed of it. Price 20s. 6d., 30s., and 40s. each.
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NUTTING AND SONS have just received a large consignment of the above fine Lilies, and offer roots at 12s. per dozen.
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LILIUM AURATUM.—Fine roots of this splendid variety, 12s. per dozen, 90s. per 100.
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PHILETHRUM AURUM (GOLDEN FEATHER), fine plants, 12s. per dozen, 90s. per 100.
JAMES CARTER, DUNNETT AND BEALE, 237 and 238, High Holborn, London, W.C.

To the Trade.

HERBACEOUS CALCEOLARIAS (See Seedlings, Cuttings, and Plants, page 56 of this week's paper).
TH. MAD. PERKINS AND SON, Nurserymen, Yeovil.

Genuine Seeds.

WM. CUTBUSH AND SONS' Catalogue of KITCHEN GARDEN, FARM and FLOWER SEEDS is now ready, and may be had on application.
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EVERY GARDEN REQUISITE.
CARTER'S New and Choice SEEDS.
HERBERT H. NICHOLSON, SEED GROWER, Lincoln.

SUTTON AND SONS' New and Choice Vegetables and Flowers, 1870, is now ready, and may be had on application.
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NEW and GENUINE GARDEN, MARKET, FARM, and FLOWER SEEDS. Prices and advantageous offers of above, on application to
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1870.—VEGETABLE and FLOWER SEEDS.—JAMES DICKSON AND SONS, Seed Merchants, &c., Newcastle and 102, Fenchurch Street, London.

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CHARLES SHARP AND CO. SEED GROWERS and MERCHANTS, Stamford, Lincolnshire, will send their CATALOGUE of GARDEN SEEDS for 1870 to all applicants.

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TELEGRAPH (NEW MANGEL).—Packets 1s. 6d. and 2s. 6d. each, free by post. The Norfolk Nurseries, Downham Market.

CUCUMBER, Choice TRICOLOR GERANIUM, and STRAWBERRY PLANTS, Wholesale and Retail.
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SUTTONS BERKSHIRE KIDNEY.
The best Potato for the main crop. Price 5s. per peck.

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The best Potato for the second crop. Price 5s. per peck.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

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To the Trade.

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Notice to the Trade.

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RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.

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FRANCIS & ARTHUR DICKSON & SONS have several thousand extra strong, thoroughly well-ripened, short-jointed VINES to offer, and have the best Lady and Hamburgh in the new ones of this season. Inspection invited. All who have seen them pronounce them to be as fine a lot of Vines as were ever grown. Price List free by post on application.

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STRONG STANDARD APPLES and PEARS.—Large horizontal Trained and Pyramid Apples and Pears; fine Standard and Dwarf-trained PEACHES and NECTARINES; fine bushy LAURELS and LAURUS COLCHICUM, up to 4 feet; extra bushy LAURESTINUS and PORTUGAL LAURELS, 2 to 3 feet; a large collection of Standard and Dwarf Perpetual, Dwarf China, and climbing ROSES of the leading sorts; deciduous flowering SHRUBS; ASH, 5 to 6 feet, for LARCH, SCOTCH, SPRUCE, and AUSTRIAN FIRS, and all kinds of FOREST TREES; strong Evergreen PRIVET and THORN QUICK for Hedges. All the above have been regularly transplanted, and are well rooted. Prices on application to

CHARLES BURGESS, The Nurseries, London Road, Cheltenham

Forest, Fruit, and other Trees.

JAMES DICKSON AND SONS' NURSERY STOCK is not surpassed in Britain; therefore, they have every confidence in recommending their unrivalled plantations to intending planters. Their EXTENSIVE NURSERIES, which can now be reached, on foot, in seven minutes, from the Chester Railway Station, by their new private road from the five-arch Bridge, Handbridge.

PRICE LISTS on application as

(*Old Established Nurseries and Seed Business*)

"Newton" Nurseries, Chester.

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J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do. of APPLE, 150 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion—Standards, 6 to 7 feet; Pyramids, 5 to 6 feet; Espaliers, 5 feet high. Also very fine Dwarf-trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12 6d in stamps. Agented for Indents, and Exports.

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CATALOGUE Free on application.

Forest Trees, Fruit Trees, Evergreens,

PLANTS for GAME COVERS, CONIFERS, ROSES, &c.

FRANCIS & ARTHUR DICKSON & SONS invite the attention of Planters to their very large stock of the above, which in extent and variety is not excelled by any Nursery in the Kingdom. Their Nurseries, which are very bleak and exposed, extend over some 60 Acres, and their trees are well known to be unusually hardy, as well as in the most perfect health and condition in every respect; and are found to thrive admirably when removed to other parts of the country.

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Their Nurseries are the most exposed in the North Western Counties, and free from all artificial shelter, render the safe removal of plants almost a certainty.

PRICED CATALOGUES post free on application; estimates and special prices for large quantities.

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APPLES, Standards, 12 distinct kinds 7 0

" " 24 " 12 0

" " 50 " 21 0

" " 100 " 50 distinct kinds 42 0

Pyramids, very fine, same prices

PEARS, Standards, 12 distinct kinds 10 6

" " 24 " 17 6

PLUMS, fine Pyramids, 12 distinct kinds 9 0

" " 24 " 17 6

PEACHES, NECTARINES, and APRICOTS, very fine, same Dwarfs, very fine .. .. .. per doz 0 0

CHERRIES, Dwarfs, very fine 7 6

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Nurseries, Side Bedingham, Essex

WANTED, one good Standard BRUGMANNIA ARBOREA, 5 to 6 feet stem; one ditto SANGUINEA, 3 to 4 feet stem; one each LILIUM AURATUM and LILIUM LONGIFLORUM; fine VALLEY roots by the bushel; Double PRIMROSES and HEPATICAS, of sorts, by the root. Send price and full particulars to

JAS. JACKSON AND SON, Nursery, Kingston, Surrey.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.

Samples, with height and price, on application to

W. VRIGHT AND SON, Woburn Nurseries, Guildford

TRANSPLANTED LARCH, 1 to 1½ foot, 15 to 18 inches, 12 to 15 inch, and 9 to 12 inch SPRUCE FIRS, SCOTCH FIRS, BEECH, ASH, SYCAMORE, &c., of various sizes. Dwarf-trained PEACHES and NECTARINES and APRICOTS, very fine, 18s. to 30s. per dozen. GOOSEBERRIES and CURRANTS, 15s. to 20s. per 100. RASPBERRIES, AMERICAN SILVER-LEAVED, LOBB'S, &c., 2, 3, 4, up to 8 feet. ENGLISH YEWS, 1½ to 2 feet, 25s. per 100; 2 to 3 feet, 50s. per 100; 3½ 4 feet, 60s. per 100. CATALOGUE of Nursery Stock forwarded on application to

EDWARD TAYLOR, Nurseryman and Seedsman, Malton, Yorkshire.

ONE HUNDRED AND FIFTY THOUSAND LARCH, 4 to 5 feet, and 5 to 6 feet

5,000 PINUS AUSTRIACA, 2 to 3 feet; fine roots.

5,000 PINUS LAURICIO, 4 to 5 feet; true from seed.

10,000 SCOTCH FIR, 2 to 3 feet; transplanted in 1869.

15,000 BEECH, 1 to 2 feet, strong.

100,000 ASH, 2 to 3 feet, 4 to 5 feet, and 5 to 6 feet.

20,000 BIRCH, 2 to 3 feet, and 3 to 4 feet, moved in 1869.

50,000 OAK, 12 to 15 inch, and 15 to 18 inch.

5,000 SILVER FIR, 2 to 3 feet.

15,000 ASH, English, 2 to 3 feet, and 3 to 4 feet.

100,000 SYCAMORE, 2 to 3 feet, and 3 to 4 feet.

50,000 LAURUSTINUS, 2 to 3 feet, and 3 to 4 feet.

50,000 LAURELS, 2 to 3 feet, and 3 to 4 feet.

10,000 SILVER WEEPING ASH, 4 to 5 feet.

10,000 ASH, MOUNTAIN, 3 to 4 feet, and 4, 5, and 6 feet.

20,000 CHESTNUT, SPANISH, 18 to 24 feet.

20,000 LIME, HOLLAND, 2 to 3 feet, 3 to 4 feet, and 4 to 5 feet

3,000 PORTUGAL LAUREL, fine bushes, well rooted, 2½ to 3, 3 to 4, and 4 to 5 feet

4,000 YEW, ENGLISH, 2 to 3 feet; fine pyramidal and well rooted, often transplanted.

Strong plants of House Chestnut, Sycamore, Mountain Ash, Norway Maple, Birch, Limes, Turkey Oak, Poplar, Abele, Lombardy, and Ontario, Willows, Laburnum, &c., from 7 to 10 feet, which can be supplied by the 100 and 1000. For prices, which will be reasonable, apply to H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

KNAP HILL NURSERY,
WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTI'S, 5 to 9 feet, 30s. to 60s. per dozen Transplanted April, 1869, and well rooted

ABIES DOUGLASII, 6, 7, to 10 feet, 72s. 6d. to 10s. 6d. each. Transplanted August, 1868

ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference.

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s., to £12 10s. per 100

The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbraziliana, &c., large numbers, many of them 20 and 30 years' growth.

CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen: 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869

CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All moved since September, 1868

CEDRUS LEBANON, 6, 7, to 10 feet Moved September, 1868

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 7s. 6d. each

" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each

" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 10s. 6d. each

JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each

All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all carefully transplanted, and are undoubtedly the finest plants to be found in any Nursery. None are grafted

PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Transplanted April, 1868, 10 to 15 feet high

PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 9 feet high All removed in 1866-69

PICEA MENZIESII, 3, 4, and 5 feet.

PICEA PINSAPO, 4, 5, 6, 7, and 8 feet, 21s. to 63s. each Some grand plants, 10 to 15 feet high, transplanted April, 1869

THUJA LOBBII, beautiful specimens, 3, 4, 5, and 6 feet high: 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed

THUJA GIGANTEA, 5, 6, to 12 feet high Moved August, 1868

THUJA LOBBII, 6 feet, 7 feet high, and as much in circumference; transplanted April, 1869

THUJA OCCIDENTALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 60s. per dozen; 9 to 8 feet, 72s. 6d. to 10s. 6d. each. All removed since August, 1868

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6 to 7 feet, 21s. to 42s. each Transplanted in August

PINUS AUSTRIACA, 5 feet, 42s. per 100. Transplanted Sept., 1868

PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft round, 10s. 6d. to 21s. each

YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all transplanted, and carefully removed; invaluable where immediate effect is sought.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high

YEWS, IRISH, handsome plants, up to 10 feet high

HOLLIES, GOLDEN and SILVER, in all the leading sorts, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference

HOLLY, GOLDEN, 4, 5, 6, and 7 feet

WATERER'S HOLLY.—This variety originated in this Nursery; we have hundreds 4, 5, and 6 ft. high, 10 and 15 ft. circumference

PERRY'S HOLLY, 4, 5, 6, and 7 feet high, 10 and 15 ft. circumference

HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869

HOLLY, COMMON, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868

HOLLY, many varieties of, not drawing kinds An immense stock of splendid plants, all transplanted in 1868-9

LAURIFOLIA and SCOTTICA, 9 to 10 feet high.

HODGINS, | ANGUSTIFOLIA,

YELLOW BERRIED, | MYRTIFOLIA, &c.

4, 5, 6, and 8 feet high

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 12 feet in circumference A large assortment

N.B.—For clusters of Hollies may select from a stock comprising at the present moment considerably over 6 acres of ground, finer or better-rooted plants cannot be wished or obtained. The prices are fair and moderate.

BOX, Green and Variegated, 4, 5, 6, 7, 8, to 8 feet.

BOX, do do., fine pyramids, up to 8 feet

BAYS, standard and pyramidal.

LAURUSTINUS, standards

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high

AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 36s. per dozen, and upwards

AMERICAN PLANTS.—The stock of American Plants at Knap Hill is, we believe, as large as, and more extensive than, anything of its kind to be met with in England, consisting of over 50 acres of land newly prepared for their cultivation. We shall be pleased to supply—

RHODODENDRONS, finest bushy plants, from layers, named kinds, £5 per 100, £40 per 1000 A dozen sent as sample on application

RHODODENDRONS, the finer kinds, by name, from £7 10s. to £10 per 100

RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference. Also a large stock of Standard Briars adapted for standards than that we call roseum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of named kinds very large

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 per 100 Sample on application. Large and handsome plants by the 1000, 4 to 8 feet high

AZALEAS, fine and well-budded pot plants, £10 per 100, upwards

AZALEAS, common kinds, £5 per 100.

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and very handsome

KALMIA LATIFOLIA, nice plant, bushy, healthy, and covered with flower-buds, 15s. to 30s. per 100

ANDROMEDA FLORIBUNDA, £5 to £7 10s. per 100, and upwards

HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100.

ERICA HYEMALIS, or LOBIANA, £5 to £7 10s. per 100, and upwards

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen

Anyone visiting the Nursery at Knap Hill Nursery cannot miss seeing 200 Acres of Healthy NURSERY STOCK of a superior class, such as Flowering Shrubs, Deciduous and Evergreen, Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELM, FIR, SCOTCH, do SPRUCE, do SILVER, OAK, SYCAMORE and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes.

RICHARD SMITH'S LIST of all the EVERGREEN FIR TRIBE suitable for Britain, giving size, price, popular and botanical names, derivations, description, form, colour, foliage, growth, timber, use in arts, native country and size there, situation, soil, and other information, with copious Index of their synonymes. Free by post for six postage stamps

EVERGREEN HEDGES. AMERICAN ARBOR VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.

SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100

RICHARD SMITH, Nurseryman, Worcester

The Northampton Nurseries.

JOHN PERKINS, SEN., begs to offer the following, well hardened off, and well rooted:—

Scotch Fir, 2 to 3 feet | Berberis aquifolia, 1 to 1½ feet

Laurels, 1½ to 2, and 2 to 3 feet | Green Box, 1½ to 2, and 2 to 3 feet.

Strong Whitethorn Quick

J. P. having a large Stock of the above, they will be offered at very low prices, which may be had on application to

52, Market Square, Northampton

Cedrus Deodara.

FINE SPECIMENS, 7, 8, 9, 10, to 15 feet, at 12s. per foot

WM. MAULE AND SONS have to offer a large supply of extra fine EVERGREEN TREES and SHRUBS, calculated to give immediate effect for Cemeteries, Gentlemen's Residences, and Pleasure Grounds, and Parks, have been recently transplanted, and are full of fibre. Price List free. For descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station in England, for carriage paper, at a moderate cost, thereby saving delay and expense of packing.

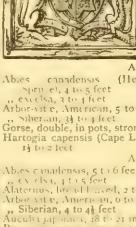

Surplus Stock.—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well-rooted, for Parks, Pleasure Grounds, and Parks, have been recently transplanted, and are full of fibre. For descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station in England, for carriage paper, at a moderate cost, thereby saving delay and expense of packing.

At 12s. per dozen

Abies canadensis (Hemlock Spruce), 4 to 5 feet	Laurel, narrow leaved, 2 to 2½ feet
" excelsa, 3 to 4 feet	" Portugal, 2½ to 3 feet
Arbor-vitæ, American, 5 to 6 feet	Picea balsamea, 1½ to 2 feet
" siberian, 3½ to 4 feet	Quercus cerris, Evergreen Oak, 15 to 18 inches [24 inches
Gorse, double, in pots, strong	Rhododendron ponticum, 21 to 30 inches, very bushy
Hartogia capensis (Cape Laurel), 1½ to 2 feet	" hybrids, fine varieties, 18 to 21 inches
	Taxus baccata (Irish Yew), 1½ to 2 feet

At 18s. per dozen

Abies canadensis, 5 to 6 feet	Phillyrea oleafolia, 2½ to 3 feet
" excelsa, 4 to 5 feet	Picea balsamea, 2 to 2½ feet
Arbor-vitæ, American, 6 to 7 feet	Quercus cerris, 2 to 2½ feet
Arbor-vitæ, American, 6 to 7 feet	Quercus ilex, 2 to 2½ feet
" Siberian, 4 to 4½ feet	Rhododendron ponticum (very bushy), 30 to 36 inches
Box, green tree pyramids, very handsome, 2½ to 3 feet	" hybrids, fine varieties, 18 to 21 inches
Box, green tree pyramids, very handsome, 3 to 3½ feet	Taxus baccata (Irish Yew), 2½ to 3 feet
Laurel, narrow leaved, 2 to 3 feet	Thujopsis borealis, 2 to 2½ feet

At 24s. per dozen

Abies canadensis, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
" excelsa, 5 to 6 feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ, American, 7 to 8 feet	" prostrata, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet	Laurel, Portugal, 3½ to 4 feet
Aucubas, very handsome, 2½ to 3 feet	Picea balsamea, 3 to 3½ feet
Cryptomeria Lobbii, 5 to 6 feet	Quercus ilex, 3 to 3½ feet
Cupressus Lawsoniana, 4 to 5 feet	Rhododendrons, hybrids (fine varieties), 24 to 30 inches
Holly, very narrow leaved, green, 2 to 2½ feet	Taxus baccata, 2½ to 3 feet
	Taxus japonica, 15 to 18 inches

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
" elegans, 2 to 2½ feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ compacta, 2½ to 3 feet	" prostrata, 18 to 24 inches
Aucubas japonica, very bushy, 2 to 2½ feet	Laurel, Portugal, 3½ to 4 feet
Cryptomeria Lobbii, 6 to 7 feet	Picea balsamea, 3½ to 4 feet
" viridis, 6 to 7 feet	Thujopsis borealis, 4 to 5 feet

At 36s. per dozen

Abies inverta (Weeping Spruce), 2½ to 3 feet	Juniperus Smithiana, 3 to 3½ feet
Arbor-vitæ compacta, 3 to 3½ feet	" viridis pendula, 3 to 4 feet
" Siberian, very fine, 5 to 6 feet	Laurel, Portugal, pyramids, very fine, 4 to 5 feet
Cupressus Lawsoniana, 5 to 6 feet	Pinus laricio, 6 to 7 feet
Juniperus chinensis fœmina, 2 to 3 feet	Taxus elegantissima (gold leaved), 18 to 24 inches
" hibernica, 3 to 3½ feet	" Irish, 5 to 6 feet
" Schottii, 3 to 3½ feet	

At 42s. per dozen

Abies inverta, fine specimens, 3 to 4 feet	Juniperus phœnicia, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet	" Schottii, 3½ to 4 feet
" Siberian (see), 6 to 7 feet	" thuriferaAlicense (juniper), 4 to 5 feet
Juniperus chinensis, 4½ to 5 feet	" virginiana, 6 to 7 feet
" fœmina, 4½ to 5 feet	Picea Pinsapo, 4½ to 5 feet
" drupacea, 2½ to 3 inches	Pinus austriaca, 5 to 6 feet
" Lecana, 4 to 5 feet	" laricio, 7 to 8 feet
	Thujopsis borealis, 5 to 6 feet

At 48s. per dozen.

Abies inverta, 4 to 5 feet	Juniperus Smithiana, 3½ to 4 feet
Juniperis chinensis, 4 to 5 feet	" thuriferaAlicense, 5 to 6 feet
" densa, 4 to 5 feet	" virginiana, 5 to 6 feet
" glauca, 4 to 5 feet	" viridis pendula, 4 to 5 feet
" Lecana, 5 to 6 feet	Pinus laricio, 8 to 9 feet
" phœnicia, 4 to 5 feet	Taxus, Irish, 7 feet
" Schottii, 4 to 5 feet	Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen

Abies Menziesii, 7 to 8 feet	Juniperus virginiana, 8 to 10 feet
" monticola, 7 to 8 feet	" viridis pendula, 5 to 6 feet
Arbor-vitæ compacta, 4 to 4½ feet	Laurel, colchic (very bushy), 8 to 10 feet [5 to 6 feet
Juniperus chinensis, very fine, 5 to 6 feet	" Portugal, pyramids (very fine),
" densa, 5 to 6 feet	Picea Pinsapo, very fine, 5 to 6 feet
" glauca, 5 to 6 feet	Pinus Cembra, extra fine, 6 to 7 ft.
" phœnicia, 5 to 6 feet	Taxus elegantissima, 2 to 2½ feet
" thurifera, 6 to 7 feet	Thujopsis borealis, 6 to 7 feet
	Wellingtonia gigantea, 3 to 3½ feet

Abies albertiana, 7 to 8 feet, 10s. 6d. each

" Douglasii, 8 to 10 feet, 72s. 6d.; 10 to 12 feet, 10s. 6d. each; extra fine, 12 to 15 feet, 15s. each

" orientalis, 4 to 5 feet, 6s.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. each

Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 30s.; 7 to 8 feet, 42s.; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 10s. 6d. each

Juniperus densata, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each

" thurifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each

Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each

Picea grandis, extra fine, 5 to 6 ft., 15s.; 6 to 7 feet, 21s. each

Picea lasiocarpa, 3 to 3½ feet, 15s.; 3½ to 4 feet, 21s.; 4½ to 5 feet, 30s. 6d.; 5 to 6 feet, 42s. each

" nobilis, best glaucous var., 18 to 24 inches, 7s. 6d.; 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each

Pinsapo, 3 to 3½ ft., 10s. 6d.; 4½ to 5 ft., 30s. 6d.; 5 to 6 ft., 42s. each

Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each

Yews, for hedges, about 12 feet high, 40s. per 100, recently transplanted, 30s. 6d. each

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Autumn Planting.

PETER LAWSON AND SON will be glad to send their CATALOGUE (just published) of FOREST and ORNAMENTAL TREES and SHRUBS, free on application.

STOCK OF LARCHES, SCOTCH FIRS, AUSTRIAN and CORSICAN PINES, &c., comprises some millions of healthy, well-grown plants, and special offers will be made for large quantities when personal inspection is not convenient.

Edinburgh and London.

TO the TRADE. — Fine furnished plants of PORTUGAL LAURELS, from 2 to 3 feet
LAURUSTINES, 2 to 3 feet | YEWS, 3 to 5 feet
EVERGREEN OAKS, 3 to 4 feet
" 1 to 2 Seedling 2 yr. bedded, 2 feet
AUSTRIAN PINES, twice transplanted, 2 to 3 feet
COMMON and CRIMSON CHINA ROSES, strong
No reasonable offer refused, as the ground is bound to be cleared
JOHN MORSE, Nurseryman, Dursley, Gloucestershire.

T. THORNTON begs to intimate to the Trade that the Stock offered below cannot be surpassed for health and fibrous roots. All been grown in maiden soil, and the stock, very extensive, is offered at low prices:—

Pinus austriaca, 9 to 15 inches	Spruce Fir, 1 to 2, and 2 to 2½ feet
P. Laricio, 9 to 15 inches	Laurel, 1 to 2 feet
P. rigida, 2 to 3 feet	Turkey Oak, 1 to 2 feet
P. taurica, 1 to 1½ foot	Cryptomeria japonica, 12 to 15 inches
P. Pinaster, 2 to 3, and 3 to 4 feet	Chinese Arbor-vitæ, 9 to 15 inches
Scotch, 9 to 15 inches	

THOMAS THORNTON, Heatherside, Bagshot, Surrey

Wandsworth Common Nursery.

Ten minutes' walk from Clapham Junction.

MR. ROBERT NEAL begs to invite the attention of the Nobility, Gentry, and the Trade in general to his very extensive and healthy stock of PLANTS, consisting of a large collection of Standard, Pyramidal, and Dwarf-trained FRUIT TREES, of all sizes; Standard and Dwarf ROSES, Coniferous and other Evergreens, Forest and Ornamental TREES and SHRUBS; also a large collection of RHODODENDRONS, all the very best in cultivation, and are of endless variety, from deep crimson and dark purple (every shade), up to white, and Hybrid Seedlings, and all the leading kinds of Scarlet, both Standard and Dwarf, set with Bloom-buds, which he can supply in large quantities at a very low price.

CATALOGUE will be sent on application

CHARLES NOBLE requests the attention of large buyers to the following, which he requires cleared before Spring:—

ROSES.

50,000 Dwarf, Hybrid-Perpetuals, and Tea-scented
A quantity of Standard and Half Standards.
75,000 Manetti Stocks, fine as usual.

FRUIT TREES.

Dwarf-trained Peaches, Nectarines, and Pears.
Maiden Peaches and Nectarines
" Pears and Apples
" Cherry and Plum
2 and 3 yr. PYRAMID APPLES and PEARS
GOOSEBERRIES, CURRANTS, FILBERTS, and COB NUTS

TREES and SHRUBS.

English Oaks, 2 to 5 feet.
" 2 years in drills.
Spruce Fir, 2 to 5 feet
Laurel, 1½ to 3 feet; common and Colchicum.
Birch, 5½ to 7 feet
Peplars, 5 to 12 feet

FOR GAME COVER.

Spiræa salicifolia
Berberis crataegina aquifolia.
Spartium junceum.
Berberis Darwinii.
" dulcis.
" Aquifolia
" japonica.
Skimmia japonica.
Fuchsia coccinea and herbacea.
" Menziesii
Rhododendron pontecum
" Seedlings.

All sizes, from 1 to 3 feet, by the dozen, 100, or 1000
CATALOGUES sent on application. Special quotations for large quantities, and all will be sold at a heavy discount for cash.

Bagshot, January 6.

BROCCOLI, ELLETSON'S NEW SURPRISE. Large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, J. & J. Ellotson, of Thorngumbald, who have for many years been so successful in the cultivation of Broccolis, and who by great industry have so far improved upon the old kind as to produce the above variety, which possesses the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.

CUCUMBER, FOSTER'S NEW, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet. Trade supplied.

EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

Garden Seeds.

THE COUNTRIES from WHENCE they originally came. See WHEELERS' LITTLE BOOK for 1870, price 6d., post free; gratis to Customers.

J. C. WHEELER AND SON, Seed Merchants, 59, Mark Lane, London, E.C.

Wheeler's First Early Pea.

IS as EARLY as ANY, and a BETTER CROPPER; 2s. per qt. See WHEELERS' LITTLE BOOK for 1870, price 6d.; gratis to Customers.

J. C. WHEELER AND SON, Seed Merchants, 59, Mark Lane, London, E.C.

Beans, Harlington Windsor.

A NEW and SUPERIOR VARIETY.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Beet, Egyptian Turnip-rooted.

QUITE NEW, fine rich colour, good flavour; 1s. per packet. Illustrated in WHEELERS' LITTLE BOOK for 1870, price 6d., post free; gratis to Customers.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Cocoa-nut Cabbage.

A NEW and very EARLY VARIETY; 1s. per packet. Illustrated in WHEELERS' LITTLE BOOK for 1870, price 6d., post free; gratis to Customers.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Paterson's Superb Melon.

THIS EXTRAORDINARY MELON was raised last summer by Mr. Paterson, Gardener to Mrs. Hanbury Leigh, of Pontypool Park. It weighed 24 lb., and measured 42 inches in circumference. It is illustrated (from a photograph) in WHEELERS' LITTLE BOOK for 1870.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Genuine Seeds of Superior Stocks.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

Complete Assortments of Choice VEGETABLE SEEDS, for A Year's Supply.

No. 1	..	..	£3 3 0	No. 4	..	..	£1 1 0
No. 2	..	..	2 2 0	No. 5	..	..	0 12 6
No. 3	..	..	1 11 6	No. 6	..	..	5 5 0

Complete Assortments of Choice Continental and English FLOWER SEEDS

No. 1	..	..	£2 2	No. 4	..	..	£0 15 6
No. 2	..	..	1 10 0	No. 5	..	..	0 10 0
No. 3	..	..	1 1 0				

Also smaller Collections, from 5s. to £1, free by post.

CATALOGUE of New and Select Vegetable and Flower Seeds, Potatos, &c., for 1870, with practical Cultural Directions, will be sent Post Free on application.

Their Seeds are all of the most select character, each variety being saved from the best stock known of its kind.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Isle of Man, excepted.

Flower Seeds free by Post or Rail.

RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds. Carriage free.

Peas—The Earliest, 1 quart
Princess Royal, 1 pint.
Youngsters' No. 1, 1 pint
Prizetaker, 1 pint.
Advancer, 1 pint.
Blue Scimeter, 1 pint
Veitch's Perfection, 1 pint.
Harrison's Glory, 1 pint
Beans—Taylor's Improved Windsor, 1 pint
Early Longpod, 1 pint
Johnson's Wonderful, 1 pint.
Green Windsor, 1 pint
Royal Cluster, ½ pint
French Dwarf, 1 pint
Scarlet Runners, 1 pint.
Beet—Nutting's fine Red, 1 qt.
Beet—New Dwarf Red, packet
Scotch Curled, packet.
Brussels Sprouts—finest, packet.
Broccoli—Early White, packet.
Purple Sprouting, packet.
Walcheren, packet.
Worcester, late white, packet.
Cabbage—Early Nonpareil, pkt.
Worcester Incomparable, pkt.
Wheeler's Imperial, packet.
Red Kidney, packet.
Curled Savoy, packet.
Carrot—Early Scarlet Horn, 1 oz.
James's Intermediate, 1 oz.
Imperial Altringham, 1 oz.
Cauliflower—Fine London, pkt.
Celery—Fine solid white, pkt
Fine Giant Red, packet
Cress—Australian, 1 oz
Plum, 4 oz
Cucumber—Smith's fine Frame, packet
Stockwood Ridge, packet.
Endive—French Curled, packet.
Leek—Musselburgh, packet.
Lettuce—Champion Cabbage, packet
Paris White Cos, packet
Bath Cos, packet.
Drumhead, packet.
Mustard—White, 4 oz.
Melon—Choice kind, packet.
Onion—Reading Improved Spanish, 1 oz
Lisbon—Keyping, 1 oz
Tripoli Red, 1 oz
Silver Skinned, 1 oz
Parsnip—Hollow Crowned, 1 oz
Parsley—Fine Grenoble, 1 pkt
Radish—Wood's Early Frame, 2 oz
Early Scarlet, 2 oz.
Turnip, mixed, 2 oz
Spinach—Summer, ½ pint.
Winter, 1 pint
Tomato—Large Red, packet
Vegetable Marrow, packet
Pot Herbs, 4 packets

For larger and smaller Collections and prices of other Garden Seeds, see DESCRIPTIVE LIST, free on application to

RICHARD SMITH, Seed Merchant, Worcester

STUART MACDONALD AND CO., SEED GROWERS and SEED MERCHANTS, 88, 8 Suthland Square, Holborn, London. STUART MACDONALD & CO.'S superb strains of CABBAGES, CAULIFLOWERS, CABBAGE PLANTS, and TURNIPS, are the best in cultivation. WHOLESALE LIST of Choice and Rare Seeds for market on application.

TO LAND PROPRIETORS requiring 2, 3, and 4-yr. Transplanted FOREST TREES, HEDGE PLANTS, and GAME COVERS, &c.—We have a very much larger stock than ever, our Prices and Stock will be found to further reduce.

FRUIT TREES for Orchards (extra Transplanted).

JOSEPH FREMLIN AND SONS,

The Nurseries, and St. Andrew's, Dartford.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester.

IVERY'S NONSUCH LETTUCE.—The best Summer variety in cultivation. 1s per packet, sealed with initials M. A. I.

Also IVERY'S NONSUCH CELERY, true, own saving; acknowledged by all who have grown it to be superior in flavour to all other varieties. Price to the Trade on application.

The Trade supplied with superior MUSHROOM SPAWN.

M. A. IVERY, Hanover Nursery, Peckham, London, S.

GENUINE TOBACCO PAPER, of the finest quality, 1s. per lb., or 4½ lbs. for 4s.

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APPLEBY'S GENUINE TOBACCO PAPER, in 2 lb. and 4 lb. packets. Testimonials too numerous for insertion. Price on application to

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The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.

Sold by Nurserymen, Seedsmen, and Florists,

In Tins of 1s., 2s. 6d., and 5s.

Powder Distributors, 1s. and 1s. 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—JOHN LEES, Superintendent, Royal Horticultural Gardens, South Kensington, 10th May, 1868.

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

Red Spider

Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1869, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in Solution of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 10 ounces as a Winter Dressing for Vines and Fruit Trees. Have also many preparations intended to supersede

CANDLE COMPANY (Limited),

Battersea, London, S.W.

Wholesale by PRICE'S PATENT

Sold Retail by Seedsmen, in packets, 1s., 2s., and 10s. 6d.

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For Samples and Prices apply to

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TRELOAR'S FINE COCOA-NUT MATTING, warrant d unbleached. No other kind is durable,—all other kinds are dear at any price. Price Lists free by post.

T. TRELOAR, Manufacturer, 67, Ludgate Hill, E.C.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.

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FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.

Lists post free; apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C., and Stean Plough Works, Leeds.

IRON HURDLES (Silver Medal of the Royal Agricultural Society):

SHEEP, 3s. 9d.; CATTLE, 4s. 2d.; OX, 5s. 10d.

List post free. GATES and IRON FENCING of every description.

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REYNOLDS' PEA GUARDS (Ninth Season), 6 rods per dozen; two dozen carriage paid to any Railway station in England.

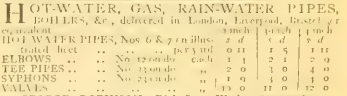

No. 480

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		inch	inch	inch
HOT-WATER PIPES, Nos. 6, 7, 8, 9, 10 in.	per yard	2 6	3 0	3 6
Ditto bent	.. .. per yard	0 11	1 5	1 11
ELBOWS	No. reversible each	1 1	2 1	2 9
TEE PIPES	No. 2 outlets "	1 6	2 0	2 6
SYPHONS	No. 2 outlets "	1 9	2 6	3 0
VALVES	.. .. "	0 9	1 0	1 2

GEORGE ROBINSON, Dial Iron Works, Stourbridge. Lease and Warehouse, 16, Grand Junction Wharf, Paddington Basin.

GEORGE HALL, late Manager to the late Saynors' Firm. He was for 30 years in their employ.

GEORGE HALL AND SON'S celebrated PRUNING and BUDDING KNIVES, SCISSORS, &c., may be obtained from the most respectable Nurserymen and Seed Merchants in the Kingdom, also America, France, Germany, Holland, Prussia, Russia, &c.

N.B.—We only make one quality, the best that can be manufactured, the same as the late Saynors always made during their lifetime, with all the latest improvements.

CAUTION.—None are genuine unless marked "GEO. HALL & SON." Other marks would cause disappointment, as these blades are tempered by a process known only to the Makers.

Engravings of Patterns, with PRICE LISTS, gratis on application.

Horticultural Cutlery Works, Sheffield.

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GOLDEN CHAMPION GRAPE.

TWO PRIZES (£5 and £3) WILL BE GIVEN BY

OSBORN & SONS, OF FULHAM NURSERY,

For the best and second best bunch of the above named remarkable Grape exhibited at South Kensington, on Wednesday the 7th of September next. The Prizes to be awarded by the Fruit Committee of the Royal Horticultural Society.

PETER JAMES PERRY,

SEED MERCHANT, BANBURY,

BEGS TO ANNOUNCE THAT HIS

PRICED CATALOGUE OF GARDEN AND FLOWER SEEDS

Is now ready, and may be had Post Free on application.

He also calls attention to his

BANBURY IMPROVED WHITE SPANISH ONION,

Twelve Bulbs of which variety were exhibited at the Royal Horticultural Society's Rooms, on December 21, 1869, and were awarded a "Special Certificate."

Price per Packet, **1s. 6d.** and **2s. 6d.**

Notice.

PURCHASERS of LARGE QUANTITIES of GARDEN and FARM SEEDS will be supplied liberally by SUTTON AND SONS

For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one Stamp. Seeds direct from the Growers, the surest way to success

RICHARD SMITH, Seed Merchant, Worcester.

Camellias, Azaleas, and Epacris.

HENRY WALTON, having a large stock of the above, finest plants possible, well set with bud, being all home worked, can with confidence recommend them.

AZALEAS, 24s to 63s per doz | CAMELLIAS, 24s. to 63s. per doz.

EPACRIS, 15s to 24s per dozen

Having several hundreds of beautiful framed Azaleas, from 2 to 4 feet, fine for exhibition purposes, 10s 6d to 63s each; also fine Half and Specimen Camellias, 10s 6d to 100s each—this is a favourable opportunity for parties furnishing new houses or improving their present collections. Trade liberally dealt with

CATALOGUES on application

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CALCEOLARIAS, Herbaceous, of our choice strain, fine healthy plants, free by post, 2s 6d per doz, or 12s 6d per 100; plants established in pots, 20s per 100.

AZALEA INDICA and EPACRIS, in great variety, blooming plants, 12s per doz. ROSES in pots, Teas scented, Noisette, Bourbon, and China, in great variety, 6s per doz; Hybrid Perpetuals, in 15 sorts, 8s per doz; Climbing, of sorts, 6s per doz; Moss Roses, 9 sorts, 6s to 12s per dozen

HAND & STIRZAKER, Skerton Nurseries, Lancaster

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s.; per 1000, £3

100 Gladioli, by name, 10 sorts 8s

100 ,, ,, 25 sorts 14s

100 ,, ,, 50 sorts .. .. 10s to 40s

All in good flowering bulbs

LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris

Rose Prices, from Paris.

LEVEQUE ET FILS, NURSERYMEN, 132 and 134, Boulevard de l'Hôpital, Paris, begs to offer the following ROSE TREES, in first quality, as plants and sorts allow choice

100 Standards, strong, heads, 100 sorts £5 0 0

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100 Dwarfs, strong heads, 100 sorts 2 0 0

1000 Dwarfs, strong heads, 200 sorts 10 0 0

100 Tea Roses, grafted, in pots, or on their own roots, p 100 3 0 0

New sorts, 1869 .. .. .. per dozen 0 12 0

New sorts, 1868 .. .. .. ,, 0 10 0

New sorts, 1872 15 per cent discount

To the Trade.

SPECIAL OFFER of LAURUSTINUS PYRAMIDALIS (NEW).

WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for Stock. It has been seen growing in his Nursery by many concert Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of sterling merit, the habit being robust, compact; flowers pure white, nearly twice the size of the old varieties, and very sweet-scented, with a continuation of flowers during the most severe weather

W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 10s 6; second size, 3 to 4 feet, do., 10s; third size, 2 to 3 feet, do. 7s; fourth size, 1½ to 2 feet, do. 5s

Floral Nursery, Hailsham, Sussex

Spring Flowers.

L. S. WOODTHORPE begs to offer the following —

Viola odorata pendula, the new Weeping Violet of New York, 12s 6d each

Violet, The Queen of Violets, large double white, 6s per doz

King of Violets, large double indigo blue, 6s per dozen

Large double red, 6s per dozen

Double Neapolitan, 4s per doz

Double Tree, fine, dark blue, 12s per dozen

Double white Tree, 12s per doz

Giant single Tree, fine and attractive novelty, 12s p doz

The Czar, the finest single Violet, 6s per dozen

Primroses, double white, 4s p doz

Double lilac, 4s per dozen

Double yellow, 6s per dozen

Double crimson, 12s per dozen

Double purple, 12s per dozen

Hepaticas, single blue, double red, single blue, and single pink, 4s per dozen

Single white, 6s per dozen

Daisies, Bacchus, Magpie, Pink Beauty, Queen of Whites, Red Rover, and Rosy Gem, 4s p doz

Aucubæfolia, the gold-blotched, 6s per dozen

Auriculas, finest alpines, 6s per dozen

Double black, 2s 6d each

Helianthemum, the dwarf Rock Cistus, fine named varieties, 4s per dozen

Rocket, double white and purple, 4s per dozen

Delkanthas, superb hybridised varieties, 3s per dozen

Gent and Beauties, per dozen

Hetherenias Picotees, 6s per dozen

Hollyhocks, new named varieties, 6s per dozen

A choice and varied Collection of Herbaceous and Rock Plants, in pots, 25s. per 100

Dwarf Roses on Manetti, in pots, 40s per 100

Do do in pots, 8s per dozen

A DESCRIPTIVE CATALOGUE of New and Choice Plants, Roses, Fruit Trees, Seed List, and General Nursery Stock, free upon application.

Munro Nursery, Sible Hedingham, Essex.

NOTED FOR GOOD SEEDS.

HOOPER & CO.'S

CATALOGUE OF SEEDS, ETC., FOR 1870,

May be had upon application.

Gentlemen and Gardeners about to make out their Orders are respectfully requested to send for a copy.

HOOPER AND CO., COVENT GARDEN, LONDON, W.C.

Now Ready, Post Free on application,

PETER LAWSON & SON'S

DESCRIPTIVE PRICED SEED CATALOGUE

OF KITCHEN GARDEN AND FLOWER SEEDS, GARDEN IMPLEMENTS, GLADIOLI, &c.

The True SANDRINGHAM CELERY, EMERALD CUCUMBER, DELL'S SUPERB BLACK BEET, SANDRINGHAM SPROUTING CABBAGE, INCOMPARABLE WHITE DUTCH CABBAGE LETTUCE, BANBURY IMPROVED WHITE SPANISH ONION, and other recently introduced VEGETABLES and FLOWER SEEDS, are fully described and are recommended.

20, BUDGE ROW, CANNON STREET, LONDON, E.C.; and EDINBURGH.

GENUINE SEEDS ONLY.

JAMES VEITCH & SONS

BEG TO ANNOUNCE THAT THEIR

ILLUSTRATED PRICED CATALOGUE OF GARDEN AND FLOWER SEEDS for 1870,

WITH LIST OF IMPLEMENTS AND OTHER GARDEN REQUISITES,

Is now published, and will be forwarded Post Free on application.

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EDINBURGH—SEED WAREHOUSE, 3, HANOVER ST. NURSERIES—DEAN PARK.

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WE beg respectfully to notify, that we have entered into Partnership, and purpose carrying on our Business of SEED MERCHANTS and NURSERYMEN, from this date, under the Firm of

MITCHELL, ARNOTT, & CO.

We avail ourselves of the present opportunity to express our cordial thanks for the support we have hitherto experienced on our separate account; and in soliciting a continuance of the same for the new Firm, we do so with an earnest assurance that we shall heartily devote our personal attention, and our increased facilities in the several branches of our Trade, to the interests of all Customers who favour us with their patronage.

DAVID MITCHELL, *Edinburgh.*

1ST JANUARY, 1870. ROBERT AUGUSTUS ARNOTT, *London.*

THE ROYAL SEEDSMEN. The Advantages of Procuring Seeds Direct from the Growers cannot be Over-estimated. THE ROYAL SEEDSMEN.

CARTER'S COLLECTIONS OF VEGETABLE SEEDS

(NEW AND UNADULTERATED), AS HARVESTED ON THEIR OWN SEED FARMS.

THESE COLLECTIONS PRODUCE A PLENTIFUL SUPPLY OF CHOICE VEGETABLES ALL THE YEAR ROUND.

Collection of Vegetable Seeds No. 1.

Price **12s. 6d.** (packing included). Suitable for a small Cottage Garden.

Carter's First Crop Pea,

The earliest in cultivation; price **2s.** per quart.

Hundredfold Pea, or the Cook's Favourite.

Illustrated at p. 1280, *Gardeners' Chronicle*, 1869. In sealed packets, **7s. 6d.** per qrt., **4s.** per pint.

Paterson's Bovinia, or Cattle Feeder Potato.

The heaviest cropper known. Per lb., **1s. 6d.**; 7 lb., **9s.**; 56 lb., **65s.**

Collection of Vegetable Seeds, No. 2.

Price **21s.** (packing included). Suitable for a Small Garden.

Collection of Vegetable Seeds No. 4.

Price **63s.** (packing included). Suitable for larger Gardens.

For detailed Table of these Collections, see CARTER'S SPECIAL ORDER SHEET for 1870, forwarded Gratis and Post Free.

Laxton's "Alpha" Pea,

The earliest Wrinkled variety, in sealed packets, **7s. 6d.** per half pint.

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Price **42s.** (packing included). Suitable for a Garden of half an acre.

Carter's Champion Potato,

The best for forcing, **5s.** per peck.

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Described as "a Grand Pea." In sealed packets, half pint, **2s. 6d.**; pint, **4s. 6d.**; quart, **8s. 6d.**

NEW POTATOS (American) (Imported Seed from the Raisers). The Early Rose, **1s. 6d.** per lb.; Bresee's Prolific, **3s.** per lb.; Climax, **3s.** per lb.

For full descriptions, see

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM FOR 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., 237 AND 238, HIGH HOLBORN, LONDON, W.C.

NEW AND GENUINE SEEDS,

CARRIAGE PAID.

B. S. WILLIAMS,

NURSERYMAN AND SEED MERCHANT,

VICTORIA and PARADISE NURSERIES,

UPPER HOLLOWAY, LONDON, N.

COMPLETE COLLECTIONS

OF

KITCHEN GARDEN SEEDS,

To suit Gardens of various sizes,

10s. 6d., 21s., 42s., 63s., and 84s. each.

New and Choice Vegetable Seeds.

Per packet.—*s. d.*

Williams' Alexandra BROCCOLI 1 6
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Williams' Matchless RED CELERY.. .. .. 1 0
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Digswell Prize ENDIVE 0 6
All the Year Round CABBAGE LETTUCE .. 0 6
Wheeler's Tom Thumb CABBAGE LETTUCE .. 0 6
Lee's Immense Hardy Green CABBAGE LETTUCE, new 1 0
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(The finest flavoured Green-fleshed variety ever offered Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)
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Earley's selected Double Curled PARSLEY, new .. 1 0
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Hundredfold, or the Cook's Favourite PEA, new, do. 2 0
Cullingford's Champion Marrow PEA, new, per quart 3 6
(The finest flavoured Wrinkled Marrow in cultivation.)
Earley's Defiance TOMATO, new 2 6
(The earliest and best variety in cultivation.)
Orangefield Dwarf Prolific TOMATO 0 6

New and Choice Flower Seeds.

Williams' superb strain of PRIMULA, Red, White, or Mixed .. .. .. 2*s. 6d.*, 3*s. 6d.*, and 5 0
CALCEOLARIA, Neill's extra choice strain, 2*s. 6d.*, 3*s. 6d.*, and 5 0
CINERARIA, Weatherill's extra choice strain, 2*s. 6d.*, 3*s. 6d.*, and 5 0
CYCLAMEN, Wiggins' Prizestrain, 1*s. 6d.*, 2*s. 6d.*, & 3 6
BALSAM, Williams' superb strain .. 1*s. 6d.* and 2 6
GERANIUM, Le Grand .. .. 1*s. 6d.* and 2 0
GLOXINIA, from the finest erect varieties 1*s.* and 2 6
HOLLYHOCKS, Chater's splendid varieties, mixed 1 0
PANSY, from Prize flowers .. .. 1*s.* and 2 6
PINK, finest double-fringed varieties.. .. 1*s.* and 2 6
POLYANTHUS, Wiggins' Prize strain 1*s.* and 1 6
VERBENA, Eckford's finest varieties.. .. .. 1 0
Williams' Improved Hybrid SOLANUMS 2*s. 6d.* & 3 6
ASTER, Dwarf, Victoria White, very fine .. 1 0
CENTAUREA CANDIDISSIMA .. 1*s.* and 2 0
CENTRANTHUS MACROSIPHON BICOLOR, new 1 0
CLARKEA INTEGRIPETALA, Tom Thumb, new 1 0
CONVOLVULUS MINOR UNICALUS, new .. 1 0
DELPHINIUM CONSOLIDA CANDELABRUM, new 1 0
ESCHSCHOLTZIA AURANTIACA, new.. .. 1 0
EUTOCA SERICEA, very dwarf, with pretty deep violet flowers, new 1 0
HELENIUM BOLANDERI, Dwarf Perennial species, new 1 0
LILIUM AURATUM 1 0
LOBELIA ERINUS GRACILIS ERECTA ALBA, new 1 0
Williams' Improved FRENCH MARIGOLD, beautifully striped and very large 1 0
Parson's New TREE MIGNONETTE 1 0
NEMOPHILA ATOMARIA ELEGANS, new .. 1 0
OXALIS TROPÆOLOIDES VIRIDIFOLIA, green-leaved variety, new 1 0
PERILLA NANKINENSIS VARIEGATA, new 1 0
PYRETHRUM PARTHENIFOLIUM AUREUM, Golden Feather.. .. .. .. 1*s.* and 2 6
EAST LOTHIAN STOCKS, per collection of three colours 2 6
(These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders.)
PURPLE QUEEN STOCK, a very dwarf and beautiful variety, the flowers are very double, and splendid colour 1 0
WHITE TEN-WEEK STOCK, Wallflower-leaved, new 1 0
(This is the purest and finest White Stock in cultivation)
IMPERIAL PURPLE SWEET PEAS, very large 0 6
TACSONIA VAN VOLXEMII, splendid greenhouse Climber 2 6
TROPÆOLUM GOLDEN KING of TOM THUMBS, new 1 0
VIOLA CORNUTA ALBA, new .. 1*s. 6d.* and 2 6
(This is an interesting and especially useful variety, producing in great abundance pure white flowers, very robust and dwarf in habit, which renders it very effective in spring and summer, and invaluable during the late autumn months.)
WALLFLOWERS, Saunders' fine dark variety .. 1 0
ZINNIA ELEGANS PUMILA Flore-pleno, new.. 1 0

B. S. W.'S DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, Post Free, on application.

New and Unadulterated Seeds.

BUTLER, M'CULLOCH AND CO.'S SPRING CATALOGUE of the above, containing a carefully selected list of novelties in Flower and Vegetable Seeds, is now ready, and will be sent post free on application.
South Row, Covent Garden, London, W.C.
Established upwards of a Century

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct, for 20*s.*; 50 plants for 30*s.*; or 25 plants, distinct sorts, for 20*s.*, hamper and package included.
Crown Nursery, Reading

Special Offer.—Madame Lemoine.

WILLIAM BADMAN offers strong Plants of this most beautiful of Double Pelargoniums, in single pots, 6*s.* per dozen. LORD DERBY, new, Pelargonium, 4*s.* per dozen. Package included. Terms cash.
Cemetery Nursery, Gravesend.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7
Foot's Cray Nurseries, Sidcup Hill, Kent.

To the Trade.

CHOICE SCARLET INTERMEDIATE STOCK SEED, saved only from plants grown in pots, 7*s. 6d.* per oz.
GEO. MACINTOSH, High Road, Hammersmith, London, W.

To the Trade.—Continental Flower Seeds, &c.

GEO. MACINTOSH (Agent to F. W. WENDEL, Seed Grower, &c., Erfurt, Prussia) begs to announce that he is now prepared to receive orders for the above. CATALOGUES free on application. High Road, Hammersmith, London, W.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1: 25 Pairs, ditto, for 6*s.*; 25 Pairs POMPONS, for 6*s.*; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6*s.* Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
Brunswick Nursery, Stoke Newington, N.

Choice Garden Seeds.

MESSRS. BOETTNER BROTHERS, SEED GROWERS, Greussen, near Erfurt, Prussia, have just published their new PRICE LIST of SEEDS of all descriptions, for the present season, which may be obtained on application to their London Agents,
Messrs. E. LIEBERAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—Notice is hereby given that the ANNUAL GENERAL MEETING of the Governors will take place at the Bedford Hotel, Covent Garden, on WEDNESDAY, January 12 next, for the purpose of RECEIVING the ACCOUNTS of the Society for the present year, and ELECTING OFFICERS for the ensuing year; also for the purpose of receiving THREE PENSIONERS on the Funds. The Chair to be taken at 6 o'Clock precisely. The Ballot will close at 8 o'Clock precisely.—By order,
E. R. CUTTLE, Secretary
14, Tavistock Row, Covent Garden

P.S. The Voting Papers have been delivered; any Subscriber not having received one is respectfully requested to make immediate application.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.—W. EGINTON HUMPHRY, Esq., will read a Paper at the Society's Meeting, February 16, a PRIZE of FIVE POUNDS for an ESSAY on the CULTURE of ARUMS; and a PRIZE of THREE POUNDS for a PAPER on the CULTURE of the CYCLAMEN.
Particulars of the above, as well as of some others not yet announced, will appear in the revised Schedule of Prizes, which will be ready in a few days, and can be had on application.

The Gardeners' Chronicle

SATURDAY, JANUARY 8, 1870.

THE beginning of another year—another span of time, affords a convenient opportunity for taking a retrospective glance over the annals of that which has departed, with the object of noting the most important of the NOVELTIES acquired in the shape of plants and flowers. They have been mustered in hosts at our flower shows and floral meetings, they have been pictured in profusion in our garden and scientific periodicals, they have been carefully housed and multiplied in our nursery gardens; and they have been, or soon will be, distributed among plant growers by our plant merchants and traders. Some are of special interest to the botanist; some commend themselves to the florist by an advance towards his standard of perfection; and some give promise of being acquisitions in the garden, either permanently, or until by progressive development their places are filled by better things. It is these latter, especially, of which we now propose to take a rapid survey.

We begin with the Palms and Orchids—the princes and nobles of the vegetable world, the former of which are surely but slowly making their way to popularity, and which they will do the more rapidly when the demand for them permits of greater moderation in price. Amongst them we have at least half-a-dozen species, which may be regarded as both new and choice, namely, Welfia regia, an Amazon Palm, of very distinct aspect, with smooth slender leaf-stalks, and deeply bilobed leaves, which, while unfolding, are of a pretty bronzy tint; Deckeria nobilis, a tropical American species, with pinnate leaves, bearing numerous whitish spines on their stalks; Seaforthia Veitchii, a fine Australian species, with pinnate leaves, in the way of S. elegans; Martinezia Lindeniana, a remarkably distinct plant, with broad bilobed leaves on glaucous leaf-stalks, armed with long slender spines, and a native of tropical America; Plectocomia elongata, a Javanese species, with bilobed leaves, whitish powdered stems, and prickly leaf-stalks; and Thrinax havanensis, a remarkably elegant slender-stalked Fan Palm, from the West Indies. These are all worth adding to any collection of tropical fine-foliaged plants.

Among Orchids we may specially record two new Indian Dendrobes, of great beauty, with large white blossoms, in the way of those of Dendrobium infundibulum; these are D. Jamesianum, distinguished by the asperities on the lateral lobes of the lip, and D. cariniferum, to be known by its strongly keeled sepals. Epidendrum syringothyrsum, from Peru, with tall reed-like stems, bearing large terminal panicles of rosy purple flowers, is a handsome addition to its genus; while in Vanda Denisoniana, from Burmah, we have a charming white-flowered Vanda. Trichocentrum tigrinum, from Ecuador, has been chronicled as the prince of its family, its large Miltonia-like flowers having a rich purple lip, with white tip and orange calli. Pescatorea Wallisii, with its great waxy-looking creamy-white flowers tipped with purple, is a Central American introduction of merit; the Mexican Mormodes uncia *alias* Greenii, with its pendulous racemes of large yellow red-spotted flowers, is probably the most beautiful of its family; and Brassia Lawrenceana longissima, with its tawny richly-spotted sepals 7 inches long, may be awarded the premier rank amongst Brassias. Then, of Oncids, we have some fine novelties in Oncidium splendidum and O. fuscatum—the former from Guatemala, with a very large yellow lip; the latter from Peru, and having the lip pure white in the front half, and purple in the basal portion. Of Odontoglossum Alexandræ, the variety Warneri, shown at one of the Floral meetings, is probably the finest yet seen, both as to size and colour; while two varieties of Odontoglossum triumphans, named respectively Marshallii and Wilsoni, stand in a similar position with respect to their type. The Vanilla Phalænopsis, of Madagascar, is a charming leafless climber, bearing umbels of large blush-white flowers, with a trumpet-shaped lip, rosy outside and orange within. Finally, among the Lady's Slippers, we get the Indian Cypripedium niveum and C. Parishii, the first white with violet-coloured dots, the second with greenish buff flowers having port-wine coloured warty petals; while to these must be added C. Harrisianum, one of DOMINY's hybrid Orchids, which has dark purplish glossy flowers of great beauty.

Ferns are not so numerous as in some former years, but they furnish some fine acquisitions. Of stove Ferns, Gymnogramma Laucheana gigantea, a garden variety raised in Belgium, deserves mention for its bold character and rich colouring; the Davallia (or Acrophorus) hemiptera, of Borneo, with its creeping rhizome and dwarf slender pinnate fronds, forms a gem for basket culture; and Davallia pallida, *alias* Mooreana, a Bornean species, with great decompound yellowish green fronds, is one of the grandest Ferns yet introduced. Greenhouse Ferns have received notable additions in the Adiantum Capillus-Veneris magnificum, which almost rivals A. farleyense in the size and fringiness of its pinnules; in Pteris serrulata cristata magnifica, an English seedling, of drooping habit, with immense crested tips to the divisions of its fronds; and in Asplenium fernandezianum, a dwarf tufted plant from Monte Video, with slender pinnate proliferous fronds. The eastern Struthiopteris orientalis, introduced from Japan, forms a distinct and welcome species of its family, with dimorphous fronds, and is nearly, if not quite, hardy.

The first place amongst Stove Plants may be given to the Godwinia gigas, from Nicaragua, on account of its botanical interest and gigantic stature, it being one of the largest Arads of which particulars have yet been published; with its monster rootstock of between 5 lb. and 6 lb. weight, its leaf-stalk of 10 feet high, and its spathe of 2 feet long, on a stalk 3 feet high, it challenges attention. Griffinia dryades is a remarkable Brazilian Amaryllid, with tall scapes bearing from 10 to 13 large blue-lilac flowers. In Posoqueria multiflora, also from Brazil, with its terminal cymes of fragant white flowers, which have slender tubes 4 inches long, we seem to have gained a magnificent stove shrub. The Godoya splendida, again, of Colombia, is described as a shrub with large, white, fragrant, lily-like flowers in thyrses of 10 to 15 together, and such a plant must be grand in the extreme, if at all manageable. A Bornean Rhododendron, shown as R. Lobbii, but perhaps the same as R. longiflorum, with whorled leaves and tubular

crimson flowers, is of an attractive character. Aphelandra acutifolia, a Peruvian Acanthad, with deep vermilion-red flowers; an Ecuadorian Melastomad, known at present under the name of Bertolonia primulæflora, but which belongs rather to M. TRIANA'S new genus, Monolæna, and which we shall shortly figure and describe under its proper name—remarkable for bearing a profusion of rosy flowers nestling in the centre of the broad lustrous leaves; and Orthosiphon stamineus, an Indian Labiate, with a raceme-like inflorescence of long-stamened pale bluish-lilac flowers, furnish other novelties of note. In Begonia Sedeni, we gain a garden hybrid, one of the handsomest of its class, with a profusion of carmine-crimson flowers. Stove creepers furnish Cobœa penduliflora, a species from the mountains of Caraccas, with green flowers having the edge of the corolla cut into pendulous lobes 3 or 4 inches long; and two species of Vitis—chontalensis and javalensis, both described on good authority as bearing in profusion cymes of scarlet flowers. The foliage division of stove plants furnishes a fair contingent. We have Ledenbergia roseo-ænea, a tall Phytolacca-like plant from the Amazon country, with large, shining, coppery-green leaves, rosy-violet beneath, and apparently of a decidedly ornamental character. Dracæna magnifica, one of the finest of the genus, with bold, broad, oblong, erect leaves, of a soft reddish bronzy hue, bordered with red; and D. excelsa, an allied plant, similar in colour, but with spreading leaves, are both from the South Sea Islands, and both decided acquisitions. Fittonia gigantea, also novel and good, resembles F. (Gymnostachyum) Verschaffeltii, but is much larger; it is from Ecuador. Dieffenbachia nebulosa furnishes a good addition to that group; it is a hybrid between D. Weirii and D. picta, and is remarkable for its stocky habit, and its spreading mottley-leaves, which are more or less spotted with white. Another desirable Arad is the Alocasia Sedeni, a cross between A. metallica and A. Lowii, and intermediate in character, apparently also very closely resembling another novelty which has been called A. hybrida, obtained from the same cross in another establishment. For these cross-bred productions we have to thank our English hybridisers, the Dieffenbachia being one of the Chiswick productions.

We have comparatively few Greenhouse Plants to notice. The finest of them all is Cordyline indivisa latifolia, a broad-leaved variety of one of our best and grandest decorative plants. Another distinct species is Cordyline Guilfoylei, a striped-leaved sort, obtained from Australia, and which in some stages takes on a tint of red; this appears likely under good culture to make a fit subject either for exhibition or greenhouse ornamentation. Phormium tenax Veitchianum variegatum, the striped-leaved form of the smaller growing rigid form of New Zealand Flax, is, like its allies, a good plant. So is Aralia Sieboldii aureo-marginata, a golden variegated form, quite distinct from the ordinary white-blotched one. Thibaudia acuminata is one of a showy family of Vacciniaceous South American evergreen shrubs, well adapted for conservatories. In Calceolaria Henrici we have a reminder of some of the old shrubby species of Slipperwort, the loss of which is a matter of regret; the present Andean plant bears clear yellow flowers in profusion. The South African Mackaya bella is a really beautiful Acanthad, producing numerous racemes of pale lilac slender-tubed flowers, which are marked in the throat with transverse purple lines, and hence suggestive of those of some Goldfussia. Richardia melanoleuca, also South African, has white-spotted leaves like R. maculata, and pale yellow expanded flower spathes, with a black-purple spot at the base. Cotyledon californica, the Echeveria californica of gardens, a species producing a rosette of ligulate-lanceolate farinosely-glaucous leaves, and forked racemes of yellow flowers, is a really pretty dwarf greenhouse succulent, eclipsed however by Cotyledon fulgens, a tall-growing Mexican plant, with obovate-spathulate glaucous leaves, and a large panicle of nodding red and yellow flowers.

Among Hardy Trees and Shrubs we have a Maple, a Tulip tree, and a Birch to recommend. The Maple is Acer rufinerve albo-limbatum, a noble Japanese tree, with broad palmately-lobed leaves, margined and mottled with white; the Tulip tree is Liriodendron tulipiferum aureo-pictum, a variety with the leaves blotched in the centre with yellow; and the Birch is Betula alba pendula elegans, which is said to be an improvement on the old weeping Birch, inasmuch as its flexile branches drop down perpendicularly, instead of arching or curving downwards, as in the older sort. Thuja gigantea (Lobbii) aureo-variegata, is a most effectively variegated golden form of one of our most elegant and valuable hardy Conifers; while Cupressus Lawsoniana albo-spica, and C. Lawsoniana pendula alba, are two remarkably distinct silvery white forms of another indispensable hardy Conifer, the first with erect, the last with drooping branches. The Versailles Laurel, Prunus Laurocerasus macrophyllus, is said to be remarkable for its very large leaves, and to be hardy and vigorous in growth; while the Chinese Ligustrum Quihoui, also cultivated in the French gardens, is described as being a very ornamental shrub, with coriaceous roundish-obtuse leaves. To these we may add two Cotoneasters—C. prostrata and C. congesta, as being pretty small-leaved prostrate berry-bearing evergreens; two fine Yuccas—Y. argospatha, with the bracts of the inflorescence of a satiny white, and Y. acutifolia, with stiff erect leaves, and a closely columnar inflorescence; and three Bamboos, namely, the Japanese Bambusa viridis striata, the Chinese B. violascens, and the North Japan B. Duquilioi, both Yuccas and Bamboos being introductions of the French gardens.

Finally, of Hardy Perennials we may invite special attention to the following plants:—Clematis æthusifolia, a remarkably distinct sub-shrubby species, with tubular bell-shaped yellowish white flowers. Acanthus longifolius, a Dalmatian species, with long pinnatiparted leaves, and rosy wine-coloured flowers, seated in the axils of whitish green-veined spiny bracts; a very handsome plant. Hoteia japonica variegata, a charming variety, in which the principal veins of the leaves are marked out by yellowish lines. Iris stylosa, an Algerian spring-flowering species, with violet-coloured handsomely banded flowers. Lilium Maximowiczii, a slender-growing Japanese sort, with drooping orange-scarlet black-spotted flowers. To the class of Rock Plants some welcome additions have been made in the alpine rosy-flowered Dianthus neglectus, the Pyrenean pink-flowered Lychnis Lagascæ, the alpine rosy-lilac Iberidella rotundifolia, the Swiss rosy-purple Primula pedemontana, the Tyrolese white carpet-growing Androsace pubescens, and the Antarctic orange-berried Nertera depressa. We have, moreover, a distinct new annual, of branched habit, and promising appearance, producing large orange-yellow flower-heads, in the Coreopsis aristosa, recently introduced from the United States of America.

IN the FRUIT department, the ACQUISITIONS during the PAST YEAR have not been of so numerous or important a character as usual. This may in some degree be accounted for through the uncongenial nature of the last spring, which rendered the bygone year memorable as the most disastrous that has ever occurred, for certain of our hardy fruits,—Peaches and Nectarines, for example,—which were almost entirely wanting in many parts of the country. It is of novelties, however, that we now desire to speak; and in respect to the Grape, the king of fruits, we certainly have it. Last year we alluded to the labours of Mr. PEARSON, and his success in hybridising the scented Fox Grapes of America with our better flavoured European varieties. This is an important step, and Mr. PEARSON deserves our special thanks. His hybrids, although not large in either bunch or berry, possess the true Strawberry scent of the parent, and are very pleasantly flavoured, especially one which is now called M. de Lesseps. Following in the same wake, we have another scented grape from Mr. MELVILLE, called the Perfumed Muscat. In appearance this somewhat resembles a small Muscat of Alexandria, and is very pleasantly flavoured; it is said to have been derived from the Muscat Hamburgh. Then, as a standard late white Grape, we have to welcome THOMSON'S White Lady Downe's, a variety possessing all the good qualities of its black parent, Lady Downe's Seedling. Another promising white Grape has been seen once or twice this season from the gardens of the Earl of DARTMOUTH; and we may also notice a curious sport from the Citronelle, resembling, in the peculiarity of its colouring and marking, the old Aleppo or Variegated Chasselas.

To Mr. RIVERS we are again indebted for all that is new and good in the class of Apricots and Peaches. In the former we acquire Golden Drop, a small very early sort; and New Large Early, a very decided improvement on the old form. In Peaches we obtain a good useful variety in Large Early Mignonne, ripening about a week earlier than the Early Grosse Mignonne: and in Nectarines another early sort, and withal of first-rate quality, named Lord Napier, and raised from a stone of the Early Albert Peach.

In the already overburdened list of Apples we are yet indebted to Mr. LAWRENCE, of Chatteris, for a very pleasing addition to our stock of winter dessert fruit in Mrs. Ward, one of the most sprightly-flavoured, pleasant, and beautiful little Apples yet introduced, having the appearance of a Court of Wick, with the colour of the Scarlet Nonpareil, from which it was raised. We may also notice, as a pretty ornamental sort, rivalling the Pomme d'Api in beauty, and of good quality into the bargain, an accidentally-crossed seedling of the Red Siberian Crab, raised by Mr. JENNINGS.

In Pears we have nothing to chronicle. Many varieties have been brought forward, but all have fallen short this season in point of flavour—a point, perhaps, for which the season is mainly to blame. In Plums we have a valuable addition, as an early dessert fruit, in Dry's Seedling, a large, roundish-oval, reddish-purple variety, very pleasantly flavoured. Raspberries, which are not often prolific of novelties, furnish us with one, M'Laren's Prolific—a double-bearing, large red variety, producing enormous crops on the young shoots; its chief merit thus being its lateness. In Black Currants also, a new or possibly an old variety comes to the front, and is named Lee's Prolific Black; it is larger than, and an improvement on, the Black Naples, and possesses the merit of hanging firmly on the bushes for a long time after being ripe.

Melons annually furnish us with some fresh material, or fresh names at least, and the flavouring of Melons is mainly a matter of cultivation. Few finer flavoured or more distinct Melons, however, have we tasted than that of Mr. GILBERT, named Burghley Green-flesh. Then again, we have a new Italian variety in Triomphe de Nice, of very fine quality. In Strawberries, Mr. STANDISH presents us with the Ascot Pine-apple, a very high-flavoured early sort, having all the characteristics of La Constante, but much earlier; and, from Dr. NICAISE, who has done so much in the way of raising and improving the Strawberry on the Continent, we have a batch of eight large and handsome varieties, which have not yet, however, been proved in this country.

Turn we now in conclusion to VEGETABLES, which, although the least attractive, are perhaps the most important of all our garden products. In Vegetables improvement has hitherto been mainly effected by careful selection of the general stock. But now the hybridiser's hand is upon them, and, in Peas especially, a great revolution has been effected by Dr. MACLEAN, Mr. LAXTON, and others. We have not, it is true, this season to record anything so very decided as last year; but Mr. LAXTON has many promising things on hand, for which we shall look forward with eagerness. In Messrs. CARTER'S Cook's Favourite we have one promising addition. In Potatos, Mr. FENN has been working with a will, and to good purpose, for to him we are again indebted for another sterling acquisition in the Rector of Woodstock, an early round variety of first-class excellence; and in Mr. TURNER'S Beaconsfield Kidney we obtain another—a large and beautiful, clear-skinned tuber of fine quality. The high-sounding American varieties, of which so much was expected, have been proved of but little value; the Early Rose, although a good cropper, is of poor quality, while the Early Goodrich is recommendable as a prolific early sort, of fair quality. In Beets, Messrs. VEITCH & SONS supply us with the Chelsea Beet, which, for uniformity and sweetness of flavour, has rarely been surpassed. In Lettuces, the Sugarloaf is an improved variety of the Brown, or Bath Cos. In Cucumbers, the winner of the past year's race was Blue Gown, a black-spined, long, handsome variety, of fine quality and prolific habits,

Further we might go, did space permit; for in many other classes there are improvements and novelties more or less decided, to be found. Nowhere do we find retrogression, but a steady progress. "Onwards" must then still be our motto, so that the review of our achievements in

the bringing forward of new fruits and vegetables in the year 1870 may contrast favourably with that of the past.

—— From the schedule of the Manchester National Horticultural Exhibition, which is to open on the 3d of June next, we learn that special prizes, amounting to upwards of £130, will be distributed, under 14 classes, to a variety of subjects, extending from Odontoglots to Cucumbers, and from Pine-apples to Pansies. The highest in amount is the citizens' prize, £30, for 16 stove and greenhouse plants. In the other part of the schedule, which extends to 73 classes, with £900 allotted as prizes, there is the usual variety; and we are glad to see that groups of miscellaneous plants, 30 for amateurs and 50 for nurserymen, are invited. These groups are to be arranged for effect, "with or without a proportion of cut flowers;" they are also to be "in pots not exceeding an average of 8 inches." Both in the case of the admission of cut flowers, and in that of the size of the pots, some further explanation of the intention of the framers, seems necessary. Is it meant that, provided the whole 30, taking the case of the amateurs, do not exceed 240 inches in the aggregate, some plants may be in 5-inch, some in 20-inch pots? The optional introduction of cut flowers appears open to objection, on the ground of introducing the element of uncertainty into the competition. The higher of the leading prizes in this part of the schedule vary from £15 down to £7. With fine weather, and the spirited support usually accorded to this exhibition, it must be one of the great floral gatherings of the year.

—— We have been requested to announce that Mr. W. Egerton Hubbard, Jun., has placed the following Prizes at the disposal of the Royal Horticultural Society, namely, the sum of £5 for the best essay on Cottage Gardening, and the sum of £3 for the best essay on Window Gardening. What Mr. Hubbard seeks to obtain is a series of plain practical directions, such as even uneducated people may easily understand, and such as may enable cottagers to utilise their gardens to the utmost, as well as to obtain from their dwelling-room windows the greatest amount of embellishment—in a word, to secure the best results from their efforts in gardening, whether indoors or out. This information is intended to be printed on cards, and placed in the hands of the secretaries of Cottage Garden Societies, &c., for distribution. The essays intended for competition are to be delivered at the offices of the Society, at South Kensington, on or before February 16.

—— We are informed that at a recent meeting of the Council of the Royal Botanic Society, Mr. James De Carle Sowerby, in consequence of advanced age, resigned the office of secretary, and Mr. William Sowerby, who had filled the post of assistant secretary for many years, was appointed to succeed him. Mr. Sowerby was one of the founders, and was nominated secretary in 1839 by the Royal Charter of Incorporation. At the same meeting Mr. Thomas Don was appointed superintendent of the Society's gardens.

—— We learn from "La Belgique Horticole" that the Botanic Garden at Brussels is likely to pass into the hands of the Government, and that the fine range of greenhouses will be converted into courts for fine art exhibitions.

—— It is happily not often that our advertising columns contain such an announcement as that which heads our New Year's Day issue, and which is to the effect, that the Royal Botanic Society has fixed one of its great summer shows for the same day on which a meeting of the Royal Horticultural Society had long before been advertised to take place—that meeting being the South Kensington Rose Show. Such an act of uncourteousness might have befitted the days of fierce and uncompromising rivalry, but seems utterly inexplicable in times when it has been understood that the two Societies were jogging on peacefully together. The fact remains; and the Rose Show has, in consequence, been shifted to June 29, as announced in the advertisement above referred to.

—— "There is a wide-spread rumour," says the *Pall Mall Gazette*, "which we hope may prove to be unfounded, that it is the intention of Mr. Ayrton to show his zeal for economy in the Office of Works, by cutting off from Hyde Park its annual supply of Pelargoniums. This measure would save so little, and cause so much general annoyance, that we cannot help fearing it must be in contemplation. Let us hope it will remain 'in contemplation,' and never be carried practically into effect. If we got as good a return for every penny of our taxation as we get for the few pounds which have of late years been expended in adorning the parks, we should have no reason to grumble—if every junior Lord of the Treasury cost as little, and did as good service as one of these Pelargoniums, we should have great cause for satisfaction. It would be far better, if our finances really are at so low an ebb that we cannot afford the few flowers which give so much pleasure to thousands, that the Government should take in its own hands the letting of chairs, which is a lucrative business, and expend the proceeds in beautifying the parks; by employing the junior members of their body to take the money, and offer the seats for hire, the young men would be usefully occupied, and all expenses saved beyond the original outlay. We recommend to Mr. Ayrton's attention an ingenious plan which, according to one of the German papers, is adopted by the gipsies in the Hop garden at Pesth to prevent the possibility of money which passes from hand to hand being appropriated by collectors. The gipsies give that one of their party whose business it is to collect money a living fly, to be held in the left hand, while he holds the collecting dish in the right. He must bring back the fly alive and well as a token that he has confined himself strictly to the duties of collection. If the fly is wanting, he receives no share of the contributions he has collected. By adopting this simple method, Mr. Ayrton might be sure that every penny thus collected would flow into the Exchequer, and the spectacle of a youthful statesman, with a bluebottle in one hand and a chair in the other, would do more than anything else to show how conscientiously our rulers are treading the path of rigid economy."

—— We learn from a recent prospectus that the issue of Seemann's Journal of Botany will be suspended, unless its sale can be increased so as to cover the expenses of the publication. It appears that up to this time the deficiency has been supplied from the purse of the Editor, obviously a very unsatisfactory state of affairs. It is to be hoped, for the credit of British Botany and British botanists that the only publication in this country devoted entirely to general botany may receive such increased support as may render a continuance of its useful services possible. With the view of giving greater prominence to British Botany, it is proposed that the interests of that department should be intrusted to Mr. J. G. Baker of the Royal Kew Herbarium, and Dr. H. Trimen of the Botanical Department of the British Museum, than whom no fitter persons could be found. The subscription price is reduced to 12*s.* per annum, payable in advance to the publishers, Taylor & Co., Little Queen Street, W.C.

—— We hear rumours of a new gardening monthly, to be published in Edinburgh under the title of the Villa Gardener, the idea being to adapt its contents specially to the wants and aspirations of villa gardeners.

—— The following letter from M. Decaisne, relating to a species of Diospyros with Edible Fruits, and hardy in North Europe, has been forwarded to us for publication:—

"You have so often, and with so much justice, called the attention of your readers to the injury done to horticulture by the incorrect naming of plants, that I ask permission to call attention to one of these errors, in order that it may be corrected at the earliest possible moment. In the 'Revue Horticole' of August 1, 1869, p. 284, was published a note on the flowering and fruiting in the Museum of a Diospyros, to which the author of the article gives the name of the true D. Kaki. Now, this so-called true Kaki differs much from the plant noticed by Kæmpfer, and which is a shrub from the warm and temperate regions of China. The plant cultivated in the open air of the Museum is, on the other hand, a plant of Mongolia and the North of China. It was carefully described 40 years ago by M. de Bunge, under the name of Diospyros Schi-tse, at p. 42 of his Enumeration of the Plants of the North of China. It is called at Pekin by the name of Kai-tsame-tsen. The writer in the article in the 'Revue' having learnt that the plant cultivated in the Museum was not the true Kaki gave it the name of Diospyros costata, as if it were really a new species, and which name moreover is badly chosen, as it indicates an abnormal state of the fruit. Thus the same author has within a few months given two names to the same plant, and committed moreover two grave errors, the one in recording the fructification in the climate of Paris of a species derived from hot climates, the other in giving a new name to a tree carefully described 40 years ago (1831). The Diospyros Schi-tse, of Bunge, differs in many points from D. Kaki. Its leaves are almost glabrous, of elliptical form, shortly acuminate; the flowers are solitary; the calyx is silky in the part concealed by the fruit, which latter often attains the size of a large Peach, of a brown, reddish-orange or deep red colour. These fruits, as M. Bunge remarks, contain from 8 to 12 seeds, or more commonly are completely seedless, as stated in letters from China, which I have received from MM. Eugène Simon and A. David, who have, moreover sent me drawings of the fruit. I should not have thought it worth while to point out these errors if they were not likely to be injurious to horticulture, and if they were not of a nature to mislead amateurs by leading them to look forward to the successful culture of D. Kaki in the North of Europe. As I believe that the Diospyros Schi-tse is the only one sufficiently hardy to take rank among our fruit trees in the North of Europe, I have deemed it desirable to publish the only true name under which it should be known and propagated. The fruit of the Diospyros Schi-tse should be completely bletted before eaten; it may then be compared with the "marmalade" of Plums or Apricots. It is eaten in great quantities at Pekin, where the Kaki cannot ripen. *J. Decaisne.*"

—— We learn that Messrs. J. M. Johnson & Sons, of Castle Street, Holborn, announce their intention of bringing out a new and cheap periodical, called the Food Journal, to be devoted entirely to the very important subjects of food and public health. These two great questions are so prominent now-a-days, and embrace so many details of personal interest, that we cannot, even on purely selfish grounds, refuse to listen to them, especially when put before us in any other but a professional and technical guise. The adulteration question will be largely and carefully dealt with, and many of the leading sanitary writers of the day will contribute to the pages of the journal.

—— The public will learn with satisfaction that the Silk Supply Association, 3, Castle Street, Holborn, London, is promoting the introduction into this country of silk reeling, an entirely new industry, which cannot fail to prove a great boon to our poor operatives now suffering from the long continued depression of the silk trade. The system is explained in a pamphlet by Thomas Dickins, Esq., J.P., the president, who recently read a paper on the subject before the Society of Arts, and will be still further elucidated in the Journal of the Association, to be published monthly, and to which communications from those interested are now invited. We shall shortly publish some further remarks on this subject.

New Garden Plants.

Odontoglossum Galeottianum, *A. Rich.*

Racemo pauciflora; bracteis triangulis spathaceis magnis; sepalo dorsali triangulo, sepalis lateralibus subæqualibus carinatis; petalis oblongis acutis; labello ima basi unguis subsecato *), unguc calloadnato, lamina triangula subcrispula, callo hiulato apice trilobo, lobis lateralibus rotundatis, lobo medio parvo triangulo acuto; columna elongata late ornithorrhyncha, alis lineatibus. *Odontoglossum Galeottianum*, A. Rich, Orch. Mex. p. 27, tab. ined. 89; Lindl. Folia I., Odontoglossum no. 22.

There is a great pleasure in at length seeing appear a hitherto quite obscure species, as in the present case. Our plant exists, to our knowledge, only in six dried specimens, two of which are in the Reichenbachian collection. Dr. Lindley never saw it. We had only A. Richard's not very useful diagnosis. It is very near Odontoglossum nebulosum, Lindl., but differs at first sight by the linear wings to the column. The flower is white, bearing a few brownish bars at the base of the petals. The long white callus, three-lobed at its apex, is covered with yellow streaks. For this *rarissima avis* we have to thank Mr. S. Low, who obtained it among plants of Odontoglossum Cervantesii. Can it be a hybrid between that and O. nebulosum? It is like the first in bulb and growth, as Mr. Low states, and our specimens bear evidence. Perhaps it may appear here or there amidst O. Cervantesii, which is easily to be recognised as soon as it flowers. *H. G. Rchb. fil.*

Maxillaria ctenostachya, *sp. n.*

Caulescens, foliis subbulbo diphyllo vaginantibus pluribus, folio summo laminigero, foliis reliquis triangulis ancipitibus carinatis, laminis ligulatis acutis; inflorescentiis distichis, squamis triangulis carinatis pluribus 11—15 imbricantibus, floribus exsertis secundis, bractea appressa acuta parva ovarium subæquante; mento obtusangulo parvo; sepalis triangulo ligulatis acuminatis; petalis subæqualibus; labello trilobo subventricoso, lobis lateralibus obtusiusculis, lobo medio ligulato obtuso producto, flavo furfuraceo, carinis tenuibus serrulatis a basi in basin lobi medii ultra ovarium ellipsoideum confluentibus, utrinque superaddita carinula serrata abbreviata.

A very interesting species, in a morphological point of view. The floriferous axes are covered with imbricate carinate triangular sheaths, and thus they look like stems of Lockhartias. From the axils of the sheaths arise the peduncled exserted flowers, which are ochre-coloured, and very like those of Maxillaria lepidota, Lindl., belonging to the "acaules" group. Their tails are so long that they remind one of a Brassia. It was imported from Costa Rica by Messrs. Veitch. *H. G. Rchb. fil.*

Oncidium calanthum, *sp. n.*

Affine Oncidio formosissimo, panicula volubili maxima apice heteranthæ, sepalis unguiculatis oblongis obtuse acutis, petalis oblongis obtusis basi in unguiculum latis, labelli auriculis cuneato ovatis, lobo mesali e limbo brevissimo latissimo obcuneato, portione antica rotunda lobulis rotundis, carinis papulosis quinis in basi, papillis tamen extus attingere, carinis postero-lateralibus acutis geminis ante carinas, columnæ alis triangulis hinc lobulatis, rostello ornithorrhyncho, tabula rhombea basi constricta.

A very rich flowered golden-yellow Oncid, with a twining and in part heteranthous inflorescence. Messrs. Backhouse imported it from Ecuador, or Peru. *H. G. Rchb. fil.*

Oncidium Semele, *Lind. Rchb. fil.*

Affine Oncidio' formosissimo panicula ampla diffusa; sepalis ligulatis dorso medio carinatis; petalis supra unguem hastato oblongis obtuse acutis; labello statim in auriculas latas oblongo-lingulatas obtuse dilatato, isthmo brevissimo subcuneato-subnullo, lobulis duobus rotundatis magnis, spongiosis, callo basilari multipapuloso, carinatis rhombeis geminis papulosis antepositis, columnæ alis triangulis lobulatis, tabula lata rhombea.

Flowers smaller than those of the Oncidium calanthum, yellow, with a very few purplish streaks and blotches. It was discovered in Ecuador by Director Linden's excellent and successful collector, Mr. Wallis. *H. G. Rchb. fil.*

THE WILD SERVICE TREE.

There is no more difficult subject for the English botanist to decide than that of the nativity of our various forest trees. Even those that are tolerably well known to have been introduced, have yet, many of them, such hoar antiquity, as to render it next to impossible, even approximately, to fix the date of their introduction. Until within the last few years these trees were in the midst of the exquisitely wild sylvan retreat of Bewdley Forest, in Worcestershire, a solitary tree which might well be appealed to in proof of both of the above propositions.

This tree is described as a native plant in different Floras under the name of Pyrus domestica. Thus, Hooker says,—"P. domestica, Sm., Sorbus domestica, L., true Service tree: a solitary tree, in Wyre Forest, near Bewdley, Worcestershire;" and more recently, Mr. Syme says of it, that "the only instance of its occurence in this country is that of a single tree in Wyre Forest, on the borders of Worcestershire, no doubt not truly native. It has also been reported from Cornwall, but on old and unconfirmed authority."

The speculations as to its forming a part of our native flora will be set at rest for the future, as we have to regret the total destruction of this solitary tree, it having been destroyed by fire by some mischievous boys in 1862—a circumstance feelingly related by our friend, Mr. Edwin Lees, as follows, in the "Botany of Worcestershire." Speaking of this part of the county, he says:—"In connection with Bewdley and Wyre Forest, Mr. George Jordan merits high commendation as an untired explorer and guide for many years, and still, at the great age of 85, retaining much botanical zeal. While his strength allowed he was ever ready to lead the way to the purlieus of the forest; as a fine nosed herbalist he was rarely at fault in his favourite ground. Having many times guided the Worcestershire Club and its members to the time-honoured though decrepid Sorb tree (P. domestica), which he regarded with almost filial love, its wanton destruction by ruffian hands was a source of much grief to him, and he gathered up with decent care the relics that were left of the limbs of the old veteran, some of which he yet retains. Mr. Jordan brought a flowering branch of the Sorb tree to the great meeting of naturalists at Malvern in June, 1855." Mr. Lees gives a woodcut of the tree in its winter garb in 1856, and on a sketch which I myself made of this celebrated tree in June, 1847, I find the following notes:—"Sorb tree, Wyre Forest, 5 feet 4 inches at a yard from the ground. It now only presents a few leaves at the tips of the branches." Indeed, it at that time showed signs of decay, but its loss in a manner so wanton is still to be deplored. At the same time, as my kind friend and companion in many a ramble, has secured me a memento of the tree, and of our rambles to its site, as also a gift of affection, I may be permitted to describe it. The wood of the Sorb tree is described in "English Botany" as very hard, and as being held in great repute for making mathematical rulers and excisemen's gauge-sticks, until foreign woods of other kinds superseded it.

The result, then, of Mr. Jordan's pious care was to share the remains of this precious tree with my friend Mr. Lees, who kindly had a portion turned into an elegantly shaped vase, 8 inches in height, surrounded with a rim of carvings representing the fruit, and on the side is a plate of silver bearing the following inscription:—

"THIS VASE,

Made from a branch of the old Sorb tree (Pyrus domestica) once growing in Wyre Forest, and the only wild example in Britain (now destroyed), was presented to Professor James Buckman by his friend Edwin Lees, of Worcester, October, 1869."

I need hardly say that an equal weight of silver would not be so precious, and that not on account of the superstition connected with the tree, but as a pledge of that friendship which seeks the rarest material, and fashions it with the choicest workmanship for the bestowal upon its object. At the same time, as some further account of the tree, and the superstitions connected with it, can hardly fail to be interesting to your readers, I beg to offer the following notes:—The leaves of this tree are pinnate, and resemble those of the Mountain Ash; the fruit, however, unlike that of the latter, is pear-shaped. Its Pears, indeed, are sometimes eaten. Thus Mr. Syme observes—"This fruit is extremely austere when at all unripe, but when mellowed by frost and keeping it becomes soft, brown, and eatable, somewhat like a Medlar, though to most people less agreeable." This Pear-bearing tree, as stated by Mr. Lees—"The country people call the Witty Pear tree from the shape of its fruit, and the Mountain Ash they simply call the Witty, or Witten, tree, and ascribe protective powers to both, though the former is considered the superior. Now, Verstegan states that 'Witega,' or 'Wytega,' was a Saxon term for a prophet, so here we have the origin of the name 'Wytty' or 'Witten,' and find it was the prophetical, or knowledge-giving tree. The term is used in Wycliffe's Bible, as signifying 'knowledge,' in the well-known passage in St. John's Gospel:—'Widder I goe ye witten, and ye witten the way.' So law papers still retain the expression, 'Worcestershire to wit.'"* In Hallewell's Archaic Dictionary we find the word thus expressed:—"'Witty,' knowing, wise.

'I wys so thou art a witty man.
Thou shalt well drynk therfore.'"
M.S. Cantab.

Mr. Lees, in the book just cited, further adds:—"The charm that, especially in Scotland, has been ever attached to the wood of the Mountain Ash or Roan tree, is well known:—

'Witches have no power,
Where there is Roan tree wood.'

And it would seem that our Witty Pear tree possessed the same efficacy in times when witchery was attached to old ladies rather than young ones, and they were toasted accordingly. The poet says—

'Rowan tree and red thread
Keep the witches at their speed."

And Mr. Lees further states that the fruit of the Sorb tree used to be hung up in the foresters' houses as a security "from the witch;" and he met with an honest woodcutter in Wyre Forest, who admitted carrying a piece of the common "Witchen," or Mountain Ash, in his pocket, but, to be on the safe side, he thought that Witty Pear tree, especially its fruit, might be rather stronger in the way of protection.

Reverting again to this single specimen of Sorb or Service tree, though it found a place in our flora as a "native to the manor born," yet its destruction can hardly be considered as leaving a blank in our aboriginal flora, as there is much reason to think that this very tree was introduced to the forest in ancient times by some recluse hermit or wizard. A reputed "wise man," as Mr. Lees suggests, "fixed his abode at this spot, and planted this sanctified tree, whose leaves and fruit he probably distributed as a protection from witchcraft, not without claiming his 'dues' for giving the means to combat successfully against sorcery."

On my visit to the spot I detected some heaps of stones near the tree, and I have no doubt that a careful search might serve to unravel some of the mystery which shrouds this formerly mysterious object.

Viewed in any light, then, the wild Service, Sorb, or Witty Pear, has an interesting history; and I am, therefore, not without hope that these few notes may be welcome to some of your readers. *J. Buckman, Bradford Abbas, Dorset.*

* From "Pictures of Nature around Malvern," by E. Lees, F.L.S., &c., p. 275.

ORCHID CULTURE.

I REGRET my inability to answer the queries of "G. H.," at p. 1113, 1869, regarding the habit of Dendrobium Falconeri and the dimensions of its bulbs, having never had the good fortune to meet with the species here, but when I find it I shall be glad to furnish the information required. "G. H." may rely on the temperatures given by me at p. 991, 1869, for they are not guessed at, but taken from 12 months daily observations near the elevation at which Dendrobium Falconeri is found. In this locality the "Ivy among Orchids" is undoubtedly Vanda Cathcartii. I once found a plant of it at an elevation of 2000 feet above the sea, completely covering, for a height of 10 feet, the trunk of a tree 12 feet in circumference. It was laden with flowers, and neither a spot on its beautiful foliage, nor a square inch of the trunk of the tree, was to be seen; this was by far the finest Orchid plant of any species I have ever seen, either here or in England. My disappointment may be imagined when, some time afterwards, on taking a friend to see my splendid plant, I found only the bare trunk of the tree. Some one had found it, and had it carried bodily away, although it must have been a good load for two Coolies. In other places I have seen it climbing along trees for 15 or 20 feet, but in a more straggling manner.

"G. H." remarks that he thinks the well-grown plants at home surpass anything found in a purely wild state; and, so far as size of individual plants is concerned, this idea in many instances is correct, for, in a wild state, Orchids, like other plants, have a "struggle for existence" with other species crowding around, and not giving them room to spread; but if by a lucky chance a single plant gets a favourable situation entirely to itself, Nature soon shoots far ahead of artificial cultivation, and in exposed places, even where the plants are crowded, though small, they flower far more profusely than any I ever saw at home. In their wild state the majority of Orchids flower most abundantly, but in England I never saw an Orchid-house with any great number of flowers in it at one time; and I have often heard it stated that the paucity of flowers produced deterred many gentlemen from growing Orchids.

It appears most surprising that Orchids should naturally be so tenacious of life, and yet be found so difficult to cultivate. Something must be wrong with the present system, and Nature should be studied to remedy the defect. To shade heavily, and ventilate sparingly, are, if I mistake not, common practices in Orchid culture, and yet directly opposed to Nature. It is true that many of the species are occasionally found in dark, shady places, but they cannot for a moment be compared with plants of the same species found fully exposed to the sun and rain. Abundance of air also appears to be essential to the welfare of the plants, for they are most abundantly found high up on isolated trees, where they catch every breeze, and it is surprising how quickly they sicken and die when the tree happens to fall among the low jungle beneath, thus placing them beyond the reach of the breeze. There are a few species that certainly will not thrive if fully exposed, but they are remarkably few and far between. A most notable instance is Vanda Cathcartii, which I have never seen except in very shady and moist situations, very generally on trees overhanging rushing streams. It cannot withstand drought for any length of time, hence the great difficulty in transmitting it alive to England. However, to know these things can be of very little service to those who are disposed to accept the warning given by Mr. Anderson at p. 1040, 1869, "against imitating Nature too nicely." This appears a strange doctrine to me, and I hope is not considered orthodox among Orchid-growers; for I am certain that the nearer Nature in her more favourable aspects is imitated, the more chance there will be of success.

Were Nature more studied than it is, there would not be so many complaints about the deaths and deterioration of the plants, as witness the remarks on the genus Phalænopsis at p. 1111, 1869; but as remarked by Mr. Anderson, "Orchid growers are hard to advise;" and to corroborate this remark he deems injudicious the advice given to dispense with shade from November to the end of February, given in my former communication. I am glad, however, to see that "G. H." found this treatment to answer, and I console myself with the idea that it is in accordance with Nature. As a proof of the injudiciousness of this advice, a plant of Broughtonia sanguinea is brought forward, "which is said to be grown in Jamaica pretty much exposed to sun-heat," and a black picture is given of the results produced by "suspending it close to the glass in the face of a full meridian sun, in the months of June or July" in England, may it have previously been never so well established. The usual establishing process is to keep the plant constantly moist in a thickly shaded pit, and surely from such a place no one would think of bringing any plant to subject it to such treatment. Not a few plants get their deathblow while undergoing the establishing process. To so great an extent are the blinds used, not only in Orchid culture, but in almost all branches of horticulture, that the sun would appear to be the gardener's greatest enemy, instead of being his best friend. It is a wonder that no one ever thought of shading his Vineries. I do not for a moment think that the blinds can entirely be done away with, for I know that they are necessary to the successful cultivation of many plants, and also for prolonging the flowering season, &c.; but they are, in the majority of instances too thick, and too frequently used. *J. A. Gammie, Government Cinchona Cultivation, Darjeeling, December 4, 1869.*

SPRING BEDDING PLANTS.

IN treating of perennial bedding plants, I think it will be advisable to enumerate them in their alphabetical order, so that none may escape observation. I cannot mention all the spring flowering perennials here, and therefore I only intend to refer to those that have been well tried, and have proved themselves well adapted for spring decoration, giving the preference to those suitable for spring bedding. The first genus from which I shall cull will be that of the Alyssums, and I shall only select one, viz., Alyssum saxatile compactum, which is a very dwarf, compact, free-flowering variety of the common Madwort. This old-fashioned flower is so well known that it needs no minute description; suffice it to say, that it is one of the hardiest, freest-flowering, and most striking objects a garden can possess; it is, in fact, everything that can be desired to constitute it a first-class bedding-plant. It is very accommodating; you can safely remove it when it has done flowering to any out-of-the-way place for the summer, and there it will prepare itself for fresh duty the following spring. These old plants, however, require a little more care than young ones do, in removing them from their summer quarters, so that they may receive no check. They should be planted in October, and they will be ready to remove again in May, so as to make room for their more fashionable rivals. There is, however, no occasion to trouble about old plants, as young ones are produced from seed very freely, and I should always give the preference to strong seedling plants, rather than those of more mature growth. The best time to sow the seed is in June, and by the end of August they will be fit for transplanting; but it must be borne in mind they will not flower very freely the first year; they flower the best the second and third seasons. It is necessary, therefore, to sow a little every year to keep up a succession of strong blooming plants. It is frequently a difficult matter to procure seed true; I have made several attempts, but failed. At last I purchased a plant of the true variety, and planted it upon my rockwork, and for the last four years it has produced sufficient seed to raise many thousands of plants.

The next important family is the Anemone, which includes many charming subjects for the spring garden. Anemone coronaria and its varieties exhibit such a combination of gorgeous colours, that they become indispensable to every garden. The colours include all shades of scarlet, red, blue, rose, and striped, so that they are exceedingly effective from February until May. This species grows from 6 to 8 inches in height, producing masses of deep green elegantly divided foliage, which forms a striking contrast with its showy flowers. The best time for planting the bulbs is from October until December, but you can plant them as late as March, though they will not then flower until June. This plant requires a good depth of rich loamy soil, with plenty of manure incorporated with it; the bed should then be surfaced with a compost of decayed cowdung and leaf-mould, into which the bulbs should be planted, covering them with a little coarse road sand. As soon as the plants begin to decay they can be taken up, but it is not necessary to do so. All of the Anemones will

flower much earlier and much finer if allowed to remain in the ground. A. hortensis and its varieties, commonly called the Star Anemone, require similar treatment; there is quite as much diversity of colour among them, and they are as free flowering as A. coronaria, and fully deserve equal attention. There are several more very beautiful species, but you cannot succeed with them unless you can plant them permanently. A. apennina, A. nemorosa fl.-pl., A. nemorosa rosea fl.-pl., A. palmata, and several others, require this treatment.

Arabis comes next in our alphabetical arrangement, but most of these are mentioned in a former paper as most suitable for edging purposes. The common A. albida blooms simultaneously with the Alyssum, and forms a striking contrast with it. After the Arabis is removed from the beds in the spring it should be pulled to pieces, and planted out for the summer in some shady border, as it soon gets unsightly unless frequently broken up. There is also a purple variety, sent out last season under the name of A. purpurea, but the shade of colour is so slight that I could not recommend it. A. blepharophylla is a decided acquisition, and will surely become a valuable plant for spring bedding; its flowers are of a bright rosy purple, and are produced very freely. There is also another variety which is spoken very highly of, viz., A. japonica, but I have not seen sufficient of it to form an opinion of its suitableness for massing.

Next come the Aubrietias, which claim more attention than I can possibly give them here. They are unique in growth, very free-flowering, and will thrive in almost any situation. They form neat compact cushions of deltoid-shaped foliage, of a pleasing dark green colour, which is surmounted in spring by innumerable lilac or purple flowers; they continue in full flower from three to four months, but bloom occasionally during the whole of the year. There are several species and varieties. Among the principal may be mentioned A. purpurea, A. deltoidea, A. hesperidifolia, A. Mooreana, A. grandiflora, A. græca, besides the variegated form of A. purpurea, which has been mentioned among the hardy edging plants. The three latter are the best and most distinct. A. grandiflora is a large flowering variety of deltoidea, producing large lilac flowers in great profusion, but the habit is not so good as that of its parent. A. græca is a beautiful species from the mountains of Greece; it forms neat compact cushions of its greyish green foliage, which renders it very distinct from all those previously mentioned; it flowers very freely, and continues in bloom for a longer period than most of the other species. A. Campbellii is a most beautiful variety, producing very freely its large flowers of a deep violet-blue colour; it does not grow so freely as any of the others, but when once planted in a favourable spot, suitable to its requirements, it forms a most striking object.

The whole of the species reproduce themselves freely from seed, but the hybrids will not do so; the seed can be sown at any time during the spring in the open ground, and will make nice plants the following spring. The seedlings should be transplanted as soon as they are large enough to handle, selecting showery weather for the purpose, and you will find they will make good plants for the spring beds the same year. When you remove your plants in the autumn, take care to do so with a good ball of earth, so that they may receive no check, for this greatly improves their flowering in the spring. As soon as they have done flowering, they can be removed with impunity, broken up, and again transplanted for further duty. The varieties, such as A. purpurea fol. var., A. grandiflora, and A. Campbellii must be increased either by division or cuttings, the latter mode I should recommend. Take off the young shoots as soon as possible, after the plant has done flowering, say when half an inch in length, and insert them in pots filled with very coarse sandy soil; they should then be placed in a cold frame, close to the glass, and treated as appearances suggest.

Varieties of the common Daisy (Bellis perennis) are very useful for spring decoration, and can be used in a variety of ways with very pretty effect; they are, on account of their dwarf habits, best adapted for edging, but that depends entirely upon the arrangement of the bed. Bulbocodium vernum is a charming hardy bulb, blooming in February and March; clumps of it have a charming appearance in the borders, but it cannot be recommended for bedding, as it requires permanently planting, and this applies generally to all hardy bulbs. Caltha palustris fl.-pl., the double Marsh Marigold, is a striking plant for a damp spot, admirably adapted for the borders, but not for the beds. Another good plant for a similar situation is the double Cuckoo-flower, Cardamine pratensis fl.-pl., also Cardamine trifoliata, which should be found in every collection. I must not omit to mention the Cerastium, a very interesting genus, which deserves notice in a selection of this kind. It should have been noticed among the edging plants, as the species are all well adapted for this purpose; the dense white foliage forms a striking contrast with any mass of green.

To the genus Cheiranthus belongs the Wallflower—C. Cheiri, an invaluable plant for the spring adornment of our gardens. There are several very pleasing varieties, all of which deserve notice; the old-fashioned double yellow and double blood Wallflowers are both too well known to need any description—the two latter are increased by cuttings, the former by seed. Among the alpine species we find C. alpinus, which forms dense cushions of foliage, which are smothered in early spring with its clear sulphur-coloured flowers; it is very free in growth, and thrives in almost every situation; it is propagated by cuttings, similar to the Aubrietia. Cheiranthus Marshallii is an orange-coloured variety of alpinus, quite as free in growth and in flowering as its parent; both of these can be used with advantage in the spring beds, and can be safely removed after they have done flowering; you can frequently pull them to pieces with advantage, and treat them like the Aubrietia. There is also a variegated form of the common Wallflower, which has a very pleasing appearance, especially when mixed with the plain-leaved varieties.

I must not pass by the Convallaria (Lily of the Valley). If you have any quiet secluded nooks be sure and fill them with these; the single white, the single rose, the double varieties, and the variegated forms are all well worthy of cultivation. There is also another beautiful species, called C. bifolia, otherwise, Smilacina bifolia, which is among the rarest and most beautiful of our British plants; it forms a dense mass of light green delicate foliage, which is smothered in the early spring, with its still more delicate pure white flowers; it simply requires planting in a shady nook, and to be left alone, when it will increase in size, and consequently in beauty every year. Another rare and beautiful plant, for a similar position, is Cortusa Matthioli; it is not unlike Primula cortusoides, but it is much more beautiful.

Corydalis bulbosa is a charming hardy bulb, with very delicate and pleasing foliage, which is covered in spring with puce Fumaria-like flowers. C. nobilis is another beautiful species, with bright yellow flowers. Crocus Aucherii is a new dwarf species from Greece, producing very early in the spring deep orange-coloured flowers. I shall only mention the Cyclamens, which appear next in order in my selection of spring flowers, since I intend making them the subject of a future paper. My next is a species of the Hound's-tongue, viz., Cynoglossum Omphalodes, sometimes called Omphalodes verna, which is valuable for planting in a damp shady spot; its sky-blue Myosotis-like flowers nestling among its light green foliage, have a charming appearance, it is among the first harbingers of spring, and should be found in every garden. I hardly like to pass by Dielytra spectabilis, as it blooms so early, but it generally gets injured by the early frosts, and therefore cannot be depended upon, but for indoor decoration this plant stands unrivalled. D. eximia flowers well out-of-doors, and is one of the best of our border flowers, but it does not bloom so early as D. spectabilis. *A. I. P., Tottenham.*

YOUNG FRUIT TREES.

It frequently occurs at this season of the year, when people are busy planting fruit trees, that the question is asked, how long shall I have to wait before my trees will come into bearing? and, again, how shall I manage them from the time I get them from the nursery, so that they may be brought quickly into profitable bearing? The time required for fruiting depends entirely on two things, viz., size and age of the trees, and proper management. In these days Pears worked on the Quince, Apples on the Paradise, and Cherries on the Mahaleb stock, may be purchased in the autumn to bear a full crop the following season; therefore those who wish for quick returns can have them by paying a little higher price for their trees.

The remarks which I am about to offer refer more particularly to the management of ordinary-sized trees (not grown as bushes) purchased from a nursery. Everybody knows perfectly well that half-starved children and cattle cannot thrive, and yet they expect young fruit trees not only to thrive and grow, but to yield good crops, when not receiving a fiftieth part of the attention that is bestowed on a half neglected herd of cattle. Crammed in the first place into small holes dug in hard soil, and afterwards left to chance, to be overgrown and choked by coarse weeds and grass, they are quite sure to refuse the injustice of repaying with a good crop such negligence, not to say utter starvation at the roots.

With respect to proper treatment, the first thing is to get good soil. To set good trees on bad land is like sitting down to dine with empty dishes; there is nothing to support the growth of the tree, nor any food to supply it with proper nourishment. Therefore if the soil is not already good, it should be made so previous to planting. If the trees are expected to thrive well, the first thing is to obtain sufficient depth of soil to enable the roots to extend themselves freely, and to hold moisture without drying up in protracted droughts; this may be obtained by digging large holes 8 feet in diameter, and 2 feet deep, and filling them with good earth. The soil should be kept clean and mellow for many feet about each tree during the whole season. Treated in this way the degree of moisture which the earth will retain a few inches below the surface, compared with the meagre supply in a hard or grass-grown surface, is surprising, and it renders watering rarely necessary. It is a frequent occurrence to find young fruit trees which have been well transplanted and properly cared for in the spring entirely neglected at midsummer. The soil becomes hard, its moisture is withdrawn, and its fertility lessened by a growth of grass and weeds. To remedy this evil, the unskilful water the surface, but instead of reaching the roots, the hard soil excludes the water, which only tends to the further hardening and baking of the surface, while the roots remain dry below. Many young trees thus perish in hot weather; or, surviving, make a feeble growth, and thus are more liable to destruction by winter frosts. Where, however, trees have been neglected till the period of severe drought, and where watering becomes necessary, the hard surface should be removed as far down as the roots will admit, and the water then poured on, and the earth replaced. Mellowing the surface and mulching will afterwards prove very beneficial. Mulching or covering the ground about the trees with straw and stable litter, or leaves, will (if timely performed) obviate the necessity of watering, even in extreme cases. Midsummer droughts will scarcely affect trees thus protected, in connection with a clean, mellow surface. As the time required for their fruiting depends very much on their management, while the quality, even more than the amount yielded, is influenced by the treatment they receive, it is well worth some pains and labour to give them every advantage. As soon as the trees arrive from the nursery, they should be planted without delay in their respective places, previously selected and prepared for them, and be firmly staked, watered, and finally mulched. This will conclude nearly all that is necessary the first season, with the exception of perhaps a little pruning and pinching in of the summer growths. *Edward Bennett, Osberton, Worksop.*

Home Correspondence.

Vine Extension.—As an advocate of the Vine extension system, I am induced to give you my experience. Fourteen years ago we planted two vineries here, six Vines in each house of eight rafters; each occupied its allotted space for the first four years; from that time I have gradually extended them, till at the present time we have only two Vines in each house. Their health and fruitfulness have been the admiration of all who have seen them. But now comes the struggle—one Vine or two in a house? This, I think, we must decide. My employer, who was at first against the extension system, is now in its favour, as he says the quality of the fruit is much superior; but I must say he had no other reason for our Vine extension than the above, and giving them more room as they became older; the roots have liberty inside or out, the front wall being on arches. "Sacred to the Vine roots" is not written here, as our borders are yearly cropped. I know one vinery in this county (Cumberland), built the same season as ours, that now has its second batch of Vines on the limited system. There may be seen a beautiful instance of the Vine extension in the gardens of a nurseryman near here. This Vine was not planted with a view to grow Grapes, but to be a shade to a plant-house, and was planted without ceremony. The crop this Vine bears is something wonderful; it has no border, and where its roots have gone to no one seems to know. It was an old Vine when I knew it first—15 years ago, and it seems to improve each year. I could point to another instance of the extension system where the Vines have borne heavy crops for a great number of years, and are still doing well. Here, again, there appears to be no prepared border. To what must we attribute this success? My humble opinion answers—extension. *John Taylor, Rose Hill Lodge, Botcherby, Carlisle.*

The Deodar.—I have been interested in the discussion on Deodars, and am quite certain that, except in soils which have much sand, none will be ever so valuable for timber as Cedars of Lebanon. I have planted them for 20 years on magnesian and on carboniferous limestones, on new red marls, &c., and all in open situations, not too much exposed, and find that the bark of all have that unhealthy gloss (not green) which all woodsmen know betokens disease. But there is a tree which grows quite as fast in good cool soil, which "cuts" very much like Beech in felling, very unlike common Spruce or valley-grown Scotch Fir or Larch. I allude to the Abies Morinda, one of which I have just cut down; although not so bushy as a Deodar, it is much taller, though of the same age. I can safely recommend this for planting in red marls, which are cool but not wet. I have little doubt that it will make at least as good timber as "yellow deals." *Somerset.*

Heliotropes all the year round.—I am much obliged to Mr. Culverwell for his advice about the Heliotrope (see p. 1331, 1869), but I certainly cannot accept it. Neither can I let his remarks on that weedy plant, as he terms it, pass unnoticed, though it may appear weedy compared with his Luculia gratissima, which, according to the description given, must be a sight worth seeing. I have no desire to say a word against the Luculia, but I question whether every one would succeed in getting it to grow so freely as it does with your correspondent. Does it answer as well in every case for cut flowers as the Heliotrope, and is its perfume as grateful as that of the latter? I fancy I hear some lady saying—no; indeed, I know ladies that would object to it as being too powerful. Therefore, I must still adhere to all I have said in favour of the Heliotrope, as I feel sure its grateful perfume will ever be a recommendation in its favour. Besides, it may be

had in bloom all the year round, as the continual cutting of the blooms induces it to make fresh growth, which, as a matter of course, gives a succession of flowers, whereas the Luculia, according to Mr. Culverwell's version, will not bloom more than five months out of the 12. Perhaps I may some day feel inclined to introduce a plant of Luculia gratissima, but certainly not with the intention of replacing the Heliotrope. *G. F. Attis, Hartsholme Hall, Lincoln.*

Garden Ivies.—Dr. Seemann has spoken plainly, and attached his name to his communications. What remains, as between him and me in connection with this subject, those who have read his book and my paper can decide for themselves. To "Hedera" and "W. T." I have nothing to say, for I make it a rule to avoid discussion with people who are ashamed of their names. *Shirley Hibberd.* [We do not insert communications without knowing the names of their writers. Certainly the writers in question have no need to be ashamed of their names, though it may not always suit their modesty to have them published. Eds.]

Tricks of the Trade.—Is your correspondent "B. M.," at p. 1280, 1869, aware that three different plants are sold in the English trade under the name of Picea amabilis? Of the true Abies amabilis (Forbes) (not Picea) I can corroborate the nurseryman's statement, that no seedlings of it are to be found in the trade, neither in England nor on the Continent, but of Abies nobilis robusta (magnifica) and A. grandis, Carr. (lasiocarpa), the two other kinds which are known as Picea amabilis, there are plenty of seedling plants to be had. We have several times received from different seedsmen, seeds of Abies amabilis said to be true, but we never succeeded in raising a single plant, nor do I know of any one else that has. I should like to know why English nurserymen persist in confounding the genus Abies with Picea. It is really a pity to see in some of their catalogues how Abies, Picea, and Tsuga, Biota and Thuja, are mixed up together. I defy any person who is not well acquainted with Coniferæ and its nomenclature, to succeed in finding in such catalogues what they are in want of. As a book which should be consulted by nurserymen who are preparing their lists, I recommend the last edition of M. Carriere's "Traité Général des Coniferes. It is the best and completest treatise issued up to the present time. *A Foreign Nurseryman.*

Cheap Tobacco.—I would strongly advise your correspondent, Mr. W. Smythe (see p. 1283, 1869), to grow his own Tobacco for fumigating purposes. Having done so myself for some years I can speak with confidence as to its efficiency, if properly prepared. My mode of preparation is very simple, and probably not new to many of your readers. I procure seed of the Virginian variety, and sow it in a shallow box or pan, about the first week in April, and then place it in a warm house or frame. As soon as the seedlings are strong enough to be handled, they are potted off into small 60-sized pots, and grown on until the end of May, when they are gradually hardened off, preparatory to being planted out in the open ground, which should previously be well manured and trenched. The plants are put out about 2 feet apart, each way, and the ground is kept clean during the summer; they then make a fine growth. About the end of August the leaves are stripped off to about half way up, leaving the topmost ones on the plants a fortnight longer, to allow of their further development. They are then placed in a cool house or dry shed to dry out the sap, which takes about two or three weeks. During this time they should be turned over every two or three days. When the leaves become quite brown in colour, they are packed in a box, and a heavy weight is put on them to induce slight fermentation. After remaining in this condition for a week they are taken out and again spread out to dry. This process of drying and packing is repeated three times. The Tobacco then acquires its true flavour, and is fit for use; so much so that I am obliged to keep it locked up to prevent its being taken by the men. Tobacco, so prepared, will destroy all insects that any known preparation of its kind will kill, besides being perfectly harmless to the most tender plant. I need scarcely remind Mr. Smythe that he must not grow too great a quantity, or he will infringe the revenue laws. I generally plant about 2 poles of ground, and that will grow about 20 pounds of good wholesome leaf. I would advise those of your readers who have not already done so to give this method a trial. *H. Beasley, Eaton Hall Gardens.*

Grapes.—Mr. Ingram, in his interesting article on Grapes (p. 1331, 1869) gives the names of some varieties worthy of cultivation, especially Mr. Pearson's new seedling with a strawberry perfume. In addition, I wish to draw attention to an old variety not very well known, namely, the Black Monukka. This Grape is, I think, the *bonne bouche* of all the race hitherto raised; for besides being seedless it possesses a crisp, juicy, refreshing flavour, and the berries may be eaten, skins and all, with the greatest gusto. [We quite agree in this estimate of the Black Monukka. Eds.] It is likewise one of the very best black Grapes for using in jellies, its very long small shouldered bunches yielding an immense supply when clipped off in small clusters for that purpose. Another early stove Grape, the Purple Constantia of Speechley's catalogue, is not grown or known so well as it ought to be where a collection of Grapes is required. It is one of the very highest flavoured of perfumed Grapes in the Frontignan section, and a great bearer. Of course none of the above varieties are show Grapes, but where the palates of our employers are to be consulted, they ought to be grown for that purpose in all large collections. I have grown a French Grizzly Grape here for some time, which I believe is named the Gromier du Cantal in the catalogues; and where variety is wanted in the dessert it is a desirable sort. Grown here in a Muscat house it shows immensely large well shouldered bunches, and when quite ripe is of a transparent rose colour, and with a very juicy and brisk flavour. For a collection of show Grapes, affording variety, it is likewise well adapted, from its peculiar tint of colour. *William Tillery.*

Game Cover. — About a year ago there was a good deal said by several of your correspondents about the best shrubs for game covert, but I don't think anyone spoke of the Bramble. Now, in the West Riding of Yorkshire I have seen Bramble coverts that put a very experienced old huntsman into raptures, and I do not think that hares or rabbits bite the Bramble much. Accordingly, I want to get a good quantity of it into certain bare portions of the woods here. Can anyone give me advice in the matter? Among other doubts, I have two—would cuttings do, placed where they are to remain? and which is the best kind of Bramble for the purpose? The small sort, called Lamberry, seems to me the best. *H. T. M., Gatehouse, Scotland.*

The Wood-Leopard Moth (Zeuzera æsculi).—Please give me the name and means of destruction of the wood-boring insect of which I send you an example. The piece of wood sent is from the end of a bough, into which the insect bored its way. It was at least 3 feet longer when it commenced its ravages. The branch was cut from the tree about two months ago, but it still continues its boring operations. *W. P. H.* [The grub is the caterpillar of the Wood-Leopard Moth (Zeuzera æsculi), of which we give an illustration. No. 1 represents the larvæ, 2 the chrysalis,

Fig. 5.

3 the male insect, and 4 a group of the eggs. As in the bough sent, it bores up the middle of the solid wood of the young branches of Apple, Pear, and Plum trees, and sometimes Elm. We presume the best remedy for them is to cut off and burn the attacked branches, but they are not in such force in this country as to do much harm. Mr. Newman says that they are never in such excess as to destroy the trees, and adds: "We have even observed that fruit trees thus infected bear more abundantly than those which are perfectly healthy"—a physiological phenomenon, the meaning of which horticulturists will be at no loss to understand. Mr. Curtis, the writer of the article from which the cut is taken, says: "Fruit trees may be protected from these mischievous larvæ by painting them with whale-oil soap, as recommended in this Journal, vol. ii. p. 304; and no doubt if tobacco smoke could be forced into perforated trees, it would drive out the larvæ, just as rats are ejected by water. We should be glad if "W. P. H." would send us a few more specimens of the grub and injured branchlets, for the Royal Horticultural Society's collection of economic entomology in the South Kensington Museum. Eds.]

Bedding Calceolarias.—These suffer more from "coddling" than almost any other plants that are used for summer bedding. Really they require but a minimum of care after all, and are much more capable of withstanding severe frost than we usually give them credit for. For some years past I have not potted one plant that was destined for bedding, nor put them under glass; for, having proved that they do as well without glass as with it, I have seen no necessity to add to my care concerning them in winter. Nothing makes a better frame for the winter reception of cuttings than some three-quarter or inch boards, and if these are afforded on the outside the additional protection and support of a little soil or ashes, that is sufficient. The cuttings may be put in in October, and the space of 4 inches allowed between the soil and the top of the frame. No covering will be needed until frost sets in, when a board top can be placed over them, which may remain as long as the frost does, and be again removed with the return of mild weather. No matter how hard the soil may be frozen, provided the covering is not removed until the thaw is complete, no evil results will follow. These cuttings will by April have grown into bushy and robust plants, that can be transplanted anywhere by the aid of a garden trowel with the greatest ease. Such plants as these will rarely if ever fail, and get so firmly established in the soil that a continuous bloom will inevitably result. This I have invariably found, even in hot dry soils, to be the case,—the effect no doubt of the thorough seasoning they have undergone during the previous winter. I have now growing in such a wooden box as I have described, a large number of seedling half-shrubby Calceolarias that had nothing but ¾-inch boards between them and the external weather. During the late frosts they were closed up for a week, and must during that time have been frozen very hard; but when I uncovered them on the 1st, I found them looking as fresh as ever. Depend upon it the Calceolaria is much more hardy than we imagine, and should be treated accordingly. As a yellow bedder, aurea floribunda still ranks as first favourite, and deservedly so, as its gorgeous masses of orange have not yet been surpassed. Treat it as a robust youth, and it will repay for the labour expended, but if coddled look out for failures. A fine old kind, that is much esteemed, is Kayii Improved; its continuity of flower is remarkable, the trusses are smaller, and the colour less bright than in the former kind, but it is on the whole more reliable. A profuse yellow blooming plant is indispensable in the summer flower garden, and certainly for that purpose the Calceolaria has not been superseded. *Alex. Dean.*

Picea cephalonica.—The following life-history of a specimen of Picea cephalonica which is growing at Haynes Park, Bedfordshire, the seat of the Rev. Lord John Thynne, may be of interest to those of our readers who are trying that tree in Britain:—The tree is perfectly hardy in Britain, but it is very rarely a free grower. In the severe winter of 1860-61, Mr. Palmer's tables show that it was only killed at four places, and much injured at one out of 67 reported on. The four places where it was killed were in Oxford, Norfolk, Stafford, and Yorkshire, and it was much injured at Flitwich House, not far from Haynes Park; thus apparently supporting the view that the inland counties are the least favourable to plants of doubtful hardiness, those nearer the sea having naturally a milder and more equable temperature. According to an old catalogue, the tree in question was planted in 1840. Some years ago the leading shoot or bud was destroyed, most probably by squirrels, and the main strength of the tree went into two of the side buds which grew stronger than the others, and, becoming great branches, spread out even beyond the lower ones, and the points turning upwards, gave the top of the tree the appearance of an inverted umbrella without a stick. While in this state the tree bore cones several times, and produced good seed. In 1865 the leading shoots of these two large branches began to grow upwards, and to increase very much in size; but it was evident that, if the weight on the extremities of these branches increased much, there would be great danger of the tree splitting. In the end of March, 1867, a thorough examination of the tree was made, and a bud about the size of a pea was found in the centre of the top of the stem, where the bark of the two large upper branches divided; there were also several other buds pushing out. It was determined to give this centre bud a chance to make a leader, the other buds were therefore rubbed off, and the two large branches were cut off at from 18 inches to 2 feet from the stem, and some others shortened. During the summer following the bud grew several inches, and had every appearance of a leading shoot. In the autumn the upper branches were again cut in, and the tree brought as much as possible into a conical form, which it had entirely lost. The new leader continued to grow during the two following years, and in November last it measured 4 feet 10½ inches in length and 5 inches round at the base; the growth of the present year measuring 3 feet 2 inches. The other dimensions of the tree are:—

	Feet	ins.
Height to the base of new leader	10	6
Circumference of stem at base	5	3
Ditto at 5 feet from ground	3	10½
Ditto just below the two large upper branches ..	2	8
Round the two large branches at 1 foot from the tree	1	8
Circumference of the lower branches, from 8 feet to 60 feet.	1	10

I am indebted for these details to Mr. F. J. Thynne, who has been kind enough to procure them for me. *And. Murray.*

The Schedule of the Royal Horticultural Society.—While there has been a manifest desire on the part of those who arranged the schedule this year to popularise these meetings, and to encourage all lovers of flowers and plants, I regret that they should have been so ill-advised as to make some (what I cannot but call) egregious blunders. May I ask what grower of variegated Pelargoniums ever advised August as the month in which they were to be shown? It is evidently intended to be a sort of test of their value, and yet not one of them can possibly be in character. Then, again, as to the Gladiolus show in August. I was told that great things were to be done for "us Gladioli growers." And yet what has been done? Two very liberal prizes have been offered by the President and Mr. Wilson, but they are as sure to go to Mr. Kelway as the Dutch prizes for Hyacinths

were to Messrs. Cutbush and W. Paul, and no one grudges them to him. In the open class, of course, no private grower can compete with men who grow 50,000 bulbs; so that there just remains the chance of one's getting a prize for six. See how it works. My neighbour, Mr. Bunyard, who grows largely, says it is no use trying to compete with Mr. Kelway; and I myself was about to have stages, &c., made, in hopes of a keen competition amongst amateurs, and now I must give it up. *D., Deal.*

Ailantus as a Timber Tree.—Seeing a question asked at p. 7 as to the value of this tree for timber, I am induced to inform you that there are two very fine specimens growing in the grounds here. They are 50 feet in height, and measure 5 feet in circumference at 12 inches above the ground. At 4 feet high they measure 4 feet 5 inches. They are both handsome specimens, but unfortunately one of them is growing too near to a fine Cedar of Lebanon, which is 60 feet high, and has a circumference of bole of 12 feet 9 inches at 5 feet above the ground, with branches spreading out gracefully all around, covering 280 feet of ground. Just by is another fine Cedar, planted by the late Duke of Wellington on August 17, 1827. Perhaps there is not another tree of its kind in England that has grown so fast as this one. If you desire it, I will, some day, give the height and general dimensions of this specimen. The Ailantus will have to be cut down to make room for the development of the Cedar, then I shall be able to give you some account of what the timber is worth. *John Chapman, Kingston Lacy Gardens, Wimborne, Dorset.* [Please do. EDS.]

Vine Budding.—The bark of the Vine stock is cut clean off, according to the size of the bud to be put on, inserting the lower end of the bud in a slit, so as to keep it firm. I have practised this kind of budding on the laterals of old Vines for five years, but the results were not satisfactory, until I discovered that the last week in August or first week in September was the best time to perform the operation, and also that each bud must be protected from the drying influences of the atmosphere by bandages of cotton wool or other similar material, which have to be kept constantly wet for three weeks. Unless this is done, budding of Vines will not be satisfactory, and people who profess to have budded Vines never have done them satisfactorily. I do not call successful budding that which gives you only one "take" in half-a-dozen, or perhaps more, and no fruit even from that; but if budding in September is managed properly, every eye will take, and show fruit just as freely as the natural buds of the Vine. The wood should be in a half-ripe state, and pliable, so as to bend uniformly upon the cut that it is to cover. *Z. Stevens, Trentham Gardens, Staffordshire.*

Chimonanthus fragrans.—I am able to add evidence that the above produces and ripens its seed in this country. Twenty-seven years ago I was admiring the fragrance of the blooms of this plant at Powis Castle, in company with Mr. Brown, the highly respected gardener. We found a small pod containing two or three seeds, which Mr. Brown allowed me to bring away. I raised a plant from one of the seeds, which is now a huge fellow, against my dining-room chimney, and covered at this time with its fragrant blooms. Mr. Brown is still at Powis Castle, and no doubt remembers the circumstance. He seemed a little surprised at the time to find a seed-pod. My tree, though blooming every January, has never produced a seed-pod. *W. M. Rowland, Bishop's Castle Vicarage, Salop.*

Sensational Vine Pruning.—There are plenty of writings truly on all that relates to the Vine, Vine pruning, and all its belongings. We get wonderful reports every now and then, of wonderful practices and like results—big stories of big bunches, and big returns, which for a time create a great sensation. Sensational, yea poetical writings we have too, occasionally, even in the pages of the practical *Gardeners' Chronicle*. I have seen nothing lately, however, to compare in any way with an article about Vine pruning by your correspondent "David Tell Fact" (p. 1307, 1869), which is very likely to give rise to perplexity and confusion. "David," some time ago, gave us an interesting account of the Vines at Bishop Stortford, and told us some valuable facts, as I supposed. "P." rudely interferes with his theme, when down comes "David," not with facts, but with what seem more like flights of fancy. If what "David" tells us are facts, then our noted Vine pruners and Grape cultivators are but barbarians and savages, despite their having lived all their lives in beautiful gardens, which is said to be ennobling. Mr. Miller, of Bishop Stortford, may well cry, "Save me from my friends." For "David" tells us that ye, yea, and all of ye, who prune your Vines on the whip-stick style, are "barbarous hackers" and "savage pruners." This, if interpreted strictly, almost amounts to a libel on the great majority of English Grape growers. It reminds me of some penny-a-liner's description of a glorious murder case. "The leading shoots run up" "like race-horses;" "but the eye of the savage" "is upon them;" one, two, three, four, five, "and they are beheaded." "Life trembles in the balance with death; it, however, conquers;" the "leader is decapitated," and the savage no longer sticks at trifles, but "one—pinch, two—cut, three—slash, and so on." Why the Polecats (Pollards) in our woods "have a more pleasant time of it compared to the barbarous cruelties perpetrated upon our Vines." We should think so, but, seriously, is this gardening? After wading through a good deal of this thrilling style of writing, "David" at last recommends something, and here it is: "When root action is excessive"—that is, I suppose, meant for when they grow too strongly, a thing which I have never seen occur in a well-made border—"it is much safer to deal with it directly by root-pruning than indirectly by top-cramping or close-pruning." Top-pruning is a "barbarous cruelty," but root-pruning is a beneficial "surgical operation." Here this, O ye savages! I forebear comment, but leave those who like the advice to adopt it, or those (if any) who have practised the root-pruning of their Vines to tell us the facts of the case. "David Tell Fact" is right in stating that Vine borders may be made too porous, but altogether wrong in his belief that "firmness, amounting to obstinacy, is one of the best physical conditions of a Vine border." There is a happy medium in this as in all things else. The example given by me, and alluded to in support of this idea, was of the "roots clustering round the broken bricks, &c.," in the walk, and why? Because of the regular supply of moisture about these bricks, and the easy access of the air—in other words its porosity. *B.*

Dolomite.—When Mr. Cramb read his paper at the Manchester Congress, on the injurious effects of magnesian limestone on his Vine borders, I was fortunate enough to be present, and in my simplicity thought it one of the most practical papers I had ever listened to; and as I had paid dearly for my information on Grape culture, I was delighted to see one hidden danger brought to light without expense, and the gardening world duly warned off one rock on which Mr. Cramb had run foul. I had never seen the author of the paper until he stood up to address his Grace the President of the Society, and his fellow gardeners, in Congress assembled; and I have no intention here of going minutely into the subject, or of repeating the arguments that were adduced *viva voce* at the Congress, still less to repeat what your correspondents have communicated to the *Gardeners' Chronicle;* but I must not pass over what I deem an unfair statement of Mr. Cramb's views, for while he made out a clear case against magnesian limestone, he did not say one word against limestone in general. The particular class of rock known as magnesian limestone, exists in vast bulk in this country and on the European continent, as well as in that of America, and may frequently be seen polished as marble. There is a fine bed of it in the neighbourhood of Mansfield, in Nottinghamshire, forming, perhaps, the best building-stone in England, and which the Mansfield people thought should have been used in building the Houses of Parliament. Now this magnesian carbonate of lime is not like the chip in porridge, that can do little good or harm by its presence, but is a gigantic affair, with a well defined character. It is called dolomite, in honour of the celebrated French geologist, Dolomieu. The Mansfield specimen, when burnt as lime for mortar, is of a dark grey colour, by no means inviting in appearance when compared with such as Buxton lime; and my inquiries have elicited the admission, that however valuable as a building material, it was of no use whatever to the land as manure. Not only does it yield immense blocks of stone for building purposes, but every fragment can be burnt to make lime mortar. The differences in carbonate of lime, as found in the quarries of this country, are very great indeed, as may be seen by comparing the printed analyses issued by the lime burners at the principal quarries. I got a very full account of one from Yorkshire, some 10 or 12 miles south of Sheffield, stating the district of Huntingdonshire and the fens as examples of soils where its best effects were produced. Ardwick lime, burnt in the suburbs of Manchester, sets under water, and its mortar is valuable on that account, but few would think of using Ardwick lime for purposes of fertilising land. In "Maunders' Scientific and Literary Treasury," published by Longman & Co., 1858, there occurs the following note:—"The lime resulting from the calcination of magnesian limestone is said to have an injurious action on vegetation." It is, therefore, evident that some 10 or 12 years, ago, dolomite had its character as well defined in regard to agriculture as Mr. Cramb has shown in respect to horticulture. A celebrated chemist in Manchester made a fortune by calcining magnesia for medicinal purposes, and every one has seen the peculiar lettered bottle, with "Henry's Calcined Magnesia" in high relief thereon. In like manner every one has seen the ordinary kiln where the lime burner calcines the limestone for building, for agriculture, and the like. Now, if the limestone and the magnesia will retain their characters after such a fiery trial as calcining, no one need be deceived by their action as powerful chemicals. The wise King said, if you thrash a fool—ay, if you pound him in a mortar—his foolishness will not leave him; but what is that to subjecting an article for hours to a white heat as is done with lime, &c., and yet the lime retains its power, and so does the magnesia, the one to constipate and the other to relax. It would be well if your correspondents would confine their remarks to dolomite, and not ramble over the very extensive field of lime, for that word embraces a host of articles very dissimilar in their action; indeed, a volume might be written on the subject, showing what soils and crops certain limes would benefit. No one has ever doubted that lime is beneficial in the formation of Vine borders, any more than they would doubt of its fertilising a field of Barley; but pretty strong doses of dolomite are not without danger to certain plants in field as well as garden. I am no partisan in this disputed case. I have never seen Mr. Cramb save at the Congress, and never spoke to him; I only write now to cast my mite into the scale of facts, hoping that truth may in the end be elicited. *Alex. Forsyth, Islington Square, Salford.*

The late Mr. W. Barnes.—In the memoir of this great plantsman, at p. 14, it is mentioned that he spent some time at this nursery. It was here that he commenced in earnest the study of botany, and first became acquainted with British plants. He has frequently told me of his love for botanical subjects, and how he employed almost every moment of leisure in exploring Epsom, Banstead, and the adjacent neighbourhood in quest of Nature's gems, and how richly his homely-constructed herbarium was stocked from these sources. It was one of his objects to ascertain the number of British plants growing wild throughout the length and breadth of the celebrated Derby Course. He enumerated 48 species, and 51 species form the maximum up to the present time. His love for plants was great, and in all his peregrinations, whether on business or pleasure, plants of all denominations commanded his attention, and appeared to possess a charm for him. *Ransley Taunton, F.R.H.S., Epsom Nurseries, Surrey.*

Foreign Correspondence.

AMERICAN CEMETERIES.—The Greenwood Cemetery, New York, is a place of public recreation, second only in importance to the parks already described. In form it is nearly rectangular, measuring about a mile across in one direction, and a mile and a quarter in the other, consisting of some 600 acres of land. Its surface is beautifully diversified by hill and dale, and the planting and laying of it out are, upon the whole, all that can be desired. It is traversed by about 20 miles of carriage roads, walks being equally numerous and extensive, and affords employment all the year round to considerably over 200 workmen. To Major Douglas belongs the credit of the design for this cemetery, which was laid out some 30 years ago. During the first four or five years of its existence its success as a commercial undertaking was somewhat doubtful; but after that time its value as a burial ground began to be fully recognised, and now it is one of the most coveted of cemeteries. Owing to the innumerable windings of the roads and walks considerable intricacy pervades the place, which is laid out in what may be called the gardenesque style; and the undulating character of the ground, heightened by judicious planting, adds much to its beauty.

Prominent among hills in this cemetery, or at least eminences of considerable elevation, may be named Vista Hill, encircled by Vista Avenue; Battle Hill, Woodland Ridge, flanked by Woodland Avenue; Walnut Hill, surrounded by Hawthorns and hardy Azaleas; Forest Ridge, with its accompanying avenue; Pine, Holly, and Meadow Hills; Mulberry, Birch, Cherry, and Lawn Girt Hills; Fountain Hill, Myrtle, Locust, Tulip Tree, and Bay Grove Hills; Orchard Hill, Aspen, Vine, and Alpine Hills, and Oak and Larch Hills. Among dells are Cedar, Crescent, Forest, Grassy, Evening, and Bay-side Dells. To paths the names of plants have been given, such as Olive, Arbutus, Hazel, Almond, &c. Avenues are named in a similar manner, the names of trees of larger growth, as Acer, Elm, Chestnut, Cypress, &c., being chosen. Of water scenery I have little to say; what may be termed lakes, of which there are several in different parts of the ground, are too small to require comment.

The view from Battle Hill, with river scenery in the distance, is grand and extensive, and the number of flowering shrubs and trees is greater than is to be found in English cemeteries. The masses of white flowers with which Greenwood Cemetery is ornamented are very effective; among them are Magnolias, Cornus florida, Spiræas, and white Lilacs, which, when planted as they are here, in connection with dark green evergreens, are shown off to excellent advantage. This is more particularly the case in the neighbourhood of Fern Path. Green glades and banks of evergreens surround sylvan water, a description of scenery with which white marble tombs form a striking yet agreeable contrast. Arbor and Landscape Avenues have bold and beautiful surroundings in the way of masses of evergreens and open greensward, while nothing could possibly exceed in magnificence as regards floral beauty Magnolia Avenue, when the noble trees from which its name is derived, are in full bloom. Three pieces of ornamental water which lie between the northern and western entrances are very prettily situated amidst charming scenery of a somewhat thickly-wooded character.

The names of trees and shrubs just given in connection with avenues, paths and hills, plainly indicate the character of the planting employed in this Transatlantic cemetery. It consists in massing together certain kinds of vegetation in such quantities as to be most effective:

here one is sheltered from fierce sun-rays by umbrageous forest-trees; there groups of Magnolias and Cornus florida break in upon the view, forming flowering masses, which, when seen against suitable backgrounds, as they are here, have, as has been stated, a chaste and pleasing appearance; whilst, over some of the more important tombs hang the golden tresses of Laburnum. Those early gems, the Snowdrop, Crocus, Hyacinth, and Narcissus, too, have not been forgotten; on the contrary, they have been planted in select positions in such profusion as to greet the advent of the floral year with a hearty welcome. In short, as much taste and style are displayed in the decoration of American cemeteries as in their parks.

An important matter in relation to Greenwood Cemetery is its drives and walks, all of which are very circuitous, leading one to believe that the ground traversed by them is even greater than it really is. The naturally undulating character of the site, too, together with the strong contrasts brought into play in the way of scenery, likewise favours this impression. No straight carriage road, leading direct from the entrance-gate to the church, as is the case in some of our London cemeteries, is to be found here, where, indeed, there exists altogether more variety than is to be met with in places of the same description either in England or on the Continent. French cemeteries, for the most part, are stiff and formal, their staple ornamentation in the way of arborescent vegetation being the Tree of Life. The English style of treating such ground is, I need scarcely say, essentially German, though that is no disparagement, inasmuch as one of the most admired of American cemeteries is to be found in Cincinnati, and that was laid out by a German. But what we want in England is a greater amount of fine specimen trees in our cemeteries, the monuments which they contain seldom having sufficient leafy background to throw out their fine architectural effects to advantage; and roads and walks more tastefully laid out than we in many cases find them. Yew trees too, favourites in churchyards though they be, are used to a greater extent than they should be in our cemeteries, which should contain also a fair proportion of deciduous trees as well as evergreens. Indeed, no better situation could possibly be found for an arboretum than some of our cemeteries furnish; an opportunity, now that we are forming so many new places of the kind, that should not be lost sight of. Where, for instance, could we find a better place for a pinetum than Woking, which is equally favourable to the growth of American plants?

In minor points of decoration, such as that of graves, much diversity of taste prevails. Strewing flowers on graves is a time-honoured custom. In France profuse floral ornamentation is bestowed on the last resting-places of departed relations or valued friends; in America, too, this custom also exists to a large extent, while we in England are more moderate in our practice in that direction. Although this must be admitted to be the rule with us, there are nevertheless many exceptions to it, in confirmation of which it may be stated incidentally that at Bewdley, when I knew it, a posey of newly-blown flowers was affectionately laid on the grave of a little girl daily for years, and may be even now for anything I know to the contrary, while wreaths of immortelles, carefully attached to tombstones, may be seen in most cemeteries. In Greenwood many hedge in graves with evergreens, against which when kept low and trim there can be little objection; but in after years, when the cemetery shall have become full and closed, such multitudes of miniature hedges, if not removed, would form a perfect jungle, and detract from the grandeur which the place might otherwise be expected to assume.

With reference to closed cemeteries, or rather graveyards, it may be stated that it is a great mistake to remove all headstones, except such as are laid down flat, as we do in England. That mode of dealing with churchyards robs them of half their interest. Where too thick, if permitted, we would certainly remove some of the less important of the gravestones, but all others we would retain *in situ*. What led to the meditations of a Harvey should surely be appreciated by us, and we would not have even the graves levelled. We would (at the risk of being accused of a Hibernianism) have all closed graveyards thrown open to the public, with whom the little inequalities of surface in question would find favour rather than disregard, and groups of tombstones, overhung with Laburnum, Scarlet May, or even half hid amongst Clematises, Honeysuckle, or Sweet Briers, would form charming associations that could not fail to be appreciated. Any combination indeed of tombstones in an erect position, with flowering and evergreen shrubs and trees judiciously selected, would have a far better effect than flat grassy surfaces, such as are now to be found in most of our closed metropolitan graveyards. Even under the shadow of our great St. Paul's Cathedral, what need prevent us having a few clumps of evergreens, enlivened even by the queen of flowers herself? Trinity Churchyard, in the Broadway, New York, is laid out in the form of a flower garden, and is even planted with subtropical plants, the walks being led so as to avoid objects that from their nature could not be removed. St. Paul's, which is contiguous to it, has also been converted into a garden, but in this churchyard there are fewer flowers than in that just named. Both contain some noble trees, among the branches of which nestle little cots for sparrows, which, on account of their keeping insects in check, receive the greatest possible attention, not only in New York, but also in other American cities. Would that our Spitalfields and hundreds of other closed churchyards in London and elsewhere, presented the same well-cared-for appearance as these two closed churchyards in the Broadway, New York. *Joseph Newton.*

Notices of Books.

The Amateur Gardener's Calendar: *being a Monthly Guide as to what should be Avoided, as well as what should be Done, in a Garden in each Month.* By Mrs. Loudon; revised and edited by W. Robinson, F.L.S. With numerous illustrations. London: F. Warne & Co. Crown 8vo, pp. 376.

The demand for new editions of books like the present, the original of which was published in 1847, and was at the time favourably noticed in our columns, is a healthy sign of the times, showing that a taste for horticulture is spreading amongst the middle classes, who, in these days of fierce competition and commercial antagonism, need more than ever such soothing, softening, elevating influences as the culture of a garden affords. The merchant with his *employés*, the professional man, or the well-to-do artisan, may turn for refreshment from the bustle and turmoil of life, to find in his garden the very thing he seeks for—repose; and in tending some floral gem, or some pomological prize, may possibly meet with the coveted relief from the daily recurring toil which oppresses him. Such an one, when first led to turn to this source of relief, would be apt to find himself bewildered by the variety of objects claiming his attention, and revealing to him his own lack of knowledge and experience; and greatly would he need, and much would he appreciate, some friendly guide, like the Calendar before us, to help him forward to success. But the guide must be intelligently followed, for the art of gardening is not to be acquired off-hand, and both limited experience, and the absence of sound elementary training, will be found to be serious hindrances to its pursuit. The inexperienced cultivator needs to be admonished, not only what to do, but what to avoid, as the seasons revolve in their course; and happy he if his monitor succeeds in keeping his mental vision clear while he passes him through the mazy paths of verbal instruction in the various practical operations which, from week to week, and month to month, claim his attention. In an art so complicated as that of horticulture, influenced as it is to a large extent by disturbing influences, of which the variations of soil and climate may be cited as prominent and evident examples, it becomes well-nigh impossible that even the simplest instructions can be intelligently understood, without some amount of practical experience; and hence arises one of the greatest difficulties with which the writers of gardening handbooks have to contend. It is easy enough to direct the unpractical man to dig here, and to cut there, to sow in this manner, and to plant in that; but it is ten to one that the direction is misinterpreted, till some friendly hand shows the way, or repeated failure in one direction leads to success by pointing in another. So much by way of caution that there is no royal road in gardening, though success will assuredly wait upon him who intelligently and perseveringly plods on in search of it.

Mrs. Loudon's well known Calendar is probably one of the best of the book-guides designed for teaching inexperienced persons the leading features of gardening as in these days practised amongst us, since in its production the literary skill of the authoress was supplemented to a large extent by the practical experience of one of our most intelligent gardeners, the late Mr. H. C. Ogle, to whom the little volume is especially indebted for a series of extremely useful hints in the shape of advice regarding the avoidance of certain operations as to which inducements might arise to perform them out of season. Indeed this is, in our view, one of the most suggestive portions of the book. Another very interesting and useful section bears the heading of Garden Enemies, and is chiefly devoted to an account of the insects which do so much damage to garden plants. This section of the book is nicely illustrated, and we borrow from it, as a sample, the annexed figures and description of the Asparagus beetle:—

Fig. 6.

"The Asparagus beetle (Lema or Crioceris asparagi) is very troublesome at this season (May). In its larva state it is very destructive, as it not only eats through the stems of the young Asparagus plants, but it also destroys the leaves and the seed. The perfect insect, which is a most beautiful beetle, is only about a quarter of an inch long, but it is most brilliantly marked with red, a rich bluish-black, orange and cream colour. The back and wing cases are marked with a kind of cross, whence the insect derives its popular French name, *Porte croix*. It takes its scientific name of Crioceris, which is derived from two Greek words signifying ram's horns, from its antennæ being shaped somewhat like the horn of a ram. Fig. 6 represents a branch of Asparagus infested with the Asparagus beetle in its different states. In this figure *a a* are the eggs, *b b* the larvæ, *c c* the exuviæ of the larvæ, *d* the imago, or perfect insect, and *e* is part of the branch not yet attacked. The upper figures show the eggs *a*, the larva *b*, the pupa *c*, and the perfect insect *d*, greatly magnified. It has been observed, that these insects prefer beds of seedling Asparagus, so that where there are beds of seedlings they should be carefully examined, even if the beds of old plants are found to be free. It is extremely difficult to destroy these insects when the Asparagus plants have been suffered to get into leaf, as the beetles, from their very small size, can scarcely be seen among the leaves; and when they are perceived they turn to the under side of the stalk, or drop down, feigning death. They should, therefore, be sought for at the time of cutting the Asparagus shoots, as they are then more easily discovered. When it is found that they have infested a bed, the long stalks of the Asparagus, when they are cut down, should be carried away to the reserve ground and burnt, as the female insect lays her eggs upon the branches; and if the Asparagus stems when cut down were laid upon the bed, as is usually the case, the eggs would remain there till they were hatched in the spring."

In the present issue, which is neatly printed, the matter has undergone revision, and additions have been made in respect to questions which have come to the surface since the original edition was published. Amongst the more prominent of these are ground vineries, orchard-houses, subtropical gardening, variegated Pelargoniums, the large-flowered Clematises, cordon training, &c. Thus worked up to the present time, the book may be recommended as one well fitted to supply the wants of the class of readers to which it is more especially addressed.

Florists' Flowers.

It is usual, as it is also well, to make a record of, and present in a condensed form, such of the New Flowers of the Year as may be regarded as acquisitions. New flowers represent the operation of two active principles in the horticultural world—the one, ceaseless activity on the part of hybridisers and producers; the other, the attainment of a higher level of comparative perfection—the great reward that sweetens and recompenses the labours of the active producer. Each succeeding year, which is but a period of activity, brings its quota to the sum of general results; and this gathering into general results has been likened to the

tracing of the course of a great river—there are several independent streams, but they all tend in one direction, until they converge and unite in one onward course. For the exhibitor and the flower gardener new flowers have special attractions, and to present to these particularly, and to all interested in gardening, the leading flowers of the past year, is the object of this communication.

As a much wanted blue bedding plant, Mr. Chater's dwarf Ageratum Imperial Dwarf is destined to fill a great void in the flower garden. Up to this time Purple King Verbena has been depended on for any satisfactory approach to the pleasant hue of blue in the outdoor garden, for after all the gorgeous Salvia patens is not adapted for general use. To the Ageratum, which, in addition to its dwarf habit and freedom and continuity of bloom, has a good hue of deep lavender blue, must be linked the valuable new Viola cornuta var. Perfection, which gives the fine deep blue of the Imperial Blue Pansy, and a multitude of blooms of a size approaching those of the ordinary bedding Pansies. Its origin is involved in mystery, for though claimed to be a seedling raised at Rothersfield Park, it has cropped up in several places at the same time, and there is no doubt as to its identity in each instance. It is a fine summer bedding plant, but its adaptability for spring work has yet to be shown. Those who have erroneously confounded it with the Good Gracious Pansy of Beaton, or what was more generally known as the old double purple kind, or, later still, as the Princess Alexandra of Messrs. Carter & Co., have done Viola Perfection a great injustice, though unintentionally. Yet another blue bedder, viz., Veronica Blue Gem, of great promise, both as a decorative plant for the greenhouse and a serviceable plant in the flower garden, of remarkably close habit, and a singularly free bloomer; it cannot fail to answer all expectations formed of it.

Of the new type of dwarf Antirrhinum, Messrs. E. G. Henderson & Sons offer a batch of something like 12 varieties, which, if the descriptions correctly represent the flowers, are something good; certain it is that the dwarf-growing forms manifest the possession of colours that can lay claim to novelty. They are represented as growing from 6 to 8 inches in height, so there must be unusual dwarfness of habit. Especially are these valuable, because the Royal Horticultural Society offers prizes at one of its meetings for Antirrhinums in pots, and these dwarf-growing forms are the very things for the purpose.

New show Auriculas multiply very slowly, and some of the leading flowers of the present day occupied the same position several years ago. Mrs. Butcher (Butcher), a fine grey-edged flower, is the only addition of the past year, and can lay claim to a splendid finish when in perfection. Of the beautiful alpine varieties, Mr. Turner has exhibited his particularly fine flowers, viz., Brunette and Constellation, both shades of rich claret-crimson, with those clear bright golden centres so extremely effective in this hardy class of Auriculas.

New Azaleas have been fewer in number than in previous years; and of those exhibited the best have been La Superbe, a fine flower, remarkable for the smoothness and substance of the flowers and their bold expanded form, the colour being a deep bright fiery-red, with a blotch of violet coloured spots; and Madame Van der Cruyssen, a large bright rose-coloured flower, of good shape, though somewhat flat, and well spotted on the upper lobes. The next best were George Eyles, soft pale salmon-red, a bold and showy flower, large, and tolerably smooth, and likely to develop next season into a higher type of quality; and Reine Marie Henriette, with large but roughly-edged pale fleshy pink flowers, having white edges and deep rosy purple spots. This quartette are all, I believe, of Continental origin, and surpass in quality, as shown, the productions of the English raisers. Of the last, Advancer (F. & A. Smith), a variety in the way of Frost's Perfection, but more perfect in form, is the most promising, and will doubtless be seen in better condition during the coming season.

Of Camellias, two splendid forms have been added to the list of varieties regarded as the cream of these splendid flowers. In Kelvingtonia the flowers are of remarkable beauty and unusual size, with an immense guard petal and a tufted centre, the colour dark rose-carmine, freely blotched with white; singular to state, the origin of this grand flower appears to be involved in much obscurity. In La Maestosa the flowers are bold, and have very broad petals, of a carmine-crimson hue, slightly blotched with white; the foliage is peculiar, inasmuch as the leaves are short and rounded.

Of new Carnations, but one variety appeared, and that a fine creamy white clove flower, of large size, full substance, and sweetly fragrant. Mr. Turner's fine new Picotees, Admiration and Miss Turner—the former classed with the purple-edged flowers, the latter with the red-edged division—are welcome additions, the first-named especially, for its great size and novelty, and vividness and breadth of the colour lacing. Perpetual Picotees, Ascot Yellow (Standish), and Prince of Orange (Perkins), are also fine additions to these most useful flowers; the first named has the deepest coloured edging, but both are of good habit, large size, and free in blooming. Pink alba multiflora, a handsome pure white forcing variety, also ranks high, and like the new perpetual Picotees is a vigorous grower.

New Chrysanthemums have been described so recently in these columns that it suffices to state that Messrs. Salter & Son have been most successful in producing some fine new forms, especially in the grotesque Japanese section. Adopting a classification sanctioned by use, these curious flowers, of varying types and hues of colour, might well be termed Fancy Chrysanthemums, seeing that they set at defiance the properties of the florist, and yet are of the highest value for conservatory decoration during the autumn and winter. Such new varieties as Emperor, Giant, Mandarin, Negro, and the Sultan, show well the marked advance made in the improvement of the Japanese varieties. Of the large-flowering varieties, Duke of Edinburgh, Miss Hope, and Mrs. Wreford Major, fully sustain the character of Mr. Salter as a raiser; and the novel but acceptable Anemone-flowered varieties, Marginata and Princess Louise, are excellent additions.

Notwithstanding the reputed decline of the Cineraria, raisers are not discouraged, and in the past season Messrs. F. & A. Smith received two First and one Second-class Certificate for new flowers. The two best were Orb of Day, a flower remarkable for the richness of colouring it displays, the florets being of an intense velvety crimson, with a narrow zone of white next the grey disc; and Royal Purple, a fine and striking flower, the pips of a deep violet-purple, a narrow white zone round a pale disc, and next to this, intervening between this and the purple, a zone of bright crimson, which gives it a very lovely appearance. The other, Ino, has a narrow edge of rosy crimson to a broad pure white ground.

Unquestionably one of the most successful floral results of the past year has been the production of the fine new series of early-blooming Clematis, raised from C. Fortunei and C. Standishii by Mr. Charles Noble, of Bagshot. The flowers are of great size, and range in colour from deep hues of dark violet to pure white. Blooming earlier than Jackman's fine kinds, though probably neither so hardy nor so robust in growth, they will yet have their appropriate functions, and, both in the greenhouse and conservatory, their splendid flowers will be effective indeed. Albert Victor, shaded lavender-purple; Lady Londesborough, pale lilac, large and showy; and Miss Bateman, pure white, are the cream of Mr. Noble's flowers.

The novel and distinct Coleus M. Sainson, marks quite an advance in the development of these useful foliaged plants, and, it may be said, promises to lay the foundation of a new race. The leaves of this curious form are of a pale whitish green hue, with dark leaf markings margined with bright carmine-red, and though shown small in size, yet promised to be effective.

So few Dahlias have not been produced for several years past, but these few generally of high class quality, and singular to state, not one really good fancy variety put in appearance at any of the meetings of the Floral Committee. Of the ordinary show flowers, Aristides (Rawlings), crimson-purple, shaded with dark; Harvard (Fellowes), a soft bright hue of lilac-rose; Queen of Yellows (Parker), a fine bold orange-yellow self; Provost (Turner), suffused with orange-red on a yellow ground; Royalty (Rawlings), bright gold, the centre petals tipped with brown; Toison d'Or (Turner), a fine yellow self; and William Lund (Burgess), deep crimson-maroon, were adjudged worthy the highest award the Floral Committee can give to new flowers.

Notwithstanding that a general resort is had to the Continent for new varieties of that charming summer flower, the Gladiolus, it is pleasant to note that English raisers are not idle in this direction. Messrs. Kelway & Son, who are unsurpassed as exhibitors, have obtained three First-class Certificates for new flowers, a pretty good index to the quality of their seedlings. Such flowers as Accius, Cherub, Medina, and Freemason well supplement the finer forms obtained from the Continent, and show the desire of English growers to keep pace with their Continental brethren. *R. D.*

(To be Continued.)

The Apiary.

Queen Encasements.—Perhaps there are few more unaccountable occurrences in an observant apiarian's experience than the discovery of a small, but hard and densely packed ball of living bees, in the centre of which will be found, if the trouble be taken of carefully unravelling the tangled knot, their own queen, living probably, but in a more or less moribund condition. This is a sight, however, which seldom comes under the notice of the ordinary bee-keeper who does not aim at much beyond the commonest methods of management. The scientific bee-keeper, particularly if he attempts much in the way of making artificial swarms and raising artificial queens, will not have pursued his peculiar observations and manipulations very long before he will have one or more instances of this very interesting, though at the same time very disagreeable encasement of a queen occurring under his own immediate notice.

The first case of the sort that I remember as taking place in my own apiary was attended with fatal consequences. A Ligurian queen was presented to me by a friend residing at a considerable distance. Having been sent in a moderate-sized nucleus box, accompanied with the bees of the small artificial swarm by which she was reared, and all being sufficiently well packed, ventilated, and supplied with food, she arrived in very good condition. I was desirous of placing her at the head of a strong swarm, so that I might obtain, as soon as possible, the full benefit of her breeding powers, and be enabled to raise numerous young queens from her, provided she proved by her progeny to be a pure-bred Ligurian. She was therefore enclosed with a few of her subjects in a perforated zinc queen cage, which was fixed among the combs of a hive from which I had previously removed the common queen; and having been allowed to remain for 24 or 36 hours in this condition, the cover was drawn, and she, with her fellow-prisoners, was set at liberty. The latter were seized upon and killed instantly, but the queen disappeared among the combs. A few hours after, observing some signs of excitement, I opened the hive, and discovered the queen encased in a dense mass of bees. Having separated them carefully, by catching each individual bee and throwing it away, her persecutors were reduced to two or three; and now was the critical time. I had great difficulty in preventing these from inflicting a fatal sting, and had to crush one or two of them between my fingers to avoid such a catastrophe. Having freed her from their embraces, I again clapped her into the queen cage, and shut her up among the combs for another period of imprisonment. Like some kings and queens in our own history, she was only secure from a violent death by being subjected to the rigours of a prison.

When I thought that a sufficient time had elapsed, and that the bees would surely have become accustomed to her presence, and acquainted with her person, she was again set at liberty. The hive was allowed to remain undisturbed for some hours, at the end of which, on going to ascertain the result, I found her lying dead on the ground outside the hive.

I have had other cases of queen encasement, in which an attempt was made to disengage the queen, and to confine her in a queen's cage; but they have nearly always, but not invariably, proved fatal.

I have had other instances where the same sort of encasement has taken place, but the bees have of their own accord gradually unfolded themselves, loosened their grasp of each other and the queen, and she has come out of the ordeal scatheless. Occasionally I have found a wing or a leg crippled, or altogether missing, having been maimed in the cruel embrace of her subsequently loving subjects. Although I have raised a very large number of artificial queens, my plan of late years has been to let the hives or small swarms alone, and on no account to disturb them or the bees to which strange queens have been given, for many days. Although I have no reason to doubt that the same kind of queen encasement has frequently taken place, yet I have hardly ever lost a queen from this cause since adopting this plan. I believe the very anxiety of the bee master too frequently defeats his object—the bees are excited to anger which they would not otherwise have manifested. To sum up in a few words, in raising artificial queens and swarms, avoid premature and injudicious meddling, and fewer casualties will occur from queen encasements. *S. Bevan Fox.*

Garden Memoranda.

Thoresby, the Residence of Earl Manvers.—The princely residence of Earl Manvers is situated in the midst of an extensive park, 10 miles in circumference, and containing about 5000 acres of land. On the north side the park joins the Duke of Newcastle's estates at Clumber, while the west abuts on the picturesque village of Budby.

To the west of the mansion there is a broad and spacious lake, more than a mile in length, which is supplied by a small river. On the lake are a number of small pleasure boats, several handsome vessels, and one full-rigged ship, which I was told was built in the neighbourhood of Gainsborough. The rustics suppose it to be the identical vessel which Mother Shipton prophesied would "sail over Nottingham Forest." The present mansion is to be superseded by a new one, built in the Elizabethan style of architecture. The site is well chosen; it is on a gentle rise of ground near the Rookery, and about a quarter of a mile from the kitchen gardens. When the new Hall is completed, and the furniture, paintings, &c., are removed, the present Hall, which is not remarkable architecturally, is to be taken down, and the flower beds turfed over, but the pleasure grounds will remain much as they are. The kitchen gardens, with the forcing houses, &c., are situated about half a mile to the north-east of the present house, while the principal flower gardens surround the mansion, and are seen from the Hall windows.

Entering the flower garden (in September last) from the park by the east end of the mansion—to the left there were a number of flower beds laid out in geometric order, and on each side of the terrace walk in front of the house there were two other sets of beds corresponding with those just named. Referring to the beds marked in the subjoined plan (fig. 7), among those that deserve special notice were Nos. 1 and 12, with the centres of Verbena venosa, and edged with Dactylis glomerata fol. var.; 2, 2, centre Pelargonium Cybister, next one row of Pelargonium Lady Plymouth, with the outer edging of Polemonium coeruleum variegatum, an elegant silver-leaved plant for decorative

purposes, dwarf and compact. The corresponding beds, 3, 3, had the centre of Pelargonium Golden Chain, with a broad band of Lobelia speciosa. 4 had the effective bed, with the centre Pelargonium Flower of Spring, surrounded with three rows of Verbena Purple King, and the outer edging Verbena Crimson King. 6, 7 and 8 were beds in the form of diamonds cut into four quarters, with the lines, 6, of Stella Pelargonium, then the two quarters, 7, 7, Coleus Verschaffeltii, and the corresponding quarters, 8, 8, Centaurea candidissima. This bed, though not so massive in its proportions as 4 and 5, was yet chaste and beautiful. Beds 19, 19, were very beautiful, the plants used were all common ones, yet the effect was such as left nothing more to be wished for. The centre was Pelargonium Christine, encircled with one ring of Verbena Purple King, and the whole belted with a broad band of Cerastium tomentosum. Of the most striking Pelargoniums I may mention Lady Constance Grosvenor, a variety much in the style and habit of Cybister, with intense fiery scarlet flowers, immense truss, free bloomer, with the advantage of being dwarf and compact in habit and growth. Bayard was of all other Pelargoniums the most Pelargonium, of Mr. Pearson's raising, that he has at present sent out.

From the flower garden, in a westerly direction, there was a ribbon border communicating with the pleasure grounds, planted as follows:—1st row, Cerastium tomentosum; 2d, Calceolaria Sparkler and Kayii alternately; 3d, Carnations and Picotees; 4th, Ageratums; 5th, Dahlias; 6th, Hollyhocks and Castor-oil plants. Leaving the flower garden and wending our way to the left, a splendid scene opened on our view. Instead of being in a nobleman's private flower garden, it might have been imagined that we were transplanted into some Transatlantic forest, for as we looked around—

> "Majestic woods of ever vigorous green,
> Stage above stage, high waving o'er the hills;
> Or to the far horizon wide diffused
> A boundless deep immensity of shade."

Below the flower garden there is a broad sweep of grass, dotted here and there with choice evergreens, that extends to the narrow lake, which receives its supply from the larger lake above. To the right, in the shrubbery, there is a rushing cascade, crossed by a light and elegant bridge, and what otherwise might have been merely a plain, tame run of water is now rendered picturesque and beautiful; for the water is made

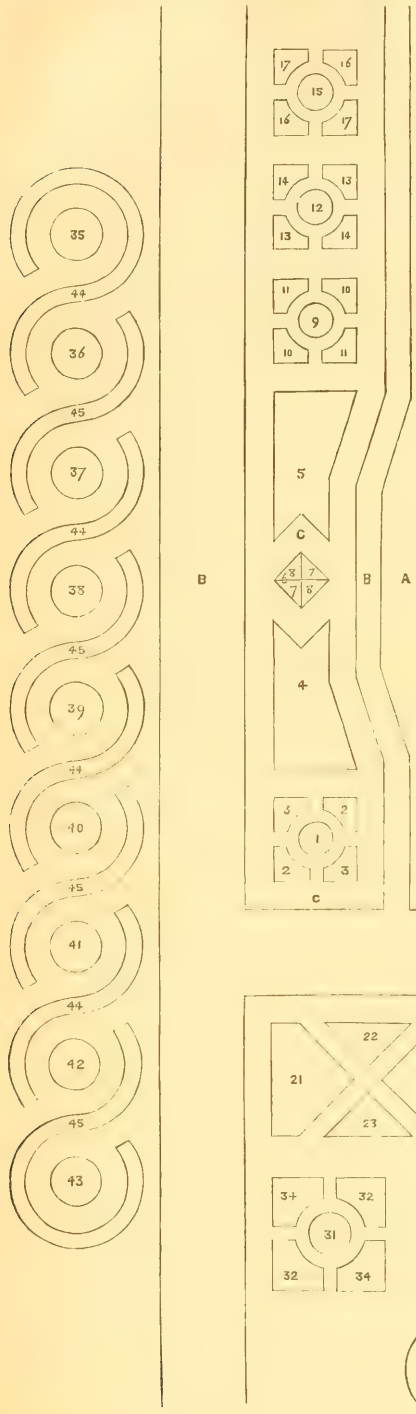

REFERENCES TO THE PLAN.

1, Verbena venosa, edged with Dactylis glomerata foliis variegatis. 2, Cybister Pelargonium, and band of Pelargonium Lady Plymouth, with the outer ring of Polemonium cæruleum variegatum.—3, Golden Chain Pelargonium, edged with two rings of Lobelia speciosa.—4, Pelargonium Le Grand, next three bands of Verbena Purple King, edged with two rings of Pelargonium Flower of Spring, the flowers picked off.—5, Pelargonium Flower of Spring, next three rings of Verbena Purple King, and two outer rings of Verbena Crimson King.—6, 7, and 8, Cross of Pelargonium Stella; 7, Coleus Verschaffeltii; 8, Centaurea candidissima.—9, Pelargonium Christine, edge Coleus Verschaffeltii.—10, Pelargonium Excellent, edged with Golden Feather Pyrethrum.—11, Pelargonium Flower of the Day, edged with Verbena Purple King.—12, Verbena venosa, edged with Dactylis glomerata foliis variegatis.—13, Calceolaria Golden Gem, edged with Verbena Crimson King.—14, Tropæolum coccineum, edged with Lobelia speciosa.—15, Centaurea candidissima, edge Pelargonium Little David.—16, Pelargonium Stella, edged with yellow Pansy.—17, Ageratum, edged with Pelargonium Flower of Spring.—18, Pelargonium Stella, one band of Pelargonium Flag of Truce, and three outer rings of Lobelia speciosa.—19, Pelargonium Christine, next a band of Verbena Purple King, edged with two rings of Cerastium tomentosum.—20, Pelargonium Amy Hogg, one ring of Golden Feather Pyrethrum, edged with Mrs. Pollock.—21, Pelargonium Le Grand, one line of Perilla nankinensis, and edged with Mrs. Pollock. 22, Pelargonium Golden Chain in centre, edged with Iresine Herbstii.—23, Nierembergia gracilis, edge Lobelia speciosa.—24, Pelargonium Lord Derby, edged with Nierembergia gracilis.—25, Pelargonium Silver Gem, edge Tropæolum coccineum.—26, Pelargonium Golden Chain, edged with Clematis Jackmanni.—27, Pelargonium International, edged with Alyssum variegatum.—28, Centaurea candidissima, edged with Pelargonium Little David.—29, Pelargonium Golden Fleece, edged with Imperial Blue Pansy.—30, Heliotrope.—31, Centaurea candidissima, edged with Golden Feather Pyrethrum.—32, Pelargonium Trentham Rose, edged with Verbena Purple King.—33, Ageratum, edged with Verbena Crimson King.—34, Pelargonium Flag of Truce, edged with Lobelia speciosa.—35, Coleus Verschaffeltii, edged with Pelargonium Golden Chain.—36, Pelargonium Christine, edged with Iresine Herbstii.—37, Pelargonium Bayard, edged with Viola cornuta alba.—38, Pelargonium Christine, edged with Verbena Purple King.—39, Pelargonium Lady Constance Grosvenor, edged with yellow Pansy.—40, Coleus Verschaffeltii.—41, Pelargonium Christine, edged with Verbena Purple King.—42, Pelargonium Amy Hogg, edged with Viola cornuta alba.—43, Pelargonium Flower of Spring, edged with Iresine Herbstii.—44, Centre line, Verbena Crimson King, and a line on each side of Alyssum variegatum.—45, Centre line, Centaurea candidissima, with one line on each side of Lobelia speciosa.—46, Rhododendrons mixed with Gladiolus.—47, Fountain.

A. Mansion. B. Gravel Walks. C. Grass.

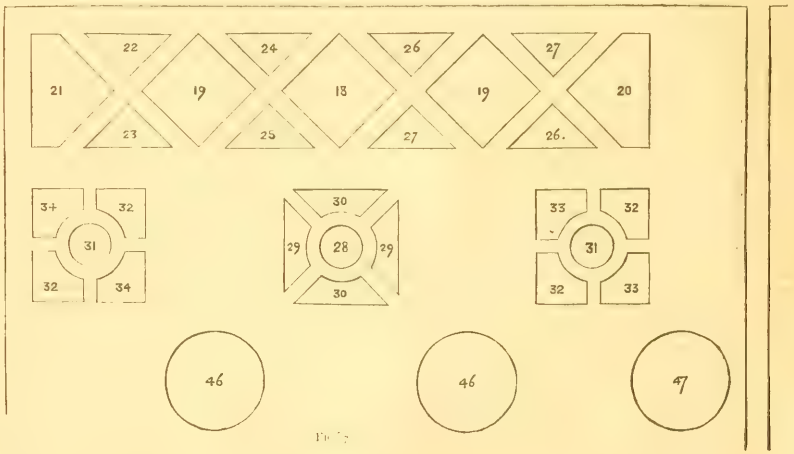

centre of Pelargonium Le Grand (which was in fine condition), next three lines of Verbena Purple King, and the two outside rows of Pelargonium Flower of Spring, with the flowers all picked off. 5 was a very conspicuous; it is a crimson-scarlet nosegay, with a wonderfully free blooming habit, large symmetrical trusses, set on beautiful dark green foliage. It is allowed by competent judges to be the best bedding

> "To ripple and shine,
> With the glory and dash of a miniature Rhine."

In the distance, and almost opposite the house, we catch a glimpse of the Chestnut avenue, an unbroken

vista a mile in length. As we rambled on I noticed a nice specimen of Pinus Cembra, a very large and venerable old Oak, also a very fine plant of the Fern-leaved Beech. Descending to the water's edge, we crossed another ornamental bridge, that brought us on to a small island planted entirely with Roses, and which might have been called the Land of Roses, and was just the spot where some of our great Rosarians would love to revel amidst the glories of the Queen of Flowers. *Quintin Read.*

(To be Continued.)

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

I HAVE before suggested that *Tritonia aurea*, one of the most showy of our late autumnal blooming plants, should not by any means be allowed to become dry at the ball, for the underground growth should never be permitted to go to rest, in the proper acceptation of the term—and for this reason: immediately the flowering stalks show signs of exhaustion in the autumn, young growths emanate from the old tuber at the base of each flower-stalk, and these, if properly encouraged, make by far the finest growth. Hence, by keeping the balls moist, such encouragement is afforded. I do not advise shifting them yet. By shifting, I mean putting the old ball into a pot one or more sizes larger. This should not be done until the young leaves are some 6 or 7 inches above the soil. Where a division of the plants is intended, the operation should be performed immediately the young growths appear through the old soil. The latter should be entirely removed when dividing them; after which the bulbs, old or young, with the young growths attached, should be carefully placed, whole and unimpaired, into fresh pots. The latter should be properly prepared beforehand by filling them about three-parts full of soil. Place the young underground shoots rather thickly when repotting. I find that they do better when thus treated. Press the soil firmly between and around the roots, and bring the tip of each young growth upward into its proper place. They thrive best in a compost, made up of one part very fibrous loam—if the smaller particles are sifted out so much the better—and three parts of fibry peat, with a good sprinkling of leaf-mould and silver sand. Like their near allies, the *Ixias*, and other Cape of Good Hope *Irids*, they do not require any more warmth than is necessary to keep out frosts. They do well in cold pits, or any other similar position, where such an amount of protection can be afforded. Indeed, like some of the Alströmerias (along with which they afford a pleasing variety), they will do in the open border if protected from ungenial extremes of weather. Treated in the above manner my plants annually produce stems laden with their peculiarly tinted blooms, some 3 and 4 feet in height. Those who do not practise the autumn potting of Japanese and kindred *Liliums*, should at this time ascertain whether they have stored their stock away in a sufficiently cool place; for, if otherwise, it is possible that a premature activity has been induced, and that they may require the shifting-on, or potting, as the case may be. Some remarks in a late number by "J. M." are very sensibly put. I have bulbs of Liliums, which have received the ordinary cool treatment, and which have leaves still green upon their active stems whilst I write; so that "circumstances materially alter cases" in this, as in many other matters. Old bulbs or plants of any of the persicum strain of *Cyclamens*, which are at this time pushing up their flower-stalks, would be materially benefited by receiving an occasional application of manure-water. If the surface soil upon the balls is overgrown with Moss, it should be removed, and a fresh surfacing of wholesome compost, containing a little dried cow-dung, broken small, should be pressed firmly in its place.

FORCING HOUSES.

Those who may have *Early Vines* in flower should maintain at this season a moderately dry atmosphere. It would be advisable to assist them in process of fertilisation by dusting the pollen on to the pistils, especially in the case of Muscats, Sweetwaters, &c. A good temperature should be maintained,—this, in fact, should average from 68° to 70°, according to the dulness or otherwise of the outer weather. Do not let the warmth decrease below 60° to 62° by night at this stage. Fresh, sweet air is also of much importance, and should be carefully admitted on all proper occasions. *Pines* will need about the same temperature as for last month, that is, from 63° to 65° by day, with an increase of 5° to 7° by actual sun-heat, and a decrease by night of 4° or 5°. Keep the surface of the tan-beds frequently moistened over by sprinkling with tepid water, &c., and occasionally stir the surface of the tan with a stick, to afford an amount of humidity to counteract the drying tendency of the artificially heated air, as it will not do to syringe the Pines too frequently at this time. Keep the evaporating pans constantly charged with moisture, and the floors damp. I would here again suggest that the night temperature should be allowed to fall three or four degrees, rather than insist upon such a mean as will cause an excessively parched atmosphere. Introduce successional batches of *Strawberry Plants* into a Peach-house, or other similar structure; advance moderately with the forcing of such subjects. Those who force *Cherries* should carry forward the operation very gently. A low temperature, from 42° to 46°, will be ample warmth if fire-heat alone is used. Of course, it may grow up more freely with natural warmth. Keep up a moist atmosphere constantly.

HARDY FLOWER GARDEN.

In resuming the subject of ornamental plants suitable for amateurs and others of limited means, I may refer to ornamental trees and shrubs apart from climbing plants. I will first of all run through the list of ornamental trees, leaving plants or shrubs of more lowly growth till the last. The *Double Crimson Thorn* (Paul's), is perhaps amongst the most beautiful. As a variegated plant of the "first water" *Acer Negundo variegatum* would, whether as a dwarf or standard, afford the most pleasing contrast to the former; and again, to form a trio, what could be more suited than the well-known *Copper* or *Purple Beech*—and especially the larger leaved improved F. s. macrophylla. The *Weeping Ash* is a well-known and distinct object, forming one of the most beautiful of Nature's bowers. Standard *Almonds*, such as Amygdalus domestica, A. nana, and especially the double variety, A. persica flore-pleno, are very pleasing objects in the early spring. *Ailantus glandulosa* (Tree of Heaven) has a tropical-looking appearance when in leaf, though of rather stronger growth than those previously enumerated. The cut-leaved *Weeping Birch* (Betula pendula incisa) looks pretty as a standard. The double-flowering *Cherry* (Cerasus Avium multiplex) is like the Almond above-mentioned, yet very distinct; the flowers, which have longer petals, are plentifully produced in spring. *Colutea arborescens* (the Bladder Senna), with its olive-green foliage and strange, puffy, bladder-like seed-pods, has much that is interesting. For the sake of variety, the *Cornelian Cherry* (Cornus mascula) and its variegated form, C. m. variegata, flowering as they do rather abundantly ere the leaves peep forth in the early spring, may be added. Turning to the well-known *Laburnums*, we have in this division one of the most strikingly pretty objects, and one having a great amount of botanical interest. I refer to the Cytisus Adami—a supposed hybrid, the flowers of which are more or less of a reddish purple tint, others being of a bright yellow; whilst here and there amongst the blooming wood push forth branches entirely of the dwarf purple Cytisus. There are others belonging to this class which are very pretty objects, and may be obtained where the varieties needed are not limited, without occupying further space in their enumeration herein. A beautiful hardy tree is the *Tulip tree* (Liriodendron tulipiferum), the foliage of which, independently of its peculiarly striking blossoms, is extremely handsome. *Paulownia imperialis* is a very ornamental tree, with large leaves. *Populus nivea* is a fast-growing variety, preferable even to the Abele, with the leaves white beneath. *Prunus triloba* blooms somewhat in the way of the Almond in early spring, the blooms being less densely packed together, but individually much larger. *Acacias* (Robinia), in three or four varieties, have very chaste foliage, independent of their blooms; they also make very pretty standards. The several varieties of the *Sumach* are exceedingly beautiful, more especially the Venetian (Rhus Cotinus). The dark crimson, double-flowered, white and yellow varieties of the flowering *Currants* (Ribes) are sufficiently known to render further notice unnecessary. The scarlet-fruited *Elder* (Sambucus racemosa) bespeaks by its name its own peculiar merits, and deserves further trial. Amongst the many lovely *Spiræas* choose S. ariæfolia, which makes so beautiful an object with its white plumes of inflorescence. Of *Brooms* (Spartiums), standards are procurable of the showy white Portuguese and the yellow varieties. Amongst *Elms*, Ulmus emarginata is very showy as a variegated one, and somewhat new. Amongst *Viburnums*, the striking old Guelder Rose is to be found, and should not be rejected.

KITCHEN GARDEN.

Earth up those *Peas* or *Broad Beans* which were sown some time ago, and which are fairly through the ground. A few rows of *Early Potatos* may now be planted upon a warm sunny aspect, to succeed those from the late frames. Get together the necessary fermented materials for the early frame *Potatos*, *Carrots*, and *Radishes*, with as much dispatch as possible, for the days will now quickly become longer. Where it is intended to fresh plant *Horse-Radish*, or to make fresh beds with the crowns of such as have, according to olden usage, been saved, let the necessary space be cleared and prepared as opportunity offers. Those who plant crowns in trenches should have these made alone. The best method, however, is to thoroughly trench a piece of ground, heavily manuring it at every spit, with some such material as rotten leaves. Then dibble in, in neat rows, such thin long lengths, from a foot and upwards, as are procurable. They quickly form usable stuff. *W. E.*

TOWN GARDENING.

GOOD bulbs of the beautiful *Lilium auratum*, *L. lancifolium*, *L. rubrum*, and *L. album* can now be obtained at a moderate price. I have no doubt of their doing well and giving great satisfaction if potted at once. The roots should be placed singly into 24-sized pots, about 2 inches below the surface of the mould, which should be composed of about two-thirds of good turfy loam chopped fine, one-third of well rotted dung and leaf-mould, and a good portion of silver sand, well incorporated. The bottom of the pots should be covered to the depth of about 2 inches with broken pots, and on this a layer of rough pieces of loam should be placed, to keep the drainage free from obstructions. When potted they should be watered very sparingly at first, and be placed in a position secure from frost. When there seems no reason to fear frost the bulbs may be put out into the open air, in dry ashes, in a position tolerably free from draughts, and where they can be in the full sun. As the flowers commence to expand they should be removed indoors. An effective bed may be made out-of-doors if a warm position is selected. This should be prepared by digging out the soil to the depth of 18 inches; the bottom should then be covered with brick rubbish, and be filled in with a similar mixture of soil to that recommended for potting them in. The bulbs should be planted 9 inches apart, about 4 inches below the surface. The bed will require protection from rain and frost, and when in bloom a canvas cover should be placed over them. *J. D.*

MONTHLY DEPTH OF RAIN IN INCHES AND HUNDREDTH PARTS OF AN INCH, WHICH FELL AT CHISWICK IN THE YEARS 1841 TO 1869, INCLUSIVE.

	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
January	2.60	1.66	1.33	2.25	2.97	2.35	1.16	1.73	1.43	0.35	3.07	2.72	2.14	1.92	0.10	1.76	2.09	0.41	0.61	2.18	0.52	1.53	3.72	2.16	1.64	1.98	1.64	1.98	1.98
February	0.76	1.32	2.25	2.27	0.93	1.47	1.34	2.58	0.35	0.65	3.05	0.41	1.09	3.57	0.35	1.45	1.42	0.52	2.18	0.52	1.53	2.19	0.57	3.50	0.95	1.98	0.95	1.98	0.32
March	1.32	1.81	0.47	2.44	1.25	1.09	0.41	3.82	0.65	0.13	0.90	1.06	0.59	0.78	1.35	0.62	0.31	1.48	1.31	1.20	1.41	0.38	0.26	0.76	3.85	1.33	0.86	0.89	0.89
April	1.58	0.15	1.52	0.33	0.95	3.93	3.66	4.42	1.79	1.43	1.65	0.52	2.58	0.30	0.26	1.97	1.77	2.13	2.01	0.95	1.44	2.29	0.54	0.77	1.65	1.98	1.07	0.93	0.86
May	2.16	1.73	5.26	0.25	2.80	1.35	1.59	0.28	3.53	1.54	1.74	1.62	4.93	1.94	4.98	0.87	2.05	1.80	3.04	1.31	3.54	2.29	0.54	0.77	3.35	1.98	1.67	0.43	1.22
June	2.45	1.58	1.62	0.97	1.36	0.80	1.31	3.20	0.31	1.40	4.69	2.54	1.53	1.48	0.88	1.91	0.78	3.10	5.15	2.35	2.33	4.46	1.70	1.84	3.60	1.37	0.73	1.26	2.76
July	3.36	1.52	1.67	2.10	2.31	1.78	0.79	2.21	2.82	2.63	3.90	2.28	4.17	2.40	6.30	1.43	1.22	2.55	2.18	2.72	1.90	2.09	0.80	0.39	2.37	1.30	3.00	1.32	0.89
August	2.69	3.48	1.84	2.79	4.30	1.30	4.70	2.21	2.82	2.63	3.90	3.71	1.87	1.77	1.45	3.50	2.80	1.46	2.49	4.16	0.39	2.40	1.96	1.59	3.64	2.69	1.37	2.55	1.32
September ...	3.71	0.58	7.31	1.77	1.96	1.66	2.00	2.40	2.16	0.97	2.03	3.87	2.41	0.58	1.15	1.99	3.32	1.05	4.05	2.82	1.28	2.74	3.47	2.79	0.58	4.04	2.65	2.37	2.37
October	4.61	4.19	4.13	1.39	5.54	1.75	2.03	2.16	1.55	2.01	3.87	3.78	2.61	6.25	1.58	4.01	3.52	1.36	2.55	1.60	1.04	3.00	1.36	1.42	6.25	2.00	2.38	1.88	3.72
November	3.41	2.13	3.06	2.11	1.43	2.66	0.90	1.38	2.63	1.87	3.71	1.87	1.77	1.11	1.34	0.94	2.40	1.36	2.72	2.66	1.04	3.00	1.68	1.94	1.70	1.16	0.39	1.07	2.18
December	3.41	2.13	3.06	2.11	1.43	2.66	0.90	1.38	2.63	1.87	3.71	1.87	1.77	1.11	1.34	0.94	2.40	1.36	2.72	2.66	1.04	3.00	1.68	1.94	1.70	1.16	0.39	1.07	2.18
Annual amount }	39.97	22.27	35.48	21.34	23.13	27.71	16.65	28.14	22.69	16.28	29.79	32.55	24.37	16.92	24.38	22.72	21.06	15.76	25.54	30.08	19.48	26.54	20.32	16.66	26.92	20.04	21.23	19.86	21.69

The amount of rain which fell in 1869 was 21.69 inches, or 1 inch 86 hundredths below the average of 40 years.

STATE OF THE WEATHER AT CHISWICK (LONDON).

For the Week ending Jan 5, 1870, as observed at the Horticultural Gardens.

Dec and Jan.	Moon's age	Barometer		Temperature					Wind	Rain.
				Of the Air.			Of the Earth			
		Max	Min	Max	Min	Mean	1 foot deep	2 feet deep.		
Thursday	30	29.950	29.625	42	37	39.5	38	37	S.	0.00
Friday	31	29.535	29.227	46	39	42.5	40	37	S.	0.35
Saturday	1	29.233	29.034	51	41	46.5	42	38	S W	0.02
Sunday	2	29.568	29.458	49	42	45.5	44	40	S	0.00
Monday	3	29.623	29.561	50	40	48.0	45	41	S	0.02
Tuesday	4	30.078	29.965	51	40	45.5	45	42	S W	0.12
Wed	5	29.981	29.593	52	35	43.5	46	42	S W	0.09
Average		29.621	29.477	50.0	39.0	44.5	41.0	39.6		0.05

Dec 30—Line; overcast, cold wind; densely overcast.
" 31—Short rain; rain, foggy; heavy rain
Jan 1—Clear and fine; cloudy; showery at night
" 2—Drench overcast; overcast, damp; densely overcast
" 3—Overcast; drench overcast; fine
" 4—Lovely, but fine; overcast; slight rain
" 5—Rain; densely overcast; hail showers 4 P.M.; rain
Mean temperature of the week, 7.7 above the average

STATE OF THE WEATHER AT CHISWICK

During the last 44 years, for the ensuing week, ending Jan 15, 1870.

January	Average Highest Temp.	Average Lowest Temp	Mean Temp	No. of Years in which it was Rained	Greatest Quantity of Rain	Prevailing Winds.							
						N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
Sunday 9	41.4	31.0	36.2	15	0.71 in	1	8	4	4	0	14	6	1
Mon ..10	49.0	30.4	39.7	18	1.40	2	10	3	6	0	7	7	2
Tues .. 11	41.4	30.3	35.8	22	1.00	4	7	5	4	0	11	5	2
Wed .. 12	42.1	30.2	36.1	18	0.70	2	7	4	5	8	11	4	3
Thurs 13	42.7	31.7	37.2	10	0.62	0	5	6	6	1	9	7	5
Friday 14	42.3	30.0	36.2	20	0.86	4	7	6	6	2	12	5	2
Satur 15	42.0	29.0	35.5	14	0.54	3	7	5	3	4	10	0	2

The highest temperature during the above period occurred on the 12th, 1852—therm 54 deg.; and the lowest on the 13th, 1867—therm 3 deg.

Notices to Correspondents.

BARNES FUND: Received, Robert Parker, £1 1s.; F. J. Baines, 10s. 6d. The following additional subscriptions have been promised: Rev. S. R. Hole, £1 1s.; R. T. Pince, Esq., £1 1s.; Messrs. Lucombe, Pince & Co., £1 1s.; Mr. W. Thomson, £1 1s.; Messrs. Rollisson & Sons, £1 1s.

CYCLAMEN HEDERIFOLIUM VAR. GRÆCUM: *Mrs. Challoner.* Apply to your nurseryman.

NAMES OF PLANTS: *Feltham.* We believe your plant is Grobya Amherstiæ, but you should have sent us more particulars respecting it.—*Fungus: W. P., Shrewsbury.* Agaricus sublateritius.

PUBLICATIONS OF THE ROYAL HORTICULTURAL SOCIETY: *G. R.* Apply to the secretary, or through any London or country newsagent or bookseller.

VEITCH MEMORIAL: *G. N.* Your letter shall be forwarded to the committee.

VENTILATING FIRE-BAR COMPANY: *T. P.* We do not know the address of this company, or even if it be still in existence.

ERRATUM. In paragraph relating to Cyperus alternifolius variegata, at p. 9, col. *c*, for "32-inch pots," read "32-sized pots."

COMMUNICATIONS RECEIVED:—W. P. A.—J. W. T.—W. E. U.—Cestrian—T. R. (next week).—H. W. P.—J. N.—M. H. M. T. T. Bucks: your fruit has not arrived.—H. J.—J. B.—Learner.—D. C.—H. M.—J. L.

Markets.

COVENT GARDEN.—January 8.

We cannot speak of any revival in business here, and the reports from other markets in the provinces are very similar. The prevailing S.W. winds, charged with so much moisture, seriously affect the keeping properties of fruit, and make people still more cautious. The Potato trade is very heavy, and prices are from 5s. to 10s. per ton lower. Flowers chiefly consist of Orchids, Pelargoniums, Mignonette, Fuchsias, Primulas, Poinsettias, Heaths, Tulips, and Hyacinths. Small plants of Aucuba japonica in pots, and well laden with fruit, sell (retail) at 5s. each.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	3 0 to 5 0		Lemons, per 100	5 0 to 10 0	
Cobs, per lb.	1 0 — 1 6		Melons, each	1 6 — 3 0	
Chestnuts, p. bush.	8 0 — 14 0		Oranges, per 100	6 0 — 12 0	
Filberts, per lb.	0 6 — 0 9		Pears, per doz	3 0 — 6 0	
Grapes, per lb.	3 0 — 6 0		Pine-apples, per lb.	3 0 — 5 0	

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, p. doz.	3 0 to 6 0		Horse Radish, p. bun.	3 0 to 5 0	
Beet, per doz.	2 0 — 3 0		Leeks, per bunch	0 2 — 0 4	
Broccoli, per doz.	3 0 — 5 0		Lettuces, p. score	1 0 — 2 0	
Brussels Sprouts, p. ½ sieve	2 0 — 3 0		Mint, per bunch	0 4 — 0 6	
Cabbages, p. doz.	1 0 — 1 6		Mushrooms, p. pott.	1 0 — 1 6	
Capsicums, p. 100	2 0 — 2 6		Onions, per bunch	0 4 — 0 9	
Carrots, p. bunch	0 4 — 0 6		Parsley, per bunch	0 2 — 0 4	
Cauliflowers, p. doz	1 0 — 3 0		Salsafy, per bundle	2 0 — 2 6	
Celery, p. bund.	1 0 — 1 6		Scorzonera, do.	2 0 — 2 6	
Cucumbers, each	1 6 — 3 0		Seakale, p. punnet	2 0 — 2 6	
Endive, per doz.	1 6 — 2 0		Shallots, per lb.	0 8 — —	
French Beans, p. 100	2 0 — 3 0		Spinach, p. bushel	2 0 — 3 0	
Garlic, per lb.	0 8 — —		Radishes, per doz.	1 0 — 2 0	
Herbs, per bunch	0 2 — 0 4		Tomatos, per doz.	0 9 — 1 6	
			Turnips, per bunch	0 4 — 0 6	

Potatos, York Regents, per ton, 75s. to 100s.; Flukes, do., 75s. to 115s.

POTATOS.—Southwark, January 3.

During the past week the arrivals coastwise have been very large, and far in excess of the demand. Trade extremely dull—quite of a holiday character, and prices declining. The following are this day's quotations:—Yorkshire Regents, per ton, 70s. to 90s.; Lincolnshire do., 60s. to 80s.; Kent and Essex do., 60s. to 80s.; Dunbar and East Lothian do., 70s. to 100s.; Perth, Forfar, and Fifeshire do., 65s. to 80s.; Ditto Rocks, 60s. to 65s.

JAMES FAIRHEAD AND SON, 7, Borough Market, London, S.E., offers the following:—

DILLISTONE'S FIRST EARLY PEAS	10s per bushel
SANGSTER'S No 1	9s per bushel.
BEDMAN'S IMPERIAL	5s per bushel.
ALTRINGHAM CARROT	50s per cwt.
LONG RED SURREY CARROT	50s per cwt
EARLY FRAME TORQUAY TURNIP	50s per cwt
DRUMHEAD CABBAGE	50s per cwt

Special prices for other articles on application.

SPECIAL OFFER to the TRADE.

DILLISTONE'S FIRST EARLY PEA	11s 6d per bushel
SANGSTER'S No 1 PEA	9s 6d per bushel
BEDMAN'S IMPERIAL PEA	10s 6d per bushel
MACLAINE'S FIRST EARLY ROYAL PEA	11s 6d per bushel
PRIZETAKER PEA	11s 6d per bushel
DICKSON'S FAVOURITE PEA	9s 6d per bushel.
ALTRINGHAM CARROT	50s 0d per cwt
LONG RED SURREY CARROT	50s 0d per cwt
EARLY SCARLET HORN CARROT	60s 0d per cwt
EARLY YORK CABBAGE	112s 0d per cwt
LARGE YORK CABBAGE	112s 0d per cwt
ENFIELD MARKET CABBAGE	120s 0d per cwt
DRUMHEAD CABBAGE	70s 0d per cwt
WHITE SPANISH ONION	2s 3d per lb
WHITE GLOBE ONION	2s 0d per lb
BROWN GLOBE ONION	2s 0d per lb
RED TURNIP RADISH	28s 0d per bushel.
WHITE TURNIP RADISH	28s 0d per bushel
MIGNONETTE	2s 0d per lb

All are fine samples, and good stocks. Any quantities may be had of above, either larger or small.

Special quotations will be gladly sent for any other description of Seeds upon application.

ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London.

THE SHIPLEY PROLIFIC FRAME CUCUMBER.—This is a new Cucumber, of most extraordinary productiveness having had as many as 19 Cucumbers on two young plants ready for cutting at the same time, with many more coming on. It has a very smooth skin, of a rich deep green colour, and grows from 18 to 20 inches long. It has also the advantage of being a first-rate variety for winter work. Price 2s. 6d. per packet, free by post.

GEORGE JOHN CHILD, Seed Merchant and Nurseryman, 49, Darley Street, Bradford, and Bradford Nurseries, Shipley.

It can also be obtained of—

London	Messrs. Veitch, Henderson & Child.	
"	"	Hurst & Son.
"	"	Nutting & Sons
Norwich	"	Ewing & Child.

Other Names to follow as received.

Appointment of Farm Manager.

CROYDON LOCAL BOARD of HEALTH.—Beddington Sewage Irrigation Farm.—Notice is hereby given, that the Croydon Local Board of Health are about to appoint a PERSON to take the Management of their Sewage Irrigation Farm, at Beddington. He must possess practical knowledge of Farming, and will be required to devote to the whole of his time to the interests of the office. Salary £150 a year, with residence. A Printed List of the general Duties required to be performed may be obtained on applying at this Office. Applications, accompanied by Testimonials, must be sent to me before 4 o'Clock on Tuesday, January 18.

By Order of the Board,

Town Hall, Croydon. R. J. CHEESWRIGHT, Clerk.

WANTED, as PROPAGATOR and GROWER of SOFT-WOODED PLANTS, a middle-aged sober Man. Wages £1 per week. Apply, by letter only, stating age and where last employed, to JOHN MORSE, Nurseryman, Dursley.

WANTED, for a town in North Wales, a trustworthy middle-aged married Couple, without family, the Man as thoroughly conversant with the Culture of Vines, Flowers, and out of the Owner's House, when absent. Highest personal characters required. Wages £40 a year, with house accommodation.—W. J., Army and Navy Club, London, W.

WANTED, a GARDENER, who thoroughly understands his business. Married, no incumbrance. Wife brought up in a gentleman's family—able to take charge of the House in the absence of the Family. None but perfectly sober, and with unexceptionable references need apply. Wages £1 per week, house and fuel. —Apply to E. J. SCHOLLICK, Esq., Addingham Hall, Ulverston

WANTED, in the Country, a GARDENER, where two are kept.—Must be thoroughly competent, steady, and industrious. Wife required as Laundress. Cottage, with laundry completely fitted up, provided.—Apply by letter, stating all particulars, and lowest wages, in the first instance, to J. W., Messrs. Cubbison, Ellis & Secrett, 18, Old Broad Street, City.

WANTED, a GARDENER; his Wife as General Servant, must be a good Plain Cook.—Apply between 12 and 3 o'Clock to T. S. TRUSS, Iron Merchant, Friar Street, Southwark Bridge Road.

WANTED, an active, industrious MAN to take charge of a Garden, and assist in other Out-door Work. Must have had ample experience in the Culture of Fruit and Vegetables.—S., 337, Strand, W.C.

Seed Trade.

WANTED, a JUNIOR ASSISTANT or IMPROVER. Must be highly recommended and a good Writer.—Apply, stating age, references, salary expected, and all particulars, to Messrs. JAMES DICKSON & SONS, Chester.

WANTED, a DAIRYMAID, who can Manage a Dairy of 12 Cows, and who can Bake well.—Letters to be addressed to Mrs. HARDY, Post Office, Foot's Cray, Kent.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon CARTER'S adopting the most stringent regulations in reference to testimonials as to sobriety, honesty, &c.—JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, and GARDENERS and BAILIFFS, of various qualifications, who are open to engagements. Further particulars as to services required and wages given should be forwarded with application.—PAUL'S Nurseries, Waltham Cross, London, N

GARDENER (HEAD).—Married, without incumbrance; thorough practical Man. Five years in present situation.—X. Y., Mr. Wintersgill, Follefoot, Wetherby, Yorkshire

GARDENER (HEAD).—Middle-aged, married, two children; has lived in Noblemen's families. Two and half years' character. Well up in his profession.—A. B. C., 17, Cowley Road, Wanstead, N.E.

GARDENER (HEAD).—Age 38, married; thoroughly practical in every department. Good Grape Grower, and Flower and Kitchen Gardener. Understands Woods, Land, and Stock, and the general work of an Estate. Can be highly recommended.—S. J., West Street, Somerton, Somerset

GARDENER (HEAD).—Age 30, married; has a thorough practical Knowledge of Vines, Pines, Peaches, Melons, and Cucumber Culture; also the Management of Stove and Greenhouse Plants, thorough Forcing of Vegetables, &c.; is fully competent to carry out the Modern Style of Gardening throughout. Five and a-half years' unexceptionable reference as to character and ability. No single-handed place accepted.—R. J., The Gardens, Preston Hall, near Maidstone, Kent

GARDENER (HEAD).—A Gentleman, breaking up his Establishment, is anxious to obtain a situation for his Head Gardener, who is thoroughly competent in every respect. He has had considerable experience in a large Establishment as Second Gardener, and has given perfect satisfaction in his present position as Head Man. He is very industrious, a good Accountant, and well understands Propagating, Forcing, &c., with economy, and given his present employer entire satisfaction.—J. L., Post Office, Hayes, Kent.

GARDENER (HEAD), age 42, married.—EDWARD BENNETT, in consequence of the death of his late employer, G. S. Pearson, Esq., begs to offer his services to any Nobleman or Gentleman requiring the services of a first-class practical Gardener, fully competent in every branch of the profession, including Specimen Plant Growing, Early and Late Forcing, Spring, Summer and Picturesque Gardening. He has been for years a most successful Exhibitor, and a well-known Horticultural Writer. Testimonials of the highest order, with 12 years' excellent character.—Osberton Hall, Worksop, Notts.

GARDENER (HEAD) or GENERAL MANAGER.—Age 38, married, one child; thoroughly competent in all branches. Also understands the Management of Woods and Land. Over nine years' good character.—A. B., Fordingbridge, Hants.

GARDENER (HEAD, or SINGLE-HANDED).—Age 30, married; thoroughly understands Vines, Peaches, Cucumbers, Melons, Stove and Greenhouse Plants, and Flower and Kitchen Gardens.—J. T., 214, Syston Street, Leicester.

GARDENER (HEAD), where two or more are kept.—Age 26, single; understands Gardening in all its branches. Reference from last employer.—B. S., Trinity Church, East Peckham, Kent.

CARPENTER (on a Gentleman's Estate).—Married; has a thorough knowledge of his profession, Building, Making and Repairing Implements, &c. Fourteen years' good character.—F. G., Post Office, Bramley, Kent.

GARDENER (JOURNEYMAN), in a good place.—A young Man (son of a Gardener), who has served some time in the Gardens of Weir House, near Exeter.—Please state terms, &c., to Mr. J. M., Mr. Poynter, Nurseryman, Taunton; or Mr. Wm. Downey, Topsham, Exeter.

GARDENER (SINGLE-HANDED, or OTHERWISE).—Age 26, married, no incumbrance; understands Forcing, Vineries, and Flower and Kitchen Gardens. Can be well recommended from the situation he has fulfilled three and a-half years.—W. D., Post Office, Enstone, Oxon.

GARDENER (UNDER), in a Nobleman's or Gentleman's Garden.—Age 20; two years' character. No objection to a Premium.—S. D., Post Office, Chipping Sodbury, Gloucestershire

GARDENER (UNDER).—Age 23; seven years' experience. Writing to make himself generally useful. First-class testimonials.—W. C., Paul's Nurseries, Waltham Cross, London, N.

GARDENER (UNDER), or to Assist in a Seed Shop.—Age 20. Good references.—E. W., Mr Moss, Shelsley Lodge, Wickham, Hants.

FOREMAN, in a Nobleman's or Gentleman's establishment.—Has a thorough knowledge of the profession.—H. G., The Nurseries, Withington, near Manchester.

FOREMAN and PROPAGATOR.—Age 40; a thorough practical Man. Good references.—B. A., 1, Wildwood Grove, North End, Hampstead, N.

To Seedsmen and Florists.

IMPROVER.—A Youth, aged 19, desires Improvement in the above; has been four years with a Nurseryman and Seedsman. Satisfactory reference can be given.—J. & C., 8, Pelham Place, Seaford, Sussex.

To Noblemen and Gentlemen.

LAND AGENT, or STEWARD.—The Advertiser is open to a re-appointment as above. Knows the general routine of an Agent's duties, Farming, Reclaiming of Land, &c. Has been 13 years in present situation, which he is about leaving. Highly satisfactory references given.—M. M., Hurst & Co., Accountants, 9, Thavies Inn, London.

To Farmers, Corn Merchants, and Others.

MANAGER, of a Small Farm (or other place of confidence where services would be useful).—Age 21; has had three years' experience on a large Farm.—A. J. M., Mr. Durban, Bookseller, 206, High Street, Croydon, S.E.

AGENT and ESTATE BAILIFF (age 38).—A Gentleman wishes to recommend a thoroughly trustworthy Person, who has been in his employ for 13 years in the above capacity. He is an excellent Farmer and most efficient Accountant, and will receive the highest character.—A. B., Messrs. Dalton & Lucy, Booksellers, Cockspur Street, Charing Cross, London, S.W.

AGENT or LAND-STEWARD.—A Scotchman, who is a practical Farmer, and who has had for many years in England the Management of a large Estate, including the Superintending of Alterations, Quarries, Drainage, and General Repairs of Farm Buildings, Drainage, &c.; also a large Home Farm, wants a situation as above. Can give good references as to character and ability.—A. S., Messrs. Thos. Gibbs & Co., Seedsmen to the Royal Agricultural Society of England, corner of Half Moon Street, Piccadilly, W.

FARM or ESTATE BAILIFF.—Middle-aged, married, respectable; of energetic habits, and thoroughly practical in Modern Farming, Steam Cultivation, Draining, &c. Good Judge and Manager of all kinds of Stock; Breeding, Feeding, Buying, Selling, Management of Woods, Improvements, &c. Good Accountant. Can be highly recommended.—F. B., Post Office, Harlaxton, Grantham.

FARM BAILIFF, on a Nobleman's or Gentleman's Estate (under an Agent or otherwise).—Age 28; thoroughly practical in all branches of Farming. Satisfactory references.—W. O., Messrs. Peter Lawson & Son, 20, Budge Row, Cannon Street, E.C.

FARM BAILIFF (or otherwise).—Age 23, single. A highly respectable, good Accountant; willing to make himself generally useful. Excellent references.—H. H., Post Office, Lewisham, Kent

SHOPMAN or TRAVELLER.—First-class references, for which apply to J. C. WHEELER AND SON, Seed Merchants, Gloucester

SHOPMAN (or SECOND), in the Seed Trade.—Age 22. Experience principal object. Three and a-half years' experience.—T. H., 46, Rupert Street, Haymarket, W.

Seed Trade.

SHOPMAN (UNDER).—Age 19; respectable. Four years' experience in a London Wholesale House.—H. L., 5, Ebury Gardens, Ebury Square, Pimlico, S.W

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.

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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.

Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.

The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term

No investigation of title necessary, and no legal expenses incurred.

Application to be made to HORACE BROKE, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

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Henry Farquhar, Esq., (Messrs. Herries, Farquhar & Co.), 16, St James Street, S.W.
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The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy, in respect of their Glebe Lands.

The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.

No investigation of title required.

For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

OXFORD MEETING, 1870.
FARM PRIZES.

A PRIZE of a PIECE of PLATE, value 100 Guineas, offered by JAMES MANSELL, Esq., and a SECOND PRIZE of FIFTY POUNDS offered by the Society, will be given to the Occupiers of the two best managed Farms (which shall be entered for competition) in the district comprised within a line drawn through the Towns of Reading, Great Marlow, Aylesbury, Buckingham, Banbury, Stow-on-the-Wold, Lechlade, and back to Reading.

The Competition is limited to Tenant-Farmers, and the LAST DAY of ENTRY is SATURDAY, February 26

Further particulars and Forms of Entry may be obtained on application to
12, Hanover Square, London, W. H. M. JENKINS, Secretary.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited), CORN, SEED, MANURE, AND OILCAKE MERCHANTS
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices upon application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

THE LONDON MANURE COMPANY (ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Dressing,
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
MANGEL and POTATO MANURES.
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c
Offices, 116, Fenchurch Street, E.C.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantities and in fine condition. It is believed to be the best Artificial Manure ever produced. It has the Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 6 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.

Agents for the North of England—Messrs. Keighley, Maxsted & Co., Hull
Agent for Lincolnshire and neighbouring Counties—W. S. Gladstone, Esq., Old Hall, Spalding
Agents for South West of England—Messrs. Wm. Smith & Co., Bristol
Agent for Kent, Surrey, Sussex, Essex, Herts, and Middlesex—Mr. John G. Barry, 8, Old Jewry, London.
Agents for Scotland—Messrs. Richard Connon & Co., Glasgow and Aberdeen.
Messrs. Allan, Edwards & Co., Dundee.
Agents for Ireland—Messrs. R. F. Gladstone & Co., Dublin.
Price £11 per ton, delivered free to Rail or Wharf in London
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.
PERUVIAN GOVERNMENT GUANO, £13 10s. per ton.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO can be obtained of the undernamed, in any quantity, from one bag upwards.
Address, JOHN G. BARRY,
8, Old Jewry, London, E.C.,
London Agent for "Rees & Co.'s Biphosphated Peruvian Guano Company, Limited."

The Biphosphated Peruvian Guano combines the stimulating power of Peruvian Guano with the nourishing properties of superphosphate. It is sent out in Sealed bags, and each bag is guaranteed by Sellers. Write for Copy of Analysis by Dr. Voelcker, Consulting Chemist to the Royal Agricultural Society of England; Professor J. T. Way, of London; and other leading chemists.

NIGHTSOIL MANURE CONCENTRATED.—Prepared under the direction of the Corporation of Rochdale.
The above Manure is in the state of a Powder, so that it can be used with the Hand, Spade or Drill, and is free from the objectionable smell of Nightsoil.
In its preparation fire-heat is not used, and all the natural properties of Nightsoil and urine are retained. It is at least eight times stronger than the nightsoil and ashes collected in towns; and the Purchasers may rely on the Lanure being of an uniform strength, the purpose of the Corporation, in the experiments it has made, and in the manufacture, not being purely a money profit, but the improved Sanitary state of the Town, and also to solve the problem of the preparation of Nightsoil so as to make it convenient for carriage and not offensive in use.
With all kinds of produce, Horticultural and Agricultural, its use has been highly satisfactory. The Corporation is prepared to deliver it at the Rochdale Station at £1 per Ton, or to arrange for its delivery where required
Address Mr. HARESCEUGH, Town Hall, Rochdale.

SILVER SAND and PEAT, from Bedfordshire, in any quantity.—This Sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W.

A MANUFACTURER of MANURE, established 16 years, wishes to appoint a few respectable AGENTS. Good Commission.—Address by post, with occupation, &c., "Manure Agency," at 158, Bishopsgate Street Without, London.

Suttons' New and Clean Grass Seeds.

SUTTON and SONS, having completed the cleaning of their NATURAL GRASS SEEDS, will be pleased to send samples and lowest quotations. They are of unusual fine quality this season, and can be relied on as perfectly free from weeds.
SUTTON and SONS, Seed Merchants, Reading, Berks.

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest known in cultivation, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses
Exotic Nursery, Tooting, Surrey, S.W.

Decorative Beet.

DELL'S JET BLACK-LEAVED BEET surpasses the Perilla as a decorative plant, and is decidedly the best Beet in cultivation, being uniform in height and colour, also fine for culinary purposes. Price 1s. 6d. per oz. The Trade supplied. To be had genuine from MITCHELL, ARNOTT AND CO., Edinburgh; and 59, Mark Lane, London, E.C.

To the Wholesale Trade.

HERBERT H. NICHOLSON, SEEDGROWER, Great Clacton (near St. Osyth), Essex, has the following SEEDS to offer, for cash only:—

ROBINSON'S PRIZE CHAMPION OX CABBAGE, 8oz. per cwt.				
NONPAREIL CABBAGE	..	..	..	112s. ,,
WHITE CELERY (Leviathan)	..	..	..	95s. ,,
SELECTED DARK RED BEET	..	..	..	140s. ,,
STUDENT PARSNIP	..	..	..	80s. ,,
MYATT'S CURLED PARSLEY	..	..	..	28s. per bush.
STUBLE TURNIP	..	..	..	28s. ,,

&c. Also all the Annual FLOWER SEEDS, at low prices.

TO the SEED TRADE.
HAMILTON'S INVINCIBLE CUCUMBER.
CUTHILL'S BLACK SPINE CUCUMBER.
OSBORNE'S WINTER WHITE PROTECTING BROCCOLI.
DOUBLE CRESS.
IMPERIAL LONG YELLOW MANGEL (superior stock).
All new of 1869, and true, of own growth, offered cheap.
STEPHEN BROWN, Seedsman, Weston-super-Mare, Somerset.

Potatos.

CHARLES TURNER'S SEED CATALOGUE contains a Select List of Kidney and Round varieties, including two new kinds now offered for the first time,
UNION, a Round variety, and BEACONSFIELD, Kidney.
The latter received a First-class Certificate at the Royal Horticultural Society. The Nurseries, Slough.

POTATOS, SEED.—Early Ashleaf Kidney (old sort), Lemon Kidney, Early Prolific, Walsworth, Telford, Dalmahoy, Golden Dwarf, and Fluke can be supplied in quantity. ARTICHOKE, JERUSALEM, of fine quality, for present use, or for seed, in quantity. SEAKALE, 2-year-old roots. ASPARAGUS ROOTS, 1 and 2 years.
For prices, which will be reasonable, apply to
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Seed Potatos.

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The Agricultural Gazette.
SATURDAY, JANUARY 8, 1870.

ONE of the most interesting parts of the Reports on the Diseases of Cattle in the United States, and more especially on the Lung Plague and Periodic Fever, is that which contains the account of the investigations which were made with a view to ascertain if possible whether there is any reason to believe that parasitic growths in the blood or elsewhere have anything to do with the malady. Our friend, Mr. H. W. RAVENEL, who has published several volumes of dried specimens illustrative of the Fungi of Carolina, undertook to examine those of Texas, while Dr. BILLINGS and Brevet-Major CURTIS applied themselves more immediately to the examination of the fluids of diseased cattle with reference to the presence of cryptogamic growths. After all that has been said as to the fungous origin of cholera,* and the confident assertion by Dr. HALLIER that each form of fever has its own specific cryptogam, this became a necessary, and, in its general bearing, a very important object of inquiry. The examinations, which were carefully conducted, do not give the very slightest reason for supposing that there is any truth in the supposition. It may be perfectly true that minute bodies known under the name of Micrococci and Bacteria may be present even in the fluids of apparently healthy individuals, but our authors say expressly—"In a general way it may be stated that all abnormal appearances observed in the fluids examined were such as might be attributed to putrefaction. Although much remains to be learned as to the causes and nature of this process, the tendency of modern science is to class it as a species of fermentation, which may be defined as a particular mode of decomposition of organised bodies, accompanied by the growth of cells of a fungoid character, supposed to be active agents in the process."

The Fungi which were generated in the fluids were the common forms which occur generally in decomposing fluids, and as regards the more minute bodies above mentioned their nature is not at present accurately known. It is true Mr. RAVENEL informs us that Dr. HALLIER raised from the blood and bile of diseased animals an organism which he calls Coniothecium Stilesianum, of which he says, "Perhaps you may succeed in finding out the places where the Coniothecium grows in Nature. At all events, it is a parasitic Fungus growing on plants, and to be looked for in the food of the wild bullocks." This is, however, jumping to a conclusion in the same way as he did with respect to the supposed origin of cholera from a Fungus derived from Rice plants; and, after all, the supposed Coniothecium may merely be a form of some of the common moulds, and may have as little to do with the genus as the much talked-of Urocystus had with respect to the Urocystus occulta of RABENHORST.

We feel very thankful to Dr. BILLINGS and his colleagues for their patient investigation, as it is highly important that attention should not be drawn off from more rational views by mere fanciful notions. The following observations are worthy of attention:—

"It seems probable, in view of the results of the above experiments, that some of the Bacteria and Micrococcus germs are really fungoid in character, and capable of development into higher forms.

"If the above expressed view of the nature of these bodies be accepted as probable, the results of the culture experiments with fluids of disease and healthy animals can readily be understood.

* In a letter just received from Meerut, where experiments with reference to the Rice plant had been made at our suggestion, there is this passage:—"The Rice grew splendidly. I watched it daily, and throughout the whole of the time that cholera was present, and not a single Fungus could I find either on living or dead leaves, or on the seed or husk."

In many animals, whether healthy or diseased, there are no Fungus germs in the blood. We have kept vacuum tubes of blood for four months, and at the end of that time the contents were perfectly normal. In other animals there are probably germs in the blood during life, as shown by the fact that in vacuum tubes filled from them, the blood putrefied, and the usual mycoderms developed. But that these germs can develop and multiply, without dead organic material as a *pabulum*, is very doubtful.

"As was stated at the beginning, our object was to determine the presence, and as far as possible the nature, of these germs. The query as to the connection between them and disease, whether they should be considered as specific causes of the disease or as carriers of contagion, or as the signs of the destruction of vitality of a part of the fluid or tissues in which they are found, said destruction being due to some other cause, is one of great interest, for the answering of which, however, the lancet and injection tube will probably be far more efficacious than the microscope and 'culture apparatus.'" *M. J. B.*

DURING the earlier history of the Smithfield Club the whole of the animals were slaughtered and weighed before the prizes were awarded. In this competition weight was the principal test upon which the awards were based. This practice, however, was ultimately abandoned, and the system adopted of judging animals by inspection and comparison of their several points of merit as animals, of the particular class in which they were exhibited. In summing up in this manner the total of the good points of any animal, a mistake may occasionally have been made; nevertheless the system has acted well, and its results, on the whole, have been highly satisfactory. While the former system made weight of beef—presuming there was no deficiency in the quality of the same—to govern decisions (so that lumpiness, coarseness, and even a mis-shapen frame were not incompatible accompaniments to a prize medal), the new mode, while encouraging early maturity, so as to get great animal weight at any fixed age, requires the animal to possess size, symmetry, style, handling (combining quality of flesh, skin, and hair), fineness of bone, straightness of limb, and uniformity of flesh; and these, except in rare instances, can be found only in animals of pure descent, bred with great care, from parents possessing, as far as possible, the special points regarded as characteristics of high merit in the eyes of modern judges.

It is clear, therefore, that the modern practice has been the means of creating the very excellencies that it demanded, and to no inconsiderable extent has been the means of carrying out the objects of the Club, by encouraging the breeding of animals of a more perfect character. It has thus, also conduced to the material prosperity of the Club, and the success of its annual meetings, as well as permanently benefited the general meat supplies of the country. The fact, indeed, is quite clear that, under this system, we have got quit of the patchy Shorthorn, the shelly Devon, the thick-skinned Hereford, and the flat-sided, long-faced flabby pig; and we have cattle beautiful in form and colour, soft and velvety to the touch, yet with beef firm and elastic as india-rubber, level as a table on the top, and round as a barrel on the sides, on short legs, standing square, and covering an immense parallelogram of ground; and, finally, weighing, at an early age, much more than the lofty, long-legged, light-middled, big-ended beast of other days, whose heaviest beef was in those parts which are too coarse to make "a roast" of. At the present time, however, although the dead or carcase weight of the cattle exhibited is not known before the award of prizes is made, the live weight of the animals is, nevertheless, taken. These weights form an interesting record of comparison from year to year, and, so far, a test of the comparative merit of the best animals in different years, in the two points of weight and early maturity.

In judging between animals, it can, however, only be a true test on the one point of weight, and cannot nullify a combination of other points of excellence in another animal which may happen to weigh less on the scale. Thus it will be seen that at the Smithfield Show, in most instances, the prize beast was not the heaviest in its class, and in some it was the lightest. Indeed the very worst animal in the yard (with the exception of the uncultivated specimen of the bovine species brought from La Plata), viz., the Welsh half-bred ox, was about the heaviest beast shown, his live weight being 1 ton 7 cwt. 3 qr. 19 lb.; while Lord AYLESFORD'S ox, the winner of all the possibilities, both at Birmingham and Smithfield, weighed only 19 cwt. 2 qr. 23 lb.

While the live weight test fails as an absolute measure of the merits of any animal—and, indeed, is an only item in the account which the successful animal has to fully satisfy—it affords scope for some very interesting comparisons between classes. The live weights of class against class, and of breed against breed, may be summed up with advantage; and an average taken that will afford some useful conclusions. This use of the materials before us will be understood, when it is considered that in taking a whole class we get a full average of all the points of excellence in both—that is, in taking 3-year-old Shorthorns against 3-year-old Herefords, the average of merit of the Shorthorns, in size, touch, and quality, will be equal to the average of the Herefords in the same points. They, therefore, stand on equal ground, when we ask the scale to decide the question of the two breeds as to the point of early maturity, and as to their relative capacity to make beef in any fixed given time—at two years old or four years old, as the case may be. Anyhow, the facts supplied are true as far as they go, and they are essential to any calculation as to the most economical mode of converting fodder into marketable flesh. To the inquirer, moreover, they are interesting as furnishing him with ascertained facts, which he can use, as he would use bricks, in the construction of an edifice of opinion.

These reasons will be sufficient for the compilation of the following tables of the weights of prize animals at the late Smithfield Show. The live weights are from official sources. If the carcase weight be desired, it may be estimated by using the following data, which show the percentage of the live weight which is beef in the case of three classes of animals of various weights, according to Mr. EWART, of Newcastle-on-Tyne,—the first class being well fed and well bred; the second well bred, not well fed; the third neither well bred nor well fed.

LIVE WEIGHTS OF CATTLE SHOWN AT THE AGRICULTURAL HALL, DECEMBER 6—10, 1869.

	Devons.			Herefords.			Shorthorns.		
	Owner.	Prize.	Live Weight.	Owner.	Prize.	Live Weight.	Owner.	Prize.	Live Weight.
			Cwt. qr. lb.			Cwt. qr. lb.			Cwt. qr. lb.
STEERS.									
Not exceeding 2 years and 6 months old.	J. H. Buller ..	1st	13 0 26	P. Turner ..	1st	14 3 0	Her Majesty the Queen ..	1st	14 1 2
	W. G. Nixey ..	2d	12 2 12	Her Majesty the Queen	2d	14 3 22	Z. W. Stilgo ..	2d	14 3 12
	Her Majesty the Queen	3d	10 3 7				R. E. Oliver ..	3d	15 1 23
Not exceeding 3 years and 3 months old.	M. C. Hambro' ..	1st	14 0 6	J. Price	1st	16 3 26	The Earl of Aylesford	1st	19 2 23
	C. McNiven ..		15 0 4	The Earl of Darnley	2d	17 1 6	R. Wood	2d	17 3 24
	W. G. Nixey ..		13 1 4	H. Bettridge ..	3d	15 3 26	Lord Penrhyn ..	3d	20 0 13
	R. Farthing ..	c.	14 1 8	A. Pike	c	16 0 6	T. Pulver ..	c	17 2 14
				R. Wortley ..	c	14 2 24			
Above 3 years and 3 months old.	W. Farthing ..	1st	14 3 0	W. Heath ..	1st	19 0 6	John Outhwaite..	1st	20 1 6
	J. J. Farquharson	2d	15 0 13	The Earl of Darnley ..	2d	18 3 16	Marquis of Exeter	2d	20 2 21
	R. Burton ..	3d	16 0 8	H. Bettridge ..	3d	17 0 24	Col. Loyd Lindsay	3d	20 2 12
							R. H. Harris	c	20 2 2
							P. Brown..	c	19 2 21
							J. Freeman	c	19 2 23
							R. Wood..	c	20 3 16
HEIFERS.									
Not exceeding 4 years old.	W. G. Nixey ..	1st	12 1 4	J. H. Arkwright	1st	14 0 8	Col. Towneley ..	1st	17 1 8
	W. Farthing ..	2d	13 1 12	T. Garrett ..	2d	14 2 19	T. Atherton ..	2d	16 3 16
	C. McNiven ..	3d	13 3 22	R. Coston ..	3d	13 3 20	J. B. Aylmer ..	3d	16 2 2
	W. Smith ..	c.	11 2 2	Her Majesty the Queen	c	15 1 6	J. Reid	c	16 0 14
COWS.									
Above 4 years old.	W. Farthing ..	1st	16 2 5	J. Baldwin ..	1st	18 1 13	Sir W. C. Trevelyan, Bart ..	1st	19 0 15
	W. Smith ..	2d	12 1 0	A. Benafield ..	2d	15 0 25	A. & A. Mitchell.	2d	16 3 14
	J. Hitchcock ..	3d	14 3 5	R. Wortley ..	3d	14 3 4	Duke of Devonshire	3d	18 3 22
							J. Whyte	c	20 1 15
							R. Eastwood ..	c	17 2 26

PERCENTAGE OF CARCASE IN LIVE WEIGHT.

Live Weight. Imperial stones.	Percentage of Beef. Class I.	Class II	Class III
120 to 150 .. .. heifers	69 to 71	66 to 68	
120 to 150 .. .. steers	66 to 68	63 to 65	63 to 66
100 to 120 .. .. heifers	66 to 68	63 to 65	63 to 66
100 to 120 .. .. steers	63 to 65	60 to 62	57 to 62
90 to 100 .. .. heifers	63 to 65	60 to 62	57 to 62
90 to 100 .. .. steers	60 to 62	57 to 60	51 to 56
80 to 90 .. .. heifers	60 to 62	57 to 60	51 to 56
Under 90	—	—	45 to 50

The following, deducting one-third, in accordance with the above table, in order to obtain the dead weights in the case of Devons, Herefords, and Shorthorns respectively—all being well bred and well fed—is the average carcase weight of the animals in the several classes:—

ESTIMATED CARCASE WEIGHT OF ANIMALS EXHIBITED AT THE AGRICULTURAL HALL, DECEMBER 5—10, 1869.

	Devons.		Herefords.		Shorthorns.	
	st.	lb.	st.	lb.	st.	lb.
Steers:—						
Under 2½ years ..	65	7	79	3	82	8
Under 3½ years ..	75	9	86	6	100	8
Over 3½ years ..	81	10	98	1	198	8
Heifers:—						
Under 4 years old	64	2	80	8	91	11
Cows:—						
Over 4 years old ..	77	7	86	0	99	4
Average of all the animals						
Male	74	4	87	12	97	3
Female..	70	12	83	4	95	8
Total	72	8	86	1	96	8

The foregoing tables furnish the following conclusions:—

That the heaviest animal shown in these classes is a Shorthorn.

That the heaviest animal in each class is a Shorthorn.

That the average weight of all the animals is greater in the Shorthorn classes than in either of the other.

That at 2 years and 6 months old the Shorthorn ox exceeds the Devon in average weight by 17 stone 1 lb., and the Hereford by 3 stone 5 lb.

That at 3 years and 3 months the Shorthorn ox exceeds the Devon by 24 stone 13 lb., and the Hereford by 14 stone 2 lb.

That at 3 years and 3 months old the Shorthorn exceeds the Devon by 26 stone 12 lb., and the Hereford by 10 stone 7 lb.

That the Shorthorn heifer under 4 years old exceeds the Devon heifer of the same age by 27 stone 9 lb., and the Hereford by 11 stone 3 lb.; and, similarly, the Shorthorn cow over 4 years old, exceeds the Devon cow of the same age by 21 stone 11 lb., and the Hereford cow by 13 stone 4 lb.

That the average weight of the Devon ox above 3 years and 3 months (81 stone 10 lb.) is about the average weight of a Shorthorn not exceeding 2 years and 6 months old.

That a Hereford ox exceeding 3 years and 3 months old is scarcely equal to the Shorthorn ox in the class under 3 years and 3 months old.

That the ratio of increase in the weight of the Shorthorn between 2 years and 6 months and 3 years and 3 months is greater than that of either Devons or Herefords.

It is as plain, from a single year's experience at the Metropolitan Show, as it is from the average agricultural experiences of the country during the past two generations of farmers that the Shorthorn is the dominant breed of cattle in the island.

—— BUSINESS has been on a limited scale in the corn market, and the tendency on Monday at Mark Lane was rather downwards, last week's quotations having been maintained with difficulty.—In the Metropolitan Cattle Market prices have been somewhat lower, and the mild weather has influenced trade unfavourably.

—— ARE we GETTING ON—or GOING BACK?—Hear what a Gloucestershire farmer says:—"I can

remember," he informs us, "when there was more fighting, thieving, sheep stealing in our parish alone, than there is in all the county now. Labourers are better off in almost every way. Wages have doubled since that time. A bushel of Wheat was always considered a man's week's pay: now it is the value of two that they receive. I won't say but they were a stronger set of men, as it seems to me, than they are; but that, perhaps, is because there were not so many chances then of work elsewhere, and so the best, who now get draughted off to better paid employment, remained upon the farm. Anyhow they are better fed now than they used to be. And there isn't the smuggling—there isn't even the poaching—there isn't the waste of time at fairs—there isn't the ignorance and vice—there was. They know better, they love their books more, they ar'n't so brutish, pounding one another about, they do love one another more.—And the land, too, is better managed than it was. Perhaps there isn't much more got out of a cow than there used to be, but there is a lot more got off the land. What used to be cut off the crown of the ridge is now got right over the whole of the field. That is true of grass land, but it is truer still of the arable. A man used to get 20 bushels of Wheat where now he must get nearer 40 to be as well satisfied. And he needs it all; for, with more labourers in his employ, and more wages to give to each of them, he has also more rent to pay. I have known rents raised three times in 20 years; and it is £2, and even £3 now, where it used to be less than 30*s*. The landlord has felt the benefit as well as the labouring man. And all I wish is, that instead of pulling down the cottages, and driving labourers away, every owner of a farm were bound to build good homes for all the men the farmer needs to work it." This is a pretty good account of a secluded country parish in a dairy county. We doubt not that the experience upon the hill district of the county is as satisfactory as that thus told us of the vale.

—— Mr. Smith, of Woolston, has an interesting autobiography in the current number of the *Farmer's Magazine*, which well deserves perusal. The following are his conclusions on a comparison of steam cultivation with that by horse-power:—

"The gains on the side of steam culture as carried out by me are: increase of depth of culture, from 6 inches under horse-culture to from 10 to 12 inches under steam-power culture, at a much less cost per seed-bed yearly, from quite £1 per acre under horse-culture to from 6*s*. 8*d*. to 10*s*. per acre. Under steam-culture a much cleaner system of working is got than under horse-power, the former never needing a fallow, while the latter needs one every fourth year on our clay soils. The result from all this is a great increase of produce, due first to having all the land in crop instead of a fourth part of it in fallow yearly, and the remaining is due to a greater fertility of the whole—in my own case full 2 qr. per acre yearly or my heavy clay land, and my land is not exceptional, for the Board of Trade has shown that there are yearly 800,000 acres of fallow in this country on like soil to my heavy clay. These 800,000 acres must be multiplied by four to represent the quantity of land worked under the fallow system. This gives 3,200,000 acres of heavy land especially needing steam-power upon it, and if my data of gain are taken as a basis of calculation, and spread over this large quantity of acres, there is shown to be a clear gain of over £12,000,000 a-year, to be had as gains of the country. Surely such a sum as that is worth trying for, especially as it can be won without any increased tenants' capital, excepting the little lost in making the change from one system to the other."

OUR LIVE STOCK.

CATTLE.

How slow is the British farmer in adopting an exact system of conducting farming business. We speak here particularly of the feeding and management of stock, and our complaint is this, that we have the greatest difficulty in really finding out the plan of feeding pursued in any given case. The horses get a *few* Oats, and are foddered with hay; the cattle get a *fairish* quantity of Turnips and hay, and a good allowance of meal, or cake; the pigs are *done* liberally, or the reverse, according to the notions of the farmer. In the same way the results are enveloped in mystery, and it is but seldom that any test is applied in order to find the increase in live weight, consequent upon a certain amount of food consumed. So much is this the case, that we are in danger of being considered as unpractical, for broaching the idea of altering what appears to us to be opposed to true economy. Farmers are to a very considerable extent experimenters. They are constantly telling each other that they have tried such a food for stock, and that they are favourably impressed with it, or the reverse. They will give you their opinion upon cooking food, cutting chaff, the relative advantage of a large or small quantity of roots, the relative profitableness of sheep and cattle, as well as upon various other subjects connected with stock management. With regard to these opinions, based as they are on what is somewhat boastfully called "experience," there is one peculiarity worthy of note, namely, that the observations of practical men are so contradictory that the unfortunate tyro who attempts to reconcile them is lost in confusion, and learns at length that his only plan is to try for himself. Living as we do in a scientific age, it is not likely that this state of things can continue, and we wish at this moment to impress upon our readers the importance of arriving at our conclusions by *recognised methods*. Just as the thermometer is now admitted to be a safer guide in cheese-making than the hand, so the scales and weights will be found a better index to progress in cattle and sheep than the eye and the touch. Well would it be for the young farmer if he would cultivate a little more exactness in ascertaining, for instance, both the weight of food and water consumed, and the amount of milk yielded in return, by cows. Every farm should be provided with a weighing machine of such a kind as to allow of cattle being weighed from time to time. The food ought to be weighed to the cattleman with the same strictness that materials are weighed from the storeroom of a factory, and the fortnightly or monthly weighing of some or all of the animals would soon supply the farmer with a series of figures, valuable both to him and to his agricultural brethren. We do not write entirely without experience, for we can testify to the great interest awakened in the mind when the time for again testing progress arrives. In these days of high rents, rising wages, low prices, and foreign competition, it behoves us to lose sight of no means of increasing our knowledge of our profession. We suspect that many of our most "knowing ones" really know very little as they ought to know it—exactly. How many pounds of hay will put on 1 lb. of carcase weight? How many pounds of hay are equal to 1 lb. of linseed-cake? What relation has oat-straw to hay for feeding purposes? Is cotton-cake or rape-cake the cheaper food? There are hosts of other questions requiring solution, but which can only be solved by the scales and weights. We again insist that farming cannot rank either with other manufactures or businesses until these questions are strictly inquired into.

—— Already notices of spring sales are appearing. The Farnley Hall sale is fixed for March 3; the late Mr. Mann's herd will be dispersed on the 1st of the same month; and the 11th will witness what is spoken of as the first periodical sale of Shorthorns at Berkeley Castle. This last herd originated in the purchase of some good heifers at Darlington, and subsequently repeated crosses of pure-bred bulls from Kingscote and other noted herds have greatly improved the quality of the stock. At a later period, and very recently, many important additions have been made to the Berkeley herd. The following cows, which have recently added heifer calves to the herd, will be recognised as bearing names once familiar at Didmarton:—*Queen of Tyre, Star of Eve, Florentia 15th, Pearl of Peru. Maid of Tyre* has lately contributed a bull calf. All these calves are by 2D Duke of Collingham, and *Bel-air Belle* has produced a cow calf to Colonel Kingscote's famous 3D Duke of Clarence. Besides these, the cows bought by Lord Fitzhardinge at Mr. Bowly's sale in the spring have not been idle. Accordingly we find—

Musical 3d has produced a roan bull to 2D Duke of Clare
Musical 11th has produced a roan bull to 3D Duke of Waterloo
Musical 12th has produced a roan bull to 6th Earl of Walton

The calves are of good colour, healthy, large, and full of hair. Most of the cows, which are looking very well, are in calf to Lord Wild Eyes 5th, a useful sire, bought at Siddington.

—— Last week it was erroneously stated in the summary of Shorthorn news, that three Siddington cows had made upon an average £460 each. The average realised was £360.

POULTRY.

Last week we borrowed from Mr. Tegetmier's work on poultry an excellent sketch of the jungle fowl, now, by common consent, looked upon as the wild progenitor of all our breeds of domestic poultry. The following remarks upon the habits of this interesting bird will, we think, not be without considerable interest to our readers:—"Owing to its secluded life the breeding habits of the jungle fowl are very little known. The question has arisen among naturalists as to whether the cock in its natural state is monogamous or polygamous. I am inclined to think the latter from seeing always so many hens to one male bird, and this in every season of the year. The period for incubation varies according to locality, but is generally at the beginning of the rains, viz., June. I have seen eggs, however, in March, and Jerdon says the hen breeds as early as January and as late as July. She selects for this purpose some secret thicket in the most retired and dense part of the jungle, scraping together a few leaves on the ground by way of nest. She remains as part of the cock's seraglio, until some seven or ten or a dozen eggs have been deposited in the above spot, to which she stealthily repairs every day, and finally quits her party, and retires alone and unseen to perform the duties of incubation. The chicks are hatched as usual, in about 20 days, and follow their mother soon after they have emerged from the egg-shell, and she leads them about, teaching them how to find their own sustenance, till they are big enough to shift for themselves, by which time the young cocks, finding that they cannot, with honour, come within a few yards of one another without a battle, separate—each one taking a number of hens with him. These particulars I have gathered from native informers, but I can add from my own experience that, either the season of incubation is uncertain, or that the hens lay in cold weather with no more ulterior view than domestic birds, for both in February and March I have heard them emit that peculiar cackle, *tuk-tuk-tuk-tuk-tukauk!* by which every one knows a hen in a farmyard proclaims to the good housewife a fresh acquisition to her larder. The flesh of the jungle fowl, under favourable circumstances, is the most delicious of all game, but that of the old cock is beyond human powers of mastication."

UNCULTIVATED LANDS,

Their Reclamation and Improvement.

There are in the United Kingdom vast tracts of land which at present are lying comparatively idle and almost unproductive, but which by a small outlay could be greatly improved and made to contribute to the support of the people five or ten times what they do at present. I know personally of vast tracts of land which at present are only yielding a rental of 2*s*. or 3*s*. or 4*s*., or at most 5*s*. per acre, a large portion of which is at this moment fit for the plough, and all the remainder of which, by a trifling outlay, might be turned into good arable land, capable of supporting ten times the stock which it supports at present. Let it not be supposed that this is an exaggeration. I myself have a large estate, which a few years ago was let to yearly tenants at an average rent of 3*s*. 6*d*. per acre, portions being let at a considerably higher rate, while other portions were of course let at much less; and yet on some of the worst parts of that land, lying at an elevation of 1100 to 1200 feet above the sea, I am now growing excellent crops of Turnips, Swedes, Carrots, Mangels, Oats, Barley, Rye, Rye-grass, and Clover. There are throughout the Principality of Wales immense tracts of the same sort of land, at present supporting perhaps one mountain sheep to each acre, but which, by a very moderate outlay, could be made to support ten times as many. I remember some years ago, a friend, in driving with me through some lands of the sort I name, expressing surprise that people should emigrate to Australia when there were such vast tracts lying wild at their very doors.

It may be asked how is it, when there is so much competition for farms, that these lands are not run after by farmers? But the answer is very simple. No farmer, unless he be a man of large capital, and unless he obtains a long lease, could afford to enter upon such land. Now, a farmer with plenty of capital, is usually a man well up in life, and he has lost the spring and the enthusiasm of his early years. A man well to do, and somewhat stricken in years, is not fond of settling in a new country, neither is he fond of a speculation which will require several years before it begins to make him any return for his outlay, and a still longer period before it returns the capital he has laid out. It seems to me, then, that these lands can only be brought into profitable cultivation at the expense of the landlords; but as very few of the landlords are overburdened with surplus capital, they are not likely to enter personally upon the speculation. There is, however, a means of doing it which, it seems to me, might be profitably adopted, and that is through the various Land Drainage and Improvement Companies, all of whom have very extensive powers for the advance of money (without any inquiry into title, and without reference to entails or mortgages), provided the money is to be applied in the improvement of the estate. The improvements which are required to render these lands fit for the occupation of an educated farmer are good buildings, roads, fences, and drainage, all of which are "landlord's outlay," and are fully within the powers of the companies I allude to. An average outlay of £5 per acre on such improvements would render these lands fit for the occupation of a first-class tenant if he were prepared to make the necessary outlay for lime and artificial manure to start the farm into fertility; and if we reckon 10 per cent. on the outlay and 5*s*. per acre as the starting rent, these lands would not cost a farmer more than 15*s*. per acre of rent when fitted with every reasonable appliance for their profitable cultivation.

Now let us suppose a case. Suppose a young enterprising and skilful farmer, possessed say of £3000 capital, sees 500 acres of such land, which is let at present for 5*s*. an acre, and suppose he goes to the landlord of it and says: "If you will let me have these 500 acres at their present rent, and will agree that £2500 (to be advanced by such and such a land company) shall be expended on it during the first two years, I will take a lease for 21 years, and will agree to pay 10 per cent. on the outlay (over and above the present rent) so as to repay the whole outlay in 14 or 15 years, and leave you the full profit of it during the last six or seven years of my take." I venture to think the landlord would prick up his ears, and if he heard a good character of his proposed tenant, would be very apt to fall into his views, because it would treble the value of his property in 15 years without a single shilling of outlay on his part.

Now, let us consider what would be the farmer's position, supposing the outlay to be made at the rate of £1500 during the first year, and £1000 during the second. His actual rent for 500 acres would be as follows:—1st year, £125; 2d year, £275; every year thereafter, £375. During the first year he would in all probability lose £250, besides spending £250 in lime and artificial manure, making his "actual outlay" that year £500. During the second year he would

expend about £350 in lime, salt, superphosphate, and paring the drained land, and he would lose perhaps £150 more in farming, making his outlay for that year also £500. During the third year he would expend about 350*l.* in lime, salt, and superphosphate; but he ought to make 350*l.* of farming profit, so that his actual outlay that year would be nothing. During the 4th and 5th years he ought to make at least 1000*l.*—say 400*l.* and 600*l.*; so that at the end of five years he would have his whole capital replaced, and he would then have a farm, with 16 years to run, that ought to produce him at least 600*l.* a year of farming profit, if not more.

Upon a 500-acre farm of the land I speak of, there would probably be 450 acres suitable for cultivating, and 50 acres rough hill-side pasture, including roads, fences, and land under buildings.

The 450 acres would be cultivated on a five-field system, thus:—1st year, winter Oats or winter Barley or Rye; 2d year, roots; 3d, spring Oats, with Grass and Clover seeds; 4th, Rye-grass and Clover; 5th year, pasture; and each division would be 90 acres. Such a farm would, when in full cultivation, keep a breeding stock of 400 ewes, selling out every year 400 sheep 30 months old in September and October, and would fatten in winter 120 beasts, or even more if no corn was sold.

The lands which I speak of lie at an elevation of 800 to 1500 feet above the sea. But they produce, nevertheless, excllent crops of Oats, Winter Barley, Rye, and roots of all descriptions, while Italian Rye-grass and Clover flourish remarkably well, giving very early and very plentiful feed for the ewes in April, and if the sheep are folded carefully over it the quantity of Grass it will produce is very great. For roots the climate is the best possible, and 25 tons of Swedes and 30 tons of Turnips are an average crop from an acre. The land is usually found partly dry and partly wet, but there is never any difficulty at those altitudes in finding an outlet for the drainage water.

The *Dry Land* we break up by sending a cultivator over it, working about 4 inches deep, with four horses to tear up and break the roots of the sod. We then sow about 5 cwt. of salt to the acre broadcast, and leave it for the winter frost to kill the Grass. In spring we plough it up about 6 inches deep, giving it 2 tons of lime to the acre, and then we sow it with Oats. In consequence of the land having been first broken with the cultivator, it comes up to the plough as easily as old broken-up land, and makes a very good seed-bed with very little trouble, and the mass of old Grass buried with the salt makes an excellent manure. If the season is favourable, the first crop of Oats should be a fair average, but whether or not, it leaves the land in excellent order, either for a second crop of Oats the next year, or for roots, whichever is preferred, and after that it will come into regular rotation.

The *Wet Land* has to be treated in a different way, for upon it the old sod is so tough and imperishable that more severe means must be taken to destroy it. Land at such an elevation, if wet, has usually a thin layer of black peat, varying from 3 to 6 inches thick, and resting on a bed of clay, and this when drained makes the best land of all, if we can only mix sufficient of the clay below with the peat above. Lime has an amazing effect on this sort of land. It dissolves the peat, and forms it into a manure that seems specially adapted for Turnips, and I fully believe that such land will continue to bring a first-rate crop of Turnips every time it comes into rotation throughout a 21 years' lease, without any other manure than lime and salt—say 2 tons of lime and 5 cwt. of salt to the acre each time it is prepared for roots, that is to say, every five years. I have myself used superphosphate on this sort of land, in conjunction with lime and salt (but not put on at the same time, say an interval of several weeks), and I am of opinion it is money thrown away; the lime and salt are all that are required. This peaty land, however, when first broken up must be pared and burnt. There is no getting over this, and it is all nonsense for any one to say it is bad farming. I have myself tried ploughing up without burning, but it is no use. You get no crop the first year, and very little the second, and the third year the old tough sods are still there to bother and trouble you. I have tried, too, ploughing it up with four-horse ploughs 13 inches deep, so as to bury the clod completely, intending to leave it undisturbed two years, putting in my second crop with a slight scuffling of the cultivator; but that also is no use. You bring up the bad sour subsoil, and your first crop, therefore, is not one-third of what it should be, and the second little more than half a crop, and at the end of two years the clods are only half rotted. In fact, you only get one crop out of two years' working and seed, and yet at the end of the two years your land is not in as good tilth as it would have been after one crop if it had been pared and burnt.

After paring and burning we send the cultivator over it twice, going about 3 or 4 inches deep the first time, and about 5 or 6 inches deep the second time, taking care to cross at a slight angle only, for to cross it at a right angle will not do, as the cultivator tears it up in great clods. We find these two cultivatings produce a sufficient tilth for winter Oats or winter Barley or Rye, one of which should be the first crop on that sort of land, and if, besides the ashes, you have given it two tons of lime to the acre, it will produce a first-rate crop. The following autumn, after the crop is off, it ploughs up easily enough, as the double turn of the cultivator has broken up the tough sods, and a winter's frost renders it quite fine enough for a crop of spring-sown Oats, which should be the second crop on that sort of land, and then the third year it is in excellent order for roots. When this land comes to be ploughed for roots the second autumn it ought to be ploughed up with four horses, 13 inches deep, so as to bring up a quantity of the clay subsoil. This lies exposed to the winter frost, and in spring it should be cross-ploughed, with a pair of horses, 6 or 7 inches deep, so as to mix the subsoil a little, and bring up some of the better soil. Then put on 2 tons of lime and 5 cwt. of salt to the acre, and harrow it all down smooth. Then sow broadcast 4 cwt. of superphosphate to each acre, and throw it up into ridges with the double-mouldboard plough. Then drill in the seed with a common double ridge-drill without any other manure. This is the only time that I would give such land superphosphate, and the plan of sowing it broadcast just before ridging up is one I have always followed, and always found most successful, for it brings the superphosphate right into the middle of the ridge (where the Turnip is going to grow), and yet so spread that the roots cannot fail to find it at once. When the crop of Turnips is off, this land will be in thorough condition, fit to grow any crop that the climate will ripen. There will be a good surface soil, 13 inches deep, made up of a mixture of peat and clay manured with 4 tons of lime, 5 cwt. of salt, 4 cwt. of superphosphate, and the ashes produced by paring and burning.

If I were a farmer taking such land, I would take care to have the money intended to be spent upon it expended only in works of real necessity. As a matter of course, I would put up a good substantial farm-house, stabling for 12 horses, houses for 120 cattle, a small granary, a wool store, and an implement shed. All wet land must, of course, be drained, and a good boundary fence put right round the farm, and if the farm were intersected by any public road, I would put fences along the sides of it, but cross divisional fences I would not care much about. Any one going to keep a large number of sheep on artificial grasses and roots must have a great number of hurdles, and where sheep are folded fences are of small value comparatively. A tenant who has to pay 10 per cent. on all outlay has a direct interest in seeing that no money is thrown away, and that nothing is spent except in works that will be reproductive. Labourers' cottages suitable for the country, and in a convenient situation for the men attending to their work, would always repay a farmer even at 10 per cent. per annum. The cost of a labourer's cottage, built for use and not for ornament, is a deal less than many people suppose. In the country I speak of £250, judiciously expended, will erect half a dozen very comfortable labourers' cottages. Building materials are cheap all through Wales, now that it has been intersected by railways, and the cost of fencing and draining is also moderate. A double wire fence, with a young hedge between, can be erected for about 1*s.* per lineal yard, and if three or four rows of trees are put on one side of the hedge, it will cost no more, because any landlord would be glad to supply the trees, and pay for putting them in; but even if he did not, it would not add more than 1¾*d.* per yard to the cost. On all land which needs draining, clay suitable for pipe-making is to be found, and the cost of erecting a tilery is not very much. Drain-pipes can be made and burnt for 12*s.* 6*d.* per 1000, and if we add 2*s.* 6*d.* per 1000 to repay the outlay on the plant, it will make the actual cost of drain-pipes close to the spot where they are going to be used, only 15*s.* per 1000. With pipes at this price, £5 per acre will drain land, 3 feet deep and 7 yards apart, including every expense.

I feel satisfied that my estimate of £2500 to cover "landlord's outlay" on a farm of 500 acres, is amply sufficient. It would not be easy to find more than 150 acres of wet land on such a farm, and £750 would drain that; and I consider the following an approximate estimate of what would be necessary:—

1	Drainage, 150 acres	£750
2	Farm-house and offices	400
3	Farm-buildings	750
4	Labourers' cottages	250
5	Fences	250
6	Roads and sundries	100
	Total outlay	£2500

Of this outlay something like £1500 would be expended on the spot amongst the people there, and of course would greatly benefit them, while £1000 would go to buy materials at some of the outports, and to pay for skilled workmen brought from a distance. Every penny, however, of the outlay benefits some one or other, but it is not so much by the present outlay as by the future annual produce that the country is to be benefited. At present these lands are producing at the utmost about 10*s.* per acre, say 5*s.* for the landlord's rent and 5*s.* for the tenant's gross profit, so that 500 acres would be producing altogether only £250 a year towards the support of the people. When, however, the land was improved in the way I speak of, the gross produce of 500 acres would be at least £1500 a year, or six times as much as its present produce; and the whole of this would in some shape or other go to the support of the people.

We hear a great deal just now about the depression of trade, the increase of pauperism, and the necessity of emigration. But why emigrate to the colonies when there is plenty of vacant land lying at our very door? The wealth of this country consists of the labour of her people. Keep the people idle and our wealth diminishes; set them to labour at reproductive works, and our wealth immediately increases. Every emigrant from our shores is a dead loss to the country, if there is work for him to do at home. A farm of 500 acres in the hands of a skilful agriculturist will give employment to about eight families; and if we reckon five to a family, that represents 40 individuals. A thousand such farms established would relieve the labour market as much as the emigration of 40,000 souls; and with this advantage, that we keep our people at home earning good wages, and every penny they spend goes in some shape or other to support some other branch of native industry. A thousand such farms established would give an annual revenue of £1,500,000 to be expended in this country, whereas at present those same lands are only producing a spendable revenue of £250,000. A judicious outlay, then, of two and a half millions of money would increase the annual income of the people one million and a quarter, thus giving a return of 50 per cent. Surely such an enterprise would be a more sensible employment for British capital than to sink it in foreign loans, or to embark it in foreign railways. *G. A. H.*

THE GAME LAWS.

[At the recent interview of a deputation from the Scottish Chamber of Agriculture with the Lord Advocate, to express the views entertained by the Chamber on the subject of the Game Laws, the following statement was made of the grievances of which the farmer complains:—]

Mr. Wilson, of Edington Mains (President of the Chamber), said that the subject of the Game Laws had been fully discussed in the Scottish Chamber of Agriculture, and that its members were perfectly unanimous as to the oppressive nature of the grievance and the exceeding desirability of its being obviated or removed. He would frankly tell his lordship, however, that the members of the Chamber were not at one as to the best means of accomplishing that end. He need not remind his lordship that his predecessor in the office of Lord Advocate gave a pledge—after several private individuals had failed in getting Bills carried with that object in view—that he would bring in a Bill in the next session of Parliament; and their primary object in coming there to-day was to urge upon the present Lord Advocate that he should fulfil that pledge by bringing in a Bill to afford relief from the evils experienced from the operation of the Game Laws as they at present exist.

He might state in general terms that this was an evil which had been growing exceedingly of late years. There were parties who for a long course of years had suffered exceedingly from the existing preservation of game, and the damage which this occasioned to their crops. The evil was not diminishing, but was rapidly on the increase. The number of proprietors preserving game was gradually becoming greater. The modern idea of sportsmen seemed to be that they could not get good sport unless they had an extraordinarily heavy stock of game. The fashion now was for a proprietor to go out, not with his keeper, as used to be the custom, but with large parties and a large attendance of drivers; and they were not satisfied unless they shot a large quantity of game. The proprietors also exchanged field days, every one being anxious to show that he had as well-stocked preserves as his neighbour had, while the heavier the stock of game the heavier was the loss to the farmers. He would remind his lordship that the value of land had of late years greatly increased throughout the country, as was shown by the greatly increased rental; the modes of husbandry were changed from what they used to be; the business of farming had now to be conducted at an enormously increased expense from that at which it used to be practised; and when a great portion of the produce of the soil was destroyed by those wild creatures, such as hares and rabbits, it told very heavily on the margin on which the farmer had to work. The damage done to the crops was often serious in the extreme. In fact, it was perfectly practicable that a landlord, taking advantage of the Game Laws as they at present stand, might, if he had the conscience to do it, ruin any tenant out at the door by sufficiently multiplying the number of animals on his estate; and, after all, the farmer would have no means of defending himself. There were cases where the thing had been carried to such an extent that the farmer was actually ruined; but, short of that, there were a great many farmers who had their means of meeting their engagements and maintaining their families very seriously encroached upon by the destruction caused, especially by hares and rabbits. It was in regard to the hares and rabbits that the complaint almost exclusively existed, and their excessive multiplication. If they got rid of that grievance, he did not believe that the tenantry would complain of partridges and grouse. There were few cases in which there was loss sustained from pheasants; they were comparatively helpless creatures, and could not take care of themselves. They were more like poultry than game; and so far as his experience went, it was only in the vicinity of policies that pheasants were in excess. But, again, where there

was a great multiplication of pheasants you will invariably find a multiplication of hares and rabbits in proportion. Then, besides the great pecuniary loss and damage occasioned by the operation of the Game Laws, there was produced a great amount of irritation and estrangement betwixt parties who ought to be acting cordially together. It seemed to him that it was perfectly impossible that a really cordial state of feeling could exist between proprietors and tenantry where one party was the means of injuring the other to the extent which prevailed in various parts of the country, in connection with the preservation of game. It seemed to him a most miserable thing that for the sake of those wretched hares and rabbits there should be so much heartburning and alienation of feeling throughout the country amongst those who ought to be acting together as one man. There was undoubtedly a large amount of that heartburing, and it was still a greater pity that it was increasing.

He thought it was perfectly relevant, in connection with the business on which they had waited on his lordship, to remind him also of the great social evil that was wrought in the community by the great increase of poaching. The fact was, that where the game increased poaching increased. And there is no doubt that where this is the case a great number of men who would have been earning a livelihood in an honest way are tempted into these breaches of the law ; they are sent to prison ; when they come out they are worse than when they went in ; they have become bad members of society, discharging their duties neither to society nor to their families. He (Mr. Wilson) thought the farmers, whom the Chamber of Agriculture represented, were entitled to expose, as far as they could, the hardships which resulted from the present operation of the Game Laws, as well as the social evils that grew out of the mischief connected with it. It was not merely the direct loss which many farmers sustained from the ravages of hares and rabbits ; but there were a number of other evils that went along with it.

His lordship might be aware that there was what he might call a taunt with which they were constantly met, when they complained of the grievances under which they laboured and the evils that resulted from the operation of the Game Laws. The taunt was this—"But you go and sign leases in which you bind yourselves to preserve the game ; and you have yourselves to blame for that." Well, that just led him to impress upon his lordship that the case was one in which they required to get redress by public means. The farmers really could not defend themselves. If farmers were to prosecute the business of farming, they must have land to farm. But now that the matter had been agitated, these reservations as to the preservation of game were, he might say, becoming so universal that he believed it would not be long till not a lease in Scotland would be granted unless it had such a reservation. If a farmer, then, refused to give such a reservation, he would lose the farm he had occupied, and he would not get another. He must either sign that or turn his attention to some other means of livelihood, or go to the colonies. He could not help himself under present circumstances. It was therefore gratuitous to say that farmers were to blame for putting their names to their leases, and agreeing to the reservation regarding game that was required by the landlord. That was the reason why they thought that the Government of the country should come to their aid ; for surely it was a subject worthy of their consideration that the food for the people of the country should be got in the largest possible quantity, and that it should not be wasted by what was really vermin. If the community generally were aware of the enormous quantities of food that were destroyed by hares and rabbits, they would probably be more alive to the importance of the subject. The rabbits and hares sold at from 1*s.* to 3*s.* each in the market ; but before they brought that value they had destroyed far more than double that amount ; and that was, therefore, the most unprofitable way of sending agricultural produce to the market that could possibly be imagined.

But owing to the extent to which game preserving was now carried, and the means that were taken to preserve the game, there were other evils which the farmers sustained. For instance, in order to get a great head of game, proprietors employed a large number of gamekeepers ; and the consequence was that they had almost exterminated the natural enemies of these vermin. The result of course was that they were all the more annoyed with other vermin that caused much damage. They were quite invaded, for instance, with woodpigeons. At one time he regarded the accounts that came from America in reference to the prevalence of woodpigeons as mere travellers' tales, but of late he had seen whole fields grey with them on farms in our own Scotland. The destruction they committed was something serious. It was not so in his younger days. And then, from the same cause, some of their best home steadings were swarming with rats and mice.——

The Lord Advocate : You are quite at liberty to kill rats and mice ?

Mr. Wilson : That is quite true. But your lordship, I have no doubt, would be astonished if you knew the sums of money that farmers have sometimes to expend in trying to destroy the rats in a steading. That is all in consequence of their natural enemies being destroyed. You cannot, in very many cases, keep the cats from getting into the traps of the keepers and being destroyed. Then the evils of which we complain have been greatly increased by the Act of 1862, by which the police were gradually converted into gamekeepers. Rabbits, before that Act was passed, were not game, but by a side wind, as your lordship may be aware, they have been made game —they have been put in the same category with hares. I hold, therefore, that the evils of which we complain have been aggravated and increased by that measure.

The Lord Advocate : There is no law I am aware of that forbids tenants, people lawfully on the land, from killing rabbits.

Mr. Wilson : The Act of 1862 tends directly in the way of increasing the number of these rabbits. But there was another thing that many had felt to be an aggravation of the evils that grew out of the operation of the Game Laws as now administered : it was, that in consequence of the multiplication of the hares and rabbits the proprietors had been in the habit of sending large numbers of these to the market. He took occasion last summer to question the assessor of taxes on the subject, and found there was no tax, local or otherwise, levied on the proprietor on that account. It was regarded as a sort of perquisite to the proprietor's family—not as income at all. This, he thought, was very unfair dealing, seeing that the farmers, on whose crops the hares and rabbits fed, had to pay taxes on all the income they made from their occupation.

[Other members of the deputation afterwards addressed the Lord Advocate, and to their remarks we may hereafter direct attention.]

TURNPIKE ACTS CONTINUANCE ACT, 1869 (32 and 33 Vict. c. 90).

[At a time when legislation on this subject is imminent, and when the subject is being discussed at Farmers' Clubs and Chambers of Agriculture all over the kingdom, it may be well to print the following analysis of the late annual Turnpike Act.]

This Act, according to its long title, is "An Act to continue certain Turnpike Acts in Great Britain, to repeal certain other Turnpike Acts, and to make further provisions concerning Turnpike Roads." Its object, therefore, is threefold—to continue certain Trusts, to repeal others, and to make provisions for turnpike roads generally. The two former it does by arranging the Acts to be continued and repealed under five schedules, and then by applying a section to each schedule. Thus by sect. 1 the 11 Acts specified in the first schedule are repealed after November 1, 1869. By sect. 2 the 39 Acts specified under the second schedule are to expire June 30, 1870. By sect. 3 the 11 Acts specified under the third schedule are also to expire June 30, 1870. Some of these would have expired during June and July of the past year, so that they were continued. By sect. 4 the 36 Acts cited in the fourth schedule are continued until November 1, 1870, unless Parliament in the meantime otherwise provides ; and by sect. 5 the three Acts specified in the fifth schedule are repealed on and after November 1, 1870, unless Parliament in the meantime otherwise provides. Sect. 6 enacts that all other Acts now in force for regulating, making, amending, or repairing any turnpike road in Great Britain, which will expire at or before the end of the next session of Parliament, or which but for the passing of this Act would have been repealed by the 31 and 32 Vict. c. 99 (*i. e.*, "The Annual Turnpike Acts Continuance Act, 1868"), shall continue in force until November 1, 1870, and to the end of the then next session of Parliament, unless Parliament in the meantime otherwise determines. Sect. 7 supplies the necessary statutory explanation required relative to doubts that have of late arisen relative to various local Acts under 3 and 4 William IV., c. 80, and 12 and 13 Vict., c. 87, which have expired during the last five years, by affording the trustees or commissioners thereof power to make the statements required by those Acts to the Secretary of State, so as to enable him to elucidate and lay the same before Parliament in accordance with the statutory provisions thus made.

An index is also given to the several counties, Trusts therein, schedules, and Acts under which the Trusts respectively are held. Thus, there are 29 counties in first column, 109 Trusts in the second, as many Acts in the fourth, and the schedule of this Act is placed opposite each Trust in the third column, *i.e.*, the schedule by which the Trust will be affected.

It has seldom been the lot of an agricultural writer to review with a favourable eye highway legislation ; and sweeping as the above Act is, it can hardly be received in any other light than preliminary to a more general reformation, in compliance with the pressure of existing circumstances. Since the opening of railways not a few turnpike roads have become almost deserted, while the traffic upon others has been increased. In a third case the traffic has been deviated from the turnpikes into the common roads and lanes of the country. And this, too, is not all, for steam locomotion on common roads begins to loom in the distance, as one of the grand realities of the future. It were difficult, therefore, to say what the pressure of existing circumstances will be, and what the demand upon this or that road Trust, say November 1, 1870. More particularly speaking, if a traction engine or horse team with a tractive force of 30 lb. can haul 1000 lb. on a stone tramway, and if a tractive force of from 60 lb. to 90 lb. is required to haul 1000 lb. on our present turnpike roads on an average, and a tractive force of 150 lb. on our common gravel roads, more than one question arises for the solution of road trustees and commissioners, whether steam-power or horse-power is to be used on their respective roads for traction. We recollect of an honest landowner compelling the trustees of a ten-mile Trust to remove one toll-bar and straighten and level the road from end to end with its surplus funds ; and the money thus spent would have laid down a double stone tramway the whole length of the road—stone quarries being at hand ; and in many cases the solution of the question at issue hardly requires more than the effort of an honest purpose ; for a single line of trams would suffice for a traction-engine on contract in removing farm produce to towns and railway stations, and bringing back in return manure, seed, feeding-stuffs, &c., at so much per ton per mile. It will no doubt be said "we have not got this length yet." Granted : but 32 and 33 Vict. c. 90, brings us close up to it, for it obviously throws upon road trustees and commissioners the onerous duty of using the respective roads under their trust for the public welfare, in a manner so as to reduce the expense of conveyance to a minimum.

"WEST INDIAN" AND STEAM PLOUGHING.

I observe that "West Indian" thinks Mr. Smith's replies to my letters, and also his letter to the *Times* worthy of careful perusal, because of "the fulness of his communications." I certainly have failed to find out this "fulness." All Mr. Smith's communications are mere "estimates of cost." He does not give the actual cost of anything, although he gives the actual amount of work done. But all the other steam plough men give quite as full accounts of work done. I have before me at this moment a small quarto pamphlet sent me long ago, by Fowler & Co., and entitled "Reports and Testimonials of Fowler's Steam Cultivating Machinery." In it there are a vast number of reports, giving acreage done, men employed, money spent, number of days working, and many other details. I opened this book at random, and it so happened that it opened at page 62, and the following is a condensation of the letter which is printed on the page in question, and which is signed "C. W. Goode," and is dated November 21, 1862 :—

"My bailiff has supplied the work done from his daybook, and has allowed for headlands in each field, so that the quantities given are what have actually been cultivated by steam from February 28 to November 21, 1862, during which time we have worked 147 days, including removals.

Land gone over	505	acres	2	roods.
Ploughed	170	,,	0	,,
Dragged	952	,,	3	,,
Scarified	1517	,,	3	,,
Crushed	163	,,	1	,,

"The total quantity of ground moved for the first time is 505 acres, and by adding 170 acres ploughed to 1517 acres scarified, you have 1687 acres for the total quantity of land 'gone over.' While doing this, 952 acres were dragged and 163 acres were clod-crushed, the respective implements being attached to and drawn after the scarifier or plough. The payments for coal and oil consumed up to this date amount to less than £70. Water-cart and horse, at 4*s.* per day, £30. Wages paid to men and boys (not including your men (Fowler's) who came to instruct), £95. Interest and wear and tear, at 15 per cent. for nine months on £900, is £100 5*s.* ; making a total cost of £296 5*s.*, or about 3*s.* 6*d.* per acre for the ground gone over, without allowing anything for the dragging and clod-crushing and the use of engine for threshing, which will far more than cover the cost of horses for helping in removal and carting coals. My farms are upwards of 750 acres in extent, of which about 700 acres are arable, and by the aid of steam tackle I believe I shall not require more than 13 horses to work them."

I think this gives as full details as any Mr. Smith has furnished, and "West Indian" will, no doubt, observe it is a roundabout tackle, of the species made seven years ago, which did this work. The "scarifying" is what Mr. Smith calls "smashing," the "ploughing" is ordinary turnover. This is a very instructive letter, but "West Indian" must not jump to the conclusion that 3*s.* 6*d.* per acre was the cost of "steam cultivation" on this farm. If he refers to the figures he will find that the whole quantity of land ploughed and cultivated was 505¼ acres, and these repeated scarifyings, dragharrowings, and clod crushings, were to produce a seed-bed. The whole sum, then, £296 5*s.*, was the cost of "making a seed-bed" on 505¼ acres, or about 11*s.* 8¾*d.* per acre. As to the work here called "scarifying," as compared with Mr. Smith's "smashing," any one who has seen a Fowler's "cultivator" and a Smith's "smasher" can form a pretty correct idea of the sort of farm work they will each do. Messrs. Burrows & Stewart exhibited at Manchester one of "Smith's" five-tine steam cultivators, and it looked like a child's toy compared with Fowler's implement.

And now let me have a word with "West Indian" about not requiring a plough! Does "West Indian" really believe that Mr. Smith works his land without a plough? What is the meaning of his "ridge ploughing." Mr. Smith is so fond of inventing new names, I do not wonder that people get confused. If "West Indian" understands farming, he must know that after land has been in Grass we must turn it over to get it into cultivation again, and it matters little whether it is turned over by an ordinary plough or by a ridge plough, the object of both is the same—to get the sward covered up so as to kill it and rot it. Many horse farmers who have never meddled with steam ploughs have given up ploughing oftener than once in three years, working their land the other two years with a common cultivator; and if Mr. Smith claims to be the originator of that system, I much fear he will find a host of assailants who will hit him quite as hard a blow as any I have attempted to deliver. If "West Indian" will go and look at one of Smith's cultivators, he will not be at all surprised at my telling Mr. Smith hard at work all day), and can return to its place to work a roundabout as regularly as the farm horses go home to their stable, perhaps he will begin to think a traction-engine is not quite such a foolish thing as in his philosophy he deems it now, especially if he should find that it really does not stick in the mud one-half so much as his own water-cart. *G. A. H.*

LABOURERS' COTTAGES AT RIBY.

FROM the account of Mr. Torr's farm here, given by Mr. H. M. Jenkins, Secretary of the Royal Agricultural Society, in the current number of their Journal, we quote what he says of the labourers and their accommodation on the farms:

"The labour account of a farm measuring nearly 2300 acres is necessarily a very heavy item in the expenditure, although between 500 and 600 acres are in permanent pasture and meadow. Mr. Torr estimated it roughly at about £60 per week; and on carefully going through his accounts I found that it

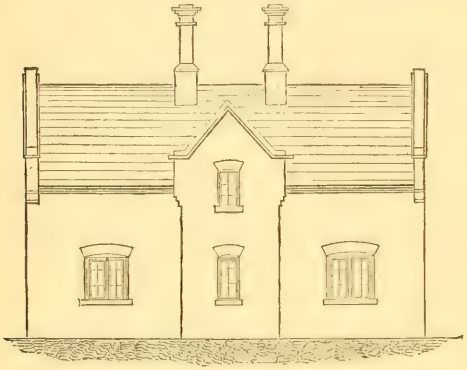

FIG. 8.—FRONT ELEVATION OF A PAIR OF LABOURERS' COTTAGES.

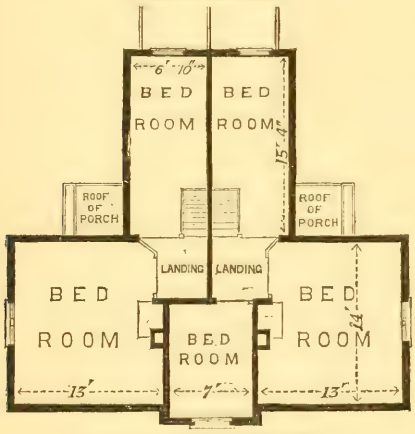

FIG. 9.—PLAN OF BEDROOM FLOOR.

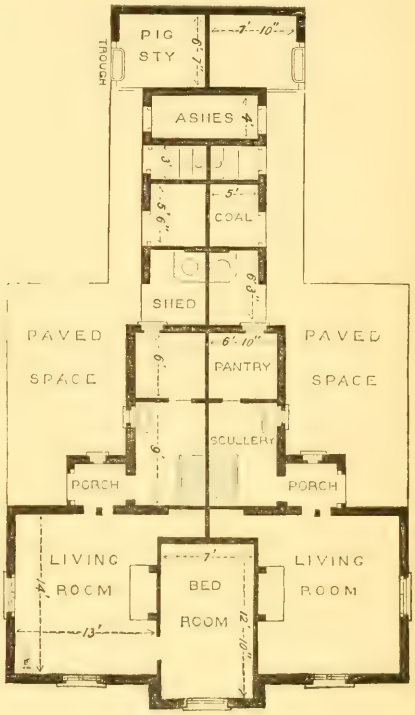

FIG. 10.

GROUND-PLAN OF COTTAGES.

of Potato-ground in one of the fields. The superior men are paid equally well in proportion, a part of their emolument, however, being a good cottage, rent free, which may be valued at 2*s.* per week, according to the standard rent for such houses in the neighbourhood. At Aylesby there are 10 of these cottages, which are let with the farm. These are occupied by the Aylesby foremen (two), the head shepherd, head waggoner, groom, two yardmen, carpenter, and two labourers. Some of these cottages, and some at Riby, have been rebuilt by Mr. Torr, at his own expense, by a process which he modestly terms "moving them," and which involves not only a change but a considerable improvement in materials, accommodation, and site. Those at Aylesby have acquired a great reputation since the visit of Prince Napoleon in 1862, as his Imperial Highness was so struck with their many excellent points, that he took away with him plans and elevations, copies of which we reproduce [in Figs. 8, 9, and 10.]

"The following statement of the wages earned by

he is not a good mechanic. Neither will it surprise him to read in the report of the Leicester trials in 1868 (see p. 474 of the Royal Agricultural Society's Journal, vol. 4):—"The implement—one of W. Smith's cultivators with five tines furnished with broad feet—was not suitable for the hard and baked surface, and left a very irregular and ridgy bottom, disturbing a considerable depth at one part, and barely entering the soil at another, the work altogether being inferior to any done by Howard's or Fowler's tools." When "West Indian" asks Mr. Smith to give an opinion upon "steam as a motive power on a farm, that is, the use of a traction-engine, &c.," he surely must have forgotten the correspondence which took place in your own Journal on this very point; or is it possible that some one else is using "West Indian's" *nom de plume?* If I mistake not, both Mr. Smith and "West Indian" were in the *mêlée* on that occasion, and Mr. Smith gave small hope of a "road locomotive" ever being useful as a farmer's implement. Nevertheless, notwithstanding the Woolston *fiat*, "West Indian" need not despair. We shall have road locomotives capable of doing a great deal of farm cartage. When Mr. Smith sees an engine which can go home every evening for coal and water (sufficient to keep it never falls below £3000 per annum. This seems a large sum for the number of acres under tillage, and I therefore analysed the accounts for the several farms, with a view of ascertaining the cause of so great an expenditure. The tillage-land at Rothwell and Riby does not cost more than 30*s.* per acre per annum, the whole of the additional money being spent at Aylesby. This might have been, to a certain extent, inferred from the fact that a large proportion of that farm consists of strong clay land, and that what appears on our map as chalk rubble is overlain by a thickness of 2 or 3 feet of tenacious loam, which makes it also very heavy to work. But beyond these facts there is also the very important one that at Aylesby are kept the valuable breeding herd of pure Shorthorns, and the scarcely less valuable flock of pure Leicesters. The large cost of making implements, as well as the wages of the ordinary carpenter and blacksmith, also come into the Aylesby account, which, if deducted, would leave the cost of tillage about 35*s.* per acre.

"The wages given are very good, and generally comparable with those ruling on the Yorkshire Wolds. The ordinary labourer gets from 13*s.* 6*d.* to 15*s.* per week in money (according to the season, and the price of Wheat), and he has the privilege of cropping a plot

the principal men employed by Mr. Torr will be more intelligible than any verbal description:—

			£ s. d	£ s. d
Foreman, Aylesby—				
One year's wages in money	.. ..	..	39 0 0	
Cottage and garden, &c., value	.. ..	..	5 0 0	
Other privileges: Malt	.. £2 10 0			
,, Pig	.. 1 0 0			
			3 10 0	
				47 10 0
Foreman, Riby—				
One year's wages in money	.. ..	..	32 0 0	
Cottage and garden, &c., value	..	..	5 0 0	
Other privileges: Malt	.. £2 10 0			
,, Pig	.. 1 0 0			
,, Poult. rearing	1 10 0			
			5 0 0	
				42 0 0
Foreman, Rothwell—				
One year's wages in money	.. ..	..	32 0 0	
Cottage and garden, &c., value	.. ..	..	5 0 0	
Other privileges: Malt	.. £2 10 0			
,, Pig	.. 1 0 0			
,, Poult. rearing	1 10 0			
			5 0 0	
				42 0 0
Shepherd, Aylesby—				
One year's wages in money	.. ..	..	26 0 0	
Cottage and garden, &c., value	.. ..	..	5 0 0	
Cow	.. ..	..	8 0 0	
Other privileges ..	.. ..	..	2 0 0	
				41 0 0

	£ s. d.	£ s. d.
Shepherd, Riby—		
One year's wages in money	22 0 0	
Cottage and garden, &c., value	5 0 0	
Cow	8 0 0	
Other privileges	2 0 0	
		37 0 0
Carpenter, Aylesby—		
One year's wages at 3s. 6d. a-day ..	54 12 0	
Extra, 12. per week	2 12 0	
		57 4 0
Waggoner, Aylesby —		
One year's wages in money	32 0 0	
Cottage and garden, value	5 0 0	
		37 0 0

The foremen board about 13 youths, who are engaged by the year at May-day, at wages averaging £12 each, and for whose board the foremen are paid as follows for each lad per annum :—

Money	£10	0	0
20 stone bacon, valued at 6s. per stone ..	6	0	0
½ cow	4	0	0
6 pecks malt, at 8s. per bushel	0	12	0
Pig in foddyard, valued at	1	0	0
Potato-ground, valued at	0	8	0
	£22	0	0

It may be considered worthy of remark, that no labourer, however aged or infirm, who has been in constant work on either of the farms, has ever been sent to a Union. However, the poor-rate comes to 1s. 10½d. at Aylesby, and 1s. 10d. at Riby, the total rates at the former parish being 3s. 10½d. per acre, and 2s. 9d. per acre at Riby.

COST OF HORSE-POWER.

"G. A. H." claims that I should pay interest upon the cost of my tackle; let us see what he and others pay, on this principle, on their horses. I think steam cultivation will come out advantageous in the comparison, in even a greater degree than has been supposed. I will take Mr. Morton's data as my guide, dividing the several items by 282, the number of horses he collated; and I shall charge £2 6s. for interest on each horse, and then rearrange what I drew the other day in your columns, and thus see how matters stand. The £7817 for cost of food, &c., when thus divided, stands at £28 per horse. The £870 needed for keeping good the implements stands at £3 per horse, and the £424s for ploughmen's wages and for boy, &c., stands at £15 per horse. Now, the interest on these items stands at, for cost of food, &c., 28s. per horse : needed for implements, 3s. per horse; and for ploughmen and boys, 15s. per horse : and I will fix the price of a horse, &c., at £45, as before. Now, let us look at the picture, and we will take horse-culture first, from March, 1869, to March, 1870 :—

Cost of 10 horses, with implements, &c., at £45 per horse	£450	0	0
Interest thereon, at 45s. per horse	22	10	0
Food, &c., for 10 horses, at £28 per horse ..	280	0	0
Interest thereon	14	0	0
For keeping good the implements, at £3 per horse	30	0	0
Interest thereon	1	10	0
Ploughmen and boys for 10 horses, at £15 per horse	150	0	0
Interest thereon	7	10	0
	£955	10	0

Now, on the steam culture side of the picture, as my horses work only, on an average, 118 days, or two-fifths of a year only, I shall charge them for ploughmen and boys with only two-fifths of a year, for the men are employed the other three-fifths of the year on the land, cleaning it, &c.

STEAM-POWER CULTURE FROM MARCH, 1869, TO MARCH, 1870.			
Half the cost of engine	£150	0	0
Interest thereon	7	10	0
Cost of tackle	216	0	0
Interest thereon	10	16	0
Cost of five horses, at £45 per horse	225	0	0
Interest thereon	11	5	0
Food for five horses, at £28 per horse	140	0	0
Interest thereon	7	0	0
For keeping good the implement, at £3 per horse	15	0	0
Interest thereon	0	15	0
Ploughmen and boys for five horses two-fifths of a year, at £15 per horse per annum ..	30	0	0
Interest thereon	1	10	0
Balance on the side of steam-power	140	14	0
	£955	10	0

The landlord's work that I am doing with my five horses ought to have been pulled off, yet I pass it. If, then, "G. A. H." will have interest of money he will find the tables are turned against him, for in this little farm of mine, only 163 acres arable, £140 14s. tenant's capital is needed for the year's work under horse culture more than under steam culture—interest, &c., on all included. He would have it, and what does he get by it? He gets the cost on horses' operations shown beyond their fair marketable value, just for the fun of showing my cost of seed-bed beyond its real value or cost up to 9s. 2d., while his, under horse culture, must go up to 25s. per acre, or more. I will not, however, alter my mode of estimating to please "G. A. H.," therefore my extras shall stand at 1s. 6d. per acre, and my cost of seed-bed will stand at 6s. 8d., for Wheat, an acre.

Now, I must talk a bit about my being a "desperately bad farmer," because I kept six horses to work my 112 acres of arable land. I confess that I did need that number to work it 6 inches deep, and for some years before I began to apply steam-power. I tried, with that number, to work one field each year deeper by subsoiling it in the ordinary way, yet failed for the want of time at the proper season in November and December. This it was that led me on to apply steam-power; but then, according to "G. A. H.," there must be some bad farmers about here now, for the farm on the north side of my own employs 9 horses to work 135 acres, and the one on the south side employs 6 horses to work 105 acres. "G. A. H." could, according to his own conceit, do on those farms with fewer horses. That may be, but the fact is plain that those are the numbers on these farms now.

I will now notice "West Indian's" two questions. Firstly, "motive power on a farm." I have no faith whatever in it. At Warwick show I had a locomotive engine that could not be made to go over a spot where a pailful of water had been thrown down. Mr. Aveling tells us, at p. 1263, that its disadvantages are—"The difficulty in moving the engines on wet land. This difficulty has been almost entirely removed by increasing the diameter and width of the driving wheels." We must remember that the last two years have been dry ones, yet we may have wet ones again. Then comes the question, how shall we get on then? No better, in my opinion; and Mr. Aveling's word "almost" is doubtful; but let us leave this and try other grounds. We have so many jobs on a farm that need the power of a single horse only, that it appears clear to me that we must keep some horses; and as we must keep some let them do the carting, for it will be a waste to do that with an engine with the horses kept in idleness. I say again, that I have no faith whatever in a locomotive for carting, &c.

Secondly, "the increased fertility of the land." It has been mainly due to the deeper working of the soil. This has enabled me to crop all my land every year with corn crops. I have not kept any additional stock.

The last two years I have used some superphosphate, and that is all I shall keep on with this, for I must not expect to get corn crops yearly upon this heavy land of mine without some additional manure than just the ordinary manure made from the straw grown upon the farm.

A word to "H. H., Leicestershire." Keep the steam pressure on the engine low when working fields that you know have stones in them. The implement will then pass slowly along, and when it strikes a stone it will jump over it or throw the driving band from the engine, and this avoids breakage. The stones must then be taken out by hand labour. I cleared them from my heavy land in this way. *William Smith, Woolston, Bletchley Station, Bucks, December 20.*

Home Correspondence.

The Real Land-tax.—Not only in your paper, but everwhere, we find writers expressing their astonishment that so few persons employ their capital in the improvement or reclamation of land, but I have never seen any notice taken of the one great impediment to such outlay. This impediment is the British rule of taxation. Directly land increases in value the assessment is raised, and no breathing time is given to the capitalist to recover himself. We are always saying that, if tenants are to do anything, they must have a long lease, so that they may reap the fruits of their outlay. The some argument applies to the outlays of landlords or capitalists. Rates and taxes vary greatly, but are often a third of the rent. Now, supposing an owner is willing to invest money in improving his land, and is satisfied with 5 per cent. In order to enable him to obtain this, the improvement must pay, not 5, but 6¾ per cent. Those who have contributed nothing to cause this increase in value, reap a large share of the benefit. And when it is further recollected that the improvement of land, unless undertaken by very skilful persons, who of course must be a small minority, is a mere commercial speculation, in which loss is possible as well as gain, can we wonder that many men prefer a good railway debenture, which is subject neither to poor rates, highway rates, nor to the other numerous lancets which cause the agriculturist to bleed? There is, however, no chance of any change in the law, because some improvements in husbandry do continue to be made, notwithstanding all discouragements. But there would be nothing unfair if an owner, upon giving notice that he purposed improving his land, should be allowed to remain at his then assessment for a reasonable space of time. *G. S.*

The Smithfield Club Show.—Can there be any improvements made in the management and proceedings of the Club in reference to the show? The exhibition hall is nearly all that can be desired, and the arrangements there made for the great meeting are very satisfactory. The stock is shown in admirable order and comprehensive design. The cattle stand quietly and comfortably in long rows nicely tied to their ringles, with classes of sheep in their front occasionally. This prevents uneasiness from confronting each other. The sheep occupy the outer area of the middle hall. The pigs are a separate show to themselves, in a very airy and convenient compartment, entered from the south-east corner of the hall. A visitor must be extremely fastidious in taking exception to these general and pleasant arrangements. This great and imposing exhibition has long ago become a national one, and it is doing a national service to suggest and be the means of carrying out any great and effective improvements. I had the pleasure to visit the late show; it was a very pleasing and highly interesting, shall I say, little show. I saw no animal in any class that stood out especially prominent before his fellows, but all, with solitary exceptions, exceedingly good and praiseworthy, denoting as much care and talent in breeding and fatting as heretofore. If there was one thing more than another that arrested my attention it was the paucity in number of exhibitors of that class I want to see most represented at such meetings—the farmers—the occupiers and cultivators of the soil, and for whose more special advancement in knowledge of stock and ultimate benefit the Club was established, *i. e.*, to show them as a class what attainments could be made in the breeding, management, and fatting of farm stock. I certainly do rejoice to find our beloved Queen, her royal son, and so many of our nobility and gentlemen, so laudably and nobly engaged in promoting our country's progress by their scientific breeding and management of this said farm stock. They have the means, and can conduct these highly useful experiments of fatting and management in a way that few farmers can afford, or can attain to. Their exhibitions of our domestic animals at this show do them infinite credit, and long may they persevere in such meritorious contests. But while I say this, I cannot forget that such exhibitors shut out in some measure the tenant-farmer. His chance of successful competition is comparatively small. Those brave men of this class who do carry off honours by attention to and pride in their "hobbies" are generally men of substance and mark—closely favoured by, or, it may be, allied to the "squire" under whom they hold, and who rejoices in his tenant's enterprise and success. The common tenant-farmers, notwithstanding, are in a great minority as exhibitors at these great gatherings. This is wrong: they ought to be the principals. The only reason they are not is simply owing to their slight chances of success in competition with those above-named. I want the Club to issue a long series of prizes to be contended for by tenant-farmers only. I believe the competition would be so great that the Agricultural Hall would be far too strait for the numbers of animals that would be sent in. I urge this advisedly, because I know that very many tenants are under the impression that these competitions can only with advantage be indulged in by men of wealth, and that the only interest they have in them is the pleasure of a visit when the show is held. What a wonderful advancement our country would experience if the feeding and fattening of stock in the most approved way were generally practised by tenant-farmers. They must be stimulated to this by such encouragements as I have suggested. We must no longer be compelled to compete with the higher classes, but with our brother tenant-farmers. A high general prize for the best animals in the show in their respective classes would be enough to bring in a competition between all exhibitors, and I for one should rejoice to find a tenant-farmer head the show, and the oftener the better. The Club might, as an experiment, try some of the leading classes first for at least two or three years—say a Shorthorn class for tenant-farmers, and a Southdown class for the same, and one or two others where the upper class of exhibitors take most ground. I name this hoping to excite some discussion upon the point, as I feel assured the great bulk of tenant-farmers are relaxing in their efforts to produce first-class animals. I am well aware that the disastrous cattle plague damped many energies; but that has passed—let us renew our efforts. *O. F.*

Foreign Correspondence.

PARIS: *Agricultural Science in France.*—Our ingenious neighbours are at present pushing their love of research especially in the direction of agriculture, and doing all they can at once to bring all the light that science can supply to bear upon the art, and to introduce a knowledge of it into general education; no object can possibly better deserve the attention of savants and professors, and although some Will-o'-the-Wisps may be created and mislead for a time, the great science of the earth and the supply of food must in the end benefit greatly by such endeavours. One of the subjects that has attracted special attention of late is the part that the alkalies play in vegetation. We all know that without potash or soda, or both, plants cannot arrive at perfection, that is to say, cannot pass regularly through all the stages of their life and produce the means of their own multiplication. This principle settled, it remains to discover what proportions of the alkalies are necessary in each case. Chemical research has not yet arrived at very definite results on this subject; the principal point ascertained is that with respect to the greater number of plants cultivated on a large scale potash is far more necessary than soda.

MM. Péligot, Payen, and Otter, eminent chemists, are now busily occupied in carrying out this investigation more completely, by careful analyses of the ashes furnished by plants after burning. When such residues are washed in water, and the solution evaporated, the following highly interesting and important fact is discovered, namely, that potash and soda are found in different proportions, not only in the same kind of

plant cultivated in various soils, but also in different plants cultivated in the same soil. From evidence such as this, furnished by many experiments, under various circumstances, it is impossible to avoid the conclusion that plants have the power of making, as it were, a choice amongst the assimilable substances which they meet with in the soil. It cannot yet be asserted with certainty of Wheat, or any other great crop, that either of the alkalies is or is not indispensable to its perfect development; any such conclusion would, it is believed, be erroneous; but it may be stated, with every appearance of probability, that the presence of potash in the soil is most important for Wheat, and for all other cereals. This is a step towards the solution of a question of great scientific interest and practical importance.

A communication was made the other day to the Academy of Science, from M. Hervé Mangon, an engineer-in-chief of Ponts et Chaussées, on the physical properties of arable land, in which it is argued that chemical analysis is insufficient alone to determine the effective value of arable land. The author of the memoir recommends, in the first place, microscopic examinations; when the component parts of the soil are finely divided by levigation in water, the microscope enables the observer to perceive great differences between the particles—he finds fragments of broken minerals and small crystals, affording precise information respecting the geologic origin of the soil.

One of the next most important points is to determine the calorific properties of the soil, its conductibility, the radiating power of its surface, and the nature and quantities of the gases condensed within it. A given quantity taken from the soil of a field is found to contain from 2 to 10 volumes of gas, and even more, the amount and the nature of the gas varying with the fertility of the soil; the phenomena of oxidation in various cases may thus be explained.

The extraction of the gases should be made in vacuo and at a low temperature. M. Mangon has by long and careful research established the fact that the gases traverse the earth with various velocities, and thus is explained the difference in the composition of the gases confined in two soils which appear to be placed under similar conditions.

The elasticity of the vapour of water in arable land depends on the nature of the soil, on the temperature, and on the proportion of water which it contains; it becomes equal to that water in the liquid state at the same temperature only when the earth contains sufficient water to saturate its power of absorption. M. Mangon has measured the tension of the vapour of water in soil by three distinct modes which check each other, and has drawn up tables for reference on the subject; he is still pursuing his experiments, and will shortly make known more of the results obtained.

That which precedes deals entirely with scientific investigation. Much is being done, also, for the propagation of scientific knowledge and a due mixture of that with practice in agricultural instruction. M. Gossin, professor at the Agricultural Institute of Beauvais, is now directing the publication of a complete course of agricultural studies by himself and other professors. Two volumes of this course, by M. F. Masure, professor at the Lycée of Orleans, have just appeared—the "Elements of Chemistry, applied to Agriculture, Domestic Economy, and Industry;" and "Theoretical and Practical Notions of Agriculture, for the use of Primary Schools,"* containing a large amount of valuable information at the lowest possible price.

M. Masure maintains that agricultural instruction without practice is fruitless; the book that a pupil reads, or the lecture to which he listens should be a *resumé* of that which he has seen with his own eyes, or touched with his own hands. Every professor should have a model farm or field in which the principal cultivated plants can be grown in a careful and methodical manner. But there is another difficulty; the teachers in the common schools, who alone can reach the young agricultural mind, have all to learn themselves. Knowing this, M. Masure has here, in fact, produced a manual for the use of teachers as well as of pupils, giving with the theory instructions relating to experiments, excursions, and cultivation. In the larger work the plan is also essentially practical; the principles of chemistry, organic and inorganic, as well as the necessary elements of physical science, are first given succinctly, and then the teacher is instructed in the mode of demonstration of each principle, and in the methods of carrying the theory into absolute practice. In an appendix a list of the apparatus required for an agricultural laboratory is given, together with explanations respecting its use, and the mode of conducting experiments. For a sum equal to 6*s.* 10*d.*, says M. Masure, a laboratory may be furnished with all that is necessary for serious experiments, the analyses of soil, and other operations, and he tells his readers of what it consists.

What is here stated is sufficient to show that our neighbours are doing their best to sow agricultural science and art broadcast, or rather, perhaps, we should say, to drill it into the land—to cause the actual cultivators of the soil to work with more effect by teaching them the why and the wherefore of their operations. We shall take an early opportunity of showing what progress has lately been made in France towards incorporating agricultural science in secondary and superior instruction.

Our neighbours have carefully studied the agriculture of Great Britain, and have liberally acknowledged the benefits they have derived from the study; they have adopted much of our machinery, and as much of our practice as suited the peculiarities of their soil and climate; and it is not at all unlikely that their able chemists and indefatigable professors will repay us handsomely by their investigations, experiments, and example.

* "Eléments," &c., 574 pages, with cuts, 2fr. 50c.; "Notions d'Agriculture," &c., 229 pages, 60c. Paris: Elériot.

Societies.

DEVON CENTRAL CHAMBER OF AGRICULTURE.

A DISCUSSION ON THE GAME LAWS: *Newton Abbot.*—After a paper read by Mr. C. J. Wade, the President of this Society, at its late meeting here, the following discussion took place:—

Mr. G. STOOKE had no sympathy with those who went for unconditional and absolute abolition of the Game Laws. He would rather see the landowner reap the benefit of the tenant's injury than see a lot of idlers let loose on the country with no restrictions on them. Many people, he thought, went in for the total abolition of the Game Laws because they thought there would be no penalty then; but they must remember that Dick, Tom, and Harry might then go over the farmer's land with impunity. He thought that game and rabbits should be regarded in the eye of the law as the property of the occupier, and then an understanding might be come to by the owner and occupier. It was true that the landlord would, to some extent, dictate terms to the tenant, but then, in return, the tenant would be able to say on what terms he would let the game back again to the landlord. They would then be able to make up in some measure for the damage done by the game, and at the same time tenants generally would be proud to give their landlords a good day's sport. There then could be a proper understanding as to the shooting, and the tenant would be able to have some voice in saying who should be the lessee. He thought there ought not to be a third party like this coming in between landlord and tenant, He would also try to assimilate the Game Laws to the Dog-tax; he would reduce the cost of a certificate to a mere nominal sum, and call on every man who carried a gun to pay, say, 10*s.* a year, and that would deter many a poacher who now slinks about with a gun, and he believed the revenue would be a gainer.

Mr. J. CREED thought that every person who kept a large stock of game should pay compensation to the tenant for all injury done, and he felt that if the compensation was paid the tenant had nothing more to complain of. But then, on the other hand, there would be a complaint from an outsider, and that would be the consumer, who would say there was so much consumed by the game, which would otherwise be brought into the market. He felt that if they legislated severely on the game question it would be the means of driving the game altogether out of the country, and that, as an old sportsman, he should not like to see. If the tenant had power to call in a valuer who should say the amount the tenant had suffered from the game, and the landlord should pay this amount, then he thought the matter as between the landlord and tenant would be at an end. He should be sorry to see the tenantry of England drive the game question so hard as to drive the landlords away from them. He did not think they should want to have House of Commons legislation on the matter, but as Englishmen they should assert their right, and he did not think that if they came honestly before the landlords that right would be refused.

Mr. NORTHCOTTE (Christow) said, on looking in history he saw that the origin of shooting was in a most barbarous age, when it was necessary for the savages to use bow and arrows or some weapons to kill wild animals for subsistence. But as soon as the country became more populous it was found necessary to till the soil, and the weapons were laid aside. We were now in a commercial stage, and what did they want of shooting now? He held that the agriculturists were entrusted with a very great mission, and that was to grow food for the people, and if they did not do it some others would. At the time the Free-trade measure was passed it was said to farmers, "Oh, you needn't grow anything more," but they found it necessary to grow more and more. But the game had done a great deal in destroying much of their produce, and he was of opinion that in the last dozen years the Game Laws had ruined more produce than would have paid off the whole of the National Debt. There was of course a difference in the amount of injury done to different estates by the rabbits. He was on one estate where scarcely 5*s.* worth of damage was done by the rabbits. On the estate he was now occupying he had a 4-acre field, and last year it was sown with Wheat; he manured it well, and in about 10 days the Wheat came up, and it was no sooner up than the rabbits bit off every blade; when he threshed that Wheat the whole produce of the field was three bags and six pecks. The injury was not only the loss of the crop, but there was also the waste of the manure. He thought the tenants should have a safeguard for the outlay of their property of two years' rent.

Mr. H. H. WATSON (Totnes) said he had been struck by the tendency of one or two of the speakers, who had led them to believe that the landowners would leave the country if the game was going to be destroyed. He could not help thinking that many of these fancies were imaginary, for he did not believe that the landlords were so unpatriotic, so selfish and unwise, as to think of such a thing for one moment. As to the injury that was done to the people of this country by the ravages of the game there could be no two opinions. It was thought by some that it was only a question between landlord and tenant, but it was very much larger than this. He believed that the tenant was not fairly compensated, nor would he ever be, for a surveyor who was called in could not give a fair estimate, for he could not tell to what extent the crops had been damaged. It was very discouraging to a tenant, after he had laid out a lot of money, to find his crop destroyed, and each succeeding crop injured. It would affect not only the farmer himself but also the landowner. The public generally had an interest in this question, inasmuch as they must be fed from the produce of the land. He was surprised to hear some gentlemen say the Game Laws were inviolable.

Mr. SOWTON (Ipplepen) thought that the tenant should have the rabbits for himself, that he should be allowed to kill them any way and at any time he thought fit. Then he thought the great evil would be destroyed. As to partridges and pheasants, he did not think there was any very great ground for discontent about them. As to the lease, what was the use of a farmer dictating to the landlord? The landlord would say, "I must have the game," and if the tenant demurred at this, the landlord could say, "If you don't like it, 20 others will have it."

Mr. COULTON (Paignton) agreed with nearly all that had been said by Mr. Sowton. As far as hares, partridges, and pheasants went, he did not think they did much harm in this county to the crops. He thought, however, that the rabbits should be entirely under the control of the tenant, who should have the power to trap, ferret, and destroy them at any time. He thought that where hares and winged game did £1 worth of damage in the county, £20 damage was done by the rabbits. Every right-minded landlord who went over a farm, and saw the injury done by rabbits, must feel that it was not right to allow such a state of things to exist. Then, as to the keepers: he should like the tenant trusted more and the keeper less—there should be greater confidence between landlord and tenant. He had seen, and of course there were, good honest gamekeepers, but some of them were as great scoundrels as ever existed. He regretted to see that the landlords were not present to-day, for it was a question which materially affected them as well as the tenants. He concluded by proposing, "that this Chamber is of opinion that the tenant should have the full power to trap, net, or destroy the rabbits at any time."

Notices of Books.

The Quarterly Journal of Science. Conducted by Sir W. Fairbairn, Bart., F.R.S.; W. Crookes, F.R.S.; Robert Hunt, F.R.S.; H. Woodward, F.G.S., F.Z.S.; and James Samuelson, Editor. No. XXV., January, 1870. Longmans.

The current number of this most interesting Quarterly contains more than usual for the agricultural reader. There is a study of the sewage question occupying 12 of its pages; and an account of the French Imperial School of Forestry also possesses agricultural interest.

In addition to these the contents are more varied than in past numbers they have been. Articles on Light and Sound, on the Total Solar Eclipse of August last, on Instruction in Science for Women, on Idiocy, on Fuller's-Earth, and notices of various scientific publications make up, together with those already mentioned, and the usual chronicle of science, a very readable number of the Journal. The following is an extract from the Agricultural Chronicle, giving the history of the latter end of 1869:—

"The past three months have bristled all over with topics of agricultural interest—many of them, unfortunately, involving disagreeable experience. It is certain, now that a large portion of the Wheat crop has been threshed, that the harvest of 1869 has been very much below the average productiveness of past years; and the low prices which Wheat commands, owing probably to no one wanting corn in the general market of the world except ourselves, whatever their benefit to the nation at large, have materially aggravated to English farmers the injury of a deficient yield. The foot-and-mouth disease—a cattle plague of more or less virulence and frequency ever since 1839, when it first appeared—has been unusually general and severe during the past autumn. It is now, however, believed to be on the decline. Though rarely fatal, it is a painful malady, stopping the milk of cows and wasting the flesh of fatting cattle, and thus destroying the property of stock owners. It is generally supposed to be an importation from the Continent; but though that probably was true 30 years ago, it can now hardly be doubted that the disease has become indigenous. Careful quarantine, both at the ports of debarkation and in home localities wherever it exists, has, however, all along been urgently demanded, and it has been at length conceded, so that we may hope to see the evil reduced within less serious limits. The miseries of cattle transit, whether by land or by sea, have been urged on public attention, especially by the interest which Miss Burdett Coutts has

taken in the subject. The use of a railway cattle-truck, in which live stock shall have access to both food and water on a long journey, is most desirable; and it is believed that the inferior condition in which cattle after a railway journey reach the metropolitan market from great distances, when they have had no refreshment on the road, must at length make consigners of such cattle willing to pay the expenses involved in the provision of better accommodation. An experiment directed by Miss Coutts, in which six cattle were sent from Edinburgh to London, shows that cattle will eat and drink upon the way with great comfort to themselves and great advantage to their owners, if they have the opportunity. The condition of Ireland, which is to a great extent an agricultural question, has of late occupied the public mind more painfully than any other topic. Among the most valuable and suggestive of the many pamphlets which have been lately published on this subject is one by Mr. James Caird, in which he insists upon the curative influence of the lease of land for a term of years, as that which by its proved effect elsewhere is more likely than any other agency within our reach to be serviceable in Ireland. The Lothians of Scotland, which are the very model farm of British agriculture, were a century ago as badly off as Ireland is at present. Since 1780, owing chiefly to 'enabling laws' affecting the condition of strictly entailed estates, the principle has become established, and the practice has become universal there, that the duty of the landlord is to provide the farm with buildings and other permanent improvements, and that the duty of the tenant is to find the capital for cultivation under the security of a lease for a fixed term of years. It is the influence of the lease for a term of years that has been so wonderfully illustrated in Scotland; and Mr. Caird would accordingly confine all Government assistance in land improvement to estates and farms let on lease; and in other ways he would urge on Irish landlords and Irish tenants the acceptance of the lease, certain that it would create fertility and insure industry and promote contentment in Ireland, as it has elsewhere.—A very striking picture of foreign agriculture has been drawn by Mr. James Howard, M.P., in a lecture before the London Farmers' Club. He has proved conclusively that the small-farm system prevalent in many Continental countries is greatly inferior to our own plan of large holdings in almost every particular in which they admit of comparison. In the actual maintenance of a large population directly on the land we presume the former must be acknowledged superior; but the condition of both occupier and owner under such circumstances is shown to be below that of the English farm labourer, while the labouring class in such a case are in a miserable plight indeed. The small-farm system, and, still more, the small-estate system, may possibly be defensible on other grounds of State policy, but for its power to turn the soil to the most useful account; and for its power, or rather want of power, to "stock" the country with an intelligent middle-class population, it admits of no defence. Mr. Howard's excellent paper is indeed a sufficiently convincing proof that English agriculture, in spite of our higher northern latitude, is on the whole more productive than that of such districts as he had visited; and that taking even Belgian farming with which to compare it, and with which it has been occasionally contrasted to its discredit, the agriculture of our country is on the whole superior, whether as to its produce of grain and of meat, or as to its maintenance of an intelligent and well-conditioned tenantry.—The condition of the English agricultural labourer has lately occupied the attention of several farmers' clubs, and it seems proved that the mere labourer in the country is, on the whole, better off than the mere labourer in town.

"The Beet-sugar manufacture is prospering. Mr. Duncan's factory at Lavenham is answering his purpose, and it is also answering the purpose of the growers of Sugar-Beet in that neighbourhood, so that in all probability we have at length secured the establishment among us of a new industry, from which, judging by its effect in agricultural districts of France and Germany, the best consequences may be anticipated.—The results of the application of sewage-manure to land have been reported at Lodge Farm, near Barking, and elsewhere, as having been this year satisfactory. It is impossible to doubt that this subject will soon rank with the very foremost in agricultural and social importance."

The Timber Trades Price Book. By William Richardson, Accountant. Longmans.

A useful pocket companion, giving in eight separate tables (1) the price per foot run, and its equivalent per 120.12 feet, irrespective of thickness or weight; (2) the prices per foot run of various sizes, from 24 inches to 5 inches wide, and the equivalent price per Petersburg standard of 120.12 feet $1\frac{1}{2} \times 111$ and per standard of 120.12 feet 3×9—and so on through the other six tables having relation to the kind of calculation continually recurring in trade transactions.

Farm Memoranda.

HAMPSHIRE: *Dec.* 27.—In taking a review of the past year it must be acknowledged on the whole to have been favourable to agriculture, for although the price of corn has been lower, yet the season for all agricultural operations, including the harvest, has been propitious. An excellent spring and summer for working and cleaning the land for various crops, followed by a fine autumn for cultivating in anticipation of another year, and, finally, one of the best Wheat seasons ever known, taking all soils into consideration, which has enabled the farmers to sow a large breadth of Wheat, now looking, in most instances, vigorous and healthy, with a full plant. The autumn, too, has been especially beneficial for all stock, whether on the pastures or arable land, the summer having been dry; when the autumn rains came, which they did with great moderation, the Grass became most abundant, and nearly all kinds of grazing land has continued available for the cattle until a much later period than usual, as evidenced by the store stock of the country showing generally in fine condition (except in cases where the foot-and-mouth disease has occurred); and sheep, also, have done remarkably well whilst feeding on the arable, and in no season can we remember when a larger amount of meat has been made between Michaelmas and Christmas by fatting sheep, nor with greater benefit to the land, for with very few exceptions the animals have had a comparatively dry and healthy layer, even on the coldest soils.

The prospect of cattle food for the coming season is good, but not excessive. The root crop, which at one time promised unusual abundance, is now found to be much over an average. The Swedish Turnips, being the chief dependence, are not large, and the weighing of the crops has been somewhat disappointing in the acreable result. The hay crop was a good one, and secured in good condition, and there is a full average quantity for use left in the county; and as feeding stuffs are easy to buy, higher prices for hay cannot be expected, more particularly when it is found that on the best conducted farms straw is used in admixture with hay to a large extent, not only for feeding bullocks and farm horses, but for sheep also of all ages. We cannot, however, help mentioning that it is now becoming a common practice to give farm horses a certain amount of root food during the winter months in admixture with chaff, the best being Swedes, Mangel, and Carrots. The exhibitions of fat stock at Christmas have been well attended, and the supply of well-fed animals, whether of cattle, sheep, or swine, has been of a good average both as regards numbers and quality, the price being somewhat higher than last year for both beef and mutton.

The shows connected with sales by auction are attracting much notice in various counties in England, particularly where medals to the breeders are given, the late exhibition for prizes held at Southampton being a prominent one. And we would here remark that there seems to be some monotony in the holding of cattle shows year after year; and although there seem to be but little, if any, progress made in the excellence of individual specimens of stock, it must not be considered that these exhibitions are useless, because although the elder and more experienced members of the societies are continually dying off, yet there is a large number of young aspirants in the agricultural profession, to whom, as well as the public at large, these exhibitions offer a lesson not so readily attained in any other way.

We are pleased to say that the horned ewes, so many of which are kept in the Southern Division, have yeaned a great number of lambs; the early Down ewes have also just commenced lambing. It is satisfactory likewise to report that the stock flocks upon the chalk-hill farms are in a healthy condition, which, we trust, forebodes a good fall of lambs during the next few months.

It is a matter of great importance when we notice that every year a larger number of bullocks are taken in to feed the straw produce, and receiving oilcake, rape-cake, &c., in addition, upon many of the hill farms, where for many years past the straw and its conversion into manure has, in many instances, been very much neglected.

In conclusion, let us look forward to the future in the hope that some of the great social and agricultural questions foreshadowed by Farmers' Clubs and Chambers of Agriculture will be carried out and decided by Parliament in a satisfactory manner during the coming year. *Joseph Blundell, Southampton.*

The Week's Work.

JANUARY 8.—*Turnip Land.*—As the crop is cleared off, either by carting or folding, plough or rib. Dry open soils are generally ploughed, but many prefer ribbing, or raftering, as it is in other places termed; wet bottomed land is thus the better kept dry and exposed to the weather. Such land, whether the Turnips are carted off or consumed by sheep, is always more or less poached, and the poaching is rectified by the weather when thus laid up high and dry. Afterwards it is again ribbed, or raftered, so as to turn up the bottom of these stetches to the weather. In early fine seasons this may be done by the close of the month, but more frequently during the ensuing one, and in late seasons in March and even April in our northern counties. Unless thoroughly drained, so as to allow the heaviest rains to percolate to the drains, the water will flow in the open furrows between the drills or stetches. In such cases the land should be carefully water-furrowed; and from the liability of the stetches to crumble down in frosty weather, or rather when the thaw comes, the water-furrows should be gone over after every storm. Ribbing, too, is a great protection to the manure in such soils, while the cross-ploughing in the spring time more thoroughly incorporates it with the land than one close-ploughing at this season. The work is sometimes done by a double-mouldboard plough, as in setting up drills for manure; but we have always found the common plough to answer better, each furrow being turned upon its own width of unmoved land: much, however, depends upon the nature of the land. When wet-bottomed soils are much rutted here and there with carting, it is more difficult to hold a double than a single-furrow plough.

Water furrows in Wheat fields, grass, or ploughed land, go over, and allow no stagnant water to be seen. At the same time examine drains to see that the under-drainage is also all right, and that no washing in of earth during a storm has taken place. Taken in time it is easy to set matters right, but it is otherwise if they are neglected at this season for weeks and months in succession.

Water meadows attend to as in December, the intervals of flooding must depend upon temperature. As a rule, never float over ice. When, therefore, the surface freezes shut the sluices, and turn on the water again when the frost is all out. Avoid washing the surface in heavy floods; in rainy weather, therefore, it may be necessary to lower the sluice so far in the evening to obviate harm during night. Experienced watermen judge by the head or height of water at the sluice.

Irrigation works may be executed during open weather, for river water, for farm sewage, town sewage, or any combination which the circumstances of the case may suggest. From the present state of rivers and all flowing streams and springs, the levels are easily determined, so that much grass-land may be irrigated at a few shillings per acre, and as fast as the waterman can spread the water over the panes. Rainwater and farm sewage may be collected and so doctored at the time of application, with guano or some soluble fertiliser, as to suit any sort of land or crop. The Barking system of irrigation is a combination of iron pipes with open gutters. Through about two miles of iron piping the sewage is conveyed, from the outfall, across the marsh, and at its termination on the farm is discharged into the reception tanks, from which it flows over the farm in open gutters by gravitation. The reception tank, or any number of reception tanks, which the surface of the land requires, may be placed at different levels. And even the two miles of marsh land might be irrigated by means of branch pipes, with hydrants and reception tanks. The Barking system therefore suggests much that can be done throughout the provinces in the application of river or rain water, farm sewage or town sewage, successfully to land.

Meadows that are intended for hay and that require top-dressing should now be cleared of the ewe flock, store sheep, or live stock of any kind. Tussac Grass and weeds of every kind dig up and cart off as directed last month, before applying the compost. Rich composts are more evenly spread by manure distributors than the shovel, but heavy doses of inferior sorts apply on the old plan. Soft flat meadows when occasionally flooded seldom require top-dressing. Irrigation is the best plan for fertilising them; but when large doses of compost have to be applied—clay or marl—advantage should be taken of frosty weather. If, however, they carry the carts without harm, the work is best done in open weather, with the exception of claying and marling. All top-dressing should be well bush or chain-harrowed in as soon as spread. When the compost does not wash in properly to the roots of the Grass, it may be advantageous to harrow a second time towards the close of the month, or early in February before vegetation commences.

Fat stock are now generally disposed of, if ripe, but some keep on for the spring growth. Care, however, requires to be taken at this time, otherwise the upshot is unfortunate. Our improved breeds, which arrive at early maturity, will now bear forcing, but not equally; so that unless very great care is taken in the selection and housing of stock and in the quantity of cake or corn allowed, animals disposed to spring growth will grow bone faster than flesh, while those of an obese type will be liable to inflammatory attacks.

Sheep folding attend to. This is generally a trying season for the shepherds in the Turnip field, however hardy flocks may be naturally. The mountain breeds of Wales and of the North will do better on the hill-side amongst Heath and Furze than in the fold in bad weather. Even in cases where the roots are stored and fresh, heavy rains are very injurious, more so than snow-storms. In either case, when storms are of short duration, often during night, it is seldom advisable to remove the flock. In places where snow lies for a length of time, and the weather continues stormy, it is better to take home the sheep to the straw and replace them under cover until the storm is over. As a rule there should be sufficient houseroom on every farm for all the live stock upon it during bad weather. Under cover sheep require to be well ventilated. Close low hovels never suit them well, even although sub-divided by hurdles. Sheep will thrive better under the shelter of a hedge than in such a place, and in temporary shieelings better than in more expensive buildings. The old maxim, "Shelter is food," is a true one, and when sheep have to endure the inclemency of snow or rain in the open field, an extra allowance of cake and corn must be given, otherwise they will lose flesh. Now that straw nets are woven at a cheap rate it would pay well to afford sheep more shelter than they now

get by subdividing the folds into pens by means of stuffed hurdles set up slanting so as not to blow over. *W. B.*

Notices to Correspondents.

ALSIKE CLOVER: *N. C. A. Prior* asks the origin of the term Alsike. It is, we believe, Swedish.

BONES AND ACID: *Inquirer.* Apply 3 or 4 cwt. per acre for Swedish Turnips. They are worth £5 10s. to £6 per ton. Coprolites and acid can be had for £4 a ton.

FARM CAPITAL: In peroration to Mr. Mechi's paper, p. 1337 *c*, 1869, for "pinching enemy," read "pinching economy."

THE PRAIRIE GRASS: *Ignoramus.* It is a Bromus.

Markets.

ENGLISH WOOL.

There have been symptoms of a decided revival in business, and wherever sellers are prepared to take late rates, transactions are pretty considerable. The better grades of wool are evidently in a smaller compass than many believed, and we think before long prices will show a distinct upward tendency.

CURRENT PRICES OF ENGLISH WOOL. Per lb.	s. d.		s. d.
FLEECES—Southdown hoggets	1 1	to	1 2
Half bred ditto	1 2	—	1 2½
Kent Fleeces	1 3	—	1 4
Southdown ewes and wethers	0 0½	—	1 1
Leicester ditto	1 2	—	1 3
SORTS—Clothing	0 10	—	1 6
Combing	1 0	—	1 8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, January 6.

Prime Meadow Hay	80s. to	87s.	Clover, old	120s. to	126s.
Inferior do.	60	70	Inferior do.	60	100
Rowen	50	70	Prime 2d cut	100	110
Inferior do.	—	—	Inferior do.	80	90
Straw	28	34	CARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, January 6.

Sup. Meadow Hay	84s. to	92s.	Inferior Clover	95s. to	110s.
Inferior do.	70	78	New do.		
New do.	—	—	Straw	32	36
Superior Clover	120	130	JOSHUA BAKER.		

COALS.—January 5.

Hastings Hartley, 15*s.* 9*d.*; Holywell Main, 16*s.* 6*d.*; West Hartley, 15*s.* 9*d.*; Walls End Harton, 16*s.* 6*d.*; Walls End Hetton, 19*s.*; Walls End Hetton Lyons, 16*s.* 9d.; Walls End Hawthorn, 16*s.* 3*d.*; Walls End Russel's Hetton, 17*s.* 9*d.*; Walls End South Hetton, 18*s.* 9*d.*; Walls End Tees, 18*s.* 9*d.*—Ships at market, 11; sold, 10.

LEADENHALL POULTRY, &c.

THURSDAY, January 6.

A very dull trade; supply small. A good deal of stale and inferior Poultry and Game in the market.

		s. d. s. d.			s. d. s. d.
Geese	each	5 0—7 0	Pigeons	each	1 0—1 3
Ducklings	,,	3 0—3 6	Tame Rabbits	,,	1 0—1 6
Turkeys	,,	5 0—10 0	Wild Rabbits	,,	0 9—1 3
Turkey pullets	,,	.. ..	Partridges	,,	1 3—1 9
Ducks	,,	2 6—3 0	Pheasants	,,	3 0—4 0
Wild Ducks	,,	2 0—2 6	Hares	,,	2 6—3 0
Surrey Fowls, couple,		7 0—10 0	Grouse	,,	—
Do. chickens	,,	5 0—7 0	Snipes	,,	0 9—1 0
Barn-door Fowls	,,	6 0—8 0	English Eggs, p. 100,		10 0—12 0
Leverets	each	..	Foreign do.	,,	9 0—10 6

Teal and Plovers, 8*d.* to 1*s.* 3*d.* each; Fresh Butter, 1*s.* 4*d.* to 1*s.* 6*d.* per lb.

METROPOLITAN MEAT MARKET. Jan. 7.

Best Fresh Butter .. .. .. 19*s.* per dozen lb.
Second do. do. .. .. .. 17*s* ,,
Small Pork, 5*s.* 0*d.* to 5*s.* 8*d.*; Large Pork, 4*s.* 2*d.* to 4*s.* 8*d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, January 3.

We are but moderately supplied with Beasts; choicest qualities are readily disposed of at full rates. The number of Sheep is quite as large, if not larger, than was expected. trade is not very brisk, yet on the average prices are good, and a clearance is effected. Trade is dull for Calves, at rather easier rates. Our foreign supply consists of 1183 Beasts, 3780 Sheep, and 73 Calves; from Scotland, 250 Beasts; from Ireland, 430; from Norfolk and Suffolk, 730; and 1237 from the Midland and Home Counties.

	s. d. s. d.		s. d. s. d.
Best Scots, Herefords, &c.	5 6 to 5 10	Best Long-wools	5 4 to 5 6
Best Shorthorns	5 0—5 8	Do. Shorn	.. ..
2d quality Beasts	3 4—4 4	Ewes & 2d quality	4 0—5 0
Best Downs and Half-breds	5 8—5 10	Do. Shorn	.. — ..
Do. Shorn	.. — ..	Lambs	.. —
		Calves	4 0—5 10
		Pigs	4 0—6 0

Beasts, 3830; Sheep and Lambs, 17,810; Calves, 83; Pigs, 100.

THURSDAY, January 6.

We have a very short supply of Beasts, and a good demand, consequently Monday's quotations are fully maintained. The number of Sheep is also small, yet the trade in this department is slow; however, prices are not lower. The demand for choice Calves very much exceeds the supply, prices have therefore advanced. Our foreign supply consists of 178 Beasts, 965 Sheep, and 79 Calves.

	s. d. s. d.		s. d. s. d.
Best Scots, Herefords, &c.	5 6 to 5 10	Best Long-wools	5 4 to 5 6
Best Shorthorns	5 4—5 8	Do. Shorn	—
2d quality Beasts	3 4 4 4	Ewes & 2d quality	4 0—5 0
Best Downs and Half-breds	5 8—5 10	Do. Shorn	.. — ..
Do. Shorn	.. — ..	Lambs	.. ..
		Calves	4 0—6 0
		Pigs	.. — ..

Beasts, 674; Sheep and Lambs, 4085; Calves, 101; Pigs, —.

MARK LANE.

MONDAY, January 3.

The supply of English Wheat to this morning's market was small, generally in bad condition, and met with a slow sale at about the prices of this day se'nnight. There was a moderate attendance; the business done in foreign Wheat was in retail, at barely last week's rates. Barley and Beans were unchanged in value. White Peas rather cheaper. The Oat trade was steady; prices unaltered. Flour as last quoted.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk White	40—49	Red	37—48
— — fine selected runs, do.	42—53	Red	40—50
— — Talavera	56—58		
— — Norfolk	—	Red	—
— — Foreign	42—53		
BARLEY, grind & dist. 29s to 31s. Chev.	39—42	Malting	34—38
Foreign .. grinding and distilling	22—25	Malting	32—40
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire .. Potato	24—26	Feed	
— Irish .. Potato	23—25	Feed	21—24
— Foreign .. Poland and Brew	22—25	Feed	19—21
RYE	32—38	Foreign	33—36
RYE-MEAL, Foreign			
BEANS, Mazagan .. 35s. to 37s. Tick	36—49	Harrow	36—49
Pigeon .. 50s. to 50s. .. Winds	—	Longpod.	—
— Foreign .. Small	41—43	Egyptian	38—40
PEAS, White, Essex, and Kent .. Boilers	37—42	Suffolk	39—43
— Maple, 41s. to 45s. .. Grey	35—42	Foreign	35—38
MAIZE	—	Foreign	29—31
FLOUR, best marks delivered .. per sack	39—43		
— 2d ditto .. ditto	28—40	Country	28—40
— Foreign .. per barrel	22—25	Per sack	29—35

FRIDAY, January 7.

The weather during the past week has been damp and mild, with some heavy showers. The expected Black Sea fleet, which must now be near at hand, continues its depressing influence, and this, together with the heavy stocks in the chief ports of the kingdom, as disclosed by the statements made up at the end of the year (and which will probably show them to be twice as large as last year) with the absence of frost, caused a dull trade during the past week, and a decline of fully 1*s.* per qr. on Wheat, where sales were forced. Spring corn of all sorts was a slow sale at barely former rates, excepting best samples of Malting Barley, which maintained their late extreme prices. Flour was neglected, and prices have declined 1*s.* to 2*s.* per sack and 6*d.* per barrel in several of our leading markets. Since Friday last 27 cargoes arrived off the coast, of which, with those left over from last week, there remained for sale last night 41 cargoes. The trade in cargoes arrived off the coast was very slow during last week; the prices of Wheat, Maize, and Barley were slightly in buyers' favour. We did not notice any disposition to enter into business for forward delivery, one solitary transaction in Maize excepted. Rapeseed, Linseed, and Cottonseed, were steady in value. The arrivals of English grain this week were small, and moderate of foreign. There was a very poor attendance at market this morning, the little English Wheat on offer was sold at about Monday's quotations, but millers showed little disposition to purchase foreign except at a reduction in price, and as holders were generally firm very little business resulted. Spring corn of all descriptions was steady at about Monday's prices.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English	340	800	—	—
Irish	—	—	—	—
Foreign	16,430	11,900	9450	60 / 1620 brls.
	16,770	12,700	9450	

LIVERPOOL, January 4.—At to-day's market we had only a limited attendance of country millers and dealers in Wheat. A small amount of business was transacted, at a decline of 2*d.* per cental. Flour was also extremely dull of sale, at prices perhaps a shade easier than last reported. Indian Corn met a slow retail demand, at prices ranging a trifle under those of last Friday. Oats and Oatmeal dull. Peas inactive. Beans in limited request, at a decline of about 6*d.* per qr.

AVERAGES.

	Wheat.	Barley.	Oats.
Nov. 27	45s 6d	38s 1d	23s 5d
Dec. 4	44 3	37 0	22 6
— 11	43 8	36 2	22 5
— 18	43 10	36 0	22 3
— 25	43 3	35 11	21 6
Jan. 1	43 8	35 9	20 10
Average	45 1	37 6	22 2

SEED MARKET.

The seed trade still rules quiet. Samples of new English white and red Clover seed are very scarce; fine qualities of foreign are held at high rates. Advices from the United States speak badly of the new crop of red Clover seed; a good quantity of old American red has been recently reshipped to New York, so that it is not at all probable we shall get any supplies this season from that country. French Italian is 1*s.* per bale dearer on the other side. Scotch and Irish Grasses are this year very cheap and plentiful. English Rape seed is exceedingly scarce, and continues to advance in price. White Mustard seed also exhibits an upward tendency. Feeding Linseed is just now in slow demand.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, January 7.

Messrs. Pattenden & Smith report that the new year has opened with a better demand for Hops of all descriptions. Stocks of New English are nearly exhausted, and have advanced fully 5*s.* per cwt. in value since this day week.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Domo" Netting.

White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for

PROTECTION from the COLD WINDS and MORNING FROSTS.

"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.

"FRIGI DOMO" CANVAS.

Two yards wide .. .. 1s. 0d. per yard run.
Four yards wide .. .. 3s. 0d. per yard.
An improved make, 2 yards wide .. 1s. 9d. per yard.
An improved make, 4 yards wide .. 2s. 8d. per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 5¾d., 6¾d., 7¼d., 7¾d. and 8¾d. per yard.

Hessian Canvas, 54 and 72 inches wide, 6¾d. and 8¾d. per yard; ¼d. extra for cut lengths.

ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom.

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—

GLASS for ORCHARD HOUSES,

As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.

Each box contains 100 feet. The prices only apply to the sizes stated.

Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15.

	16 oz. to the foot.	21 oz.
Fourth quality	15s 0d	16s 6d
Third quality	16s 0d	22s 6d
Seconds	18s 6d	25s 0d
English	20s 0d	27s 0d

The above prices include the boxes, which are not returnable.

HORTICULTURAL GLASS.

Stock sizes, 16 oz., in 100 feet boxes, boxes included. These prices only apply to the sizes stated.

				4ths. s. d.	3rds. s. d.	2nd. s. d.
11 by 9	12 by 9	13 by 9	14 by 9			
12 by 10	13 by 10	14 by 10	15 by 10	13 0	15 0	17 0
13 by 11	14 by 11	..				
14 by 12	15 by 12	15 by 11	16 by 11			
18 by 12	19 by 12	16 by 12	17 by 12			
16 by 13	17 by 13	20 by 12	..	15 0	16 0	18 6
19 by 14	19 by 13	18 by 13	..			
	17 by 14	18 by 14	..	16 to 17 oz. to the foot		
	20 by 14					

SMALL SHEET SQUARES, in 100 feet Boxes. [illegible]

Boxes 2s. each, returnable at full price.

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application.

JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD HOUSE SIZES.

in. in.			4ths.	3rds.	2nds.	Best.
20 by 12, 20 by 13, 20 by 14, 20 by 15, 20 by 16	Per 100 feet	15 oz.	12s 3d	15s 0d	16s 0d	18s 0d
		21 oz.	15s 0d	20s 0d	22s 0d	24s 0d

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in. in.				4ths	3ds.	2nds	Best.
6 by 4, 6½ by 4½	7 by 5, 7½ by 5½	8 by 6, 8½ by 6½	9 by 7, 9½ by 7½	11s 3d	12s 6d	14s 0d	15s 6d

Per 100 feet.

10 by 8, 10½ by 8½, 11 by 9, 11½ by 9½	12 by 9, [illegible]	12½ by 10½, 13 by 10, [illegible]	13½ by 11½, 15 by 10, 13 by 11, [illegible]	11s 6d	13s 6d	15s 3d	17s 6d

LARGE SHEET SQUARES, 15 oz., per 100 feet.

in. in.	in. in.	in. in.	in. in.	4ths	3ds	2nds.	Best.
15½ by 10½	14 by 12	22 by 12	22 by 16				
16 by 10	14½ by 12½	17 by 13	24 by 16				
14½ by 11½	15 by 12	23 by 13	20 by 17				
15 by 11	15½ by 12½	18 by 14	22 by 17	12s 3d	15s 6d	16s 9d	18s 0d
15½ by 11½	16 by 12	22 by 14	24 by 17				
16 by 11	16½ by 12½	24 by 14	20 by 18				
21 by 11	17 by 12	20 by 15	22 by 18				
13 by 12	18 by 12	24 by 15	24 by 18				

The above Prices are only for the sizes stated; if a quantity of any other Size be required, a Special Price will be given.

SHEET GLASS.

In Crates for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz.	
4ths quality, per 300 feet case,	36s.	4ths quality, per 200 feet case,	36s.
3ds ,, ,,	42s	3ds ,, ,,	42s
2ds ,, ,,	62s	2ds ,, ,,	62s
Best ,, ,,	75s	Best ,, ,,	75s.

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in ⅛th in., 3⁄16th in., ¼th in., and ⅜th in. substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 21s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is mixed with raw oil or water.

WHITE ZINC PAINT, 40s. per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a half of White Lead and six gallons of Linseed Oil. Special Drivers for this Paint.

IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-Corrosion Paint is extensively used for all kinds of work in exposed situations, on Brick, Stone, Compo, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 4s. per gallon.

Per cwt.—s. d.		Per gallon.—s. d.	
GENUINE WHITE LEAD	[illegible] 0	LINSEED OIL	2 9
SECONDS WHITE LEAD	[illegible] 0	BOILED OIL	3 2
GROUND PATENT DRYERS, 4d. to 5½d. per lb.		TURPENTINE	2 9
,, OXFORD OCHRE, 3d. to 3½d. per lb.		LINSEED OIL PUTTY, [illegible] per cwt.	
,, RAW UMBER, 4½d. to 6d. per lb.		,, OAK VARNISH, 10s to	12 0
,, BURNT do., 6d. to 9d. [per lb.		,, CARRIAGE do., 12s to	14 0
GREEN PAINT, all shades, 28s to	60 0	,, PALE do., 10s to	12 0
BLACK PAINT	24s to 30 0	,, COPAL	16 0
RED PAINT	28s to 30 0	KNOTTING	10 0
		Patent GOLD SIZE	10 0
		,, BLACK JAPAN	12 0

GLAZIER'S DIAMONDS and TOOLS.
GROUND BRUSHES | MILLED LEAD and PIPES.
DUSTERS | SASH TOOLS. | OLD LEAD Bought or taken in
DISTEMPER BRUSHES | Exchange.

The above are Nett, for Cash, and as such cannot be booked. Lists of any of the above on application.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make. All such will be prosecuted by the Sellers and Makers.
S. & C. PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Patton Works, Sheffield. Established upwards of 125 years.

Cottam's Iron Hurdles, Fencing, and Gates.

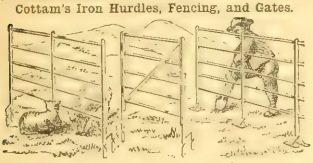

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra Metallic Ware, Terra Cotta, Stoneware, and Redware, and of great durability. The planet soils are especially suited for KITCHEN GARDENS, as the harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently are much cheaper.
GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, also in plain variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability. Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REGATE), at the above addresses—145 per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 5 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by the 14 lb. Parcel Post.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Address as above.
N.B. Orders prompt executed by Railway or Vessel.
A liberal discount to the Trade.

Vases and Fountains, for the Garden and Conservatory.

ANDREW HANDYSIDE AND CO., Britannia Iron Works, Derby; and 32, Wilbrook, London. Lithographed Sheets of Designs and Prices to be post free on application.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

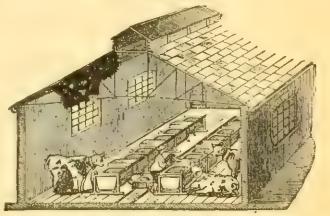

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack, dispense I with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent overgorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, £5.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

CARTER'S "PRIZE MEDAL" GRASS SEEDS.

J. C. AND CO. having secured their immense Stock of NATURAL GRASSES in splendid condition, are prepared to execute orders for Grass Seeds for Pastures, Lawns, &c.

The germinating quality (after most careful testing) is assured to be first-rate; and, from the great pains taken by Messrs. CARTER to adapt the Mixtures of Grasses to suit the particular nature of the soil intended to be laid down, the possibility of failure can scarcely be entertained.

It is only necessary when ordering to give a general description of the soil, situation, &c.

CARTER'S GRASS SEEDS FOR PERMANENT PASTURES (choicest quality).

For HEAVY SOILS, 28s. to 32s. per acre. | For LIGHT SOILS, 28s. to 32s. per acre. | For MEDIUM SOILS, 28s. to 32s. per acre.

Second quality cheaper. Reduced rates for more than 10 Acres.

CARTER'S "ROYAL MIXTURE" FOR LAWNS, 20s. per bushel

(as used in the Chief European Royal Gardens).

For the fullest information to insure successful Seeding down Land to Grass, see

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM for 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

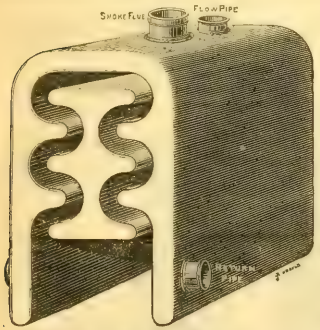

ORMSON'S PATENT CONVOLUTED BOILER.

NOTICE.

ROYAL GARDENS, KEW.

The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by HENRY ORMSON as a specimen of his first-class and substantial style of building Horticultural Structures. Also his Patent Wrought-iron Boilers, by which the new Hothouses, and many other Buildings are heated on a very extensive scale in the above great establishment.

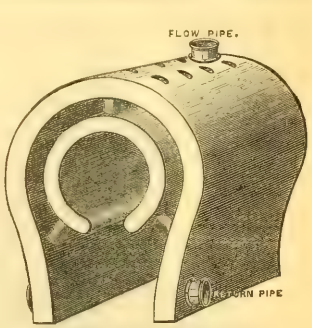

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

Confidence in Cast-iron Boilers is now, to a very great extent, lost in consequence of their continual cracking and failing, and are being replaced by ORMSON'S PATENT WELDED WROUGHT-IRON BOILERS, which are not only free from all danger of cracking, but have proved themselves far more economical in consumption of fuel.

HOTHOUSES MANUFACTURED BY STEAM MACHINERY. BEST MATERIALS AND LOWEST PRICES.

Plans, Specifications, and Estimates for Erecting Conservatories, Hothouses, and Hot-water Apparatus of every description in all parts of the country and abroad.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,
AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.
STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

NOTICE.

ROYAL HORTICULTURAL SOCIETY, LONDON.
ROYAL ZOOLOGICAL SOCIETY, LONDON.
ROYAL BOTANIC SOCIETY, LONDON.
ROYAL BOTANIC GARDENS, DUBLIN.
ROYAL BOTANIC GARDENS, LIVERPOOL.
ROYAL BOTANIC GARDENS, CAMBRIDGE.
ROYAL WINTER GARDEN, DUBLIN.
ROYAL DEPARTMENT OF SCIENCE AND ART, LONDON.

It is with great gratification that we announce our permission to refer upon any occasion to the various

HEATING APPARATUSES at the above, where our "**ONE BOILER SYSTEM**"

HAS FOR YEARS BEEN SUBJECTED TO THE MOST CRITICAL TESTS WITH EVERY SATISFACTORY RESULT.

It is matchless for efficiency, and is working the largest apparatus on record.

These are no theoretical statements, but positive facts, and it is not too much to add, that no boiler can boast a parallel.

For List of Details, see "ILLUSTRATED BOOK of DESIGNS" (12th Edition), which can be obtained by addressing a note to

JOHN WEEKS AND COMPANY,
HORTICULTURAL ENGINEERS, &c., KING'S ROAD, CHELSEA, LONDON, S.W.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

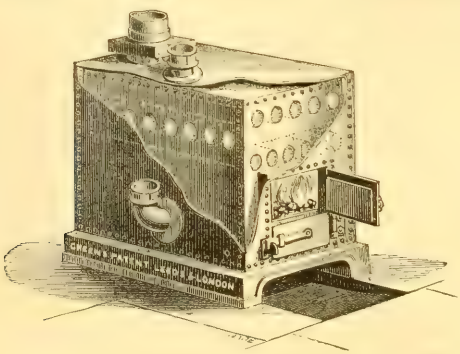

OBLONG BOILER.

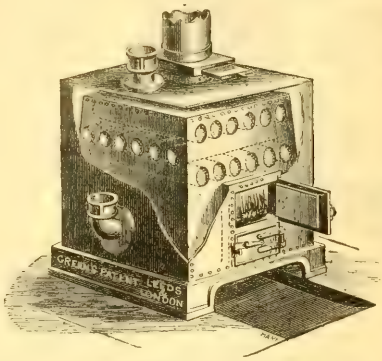

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS;
and 54 & 55, BLACKFRIARS ROAD, LONDON, S.E.

RIDDELL'S PATENT ELASTIC JOINTED SOCKET PIPE

FOR HOT OR COLD WATER, GAS OR STEAM.

PATENT DATED 12TH JUNE, 1869.

These Joints are the most perfect ever produced. A 4-inch Joint, which will bear a pressure of 200 lb. to the square inch, can be made by an intelligent labourer in 4 minutes, and it can be removed as quickly without injury to pipe or joint.

Nett Prices, delivered into Buyers' Vans, from Stock, at the WORKS, HANGER LANE, STAMFORD HILL, N., for cash with order:—

		2-inch.	3-inch.	4-inch.
9 feet lengths ..	per yard ..	1s. 8d.	2s. 2d.	
6 feet lengths ..	.. ..	1s. 2d.	1 8	2 2
Elbows ..	.. each	1 6	2 6	3 0
Syphons ..	.. ..	2 0	3 0	4 0
Patent Joints ..	.. ..	1 0	1 3	1 6

The Pipes and Joints may also be seen at the

PATENTEE'S WAREHOUSE, 155, CHEAPSIDE, LONDON, E.C.,

Where Price Lists and every information may be obtained.

A LONG-FELT WANT PROVIDED.

A NEW ERA IN THE HORTICULTURAL WORLD.

EVERY PERSON POSSESSING a GARDEN CAN NOW ERECT for HIMSELF a GREENHOUSE at a TRIFLING COST

DENNIS & COMPANY, CHELMSFORD,

Have succeeded in producing a really good, strong, and useful Building for less than £5, so simple in its construction that any ordinary mechanic can fix it with ease, thereby doing away with the cost of expensive mechanics' time and travelling fares.

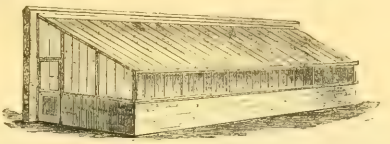

LEAN-TO, with Front Lights to Open (Class B.)

Suitable for Cucumber or Melon Houses, Stoves or General Forcing Houses, Small Vineries, Greenhouses, Peach-houses, &c. They are made only of the following external widths, with two glass ends and one door, including 16-oz. Horticultural Glass, cut up, and one priming coat of paint on the wood framing:—

Width.	Height to Eaves.	Height to Ridge.	Length 6 feet 4½ inches.	For every additional 6 feet, add	For glass partitions and door, add	If doors at both ends, add	If only one glass end, deduct
Ft. In.	Ft. In.	Ft. In.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
5 4½	5 0	7 8	4 11 0	2 8 3	1 4 6	0 5 3	0 18 6
6 3½	5 0	8 1½	5 6 9	2 14 3	1 9 3	0 5 3	1 13 3
			12 ft. 4½ in.				
			£ s. d.				
7 2½	5 0	8 7	8 16 0	2 17 6	1 13 9	0 5 3	1 7 9
8 1	5 0	9 0	9 15 2	3 3 0	1 17 9	0 5 3	1 11 0
10 0	5 0	10 0	12 10 3	3 16 9	2 11 6	0 5 3	2 5 0
12 0	5 0	11 0	14 6 9	4 7 6	3 3 0	0 5 3	2 17 9

Note.—For every additional length of less than 6 feet, the cost of 6 feet will be charged

Full particulars as to the various classes of Buildings, their dimensions, adaptations, and suitability for different purposes are contained in their Catalogues, which will be forwarded on application to

T. H. P. DENNIS AND COMPANY, HORTICULTURAL BUILDERS AND ENGINEERS, ANCHOR IRON WORKS, CHELMSFORD.

PORTABLE AND FIXED HOT-WATER APPARATUS,

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

TRUSS'S PATENT UNIVERSAL FLEXIBLE AND LEAKLESS PIPE-JOINTS.

T. S. TRUSS

Begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the ROYAL HORTICULTURAL SOCIETY at SOUTH KENSINGTON and CHISWICK, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantages obtained by his IMPROVED SYSTEM cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; EFFECTS a SAVING of 25 PER CENT. on cost of Apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; can be erected by any Gardener; an ordinary size Apparatus erected in one day; and PERFECTNESS of DESIGN SUPPLIED, INSURING NO EXTRAS. Complete Apparatus, of the best materials, delivered to any Railway Station in England, and Erected at the following prices. Erection beyond 25 miles of London, railway fare for one man additional. Considerable reduction on large works.

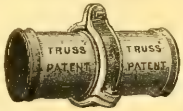

Two Four-inch Pipes along One Side and One End of House.

Size of House.	Apparatus Complete.	Erection	Size of House.	Apparatus Complete	Erection.
20 feet by 10 feet ...	£9 0 0 ...	£2 0 0	50 feet by 15 feet ...	£17 10 0 ...	£3 0 0
30 feet by 12 feet ...	11 15 0 ...	2 10 0	75 feet by 15 feet ..	20 0 0 ..	3 0 0
40 feet by 15 feet ...	15 0 0 ...	2 15 0	100 feet by 15 feet ...	26 0 0 ...	3 5 0

Bath and Gas Work Erected in Town or Country. The TRADE SUPPLIED.

Price Lists, Plans, and Estimates forwarded on application to

T. S. TRUSS, C.E., CONSULTING HORTICULTURAL ENGINEER, &c., SOLE MANUFACTURER, IRON MERCHANT, HOT-WATER APPARATUS MANUFACTURER, AND HORTICULTURAL BUILDER, FRIAR STREET, BLACKFRIARS ROAD, LONDON, S.E.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS Each

6 ft by 4 ft Lights, 2 in thick, unglazed .. £0 5 0
" " Primed and Glazed with 10 oz Sheet 0 11 0
" " with stout portable Box, but Painted 1 3 0
" " Painted four coats, and Handles on 1 8 0
" " Packed and Delivered in Railway van 1 10 0
6 ft by 8 ft, Double Lights, do 2 15 0

GREENHOUSES Per Ft. super

Woodwork only Prepared and Fitted 0 0 6
" Primed and Glazed with 16 oz Sheet 0 0 9
" Delivered, and Fixed with Ironwork 0 1 0
" Painted four coats, two sides, ready for use .. 0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

Preserve your Wall-fruit Trees from Spring Frosts.

EVERYONE MAY FIX HIS OWN WALL COVER.

BEARDS PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Victoria Works by C. BEARD, Horticultural Engineer, Bury St. Edmunds, Suffolk.

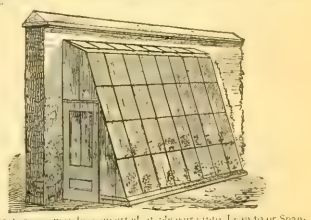

These Screens may be converted at pleasure into Lean-to or Span-houses.—Full particulars of their adaptation, and price, may be obtained at the Works, by enclosing stamp, where also an Illustrated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable systems of manufacture in both patent glazing and ventilation

T. G. MESSENGER, MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH

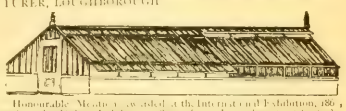

Honourable Mention awarded at the International Exhibition, 1862, and at the Dublin Exhibition, 1865, also a First-class Certificate by the Royal Horticultural Society.

T. G. MESSENGER, Patentee of many important improvements in Buildings and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed.

Any House Glazed, single or double, with or without putty. The mode adopted by T. G. MESSENGER for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented.

HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof and sides as though the glass were entirely removed, at once placing the plants in the external atmosphere

T. G. MESSENGER'S BOILER possesses all the advantages of the Tubular and Saddle combined, has hollow furnace bars, requires but a shallow stokehole, exposes as much surface to the direct action of the fire as can possibly be obtained, the whole of which can be easily cleaned; and it is an important fact, that out of upwards of 500 now at work made upon the improved principle not one has cost keel

T. G. MESSENGER'S VALVE (single or double) is effective, simple, easy to work, and as durable as the pipe to which it is attached

Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended. A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 33 stamps

SHANKS'S PATENT LAWN MOWERS for 1869,

The Patent Improvements recently introduced give SHANKS'S MACHINE

Several important advantages possessed by no other Lawn Mower PATENT DOUBLE EDGED SOLE-PLATE, WIND-GUARD, &c.

The unprecedented Sale for 1868, notwithstanding the Dryness of the Season, forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers

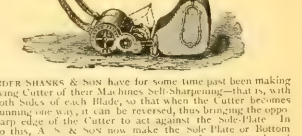

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, by bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole Plate or Bottom Blade of their Machine with Two Edges, one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind

There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned

Illustrated Circulars, with full particulars, sent free on application

A. SHANKS AND SONS, Arbroath Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all Sizes of Lawn Mowers always kept at 27, Leadenhall Street

The New Vade Mecum (Invented & Manufactured by CHARLES H. VINCENT, OPTICIAN, of 23, Windsor Street, Liverpool), consists of a TELESCOPE well adapted for Tourists, &c., to which is added an excellent MICROSCOPE of great power and first-class definition, quite equal to others sold at ten times the price. Wonderful as it may seem, the price of this ingenious combination is only 3s 6d; and Mr VINCENT sends it (carriage free anywhere, with printed directions, upon receipt of Post-office order o stamps to the amount of 3s. 10d.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.

Plans and Estimates on application.

J. JONES AND SONS, 35, King Street, Cheapside, London, E.C.
Manufactory, 6, Rankside, Southwark

Hothouses for the Million.—Notice of Removal.

MESSRS. HEREMAN AND MORTON beg to give notice to their Patrons and the Public that in consequence of the offices occupied by them at 7, Pall Mall East being required for other purposes, they have taken larger rooms at 14, THEODORE STREET, REGENT'S QUADRANT, W., to which address only all applications for prices of Sir J. PAXTON'S HOTHOUSES, and other information respecting Horticultural Buildings and Heating Apparatus of every description, should be made after the first week in January, 1870.

A PAMPHLET and PRICE LIST, &c., with 15 illustrations, description, and testimonials, will be sent post free on receipt of two stamps.

A HANDBOOK of VINE and FRUIT TREE CULTIVATION, with Views and Sections of Houses, Hints for Heating, complete Lists of Trees, &c., by S. HEREMAN, Chiswick, post free for 13 stamps.

HEREMAN AND MORTON, Horticultural Builders and Hot-water Engineers. Country Works in Gloucester, Coventry, near Ulverstone, Paisley, and Aberdeen.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (Dog Wharf), are prepared to supply WROUGHT IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice

An Illustrated Price List of Galvanised Iron, and other of BRABY'S Special Manufactures sent on application.

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage

The only Stove without a Flue.

NASH AND JOYCE'S PATENT, for WARMING HALLS, SHOPS, GREENHOUSES, &c.

These Stoves burn without attention or replenishing 12 to 24 hours. Price 12s. 6d. to Six Guineas. PATENT FUEL, 1s. 6d. per bag.

STOVES made expressly for Greenhouses, to Burn all Winter by filling up with the Patent Fuel every 12 hours.

S. NASH, Patentee, General Furnishing Ironmonger, 253, Oxford Street, W.; Joyce's Stove Depôt, 110, Newgate Street, E.C.; and Leinster Terrace, Bayswater, W.

Prospectuses of Patterns and Prices post free.

OSLER'S CRYSTAL GLASS CHANDELIERS, WALL LIGHTS and LUSTRES for Gas and Candles.
CHANDELIERS in Bronze and Ormolu.
MODERATOR LAMPS and LAMPS for INDIA.
TABLE GLASS of all kinds.
ORNAMENTAL GLASS, English and Foreign.
Mess, Export, and Furnishing Orders promptly executed
ALL articles marked in plain figures.
LONDON—Show Rooms, 45, OXFORD STREET, W.
BIRMINGHAM—Manufactory and Show Rooms, Broad Street.
Established 1807.

BY HER MAJESTY'S ROYAL LETTERS PATENT.

TO MEET A WANT WHICH HAS BEEN LONG FELT BY THE HORTICULTURAL PUBLIC,

MAW & CO.'S PATENT IMPERISHABLE TERRA-COTTA PLANT MARKERS

Are offered as a cheap and permanent substitute for WOODEN and ZINC TALLIES for the Labelling of Plants in Pots and in the Open Border, and for suspending to Roses, Orchids, Ferns, Fruit Trees, &c. These Labels, unlike Wood and Zinc, combine perfect durability with a lasting legible inscription, and form an elegant adjunct to the Garden and Conservatory for the naming of Horticultural and Botanical Collections. They are also invaluable for the labelling of Wine Cellars and for general use in situations where other materials are perishable by damp.

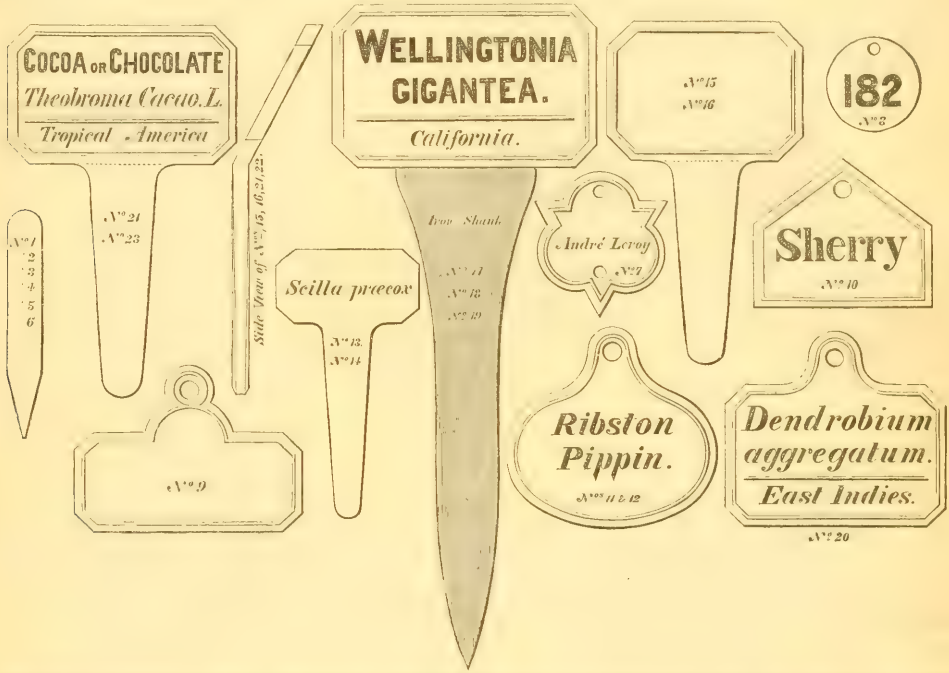

Commended by the Editors of the *Gardeners' Chronicle*, and the Floral Committee of the Royal Horticultural Society. (See *Gardeners' Chronicle*, July 11, 1868.)
Can be procured from the Manufactory, or through any Nurseryman, Seedsman, or Ironmonger.

Specimens sent Post Free on application.

No. 1 .. .. .. 3½ by ½ inch.	No. 6 .. .. .. 8 by 1 inch.	No. 11 .. .. .. 5½ by 3 inch.
No. 2 .. .. .. 4½ .. ½ ..	No. 7 .. .. .. 2½ .. 2 ..	No. 12 .. .. .. 5 .. 4½ ..
No. 3 .. .. .. 5½ .. ½ ..	No. 8 .. .. .. 1½ inch diam.	No. 13 .. .. .. 2 .. 4 ..
No. 4 .. .. .. 6 .. ½ ..	No. 9 .. .. .. 3½ by 2½ inch.	No. 14 .. .. .. 3 .. 5 ..
No. 5 .. .. .. 7 .. ½ ..	No. 10 .. .. .. 2½ .. 2½ ..	

Can be seen in use at the Royal Gardens, Kew; the Gardens of the Royal Horticultural and Royal Botanic Societies, Battersea Park; the Royal Botanic Garden at Edinburgh; and Botanic Gardens, Glasnevin, near Dublin, &c.

Directions for writing on the Labels with Black-lead Pencil. Apply a little whitespirit paint thinly over the part to be written upon, and *whilst wet*, write with a hard fine-pointed black-lead pencil. The writing will be perfectly indelible and unaffected by wet immediately the paint is set.

Black Enamel Writing on the Labels. All the above sizes can be supplied in several colours, ready written upon, with black enamel, having the appearance of jet black ink, but perfectly permanent. On receipt of Lists of Names, Estimates of Cost will be sent for any quantities of Pot or Border Labels, Suspending Labels for Orchids, Roses, Ferns, Fruit Trees, &c. Consecutive Sets of Numerals printed on the Labels, and Labels for Wine Bins, ready written with Enamel, kept in stock.

MAW & CO.'S ENCAUSTIC TILE and GEOMETRICAL MOSAIC PAVEMENTS and WALL LININGS

FOR CONSERVATORIES, GREENHOUSES, ENTRANCE HALLS, VERANDAHS, DAIRIES, &c.

Printed Patterns of various Designs suitable for the above will be forwarded on application, and Drawings, free of charge, of any of the Designs adapted to the given dimensions of spaces proposed to be Paved, will be supplied, accompanied by estimates of cost, including the expense of laying or otherwise. Applications for Estimates should be accompanied by an exact plan of the space drawn to scale, with all the dimensions marked in figures, and care should be taken that the size and position of all door-entrances and recesses that have to be paved are correctly represented; and when the walls are not exactly parallel, the measurements between the *opposite* angles, as well as along each wall, should be given.

WHITE GLAZED TILES for DAIRIES, &c.

Address—MAW AND CO., BENTHALL WORKS, BROSELEY, SALOP.

The Telegraph and Railway Station at Ironbridge, on the Severn Valley (Great Western) line is within three minutes' walk of the Works.

S. OWENS & Co.,

HYDRAULIC ENGINEERS,

WHITEFRIARS STREET, LONDON, E.C.

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

No. 37. DEEP WELL PUMPS for Horse, Hand, Steam, or other Power.
No. 63. PORTABLE IRRIGATORS with Double or Treble Barrels for Horse or Steam Power
No. 46a. IMPROVED DOUBLE ACTION PUMPS on BARROW for Watering Gardens, &c.
No. 49a. GALVANIZED SWING WATER CARRIERS, for Garden use.
No. 50 and 54a. FARM and MANSION FIRE ENGINES of every description.
No. 38. PORTABLE LIQUID MANURE PUMPS, on Legs, with Flexible Suction.
No. 49. GARDEN ENGINES, of all sizes, in Oak or Galvanized Iron Tubs.
No. 54b. THE CASSIOBURY FIRE EXTINGUISHER, as designed for the Right Hon. the Earl of Essex
No. 44. WROUGHT-IRON PORTABLE PUMPS of all sizes.
No. 4. CAST-IRON GARDEN, YARD, or STABLE PUMPS.
No. 30b. IMPROVED HOSE REELS for Coiling up Long Lengths of Hose for Garden use

S. OWENS and CO. Manufacture and Erect every description of Hydraulic and General Engineers' Work for Mansions, Farms, &c., comprising PUMPS, TURBINES, WATER WHEELS, WARMING APPARATUS, BATHS, DRYING CLOSETS, GAS WORKS, Apparatus for LIQUID MANURE distribution, FIRE MAINS, HYDRANTS, HOSE PIPES, &c., &c. *Particulars taken in any part of the Country. Plans and Estimates furnished.*

ILLUSTRATED CATALOGUES CAN BE HAD ON APPLICATION.

GREEN'S PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, ROLLING, and COLLECTING MACHINES, for 1869.

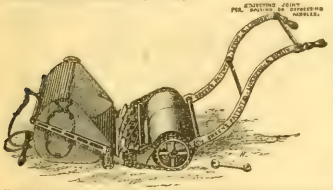

Every Machine is warranted to give entire satisfaction, and if not approved of, can be returned at once unconditionally

PRIZE MEDALS AWARDED to GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862
First Prize Medal at the International Exhibition, Dublin, 1865
First Prize Medal at the Namur Exhibition
First Prize Medal at the Ghent Exhibition.
First Prize Medal at the Lucken Exhibition
First Prize Medal at the Lucerne Exhibition
First Prize Medal at the Brussels Exhibition, on two occasions
First Prize Medal at the Hamburg Exhibition

GREEN'S Patent Lawn Mowers have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S Patent Lawn Mowers is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features:—1st. Simplicity of construction, every part being free of access. 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S Patent Lawn Mowers combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.

N.B.—All orders are executed on the day they are received

THE SOCIETY of PAINTERS in WATER COLOURS.—The WINTER EXHIBITION of SKETCHES and STUDIES is NOW OPEN. 5, Pall Mall East. Ten till Five. Admission 1s. Gas on dark days.

WILLIAM CALLOW, Secretary

EVENING LECTURES to WORKING MEN. ROYAL SCHOOL of MINES, Jermyn Street.

The THIRD COURSE of this SESSION, consisting of SIX LECTURES on the STUDY of APPLIED MECHANICS, by Professor GOODEVE, M.A., will COMMENCE this (Saturday) DAY, January 22, at 8 o'clock. Tickets may be obtained by Working Men only, on Saturday Evening, January 15, from 7 o'clock, upon payment of a Registration Fee of 6d. for the whole Course.

N.B. Only One Ticket can be issued to each applicant, who is requested to bring his Name, Address, and Occupation, written on a piece of paper, for which the Ticket will be exchanged.

WILLIAM REEKS, Registrar

THE QUARTERLY REVIEW, No. 255, will be published on SATURDAY, January 15

CONTENTS.

I. MR. TENNYSON'S HOLY GRAIL.
II. LIFE ASSURANCE COMPANIES.
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AND
AGRICULTURAL GAZETTE.

No. 3.—1870.] SATURDAY, JANUARY 15. { Price Fivepence. / Stamped Edition, 6d.

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DOWNIE, LAIRD, AND LAING, Frederick Street, Edinburgh, and Stanstead Park, Forest Hill, London, beg to intimate that their DESCRIPTIVE PRICED CATALOGUES of Garden, Flower, and Agricultural Seeds, Gladiolus, Florist Flowers, and New Plants are now ready, and may be had free on application

EVERY GARDEN REQUISITE KEPT in STOCK at CARTER'S New Seed Warehouses, 237 & 238, High Holborn, London

HERBERT H. NICHOLSON, SEED GROWER, Great Clacton, near St. Osyth, Essex, has a large quantity of FLOWER and VEGETABLE SEEDS, of his own growing, all new, FOR SALE. Lists on application.

STUART AND CO., Seed Growers, Nice—Seed Merchants, 9, Tavistock Row, Covent Garden, London, W.C. (REMOVED from 85, Southampton Row.)
WHOLESALE LIST sent free on application

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended
Highgate Nurseries, London, N.

STUART, MACDONALD, AND CO., Seed Growers and Seed Merchants, 85, Southampton Row, Holborn, London, W.C.
S., M. & Co.'s WHOLESALE LIST of all the choice Flower Seeds in cultivation forwarded on application

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H. AND F. SHARPE'S WHOLESALE CATALOGUE of HOME-GROWN SEEDS is now ready. The prices are very low, and the quality of the seeds very fine.
Seed Growing Establishment, Wisbech.

Seeds.

CHARLES TURNER'S CATALOGUE of KITCHEN GARDEN, FARM and FLOWER SEEDS is now ready, and may be had on application. This List contains only such varieties as may be depended on, after trials and comparisons.
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Garden Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown from carefully selected stocks.

Farm Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks.

CARTER'S GENUINE SEEDS. See pages 70 and 92.—237 and 238, High Holborn, London, W.C.

CARTER'S COLLECTIONS of VEGETABLE SEEDS. See pages 70 and 92.
237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See pages 70 and 92.
237 and 238, High Holborn, London, W.C.

CARTER'S NEW PEAS, &c., See pages 70 and 92.—237 and 238, High Holborn, London, W.C.

CARTER'S SELECTED SEED POTATOS. See pages 70 and 92.—237 and 238, High Holborn, London, W.C.

CARTER'S COLLECTIONS of FLOWER SEEDS. See pages 70 and 92.—237 and 238, High Holborn, London, W.C.

CARTER'S SPECIAL ORDER SHEET for 1870 is ready, and will be forwarded, post free, on application.
237 and 238, High Holborn, London, W.C.

For Seed.

HALLETT'S TRADE PEDIGREE MARK BARLEY and OATS.

See Advertisement on page 81 of this Paper.

LONG GUN CUCUMBER, warranted true, decidedly the best sort in cultivation. Four seeds, 1s. Post free for ready money.
SEP. THORNHILL, Beeston, near Nottingham.

To the Trade.

WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and BEDMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply, for cash, home-grown WHITE SPANISH ONION SEED, 2s. per lb, all new and genuine; mixed laced PINKS, 20s. per 100; old Crimson CLOVES, 10s. per 100.

RICHARD WALKER has the following to offer, for cash: splendid SEAKALE, for forcing, extra fine, 9s. per 100; fine GIANT ASPARAGUS, for planting, 4s. per 1000, or 3s. per 100; SEAKALE, for planting, 3s. 6d. per 100
Biggleswade Market Gardens.

To the Trade.—Henry's Hybrid Leek, Genuine.

DOWNIE, LAIRD, AND LAING are now sending out the above unrivalled LEEK, in sealed packets, at 6s. per dozen, or 40s. per 100 packets
Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

SEED POTATOS (SELECTED). PRICED LIST on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

True Early Rose Potato.

CHARLES SHARPE AND CO., Sleaford, have received a large consignment of the above from America, and are able to offer them in quantity. Price on application.

Seed Potatos.

H. AND F. SHARPE'S WHOLESALE LIST of all the new and best varieties of Early and Late POTATOS is now ready, and may be had on application. The quality is very fine, and prices low.
Seed-Growing Establishment, Wisbech.

Early Rose Potato.

H. AND F. SHARPE have just imported a very true stock of the above extraordinary prolific POTATO, direct from one of the best growers in America; and are prepared to offer it to the Trade at a reduced price.
Seed-Growing Establishment, Wisbech.

NEW AND GENUINE SEEDS,
CARRIAGE PAID.

B. S. WILLIAMS,
NURSERYMAN AND SEED MERCHANT,
VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

COMPLETE COLLECTIONS
OF
KITCHEN GARDEN SEEDS,
To suit Gardens of various sizes,
10s. 6d., 21s., 42s., 63s., and 84s. each.

New and Choice Vegetable Seeds.

	Per packet — s. d.
Williams' Alexandra BROCCOLI	1 6
Dell's fine Dark BEET	1 0
Williams' Matchless RED CELERY	1 0
Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Digswell Prize ENDIVE	0 6
All the Year Round CABBAGE LETTUCE	0 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Lee's Immense Hardy Green CABBAGE LETTUCE, new	1 0
Webb's Climax MELON, new (The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	2 6
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2 6
Nuneham Park ONION, quite distinct from any other variety	1 0
Earley's selected Double Curled PARSLEY, new	1 0
Laxton's Supreme PEA, new per half pint	2 0
Hundredfold, or the Cook's Favourite PEA, new, do.	2 0
Cullingford's Champion Marrow PEA, new, per quart (The finest flavoured Wrinkled Marrow in cultivation.)	3 6
Earley's Defiance TOMATO, new (The earliest and best variety in cultivation.)	2 6
Orangefield Dwarf Prolific TOMATO	0 6

New and Choice Flower Seeds.

Williams' superb strain of PRIMULA, Red, White, or Mixed 2s. 6d., 3s. 6d., and	5 0
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., and	5 0
CYCLAMEN, Wiggins' Prize strain, 1s. 6d., 2s. 6d., &	3 6
BALSAM, Williams' superb strain 1s. 6d. and	2 6
GERANIUM, Le Grand 1s. 6d. and	2 0
GLOXINIA, from the finest erect varieties 1s. and	2 6
HOLLYHOCKS, Chater's splendid varieties, mixed	1 0
PANSY, from Prize flowers 1s. and	2 6
PINK, finest double-fringed varieties 1s. and	2 6
POLYANTHUS, Wiggins' Prize strain 1s. and	1 6
VERBENA, Eckford's finest varieties	1 0
Williams' Improved Hybrid SOLANUMS 2s. 6d. &	3 6
ASTER, Dwarf, Victoria White, very fine	1 0
CENTAUREA CANDIDISSIMA 1s. and	2 6
CENTRANTHUS MACROSIPHON BICOLOR, new	1 0
CLARKEA INTEGRIPETALA, Tom Thumb, new	1 0
CONVOLVULUS MINOR UNICALUS, new	1 0
DELPHINIUM CONSOLIDA CANDELABRUM, new	1 0
ESCHSCHOLTZIA AURANTIACA, new	1 0
EUTOCA SERICEA, very dwarf, with pretty deep violet flowers, new	1 0
HELENIUM BOLANDERI, Dwarf Perennial species, new	1 0
LILIUM AURATUM	1 0
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	1 0
Williams' Improved FRENCH MARIGOLD, beautifully striped and very large	1 0
Parson's New TREE MIGNONETTE	1 0
NEMOPHILA ATOMARIA ELEGANS, new	1 0
OXALIS TROPÆOLOIDES VIRIDIFOLIA, green-leaved variety, new	1 0
PERILLA NANKINENSIS VARIEGATA, new	1 0
PYRETHRUM PARTHENIFOLIUM AUREUM, Golden Feather 1s. and	2 6
EAST LOTHIAN STOCKS, per collection of three colours (These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders.)	2 6
PURPLE QUEEN STOCK, a very dwarf and beautiful variety, the flowers are very double, and splendid colour	1 0
WHITE TEN-WEEK STOCK, Wallflower-leaved, new (This is the purest and finest White Stock in cultivation.)	1 0
IMPERIAL PURPLE SWEET PEAS, very large	0 6
TACSONIA VAN VOLXEMII, splendid greenhouse Climber	2 6
TROPÆOLUM GOLDEN KING of TOM THUMBS, new	1 0
VIOLA CORNUTA ALBA, new 1s. 6d. and	2 6
(This is an interesting and extremely useful variety, producing in great abundance pure white flowers, very robust and dwarf in habit, which renders it very effective in spring and summer, and invaluable during the late autumn months.)	
WALLFLOWERS, Saunders' fine dark variety	1 0
ZINNIA ELEGANS PUMILA Flore-pleno, new	1 0

B. S. W.'S DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, Post Free, on application.

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most critical and choice Seeds are either home saved or have been saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

GENUINE SEEDS ONLY.

JAMES VEITCH & SONS

BEG TO ANNOUNCE THAT THEIR

ILLUSTRATED PRICED CATALOGUE OF GARDEN AND FLOWER SEEDS for 1870,

WITH LIST OF IMPLEMENTS AND OTHER GARDEN REQUISITES,

Is now published, and will be forwarded Post Free on application.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.

SEEDS CARRIAGE FREE.

Now ready, Gratis and Post Free, an Illustrated

CATALOGUE of GARDEN, AGRICULTURAL and FLOWER SEEDS,

GARDEN SUNDRIES, HORTICULTURAL ELEGANCIES, &c.

Forming a most complete List of Requisites for the furnishing of a Garden, Conservatory, &c., with Instructions for Sowing, &c., &c.

DICK RADCLYFFE AND CO., 129, HIGH HOLBORN, W.C.
SEED GROUNDS—ERFURT, PRUSSIA.

PETER JAMES PERRY,

SEED MERCHANT, BANBURY,

BEGS TO ANNOUNCE THAT HIS

PRICED CATALOGUE OF GARDEN AND FLOWER SEEDS

Is now ready, and may be had Post Free on application.

He also calls attention to his

BANBURY IMPROVED WHITE SPANISH ONION,

Twelve Bulbs of which variety (weighing 12¾ lb.) were exhibited at the Royal Horticultural Society's Rooms, on December 21, 1869, and were awarded a "Special Certificate."

Price per Packet, **1s. 6d.** and **2s. 6d.**

CAREFULLY SAVED GARDEN SEEDS.

ARTHUR HENDERSON & CO.'S

CATALOGUE OF CHOICE VEGETABLE AND FLOWER SEED NOVELTIES

Is now Published, and can be forwarded Post Free on application.

The VEGETABLE SEED SECTION contains—

Selected LISTS of the best varieties of each kind most worthy of cultivation, also some excellent new sorts of both VEGETABLE and FLOWER SEEDS of sterling merit; attention is also directed to the Pine-apple Compact-top BEET (the finest and richest flavoured variety extant), carefully saved, true from the original stock. Also the new DWARF WATERLOO BEET; top leaves rich metallic crimson; growth true, even, and regular. This beautiful foliaged variety may with advantage be cultivated in the flower garden as a border, ribbon, or edging plant; its root is a trifle larger than the Pine-apple Compact-top, flavour excellent, full of a sweet saccharine juice, colour crimson, texture tender and uniform throughout.

The FLOWER SEED SECTION contains—

Imported GERMAN FLOWER SEEDS in Collections; Choice Strains of FLORISTS' FLOWER SEEDS; a careful LIST of FLOWER SEED NOVELTIES of the season; HORTICULTURAL REQUISITES of every kind, KNIVES, PROTECTING MATERIALS, HORTICULTURAL MANURES, &c., &c.

N.B. Everything in this Catalogue is priced.

PINE APPLE PLACE, MAIDA VALE, LONDON, W.

☞ **All Seeds Carriage Free.**

Now Ready, Post Free on application,

PETER LAWSON & SON'S

DESCRIPTIVE PRICED SEED CATALOGUE

OF KITCHEN GARDEN AND FLOWER SEEDS, GARDEN IMPLEMENTS, GLADIOLI, &c.

The True SANDRINGHAM CELERY, EMERALD CUCUMBER, DELL'S SUPERB BLACK BEET, SANDRINGHAM SPROUTING CABBAGE, INCOMPARABLE WHITE DUTCH CABBAGE LETTUCE, BANBURY IMPROVED WHITE SPANISH ONION, and other recently introduced VEGETABLES and FLOWER SEEDS, are fully described and are recommended.

20, BUDGE ROW, CANNON STREET, LONDON, E.C.; and EDINBURGH.

SEEDS WHICH MAY BE DEPENDED ON.

HOOPER & CO.'S

ASSORTMENTS OF KITCHEN GARDEN SEEDS,

CONTAINING A SUPPLY FOR TWELVE MONTHS' REQUIREMENTS.

No. 1.—For largest Gardens, Carriage Free	£5	0	0	No. 4.—For smaller Gardens, Carriage Free	£1	5	0
No. 2. For large Gardens ditto	3	0	0	No. 5.—For smaller Gardens	0	15	0
No. 3.—For smaller Gardens ditto	2	0	0	No. 6.—For smallest Gardens	0	10	0

NEW POTATOS for 1870.—Early Rose, 1s. 6d. per lb.; 7lb. for 9s.; 1 bushel (56lb.) for 65s. Bresee's King of the Earlies (10 days earlier than the above), was sold for 50 dollars a tuber in America last season, to per lb.; 7lb. for 40s. Bresee's Prolific, 3s. per lb.; 7lb. for 18s. 6d. Climax, 3s. per lb.; 7lb. for 18s. 6d. Paterson's Beauty (new sort, cropped), 1s. 6d. per lb.; 7lb. for 9s.; 1 bushel (60lb.) for 65s. The Queen's Potato (Perfection), 12s. per peck; 45s. per bushel. Full descriptions in HOOPER AND CO.'S SEED CATALOGUE, Part I., gratis on application.

HOOPER AND CO., COVENT GARDEN, LONDON, W.C.

EARLY GOODERICH POTATO.—This variety was sent us three years since by an eminent American Nurseryman, and having thoroughly tested it, we can recommend it as by far the HEAVIEST CROPPER of any VERY EARLY Potato known to us, and it must prove an acquisition where EARLINESS and a FULL CROP is an object. The tubers are round and full sized; and the foliage is very distinct, being remarkably broad and of vigorous growth. Price 21s. per bag containing 1 cwt., delivered carriage paid to the principal Railway Stations.

We can also supply DALMAHOY, GRYFFE CASTLE, DRUMMOND'S PROLIFIC, WALKER'S REGENTS, &c. Prices on application.

Seed and Nursery Establishment, Stirling, N.B. WM. DRUMMOND AND SONS.

VEITCH'S IMPROVED EARLY ASHLEAF KIDNEY POTATO.

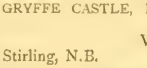

MESSRS. VEITCH & SONS

BEG TO OFFER

THIS SPLENDID FORCING POTATO,

Of which so many flattering Testimonials have appeared in the *Gardeners' Chronicle* and other publications,

Price 5s. per peck.

In the *Gardeners' Chronicle*, July 11, 1868, p. 740, Mr. J. EDLINGTON, Wrotham Park, Barnet, writes:—"This Potato with me this season is really first-rate. As its name indicates, it is without doubt a great improvement on the old Ashleaf. It is prolific, early, and its flavour, when properly cooked, is excellent. I purpose employing it another season rather extensively for forcing purposes."

In the "Journal of Horticulture," July 16, 1868, p. 48, the Editor remarks, in reply to "J. R. P.":—"The sample sent is very good of this very good variety. As the tubers are quite ripe, we have no doubt that you will succeed in raising a second crop this year, for it is a quickly-growing and quickly-maturing variety."

Report of Sample sent in February, 1868, to Royal Horticultural Gardens, Chiswick, for Trial.

"Your IMPROVED ASHLEAF POTATO proved to be very early, fit for use June 29th, very flowery, and beautifully white.—A. F. BARRON, Superintendent."

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

SUTTONS' GRASS SEEDS FOR ALL SOILS,

CARRIAGE FREE.

SUTTONS' Permanent Pasture MIXTURES for STIFF CLAY SOILS.
SUTTONS' Permanent Pasture MIXTURES for HEAVY LOAMS.
SUTTONS' Permanent Pasture MIXTURES for MEDIUM LOAMS.
SUTTONS' Permanent Pasture MIXTURES for LIGHT LOAMS.
SUTTONS' Permanent Pasture MIXTURES for LIGHT SANDS.
SUTTONS' Permanent Pasture MIXTURES for SHARP GRAVELS.
SUTTONS' Permanent Pasture MIXTURES for SHEEP DOWNS.

The sorts contained in these Mixtures are grown in different localities, and gathered separately by the hand expressly for this purpose, by which means all noxious weeds are excluded. They consist of the most nutritive kinds of Fescues, Poas, Sweet Vernal, Perennial Clovers, Loliums, &c., and are mixed in such sorts and proportions as are most suitable to the soils to be laid down. In this we use our discretion, in accordance with our many years' experience in all parts of the kingdom, as well as in other countries.

Prices.—SUTTONS' BEST MIXTURE for the above soils, **28s.** to **32s.** per acre; carriage free.
SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre; carriage free.
MIXTURES for One, Two, Three or Four Years' lay are also prepared for the above soils at from **12s. 6d.** to **22s.** per acre; carriage free.
SUTTONS' RENOVATING MIXTURE for Improving old Pasture should be sown during the early Spring months. A great improvement in the quantity and quality of the succeeding Hay crops may be effected by sowing from 6 to 12 lb. per acre of this Mixture. Price **9d.** per lb., **80s.** per cwt; carriage free.
For full Instructions on the Formation and Improvement of Grass Lands, apply to

SUTTON AND SONS, SEEDSMEN TO THE QUEEN, READING, BERKS.

KNAP HILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted April, 1869.
ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868.
ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference.
ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s., to £12 10s. per 100.
The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbrazilliana, &c., large numbers, many of them 20 and 30 years' growth
CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869.
CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868.
CEDRUS LEBANON, 6, 7, to 10 feet. Moved September, 1868.
CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen;
" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each.
" " GRACILIS, 3 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.
JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.
PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and unquestionably the finest plants to be found in any Nursery. None are grafted.
PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high.
PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 9 feet high. All removed 1868 69.
PICEA MAGNIFICA, 2, 3, and 4 feet.
PICEA PINSAPO, 4, 5, 6, and 8 feet, 21s. to 63s. each. Some grand plants, to 15 feet high, transplanted April, 1869.
THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed.
THUJA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868.
THUJA SIEBOLDII, 8 to 14 feet high, and as much in circumference; transplanted April, 1869
THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868
WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each. Transplanted in August.
PINUS AUSTRIACA, 3 feet, £5 per 100. Transplanted Sept., 1868
PINUS CEMBRA, 8 to 10 feet, 10s. to 12 ft round, 10s. 6d. to 21s. each.
YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought
YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.
YEWS, IRISH, handsome plants, up to 10 feet high.
HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—
HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet.
HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference.
HOLLY, SILVER QUEEN, 4, 5, and 6 feet.
WATERER'S HOLLY.—This variety originated in this Nursery; we have hundreds 4, 5, and 6 ft. high, 10 and 15 ft. circumference.
PERRY'S WEEPING HOLLY.—Standards, 10s. 6d. to 21s. each.
HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868
HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868 and 69.

LAURIFOLIA and SCOTTICA,	4, 5, 6, to 10 feet high.
HODGINS',	ANGUSTIFOLIA,
YELLOW BERRIED,	MYRTIFOLIA, &c.
	4, 5, 6, and 8 feet high

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number.
N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better rooted plants cannot be wished or obtained. The prices are low and reasonable
BOX, Green and Variegated, 4, 5, 6, to 8 feet.
BOX, do. do., fine pyramids, up to 8 feet.
BAYS, standards and pyramids.
LAURUSTINUS, standards.
AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high
AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards.
AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—
RHODODENDRONS, nice bushy plants, from layers, named kinds £5 per 100; £40 per 1000. A dozen sent as sample on application.
RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s. per 100, and upwards
RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000.
STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference. There is probably no kind better adapted for standards than that we call roseum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.
RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s per 100. Sample on application. Large and handsome plants by the 1000, 4 to 8 feet high.
AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.
AZALEAS, common kinds, £5 per 100.
AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, as much in circumference.
KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100
ANDROMEDA FLORIBUNDA, £5 to £7 10s per 100, and upwards.
HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100
ERICA CARNEA, for winter blowing, many thousands.
ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening
SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen.

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

Established 1806.

THE HANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application
Seed Warehouse, 24, Cockburn Street, Edinburgh.
Nurseries: Bruntsfain Glen, Musselburgh

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties), including genera of Hardy Exotic Ferns of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7
Foot's Cray Nursery, Sidcup Hill, Kent

MESSRS. LITTLE AND BALLANTYNE, Nurserymen and Seedsmen, Carlisle, respectfully beg leave to intimate that
MR. WILLIAM SMITH
Has been appointed sole Manager of the Business, and they feel sure that this arrangement will give satisfaction to their numerous friends and customers.
MR. SMITH has had a very long and extensive experience in every department of the Nursery and Seed Trade in connection with the Firm of Messrs. Peter Lawson & Son, of Edinburgh and London, and he will now devote his whole attention to carry on the Business of the Firm with the same careful and prompt attention. He will be especially careful in providing pure and unadulterated Seeds, saved from the best selected stocks, the growth of which will be correctly proved before they are used for sale. The best by following this course to secure an increased share of public favour, and to merit the continuance of the confidence which has been placed in the Firm for many years.
PRICED CATALOGUES of SEEDS, PLANTS, &c., may be obtained on application.
44, English Street, Carlisle.—January 6, 1870.
P.S. Mr. William Clarke, recently in the service of the Firm, is no longer in their employment.

Laurus latifolia.

L. PAILLET, Nurseryman, Chatenay les Sceaux, near Paris, France, is now filling the numerous orders received for this splendid Novelty. Persons wishing to secure good plants are requested to send their orders as soon as possible, for the plants are now getting very limited in number.
M. L. PAILLET offers also to the Trade a large quantity of FRUIT TREE STOCKS, at the following rates:—

	Per 1000—£ s. d.		Per 10,000—£ s. d.
Pears, extra choice	1 10 0	first choice	11 12 0
Quince, do.	1 10 0	,,	8 12 0
Apple, do.	1 0 0	,,	5 0 0
Doucin, do.	1 0 0	,,	8 10 0
Paradis, do.	1 4 0	,,	10 10 0
Plums (not Julien), do.	0 14 0	,,	0 16 0
Cherries, do.	1 0 0	,,	0 12 0
St. Lucie, do.	0 10 0	,,	0 0 0

ROSES, our own best selections. Standards, good, £3 per 100. Half Standards, £2 10s per 100; Low Budded Dwarfs, £10 per 1000; on their own roots, £12 per 1000; Bengals, three best sorts, £9 per 1000; Marèchal Niel, on Standard, 10s 6d each.
Yearling FOREST TREES and SHRUBS, 1, 2, or 3 of old, such as Acacia, Alder, Ash, Beech, Birch, Quercus, Thorn, Maple, &c.; and EVERGREENS of all sorts, Ornamental Trees and Shrubs, at per 1000, 100,000, and 1000,000.
DWARF ROSES SPECIAL OFFER TO THE TRADE.
M. L. PAILLET has secured the second lot Dwarf Roses he will send carriage free to London, packing included, at £80 per 1000, best selection. Cash on delivery.
All orders must be sent to L. PAILLET, as above, or to his Agents, Messrs. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

Special Offer.

JOHN CRANSTON, having a large surplus stock of the undermentioned articles, will be happy to furnish special quotations, both wholesale and retail.
ROSES.—Standards and Half Standards, all the leading Perpetuals.
Dwarfs, in pots, very fine stock for bedding or potting.
Dwarf Standard Roses, 6 to 8 feet stems.
Climbing, and Pillar Roses.
Roses for forcing, of extra size.
New Roses for 1870, 3s 6d each. Plants ready early in March.
FRUIT TREES. Dwarf-trained Apples, Pears, Plums and Cherries, well grown Trees.
Pyramids, do.
Standard-trained Peaches and Nectarines
Standard Pears, Plums and Cherries, very fine.
Gooseberries, upwards of 200 varieties, 3 and 4 yr. old plants
Currants
Vines, strong fruiting and planting Canes.
CONIFERÆ.—Handsomely grown specimens, 6 to 10 feet
Finus austriaca, all quartered and recently transplanted, 2 to 3 feet, and 3 to 4 feet
Spruce Fir, quartered, 2 to 2½, and 2½ to 3 feet.
Wellingtonia gigantea, 2½ to 3, and 3 to 4 feet.
Thuja aurea, beautiful plants, 9 to 12, 12 to 15, and 15 to 18 inches
Thuja gigantea, Lobbii, Abies Menziesii.
Thujopsis borealis, &c.
LAUREL, Common and Portugal, Mahonia aquifolia, &c.
WEEPING ASH, 6 to 10 feet, very fine.
ENGLISH OAK, 2 to 3 feet.
ASPARAGUS, 2 to 3 yr.; RHUBARB, SEAKALE, &c.
Nurseries, King's Acre, near Hereford

Planting Season.

DICKSONS AND CO., Nurserymen and Seedsmen, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their extensive and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for Transplanting. They are growing on very exposed ground, are finely rooted, and their wood is thoroughly ripened. Samples and Catalogues on application. Special prices will be quoted where large quantities are taken

Wandsworth Common Nursery.

Ten minutes' walk from Clapham Junction
MR. ROBERT NEAL begs to invite the attention of the Nobility, Gentry, and the Trade in general to his very extensive and healthy stock of PLANTS, consisting of a large collection of Standard, Pyramidal, and Dwarf-trained FRUIT TREES, of all sizes; Standards and Dwarf ROSES, Coniferous and other Evergreens, Forest and Ornamental TREES and SHRUBS; also a large collection of RHODODENDRONS, all the very best in cultivation, and are of endless variety, from deep crimson and dark purple (every shade) to pure white, and Hybrid Seedlings, and all the leading kinds of Scarlet, both Standard and Dwarf, set with Bloom-buds, which he can supply in large quantities at a very low price.
CATALOGUES free on application.

Wandsworth, January 6, 1870.

JOSEPH SMITH, Jun., Moor Edge Nurseries, Tansley, near Matlock, Derbyshire, has to offer the following, from grounds that must be cleared, viz. (at per 1000):—
ASH, Common, 2½ to 2 feet, 2s 6d; 2 to 3 feet, 22s.
ASH, Mountain, 1½ to 2 feet, 18s; 2 to 3 feet, 20s.
ALDER, 1½ to 2 feet, 16s.; 2 to 2½ feet, 20s.
ELM, Wych, 1½ to 2½ feet, 18s.
FIR, Scotch, 9 to 15 inches, 15s.; 1 to 1½ feet, 20s.; 1½ to 2 feet, 25s.
FIR, Spruce, 1 to 1½ feet, 15s.; 1½ to 2 feet, 25s.; 2 to 2½ feet, 30s.
OAK, English, 1½ to 2 feet, 18s.; 2 to 3 feet, 22s.
PINUS MARITIMA (sea Pine), 2½ seedling, 3s
,, transplanted, 6 to 12 inches, 8s.; 1 to 1½ foot, 12s.; 1½ to 2 feet, 20s.
PRIVET, Evergreen, 1 to 2 feet, 20s.; 2 to 2½ feet, 25s.
QUICKS, 2-yr. transplanted, 8s.; 3-yr. transplanted, 10s.
SYCAMORE, 2 to 3 feet, 30s.; 3 to 4 feet, 40s.
WILLOWS, Bedford, 1 to 1½ feet, 18s.; 1½ to 2 feet, 30s.
BROOM, Yellow, 2 to 3 feet, 25s.; White, 2 to 3 feet, 40s.
FURZE, or Gorse, 3 yr., 2 to 3 feet, 25s.
COTONEASTER, Microphylla, transplanted, 18 inch, 40s.
RHODODENDRON, two years transplanted, 9 to 15 inches, £6 10s.; 1 to 1½ foot, £8; 1½ to 2 feet, £14; 2 to 2½ feet, £20
Hirsutum, 9 to 12 inches, £5.
TREE BOX, 9 to 12 inches, 15s.; 1 to 1½ foot, 30s.; 1½ to 2 feet, 130s. (At per 100).
ABIES ALBA, 3 to 4 feet, 15s.
ARBORÆ VITÆ, Americana, 2 to 3 feet, 15s.; 3 to 4 feet, 20s.; 4 to 5 feet, 30s.
BROOM, White, 3 to 4 feet, extra, 8s. [feet, 30s.
CEDRUS ATLANTICA, 2 to 3 feet, 50s.
LIMES, 1 to 1½ foot, 6s.; 2 to 2½ feet, 12s.; 2 to 2½ feet, 15s.
And a large general Nursery Stock, of which CATALOGUES may be had post free. N.B. Prices to the Trade on application

Evergreen Hedges.

AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100.
RICHARD SMITH, Nurseryman, Worcester

Richard Smith's List of all the Evergreen Fir Tribe suitable for Britain, giving size, price, popular and botanical names, derivations, description, form, colour, foliage, growth, timber, use in arts, native country and size there, situation, soil, and other information, with copious Index of their synonymes. Free by post for six postage stamps.

To the Trade.

SPECIAL CHEAP OFFER of Dwarf-trained Morello and other CHERRIES
True KENTISH FILBERTS.
Dwarf-trained PEARS.
Standard-trained PLUMS, extra fine
Dwarf-trained GREENGAGES and other PLUMS
STANDARD PLUMS.
STANDARD ROSES.
ABIES CANADENSIS, 9 inches to 3 feet, extra fine
BERBERIS ILICIFOLIA, 9 inches to 3 feet.
BERBERIS REALLI, 9 inches to 3 feet.
Double FURZE
ACER PSEUDO SINENSIS, 1 to 3 feet
PHILLYREAS, fine and healthy, 2 to 4 feet
THUJA AUREA, splendid, 21 inches to 3 feet
,, ORIENTALIS ELEGANTISSIMA, fine stock of this splendid variety (Rollissons), 9 to 20 inches.
YUCCA RECURVA, fine.
Standard SPANISH CHESTNUTS.
,, CHICHESTER ELMS, fine, 6 to 10 feet.
BEECH, 8 to 10 feet.
BOX for edging
EVONYMUS AZUREA (best variety), and a variety of other good and useful CONIFERÆ, CLIMBERS, &c
PRICED CATALOGUE free on application.
THOS. RUNYARD AND SONS, Nurserymen, Florists, and Seedsmen, Maidstone, Kent.

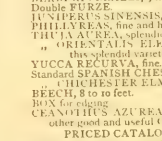

Surplus Stock.—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well-grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For Descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.
Trucks for 1 ton and upwards may be sent through any Railway Station on the narrow gauge lines, at a moderate cost, thereby saving delay and expense of packing

At 12s. per dozen
Abies Canadensis (Hemlock Spruce), 4 to 5 feet
,, excelsa, 3½ to 4 feet
Arbor-vitæ, American, 5 to 6 feet
,, Siberian, 4 to 5 feet
Gorse, double, in pots, strong
Hartogia capensis (Cape Laurel), 15 to 2 feet

At 18s. per dozen
Abies canadensis, 5 to 6 feet
,, excelsa, 4 to 5 feet
Alaternus, layered, 2 to 2½ ft.
Arbor-vitæ, American, 6 to 7 feet
,, Siberian, 4 to 4½ feet
Aucuba japonica, 18 to 21 inches
Box, good tree topiarians, very handsome, 2½ to 2½ feet
Hartogia capensis, 2 to 2½ feet
Laurel, narrow-leaved, 2½ feet

At 24s. per dozen
Abies elegans, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet
Aucuba japonica, 24 to 30 inches
Cryptomeria Lobbii, 5 to 6 feet
Cupressus Lawsoniana, 4 to 5 feet
Holly, silver-leaved, green, 2 to 2½ feet

At 30s. per dozen.
Abies canadensis, extra fine, 6 to 7 feet
,, elegans, 2 to 2½ feet
Arbor-vitæ compacta, 2½ to 3 feet
Aucuba japonica, very bushy, 2 to 2½ feet
Cryptomeria Lobbii, 6 to 7 feet
,, viridis, 6 to 7 feet

At 36s. per dozen.
Abies inverta (Weeping Spruce), 2½ to 3 feet
Arbor-vitæ compacta, 3 to 3½ feet
,, Siberian (very fine), 5 to 6 feet
Cupressus Lawsoniana, 5 to 6 feet
Juniperus chinensis fœmina, 3 to 4 feet
,, hibernica, 3½ to 4 feet
,, Schottii, 3 to 3½ feet
Laurel, Portugal (pyramids, very handsome, 3 to 4 feet
Phillyrea oleafolia, very fine, 3 to 4
Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Taxus japonica, 15 to 18 inches

At 42s. per dozen.
Ivy, green tree, extra fine and bushy, 2 to 2½ feet
Juniperus chinensis, 3 to 3½ feet
,, drupacea, 18 to 24 inches
,, glauca, 3 to 4 feet
,, Keeana, 3 to 4 feet
Pinus austriaca, 4 to 5 feet
Thujopsis borealis, 4 to 5 feet

At 48s. per dozen.
Abies inverta, 4 to 5 feet
Juniperus chinensis, 4 to 5 feet
,, densata, 4 to 5 feet
,, glauca, 4 to 5 feet
,, Keeana, 5 to 6 feet
,, phœnicia, 4 to 5 feet
,, Schottii, 4 to 5 feet

At 60s. per dozen.
Abies Menziesii, 7 to 8 feet
,, monstrosa, 7 to 8 feet
Arbor-vitæ compacta, 4 to 4½ feet
Juniperus chinensis, very fine, 5 to 6 feet
,, densata, 5 to 6 feet
,, glauca, 5 to 6 feet
,, phœnicia, 5 to 6 feet
,, Smithiana, 4 to 5 feet
,, thuifera, 6 to 7 feet

Abies albertiana, 7 to 8 feet, 10s. 6d. each
,, Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each
,, nobilis, 4 to 5 feet, 5s.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. 6d. each
Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s.; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 63s.; 10 feet, each
Juniperus pendula, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each
,, thuifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each
Picea grandis, extra fine, 5 to 6 ft., 15s.; 6 to 7 feet, 21s. each
Picea lasiocarpa, 2½ to 3 feet, 15s.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d. each
,, nobilis (best glaucous var.), 18 to 24 inches, 7s. 6d.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
,, Nordmanniana, 4 to 5 feet, 15s.; 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each
,, Pinsapo, 3½ to 4 feet, 10s. 6d.; 4 to 4½ ft., 15s.; 4½ to 5 ft., 21s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. ea.
Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Wellingtonia gigantea, 3½ to 4 feet, 7s. 6d. each
Yews, for hedges, about 12 feet high, 40 years old, recently transplanted, 31s. 6d. each

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Golden Champion Grape.

OSBORN AND SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it. Price 10s. 6d., 21s., and 30s. each.
Fulham Nursery, London, S.W.

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.
L. W.'s system of packing saves nearly half the cost of carriage.
Munro Nursery, Side Hedingham, Essex.

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.
Price 21s., 42s., and 63s. each.
THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Vines.

JAMES CARTER AND CO. can now offer strong, well-grown CANES, growth 1869. For description of Varieties and Prices, see AUTUMN CATALOGUE, now published
JAMES CARTER AND CO., Seedsmen and Nurserymen, 237 and 238, High Holborn, W.C.

Vines, Extra Strong Fruiting.

FRANCIS & ARTHUR DICKSON & SONS have several thousand extra strong, thoroughly well-ripened, short-jointed VINES to offer, of the best known kinds, including the new ones of this season. Inspection invited. All who have seen them pronounce them to be as fine a lot of Vines as were ever grown. Price List free by post on application.
The "Upton" Nurseries, Chester.

Forest Trees, Fruit Trees, Evergreens,

PLANTS for GAME COVERS, CONIFERS, ROSES, &c.
FRANCIS & ARTHUR DICKSON & SONS invite the attention of Planters to their very large stock of the above, which in extent and variety is not excelled by any Nursery in the Kingdom. Their Nurseries, which are very bleak and exposed, extend over some 150 Acres, and their plants are well known to be unusually hardy, as well as in the most perfect health and condition in every respect; and are found to thrive admirably when removed to other parts of the country.
PRICED CATALOGUES post free upon application. Estimates and special prices for large quantities.
The "Upton" Nurseries and "Old" Established Seed Warehouse, 100, Eastgate Street, Chester

Fruits, Fruits.—Ground must be cleared.

WM. DILLISTONE begs to offer Strong TREES of the following, for cash only:—

	s.	d.
APPLES, Standards, 12 distinct kinds	7	0
,, ,, 24 ,, ,,	12	0
,, ,, 50 ,, ,,	21	0
,, ,, 100, 50 distinct kinds	42	0
,, Pyramids, very fine, same prices.		
PEARS, Standards, 12 distinct kinds	10	6
,, ,, 24 ,, ,,	17	0
PLUMS, fine Pyramids, 12 distinct kinds	9	0
,, ,, 24 ,, ,,	17	0
PEACHES, NECTARINES, and APRICOTS, very handsome, Dwarfs per doz.	9	0
CHERRIES, Dwarfs, very fine ,,	7	0

Post Office Orders on Castle Hedingham.
See W. DILLISTONE'S List of Hardy Herbaceous Spring Flowers, &c., free on application; also, of Roses, New Plants, &c.
Nurseries, Sible Hedingham, Essex

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trade supplied. Stocks of 1870, 70,000 of APPLE, 170 do of PLUM, 150 do of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 3 to 5 feet high; also very fine Dwarf-trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12. 6d. in stamps. Printed List or Index sent free.
Also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety.
CATALOGUE free on application.

Forest, Fruit, and other Trees.

JAMES DICKSON AND SONS' NURSERY STOCK is not surpassed in Britain; therefore, they have EVERY CONFIDENCE in soliciting Orders, and inviting intending planters to visit their EXTENSIVE NURSERIES, which can now be reached, on foot, in seven minutes, from the Chester Railway Station, by their new private road from the foot of the Flookersbrook Railway Bridge.
PRICE LISTS on application
(*Old Established Nursery and Seed Business*)
"Newton" Nursery, Chester.

THORNTON begs to intimate to the Trade that the Stock offered below cannot be surpassed for health and fibrous roots. All been grown in maiden soil, and the stock, very extensive, is offered at low prices:—

Pinus austriaca, 9 to 15 inches	Spruce Fir, 1 to 2, and 2 to 2½ feet
P. Laricio, 9 to 15 inches	Laurel, 1 to 2 feet
P. rigida, 2 to 3 feet	Turkey Oak, 1 to 2 feet
P. taurica, 1 to 1½ foot	Cryptomeria japonica, 12 to 15 inches
P. Pinaster, 3 and 3 to 4 feet	Thujopsis borealis
Scotch, 9 to 15 inches	Chinese Arbor-vitæ, 9 to 15 inches

THOMAS THORNTON, Heatherside, Bagshot, Surrey.

The Northampton Nurseries.

JOHN PERKINS, SEN., begs to offer the following, which are all stout and well-rooted:—
Fine Larch Fir, 4 to 6 feet, transplanted 1868.

Scotch Fir, 2 to 3 feet	Berberis aquifolia, 1 to 1½ feet.
Laurels, 1½ to 2, and 2 to 3 feet	Green Box, 1½ to 2, and 2 to 3 feet
Strong Whitethorn Quick.	

J. P. having a large Stock of the above, they will be offered at very low prices, which may be had on application to
52, Market Square, Northampton

CHARLES NOBLE requests the attention of large buyers to the following, which he requires cleared before Spring:—
ROSES
50,000 Dwarf, Hybrid Perpetual, and Tea-scented.
A quantity of Standard and Half Standards.
75,000 Manetti Stocks, fine as usual.
FRUIT TREES.
Dwarf-trained Peaches, Plums, and Pears.
Maiden Peaches and Nectarines.
,, Pears and Apples.
,, Cherry and Plum
,, and 3-yr. Standard APPLES and PEARS
GOOSEBERRIES, CURRANTS, FILBERTS, and COB NUTS.
TREES and SHRUBS.
English Oaks, 2 to 5 feet.
,, ,, 3 years in drills.
Spruce Fir, 2 to 3 feet.
Laurel, 1½ to 3 feet; common and Colchicum
Birch, 2 to 3 feet
Poplars, 5 to 10 feet
FOR GAME COVER.
Spiræa callosa
Deutzia crenata flore-pleno
,, hybrida lancinata.
Berberis Darwinii.
,, dulcis.
,, aquifolia.
,, japonica.
Skimmia japonica.
Erica carnea and herbacea.
,, Mentiesii
Rhododendron ponticum
,, hybrid seedlings
All sizes, from 1 to 3 feet, by the dozen, 100, or 1000
CATALOGUES sent on application. Special quotations for large quantities, and all will be sold at a heavy discount for cash
Bagshot, January 6

Autumn Planting.

PETER LAWSON AND SON will be glad to send their CATALOGUE (just published) of FOREST and ORNAMENTAL TREES and SHRUBS, free on application

The stock of LARCHES, SCOTCH FIRS, AUSTRIAN and CORSICAN PINES, &c., comprises some millions of healthy, well-grown plants, and special offers will be made for large quantities when personal inspection is not convenient

Edinburgh and London.

Cedrus Deodara.

FINE SPECIMENS, 7, 8, 9, 10, to 15 feet, at 15 per foot.

WM. MAULE AND SONS have to offer a large supply of extra fine EVERGREEN TREES and SHRUBS, calculated to give immediate effect to Parks, Cemeteries, and Plantations, and suitable for screening and blocking out new Buildings, that are springing up daily in the vicinity of all large towns.

The Nurseries, Bristol.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELM, FIR, SCOTCH, or SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, on all the usual sizes.

Forest Trees, Fruit Trees, Evergreens, &c.

CHIVAS and WEAVER respectfully invite the especial attention of Planters to their very extensive, healthy, and well-grown Stock of the above.

They have grown the most exposed in the North-Western Counties, and free from all artificial shelter, render the safe removal of plants almost a certainty.

PRICED CATALOGUES post free on application; estimates and special prices for large quantities.

The Eaton Road Nurseries having been largely extended, an entrance is now obtained immediately on reaching Queen's Park by the suspension Bridge.

Eaton Road Nurseries, and 108, Eastgate Street, Chester.

Spring Flowers.

L. S. WOODTHORPE begs to offer the following, well established in pots :—

Viola odorata pendula, the new Weeping Violet of New York, 1s. 6d. each

Violet, The Queen of Violets, large double white, 6s. per dozen

King of Violets, large double indigo-blue, 6s. per dozen

Large double red, 6s. per dozen

Double Neapolitan, 4s. per doz

Double Free, fine, dark blue, 12s. per dozen

Double white Free, 12s. per doz

Giant single Tree, fine and attractive novelty, 12s p. doz

The Czar, the finest single Violet, 6s. per dozen

Primroses, double white, 4s. p. doz.

Double blue, 4s. per dozen

Double yellow, 6s. per dozen

Double crimson, 12s. per dozen

Double purple, 12s. per dozen

Hepaticas, single blue, double red, single blue, and single pink, 4s. per dozen

Single white, 6s. per dozen

Daisies, Bacchus, Magpie, Pink Beauty, Queen of Whites, Red Rover, and Rosy Gem, 3s. p. doz

Aucubaefolia, the gold-blotched, 6s. per dozen

Auriculas, finest alpines, 6s per dozen

Double black, 2s. 6d. each

Helianthemum, the dwarf Rock Cistus, fine named varieties, 4s. per dozen

Rockets, double white and purple, 4s. per dozen

Polyanthus, superb hybridised varieties, 3s. per dozen

Gentiana acaulis, 6s. per dozen

Herbaceous Pæonies, 9s. per dozen

Hollyhocks, new named varieties, 9s per dozen

A choice and varied Collection of Herbaceous and Rock Plants, in pots, 25s. per 100

Dwarf Roses on Manetti, 40s per doz.

Do. do., in pots, 8s. per dozen

A DESCRIPTIVE CATALOGUE of New and Choice Plants, Roses, Fruit Trees, Seed List, and General Nursery Stock, free upon application

Munro Nursery, Sible Hedingham, Essex.

Special Offer to the Trade.

ROBERT PARKER begs to offer the undermanned home saved SEEDS, last season's crop; all are genuine, and warranted true to name. Prices forwarded on application —

BROCCOLI, superb dwarf white Snow's.

CUCUMBER, Stone House, Improved Telegraph

LETTUCE, Cos, Brown or Bath, black seeded.

" Hammersmith

" Hick's Hardy White

NASTURTIUM, Dwarf, mixed

" Tall, mixed.

POTATO, Gloucestershire Kidney

" Milky White (Wheeler's).

FLOWER SEEDS.

CONVOLVULUS MINOR, fine mixed

ESCHSCHOLTZIA CROCEA ALBA ROSEA.

LARKSPUR, Tall Branching Blue.

MYOSOTIS SYLVATICA (Sweden variety).

PRIMULA SINENSIS FIMBRIATA, fine mixed, in packets

PYRETHRUM PARTHENIUM AUREUM.

STOCK, Scarlet Intermediate.

TROPÆOLUM, Tom Thumb.

" flavum

VIOLA CORNUTA ALBA

Exotic Nursery, Tooting, Surrey, S.W.

Specimen Conifers, &c.

WILLIAM BRYANT (late GEO. BATLEY) begs to invite the attention of intending planters to the following LIST of handsomely-grown TREES and SHRUBS, which have been recently Transplanted, and are in every way superb :—

ABIES DOUGLASII, splendid plants, 10 to 15 feet high, 20 to 27 feet in circumference

ABIES PICEA (NORDMANNIANA), 1 foot by 4.

ABIES MENZIESII, 3 to 10 feet high

ARAUCARIA IMBRICATA, fine symmetrical plants, 4 to 10 feet

CEDRUS ARGENTEA, 8 to 10 feet

CEDRUS DEODARA, fine vigorous specimens, 6 to 16 feet high, 12 to 48 feet in circumference

CEDRUS DEODARA ROBUSTA, 6 to 8 feet.

CUPRESSUS FRAGRANS, 6 to 10 feet

CUPRESSUS LAWSONIANA, 3 to 8 feet; fine plants, 10 feet high, 15 feet in circumference.

CUPRESSUS MACROCARPA, 4 to 6 feet.

JUNIPERUS CHINENSIS, 6 to 8 feet

JUNIPERUS EXCELSA, 8 to 10 feet

PICEA LASIOCARPA, 3 feet; handsome plants; 7 feet high, 18 feet in circumference: these are invaluable where immediate effect is required

PICEA LOBBII, 2 to 4 feet, fine

PICEA NOBILIS, 2 to 5 feet

PICEA PINSAPO, 2 to 3 feet; handsome plants, 4 feet high, 12 feet in circumference

PINUS AUSTRIACA, 4 to 7 feet

PINUS BENTHAMIANA, 3 to 5 feet.

PINUS CEMBRA, 4 to 6 feet

PINUS EXCELSA, 3 to 4 feet; fine plants, 4 to 6 feet

PINUS INSIGNIS, 6 to 8 feet; fine specimens, 10 feet high, 30 feet in circumference

PINUS MARITIMA, 6 to 10 feet

PINUS PYRENAICA, 3 to 4 feet

TAXODIUM SEMPERVIRENS, 6 to 12 feet

TAXUS ADPRESSA, 2 feet high, 24 feet in circumference

TAXUS BACCATA FASTIGIATA (Irish Yew), 2 to 10 feet high.

TAXUS BACCATA ELEGANTISSIMA, splendid plants; 5 feet high, 12 feet in circumference.

TAXUS BACCATA VARIEGATA, 3 to 6 feet; fine.

THUIA GIGANTEA, 10 feet by 4

THUIA LOBBII, 6 to 10 feet

THUIA LOBBII AUREA, 8 feet; fine plants

THUIA AUREA, 2 to 4 feet

THUIA ORIENTALIS, 3 to 10 feet

THUIA ORIENTALIS VARIEGATA, 4 to 5 feet.

THUIOPSIS BOREALIS, 8 to 10 feet; handsome plants

WELLINGTONIA GIGANTEA, 3 to 8 feet, 10 to 15 feet high, 18 to 24 feet circumference.

BOX (TREE), Green and Variegated, 6 to 8 feet, fine specimens.

LAUREL (PORTUGAL), extra fine specimens, 3 to 5 feet.

OAK (EVERGREEN), 4 to 10 feet.

LIME (WEEPING), fine trees, 20 feet high, girth of stem, 2 feet.

ELM, fine ornamental trees in great variety.

Prices on application to the Nursery, Rugby

Native Scotch Fir, of fine quality.

ON SALE, by the SUBSCRIBER,
500,000 2-yr Seedlings, 1 yr transplanted, 5s per 1000.
300,000 2-yr Seedlings, 2-yr transplanted, 5s per 1000. Also,
20,000 RHODODENDRON PONTICUM, from 9 to 24 inches.
Samples sent on application
J. ROY, Inn., Aberdeen.

Overstock of Magnolia grandiflora & Portugal Laurels.

TO BE SOLD CHEAP, FOR CASH

J. A. DYER, of the North Town Nurseries, Taunton, has to offer as under :—

MAGNOLIA GRANDIFLORA (True Exmouths)
Fine bushy plants, in pots, 3½ to 4 feet, 36s. per dozen.
" " 3 feet, 30s. per dozen.
" " 2½ to 3 feet, 24s. per dozen
" " 1½ to 2 feet, 18s. per dozen

PORTUGAL LAUREL (Transplanted).
Bushy and good rooted stuff, 3 to 4½ feet, 18s. per 100
" " 2½ feet, 25s. per 100
" " 1 to 1½ feet, 20s. per 100

ONE HUNDRED and FIFTY THOUSAND LARCH, 14 to 2 feet, and 3 to 4 feet
5,000 PINUS AUSTRIACA, 2 to 3 feet; fine roots.
5,000 SPRUCE, NORWAY, 4 to 5 feet; moved in 1869.
10,000 SCOTCH FIR, 2 to 3 feet, moved in 1869
15,000 PRIVET, EVERGREEN, strong, 3 to 4 feet
100,000 SPRUCE, NORWAY, 2 to 3 and 3 to 4 feet
20,000 BIRCH, 2 to 3, and 4 and 5 feet; moved in 1869
50,000 OAK, 1½ to 2, and 2 to 3 feet
20,000 SILVER FIR, 1½ to 2 feet; moved in 1869
150,000 ASH, 2 to 3, and 4 and 5 feet
100,000 SYCAMORE, 2 to 3, and 4, 5, and 6 feet.
50,000 ELM, SCOTCH, 1½ to 2, and 3, 4, and 5 feet.
10,000 LIMES, RED, 1½ to 2, and 3, 4, and 5, and 6 feet.
10,000 ASH, MOUNTAIN, 2 to 3, and 4, 5, and 6 feet.
20,000 CHESTNUT, SPANISH, 1½ to 2½ feet
10,000 ALDER, BLACK, 1½ to 2, and 2 to 3, and 4 and 5 feet
3,000 PORTUGAL LAUREL, fine bushes, well rooted, 2½ to 3, 3 to 4, and 4 to 5 feet
4,000 YEW, ENGLISH, 1½ to 6 feet; fine pyramidal and well rooted, often transplanted.

Strong plants of Horse Chestnut, Sycamore, Mountain Ash, Norway Maple, Birch, Limes, Turkey Oak; Poplar, Alder, Lombardy, and Ontario; Willows, Laburnum, &c., from 7 to 10 feet, which can be supplied by the 100 and 1000. For prices, which will be reasonable, apply to H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

To Market Gardeners and Others.

SUTTON and SONS having grown largely of the following excellent PEAS, can supply them, very true to name, at low prices for large quantities :—

Suttons' Ringleader — the for wardest known	Fortyfold Green Marrow
Suttons' Improved Early Champion	Champion of England
Dickson's Favourite	Veitch's Perfection
Princess Royal	Hair's Dwarf Mammoth
Blue Prussian	Yorkshire Hero
	Prizetaker Green Marrow

For lowest prices, apply, stating quantities required, to
SUTTON AND SONS, Seed Growers, Reading

SPECIAL OFFER to the TRADE.

Per bushel —	£	d	Per cwt —	£	d
Dillistone's First Early Peas, 10	0		Early York Cabbage	100	0
Sangster's " Peas	0	0	Large York Cabbage	100	0
Beliman's Imperial Peas	9	6	Enfield Market Cabbage	100	0
Maclean's Prince Royal Peas	12	6	Drumhead Cabbage	65	0
Prizetaker Peas	12	6	Improved Spanish Onion	lb	2 0
Dickson's Favourite Peas	9	0	White Globe Onion	"	2 6
Altringham Carrot	100	0	Brown Globe Onion	"	2 0
Long Red Surrey Carrot	40	0	Long Scarlet Radish, bush.		27 0
Scarlet Horn Carrot	80	0	Mint	lb	1 9

Special quotations for other articles will be forwarded on application to Messrs. FAIRHEAD AND SON, Borough Market, S.E.

Scott's New and Genuine Seeds.

J. SCOTT'S Seed Stores, Yeovil, Somerset, are replete with every choice class of seeds, and the Choice VEGETABLE and FLOWER SEEDS, choicest Exhibition ASTERS, STOCKS, MARIGOLDS, &c., and AGRICULTURAL SEEDS, all of purest and best quality.

COMPLETE COLLECTIONS OF CHOICE VEGETABLE SEEDS

No 1	£1 1 0	No 3	£1 1 0
No 2	2 2 0	No 4	0 10 6
No 5	£5 10s

For List of sorts, and collections of Flower Seeds, see J. SCOTT'S Descriptive Priced Seed CATALOGUE, just published, free on application

Genuine Seeds of Superior Stocks.

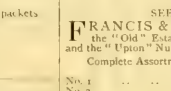

SEEDSMEN TO THE QUEEN

FRANCIS & ARTHUR DICKSON & SONS, the "Old" Established Seed Warehouse, 100, Eastgate Street, and the "Union" Nurseries, Chester.

Complete Assortments of Choice VEGETABLE SEEDS, for A Year's Supply.

No 1	£3 3 0	No 4	£1 1 0
No 2	2 2 0	No 5	0 12 6
No 3	1 11 6	No 6	5 5 0

Complete Assortments of Choice Continental and English FLOWER SEEDS.

No 1	£2 2 0	No 4	£0 15 6
No 2	1 10 0	No 5	0 10 6
No 3	1 1 0		

Also Smaller Collections, from 5s. to 7s. 6d., free by post.

CATALOGUE of New and Select Vegetable and Flower Seeds, Potatos, &c., for 1870, with practical Cultural Directions, will be sent Post Free upon application.

These Seeds are of the most select character, each variety being saved from the best stock known of its kind.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom.

Farmers' Seeds free by Post or Rail.

RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds. Carriage free.

Peas—The Earliest, 1 quart
Princess Royal, 1 pint
Sangster's No. 1, 1 pint
Prizetaker, 1 pint.
Advancer, 1 pint.
Blue Scimetar, 1 pint
Veitch's Perfection, 1 pint.
Harrison's Glory, 1 pint.
Beans—Taylor's Imperial Windsor, 1 pint
Early Longpod, 1 pint.
Johnson's Wonderful, 1 pint.
Green Windsor, 1 pint
Royal Cluster, 1 pint
French Dwarf, 1 pint.
Scarlet Runners, 1 pint
Beet—Nuttings' fine Red, 1 oz
Borecole—New Hearting, packet
Scotch Curled, packet
Brussels Sprouts, finest, packet
Broccoli—Early white, packet.
Purple Sprouting, packet.
Walcheren Winter, packet.
Worcester, late white, packet.
Cabbage—Early Nonpareil, pkt
Worcester Heartsdelight, pkt
Wheeler's Imperial, packet.
Red Pickling, packet.
Curled Savoy, packet.
Carrot—Early Scarlet Horn, 1 oz
James's Intermediate, 1 oz
Imperial Altringham, 1 oz
Cauliflower—Early London, pkt

Celery—Fine solid white, pkt
Fine Giant Red, packet
Cress—Australian, 1 oz
Plain, 4 oz
Cucumber—Smith's fine Frame, packet
Stockwood Ridge, packet.
Endive—French Curled, packet.
Leek—Musselburgh, packet.
Lettuce — Champion Cabbage, packet.
Paris White Cos, packet.
Bath Cos, packet.
Drumhead, packet.
Mustard—White, 4 oz.
Melon—Choice kind, packet.
Onion—Reading or Spanish, 1 oz
James's Keeping, 1 oz
Blood Red, 1 oz.
Silver Skinned, 1 oz.
Parsnip—Hollow Crowned, 1 oz
Parsley—Fine curled, per pkt.
Radish—Wood's Early Frame, oz
Early Scarlet, 2 oz
Turnip, mixed, 2 oz
Spinach—Summer, 1 pint
Winter, ½ pint.
Turnip—Early Six-Weeks, 1 oz
Early Green-top, 1 oz
Orange Jelly, 1 oz.
Tomato—Large Red, packet.
Vegetable Marrow, packet
Pot Herbs, 4 packets

For larger and smaller Collections and prices of other Garden Seeds, see DESCRIPTIVE LIST, free on application to
RICHARD SMITH, Seed Merchant, Worcester

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.

Exotic Nursery, Tooting, Surrey, S.W.

IVERY'S NONSUCH LETTUCE.

The best Summer variety in cultivation. 15 per packet, sealed with initials M. A. I.

Also IVERY'S NONSUCH CELERY, true, own saving; acknowledged by all who have grown it to be superior in flavour to all other varieties. Price to the Trade on application.

The Trade supplied with superior MUSHROOM SPAWN.

M. A. IVERY, Hanover Nursery, Teckham, London, S.

TO the SEED TRADE.

HAMILTON'S INVINCIBLE CUCUMBER

CUTHILL'S BLACK SPINE CUCUMBER

OSBORNE'S WINTER WHITE PROTECTING BROCCOLI.

DOUBLE CRESS.

INTERMEDIATE LONG YELLOW MANGEL (superior stock).

All new of 1869, and true, of own growth, offered cheap

STEPHEN BROWN, Seedsman, Weston-super-Mare, Somerset.

Notice to the Trade.

JAS. FAIRHEAD AND SON, 7, Borough Market, London, S.E., beg to offer the following PEAS :—Sangster's No. 1, Dillistone's First Early, Champion of England, McLean's Advancer, and Prizetaker. All from select stocks, and of Crop 1869. Prices on application.

PEAS.—Maclean's Premier, Little Gem, fine Wrinkled Marrows, Early Emerald, Early Sabaudine.

For full description see CHARLES TURNER'S DESCRIPTIVE CATALOGUE, now ready.

The Royal Nurseries, Slough

POTATOS, SEED.—Early Ashleaf Kidney (old sort), Lemon Kidney, Early Handsworth, Oxford, Dalmahoy, Golden Dwarf, and Fluke can be supplied in quantity. ARTICHOKE, JERUSALEM, of fine quality, for present use, or for seed, in quantity SEAKALE, 2-year-old roots. ASPARAGUS ROOTS, 1 and 2 years.

For prices, which will be reasonable, apply to

H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

To the Wholesale Trade.

HERBERT H. NICHOLSON, SEEDGROWER, Great Clacton (near St. Osyth), Essex, has the following SEEDS to offer, for cash only :—

ROBINSON'S PRIZE CHAMPION OX CABBAGE, 80s per cwt.

NONPAREIL CABBAGE	..	..	112s	"
WHITE CELERY (Leviathan)	..	..	95s	"
SELECTED DARK RED BEET	..	..	110s	"
STUDENT PARSNIP	..	..	80s	"
MYATT'S CURLED PARSLEY	..	..	28s	per bush.
STUBBLE TURNIP	..	..	28s	"

&c. Also all the Annual FLOWER SEEDS, at low prices.

Potatos.

CHARLES TURNER'S SEED CATALOGUE contains a Select List of Kidney and Round varieties, including two new kinds, now offered for the first time,

UNIQUE, a Round Kidney, and SWINSFIELD, Kidney

The latter received a First-class Certificate at the Royal Horticultural Society

The Royal Nurseries, Slough

Seed Potatos.

GEORGE SIBBALD, Drumgeath, by Dundee, has for Sale a large stock of the following kinds of his own growing, true to name and carefully selected :—Victoria, Webb's Early Rotundo's Dun, Early Regent, Dauntless, Early Manchester, Royal Ashleaf Kidney, Myatt's Kidney, Scott's Knobbie Kidney, Sutton's King of Kidneys, Early Rose Kidney, Munro's Early Kidney, Sutton's Berkshire Kidney, Ashleaf Kidney, Early Ashleaf Kidney. Also about 1 cwt. superfine Early Dwarf York CABBAGE SEED.

Prices on application

THE SHIPLEY PROLIFIC FRAME CUCUMBER.

—This is a new Cucumber, of most extraordinary productiveness having had as many as 19 fruit members on two young plants ready for cutting at the same time, with many more coming on. It has a very smooth skin, of a rich deep green colour, and grows from 18 to 20 inches long. It has also the advantage of being a first-rate variety for winter work. Price 1s. 6d. and 2s. 6d. per packet

GEORGE JOHN CHILD, Seed Merchant and Nurseryman, 49, Darley Street, Bradford, and Bradford Nurseries, Shipley.

It can also be obtained of—

London	..	Messrs. Beck, Henderson & Child.
"	..	" Iles Carter & Co.
"	..	" Hurst & Son.
"	..	" Nutting & Sons
Norwich	..	" Ewing & Child.
Birmingham	..	" Felton & Sons

Other Names to follow as received

BROCCOLI, ELLETSON'S NEW SURPRISE,

a large late White Protecting. A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, J. & J. Ellotson, of Thorngumbald, who have for many years been successful in the cultivation of Broccolis, and who have great industry have made an improved upon the old kind as to produce the above variety, which possesses the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction that it was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.

CUCUMBER, POSTER'S NEW, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour and shape for a long time. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet. Trade supplied.

EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull

Johnstone's St. Martin's Rhubarb.

W. P. LAIRD AND SINCLAIR, NURSERYMEN, Dundee, N.B., have pleasure in offering the above new variety of RHUBARB, which they have confidence in recommending as the earliest and best sort in cultivation. The raiser of it describes it "as one of a batch of Seedlings from Victoria; the Seedling Plant was a fortnight earlier than any of the remainder of the lot, and grown beside Prince Albert and Linnæus, always 10 days earlier than them, and giving a larger quantity of superior stems to either of these varieties. It forces better than any variety I know, and has a splendid colour."

Strong Roots, 2s. 6d. each. Usual Discount to the Trade

For Testimonials see previous Advertisements

London Agents—Messrs. Howard, 52, Covent Garden Market, W.C

May be had true from—

Sheffield—Fisher, Holmes & Co.	Tunbridge Wells — Thos Cripps & Son.
Lichfield—Mr. Edward Holmes	Northampton—Mr. F. Perkins
Exeter—Sclater & Co.	East Retford—Mr. W. Wright
Andover—Mr. Wm. Miller	Malton—Mr. T. Taylor
Glasgow—Austin & M'Aslan	Ayr—Slater & Son
Dublin—Joseph Berry & Sons	London—Hurst & Son
Cirencester—John Jeffries & Son	Stirling—W. Drummond & Son
Downham—Mr. Adam Bird	Derby—Mr. Edwin Cooling
York—Messrs. Backhouse & Son	Kelso—Stuart & Mein
Kilmarnock—W. & P. Samson	Birmingham—Felton & Sons
Chester—F. & A. Dickson & Son	
" James Dicks & Son	

Further Names published as received

GENERAL TRADE NURSERY LIST may be had on application

SILVER SAND and PEAT, from Bedfordshire, in any quantity.—This Sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, &c., Clapperhall Street, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North Western Railway Depot

The Advantages of Procuring Seeds Direct from the Growers cannot be Over-estimated.

CARTER'S

COLLECTIONS OF VEGETABLE SEEDS

(NEW AND UNADULTERATED), AS HARVESTED ON THEIR OWN SEED FARMS.

THESE COLLECTIONS PRODUCE A PLENTIFUL SUPPLY OF CHOICE VEGETABLES ALL THE YEAR ROUND.

COLLECTION of VEGETABLE SEEDS No. 1
Price **12s. 6d.** (packing included). Suitable for a small Cottage Garden.

Carter's First Crop Pea,
The earliest in cultivation; price **2s.** per quart.

Hundredfold Pea, or the Cook's Favourite.
Illustrated at p. 1280, *Gardeners' Chronicle*, 1869. In sealed packets, **7s. 6d.** per qrt., **4s.** per pint.

Paterson's Bovinia, or Cattle Feeder Potato.
The heaviest cropper known. Per lb., **1s. 6d.**; 7 lb., **9s.**; 56 lb., **65s.**

COLLECTION of VEGETABLE SEEDS No. 2
Price **21s.** (packing included). Suitable for a Small Garden.

COLLECTION of VEGETABLE SEEDS No. 4
Price **63s.** (packing included). Suitable for larger Gardens.

For detailed Table of these Collections, see
CARTER'S SPECIAL ORDER SHEET FOR 1870,
forwarded Gratis and Post Free.

COLLECTION of VEGETABLE SEEDS No. 3
Price **42s.** (packing included). Suitable for a Garden of half an acre.

Carter's Champion Potato,
The best for forcing, **5s.** per peck.

Laxton's Supreme Pea,
Described as "a Grand Pea." In sealed packets, half pint, **2s. 6d.**; pint, **4s. 6d.**; quart, **8s. 6d.**

NEW PEA, LAXTON'S ALPHA, the earliest Wrinkled variety.

THE ROYAL SEEDSMEN.

The following Reports are published *verbatim*, as given by the various authorities:—

"A blue wrinkled marrow (the result of a cross between Laxton's Prolific and Advancer), height 3½ feet; a first early sort, earlier than Little Gem and Advancer. This Pea produces pods from the bottom to the top of the haulm, and therefore needs no recommendation as to prolificacy; the pods, which are larger than any other wrinkled marrow, are well filled with Peas, which latter, when cooked, are said to be of a very fine flavour. This is altogether a desirable acquisition, and to it the Fruit Committee of the Royal Horticultural Society lately awarded a First-class Certificate."—*Gardeners' Chronicle*, August 21, 1869.

"Messrs. Carter & Co. exhibited a fine sample of Laxton's Alpha Pea, a wrinkled marrow of fine flavour, which has proved itself to be a desirable acquisition, to which a First-class Certificate was given."—*Royal Horticultural Society, Fruit Committee*, July 6, 1869.

THE ROYAL SEEDSMEN.

"Alpha, obtained by crossing Laxton's Prolific, I suggested with Advancer, is a wonderful Pea, as early as Dillistone's Early, but a fine wrinkled marrow, with numerous pods curved at the point like Auvergne, the Peas large, of a deep green colour, about 2 feet 6 inches high, not branching." *Vide* Report of the Chiswick Trial of Early Peas.—*Gardeners' Chronicle*, July 6, 1867.

That Mr. Thomas Laxton has been preeminently successful in raising from seed some late new varieties of Peas, is abundantly proved from a trial of the same at Chiswick:—"The earliest is Alpha, a very fine and prolific variety, with long curved and well filled pods. Its height is about 2½ feet, but it is slightly mixed with some plants of a kind similar in character to D favorite" (the Pea has since been carefully selected). *Vide* Report upon the Early Peas at Chiswick.—*Gardeners' Chronicle*, June 27, 1868.

"Mr. Laxton's Peas of this year are full of promise. Alpha is a fine early variety, with a large curved pod." *Vide* official Report of Royal Horticultural Committee.—*Gardeners' Chronicle*, June 20, 1868.

Awarded a First-class Certificate, Royal Horticultural Society. (*From a Photograph.*)

7s. 6d. per half pint, in sealed packets.

CARTER'S COLLECTIONS OF FLOWER SEEDS,

Consisting of showy varieties, of easy culture, and such as will produce a pretty display in the Conservatory and Flower Garden throughout the season.

Collection A, price 10s. 6d., Post Free for 11s., contains

An assortment of 12 choicest varieties FRENCH ASTER.
An assortment of 16 choicest varieties GERMAN STOCK.
12 Showy hardy DWARF ANNUALS, including Tom Thumb Nasturtium, Saponaria, Blue Nemophilla, &c.
12 Showy tender ANNUALS (to be sown in frames, and then transplanted or sown in the open borders at the end of April), for Summer and Autumn blooming, including choice Phlox Drummondi, Balsam, Celosia, Amaranthus ruber, Perilla nankinensis, Zinnia, &c.

Collection B, price 15s., Post Free for 15s. 6d., contains—

An assortment of 12 choicest varieties FRENCH ASTER.
An assortment of 16 choicest varieties GERMAN STOCKS.
3 Choice EVERLASTING FLOWERS, for Winter Bouquets.
3 Showy NEW ANNUALS, for Bedding.
12 Showy hardy DWARF ANNUALS, including Tom Thumb Nasturtium, Saponaria, Blue Nemophila, &c.
12 Showy tender ANNUALS (to be sown in frames, and then transplanted or sown in the open borders at the end of April), for Summer and Autumn blooming, including choice Phlox Drummondii, Balsam, Celosia, Amaranthus ruber, Perilla nankinensis, Zinnia, &c.
6 Hardy PERENNIALS for Autumn and Spring blooming, including Hollyhock, Wallflower, Gaillardia, Alyssum saxatile, &c.

LARGER COLLECTIONS, 21s. 6d., 42s. 6d., and 64s., Post Free.

For full descriptions, see
CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM FOR 1870.
Post Free, One Shilling; Gratis to Purchasers

JAMES CARTER AND CO., 237 AND 238, HIGH HOLBORN, LONDON, W.C.

SUTTONS'

HOME-GROWN SEEDS.

CARRIAGE FREE.

THE FORWARDEST PEA KNOWN IS

Suttons' Ringleader.

The Royal Horticultural Society tested carefully the merits of the leading kinds of Early Peas, and in the *Gardeners' Chronicle*, June 27, 1868, the following brief but emphatic statement appeared :—"The earliest form of all was Ringleader. Several of the Peas blossomed at the same time, but Ringleader was fit to gather first."

Sutton's Ringleader Pea is also the best variety for very late sowing. The following is extracted from the *Gardeners' Chronicle* :—"Late Peas are indeed a luxury. I sowed Sutton's Ringleader the second week in July, and gathered one peck of well-filled pods the second week in September. I sowed two rows a fortnight later, and gathered Peas on October 6—a really good dish—much to the satisfaction of my employers. I have to-day (October 13) picked another good dish of Peas from Plants which show no appearance of mildew."—E. HAWTHORN, *Gr. to P. Kemp, Esq., Goldwell House.*

Price **2s.** per quart, cheaper in large quantities.

SUTTONS' GUINEA COLLECTION

OF

CHOICE VEGETABLE SEEDS,

FOR AN ORDINARY SIZE GARDEN,

(forwarded Carriage Free).

CONTENTS

1 quart Suttons' Ringleader Pea	1 packet Savoy, Drumhead
1 do. Emperor do.	1 do. Cauliflower, London
1 pint Princess Royal do.	1 do. Celery, Superb White
1 do. Prittaker do.	1 do. do., Superb Pink
1 do. Champion of England do.	1 do. Cucumber, Stockwood
1 do. Veitch's Perfection do.	1 do. do., Best Frame
1 do. Scimitar do.	1 oz. Onion, Improved Reading
1 do. Victoria do.	1 do. do., Brown Globe
1 do. Longpod Beans	½ do. do., Silver Skin
1 do. Taylor's Windsor do.	½ do. do., Blood Red
1 do. Green Windsor do.	1 packet Melon, best flavoured
½ do. Royal Cluster do.	1 oz. Carrot, Early Horn
½ do. Scarlet Runner do.	1 do. do., Long Red Surrey
½ do. Beck's Gem do.	1 do. do., Intermediate
½ do. Dwarf Kidney do.	2 do. Parsnip, Student
½ oz. Beet, Suttons' Dwarf Red	1 packet Endive, Green Curled
1 packet Kale, Curled Scotch	1 do. Leek, Musselburgh
1 do. do., Cottager's	1 do. Thyme
1 do. Sprouts, Brussels	1 do., Winter Savory [White Cos
1 do. Broccoli, Superb Early White	1 do. Lettuce, Suttons' Superb
1 do. do., Dalmeny Park	1 do. do., Black-seeded Bath Cos
1 do. do., Purple Sprouting	1 do. do., finest mixed
1 do. do., Walcheren	1 do. Vegetable Marrow
½ oz. Cabbage, Suttons' Imperial	1 oz. Parsley, fine Curled
½ do. do., Wheeler's Imperial	½ oz. Turnip, Suttons' Short top
½ do. do., Nonpareil	Six weeks
½ do. do., Hull's Incomparable	1 do. do., Green-top do.
1 packet do., Pickling	1 do. do., Orange Jelly
1 do. Coeur Tronchuda	1 packet Tomato, mixed
½ oz. Mustard, White	2 oz. Spinach, Round
½ do. Cress, plain	2 do. do., Prickly
1 do. do., Curled	2 oz. Radish, Beck's Short top
1 packet do., American	1 do. do., Scarlet Olive
½ do. Savoy, Green Curled	2 do. do., Mixed Turnip

Should any of the above not be required, Messrs. SUTTON will be pleased to substitute others in the place of those omitted.

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THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—At a GENERAL MEETING of the Members of this Institution, held on WEDNESDAY, January 12, for the purpose of electing THREE PENSIONERS on the Funds, the following communication from the Committee was read :—

"That in consequence of the death of several Pensioners since the Voting Papers were issued, the Committee recommend to the General Meeting that the whole of the Candidates named therein be elected Pensioners."

It was moved, seconded, and resolved unanimously, that the recommendation of the Committee be adopted.

The Meeting then declared HENRY BINSBY, ELIZABETH ELLIOTT, CHARLES SMITH, and GEORGE TARRANT duly elected Pensioners of this Society.—By order,

E. R. CUTLER, Secretary.

14, Tavistock Row, Covent Garden, W.C., Jan. 13.

The Gardeners' Chronicle

SATURDAY, JANUARY 15, 1870.

MEETINGS FOR THE ENSUING WEEK

WEDNESDAY, Jan. 19	Royal Horticultural (Fruit and Floral Committee) at S. Kensington	.. 11 A.M.
	Ditto (scientific Committee) ..	.. 1 30 P.M.
	Ditto (General Meeting) ..	.. 3 P.M.
THURSDAY, — 20—	Linnean	.. 8 P.M.

The SILK FAMINE is running its course. Already have silken fabrics become almost solely an article of luxury. The imports of raw silk have fallen off 40 per. cent.; the prices have risen 100 per cent. The well-known useful silk can no longer be manufactured profitably, because it cannot be produced at a price which can compete with other fabrics. Manufacturers, therefore, are abandoning their trade; and weavers have to seek other work, or suffer the extreme poverty and want which attend partial employment. A general distress presses upon the whole trade, excepting the few branches occupied in producing the richest and most valuable classes of goods, for which wealth and fashion are at all times content to pay the inevitably enhanced cost.

Such is the statement (and we believe it is strictly true) which is put forth by the President, and under the sanction, of a new Association, entitled the "Silk Supply Association," which was organised during the past year for the purpose which its name implies.

The Association obviously means work, and at once puts aside the *dilletante* attempts at introducing new silk material, such as the Tussen silk, the Ailantus silk, &c., as play, and unworthy of serious attention. "These yield fibres," it is said, "which, although continuous, are very inferior as substitutes, and altogether unsuitable for the general purposes of true silk. Fabrics from those fibres may be classed with alpaca, wool, or linen, but can never attain among textile fabrics the value of true silk." We quite concur in this judgment, and our readers may recollect that it is the opinion which we have all along expressed.

The aim of the Association is to increase and improve the supply of silk of the Bombyx mori, or true silkworm, and the means by which it proposes to do so are to take steps—

1st. To stimulate the production of silk by cottage cultivation and otherwise in every country where the Mulberry tree is capable of giving food to silkworms.

2nd. To encourage the introduction and exchange of the eggs of the best kind of silkworms in silk-producing districts.

3rd. To offer practical suggestions and encouragement to the producers of silk for improving the quality, and securing a better classification, and for ensuring greater care in the reeling of the silk.

4th. To promote the cultivation of silk in the various silk-producing districts of India, where the production of silk has not recently increased, and in other districts of India, where the cultivation of the silkworm has almost ceased, but which are known to possess special advantages, by the growth of the Mulberry tree, and the habits of the people, for its propagation.

5th. To promote the importation of cocoons from countries not well able to reel them.

6th. To communicate with the Foreign, Colonial, and Indian Departments of her Majesty's Government, and to obtain the aid of the English representatives in the British Colonies, and Consular Agents in all foreign countries, to promote and extend the cultivation of silk.

It is intended that all the officers in connection with the proposed Association shall be honorary, and that no payments be made except for rent, clerk's services, printing, postages, and office management.

In furtherance of these objects it is proposed also to publish a monthly journal devoted to silk, its cultivation, manipulation, &c., to be called "The Journal of the Silk Supply Association," and in the meantime, and as a foretaste of the Journal, the Association has published a "Guide to Sericulture," which its President, Mr. DICKINS, has written, and which we may hereafter notice separately.

Our immediate object is, first, to draw attention to the Association and its objects, and to back them, so far as they seem to us to be judicious, and next to offer a caution against any steps which seem to us questionable or injudicious. The aim is so praiseworthy that no one who is anxious for the well-being of his fellow men can refuse his sympathy. But the subject is one in which great interests are already at stake, and any tampering or injudicious interference with them may be attended with the most serious consequences. Its course, therefore, requires wary walking, and we give the best evidence of our interest in the movement, and our desire to support it, by offering suggestions on one or two points, to which we would invite serious consideration.

A matter of great interest to the Association, although not perhaps of equal importance to the silk trade, is the prudence or probability of success of the attempt to rear silkworms for silk in this country. Mr. DICKINS says, in his "Guide :"—"The author feels now justified in recommending the growth of silk in this kingdom as a remunerative agricultural produce. Various unsuccessful attempts have been made, the last serious one having been in 1825, but of the causes of failure some no longer exist, and others are remediable by extended knowledge, improvements on former systems, and especially by the facilities now afforded by steam locomotion. The objections as to climate and labour are easily disposed of, indeed a temperate and cool climate produces the best silk." We cannot agree with this. As we understand it, the real difficulty in the way of producing silk in this country is, not that Mulberry trees cannot be grown, and silk produced well enough, but that the cocoons produced are inferior in weight to those produced in competing countries.

Mrs. WHITBY, a lady who made the experiment commercially, and published the result, found that her cocoons were on the average only a *fifth* of the weight of those from the north of Italy. Now, no British producer thus handicapped, with five to one against him, in addition to higher wages and climatal disadvantages, could hope successfully to compete with the producers on the Continent, except when some accidental circumstances, such as the disease, puts the latter *hors de concours*. We think, too, that Mr. DICKINS treats the disadvantages of the English climate too lightly, and commends the effect of such a climate too highly, when he says in relation to England that a temperate and cool climate produces the best silk. We should like to know the facts on which he grounds this statement. It appears to us to be erroneous, witness the inferior quality of the British and Japanese cocoons. But assuming that at least a temperate and cool climate is not unfavourable, a variable one certainly is. We could quote the report in the Appendix to his own book against him on this point; and if temperate and cool climates produce good silk, it can, at any rate, never be said that they produce the best silk, for the best is from Novi, and from Novi stock transferred to Algeria, neither of which places can rightly be called temperate or cool. But although we do not think the production of silk can be conducted to profit in England except when the disease is in France, we do not mean to say that it should not be attempted. We may lose our labour whenever the disease goes, but we fear there is no immediate prospect of its departure, and what this country would be better fitted for during its continuance than producing light silk for manufacture would be growing "graines" or eggs. As Mr. DICKINS truly says, those grown in this country would be every whit as good as the Japanese—always provided that we keep out the disease. But this would be the great difficulty if Sericulture were once seriously begun in this country. We know that the disease has already been in it from graines imported from France : but there is no reason to think that it has taken root. There was nothing for it to take root upon. It killed all the produce of the imported French graines, and there was an end. The field, we hope, is free—but one of the first subjects for the Association's consideration should be, how to keep it so.

Having thus drawn attention to the aims of the Silk Supply Association, and pointed out what appears to us to be the chief difficulty in

the way of introducing Sericiculture as a branch of industry in this country—a difficulty which may prove surmountable or not—we proceed to remark further, that there is ample scope for the operations of the Association abroad, where it may do great good by opening new sources of supply and extending and improving the old. But this field, too, has its difficulties; and what we said as to wary walking especially applies to this. It would be a horrible thing if we English, in our meddling with an industry with which, as yet, at least, it may be said we have nothing to do, should be the means of wholly extinguishing it, and so adding to the misery and distress which it is our object to relieve. We are led to this consideration by finding that the second article in the programme of the Association is "To encourage the introduction and exchange of the eggs of the best kind of silkworms in silk-producing countries." Such a plan properly carried out *might* do no harm, but it is so fraught with danger that we protest against its introduction at all. The injudicious zeal of a single ignorant clerk might destroy every source from which the old world at present receives uninfected graines.

Every one knows that the silk disease began in France; that it gradually invaded the rest of the silk-producing countries of Europe, passed on into Asia, destroyed the Indian trade, and thence has gone on into China. Latterly the chief resource of the silk growers in Europe has been graines or eggs from Japan. Being separated from China by a tract of sea, the disease has not penetrated to that country; and it has been generally thought that it, as well as Australia and America, might be regarded as secure from infection, because it was not easy to see how it could reach them, for it cannot be imagined that any one would be so reckless or wicked as to propose to introduce infected eggs. And yet, unless the Association is put on its guard, this is one of the very things it may do. The President in his book seems not to be aware of the immunity of Japan from disease, or of its significance, for he says the disease "has not appeared in England nor in Egypt, and is but very little known in Japan or China." It *has* appeared in England, for if he reads Dr. WALLACE's last little book he will find that his French imported graines produced worms which all died of it, and not only his, but others also. We have no doubt it has appeared in Egypt, although on the spur of the moment we cannot cite chapter and verse for it. So far from being very little known in China, the imports of that country to Great Britain alone fell between the years 1857 and 1864 from 9,000,000 lb. of silk per annum, to 3,000,000 lb., the great fall taking place in 1864, when it fell in one year from 7,000,000 lb. down to 3,000,000 lb. Japan we believe to be, happily, as yet entirely free from it. Of course we cannot prove this. No man can prove a negative. But we have never heard of its appearance in Japan, and we think we should, had it come. A very interesting report of a tour by Mr. ADAMS, Secretary of Legation at Japan, and three silk inspectors of silk firms in Yokohama, through nearly 300 miles of the silk districts of Japan, published as an appendix to Mr. DICKINS' own "Guide" makes not the slightest mention of it, although it speaks of other diseases, or supposed diseases, from which the worms suffer. It may, perhaps, be said, and we hope we shall be told, that the Association never had an idea of doing anything so mad, and yet had we not spoken it might very well have happened. To one who supposes that the disease is already in Japan, there could be no object in refraining from sending graines to Japan if it were otherwise desirable—and certainly but for that it would be desirable, for the cocoon of the silkworm of Japan is a very small inferior article, not a third of the size of the Italian cocoons. But when the chance of infecting the whole district with the disease is taken into account, the advantage offered ceases to have any attraction. When the disease is gone it will be another thing; then what is now almost criminal will become meritorious.

As things go on at present, however, there seems little chance of that most desirable consummation being soon attained. We are very much disposed to go along with the theory propounded by Mr. ANDREW MURRAY in his Report to the British Commissioners on the Products of Useful Insects in the Paris Exhibition of 1867. With certain significant exceptions, all other epidemics, after having thoroughly ravaged and desolated a country or a city, have taken their departure, leaving the district to recover itself. The only exceptions have been in certain great cities or commercial centres, to which a fresh concourse of people was constantly flowing, such as Mecca, Cairo, Constantinople, London, &c. Mr. MURRAY argued that in the ordinary case where the epidemic went away, it, like a flight of locusts, had eaten all the food that was open to its attack; or, like a fire, had consumed everything that was combustible, and that the explanation of its continuance in such places as Mecca or Constantinople was the constant arrival of fresh food or fuel for the epidemic in the shape of fresh victims. He maintained that it was the same with the silk disease; that it was the constant importation of fresh graines into the district before it had got thoroughly free from the infection, that perpetuated its presence, and that what was needed for its cure was a temporary cessation of the importation of graines into infected countries. Now whether the theory be sound or not, it has at least the negative support of facts both before and since it was promulgated. The remedy indicated has not been applied, and the disease is as bad as ever, and more widely extended than ever. We do not think, therefore, that any one interested in the subject would be wise wholly to disregard the possibility of the explanation being well founded, and we hope that the Association will take what we have said in good part, and reconsider the second part of its programme.

With these qualifications, we wish the Association all success, and shall be happy to do anything we can to promote its interests.

—— WE subjoin a figure of DRETCHSLER'S PATENT FUMIGATOR, to which we have incidentally alluded on one or two previous occasions. It consists of an iron

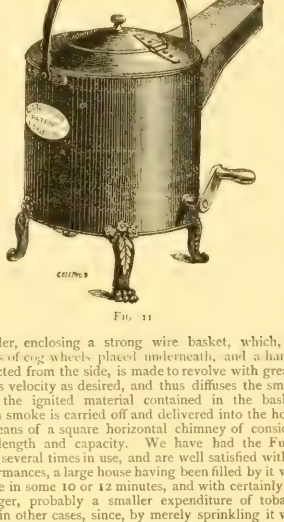

FIG. 11

cylinder, enclosing a strong wire basket, which, by means of cog wheels placed underneath, and a handle projected from the side, is made to revolve with greater or less velocity as desired, and thus diffuses the smoke from the ignited material contained in the basket, which smoke is carried off and delivered into the house by means of a square horizontal chimney of considerable length and capacity. We have had the Fumigator several times in use, and are well satisfied with its performances, a large house having been filled by it with smoke in some 10 or 12 minutes, and with certainly not a larger, probably a smaller expenditure of tobacco than in other cases, since, by merely sprinkling it with water from the hand, it is readily kept in the condition of smother-burning—more so, we think, than in those cases where hot embers have to be used. The two special advantages this apparatus presents are these:—1. It may be set in operation by simply igniting a piece of paper with a lucifer match, and thus the trouble and inconvenience of running about to get burning embers is altogether saved. 2. It may be used most readily without subjecting the operator to be "smoked" like the insects he is bent on destroying; for, by putting the chimney through an aperture, such as might be made by having a loose half-brick in the wall of the house or pit, or in any other more convenient way, the operator may stand outside while he is working the machine, and pouring forth into the interior its narcotic smoke-clouds. The tobacco or tobacco-paper requires to be occasionally damped, while the machine is in operation. Frames and pits are fumigated by inserting the chimney under the front part of the sash, and then setting the machine in motion. With some slight additions the apparatus becomes adapted for winnowing seeds, and may be used for a variety of other purposes.

—— At a recent meeting of the Special Committee appointed at Oxford to aid in carrying out a Grand Exhibition in conjunction with the ROYAL HORTICULTURAL SOCIETY of London, on the 19th of July next and following days, during the visit of the Royal Agricultural Society of England, the Secretary (Mr. W. R. HOBBS) reported that the London Society had published its list of prizes, amounting to upwards of £470, and had also given £25 as a special prize; and several special prizes were also reported, from the *Gardeners' Chronicle* and other horticultural and floral publications. The sum of £25 has been voted by the committee of the Oxford Horticultural Society, and an effort is being made to raise donations from the nobility, ladies, gentry, and clergy of this and the neighbouring counties, so as to enable them to offer a sum for special prizes equal to that of the London Society. The donations already received include £10 from the High Sheriff of the county, £10 from the Right Hon. E. CARDWELL, £10 from W. W. WOOTTEN, Esq., and £5 each from the Warden of New College and Mr. NUTTING, besides a number of smaller amounts. The special committee appointed for this show are: the Right Hon. the Earl of ABINGDON, President; HERBERT PARSONS, Esq., treasurer; W. WOOTTEN WOOTTEN, Esq., and JOHN THOMSON, Esq., hon. secretaries; the Worshipful the Mayor of Oxford; the Rev. the Warden of New College; the Rev. R. H. CHARSLEY; the Rev. W. J. DRY, Weston-on-the-Green; the Rev. S. J. HULME; the Rev. ROBERT MAIN; Mr. Ald. CAVELL; HENRY CHURCHILL, Esq., Deddington; Mr. HENRY GRANT; Mr. HENRY GAMMON; Mr. JOHN RING; Mr. BENJAMIN ROBINSON; Mr. JOHN WALKER, Thame; and the general committee for 1870, with power to add to their number.

—— During the violent gale which raged throughout London and its suburbs on Saturday last, at about mid-day, when at its height, a terrific gust bore with full force on the ROSERY at the CRYSTAL PALACE, and completely lifted a section of the corrugated iron forming the roof of one of the 12 arches, which, in falling, carried away with it three of the other arches. Soon afterwards the great flag-mast, upwards of 100 feet high and 4 feet in circumference at the base, which stood in the centre of the Rosery, was uprooted from the ground, and blown through the opening previously made, though fortunately without injury. Considerable damage was also done to the trees in the park.

—— It is with much pleasure that we are enabled to state that, through the active exertions of Messrs. KELWAY and others, the meeting at the South Kensington Gardens, at which GLADIOLI are to be exhibited August 17—promises to be a most attractive one. Subscriptions have been obtained through the instrumentality of gentlemen interested in this flower, as was done in former seasons with the Variegated Zonal Pelargonium, with the view of offering some liberal prizes, open to English and foreign growers. Among those who have responded to this invitation may be mentioned MM. VILMORIN-ANDRIEUX & Co., who subscribe £5 5*s.*; M. SOUCHET, £6; M. CHARLES VERDIER £2; M. EUGENE VERDIER, £1. Several English growers, both amateurs and nurserymen, have promised to meet this liberality of the foreign growers by subscribing to the fund, and we hope to have a large list of contributors to publish. The number of prizes cannot be determined till the amount of subscriptions has been ascertained; so that it is most desirable that any person who may wish to add his name to the list, should do so at once, by communicating either with Mr. RICHARDS, Royal Horticultural Gardens, South Kensington, or with the Chairman of the Floral Committee. The prize list will be published as soon as possible, and will be entirely in addition to the prizes already advertised by the Society. It is proposed that a liberal prize should be offered for the best six English seedlings. The subscriptions already promised are as follows:—

	£	s.	d.		£	s.	d.
Mr. Vincent Stuckey Langport	1			M. Eugène Verdier & Sons	1		
Mr. Marshall, Taunton ..	1	1		M. Charles Verdier ..	2	0	
MM. Vilmorin-Andrieux & Co.	5	5		Messrs. Kelway & Sons	2	2	
M. Souchet	6	0		Messrs. Paul & Son ..	2	2	
				Mr. Bunyard	1	0	

—— Prof. DELPINO, of Florence, has published some interesting researches on the relation between the DIFFUSION of PLANTS and ANIMALS, which are quoted in "Nature" from the "Botanische Zeitung." The life of every plant has three principal objects; its nourishment, its reproduction, and the distribution of its seeds, special biological conditions being requisite for each of these three objects. The fertilisation of many plants can be effected only by some particular animal; as Arum italicum, Aristolochia, and Asarum, by gnats; the Fig tribe by different species of Cynips (or gall-fly); Arum Dracunculus, Stapelia, and Rafflesia, by blue-bottle flies; many others by different kinds of flies or bee-like insects (hymenoptera), and some even by small birds belonging to the family of Trochilidæ, or humming-birds; Rosa, Pæonia, and Magnolia grandiflora, by beetles of the chafer tribe; others again by small slugs. If in any particular locality the animal necessary for the fertilisation of a particular plant is absent, it is certain that the plant cannot spread; and thus the conditions for the diffusion of plants

are dependent on the geographical distribution of animals. A remarkable illustration is furnished by two plants belonging to the same genus, grown in the botanic gardens in Italy, Lobelia syphilitica and L. fulgens; the flowers of the former are abundantly visited by Bombus terrestris and italicus, and freely produce seeds; the latter, notwithstanding its beauty and its great store of honey, is never visited by insects in the neighbourhood of Florence, and never bears seeds spontaneously, but can be readily fertilised by artificial impregnation. Professor DELPINO conjectures that it is naturally fertilised by humming-birds. He believes that the scarlet colour of the corolla, so common in the tropics, but comparatively rare with us, is especially attractive to small birds, but offensive rather than otherwise to hymenoptera. As a rule, scarlet flowers are large, bag-like in form, horizontal in position, and with the nectar completely separated, which would of itself perfectly prevent their fertilisation by insects. The largest European flowers, such as the Pæony and large Bindweed (Convolvulus Sepium) are fertilised by sphinxes and rose-chafers.

—— The speedy publication of Mr. MONGREDIEN'S work on TREES and SHRUBS for English plantations is announced.

—— The following quotation is not without interest as bearing on the discussion carried on in our columns as to the superiority of certain SOILS over others for the culture of VINES. It is taken from a speech of the celebrated French Minister, M. DROUYN DE LHUYS, and is taken from the pages of the *Scotsman* newspaper of Jan. 1. The facts here given bear out in a very direct manner the opinions advanced by our correspondent "B.," at p. 1231, 1869:—

"*French Wines.* M. DROUYN DE LHUYS gave some interesting information on French wines the other day, at the opening of the international Wine Growers' Congress at Beaune, of which he was chosen president. He said the cultivation of the Vine now extends over 79 French departments, producing nearly 71,000,000 hectolitres of wine, which, at the average price of 23 francs per hectolitre, represents a total value of 1,600,000,000 francs. If we calculate the expenditure of each wine-grower's family, consisting on the average of four persons, at 1000 francs a year, it will be found that this branch of industry alone satisfies the requirements of 1,600,000 families, or 6,500,000 of the population. To this number should be added about 2,000,000 carters and traders, all of whom participate in the profits. It may, therefore, be stated without exaggeration that the cultivation of the Vine feeds one-fifth of the whole population of France, and produces a revenue equal to one-fourth of the value of the agricultural produce of the country. M. DROUYN DE LHUYS also stated that the ground on which the Vine is cultivated is generally useless for any other purpose, and that Vines will grow on all kinds of soil. At Cape Breton it grows on the quartziferous sand of the dunes; in Medoc, on sand, mixed with pebbles; in Anjou, on clay; in Champagne, on chalk. The wine known as Hermitage is produced from Vines growing on granite rocks, and the best vineyards of Burgundy are on limestone cliffs and marshy ground."

—— It is not often that a translation can be said to be better than the original. Such may at least be affirmed of the accompanying version of a pseudo-poetical and quasi-grammatical ADVERTISEMENT, which we extracted from a Tottenham paper some time ago (p. 1062, 1869). The gardener in question owes the honour done to him by translating his effusion, to "E. A.," while for its publication he is indebted to "La Belgique Horticole." Query—Has he obtained a situation any the sooner on account of his poetical talents?

"Un jardinier vivait paisiblement,
Quand une mort cruelle emporta sa maîtresse,
Que l'on juge de son tourment,
Lorsque pour comble de détresse,
On l'envoya chercher un autre logement,
Lui qui sur son jardin épuisant sa tendresse
Ne méritait qu'un compliment
Il cherche maintenant une place nouvelle,
Affirmant qu'il est sans défaut,
Et qu'à celui qui veut du talent et du zèle
C'est tout à fait l'homme qu'il faut."

—— An official notification in the *St. Helena Guardian* states that several thousand seedlings of CINCHONA TREES have been raised in the Government nursery from seed forwarded by Dr. HOOKER from the Royal Gardens, Kew. The young plants will be distributed amongst the landed proprietors in those parts of the island considered by the superintendent of the Government plantations to be suitable for the growth of this tree, and will be planted under his directions. We further gather from a statement in the French journal, *Les Mondes*, that Dr. VINSON has plants enough of Cinchona officinalis to plant (*ensemencer*) the whole island of Réunion. This intelligence was communicated by Général MORIN at a recent sitting of the French Academy of Sciences.

New Garden Plants.

BARLERIA LICHTENSTEINIANA, *Nees v. Esenb.*

"Fruticosa procumbens, spicis sessilibus secundis, bracteis dorsalibus ovatis incumbentibus apice spinosis bracteolisque lanceolatis spinoso-dentatis, foliis ovato-oblongis spinoso-dentatis mucronatis petiolatis tomentosis, calycis lacinis exterioribus maximis late ovatis spinoso-acutatis dentatisque, 9-11 nervibus hirtis. Ad Grootrivier Prom. Bon. sp." Nees v. Esenbeck in D. C. Prod. xi., p. 235, anno 1847.

This is one of the most peculiar-looking plants we have ever had the fortune to see, and though it is destitute of the attractive colours which render so many of its fellow Acanthads such favourites in our stoves, it is very far from inelegant. The structure of the flowers, and the arrangements apparently intended to prevent cross-fertilisation and to secure self-fecundation, invest it with additional attractions for the plant lover. We will first give a general description, and then allude to some of the more striking peculiarities, of the plant.

FIG. 12.

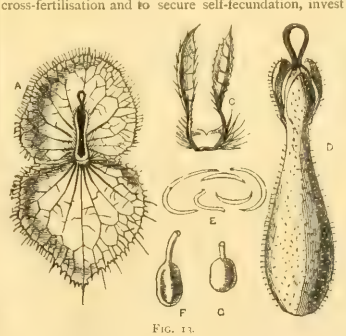

FIG. 13.

The shrub is covered over its whole surface with close, white, hoary down. The branches are slender, virgate, sub-angular. The leaves are opposite, 1-2 inches in length or longer, linear-lanceolate, entire, mucronate, with a central rib and numerous arched veins, tapering at the base into a very short stalk. The flower-spikes are axillary, 2-3 inches long, ovoid or oblong, consisting of a large number of closely packed overlapping bracts, all turned to the fore or lower part of the spike (secund). Each bract is ovate-acuminate, mucronate, spine-toothed, 1-ribbed, with prominent and curved veins, and an inch to an inch and a half long. The calyx consists of four sepals in two rows; the two outer sepals are appressed, the posterior one, B, nearest the stem is suborbiculate, mucronate, spine-toothed and ciliate, many ribbed, about an inch long; the anterior sepal, A, nearest to the bract is similar to the preceding, teeth smaller and unarmed; these two sepals project at the sides beyond the bracts, and completely hide the two inner sepals C, which decussate with the outer ones, than which they are much smaller (¼-inch long, one line broad), linear, spathulate, acute, ciliate at the base. On the posterior side of the flower, between the two inner sepals, is a vacant space, apparently indicating the position of a fifth suppressed sepal. The corolla D is slightly larger than the inner sepals, of a brown colour, tubular, tube compressed from back to front, dilated at the base; its limb is divided into five short, ovate, erect, overlapping lobes, two external to the three others, and all so tightly appressed that they close the mouth of the corolla. Stamens 5, attached to the tube of the corolla a little below its mouth—2 fertile, 3 sterile; filaments erect, hairy; anthers of fertile filaments erect, adnate, sagittate, oblong, black, 2-celled—cells splitting lengthwise, and towards the centre of the flower. Pollen grains large, globose, reticulated. Ovary about two lines long, oblong-ovoid, compressed from back to front, 2-celled, with axile placentas; ovules 4, two in each cell, each orbicular, ascending, the lower one overlapping the upper one. Style cylindrical, ultimately longer than the corolla, curved at the apex, where it terminates in an obliquely truncated stigma. The fruit, which we have not seen, is described as tetragonal.

The inflorescence, with its curious one-sided arrangement of bracts, resembles in general appearance that of some composite, as Carlina, but is lateral, not terminal. The construction of the flower seems to favour self-fertilisation, as will be seen from the following facts: the two outer sepals are closely pressed together, so that it is not altogether easy to separate them, the edge of the larger of the two sepals is spiny, and the teeth would seem rather to deter than favour the access of insects. The corolla is completely concealed within the sepals, its lobes are also tightly appressed and clip the stigmatic end of the style, and prevent its passage from the flower, so that the stigma is always included. If young flower-buds be examined, the style will be seen to be erect and straight (G), but as the style lengthens and comes into contact with the lobes of the corolla, its further progress is arrested, it becomes curved (F), and in the fully developed flower, D, the style forms a complete loop, owing to the stigma being retained within the corolla. Such are the appearances presented by the flower, and the inferences deduced from them. We have had no opportunity of testing how far those inferences are borne out in practice. For specimens of this singular plant we are indebted to Mr. W. Bull. Fig. 12 shows a branch with the under-side of the inflorescence; fig. 13 shows the details of the flower. A and B are the two outer sepals, natural size, forced open, showing the erect flower in the centre; C represents the two inner sepals, separated, natural size; D shows the corolla, enlarged; E is a section showing the arrangement of its lobes; G and F represent ovaries, with the young style beginning to become curved. *M. T. M.*

HISTORICAL TREES.

THE interesting article by your able correspondent, Mr. Forsyth, at p. 7, suggests to my mind that an account of some of the rare and beautiful trees in the gardens of Lord Ravensworth would not be unacceptable. Of the beautiful Maiden-hair tree, there are two specimens of nearly the same height; but unfortunately, as far as is known, they are both of the same sex. Another rare tree is the Sophora japonica. It is said that this tree was first introduced into this country by Mr. Jas. Gorden in the year 1753, and planted when 2 feet high in the place where it now stands, by the late John Ord, Esq., the then proprietor of Pursers Cross. To show the rapid growth of the Sophora, I may state that in the year 1809 this tree was 50 feet high; its girth, at 3 feet from ground, 9 feet 7 inches; in 1812 its girth was 10 feet. It first flowered in the year 1807. There are two healthy trees of this Sophora, nearly 30 feet high, in Lord Ravensworth's gardens, at the present time. Mr. Wood, the gardener, acting under the instructions of his employer, guards the remains of the original Sophora as sacred. About 6 feet of the trunk still stands, the girth at the present time being 16 feet. Many more rare trees are to be seen here, such as Juglans nigra, or Black Walnut, &c., but as there are older specimens of these to be found in the country I will not describe them here. I may, however, mention that at this place was raised,

about 100 years ago, from a pip or seed of the Newtown Pippin, the Apple known as "Old's Apple," and it was, I believe, first distributed in this country by the father of the present Messrs. John & Charles Lee of the Hammersmith Nurseries.

At a short distance from Lord Ravensworth's is the nursery of Messrs. Osborn & Sons, where may be seen the original Quercus fulhamensis, nearly 200 years old; also in the nursery, a fine specimen (near the public road) of the Quercus Suber, said to be a seedling of the far-famed Cork tree, known as "Bishop Compton's tree," the history of which is, that it was planted in the year 1686, when Bishop Compton held the see of London. This tree is said to be the oldest Cork tree known in Britain: its height is 50 feet; girth, 3 feet from the ground, 9 feet 10 inches. Whether we look on the Cork tree at Fulham Palace gardens as an historical or memorial tree, it recalls memories of the past. Mr. London, afterwards gardener to King William, was the gardener then at Fulham Palace. His name it would be unpardonable to omit in connection with this rare old tree, as I presume it may have been planted by him, although it is looked on as a memorial of Bishop Compton. It is said of him by his apprentice Switzer, also by Evelyn, that Mr. London was the greatest gardener of his day, &c. He was the originator of the firm of "London & Wise," of Brompton Park, whose nursery was the most extensive one known at that time, and if the stock had been valued at *1d.* per plant it would have realised upwards of £40,000. Quercus Ilex (or evergreen Oak) is still to be seen at Fulham Palace gardens; this tree was considered the handsomest specimen of the sort known in England, but the snow, which did such damage to telegraph wires and to many a noble tree throughout England in 1865-6, so crippled this once grand tree, that those who knew it as the oldest and grandest specimen of Q. Ilex, would, after that unfortunate fall of snow, have scarcely recognised it. It was said to have been planted at the same time as the Cork tree—in the year 1686; height, 35 feet; girth, 11 feet.

And now for the Judas tree. This is considered to be the very oldest tree of the sort in England; it, too, has a history, for it is supposed to be the same sort of tree as that on which Judas hanged himself. To see its beautiful purple flowers in conjunction with those of the White Thorn and yellow Laburnum in May, one would wish to know it by some other name than the one which recalls the "traitor's kiss." The height of the Judas tree at Fulham Palace is 40 feet, girth 8 feet 6 inches. It was planted 1686. Juglans nigra, or Black Hickory, is a wonderful tree, and was probably planted some years before those I have noticed as being planted, and known as Bishop Compton's trees. I find the famous botanist, Ray, a great friend of Bishop Compton's, while giving an account of the rare trees at Fulham Palace, describes the Juglans nigra as being then of good size: the height of this tree is 70 feet; girth, 3 feet from the ground, 15 feet 9 inches. I have often been sorry that this fine timber tree has been so long overlooked by our landed proprietors in this country; it is truly a wonderful tree as seen at Fulham, and its wood takes a polish as beautiful and dark as Mahogany.

The Pomegranate planted at Fulham is trained to the south-west front of the Palace. There is no account of its origin so far as I know, but in the year 1838 it was killed down by what some call Murphy's frost, and, judging from the girth of the old stem, from which the present tree sprung, I should say it was upwards of 100 years old, I find that the best mode of flowering this, the double-flowered Pomegranate, out-of-doors in this country, is to give it the same treatment as the Vine,—that is, it flowers best on the last year's shoots, some of which ought to be left a foot or so long; or by pinching the shoots in summer you will then be able to have abundance of bloom, so useful for bouquets, &c., in the month of July and August. I think the fortunate possessors of such relics ought to guard them as real treasures, and to the honour of the present bishop be it said, that he takes a great interest in them; and let us hope, while his lordship has the guardianship of these trees, they will be held sacred to the memory of good Bishop Compton, who did more to encourage gardening than any other gentleman of his time. *D. Cunningham.*

THE APPLE-BARK LOUSE.

This insect has received various scientific appellations—Coccus conchiformis, Coccus arboreum linearis, Diaspis linearis, &c. The most generally adopted specific name is conchiformis, first given by Gmelin, in allusion to its shape and appearance, which is very much that of a miniature mussel-shell, and it has been placed in divers genera of Coccidæ, as Coccus, Chermes, Lecanium, Aspidiotus, and Diaspis. The genus in which it has been placed by the most recent author who has treated of these insects, Boisduval, is Chermes, and his name is Chermes conchiformis; but we prefer to retain it in the wider genus Coccus in the meantime, until we see what Dr. Signoret, who is now engaged on a monograph of the whole family of Coccidæ, says on the subject. He may, perhaps, find some better generic characters than have yet been proposed. But what's in a name? Let us pass to the creature itself.

The male is, we believe, still unknown, but the female, or rather its house or shell, or more strictly speaking back, is a small oblong flattish brown scale, shaped like a mussel-shell, but usually more curved and sometimes bisinuate, fixed to the smooth bark of fruit trees, chiefly the Apple and Pear. The colour is burnt umber, except at the ends (and more particularly the smaller end) which are pale burnt sienna. It sometimes occurs in immense numbers, covering and crowded over the bark from the root to the ends of the twigs, and even lying across each other, and extending occasionally, although more rarely, to the leaves and fruit. This scale is the dried carapace, shell or back of the female. Boisduval supposes that it must couple and lay its eggs in the autumn, because it dies in the winter, and this dried carapace covers the eggs until about May 15, when they come out. If one of the scales be removed (as can easily be done with the point of a needle), from 13 to above 100 excessively minute eggs may be seen under it; these are slightly elongated, showing white or yellowish. When they come out in May they spread over the bark, where at first they appear like very small white points. The male, when discovered, will probably turn out to be, as is the case with many crustaceans and some insects, disproportionately small; and it is not improbable that, as in the allied family of aphides, parthenogenesis may be common.

The reader will find a fuller description and figures of it (which we here reproduce in Fig. 14) in our third volume (1843) pp. 735-6, from the pen of the eminent entomologist, the late Mr. Curtis, under his *nom de plume* "Ruricola." A correspondent of the "Gardeners' Magazine," whom he quotes, says: "I believe this disease is mostly, if not entirely, confined to wall-fruit in the open air, standards not affording them sufficient warmth and shelter during our winters, especially in Scotland, where they have been very abundant and very troublesome." And Mr. Curtis adds: "Although it is generally trained trees that are most attacked by the mussel-scales, I have seen standards so covered by them that they were completely hide-bound, it might

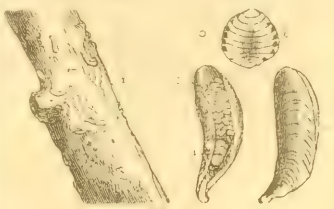

Fig. 14.

be said, so that it was impossible for the trees to increase in size."

When a tree has been infested with this scale for some years the fruit does not ripen, the tree dwindles away, and finally dies; and in the United States, to which it has been imported, it has been found that this is especially the case when the tree stands by itself, so that the scale cannot spread to others, and its whole numbers are concentrated on it alone. Where it has facility for spreading, it has been observed that after badly infesting a tree for two or three years it leaves it, giving rise to the supposition that by that time it has exhausted the nutrient properties of that tree, and goes on to pastures new on others. The number of eggs, too, under the carapace has been observed to be greater on a thriving tree than on a weak one.

It is a native of Europe, and appears to have been first described by Reaumur in 1738, who found it on an Elm in France; and, as already mentioned, it has been introduced from this country into North America on exported Apple trees, and is now on the whole the most pernicious and destructive to the Apple tree of any insect in that country. It has spread far to the west, having reached Michigan in 1856, when Dr. Asa Fitch gave an account of its progress. As has often been observed, where hurtful insects have been introduced from one country to another, it has been found to do great injury at first, but after becoming fully naturalised it does less damage.

Many are the devices which have been tried to protect the trees from this scourge, and to extirpate it from districts where it has established itself. Mr. Curtis recommended, what we are afraid would be found to be the very unpractical remedy of scraping the bark with a wooden knife, so as to bruise and crush the females without lacerating the tree, and immediately after to wash the trunk and branches with some gas-tar. A more easily executed process is that recommended by Boisduval, as practised successfully in France, viz., to paint the tree with weak wet lime. In America various remedies have been tried, some of them impositions, others really good. Of the former was a secret hawked about in the prairie districts as perfectly sure to destroy these lice, which turned out to be simply an infusion of quassia, with which the trees were to be wetted from a syringe or watering-pot. This was soon discovered to be worthless, or effectual only when applied to the young newly-hatched lice, at which time infusion of tobacco or soapsuds would be a more economical and still more effectual remedy. The application of strong lye, potash-water, whitewash, dry ashes, sulphur, and many other articles has also been tried with more or less success. The most successful, however, appears to have been the following, which are described by Dr. Asa Fitch in his work on the "Noxious Insects of New York." The first is apparently not recommended from his own personal observation, but is quoted from the "Michigan Farmer," vol. 13, p. 82, where Mr. A. G. Hanford gives a very favourable account of the effects of tar and linseed oil, beaten together and applied warm with a paint-brush thoroughly, before the buds begin to expand in spring. This when dry cracks and peels off, bringing off the dead scales with it. Trees, which were thus treated, and which had advanced only a few inches in previous years, grew from 2 to 2½ feet the next summer. The other remedy, and which is the last we shall mention, has the advantage of Dr. Fitch's *imprimatur*, he having himself examined the trees on which it was tried. It was the device of Mr. George Kimball, of Kenosha, Wisconsin, and was tried at a time when the whole of that district was overrun and dying from these insects—"a tree only living about three years after it became badly infested, and on almost every farm several dead trees might be seen, and many more which were so far gone that they could never recover." His plan was this: he boiled leaf-tobacco in strong lye until it was reduced to an impalpable pulp, which it becomes in a short time, and then mixed with it soft soap (which had been made cold, not the jelly-like boiled soap), to make the mass about the consistence of thin paint, the object being to obtain a preparation that could not be entirely washed from the tree by the first rains, as lye, tobacco-water, and most other washes are sure to be. The great advantage of this is that it not only kills the present inhabitants of the tree, which probably any other close application which would exclude the air might do, but after the tree is cleared it seems to render it distasteful to others, and so prevents a fresh brood making their way to it from neighbouring trees. The fibres of the tobacco diffused through the preparation apparently cause a portion of its strength to remain wherever it is applied longer than any application which is wholly soluble in rain-water can do. Mr. Kimball began by trimming the trees well, so that every twig could be reached by the paintbrush, and applied the preparation before the buds had much swelled in the spring. Two men, who were strictly charged to take their time, and be sure that they painted the whole of the bark to the ends of every twig, were occupied a fortnight in going over 150 young trees, and Dr. Fitch adds, that when he saw the trees in the latter part of the September after, "this composition was still plainly to be seen upon the rough bark of their trunks, and upon the under sides of their limbs, resembling a whitish mouldiness of the bark. The trees had grown very thriftily, and yielded well, whilst only a single scale could here and there be found upon the twigs of the present year's growth, all the older parts being entirely free from them. Although trees, perishing with lice, were standing in the adjacent yards and gardens, it seemed these insects preferred starvation at home rather than being poisoned by invading these trees; hence it appears that one thorough application of this preparation is sufficient to destroy all the insects upon the trees, and to protect them from invasion from neighbouring trees for a period of two years; for free as the trees were from these insects in September there can be no call for a renewal of this composition upon them the coming spring." *A. M.*

[It is to be hoped that in case of any of our readers trying any of the above prescriptions they will *Chronicle* the result. Eds.]

Home Correspondence.

The Nationality of St. Fiacre.—I should like to be permitted to make a few remarks on the passages relative to St. Fiacre, the patron saint of gardeners, quoted by your reviewer in the notice of Mrs. Palliser's book, "Brittany and its Byways," at p. 13. St. Fiacre is said by Mrs. Palliser to have been an Irish monk, with remarkable powers, if we may credit tradition, of amplifying boundary lines, and subsoiling gifts, which I am able to assert, from recent experience, might be profitably emulated by the Bretons of the present day. I should be very sorry to take anything, the retention of which is likely to confer honour, from our Hibernian *confrères*, but still I must question the accuracy of Mrs. Palliser's history, when she makes Ireland the birthplace of St. Fiacre. That eminent man (for I am sure the judgment of the gardening fraternity must not be disputed in a matter so important as the selection of a patron saint) was born in Scotland, and was pre-eminently a son of Caledonia, as his father was Evan, 4th King of Scotland; he visited France as a missionary, and died in the odour of sanctity. It is said that his relics, deposited at Meaux, were visited by many pilgrims, and the name of "Fiacre" was given to hackney coaches, from "a multitude of sick and infirm people who were conveyed in them to the saint's shrine." I have a tender recollection of the influence of the good saint, as in the *jours de ma jeunesse* I had the

privilege of a holiday with the rest of the *garçons jardiniers* in the gardens of Louis Philippe, on the *fête* of St. Fiacre, which I spent very happily amongst the Roses, with my old and valued friend Monsieur Laffay, at Bellevue, and more with Madame Laffay, both Rose and lady; and I was not sorry to find, visiting Paris a year or two ago, that the saint's day was to be celebrated by a grand *fête* and assemblage of gardeners, to which as an old *dévot* I was of course invited. If my reading of history be disputed in regard to the nationality of St. Fiacre, I shall fall back upon the theory of probabilities, and ask how it is that a cold ungenial northern clime, like Scotland, should become pre-eminent for the production of fruit and flowers? How is it that so many Scotchmen should devote themselves to horticultural pursuits, and so successfully (unhappy man that I am that I was not born beyond the Tweed), that royal and regal places are ever at their command. The answer and explanation of these well-accredited facts is at once suggested. Flora and Pomona's pet and Evan's son, the good St. Fiacre, left his blessing, and, perhaps, a happy family of horticulturally-disposed Fiacres, behind him. His benign influence has shone upon the Land o' Cakes, and flavoured many a cup of brose with the scent of Roses; and Scotland's gardeners, almost unwillingly, have for centuries been under the special patronage of one of the most respectable saints in the Calendar—to wit, the good St. Fiacre. The rood loft you have figured, with the representation of the saint, is fast falling to decay in the ruinous chapel; we unblessed Englishmen may perchance propitiate his saintship by assisting in the restoration of a shrine specially dear to him. In these days of testimonials will anybody join me (English *bien entendu*) in a subscription to be devoted to the restoration of the chapel of the patron saint of gardeners—St. Fiacre? *William Ingram, Belvoir.* [Since the *fiacres* (of London) have been so much favoured of late by the Chancellor of the Exchequer, and up to this time have done nothing to show their gratitude, we, as Englishmen, do not see the necessity (in these hyper-testimonialising days) for propitiating his saintship, even though we incur the penalties of *cloche*—well, we mean bell—book, and candle. EDS.]

Gentiana acaulis.—Possibly the whole army of alpine plants does not furnish a more beautiful—I had well nigh said splendid!—edging plant than this. It is, however, difficult to treat and to grow well. Many no doubt could write of their ill success, but there are perhaps but few who could say that they have succeeded in cultivating it to their satisfaction. And yet the Gentian I refer to, and its beautiful ally, G. verna, are, we are assured, but native weeds, G. acaulis growing somewhere in the Principalities—whether in North or South Wales I have no knowledge—and G. verna being an inhabitant of England. There are one or two noticeable features in connection with their successful culture which, if made use of, may afford material aid to those who may not have hitherto succeeded with them. I find that the kind of soil in which G. acaulis really thrives thoroughly well is composed in the main of the soft flour-like dark yellow loamy sand in which Rhododendrons have been observed to grow moderately well, in addition to which about a fifth of its own bulk of good peat should be added. Perfect drainage is also, it would appear, of the first importance; aspect also has much to do with its successful culture. Indeed I have proven that whilst it will do and thrive well upon one side of a bed as an edging, it ceases to grow, or even to exist upon the other or opposite side, this even to the extent of exhibiting a dwindling look as it just rounds the corner from the side where it does so well. The aspect it thrives best in is one nearest approaching to north-east, where it is freely blooming at the present moment—other parts rounding to the eastern side, though healthy in the matter of growth, at the same time have not a flower upon them. The plants which I speak of are planted upon a somewhat mound-like form sloping to the aspect described. The soil is kept as firmly as its component parts will permit of, and the whole edging has a thick mulching once a year with well decomposed and sifted leaf-mould. This is sown in amongst the growths, and left to waste itself amongst the shoots and upon the soil. I never permit the surface to be forked or otherwise roughed over beyond what is necessary in the removal of weeds, leaves, &c. Nor does this plant take so long to establish itself, and to make a display, as some would surmise. If planted in February, it affords ample display in the second spring and early summer following, and constantly onward for years, affording, as I have already said, plenty of flowers at this dull season, December—January, when scarcely a Daisy flower can push forth, though of course varying somewhat according to the seasons, whether they be felicitous or otherwise to the formation of an autumn bloom. There is reference made to this lovely plant in an American volume before me, which, both in the description and the matter of culture, is very tersely put, and is as follows:—"Gentiana acaulis, with its large, deep blue Gloxinia-shaped flowers, if grown in deep rich loam, makes a lovely edging in early summer." Very many have tried to grow this plant by simply dotting the plants promiscuously into herbaceous borders, and amongst herbaceous plants. Of such a mode of culture I cannot add anything very encouraging. To grow it well, it not only needs a properly chosen place set apart to its use, but such further attentions besides as I have stated above. *William Earley, Digswell, Welwyn.* [We have seen it in great beauty, in a south-west aspect, planted in similar soil to that recommended by our correspondent, and afterwards paved under with medium-sized pebbles. At Harlaxton, near Belvoir, we have also seen it doing splendidly. EDS.]

Orchid Culture.—Mr. Gammie's letter at p. 40 leads me to write to you again upon the climatic conditions required by Orchids. This correspondence commenced with the discussion of the treatment required by Dendrobium Falconeri, but as we are now in mid-winter, when the advantages of the several systems of growing this Orchid cannot be spoken of with certainty, I shall postpone the subject till the Spring, when I shall be glad to hear how Mr. Salt's plant has passed the winter under its cold treatment. I take Mr. Gammie's remarks to apply particularly, as regards heat, light, and air, to the treatment of such Dendrobiums as come from the locality where he is located, and I turn to his letter as headvises, for the temperatures he gives:—From November to February, inclusive, minimum at night, 42° to 50°; day, from 50° to 65°; with sun-heat, 70° to 75°; March, April, gradually raised; from May to end of August, minimum at night not lower than 65°—day, 70° to 75°, with sun 85° to 90°, or higher. Now these are not by any means excessive temperatures; let us take those of the large conservatory at Chiswick as given by the late Mr. Thompson: May minimum, 51°, maximum, 79°; June minimum, 58°, maximum, 83°; July minimum, 58°, maximum, 80°; August minimum, 56°, maximum, 77°; September minimum, 54°, maximum, 71°; October minimum, 50°, maximum, 65°. What the highest maximum reached was I am not quite certain, but I think 96°: however, Mr. Rivers gave us the other day 105° as a temperature he had observed in one of his unheated houses—a Dendrobium would, I should think, grow wonderfully well hung in a basket in such a temperature, and should its bulbs be more liable to suffer from sun-heat than the tender Vine leaves? I will send Mr. Barron a couple with pleasure, if he wishes to try. Mr. Gammie's description of the place where he found Vanda Cathcartii growing, agrees with Mr. Wallace's finding V. Lowii in Borneo, which island, he says, enjoys the most uniformly high and humid temperature in the world; and yet V. Lowii must needs want to grow hanging near the water running from a hot spring. I had thought we were living down cool treatments. A friend of mine used to write about the cool treatment his Orchids got, while growing in his vinery, till one day I asked him if his grapes were good, as I had not heard of good cool-growing Black Hamburghs taking prizes. He thought awhile, and then said—"We speak comparatively." When we have a thermometer, it is better to bring all comparative statements down to its standards. One of your correspondents gave us at p. 1278, 1869, some information upon the home of the Mexican ever-bearing Strawberry—Ambato, having an elevation of from 7000 to 9500 feet, with a mean temperature of 59° to 76°; also of Guachi, 9000 feet high, and a mean temperature of 60°. Here rainy weather is almost as rare as frost. Contrast this with Quito, where 10 months out of the 12 are rainy. This is also an Orchid country. I turn to "Earth and Sea," a book I have been reading with interest, and I find Quito has an elevation of 9543 feet, is the capital of the republic of Ecuador, and had a population of 80,000 in 1858. I turn to the table of the heights of the snow-line in English feet, where I find that on the south side of the Alps it is given as 9150 feet, Andes of Quito, 15,680 feet. What can any one say more? These 80,000 inhabitants are living above our European snow-level. The snow-line of the Himalayas is given, north side, 19,560, south side, 15,500 feet. The reason of its being higher on the north side is owing to the dry atmosphere of Tibet. On the south side, grains flourish at 11,800 feet, shrubs at 15,200, and the Tea plant grows everywhere at 5000; and here the Brothers Schlagintweit mounted to the greatest height ever attained by man, 22,000 feet. Some of these scraps of information are needful when we read of a Strawberry wanting a nearly stove treatment, that comes from an elevation of 9000 feet, and Vanda Cathcartii growing at 2000 feet; and they must, I think, be highly interesting to all Orchid cultivators. *G. H.*

Violas as Yellow Bedding Plants.—Mr. Bennett is quite right in what he says (p. 1310, 1869) respecting the Violas and bedding Pansies. From long and intimate knowledge of their habits, and having extensively used them for bedding purposes, both in wet and dry soils, I have long since come to the conclusion that they have few equals amongst bedding plants; only give them proper treatment, and they will produce a continual display of bloom from the end of March to the beginning or end of November. At the time I write (January 4), we have here a bed of the variety known as V. lutea grandiflora, from which dozens of flowers might be gathered; and all through the early spring, summer, and autumn months this bed has been a perfect mass of yellow flowers. The same may be said of it in Battersea Park, where it has attracted the notice of many who have recorded their opinion of its usefulness as a bedding plant. There is little doubt but that it will entirely supersede the yellow Calceolaria as a yellow bedder [?], for no weather seems to spoil its effectiveness; it has stood the scorching summer sun, 15° of frost, and all the varied changes of temperature that occurred from March to January. The secret of successfully cultivating this valuable plant, as well as of all the other Violas, is to give them liberal treatment, the following simple plan securing them all that they require:—1, in preparing the bed previous to planting them out, have the ground trenched to a good depth, placing a thick layer of manure in the bottom of every trench; 2, mix a little well-decomposed manure amongst the surface soil after the trenching has been finished, in order to give the plants a good start, while as the season advances they will send their roots down in search of the manure in the bottom of the trenches, which will supply them with sufficient food to sustain them during the heat of summer; 3, should the weather continue dry and hot for any length of time, they will, like other bedding plants, require frequent and copious soaking of water. If the above plan of cultivation is carried out, we shall hear very few complaints of the Violas; they will be grown much more extensively, and everybody will be charmed with their beauty and usefulness. *J. Wills, F.R.H.S., Royal Ashburnham Nursery, King's Road, Chelsea, S.W.*

Coning of the Wellingtonia.—In answer to Mr. Bowie's inquiry (p. 1330, 1869), I beg to state that although hundreds of plants of various sizes, from 18 inches upwards, have produced cones in different parts of the kingdom, very few of them have yet produced male catkins, and from this cause the cones have of course neither produced seeds nor attained their natural size. The cones which are impregnated by the pollen of the male catkins very soon grow away from the barren cones, and may easily be discerned at a distance in consequence of their extra size. The fruitful or seed-producing cones of the Wellingtonia, when fully grown, are about the size of a Walnut, and in shape something between that of the cones of Cupressus macrocarpa and of Cedrus Deodara. The cones formed and impregnated in one year do not perfect their seed till the next September or October, 12 months later. I gave an account of the cones and seeds some years since in the "Florist and Pomologist" (1866, p. 248), and left a batch of nice young plants raised from these seeds in the nursery of rare plants at Bicton. *James Barnes.*

Grafting.—I recently received a letter from an amateur friend, asking for some grafts of the French Crab Apple, to be sent him in the spring. "Be sure," he says, "send me straight upright shoots, as they form straighter trees than those taken from the lower branches." I believe it is a common opinion that the new tree is influenced by the part of the old tree from whence the grafts have been cut. My experience, however, does not favour this opinion. I can see no difference. Cultivators sometimes arrive at erroneous conclusions through reasoning on false analogies. The improvement in corn and other crops by successive selections of the seed, has induced some to think that similar changes may be made by successive selections of grafts; but when seed is planted, a new individual or new variety is produced at each germination, while grafting or budding is only a perpetuation of the same individual or variety. It may, indeed, be modified for the time being by external and constantly acting causes; but its nature cannot thus be permanently changed. The quality of a Pear is often greatly altered by grafting it on the Thorn, Apple, Quince, &c.; but it again resumes its former character when grafted back to its original kind of stock. A certain variety of the Apple may be changed in quality and productiveness by being transplanted into a different soil, but trees propagated from the latter, and sent back into the former soil, will not retain any of the change. No permanent influence appears to be wrought upon the variety, the stock does not change the character of the species of trees which may be grafted on it—not even that of the variety, if the connection between the stock and scion is intimate; but by a particular variety of stocks the tree is often modified differently as to the dimensions of its parts, its general aspect, and the flavour and size of its fruit, though perhaps in a very slight degree, and also in the duration of its existence. *E. Bennett, Osberton.*

Orchard-house Lettuces.—I have been told by my neighbour, that acting under the advice of the glass advertisers, there are many amateur gardeners trying to grow winter Lettuces under bell-glasses, or as they term them now, *cloches*. Why, I remember "the stupid old things," as we boys called them, being tried nearly 70 years ago, and soon kicked all to pieces by our garden labourers. Still folly will repeat itself, and bell-glasses be used—for a very short time, and then their introducers and the glass advertisers will have their due share of abuse—and deserve it. I live out of the gardening world, but follow my own bent, and read lustily if I can find anything sound and good about gardening to read. We must, however, "*revenon a nos moutons*," *c'est à dire*, "*laitues de serres*." I have a low house, built on the orchard-house principle, in which I have a border 60 feet long and 6 feet wide, cropped with winter Lettuces. They were sown in September, where they stand, in rows, and are now in full growth: the sorts

that are the most succulent and tender are the Tennis-Ball or Tom Thumb, and the Grand Admiral. The Cos Lettuces are not nearly so tender and crisp as the last-named, which, without tying, is so crisp that it breaks to pieces on being dropped from the hand. My border in this house, as I have said, is 60 feet long, and nearly 6 feet wide; this has given room for 60 rows of Lettuces, 10 in a row. They have been very luxuriant all the autumn, so that it has been quite pleasant to see their bright greenness. During the late severe frost some small Archangel mats were thrown over them. With this slight protection they have resisted the late frost, and are this morning as bright and as green as ever. (I send you specimens to show they have not been tied up.) Sixty rows of Lettuces as above give me 600; the same border would give space enough for 20 rows of *cloches*, three in each row, each *cloche* occupying 18 inches of width, and leaving a path between them 2 feet wide between each row, or the *cloches* will soon come to grief from the toes of the workmen. Referring to a contemporary, in an article comparing *cloches* with the improved ground vinery and Rendle's patented erections, I find that the cultivable space in a *cloche* is one square foot; this will with difficulty give room enough for five such Lettuces as I have sent to you. We thus have, from 60 *cloches*, 300 Lettuces, with much trouble in protecting, giving air, and sustaining constant breakage, unless the workmen wear woollen slippers. What a backward step for us English to take, to think of employing glass after the French fashion of Louis XIV.'s time—the length of folly can no farther go. When travelling in France, I have often pitied the patient small market-gardeners found near most of the great towns in France, toiling from 4 A.M. to 8 P.M. in summer, and never seeming to get forward, their tools and their "appurtenances" all so inferior to ours; and I have strongly wished I lived near them to show them how to take advantage of their bright sun and warm soil, by employing glass in the English fashion, so as to have early crops of fruit and vegetables. I should probably have had my notions ridiculed, for your Frenchman thinks he is one of a nation clever beyond all others, and I should probably have received the reply given to an English ploughman, who told his French brother ploughman to keep his eye forward, and plough straight furrows instead of crooked ones. "Ah! monsieur, you may talk, but don't you see that, by going here and there, I stir all the land, while you with your straight lines always leave a slice unstirred. Bah! *C'est bête Anglaise.*" *Anti-Isoche.*

Ailantus as a Timber Tree.—We have for some years attempted the growth of Ailantus glandulosa, but find it so susceptible of frost that it is entirely useless to us here, either as an ornamental tree or for timber. It grows freely, as your correspondent observes, in some cases making a shoot of 3 feet or more, which is as certainly destroyed by the first frost to within as many inches of the last year's wood. We destroyed a tree last year which had stood in our nursery for 18 or 20 years, and when cut down it was not more than 8 feet high and 3 inches in diameter at the thickest part of the stem. Our nursery grounds lie at an elevation of 108 feet above the sea, and about 20 miles distant from it. *Jos. Robson & Son, Bank Foot Nurseries, Hexham, Northumberland.*

Tricks of the Trade.—Your correspondent "B. M.," in p. 11, has given us words in season. The cultivation of plants and trees, otherwise the calling of a nurseryman "pure and simple," is indeed a noble profession, leading man, through Nature, to the contemplation of the great Source of Nature; the trade of a seedsman, too often associated with that of nurseryman, is a mere trade of buying and selling, and has but a poor relationship to that of the cultivator. I have read the remarks of "B. M." about Picea amabilis with much interest, for many years ago I essayed in vain to procure the true kind; at last I received a young tree from Mr. Barron, then of Elvaston, which he assured me was the true kind, as it had the invariable characteristic of the species—a very small cleft at the tip of each leaf. I still possess this plant, which is a dwarf compact bush, of a very deep green, and although so old, it is barely 3 feet high, I have not been able to find this little cleft in any other species of Picea. Thinking of "tricks of the trade,"—which, I hope, owing to the growing intelligence of the day, are at their last gasp—I have been led to notice a certain degree of meanness, resulting perhaps from jealousy—the meanest of all business feelings, and which I hope, if adverted to in your columns, will soon cease to exist. It is the apparently wilful omissions in describing trees and plants to which I allude. Honour is not given where honour is due; for in reading the various fruit lists I find no acknowledgment of the sources whence have been derived many of the new kinds of fruits, no inverted commas to denote that the descriptions of them are quotations—for how otherwise could correct descriptions be given of fruits never seen. This is, however, perhaps of less consequence than the total omission of the name of the originator of a new kind of fruit, the work of many years of care and attention. With new varieties of flowers now raised so abundantly, and so ephemeral in their nature, the omission may be passed over, but when I see the name of my friend Thos. Rivers, the raiser of new fruits, entirely ignored, I confess to feeling some indignation at this "trick of the trade." It is well known that for many years he has devoted himself to the raising of new fruits, only a small portion of which has been made known to the public; for, independently of the number of years required to bring a fruit tree, raised from seed, into a bearing state, many years must pass before the true character of its fruit can be arrived at. To illustrate this I may mention a Pear Mr. Rivers raised from the Easter Beurré more than 30 years ago; it was cultivated for nine years as a standard, was found to be hardy and a good bearer, but was thought to be too acid for this climate, was not tried against a wall, and its culture was discontinued. It is only within these last few years that a friend from Bordeaux, to whom it was sent, told Mr. Rivers that his Winter Beurré, *alias* Beurré d'Hiver of Rivers, was the best winter Pear known there. There are many hundreds of seedling Pears at Sawbridgeworth, as I happen to know, which, as they have been raised from carefully fertilised sorts, will probably make a sensation in the Pear world, on their appearance, long after Mr. Rivers is "gathered to his fathers." A list of those that bore fruit last season would be of interest, but they must bear again and again before their qualities are fully ascertained. The time and care thus required are sufficient to show that due honour should be given to any English cultivator who endeavours to raise fruits adapted to our English climate. I will now proceed to notice the omission I have referred to, in Mr. Richard Smith's catalogue. I do this without the least unkind feeling towards him, merely to point out to nurserymen the necessity of a generous policy in all their doings, and the policy of giving honour to the person deserving it. I now quote from the catalogue I refer to:—"Alexandra (seedling Noblesse);" this is wrong,—it is not the seedling Noblesse, a sort raised 40 years ago by Mr. Rivers; the quotation is from Dr. Hogg. "Dagmar (new), Dr. Hogg (new), Early Alfred (new), Early Beatrice (new), Early Louise (new), Early Rivers (new)." Ten or twelve other kinds of Mr. Rivers' Peaches are described in the catalogue, not one of them credited to the raiser; and all of them, except two, having merely the word "new" attached to their names. Eight kinds of Nectarines, all seedlings, raised by Mr. Rivers, are in like manner passed over without the acknowledgment I think due. Two out of three of the Plums in the list are duly acknowledged, and so it is probable that the compiling of the list was trusted by Mr. Smith to some person who was unacquainted with what should be a sacred custom with all catalogue makers. Mr. C. Turner's compiler enumerates 12 of Mr. Rivers' Peaches without any acknowledgment whatever, not even the word "new" to them. I could name other catalogues compiled with the same carelessness, for it is impossible that any motive could exist to lead to the numerous omissions; and I write this notice of the practice to point out to nurserymen their duty to "do as they would be done by," and above all not to forget, when they quote from authorities, those little things with a great meaning attached to them—inverted commas. *Observer.* [The code of Botanical nomenclature might well be applied here; priority has its rights. Eds.]

Chimonanthus fragrans. — Noticing that the records of the fruiting of this plant are receiving some attention at the hands of your correspondents, and thinking that Mr. Bennett may perhaps be glad of additional testimony on the subject, I am happy to record an instance which came under my own observation. I well remember, some four or five seasons ago, having gathered ripened fruits from a fine shrub of Chimonanthus fragrans, which was trained to a wall having a south aspect, and fully exposed to the sun, at Brantingham, in East Yorkshire; and at the time looked on the circumstance with considerable interest, as being, presumably, of rare occurrence. Has any one remarked a like circumstance in any locality as far north as this? *R. C. Kingston.*

Sambucus racemosa.—We have here two fine bushes of this plant, about 12 feet in height, and 8 feet through, which are growing in great luxuriance. As far as hardiness is concerned, they appear to be quite at home. Unfortunately, they have as yet produced but few berries, a circumstance which I attribute to the spring frosts destroying the bloom. Last spring both plants were a mass of bloom in the third week in April, but it was all destroyed by the frosts in May, which proved so disastrous to the fruit crops. *P. W., Moore Abbey, Kildare.*

—— I was surprised to see "S. S." speaking of the scarlet-berried Elder as a rarity, and as of doubtful hardiness. Eighteen years ago I saw it doing well at Tunbridge Wells, and there had been hard winters about that time I think. I have seen it wild in Switzerland, where the cold is greater than with us. There is a good large shrub of it at the South-Western Railway Station at Dorchester. *H. T. M., Gatehouse, Scotland.*

Wild Service Tree.—Professor Buckman's interesting notes on the "Wild Service Tree," in your last issue, recall to my mind that it is known in this county (Sussex) by a name that I have been unable to find in any book, viz., Chequer tree, and the fruits Chequers. It is generally known to all classes in the county, as it is sometimes planted for undergrowth in the woods, and here and there a specimen remains undisturbed, forming a tree, and it is almost invariably designated as above, though some few call it "Silver Pear," on account of the silvery-white of the under surface of the leaves, and the form of the berry. I have some doubts whether the fruits of P. domestica and P. torminalis are not both known under the name of Chequers, but I am unable to settle this point at present. Whether my orthography of the word is correct I cannot determine, and I am equally at a loss to discover the signification of the term as the name of a tree, and its applicability in the present instance. There are several country inns in my neighbourhood with the written sign of the Chequers, and I do not feel certain about the allusion, as there is nothing more than the name; but, of course, it can have no reference to the tree. I dare say the origin of the name, as applied to the tree, is simple enough, though I am unable to ascertain for myself. The fruit of the tree is collected and stowed in the same manner as the Medlar in this county, and is not much inferior in flavour, though very much smaller. In some parts of the county, too, the bunches of fruit are strung round a stick and sold at so much per stick. It is not a common tree, though frequently met with in our plantations, and occasionally in what appear to be original woods, but always as a planted tree. I should feel obliged to any of your correspondents who will, if they can, enlighten me upon this subject through the medium of your paper. *H.*

—— Professor Buckman will be pleased to hear that there are still living specimens of the wild Service tree, Pyrus domestica. We have two trees here, one was very much disfigured about two years ago by the wind breaking off two large branches. The other is a fine healthy specimen, of the following dimensions:—height, 61 feet; spread of the branches, 10 feet: circumference of bole, at 12 inches from the ground, 10 feet 6 inches, and at 3 feet high, 7 feet 10 inches; the length of the trunk from the ground to the first branch is 9 feet 6 inches. *T. Jones, Gr., Ribston Hall, Wetherby, Yorkshire.* [There is a young tree in the Oxford Botanic Garden, but not wild. Eds.]

Societies.

The following extracts relating to meteorological phenomena are taken from the report of a lecture by Mr E. J. Lowe, F.R.S., delivered at the Nottingham Literary and Philosophical Society on the 6th instant.]

Such phenomena as the great snowstorms of olden days must be of rare occurrence; certainly, of late years we have not experienced any of these remarkable snowstorms that have been recorded in history, and which require not only an unusually great fall, but a violent gale blowing at the same time, in order to produce the disastrous effects which we read of in old chronicles, as for example:—"In 1615, at Youlgrave, Derbyshire, on January 16, began the greatest snow which ever fell uppon the earth in man's memory. It covered the earth 5 quarters deep uppon the playne, and for heapes or drifts of snow they were very deep, so that passengers, both horse and foot, passed over gates, hedges, and walles. It fell at ten severall tymes, and the last was the greatest. It continued by daily increasing until March 12, without the sight of any earth eyther uppon hilles or valleys, uppon which day it began to decrease, and so by little and little consumed till May 28, and then all the drifts were consumed, except one uppon Kinder Scout, which lay till Witson week." In 1620, occurred the 13 days' snow, known as the "13 days' drift," where on Eskdale Moor, out of 20,000 sheep, only 45 were left alive. With regard to floods, civilisation has checked their ravages to a great extent, engineers have raised the river banks, and this has had the effect of diminishing the amount of water, which, otherwise, would have flowed out of the proper course. Had this precaution been neglected, and, at the same time, the drainage of the land been carried out, the floods would have been even more destructive, because drained land conveys the rain more rapidly into the rivers than before these artificial channels of communication were made. The recent great flood was mainly caused by a sudden heavy rainfall immediately succeeding a sharp frost, which, having frozen the ground, prevented its penetration; hence its unusually rapid conveyance into the rivers of England. Camden says that in the year 245, in Lincolnshire, many thousand acres were flooded by the sea which have never been recovered, and in 353 there was a great flood in Cheshire when 5000 persons and an innumerable quantity of cattle perished. According to Hollinshed, in October, 1483, the river Severn overflowed for 10 days, and carried away men, women, and children; and on October 5, 1571, a tremendous gale and flood occurred between Hummerston and Grimsby; 20,000 of the cattle and sheep perished, houses were blown down, bridges washed away, and many ships wrecked. In our own time we have experienced excessive frosts, such as those of 1814, 1860, and 1864. Perhaps as low a temperature has been reached this century as in years gone by. Nevertheless we have not had frosts of long duration, such as those which, for weeks together, have kept our great rivers encased in ice. In the year 220 and 759 great frosts lasted five months; in 1035 a frost occurred on Midsummer's Day (June 24) so intense that corn and

fruit were destroyed; in 1534 a great frost lasted from November until February, the river Thames being frozen some miles below Gravesend; and in 1564 a great frost occurred in London at Christmas; the surface of the Thames being as solid as a rock; the population left the streets to walk the whole distance from Westminster to London Bridge on the ice, and Queen Elizabeth was daily on the river. The frost broke up suddenly into fearful inundations, bearing down houses. Whittock says that at Alrewas, in Staffordshire, in 1607, there was "a greate froste and snowe, the which begane the fyfte daye of December, and so continued until the fourteenth daye of February, 1608, all which time all our rivers weare frozen in moste partes that they would bear horse and man loaded; the moste parte of the milles weare so frozen up that they could not grynde any corne but with much adoe, and did much hurte to many things, as wheate, grasse, and herbes." The Thames was frozen over, and the people crossed from Southwark to Lambeth. At York the river Ouse was frozen over, and people crossed on the ice. Evelyn has recorded that in 1683 there was a great frost with fearful destruction of trees and plants. Great Oaks suffered, the bark having been rifted by the frost, on the estates of Lords Weymouth, Chesterfield, and Ferrars. Elm, Ash, and Walnut were cleft by the frost; the Oaks on being cleft made a noise like a gun. Yews and Hollies were in some places killed, and the ice on the river Thames was 11 inches thick. Nearly all the birds perished. Very curious frosts have from time to time occurred, such as showers of rain freezing as the moisture fell, until the great weight of the ice was too much for the trees, and branches broke, and even the trees fell bodily. Such a storm occurred in 1671, during three days, according to Dr. Wallis, F.R.S.

The years of drought like the flood years have been numerous. We have had such in our own times, and have witnessed the burning of corn and forests. Excessive droughts or excessive rains often were not isolated, but had occurred for several successive years. The last two summers were instances, although the past year had a greater drought in Scotland, the rivers being so low that in September he (Mr. Lowe) walked over the Tay at Dunkeld, where in the succeeding month the waters were above 28 feet deep. In summer, heat and drought were always companions; if rain did not fall to cool the atmosphere the temperature increased. In 993 and, again, 994, the summer was so hot that the corn and fruit dried up. In 1114, on April 4, the river Thames, in London, was so dry that children waded over between the bridges and the town. Under London Bridge the water was only knee deep, and the river Medway, in Kent, was dry. Stow says that in 1110 the river Trent, at Nottingham, was dry from morning until 3 P.M. for a mile in length, so that it could be passed with dry feet. In 1538 and 1539 it was excessively hot, and the rivers were dried up in summer; and in 1541, at Nottingham, there was a remarkable drought, almost all the small rivers were dried up, and the river Trent demolished to a straggling brook. Much cattle died for want of water. In 1581, on December the 21st, "At Alrewas, in Staffordshire, was the water of Trent dryed up, and sodenly fallen so ebb, that I, John Falkner (vicar), went over into the hall meddow in a lowe pair of showes, about 4 of the clocke in the afternoone, so it was never in the remembrance of any man there living at that time in the droughtest year that any man had known, and the same water in the morning before was bankefull, which was very strange." In 1591, in spring, an uncommon drought happened in Nottinghamshire, the Trent and other rivers being almost without water. In 1661 the river Derwent was so wonderfully dried up that in many places there was no water and people might go over dryshod. The advantages derived from the interchanges with different nations in our trade transactions, make it perhaps impossible that we could suffer from famine as in years gone by, for we find that in 272 there was a famine in Britain so grievous that people ate the bark of trees. Also in 1315, there was a dreadful famine in England, when the poor ate horses, dogs, and cats. In 1316, after three years' adverse seasons, all the grain was destroyed. In Nottingham the people were driven to eat horses, dogs, cats, and vermin, and even children were stolen and eaten. A few years later (1348) a pestilence of a terrible character occurred in London, in which 50,000 perished. Every now and then a destructive gale passed over England, the most destructive had been one in 944, when in London alone 1500 houses were unroofed; great gales also occurred in 1570 and 1658, and as recently as January, 1839, a most alarming gale occurred throughout England, 200 persons losing their lives near Liverpool.

Slowly, but surely, the science of meteorology was advancing; and the day was not far distant when it might be placed on the same foundation as astronomy. It was the connecting link that was now required. We had a knowledge of heat, of pressure, of vapour, and electricity, but something else was required which would give us laws that would bind all the phenomena of Nature together. Mr. Lowe proceeded:—We can observe actions at work, which extend to certain limits; we can see effects, such as great heat, great cold, great floods and their resultants, great thunderstorms and gales; but we cannot yet make out the cause of the great heat, cold, and downfalls of rain, snow, and hail. We see a law that gives us heat in summer and cold in winter, that the temperature gradually increases from January to July; but as to what those disturbing influences are which make the thermometer in June 40° on one day, and 90° on another, or in December 8° below zero on one day and 55° on another, we are as yet in the dark. One circumstance we do know, at all events within certain limits, and that is, that the earth in its own hemisphere has a certain increasing temperature from winter to summer; whilst in the opposite hemisphere it has a certain decreasing temperature from summer to winter; in other words, that in each year there is the same temperature in the same hemisphere. The whole amount of heat does not vary. So that the difference we feel becomes due to lateral displacements, *i.e.* if it is hotter than usual with us, it must be colder than usual somewhere else. So, likewise, with the indications of the barometer, if it rises in one locality, it must fall elsewhere, for the pressure of the barometer is due to gravitation, a vertical pressure of a certain weight, which becomes altered laterally.

No doubt every one has read in the newspapers a weather prediction of a severe winter, based on the assumption that severe frosts recur every 10 years, *i.e.*, in every year ending with the figure 9; and no doubt every one has thought that, were such the case, it certainly would not have required a weather prediction to point out a fact that would have been known many generations ago. Now, if we take the 98 great frosts which have occurred since the year 220, we shall find that 13 have taken place in years ending with 4, and that figure 9 is not the lucky number. Mr. Lowe pointed out that there is a practical value attached to investigations that embrace all these phenomena of Nature which have occurred from the most remote times. By analysis we arrive at the important fact that, using 1650 years, we cannot discover a recurring whole year period. We shall, therefore, either have to assume that there are a number of rings of heat and cold, independent of each other, or that we shall have to embrace the great frosts and droughts of other countries of the northern hemisphere in the hopes of finding shifting waves of heat and cold. Perhaps, more probably, the cycle will be found to be one consisting not of whole years. However, it matters not whether the departure of 6° or 8° in mean temperature occurs in winter or summer. If this departure can be established the cycle will be found. If we take the period of maxima in solar spots and of magnetic variations, we shall have to assume a period of 11 years and 40 days, and it is possible that this may be the true cycle, though we are not yet in a position to prove it. Investigations into this subject have many difficulties to be overcome, but there are encouraging facts that give rise to some hopes of ultimate success. A period of 11 years and 40 days would bring a recurring severe winter every 100 years nearly, and such a view receives the following confirmation:—Great frosts in 1114 and 1215, a great frost in 1515, another in 1614, another in 1714-15, and another in 1814, making five recurrences at intervals of about 100 years. But there is something further than this, there are the recurring 11 years and 40 days, and we find severe frosts in 1125, in 1505, in 1826, in 1838, in 1849, and in 1860. So that, if this period should form the correct one, then the recurring one of 1871 will be in summer, so that we may experience a more unfavourable summer than even that of 1860. I do not assert that 11 years and 40 days is the true cycle, but merely point out that more recurring frosts are to be got from this assumption than any other. If we take the number of frosts in the 18th century, and add to them those of the 19th century, we find the result on the 70 years coincides with that of the 18th century; if we take the heat and drought in the same manner we still come at the same result, and were there not several whole cycles in the 170 years it is extremely doubtful as to whether we should have found so close a resemblance; therefore, this is another encouraging fact.

Notices of Books.

Sertum Angolense, &c. *A Description of certain new or little known Plants, observed in Angola and Benguela.* By Frederick Welwitsch, M.D.; with 26 plates. (Transactions of the Linnean Society. 1869.)

The last issued part of the Transactions of the Linnean Society is devoted to the description (in Latin) and illustration of numerous plants collected in Angola, by Dr. Welwitsch. The technical descriptions are preceded by an account of the physical geography and vegetation of Angola. Although we have not here accounts of flowers to rival those of the superb Camoensia or Baikiea, also discovered by Dr. Welwitsch, and described in a former part of the Transactions, yet a selection from Dr. Welwitsch's large and admirably selected herbarium naturally comprises many plants of great botanical interest. Such is a Sterculiaceous genus (Octolobus), showing much resemblance to Anonaceæ. Monodora angolensis furnishes seeds having many of the properties of Nutmegs, and which are used for like purposes. Oncoba Welwitschii has splendid rosy flowers, resembling in form those of Stuartia or Gordonia. Of the curious Myrothamnus flabellifolia, a shrub having much the aspect of our Myrica Gale, and like it having an aromatic perfume, but with fruits more like those of Buxus, the following freely translated account is given:—The vitality of this shrub is most remarkable; for six months, from May to October, during which no rain falls, and the soil is burnt up by the sun's heat, the leaves of the shrub remain closely rolled up and pressed against the stem, and so dried up as readily to be pulverised between the finger and thumb, a striking reflex of the arid soil. No sooner do the spring rains fall than the plant, previously to all appearance dead, immediately revives, unfolds its green fan-like leaves, and thus once more bedecked with its cheerful looking green foliage, produces its flowers and fruit.

Two or three singular Passifloreæ, with the habit of Violaceæ, are mentioned, a circumstance which leads Dr. Welwitsch to remark that in tropical Africa—where long experience has taught us to look for "Anthropophagi and men whose heads do grow beneath their shoulders," and other similar eccentricities — many plants belonging to genera whose members usually are of climbing habit, have erect stems. This change occurs especially in the higher regions, and in poor soils. In the lower regions of Angola, for instance, the Vines (Ampelideæ) have their usual climbing habit, while in the more elevated district of Huilla the species of the same family have erect stems. A similar circumstance is noted by Dr. Welwitsch in some Cucurbits, in Gloriosa abyssinica, in Clematis, in some Dilleniads, &c. Acanthosicyos horrida, an extraordinary Cucurbit, with fruits of the size of an Orange, and with pleasantly acid-flavoured pulp, is recommended for cultivation in the arid districts of Africa, on account of its power of resisting drought and the attendant unfavourable climatic conditions, its power of binding the loose sand, and, last not least, for its grateful pulp and juice—against the excessive use of which, however, a prudent caution is given. There are many parched spots, as in Peru, Spain, or in Australia, where such a plant would be most valuable, and perhaps not the least service Dr. Welwitsch will have rendered will be the making known this valuable plant. Another drought-resisting plant is a Grass, a species of Aristida, which Dr. Welwitsch calls prodigiosa, because, although from the similarity of its colour to that of the soil it readily escapes the notice of the botanist, yet it furnishes to multitudes of zebras, antelopes, and hares, as well as to flocks of domestic cattle, an agreeable forage, and, indeed, during the dry season supplies them with their only food.

Rhipsalis Cassytha is remarkable as the sole representative of Cactaceæ in Africa, and this is not the only instance of the presence of American types in that continent, as species of Symphonia, Cacoucia, and Cyrtopera, are also mentioned as having been found in the same spot with the Rhipsalis just mentioned. The most remarkable point as to this identity of American and African forms is this, that the latter do not occur on the African coast facing the American shore, nor in the woods near the coast, but in the upland regions in the interior, far away from the sea. Brasenia peltata, for instance, an aquatic plant, occurs in a lake at an elevation of 5000 feet, and more than 120 miles from the Atlantic. These are facts for the botanical geographers and the geologist to consider. Mussænda splendida is described as "inter congeneres facile ornatissima." Ascolepis protea, a Cyperaceous plant of much elegance, derives its name from the wonderful series of varieties it exhibits—varieties exceedingly numerous, and some very different-looking from others, yet so linked one to another by intermediate forms as to preclude their being considered as distinct species. Having been privileged to inspect Dr. Welwitsch's series of specimens selected to show the range of variation in this plant, we can endorse his remarks on this point, and bear grateful testimony to the great value of such carefully collected and selected specimens as Dr. Welwitsch amassed in such numbers while sojourning in the wilds of Angola.

Dr. Welwitsch's fame as a traveller and naturalist stood in no need of the enhancement the present publication will give, but it will assuredly elicit expressions of gratitude from all working botanists, whether specially concerned with African vegetation or no. At the same time, the critical annotations, and the notices as to the useful properties of the plants described, will induce all interested in plants, scientifically, æsthetically, or economically, to ask for more from the same pen.

Garden Memoranda.

THORESBY, THE RESIDENCE OF EARL MANVERS (*concluded from p.* 47).—Crossing the park we arrived at the kitchengardens, where neatness, order, and regularity were predominant. The space inclosed within the walls is 5¼ acres, including the outside borders and orchard 8¼ acres. There is a border about 12 feet wide, which runs round the outside wall, except the portion with a north aspect. These borders are cropped with such vegetables as are dwarf in habit, and not great impoverishers of the soil. The whole are belted with a broad irregular border of the choicest shrubs, including many rare and beautiful Conifers, such as Araucarias, Thujopsis borealis, T. dolabrata, Picea nobilis, P. Nordmanniana, Wellingtonia gigantea, Junipers of sorts, Cedrus Deodara, Cupressus Lawsoniana, variegated Yews, &c. The whole of the walls surrounding the kitchen garden, besides the glass houses, have been erected within the last eight years. The wall with

an east aspect was planted entirely with Pears—riders and dwarfs alternately; indeed, this system was adopted on all the walls. It has its advantages over planting only dwarfs, for the walls were covered, and the riders were bearing nice crops of fruit. As the dwarfs get up and monopolise the wall, the riders will be cut away to give place to them. The south wall was planted with Apricots from the west corner to the massive gilded gates in the centre; from the gates to the east corner were Plums, Cherries, and Pears. The wall to the west was all Pears again. The inner walls are covered with Plums, Cherries, Pears, and other fruit trees, as well as Gooseberries and Red Currants, which can be protected with very little trouble, and are useful in a large establishment like Thoresby when the bush trees are all over. All the trees were in vigorous health, and every branch trained with the utmost care and exactness. The borders for the whole of the wall trees are properly drained with rough material, on which is placed a layer of turf, grass side downwards. The compost for the borders was prepared with as much care as if it had been wanted for Vine borders. The walls are covered with a trellis of galvanised iron wire. The wires are fixed horizontally, about 4½ inches apart, and are passed through holdfasts projecting about three quarters of an inch, so that the wires are about half an inch from the wall. The wires pass through iron plates at each end of the wall, through which they can be strained from each end. The plates are made quite firm to the wall, and to maintain the wires equidistant the holdfasts are about 4 feet from each other. The appearance is neat, and the trees thrive well against the trellis, nor is the wall damaged by nailing. The whole arrangements have been made on a grand and liberal scale; and what Mr. Henderson has done in the way of fruit culture he has done well, and he is now reaping the results in an abundant supply of fine fruits.

Entering the kitchen garden, through the gates just mentioned, the first objects that arrested attention were two beds of flowers down each side the centre walk in the pannelled style of planting, which is far more effective than the ordinary ribbon fashion. These borders were planted as follows:—The borders are 12 feet wide, and about 400 feet long. At the distance of every 12 feet a circle was formed, 5 feet in diameter. These circles were planted with Centaurea candidissima and Pelargonium Little David alternately from end to end; then, beginning next the walk, there was a row of Cerastium tomentosum; 2d, a row of Pelargonium Tom Thumb; 3d, a row of yellow Pansies. Then in the same position on the opposite side the border, the back row was Pelargonium Trentham Rose, and Verbena venosa mixed; 2d row, Verbena Crimson King; 3d, Tropæolum luteum. The groundwork between the circles and marginal lines was Viola cornuta, 5 feet wide. Passing to the top of this walk, I noticed another border, which runs nearly the whole length of the garden; it is 560 feet long and 12 feet wide. The border is on the lower side of the walk, and on the opposite side there is a grass slope, which I shall refer to again. This border was one of the finest I ever saw. It was in the same style as the two borders above named, but composed of different plants; at the distance of every 12 feet a circle was drawn, 5 feet in diameter. These circles were planted alternately, from end to end, with Pelargonium Cybister and Verbena Crimson King. Then beginning at the front, next the Box edging, there was a row of yellow Pansies; 2d, a row of Pelargonium Little David; 3d, a row of Viola cornuta. Then on the opposite side the border, in the same position, the back row was Pelargonium Stella; 2d row, Calceolaria Kayii; 3d row, Verbena Purple King. The groundwork between the centre clumps and the marginal lines was Cerastium tomentosum, 5 feet wide.

I must not omit to mention the splendid rows of yellow Pansies. Much has been written about yellow bedding plants of late, and it is now an undisputed fact that in many gardens the yellow Calceolaria proves a failure. The yellow-foliaged Pelargoniums considerably aid the flower gardener, and the Golden Pyrethrum has also proved a useful foliage plant. But this yellow Pansy fills up a gap which neither Pelargoniums nor Pyrethrums can supply. It produces a profusion of bright golden flowers throughout the season, which alike withstand the evil effects of wind, rain, and drought. Beyond the beds of flowers there was a row of Pear trees about 5 feet high, trained as espaliers to a neat framework of iron, which entirely excluded the view of the plots of Cabbages, Cauliflowers, &c., beyond; for however beautiful ribbon or pannelled borders may look by the side of kitchen garden walks, the effect is entirely destroyed when placed in close proximity to Cabbages and other common vegetables. When in the centre walk I observed behind the espaliers a row of Tritoma Uvaria, with its singular-looking flowers just peeping above the Pear trees. I had long heard of the success attending Mr. Henderson's vegetable culture at Thoresby before I saw the place, and in this department I was highly pleased. I noticed a large plot of Beet of various sorts, and that known as Dell's Crimson was the most beautiful in foliage.

The ranges of houses are erected on a terrace 80 feet wide, at the upper portion of the garden. The terrace is separated from the other part of the garden by a grass slope about 5 or 6 feet deep, before alluded to. All the houses in the front range are span-roofed. The first house in the range, 25 feet by 13, was devoted to Melons, just ripening; two very fine varieties, to which Mr. Henderson drew attention, were Fordel Hybrid, and Bailey's Eclipse; the fruit was handsome shaped and well flavoured. The second house, 25 feet by 13, had Cucumbers growing in the side beds; these had been in bearing from February up to the time of my visit in the middle of September, and they were still good. In the centre bed were Pine suckers, in excellent health. Passing into the third house, 40 feet by 18, which is for fruiting Pines, some of which were in pots and others were planted out, I am only doing justice to Mr. Henderson by stating that it is the finest collection in the district. The Thoresby Queen is a beautiful and distinct variety, and only requires to be better known to be more extensively cultivated. One thing was very observable, all the plants were dwarf and sturdy, and the foliage thick and leathery, and offering a marked contrast to the lanky, rusty objects we sometimes meet with. On the outer benches were nice plants of Gesnera cinnabarina and other useful plants for decorative purposes. The fourth house, 40 feet by 18, was for successional Pines, and they approached closely the fine specimens in No. 3, just mentioned. The fruit of many was just beginning to show, and the Thoresby Seedling, generally known as Thoresby Queen, was very conspicuous. On the benches round the house, among other things, I noticed a lot of the new Gesnera exoniensis, a very handsome winter-blooming plant, with fine dark velvety foliage, and which produces a multitude of extremely brilliant orange-scarlet blossoms. It makes one of the prettiest dinner-table plants in cultivation. A house, the fifth, 25 feet by 13, is to be an early vinery, but when I saw it, it was used for Cucumbers and pot Vines. The sixth house, 25 feet by 13, is used for early Strawberries, of which about 1600 pots are forced. After the Strawberries are over it is used for Melons. The seventh house, 25 feet by 13, was the Fig-house, the plants in which were all in excellent health. Some were planted out, and others were in pots, but those in pots were evidently the most prolific. Brown Turkey was very good, and ripened well. I give the precedence to Castle Kennedy, Figue d'Or, and Datte. The eighth and last house in the range, 30 feet by 20, was a plant stove. Here were fine specimens of Croton variegatum and Croton angustifolium, from 6 to 8 feet high, like huge "pillars of gold." Also nice young plants of Croton interruptum and Croton irregulare, two new varieties recently introduced by Messrs. Veitch & Sons, and deserving a place in every collection of plants with fine foliage. Alocasia Jenningsii was also a novelty, from the same firm as the two preceding. The ground colour of the leaves was a glaucous green, covered with very dark almost black blotches, which produced a brilliant and striking contrast. For exhibition purposes it will always prove useful, and for table decoration nothing can be more effective and handsome. There were also some very fine Ferns, and noble specimens of Cyanophyllum magnificum, Anthurium magnificum, and all the leading sorts of Dracænas.

The back range of houses was chiefly devoted to the cultivation of Grapes and Peaches, with the exception of the magnificent conservatory in the centre of the range. The vineries are large, spacious houses for lean-tos, and the crops of Grapes very fine. Taking them in the order in which we passed through them, the first was a Peach-house, 45 feet by 18, the second in order of forcing. There were two sets of trees, one trained to an iron trellis in the front of the house, and the other to the back wall. The second house in the range was a vinery, 45 feet by 18, planted with Lady Downe's, Black Alicante and Raisin de Calabre. Here were some huge bunches, reminding one of the description of the Grapes that once grew in the Vale of Eschol. The Raisin de Calabre had 12 bunches to each Vine, and they averaged 6 lb. or 7 lb. each; some of the best bunches would weigh 9 lb. or 10 lb. each. All the Grapes in this house were fine in colour and finish, and the foliage was healthy, clean, and luxuriant. The third house in the range was also a vinery, of the same dimensions as the two preceding; the fruit was all gathered except a few bunches of the Gros Guillaume, which were of extraordinary size. Beneath the Vines were some good plants of Lomaria gibba and Cycas revoluta. The conservatory is 45 feet by 25. In the centre there was a bed planted with Camellias, growing into nice specimens. Besides the Camellias there were plants in bloom arranged on benches round the house. All the popular greenhouse plants that generally bloom in autumn were well represented by good and healthy specimens, and these were interspersed with many of the new Coleuses. Many of the latter were very beautiful, among the best may be mentioned Baroness Rothschild and Princess Royal, both were very rich in colour. The next, and fifth house in the range, was a vinery planted last spring, and the sixth house was an early vinery; the fruit was all gathered, and the Vines all pruned ready for another season. The wood was strong and promising. The seventh house was an early Peach house. The last three houses were each 45 feet by 18, the same as the first three in the range. The next was an unheated Peach case, 126 feet by 12. Here the same tale was to be told, as in many a place during the last season, the Peaches were very scarce, yet the trees were in excellent health.

In another part of the garden are several other houses; among them one large pit was filled with Heaths, another with Azaleas; several low span-roofed houses had miscellaneons collections of greenhouse plants, magnificent specimens of Tree Mignonette for winter work, and fine plants of the Epiphyllums and Solanums; whole pits were filled with Cinerarias and Primulas, and several with successional Pines. One long house, nearly 100 feet long, was filled with Pelargoniums in boxes that had been struck in the open air; and another pit we noticed, full of Centaurea candidissima, struck separately in small pots, and the thick fleshy leaves tied to small stakes to keep them steady.

The gardeners' house is situated in the inside of the kitchen garden on the east end of the terrace before alluded to, parallel with the ranges of houses, and commanding a pleasant view of the panel border that skirts the upper portion of the garden. It forms a decided contrast to the inconvenient back sheds, unhealthy, ill-ventilated rooms over stables, and low damp lodges in which gardeners too frequently have to reside. Mr. Henderson may well be congratulated, not only on this point, but on the excellent condition of every department under his charge. *Quintin Read.*

Obituary.

We regret to have to record the death on the 3rd instant of Mr. John Sladden, surgeon, of Ash, near Sandwich, in his 58th year. Mr. Sladden was well known as a keen florist, and took great pleasure in raising new varieties of the Gladiolus and other florists' flowers.

Miscellaneous.

Osberton and its Changes.—Owing to the changes at Osberton, consequent on the death of Mr. Foljambe, a reduction in the gardens at that establishment, so successfully managed by our correspondent Mr. Bennett, is decided on. Mr. Bennett's skill as a plantsman is such, that a visit to Osberton has been always considered as a great horticultural treat.

Garden Operations.

(for the ensuing week.)

PLANT HOUSES.

The beautiful *Eucharis amazonica*, if treated specially for Christmas or mid-winter blooming, will have finished flowering by this time. It would be advisable, where the plants are not engaged in forming young leaves, to afford them a slight period of rest at this time. This may easily be done by withholding water from them, except such an amount as may be necessary to keep them from flagging or too greatly deranging their system. A cool place will likewise be more suitable for them during such a time; a warm corner in any greenhouse free from draught will suit them admirably. Those who have a good stock of this lovely plant, and flower it successionally, should introduce another lot into a good high temperature, and if into a little bottom-heat so much the better. When a nice amount of heat is assured, and the plants commence an active growth, they cannot well be watered too frequently if perfect drainage is secured. Sponging the leaves is of very great benefit to them, as, independently of the assistance which it affords to the bulbs in carrying out their regular functions, it tends materially to enhance the beauty of their deep green leaves. Particular attention should now be given to the staking or tying out of such specimen plants as may require this operation. The grower must judge for himself whether any specimens are sufficiently supported to carry them safely through another season of activity, and if any doubt exists on this point they should be attended to at once. In putting new stakes into the pots, great care should be taken not to injure the roots any more than can be helped. To facilitate this, let every stake be nicely pointed, and the sides rounded off in such a manner that no sharp edges are left to bruise the roots as they are forced down through them. In forcing the stakes into the balls, always select an intermediate space between the base of the plant and the inner side of the pot. Too frequently stakes are pushed down close to the inner side of the pot, where the roots, being confined, congregate and elongate around the outer portion of the ball, and thus sustain great injury. In tying a plant, make it assume as natural and artistic an outline as possible, and by no means give it that cramped formal appearance which was so prevalent a year or two since. What does it matter if a healthy thriving branch does thrust itself beyond a given circle, or mars the effect of an otherwise truly formed figure? There can be no merit attached to cultivation where studied restraint is the system adopted. Where is the beauty of a plant with a faultlessly circular outline that has an inner circle sufficiently large to empound the trainer himself?—a fitting place for him, too. Rather encourage, first of all, a stiff, sturdy main stem, as nearly self-supporting as possible, and then cultivate such a form as will, as far as practicable, represent the native beauty of a plant; and far greater merit will thus be realised than the most laboriously wrought formal shapes can ever attain to. *Poinsettias*

should receive less water when their flowering period is past. Give to *Begonias* which have filled their pots well with roots, and are flowering freely, an occasional watering with clear liquid manure. Very little alteration will be needed in regard to the routine of plant-house management. To counteract the effect of mild external weather, give a more liberal supply of air. This, whilst it will aid in maintaining the minimum temperature necessary at this time, will also tend to imbue the plants with additional vigour, especially soft-wooded ones in active growth. *Hedychiums* should now, in part or whole, be examined and placed into a good stove heat if they are required to flower early. Hard-wooded plants, such as *Azaleas* and the like, must be watered very carefully. The buds are now fully formed upon them, and the nearest approach to a period of non-activity having arrived, cultivators should be very particular on the above point. Give late specimen *Cinerarias* their final shift, in a compost possessing more loam and of a more staple nature than was previously used.

FORCING HOUSES.

Early Vineries must not by any means suffer by sudden falls of temperature. Whatever degree of warmth has been previously maintained, great care must be taken to keep it up, carefully and gradually raising it a few degrees at a time, as the light increases and the Vines advance in growth. Vines past the flowering period should have the necessary stopping, thinning, &c., done, as any neglect or putting off of these duties involves absolute loss. It is not essentially necessary that *Pot Vines* should be trained in any particular form after the crop has been secured, hence a good leaf surface may in any way be encouraged after the first stopping has been performed. See that a proper temperature (averaging a mean of about 78° or 80°) exists in the bark-beds of all *Pineries*, and do not yet let the top heat materially exceed a mean of 60° to 62°. In instances where *Early Peach-houses* are so forward as to need such attentions, let disbudding of the shoots be proceeded with in the same way as with Vines, and anticipate the requirements of each tree by taking off a few buds occasionally, instead of all at once. *Early Strawberry* plants which are in flower may be subjected to a temperature of 64° or 66° before air is given in the fore-part of the day. They must, however, have a plentiful supply of fresh air during the rest of the day. Let the temperature fall to 55° by night, and even if it be 5° lower no harm will befall the plants. Do not syringe them at such a period, but when the flowers have set do so both night and morning. Forward *Figs* should have the more prominent young growths pinched back at the fourth joint or leaf. These will now require a temperature of from 56° to 58° by night, with an increase of about 10° by day. Crowd the forcing-pits now with every kind of plant that will bloom early. The most suitable for this purpose are *Rhododendrons*, *Sweet Briers*, *Lilacs*, *Solomon's Seal*, perpetual flowering *Carnations*, *Pinks*, &c.; *Prunus* of the triloba section, *Kalmias*, *Andromedas*, *Weigelas*, *Azaleas*, both Indian and Ghent, *Deutzias*, *Syringas*, *Guelder Rose*, *Roses*, *Cinerarias*, &c. Such subjects force very kindly; heat, moisture, air, and as much light as possible will all be needed, in well-balanced proportions.

HARDY FRUIT GARDEN.

Continue the necessary pruning operations and the subsequent nailing in upon all mild and fitting occasions, removing rambling useless young shoots from *Pears*, *Apricots*, and the like, using every legitimate effort to reduce the length of the existing spurs, and training fresh young wood into all vacancies. Take off, and place by the heel, such scions or cuttings of shoots from trees as may be wanted for future grafting. Well ripened young growths of the preceding year are those best adapted for such a purpose.

HARDY FLOWER GARDEN.

I would add a word regarding the planting of ornamental trees in continuation of my previous remarks on this subject (see p. 47). There should be no promiscuous and ill-studied planting, judgment and forethought should always be brought to bear upon the work—the manner in which trees will contrast with each other should be considered; and when a proper contrast has been worked out, another consideration is, how the plants individually, in the matter of form, habit, or size, will accord with other subjects, such as shrubs of more lowly growth, buildings, landscapes, walks, roads, or the like—not now, but by-and-by, when they have attained to fair dimensions. These and all similar considerations must be fairly weighed and taken into account, if a display in keeping with the requirements of a cultivated eye is to be attained. *Calceolarias*, *Verbenas*, and the generality of such subjects as are intended for the beds in May, must now undergo a careful supervision, so as to ascertain if any sorts are too greatly reduced in number from any cause. If such is found to be the case, the stock should be placed forthwith in moderate heat to induce growth preliminary to the early formation of cuttings. If these are already formed upon any desirable sort, do not attempt to strike them yet, but rather induce an active root action, which will conduce to a more plentiful supply at an early date. Those who have a few late struck and potted-off cuttings of any new or choice plants, such, for instance, as *Iresine Lindeni*, would now do well to give the balls a shift into pots a size larger, and into a rich compost; placing them in a nice warm temperature, to induce more strength and to furnish a more plentiful supply of cuttings next month.

KITCHEN GARDEN.

The early *Asparagus bed*—such, in fact, as was forced—may now have the old roots taken off and replaced by fresh ones, where convenient pits and bottom-heat exist, otherwise fresh successional beds should be made, as previously suggested. The late frosts having in most instances greatly injured the crop of *Greens* upon old Cabbage stumps, it will be advisable to clear them off, and to trench the ground well in preparation for future crops. Some time since I suggested the desirability of getting in a supply of forced *Mint*, ready for any emergency. A successional supply should now be placed in, to succeed that which is already in use. Forward sorts of *Potatos*, not required for very early use, should, if much sprouted, and if they lie too closely together, have the young shoots rubbed off; otherwise, if left, the tubers become much weakened, and the shoots will be long, weak, and dwindling. *W. E.*

TOWN GARDENING.

THAT most popular border flower, the *Antirrhinum*, which produces a great diversity of colour, will bloom nearly all the summer if not allowed to go to seed. Seed should be sown now, in a small frame, or in a contrivance such as "Looker's patent propagating boxes," which are very useful for raising small seeds and cuttings. When the plants are well up, they should be pricked out about an inch apart around the sides of 48-sized pots, and placed in a cold frame, so as to protect them from bad weather until May, when they should be planted out either in the borders or on rockwork, where they will make a fine display. The *Golden Feather* (Pyrethrum aureum), a showy foliage plant, and the pretty little *Lobelia speciosa* also, do well if treated in a similar manner. The *Angelica* (Archangelica officinalis) is a grand plant for town gardens, as it thrives under trees and in the most confined situations. It grows from 2 to 3 feet high, and produces bright green foliage, which has a very lively appearance in early spring. The seed should be sown in May in the open border, and be planted out at this time. The *Lily of the Valley* will flower in the spring if transplanted now in lumps, and covered with leaf-mould, &c. Keep the lights off frames at all times when the weather is fine and mild. Clear the plants from all dead leaves, and lightly stir the soil on the top of the pots. Water very sparingly, and only on fine, bright mornings, which will fortify the plants against damp, should the frames have to be closed in case of frost. *J. D.*

STATE OF THE WEATHER AT CHISWICK (LONDON).

For the Week ending Jan 12, 1870 as observed at the Horticultural Gardens

January	Month's Rain	Barometer. Max	Min	Temperature. Of the Air. Max	Min	Mean	Of the Earth 1 foot deep.	Of the Earth 2 feet deep.	Wind	Rain.
Thursday	6	29.771	29.257	52	39	45.6	44	42	S.W.	.06
Friday	7	29.477	29.173	51	40	45.0	45	43	W.	.14
Saturday	8	29.728	28.879	49	34	41.0	47	43	S.W.	.10
Sunday	9	29.696	29.394	50	34	42.0	47	43	S.W.	.10
Monday	10	29.8	29.5	50	35	42.5	47	43	S.W.	.02
Tuesday	11	30.0	29.8	52	42	47.0	46	44	S.W.	.04
Wed...	12	29.8	29.6	53	42	47.5	46	44	S.W.	.04
Average	.	29.675	29.395	51.3	39.8	45.6	45.7	42.0		0.51

Jan 7—Cloudy: rain at night.
" 8—Hazy: cloudy, but fine: stormy with rain at night.
" 9—Dense fog: cloudy, but fine: overcast.
" 10—Clear and fine: hoar frost.
" 11—Sharp frost: cloudy and fine: clear.
" 12—Clear and frosty: very fine: clear and frosty.

Mean temperature of the week, 3.2 deg. above the average.

STATE OF THE WEATHER AT CHISWICK

During the last 44 years, for the ensuing week, ending Jan 22, 1870

January	Average Highest Temp.	Average Lowest Temp.	Mean Temp.	No. of Years in which it Rained	Greatest Quantity of Rain	Prevailing Winds. S.	S.W.	W.	N.W.	N.	N.E.	E.	S.E.
Sunday 16	42.2	31.1	36.6	21	0.34 in.	1	5	7	10	5	3	1	2
Mon. 17	41.0	31.0	36.0	15	0.49	1	5	3	9	10	4	1	1
Tues. 18	42.1	30.2	36.2	19	0.67	1	6	3	5	11	8	1	1
Wed. 19	43.1	30.4	36.7	22	0.83	4	2	1	5	7	11	8	3
Thurs 20	42.5	30.5	36.5	25	0.25	4	2	4	3	8	11	3	4
Friday 21	43.5	31.0	37.2	20	0.16	2	5	1	7	14	7	2	1
Satur. 22	43.2	32.2	37.7	18	0.47	3	6	1	6	4	17	0	1

The highest temperature during the above period occurred on the 16th, 1828—therm. 60 deg.; and the lowest on the 19th, 1838—therm. 4.1 deg. below zero.

Notices to Correspondents.

BARNES MEMORIAL. Received, Charles Turner, £1 1s.; A. Parsons, £1 1s.; James Veitch & Sons, £5 5s.; J. Martin, £1 1s.; Barr & Sugden, £1 1s.

BIRDS: *W. C. W.* Apply at the "Journal of Horticulture" Office, 171, Fleet Street, E.C.

BOOKS: *A Gardener.* Kemp's "How to Lay-out a Garden."—*G. M.* Hoopes' "Book of Evergreens," Gordon's "Pinetum," or Carrière's "Les Conifers."—*P.* Kemp's "How to Lay-out a Garden," "Standish and Noble on Ornamental Planting," Hogg's "Fruit Manual," and Leroy's "Dictionary of Pomology.—*H. H., Bristol.* The information you require is given when the works are reviewed.

COOK'S [illegible] PEA: *A. H.* [illegible] what difference there is between "Cook's Favourite Pea or Hundredfold," and Prizetaker, both samples being alike in colour and size.

FERNS [illegible] tolerably firmly with gritty soil, left rather uneven on the surface. Set these in pans of water, so that the soil may keep moist by capillary attraction; scatter the spores on the surface of the soil; cover at once with a glass, flat or otherwise; do not water over the surface. If you treat them thus the spores will grow, provided you have any, but it often happens, in the case of so-called spores sent from a distance, that you get only empty spore-cases.

INSECTS: *H. C.* The grub which has attacked the binding of your books, stowed away in a damp room, is that of a common little moth (Tinea sarcitella), which will eat any kind of animal matter left in neglected situations. The figures given below show the grub (fig. 1) magnified; 2, the natural length; 3, the chrysalis; 4, the moth, with its wings [illegible]

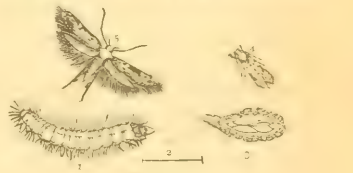

Fig. 1.

sitting on windows in spring; and 5, a female flying, a little larger than life. If the room is much infested with the insects, you cannot do better than fumigate it well with brimstone smoke. *W.*

NAMES OF PLANTS: *W. M.* [illegible] 2, Cupressus macrocarpa; 3, Picea Lowiana; 5, Thuja occidentalis; 4, not known. Probably one of the new Japanese Spruces, Abies Jezoensis (not Picea Jezoensis), or the supposed new species, lately introduced by Mr. Standish under the name of Abies japonica; but without more information or better materials it would be unsafe to give an opinion. If "M. H. M." will say whether the twig is from an old or a young tree, from a thriving or decaying tree, what country it comes from, or, if that is not known, from what nurseryman or garden it was received, we shall endeavour to decipher it for him. Our contributors should bear in mind that the object in sending us plants to be named is not to test our skill by communicating the minimum of information (which, judging from the amount usually sent might fairly be supposed to be the case), but to ascertain what the name really is; and for this purpose the more information that is sent the more likely is our determination to be correct, especially when the material sent is only a few leaves without either fruit or flower.—*N. H. P.* 1, Sempervivum aizoides variegatum; 2, too much crushed.—*A Devonian.* The long pod is that of the Catalpa; the pulpy fruit (smashed) is probably Diospyros Lotus; the third we do not recognise in its mutilated state.—*T. D., Hythe.* Saccolabium Harrisonianum, which is only a white variety of S. violaceum.—*P. C.* We do not know your plant, which is anything but attractive. Is it from the East or West, and what is the length of the flower-spike? How many leaves has it on a bulb?—*H. J.* 1, Maranta fasciata; 2, Peperomia arifolia var. argyrea (it is probable that the name P. Saundersii will in future be adopted for this plant); 3, Higginsia refulgens, formerly Campylobotrys.

OAK FENCING AND PALINGS: *G. M.* If you employ oak fencing it would be well to have the bases impregnated with creasote. Johnson's continuous bar fences, however, which are apparently very neat, would seem to be more eligible. There would, undoubtedly, be danger, though perhaps not very soon, if you use wood without any chemical preparation. *M. J. B.*

ROSE NAMES: *E. S.* asks us to suggest some way in which the lovers of Roses could combine to place the names of, say, to begin with, all the family of Verdier, on honourable record, anywhere "except" on our plant labels. Sorry we can't help him. Perhaps Rose sponsors will take the hint.

SKELETON LEAVES: *Castrian.* The following method for making skeleton leaves appeared in the *Chemical News*, 1865:—"The leaves are boiled for two minutes, then transferred to a strong solution of permanganate of potash and gently heated. In an hour or two the laxer tissues may easily be removed by means of a brush. Sulphurous acid, or a solution of chloride of lime may be used for bleaching them. The stains of permanganate of potash upon the fingers are easily washed off by dilute sulphuric acid."

COMMUNICATIONS RECEIVED:—G. F. J.—A. E. H.—W. M.—J. R. H.—W. S.—G. W.—P. S.—Old Reader.—A Forester.—T. D.—W. T.—J. R. P. T. S.—Owen Orpe.—J. C. W. & Son thanks.—G. W.—H. M.—J. F.—Subscriber.—Delta.—G. E. C.—J. D.—D. T. F.—Arum shall be reported on.

Markets.

COVENT GARDEN, January 15.

We have scarcely any improvement worth noting, but what business is doing is of a steady character. Forced Vegetables, comprising Seakale, French Beans, Asparagus, and Rhubarb, are now coming into general use. We are also receiving excellent salading from Paris, and Asparagus and Artichokes from Algiers, the former realising from 20s. to 30s. per bundle. Cornish Broccoli are plentiful, but inferior in quality. The Potato trade is very heavy, except for choice samples. Flowers chiefly consist of Orchids, Pelargoniums, Mignonette, Fuchsias,

Poinsettias, Heaths, Primulas, and Tulips and Hyacinths, which are plentiful and good.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, per ½ sieve ..	3 0	to 5 0	Lemons, per 100 ..	5 0	to 10 0
Cobs, per lb ..	0 9	— 1 0	Melons, each ..	1 6	— 3 0
Chestnuts, per bush ..	8 0	— 14 0	Oranges, per 100 ..	6 0	— 12 0
Filberts, per lb. ..	1 0	— 0 0	Pears, per doz. ..	3 0	— 6 0
Grapes, per lb. ..	4 0	— 8 0	Pine-apples, per lb.	4 0	— 6 0

VEGETABLES

	s. d.	s. d.		s. d.	s. d.
Artichokes, p. doz. ..	3	to 6 0	Horse Radish, p. bun.	1	to 3 0
Beet, per doz. ..	0	— 3 0	Leeks, per bunch ..	0 2	— 0 4
Broccoli, per doz. ..	1 0	— 2 6	Lettuces, p. score ..	1 0	— 2 0
Brussels Sprouts, p. ½ sieve ..	2 0	— 3 0	Mint, per bunch ..	1 0	— 1 6
Cabbages, p. doz. ..	1 0	— 1 6	Mushrooms, p. pott.	1 0	— 2 0
Capsicums, p. 100. ..	2 0	— 2 6	Onions, per bunch ..	0 4	— 0 5
Carrots, p. bunch ..	0 4	— 0 8	Parsley, per bunch.	0 2	0 4
Cauliflowers, p. doz.	1 0	— 3 0	Salsafy, per bundle .	1 0	— 1 6
Celery, p. bund ..	1 0	— 1 6	Scorzonera, do. ..	1 0	— 1 6
Cucumbers, each ..	1 6	— 3 0	Seakale, p. punnet ..	2 0	— 2 6
Endive, per doz. ..	1 6	— 2 0	Shallots, per lb. ..	0 8	— ..
French Beans, p. 100	2 6	— 3 0	Spinach, p. bushel .	2 0	— 3 0
Garlic, per lb. ..	0	— ..	Radishes, per doz. ..	1 0	— 1 6
Herbs, per bunch ..	0 2	— 0 4	Tomatos, per doz. ..	0 9	— 1 6
			Turnips, per bunch ..	0 4	— 0 6

Potatos, York Kegents, per ton, 75s. to 100s. ; Flukes, do., 75s. to 115s.

POTATOS.—Southwark, January 10.

During the past week the arrivals by rail have been large, but limited coastwise; the large quantity at the waterside left over from former arrivals is more than equal to the demand. Trade very dull, and the prices of the former week were not maintained. Quotations :—Yorkshire Regents, per ton, 70s. to 90s. ; Lincolnshire do., 60s. to 80s. ; Kent and Essex do., 60s. to 80s. ; Dunbar and East Lothian do., 70s. to 100s.

Special Offer.—Madame Lemoine.

WILLIAM BADMAN offers strong Plants of this most beautiful Zonal Pelargonium, in large pots, 6s per dozen. LORD DERBY, finest Pelargonium grown, 4s per dozen. Package included. Terms cash

Cemetery Nursery, Gravesend.

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices.—100 plants, distinct sorts, for 50s ; 50 plants for 30s ; or 25 plants, distinct sorts, for 20s, package included.

Crown Nursery, Reading.

To the Trade.

CHOICE SCARLET INTERMEDIATE STOCK SEED, saved only from plants grown in pots. 7s 6d per oz

GEO. MACINTOSH, High Road, Hammersmith, London, W.

To the Trade.—Continental Flower Seeds, &c.

GEO. MACINTOSH (Agent to J. C. WENDEL, Seed Grower, &c., Erfurt, Prussia) begs to announce that he is now prepared to receive orders for the above. CATALOGUES free on application. High Road, Hammersmith, London, W.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, BORDER PLANTS, and HARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post

RICHARD SMITH, Nurseryman and Seedsman, Worcester

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Training, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples ; Standard Plums, Pears, Apples ; Standard and Half Standard and Dwarf Roses, of all the leading kinds ; Gooseberries, Currants, Manetti, and Cuttings ; Standard Laurels, Berberis Aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick

Samples on the ground may be seen.

W. VIRGO AND SON, Wonersh Nursery, Guildford.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his large collection of CHRYSANTHEMUMS, for 25 Pairs, ditto, 20s 6d ; 25 Pairs POMPONS, 10s 6d ; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or Cheque on Nottingham.

Brunswick Nursery, Stoke Newington, N.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, the best sort for cutting, per dozen, at 10s 6d each, in strict rotation as the orders are received. Prices on the Trade on application. The Nurseries, Withington, near Manchester

JAMES CARTER AND CO. have a beautiful Stock of CALCEOLARIA, CINERARIA, and PRIMULA, in pots, fit for potting on immediately for early spring Blooming. Worthy the attention of those who have omitted to sow at proper time. Price, 20s per 100, 3s per dozen

JAMES CARTER AND CO., 237 and 238, High Holborn, W.C. ; and Crystal Palace Nurseries, Forest Hill, S.E.

CALCEOLARIAS, Herbaceous, of our choice strain, fine healthy plants from three-inch pots, 6d per doz, or 12s 6d per 100 ; plants established in pots, 20s per 100

AZALIA INDICA, or EXIMIA, in great variety, blooming plants, 12s per doz. Roses in pots, Tea-scented, Noisette, Bourbon, and China, in great variety, 9s per doz. Hybrid Perpetuals, in pots, 8s per doz ; Climbing, of sorts, 6s per doz. ; Moss Roses, sorts, 6s to 12s per dozen

H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

Rose Prices, from Paris.

L'EVÊQUE ET FILS, NURSERYMEN, 132 and 134, Boulevard de l'Hôpital, Paris, begs to offer the following ROSE TREES, in first quality, as plants and sorts (their choice) :—

100 Standards, strong heads, 100 sorts	£5 0 0
100 Half Standards, strong heads, 100 sorts	4 0 0
100 Dwarfs, strong heads, 100 sorts	2 0 0
100 Two Years, strong heads, 100 sorts	16 0 0
100 Tea Roses, grafted, in pots, or on their own roots, p. 100	7 0 0
New sorts, 1869 .. .. .. per dozen	0 12 0
New sorts, 1870 .. .. .. ,,	0 10 0
New sorts, 1870, 15 per cent. discount	

To the Trade.

SPECIAL OFFER of LAURUSTINUS TYRAMIDALIS (NEW)

WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for Stock. It has been seen growing in his Nursery by many eminent Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of striking merit, the habit being robust, compact, flowers pure white, nearly twice the size of the old varieties, and very sweet scented, with a continuation of flowers during the most severe weather

W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 16s ; second size, 3 to 4 feet, do., 10s ; third size, 2 to 3 feet, do., 6s ; fourth size, 1½ to 2 feet, do., 5s

Floral Nursery, Hailsham, Sussex

Notice.

PURCHASERS of LARGE QUANTITIES of GARDEN and FARM SEEDS will be supplied liberally by SUTTON AND SONS.

For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

New and Unadulterated Seeds.

BUTLER, M'CULLOCH AND CO.'S SPRING CATALOGUE of the above, containing a carefully selected list of novelties in Flower and Vegetable Seeds, is now ready, and will be sent post free on application

South Row, Covent Garden, London, W.C

Established upwards of a Century

Great Eastern Seed Establishment.

DAVID GOLD MCKAY'S Illustrated CATALOGUE of GARDEN and FLOWER SEEDS, embracing the most extensive Collection to be met with in this country, both of Home and Continental origin, including a newly arranged LIST of GLADIOLI, is now ready, free by post on application

Seed Warehouse, Nursery, and Seed Grounds, Springfield, and Great Cornard, Sudbury, Suffolk

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Flavour, Source, and other qualities essential. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success.

RICHARD SMITH, Seed Merchant, Worcester.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s. ; per 1000, £3

100 Gladioli, by name, 10 sorts 8s
100 ,, ,, 25 sorts 14s
100 ,, ,, 50 sorts .. .. 10s to 40s

All in good flowering bulbs

LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris

Notice.

ELIZABETH BARNES, Widow of the late WILLIAM BARNES, of Camden Nursery, Camberwell, London, desires to inform the Friends and Patrons of the Deceased, and the Public generally, that it is her intention to CARRY ON the BUSINESS as heretofore at the above premises ; and that it is her resolve to endeavour, by unremitting and strict attention, and by supplying every article of the best possible quality, to merit a share of the liberal support so kindly extended to her late Husband.

To Farmers, &c.

PARTNERSHIP.—A Partnership is offered on a First-class Mixed Husbandry Farm, in Yorkshire, size upwards of 600 Acres, of very good land, within a short distance of a Railway. Unexceptionable security required and given, and Interest. M. C. H. MAY'S General Advertising Office, 28, Gracechurch Street, London, E.C.

Appointment of Farm Manager.

CROYDON LOCAL BOARD of HEALTH.

Beddington Sewage Irrigation Farm.—Notice is hereby given, that the Croydon Local Board of Health are about to appoint a PERSON to take the Management of the Sewage Irrigation Farm, at Beddington, who must be practically conversant with Farming, and will be required to devote the whole of his time to the duties of the office. Salary £150 a-year, with residence. A Printed List of the General Duties required to be performed may be obtained by applying at the Office. Applications, accompanied by Testimonials, must be sent to me before 4 o Clock on Tuesday, January 18.

By Order of the Board,

Town Hall, Croydon. R. J. CHEESWRIGHT, Clerk.

WANTED, as HEAD GARDENER, a first-class, energetic Man, to take the entire Management of extensive Houses and Pleasure Grounds. Must thoroughly understand growing Grapes, Pines, Stove, and Greenhouse Plants. Will have nine Men under him. Salary £100, with house, fuel, and vegetables.—Send copies of testimonials to B, Mr C. Hedgelong, Grafton Street, Dublin

WANTED, a HEAD WORKING GARDENER.—Must have a thorough practical knowledge of Vines, Fruit and Kitchen Garden Culture, Cows, Pigs, and Meadow Land ; no Farming required, but a thorough knowledge of Successful Flowers for Dressing and Show quite indispensable. Wife : Scattered Lodge and Poultry. No young children. Wages one guinea per week, with lodge.—C. D., Messrs Sutton & Sons, Reading

WANTED, an experienced WORKING GARDENER, able to Plan and Lay-out Gardens, &c. Also a well-educated YOUTH in the Nursery.—R. THORNHILL, Bowdon Nurseries, Bowdon, Cheshire

WANTED, a WORKING GARDENER (where a labourer is kept), who thoroughly understands Vines, Pits, Flower and Kitchen Gardening. None need apply unless perfectly sober, and with unexceptionable character. State age and wages.—E. S., Linden Hall, Burton, Westmoreland.

WANTED, an experienced GARDENER, well versed in Growing Stove and Greenhouse Plants ; also in Orchard-house and Kitchen Garden. None need apply but those who are steady and can be well recommended.—W. BALLARD, Esq., Woodcote Lodge, Tillington, Leamington

To Parents and Guardians.

WANTED, an active, intelligent, well-educated Youth, about 15, as APPRENTICE, in a large Private Garden. Moderate Premium.—A. B., Post Office, Bury St. Edmund's, Suffolk

WANTED, a highly respectable Man, as HEAD SHOPMAN, who thoroughly understands all branches of the Seed Trade, and is in every respect capable of filling a Situation of considerable Trust and Responsibility. He must be a man of good address and first-rate business capacity.—CHARLES SHARPE AND CO., Sleaford

To the Seed Trade.

WANTED, a competent and energetic Young Man to act as HEAD SHOPMAN ; one who thoroughly understands the Seed Trade in all its branches. None need apply whose character and testimonials will not bear investigation. Address, giving references, stating age, expectations of salary, and also whether married or single, to M., Messrs Hooper & Co., Seedsmen, Covent Garden, London, W.C

WANT PLACES.—Letters to be Post Paid.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & Co. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, and GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. The fullest information as to services required and wages given should be forwarded with application.—PAUL'S Nurseries, Waltham Cross, London, N

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W

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GARDENER (HEAD).—Age 29, married ; understands Orchids, Ferns, Stove and Greenhouse Plants, Vines, and general Gardening.—A. B., Post Office, Stanley Bridge, King's Road, Fulham.

GARDENER (HEAD).—A Young Man, understands the profession in all its branches. Can be well recommended.—G. R., Post Office, Blandford, Dorset.

GARDENER (HEAD), where the services of a thorough practical Man are required.—Age 30, married.—I. C., The Palace Gardens, Ripon

GARDENER (HEAD), first-class.—Thoroughly competent in every department ; also the Management of Woods and Plantations. Liberal wages required.—WILLIAM WILSON, West Dean, Chichester

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GARDENER (HEAD).—Middle-aged, married, no incumbrance ; great practical knowledge in all branches of the profession. Good character.—T. HOLBROW, Church Cottage, Freemantle, Southampton.

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GARDENER (HEAD).—Age 38, married ; thoroughly practical in every department. Good Grape Grower, and Flower and Kitchen Gardener. Understands Woods, Land, and Stock, and the general work of an Estate. Can be highly recommended.—S. J., West Street, Somerton, Somerset.

GARDENER (HEAD), where ability and energy combined with economy are required.—Age 32 ; thoroughly conversant with Planting, Laying-out New Grounds, the Formation of Rockwork, Ornamental Ponds, &c. Wife a good Laundress.—GARDENER, Duncan's Yard, Westerham, Kent

GARDENER (HEAD) ; age 32, no incumbrance.—A Gentleman is desirous of recommending his Head Gardener to any Lady or Gentleman requiring the services of a thoroughly practical Gardener. The Subscribers will furnish the name and address of the Gentleman.—WM. WOOD & SON, Nurseries, Maresfield, Uckfield, Sussex

GARDENER (HEAD, WORKING).—Middle-aged, single ; thoroughly practical and experienced in all branches, including the Cultivation of Pines, Vines, Peaches, Melons, Cucumbers, Oranges, Lemons and Citrons, Stove Plants, and Exotic Ferns, and Land and Stock, if required. Three years and eight months' unexceptionable character.—R. B., Oak Street, Palmer, Middlesex, W.

GARDENER (HEAD), or Single-handed.—Age 32 ; understands Vines, Orchard-house, Pits, Frames, Flower and Kitchen Gardening, &c.—W. P., Mr Grimley's, East Bridgeford, Notts

GARDENER.—S. GARLAND, Gardener to the late Bishop of Exeter, is open to an engagement with any Lady or Gentleman requiring the services of a good Gardener.—S. GARLAND, 3, Ilsham Cottages, Wellswood, Torquay

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To the Trade.

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UNDER-STEWARD, FARM BAILIFF, or other respectable and confidential position upon an Estate, where ability, integrity, and industry are required.—Gentleman, possessing very considerable practical experience in Architecture, Land Surveying, &c., and a general knowledge of Agriculture, Horticulture, Improvements of Lands, Farm Accounts, Road and Brick making, &c.—CERES (care of Housekeeper), at South-Eastern District Post Office, Borough, London.

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SHOPMAN or CLERK.—Age 32, married ; 15 years' experience. Reference, London House.—R., 71, Stamford Street, London, S.E.

SHOPMAN or ASSISTANT.—Age 20 ; 12 years experience in the Seed Trade.—J. H., Post Office, Rowthorne, near Chesterfield

To the Seed Trade.

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THE FIRST SESSION of 1870 has just COMMENCED at the above Establishment.

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A Spade-labour Farm of 53 acres; a small Farm of 25 acres, which is worked with simple and inexpensive implements, and a large Farm of nearly 200 acres, on which is employed the most improved agricultural implements and machines. Various rotations and systems of farm management are pursued.

The charge for paying Pupils is £20 a year, payable quarterly, in advance.

Extern Pupils are permitted to attend the Lectures, and take part in the general business of the Farm, at a charge of £5 a quarter.

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The Model Farm is within three miles of Dublin.

For further information apply to the Secretary, Office of National Education, Marlborough Street, Dublin; or to the Superintendent, Model Farm, Glasnevin, Dublin.

OXFORD MEETING, 1870.
FARM PRIZES.

A PRIZE of a PIECE of PLATE, value 100 Guineas, offered by JAMES MASON, Esq., and a SECOND PRIZE of FIFTY POUNDS offered by the Society, will be given to the Occupiers of the two best managed Farms (which shall be entered for competition) in the district comprised within a line drawn through the Towns of Reading, Crowle, Marlow, Aylesbury, Buckingham, Banbury, Stow-on-the-Wold, Lechlade, and back to Reading.

The Competition is limited to Tenant-Farmers, and the LAST DAY of ENTRY is SATURDAY, February 26.

Further particulars and Forms of Entry may be obtained on application to

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REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantities to suit Purchasers. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 6 to 7 per cent. of Ammonia, with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Higston, and Mr. Nilson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.

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Write for Copy of Analysis by Dr. Voelcker, Consulting Chemist to the Royal Agricultural Society of England; Professor J. T. Way, of London; and other leading Chemists.

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Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
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Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c

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AMERICAN and other CAKES at market prices.

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THE EARLY ROSE } The best of the American varieties,
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And other valuable varieties. See SUTTONS' DESCRIPTIVE CATALOGUE, gratis and post free. Application

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This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening in the middle of July, it has the great merit of keeping perfectly sound and fit for use until the following August.

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THIS EXTRAORDINARY MELON was raised last summer by Mr. Paterson, Gardener to Mrs. Hanbury Leigh, of Pontypool Park. It weighed 24 lb., and measured 42 inches in circumference. It is illustrated (from a photograph) in WHEELERS' LITTLE BOOK for 1870.

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WANTED, One, Two or more ACRES of LAND, or a HOUSE and LARGE GARDEN, suitable for a Florist, within 10 miles of St. Paul's. The South East part preferred.—Apply to Mr. P. Hoddle, Rushy Green, Lewisham, S.E.

TO BE DISPOSED OF, with immediate possession, a large and influential West-End FLOWER and SEED BUSINESS, old established, and doing a good business in Plants, Cut Flowers, Bulbs, Seeds, and Fancy Goods. There is a large connection to be met with for an energetic Young Man. Long Lease may be had. Capital required, £400.

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TO BE LET, for Flower Seed Growing, from Five to Ten Acres of LAND, in an agreeable part of France. Gentlemen, Amateurs, or practical Men with small Capital will find this a good opening, and may get a very quick and profitable return for their labour and outlay.

Application by letter to be made to Mr. MCWHIRTER, 15, Queen Square, Bloomsbury, London, W.C.

SALES BY AUCTION.

Seeds and Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on FRIDAY, January 21, at half-past 12 o'clock precisely, an Importation of CALIFORNIAN TREE SEEDS, consisting of Wellingtonia gigantea, Abies Douglasii, Pinus gigantea, Pinus ponderosa, Benthamiana, Sabiniana, and Lambertiana; Cupressus macrocarpa and Lawsoniana; also Picea Nordmanniana, orientalis, and Pinsapo; 4000 Bulbs of LILIUM AURATUM, just arrived from Japan; and about 100 Australian TREE FERNS.

On view the Morning of Sale, and Catalogues had

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Full particulars in Catalogues, to be obtained at the Dolphin Hotel, Botley; or of the Auctioneer, Goldworth Nurseries, Woking, Surrey.

Bugle Hotel, Fareham, Hants,

MR. W. ABRAHAM is also instructed to SELL by AUCTION, a splendid Collection of FRUIT TREES, CONIFERÆ, HARDY ORNAMENTAL TREES, ROSES, CLIMBERS, PRIVET, CLIMBERS, direct from adjacent Nurseries, in the Bugle Hotel Yard, on MONDAY, January 24, at 11 o'clock.

See Catalogues, to be obtained at the Hotel; or of the Auctioneer.

Watford, Herts.

EXTENSIVE SALE OF NURSERY STOCK

MESSRS. HUMBERT AND COX are instructed by the Executors of the late Mr. GEORGE SEELEY, deceased, to SELL by AUCTION, on the Premises, The Rectory Nurseries, Watford, on THURSDAY, January 27, and following days, at 12 o'Clock, the STOCK in TRADE, comprising 25,000 Firs and Forest Trees, Fruit Trees, fine specimen Trees, Flowering Shrubs, Greenhouse Plants, Hardy Herbaceous Plants (in Lots to suit Private Buyers); also the Trade Erections, Implements, and numerous items.

May be viewed two days before the Sale; and Catalogues had (free by post) of Messrs. HUMBERT and COX, Auctioneers, &c., 88, St. James's Street, S.W.; and Watford, Herts.

The Agricultural Gazette.

SATURDAY, JANUARY 15, 1870.

THE doctrine of faith without works, in agriculture, has been openly preached in a recent publication.* We are told that "THE HIGHEST ART OF FARMING is to grow continual corn crops without manure, which the Bengali ryot succeeds in doing to the confusion of the theorists. And his process is fundamentally identical with that pursued by those irrepressible farmers in England, who succeed in growing corn after corn without, or with exceedingly little, manure, after Baron LIEBIG has demonstrated the impossibility of doing so." The author declares he "has never seen an exhausted clean farm in England." He informs us that, "the English advanced practical farmers have steadily rejected the mineral theory; they have rather marked out for themselves a form of the struggle-for-existence theory: they assert that on a tolerably retentive, even poorish clay, they can grow corn for ever, if they can only keep the land clean, especially from Grasses and Sedges, which, as allied plants, compete most closely with corn. They oppose LIEBIG at every point: they talk of ploughing as a necessary evil, only to be resorted to in extremity, and they till mainly by the cultivator, the scarifier, and the hoe." Again, "The advanced English farmer is partial to cultivators, and when he ploughs, he can never get a man to plough fleet enough for him."

The writer must have left England before the steam cultivators began to smash up the land a foot deep; he never went through our clay districts after harvest, and saw us breaking the ploughshares in those terribly hard stubbles which are all to be ploughed, if possible, with a deep furrow, before the Christmas dinner is eaten: he has not read of what is so often said at our farmers' clubs, or written in our journals, on the subject of deep cultivation, or he would

* "On the Growth of Rice in East Bengal: Liebig's Natural Law of Husbandry." A pamphlet reprinted from the "Calcutta Review." 1869.

[illegible] contrasted shallow ploughing and modern English farming. It is true there are thin-skinned soils with bad subsoils. The chalk farmer, for instance, sometimes has only 3 or 4 inches of [illegible] to plough. He applies heavy dressings, feeds them off with plenty of corn, and ploughs fleet, because he would not lose his manure in the chalk rock below; but most farmers plough 6 or 8 inches once in four years, and many plough [illegible] the chalk pit.

Perhaps our author's recollections refer to light chalks, where, on Hants hills or on Cambridgeshire slopes, his "father fed his flocks." He mentions the "English rotation of Wheat, July harvested, then white Turnips fed off in February, then Barley;" and attributes the "excellence of the Barley, not to any rest the land got (on the LIEBIG theory), but to the capital autumn tilth the land got from the two or three hoeings bestowed on the Turnips."

A suitable seed-bed is desirable both for Turnips and Barley, but we must not give too much credit to the cradle in which the child is rocked. Growth, vigour, and future maturity depend, not on rocking, but chiefly on nourishment. We assure the Rice grower from Cambridgeshire that however much the two tilths might have done for the Barley, a great deal more was done for it by the 1½ cwt. of guano and 2 cwt. of superphosphate applied to the Turnips, and by the cake, beans, and hay given to the sheep which consumed them. A good corn crop cannot be grown except with high farming.

There are other plans besides the above. Oats and Barley frequently follow Wheat on strong land, without Turnips, especially in Grass districts where litter is scarce. The Wheat stubble is ploughed deeply after harvest, another ploughing follows early in February, and in this cradle the corn is rocked, with 3 cwt. of guano for nourishment. The second corn crop is profitable to high farmers and ruinous to others.

The fact is, almost everything the English farmer now-a-days can do is done by means of bones and brains—his own brains and somebody else's bones. Both are desirable, no doubt; but, though he might get pretty good crops with rather less brains, we are sure he would grow nothing worth naming without the bones. We have heard that a pasture, broken up, is "a mine of wealth," and will produce several crops of corn without manure. But the mine is exhausted in time by working it, and new land is impoverished by cropping without manure; how then can our author "suspect that its mechanical capacity as a mere retainer of moisture is one of its most important offices both in England and in Bengal?" It is all very well to suspect "that the vital force in plants can effect revolutions which LIEBIG cannot," and that possibly "a growing plant may supply itself with phosphorus and silica out of air and water in which LIEBIG can find none." Unfortunately, nothing of this kind happens. When our worn-out cow pastures are exhausted of phosphates, we have to apply bones to them at a cost of £5 or £6 an acre; and when our fields are exhausted of soluble silica, the corn gets laid for want of the flinty stiffening in the straw. Unless the soil is the storehouse of plant food, how are we to explain the cumulative results of high farming; the chemical effects of paring and burning and of deep tillage; the unexhausted fertility of the prairie and the forest, where vegetation decays for centuries on the spot; and then again the rapid decrease in the yield of the crops under pioneer farming?

The writer of the pamphlet we are noticing rejects an established theory on mistaken evidence, so far as English farming is concerned. We believe that he has equally mistaken the facts which lay before him in Bengal. The "natural laws of husbandry" are the same everywhere, and we learn from other writers on the agriculture of India that the law of compensation by restoration of the ash constituents removed in the crops, is recognised in the practice of husbandry that prevails in that country.

Our author puts forth a theory which is certainly in opposition to science, and also, we think, to common observation. It is a perfectly logical conclusion from the false premises he has laid down, that manure and deep tillage, by which the plant is directly supplied with food, are of less importance than English farmers have believed them to be. And it is equally consistent to doubt the truth of the general opinion as to the cause of the perennial fertility of the inundated plains of the Ganges and the Nile. The writer is "sure the water does not deposit anything," and declares his belief that "an excellent crop of Rice might be grown if it were, for "experiment, watered with distilled water, provided enough distilled water were given." We know something about irrigation and even inundation in this country, and we find that the quality of water depends on what it holds in solution. For instance, when it carries with it the "waste" of North London, it causes a gravel soil at Barking to produce a succession of heavy crops! We have seen water that was perfectly clear and yet highly fertilising, and we know that water flowing through chalk is not of the same quality as that which passes through the primitive strata of Devonshire. The plains of the Ganges are watered by fertilising streams that are swelled by a thousand rills, having their source in the vast snow-clad range of the Himalaya. Water and carbonic acid have the same solvent power, and primitive and sandstone rocks contain the same elements of plant food, among these gigantic mountains, as in localities more often explored by the chemist. We are told, "Baron LIEBIG never has seen Bengal;" but there is no reason to suppose, therefore, that the silent agencies of Nature are not working obediently to universal laws. We would rather conclude that the present interpreter of the natural laws of husbandry in Bengal has not, at present, bestowed on his task the necessary amount of knowledge and patience. All the other evidence in India, as in England, is entirely opposed to that which we have just quoted. Dr. FRANCIS BUCHANAN, who surveyed a considerable portion of Hindostan, in writing of a district in Bahar, after describing "the vast pains that have been taken to adapt the country for Rice cultivation by collecting and conducting water," mentions that in some years the torrents from the mountains overflow their channels for a day or two, during the heaviest fall of rain, and do some occasional injury; but such inundations in general improve the fertility of the soil, over which they have extended." Dr. BUCHANAN describes the district of Dinajpur, in the northern part of Bengal, as a country not particularly flat, with many rivers, and a good deal of land near them, so low that it is inundated to the depth of 20 feet, and is consequently unfit for cultivation. The banks of these rivers are not, as is often the case in alluvial countries, raised above the more remote parts by a more copious deposition of sediment. The soil is in general remarkably rich, though in some places covered by beds of sand. The sandbanks of rivers are called "chora" lands, from their situation, and they are alternately cultivated and allowed to lie in waste. Some of the "mixed" soil, having a proportion of clay, is extremely rich, bearing a great variety of lofty fruit and flower-bearing trees, luxuriant Bamboos, and a rank vegetation, which shades the cottages. When this land is near enough to the houses of the cultivators to be manured, it produces rich crops of Mulberry, Sugar-cane, Ginger, and Turmeric; or a crop of summer Rice, followed by Wheat, Barley, Mustard, and other oil seeds and pulse, also plants for chewing and smoking, and vegetables for kitchen use. Where the soil is a rich clay, it yields two crops in a year, and pays a high rent. The first crop is Cotton, the second *sorisha* (a species of Sinapis, or Mustard), which is the great winter crop raised on land that has given a summer crop of Rice. It is also frequently mixed with Wheat, Lentils, or other pulses. A great variety of aromatic, narcotic, and textile plants, Melons, Gourds, &c., are grown, and many of them are manured. In the south of India, where the climate is drier, as well as hotter, irrigation is the *sine quâ non* of agricultural production. But the rivers are smaller, and water is applied artificially and in more stinted measure; it is not, as in Egypt and Bengal, a substitute for the ordinary means of restoring fertility to the earth. All manures are collected with extraordinary assiduity.

We must reserve any further notice of the agriculture of India to a future occasion; for the present we are content to point out that any theory of agriculture which is based on erroneous premises is mischievous, as, in fact, all opposition to truth must be, just in proportion to its extent and prevalence. Our author is mistaken in his opinion that English farmers are opposed to the teaching of science. They understand the practical necessity of "restoration," and they know how dearly we pay for manures. It is true there is great public ignorance and apathy as regards the neglect of the waste of towns. At present only the sanitary aspect of that subject has been forced practically on public attention.

But intelligent men are quite aware that what is now removed from our towns as a pollution will be ultimately applied to the land as a manure, because the fertility of the soil can otherwise only be maintained by means which are already costly, and which may become impracticable or insufficient.

—— THE tendency of prices in the corn market is still rather downwards. Both foreign and English Wheat are somewhat cheaper than they were. ——On Monday in the Metropolitan Cattle Market trade was brisk. On Thursday supplies were in excess, and prices fell. ——Wool is gradually rising in price, and stocks are held firmly. ——In the seed market good Clover is dear. Other seeds are cheap.

—— MR. H. KANIS-JACKSON, of Mark Lane, in a letter on the grain trade which he has contributed to the *Times*, says, "The average price of Wheat for the five years 1861-5 was 47*s*. 6*d*.; the present average is 3*s*. 9*d*. per quarter below a level taken from a mean that included two very abundant harvests. It is, therefore, open to suppose that at present value is unduly depressed, and may be followed by a reaction upwards." He does not expect such a rebound for the following reasons, among others:—

"We had in January, I consider, I we wanted only [illegible] of Wheat for the week, [illegible] the imports of Wheat and flour for the present year are [illegible] and if [illegible] be the absence of [illegible] ought to be, 2,500,000qr. in stock in the United Kingdom; [illegible] there is, I expect will be [illegible] during the present week, as warehoused in London, Glasgow, Hull, Bristol, Gloucester, Cork, &c. [illegible] to the last return, preceded by another 2,000,000 qr., makes so large an aggregate, that nothing short of disaster could now lift value beyond the common 2*s*. to 3*s*. per quarter, that fluctuate, like the ebb and flow of the tide of commerce, always between buyers and sellers."

—— An International Exhibition of home and foreign products of art and industry is to be held in the city of Cordova, in the Argentine Republic, to commence on October 15, 1870. Agricultural implements are expected to occupy a chief place, and these, it is thought, will be largely supplied from England and America. All kinds of manufactures are at the same time invited, and in the depressed state of many of our foreign markets the new field rapidly opening up in the interior provinces of the River Plate is likely to be regarded with interest. Agricultural machinery intended for the occasion must be forwarded from this country to the port of Rosario, whence, at the expense of the National Government, they will be conveyed by the Argentine Central Railway direct to the Exhibition. Forms of application for space and full particulars may be obtained from Messrs. J. M. JOHNSON & SONS, of Castle Street, Holborn, London.

—— MESSRS. BALFOUR & CO., of Liverpool, report an increase of nearly 100,000 tons in the production of Beet-sugar in Europe, which will probably reach 725,000 tons, against 625,000 tons last year. No one who has carefully studied the progress made of late years, can doubt but that in a very few years 1,000,000 tons will be produced annually. It now already exceeds the quantity furnished by the most important of all the sugar producing countries, viz., Cuba. The value of this great industry and its collateral advantages may be better estimated by looking at the number of manufactories which at present exist in the following countries:—France, 475; Belgium, 120; Zollverein, 297; Austria, 200; not to mention many thousand spirit distilleries and alkali works, all the result of this industry.

—— MR. W. A. GIBBS' METHOD OF ARTIFICIALLY DRYING HAY OR CORN need not be here described at length. Last week a most interesting series of models illustrative of this invention were, through the courtesy of the Duke of SUTHERLAND, exhibited at Stafford House, to a considerable number of scientific men and agriculturists. It is sufficient to remind our readers of the agent employed by Mr. GIBBS in drying wet and bulky materials, namely, a current of hot air, that has just passed over the heated surface of a furnace, thrown by means of a fan into a closed chamber containing the wet hay or corn. Thus, not only heated air, but the products of combustion, are brought into contact with the wet material, and drying is quickly effected. On looking at this exceedingly simple machinery, two or three important questions arise which, according to Mr. GIBBS, may be satisfactorily answered. First, is there any danger of fire? We are told not, as the large proportion of carbonic acid, and other incombustible gases, renders the air unable to support combustion. Thus we are informed that even red-hot cinders, thrown purposely into the dried and heated mass, failed to kindle it. Secondly, the rapidity of the process is an important item towards success. Nine thousand sheaves may be dried in 24 hours with the

largest set of links, or 9 acres, if we assume 1000 sheaves to fairly represent the produce of 1 acre. As to economy, that is a matter which requires to be further tested, but the cost must be excessive, which would deter the farmer from using it in case of a very wet harvest. Mr. GIBBS thinks that, when required, the fan blast should be taken to the field with a traction engine, accompanied with trucks, such as were used on the Britannia farms last harvest. The corn would be dried in the field, and carried home on the trucks. No doubt Mr. GIBBS' valuable apparatus will be largely employed in various manufacturing processes as well as in agriculture. The past two seasons have been too favourable for harvest operations to allow Mr. GIBBS' machinery fair play, but should we be visited by a wet season, those who, like the Duke of SUTHERLAND, have invested in the apparatus will be in an enviable position.

—— Mr. MECHI writes to the *Times* as follows on AGRICULTURAL IMPROVEMENTS :—

"It is a remarkable fact, that while we have an enormous surplus capital seeking for profitable employment, so little of it find its way to agricultural improvements. There are several land drainage and land improvement companies ready and willing to invest capital in necessary agricultural improvements, but there is little demand for it, although at least £100,000,000 would be very profitably employed in drainage alone. There are some instances in my immediate neighbourhood where permanent drainage has been effected by such companies, at a cost annually of about 7*s*. 6*d*. per acre, to liquidate principal and interest. I can safely state that the crops on such drained land have been increased in value annually from 20*s*. to 40*s*. per acre, even at present low prices, and this without any outlay of capital on the part of either landowner or tenant beyond the annual payment of 7*s*. 6*d*. The want of drainage will this wet season be severely felt on a vast extent of land, and prove a costly agricultural neglect.

"It is now some 26 years since I drained all this land, and every drain acts perfectly now, so that we may look upon it as a permanent improvement merely requiring a careful attention to the outlets and a clearing away of any roots that may reach a drain.

"I am sorry to say that there is still prevailing a very erroneous impression that it is of no use to drain the heavy clays or tenacious tile earths because the water cannot pass through them. This is a great mistake ; for even at 40 feet and 50 feet apart and 5 feet deep my drains on such soils are discharging abundantly, although made a quarter of a century ago.

"Altogether, there is an enormous scope for improvement by investment of capital in agriculture.

"Experience has taught me that not only does such investment greatly increase our store of home-grown food, but it likewise vastly enlarges the employment of human labour.

"Draining must not be less than 4 feet now, for over 30-horse power engines are already cultivating to the depth of 30 inches to 36 inches, and it is expected that engines of 50-horse power will soon be preferred as most economical."

We should like to know where steam-engines are now cultivating to the depth of 30 inches to 36 inches. Some experience in the measurement of tilth makes us doubt big words on that subject. And, referring to the general management of whole districts, we believe the deepest cultivation in the country is still to be found on the horse-cultivated farms in the Lothians of Scotland.

—— A long discussion took place the other day at the meeting of the Council of the Society of the Agriculturists of France, under the presidency of M. DROUYN DE LHUYS, when the views of a large number of leading men respecting the commercial TREATIES WITH ENGLAND were expressed, and it was decided that the general meeting of the Society, which had been fixed for February 24, should be held a month earlier, in order that the whole question of the maintenance or denunciation of the treaty with England should be fully discussed in all its bearings. The Government will, it is believed, have an energetic ally in this new society, as far as relates to the commercial treaties.

—— Our able correspondent, "G. A. H.," the author of the paper on Land Reclamation in last week's *Agricultural Gazette*, has been good enough to send us a sample of Oats grown on recently enclosed land in Radnorshire, and just threshed, to illustrate the practicability of reclaiming wild lands, as pointed out by him in the paper to which we refer. The sample sent is perfect. The Oats are short, plump, clean, and unstained.

OUR LIVE STOCK.

CATTLE.

IN conducting experiments upon the feeding of live stock, simplicity is of the greatest importance. Nature must be asked only one question at a time, by which we mean that the conditions of the experiment should be so arranged that the result should embody a decisive answer. If, for instance, it be desired to test the merits of malt against barley, it would be desirable to select for the experiment cattle or sheep which had undergone a similar previous treatment, of the same age and breed, and as nearly as possible of identical condition. These preliminaries having been arranged, we shall suppose the two lots of animals to be placed under as similar circumstances as possible with regard to accommodation, and it would be advisable to place both experimental lots upon as similar a dietary, for at least a fortnight before the absolute experiment commenced. The animals should be weighed both at the beginning and end of this first fortnight, and after that the different style of feeding or management contemplated might be commenced. We have supposed a trial between malt and barley ; let it then be only between these two foods, or, in other words, let every other condition be alike in both cases, and the sole difference of management consist in the relative proportions of these two feeding stuffs. In order more clearly to explain our meaning, we shall suppose horned cattle to be the subjects of the experiment : to one lot we shall give, say 40 lb. of roots, a known quantity of hay, linseed-cake, and malt ; to the other lot we shall give 40 lb. of roots, a precisely similar quantity of hay and linseed-cake, and such a quantity of barley-meal as would correspond with the allowance of malt given to the first lot. In this case it will be seen that similar cattle have been placed under such conditions and upon such diet that there is a fair presumption that if one lot does better than the other, the result is due to the barley or the malt, as the case may be, and this because in every other point the treatment has been identical. This is trying an experiment upon cattle feeding under the best conditions for insuring success, but the result is not decisive, and always requires confirmation, as we can by no means be sure that constitutional differences in the individual cattle rather than peculiarities in the treatment may be the cause of the different effects registered.

In weighing cattle great care is requisite, and exactness is best insured by weighing them at similar periods of the day, when the contents of the stomach and intestines may be supposed to be about the same.

These remarks are suggested, first because we consider it important that every one should understand the leading characteristics of a good experiment ; and, secondly, because we are assured that most excellent results would be obtained, were stock-feeders to institute a few simple experiments upon the relative merits of various dietaries, both as a means of laying on flesh and producing milk.

POULTRY.

BEYOND the fact that an egg consists of yolk, white, and shell, little is popularly known respecting its structure ; and even a less amount of knowledge prevails regarding the changes that occur in it during the development of the embryo. In these, as in all other cases, ignorance leads to serious errors in management, and consequently, to severe losses in practice. The first part that claims our notice is the shell. This, which usually weighs about one-tenth of the entire egg, is formed of carbonate of lime. The materials of the egg-shell do not, however, form an uniform layer, but are arranged in such a manner as to leave pores or minute apertures through which the moisture of the egg can evaporate, and the external air gain entrance, to support the breathing of the unhatched chick. The particles of carbonate of lime are arranged in somewhat the same manner that the bricks are placed in a dome or arch. By this means enormous strength is given to the shell. It may, perhaps, surprise many persons to be told that the strongest man cannot crush an egg if his strength be fairly and uniformly applied. This experiment is easily tried by placing an egg endways between the palms of the hands : it will be found that the greatest exertion fails to crush it when it is fairly and evenly pressed from end to end. The structure, however, of the shell, that gives this great strength to the fabric, is entirely disarranged during the process of incubation. At the period of incubation the particles of carbonate of lime are confused together, and have lost all their regularity of arrangement ; hence the egg-shells at this time become very brittle, and the exit of the young bird is easily accomplished. So different is the arrangement of the particles in the shells of hatched and unhatched eggs, that they can readily be distinguished by microscopic examination. It is this peculiar change of structure that causes the cracked sound given out on moving the eggs in a nest when they are nearly hatched. Inside the shell is the membrane or skin. This, which is formed of delicate interlaced fibres, appears single, but is in reality double. The two skins separate at the larger end of the egg, forming an air chamber, the size of which is a very good criterion of the freshness of the egg. When first laid this air chamber is not larger in extent than a threepenny-piece, but as the egg is kept the moisture evaporates through the pores of the shell, and as the fluids diminish air necessarily enters to supply their place ; hence the air chamber becomes larger and larger, so that on breaking the large end of a stale egg we sometimes see a cavity that seems to occupy a quarter of the shell. Inside the skin or membrane is the substance known as the white of the egg. This is a thick glairy liquid, forming usually more than half of the entire weight. Most persons imagine that the white is uniform throughout, but in reality it possesses a peculiar structure, being arranged in layers like those constituting the coats of an onion ; these layers, which are firmer and more dense toward the centre, can be readily seen and separated from one another in the white of a hard-boiled egg. The difficulty of mixing white of egg with water or other liquids depends on the existence of these layers, which must be beaten up before it can be dissolved. The remaining portion of the egg is known as the yolk or yelk. This consists of albumen and water mixed with a very large proportion of yellow oil, the whole being so intimately mixed as to be eminently digestible. The yolk in fact is designed by Nature to form the first food of the chick at the period of hatching, and is one of the most nutritive of all known articles of food. The yolk is enclosed in an exceedingly delicate membrane, which prevents its admixture with the white. In breaking a number of eggs into a basin there may be observed a small circular speck on each yolk. This speck is the rudiment of the young chick, and the construction of the egg is such that on whichever side it is turned the rudimentary germ is always uppermost, so as to receive the heat from the breast of the setting hen. The mechanism by which this is managed is very simple ; the lower side of the yolk is weighted by two twisted heavy masses of very firm albumen, called the Chalayce, which, hanging down, keep the germ constantly uppermost on whichever side the egg may be laid. Contrary to general belief, these ballasting weights are found in all eggs, whether laid by pullets or old hens. It should not be imagined that the yolk is a mere unorganised liquid ; it is composed, like the white, of concentric layers, which may be seen when it is boiled hard ; and from the germ a tube runs to a central hollow cavity that is also often to be noticed when an egg boiled hard for salad is cut across.

WOOLSTON, "G. A. H.," AND "LOOKER-ON."

THE agricultural Achilles sulks in his tent, and "Looker-on" puts on his armour and comes out to fight in his stead. I wonder he did not sign himself Patroclus. What a wonderful man is "Looker-on." He has actually found out that if a farm of 100 acres is divided into three parts, one being half a mile off, and another a mile and a-half away from the homestead, it takes more horses to work it ! He tells us also that horses find it easier to work on the level than up-hill. Like Dominie Sampson, I am inclined to cry, "Prodigious !" When I read a bit further, too, I am all but struck dumb at my own temerity in writing about such an awful man, he is so great an authority himself that he despises the best authorities, under whose wings I modestly thought to shelter myself. What a rich fellow he is to. He disdains men who trade on borrowed capital, and pities them ! I wonder if he pities the Bank of England, the London and Westminster, and the London Joint Stock Banks, all of whom trade with borrowed capital. His hint about paying less attention to letter-writing is very friendly, but as his postscript invites me to break a lance against him, I must reject the hint and accept the challenge. He tells me that if Mr. Smith is coxy, I am coxy too. This *tu quoque* argument reminds me of the schoolboy's "you're another." "Looker-on" is a farmer, and as a farmer ought to know that like begets like. I wish that he would tell me where it was that I told him I was "an eminent mechanic and accountant." No doubt I expressed an opinion that I knew more about mechanics and accounts 20 years ago than Mr. Smith does now, but I am sorry to say that does not entitle me to the high position "Looker-on" would award me. A boy at school may know more than "booby," and yet after all be only last but one in a large class of mediocrities. Any one who looks at a Woolston smasher can easily see that Mr. Smith is no great mechanic, and any one who reads his criticisms of the Tiptree accounts can see he is no great accountant. *Facile princeps inter cœcos*, is a saying which I have no doubt "Looker-on" knows well. As "Looker-on" is so great an authority about horse work on a farm, and objects to my estimate of four horses, will he tell me and your readers how many horses ought to be employed in working a farm of 112 acres of arable land, partly light and partly heavy, lying in a country similar to that around Bletchley Station ? I hope, in giving his answer, he will remember it must be a farm, because three patches of land separated by long distances hardly come under that name. If a man had one patch at John o' Groat's house and another at the Land's End, and his homestead at the North Foreland, it would hardly constitute a farm.

"Looker-on" denies that farmers balance their accounts to see if they have made a profit or a loss, and tells us "that 99 out of every 100 'good' farmers never think of wasting their time about such a stupid purpose." He says that "balance-sheets are mere fallacies," and "puts a case, by way of illustration," to show how impossible it is ! Now, does "Looker-on" suppose the London and North-Western Railway Company ever make a balance-sheet, and if so, do they "estimate?" Or, to come down to a more humble grade, I suppose "Looker-on" deals with a grocer. Now, does he suppose a grocer ever takes stock to make a balance, and if he do, how does he manage to find out how many ounces of pepper and pounds of tea he has got, and how does he suppose he foretells the exact price they will sell for ? If "Looker-on" cannot understand how this is done, he had better consult an accountant. But I think that even his friend Mr. Smith could tell him, notwithstanding his being unable to comprehend the Tiptree accounts. I am afraid there are a great many farmers in this world who, if "Looker-on's" assertion be true, must be content to be classed not amongst "good" farmers.

As "Looker-on" keeps no accounts, and never

makes a balance or takes stock to see how he stands, it is quite hopeless to make him understand that farmers cannot keep horses and make a "profit" out of their farm without paying interest on the cost price of their horses. Profit consists of the clear surplus which remains over after paying every expense, including the ordinary rate of interest on the capital employed. Some men may mix up their profits and interest together, but that does not alter the fact. If a farmer has £1000 which he could lend out and get £50 a year for, without any trouble or exertion of his own, that is "interest." If he employs that £1000 in farming, and finds at the year's end he has £1150, or £150 more than at the beginning, £50 of that is "interest," and £100 is "farming profit," and the remaining £1000 is his original capital. But now let us come to Mr. Smith and his horses. I say Mr. Smith's horses have nothing to do with the cost of steam ploughing, "Looker-on" says they have. Now Mr. Smith was not saying "My seed-bed with horses used to cost me so and so," but "My seed-bed with steam power only costs me 6*s.* 8*d.* per acre." What, then, is it to us whether he paid for his engine with gold or with bank-notes or with horses? His steam-ploughing apparatus cost £500, or at all events his manufacturer will not supply one for less; and whether that £500 be paid in gold or in notes, or in Wheat or in horses, has nothing whatever to do with the question. The £500 had to be paid in some shape or other, and if that £500 or £375 of it was engaged in doing nothing but "plough," then the cost of ploughing must be charged with interest on that sum, and with a sufficient sum in addition to pay for all repairs and for the replacement of the capital when the engine and implements are worn out. The usual allowance to cover these things has hitherto been 5 per cent. for interest, 5 per cent. for repairs, and 5 per cent. to replace the capital when the implement is worn out. Mr. Smith only allowed 1*s.* 6*d.* per acre to cover those three items, and I showed that on his 100 acres it only amounted to £7 10*s.* per annum, or just 2 per cent. on £375, the amount of capital sunk in the ploughing apparatus. You, sir, pointed out that Mr. Smith's 1*s.* 6*d.* per acre meant 12*s.* per day; and that, said you, for 100 days, comes to £60 per annum. Mr. Smith adopted your explanation (thereby falling into a neat little hole), and I thereupon joined issue, and showed that to make up £60 at 1*s.* 6*d.* per acre, Mr. Smith must plough 800 acres a-year, which represents an arable farm on the four-field system of nearly 1100 acres; whereas Mr. Smith had never ploughed more than 100 acres, and my 12*s.* per acre is simply this £60 divided over 100 acres. Mr. Smith adopted your admission that £60 a-year was a fair sum to put down to cover interest, repairs, and replacement of capital; and thereupon I showed that his estimate of 1*s.* 6*d.* per acre must be raised to 12*s.*, leaving his other items as he himself fixed them, namely, men, coals, water, oil, 3*s.* 2*d.*, and scuffling with horses, 2*s.*; and these three sums make up my 17*s.* 2*d.* per acre. All the nonsense which has been written about the Royal Agricultural Society fixing 200 days as the basis for awarding their prizes is simply "twaddle." The Royal Agricultural Society are not infallible any more than the Pope is; and if they really did what is alleged, they made a very silly mistake, because everyone must know that English farmers cannot plough 200 days in the year, seeing that their land is occupied with growing crops for at least half the year, and during the other half there are only 156 working days. I repeat, then, the cost price of Mr. Smith's horses had nothing to do with the alleged cost of his seed-bed. So far as it was concerned the horses might have been hired in by the day to do the job, because the horse work is put down at 2*s.* per acre for one cultivating or scuffling, and that 2*s.* per acre is supposed to cover every expense connected with the horses, their implements, and their drivers. Now, "Looker-on" declares that Mr. Smith's horses, and their prime cost and keep, had to do with the cost of steam ploughing, and ought to be deducted therefrom. (He supports Mr. Smith, who makes that assertion.) I will, therefore, conclude this long letter in a way somewhat peculiar. When I was a boy I remember a very celebrated attorney who used to make out his briefs for counsel in the ordinary verbose style, because he could not make the usual charges for them otherwise, but along with them he always sent what he called "a dagger brief," and which contained the pith of the matter in a very few words. He was a great favourite with the barristers, for if a barrister had a brief prepared by old "Dagger Brief" he very seldom lost his case. I will follow old "Dagger Brief's" example.

The dispute between Mr. Smith and myself is as follows:—Mr. Smith has for many years cultivated 112 acres of arable land, upon which he has employed what he calls his steam-smasher. He asserts that with his steam-smasher he has regularly made a seed-bed for Wheat, each year, at a cost of 6*s.* 8*d.* per acre, which consists of 3*s.* 2*d.* for men, coals, water, and oil (those figures I accept), 2*s.* for scuffling once over with horses in spring (which figure I also accept), and 1*s.* 6*d.* for interest, repairs, and replacement of capital, and these last figures I dispute, and declare to be a fallacy. Mr. Smith admits that his apparatus, including the engine, would cost £500, but as the engine (costing £250) is employed also at threshing, half her cost, or £125, is deducted, making the actual capital engaged in steam ploughing £375. This sum is admitted by both of us, but Mr. Smith declares that, having sold three horses, he is entitled to deduct the value of these horses from the capital, and also to deduct the cost of their keep. This I dispute, and thereupon we join issue.

Now, following the example set by "Looker-on," I will "put a case," and then ask him some questions upon it. Suppose that "Looker-on" were a young farmer, and had just taken 112 acres of land near to Bletchley, and which he intended to farm on Mr. Smith's plan, never ploughing more than 100 acres each year. And suppose Mr. Smith had persuaded him to spend £500 in buying a Woolston roundabout steam-smasher, but as the steam-engine was to be employed in threshing, half its cost, or £125, is to be put down to that department, and only £375 is the capital sunk for steam ploughing. And suppose this steam-plough is to be employed solely on the 100 acres at home, and is never to work for hire with any of the neighbouring farmers. And suppose the adjoining farmer comes to him, and says, "My young friend, do not spend any money in horses, I have more than I require, and I will be happy to do your horses work for hire at very moderate rates; here they are, and amongst them you will find that I will scuffle your land with horses in spring once over (after the steam-smasher has been across) for 2*s.* per acre." Now, with these figures before him, will "Looker-on" be good enough to tell me and your readers—

1st. How he can make a seed-bed for Wheat for 6*s.* 8*d.* per acre.

2d. How he can reduce the £375 capital sunk for steam ploughing apparatus, seeing that he has sold no horses?

3d. How he can reduce the cost of steam ploughing by deducting from it the cost of keeping three horses, seeing that he has never kept a horse at all, and never intends to keep one?

These are my questions; they are plain and simple, and I ask "Looker-on" to give answers equally plain and simple. But I warn him beforehand, that if he attempts, like Mr. Smith, to confuse the matter with a cloud of figures, in order to conceal his own defeat, I will not allow it. I will sweep his figures away as I would a swarm of flies, and if he fail to give me a plain and simple answer, I will claim that my literary dagger has struck home, and, as far as wordy warfare can do, has killed both himself and his friend at Woolston.
G. A. H.

THE IRISH LAND QUESTION.

From all I have heard and read on the subject, I think there are few who really know the practical difficulties that are in the way of legislating so as to give satisfaction.

Proprietors think generally that if a fair and equitable measure be passed, giving the tenant on quitting his land compensation for effectual drainage, fencing, buildings erected by him, and any other unexhausted improvement he may have made, he ought to be satisfied, and it is all he ought to expect. So he would under certain circumstances, but the question is, will the tenant be satisfied with this in the present state of affairs? I think not; he well knows that such a measure would give to many a landlord a better claim than he has at present to the land, and get rid of some of his difficulties; while other landlords would avail themselves of the powers there given, and take possession of the soil themselves.

What would be the tenant's prospects when he is turned out of his land, and loses his means of existence in a country where there are so few resident landlords, large farmers, or manufacturers who employ a large number of hands, as in this country, on regular weekly wages? The only choice left him under such circumstances would be to emigrate, or else add one more to the ranks of the disaffected and miserable population in the suburbs of the larger towns. Is it a wonder, then, that he becomes reckless, goes in for fixity of tenure or long leases, and conspires against the man or the Government whom he conceives is about to bring all this misery upon himself and his family?

Surely there is a remedy for this, and the only practical one that I can see is, for the Government by themselves, or by assisting companies or others, to purchase estates in different parts of the country, and thoroughly drain and reclaim them, and afterwards let them, or cultivate them, according to circumstances—first erecting a sufficient number of cottages for those to be employed. This would provide employment for all those who may be turned out of their lands, and entirely alter the peasants' views; he would no longer cling to the soil as he now does, but would in many cases voluntarily give up his land for regular employment. I say this because I have experienced it, and have had it from the mouths of hundreds myself, that they would prefer constant labour at fair wages to holding a small quantity of land; but the Irish peasant is very shrewd and far-seeing, and does not like giving up his land unless he can see something permanent in what is offered as a substitute.

It may be asked—What are fair wages? I have employed a large amount of labour in Ireland at all prices, and I believe that labour at 2*s.* per day is the cheapest. Give an Irishman this, and treat him with firmness, but with civility and as a fellow-creature, and you will be served by a willing hand, and get full value in return. I believe the man who deals in a straightforward way with the Irish, and is consistent himself, is as safe in Ireland, even at the present time, as in any part of her Majesty's dominions.

A plan similar to that I have suggested, if carried out, would, I believe, in a commercial point of view, be a paying one, and would in some measure recompense for the loss of the resident proprietor, and the absence of manufactures; it would soon produce a different feeling in Ireland, and alter the state of things altogether. It would also render legislation on the Land Question comparatively easy; but there are more difficulties in the way than many conceive in dealing with it without first finding employment for the people.

I fear I have already made my letter a long one, and I have only touched on what I conceive to be part of the duty of the State towards Ireland. There are very many others relating to private proprietors, the sale of encumbered estates, &c., which I would fain have spoken of, but time does not permit. *John B. Spearing, Bexham Lodge, near Reading, Jan.* 10.

MR. WILLIAM SMITH, OF WOOLSTON.

[The following extract is taken from an autobiography in the "Farmer's Magazine" for January, where it appears with a portrait.]

At the death of my father in 1837 I came in possession of my farm, now known as the Woolston Farm, and thus stood the representative of the family who had possessed it for 200 years. It consisted of 86 acres of grass-land and 5 acres of ploughed land upon the flat, near the house; and on the clay hill, 1½ mile from home, there was a grass field containing 9 acres, and four fields of what was called ploughed land, containing together 38 acres; yet in each of these fields there were two acres of roundabouts or waste land, most of which was said to be worthless for cultivation. In all 136 acres. The ploughed land was worked upon the four-course system, viz., first year dead fallow, then followed Wheat, and after that Beans, and last of all came Wheat again. Barley or Oats came as the last crop occasionally. Four good horses were always kept to work this 35 acres of arable land, and very frequently there were five kept to do it with the work of the whole farm. I at once ploughed up the 8 acres of roundabouts or idle land in the four ploughed fields, and thus increased my ploughed land to 43 acres.

In 1842 I bought a ploughed field containing 13 acres, adjoining my land upon the flat near home. Soon after this I ploughed up fields now known as Nos. 1, 3 part 2, 4, and 5, containing together 42 acres, and thus increased my ploughed land to 98 acres; and soon after this I bought another field of grass-land near to my flat land. I at once ploughed it up, and thus increased my arable land to 112 acres. To work it, it needed six good horses; and to save the carting of the heavy land corn and manure 1½ mile, I built a barn and yard upon it.

In 1845—after having worked my heavy land upon the dead fallow and three-crop system, and finding that the crops were not over-productive, about 20 bushels per acre, fallow land included—I came to the conclusion that subsoiling must be good upon such land, so I had a subsoiler made, and tried the first time on field No. 2, heavy land, by ploughing the field across to make sure that the trial should be fair. I subsoiled a piece across the middle, leaving the top and bottom of the field unsubsoiled. The land had been manured alike. In the February following I planted the field with Beans: they all came up well together; but in May it could be seen that those on the subsoiled land were taking the lead, and by the end of May they were fully 8 inches the highest, and they kept the lead up to harvest, when it could be plainly seen that they were not only the highest but the fullest of corn. This convinced me that deeper culture was needed for Beans, but with only six horses I could not find time before Christmas to plough and subsoil in the ordinary way a field of land a-year for Beans, for the plough needed four horses to work it, and the subsoiler needed three—seven good horses in all; therefore, as I had only six, I was obliged to make any shift to do a bit at all. I did not like it, so I contrived the plan of ploughing my land in ridge, a yard from ridge to ridge; and then subsoiling round the ridges; in this way I could ridge first, and then subsoil half an acre a-day with four horses. The work was heavy to the man, as he had to hold the plough sideways all the time. In the February following the land was planted with Beans, one row on each side the ridge. They thrived well, and I had a good crop. After harvest I took my subsoiler and pulled it with four horses along every ridge, and thus cracked the land, and then passed a powerful cultivator, worked with six horses, across the ridges, smashing the whole to a depth of 6 inches, and thus prepared my land for Wheat the next year. I liked the plan, and continued to work upon it till 1855, when I began to work with steam-power. It had one drawback, viz., heavy work to the man.

In 1855 it occurred to me that if I combined a powerful double-mouldboard plough and two subsoilers together, and worked it with a steam-engine, I could

throw up a ridge a yard in width and subsoil it at one operation, and I resolved to make a trial of it by setting my blacksmith to work to make a combined ridger and subsoiler; and I also had made a three-tined smasher upon the same principle, by merely substituting another subsoiler, or rather a powerful tine in the place of the double-mouldboard plough. I then provided myself with a windlass, &c., and a 7-horse power engine, and in December of that year, after selling off three horses to make room for the engine, I made a start. The first day's trial showed many defects in my arrangement. The implements were right but the speed of the engine was wrong, for it was much too fast, for the implement when set to work at a depth of 6 inches held the engine with 50 lb. pressure of steam upon it at a dead stand. We relieved the engine by taking the implement out of the ground 2 inches; at this depth (4 in.) the engine made the implement trot across the field full five miles an hour. The lookers-on, who looked old and shook their heads when they saw the engine stuck fast, now laughed as they trotted along with the implement. Yet the depth (4 inches) for ridging and subsoiling would not do for me. The turning of the implement at land's-end would not do with one rope in front to pull the implement along, and the other hooked on behind to pull the back rope up; for as soon as the implement had been stopped we had to pull with the strength of three or four men to unhook the back rope, and at turning the first time we lifted the implement with levers to place it in position for going back. This done, and hocking on the rope, we trotted across the field again, but as soon as we stopped the second time I had the back rope unhooked and pulled on to the front of the implement, and hooked it to the stem of the front wheels with a strong S hook; and without the aid of any lifting or levers we set the engine to work to pull the implement round itself, which it did in first-rate style, and thus saved for ever after all the levering and pulling. Our anchorage was bad; they were wooden ones, needing holes dug in the ground (at the end of each bout), 3 feet wide and from 2 to 3 feet in depth, and as I had got a number of these holes prepared ready for the first day's trial, the lookers-on asked whether I had got a lot of graves dug ready to bury them. I could stand all that. Besides making use of these holes, I had to contrive, before I started, another anchor, for with the two that I had received as a set I could not start; therefore I fixed upon a stile-post for a third, fixing the snatch-block to it with a strong rope. As soon as the implement had crossed the field four times, I told the lookers-on that I had seen enough, but that if they would like to trot round again they might. They should, was the reply, and so away they went, for some half-dozen times, and all was over for the day. I got new pulleys put upon the engine and windlass, to reduce the speed of the implement to about two miles an hour; a set of new anchors (iron ones)—those now known as the Woolston anchors; a fourth snatch-block; and a turning bow for the implement, to attach the ropes to, to enable the engine to turn it easily at land's-end. As soon as I had got all this done I started again, and got off well, using the smasher, and completed two fields—No. 1 and No. 2 light land—containing together 25 acres, and we packed the tackle up till the March following, when we brought it again to work No. 3 heavy land over twice for Peas (under horse culture it would have been dead fallow), and we got on well, for we smashed the 12 acres and crossed it by steam, and then scuffled it once by horses; we then burnt a lot of the Twitch that we had dragged out, and then drilled in the Peas. All this was done in 10 days, and at harvest I had a good crop—5 qr. per acre. We then packed up the tackle again, and after harvest we set-to again, and the best thing that can be said about what I did then is to re-write what I wrote to the *Mark Lane Express*, on November 13, 1856.

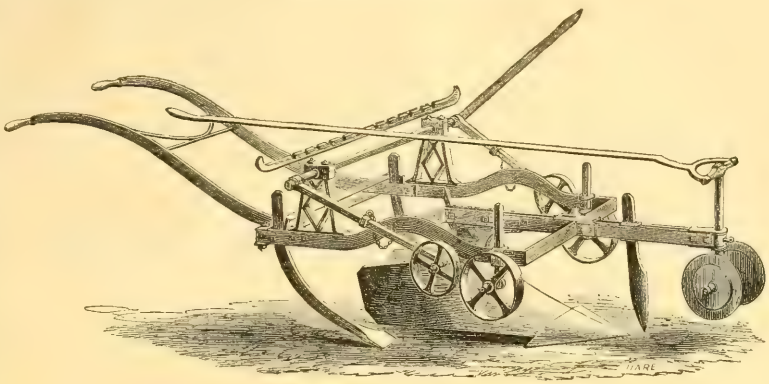

FIG. 16.—THE WOOLSTON RIDGER AND SUBSOILER.

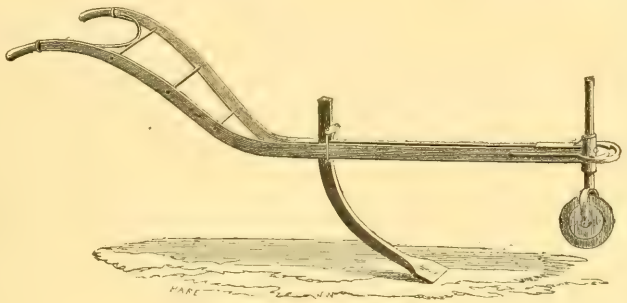

FIG. 17.—THE WOOLSTON SUBSOILER.

[We need not reproduce the correspondence, which gives the history of Woolston Steam Cultivation, as it has already appeared in our columns.]

Now, I will show and explain my implements:—

Fig. 16 is my ridger and subsoiler with which I started in 1855. It is a ridging plough and subsoiler, arranged in a strong frame, with a pair of wheels in front and from work done by it, and the after operations for the succeeding crop have always been found light. The implement is but little known, therefore I am the more desirous of giving it here to make it more generally known, and the more so as the work done by it is vastly valuable.

Fig. 18 is my smasher, with which I started in 1855. As will be seen, it has three tines arranged in a strong frame, and the depth of working is regulated, and it is guided the same as my ridger and subsoiler. It is a very valuable implement for breaking up Bean and Pea stubbles in the autumn. It clears a width of from 30 to 36 inches. I continued to work it for several years; but after giving £100 and my 7-horse engine for a more powerful engine, I had constructed for me a very powerful five-tined implement upon the same principle, covering a width of 48 inches, with which I can with the more powerful engine average 8 acres a-day; whereas, with the three-tined implement and 7-horse engine, I could do only 5 acres a-day, therefore the cost of operation is brought down from 5*s.* 2*d.* to 3*s.* 2*d.* an acre.

Fig. 17 is my sub-soiler, with which I subsoiled round the ridges under horse-culture, before I adopted steam-power, and which I find very useful now.

Now, I will explain how I use them. My field No. 1 (heavy land) was worked after a crop of Wheat with the ridger and subsoiler. The land lay in the state in which the implement left it until February (a careful man previously to this having walked every ridge, and took everything objectionable in the shape of Dock or Twitch, &c., from it—3 acres a day is not more than a short winter day's work at this job), when I planted the Beans one row on each side the ridge. This placed the rows from 18 to 20 inches from row to row. After planting, the land was harrowed, to pull down the ridges and cover in the Beans. The Beans were hand-hoed over three times, to keep the land clean from seeding weeds, and I had a good crop of Beans. As soon as the Beans were harvested, I set my smasher to work to pull up the Bean stubble, and cross-cultivated it with horses, and that was all that was done to it before planting it with Wheat. Next year this field will be ridged and subsoiled again for Beans, and go through the same process as it did for the preceding crop of Beans, and so on—Wheat and Beans as long as I live.

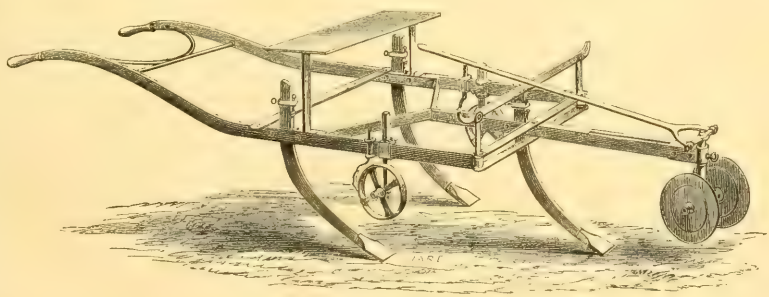

FIG. 18.—THE WOOLSTON SMASHER.

Now, I will leave the heavy land, and go to the light land field No. 1. It was Wheat last year, and has been manured and ridged and subsoiled for roots next year. A careful man will look over it in the winter, and take everything objectionable away. He will do three acres a-day, I am certain. In March I shall put four horses to work to pull my subsoiler along every ridge, and another pair at the middle of the framing to regulate the depth, and the front wheels are also the guiding wheels. There is also an additional pair of wheels to raise the plough at land's-end; the subsoiler being set so as to penetrate 4 or 5 inches deeper than the bottom of the trenching plough. By this operation the land is trenched, subsoiled, and laid up dry for the winter more effectually and in better style than is done in our gardens with a spade. I never had a failing crop thus split them. The part for Mangels I shall pass a harrow over, and drill in the seeds; and the part for Swedes will get a cultivating once over in April afterwards (a harrowing or two), and the seeds will be drilled in. The horse subsoiler does more than the splitting of this ridged land for roots; for with it and the common plough I ridge up and subsoil all my headlands round my ridged work, and in a dry spring I may on my heavy land split my ridges before planting the

Beans. This in dry weather in February was a very good operation.

We have work enough on hand to keep a good steady party, provided the land could be got into cultivation as desired, and need not be afraid of a new period.

Home Correspondence.

Belgian Agriculture.—If your correspondent "J. C." who must have read my paper attentively, will give his name, I shall be pleased to discuss the questions he has raised in his letter which appears in your communication this week, but I have no mind to enter the lists against an anonymous writer. The report of the Royal Agricultural Society's Commission upon Belgian agriculture will very shortly appear. Should the present correspondence go no further, I would simply ask your readers to suspend judgment upon the points at issue until they have heard what Mr. Jenkins and Dr. Voelcker have to say on the subject. *James Howard, Bedford, January 8.*

Tithe Commutation.—Septennial Averages.—A number of your readers may feel anxious to know the results of the Corn Averages for the seven years to Christmas, 1869, published in the *Agricultural Gazette* of this evening—viz., Wheat, 6*s.* 3½*d.* per imperial bushel; Barley, 4 0[illegible]; Oats, 2*s.* 11½*d.* I beg to refer to their information that each £100 of tithe rent-charge will, for the year 1870, amount to £101 1*s.* 0½*d.*, or nearly ¼ per cent more than last year. The following shows the worth of £100 tithe rent-charge for the last seven years:

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
1869..	[illegible]

The average value of £100 tithe rent-charge for the 34 years elapsed since the passing of the Tithe Commutation Act is £[illegible] 17*s.* [illegible]*d.*

Land Valuer, South Wales, January 11, 1870.

Drainpipes in Pasture Land.—In the various papers lately inserted in your columns, no notice is taken of one very important point which often, no doubt in the course of a few years, makes the best laid-out draining in pasture-lands quite useless, I mean the liability of drainpipes to become entirely choked by the roots of certain plants. In my own case I laid a drain in a pasture field, probably about 30 inch deep, which answered perfectly at first, but in two or three years became quite useless, and the pipes, on being taken up, were found entirely filled with the root of some plant. As there were no trees within a great distance, it was plain that the evil must arise from some plant forming part of the herbage of the field, and I could only attribute it to the common Iron-head (Centaurea nigra), which was very abundant. My object in writing is to point out an unexpected obstacle to effectual drainage, and to inquire whether it would be obviated by additional depth, or by throwing plenty of broken stone over the pipes, or by any other means? *P. P. C.*

Cottages.—I sent the *Gardeners' Chronicle and Agricultural Gazette*, containing the Society's cottages, to Lord Rivers, for him to see. When I was staying at Rushmore Lodge some little time back, he took me to see two cottages that he had built at Birdmore Green—a picturesque spot—in the Cranborne Chase, which surrounds the house. I thought them very convenient, made of excellent materials, and well executed. I guessed them to have cost £450. I wrote to Lord Rivers for an account of them, and received the following answer:—"My cottages have three rooms upstairs, with a fireplace in one; one sitting-room below, with back kitchen, oven, and pump, and a small pantry. There is one tank for 50 hogsheads of water for the two cottages. The pigstye, fuelhouse, and 'convenience' to each are all of wood, with tiled roof. The cottages are lined inside and out, with windows sliding on rollers. The bricks and tiles had to come from Donhead, about seven miles. The cost of the pair was £[illegible]. The rooms were of good size. It is essential to have three bedrooms for families. No cottage can be let cheap without these. I put the chimneys to with an oval iron to [illegible] down, and to be much warmer. *H. J. C.* [illegible]

Fowler's Steam-plough at Orlingbury.—Mr. Watts' evidence (p. 22) goes against the clip-drum and balance-cultivator, and for the turnround cultivator, and he has got the double-engine tackle upon trial. I claim his turnround cultivator, for it is constructed upon my principle, branded with "Fowler" instead of "Smith." Mr. Watts' expenditure is no guide to us. It may have been profitable to him as a contractor; but we want all the particulars, viz., the quantity of each kind of work done on each man's farm, with the time needed, the quantity of coal and water for each kind of work on each of the several fields, stating whether they are heavy or light land, and the depth at which the land is worked, and the number and size of men employed. If we can find give us this next year, he will render good service to agriculture. The price he charges per acre for contract work on each of the kinds of work should also be given, and so should the particulars about his own work. ——I must have another word upon the "interest of money" question. Mr. Mechi's balance-sheet, published in your paper, January 23, 1869, shows a gross profit for the year of £525 13*s.* 6*d.* for "rent and profit on farm capital," and he divides it thus:—Rent, £256; interest of money and income profit, £269 13*s.* 6*d.* Thus shown plainly that Mr. Mechi did not encumber the rest of his several operations with either rent, interest of money, or income profit; and he did rightly, for that is the true way of considering these items, and it is the way in which every practical farmer in England considers them; and I considered them in that way when I made my report to the *Manchester Farmers* in 1850, excepting that I considered the little extra capital needed at starting; therefore, upon all the evidence to be found in the country, I considered the matter correctly, and my cost for 9 seed bed for Wheat on my heavy clay land land at £[illegible] an acre, no matter what the assertion of "G. A. H." may be. "G. A. H." says:—"If Mr. Smith's smasher were to meet with a land-fast stone it would most likely cease to be the smasher and become the smashed," but it has been repeatedly shown that my smasher has pulled up or smashed large stones. I showed a very heavy flint at the Society of Arts in 1857, that it pulled up, and I have seen it smash or pull up numbers of large stones, and I have seen it hold my engine at a dead standstill against roots, yet it has never been broken; and my old fellow with which I started I have by me in good working order now: and, besides all that, how comes it that the Fowler party are now making implements upon my principle—the principle of that implement—and turning them out with their brand upon them? "G. A. H." has spoken with neither knowledge nor consideration, for the Woolston implements have stood, and will stand, against anything that can be brought against them, whether the Woolston man is a "bad mechanic" or not. *William Smith, [illegible]*

Balance Sheets.—I observe "Looker-on" in your impression of January 1, endeavouring, if possible, to silence "G. A. H.," says: "Another of 'G. A. H.'s' facts is, 'that every good farmer at the end of each year makes up an annual balance-sheet.' This I *utterly* deny." (Italics are mine.) "I *think* that 99 out of every 100 *good* farmers, never think of wasting their time for any such stupid purpose." Is he in sober earnestness, when he thus thinks? And can he not "tell within a long way how many quarters" a stack of corn contains, more particularly as he grew the corn? If such is the case, the advice he gives to "G. A. H." recoils on himself; "pay more attention to the field and field and less to the latest warning," especially on subjects which he knows little about. And let him tell us how many out of every 100 farmers (I do not here include the agriculturists who leave everything to their bailiff), who, I might almost say pride themselves, in telling how many quarters are in a stack are the engine commences the work of knocking out. He continues: "He next visits the bullock-yard, and in the shed finds a number of beasts he does not know within 4*d.* or 1*s.* a stone what they will realise." In making a valuation it is their value, as they stand before him that is required, and not what they may fetch in four or five months hence; the latter, I allow, no man can tell: it may be, "foot-and-mouth disease" will save him the trouble of realising. His success in farming has not, it would appear, been very great, for he observes, "I find I have quite enough to do to pay rent with one hand," &c. Now, Mr. Wm. Smith, of Woolston, can give him a lesson on that point; and let him but sit at the feet of those two men, to each of whom agriculture owes much, Mr. W. Smith and Mr. Mechi; and if "Looker-on" is but an apt and attentive student, he will learn how to cultivate, and to bring up the annual balance-sheet of a farm. *West Indian.* ["Looker-on" is a known correspondent, and a good practical farmer.]

Scientific Book-keeping.—In acknowledging the toast of "The Experimental Committee" at the Cirencester Chamber of Agriculture, the other day, Professor Wrightson, alluding to the experiments that were carried out on some 110 to 120 plots of ground by various gentlemen connected with the Chamber of Agriculture, stated that "the exact amount of manure has been known, its chemical constituents, and the exact weight of its produce ascertained." . . . "The manures which have been used have been taken from the same samples, and subjected to analysis in the college laboratory." May we not think the first of the above quotations alludes to home-grown farmyard manure; the second reads to dealing with artificials. Is it so? He also stated, "and I may say, the results have been of a very interesting character, without troubling you with figures." There is no doubt that at the meeting where these words were spoken, to enter on a lengthy string of figures would not only have been troublesome, but next to useless. But allow me to suggest, that it would be most useful if the more striking of these experiments were given to the public, adapting them as much as possible to the ordinary run of farms cultivated according to the custom of the district, as I presume is intended to be carried out in these experiments, so that we may know how we are getting on, and what we return in the manures we use. Further, was any analysis made to show the state of the land on which these experiments were made? For some soils, according to their constituents, are more adapted for, or will show better results than others, when treated with farmyard or artificial manure, as the case may be: the one may be rank, the other the contrary. I may be informed that chemists, in determining the constituents of manures, do not give the various constituents under the same denomination, but I may be permitted to ask, Is it not possible to do so? or at all events, to note their equivalents. As observe Professor Voelcker, in analysis of spurious guano sent by Mr. Alexander Howden, Marston Court, Pembridge, Herefordshire, gives 28.53 tribasic phosphate of lime as being equal to 13.07 of phosphoric acid. May not some such equalisation of the various constituents of soil, manures, and produce be carried out, to enable the farmer to make use of those tables which every work of note presses on his attention? *Scientia Triumphans.*

Foreign Correspondence.

BELGIUM: *Belgian Agriculture.*—The following table indicates how rural property is subdivided in Belgium. In the year 1856 there were farms not exceeding—

1[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

This total comprises 6,507,590 acres, of which 3,558,632 acres are cultivated directly by the owners, and 2,948,958 acres by tenant-farmers. The following is the mean extent of the farms in the various provinces:—

Antwerp	[illegible]	Limburg	[illegible] acres
[illegible]	[illegible]	[illegible]	[illegible] "
Western Flanders ..	9[illegible] "	Luxemburg ..	28 "
[illegible]	[illegible]	Namur	[illegible] "
[illegible]	[illegible]	[illegible]	[illegible]

Average [illegible] whole country, [illegible] acres

Landed property in Belgium tends to subdivision. This is the inevitable consequence of legislation which gives to each child the right of claiming one share of the paternal estate, and also is a consequence of the increase of public wealth. Many people who have acquired wealth in business wish to become landed proprietors. ——The average rent of farms in the various provinces in 1856 was:—

Antwerp [illegible]	[illegible]	[illegible]	per acre
[illegible]	..	Limburg [illegible]	..
Western Flanders ..	..	Luxemburg [illegible]	..
[illegible]	..	Namur [illegible]	..
[illegible]			

Average [illegible] whole country, [illegible] per acre

Rents have increased considerably during late years in those parts where agricultural industries have been established, chiefly sugar factories. There are in the neighbourhood of Brussels farms which are let at the rate of 58*s.* per acre. The rents for small farms, for which there is much competition, range generally from 40*s.* to 48*s.* per acre.—— The land is always let on lease. The duration of the leases is generally nine years, with the option of withdrawal at the end of three and six years; but some intelligent landowners are beginning to understand that it is to their interest to give longer leases, and there are already some of 12 years. Agricultural societies aim at this amelioration. In some parts of the country the outgoing tenant has a claim to an indemnity on the part of the incoming tenant for manure in the land and the improvements he may have made; this is an excellent system, and gives much security to the farmer. Agricultural societies endeavour, also, to make this custom the general one. Leases are always made in writing, and they often contain restrictions. These last, however, are disappearing as the leases become longer, and as the principle of paying the outgoing tenant is adopted.——The following crops are grown:—Cereals: Wheat, Rye, Barley, Oats, Buckwheat. Roots: Turnips, Carrots, Beetroot, and Potatos. Plants used in industry: Colza, Rape, Flax, Sugar-Beet, Hemp, Hops, Chicory, Tobacco; Vegetables: Vetches, Beans, Horse Beans, Fodder. The rotation of crops is triennial or quadrennial.

Wheat	.. ..	[illegible] bushels per acre.	
Rye	.. ..	[illegible]	..
Barley	.. ..	[illegible]	..
Oats	.. ..	[illegible]	..
Colza	.. ..	[illegible]	..
Flax	.. .. (Belgium)	[illegible]	..
Do.	.. .. (France)	[illegible]	..
Beetroot	.. ..	[illegible]	..
Beans	.. ..	[illegible]	..

Here follow the average selling prices of land in the various provinces in 1856:—

Antwerp	[illegible]	Liege ..	[illegible] to [illegible]
[illegible]	[illegible]	Limburg	[illegible]
Western Flanders ..	[illegible]	Luxemburg	[illegible] to [illegible]
[illegible]	[illegible]	Namur	[illegible]
Hainault ..	[illegible]	Average [illegible] country	[illegible]

On account of the situation, or of particular circumstances, land frequently reaches the value of £112 to £160 per acre.—We use the following manures: guano,

animal charcoal, superphosphate of lime, crushed bones, turf ashes, powdered oilcake, rags, and woollen refuse, lime, marl, fecal matters, and town mud.

The usual depth of cultivation for cereals is 6 to 7 inches; roots, 8 to 9 inches. Deep ploughing is not generally practised. On small farms the land is sometimes dug to a depth of 8 or 10 inches.——The average wages of farm labourers are 1*s.* 1*d.* per day without food, and 2*s.* with food. The maximum wage without food is 1*s.* 8*d.* for men and 11*d.* for women; the minimum is 9*d.* for men and 6*d.* for women. With food the maximum wage is 11*d.* for men and 6*d.* for women; the minimum is 5*d.* for men and 3*d.* for women. Workpeople engaged by the year do not receive anything extra at harvest-time, but day labourers are paid 2*s.* 5*d.* to 3*s.* 2*d.* per day at this season. In many parts the harvest is gathered by men working by the piece, who earn from 4*s.* to 4*s.* 9*d.* per day. In the cultivation of the soil of Belgium it is computed that the labour amounts to 27,500,000 men's working days, and 14,660,000 women's working days.——Manual labour is becoming more and more rare in Belgium, on account of the great development of industry and the high wages obtained by workmen who leave the country for the seats of manufacture. The insufficiency of manual labour is partly supplied by the use of machines, which have much increased of late, particularly threshing machines. Reapers and mowers are not yet much used. Wages have increased 2*d.* to 3*d.* per day since 1846.

Hired farm servants are lodged at the homestead. Day labourers are lodged at their own expense in small houses which belong to or are let to them. A labourer's house in the country costs from £6 to £8 a year according to its size. In the poorer parts of the country a similar house lets for only £2 8*s.* a year. The general usage in Belgium is, that each family has its own separate habitation, even in towns. In the country one never finds several families in the same house. Every family in rural districts has a kitchen garden, and very frequently a small field, which furnish Potatos and grain for the family consumption. These gardens and fields are hired.

Pleuro-pneumonia has made ravages in Belgium on several occasions, particularly on the farms of Beet-root distillers, who fatten much cattle. No good curative is known. Dr. Willems de Hasselt has proposed inoculation as a preventive, and this method is practised by a large number of distillers and farmers, who maintain that it gives good results. The special commission, however, instituted by the Government to experiment upon this system, has not been able to conclude anything positive from the numerous experiments which it has carried on for several years past. The foot-and-mouth disease is prevalent at this moment in almost all parts of Belgium. The animals suffer from a fortnight to three weeks, but few die. Cleanliness and the use of oximel (a mixture of water, vinegar, and honey) are the means employed for combating the disease. Small-pox and foot-rot are not frequent amongst our sheep.

Landed property pays rates to the Government, the province, and the parish. These rates are based upon the assessed income fixed by the assessor. The assessed income is generally 25*s.* less than the real income. The contributions to the Government vary somewhat, according to the different districts of the country under consideration. It is on an average calculated at the rate of 0.067 of the assessed income. The contributions to the province are on an average 0.15 of those paid to the Government. The contributions to the parish are very variable, according to the districts. They vary from 5 to 50 per cent. of the contributions to Government. There are no special taxes on the land for the support of the poor. The summary of the taxes noted above may be estimated on an average at 5*s.* 6*d.* per acre. These taxes are based on the income of the proprietor derived from his possessions. The farmer has also to pay personal taxes towards the Government, province, and parish expenditure. The poor are relieved by the *bureaux de bienfaisance*, or public relieving offices, in the rural parishes. In towns there are, besides the *bureaux de bienfaisance*, hospital boards (*administrations de l'hospice*). These two institutions, which are under the control of the Government, have for the most part—the hospital boards (*administrations de l'hospice*) always—properties of more or less importance, resulting from donations, legacies, &c. The *bureaux de bienfaisance* are subsidised by the parishes when they have no longer sufficient resources. Several hospital boards, those for example at Brussels, Nivelles, and Namur are very rich, and cannot find ways to employ all their revenues.

In some provinces in Luxemburg, where the land is hilly and small watercourses abound, the water is used in the winter for artificial irrigation, but the results are not very satisfactory, because irrigation is generally badly conducted. The proprietors will not go to the necessary expense for levelling the land so as to facilitate the regular distribution and flowing off of the water. It is only in that part of the provinces of Antwerp and Limburg, known under the name of "Campine" that well-established irrigation is found. With the view of fertilising this region, which 25 years ago was quite uncultivated, Government caused to be constructed about 120 miles of canals, which are fed by the River Meuse, and which serve simultaneously for navigation and irrigation. Since the year 1848 we have been able to create, by means of these canals, irrigated meadows, which occupy now a superficies of about 9250 acres. The insufficiency of water has not permitted us to extend them more. The soil of the "Campine" district being on about a level, it is set out in ridges for irrigation, and this is effected by tapping the main courses. The comparative expenses come to about 52*s.* 6*d.* per acre. A new law on watercourses is at this moment before the Chamber. Its application will probably admit of the utilisation, for the profit of the agriculturist, of those riches which are at present lost or badly employed on account of the state of the watercourses. Irrigation would then develop itself in a manner quite impossible at the present time. Sewage water has not been used for irrigating in Belgium up to the present time. An English public company (the Belgian Public Works Company) are carrying out at this time at Brussels an important work of purification, which comprises the utilisation of the sewage water of this town for the irrigation of 150 acres of meadow situate in the valley of the Seune. But this portion of the work is not yet begun, and it is likely that it will not give a good result, because the extent of the meadows to be irrigated appears much too limited for the quantity of sewage water to be employed.——There is a very stringent Game Law in Belgium; the result is, that so much game is often preserved, that farmers have frequently to complain of its ravages. The right of shooting is always reserved by the landowner, if not for his own pleasure, for letting to others. About 3*s.* per acre is paid for the right of sporting.

M. T. Lodo, Inspector General of Agriculture, Belgium.

Societies.

CHELMSFORD.

INOCULATION FOR PLEURO. At a late meeting, the secretary, Mr. RIGBY, read the following report of the deputation appointed to proceed to London to inquire into the value of inoculation as a preventive of pleuro-pneumonia. The deputation, it will be remembered, consisted of Mr. Jackson, Mr. Aston, and Mr. Rigby:

"We are sorry to have to say that the results of our inquiry respecting the efficacy of inoculation as a preventive of pleuro-pneumonia in cattle is not as satisfactory as we could wish. All the cowkeepers we saw in London spoke favourably of it, but the opinion in its favour we found was evidently given more as an expression of hope and of feeling than of direct testimony from actual experience. They resorted to it on a first attack of the disease, said they, but as a rule did not inoculate so long as their stocks were healthy. When asked why they did not inoculate all their cows as soon as they came into their possession, or when they were quite free from the disease, as a safer precaution if their theory was correct, they answered, 'There was always a risk of some cattle dying from the effects of inoculation, and they thought it best to let well alone.' The utmost support of the practice we got was that they thought their losses were less in an attack of pleuro when their cattle had been inoculated than when they had to combat the disease without this protection. Since the plague had swept away their cattle their sheds had been comparatively free from pleuro, but now it was making its appearance again, and they were again resorting to inoculation.

"That they did inoculate largely before the time of the plague was confirmed to us by Mr. Priestman, a veterinary surgeon having an extensive practice among cattle, who was recommended to us by Professor Simonds, as the best authority on the question in London, and who supplied us with a list of 57 names of persons for whom he inoculated 4514 cows from the year 1858 to 1863, and many cattle keepers, he informed us, practised the operation themselves in their own stocks.

"On the other hand he admitted that some cows took the disease after having been successfully inoculated, and that some died from its effects. The proportion of deaths was difficult to state, he said, as the rule with them was to sell their cattle to the butcher as soon as attacked. Their practice was to keep their cows in good condition, and as they were always meat it paid them better than to attempt their recovery.

"We visited nine large dairies in different parts of the town and suburbs, being introduced and accompanied by Mr. Priestman, and saw the effects of inoculation in several of them in different stages. The operation in itself is very simple. The hair being cut close off on one side of the end of the tail for about an inch square an incision is made lengthwise well through the skin with a sharp pointed knife and held open while one or two drops of matter are dropped in out of a bottle. The selection of the virus or matter is most important. Mr. Priestman prefers obtaining it from the lung of a cow that has had the disease three or four days only, and using it as soon as possible, as stale matter induces swelling of the tail and often necessitates its being cut off. A blow on the tail after the operation, and before the wound is properly healed, should be avoided, as it will cause much swelling and may soon result in mortification. Careful attention should be given daily, and prompt means used to reduce inflammation as soon as it appears. Of the 4514 which Mr. Priestman inoculated, 32 died from its effects, or three quarters per cent., and 248 were seriously affected but ultimately recovered.

"We also had the advantage of a conversation with Professor Brown, of the Veterinary Department of the Privy Council, on the subject, in the course of which he stated that he had little faith in its effects. The evidence of its success was most conflicting. Professor Gamgee he knew was enthusiastic in its praise, but he had known cattle to die of pleuro that he had inoculated, some of which had suffered the loss of their tails from the operation. Professor Simonds, he said, had inoculated cattle in the tail with gum water and creosote, and had obtained the same outward results as with the matter from diseased cows' lung. It was true that feeders that possessed a number of plants of equal merit sometimes, in London after inoculation; but it was also true that there were many dairies which had not been attacked by the disease on which inoculation had been practised. He had seen the experiment being tried at the premises of Mr. [illegible] in Chelsea in January last, but there was on the side of beast suffering from pleuro and exposed to the effects of contagion in the same stall, and the result did not prove much. To be perfect in the trial he had consulted should also be placed with them. Some cattle seemed to be invulnerable to attack.

"The facts which we gathered incontrovertibly were not sufficient to induce us to report to the Chamber. Dutch cattle we are told suffered less from outbreaks of pleuro and disease generally than any of the English breeds in London. An instance of the recovery of 25 cows out of 60 from plague was given us, 21 of which were Dutch and only four English. Foot-and-mouth disease seemed to prevail more or less in most of the dairies we saw, and it was thought that pleuro often followed in its wake. This, however, did not appear to deter dairymen from making fresh purchases. One man had just given £90 for three cows, which he would have to place in the same shed with about 20 others, nearly all of which had got foot-and-mouth disease. Milk selling in London we thought must be profitable. Two only of the sheds we visited were in good keeping. One, containing about 120 cows, was a dark, ill-managed building, and so crowded that we wondered not at the proprietor's statement that he had lost 16 cows per month for months together from plague!

"Mr. Priestman strongly recommends the use of carbolic acid in cases of pleuro and foot-and-mouth disease, and he furnished us with a detailed report of the treatment he had pursued in 18 different stocks of cattle, and the result. He proposes to apply it as a disinfectant, diluted with water, on the floor, walls, and ceiling, or rest of the premises, applied with a syringe, and to administer it internally three times per day in suitable proportions; and asserts that when used early and plentifully, it is 'pleuro's master,' and soon drives away the foot-and-mouth complaint. Professor Brown also spoke favourably of the treatment."

Mr. Aston said he thought it seemed scarcely necessary that he should add anything to the able report just read by the secretary, still there were two or three remarks that he should like to make. From what he had seen and heard in the London dairies, and from inquiries he had made in the country for a number of years, he was in favour of inoculating cattle for pleuro-pneumonia. He would not attempt to argue that it secured entire freedom from the disease. Those who were acquainted with the experiments made in the country and on the Continent, must admit that there was a certain percentage of cattle which had been inoculated that were liable to take the contagion; still, if they had been operated upon in a proper manner, he believed that the attacks were not so numerous or virulent, and the recoveries were greater from those inoculated than others. It appeared from an experiment made on the Continent some few years ago on rather a large scale, that 34 per cent. of the cattle removed from healthy districts to those which were affected entirely escaped contagion, 66 per cent. were affected with the disease in a greater or less degree, and 17 per cent. of those died. He had a conversation with a farmer on Tuesday evening, residing within about two miles of Tarporley, who lately had pleuro. On inquiry he ascertained he had only six cases, three of which had proved fatal, while there were three recovered. After the first four cases he inoculated all his cattle; one was suffering from the disease at the time, and this recovered. He had also another attacked after the operation, but this also had recovered, and since that time, which was about ten weeks ago, his stock had continued in a healthy condition. He appeared to have strong faith in the operation, considering it was inoculation which had arrested the progress of pleuro.

Mr. JACKSON said he was very happy to confirm the very correct report read by the secretary. In addition to it he would read the following letter, which he had received in reply to one he had addressed to a large cowkeeper, living at Kennington Park Road, London:

"24, Kennington Park Road, Dec. 15, 1869.

"My dear Sir,—We have practised inoculation for the last 12 years with very good results, and in every instance that the cattle have lost a portion of the tail, they have kept free from pleuro pneumonia. We have lost several by the inoculation running upon the body, but that we could generally attribute to want of care.

"There are a great many that will not take when inoculated, and of course it is not a preventive; neither do we think it is much good unless they are inoculated when first they are brought into the sheds. Our own men that attend to them perform the operation, and great care is required in choosing the lung at the slaughter-house.—I remain, yours truly,

"To Jackson, Esq. "Jas. Hodges."

Some time ago he was reading a paper, by Mr. Howard, M.P., reported in the "Journal of the Farmers' Club," part of which was to the following effect:—"Pleuro-pneumonia has made such ravages that M. Dumont and many others have adopted the practice of inoculation; the pus is obtained from the State Veterinary College, and inserted at the tail. If the operation is performed in hot weather the tail drops off through mortification setting in, but when done in cool

weather no injurious consequences ensue. Having suffered much from this fatal disease among my cattle I was determined to try it, but have hitherto been prevented by order of the veterinary inspector of the county, who has acted on the advice of Professor Simonds. The Professor opposes the practice; but those practical Belgian farmers who have had extensive experience, regard it, to use M. Dumont's own words, as a 'sovereign remedy.'" Since this he has addressed a note to Mr. Howard, and had received this reply:—

"Dulwich House, Surrey, Nov. 27 1869.

"Dear Sir,—It would afford me much pleasure if I could give you any further information on the question of inoculation than is contained in my lecture on Continental Farming; all I can say is, that many sound practical farmers in Belgium, Germany, and France, seemed to place much faith in the practice. M. Dumont, of Fleurus, Belgium, is quite an authority in that country. On his farm I saw a considerable number under inoculation.

"I have suffered much upon my own farm from pleuro-pneumonia, and hence I strongly urged on Mr. Forster before the introduction of his Bill the necessity for dealing with this and the foot-and-mouth complaint, as well as making provision for rinderpest. I agree with you that the only plan to rid the country of this ruinous disease, pleuro, is combined exertion to stamp it out. I believe the virus remains active for an almost incredible period. For three years in succession it broke out on my farm in one field, and months elapsed in the last case before fresh stock were put into it. I am yours, very truly,

"JAMES HOWARD.

"P.S.—The Government departments of France and Belgium would doubtless supply information on the subject. I had a talk this week with Mr. Forster about inoculation, who thought it was not a matter for Government to undertake, but rather for the Agricultural Societies. I think the Royal Agricultural Society might fairly be called upon—it has plenty of funds."

He (Mr. Jackson) had a strong impression at first that inoculation was like a good many other things that had been tried to prevent the spread of pleuro, and was unwilling to believe that there was much to be relied upon in it; but from the inquiries he had made, and from a statement made by a neighbour of his who had been to Australia and had considerable experience in connection with the matter there, he was strongly inclined to come to a different conclusion. About five years ago a cow was brought out to that gentleman from England, which, in about three months after landing, was seized with pleuro. She was slaughtered, and all the animals in connection with her were slaughtered too, and it was hoped that these strong measures would stop the spread of the disease. Unknown to them, however, some bullocks had been in connection with the cow, and these, being travelling bullocks, went up the country about 200 miles, and spread the disease along the whole track. Slaughtering was largely resorted to, but that was impossible in all cases. What they did not slaughter, however, they inoculated, and they found the practice exceedingly beneficial. They seemed to consider that they stopped it quite as much by inoculation as they did by slaughter, and he said that he inoculated thousands himself. If they inoculated with virus of a particularly malignant kind they lost them: but generally speaking the losses were not serious, and they had so modified their virus that they could calculate upon a very small percentage of death. He did not recommend the inoculation of healthy stocks unless there was a likelihood of their coming in contact with the disease; but when there was actual disease he recommended all the cattle in contiguity with it to be inoculated. It was quite true that it could not be looked upon as an absolute preventive. Unfortunately in his own locality they had the pleuro about six months ago, introduced by a cow brought from Wrexham fair. After slaughtering nine or ten they sent for Mr. Dunn, of Tarporley, and inoculated the rest. Afterwards three cases occurred. One was violent and they slaughtered it; the other two were milder and they allowed them to live. Since then they have had no cases of pleuro whatever. This would seem to throw some doubt upon the value of inoculation, but the general impression in the neighbourhood was that the virus had not taken proper effect, as only three or four of the dozen cows which were operated upon seemed to have suffered inflammation in the tail. He would only say further that had he a case of pleuro in his own stock he would consider it his duty to inoculate the whole stock at once.

Mr. RIGBY said he believed the pus was considered best when it was taken from a beast that had had the disease three or four days. They did not like to take matter from cows in the last stage of the disease, as the blood might be poisoned, and this would produce mortification.

Mr. G. SLATER said he had been sceptical in regard to inoculation, but he was pretty nearly converted. He had some conservation lately with a man of great practical experience, who had lost three or four of his cattle by pleuro, and had then inoculated the whole of his stock, numbering 30 or 40, and had saved every one of them. He (Mr. Slater) asked him particularly what he would recommend in reference to healthy stock, and he said—he certainly would not inoculate healthy stock unless the disease made its appearance, as there was a little risk and expense with it, but when he had an animal suffering three or four days, he would slaughter it, take the virus from its lung, and inoculate the rest, and he should confidently calculate upon saving them. Mr. Slater then referred to the case of a friend who had been for some years residing in South Africa, where he said inoculation was very generally practised, and he laughed at the ignorance of the Cheshire farmers, who were only just making experiments to test its value.

The CHAIRMAN (Lord Egerton) said, after the very able report which had been read, the question to consider would be this—whether the Chamber considered itself in a position to commend to the farmers of Cheshire the process of inoculation. He confessed that after the strong opinion which had been pronounced by the gentlemen in London upon the subject, he hardly thought they were in a position to make a positive recommendation to that effect. He should like to make a remark with respect to carbolic acid. He (Lord Egerton) had had the foot-and-mouth disease through the whole of his stock, and they found the use of carbolic acid diluted, both in washing the mouth and feet, and in some cases taken internally, to be of the greatest value. At the time of the rinderpest he lost a great number of cattle out-of-doors. They took the remainder into the shippon, where they remained nearly a year and a half shut up, chlorine gas being freely used, and they found it the best disinfectant that could be employed. It never affected either the cattle or the men, and it was no inconvenience whatever. He was happy to say that in consequence of the able measures taken by the Chief Inspector, Captain Smith, with the co-operation of the farmers, pleuro had not spread very extensively in this county. The number attacked from the 28th August to the 11th December was 123, out of which 26 had been killed for burial, 31 for meat, 23 had died, 38 had recovered, and 5 were under treatment. In the case of foot-and-mouth disease during the same period 2269 had been attacked, 4 killed for burial, 3 for meat, 11 had died, 1935 had recovered, and 316 were under treatment. He might say likewise that the other day one of the committee on the subject had looked over the accounts of Capt. Smith, and had found that it had been done at a very small expense indeed, not exceeding £80 for the three months, and out of that a-half or two-thirds had been paid for the dresses of inspectors and other things which would not recur. The county then might feel that they had a very efficient body of inspectors at a very small expense. With regard to stock, he should strongly recommend that if they tried the experiment they should do it with cattle of a certain age. Very young stock were not at all liable to the disease. It went through the whole of his (the Chairman's) herd of oxen, but out of 700 head in the adjoining park out at ley not one was attacked. Cows in milk, and especially those in full milk, were much more liable to the disease, and when they had it, they had it far more severely.

SWINDON.

THE INFLUENCE OF CHAMBERS OF AGRICULTURE.—At the first meeting of the Swindon Chamber of Agriculture a paper was read by Mr. T. ARKELL, the President, upon this subject.

Mr. ARKELL said—In taking the first part of the subject—What have the Chambers done?—if we only look to their effect upon Acts of Parliament passed during their three years of existence, probably not more than two or three measures have been altered or improved by their influence. The one that strikes me most forcibly is the Contagious Diseases (Animals) Act, passed last session. No one, I think, will be bold enough to deny that the discussion and agitation carried on by the several Chambers last year (although we did not get all we required for our safety) had considerable influence on that measure through our representatives, and we got more than the Government first intended we should; and as a proof that what we asked for was nothing more than justice, and that which was necessary to keep our stock free from foreign diseases, the alarm and agitation increases rather than diminishes since the passing of the Act, as the measure has proved inadequate to prevent the introduction of disease into this country.

Another instance of Chamber influence is seen in reference to turnpike roads. The next best thing to having a good Act of Parliament passed, is to prevent a bad one passing. In the report of the Central Chamber for 1868, it is stated that in their opinion, as no settlement of the question can be satisfactory which is based upon the exclusive rating of real property, Mr. Knatchbull Hugesson's Turnpike Trusts Bill should be opposed, which I believe was done effectually, and Mr. Hugesson in moving the second reading on June 17, admitted that the Chambers of Agriculture had been extremely agitated about the measure.

Another measure has been discussed by several of the Chambers. I mean the County Financial Boards. The question has been agitated for years on the ground that those who pay the county rates should be represented in its expenditure, which no doubt is quite proper.

I may also mention that the appointment of a committee of the House of Commons to inquire into the bearings of the Malt-tax had the approval of the Central Chamber, and I trust the evidence taken will be produced and the question taken up at an early day. No doubt there are other questions, although not yet ripe for legislation, which will, from their discussion by the Chambers of Agriculture, educate the country as well as our representatives, and in due time become law.

I often look back with satisfaction at being one of a very few at a meeting in London to establish the Central Chamber of Agriculture. I am not quite sure whether I did not pay down the first pound as a member to Mr. Clay, who was the principal person in calling the meeting; and I cannot at a better time urge all to become members to increase the funds at its disposal. We have in these Chambers a connection, a sort of agricultural union, we never possessed before. In years gone by, at any agricultural meeting or dinner, if any speaker opened his mouth on agricultural politics he was almost always hooted down with the cry of "No politics! no politics!" This sort of negative politics, encouraged by the landowners, lasted all through the agitation of the Corn Law Repeal, no doubt much to the satisfaction of the commercial and trading classes, and the Government who were then legislating for their benefit. Had Chambers of Agriculture been in existence then, do you think that the Corn Laws would have been repealed without the repeal of the Malt-tax? Should we not have said, there are two unjust laws in existence—one to make Wheat dear, another to make Barley cheap—but both to make bread and beer dear! Repeal them both; let us have a fair field and no favour; but the influential agricultural politicians of that day (the landowners) were afraid of the repeal of the Malt-tax, or at all events they were uneducated as to what was beneficial to agriculture.

Again, referring to the third annual report of the Central Chamber, I find there are 66 Chambers and branches, consisting of about 15,000 members, with an estimated income of about £7000, and represented at the Central by 90 deputed members, and a subscription of £220. These 66 Chambers do not embrace the whole of England and Wales, there being some large portions of counties, like Wiltshire for instance, 10 English and 10 Welsh, apathetic counties, without any Chambers in 1868. Let us hope they have or are about forming some, and so add to our influence.

"What remains to be done, and how to accomplish it?" My impression is not to undertake too many subjects at once, but watch the signs of the times, see what measures the Government are about to introduce in the coming session affecting our interest, and be prepared to discuss them. For this reason I was anxious to see our members present, to know from them what measures are likely to come before them at the meeting of Parliament. If I were to give any opinion as to the most urgent on our behalf, I should say—

1st. The amendment of the Bill of last session, so as to make it compulsory to slaughter foreign animals at the ports of debarkation.
2d. The revision and extension of local taxation.
3d. The repeal of the Malt-tax, to cheapen the raw material of beef, mutton, and pork.

But if I name what in my opinion are most likely to be introduced, I should say—1st, a Compulsory Education Bill, the funds to support it to be raised principally from the present ratepayers; 2d, a Turnpike Abolition Act, the roads to be repaired principally by the present ratepayers; 3d, the repeal of the tea and sugar duties, in preference to the repeal of the Malt-tax, which I trust our representatives will be strong enough to oppose successfully—the two former upon the ground that no more Acts of Parliament be allowed to pass affecting the expenditure of money collected by rate, until an extension of the law of rating to other property besides real. A stand should be made somewhere: it ought to have been made before. During the last 30 years rates have increased to a considerable extent.

There is another difficult question which will require considerable discussion before it is satisfactorily settled—Game, or Game Laws. I am inclined to think the discussions that have taken place on the preservation of ground game have not been without benefit to many already, and I look more to the redress of this grievance through moral suasion than by Act of Parliament. I don't believe gentlemen, or even common men, can continue to inflict so intolerable a nuisance as keeping a large quantity of ground game is to the farmer, in the face of free discussion of the injustice involved; and I look to a gradual abatement of the nuisance, for I am afraid (being a bit of a sportsman myself) that if legislation took place at all, it would not be confined to ground game.

Notices of Books.

Guano. *Correspondence between G. C. Dobell & Co., Professor Voelcker, and H. M. Jenkins, Esq., Secretary of the Royal Agricultural Society.* Liverpool: Lee & Nightingale, 16, Castle Street.

The publication of an analysis of Patagonian guano, supplied by Messrs. Dobell to Mr. Howden, among a number of others gibbeted by the Agricultural Society, has given rise to an angry correspondence. We gather from it that the guano in question was "genuine as imported;" that it was sold on an analysis which fairly indicated its quality, and that it was not even guaranteed as coming up to the analysis. It is also plain that whichever analysis of the two that have been published

be taken as representing the character of the bulk, low as was its price, it was sold at considerably over its intrinsic value.

On these facts our opinion is that the Society did good service in publishing this instance of manure-market experience on their list of inferior guanos. It is right that farmers should know the purchase of these comparatively worthless fertilisers to be against their interests, however cheap they be; and no method so effectual can be taken as to nail up examples of this kind along with vermin of even worse description. Moral delinquency is not charged by this act—but farmers are warned of the risks that they incur.

As to other matters, we are clearly of opinion that no ordinary reader of Dr. Voelcker's report upon this case will understand his words, to which Messrs. Dobell object, as throwing any doubt upon their truthfulness in the statement which they make as to the "genuineness" of the guano in question. We agree with Messrs. Dobell in thinking that it would have been only justice to them if the price at which the guano was sold had been given along with its analysis; and we think with them, that as further explanations were sought from the purchaser of their guano before the report of its composition was published, so also opportunity of further explanation should have been given to the firm who sold it.

We do not think it at all helps that firm to have dragged into the controversy their other personal relations with their customer which have no public interest.

We have only to add that Mr. Howden has since published a letter, which should be read in connection with the pamphlet. Messrs. Dobell will no doubt make whatever reply to it they may think it needs, and promising that this reply we shall be very happy to give, we add the following extract from Mr. Howden's communication to the secretary of the Society :—

"Messrs. Dobell say in their statement that 'Mr. Howden was distinctly told, when the sale was made, that in the case of such low-priced guano (as to which there was great uncertainty) we invariably declined to guarantee the analysis.' That such a reservation was made, or that anything was said by Messrs. Dobell suggestive of risk in purchasing this 'guano,' I most positively and distinctly deny. They stated that the guano was genuine 'Patagonian guano,' and that the analysis was a fair one they had just had taken by the well-known chemists 'Huson and Arrott.'

"It appears to me to be ridiculous—to say nothing more of it—to say that the fair purpose of showing an analysis is to be taken as anything else than a fair representation of quality to which the goods sold shall have a reasonable correspondence. Messrs. Dobell say further, that 'Mr. Howden was perfectly aware, both from the low price and the analysis, that he was purchasing an inferior article.' To this I have to answer that I was aware from the analysis given that the guano was one of a rather inferior class; but I was not aware that it was spurious, or that its quality was so inferior to the analysis given, as Dr. Voelcker's analysis shows it to be. But that I relied on its being genuine Patagonian, and on its being up to the analysis given, I should certainly not have purchased it. I well recollect on my saying that the price, though small, was too much for such an analysis, Mr. Dobell assuring me that it was a fair analysis for Patagonian guano, and that there was something peculiar about Patagonian guano, which, though, compared with other guanos of the kind, it showed but a poor analysis, yet, contrasted by its effects in the field, showed always very favourably, the results from it in the crop being always much better than the analysis would indicate. He stated that he had just sold a considerable quantity of this same cargo to another customer of his, who had great experience in manures, and this person had been making the same remark as to this peculiar property in Patagonian guano.

"I may observe also that the price (which, by the way, as Messrs. Dobell seem to endeavour to make it appear s low as possible by detailing that they carted the stuff to the railway, I may mention was for nett cash without the customary deduction of 2½ per cent.) is not out of the common range of price for ordinary phosphatic guano. I have for the last eight or ten years used such guano largely, at somewhat similar prices, and with satisfactory results."

Waste Labour to Waste Land. *A Special Plea, &c.* Industrial Employment Association, 35, Parliament Street, S.W.

Land reclamation seems, just now, to occupy the thoughts of many. Our correspondent, "G. A. H.," advocates it in the general interest as a good agricultural investment; our correspondent, Mr. Spearing, who has had large experience in both islands, advocates it as especially the work to be encouraged and directed by the Government in Ireland; Mr. James Howard, M.P., has, we hear, a scheme of the kind especially directed towards the solution of the Irish difficulty; and here we have a series of letters by Admiral Wiseman, the chairman, and Mr. Francis Fuller, hon. secretary to the Industrial Employment Association, on the prevention of pauperism and crime by affording immediate and remunerative employment to the masses. We doubt the wisdom of some of the suggestions given in these letters, and do not think the following "practical measure" would tend to diminish the rates or diminish pauperism :—

"Within a convenient radius from London numerous farms are obtainable upon lease at easy rentals, and upon which children and able-bodied poor could be put to work immediately and profitably—the former to be brought up healthy in body and mind, imposing no burden upon the rates, but producing the cost of their maintenance and education, and the latter to earn at least subsistence money, until 'times mend,' and employment at their usual avocations is once more to be had by those who may prefer it.

"It may startle some of your readers to say that such farms are available within an easy distance from London. But I state a positive fact, from my personal and professional knowledge of it; and I can, when called upon so to do, point out several eligible ones, not tenanted, but 'in hand,' so that no existing occupier need be disturbed, and which the owners would be glad to let at a few shillings per acre more than ordinary tenants would pay. Very tolerable land can be rented at not more than 30s. per acre, which, treated by spade husbandry, would yield enormous returns, to the proportionate reduction of the poor-rate, and in due course the rescue of thousands from the humiliating predicament of pauperism. There is no labour that can be properly put upon a farm but will pay. The very young and the very old—of course excepting the extremes at either stage of life—can equally have their capabilities turned to account with pleasure and benefit to themselves. It is an operation, moreover, that could be commenced immediately, and with virtually immediate productiveness in the shape of the certain returns in the next harvest"!!

No doubt "there is no labour that can be properly put upon a farm but will pay;" we doubt, however, entirely whether boards of guardians dealing with their paupers as suburban dairy farmers, are likely to put labour properly on a farm. The scheme, if attempted to be carried out, would be certain to increase the rates.

Farm Memoranda.

THE EMPEROR'S MODEL FARM AT VINCENNES.—"The farm is a comfortable-looking place, without any attempt at superiority in point of building or picturesqueness, and the division between the fields is a sunk dry ditch or a rough paling. The first thing we visited was the principal byre or cow-house, containing 200 cows. It is a long, straight, and rather wide building—high, well lighted, and well ventilated. The cows face each other, having a space 6 feet wide between them, 4 feet of which is a deep asphalted trough. Each cow had a considerable space allotted to her, and was fastened by a leather strap round the neck with a ring and chain; at the other end of the chain is a second ring, that slips easily up and down an iron bar placed horizontally at the head of each stall—an arrangement we had often seen before. The cows could lie down or stand in any position, and were prevented from actually crossing the trough by a couple of iron bars run across the top of their stalls, so wide apart that the animals could get well forward to drink. Low racks on one side of their stalls were full of hay, and they are fed upon that, chopped Mangel Wurzel, and Beetroot.

"Turnips grow too badly and scantily in that part of France to be available. The divisions between the stalls were low and of neatly-painted wood; a grating allowed all liquid manure to drain down into a subdrain with a good incline, which carried it completely out of the building to a huge tub placed at a convenient distance from the byre. At certain hours a cask of water at one extremity of the byre floods the trough; and it was an interesting sight to see such a number of animals drinking at once, splashing up the water in each other's faces, and evidently enjoying themselves. It is scarcely possible to give an accurate idea of the fine appearance of the cows, or of the variety represented in that one place.

"The Emperor never does anything by halves, and he has agents all over Europe, who have the means of outbidding all competitors, the result of which is to bring together stock that, as a whole, are quite unequalled. There were Ayrshires and Shorthorns that had carried off prizes at the principal agricultural shows in Scotland, England, Ireland, and France; red Durhams and superb black polled Angus cows. The Devons were facing magnificent Swiss animals, with their enormous frames and huge udders; Brittany cows with their deer-like heads; hardy Highland cows scarcely to be distinguished in shape and make from the sturdy little north country French animals; Dutch cows with their ungainly rounded backs, and good milking qualities; even the gazelle-eyed Brahmin cows were there, and all evidently quite at home. In some of the stalls newly born calves were happy with their mothers, to whom they are taken at stated times, and with whom they remain during the night for the first few weeks.

"In a building close by were the bulls of the different breeds, comfortably housed in loose boxes.

"We asked the manager which breed gave the best milk, on the whole, and at the same time gave the largest quantity. He said the Swiss, and that the average quantity was six to nine English quarts at a time. They are milked twice a day. Looking at their immense udders and great size, one can quite believe the statement. He said their milk was very nearly as rich as that of the Alderney cows, and he gave us some to drink, which certainly verified his assertion. These large cows are great feeders, and are quite distinct from the small, active cows that are met with all over Switzerland; and it is from this large and profitable breed that the famous Swiss cheeses are made. After lingering in this place of byres, we went to see the sheep; they were also well housed, chiefly in wooden buildings, but with spacious paddocks in front. There were Southdowns, Leicesters, Cheviots, and various other kinds, of which the black-faced Highland breed and a small species from the Pyrenees (the prettiest as far as shape went) were the most conspicuous. There were also some very good specimens of the only fine breed to be found in France, the *pre sale* from around and below the Pas de Calais.

"We next inspected the pigs. They were all inside a building in small loose boxes, the ventilation more than imperfect. The stench was dreadful; nothing but a firm determination to see all enabled us to go patiently from pen to pen. Here, as in other things, the Emperor has laid all Europe under tribute. Improved Berkshire and great Yorkshire pigs; improved Suffolks, with the shortest possible snouts; the large Westphalian breed, and the smaller kind from Austria, with numberless other sorts, made it a very interesting collection; but the place of honour was filled by an English pig called Fairhope, which had gained many a prize in its own country. After recovering a little in the fresh air, we next bent our steps to a large shed where some old-fashioned and cumbersome machinery was kept in motion by the ceaseless round of a huge blindfolded Swiss ox. The object of this was simply to chop the Mangel Wurzel, &c., for the cows, as not 50 yards off there was a blazing fire, used solely for steaming food for pigs; we could not help considering how speedily a Scotch farmer would have combined economy and efficiency, and done away with this waste of time and labour. A man was in charge of the ox, two men in charge of the fire, and at least 12 men and women were feeding the machine, and this with coals at 50s. a ton. We inquired of the manager why the pigs were warmly housed and so warmly fed. He said, 'They are kept so warm in England, and in order that they should thrive, we continue it.' We asked the exact acreage of the farm, and the manager said, 'It depends upon the stock; sometimes we have to hire a few fields, and sometimes not. We always have to buy food.' 'Does the farm pay, then?' 'Well, it generally covers its expenses. We never make butter; we sell the milk in Paris, and it always sells well, and the young stock, being valuable, fetch high prices.' In fact, it is simply a breeding farm, in which expense is no object. The word 'model' is a complete misnomer. There is a very pretty rustic summer-house in a small garden, where the Empress and her ladies sometimes go to drink milk out of Sèvres cups with the Imperial crown upon them.

"The most curious thing in such a poultry-loving country as France is the absence of everything in the shape of poultry—there are even no pigeons. The manager said—'We used to have an enormous quantity, but they were stolen so continuously that we were obliged to give them up. They were very valuable, and it was, of course, a great temptation.' (This was added in an apologetic tone.) Insensibly, as it were, we looked towards the fortress of Vincennes; the manager caught our glance, and gave a satirical smile and the inevitable French shrug.

"The only horses on the establishment are the white Norman breed for the farm work. They are heavy and powerful, and well adapted for the soil they have to work. Almost all the farm implements have the names of English makers. The stock on this model farm is assuredly well worth seeing, but most of our readers will agree in the opinion that none of our clear-headed, practical north country farmers would approve altogether of the management. There appeared, for instance, to be a great deal of waste. Owing to the racks in the cow byre being so low, the animals trod a good deal under foot; and the hay being cut over-ripe, the trough in the cow byre was strewed with the seed, which in our own country and in Holland is used with such advantage mixed with other things. We saw it swept away before the animals were entered, and asked if they made any use of it. The manager smiled again, and seemed quite amused by such an economical idea. As we returned to Paris we talked with our friend over what had most struck us. He had been both in England and Scotland, and admired the farms and management exceedingly. We spoke of a probable time when France would support the Emperor's efforts more heartily, and take a greater interest in agriculture; but our friend seemed very incredulous, and said that though there were isolated cases of agricultural pursuits being adopted by proprietors, so long as a man could work an ox during its best days, and then sell it well (French cooks having the talent of disguising inferior meat), he was not likely to give high prices for stock. 'And there is another reason. We are naturally fond of our centre—Paris. Out of Paris we do not exist—we vegetate; and I do not believe that the pursuit of agriculture will ever attract us—it is not in the people. The Emperor is filling the country with a better breed of animals, and in that he does all that he is ever likely to accomplish.' 'But the saving of money?' 'Bah, *mon cher*,' he said, 'there are three things against the realisation of your dream—want of taste for it, want of capital, and want of habit. After all, what does it signify?' And with this morsel of French philosophy or pococurantism we conclude." *Inverness Courier.*

Miscellaneous.

MOUNTAIN SHEEP FARMING.—There is no point of management that the older flock-masters insist so much upon as a good supply of mountain hay. In a paper which Mr. Aitchison, of Linhope, read a few years ago before the Teviotdale Farmers' Club, of which he is president, he observed: "Sheep make up nearly half the rental of Scotland, and yet landlords are sadly remiss, and very little is done for them. Sheep drains, sheep stells, and march fences have done much, but still more is expended on 40 acres of wet low land than would put a sheepwalk in form. Corn, beans, and bran with hay may enable the flock-master with a heavy purse and a willing heart to tide through the dreary time till verdure begins, and nature dethrones art on the hills, but still mountain hay must be the sheet anchor. Go in for mountain hay, and the storms of winter may drift up the valley, and tempests whistle over the hills in vain." Again, "Partial feeding is worse than no feeding, as the sheep listlessly wait on it; and no longer, in the absence of fresh weather, search after regular food. Giving it in handfuls may do for calm weather, but sheep hecks will alone prevent the wind from pilfering, and save one-third of the hay." His recommendation was that every hireselll of 30 score should have four enclosures of a few acres each, with sheep houses and hecks, which should be limed and cut two and two, in alternate years, and this plan has been pretty generally followed." *Mr. H. Dixon in Royal Agricultural Society's Journal.*

The Week's Work.

JANUARY 15.—*Wheat sowing* may be prosecuted in open weather, as the land is cleared of Turnips, or otherwise got ready. We have seen a farmer sowing Wheat in low land by the sea-side when the more elevated part of his farm was covered with snow, knee-deep in places, and getting in the seed too in a fine promising seed-bed. It is generally good policy to sow on a stale furrow, but in the present difficult weather you must sow as soon as the land is ploughed, yoking the drill, and finishing as you go along. In the absence of seed-drills the old practice was for the sower to follow the last plough with the harrow at his heels. The extension of the practice of storing root crops in autumn, and the use of the steam-plough and seed-drill, are greatly reducing the area of land ploughed and seeded with Wheat at this season. But even under this improved practice there is much Wheat land that cannot be sown earlier, and whenever a good seed-bed can be had it is better to sow than to put off till spring, which may be late and unfavourable. Some sow regardless of the seed-bed, under the impression that future frost will correct present harm; but the old rule of the seed being at the footland before the sower in a rainy day is out of date; for, apart from the sacrifice of seed, frost will not correct land that has been poached both with implements and the horses' feet—on the contrary, nothing can be more ruinous to heavy Wheat land.

Clay, Marl, and Chalk.—Cart and apply to land that will carry the teams. Marls are of a very diversified character, clay containing a portion of chalk or lime being in some places calcareous earths—gravelly marls in others. They are all well known in the localities where found, but their value is too often under-estimated. In frosty weather they may be applied not only to grass-land, but ploughed land for spring corn or root crops, and harrowed or grubbed in when the thaw comes to incorporate them with the staple. A good dressing of clay will double the value of some lands; frost very soon breaks it down, so as to deprive it of its adhesive character, and thus fit it for incorporation with arable or ploughed land, or for bush-harrowing into grass-land. Nodules of chalk often require alternate rains and frosts to break them down for the bush-harrow. In such cases it is not well adapted for grass-lands; but chalk may easily be crushed or ground by machinery to a sufficiently fine state for application to the land, and may be spread by a broadcast manure-distributor in frosty mornings when it cannot be done in the afternoon; or from the carts, as lime, with shovels; or it may be laid down in heaps, and then spread. Unlike quicklime from the kiln, chalk improves by exposure to the atmosphere, and therefore when carted at this season it should be applied immediately. Some dig and cart into hills in the summer time, to be ready for autumn, winter, or spring use.

Lime Compost, prepare. Where land lies at a considerable inclination, the earth which the ploughs, &c., bring out to the lowet land's-end accumulates, so that eventually a spit deep may be carted off and laid up in hills for compost. This is best done in frosty weather. The scourings of ditches, parings from roadsides, and all sorts of earthy matter fit for the same purpose, are thus collected together. These hills should be turned over once or twice before farmyard dung or lime is mixed with them. Where lime has to be procured from a distance, it may be carted, and the quicklime mixed with the compost hills in turning them. With earth full of vegetable matter, this makes an excellent lime compost for grass-lands, and if the lime and earth are properly mixed in the turning, the compost will be ready for application in a week or ten days. In other words, when cool it is ready for application, which should be done in dry, open weather, when the compost can be well harrowed down to the roots of the Grass. There is no rule as to the quantity of lime that requires to be mixed with a cubic yard of earth; some mix a bushel of shells from the kiln, but it depends upon the nature of the land and the effect the farmer wishes to produce. In the form of compost the smallest quantity of lime will produce a favourable effect. But when there is much Moss, effete vegetable matter and sourness in the land, a much larger quantity of lime should be used. The compost then should have a whitish appearance, from the proportion of lime in it, and should be applied comparatively hot.

Warping.—The high floods of the season are favourable for carrying out this operation, both naturally and artificially. There are only a few places where river water can be let in naturally to warp land lying at a lower level. It is otherwise with the artificial practice, for by means of pumping apparatus and machinery for breaking down clay or any sort of earthy matter in flowing water, advantage may be taken of flood-water to warp extensive areas of land. Thus bogs might often be artificially warped with advantage; so may most of the fen lands of England. In point of fact, large areas of peaty soil in Lincolnshire and the West Riding of Yorkshire have already been so warped; and there are large areas of poor sandy and gravelly soils that can be warped in like manner. It does not require a very great fall to convey clay, marl, and earthy matter in suspension by gravitation, as high floods increase the velocity, and the earth may be broken down with the spade, and conveyed to the land in the common carriers of irrigated land.

Threshing.—Much corn is threshed out this month, for market, let the weather be wet or dry. Farmers whose threshing machines are driven by water, and who have a short supply in dry weather, take advantage of floods to thresh out and stack what straw is required for litter or summer use when the supply of water fails, but care should be taken that the outsides of the stacks are dry, when taken into the barn, otherwise the wet butts will damp the grain in threshing. Those who use steam and horse-power thresh out in frosty weather, and so do those who have a full command of water. Some cut up large quantities of straw and hay into chaff, salt and store it past in bins for consumption during the busy months of spring. Others object to stale straw or chaff, and thresh daily, or stack after stack, so as to have fresh straw and chaff daily. If corn has been badly harvested or the grain laid when cut, threshing and salting may improve the chaff, but clean straw in the sheaf and stack is always best newly threshed.

Chaff-cutting and Root-pulping.—With the large chaff-cutting and chaff-sifting machines now in use the straw can be yelmed with hay and cut up as fast as threshed and carried to the bins by traveller bands and salted. But chaff should always be given to live stock mixed with less or more pulped roots and meal at this season, and all this is now done at one conjoint operation by machinery; and the storing of the prepared or cooked food thus manufactured involves several important considerations of economy. Thus the mess should lie for some time before it is served to stock, and the length of time will depend upon the temperature of the weather, or, rather, of the place in which the food is kept, and the quantity of each of the different feeding materials of which it is composed, as straw, hay, roots, meal, salt. Then we have the kind of straw, as wheat-straw, oat-straw, barley-straw, with the kind of roots, as Turnips, Swedes, Mangel, Carrots; and kinds of meal, as pea or bean meal, barley-meal, oatmeal, Indian corn meal, linseed-meal, ground cake, &c.; and lastly, the demands of the different kinds of stock and season. It is very evident, therefore, that every farmer must be left to make his own rule as to what should be done as to supplying the raw materials, and the length of time they require to lie after being mixed before the cooked mess is served. To beginners we may however say, err upon the safe side, and not let the mess lie too long to sustain injury from fermentation, or, rather, putrefaction. See that roots are perfectly clean and free from rottenness and everything that will induce the putrefactive process.

Early Lambs.—In our southern provinces lambing continues throughout the month. Sudden outbursts of rain, sleet, frost, and snow, are now and then experienced, but the storms generally are of short duration, the weather upon the whole being favourable as compared with March and April in the north. The sudden changes, however, are trying, and ewes do better under cover on pulped Carrots, meal and clover-chaff, than in the open field. October and November lambs are being sent to the shambles, their dams, in some instances, being ripe to go with them. *W. B.*

Notices to Correspondents.

CATTLE FOOD: *H P.* In feeding store cattle and sheep on concentrated foods, as oilcakes, meals, &c., it is desirable at all times to mix them with a bulkier food, as bran, chaff, pulped roots, &c. Bran is valued higher by the chemist than by the practical man. Its nutritive value is diminished by its laxative effect as food. Can any one tell us, from experience, its approximate feeding value as compared with first-rate meadow hay?

COPROLITES: *S.* Can any one say what average percentage of moisture is lost in the process of grinding phosphates into a fine powder by means of horizontal stones?

DRAUGHT-HORSE POWER: *Inquirer.* You will find all that is known on the subject in the Useful Knowledge Society's book on the horse. We will make an extract next week.

GAS LIME: *An Original Subscriber* would feel much obliged by Mr. Chambers, bailiff to the Strines Calico Printing Company, kindly saying what quantity of gas lime per acre he ploughs into his land in preparation for Potatos, as mentioned in the *Agricultural Gazette.*

LIME: *D. M.* We would make a compost with vegetable matter of any kind, and apply so much as would contain 80 bushels per acre, as a top dressing on pasture land which is very mossy and light.

MAIZE FOR HORSES: *J. D. H.* It is largely used in the stable when cheap enough. We believe, however, it is preferred especially for cart and farm horses; and nothing beats good Oats and Beans for the hunter or the hack. See the report of the discussion before the Lavenham Farmers' Club, p. 24.

SEWAGE: *A. B.* We are asked for any trustworthy examples in England of town sewage being profitably converted into a dry manure. We know of none.

Markets.

ENGLISH WOOL.

There has been a good demand, and some of the classes of foreign wool competing with English fleeces, such as Oportos, Egyptian, coarse South American, &c., have been dealt in at ¼*d.* to ½*d.* per lb. advance, and are now held for still more money, with very limited stocks. We look for a decided upward move next month.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	*s. d.*	*s. d.*
FLEECES: Southdown hoggets	.. .. ..	1 1	to 1 6
Half-bred ditto	.. .. ..	1 2	1 2½
Kent Hoggets	.. .. ..	1 3	1 4
South Down ewes and wethers	.. ..	0 0½	1 1
Half-bred ditto	.. .. ..	1 0	1 3
SORTS: Oil thing	.. .. ..	0 10	1 6
Combing	.. .. ..	1 0	1 8

HAY, per Load of 36 Trusses.

SMITHFIELD, Thursday, January 13:

Prime Meadow Hay	80s. to 85s.	Clover, old	120s. to 130s.
Inferior do.	60 70	Inferior do.	100 110
Rowen	50 70	Prime 2d cut	100 110
Inferior do.	— —	Inferior do.	80 90
Straw	28 34	CARLES JAMES EASTON.	

COMBERLAND MARKET, Thursday, January 14.

Sup. Meadow Hay	84s. to 95s.	Inferior Clover	108s. to 116s.
Inferior do.	70 77	New do.	— —
Rowen	— —	Straw	28 38
Superior Clover	126 132	JOSHUA BAKER.	

COALS. January 12.

Holywell Main, 16s. 6d.; West Hartley, 15s. 9d.; Walls End Acorn Close, 17s. 3d.; Walls End Harton, 16s. 9d.; Eden Main, 17s.; Walls End Braddyll's Hetton, 17s. 6d.; Walls End Elliot, 18s. 3d.; Walls End Haswell, 18s. 6d.; Walls End South Hetton, 18s. 3d.; Walls End Tunstall, 19s. 6d.; Walls End Hough Hall, 18s.; Walls End East Hartlepool, 18s. 3d.; Walls End Tees, 18s. 3d.—Ships at market, 70; sold, 64.

METROPOLITAN MEAT MARKET. Jan. 14.

Best Fresh Butter .. .. .. 15s. per dozen lb.
Second do. do. .. .. 17s. "
Small Pork, 5s. 6d. to 6s. 8d.; Large Pork, 4s. 2d. to 4s. 6d. per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, January 10

We have a shorter supply of Beasts, and the average quality is very good; trade is active for choicest qualities, at fully last week's quotations; a fair clearance is effected of all kinds. The number of Sheep is nearly the same as last Monday; trade is brisk for them, and choicest qualities make rather higher prices. Choice Calves are very scarce and dear. Our foreign supply consists of 497 Beasts, 2340 Sheep, 119 Calves, and 140 Figs; from Scotland, 297 Beasts; from Ireland, 600; from Norfolk and Suffolk, 1050; and 1130 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5 6	6 10	Best Long-wools	5 6	6 8
Best Shorthorns	5 4	5 8	Do. Shorn	— —	— —
2d quality Beasts	3 4	4 4	Ewes & 2d quality	4 4	5 4
Best Downs and Half-breds	5 8	6 0	Do. Shorn	— —	— —
Do. Shorn	— —	— —	Lambs	— —	— —
			Calves	4 0	6 4
			Pigs	4 0	6 0

Beasts, 3578; Sheep and Lambs, 16,770; Calves, 140; Pigs, 250.

THURSDAY, January 13.

We have a large supply of Beasts and only a moderate demand, prices for all kinds are consequently lower; our top quotations are only realised in a few instances for choicest qualities; several lots remain unsold. There are a few more Sheep than on Thursday last, but we are not overdone with best descriptions, and Monday's quotations are pretty well maintained. Choicest Calves continue dear. Our foreign supply consists of 744 Beasts, 850 Sheep, and 96 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5 4	05 6	Best Long-wools	5 4	05 8
Best Shorthorns	5 0	—5 4	Do. Shorn	— —	— —
2d quality Beasts	3 0	—4 0	Ewes & 2d quality	4 0	—5 0
Best Downs and Half-breds	5 8	—6 0	Do. Shorn	— —	— —
Do. Shorn	— —	— —	Lambs	— —	— —
			Calves	4 0	—6 4
			Pigs	4 0	—6 0

Beasts, 1810; Sheep and Lambs, 5505; Calves, 125; Pigs, 20

MARK LANE.

The supply of English Wheat to this morning's market was very small, and was cleared at the quotations of this day se'nnight. There was a fair attendance, and a moderate demand for foreign Wheat at a decline of 1s. per qr. upon last Monday's rates. Barley was unchanged in value. Beans and white Peas were 1s. to 2s. per qr. cheaper. The Oat trade was quiet at last week's prices. Flour was difficult of sale, and rather lower.

MONDAY, January 10.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk.. White	40	49	Red.....	37	48
— — fine selected runs..do.	42	53	Red.....	40	50
— — Talavera	56	58			
— — Norfolk	-	-	Red.....	—	
— — Foreign	38	53			
BARLEY, grind. & distl...29s to 31s.. Chev	34	42	Malting ..	34	38
— Foreign .. grinding and distilling	22	25	Malting ..	30	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire.. Potato	24	26	Feed	—	
— Irish ..... Potato	23	25	Feed	21	24
— Foreign ..... Polland and Brew	22	25	Feed	19	21
RYE	32	38	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Maragan ... 32s. to 37s.. Tick	34	49	Harrow ..	34	49
— Pigeon ... 50s. to 56s.. Winds	-	-	Longpod. .	—	
— Foreign ..... Small	41	43	Egyptian..	38	40
PEAS, White, Essex, and Kent.. Boilers	34	42	Suffolk ..	36	43
— Maple, 41s. to 45s. ..... Grey	35	42	Foreign ..	33	37
MAIZE	—		Foreign ..	29	31
FLOUR, best marks delivered.. per sack	39	43			
— 2d ditto ..... ditto at	28	40	Country ..	28	40
— Foreign ..... per barrel	22	25	Per sack..	29	55

FRIDAY, January 14.

Since the 7th inst. we have had, alternately, frosty and mild weather, with high winds and heavy rain. The frequent changes in the weather lead millers and dealers to expect an early re-opening of the Baltic ports, and, as the Black Sea cargoes are dropping in, the excessive stocks in our seaports on the 1st inst. have had no chance of being diminished, a dull trade has continued during the past week, with prices of Wheat fully 1s. per qr. lower for all sorts. Best Barley steady, other sorts moved off very slowly. The tendency of prices for Oats, Beans, and Peas, has been adverse. Flour was neglected, and where sales were forced prices declined 6s. per barrel and 1s. per sack.

Since Friday last 126 grain and seed laden vessels arrived off the coast, of which, with those left over from last week, there remained for sale last night 89 cargoes. The above cargoes having chiefly arrived during the last day or two, sufficient time has not elapsed for the distribution of samples to the out-ports. Business in Wheat has been to a fair extent during the past week, inferior sorts were sold at a reduction of about 1s. per qr., whilst better qualities, being comparatively scarce, hardly receded in value: Maize was quiet and rather cheaper to sell. Barley was neglected at the beginning of the week, but inquired after at the close: Rye exhibited a drooping tendency throughout. In cargoes on passage and for forward shipment business remains in abeyance.

The arrivals of English Grain and foreign Wheat and Barley are small, and moderate of foreign Oats. There was a poor attendance at market, and the business done in Wheat was of a retail character at about Monday's quotations, prices rather in favour of Buyers. Oats were 6d. per quarter cheaper, other descriptions of spring corn were unchanged in value.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	430	170	-	—
Irish ..	-	-	-	
Foreign ..	7530	4460	21,000	1560 (6500 brls.
	7960	4630	21,000	

LIVERPOOL, January 11. We had a large attendance at our market to-day, and in Wheat a large business took place at a decline of about 2d. per cental on Friday's rates. Flour dull, and 6d. per barrel and sack cheaper. Indian Corn in good request, at a reduction of 3s. per qr. Peas rather easier. Oats and Oatmeal unchanged. Beans 3s. per qr. lower.

AVERAGES.

	Wheat.	Barley.	Oats.
Dec. 4 ..	41s 3d	37s 0d	22s 6d
— 11 ..	43 8	36 2	22 8
— 18 ..	43 10	36 0	22 6
— 25 ..	43 5	35 11	21 10
Jan. 1 ..	44 8	35 9	20 10
— 8 ..	44 5	35 11	20 1
Average ..	43 10	36 1	21 7

SEED MARKET.

No great demand having yet arisen for agricultural seeds, the business done during the week has been small. Samples of new home-grown Clovers are scarce; for the few as yet shown long prices are asked; of fine foreign parcels there is a limited quantity offering. Best white Clover seed is in short supply, and realises high rates. Trefoil seed meets at present with but little attention; new English Alsike is scarce and dear; Italian continues to advance in price. Canary seed is in moderate request at the unusually low values now current. We have a fair demand for Hemp seed. Mustard and Rape seed both maintain the recent advance. Foreign Tares sell slowly at the late decline. Feeding Linseed is without alteration. The Pea trade is this season very bad.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, January 14.

Messrs. Pattenden & Smith report that there is a steady demand for all descriptions, prices being fully maintained. The stock of 1869 English is extremely small, and holders in many instances stand out for higher rates.

THOMSON'S STYPTIC prevents Bleeding in the Vine, and all other Plants. Manufactured and Sold by JOHN YOUNG AND SON, Dalkeith, and may be had of all Nurserymen and Seedsmen. Price 3s. per bottle

GENUINE TOBACCO PAPER, of the finest quality, 10d. per lb., or 8d. per cwt
WILLIAM RUSHFORTH, Nurseryman and Seed Merchant, Leeds.

APPLEBY'S GENUINE TOBACCO PAPER in 2 lb. and 4 lb. packets. Testimonials too numerous for insertion. Price on application to
HENRY APPLEBY (Foreman to Messrs. Ivery & Son, Nurserymen), Dorking, Surrey.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Destributors, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 5, 1868.
Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

Red Spider — Magnified

GISHURST COMPOUND.
Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea, London, S.W.

FOWLER'S PATENT STEAM PLOUGH
TRIAL FOR 1870 to be SEEN at WORK in every Variation of Soil in England.
Full particulars of JOHN FOWLER AND CO., 71, Cornhill, London, E.C., and Steam Plough Works, Leeds.

IRON HURDLES
(SECOND MEDAL of the Royal Agricultural Society):
SHEEP, 5s. 6d.; CATTLE, 4s. 3d.; PONY, 3s. 11d.
Lists free of GATES and FENCING of every description at Parkers Iron Works, Compton Old St. Pancras Road, London, N.W.

Cottam's Iron Hurdles, Fencing, and Gates.

COTTAM'S HURDLES are made in the best manner, of Superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Wrigley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

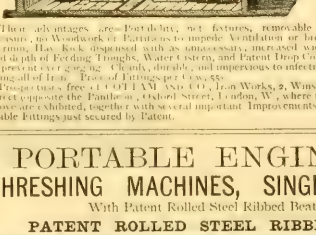

Their advantages are—Portability, not fixtures, removable at pleasure; no Woodwork or Partitions to impede Ventilation or breed Vermin. Has Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cheaply, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Wrigley Street, opposite the Pantheon, Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

Greenhouses and Conservatories.
H. FREEMAN AND SONS, Horticultural Works, 106, Mare Street, Hackney, E. Established 20 years. Good substantially made GREENHOUSES, glazed, ready for fixing, 42 feet long, 11 feet wide, £50; 21 feet by 11 feet, £48; 12½ feet by 10 feet, £28; handsome CONSERVATORY 20 feet by 15 feet, £110. Nurserymen's LIGHTS, £25 per 100 feet.

Glass for Garden Purposes.
JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES

	Each	s	d		Each	s	d
3 inches in diameter	..	0	3½	12 inches in diameter	..	1	0
4 " "	..	0	5½	14 " "	..	2	0
5 " "	..	0	6½	15 " "	..	2	6
6 " "	..	0	8	16 " "	..	3	6
7 " "	..	0	10	17 " "	..	4	6
8 " "	..	1	0	18 " "	..	5	0
9 " "	..	1	2	19 " "	..	6	0
10 " "	..	1	4	20 " "	..	7	0
11 " "	..	1	6				

BEE GLASSES, with ventilating hole through knob

	Each	s	d		Each	s	d
4 inches in diameter	..	0	6d	9 inches in diameter	..	1	8d.
5 " "	..	0	8	10 " "	..	2	0
6 " "	..	0	10	11 " "	..	2	6
7 " "	..	1	1	12 " "	..	3	0
8 " "	..	1	4				

Either flat or conical tops

CUCUMBER GLASSES

	Each	s	d		Each	s	d
24 inches long	..	0	6d	16 inches long	..	1	4d
22 " "	..	1	0	14 " "	..	1	2
20 " "	..	1	2	12 " "	..	0	9
18 " "	..	1	0				

HAND GLASSES, WITH OPEN TOPS

	Each	s	d		Each	s	d
12 inches	..	0	6	20 inches	..	0	10
14 "	..	0	8	22 "	..	1	6
16 "	..	0	9	24 "	..	1	9
18 "	..	0	9				

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS, PAINTS of various colours, ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, FANCY SHEET, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

SHANKS'S PATENT LAWN MOWERS for 1869, The Patent Improvements recently introduced give
SHANKS'S MACHINE.
Several important advantages possessed by no other Lawn Mower
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The unprecedented Sale for 1868, notwithstanding the Dryness of the Season, forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

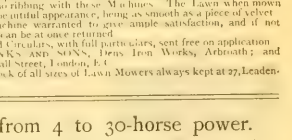

ALEXANDER SHANKS & SON have for some time past been making the Knife-edge Cutter of their Machines Self-sharpening: that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application.
ALEX. SHANKS AND SON'S Works, Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.
N.B. A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

PORTABLE ENGINES, from 4 to 30-horse power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,
With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.
PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

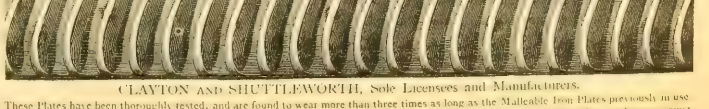

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.
These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.
CLAYTON AND SHUTTLEWORTH are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to
CLAYTON AND SHUTTLEWORTH,
STAMP END WORKS, LINCOLN, or, 78, LOMBARD STREET, LONDON, E.C.

CARTER'S "PRIZE MEDAL" GRASS SEEDS.

J. C. AND CO. having secured their immense Stock of NATURAL GRASSES in splendid condition, are prepared to execute orders for Grass Seeds for Pastures, Lawns, &c.

The germinating quality (after most careful testing) is assured to be first-rate; and, from the great pains taken by Messrs. CARTER to adapt the Mixtures of Grasses to suit the particular nature of the soil intended to be laid down, the possibility of failure can scarcely be entertained.

It is only necessary when ordering to give a general description of the soil, situation, &c.

CARTER'S GRASS SEEDS FOR PERMANENT PASTURES (choicest quality).

For HEAVY SOILS, **28s.** to **32s.** per acre. | For LIGHT SOILS, **28s.** to **32s.** per acre. | For MEDIUM SOILS, **28s.** to **32s.** per acre.

Second quality cheaper. Reduced rates for more than 10 Acres.

CARTER'S "ROYAL MIXTURE" FOR LAWNS, 20s. per bushel; 1s. per lb.

(As used in the chief European Royal Gardens). Sow 3 bushels per acre.

For the fullest information to insure successful Seeding down Land to Grass, see ESSAY in

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM for 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

NEW SEED POTATOS.

THE ASH-TOP FLUKE POTATO.

JAMES CARTER AND CO. are now prepared to execute orders for this Potato, which has proved its claim to rank with the best varieties in general use.

"I wish to inform you that I have dug up the Ash-top Fluke Potatos that you sent me, and, although it has been such a dry season, I am very much pleased with them."—THOMAS HOLLAND, *Gardener, Hethersett Park*, 1868.

"I am perfectly satisfied with the Ash-top Fluke Potato."—F. GATES, Esq., *Derby, February* 20, 1869.

☞ This variety has now been before the Public for three years, and the general demand for it, both in private Gardens and amongst the Cornish Growers for market, stamps it as one of the best sorts in cultivation.

Price, per peck, 11s. Much cheaper in large quantities.

The EARLY ROSE POTATO, BRESEE'S PROLIFIC POTATO, THE CLIMAX POTATO, } New American varieties, imported direct from the raiser. { per lb., **1s. 6d.**; 7 lb., **9s.**; 56 lb., **65s.** **3s.** per lb. **3s.** per lb.

For full DESCRIPTIVE CATALOGUE of POTATOS and GARDEN SEEDS, see

CARTER'S ILLUSTRATED GARDENER'S and FARMER'S VADE MECUM for 1870,

Post Free, One Shilling. Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 AND 238, HIGH HOLBORN, W.C.

PORTABLE AND FIXED HOT-WATER APPARATUS,

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

TRUSS'S PATENT UNIVERSAL FLEXIBLE AND LEAKLESS PIPE-JOINTS.

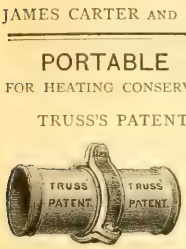

T. S. TRUSS

Begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the ROYAL HORTICULTURAL SOCIETY at SOUTH KENSINGTON and CHISWICK, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantages obtained by his IMPROVED SYSTEM cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; EFFECTS a SAVING of 25 PER CENT. on cost of Apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; can be erected by any Gardener; an ordinary size Apparatus erected in one day; and PERFECTNESS of DESIGN SUPPLIED, INSURING NO EXTRAS. Complete Apparatus, of the best materials, delivered to any Railway Station in England, and Erected at the following prices. Erection beyond 25 miles of London, railway fare for one man additional. Considerable reduction on large works.

Two Four-inch Pipes along One Side and One End of House.

Size of House	Apparatus Complete	Erection	Size of House	Apparatus Complete	Erection
20 feet by 10 feet	£6 0 0	£2 0 0	50 feet by 15 feet	£17 10 0	£3 0 0
30 feet by 12 feet	11 15 0	2 10 0	75 feet by 15 feet	20 0 0	3 0 0
40 feet by 15 feet	15 0 0	2 15 0	100 feet by 15 feet	26 0 0	3 5 0

Bath and Gas Work Erected in Town or Country. The TRADE SUPPLIED.

Price Lists, Plans, and Estimates forwarded on application to

T. S. TRUSS, C.E., CONSULTING HORTICULTURAL ENGINEER, &c., SOLE MANUFACTURER, IRON MERCHANT, HOT-WATER APPARATUS MANUFACTURER, AND HORTICULTURAL BUILDER, FRIAR STREET, BLACKFRIARS ROAD, LONDON, S.E.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or equivalent.

	2-inch.	3-inch.	4-inch.
HOT-WATER PIPES, Nos. 6 & 7 on illus.	2 d.	3 d.	4 d.
Trade Sheet .. .. .. per yard	0 11	1 5	1 11
ELBOWS .. .. No. 12 on illus. each	1 4	2 1	2 9
TEE PIPES .. .. No. 13 on illus. "	2 0	3 0	4 0
SYPHONS .. .. No. 21 & 22 on "	1 9	3 0	4 0
VALVES .. .. .. "	10 0	11 0	12 0

GEORGE ROBINSON, Tee Iron Works, Stourbridge.
London Warehouse, 10, Grand Junction Wharf, Paddington Basin.

W. H. LASCELLES' MACHINE-MADE

MILTON LIGHTS	Each.
6 ft. by 4 ft. Lights, 21 in. thick, unglazed .. £0	5 0
" " Painted and Glazed with 10 oz. Sheet	0 11 0
" " with stout portable Box, not Painted	1 3 0
" " Painted four coats, and Handles on	1 8 0
" " Packed and Delivered in Railway Van	1 10 0
6 ft. by 8 ft., Double Lights, do	2 15 0
GREENHOUSES	Per ft. super
Woodwork only Prepared and Painted	0 0 6
" Ditto, not Glazed with 10 oz. Sheet ..	0 0 9
" Delivered, and Fixed with Ironwork	0 1 0
" Portable Hot-water Greenhouses, ready for use ..	0 1 3

Timber Stock Yard, Works, 121, Bunhill Row, E.C.

Hothouses for the Million.—Notice of Removal.

MESSRS. HEREMAN AND MORTON beg to give notice to their Patrons and the Public that in consequence of the Railway Company's Improvements, Bull-Mall Yard being required for other purposes, they have taken larger rooms at 14, PICTHORNE STREET, PIMLICO, S.W., to which address *only* all applications for Estimates of new FRANCONIAN HOTHOUSES, and other hot-water Heating Apparatus, are to be sent. The Heating and Building Apparatus will be ready for use, as usual, in the autumn.

A PAMPHLET and PRICE LIST, 8vo, with 15 illustrations, descriptive of the Hothouses, will be sent (free on receipt of two stamps).

A HANDBOOK OF VINE and PEACH TREE CULTIVATION, with Woodcuts and Plans of Houses, Hints for Heating, complete Lists of Trees, &c., by S. HEREMAN, Chatsworth, post free for 13 stamps.

HEREMAN AND MORTON, Horticultural Builders and Hot-water Engineers. Country Works in Gloucester, Coventry, near Chesterton, Tarsley, and Aberdeen.

Established Fifty Years.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 1851, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.

Strong ZINC HAND-GLASSES, all sizes.

References to the Nobility, Gentry, and Trade in most of the Counties in England.

Preserve your Wall-fruit Trees from Spring Frosts.

EVERYONE MAY FIX HIS OWN WALL-COVER

BEARDS PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Victoria Works by C. BEARD, Horticultural Engineer, Bury St. Edmunds, Suffolk.

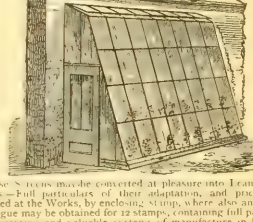

These Screens may be converted at pleasure into Lean-to or Span-houses.—Full particulars of their adaptation, and price, may be obtained at the Works, by enclosing Stamp, where also an Illustrated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable existence of manufacture in both patent glazing and ventilation.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

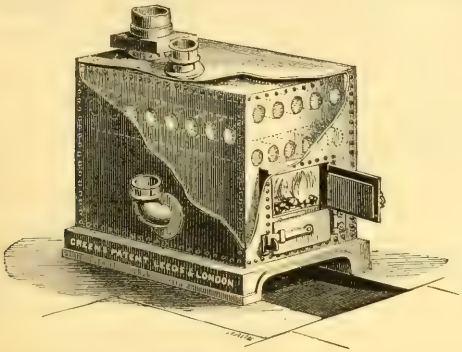

OBLONG BOILER.

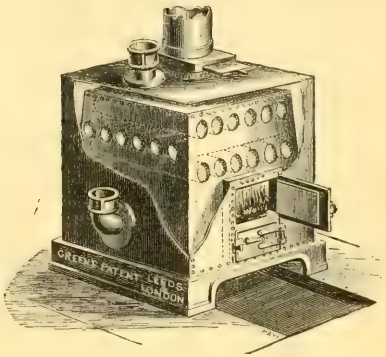

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS;
and 54 & 55, BLACKFRIARS ROAD, LONDON, S.E.

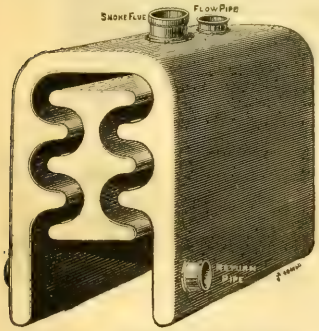

ORMSON'S PATENT CONVOLUTED BOILER.

NOTICE.

ROYAL GARDENS, KEW.

The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by HENRY ORMSON as a specimen of his first-class and substantial style of building Horticultural Structures. Also his Patent Wrought-iron Boilers, by which the new Hothouses, and many other Buildings are heated on a very extensive scale in the above great establishment.

Confidence in Cast-iron Boilers is now, to a very great extent, lost in consequence of their continual cracking and failing, and are being replaced by ORMSON'S PATENT WELDED WROUGHT-IRON BOILERS, which are not only free from all danger of cracking, but have proved themselves far more economical in consumption of fuel.

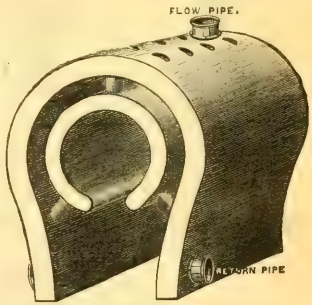

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

HOTHOUSES MANUFACTURED BY STEAM MACHINERY. BEST MATERIALS AND LOWEST PRICES.

Plans, Specifications, and Estimates for Erecting Conservatories, Hothouses, and Hot-water Apparatus of every description in all parts of the country and abroad.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,
AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.
STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
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Manufactory, 6, Banksyde, Southwark

TANNED GARDEN NETTING, for Preserving Seed Beds, Fruit, Strawberries, from Frost, Blight, Birds, &c., and as a Fence for Fowls, &c. One yard wide, 1d.; two yards, 2d.; three yards, 3d.; and four yards, 4d. per yard in any quantity. May be had of CHAS. WRIGHT AND CO., William Street, Newark-on-Trent, or their Agents, Messrs. HOOPER AND CO., Covent Garden Market, London, W.C.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.
The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature when it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS.
"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
"FRIGI DOMO" CANVAS.
Two yards wide .. .. 1s. 9d. per yard run.
Four yards wide .. .. 3s. 6d. per yard.
An improved make, 2 yards wide .. 1s. 6d. per yard.
An improved make, 3 yards wide .. 2s. 8d. per yard run.
Scrim Canvas, 72 inches wide, 70 yards long, 5½d., 6½d., 7½d., 7½d. and 8½d. per yard.
Hessian Canvas, 54 and 72 inches wide, 6½d. and 8½d. per yard; 1d. extra for cut lengths.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom.

Vases and Fountains, for the Garden and Conservatory.

ANDREW HANDYSIDE AND CO.,
Britannia Foundry, Derby [32, Wallbrook, London
The Britannia Iron Works have for the last 30 years been well known for the production of fine Iron Castings. The use of Cast iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra-cotta. Cast-iron Vases, if occasionally painted, are imperishable, and will not crack when exposed to wet or frosty weather.

Five large Sheets of Designs and Price Lists post free for 6 stamps.
A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 29, Oxford Street, Manchester

TRELOAR'S FINE COCOA-NUT MATTING, warranted unbleached. No other kind is durable,—all other kinds are dear. Catalogues free by post.
T. TRELOAR, Manufacturer, 67, Ludgate Hill, E.C.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.
S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years

GRAY'S OVAL TUBULAR BOILER.

INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his
NEW OVAL TUBULAR BOILER.
Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report on GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*
"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

ST. PANCRAS IRON-WORK COMPANY.

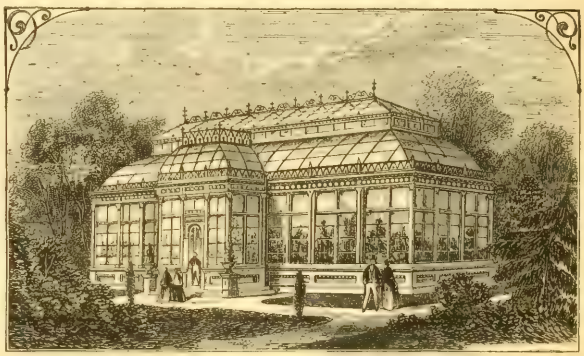

CONSERVATORIES, GREENHOUSES, &c.
ARCHITECTS' DESIGNS CAREFULLY CARRIED OUT.
APPLY FOR ESTIMATES TO
OLD SAINT PANCRAS ROAD, LONDON, N.W.

T. H. P. DENNIS & COMPANY, PATENTEES,
HORTICULTURAL ENGINEERS AND BUILDERS IN WOOD AND IRON.

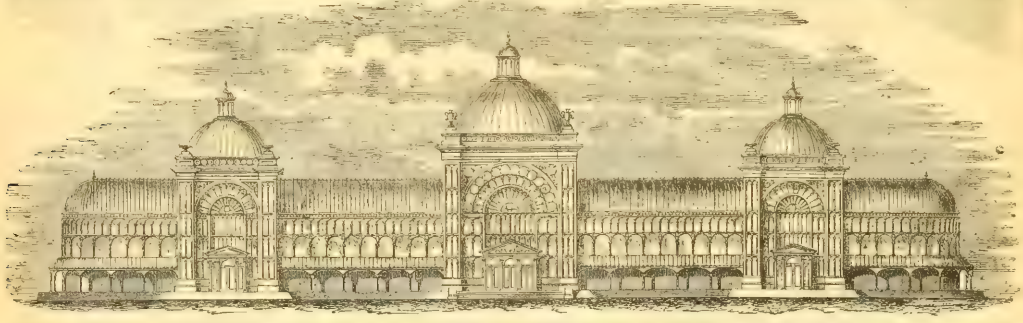

T. H. P. DENNIS AND COMPANY beg to direct the attention of Noblemen, Gentlemen, Nurserymen, and Gardeners, to the many and varied improvements they have made in every description of Horticultural Erections. They continue to Manufacture Buildings of the highest order in Wood, Galvanized Metal, and their HIGHLY APPROVED Patent Wrought Iron Construction. They have much pleasure in announcing that by the aid of modern appliances, in their Manufactory, all kinds of Horticultural Building will be supplied at the most moderate prices consistent with the high standard of their workmanship. Every description of Garden Structure arranged, designed, and heated on T. H. P. D. AND CO.'S improved system, will be guaranteed to fully answer the purpose for which they are intended.

Gentlemen waited upon by Members of the Firm to advise and arrange for contemplated Buildings.

Our NEW HOT-WATER BOILER and other Specialities and Patented arrangements are described in other Advertisements, and also in our Catalogue, which may be had on application.

ANCHOR IRON WORKS, CHELMSFORD.

"Every Cottage should be provided with a Water Tank." *Dinradli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (Iza Wharf), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

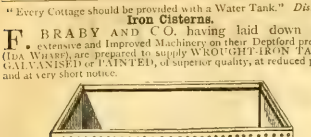

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.

F. BRABY AND CO., Limited, Pitfrey Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage

Rosher's Garden Edging Tiles.

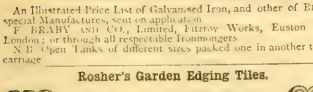

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and do not cut down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper

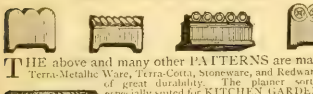

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F. & G. ROSHER, Manufacturers, Upper Ground Road, Blackfriars, S.E. Queen's Road West, Chelsea, S.W. Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs Likewise more elaborate designs Pattern Sheets of Pavement, with prices, forwarded for stamped envelope

WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c Grooved and Chit Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slabs, Cements, &c.

To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—

14s per Ton, 1s 6d per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf Quantities of 4 Tons, 1s per Ton less. As coarse grained Sand 4s per Ton more. Samples of Sand by post on receipt of stamp

FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates

F. & G. ROSHER.—Addresses see above.

N.B. Orders promptly executed by Railway or Vessel. A liberal discount to the Trade

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.

NEW LISTS for ORCHARD HOUSE GLASS, as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in.	in.		4ths	3rds	2nds	Best.
20 by 12	to					
20 by 13	to		15 0/	12s 3d	15s 6d	16s 9d 18s 0d
20 by 14	to	Per 100 feet				
20 by 15	to		21 0/	18s 0d	20s 0d	22s 0d 24s 0d
20 by 16	to					

SMALL SHEET SQUARES, 15 oz., per 100 feet

in.	in	in	in.	in	in	4ths	3ds	2nds	Best
6 by 4	7 by 5	8 by 6	9 by 7	10 by 8	12 by 9	12s 3d	12s 6d	14s 0d	15s 6d
6 by 4½	7½ by 5½	8½ by 6½	9½ by 7½						
Per 100 feet.									
10 by 8	12 by 9	12½ by 10	14½ by 10½						
10½ by 8½	12½ by 9½	13 by 10	14½ by 11			11s 9d	14s 9d	15s 3d	17s 6d
11 by 9	13 by 10	14 by 10½	15 by 11						
11½ by 9½	13½ by 10	14 by 10	14½ by 11						

LARGE SHEET SQUARES, 15 oz., per 100 feet

in	in	in	in	in	in	4ths	3ds.	2nds.	Best
15½ by 10½	14 by 12	15 by 11	16 by 12	17 by 12	18 by 12				
15½ by 11½	14 by 12½	15 by 12	16 by 12½	17 by 13	18 by 13				
14½ by 11½	15 by 12	15 by 12½	16 by 13	17 by 13	20 by 17				
15 by 11	15½ by 12½	16 by 13	17 by 14	18 by 14	22 by 17	12s 3d	15s 6d	16s 9d	18s 0d
15 by 11½	15½ by 12	16 by 12½	17 by 13	18 by 13	22 by 17				
16 by 11	16½ by 12½	17 by 13	18 by 14	20 by 14	20 by 18				
16 by 11	17 by 12	18 by 12	19 by 13	20 by 14	22 by 15				
16 by 11½	17 by 12	18 by 12½	19 by 13	20 by 14	22 by 18				

The above Prices are only for the Sizes stated; if a quantity of any other Size be required, a Special Price will be given.

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15 oz.			21 oz.
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3ds " "	42s.	3ds " "	42s.
2nds " "	52s.	2nds " "	62s.
Best " "	75s.	Best " "	75s.

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	Per cwt.	Per gallon —s. d.
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SECONDS WHITE LEAD	28 0	BOILED OIL 3 2
GROUND PATENT DRY-		TURPENTINE 2 9
ERS, 3d to 4½d per lb.		LINSEED OIL PUTTY,
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to 4½d. per lb.		Finest OIL VARNISH, 10s. to 12 0
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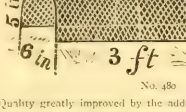

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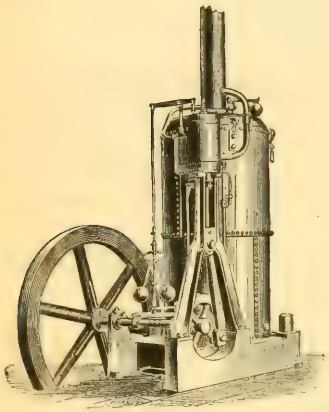

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4	"	5⅛	12	"	7 " 0	2 " 4	.. ..	£85
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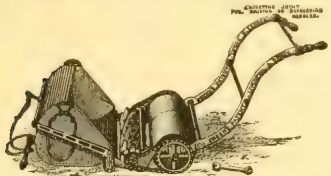

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AND
AGRICULTURAL GAZETTE.

No. 4.—1870.] SATURDAY, JANUARY 22. { Price Fivepence. *Stamped Edition, 6d.*

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LEEDS (SPRING) FLOWER SHOW will be held in the Leeds Royal Park on EASTER MONDAY, TUESDAY, and WEDNESDAY, April 18, 19, and 20 As this will be the first Spring Show held in Leeds, I shall be glad to receive suggestions either as to entries, classes, or prizes, so that the Show may be satisfactory in every respect. Schedules will therefore not be issued until the end of January.
Leeds Royal Park. THOMAS CLAPHAM, Proprietor

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870, JUNE 3 to 10. ONE THOUSAND POUNDS in PRIZES. To be held in the BOTANIC GARDENS, MANCHESTER Schedules are ready, and can be had on application to the Undersigned
Botanic Gardens, Manchester. BRUCE FINDLAY

LOUGHBOROUGH HORTICULTURAL SOCIETY SPECIAL PRIZES for ROSES.
Prizes amounting to £50 will be given for Roses alone. Prizes over 20 Guineas are offered for the best 12 Stove and Greenhouse Plants.
The Exhibition will be held on JULY 12. Full information may be had from WM PALLETT, Secretary

R. B. HAZLETT, BAKER, Foot's Cray, would feel obliged if any one would INFORM him where JAMES OSBORN is LIVING (late Gardener to Viscount Sydney, Frognal).

Transit Agency for Plants, Seeds, &c.
CHAS. JOS. BLACKITH, only surviving Partner of the late firm of BLACKITH and BLACKITH, begs to announce that he intends in future to conduct Business at the same address, under the style of CHAS. JOS. BLACKITH and CO., and hopes to receive a continuance of his favours of the Trade.
Cox's and Blackwall's Quays, Near Thames Street, London.—Jan. 3.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

DOBSON and SONS' PRIZE FLOWER SEEDS are second to none in quality.

CALCEOLARIA.—Seeded packets, 1*s.* 6*d.*, 2*s.* 6*d.*, 5*s.* 6*d.*, and 5*s.* First Prizes, Crystal Palace, Horticultural, Botanic and Reading, &c.

CINERARIA.—1*s.*, 2*s.* 6*d.*, and 5*s.* Sixty First Prizes in six years.

PRIMULA SINENSIS FIMBRIATA RUBRA and ALBA. Separate, 2*s.* 6*d* and 5*s* ; mixed, 1*s.*, 2*s* 6*d.*, and 5*s*

BALSAM.—A particularly fine strain ; eight varieties, 2*s* ; mixed, 1*s*

CYCLAMEN PERSICUM and Varieties, 1*s.* and 2*s* 6*d*

SCARLET INTERMEDIATE STOCK, very double, and rich in colour ; 6*d* and 1*s.*

SUPPLIED by 300 Leading Seedsmen and the Trade. J. DOBSON and SONS, Woodlands Nursery, Isleworth, London, W.

DOBSON and SONS' SEED CATALOGUE, gratis and post free.—Woodlands Nursery, Isleworth, W.

RHODODENDRON SEED (clean new seed). Price upon application to
JAMES DICKSON and SON, 102, Eastgate Street, and Newton Nurseries, Chester.

STUART and CO., SEED GROWERS, Nice—SEED MERCHANTS, 5, Tavistock Row, Covent Garden, London, W.C. (REMOVED from 85, Southampton Row.)
WHOLESALE LIST sent free on application.

TUBEROSES.—Splendid roots, just ready, price 3*s.* per dozen ; extra picked bulbs, 6*s.* per dozen. Plenty for the Trade. Prices on application to
HOOPER and CO., Seedsmen, Covent Garden, London, W.C.

English Oak.—Special Offer.
W. ABRAHAM and SON, of the Goldworth Nurseries, Woking, Surrey (late R. Donald & Son), offer 80,000 clean grown ENGLISH OAK, 2 to 2½ feet, at 15*s.* per 1000 ; al o 3000, 5 to 6 feet, at 12*s.* per 100, for cash. Apply as above.

CARTER'S GENUINE SEEDS. See pages 99 and 102 237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See pages 99 and 102 237 and 238, High Holborn, London, W C

CARTER'S GRASS SEEDS. See pages 99 and 102. 237 and 238, High Holborn, London, W C

CARTER'S NEW PEAS for 1870. See pages 99 and 102. 237 and 238, High Holborn, London, W C

CARTER'S SELECTED SEED POTATOS. See pages 99 and 102.—237 and 238, High Holborn, London, W C

CARTER'S GENUINE SEEDS. See pages 99 and 102. 237 and 238, High Holborn, London, W.C

Rose Catalogue.
JOHN CRANSTON'S ROSE CATALOGUE for 1869 is now ready, and will be sent post free on application.
The Nurseries, King's Acre, near Hereford.

The Roses of the Season are those of
PAUL AND SON, The Old Nurseries, Cheshunt, N.
PRICED DESCRIPTIVE LIST post free on application.

RICHARD SMITH'S ROSE LIST, containing all the leading and most popular kinds of Roses, may be had free by post.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

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WM. PAUL has a few thousand MANETTI STOCKS, extra fine, to offer in the Trade. Price, low, given on application. Waltham Cross, London, N.

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For immediate use, 30*s* per 1000.
For summer use, second size, 25*s* per 1000.
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MESSRS. HAWKINS AND BENNETT, FLORISTS, Twickenham, S.W., have a quantity of the above to dispose of Price per yard upon application

GIANT VIOLETS. — Large free-flowering Plants, highly scented, to be had of
Messrs. HAWKINS AND BENNETT, Florists, Twickenham, S.W.

Verbenas, Verbenas.
PHILIP LADDS is now sending out 30 new varieties of VERBENAS of 1869 at 2*s.* per dozen, in pots; also 24 New FUCHSIAS of 1869 at 3*s.* per dozen, in pots.
Nursery Bexley Heath, Kent

To the Trade.—Show Pansy Seed.
DOWNIE, LAIRD, AND LAING, Edinburgh, have to offer a limited quantity of the above, saved from their own celebrated Collection Price per ounce on application

Golden Champion Grape.
OSBORN AND SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it Price 10*s.* 6*d.*, 21*s.*, and 30*s* each.
Fulham Nursery, London, S.W.

Grape Vines.
B. S. WILLIAMS' stock is remarkably fine, and in good condition. Can supply all the best kinds. Prices on application
Victoria and Paradise Nurseries, Upper Holloway, London, N.

Pines.
B. S. WILLIAMS has all the best kinds, in splendid condition, warranted clean. Prices on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

VINES WANTED.—A lot of BLACK HAMBURGH VINES, for cutting down, required, to grow for another season Anyone having such on hand, to sell cheap, may hear of a Customer by applying to
X P, Messrs. Hurst, Leadenhall Street, London, E.C.

Apples.
J. SCOTT, Merriott, Somerset, has still on hand a few bushels of best DESSERT APPLES only, at 8*s* per bushel

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, Vines, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

CHRISTMAS TREES.—Very handsome SPRUCE FIRS, 4 to 5 feet high, 30*s* per dozen.
RICHARD SMITH, Nurseryman, Worcester.

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (See Dr. Hooker, "Botanical Magazine," No. 285) Price 10*s.* 6*d.* each; in quantity, a special price will be given The honour of importation for this is to Mr. Fortune; the honour of distribution (in England) to CHARLES NOBLE, of whom fine plants can be obtained.—Bagshot, Jan 20

SCARLET DOGWOOD, so valuable for Game Covers, as Hares or Rabbits do not eat it, may be had at half the usual price (carriage to be paid) from
L. T. DAVIS, Ogle's Grove Nursery, Hillsborough, Co. Down.

SUTTONS' £3 3*s.* COLLECTION of GARDEN SEEDS, for a large Garden, carriage free.

SUTTONS' £2 2*s.* COLLECTION of GARDEN SEEDS, for a moderate large Garden, carriage free.

SUTTONS' £1 1*s.* COLLECTION of GARDEN SEEDS, for an ordinary-sized Garden, carriage free.

SUTTONS' 12*s.* 6*d.* COLLECTION of GARDEN SEEDS, for a small Garden.

Gladiolus Brenchleyensis.—To the Trade.
JAMES CARTER, DUNNETT, and BEALE have a fine stock of flowering Bulbs. Lowest price per 1000 on application.
237 and 238, High Holborn, London, W.C.

To the Trade.—Continental Flower Seeds, &c.
GEO. MACINTOSH (Agent to F. W. WENDEL, Seed Grower, &c., Erfurt, Prussia) begs to announce that he is now prepared to receive orders for the above. CATALOGUES free on application. High Road, Hammersmith, London, W.

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WM. PAUL has to offer a magnificent lot of the above, Dutch-grown roots, at 2*s.* 6*d.*, 3*s.* 6*d.*, and 5*s* each; 21*s.*, 30*s.*, and 50*s.* per dozen; a few extra large roots, 7*s.* 6*d* each The usual discount to the Trade off the dozen rates when ordered by the dozen.
PAUL'S Nurseries, Waltham Cross, London, N.

Betteridge's Superb Quilled Asters.
CHARLES TURNER begs to offer new seed of the above Exhibition ASTERS, in collections of 12 varieties, including the fine new variety, OXONIAN, 5*s.*
The Royal Nurseries, Slough

1870.—VEGETABLE and FLOWER SEEDS. PRICED CATALOGUE post free on application
JAMES DICKSON and SONS, Seed Merchants, &c., "Newton" Nurseries, and 102, Eastgate Street, Chester.

HERBERT H. NICHOLSON, SEED GROWER, Great Clacton, near St. Osyth, Essex, has a large quantity of FLOWER and VEGETABLE SEEDS, of his own growing, all new, FOR SALE Lists on application

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

Garden Seeds.
CHARLES SHARPE and CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown from carefully selected stocks.

Farm Seeds.
CHARLES SHARPE and CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks.

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CHARLES TURNER'S CATALOGUE of KITCHEN GARDEN, FARM and FLOWER SEEDS is now ready, and may be had on application. This List contains only such varieties as may be depended on, after trials and comparisons.
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WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

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H. AND F. SHARPE'S WHOLESALE CATALOGUE of HOME-GROWN SEEDS is now ready. The prices are very low, and the quality of the Seeds very fine.
Seed Growing Establishment, Wisbech.

SUTTONS' GRASS SEEDS for ALL SOILS. For prices and particulars, see back outside page of this week's *Gardeners' Chronicle*
SUTTON and SONS, Seedsmen to the Queen, Reading.

For Seed.
HALLETT'S | TRADE PEDIGREE MARK. | BARLEY and OATS.

See Advertisement on page 115 of this Paper.

WANTED, a quantity of VICTORIA RHUBARB Stools Apply to
A. AND F. BATH, Colgates Farm, Halstead, Seven Oaks, Kent.

To the Trade.—Henry's Hybrid Leek, Genuine.
DOWNIE, LAIRD, AND LAING are now sending out the above unrivalled LEEK, in sealed packets, at 6*d.* per dozen, or 4*os.* per 100 packets.
Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

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RICHARD WALKER can supply, for cash, a home-grown WHITE SPANISH ONION SEED, 2*s.* per lb., all new and genuine; mixed laced PINKS, 20*s.* per 100; old Crimson CLOVES, 10*s* per 100.
RICHARD WALKER has the following to offer, for cash: splendid SEAKALE, for forcing, extra fine, 9*s.* per 100; fine GREEN ASPARAGUS 5*s.* 6*d* per 1000, 4*s* per 1000, or 3*s.* per 100; SEAKALE, for planting, 3*s* 6*d* per 100
Biggleswade Market Gardens.

YORKSHIRE HERO PEA, 2½ feet, fine flavour, splendid cropper, does not require sticking. Price 1*s* 6*d.* per quart, or 5*s.* per gallon. A reference must accompany all orders.
Mr JAMES NEATE, Market Lavington, Wilts.

To the Trade.
WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and BADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

RIVERS' ROYAL ASHLEAF SEED POTATOS, thoroughly true. A few Sacks to Dispose of, cheap.
J. SPAVEN, Stud House, Hampton Court, Middlesex, S.W.

SEED POTATOS (SELECTED). PRICE LIST on application.
JAMES DICKSON and SONS, "Newton" Nurseries, Chester.

True Early Rose Potato.
CHARLES SHARPE and CO., Sleaford, have received a large consignment of the above from America, and are able to offer them in quantity. Price on application.

POTATOS.—A fine sample of Paterson's Victoria, clean and true to name, at 6*s* per ton, delivered at Raskelf Station, North-Eastern Railway. No order executed under one Ton.
PETER STEVENSON, Jun., Rainton, Thirsk.

POTATOS.—1000 bushels of the finest sorts in cultivation. See List and Price of 10 to 20 sorts.
WM. DILLISTONE, Nurseries, Sible Redingham, Essex.
N B 10,000 ROSE BRIERS to spare.

PATERSON'S VICTORIA POTATOS won the First Prize at the Staffordshire Agricultural Show; First Prize and Highly Commended for the Second at the Birmingham Show. Price 5*s.* per 56 lb Also a few MILKY WHITES, 7*s.* per 56 lb.
Mr. PEARCE, Measham, Atherstone.

To Nurserymen.
FOR SALE, 8 Tons of MYATT'S PROLIFIC POTATOS, very true; price £2 2*s.* per ton, cash. Also 28 Bushels of HALL'S WESTBURY SWEDE TURNIP SEEDS (fine stock), price 18*s.* per bushel
G. WILKINSON, Skirbeck, Boston

SEEDS OF STERLING MERIT.

MESSRS. VEITCH & SONS

DESIRE TO DIRECT PARTICULAR ATTENTION TO THE FOLLOWING

CHOICE VEGETABLE AND FLOWER SEEDS.

VEGETABLE SEEDS.

BEET, DELL'S CRIMSON.—A very handsome medium-sized variety, of deep red colour and excellent flavour. The foliage, which is of an intensely bronzy purple shade, renders it also one of the very best for bedding purposes .. .. Per packet, 1s.

BORECOLE, VEITCH'S DWARF LATE CURLED.—This excellent and very hardy variety, which comes in much later than the ordinary Dwarf Green, is of dwarf habit, and beautifully curled. It stands the coldest seasons uninjured, and we cannot too strongly recommend it .. .. Per packet, 1s.

BROCCOLI, LAUDER'S GOSHEN SUPERB LATE WHITE PROTECTING. A splendid late variety, heading as late as June, pure white, and very hardy; strongly recommended to us by Mr. Thomson, of Dalkeith Gardens .. ..Per packet, 2s. 6d.

BROCCOLI, SNOW'S SUPERB WINTER WHITE.—Guaranteed true. The best winter variety in cultivation .. .. Per oz., 6s.; per packet, 1s. 6d.

CAULIFLOWER, VEITCH'S AUTUMN GIANT.—This new and extremely valuable late variety is perfectly distinct from any other sort. The leaves are long and tapering, and the habit of the plant is robust, but very upright and compact. The heads are magnificent, beautifully white, large, firm, and compact, and being thoroughly protected by the foliage, remain longer fit for use than any other sort. If sown in May it will succeed the Walcheren, and coming in between that variety and Snow's Winter Broccoli, will be a great acquisition to all gardens. We cannot too strongly recommend it .. .. Per packet, 2s. 6d.

CELERY, VEITCH'S SILVER WHITE.—A variety of excellent flavour, beautifully solid and crisp, of medium growth, and very hardy, withstanding the wet when other varieties have perished .. .. Per packet, 1s.

CUCUMBER, DALE'S CONQUEROR (WHITE SPINE).—As an exhibition variety unequalled; length from 2 feet 8 inches to 3 feet, flesh of excellent quality; has received many first prizes. A gardener who was awarded four first prizes for this sort during the past summer, writes us to say, "it is the best and most productive Cucumber for summer work I have ever seen." .. .. Per packet, 1s. 6d.

CUCUMBER, MASTERS' PROLIFIC.—Without doubt one of the finest Cucumbers in cultivation, being equally suitable for summer or winter growing; very free bearing, and of excellent quality. It is a seedling from the Sion House, but much more prolific, and of a hardier constitution than that variety. The fruit, which averages from 12 to 15 inches in length, is very handsome, and the handle remarkably short .. .. Per packet, 1s.

ENDIVE, FRASER'S IMPROVED BROAD-LEAVED.—An excellent large variety of great hardiness, being invaluable for winter cultivation .. .. Per oz., 1s.

LETTUCE, HICKS' HARDY WHITE COS.—A splendid variety, very hardy, large, and crisp; stands a long time, and is well adapted for either spring or autumn sowing; strongly recommended .. .. Per oz., 1s. 6d.

MELON, QUEEN EMMA.—A remarkably handsome fine flavoured variety, obtained from the Heckfield Hybrid Melon, crossed with Meredith's Cashmere. The flesh is almost white, exceedingly melting and juicy, and with a very thin rind. Its constitution is excellent, and it will be found a very desirable variety, whether for exhibition or dessert .. .. ..Per packet, 1s. 6d.

PEA, LAXTON'S SUPREME.—A Green Marrow of excellent quality, with very long, well filled, curved pods. Described by the growers as "a grand Pea," attaining a height of about 6 feet, and as early as Daniel O'Rourke. It has received a First-class Certificate from the Royal Horticultural Society .. .. Per pint, 4s. 6d.; per half pint, 2s. 6d.

TURNIP, VEITCH'S RED GLOBE.—This excellent variety should be grown in every garden. It is far superior to the Red American Stone, both in flavour and shape, and has the additional very great advantage of remaining a long time fit for use Per oz., 6d.; per pint, 3s. 6d.

POTATO, VEITCH'S IMPROVED EARLY ASH-LEAF KIDNEY.—We desire again to direct attention to this excellent variety, respecting which we have received many very flattering testimonials during the past summer. It is quite distinct from every other sort, and may fairly be described as the best Ash-Leaf Kidney in cultivation, being a very heavy cropper, of excellent quality, and a first-rate forcer. As the stock is very limited, early orders are necessary to secure a supply .. .. Per peck, 5s.

COLLECTIONS of VEGETABLE SEEDS at 10s. 6d., 21s., 42s., 63s., and 105s. each. In all respects similar to those advertised by other Firms.

COLLECTIONS of GARDEN SEEDS for Cottagers' Gardens, Schools, &c.

J. V. AND SONS will be happy to supply those on very liberal terms, and will have much pleasure in forwarding prices on application.

FLOWER SEEDS.

ASTER GIANT PÆONY-FLOWERED PERFECTION.—An excellent new variety, combining the best qualities of the Giant Emperor and Truffaut's Pæony-flowered Asters. The flowers not only attain but even exceed in size those of the Giant Emperor, while at the same time they are full, double, and of the perfect Pæony form.
Finest mixed, per packet, 1s.; collection of eight distinct colours, 2s. 6d.

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DAHLIA IMPERIALIS.—A magnificent foliage plant, of noble appearance, attaining a height of 12 feet. It is also exceedingly ornamental as a late flowering conservatory decorative plant, each of its numerous branches terminating with a grand paniculate inflorescence of beautiful white flowers. See *Gardeners' Chronicle* of April 11, 1868, p. 380 .. Per packet, 1s. and 2s. 6d.

DELPHINIUM CONSOLIDA CANDELABRUM, fl.-pl.—Quite a new and very elegant dwarf race of Larkspurs, growing to a height of about 1 foot. Close to the ground the stem throws out beautifully curved branches, which diminish in length as they approach the top of the principal spike, thus giving the whole plant the appearance of a candelabra.
Mixed colours, per packet, 1s.; collection of 6 colours, separate, 4s.

DIANTHUS HEDDEWIGII DIADEMATUS, fl.-pl. (Double Diadem Pink).—A splendid and striking variety, of luxuriant but dwarf and compact growth. The flowers, which have a diameter of 2 to 3 inches, are very regular and densely double, comprising all shades of colour, from lilac, crimson, and purple, to deepest black purple, each petal consisting of two distinct zones, surrounded by an elegant white or light coloured edge .. .. Per packet, 1s.

PHLOX DRUMMONDII HEYNHOLDII (True Scarlet Phlox).—A splendid novelty, of very compact habit, and which will prove most useful either for bedding purposes or pot culture. This variety is quite distinct from the one already known under the name of "coccinea." .. .. Per packet, 1s. 6d.

PRIMULA SINENSIS FIMBRIATA PUNCTATA ELEGANTISSIMA.—A beautiful new, quite distinct, and constant variety; a really fine addition to those already in cultivation. Its flowers are deep velvety crimson, strongly fringed, and regularly marked at the borders with small snow white spots .. ..Per packet, 2s. 6d.

RESEDA ODORATA MELIORATA (Improved Large-flowered Pyramidal Mignonette).—This new Mignonette is quite distinct from, and far superior to, the old large-flowered variety, on account of its giant pyramidal growth, and its remarkably large flowers, which are of an orange-red colour .. .. Per packet, 1s.

SOLANUM WARSCEWICZII.—A magnificent plant, with immense lobed leaves of a deep green colour. It attains an average height of 6 to 8 feet, and when planted in masses produces a grand effect. It is probably the best of the large-leaved Solanums yet introduced .. .. Per packet, 1s.

LARKSPUR, DOUBLE DWARF RANUNCULUS-FLOWERED.—A very handsome variety, attaining an average height of 1 foot, and covering itself with small but beautiful Ranunculus-shaped flowers .. .. Mixed colours, per packet, 1s.

STOCK, EAST LOTHIAN.—This magnificent variety is of dwarf and compact habit, furnishing itself with immense Hyacinth-like spikes of bloom. Mr. Thomson, formerly of Archerfield Gardens, who has grown it very extensively, describes it as unrivalled amongst effective bedding plants, and if grown in a rich soil it will keep up a succession of bloom from July till the end of November, after which the plants may be potted and kept to make a further display during the following summer. Per collection of three colours (scarlet, white, and purple), separate, 2s. 6d.

VIOLA CORNUTA ALBA.—The flowers of this variety, which are of a pure white colour, are produced in great abundance. The foliage is bright and striking, and the plant is of the same dwarf habit as V. cornuta, to which it will form an effective and pleasing contrast .. .. Per packet, 1s.

CHOICE FLORIST FLOWERS.

	Per packet — s.	d.
ANTIRRHINUM, saved from the newest and finest varieties	6d. and 1	0
AURICULA, from a splendid collection of stage flowers	1	0
BALSAM, Camellia-flowered, choicest mixed	6d. and 1	0
" double Rose flowered, finest mixed	6d. and 1	0
CALCEOLARIA, herbaceous, from James's splendid collection	2	6
" from the Dalkeith collection	1s. 6d. and 2	6
CARNATION, choicest mixed, from a prize collection	1s. and 2	6
CINERARIA, saved from a first-class collection	2	6
COCKSCOMB, dwarf crimson, from selected plants	6d. and 1	0
CYCLAMEN PERSICUM, from finest prize strains	1s. and 2	0
" in separate colours	1	6
DAHLIA, from English show flowers	6d. and 1	0
FUCHSIA, choicest mixed, saved from named varieties only	1	0
GERANIUM, Gold Tricolor, from a first-class collection	2	6
" Silver Tricolor, from the finest varieties	2	6
" Zonal, from the best varieties	6d. and 1	0
GLADIOLUS, saved from the finest hybrids	6d. and 1	0
GLOXINIA, from our own collection of drooping and erect flowering varieties	1	0
HOLLYHOCK, from choicest named flowers only	6d. and 1	0
LOBELIA SPECIOSA, our own saving, a very fine strain	6d. and 1	0
PANSY, choicest mixed, from English show varieties	1	0
" Belgian or French, choicest mixed	1	0
PELARGONIUM, large flowering English varieties, choicest mixed	1s. and 2	6

	Per packet — s.	d.
PELARGONIUM, Fancy, first quality, from the best kinds	1s. and 2	6
" large flowering French varieties, choicest, mixed	1s. and 2	6
PETUNIA HYBRIDA, choice varieties, in mixture	6d. and 1	0
PHLOX, herbaceous, from the newest and finest varieties	6d. and 1	0
PICOTEE, first quality, choice, mixed	1s. and 2	6
PINK, choicest mixed laced varieties, from a prize collection	1s. and 2	6
POLYANTHUS, very choice, saved from finest gold-laced flowers only	1	0
PRIMULA SINENSIS FIMBRIATA ALBA, very choice	2	6
" " RUBRA, very choice	2	6
" " choicest mixed	2	6
" " FILICIFOLIA ALBA, } Distinct and beautiful varieties, with long	2	6
" " " RUBRA } undulate Fern like foliage	2	6
" " Russell's Pyramid Red, } Two splendid varieties, throwing the flowers	2	6
" " White, } well above the foliage	2	6
" " KERMESINA SPLENDENS, a very showy large-flowering variety, with beautiful bright crimson coloured flowers	2	6
" " FLORE-PLENO ALBA (double white), comes true from seed	2	6
" " FIMBRIATA CRIMSON EMPEROR, rich crimson coloured flowers, with a golden yellow throat, producing a splendid effect	2	6
" " FIMBRIATA STRIATIFLORA, a distinct and beautiful variety, with dark stems, flowers white, irregularly striped with dark rose	2	6
STOCK, Intermediate Scarlet, our own saving, very superior	6d. and 1	0
SWEET WILLIAM, Bragg's Improved, finest mixed	1	0
VERBENA HYBRIDA, from finest varieties	0	6

SUBTROPICAL and ORNAMENTAL FOLIAGE PLANTS.

MESSRS. VEITCH AND SONS have secured supplies of Seeds of the most admired plants in this important section, full descriptions of which will be found in their **VEGETABLE and FLOWER SEED CATALOGUE** for 1870, which will be forwarded Post Free on application.

Assortment of 12 best varieties of the above, 5s. | Assortment of 24 best varieties of the above, 10s.

The "CHELSEA" BLIGHT COMPOSITION, for destroying Mealy-Bug, Black and White Thrip Scale. Greenfly, &c.—MESSRS. VEITCH AND SONS having for some time used, with great success, a Composition for destroying insects on plants, have determined to offer it for sale, believing it will be a real boon to plant cultivators. MESSRS. V. AND SONS have always found this Composition more efficacious than any other they have yet tried, and it has been constantly used by them for cleaning all kinds of Stove and Greenhouse, Flowering and Foliage Plants, Orchids, and even Ferns, with the exception of the more delicate kinds, and the success which has invariably attended its use induces them to introduce it to the public. Full instructions as to its application accompany each bottle. Bottle sufficient to make 1 gallon of Mixture fit for use, 1s. 6d.; 2 gallons, 3s.; 4 gallons, 5s. 6d.; 8 gallons, 10s. 6d.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.

NEW AND GENUINE SEEDS.

CARRIAGE PAID.

BENJAMIN S. WILLIAMS

BEGS TO ANNOUNCE THAT HIS

DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS, for 1870,

Containing many New and Choice Varieties, is now ready. Post Free on application.

VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW AND UNADULTERATED SEEDS.

PRIZE MEDALS, 1851 AND 1862.

BUTLER, McCULLOCH, & CO.'S

COMPLETE COLLECTIONS FOR ONE YEAR'S SUPPLY.

No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
£3 3s.	£2 2s.	£1 10s.	£1 1s.	10s. 6d.

The above Collections contain only useful varieties, the quantities of which may be varied to suit the requirements of Customers.

PRICED DESCRIPTIVE CATALOGUES, containing details of Collections; also carefully selected LISTS of choice FLOWER SEEDS and NOVELTIES in FLOWERS and VEGETABLES sent Post Free on application.

Orders amounting to 21s. sent Carriage paid. All packets of Flower Seeds sent Post-paid. No Charge for packages.

SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.

Established upwards of a Century.

THE LONDON AND CONTINENTAL SEED COMPANY,

68, WELBECK STREET, CAVENDISH SQUARE, LONDON

(LATE RENDLE AND COMPANY, OF PLYMOUTH).

This Company was formed by the purchase of the large and extensive Business formerly carried on by Messrs. Rendle & Company, of Plymouth; and the Directors have much pleasure in stating that they have made arrangements with Mr. Rendle, one of the Partners of the late Firm, to be the Managing Director.

COLLECTIONS OF KITCHEN GARDEN SEEDS.

		Credit price.	Cash price.
1.	A COMPLETE COLLECTION for One whole Year's Supply for a large Garden	£3 3 0	£2 17 0
2.	A COMPLETE COLLECTION, in quantities proportionately reduced	2 2 0	1 18 0
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4.	A COMPLETE COLLECTION, in quantities proportionately reduced	1 1 0	0 19 0
5.	A COMPLETE COLLECTION, in quantities proportionately reduced	0 15 0	—
6.	A COMPLETE COLLECTION, for a small Garden	0 12 6	—
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The Carriage is Paid of Collections Nos. 1, 2, 3, 4, and 7.

ALL PARCELS CARRIAGE FREE.—All parcels above the value of 20s. will be sent Carriage Free to any Railway Station in England, and to all the Steam Ports in Ireland.

IMPORTANT DISCOUNT.—A discount of 2s. in the Pound will be allowed on all Orders.

THE GENERAL CATALOGUE of SEEDS for the KITCHEN GARDEN

is just published, and can be had Post Free on application.

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LONDON AND CONTINENTAL SEED COMPANY, 68, WELBECK STREET, CAVENDISH SQUARE, LONDON, W.

Vines, Extra Strong Fruiting.

FRANCIS & ARTHUR DICKSON & SONS have several thousand extra strong, fruiting VINES well-named, short-jointed VINES to offer, of the best sorts for forcing or planting, the new ones of this season. Those not named. Amateurs who know what they require can name them by their fruit and colour as well as their growth. Price List free by post on application.

The "Upton" Nurseries, Chester.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various hardy fruit Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their Synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half-Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Golden Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.

Samples, with height and price, on application to

W. VIRGO AND SON, Woburn Nursery, Guildford.

STRONG STANDARD APPLES and PEARS.—Large horizontal Trained and Pyramid Apples and Pears; fine Standard and Dwarf trained PEACHES and NECTARINES; fine bushy LAURELS and LAURUS COLCHICUM, up to 3 feet; extra bushy LAURUSTINUS and PORTUGAL LAURELS, 4 to 5 feet; a large collection of Standard and Dwarf Perpetual, Dwarf China, and climbing ROSES of the leading sorts; deciduous flowering SHRUBS; ASH, 2 to 5 feet; LARCH, SPRUCE, and AUSTRIAN FIRS, and all kinds of FOREST TREES; strong Evergreen PRIVET and THORN QUICK for Hedges. All the above have been regularly transplanted, and are well rooted Prices on application to

CHARLES BURGESS, The Nurseries, London Road, Cheltenham

Fruits, Fruits.—Ground must be cleared.

WM. DILLISTONE begs to offer Strong TREES of the following, for cash only —

		£	d.
APPLES, Standards, 12 distinct kinds		7	6
" " 24 " "		12	0
" " 36 " "		21	0
" " 150, in 50 distinct kinds		42	0
Pyramids, very fine, same price			
PEARS, Standards, 12 distinct kinds		10	6
" 24 " "		17	6
PLUMS, fine Pyramids, 12 distinct kinds		9	0
" 24 " "		17	6
PEACHES, NECTARINES, and APRICOTS, very handsome, Dwarf, per doz.		9	0
CHERRIES, Dwarfs, very fine "		7	6

Post Office Orders on Castle Hedingham.

See W. DILLISTONE'S CATALOGUE of Choice Spring Flowers, &c., free on application; also, of Roses, New Plants, &c.

Nurseries, Sible Hedingham, Essex.

Forest, Fruit, and other Trees.

JAMES DICKSON AND SONS' NURSERY STOCK is not surpassed in Britain; therefore, they have EVERY CONFIDENCE in soliciting Orders, and inviting intending planters to visit their EXTENSIVE NURSERIES, which can now be reached, on foot, in seven minutes, from the Chester Railway Station, by their new private road from the foot of the Flookersbrook Railway Bridge.

PRICE LISTS on application to

(*Old Established Nursery and Seed Business*)

"Newton" Nurseries, Chester.

Forest Trees, Fruit Trees, Evergreens,

PLANTS for GAME COVERS, CONIFERS, ROSES, &c.

FRANCIS & ARTHUR DICKSON & SONS invite the attention of Planters to their very large stock of the above, which in extent and variety is not excelled by any Nursery in the Kingdom. Their Nurseries, from one Chester Railway Station, by their new private road from the foot of the Flookersbrook Railway Bridge, are open and exposed, extend over some 150 Acres, and their plants are well known to be unusually hardy, as well as in the most perfect health and condition in every respect; and are found to thrive admirably when removed to other parts of the country.

PRICED CATALOGUES post free upon application. Estimates and special prices for large quantities.

The "Upton" Nurseries and "Old" Established Seed Warehouse, 106, Eastgate Street, Chester

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 5 to 5 feet high. Also very fine Dwarf trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12s. 6d. in stamps. A printed List or Index of Sorts free on application.

J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety

CATALOGUE free on application.

Cedrus Deodara.

FINE SPECIMENS, 7, 8, 9, 10, to 15 feet, at 1s. per foot.

WM. MAULE AND SONS have to offer a large supply of extra fine EVERGREEN TREES and SHRUBS, calculated to give immediate effect to Parks, Cemeteries, and Plantations, and suitable for screening and blocking out new Buildings, that are springing up daily in the vicinity of all large towns.

The Nurseries, Bristol.

The Northampton Nurseries.

JOHN PERKINS, SEN., begs to offer the following, which are all stout and well-rooted —

Fine Larch Fir, 4 to 6 feet, transplanted 1868

Scotch Fir, 2 to 3 feet	Berberis aquifolia, 1 to 1½ feet
Laurels, 1½ to 2, and 2 to 3 feet	Green Box, 1½ to 2, and 2 to 3 feet

Strong Whitethorn Quick.

J. P. having a large Stock of the above, they will be offered at very low prices, which may be had on application to

52, Market Square, Northampton.

CARTER'S "PRIZE MEDAL" GRASS SEEDS.

J. C. AND CO. having secured their immense Stock of NATURAL GRASSES in splendid condition, are prepared to execute orders for Grass Seeds for Pastures, Lawns, &c.

The germinating quality (after most careful testing) is assured to be first-rate; and, from the great pains taken by Messrs. CARTER to adapt the Mixtures of Grasses to suit the particular nature of the soil intended to be laid down, the possibility of failure can scarcely be entertained.

It is only necessary when ordering to give a general description of the soil, situation, &c.

CARTER'S GRASS SEEDS FOR PERMANENT PASTURES (choicest quality).

For HEAVY SOILS, **28s.** to **32s.** per acre. | For LIGHT SOILS, **28s.** to **32s.** per acre. | For MEDIUM SOILS, **28s.** to **32s.** per acre.

Second quality cheaper. Reduced rates for more than 10 Acres.

CARTER'S "ROYAL MIXTURE" FOR LAWNS, 20s. per bushel; 1s. per lb.

(as used in the chief European Royal Gardens). Sow 3 bushels per acre.

For the fullest information to insure successful Seeding down Land to Grass, see ESSAY in

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM for 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

KNAP HILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen Transplanted April, 1869.
ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each Transplanted August, 1868
ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, to 10 to 12 feet high, 15 and 20 feet in circumference
ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s., to £12 10s. per 100
ABIES MENZIESII, variety of Spruce, such as pumila pygmæa, Gregorii, Clanbrazilliana, &c., large numbers, many of them 20 and 30 years' growth
CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these Young Deodars. All have been removed since August, 1868; many since April, 1869
CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each All removed since September, 1868
CEDRUS LIBANON, 6, 7, to 10 feet Moved September, 1868
CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 10s. 6d. each
" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each
" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s
JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.
PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery None are grafted.
PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid plants, moved August, 1868, 10 to 15 feet high
PICEA LASIOCARPA —Hundreds of most beautiful plants, 4, 5, 6, 7, 8, and 9 feet high. All removed 1868-69.
PICEA WEBBIANA, 3, 4, and 5 feet, 21s. to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869.
PICEA PINSAPO, 4, 5, and 8 feet, 21s. to 63s. each. Some grand plants, to 10 to 15 feet high, transplanted April, 1869.
THUJA ALDERLEYENSIS, 5 to 6 feet, and 6 to 7 feet high; 10 to 20 feet in circumference. This fine plant originated in this Nursery, and our stock is unsurpassed
THUJA GIGANTEA, 5, 6, to 10 feet high Moved August, 1868
THUJA LOBBII, 8 to 12 feet high, and as much in circumference; transplanted April, 1869
THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868
WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each Transplanted in August
PINUS AUSTRIACA, 3 feet, £5 per 100 Transplanted Sept., 1868
PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft round, 10s. 6d. to 21s. each
YEWS, the COMMON ENGLISH, 5, 6, 7, 8, 9, 10, and 12 feet high Thousands, all constantly removed; invaluable where immediate effect is sought.
YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high
YEWS, IRISH, handsome pyramids, up to 10 feet
HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—
HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet.
HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and 3 feet in circumference
HOLLY, SILVER QUEEN, 4, 5, and 6 feet
WAITERER'S HOLLY —This variety originated in this Nursery; sorts, 4 hundreds, 5, 6, and 8 feet, and 15 ft circumference
PERRY'S WEEPING HOLLY —Standards, 10s. 6d. to 21s. each
HOLLY, COMMON WEEPING —The finest specimens we have seen, 5 to 8 feet high
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand All moved since April, 1868
HOLLY, choicest variegated sorts, 3 to 10 feet high An immense stock of splendid plants, all transplanted in 1868-9:—
LAURIFOLIA and SCOTTICA, 4, 5, 6 to 10 feet high.
HODGINS', " ANGUSTIFOLIA,
YELLOW BERRIED, " MYRTIFOLIA, &
4, 5, 6, and 8 feet high
STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference A large number.
N.B.—Purchasers of Hollies may select from a stock occupying at the present time upwards of over 6 acres of ground; finer or better rooted plants cannot be wished or obtained The prices are fair and reasonable.
BOX, Green and Variegated, 4, 5, 6, to 8 feet.
BOX, to clip, fine pyramids, up to 8 feet.
BAYS, standards and pyramids.
LAURUSTINUS, standards.
AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.
AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz and upwards
AMERICAN PLANTS —The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of the kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation We shall be pleased to supply—
RHODODENDRONS, nice bushy plants, from layers, named kinds for effect, £9 per 100, £1 per dozen, sent as sample on application.
RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s per 100, and upwards.
RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000
STANDARD RHODODENDRONS —Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference There is probably no kind better adapted for standards than that we call flowersum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons standards of many other kinds
RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s per 100 Sample on application Large and handsome plants by the 1000, 4 to 8 feet high
AZALEAS, the very best kinds, nice plants, £10 per 100, upwards
AZALEAS, common kinds, £5 per 100
AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference
KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100.
ANDROMEDA FLORIBUNDA, £5 to £7 10s. per 100, and upwards
HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100
ERICA CARNEA, for winter blooming, many thousands
ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.
SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen.

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary Nursery STOCKS of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same truck, without Package, from Woking to almost any Railway Station in England.

FRESH SEED of CUPRESSUS LAWSONIANA and THUJA LOBBII, in any quantity. For prices, see pages 74 and 75 of our TRADE CATALOGUE, which may be had post free THOS CRIPPS AND SON, Nurserymen, Tunbridge Wells.

SACCOLABIUM GIGANTEUM. — For SALE a specimen plant, in perfect health, of this beautiful Orchid, having two large leading growths and one small, bearing three spikes partly in bloom Price 25 guineas.
SACCOLABIUM, 52, Chapel Street, Grosvenor Square, London, W.

STRONG, Healthy, Fruit-bearing RED GRAPE CURRANTS, 10s. per 100; Raby Castle or Queen Victoria do. (true), 10s. per 100. Strong, fruit-bearing BLACK CURRANTS, 12s. 6d. per 100 DWARF MOSS ROSES, on own roots, 20s. per 100. A remittance or reference from unknown correspondents
FIELD BROTHERS, Tarvin Road Nursery, Chester

EXTRA fine FRUIT TREES.
Standard Apples, 45s. per 100 | Standard Pears, 50s. per 100
Standard Cherries, 40s. per 100 | Standard Plums, 50s. per 100
2 and 3-yr. Pyramid Apples and Pears, Plums and Damsons, 30s. to 40s. per 100. A LIST of sorts on application to
FREDERICK PERKINS, Bedford Road Nursery, Northampton.

Forest Trees, Fruit Trees, Evergreens, &c.

CHIVAS and WEAVER respectfully invite the especial attention of planters to their very extensive, healthy, and well-grown Stock of the above.
Their Nurseries being the most exposed in the North Western Counties, and free from all artificial shelter, render the safe removal of plants quite certain.
PRICED CATALOGUES post free on application; estimates and special prices for large quantities.
The Arboretum having been largely extended, an entrance is now obtained immediately on reaching Queen's Park by the suspension Bridge
Eaton Road Nurseries, and 108, Eastgate Street, Chester

To the Trade.

SPECIAL CHEAP OFFER of Dwarf-trained Morello and other CHERRIES.
True KENTISH FILBERTS.
Dwarf-trained PEARS.
Standard-trained PEARS, extra fine.
Dwarf-trained GREENGAGES and other PLUMS.
STANDARD PLUMS.
STANDARD ROSES.
ARBUTUS UNEDO, 9 inches to 3 feet, extra fine.
BERBERIS BEALLI, 9 inches to 3 feet.
Double PRIVET.
JUNIPERUS SINENSIS, 1 to 3 feet
PHILLYREAS, fine and healthy, 2 to 4 feet.
THUJA LAURIFOLIA, splendid, 4 inches to 2 feet
" ORIENTALIS ELEGANTISSIMA, fine stock of this splendid variety (Kollisson's), 9 to 20 inches.
YUCCA RECURVA, fine.
Standard SPANISH CHESTNUTS.
" CHICHESTER ELMS, fine, 6 to 10 feet.
BEECH, 8 to 10 feet.
BOX for Edging.
CEANOTHUS AZUREA (best variety), and a variety of other good and useful CONIFERÆ, CLIMBERS, &c.
PRICED CATALOGUE free on application.
THOS. BUNYARD AND SONS, Nurserymen, Florists, and Seedsmen, Maidstone, Kent.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per100
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 4 feet, 60s. per 100; 4 to 5 feet, 80s. per 100
RICHARD SMITH, Nurseryman, Worcester

RICHARD SMITH'S LIST of all the EVERGREEN AND FIR TRIBE suitable for Britain, giving size, price, popular and botanical names, derivations, description, form, colour, foliage, growth, time in sorts, native country and size there, situation, soil, and other information, with copious Index of their synonymes. Free by post for six postage stamps

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post
RICHARD SMITH, Nurseryman and Seedsman, Worcester

LIMES and ELMS.
Standard Limes, 8 to 10 feet, with fine straight stems and good heads, 15os. per 100; 21s. per dozen
Chichester and Hertfordshire Elms, straight and stout, 10 to 12 feet, 100s. per 100; 15s. per dozen 12 to 14 feet, 125s. per 100; 18s. per dozen. Price to the Trade on application to
EWING AND CHILD, The Royal Norfolk Nurseries, Norwich

SYCAMORES or PLANES, 7 to 9 feet, 3os. per dozen.
LABURNUMS, 6 to 7 feet, 2os. per dozen
ASH and HORSE CHESTNUTS, 7 to 9 feet, 25s. per 1000
OAKS, 2 to 3 feet, 5s. per 1000 BEECH, 1½ foot, 12s. per 1000
LAURELS, 1 foot, 5s.; 1½ foot, 6s.; 2½ feet, 7s. per 100
PINUS AUSTRIACA, 2 and 3 feet, 5s. per 100
ROSES, 2 feet and upwards, 9s. per dozen; less than 2 feet, 6s. per doz.
Fine CUCUMBER SEED, 7s. per lb.; 6d. per oz.
For cash only.
A. WILKIN, Tiptree, Kelvedon, Essex.

TWO MILLION WHITE THORN, 2 and 3-yrs. transplanted, also in quantity, extra fine.

Ash, transplanted, 2 to 3 feet.		Black Italian Poplar, do., 3 to 4 ft.	
Do. do.	3 to 4 feet	Do. do., 4 to 5 ft	
Alder, do., 2 to 3 ft.	Do. do.	3 to 4 ft	Hazel, do., 3 to 4 feet.
Beach, do., 1½ to 2 feet		Sweet Briar, do., 2 to 3 feet	
Wych Elm, do., 2 to 3 feet		Sycamore, do., 4 to 6 feet	
Do. do.	3 to 4 feet		

A large quantity of PORTUGAL and COMMON LAUREL, BOX, WHITE and YELLOW BROOM. Samples and prices on application to
FREDERICK PERKINS, Bedford Road Nursery, Northampton

CHARLES NOBLE requests the attention of large buyers to the following, which he requires cleared before Spring:—

ROSES
50,000 Dwarf, Hybrid-Perpetual, and Tea-scented.
A quantity of Standard and Half Standards.
75,000 Manetti Stocks, fine as usual.
PEARS.
Dwarf-trained Peaches, Plums, and Pears.
Maiden Peaches and Nectarines.
" Pears and Apples.
" Plums and Plum.
2 and 3-yr. PYRAMID APPLES and PEARS.
GOOSEBERRIES, CURRANTS, FILBERTS, and COB NUTS.
TREES and SHRUBS.
English Oaks, 2 to 5 feet.
" " 3 years in drills.
Spruce Fir, 2 to 5 feet.
Laurel, 1 to 3 feet; common and Colchicum.
Birch, 5 to 7 feet
Poplars, 5 to 12 feet
FOR GAME COVER.
Spiræa callosa
Deutzia crenata flore-pleno.
Spartium junceum.
Berberis Darwini.
" dulcis
" aquifolia.
" japonica.
Skimmia japonica.
Erica carnea and herbacea.
" Menziesii.
Rhododendron ponticum.
" hybrid seedlings.
All sizes, from 1 to 3 feet, by the dozen, 100, or 1000
CATALOGUES sent on application. Special quotations for large quantities, and all will be sold at a heavy discount for cash.
Bagshot, January 6.

NEW AND GENUINE SEEDS,

CARRIAGE PAID.

B. S. WILLIAMS,

NURSERYMAN AND SEED MERCHANT,
VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

COMPLETE COLLECTIONS
OF
KITCHEN GARDEN SEEDS,

To suit Gardens of various sizes,

10s. 6d., 21s., 42s., 63s., and 84s. each.

New and Choice Vegetable Seeds.

	Per packet.—s. d.
Williams' Alexandra BROCCOLI	1 6
Dell's fine Dark BEET	1 0
Williams' Matchless RED CELERY	1 0
Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Digswell Prize ENDIVE	0 6
All the Year Round CABBAGE LETTUCE	0 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Lee's Immense Hardy Green CABBAGE LETTUCE, new	1 0
Webb's Climax MELON, new	2 6
(The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2 6
Nuneham Park ONION, quite distinct from any other variety	1 0
Earley's selected Double Curled PARSLEY, new	1 0
Laxton's Supreme PEA, new per half pint	2 0
Hundredfold, or the Cook's Favourite PEA, new, do.	2 0
Cullingford's Champion Marrow PEA, new, per quart	3 6
(The finest flavoured Wrinkled Marrow in cultivation.)	
Earley's Defiance TOMATO, new	2 6
(The earliest and best variety in cultivation.)	
Orangefield Dwarf Prolific TOMATO	0 6

New and Choice Flower Seeds.

Williams' superb strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice strain,	2s. 6d., 3s. 6d., and 5 0
CINERARIA, Weatherill's extra choice strain,	2s. 6d., 3s. 6d., and 5 0
CYCLAMEN, Wiggins' Prize strain,	1s. 6d., 2s. 6d., & 3 6
BALSAM, Williams' superb strain	1s. 6d. and 2 6
GERANIUM, Le Grand	1s. 6d. and 2 0
GLOXINIA, from the finest erect varieties	1s. and 2 6
HOLLYHOCKS, Chater's splendid varieties, mixed	1 0
PANSY, from Prize flowers	1s. and 2 6
PINK, finest double-fringed varieties	1s. and 2 6
POLYANTHUS, Wiggins' Prize strain	1s. and 1 6
VERBENA, Eckford's finest varieties	1 0
Williams' Improved Hybrid SOLANUMS	2s. 6d. & 3 6
ASTER, Dwarf, Victoria White, very fine	1 0
CENTAUREA CANDIDISSIMA	1s. and 2 6
CENTRANTHUS MACROSIPHON BICOLOR, new	1 0
CLARKEA INTEGRIPETALA, Tom Thumb, new	1 0
CONVOLVULUS MINOR UNICALUS, new	1 0
DELPHINIUM CONSOLIDA CANDELABRUM, new	1 0
ESCHSCHOLTZIA AURANTIACA, new	1 0
EUPHORBIA SERICEA, very dwarf, with pretty deep violet flowers, new	1 0
HELENIUM BOLANDERI, Dwarf Perennial species, new	1 0
LILIUM AURATUM	1 0
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	1 0
Williams' Improved FRENCH MARIGOLD, beautifully striped and very large	1 0
Parson's New TREE MIGNONETTE	1 0
NEMOPHILA ATOMARIA ELEGANS, new	1 0
OXALIS TROPÆOLOIDES VIRIDIFOLIA, green-leaved variety, new	1 0
PERILLA NANKINENSIS VARIEGATA, new	1 0
PYRETHRUM PARTHENIFOLIUM AUREUM, Golden Feather	1s. and 2 6
EAST LOTHIAN STOCKS, per collection of three colours	2 6
(These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former, and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders.)	
PURPLE QUEEN STOCK, a very dwarf and beautiful variety, the flowers are very double, and splendid colour	1 0
WHITE TEN-WEEK STOCK, Wallflower-leaved, new	1 0
(This is the purest and finest White Stock in cultivation.)	
IMPERIAL PURPLE SWEET PEAS, very large	0 6
TACSONIA VAN VOLXEMII, splendid green-house Climber	2 6
TROPÆOLUM GOLDEN KING of TOM THUMBS, new	1 0
VIOLA CORNUTA ALBA, new	1s. 6d. and 2 6
(This is an interesting and extremely useful variety, producing in great abundance pure white flowers, very robust and dwarf in habit, which renders it very effective in spring and summer, and invaluable during the late autumn months.)	
WALLFLOWERS, Saunders' fine dark variety	1 0
ZINNIA ELEGANS PUMILA Flore-pleno, new	1 0

B. S. W.'S DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, Post Free, on application.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1 2s Pairs ditto, 10s. 6d.; 25 Pairs POMPONS, 10s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
Brunswick Nursery, Stoke Newington, N.

Autumn Planting.

PETER LAWSON AND SON will be glad to send their CATALOGUE (just published) of FOREST and ORNAMENTAL TREES and SHRUBS, free on application.
The stock of LARCHES, SCOTCH FIRS, AUSTRIAN and CORSICAN PINES, &c., comprises some millions of healthy, well grown plants, and special offers will be made for large quantities when personal inspection is not convenient.
Edinburgh and London.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of AMERICAN ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do. SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEW; also an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes.

Native Scotch Fir, of fine quality.

ON SALE, by the SUBSCRIBER,
500,000 2-yr. Seedlings, 1-yr. transplanted, 3s. per 1000.
300,000 2-yr. Seedlings, 2-yr. transplanted, 5s. per 1000. Also,
20,000 RHODODENDRON PONTICUM, from 9 to 24 inches
Samples sent on application.
J. ROY, Jun., Aberdeen.

Wandsworth Common Nursery.

MR. ROBERT NEAL begs to invite the attention of the Nobility, Gentry, and the Trade in general to his very extensive and healthy stock of PLANTS, consisting of a large collection of Standard, Pyramidal, and Dwarf-trained FRUIT TREES, of all sizes; Standard and Dwarf ROSES, Coniferous and other Evergreens, Forest and Ornamental TREES and SHRUBS; also a large collection of RHODODENDRONS, all the very best in cultivation, and are of endless variety, from deep crimson and dark purple (very shade), up to white, and Hybrid Seedlings, and all the leading kinds of Scarlet, both Standard and Dwarf, set with Bloom-buds, which he can supply in large quantities at a very low price.
CATALOGUE will be sent on application.

TO THE TRADE.—Fine Stocks of the following:—
MANGEL WURZEL.
Yellow Globe. | Long Yellow. | Red Globe. | Orange Globe.
TURNIP.
White Garden Stone | Stratton | Green | Grey Top Stone.
Stubble | Round. | Dale's Hybrid.
RADISH, Wood's Early Frame, our original genuine kind.
Lowest prices on application to WOOD AND INGRAM, Seed Merchants, Huntingdon.

T. THORNTON begs to intimate to the Trade that the Stock offered below cannot be surpassed for health and fibrous roots. All been grown on maiden soil, and the stock, very extensive, is offered at low prices:—

Pinus austriaca, 9 to 15 inches	Spruce Fir, 1 to 2, and 2 to 2½ feet
P. Laricio, 9 to 15 inches	Laurel, 1 to 2 feet
P. rigida, 2 to 3 feet	Turkey Oak, 1 to 2 feet
P. tanrica, 1 to 1½ feet	Cryptomeria japonica, 12 to 15 inches
P. Pinaster, 2 to 3, and 3 to 4 feet	Chinese Arbor-vitæ, 9 to 15 inches
Scotch, 9 to 15 inches	

THOMAS THORNTON, Heatherside, Bagshot, Surrey

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s.; per 1000, £3.

100	Gladioli, by name, 10 sorts	8s.
100	" " 25 sorts	14s.
100	" " 50 sorts	10s. to 40s.

All in good flowering bulbs.
LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

LILIUM, in 80 superb varieties. Choice selections, 5s., 9s., 12s., 18s., and 24s. per dozen
GLADIOLI, in 300 splendid varieties. Choice assortments, 2s., 5s., 9s., 12s., and 18s. per dozen.

100 roots in 10 varieties	18s.
100 roots in 20 varieties	22s.
100 roots in 30 varieties	30s.
100 roots in 50 varieties	45s.
100 roots in 25 extra varieties	54s.
100 roots in 50 extra varieties	70s.
50 roots in 50 splendid varieties	36s.

GANDAVENSIS, 25 per dozen; 12s. per 100
BRENCHLEYENSIS, 25 per dozen; 12s. per 100
BOWENENSIS, 25 per dozen; 16s. per 100
CATALOGUES free on application
HERBACEOUS and ALPINE PLANTS

100 distinct and showy varieties	30s.
100 superior and new varieties	50s.

Per dozen, 3s., 6s., 9s., 12s., and 18s.
CATALOGUES free on application.
STEPHEN BROWN, Weston-super-Mare, Somersetshire

GLADIOLI.—To be DISPOSED OF at once a very fine collection of Gladiolus Bulbs, the property of the late Mr. JOHN STADDEN, a well known amateur grower. The collection comprises about 1000 Bulbs of named varieties, including the best show flowers raised in France, and some magnificent Seedlings of Mr. Stadden's own production; also several thousands of unblowned and mixed Seedlings, which former named from hybridised and picked seed. The Bulbs, which are remarkably good, will be sold at very moderate prices, either in one lot, or in smaller quantities. Offers are requested. Apply, by letter, to Mr. STADDEN, Brewery House, Chipping Norton.

THE GOLDEN VARIEGATED WELLINGTONIA.
Local Certificate from Royal Horticultural Society of England, 1866
First-class Certificate from Royal Horticultural Society of Ireland, 1867.
First-class Certificate at Manchester International Exhibition, 1867.
First-class Certificate at Paris International Exhibition, 1867.
First class Medal at Hamburgh International Exhibition, 1869.

Plants have been distributed through France, Austria, Prussia, Switzerland, Belgium, Italy, Holland, &c.

This Season patronised by the leading Nobility of this kingdom, from whom numerous testimonials have been received.

"How very beautiful."—Editors of *Gardeners' Chronicle*.

"A pyramid of superbly coloured variegation."—Editor of *Gardeners' Magazine*

"Never the distinctive characters of a variety seemed fixed, they are in this splendid acquisition."—Editor of *Irish Farmers' Gazette*.

"Brilliant compared with Biota aurea—a pillar of beauty."—*Mr Mitchell, Bradfield, Co. Wexford*.

Chromo-lithographs of the parent tree, by Day & Son, Limited, on superior cards, 10 to 8 inches, very faithful in outline, but deficient in representing the glorious colour of the original. These are sent free by post for 2s Stamps, and one sent to each purchaser.

PRICES.—First Size, extra choice, 24 to 27 inches, £5 5s; Second Size, very fine, 15 to 18 inches, £2 2s; Third Size, stout and fine, 12 to 14 inches, 1 guinea; Fourth Size, nice little plants, 8 to 10 inches, 6s.

R. HARTLAND, The Lough Nurseries, Cork, January 19.

Surplus Stock.—Very Cheap

SPECIMEN CONIFERS and EVERGREENS, handsome and well-grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For Descriptions, also Prices of other sizes, see RICHARDSMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow guage lines, at moderate cost, thereby saving delay and expence of packing.

At 12s. per dozen.

Abies canadensis (Hemlock Spruce), 4 to 5 feet	Laurel, narrow leaved, 2 to 2½ fee
" excelsa, 3 to 4 feet	" Portugal, 2½ to 3 feet
Arbor vitæ, American, 5 to 6 feet	Picea balsamea, selected, 4 to 5 ft.
" Siberian, 3½ to 4 feet	Quercus ilex (Evergreen Oak), 15 to 18 inches [24 inches
Cupressus Lawsoniana, 4½ to 5 feet, strong	Rhododendron ponticum, 21 to
Hartogia capensis (Cape Laurel), 2½ to 2 feet	Holly, screw-leaved, green, 2½ to
	Phillyrea oleafolia, 2 to 2½ ft [2 ft.

At 18s. per dozen

Abies canadensis, 5 to 6 feet	Phillyrea oleafolia, 2½ to 3 feet
" excelsa, 4 to 5 feet	Picea balsamea, 5 to 6 feet
Alternus, broad leaved, 2 to 2½ ft	Pinus austriaca, 3 to 4 feet
Arbor vitæ, American, 6 to 7 feet	Quercus ilex, 2 to 2½ feet
" Siberian, 4 to 4½ feet	Rhododendron ponticum (very bushy), 2 to 2½ feet
Aucuba japonica, 18 to 21 inches	" hybrids, fine varieties, 18 to 21 inches
Box, green tree (pyramids, very handsome) 2½ by 2½ feet	Taxus japonica (Japan Yew), 12 to 15 inches
Hartogia capensis, 2 to 2½ feet	
Laurel, narrow leaved, 2½ to 3 feet	

At 24s. per dozen.

Abies elegans, 18 to 24 inches	Ivy, green tree, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet	Laurel, Portugal, pyramids, 3 to 4 feet [feet
Aucuba japonica, 21 to 24 inches	Phillyrea oleafolia, very fine, 3 to 4
Cryptomeria Lobbii, 5 to 6 feet	Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Cupressus Lawsoniana, 4 to 5 feet	Taxus japonica, 15 to 18 inches
Holly, screw leaved, green, 2 to 2½ feet	

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
" elegans, 2 to 2½ feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ compacta, 2½ to 3 feet	" drupacea, 18 to 24 inches
Aucuba japonica, very bushy, 2 to 2½ feet	" glauca, 3 to 4 feet
Cryptomeria Lobbii, 6 to 7 feet	" Lecana, 3 to 4 feet
" viridis, 6 to 7 feet	Pinus austriaca, 4 to 5 feet
	Thujopsis borealis, 4 to 5 feet

At 36s. per dozen.

Abies inverta (Weeping Spruce), 2½ to 3 feet	Juniperus Smithiana, 3 to 3½ feet
Arbor vitæ compacta, 3 to 3½ feet	" viridis pendula, 3 to 4 feet
" Siberian (very fine) 5 to 6 feet	Laurel, Portugal (pyramids, very fine), 4 to 5 feet
Cupressus Lawsoniana, 5 to 6 feet	Pinus laricio, 6 to 7 feet
Juniperus chinensis fo mina, 3 to " densata, 3 to 4 feet [3½ feet	Taxus elegantissima (gold leaved), 18 to 24 inches
" Schottii, 3 to 3½ feet	" Irish, 5 to 6 feet

At 42s. per dozen.

Abies inverta, fine specimens, 3 to 4 feet	Juniperus phœnicia, 3 to 4 feet
Arbor vitæ compacta, 3½ to 4 feet	" Schottii, 3½ to 4 feet
" Siberian (very fine), 6 to 7 feet	" thuriferal (Incense Juniper), 4 to
Juniperus chinensis, 3½ to 4 feet	" virginiana, 6 to 7 feet [5 feet
" " fo mina, 3½ to 4 feet	Picea Nordmannniana, 18 to 24 ins.
" drupacea, 24 to 30 inches	Pinus austriaca, 5 to 6 feet
" Lecana, 4 to 5 feet	" laricio, 7 to 8 feet
	Thujopsis borealis, 5 to 6 feet

At 48s. per dozen.

Abies inverta, 4 to 5 feet	Juniperus Smithiana, 3½ to 4 feet
Juniperus chinensis, 4 to 5 feet	" thurifera, 5 to 6 feet
" densata, 4 to 5 feet	" virginiana, 7 to 8 feet
" glauca, 4 to 5 feet	" viridis pendula, 4 to 5 feet
" Lecana, 5 to 6 feet	Pinus laricio, 8 to 9 feet
" phœnicia, 4 to 5 feet	Taxus, Irish, 6 to 7 feet
" Schottii, 4 to 5 feet	Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen.

Abies Menziesii, 7 to 8 feet	Juniperus virginiana, 8 to 10 feet
" monstrosa, 7 to 8 feet	" viridis pendula, 5 to 6 feet
Arbor vitæ compacta, 4 to 4½ feet	Laurel, colchic (very fine), 8 to 10 feet [5 to 6 feet
Juniperus chinensis, very fine, 5 to 6 feet	" Portugal, pyramids (very fine),
" densata, 5 to 6 feet	Picea Nordmanniana, 2 to 2½ feet
" glauca, 5 to 6 feet	Pinus Cembra, very fine, 6 to 7 ft.
" phœnicia, 5 to 6 feet	Taxus elegantissima, 2 to 2½ feet
" Smithiana, 4 to 5 feet	Thujopsis borealis, 6 to 7 feet
" thurifera, 6 to 7 feet	Wellingtonia gigantea, 3 to 3½ feet

Abies albertiana, 7 to 8 feet, 15s. 6d. each
" Pinsapo, 8 to 10 feet, 21s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each
" orientalis, 4 to 5 feet, 7s. 6d.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. 6d. each
Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s.; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 63s. to 84s. each
Juniperus drupacea, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each
" thurifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each
Picea grandis, extra fine, 5s. to 6s.; 15s.; 6 to 7 feet, 21s. each
" Pindrow, 6 to 7 feet, 21s. each
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

Picea lasiocarpa, 2½ to 3 feet, 15s. 6d.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d. each
" nobilis (best glaucous var.), 18 to 24 inches, 7s. 6d.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
" Nordmanniana, 4 to 5 feet, 15s.; 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each
" Pindrow, 3½ to 4 feet, 15s. to 4 ft., 15s.; 4 to 4½ ft., 21s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. ea.
Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Wellingtonia gigantea, 3½ to 4 feet, 7s. 6d. each
" pendula, 4 to 5 feet, 15s.
Yews, for hedges, about 12 feet high, 40 years old, recently transplanted, 10s. 6d. each

GENUINE KITCHEN AND FLOWER GARDEN SEEDS.

PAUL & SON,

THE OLD NURSERIES, CHESHUNT, N.,

Have ready for delivery their, as usual, most carefully selected Stocks of the above.

Specially they would mention their home saved strains of HERTFORDSHIRE CAULIFLOWER, SNOW'S BROCCOLI, PAUL'S DEEP CRIMSON BEET, DELL'S DEEP CRIMSON for flower gardening, IMPROVED WHITE SPANISH ONION, IMPROVED TELEGRAPH CUCUMBER; HOLYHOCKS, 12 finest varieties, in collections or mixed; imported ASTERS, STOCKS, &c.

Priced DESCRIPTIVE CATALOGUE Post Free.

Thomas Gibbs

CORNER OF
HALF-MOON ST.,
PICCADILLY, LONDON, W.

KITCHEN GARDEN SEEDS
GRASS SEEDS

THOS. GIBBS & Co.
Corner of
HALF-MOON St
PICCADILLY,
London.

CORNER of STREET.

FLOWER SEEDS
AGRICULTURAL SEEDS

CATALOGUES FORWARDED POST FREE TO ANY ADDRESS ON APPLICATION.

COLLECTION OF SEEDS FOR THE KITCHEN GARDEN,
OFFERED FOR SALE, BY
MARTIN & SON,
SEED GROWERS, MERCHANTS, AND NURSERYMEN,
COTTINGHAM, AND 7, MARKET PLACE, HULL.

	£3 3s. Collection	£2 2s. Collection	£1 10s. Collection	£1 Collection	15s. Collection	10s. 6d. Collection
PEAS, the best for succession	20 quarts	12 quarts	8 quarts	7 quarts	4 quarts	5 pints
BEANS, the best for succession	6 quarts	4 quarts	3 quarts	2 quarts	3 pints	2 pints
" Kidney, dwarfs and runners	6 pints	4 pockets	2 pints	1½ pint	1 pint	1 pint
BEET, of sorts	4 oz.	2 oz.	1 packet	1 packet	1 packet	1 packet
BORECOLE, curled, and Martin's golden crested	1 oz.	¾ oz.	3 packets	3 packets	3 packets	1 packet
BRUSSELS SPROUTS, imputed	1 packet	1 packet	1 packet	1 packet	1 packet	1 packet
BROCCOLI, headed, best for succession	6 packets	5 packets	4 packets	3 packets	3 packets	2 packets
CABBAGE, headed, best for succession	5 packets	4 packets	2 oz.	2 packets	2 packets	1 packet
SAVOYS, curled and Drumhead	1 oz.	¾ oz.	½ oz.	2 packets	2 packets	1 packet
CARROT, summer and winter use	8 oz.	5 oz.	4 oz.	3 oz.	3 oz.	2 oz.
CAULIFLOWER, Walcheren, London, &c.	1½ oz.	2 packets	2 packets	1 packet	1 packet	
CELERY, Cole's white Defiance, and Laing's	2 oz.	1 packet	2 oz.	2 packets	2 packets	1 packet
CRESS, curled	2 pints	8 packets	6 oz.	4 oz.	2 oz.	2 oz.
CUCUMBER, of the best sorts	3 packets	3 packets	2 packets	2 packets	1 packet	1 packet
ENDIVE	1 oz.	½ oz.	1 packet	1 packet	1 packet	
LEEK, Scotch	1 oz.	½ oz.	½ oz.	1 packet	1 packet	
LETTUCE, Drumhead, Bath Cos, &c	2 oz.	1½ oz.	4 packets	3 packets	3 packets	2 packets
MUSTARD	1 quart	1 pint	½ pint	4 oz.	2 oz.	2 oz.
MELON, best sorts	2 packets	2 packets	2 packets	1 packet		
ONION, Portugal, Globe, Tripoli, &c.	10 oz.	6 oz.	4 oz.	2 oz.	1 oz.	1 oz.
PARSLEY, Myatt's Garnishing	2 oz.	½ oz.	¼ oz.	1 oz.	½ oz.	1 packet
PARSNIP	6 oz.	3 oz.	2 oz.	2 oz.	1 oz.	1 oz.
RADISH, finest for succession	1½ lb	1 lb	10 oz.	6 oz.	4 oz.	3 oz.
SPINACH, round and prickled	2 pints	1 pint	4 oz.	4 oz.	4 oz.	2 oz.
SALSAFY	1 packet	1 packet	1 packet			
SCORZONERA	1 packet	1 packet	1 packet			
TURNIP, Martin's superior Garden stone, &c	16 oz.	8 oz.	6 oz.	3 oz.	2 oz.	
VEGETABLE MARROWS	1 packet	1 packet	1 packet	1 packet	1 packet	2 oz.
HERBS, of sorts	8 packets	7 packets	4 packets	3 packets	2 packets	1 packet

CATALOGUES of SEEDS, and also of their immense NURSERY STOCK, may be had on application.

Notice.

PURCHASERS of LARGE QUANTITIES of GARDEN and FARM SEEDS will be supplied liberally by SUTTON and SONS

For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

Notice.

ELIZABETH BARNES, Widow of the late WILLIAM BARNES, of Camden Nursery, Camberwell, London, desires to inform the Friends and Patrons of the Deceased, and the Public generally, that it is her intention to CARRY ON the BUSINESS as heretofore at the above premises; and that it is her resolve to endeavour, by unremitting and strict attention, and by supplying every article of the best possible quality, to merit a share of the liberal support so kindly extended to her late Husband.

Special Offer.

JOHN CRANSTON, having a large surplus stock of the undermentioned articles, will be happy to furnish special quotations, both wholesale and retail.

ROSES.—Standards and Half-Standards, all the leading Perpetuals.
Dwarfs, do. do., very fine plants for bedding or potting.
Dwarf Standard, Tea-scented, Noisette and Chinas, suitable for potting.
Extra tall Standard Roses, 6 to 8 feet stems.
Climbing and Pillar Roses.
Roses for forcing, of extra size.
New Roses for 1870, 30 varieties. Plants ready early in March.
FRUIT TREES.—Dwarf-trained Apples, Pears, Plums and Cherries, well-grown Trees.
Pyramids do. do.
Standard-trained Peaches and Nectarines.
Standard Pears, Plums and Cherries, very fine.
Gooseberries, upwards of 200 varieties, 3 and 4 yr. old plants.
Currants.
Vines, strong fruiting and planting Canes.
CONIFERÆ.—Handsomely grown specimens, 6 to 10 feet.
Pinus austriaca, all quartered and recently transplanted, 2 to 3 feet, and 3 to 4 feet.
Spruce Fir, quartered, 2 to 2½, and 2½ to 3 feet.
Wellingtonia gigantea, very fine, 2 to 2½, 2½ to 3, and 3 to 4 feet.
Thuja aurea, beautiful plants, 9 to 12, 12 to 15, and 15 to 18 inches.
Thuja gigantea, Lobbii, Abies Menziesii.
Thujopsis borealis, &c.
LAUREL, Common and Portugal, Mahonia aquifolia, &c.
WEEPING ASH, 6 to 10 feet, very fine.
ENGLISH OAK, 2 to 4 feet.
ASPARAGUS, 2 to 3 yr.; RHUBARB, SEAKALE, &c.
Nurseries, King's Acre, near Hereford.

Specimen Conifers, &c.

WILLIAM BRYANT (late GEO. BAILEY) begs to invite the attention of intending planters to the following LIST of HARDY EVERGREEN TREES and SHRUBS, which have been recently Transplanted, and are in every way superb:
ABIES DOUGLASII, splendid plants, 12 to 15 feet high, 20 to 27 feet in circumference.
ABIES EXCELSA (LAMBRASHIANA), 4 feet high.
ABIES MENZIESII, 3 to 10 feet high.
ARAUCARIA IMBRICATA, fine symmetrical plants, 4 to 10 feet.
CEDRUS ARGENTEA, 8 to 10 feet.
CEDRUS DEODARA, magnificent specimens, 6 to 16 feet high, 12 to 28 feet in circumference.
CEDRUS DEODARA ROBUSTA, 6 to 8 feet.
CUPRESSUS FRAGRANS, 6 to 10 feet.
CUPRESSUS LAWSONIANA, 3 to 8 feet; fine plants, 10 feet high, 12 feet in circumference.
CUPRESSUS MACROCARPA, 4 to 6 feet.
JUNIPERUS CHINENSIS, 4 to 6 feet.
JUNIPERUS EXCELSA, 3½ to 6 feet.
PICEA LASIOCARPA, 3 to 5 feet, handsome plants; 7 feet high, 18 feet in circumference: these are invaluable where immediate effect is required.
PICEA LOBBII, 2 to 4 feet, fine.
PICEA NOBILIS, 2 to 5 feet.
PICEA PINSAPO, 3 to 5 feet; handsome plants, 4 feet high, 12 feet in circumference.
PINUS AUSTRIACA, 4 to 7 feet.
PINUS BENTHAMIANA, 3 to 5 feet.
PINUS CEMBRA, 4 to 6 feet.
PINUS EXCELSA, fine plants, 4 to 6 feet.
PINUS INSIGNIS, 6 to 8 feet; fine specimens, 10 feet high, 30 feet in circumference.
PINUS MARITIMA, 6 to 10 feet.
PINUS PYRENAICA, 3 to 4 feet.
TAXODIUM SEMPERVIRENS, 6 to 12 feet.
TAXUS ADPRESSA, 6 feet high, 24 feet in circumference.
TAXUS BACCATA (ADPRESSA) ERECTA, 6 to 10 feet high.
TAXUS BACCATA VARIEGATA, splendid plants; 5 feet high, 12 feet in circumference.
TAXUS BACCATA VARIEGATA, 3 to 6 feet; fine.
THUJA GIGANTEA, 10 feet by 4.
THUJA LOBBII, 6 to 10 feet.
THUJA WAREANA, 5 to 8 feet; fine plants.
THUJA AUREA, 2 to 3 feet.
THUJA ORIENTALIS, 3 to 10 feet.
THUJA ORIENTALIS VARIEGATA, 4 to 5 feet.
THUJOPSIS BOREALIS, 8 to 10 feet; handsome plants.
WELLINGTONIA GIGANTEA, 3 to 8 feet, some 15 feet high, 18 to 24 feet circumference.
BOX (TREE), Green and Variegated, 6 to 8 feet, fine specimens.
LAUREL (PORTUGAL), extra fine specimens, 3 to 5 feet.
OAK (EVERGREEN), 4 to 10 feet.
LIME (WEEPING), fine trees, 20 feet high, girth of stem, 2 feet.
ELM, fine ornamental trees in great variety.
Prices on application to the Nursery, Rugby.

PETER JAMES PERRY,

SEED MERCHANT, BANBURY,

BEGS TO ANNOUNCE THAT HIS

PRICED CATALOGUE OF GARDEN AND FLOWER SEEDS

Is now ready, and may be had Post Free on application.

He also calls attention to his

BANBURY IMPROVED WHITE SPANISH ONION,

Twelve Bulbs of which variety (weighing 12¾ lb.) were exhibited at the Royal Horticultural Society's Rooms, on December 21, 1869, and were awarded a "Special Certificate."

Price per Packet, **1s. 6d.** and **2s. 6d.**

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most critical and choice Seeds are either home saved or have been saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

Now Ready, Post Free on application,

PETER LAWSON & SON'S

DESCRIPTIVE PRICED SEED CATALOGUE

OF KITCHEN GARDEN AND FLOWER SEEDS, GARDEN IMPLEMENTS, GLADIOLI, &c.

The True SANDRINGHAM CELERY, EMERALD CUCUMBER, DELL'S SUPERB BLACK BEET, SANDRINGHAM SPROUTING CABBAGE, INCOMPARABLE WHITE DUTCH CABBAGE LETTUCE, BANBURY IMPROVED WHITE SPANISH ONION, and other recently introduced VEGETABLES and FLOWER SEEDS, are fully described and are recommended.

20, BUDGE ROW, CANNON STREET, LONDON, E.C.; and EDINBURGH.

EARLY GOODERICH POTATO.—This variety was sent us three years since by an eminent American Nurseryman, and having thoroughly tested it, we can recommend it as by far the HEAVIEST CROPPER of any VERY EARLY Potato known to us, and it must prove an acquisition where EARLINESS and a FULL CROP is an object. The tubers are round and full sized; and the foliage is very distinct, being remarkably broad and of vigorous growth. Price 21s. per bag containing 1 cwt., delivered carriage paid to the principal Railway Stations.

We can also supply DALMAHOY, GRYFFE CASTLE, DRUMMOND'S PROLIFIC, WALKER'S REGENTS, &c. Prices on application.

WM. DRUMMOND AND SONS.

Seed and Nursery Establishment, Stirling, N.B.

THE ROYAL SEEDSMEN. The Advantages of Procuring Seeds Direct from the Growers cannot be Over-estimated. THE ROYAL SEEDSMEN.

CARTER'S

COLLECTIONS OF VEGETABLE SEEDS

(NEW AND UNADULTERATED), AS HARVESTED ON THEIR OWN SEED FARMS.

THESE COLLECTIONS PRODUCE A PLENTIFUL SUPPLY OF CHOICE VEGETABLES ALL THE YEAR ROUND.

COLLECTION of VEGETABLE SEEDS No. 1, price 12s. 6d., packing included, suitable for a small Cottage Garden.

CARTER'S FIRST CROP PEA, the earliest in cultivation, price 2s. per quart.

HUNDREDFOLD PEA, or the COOK'S FAVOURITE (illustrated at page 1280, *Gardeners' Chronicle*, 1869), in sealed packets, 7s. 6d. per quart, 4s. per pint.

PATERSON'S BOVINIA, or CATTLE FEEDER POTATO, the heaviest cropper known. Per lb., 1s. 6d.; 7 lb., 9s.; 56 lb., 65s.

COLLECTION of VEGETABLE SEEDS No. 2, price 21s., packing included, suitable for a Small Garden.

COLLECTION of VEGETABLE SEEDS No. 4, price 63s., packing included, suitable for large Gardens.

For detailed Table of these Collections, see CARTER'S SPECIAL ORDER SHEET for 1870, forwarded Gratis and Post Free.

LAXTON'S "ALPHA" PEA, the earliest Wrinkled variety, in sealed packets, 7s. 6d. per half pint.

COLLECTION of VEGETABLE SEEDS No. 3, price 42s., packing included, suitable for a Garden of half an acre.

CARTER'S CHAMPION POTATO, the best for forcing, 5s. per peck.

LAXTON'S SUPREME PEA, described as "a Grand Pea." In sealed packets, half pint, 2s. 6d.; pint, 4s. 6d.; quart, 8s. 6d.

NEW POTATOS, American (imported Seed from the raisers). The Early Rose, 1s. 6d. per lb.; Bresee's Prolific, 3s. per lb.; Climax, 3s. per lb.

For full descriptions, see

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM FOR 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., 237 AND 238, HIGH HOLBORN, LONDON, W.C.

Beta chilensis.

BUTLER, McCULLOCH, AND CO., are enabled to offer SEED of the true variety of this magnificent foliage plant in packets 1s., and 2s. 6d., sent post free.
South Row, Covent Garden Market, W.C.
Established upwards of a century.

Special Offer.—Madame Lemoine.

WILLIAM BADMAN offers strong Plants of this most beautiful of Double Pelargoniums, in single pots, 6s. per dozen. LORD DERBY, finest Pelargonium grown, 4s. per dozen. Package included. Terms cash.
Cemetery Nursery, Gravesend

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices: 100 plants, distinct sorts, for 30s.; 50 plants for 20s.; 25 plants, distinct sorts, for 10s.; hamper and package included.
Crown Nursery, Reading.

New Catalogues.

DOWNIE, LAIRD, AND LAING, Frederick Street, Edinburgh, and Stanstead Park, Forest Hill, London, beg to intimate that their DESCRIPTIVE PRICED CATALOGUES of Garden, Flower, and Agricultural Seeds, Gladiolus, Florist Flowers, and New Plants are now ready, and may be had free on application.

Established 1806.

T. HANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application.
Seed Warehouse: 24, Cockburn Street, Edinburgh.
Nurseries: Brunstain Glen, Musselburgh.

Great Eastern Seed Establishment.

DAVID GOLD McKAY'S Illustrated CATALOGUE of GARDEN and FLOWER SEEDS, embracing the most extensive Collection to be met with out of London, both of Home and Continental origin, including a newly arranged LIST of GLADIOLI, is now ready, free by post on application.
Seed Warehouse, Market Hill; Nursery and Seed Grounds, Springfield, and Great Cornard, Sudbury, Suffolk.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, storing, Use, Flavour, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success.
RICHARD SMITH, Seed Merchant, Worcester

The Gardeners' Chronicle

SATURDAY, JANUARY 22, 1870.

MEETING FOR THE ENSUING WEEK
MONDAY, January 24—Entomological .. .. .. 7 P.M.

WHAT difference can it make, when the house is full of rods, whether they all start from one stem or root, or from several, the treatment being alike in both cases? Thus asks a correspondent, *apropos* of VINES and VINERIES, the question having been suggested by the recent discussion in our columns in reference to the rival systems of Grape growing. It is evident that our querist is an unbeliever in the extension system, and concludes with some *primâ facie* justification, that in increasing the number of the sources of nutrition he must be securing an advantage as regards the health and productiveness of the inmates of his vinery. We think, however, that he misses the point of the disputation; for whether the many stems and many roots will prove to be advantageous, must surely depend in some degree on the habit of the particular plant under consideration. We are not now about to enter at any length into the subject, but propose to address ourselves briefly to the above inquiry from this one point of view.

We have said that whether in filling a house with healthy and prolific rods, the many stems and many roots, or in other words the many sources of supply, have any advantage over channels of supply more limited as to the number of their conduits, will depend greatly upon the habit of the plant under treatment. This may, perhaps, be made plainer by an illustrative example. Suppose we were dealing with a houseful of Tea Roses. In this case the natural habit of the plant would not be adapted for filling the house from a single stem, and it would be found that one rafter, or at the most two, would be as much as the Rose would conveniently furnish, since this space would afford scope enough for it to develop something like its natural growth. Now the case would be very different with the Vine. The Vine is naturally a rambler, and its habit being to spread, far and wide, it is constitutionally adapted for this manner of growth. True, it is a very docile plant, and bears repression to a certain extent, yet after all repression is repression, and there is a tendency in the plant to rebel, by pushing out rapidly in all directions, unless indeed the repression has been carried so far that the vigour of its roots has been subdued, and its natural robustness tamed down by the too close and too successful application of the system of famishment. Let the Vine, however, have headway, and if it be planted in congenial soil and under favourable—yea, oftentimes, under adverse—conditions, its leaves and its roots will take care of each other; and the result in its case is, and must be, fertility, supposing the treatment in other respects to be sound.

One other example in the opposite direction in support of this view, and we have done. It is well known that in the case of conservatory climbers of vigorous habit—Tacsonia, for instance—they will not produce flowers if cut back with too keen an eye to secure neatness; their branches must be suffered to run freely—that is the professional phraseology—before the inflorescence will reward the cultivator. How grand are many of our noble stove climbers when they thus have opportunity to grow in some degree after their natural habits. How charming the Luculia, which Mr. CULVERWELL describes in our last volume, and how unlike the ordinary appearance of the plant! The same principle applies in all these cases, the chief difference being, that the Vine is the more tractable of the subjects we have instanced.

—— SOME time since Mr. UPHILL, of Moreton, Dorchester, was good enough to forward us specimens of POTATOS in which shoots terminated by small tubers had formed in the interior of the parent tuber, and having at length burst the rind, appeared filling up the cleft. It will be remembered that a short distance within the rind of the Potato is a ring of vascular tissue, faintly conspicuous to the naked eye, but easily visible on microscopic examination; from this ring proceed the vessels that supply the "eye," and which, of course, under ordinary circumstances are directed outwards towards the rind. In the present instance the vessels, checked by the persistent rubbing off of the eyes on the exterior, confined their operations to the interior, and at length succeeded in developing shoots *inside* the Potato, as explained in Mr. UPHILL'S note, which we subjoin, merely adding that we do not remember to have seen a similar case before in the Potato, though in Turnips and Carrots we have witnessed occasionally something similar:—

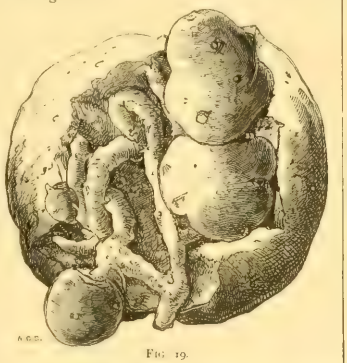

FIG. 19.

"The Potatos sent are of 1868 growth, and which were several times sprouted in the spring and early part of the summer, which had the odd effect of causing them to break from the inside and grow in the interior of the Potato. It appears that Nature, being repeatedly frustrated in her efforts to reproduce in the usual way, tried an opposite course, and was so far successful, until the young tubers burst the old one and disclosed the fact. Possibly it frequently happens when Potatos are kept so long, but as I have not hitherto observed it, I forward it to you."

—— An important decision on the question of COMMONERS' RIGHTS was pronounced by the Master of the Rolls on the 14th inst. The following extract from the *Times* report will put our readers in possession of the main facts of the case:—

"SMITH *v.* EARL BROWNLOW.—*The Berkhamstead Common Case.*—The suit was instituted by the plaintiff, on behalf of himself and all other the freehold and copyhold tenants of the manor of Berkhamstead, to obtain a declaration that they are entitled in respect of their tenancy to the right of pasture and other commonable rights, including the right of herbage and pannage (*i. e.*, the right to feed swine on the mast and acorns), and to cut Furze and Gorse over four pieces of waste land known generally as Berkhamstead Common. A right to estovers and a right to use the whole of the same common for walking, driving, and riding on horseback, and for the enjoyment of air and exercise, and for amusement and recreation, were also claimed by the Bill. The suit was occasioned by the act of the late Earl, who had railed off a large portion of the common in question, about 400 acres in extent, with a high iron railing, so as practically to exclude the commoners from the enjoyment of the rights to which they allege themselves to be entitled as tenants of the manor. The manor of Berkhamstead, which in the opinion of the Court had been proved to comprise both the borough of Berkhamstead and the hallimote of Northchurch, is in circumference about 11 miles, including the common in question, and the tenants of both manors enjoyed indiscriminately and in common the whole waste. His lordship, after reviewing the evidence and the technical objections that had been raised, was of opinion that the plaintiff was entitled to a declaration in his favour as regards the right of pasture and other commonable rights, and an injunction would be granted to put an end to the encroachment on the commoners' rights, but this decree would not establish the right of estovers, nor the right to use the common for purposes of recreation, as to which the evidence was entirely of modern date. The costs must follow the event. It was true that the present defendant did not himself erect the fence, nor did he seem to desire by any active steps to support the encroachment; and if he had abandoned the case when he succeeded the late Earl, the estate of the latter alone would have been liable for the costs; but he had thought it proper to stand in the place of the late Earl, and must accordingly pay the costs. His lordship concluded by expressing his opinion that the case was quite one for trial before a court of equity, and that the alleged pendency of an action for trespass brought by the Earl need not affect his decision as to the costs.

—— The "Belgique Horticole" records the fertilisation and fructification of ENCEPHALARTOS LEHMANNI under interesting circumstances. It appears that M. JEAN VERSCHAFFELT, of Ghent, imported from the Cape a number of plants of this species. The trunks were received in a dormant state, and deprived of their leaves. When placed in the stove they began to show signs of life—some produced fronds, and others inflorescence, male and female. The pollen from the stamen-bearing catkins was dusted over the female cones in the ordinary way, and the result was the production of numerous fertile seeds. The fertile cones of Encephalartos Lehmanni resemble in form and size a large Pine-apple.

—— Orchidophilists will rejoice to hear of the rediscovery of the glorious ODONTOGLOSSUM WARSCEWICZII, hitherto known to us only by the plate in REICHENBACH'S "Xenia," for which a drawing of the ill-requited traveller whose name it bears, supplied the materials. Since the appearance of the figure, every botanical collector visiting the isthmus of Central America has searched—and until now searched in vain—for this plant, which is probably the most beautiful species of the genus to which it belongs. As the fortunate finder wishes the habitat to be kept, for the present, a profound secret, we have nothing further to communicate beyond the intimation that living plants may be expected in the course of the ensuing season.

—— Every one must have seen, but apparently few have thought it worth their while to record, the singular SHEDDING of the BRANCHLETS of the TAMARISK. At this time of year by the seacoast, where the shrub is planted, the ground is strewn with the fallen twigs. The learned call this natural pruning CLADOPTOSIS; it occurs in many plants, particularly in Thuja, Taxodium, Glyptostrobus, &c.

—— In connection with the systematic DESTRUCTION of TIMBER in AUSTRALIA, it is stated in "Nature" that in the Ballarat district this destruction has been accompanied by a corresponding diminution in the rainfall, and that since 1863 there has been a more or less regular reduction, from 37·27 inches in 1863 to 14·23 inches in 1868. The Government has recently appointed an Inspector of State Forests, whose duty it will be to prevent the waste of timber, and establish nurseries of forest trees in various parts of the colony.

—— We are requested to state that the following premiums, relating to PERFUMES produced from PLANTS in the British dependencies, have been placed at the disposal of the Council of the Society for the Encouragement of Arts, Manufactures, and Commerce, for the term of seven years, by Dr. SEPTIMUS PIESSE, F.C.S.:—1. A premium of £5, for 1 lb. of Otto of Bergamot, of the value of 16*s.* or more in the London market, being the produce of plants (Citrus Bergamia) grown in Australia, New Zealand, Natal, any of the British West India Islands, or any other British colony or dependency. 2. A premium of £5, for one ounce of Otto of Roses, of the value of 20*s.* or more in the London market, being the produce of any variety of Roses grown together in one plantation in Australia, New Zealand, Natal, any of the British West India Islands, or any other British colony or dependency. 3. A premium of £10, for a canister of enflowered butter or fat, so scented with any kind or sort of flower, either by infusion or enfleurage, or by means of these processes jointly, of the weight of 3 lb. or more, and of the value of 6*s.* per lb. in London. The said butter or fat to be enflowered or infused with flowers grown for the purpose in Australia, New Zealand, Natal, any of the British West India Islands, or any other British colony or dependency.

—— At the meeting of the Royal Horticultural Society on Tuesday last, Mr. BATEMAN announced that he would give a prize of £5 for the best collection of cut flowers of varieties of Cattleyas, indigenous in cool countries, with the stipulation that the flowers were to become the property of the Society, for distribution amongst the ladies present on the day of competition, and which was fixed for the first meeting of the Society in 1871.

—— We have received from M. RAFARIN the following particulars relating to the admission of CANDIDATES—"*aspirants élèves*"—into the establishment of the "FLEURISTE DE LA VILLE DE PARIS," for the year 1870:—1. The candidate must be of the full age of 18 years, must bring evidence of his being the person he represents himself to be, must possess an acquaintance with the rudiments of gardening, and have

been engaged in its practice for at least a year. 2. The administration allows the following sums to be paid to the candidates in return for their services—for the first three months 60 francs, for the succeeding three months 70 francs, and for the ensuing six months 80 francs a month. The year having expired, the candidate "aspirant" may be admitted as a pupil (*eleve*), when the monthly salary is raised according to the ability of the pupil, to 85—90 francs and upwards. In order that the course of instruction may be as complete as possible, the candidates and pupils will be employed in succession in the different departments, and will have to conform to the regulations laid down for the foremen and workmen; should they require to leave the establishment, they must make their wishes known to the foreman a fortnight in advance; and they cannot receive any salary that may be due to them except on the days appointed, that is, from the 8th to the 10th of each month.

—— The Anniversary Dinner of the Horticultural Club was held on Wednesday evening at Anderton's Hotel, Dr. W. H. Sankey presiding, and Mr. W. Paul occupying the vice chair. Some splendid Grapes were presented by Mr. Meredith, and the harmony of the evening was enhanced by the capital singing of some of the lady friends of the Club.

—— Considerable dissatisfaction having been expressed, and not without reason, as to the plan followed in making the annual change in the constitution of the Floral Committee, we were glad to learn that the whole subject was to receive the attention of the Council of the Royal Horticultural Society at its last meeting, and that it was probable that a proposal of an equitable nature would be made with a view to prevent the occurrence in future of the grievances of which complaint has been made. We hope shortly to be able to announce the result of the deliberations of the Council.

—— The subjoined correspondence, which we extract from the *Times*, will be of interest to many of our readers who have to make Declarations for obtaining licences for Assessed Taxes:—

(To the Editor of the Times.)

"A vague sense of uneasiness and alarm exists in the minds of men as to what is to be the accepted interpretation of the words used in the 'Declaration to be made for obtaining licences for assessed taxes?' and this feeling is not likely to be allayed by the conflicting answers which are being sent out from the Board of Inland Revenue. The following three replies have been received within the last few days, and are to some extent supplemental to Mr. Pedlar's, which was published in the *Times* of Wednesday last. I am, sir, your obedient servant,

"Linnington Ash."

"Holsworthy, Devon, Jan. 15."

"Court Barn, Clawton, Holsworthy, Devon, December 27, 1869.

"Sir,—Another point I shall feel obliged to be informed on. Are persons wholly following an agricultural pursuit, and making their living wholly or principally by agriculture, to pay for, firstly, 'a gardener;' secondly, or 'other servant?' The words of the Act are, 'persons wholly or partially in any of the following capacities,' under which gardeners are enumerated, and stable boys, &c. I apprehend, in my own instance, as a gentleman, I should be liable, although I do not keep a professional gardener, but only employ one of my day labourers partially in the garden and pleasure-ground. But would a mere farmer be liable if he sends his farm labourer, or one of his farm servants living in the house, partially to cultivate the garden, which has neither wall nor glass? I am sorry to thus trouble you, but I have a twofold object in view—the one, that I may make my own declaration as the law contemplates; the other, to inform some agriculturists in the neighbourhood. I have the honour to be, sir, your obedient servant,

(Signed) "Walter Wm. Melhuish,

"A Commissioner of Taxes, and a J. P. for Devon.

"The Secretary, Board of Inland Revenue, Somerset House, London."

(*Reply.*)

"Inland Revenue, Somerset House, London, W.C., Jan 3, 1870.

"Sir,—In reply to the inquiries contained in your letter of the 27th ult., I am desired to inform you that in a case where armorial bearings are used, both on a carriage and otherwise, it will only be necessary, in filling up the declaration paper, to return them once, but, of course, at the higher rate; and, as regards the employment of a farm labourer partially as a gardener or groom, that the case would come within the terms of the Act requiring payment of licence duty. Any person, whether a farmer or not, who may employ, wholly or partially, a gardener or a domestic servant in any of the capacities enumerated in the declaration paper would be liable.

"I am, sir, your obedient servant,

"W. M. Rossetti, Assistant Secretary.

"W. W. Melhuish, Esq."

"Holsworthy, Jan. 6.

"Sir,—Attached to most of the houses in this town are very small gardens, which are principally used for vegetable purposes, and require (each) about six days' labour to keep them in proper culture for a year. I shall feel obliged to be informed whether, if a farm labourer is employed to perform the above labour, the party employing him is liable to pay the duty of 15*s.* imposed on every one who partially employs a person in his garden.

"I am, sir, your humble and obedient servant,

"George Braund.

"The Secretary, Board of Inland Revenue, Somerset House, London."

(*Reply.*)

"Inland Revenue, Somerset House, London, W.C., Jan. 11, 1870.

"Sir,—In reply to your inquiry of the 6th inst., I have to acquaint you that the Board will not charge licence duty as for a male servant, in respect of a farm labourer employed occasionally as a jobbing gardener.

"I am, sir, your obedient servant,

(Signed) "W. M. Rossetti, Assistant Secretary.

"George Braund, Esq."

"Holsworthy, Jan. 8, 1870.

"My lords and gentlemen,—May I request the favour of your opinion on the following case, in accordance with the recent alterations in respect of assessed taxes? 'A.' pays for a licence for a man who acts as a general servant, whose work is to look after 'A.'s' horse and carriage, to work in 'A.'s' garden, and to cut up wood, &c., for 'A.'s' house. One day in each week 'A.' employs a labourer to assist in the garden. Is 'A.' liable for an additional licence for the labourer so employed in the garden.—I have the honour to be, my lords and gentlemen, your obedient servant, "Linnington Ash.

"To the Board of Inland Revenue, Somerset House, London."

(*Reply.*)

"Inland Revenue, Somerset House, London, W.C., Jan. 13, 1870.

"Sir,—I am to acquaint you, in reply to the inquiry contained in your letter of the 8th inst., that a person is not liable for licence duty in respect of a labourer only occasionally employed in his garden by the day.—I am, sir, your obedient servant,

(Signed) "W. M. Rossetti,

"Mr. L. Ash." "Assistant Secretary."

—— The following account of a local Society has been sent us by a correspondent. As such institutions, properly managed, are likely to be very useful, we insert this notice in the hope it may stimulate others to do likewise:—The Bitterne and West End Gardeners' Mutual Improvement Society has just issued its annual report, from which we gather that it is proving successful in its operations, so far as it has gone. As yet these have been limited to the circulation amongst its members of weekly and monthly gardening publications, thereby diffusing a large amount of valuable and interesting information upon subjects that are essential to a gardener's education. It is right, however, to state that the committee express themselves as by no means satisfied with the extent of their success, for the Society was not receiving that amount of practical support from gardeners, amateurs, and cottagers, in the locality, that it deserves, and especially had they to express their surprise that gardeners did not more generally avail themselves of its advantages. The local gentry had greatly assisted, by becoming honorary subscribers, in the hope that those in their employ would heartily strive to reap the benefits it afforded. The publications circulated weekly are three copies of the *Gardeners' Chronicle*, three of the "Journal of Horticulture," three of the "Gardeners' Magazine," and one copy of the "Gardeners' Record." The monthly magazines are the "Gardener" and "Florist." The weekly subscription per member is 1*d.*, and the papers are supplied to each with great regularity. The balance-sheet for the past year shows an income of £7 0*s.* 4*d.*, and the expenditure of £4 1*s.* 1*d.*, leaving a balance of £2 19*s.* 3*d.*, which they hope to use in further extending the Society's operations during the present year.

New Garden Plants.

Odontoglossum odoratum, *Lindl.*

Paniculatum, sepalis petalisque cuneato-oblongis acuminatis crispulis, labello utrinque basi erecto triangulo-angulato, dein replicato in laminam triangulam acuminatam hinc crispulam angulatam, callo didymo supra centrum utroque laminae lobulato, columna clavata medio valde angulata, cirrhis terminalibus antrorsis basi dente adventato, angulo membranaceo utrinque superadditis. *Odontoglossum odoratum*, Lindl. Orch. Linden no. 86: Id. Folia 1., Odontoglossum, no. 4.

It is a great satisfaction at length to have this plant alive before us. We have had great annoyance with it. Odontoglossum odoratum and constrictum both bear the same Lindenian number, 623, and have been confounded by both Messrs. Lindley and Linden, so that, for example, Dr. Lindley gave O. constrictum for it to Achille Richard, and Director Linden insists that a broad-flowered branched form of O. constrictum is O. odoratum. Yet the *verba ipsissima*, "labello . . . lobo intermedio acuminato" of O. odoratum, and "epichilio subpandurato" of O. constrictum, should solve the question and clear up the unhappy confusion of the Lindenian specimens in the herbaria. The specimens in the Lindleyan herbarium are correct, and we have from Dr. Lindley two typical flowers of his odoratum, and that is the only Lindenian, 623, belonging to O. odoratum, we have ever seen, all the others belonging to O. constrictum. To increase the difficulty I find there is in the herbarium of Dr. Lindley a sketch, with expanded side lobes of the lip (not even of a typical one), giving quite a wrong idea of the plant, and making it appear as if it had a hastate flat lip, with very rounded side lobes. Our other specimens come from Merida: Moritz (1095), Wagener; N. Grenada: Linden, 1267, Schlim, 71, 721. It is a very pretty thing, bearing a rich panicle of stellate flowers, much acuminate and crisp, of a nice golden yellow with brown blotches. The lip, too, is of same colour, with awhite callosity. The column is whitish, with brown spots. Now the difficulty about Odontoglossum odoratum being solved, there arises a new sorrow. We believe Odontoglossum gloriosum, Rchb. fil., in its typical form, to be widely different from odoratum, and more than a white variety, showing different colours and "cirrhi," and a different callus. Yet we are suspicious, that among the small flowered varieties there may be some which are nothing else than a white variety of odoratum. Ah! when at length shall we have the necessary assistance of scientific travellers, making full inquiries where alone they can be properly solved—on the spot?

As to the confusion arising from the same number having been given to two different plants from Merida and La Guayra, we scarcely believe M. Linden has ever distributed under one number plants from two localities, and we do not understand how the mistake arose. Our specimen is due to M. Wallis's researches in the Meridan Sierra Nevada, and it has been lately sent by Director Linden. *H. G. Rchb. fil.*

Odontoglossum Wallisii, *Lind. Rchb. fil.*

Paniculatum? ramo fractiflexo pauciflore grandiflore; sepalis petalisque ligulatis acuminatis; labelli ungue ligulato, utrinque erecto, callo parvo interposito basin versus, lamina pandurata antice retusa cum apiculo, callis ternis falcatis utrinque in basi antepositis callis ascendentibus furcatis, utrinque pilis arachnoideam lanam efficientibus bilmeatis in disco; columna gracili basi utrinque angulata, alis trianguli-serratis, infra juxta foveam angulatis.

Much in the way of Odontoglossum Lindleyanum and O. lacerum, Lindl., in Herb. Hook. The flowers bear honey coloured sepals and petals marked with brown streaks. The pretty lip is white, with a violaceous anterior part, and marked with similar streaks on the base. The pandurate anterior part, as well as the triangular serrate wings, give very remarkable characters to this novelty. It was discovered in New Granada by Director Linden's invaluable lynx-eyed traveller, M. Gustav Wallis, to whom it is dedicated most thankfully by us. *H. G. Rchb. fil.*

Odontoglossum leucopterum, *Lind., Rchb. fil.*

Pubis pergamenei sub-bipedalibus oblongo-lanceolatis acutis; paniculâ amplissima, ramis fractiflexis; sepalis complicato unguiculatis oblongis acutis undulatis, petalis late unguiculatis oblongis acutis; labello triangulo utrinque basi dilatato angulato; callo gemino tumido ligulato apiculato velutino a basi versus discum vehitino; callis falcatis pauci bicarinatis antepositis seu extus appositis; columna clavata sub fovea angulata, ala triangula parvula utrinque juxta stigma.—*Odontoglossum leucopterum*, Lindl., Rchb. fil., in Seemann's Bonplandia, ii., p. 279. 1854.

Sepala alba, carina externa mediana viridi. Tepala alba, basi brunneo lobriata, guttis antepositis brunneo purpureis paucis. Maculae guttae multae kermesinae in labello.

A very pretty plant, bearing numerous flowers a little smaller than those of Odontoglossum constrictum, cream coloured, with chocolate-brown streaks and dots on the petals, and some purplish violet spots on the lip. The grand panicle bears zigzag branches. Originally discovered by the late Schlim, it has now been met with a second time by M. Gustav Wallis, who sent specimens alive to Director Linden, with whom the plant is now in full flower. *H. G. Rchb. fil.*

PORTRAITS OF GARDEN PLANTS.

Aerides japonicum, *Bot. Mag.* t. 5798.

An interesting greenhouse Orchidaceous epiphyte, having a short stem, short linear-oblong obtusely-bilobed leaves, and pendent racemes of several pretty white flowers, having the lateral sepals slightly barred with brown purple, and the obovate spathulate purple-spotted lip marked with a dark violet central ridge. Introduced by M. Linden, and subsequently by Messrs. Veitch & Sons, from Japan.

Aloe Croucheri, *Bot. Mag.* t. 5812.

This very handsome greenhouse succulent, somewhat resembles A. acinacifolia in habit, being stemless, with spreading ligulate unequally trigonous leaves, a foot long, dark green, marked with oblong whitish spots, and bearing branched scapes, with numerous long racemes of pendent curved tubular flowers, pale rose-coloured in the lower half, white with green veins above. It has long been cultivated at Kew, origin unknown, and is now named in compliment to Mr. Croucher, "under whose care the succulent plants of the Royal Garden are placed, and to whose zeal and especial love for this class of plants the collection owes much of its value and interest." It belongs to the group Gasteria, of which Dr. Hooker remarks: "I suspect it will prove to be as good a genus, both in habit and floral characters, as most of Liliaceæ."

Androsace pubescens, *Bot. Mag.* t. 5808.

A lovely little Primulaceous alpine, from the lofty mountains of Dauphiny, the Pyrenees, &c., forming a dense carpet-like tuft of numerous short branches, with crowded rosulate linear-oblong or oblong-obovate ciliated leaves, and excessively numerous white flowers with a faint yellow eye, solitary at the ends of the branchlets. Cultivated and flowered in the splendid collection of alpines at Messrs. Backhouse's nursery, York.

Blandfordia aurea, *Bot. Mag.* t. 5809.

A beautiful Australian Liliaceous perennial, with numerous rigid distichous narrow grass-like channelled leaves, and a scape 1 foot to 1½ foot high, bearing at top from three to five large campanulate golden-yellow flowers. Flowered by the Messrs. Veitch & Sons, in July, 1869.

Crotalaria Cunninghamii, *Bot. Mag.* t. 5770.

A remarkable-looking greenhouse Leguminous shrub, clothed throughout with velvety glaucous pubescence, and having ovate obtuse leaves, and dense racemes of large yellow-green flowers, which are marked with purple lines on the reflexed standard. Native of the dry, almost desert, regions of North-Western and Central Australia, and raised and flowered by W. Wilson Saunders, Esq.

Eria vestita, *Bot. Mag.* t. 5807.

A curious and attractive Orchid, which has been exhibited as Trichotosia ferox. Its stems bear coriaceous

lanceolate leaves, and long pendulous flexuose racemes of singular reddish orange flowers—the flowers and rachis especially, and to some extent the leaves and stems, clothed with rust-coloured hairs. The bracts are large, orbicular-ovate, white, with a blood-red tip. It has been found in Singapore, the Philippines, and Borneo. The specimen figured flowered with Mr. Wilson Saunders.

GLADIOLUS CRUENTUS, *Florist and Pomol.*, 1869, 121; *Bot. Mag.* t. 5810.

A strikingly handsome species of Cornflag, growing from two to three feet high, with large linear-ensiform leaves, and a distichous spike of numerous large broadly campanulate, bright blood-red flowers, with blunt obovate emarginate segments, the two lateral lower ones marked by a white transverse red-spotted zone running out into a lanceolate stripe. Introduced from Natal by Mr. Bull, and now in the hands of Messrs. Standish & Co., who have successfully employed it for cross-breeding purposes, and have now a large crop of seedlings obtained from it.

GYMNOGRAMMA LAUCHEANA GIGANTEA, *L'Illust. Hort.* t. 576.

A remarkable fine Gold Fern, having the general features of G. chrysophylla but distinguished by its broad leafy decurrent lobulate pinnules, which give it a peculiarly bold aspect. The under surface is of rich deep golden colour. It was raised by M. Stelzner of Ghent, and is said to have been obtained by sowing the spores of G. Laucheana mixed with those of G. Stelzneriana.

MIMULUS LUTEUS ALBO-MARGINATUS, *Flore des Serres*, t. 1822.

A variety of the well-known hardy perennial Monkey-flower, in which the leaf-stalks are rose-coloured, and the leaves broadly margined with blush white. It is cultivated in the Belgian gardens.

PÆONIA OFFICINALIS AUREO-LIMBATA, *L'Illust. Hort.* t. 579.

A fine hardy herbaceous Ranunculaceous perennial, the flowers of which have broad deep crimson guard petals, surrounding a central tuft of narrow spreading ones, which are crimson bordered with yellow. It is a garden variety, and was raised by M. Arnould, of Nancy.

PELARGONIUM FUMARIOIDES, *Refug. Bot.* t. 29.

A greenhouse annual or biennial, with slender diffuse stems, deltoid, bi-tripinnatifid leaves, and inconspicuous white flowers, with the petals shorter than the calyx. Introduced from South Africa by Mr. W. Wilson Saunders.

PELARGONIUM HISPIDUM, *Refug. Bot.* t. 30.

A handsome, free-flowering, greenhouse shrub, with hairy stems, and cordato-deltoid, palmatifid, serrato-denticulate leaves; the stems are copiously dichotomously-branched at top, producing from 20 to 30 umbels of large purplish flowers, of which the two upper petals are obovate-cuneate, and the three lower ones narrower. Introduced from South Africa by W. Wilson Saunders, Esq. The leaves have a scent similar to, but fainter than, that of P. tomentosum.

ORCHID CULTURE.

To reduce the death-rate of cultivated Orchids to a minimum, how are we to proceed? Are we to shape our course in accordance with natural habitat, in respect of temperature, soil (so called), moisture, shade, or no shade? I have always been sceptical as to following a blind leading,—not that I undervalue the smallest item of information that collectors on the spot have furnished us with, but I hold that the strongest evidence of natural conditions must be weighed in the balance, and judgment and experience must assess its value in catering for the best artificial home. By all means let us have all knowledge of the physical conditions of the country of their nativity, and every particular respecting successful growth and profuse inflorescence. I hope—indeed I know—that neither publicly nor privately have I said anything derogatory to the observations of collectors or observers, else I would hasten to make the *amende honorable*. At p. 76, 1865, I acknowledge information from them to be "most valuable;" and, again, at p. 1040, 1869, I reiterate that "Orchid growers are at all times exceedingly indebted to those gentlemen who give information concerning native habitats." I am, therefore, surprised that Mr. Gammie, after a fresh perusal of my views, should remark that "to know these things can be of little service to those who are disposed to accept the warning of Mr. Anderson against imitating Nature too nicely." A cultural line of treatment based upon a remove or two from natural conditions is not considered orthodox by that gentleman. Without going into the whole case, or treating the matter elaborately, let me cite an instance or two where artificial cultivation, even in Orchids, triumphs over a cultivation of natural circumstances. Take the family of Cattleyas, for instance. These, as a rule, judging by what we see of imported plants, are in the main purely epiphytal. Well, being so, according to Nature, we European growers imitate the plan, and grow all our Mossiæ, &c., upon blocks of wood or stone, or anything which roots cannot penetrate, and what kind of specimen plants are producible ten years hence? I would like to compete against them and their curator, let him be the best grower in the kingdom. But such an issue is not restricted to Cattleyas only. Take the well-known Lycaste Skinneri, take Odontoglossum grande, and the same comparative results will be the outcome. Take Vandas and Aerides, and I will guarantee the superiority of plants with their roots in pots embedded in sphagnum against those of any kind of block treatment you like to devise.

Take the other side of the picture, from a purely growth point of view, and the experienced cultivator will find that he cannot with impunity deviate so much from purely natural conditions. Cattleya Aclandiæ, C. marginata, and such-like Liliputian subjects, will not thrive under the ordinary pot culture *régime*. Neither will many of the Saccolabiums, Phalænopsids, the dwarfer Aerides, and Vandas grow apace, with their roots imbedded in cube feet of sphagnum; but that by no means destroys the theory I set out with—that the cultivator is to keep pace with the times, and cultivate, in the highest sense of the word, the plants that will submit to be cultivated by him.

Then, again, the artificial atmosphere, of course, is unnatural at the best. For that very reason you must give up all idea of periods of drought and periods of moisture common to foreign climes. In that respect you must take the next best move practicable, that of having a dryish day atmosphere and a wetter night one. You must "go in" for diurnal changes as against periodical changes, and, upon the whole, if the thing is done intelligently, the issue is well. Moreover, in a house you will have congregated together plants from a variety of districts, differing considerably physically and in all other respects; and it is just probable that the treatment, atmospherically speaking, particularly in respect of moisture, which may be good for the one, may be killing for the other.

As to the shading necessary, I have evidently misunderstood Mr. Gammie's original teachings in that respect. I took it to be rule absolute, in the case of Dendrobium Falconeri, to dispense with the blinds. I now see he counsels shading from May to November. I agree with him that, except in our country, April to October would be the better limits. But I hold that, generally speaking, in our houses in England, and particularly on the Continent, there must be a greater degree of shading than what Nature affords to plants growing under the most favourable aspects. The sun playing upon glass has a powerful and withering effect upon most Orchid plants. Some of them, such as Dendrobium nobile and D. chrysanthum, and robust plants even of Vanda suavis and others of that section, might be left in houses with their gables standing north and south without any shading whatever throughout the season; but this is a dangerous concession in the hands of the young Orchidist. In the case of sickly or etiolated plants the sun will suck the life-blood from them; and with beginners, unfortunately, this state of matters is more the rule than the exception; consequently, it is safer to blind heavily than not to blind at all.

As to temperature and air circulation I have found no good result from experimenting contrariwise to the plants in a state of Nature. In that respect particularly no deviation of consequence is attended with good results. Bar this, however, that in the case of localities where hoar-frost makes its appearance without doing devastating work, I would not like to practise upon plants that have come thence unscathed, and expose them to the hoar-frosts of our country. Looking to the minimum of 42° (see p. 991, 1869) as a season of rest for D. Falconeri in its native habitat, that is what we consider cool, almost Andean Peruvian treatment. Against that and the higher temperature of 90° at the solstice, accompanied with blinds, I have nothing to say. What I did admire was the extreme health and beauty of Mr. Salt's plants—not one but half-dozens of them grown under comparatively cool treatment, warmer certainly than Mr. Gammie's standard in winter, and not so warm in summer. I had grown it, and all but failed in our East Indian climate, and was glad to record such undoubted examples of success in a cooler temperature than I had been accustomed to give it.

I am concerned also in defending the successful British Orchidist from incapacity in his art. Mr. Gammie says (p. 40):—"In their wild state the majority of Orchids flower most abundantly, but in England I never saw an Orchid house with any great number of flowers in it at one time, and I have often heard it stated that the paucity of flowers produced deterred many gentlemen from growing Orchids." I don't know when Mr. Gammie left England, but I should imagine it must have been many years ago. Had he ever seen the display at the International from Mr. Robert Warner's collection alone, and that of Mr. Turner, of Leicester, not to speak of the premier nursery collections, he could scarcely have made such a remark. Ever since these great things have been done, enterprising collectors have sent home quantities which, as a rule, have been well cared for; and it is no uncommon thing, now-a-days, to see Orchid flowers, and flowers in abundance, every month of the year. I might even invite Mr. Gammie—whose observations, supposing I differ from him in some important particulars, I have read with interest and profit—to come and see Meadow Bank any month in the year, in the hope that I should be able to disabuse him of the unfavourable impression he has gathered concerning the British grower, in the matter of inflorescence. No gentleman need be scared with a phantom of that kind. The culturist at home has many opportunities of studying the eccentricities of plant life, of watching its progress day by day and hour by hour, such as the most attentive observer at a natural habitat cannot possibly have. A collection of Orchids under a good eye at home is about as well known to the gardener as sheep to a discerning shepherd. If conditions appear to be unfavourable to the growth of any particular species, they can be altered, according to judgment—very often for good, sometimes for evil. He may all the more readily be pardoned, therefore, for feeling his way in a doubtful case, before accepting any conditions, however favourable, in a state of Nature. *James Anderson, January* 11.

NOTES ON THE "DOGWOOD" OF GUNPOWDER MANUFACTURERS.

In a letter, Mr. G. E. Frere, Roydon Hall, Diss, remarks—"Are you aware that the wood which is called 'Dogwood' at the gunpowder works, and used in the manufacture of the finer kinds of powder for small arms and fowling pieces, is not Cornus sanguinea, but Rhamnus Frangula, and that the main supply of it is imported into this country from Belgium and Prussia? This last-mentioned circumstance makes me think the R. Frangula ought to be more frequently cultivated in England, for it is quite out of character that the nation should be dependent on foreigners for the supply of an important material of defence. Failing to procure plants from the English nurseries, I looked into the catalogues of the Edinburgh nurserymen, and I find the Messrs. Lawson quote it amongst ornamental trees and shrubs, at 1*s.* to 3*s.* 6*d.* each; while Reid, of Aberdeen, does not mention it at all. Of course there is no planting it by the acre at Lawson's price. If you have any means, by labeling the Rhamnus Frangula in the Edinburgh Botanic Garden, or otherwise, of informing the public that it is the Dogwood of gunpowder makers, you will be doing a national benefit thereby; and perhaps nurserymen may then turn their attention to its cultivation for coppice wood."

The notice by Mr. Frere of the use of the Rhamnus Frangula, or Alder Buckthorn, as it is called, in the manufacture of the finer kinds of gunpowder, is not new, this having been already noticed by several old authors. It is, however, a most important subject, and one worthy of the attention both of nurserymen and arboriculturists. This species of Buckthorn is a tree resembling in habit some plants of the common White Hawthorn. It is of easy cultivation, both in light and heavy soils, and by a little attention could soon be got in large quantities. It produces abundance of fruit, which ripens freely in favourable seasons. It could easily be cultivated in hedge-rows, or used to form hedges, as it bears cutting-in remarkably well. It could also be planted with great advantage on many railway embankments, both in England and Scotland; with a little care after planting it would succeed well. In such places it would sustain no injury from engine sparks.

The subject of using charcoal-producing plants for gunpowder purposes is a most important one, and one which the Highland and Arboricultural Societies should keep prominently forward for prize papers, in order that it may be fully investigated.

The genus Rhamnus now numbers about 26 different species and varieties, and all are probably suited for gunpowder charcoal. A few of the species are subtropical, some are natives of North America, others of Spain, Switzerland, and the South of Europe, while Rhamnus Frangula and R. catharticus, although Continental species, are likewise considered as natives of Britain.

Dr. F. Buchanan White has recently discovered the Rhamnus Frangula in the parish of Contin, Rosshire; he says—"The plants (of whose number I cannot, owing to the dense growth of other bushes, speak with certainty) were in well-established bushes, about 4 feet in height, flowering freely, and growing in a marshy ground. Its associates were all native plants—Alder, Willow, Birch, Sweet Gale, Common Heather, &c." This circumstance shows there is no limit in Britain to its cultivation, if parties feel inclined to grow it for profit.

It is not improbable that many other genera of shrubby plants are capable of producing a fine quality of charcoal as well as the Common Alder, the Alder Buckthorn, and Dogwood, all now in use. Experiments could be made on the following British woods (if they have not already been tried):—The Sea Buckthorn, Common Maple, White Hawthorn, Rowan tree, Bladder-nut, Spindle tree, Barberry, Guelder Rose, Wayfaring tree; also the Hazel, Birch, Hornbeam, Black Sloe, Furze, Broom, or even the Ivy, which, in many districts, is injuring our forest trees to a great extent; likewise several exotic shrubs and trees, now largely cultivated in this country. Experiments could also be made with dried roots of many of our forest trees. After felling, such roots are generally left in the ground to rot, and are often very troublesome. If any, or all could be turned to account for producing a useful charcoal, it would hold out an inducement to remove them from the ground, which could then be used for planting, or for agricultural purposes.

The high price which the wood and branches of the Rhamnus Frangula bring in the British market—£10 to £14 a ton—is certainly an inducement for landholders to turn their attention to the cultivation of the Alder, Buckthorn, Dogwood, or any other trees and shrubs found best calculated for producing the finer kinds of charcoal. The dry Buckthorn branches are sent from the Continent in the form of compressed faggots, and peeled previous to being charred.

Since the above was written, I have received,

through the kindness of Mr. P. S. Robertson, a sample of the gunpowder-wood from the Roslin Mills, with the following letter from Messrs. Hay, Merricks & Co. :—"We have pleasure in sending you a sample of the Dogwood we use here in the manufacture of gunpowder. The sample sent is of English growth, in the county of Sussex, and the price varies from £10 to £14 per ton, according to quality. We require all peeled and packed into bundles of 100 pieces in each. The wood is cut generally in May and June." The specimen sent from the Roslin Mills was subjected to a microscopic examination, with recent woods of Buckthorn and Dogwood, and turns out to be the true Alder Buckthorn (Rhamnus Frangula.) Besides structure, it can readily be distinguished, both in the fresh and dried state, from the Dogwood (Cornus sanguinea) by turning yellow immediately on being moistened, which is not the case with Dogwood. If Dogwood is really a charcoal-producing shrub, no plant could be so easily grown, as cuttings can be got in quantity. They will soon strike root, and grow as free as a Red or Black Currant.

The misnomer of Dogwood for Alder Buckthorn ought to be corrected by all powder manufacturers, as it is apt to lead to unpleasant consequences, by parties growing and supplying the true Dogwood, and afterwards refused by manufacturers as not being the Dogwood required by them. *J. M'Nab, Royal Botanic Gardens, Edinburgh, in "Farmer."*

PRUNING GOOSEBERRY BUSHES, &c.

THE practice of pruning these bushes is thought little about, and little understood by many cottagers. It is even held in contempt by some who get part of their livelihood by the sale of the fruit they produce. Any excuse is made rather than follow the advice to prune, so that the bushes grow on until they become an impenetrable thicket : then they are, with bleeding hands and ruffled temper, consigned to the flames, and replaced by young ones before one quarter of the profits they are calculated to yield are reaped. It is not the age of the bush that has made it useless, but bad management. I know Gooseberry trees 50 years old and more, which still bear good fruit, are still manageable, and likely to live years longer. They have, moreover, been severely pruned, which goes to prove that pruning does not shorten the life of trees to such a degree as some would have us think.

"Oh," said a Gooseberry grower to me, "do you go over every tree like that?" "Yes," said I. "Why," said he, "it would never pay me to do so, for I have acres of them!" "Is that not a reason why you should be more particular in your treatment?" "Oh," said he, "I go over my trees with a pair of shears, and just top off any stray shoots." Now, that treatment only makes matters worse ; the bushes become more dense, and, consequently, air and light are more efficiently excluded, and the existence of the plant as a useful fruit-bearing bush, shortened. Hear what another says : "I should like big Gooseberries, and at the earliest time possible. I want to fill the quart with the least trouble in picking, and this, too, when the price of green Gooseberries is high." Now, here are two extremes, both to be guarded against. Although the Gooseberry, in a green state, is, perhaps, most profitable for a cottage, yet big Gooseberries are not good for tarts, not nearly so good as small ones. And the treatment necessary to get big fruit, is not required for the bushes which are allowed to grow fruit for tarts. These should be picked clean when saleable, other trees under different treatment being kept to grow big fruit which is to be allowed to ripen. Most people who sell fruit of this kind do not care so much to lengthen out the supply, or to have them late—by planting in various situations—as to have a good general crop, and sell off while the price is high.

I shall, therefore, proceed to make a few remarks on pruning. Here the experienced differ, but I shall state my system. The pruning of a bush required to produce Gooseberries, to be consumed in a green state, can best be done by thinning out the bush, *i. e.*, cutting out altogether all the branches that seem to be spent ; then thinning the firm branches and shoots, not shortening them, cutting away all those which cross one another, leaving them all free. The birds even do not make such havoc on the buds of these slender shoots as on the stumps when shortened. A branch or two may be allowed to grow up in the middle of the bush ; the shoots should be well thinned out. These branches will afford protection to other parts of the bush, and if not allowed to grow into such proportion as to suffocate the whole, will be more profitable than otherwise. Let every branch stand clear of its neighbour—which is the last remark to make on pruning a bush.

Now for dessert fruit a somewhat different practice is advisable. The size and flavour of the fruit are the chief essentials to ensure. As this can only be done by the free admission of the sun and air, the pruner has it entirely in his hands. While some of the properties of the fruit are brought up by the roots, some are taken in at the fruit itself ; so that without the air, moisture, and the sun have free passage through the bush, the fruit will not perfect in this respect. I prefer the bushes termed dwarf standards, as shown in Fig. 20, which is intended as a suggestion for a plantation of bush fruits. These are got by cuttings about 16 inches long, having all their buds, with the exception of four or five nearest the top, cut off. These buds when grown form the foundation of the bush.

Thinning of these, too, is the best mode of pruning. They should, however, be kept more open, and by no means have any branches in the centre of the bush. I do not even, for these bushes, recommend shortening the shoots, except where required to furnish the tree with a fresh branch. Cutting the last year's bearing shoots clean out, and leaving another set for the ensuing season, is the practice I have found to answer best, the fruit being more exposed to the influence of the sun. The practice of shortening is sure to produce an abundance of shoots, which only tends to shade the fruit and render the bush unshapeable. The very strong shoots should be entirely removed ; if fruit should form on them they are not so fine as on the smaller-sized shoots. It is not always that a shoot is found in the right position, yet much can be done by foresight. A pruner should look a year or two a-head, and by cutting at a bud in various directions he can turn a poor-shaped tree into one of a better type.

The cottager seldom realises the value which a few Black Currant bushes are calculated to produce. The fruit of these when ripe is worth from 4*d.* to 8*d.* per quart. Thus a full grown well managed tree is worth 2*s.* per year. Six perches, growing 25 good-sized trees, would produce at that rate, 50*s.* This must be taken as the maximum of yield, good situation and soil, &c., taken into account. But if divided by two, how many are there who, having this amount of ground and trees, get even half of that amount? The principal part of pruning of these trees is also thinning. It will readily be seen on looking at a tree that some branches—generally those which have borne fruit—are sticky, and less vigorous than the others. These should be cut down to the bottom. Some keep their bushes as long as possible to one stem at the bottom ; they look well, but eventually a branch is wanted, and is supplied from near the root, and the bush then gets out of shape. The bottom of the bush is now formed into a kind of stool, from which an endless supply of shoots will come up. These, pruned with a little foresight, will give a supply of shoots to form the bush when the upper branches have exhausted themselves in bearing fruit. Trees treated thus will live for a long time. The branches should be kept so thin that the sun can peep in at summer time, and as the day rolls away have a look all around. Never shorten the younger shoots, except those you want to form into the bush. These should be cut to the bud best adapted to that object.

The Red and White Currant—the former especially—cottagers would find profitable if well managed. These plants bear chiefly on spurs ; the pruning is therefore termed shortening back. Supposing a good sized bush is to be pruned, there will be found in the centre a quantity of useless spray or unripe wood, which ought first to be cleared away. Now each branch should be taken and examined to ascertain if it is sound and healthy ; if healthy, shorten the young shoot at the top to six or seven buds ; also shorten the side shoots which are not strong, to two or three buds. Cut out all strong shoots to one bud ; those which are thrown out from the spur small, and not more than 3 inches long, might be left entire. These will bear the largest clusters of fruit. Of course care must also be taken here to keep a supply of branches. This is done by leaving some shoots at the bottom and training them up gradually, as wanted. The best shape for these trees is that of a goblet, which will ensure plenty of air, and permit the sun to act freely on all its parts.

FIG. 20.

As to the time to perform this operation Nature is our best teacher. When she divests the trees of their clothing she appears to say, the descent of the sap which still remains to go down will in its course heal the wounds, and by depositing a kind of oil and resin make it secure against frost in winter, and against bleeding in spring. However, early pruned trees are noticed to have stronger growth than later pruned ones, which speaks it a healthy practice. From the latter part of October to the end of November is considered the proper time. Many defer it until spring on account of the attacks from the birds, but it is better to prune and protect, than allow the birds to divest of its buds the part you want to form the tree, and then to prune. Both Nature and science point to early autumn as the best time to plant these as well as most other fruit trees. Practice has also proved it ; the soil is warmer than at a later period. This warmth induces the formation of fibrils at once, thereby setting agoing the process of feeding almost directly. Those fruits like a moderately good deep soil. The Gooseberry enjoys the sun, while the Currants are apparently not so particular, but are the better for it, as all other fruits are which require to be ripened before eaten. *Bush* v. *Brake.*

Home Correspondence.

Scillas.—Surely there are no very early flowering bulbs more charming than the Scillas ; last spring (1869) they were more than usually beautiful, and gave a succession of flowers from the end of February till nearly the end of April. I kept a sort of journal of their time of flowering ; the different species and varieties made their appearance in the following order :—1, S. bifolia ; 2, S. bifolia rubra ; 3, S. bifolia alba. Of the first and third I have beds of many hundreds of bulbs. 4, S. sibirica, the most beautiful and the most enduring of all ; my bed of from 1000 to 2000 bulbs was quite enchanting, there was such a long succession of flowers ; 5, S. italica and S. amœna, very pretty ; 6, S. non scripta ; 7, S. non scripta alba ; 8, S. non scripta carnea, very distinct ; 9, S. nutans ; 10, S. peruviana alba ; 11, S. peruviana : the two latter put forth their leaves in October, and in spite of frost seem to grow all the winter. If from Peru, they must have their home on the high slopes of the Andes. Scillas seem to like a stiff, moist, soil. My soil where they grow, is dark and heavy, resting on the boulder clay, full of chalk stones : it is never stirred except with the hoe, to destroy the weeds. This solid soil seems favourable to nearly all kinds of bulbs, for my beds of Scillas have remained as they are from 10 to 15 years. Many others bulbs seem to like this let-alone treatment, for the Narcissi, Hyacinths, Crocuses, and others, stand here untouched for many years, and form themselves into perennials, blooming abundantly every season. I once had a large bed of the Persian Iris, which remained *in statu quo* for some 20 years, and every season put forth thousands of its pretty fragrant flowers. I think I remember some traveller in Northern Syria remarking that some of the hard clayey deserts there were, in February and March, gay with the blossoms of spring flowering bulbs, and when he travelled through the same districts in May, they were hard and dry, without any signs of the beauty he had witnessed. Some of my beds of Scillas I treat as follows :—In the month of May, towards the end, the dying foliage is cleared off, 2 or 3 inches of manure from old hotbeds are placed on the surface, and the different kinds of Pelargoniums, such as Mrs. Pollock, Luna, &c., are planted between the rows of Scillas ; they grow well, and are a great ornament all the summer. In the following spring the Scillas come forth as usual, and never fail to gladden early spring with their brightness. *T. R.*

Wild Service Tree.—There is a wood in Northamptonshire which had at least a score of these trees in it, some dozen years since. When a boy I have with other lads gone many times to gather the fruit, which we used to relish in those days, though I question if any of the same party would now go far out of the way to get a bunch of them. It would be interesting to learn in what parts of the country the tree does occur, for I have not seen it since I left that neighbourhood. *J. W. K., Bolton Hall Gardens.*

—— The statement at p. 39 respecting the destruction of the wild Service tree in Worcestershire suggests another question, viz., as to the occurrence of the plant in nurseries and shrubberies. There is good reason to believe it is by no means common, and certainly it is often unknown, for when ordered on the strength of catalogues, the plants supplied have proved to be either

Mountain Ash, or some of the varied forms of Pyrus Aria: the nurserymen being obviously unconscious of the difference. In the Oxford Botanic Garden is a fair-sized tree, which in some years produces fruit, from which seedlings are occasionally raised. By the kindness of Mr. Baxter, a small plant was furnished to the park here. It grows very slowly, though quite healthy. As is generally the case, the best account of the plant is to be found in Loudon, who says it used to be common in Loddiges' nursery at Hackney. *Bath, January* 13.

The Pine Beetle.—I send you shoots cut from Scotch Fir trees, badly attacked by the beetle, Hylurgus piniperda, which may be the grub doing so much damage to Pinus insignis in South Devon, as reported by your correspondent (p. 1283, 1869). The wood from which the shoots were taken is of natural growth, and is several acres in extent, growing on a gentle slope towards the north, altitude about 500 feet above sea level; the trees are from 3 to 18 feet in height, and from 10 to 20 years old. Previous to the summer of 1868 healthier trees could not be seen anywhere, but during the summers of 1868 and 1869 they were so unmercifully attacked by these destructive creatures that I am about to advise the cutting down of the wood, as it is utterly ruined. It would be very useful if other correspondents would note any damage they may have noticed done to Pines by insects. *A Forester.* [This is the first instance that has come under our notice of the ravages of the Hylurgus piniperda proving so serious in this country as to lead to the cutting down of the plantation in which they occur. We would suggest to our correspondent that, if he puts his intention into execution, he should leave a portion of the wood standing, in order to see what would have been its fate had it all been allowed to stand. He obviously appreciates the importance of such observations, and the experiment can do no harm, for he will not think of immediately planting Scotch Fir on the same ground. We suggest this respite for a portion of the wood, because we can recall to memory so many instances where injury from the attacks of insects has been hastily assumed to be fatal, and yet the trees which have been left have recovered. The extraordinary vicissitudes in different years in the number and spread of insect enemies always leaves us in corresponding uncertainty as to the fate of the trees attacked. EDS.]

Yellow Bedding Calceolarias. — Permit me, through the medium of your columns, to state the treatment which I have seen followed with these plants for several years, and in various places, with almost unvarying success. That there is evidently a disease, constitutional or otherwise, prevalent among this class of plants, few will deny, but much may be done to counteract its effects by judicious treatment. The following remarks do not apply to the old variety, known as amplexicaulis, and one or two others, but to all the more hardy kinds, including the well known aurea floribunda. Towards the end of October or beginning of November prepare a two-light box, or more, according to quantity (hand-lights will answer equally well), by placing over the bottom a layer of brick rubbish, clinkers, &c.; a small quantity of lime sprinkled in will prevent the ingress of worms; over this place about 4 inches of sandy loam; a little silver sand may be sprinkled on the top, but this is not absolutely necessary; make the whole firm and perfectly smooth on the surface. Procure the cuttings by choosing those of a green colour, and of free growth; those that assume a sickly yellow colour, and others that are running up to bloom should be discarded, as they will be almost sure to end in failure, and consequently disappointment. Insert the cuttings, 2 or 3 inches apart, over the surface of the bed; fix them well, and give a gentle watering. Keep them rather close for a few days, gradually increasing the amount of air. By Christmas they will be found to be well rooted, when they should have the lights drawn off on all favourable occasions; cover up only to prevent the ingress of frost; as they proceed in growth stop them at once. Towards the end of February, if the weather prove favourable, select a piece of open but rather sheltered ground, with a hard bottom of coal ashes, rough gravel, &c.; on this make a bed, or several, as required—about 5 feet in width will be found very convenient. The bed need not be more than 5 inches deep, composed of rich sandy loam. Insert the plants in rows 5 or 6 inches apart, or further if the number be limited; fix them well, and give a good watering. Some protection must be afforded them for a time on cold nights, and sometimes on cutting windy days. This can be easily effected by bending hoops over the beds, and covering with mats, Spruce boughs, &c. By the middle of May, if attended to in the shape of weeding, occasional watering, &c., they will be strong bushy plants, covering the bed. Before transplanting soak the bed thoroughly with water, take a spade or large edging iron, and cut down to the bottom of the bed in the centre of each row, likewise between each plant; the spade can then be inserted under each plant, and they will come up in little squares, full of roots, like lumps of turf; they can then be placed on trays or hand-barrows, and conveyed to the flower garden. The beds or borders for their reception should be composed of soil of a loamy nature, trenched two spits deep, with a little rotten dung incorporated with it. Firm the plants well in the bed, watering at the same time. If the operation of removal be done carefully, the plants will scarcely feel the shift; water in dry weather, and an inch of a worn-out Mushroom bed will be found beneficial in the shape of a mulching as the season advances. The result of failure in many cases (though not always) is caused by having a sickly, starved, pot-bound lot of plants, at bedding-out time, which just recover in time for the next season's propagating; or perhaps, ere that time arrives, they are consigned to the rubbish heap. The old system of planting on raised beds, high in the centre and low at the sides, is very detrimental to the well-doing of those Calceolarias that are situated in the centre of the bed—as in such a position it is a difficult matter to retain that moisture and coolness about them that is so essential to their welfare. Two plants, which have already proved themselves very deserving of cultivation as yellow bedders, are Viola lutea and the larger flowering variety, V. lutea grandiflora, as sent out by Mr. J. W. Wimsett; planted rather thickly in a moist rich soil they will be found to succeed well, and continue in beauty for a long time, if the decaying blooms are occasionally removed. *J. R. H., Daylesford, Oxon.*

—— I quite agree with Mr. Dean's remarks (p. 42) in advocating the hardy treatment of the Calceolaria, and encouraging in as far as possible a dwarf sturdy growth during the winter months, for on ensuring a well grounded constitution will in a great measure depend the subsequent display, providing that the selection of varieties is such as will suit the soil and situation, and withstand the searing influence of the summer sun; for depend upon it, that inattention to this is the primary cause of so much complaint and want of success. Mr. Dean says that aurea floribunda is still the favourite. Well, where it succeeds I have no wish to dispute it a front-rank place; but with me this variety is not worthy of a position, as it succumbs to the summer's drought. Treat it as I may, not one-third of them will survive the month of August, while such varieties as Yellow Prince and Gaines' Yellow grow and flower luxuriantly during the season. They are varieties possessing first-class qualifications, rich in colour, and of dwarf habit, yet of sufficient growth to ensure continuity of bloom. During the last two trying seasons they have been greatly admired. In the princely gardens of the Earl of Stamford at Enville, where bedding-out is so extensively and well done, the last two named varieties, last autumn, were pre-eminently conspicuous; and Mr. Taplin told me that aurea floribunda was very uncertain there, as I know it to be in other instances. Thus it will be seen there is no rule without an exception, and where one variety of Calceolaria does not succeed another may, and does perfectly: and a man is right by all means to use the bridge that takes him safest over the stream. I find it advantageous to mulch the beds and water freely, to maintain the plants in a growing state. There is no substitute for the Calceolaria for summer decoration that at all bears favourable comparison; there is a richness, a nobleness of aspect, in a mass of Calceolaria, which is obtained from no other yellow-flowered plant in the flower garden. *Geo. Westland, Witley Court.*

Wellingtonias.—A specimen of this tree now growing at Orton Hall, Huntingdonshire, the seat of the Marquis of Huntly, is 36 feet high, the circumference of the trunk at its base is 5 feet 8 inches, circumference of the branches, 45 feet. There are others on the place varying in height from 10 to 30 feet, some of them showing a great many cones, which are, however, as yet perfectly green, from which we must infer that they take two years to ripen their cones, which is somewhat strange, seeing that the trees are such fast growers. I have noticed in some of the horticultural journals some remarks on these trees dying from Fungus or some other unknown cause, which suggests the startling question —is the Wellingtonia likely to be a long liver? What a shock this will be to some who may have planted them extensively, as is the case here. Now, as it is only 39 years since they were first introduced to this country, and as there are but very few deaths out of so many hundreds which have been planted, I think that question may safely be left for the rising generation to answer. *P. Sharpe.*

Lithospermum purpureo-cœruleum. — Those who take an interest in alpines will be glad to know something of an unique specimen, or rather mound, of the above, which I had the pleasure of seeing a short time ago. The elevation on which the object in question stood, was formed by roots and stones along with ordinary garden soil, and had a circumference of 38 yards, and a central elevation about 7 feet above the level of the adjacent lawn. Just imagine this large circular space, of a conical shape, rising gently in the distance and early in summer, all clothed, from brow to base, with lovely blossoms of a deep blue colour; and some idea may be formed of the rich treat in store for those who are so fortunate as to visit Colworth during the month of June. In order to prevent anyone from being disappointed, it should be mentioned that the entertainment under consideration will contain little, if anything, to suit the mere sensational palate, for it is to consist of a simple hardy flower, surrounded by art, nursed by Nature, and rare because of neglect. It is no more than an illustrious example of those modest gems which used to enliven the landscape in the vicinity of nearly every gentleman's mansion during the boyhood of men now old. Such an ornament is crowned with delightful associations, and its preservation through the din and excitement caused by the fanciers of Scarlet Pelargoniums is an honour to its owner. Colworth is the property of Charles Magniac, Esq., M.P., and is beautifully situated about eight miles from Bedford, and close to the Sharnbrook railway station. Although I have confined myself to a single species of it, there are many others of sterling merit left untouched, which I hope to notice on another occasion. Indeed, every department of practical horticulture is well represented and skilfully managed by Mr. D. Mackillar, the intelligent gardener of the establishment. *J. D.*

The Gladiolus Show—As a lover of this beautiful flower, and as one who has taken some interest in endeavouring to promote its cultivation, I should like to say a few words about the proposed exhibition, and the extra prizes which Mr. Dix and Mr. Kelway, with such praiseworthy energy, are endeavouring to promote. Last year I attempted to get up a special show at the Crystal Palace, the directors very handsomely offering to give £50, which they would have increased to £75. I obtained the promise of about £25, but before accepting the Company's money, I thought it was but fair to see whether such an exhibition could be obtained as would compensate them for the outlay I therefore wrote to the several subscribers, and asked what amount of staging they would require, and the answers were quite sufficient to persuade me that it must be a failure, and so I wrote to Mr. Williams, and gave up the project. I am glad therefore that others have taken it up, and as Kensington is not the Crystal Palace I have no doubt an effective exhibition may be obtained. But there are some points to be considered:—1, as to foreign growers; it would be manifestly unfair to ask them to compete with English nurserymen, because it would be impossible for them to stage their flowers effectually, and there is no flower in which staging is of so much importance as the Gladiolus. Their flowers will have to travel some 200 or 300 miles, be probably sorely bruised in the journey, and then set up in Hyacinth glasses or something of the kind, tumbling about in all directions. An English grower could bring up his flowers 50 or 100 miles without injuring a petal, and put them up in stands exactly suited for them. I would therefore suggest that a class be made especially for the foreign growers; and the most graceful thing to do, to my mind, would be to offer, from the money collected here, prizes to them, and let their subscriptions go to prizes for English grown flowers. Again, as I have already said, there ought to be a separate class of good prizes for amateurs. It is impossible for an amateur with 400 bulbs to compete with a man who has 4000 or 40,000, and it ought to be a matter of consequence to induce amateurs to come forward. Then again, as to English seedlings, caution is required here; I know of but two persons who rear seedlings to any extent, and it might be a matter of consideration whether it would not be better to offer the prize for the best six seedlings of English or foreign growth. Finally, I would say, let the schedule be prepared by those gentlemen in whom Gladiolus growers would have confidence; and as the exhibition is to be held at Kensington, oh! let it not be held in that dreary council-room, but in the conservatory. I feel it to be impossible to write just now about the Gladiolus without referring to the great loss sustained in the death of my lamented friend, Mr. John Sladden, of Ash. His latter days have been days of great suffering, and we shall miss from amongst us an enthusiastic florist, and a kindly and genial man. *D., Deal.*

—— I was glad to see that the beauty of this gorgeous autumn flower was about to be recognised by the Royal Horticultural Society, by their giving some handsome prizes for it in August next. The date, however, fixed, is too early for us growers in the midland and northern districts; and if there is to be an exhibition of the flower annually, I think the first week in September would suit all growers best. [Not the foreign exhibitors, as their blooms would be over by September. EDS.] Of the Gandavensis section of Gladioli, it is only Queen Victoria, Shakespeare, and other light-coloured varieties of their blood, that flower by the middle of August in this locality, even when the bulbs are planted very early. The great growers of the flower can always find plenty to cut throughout the season for exhibition purposes, and they should only be allowed to show in a class by themselves, like the great Rose growers. I should be glad to add my name to the list of subscribers for a guinea, with the proviso that the greatest share of the subscribed money is to be given, in liberal prizes, to small growers, such as gardeners and amateurs, and for a class for the best English raised seedlings. *William Tillery.*

Bunney's Incomparable Green Cos Lettuce.—I have grown this Lettuce for the last two seasons along with Moorpark, Neapolitan Brown Cos, &c., and find it stands longer with me before running to seed than any of the others. In other respects I find it to be first-rate, being quite hardy, large, crisp, and sweet, and requiring but little tying. In shape it resembles the Moorpark, but it is larger than that variety. I can strongly recommend this Lettuce to all who desire to have a first-class

Lettuce in the heat of summer. *John Fraser, Gr., Ashby Hall, Lincolnshire.*

Gentiana acaulis.—As your correspondent Mr. Earley does not allude to one mode of treatment, which I have found to answer, and which I supposed had been well known, it may be that it is less known than it deserves to be. It is supplying the roots with decaying pieces of branches of wood on which to fasten. I remember struggling against an unresponsive edging of Gentian in Fifeshire for years, when all at once a part of it began to do well; on lifting some of the thriving plants, and dividing them to fill up blanks, I found their roots embracing a rotten twig, or branch, which had been delved into the border with leaf mould. I took the hint, and supplied the rest of the edging with similar bits of rotten wood, and the whole edging became a thing of beauty and a joy to everyone that saw it—all except at one corner, where some speciality interfered to prevent its getting fair play. I mentioned our success, and its supposed cause, as a discovery, to some of my gardening friends, who told me it was well known. If you print it in your *Chronicle* it will be still better known, and we may have the advantage of ascertaining by fresh experience of those who read it, and may try it, whether our success was really due to the rotten bits of wood, or was only a coincidence. *C.*

French *v.* English Lettuce Culture.—"Anti-Cloche" has, like a true Briton, spoken out boldly with reference to the revival of the old kitchen garden bell-glasses; for so, I believe, we in England were wont to call them. He probably knows, as most gardeners who have moved much from home know, that there are few gardens of any standing in the horticultural world, but what have sundry odd lots of these old bell-glasses stored away in seed and fruit rooms, owing to the fact, that in the use they have not answered the expectations formed by the original purchasers of them. Believing, as I do, that neither in the matter of lawns, summer flower gardening, tropical gardening, or forcing, whether underground, in the caves, or above ground, do the good gardeners across the Channel really beat us, whatever may have been advanced to the contrary—considering, of course, the greater difficulties the British gardener has to deal with—I nevertheless do maintain that in the simple matter of Lettuce growing in winter, the French gardener does beat us, and that—so at least it is said—by the simple use of the old kitchen bell-glass or *cloche*. There is one question in connection with the *cloche* and its use which has never yet been made clear to me, and which, it may be, has an important bearing in this controversy, and that is, "Have we on this side of the Channel a knowledge of the ordinary management necessary to produce these satisfactory results?" "Anti-Cloche" speaks of the shoe-toes of clumsy workmen coming in contact with and so breaking the glasses up in process of air-giving. Now it strikes me that at the full growing period no air is given to the plants by the Parisian cultivator—that is, after the preliminary preparation has been made. If not, much labour and risk from breakage is avoided. This I infer from the fact, that, as all observant gardeners know full well, young winter Cauliflowers and the like, even to the aforesaid Lettuces, in ordinary frames, or hand-lights, will do and thrive equally well through the winter, if the lights are left always on, and no air be admitted save and except what reaches them through the existing apertures. Of course they are not nearly so hardy in consequence. But my remarks bear upon a different subject. As I have only had time to make a cursory acquaintance with Mr. Robinson's work, in which these and other matters are alluded to, I may be pardoned for asking him the simple question whether the Parisian Salad grower does not choose a fine dry period upon which to place a regiment of *cloches* over a given quarter of Lettuce plants, and whether air is ever given afterwards or not? If not, a "firm" growth is induced, in a somewhat rarified, moderately dry air, at no cost for labour. If Mr. Robinson could give us some such information as this to base our practice upon, we should indeed have something to thank him for. If regular air-giving is an essential, and such attentions are constantly needed as are required to grow specimen plants, or to force a house of Grapes, then I must say with "Anti-Cloche," give me a low house, built on the orchard-house principle, in preference. *William Earley, Dipwell.*

Silkworm Disease.—The first origin of epidemics, epizootics, contagious and infectious diseases, affecting man and animals, is clouded in great mystery, and any small fact which at all seems to offer any elucidation is deserving of record. Some 12 or 14 years ago, when residing at Cottons, adjoining Romford, having in the garden two large Black Mulberry trees (very fruitful and healthy), I one day, when in Covent Garden market, bought, I think, a score of silkworms about three quarters of an inch in length, and took them home. At first I kept them on the ground floor, which was some eight or ten steps above the ground outside, in the usual card-board trays, and fed them upon newly gathered Black Mulberry leaves. They soon, however, began to sicken, and I think a marked diminution in their rate of growth and voracity were the first symptoms observed, and they soon refused to eat at all, and then died. In the daytime, in fine weather, I placed them outside, with a view of ascertaining if their illness could possibly arise from anything like confinement; and the last I had I removed to the top room of the house,—but all to no purpose, they all died, and I then made an early visit to Covent Garden, and upon telling of my ill-success to the old lady from whom I had bought them, she showed me some of the batch from which mine had been taken, and which had grown prodigiously, and were most robust. Obviously there must have been something injurious at Cottons to silkworms, and it would be easy and interesting to repeat the trial. Some years prior to the time named above, to save the trouble of picking out the old eaten leaves, I used to place the leaf-stalk between two pieces of laths, with a few layers of wet cotton rag tied together, and when the silkworms required fresh leaves it was only necessary to place these thus secured among those required to be removed, when the worms soon travelled to the fresh ones. A groove with sponge I would suggest instead of rag. This would save much labour. *W. A. Wooler.*

Vanilla planifolia.—Since my communication on the above appeared in your columns two years since, I have had many inquiries respecting the temperature required to grow and fruit it in. I was not prepared to give a decided answer to all inquiries, but I promised to do so through these columns when I had tried a few experiments by planting it out in different temperatures. The large plant, which was the subject of some discussion two years since, is still growing in the successional Pine-pit, in a mixture of peat and charcoal, the temperature of which rarely exceeds 50° in winter, and frequently it is even lower than that, the summer temperature varying from 55° to 65°, and above. The plant is now in the best possible health, and growing vigorously. It is heavily laden with fruit, very many of the pods being of great length. The plant covers the entire back of the pit, 40 feet in length, and about 3 feet in width. In June, 1868, I planted out a young plant in the fruiting Pine-house, in a mixture of peat, charcoal, and mortar rubbish, the temperature of this house ranging from 65° to 85°. It grew amazingly, and this season it has 12 pods of fruit upon it. It would have borne several more, but the first flowers escaped my notice, and consequently were not set. I also placed a second plant in quite a cool house, one used for bringing forward Roses, the temperature being kept but a little higher than a greenhouse. This plant has not made so much progress, but I have six pods of fruit upon it. This plant has been but little cared for, being, I may say, entirely left to chance, with the exception of setting its fruit, in order to see how it would succeed in a cool temperature and with rough treatment. I am now satisfied it will grow and fruit in a comparatively low temperature; the only thing required is the knowledge of the art of fertilising the stigma, an operation which, though simple, requires great care and some skill. It is requisite, therefore, that the Vanilla should be planted and trained, so that when the flowers expand they may be easily got at to be fertilised. They open for the most part during the night, or early in the morning; therefore, the best time to fecundate the flowers is in the morning, and this must be attended to daily as long as the plant is in bloom. I find from six to eight pods sufficient to set in a cluster, although I have some clusters with from a dozen to 14 pods upon them; but of course the fruit is much larger when a smaller quantity is grown in a cluster. I have sent a specimen for your inspection. I have both larger and smaller pods. *Edward Bennett, Osberton Hall, Worksop.*

The Royal Horticultural Society's Floral Committee.—I have just received, from the Royal Horticultural Society, a communication which informs me "that in making the annual changes in the constitution of the Floral Committee your name was chosen as one of those whom the Council were compelled to withdraw from that body." In another and a later communication of an official character, I learn that the names removed, besides my own, are those of Messrs. Ivery, of Dorking, Jackman, of Woking, and J. G. Veitch, of Chelsea. My aim in writing is to raise the question of the principle on which the Council of the Royal Horticultural Society proceeds "in making the annual changes in the constitution of the Floral Committee." During the three years I have sat on the Floral Committee, my attendance at the meetings has been so regular that I have only been absent from a very few of them—in 1869 from two meetings only. During 1869 Mr. Ivery was present at a few meetings; Messrs. Jackman and Veitch at, I believe, not a single meeting. I presume the names of these gentlemen were removed in consequence of the infrequence of their attendance. But, on what principle is my name removed? I put this question because, in an editorial remark appended to a communication from Mr. Keynes on the same subject, which appeared in the *Gardeners' Chronicle* of the 2d October last, it was stated "that it has been customary—and we think it a proper custom—to make a slight change annually, so as to admit some three or four new members; and in order that this may be done without injustice or invidiousness, we believe the plan of selection has been to strike off those whose attendances have been fewest during the year." If this principle be an approximately just one, then the striking off of my name certainly savours of injustice or invidiousness, as my attendance will favourably contrast with that of any other member. The custom hitherto adopted at the last meeting of the Floral Committee in each year was, for the secretary to read a list of attendances of each member during the year, to strike out the names of a few of the members whose attendances had been the lowest, and to substitute others, it being understood that the list of names so modified was to be submitted to the Council for their concurrence. At the last meeting of the Floral Committee, on December 21, no list of attendances was read—no mention was made of striking out a single name—a few nominations were made, and the large majority of the members of the Committee went their way, many of them censuring such a state of things as involving much personal uncertainty, neither called for, nor wise in its operation. I feel that I have not been fairly treated, especially when, on looking over the list, I find retained the names of gentlemen whose average attendance during 1869 falls considerably below my own. *Richard Dean, Ealing.*

Gladioli at the Edinburgh International Exhibition.—In Messrs. Downie, Laird & Laing's (of Edinburgh) lists of French hybrid Gladioli for 1869 and for 1870, I find the following paragraph, to which I beg to call attention:—"D., L. & L. were this year awarded the 1st prize for the finest collection of Gladiolus blooms at the autumn exhibition of the Royal Caledonian Horticultural Society." Pray what does this mean? So far as I know, there was no autumn exhibition of the Royal Caledonian Horticultural Society held under that name. It was merged this year in the Great International Exhibition. At it we were awarded the 1st prize for the finest collection of Gladiolus blooms. The prize was fairly and honestly won. *William Mein, F.R.H.S.* (*for Stuart & Mein, Kelso*).

Vine Restriction *v.* Vine Extension.—"P.," in a leading article (see p. 1277, 1869), revives the interesting question of Vine extension, and points out some facts to show why it should be adopted by modern Grape growers. By the light of the engraving by which he illustrates his remarks, his extension system might be supposed to run to the one-Vine-one-house principle, and the whole bent of his argument is in favour of age being represented by an extending dominion of root and leaf action. His argument, in fact, amounts to this: Given a good border and a healthy plant, and the older it is, provided there be discrimination and ability at pruning time, the better is it calculated to yield crops that, as the Yankees say, will beat creation. I demur to such leading, and will call in the evidence of the best fruit and plant growers to combat the point. Take the case of hardy fruit trees in an orchard, and what of their history? Is it from aged fellows in a good state of health that you are to expect fruit that will take position at South Kensington or any of the autumn or winter shows throughout the kingdom? Or if you are determined to represent pomological advancement, from what kind of trees will you send up Apples or Pears for dessert? Will it not be from young vigorous plants, that have generated and produced such quality of fruit as is not only beautiful to look upon, but pleasing to the palate? Is it not by judicious root and branch pruning, by keeping them within prescribed limits, and by setting them a-going again with a new lease of life? Encourage their dominion heavenwards and earthwards, and you have no end of antagonistic ills to contend with. By canker and blight the constitution of your trees become impaired, and even without them the root extension in the best media is not calculated to reciprocate that power of production which younger or even contemporary plants well handled can do. You may have an increased return, but what of that? Quantitative production is generally at the expense of qualitative results, and therefore the argument in favour of unlimited extension pales before the cultural student. He has to cater for an aristocratic palate: it is no part of his plan to cater for or feed the indiscriminating million, and that is just what extension beyond very ordinary dimensions leads to. Take again the case of the plant grower, and what is his object? Not certainly to have a great multitude of flowers in an ill-conditioned state, as to persistency, size, and colour; nor to have plants of beautiful foliage rendered less beautiful by the wearing-out process by which age is accompanied, telling upon the size and substance of the leaves, and the contour of the whole plant. The corrective process of advanced culture must come in, and where it is not practicable to interfere with the knife to limit root and branch extension upon the fresh lease principle, they must be sacrificed and younger plants must take their position. After your own capital leading article upon limiting the size of specimen plants, in order to have freshness and vigour to the highest degree presentable, both at home and upon the exhibition table, judge of my surprise to see the position assigned to an article condemnatory of the principle there propounded and enjoined. One has only to look to the huge specimen plants tabled by our foremost exhibitors, to see the necessity of a moderate restrictive system. Wonderful they are, no doubt, as specimens of skill, but the wearing-out process, to the practised eye, is beginning to tell upon them; and the trusses, spikes, flowers, foliage, all combine to show that the plants are approaching the afternoon of life. Coming to the Vine itself, what is the evidence adduced in favour of this extension system by your correspondent? It has a positive and a negative face: positive as regards Mr.

Henderson's excellent Grape growing; negative in reference to the Bishop Stortford Vines. But what does all this prove in the first instance?—that Grapes of very good quality can be shown upon the extension system, which nobody doubts; and in the second instance, that failure may occur in any vinery or vine-yard under improper management. For every instance that can be cited as to the extension system producing prize Grapes—as that is the test upon which "P." founds his theory, I could enumerate dozens where, in respect of size of bunch, berry, and general excellence, as assessed by judges of modern times, Grapes grown upon the restrictive system, and pruned season after season like "whipping rods" or walking-sticks, would beat them out of court. I must stipulate, however, for "youth" on my side; and with that, every other thing being equal, Mr. Henderson and other growers with aged plants could not approach me. At the great international shows held in Edinburgh in 1865 and 1869, who took the prizes, and from what sort of plants as to age and culture came the prize Grapes? Mr. Meredith and Mr. Fowler were the great champions for quantity and quality of fruit, and what of their system of cultivation? Readers will find my opinions at length on both places published in this Journal at pp. 901, 1023, 1145, and 1320, 1867, in pp. 894 and 967, 1868. All their plants are grown upon the restrictive system, and Mr. Meredith's, in particular, in many cases, are only 18 inches apart. Mr. Fowler's are from 3 to 4 feet, and in some cases a double rod is taken up, but the general rule is the one rod system, which may be extended to two, according to the notions of the great majority of our Grape growers; but, beyond that, none of them would vouch for placing the same quality of bunch upon the table, nor could they calculate upon anything like uniform results. Mr. David Thomson cultivated Grapes, both in regard to quantity and quality, probably fully as good as any man that ever tried them. My estimate of his work in that way will be found at p. 1139, 1868; and what was this ascribable to? To young Vines, to good management, without and within, and to pruning upon the fishing-rod principle. Any kind of pruning, however, would have done well enough with such stores of organisable material to draw from, and hence it is not so much a "cut-to-the-best-bud" principle as it is the vigour of youth. But, again, taking 1869, what do we see?—such an array of Grapes in the Assembly Rooms of Edinburgh as might have astonished the world if its inhabitants could have seen it. And from what kind of Vines were these splendid Grapes cut? From Vines which, as your columns tell us at p. 1004, 1867, were not at that time planted! Mr. Johnston, of Glammis Castle, as is well known, was the grower; and few that had the privilege of seeing his productions will soon forget them. I hold, therefore, that although the Cole Orton old Vines have done well, that younger plants, equally well managed, would have done better. A great deal is made of the cut-to-the-best-bud principle, but it bears upon the very face of it a predisposition to weakness. We may prune young Vines of from 1 to 15 years standing to the latent eye, and they will produce an abundant yield of bunches of such a size as is desirable in all respects to grow to proper proportions as to size of berry, and then finish so as to be presentable at table. I hold, therefore, it is a mere begging of the question to argue for prominent eyes, which may produce by the way three or four bunches, which must in turn be reduced to one by the operative gardener. It is no use bolstering up a system by an out-of-the-way effort, which must again re-act at the most punishing period of the season—the colouring time. From the above statistics of success on the restrictive system of growth, any one will see that it is not, for good practical purposes, at all desirable to prolong the life of the Vine unless for mere fancy, to enlighten physiologists, and to astonish the credulous. One can well understand the respect engendered for aged trees, they beautify the landscape, but give nothing to the gourmand. Gigantic stature and a leafy garniture, to speak not of forestry gains, are a sufficient return for admiring eyes. What delights the palate must be grown for the palate, irrespective of all sensational whims. To keep pace with the times we live in, an effort must be made, on the appearance of decline, to correct the physical condition of the borders, to introduce a new colony of plants to take the places of those that have served "their day and generation." This may not at all times be practicable or convenient. If interests of economy are to be studied, I would rather raise my voice, and give my vote for getting a new cane away upon its own account from the lowest lateral of the closely spurred Vine, cutting the latter away, and even turning up the border, root-pruning the plants, and incorporating a little fresh material, to give the whole a better mechanical and chemical consistency, than I would extend either branch or root dominion. The farther away from home the more liable to accidents; the nearer home, with plenty of sources of supply, without being cramped as in pot-culture practice, the greater, depend upon it, are the chances of success. Youth and beauty in a proper sphere of work can always vie, for physical endurance and physical outcome, against the most laboured attempts of pampered age; and the Grape Vine, although it can put forth plenteous foliage in the second century of its lifetime, cannot be coaxed or induced by any process of culture to yield its luscious fruits in such perfection as will please the fastidious palates of those whom the gardening fraternity have the honour to serve. The strongest argument in favour of the extension system is the inevitable natural deduction that the more the foliage is encouraged, the greater will be the extent every other way as regards trunk, branches, and roots. But then comes in again the poser of an extended branch manufacture out of proportion to the space available, as regards a satisfactory production of fruit. It cannot be called an economical mode of culture that will allow laterals to sprawl about in all directions, holding fast by their tendrils, and becoming so intermingled as to be representative of chaos. But then look to the infringement that is likely to take place physically in respect of branch fighting with branch, and leaf fighting with leaf, to elbow themselves into the best position available for light, and all more or less suffering. Granted that by such a code of cultural laws, properly carried out, you may improve the position of one Vine; but then look at the growing space occupied, and the less room for "strings to your bow" in the aggregate yield of a house of any given size. No doubt in many places the so-called restrictive system is abused in the too free manipulation of laterals after the first stopping, but dealing with it sanely, and looking before you for a future year's successful crop, you must stop the laterals hard and fast wherever they entrench upon others' quarters which have a co-ordinate right of position. I look upon the extension system from this point of view, *i. e.*, in the shape of encouragement of either principal shoots or laterals, as of first importance for extending the dimensions of the Vine for propagation or any other purposes. As a generally satisfactory fruit-producing system of cultivation, where people are to look for great results in respect of crop, size of bunch, size of berry, finish, and any other thing which ought to be introduced into the estimate to call a bunch of Grapes superb, we must abide by a very moderate extending system, what some writers nowadays call restrictive; and if, as was said above, we have plants with youth on their side, and a good root-growing medium to sustain them, we need have no fear of the results. *A.*

Crassula lactea.—This plant, which was introduced into England nearly 100 years ago, is now rarely seen except in collections of succulents. Surely the purity and abundance of its tiny white star-shaped blossoms ought to make it a general favourite, coming into bloom as it does in this dreary month of January, when so few delicate flowers are to be had. There is a figure of it in "Loudon's Encyclopædia; but all the dictionaries make its flowering month to be September. Like most of its order, its blooms last a long time out of water, and it should therefore be a valuable plant for bouquets and button-holes. I fell in with some plants of it lately at Mr. Haynes' nursery at Penge, where I was pleased to find that the propagator had had instructions to make as many flowering plants as possible for next year. *W. T.*

Dipladenia Martiana, *alias* **crassinoda.**—A striking case of a plant bearing an utterly erroneous name—one by which it is now universally known, and which, in all probability, it has held ever since its introduction to European gardens—is furnished by the well-known stove plant, "Dipladenia crassinoda." From having long been familiar with this plant, and relying on the accuracy of the name so constantly applied to it, my surprise at discovering its falseness was great, and having in consequence paid some little attention to its recorded history, I have thought the facts of the case it presents worthy of publication in your columns, and of interest to cultivators generally. In this case the name "crassinoda" was first applied by Dr. Gardner to a plant he discovered near the summit of the Corcovado mountains in Brazil, and which he described, referring it to the genus Echites, in Hooker's "London Journal of Botany" (i. 554). Professor A. De Candolle in revising the order Apocynaceæ in the "Frodromus" (vol. viii.), founded on this and several allied species (all of which had previously been referred to Echites) the new genus, Dipladenia. Here, then, we have the first occurrence of the name Dipladenia crassinoda (see Prod. viii. 676) applied, as we have seen, to Gardner's plant—No. 250 of his Brazilian collections. This plant is described as a "tuberous-rooted shrub," growing "about 2 feet high:" and it was by accidentally seeing one of the original specimens with the name "D. crassinoda" attached to it, that I first became aware that our garden favourite has no true claim on the name. Two plants of the same genus could scarcely present a greater difference in their general appearance than do these. Gardner's plant has stiff, thick, woody shoots, densely crowded with foliage, the much swollen nodes (the clue to the specific name) being only ¼ of an inch apart. The leaves are narrowly lanceolate, slighly acute, coriaceous, and in size about 2—2½ inches long, by ½ an inch broad; the flowers arising from the axils of the uppermost leaves. So far good, but here follows the mistake. The introduction into English gardens of the plant now so generally cultivated appears to have taken place soon after the publication of the eighth volume of the "Prodromus;" and on being figured in the "Botanical Register," vol. xxx. t. 64, it was most unfortunately mistaken by Dr. Lindley for the counterpart of Gardner's plant, an error which, in gardens at least, has been perpetuated to the present day. It seems utterly impossible that Dr. Lindley could have ever seen any original type specimen, or such an error as confusing two plants of such distinct appearance could not have arisen. It is indeed surprising that, from the descriptions he had before him, he should have felt so satisfied as to their identity as actually to cite Gardner's locality in giving the history of his plant. (See "Botanical Register," vol. xxx. t. 64.) Dr. Müller, of Geneva, in working up the Brazilian Apocynaceæ, detected Lindley's error, and refered his plant to the Dipladenia Martiana of A. De Candolle. This, then, is the name under which, by all good right, our well-known garden favourite must henceforth be known; and as, in a similar manner, a usurper has long been cultivated as Vanda insignis, the true plant having only recently been introduced, it is to be hoped that D. Martiana may no longer be allowed to usurp the name of a congener, which, if I mistake not, does not exist (and probably never has existed) in English gardens. *R. C. Kingston.*

"Honesty."—This is certainly one of our most useful spring blooming decorative plants, and is so well known that I should not have here referred to it, but for the wish I have to correct a statement made by a writer on spring flowers, not long since, as to the proper time of sowing it. He intimated that August was the best time for this purpose, but experience has proved to me that to secure strong bushy plants in April, 2 feet in height and 15 inches through, and a mass of bloom, the sowing should take place in the month of May previously. They should be treated entirely as other hardy annuals, and pricked out 6 inches apart when large enough to conveniently handle; this will allow the plants to grow dwarf and robust. For the back rows of ribbon borders, or the centres of large beds, the "Honesty" is invaluable; it is also eminently useful when planted either singly or in clusters about the shrubbery borders. Whilst for those who require large quantities of early cut flowers, a stock of it must prove of great assistance. I have grown three distinct colours of it—purple, lilac, and white; the latter is the showiest of them, but at the same time I believe the most scarce. The flowers of the dark kind will also often assume a flaked or variegated form, but this characteristic is simply a sport. I think there is no garden, however grand, that will not be improved by the cultivation growth of a little "Honesty." *A. D.*

Gigantic American Flowers.—Tropical America enjoys the pre-eminence of producing the largest floral development in a good many natural orders, there being the Victoria regia amongst Nymphæaceæ, the Brugmansia candida amongst Solanaceæ, the Lasiandra macrantha amongst Melastomaceæ, the Sapranthus nicaraguensis amongst Anonaceæ, the Godwinia gigas amongst Aroideæ, &c. Until I discovered Sapranthus nicaraguensis (*Gardeners' Chronicle*, 1869, p. 1334), tropical Africa was supposed to possess the largest Anonaceous flowers in existence (Monodora), and now I learn from your columns (*l. c.* p. 1330) that Dr. Welwitsch has found in Africa an Aroid even larger than my Godwinia gigas. As I "out-monodored" him in the Anonaceæ, of course I must not grumble if he "out-godwinias" me in Aroideæ; but I still trust that when actual measurements are produced, America may yet come off victorious in the question. There is no reason to assume that the few specimens of Godwinia measured in Nicaragua were the largest ever produced in the country, and there is every reason to assume that if my specimens, after suffering somewhat in their passage to England, attained the past season dimensions equalling within a few inches those of the plants in Nicaragua, they may exceed them even if Mr. Bull really does begin to cultivate them. *Berthold Seemann.*

Cyclamen persicum.—I think of all winter and spring blooming plants this is the most pleasing, and yet how seldom we see it grown to any extent. This may be attributed not altogether to want of space or convenience for growing it, but rather to the plant not being known and valued as it should be. As a dwarf decorative plant for the greenhouse or conservatory it stands unrivalled; when interspersed with Primulas on the front row of a stage or platform the effect is most pleasing. Equally useful is it to those who have a demand for cut flowers during the dreary winter and early spring months. The sweet-scented kinds are, I think, indispensable for bouquet making, imparting as they do the most delicious odour, little inferior to that of the Violet; and after yielding such a succession of flowers as few plants will do, depriving them of their blooms as fast as they open, there is then enough in it as a fine foliage plant to please the most fastidious. Any amateur, with only the means at hand of an ordinary frame and greenhouse, may grow it to perfection; and to such I will offer a few hints on its management. In the latter part of January last a packet of seed was sent me, being selected from a famous collection of plants grown at Strawberry Hill, near London. I sowed it at once in a well drained pan, the compost containing equal parts leaf-mould, dried cowdung, and loam, with a fair admixture of silver sand, and placed it in a dung-frame already prepared for propagating purposes. After well watering, I covered the pan with a pane of glass. Treated in this way germination soon took place, and consequently the plants

quickly showed themselves well above the surface. At this stage they should be removed to a shelf near the glass in a warm greenhouse. This puts a stop to anything like damping, and also prevents them from becoming drawn. It is necessary that this point should be well borne in mind—not to allow them to become long and weak in the leaf-stalk prior to being pricked off, success in a great measure depending on keeping the plants strong and sturdy. I have generally found them strong enough to handle in five or six weeks from the day of sowing, potting them singly then into small 60-pots, and replacing them on the greenhouse shelf until the end of May, then to receive their final shift. If they are properly attended to after this as to watering, shading, air-giving, &c., nothing can be better than a frame or pit to grow them in during the summer. As a rule, 48-pots are the most convenient size; of course plants of this age come into flower sooner and bloom more profusely than they would do if allowed too much pot room. As autumn approaches, it is well to get them on a drier bottom; the early part of September is quite late enough to house them. From the packet of seed above alluded to I have upwards of 200 plants promising for three months longer a splendid show of bloom. With the conviction that the merit due to this most interesting class of plants is not established so universally as it deserves to be, I feel that my time has not been altogether wasted in bringing it more prominently to the notice of your amateur readers. *Thos. Turner, Gr. to E. T. Simpson, Esq., Walton, York.*

Bottom-heat for Vines.—In the discussion that has gone on for some time in your pages for and against applying heat to the roots of the Vine, there is one fact that has come under my observation which I have not seen mentioned in any of the numerous articles bearing on the subject; and if the experience of others who have tried bottom-heat for Vine borders corresponds with mine in this particular, a very valuable argument in its favour will be brought forward. The fact I allude to is that Grapes growing in a heated border never shank—at least such has been my experience in a small house here; while in others, with unheated borders, we are troubled more or less with that annoying disease. I shall be glad to hear whether the opinion of others coincides with my own, or otherwise. *T. Dobson, Whitburn Hall, Sunderland.*

Timber Trees.—What trees shall we see recommended to be planted for timber next? "Somerset," p. 41, recommends Abies Morinda, a tree which here scarcely can exist, which is so often injured by spring frosts that it quickly becomes both ugly and unhealthy. This appears to me worse than recommending the Deodar for that purpose. *J. R. Pearson, Chilwell.*

Tricks of the Trade. — At p. 76 there are some remarks on Mr. Smith's and Mr. Turner's catalogues by "Observer." I have not Mr. Smith's catalogue by me, but on referring to Mr. Turner's list of fruit trees, I find he has given a full and fair description of the varieties complained off, namely, Peaches and Nectarines. I am quite of the same opinion as "Observer,"—give "honour where honour is due,"—and should be pleased to see the raiser's name attached to each variety, but as that has never been the custom hitherto with nurserymen, it is scarcely fair to accuse Messrs. Turner and Smith of "tricks," for following the universal practice. What purchasers require is a true and faithful description: in this respect I have seen none superior to the annual catalogue issued from Slough. The question "new" is a very open one; can a variety of a few years' standing, that is in the hands of hundreds, be called "new?" Are nurserymen to commence a new practice by adding the names of every raiser, or only attach "Rivers" to those varieties emanating from Sawbridgeworth? for I observe he is the only raiser named by "Observer." We have other men, whose names stand high as raisers of good fruit, and the omission of names in nurserymen's catalogues is about the same with one as another. I say, again, with "Observer," that I should be pleased to see all honour given to those who have spent a good portion of their time in the improvement of our different kinds and varieties of fruits. I think, to attain this end, we must not begin with the nurserymen. They only followed in the track of the Fruit Catalogues of the Royal Horticultural Society. There we find that the name of the raiser is not given except to distinguish certain varieties. It is an acknowledged authority, and with the help of it many nurserymen get up their fruit lists. I would, therefore, humbly suggest that, in the next catalogue issued by the above society, the name of the raiser (when known) should be added to each variety. I am extremely sorry an anonymous "Observer" should attempt to throw obloquy on two names of such high standing in the profession. *J. Powell.* [We have received several communications from correspondents, whose views on this subject coincide with those of Mr. Powell. Eds.]

Yucca aloifolia variegata.—It may be worth recording that the heads of large plants of this kind will strike freely from cuttings. Some time ago we had a large plant here measuring nearly 9 feet high, with a stem 13 inches in circumference at 6 inches from the pot. The plant had a beautiful head of about 3 feet, the remainder being a naked stem, and as it was by no means a straight stem, it was for some time a great eyesore to me. I at length determined either to kill or to cure, and accordingly I cut off the head 8 inches below the foliage. This I prepared as a cutting, inserted it in a 12-inch pot, and plunged it in a good strong bottom-heat in the back part of a lean-to Cucumber-house, giving it a slight syringing two and three times a day for a month. After 12 weeks had elapsed it had filled its pot with roots, and was in due time potted into a good sized pot. It is now 6 feet high, and occupies a No. 1 pot, and a better specimen is hardly to be found in the country. For decorative purposes this plant cannot be overestimated, and should have a place in every conservatory, while for exhibition purposes it stands unrivalled. *Thomas Simpson, Broomfield, Chelmsford.*

Chimonanthus fragrans. — A small plant was planted on a south wall here some few years since. For the last three or four years it has bloomed beautifully, and produced a good quantity of well-ripened seeds. I have distributed amongst my friends most of the seeds, and I hear it has vegetated very satisfactorily. *W. H. Mountfood, The Gardens, Knowsley Park, St. Asaph.*

—— This plant produces fruit almost every year at Dalhousie Castle. This year I observe several fruits already set. *R. Gray, Gr., Dalhousie Castle.* [Is it C. fragrans or the variety grandiflora which has fruited in the cases recorded? Eds.]

Fumigating.—If "Youngster" wishes to have a simple and effectual mode of fumigating his plant houses, without going to the expense of a fumigator, I would recommend the following plan:—Dissolve 2 oz. of saltpetre in about a pint of water, with this thoroughly wet some thick brown paper, and when dry cut it into squares the size required. For a small house I should put ¼ lb. of dry tobacco in two pieces, a foot square, rolling it the same as you would a jam pudding, tying it in the middle; then put it on a small flower-pot in the house, light both ends, and leave it to do its work. *Owen Orpet.*

Greenhouse Ventilation.—We subjoin a section, which is self-explanatory, of a plan of ventilating

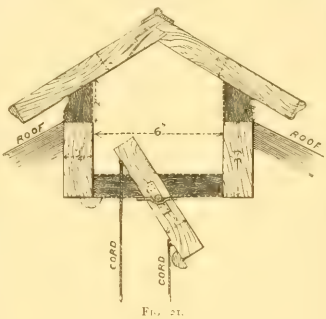

Fig. 21.

greenhouses, designed by Mr. W. Cunningham, nurseryman, of Newton Road, Burton-on-Trent, and communicated to us by Mr. J. A. Mason, who informs us that in practice it answers perfectly. Its construction is very simple, and it is both inexpensive and not liable to derangement. It is an ingenious modification of the lantern system of ventilation.

Magnesian Limestone Soils.—As Mr. Forsyth is open to enlightenment on the question of magnesian limestone soils (p. 43), I hope to convince him that he is in error when he doubts their fertility. Where North Derbyshire joins this portion of Nottinghamshire, and as far as Mansfield, the soil is all on the dolomite limestone formation, and it is reckoned by farmers the best soil they have, when deep enough. Sometimes in dry warm summers, such as in 1868 and in the past summer, this soil when near the rock gets hard and cracks, and the corn ripens prematurely; but even in last summer one of the best crops of Wheat I saw grew at Whitwell, near this, on the side of a magnesian limestone hill, where the soil was only about 8 inches deep. This limestone when burnt is of the same dark grey colour as described by Mr. Forsyth, but I should no more think of using it in its caustic state in Vine or fruit tree borders than I should think of using a strong dose of salt for such a purpose. Its pernicious effect is seen for years when used in quantities for top-dressing grass-lands, or even when ploughed in the soil. It makes a famous dose when used fresh burnt for the Turnip-fly, and for caterpillars, such as the slimy Sawfly caterpillar, on the Cherry trees. When used in a composition of sulphur, soft soap, and clay, and painted over Peach trees infected with mildew, it eradicates it, and keeps insects down after a few years' winter dressing. I have likewise tried this composition on Pear and Apple trees on the walls, to kill the scale and the Apple mealy-bug, with the best effect. Some years ago a great quantity of peaty sour soil, mixed with tussocks of reed roots and other grasses, was excavated from the sides of a lake. This mass was mixed with this lime in a quick state, and after lying exposed to the air for three or four years, the lime thoroughly reduced all the grass roots, and the compost was used with the best effect on light sandy land as a top-dressing. When the late Mr. Mearns first came to Welbeck, he skimmed many acres of turfy soil off the top and sides of a magnesian limestone rock. This soil was used to renovate some old Peach, Nectarine, and Apricot trees on the walls, which had been for years martyrs to gumming and mildew. Some of these trees were as old as Speechley's time, and some had been planted by Mr. Thomson; and it was astonishing, what with the fresh soil and the painting the young wood with the lime composition, how soon they became healthy and fruitful. Mr. Mearns likewise used this soil for his Vines planted in chambered borders, without any admixture of other soils or manures of any kind. It was put into the borders as pared off from the rock, and only a portion of the turf was chopped to cover the Vine roots with, and the Vines prospered as well as could be desired, both as regards fruitfulness and fine healthy wood and foliage. These borders, however, were too shallow, being only 18 inches deep, for when the soil got consolidated, it cracked in warm dry summers, and I had to make them deeper by adding fresh turf. In April last year I planted some young Mayduke Cherries and Apricots in turfy magnesian soil, and they made such a wig of fibres in it that I thought of sending one up in autumn to one of the meetings of the Fruit Committee, but the carriage of it turned out a weighty consideration. The magnesian limestone rocks, from which all our supplies have been taken, have been denuded of their top soil for years, but they are again forming another covering. The chemical agency of heat, frost, and rain in Nature's grand laboratory makes the disintegration of these rocks go gradually on, and then vegetable life adds layer after layer of fertile mould. When the new kitchen garden was formed here, all the borders of the Peach-houses were made with the magnesian limestone soil, without any mixture of manures or other soils whatever, and it is impossible for trees to be healthier or more fruitful. It likewise forms to a great extent the chief ingredient as regards soil in all the Vine and fruit tree borders lately planted in the same garden, and I have never been able to detect any ill effects from its use. *William Tillery, Welbeck.*

—— I think Mr. Alex. Forsyth, p. 43, has hardly improved upon Mr. Cramb in the matter of Vine soil, or, if my memory be accurate, correctly stated what he advanced. I think he (Mr. Cramb) considered all calcareous matter to be injurious to the Vine, not dolomite limestone only. Is it possible that Mr. Cramb used burnt or quick lime in his borders? I cannot help thinking he must have done so. I see no reason to think dolomite limestone, in its natural state, could be injurious to the Vines? Many plants contain and require magnesia, and many soils on the magnesian limestone are exceedingly fertile. But burnt or caustic lime is quite another thing. The magnesian limestones vary very much in the quantity of magnesia they contain, *i. e.*, the relative proportions of carbonate of lime and carbonate of magnesia vary very much even in the same quarry. Carbonate of lime contains 43 per cent. of carbonic acid, and carbonate of magnesia 51 per cent., which is all driven off by the heat; the lime and magnesia are then in a caustic state. Caustic lime soon absorbs water and carbonic acid from the air, and thus returns to the state of mild lime. Caustic magnesia absorbs both much more slowly, and thus remains caustic much longer. The alkali, which is in a caustic state, will the more greedily unite itself with acids formed in the soil by the decomposition of vegetable and animal matters, thus forming soluble salts; and in this way it is supposed that the amount of magnesia taken up by plants may be injurious, or even poisonous. If Mr. Cramb used burnt dolomite limestone, I can quite understand why his Vines should suffer. I use dolomite lime for building, and where a heap has been made up the soil is rendered barren for years afterwards. *J. R. Pearson, Chilwell.*

Societies.

Royal Horticultural: *January* 10.—James Bateman, Esq., F.R.S., in the chair. The usual preliminary business being concluded, the Rev. J. Dix announced the awards of the Floral Committee, and the chairman, in the absence of Mr. Wilson, those of the Fruit Committee. The Rev. M. J. Berkeley then called attention to a specimen of Philodendron crinipes, from Mr. W. W. Saunders, on which the petioles of the leaves were covered with adventitious excrescences, similar to those met with in some Begonias. In reference to a plant of Cissus (?) porphyrophyllus, in the same collection, Mr. Berkeley said there was some doubt as to whether it did not properly belong to the genus Piper, as many of the species of that genus produced as large leaves as the plant in question, which had not yet flowered in this country. Sprays of a specimen of Pinus lasiocarpa, and of a seedling from it, the latter somewhat differing in character from the former, were also exhibited.

Mr. Bateman then made some comments on the Orchids exhibited, and announced that the next meeting would be held on February 10.

Scientific Committee.—W. W. Saunders, Esq., F.R.S., in the chair. A letter from Mr. Geo. Maw was read relating to the method of carrying out the proposed experiments on the effect of variously-coloured light on the

ripening of fruits, &c. A highly important communication from Mr. Laxton was then read, relating to some changes and variations in the offspring of cross-fertilised Peas, from which the following is an abstract :—

"The seeds exhibited were derived from a single experiment. Amongst these seeds will be observed some of several remarkable colours, including black, violet, purple-streaked and spotted, maple, grey, greenish, white, and almost every intermediate tint, the varied colours being apparently produced on the outer coat or envelope of the cotyledons only. The Peas were selected for their colours, &c., from the third year's sowing, in 1869, of the produce of a crop in 1866 of the early round white-seeded and white-flowered garden variety, Ringleader, which is about 2½ feet in height, fertilised by the pollen of the common purple-flowered Maple Pea, which is taller than Ringleader, and has slightly indented seeds. I effected impregnation by removing the anthers of the seed-bearer, and applying the pollen at an early stage. This cross produced a pod containing five round white Peas, exactly like the ordinary Ringleader seeds. In 1867 I sowed these seeds, and all five produced tall purple-flowered, purplish-stemmed plants, and the seeds, with few exceptions, had all maple or brownish-streaked envelopes of various shades, the remainder had entirely violet or deep purple-coloured envelopes; in shape the Peas were partly indented, but a few were round. Some of the plants ripened off earlier than the Maple, which, in comparison with Ringleader, is a late variety; and although the pods were in many instances partially abortive, the produce was very large. In 1868 I sowed the Peas of the preceding year's growth, and selected various plants for earliness, productiveness, &c. Some of the plants had light-coloured stems and leaves; these all showed white flowers, and produced round white seeds; others had purple flowers, showed the purple on the stems and at the axils of the stipules, and produced seeds with maple, grey, purple-streaked, or mottled, and a few only, again, with violet-coloured envelopes. Some of the seeds were round, and some partially indented. The pods on each plant, in the majority of instances, contained Peas of like character, but in a few cases the Peas in the same pod varied slightly, and in some instances a pod or two on the same plant contained seeds all distinct from the remainder. The white-flowered plants were generally dwarfish, of about the height of Ringleader, but the coloured-flowered sorts varied altogether as to height, period of ripening, and colour and shape of seed: those seeds with violet-coloured envelopes produced nearly all maple or parti-coloured seeds, and only here and there one with a violet-coloured envelope, that colour appeared again only incidentally, and in a like degree, in the produce of the maple-coloured seeds. In 1869 the seeds of various selections of the previous year were again sown separately, and the white-seeded Peas again produced only plants with white flowers and round white seeds: some of the coloured seeds, which I had expected would produce purple-flowered plants, produced plants with white flowers and round white seeds only, the majority, however, brought plants with purple flowers and with seeds principally marked with purple or grey, the maple or brown-streaked being in the minority. On some of the purple-flowered plants were again a few pods with Peas differing entirely from the remainder on the same plant; in some pods the seeds were all white, in others all black, and in a few again all violet, but those plants which bore maple-coloured seeds seemed the most constant and fixed in character of the purple-flowered seedlings, and the purplish and grey Peas, being of intermediate character, appeared to vary most. The violet-coloured seeds again produced almost invariably purplish, grey, or maple Peas, the clear violet colour only now and then appearing, either wholly in one pod or in a single Pea or two in a pod. All the seeds of the purple-flowered plants were again either round or only partially indented, and the plants varied as to height and earliness.

"In no case, however, does there seem to have been an intermediate-coloured flower, for although in some flowers I thought I found the purple of a lighter shade, I believe this was owing to light, temperature, or other circumstances, and applied equally to the parent maple. I have never noticed a single tinted white flower, nor an indented white seed in either of the three years' produce. The whole produce of the third sowing consisted of seeds of the colours, and in the approximate quantities, in the order as follows: viz., 1st, white, about half; 2d, purplish, grey, and violet (intermediate colours) about three-eighths; and, 3d, maple about one-eighth.

"From the above I gather that the white-flowered white-seeded Pea is (if I may use the term) an original variety, well fixed and distinct entirely from the maple, that the two do not thoroughly intermingle, for whenever the white flower crops out, the plants and its parts all appear to follow exactly the characters of the white Pea, and that the maple is a cross-bred variety which has become somewhat permanent, and would seem to include amongst its ancestors one or more bearing seeds either altogether or partly violet or purple-coloured; for although this colour does not appear on the seed of the maple, it is very potent in the variety, and appears in many parts of the plant and its offspring from cross-fertilised flowers, sometimes on the external surface of, or at the sutures of, the pods of the latter, at others on the seeds and stems, and very frequently on the seeds, and whenever it shows itself on any part of the plant, the flowers are invariably purple. I have also deduced from my experiments, in accordance with the conclusions of the late Mr. Knight and others, that the colours of the envelopes of the seeds of Peas, immediately resulting from a cross, are never changed. I find, however, that the colour, and probably the substance of the cotyledons, are sometimes, but not always, changed by the cross-fertilisation of two different varieties; and I do not agree with Mr. Knight, that the form and size of the seeds produced are unaltered, for I have on more than one occasion observed that the cotyledons in the seeds directly resulting from a cross of a blue wrinkled Pea, fertilised by the pollen of a white round variety, have been of a greenish white colour, and the seeds nearly round and larger or smaller, according as there may have been a difference in the size of the seeds of the two varieties. I have also noticed that a cross between a round white and a blue wrinkled Pea will in the third and fourth generations (second and third year's produce) at times bring forth blue round, blue wrinkled, white round, and white wrinkled Peas in the same pod; that the white round seeds, when again sown, will produce only white round seeds; that the white wrinkled seeds will, up to the fourth or fifth generation, produce both blue and white wrinkled and round Peas; that the blue round Peas will produce blue wrinkled and round Peas, but that the blue wrinkled Peas will bear only blue wrinkled seeds. This would seem to indicate that the white round and the blue wrinkled Peas are distinct varieties, derived from ancestors respectively possessing one only of those marked qualities, and, in my opinion, the white round Peas trace their origin to a dwarfish Pea, having white flowers and round white seeds, and the blue wrinkled varieties to a tall variety, having also white flowers but blue wrinkled seeds. It is also noticeable, that from a single cross between two different Peas many hundreds of varieties, not only like one or both parents and intermediate, but apparently differing from either, may be produced in the course of three or four years—the shortest time which I have ascertained it takes to attain the climax of variation in the produce of cross-fertilised Peas, and until which time it would seem useless to expect a fixed seedling variety to be produced, although a reversion to the characters of either parent, or of any one of the ancestors, may take place at an earlier period. But, in conclusion, I may perhaps, in furtherance of the objects of this paper, be permitted to inquire whether any light can, from these observations or other means, be thrown upon the origin of the cultivated kinds of Peas, especially the 'maple' variety, and also as to the source whence the violet and other colours which appear at intervals on the seeds and in the offspring of cross-fertilised purple-flowered Peas are derived?"

Mr. William Earley exhibited through Dr. Masters some roots of Parsnips, bent horizontally in the middle of their length. The curvature was explained by the fact that the manure had not been forked in deeply enough; hence the roots, on reaching the manure, were not inclined to go further, but did their best to avail themselves of it at the high level. Dr. Voelcker alluded to some even more remarkable illustrations of the same kind in the case of Beetroots grown on the Sewage Farm at Barking, and where the manure was applied superficially.

Mr. Glaisher reported on the results of his investigation of the meteorological records at Chiswick, and remarked that, though the observations had for the most part been made with much painstaking and method, yet in many particulars, and especially as regards the minimum thermometer, the records were so untrustworthy that little reliance could be placed on them. Many of the other observations, especially those of the barometer, could, however, be utilised with safety. Mr. Glaisher then stated that he had made arrangements for the supply of new instruments to the Society, and for the continuance of the observations under his own supervision, so that in future errors would speedily be detected and remedied. Professor Ansted remarked that the value of the observations depended almost as much on the ability of the observer as on the perfection of the instruments.

The Chairman exhibited a Date stone attacked by a Fungus, while the surrounding pulp was healthy. This led to a conversation as to the manner in which Fungi found access to closed cavities, in the course of which Dr. Charlton Bastian expressed his belief that the Fungi were often formed in the situation where they were found, and were not introduced from without. He stated that he had seen the cells in the interior of a young shoot filled with Bacteria, and moreover that he was satisfied from actual observation that Torula-like or fungoid bodies were actually developed from the Bacteria. Mr. Berkeley expressed his doubts on this subject, considering that the alleged development of Fungi from Bacteria had not been proved. Dr. Bastian's work on this subject will shortly be published.

Floral Committee.—Rev. Joshua Dix in the chair. This was a remarkably good meeting for the season, the council room looking quite gay with Orchids, Cyclamens, Primulas, &c. Of the former were a splendid group from the gardens of Lord Londesborough, at Grimston Park, consisting of a noble specimen of the handsome Læliaanceps Barkeri, with upwards of 20 fine spikes, L. furfuracea, a fine Mexican variety, somewhat difficult to cultivate, with one good flower; Odontoglossum Alexandræ, a noble spike, with 10 large and finely developed flowers; the curious though pretty Oncidium Kramerianum, O. leucochilum, and O. leopardinum, the pretty Peruvian species with yellow and deep chestnut-brown flowers. Special Certificates were awarded to the two first-named and the collection, and to the latter one of the First-class was given. To Mr. Parsons, gr., Danesbury Park, a Special Certificate was also given for a fine specimen of the dwarf Odontoglossum Rossii, with six fine white and purple flowers. From Mr. B. S. Williams also came a fine group, containing a large specimen of Ansellia africana, with four fine spikes; Angræcum sesquipedale, with four superb flowers; A. eburneum virens, a very healthy robust specimen, with four nice spikes; and some fine cut flowers of Lælia anceps delicata, &c. A Special Certificate was awarded. Messrs. Veitch also staged a large collection, which gained the same award. In this group were a good example of Barkeria Skinneri, with 13 fine spikes of warm rose-coloured flowers; Odontoglossum cordatum, a pretty species from Guatemala; Dendrobium crassinode, and D. macrophyllum Huttoni, with pretty purple and white flowers; the new Cypripedium Harrisianum; Saccolabium giganteum, with two handsome spikes; and Lælia anceps, with 10 fine spikes, &c. From Mr. Wilson, gr. to W. Marshall, Esq., Enfield, came a collection of cut flowers of Cattleyas, amongst which the following were selected for First-class Certificates:—C. Trianæ var. Io (Hort.), a large deep blush with purplish rose lip, paler at the edges; C. Trianæ var. Penelope (Hort.), a large warm lilac flower, with a broad lemon-coloured bar on the lip; C. Trianæ var. Atalanta (Hort.), pale rose, with deep rich purple lip; and C. Trianæ var. Venus (Hort.), resembling the latter in colour, but larger, and tinged with orange in the upper part of the lip. To Mr. Wiggins, gr. to W. Beck, Esq., Isleworth, Special Certificates were awarded for a fine batch of well-grown Cyclamens; and a collection of Primulas, including some pretty striped flowers of great substance. The same award was also made to a group of Primulas, containing some flowers of immense size, from Mr. Edmunds, of Hayes. Mr. J. Welch, Parkfield House, Hillingdon, sent specimens of a high-coloured strain of Cyclamen persicum named kermesinum, a desirable acquisition, with rich carmine-rose flowers, to which a First-class Certificate was given. From Mr. C. Green, gr. to W. W. Saunders, Esq., came a small group of interesting plants, consisting of Anemone capensis, a scarce plant, with the habit of A. suffruticosa; a species of Anthurium with deeply lobed leaves; the large-leaved Cissus (?) porphyrophyllus, and a fine pale-flowered variety of Odontoglossum Cervantesii. Prizes were offered for nine Ivies in pots, and nine hardy Conifers. Of the latter, the Messrs. Veitch were the only exhibitors. Their collection comprised well-furnished specimens of Thujopsis dolabrata, Picea bracteata, and P. magnifica; Retinospora plumosa, R. obtusa nana aurea, a small plant of stunted growth, but pleasing in colour, and the graceful drooping R. filifera; with a fine specimen of the handsome Cryptomeria elegans. In the class for Ivies the competition was very good, considering that this group of plants is a comparatively new one for show purposes; now, however, that the growers have taken them in hand, judging from the neatness of the specimens shown, there is no reason why the boldest foliaged variegated forms should not be improved, and grown for the decoration of cool greenhouses, and indoors in winter, and for terraces in summer, for which purposes they are eminently adapted. The 1st prize was taken by Mr. Turner with compact pyramidal specimens of H. algeriensis, H. grandifolia (canariensis) latifolia maculata, a large-leaved showy kind; H. grandifolia (canariensis) arborescens; and of small-leaved varieties, H. Helix major and H. Helix minor; H. elegantissima, silvery variegated; H. lobata major; H. marmorata minor, and H. lucida; all very healthy and well furnished specimens. Mr. W. Paul was 2d with H. Rœgneriana, a dark leathery-leaved variety; H. Rœgneriana arborescens, a shrubby growing kind, with bright dark green foliage; H. arborescens baccata lutea, in fruit; H. canariensis foliis aureis, &c. Messrs. E. G. Henderson & Son also staged a nice group of smaller plants than the above, to which an extra prize was given; also a large and beautiful collection of green-leaved and variegated forms, which received a Special Certificate. Mr. Wm. Paul sent several varieties of Laurels, amongst which one named Cerasus Laurocerasus rotundifolia was awarded a Second-class Certificate. The plant was rather small, but if it retains its close compact growing habit it will be acceptable as an improvement on existing kinds.

Fruit Committee.—The Rev. George Kemp in the chair. At this meeting, which was well attended, several prizes were offered for culinary Apples and Pears. The competition in the class for the former was very spirited, good collections being shown by Mr. Gardiner, gr., Eatington Park; Mr. Parsons, gr., Fairlawn, Acton Green; Mr. Parsons, gr., Danesbury Park; and Mr. Earley, gr., Digswell Park, &c. Mr. Parsons, Danesbury, took the 1st prize with fine dishes of Blenheim Orange, Burr Knot and Wellington; and Mr. Earley the 2d, with excellent examples of Golden Noble, Yorkshire Greening, and the Gooseberry Apple. Mr. C. Ross, gr. to C. Eyre, Esq., Welford Park, Newbury, was 1st in the class for Pears, with very handsome specimens of Uvedale's St. Germain and Catillac; Mr. Hobbs, Thames Bank, Great Marlow, coming in 2d, also with large and fine examples of Catillac. Mr. Gardiner, gr. to Sir T. Dyke Acland, Bart., Killerton, Devon, contributed good specimens of Verulam, Vicar of Winkfield, and Bellissime d'Hiver, an excellent stewing Pear, not generally cultivated. From Mr. Meredith, The Vineyard, Garston, came a splendid basket of Grapes, consisting of Black Alicante, Muscat of Alexandria, and Lady Downe's Seedling, all large and in fine order: a Special Certificate was awarded. The same award was also made to some finely flavoured and well kept Muscat of Alexandria Grapes, sent by Mr. Fowler, gr. to the Earl of Harewood, Harewood House. They were cut from the old Vine at that establishment, which last season produced over 200 bunches, and were fully ripened in September. To Mr. Paul, Waltham Cross, a Special Certificate was also awarded for a beautiful collection of Apples. From Mr. Gilbert, gr. to the Marquis of Exeter, came a good specimen of the Smooth-leaved Cayenne Pine-apple, which had been produced by a plant grown on the "cutting over" principle. Mr. Sharpe, Tangleymere, Guildford, sent a fruit of a Pine received from Bahia, which was sound and juicy, and much better in flavour than imported Pines usually are. Mr. Miles, gr. to Lord Carington, sent a dish of the fruit of Solanum betaceum, known in gardens as S. Guisados, which was said by Mr. Berkeley to be good when cooked; also some very good home-grown Lemons. Messrs. Carter & Co. exhibited a collection of English and new American Potatos, and several varieties of Beet.

Manchester Botanical and Horticultural: *Jan. 17* (42d annual meeting.)—Mr. S. P. Callender in the chair. There was a numerous attendance. From the report of the Council it appeared that, profiting by the experience of the past, a great exhibition would be held in Whit-week, 1870. A special prize fund would be again established, which it was hoped would be large enough to permit of the guarantee fund being dispensed with. The Council regretted that the Royal Horticultural Society did not hold its July exhibition in the gardens; but it was imperative to preserve the rights of the proprietors and subscribers. The chairman, in moving the adoption of the report, congratulated the proprietors on the improved financial condition of the

Society's affairs. During the year the permanent debt had been reduced to the extent of nearly £1000, besides which a new Orchid-house, costing £230 14s. 8d., had been erected in the gardens, out of the year's income; and after paying interest and all charges they had saved about £1230. With a few more years of success like that of the last two years they would be enabled to entirely clear the gardens from debt; and then this large sum of £1100 or £1200 per year might be applied towards improvements. The report was adopted. Thanks having been voted to the retiring Council, and to the donors of prizes, &c., the Council and officers for the ensuing year were appointed.

It would appear that the total income of the Society for the year was upwards of £4000, derived from :—

Fellows' subscriptions	£2510 11 0
National Horticultural Exhibition	1713 18 7
Musical promenades	292 7 6
Privilege for sale of refreshments	100 0 0
Miscellaneous receipts	125 3 6

And that the profit on the year's account was £1254 17 7

The meeting was then made special for the purpose of receiving and considering the following motion :—"That on Sundays every proprietor have free admission to the garden from the hour of 2 o'clock in the afternoon to sunset, for himself or herself and the resident members of his or her family, including resident tutors and governesses, and for strangers (introduced personally by proprietors) having no place of abode or business within ten miles from the gardens." On a scrutiny of the voting papers, it appeared that there were for the opening 119, against 183. The motion was therefore lost. The total number of proprietors was stated to be 418.

Florists' Flowers.

In resuming, from p. 45, the record of the Novelties of the past Year, let us begin with that fine old florist's flower, the Hollyhock, which is yet dear to many. Its improvement is carried on by Messrs. Chater, Downie, and others, as it was in days gone past, when the honoured names of Bircham and Paul had made it famous. In Carus Chater, dark crimson; Constance, pale flesh; Junia, blush, suffused with soft pink; Leah, yellow, with a dark shading; and Walden Queen, pale rose, Mr. Chater has a fine batch of new flowers of superb quality. Report speaks highly of Messrs. Downie, Laird & Laing's new batch, though they have not been produced at any of the floral meetings held in London.

Of large flowering Pelargoniums, Admiration (Foster), Corsair (Foster), Heroine (Foster), Lady of Lyons (Foster), and Northern (Foster), all fine flowers, add new glory to the well-worn laurels of this raiser. Some of the best of the flowers exhibited this season are held over for distribution another year, but the foregoing comprise some good new things. Mr. Wiggins offers a large batch of Mr. Beck's seedlings, so that there is no fear of this grower's name being lost to floriculture. Mr. Turner's batch of six new fancy kinds, viz., Agrippa, East Lynne, Excelsior, Lady Carington, Leotard, and Marmion, are unquestionably the finest kinds ever offered, and will give a good account of themselves by-and-by on the exhibition stage. Of great size and substance, and comprising some fine self flowers of new and distinct colours, they indeed represent an advance very satisfactory to note.

As compared with 1868, there has not been such a large number of new forms of the various sections of bedding Pelargoniums produced, though they are plentiful enough for all practical purposes. Coleshill (Eckford), Duchess of Abercorn (Mann), Illuminator (Mann), and Lord Stanley (F. & A. Smith), represent the cream of the ordinary zonal section; the advance being not so much in novelty of colour as in the massiveness and superior finish of the flowers. In Marie Lemoine, Victor Lemoine, and Wilhelm Pfitzer, good additions are made to the double flowered class—one rapidly rising in popular estimation. The advance is marked by the presence of dwarf, compact, close growing habit, and freedom of bloom; and in the two last-named are found flowers of full substance, and of showy scarlet and crimson hues. The nosegay class shows an even more decided advance in the way of fine well-formed stout flowers, still allied to the large trusses that make the nosegay section so valuable for outdoor decorative purposes. In Claudius (George), Gustave de Rothschild (Tirebuck), Harry George (George); Lady Hawley, Lady Kirtland, and Stanstead Rival, Messrs. Downie, Laird & Laing's new batch; in Sydney Dunstan (George), and in Mr. Smith's fine new kinds, Soleil and W. E. Gladstone, can be found a batch of nosegays that are a great honour to the several raisers. In regard to the Ivy-leaved section, such a break has been obtained that, in importance, it amounts to a kind of floral revolution. What Mr. Wills has done in the way of hybridising the Ivy-leaved kinds after much patient labour, has been imitated by Messrs. Ford and Eckford with results similarly successful, and in Willsii and Willsii rosea, Gem of the Season (Ford) and Lady Edith (Eckford), the floral world is put into possession of some valuable acquisitions, having the habit and growth of the Ivy-leaved varieties added to novel coloured flowers, round and smooth, like those of the zonal kinds. For house decoration these hybrids will be most valuable. In Compactum (Turner) and Mr. Lambert (Harman) are obtained two good additions to the variegated Ivy-leaved Pelargoniums. With the exception of Impératrice Eugénie (Downie & Co.), the gold and bronze section has only presented subjects inferior to those already possessed; and of the variegated zonal section, of which new varieties have been sparingly produced as compared with the rush of last year's produce, but two golden-edged varieties have been selected for First-class Certificates, namely, Macbeth (Bell & Thorpe), and Peter Grieve (E. G. Henderson & Son); and only one silver-edged kind, namely, Lass of Gowrie (E. G. Henderson & Son). Of the ordinary variegated section, Bright Star (Turner), and the white-flowered Waltham Bride (W. Paul), are both good, the leaf foliage effective, the habit compact, and yet robust. That useful section most requiring improvement, the golden-leaved varieties, has shown no advance on what we already possessed.

That charming spring flower, the Chinese Primula, which has of late years exhibited such a capacity to produce variation, has this season exemplified this, in a remarkable degree, in the case of such splendid forms as rubra magnifica (Williams), Wonderful (Weatherill), and Waltham White (W. Paul), which are distinct and varied, and, it is said, capable of being reproduced from seed. In Miss Kingsbury and Snowflake, two fine double flowered forms, Messrs. Windebank and Kingsbury make capital additions to the fine varieties they have produced in previous years; and in the lilac form of P. cortusoides amœna, Messrs. Veitch & Son have a valuable acquisition.

The fact that Mr. Turner is to send out a batch of 13 new Verbenas, raised by Mr. Perry, of which nine have obtained First-class Certificates, is a pretty conclusive proof that in respect to the Verbena there is no retrogression. Out of Mr. Eckford's batch of eight new kinds, four have obtained First-class Certificates, and thus fully sustain Mr. Eckford's reputation as a raiser. Notwithstanding its pretty general banishment from the flower garden, the Verbena must be in large demand, as the raisers appear to be as active as ever. Of Mr. Perry's flowers, Ada King, Butterfly, Rev. Joshua Dix, R. H. Vertegans, and Rising Sun, might be singled out for especial mention; and of Mr. Eckford's lot, Countess of Radnor, Eclipse, Harry Eckford, and Lady Ann Spiers.

So much for the floral retrospect of 1869, and who would be prepared to say that there is any falling off in the way of enterprise and persistent labour on the part of our florists? Notwithstanding that it might be reasonably supposed each year's improvements tend to limit to some extent the chance of producing new and improved forms of floral beauty, yet the ceaseless activity of Nature does year by year yield from its bountiful supplies new evidences of its rich treasures, ever ready to be called into being if intelligence, and skill, and patient work be invested in such a goodly enterprise. *R. D.*

Garden Memoranda.

The Royal Botanical Gardens, Edinburgh. —Twenty-eight imperial acres are now included in the gardens, these dimensions being an increase of 14 acres upon the original enclosure. The extension has been carried out by adding to the ground the old garden of the Horticultural Society, which immediately adjoined it. Through the plans and arrangements of Mr. M'Nab, the curator, great benefits are being gained by the enlargement. The limited space previously at disposal prevented anything like a scientific arrangement of the various classes of trees; the contributions had simply to be placed where there was room for them, and visitors were left to find them as best they could. While in this state, it was impossible that the gardens could serve any good practical purpose, for to the gardener and planter such establishments can only be useful in so far as they permit of an adequate idea being formed from actual observation of the effects and respective merits of the different species of each genus, planted in distinct and properly arranged groups. The additional space which Mr. M'Nab has now under his control affords him scope for carrying out grouping and practising landscape gardening in a manner which in time must have a beneficial effect over the entire country, for in this way instruction is conveyed which otherwise could never be obtained. When proprietors know that in the Royal Botanical Gardens they can see in health and vigour a scientific arrangement of the various genera and species of trees from which they might wish to make selections, it is natural that before planting they will avail themselves of the opportunity thus afforded, and ascertain what it is possible for them to do in the way of ornamenting and improving their property.

It is satisfactory to know that to a large extent this desirable purpose is now being served by these gardens. Their whole aspect has undergone a change since their extension. The monotonous crowded groups have been opened up, and the different genera, as far as possible, collected together from their previous disorderly intermixture. Apart from the utility of the new arrangement and freer space, the effect produced is sufficient recompense for the efforts made, as the grounds now afford a very excellent specimen of landscape gardening—a number of delightful vistas having been opened out by lifting and replanting; while in the arrangement of the trees every attention has been paid to required harmony of colours, and the walks and elevations have been formed with admirable skill. Even in these wintry days the landscape part of the garden has quite a green and attractive appearance, from the judicious intermixture of evergreen and deciduous trees, and the grouping of the different varieties. But the great benefit derived from the extension of the grounds is the formation of an arboretum, one of the chief divisions of which consists of the Coniferæ. The importance of these to planters is every year becoming greater. The specimens are constantly being multiplied, and it is very desirable that justice should be done to them, as they are brought home by travellers. In a piece of ground 28 acres in extent it is, of course, impossible to bring to maturity all kinds of forest trees; and a selection only can be made. Mr. M'Nab has taken up the Coniferæ complete, and in this respect the garden possesses a very great attraction, and one which will no doubt prove of excellent service. This complete section shows what might be done in the forest department if space permitted. The Elms, Limes, Oaks, &c., though numerous in the grounds, are but a mere sprinkling in each class compared with the number of varieties to be obtained. The Coniferæ in their various groups have all been planted within the last two years or so, at all seasons. So successfully has the transplanting been carried out by Mr. M'Nab that of 2800 trees transplanted only two have perished. Many of the trees removed weighed fully three tons. The Pinaceæ form the largest group, and contain perhaps a greater number of varieties than is comprised in any collection to be found elsewhere.

The complete growth of Coniferæ is one of the most serviceable branches of cultivation that could have been adopted, but there is equal necessity for development in other departments. There is great need, for instance, of a house to be entirely devoted to the cultivation of Ferns—both the tree and herbaceous varieties. Moreover, attention must before long be given to the Palm houses, for the accommodation in the existing buildings has become much too small for the fine plants now growing within them, and the same want of classification and arrangement prevails there that existed in the garden in regard to the Coniferæ previous to the extension. We believe that representations have been made to the Government as to the necessity for erecting new houses, in order to permit both of the unrestricted growth of the trees, and also of the required classifications. The present handsome house, it will be remembered, was erected about 10 years ago, and it was only after many appeals to the Board of Works that the grant was given for it. The fine healthy Palms had long outgrown the old house to which they were confined. Season after season the leaves pushed through the roof, and had to be cut and the roof reglazed. At length, after one vigorous tree had again broken through its confinement, and been allowed to grow in splendid luxuriance high over the roof of its prison-house, a photograph of it was taken, and sent up to London, as the best means of convincing the authorities of what was wanted. This had the desired effect. With little delay, instructions came down that every care was to be taken during the cold weather of "that Palm," and that a grant for a new house would be asked for on the earliest opportunity. The opportunity in due time came, and the result was the erection of the present handsome house which now adorns the gardens, but which, even with the adjoining building, is no longer capable of affording the amount of accommodation required. The allowances granted to the National Botanical Gardens have, unfortunately, never been more than barely sufficient to maintain them in a moderately stocked condition. The great service which it is possible they may render the country ought to secure for their claims some amount of liberal attention, especially when such skilful and zealous service has been obtained for them as that given by Mr. M'Nab.

In the course of the improvements which are being carried out, some very novel features have been given to the gardens. The materials of the old wall which divided the grounds from the Horticultural Gardens, and which has recently been removed, have been used by Mr. M'Nab to excellent purpose in the construction of a rockery, which may well serve as a model for such works—not so much from its mere picturesque effect, which too often is alone studied, but because the plants are there permitted to grow as they ought to be—full, free, and unconfined. Generally, plants on rockeries are found running through each other, with scarcely any classification, and with little or no arrangement, but here any specimen may be picked out without the least confusion or trouble in search. The rockery is not yet extended to one-half the size that is intended, but the space already occupied approaches a quarter of an acre, and the work may be considered as the nucleus of an undertaking which, when completed, will be one of the best things of the kind in the country. There are already more than 800 different specimens of alpine and other plants in the part formed, and such a collection, presented in this interesting way, is of course of great value.

Miss Burdett Coutts, while recently in Edinburgh, paid a visit to the gardens, and planted a memorial Oak; a ceremony, we believe, which that lady had not previously performed. Still more recently another memorial Oak was planted by Mr. Jenner, a gentleman who is perhaps unsurpassed in the warm interest which for many years past he has taken in the gardens, and who is well-known as one of our most zealous and successful botanists. *Edinburgh Paper.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Those *Camellia plants* which made a strong growth during the past summer will now be pushing their wood buds prominently at the apex of the young shoots; to induce more buds to break, and thus to maintain a more bushy habit, it is advisable to break off these very strong buds. By removing them at this time, the less prominent buds towards the base of the shoots will have ample time to develop themselves more fully, so that at no distant date each shoot will be enabled to make three or more good growths in the place of a single strong one only. Camellias may even be pruned in severely with the knife, where it is necessary to reduce the bulk of the head, or to form dwarfer and more bushy plants. The plants may be pruned back or cut in as soon as they have finished flowering. And the sooner this is done the better, even if it be necessary to force the flowers open, upon those plants which are to be so treated. This will give the old wood more time to form the necessary number of young buds, preliminary to making growth when the warm spring sun arrives. *Cape Pelargoniums* will be found to thrive rather more during mild days, such as occasionally occur at this time. Should the wind be buoyant and searching, let the air blow freely into and amongst the plants. Such specimen plants as are not intended for late blooming, should now receive their final shift. The necessary fumigating for the destruction of green-fly should now be performed rather more frequently than during the past dull weather, when little growth, or, indeed, increase of insect life was possible in such cool greenhouses as this class of plants are grown in. Fumigate at well-regulated intervals, more as a prevention than as a cure. In instances where this operation has not been regularly performed in stoves, a good fumigation should now be given, for it will be seen at this time that aphis pests are on the increase. Varieties of the beautiful autumn-blooming *Dichorisandra*, of which the *D. thyrsiflora* is the best I know, should now be started into active growth in a nice bottom-heat, with a stove temperature. As herbaceous perennials from the Brazils, their further general treatment will be understood. Those who do not possess this plant should sow seeds of it at once.

FORCING HOUSES.

According to the forwardness of early *Vineries*, so must the work within them be continually proceeded with. Disbudding, and the tying out of the young shoots, must be attended to. Next, the thinning out of berries, when these are forward enough to require it. When the berries are well set, and commence swelling perceptibly, advance the temperature to a mean of 70°, and keep all other necessary accessories, such as syringing, watering, atmospheric humidity, &c., well up to such a degree of heat, bearing in mind that the more dry artificial heat required to carry forward the different stages of growth, the greater will be the amount of moisture absorbed from the atmosphere. Hence it is essentially necessary that the moisture should be constantly replenished or made good. In the hands of good cultivators an occasional supply of warm and buoyant humidity may be furnished by just damping over the pipes when moderately warm, only so warm, in fact, that the steam is made to rise slowly, and is only just perceptible. I would not recommend very young beginners to do this except with great caution. They should be especially careful not to throw water either casually or purposely upon pipes which are anyway approaching to hot. The steam which would be created thereby, rushing up in its highly heated state, would too certainly cause the berries to "rust," thereby causing the best prospects to be blighted. These remarks apply also to fruiting *Pines*, or to such as must be pushed quickly along, regardless of a not over robust growth. Other Pine-plants, which are younger, should be kept very quiet. Nothing that is likely to excite them into growing should by any means be permitted. Those who, from the want of better means, are constrained to grow early *Cucumbers* in frames, should proceed actively with the preparation of the materials for making the beds—the best are fallen leaves, and good wholesome stable litter. This last should always be formed of Wheat-straw, in preference to any other, as it lasts so much longer, and as such maintains the heat better: a very essential requisite in connection with the making up of hot-beds, which necessarily should maintain a good heat to the last. The seedling *Cucumbers*, which are up and have pushed the third, or as it is sometimes termed, "the rough leaf," should be potted off into 60-sized pots in a nice rich compost consisting in the main of finely-sifted leaf-mould. These should then be kept as near to the glass as possible, and be fully exposed to the light. *Cherry trees*, which are in bloom, will be much assisted if the flowers are gently shaken, so as to distribute the pollen better. A temperature of from 44° to 46° by night, with an advance of 8° to 10° by day, will be ample for them at the present time. Of course a nice buoyant and moderately dry atmosphere must be insured by the constant admission of fresh air upon all proper occasions.

HARDY FRUIT GARDEN.

Proceed with the pruning of wall fruit trees. In some instances, in the case of old trees, which have been grown upon the spur system, the older spurs will have become rather long, and hence somewhat unsightly. Some of the more prominent of such shoots should be cut out near to the main or parent branch. In the majority of instances they have the means at their base to form another spur, as dormant buds are generally clustered around the base of the spurs, which are ready to take the place of the others when removed. Finish dressing *Orchard-house trees* in pots, by removing as much of the old soil as possible, so that more of a better and fresher material may be substituted. Where the potting of any trees of this kind was delayed in the autumn let it now be done without further delay. That is, so far as shifting any into larger pots is concerned. Otherwise I would not advise the regular potting of any at this time, considering that it is too late to tear the roots and soil from such trees as are required to produce fruit early in the season.

KITCHEN GARDEN.

Those who have a good succession of *Brussels Sprouts* should now, in view of clearing a portion of the ground at an early date, mark out a part, the heads of which may be taken off as needed for use. This will induce the remaining Sprouts to grow more freely, and so facilitate the removal, if these alone be put to use. Put successional batches of *Seakale*, *Rhubarb*, and *Barbe de Capucin* or *Chicory* into the Mushroom-house. Remove every form of protection from off flowering *Broccoli* and young *Cauliflowers* during mild periods. *W. E.*

TOWN GARDENING.

Dig all vacant *Beds* and *Borders*, except where there are many plants, in which case defer digging until March, for I find, by experience, that plants in town stand the weather better if the soil is left undisturbed during the winter. The bulbs of *Hyacinths*, *Tulips*, and *Crocuses*, &c., that yet remain aboveground, should be at once planted, if the weather permits. Good *gravel walks* are an important requisite at all times, both for their appearance and utility. Now is a good time to make them. Commence first by marking them out the required width; the earth should then be taken out about 12 inches deep, so that 8 inches of brick rubbish can be put in the bottom. This will make them firm, will keep down worm casts, and prevent weeds from growing through. In making new walks, great attention is necessary in regard to the level of the ground on which they are intended to be made; so that when they are finished they may slope towards the lowest part, and thus carry the water away easily. Where the ground is level, and there is no declivity to carry off the water, it will be necessary to put in a cesspool of open brick work in the bottom of the walk, so that it can be drained by means of sink stones placed at intervals at the edge of the walk; for, if this precaution be not taken, the water will remain upon the walks after a heavy rain, and leave a deposit of soot and dirt, which will render them unsightly and unfit for use. It will also be necessary to raise the walks about 2 inches in the centre when completed, so that the water will not remain on the surface. The month of March is the best time for finally completing walk making, but as that is a busy month, I think it advisable to get forward as much work as possible, and to complete them, with the exception of the final layer of fine gravel. The walks will then present a bright appearance for the summer. *J. D.*

STATE OF THE WEATHER AT CHISWICK (LONDON), For the Week ending Jan 19, 1870, as observed at the Horticultural Gardens

January	Mean's age.	Barometer Max	Barometer Min	Temperature Of the Air. Max	Of the Air. Mean	Of the Earth 1 foot deep	Of the Earth 2 feet deep	Wind	Rain.
Thursday 13	11	29·768	29·586	48	33	39	39	W.	·14
Friday 14	12	29·841	29·416	51	38	40	41	S.W.	·07
Saturday 15	13	29·813	29·603	51	41	46	44	S.W.	·02
Sunday 16	14	30·219	30·074	40	41	45	44	W.	·02
Monday 17	15	30·485	30·313	51	40	46	45	S.	·09
Tuesday 18	16	30·403	30·246	38	34	44	42	S.E.	·00
Wed ... 19	17	30·416	30·400	38	32	42	41	S.E.	·00
Average		30·682	29·079	46·1	34·9	40·5	43·3	40·5	0·18

Jan 13—Frosty air; cloudy, but fine; rain.
" 14—Clear and fine; cloudy; fine.
" 15—Fine morning; overcast; drizzling rain.
" 16—Densely overcast; heavy; foggy, very mild.
" 17—Dense fog; foggy; densely overcast.
" 18—Overcast; overcast; overcast; heavy
" 19—Overcast, cold wind; clear and fine; cold wind.
Mean temperature of the week, 1 deg. above the average.

STATE OF THE WEATHER AT CHISWICK

During the last 44 years, for the ensuing week, ending Jan 29, 1870.

January	Average Highest Temp.	Average Lowest Temp.	Mean Temp.	No. of Years in which it Rained	Greatest Quantity Rained	Prevailing Winds. N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.
Sunday 23	44·6	32·2	38·4	18	0·27 in.	2	4	2	4	8	14	4	6
Mon ..24	44·0	31·8	37·9	19	0·61	3	5	2	3	5	18	6	6
Tues ..25	44·2	32·2	38·1	21	0·99	1	5	3	1	7	10	6	6
Wed ..26	45·3	32·1	38·7	20	0·50	2	6	3	4	3	17	4	5
Thurs 27	44·9	31·3	38·1	20	0·70	3	5	4	1	6	13	6	5
Friday 28	46·0	31·0	38·5	19	0·62	5	4	1	2	8	18	7	6
Satur 29	45·7	31·6	38·7	19	0·38	1	5	5	2	2	15	8	7

The highest temperature during the above period occurred on the 20th, 1863—therm 58 deg; and the lowest on the 24th, 1869—therm. 16 deg.

Notices to Correspondents.

Barnes Memorial.—The following further subscriptions have been promised:—Sigismund Rucker Esq., £1 1s.; Mr. B. S. Williams, £1 1s.; P. G. Henderson & Son, £1 1s.; Mr. John Mitchell, Tarrick Park, £1 1s.; Mr. Tillyard, Brocklesby, £1 1s.; Mr. H. Gadd, Wollaton, £1 1s.; George and Richard Ayre, Chatsworth, 10s. 6d.; Mr. W. Pawley, Bromley, £1 1s.; Mr. J. Ulvey, Gedling, £1 1s. Received:—Mr. F. R. Kinghorn, £1 1s.

Drechsler's Patent Fumigator: *W. B. S.* Apply to Dick Radclyffe & Co., 129, High Holborn, W.C.

Fuel: *G. E. C.* Your question depends a great deal upon the weather, and whether the boiler is properly set and works well. If constantly at work, one chaldron of coke should last from three to four weeks; but as fire is only required for the tank, and very seldom for the other houses, this quantity should last much longer.

Fungus: *W. T.* The Fungus on the piece of wood which you have sent is the young state of Merulius lacrymans, the common dry rot. *M. J. B.*

Grafting Fruit Trees: *Bob-stick.* Prepare the stocks by heading them down now during mild weather, and graft in March. Any nurseryman or seedsman will supply you with grafting wax.

Insects: *Samian.* We believe that nothing definite has been recorded respecting the hybernation of the red spider; indeed, as the insect is chiefly found in hothouses, we question whether there be any cessation in the development of the species, although it is of course much more prolific in hot weather. *W.*

Looker's Patent Propagating Boxes: *M. W.* Hooper & Co., Covent Garden.

Mealy Potatos: *B. D. 1.* Hogg's Early Coldstream, round, and Rivers' Royal Ashleaf, kidney, will meet "the most mealy" requirements at starting: then Daintree's Seedling, white, round; Paterson's Scotch Blue, round; Wheeler's Milky White, and Dean's (of Ealing) Waterloo Kidney, as second earlys, followed by Gryffe Castle Seedling, Walker's Second Early—the first excellent, and the latter following it up for the winter months. Then Haigh's Cobbler's Lapstone, Pebble White *alias* Crystal Palace, kidney, or Edgecote Second Early; all of the Lapstone family are excellent mealy late keepers. Veitch's Improved Ashleaf; Rector of Woodstock, round; and Thomas Almond's Yorkshire Hero, are Potatos of the future for your correspondent to keep in memory—possibly the Veitch's and Almond's might now be got. 2. Keep your vinery cool and dry, and wait a while before taking the lights off. *R. Fenn.*

Names of Fruits: *G. Wood.* Your Apple is Hoary Morning. The Pear we do not recognise at present, although it seems a familiar variety.

Name of Plant: *A. V. C.* Fittonia, or Gymnostachyum Pearcei.

Salt for Vines: *Old Reader.* Salt is undoubtedly a manure if applied in moderation, if in excess it will kill. We have no experience in its application to Vines, and should be sorry to try it to any extent. It is applied, and with good effect, to Asparagus and other sea-side plants. It must in every case be applied with extreme caution. If you wish to ascertain the result try the experiment yourself on a pot plant.

Sowing Forest Tree Seeds: *W. T.* We know of no book other than those you mention.

The Raspberry Grape: *T.* asks if any of our correspondents can tell him where he can obtain a plant of the black "Framboise," or Raspberry Grape, which is much in use for the table at Avignon, Nice, &c.; also whether it is a good one to force, and whether it retains its flavour in this country?

Veitch Memorial: *G. N.* We cannot undertake to publish all the suggestions we receive. We submit them to the committee, where they will receive due consideration. When matters are so far advanced that we may advantageously refer to any of the suggestions we shall do so, not before.

Vines: *A Novice.* As a white Grape to succeed alongside of your Black Hamburgh we would recommend Royal Muscadine, and if another black one is wanted, Black Prince. We recommend these on account of their hardy constitution and free fruiting qualities. Having an established Vine, however, why not adopt the extension system as recommended in our columns? You cannot have a better variety; if, however, variety is wanted, then graft on the young shoots.

Cucumbers: *W. T.* Mr. Turner, Slough.

Communications received: W R R (see p 104) -J A P.—R. -John Bull.—G. L.—W. H.—H K—A G & Son—A C—J. D.—S. R.—J. W.—P.—W. F.—D. L. A. Y -G. L.—A E.—M.—T. R. (a nurseryman).—W. T.—G. W. (next week).—E. M.

Markets.

POTATOS.—Southwark, January 17.

During the past week the arrivals both coastwise and by rail have been heavy, and far in excess of the demand. Trade continues extremely dull, and all second-rate or inferior lots are neglected. The quotations are as follow:—Yorkshire Regents, per ton, 70s. to 90s.; Lincolnshire do., 60s. to 80s.; Kent and Essex do., 60s. to 80s.; Dunbar and East Lothian do., 70s. to 100s.; Perth, Forfar, and Fifeshire do., 60s. to 80s.; Ditto Rocks, 60s. to 65s.; French and Belgian Whites, 55s. to 60s.

COVENT GARDEN.—January 22.

The meeting of Parliament and near approach of the London season will, we trust, bring a substantial improvement in business before long. Hothouse Grapes and Pines are both in somewhat better demand, and prices have advanced. The general supply of outdoor and foreign produce continues ample for all requirements. Oranges are excellent this season; there have been also a few Pines from St. Michaels, but not such good specimens as we had two years ago. The Potato trade continues heavy

at former prices. In the Flower Market, Poinsettias (cut) may still be bought at 1s. each; Scarlet Pelargoniums, 3s. to 4s., larger sorts 6s.; Primulas, 3s.; Cinerarias, 6s. per dozen trusses; Azaleas, 4s. to 6s., and Cyclamens, 1s. 6d. per dozen blooms; Maidenhair Fern, 1s. 6d. per dozen fronds. These prices will rule without much change for another fortnight.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3 0 to 5 0		Lemons, per 100 ..	5 0 to 10 0	
Cobs, per lb. ..	0 9 — 1 0		Melons, each ..	1 6 — 3 0	
Chestnuts, p. bush. ..	8 0 — 14 0		Oranges, per 100 ..	6 0 — 12 0	
Filberts, per lb. ..	0 0 — 0 0		Pears, per doz. ..	3 0 — 6 0	
Grapes, per lb. ..	6 0 — 10 0		Pineapples, per lb. ..	2 0 — 8 0	

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund	3 6 — 15 0		Herbs, per bunch ..	0 2 — 0 4	
Artichokes, p. doz. ..	3 0 to 6 0		Horse Radish, p. bun.	3 0 to 5 0	
Beet, per doz. ..	2 0 — 3 0		Leeks, per bunch ..	0 2 — 0 4	
Broccoli, per doz. ..	1 0 — 2 6		Lettuces, p. score ..	1 0 — 2 0	
Brussels Sprouts, p. ½ sieve ..	2 0 — 3 0		Mint, per bunch ..	0 2 — 0 3	
Cabbages, p. doz. ..	1 0 — 1 6		Mushrooms, p. pott.	1 0 — 1 6	
Capsicums, p. 100 ..	2 0 — 2 6		Onions, per bunch ..	0 4 — 0 9	
Carrots, p. bunch ..	0 4 — 0 8		Parsley, per bunch ..	0 2 — 0 4	
Cauliflowers, p. doz. ..	1 0 — 1 3		Salsafy, per bundle .	1 0 — 1 3	
Celery, p. bund. ..	1 0 — 1 6		Seakale, p. punnet ..	2 0 — 2 6	
Cucumbers, each ..	1 6 — 3 0		Shallots, per lb. ..	0 8 — ..	
Endive, per doz. ..	1 6 — 2 0		Spinach, p. bushel ..	2 0 — 3 0	
French Beans, p. 100	2 6 — 3 0		Radishes, per doz. ..	1 0 — 1 6	
Garlic, per lb. ..	0 2 — ..		Turnips, per bunch ..	0 4 — 0 6	

Potatos, York Regents, per ton, 75s. to 100s.: Flukes, do., 75s. to 115s.

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.

L. W.'s system of packing saves nearly half the cost of carriage

Buried Nursery, Noble Hedingham, Essex.

THOMSON'S WHITE LADY DOWNES GRAPE.

Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened; immediate orders are respectfully requested.

Price 21s. and 42s. each.

THOMAS METHVEN, Leith Walk Nurseries, Edinburgh

STUART, MACDONALD, AND CO., SEED Growers and SEED Merchants, 85, Southampton Row, Holborn, London.

S. M. & Co.'s WHOLESALE LIST of all the choice Flower Seeds in cultivation forwarded on application

To Seed Importers, Nurserymen, &c.

BETHAM AND SON, Custom House, Shipping and General Transit Agents, beg to inform them that they receive and forward SEEDS, PLANTS, and NURSERY MERCHANDISE from and to all parts of the world, at charges as low as possible. Cox & Hammond's Quays, and Office, 9, Lower Thames Street, London

Correction of Catalogue.

CHARLES NOBLE regrets that, by a Printer's Mistake in his TRADE CATALOGUE (just issued), he is made to offer certain kinds of GREENHOUSE. All will please understand the prices are intended to apply only to those plants with an asterisk attached;—these are coming into fine bloom, and orders are solicited. —Bagshot, Jan. 20.

JOSEPH SMITH, SEN., Tunsley Nursery, Matlock, begs to intimate that his CATALOGUE of GENERAL NURSERY STOCK is now ready, which he will be happy to forward on application. It contains a large Stock of Forest Trees, Handy Evergreens, Ornamental Trees and Shrubs, American Plants, &c.

The Nursery is in a very exposed situation, the soil of a fibrous nature, and the Plants take up with excellent roots so as to ensure the best success in their removal.

WILLIAM COCKS begs to offer 2-yr. Seedling QUICK, 1 to 2½ feet; 2 yr. transplanted OAK, 1½ to 3½ feet; MYATT'S EARLY PROLIFIC and DALMAHOY POTATOS.

Samples and Prices on application to Old Nurseries, Donington, Spalding

COLEUS, COLEUS.—Queen Victoria and Princess Royal, the best two, 2s. per dozen, or 12s. per 100; strong old plants, with cuttings, 3s. per dozen; six or twelve best varieties for bedding, per dozen, 2s. or 3s.

Twelve new VERBENAS (1869), 3s.

CUCUMBERS.—Hamilton's Invincible, the longest and finest grown, for 14 stamps; Scott's Long Green, a good sort, 12 seeds for 13 stamps.

MELONS.—Heckfield Hybrid, Malvern Hall, and Meredith's Hybrid, each, per packet of 12 seeds for 13 stamps.

EVERGREEN OAKS, from 4 to 6 inches, seedlings, per 1000, 14s

Terms cash.

EDWIN HILLIER, Nurseryman, Winchester.

Special Offer to the Trade.

DOUBLE GERANIUMS, &c.—Marie Lemoine, the greatest advance and finest flowering double yet sent out, 15s. per dozen; Wilhelm Pfitzer, dwarf grower, and free flowering, 15s. per dozen

Madame Lemoine, 6s. per dozen | Gloire de Nancy, 6s. per dozen
Capitaine L'Hermit, 6s. per dozen | Triomphe, 6s. per dozen.
Triomphe de Thumesnil, 4s. per dozen
Lord Derby, single, 1s. per dozen

The above are good plants, in 60-size pots, 12 to 24 sized pots, suitable for travelling. Orders are now being booked for perpetual flowering Pentet, Prince of Orange, which received five First-class Certificates during last season.

FRED. PERKINS, Seed Warehouse, Regent Street, Leamington

To the Trade.

SPECIAL OFFER of LAURUSTINUS PYRAMIDALIS (NEW). WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for Stock. It has been seen growing in his Nursery by many eminent Nurserymen, to whom it has proved to be a fine, hardy, compact plant, of sterling merit, the habit being robust, compact; flowers pure white, nearly twice the size of the old varieties, and well-developed, with a continuation of flowers during the most severe weather

W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per 100, 60s.; 3 to 4 feet, do., 40s.; 2½ to 3 feet, do., 30s.; third size, 2 to 3 feet, do., 25s.; fourth size, 1½ to 2 feet, do., 15s.

Floral Nursery, Hailsham, Sussex

MESSRS. LITTLE AND BALLANTYNE, Nurserymen and Seedsmen, Carlisle, respectfully beg leave to intimate that MR. W. BAXTER SMITH

has been appointed sole Manager of the Business, and they feel sure that this arrangement will give satisfaction to their numerous friends and customers.

MR. SMITH has had a very long and extensive experience in every department of the Nursery and Seed Trade in connection with the Firm of Messrs. Peter Lawson & Son, of Edinburgh and London, and he will now devote his whole attention to carry on the Business of the Firm with the most careful and prompt attention. He will be especially careful in providing pure and unadulterated Seeds, saved from the best selected stocks, the growth of which will be correctly proved before they are sent out. We trust by following this course to secure an increased share of public favour, and to merit the continuance of the confidence which has been placed in the Firm for so many years.

PRICED CATALOGUES of SEEDS, PLANTS, &c., may be obtained on application

44, High-sh Street, Carlisle—January 6, 1870

P.S. Mr. William Clarke, recently in the service of the Firm, is no longer in their employment

Paul's Rose Catalogue.

"A very complete and able catalogue."—*Floral World.*

WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. The stock of Plants is large and excellent.

Paul's Nurseries, Waltham Cross, London, N.

Marechal Niel Rose.

PAUL AND SON, The Old Nurseries, Cheshunt, N., strongly recommend, as the best mode of growing this Rose, planting strong Standards. They have a thousand such, carefully protected from past bad weather; wood thoroughly ripened. Price 2s. 6d. each; 24s. per dozen.

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants

60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application.

WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.

Foot's Cray Nursery, Sidcup Hill, Kent.

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W. WOOD AND SON will have much pleasure in furnishing designs and executing to any extent LANDSCAPE GARDENING in all its various branches, including Forming, Re-forming, Improving, Planting, Draining, Levelling, Grounding, Cemeteries, Orchards, Kitchen, Fruit, and Flower Gardens. The Making of New Roads, Ornamental Water, &c., at the lowest prices consistent with good workmanship

N.B.—Estimates and Specifications supplied on the shortest notice

W. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WANTED, an active PARTNER in a Small Nursery, Florist, and Jobbing Business in Islington. Long Lease. £50 cash required.

G. R., 32, Rotherfield Street, Islington, N.

WANTED, a PARTNER, in an Old-established and Provincial Nursery of the highest respectability. From the position and reputation of the establishment, this would form an excellent opening for a Gentleman of moderate capital, business habits, and knowledge of the Trade

Messrs. OTHERGE AND MORRIS, The American Nurseries, Leytonstone, N.E.

MESSRS. VEITCH AND SONS wish to ENGAGE a Person thoroughly competent to take the MANAGEMENT of the PACKING SHED, and to see to the general execution of orders, including the Correct Naming of Plants, &c. Apply by letter, stating references and wages required, to the Royal Exotic Nurseries, Chelsea, S.W.

WANTED, in the Country, as FOREMAN and SHOPMAN, a respectable married Man, to take charge of a few Greenhouses and assist in the Shop and Warehouse. Must be of good address, able to attend to Customers, and willing to make himself useful in or out of doors.—Apply by letter, in the first place, to N. X., Messrs. Rivers and Son's, Sawbridgeworth, Herts, &c.

WANTED, a steady industrious Man, as WORKING FOREMAN, in a small Country Nursery. Wages, 18s. per week.—JOHN CAVE, Market Place, Spalding

WANTED, a working, energetic MAN, to MANAGE the OUTDOOR DEPARTMENT of a SMALL NURSERY. None need apply but those who can produce good Character.—FREDERICK PERKINS, Seed Warehouse, Regent Street, Leamington.

WANTED, as ESTATE BAILIFF, an active, married Man, not less than 30 nor more than 45 years of age, to make purchases and payments for Hay, Corn, and Wages, on the outdoor Establishment, to receive Money and execute Accounts, and under the superintendence of the Agents to take the charge of the Woods, Repairs, &c., and pay all parochial outgoings, on a large Estate near Penrith. Salary £35, with cottage and coals. No Beer provided. Some similar employment on a residential property and the highest character for integrity essential. Practical experience preferred to polish and address indispensable.—Applicants must state particulars as to their previous engagements, and name their Referees, by letter only, to BAILEY, NORMAN, AND BROWN, Land Agents, 8, Spring Gardens, Charing Cross, S.W.

WANTED, a highly respectable Man, as HEAD SHOPMAN, who thoroughly understands all branches of the Seed Trade, and who has had great experience, and is capable of filling a Situation of considerable Trust and Responsibility. He must be a man of good address, and well-first-rate business capacity.—CHARLES SHARPE AND CO., Sleaford.

WANTED, a DAIRYMAID, competent to take charge of a Dairy of 14 Cows, and thoroughly experienced in the making of Cheese, &c., and in Churning Butter, and who also understands Baking. She must be strong, active, and between 25 and 35 years of age.—Apply by letter, to Mr. JOHN M'LEAN, Calbourn, Newport, Isle of Wight

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MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS and GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. The fullest particulars as to services required may be obtained by calling at or addressing PAUL'S Nurseries, Waltham Cross, London, N.

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Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under)

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & Co. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

GARDENER (HEAD).—A Young Man; understands the general routine of Work. Can be well recommended.—G. R., Post-office, Blandford, Dorset.

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GARDENER (HEAD).—Understands Stove, Vines, Greenhouse, and Flower and Kitchen Gardening in all branches; also Land, if required. Abstainer.—G. H., Beslen, Baker, Walford New Town, Herts.

GARDENER (HEAD).—Middle-aged, married, no incumbrance; great practical knowledge in all branches of the profession. Good character.—T. HOLBROW, Church Cottage, Freemantle, Southampton

GARDENER (HEAD).—Middle-aged; plenty of experience in every department, with a good will to use it in the interest of his employer. Good character.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey.

GARDENER (HEAD).—Age 36, married; energetic, thoroughly practical. Leaving in consequence of reduction in the establishment.—Testimonials on application to H. F., Post Office, Barnsley, Yorkshire

GARDENER (HEAD).—Age 29, married, no incumbrance; thoroughly understands the profession in all its branches. Good character from present and previous employers.—J. B., Milford, Godalming, Surrey.

GARDENER (HEAD). Age 28, married, no incumbrance; thorough knowledge of Early and Late Forcing, Fruit, Flower, and Kitchen Gardening, &c. Good character.—H. D., Wood's Post Office, Seven Sisters Road, Holloway, N

GARDENER (HEAD). Age 42, married, one son; thoroughly understands the management of Vines, Pines, Stove and Greenhouse Plants, Kitchen and Flower Gardening, &c. Good character from present and former employers.—Mr. SALTFORD, Clifton Road, Brighton, Bristol

GARDENER (HEAD).—Age 33, married, one child only.—A Gentleman is desirous of recommending his Head Gardener, a steady, industrious man, who well understands every branch of his profession. Six years' character.—T. C. R., care of Wm. Wood & Son, The Nurseries, Maresfield, Uckfield, Sussex

GARDENER (HEAD).—Age 38, married; thoroughly practical in every department. Good Grape Grower, and Flower and Kitchen Gardener. Understands Woods, Land, and Stock, and the general work of an Estate. Can be highly recommended.—S. J., West Street, Somerton, Somerset.

GARDENER (Head), age 29.—Mr. T. EAST, Wolveton Gardens, Dorchester, can confidently recommend his Foreman, he having filled his present situation for four years to his entire satisfaction. He is practically acquainted with Fruit, Flower, and Kitchen Gardening, and is well up in Forcing.

GARDENER (HEAD), married.—W. SWAN, late Gardener to T. Jones, Esq., Whalley Range, desires a re-engagement. Thoroughly practical; first-class Grower and successful Exhibitor of Orchids. Best references.—W. SWAN, 49, Augustus Street, Shorton Road, Manchester.

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GARDENER.—Age 27, married, two children; practical, and thoroughly understands the profession, including Early and Late Forcing of Fruit, Vines, Pines, Kitchen, Flower Garden-ing, and Land if required. Good character.—G. KING, Oatland Cottage, Park Road, Freemantle, Southampton

GARDENER, BAILIFF, or FORESTER.—A sensible, intelligent, middle-aged Christian Man, who, though the loss of his Master, after a faithful service of 25 years, needs a fresh situation. He can be strongly recommended for any place of trust by the Lady who inserts this Advertisement.—J. S., John Deacon, Esq., Mansfield, Cambridge, S.W.

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FARM BAILIFF (Working).—Age 30, respectable; thoroughly understands the Cultivation of Land, and Breeding and Rearing all kinds of Stock. Wife would undertake Dairy or Poultry if required. Good character from last employers.—J. M. BROOMHAM, Kingsuynton, Devon

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To Seedsmen.

SHOPMAN (Assistant), or UNDER WAREHOUSEMAN. Age 20; six years' experience in a Wholesale and Retail Business. Good reference.—A. B., 12, Union Street, Ipswich

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The Course of Instruction embraces Lectures on:—

1 Agricultural Chemistry and Geology, by W. K. SULLIVAN, Ph.D., Professor of Chemistry, Royal College of Science, Dublin.
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The Establishment is now open to a class of paying Pupils, who in addition to instruction by Lectures, receive also instruction in the Practice of Agriculture on the three Farms into which the land is divided—viz.:

A Spade-labour Farm of 51 acres; a small Farm of 25 acres, which is worked with simple and inexpensive implements, and a large Farm of nearly 150 acres, on which are employed the most improved agricultural implements and machines. Various rotations and systems of farm management are pursued.

The charge for paying Pupils is £20 a year, payable quarterly, in advance.

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The Model Farm is within three miles of Dublin.

For further information apply to the Secretaries, Office of National Education, Marlborough Street, Dublin; or to the Superintendent, Model Farm, Glasnevin, Dublin.

OXFORD MEETING, 1870.

FARM PRIZES.

A PRIZE of a PIECE of PLATE, value 100 Guineas, offered by JAMES MASON, Esq., and a PRIZE of FIFTY POUNDS offered by the Society, will be given to the Occupiers of the two best managed Farms (which shall be entered for competition) in the district comprised within a line drawn through the Towns of Reading, Basingstoke, Marlow, Aylesbury, Buckingham, Banbury, Stow-on-the-Wold, Lechlade, and back to Reading.

The Competition is limited to Tenant-Farmers, and the LAST DAY of ENTRY is SATURDAY, February 26.

Further particulars and Forms of Entry may be obtained on application to

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Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Laying Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
MANGEL and POTATO MANURES

Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c. E. PURSER, Secretary.

Offices, 116, Fenchurch Street, E.C.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains a large proportion of Soluble Phosphates 6 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, on which is secured by a leaden seal, bearing the Company's Trade Mark. Its analysis is guaranteed so long as the seals remain unbroken.

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Agents for South-West of England—Messrs. Wm. Smith & Co., Bristol.
Agent for Kent, Surrey, Sussex, Essex, Herts, and Middlesex—Mr. John G. Barry, 8, Old Jewry, London.
Agents for Scotland—Messrs. Richard Connon & Co., Glasgow and Aberdeen.
Messrs. Allan, Edwards & Co., Dundee.
Agents for Ireland—Messrs. R. F. Gladstone & Co., Dublin.
Price £11 per ton, delivered free to Rail or Wharf in London.
REES and CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.
PERUVIAN GOVERNMENT GUANO, £13 10s. per ton.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO can be obtained of the undernamed, in any quantity, from one bag upwards.

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The Biphosphated Peruvian Guano combines the stimulating power of Peruvian Guano with the nourishing properties of Superphosphate. It is sent out in Sealed bags, and each bag is guaranteed by Sellers. Price £11 per ton; discount for cash.

Write for Copy of Analysis by Dr. Voelcker, Consulting Chemist to the Royal Agricultural Society of England; Professor J. T. Way, of London; and other leading Chemists.

LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. NITRATE of SODA supplied ex Ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices.

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PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures.
AMERICAN and other CAKES at market prices.

NIGHTSOIL MANURE CONCENTRATED.—Prepared under the direction of the Corporation of Rochdale.

The above Manure, in the state of a fine powder, so that it can be used with the Hand, Spade or Drill, and is free from the objectionable smell of Nightsoil.

In its preparation fire-heat is not used, and all the natural properties of Nightsoil and urine are retained. It is at least eight times stronger than the nightsoil and ashes collected in towns; and the Purchasers may rely on the Manure being of an uniform strength, the purpose of the Corporation, in the establishment of the works, and in the manufacture, not being purely a money profit, but the improved Sanitary state of the Town, and also to solve the problem of the preparation of Nightsoil so as to make it convenient for carriage and not offensive in use.

With all kinds of produce, Horticultural and Agricultural, its use has been found highly successful. A pamphlet, explanatory, is prepared to deliver it at the Rochdale Station at £4 per Ton, or to arrange for its delivery where required.

Address Mr. HARESCEUGH, Town Hall, Rochdale.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING and COMPANY (Limited), CORN, SEED, MANURE, and OILCAKE MERCHANTS.

Address, 26, Seed Market, Mark Lane, E.C.; or Bassingstoke.

Samples and prices post free on application. Prize Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

For Seed.

HALLETT'S TRADE PEDIGREE MARK

CHEVALIER BARLEY, which was awarded the First Prize three years in succession (1867, 1868, 1869), at the Birmingham and Midland Counties Show. Yielded, at Brighton, in 1869, 10 quarters per acre, weighing 57 lb. per bushel. Also PEDIGREE BLACK TARTARIAN and PEDIGREE WHITE CANADIAN OATS.

For price and full particulars of above, and of Pedigree Seed Wheats, apply to the Originator of the System, Captain HALLETT, F.L.S., Brighton.

SUTTONS RENOVATING MIXTURE, for improving Pastures, should be sown in the early spring months.

This Mixture consists of the finest kinds of Permanent Grasses and Clovers, and will greatly increase the quantity and quality of succeeding Hay crops. The Mixture should be harrowed with heavy iron harrows previous to sowing, and bush harrowed after sowing, and in some cases a top-dressing of manure will be found beneficial. Sow 10 to 12 lb. per Acre, according to condition of the Pasture. Price 9d. per lb.; 80s. per cwt.; carriage free.

For prices and full particulars of other mixtures apply to SUTTON AND SONS, Seedsmen to the Queen, Reading.

Notice to the Trade.

LAXTON'S NEW PEAS, ALPHA and SUPREME.

HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties; also the HUNDREDFOLD, EARLY FAVORITE, and the other sorts of McMILLAN'S QUEEN of the MANOR. They have also grown largely of LAXTON'S PROLIFIC. Descriptions of all in CATALOGUE, which may be had on application. They have at present a good supply of the true RED and WHITE ITALIAN TRIPOLI ONION, and the GIANT ROCCA, all of which are scarce this season.

HURST AND SON, 6, Leadenhall Street, E.C.

Seed Potatos.

GEORGE SIBBALD, Drumgeath, by Dundee, has for Sale a large stock of the following kinds of his own growing, true to name:—Paterson's Victoria, Walker's Early, Rintoul's Don, Early Oxford, Banner's Fluke Kidney, Royal Ashleaf Kidney, Myatt's Kidney, Sutton's Racehorse Kidney, Sutton's King of Kidneys, Early Rose Kidney, Mona's Pride Kidney, Sutton's Berkshire Kidney, Ashleaf Kidney, Early Frame, &c. Also about 4 cwt. superfine Early Dwarf York CABBAGE SEED.

Prices on application.

Seed Potatos.

HAND F. SHARPE'S WHOLESALE LIST of all the new and best varieties of EARLY and LATE POTATOS is now ready, and may be had on application. The quality is very fine, and prices low.

Seed-Growing Establishment, Wisbech.

Early Rose Potato.

H. AND F. SHARPE have just imported a very true Stock of the above extraordinary prolific POTATO, direct from one of the best growers in America; and are prepared to offer it to the Trade at a reduced price.

Seed-Growing Establishment, Wisbech.

Seed Potatos—Choice selected Stocks.

JAMES CARTER AND CO. are now prepared to execute orders for the following new and popular varieties:—

POTATOS.

The Early Rose } Imported direct { per lb., 1s. 6d.; 7 lb., 9s.;
Breese's Prolific } from the Raiser in { ,, 3s. [56 lb., 65s.
The Climax } America. { ,, 3s.
Paterson's Bovinia, or Cattle Feeder, p. lb., 1s. 6d.; 7 lb., 9s.; 56 lb., 65s.
The Queen's Potato, as used at the Royal table, 12s. per peck.
The Ashtop Fluke, much recommended, 11s. per peck.
Carter's Champion, best for forcing, 5s. per peck.
Milky White, very prolific, 4s. per peck.
Rivers' Royal Ashleaf, 4s. per peck.
Fluke Kidney, very choice seed, 2s. 3d. per peck.
Early Handsworth, a good early variety, 3s. 6d. per peck.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

SUTTONS' CHOICE SEED POTATOS, for planting. Much cheaper by the bushel, sack, or ton—prices of which may be had on application.

SUTTONS' BERKSHIRE KIDNEY, the best Potato for the main crop. Raised and selected from among 40 Seedlings of the Fluke. Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed. 5s. p. peck.
GOLDEN BLOSSOM, excellent, fine flavour, good cropper, 4s. p. peck.
EARLY VEGETABLE MARROW, fine, 3s. 6d. per peck.
MONA'S PRIDE, very early, small foliage, 4s. per peck.
THE KING OF POTATOS, one of the best in cultivation, 3s. 6d. per peck.
PRINCE OF WALES' KIDNEY, an abundant cropper, shallow eyes, 4s. per peck.
PATERSON'S BOVINIA, the new Cattle-feeding Potato, 1s. 6d. p. lb.
THE EARLY ROSE, the best of the American varieties, 1s. 6d. p. lb.
And other excellent varieties. See SUTTONS' DESCRIPTIVE CATALOGUE, grats and post free on application.
N.B. Potatos as well as Seeds carriage free.
SUTTON AND SONS, Royal Berks Seed Establishment, Reading.

Suttons' New and Clean Grass Seeds for Exportation.

SUTTON AND SONS, having completed the cleaning of their NATURAL GRASS SEEDS, will be pleased to send samples and lowest quotations, in large quantities. They are of unusual fine quality this season, and can be relied on as perfectly free from weeds.

SUTTON AND SONS, Seed Merchants, Reading, Berks.

Garden Seeds.

THE COUNTRIES from WHENCE they originally came. See WHEELERS' LITTLE BOOK for 1870, price 6d.; post free; gratis to Customers.

J. C. WHEELER AND SON, Seed Merchants, 59, Mark Lane, London, E.C.

Wheeler's First Early Pea

IS as EARLY as ANY, and a BETTER CROPPER; 2s. per qt. See WHEELERS' LITTLE BOOK for 1870, price 6d.; gratis to Customers.

J. C. WHEELER AND SON, Seed Merchants, 59, Mark Lane, London, E.C.

Beans, Harlington Windsor.

A NEW and SUPERIOR VARIETY.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Beet, Egyptian Turnip-rooted.

QUITE NEW, fine rich colour, good flavour; 1s. per packet. Illustrated in WHEELERS' LITTLE BOOK for 1870, price 6d.; post free; gratis to Customers.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Cocoa-nut Cabbage.

A NEW and very EARLY VARIETY; 1s. per packet. Illustrated in WHEELERS' LITTLE BOOK for 1870, price 6d.; post free; gratis to Customers.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

Paterson's Superb Melon.

THIS EXTRAORDINARY MELON was raised last summer by Mr. Paterson, Gardener to Mrs. Hanbury Leigh, of Pontypool Park. It weighed 24 lb., and measured 42 inches in circumference. It is illustrated (from a photograph) in WHEELERS' LITTLE BOOK for 1870.

J. C. WHEELER AND SON, 59, Mark Lane, London, E.C.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex

SALES BY AUCTION.

Lilium auratum.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, January 27, at half-past 12 o'Clock precisely, 16,000 fine BULBS of LILIUM AURATUM, just arrived from Japan.

On view the morning of Sale, and Catalogues had.

Bugle Hotel, Fareham, Hants,

MR. W. ABRAHAM is instructed to SELL by AUCTION a splendid Collection of FRUIT TREES, CONIFERÆ, HARDY EVERGREENS, ROSES, QUICK, CLIMBERS, direct from adjacent Nurseries, in the Bugle Hotel Yard, on MONDAY, January 24, at 12 o'Clock.

See Catalogues, to be obtained at the Hotel; or of the Auctioneer.

Watford, Herts.

EXTENSIVE SALE OF NURSERY STOCK.

MESSRS. HUMBERT AND COX are instructed by the Executors of the late Mr. Greenus to SELL by AUCTION, on the Premises, The Railway Nurseries, Watford, on THURSDAY, February 3, and two following days, at 12 o'Clock, the STOCK in TRADE, comprising 25,000 Fruit and Forest Trees, Fruit Trees, fine specimen Trees, Flowering Shrubs, Greenhouse Plants, Hardy Herbaceous Plants (in Lots to suit Private Buyers); also the Trade Erections, Implements, and numerous items.

May be viewed two days before the Sale; and Catalogues had (free by post) of Messrs. HUMBERT AND COX, Auctioneers, &c., 88, St. James Street, S.W.; and Watford, Herts.

Notice.

MR. DUCKHAM'S SECOND PERIODICAL SALE of HEREFORD CATTLE is POSTPONED until TUESDAY, February 8, being the day before Hereford Fair.

Farnley Hall, near Otley.

IMPORTANT SALE OF SHORTHORNS.

MR. STRAFFORD has received instructions to announce for SALE by AUCTION, without reserve, on THURSDAY, February 24, THIRTY HEAD of very superior and Pure-bred SHORTHORNS, the property of F. R. Fawkes, Esq., Farnley Hall, near Otley, and a choice selection from his justly famed Herd, which has been long and carefully bred from the best sources, and maintained a high position at the Royal Agricultural Society of England, the Yorkshire, and other National and County Shows.

Catalogues, with pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. SCOTT, Farnley, near Otley, Yorkshire.

Extensive Sale of Pure-Bred Shorthorns.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve, on TUESDAY, March 1, at 1 o'Clock, at The Asps, one mile from Warwick, the entire Herd belonging to the late Mr. Henry Mason. It consists of FORTY HEAD of BULLS, COWS, and HEIFERS, bred for a period of 40 years from some of the oldest stock in the country. About one-half the Herd is of the celebrated "Dido" tribe. Pure-bred Bulls from Sir Charles Knightley's herd have been used for several generations.

Catalogues, with pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, or at The Asps Farm.

The Agricultural Gazette.

SATURDAY, JANUARY 22, 1870.

MEETING FOR THE ENSUING WEEK.

January 24 { Institute of Surveyors (adjourned discussion on Mr. Hope's paper on Town Sewage).

IT is hard to imagine any fresh ideas on so well worn a subject as TENANT-RIGHT. But our readers will find in another page a discussion of that subject by Mr. EVAN DAVIES before the Shropshire Chamber of Agriculture, which, if it does not throw altogether new light upon an old topic, at any rate states the argument in favour of an enactment of tenant right in an unusually clear and forcible way. Mr. DAVIES points to a large class of tenantry in this country in favour of whom tenant-right has virtually already been enacted. The tenants for life, who really have the making of the law, have claimed to charge their estates—and that is their successors—for unexhausted improvements, and the claim of those who hold from year to year is of the very same description.

The landlords required, the landlords petitioned, and the landlords obtained from the

Legislature an Act of Parliament to enable them to claim from their successors compensation for unexhausted improvements. If a measure of this description was found necessary for a life tenant, how much more necessary for a tenants-at-will? If the landlord, although sure of his holding for life, considered it impolitic to effect any improvement on his estate without the power to charge such improvement on his successor, how much more a tenant subject to six months' notice to quit, and such notice often the result of the caprice of an agent, or the evil suggestion of a gamekeeper? If the landlord refused to trust to the generosity of his own son to recoup him for improvements effected on the estate without an Act of Parliament to compel him to do so, is it unreasonable of us if we say we cannot trust those who are no kindred in blood and often unknown in person, unless we have an Act of Parliament to compel them to do that which is just and right?

This is Mr. DAVIES' argument. We do not see how a landowner can avoid its obvious conclusion. It would not do to say that many of the improvements which the tenant has made, and for which he desires protection, are really but picklocks by which he has been enabled the more effectually to rifle the landlord's treasure-box. Drainage is, no doubt, such a picklock—giving access to treasures in the soil, otherwise inaccessible, which are properly the landlord's property. But drainage is one of the leading improvements under the Lands Improvement Acts, by which landowners charge on *their* successors the costs of their estate improvements. These Acts are among the most useful pieces of legislation of late years. They have secured the proper improvement and equipment of land which must otherwise have remained in miserable plight from generation to generation. No doubt some such security as they give to life tenants, which shall in like manner induce a more enterprising outlay on the part of the tenant-at-will, in ordinary farming operations, will be equally fruitful of advantages.

Hear Mr. DAVIES once more:—

"Talk of our seeking landlords' wrong. What do we seek? Nothing more or less than a measure that will induce us to lay out our money more freely in the improvement of the landlords' property. I have been often told, and I have no doubt other farmers likewise, to send my sons into Norfolk or Lincolnshire to learn farming. There I am told that they will not only see farming in the very highest state of perfection, but they will meet with men of the greatest intelligence in action and thought. And how have those two counties so signalised themselves? Why, simply, that no Norfolk man would take a farm of any landlord without a lease, and no Lincolnshire man without a clause in his agreement securing to him compensation for unexhausted improvements on the termination of his tenancy. The high position of these two counties is the very strongest argument that can be adduced in favour of the measure I have now so imperfectly laid before you, and I cannot resist calling your attention to a short extract from Caird on Lincolnshire farming. He says:—'In the parish of Limber, 60 years ago, four tenants occupied 4000 acres of land at 2*s.* 6*d.* per acre, and became bankrupts. The rent is now 20*s.*, and the tenants prosperous; and in Blankney several thousand acres were let as rabbit warrens at 2*s.* per acre, which now let at 20*s.*, and in both cases with the increasing wealth of the tenants;' and Mr. Caird thus sums up:—'It was very fortunate when the time for this transition arrived. The leading landlords were liberal and enlightened men. They saw the advantage of encouraging tenants to embark their capital freely; and as leases were not the fashion of the county, they gave them that security for their invested capital which is termed tenant-right, or compensation for unexhausted improvement.' So you see, the granting of that measure which we now desire was the means of raising the tenants from bankruptcy to a state of affluence, and the landlords' rent from 2*s.* 6*d.* to 20*s.* Can I say more than this?'

THE peculiarities of climate and the physical and chemical properties of the soil determine the character of the plants that flourish on it. This is a maxim of immediate and practical influence on the practice of English farmers, notwithstanding that it is generally illustrated and confirmed by the great facts regarding latitudes and continents which make up the geography of plants. The amount of rainfall sometimes controls vegetation. Thus in the United States the abundant moisture of the New England and other Eastern States has covered even poor land with noble forests. But in the Far West the dry climate prevents the growth of timber, even on the richest soils. The country is there covered with interminable prairies and occasional patches of scrub Oak. Fine timber is found only on the river banks. In South Ohio and Kentucky, on the Trenton limestone, there are noble forests of Oak, Elm, Locust, Chestnut, Hickory, Beech, Tulip tree, Maple, &c., with an undergrowth of cane-brake. Here circumstances have effected a singular change in the natural growth of the forest. The cattle of the settlers first destroyed the cane-brake by cropping the leaves, then a growth of fine Grasses took possession of the land, and afforded famous "wood pastures," sheltered from the sun. Then came the heavy Shorthorn cattle, introduced from England, whose trampling altered the physical condition of the soft rich soil, and caused the extirpation of some kinds of trees.

The shallow-rooting Beech grows where the subsoil is hard and compact. The Oak and Hickory find deep root-hold in clays, loams, and friable soils. The great deciduous Cypress is called the "swamp Cedar," from the spot which it selects for its giant growth. The Fir occupies the poor dry sands. Seventeen hundred miles of "Pine barrens" fringe the coast from Virginia to the Mississippi for an average width of 130 miles, and on this wide tract there is very little other vegetation that subserves the wants of man. The same poverty-loving tree is the only one that grows on land which is plentiful in Alabama, the Carolinas, and the South generally, and which has been exhausted by cotton culture and then abandoned. The change in the physical and chemical condition of the soil has caused singular rotations of timber trees. The broad-leaved trees which flourished before the spoiling of the land can no longer establish themselves. The narrow-leaved Fir, with its hardy habit, exhaling little and requiring little to sustain its growth, can alone exist on the impoverished site.

The cause of this has been referred to the gradual change in the climate, and especially to the rainfall having decreased after the removal of the forests. We do not think it is a fact that the Fir affects dry climates, it certainly thrives in many that are moist, but it undoubtedly marks poor soils. In Canada the natural forests of Fir are on the worse land, those of broad-leaved trees are on the better land. In Britain the Fir thrives where the Oak, Elm, &c., would starve.

Plants have a life of their own; their powers of life, their capacity to extract food from the soil, their habit, all influence the phenomena of vegetation. Palms flourish on the naked sands. The wild Thyme which carpets the surface of the bare chalk down requires the air of the hills, and does not thrive in the sheltered valley below, even if removed there with a cartload of its native earth. It still finds the chemical conditions of its growth; but something is wanting, and it sickens and dies in two or three years. Turnips grow to a larger size in cool climates, where their growth is extended over a long period, than where the summer temperature is hot: therefore they succeed better in England than in America; the contrary is the case with Pumpkins. These differences must be referred to habit. No microscopic examination of the tissue has at present discovered the cause of differences like these, however much of other truth it has revealed that is interesting.

But to return to the exhausted cotton soils. The fact that the Fir replaces the broad-leaved trees, must, we think, be referred to the reduced fertility of the soil, not to a change in the climate. A parallel case has occurred constantly in the badly farmed districts of France and Germany, where land that once grew Wheat is now so impoverished that farmers resort to Rye and Buckwheat—crops endowed with a habit which enables them to extract nutriment from poor soils. The subject of the exhaustion of soils recently engaged scientific authorities in a warm controversy, and any facts relating to it are important as throwing light on points in regard to which our knowledge is deficient, and our practice defective.

If it be necessary to add a moral, we would say, eschew exhausted soils, so as not to have to seek for poverty-loving plants.

—— THE corn trade is still extremely inactive; and, notwithstanding the very low prices which have lately ruled, Wheat was still a shilling cheaper in Mark Lane on Monday last, and did not recover the decline at Friday's market.——In the Metropolitan Cattle Market both beef and mutton, influenced by the mild weather and the large supplies, and uninfluenced apparently by the excellent quality of what has been sent to market, has been cheaper by at least 2*d.* per 8 lb. At Thursday's market trade was tolerably active, at Monday's quotations.

—— The London Farmers' Club have announced the following subjects for discussion during the ensuing session:—On February 7, "Grass-land—when to be profitably broken up, and when more profitably kept in pasture," introduced by Mr. CLEMENT CADLE, Gloucester; March 7, "Sewage farming," by Mr. J. BAILEY DENTON, 22, Whitehall Place, London; April 4, "Exhaustion of soil in relation to landlord covenants, and the valuation of unexhausted improvements," by Mr. J. B. LAWES, Rothamsted, St. Albans; November 7, "The fen country," by Mr. A. S. RUSTON, Aylesby House, Chatteris; December 5, "The size of farms," Mr. J. TRASK, Highleaze, Yeovil. The discussions are held in the club rooms at the Salisbury Hotel, Fleet Street, and will commence at half-past five o'clock, P.M. There are no meetings in January, June, July, August, September, or October.

—— The Rev. Canon GIRDLESTONE thus made it up with his Devonshire neighbours at the late annual meeting of the Devonshire Chamber of Agriculture. He said:—"I hope I am not presuming too much in supposing that the invitation to me to be here to-day partakes somewhat of the nature of an olive branch. If I am correct in this, I am as anxious to accept the olive branch as you can be to offer it. If there have been any hard words passed—if I have sounded the alarm perhaps rather too loudly for some sensitive ears—if there have been faults on either side—and generally there are some faults on both sides—then I say let us forget it all, and let bygones be bygones. This county, as we all well know, has many honourable and glorious traditions—traditions of war, art, commerce, trade, and manufacture. I, for one, as a man of peace, cannot express any wish that her glories in war should be renewed. I wish most anxiously that all her future victories should be marked, not by blood, but by the peaceful traces of education, improvement, enlightenment, and civilisation. Let us then all unite for that which I say forms the greatest and most noble mark for all of us to aim at, viz., to improve the social position of every one with whom we live and mix. Let us, with a pull altogether, unite to do our best to make Devon—this county of ancient tradition and renown, this garden of England, as it is justly called, with its almost Italian climate and fertile soil—the best cultivated county in the empire—a county in which its landowners should be far and widely known as most kind, considerate, and liberal, in their treatment of their tenants; in which the farmers should be known as the most intelligent, well educated, enlightened, and enterprising of their class; and in which the labourers should be spoken of as the best paid and best educated, the most contented, thriving, thrifty, happy, rosy-cheeked peasantry in the world."

—— Mr. MECHI has appeared, among other useful capacities, in that of almanac writer. The clergyman of the parish of Norton-in-Hales, issuing a sheet almanac to his parishioners, obtains the assistance of the Essex agriculturist, who prefaces the calendar with a number of useful paragraphs, from which we make the following extracts:—

"*On Weeds.*—Twenty-five years of experience as a farmer, have taught me that the growing crops should have no competitors to share their food, but that all the ground should be for their own sole use. If an accurate table could be drawn up of the loss caused by weeds in the United Kingdom, the sum would amount to several millions sterling. Labour is never more profitably employed than in extirpating weeds. Deep-rooted old weeds are best got rid of by very deep cultivation—say one plough following in the track of another—the mouldboard being removed from the deeper plough. I always double-plough thus in the autumn on the fields intended for Mangel or roots. Docks and other strong weeds should be spudded out of pastures or Clovers. I cut out weeds from Clovers in the spring. My Wheat and Beans are horse-hoed with Garrett's horse-hoe, in the spring, two or three times. The greatest evil the English farmer has to contend with, in my opinion, is Twitch or Couch-grass. The more you cut it to pieces and harrow it about, the more it spreads. Without doubt the cheapest and best way is to fork it out with steel forks, and then carry it off the land, every piece being picked off by boys or women in suitable weather. If it cost 10*s.* or even 20*s.* an acre, it is money well laid out, for Twitch, being of the same nature as the Wheat or cereal crops, will most surely devour the lion's share, and leave a miserable harvest for the farmer. I often get six or seven quarters per acre of Wheat. This I could not do if I left Twitch or weeds in the soil. I have seen heavy lands so full of Twitch that it resembled a pasture. In such a case paring and burning is the best remedy; or, should it be a very dry summer, the land may be summer-fallowed. The best time to fork out Twitch is after harvest, when the plant shows itself. There can be no excuse for having Twitch in a root crop. Baron Liebig says that a Wheat plant has no greater enemy than another Wheat plant.

"*Manure and Feeding.*—A great reform is coming in this matter. The days of manure-heaps and open farmyards are numbered. When cattle are kept under cover (with ample ventilation), the floors paved and cemented, and all the manure absorbed and mixed with the straw and carried periodically to the field and there spread and ploughed in, this bullock-fold will be found equal to the sheepfold. People say that it is the feet of the sheep that do so much good, but in reality it is the liquid and solid manure. In open farmyards much of the best of the manure is washed away and lost. My shed-manure excels bones, superphosphate, guano, and all artificial substances, on my land. A landlord cannot do his tenant better service than by putting up an enclosed and covered cattle-yard, and charging him 5 per cent for the investment. If you wish to enrich your land and increase your crops, feed your animals as far as you can with food that did not grow on your lands, such as cake, beans, malt-combs, and bran. It pays to do this, as I know by 25 years of practical experience.

"*Manure Pumps.*—Never use a man who can use

a horse, because the force is so much greater, and the cost only equal. By the same rule, never use a horse where you can use steam; because steam never tires, and a steam horse costs less per day to keep than a live horse, and can do more than double the work of a live horse.'

OUR LIVE STOCK.

CATTLE.

THE British farmer is no stranger to foreign competition. Up to very recent times, however, his live stock were exempt from the rivalry of foreign markets, and the production of beef, mutton, and other animal products was looked upon as peculiarly unassailable. This cannot now be held with truth. How long our beef and mutton trade will be protected by our insular position is doubtful, but the farming body have lately been aroused to the fact that their cheese trade is slipping out of their hands. It is not our intention here to give a digest of the proceedings of the Derbyshire Agricultural Society, but it is a significant fact that that body have appointed a committee to organise a cheese factory upon the same principle as those which have been the means of effecting such a great improvement in the cheese produced in America. A factory involves science, *i.e.*, system; rigid cleanliness, enforced by constituted authority; exact temperature, tested by the thermometer at various periods of the cheesemaking process, and strict economy with regard both to material, waste products, and labour. The result of this is uniformity of sample beyond what can be obtained in private dairies, especially in the case of small farms, where the apparatus and accommodation is almost necessarily imperfect. We sincerely hope the factory system may be thoroughly organised, and that, while it enables us to successfully compete with all comers, it may relieve the families of dairy farmers of a drudgery hardly consistent with comfort.

—— The following sales have recently been effected at Holly Bank by Mr. Willoughby Wood:—*Fidelity 5th*, a roan, calved August 8, 1864, by 10TH DUKE OF OXFORD, dam *Fidelity 3d* by BUSHIRE (14,213), and *Mermaid*, by EARL OF WALTON, have both been purchased by Mr. Hart, of Bulkeley, Malpas, Cheshire. Also DUKE OF SUTHERLAND, bred at Brockton House, by LORD LIVERPOOL—dam *Tryphena* by 4TH DUKE OF OXFORD—has been sold to Mr. Loverock, near Burton-on-Trent.

SHEEP.

FEW subjects are more important to the stock breeder than the management of his ewe flock. We would esteem it as a kindness, if our readers would favour us with their views on this section of live stock management, even if their opinions took the form of adverse criticism on the few remarks we have now to make. During the summer the ewe flock lives somewhat hardly, being brought into better condition shortly before the time of admitting the ram. It is with the winter management, however, we have now to do. Should the ewes be placed upon a liberal allowance of Turnips, and be kept upon the arable land, as is done in the Cotswold district?—or, should they be allowed to run thinly over grass-land? What allowance of extra food is requisite, and in what condition should they be maintained? To such questions it is difficult to give general and decided answers, although they ought to occur to every sheep-master, and to be dealt with according to the peculiarities of his flock and of his farm. We incline to the plan of keeping the flock in healthy, moderate condition, which, in an open winter like the present, may be accomplished with very little extra food: they should run over the pastures, receiving a restricted quantity of Swedes or yellow Turnips. Not only is this an economical method of keeping ewes, but it is safer, when they are heavy with lamb, than the plan of placing them upon arable land, when the poached condition of the ground, and consequent difficulty of locomotion, may bring on abortion. In Northumberland, where the custom prevails of taking Oats instead of Wheat after Grass, this plan is generally pursued, as the Clover leys lie unbroken up until mid-winter, when they are ploughed so as to secure a stale furrow by March. In the greater part of the south of England, where Wheat is taken after seeds, the arable farmer is not so favourably placed for keeping his ewes on grass-land, his leys being all broken up as early as possible for the October seed time. At the present season ewes should be brought into fair condition, both to give them strength to bring forth their young, and to stimulate a good flow of milk. Care at the same time should be taken not to make them fat, as this is alike extravagant management and likely to induce inflammatory symptoms after parturition. Any description of the lambing shed, or details of the management of ewes during and after lambing, would be wearisome and ineffective here. The subject, however, is interesting, and will be again referred to in the course of the spring; and the free ventilation of opinion on such an important point cannot fail to be of use to those engaged in sheep breeding.

—— The following interesting facts appear in the section on Sheep in Mr. Darwin's book on domesticated animals. Great confusion exists in the minds of naturalists as to the wild progenitors of our flocks, although most authorities agree that they are descended from several distinct species. Sheep have been domesticated from a very ancient period, and their bones have been found by Ruttimeyer in the Swiss lake dwellings. Sheep assume very different characters in various parts of the world. Thus, Pallas describes an eastern race with a long tail, including 20 vertebræ, and so loaded with fat that it is sometimes placed on a truck, which is dragged about by the living animal. The horns of sheep present an endless diversity of character, being sometimes absent, especially in the female sex, and in other cases amounting to four or even eight in number. It is remarkable that multiplicity of horns is generally accompanied by great length and coarseness of fleece; this is, however, not invariable. Great heat acts directly on the fleece, and several accounts have been published of the change which sheep imported from Europe undergo in the West Indies. Dr. Nicholson, of Antigua, states that after the third generation the wool disappears from over the whole body, except over the loins, and the animal then appears like a goat with a dirty doormat on its back. A similar change is said to take place on the west coast of Africa; although, on the other hand, many wool-bearing sheep live on the hot plains of India. A slight difference in climate or pasture sometimes, as is well known, affects the fleece even in this country, but the tendency may be checked by careful selection. We conclude this notice with the description of two semi-monstrous breeds propagated successfully in America and France. In 1791 a ram lamb was born in Massachusetts, having short crooked legs, and a long back like a turnspit dog. From this one lamb the Otter or Ancon breed was raised. These sheep transmit their peculiarities so truly that, according to Colonel Humphreys, he had only heard of one questionable case in which an Ancon ram and ewe had not produced Ancon offspring. A more interesting case is recorded in the Report of the Juries for the Great Exhibition (1851), namely, the birth of a merino ram lamb on the Mauchamp Farm in 1828, remarkable for its long, smooth, straight, and silky wool. By 1833 M. Graux had raised rams enough to serve his whole flock, and after a few more years he was able to sell stock of his new breed. So peculiar and valuable is the wool, that it sells at 25 per cent. above the best merino wool; even the fleeces of half-bred animals are valuable, and are known in France as Mauchamp merino. If the Mauchamp and Ancon breeds had originated a century or two ago, we should have had no record of their birth, and many a naturalist would no doubt have insisted, especially in the case of the Mauchamp race, that they had descended from, or been crossed with, some unknown aboriginal form.

POULTRY.

THE Poultry Show of the past week, including 1500 pens, has been one of the finest displays ever exhibited at the Crystal Palace. The spangled Hamburghs, the gigantic Brahmas, the popular Dorkings, and the sprightly Bantams were among the best classes. "Houdans" and "Crèvecœurs," French breeds, were also well represented. The judges of the poultry were Messrs. Hewitt and Teebay; those of the pigeons, Messrs. Percival and Corker. Among the prizetakers are the following names:—

Dorkings: J. Martin, J. Clift, W. Denison, W. Woodhouse, J. Robinson.—*Cochins:* H. Mapplebeck, W. A. Taylor, Mrs. Williamson, F. W. Zurhorst.—*Brahmas:* F. James, H. Lingwood, H. Maynard, A. Worthington, E. Crook.—*Spanish:* H. Lane, E. Cooke.—*Houdan:* W. O. Quibell, T. Crowley.—*La Flèche:* Hon. C. Fitzwilliam.—*Hamburghs:* W. A. Hyde, Mr. Pattison, Miss E. Browne, F. Pittis, H. Beldon, Rev. W. Sergeantson, Mason, and Walker.—*Game:* S. Matthew, W. Page, and J. R. Smith.—*Polish:* D. Mutton, T. Edwards, and G. C. Adkins.

THE IRISH LAND QUESTION.

MR. SPEARING settles this question in a way which, however satisfactory he may think it, is about as practicable as the well-known proposition to sink the island under the Atlantic for 15 minutes and then bring it up again. Does Mr. Spearing know that his proposition is pure "Communism," and simply the French workshops of 1848 over again? If the State is to find work for discontented Irish peasants, why should not the State equally find work for the unfortunate shipbuilders in the east end of London, and for the starving silk weavers of Bethnal Green and Coventry? Suppose Mr. Spearing owned an estate in Ireland of 1000 acres, on which there were 200 tenants holding from 2 acres up to 20 acres each, and averaging 5 acres to a tenant; and suppose when the son of each tenant married that his father allowed him to build a cabin in one corner of his little farm, and let him fence off a quarter or half an acre for a Potato garden, and when a second and a third son married he did the same, and when a daughter married he allowed the son-in-law to do likewise—the whole farm being 5 acres—what would Mr. Spearing say?—would he allow it? And supposing he did allow it, as many an Irish landlord has done,—not for any benefit that he himself has received by it, but from pure soft-heartedness, which prevented him turning these poor people into the high-road; and supposing the Legislature were to pass a law (as now proposed) that every Irish tenant was to be entitled to compensation from his landlord for anything he had done upon the land, and supposing all these people took it into their head some miserable morning, as they did in 1847 and 1848 (stimulated by famine), to give up their cabins and emigrate to the United States, and suppose Paddy, the father, came to Mr. Spearing and said,—"Please, your honour, I and my children are going to America, but they have each built a neat little cabin on your property, and there is not a boy in the parish would build the like for a ten-pound note; and they have built neat little pig-styes by the side of them that would cost at least a pound apiece to build; and they have made an elegant ditch round the Potato gardens, which has a bank 4½ feet wide and a trench 3 feet broad and 3 feet deep, and there is not a man in the parish could make a ditch like it for a shilling a perch, and there are 20 perches of it to each, so that is another pound, making only £12 each, for the four cabins and Potato gardens. Please your honour, will you be after giving me my £48, and letting me go to America?"—what would Mr. Spearing say? Would he not be very apt to reply that Paddy had put up these cabins and pig-styes, and made these ditches for his own convenience, and that it was no manner of use to the landlord; that the cabins only occupied good ground, and were no earthly use to any one except an Irish peasant, and they were all going away; and that to pull them down and get the ground into cultivation again would cost him at least a pound each; that the ditches, so far from being a benefit, were a serious injury; that each occupied 350 square yards (for an Irish perch is 7 yards) of good land, or more than quarter of an acre to the four; and that it would cost at least £2 to level them, and even then no crop would grow upon that part of the land for several years, and that instead of paying Paddy £48 for his "improvement" he thought Paddy ought to pay him at least £12 for the damage he and his boys had done. And suppose Paddy thereupon said, "Oh, then, your honour, we must go to law; there is a new law passed by Cardinal Cullen and Mr. Gladstone, and so we will leave it to a jury to decide," And now will Mr. Spearing or any one else tell me who are to be the jury? If it be a jury of squatters, no doubt Paddy would be satisfied, and would get his £48, but what about the landlord? If it be a jury of landlords, no doubt the landlord would be satisfied, but would Paddy or his compeers believe that justice had been done to him?

My father was an owner of land in Ireland, and when I was a boy I have often gone with him to collect his rents. One of my brothers is an owner of Irish land now, and another member of my family is so likewise. I have a number of cousins and friends all Irish landowners, and I know several Irish land-agents. I have other relatives and friends who are landowners in Scotland, and others, again, who are landowners in England, and I am myself an owner of land in England and in Wales, and I know the way in which people deal with their tenants, and I have no hesitation in saying that Irish tenants are far more leniently dealt with than tenants either in Scotland or England. This is done partly because the landlords pity their poverty, and partly because they are hopeless of being able to benefit their estate by any changes they could possibly make. The curse of Ireland is that manufactures and commerce have never taken any hold there, and it is the peculiar temperament of the people which has driven capital away. No two Irishmen were ever yet employed by one master, but what they laid their heads together to combine against him. Instead of looking upon their employer as a friend, they look upon him as their enemy. Trades unionism, which has only raised its head in England to any serious extent within the last 30 or 40 years, was rampant in Ireland before the close of the last century, and capital shrunk back from the ugly monster. Capital is a timid damsel, but she is also a sensible one, and when once she has shrunk abashed from Irish soil, it will need something more than Irish blarney to induce her to pay a second visit. Mr. Gladstone may kick down the Irish Church, and Cardinal Cullen may establish his Popish universities, and Mr. Bright may buy up the landed estates of the great London companies, the assurance offices, and the English noblemen who possess Irish properties, but not one of them will do the country one bit of good until they can persuade capital to come back there, and set up manufactories to employ the people, and until they can persuade those people not to shoot down and drive away the owners of capital who came amongst them to employ them and to do them good. As to "Government" purchasing estates and draining and improving them to give employment to the Irish people, I, for one, as an English tax-payer, protest against it; and I venture to predict that the overwhelming majority of English and Scotch tax-payers will do so likewise.

One paragraph in Mr. Spearing's article is the purest "bosh" that anyone could write; here it is: "Proprietors think that if a measure be passed giving the tenant compensation for unexhausted improvement, he ought to be satisfied. So he would under certain circumstances, but the question is, will the tenant be satisfied with this in the present state of affairs? I think not; he well knows that such a measure would give to many a landlord a better claim than he has at present to the land, and get rid of some of his difficulties!"

Mr. Spearing evidently thinks that some Irish landlords have bad titles, and, therefore, could not make their present tenants pay if at any time they chose to refuse. Mr. Spearing should know that if a tenant

has once "attorned" to his landlord—that is to say, has ever paid him a shilling of rent—the courts of law would make very short work of him if he attempted thereafter to dispute his landlord's title. I expect there are very few tenants indeed in Ireland who have not attorned to their landlords, and if so, in what way could such a measure as he hints at improve the landlord's title?

I have no doubt Mr. Spearing is greatly enamoured of his idea of Government buying up the land, and Government setting the people to work, and Government paying them wages, and Government being a great beneficent landowner; but did it not occur to him that Government in this country is simply the people themselves, and that if the Government are to find the money to do this, they must take it from the people themselves? But if Government find that some part of the people have money and that others have none, they must take from those who have, for they cannot take from those who have not; and as the money is to be given to those who have not, would it not be much simpler for Government to pass a general law that every one who has a shilling shall throw it into one general stock, so that the whole may be rateably divided. I hope Mr. Spearing, if he have any property, is prepared to join in this nice little rearrangement, and I hope he is also prepared to advocate a similar rearrangement and division once a quarter at least; for we should all get desperately uneven again before three months were out. It would be well, however, before we begin, to ask Louis Napoleon or our American cousins to pay us a visit, for otherwise I am afraid there will be a vast number of big houses vacant; because where none of us have any incomes, I do not see how any one is to occupy them. I should think Buckingham Palace and Devonshire House would both be to let, and I do not feel at all sure but what "Bearham Lodge, near Reading," would be so likewise. *G. A. H.*

HORSE-POWER versus STEAM-POWER.

Mr. Smith's Mistakes.

In a recent Number (p. 55) Mr. Smith gives us an "estimate" of the relative cost of horse-power and steam-power, as applied to ploughing. But it is so full of mistakes that I hardly think even "West Indian" will deem it worthy of careful reperusal. Mr. Smith has hitherto farmed 112 acres of arable land, of which he has never ploughed so much as 100 acres in any one year, and before he got steam-power he employed six horses upon it; but since he got steam-power he has only employed three horses. Now to use six horses upon 112 acres of arable land was plainly a piece of wasteful extravagance. If Mr. Smith's 112 acres were really a farm, and he could not work it with less than six horses, then I say that Mr. Smith was a very bad practical farmer. I myself, as I mentioned once before, have a small farm in Sussex of 290 acres, upon which there are 147 acres of arable land. It is on the Wealden clay, well known to be one of the heaviest soils in England. It is a hilly farm, not a single field upon it lying anything like level, and not one of them like square; nevertheless it is worked with five horses, one of which cost £35 and the other four considerably under £25 each. Mr. Smith and his friend "Looker-on" have a very great contempt for my farming abilities, a contempt in which very possibly they are fully justified, for I do not pretend to know the weight of a bullock by the touch, or tell the breed of a sheep the like of which I never set eyes on before. I will, therefore, go to a much higher authority than my Sussex experience, in support of my assertion, that six horses to work 112 acres of arable land is quite preposterous.

In the last number of the Royal Agricultural Society's Journal, from page 386 to page 508, will be found a number of most interesting reports of the mode of cultivation adopted on a number of the best farms in England, managed by some of the very best farmers. These are men that even "Looker-on" cannot sneer at as paying too much attention to letter-writing, and too little to field and fold. Well, then, what do we find here? Why, that the number of horses used on the farms visited was as nearly as possible three horses to the 190 acres of actual arable land; not to the 100 acres of farm, but to the 100 acres of actual arable. All the farms were strong land, and some of them very heavy land. In some the proportion of horses was considerably under three to the 100 acres, and in others it was over, but in none did it ever go below 2½, neither did it ever rise so high as 3½.

Well, then, with these data before us, I think I am fully justified in saying that Mr. Smith ought to be able to work his 112 acres with four horses without the aid of a steam plough. It seems that with the aid of a steam plough he actually keeps three horses, and therefore only saves one horse! Now, what will Mr. Smith say when I tell him that one horse is all he could expect to save on so small a farm by using a steam plough, if it be used only in the way that Mr. Smith uses it? Mr. Smith simply uses his steam-power to plough and nothing else. He does all the scuffling, all the harrowing, all the sowing, all the rolling, and all the carting with horse-power. People are terribly apt to think that ploughing is the only horse work upon a farm. Why, on a light land farm it is not one-fourth of the whole horse work, and on a heavy land farm it is not one-third of the horse work. Perhaps Mr. Smith and "Looker-on" will rub their eyes (I could not be so rude as to say their spectacles) when they hear this, but I do not think "West Indian" will, because he does not pretend to be so very "practical," and so the chances are he has "thought" more. Now let us take a few figures. On a light land farm one pair of horses to 75 acres of "actual plough" is the usual allowance, but light land is never "ploughed" more than once, and a pair of horses will easily do from an acre to an acre and a-quarter per day; they will, therefore, only be from 60 to 75 days in each year ploughing, but as there are 311 working days in the year, deducting Sundays, Christmas Day, and Good Friday, it is plain the horses will not be occupied one-fourth of their time in ploughing. Now, let us look at heavy land. Clay land is usually ploughed twice on the average, and one pair of horses to 50 acres of actual plough is the usual allowance. But a pair of horses will plough and cross-plough an acre in two days, therefore a pair of horses will be 100 days ploughing and cross-ploughing 50 acres, or less than one-third of the whole working days in a year. Mr. Smith's proper number of horses then being four, and the work of ploughing being less than one-third of their whole work, he could only save one-third of his horses, if he got the ploughing done by steam-power; and as he could not use two horses and two-thirds, of course he must use three and only save one.

Now, then, let us proceed to another point. Mr. Smith gave us a very valuable quotation from Mr. Morton's paper. Mr. Morton had collected the statistics of 21 farms, and on these he found that there were 282 horses kept, whose yearly cost was as follows:—

1 For food, for depreciation in value, and for blacksmith's and saddler's bill	£7,815
2 For wages of ploughmen and boys employed with them	4,241
3 For repairing and keeping good the implements	870
Making in all	£12,926

But to this we must add interest on the money which these horses cost. Now, if we allow their average value to be £25 each, it would be pretty near the truth; but let us estimate them highly, and call them £30 each. Well, 282 horses at £30, would amount to £8460, and 5 per cent. on that would be £423, which, added to £12,926, gives us £13,349 as the yearly cost of 282 horses, or £47 6s. 8d. each horse. Now it will be observed that this sum covers every expense connected with the horse,—it pays interest on his first cost; it pays for depreciation in value; it upholds, and repairs, and pays for the depreciation of his harness, and all the implements that he works; and it includes the wages of those who work him and take care of him.

Well, then, let us look at Mr. Smith's farm of 112 acres (so far as the cultivation of it is concerned) when worked with horses and with steam-power:—

Capital for Horse-power.

1. Four horses, at £30	£120 0 0
2 Two ploughs at £5	10 0 0
3 One dead-furrow-mouldboard plough	5 0 0
4. Harrows, rollers, scarifiers, and all other implements, the same in both cases; therefore, they disappear from the "contrasted account"	—
Total capital sunk for horse-power	£135 0 0

Now let us take steam-power:—

Capital for Steam-power.

1. Three horses, at £30	£90 0 0
2 Steam-ploughing apparatus, including half cost only of engine	375 0 0
3. Harrows, &c., same in both cases, and therefore do not appear	—
Total capital sunk for steam-power	£465 0 0

This shows that steam-power in his case requires £330 more capital. Now let us see the annual cost:—

Annual Cost for Horse-power.

1. Four horses, at £47 6s 8d each, which includes wages, interest, wear and tear, depreciation, and all expenses	£189 6 8
2. Interest, wear and tear, and depreciation upon three ploughs (costing £15) at 15 per cent. per annum	2 5 0
Total yearly expense .. When horses only are used.	£191 11 8

Annual Cost with Steam-power.

1. Three horses only, at £47 6s 8d, which includes all expenses	£142 0 0
2. Interest, wear and tear, and depreciation on steam-ploughing apparatus cost £375, at 15 per cent	56 5 0
3. Coal, oil, water, and wages working steam-plough (see Mr. Smith's own account, October 30, p. 11451, £11 12 7d and £9 13s 2d	20 14 8
Total yearly expense .. When both steam and horses are used.	£218 19 8

It appears, then, that to work such a farm as Woolston, 112 acres, with steam-power, in the way Mr. Smith works it, would require £330 more capital and £27 8s. extra expenditure, or 5s. per acre extra cost for steam cultivation. This is a very different result from what Mr. Smith arrives at.

What a nice little interest account Mr. Smith makes out. By Jove, sir, Shylock was a joke to him. A little while ago and he would not have interest in any shape. Now he is so enamoured of it that he actually proposes to charge interest on the food he gives his horses day by day, and the wages he pays his men week by week! I think he had better go and ask an accountant what interest means, and how it is usual to calculate it, at least among Christians—Jews are said to have a way of their own.

Mr. Smith's paragraphs, too, addressed to "West Indian" and "H. H.," are delightful. He had a locomotive at Warwick that "jibbed," and would not be coaxed over a spot where a pail of water had been thrown down! Surely the water was bewitched, or possibly the engine was like Balaam's ass, and saw what its master could not see. As to the advice he gives "H. H.," how is he to get over 8 acres per day if he keeps the steam low? If "H. H." will have steam-power, let him put on a friction-clutch; it will do a deal better than "low" steam, or making the plough "jump over a stone! *G. A. H.*

GLASGOW SEWAGE.

[Extracts from a report by Professor Anderson to the magistrates of Glasgow.]

According to Messrs. Bateman and Bazalgette, the sewage of Glasgow, independent of the rainfall, amounts to 70 gallons a-day per head of the population, which is equivalent to 119 tons per annum. The rainfall of Glasgow is about 38 inches yearly; and as every inch of rain falling on an acre of land weighs rather more than 100 tons, and the area of the city of Glasgow is 5063 acres, there must fall upon it every year 19,239,000 tons of rain, all of which passes by the sewers. Assuming the population at 500,000, this gives rather more than 38 tons of rain per head. The excrementitious matters from each head of the population must therefore be diluted with 152 tons, or say, in round numbers, 150 tons of water. The excrementitious products, when diluted to this extent, yield a sewage containing 2.60 grains of ammonia per gallon, and may be estimated as worth two-thirds of a penny per ton.

A calculation such as this appears to me to give a far more accurate estimate of the average value of Glasgow sewage than can be obtained by even the most protracted series of analysis of the contents of individual sewers, and I am satisfied that it may be accepted as representing its true average composition. It is, then, manifestly a very dilute sewage, but its inferiority to that of other towns is not so great as might be supposed. The sewage of Rugby contains (as examined by Parliamentary Commission) 6.5 grains of ammonia per gallon, and is, therefore, about two-and-a-half times as valuable as that of Glasgow. As both the water supply and rainfall at Rugby are small, its sewage must be more concentrated than that of most towns. It is certainly more so than that of London, where the sewage and rainfall together amount to about 100 tons per head, and must, therefore, contain 4.41 grains of ammonia per gallon. From these data it appears that the sewage of Glasgow must be worth about two-thirds that of London; and this estimate I am satisfied may be accepted as a near approximation to the truth.

In fixing the value of the Glasgow sewage, there is, however, one other point to be noticed, in regard to which doubts have been expressed. It has been asserted, that its value is more or less completely neutralised by the presence of different kinds of manufacturing refuse, which it is supposed must be injurious to plant life, and that it is thereby rendered unfit for direct application to the soil by irrigation. The analysis already given lend no countenance to this view.

So far from the refuse matters from manufactories in general injuring the sewage for agricultural purposes, many of them are positively beneficial. A very striking illustration of this is offered by the sewage of Main Street, Bridgeton, which contained no less than 6.6 grains of ammonia per gallon, mostly in the state of sulphate, and which was undoubtedly refuse from the large coal-tar works in that neighbourhood. By this refuse the contents of that sewer had been raised to a standard far above that of any other examined. The same thing applies, though in a less degree, to the refuse of distilleries, printworks, and many other manufactories. The spent wash contributes to the sewers the soluble nitrogenous matters and salts of the malt and grain; and the same substances are obtained in the refuse of dye works; while the alum, chromate of potash, prussiate of potash, and other substances used, add potash, which is so valuable to the plant.

On the whole, I am of opinion that manufacturing refuses enrich rather than impoverish the sewage; and as the estimate I have already made of the value of the sewage of Glasgow takes no account of these substances, I believe it will prove to be under rather than above the truth. In all the observations I have made, I have founded on the quality of the sewage of Glasgow as it at present exists; but whatever method of disposing of it may be ultimately adopted, it can scarcely be doubted that some means of diminishing its quantity must be adopted. The rainfall, which amounts to nearly one-third of the whole matter passing through the sewers, may obviously be excluded; and Messrs. Bateman and Bazalgette are of opinion that the enormous waste of water may be considerably reduced. A large proportion of the refuse water from manufactories may also be excluded. Much of it is only discoloured and rendered unsightly by use; and provided it contains no putrescible matter, it may be allowed to flow into the river without producing any injurious effects. By this means, I have

no doubt, the value of the Glasgow sewage may be so increased as to enable it to bear comparison with that of any other large town.

It remains for me to express an opinion as to the method by which the sewage of Glasgow may be most advantageously utilised. The plans which have been proposed for the utilisation of sewage are extremely numerous, but they may be divided into four classes—1st, dry processes; 2d, processes dependent on precipitation; 3d, processes dependent on the separation of the excrementitious matters from other refuse; 4th, irrigation.

The first of these methods I think it unnecessary to consider; for, though some of them undoubtedly fulfil all that is required in a sanitary point of view, the cost of carrying them out on a large scale would, I am satisfied, prove extremely large; and, even supposing it possible to employ them with a reasonable chance of partially recovering expenses, they involve such a revolution in the domestic habits of the population as to make it almost impossible to introduce them.

As regards processes of precipitation, I have already, eleven years since, expressed an unfavourable opinion. That opinion was much criticised at the time; but it has been completely confirmed by the course of events. Several of the most feasible processes of the kind have been tried on a considerable scale, but all have proved failures; and no other result can be expected from a process which must be content to sacrifice the ammonia, on which at least three-fourths of the value of sewage depends. A variety of processes have been proposed, which aim at separating the excrementitious matters from the general sewage, and subjecting the highly concentrated matters thus obtained to a variety of manufacturing processes, by which they are to be converted into dry manures. Many of these processes are highly ingenious; but they are given to the public in so crude a state, that it is difficult to form any estimate of the cost of carrying them out in practice.

Independently of this, however, I am satisfied that any plan which contemplates a double set of sewers is likely to fail, owing to the amount of care and attention which it would require on the part of the public. Double sewers would require the use of a double set of vessels, in which the different kinds of refuse may be conveyed, each to their appropriate sewers; and I believe it would be impossible to get the necessary precautions adopted. Servants would take the easiest way for themselves, and the refuse would be constantly poured into the wrong sewers.

There remains only, then, the method of irrigation, which I believe to be the one most likely to succeed in practice. It has already borne the test of experience, and at Edinburgh, Croydon, and other places, has proved eminently successful. I think it unnecessary here to enter into any details on this matter, because the present state of the question has been very fully discussed by Messrs. Bateman and Bazalgette in their report. With the opinions they have expressed I fully concur. I am satisfied, indeed, that the use of the sewage of Glasgow by irrigation would go far to cover the large expense of conveying it to a distance. To support any other plan in the present state of our knowledge would be to advise the Corporation to embark in a commercial speculation of very doubtful character, which might involve a very large useless expenditure.

THE MANURE OF THE FARM.

By Judge French.

Tie a piece of muslin over a tumbler kept filled with water, and put upon the muslin a half-dozen Peas so that they will rest on the water, and suspend the tumbler in a sunny window by three or four strings, and the Peas will not only vegetate, but will grow a foot or two high, and blossom with thrifty stems and leaves. Probably they will not produce Peas, but as to the rest I will bear witness from personal observation.

It is common in propagating houses to start plants, as Grapes, from single eyes or cuttings of various kinds, by placing them in shallow beds of pure sand, and with water, heat, and light they speedily strike root and send up leaves and stems, and form a plant fit to set in open ground for ordinary culture.

Experiments often repeated have shown that a plant may be raised in a flower-pot from a seed, and receive no nourishment but pure water, and yet shall far exceed in weight all the soil in which it grew.

In all these cases the plants receive all they want from the ordinary essentials of plant growth, air, light, heat, moisture. To mature a profitable crop, however, we find practically that something besides air, light, heat, and moisture is essential, and that something is not pure silex, however well silex may answer for the first process of germination.

Besides our processes which change the physical character of the soil, as drainage, and pulverisation by ploughing, and the like—besides what may be called amendments of the soil, as when we mix sand with clay or peat—we must systematically add something which we call manure, or the richest soil will by-and-by be exhausted.

It is not my purpose to advance any new theory; I wish merely to make clear to the mind what a little reflection might make manifest to anyone. The air, and heat, and light, and moisture, will usually do their part with no artificial help. And again, most of our soils contain enough of sand, so that we do not haul on 40 loads, more or less, of compost to each acre, to supply either of these essentials.

The want of manure is the limit of our cultivation on most New England farms. We might readily double and quadruple our crops if we had only manure enough. Chemists, no doubt, tell us correctly what elements make up the matured crop, and the chemist knows better than we how many embarrassments Nature interposes to his investigations,—how the life-principle modifies chemical processes in the soil, and exerts influences which he cannot measure. In general we know what we want to add to the soil by knowing what we take from it, as shown by chemical analysis. I shall not attempt to define what kinds of fertilisers we should apply to our land, but I desire rather to impress on the farmer the folly, or at least the wastefulness, of much of his labour in applying to his farm what he calls manure.

With many farmers *quantity* seems to be the great object, and their manure-heap seems valuable in proportion to its size. They haul from the fields the headlands and the middle furrow, and all they can scrape of ordinary soil, into their barn-cellars, to the amount of hundreds of loads annually, and in a few months haul it out again upon the same fields mixed with manure from their cattle. Again, it is quite common to team wet swamp mud a mile or two to be used in compost. So far as dry material is needed to absorb the liquids of the cellar, any dry soil may be useful, and a reasonable amount of sand even may be used as a divisor to render manure fine and convenient of application; but it is well to remember that soil from the field hauled into the cellar and out again, is not by that process rendered valuable. Peat and swamp-muck contain usually valuable elements of fertility; but we often fancy that our teams are loaded with manure, when in fact they are toiling all day to haul water upon farms already too wet. The true value of some of the substances which we are in the habit of using in our compost heaps is well expressed in a valuable essay by Dr. James R. Nichols, published in the "Agriculture of Massachusetts" for 1868. He thus disposes of two of our favourite articles, leaves and peat:—

"A bushel of well-pressed dry leaves, as they fall from the trees in autumn, weighs about 4 lb.; by further drying they part with a little more than 30 per cent. of water held in the cells of the leaf structure. A cord of absolutely dry leaves will weigh about 325 lb., reckoning 100 bushels to the cord. In weight, then, a cord represents about one-twelfth of a cord of wet barnyard manure, and if they contained the same amount of fertilising material in the same condition, would be equal in value to that amount of manure. But this is far from being the fact. The dried leaves I have found to stand relatively to the leached organic matter of manure as 10 to 30 in ash value, and when the soluble salts of manure are taken into account, the comparative value is as 10 to 60, weight for weight. A cord of dry forest leaves, made up of the usual deciduous varieties, Maple, Beech, Oak, &c., has an actual manurial value of not over 50 cents, reckoning stable manure at eight dollars the cord. Will it pay to collect them? Certainly not for the amount of fertilising material they contain. As litter or absorbents in the stable, leaves have some value, but much less than straw, inasmuch as they lack the reedy character of straw, and because they are far more difficult and slowly decomposed.

"A pound of good, thoroughly formed peat, taken fresh from the meadow upon my farm, lost of water in drying a little more than 14 oz. A farmer, drawing from his meadow a cord of peat weighing 4000 lb., has upon his waggon 3500 lb. of water, and but 500 lb. of the dry material he seeks. This, dried and compressed, could be placed in a couple of our largest-sized farm baskets. The amount of ash constituents in the pound of peat after drying was a little less than 10 per cent.; so that when we reduce the heavy load of peat which, to the eye, appears so bulky and valuable, down to its contained inorganic principles, we find the whole amount to be less than 50 lb. I hope not to be misunderstood in the matter. The ashes are far from being the only manurial part of peat; and as in burning some of the most valuable elements are volatilised and lost, it is not good economy to burn peat for the purpose of securing the ashes. Fresh peat, allowed to ferment in contact with lime, is changed into new substances capable of nourishing plants; and where it can be easily obtained, it pays the farmer well to secure a good supply. I cannot help remarking, however, in this connection, that many of the statements made by our chemists and journal writers regarding the value of muck or peat are simply absurd, and are proved erroneous by practical experiment. The great value of peat, after all, lies in its absorbent qualities."

The "Report of the Department of Agriculture" for May and June gives a paper by Dr. Antisell upon the "Value of Sewage Deposit of the City of Washington." It seems that a large part of the sewage of the city is discharged into the broad canal on the northern border of the public grounds west of the capitol. Dr. Antisell speaks of the emanations from the canal as "potent causes of disease," and it is stated that "the colour and odour of the mud give vivid and strong impressions of fertility." A careful analysis of this mud is given by him, and the result shows that it has no value as manure which will pay for transporting it at all. From 100 lb. of the mud dry enough to transport, 25 lb. of moisture may be dried. The remaining 75 lb. he found to contain 71.25 lb. of insoluble sand and silicates, and 3.75 lb. of saline matter. From one ton he estimates that fertilising materials to the value of 98 cents may be obtained, "to obtain which the farmer would have to haul 1300 lb. of water, and 800 lb. of useless sandy clay." I will conclude my sermon with the following moral reflections:—

1. Although, as a good citizen of a commonwealth which has a prohibitory liquor law, I have a profound respect for cold water, it seems to be folly to haul a ton of it many miles for the sake of 250 lb. of peat or muck, which is then half sand.

2. However essential silex may be to vegetation, yet since most of our soil contains plenty of it, it is unwise to cart it into our cellars except as an absorbent, or to use upon peats and clays.

3. We may learn from Dr. Antisell that the sense of smell is a very unsafe test of the value of manures. Two or three dead cats will scent a ton of spurious superphosphate to an intolerable degree, while the pure article is nearly inodorous. His statement also shows our liability to mistake bulk for value, and confirms opinions of scientific men, so often given, that the sewage of cities in the common system of drainage, is practically worthless for agricultural purposes, because too bulky to pay freight.

4. When we consider that 90 per cent., at least, of even our farm manure is water and sand, we may see that a very small bulk comprises all that is really valuable, and that it is not incredible that 500 lb. of the right stuff per acre is enough for a crop, and that commercial fertilisers honestly made, and properly inspected and certified, may be profitably used in the production of valuable crops. After consuming the fodder raised on our farms, we must look in that direction for the further supply of manure. *American Country Gentleman.*

LAND DRAINAGE.

A Paper by J. Scott, Hermongers Farm, Rudgwick.

In a former article I somewhat briefly referred to the injurious effects of an excess of water in a soil, and endeavoured to show the necessity which then exists for the institution of an efficient system of land drainage, the object of which is to render it permanently dry, and so to regulate the supply of water that while the soil shall have every facility for absorbing the necessary quantity of moisture, stagnation shall be prevented by the withdrawal of all superabundance. Almost all grounds require it, in whole or in part, and it is seldom that even one small field can be enclosed without draining some proportion of it.

The causes which render the soil wet must first be considered; when these are known and understood, it will be easy to decide upon the best means of providing a remedy. But in this consideration the strata of the district must be taken into account, as well as the contour of the surface, and the texture of the super and sub-soils. We have often seen farmers commence to drain a bog or a field with no other idea than that of making a uniform system of drains in and around the parts where the water came to the surface, and quite undecided in their opinion as to the propriety or impropriety of the course they were adopting. Who need wonder that such guesswork should prove futile, and that the drainage should require to be re-done, thus involving a double cost, which, there can be no doubt, a little mature consideration would have entirely obviated?

If the surface of the ground is level, and the structure of the soil uniform, the drains may be arranged at regular intervals apart, with the feeders at right angles to the mains, and the necessary slope must be gained by cutting deeper towards the outfall. An undulating surface requires the mains to be placed at the lowest levels, and the minor drains should run into them in the direction of the inclination of the ground. When the surface inclines there will generally be sufficient fall for discharge if the drains are cut throughout to a uniform depth.

If the strata consist of soils of various retentive power, their relative positions, both on plan and in section, must be regarded in the arrangement of the drains. It is want of attention to this point which is the true source of so many fruitless attempts at successful drainage. Instead of following ready-made rules for fixing the proportionate depths and distances of drains in light and heavy soils, we must determine these points by reference to the thickness and order of the substrata no less than by the character or texture of the supersoil.

If the upper bed is retentive and of such depth that the drains cannot be cut completely through it, the best system to adopt will be that of shallow drains at close intervals; and, on the contrary, a pervious material should have deeper drains at wider intervals. If a comparatively thin bed of clay rests upon a porous substratum, the drains should be cut into the latter, or through it, according to its depth; and they must in any case be laid at small intervals. When the case occurs, as it sometimes does, that a free supersoil, about 3 feet in depth, overlies a comparatively thin bed of clay, it is often advisable to limit the depth of the drains to that of the porous bed. By penetrating the clay the land would be better drained, but in doing so there is a risk of exposing springs if they exist below

the clay. When springs, which are fed from a higher level, lie immediately below a clay substratum which exceeds the practicable depth of the drains, recourse may be had to tapping by means of an auger-hole or vertical bore, which will open a communication to the drains by which the contents of the springs will be carried off.

The drainage of deep and wet boggy land is a gradual process, requiring sometimes years to reach the proper depth. The drains should at first be cut as deep as the sides will stand, and gradually deepened as the land subsides, taking care always to keep the open trenches well cleaned out. When the land has become sufficiently consolidated, the usual pipe drains may be put in, but they should be laid rather beyond the depth which would be thought necessary in a firmer soil of the same nature. If the moss will not carry the ordinary pipes, it will be advantageous to use the sole and tile form of drain, making the sole of the same width as the bottom of the drain. Or, the same end may be served by resting the pipes on layers of rubble stone, and covering them with one or two layers of the same.

Marshes, and even lakes, which occupy a bowl-shaped cavity, rendering drainage by the ordinary means impracticable, have often been completely drained by boring or digging through the impermeable surface layer when it is not thick, and rests upon a porous substratum of sufficient depth to bear the water and drain it off from the surface. But this method should not be tried without due attention to the disposition of the sectional strata of the district, for if the porous soil is surcharged with water from a higher level, the proposed cure will prove an aggravation of the existing evil.

The circumstances affecting the proper depth and distance of drains are very numerous. Deep drains are longer in beginning to flow, but, if the soil is porous, they will carry off the surface water after heavy rains sooner than shallow drains. They also drain a greater bulk of the soil, and allow the water time to deposit the particles of mould and manure which it carries in from the surface of the ground.

On an open soil which the water penetrates freely, the drain will draw from a considerable distance if the depth is made proportionate; but on stiff, compact soils, percolation will be greatly hindered, and therefore the drains will draw from a less distance than on free and open soils where the water finds a ready escape. No amount of depth will compensate for excessive distance on a compact soil, because the material either resists the passage of the water altogether, or the removal is so slow that the drainage is worthless. It is also evident that drains may be laid too deep, for the same causes which hinder the lateral course of the water are obstructive to its vertical descent in the soil.

The requirements of vegetation must also be considered in determining the proper depth of drains. The depths to which the rootlets of the plants penetrate may afford some indication of how far the free subjacent water should be retained below the surface. As its availability for their supply will be regulated by the porosity of the soil, the bottom of the drains should be at a less distance from the roots on a heavy soil than on a light one. In dry summers, grass-land especially is subject to great injury, owing to the depth of the drains below the rootlets being beyond the capillary powers of the soil.

Another circumstance which will occasionally have an influence in regulating the depth, is the rate of fall which can be obtained, according to the surface-levels of the district. Theoretically, water will flow if there is but the smallest possible deviation from a horizontal line, but in practice this is not sufficient, for it implies a perfectly smooth and regular bed, a condition which cannot be expected to exist in land-drains. The water should not pass too quickly through the soil before it has time to deposit its nutritive ingredients, but neither should it be allowed to stagnate, as it will do if the drains are deeper than it can readily permeate, or if the fall is insufficient to induce a free discharge. When the drains are sufficiently active, they will not allow the water to stand on the surface longer than a few hours after heavy rains.

For purposes of cultivation the drains should seldom, if ever, be laid at a less depth than 3 feet from the surface of the ground. In some cases 2½ feet may be sufficient, but where all other circumstances are favourable 3 feet should be the minimum depth.

The dimensions found most efficient in actual practice vary from 3 to 5 feet in depth, and from 9 to 45 feet apart, according to the closeness or porosity of the soil; and the cost of cutting and filling varies from 5*d.* to 14*d.* per rod, according to the depth of the drain and the hardness of the substrata.

The laying of the pipes should be entrusted to a careful workman, who is paid day's wages, as more attention in the performance of the work is thus insured than when it is done by the drainer at piece-work. It is very important that the capacity of the pipes should be of ample proportion to the quantity of water they have to discharge. If the fall is considerable, a pipe of less dimensions will be sufficient than if the inclination had been smaller.

COTTAGES ON EASTBURN FARM,

NEAR DRIFFIELD, YORKSHIRE.

[The following paragraphs (with the woodcuts are taken, by permission, from the current Number of the Royal Agricultural Society's Journal.

At each homestead is a hind's cottage, constructed with reference to the system of employing and boarding a certain number of lads who are engaged by the year. These lads, of whom there are seven at each farmstead, are hired at Martinmas, and are paid from £9 to £18 each per annum, according to their ability, length of service, &c., the average payment being about £13. They live with the hind, who is paid by the occupier of the farm 8*s.* 6*d.* per week each for their board. The hinds get 17*s.* per week besides a cottage rent free, an allowance of potatos for the household, and sundry perquisites for his wife's trouble.

FIG. 22.—PLAN OF A HIND'S COTTAGE AT EASTBURN, ILLUSTRATING THE ARRANGEMENT FOR BOARDING LADS.

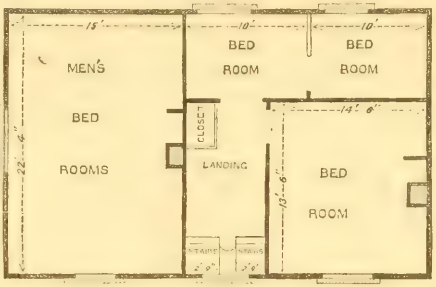

Bedroom Floor.

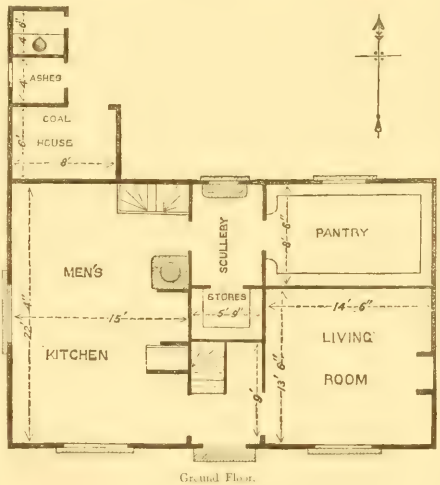

Ground Floor.

The hind's cottages are designed specially with a view to prevent the hind and his family being inconvenienced by so many young men living in the house; and the annexed plans will show how admirably this has been arranged, the portion devoted to the hind and his family being almost entirely isolated from the living and sleeping rooms appropriated to the lads. The "men's kitchen," it will be seen, contains a staircase leading to the men's bedroom, which is not accessible from the main staircase; it also contains a copper, and is in direct connection with the washhouse and the pantry.

The ordinary labourer's wages are 2*s.* 6*d.* per diem; but in harvest-time wages run as high as 18*s.* per week, with meat in addition. An allowance of two pints of beer per man is also given in harvest time and on threshing days; some of the labourers live on the farm, and others in neighbouring villages; but in either case it is a characteristic of them that they remain on the same farm from youth to old age. There are four good roomy labourers' cottages on the farm, each of which contains a parlour, kitchen, pantry, and outhouses on the ground floor, with three good bedrooms having separate entrances above, and to each is attached a garden about half a rood in extent. The rent charged to the farm-labourer for this accommodation is 1*s.* 3*d.* per week.

The average annual expenditure for labour, including harvest and turnip hoeing, is about 30*s.* per acre on the whole acreage of the farm, say 1300 acres.

MEMORANDUM RESPECTING AN ALTERATION OF THE GAME LAWS IN SCOTLAND.

ANY change in the law which should authorise and induce tenant-farmers, generally, to become, in their own persons, killers of rabbits, hares, and other game, as a necessary occupation for their own protection on the farms they occupy, would lead to a very undesirable change in their habits and pursuits, most disadvantageous to themselves. In the same way, any change in the law which should authorise them to appoint other persons to do this duty for them, would lead to unpleasant feelings and differences, and misunderstandings with their landlords, without end. It would be easy to enlarge on, explain, and illustrate this part of the subject, especially as regards the innumerable evils certain to be engendered by servants killing game on the land rented by their masters.

A landlord would naturally and inevitably dislike to see men with guns and dogs roaming over his estate, while he himself might have abstained from doing so, and even if doing no wrong act, such persons would inevitably raise a belief that they were doing what they ought not to do, and this it would be most difficult to disprove.

Such would be the evil effects of any of the changes in the law which were proposed in the last session of Parliament.

It is conceived that a different system and scheme would be much preferable, as an abatement of the intolerable nuisance and grievance to which very many, but by no means all, tenant-farmers are now subjected, of which they most justly complain, and for which a remedy must be found.

Let the sheriff in each county in Scotland be ordained by law to select within his county a sufficient small number of discreet and sensible persons, whom he shall denominate game inspectors, or by some better name. Let him be directed and required by law, whenever a case of injury from excess of game and consequent complaint shall be brought before him, to call upon any two of such persons to inspect any farm on which it shall be alleged that an excessive and injurious quantity of game, (or rabbits and hares, alone) exists and is maintained, who shall forthwith report to him the result of their inspection, and the amount of injury, within a specified period. Let the sheriff, having duly considered such report and estimate of damage, be empowered and required to give decree in terms of such report and estimate, against the landlord, who must be called into court and heard before such decree shall be pronounced, and unless he can prove to the contrary of the report of the inspectors, the decree shall go forth and the money shall be paid, or deducted from the rent next to be paid by the tenant.

The tenant, having thus been empowered to apply for such inspection, and having so applied, let it be in the power of either party to appeal from the decision of the sheriff-substitute to the sheriff-depute, whose judgment, on appeal, shall be final.

The whole proceedings to be conducted in a summary manner, no written pleadings—oral discussion alone—but a written record.

It is believed that if a few cases were disposed of in this manner, in several counties, a reasonable state of things would be speedily brought about throughout the whole of Scotland.

A smart reduction from rent in one year would render it pretty certain that there would be no similar deduction, but a great deal less game, in the next year, —and the owner of the soil is the proper person to reduce the quantity of game.

Let the sheriff have a power to inflict a penalty on the tenant who shall make a complaint which is not sustained by the report of the inspectors, and let the subject of costs follow the issue of the inspection.

It is believed that, under a system of this kind, the good relations between landlord and tenant would be much better maintained than under a law which made tenant-farmers the redressers of their own grievances.

It is a great object not to make changes where changes are not required;—on some estates, the subject of game is never heard of, because there is no grievance and no ground for complaint. It is most undesirable to introduce change in such cases, which would be certain to create great and instant evils, which do not at present exist. It would be a great evil that killers of game should be introduced on estates and farms where there is no excess of game, and no grievance and no complaint; why should the innocent

suffer for the guilty? Such persons would have no proper duty to perform—they would themselves constitute a great nuisance—and could only do that which would be wrong, and create evils of many kinds which do not now exist.

Let remedies therefore be confined to the places where they are wanted. The system proposed in this paper provides a remedy quite effectual, and exactly co-extensive with the surface over which the grievances to be redressed extend, or may extend, and no further.

It has been attempted to make this statement as brief as possible. T. F. K.

Home Correspondence.

Comparative Weights of Different Breeds.—In the *Agricultural Gazette* of January 8 is a very interesting history of the early days of the Smithfield Club, when the animals were slaughtered and weighed before the prizes were awarded, and weight was the principal test upon which the awards were based. It states "at the present time, however, although the dead or carcase weight of the cattle exhibited is not known before the award of prizes is made, the live weight of the animals is, nevertheless, taken." This live-weight test "affords scope for some very interesting comparisons between classes," which the writer has very correctly given in a table of the live weights of cattle shown at the last meeting of the Smithfield Club, and which shows the superiority of the Shorthorns in the classes of Devons, Herefords, and Shorthorns. But from a statement given in the *Sussex Express* of December 28, it appears to me that the Sussex breed should be allowed to come into competition with the other three classes. The report of weight and age there given shows that in two classes of steers—the animals compared being the eight 1st prize steers in the two classes for each breed, viz., under 3 years and 3 months, and above 3 years and 3 months—the Sussex breed have decidedly the advantage. The following is the letter from the *Sussex Express*:—

Sussex Breed — Weight for Age. — Much having been said of late about the Sussex beasts being crossed with the Devon, and as possibly some Sussex breeders might be lead astray by the false report, and induced to try the experiment of crossing with the Devon to their cost, I have made a strict comparison of the four pure breeds, and as the result may be interesting to the breeders of Sussex cattle, I enclose it for insertion in your paper. The animals compared are the eight 1st prize steers exhibited at Islington this year in the two classes for each breed, viz., under 3 years and 3 months old, and above 3 years and 3 months. The result is as follows, sinking, in each case, the weight of the calf at the fall:—

Steers under 3 years and 3 months old.

	Age.	Cwt. qr. lb.	
Devon, 188 months	.. 14	0 —or 40 lb.	per month from birth
Hereford, 38 months	.. 19	2 26—or 50 lb.	,, ,,
Shorthorn, 38 months	. 19	2 23—or 58 lb.	,, ,,
Sussex, 32 months	.. 17	3 10—or 62 lb.	,, ,,

Steers above 3 years and 3 months old.

Devon, 45 months	. 14	3 0—or 36 lb.	per month from birth
Hereford, 49 months	.. 19	0 6—or 43 lb.	,, ,,
Shorthorn, 47 months	. 20	1 6—or 48 lb.	,, ,,
Sussex, 45 months	.. 22	2 2—or 50 lb.	,, ,,

A. Horsman.

Woolston, "G. A. H.," and "Looker-on."—"G. A. H." says that I am a wonderful man. I am obliged to him for the information. I was not aware of the fact before, and as no one else besides himself seems to have discovered it, I suspect he must be a great genius. He tells us that Mr. Smith tries to confuse the matter by a cloud of figures, I retaliate by telling him that he tries to confuse by a mass of verbiage. "G. A. H." grounds his opinion of my capabilities chiefly on the fact that I stated that if a farm of 100 acres is divided into three parts, one being half a mile off, and another a mile and a half away from the homestead, it takes more horses to work it, and that I said that horses found it easier to work on the level than uphill. I see nothing wonderful in having expressed such an opinion, but I should think "G. A. H." a wonderful man if he attempted to deny it. "G. A. H." says I must be a rich fellow; I deny it. He further says, I disdain men who trade on borrowed capital; I deny it. I am sorry for farmers who trade with borrowed capital, but I do not pity the Bank of England, the London and Westminster, and other banks which do so. It is their trade to borrow money from one customer and lend to another, but that is not the trade of the man who manufactures bread, beef, and beer. "G. A. H." next asks me to tell him how many horses it will take to work 112 acres of land round Bletchley station. I reply, it is a question entirely of circumstances. Not, he observes, consisting of three patches of land separated by long distances. He must know as well as myself that there are many farms of this description, and that a man who happens to occupy a scattered farm of this kind cannot justly be charged with being a bad farmer, because he employs more horse-power than one who has a more compact occupation. I will not, however, shirk "G. A. H.'s" question, but say, unreservedly, that in the case he puts I would prefer to keep six horses instead of four. On heavy land I believe that there is but one way to ensure a crop, and that is by being well forward with every operation; and any other expense in horse keep will be repaid by securing this result. "G. A. H." asks me if I do not suppose that the London and North-Western Railway make balance-sheets. I do not suppose at all; I know that they do, as I am in the habit of seeing them. I also know that other railway companies, as well as banking and insurance companies, have made periodical balance-sheets, and some of my intimate friends have been awfully let in by them. Let me tell "G. A. H." that I want to be instructed in figures neither by himself nor Mr. Smith. I am perfectly conversant with single and double entry, and would undertake to show a profit or loss in any concern (where the items were chiefly elastic) in which "G. A. H." could not stick a pin. Figures, unless they represent facts, are, notwithstanding, valueless. "G. A. H." talks about twaddle, and that the Royal Agricultural Society, like the Pope, are not infallible. It seems to me that he thought nobody infallible except himself. Nothing, however, could be more twaddling than the paragraph in which he tells us that if a farmer who employs £1000 in farming, and finds that at the end of the year he has £1150, £50 is interest, and the remaining £100 is profit. "G. A. H." winds up by putting a case, but it is such a case as never has been, nor is likely to be, reduced to practice. I do not suppose that any man will ever find horses to do the work of another's farm. He also puts some questions, not on what I said in my former letter, but on what Mr. Smith, or somebody else has said. If he reads my letter again, he must admit this. He has not denied a single proposition I made. When he talks of sweeping away my figures as a swarm of flies, and exulting over my literary defeat, he reminds me of what I have somewhere read, that if the old story of the lion and the unicorn had been told by the unicorn, we should, no doubt, have had a very different version. *Looker-on.*

Mr. Smith and "G. A. H."—"G. A. H." begins, "The agricultural Achilles sulks in his tent." Now there is plenty of published evidence to prove how much or how little truth there is in this bit of banter. He is a fast random writer, from whose wild hits, however, I do not shrink. The high-flown flourish in his last paragraph, about his "literary dagger," had nearly escaped me. I confess that I do not claim to possess his high attainments, yet I have a brother a high wrangler, a nephew who came out second classic of his year, and is now a Fellow of St. John's, Cambridge, and senior examiner for this year's classical tripos; another nephew, a wrangler, who has some time since been called to the bar, and I may add to this another nephew who is hard on for classical honours. Therefore, although I am only a plain farmer, I am not destitute of literary aid, if needs be. Yet I do not seek the untried dagger to which he alludes. I now call upon the great giant to stand forth and show us how he gets on with the load of interest that I packed upon his back last week, and how he likes Mr. Mechi's mode of treating the interest of money question explained in my letter this week. *William Smith, Woolston, Bletchley Station, Bucks, January* 17.

Steam Ploughing.—The remarks I have made on this subject from time to time in the *Agricultural Gazette* have not been intended to advocate any system in particular, but to draw the attention of my brother farmers to the immense advantages to be derived from steam, in reducing the expenditure on the mechanical operations of the farm, ensuring deeper and more effective cultivation, greater economy of manures and of labour, the aëration of the land, and the increased efficiency of the drainage. No doubt I have preferred the roundabout system to the direct tackle, but simply on account of its price bringing it within reach of the 150 to the 250 acre farmer, and of its adaptability to small fields. A common error into which the advocates of the larger tackle fall is in supposing that Bedfordshire or Lincolnshire, for instance, is all England—that the farms are all large, with large fields—and that the farmer of capital, having introduced a double engine tackle for his own convenience and profit, the surrounding smaller men must in due time become dependants. That farms of 150 to 250 acres are capable of bearing the expense of steam, is plainly shown: indeed, have we not the evidence of the judges at the Leicester show as to the latter size?—nor are examples wanting as to the former. Mr. Smith of Woolston stands foremost as "a hard worker in the agriculturist's cause." Any one can now exclaim, "Aha! this is the way;" but, pray, who opened the way? Was it Mr. Smith, or those who followed him? In previous paragraphs on this subject I have alluded to other matters which, I am sorry to say, are often overlooked in farming practice. My hope is that my brother farmers will not allow themselves to be caught in this trap of steam hiring,—I mean as a rule,—but endeavour to have a tackle of their own, and where not practicable draw a neighbour's thoughts into the same groove as his own, and work one between them. One considered to be a competent judge observed that the "wear and tear, cost of removals, loss of time, &c., added so much to the expense that work costing 5*s.* at home could not be done with a fair profit at less than double that price, or 10*s.* per acre." "G. A. H." quotes a letter of 1862, but may I not ask, Is not the evidence given to the public in the columns of the *Agricultural Gazette* of January 20, 1866 — four years later—of more weight? Did "G. A. H." accept Mr. Smith's public invitation, given in your columns, to see the work done by the implement? I saw the ridge plough at work on the day in question, and also followed our host and instructor, Mr. Smith, over the farm; there were, I think, 23 or 24 gentlemen present, and I did not hear anyone express disappointment in any way. Does "G. A. H." mean Clover by the word "Grass?" If the former, farmers are guided by various circumstances, of season, time, &c., in preparing them for Wheat; some break them up and make a bastard fallow; this I believe will get into practice where steam has been introduced; others plough them with the horses requisite, where portable engines, in particular, are in use. *West Indian.*

"G. A. H." and C. W. Goode.—"G. A. H." has placed C. W. Goode in the box to witness against me, or rather to put the extinguisher upon me, if he can. I have by me a copy of Fowler's reports, including Mr. Goode's of Nov. 21, 1862, and can confirm all "G. A. H." says except on one point, and that is where he tells "West Indian" that he "will no doubt observe that it is a roundabout tackle of the species made seven years ago which did this work,"—that is, Mr. Goode's work. Now "G. A. H." must have been very short-sighted, for if his eye had looked to p. 5 of the catalogue from which he was quoting, he would have seen that it was a clip-drum set, therefore working upon the direct-action plan. Now let us see whether C. W. Goode can extinguish my 6*s.* 8*d.* an acre for Wheat seed-bed. "G. A. H." says that the whole sum of £296 5*s.* represents the making of seed-beds on 505½ acres of land, or about 11*s.* 8½*d.* an acre, interest and all included. Here he jumps at conclusions—therefore wrong again; for he showed that 13 horses were needed upon the farm, yet does not tell us what part they take in seed-bed making. Let us set their share against interest of money, and I beat Mr. Goode double. I can give "G. A. H." something more recent from Mr. Goode, for in the "Facts of Interest to the Farmer" there is a report dated November 27, 1865, in which he tells us that down to that period he had done "at least 4000 acres" of cultivating and ploughing. Now if we pull the 1687 acres done in 1862 from the 4000 acres, we find that he did only about 2213 acres in the three following years, so that he had in that time cooled down from 1600 acres to 700 acres a-year. What he has done since I cannot tell "G. A. H." anything about, for I have not seen a subsequent report from that quarter. It may be that he, like Mr. Watts, has changed his clip-drum for a two-engine set. "G. A. H." next compares my implements with Fowler's, by making it out that those made upon my principle, and shown by makers at Leicester, were bad ones in comparison with those shown by Fowler. Whose are Fowler's cultivators? Mainly mine; and here is what I wrote about it after my visit to the World's Fair in 1862; and I will add a letter of what I said then about the clip-drum and turnover plough:—"The clip-drum tackle used by for those to buy who like, and who have got plenty of loose halfpence to pay for it. The old-fashioned four-furrow plough stood next: that must go out of fashion before England can be cultivated by steam-power. Near it stood a seven-tined balance grubber, the tines of which are as bright as silver, and of the identical pattern of the Woolston grubber. This is great honour done to the Woolston man. Mr. Fowler discards the grubber tines that he brought to light in 1859 (three years after I had publicly proclaimed for steam cultivation), and proclaims to the world that the Woolston grubber is the best." According to the evidence of "G. A. H.," Fowler & Co. are my best makers, and that is all; but then Mr. Watts tells us that this balance-grubber "jumps and slips its work," and that he is now working a Smith's, made by Fowler. Therefore, when "G. A. H." is talking for Fowler he is actually talking for me, and he must now be beginning to see that I spoke rightly about the clip-drum and old plough when shown at the World's Fair in 1862. The old plough is nearly dead, and so is the clip-drum, and the balance-cultivator jumps and slips its work, and is fast making way for Smith's turn-round implements, whether made by Fowler & Co. or other makers. *William Smith, Woolston, Bletchley Station, Bucks, Jan.* 10.

A Ploughing Match.—The 26th annual ploughing match came off at Harton, near South Shields, the other day. The land being slightly crusted by frost, made it awkward work for the competitors. Nevertheless some good work was done in all the classes; but the time—seven hours and a half to plough half an acre is outrageous—when three hours and a half is the time given in the midland counties for the same task, and goes to show that swing-ploughs are slow in comparison to the wheel-ploughs. I was surprised to see Messrs. Ransome's champion man (Barker), who is sent to teach the farmers how work should be done, take above seven hours to finish his half acre; it was enough to petrify a lively body to witness the creeping pace of these Durham ploughmen, imitated and practised by the crack ploughman of England. Though they are slow they are sure, for there is some first-rate farming in the district. Much interest was taken in the working of one of the Messrs. Howard's, of Bedford, celebrated double-furrow ploughs, which had to suffer long neglect through the slow movement

of their agents, who after getting the three horses necessary, forgot the swingle-trees; so a sort of make-shift arrangement was got up, and a start under difficulties was made, and some very good work done by it; and we must say this will be a most valuable farm implement, being light in draft, efficient, and expeditious. *A Moving Member.*

Harvesting in Wet Seasons.—In the notice which you very kindly gave last week of the models at Stafford House, the question as to the cost of the process is again raised. Now as this is really the vital question of the whole matter, it was the one to which I devoted from the outset of my experiments (now nearly 10 years ago) the most careful attention, in order to obtain sound and reliable facts on all points. It will, I think, be conceded, that to drive machinery by means of horses is much more costly than the use of steam or water-power, but yet on many farms it would surely be better in a wet season to employ the horses to help to dry the crop as well as carry it home if it could be so done with "sufficient economy for practical purposes." In order to ascertain this fact I substituted last season horses for the steam-engine, and obtained the following result:—

LABOUR-COST OF DRYING HAY BY HORSE-POWER.

Two horses, and boy to drive, per working day of 10½ hours	£0	5	6
One boy to pull wet hay off the cart	0	0	6
Two men to feed it into drying-house, at 3*s*.	0	6	0
Two men to guide the lever forks, at 3*s*.	0	6	0
One man to throw dry hay out of house, at 3*s*.	0	3	0
(2*s*. 6*d*. for 10½ hours = 2*s*. per hour)	£1	1	0

When a load of hay (of 18 cwt., *i.e.*, 36 trusses) contains 2 cwt. of water, requiring to be expelled before it is fit for stacking, it can be dried in three quarters of an hour by half a cwt. of coke.

Three quarters of an hour, at 2*s*. per hour	£0	1	6
Half cwt. of coke, at 1*s*. per cwt.	0	0	6
	£0	2	0

From this total cost of 2*s*. per load must be deducted the usual expense of finishing hay in the field, which varies very largely, according to the climate and the nature of the weather at harvest time. On dry, cold, and cloudy days, the writer found, by careful estimate, that six loads of hay, in the condition named above, took 10 men and one horse (in the hay-tedder) 4½ hours to render them fit for stacking, which would put a cost of fully 2*s*. per load upon the hay thus finished, besides which it is obvious that if rain comes on whilst hay is being shaken out in the field, all the previous labour cost is wasted, and the hay itself injured; whereas, by the help of the drying-house, whatever cost is incurred has a positive and certain result, and whatever hay is made by this process is saved and stacked in fine condition. Taking the above estimate as a starting point, any practical farmer may ascertain how much it will cost him to dry his hay in any state of wetness in which he may be compelled to deal with it. He need only weigh 30 or 40 oz. of it from the field, dry it before a fire to the proper "stacking point," and note how much it has lost in weight by such drying. If the loss is in proportion of 2 to 18, it will cost 2*s*. per load to finish it; if 4 to 18, it will cost 4*s*. per load to finish it; if 8 to 18, it will cost 8*s*. per load to finish it; or if 16 to 18 (*i. e.*, nearly its own weight of water), 16*s*. per load. But when the season or the climate require us to deal with hay in this extreme condition of wetness, the steam-engine should be used instead of horses; the waste heat from the boiler will then largely reduce the charge for fuel, and the cheaper and greater power will materially lessen both time and labour. For calculations of quantities and cost of drying Wheat and other grain crops, I would ask leave to refer to p. 10 of my Essay on this subject, which gives, as the highest cost of dealing with such crops in their wettest probable state, a nett extra charge of 2*s*. per quarter on the grain thus saved. I have just received the gratifying intimation that the Highland and Agricultural Society of Scotland have awarded their large Gold Medal to my paper on this subject, in which full details of the above-named experiments are given, and as this paper will probably be published shortly, I will not trespass any further on your space until I have permission to lay it before you for the consideration of your readers. *W. A. Gibbs.*

Societies.

SHROPSHIRE.

COMPENSATION FOR UNEXHAUSTED IMPROVEMENTS.—Mr. EVAN DAVIES opened a discussion on this subject. He asked:—Why is it necessary to discuss the merits of a question the principle of which is now admitted by all except a few interested ones? The fact is, the Legislature refuses to take action upon any matter until a large amount of agitation has taken place upon it. All those great measures passed of late years, which the country has now cause to be proud of, have been the result of pressure from without, rather than any initiative quality from within. Why does the tenant-farmer require this protection now? In one word, he has progressed. The very cry for this protection is the surest sign of a spirit of improvement and advancement in the pursuit of agriculture. Had we been content to farm as our forefathers did before us, had we been satisfied with the least possible amount of produce raised at the least possible expense, had we been satisfied to leave our fences, as Colonel Corbett said at our club dinner, 7 yards wide, had we been content to allow our farms to remain undrained, to see our cattle unhoused, and our cottagers uncared for, then, perhaps, the want of compensation for unexhausted improvements would have been unnecessary and unasked for. But, what is it we require? Nothing more than what others have obtained. The landlords asked it. Why may not we? The landlords required, the landlords petitioned, and the landlords obtained from the Legislature an Act of Parliament to enable them to claim from their successors compensation for unexhausted improvements. If a measure of this description was found necessary for a life tenant, how much more necessary for a tenant-at-will? If the landlord, although sure of his holding for life, considered it impolitic to effect any improvement on his estate without the power to charge such improvement on his successor, how much more a tenant subject to six months' notice to quit, and such notice often the result of the caprice of an agent, or the evil suggestions o a gamekeeper? If the landlord refused to trust to the generosity of his own son to recoup him for improvements effected on the estate without an Act of Parliament to compel him to do so, is it unreasonable of us if we say we cannot trust those who are no kindred in blood and often unknown in person, unless we have an Act of Parliament to compel them to do that which is just and right? In arguing this question, let us take the case of a tenant taking a farm out of condition, as under the present system they always will be taken out of condition, as no man in his senses, if he can see the termination of his tenancy, but what would take all out of the farm he could if unprovided with the means to obtain compensation for unexhausted improvements. Well, this tenant, an enterprising young man, at once lays out his capital freely, drains, manures, renews fences, and brings the farm into a creditable state of cultivation. Having done so as tenant-at-will, he at once becomes a slave to the caprice of others; a wrong vote at an election, a frown from the agent, or a quarrel with the keeper, may at once rob him of the chance of obtaining the benefit of his improvements, and make him feel that a drawn sword was suspended over his head by the merest thread. But this question must now be taken out of the category of landlord and tenant. With our rapidly increasing population it becomes a national question, affecting the feeding of our teeming millions.

Talk of our seeking landlords' wrong. What do we seek? Nothing more or less than a measure that will induce us to lay out our money more freely in the improvement of the landlords' property. Gentlemen, I have been often told, and I have no doubt other farmers likewise, to send my sons into Norfolk or Lincolnshire to learn farming. There I am told that they will not only see farming in the very highest state of perfection, but they will meet with men of the greatest intelligence in action and thought. And how have those two counties so signalised themselves? Why simply that no Norfolk man would take a farm of any landlord without a lease, and no Lincolnshire man without a clause in his agreement securing to him compensation for unexhausted improvements on the termination of his tenancy. The high position of these two counties is the very strongest argument that can be adduced in favour of the measure I have now so imperfectly laid before you, and I cannot resist calling your attention to a short extract from Caird on Lincolnshire farming. He says: "In the parish of Limber, 60 years ago, four tenants occupied 4000 acres of land at 2*s*. 6*d*. per acre, and became bankrupts. The rent is now 20*s*., and the tenants prosperous; and in Blankney several thousand acres were let as rabbit warrens at 2*s*. per acre, which now let at 20*s*., and in both cases with the increasing wealth of the tenants;" and Mr. Caird thus sums up: "It was very fortunate when the time for this transition arrived. The leading landlords were liberal and enlightened men. They saw the advantage of encouraging tenants to embark their capital freely; and as leases were not the fashion of the county, they gave them that security for their invested capital which is termed tenant-right, or compensation for unexhausted improvement." So you see, gentlemen, the granting of that measure which we now desire was the means of raising the tenants from bankruptcy to a state of affluence, and the landlords' rent from 2*s*. 6*d*. to 20*s*. Can I say more than this?

But before I sit down, you must permit me to read the last paragraph from one of the prize essays of the Wenlock Farmers' Club. The essayist, speaking of the general advantages that would accrue from the adoption of tenant-right, says:—"The paramount duty of the Government, the basis of the national prosperity, is the well-doing of the people; and that people at this very moment are suffering more or less from two great evils of over-population—a want of employment and a want of food. In direct antithesis to this, the producible land of the kingdom is cultivated as if there was actually a scarcity of labour. The natural question that arises here is, how comes it that one evil is not made to destroy the other by the application of the labour to the land? Simply because there is a hesitation as to embarking capital to bring them together, and yet in the face of this hesitation it is generally allowed that nothing will pay a better interest than money laid out in the improvement of the soil. The people want employment, the land wants more cultivation. The use of capital refused, and yet no use of capital known to pay better. Paradoxes explained and removed by the one simple remedy and right—security. Give but that, and you make the island as it should be, mainly dependent on its own resources for food and its people for support." At the close Mr. Davies proposed the following resolution:—"That in the opinion of this meeting it is necessary for the encouragement of a better system in the cultivation of the land that some legislative enactment should be obtained giving to the tenant compensation for unexhausted improvements in the case of buildings and draining, the landlords' permission having been obtained."

DISCUSSION.

[An animated discussion ensued, from which we make the following extracts.]

Mr. J. BATHER had hoped to hear a discussion on a system of compensation for unexhausted improvements, but there had been nothing of the sort. At the bottom of all that had been said there lay an assumption that improvements belonged to the tenant, and that the tenant had a right to compensation. This had not been explained as he should have liked to have heard it explained. They ought to look at the way in which land was let in this county. If they did anything to fetter a landlord in letting his land, or a tenant in taking it, they would not be doing a very wise thing, whether it was done by legislation or otherwise. A man ought to be allowed to do the best for himself, whether as a landlord or tenant. He was sure no prudent man would put down his capital unless he had reasonable security that he would receive it back again. He thought that the system they proposed would be a miserable system in itself, and he felt sure that it would be the worst thing that could happen for the agriculturists of that county. They were only inventing a millstone to hang round their own necks. They might depend upon it that the improvements would not be paid for by the landlord, but by the incoming tenant. Some of the things claimed by the outgoing tenant as improvements might not be considered such by the incoming one. The draining might be considered useless; the manures as so much ashes. He considered that landlords could be trusted on the whole, but there were some that could not be trusted; then he would say, get a lease from those that could not be trusted, and thus let them use their own discretion.

Mr. BOWEN JONES said Mr. Bather had asked some one to show him what a man was entitled to. He asked him (Mr. Bather), in reply, was a man entitled to his capital who left in six months? If Mr. Bather had furnished a house, would he think it just if he could not take his furniture away when he left? Agreements were generally one-sided; therefore tenants preferred to be guided by the custom of the country. With respect to leases, they got bad farming under them, because, at the end of a lease, they would not highly cultivate the land when they knew they had got all they could out of it. He took it that if anything was done that was an improvement the incoming tenant could better afford to pay for it.

The Chairman, Mr. JASPER MORE, said he was surprised that no one had referred to the committee on agricultural customs, which had taken evidence on the question before them from all parts of England. After the evidence of 54 witnesses before the committee, the chairman, Mr. Pusey, now suggests the following report to the House of Commons:—"That it is advisable, as well for increasing the productiveness of the soil as for the object of widening the range of employment for the village labourers, within his own neighbourhood, to render the principle of tenant-right or improvement general throughout England, by giving it prospectively the validity of a custom, subject, however, as any other custom, to be dealt with and modified by mutual agreement between landlord and tenant." This, however, was rejected by the committee. What they did carry were resolutions to the effect that different uses conferring a claim to an outgoing tenant for various operations in husbandry have long prevailed in different counties. That this claim extends to the crop which the outgoing tenant has sown and leaves in the ground, as remuneration for the preparation of the soil for tillage, for the straw, hay, and dung left on the farm, and for growing underwood. That this wider system of compensation to the outgoing tenant seems to be highly beneficial to agriculture, to the landlord, and the tenant; but that though it is highly desirable that no difficulties should stand in the way of its extension by the voluntary act of landlord and tenant, to make it compulsory would be met by invincible difficulties. Such was the result arrived at by the majority of the most experienced men of the most opposite views.

Mr. EVAN DAVIES said: Most of those who had spoken had forgotten the national benefits. Were the people of the present day to pay the price they did for beef and mutton, when there were thousands of acres of land in the country not under cultivation? They ought to keep the land in the highest state of cultivation, to produce food for the population. He thought Mr. Bather's remarks uncalled for. He would just mention two cases. A. and B. take two farms under a good landlord. A., by draining, &c., brings his farm to a high state of cultivation, from degradation;

while B., who farms well, refuses to make the improvements which A. has, and the consequence is that when a change takes place in the landlord, A. has his rent raised 20 per cent. and B. has his lowered.

The CHAIRMAN put the resolution to the meeting, and it was carried unanimously.

MELPLAISH, DORSET.

THE INFLUENCE OF THE MOON.—At the late meeting of this Society, Mr. John Pope, of Symondsbury, in the chair, Captain EDWARDS read a paper on this subject. He said: Popular opinion has in all ages claimed for the moon a vast number of influences which do not seem to appertain to its mere physical attraction. The vicissitudes of the weather which have been supposed to follow the course of the lunar phases might be imagined, if they could be shown to have any reality, to be produced by atmospheric tides or currents arising from the moon's attraction, like the tides of the ocean. But I shall endeavour to show that there are no grounds whatever, either in theory or observation, for imputing to the moon any such influence, and that, as a matter of fact, there is no such accordance or correspondence whatever between the lunar phases and the changes of the weather. According to popular opinions and traditions, the moon is responsible for a vast variety of influences on the organised world. The circulation of the sap in vegetables, the qualities of grain, the goodness of the vintage, are severally laid to its account; and timber must be planted, transplanted, and felled, the harvest cut and gathered in, the juice of the Grape expressed, and its subsequent treatment regulated at times and under circumstances having determined relations to the aspects of the moon, if excellence be looked for in these products of the soil. According to popular belief the moon also presides over human maladies, and the phenomena of the sick chamber are governed by lunar phases; nay, the marrow of our bones and the very weight of our bodies suffer increase or diminution under its influence. Nor is its influence limited to mere physical or organic effects: it extends its sway into the region of intellectual phenomena, and notoriously governs mental derangement. If such doctrines and opinions were limited to particular nations, and only prevailed at particular epochs, they would be less entitled to serious consideration. But it is a curious fact, and one which it is difficult to account for, that many of these doctrines prevail, and have prevailed, among nations and peoples so distant and unconnected, that it is impossible to imagine the same errors to have had the same origin. At all events, the extent and long continuance of their prevalence entitles them to grave consideration.

On Plants.—I propose, therefore, at present to state some of the principal facts and arguments bearing on these points, and shortly examine how far they can be reconciled with the established principles of astronomy and physics. It is believed generally, especially in the neighbourhood of Paris, that in certain months of the year the moon exerts great influence upon the phenomena of vegetation. Gardeners give the name of "Red Moon" to the moon which is full between the middle of April and the close of May. According to them the light of the moon at that season exercises an injurious influence upon the young shoots of plants. They say that when the sky is clear the leaves and buds exposed to the lunar light redden and are killed as if by frost, at a time when the thermometer exposed to the air stands at many degrees above the freezing point. They say, also, that if a clouded sky intercepts the moon's light it prevents these injurious consequences to the plants, although the circumstances of temperature are the same in both cases. The fact observed by the gardeners and agriculturists is real, subject only to the objection that their observation of it has not been sufficiently extended. Had they seen the effects produced on clear and clouded nights which are not moonlit, they would have discovered the moon's innocence of the offence they charge her with. That these phenomena are wrongly ascribed to the influence of the moon, will be easily comprehended by any one who is familiar with the physical principles which govern the radiation and reflection of heat. A clear and uncloued sky cannot reflect back to the earth any of the heat which is radiated by bodies on the earth; but if the sky be clouded the heat thus radiated will be reflected back to the earth in a greater or less degree. If, therefore, the firmament at night be clear and uncloued, all bodies on the surface of the earth radiating towards it, and receiving back no part of that heat by reflection, will lose temperature, will become colder; and this fall of temperature will become greater with bodies which are strong radiators than with those which are feeble radiators. But if the firmament be covered with clouds the heat which all bodies on the surface of the earth radiate will be reflected back to them by the clouds, and, receiving nearly as much as they emit, their temperature will be maintained. The leaves and flowers of plants are always strong radiators of heat, and on a clear and unclouded night they lose temperature continually by this radiation, not receiving, at the same time, any return by reflection; but if, as has been before explained, the sky be clouded, they will receive as much as they give, and their temperature will not fall. The moon, therefore, has no connection whatever with this effect, and it is certain that plants would suffer under the same circumstances whether the moon is above or below the horizon.

An opinion is also entertained that timber should be felled only during the decline of the moon; for if it be cut down during its increase it will not be of good or durable quality. This impression prevails in various countries. But can there be imagined in the whole range of natural science a physical relation more extraordinary and unaccountable than this supposed correspondence between the movement of the sap and the phases of the moon? Certainly theory affords not the slightest countenance to such a supposition; but let us inquire as to the fact, whether it be really the case that the quality of timber depends upon the state of the moon at the time it is felled. M. Duhamel, a celebrated French agriculturist, felled a great many trees of the same age, growing in the same soil, and exposed to the same aspect, and never found any difference in the quality of the timber, when he compared those which were felled in the decline of the moon with those which were felled during its increase; in general they have afforded timber of the same quality.

It is a maxim among gardeners that Cabbages and Lettuces which are desired to shoot forth early, flowers which are to be double, trees which are desired to produce early ripe fruit, should be severally sown, planted, and during the increase of the moon; and that, on the contrary, trees which are expected to grow with vigour should be sown, planted, grafted, and pruned during the decrease of the moon. These opinions are altogether erroneous. The increase or decrease of the moon has no appreciable influence on vegetation, and the experiments of several eminent agriculturists have clearly proved this. Pliny states that if we would collect grain for the purpose of immediate sale we should do so at the full of the moon, because during the moon's increase the grain augments remarkably in magnitude; but if we would collect the grain to preserve we should choose the new moon. So far as it is consistent with observations that more rain falls during the increase of the moon than during its decline, there may be some reason for this maxim; but Pliny can scarcely have credit for grounds so rational; besides which the difference in the quantity of rain which falls during the two periods is so insignificant as to be totally incapable of producing the effects adverted to.

It is a prevalent notion in some parts of Europe that the moon's light is attended with the effect of darkening the complexion. That light has an effect upon the colour of material substances is well known in physics and in the arts. Vegetables and flowers which grow in a situation excluded from the light of the sun are different from those in colour which have been exposed to its influence. The most striking instance, however, of the effect of certain rays of solar light in blackening a light-coloured substance is afforded by chloride of silver, which is white, but which immediately becomes black when acted upon by the rays near the violet extremity of the spectrum. This substance, however, highly susceptible as it is of having its colour affected by light, is, nevertheless, found not to be changed in any degree when exposed to the light of the moon, even when that light is condensed by the most powerful burning lenses. It would seem, therefore, that as far as any analogy can be derived from the qualities of this substance, the impression of the influence of the moon's rays in blackening the skin receives no support.

On Health.—Pliny and Plutarch have transmitted it as a maxim that the light of the moon hastens the putrefaction of animal substances, and covers them with moisture; and that if a wounded mule be exposed to the light of the moon during the night the wound will become irritated, and frequently become incurable. The answer to this is, animal substances exposed to a clear sky at night are liable to receive a deposit of dew, which humidity has a tendency to accelerate putrefaction. But this effect will be produced if the sky be clear, whether the moon be above the horizon or not. The moon, therefore, in this case is a witness, and not an agent, and we must acquit her of the misdeeds imputed to her.

It is a very ancient remark that oysters and other shell-fish become larger during the increase than during the decline of the moon. The fact, however, has been carefully examined by many, who have compared shell-fish taken at all periods of the lunar month, and found that they exhibit no difference of quality. An opinion is prevalent among butchers that the marrow found in the bones of animals varies in quantity according to the phase of the moon in which they are slaughtered. This question has been examined by a series of observations continued for 20 years with a view to test it, and the result was that it was proved completely destitute of foundation. Sanctorius, whose name is celebrated in physics for the invention of the thermometer, held it as a principle that a healthy man gained 2 lb. weight at the beginning of every lunar month, which he lost towards its completion. This opinion appears to have been founded on experiments made upon himself, and affords an instance of a fortuitous coincidence hastily generalised. The error would have been corrected if he had continued his observations a sufficient length of time. It is a prevalent opinion that births occur more frequently in the decline of the moon than in her increase. This is also incorrect. It is a maxim, handed down by Pliny, that eggs should be put to hatch when the moon is new. In France it is a maxim generally adopted that the fowls are better and more successfully reared when they are hatched at full moon. As these differ I must leave you to decide which, if either, is correct.

The influence on the phenomena of human maladies imputed to the moon is very ancient. Hippocrates had so strong a faith in the influence of celestial objects, especially the moon, upon animated beings, that he expressly recommends no physician to be trusted who is ignorant of astronomy. Hence in diseases the lunar periods were said to correspond with the succession of the sufferings of the patient. Of these absurd notions there is now no relic except the term lunacy, which still designates unsoundness of mind. But even this term may in some degree be said to be banished as a medicinal one, and it has taken refuge in that receptacle of all antiquated absurdities of phraseology—the law—lunatic being still the term for the subject who is incapable of managing his own affairs. The eclipses of the moon were long considered injurious to health. In 1693 an unusual number of persons died in Italy at the time of a lunar eclipse, but an epidemic fever which was then raging had, doubtless, more to do with these deaths than the moon.

On the Weather.—Captain Edwards then proceeded, taking up the second and main part of his address—the influence of the moon on the weather. The physical laws which govern the phenomena of our atmosphere and regulate the changes of the weather have always been a favourite topic of speculation. The connection of the lunar motions with the tides was apparent long before the influence by which the moon produced the rise and fall of the waters of the ocean was explained; and this gave countenance, at a very early period, to the idea that that body had an influence on the atmosphere, if not as certain and regular as on the ocean, still sufficiently so to furnish grounds for conjecture as to changes of the weather. Ancient prognostics derived from the moon were in the first instance used as indications of the state of the atmosphere by persons too simple to trouble themselves with the philosophy of cause and effect; but when these appearances came into the hands of philosophers they were at once elevated to the rank of physical causes. Such notions were in keeping which made the moon the boundary between change and passiveness on the one hand and the active powers of Nature on the other. Although from age to age the particular circumstances connected with the moon, by which the atmospheric vicissitudes were prognosticated, were changed, still the faith of mankind in general in her influence on the weather has never been shaken. Many, it is true, may discard predictions which affect to define, from day to day, the state of the weather. There are few, however, who do not look for a change of the weather with the changes of the moon. It is worthy of remark that this persuasion is strongest with those most interested in fore-knowing the weather. No navigator, from the captain to the commonest seaman—no agriculturist, from the largest farmer to the field labourer, ever doubts the influence of new and full moon on fair weather and foul.

In a work on gardening I find a chapter on the means of telling the weather, in which the supposed influence of the moon's changes has precedence over the indications of the barometer, the thermometer, and the rain-guage; the former being characterised by the author as natural, and the latter as artificial data. Why the variations of the atmospheric pressure and temperature should be regarded as less "natural" indications of the weather than the moon, the author does not say. In one of the weather almanacs lately in circulation there appeared a table professing to indicate the relation between the changes of the weather and the moon's phases, entitled "Herschel's Weather Table." The general public have fallen into a mistake in supposing that this absurd affair has been sanctioned by the authority of the illustrious astronomer whose name it bears. Whether the table in question is really the production of any person bearing that celebrated name, I cannot say; but you may be assured that neither of the eminent astronomers who have rendered the name of Herschel ever memorable has had any concern in it.

As you must all know, panics of different kinds have occurred in England. In 1838, the English public were seized with what I shall call a weather panic. There was at that time a rage for weather prognostics, produced apparently by an unusually rigorous and long-continued frost, which took place in the months of January and February. In one of the numerous almanacs which were then circulated, it appeared that the author, named Patrick Murphy, had predicted the coldest day. So extreme was the public excitement at the moment on this subject that the book was actually purchased, though its price was high, by the hundred thousand. So urgent was the demand for it, that the shop of the publisher was obliged to be protected by the police, who, to keep the thoroughfare unobstructed, marshalled the expectant purchasers in a *queue*, which extended to an incredible length. Yet will it be believed that when this weather almanac was read, with the actual changes of the weather, its pretended predictions were found to fail in 17 cases out of 24! The imputed influence of the moon on the weather may be considered either as a question of theory or a question of fact.

Let us consider for a moment the theoretical question. If the moon acts upon our atmosphere by attraction, as she acts upon the waters of the ocean, she will produce atmospheric tides. Thus, as there is high water twice daily, so would there be high air twice daily. The same causes also which at new and full moon produce spring tides, and at the quarters neap tides, would produce spring and neap atmospheric tides at the same epochs. At new and full moon, therefore, the air ought to be higher daily, at noon and midnight, than at any other times during the month, and, on the other hand, at quarters it ought to be lower. The barometer, therefore, should be always highest at new and full moon and lowest at the quarters; and were this the case the weather at new and full moon would be fair, while at the quarters bad weather would generally prevail. But this is not the popular opinion, the traditional maxim being that a change may be looked for at new and full moon; that is, if the weather be previously fair, it will become foul, and, if previously foul, fair. Investigations have been made at the Paris Observatory for 12 years, and it has been found that the effect of the lunar attraction on the barometer at the epochs of the high and low atmospheric tides could not have exceeded the 16-100th part of an inch—a quantity such as could have no conceivable effect on the weather. It is evident, then, that if the moon has any influence on our atmosphere it cannot proceed from any cause analogous to that which produces the tides of the ocean.

But let me dismiss the theoretical view of the question and inquire as to the facts. Toaldo gives the result of observations extending, at Padua, over a period of 45 years. He was himself an avowed believer in the moon's influence, not merely upon the atmosphere but even on the state of organised matter. In his memoir he has not informed us what atmospherical changes he has taken as changes of weather; and it is fair to presume that the bias of his mind would lead him to class the slightest vicissitudes under this head. But, further, in recording the changes of weather coinciding with the epochs of the phases, he did not confine himself to changes which took place upon the particular day of the phase. On the pretext that time must be allowed for the physical cause to produce its effect, he took the result of several days. At the new and full moon he included in his enumeration all changes which took place two or three days before or two or three days after the day of new or full moon; while for the quarters he included the day preceding and the day following the phases. It appears, then, that by the changes coinciding with a new and full moon recorded by him are understood any changes occurring within the space of from four to six days, and for the quarters those changes which occur within three days. At every seven new moons the weather changed at six and only settled at one; for every six full moons the weather changed at five and settled at one; for every three epochs at the quarters there were two changes of weather. With such a calculation the only wonder is that the proportion he has found was not more favourable to his hypothesis.

A Mons. Schubler examined this question with considerable care so recently as 1830. His calculations were founded on observations extending over 28 years. So far as these may be relied on it would follow that there was less change of the weather on the average the days of the moon's changes than on any others. A stronger argument against the moon having an influence upon the weather cannot, I think, be adduced than the following:—After a cycle of 53 years, the moon being on the same day of each successive year at the same distance from the earth, her influence, so far as depends on distance, will be the same, and will produce the same effect on the weather; thus, if the state of the weather throughout the year 1816 should be examined, it ought to be the same as we are now having, and next year it should correspond with the weather of 1817; but it is well known that no calculations can be made on this data.

In conclusion, I will mention the absurdity, which you will all remember, of Mr. Saxby's predictions; opposed to him we have the authority of our Astronomer-Royal, who has asserted that the coming weather, as a rule, cannot be predicted with any certainty for more than 24 hours. The point, and the only point of importance, that remains for discussion, is whether, regarded as a mere matter of fact, any correspondence between the changes of the moon and those of the weather exists, as is popularly supposed. I think that the short examination of recorded facts which I have made proves that it does not.

Farm Memoranda.

Vale of Pickering, Yorkshire: *Tenant Right.*—In this district we have no leases and few written agreements, and the custom is this:—The out-going tenant, after his tenancy expires at Lady-day, is still entitled to reap one-third of his tillage of the farm the following autumn. The corn on that portion of the land and the straw belong to him. The straw he may not remove, but may make a temporary yard and turn it into manure (which manure belongs to the on-coming tenant), so that it is the eatage of the straw rather than the straw itself which belongs to the off-going tenant. The off-going tenant, however, may not take his following crop where he has pulled off his Turnips, or mown seeds, or grown Potatos. About half the tillage of a farm is in green crops (*i. e.*, Turnips, seeds, Potatos, &c.), and half is in corn: say on a farm with 90 acres of tillage, 45 acres of each (we have no naked fallows); the off-going tenant would be entitled to take 30 acres of following corn crop, leaving 15 acres for the on-coming tenant. It need hardly be said that the following crop is taken on the best part of the land if there be a difference. The manure of the farm, which is in the fold-yard or in compact heaps, is turned over and laid of an even depth and measured, and is valued by two men, one named by each of the parties, which valuers call in an umpire in case of a difference. Occasionally, though rarely, both parties name a single man to value, who then acts as umpire at once. It generally happens that, instead of the following crop being actually reaped by the off-going tenant, his right is valued by the person or persons appointed to value the manure, and paid for in cash by the on-coming tenant by two instalments, one at Christmas and one at Candlemas, allowance being made, on the one hand, for the cost of reaping, harvesting, and threshing, and on the other hand for the eatage of the straw. The seed bill, *i. e.*, the bill for Clover, &c., sown by the off-going tenant in his last year, is produced, and is allowed to him in the valuation; but he forfeits this if he has pastured the young seeds. The valuation is given simply in a lump sum, and it is surprising how few disputes arise. In order to secure a good following crop it is the interest of the off-going tenant to do fairly by his Turnip land, and generally to keep the farm in a tolerably good state of cultivation. The custom is, therefore, very much to the landlord's advantage.

It has been stated to me that the law in Ireland recognises nothing of this nature, although a larger tenant-right is claimed by the tenant, and enforced as best he can with a blunderbuss. If this be so, it might be a mutual advantage to exchange such a claim and such a process of recovery even for a smaller tenant-right recognised by law, and capable of being enforced in a manner less exceptionable.

So far as a tenant-right secures good cultivation it is a gain to both owner and occupier; but when it exceeds this and gives the tenant a share of the landowner's property without paying for it, it is clearly a loss to the proprietor. And though the first tenant might gain by having a portion of his landlord's property handed over to him, yet, as the next man would have to buy out this right before entering on his farm, all this part of his capital would lie comparatively dead, or, at best, could only be expected to pay at the rate of other landed investments, and his proper business as a farmer would be comparatively starved.

In a degree a large tenant-right puts a tenant so far in a position of a part owner of the freehold, and a nation of freeholders farming their own land means small farmers and bad cultivation. *E. S. Cayley, Wydale, Brompton, York (in the "Pall Mall Gazette.")*.

P.S. The district referred to extends from the borough of Malton to the borough of Scarborough, and is bounded on the south by the East Riding and on the north by the moors.

The Week's Work.

Jan. 22: *Ribbing or Rafftering*—Turnip lands and stubble lands that were ribbed or raftered immediately after harvest, to lie over winter, may in favourable weather be ribbed or raftered again just now, whether intended for spring corn or root crops. The practice was at one time more common on certain friable soils or stubble lands intended for root crops than it is at the present day, under the impression that it preserved "bone" in them. It can only be commended as exceptional, and better adapted for our northern provinces, when harvest and seed-time are late, than for southern, where autumn fallowing and early spring sowing is the rule. There are, however, exceptions to this rule in the south, where the practice may be followed; but if manured on the stubble in autumn for Beans, it may not be advisable to re-rib where planting is early, provided the bottom is sound. If, however, the bottom requires to be turned up to the weather, then this ribbing may be advisable, keeping the manure in the middle of the stetch, and using the roller next month if the stetches are not consolidated by the weather, so as to fit them for Bean planting. Where manure has not been applied, some give the land a stroke of the harrows and then cross-plough, with a close deep furrow. Sometimes Rye-grass and Clover stubbles, or leas as they are more commonly termed, are ribbed in December, re-ribbed this month, scarified across, and then either drilled or sown broadcast with Wheat; and this applies to Turnip land.

Hedges.—Pleaching hedges is best done in open weather, but in several prominent and sheltered places, under the influence of the sea-breeze, frost is seldom so severe as to interfere with the work beyond a day or two. And even then the superfluous wood and accumulations of effete earth about the roots may be carted away and fresh lime compost dug in, should such be required. In many cases a liberal dose of quicklime, dug in hot, will convert the whole of the effete vegetable matter about the roots into a healthy state, so as to set up strong vigorous shoots from the newly plashed hedge. Frost seldom penetrates to any great depth in such effete matter, even in elevated inland exposed situations, so that it can be dug during all weathers. The hot lime should be thoroughly incorporated in digging; none but plants with healthy roots should be left; stubb out sickly and diseased or rotten roots; there is no use in leaving them. Gaps which cannot be closed by pleaching may be filled up from old fences that are being stubbed or that are intended to be so next year; and if old plants cannot be got from this source, it is better to stubb up part of the fence to be plashed for filling gaps than to fill up short spaces, here and there, with young Quicks. The spaces thus cleared should then be trenched and planted with a new hedge in the usual way, well manuring and liming the ground. But the rule is not imperative, although some affirm it is, for short gaps in a pleached hedge may be filled up with young plants, provided the ground is properly prepared for them and the plants are healthy and of sufficient age, for under these conditions they will start and rise as vigorously as the shoots from the newly plashed live wood. The droppings from hedges in rainy weather have a pernicious influence upon the soil in which they grow, and if this kills out the old plants in course of time it would be unreasonable to expect young Quicks to thrive. The same rule applies when the subsoil is unsound in places. A few inches of moorband, or other obnoxious bottom, dug out from below, so as to let down the roots, will relieve the subsoil-poisoned part of a hedge, and thus prevent gaps, while quicklime, or lime compost, dug in, will have the same corrective and ameliorating effect, when the roots are injured from droppings, the poisonous matter being converted into wholesome food. Gaps on chalky and calcareous soil may indicate a deficiency of clay, or the like, and on rocky soils a want of depth. In such cases loosen the bottom as much as practicable, and cart on fresh soil, for a few inches will sometimes set up a vigorous fence, which before was becoming stunted in growth, and sickly—overgrown, it may be, with Moss. So with old hedges that require plashing, for in the majority of cases it is the droppings, or subsoil, or both, that is the primary cause of decay.

Gorse hedges furnish a valuable supply of green food for milch cows and other stock. They are cut with a short scythe, or bagging-hook, as when Gorse is grown on the flat, or with a hedgebill, or shears; and care should be taken in the cutting to preserve both the health of the plants and form of the hedge, otherwise gaps will be produced by the injured parts ceasing to defend cattle. They are only adapted for the poorer class of ferruginous soils, where other kinds of hedges will not grow, and on such they should be more extensively grown than they are. A narrow mound, faced at the bottom with a rough stone wall, from 1 foot to 2 feet high on both sides, makes the best foundation. Sow next month in our southern provinces, and in March and April in our northern. Gorse fences are also sown in poor sheep pastures, both for food and shelter, and the ground may be prepared for seed just now, by gathering up three or four furrows into a narrow ridge by a common plough. Or, if the ground is too rough—unlevel and stony—for the plough, the work may be done by simply breaking the surface with a pick and spade, so as to form narrow seed-beds, at intervals of 20, 50, or 100 yards asunder, or just as the flockmaster sees fit to provide food and shelter for his flock. We have converted a very poor stunted heath of several hundred acres into a fine sheep-walk by such means.

Store Cattle keep growing in bone and flesh. The too common plan of stinting the young stock in the yards, to pamper the fattening cattle in the stalls or boxes, is penny-wise and pound-foolish. The very reverse of this is the sounder practice, for the last year's calves require very careful keeping during this month, otherwise a year's growth may be sacrificed, and something more; for besides the loss in growth, they are more difficult to fatten next year. Give them plenty of pulped roots and chaff with meal. It is better to dissolve the salt in water, and sprinkle the solution over the chaff, than to mix dry, especially in frosty weather, as the dry salt falls to the bottom. In moist weather the salt absorbs moisture from the atmosphere, and being thus dissolved it is absorbed by the chaff, but not always equally. But the chaff can be equally wetted with salt water, which will make the meal adhere to it, so as to form, with pulped roots, a wholesome diet. Thus fed, a young ox will both grow and fatten on a less quantity of feeding materials consumed; whereas, when otherwise fed on the same quantity of feeding material, given separately—the straw, as it comes from the threshing-machine, at one time, the frozen or dirty Turnips as they come from the field at another time, and the dry meal by itself,—it will starve this year, and prove a profitless fattener next. *W. B.*

Notices to Correspondents.

Books: *Subscriber.* The "Farmers' Calendar" (Warne & Co., Bedford Street, Covent Garden) is the kind of book you require.

Hops: *Maize.* They are grown all through Belgium and Germany. Wire is used as support to the plant with perfect success.

Meat: *Maize.* The following paragraph is to some extent an answer to your question:—The Food Committee

of the Society of Arts having been furnished by the Colonial Office with samples of preserved meats from Australia (boiled beef and boiled mutton in tins), have, after a careful examination of the same, made a report, in which they say that "the meat is thoroughly sound; the fat is not excessive; the gelatine is slightly defective, as compared with some other samples which the committee have formerly had from Australia; the texture of the meat is good; and the flavour and nutritive qualities appear to equal those of other specimens from Australia which have been before the committee, but are not equal to those of the sample from her Majesty's Victualling-yard at Deptford, of meat preserved in that establishment by the process now in use there. How far this difference may be due to the nature and condition of the meat itself, previous to its preservation, to the situation in which it is preserved, or the mode of preserving it, the committee cannot say, but they recommend that specimens of the meat preserved at Deptford should be sent to Australia, together with full details of the process of preservation."

Markets.

ENGLISH WOOL.

Markets have been rather quieter, but no disposition is evinced to give way in price. We consider the temporary lull mainly due to the present political excitement in France, and fancy it will not be of long duration.

Current Prices of English Wool.	Per lb.	s.	d.	s.	d.
Fleeces—Southdown hoggets	.. .. ..	1	1	to 1	2
Half-bred ditto	.. .. ..	1	2	— 1	2½
Kent Fleeces	.. .. ..	1	3	— 1	4
Southdown ewes and wethers	.. ..	0	9½	— 1	1
Leicester ditto	.. ..	1	2	— 1	3
Sorts—Clothing	.. ..	0	10	— 1	0
Combing	.. ..	1	0	— 1	8

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, January 20.

Prime Meadow Hay	80s. to 85s.	Clover, old ..	..120s. to 130s.
Inferior do.	to 70	Inferior do. ..	..100 110
Rowen	— —	Prime 2d cut	..100 110
Inferior do.	— —	Inferior do ..	.. 80 90
Straw	28 34	Charles James Easton.	

Cumberland Market, Thursday, January 20.

Sup. Meadow Hay	£4s. to 5os.	Inferior Clover	.. 90s. to 110s
Inferior do.	70 70	New do.	.. — —
New do.	— —	Straw	32 36
Superior Clover ..	126 132	Joshua Baker.	

METROPOLITAN MEAT MARKET.—Jan. 21.

Best Fresh Butter .. .. .. 19s. per dozen lb.
Second do. do. .. .. 17s.
Small Pork, 4s. 8d. to 5s. 4d.; Large Pork, 4s. 0d. to 4s. 4d. per 8 lb.

METROPOLITAN CATTLE MARKET.

Monday, January 17.

We have a larger supply of Beasts, and the quality is very good; the weight of beef is much greater than we have seen here for some time past, the Christmas week excepted; prices are lower, and a clearance cannot be effected. There are a few more Sheep, and the demand is smaller; trade is slow, at rather lower rates. Good Calves are still scarce and dear. Our foreign supply consists of 1668 Beasts, 2035 Sheep, 133 Calves, and 290 Pigs; from Scotland, 280 Beasts; from Ireland, 383; from Norfolk and Suffolk, 980; and 613 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-fords, &c. ..	5 2	05 4	Best Long-wools	5 4	05 6
Best Shorthorns ..	4 10	— 5 2	Do. Shorn	..	— ..
2d quality Beasts	3 0	— 3 10	Ewes & 2d quality	3 10	— 4 8
Best Downs and Half-breds ..	5 8	5 10	Do. Shorn	..	— ..
Do. Shorn	..	— ..	Lambs	..	— ..
			Calves	3	8—6 0
			Pigs	3	8—5 8

Beasts, 3844: Sheep and Lambs, 17,570; Calves, 167; Pigs, 420.

Thursday, January 20.

We have a short supply of Beasts, but the demand is by no means large; trade is tolerably active, at last Monday's quotations. The number of Sheep is very small, quite equal, however, to the demand; the few choice qualities on offer are readily disposed of at full prices. Calves are selling as on Monday. Our foreign supply consists of 364 Beasts, 1690 Sheep, and 30 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-fords, &c. ..	5 2	05 4	Best Long-wools	5 4	05 6
Best Shorthorns ..	4 10	— 5 2	Do. Shorn	..	— ..
2d quality Beasts	3 0	— 3 10	Ewes & 2d quality	3 10	— 4 8
Best Downs and Half-breds ..	5 8	— 5 10	Do. Shorn	..	— ..
Do. Shorn	..	— ..	Lambs	..	— ..
			Calves	3	8 6 0
			Pigs	3	8 5 8

Beasts, 802; Sheep and Lambs, 4645; Calves, 168; Pigs, 35.

HOPS.

Borough Market, January 20.

Messrs. Pattenden & Smith report a good demand for all classes of English 1869's, at an advance of from 5s. to 10s. per cwt. on last week's prices. There is more inquiry for Americans and other sorts, the tendency being dearer.

COALS.—January 19.

Buddle's West Hartley, 15s. 3d.; Hastings Hartley, 15s. 3d.; Holywell Main, 16s. 6d.; West Hartley 15s. 3d.; West Wylam, 16s. 3d.; Walls End Haswell, 19s.; Walls End Hetton, 19s.; Walls End Russel's Hetton, 17s. 6d.; Walls End Stewarts, 18s. 6d.; Walls End Hartlepool, 18s. 6d.; Walls End East Hartlepool, 18s. 9d.—Ships at market, 46; sold, 42.

MARK LANE.

Monday, January 17.

The supply of English Wheat to this morning's market was very small; picked samples were taken at the prices of this day se'nnight, but inferior and out-of-conditioned lots were 1s. per qr. cheaper. There was a good attendance, but a limited demand only at last Monday's rates for good fresh Baltic; other descriptions were 1s. per qr. lower. Prime Barley was unchanged in value; other kinds, as also Beans and Peas, could only be sold at a reduction of 1s. per qr. Oats were a slow sale, at a decline of 6d. per qr. Flour was neglected.

Price per Imperial Quarter.	s.	s.		s.	s.
Wheat, Essex, Kent, Suffolk. White	40	49	Red	37	48
— — fine selected runs	do.	42	53	Red	40	50
— — Talavera		56	58			
— — Norfolk				Red	—	—
— — Foreign		38	53			
Barley, grind. & dist. 26s to 30s.	Chev.	39	42	Malting	34	38
— Foreign .. grinding and distilling		22	25	Malting	30	40
Oats, Essex and Suffolk		22	24			
— Scotch and Lincolnshire	Potato	24	26	Feed	—	—
— Irish	Potato	23	25	Feed	21	24
— Foreign	Poland and Brew	21	24	Feed	19	21
Rye		32	38	Foreign	33	36
Rye-meal, Foreign						
Beans, Mazagan	30s. to 37s.	Tick	32	49	Harrow	32	49
Pigeon	50s. to 56s.	Winds.	—		Longpod.	—	—
— Foreign		Small	41	43	Egyptian	38	40
Peas, White, Essex, and Kent	Boilers	32	42	Suffolk	35	43
— Maple, 41s. to 45s.	Grey	32	42	Foreign	33	37
Maize			—	Foreign	31	32
Flour, best marks delivered	per sack	39	43			
— 2d ditto	ditto	28	40	Country	28	40
— Foreign	per barrel	22	25	Per sack	29	55

Friday, January 21.

During the early part of the past week we have had dull, mild weather; but since Tuesday it has been colder, with snow in the northern districts. The absence of seasonable frost, and the continuance of supplies from various quarters cause millers and dealers to reduce their stocks rather than increase them by fresh purchases, and the result has been a slow trade throughout the markets of the kingdom, with a further decline of nearly 1s. per qr. in the value of Wheat. The trade in spring corn of all descriptions has been dull, and the prices were mostly in buyers' favour. Flour was of difficult sale at a further slight reduction. The arrivals off the coast consisted this week of 113 cargoes, of which with those left over from last week there remained for sale last night 73 cargoes. Samples of arrived cargoes having been fully distributed, and a fair choice of Wheat being on the coast, buyers for the Irish and Scotch ports have competed with those for our English markets during the past week—so that a large proportion of the fleet has now been absorbed at gradually hardening prices, some of the sales showing an advance of 6d. to 1s. per qr. from the late lowest prices. Maize commanded more attention at previous rates. Barley met with a quiet sale, and Rye has been generally held above buyers' views. In cargoes on passage and for forward shipment business remains in abeyance.

The arrivals of English grain this week are small, of foreign moderate. There was a poor attendance at this morning's market; English Wheat brought Monday's prices, and for foreign the demand was limited at the quotations of that day. Spring corn was steady, Oats bringing an advance of 6d. per quarter.

Arrivals.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	1190	1180	—	—
Irish ..	—	—	—	—
Foreign ..	14,880	7370	44,630	1330 (1000 brls.
	16,070	8550	44,630	

Liverpool, January 18.—Wheat in moderate consumptive demand, at Friday's rates for white Californian; red American is a shade easier. Flour dull, and nominally unaltered. Beans steady, at late rates. Oats 1d. per load cheaper. Indian Corn in retail inquiry, and a shade easier. Flour dull, and nominally unchanged. Beans steady, at late rates.

Averages.

	Wheat.	Barley.	Oats.
Dec. 11 ..	43s 8d	36s 2d	22s 6d
— 18 ..	43 10	36 0	22 3
— 25 ..	43 5	35 11	21 6
Jan. 1 ..	43 8	35 9	20 10
— 8 ..	44 5	35 11	20 1
— 15 ..	44 1	36 4	21 4
Average ..	43 10	36 0	21 5

SEED MARKET.

Our markets have been better attended during the past week, and there has been an improved inquiry for agricultural seeds. Samples of English red Clover seed come forward very slowly; for the few on offer very long prices are demanded; the yield has, without doubt, proved very small. Best qualities of foreign red are in short supply, and realise high rates; one parcel of French was sold on Monday last at 84s. per cwt. Alsike and white Clover seed fully maintain the high values now current; for white Clover quotations are now higher than they have been for some time, 120s. per cwt. having been made. Fine new Trefoil seed is remarkably scarce, and a few parcels have been lately placed at unusually high rates; there is no foreign offering of superior quality; secondary samples are very abundant, and can be bought on quite moderate terms; French Italian is 6d. to 1s. per cwt. dearer. Perennial Grasses are cheap and plentiful. In bird seeds we have no change to report, English Rape seed has advanced 1s. to 2s. per qr. White Mustard seed is scarce, and is held with great firmness.

John Shaw & Sons, 16, Water Lane, London, E.C.

To the Seed Trade.

Hamilton's Invincible Cucumber.
Cuthill's Black-spine Cucumber.
Osborne's Winter White Protecting Broccoli.
Double Cress.
Improved Long Yellow Mangel (superior stock).
All new of 1869, and true, of own growth, offered cheap.
Stephen Brown, Seedsman, Weston-super-Mare, Somerset.

To the Wholesale Trade.

Herbert H. Nicholson, Seedgrower, Great Clacton (near St Osyth), Essex, has the following SEEDS to offer, for cash only:—
Robinson's Prize Champion ox Cabbage, 8os per cwt.
Nonpareil Cabbage .. .. 12s "
White Celery (Wrinkled Giant) .. .. 6s "
Selected Dark Red Beet .. .. .. 14os "
Student Parsnip .. .. 8os "
Myatt's Curled Parsley .. .. .. 28s per bush.
Stubble Turnip .. .. 18s "
&c. Also all the Annual Flower Seeds, at low prices.

Genuine Seeds of Superior Stocks.

Seedsmen to the Queen.

Francis & Arthur Dickson & Sons, the "Old" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

Complete Assortments of Choice Vegetable Seeds, for A Year's Supply.

No 1	£1 3 0	No 4	£1 1 0
No 2	1 1 6	No 5	0 12 6
No 3	1 1 6	No 6	5 5 0

Complete Assortments of Choice Continental and English Flower Seeds.

No 1	£2 2 0	No 4	£0 15 6
No 2	1 10 0	No 5	0 10 6
No 3	1 1 0		

Also Smaller Collections, from 5s. to 7s. 6d., free by post.

CATALOGUE of New and Select Vegetable and Flower Seeds, Potatos, &c., for 1870, with practical Cultural Directions, will be sent Post Free upon application.

Their seeds are all of the most select character, each variety being saved from the best stock known of its kind.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Potatos, &c., excepted.

Flower Seeds free by Post or Rail.

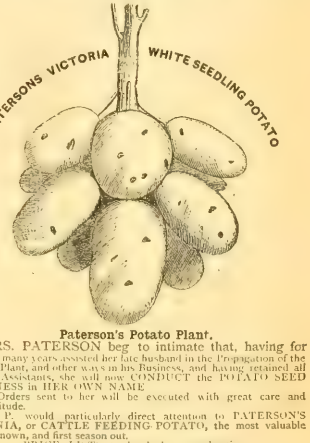

Paterson's Potato Plant.

Mrs. Paterson beg to intimate that, having for many years assisted her late husband in the Propagation of the Potato Plant, and other ways in his Business, and having retained all the old Assistants, she will now CONDUCT the POTATO SEED BUSINESS in HER OWN NAME.

All Orders sent to her will be executed with great care and promptitude.

Mrs P. would particularly direct attention to PATERSON'S BOVINTA, or CATTLE FEEDING POTATO, the most valuable tuber known, and first season out.

PRICE LISTS to be had on application.

38, Union Street, Dundee.

Richard Smith's 21s. Collection of Vegetable Seeds contains the following approved kinds. Carriage free.

Peas—The Earliest, 1 quart
Princess Royal, 1 pint
Sangsters' No 1, 1 pint.
Prizetaker, 1 pint
Advancer, 1 pint
Blue Scimetar, 1 pint
Veitch's Perfection, 1 pint.
Harrison's Glory, 1 pint
Beans—Taylor's Imperial Windsor, 1 pint.
Early Longpod, 1 pint.
Johnson's Wonderful, 1 pint
Green Windsor, 1 pint
Royal Chelsea, 1 pint.
French Dwarf, 1 pint.
Scarlet Runners, 1 pint.
Beet—Nutting's fine Red, ½ oz.
Borecole—New Hearting, packet.
Scotch Curled, packet.
Brussels Sprouts—finest, packet.
Broccoli—Early white, packet.
Purple Sprouting, packet.
Walcheren, packet.
Worcester, late white, packet.
Cabbage—Early Nonpareil, pkt
Worcester Incomparable, pkt.
Wheeler's Imperial, packet.
Red Pickling, packet.
Curled Savoy, packet.
Carrot—Early Scarlet Horn, 1 oz
Tamey's Intermediate, 1 oz
Imperial Altringham, 1 oz
Cauliflower—Early London, pkt.

Celery—Fine Giant Red, packet.
Cress—Australian, 1 oz.
Plain, 1 oz
Cucumber—Smith's fine Frame, packet
Stockton Ridge, packet.
Endive—French Curled, packet.
Leek—Musselburgh, packet.
Lettuce—Champion Cabbage, packet.
Paris White Cos, packet.
Bath Cos, packet.
Drumhead, packet.
Mustard—White, 4 oz.
Melon—Choice kind, packet.
Onion—Nutting's fine Keeping or Spanish, 1 oz.
James's Keeping, 1 oz.
Bicol Red, ½ oz.
Silver Skinned, ½ oz.
Parsnip—Hollow Crowned, 1 oz
Parsley—Fine Garnishing, per pkt
Radish—Wood's Early Frame, 2 oz
Early Scarlet, 2 oz.
Turnip, mixed, 2 oz.
Spinach—Summer, ½ pint.
Winter, ½ pint.
Turnip—Early Six-Weeks, 1 oz
Early Green Top, 1 oz.
Orange Jelly, 1 oz
Tomato—Large Red, packet.
Vegetable Marrow, packet.
Set Herbs, 4 packets

For larger and smaller Collections and prices of other Garden Seeds, see DESCRIPTIVE LIST, free on application to
RICHARD SMITH, Seed Merchant, Worcester.

Broccoli, Alleston's New Surprise, Late White Protecting—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, J. & J. Elliotson, of Thorngumbald, who have for many years been so successful in the cultivation of Broccolis, and who by great industry have so far improved upon the old kind as to produce the above variety, which possesses the hardiness of the parent, surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.

CUCUMBER, FOSTER'S XL, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet. Trade supplied.

EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.

Exotic Nursery, Tooting, Surrey, S.W.

Scott's New and Genuine Seeds.

J. SCOTT'S Seed Stores, Yeovil, Somerset, are replete with a very choice stock of seeds, new and choice VEGETABLE and FLOWER SEEDS, choicest EXHIBITION ASTERS, STOCKS, MARIGOLDS, &c., and AGRICULTURAL SEEDS, all of purest and best quality.

COMPLETE COLLECTIONS OF CHOICE VEGETABLE SEEDS.

No. 1	.. .. ..	£1 3 0	No. 3	.. .. ..	£1 1 0
No 2	.. .. ..	2 2 0	No. 4	.. .. ..	0 10 6
	No. 5	.. .. ..	£5 10s		

For List of sorts and collections of Flower Seeds, see J SCOTT'S Descriptive Priced Seed CATALOGUE, just published, free on application

To Market Gardeners and Others.

SUTTON and SONS having grown largely of the following excellent PEAS, can supply them, very true to name, at low prices for large quantities:—

Suttons' Ringleader — the forwardest known	Fortyfold Green Marrow.
Suttons' Improved Early Champion	Champion of England
Dickson's Favourite.	Veitch's Perfection
Princess Royal.	Hair's Dwarf Mammoth.
Blue Prussian	Yorkshire Hero.
	Fricteaker Green Marrow.

For lowest prices, apply, stating quantities required, to SUTTON and SONS, Seed Growers, Reading.

New Cucumbers.

GEORGE EDWARD has great pleasure in offering seed of the following first-rate CUCUMBERS, feeling satisfied that they will fully maintain the characters that have been given to them.

EBOR.—This will prove to be the most useful variety grown, either for Market or Gentleman's Gardener for every-day use. In packets of six seeds, 2s 6d The following is the opinion given in the *Gardeners' Chronicle*, and the "Cottage Gardener:"—

"Your Cucumber, raised from Edward's Eclipse, crossed with Craigg's Prolific, and with a cross of the strongest constitution and most prolific variety known, belongs to the spined class. The samples of fruit sent are good looking, evenly swelled, of moderate length, and of good average quality."—*Gardeners' Chronicle*, Dec. 4, 1869.

"The specimen you sent, which you state is a cross between Edward's Eclipse and Craigg's Prolific, is very handsome, and of a most useful size."—*Cottage Gardener*, Dec. 9, 1869.

EDWARD'S ECLIPSE, in packets of six seeds, 1s. 6d.—A brace of the above was sent to the Editor of the *Gardeners' Chronicle*. The following was his opinion, on December 19, 1868:—

"A handsome white variety, of good flavour, and having the recommendation you mention; it is a desirable variety."

REYNOLD'S PERPETUAL BEARING.—The most useful and prolific Cucumber in cultivation, both winter and spring, free growing habit, smooth thin skin, not seedy, size medium. In packets of six seeds, 1s 6d

CARNATION and PICOTEE SEED, saved from G. E.'s collection, which contains all the best varieties in cultivation, in packets of 100 seeds, 2s each.

Can also be obtained of—

Messrs. Hurst & Son, London	Mr. John Keynes, Salisbury
Mr I Wimsett, Chelsea, S.W.	Mr. Charles Turner, Slough
Messrs. J. F. Shape, Wilton	Mr. John Salter, Oxford Street.
Mr John Cobb, Sunderland	Manchester
Mr A Balfour, Newcastle-on-Tyne	Mr Harrison, Darlington
Messrs. Littlewort & Co., Bristol	Mr. Taylor, Malton

GEORGE EDWARD, Nurseryman, Seedsman, and Licensed Valuer, 1, King Street, York

Johnstone's St. Martin's Rhubarb.

W. P. LAIRD and SINCLAIR, NURSERYMEN, Dundee, N B, have pleasure in offering the above new variety of RHUBARB, which they have confidence in recommending as the earliest and best sort in cultivation. The raiser describes it "as one of a batch of Seedlings from Victoria; the Seedling Plant was a fortnight earlier than any of the remainder of the lot, and grown beside Prince Albert and Victoria, which are the two earliest varieties, and giving a larger quantity of superior stems to either of these varieties. It forces better than any variety I know, and has a splendid colour"

Strong Roots, 2s. 6d each Usual Discount to the Trade

For Testimonials see previous Advertisements

London Agents—Messrs Hooper & Co., Covent Garden Market, W.C. Orders may be had free from the following:—

Sheffield—Fisher, Holmes & Co.	Northampton—Mr. F. Perkins
Lichfield—Mr. Edward Holmes	East Retford—Mr. W. Wright
Exeter—Sclater & Co.	Malton—Mr. E. Taylor
Andover—Mr. Wm. Miller	,, Slater & Son
Glasgow—Austin & M'Alsan	London—Hurst & Son
Dublin—Joseph Berry & Sons	Stirling—W Drummond & Son
Cirencester—Harding & Son	Derby—Bryan & Colin Cooling
Downham—Mr James Bird	Kelso—Stuart & Mein
York—James Backhouse & Son	Birmingham—Felton & Sons
Kilmarnock—W & T. Samson	Taunton—Hall & Mayer
Chester—F & A Dickson & Son	Torquay—W B amale
,, James Dickson & Son	Westerham—John Cattell
Tunbridge Wells—Thos Cripps & Son.	Hertford—Harrison & Sons
	Cheltenham—Thos. Hampton

Further Names published as received

GENERAL TRADE NURSERY LIST may be had on application

Broccoli; Hammond's Imperial Hardy White Broccoli.

The BEST BROCCOLI in cultivation Read the following report

WILLIAM ARMITAGE AND SON, Huddersfield, having secured the Stock from Mr. Hammond, offer it in 2s. packets; small plants, 12s. per doz. Any one in the Trade desiring this BROCCOLI should send at once; owing to the already large demand, the stock is very limited.

From the "Gardener's Magazine," May 30, 1868

"HAMMOND'S Imperial Hardy White Broccoli. We have received samples of this variety from Mr. W. Hammond, market gardener, Birkby, Huddersfield, Yorkshire. The heads are large, even in outline, of somewhat globular form, close and firm, and remain good for so much as the point of a pencil, the colour creamy white, average weight when trimmed for cooking, 3lb; in quality first-rate, as mild and sweet as a cauliflower."

From the "Gardener's Magazine," June 13, 1868

"HAMMOND'S Imperial Hardy White Broccoli.—Several corres pondents have inquired after seed of this variety, and in one case stamps are forwarded to us for a supply. We have returned the stamps to the sender, and informed him, as we now for the hundredth time inform everybody, that we do not trade in seeds, plants, or any kind of nursery produce. In the note on this Broccoli, at p. 290, we told our readers all we knew about it, and gave the name and address of the cultivator to whom we were indebted for the samples But as some of our readers wish for further information, we return to the subject for the purpose of publishing Mr Hammond's statement of its character and merits. He says, 'The Broccolis I sent you were fair samples of about 8000 grown for market. Hundreds of them weigh 8 lb. to 10 lb. each, and are as free from rot, mildew, and snails as the severest winter I have grown it upwards of 20 years, and have always carefully selected the best for seed to keep it true It is the only Broccoli that we can rely upon for a supply of flower in the early spring The samples sent to you were fully exposed to the sun, which soon changes their colour, but if shaded with a leaf the heads are as white as snow.' The great size to which this variety may be grown is, in our opinion, no great recommendation; but there are thousands of cultivators who believe in large Broccoli, and to such this will be valuable. As for those who prefer smallish heads (as we do), planting rather thick will no doubt accomplish their object, and render the plants additionally self-protective against severe winter weather Any further inquiries on this subject must be addressed to Mr. Hammond, market gardener, Birkby, Huddersfield.

To be had through the London Trade.

PEAS.—Maclean's fine Wrinkled Marrows, Premier, Early Emerald, Little Gem, Advancer. For full description see CHARLES TURNER'S DESCRIPTIVE CATALOGUE, now ready.

The Royal Nurseries, Slough.

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, opening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until the following August.

OPINIONS OF THE PRESS

"R. Headley. Your Seedling Potatos were quite first-rate; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 30, 1869.

"White Kidney. A very fine variety; a heavy cropper; uniform in size; ripening off all at once quickly and completely; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 14."—*Gardeners' Magazine*, Jan. 30, 1869.

"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are like those also in flavour, but are more mealy."—*Journal of Horticulture*, Oct 21, 1869

Price 5s. per peck. The usual discount to the Trade.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

SILVER SAND and PEAT, from Bedfordshire, in any quantity.—This Sand is acknowledged by Florists to be the best yet obtained Price £40 per truck-load, delivered at Mr. JOHN ARLOTT, Builder, 29, Clarendon Square, St. Pancras, N W Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depot.

SHELL GRAVEL, for Gardens, Conservatories, and Terraces; clean, dry, and neat in appearance, used in the Parks and the Horticultural Gardens.—Sold by FRANCIS and CO., Surrey (foot of Vauxhall Bridge), London, S.W.

GENUINE TOBACCO PAPER, of the finest quality, 10d. per lb., or 84s. per cwt.

WILLIAM RUSHFORTH, Nurseryman and Seed Merchant, Leeds.

APPLEBY'S GENUINE TOBACCO PAPER, in 2 lb and 4 lb packets Testimonials too numerous for insertion. Price on application to

HENRY APPLEBY (Foreman to Messrs Ivery & Son, Nurserymen), Dorking, Surrey.

TOBACCO CLOTH and PAPER.—The cheapest and best article for Smoking Greenhouses and Destroying the Fly. Price, 1s. 4d per lb.; 10 lb., 12s. 6d.; 20 lb., 24s.; 50 lb., £2 14s. 6d.; 112 lb., £4 4s. per cwt. Post-office Orders payable at Fleet Street.

JOSEPH BAKER, 14, Nelson Square, Blackfriars Road, S.E.; late 10, Gough Square, E.C.

TOBACCO TISSUE, for FUMIGATING GREENHOUSES Will destroy all the Insects, and not injure the Plants, and Burns without the assistance of Blowing. Price 3s. 6d. per lb., carriage free. A reduction in price for large quantities

To be had of Messrs R ROBERTS and SONS, 112, St. John Street, Clerkenwell, London, E.C.; and of all Seedsmen and Nurserymen

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON BOARD OF CUSTOMS

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.

Sold by Nurserymen, Seedsmen, and Florists,

In Tins at 1s., 2s. 6d., and 5s.

Powder Distributors, 2s. 6d. and 3s. 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants"—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington May 7, 1868

Sole Manufacturer, T A POOLEY Bonded Warehouse, Sussex Wharf, Wapping, E.

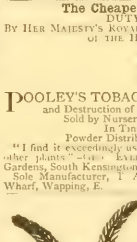

Red Spider

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1860, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions from 1 to 5 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it

Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d

Wholesale by PRICE'S PATENT CANDLE COMPANY (Limited), Battersea, London, S.W.

Magnified.

Seeds Carriage Free.

THE NEW HOLZEISERNE GARDEN FURNITURE, FLOWER POTS, &c

A complete ILLUSTRATED LIST gratis and post free.

DICK RADCLYFFE AND CO., Seedsmen, &c., 120, High Holborn, London, W.C

Seed Grounds—Erfurt, Prussia

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.

The above can be had, of all sizes, wholesale of CHARLES J. BLACKITH AND CO., Cox's Quay, Lower Thames Street, London, E.C. Retail of the principal Seedsmen. Terms on application.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application

JAS T ANDERSON, 7, Commercial Street, Shoreditch, London.

Archangel and Petersburg Mats.

J. BLACKBURN AND SONS have received a large consignment, and are now offering them at very low prices. Price, &c., on application at 4 and 5, Wormwood Street, London, E.C.

HESSIANS and SCRIMS for SHADING. 4-4 Scrim, from 2d. to 5d. per yard, advancing ¼d.

54-inch Hessian and Scrim, 3d., 3½d., 4d., 4½d. and 5d.

J. BLACKBURN AND SONS, Sack and Bag Makers, and Canvas Manufacturers, 1 and 5, Wormwood Street, London, E.C.

Greenhouses and Conservatories.

H. FREEMAN AND SONS, Horticultural Works 106, Mare Street, Hackney, E. Established 20 years. Good substantially made GREENHOUSES, glazed, ready for fixing, 42 feet long, 13 feet wide, £60; 21 feet by 13 feet, £78; 12; feet by 10 feet, £15 handsome CONSERVATORY on hand, 35 feet by 15 feet by 8 feet, £110 Nurserymen's LIGHTS, £25 per 100 feet

DEEP WELL PUMP, for a Well 120 feet deep, with horse-gear complete, to be SOLD a Bargain, in consequence of the Farm being now supplied by public waterworks. Can be seen, or particulars obtained, on application to

MESSRS J AND F HOWARD, Britannia Iron Works, Bedford

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Domo" Netting.

White or Brown made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for

PROTECTION from the COLD WINDS and MORNING FROSTS.

"FRIGI DOMO" NETTING, 2 yards wide, 12 6d per yard run.

"FRIGI DOMO" CANVAS.

Two yards wide	.. ..	12 6d per yard run
Four yards wide	.. ..	30 6d per yard
An improved make, 2 yards wide	..	18 6d. per yard.
An improved make, 3 yards wide	..	22 6d. per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 5s4d, 6s4d, 7s4d, 7s4d, and 8s4d. per yard.

Hessian Canvas, 54 and 72 inches wide, 6s4d. and 8s4d. per yard; 3d. extra for cut lengths.

ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom.

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—

GLASS for ORCHARD HOUSES.

As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.

Each box contains 100 feet The prices only apply to the sizes stated

Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15

16 oz. to the foot. 21 oz.

Fourth quality	.. .. 15½ 0d.	.. .. 19s 6d.
Third quality	.. .. 18½ 6d	.. .. 22s 6d.
Seconds	.. .. 18s 6d	.. .. 26s. 0d.
English	.. .. 20s 0d.	.. .. 27s. 0d.

The above prices include the boxes, which are not returnable.

HORTICULTURAL GLASS.

Stock sizes, 16-oz., in 100 feet boxes, boxes included.

These prices only apply to the sizes stated.

						4ths	3rds	2nds
						s. d	s. d	s. d
11 by 9	12 by 9	13 by 9	14 by 9	15 by 9	16 by 9	13 6	15 6	17 0
12 by 10	13 by 10	14 by 10	15 by 10	16 by 10				
13 by 11	14 by 11	..	..	..	..			
14 by 12	15 by 12	16 by 12	..	..	..			
18 by 12	19 by 12	20 by 12	17 by 12	..	..			
16 by 13	17 by 13	20 by 13	..	..	..	15 0	16 0	18 6
16 by 14	17 by 14	18 by 13	..	..	..			
	17 by 14	18 by 14	..	..	..	16 0	17 0	19 0
	20 by 14	..	..	..	..			

SMALL SHEET SQUARES (in 100 feet Boxes)

6 by 4	6d by 4½	7 by 5	7½ by 6½	..	..	12s 6d
8 by 6	8½ by 6d	9 by 7	9½ by 7½	..	..	
		10 by 8	10½ by 8½	..	..	13s 6d.

Boxes 25 each, returnable at full price.

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ENGLISH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 191, Bishopsgate Street Without, London, E.C.

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom

ORCHARD-HOUSE SIZES

in.	in.	4ths.	3rds.	2nds.	Best.
20 by 12					
20 by 13	Per 100 feet	15 0z	125 3d	150 6d	165 0d 180 0d
20 by 14					
20 by 15		21 0z	180 0d	200 0d	220 0d 240 0d
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in.	in	in.	in	in.	in.	4ths	3ds	2nds.	Best.
6 by 4	7 by 5	8 by 6	9 by 7						
6½ by 4½	7½ by 6½	8½ by 6½	9½ by 7½			110 3d	120 6d	140 0d	150 6d

Per 100 feet.

10 by 8	12 by 9	12½ by 9	13 by 9	14½ by 10	16½ by 10				
10½ by 8½	12½ by 9½	13 by 10	15 by 10			115 0d	145 0d	155 3d	175 6d
11 by 9	13 by 9	13½ by 10½	14 by 11						
11½ by 9½	12 by 10	14 by 10	15 by 11						

LARGE SHEET SQUARES, 15oz., per 100 feet

in	in	in	in.	in.	in.	4ths	3ds	2nds	Best.
15½ by 10½	14 by 12	22 by 12	22 by 16						
16 by 10	14½ by 12½	23 by 13	24 by 16						
14½ by 11	15 by 12	23 by 13½	24 by 17						
15 by 11	15½ by 12½	18 by 14	22 by 17			120 3d	150 6d	160 0d	180 0d
15½ by 11½	16 by 12	22 by 14	23 by 17						
16 by 11	17 by 12	24 by 14	24 by 17						
21 by 11	17 by 12	20 by 15	22 by 18						
13 by 12	18 by 12	24 by 15	21 by 18						

The above Prices are only for the Sizes stated; if a quantity of any other Size be required, a Special Price will be given.

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.			21 oz.		
4ths quality, per 100 feet case, 36s			4ths quality, per 200 feet case, 36s		
3ds	"	"	42s	3ds	" " 42s
2ds	"	"	62s	2ds	" " 62s
Best	"	"	75s	Best	" " 75s

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., and 42 oz.

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 3-8th in substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 29s. per cwt. This Paint adheres firmly to the walls, covers like a rubber, and will stand for from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade It is mixed with rain or pure river water.

WHITE ZINC PAINT, 28s. per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a-half of White Lead and six gallons of Linseed Oil. Special Dryers for this Paint.

IMPROVED ANTI-FOULING PAINT, 28s. to 32s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Brick, Stone, Compo, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is sold on by any ordinary workman. Prepared Oil for ditto, 4s. per gallon.

Per cwt.—s. d.	Per gallon.—s. d.
GENUINE WHITE LEAD 30 0	LINSEED OIL 2 9
SECONDS WHITE LEAD 28 0	BOILED OIL 3 2
GROUND PATENT DRYERS, 3d to 4d per lb	TURPENTINE 2 9
" OXFORD OCHRE, 2d to 3d per lb	LINSEED OIL PUTTY, 1½d per lb
" RAW UMBER, 4d to 6d per lb	BROWN VARNISH, for 1012 0
" BURNT do., 6d to 8d	" CARRIAGE do., 1216 0
GREEN PAINT, all shades, 28s to 60s 0	" PALE do., 1216 0
BLACK PAINT 24s to 36 0	" COPAL 16 0
RED PAINT .. 28s to 36 0	KNOTTING 10 0
	Patent GOLD SIZE .. 10 0
	" BLACK JAPAN .. 12 0
GROUND BRUSHES	GLAZIER'S DIAMONDS and TOOLS.
DUSTERS SASH TOOLS	MILLED LEAD and PIPES.
DISTEMPER BRUSHES.	OLD LEAD Bought or taken in Exchange.

The above are NETT, for Cash, and as such cannot be booked

Lists of any of the above on application

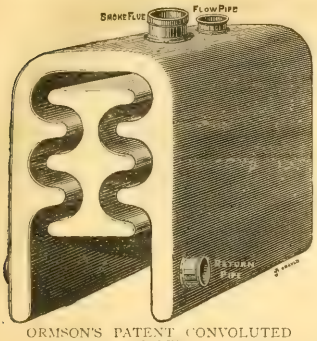

ORMSON'S PATENT CONVOLUTED BOILER.

NOTICE.

ROYAL GARDENS, KEW.

The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by **HENRY ORMSON** as a specimen of his first-class and substantial style of building Horticultural Structures. Also his Patent Wrought-iron Boilers, by which the new Hothouses, and many other Buildings are heated on a very extensive scale in the above great establishment.

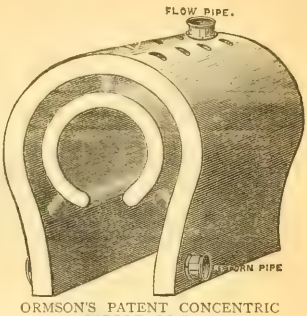

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

Confidence in Cast-iron Boilers is now, to a very great extent, lost in consequence of their continual cracking and failing, and are being replaced by **ORMSON'S PATENT WELDED WROUGHT-IRON BOILERS,** which are not only free from all danger of cracking, but have proved themselves far more economical in consumption of fuel.

HOTHOUSES MANUFACTURED BY STEAM MACHINERY. BEST MATERIALS AND LOWEST PRICES.

Plans, Specifications, and Estimates for Erecting Conservatories, Hothouses, and Hot-water Apparatus of every description in all parts of the country and abroad.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,
AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.
STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

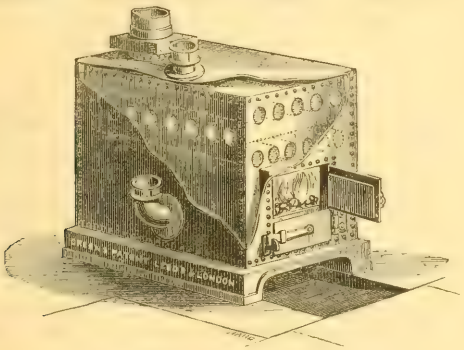

OBLONG BOILER.

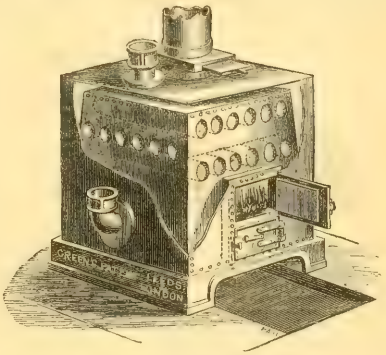

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS;
and 54 & 55, BLACKFRIARS ROAD, LONDON, S.E.

GREEN'S PATENT BOILER

WITH INVERTED CYLINDER ENGINE COMBINED.

Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
" Water, 1 Cubic foot " " "

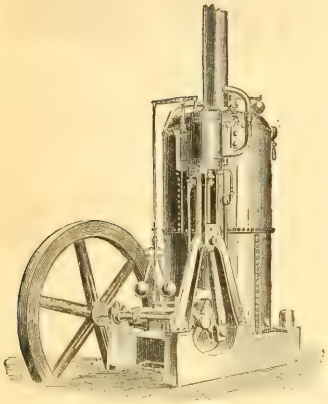

Horse Power	Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.			
1	..	3½ in.	8 in.	..	4 ft. 0 in.	1 ft. 8 in.	..	..	£40*
2	..	4	10	..	5 .. 0	2 .. 4	..	..	£55*
3	..	4½	10	..	5 .. 0	2 .. 4	..	..	£65*
4	..	5½	12	..	7 .. 0	2 .. 4	..	..	£85
6	..	6½	14	..	8 .. 0	2 .. 8	..	..	£120
8	..	8	16	..	9 .. 0	3 .. 0	..	..	£160
10	..	9¼	16	..	10 .. 0	3 .. 4	..	..	£185
12	..	10	18	..	11 .. 0	3 .. 8	..	..	£200
14	..	11	18	..	11 .. 6	3 .. 10	..	..	£220
16	..	12	20	..	12 .. 0	4 .. 0	..	..	£250
18	..	12½	20	..	12 .. 0	4 .. 2	..	..	£285
20	..	13½	22	..	13 .. 0	4 .. 4	..	..	£310
25	..	14½	24	..	14 .. 0	4 .. 8	..	..	£380
30	..	15½	24	..	15 .. 0	5 .. 0	..	..	£450
35	..	16½	24	..	16 .. 0	5 .. 4	..	..	£520
40	..	18	24	..	17 .. 0	5 .. 8	..	..	£585

* 1, 2, and 3, if not fitted with Governors, less £5.

The Fly-wheel Shaft is made sufficiently long to admit a drum being fixed on if required, which can be supplied along with the Engine at a diameter ordered, at an extra cost according to size.

The above Engines and Boilers occupy a very small space, and will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

The Boilers are fitted up with Strong Welded Tubes, intersecting the fire-box (varying in number according to the size of the boiler), and a mud hole is placed opposite each tube for the purpose of cleaning them out. They are tested up to 200 lb. pressure to the square inch.

The Foundation Plate answers the purpose of Feed Water Tank, in which the water is heated before passing into the boiler, and also of an ash pit, and no brickwork or foundation is required.

The Engines are so constructed that Coal, Coke, or Wood can be used as Fuel.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1203 : -

"*Vertical Engines* continue to merit growing patronage. They have their advantages over the horizontal engines, not only in construction as to the working and extra and unequal tear and wear of the piston and cylinder, but in their adaptation to light work—as grinding, chaff-cutting, and root-pulping. The small area of space they occupy is also greatly in their favour. Of late years very great progress has been made in the cattle feeding department of farm practice, hence the growing demand for engines of this class; but this is not all that must be reported, for they are evidently also entering into competition with their rivals in the threshing barn. They have long been in extensive use by builders for hoisting and pumping, being made locomotive by means of rails; and constructed on this plan they are proving equally effective and advantageous in the brick-field, quarry, wood-yard, large dairies for churning, laundries, for driving washing machines, and the like. Add to this the growing use of a heavier class of engines for steam culture, which necessitates as it were the employment of small vertical ones at the homestead, it is easy accounting for the growing popularity of the latter at all our implement exhibitions. In construction there is a close similarity on the whole, but in details of mechanism they are diversified. Something of course depends upon the special purposes for which they have been made, and whether they are to be used outdoors or indoors, and whether they are to burn coal or coke, and so on.

GREEN'S PATENT SILENS MESSORS,

OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

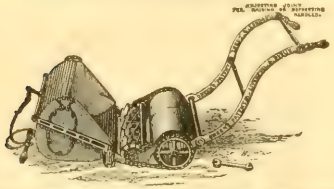

Every Machine is warranted to give entire satisfaction, and if not approved of, can be returned at once unconditionally.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—1st. Simplicity of construction, every part being free of access. 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

N.B. All Orders are executed on the day they are received.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	13	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	..	..	..	..	..	..	..	£4	0	0
20 ..	22 ..	..	..	..	..	..	..	3	2	0
16 ..	17 ..	..	..	..	..	..	..	2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

Hothouses for the Million.—Notice of Removal.

MESSRS. HEREMAN AND MORTON beg to give notice to their Patrons and the Public that in consequence of the offices occupied by them at 7, Pall Mall East being required for other purposes, they have taken larger rooms at 14, TICHBORNE STREET, REGENT'S QUADRANT, W. (to which address *only* all applications for prices of Sir J. PAXTON'S HOTHOUSES, and other information respecting Horticultural Buildings and Heating Apparatus of every description, should be made after the first week in January, 1870

A PAMPHLET and PRICE LIST, &c., with 15 illustrations, description, and testimonials, will be sent post free on receipt of two stamps.

A HANDBOOK of VINE and FRUIT TREE CULTIVATION, with Views and Sections of Houses, Hints for Heating, complete Lists of Trees, &c., by S. HEREMAN, Chatsworth, post free for 13 stamps.

HEREMAN AND MORTON, Horticultural Builders and Hot-water Engineers. Country Works in Gloucester, Coventry, near Ulverstone, Paisley, and Aberdeen.

SHAW'S TIFFANY.

For Samples and Prices apply to
J. SHAW AND CO., 29, Oxford Street, Manchester.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c

Plans and Estimates on application

J. JONES AND SONS, 25, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS

		Each
6 ft. by 4 ft.	Lights, 2 in thick, unglazed	£0 5 0
" "	Primed and Glazed with 10 oz. Sheet	0 11 0
" "	with stout portable Box, not Painted	1 3 0
" "	Painted four coats, and Handles on	1 8 0
" "	Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do.		2 15 0

GREENHOUSES Per ft. super.

Woodwork only Prepared and Fitted	0 0 6
" Primed and Glazed with 16 oz. Sheet	0 0 9
" Delivered, and Fixed with Ironwork	0 1 0
" Painted four coats, two sides, ready for use	0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or Hull, equivalent

	2 inch	3 inch	4 inch
HOT-WATER PIPES, Nos 6 & 7 on illustrated sheet per yard	s. d. 0 11	s. d. 1 5	s. d. 1 11
ELBOWS No 12 on do. each	1 4	2 1	2 9
TEE PIPES No 34 on do. "	2 0	3 0	4 0
SYPHONS No 23 on do. "	1 9	3 0	4 0
VALVES "	10 9	11 0	12 0

GEORGE ROBINSON, Iron Works, Stourbridge
London Warehouse, 16, Grand Junction Wharf, Paddington Basin

Established Fifty Years.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS,
353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.

Strong ZINC HAND-GLASSES, all sizes

References to the Nobility, Gentry, and Trade in most of the Counties in England.

T. G. MESSENGER, MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH.

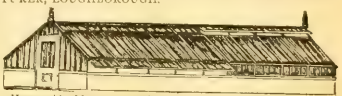

Honourable Mention awarded at the International Exhibition, 1862 and at the Dublin Exhibition, 1865; also a First-class Certificate by the Royal Horticultural Society

T. G. MESSENGER, Patentee of many important improvements in Buildings and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed

ANY HOUSE Glazed, single or double, with or without putty. The mode adopted by T. G. MESSENGER for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented

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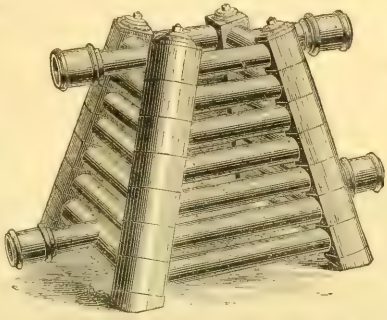

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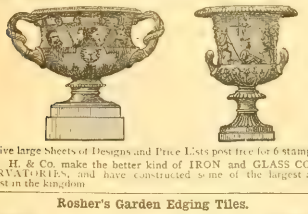

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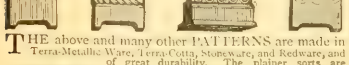

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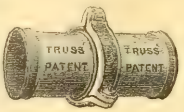

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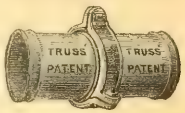

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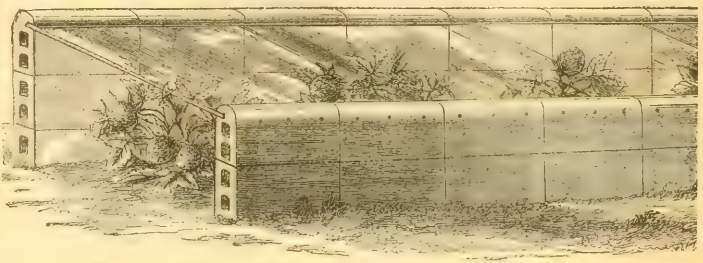

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10 feet in length, Glass 9 in. wide, for	0 10 0	0 12 6	0 15 0
10 feet in length, Glass 12 in. wide, for	0 12 0	0 15 0	0 17 6
10 feet in length, Glass 18 in. wide, for	0 14 0	0 17 6	0 21 0
10 feet in length, Glass 24 in. wide, for	0 16 0	0 20 0	0 25 0
100 feet in length, Glass 9 in. wide, for	4 10 0	5 0 0	6 0 0
100 feet in length, Glass 12 in. wide, for	5 0 0	6 0 0	7 0 0
100 feet in length, Glass 18 in. wide, for	6 10 0	7 0 0	8 0 0
100 feet in length, Glass 24 in. wide, for	8 0 0	8 10 0	9 10 0

A Reduction of 10s. per 100 feet will be made if 500 feet be taken at one time.

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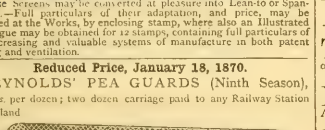

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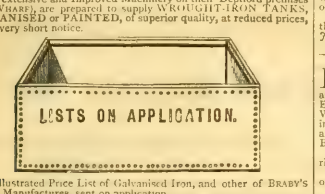

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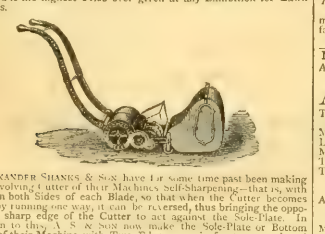

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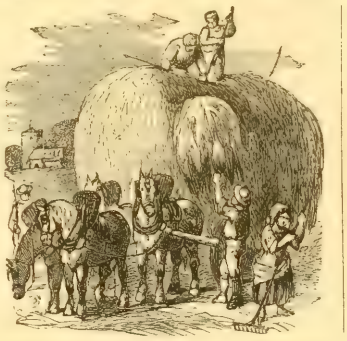

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No. 5.—1870.] SATURDAY, JANUARY 29. { Price Fivepence. / *Stamped Edition, 6d.*

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LEEDS (SPRING) FLOWER SHOW will be held in the Leeds Royal Park on EASTER MONDAY, TUESDAY, and WEDNESDAY, April 18, 19, and 20. As this will be the first Spring Show held in Leeds, I shall be glad to receive suggestions either as to entries, classes or prizes, so that the Show may be satisfactory in every respect. Schedules will therefore not be issued until the end of January.
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THOMAS KITLEY, Oldfield Nursery, Bath.

RHUBARB STOOLS WANTED.—A large quantity of the Victoria required, for about 3 acres. State price to A. AND E. BATH, Colgates Farm, Halstead, Seven Oaks, Kent.

RIVERS' ROYAL ASHLEAF SEED POTATOS, thoroughly true. A few Sacks to Dispose of, cheap.
J. SPAVEN, Stud House, Hanwell Park, Middlesex, S.W.

SEED POTATOS (SELECTED). PRICED LIST on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

True Early Rose Potato.
CHARLES SHARPE AND CO., Sleaford, have received a large consignment of the above from America, and are able to offer them in quantity. Price on application.

POTATOS.—A fine sample of Paterson's Victoria, clean and true to name, at £5 per ton, delivered at Raskelf Station, North-Eastern Railway. No order executed under one Ton
PETER STEVENSON, Jun., Rainton, Thirsk

POTATOS.—1000 bushels of the finest sorts in cultivation. See list and Price of 20 to 30 sorts.
WM. DILLISTONE, Nurseries, Side Hedingham, Essex.
N.B. 10,000 ROSE BRIERS to spare.

WHEELERS' MILKY WHITE POTATO, warranted true 5s per ton, or 1s per sack of 2 cwt. Delivered to the Cave Railway Station. Terms cash.
A. L. CHIVERS, Cotton Hill, Calne, Wilts.

PATERSON'S VICTORIA POTATOS won the First Prize at the Staffordshire Agricultural Show; First Prize and Highly Commended for the Second at the Birmingham Show. Price 5s. per 56 lb. Also a few MILKY WHITES, 7s. per 56 lb.
Mr. PEARCE, Measham, Atherstone.

POTATOS, for Planting.—Twenty tons of Dalmahoys, do. Myatt's Prolific, and a good selection of about 20 useful sorts, at the lowest remunerating prices, for cash. Price Lists on application.
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough

Important Notice to Potato Planters.
TO BE DISPOSED OF, a few Tons of DALMAHOY POTATOS, good sample and true. Price £6 per Ton, delivered to Bedford Stations. Sacks extra.
THOMAS FANE, Bedford

To Nurserymen.
FOR SALE, 8 Tons of MYATT'S PROLIFIC POTATOS, very true; price £5 5s. per ton, cash. Also 28 Bushels of HALL'S WESTBURY SWEDE TURNIP SEEDS (fine stock), price 18s. per bushel.
G. WILKINSON, Skirbeck, Boston.

To the Trade.—Henry's Hybrid Leek, Genuine.
DOWNIE, LAIRD, and LAING are now sending out the above unrivalled LEEK, in sealed packets, at 6s. per dozen, or 40s. per 100 packets.
Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

SUTTONS' PERMANENT PASTURE GRASSES and CLOVERS. For prices of various Mixtures for various Soils see p. 149 of this week's Paper

For Seed.
HALLETT'S | TRADE PEDIGREE MARK. | BARLEY and OATS.
See Advertisement on page 149 of this Paper.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

CARTER'S GENUINE SEEDS. See page 136.
237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See page 136.
237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 102.
237 and 238, High Holborn, London, W.C.

CARTER'S NEW PEAS for 1870. See page 136.
237 and 238, High Holborn, London, W.C.

CARTER'S SELECTED SEED POTATOS. See page 136 237 and 238, High Holborn, London, W.C.

CARTER'S GENUINE SEEDS. See page 136.
237 and 238, High Holborn, London, W.C.

Seeds.
THOMAS METHVEN'S DESCRIPTIVE CATALOGUE of GARDEN, FLOWER and AGRICULTURAL SEEDS is now ready, and may be had post free on application. 15, Prince's Street, Edinburgh.

STUART AND CO., SEED GROWERS, Nice—SEED MERCHANTS, 5, Tavistock Row, Covent Garden, London, W.C. (REMOVED from 85, Southampton Row.)
WHOLESALE LIST sent free on application.

HERBERT H. NICHOLSON, SEED GROWER, Great Clacton, near St. Osyth, Essex, has a large quantity of FLOWER and VEGETABLE SEEDS, of his own growing, all new, FOR SALE. Lists on application.

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

NEW AND GENUINE SEEDS,
CARRIAGE PAID.

B. S. WILLIAMS,
NURSERYMAN AND SEED MERCHANT.
VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

COMPLETE COLLECTIONS
OF
KITCHEN GARDEN SEEDS,
To suit Gardens of various sizes,
10s. 6d., 21s., 42s., 63s., and 84s. each.

New and Choice Vegetable Seeds.

Per packet

Williams' Alexandra BROCCOLI 1 0
Dell's fine Dark BEET 1 0
Williams' Matchless RED CELERY 1 0
Williams' Matchless WHITE CELERY, new .. 1 6
Telegraph CUCUMBER, Woolley's improved variety 1 6
Digswell Prize ENDIVE 0 0
All the Year Round CABBAGE LETTUCE .. 0 6
Wheeler's Tom Thumb CABBAGE LETTUCE .. 0 6
Lee's Immense Hardy Green CABBAGE LETTUCE, new 1 0
Webb's Climax MELON, new 2 6
(The finest ill-varied Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new 2 6
Nuneham Park ONION, quite distinct from any other variety 1 0
Earley's selected Double Curled PARSLEY, new .. 1 0
Laxton's Supreme PEA, new .. .. per half pint 2 0
Hundredfold, or the Cook's Favourite PEA, new, do. 2 0
Cullingford's Champion Marrow PEA, new, per quart 3 6
(The finest flavoured Wrinkled Marrow in cultivation.)
Earley's Defiance TOMATO, new 2 6
(The earliest and best variety in cultivation.)
Orangefield Dwarf Prolific TOMATO 0 6

New and Choice Flower Seeds.

Williams' superb strain of PRIMULA, Red, White, or Mixed .. .. .. 2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and 5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., and 5 0
CYCLAMEN, Wiggins' Prize strain, 1s. 6d., 2s. 6d., & 3 6
BALSAM, Williams' superb strain .. .. 1s. 6d. and 2 6
GERANIUM, Le Grand .. .. 1s. 6d. and 2 0
GLOXINIA, from the finest erect varieties 1s. and 2 6
HOLLYHOCKS, Chater's splendid varieties, mixed 1 0
PANSY, from Prize flowers .. .. 1s. and 2 6
PINK, finest double-fringed varieties.. 1s. and 2 6
POLYANTHUS, Wiggins' Prize strain 1s. and 1 6
VERBENA, Eckford's finest varieties.. .. .. 1 0
Williams' Improved Hybrid SOLANUMS 2s. 6d. & 3 6
ASTER, Dwarf, Victoria White, very fine 1 0
CENTAUREA CANDIDISSIMA .. 1s. and 2 6
CENTRANTHUS MACROSIPHON BICOLOR, new 1 0
CLARKEA INTEGRIPETALA, Tom Thumb, new 1 0
CONVOLVULUS MINOR UNICALUS, new .. 1 0
DELPHINIUM CONSOLIDA CANDELABRUM, new 1 0
ESCHSCHOLTZIA AURANTIACA, new.. .. 1 0
EUTOCA SERICEA, very dwarf, with pretty deep violet flowers, new 1 0
HELENIUM BOLANDERI, Dwarf Perennial Species, new 1 0
LILIUM AURATUM 1 0
LOBELIA ERINUS GRACILIS ERECTA ALBA, new 1 0
Williams' Improved FRENCH MARIGOLD, beautifully striped and very large 1 0
Parson's New TREE MIGNONETTE 1 0
NEMOPHILA ATOMARIA ELEGANS, new .. 1 0
OXALIS TROPÆOLOIDES VIRIDIFOLIA, green-leaved variety, new 1 0
PERILLA NANKINENSIS VARIEGATA, new 1 0
PYRETHRUM PARTHENIFOLIUM AUREUM, Golden-feather .. .. .. 1s. and 2 6
EAST LOTHIAN STOCKS, per collection of three colours 2 6
(Here are, without exception, the finest strains we have ever offered, the colours being scarlet, purple and white, and in remarkable brilliancy and the finest form and purity in the latter, the flowers are very double, and produce numerous spikes of bloom; they make a grand display in beds and for cut flowers.)
PURPLE QUEEN STOCK, a very dwarf and beautiful variety, the flowers are very double, and splendid colour 1 0
WHITE TEN-WEEK STOCK, Wallflower-leaved, new 1 0
(Flowers the purest and finest White Stock in cultivation.)
IMPERIAL PURPLE SWEET PEAS, very large 0 6
TACSONIA VAN VOLXEMII, splendid greenhouse Climber 2 6
TROPÆOLUM GOLDEN KING of TOM THUMBS, new 1 0
VIOLA CORNUTA ALBA, new .. 1s. 6d. and 2 6
(This is an interesting and extremely useful variety, producing in great abundance pure white flowers, very robust and dwarf in habit, which renders it very effective in spring and summer, and invaluable during the late autumn months.)
WALLFLOWERS, Saunders' fine dark variety .. 1 0
ZINNIA ELEGANS PUMILA Flore-pleno, new.. 1 0

B. S. W.'S DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, Post Free, on application.

CHOICE FLOWER SEEDS.

MESSRS. VEITCH & SONS,
ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.,

DESIRE TO DIRECT PARTICULAR ATTENTION TO

THE FOLLOWING SEEDS OF STERLING MERIT.

NOVELTIES.

Aster Giant Pæony-flowered Perfection.
Per packet, 1s

Cineraria acanthifolia.
Per packet, 2s. 6d.

Dahlia Imperialis.
Per packet, 1s. and 2s. 6d.

Delphinium consolida candelabrum fl.-pl.
Per packet, 1s

Dianthus Heddewigii diadematus fl.-pl.
Double Diadem Pink Per packet, 1s

Phlox Drummondi Heynholdi.
True Scarlet Phlox Per packet, 1s 6d.

Primula sinensis fimbriata punctata elegantissima.
Per packet, 2s. 6d

Reseda odorata meliorata.
Improved large-flowered Pyramidal Mignonette. Per packet, 1s

Larkspur, double dwarf Ranunculus-flowered.
Per packet, 1s.

Solanum Warscewiczii.
Per packet, 1s

Stock East Lothian.
Per collection of 3 colours (scarlet, white, and purple), separate, 2s 6d.

Viola cornuta alba.
Per packet, 1s.

For descriptions of the above and CHOICE VEGETABLE SEEDS, see Advertisement in *Gardeners' Chronicle* of January 22, 1870, p. 98.

IMPORTED COLLECTIONS OF FLOWER SEEDS,

Obtained direct from the most celebrated Continental Growers, sent out in the original papers, and strongly recommended as being of the very best quality.

Asters.

	s.	d.
Dwarf Chrysanthemum-flowered, 12 distinct colours, separate ..	2	6
Tall Chrysanthemum-flowered, 12 do. do., do.	2	6
Truffaut's Perfection Pæony-flowered, 12 do. do., do.	2	6
Truffaut's Globe Pæony-flowered, 12 do. do., do.	2	6
Pompone Imbricated, 12 do. do., do.	2	6
Improved New Pæony Perfection, 8 do. do., do.	2	6
Crown or Cocardeau, 6 do. do., do.	1	6
Reid's Improved Quilled, 12 do. do., do.	2	6
Victoria, very fine, 10 do. do., do.	2	6
Kanun ulus-flowered, 8 do. do., do.	1	6
Dwarf Bouquet Boltze, 9 do. do., do.	1	6

For packets of the above in finest mixed colours, see Catalogue page 38

Messrs. V. AND SONS were awarded a Special Certificate for the excellence of their Asters, of which they exhibited a large collection at the Royal Horticultural Society's Meeting, September 4, 1869

Stocks.

	s.	d.
Dwarf German Ten-Week, 12 distinct colours, separate	2	6
Large-flowering German Ten-Week, 12 do. do., do.	2	6
Pyramidal large flowering Ten-Week, 12 do. do., do. ..	2	6
Earliest-flowering Autumn, 6 do. do., do.	1	0
Emperor large-flower ng, 8 do. do., do.	2	0
Brompton, 12 do. do., do.	2	6
Cocardeau or Giant Cape, 6 do. do., do.	1	6

For packets of the above in finest mixed colours, see Catalogue, page 49

Antirrhinums.
From Mr. Cox's splendid collection, see *Gardeners' Chronicle* of 1868, page 820.
Assortment of 18 finest varieties, separate, 2s

Balsams.
Smith's Camellia-flowered, in 9 distinct colours, separate, 2s 6d
Camellia-flowered Blotched, in 8 do. do., do., 2s 6d
Rose-flowered, in 8 do. do., do., 2s. 6d.

Cannas.
Assortment of 12 finest varieties, separate, 5s
Assortment of 18 finest varieties, separate, 7s 6d

Carnations and Picotees.

Self or one coloured, in 12 vars
Flake, in 12 varieties
Bizarre, in 12 varieties
Fancy, in 12 varieties
Yellow Flake in 12 varieties
Yellow Bizarre and Self, in 12 varieties
Yellow Fancy, in 12 varieties
Perpetual or Tree, Self, in 12 vars
Perpetual Flake, in 12 varieties
Perpetual Bizarre, in 12 varieties
Perpetual Fancy, in 12 varieties
Picotees, white ground, in 12 vars
Picotees, yellow ground, in 12 vars
Picotees, Perpetual or Tree, in 12 varieties

The above superb collections, 3s. 6d. each

Cockscombs.
Dwarf varieties, in 12 distinct colours, separate, 2s. 6d

Double Helichrysums.
Assortment of 10 splendid varieties, separate, 1s. 6d

Everlastings.
Assortment of 25 best varieties, separate, 1s
Assortment of 12 best varieties, separate, 2s

Hollyhocks.
Saved from a choice collection, in 12 named varieties, 2s. 6d

Ipomœas.
Assortment of 12 finest varieties, separate, 3s

Larkspurs.
Double dwarf Rocket Hyacinth-flowered, in 10 distinct varieties, 2s
Double dwarf Ranunculus-flowered, in 6 distinct varieties, 2s
Double tall Stock-flowered, in 8 distinct varieties, 2s

Marvel of Peru.
Assortment of 12 finest varieties, separate, 1s 6d

Ornamental Grasses.
Collection of 50 finest varieties, 5s
Collection of 25 finest varieties, 3s 6d.
Collection of 12 finest varieties, 2s

Ornamental Gourds.
Collection of 24 finest varieties, 3s.
Collection of 12 finest varieties, 2s.

Giant Gourds.
Collection of 12 finest varieties, separate, 2s 6d.

Petunias.
Assortment of 12 varieties, separate, 4s

Phlox Drummondi.
Assortment of 12 finest varieties, separate, 2s. 6d.

Poppy.
Pæony-flowered, in 10 distinct colours, separate, 1s. 6d.
Carnation, in 12 distinct colours, separate, 1s. 6d.

Portulacas.
Double-flowered, in 6 finest varieties, separate, 1s 6d.
Single-flowered, in 8 finest varieties, separate, 1s. 6d

Salpiglossis.
Assortment of 10 finest varieties, separate, 2s

Scabious.
Large-flowered, in 8 distinct colours, separate, 1s 6d
New Dwarf, in 8 distinct colours, separate, 1s 6d

Wallflower.
German, double, in 10 splendid varieties, 3s.

Zinnia elegans.
Double-flowered, in 8 distinct colours, separate, 1s. 6d
Single-flowered, in 6 distinct colours, separate, 1s.
Packets of the above in Mixture, see Catalogue.

SUBTROPICAL AND ORNAMENTAL FOLIAGE PLANTS.

MESSRS. VEITCH AND SONS have secured supplies of Seeds of the best and most admired Plants in this important section, full descriptions of which will be found in their "VEGETABLE and FLOWER SEED CATALOGUE for 1870," which will be forwarded Post Free on application.

Assortment of 12 best varieties of the above, 5s.
Assortment of 24 .. .. .. 10s.

The "CHELSEA" BLIGHT COMPOSITION, for destroying Mealy-Bug, Black and White Thrip, Scale, Greenfly, &c.—MESSRS. VEITCH AND SONS having for some time used, with great success, a Composition for destroying insects on plants, have determined to offer it for sale, believing it will be a real boon to plant cultivators. MESSRS. V. AND SONS have always found this Composition more efficacious than any other they have yet tried, and it has been constantly used by them for cleaning all kinds of Stove and Greenhouse, Flowering and Foliage Plants, Orchids, and even Ferns, with the exception of the more delicate kinds, and the success which has invariably attended its use induces them to introduce it to the public. Full instructions as to its application accompany each bottle. Bottle sufficient to make 1 gallon of Mixture fit for use, 1s. 6d.; 2 gallons, 3s.; 4 gallons, 5s. 6d.; 8 gallons, 10s. 6d.

SEEDS CARRIAGE FREE.

DICK RADCLYFFE & CO.'S

ILLUSTRATED CATALOGUE of GARDEN, AGRICULTURAL and FLOWER SEEDS,

GARDEN SUNDRIES, HORTICULTURAL ELEGANCIES, &c.,

Is now ready, Gratis and Post Free.

Forming a most complete List of Requisites for the furnishing of a Garden, Conservatory, &c., with Instructions for Sowing, &c., &c.

129, HIGH HOLBORN, W.C. | SEED GROUNDS, ERFURT, PRUSSIA.

NEW AND GENUINE SEEDS.

CARRIAGE PAID.

BENJAMIN S. WILLIAMS

BEGS TO ANNOUNCE THAT HIS

DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS, for 1870,

Containing many New and Choice Varieties, is now ready. Post Free on application.

VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most critical and choice Seeds are either home saved or have been saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

Thomas Gibbons

CORNER OF HALF-MOON ST., PICCADILLY, LONDON, W.

KITCHEN GARDEN SEEDS

GRASS SEEDS

ROYAL AGRICULTURAL SOCIETY FOR ENGLAND. THOS. GIBBS & Co. Corner of HALF-MOON St PICCADILLY, London. APPOINTED APRIL 1844 THE SEEDSMEN

CORNER of STREET.

FLOWER SEEDS

AGRICULTURAL SEEDS

CATALOGUES FORWARDED POST FREE TO ANY ADDRESS ON APPLICATION.

CAREFULLY SAVED GARDEN SEEDS.

ARTHUR HENDERSON & CO.'S

CATALOGUE OF CHOICE VEGETABLE AND FLOWER SEED NOVELTIES

Is now Published, and can be forwarded Post Free on application.

The VEGETABLE SEED SECTION contains—

Selected LISTS of the best varieties of each kind most worthy of cultivation, also some excellent new sorts of both VEGETABLE and FLOWER SEEDS of sterling merit; attention is also directed to the Pine-apple Compact-top BEET (the finest and richest flavoured variety extant), carefully saved, true from the original stock. Also the new DWARF WATERLOO BEET; top leaves rich metallic crimson; growth true, even, and regular. This beautiful foliaged variety may with advantage be cultivated in the flower garden as a border, ribbon, or edging plant; its root is a trifle larger than the Pine-apple Compact-top, flavour excellent, full of a sweet saccharine juice, colour crimson, texture tender and uniform throughout.

The FLOWER SEED SECTION contains—

Imported GERMAN FLOWER SEEDS in Collections; Choice Strains of FLORISTS' FLOWER SEEDS; a careful LIST of FLOWER SEED NOVELTIES of the season; HORTICULTURAL REQUISITES of every kind, KNIVES, PROTECTING MATERIALS, HORTICULTURAL MANURES, &c., &c.

N.B. Everything in this Catalogue is priced.

PINE APPLE PLACE, MAIDA VALE, LONDON, W.

☞ All Seeds Carriage Free.

KNAP HILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be obtained.

ABIES ALBERTIANA, 5 to 9 feet, 30s to 60s per dozen Transplanted April, 1860

ABIES BRACHYPHYLLA, 6, 7, to 10 feet, 7s 6d to 10s 6d each Transplanted August, 1868

ABIES CEPHALONICA, 5, 6, and 7 feet, 7s 6d to 21s Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 & 9 feet high, £5, £7 10s, to £12 10s per 100

The dwarf varieties of Spruce, such as pumila pygmæa, Gregoria, Clanbrasiliana, &c., large numbers, many of them 20 and 30 years' growth

CEDRUS DEODARA, 5 to 6 feet, 60s per dozen; 7 to 8 feet, 84s per dozen; 10 to 12 feet, 10s 6d to 21s each, and upwards We have several of these noble and three large Deodars All have been removed since August, 1868; many since April, 1869

CEDRUS ATLANTICA, 6 to 7 feet, 42s to 60s per dozen; 8 to 10 feet, 7s 6d to 10s 6d each All removed since September, 1868

CEDRUS LIBANOTICA, 6, 7, to 10 feet Moved September, 1868

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s to 42s per dozen; 8 to 10 feet, 5s to 10s 6d each

" " ARGENTEA, 3 to 4 feet, and 18s each in circumference, 7s 6d to 10s 6d each

" " GLAUCA, 4 to 5 feet high, 36s per dozen; 6 feet round, 7s 6d to 21s

JUNIPER, CHINESE, 4 to 5 feet, 42s per dozen, £15 per 100; 5 to 6 feet, 60s per dozen, £20 per 100; 7 to 8 feet, 7s 6d to 10s 6d each All removed since August, 1868 Purchasers may select from a Stock of many thousands of this fine plant, 5 to 8 feet high

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are unsurpassed for the finest plants to be found in the Nursery Newness greatness

PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s to 42s each, and 12 and 15 feet Splendid Plants, moved May, 1868, 30 to 35 feet high

PICEA PARSONSII Hundreds of most beautiful plants, 4, 5, 6, 7 feet, 18s to 42s each All removed in 1869

PICEA MORINDA, 4, 5, and 6 feet, 21s to 63s each Some grand plants, 10 to 15 feet high, transplanted in April, 1867

PICEA PINSAPO, 5, 6, and 8 feet, 21s to 63s each Some grand specimens, 10 to 15 feet high, transplanted in April, 1867

PINUS AUSTRIACA, 5 to 6 feet, beautiful specimens, 42s to 63s per dozen; 7 to 8 feet, 7s 6d to 10s 6d each Transplanted in August, 1868

PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft round, 10s 6d to 21s each

PINUS LARICIO, 6, 7, to 10 feet, 10 to 12 ft round, 10s 6d to 21s each

PINUS MONTANA, 3 to 4 feet, 30s to 42s per dozen; 5 to 6 feet, 7s 6d to 10s 6d each All removed since August, 1868

PINUS PINEA, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

PINUS PONDEROSA, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

PINUS PYRENAICA, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

PINUS TAURICA, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

PINUS WEYMOUTHII, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

PINUS WILLIAMSONII, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

SEQUOIA GIGANTEA, 4 to 5 feet, 7s 6d to 10s 6d each; 6, 7, 8, and 9 feet, 21s to 42s each Transplanted in August

THUJOPSIS BOREALIS, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

THUJOPSIS DOLABRATA, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

TORREYA MYRISTICA, 5 to 6 feet, 7 to 8 feet, and 8 to 10 feet, 7s 6d to 10s 6d each All removed since August, 1868

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s 6d to 10s 6d each; 6, 7, 8, and 9 feet, 21s to 42s each Transplanted in August

YEWS, COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high Hundreds, all constantly removed; invaluable where immediate effect is required

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large quantities, and of full size, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.

YEWS, IRISH, handsome plants, up to 10 feet high

HOLLIES.—The stock of Hollies in this Nursery is, we believe, the largest to be met with in Europe; it comprises, as well as ordinary sorts, together, many thousands of the following varieties:

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet.

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, as pyramids in circumference

HOLLY, SILVER QUEEN, 4, 5, and 6 feet

WATERER'S HOLLY.—This variety originated in this Nursery; we have hundreds 4, 5, and 6 ft high, round 15 ft circumference

FERRY'S WEEPING HOLLY.—Standards, 7s 6d to 21s each.

HOLLY, COMMON WEEPING.—The finest specimens we have seen Moved, April, 1869

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand All moved since April, 1868

HOLLY, Green varieties of the following kinds An immense stock of splendid plants, all transplanted in 1868-9:—

	LAURIFOLIA and SCOTTICA, 4, 5, 6 to 10 feet high
HODGINS',	ANGUSTIFOLIA,
YELLOW BERRIED,	MYRTIFOLIA, &c.

4, 5, 6, and 8 feet high

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference A large number

N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 60 acres of ground, finer or better rooted plants cannot be wished or obtained The prices are fair and reasonable

IVAN, Green and Variegated, 4, 5, 6, to 8 feet.

IVAN, do. do. fine pyramids, 10 to 8 feet.

BAY'S, standards and pyramids.

LAURUSTINUS, standards.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 feet to 6 feet high

AUCUBA JAPONICA, Berried, hundreds, 2½ to 4 feet high; in the open ground and pots, from 18s to 120s per doz. and upwards

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation We shall be pleased to supply—

RHODODENDRONS, in distinct named kinds, from layers, named kinds £5 per 100, £40 per 1000 A dozen sent as sample on application

RHODODENDRONS, the finer kinds, by name, from £7 10s. to £15 per 100, and upwards

RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 100

STANDARD RHODODENDRONS of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference There is probably no finer or better adapted for standards than that we call roseum elegans, many of which we supplied to Rotten Row We have also Rhododendrons, standards, of many other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s per 100. Samples on application. Large and handsome plants by the 1000, 4 to 8 feet high

AZALEAS, the very best kinds, fine plants, £10 per 100, upwards.

AZALEAS, common kinds, £5 per 100

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and one mass of bloom in different colours

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100

ANDROMEDA FLORIBUNDA, £5 to £7 10s per 100, and upwards

HARDY HEATHS, a very fine collection, every plant a specimen, and a large stock to select from, from 20s to 40s per 100

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and succeeds like new-blown bay Unsurpassable for Winter Gardening

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s to 18s per dozen.

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of Ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway station in England

To the Trade.

SPECIAL OFFER of LAURUSTINUS PYRAMIDALIS (NEW).

WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for Stock. It has been seen growing in his Nursery by many eminent Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of sterling merit, the habit being robust, compact; flowers pure white, nearly twice the size of the old varieties, and very sweet-scented, with a continuation of flowers during the most severe weather.

W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 10s.; second size, 3 to 4 feet, do., 10s.; third size, 2 to 3 feet, do. 7s.; fourth size, 1½ to 2 feet, do., 5s.

Floral Nursery, Hailsham, Sussex.

LILIUM, in 80 superb varieties. Choice selections, 5s., 9s., 12s., 18s., and 24s. per dozen

GLADIOLI, in 200 splendid varieties. Choice assortments, 3s., 5s., 9s., 12., and 15s. per dozen.

100 roots in 10 varieties .. .. 18s.
100 roots in 20 varieties .. .. 22s.
100 roots in 30 varieties .. .. 30s.
100 roots in 50 varieties .. .. 45s.
100 roots in 25 extra varieties .. .. 54s.
100 roots in 50 extra varieties .. .. 70s.
50 roots in 50 extra varieties .. .. 30s.

GANDAVENSIS, 2s. per dozen; 12s. per 100
BRUNCHILYENSIS, 2s. per dozen; 10s. per 100
BOWIENSIS, 2s. per dozen; 10s. per 100
CATALOGUES free on application.
HERBACEOUS and ALPINE PLANTS.
100 distinct and showy varieties .. .. 30s.
100 superior and new varieties .. .. 50s.
Per dozen, 1s., 6s., 9s., 12s., and 18s.
CATALOGUES free on application.
STEPHEN BROWN, Weston super-Mare, Somersetshire.

Special Offer.

JOHN CRANSTON, having a large surplus stock of the undermentioned articles, will be happy to furnish special quotations, both wholesale and retail.

ROSES.—Standards and Half Standards, all the leading Perpetuals.
Dwarfs, do. do., very fine plants for bedding or potting
Dwarf Standard, Tea-scented, Noisette and Chinas, suitable for potting
Extra tall Standard Roses, 6 to 8 feet stems.
Climbing and Pillar Roses.
Roses for forcing, of extra size.
New Roses for 1870, 30 varieties. Plants ready early in March
FRUIT TREES. Dwarf-trained Apples, Pears, Plums and Cherries, well grown Trees.
Pyramids do. do.
Standard-trained Peaches and Nectarines.
Standard Pears, Plums and Cherries, very fine.
Gooseberries, upwards of 200 varieties, 3 and 4-yr. old plants
Currants.
Vines, strong fruiting and planting Canes
CONIFERÆ.—Handsomely grown specimens, 6 to 10 feet.
Pinus austriaca, all quartered and recently transplanted, 2 to 3 feet, and 3 to 4 feet
Spruce Fir, quartered, 2 to 2½, and 2½ to 3 feet
Wellingtonia gigantea, very fine, 2 to 2½, 2½ to 3, and 3 to 4 feet
Thuja aurea, beautiful plants, 9 to 12, 12 to 15, and 15 to 18 inches
Thuja gigantea, Lobbii, Alaes Menziesii
Thujopsis borealis, &c.
LAUREL, Common and Portugal, Mahonia aquifolia, &c.
WEEPING ASH, 6 to 10 feet, very fine
ENGLISH OAK, 2 to 4 feet
ASPARAGUS, 2 to 3 yr.; RHUBARB, SEAKALE, &c.
Nurseries, King's Acre, near Hereford

Laurus latifolia.

L. PAILLET, NURSERYMAN, Chatenay les Sceaux, near Paris, France, is now filling the numerous orders received for this splendid Novelty. Persons wishing to secure good plants are requested to send their orders as soon as possible, for the plants are now getting very limited in number.

M. L. PAILLET offers also to the Trade a large quantity of FRUIT TREE STOCKS, at the following rates:—

	Per 1000			Per 10,000	
	£	s.	d.	£	s. d.
Pears, extra choice	1	10	0	first choice	11 12 0
Quince, do.	1	10	0	,,	8 12 0
Apples, do.	0	18	0	,,	5 0 0
Doucin, do.	1	6	0	,,	8 10 0
Paradis, do.	1	4	0	,,	0 16 0
Plums (real St. Julien), do.	1	10	0	,,	0 16 0
Cherries, do.	1	0	0	,,	0 12 0
St. Lucie, do.	0	10	0	,,	0 6 0

ROSES, our own best selections.—Standards, good, £4 per 100; Half Standards, £3 10s per 100; Low Budded Dwarfs, £16 per 1000; on their own roots, £12 per 1000. Bengals, three best sorts, £9 per 1000; Maréchal Niel, on Standards, 16s. per dozen.

Young Seedling FOREST TREES and SHRUBS, 1, 2, or 3-yr. old, such as Acacia, Alder, Ash, Beech, Birch, Quercus, Thorn, Maple, &c.; and EVERGREENS of all sorts, Ornamental Trees and Shrubs, at per 1000, 100,000, and 1,000,000.

DWARF ROSES.—SPECIAL OFFER TO THE TRADE.

M. L. PAILLET has several thousand fine Dwarf Roses he will send carriage free to London, packing included, at £16 10s. per 1000, best selection. Cash on delivery.

All orders must be sent to L. PAILLET, as above; or to his Agents, Messrs. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

NEW AND UNADULTERATED SEEDS.

PRIZE MEDALS, 1851 AND 1862.

BUTLER, McCULLOCH, & CO.'S

COMPLETE COLLECTIONS FOR ONE YEAR'S SUPPLY.

No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
£3 3s.	£2 2s.	£1 10s.	£1 1s.	10s. 6d.

The above Collections contain only useful varieties, the quantities of which may be varied to suit the requirements of Customers.

PRICED DESCRIPTIVE CATALOGUES, containing details of Collections; also carefully selected LISTS of choice FLOWER SEEDS and NOVELTIES in FLOWERS and VEGETABLES sent Post Free on application.

Orders amounting to 21s. sent Carriage paid. All packets of Flower Seeds sent Post paid. No Charge for packages.

SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.

Established upwards of a Century.

NEW LARGE

ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

These varieties are grown in Italy specially for us, from large selected bulbs, and can be highly recommended. They attain a much larger size than the ordinary French Globe or Flat Tripoli, or indeed any other kind of Onion, when sown at the ordinary season in March, and are also of a more mild and delicate flavour. To grow them to perfection they should be sown in July and planted out the following spring, 8 or 9 inches apart, on land that has been dug 18 inches deep, and well manured; they will then grow to an enormous size. Our Italian grower has produced Onions of these varieties weighing 4 lb. each. Should any of the bulbs after planting start for seed, it is only necessary to take off the top, the bulb will then continue to grow as usual.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season, the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS, SOUTHWARK STREET, S.E.

WAITE, BURNELL, HUGGINS, & CO.'S

PRICED LIST of GARDEN and FLOWER SEEDS for 1870,

Is now published, and may be had Post Free on application.

NEW AND CHOICE SEEDS.

Early CARACTACUS PEA
McLEAN'S LITTLE GEM PEA
Large flat White ITALIAN TRIPOLI ONION
Large Red ITALIAN TRIPOLI ONION
Hay wood's White QUEEN CELERY
NORBITON GIANT CUCUMBER.
Burnell's BLOOD-RED BEET
Hammond's Improved Hardy White BROCCOLI.
Burnell's Imperial White COS LETTUCE
The Early ROSE POTATO. | Early CLIMAX POTATO.

The above varieties can be recommended with the fullest confidence.

WAITE, BURNELL, HUGGINS, AND CO., SEED MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

THE ROYAL SEEDSMEN. The Advantages of Procuring Seeds Direct from the Growers cannot be Over-estimated. THE ROYAL SEEDSMEN.

CARTER'S

COLLECTIONS OF VEGETABLE SEEDS

(NEW AND UNADULTERATED), AS HARVESTED ON THEIR OWN SEED FARMS.

THESE COLLECTIONS PRODUCE A PLENTIFUL SUPPLY OF CHOICE VEGETABLES ALL THE YEAR ROUND.

COLLECTION of VEGETABLE SEEDS No. 1, price 12s. 6d., packing included, suitable for a small Cottage Garden.

COLLECTION of VEGETABLE SEEDS No. 2, price 21s., packing included, suitable for a Small Garden.

COLLECTION of VEGETABLE SEEDS No. 3, price 42s., packing included, suitable for a Garden of half an acre.

CARTER'S FIRST CROP PEA, the earliest in cultivation, price 2s. per quart.

HUNDREDFOLD PEA, or the COOK'S FAVOURITE (illustrated at page 1280, *Gardeners Chronicle*, 1869), in sealed packets, 7s. 6d. per quart, 4s. per pint.

PATERSON'S BOVINIA, or CATTLE FEEDER POTATO, the heaviest cropper known. Per lb., 1s. 6d.; 7 lb., 9s.; 56 lb., 65s.

COLLECTION of VEGETABLE SEEDS No. 4, price 63s., packing included, suitable for large Gardens.

For detailed Table of these Collections, see CARTER'S SPECIAL ORDER SHEET for 1870, forwarded Gratis and Post Free.

LAXTON'S "ALPHA" PEA, the earliest Wrinkled variety, in sealed packets, 7s. 6d. per half pint.

CARTER'S CHAMPION POTATO, the best for forcing, 5s. per peck.

LAXTON'S SUPREME PEA, described as "a Grand Pea." In sealed packets, half pint, 2s. 6d.; pint, 4s. 6d.; quart, 8s. 6d.

NEW POTATOS, American (imported Seed from the raisers). The Early Rose, 1s. 6d. per lb.; Bresee's Prolific, 3s. per lb.; Climax, 3s. per lb.

For full descriptions, see

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S VADE MECUM FOR 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., 237 AND 238, HIGH HOLBORN, LONDON, W.C.

Vines, Extra Strong Fruiting.

FRANCIS & ARTHUR DICKSON & SONS have several thousand extra strong, thoroughly well-ripened, short-jointed VINES to offer, of the best known kinds, including the new ones of this season. Inspection invited. All who have seen them pronounce them to be as fine a lot of Vines as were ever grown. Price List free by post on application.
The "Upton" Nurseries, Chester.

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.
L. W.'s system of packing saves nearly half the cost of carriage.
Munro Nursery, Sible Hedingham, Essex.

THOMSON'S WHITE LADY DOWNE'S GRAPE.

—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.
Price 21s., 42s., and 63s. each.
THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Golden Champion Grape.

OSBORN AND SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, by the Canes are strong and thoroughly ripened. Immediate orders are respectfully requested. previously formed of it. Price 10s. 6d., 21s., and 30s. each.
Fulham Nursery, London, S.W.

STRONG, Healthy, Fruit-bearing RED GRAPE CURRANTS, 10s. per 100; Raby Castle or Queen Victoria do. (true), 10s. per 100. Strong, Fruit-bearing BLACK CURRANTS, 22s. 6d. per 100. DWARF MOSS ROSES, on own roots, 20s. per 100. A remittance or reference from unknown correspondents.
FIELD BROTHERS, Tarvin Road Nursery, Chester.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.
Samples, with height and price, on application to
W. VIRGO and SON, Wonersh Nursery, Guildford.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Staking, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

New Melon, Scarlet King.

BURGESS AND KENT have much pleasure in offering the above splendid MELON, which is without doubt the best scarlet-fleshed variety in cultivation. It grows to a large size, with a smooth skin and handsome ribbing, and has never been known to crack.
Mr. Hill, of Keele Hall Gardens, says it is one of the handsomest and best flavoured Melons he ever tasted.
Seed, per packet, 2s. 6d. Trade price on application. May be had from Messrs. Hurst & Son, 6, Paternoster Row, London;
" Minier, Nash & Son, 60, Strand, London; or direct from
BURGESS AND KENT, Penkhull Nursery, Stoke-on-Trent.

FOR SALE, Three ORANGE TREES, fine specimens, in fruit. No. 1.—Height, 7 feet; diameter, 5 feet, in tub. No. 2. Height, 5 feet; diameter, 4 feet, in tub. No. 3.—Height, 8 feet; diameter, 5 feet, in tub. For price, apply to
JOHN PILLINGER, The Nursery, Chepstow.

To the Trade.

SPECIAL CHEAP OFFER of
Dwarf-trained Morello and other CHERRIES.
True KENTISH FILBERTS.
Dwarf-trained PEARS.
Standard-trained PEARS, extra fine.
Dwarf-trained GREENGAGES and other PLUMS.
STANDARD PLUMS.
STANDARD ROSES.
ARBUTUS UNEDO, 9 inches to 3 feet, extra fine.
BERBERIS BEALLII, 9 inches to 3 feet.
Double FURZE.
JUNIPERUS SINENSIS, 1 to 3 feet.
PHILLYREA VS, fine and bushy, 2 to 4 feet.
THUJA AUREA, splendid, 21 inches to 3 feet.
" ORIENTALIS ELEGANTISSIMA, fine stock of this splendid variety (Rollisson's), 9 to 20 inches.
YUCCA RECURVA, fine.
Standard SPANISH CHESTNUTS.
" CHICHESTER ELMS, fine, 6 to 10 feet.
BEECH, 8 to 10 feet.
BOX for edging.
CEANOTHUS AZUREA (best variety), and a variety of other good and useful CONIFERÆ, CLIMBERS, &c.
PRICED CATALOGUE free on application.
THOS. BUNYARD AND SONS, Nurserymen, Florists, and Seedsmen, Maidstone, Kent.

Forest, Fruit, and other Trees.

JAMES DICKSON AND SONS' NURSERY STOCK is NOT surpassed in Britain; therefore, they have EVERY CONFIDENCE in soliciting Orders, and inviting intending planters to visit their EXTENSIVE NURSERIES, which can now be reached, on foot, in seven minutes, from the Chester Railway Station, by their new private road from the foot of the Flookersbrook Railway Bridge.
PRICE LISTS on application.
(*Old Established Nursery and Seed Business.*)
"Newton" Nurseries, Chester.

Forest Trees, Fruit Trees, Evergreens,

PLANTS for GAME COVERS, CONIFERS, ROSES, &c.

FRANCIS & ARTHUR DICKSON & SONS invite the attention of Planters to their very large stock of the above, which in extent and variety is not excelled by any Nursery in the Kingdom. Their Nurseries, which are very bleak and exposed, extend over some 150 Acres, and their plants are well known to be unusually hardy, as well as in the most perfect health and condition in every respect; and are found to thrive admirably when removed to other parts of the country.
PRICED CATALOGUES post free upon application. Estimates and special prices for large quantities.
The "Upton" Nurseries and "Old" Established Seed Warehouse, 106, Eastgate Street, Chester.

LIMES and ELMS.
Standard Limes, 8 to 10 feet, with fine straight stems and good heads, 15s. per 100; 22s. per dozen.
Chichester and Hertfordshire Elms, straight and stout, 10 to 12 feet, 100s. per 100; 15s. per dozen. 12 to 14 feet, 125s. per 100; 18s. per dozen. Price to the Trade on application to
EWING AND CHILD, The Royal Norfolk Nurseries, Norwich.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do. of APPLE, 170 do. of PLUM, 100 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 5 to 6 feet high; also very fine Dwarf-trained Trees of all kinds, of superior growth, not offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12. 6d. in stamps. A printed List or Index sent gratis.
J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety
CATALOGUE free on application.

Forest Trees, Fruit Trees, Evergreens, &c.

CHIVAS AND WEAVER respectfully invite the especial attention of Planters to their very extensive, healthy, and well-grown Stock of the above.
Their Nurseries being the most exposed in the North-Western Counties, and free from all artificial shelter, render the safe removal of plants almost a certainty.
PRICED CATALOGUES post free on application; estimates and special prices for large quantities.
The Eaton Road Nurseries having been largely extended, an entrance is now obtained immediately on reaching Queen's Park by the suspension Bridge.
Eaton Road Nurseries, and 108, Eastgate Street, Chester.

To Planters.

LARCH, SPRUCE, and OAK, 2 to 3 feet, fine; AUSTRIAN PINE, SCOTCH FIR, and BIRCH, 1½ to 2 feet, fine; THORN QUICKS, 2-yr. transplanted. Extensive stock. Prices on application to
JOSEPH TREMBLE AND SONS, Nurserymen, &c., Penrith.

Larch Plants Wanted.

WANTED, 20,000 LARCH PLANTS, from 18 to 24 inches high, either delivered at Uckfield Station, on the Brighton Line Apply, stating price, to
A. DONOVAN, Esq., Framfield Place, Sussex.

TRANSPLANTED SYCAMORE, 3 to 4 feet, and 4 to 5 feet, 25s. per 1000; SCOTCH, twice transplanted, 2 to 3 feet, 30s.; 3 to 4 feet, 40s. per 1000; ENGLISH OAK, 9 to 18 in., 3s. 6d.; 1 to 2 feet, 5s. per 100. Also a large quantity of transplanted LAURELS, all sizes. WANTED, small transplanted PINUS AUSTRIACA and LARICIO.
R. FRYER, Nurseryman, Bampton, Devon.

SYCAMORES or PLANES, 7 to 9 feet, 3s. per dozen.
LABURNUMS, 6 to 7 feet, 2s. per dozen.
ASH and HORSE CHESTNUT, 3 to 4 feet, 30s. per 1000.
OAKS, 2 to 3 feet, 5s. per 100. BEECH, 1½ foot, 12s. per 1000.
LAURELS, 9 to 15 inches, 6s. per 100; 15 to 18 inches, 7s. per 100.
PINUS AUSTRIACA and EXCELSA, 3 feet, 4s. per dozen.
ROSES, 2 feet and upwards, 9s. per dozen; less than 2 feet, 6s. per doz.
Fine CUCUMBER SEED, 2s. per lb.; 6d. per oz.
For cash only.
A. WILKIN, Tiptree, Kelvedon, Essex.

T. THORNTON begs to intimate to the Trade that the Stock offered below cannot be surpassed for health and fibrous roots. All been grown in maiden soil, and the stock, very extensive, offered low prices :—

Pinus austriaca, 9 to 15 inches	Spruce Fir, 1 to 2, and 2 to 2½ feet
P. Laricio, 9 to 15 inches	Laurel, 1 to 2 feet
P. rigida, 2 to 3 feet	Turkey Oak, 1 to 2 feet
P. taurica, 1 to 1½ foot	Cryptomeria japonica, 12 to 15 inches
P. Pinaster, 2 to 3, and 3 to 4 feet	Chinese Arbor-vitæ, 9 to 15 inches
Scotch, 9 to 15 inches	

THOMAS THORNTON, Heatherside, Bagshot, Surrey.

Surplus Stock, very cheap.

W. ABRAHAM, Fort Prospect Nursery, Limerick, offers ENGLISH OAKS, from drills, 3-yr., 1 to 2 feet, 3s. per 1000; HORSE CHESTNUT, from drills, 3-yr., 2 to 3 feet, 15s. per 1000; do. transplanted, 4 to 6 feet, 40s.; LAURUSTINUS, very fine, from cuttings, 40s. per 1000; do. transplanted, bushy, 1 to 2 feet, 25s. per 100; Variegated BOX, 2 to 3 feet, 25s. per 100; American and Chinese ARBOR VITÆ, 3 to 4 feet, per 100 Scotch JUNIPER, 3 to 5 feet, 25s. per 100; also ARABIS LUCIDA VARIEGATA, in pots, 4s. per dozen; 25s. per 100. Terms, 6 months nett, or 2½ per cent. discount for prompt cash.
Through rates to London, Liverpool, Bristol, and Glasgow.

The Northampton Nurseries.

JOHN PERKINS, SEN., begs to offer the following, which are all stout and well-rooted :—

Fine Larch Fir, 4 to 6 feet, transplanted 1868.

Scotch Fir, 2 to 3 feet.	Berberis aquifolia, 1 to 2½ feet.
Laurels, 2½ to 2, and 2 to 3 feet.	Green Box, 1½ to 2, and 2 to 3 feet

Strong Whitethorn Quick.

J. P having a large Stock of the above, they will be offered at very low prices, which on application to
52, Market Square, Northampton.

CHARLES NOBLE requests the attention of large buyers to the following, which he requires cleared before Spring :—

ROSES.
50,000 Dwarf, Hybrid-Perpetual, and Tea-scented.
A quantity of Standard and Half Standards.
75,000 Manetti Stocks, fine as usual.
FRUIT TREES.
Dwarf-trained Peaches, Plums, and Pears.
Maiden Peaches and Nectarines.
" Pears and Apples.
" Cherry and Plum.
" 2 and 3-yr. PYRAMID APPLES and PEARS.
GOOSEBERRIES, CURRANTS, FILBERTS, and COB NUTS.
TREES and SHRUBS.
English Oaks, 2 to 5 feet.
" " 3 years in drills.
Spruce Fir, 2 to 5 feet.
Laurel, 1 to 3 feet; common and Colchicum.
Birch, 5 to 7 feet
Poplars, 5 to 12 feet.
FOR GAME COVER.
Spiræa callosa
Deutzia crenata flore pleno.
Spartium junceum.
Berberis Darwinii.
" stolosa.
" aquifolia
" japonica.
Skimmia japonica.
Erica carnea and herbacea.
" Menziesii.
Rhododendron ponticum.
" hybrid seedlings.
All sizes, from 1 to 3 feet, by the dozen, 100, or 1000
CATALOGUES sent on application. Special quotations for large quantities, and all will be sold at a heavy discount for cash.
Bagshot, January 6.

Wandsworth Common Nursery.

Ten minutes' walk from Clapham Junction.

MR. ROBERT NEAL begs to invite the attention of the Nobility, Gentry, and the Trade in general to his very extensive and healthy stock of PLANTS, consisting of a large collection of Standard, Pyramidal, and Dwarf-trained FRUIT TREES, of all sizes; Standard and Dwarf ROSES, Coniferous and other Evergreens, Forest and Ornamental TREES and SHRUBS; also a large collection of RHODODENDRONS, all the very best in cultivation, and are of endless variety, from deep crimson and dark purple (every shade), up to white, and Hybrid Seedlings, and all the leading kinds of Scarlet, both Standard and Dwarf, set with Bloom-buds, which he can supply in large quantities at a very low price
CATALOGUE will be sent on application

To Planters.

JOHN NELSON has a splendid stock of the following Trees, which he will supply at greatly reduced prices to effect a clearance :—
ENGLISH OAK, in drills, 12 to 18 inches; transplanted, 2 to 3 feet.
ASH, 3 to 4 ft., transplanted | HORNBEAM, 3 to 4 ft., transplanted
Standard ROSES, of all the best kinds.
MANETTI STOCKS. Strong THORN QUICK
MYATT'S ASHLEAF POTATOS.
Terms cash from unknown Correspondents, or satisfactory reference. Prices on application.
JOHN NELSON, St Michael's Hill Nursery, Bristol.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s.; per 1000, £3.

100	Distinct	.. .. ..	8s.
100	" "	25 sorts	12s.
100	" "	50 sorts	20s.

All in good flowering bulbs.
LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

THE GOLDEN VARIEGATED WELLINGTONIA.

First-class Certificate from Royal Horticultural Society of England, 1866.
First-class Certificate from Royal Horticultural Society of Ireland, 1867.
First-class Certificate at Manchester International Exhibition, 1867.
First class Certificate at Edinburgh International Exhibition, 1869.
First-class Medal at Hamburgh International Exhibition, 1869.
Plants have been distributed through France, Austria, Prussia, Switzerland, Belgium, Holland, &c.
This Season patronised by the leading Nobility of this kingdom, from whom numerous testimonials have been received.
"It is very beautiful."—Editor of *Gardeners' Chronicle*.
"A pyramid of superbly coloured variegation."—Editor of *Gardeners' Magazine*.
"Never the distinctive characters of a variety seemed fixed, they are in this splendid acquisition."—Editor of *Irish Farmers' Gazette*.
"Brilliant compared with Biota aurea—a pillar of beauty."—*Mr. M'Dowall, Woodcock, Co. Kilkenny*; &c., &c.
Illustrated Photographs of the parent tree, by Day & Son, Limited, on superior cards, to by 8 inches, very faithful in outline, but deficient in representing the glorious colour of the original These are sent free by post for 25 stamps, and one sent to each purchaser.
PRICES.—First Size, extra choice, 24 to 27 inches, £5 5s.; Second Size, very fine, 15 to 18 inches, £2 2s.; Third Size, stout and fine, 12 to 14 inches, £1 1s.; Fourth Size, nice little plants, 8 to 10 inches, 10s. 6d.
R. HARTLAND, The Lough Nurseries, Cork, January 19.

To the Trade.

CATTELL'S ECLIPSE BROCCOLI, 4s. per lb.; THE HORTICULTURAL SUPERB, 3s. per lb. The best and latest Broccolis grown.
RINGLEADER PEAS, true, 10s. per bushel, 2s. per quarter.
WM. HORLEY, Toddington, Beds

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources in this country, are genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, Surrey, S.W.

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SEEDS DIRECT FROM THE GROWERS, THE

BEST MEANS OF PREVENTING DISAPPOINTMENT.

SEEDSMEN TO THE QUEEN.

SUTTONS' COMPLETE COLLECTIONS for the FLOWER and KITCHEN GARDEN, carriage free.

FOR THE KITCHEN GARDEN.

No. 1 COLLECTION, for a large Garden, Carriage Free	£3 3 0
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Particulars of the above Collections may be had on application, and any articles not required will be excluded, and others included according to the wish of the purchaser.
Priced LISTS of Garden Seeds, Grass Seeds, and Farm Seeds, post free on application.
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds. Carriage free.

Peas—The Earliest, 1 quart.	Celery—Fine solid white, pkt.
Princess Royal, 1 pint	Fine Giant Red, packet.
Sangsters' No. 1, 1 pint.	Cress—Australian, 1 oz.
Prizetaker, 1 pint.	Plain, 4 oz.
Advancer, 1 pint	Cucumber—Smith's fine Frame,
Blue Scimetar, 1 pint	Stockwood Ridge, packet.
Veitch's Perfection, 1 pint.	Endive—French Curled, packet.
Harrison's Glory, 1 pint.	Leek—Musselburgh, packet.
Beans—Taylor's Imperial Windsor, 1 pint.	Lettuce — Champion Cabbage, packet.
Early Longpod, 1 pint.	Paris White Cos, packet.
Johnson's Wonderful, 1 pint.	Bath Cos, packet.
Green Windsor, 1 pint.	Drumhead, packet.
Royal Cluster, ½ pint.	Mustard—White, 4 oz.
French Dwarf, 1 pint	Melon—Choice kind, packet.
Scarlet Runners, 1 pint.	Onion—Reading or Spanish, 1 oz.
Beet—Nuttings' fine Red, ½ oz.	James's Keeping, 1 oz.
Borecole—New Hearting, packet.	Blood Red, ½ oz.
Scotch Curled, packet.	Silver Skinned, ½ oz.
Brussels Sprouts—finest, packet.	Parsnip—Hollow Crowned, 1 oz.
Broccoli—Early white, packet.	Parsley—Fine Garnishing, per pkt.
Purple Sprouting, packet.	Radish—Wood's Early Frame, 2 oz.
Walcheren, packet.	Early Scarlet, 2 oz.
Worcester, late white, packet.	Turnip, mixed, 2 oz.
Cabbage—Early Nonpareil, pkt.	Spinach—Summer, ½ pint.
Wortster Incomparable, pkt.	Winter, 1 pint.
Wheeler's Imperial, packet.	Turnip—Early Six-Weeks, 1 oz.
Red Pickling, packet.	Early Green-top, 1 oz.
Curled Savoy, packet.	Orange Jelly, 1 oz
Carrot—Early Scarlet Horn, 1 oz	Tomato—Large Red, packet.
James's Intermediate, 1 oz.	Vegetable Marrow, packet.
Imperial Altringham, 1 oz	Pot Herbs, 4 packets.
Cauliflower—Early London, pkt	

For larger and smaller Collections and prices of other Garden Seeds, see DESCRIPTIVE LIST, free on application to
RICHARD SMITH, Seed Merchant, Worcester

HARDY ORNAMENTAL TREES AND SHRUBS.

OSBORN & SON'S

NEW PRICED CATALOGUE OF THE ABOVE,

CONTAINING UPWARDS OF FIFTEEN HUNDRED DISTINCT SPECIES AND VARIETIES,

Accurately named, with (in most cases) the authorities for the same affixed.

MAY NOW BE HAD ON APPLICATION.

THE NURSERIES, FULHAM, LONDON, S.W.

SUTTON'S HOME-GROWN SEEDS
A FIRST PRIZE
SILVER MEDAL, PARIS, 1867.

THE FORWARDEST PEA KNOWN
IS
SUTTONS' RINGLEADER.

PRICE—2s. per Quart, cheaper by the Peck or Bushel.

SUTTON'S HOME-GROWN SEEDS
A FIRST PRIZE
SILVER MEDAL, PARIS, 1867.

In 1868 the Royal Horticultural Society carefully tested the merits of the leading kinds of Early Peas, and in that report, which appeared in the GARDENERS' CHRONICLE, June 27, the following brief but emphatic statement appeared:—

"THE EARLIEST OF ALL WAS RINGLEADER."

UNSOLICITED
TESTIMONIALS
In favour of SUTTONS' Ringleader Pea.

May 20.—From Mr. H. BEAM, *Gr. to* Sir Charles Pressley, *Fern Hill, Farnborough.*

"I gathered to-day a good dish of your far-famed Ringleader Pea. I have grown it now three seasons in succession, and never began gathering later than May 24."

May 27.—From Mr. T. HOLLOWAY, *Gr. to* Lord Grantley, *Wonersh.*

"I picked your Ringleader Pea a week ago from this day."

May 25.—From Capt. C. W. FORD, *Kelston Lodge, Kelston, Bath.*

"I sowed your Ringleader Pea on the 21st January, and picked the first dish to-day, this being much earlier than I have ever done with any other Pea."

July 17.—From Mr. JOSEPH MERRICK, *The Gardens, Le Court, Petersfield.*

"Your Ringleader Pea this year was the most prolific early Pea I have ever grown, and I was very pleased with it."

April 2.—From J. BARTON AKLAND, Esq., *N. Peel, Rangitata, New Zealand.*

"You may perhaps like to know of the success of your Ringleader Pea in the southern hemisphere. I had it from you last year, and picked Peas on November 11, which is 14 days earlier than I ever picked before. My residence is 1000 feet above the sea level, or they would have been earlier still. I would only add that all the seeds I have received from you at various times have been most satisfactory."

UNSOLICITED
TESTIMONIALS
In favour of SUTTONS' Ringleader Pea.

June 12.—From Mr. A. MAXIM, *Gr., Purley Park.*

"Your Ringleader Pea deserves all its fame. I sowed the first lot on the 2d of February, and gathered on the 4th June. I could have gathered four days earlier had I wished, from well-filled pods. I also made another sowing on the 22d February, by the side of your valuable Champion Pea, and I gathered from Ringleader June the 10th; the Champion will be about six days after, all sown on a south border. I must say great praise is due to you for bringing out such a distinct early Pea as the Ringleader."

July 10.—From H. WOOLLETT, Esq., *Bexhill, Sussex.*

"Your Ringleader Pea is the first in this district."

January 3.—From Mr. J. STRADLING, *at* Mrs. Tanner's, *The Rwalls, Seaton, Devon.*

"Your Ringleader Pea is decidedly the best early Pea I have ever grown."

January 18.—From Mr. B. LEWIS, *Gr., Brecon Road, Merthyr Tydvil.*

"I consider Suttons' Ringleader Pea to be first-rate in every respect. In the year 1865 I sowed it in the last week in April, and gathered a nice dish in the second week in June, which was only about six weeks from the time of sowing. I think they cannot be surpassed."

August 17.—From Mr. JOHN WILLIAMS, *Gr. to* G. H. Horsfall, Esq., *Estherdine Hall, Ruabon.*

"Your Ringleader Pea is the finest and earliest Pea I have ever grown."

SUTTONS' RINGLEADER PEA, the forwardest known and best for late sowing.

June 12.—From Mr. CHARLES TURNER, *The Royal Nurseries, Slough.*

"We gathered a good dish of Suttons' Ringleader on May 28. These were sown and grown in the open ground, without any protection. Six rows of Daniel O'Rourke were sown at the same time, from which our first gathering was on June 8. Ringleader has also the advantage of being dwarfer; and I do not hesitate to pronounce it the best early Pea that has been grown here. No other Pea has been gathered about here at the date mentioned."

From Mr. F. HAWTHORN, *Gr. to* P. Kemp, Esq., *Goldwell House.*

"Late Peas are indeed a luxury. I sowed Suttons' Ringleader the second week in July, and gathered one peck of well-filled pods the second week in September. I sowed two rows a fortnight later, and gathered Peas on October 6—a really good dish—much to the satisfaction of my employers. I have to-day (October 13) picked another good dish of Peas from plants which show no appearance of mildew."

SUTTONS' RINGLEADER PEA is included in all MESSRS. SUTTONS' COLLECTIONS of VEGETABLE SEEDS for ONE YEAR'S SUPPLY. For particulars of which, with LIST of CHOICE NOVELTIES for the FLOWER and KITCHEN GARDEN, see

SUTTONS' AMATEUR'S GUIDE FOR 1870,
Price One Shilling. Gratis to Customers.

SUTTONS' ABRIDGED LIST FOR 1870,
Gratis and Post Free.

ALL GOODS CARRIAGE FREE (except very small parcels). Five per cent. allowed for cash payments. Special quotations given for large quantities.

SUTTON AND SONS, SEEDSMEN TO THE QUEEN, READING, BERKS.

Seeds.

CHARLES TURNER'S CATALOGUE of KITCHEN GARDEN, FARM and FLOWER SEEDS is now ready, and may be had on application. This List contains only such varieties as may be depended on, after trials and comparisons.
The Royal Nurseries, Slough.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

Home-grown Agricultural and Garden Seeds.

H. AND F. SHARPE'S WHOLESALE CATALOGUE of HOME-GROWN SEEDS is now ready. The prices are very low, and the quality of the Seeds very fine.
Seed Growing Establishment, Wisbech.

Established 1806.

T. HANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application
Seed Warehouse, 24, Lockburn Street, Edinburgh.
Nurseries, Brunstain Glen, Musselburgh.

Seed and Nursery Establishment, Dumfries.
ESTABLISHED 1787

THOMAS KENNEDY AND CO., Dumfries, N.B., will be glad to send Copies of their DESCRIPTIVE PRICED CATALOGUES of Vegetable and Flower Seeds, &c., Farm Seeds, &c., and Forest, Fruit, and Ornamental Trees, &c., to any address, post free, on application

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Stems, Use, Time of Flowering, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success.
RICHARD SMITH, Seed Merchant, Worcester.

New Catalogues.

DOWNIE, LAIRD, AND LAING, Frederick Street, Edinburgh, and Stanstead Park, Forest Hill, London, beg to intimate that their DESCRIPTIVE PRICED CATALOGUES of Garden, Flower, and Agricultural Seeds, Gladiolus, Florist Flowers, and New Plants are now ready, and may be had free on application.

Correction of Catalogue.

CHARLES NOBLE regrets that, by a Printer's Mistake in his TRADE CATALOGUE just issued, he is made to offer certain kinds of VIOLETS. All will please understand the prices are intended to apply only to those kinds with an asterisk attached;—these are coming into fine bloom, and orders are solicited.
—Bagshot, Jan. 20

Great Eastern Seed Establishment.

DAVID GOLD McKAY'S Illustrated CATALOGUE of GARDEN and FIELD SEEDS, embracing the most extensive Collection to be met with out of London, both of Home and Continental origin, including a newly arranged LIST of GLADIOLI, is now ready, free by post on application.
Seed Warehouse, Market Hill; Nursery and Seed Grounds, Springfield, and Great Cornard, Sudbury, Suffolk

VEGETABLE and FLOWER SEEDS.—Select and comprehensive LIST of all the best varieties in cultivation, now ready, post free on application
MITCHELL, ARNOTT, AND CO., Nurserymen and Seed Merchants, Edinburgh; and 59, Mark Lane, London

EAST LOTHIAN INTERMEDIATE STOCKS. February is the best month for sowing these celebrated stocks, unrivalled both for flower gardening and for pot culture. May be had true (scarlet, white and purple), in packets, 1s., 2s. 6d., and 5s. each, from
THOMAS METHVEN, 18, Princes Street, Edinburgh.

A GENTLEMAN, breaking up his Establishment, has to DISPOSE OF a number of AZALEAS, CAMELLIAS, Pot VINES, STRAWBERRY PLANTS, Orchard-house TREES, and GREENHOUSE PLANTS. For prices and size of plants apply to G. A., Post Office, Ludgershall, Wilts.

To the Trade.—Continental Flower Seeds, &c.

GEO. MACINTOSH (Agent to F. W. WENDEL, Seed Grower, &c., Erfurt, Prussia) begs to announce that he is now prepared to receive orders for the above. CATALOGUES free on application. High Road, Hammersmith, London, W.

Warranted German Flower Seeds.

MESSRS. BOETTNER BROTHER'S (SEED Growers, Gruissen, near Erfurt, Germany), new PRICE LIST of ASTERS, STOCKS, &c., genuine and first-class quality, can be had gratis and post free from their London Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nurseries, Sidcup, Kent.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

Lilium auratum.

WM. PAUL has to offer a magnificent lot of the above, Dutch-grown roots, at 2s. 6d., 3s. 6d., and 5s. each; 24s., 36s., and 50s. per dozen; a few extra large roots, 7s. 6d. each. The usual discount to the Trade off the dozen rates when ordered by the dozen.
PAUL'S Nurseries, Waltham Cross, London, N

Lilium auratum.

MR. LEUTSCHEL, Colchester, Importer of Japanese Orchids, Bulbs, Seeds, &c., has just received a small Consignment, in good order, of very fine LILIUM AURATUM. Measurements taken round the sides, 7 to 11½ inches; round base and crown, 8 to 12 inches. Price 5s. 6d. and upwards. The Collector reports:—"These are the largest I have ever seen.—extra large ones."

TRANSPLANTED OAK, very stout, 1½ to 2 ft., 13s.; do., 2 to 3 feet, 17s. 6d. per 1000 BERBERIS AQUIFOLIA, 9 to 12 inches, 27s. 6d.; 12 to 20 inches, 35s. per 1000, 3s. and 4s. per 100. Samples on application to
J. J. MARRIOTT, Highfield Nursery, Matlock, Derbyshire.

Beta chilensis.

BUTLER, MCCULLOCH, AND CO. have great pleasure in being able to offer SEED of the true variety of the above magnificent foliage plant, which is fully described in their SPRING CATALOGUE, sent post free on application.
South Row, Covent Garden Market, W.C.
Established upwards of a Century

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and show varieties, strong and ready, at the following low prices:—100 plants, distinct sorts, for 50s.; 50 plants for 30s.; or 25 plants, distinct sorts, for 20s., hamper and package included.
Crown Nursery, Reading.

Special Offer.—Madame Lemoine.

WILLIAM BADMAN offers strong Plants of this most beautiful of Double Pelargoniums, in single pots, 6s. per dozen. LORD DERBY, finest Pelargonium grown, 4s. per dozen. Package included Terms cash
Cemetery Nursery, Gravesend.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1; 25 Pairs ditto, for 6d.; 12 Pairs ROOTED, 10s. 6d.; 6 Pairs ditto, JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
Brunswick Nursery, Stoke Newington, N

Notice.

PURCHASERS of LARGE QUANTITIES of GARDEN and FARM SEEDS will be supplied liberally by SUTTON AND SONS.
For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

RICHARD SMITH'S LIST of all the EVERGREEN FIR TRIBE suitable for Britain, giving size, price, popular and botanical names, derivations, description, form, colour, foliage, growth, timber, use in arts, native country and size there, situation, soil, and other information, with copious Index of their synonymes. Free by post for six postage stamps.

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants.
60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Paul's Rose Catalogue.

"A very complete and able catalogue."—*Floral World.*

WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. The stock of Plants is large and excellent.
Paul's Nurseries, Waltham Cross, London, N

The Gardeners' Chronicle

SATURDAY, JANUARY 29, 1870.

MEETING FOR THE ENSUING WEEK
THURSDAY, Feb 3—Linnean .. .. 8 P.M.

HORTICULTURE has contributed more than any other branch of natural science to our knowledge of the EFFECTS of CLIMATE upon LIFE. It is natural that it should have done so. For every animal that has been removed from its native home, and subjected to a new climate and phase of life, thousands of plants have been so treated, and as plants are more manageable and more easily observed than animals, it was inevitable that more facts bearing on the influence of climate on life should be accumulated by the observers of the vegetable kingdom, provided only that they were as competent, as diligent, and as numerous as the observers of the animal kingdom,—qualifications which, we presume, no one, at any rate no reader of our journal, will dispute that they possess.

It is not therefore as depreciating the merits of what has been done, nor as complaining that more has not been done, that we invite our workers to additional exertion in this branch of scientific labour. It is that their very diligence in the past, and the magnitude of the material which they have accumulated, has rendered the acquisition of more information necessary to enable us to understand that which we have. The special point to which we at present desire to direct the attention of our readers, and more particularly those in foreign lands, relates to what we may call reciprocity in climate. At first sight one might think it safe to assume that wherever plants of one country thrive in another, those of the latter will also thrive in the former. Generally speaking they do. But it is not a rule. Sometimes the reciprocity fails—and it is especially where it does so that information regarding the circumstances attending the condition of the plant, both in its old and its new country, is wanted. For it is plain that there must be identity, or close similarity, in the apparent conditions of life, before we can look for reciprocity in result. It is no want of reciprocity on the part of America to England for example, if in return for supplying her with English plants which thrive, we find that some desert plant from her sandy, waterless wastes, does not thrive here when planted in a bog, or that a sea-side plant does not thrive on the top of a highland mountain. But what we want to know is, why, when the conditions are apparently the same in both countries, the plants do not always equally thrive? Of course we know that there must be some important difference in condition—the very fact of non-thriving implies as much; but although it implies as much, it does not tell us what the difference of condition is, and it is from a study of these exceptional cases that we look to learn not only the cause which has prevented reciprocity, but also indirectly to learn something of the nature of the subtle influences which go to make up "condition of life," and of the still more mysterious element of life on which the individual "constitution" of organic beings depends.

If, for instance, we compare the north and middle of the United States with England, we find some of these anomalies. Although the climate is so nearly the same that most of the plants of the one country thrive in the other, a certain number do not. The American Lime thrives in England, but the English Lime does not in the United States. The Canada Poplar is common and thriving in this country, but the Lombardy Poplar, although long established in America, is now dying ont. There are plenty of large old trees, but they are all going back; at their best, and in the most leafy season of the year, they are now no better clothed than ours are in the month of November, when half their leaves are withered and gone. On the converse side, we may instance our Scotch Fir and Spruce, which do well in America, but the American Pinus resinosa and Balm of Gilead are unsatisfactory in England; the former never makes much way, and the latter, although healthy and thriving when young, never lives longer than about 30 years.

Of course for these and all other unusual cases we have an explanation ready. Who ever caught a horticulturist without his answer? As the old saying has it—for every hole we have a pin.

As regards the Lime its failure is accounted for by a beetle, Saperda candida, which attacks its roots; and which, after the tree had been well established, has nearly exterminated it. It is true that beetles do not generally attack healthy trees. Their mission is rather to remove those which are moribund, and likely soon to decay, and it is rarely that they leave native plants for exotic species. The latter have very generally an immunity from insect attacks. The Lombardy Poplar, again, is going, because only one sex of the tree was originally introduced; and all the trees in the country are from cuttings of that stock, and they are now all dying because the stock is worn out. But this ingenious explanation is open to the answer that the truth of the theory that all the cuttings, buddings, or other reproduction of a tree (other than by seed), die about the same time, is not yet proved or admitted; and if it were, it seems strange that, knowing or believing it, and with plenty of nurserymen in every town of America, and fortnightly communication with Europe, plenty of seeds of the Lombardy Poplar should not long since have been imported into that country. The short life of the Balm of Gilead in Europe again is disposed of by the assertion that the tree is naturally shortlived, and that it is not more so in England than America.

All these explanations may be true, but it would be satisfactory not to have to take them on trust and *ex cathedrâ*, but to have them dealt with, as all statements on matters of science should be—held to be wrong until proved to be right. Every statement, assertion, explanation, or theory, ought to be treated as disputed, and all imaginable objections started to it, and fairly met and discussed. Most of them must be capable of instant solution by those on the spot. In Nova Scotia every one must know whether the Balm of Gilead is shortlived or not. At New York every botanist can tell whether all the Lombardy Poplars are of the same sex, and every nurseryman can say whether the young plants of it are raised from seed from Europe, or from cuttings from the old ones. At Philadelphia, anyone who sees a dying English Lime (if any remain to die), should be able to say whether the tree is sound at heart or not.

We invite observation to such facts. If horticulturists, and more especially the nurserymen in Canada, the United States, both east and west of the Rocky Mountains, Chili, Australia, New Zealand, and any other country which has supplied England with hardy introductions, would only give us a list of the English plants they have introduced, or tried to introduce, in their respective countries, with the amount of success which has attended their efforts, we should at once have a great amount of valuable information. Nay, if they would only note their failures, which would not take much time to do, even that would be of importance. We trust some may be induced to do so; and we are sure none who do will repent the trouble.

—— A COPY of the balance-sheet of the GARDENERS' ROYAL BENEVOLENT INSTITUTION for 1869 has been placed in our hands, from which it appears that after paying in pensions nearly £800 during the year, and after purchasing £350 in Three per Cent. Consols, and after the payment of all necessary expenses, there still remains an available balance to be carried over. The expenses of management are moderate (save apparently in the item of postage)—a fact which, we fear, does not show much for the promptitude of the subscribers. Under these circumstances we are glad to find that all four of the candidates at the recent election were placed on the pension list. At the recent annual meeting ROBERT WRENCH, Esq., was re-elected as treasurer; H. W. PEEK, Esq., M.P., as a vice-president, in the room of the late Sir Wentworth DILKE, Bart.; Messrs. THOMAS OLDEN and W. HUNT as

trustees in the room of the late Mr. JAMES VEITCH, and of Mr. J. A. HENDERSON resigned. Messrs. EDMONDS, LEE, and FORSYTH, were re-elected as auditors; while the committee received an accession of new blood by the election as members of Messrs. JOHN LEE, ROBERT MARNOCK, E. J. BEALE, A. DICKSON, THOMAS MOORE, and CHARLES PILCHER, in the room of others retiring by rotation; while Mr. B. S. WILLIAMS fills the vacancy caused by the death of the late Mr. W. BARNES. Messrs. JAMES GRAY, W. B. BOOTH, J. E. KOCH, JOHN GREEN, and T. TAYLOR, were elected arbitrators, and Mr. E. R. CUTLER was re-elected as secretary. The Earl of DERBY has consented to preside at the anniversary dinner, to be held in the summer of the present year. We may add, that there are at present on the pension list 27 men, receiving £10 per annum, and 27 women, receiving £12 per annum.

—— The following Circular, containing some interesting information, has been distributed among the Fellows of the ROYAL HORTICULTURAL SOCIETY:—

"The Council have the satisfaction of announcing to the Fellows of the Society that arrangements have been made with Her Majesty's Commissioners for the Exhibition of 1871 (in connection with the proposed annual International Exhibitions to be held by the Commission) for the completion of the gardens and arcades, without entailing any liability on the Society. The Commissioners will also construct conservatories on the upper arcades, by which the first floor of their permanent exhibition buildings to be erected on the annexes adjoining the central arcades will be put into direct communication with the Society's conservatory. These works will be completed before May 1, 1871, the date fixed for the first of the series of International Exhibitions. The exhibitions will consist solely of objects which have some special interest or recommendation; and while pictures and other attractive works of Art will form part of each exhibition, selected manufactured objects, of a few classes only, will be admitted in any one of the series, so as to extend this branch of the exhibition over a sufficient number of years to allow time for improvement, before the same class of objects is again brought forward. [Information as to the nature of exhibitions has been given by us at p. 837, 1869.] Whilst these exhibitions will be held in connection with the gardens of the Society, which will participate in any profits that may arise from the exhibitions, not only will the present rights and privileges of the Fellows be maintained, but considerable advantages over the public, as respects admission to the exhibition itself, will be given to them. Another subject in which the Fellows are interested, and may look for information from the Council, is the progress of the Royal Albert Hall. By means of it the Society hopes to obtain an additional access to the garden, and better accommodation for their shows, meetings, library, reading-room, &c., and they cannot but feel that the prosperity of the garden, and to some extent that of the Society itself, must be materially influenced by the success which may attend this and the other undertakings which Her Majesty's Commissioners have entered upon on their estate. The Council have therefore pleasure in informing the Fellows that the building is proceeding with rapidity and success, and that there is no doubt that it will be finished and ready for opening by the same time as the new exhibiton buildings in the annexes."

All this sounds promising for the Fellows of the Society. We may, however, express a hope that steps will be taken to render the Lindley Library available before May, 1871. We do not know whether it is the Society or the Trustees who are answerable for the delay. In any case it is not creditable that the library should remain in its present condition.

—— Two prizes, of the value of £10 and £5 respectively, have been offered by Major TREVOR CLARKE to the exhibitor (whether amateur or nurseryman) who may, during the year 1871, obtain the largest number of marks for specimen plants illustrative of the phenomena of HYBRIDISATION shown at the meetings of the Royal Horticultural Society. In awarding the marks, we are informed that judges will be instructed to consider the following points:—1. Crosses hitherto unattempted. 2. Results of great horticultural excellence. 3. Results of great botanical or physiological interest, as for instance between supposed genera or distant species. 4. Results well illustrating the effects of hybridisation. 5. Plants raised by the exhibitor. 6. Difficult or supposed impossible unions. 7. The largest meritorious exhibitor of hybrid plants during the season of 1870. The plants should, if possible, be accompanied by both parents, or at least one. Plants may be shown as cut specimens where removal of the whole plant is impracticable. The plants may be shown as cut specimens in water.

—— In reference to the proposed GLADIOLUS SHOW next summer, we are requested to state that it was arranged at the Floral Meeting on January 19, amongst the subscribers to the prize fund for the exhibition on August 17, that a meeting should be held at South Kensington on February 16, at 1 P.M., at which the subscribers and others who may wish to support the Show by their contributions are invited to attend, in order to consider the final arrangements, and the number of prizes to be offered.

—— We had occasion last week to mention that the METEOROLOGICAL REGISTER kept for so many years at CHISWICK had been placed in the hands of Mr. GLAISHER for revision, and that the same distinguished physicist had also consented to reorganise the system of observations carried on in the garden, and to ensure the accuracy of the new instruments to be supplied to the Society. We have now the pleasure to state that, pending the necessary alterations, Mr. GLAISHER has kindly consented to furnish us with a record of the meteorological phenomena for the week, as observed at Blackheath, and also a summary of the state of the weather in various parts of Britain, and which will, we hope, be of service to our readers. We shall shortly advert to the whole subject of the relations of meteorology to vegetation, and in the meantime, lest any should regret the omission from our columns, even temporarily, of the Chiswick record, we may say that only a sense of the necessity of the omission would have induced us to break the continuity of the records which have for so long a period been made in our pages.

—— Subjoined is the result of GARDENERS' EXAMINATIONS, held under the auspices of the Royal Horticultural Society, December 7 and 8, 1869:—

Name.	Fruit and Vegetable Culture.		Floriculture.	
	Cert.	Marks.	Cert.	Marks.
1. Charles Burley, R. H. S., Chiswick	2	700	2	800
2. George Downton, ditto ..	1	1140	1	990
3. George Haskins, ditto .	3	430	3	550
4. Alfred Jones, ditto .. .	2	750	3	300
*5. Alfred Bradley, Eltham ..	2	600	1	925
6. Charles Boswell, Denbies, Dorking	2	840	1	965
7. W. Read, Royal Gardens, Kew	2	670	1	935
8. Walter Davis, New Hampton	1	910	1	1050
9. Robert Mearns, Royal Gardens, Kew..		290	3	580
10. George Payne, ditto .	2	600	2	760
11. R. J. Lynch, ditto	1	1000	1	1180

* This candidate was examined for the Associateship

—— Among early spring flowers, ANEMONE BLANDA deserves notice. This pretty plant, which blows in this country some months before Anemone appenina, is clearly a variety of that species. A good account of it will be found in BOISSIER'S "Flora Orientalis." This author considers it distinct, founding his opinion upon the younger carpels in the Italian plant being surmounted by a style of equal length with themselves, in the radical leaves being broader and more divided, their outline being triangular and not roundish, while the segments have a longer petiole; the sepals, moreover, are covered with more or less appressed down. The divergence from these characters is not sufficient to justify us in considering the plant as more than a marked variety, which does not, however, seem to be so precocious in its native localities as it is when in cultivation. It occurs in Corfu, Macedonia, and one or two other localities of Eastern Europe, and appears to be pretty generally dispersed over Asia Minor, sometimes not making its appearance till the snow melts in early summer. It is clearly the variety γ parvula of DE CANDOLLE, foliis fere sessilibus, the localities assigned for which are Iberia, Caucasus, and the banks of the Simois. Its very early appearance in our gardens, even before the Yellow Aconite, makes it a most desirable object of cultivation, notwithstanding its diminutive size. *M. J. B.*

—— We extract from the American "Gardeners' Monthly Magazine" the following particulars relating to a HORTICULTURAL SCHOOL FOR WOMEN:—"The working plan of the school comprises a farm, to be procured in the vicinity of Boston, containing about 20 acres, 5 acres to be used for the cultivation of small fruits, flowers, salads, and such vegetables as are suitable for cultivation by female labour, the rest to be devoted to mowing and pasturage; a good dwelling-house capable of accommodating about 30 inmates; a barn large enough for the farm stock; an experimental plant-house, for growing flowers and early vegetables, and the forwarding of plants for field crops. The control of the institution is to be vested in a president, secretary, treasurer, and 24 managers—one-half of which shall be women—who will be aided by a competent instructor, an experienced farmer, and the other necessary assistants. The pupils will be instructed in plain sewing, the use of sewing machines, and all kinds of housework, as well as in horticulture; the lecturers and teachers in kindred branches of labour and service will be employed from time to time. It is intended to receive pupils to the number of 25, who are to be from the ages of 16 upwards, of good character, fair education, and able to work as may be required. The course of instruction will extend through two years. The estimated cost of procuring the farm and out-buildings and maintaining the school for three years to be 30,000 dollars."

—— The SANDRINGHAM SPROUTING CABBAGE, judging from a specimen which has been sent for our inspection, is likely to be a useful addition to the list of hardy vegetables. It is described to us as a Cabbage, the result of a cross between MCEWEN'S Cabbage and the Brussels Sprout, the latter being the seed-bearing parent. It forms a head like a small Cabbage, and has the stem clothed with moderate-sized sprouts, which form close heads, much in the way of the branches of the Brussels Sprout, except that they are larger. When cooked they are exceedingly sweet and tender, with quite the flavour of a mild Cabbage.

—— We learn that the Parks Committee of the Metropolitan Board of Works has recommended that Mr. M'KENZIE be employed to assist in the preparation of the plans for planting on the plots of ground on the THAMES EMBANKMENT, North, to purchase the necessary trees and shrubs, and to superintend the works of laying out and planting, and that the sum of 200 guineas be paid to him for performing those services, such sum to include all travelling and other expenses.

—— The Council of the ROYAL HORTICULTURAL SOCIETY, has, we learn, decided that the various COMMITTEES shall in future be elected for one year only, so that at the end of each year the functions of the existing Committees will cease until they are re-appointed, as was indeed the original custom. The old members will be eligible for re-election on the new Committees. Some other arrangements are, we are told, under consideration, by which, it is believed, all cause for any feelings of irritation, such as have sometimes been excited on the part of individual retiring members, will be removed.

New Garden Plants.

CATTLEYA VELUTINA, *sp. n.*

Perigonio bene coriaceo; sepalis ligulatis acutis, recurvis; petalis cuneato-oblongis acutis hinc lobosis; labelli laciniis lateralibus humillimis semiovatis columnam involventibus dorso liberam, lacinia antica ovata subacuta denticulata venis omnibus discoque velutinis.

This fine new species, of which we have only seen a flower, is described as having "a terete stem 18 inches high, supporting a pair of oblong acute leaves, 8 inches in length and about 1½ inch in width; from the top of this stem grows a sheath, whence the flower-stem emerges. In this instance two flowers were produced, but, probably, when the plant is more vigorous, a larger number may be developed." The flower is as large as that of Cattleya bicolor, olive-green, with some purplish spots in rows. The lip is highly penciled, the side laciniæ are semiovate and as small as in Cattleya Walkeriana, Gardn. (bulbosa, Lindl.); the anterior lacinia very large, ovate-apiculate, crispo-toothletted. The disc between the side laciniæ is yellow, with some purplish streaks; the radiating veins on the side laciniæ are purplish; the whole anterior part of lip is rosy, with dark purplish veins, and wholly velvety. The column has a beautiful purplish border around the androclinium and many purplish spots.

It is a very interesting and intricate novelty. The pollen apparatus is quite genuine, as in all Epidendrums. Hence, if it is a mule, it is at least from genuine Cattleyoid parents. If we were entitled to offer some hypothesis, we might suggest that it may have descended from Cattleya Walkeriana, Gardn. (bulbosa, Lindl.), and from C. Schilleriana, Rchb. fil. The sepals and petals are very near those of C. Schilleriana, yet not so undulated, and the velvet of the anterior part of the lip can only be derived from that species. On the other hand, the shape of the lip is very much that of the lip of Cattleya Walkeriana. One might be led at first sight to compare it with Cattleya guttata, yet there are no asperities on the anterior part of the lip. The flower is said to be very sweet-scented, so much so as to perfume the whole house in which it is grown. We have to thank Mr. Thomas Moore for a flower which he received from J. Broome, Esq., of Manchester, with the information that it is probably Brazilian, having been received in a collection obtained through an agent whose headquarters are at Rio. The sepals, are, we learn, naturally recurved. *H. G. Rchb. fil.*

PORTRAITS OF GARDEN PLANTS.

PELARGONIUM RUTÆFOLIUM, *Refug. Bot.* t. 27.

One of the fleshy-rooted perennial species of Pelargonium, producing radical pinnate leaves, the pinnæ of which are bipinnatifid, with linear segments, and erect scapes, bearing an umbel of narrow-petaled yellow flowers, the upper petals reflexed. Introduced from South Africa by Mr. W. Wilson Saunders, through his collector, Mr. Cooper.

PELARGONIUM SISONIFOLIUM, *Refug. Bot.* t. 28.

A greenhouse shrubby species, with thick succulent stems, swollen at the nodes, bearing pinnate leaves with rhomboidal toothed segments, and umbels of small white red-veined flowers. Introduced from South Africa by Mr. Cooper.

PELARGONIUM SCHOTTII, *Bot. Mag.* t. 5777.

This handsome Pelargonium is nearly related to P. cheerophyllum, a hybrid raised about 50 years ago between P. fulgidum and P. sanguineum. It has succulent stems, pinnate leaves with crisped lobate segments, and umbels of bright crimson showy flowers marked on each petal with an elongate broken black blotch running out into veins towards the base. Cultivated at Kew, and in Mr. W. Wilson Saunders' rich collection, having been received from the Continent.

SEDUM ALBO-ROSEUM, *Refug. Bot.* t. 33.

A hardy Crassulaceous perennial, producing numerous stout ascending stems, 1½ foot high, broad oblong-spathulate leaves, and large terminal corymbs of white flowers with rosy-tinted stamens and carpels. This Japanese plant, though introduced many years since, does not appear to have been hitherto described.

SEDUM CORDIFOLIUM, *Refug. Bot.* t. 34.

A hardy Crassulaceous perennial, with reddish-brown

stems, 1½ foot high, broad cordate-oblong leaves, the rounded basal lobes of which slightly clasp the stem, and alternately-branched corymbs of crowded white flowers, tinged with reddish-purple. Its native country is unknown, though it has been for some time in cultivation.

TRICYRTIS MACROPODA, *Gartenflora*, t. 613.

A hardy or half-hardy perennial, belonging to the Melanthaceæ, with glabrous stems, ovate-oblong amplexicaul leaves, and terminal and axillary solitary flowers, with greenish-yellow segments, dotted inside with purple. Introduced to the St. Petersburg Botanic Garden.

VANDA DENISONIANA, *Bot. Mag.* t. 5811.

A very distinct and desirable Orchidaceous epiphyte, producing strap-shaped, acutely-bilobed leaves, and five or six-flowered racemes of pure white flowers, which bear only a few orange streaks at the base of the lip. Discovered by Lieut.-Colonel Benson in the Arracan mountains, and flowered by Messrs. Veitch & Sons.

VANILLA PHALÆNOPSIS, *Flore des Serres*, t. 1769-70.

A remarkably showy stove Orchidaceous epiphyte, of climbing habit, furnished with fleshy, leafless, rooting stems, which bear from their nodes umbels of large blush-white flowers, the lip of which is trumpet-shaped, rosy tinted on the outside, and of a deep orange hue within. The species, which is native of Madagascar and the Seycheells, is closely allied to V. Walkeræ, and is cultivated by M. Van Houtte.

EARLY VERSUS LATE VINES.

THERE has been much controversy as to which will continue to produce fruit for the longest period, early forced Vines which get clear of their load when ripe, or rather when black enough for table or market, or late Vines which have to carry their fruit from four to five months after it has ripened. I am not prepared to settle the question, but I propose to make a few practical remarks before going into the merits of the annexed transverse section of an early vinery for fruiting pot Vines.

It is very well known how willing the Vine is to bear fruit from ripe or unripe wood. The latter I will leave to enthusiasts to fruit,—it has been done and can be done again; the former I will principally refer to.

The Brobdingnag bunches, which both in present and former days occasionally take precedence at our horticultural exhibitions, on inquiry generally turn out to have been produced from young Vines of three or more years' growth, and from which a limited crop is taken. Once overcrop the Vine in its first stages of fruiting, while it is willing to fruit, and such bunches are never heard of again until the borders are aërated afresh, when an unforeseen difficulty at once arises (fortunately not in all places)—that of going into the park again for fresh turf, which is often peremptorily denied, too much having, it is said, been taken already. If a speculating merchant fails to secure the object he has in view he tries again and again, even with his last penny, until he succeeds. But once let the anxious and ambitious cultivator of the Vine miss his mark, and talk of going into the park for turf, and he feels himself placed in rather an awkward position, unless those he has to deal with are open to reason.

I revert again to the question of early Vines being killed through early forcing, according to the belief of many cultivators. In some cases it may be so. In my own case I have forced the same vinery for upwards of 12 years, and I firmly believe the last crop was better than the first. I had no means of knowing the age of the Vines, but they were not over 50 years old. Once in this time I stripped the old surface of the border until I came to their roots, and added a good space to the front of the border, using a turfy loam, that the Hop plant delighted to grow in. I never knew these Vines fail in giving a crop, and I never could observe that they were injured in any way by the early forcing. The borders were about 4 feet deep; the natural soil was a fine brown loam, about 10 feet deep, resting on a bed of gravel, which was all the drainage the borders had. Generally the Vines in this vinery kept their leaves longer in proportion than those in the later vineries, which I have no doubt was the cause of their keeping so healthy and fruitful. As to keeping Grapes late upon established Vines, I am doubtful if this does not tell more against them than mere early forcing. For instance, I have proved to my satisfaction in the case of Vines in pots, bearing fruit ripe in March and April, and clear of their fruit at an early date, that they always break stronger than those which have ripened late, and carried their fruit up to March and April. I am of opinion that the late Grapes take more nourishment from the Vines than is generally imagined; and I also observe with the Vines in our late vinery, that the sooner the Grapes are cut the stronger they break the following season, and show larger bunches than in cases where they are allowed to hang very late.

I would draw attention to the accompanying section of a vinery (fig. 23) wherein I used to fruit upwards of 70 pot Vines yearly, some 20 years ago, commencing to cut in April; the sorts were Black Hamburgh, St. Peter's, Black Prince, White Frontignan, Black Frontignan, Grisly Frontignan, White Muscat, Canon Hall Muscat, Kempsey Alicante, Black Morocco, called also the Liverpool Grape, Josling's St. Albans [Chasselas Musqué], and Chaptal. The house in question had Vines well established in an outside border, and by a manœuvre in the front lights they were easily turned out-of-doors, and tied to stakes along the front of the house, and rested there until the early Grapes were ripe, when the Vines were cut with the bunches thereon, and hung up in a cool fruit-room, in order to take in the established Vines, which, according to the season, were often showing their bunches as they lay outside. I may state, that as long as I grew pot Vines I had yearly two crops of Grapes off this house. Although the Vines were grown in pots, they were not fruited in pots, the pots being required for next year's succession of Vines. By referring to the section, it will be seen that a wooden trough ran along the front part of the house, with another half way up the rafter. These troughs were 17 inches wide and 22 inches deep; the pit in the middle of the house was filled with fermenting materials, with pots plunged to their rims. The temperature of the house was kept low until the roots or spongioles began to move round the sides of the pots. In a short time the eyes began to swell, and by keeping them perfectly level at this early season, they were induced to break with the utmost regularity, with a bunch at every eye. Some rich turfy soil mixed with fresh horse-droppings was aired and warmed in the pit previous to planting the Vines out into the troughs. The troughs being well drained, with a layer of sods over the drainage, we began at one end of the trough to plant the Vines, carefully turning them out of their pots, and putting them into the troughs, filling in all round the balls with the above-mentioned rich soil, packing the balls of the Vines as they came out of the pots, pretty close to each other, and at the same time ramming the soil perfectly firm, both with the hand and with a wooden rammer, so that it might retain the waterings to a certaint extent. The Vines planted in the lower trough reached up to the second trough, or the middle of the rafter; while those planted in the upper trough went to the top of the house, so that the entire roof was filled with canes about 15 inches apart. If proper attention is paid to the breaking of the Vines before they are tied up to the wires, such a roof cannot fail to present a pleasing sight in the shape of a mass of fruit, to cut from and come again.

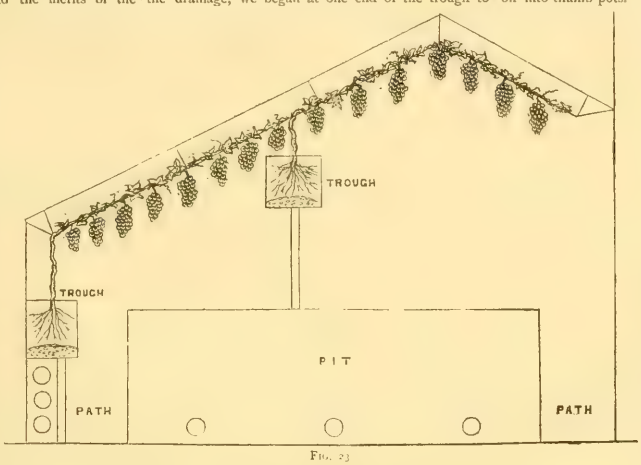

FIG. 23

I well remember my first attempt to fruit pot Vines on the above principle; the system was novel, and interesting from being especially connected with some pleasing facts. In those days I found the Black Hamburgh to be the best for pot culture; the Frontignans next. Josling's St. Albans was a sure fruiter, and seldom cracked under this system of cultivation, and was generally rich in flavour. The larger sorts I discarded after my first year's experiment, and grew Black Hamburgh principally. As to bottom-heat, I believe they had all that they required from the temperature of the house. They were watered plentifully with liquid manure until ripe. I strongly recommend the above system where quantities of Grapes are required early, if the system can be properly carried out. There is no trouble with top and bottom-heat, as in outside borders; all is immediately under the eye of the cultivator; no risks of starving or overheating the roots, and when the Grapes are ripe the Vines can be thrown away, and the succession lot brought from another department to get ripened off for next year's crop. One of the principal features is to get the canes ripe early, and rested previous to forcing. With the buds well up, I have found from later experience that it is only loss of time beginning with too low a temperature—if the fruit is in embryo it will come. One particular must be strictly attended to, to get the canes to break regularly when first introduced into a high temperature, as the sap is sure to flow to the highest part of the rod. I have found that tying the canes to a straight rod, and keeping them perfectly level, was the only chance of securing a regular break; afterwards they can be moved to any position. *J. Miller, Worksop Manor.*

SOLANUM PSEUDO-CAPSICUM.

AMONGST plants for dinner-table or conservatory decoration during the dull months of winter, I know of none more useful or effective than the above. One can scarcely imagine anything more suitable or seasonable for a winter's evening party than a small plant with a clean stem of about 18 inches, and a bushy head of rich green foliage, amongst which its bright scarlet berries cluster in such rich profusion that the branches are actually made to droop with their weight. During the past autumn I have visited many gardens both in England and Scotland, in which this useful member of the Solanum family seemed quite neglected or forgotten. This induces me to give you the details of a mode of culture under which my favourites thrive amazingly; indeed, its application to some much neglected and apparently worn-out specimens wrought quite a transformation.

Presuming that the intending cultivator has neither old nor young plants to begin with, he must commence with seedlings. Seed can easily be obtained from any seedsman. Weatherill's strain is undoubtedly the best. It should be sown in heat in October, and when the seedlings are large enough they should be pricked off into thumb pots. Grow them on in a temperature of about 55° min. They will make but little progress till the days begin to lengthen, and will not require a shift till the end of January, when they should be potted into 4-inch pots, in a compost of rich fibrous loam. As soon as they commence to grow, remove them to the coolest part of an intermediate house, where air and light can be freely admitted. Where there is not the accommodation of a house of this kind, the warm end of a greenhouse or pit will do equally as well. On no account let them become drawn and weakly; keep them stubby, though the growth may be slow. The side shoots should be removed as they make their appearance, so as to encourage the leading shoot to make a clean straight growth. Shift the plants into 6-inch or 7-inch pots as they require it, and stop the leading shoot when it attains the desired height.

When the pits are cleared of the bedding plants in spring, remove the Solanums into them, and plunge the pots up to the rims in coal ashes. It will probably be the end of May or beginning of June before this can be done, so that if the weather is mild no artificial heat will be required. Air should be given freely during the fore part of the day, and be taken off rather early in the afternoon, at the same time giving the plants a good syringing. Frequent attention must be paid to the stopping of the shoots; look over them once a fortnight for this purpose, and by letting the finger and thumb do all the training a good symmetrical head will soon be formed. As the summer advances give air gradually, more and more freely, and by the end of July the lights may be removed entirely. A liberal supply of water must be given, as the plants soon fill the pots with roots. A few hours neglect in this respect will show itself by a discoloration and loss of foliage. Weak liquid manure may be applied to them often; I have found no better material for this purpose than guano. As it is desirable to keep the plants in as small pots as possible, liberal feeding must be resorted to, in order to maintain them in health and vigour.

The plants may be left fully exposed till the middle of September, when they will be thickly studded with berries, to ripen which the lights should be replaced, and a little fire-heat applied when necessary during the autumn. It is not desirable to continue the cool treatment too long, as the foliage becomes discoloured; and plants with a succession of berries (as there is sure to be) will remain in full beauty for more than three months if kept in a temperature of 55° minimum. A conservatory suits them admirably.

About the end of February they begin to shed their berries, and as many forced spring flowers come in about this time, they may be removed to any out-of-the-way corner in an intermediate house, first pruning them in quite closely in a similar manner to the plan adopted with show Pelargoniums. The operator need be under no apprehension of cutting too close, as I have seen them break strong and well, even from

three or four years old wood. When the young "breaks" are about an inch long, shake them thoroughly out of the old soil. I have sometimes found it necessary to use the garden-engine to do this well. Repot them into 6-inch pots, using as before a rich fibrous loam. They may remain in these pots the whole season if it is not the intention to grow large specimens. I believe in most cases plants in 6 and 8-inch pots will be found the most serviceable. After potting, keep them close and warm for a few days, to encourage root-action. Reduce the temperature gradually till the plants get well established, when they may be removed to a cold frame, and be treated in the same manner as detailed for seedlings. By this method plants may be kept of a suitable size for table-decoration for several years, and will produce better crops of berries than younger plants. To keep up the stock by replacing any that show signs of debility, a few seedlings should be raised annually. Those who prefer cuttings may strike any number in an ordinary propagating pit in the spring. *W. B. U.*

HELLEBORES.

No hardy plants flower so early as do some of the Hellebores, and none deserve more general cultivation. The whole of the species of Helleborus are perfectly hardy, of exceedingly free growth, and will well repay the little care that is required in their cultivation. They thrive in almost any soil and situation, but they certainly grow best where they receive a partial shade.

H. atrorubens, syn. *H. olympicus ruber*, is a tall evergreen species from Austria, which grows from 15 to 18 inches in height, and produces long, stiff, light-green foliage, and purplish-coloured flowers ; these form a very pleasing contrast with its foliage. It flowers freely in February and March, and often before that, but the time of flowering depends in a great measure upon the season. It is readily increased by dividing the roots in spring.

H. colchicus is one of the most rare and beautiful of this family ; it is by far the best of all the red-flowering species. It grows very freely, and throws up immense trusses of large bright red flowers.

H. cupreus is an early blooming species, flowering in January. It grows about 1 foot in height, and produces numerous copper-coloured flowers.

H. fœtidus, or the Stinking Black Hellebore, is found growing in many parts of this country, especially in the woods of Sussex. This species grows to the height of 2 feet, and throws out numerous branches near the top, from each of which issue large greenish flowers, slightly tinged with purple at the edge. It flowers in large trusses during February and March, and the seed, if allowed to drop, will germinate the following spring. This plant emits a very nauseous odour, hence its name ; but it must not be discarded on that account, as it presents a very lively appearance during the early spring months.

H. niger is the true Black Hellebore or Christmas Rose ; it is one of the best of this family, and more generally known than any of the others. It grows very freely in a damp shady situation, and flowers most profusely. The flowers are very large, and are produced on naked footstalks 4 to 6 inches in height. Nothing can have a more charming appearance at this season of the year than established masses of this beautiful plant. It commences flowering in December, and continues without intermission frequently until March.

H. niger grandiflorus is a much stronger growing variety than the former, often forming masses of large foliage from 12 to 18 inches in height. It flowers about the same time as H. niger, but is much larger, and is of a more pure white colour. This variety is sometimes called H. niger var. major.

H. olympicus is a beautiful species from India, and deserves as much attention as H. niger. It grows about 18 inches in height, and produces large greenish white flowers, which, in contrast with the delicate light green foliage, render the plant exceedingly effective.

H. orientalis is another pretty dark-flowering species, but it does not grow so freely as many of the others. I have never seen a good specimen of this plant, and I am inclined to think it requires a little protection during the winter.

H. purpurascens is a dwarf species, not exceeding 12 inches in height. It flowers very freely in February and March, and succeeds in any ordinary border ; the flowers are of a purplish green colour, upon stalks 3 or 4 inches in height. It is a native of Austria, occurring in woods, as do most of the species of this family.

H. viridis is a British species found growing in abundance in Derbyshire and a few other places, generally under the shade of trees. It has upright cylindrical stems about 1½ foot in height ; the upper leaves are stalkless, while the lower ones have long stalks. The flowers are large and of a green colour, and are produced in March. This plant also emits a nauseous odour, and is, like most of its race, extremely poisonous. It is easily obtained by seed in the ordinary way.

I might mention many more members of this family quite as interesting as those enumerated, but they are comparatively scarce, and but little known, such as H. odorus, H. graveolens, H. vernalis, H. pedatus, and H. chinensis, not forgetting our old ever-welcome friend, the Helleborus or Eranthis hyemalis, the Winter Aconite. *A. I. P., Tottenham.*

THE EPACRIS.

Few things in the way of greenhouse plants make a better return for the trouble they require, or are less expensive at this dull season of the year, than the Epacris. Although placed in close proximity with the king of flowers—as the Camellia may be termed—it gives rather than receives beauty from such an association. Their slender shoots, covered with every tint of colour from white to crimson, and sometimes nearly all these colours are combined in one flower, form a beautiful contrast to the large leaves and gorgeous flowers of His Majesty. Flowering as they do just at the same time, and both at that time enjoying the same temperature, they mix well together. If kept in health these two kinds of plants, with the addition of a few Cyclamens and Iresines and Primroses, will at this season afford much more healthy enjoyment than the steam of a stove, or the faint perfume of an Orchid-house, with all their varied occupants. Perhaps few enjoy flowers more than those who have but one little house, who can but badly afford the daily attendance of a professional, and who are left to their own resources, perhaps four days out of six. The remarks which I shall make will be more especially for the benefit of those thus situated.

The Epacris requires little house room after the winter months are over. The house can be filled with other subjects as the season advances, which is another thing in its favour. These flowers need not be confined to the noble mansion, where there is no end of gardening appliances, and houses and plants are in abundance. Hear no excuse about their "miffiness." Young ladies want them for wreaths, and ladies for bouquets. The gentleman, too, after the dreary sameness of the desk or of the wood, has greater pleasure in consuming his cigar while sitting among plants of such charming colours. I know of an instance where many pounds were spent by a gentleman in the purchase of these plants after gazing with admiration on a few well-grown specimens full of flower. Yet, before the year was out, most of these plants were dead as brooms. The question is, why people bring about this disappointment, and give up growing, or, rather, buying these plants. Some, or all, of the following reasons may be given—1st, wrong soil ; 2d, bad potting ; 3d, over potting ; 4th, injudicious pruning ; 5th, exposure to cold draughts ; 6th, confinement in heated air ; 7th, unskilful watering. Many folks have as crude notions about the management of a house of plants, as they have with respect to a piece of ground with Cabbages in it. How, say they, can a thing help growing in such a place? They forget that, in a house, Art must do for the plants what Nature does for the Cabbages in the open ground.

The Epacris, as well as the Erica, to which most of the following remarks equally apply, is found growing on mountains where the soil consists of decomposed vegetable matter—doubtless decayed plants of the same species—which is washed into crevices of the rock, where they are well drained. The soil, therefore, is not "bog" nor black clayey soil, but a light woody fibrous soil, such as is found under the heath which for ages has been growing on the same spot. A little sand will be beneficial, mixed with this light soil. Soil of this nature retains the properties necessary for the growth of these plants for many years. I have known plants undisturbed remain in health for a dozen years. In potting or shifting these plants into larger pots, care should be taken that none of the thread-like roots are destroyed. I would have even the crocks at the bottom remain, if the roots have covered them, rather than disturb them. Scratching the ball all over, as some do, is an abominable practice, and should be avoided. Some recommend large shifts, others small ones. The additional anxiety of the large shift in the matter of watering, souring the soil, &c., will at once convince anyone that the most prudent practice is the small shift. Care should always be taken that the soil is firmly placed all around the ball, not leaving any hollow places. To my mind small plants—that is, plants occupying 8 or 10-inch pots—are preferable to plants of larger dimensions. In fact, a large plant of any Epacris is a poor figure when examined. In potting, drainage is an important point to be attended to. When once this is done well, few things keep their drainage better, with regard to their roots, than these plants. They should, therefore, have something they like to root in immediately over the crocks. A layer of heath will be found a good thing, if not the best ; the plants will root in it, and make firm every particle of it, thus ensuring a perfect drainage besides giving the plant an additional supply of soil.

Some fail in pruning. It is done either at the wrong time or in a wrong manner. If we go again to the mountain we shall find the Heath or Erica pruned down close, yet in perfect health. The goat or the ass constantly carries on this pruning among them. Those in a house should be pruned down as soon as the flowers begin to look shabby. Now I prefer close pruning, and am prepared to contend that it is best. Long shoots covered with bloom are better than huge cone-shaped plants with 3-inch shoots, with hardly 2 inches in flower, and this seldom all over the outside, while the inside is full of bare sticks and rottenness.

Long shoots covered with bloom look best, are more useful, and I believe the plant is kept in better health, and is longer lived, by the adoption of the usual cutting down process than by allowing the plant to become a thicket. By cutting down close, I mean leaving only an inch or so of the last year's shoot. Weak shoots may be left at 6 inches or more, as these will draw the sap until the stronger shoots get to such a size as to take the lead. Care should be taken to prevent the young shoots receiving checks from cold draughts, and also not to place the plants near or into any artificially heated air, such as near heated flues or pipes, &c.

A thick mystery seems to hang over the particular laws laid down with regard to watering these plants in the minds of some amateurs. They adopt a stated time, such as once a day or once a week, to perform that operation, and then, as is too often the case even with gardeners' assistants, without any discrimination, they give all a shower alike. Nothing can be more prejudicial to the health of the plants than this practice. Every plant will not be found alike in its requirements. The health, situation, size of pot, state of drainage, will vary the condition of the soil accordingly. Water when the state of the soil asks for it ; and, in order to acertain this, a close examination is necessary. Let the same sympathetic feeling prompt the action as it would do in dieting a child ; treat each plant as if it were the only one. Those who do this have found out the secret of plant growing.

The time of the day best suited for watering plants is when air has been admitted into the house. The air will carry off the evaporation which often makes the soil appear damp when it is not. Another reason for doing it at this time is, that the dampness caused by water running through the pots will escape in a measure ; for when water is given it should be given in abundance, so that all the roots in every part of the ball are well saturated, otherwise, some of the roots will remain dry although apparently at the surface all is well. A good brick pit should always be an acccompaniment to a conservatory, if no other house exist. This need not be adjoining, but may be out of sight from the house, in the kitchen-garden yard, or at the back of the dwelling-house. This pit should be divided into compartments, such as nursery, hospital, convalescent home, &c. For if plant pests are allowed to establish themselves in such a place as a conservatory, disappointment and vexation will surely ensue on the part of the owner. He will be baffled in his attempt to clear them and preserve the neatness and the floral display which such a structure is expected always to present. When the Epacrids are cut down, they should go into the pit—that compartment which is clean should have clean plants placed in it ; those plants which have to undergo a cleaning should go into the hospital, &c. The plants should stand so as to have all the light possible—on inverted pots or bricks. Never put them on bare earth—coal-ashes should be placed over that, if no other thing is used to rest the plants upon.

When the plants are cut down and placed in this pit a comparatively close atmosphere will benefit them, and aid their breaking. Little heat beyond that sufficient to keep out frost need be applied—no bottom-heat is necessary at any time. Air should be freely admitted an hour or two every day, when no danger of frost is anticipated, in order to dry the foliage of the plants, which in a young state is apt to damp off. In the latter part of July and beginning of August the plants will have made nice long shoots. They should then be set against a north hedge or wall. Care should be taken that no pest, in the form of insect or mildew, exists on Roses or any other thing that may be against the wall. They should here also be set on pots, or bricks, with a bit of slate between to prevent any worms getting into the hole at the bottom of the pot the plant is in. After a week or two in this situation, they would be benefited by a move where more sun would shine on them, this would ripen their wood. The pots should, however, be protected by tying a few Fern fronds around them, as the sun is apt to dry the soil through the side of the pot, which the thread-like roots cannot endure. They can remain here until heavy rains or frosts threaten, when they should be removed to the house for flowering ; here they will, among other things, help to cheer the mind and enliven the spirits of their possessors in the dullest period of the year. *H. M.*

THE CLEMATIS FOR DECORATIVE PURPOSES.

In these sensational days, when surprises of all kinds are fashionable, it is not wonderful that our recent acquisitions in this fine genus of climbing plants, through the introduction of the larger-flowered Japanese kinds, and the triumphs of the Messrs. Jackman & Son of Woking by hybridisation, should be turned to account, and made to hold a conspicuous place in ornamental gardening. Those who have not seen the leading kinds in the full vigour of established growth have a real pleasure in store, for whether we look upon them simply as hardy bedding plants capable of giving us sumptuous masses of matchless colour for several months during the summer and autumn, or as plants suited by their habit of growth to cover masses of rock or root-work or any mural ruin with verdure and beauty, or whether we regard them in the more classic form of plants adapted for clothing the massive pyramid, or for wreathing the garden arcade or the basket with a chain of beauty—suspended over chasms or rustic banks by the sinewy arm of the

hoary Oak—we shall find them unsurpassable in splendour; so much so, that even the climbing Rose must for actual display sink into the shade when compared with the glowing colours of the Clematis.

Nor is this all, for treated as pot plants, and trained upon suitable trellises for the decoration of the conservatory, the terrace, or the balcony, the Clematis promises to become one of the most useful plants in cultivation. Whether our great horticultural societies have yet seen their way to offering prizes for well grown collections of these plants, I know not; but if they have not, I hope another season will not pass without their doing so: for I feel certain that a well grown collection of these large free-flowering varieties of Clematis would form a splendid group for exhibition purposes.

The following account, written originally for the "Florist and Pomologist," may not be without interest, inasmuch as it describes some of the finest groups I have yet seen:—

"In the garden of Mr. Essington, Ribbesford House, Bewdley, there are two magnificent and noteworthy beds, which, when I saw them in September last, were apparently in the height of blooming. It is difficult to imagine anything more strikingly beautiful than they were, or anything that could produce a more gorgeous effect. Being associated with the general arrangement of bedding plants, the superiority of the Clematis was very apparent, the purple bedders being altogether eclipsed by the masses of rich violet purple of C. Jackmanni, which is one of the best for bedding purposes. The beds were round, about 15 feet in diameter, and well raised towards the centre. In the centre of one bed, which was planted in 1867, a few stakes about 8 feet in height were placed, and these being well covered with the Clematis, formed a perfect floral pillar, which gave a good effect. The other bed, planted in November, 1868, was equally good. The plants were planted at about 2 feet apart, and were carefully trained. Some attention is necessary in regard to training, for if the shoots are allowed to become entangled, it is afterwards difficult to get them apart, so as to maintain the perfect proportions of the beds. At Ribbesford this had been scrupulously attended to. The plants are annually cut down and the beds well manured. The soil they do best in is a light sandy loam, well manured, and liberally watered during the growing season, for on maintaining the plants in a growing condition for the greatest length of time possible depends in a great measure the continuity of bloom.

"The idea is entertained by many that the blooming season of these plants is not of sufficient duration to warrant their adoption for bedding purposes. In this doubt I frankly own to having been at one time a participator, having formed but a vague idea of their capabilities; but I have learned that by judicious treatment the season of flowering may be so prolonged as to do away with any objection on that point. To those who still doubt I would say, give them a trial, and you will not be disappointed with the result."

It is a noteworthy fact, that the Clematis appears more at home in the open when trained over the ground, or festooning from pillar to pillar, as shown in the engravings (figs. 24 and 25), than when trained against a wall. When at Ribbesford, I noticed that the same varieties when trained against a wall were not nearly so fresh and lasting as those growing upon the open beds; in fact the former were a little seared in the leaf, as if the situation had been too hot and dry for them, while those upon the beds, I have reason to know, remained fresh and vigorous so late as the end of October. Thus these beds had been in fine condition for four months, and were really splendid for three months—and that, be it remembered, at the end of the season, when tender plants generally are getting shabby. So rich and glowing are some of the colours, that at a distance the beds might be mistaken for dense groups of Irises, so unusual are they in aspect.

Fig. 24

One of the most useful purposes to which these Clematises could be put, would be to drape a ruin, or to cover unsightly banks or slopes. They will grow almost anywhere, if the roots of other plants do not rob them of their fair share of food, and nothing more is necessary than to throw in a few tree roots or rough branches for them to scramble over. While, however, it is evident that the Clematis will grow almost anywhere, let it not be inferred that they do not well repay the use of good soil. The most suitable for their cultivation appears to be a deep rich sandy loam; and therefore upon heavy soils it will be necessary to drain the beds, and to trench-in such a portion of vegetable matter as will bring the soil to the proper consistency. Good soakings of liquid, during the growing season, especially after the plants have been planted a year or two, will be found to be of great benefit.

As to pruning, when the plants are once established

Fig. 25

they may, for bedding purposes, be annually cut to the ground, in the manner of Hops; but for festooning it will of course be desirable to retain the wood in its entirety so far as it is properly ripened, and hence in the winter pruning cut with that object. When growing in a wild natural manner it will be wise to prune as little as possible.

The engravings, which it must be observed are from photographs, and not drawings, show very plainly what the plant will do when judiciously treated according to the instructions conveyed in the preceding remarks. Among the best varieties for decorative purposes may be mentioned:—Clematis Jackmanni, C. Rubro-violacea, C. Rubella, C. Prince of Wales, C. Lady Bovill, and C. Thomas Moore.

These remarks will, I trust, be of use to those who purpose planting this season. It is gratifying to know that the use of the Clematis will in some measure abridge our preparations for bedding out, and at the same time impart a glow of colour new to the flower garden, and not to be obtained from any other source. Any plant that will lessen the annual preparations for the bedding system must be a gain, and therefore it is with pleasure that I recommend these hardy acquisitions to the notice of your readers. *George Westland, Witley Court.*

Home Correspondence.

Vine Soils.—"B." has certainly made a strenuous effort to show the readers of the *Gardeners' Chronicle* how egregiously I have erred in my estimate of Vine soil, and cautioned them anxiously against placing any dependence upon what he has been pleased to call unproved statements. "B.'s" strictures are doubtless to some very conclusive, but when thoughtful minds begin to investigate, with the sole object of eliciting truth, they discover that his collection of facts is insufficient, and his arguments of no force. "B." has not openly asserted, but has tacitly implied, that I have protested against the use of any but purely siliceous soil. Now I have advanced nothing of the kind. What I have said and still maintain is, that this description of soil will produce Grapes of better quality than calcareous soil. But let it be observed that there is considerable difficulty in securing soil entirely free from lime. The soil we use at Tortworth contains between 2 and 3 per cent., an amount scarcely deserving of notice, but go on increasing the quantity of lime, and according to the rate of progression will the quality of the fruit deteriorate. Only increase the calcareous to 80 per cent., such as is to be found over the greater part of the Cotswold hills, and under no system of management do I believe that Grapes of even second-rate quality can be produced. I do not hold it to be an indispensable condition, that the selection of soil should be confined to the new and old red sandstone, as it may be had equally free from lime from igneous rocks. "B." tells his readers, but on what authority I know not, that my statements are only pet theories, and are therefore unworthy of notice. In reply, I may be allowed to repeat that experience was my only teacher, and the lessons I have thus learned I hold to be of more value than all "B.'s" instructions. I am also charged with supplying a few facts only, and filling up the deficiency with mere opinions. "Are we," says "B.," "to be led from a solitary example in the extremely limited actual experience of Mr. Cramb to such a hasty conclusion, and protest against the presence of calcareous matter?" Now I would ask "B." in all candour, if 14 years' incessant inquiry, conducted with care, in a great number of cases, and under a variety of circumstances, may fairly be said to be, "a solitary example in the extremely limited actual experience of Mr. Cramb?" I would just notice further, that my attention has been engaged on the subject of Vine soil for at least 30 years. I may mention that I started on a gardening excursion about three years ago, and landed first at Combe Abbey, and can affirm, without the slightest exaggeration, that the crop of Grapes was magnificent,—not a large bunch to be seen here and there only, but heavy throughout, and nearly of an equal size. I asked Mr. Miller whether such results were attained by what is usually called "practical management," or whether they were the effect of soil? when he replied, without hesitation, "Whatever my success may be, it is principally due to the mineral property of the soil I have employed," collected, as I afterwards found, from the red sandstone formation. Next I passed on to Trentham, where the Grapes under Mr. Stevens' management were in no point inferior to Mr. Miller's. Now, according to "B.'s" own showing, the soil employed is the new red sandstone, and must contain but a trifling quantity of lime, or the Rhododendrons in the pleasure-ground would neither grow so freely nor look so healthy. I have no intention of discussing the question as regards the physical arrangement of soil, but I may repeat again that porosity, up to a certain limit, is one of the most active agents in developing the energies of plant life. Deprive soil of this property, as the merest tyro knows, and we effectually shut out those gases that feed the roots. But it is equally certain that, should the physical state be exactly suited to the demand of any plant or class of plants, the atmosphere has very little control over the mineral constituents, to alter their condition, whether beneficial or hurtful; hence occurs the damage, as spongelets have not the power of selection. Will "B." favour me by stating whether his coal-clinkers and broken bricks contain lime, and if so, to what extent. They must, I think, possess a considerable portion, or how was it possible for him to eclipse his neighbours by the wonderful superiority of his Grapes? Whatever may be the opinion of other gardeners, I fear that the coal-clinker borders at Isleworth, so approvingly spoken of by "B.," have very few merits to recommend them, or why, in this progressive age, should they not have extended throughout the kingdom? I have quite recently received a letter from Mr. Coleman, gr. to Earl Somers, Eastnor Castle, containing an unsolicited statement on the subject of Vine soil. He says, "Since I last saw you I have lifted a number of Vines, five years old. They were planted in a mixture of igneous and calcareous turf, not by any means well incorporated, and I found ten to one more roots in the former than in the latter. A Black Hamburgh planted in igneous soil produced bunches last year weighing 5lb. Till I adopted this kind of soil I was never able to grow a perfect bunch of Muscats." Chalk, when deprived of its earthy matter, is a pure carbonate of lime, less caustic than newly slaked lime, but it will, by constant exposure, like the former, lose its causticity, but still retain a damaging property; and if the character is magnesian, the biting action will be so much more powerful. To my own I may add the testimony of Mr. Meredith, publicly given at the Manchester discussion. The atmosphere is constantly dissolving rocks, reducing them to dust. This action the limestone does not escape, and the residue is a carbonate which when held in an excess by the soil destroys the roots—not roots only, as it operates with great force on some of our softer metals, which we might suppose are more resisting than the spongelets of plants. As an instance, some years ago we found it necessary to remove a lead pipe which had been lying only a few years in calcareous soil, and it may surprise "B." to be told that it was eaten into holes by the lime. On renewing an old Vine-border last autumn where the soil contained 60 per cent. of lime, the house having been planted exclusively with the White Muscat of Alexandria—the same to which I referred in my Manchester paper—I found the roots diseased, the spongelets eaten away as if immersed for a short time in a corrosive fluid. In an adjoining house, where the border was exactly the same, no difference whatever existing as regards drainage, the soil a fibrous siliceous loam, holding a very small percentage of lime, the Vines being a miscellaneous collection, I have examined the roots, and found them perfectly healthy, not a blemish of any kind to be seen. The produce of last year was excellent—the Muscat with which I have had so much trouble was large in the bunch and berry, and highly coloured; the other kinds were equally satisfactory. The Vines have only been planted two years, and have not arrived at their full strength. What is the cause of the difference between the two cases? Is it not due to the erosive or caustic property of the lime that acts both upon the leaden pipe and the Vine roots, eating into the one and cankering the other? Whatever qualities "B." may possess, his energy is indomitable. He first rushes over a great part of the kingdom, asking the opinion of this and that gardener in support of his theory, and lastly crosses the Channel and inquires how Grapes are managed in France, and returns with what he imagines a weight of evidence sufficient in future to stifle all opposition. "B." refers to the astonishing results that have been produced at The Denbies by the use of calcareous soil, but has utterly failed to mention how much lime it contains. With justice it may be called calcareous without holding more than a small portion of calx. Without wishing in the least to bring any discredit on Mr. Drewett as a Grape grower, I cannot help saying, how frequently do startling results occur, and again with equal rapidity sink out of sight. Mr. Drewett's Grapes may have been excellent, but, so far as I know, have failed to attract general attention. What we so greatly desire, is to establish, as far as it can be done, a permanent instead of a transient effect. It is very evident that "B." is hardly pressed, or he would not have brought forward Mr. Drewett's Trebbianos with the view of strengthening his position, for, as everybody knows, this is the very Vine, among all others, that will endure the greatest amount of ill treatment, and still produce large bunches, as it is in truth its nature to do so. The mere fact of a dish of Grapes being awarded a first prize at any of our metropolitan or local shows is by no means a reliable test of superiority. True, they may be the best in their class, while their merits are only second-rate. Having disposed of "B.'s" remarks, so far as they are founded upon information he has obtained from others in her Majesty's dominions, in so far as they are worthy of notice, let us now accompany him to the neighbourhood of Paris, and listen to what he has further to bring forward in support of his views. It is singular that in the outset "B." tells us that the soil is very calcareous, and the Grapes inferior, but solves the difficulty by traducing the cultural ability of the French gardeners, asserting that they are ignorant of the management of the Grape Vine. To prove that the French gardener is actually in fault, Mr. Knight, then gardener at Pontchartrain, is brought forward to testify that mere external manipulation is the only requisite that a Grape grower need possess. This gentleman, it would appear, grows his Grapes in a soil nearly approaching to lime, and "B." tells us that their quality was such as to "astonish the world." Really, can this be true? One thing I am certain of, from my own personal knowledge, and that is, that the Grapes produced by Mr. Knight in 1865, at the Edinburgh International meeting, were certainly not of such a character as to "astonish the world," and we cannot suppose that Mr. Knight would bring forward any but his best productions. The varieties, so far as I can recollect, were White Muscat of Alexandria, Tynninghame Muscat, Burchardt's Prince, and two or three more kinds. Grapes of a better quality may be seen any day in an ordinary amateur's garden. In this statement I cast no reproach upon Mr. Knight's abilities as a Grape producer, being thoroughly convinced that the soil plays a more important part than any particular system of management. Now, in all honesty, if we are to value "B.'s" preceding statements in proportion to accuracy of the latter, they are not worth an ounce of chaff. I, for one, have done with this subject, and shall not recur to it again, at least until I acquire more information. *Alexander Cramb, Tortworth.*

Iris reticulata.—This is one of the most lovely of all our hardy spring bulbs, and one that is hardly known, or I am sure it would be more eagerly sought after. It is a native of Iberia, and was introduced into this country some 50 years since, but like many more of our good old favourites has been almost lost sight of, until it was re-introduced. It is one of the hardiest of all our spring bulbs, of the easiest cultivation, and almost indifferent to the treatment it receives, for with the first return of spring the dwarf grassy stems of this charming Iris appear. It grows in clumps, from 9 to 12 inches in height, and produces freely flowers of the most brilliant rich purple colour, with a band of orange at the base. It is one of the most charming plants for early decoration that can be imagined, and anyone that has not yet seen the plant should do so this season, and thus form an idea for themselves. I had the good fortune to see a specimen at the Hale Farm Nurseries the other day, which quite repaid me for my walk. It was a clump composed of some five or six bulbs in a 5-inch pot, and which had been potted late in November. The foliage I should think was at least 15 inches in height, of a deep glossy green colour, very stiff and pointed. There were three flowers already expanded, and I counted five more which will shortly open. These were surrounded by the foliage, which gave the plant a most charming and interesting appearance. *A. I. P., Tottenham.*

Nurserymen's Catalogues.—I beg to suggest to nurserymen the propriety of printing a British general nursery catalogue, to be prepared and arranged by a competent committee of the trade. The value of this publication, if properly arranged, will be—Firstly, a guide to all the trade who may desire to publish catalogues of their own. The spelling, descriptions and arrangement would be accurate and intelligible; secondly, if it were numerically arranged it would save much trouble in writing, as in many cases the numbers only might be used instead of long names; thirdly, it would inform purchasers what was a fair price for any plant named therein, and if a trade directory was given with it, no doubt the number sold would more than cover the expenses. I have spoken of this to several distinguished members of the trade, and I find that their opinions are in accordance with my own. *A Nurseryman.*

Chequers.—Your correspondent "H." inquires about the derivation of this name. Dr. Prior derives it "from choker, the Choke Pear [Pyrus communis, L.], being an antique pronunciation of the word which we find in the humourous old ballad of The Frere and the Boy, l. 115:—

> "Whan my fader gyveth me mete
> She wolde thereon that I were cheke"—

(*i. e.* choked). I believe, however, that the name—which in Kent and Sussex is certainly also given to P. torminalis—will be found to take its origin from the peculiar dotted appearance of the fruit, which, I think, is also to be observed in P. Aria. The same word is used in Gerarde's name, "Chequered Daffodil," and Withering's "Chequered Tulip," for Fritillaria Meleagris; and this is universally understood as referring to the chessboard-like markings on the flower of this plant. The sign, "The Chequers," is usually represented by a board painted in squares in this fashion. In connection with this, we may note the name "Chess-apples," given by Ray for P. Aria. The name "Silver Pear" would be far more applicable to P. Aria than to P. domestica; is it possible that "H." has confused these two species? It is not, I think, generally known that P. domestica is as frequent in Sussex as would appear from his remark. The white underside of the leaves of P. Aria has gained it several names, including its ordinary book-title, "White Beam,"—the Hampshire "Witten-beam" (which curiously reminds one of the Dutch "Witte-boom," given by the colonists at the Cape to Leucadendron argenteum); "White Rice" (from the German or Teutonic *reis*, brushwood), and "Hoar-withy;" the Buckinghamshire "Widbin," evidently a corruption of "White Beam," and others. All these, and the absence of corresponding ones for P. domestica, point

to P. Aria as the rightful owner of "Silver Pear;" but it is impossible to generalise from local use. Perhaps "H." will set the matter at rest by stating whether the last-named species is known by any local name in Sussex. I take this opportunity of reminding your readers that I am still actively engaged in collecting the names of plants in popular use, and that any information bearing upon, or folklore connected with them, will be very gladly received. *James Britten, Royal Herbarium, Kew, W.*

—— There is a Wild Service tree in this neighbourhood, some 30 feet high, in a hedgerow adjoining an orchard. Walking in the woods a week or two since, I came upon several bushes of it that had been cut down three years previous with other wood for Hop-poles and other purposes; it goes by the name of Chequer-wood, and the farm labourers use it in preference to other wood to make flails for threshing corn. There is an inn named the Chequers Inn in this neighbourhood. *A. Jackson, Edenbridge, Kent.* [The Wild Service tree, that is, Pyrus torminalis, is common in West Kent. It is the *true* Service tree, P. domestica, which Professor Buckman alluded to at p. 39. EDS.]

—— Those interested in this tree will be glad to learn that there is one growing in Dickson & Turnbull's nursery, very nearly as large as the one mentioned by Professor Buckman—the height is 25 feet; circumference or girth at 3 feet from the ground, 4 feet 1 inch; 9 feet ditto, 3 feet; circumference of branches, 66 feet; then branching off into three equal branches. The fruit is the shape of a Pear, with silver down; the leaves are pinnate. *T. F.*

Silkworm Disease (see p. 108).—When at Bergamo, in North Italy, in the year 1858, I took a cicerone from the hotel to show me the sights, and finding him a man of education and a gentleman, I asked him how he came to be in the position in which I had found him. He told me that he had been a leaf merchant, and that it was his business to buy up the crop of leaves of Mulberry trees while still on the trees, and employ people to gather and sell them to those who reared silkworms, but that the Vine disease had that year extended to the Mulberry trees and poisoned the silkworms, and that having entered into engagements with the proprietors of the trees and having no sale for his leaves, he was a ruined man. Perhaps Mr. W. A. Wooler may find the disease to have attacked his trees also. *R. C. A. P.* [We do not think the identity of the silkworm disease and that of the Vine has been proved. EDS.]

Potato Grafting.—Last year about this time a gardener called at Lucombe, Pince & Co.'s, having at the time a fine Potato in his hand, upon which he set great value as being new. It was a long Kidney Potato called the Giant King, with eyes scattered over its whole surface. I begged him to cut me off one eye, which he did; but fearing there was not sufficient of the Potato to support the growing eye, I grafted it upon a fine Paterson's Victoria in this way:—After carefully removing the eye, I fastened the two parts together firmly with pins, and tied them. This I did in the presence of Mr. Pince. I then planted it in a good position, and it grew very strongly, and I kept earthing up as it grew till it was quite ripe, when I dug the produce. This amounted to fully a peck and a-half of Potatos of different sizes, from 2 to 9 inches in length, and apparently all alike—smooth kidneys, with eyes at one end only. This is the most remarkable part, as both the Potatos I used have eyes at different parts. I have had a few cooked, and find that they are floury, and have a very fine flavour, and I intend to plant the whole again this season, when I shall be happy to let you know the result. *S. Randall, Exeter.* [Pray do. EDS.]

Lee's Prolific Black Currant.—Allow me to correct a mistake which appeared in your columns at p. 38 as to Lee's Prolific Black Currant being "possibly a variety." I beg to state that it is one of a batch of seedlings raised in 1860, and which fruited for the first time in 1863; but the plants were not allowed to fruit again (being cut up for propagation) till the plants from which the fruit was sent to the Royal Horticultural Society's meeting were put out for fruiting last season. *George Lee, Clevedon.* [All such information should be given whenever anything is first exhibited as new. EDS.]

Wellingtonias.—There is some mistake about Mr. P. Sharpe's statement (*Gardeners' Chronicle*, January 22, p. 107), that it is now 39 years since the Wellingtonia was first introduced to this country. The tree was not discovered until 1850, as I conjectured, by G. M. Wooster, whose name, coupled with the date, "In 1850," was found carved on one of the largest trees (Hercules) of California. But from a work published in 1865 by Chapman & Hall ("Scenes of Wonder and Curiosity in California"), it appears that Mr. Wooster "disclaims all title to the discovery, and gives it to W. Whitehead, Esq., who, whilst tying his shoe, looked casually around, and saw the trees, June, 1850." It was not until 1853 that Dr. Lindley published his account of "Wellingtonia" from materials supplied by Messrs Veitch's collector, the indefatigable William Lobb. *Berthold Seemann.*

—— In last week's *Gardeners' Chronicle*, p. 107, the dimensions of some of the Wellingtonias at Orton Hall, Huntingdonshire, are given. It may be interesting to intending planters to learn that the parent seeds of these plants were sown in March, 1857. Six hundred plants came up, consequently these trees, including the largest, which is 36 feet in height, are only 13 years from seed. During the first seven years of their growth much attention was bestowed on their training, but no knife was allowed to approach them. The benefit of substantial planting is exhibited in the dense habit and symmetry of these trees. It may be here noticed that four of the Wellingtonias alluded to were planted, in direct opposition to the theory of the time, in a conglomeration from the stick-yard of all the chips, twigs, bark, &c., the accumulation of years, only adding one-third earth; and up to 1869 this ill-favoured compost has proved to be harmless to the growth of Wellingtonias. *John Reid, Haigh Hall Gardens.*

Abies Morinda.—Your correspondent from Chilwell may well find difficulty in raising Abies Morinda, it being a mountain tree, impatient of low damp places. I can only repeat that mine never suffer, whereas all my Deodars (some scores) show a "weather" side, excepting one, which is very much sheltered, and is in a well-manured old kitchen-garden; all are about 400 feet above the sea, and, for the most part, face the north. I hope to send you a section of this so much abused, but (in its proper place) perfectly hardy tree. Here, Wellingtonia, Taxodium sempervirens, Cryptomeria, and Pinus excelsa, are a little browned in winter; the Morinda never, nor the Pinus insignis. *Somerset.*

Paterson's Superb Melon.—The extraordinary Melon represented by the accompanying woodcut (Fig. 26) (prepared from a photograph, for the use of which we are indebted to Messrs. Wheeler, of Gloucester),

Fig. 26.

was raised during the summer of 1869 at Pontypool Park, by Mr. Paterson, gr. to Mr. Hanbury Leigh; it weighed 24 lb., and measured 42 inches in circumference. It was raised from the Netted Scarlet-flesh, crossed with the Black Rock. The fruit is of exquisite flavour, and very handsome, with fine rich scarlet flesh, and, as seen by the dimensions given, of extraordinary size, and weight. It produced 169 seeds, which is all the stock of it.

Fumigating.—If "Youngster" wants an easy and effectual way of fumigating his plant-houses without fumigating himself, let him take a common riddle or sieve of the usual size, as small in the mesh as will prevent the cinders falling through; a lining of damp moss should be put round the inside of the riddle, to prevent the wood being burnt; a small quantity of red cinders should then be placed on the riddle, which should be set on three flower pots to give it draught, just inside the door of the house. Enough tobacco-paper to smoke the house should be put on, with a little damp moss all over it. Let the fumigator get outside and shut the door. If the tobacco is inclined to blaze, give it a slight damping, with a fine rosed watering pot. When the house is full, which it will be in less than five minutes, put out the fire, or lift the whole to another house. *J. R., Ferniegar, Helensburgh.*

The Pine Beetle.—In the autumn of 1866 I planted 25 acres with Scotch Firs and Larch, the land had previously grown a crop of timber of the sorts before-mentioned. The young plants were attacked in the following spring with a quantity of brown beetles. They punctured the bark all up the stem of the plants, the result being that 99 out of 100 died. I replanted a small portion of it the second spring, and the result was the same as before. The land at the present time lies destitute of plants. The ground is elevated, and chiefly consists of peaty soil, with a north-east aspect. I should be thankful for any information that would lead to their destruction. *W. Greenway, Prospect Nurseries, Cheltenham.*

Cloches.—It seems to me, on reading the letter of "Anti-cloche," that the right use of the *cloche* is certainly not properly understood by him, and it may not be by many others. As to how I used the *cloche* in France I refer your readers to an article in the "Gardener" of 1868. To tell how I use them now, some hundreds of miles farther north, is the object of this paper, which may in a measure remove any narrow prejudices concerning them. Everybody knows how to supply Lettuces from May to September. September's beginning, then, must see a sowing made of two or three good hardy kinds, such as the true hardy French kinds, that will stand 30° of frost without snow or any other covering. At the foot of walls of south and west aspects we have hundreds planted in threes, ready for the *cloches* to be placed over. Every alternate three only will be covered just now, for this reason, that those not covered get a slight protection from the bell-glass next them, and so on. These plantations were made from the September seed-beds, from the largest and best plants, and the beds have still a large quantity of small stuff ready for another plantation to bring up a succession; while another sowing now of seed will carry on the supply till May. The Lettuces we are cutting now were half-grown out-of-doors, and lifted with balls in October, and planted in leaf-mould in Melon frames on beds of leaves; or had we an orchard-house low enough, like "Anti-cloche's," I would have put them there as more convenient perhaps; so that I am no despiser of frames or orchard-houses, it will be seen, for supplying tender Lettuces at a period when protection is easily applied. "Mais revenons à nos moutons maintenant, c'est à dire cloches du jardin." Though I have been instrumental in introducing the French bell-glasses into this country, I have no interest in them any more than I have in orchard-houses; but I say this from experience, that there is no appliance yet invented that will produce Lettuces in such perfection as this *cloche*, at this time and onwards—that is to say, from New Year's Day till May. Let any one try a bell-glass over a young Lettuce that has stood 20° or more of frost. The great mass of roots it possesses in proportion to its head or leaves, after being covered and sun-heated, soon rushes up into double its size. Apart from its utility as a Lettuce producer, the *cloche* is infinitely superior to the hand-light for Cauliflowers; for the price of one hand-light we can buy nine *cloches;* one handlight commonly holds three Cauliflowers, and one to each *cloche* makes a great difference to the produce. And they come in so handy for dozens of other things, that I consider them invaluable about a garden—so valuable, indeed, that I intend to augment my stock of them another year. Though they were invented in Louis Quatorze's time, I think none the less of them for that. I think none the less of orchard-houses or orchard-house trees in pots, because they were to be seen in France in Louis Quatorze's time; at least, pot or tub trees, if not orchard-houses, were to be seen in every old woman's garden. "Still folly will repeat itself,"—repetitions of furniture and dress; the fashions of such periods will be folly in some people's eyes no doubt, but folk the age of *trentaine* see and walk in a different groove. Though neither, perhaps, can see their way clear to grow an orchard house tree under a *cloche*, and neither can afford to have a low orchard-house for growing Lettuces in, I don't think the amateurs or cottagers of Britain will have cause to abuse the introducers of "the stupid old things." At least "Anti-cloche" seems to be the only abuser in the meantime; *mais nous verrons. H. Knight, Floors Gardens.*

French v. English Lettuce Culture.—Mr. W. Earley, referring to this subject in your last Number (p. 108), asks me a question; before replying to him I will endeavour to remove one or two errors under which he labours. In discussing matters of this kind it is desirable that we thoroughly understand the exact point in dispute, or our words are wasted. A not uncommon and far from sensible way of discussing the merits of a mode of cultivation is to assume that it is the same as something else tried before, and then, of course, without any fair examination, condemning it and its advocates. Not a few have done this in the case of the cordon, by saying it was the same as the espalier. In the present instance it is done in the case of the *cloche*. 1st. "Mr. W. Earley is in error in considering the *cloche* another name for the old kitchen garden bell-glasses." The *cloche* differs from these, first in shape, second in clearness, third in price, fourth in utility. The *cloches*, each 16 inches in diameter, are bought by the Parisian market-gardeners for less than £40 per 1000. The produce grown under each in a single winter and spring more than pays their cost. The old-fashioned bell-glasses, alluded to by Mr. W. Earley, cost, as I am informed by a London market-gardener who has a number of them, at least seven times as much as the *cloches;* they are of a tawny bottle-glass hue, and are found so useless in proportion to their cost that they have nearly disappeared. 2d. Mr. W. Earley is mistaken in stating "that there are few gardens of any standing in the horticultural world but what have sundry odd lots of these old bell-glasses stored away in seed and fruit rooms." The truth is, that there are very few gardens of the aforesaid standing, or private gardens of any kind, that have them. Where they were used they have been long superseded by the hand-light. Mr. Earley may, however, be interested to learn that they are yet in use in some market gardens near London. Mr. Earley says, "there is one question in connection with the *cloche* and its use which has never been made clear to me," and that he proceeds to explain it—whether air is given to the plants under the *cloche* or not. I am somewhat surprised that a reader of, and a weekly writer in, your journal, should put to me such a question as this, inasmuch as I have already stated that

only was no air given to some of the more important winter and spring Lettuces for a considerable time, but I gave a special notice of the Lettuce Petite Noire, distinctly stating that from the day it was sown till the day it was cut for market it never got any air at all. From his note people might imagine that I had in my book treated the subject in the curtest and haziest way, whereas there is a special chapter devoted to this subject, and a diagram is given, showing the various stages of the plants under the *cloche*, and an illustration showing the Lettuce Petite Noire asseen under the *cloche* in early autumn. Three pages are specially given to the cultivation of this highly important winter Lettuce of the Paris cultivators, and it is therein stated distinctly that in the course of its culture it never [directly] gets any air! *W. Robinson.*

Societies.

EDINBURGH BOTANICAL: *December 9, 1869.* — Sir Walter Elliot, the newly elected President, in the chair. The following communications were read:—

I. *On the Structure of a Lignite from the Old Red Sandstone.* By W. R. M'Nab, M.D., Edinburgh. The transverse section exhibits no trace of annual rings, but the structure agrees with that of the Coniferæ, in there being no large openings, all the cells being of very nearly the same size. As the stem has been greatly compressed, the cells are more or less flattened. The longitudinal sections exhibit at certain parts peculiar punctated discs. The external disc is slightly oval, closely resembling the circular discs of the ordinary Conifers, but the central dot is replaced by an elliptical opening, exactly the same as the peculiar central markings found in the punctated tissue of the Cycadeaceæ. The long axis of the central opening corresponds to the long axis of the external disc. These markings are 5-6000ths by 3-6000ths, external diameter; the central elliptical opening being nearly 4-6000ths long, and 1-6000th broad. They seem to be smaller than the ordinary coniferous punctations, and as in the sections they are only to be seen with great clearness in one place, it is not to be wondered at that they had escaped observation. The tangential section shows the medullary rays cut across. In the transverse section, the medullary rays can also be seen very clearly. What are the relations of this lignite from the old red sandstone? The discs are cycadeaceous, but the structure of the rest of the stem precludes the idea of their stem being cycadeaceous. The transverse section shows a very much closer relationship to the Coniferæ; but, as far as I know, all the Coniferæ, with the exception of Salisburia, have circular dots in the punctated tissue. The peculiar form of the punctated markings indicates also a rather close resemblance to scalariform tissue—an almost intermediate step between scalariform tissue and true punctated tissue. The presence of medullary rays, the uniform size of the cells, as seen on transverse section, and the presence of punctations, although they are peculiar, seem all to point to a close relation to the Coniferæ. As I cannot refer the lignite to the carboniferous genera Dadoxylon, or Dictyoxylon, it seems possible that it will have to be referred to a new genus; if so, I would venture to suggest the name of Palæopitys Millerii for the old red sandstone lignite now described. The relation of the markings found in the lignite to those of Salisburia is of peculiar interest. The Salisburia is known to have leaves very closely resembling those of certain Ferns. May it not turn out that some of the so-called Fern-like leaves from the older formation should be referred to plants resembling the Salisburia of the present day. Murchison* states that plants from the old red sandstone of Caithness, examined by Professor Quekett, exhibited a true coniferous structure, allied to Araucaria. The lignites from Caithness, examined by Quekett, are therefore quite distinct from the lignite of Cromarty, discovered by Mr. Miller.

II. *Histological Notes.* By W. R. M'Nab, M.D., Edinburgh.—1. On the Structure of the Adventitious Roots of the Portugal Laurel. These adventitious roots were submitted to a careful microscopic examination, and were found to present the usual histological characters of true roots. They arise in patches, more or less large, from the branches, but not in any regular order, their position on the branch not giving any clue to their relative age. The bark was always ruptured and pushed aside by the rootlets, showing that they have a deep-seated and not a superficial origin. Sections made in various directions showed that the roots are in direct relation to the cambium layer; and, in certain sections, the medullary rays could be traced for some distance into the adventitious root. All the cells of the medullary rays in the neighbourhood of the rootlet were filled up with small rounded starch granules, which gave the characteristic blue reaction with iodo-chloride of zinc solution. The apex of the root was covered with the mass of loose cells common to ordinary roots, and forming a slightly developed pileorhiza. When sections were placed in carmine solution, the active cells at the growing point became, as usual, brightly coloured. One section was left, by mistake, for a long time in the carmine solution; this, when taken out and carefully washed, showed a coloured matrix, in which the apparently loose cells were immersed. These cells, although apparently loose, can be always removed with the section from slide to slide. It is thus probable that the cells, instead of being loose as described, are more or less immersed in a gelatinous matrix, probably due to the degeneration of the primary cell-wall. I have not been able to get the same appearance again, as the rootlets were all destroyed before the above observation was made. The appearance was certainly not due to some of the colouring matter remaining between the cells, as every attempt was made to remove it without success. The only difference between these adventitious and the true roots is in their position and irregular mode of growth. In their growing by addition to the growing point, and in histological characters, they are indistinguishable from true roots. Root hairs were also produced in abundance by the epidermis.—2. On Intercellular Substance and Cuticle. At the meeting of the Botanical Society held last January I communicated a paper on the staining of certain vegetable tissues. In it I took occasion to remark that the cuticle covering the external parts of plants could be readily stained with carmine, the so-called intercellular substance remaining colourless. During the year these experiments have been frequently repeated, and always with the same result—that while the cuticle was quickly and deeply stained with carmine, the intercellular substance remained colourless. Careful observation of the growth of cells in the young roots of the white Mustard, the Canary Grass, and the garden Pea and Bean, have led to the conclusion that the so-called intercellular substance is in reality the original or primary cell-wall—that as growth goes on this primary cell-wall becomes thickened by the addition of numerous more or less marked layers on the inside. In the stems of many plants it requires some care to be able to demonstrate that the cell-wall and thickening layers are separate. In the layer of cells of the epidermis, on which the cuticle rests, the outer surface is in general greatly thickened, while the inner parts of the cells are only thickened at the angles at which the other cells join. This thickening at the angles is often so great that the cell appears almost filled up, or the thickening appears as a continuous layer. In the epidermal and sub-epidermal cells of the Ivy the thickening is so great that without careful examination the thickening might be considered continuous. On the more or less thickened external surface the cuticle rests, and may be considered as thickening occurring outside the cell-wall. We have many examples of this thickening outside a cell-wall, the covering being analogous to a cuticular layer. As in the extine and intine of the pollen grain—the intine representing the primary cell-wall, the extine the cuticular layer—the intine is the more important part, because the extine may be very thin or wanting, as in the pollen of Zostera. The outer covering of many spores (the exosporium) is also another example of a cuticular layer on a single cell. The so-called intercellular substance, as seen in sea-weeds, &c., seems to be a degenerated and gelatinous condition of the cell-wall, and of an entirely different character from that of the cuticle. From all the observations I have made, I think we must reject the statements of Wigand, Schacht, and others, regarding the identity of intercellular substance and cuticle, as untenable.

III. *Notice of Hieracium stoloniferum*, Waldst. and Kit.; *H. glomeratum*, Fr.; and *H. praltum*, Vill., as occurring in the neighbourhood of Edinburgh. By Professor Balfour.

IV. *Notice of Additions to the Botany of Shetland*, since the publication of Edmondston's "Flora." By Mr. John Sadler.

V. *On the Propagation of the Ipecacuan Plant* (*Cephaelis Ipecacuanha*). By Mr. M'Nab. The Ipecacuan plant has recently been attracting much attention from the belief that it will become, like the Cinchona, a profitable plant to cultivate in various districts of India. The Cephaëlis Ipecacuanha is a native of the moist woods of Brazil, and was first introduced into the British gardens in 1830. It is a plant of remarkably slow growth. The largest now in the Botanic Garden is scarcely 1 foot in height, although more than 30 years of age. The method hitherto adopted for propagating the Cephaëlis (as far as I am aware) is by cuttings, but of these not more than one or two can be got at a time, and at very long intervals. By this slow method of propagating, the Cephaëlis must always remain exceedingly scarce. The roots, or rather rhizomes, of the Cephaëlis are moniliform. A few of these were taken from one of the plants in the Botanic Garden during the month of August, 1869, and after being cut into small transverse sections, they were inserted in a horizontal position over the surface of a pot prepared with drainage and white sand. This pot was placed under a hand-glass in a warm propagating bed and kept moist. A few weeks after, the cuttings showed buds on the upper side, roots being also sent out from the under surface. The plants are now beginning to grow, each being furnished with two leaves, the largest measuring ¾ of an inch over. In order to meet the demand, which, in all likelihood, will be made on nurserymen for plants of the Cephaelis, it is well to know how it can be propagated independently of cuttings, and at the same time without injury to the parent plant.

VI. *Notes on the "Dyeing" of Dresden Manufactures.* By Mr. M'Nab. [See p. 105.]

VII. *Notice of Ruscus aculeatus.* By Mr. M'Nab. Mr. M'Nab exhibited a specimen of the Ruscus aculeatus, or Butcher's Broom, covered with rich crimson berries, sent by George E. Frere, Esq., of Roydon Hall, Diss, with the following letter:—"Some years ago I found this plant in a state of ripe fructification. It is brought every Christmas into the market at Brighton for the decoration of houses at that season. I had never seen before, in any other part of England, more than one or, at most, two berries in any one clump of the plant, and I wished very much to get it to fruit in profusion at this place. "I was reminded that the plant was dioecious, and I found friends to supply me with female plants. Soon after I received them it was suggested to me that my plants might possibly not have been hitherto barren, because they were of the male sex, but for want of impregnating agencies. I saw, a day or two since, an article in 'Nature,' by A. W. Bennett, who calls attention to the fact that the normal time of flowering of the plant is almost the depth of winter, when the number of insects that can assist in its fertilisation is certainly very small. Mr. Bennett also remarks on the incorrectness of the periods generally given in the text-books of Botany for the flowering of each species. Hooker, in his 'British Flora,' and Sowerby, in his original edition of 'English Botany,' give March and April for the flowering of this plant." Mr. M'Nab mentioned that, although several large clumps of the Butcher's Broom exist in various parts of the Botanic Garden, he had never seen ripe fruit on any of them. All the plants but one have a dark green colour, all are very compact, and are now covered (December 8, 1869) with rudimentary fruit-buds, but no male flowers have yet been obtained. The one above alluded to, a tall light green variety, has a few incipient scales on the side of the leaf. This may be the male plant, but as it is not growing beside what is undoubtedly the female plants, no seeds could be perfected. The specimen sent by Mr. Frere, although containing numerous ripe berries, has also a number of apparent rudimentary fruit-buds for next year, similar to those now seen on the plants in the garden. It is difficult to say at what stage the impregnation of the ovules takes place. The plant is recorded as dioecious, and flowers during March and April, and possibly this is the time when the male blossoms expand. It will be interesting to ascertain whether these rudimentary fruit-buds, now covering the plants, remain as they are till the month of March, when the male flowers expand. I have just received from the nursery gardens of Messrs. P. Lawson & Son, two specimens of Ruscus, one called R. aculeatus, and the other R. aculeatus rotundifolius. The former is identical with the one cultivated here, and is also covered with rudimentary female flowers. The specimen called R. aculeatus rotundifolius is also covered with buds; but after a careful microscopic examination all turn out to be male buds, while the specimen sent from England by Mr. Frere has many buds and ripe fruit on the same branch. From the state of the male buds on both plants alluded to, it seems impossible that these male flowers can have the stamens sufficiently developed before March or April.

VIII. *Notes on Carex paniculata.* By Mr. M'Nab. The Royal Botanic Garden has recently been presented with three plants of Carex paniculata, sent by Mr. Archibald Gorrie, forester to the Earl of Leicester, Holkham Hall, Norfolk. The plants measure, from the base of the roots to the extreme points of the leaves, 8 feet 6 inches, independently of what must have been cut off in the lifting. They have been growing in deep rich soil, as 3 feet of the lower portion of each has been bared of the peat; the part remaining is filled up with a mass of longitudinal roots or fibres, each nearly half an inch round. The circumference of the upper root portion of the largest plant is 5 feet 3 inches wide, from which a large crown of leaves proceeds. One of the plants has an upright stem above the peat, 1 foot 9 inches long, and 3 feet 6 inches in circumference, composed of the dead portions of the leaves; from the top of this pseudo-stem the large tuft of leaves is growing. The stem of this plant between the leaves and the lower base of the fallen leaves quite short and brown, appearing as if they had been destroyed by fire. It is impossible to guess at the age of these gigantic Sedges; but, judging from the quantity of decayed leaves round the base of each plant, and the way the peat seems to grow or rise round them, they must at least be a century old. Very few fruit-spikes were observed, and of those found the heads were comparatively small, the largest not more than 2½ inches long. Some idea may be formed of the size and weight of these plants from the fact that it required three men to lift each of them. Mr. Gorrie writes:—"We have some taller and heavier plants than any of those sent. I observe they grow strongest when the roots get into the water. I am told, when foxes abound, they are very fond of lying on the top of the Carex tussocks, and basking in the sun. This gigantic Carex is very common on sodden peaty soils in Norfolk. I have also seen it at the Duke of Buccleuch's, and other places in Suffolk, likewise near Bury St. Edmunds."

IX. *Notes on Pinus Benthamiana.* By Mr. M'Nab. Mr. C. W. Peach, of Haddington Place, Edinburgh, exhibited a large cone, ripened at Overton, Orton, Peterborough, the seat of Charles Bodger, Esq., under the name of Pinus macrocarpa. This cone is 6½ inches long, and 14 inches in circumference. Mr. Bodger writes:—"The tree stands in the centre of my garden. It bore three drooping cones in 1868 on the main stem, where that season's wood shot from; no signs since of any more. It has made two shoots from branches since the cones were taken off, one each season. There are 23 spreads of branches from the main stem. I believe it has been planted where it now stands for 22 or 23 years. The tree is 34 feet in height, and 23 feet across the branches. The circumference of the stem at the surface of the ground is 4 feet." Pinus macrocarpa is by many considered as synonymous with Pinus Coulteri and P. Sabiniana. The cone sent by Mr. Peach agrees with the description of Pinus Benthamiana, of Hartweg, which we have never seen in cone. Numerous plants are cultivated throughout the country, raised from cones, introduced about twenty years ago, under the name of Pinus Benthamiana. The cones were 4½ inches long, and 7 inches in circumference. The habit of the plants, and the size and arrangement of the leaves of many of them, resemble the true P. Benthamiana. It is not improbable that all will turn out to be Pinus ponderosa, or a variety of it. In all cases a few cones ought to be sent home with seeds for identification.

* Siluria (3d ed.), pp. 290, 291

Obituary.

WE regret to have to announce the death of MR. SAMUEL BROOME, the well-known gardener of the Inner Temple, who died of apoplexy on the 22d inst. The following particulars are from the *Times* of Thursday last:—"Mr. Samuel Broome, long honourably known to the London public, and especially to the members of the Bar, as the gardener at the Temple, died a few days ago somewhat suddenly. For nearly 40 years he had endeared himself to that branch of the profession, and to the Benchers in particular, by the assiduous care he took in cultivating and adorning their little oasis in the heart of the City of London, by the honest pride with which he followed his vocation, and by his simple and kindly manners. Of late

years especially he was brought conspicuously into note by the marked success with which he cultivated the Chrysanthemum, always a work of difficulty amid the London smoke; and his winter flower-shows in the Temple not only charmed the ordinary denizens of the place, but attracted hundreds of people from various parts of the metropolis. Originally he was a Staffordshire man, having been born at Weston-under-Lizard, and having served his apprenticeship there in the gardens of the Earl of Bradford. He afterwards came to London, and ultimately settled in the Temple, where he was gardener for 38 years until his death. He was accustomed to boast that his last year's show of Chrysanthemums was the best he ever had, and to attribute much of his success to the operation of the Smoke Prevention Act, passed some years ago." In addition to the above we have the following from Mr. Broome's old friend and colleague, Mr. J. Dale, of the Middle Temple Garden :—"Mr. Broome was for 38 years employed in the gardens of the Honourable Society of the Inner Temple, and for the last 27 years he filled the responsible post of Head Gardener. Being always the same genial, warm-hearted, persevering man, he was alike respected by rich and poor, and earned for himself the reputation of being a true philanthropist—not that he was rich, as the word goes, in this world's goods, but he was ever ready to give valuable counsel and assistance to the humbler classes, and to those who find riches and abundant pleasure in the cultivation of one of God's best gifts to man, the flower. Specially did he devote himself to the one most suited for town gardens—the Chrysanthemum; and his knowledge of the culture of this flower rendered him a general referee to those desirous of obtaining information concerning it.

"To know 'Sam Broome,' as his friends called him, was to know a man of sterling worth. He died suddenly, on the morning of the 22d inst., at the age of 64, greatly respected, and very deeply regretted by all who knew him." It is unnecessary to add more to this genuine and well-merited tribute to the memory of a fine specimen of his race and profession.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

A good batch of *Caladiums*, *Gloxinias*, and *Achimenes* should now be placed in a high temperature to induce active growth and an early display. In potting the Caladiums the old soil should be entirely removed and the tubers should be put into the smallest sized pots into which they can readily be placed, there to make the preliminary start. I will suppose that Gloxinias have been already potted, but where this is not the case the same remarks apply as to the size of pots. The same soil will suit all three at this stage, only the Achimenes will prefer rather more sifted leaf-mould in admixture with the peat and sand than the other two. The latter should not be potted so firmly as the other two, and if the tubers be placed singly or otherwise in pots, a most liberal drainage should be afforded. Shallow pans are best for starting them in, as they can be readily potted off after the young shoots have grown sufficiently large. They will all need a temperature of 70° to 75° to start them efficiently, and at first should not have very much water afforded them, nor in fact till signs of activity are manifest. The moisture afforded to the pots from any bed of fermenting materials in which they may be plunged would in fact be ample, and suit them exactly. All *Heaths* and *Epacrids* should have the surface of the soil in the pots freshened at once, if at all green or soured. Remove all decayed leaves, flowers, &c., from the centre or other parts of the plants, and afford a plentiful supply of air. Induce such subjects as *Dendrobium nobile*, *Maxillaria aromatica*, and other similar plants, to push their flowers more freely by removing them into warmer structures, and so obtain and maintain as many blooming plants as possible at this dreary season.

FORCING HOUSES.

Amongst *Vines*, which are blooming at this time, the Muscat of Alexandria in inexperienced hands does not always "set" very kindly. The temperature should be gradually brought up to a mean of from 67° to 69° by night, and from 73° to 75° by day, by the aid of fire-heat alone, allowing an increase of from 7° or 8° by sun-heat besides. Well damp the floors and all cool surfaces twice a-day, say at half-past 8 A.M. and half-past 3 P.M. Give as much air as possible at all times. A little should be admitted in the front in the vicinity of the pipes, so that the internal air may be put into motion. Where the flowers are fully expanded and the pollen is ripe for use, gently shake the bunches with the hand, as is done in the process of early setting of Grapes generally. The latest show *Pines* may now have the temperature advanced to 65° by night, and up to 86° or 88° by day; shut up soon after noon, and insure a nice amount of warm atmospheric humidity. Look after the necessary supply of fresh tan or other fermenting materials preliminary to a rearrangement in a short time. Get a sufficiency of good soils under cover, that they may have ample time to dry and become mellowed by the time they are wanted. *Pines* which are ripening should not be permitted to remain upon the plants until fully ripe, if they are not intended for use immediately they are cut. Make up the last *Mushroom-beds* in those houses intended to grow them for winter use only; these will then last the season out. Where it is not convenient to plant out a frame or pit with *Early Potatos* at once, let the necessary number of tubers intended for any given structure be potted singly into small pots, and be placed in any house where an intermediate temperature can be insured, there to make a preliminary growth. Sow *French Beans* in 60-sized pots for successional use, and keep friends with the cook by keeping up a good successional supply of *Tarragon*, *Mint*, &c.

HARDY FLOWER GARDEN.

Amongst *Shrubs*, both evergreen and deciduous, the following are to be preferred to many others :—Of *Hardy Azaleas*, commonly known as Ghent Azaleas, there are more than 100 varieties, the choice of which must be left to the purchaser. *Aucuba japonica* has increased in variety wonderfully since the male varieties have been introduced; the berries on the female plants add greatly to their beauty. The *Arbutus*, or Strawberry tree, indigenous in some parts of Ireland, is one of the most constant of evergreens. Of *Box trees*, perhaps Buxus latifolia, sundry variegated varieties, and the Minorca Box, or B. balearica, are the most distinct. The varieties of *Cistus*, or Rock-rose, show much variety of colour; they are very dwarf, and should have a dry situation to grow in. The woolly and Alder-leaved varieties of *Clethra* produce showy spikes of white flowers. The red and white-flowered *Cydonias*, with their singular fruits, flower early in the spring, and have been too much neglected of late. *Deutzias*, *Daphnes*, and *Weigelas* are all good, very hardy, and make in the early spring a very showy contrast. *Fuchsias* sanguinea and Riccartoni are sufficiently hardy to plant in the open borders if a slight mulching be placed over the roots in winter. The dwarf Brooms or *Genistas*, having yellow flowers, are suitable for rockwork, &c. The Syrian *Hibiscus* (Althæa frutex) has large showy flowers.

HARDY FRUIT AND KITCHEN GARDEN.

Space does not permit me to do more than suggest that all the pruning operations be pushed forward quickly, and that a sowing of marrow *Peas* be made in the kitchen garden, and that all arrears of digging, trenching, &c., be worked up with all despatch. As the days increase in length, so in proportion will the gardener's duties multiply. The forwarder these operations are, therefore, the better will his chance be of meeting all future demands on his time and attention. *W. F.*

TOWN GARDENING.

The best situation for a rockery is one facing S.W., and where it is shaded with trees. It can be made to present a pleasing and ornamental appearance if built as directed at p. 1260, 1869, and is capable of holding a great variety of beautiful and interesting plants which will do well in town, such as many of the British *Ferns*. Several of the curious *Sedums* will flourish during the summer, but will require potting to keep them through the winter. The pretty little *Linaria Cymbalaria*, and most of the *Antirrhinums*, thrive well. No class of plants differ more in their nature and habits than the Ferns, some thriving in swamps, some on rocks, some on trees, and some on ruins. We must therefore, in forming the rockery, endeavour to supply their natural wants, and imitate Nature. The Royal Fern, Osmunda regalis, should be planted in a mixture of bog and sand in a slight excavation, so that it can be flooded with water; Blechnum boreale, or Hard Fern, should be placed higher and drier, in rotten wood; Ceterach officinarum thrives in old mortar rubbish, and Scolopendrium officinarum, or Hart's-tongue Fern, will do well in old brick rubbish. I have found these and many others to thrive in very confined place, if attention be paid to the soil, and the plants be well syringed on fine mornings and evenings. A few roots of the common *Primrose* and *Pansy*, and of *Iris germanica* make a nice variety. *J. D.*

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

During the Week ending Saturday, January 22, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range.	Mean of all the Highest.	Mean of all the Lowest.	Mean Daily Range	Mean.	Fall of Rain.
	Deg.	Deg	Deg	Deg.	Deg	Deg.	Deg.	In.
Portsmouth ..	51 2	27 0	24 2	41 1	33 1	8 0	36 9	0 03
Blackheath ..	48 0	29.6	18 4	39.0	33.9	5 1	36 1	0.05
Over Court (Bristol)	50.1	20.6	20 5	39.8	35.0	4 8	37 2	0.11
Birmingham ..	50 7	31.1	19 6	39 6	34.3	5 3	39 7	0 05
Wolverhampton	49.0	30.3	18 7	38.7	34.2	4 5	38.1	0 10
Leicester ..	46 7	28 0	18 7	38 3	33 0	5 3	35 4	0 05
Norwich ..	42 7	30 0	12 7	38 5	32.0	6 5	35 0	0 05
Nottingham ..	48 0	27 6	20 4	39 7	32 8	6 9	36 0	0 06
Sheffield ..	46.0	29.0	17.0	38 5	33.0	5 5	35 6	0 06
Liverpool ..	50 0	29 8	20 2	40 0	34 4	5 6	37 0	0 10
Manchester ..	48 0	30 0	18 0	40 1	34 4	5 7	37 0	0 21
Eccles (Salford)	47.4	30.0	18 0	39.8	34 2	5 6	36 8	0 21
Bradford ..	49 5	30 0	19 5	40 6	33 1	7 7	36 8	0 12
Leeds	47.0	32 0	15 0	40 4	34 1	6 3	36 8	0 15
Hull	42.0	23.0	19.0	37 7	30.6	7.1	33.9	0 10
Newcastle-on-Tyne	44.0	30.0	14.0	38 8	32.0	6.8	35 2	0.01
Edinburgh ..	46 7	29.0	17 7	..	..	..	36.6	0.10
Glasgow ..	43.7	29.7	14.0	..	..	..	35.4	0.23
Aberdeen ..	43.1	30.3	12.8	..	..	..	36.6	0.18

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
For the Week ending Wednesday, January 26, 1870

1870. Month and Day.	Readings of Barometer reduced to 32° Fahr.	Dry Thermometer	Wet Thermometer	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air
	Ins.	Deg	Deg	Deg.	Deg.	Gr
20. Thurs.	30 25	31 4	28 4	20 9	64	1 4
21 Friday	30 15	31 3	29.0	23.0	70	1 5
22. Satur ..	30 21	32 4	31 7	30 2	91	2 0
23 Sunday	30 22	36 9	36 1	35 5	95	2 5
24 Monday	30 22	35 9	34 2	31 0	85	2 0
25 Tues. ..	30 24	34 3	33 6	32 3	93	2 3
26 Wednes	30 28	25 3	25 3	25 3	100	1 6

1870 Month and Day.	Temperature of the Air. Highest	Lowest.	Range in Days.	Mean.	Departure of Mean from Average of 39 Years.	Wind. Direction.	Horizontal Movement	Rain. In Inches
January	Deg	Deg.	Deg.	Deg.	Deg.		Miles	
20. Thurs	32 9	30 5	2 4	31 1	—5 9	N.E	419	0 00
21 Friday	33 7	30 3	3 4	31 5	—5 5	N.E.	349	0.00
22. Satur	36 7	29 6	7 1	33 2	—4 2	,,	178	0 00
23 Sunday	40 8	31 3	9 5	35 7	—1 7	N.N.E.	199	0 00
24 Monday	39 4	32 8	6 6	35 8	—1 6	N.E.	510	0.00
25 Tues.	38 7	26.0	12 7	32 1	—5 0	N.E.	209	0 00
26 Wednes	35 8	21 8	14 7	28 7	—9 0	Calm	85	0 00

January 20 —Generally overcast through out the day; a little snow fell
" 21 —Generally overcast
" 22 —Overcast throughout; a little snow fell during the morning
" 23 —Large amounts of cloud prevailed, and thin rain fell occasionally
" 24 —Cloudy during the day; variable at night
" 25 —A very fine day; generally cloudless
" 26 —Very fine; clear less; slight fog in the morning

JAMES GLAISHER.

Notices to Correspondents.

Barnes Memorial. Subscription promised: Dr. Armstrong, Peckham House, £1. 1s. Received: J. Harlock, Lilford Hall, 10s. 6d.

Beaucarnea: *W. T.* Liliaceæ, near to Dasylirium, syn. Pincenectitia.

Galvanised Wall Nails: *H. P.* We cannot tell you where these are to be obtained. Those who have them for sale should advertise them.

Gas for Hot Water Apparatus: *Inquirer.* We do not know if this has been tried on the large scale. For small houses Trotman's apparatus answers well.

Grafting Wax: *Inquirer.* Excellent grafting wax is made of three parts beeswax, three parts rosin, and two parts of tallow. For other recipes see "Thomson's Gardeners' Assistant."

Heating Apparatus: *A. Y.* Your valves are in the right places. It would have been a better arrangement if the stove had been under the greenhouse, as it would have been in more direct contact with the boiler, and the water would have had less distance to travel before getting back to the boiler. You appear to have the same quantity of pipe in both houses; if so, you should double the amount in the stove. The valves should regulate the flow; turn on just sufficient to the greenhouse, and turn full on when the greatest heat is required. The pipes under the walk may have sunk down; if so, they will not work: they should have been placed in a brick drain.

Irish Nurserymen: *D. Mcl.* We cannot undertake to recommend any particular firms. See our advertising columns; you will find a list in "Hogg's Gardeners' Year Book."

Names of Plants: *Flora.* Eucharis amazonica. For information respecting its culture, see pp. 10, 78 of this Journal.—*X. Y.* The Alexandrian Laurel, Ruscus racemosus.—*S. R.* 1, Microlepia polypodioides; 2, Lastrea tenericaulis; 3, apparently Tecoma grandiflora,—send when in flower. The Unaslaschkan Romanzowia is staded by Stendel to be the same as Saxifraga nutans. Hooker and Bentham refer it doubtfully to Hydroleaceæ. We are not aware that it has been introduced.—*H. T. B. R.* Your plant is Kleinia or Cacalia articulata, commonly called the Tallow-candle plant.—*W.* Imantophyllum miniatum.—*G. S.* Dendrobium nobile.

Peat: *D. M.* We cannot recommend dealers. Consult our advertising columns.

Tree Transplanting Machine: *W. S., Hampstead Heath.* We do not know. Those who have such things should advertise them.

Communications Received: J. R.—F. B.—C. Q.—T. R.—W. S. S.—Constant Reader.—G. E. (next week).—W. H.—B. D.—W. C.—Inquirer—W. G.—C. L.—X. Y.—W. C.—J. F. L.—A. F.

Markets.

POTATOS.—Southwark, January 24.

During the past week the arrivals coastwise and by rail have been more than equal to the demand, which is limited. Trade continues in a languid state. Quotations:—Yorkshire Regents, per ton, 70s. to 90s.; Lincolnshire do., 60s. to 80s.; Kent and Essex do., 60s. to 80s.; Dunbar and East Lothian do. 70s. to 100s.; Perth, Forfar, and Fifeshire do., 60s. to 75s.; Ditto Rocks, 60s. to 65s; French and Belgian Whites, 55s. to 60s.

COVENT GARDEN.—January 29.

The cold during the past week has somewhat interfered with the supplies of home-grown produce, but has not caused any material advance in prices. Forced Vegetables are ample for all requirements. Continental cargoes have arrived in excellent condition. The supply

of Oranges is not so heavy. Asparagus, Artichokes, new Potatos, and the usual assortment of salading, reach us three times a week.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3 0	to 5 0	Lemons, per 100 ..	5 0	to 10 0
Cobs, per lb. ..	0 9	— 1 0	Melons, each ..	1 6	— 3 0
Chestnuts, p. bush. .	8 0	— 14 0	Oranges, per 100 ..	6 0	— 12 0
Filberts, per lb. ..	0 6	— 0 9	Pears, per doz. ..	3 0	— 6 0
Grapes, per lb. ..	6 0	— 10 0	Pine-apples, per lb.	6 0	— 8 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6	— 15 0	Herbs, per bunch ..	0 2	— 0 4
Artichokes, p. doz. ..	3 0	to 6 0	Horse Radish, p. bun.	3 0	to 5 0
Beet, per doz. ..	2 0	— 3 0	Leeks, per bunch ..	0 2	— 0 4
Broccoli, per doz. ..	1 0	— 2 6	Lettuces, p. score ..	1 0	— 2 0
Brussels Sprouts, p. ½ sieve ..	2 0	— 3 0	Mint, per bunch ..	0 1	— 1 6
Cabbages, p. doz. ..	1 0	— 1 6	Mushrooms, p. pott.	1 0	— 1 6
Capsicum-, p. 100..	2 0	— 2 6	Onions, per bunch ..	0 4	— 0 9
Carrots, p. bunch ..	0 4	— 0 8	Parsley, per bunch ..	0 2	— 0 4
Cauliflowers, p. doz.	1 6	— 3 0	Salsafy, per bundle .	1 0	— 1 3
Celery, p. bund. ..	1 0	— 1 6	Scorzonera, do. ..	1 0	— 1 3
Cucumbers, each ..	0 6	— 2 0	Seakale, p. punnet..	2 0	— 2 6
Endive, per doz. ..	1 6	— 2 0	Shallots, per lb. ..	0 8	— ..
French Beans, p. 100	2 6	— 3 0	Spinach, p. bushel..	2 0	— 3 0
Garlic, per lb. ..	0 8	— ..	Radishes, per doz...	1 0	— 1 6
Potatos, York Regents, per ton, 75s. to 100s. ; Flukes, do., 75s. to 115s.			Turnips, per bunch .	0 4	— 0 6

TO BE SOLD, ASH, LARCH, and ALDER.
40,000 2 to 3 feet ASH
50,000 2 to 3 feet LARCH.
10,000 5 to 6 feet ALDER
Stout, transplanted, and well-rooted.
Apply to Mr. CHORLEY, Uckfield, Sussex

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do. SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLAR, QUARNIAN, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes.

Native Scotch Fir, of fine quality.

ON SALE by the SUBSCRIBER, 500,000 2 yr Seedlings, 1 yr transplanted, 3s per 1000
100,000 2 yr Seedlings, 2 yr transplanted, 8s per 1000. Also,
20,000 RHODODENDRON PONTICUM, from 9 to 24 inches
Samples sent on application
J. ROY, Jun., Aberdeen

Planting Season.

DICKSONS AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES, and SHRUBS, which are now in fine condition for Transplanting. They are growing on very exposed ground, are finely rooted, and their wood is thoroughly ripened. Samples and Catalogues on application. Special prices will be quoted where large quantities are required.

To the Trade.

G. FARNSWORTH has to offer a large quantity of the undermentioned, which are strong grown and well rooted; sample on application at the Nurseries, Matlock :—
BIRCH, 3 to 4½ feet, twice transplanted, 30s. per 1000.
LARCH, 9 to 15 inches, 12s. per 1000.
SCOTCH, 1½ to 2 feet, 20s ; 1½ to 2½ feet, 23s per 1000
SPRUCE, 1 to 1½ feet, 15s ; 1½ to 2½ feet, 20s per 1000
PINUS INSIGNIS, 1 foot, twice transplanted, 50s per 1000.
LIMES, 2 to 3 feet, 70s. ; QUICK, strong, 18s. per 1000.
1-yr. PRIVET CUTTINGS, 4s. ; 2-yr. Double WHIN, 40s. per 1000.
3-yr. SEEDLING RHODODENDRONS, 7s per 100
SPECIAL OFFER to the TRADE.—
Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s per dozen
Dwarf trained 3-yr. Sweet CHERRIES, ten leading sorts, 15s per doz
Strong cut-back evergreen Box Trees, 1-yr., 4s per dozen, 45s per 100.
Rider Trained CHERRIES, 30s per dozen
PEACHES and NECTARINES, 6s per dozen
Half "Standard H.P. ROSES, 2 feet, splendid stuff, best sorts, 50s per 100
Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.
" Common LAUREL, 6 to 8 feet, 25s per 100.
W. KNIGHT, Nursery, Pulborough, Sussex.

LOUIS VAN HOUTTE begs to state that his CATALOGUE, No. 130-131 H. J., is still to be had from his Agents, Messrs R SHEARER & SON, 5, Hart Lane, London, E.C. This Catalogue contains the HARDY PERENNIALS, ORNAMENTAL BULBS, ORNAMENTAL SHRUBS, TREES, CONIFERÆ of all kinds, the frutticose GESNERACEOUS PLANTS, in dry roots, viz., Achimenes, Wesgelas, Eucodonias, Plectopomas, Gesneras, Tydeas, and others, also FERNS, GARDEN and GREENHOUSE MATERIAL.
LOUIS VAN HOUTTE'S SEED CATALOGUE for 1870 is now ready, and is sent to his usual Customers.
The ADDITIONS to the NOVELTIES are enumerated in LOUIS VAN HOUTTE'S Catalogue, No. 130-131 H. J., but their description can only be found in the French issue of the same Catalogue.
The Parts 4, 5, and 6 of Vol. XVIII. of the FLORE have appeared; their contents can be found at p. 499 of the Catalogue. Price of subscription for the Volume of 12 Parts, £1 10s. (more than One Hundred highly-coloured Plates, Woodcuts, miscellaneous matter, &c.)
Ghent Botanic Nursery, January 20.

WILLIAMS' PARADISE GEM MELON, warranted true.—A fruit of rare excellence, which will give every satisfaction to a successful cultivator, being so free to set, very early, good size, and first rate flavour. 6 seeds, 1s ; 18 seeds, 2s 6d
THOMAS RIDLEY, Hadfield Nursery, Bath.

To Market Gardeners and Others.

SUTTON and SONS having grown largely of the following excellent PEAS, can supply them, very true to name, at low prices for large quantities :—
Suttons' Ringleader — the forwardest known.
Suttons' Improved Early Chancellor.
Dickson's Favourite.
Princess Alice.
Blue Prussian
Fortyfold Green Marrow
Champion of England.
Veitch's Perfection
Hair's Dwarf Mammoth.
Yorkshire Hero.
Prizetaker Green Marrow
For lowest prices, apply, stating quantities required, to
SUTTON AND SONS, Seed Growers, Reading.

SCOTT'S NEW and GENUINE SEEDS.—Scott's Superb Crimson Beet, Melville's Triple Curled Borecole, Scott's Eclipse Brussels Sprouts, Martin's Green-long Carrot, the Favourite and Davis' New Giant Green Cos Lettuce, Bailey's Prize Eclipse Melon, several New Peas, Scott's Early Oxhorn Kidney Potatos, and many other varieties of new and choice Vegetable Seeds are fully described in J. SCOTT'S PRICED DESCRIPTIVE CATALOGUE of SEEDS; also his extra choice exhibition Asters, Stocks, Marigolds, Cosmos, Phlox Drummondi, Drummondi, Zinnia, and other Flower Seeds ; post free on application to
J. SCOTT, The Seed Stores, Yeovil, Somerset

Notice to the Trade.

LAXTON'S NEW PEAS, the ALL BIG and SUPREME.
HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties ; also the HUNDREDFOLD or COOK'S FAVORITE, and the entire stock of McMILLAN'S QUEEN of the MARROW. They have also grown largely of LAXTON'S PROLIFIC Descriptions of all in CATALOGUE, which may be had on application. They have at present a good supply of the true REDand WHITE ITALIAN TRIPOLI ONIONS, and the GIANT ROCCA, all of which are scarce this season
HURST AND SON, 6, Leadenhall Street, E.C.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.
RICHARD SMITH, Nurseryman and Seedsman, Worcester.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100 ; 2½ to 3 feet, 50s. per 100 ; 3 to 3½ feet, 60s. per 100 ; 3½ to 4 feet, £4. per 100.
RICHARD SMITH, Nurseryman, Worcester.

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (See Dr. Hooker, "Botanical Magazine," No. 5785.) Price 50s. 6d. each ; in quantity, a special price will be given.
The honour of importation is due to Mr. Fortune ; the honour of distribution in England to CHARLES NOBLE, of whom fine plants can be obtained.—Bagshot, Jan. 20.

Cedrus Deodara.

FINE SPECIMENS, 7, 8, 9, 10, to 15 feet, at 1s. per foot.
WM. MAULE AND SONS have to offer a large supply of extra fine EVERGREEN TREES and SHRUBS, calculated to give immediate effect to Parks, Cemeteries, and Plantations, and suitable for screening and blocking out new Buildings, that are springing up daily in the vicinity of all large towns.
The Nurseries, Bristol

Landscape Gardening.

WOOD AND SON will have much pleasure in furnishing designs and executing to any extent LANDSCAPE GARDENING in all its various branches, including Forming, Reforming, and Planting Parks, Lawns, Pleasure Grounds, Cemeteries, Orcharding, Kitchen, Fruit, and Flower Gardens. The Making of New Roads, Ornamental Water, &c., at the lowest prices consistent with good workmanship
N.B.—Plans and Specifications supplied on the shortest notice
WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

WANTED, a WORKING PARTNER, in a Nursery and general Forcing Business, 12 miles from Covent Garden A good opportunity for a steady, honest, and industrious Man.
A. B., 1, Seven Sisters Road, Holloway, Essex

WANTED, in a Local Nursery, as FOREMAN and PROPAGATOR, an active Man, of good address, where Ericas, Epacrids, Azaleas, Camellias, and a collection of Hard wooded Plants are extensively grown. State age, wages, where, and how long in last situation. None need apply unless character for honesty, sobriety, and ability will not bear the strictest investigation.—A. B, Messrs. Hugh Low & Co., Upper Clapton, London, E.

WANTED, a first-class PLANT GROWER, for Exhibition. Wages 30s. per week. No one but a steady, honest, energetic Man need apply.—JOHN SHAW, Nurseryman, Manchester

WANTED, a MARKET GARDENER, by a Gentleman who acts as his own Head Gardener, and who wishes by sales to develop the resources of the Garden, which is extensive, well stocked with Fruit Trees, Vineries, and Conservatory. Must keep the accounts, be willing, active, and obliging, and earnest in endeavouring to make the garden produce valuable by sale.—Apply to H. MERVYN D'ARCY IRVINE, Esq., Castle Irvine, Inniskeen, Ireland

WANTED, for a superior Farm House, a good WORKING GARDENER, who understands Vines, &c.—H., Mr. Vickers, 2, Cowper's Court, Cornhill, E.C.

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WANTED, a JUNIOR ASSISTANT, to a general Seed Business in the Country.—X. Y., *Gardeners' Chronicle* Office, W.C.

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EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended.—Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON and SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times Gardeners of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken by the Gardener, so that suitable Men may be selected.—Highgate Nurseries, London, N

To Gardeners and Bailiffs (Head, Foremen, or Under)

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, AGE, and TERMS, and a STAMPED ENVELOPE for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may freely call at CARTER & CO.'s, adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS and GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. The fullest particulars as to services required and wages given should be supplied with application.—PAUL'S Nurseries, Waltham Cross, London, N.

GARDENER (HEAD).—Understands the profession in all its branches. Can be well recommended.—G. R., Post Office, Blandford, Dorset.

GARDENER (HEAD).—Married ; thoroughly practical in every department. Can Grow Pines and Flower the Kitchen Gardener ; well up in the general Work of an Estate. Unexceptionable character.—J. D., Taplow, Maidenhead.

GARDENER (HEAD).—Age 35, married, no incumbrance ; thoroughly understands the profession in all its branches. Can be highly recommended.—A. B., 10, Cambridge Road, Markhouse Common, Walthamstow, Essex

GARDENER (HEAD) ; age 32, no incumbrance.—A Gentleman is desirous of recommending his Head Gardener to any Lady or Gentleman requiring the services of a thoroughly practical Gardener. Early and Late Forcing, &c. Good character.—A. B., 10, Cambridge Road, Markhouse Common, Walthamstow, Essex

GARDENER (HEAD), middle-aged, single.—G. H. RICHARDS being desirous of an engagement as Head Gardener, begs to inform Noblemen and Gentlemen that, from his long experience in the Cultivation of Vines, Stove and Greenhouse Plants (Orchids included), Cucumbers, Melons, Flower and Kitchen Garden, &c., he can have first-class testimonials—All particulars on application to G. H. R., Newton Nurseries, Chester.

GARDENER (HEAD).—Middle-aged, with plenty of experience in every department, and a good will to use it in the interest of his employer. Good character.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey.

GARDENER (HEAD).—Married, no incumbrance ; a steady, trustworthy, and energetic Man ; thoroughly practical in every branch of Gardening, having had many years' experience in the Management of Noblemen's and Gentlemen's Gardens.—Good character.—T. K., 25, Eleanor Road, Waltham Cross, London, N.

GARDENER (HEAD).—Age 34 ; thoroughly understands the Management of Vines, Pines, Stove and Greenhouse Plants, Early and Late Forcing of Fruits, and Kitchen and Flower Gardening. Good references.—A. B., 20, Hethpool Street, Hall Lane, Paddington, W.

GARDENER (HEAD).—Age 33, married, one child only.—A Gentleman is desirous of recommending his Head Gardener, a steady, industrious man, who well understands every branch of his profession. Six years' character.—T. C. R., care of Wm. Wood & Son, The Nurseries, Maresfield, Uckfield, Sussex.

GARDENER (HEAD), or GARDENER and BAILIFF.—Middle-aged, married, no incumbrance ; is well experienced in both capacities ; is a thoroughly practical Gardener and Farmer, an excellent Florist, well up in Forcing, and thoroughly understands the routine of Gardening generally. Can be highly recommended. Satisfactory reasons given for leaving present situation.—L. W., 7, Bond Street, Sandfields, Swansea.

GARDENER (HEAD, Single-handed, or otherwise).—Age 23, single ; has had experience in Forcing Fruit, Flowers, &c. Please state wages, &c., to T. BLOW, Wolveton Gardens, Dorchester, Dorset.

GARDENER (HEAD), or where one is kept.—Age 36, married. Good reference.—W. W., 18, South Road, Wimbledon

GARDENER (HEAD), where two or more Men are kept.—Age 30, single ; thoroughly practical in every department of the profession. Can be highly recommended.—T. B., Post Office, Woodstock, Oxon.

GARDENER (HEAD), where two or more are kept.—Age 28, married, no incumbrance ; thoroughly understands Early and Late Forcing, Stove and Greenhouse Plants, Fruit, Flower, and Vegetable Culture. Good testimonials.—J. B., Firbeck Hall, Rotherham.

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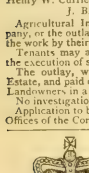

ROYAL AGRICULTURAL SOCIETY of ENGLAND.
AGRICULTURAL EDUCATION.
The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.
Copies of the Form required to be sent in by March 31 may be had on application to H. M. JENKINS, Secretary.
12, Hanover Square, London, W.

OXFORD MEETING, 1870.
FARM PRIZES.
A PRIZE of a PIECE of PLATE, value 100 Guineas, offered by JAMES MASON, Esq., and a SECOND PRIZE of FIFTY POUNDS given by the Society, will be given to the Occupiers of the two best managed Farms (which shall be entered for competition), district comprised within a line drawn through the Towns of Reading, Great Marlow, Aylesbury, Buckingham, Banbury, Stow-on-the-Wold, Lechlade, and back to Reading.
The Competition is limited to Tenant-Farmers, and the LAST DAY of ENTRY is SATURDAY, February 26.
Further particulars and Forms of Entry may be obtained on application to
12, Hanover Square, London, W. H. M. JENKINS, Secretary.

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CORN, SEED, MANURE, and OILCAKE MERCHANTS.
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Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

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PERUVIAN GOVERNMENT GUANO, £13 10s. per ton.

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These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
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CORN MANURE, for Spring Use
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Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
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CHEVALIER BARLEY, which was awarded the First Prize three years in succession (1867, 1868, 1869), at the Birmingham and Midland Counties show. At Brighton, in 1869, 10 quarters per acre, weighing 57 lb. per bushel. Also PEDIGREE BLACK TARTARIAN and PEDIGREE WHITE CANADIAN OATS.
For price and full particulars of above, and of Pedigree Seed Wheats, apply to the Originator of the System, Captain HALLETT, F.L.S., Brighton.

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IMPERIAL LONG YELLOW MANGEL (superior stock).
All new of 1869, and true, of own growth, offered cheap.
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TO BE LET, at Lady Day next, THREE ACRES of GARDEN GROUND, and TWO ACRES in GRASS, &c., all walled in Gardener's House, Workman's Lodging Room, large range of Glass Houses stocked with Vines, &c. The walls covered with Fruit Trees. Situated at Astley, three miles from the Stourport Station, on the Severn Valley Line.
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On view the morning of Sale, and Catalogues had.

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On view the morning of Sale, and Catalogues had

Spring Grove, Middlesex, W.
CLEARANCE SALE of VALUABLE NURSERY STOCK.
MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Plantation, in the Thornbury Road, Spring Grove, near the Spring Grove and Isleworth Station, on the South-Western, London and Windsor Railway, on MONDAY, February 7, at 12 for 1 o'Clock precisely, by order of the Proprietor, without reserve, the valuable NURSERY STOCK, comprising choice Evergreens and Conifers, including 2500 Portugal Laurels, 2 to 4 feet; 1000 Common Laurels, 3 to 4 feet; 500 Aucuba japonica, 500 Green Hollies, 3 to 6 feet; 800 Arbor-vitæ, Thuja aurea, Wellingtonias, Araucarias, Arbutus, Berberis, &c. Also about 2000 Standard, Dwarf, Pyramidal, and Dwarf-trained Apples, Pears, Plums, Cherries, &c., in collections; 500 Standard and Dwarf Roses, in variety; a large quantity of miscellaneous Nursery, including 800 Laburnums, 4 to 5 feet; Privet, Ribes, Snowberry, Guelder Roses, Laburnums, &c.; 150 yards Box Edging, some hardy Climbers, &c.
May be viewed two days prior to the Sale. Catalogues may be had of Mr. W. COLE, 110, Cannon Street, City, E.C.; at the Estate Office, Spring Grove, W.; and of the Auctioneers and Valuers, Leytonstone, E.

Preliminary Notice.
MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. John Waller, to offer for unreserved SALE by AUCTION the valuable NURSERY STOCK, and a quantity of choice GREENHOUSE PLANTS; the land being required by Lady Day next for the Great Eastern Railway extension of line

Extensive Sale of Nursery Stock.
TO BE DISPOSED OF, by PUBLIC AUCTION, at the West Shaw Street Nursery, Kilmarnock, on THURSDAY, February 10, at 11 o'Clock, the saleable STOCK of the NURSERY belonging to the Sequestrated Estate of Dreghorn & Aitken, Nurserymen and Seedsmen.
The Nurseries are very extensive, and the Stock to be Sold consists of large quantities of Seedling and Transplanted Forest and Ornamental Trees, Fruit Trees, Shrubs, Roses, &c., and will be put up in Lots to suit purchasers. Catalogues and all particulars may be had on application to the Trustee.
The Stock remaining after the Public Sale, with the Glass-houses and Lease of Nurseries, will be Disposed of privately, offers for which will be received by the Subscriber up to March 1.
DAVID LAURIE, Trustee.
Union Bank, Kilmarnock, January 20, 1870.

Bedding and Hothouse Plants, Outdoor Effects.
MR. COX will SELL, on FEBRUARY 19, at Belsize, Hampstead, the contents of VINERIES, CONSERVATORIES, STABLE, YARD, and GROUNDS; some thousands of GERANIUMS, ALOES, Standard MYRTLES, RHODODENDRONS, CACTI, CAMELLIAS, AZALEAS, and FERNS.
Auctioneer's Offices, Bond Street, W.

The Agricultural Gazette.
SATURDAY, JANUARY 29, 1870.

MEETING FOR THE ENSUING WEEK.
FEBRUARY 1 { North of England Chamber of Agriculture (Subjects: "Cattle Feeding and Cattle Management—Agricultural Statistics")—2 P.M.

It is now some 10 years since we experimented upon the germination and growth of the Flax Dodder, Cuscuta epilinum, the details being thus published in our journal for September 10, 1859. From that time until the present we have been anxious to secure some ripe seeds of its congener, the Clover Dodder, Cuscuta trifolia, and in this our endeavours were only very partially crowned with success until the past season, when a conspicuous patch of it made its appearance in a Clover crop.

As it made its appearance in a field "hained"

up for seed, we at once had it hurdled off in a piece of about 3 yards each way, making a square of 12 yards. The parasite, as we watched it from time to time, never got beyond the hurdles, but it completely destroyed the whole of the Clover plant within the boundary. There it stopped safely, affording us time and opportunity for observation until the Clover seed was carried; and then as the plant shot up again it was folded with sheep, when, sad to relate, our shepherd, without any regard for the hurdles, to say nothing of a want of respect for science, removed the boundary, and the whole mass was trodden into the earth by the flock. Here was a sad ending to a crisis we had waited for, for ten long years! In that time we have had many troubles, have been betrayed by false friends, have been misrepresented to real ones, "have loved and have lost," but the climax to our misfortunes has been the loss of our Clover Dodder.

Still, as "each cloud has a silver lining," we are to be congratulated upon the circumstance of having saved a few seeds as they became ripe, and we are now enabled to describe their mode of germination and growth from actual experiment and trial in the same way as we did ten years since with respect to the Flax Dodder.

As we might expect, the whole process of germination of the Clover parasite is so exactly that of the Flax Dodder that it will perhaps be well to refer to our drawings in the *Agricultural Gazette* of September 10, 1859. The testa of the seed of the Flax Dodder is there seen to be elevated to the apex of the plumule. In the germinating seeds of the Clover Dodder, on the contrary, the testa always remains at the radicle end, and as the young plant, when attached to the Clover, is lifted from the ground, the testa is usually left in the soil, as in the figure below.

The seeds of Clover Dodder are little more than half the size of those of the Flax Dodder, and consequently the young thread-like plant on its first germinating is more delicate; Fig. 27 is an example of its early mode of growth.

Clover Dodder seed was sown with Cow-grass Clover (Trifolium pratense perenne), Common Red Clover (Trifolium pratense), Alsike Clover (Trifolium hybridum)—on all of which it soon established itself; and there can now be no doubt that it goes through the same phases and in much the same way as before recorded of the Flax Dodder.

It will be unnecessary here to enter into any lengthened description of the plant; it is beautifully figured in the new edition of Sowerby's "English Botany," Plate DCCCCXXIX; and we quite agree with the learned Editor of that work when he says that "this plant comes very near C. epithymum, of which it is not improbably merely a sub-species." Indeed, we look upon it as a foreign form of the latter, which has no doubt been introduced in Continental seed samples.

It is altogether smaller and more delicate than the Flax Dodder, and maintains this from its starting into life until it seeds, when its minute fibres become matted into such thick masses as ultimately to bear down and utterly annihilate its foster parent, so that in this thick tangled hair-like state there is no wonder the French should give it the name of *perruque*. During the time of its perfect inflorescence it gives out abundance of a not unpleasing odour, on which account it has been called C. suaveolens, now known as C. hassiaca (Pfieff.), a figure of which (not over clear or accurate) is given in the volume of the "Transactions of the Woolhope Naturalists' Field Club" for 1868. It occurred on Lucerne at Pembridge, in Herefordshire, and Mr. CROUCH remarks:—"The Lucerne was raised from seed purchased in London, and was of probably foreign growth." It is just possible that the slight differences observed in some of our home and foreign forms are due to the different nature of the plants upon which they grow. It is, however, a mistake to say that "each species of Dodder attaches itself to its favourite crop, and no other will nourish it," as stated in Sowerby's "English Botany"—for we have grown the Flax Dodder on several plants, and among others on one as distinct as the Tomato, but it wants a series of experiments to decide whether any great differences result from these causes; and in as far as the Clover Dodder is concerned, we have not yet tried to grow it on any but the Clover family, but we have succeeded on the following:—Trifolium incarnatum, T. pratense, T. pratense perenne, and T. pratense medium.

That the Clover Dodder sometimes occurs in large and frequent patches in our Clover fields is quite certain, and yet it is on record that out of 150 agricultural gentlemen from all parts of England, at one of Mr. MECHI's celebrated gatherings, not one farmer could tell what it was. The country people, however, know it as Strangle-weed, and in Gloucestershire we have heard it called Devil's Guts, a name no doubt intended to mark the detestation in which it is held.

Anyhow, where the Dodder has been observed in our crops it has always been an object of something like superstitious feeling: few believing that it is actually produced from seed. One correspondent says he could never detect any seed, and the noxious plant seems as though it was bred spontaneously. Upon this subject, of course, the botanist will want no further evidence than its well-developed flowers. Professor SYME says:—"The Dodders are all annuals, and commence life usually in the earth, where the seeds vegetate, and whence they climb on to the objects of their attack, attaching themselves by minute tubercles to the surface of the stalks." And in another place he says, "the seeds possess the double power of germinating in the earth or in the capsule." Our own experiments convince us that they germinate only in the ground, and go through the phases represented in our figures. The plant grows very rapidly when it has started, and as it is so abundant, it then becomes a curious question as to how it had been so difficult to obtain its seeds as to make it a matter only imperfectly accomplished in 10 years. The truth is, that in farming the first crop is entirely destroyed; it makes but little way in the early part of the season, and this is for the most part cut down either by depasturing or the scythe. It is thus the second growth that is usually observed, and this without great care has hardly time to ripen its seed.

FIG. 27.

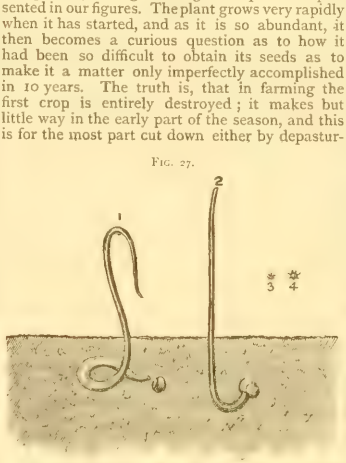

1. The twisted thread-like germ, with the radicle just escaped from the testa. 2. An upright thread-like germ, on the look-out for a foster-parent. its testa still attached. 3. Seed of Clover Dodder.—4. Seed of Flax Dodder.

The question—How to get rid of this pest in Clover—is one that constantly recurs. Many plans have been recommended, such as tearing away the Dodder fibres with a rake. Mowing and burning to the extent of the circles is, we think, the least onerous of all plans. Various chemical solutions have been commended, such as salt and water, or solutions of sulphate of iron; these are certain to kill the Dodders, as they kill the Clover, but it is a troublesome and expensive plan, whereas the scythe is more expeditious and less costly.

Of course prevention is better than cure, clean seed is the remedy, for in no case do we know of it as "natural to the soil," in whatever sense that phrase may be used; it is introduced with the seed, it really and truly germinates in the soil; but, once coiled round the Clover, its independence ceases, and it is from that moment a true parasite, hence entirely without leaves: but its thread-like fibrils climb from plant to plant of the foster parent, sending out aërial roots, which penetrate into its bark, and so "suck the verdure out on't."

The history of the Clover Dodder may be considered as of as great interest as simplicity; and we rejoice in being enabled, from actual experiments, to explain a matter about which there has hitherto been no little mystery. *B.*

—— At Monday's market, in Mark Lane, there was but little trade. Only good samples were saleable at last week's rates. Inferior qualities could only be sold at a reduction. Beans and Peas were 1*s.* and 2*s.* a quarter cheaper. On Friday the few sales of Wheat made were at about Monday's rates. —— At the Metropolitan Cattle Market also prices have been somewhat lower. On Thursday prices were steady at Monday's rates, and with a continuance of the present frosty weather they may be expected to improve.

—— Mr. C. S. READ, M.P., has published the following definition of Tenant-Right from the English farmer's point of view:—

"It is not fixity of tenure; it is not payment for the goodwill of a farm; it is not rental based upon a Government valuation; it is not even 21 years' leases. It is simply compensation for the tenants' unexhausted improvements. In other words, it is a demand for the extension to the whole of England of the tenant-right which now exists generally in Lincolnshire and partially in some other counties. The custom of the country where this right prevails is for the incoming tenant to pay the out-goer a certain fixed proportion of the money he has recently expended in buildings, draining, artificial and mineral manures, feeding-stuffs, &c. The land is almost all held under yearly tenancies, with a six months' notice to quit, and yet, thanks mainly to the tenant-right, Lincolnshire is one of the best, perhaps now the very best, farmed county in England. It is, indeed, hard to understand how the extension of this custom should injuriously affect the land market, or in any way alarm the most timid of mortgagees. There is no other district south of the Tweed, save perhaps West Norfolk, in which the value of land, by the expenditure of the tenant's capital, has been so enhanced, for in one generation the rental of thousands of acres has been raised from 5*s.* to 30*s.* an acre, and the fee-simple of the land from £10 to £50.

—— At the general meeting of the Highland and Agricultural Society on Wednesday of last week, Miss BURDETT COUTTS was elected as a lady member of the Society, and 89 other candidates were also added to the list of members. The country meeting of the Society for 1871 was appointed to be held at Perth. Further details regarding the Dumfries show in the coming summer were sanctioned. The following list of prize awards was announced:—

The Gold Medal or £10 (1) to William Alfred Gibbs, Gillwell Park, Seward-stone, Essex, for a Report on the Hot Blast Fan used in Harvesting.—(2) to W. W. Hozier, of Tannochside, Bellshill, Glasgow, for a Report on Agricultural Drainage.—(3) to Robert Hutchison, of Carlowrie, Kirkliston, for a Report on the Dwellaries of English Agricultural Labourers.—(4) to George Malcolm, factor, Invergarry, Inverness-shire, for a Report on Striking the Fiar's Prices.—(5) to the late W. Paterson, Union Street, Dundee, for a Report on Propagating New Varieties of Potatos.—(6) to Patrick Shirreff, Haddington, for a Report on the Means employed by him for Obtaining a New Variety of Wheat called King Richard.—(7) to N. P. Stewart, Cemaes, Llanrwst, N. Wales, for a Report on Dipping, Pouring, and Smearing Sheep.

The Medium Gold Medal or £5 (1) to George Armatage, M.R.C.V.S., Linslade, Leighton Buzzard, Beds, for a Report on the Duties of a Veterinary Surgeon in examining Horses as to Soundness.—(2) to said George Armatage for a Report on Veterinary Contracts.—(3) to Robert Laidlaw, Chapelhope, Selkirkshire, for a Report on Dipping, Pouring, and Smearing Sheep.—(4) to John Milne, Laithers, Turriff, for a Report on the Agriculture of Aberdeen and Banff shires.—(5) to Andrew Spreull, M.R.C.V.S., Milngavie, Glasgow, for a Report on the Duties of a Veterinary Surgeon in Examining Horses as to Soundness.—(6) to Robert Hutchison, of Carlowrie, Kirkliston, for a Report on the Effects of the Dry Season 1868 on Trees and Shrubs.

The Minor Gold Medal to John Blaikie Webster, Forester to Sir William Verner, Bart., Church Hill, Verner's Bridge, Moy, Ireland, for a Report on the Growth of the Roots of Coniferous Trees after Felling.

The Silver Medal to the author of a Report on the Effects of the Dry Season 1868 on Trees and Shrubs, bearing the motto "Hortus Siccus."

It was also stated that the directors had resolved to publish the Report on Agricultural Drainage, by Mr. Hozier, in a separate form for sale, so as to place it within the reach of all interested in such operations.

It was further announced, as regards the chemical department of the Society, that the number of analyses made for members of the Society during the past year had amounted to no less than 372, embracing the analyses of soils, waters, manures, feeding-stuffs, and, in fact, all the ordinary articles of agricultural consumption. This exceeds the analyses made by Dr. VOELCKER for the Royal Agricultural Society, although the number of members of that Society exceeds that of the Highland and Agricultural Society by more than 1000. Dr. ANDERSON reports that some improvement in the quality of different manufactured manures is slowly becoming manifest. One of the most troublesome matters in this respect lies in the great difference in the quality of different manufactured manures, none of which can be described as adulterated in the strict sense of that word, but which differ so greatly that, though sold at the same price, one may be worth £1, £2, or even £3 per ton more than the other. This occurs to such an extent that, by the judicious choice of manures, the farmer can often effect a very material economy, and numerous cases have occurred in which £10, £20, and £30 have been in this way saved on comparatively small purchases of manures. During the past season the series of experiments extending over a rotation have been continued, and a set of experiments on the action of different manures on the Potato have been successfully carried out.

—— A correspondent of the *Pall Mall Gazette* reports thus of the remaining stock of Peruvian guano:—

"The following deposits of guano, which are as yet practically untouched, exist to the north of the Chincha Islands, viz.:—

	Tons.		Estimated net proceeds.
Guanapa Islands	2,500,000 1st class	£6 per ton	£15,000,000
Lobos Islands (two)	3,000,000 ,,	6 ,,	18,000,000
Ditto	1,000,000 2d ,,	4 ,,	4,000,000
Macabi Islands (two)	1,500,000 1st ,,	6 ,,	9,000,000
Not less than	8,000,000 tons		£40,000,000

The above statistics were published in *El Comercio* of

Lima, on June 13, 1863, and are said to be from actual surveys and measurements. Now, assuming that the sales are 500,000 tons annually, it follows that even at that rate of consumption there is enough guano to last for 16 years, excluding the Chinchas and other deposits entirely.

—— The experiments in inoculation, as a preservation against pleuro-pneumonia, which have been undertaken for the Norfolk Chamber of Agriculture, have been reported on by Mr. W. SMITH, M.R.C.V.S.; and the following is his summary:—

"Inoculated, 87; attacked with pleuro-pneumonia, 12; died and slaughtered, 9; recovered, wholly or partially, 3; remaining at present healthy, 75.

"Thus we see," he says, "that only 12 animals out of the 87 inoculated were attacked with pleuro-pneumonia, and these, I confidently believe, took the disease in a natural way, for these reasons, that they were not at all affected locally by the operation; and that inoculation for other contagious diseases in animals, such as small-pox in sheep, rinderpest and foot-and-mouth disease in oxen, communicates the specific malady to nine-tenths or more of those operated upon in a form either mild or more or less virulent." Mr. SMITH adds:—

"I do not attach much importance to the results of these experiments. They are, in my opinion, insufficient and incomplete. I think, however, they incontestably demonstrate two facts: First, that pleuro-pneumonia inoculation, when scientifically performed, is a harmless operation, and not likely to cause an extension of the disease, and that the loss of animals tails' and other untoward effects, when they occur, are produced by the ignorance and want of skill of the inoculator; secondly, that it differs in most essential points from the conditions induced by inoculations in other contagious diseases, such as small-pox or cattle plague."

—— At the annual ploughing and hedge-cutting competition of the Northumberland Agricultural Society, held on Tuesday, upon the farm of Mr. THOMAS CHARTRES, Turvelaws, Wooler, the following was the number of competitors in the various classes:—Class 1, for swing ploughs only, 41 competed. Class 2, for youths under 18 years of age, for swing ploughs, 12 competed. Class 3, for wheel ploughs, 4 competed. Class 4, for double-furrow ploughs, 8 entries. This is the first time that these ploughs have been introduced into the Northumberland Agricultural Society's matches. For hedge-cutting there were 29 entries, and out of this number 27 competed. The hedge-cutting was very good. This is decidedly the greatest ploughing match of the district, and a large number of visitors from all the surrounding districts frequented the fields where the matches were held, and were evidently delighted with the excellent work that was executed. Mr. JACOB WILSON, of Woodhorn Manor, Morpeth, discharged the duties of secretary in a most praiseworthy manner.

—— In the Court of Common Pleas, on Wednesday, judgment was given in the case of "DICKONS *v.* HAYWOOD," in which the plaintiff, a farmer, near Mansfield, had obtained £500 damages against a local game association for libel. The slander was contained in a letter written to the agent of the Duke of PORTLAND, plaintiff's landlord, and through the letter having been written, Mr. DICKONS had been ejected from his farm. A rule *nisi* to set aside the verdict had been obtained, but the Court has decided that the decision of the jury must stand.

OUR LIVE STOCK.

CATTLE.

Mr. W. J. EDMONDS thus speaks of the management of fatting cattle:—I apprehend that the problem we want to solve with regard to stall-feeding is what food, or what proportions of different kinds of food, shall we give our fatting cattle in order to make the greatest weight of meat at the least cost. I have heard of graziers who have given to large heavy oxen as much as 14 lb. of oilcake per day, with hay *ad libitum*, but most of us would be inclined to say that such feeding was extravagant. We know that it is useless to give an animal more stimulating and nutritious food than it can assimilate, for if we do the excess is voided by the animal; and although we may have a very rich manure we have a very expensive one. I am an advocate for steamed food, as I have tried it on a large scale, and found it answer admirably. For fatting cattle I should recommend two parts hay and one part straw, or, in forward animals, three parts hay and one part straw cut into chaff. Those of average size will eat somewhere about 5 bushels per day, with 4 or 5 lb. of oilcake and half a peck of mixed meal, Barley and Peas or Beans; if cheap also a proportion of Wheat, to be increased to 1 peck per day in a month or six weeks after they have come to stall; the oilcake and meal to be boiled in water for half or three quarters of an hour and thrown in the form of rich soup over the chaff, and well mixed, to which add a little salt. The perfume arising from such chaff is that of newly-made hay, and the animals eat it with avidity. The mixture with the chaff should never be made more than 12 or 14 hours before it is used—seven or eight hours is still better—or it becomes a little sour, and they do not like it so well. A double quantity can be boiled on Saturday, to be mixed in tubs and used as required. My Christmas cattle were fed in this way, with the addition of a peck of roots, and the six best were sent to London and made £39 each into pocket. In support of my own view of cooked food, I may mention that the late much respected Mr. W. Bowly cautiously commenced the system, gradually adopted it for all his cattle, and spoke highly of it. The following is the recipe I had from his man:—A furnace of 70 gallons is sufficient for 15 cows. Fill the furnace with water and boil; then put in 10 lb. of flour per cow, stirring, and boil gently for an hour; put 3 bushels of chaff per cow into a long trough (a cow will eat in the day 6 bushels), then mix half the boiled meal, and after allowing it to stand for half an hour give it to the cows; the remainder of the meal will be similarly mixed in the afternoon.

—— A catalogue of Mr. Bolton's herd, of The Island, county Wexford, has just been published, containing the names and pedigrees of 53 cows and heifers. The interest of this catalogue is increased by the insertion of occasional notes on the honours taken by the various animals composing the herd. First in the list stand several representatives of the *Princess* or *Gwynne* tribe; next come two *Blossoms*, descended from *Bloom*, No. 22 at the Chilton sale, followed by other representatives of Mr. Mason's famous old stock. *Buttercup 2d*, by YOUNG WINDSOR, and of the *Anna* by PILOT tribe, and others of the *Calomel* or *Chalk* family; *Royal Mistress*, by ROYAL BUCKINGHAM, descended from *Water Witch* by ROYAL BUCK; and three *Woodbines* of the *Buttercup* by 2D DUKE OF NORTHUMBERLAND family, all strike the eye on looking through the list, as being descended from good old tribes. Reference to the commencement of the catalogue shows that considerable pains have for long been taken in the selection of male animals. The system pursued we are told, in the few prefatory remarks, has for long been to secure the best bulls possible; lately, however, the sires have been chiefly of Booth blood, eight of the last being almost entirely so.

—— Several changes have lately taken place in the Kingscote herd. PRINCE OF CLARENCE has left Kingscote, having been let to Lord Sudeley, at a high figure. Good judges consider this bull to be as fine an animal as his sire, 3D DUKE OF CLARENCE. LORD RED EYES 2D has returned from Lord Suffolk's herd, and DUKE OF DURSLEY has taken his place; DUKE OF CLARO 5TH has been sold to Sir George Jenkinson, HEIR OF CLARENCE 4TH to Mr. Ferris, Maningford, and DUKE OF CARLO 5TH to the Hon. G. H. S. Estcourt. A very short time since we had the pleasure of looking over the magnificent herd at Kingscote, and were much struck with the style and rich abundant coats of 3D DUKE OF CLARENCE'S stock. He is a magnificent animal, and it is pleasing to learn that almost all the cows in the herd are in calf to him, and that he has proved himself an admirable sire.

SHEEP.

COLONEL KINGSCOTE, of Kingscote, recently sold a few Sussex wethers which had originally been intended for the Birmingham Show, but were subsequently considered scarcely good enough. These sheep were 22 months old, and were purchased and slaughtered by butchers in their own neighbourhood at 9*d*. per lb.—the heaviest weighed 44 lb. per quarter, and realised £6 12*s*.; and the lightest 35 lb. per quarter, equal to a money value of £5 5*s*.

SWINE.

FEW English writers on live stock have done more for their subject than the late Professor Lowe, and his opinion on any subject connected with the improvement of our native breeds of stock is worthy of respect. We have before us, in the large edition of his "Domestic Animals," a coloured plate of a Berkshire pig, the property of Thomas Astley, Esq., who is spoken of as one of the first improvers of this wide spread race. The picture in question represents a well-formed animal, well covered with hair, and of a mixed tawny red and black colour, very different from the black with white-streaked forehead, and white points, of the breed, as now seen. At a pleasant agricultural gathering at Coleshill, shortly before the late Earl of Radnor's sale, the original colour and appearance of the Berkshire pig was the subject of some interesting conversation, and the company had the advantage of hearing Mr. Moor, Mr. H. Humphreys, and other experienced men speak on the subject. It appears that the present colour has long been associated with the Berksire breed, and men of middle age spoke of it as having been always the same from their earliest memory. It appears, however, that a tawny white or brown colour mixed with black, had been prevalent early in the century; and taken in connection with the coloured engraving above alluded to, a black and tawny or reddish brown appears to have been the original colour. The present uniform tint is probably due to Chinese crosses and to careful breeding. That black is not a very fixed characteristic of the race is evidenced by the liability Berkshire pigs always exhibit of becoming spotted with white on various parts of their bodies; and also it has been again and again remarked that a white sow crossed with a black boar is likely to produce a white litter. We speak on this interesting point under correction, and with a view of eliciting further information upon it.

POULTRY.

IN most poultry yards, says a good authority, more than half the food is wasted. The same quantity is thrown down day after day without reference to the time of the year, alteration of numbers, or variation of appetite. Many a poultry yard is coated with corn and meal. As it is important that fowls should have fresh mixed food, a careful poultry feeder will always rather mix twice than have any left, and it is occasionally beneficial for the birds to have a scanty meal. It is common to ask what is the best food for making fowls lay? High feeding of any sort will do it, but more particularly hempseed and tallowchandlers greaves. The former is given whole, the latter should be chopped fine and then put in a bucket and covered with boiling water. The mouth of the bucket should be covered with a double sack or other cloth, so as to exclude air and confine the steam till the greaves are softened. When they are nearly cold they may be given. These will make them lay, but it is only for a time: premature decrepitude comes on, and disease in many forms appear. A less forcing system of feeding will, therefore, generally be adopted with advantage.

FARM LOCOMOTIVE ENGINES.

As the subject of farm locomotives seems to have considerable interest for many of your readers ("West Indian" among the number), I will, with your permission, describe a locomotive engine, which I have designed for my own use, and which is at present being built for me by Messrs. Kinsey, Norton, Hill & Co., of Nottingham.

I may observe, that I am perhaps somewhat peculiarly situated. I use very large quantities of lime and salt for manure, and of coals for pipe burning. During the past year I have drawn more than 1500 tons, and as my farmyard is nearly 11 miles away from a railway station, a good traction-engine is an object, but I have not lost sight of the fact, that I also want an engine to plough, and to thresh, and, if possible, to draw out my manure from the farmyard to central positions on my farm. My land lies 1100 feet above the sea, and the total rise from the railway station is in round numbers 1000 feet, along a very winding road. The greater part of this road is a gradual rise, varying from 1 in 50 to 1 in 22; but there are three very stiff hills, of 1 in 14, 1 in 12, and 1 in 8. An ordinary traction-engine would be quite useless. The road winds so much, the engine would be constantly stopping to unlock or lock the wheels, for as to compensating gear, not to mention that the noise of it when in operation would frighten most passing horses into fits, it seems to me a compensation humbug. The horizontal position of the boilers, too, is another serious objection; either we must stop at the top of a hill to pump water in, so as to make the boiler safe, and stop again at the bottom to pump it out, to prevent the engine priming, or we must run the risk of burning our fire-box and melting our leaden plug, possibly causing a serious explosion.

But a still greater difficulty was the hill of 1 in 8. No ordinary engine with smooth wheels would go up such a hill, and draw any load behind it worth consideration. A traction-engine weighs 8 or 10 tons, and unless it would face this hill, and draw a waggon behind it carrying 6 or 8 tons of lime, and weighing 8 or 10 tons gross, it would be no use to me. Now there is only one engine in existence which could do this with lawful wheels. I say advisedly lawful wheels, because the wheels which Aveling, and Fowler, and Roby and Howard, put upon their engines are quite illegal, and contrary to the Act of Parliament, and those who use them are liable at any moment to be stopped by the road trustees, and forbidden to work them on turnpike roads. These wheels have wrought iron bars rivetted on across the tires, or else cast-iron projections cast upon these, which are, in fact, so many cog-wheels working along the roads. There is, however, as I said, one engine which would face this hill, and that is, Thompson's road steamer, which has india-rubber tires; but the enormous expense of Mr. Thompson's engines put them quite out of the question as farm implements, for, besides their first cost, the india-rubber very quickly rots if not kept in constant use, entailing thereby an annual expense of something like £150 for their renewal.

I was therefore driven back upon my own resources, or else I must give up all idea of having a road locomotive suitable for farming purposes. Now, the qualities which I considered it necessary an engine should possess to make it suitable for me were as follows:—

1. The engine must be able to go up and down any hill without the slightest risk of uncovering the top of the fire-box, from the water being too shallow over it.

2. The engine must be able to go round any corner without stopping to unlock or lock one of the wheels.

3. The engine must be capable of doubling the strain upon the pistons in a moment if called upon to overcome an unexpected difficulty.

4. The engine must have smooth wheels, and yet be able to go up a hill of 1 in 8, drawing a load behind at least equal to its own weight, say a gross load of 20 tons if its own weight were 10 tons.

Now the engine which I have designed to fulfil these conditions is a very simple affair, and presents no great novelty except in one point, the driving-wheels, and experience alone can prove if they will work or not; but even if they should not I have not left myself without a line of retreat. The engine will have an upright multitubular boiler, and two 8-inch cylinders, but instead of having these two cylinders both acting on one crank shaft, I have the crank shaft cut in two in

the middle of its length, so that each cylinder acts on its own crank only, and that crank works the driving-wheel on its own side only, each driving-wheel having its own separate axle, on which it revolves freely, independently of the other: consequently the engine will twist about in any direction the steersman pleases; and as the boiler is upright, it cannot possibly uncover its fire-box when going up or down hill. Although I have, as shown in the following figure, two separate crank shafts, I take care to set them truly in line, and provide them with a clutch which can be thrown in or out of gear at pleasure, so that when put in gear with the cranks at right angles, the engine will practically be the same as any ordinary double-cylinder engine, and will enable us to pass out the whole power through either end of the shaft, upon which there will be two fly-wheels, one turned for a belt to work a threshing-machine, the other grooved for an endless rope band to work a steam-plough on Fisken's plan of a flying rope.

I may observe that this arrangement of two cylinders and separate crank shafts has another advantage, because on every farm there is a great deal of light work, chaff-cutting, pulping, &c.; and to put a large, powerful engine to it is like putting a giant to do the work of a dwarf. When such work has to be done the steam will be let on to one cylinder only, the other standing idle.

In so far, then, I have filled my first two conditions; I have got an engine which will never uncover its fire-box, and which will turn round any corner. The third condition is that I must be able to double the strain on the pistons at any moment, and this I provide for as follows. My boiler is to be made as strong as any railway locomotive, and is to be worked always with 120 lb. on each square inch of the safety-valve; that is to say, 135 lb. into a vacuum. It will be a nominal 8-horse, having rather more than 160 square feet of water-heating surface; but, being upright, it will also be a superheater, having rather more than 80 feet of superheating surface. The pistons are 8 inches diameter, with 12-in-stroke, and will run at 300 feet per minute, or 150 revolutions of crank shaft. Now, such a boiler would never supply such cylinders at such a speed with 135 lb. steam. But each cylinder, besides having the usual link motion for reversing, will be supplied with a third eccentric, working a separate cut-off valve; and it is my intention to cut off at a very early period in the stroke, making the expansive power of the steam do most of the work. When working as a locomotive the cut-off will usually be at one eighth of the stroke, which gives a theoretical strain on the pistons of 3726 lb.; but if I suddenly change the cut-off to one-third instead of one-eighth (and I can do so in a few seconds, without stopping the engine), the theoretical strain becomes 7973 lb., or considerably more than double; and if I chose to make the cut-off one-half, then the theoretical strain would be 9958 lb., or nearly three times the ordinary strain. Of course, in cutting off at one half the pistons would not go at the same speed, because the boiler could not supply steam fast enough; but that would not signify: my train would move more slowly but still it would overcome its obstacle. The boiler would, however, supply steam to keep up the full speed of 300 feet if the cut-off were made one-fourth; and at such a cut-off the theoretical strain on the pistons would be 6583 lb., which is about as great a strain as a nominal 18-horse portable engine could exert working with 50 lb. on the safety valve. I have thus, then, provided for the third condition, and now the fourth remains.

How am I to make a smooth-wheeled engine go up an incline of 1 in 8 and draw both itself and a waggon behind it as heavy as itself, that is to say, to make each ton of the engine haul up two tons gross load. It is a well-known fact, proved by many experiments, that if a wheel be loaded on the axle with one ton (2240 lb.), and set upon a common road, a strain of 600 lb. applied at the rim will make that wheel slip round. But in any traction engine it is not possible to get more than three-quarters of its own weight to bear on the driving-wheels, therefore a single ton of weight in the engine only gives three-quarters of a ton on the driving-wheel, and a traction strain of 450 lb. (three-fourths of 600) will overcome the adhesion and make the wheel slip. Now a traction strain of 450 lb. cannot possibly draw two tons (4480 lb.) up an incline of 1 in 8. This is easily demonstrated. To move two tons along a level macadamised road at the rate of three miles an hour, or 264 feet per minute, requires 1-horse power, or 33,000 foot-pounds per minute. But the rim of the wheels would be moving at the rate of 264 feet per minute, and dividing that into 33,000, we get 125 as the traction strain for 2 tons on an ordinary road that was perfectly level. But if 2 tons are moving up an incline of 1 in 8 at the rate of 264 feet per minute, they rise 33 feet in a minute, and 4480 (2 tons) multiplied by 33, give 147,840 foot-pounds as the power necessary to raise the load that height; and if we divide this by 264 (the speed of the rim of the wheel), we get $147,840 \div 264 = 560$ as the strain at the rim of the wheel. Adding this to 125 (the strain upon a level) we get 685 as the total traction strain at the rim of the driving wheel requisite to move 2 tons up an incline of 1 in 8; and as I have shown before that 450 is the limit of the adhesion, it is quite plain the wheels would slip, and no smooth-wheeled engine could possibly go up an incline of 1 in 8 and draw a load behind it equal to its own weight. Now, the plan I have fallen upon to increase the adhesion is to make the tire of the wheel flatten upon the ground. An india-rubber tire would do this, but india-rubber is too costly and too perishable; I therefore propose to make the tire of my wheel thin elastic steel, and to make the spokes volute springs, so that both may yield as the wheel rolls round. Whether these will be durable or not experience only can tell, but even if they should not I have not left myself altogether without a line of retreat. These elastic wheels, however, serve several purposes besides enabling the engine to go up steep inclines. The engine, by means of them, will be altogether hung upon springs, for the fore carriages will have common semi-elliptic springs, and I also think they will enable the engine to pass over soft ground without sinking into it. I expect the surface bearing on the road will be ten times as great as that of an ordinary round wheel with rigid tire; so that the average pressure on each square inch of road will only be one-tenth part of what it would be with rigid wheels—which is a very material point in going over soft places. With these wheels, then, I expect to fulfil my fourth and last condition.

I have mentioned above that the engine is intended to be worked at a very high rate of expansion, and it is in this expansive principle that one great element of its economy, and I hope its success, will subsist. The cylinders are nominally 12-horse, and the boiler is nominally 8-horse, but by cutting off the steam early in the stroke the boiler will be amply large to supply the cylinders. A common portable engine works with 50 lb. on the safety-valve (65 lb. steam), and does not expand beyond shutting off the steam a little before the end of the stroke to produce the recoil, say at nine-tenths of the stroke. My engine will generate steam with 120 lb. on the safety-valve (135 lb. steam), and when ploughing will cut off at one-sixth of the stroke. Now, 1 cubic foot of water raised into steam with 50 lb. on the safety-valve, and cut off only at nine-tenths of the stroke, will do a theoretical duty of 3,227,040 foot-pounds; but the same cubic foot of water if raised into steam with 120 lb. on the safety-valve, and cut off at one-sixth of the stroke, would do a theoretical duty of 8,438,109 foot-pounds. But the consumption of water and of coal in the two engines will be in the inverse ratio of these two numbers; therefore, $8,438,109 : 3,227,040 :: 1000 : 382$. That is to say, if a common portable engine required 1000 gallons of water to perform a certain work, my engine, owing to its high expansion, ought to perform that work with only 382 gallons; and the same rule will hold as to coals. But this is one of the great points I aim at, namely, to reduce the quantity of water. One pound of coal in a well made portable engine will boil off from 6 to 8 or even 10 lb. of water, therefore the cartage of water is a very serious item. In my engine the water cistern will be made to hold about 700 gallons, and there will be a pump to enable it to fill it from any stream or pond. But this quantity (700 gallons) will be ample for the longest and hardest day's work, so that I expect the engine to go every evening when the ploughing is over to fill her own water cistern and return to her place, and so dispense with all horse-work in carting of water.

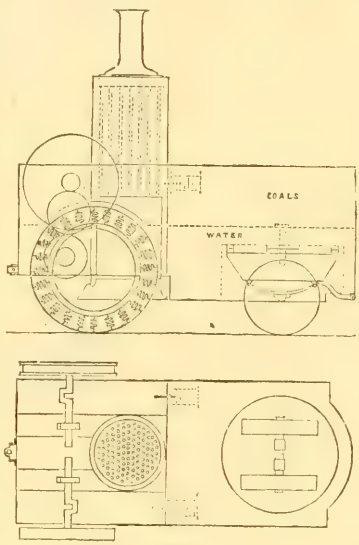

Fig. 28.

The system of ploughing which I mean to adopt is that known as Fisken's flying rope, with two self-moving friction-clutch windlasses working on opposite headlands, but the implements will be Fowler's, for, so far as I can form an opinion, there are no implements made that can compare with them.

As for power, provided Fisken's flying rope does its duty, I am not the least afraid of not being able to pull any plough that has ever yet been made. Whatever gives way, I do not think the steam on the piston will be the weakest point of the machine.

I may mention that the extreme size of the engine will be 14 feet 3 inches by 6 feet 6 inches wide on the road, or 7 feet 6 inches over the fly-wheels, but as they are high up and would clear a gate-post it could quite easily turn in at any farm gate, and as the front wheels work clear round, it could turn itself right round in a road 20 feet wide. The driving-wheels will be 15 inches broad, and the front 9 inches, but the two front wheels will be brought close together, so as to give it the steadiness of a three-wheel engine in going over uneven ground.

If my farms were large enough, I should undoubtedly use two engines, and work the plough between them, for there is a simplicity about that mode which will always commend itself, and for very large occupations or for hiring out it is no doubt the best. The loss of fuel by one engine standing idle while the other is at work is a mere bagatelle. The waste of fuel in any engine takes place by the evaporation of the water, and as long as the steam is kept shut in and the dampers closed the waste of heat is very trifling, provided the boiler is well lagged.

In my case, however, I could not afford two engines. One is ample to do all my carting, all my threshing, and all my ploughing with a roundabout, reckoning 60 days for ploughing. Now, a second engine would cost me quite £400 extra, and must be put down entirely as an extra charge against ploughing. When my farms are all in order, I shall only have 700 acres under rotation, three years in crop and two years in Grass; and this only gives 420 acres of actual plough each year. Now, 15 per cent. on £400 would come to £60 a-year, and that would add about 3s. per acre to the cost of ploughing, besides requiring me to find £400 additional capital.

In conclusion, allow me to say that if I desired to use india-rubber tires to my wheels, I would do so without caring three straws for Mr. Thompson's patent. A traction engine was exhibited by Bray at the Great Exhibition of 1862 with india-rubber tires, and a thin steel tire outside it. But, besides this, more than 20 years ago Mr. Gurney and others had steam carriages running about the streets of London, all of which had india-rubber tires, and the common complaint was that people ran great risk of being run over because these things came up so noiselessly behind them. *G. A. H.*

ANALYSES OF MANURES, FROM THE WINFRITH FARMERS' CLUB.

[The following has been forwarded to us by Mr Reader, Hon Secretary to the Winfrith Farmers' Club, after publication at the instance of that Club.]

Of the following manures, No. 3 must be regarded apart and as a special manure. The others are of the kinds called nitrophosphate and superphosphate—the items of their analyses will show them to graduate from the one class to the other.

Respecting these, the insoluble phosphate consists partly of bone-ash, partly of mineral phosphate, a few only containing a little bone. In respect of the attackability of the insoluble phosphate they may be arranged in decreasing order as follows:—2, 12 (8, 13), 1 (5, 4, 7), 6 (11, 9), 10—those within a bracket being sensibly alike.

	No. 3.
	per cent.
Moisture	7 00
Organic matter, &c.	7 31
Siliceous matter	5 00
Silicic acid	1 25
*Phosphoric acid, soluble	2 23
† ,, insoluble	2 78
Sulphuric acid	19 50
Carbonic acid	8 21
Chlorine	11 14
Oxide of iron and alumina	2 03
Lime	14 20
Magnesia	0 75
Potash	5 43
Soda	6 63
	102 51
Deduct oxygen	2 51
	100
*Equal neutral phosphate made soluble	4 86
† ,, ,, insoluble	6.07
Total	10 93
Nitrogen, equal to	0 14
Ammonia	0 17
Market value per ton	£5 0 0
Market price per ton	8 0 0
	Lucks. Potash.

The sample No. 3, besides being a complete special mineral manure, has its insoluble phosphate in a form more attackable than any of the others. The phosphates are only 11 per cent., about 5 being soluble. The potash and magnesia it contains suggest its use for

Clover, Peas, Beans, Potatos, on soils poor in potash. We consider its market value about £5 per ton.

The use of potash as a manure has lately attracted much attention, and the results of the numerous experiments have been various, proving its efficacy to be greatly restricted by circumstances, so that great care is required in judging of the advisability in a case of using this expensive article.

It appears that as a muriate of sulphate it is followed with good results when used with phosphates on poor light soils deficient in potash, for Clover and Grasses, and doubtless generally for plants requiring potash. It cannot be wholly replaced by soda (salt) for such, and if not procurable in sufficient quantity from the land, it must be supplied in some form or other, the same as any other element required, and the result depends on all these requirements being met. We believe the

	No. 1.	No. 2.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.	No. 9.	No. 10.	No. 11.	No. 12.	No. 13.
	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
Moisture	12.60	21.85	13.20	15.55	16.65	20.75	13.30	17.00	19.15	14.00	16.00	18.12
Organic matter, &c.	7.04	10.61	2.45	11.07	3.00	3.52	21.14	9.38	8.91	5.07	15.37	5.60
Siliceous matter	3.70	4.20	5.85	4.10	4.45	4.75	4.81	5.60	6.90	4.19	5.70	3.60
Oxide of iron and alumina	2.98	2.35	3.25	3.03	3.48	3.85	2.85	4.35	3.55	2.12	2.35	2.52
Soluble phosphate of lime	15.46	13.73	14.63	11.93	12.42	11.98	9.94	12.02	9.36	16.33	10.10	12.57
(Equal to neutral ditto)	(24.20)	(21.58)	(22.90)	18.68)	(19.45)	(18.75)	(15.57)	(18.82)	(14.66)	(25.57)	(15.82)	(19.67)
Insoluble ditto	9.03	7.43	7.61	10.30	15.05	11.62	14.73	11.06	17.25	15.55	7.75	9.19
Alkaline salts	0.25	0.44	trace	0.23	0.19	1.63	1.15	trace	0.23	0.27	10.31	trace
Hydrated sulphate of lime, &c.	48.94	39.39	53.01	43.79	44.76	41.90	32.06	40.59	34.65	42.47	32.42	48.40
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
Neutral phosphate made soluble	24.20	21.58	22.90	18.68	19.45	18.75	15.57	18.82	14.66	25.57	15.82	19.67
" insoluble	9.03	7.43	7.61	10.30	15.05	11.62	14.75	11 06	17.25	15.55	7 75	9.19
Total	33.23	29.01	30.51	28.98	34.50	30.37	30.32	29.88	31.91	41.12	23.57	28.86
Nitrogen, equal to	0 71	0 67	0.07	0.81	0.14	0 11	1.25	0.28	0.49	0.49	1 69	0.53
Ammonia	0.86	0.81	0.09	0.98	0.17	0.13	1.51	0.34	0.60	0.60	2.05	0.64
Value per ton, according to Mr. Nesbit's published tables	£7 12 2	£6 15 3	£6 14 3	£6 8 11	£6 9 1	£5 19 7	£6 7 3	£6 2 1	£5 13 11	£8 4 5	£6 4 7	£6 7 7
Market price per ton	6 10 0 Lawes. Super.	6 10 0 Hill and Co. Super.	6 0 0 Prentice. Super.	8 0 0 Miller and Jonson. Nitro.	6 10 0 Miller and Jonson. Super.	6 0 0 Odams. Super.	7 0 0 Odams. Blood.	6 0 0 London Universal. Super.	6 10 0 Stevens and Co. Super.	6 10 0 Spooner and Bailey. Super.	8 0 0 Dixon and Cardus. M. M.	6 10 0 Virtue and Homer. Super.

instances where potash is required are, however, fewer than many are disposed to imagine. *J. C. Nesbit, Landsdell & Co., Laboratory*, 38, *Gracechurch Street, London, E.C.*

Home Correspondence.

Irish Land Question.—I should be sorry to deprive your correspondent "G. A. H." of the pleasure he must derive from indulging so largely in criticism; all that I would suggest is, that he should read more attentively, and refrain from putting constructions on words and sentences they are not intended to convey. In speaking of compensation from the landlord, "G. A. H." supposes a case where the tenant claims for anything he has done upon the land. I spoke of efficient work; and there would be no difficulty in distinguishing between improvements which were efficient and works that would be only a barrier to future improvement. Again, "G. A. H." must be very ignorant of the present state of Ireland, and of the claims he would find on many of the properties that are constantly being offered in the market for sale, if he supposes that all a person has to do is to buy an estate and go and take quiet possession of it; he would not find it so easy to dispose of those tenants who have ever attorned or paid 1*s.* of rent, as he imagines; nor would the law courts make such very short work of him, as "G. A. H." would find to his cost. Your correspondent "G. A. H." says a good deal about State aid and Government help. I do not say one word about Government giving 1*s.* to Ireland; all that I recommend is a plan (without defining how it should be carried out) which in a commercial point of view offers one of the best possible investments for capital. I do not say what manufactures would do for Ireland, or how far they may succeed in competition with the world; but I do say that she is capable of growing roots and producing meat, and in this she could compete with any other country. I quite disagree with what "G. A. H." says about the Irish labourer combining against his master, or looking upon him as his enemy, but his remarks on this head show to what school he belongs. *John B. Spearing, Beenham Lodge, near Reading, Berks, Jan.* 25.

—— Gunpowder is a powerful agent; it is composed of materials somewhat dissimilar; unless it contains a certain element, which, compared with the other components may be termed slow and heavy, it will be almost worthless. We find, too, that ships are all the better for a little ballast. Instances might be multiplied where gravity and even information are good things in their proper places. For example, a letter to a newspaper might be advantageously freighted so that it would show the writer to be a man of sense and information; for although there are few who cannot discern the difference between tinsel and the real metal, it does not reflect much credit upon anyone, be he a young man or an old, if he is merely the author of letters whose only claim to notice is that they are smartly written. "G. A. H." is a very spirited writer, and when dealing with his letter upon the above question I think I have given him his full quota of justice in saying this much:—If "G. A. H." is not an Irishman, his hot-headed and ill-considered letter cannot do aught else than cause those who look upon the Hibernian as a "rattlin', tearin'" sort of body to give him credit for being at least akin to "Paddy." But surely if he were an Irishman he would not write thus of his countrymen. If he is an Englishman, what a pity that the patrimonial acres in Ireland were not largely apportioned to such a cool calculator as "G. A. H.," whose example of deliberation, forethought, and consideration for those inferior to him would be the means of regenerating the country, and thus there would be no occasion for its submersion. Let us hope that "G. A. H." is the only gentleman of warm temperament belonging to his family, and that his relatives in Ireland, "too numerous to mention," are managing their estates in a way creditable to themselves and beneficial to their country. "G. A. H." is sweeping in his assertion when he says, "No two Irishmen were ever yet employed by one master, but what they laid their heads together to combine against him." The repetition of this ought to be sufficient to stamp "G. A. H." as a writer unworthy of credit. Fortunately the time has passed when such tirades would be acceptable to English readers. We have arrived at a period when mere sensational writers will be weighed in the balance. There is a sense of justice in England which it is hoped merely requires to be invoked for worthy purposes. And the publicity which is given to the views of sensible Englishmen show that "G. A. H." is amongst the rapidly decaying class, whose chief aim seems to be to set class against class. *T. C.*

Dry Sewage Manure.—"A. B." asks about dry sewage. Let him look at your advertising columns, p. 49, January 8, 1870, first column, "night-soil manure." The Corporation of Rochdale are worthy of great praise for trying to convert night-soil into a dry powder, and farmers should aid them by experimenting with it. A single ton will hurt no one, and if it should be found to succeed, if we had all the night-soil from all the large towns in England converted into a dry powder, it would add greatly to our farm produce. *G. A. H.*

A Suggestion to Agricultural Societies.—The agricultural societies of England have now become a very important and powerful "institution" in this country. During the last 30 years they have, by their various excellent shows of cattle and improved implements, done a wonderful amount of good, the benefits of which are now felt by all classes of society in town and country. The breed and quality of cattle have been greatly improved; the progress made in agricultural implements has been astonishing; the laying-out and manuring of lands and the rotation of crops have also been greatly improved upon, larger and better crops have been the result; and all this has been either entirely or partly brought about by agricultural societies and their great annual competitive shows throughout the country. But there is yet one great problem connected with agriculture to be solved. At the present, and for some time past, civil engineers and sanitary reformers have been endeavouring to solve it; but I feel convinced that our more advanced agricultural societies will have to step in with their able aid and assistance in this important matter. I allude to the utilisation of town sewage. The late Earl of Derby offered £100 to any town in North Lancashire that would adopt a system of utilising sewage similar to that carried out at Wellington College, Sandurst, by which the sewage matter of the district is intercepted, and made available for agricultural purposes. This prize has not yet been awarded—not even competed for—and, from all appearances, is not likely to be. As the various agricultural societies are now about fixing upon the towns wherein they intend holding their next shows, also fixing the prizes they intend awarding, I beg respectfully to suggest to all agricultural societies the great necessity of offering prizes for the first, second, and third best systems of utilising town sewage for agricultural purposes, such plans or systems to be shown by models or drawings at the forthcoming shows. The judges in this department ought to be gentlemen possessing a practical knowledge of agriculture, as well also of civil engineering. I feel certain that if this suggestion were acted upon, it would greatly assist in solving this most important question, and by so doing the science of agriculture would be benefited, and our large cities and towns improved in a sanitary as well also as in a pecuniary point of view. *J. Duthie, Preston, Jan.* 26.

Lambs and their Diseases.—I have had eight died, and having inspected them after death, I have found in them all tapeworms in their intestines and purgings, and that was the cause of their death. I should be glad to know if flock-masters or practical men can give me any information how to prevent these worms, or cure them. *J. S. Hind, Penair, Truro, Cornwall.* [The origin of tapeworms in lambs is not well understood. No doubt, like other tapeworms, they are developed from hydatids; but the particular germ has never been seen. Give the animal a mixture of four parts of common salt, two parts of powdered Areca nut, and one part of turmeric. The powder may be mixed with bruised oats, meal, or other food, so as to allow half an ounce to each animal in the day.]

Mr. Smith and "G. A. H."—At *p.* 121 there is a paragraph under this head, which I am very sorry to see, and very sorry that my banter should have roused up Mr. Smith to write it. When he cools down a little, Mr. Smith will see that such a paragraph gives me a weapon, which in the hands of an unscrupulous antagonist might be made very unpleasant for him and his. I have, however, a great deal too much respect for Mr. Smith, and for the highly honourable class to which he belongs, to make any such unworthy use of it. In my encounter with Mr. Smith I have always endeavoured to treat him, I hope, as a gentleman, but also as the advocate and inventor of a particular system of steam cultivation; and although I may have been somewhat unsparing of ridicule, and hit him some hard blows, I do not think I have said a single word that ought to have called forth such a writing on his part. If, however, I have said anything which he fancies can in any way reflect on him or his, I tender him my most respectful apologies. If Mr. Smith supposes I am some great man, who in the conceit of a high position looks down upon him, he makes a great mistake; and, will he excuse me for saying that he lowers himself by such a suspicion. Mr. Smith belongs to a class of men who are the backbone of England, and upon whom even the highest in the land beneath the Crown have no right to look down. It matters little to Mr. Smith, or your readers, who or what I am, or whether I have a long line of ancestors or not; nevertheless let me assure Mr. Smith that if he be, as he is pleased to call himself, a plain farmer, I am simply a working man, and as proud of my prowess as a workman as the noblest in the land could be of a long descent. I hope Mr. Smith will not be angry with me, if I say that in any argument it is an unwise thing to lose your temper; it gives your opponent a handle, which, if he chooses, he can use against you most unmercifully. Mr. Smith is as genuine a specimen of the real old John Bull as could be met with; and he must allow me to remind him that John Bull always used to be quite as ready to receive a blow as to give one. *G. A. H.*

Belgian Farming.—As Mr. Howard is kind enough to say he will discuss the questions raised by me provided I give my name, and as I am desirous that the matter should be ventilated as its importance seems to require, I cannot, by withholding my name, deprive myself or your readers of the privilege of becoming acquainted more intimately with Mr. Howard's views upon the above subject. Gladly, then, will I place myself under his tuition; and I trust he will not consider his pupil troublesome

if, during the course, he is inquisitive. It is probable that all who have heard Mr. Howard's paper, as read by himself, or those who have become acquainted with it through the public papers, may not coincide in the opinions of the author. I had conceived ideas very different from those expressed by Mr. Howard, I had also read the opinions of others more competent than I am to judge in the matter, and I must say that I was not pleased that all my air-built castles should so soon be threatened with destruction. I have seen in Belgium much that I considered admirable; I have become acquainted with a people who, though uncouth in look and having an air of depression, are yet in reality not such clowns as we might suppose; nor are there the heartburnings or longings that we find in those with whom we are better acquainted. Undoubtedly the English labourer is paid higher wages, and he generally supplies himself, or is supplied, with a more nutritious and costly diet; but I am supported in the view that the Belgian is as happy and satisfied as the English labourer. It has been said that, "English travellers, as they hurry through Europe, pronounce the peasantry of every Continental country poor and miserable, its agriculture and social system a failure, and the English the only *régime* under which labourers are well off. It is truly enough the only *régime* under which labourers, whether well off or not, never attempt to be better. So little are English labourers accustomed to consider it possible that a labourer should not spend all he earns that they, the travellers, habitually mistake the signs of economy for those of poverty." As regards their management of the land the following are not the views of a people deficient in points of careful, and I might say scientific farming. We might wish that as much might be said of farmers in districts of our own country. "In Flanders they have a perfect knowledge of the relative importance of different sorts of manure. The Flemish say that whoever withholds a sufficient fodder from his lands and his cows can never raise a sufficient profit out of cheese. This is the cause that the manure is well paid for in Flanders, and that into the very centre of the country it is imported in abundance." And again, in noticing improvements:—"In former times, in Flanders, they were of opinion that husbandry was impossible, without pastures. They kept then less cattle, and, although the farmers could dispose of more ground, it could not be brought to a sufficiently fertile state, and the profits were smaller. It is since the improved manner of husbandry has been introduced that Flanders has become an example for other countries." In the last quotation we find an argument against Mr. Howard's depreciation of *petite culture*. With reference to the coming report of the Royal Agricultural Society's Commission I shall welcome its contribution to our stock of information upon the subject under discussion. We are led to expect an exhaustive treatise upon Belgian farming, and I trust we may not be disappointed. *T. Carroll, Coalville, Leicester.*

The Woolston Smasher.—At page 85 you give drawings of three of Mr. Smith's implements, and at page 86 you insert some remarks of Mr. Smith, which are both amusing and astounding, for he claims Fowler & Co.'s new turnround cultivator as being his invention. He says, "I claim his turnround cultivator, for it is constructed on my principle, branded 'Fowler' instead of Smith." Prodigious! I saw Fowler's new cultivator at the Smithfield Club Show, and a very ingenious plan it seemed, for it lifts the working parts of the implement clean out of the ground It struck me when I saw it that possibly the suspension plough, invented by Mr. Beard, of Stowe Park, and made by Kinsey & Co., of Nottingham, might have suggested the idea, but that a Woolston smasher had done so was far beyond me. I had seen a smasher, but I thought I would take a look at your woodcut again. So I went and got my very best treble magnifiers, and rubbed the glasses very clean, but for the life of me I could see nothing in "figure 18, the Woolston Smasher," which lifts the tines out of the ground. So I supposed there must be some other point of resemblance, and I turned and twisted the paper in all directions, but not a thing could I detect any likeness in (for after all a giant might be like a dwarf) until at last a hazy idea passed through my puzzled brain. Shade of Beau Nash! I exclaimed, surely the man cannot have the hardihood to claim for his own the Bath chair arrangement in front, the long handle and swivel-wheel which every old lady in Bath was familiar with long before Mr. Smith was begotten? Is this what Mr. Smith claims to be his "principle?" or is it the two little wheels with a hand-lever which I see stuck behind the others in "figure 16, the Woolston ridger and subsoiler?" If it be the hand-lever, did Mr. Smith ever see a Coleman's cultivator? It, to be sure, has a hand-lever too, but then it does not lift the implement, it only lifts the tines out of the ground, and no doubt it is easier to lift the whole than a part! But, after all, what does it signify?—a child could lift his toy cart and put it upon the table, but it would take a stronger man than Mr. Smith to lift a real dungcart. *G. A. H.*

Mr. Mechi and 36-inch Ploughing.—I see that Mr. Mechi has great faith in the steam-plough, although he has long hesitated to adopt it at Tiptree. He believes that already the land has been ploughed 30 inches deep, and that 50-horse engines are shortly to open it up 3 feet deep. But is not Mr. Mechi endowed with the spirit of prophecy? Did he not tell us at Chelmsford, in 1852, more than 17 years ago,—"I see all this in the distance, it is a mere question of time. I see mighty engines tearing up furrows a yard deep, and making the land look like a sea!" How grand! What a splendid sight it must have been at Chelmsford 17 years ago to look upon the worthy alderman, "his eye in a fine phrensy rolling," delivering his mighty prophecy, this Daniel of the nineteenth century. But alas! how are the mighty fallen; is it possible that the old gentleman is getting blind, and has mistaken a mole-plough for a cultivator! Or is he getting deaf, and has he only heard of this 30-inch ploughing? For if so, perhaps his friend told him 13, which his indistinct hearing converted into 30. *Who can Tell.*

Depth of Cultivation by Steam-Power.—In commenting on my letter to the *Times* about 4 feet draining being requisite, owing to the very deep cultivation, you speak of "big words." On reference to the report of the Steam Cultivating Committee, appointed by the Royal Agricultural Society, I read at p. 361, vol. 5 (new series) of their Journal:—"Mr. Smith has also begun to subsoil Hop grounds between the rows of poles—a single tine on the cultivator going 2 feet deep, with a space at bottom 18 inches breadth." If this can be done with a 10 or 12-horse engine, it would be no great stretch of imagination to calculate on 30 to 36 inches with a 30-horse engine, and at a still greater depth with a 50-horse engine. I am informed that the 30-horse engines are doing 36 inches, going a second time across the first work. At all events it is manifestly unsafe to perform shallow drainage in the face of such approaching changes. On a farm in Essex 50 acres were broken up 20 inches deep, at a contract price of 21*s.* per acre, and I was informed that owing to a number of great clay stones and impediments, the contractors (an Essex firm) lost £50 by the job. We know that draining engines draw the great mole-plough through the soil at a depth of 3 feet. *J. J. Mechi, Jan. 20.*

Mr. Mechi and Howard's Engines.—In the paper which Mr. Mechi read at Framlingham the other day, I find the following sentence: "Said an implement maker to me at the show last week, a farmer declined to buy one of the great traction engines because his gateways were too narrow. The implement maker wondered, smiled sarcastically, and thought many things, some of which he told me." The widest engines made are Howard's, 8 feet 10 inches across; and some time ago I declined to buy one of Howard's engines, although I was on the outlook for a good engine, and one reason I gave was that it was too wide for my gateways. A 9-foot farm gate has only 8 feet 8 inches clear space, and as I have nearly 200 such gateways on my land, I thought it would add unreasonably to the cost of my engine if I had to alter all my gates to suit it. No doubt a rich London alderman would think nothing of such a trifle, especially when he contemplates ploughing land 30 or 36 inches deep; but a poor farmer must suit his end to his means. The width of the engine, however, was not my only objection. Howard makes very good ploughs, and I have used no other for ten years, but a good plough-maker is not of necessity a good engineer. The old comic song, "She's my very particular Friend," has immortalised the name of Cartwright as a dentist, and if I wanted a tooth stuffed or a stump drawn, I should probably go to a Cartwright; but for a more serious operation, cutting off a leg or setting a broken arm, I really would prefer Sir William Ferguson. When I declined to buy Howard's engine, I had not seen it, I had only seen a drawing of it, but that was quite enough for me. Some time after I was at the Bath and West of England Show at Southampton—last May I think, and there I saw one of Howard's engines for the first time. It was pulling a 3-furrow plough, and turning over three very neat furrows, but by no means deep. In the same field, a short way off, I saw three of Fowler's horses working one of his "Pirie's patent ploughs," and turning over two furrows at a very good rate, and without any apparent distress. The furrows seemed to me as wide and as deep as those done by Howard's steam-plough, but then, to be sure, there were only two instead of three. I had a friend with me, but whether I smiled sarcastically and thought many things, I really do not know. Possibly, I thought Fowler was doing a bit of the sarcastic in sending a Pirie's plough and three horses to compete with the Bedford steam-engine, but I certainly thought my money was a great deal better in my pocket than spent on one of Howard's engines—£800 to do the work of four and a half horses! So I blessed my narrow gateways, and was thankful for small mercies. *An Old File.*

The Game Laws.—Mr. G. Stookes' speech at the Devon Central Chamber of Agriculture (*Agricultural Gazette*, January 8), was the most reasonable of the lot there given. He said he would try to assimilate the Game Laws to the Dog-tax, and made a sensible proposition to reduce the certificate to a mere nominal sum, say 10*s.*; and I feel quite confident the revenue would be a gainer. Under the old law with the dogs some were under age, some one thing and some another, and half of them were shepherds' dogs; but now if they are over six months old it does not matter what they are; if they are dogs they must pay. Under the old law those who thought well to pay did so, and those who did not were not forced, so the honest man paid, and the rogue got let off; and I am sorry to say the game licensing is got into just the same sad mess: those who like to pay do, and those who don't (and there is a lot of them) get off; so there, too, the honest man has the worst of it. As Mr. Stookes says, if every person without exception, young or old, who carried a gun was obliged to take out a certificate, the guns would get into better hands, and I think we should hear less of distressing accidents; and then there would be no difficulty in finding out who had got a license and who had not. No matter which way you turn, you see some little child or another with the deadly weapon; some will say they are felt shooting, some shooting small birds, some one thing and some another, and they shoot anything else they can get near: but if each one had to pay 10*s.* a year for carrying the gun, it would put an end to all these excuses, and you would not see quite so many of the children with them. No measure has been passed during these last few years that has given more general satisfaction than dog licensing; it seems to suit everybody, as now an honest man can keep a dog for a moderate licence; and I think if the game licensing was altered, and brought on the same terms as the Dog-tax—no exception except "under age"—I think that would give universal satisfaction, and I feel confident the revenue would be a gainer, as it would bring all to book who don't take out a certificate now; so if ever they were carrying a gun, if there was any doubt about them some one would be sure to inquire if they had got a certificate. I think very few shooters are asked for their licence. Now, if my suggestions could be brought into operation, I think the very great evil now existing would be remedied, and I hope ere long Mr. Stookes' proposition will get through Parliament and become law, as I am sure something must be done in the matter before fair taxation in this respect can be obtained. Trusting that abler pens than mine will take the matter up, and that we shall hear what the sporting world thinks of the question, so that it can be publicly discussed, when I think there would be something done in the matter, I hope this may excite some of the excise and police to look into the matter. *A Subscriber.*

Foreign Correspondence.

KANSAS: *Emigration to the Prairies of Western America.*—Will you let me inform your readers that there are to be had in the Neosho Valley, Kansas, United States, freehold farms of any extent, from 100 acres upwards, at prices varying, according to selection, from 2 to 10 dols. per acre. A dollar is about 4*s.* 2*d.* One-tenth of the purchase money is to be paid down, and the remainder spread over equal payments of ten years. This land, from which I have just returned, with power to negotiate the sale and settlement thereof, consists of nearly a million and a-half acres, and is but 14 days' journey from England. If any of your readers should be inclined to try their fortunes in this rapidly rising country, they will find a cordial welcome from a hospitable people, speaking the same language as themselves, and proud of their common descent.

The prairie is a vast natural meadow, the surface slightly undulating, the soil of unequalled richness, being a dark sandy loam of many feet in depth lying upon the limestone rock. That, added to the splendid climate, enables them to grow immense crops of nearly everything. I know of one instance where a farmer this year grew upwards of 50 bushels of Wheat per acre, then sowed Hungarian Grass, and the same autumn cut from two to two and a-half tons of hay per acre; then reploughed the land, and it is now Wheat again. But Wheat is considered by them quite secondary compared with their wonderful crops of Indian corn, specimens of which I brought with me, some collected from fields averaging 100 bushels per acre. Many English and Scotch farmers are already there. The cost and manner of opening a farm is as follows: a frame-house, weather boarded—and such houses are very comfortable—20 by 25 feet, and 12 feet in the sides, which allows of a lean-to attic, costs about 160 dols.; and two ordinary men can (as I have seen it done many a time) put up such a house in 10 or 12 days;—a cooking stove costs about 30 dols., a few articles of plain furniture, and then home is ready. Crockery had better be taken, as it is very dear.

Next come out-of-door purchases, which are a span (two) of horses — cost about 300 dols., harness 30 dols., waggon 100 dols., a cow 30 dols., breaking plough 30 dols. That leaves, out of 1000 dols., a balance of 320 dols. for living until the first fruits of the land are obtained. And this can be materially increased by working occasionally for his richer neighbours, who will gladly employ both him and his team until he turns the corner, and can afford to employ. If he has money enough without, he will find plenty to do on his own farm, making together, in careful hands, a sum sufficient; and many now opulent settlers had far less, although a man having capital, the greater his advantage. Add to this the passage by sea, cabin, £12; or steerage, £6; and railway journey, £6. Assuming a steerage passage, which I should by no

means recommend, the expense of getting there will be about £15. Then the very easy instalment to be paid to secure the land, at, say a medium price of 5 dollars per acre; the one-tenth will be 50 dollars. Thus, I have roughly shown, that for about £200 a man can obtain a freehold farm of 100 acres, of some of the finest land I have ever seen, requiring no draining, no grubbing or timber felling, no back-aching, life-long struggles to get the land cleared, but at once as ready for the plough as the fairest English pasture. And quite as ready markets for his produce as in this country, with railways within 10 to 15 miles of him. It will cost him nothing to keep his stock, as there is limitless pasturage, and he can cut hay for winter provision as much as he will. The American mowing machines appear to me perfect. I have myself cut in a day, with a pair of horses, from 7 to 10 acres of heavy prairie Grass, nearly 2 tons to the acre, and making excellent hay. I must say the Americans are behind us in scientific farming; but they are certainly before us in ready ingenuity. The marvellous quantity of hay only a couple of men will get together would astonish some of us English routine farmers. However, they are great admirers of English farming, and no doubt each can learn of the other. I will not trespass more upon your valuable space, except to say, I shall return, I hope, to the Neosho Valley at the head of a large colony in the spring; and anyone desirous of going with me will have my assistance to secure their passage by sea and rail, and the advantage of my judgment in selecting their land. And I think you will allow me to add, from the many years you have known me as a practical agriculturist, that my experience may be useful to many. All detailed information can be obtained on application to me, at the office of the Neosho Valley Settlement, Messrs. King, Son & King, Land Agents and Surveyors, 39, Lombard Street, City; and a pamphlet of the Neosho Valley forwarded on the receipt of 12 postage stamps. *Sawyer Spence, Land Agent to the Commissioners of the Union Pacific Railroad, Southern Branch.*

[We allow Mr. Spence thus fully to advertise his proposals, believing that emigration is a great step upwards in the lives of many Englishmen, and that the Neosho Valley well deserves favourable consideration at the hands of intending emigrants. Of course, however, having no personal knowledge of the locality, we must disclaim all responsibility; and the proposal must be most carefully examined before it is acted upon.]

Societies.

LAVENHAM.

A Discussion on Farm Capital.—The following conversation followed Mr. Mechi's recent lecture here on this subject:—

Mr. R. Garrard, Brundish, would like to ask Mr. Mechi how it is possible for a tenant to put £30 an acre upon the land if he has no security for it. He thought Mr. Mechi's estimate of the amount of capital a tenant had invested in the land rather low, and that it was something like £10 or £12 an acre in this district. At present the amount of capital lying in the valuation between incoming and outgoing tenants was very large, but if the tenant were to put three times the amount of capital in the land of course the covenants would be very much higher, and he doubted whether he would see his capital back again.

Mr. G. Ling, Bedfield, had for a long time thought their friend Mechi was simply a beacon for farmers to beware of, and that opinion was confirmed that night. Mr. Mechi talked to them about putting a lot of capital into the land, but he had seen his own figures to the effect that he gave £25 an acre for the Tiptree Hall farm, and then laid out nearly £50 an acre as landlord's permanent improvements, and then it was to have £20 an acre as tenant's capital, which amounted to £12,000 on the 160 acres. His profits were £600 a year at the extreme, which was 5 per cent. for his money, including landlord's and tenant's capital, and a man must be a very bad judge of laying out his capital if he could not make it pay more than 5 per cent. The landlord would claim 2½, 3—some might want 4 per cent. for their outlay; and if that was paid to the landlord how was the tenant to live? Mr. Mechi was a self-appointed teacher of farmers—and he had got a lot of very inapt pupils. If he (Mr. Ling) wanted information he would prefer to go to a man who farmed 200 acres at say 30*s.* an acre rent and 10*s.* more for rates and tithes, and who, he knew, had brought up 8 or 10 children and given them a good education. He always looked on Mr. Mechi as an amateur farmer, which was the same as an amateur runner or sculler—he did not do it for gain. There was no difficulty in making a lot of fat bullocks—it could be done with money, but the question was, how about the pay? It was all very well to talk about growing food for the people, but what he said was, "Let us grow food for ourselves first."

Mr. H. Biddell said he had opposed Mr. Mechi as much as anyone, but he did not term him a self-appointed instructor. He thought him a very willing adviser, but they were at liberty to take or reject his advice—but they should be very careful to do so in the same kindly and good-tempered manner in which it was given. For his own part, if he were not restricted as to capital, he should examine some of Mr. Mechi's suggestions very closely before he should think himself justified in using capital as he advised. He understood Mr. Mechi to say that the employment of more capital would answer better on poor land than good land. Now, between Wilford Bridge and Oxford Quay was a large quantity of very poor land, worth perhaps 7*s.* an acre, and he would ask whether it would pay better to put £15 or £20 an acre capital on that land than on such land as they would find in a circuit of a mile and a-half round Framlingham Castle, the rent of which would be 37*s.* an acre. His own opinion was, that if this great capital were used, the better the land that it was used on the better return would be obtained.

Mr. Mechi expressed the hope that some gentleman would state what he thought was a sufficient tenant's capital in Suffolk.

Mr. Ling said about here it was generally thought that a man who farmed his land best with the least money was the best farmer. The man who made a little money go a long way was the best. The tenant's capital in this district might be set at about £10 an acre on the average.

Mr. G. Goodwyn said Mr. Mechi believed that he could produce a much larger amount of food from cultivated arable than from the pastures. He (Mr. Goodwyn) did not deny that, but they must look to their balance-sheet for the results. Mr. Mechi said, that with the pastures but a small amount of labour was required. Now, labour was a very serious item in their expenditure, amounting to from 30*s.* to 40*s.* an acre. At the present time stock brought more remunerative prices than some cereal crops, and it became a serious question whether it was desirable to continue to reduce the amount of pasture land at the ratio which had up to the present prevailed, for it was by means of the pastures that stock was kept. Another effect of Mr. Mechi's proposal would be to sweep away altogether an immense mass of men now engaged in agriculture, and the result would be that the competition for occupations would be much less and the landlords would not get such high rents; and he must confess he regarded it as a thing to be contemplated with much seriousness when it would put *hors de combat* a fourth or a third of the present tenantry of the kingdom. Twenty or thirty pounds an acre was a formidable amount to invest in an occupation. Mr. Garrard had said the valuation paid by the incoming tenant is so much capital lying dead instead of being lively; and if more capital were put in the land of course the valuation would be heavier. Mr. Mechi contemplated getting rid of all fences and trees and substituting steam for the present source of labour. By so doing he would, of course, sweep off the horses and men too, for he told them one man could work an engine of 30 or 50-horse power, whereas it would take 25 men to work 50 horses. Then what an enormous amount of capital would be sunk in these engines.

Mr. Mechi said the pair of 30-horse engines to which he had alluded, with the tackle, cost £4500, and they were doing cultivation 10 inches deep at 2*s.* 6*d.* an acre, after paying interest on the outlay. These enormous engines were used as a matter of economy, and it was considered that 50-horse power engines would be cheaper than 30.

Mr. Goodwyn did not suppose any one in this neighbourhood had any experience of cultivating 2 or 3 feet deep, but some years ago subsoiling was the fashion on poor lands, and in some of them the result seemed to be that all fertilising power was done away with for several years. He supposed Mr. Mechi would accompany this with heavy manuring, and it seemed to him almost impossible to make manure enough for that. Mr. Mechi spoke of keeping more stock per acre, and yet he sold the straw off the farm. At present the difficulty was to find straw enough. He knew Mr. Mechi would turn round and tell him that he should cover the yards; but Mr. Mechi should tell the landlords to do that.

Mr. P. Read (Framlingham) argued that closely connected with the question of agricultural capital was that of labour, and asked, if labour was unenlightened and unskilful, what was the use of their capital? He urged the necessity for a better system of education, and as an illustration of the necessity, said if an agricultural labourer came to his shop and wanted a boot-lace and had to take off a boot, a good half-hour was wasted. Education would make them quicker, and without it we should be left in the rear by other European countries. He would like to ask Mr. Mechi how many men he would think it advisable to have on a hundred acres of land, what wages he paid them, and whether he liked an intelligent or a stupid man best?—because there were farmers in this district who positively preferred stupid labourers.

Mr. Mechi said he paid ordinary labourers 10*s.* and horsemen 11*s.* a week, but almost all his work was done by the piece, and a man earned about £35 a-year.

Mr. Read said that was about £5 a year more than they made here. He would take it 10*s.* a week and the harvest.

Mr. Mechi said his men earned about £6 for their harvest, and beer worth about 15*s.* besides. They had to cut the Wheat and see it on the stack at 11*s.* 6*d.* an acre, and most of his crop was Wheat, and at that rate they earned the £6 in about a month.

Mr. Read contended that the present scale of wages was insufficient to maintain labourers so as to enable them to do a good day's work and educate their children.

Mr. Corrance, M.P. (President), said if the whole of the appliances Mr. Mechi had mentioned were brought to bear, the tenant's capital would not be less than £40 an acre, and he wanted to see how far that view was borne out. Whether it was practical was a totally different thing. Theory must precede practice, and the one unanswerable argument against putting that amount of capital in the land was that they had not got it. It would, however, be useful to see whether the possibility existed for the appliance of that amount of capital if they had it, and with that object he would follow Mr. Mechi through a few of his statements. He agreed that capital goes abroad to increase the profits of foreigners, and employ foreign labourers in competition with us when we buy foreign produce. Mr. Mechi further said this was a pity, because not more than £4 or £5 per acre was employed on the average on the land under cultivation, and that statement was borne out by the estimate of M. Lavergne in 1854, which was £3 7*s.* per acre, half the land being pasture. This miserable sum might bring something back; and from a series of calculations he had made he had come to the conclusion that £4 capital per acre would bring a return of not more than 5 per cent., and he defied them to make more. That was, supposing the farm contained 100 acres and the capital was £400, they would get the not very adequate remuneration of £20. If they had £600, and the percentage were the same, they would get £36—not a labourer's wages; and if £1000, the profit would be £50. Mr. Mechi said they might go to £15, £20, or £25 an acre. Now, to apply the test. He had assumed that the return would be 5 per cent. whatever the amount of capital employed, but he had come to the conclusion that under circumstances as at present existing, without the large supply of town manure, without the assistance of landlords, in the way of covered yards and the other improvements Mr. Mechi advocated, £15 per acre might, under the best possible management, produce 15 per cent. profit. That was the maximum he thought could be obtained under the present circumstances, and if they employed a greater capital they would find the profit would be diminished, and with £20 an acre they could not get more than 10 per cent.; and with £25 an acre they would go down to 7 or 5 per cent. Applying this to a farm of 100 acres with £500 employed, the profit would be £25; with £1000 capital it would be, at 10 per cent., £100; with £1500, at 15 per cent., £225; with £2000 they had passed the maximum and found the scale descending, and would only get 10 per cent., or £200; and with £2500 they would only get 5 per cent, or £75.

Mr. Corrance then referred to the question of breaking up the pastures, the policy of which he questioned until both landlord and tenant had the capital, reminding them that farms with a fair amount of pasture were most sought after, and that every acre of Grass which is broken up made more capital and more labour a necessity. Their Grass might be very poor, and badly treated, but it was an immense accommodation. As to the description of land to which more capital might be most advantageously applied, he thought the poor clay lands could so be improved in a greater ratio than others. The next question was, where the additional capital is to come from, and why landlords would not take the money which the Land Drainage Companies would lend on such easy terms? The deficiency of capital arose first from the fact that the farming class, as a class, were not wealthy. A commercial man with money hesitated about taking a farm, knowing that he will lose a great deal of money before he can get an adequate result. The main reason rested on the principle of political economy—that capital will go where it meets an adequate return and where the conditions are favourable to its employment. What would produce these favourable conditions? High profits, low taxation, good security. A man with one thousand pounds would not put it into a business in which a very moderate profit of 8, 9, or 10 per cent. was made, and he was exposed to an enormous burden of taxation, some special and some general—the local burdens alone, falling on landlord and tenant, amounting to no less than £57 15*s.* 10*d.* on every hundred acres. If a man had a sum in the funds at 3, 4, or 5 per cent. would he put it into farming, where the profits would not be greater and he would have to pay such heavy rates? He would say, "No, I will employ my capital in brewing or some other trade, for why should I make it subject to such a tax?" Then, another reason was the low security. This brought him to the question of leases and agreements. His idea of security was that the tenant should not invest any capital at all over which his landlord could have any absolute command. It was monstrous that a tenant on a yearly hire or short tenancy should bring in capital to be subject to the will of any other man. It seemed monstrous to him in these commercial days, though it did not 20 years back, when the state of things was more of a patriarchal nature, and they occasionally heard of a landlord at Christmas returning his rent to a tenant who had been unfortunate, but they did not hear of that now. They stood on other relations altogether—business relations—and those relations ought to rest on a sound and solid foundation, and his conclusion was, that all permanent improvements, such as farm buildings, &c., ought to

be absolutely done by the landlord, if his capital permit, or if the security he could offer permit; for though he had not always capital, credit was equally good. If we could remove all the capital that the tenant has invested, not only here but in Ireland, on the security simply of good faith, and put it on the landlord's back, we could stand on thoroughly sound relations. To give the tenant adequate security for the capital he would invest, he would always give him four years to prepare to leave the occupation. That was the form of agreement that had been adopted on his father's estate, and if the tenant could see a good four years before him, to get a fresh occupation, and prepare to leave that which he then held, he thought they would agree with him that there would be no necessity to talk about fixity of tenure or any such nonsense. There had been a total want of knowledge on this subject. He contended that if a landlord allowed a tenant to lay out £1000 in permanent improvements on the estate he really alienated from himself a portion of the fee-simple. Customs of the country had done good work and were of enormous use, but only until the two parties could come to fair business-like working relations with each other. In conclusion he asked Mr. Mechi what inducement they could offer to bring capital out of the coffers of the wealthy men to be employed in the cultivation of the land?

Mr. BIDDELL said the President told them that the profits of farming ranged from 5 to 15 per cent., according to the amount of capital invested, and then he said that capitalists would not take money out of the banks or the funds, where they got 2½ to 3 or 4 per cent. to put it in the land, because of the taxation. He (Mr. Biddell) thought if the commercial man knew he could make 10 per cent. of his money he would not be frightened by the taxation cry into letting it remain where it returned only 2½ or 3. Why did not capitalists come and invest their money in farming? Because they did not believe that it paid—they knew better, that was the reason.

Mr. MECHI, in reply, said the real point at issue is whether it would be better in his case to put his £16 on one acre or two. He had arrived at the conclusion, from his experience, that the £16 will pay a better percentage on one acre than on two of his land, and he went further and said, if he had £5 an acre more he could do better than now—he could buy his cattle and sell his corn when it suited best, could keep more stock, make more manure, and grow greater crops. Now, there was one difference between him and many of them. His landlord—and he always spoke kindly of him, for it was himself (laughter)—had done what the President said he ought: he had made the conditions favourable to the employment of capital. That was the most important word the President had said that evening. His conditions were favourable for the employment of capital. Was that so, as a rule? He said it was not. They were shut in by fences and trees, they had not covered yards in many cases, and many appliances were wanting, and he therefore asserted that the landlords had not put the land in a condition favourable to the employment of capital. His landlord had, and he paid him the fair interest of 4 per cent. or 40*s.* per acre instead of the 20*s.* which was about what it was worth before the farm was improved. They must compare the conditions as well as the operations, and he said if he had £16 an acre invested in their land he could not derive the same profit he did from his own, though he paid the higher rent for the improved conditions; and if he had to pay the diminished rent for his own land in its former unimproved state, he could not make the percentage he did now on his £16. Let us hope the time will come when landlords will think it right to put the land into this condition by their own capital, or that which they can get elsewhere. It was admitted that the average produce per acre was from £3 12*s.* to £4. That was unsatisfactory, and arose in a great degree from what Mr. Goodwyn commended so much—poor grass-land, which was not estimated to produce more than from 40*s.* to 45*s.* per acre. It was said that grass-land required little labour, but the question was whether, if that land was broken up and farmed with a large capital, the return, after payment of the expenses in produce and profit, would not be greater than now. His experience was greatly in favour of arable land.

The PRESIDENT: Where is the capital to come from?

Mr. MECHI would say to both landlord and tenant, if they take 200 acres instead of 400 they would double the capital per acre directly. If a man with 200 acres would be content to take 100 with the same capital he now employs on 200, he would be much better off; and the same may be said of the landlord. Half the land in the kingdom is unimproved, and if they had less it would be better both for the tenants and the country generally. He reminded them that this was no longer a pastoral age. If he had all his land under pasture he might put all the capital he could on it but could not make it pay him. He knew pasture is acceptable because it employs very little labour and requires very little capital.

The PRESIDENT: Where would you breed?

Mr. MECHI: Where I can grow great crops of Tares and roots and other food. Never mind if you can give them plenty of food and air and not too much exercise.

The PRESIDENT: Can you breed in yards without Grass?

Mr. MECHI: To be sure; I have 30 calves a-year.

Mr. BIDDELL: Where do the calves come from?

Mr. MECHI: From the cows, of course.

Mr. BIDDELL; Where do the cows live?

Mr. MECHI said it was not necessary to have pasture. Give the animals plenty of corn and cake and clover hay and so on, and they would produce as good animals as any one—in fact, he believed the best animals were not those produced on poor grass-land, but as he had mentioned. He then alluded to restrictions, asking whether they thought if he had been tied down to a particular rotation suitable only to a small capital that he could put a large capital on the land with advantage? When they produced an enormous quantity of manure by the employment of large capital they produced large crops of roots, &c., which they could sell off the farm, but under their present conditions they could not sell those crops without diminishing the fertility of the land. Mr. Goodwyn professed a very great deal of feeling for the labourer, but he (Mr. Mechi) did not believe in it. Of course, Mr. Goodwyn had a fine feeling for the men in his employ, but if he could do with one-fourth of the number he would, without a moment's hesitation.

Mr. GOODWYN: Of course I should.

Mr. MECHI said: Then what became of the cry, "What are the labourers to do?" The farmers had to look to the cheapest way in which they could raise their produce. They had the natural and proper kind feeling towards the labourers they must of necessity employ, paid them according to the market, looked to their welfare, education, and so on; but don't tell him (Mr. Mechi) that they were afraid of not having employment for their labourers. What they wanted was to reduce the amount of labour. The same was the case with horses. They had no love for their horses if they could supersede them by a cheaper power. If they now proposed to a manufacturer to put horses in a wheel to drive his machinery instead of steam, he would think they had gone back a hundred years, when a man wore his breeches three years instead of having a new pair every six months. The landlords had not, according to modern principles, done their duty. It was a failing on their part rather than a fault; but steam was changing all that, and he anticipated the time when there would be freedom of action and security of investment on the part of the tenant such as now existed to a great extent in Scotland. What had made Scotland, but 19 years' leases and freedom of action? A Scotchman, if he could raise a good crop of Potatos, and it would pay him to send them to the London market, did so. The great point was that a tenant must not reduce the fertility of the soil below what it was when he took the land; and if his action is to increase rather than diminish it, he ought to be as free as air to produce that which is suitable to the requirements of the population. He treated all his farming transactions as a matter of business, and he said that it paid him best to raise 40 tons of Mangels on 1 acre with one ploughing, one rent, rates, taxes, seeding, &c., than to grow the same quantity on 2 acres with these expenses doubled. Mr. Knatchbull told him he had seen 68 tons of Mangels to an acre.

Rev. H. E. KNATCHBULL said he saw, at the Smithfield show, a sample of Mangel certified to be part of a crop that weighed 100 tons to the acre. On inquiry he found the acre was an Irish one, which gave 66 tons to the English acre.

Mr. GOODWYN said Mr. Mechi misunderstood what he said about the labourers. He said breaking up the pastures would increase the demand for labour. As a matter of business he should reduce his farming to the least expense. He proposed a vote of thanks to Mr. Mechi.

Mr. MECHI proposed a similar compliment to the President, and the meeting ended.

Notices of Books.

Considerations on Agricultural Education in General, *in the Journal de l'Agriculture*. 1869, vol. 4, pp. 321 to 341. Paris.

Under this title M. Chevreuil, the eminent chemist, and President of the Imperial and Central Society of Agriculture of France, has reviewed the whole subject of scientific education in connection with agriculture, and the arrangements lately made for the education of agricultural professors at the Jardin des Plantes.

After a preliminary examination of the services that abstract science may render to agronomy, the author proceeds to show that chemistry and other sciences have done much less for agriculture and industry, and to point out where the two stand in the same relation to science, and wherein they differ in circumstances.

Our space will not allow us to follow M. Chevreuil through his examination of the course of study established at the Jardin des Plantes, and an outline of it has already been given in our columns; what we propose to do is to give his views of the practical value of such education in raising the general level of agricultural knowledge.

All who have given any attention to the subject will, we think, agree with M. Chevreuil when he says:—"Practical instruction can only be given on the farm, but scientific education may be given in towns." After protesting against the unpractical views of professors of pure science, and, with equal force, against the general want of theoretical knowledge amongst practical agriculturists, the writer asks what will be capabilities of young men who, after having passed through the normal schools, have attended the two years' course of scientific study in Paris? It must be recollected, he says, that the decree establishing these courses of instruction has reference to young men destined for teachers, and not to manage farms; agronomic education, then, such as can be given, and is given, at the Museum of Natural History—that is to say, the schools attached to the Jardin des Plantes of Paris—is sufficient for them; for what it is necessary for them to know is, evidently, the various principles of agronomy, principles which constitute the bases of the natural sciences which are there taught. It is these principles, together with a rigorous system of *à posteriori* reasoning, which should be taught them, not in the form of a dogmatic *resumé*, but combined with the results of precise experiments. The mind of the pupil thus prepared will acquire that practical sense which will enable him to estimate at their just value a mass of writing, for which agriculture is the pretext, but which is in reality only the expression of flippancy, ignorance, and charlatanism.

The pupils then pass two years at the Museum, not with the view of afterwards cultivating a domain, but in order to assist as teachers in spreading just ideas of agriculture over the country. The experiment is now being made, it is not yet accomplished, and a decisive opinion upon the results would be certainly premature; nevertheless, judging from the past, there is every cause to believe that the end in view will be realised. Twenty-four young men, chosen out of 600, were sent to Paris without having been in any way prepared to fellow courses of instruction, perhaps too numerous and too varied; but they have shown by the attention they have given to the lessons, and by the answers subsequently given to questions by the professors, that the hopes of the Government have not been disappointed, and that there is every reason to believe that the new institution, if judiciously managed, must be successful.

After completing their studies, these young men, formed into teachers, will study the agricultural condition of the locality to which they are sent, and will become authorities. Some of these teachers may become agronomic inspectors; thus a new career will be opened to them, and their position and acquirements will enable them to render profitable agricultural service.

The scientific and the practical man are at present, says M. Chevreuil, so wide apart intellectually, that the former is often totally unable to give his aid, because cases and questions are put before him with such an entire absence of scientific method, in such loose and general terms, that in spite of the desire to be of service he is forced to keep silence. It is hoped that these young teachers will in a measure supply the wanting link. "The agricultural pupils learn at the Museum that there can be no science of agriculture without a knowledge of the causes which contribute to the success of crops; that these causes are, on one hand, forces, such as heat, light, electricity, and ponderable bodies—such as the principles of the atmosphere, of natural waters, of the soil, of manures, &c.; and that it is these ponderable bodies, all endowed with molecular attraction, which, under the influence of the physical forces, give to organised bodies the means of living and increasing in bulk and in weight."

Science knows the action of those forces, and of those ponderable bodies in their relations with plants and animals; but, says M. Chevreuil, very tersely and effectively "the difficulty of the agriculturist is in the proper appreciation of relations for any given locality." It would not be easy to express in few words the obstacles that intervene between theory and practice.

That a number of well-instructed young men who have passed through the scientific courses of the Museum, and who are especially devoted to the teaching of agriculture in provincial colleges and schools, promise to be of great value in gradually marrying science to practice, there can hardly be a question; at any rate, our neighbours are taking every possible means to lay a sound foundation for improvements in agriculture; and whether they attain their end in the manner expected is of small consequence, for real scientific instruction cannot be without its effect eventually, and nothing but good can come by placing science within reach of practical men, and leaving them to avail themselves of it or not according as their success, their wants, or their fancies may dictate; and when such sensible and praiseworthy attempts are being made on one side of the Channel in aid of agriculture, a nation on the other side cannot surely be indifferent.

Farm Memoranda.

BANFFSHIRE, BOYNE DISTRICT: *January* 17.—Since the year came in we have had rather backward weather for ploughing, sometimes frost for a few days very severe, then fresh for a few days, but before the old bone was out of sheltered places, frost set in again, so that there is a good deal of lea to plough yet, and in

the upper part of the county a good deal of stubble remains unploughed, and we may say ploughing is a month back by what it was at this date last year. Stackyards stand out well, also the Turnip fields, but so much bare frost has injured them a good deal, where they were not furred up. Live stock of all kinds are in good demand and bring good prices, and our county is said to be free of disease, and has been for some time, which is a great matter. Now that most farmers have got rid of a good part of their fat stock, they generally buy a few stores at the fairs to eat the Turnips as they see them stand out. Also a good many of our Shorthorn sales come off soon; the only one of importance in this district is that of Mr. Longmore, Rettie, who generally sells from 15 to 20 bulls and a few heifers in the beginning of March. A good many of the farmers in this district have lately renewed their leases, and are now commenced to drain their farms, which creates work for our labourers, who otherwise would not be well off, but provision is cheap this year, at least oatmeal is not much above half what it was this time last year; and grain of all kinds is cheap in proportion. Potatos keep well in the pits and are cheap also, and if it were not for his cattle, the farmer would shake a light purse. *W. J.*

Roxburghshire, Tweedside: *January* 25.—The variable temperature we have had this winter, commencing early in December with very keen frost, which was scarcely out of the ground ere we had a fall of snow, and again the thermometer as low as 14°, has kept farm labour far behind. Turnips were very much damaged by the first frost, perhaps a third of their value will be lost, and unfortunately there were fewer stored than usual when we were caught by the weather. It is surprising how the stock have thriven on them, both sheep and cattle doing well, though getting little extra feeding, and with Turnips quite foggy; of course they eat a great many more of them than they could were they all sound. There is never much Wheat grown in this neighbourhood, but with the frost and wet together the ground has never been in good order, and this year there is scarcely a field sown with Wheat to be seen in the district.

Fat cattle are beginning to come out, and are fetching remunerating prices. Old sheep will be pretty well cleared out now, and the hogs, of which there is a large number feeding, have scarcely commenced to come into the markets; they have so far been very healthy, with the exception of a few lots that have had the murrain. This disease still continues in the county amongst cattle, but is not so prevalent as it was in November, and it seems to be of a mild character.

Good fine coloured Barley and Oats of good weight, which are scarce, continue to bring good prices, but inferior samples are difficult to sell at low rates. Feeding stuffs of all kinds are lower than they were last year, and there is more demand for the low-priced varieties than for the dearer cakes. The cake bills were so heavy last winter that this season we are obliged to be very economical. *H.*

Miscellaneous.

The Landlords. — Mr. Goodlet, Bolshan, believed there was not an agricultural club in the country that has done more for the interests of the landlords than the Eastern Forfarshire. This might seem an extraordinary statement. They were not looked upon with the most favourable eye by the landlords; but if landlords knew their own interests rightly, they would see that they were anxious to promote the interests of all connected with agriculture—landlords, labourers, as well as tenants. Sometimes when they met as an association their opinions were not always agreeable to many of the landlords; but these opinions were no worse of being ventilated, as they were the sincere and honest convictions of their own minds. If the landlords knew them better, they would like them better, and would think more of them; but they were so surrounded with an atmosphere of legal gentlemen and gamekeepers, that they could not see the tenants. He hoped better days were coming. They had been agitating about the hypothec, and Game Laws, and various other questions; and really he was beginning to think in a short time the landlords would find it to be for their own interests to have hypothec abolished and the Game Laws, if not done away with, at least materially modified.—*Report of late meeting of Eastern Forfarshire Farmers' Association.*

The Week's Work.

January 29.—Early sown *Beans* and *Peas* generally corn better than the later sown, and they have a better chance to escape fly (aphis). In favourable situations many sow about the close of this month, or beginning of February. In such places there is ample time after harvest to autumn fallow the land either on the flat or stetch system, the manure in the former being ploughed in, and in the latter drilled. In either case the land requires very little preparation at this season to fit it for seed, and perhaps in the majority the teams are not allowed to set a foot upon the land, the seed being dibbled in as soon as the ground is sufficiently dry to carry the feet of the workmen without poaching. For Beans it is seldom advisable to yoke the plough at this season, more especially on land that had been well cultivated last autumn by steam; but on land not manured it may be otherwise for Peas, if the work of smashing or ploughing and of seeding is to be done by steam.

Oat Sowing towards the close of January and beginning of February is in many cases preferable to sowing at a later period, as the crop, like that of Wheat, covers the ground before the dry weather sets in. The practice is more common in our southern provinces on soils liable to be burnt up about May, and also on land where late sown crops are liable to lodge, than in the north. But the above reasons have obviously a very extensive application, for in all places where Wheat is sown at this season, in preference to later in the spring, so may Oats in not a few instances, where a dry seed-bed can be had, so as to obviate the heavy losses sustained from the above extremes, viz., too little and too much straw.

Renovating Grass-lands.—Worn-out meadows and pastures on close bottoms that require subsoiling, subturfing, prior to top-dressing, and the sowing of fresh seeds, should be worked and finished as soon as the weather will permit. In many cases, if not the majority, the more advisable course is to break up such land, either by ploughing, digging, trenching, at an early period, or by paring and burning later in the season; but there are numerous exceptions where the Grass cannot be spared, the demands of the live stock on the farm being imperative in this respect; hence the several operations should be finished with all possible despatch, so as to profit by the first start of spring growth. The land should be first thoroughly drained, otherwise the loosening of the subsoil, or soil under the green sward, will do very little good. The work is best done by manual labour, the green sod being removed by a turfing iron, and placed immediately on the dry or looser soil; but the expense is considerable. By a subsoiler under a paring plough, with the turnover removed, the work may be done by horse or steam-power for very little. Ant-hills, Tussack Grass, and everything of this kind, should previously be carted off, so as to have a smooth level surface for the plough. After a good top-dressing of lime compost, well chain-harrowed in with Grass seeds, a rich green sward will rapidly spring up the moment spring vegetation commences.

Dykes.—In reclaiming stony land, the stones thrown to the surface in trenching are carted into large hills, termed consuming dykes, and hill pastures and woodland are enclosed by ring and subdivision fences, formed by rolling together large stones, so as to form a rude wall or dyke. Were the interstices between the stones in both these and similar cases filled up with earth dug from the foundation, such fences would form excellent seed-beds for Gorse or Furze, so as to form Gorse hedges, which would yield a crop more valuable in most cases than an equal area of the cleared ground, pasture, or woodland; and besides the annual cutting of Gorse at this season, they would afford much more shelter in exposed places than the bare stones. In many places it would pay well to form shelter hedges of this kind, and between two such fences belts, formed of various kinds of wood, to suit the land, might be planted at this season in open weather.

Early Potatos may be planted in dry warm soils in southern counties where they can be grown. The demand is increasing in all our large towns with the increase of population, while the extension of railway conveyance is everywhere giving encouragement to the practice. Low lying lands subject to frosting are not suitable for their growth, but they may be grown at higher elevations and further north than is generally credited. The land should always be manured in the autumn, so as to leave as little field work at this season as possible. They are grown in drills or ridgelets, and on the flat. Split the drills, plant and cover, and on the flat plant in every second or third furrow. The potato sets should be ready a week or ten days beforehand, and free from all mouldiness when planted.

Town Sewage and Liquid Manures of all sorts adapted for Italian Rye-grass or other crops grown may be applied to warm dry soils in our southern counties, where vegetation commences thus early, weather permitting; and the slight frosts and snowstorms experienced in such places may be overcome or kept off, as it were, by the sewage. The first cutting of Grass is often invaluable for milch cows, ewes and lambs, and for mixing with straw chaff for all sorts of live stock, more especially where the improved breeds are kept and forced forward to early maturity and heavy weights. Sewage may also be so applied to force forward Rye, Vetches, Clover, and other forage plants for early soiling. Dry, warm, sandy, and gravelly soils may be sewaged for Potatos, Parsnips, Carrots, Mangels, Cabbages; and winter crops of the latter may be forced forward.

The Frost.—If the sharp weather experienced while we write should last, of course seed operations are impossible; and the work will be confined to carting out manure upon the land, and carting stones and lime and tiles and market produce.

The Dairy.—Butter dairies for town supply require to be kept at as uniform a temperature, by artificial heat, as practicable, and at the same time well ventilated. Opinion is somewhat divided as to what the proper temperature should be this season, in dry frosty weather and in moist the range being from 55° to 62°; but in practice one of the greatest difficulties experienced is to keep the different departments dry as well as warm, owing to the fickleness of the weather. In cheese dairies this is "one of the dead months."

Of *Dairy Pork* large supplies are produced at this season by butter dairies, the young porkers thriving amazingly on their meal well steamed, with butter milk. Bacon hogs keep warm and dry, and force onwards.

Highland Sheepwalks.—This is a trying month for hill shepherds. Most of the stocks are in the lowlands, the more elevated walks being without a sheep; on the intermediate grounds a daily supply of hay is given when the ground is deeply covered with snow. *W. B.*

Notices to Correspondents.

Poultry: *Aberdeen.* The Dorking cock is the best bird to use; and a poultry authority assures us that the best bird with which he is to *cross* is the Dorking hen!

Skim-Milk: *Young Beginner.* It will not answer the same purpose as new milk, nor will it by itself fatten anything. Used in making gruel it will answer very well, if you can keep digestion right.

Markets.

COALS.—January 26.

Buddle's West Hartley, 15*s.* 3*d.*; Hastings Hartley, 15*s.* 3*d.*; Holywell Main, 16*s.*; Throckley East Wylam, 15*s.*; Walls End Acorn Close, 17*s.* 6*d.*; Eden Main, 17*s.* 9*d.*; Walls End Braddyll's Hetton 18*s.* 3*d.*; Walls End Haswell, 19*s.* 6*d.*; Walls End Hetton, 19*s.* 6*d.*; Walls End Russel's Hetton, 17*s.* 9*d.*; Walls End Hartlepool, 18*s.* 6*d.*; Walls End Heugh Hall, 18*s.*; Walls End East Hartlepool, 18*s.* 9*d.*; Walls End South Kelloe, 18*s.*; Walls End Tees, 18*s.* 9*d.*; Brancepeth Cannel, 18*s.*—Ships at market, 91; sold, 70.

ENGLISH WOOL.

Business has continued much on the same scale as last week. Wool firmly held; a fair consumptive demand, but no life or spirit. All bright-haired kinds are in very short supply, others are also getting into a smaller compass.

Current Prices of English Wool.	Per lb.—*s.* *d.*	*s.* *d.*
Fleeces—Southdown hoggets	1 1	to 1 2
Half bred ditto	1 2	— 1 2½
Kent Fleeces	1 3	— 1 4
Southdown ewes and wethers ..	0 0½	— 1 1
Leicester ditto	1 2	— 1 3
Sorts—Clothing	0 10	— 1 6
Combing	1 0	— 1 8

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, January 27.

Prime Meadow Hay	80*s.* to 87*s.*		Clover, old ..	..120*s.* to 130*s.*	
Inferior do. ..	60	70	Inferior do. ..	..100	110
Rowen	50	70	Prime 2d cut ..	..100	110
Inferior do.	—	—	Inferior do.	80	90
Straw	28	34			

Charles James Easton.

Cumberland Market, Thursday, January 27.

Sup. Meadow Hay	84*s.* to 90*s.*		Inferior Clover ..	90*s.* to 112*s.*	
Inferior do.	70	77	New do.	—	—
New do.	—	—	Straw	33	38
Superior Clover ..	123	130			

Joshua Baker.

METROPOLITAN MEAT MARKET.—Jan. 28.

Best Fresh Butter	19*s.* per dozen lb.	
Second do. do.	17*s.*	,,
Small Pork, 4*s.* 8*d.* to 5*s.* 4*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 6*d.* per 8 lb.		

METROPOLITAN CATTLE MARKET.

Monday, January 24.

The number of Beasts is smaller than on Monday last, and there is a good attendance of buyers. The choicest descriptions are rather dearer, but on the average there is not much alteration in price. The supply of Sheep is larger; the demand is, however, pretty good, and prices are scarcely any lower. Choice Calves are dearer. Our foreign supply consists of 1088 Beasts, 4360 Sheep, and 104 Calves; from Scotland, there are 209 Beasts; from Ireland, 439; from Norfolk and Suffolk, 1080; and 717 from the Midland and Home Counties.

	s. *d.*	*s.* *d.*		*s.* *d.*	*s.* *d.*
Best Scots, Hereford, &c. ..	5	4 to 5 6	Best Long-wools	5	4 to 5 6
Best Shorthorns ..	5	0—5 4	Do. Shorn ..	..	— ..
2d quality Beasts	3	0—3 10	Ewes & 2d quality	3	10—4 8
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn ..	..	— ..
Do. Shorn	—	— ..	Lambs	..	— ..
			Calves	4	0—6 4
			Pigs	4	0 6 0

Beasts, 3533; Sheep and Lambs, 19,565; Calves, 148; Pigs, 130.

Thursday, January 27.

The supply of Beasts is good, and trade very dull; prices are lower for all descriptions, and a clearance cannot be effected. The number of Sheep is very much larger than on a Thursday for some time past; they cannot all be disposed of, although there is a disposition to take rather lower than we quote. Calves are rather lower. Our foreign supply consists of 268 Beasts, 2815 Sheep, and 132 Calves.

	s. *d.*	*s.* *d.*		*s.* *d.*	*s.* *d.*
Best Scots, Hereford, &c. ..	5	2 to 5 4	Best Long-wools	5	2 to 5 4
Best Shorthorns ..	4	8—5 0	Do. Shorn ..	..	— ..
2d quality Beasts	3	0—3 8	Ewes & 2d quality	3	8—4 8
Best Downs and Half-breds ..	5	6—5 8	Do. Shorn ..	..	— ..
Do. Shorn	—	— ..	Lambs	..	— ..
			Calves	3	8—6 0
			Pigs	4	0—6 0

Beasts, 895; Sheep and Lambs, 12,635; Calves, 180; Pigs, 5.

MARK LANE.

MONDAY, January 24.

The supply of English Wheat to this morning's market was again small, and realised the prices of this day se'nnight. There was a fair attendance, but foreign Wheat was in limited request at about last week's rates. There was no change in the value of Barley, Beans, or Peas. The Oat trade was quiet, at an advance of 6*d*. per qr. upon the prices of last Monday. Flour was in moderate demand at late quotations.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	40	49	Red	37	48
— — fine selected runs..do.	42	53	Red	40	50
— — Talavera	56	58			
— — Norfolk	—	—	Red	—	—
— — Foreign	38	53			
BARLEY, grind. & dist.,26s to 30s..Chev.	39	42	Malting	34	38
— Foreign .. grinding and distilling	22	25	Malting	30	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire	24	26	Feed	—	—
— Irish	23	25	Feed	21	24
— Foreign ..Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan	32	36	Tick	32	49
— Pigeon	50	60	Winds	—	—
— Foreign	41	43	Egyptian	38	40
PEAS, White, Essex, and Kent.. Boilers	32	35	Suffolk	35	43
— Maple, 41s. to 45s.	32	42	Grey	33	37
MAIZE	29	31	Foreign	29	31
FLOUR, best marks delivered.. per sack	39	43			
— 2d ditto	28	40	Country	28	40
— Foreign	per barrel 22			per sack 29	55

FRIDAY, January 28.

The cold weather has given more tone to the Wheat trade throughout the Markets of the kingdom, and excepting home-grown out of condition, which was sold at a further reduction, the tendency of prices for best qualities has been upward, but we have no decided improvement to quote. The value of Oats and Barley remained unaltered; Beans and Peas moved off slowly on rather easier terms. Buyers of Flour found no difficulty in supplying themselves at late rates. The supplies off the coast consisted this week of 36 cargoes, which, with those left over from last week, there remained for sale last night 29 cargoes. The trade in Wheat off the coast was steady, at fully former prices; Maize and Barley were sold at 3*d*. to 6*d*. per qr. reduction; Rye sold on rather easier terms. In cargoes on passage, and for forward shipment, business remains suspended, excepting Maize for summer shipment from the Danube, in which a large trade at hardening prices has been effected.—Paris, January 27, 1870. The trade in Wheat and Flour is very inactive at about late rates. The six marks are quoted at equal to 34*s*. 6*d*. per 280 lb. The stock at the Halle is estimated at 9280 cwt.

The arrivals of Grain, both English and foreign, during the week, were small. There was a very poor attendance at market this morning, and but little demand for Wheat, the few sales made of either English or foreign were at about Monday's quotations. Spring corn was unchanged in value.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	810	1280	—	—
Irish ..	—	—	—	—
Foreign ..	10,400	570	13,750	1330
				— brls.
	11,210	1850	13,750	

MANCHESTER, Jan. 27.—The trade since last week has remained in the same quiet state as for some time past, without, however, leading to any material change in values. At our market this morning buyers showed very little disposition to operate, and Wheat, whether English or foreign, met a slow sale, at the currency of this day se'nnight. Flour was difficult to quit, but not quotably lower. In Oats or Beans there was no material alteration. Indian Corn was 6*d*. per qr. cheaper.

AVERAGES.

	Wheat.	Barley.	Oats.
Dec. 18	43*s*10*d*	36*s* 0*d*	22*s* 3*d*
— 25	43 5	35 11	21 6
Jan. 1	43 8	35 9	20 10
— 8	44 5	35 11	20 1
— 15	44 1	36 4	21 4
— 22	43 6	36 2	20 10
Average ..	43 10	36 0	21 2

SEED MARKET.

The seed trade continues quiet but firm. The quantity of home-grown red Clover seed on our market is exceedingly small, and the quality very indifferent; for the few parcels on offer the long prices demanded prevent business; this season's new seed, it should be remembered, is saved from Clover seed sown in the spring of 1868, and, as, owing to the excessive drought of the following summer, a large proportion of this failed, there was only a very small acreage left, and as on this the plants were unusually poor and thin, the yield of 1869 has in consequence been very limited. Foreign Clover seeds maintain their values; the same can also be said of all descriptions of Alsike and white Clover seed. French Italian is firm at the recent advance. Bird seeds are without change.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, January 28.

Messrs. Pattenden & Smith report the market steady at the advance, with a very bare supply of English samples. Americans and other sorts are coming more into request, late quotations being well supported.

Genuine Seeds of Superior Stocks.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

Complete Assortments of Choice VEGETABLE SEEDS, for A Year's supply.

No 1	.. .. ..	£3 3 0	No 4	.. .. ..	£1 1 0
No 2	.. .. ..	2 2 0	No 5	.. .. ..	0 12 0
No 3	.. .. ..	1 1 0	No 6	.. .. ..	5 5 0

Complete Assortments of Choice Continental and English FLOWER SEEDS

No 1	.. .. ..	£2 2 0	No 4	.. .. ..	£0 15 6
No 2	.. .. ..	1 11 6	No 5	.. .. ..	0 10 0
No 3	.. .. ..	1 1 0			

Also Smaller Collections, from 5*s*. to 70*s*. 6*d*., free by post

CATALOGUE of New and Select Vegetable and Flower Seeds, Potatoes, &c. for 1870, with practical Cultural Directions, will be sent Post Free upon application

Their Seeds are all of the most select character, each variety being saved from the best stock known to Science.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Potatos, &c., excepted.

Flower Seeds by Post or Rail.

Johnstone's St. Martin's Rhubarb.

W. P. LAIRD AND SINCLAIR, NURSERYMEN, Dundee, N.B., have pleasure in offering the above new variety of RHUBARB, which they have confidence in recommending as the earliest and finest flavoured variety. The raiser of it describes it "as one of a batch of seedlings from Victoria; the Seedling Plant was a fortnight earlier than any of the remainder of the lot, and grew beside France Allcock and Sons' Seedling rather than them, and giving a larger quantity of superior stems to either of these varieties. It forces better than any variety I know, and has a splendid colour."

Strong Roots, 2*s*. 6*d*. each. Usual Discount to the Trade.

For Testimonials see previous Advertisements.

London Agents—Messrs. Hooper & Co., Covent Garden Market, W.C.

Sheffield—Fisher, Holmes & Co.
Lichfield—Mr. Edward Holmes
Exeter—Sclater & Co.
Andover—Mr. W. Miller
Glasgow... Austin & M'Alslan
Dublin—Joseph Berry & Sons
Gravesend—Mr. Jeffcock & Son
Downham—Mr. James Bird
York—James Backhouse & Son
Kilmarnock—W. & J. Samson
Chester—E.A. Dickson & Son
" James Dickson & Son
Tunbridge Wells — Thos. Cripps & Son.
Northampton—Mr. F. Perkins
East Retford—Mr. W. Wright
Malton—Mr. F. Taylor
" Mr. Geo. Cobb
London—Hurst & Son
Stirling—W. Drummond & Son
Horsham—Edwin Cooling
Kelso—Stuart & Mein
Birmingham—Felton & Sons
Taunton—J.A. Dyer
Torquay—R.B. Smale
Westerham—John Cattell
Leicester—Harrison & Sons
Bridport—Thos. Hampton

Further Names published is received

GENERAL TRADE NURSERY LIST may be had on application

New Cucumbers.

GEORGE EDWARD has great pleasure in offering for sale the following first rate CUCUMBERS, being satisfied that they will fully maintain the characters that have been given to them.

EBOR—a true Frame Cucumber, of handsome form, and rather dark Market Gardener's Cucumber for every day use. In packets of six seeds, 5*s*. 6*d*. The following is the opinion given in the *Gardeners' Chronicle* and *Agricultural Gazette* of this variety:—

"Your Cucumber, raised from Epicure × Ilpse, crossed with Craigg's Prolific, is one which you say retained the strongest constitution and most prolific variety known, belongs to the spined class. . . . Fruit handsome, dark green, evenly swelled, of moderate length, and of good average quality."—*Gardeners' Chronicle*, Dec. 4, 1869.

"The specimen sent, which you state is a cross between Edward's Eclipse and Craigg's Prolific, is very handsome, and of a most useful size."—*Cottage Gardener*, Dec. 9, 1869.

EDWARD'S EUTHUSIA, in packets of six seeds, 1*s*. 6*d*.—A brace of the above was sent to the Editor of the *Gardeners' Chronicle*. The following was his opinion, on December 19, 1868

"A handsome white spine variety, of crisp flavour, and having the recommendation you mention; it is a desirable variety."

REYNOLDS'S BERYL CUCUMBER. The most useful and prolific Cucumber in cultivation for winter forcing, free growing habit, smooth thin skin, mid seedy, size medium In packets of six seeds, 1*s*. 6*d*

CARNATION and PICOTEE SEED, saved from G. E.'s collection, which contains all the best varieties in cultivation, in packets of 100 seeds, 1*s*. each

Can also be obtained of—

Messrs. Hurst & Son, London
Mr. J. Wilmer, Chelsea, S.W.
Messrs. H. & F. Sharpe, Wisbech
Mr. John Cobb, Sunderland
Mr. A. Bullock, Ipswich
Messrs. Little & Ballantyne, Carlisle
Mr. John Keynes, Salisbury
Mr. Charles Turner, Slough
Mr. John Shaw, Oxford Street, Manchester
Mr. Thomas Darlington
Mr. F. Taylor, Malton

GEORGE EDWARD, Nurseryman, Seedsman, and Licensed Valuer, 1, King Street, York

Patersons' Victoria Potatos.

ON SALE, for Planting, One Thousand Bushels of PATERSONS' VICTORIA POTATOS, grown on turf down for two years, from seed supplied by Messrs. Paterson, Dundee. The Victoria is the best of all the late varieties of Potatos, being a heavy cropper, suitable for field or garden culture, the tubers uniform in size, and of the finest quality.—Per prize, &c., apply to

Mr. F. BIRCH, Great Barr, near Birmingham.

Seed Potatos—Choice selected Stocks.

JAMES CARTER AND CO. are now prepared to execute orders for the following new and popular varieties :—

POTATOES

The Early Rose	Imported seed direct	per lb., 1*s*. 6*d*.; 7 lb., 9*s*. ;	
Bresee's Prolific	from the Raiser in	" 3*s*.	56 lb., 65*s*.
The Climax	America	" 3*s*.	
Paterson's Bovinia, or Cattle Feeder,		per lb., 1*s*. 6*d*.; 7 lb., 9*s*.; 56 lb., 65*s*.

The Queen's Potato, as used at the Royal table, 12*s*. per peck.
The Ashtop Fluke, much recommended, 12*s*. per peck.
Carter's Champion, best for forcing, 6*s*. per peck.
Milky White, very popular, 4*s*. per peck.
Rivers' Royal Ashleaf, 4*s*. per peck.
Fluke Kidney, very choice seed, 2*s*. 3*d*. per peck.
Early Handsworth, earliest round variety, 3*s*. 6*d*. per peck.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

SUTTONS' CHOICE SEED POTATOS, for planting. Much cheaper by the bushel, sack, or ton—prices of which may be had on application.

SUTTONS' BERKSHIRE KIDNEY, the best Potato for the main crop. Raised and selected from among 40 Seedlings of the Fluke. Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkable for its freedom from disease, while other varieties growing close by were almost destroyed. 5*s*. p. peck.

GOLDEN BLOSSOM, excellent, fine flavour, good cropper, 4*s*. p. peck.

EARLY WALNUT LEAF, true variety, 1 lb., 1*s*. 6*d*. per peck.

MONA'S PRIDE, very early, small foliage, 3*s*. per peck.

THE KING OF POTATOS, one of the best in cultivation, 3*s*. 6*d*. per peck.

PRINCE OF WALES' KIDNEY, an abundant cropper, shallow eyes, 4*s*. per peck.

PATERSON'S BOVINIA, the new Cattle-feeding Potato, 1*s*. 6*d*. p. lb.

THE EARLY ROSE, the best of the American varieties, 1*s*. 6*d*. p. lb.

And other excellent varieties. See SUTTONS' DESCRIPTIVE CATALOGUE, gratis and post free on application.

N.B. Potatos as well as Seeds carriage free

SUTTON AND SONS, Royal Berks Seed Establishment, Reading

Seed Potatos.

H. AND F. SHARPE'S WHOLESALE LIST of all the new and best varieties of Early and Late POTATOS is now ready, and may be had on application. The quality is very fine, and prices low.

Seed-Growing Establishment, Wisbech

Early Rose Potato.

H. AND F. SHARPE have just imported a very true Stock of the above extraordinary prolific POTATO, direct from one of the largest growers in America; and are prepared to offer it to the Trade at a reduced price.

Seed-Growing Establishment, Wisbech.

Seed Potatos.

GEORGE SIBBALD, Drumgeath, by Dundee, has for Sale a large stock of the Potatos on his own growing, true to name—Paterson's Victoria, Wilkie's Early, Rintoul's Don, Early Oxford, Dunnett's Early, Fluke Kidney, Royal Ashleaf Kidney, Myatt's Improved Ashleaf, Sutton's Berkshire Kidney, Hopetoun Kidney, Early Red Kidney, Mona's Pride Kidney, Sutton's Berkshire Kidney, Ashleaf Kidney, Early Red Kidney. Also about 4 cwt. superfine Early Dwarf York Cauliflower Plants. Terms on application

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., on sandy peat. It has never produced a diseased tuber, is a heavy cropper, very handsome, and superior in flavour to all other kidneys. It is a good keeper. Although a seedling variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August, or the following year

OPINIONS OF THE PRESS.

"R. Headley Your Seedling Potatos were quite first-rate; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 30, 1869.

"White Kidney. A very fine variety; a heavy cropper; uniform in size, and grown all of one quality in the same row; excellent; handsome, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested Jan. 14."—*Gardeners' Magazine*, Jan. 30, 1869.

"Seedling Potato R. Headley. In shape the tubers resemble those of the Flake. They are like those also in flavour, but are more mealy."—*Journal of Horticulture*, Oct. 21, 1869.

The usual discount to the Trade.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

Surplus Stock.—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well-grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For Descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow gauge lines, at a moderate cost, thereby saving delay and expense of packing.

At 12*s*. per dozen

Abies canadensis	Laurel, narrow leaved, 2 to 2½ feet
" monstrosa, 4 to 5 feet	" Portugal, 2½ to 3 feet
" excelsa, 3 to 4 feet	Picea balsamea, selected, 4 to 5 ft
Arbor vitæ, American, 6 to 8 feet	" nobilis (Nordmann's), 15 to 18 inches
" siberian, 4 to 5 feet	" pungens, 15 inches
Gorse, double, in pots, strong	Pinus austriaca, 2½ to 3 feet
Hartogia capensis (Cape Laurel), 12 to 24 feet	" halepensis, 2½ to 3 feet
	Retinospora obtusa, 2 to 2½ ft.

At 18*s*. per dozen

Abies canadensis, 6 to 6 feet	Phillyrea oleafolia, 2½ to 3 feet
" excelsa, 4 to 5 feet	Picea pungens, 3 to 4 feet
Alaternus, broad leaved, 2 to 2½ ft	Pinus austriaca, 3 to 4 feet
Arbor-vitæ, American, 6 to 7 feet	" halepensis, 2½ to 3 ft
" Siberian, 4 to 4½ feet	Rhododendron, various, 15 inches
Aucuba japonica, 18 to 21 inches	Rose, 3 to 5 feet
Box, green tree pyramids, very handsome, 2½ to 3 feet	" hybrids, fine varieties, 18 to 21 inches
Hartogia capensis, 2½ to 3 feet	Taxus japonica (Japan Yew), 12 to 15 inches
Laurel, narrow leaved, 2½ to 3 feet	

At 24*s*. per dozen

Abies elegans, 18 to 24 inches	Ivy, green tree, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet	Laurel, Portugal, pyramids, 5 to 6 feet
Aucuba japonica, 21 to 24 inches	Phillyrea oleafolia, very fine, 3 to 4 feet
Cryptomeria Lobbii, 5 to 6 feet	Rhododendron, splendid mixed (fine varieties), 21 to 24 inches
Cupressus Lawsoniana, 4 to 5 feet	Taxus japonica, 15 to 18 inches
Holly, screw leaved, green, 2 to 2½ feet	

At 30*s*. per dozen

Abies canadensis, extra fine, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
" elegans, 2 to 2½ feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ compacta, 2½ to 3 feet	" elegantissima, 18 to 24 inches
Aucuba japonica, very bushy, 2 to 2½ feet	" glauca, 3 to 4 feet
Cryptomeria Lobbii, 6 to 7 feet	" recurva, 3 to 4 feet
Cupressus Lawsoniana, 4 to 5 feet	Pinus australica, 4 to 5 feet
Holly, 9 to 7 feet	Thujopsis borealis, 4 to 5 feet

At 36*s*. per dozen.

Abies inverta (Weeping Spruce), 2½ to 3 feet	Juniperus Smithiana, 3 to 3½ feet
" Menziesii, 2 to 3½ feet	" Pinus laricio, 6 to 7 feet
Arbor-vitæ compacta, 3 to 3½ feet	Picea Nordmanniana, 2½ to 3 feet, very fine), 4 to 5 feet
" Siberian (very fine) 5 to 6 feet	Pinus laricio, 6 to 7 feet
Cupressus Lawsoniana, 5 to 6 feet	" Lambertiana, 3 to 4 feet
Juniperus chinensis, 4 to 4½ feet	Retinospora chinensis (gold leaved), 18 to 24 inches
" densata, 3 to 4 feet	" Irish, 5 to 6 feet
" Schottii, 3 to 3½ feet	

At 42*s*. per dozen.

Abies inverta, fine specimens, 3 to 4 feet	Juniperus phœnicia, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet	" Schottii, 3½ to 4 feet
" siberian (very fine), 6 to 7 feet	" thurifera (Incense Juniper), 4 to 5 feet
Juniperus chinensis, 3½ to 4 feet	" virginiana, 6 to 7 feet
" densata, 3 to 4 feet	Picea Nordmanniana, 3½ to 4 feet
" elegantissima, 2 to 2½ feet	Pinus austriaca, 5 to 6 feet
" glauca, 4 to 5 feet	" laricio, 7 to 8 feet
" Lewana, 4 to 5 feet	Thujopsis borealis, 5 to 6 feet
" phœnicia, 4 to 5 feet	
" Schottii, 4 to 5 feet	

At 48*s*. per dozen.

Abies inverta, 4 to 5 feet	Juniperus Smithiana, 3½ to 4 feet
Juniperus chinensis, 5 to 5 feet	" thurifera, 5 to 6 feet
" densata, 4 to 5 feet	" virginiana, 7 to 8 feet
" glauca, 4 to 5 feet	" viridis pendula, 4 to 5 feet
" Lewana, 5 to 6 feet	Pinus laricio, 8 to 9 feet
" phœnicia, 4 to 5 feet	Taxus, fine bushy, 6 to 7 feet
" Schottii, 4 to 5 feet	Wellingtonia gigantea, 2 to 3 feet

At 60*s*. per dozen.

Abies Menziesii, 7 to 8 feet	Juniperus virginiana, 8 to 10 feet
" monstrosa, 7 to 8 feet	" viridis pendula, 5 to 6 feet
Arbor-vitæ compacta, 4 to 4½ feet	Laurel, colchic (very fine), 9 to 10 feet
Juniperus chinensis, very fine, 5 to 6 feet	" Portugal, pyramids (very fine), 8 to 10 feet
" densata, 5 to 6 feet	Picea Nordmanniana, 3½ to 4½ feet
" glauca, 5 to 6 feet	Pinus Cembra, extra fine, 6 to 7 ft.
" phœnicia, 5 to 6 feet	Taxus elegantissima, 2 to 2½ feet
" Schottii, 5 to 5½ feet	Thujopsis borealis, 6 to 7 feet
" thurifera, 6 to 7 feet	Wellingtonia gigantea, 3 to 3½ feet

Abies albertiana, 7 to 8 feet, 10*s*. 6*d*. each
" Douglasii, 5 to 10 feet, 7*s*. 6*d*.; 10 to 12 feet, 10*s*. 6*d*.; extra fine, 12 to 15 feet 15*s*. each
" orientalis, 4 to 5 feet, 6*s*.; 5 to 6 feet, 7*s*. 6*d*.; 6 to 7 feet, 10*s*. 6*d*. each
Araucaria imbricata, 4 to 6 feet, 21*s*.; 6 to 7 feet, 31*s*. 6*d*.; 7 to 8 feet, 42*s*.; 8 to 9 feet, 52*s*. 6*d*.; 9 to 10 feet, 63*s*. to 84*s*. each
Juniperus densata, 6 to 7 feet, 6*s*.; 7 to 8 feet, 7*s*. 6*d*. each
" thurifera, very fine, 7 to 8 feet, 21*s*. each
Laurel, Portugal, pyramids, extra fine, 7*s*. 6*d*.; very large, 10*s*. 6*d*. each
Picea grandis, extra fine, 5 to 6 ft., 15*s*.; 6 to 7 feet, 21*s*. each
Picea lasiocarpa, 2½ to 3 feet, 15*s*.; 3 to 3½ feet, 21*s*.; 3½ to 4 feet, 31*s*. 6*d*.; 4 to 4½ feet, 42*s*.; 5½ to 6 feet, 63*s*. each
" nobilis (most glaucous var.), 18 to 24 inches, 7*s*. 6*d*.; extra fine, 2 to 2½ feet, 10*s*. 6*d*.; 2½ to 3 feet, 15*s*.
" Nordmanniana, 4 to 5 feet, 15*s*.; 5 to 6 feet, 21*s*.; 6 to 7 feet, 31*s*. 6*d*.; 7 to 8 feet, 42*s*.
" Pinsapo, 3 to 3½ ft., 10*s*. 6*d*.; 3½ to 4 ft., 15*s*.; 4 to 4½ ft., 21*s*.; 5 to 5½ ft., 31*s*. 6*d*.; 5½ to 6 ft., 42*s*. each
Pinus Cembra, 7 to 8 feet, 6*s*.; 8 to 9 feet, 7*s*. 6*d*. each
Wellingtonia gigantea, 3½ to 4 feet, 7*s*. 6*d*. each
Yews, for hedges, about 12 feet high, 3½ years old, recently transplanted, 3*s*. 6*d*. each

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

GENUINE TOBACCO PAPER, of the finest quality, 10d. per lb., or 8½. per cwt.
WILLIAM RUSHFORTH, Nurseryman and Seed Merchant, Leeds.

APPLEBY'S GENUINE TOBACCO PAPER, in 2 lb. and 4 lb. packets. Testimonials too numerous for insertion. Price on application to
HENRY APPLEBY (Foreman to Messrs. Ivery & Son, Nurserymen), Dorking, Surrey.

TOBACCO CLOTH and PAPER.—The cheapest and best article for smoking Greenhouses and Destroying the Fly. Prices, 1s. 4d. per lb.; 10 lb., 12 lb. Tobacco Dust, 1s. per lb.; 7 lb. and 14 lbs. per cwt. Post-office Orders payable at Fleet Street.
JOSEPH BAKER, 24, Nelson Square, Blackfriars Road, S.E.; late 19, Gough Square, E.C.

TOBACCO TISSUE, for FUMIGATING GREENHOUSES. Will destroy all the Insects, and not injure the Plants, and Burns without the assistance of Blowing. Price 3s. 6d. per lb., carriage free. A reduction in price for larger quantities.
To be had of Messrs. R. ROBERTS and SONS, 113, St. John Street, Clerkenwell, London, E.C.; and of all Seedsmen and Nurserymen.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
By Her Majesty's Royal Letters Patent, and by Permission of the Hon. Board of Customs.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, Gardeners and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributers, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for destroying Thrip, Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

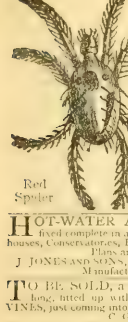

GISHURST COMPOUND.
Used by many of the leading Gardeners since 1850, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions from 1 to 2 ounces to the gallon of soft water, and of from 4 to 10 ounces as a Winter Dip, using for Vines and Fruit Trees. Has stood many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
Wholesale by
PRICE'S PATENT
Red Spider — Magnified.
CANDLE COMPANY (Limited),
Battersea, London, S.W.

HOT-WATER APPARATUS of every description, for Heating Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
J. JONES and SONS, 25, Kensington Gore, and 143, London, E.C.
Manufactory, 9, Banksside, Southwark.

TO BE SOLD, a GRAPERY, 15 feet wide, by 65 feet long, fitted up with Hot-water Apparatus, and some splendid VINES, just coming into bearing
G. C., Post Office, Reading

SHANKS'S PATENT LAWN MOWERS for 1870, The Patent Improvements recently introduced give SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The unprecedented Sale for 1868, notwithstanding the Dryness of the Season, forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

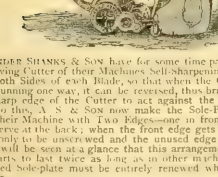

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reverse at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application
A. SHANKS and SONS, Arbroath Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.
☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society's Garden.
The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat and cold, keeping a level temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS
"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
"FRIGI DOMO" CANVAS.
Two yards wide .. .. 1s. 9d. per yard run.
Four yards wide .. .. 3s. 6d. per yard
An improved make, 2 yards wide .. 1s. 6d. per yard
An improved make, 3 yards wide .. 2s. 8d. per yard run.
Scrim Canvas, 72 inches wide, 70 yards long, 52s., 63s., 73s., 78s. and 86s. per piece.
Hessian Canvas, 54 and 72 inches wide, 63d. and 83d. per yard; 44 other sizes and lengths.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nursery men and Seedsmen throughout the Kingdom.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

Vases and Fountains, for the Garden and Conservatory.
ANDREW HANDYSIDE AND CO., Registered Iron Works, Derby; and 32, Walbrook, London
Two large illustrated Books, 20s. and 10s., Post free, or for 10 stamps

Preserve your Wall-fruit Trees from Spring Frosts.
EASILY and MAY FIX HIS OWN WALL COVER
BEARDS' PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Victoria Works, by J. Deane, Horticultural Engineer, both St. Edmunds, Suffolk

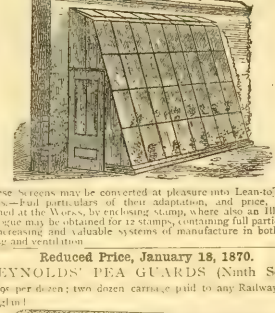

These Screens may be converted at pleasure into Lean-to or Span-houses.—Full particulars of their adaptation, and price, may be obtained at the Works, by enclosing Stamp, where also an Illustrated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable systems of manufacture in both patent glazing and ventilation

Reduced Price, January 18, 1870.
REYNOLDS' PEA GUARDS (Ninth Season), 9s. per dozen; two dozen carriage paid to any Railway Station in England

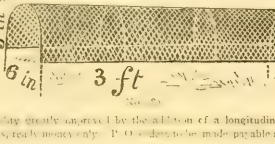

One lay greatly improved by the addition of a longitudinal stay. Terms, ready money only. P.O. Orders to be made payable at Greek Street.
Inventors and Manufacturers, J. REYNOLDS and CO., 57, New Compton Street, London, W.C.
An Illustrated and Priced Catalogue of Poultry Fences, Wire Netting, &c., forwarded post free. A Silver Medal, Prize Medal in the Great Exhibition of Wire Work, 1862. Bronze Medal, 1862.

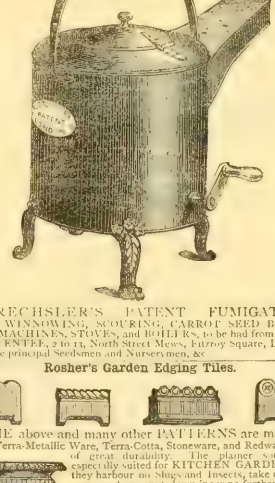

DRECHSLER'S PATENT FUMIGATORS, WINNOWING, SCOURING, CARROT SEED BEARDING MACHINES, STOVES, and BOILERS, to be had from the PATENTEE, 2 to 13, North Street Mews, Fitzroy square, London; and the principal Seedsmen and Nurserymen, &c.

Rosher's Garden Edging Tiles.

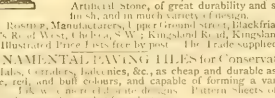

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The planter sets are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and edge put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.
GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

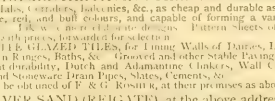

F. & G. Rosher, Manufacturers, Upper Ground street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Lobbies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Also, geometric mosaic designs. Pattern Sheets of Parquetry, with prices, forwarded for selection
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Coved and other Suitable Paving Bricks of great durability. Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. Rosher, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of sand forwarded on receipt of stamp.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
To be obtained of F. & G. Rosher, at their premises as above
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on French Gardening, are now ready. Prices and particulars of the Archimedean Screw Company, 83, Upper Thames street, where a stock is kept, also at 36, Long Acre.
J. GOODERIDGE, Agent.

Horticultural Glass Warehouse.
THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.
NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in.	in.		4ths	3rds.	2nds.	Best.
20 by 12						
20 by 13			15 oz.	12 oz.	16 oz.	18 oz.
20 by 14	} Per 100 feet		18 oz.	20 oz.	22 oz.	24 oz.
20 by 15						
20 by 16						

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in.	in.	in.	in.	in.	in.	4ths	3ds.	2nds.	Best.
6 by 4	7 by 5	8 by 6	9 by 7	10 by 8	11 by 9	12 oz.	14 oz.	16 oz.	18 oz.
6 by 4	7 by 5	8 by 6	9 by 7	10 by 8	11 by 9	12 oz.	14 oz.	16 oz.	18 oz.

Per 100 feet.

10 by 8	12 by 9	12 by 10	13 by 10						
10 by 8	12 by 9	13 by 10	15 by 10			22 oz.	24 oz.	25 oz.	26 oz.
11 by 9	13 by 9	13 by 10	13 by 11						
11 by 9	12 by 10	14 by 10	14 by 11						

LARGE SHEET SQUARES, 15 oz., per 100 feet.

in.	in.	in.	in.	in.	in.	4ths	3ds.	2nds	Best.
15 by 10	14 by 12	22 by 12	22 by 16						
16 by 10	14 by 12	17 by 13	24 by 16						
14 by 14	15 by 12	23 by 13	20 by 17						
15 by 11	15 by 12	16 by 14	22 by 17			12s. 3d.	15s. 6d.	16s. 9d.	18s. 0d.
15 by 14	14 by 16	17 by 12	29 by 14						
16 by 11	16 by 12	24 by 14	20 by 18						
21 by 11	15 by 12	29 by 15	22 by 18						
18 by 12	18 by 12	24 by 15	23 by 18						

The above Prices are only for the Sizes stated; if a quantity of any other Size be required, a Special Price will be given.

SHEET GLASS.
In Sheets for Cutting up, averaging from 6 to 9 feet super.

	15 oz.		21 oz.	
4ths quality, per 300 feet case, 36s.		4ths quality, per 200 feet case, 36s.		
3ds " "	42s.	3ds " "	42s.	
2nds " "	52s.	2nds " "	62s.	
Best " "	75s.	Best " "	75s.	

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.
HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 5-8th in. substances.
BRITISH PLATE GLASS for Shop Windows, and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.
PAINTS, COLOURS, VARNISHES, &c
STUCCO PAINT, 24s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from gloss. Any appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is mixed with rain or pure river water.
WHITE ZINC PAINT, 30s. per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a-half of White Lead and six gallons of Linseed Oil. Special Drier for this Paint.
IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Bricks, Stone, Canvas, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 4s. per gallon.

	Per cwt.—s. d.		Per gallon.—s. d.
GENUINE WHITE LEAD	36 0	LINSEED OIL	2 9
SECONDS WHITE LEAD	28 0	BOILED OIL	3 2
GROUND PATENT DRY	24 0	TURPENTINE	2 9
RED LEAD, 24d. per lb.		LINSEED OIL PUTTY,	
" OXFORD OCHRE, 3d. to 4½d. per lb		8s. per cwt.	
		FINE OAK VARNISH, 10s. to 12	0
" RAW UMBER, 4½d. to 6d. per lb.		" CARRIAGE do., 12s. to 14	0
" BURNT do., 6d. to 9d.		" PALE do., 10s. to 12	0
GREEN PAINT, all shades,		" COPAL	16 0
28s. to 60	0	KNOTTING	10 0
BLACK PAINT 24s. to 36	0	Patent GOLD SIZE	10 0
RED PAINT 28s. to 36	0	" BLACK JAPAN	12 0
		GLAZIER'S DIAMONDS and TOOLS.	
GROUND BRUSHES		MILLED LEAD and PIPES.	
DUSTERS. SASH TOOLS.		OLD LEAD Bought or taken in Exchange.	
DISTEMPER BRUSHES.			

The above are Nett, for Cash, and as such cannot be booked
Lists of any of the above on application

Glass for Garden Purposes.
JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

	Each.—s. d.		Each.—s. d.
2 inches in diameter	0 3½	12 inches in diameter	1 9
3 " "	0 4½	13 " "	2 0
4 " "	0 5½	14 " "	2 3
5 " "	0 7	15 " "	2 6
6 " "	0 8	16 " "	3 6
7 " "	0 10	17 " "	4 0
8 " "	1 0	18 " "	5 0
9 " "	1 2	19 " "	6 0
10 " "	1 4	20 " "	7 0
11 " "	1 6		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	0s. 6d.	9 inches in diameter	1s. 8d.
5 " "	0 8	10 " "	2 0
6 " "	0 10	11 " "	2 6
7 " "	1 0	12 " "	3 0
8 " "	1 4		

Either flat or conical tops.

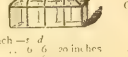

CUCUMBER GLASSES.

24 inches long	2s. 0d.	36 inches long	3s. 4d.
22 "	1 10	14 "	3 2
20 "	1 8	12 "	2 6
18 "	1 6		

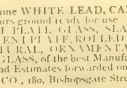

HAND GLASSES, WITH OPEN TOPS

	Each.—s. d.		Each.—s. d.
12 inches	6 6	20 inches	10 6
14 "	7 6	22 "	11 6
16 "	8 6	24 "	12 6
18 "	9 6		

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS, PAINTS of various colours, ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENTED VICTORIA ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, and ORNAMENTAL COLOURED, SHEET, HORTICULTURAL, and ORNAMENTAL COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

A GROSS of PRINTS for 3s. 6d.—A Job Lot of ENGRAVINGS and LITHOGRAPHS, by eminent Artists, 156 various, different styles, some Coloured, Home, Foreign, and Marine Views, Rural and Domestic Scenes, Female Figures and Portraits, &c., post free, by return, for 42 stamps.
J. REYNOLDS, 174, Strand, W.C.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IDA WHARF), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage.

TANNED GARDEN NETTING, for Preserving Seed Beds, Fruit, Strawberries, from Frost, Blight, Birds, &c., and as a Fence for Fowls, &c. One yard wide, 1*d*; two yards, 2*d*; three yards, 3*d*; and four yards, 4*d*. per yard in any quantity May be had of CHAS. WRIGHT AND CO., William Street, Newark-on-Trent, or their Agents, Messrs. HOOPER AND CO., Cove Garden Market, London, W.C.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

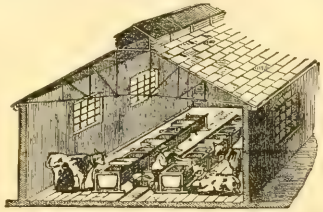

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55*s*.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

SHAW'S TIFFANY. For Samples and Prices apply to J. SHAW AND CO., 29, Oxford Street, Manchester.

TRELOAR'S FINE COCOA-NUT MATTING, warranted unbleached. No other kind is durable,—all other kinds are dear. Catalogues free by post.

T. TRELOAR, Manufacturer, 67, Ludgate Hill, E.C.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application

JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

Archangel and Petersburg Mats.

J. BLACKBURN AND SONS have received a large consignment, and are now offering them at very low prices. Price, &c., on application at 4 and 5, Wormwood Street, London, E.C.

HESSIANS and SCRIMS for SHADING. 4-4 Scrim, from 2*d* to 6*d* per yard, advancing ¼*d*.

51-inch Hessian and Scrim, 3*d*, 3½*d*, 4*d*, 4½*d* and 5½*d*

72 " 4½*d*, 5½*d*, 6*d*, 6½*d*, and upwards.

J. BLACKBURN AND SONS, Sack and Bag Makers, and Canvas Manufacturers, 4 and 5, Wormwood Street, London, E.C.

IRON HURDLES (Silver Medal of the Royal Agricultural Society): SHEEP, 5*s*. 6*d*.; CATTLE, 4*s*. 3*d*.; OX, 5*s*. 11*d*.

List by post. GATES and FENCING of every description.

St. Pancras Iron Work Company, Old St. Pancras Road, London, N.W.

The New Vade Mecum (Invented & Manufactured by

CHARLES H. VINCENT, OPTICIAN, of 23, Windsor Street, Liverpool, consists of a TELESCOPE well adapted for Tourists, &c., to which is added an excellent MICROSCOPE of great power and first-class definition, quite equal to others sold at ten times the price. Wonderful as it may seem, the price of this ingenious combination is only 30*s*. 6*d*.; and Mr. VINCENT sends it (carriage free) anywhere, with printed directions, upon receipt of Post-office order of stamps to the amount of 31*s*. 6*d*.

RENDLE'S

PATENT GROUND VINERIES AND PLANT PROTECTORS.

The following important Letters have just been forwarded to the Patentee, who has received permission to publish the same:—

COPY OF LETTER FROM W. FERRAND, ESQ., LATE M.P. FOR DEVONPORT.

"BELVOIR CASTLE, GRANTHAM,

"January 24, 1870.

"Sir,

"MR. INGRAM, of these Gardens, has shown me your Patent Ground Vineries and Plant Protectors, which *answer admirably.* Be so good as to send to my gardener, MR. SHOOSMITH, St. Ives, Bingley, Yorkshire, 500 feet at once by Midland Railway.

"Yours faithfully,

"W. FERRAND.

"MR. RENDLE."

Mr. INGRAM is Gardener to the Duke of Rutland, and is one of the highest authorities in Horticulture.

COPY OF LETTER FROM MR. WM. INGRAM, OF BELVOIR CASTLE GARDENS.

"BELVOIR CASTLE GARDENS, GRANTHAM,

"January 26, 1870.

"MR. W. E. RENDLE,

"68, Welbeck Street, Cavendish Square, London.

"Dear Sir,

"I have employed your Plant Protectors for growing *Lettuces during the winter*, and *no plan that I have tried has answered so well.*

"The tiles are placed to allow glass 22 in. by 14 in. to slide in the grooves, this gives space for three rows of Lettuces, and forms a convenient little pit. *The protection given is greater than I expected, for although we have had* 12° *of frost, the growth of the plants does not appear to have been checked.*

"The successful application of your plan for securing a supply of Cos Lettuce struck the gentleman (W. B. FERRAND, Esq.), who wrote to you, and led to the order you refer to.

"The few examples of the semicircular tiles came too late in the season for the purpose you recommend them, but I made use of them for *ripening some Tomatos, which they did completely.*

"I will give your tiles a fair trial as I promised, and send you the result later in the year.

"I am, yours truly,

"W. INGRAM."

FOR PRICES AND PARTICULARS OF THIS VALUABLE INVENTION, APPLY TO THE PATENTEE,

MR. W. E. RENDLE, 68, WELBECK STREET, CAVENDISH SQUARE, LONDON, W.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

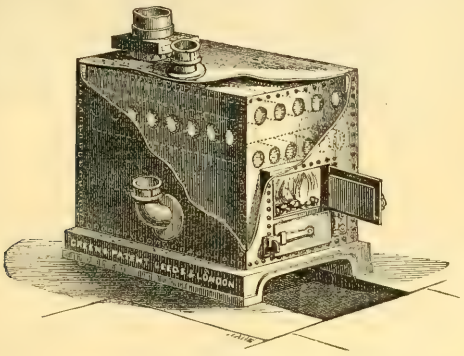

OBLONG BOILER.

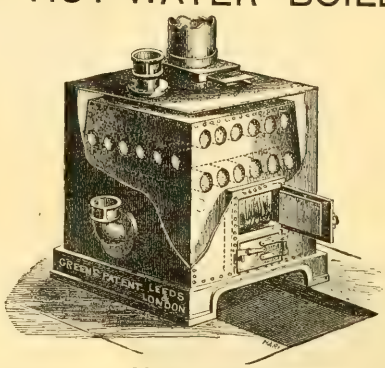

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THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

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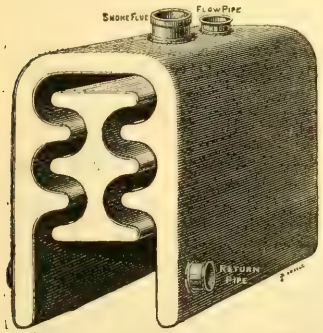

ORMSON'S PATENT CONVOLUTED BOILER.

NOTICE.

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The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by **HENRY ORMSON** as a specimen of his first-class and substantial style of building Horticultural Structures. Also his Patent Wrought-iron Boilers, by which the new Hothouses, and many other Buildings are heated on a very extensive scale in the above great establishment.

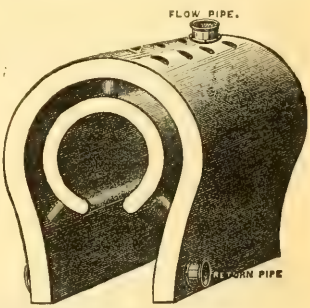

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

Confidence in Cast-iron Boilers is now, to a very great extent, lost in consequence of their continual cracking and failing, and are being replaced by **ORMSON'S PATENT WELDED WROUGHT-IRON BOILERS,** which are not only free from all danger of cracking, but have proved themselves far more economical in consumption of fuel.

HOTHOUSES MANUFACTURED BY STEAM MACHINERY. BEST MATERIALS AND LOWEST PRICES.

Plans, Specifications, and Estimates for Erecting Conservatories, Hothouses, and Hot-water Apparatus of every description in all parts of the country and abroad.

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6 ft. by 4 ft. Lights, 2 in thick, unglazed £0 5 0
" " Primed and Glazed with 16 oz Sheet 0 11 0
" " with stout portable Box, not Painted 1 3 0
" " Painted four coats, and Handles on 1 8 0
" " Packed and Delivered in Railway van 1 10 0
6 ft. by 8 ft, Double Lights, do. 2 15 0
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Woodwork only Prepared and Fitted 0 0 6
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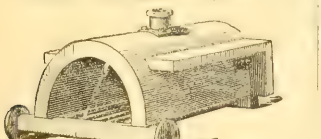

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IRON WATER PIPES, Nos 6 & 7 on illus.	2 6	3 6	4 6
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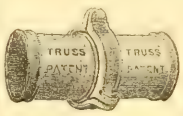

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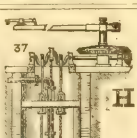

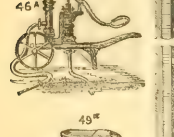

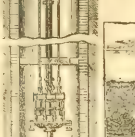

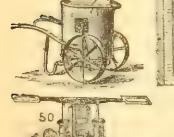

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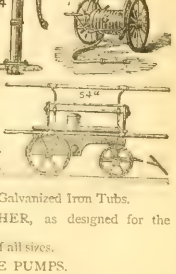

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	Ft. In.	Ft. In.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
	5 4½	5 0	7 8	4 11 0	2 8 3	1 4 6	0 5 3	0 18 6
	6 3½	5 0	8 1½	5 6 9	2 14 3	1 9 3	0 5 3	1 13 3
				12 ft. 43 in.				
				£ s. d.				
7	2½	5 0	8 7	8 16 0	2 17 6	1 13 9	0 5 3	1 7 9
8	1	5 0	9 0	9 15 2	3 3 0	1 17 9	0 5 3	1 11 0
10	0	5 0	10 0	12 10 3	3 16 9	2 11 0	0 5 3	2 5 6
12	0	5 0	11 0	14 6 9	4 7 0	3 3 0	0 5 3	2 17 9

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Appendix to Chapter I. by Mr. W. Buckley, Tooting.
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Beware of imitations, and see the names of LEA & PERRINS on all bottles and labels.
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THE OLDEST
PATENT MEDICINE
In boxes at 1*s*. 1½*d*., 2*s*. 9*d*., 4*s*. 6*d*., and 11*s*.

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Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
" Water, 1 Cubic foot " " "

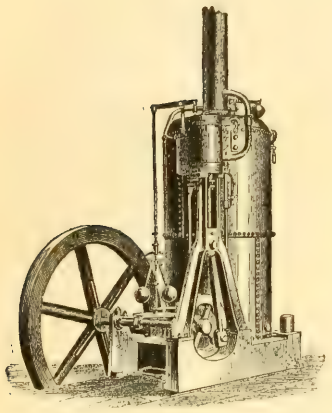

Horse Power	Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.		
1	"	3¼ in.	8 in.	"	4 ft. 0 in.	1 ft. 8 in.	.. ..	£40*
2	"	4	10	"	*5 " 0	2 " 4	.. ..	£55*
3	"	4¾	10	"	5 " 6	2 " 4	.. ..	£65*
4	"	5¾	12	"	7 " 0	2 " 4	.. ..	£85
6	"	6½	14	"	8 " 0	2 " 8	.. ..	£120
8	"	8	16	"	9 " 0	3 " 0	.. ..	£160
10	"	9¼	16	"	10 " 0	3 " 4	.. ..	£185
12	"	10	18	"	11 " 0	3 " 8	.. ..	£200
14	"	11	18	"	11 " 6	3 " 10	.. ..	£220
16	"	12	20	"	12 " 0	4 " 0	.. ..	£230
18	"	12¾	20	"	12 " 6	4 " 2	.. ..	£285
20	"	13¾	22	"	13 " 0	4 " 4	.. ..	£310
25	"	14¾	28	"	14 " 0	4 " 8	.. ..	£380
30	"	15¾	28	"	15 " 0	5 " 0	.. ..	£430
35	"	16¾	28	"	16 " 0	5 " 4	.. ..	£520
40	"	18	28	"	17 " 0	5 " 8	.. ..	£585

* 1, 2, and 3, if not fitted with Governors, less £5.

The Fly-wheel Shaft is made sufficiently long to admit a drum being fixed on if required, which can be supplied along with the Engine any diameter ordered, at an extra cost according to size.

The above Engines and Boilers occupy a very small space, and will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

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The Foundation Plate answers the purpose of Feed Water Tank, in which the water is heated before passing into the boiler, and also of an ash pit, and no brickwork or foundation is required.

The Fire-box is so constructed that Coal, Coke, or Wood can be used as Fuel.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1293:

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OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

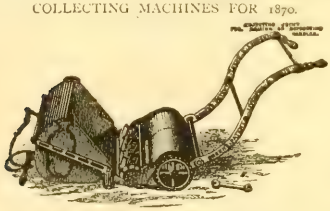

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Suitable for Hand or Horse Power.

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Diam.	Length	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	13	0
16 in.	17 in.	2	15	0

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ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches	by	26 inches	..	..	..	..	..	£4	0 0
20 "		22 "	..	..	..	..	..	3	2 6
16 "		17 "	..	..	..	..	..	2	10 0

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 6.—1870.] SATURDAY, FEBRUARY 5. {Price Fivepence. / Stamped Edition, 6d.

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☞ NOTICE. *The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will, on and after* MARCH 4, *be published on* FRIDAY, *at* 2 P.M., *instead of on* SATURDAY, *as hitherto.*

ADVERTISERS *will please send their* COPY *a* DAY EARLIER *than usual.*

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870, JUNE 3 to 10. ONE THOUSAND POUNDS in PRIZES. To be held in the BOTANIC GARDENS, MANCHESTER. Schedules are ready, and can be had on application to the Undersigned.
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NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

Garden Seeds.
CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown from carefully selected stocks.

Farm Seeds.
CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks.

SUTTONS' GRASS SEEDS for ALL SOILS. For prices and particulars, see back page of this week's Paper.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

For Seed.
HALLETTS | TRADE PEDIGREE MARK | BARLEY and OATS.
See Advertisement on page 183 of this Paper.

FOR A LARGE GARDEN, SUTTONS' £3 3s. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round

FOR A MODERATE-SIZED GARDEN, SUTTONS' £2 2s. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round

FOR AN ORDINARY-SIZED GARDEN, SUTTONS' £1 1s. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round.

FOR A SMALL GARDEN, SUTTONS' 12s. 6d. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round.

SUTTONS' COMPLETE COLLECTIONS of VEGETABLE SEEDS. For prices and full particulars apply to SUTTON AND SONS, Seedsmen to the Queen, Reading.

VEGETABLE and FLOWER SEEDS.—Select and comprehensive LIST of all the best varieties in cultivation, now ready, post free on application.
MITCHELL, ARNOTT, AND CO., Nurserymen and Seed Merchants, Edinburgh; and 59, Mark Lane, London.

ESCHALOTS WANTED.—State quantity and price, for cash, to
WILLIAM ARMITAGE AND SON, Seed Merchants, Huddersfield.

CUCUMBER PLANTS. Telegraph, strong plants. For prices apply to
A. WATKINS, Nursery, Hackerill, Bishop Stortford.

TELEGRAPH CUCUMBER SEED, warranted true, which is, without doubt, in every respect, the best in cultivation. Four seeds, 1s.; 12 seeds, 2s. 6d.
THOMAS KITLEY, Oldfield Nursery, Bath.

To the Trade.
WINDSOR and LONG-POD BEANS, SANGSTERS No. 1, and BADMAN'S IMPERIAL PEAS, &c., on offer. Advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

To the Trade.—Henry's Hybrid Leek, Genuine.
DOWNIE, LAIRD, AND LAING are now sending out the above unrivalled LEEK, in sealed packets, at 6s. per dozen, or per 100 upon application to
Edinburgh; and stanstead Park, Forest Hill, London, S.E.

The Market Gardens, Biggleswade, Beds.
RICHARD WALKER can supply, for cash, 80 home-grown WHITE SPANISH ONION SEED, 2s. per lb., all new and genuine; mixed laced PINKS, 20s. per 100; old Crimson CLOVES, 10s. per 100.

THE BEST POTATO for the MAIN CROP, see back outside page of this week's Paper
SUTTON AND SONS, Seedsmen to the Queen, Reading

SEED POTATOS (SELECTED).
PRICED LIST on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

WANTED to PURCHASE, a few Tons of the old SHORT-TOP ASHLEAF and EARLY OXFORD
JOSIAH H. BATH, Salesman, Borough Market, London, S.E.

ROYAL ASHLEAF POTATOS.—A few Tons of the true sort are offered, at £12 per ton.
THOS. RIVERS AND SONS, Nursery, Sawbridgeworth.

RIVERS' ROYAL ASHLEAF SEED POTATOS, thoroughly true. A few Sacks to Dispose of, cheap.
J. SPAVEN, Stud House, Hampton Court, Middlesex, S.W.

True Early Rose Potato.
CHARLES SHARPE AND CO., Sleaford, have received a large consignment of the above from America, and are able to offer them in quantity. Price on application

POTATOS.—A fine sample of Paterson's Victoria, clean and true to name, at £5 per ton, delivered at Raskelf Station, North-Eastern Railway. No order executed under one Ton.
PETER STEVENSON, Jun., Kainton, Thirsk.

KNAP HILL NURSERY,
WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted April, 1869

ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s 6d each. Transplanted August, 1868

ABIES ORIENTALIS, 5, 6, and 7 feet, 7s 6d to 21s Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s, to £12 10s per 100

The dwarf varieties of spruce, such as pumila pygmæa, Gregorii, Clanbrazilliana, &c., large numbers, many of them 20 and 30 years' growth.

CEDRUS DEODARA, 5 to 6 feet, 60s per dozen; 7 to 8 feet, 84s per dozen; 10 to 12 feet, 10s 6d. to 21s. each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869

CEDRUS ARGENTEA, 6 to 7 feet, 42s to 60s per dozen; 8 to 10 feet, 7s 6d to 10s 6d each. All removed since September, 1868

CEDRUS LIBANOS, 6, 7, to 10 feet. Moved September, 1868

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s to 42s per dozen; 8 to 10 feet, 5s. to 10s. 6d. each.

" " ARGENTEA, 3 to 4 feet, and 2½ much in circumference, 7s. 6d to 10s. 6d each

" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s 6d to 21s

JUNIPER, CHINESE, 4 to 5 feet, 42s per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted

PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s to 42s each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high

PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 9 feet high All removed 1868-69.

PICEA MAGNIFICA, 3, 4, and 5 feet.

PICEA PINSAPO, 4, 5, 6, and 8 feet, 10s. to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869

THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference This plant originated in this Nursery, and our stock is unsurpassed.

THUJA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868

THUJA LOBBII, 8 to 14 feet high, and as much in circumference; transplanted April, 1869

THUJOPSIS BOREALIS, 5 to feet, 7 and 8 feet round; 42s. to 60s per dozen; 7 to 8 feet, 7s 6d. to 10s 6d. each. All removed since August, 1868

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s 6d to 10s 6d each; 6, 7, 8, and 9 feet, 21s to 42s each Transplanted in August

PINUS AUSTRIACA, 3 feet, £5 per 100 Transplanted Sept., 1868

PINUS CEMBRA, 8 to feet, 10 to 12 ft round, 10s 6d to 21s each

YEWS, the COMMON ENGLISH 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of stem, and up to 10 feet high.

YEWS, IRISH, handsome plants, up to 10 feet high

HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference.

HOLLY, SILVER QUEEN, 4, 5, and 6 feet

WATERER'S HOLLY.—This variety originated in this Nursery; we have hundreds 4, 5, and 6 ft. high, 10 and 15 ft circumference.

PERRY'S WEEPING HOLLY.—Standards, 10s 6d. to 21s. each.

HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868.

HOLLY, Green varieties of the following kinds An immense stock of splendid plants, all transplanted in 1868-9.—

LAURIFOLIA and SCOTTICA,	4, 5, 6 to 10 feet high.
HODGINS',	ANGUSTIFOLIA,
YELLOW BERRIED,	MYRTIFOLIA, &c.

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4, 5, 6, and 8 feet high

4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number.

N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better rooted plants cannot be wished or obtained The prices are fair and reasonable.

BOX, Green and Variegated, 4, 5, 6, to 8 feet.

BOX, do. do., fine pyramids, up to 8 feet.

BAYS, standards and pyramids.

LAURUSTINUS, standards.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high

AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as large, and more extensive than, any thing of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation We shall be pleased to supply—

RHODODENDRONS, nice and many plants, from layers, named kinds, £5 per 100, £40 per 1000. A dozen sent as sample on application.

RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s per 100, and upwards.

RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000.

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference There is probably no kind better adapted for standards than that we have of the fine old purple maximum, which we supplied to Rotten Row We have also Rhododendrons, standards, of many other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s per 100 Sample on application Large and handsome plants by the 1000, 4 to 8 feet high.

AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.

AZALEAS, common kinds, £5 per 100

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference.

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100

ANDROMEDA FLORIBUNDA, £5 to £7 10s per 100, and upwards.

HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s to 40s per 100

ERICA HYEMALIS, for winter flowering, many thousands

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s to 18s per dozen

As well as the above we, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

NEW AND UNADULTERATED SEEDS.
PRIZE MEDALS, 1851 AND 1862.

BUTLER, M'CULLOCH, & CO.'S

COMPLETE COLLECTIONS FOR ONE YEAR'S SUPPLY.

No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
£3 3s.	£2 2s.	£1 10s.	£1 1s.	10s. 6d.

The above Collections contain only useful varieties, the quantities of which may be varied to suit the requirements of Customers.

PRICED DESCRIPTIVE CATALOGUES, containing details of Collections; also carefully selected LISTS of choice FLOWER SEEDS and NOVELTIES in FLOWERS and VEGETABLES sent Post Free on application.

Orders amounting to 21s. sent Carriage paid. All packets of Flower Seeds sent Post paid. No Charge for packages.

SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.
Established upwards of a Century.

Thomas Gibbs & Co

CORNER OF
HALF-MOON ST.,
PICCADILLY, LONDON, W.

KITCHEN GARDEN SEEDS
GRASS SEEDS

ROYAL AGRICULTURAL SOCIETY OF ENGLAND
THOS. GIBBS & CO.
Corner of
HALF-MOON St
PICCADILLY,
London.
APPOINTED Ap. 3, 1844
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CORNER of STREET.

FLOWER SEEDS
AGRICULTURAL SEEDS

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E. G. HENDERSON & SON

BEG TO CALL ATTENTION TO THE

NEW VARIEGATED

JAPANESE SPIRÆA,

AND FOLLOWING SELECT

NOVELTIES in FLOWER SEEDS

FOR THE PRESENT YEAR.

For full descriptions, see

CATALOGUE No. 140,

Containing all the Improved Sorts of

FLOWER and VEGETABLE SEEDS,

Post Free on application.

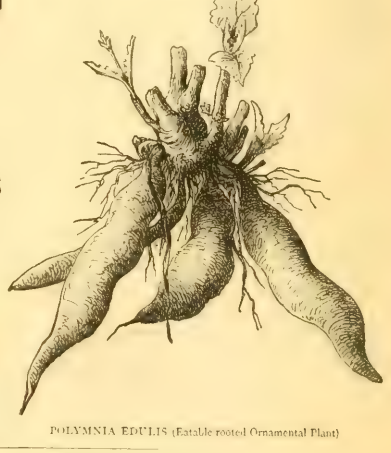

POLYMNIA EDULIS (Eatable rooted Ornamental Plant)

SPIRÆA JAPONICA AUREA VARIEGATA.

This highly interesting plant is a most beautiful form of the fine green-leaved species (S. japonica), which, for its decorative effect, has been so greatly admired at the various Horticultural Exhibitions during the last two seasons. The present plant is a hardy herbaceous Perennial of remarkably neat erect growth, 1 to 2 feet in height, with glossy red tinted stems, and triply three-lobed dark green leaflets, richly traced throughout with gold coloured veins. The flowers are produced in large, erect, densely-flowered, snow-white plumes—like racemes—and thus forming an exceedingly graceful decorative table plant, either singly or in groups, and equally beautiful for promiscuous decoration in the Conservatory, Drawing-room, or Vestibule. **21s.**

	Per packet	s	d
AQUILEGIA CERULEA, fine species		1	0
CALCEOLARIA DARLBRICA	1s and	2	6
CINERARIA ACANTHIFOLIA		1	0
DAHLIA IMERIALIS ROSEA		2	6
DALEA MUTISI		1	0
DALECHAMPIA ROEZLIANA ROSEA	1s and	2	0
DENDROCALAMUS STRICTUS	1s and	2	0
EUPHORBIA VITIFOLIUS		2	6
GAHNIA EBONOCARPA		1	0
GLOBULARIA TRICHOSANTHA		1	0
GODETIA LINDLEYANA, var versicolor grandiflora		0	6
HELICHRYSUM MINIMUM ATROPURPUREUM		1	0
" COCCINEUM		1	0
" PROCUMBENS ATROROSEUM PLENUM		1	0
" ROSEUM PLENUM		1	0
HEPATICA ANGULOSA		1	0
IBERIS UMBELLATA, dwarf lilac		0	6
" white		0	6
LAFŒRIA ROSEA		1	0
LARKSPUR, CANDELABRE, new dwarf branching Rocket		1	0
" new dwarf Ranunculus-flowered, 1 foot		0	6
LEPTOSYNE MARITIMA		1	0

	Per packet	s	d
LINUM GRANDIFLORUM ROSEUM	1s and	2	6
LOBELIA PUMILA GRANDIFLORA		1	0
" SPECIOSA ALBA		1	0
" SILVER CHAIN		1	0
MIGNONETTE, Giant Pyramid Red-flowered (Reseda odorata	6d and	1	0
" (Parson's New Tree (Reseda Parsoni)		1	0
MYOSOTIS LATIFOLIA		1	0
" OBLONGATA		1	0
NICOTIANA CAVOLO, best for cigars		1	0
OXALIS TROPŒOLOIDES VIRIDIFOLIA		1	0
OXLIP, improved, various colours		1	0
PHLOX DRUMMONDI HEYNHOLDI		2	6
PINK, Double-flowered Hybrid Chinese		1	0
POLYMNIA EDULIS	1s and	2	6
PRIMULA SINENSIS FIMBRIATA MAGNUM BONUM		2	6
PSYCHOTIS AJOWAN		0	6
SILENE PENDULA RUBERRIMA, double-flowered		1	0
TROPŒOLUM PRINCE OF WALES		1	0
WALLFLOWER GOLDEN TOM THUMB		1	0
" Dwarf, early-blooming yellow		1	0
ZEA (Maize) GRACILLIMA		1	0

THE WELLINGTON NURSERIES, ST. JOHN'S WOOD, LONDON, W.

J. C. WHEELER & SON,

SEED GROWERS,

GLOUCESTER; and 59, MARK LANE, LONDON, E.C.

J. C. WHEELER AND SON'S CELEBRATED SEED POTATOS.

WHEELERS' GLOUCESTERSHIRE KIDNEY

We can recommend for earliness, flavour, size, and crop. In comparison with the Ashleaf it is as early, whilst it produces nearly double the crop, and is altogether superior to that variety. We can recommend it with the most perfect confidence, and have much pleasure in referring to the annexed letters, speaking in high terms of its earliness and excellence.

3s. 6d. per peck; 12s. per bushel (56 lb.)

"I have grown your Gloucestershire Kidney here for the last five years, this year I had most of it seasoned among them, and double the crop from any I have had for the 11 years I have planted on these premises the earliest."—Mr STEED, *Gardener to the* Right Hon. Lord Penrhyn, *Penrhyn Castle*

"Your Gloucestershire Kidney, which I had from you last year, turned out so well that I feel I cannot do better than have some more seed this year."—NATHANIEL TREASURE, *Tetchy-Bury Union*

"Your Gloucestershire Kidney, which I had from you last year, turned out so well that I feel I cannot do better than have some more seed this year."—NATHANIEL TREASURE, *Tetchy-Bury Union*

"I grew last year more than 100 lbs. of Gloucestershire Kidneys per perch, and I hesitate not to say they are the finest variety. My main crop is split, and I think he is right."—Rev. JAMES L. MAW, *West Putford, North Devon.*

WHEELERS' MILKY WHITE.

4s. per peck; 14s. per bushel (56 lb.)

"I was greatly delighted with the Milky White Potato last year. It was the best sort I ever grew, and just what suited me."—J. STEED ROBINSON, *Wilcumstead, Bedford*

"Your Milky White Potatos are all I can say of them, and more. I was rather shy of them at first, as you, and your correspondents say, they were rather liable to disease. I have now tried them three years, and could not wish for a better Potato in every way. They have been very free from disease, and came off the ground before the autumn rains set in. Those who have never baked some of the largest ones should oblige. Hereafter you have given them unto them I am sure I have been thanked again and again for recommending them."—Rev. A. WOOD, *Castlewarden.*

WHEELERS' GUINEA COLLECTION OF GARDEN SEEDS.

1 quart Wheelers' First Early Peas	1 oz. Early Horn Carrot	1 packet Myatt's Garnishing Parsley
1 quart Early Green Marrow Peas	1 oz. Altringham Carrot	1 oz. Myatt's Turnip
1 quart Dickson's Favourite Peas	1 oz. James Green-top Carrot	1 oz. Student Parsnip
1 quart British Queen Peas	1 packet Early London Cauliflower	2 oz. Wood's Frame Radish
1 quart Taylor's Windsor Beans	1 packet Scott's extra fine Celery	1 oz. Olive Radish
1 quart Early Longpod Beans	4 oz. Curled Cress	1 oz. Mixed Turnip Radish
1 pint Green Longpod Beans	1 packet Australian Cress	1 packet Savoy
1 pint Scarlet Runners	1 packet Wheelers' Tender Cucumber	2 oz. Summer spinach
½ pint Dwarf French Beans	1 packet Stockwood's Ridge Cucumber	2 oz. White Spinach
1 packet Wheelers' extra fine Beet	1 packet Brobdignag Hall Melon	1 oz. Snowhall Turnip
1 packet Green Curled Borecole	1 packet Mrs. Curtis's Melon	1 oz. American Red Stone Turnip
1 packet Asparagus Kale	1 packet Hodge's Pear Leek	1 oz. Orange Jelly Turnip
1 packet Brussels Sprouts	1 packet Wheelers' Tom Thumb Lettuce	1 packet Summer Savory
1 packet Walcheren Broccoli	1 packet Giant White Cos Lettuce	1 packet Capsicum
1 packet Snow's Superb Winter Broccoli	1 packet Hardy Hammersmith Lettuce	1 packet Chili
1 packet Edelston's Mammoth Broccoli	1 oz. Mustard	1 packet Tomato
1 packet Adams's Early White Broccoli	1 oz. White Spanish Onion	1 packet Vegetable Marrow
1 packet Wheelers' Imperial Cabbage	1 oz. Giant Rocca Onion	1 packet Sweet Marjoram
1 packet Cocoa-nut Cabbage	1 oz. Tripoli Onion	1 packet Sweet Basil
1 packet Red Pickling Cabbage	1 oz. Silver Skin Onion	1 packet Thyme

1 packet Guards

"I am much pleased with your Guinea Collection of Garden Seeds received to-day; they are particularly well and liberally selected."—J. LUKIN, *Potteschan, Pembroke*

"I take this opportunity of expressing my great satisfaction with the polite attention you have paid to my small orders, and also to state that your seeds have fully borne out your recommendation in many cases exceeded it. I shall at all times feel great pleasure in recommending my friends to you, as the very best house to do business with, as they will receive prompt attention, genuine and reliable seeds, at a reasonable price."—HENRY BAKER, *Strood*

"The seeds I had from you before were the cleanest I ever saw, and when grown to maturity were acknowledged by everyone who saw them to be one of the cleanest and best crops in the parish of Llanrian."—P. M. G. WILLIAMS, M.R.C.V.S., *Trecastell, Letterston*

"The seeds reached me safely on Thursday morning, and I have to thank you for so liberally meeting my request. Nothing can exceed the excellent way in which your seeds are put together, and I never lose a fit opportunity to mention you to my friends. Year after year your seeds maintain their excellent character, and I have never a per cent. of disappointment in the matter of seeds, either failing or not coming true to name, since I first dealt with you, now some few years ago."—Captain W. H. PATTEN PATTESON, *Biddenden*

"I have received and been pleased with your 'Little Book;' the little one I have ever met with. It gives full directions ordering seeds, &c."—Rev. T. BARNETT, *Vicarage, Basing St. Arch'as*

"Your 'Little Book' is a very great favourite with us. I don't believe that ever I saw a catalogue put together so orderly."—JOHN BLAIR, *Alva, Isle of Wight*

"I say with confidence that your 'Little Book' is the best catalogue of seeds out; it pleases everyone."—F. J. HILLS, *Brigg, Lincolnshire*

"I first sent and began dealing with seeds. They gave me much satisfaction."—Captain WADE, *Pooley Green*

"I consider your seeds excellent. For the last two or three seasons I have used no others."—Captain H. ST. JOHN, R.N., *Thornbury.*

COCOA-NUT CABBAGE. 1s. per packet, Post Free.

THE COCOA-NUT CABBAGE IS A NEW AND VERY EARLY VARIETY, PERFECTLY DISTINCT, OF MOST EXCELLENT FLAVOUR.

It should be planted 18 inches apart.

Will yield an early and continuous supply.

This Cabbage is a decided novelty, and a great acquisition.

WHEELERS' TOM THUMB LETTUCE.

Large packet, 1s.; Smaller packet, 6d., Post Free.

"Your Tom Thumb Lettuce is a wonderful favourite with my family and friends. For a summer Lettuce I have never seen its equal."—GEORGE F. A. FLOWER, *Stafford Farm*

"Wheeler's Tom Thumb Lettuce is a capital variety for winter and early spring."—THOMAS RIVERS, *Sawbridgeworth.*

"Your Tom Thumb Lettuce is a very good sort; it is the best I ever had."—I. YEATS, *Gardener to* Baroness Rutzen.

"Many Variety would think Messrs. Wheeler to send him another packet of their celebrated Tom Thumb Lettuce."—*Woodhurst Hall*

"Be good enough to send me another packet of the best Lettuce grown, Wheelers' Tom Thumb."—H. P. WEBB.

PATERSON'S SUPERB MELON. 1s. per Seed.

This extraordinary Melon was raised during the last summer (1869) at Pontypool Park, by Mr. Paterson, Gardener to Mrs. Hanbury Leigh; it weighed 24 lb., and measured 42 inches in circumference. It was raised from the Netted Scarlet-flesh, crossed with the Black Rock; of exquisite flavour, and very handsome, with fine rich scarlet flesh; and, as seen by the dimensions given, of extraordinary size and weight. It produced 159 seeds, and this is all the stock there is of it. Paterson's Superb Melon can only be obtained true of

J. C. WHEELER AND SON, of GLOUCESTER, and 59, MARK LANE, LONDON, E.C.

WHEELERS' LITTLE BOOK for 1870, Price 6d., Post Free. Gratis to Customers.

J. C. WHEELER AND SON deliver all Seeds and Seed Potatos Carriage Free by Rail (excepting very small parcels), and all Flower Seeds Free by Post. Five per cent. discount for cash.

J. C. WHEELER AND SON, SEED GROWERS, GLOUCESTER; and 59, MARK LANE, LONDON, E.C.

NEW AND GENUINE SEEDS,

CARRIAGE PAID.

B. S. WILLIAMS,

NURSERYMAN AND SEED MERCHANT,

VICTORIA AND PARADISE NURSERIES,

UPPER HOLLOWAY, LONDON, N.

COMPLETE COLLECTIONS OF

KITCHEN GARDEN SEEDS,

To suit Gardens of various sizes,

10s. 6d., 21s., 42s., 63s., and 84s. each.

New and Choice Vegetable Seeds.

	Per packet—*s. d.*
Williams' Alexandra BROCCOLI	1 6
Dell's fine Dark BEET	1 0
Williams' Matchless RED CELERY	1 0
Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Digswell Prize ENDIVE	0 6
All the Year Round CABBAGE LETTUCE	0 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Lee's Immense Hardy Green CABBAGE LETTUCE, new	1 0
Webb's Climax MELON, new	2 6
(The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2 6
Nuneham Park ONION, quite distinct from any other variety	1 0
Earley's selected Double Curled PARSLEY, new	1 0
Laxton's Supreme PEA, new, per half pint	2 0
Hundredfold, or the Cook's Favourite PEA, new, do.	2 0
Cullingford's Champion Marrow PEA, new, per quart	3 6
(The finest flavoured Wrinkled Marrow in cultivation.)	
Earley's Defiance TOMATO, new	2 6
(The earliest and best variety in cultivation.)	
Orangefield Dwarf Prolific TOMATO	0 6

New and Choice Flower Seeds.

Williams' superb strain of PRIMULA, Red, White, or Mixed	*2s. 6d., 3s. 6d.*, and 5 0
CALCEOLARIA, Neill's extra choice strain,	*3s. 6d.*, and 5 0
	2s. 6d., 3s. 6d., and 5 0
CINERARIA, Weatherill's extra choice strain,	*2s. 6d., 3s. 6d.*, and 5 0
CYCLAMEN, Wiggins' Prize strain,	*1s. 6d., 2s. 6d.*, & 3 6
BALSAM, Williams' superb strain	*1s. 6d.* and 2 6
GERANIUM, Le Grand	*1s. 6d.* and 2 0
GLOXINIA, from the finest erect varieties	*1s.* and 2 6
HOLLYHOCKS, Chater's splendid varieties, mixed	1 0
PANSY, from Prize flowers	*1s.* and 2 6
PINK, finest double-fringed varieties	*1s.* and 2 6
POLYANTHUS, Wiggins' Prize strain	*1s.* and 1 6
VERBENA, Eckford's finest varieties	1 0
Williams' Improved Hybrid SOLANUMS	*2s. 6d.* & 3 6
ASTER, Dwarf, Victoria White, very fine	1 0
CENTAUREA CANDIDISSIMA	*1s.* and 2 6
CENTRANTHUS MACROSIPHON BICOLOR, new	1 0
CLARKEA INTEGRIPETALA, Tom Thumb, new	1 0
CONVOLVULUS MINOR UNICALUS, new	1 0
DELPHINIUM CONSOLIDA CANDELABRUM, new	1 0
ESCHSCHOLTZIA AURANTIACA, new	1 0
EUTOCA SERICEA, very dwarf, with pretty deep violet flowers, new	1 0
HELENIUM BOLANDERI, Dwarf Perennial species, new	1 0
LILIUM AURATUM	1 0
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	1 0
Williams' Improved FRENCH MARIGOLD, beautifully striped and very large	1 0
Parson's New TREE MIGNONETTE	1 0
NEMOPHILA ATOMARIA ELEGANS, new	1 0
OXALIS TROPÆOLOIDES VIRIDIFOLIA, green-leaved variety, new	1 0
PERILLA NANKINENSIS VARIEGATA, new	1 0
PYRETHRUM PARTHENIFOLIUM AUREUM, Golden Feather	*1s.* and 2 6
EAST LOTHIAN STOCKS, per collection of three colours	2 6
(These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders.)	
PURPLE QUEEN STOCK, a very dwarf and beautiful variety, the flowers are very double, and splendid colour	1 0
WHITE TEN-WEEK STOCK, Wallflower-leaved, new	1 0
(This is the purest and finest White Stock in cultivation.)	
IMPERIAL PURPLE SWEET PEAS, very large	0 6
TACSONIA VAN VOLXEMII, splendid green-house Climber	2 6
TROPÆOLUM GOLDEN KING of TOM THUMBS, new	1 0
VIOLA CORNUTA ALBA, new	*1s. 6d.* and 2 6
(This is an interesting and extremely useful variety, producing in great abundance pure white flowers, very robust and dwarf in habit, which renders it very effective in spring and summer, and invaluable during the late autumn months.)	
WALLFLOWERS, Saunders' fine dark variety	1 0
ZINNIA ELEGANS PUMILA Flore-pleno, new	1 0

B. S. W.'S DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, Post Free, on application.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, has decided to offer CUTTINGS, in the varieties from the collection of Chrysanthemums, for 25 Pairs, 10s.; 50 Pairs, 18s.; 100 Pairs, 30s.; to Pass Inland. FAVOR-ITE CHRYSANTHEMUM, No. 1 of the above, forwarded post free on receipt of Postage Stamps to the amount.

Ironmonger-street, Hull.

Ranunculuses, Anemones, Flower Seeds, &c.

CLYSO, FLORIST, &c., Wallingford, Berks, offers, [illegible] CATALOGUE, [illegible] Ranunculuses, Anemones, Flower Seeds, Bulbs, &c. [illegible] Post-free on application.

Wandsworth Common Nursery.

Ten minutes' walk from Clapham Junction

MR. FORBERT NEAL begs to invite the attention of the Nobility, Clergy, and the Trade in general to the very fine stock of well-established HEATHS, comprising all the best varieties, Standard and Dwarf ROSES, Conifers and other Ornamental Trees and Shrubs, Fruit Trees, Vines, Strawberries, &c. A CATALOGUE of the above may be had on application. The Nursery is situated within half a minute's walk of the Railway Station, and the Trains leave Clapham Junction every few minutes for Wandsworth Common.

CATALOGUE will be sent on application.

LILIUM, in 250 superb varieties. Choice [illegible]

GLADIOLI, in complicated varieties. Choice [illegible]

[illegible]

CANNAS [illegible]

CATALOGUE free on application.

HELLEBORUS and ALPINE PLANT

Descriptive CATALOGUE [illegible]

CATALOGUES free on application.

STEPHEN BROWN, Wellington Mart, Commercial-road East.

To the Trade.

SPECIAL OFFER of LAURUSTINUS (VIBURNUS TINUS).

WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for the market for [illegible] years in his Nursery by means of careful selection, layering, &c., been propagated in large, bushy, compact plants, [illegible] and, the bright young shoots, compact; flower-panicles, nearly twice the size of the old varieties, and very sweet-scented, with a continuation of flowers during the most severe weather.

WM. K. is also under offering to the trade specimens, 4 to 6 feet, full of bud, per pair, 10s.; second size, 4 to 5 feet, do., 6s.; third size, 3 to 4 feet, do., 4s. Cash with order. Packed free by rail.

Hurst Nursery, Hailsham, Sussex.

Special Offer.

JOHN CRANSTON, having a large surplus stock of the most useful and ornamental, will be happy to forward upon receipt of P.O.O. at Hall Cross, [illegible]

Rose [illegible] and Half-Standards, all the leading Perpetuals.

Dwarf [illegible] Standard, Tree, and Weeping Ashleaf, Moss, Provence, Standard, Tree, and Noisette and Chinas, suitable for [illegible]

Extra Clematis Roses, [illegible] varieties

Choice and Fillet Roses

[illegible] Evergreens, Deciduous

New Roses for 1869, in varieties. Plant ready early in March

FRUIT TREES. Dwarf-trained Apples, Pears, Plums and Cherries, well-trained Trees

Pyramidal do. do.

Standard-trained Peaches and Nectarines

Standard Duke, Thomas's, and Morello Cherries, very fine

Gooseberries, specimens of 200 varieties, 3 and 4 year old plants

Currants

Asters, strong, fruitful, and planting Canes

CONIFERÆ. Handsome young specimens, 6 to 10 feet

Pinus, in three, well-furnished, and recently transplanted, 2 to 3 feet, and 3 to 4 feet

Spruce, Fir, quartered, 2 to 3, and 3 to 4 feet

Wellingtonia, 2 to 3, 3 to 4, 4 to 5, 5 to 6, and 6 to 7 feet

Thuja occidentalis plicata, 9 to 12, 12 to 15, and 15 to 18 inches

Thuja gigantea, Lobbii, Menziesii

Retinospora lycopodioides

LAURELS, Common and Portugal, Magnolia grandiflora, &c.

WEEPING Ash, Elm, Oak, &c.

ASPARAGUS, Seakale, RHUBARB, SEAKALE, &c.

Sound [illegible], Hall Cross, near Hereford

BEAUTIFUL SPRING FLOWERS. Now ready, [illegible]

HEPATICAS, double [illegible]

PRIMROSES, double [illegible] per dozen

" Yellow, [illegible] Purple, 1s. per dozen

" Rose, [illegible] 1s. per dozen

ROCKETS, double White and Purple, 1s. per dozen

VIOLETS, in excellent [illegible] Catalogue, 1s. per dozen

POLYANTHUS, the finest Show in the world, 1s. 6d. per dozen, [illegible]

PANSIES, [illegible] 6d. per dozen, 4s. per 100

DAISIES, [illegible] per dozen

AURICULAS, Fancy, [illegible]

HOLLYHOCKS, [illegible]

PANSIES (Rose), [illegible]

DELPHINIUMS (Perennial), [illegible] 6d. per dozen

ALSTRŒMERIA, [illegible]

ADONIS VERNALIS, [illegible]

MYOSOTIS DISCOLOR [illegible] per dozen, 2s. per 100

ARABIS ALBIDA VARIEGATUS. DOUBLE VARIEGATED (New [illegible]

HOLCUS LANATUS. ALBO VARIEGATUS (New Striped Grass), [illegible]

HONESTY, fine [illegible]

WALLFLOWER, double, [illegible]

DRACÆNAS, [illegible]

ARABIS ALBIDA VARIEGATA, 2s. 6d. per dozen, 20s. per 100

ROSES, old Chinese in China, [illegible]

" Blush [illegible]

CHRISTMAS ROSE, HELLEBORUS NIGER and others, 6s. per doz.

EPIMEDIUMS, New 1869, 12s. beautiful varieties in pots, 6s. 12 plants, 10s. 6d.

GERANIUMS, Zonal, New 1869, 12 of the best ever raised, 30s. per doz.

" Double, New 1869, 12 of the best ever raised, 30s. per doz.

" Madame Thomann, 6s. per dozen

TWENTY NEW CHRYSANTHEMUMS of 1869, 6s. 6d.

Double Pompon Chrysanthemums only, Hedgehogium

An [illegible] of the best New Plants of 1869, Roses, Fruit Trees, &c., free on application

WM. DILLISTONE, Nurseryman, &c., Sible Hedingham, Essex

Beta chilensis.

BUTTLER, McCULLOCH, AND CO. are enabled to offer SEED of the true variety of this magnificent foliage plant; it is quite distinct from Beta cicla, and is fully described in their [illegible] CATALOGUE, sent post free on receipt of 2d. per packet

South Row, Covent Garden Market, W.C.

Established upwards of a Century

Lilium auratum.

WM. PAUL has to offer a magnificent lot of the above, DUTCH GROWN BOLBS, at 2s. 6d., 3s. 6d., and 5s. each; 24s., 36s., and 48s. per dozen; JAPANESE BOLBS, at 1s., 2s., and 2s. 6d. each; 12s., 18s., and 24s. per dozen. The usual discount to the Trade off the dozen rates when ordered by the dozen.

PAUL'S Nurseries and Seed Warehouse, Waltham Cross, London, N.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first class), per 100, 7s.; per 1000, £3

100 Gladioli, by name, [illegible] 8s.

100 " [illegible] 14s.

100 " [illegible] 20s. to 30s.

Mixed, flowering bulbs, [illegible]

HYACINTHS, NARCISSUS, &c. and 124, Boulevard de l'Hôpital, Paris.

DAVID GOLD McKAY offers the following at low prices. Carriage free above 20s.

Per dozen	s.	d.
Cineraria, large flowered	3	0
Cockspur (pyramidalis)	3	0
Dwarf Perfection	3	0
Heliotrope, dark varieties	3	0
Ivy-leaved, dark varieties	3	0
Mignonette, Parsons'	6	0
Pelargonium, Bijou	3	0
Pelargonium, Cedric Lucas	3	0
Pelargonium, Crystal Palace gem	3	0
Pelargonium, Flower of the day	3	0
Pelargonium, Lady Cullum	3	0
Pelargonium, Mrs. Pollock	3	0
Pelargonium, Prince Arthur	3	0
Pelargonium, Princess Alexandra	3	0
Pelargonium, Princess of Wales	3	0
Pelargonium, Rose Queen	3	0
Pelargonium, Sir Colin Campbell	3	0
Pelargonium, Sir Garnet Wolseley	3	0
Pelargonium, Sir Roger Tichborne	3	0
Pelargonium, Sultan	3	0
Pelargonium, Tom Thumb	3	0
Pelargonium, Victoria Regina	3	0
Pelargonium, Zouave	3	0
Petunia, Countess of Ellesmere	3	0
Petunia, Duke of Edinburgh	3	0
Petunia, Duke of Wellington	3	0
Petunia, Duke of York	3	0
Petunia, Lady Mary Fox	3	0
Petunia, Lord Derby	3	0
Petunia, Lord Elcho	3	0
Petunia, Lord Lyons	3	0
Petunia, Mrs. Gladstone	3	0
Petunia, Prince Arthur	3	0
Petunia, Prince of Wales	3	0
Petunia, Princess Alexandra	3	0
Petunia, Princess Mary	3	0
Petunia, Princess Royal	3	0
Petunia, Queen of the Belgians	3	0
Petunia, Queen of the Netherlands	3	0
Petunia, Queen of Whites	3	0
Petunia, Rose Queen	3	0
Petunia, Sir Colin Campbell	3	0
Petunia, Sir Garnet Wolseley	3	0
Petunia, Sir Roger Tichborne	3	0
Petunia, Sultan	3	0
Petunia, Tom Thumb	3	0
Petunia, Victoria Regina	3	0
Petunia, Zouave	3	0
Phlox Drummondi, Crimson Queen	3	0
Phlox Drummondi, Lady Ellen Grey	3	0
Phlox Drummondi, Mrs. Pollock	3	0
Phlox Drummondi, Prince Arthur	3	0
Phlox Drummondi, Princess Alexandra	3	0
Phlox Drummondi, Princess Mary	3	0
Phlox Drummondi, Princess Royal	3	0
Phlox Drummondi, Queen of the Belgians	3	0
Phlox Drummondi, Queen of the Netherlands	3	0
Phlox Drummondi, Queen of Whites	3	0
Phlox Drummondi, Rose Queen	3	0
Phlox Drummondi, Sir Colin Campbell	3	0
Phlox Drummondi, Sir Garnet Wolseley	3	0
Phlox Drummondi, Sir Roger Tichborne	3	0
Phlox Drummondi, Sultan	3	0
Phlox Drummondi, Tom Thumb	3	0
Phlox Drummondi, Victoria Regina	3	0
Phlox Drummondi, Zouave	3	0
Stocks, Ten-week, Dwarf, Crimson	3	0
Stocks, Ten-week, Dwarf, Lilac	3	0
Stocks, Ten-week, Dwarf, Purple	3	0
Stocks, Ten-week, Dwarf, Rose	3	0
Stocks, Ten-week, Dwarf, White	3	0
Stocks, Ten-week, Dwarf, Yellow	3	0
Strawberries, The Lady, per 100	5	0
Strawberries, Myatt's Eleanor, per 100	5	0
Strawberries, Trollope Victoria, per 100	5	0
Verbena, Defiance	3	0
Verbena, Purple Perfection	3	0
Verbena, Scarlet Defiance	3	0
Verbena, Scarlet Perfection	3	0
Verbena, Scarlet Queen	3	0
Verbena, Scarlet Unique	3	0
Verbena, White Perfection	3	0
Verbena, White Queen	3	0
Verbena, White Unique	3	0

CATALOGUES free.

The "Old" Nursery, Sudbury, Suffolk.

Spring Flowers.

LEWIS S. WOODTHORPE will be happy to forward, free, his CATALOGUE containing List of all the most lovely of the early Spring blooming Plants, Violets, Primroses, Hepaticas, Daisies, Rockets, &c., also the Dwarf and choice Plants of the season, with Lists of Roses, Fruit Trees, Seed Lists, and a general and well-grown Nursery stock.

Mount Nursery, Sible Hedingham, Essex

To Noblemen and Gentlemen engaged in Planting.

THE RED LODGE NURSERY, Southampton, will be found replete with a magnificent collection of Hardy CONIFERÆ of all sizes, which, from frequent removal, will transplant with a certainty of success.

Choice named Scarlet and other coloured RHODODENDRONS. Also the Pontica sort, Hybrid varieties, for forming hedges, covers, or lasting flowering shrubs.

SHRUBS and ORNAMENTAL TREES of every description; FRUIT TREES of the most esteemed sorts, true to name; STRAWBERRIES and DWARF POT PLANTS.

A visit to the Nursery is requested, and respectfully solicited. Priced CATALOGUES and every information may be obtained of the Proprietor,

W. H. ROGERS.

LOUIS VAN HOUTTE begs to state that his CATALOGUE, No. 1869 B.L., is ready to be sent from his Agents, Messrs. R. Sinnett & Son, 4, Hay's Lane, London, E.C. It includes the choicest FANCY FOLIAGED PLANTS, ORNAMENTAL TREES and SHRUBS, CONIFERÆ, ROSES of all kinds, the finest in GENERATIONS PLANTS, dwarf, tree, and climbing, WATER PLANTS, Bedding Plants, Grasses, Bulbous and tuberous roots; the FRUIT TREES in general.

LOUIS VAN HOUTTE'S SEED CATALOGUE for 1870 is now ready, and is sent to his usual customers.

The GLADIOLUS GANDAVENSIS are enumerated in LOUIS VAN HOUTTE'S catalogue, No. 1869 B.L., but the description can only be found in the Horticulteur Belge of the same date.

The Parts, 5, and 6 of Vol. XVIII. of the FLORE have appeared; the contents can be found at p. 249 of the Second Volume. Price 1 franc each Part. Subscription for 12 Parts, 12 francs. Orders from Our Hundred highly-coloured Plates, Woodcuts, miscellaneous matter, &c.)

Ghent Royal Nursery, January 29.

NEW AND GENUINE SEEDS.

CARRIAGE PAID.

BENJAMIN S. WILLIAMS

BEGS TO ANNOUNCE THAT HIS

DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS, for 1870,

Containing many New and Choice Varieties, is now ready. Post Free on application.

VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most critical and choice Seeds are either home-saved or have been saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

NEW LARGE

ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLO D-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations, and in consequence of the short crop last year on the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

POTATOS.

GRYFFE CASTLE, or BLACKSTOUN DON,

In Bags, containing 1 cwt., 10s. 6d.; 2 cwt., 20s., Bag included.

For quality and quantity this variety is pre-eminent, being as early as the Dalmahoy and yielding as heavy a crop as the Regent. It is suitable either for the Garden or the Farm. The "Gardeners' Magazine" says regarding it:—"An excellent Potato, cropping well, free from disease, and elegant upon the table." W. D. Radclyffe, in *Gardeners' Chronicle*, says:—"If you keep three Potatos, buy these—Royal Ashleaf, Gryffe Castle, and Hero; they will carry you from June to June."

RED BOG. Extensively grown for the early supply of the Glasgow market. A fine Potato.

DALMAHOY, WALKER'S REGENT, PATERSON'S VICTORIA.

The above are all carefully selected stocks, specially grown for Seed on Peat soil, and well worth the attention of parties desirous of obtaining a pure stock. Price per dozen or per sack on application.

SMITH AND SIMONS, 36 and 38, HOWARD STREET, GLASGOW.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and stone, THORNS; a immense stock of Evergreen and Deciduous Shrubs, at low prices, also in all the usual sizes.

SYCAMORES or PLANES, 7 to 9 feet, 3s. per dozen.
LABURNUMS, 6 to 7 feet, 2s. per dozen.
ASH and HORSE CHESTNUT, 3 to 4 feet, 30s. per 1000.
OAKS, [illegible] feet, [illegible] per 1000. BEECH, [illegible] feet, 12s. per 1000.
LAURELS, [illegible] feet, [illegible]; [illegible] feet, 7s. per 100.
PINUS AUSTRIACA and EXCELSA, 3 feet, [illegible] per dozen.
ROSES, 2 feet and upwards, 9s. per dozen; less than 2 feet, 6s. per doz.
Fine CUCUMBER SEED, [illegible] per lb.; [illegible] per oz.
For cash only.
A. WILKIN, Tiptree, Kelvedon, Essex.

WANTED, Eight Handsome Standard PORTUGAL LAURELS, to match exactly; on Clean, Straight Stems at least 3 inches in diameter, with well proportioned globular heads 4½ feet through. Also large specimen AZALEAS and CAMELLIAS, must be handsome Plants, and first-class varieties. State dimensions and lowest price, etc., to
FRANCIS AND ARTHUR DICKSON AND SONS, "Upton" Nurseries, Chester.

To the Trade.

FRESH CONIFEROUS SEEDS.
ABIES, excelsa, Common Fir, per 100 lb., 50s.; per lb., 8d.
„ pectinata, Common Spruce, per 100 lb., 38s.; per lb., 6d.
„ Apollinis, per lb., 10s.; per oz., 1s.d.
„ balsamea, per lb., 10s.; per oz., 1s.d.
„ Brunoniana, 1000 seeds, 15s.
„ canadensis, per lb., 14s.; per oz., 1s.
„ alba, per lb., 18s.; per oz., 1s. 4d.
„ cephalonica, per lb., 10s.; per oz., 10d.
„ Fraseri, per oz., 2s. 6d.
„ Khutrow (Morinda), 100 seeds, 2s. 6d.
„ orientalis, per lb., 20s.; per oz., 1s. 6d.; nobilis, per oz., 5s.
„ Nordmanniana, per lb., 20s.; per oz., 1s. 6d.
„ Pinsapo, per lb., 16s.; per oz., 1s. 3d.
„ Reginae Amaliae, per lb., 10s.; per oz., 10d.
„ rubra canadensis, per oz., [illegible]; Pichta, per oz., [illegible]
CRYPTOMERIA, japonica, per lb., [illegible]; per oz., 6d.
„ Lobbii, per oz., [illegible]
CUPRESSUS, Corneyana, per oz., [illegible]; funebris, per oz., 2s.
„ Lawsoniana, per lb., [illegible]; per oz., [illegible] 3d.
„ Lambertiana, per oz., [illegible] 6d.
CEDRUS, atlantica, clean seed, per lb., 12s.; per oz., 1s.
„ Libani, clean seed, per lb., [illegible]; per oz., 1s. 3d.
JUNIPERUS, excelsa, per oz., [illegible] 6d.; excelsa, per lb., 18s.; per oz., 1s. 6d.; virginiana, clean seed, per lb., 13s.; per oz., 1s.
LARIX, Common Larch, per 100 lb., 100s.; per lb., 1s. 3d.
PINUS, [illegible], per 100 lb., [illegible]; per lb., 1s. 3d.
„ Cembra, per 100 lb., [illegible]; per lb., [illegible]
„ [illegible]
„ [illegible], per lb., 5s. 6d.
„ sylvestris, Common Pine, 100 lb., 150s.; per lb., 1s. 9d.
„ Benthamiana, per oz., [illegible]
„ [illegible], per lb., 3s. 6d.; per oz., 6d.
„ Lambertiana, per oz., 5s.
„ [illegible], per lb., [illegible]; per oz., 11d.
„ Mughus, per lb., 5s. 6d.; per oz., 6d.
„ [illegible], per lb., 13s. 6d.; per oz., 1s.
SALISBURIA, [illegible], 30s.
SEQUOIA, sempervirens, per oz., [illegible] 6d.
THUJA, [illegible], per oz., [illegible]; [illegible], per lb., 9s.; per oz., 9d.; intermedia, per oz., 1s. 6d.; occidentalis, per lb., 3s. 6d.; orientalis, per lb., 3s.; occidentalis aurea variegata, per oz., [illegible]; pyramidalis, per lb., 7s.; per oz., 6d.
WELLINGTONIA, gigantea, 1000 seeds, 12s.; 25,000 seeds, 250s.

ROBERT NEUMANN, Importer and Exporter of Seeds, &c., begs to offer the foregoing CONIFEROUS SEEDS, in fresh quality, to the Trade. A List of a great many other sorts, with lowest prices, on application. Orders are respectfully requested as soon as possible. The Nurseries, Erfurt, Prussia.

Cottingham Nurseries.—Established 1788.

HULL ESTABLISHMENT, 7, MARKET PLACE.
MARTIN AND SON respectfully offer as follows:—
APPLES, pyramids, on Paradise, 2 and 3 yr., from 15s. per dozen.
„ „ Crab, strong, from 9s. per dozen.
PEARS, pyramid, on Quince, 1, 2, and 3 yr., 9s. to 21s. per dozen; Pear, 2 and 3 yr., 9s. to [illegible] per dozen; standards, fine, 12s. per dozen.
PLUMS, pyramids, 2 and 3 yr., 15s. and 21s. per dozen.
„ standards, 12s. to 18s. per dozen.
CHERRIES, standards, 12s. per dozen.
„ pyramids, fine, 12s. to 21s. per dozen.
ACER NEGUNDO, foliis argentea, dwarfs, fine, 12s. to 18s. per doz.
„ „ „ „ standards, 18s. to 30s. per dozen.
ASH, Weeping, 6 to 8 feet stem, 12s. to 30s. per dozen.
ARBOR-VITÆ, American, 3 feet, 4s. per dozen; Chinese, 2 to 3 feet, 6s. per dozen; elegantissima (Rollisson's), 6 to 12 inches, 9s. to 12s. per dozen; Thuja gigantea, 6 to 30 inches, 8s. to 42s. per dozen; flagelliformis, 5 feet, fine specimens, 24s. per dozen.
AUCUBA, japonica, 12 to 15 inches, 8s. per dozen.
„ „ 1½ to 2 feet, 12s. per dozen.
AGAPANTHUS, variegata, 12s. per dozen.
AZALEA, indica, fine and strong, 12s. per dozen.
ALTHÆA, frutex, fine and strong, 9s. per dozen.
BOX TREE, 1 to 1½ foot, 3s. per dozen.
BIRCH, new, weeping, Fernleaf, 18s. per dozen.
BERBERIS, Darwinii, 1 to 1½ foot, bushy, 6s. per dozen.
CAMELLIAS, fine, named kinds, 2 or 3 yr., 21s. to 60s. per dozen.
CRYPTOMERIA, japonica, 1 foot, fine, 3s. per dozen, 16s. per 100, £5 per 1000.
CUPRESSUS, Lawsoniana, gold variety, 30s. to 60s. per dozen.
„ „ 8 to 12 in., and 2 to 3 feet, 3s. to 18s. per doz.
CLEMATIS, all the best kinds, 12s. per dozen.
CORYLUS, purpurea, 12s. per dozen; laciniata, 12s. per dozen.
CHESTNUT, Common, 8 to 10 feet, 8s. to 10s. per dozen.
CORCHORUS, japonica, variegata, 3s. per dozen.
ELM, English, grafted, 3 to 6 feet, 20s. to 30s. per 100.
„ Wych, 6 to 10 feet, 16s. to 75s. per 100.
„ narrow leaf, English, 2 to 4 feet, 3s. to 6s. per 100.
„ Weeping, fine, 21s. per dozen.
GERANIUMS, green zonal, fine, 20s. to 25s. per 100; tricolor, do., 30s. to 60s. per 100; bicolor, 20s. per 100.
HOLLY, Weeping, green, 5s. to 10s. 6d. each.
„ „ variegated, silver, 10s. 6d. to 21s. each, £6 6s. per doz.
„ „ fine standards, 10s. 6d. to 21s. each, £6 6s. per doz.
IVY, Irish, strong, 3s. per dozen, 80s. per 1000.
„ gold leaf, fine, 10s. per dozen.
JUNIPERUS, sinensis, 1½ to 2 feet, 12s. per dozen.
„ excelsa stricta, 5 inches to 2½ feet, 18s. to £5 per dozen.
LARCH, 1 yr. fine, [illegible] per 1000, or £7 [illegible] per 100,000.
„ 1½ to 2½ feet, price on application.
LIMES, [illegible] to 8 feet, 6s. to 12s. per dozen.
LAPAGERIA, rosea, 12s. per dozen.
LILY, lancifolium rubrum, 9s. per dozen; auratum, 18s. to 30s. per dozen.
LIGUSTRUM, ovalifolia, bushy, 3 to 4 feet, 9s. per dozen.
LILAC, purple, 3 to 4 feet, 3s. per doz.; white, 3 to 4 feet, 6s. per doz.
LAUREL, caucasica, fine, 8s. per dozen; Colchic, fine, 6s. per dozen; Portugal, bushy, 2 to 3 feet, 40s. to 75s. per 100.
OAKS, 2 to 3 feet, 27s. 6d. per 1000.
POPLARS, of kinds, 8 to 14 feet, 16s. to 30s. per 100.
PLATANUS, 5 to 6 feet, 9s. per dozen.
PINUS CEMBRA, 12 to 18 inches, 12s. per dozen.
QUICKWOOD, 3 yr. transplanted, 20s. per 1000.
ROSES, fine named kinds, dwarfs, in pots, 60s. per 100.
„ „ „ from the ground, 50s. per 100.
„ „ standards, 100s. per 100.
„ „ climbers, very strong, 50s. per 100.
RHODODENDRONS, the Queen, new, 10s. 6d. each.
„ fine named varieties, 75s. per 100.
THUJOPSIS BOREALIS, 1½ to 5 feet, 12s. to 42s. per dozen.
WILLOW, American Weeping, standards, 12s. per dozen.
YEWS, English, 2 to 3 feet, 60s. per 100; Irish, 2 to 3 feet, 60s. per 100; adpressa, strong, [illegible] per dozen.
CATALOGUES may be had on application.
See Seed Advertisement in *Gardeners' Chronicle* of Jan. 22.

To Planters.

JOHN NELSON has a splendid stock of the following Trees, which he will supply at greatly reduced prices to effect a clearance:—
ENGLISH OAK, in drills, 12 to 18 inches; transplanted, 2 to 3 feet.
ASH, 3 to 4 ft., transplanted | HORNBEAM, 3 to 4 ft., transplanted.
Standard ROSES, of all the best kinds.
MANETTI STOCKS | Strong THORN QUICK.
MYATT'S ASHLEAF POTATOS.
Terms cash from unknown Correspondents, or satisfactory reference. Prices on application to
JOHN NELSON, St. Michael's Hill Nursery, Bristol.

THE GOLDEN VARIEGATED WELLINGTONIA.
First-class Certificate from Royal Horticultural Society of England, 1866.
First-class Certificate from Royal Horticultural Society of Ireland, 1866.
First-class Certificate at Manchester International Exhibition, 1866.
First-class Certificate at Edinburgh International Exhibition, 1869.
First-class Medal at Hamburgh International Exhibition, 1869.
Plants have been distributed through France, Austria, Prussia, Switzerland, Belgium, Italy, Holland, &c.
This Season patronised by the leading Nobility of this Kingdom, from whom numerous testimonials have been received.
"It is very beautiful."—Editors of *Gardeners' Chronicle*.
"A pyramid of superbly coloured variegation."—Editor of *Gardeners' Magazine*.
"If ever the distinctive characters of a variety seemed fixed, they are in this splendid acquisition."—Editor of *Irish Farmers' Gazette*.
"Brilliant compared with Biota aurea—a pillar of beauty."—*Mr. M'Donald, Woodstock, Co. Kilkenny*; &c. &c.
Chromo-lithographs of the parent tree, by Day & Son, Limited, on superior cards, 10 by 8 inches, very faithful in outline, but deficient in representing the glorious colour of the original. These are sent free by post for 25 stamps, and one sent to each purchaser.
PRICES:—First Size, extra choice, 24 to 27 inches, £5 5s.; Second Size, very fine, 15 to 18 inches, £2 2s.; Third Size, stout and fine, 12 to 14 inches, £1 1s.; Fourth Size, nice little plants, 8 to 10 inches, 10s. 6d.
R. HARTLAND, The Lough Nurseries, Cork, January 19.

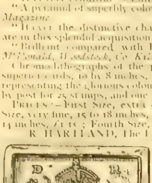

Surplus Stock.—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For Descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow guage lines, at a moderate cost, thereby saving delay and expense of packing.

At 12s. per dozen.

Abies canadensis (Hemlock Spruce), 4 to 5 feet	Laurel, narrow leaved, 2 to 2½ feet
„ excelsa, 4 to 5 feet	„ Portugal, 2½ to 3 feet
Arbor-vitæ, American, 5 to 6 feet	Picea balsamea, selected, 4 to 5 ft.
„ Siberian, 3½ to 4 feet	Quercus ilex (Evergreen Oak), 15 to 18 inches
Gorse, double, in pots, strong	Rhododendron ponticum, 21 to [24 inches]
Hartogia capensis (Cape Laurel), 1½ to 2 feet	Holly, screw leaved, green, 1½ to [2 ft.]
	Phillyrea oleæfolia, 2 to 2½ ft.

At 18s. per dozen.

Abies canadensis, 5 to 6 feet	Phillyrea oleæfolia, 2½ to 3 feet
„ excelsa, 4 to 5 feet	Picea balsamea, 5 to 6 feet
Abietinus, broad leaved, 2 to 2½ ft.	Pinus austriaca, 3 to 4 feet
Arbor-vitæ, American, 6 to 7 feet	Quercus ilex, 2 to 2½ feet
„ Siberian, 4 to 4½ feet	Rhododendron ponticum (very bushy), 2 to 2½ feet
Aucuba japonica, 18 to 21 inches	„ hybrids, fine varieties, 18 to 21 inches
Box, green tree, pyramids, very handsome, 2½ by 2½ feet	Taxus japonica (Japan Yew), 12 to 15 inches
Hartogia capensis, 2 to 2½ feet	
Laurel, narrow leaved, 2½ to 3 feet	

At 24s. per dozen.

Abies elegans, 18 to 24 inches	Ivy, green tree, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet	Laurel, Portugal, pyramids, 3 to 4 feet
Aucuba japonica, 21 to 24 inches	Phillyrea oleæfolia, very fine, 3 to 4 feet
Cryptomeria Lobbii, 5 to 6 feet	Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Cupressus Lawsoniana, 4 to 5 feet	Taxus japonica, 15 to 18 inches
Holly, screw leaved, green, 2 to 2½ feet	

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
„ elegans, 2 to 2½ feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ compacta, 2½ to 3 feet	„ drupacea, 18 to 24 inches
Aucuba japonica, very bushy, 2 to 2½ feet	„ glauca, 3 to 4 feet
Cryptomeria Lobbii, 6 to 7 feet	„ Fecana, 3 to 4 feet
„ viridis, 6 to 7 feet	Pinus austriaca, 4 to 5 feet
	Thujopsis borealis, 4 to 5 feet

At 36s. per dozen.

Abies inverta (Weeping Spruce), 2½ to 3 feet	Juniperus Smithiana, 3 to 3½ feet
Arbor-vitæ compacta, 3 to 3½ feet	„ viridis pendula, 3 to 4 feet
„ Siberian (very fine), 5 to 6 feet	Laurel, Portugal (pyramids, very fine), 4 to 5 feet
Cupressus Lawsoniana, 5 to 6 feet	Pinus Laricio, 6 to 7 feet
Juniperus chinensis fœmina, 3 to 3½ feet	Taxus elegantissima (gold leaved), 18 to 24 inches
„ densata, 3 to 4 feet	„ Irish, 5 to 6 feet
„ Schottii, 3 to 3½ feet	

At 42s. per dozen.

Abies inverta, fine specimens, 3 to 4 feet	Juniperus phœnicia, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet	„ Schottii, 3½ to 4 feet
„ Siberian (very fine), 6 to 7 feet	„ thurifera (Incense Juniper), 4 to 5 feet
Juniperus chinensis, 3½ to 4 feet	„ virginiana, 6 to 7 feet
„ „ fœmina, 3½ to 4 feet	Picea Nordmanniana, 18 to 24 ins.
„ drupacea, 21 to 30 inches	Pinus austriaca, 5 to 6 feet
„ Fecana, 4 to 5 feet	„ Laricio, 7 to 8 feet
	Thujopsis borealis, 5 to 6 feet

At 48s. per dozen.

Abies inverta, 4 to 5 feet	Juniperus Smithiana, 3½ to 4 feet
Juniperus chinensis, 4 to 5 feet	„ thurifera, 5 to 6 feet
„ densata, 4 to 5 feet	„ virginiana, 7 to 8 feet
„ glauca, 4 to 5 feet	„ viridis pendula, 4 to 5 feet
„ Fecana, 5 to 6 feet	Pinus Laricio, 8 to 9 feet
„ phœnicia, 4 to 5 feet	Taxus, Irish, 6 to 7 feet
„ Schottii, 4 to 5 feet	Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen.

Abies Menziesii, 7 to 8 feet	Juniperus virginiana, 8 to 10 feet
„ monstrosa, 7 to 8 feet	„ viridis pendula, 5 to 6 feet
Arbor-vitæ compacta, 4 to 4½ feet	Laurel, colchic (very fine), 8 to 10 feet
Juniperus chinensis, very fine, 5 to 6 feet	„ Portugal, pyramids (very fine), 5 to 6 feet
„ densata, 5 to 6 feet	Picea Nordmanniana, 2 to 2½ feet
„ glauca, 5 to 6 feet	Pinus Cembra, extra fine, 6 to 7 ft.
„ phœnicia, 5 to 6 feet	Taxus elegantissima, 2 to 2½ feet
„ Smithiana, 4 to 5 feet	Thujopsis borealis, 6 to 7 feet
„ thurifera, 6 to 7 feet	Wellingtonia gigantea, 3 to 3½ feet

Abies albertiana, 7 to 8 feet, 10s. 6d. each	Picea lasiocarpa, 2½ to 3 feet, 15s.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d. each
„ Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each	„ nobilis (best glaucous var.), 18 to 24 inches, 7s. 6d.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
„ orientalis, 4 to 5 feet, 6s.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. 6d. each	„ Nordmanniana, 4 to 5 feet, 15s.; 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each
Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s.; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 63s. to 84s. each	„ Pinsapo, 3 to 3½ ft., 10s. 6d.; 3½ to 4 ft., 15s.; 4 to 4½ ft., 21s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. each
Juniperus densata, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each	Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
„ thurifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each	Wellingtonia gigantea, 3½ to 4 feet, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each	Yews, for hedges, about 12 feet high, 40 years old, recently transplanted, 21s. 6d. each
Picea cephalonica, extra fine, 5 to 6 ft., 1[illegible]; 6 to 7 feet, 21s. each	

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Seeds.—Roses.—Gladioli.

FREDERICK PARSONS, Son and Successor to Mr. George Parsons, begs to call attention to his SEED LIST for 1870, which will be found to contain all the most [illegible] Garden and Flower Seeds, carefully selected from the best [illegible] Growers.
F. P.'s complete Collections of Garden Seeds, [illegible] any size:—No. 1, 60s.; No. 2, 40s.; No. [illegible], 20s.; No. [illegible], 10s.
Collections of the most approved varieties of Flower Seeds, from 5s. upwards.
German Seeds imported [illegible]
ASTERS.—A splendid assortment of all the [illegible]
STOCKS, BALSAMS, PORTULACA, [illegible], LARKSPURS.
First class strains of CALCEOLARIA, 1s. 6d. [illegible] packet; CINERARIA, 1s. 6d. per packet; PRIMULA, [illegible]
PARSONS' NEW HYBRID TREE MIGNONETTE.—The new Tree Mignonette [illegible] habit, and deliciously sweet. [illegible] certain selection for the [illegible] become a universal favourite. [illegible] height and 8 feet in circumference [illegible] nine months from the [illegible] sowing [illegible] of sowing. [illegible] packets, 1s.
GLADIOLI.—A superb [illegible]
GLADIOLUS BRENCHLEYENSIS, [illegible]
Price on application.
ROSES.—F. P. has a fine collection of Standard, Half-standard, and Dwarf together, at very reasonable prices. [illegible] quantity required.
F. PARSONS, 27 and 28, Western Road, Brighton; and [illegible] Gate Nursery, Keymer, Hurstpierpoint.
Post Office Orders payable at the General Office, Brighton.

To the Trade.

G. FARNSWORTH has to offer a large quantity of the undermentioned, which are strong, clean, [illegible]. Samples on application at the Nurseries, Matlock.
BIRCH, 3 to 4½ feet, twice transplanted, 30s. per 1000.
LARCH, 9 to 15 inches, 12s.
LIMES, 2 to 3 feet, 70s.
SCOTCH, 1½ to 2 feet, 20s.; 1½ to 2½ feet, 23s.
SPRUCE, 1 to 1½ feet, 11s.; 1½ to 2½ feet, 20s.
SYCAMORE, 2 to 3 feet, 20s.
QUICK, strong, 18s.
WHIN, [illegible] double, [illegible]
PRIVET, [illegible]
RHODODENDRONS, 2 yr. Seedlings, 7s. 6d.

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.
ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the best kinds in cultivation of the abovenamed, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources, and are warranted [illegible], and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, Surrey, S.W.

SCOTT'S NEW and GENUINE SEEDS.—Scott's Superb Crimson Beet, Melville's Improved [illegible], Scott's [illegible] Brussels Sprouts, [illegible] Favourite and Pavy's New [illegible] Eclipse Melon, several New Peas, Scott's Early Oxford Kidney Potatos, and many other varieties of new [illegible] Vegetable Seeds, are fully described in J. SCOTT'S PRICED DESCRIPTIVE CATALOGUE of SEEDS; also his extra choice [illegible] Asters, Stocks, Marigold, Petunia, double and single Phlox Drummondii, Zinnia, and other Flower Seeds, post free on application to
J. SCOTT, The Seed Stores, Yeovil, Somerset.

TO the SEED TRADE.
HAMILTON'S INVINCIBLE CUCUMBER.
CUTHILL'S BLACK SPINE CUCUMBER.
OSBORNE'S WINTER WHITE PROTECTING BROCCOLI.
DOUBLE CRESS.
IMPERIAL LONG YELLOW MANGEL (superior stock).
All new of 1869, and true, of own growth, offered cheap.
STEPHEN BROWN, Seedsman, Weston-super-Mare, Somerset.

1870.—SELECTED VEGETABLE and FLOWER SEEDS, SEED POTATOS, &c. (Carriage free.)
Fully DESCRIPTIVE PRICED LIST post free on application.
Carefully assorted Collections of VEGETABLE SEEDS, at [illegible], 21s., 31s. 6d., 42s., 63s., and 105s.
Choicest assortments of Continental and other FLOWER SEEDS, from 5s. upwards. See List.
CATALOGUES of Forest, Fruit, and other Trees and Plants, also post free on application.

James Dickson & Sons.

(Old Established Nursery and Seed Concern),
"Newton" Nurseries, and 102, Eastgate Street, Chester.

BROCCOLI, ELLETSON'S NEW SURPRISE, Large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, E. & J. Elletson, of Thorngumbald, who have for many years been so successful in the cultivation of Broccolis, and who by great industry have so far improved upon the old kind as to produce the above variety, which possesses the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.
CUCUMBER, FOSTER'S XL, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet. Trade supplied.
EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds:—Carriage free.

Peas—The Earliest, 1 quart.	Celery—Fine solid white, pkt.
Princess Royal, 1 pint	Fine Giant Red, packet
Sangsters' No. 1, 1 pint	Cress—Australian, 1 oz.
Prizetaker, 1 pint	Plain, 4 oz.
Advancer, 1 pint	Cucumber—Smith's fine Frame, packet
Blue Scimetar, 1 pint	Stockwood Ridge, packet
Veitch's Perfection, 1 pint	Endive—French Curled, packet
Harrison's Glory, 1 pint	Leek—Musselburgh, packet
Beans—Taylor's Imperial Windsor, 1 pint	Lettuce—Champion Cabbage, packet
Early Longpod, 1 pint	Paris White Cos, packet
Johnson's Wonderful, 1 pint	Bath Cos, packet
Green Windsor, 1 pint	Drumhead, packet
Royal Cluster, ½ pint	Mustard—White, 4 oz.
French Dwarf, 1 pint	Melon—Choice kind, packet
Scarlet Runners, 1 pint	Onion—Reading or Spanish, 1 oz.
Beet—Nuttings' fine Red, ½ oz.	James's Keeping, 1 oz.
Borecole—New Hearting, packet	Blood Red, ½ oz.
Scotch Curled, packet	Silver Skinned, ½ oz.
Brussels Sprouts—finest, packet	Parsnip—Hollow Crowned, 1 oz.
Broccoli—Early white, packet	Parsley—Fine curled, per pkt.
Purple Sprouting, packet	Radish—Wood's Early Frame, 2 oz.
Walcheren, packet	Early Scarlet, 2 oz.
Worcester, late white, packet	Turnip, mixed, 2 oz.
Cabbage—Early Nonpareil, pkt.	Spinach—Summer, ½ pint.
Worcester Incomparable, pkt.	Winter, ½ pint.
Wheeler's Imperial, packet	Turnip—Early Six Weeks, 1 oz.
Red Pickling, packet	Early Stone, 1 oz.
Curled Savoy, packet	Orange Jelly, 1 oz.
Carrot—Early Scarlet Horn, 1 oz.	Tomato—Large Red, packet
James's Intermediate, 1 oz.	Vegetable Marrow, packet
Imperial Altrincham, 1 oz.	Pot Herbs, [illegible]
Cauliflower—Early London, pkt.	

For larger and smaller Collections and prices of other [illegible], see DESCRIPTIVE LIST, free on [application].
RICHARD SMITH, Seed Merchant, Worcester.

THE NEW GIANT ROCCA ONION OF NAPLES,

NOW BEING DISTRIBUTED BY

JAMES CARTER & CO.,

THE ROYAL SEEDSMEN, 237, HIGH HOLBORN, LONDON, W.C.

JAMES CARTER AND CO., OFFER THEIR

CHOICE SELECTED STOCKS OF THE FOLLOWING ONIONS.

THE NEW GIANT ROCCA ONION of NAPLES, 1s. per packet.
EARLY WHITE NAPLES ONION, Silver-skinned, very fine, 1s. per packet.
ITALIAN RED TRIPOLI ONION, 1s. per packet.
NEW LARGE WHITE GLOBE TRIPOLI ONION, 1s. per packet.

JAMES CARTER AND CO.
AWARDED A SPECIAL CERTIFICATE
BY THE ROYAL HORTICULTURAL SOCIETY,
December 21, 1869.

FOR SPECIMENS OF ONIONS AS FOLLOWS —
1 Bulb of NEW GIANT ROCCA of NAPLES, weighing 3 lb. 9 oz.
2 Bulbs of ITALIAN RED TRIPOLI, weighing 5 lb. 1 oz.
1 Bulb of RED GLOBE TRIPOLI, weighing 3 lb.

Price to the Trade on application. *Price to the Trade on application.*

NEW GIANT ROCCA ONION OF NAPLES.

Carter's Select Stock, awarded a Special Certificate by the Royal Horticultural Society.

A splendid variety of Onion, of delicate flavour, large globular shape, and light brown skin. Cultivation for Autumn sowing:—Sow in July and plant out the following Spring, 8 or 9 inches apart, on land that has been dug 18 inches deep and well manured. Should any of the bulbs after planting start for seed, it is only necessary to take off the top, the bulb will then continue to grow as usual. If sown in the Spring, this variety will produce larger Onions than any Spring sort.

CARTER'S COLLECTIONS OF VEGETABLE SEEDS

(NEW AND UNADULTERATED), AS HARVESTED ON THEIR OWN SEED FARMS.

These Collections produce a plentiful supply of Choice Vegetables all the year round.

COLLECTION of VEGETABLE SEEDS No. 1, price 12s. 6d., packing included, suitable for a small Cottage Garden.

HUNDREDFOLD PEA, or the COOK'S FAVOURITE (illustrated at page 1280, *Gardeners' Chronicle*, 1869), in sealed packets, 7s. 6d. per quart, 4s. per pint.

PATERSON'S BOVINIA, or CATTLE FEEDER POTATO, the heaviest cropper known. Per lb., 1s. 6d.; 7 lbs., 6s.; 56 lbs., 65s.

COLLECTION of VEGETABLE SEEDS No. 2, price 21s., packing included, suitable for a Small Garden.

COLLECTION of VEGETABLE SEEDS No. 4, price 63s., packing included, suitable for larger Gardens.

For detailed Table of these Collections, see CARTER'S SPECIAL ORDER SHEET for 1870, forwarded Gratis and Post Free.

COLLECTION of VEGETABLE SEEDS No. 3, price 42s., packing included, suitable for a Garden of half an acre.

LAXTON'S "ALPHA" PEA, the earliest Wrinkled variety, in sealed packets, 7s. 6d. per half pint.

LAXTON'S SUPREME PEA, described as "a Grand Pea." In sealed packets, half pint, 2s. 6d.; pint, 4s. 6d.; quart, 8s. 6d.

For full descriptions, see CARTER'S ILLUSTRATED GARDENER'S and FARMER'S VADE MECUM for 1870, Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

RICHARD SMITH'S LIST of all the EVERGREEN FIR TRIBE suitable for Britain, giving size, price, popular and botanical names, derivations, description, form, colour, foliage, growth, timber, use in arts, native country and size there, situation, soil, and other information, with copious Index of their synonymes. Free by post for six postage Stamps.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100.
RICHARD SMITH, Nurseryman, Worcester.

To the Trade.

GEORGE R. DAVIDSON, The Nurseries, Newry, Ireland, offers Two Acres of THORNS, 2-yr. old, 10 to 18 inches; 1,000,000 FOREST TREES; 40,000 COMMON LAUREL, transplanted, bushy plants, 2½ to 3 feet; large lot PORTUGAL LAURELS, 2 to 3 feet. Samples sent on application.

Cedrus Deodara.

FINE SPECIMENS, 7, 8, 9, 10, to 15 feet, at 1s. per foot.

WM. MAULE and SONS have to offer a large supply of extra fine EVERGREEN TREES and SHRUBS, calculated to give immediate effect to Parks, Cemeteries, and Plantations, and suitable for producing a blocking out new Buildings, that are springing up daily in the vicinity of all large towns.
The Nurseries, Bristol.

LIMES and ELMS.
Standard Limes, 8 to 10 feet, with fine straight stems and good heads, 150s. per 100; 21s. per dozen.
Chichester and Hertfordshire Elms, straight and stout, to 10 to 12 feet, 100s. per 100; 15s. per dozen. 12 to 14 feet, 125s. per 100; 18s. per dozen.
Free to the Trade on application to
EWING AND CHILD, The Royal Norfolk Nurseries, Norwich.

Native Scotch Fir, of fine quality.

ON SALE, by the SUBSCRIBER, 500,000 2-yr. Seedlings, 1-yr. transplanted, 3s. per 1000.
300,000 2-yr. Seedlings, 2-yr. transplanted, 5s. per 1000. Also,
20,000 RHODODENDRON PONTICUM, from 9 to 24 inches
Samples sent on application.
J. ROY, Jun., Aberdeen.

The Northampton Nurseries.

JOHN PERKINS, SEN., begs to offer the following, which are all stout and well-rooted:—
Scotch Fir, 2 to 3 feet. Berberis aquifolia, 1 to 1½ feet.
Laurels, 1½ to 2, and 2 to 3 feet. Green Box, 1½ to 2, and 2 to 3 feet
Standard Striped White Poplars.
J. P. having a large stock of the above, they will be offered at very low prices, which may be had on application to
52, Market Square, Northampton.

Cedrus Deodara.

RICHARD S. YATES, Sale, Cheshire, respectfully informs growers of Orchids that his unrivalled stock of the above are this year specially fine, and are now coming into bloom. He offers 9 or 8 Plants, for cash only, from 15 to 30 Guineas each. There are 400, 500, or probably more Plants in a Pan, and 50 to 70 Spikes on each Pot, many of them having five flowers on each stem. Good plants from One Guinea each.

SPIRÆA PALMATA.—By far the handsomest species of Siberia imported. (See Dr. Hooker, "Botanical Magazine," No. 2683.) Price 10s. 6d. early in quantity; a specimen will be given.
The honour of importation is due to Mr. Fortune; the honour of distribution in England to CHARLES NOBLE, of whom fine plants can be obtained.—Sheffield, April 30 to 70 Spikes on each Pot.

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants.
60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Paul's Rose Catalogue.

"A very complete and able catalogue."—*Floral World.*
WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. The stock of Plants is large and excellent
Paul's Nurseries, Waltham Cross, London, N.

To the Trade.

STANDARD ROSES, £3 10s. per 100; Dwarfs on Manetti, £2 per 100; fine plants. AMERICAN EARLY ROSE POTATO, 25s. per bushel; also PATERSON'S VICTORIA, RIVERS' ASHLEAF and RUBY, AMERICAN LEAF & KIDNEY POTATOS, cheap. W. JACKSON, Blakedown Nursery, Kidderminster.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including price of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Fern's Cray Nursery, Sidcup Hill, Kent.

Great Eastern Seed Establishment.

DAVID GOLD McKAY'S Illustrated CATALOGUE of GARDEN and FLOWER SEEDS, embracing the most extensive collection to be met with in the trade, both of Home and Continental origin, including a newly arranged LIST of GLADIOLI, is now ready, free by post on application
Seed Warehouse, Market Hill, Nursery and Seed Grounds, Springfield, and Great Cornard, Sudbury, Suffolk

Special Offer.—Madame Lemoine.

WILLIAM BADMAN offers strong Plants of this most beautiful of Double Pelargoniums, in single pots, 6s. per dozen. LORD DERBY, finest Pelargonium grown, 4s. per dozen. Package included.
Plums cash.
Cemetery Nursery, Gravesend.

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct sorts, for 50s.; 50 plants for 30s.; or 25 plants, distinct sorts, for 18s., package included.
Crown Nursery, Reading

WILLIAM POTTEN can now supply MADAME LEMOINE, at 6s. per dozen; Mrs. POLLOCK, at 3s. per dozen, good ZONALS, sorts, at 2s. per dozen. All good plants, in 3-inch pots; package free. Orders are booked now for April and May.
A priced LIST of most of the new and leading sorts can be had on application to
WILLIAM POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

TRICOLOR PELARGONIUMS. In strong Plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2s. 6d.; Lady Cullum, 6s.; Sunset, 3s.; Sophia Dumaresque, 3s. 6d.; Italia Unita, 3s.; Picturata, 3s. 6d.; Gold and Bronze Zonals.—Beauty of Calne Gold, 3s. 6d.; R. G. Henderson, 6d.; Duke of Edinburgh, 9s.; Her Majesty, 6s.; Luna, 2s. 6d.; Neatness, 2s. 6d. Baskets and Packing, 1s. for a single dozen, and 6d. for every subsequent dozen. Testimonies requested from unknown correspondents.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

Forest Trees, Fruit Trees, Evergreens, &c.

CHIVAS and WEAVER respectfully invite the especial attention of Planters to their very extensive, healthy, and well-grown stock of the above.
Their Nurseries being the most exposed in the North-Western Counties, and free from all artificial shelter, render the safe removal of plants almost a certainty.
PRICED CATALOGUES post free on application; estimates and special prices for large quantities.
The Eaton Road Nurseries having been largely extended, an entrance is now obtained immediately on reaching Queen's Park by the suspension Bridge.
Eaton Road Nurseries, and 108, Eastgate Street, Chester.

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.
L. W.'s system of packing saves nearly half the cost of carriage.
Munro Nursery, Silver Hendingham, Essex.

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.
4s., 42s., and 63s. each.
THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Golden Champion Grape.

OSBORN and SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it. Price 10s. 6d., 21s., and 30s. each.
Feltham Nursery, London, S.W.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Hollies, Chestnuts, Seedling Hazel, and Hedge Quick.
Samples, with height and price, on application to
W. VIRGO and SON, Wonersh Nursery, Guildford.

SURPLUS STOCK, at reduced prices.—10,000 fine Dwarf ROSES on Manetti, Pyramid PLUMS of sorts, ARBOR-VITÆ, Scotch and Silver Fir, RED CEDARS, Portugal LAURELS, EVERGREEN OAKS, SWEET BRIAR, SPRUCE FIR, and BALM of GILEAD ditto, English OAKS, SYCAMORE ditto. Price on application to
THOMAS PERKINS, 42, Drapery, Northampton.

STRONG STANDARD APPLES and PEARS.—Large horizontal Trained and Pyramid Apples and Pears; fine Standard and Dwarf-trained PEACHES and NECTARINES; fine bushy LAURELS and LAURUS COLCHICUM, up to 4 feet; extra bushy LAURELS and PORTUGAL LAURELS, 2 to 3 feet; a large collection of Standard and Dwarf Perpetual, Dwarf China, and climbing ROSES of the leading sorts; deciduous flowering SHRUBS; 30,000 ARBOR-VITÆ, 1 to 5 feet; SCOTCH, SPRUCE, and AUSTRIAN FIRS, and all kinds of FOREST TREES; strong Evergreen PRIVET and THORN QUICK for Hedges. All the above have been regularly transplanted, and are well rooted. Prices on application to
CHARLES BURGESS, The Nurseries, London Road, Cheltenham.

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s. per dozen.
Dwarf-trained 3-yr. Sweet CHERRIES, ten leading sorts, 15s. per doz.
Strong cuttack extra fine Bushes, 3-yr., 5s. per dozen, 35s. per 100.
Rider Trained CHERRIES, 30s. per dozen
" PEACHES and NECTARINES, 60s. per dozen.
Half Standard ROSES, 2 feet, splendid stuff, best sorts, 50s. per 100.
Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.
" Common LAURELS, 5 feet, 6s. per 100.
W. KNIGHT, Floral Nursery, Hailsham, Sussex

CIRENCESTER FAVOURITE MELON, per packet, 2s. 6d.—A scarlet-fleshed Melon of first-rate quality, a free setter, and of a hardy constitution.
JNO. JEFFERIES and SONS, Cirencester and Oxford.

New Melon, Scarlet King.

BURGESS and KENT have much pleasure in offering the above splendid MELON, which is without doubt the best scarlet-fleshed variety in cultivation. It grows to a large size, very smooth skin, free setter, and has never been known to crack.
Mr. Hill, of Keele Hall Gardens, says it is one of the handsomest and best Melons he ever grew.
Seed, per packet, 2s. 6d. Trade price on application. May be had from Messrs. Hurst & Son, 6, Leadenhall Street;
" Minter, Nash & Nash, 30, Strand, London; or direct from
BURGESS and KENT, Penkhull Nursery, Stoke-on-Trent.

MELON, GOLDEN QUEEN (STUART & MEIN).—Fruit of medium size, 2 to 2½ lb. in weight, round shaped, irregularly netted, extremely thin-skinned, juicy, tender, melting, and of delicious flavour; a beautiful green-fleshed variety. It has been awarded many first prizes during the past two seasons. In July, 1869, it was awarded the 1st prize at the Royal Horticultural Society's Exhibition, held at Manchester. 1s. per packet.
General CATALOGUE of PLANT and FLOWER SEEDS, also of HYBRID GLADIOLUS, may be had on application.
STUART and MEIN, Kelso, N.B.

Leicester Abbey Nurseries.

THOMAS WARNER begs to remind intending Planters and the Trade that, in addition to his extensive General Nursery Stock, he has the following in large quantities, of unsurpassed quality, and at very moderate prices. CATALOGUES, Wholesale or Retail, may be had free on application.
APRICOTS, Standard Moiden, Moor Park.
CHERRIES, Standards, Dwarfs, and Pyramids.
CURRANTS, White Dutch.
PEARS, Standards and Pyramids
PLUMS, Standard, Pyramid, Victoria.
MANETTI ROSE STOCKS
ARBOR-VITÆ (of sorts), single specimens, 1½ to 5 feet.
AUCUBA JAPONICA, single specimens, 1 to 2 feet
BOX, Tree (of sorts), 1½ to 6 feet
CHESTNUTS, Scarlet and White, Standards, 5 to 8 feet.
ELM, Ornamental (of sorts), Standards, 4 to 12 feet.
LABURNUM, English, 4 to 8 ft.
POPLAR, New Silver, 1½ to 8 feet.
OAK, English, Transplanted, extra fine, 3 to 5 feet.
SPRUCE FIR, single specimens, 1½ to 3 feet
ROSES, Dwarf, most of the leading and newer kinds.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Fruit Trees.

WILLIAM PAUL has to offer, of superior quality, Half-Standard and full Standard trained PEACHES and NECTARINES, 5s. to 7s. 6d. each.
Ditto, bearing trees, of many sorts, at 2s. 6d. to 10s. 6d. each.
STANDARD APPLES, PEARS and PLUMS, very fine, 1s. 6d. to 2s. 6d. each.
PYRAMID APPLES on Paradise and Doucin stocks, 18s. per dozen
These may be planted the same distance apart as Gooseberry trees, bearing fruit like wall trees immediately.
PYRAMID PEARS on Quince and Pear stocks, 1s. 6d. to 3s. 6d. each.
" PLUMS, 1s. 6d. to 2s. 6d. each.
Dwarf Trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES and NECTARINES, 2s. 6d. to 5s. each.
RED CURRANTS, 21s. per 100; 3s. per dozen.
PAUL'S Nurseries, Waltham Cross, London, N.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The following are offered:—100 APPLE PEARS, 700 do of APPLE, 170 do of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 3 to 5 feet high; also very fine Dwarf-trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12s. 6d in stamps. A printed List or Index sent gratis.
J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety.
CATALOGUE free on application.

Genuine Seeds.

WM. CUTBUSH and SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

Home-grown Agricultural and Garden Seeds.

H. AND F. SHARPE'S WHOLESALE CATALOGUE of HOME-GROWN SEEDS is now ready. The prices are very low, and the quality of the Seeds very fine.
Seed Growing Establishment, Wisbech.

Established 1806.

T. HANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application.
Seed Warehouse: 24, Cockburn Street, Edinburgh.
Nurseries: Bruntsfield Links, Musselburgh

Seeds.

CHARLES TURNER'S CATALOGUE of KITCHEN GARDEN, FARM and FLOWER SEEDS is now ready, and may be had on application. This List contains only such varieties as may be depended on, after trials and comparisons.
The Royal Nurseries, Slough.

Seed and Nursery Establishment, Dumfries.

ESTABLISHED 1787.

THOMAS KENNEDY and CO., Dumfries, N.B., will be glad to send Copies of their DESCRIPTIVE PRICED CATALOGUES of Vegetable and Flower Seeds, &c., Farm Seeds, &c., and Forest, Fruit, and Ornamental Trees, &c., to any address, post free, on application.

RICHARD SMITH'S SEED CATALOGUE &c. contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Seasons, Suitableness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success
RICHARD SMITH, Seed Merchant, Worcester.

New Catalogues.

DOWNIE, LAIRD, AND LAING, Frederick Street, Edinburgh, and Stansted Park, Forest Hill, London, beg to intimate that their DESCRIPTIVE PRICED CATALOGUES of Garden, Flower, and Agricultural Seeds, Gladiolus, Florist Flowers, and New Plants are now ready, and may be had free on application.

Warranted German Flower Seeds.

MESSRS. BOETTNER BROTHERS' (Seed Growers, Grenzau, near Erfurt, Germany), new PRICE LIST of ASTERS, STOCKS, &c., genuine, and finest quality, can be had gratis and post free from their London Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

ROYAL BOTANIC SOCIETY, Regent's Park.—EXHIBITION of SPRING FLOWERS, WEDNESDAYS and THURSDAYS, March 30, 31, and April 27, 28.
SCHEDULE OF PRIZES.—Besides the classes of plants specified in this Schedule, new and rare plants, whether in bloom or not, or plants possessing economical or other interest, will be received, as usual, at each of the Spring Exhibitions, and Certificates of Merit awarded
MARCH 30 and 31.
12 Greenhouse Plants, in flower (Open), £3, £2, £1
12 Forced Hardy Herbaceous Plants, not less than 6 varieties, such as Spiræas, Anemone japonica, Phloxes, Campanulas, &c. (Open), £2, £1 10s., £1.
6 Forced Hardy Hard-wooded Plants or Trees, not less than 3 varieties, such as Double Peaches, Lilac, &c. (Open), £2, £1 10s., £1.
12 Liliaceous Plants, not less than 6 varieties (Open), £2, £1 10s., £1.
6 Azaleas, in 8-inch pots (Open), £2, £1 10s., £1.
12 Cyclamens (Open), £1 10s., £1 5s., 15s.
6 Chinese Primroses (Open), £1 10s., £1 5s., 15s.
6 Cinerarias (Open), £1, 15s., 10s.
12 Hyacinths (Amateurs), £2, £1 5s., 15s.
12 Hyacinths (Nurserymen), £1 10s., £1, 10s.
1 Specimen Chinese Primrose (Open), 10s.
1 Specimen Cyclamen (Open), 10s.
1 Specimen Cineraria (Open), 10s.
1 Specimen Deutzia (Open), 10s.
12 Cut Blooms Camellias (Amateurs), £1 5s., 15s., 10s.
12 Cut Blooms Camellias (Nurserymen), £1 5s., 15s., 10s.
APRIL 27 and 28
12 Greenhouse Plants, in flower (Open), £3, £2, £1
12 Hardy Herbaceous Plants, not less than 6 varieties (Open), £2, £1 10s., £1.
12 Rhododendrons (Open), £2 10s., £1 15s., £1.
6 Roses, in pots (Amateurs), £2 10s., £1 15s., £1 5s.
9 Roses, in pots (Nurserymen), £2 10s., £2, £1 5s.
6 Azaleas, in 8-inch pots (Open), £2, £1 10s., £1.
6 Orchideæ (Open), £2, £1 10s., £1.
6 Pentstas (Open), £1 10s., £1, 10s.
Cut Blooms of Roses, miscellaneous collection, not limited (Open), £2, £1 10s., £1.
The regulations, &c., may be obtained upon application by post
By order of the Council,
WILLIAM SOWERBY, Secretary.

The Gardeners' Chronicle

SATURDAY, FEBRUARY 5, 1870.

MEETINGS FOR THE ENSUING WEEK.

MONDAY, Feb. 7—Entomological .. .. 7 P.M.
TUESDAY, — { Royal Horticultural (Anniversary), at South Kensington .. .. .. 3 P.M.

"ACCORDING to the best calculations," writes Mr. McKENZIE, in a pamphlet entitled "The Parks, Open Spaces, and Thoroughfares of London," "we are justified in assuming that within the next forty years London will contain six millions of inhabitants, and it therefore becomes the duty of the present generation to provide as far as possible, before the existing opportunities are lost, for the health and recreation of its successors;" and to point out some improvements which he thinks are neither impracticable nor expensive." Mr. McKENZIE'S idea of the town, however, seems to consist of the suburbs, as generally understood, and among the places he details as affording the opportunities to be taken advantage of are Clapham, Wimbledon, Barnes, and Blackheath Commons, Hampstead Heath, and Epping Forest; and he assures us that the total extra cost of keeping up these places as public parks—irrespective, we presume, of the laying out—with lakes, gymnasiums, cricket grounds, shrubberies, and all the usual paraphernalia, except flower-beds, would not exceed the cost for the maintenance and keeping-up of the London parks at present under the Crown—a

faint reflection, we conceive, on the Office of Works. In fact, he believes that eleven additional parks could be added to the metropolis, without any excess of annual expenditure beyond that already voted by the House of Commons for the maintenance of the London parks. We wish we could think likewise; but as there are no data supplied by which to test the assertion, our readers must take it for what it may be worth.

The next measure proposed—although this is an opportunity that may probably be equally open to the public forty years hence—is the abolition of all private rights in London squares, and we presume the residents in those squares will be expected to contribute their quota towards the metropolitan rate for effecting the improvement, and depriving them of their privileges, unless the country will kindly bear a portion of the expense. It seems hardly necessary to point out that most of the squares are private property, and can only be acquired as other private property is, by paying for it; and that the owners of the squares, moreover, would have to compensate the residents in the houses surrounding the squares for the breach of contract this would entail, which would enhance the price. There is no reason why such a principle should not be extended to the seats of the nobility and gentry throughout the country! Even if the squares could by any inexplicable process become the property of the Metropolitan Board of Works, it is extremely doubtful whether the public would gain any appreciable advantage from them, since they would probably become popular playgrounds for the children of the adjoining alleys and mews, which would render the surrounding property liable to very considerable deterioration, and hardly conduce to the beauty or cleanliness of the town.

We can sympathise with the Board in not obtaining possession of Leicester Square, although they seem to have adopted somewhat singular means for conciliating the present owners of the square. They placed in various portions of the square notices intimating their intention to take steps for its future management. These proceedings were very naturally resisted by the owners of the square, who brought an action for trespass against them. The action was successful, and on appeal the verdict was confirmed; so that after great expenditure in litigation, the Board found they had taken means but ill adapted to the end. We think the ratepayers may fairly question such use being made of their money.

Our limited space prevents us entering into some remarks referring to the disused cemeteries in the metropolis. We are glad to agree that a considerable improvement might be effected in them by a little judicious planting, but at the same time it is an open question whether it would be advisable to remove all gravestones that are uninteresting, as the resting place of the dead has always been an object of veneration to Englishmen, and we can hardly conceive on what grounds of moral equity one grave should be held in greater respect than another, unless some serious inconvenience creates the necessity for showing a distinction. We should also be glad to see any improvement that could be made in the thoroughfares of the metropolis, and rows of trees no doubt might be planted with effect in some places, as in continuing the line of the avenue from the broad walk in the Regent's Park to Portland Place, through the gardens of Park Square, an improvement we prominently advocated in our columns (1865, p. 410).

We cannot help wondering how it was that some beneficent genius did not abridge the remarks advising the absence of flowers from our public promenades. The Geraniums are to Mr. McKENZIE what a red rag is to a bull; and when he reflects that all these flowers cost money that might be spent at Barnes, or elsewhere, in the suburbs, his indignation knows no bounds. There is a rumour that the new First Commissioner intends to curtail the sum devoted to the summer decoration of the parks, and to look after gardeners and all those sort of persons; but he has confessed he is not to be considered as an authority in these matters, and we are inclined to believe him.

However, the great object of this pamphlet, and which has induced us to follow its observations thus far, is to advocate the transference of all public works in the metropolis from the Office of Works to the Metropolitan Board. The career of the Albert Life Insurance, of OVEREND & GURNEY, and of various railway companies, has not created that confidence in the public mind in the administration of City men, that the author of this pamphlet professes to expect. For our own part, we would rather have a First Commissioner—even, we were going to say, Mr. AYRTON—whom we can criticise and possibly displace, than a Board which can hardly pretend to any special knowledge of the Art side of matters they are called upon to decide. The Office of Works presents many anomalies, but a City administration might be worse.

— We perceive that Mr. BATEMAN is announced to deliver a lecture on the WELLINGTONIA the GREAT TREE and the GREAT MAN at the Charlotte Street School, Pimlico, on Tuesday evening next, the proceeds to be devoted to charitable purposes. May the learned lecturer have an audience befitting the greatness of his subject!

—— Mr. THISELTON DYER, lately Professor of Natural History at the Royal Agricultural College, Cirencester, has been appointed to the chair of Botany in the ROYAL COLLEGE OF SCIENCE, Dublin. We see some of our contemporaries raise an outcry against this appointment. For our own parts we know nothing as to the merits of the case further than this, that Mr. DYER is a very competent person to fill the appointment in question.

—— Gardeners—"Town Gardeners," especially—will feel honoured by this tribute from "Punch" to the memory of "SAM BROOME." It is headed—

"A BLESSING ON AN OLD BROOME.

"Poor old BROOME, art thou gone! and shall we hear
Thy annual *jubilate* never more,
O'er the Chrysanthemums that were so dear
Unto thy honest heart, as, year by year,
They decked the Temple Garden's swarded floor!

"Like HENRY BROUGHAM, thy greater homonym,
Thy pride and joy was to see cleared away
The stagnant, stifling smoke-clouds, that made dim
The Temple of the law, and on Thames brim,
Alike for flowers and lawyers darkened day.

"And when the Smoke-Act passed and on Thames stream
Steamers forbore to smoke, and on Thames shore
Chimney-shafts ceased from sooty mouths to teem
The blacks, that turned to griminess the gleam
Of the Chrysanthemums thou didst adore—

"Never was simple man more glad than thou,
Never were gentler pride and joy than thine
Pleased to see pleas'd crowds round thy *Pompons* bow,
Children, maids, barristers of parchment brow,
Who rarely noticed sun's or blossom's shine.

"Along Thames bank thy blooms stood brave and bold,
The brighter for the brick and mortar round:
And if *thy* flowers were flowers of gold,
So innocent none grew from Temple mould,
None so enriched, yet cumbered not, the ground.

"How oft, when autumn daylight in the West
Was blended with the City's lurid flare,
Pale cheeks and aching brows thy flowers have blest,
That breathed a breath of Nature and her rest,
On brains o'er-wearied with law's cark and care.

"Farewell to thee, kind, honest, old SAM BROOME,
In *boutons d'or* above thee bloom the mould—
No London smoke distress thee in the tomb,
And whoso'er i' the Temple fills thy room,
May the new Broom sweep clean as did the old.

—— Messrs. DICK RADCLYFFE & Co. have submitted to our inspection a specimen of a PERFORATED ENAMEL FLOWER-POT, introduced by them with the view of insuring the perfect aëration and drainage of the soil in which the plant is potted. For this purpose the side and bottom of the new flower-pot are pierced with a series of fine holes (about 100 to the square inch), which are sufficiently small to prevent the mould sifting through the pores, and yet large enough to admit, not only of the evaporation of all superfluous moisture, but the ready access of air to the mould itself. Hence the two conditions essential for the successful cultivation of land—viz., the oxygenation of the earth, either by digging or ploughing, and the partial desiccation of the soil by means of draining—are effectually accomplished, and that in the simplest possible manner. So that, not only is it impossible for the roots to become soddened by an excess of moisture remaining stagnant in the pot, but the soil is continually being enriched by the "eremacausis" (or slow combustion of the carbonaceous matter in the earth) which necessarily ensues immediately the mould is brought into connection with the atmosphere, and by the consequent regular supply of carbonic acid and ammonia to the roots. Such is the theory upon which the efficacy of the new perforated flower-pot is founded; and this is, say the inventors, proved to be fully borne out in practice. Of this we cannot yet speak from experience, but the invention is elegant, and deserves a trial.

— We published at p. 108, some remarks referring to a letter addressed to the Council of the ROYAL HORTICULTURAL SOCIETY by one of the gentlemen recently removed from the FLORAL COMMITTEE. The official reply received to that letter, a copy of which we have seen, merely states that "the Council decided on the gentlemen whom they would this year invite to act on the Floral Committee after a full consideration of the subject." Of course it could hardly be expected but that the Council would uphold its dignity under the circumstances, the more so as it appears there has been no absolute rule laid down as to the manner in which the annual changes in the Committees shall be made; and therefore it is open to the Council to do just as it pleases. It is almost too much to expect from corporate human nature that which we do expect from honourable individuals—a confession of a mistake, but at any rate the members of the several Committees have a right to know precisely on what terms they hold office, and what are the conditions under which they are liable to be removed. If the members of these Committees are to be mere puppets in the hands of the Council, to be pulled this way or that way as that august body may choose, the authority of the Committees as a whole, and the self respect of their individual members, will be reduced to a minimum. We do not believe that this is the intention of the Council, nor is it likely that it would be submitted to by the Committees. We prefer to retain the hope that the new arrangements which are to be made will satisfy the equitable requirements of the case, and prevent the recurrence of proceedings such as those which have given rise to this discussion.

—— Mr. FISH sends us an interesting illustration of the fact that VINE ROOTS will live and grow for a period of five or less years without any top growth at all:—

"In the specimens sent there are a dead root and a living growing extremity. The living portion received nothing through or beyond the dead portion. Neither along the entire distance between the two—which, in the case of the specimen with the upper portion tied on to the under, was at least a yard—has a shoot or leaf of any kind been produced. The roots, nevertheless, were in active growth, with abundance of spongioles feeding apparently in the usual manner. The discovery of the large specimen sent was made in this wise. A set of old Muscat Vines, which were prized on account of family associations, were transplanted into a new border six years ago. It is my practice at this season of the year to remove the worn-out surface soil and replace it with new. This season the renewing process was carried deeper than usual. In removing the earth we came upon the largest root sent. It seemed in splendid condition, rooting away as one likes to see them do, but by the removal of the earth its main branch was laid bare; and my disappointment and astonishment were great when I found that it terminated in rottenness; and I believe that the connection must have been severed soon after the Vines were transplanted. During the process of removal several of the roots looked somewhat suspicious. Many were cut off, but all that seemed to have a chance of living were left. This is doubtless one that refused to profit by its chance of new life. On examining the rotten portion, you will, I think, come to the same conclusion, that it has been dead many years. [Yes.] But I have more positive evidence to offer on that head. Five years ago we resolved to renew another house of Vines. The portion of the border next the house was taken out, the new soil introduced, and a brick wall built up between the new border and the old. A few days since part of this wall was removed to see if further extension was necessary. It was not. But outside the wall plenty of old roots were found, and in full growth, like those sent. They were all unattached, and had made no attempt to form tops."

We do not remember to have heard of a precisely similar case before in Vines, though every one must have observed how long the vitality lasts in the roots of trees left in the ground and severed from the top. The fact is somewhat analogous to that of the subterranean tubers of some Orchids, which increase and multiply below the ground for years without putting up a leaf. In the case of Fir trees, the stumps of which are said occasionally to increase annually by the formation of woody rings, GOEPPERT has traced a junction or "anastomosis" between the roots of the stump and those of adjacent perfect trees.

—— It would appear, from some remarks of Mr. ANDERSON in the current number of the "Florist," that GOODYERA DAWSONIANA must henceforth be the name of the plant known in gardens as Anæctochilus Dawsonianus, the plant on producing its flowers—white, in a hyacinth-like spike—proving to belong to the latter genus. One great advantage which this plant possesses over others of its race, consists in the facility with which it may be cultivated. "As a rule, each Anæctochilus has a little artificial atmosphere for itself enclosed by a bell-glass, but this thrives far better without any coddling of the kind. Its fine foliage becomes of an intenser hue of dark velvety umber-brown, when left exposed to the ordinary state of a stove atmosphere, and as a consequence the texture of the leaf is much firmer, and less liable to get injured either by inferior cultivation or, by what is attended often with fatal effects, the long duration of dark days. It seems to get along well under the ordinary food treatment given to Indian Orchids."

—— An extraordinary FROST has been experienced in ALGERIA. It appears, from a letter addressed to Dr. HOOKER by Colonel PLAYFAIR, the British Consul-General, that the last three days of the old year were very severe all over the country, but that in the neighbourhood of Algiers a hard frost prevailed, and sheets of ice were formed in the garden of the British Consulate—"a thing," Colonel PLAYFAIR says, "not known since the French occupation of Algeria. The effects of this unusual visitation, in a country where many tropical plants flourish in the open air, has been

to kill such introduced plants as Bamboo, Cherimoyers, Guavas, Bananas, as well as a good many other plants, which were growing in an unheated greenhouse, such as Marantas, Stephanotis, Allamandas, and Passifloras. Colonel PLAYFAIR says—"Truly this is a delightful climate to live in, but a most perplexing one for a horticulturist; the heat of summer and the cold of winter, want of rain, siroccos, locusts, &c., are evils that no care can entirely guard against. The Musa Ensete is very much injured, but the Jardin d'Essai lies so low that it is doubtful if it ever actually froze there. The garden of the British Consulate, on the other hand, is high and very cold."

—— M. VAN HOUTTE, in the last number of the "Flore des Serres," announces the new VIOLET MARIE LOUISE as a variety of great merit and excessively odoriferous, the flowers very large and very double, brilliant and distinct in colour, having the outer part of a lavender-blue, and the centre white. The foliage is shining, the peduncles long and firm, and altogether, he says, the new variety is one of very choice quality, bearing an entirely novel aspect.

FRUITS AND VEGETABLES.

WE live in an age which abounds in bewildering catalogues, and also of "puffing" and "anti-puffing;" I have thought it may be of service to beginners if I name some of the above that I know to be good.

FRUITS.

Peaches.—Early Alfred and Princess of Wales, a noble Peach. They are seedlings raised by Mr. Rivers. These older Peaches are excellent here—Early York, Grosse Mignonne, Royal George, Noblesse, Bellegarde, and Barrington.

Nectarines.—Rivers' Pine-apple and Rivers' Orange, both splendid; Roman, Violette Hâtive, Elruge, and the Old White Nectarine. I do not recollect the names of the raisers of the six older Peaches and four Nectarines mentioned above.

Pears.—Summer Beurré d'Aremberg, Vineuse, St. Michel Archange, Poire Pêche, Dana's Hovey, Beurré Bachelier, Beurré Hardi, Beurré Superfin, Doyenné du Comice, Josephine de Malines, Beurré d'Aremberg, Bergamotte d'Esperen, Beurré Diel, and Duchesse d'Angoulême.

Apples.—Cornish Gilliflower, Ribston Pippin, Hughes' Golden Pippin, Cox's Orange Pippin, Winter Pearmain, Old Nonpareil, and Boston Russet. For kitchen and dessert: Blenheim Orange.

Grapes.—Black Hamburgh; Early Smyrna, Primavis, Early Golden, Early Silver, and Chasselas Musqué de Sillery. These five are Frontignans and delicious. They are all grown in pots without heat in my little vinery.

Melons.—Scarlet Gem, Climax, Graham's Melon, Beechwood. The two first, respectively scarlet and green-flesh, are admirable, and of perfect cylindrical shape.

Cherries on the Mahaleb stock.—Guigne tres précoce, Frogmore Bigarreau, Early Lyons, the noblest of all; Bigarreau Napoléon, and Large Late Black Bigarreau. The three last are specially fine and good. They were planted last spring (April 2), and bore great crops. They are now full of Cherry buds in bouquets on the main stalk. They take up scarcely more room than a walking-stick.

Plums.—For dessert: De Montfort, Greengage, Transparent Gage. For the kitchen: Diamond, Dove Bank, Mitchelson's, and Belle de Septembre.

Red Raspberry.—Fillbasket.

Gooseberries.—Walnut Green, the best flavoured of all; Whitesmith, Red Champagne, and Warrington. For bottling: Ironmonger.

Strawberries.—Rivers' Eliza, Dr. Hogg, Mr. Radclyffe, Lucas, Frogmore Pine, Cockscomb, Wonderful, Bicton Pine, Royal Hautbois, and Galande—a red Alpine, and the best of the race. They are all hardy, of fine flavour, and good bearers.

VEGETABLES.

Potatos.—Royal Ashleaf, Gryffe Castle, Yorkshire Hero, Taylor's Yorkshire Hybrid, Pebble White, and Cobbler's Lapstone.

Ridge Cucumber.—Fogmore Ridge.

Lettuce.—Dixon's "All the Year Round."

Carrots.—The Long Horn.

Parsnips.—The Student.

Onions.—The White Spanish.

Cabbages.—Turner's Improved Nonpareil, Green's Early, Wheeler's Improved.

Beet-root.—Fine-apple.

Garden Turnips.—Early Stone, still the best; and Early Six-weeks, good. My Potatos were dug up last year by August 7, and I had capital crops of the above Turnips after them. The spring-tops of the Early Stone are delicious.

Peas.—These carried me to September 26, without sticks: Little Gem, Tom Thumb, Sangster's No. 1. I saw on sticks, September 6, at Mr. Sturt's, most noble lines of Veitch's Perfection. Mr. Sturt said they were delicious. The haulm was laden with pods, nine Peas in a pod. My readers cannot hurt themselves by selection from "my catalogue." *W. F. Radclyffe.*

CEROPEGIAS.

THESE plants are not met with in our collections as frequently as might be expected from the singularity and even elegance of their flowers. Indeed it is rare to meet with them at all, except in botanic gardens. In gardening, as in other matters, people are the slaves of fashion, and virtually ignore the existence of floral beauties if they do not happen to be *à la mode*.

Our figure represents a recently introduced species, Ceropegia Sandersoni, figured a short time since in the "Botanical Magazine," and which is perhaps the most striking of the whole group. The stem is long, about as thick as a goose quill, and, as remarked by Dr. Hooker, is somewhat like that of a Vanilla. The leaves are ovate-cordate in form, thick and fleshy, and borne on short round petioles. The peduncles are axillary, 3—4 flowered. Flowers large, of the peculiar form represented in the engraving; they are of a pale green, mottled and veined with darker green, and have a peculiarly translucid appearance. The 5-lobed hood is ciliated along the margin, with flat, white, capillary processes. This peculiar plant is one of the discoveries of Mr.

Fig. 29

Sanderson, in Natal, who found it near the Umgeni river.

There are a considerable number of species mentioned as having been in cultivation at one time or another, though it is to be feared that most of them have disappeared. Almost all of them are twining plants, and their young shoots manifest that spontaneous revolving power which is so remarkable a feature in twining plants generally. Darwin tells us that one of the species examined by him moved in a direction opposite to that traversed by the sun, and not in the same course, as happens with the Hop and many similar twiners. The colour of the flowers is usually somewhat dingy, a dull purple hue speckled with white spots being the predominating colour; but in other instances, as in the present one, a light green colour prevails, in others a red tint, blended with cream colour. The form of the corolla is sometimes grotesque, often elegant. C. Bowkeri has singular pendulous lobes produced from the margins of the flower-tube, and swaying to and fro at the lightest touch. C. Wightii is a very graceful species. C. stapeliiformis has an erect fleshy stem, like a Stapelia. The species are natives of India, the Indian Archipelago, or the Cape of Good Hope.

They may be grown easily in an ordinary plant stove, where their singular flowers will develop themselves to perfection, and attract quite as much attention as plants with more showy blossoms. A compost of turfy loam, leaf-mould, and sand will suit them admirably; they require an abundance of water when growing, but very little when at rest. This last remark applies more particularly to those species with thick tuber-like stems. *F. W. B.*

HOW TO RAISE NEW PEARS.

I FEEL that I can recommend to the young pomologist no occupation more interesting than that of raising Pear trees from the pips of our finer kinds of Pears. The operation is very simple, for he has only to save the pips of a favourite Pear, and at once to plant them in a flower-pot, say 6 inches in diameter, filled with fresh mould, using his finger and thumb so as to press them into the mould to the depth of an inch, and in the centre of the pot, in a circle 4 or 5 inches in diameter; the pot should then be plunged in sawdust or cocoa-nut fibre, and the surface of the mould covered to the depth of 3 or 4 inches with the same material. Early in March this should be removed, and the young trees will soon make their appearance. To add to the interest of these young things, a label should be placed in the pot at the time of sowing, stating the name of the Pear whence the pips were taken. In the month of April the young plants may be potted singly into small pots; when they are fully established they may be planted into a rich border, about a foot apart; they will make vigorous growth, and after two years may be planted where they are to remain till they show symptoms of coming into bearing. This final planting should give a distance of from 3 to 4 feet apart.

I have to-day (January 20) amused myself with looking over my numerous seedling Pear trees, from 1 to 25 years old. There are many hundreds of them, yet no two are exactly alike, either in foliage or shoots. It is, however, the latter that we must, at this bare and lifeless season of the year, look at and find some interest in, for there is not a thorn or a twig but has some interest in it to the eye of the cultivator. It is also gratifying to observe, or to fancy you can observe, *n'importe* which, the marks of race in seedling Pear trees. My attention this morning was first called to a row of seedlings, about a dozen, from the Chaumontel Pear, from unfertilised * flowers, the trees five years old. Now in this row the mark of race is apparent, as there is a sort of family resemblance; yet every tree differs in minute characters, one being thorny, another without thorns, and so on. The next two rows are trees raised from Williams' Bon Chrétien, the flowers also unfertilised. These trees are most robust and distinct, with yellowish bark, prominent buds, erect habit, and altogether a most marked and distinct race, with some curious exceptions, such as two or three being formidable thorny bushes, and one or two of delicate growth. I confess to having a leaning to thorny seedling Pears, they look so robust and independent, and they generally produce the best fruit; this is, I think, contrary to some Continental theory, which has now passed away. The next batch of seedlings are from Williams' Bon Chrétien, from flowers fertilised with pollen of Glou Morceau. These trees are most interesting, from their divergence from those above-mentioned; some of them have stout robust laterals tipped with a sharp thorn, reminding one of Gleditschia horrida. Of these I have great hopes. A row of trees raised from Grosse Calabasse next attracts notice, by the robust habit of the trees, many of which, although at the utmost but six years old, have formed incipient blossom-buds. These trees, now two dozen in number, seem to adhere to the habit of the parent sort with but slight variations. A row of trees raised from the Seckel, crossed with Duchesse d'Angoulême, is interesting on account of the strange mixture of habit, for no two are alike—some inclining to the weak habit of the Seckel, and others partaking of the robust habit of the other parent. It is curious to observe the adhesion to race in seedlings from the Doyenné d'Eté, they seem all alike, with a dwarf habit and thornless shoots, while some of the same kind raised from flowers fertilised with Gratioli of Jersey, are so distinct in habit, and are thorny and robust beyond belief. I have, however, seen nothing more marked in its departure from the parental habit than some seedlings raised from that magnificent Pear Van Mons Léon le Clerc, one of the largest and finest Pears known; its habit is, as a rule, feeble, and it seems to require a fine soil and climate. The seedlings from flowers fertilised with those of Poire Prévost, and those from unfertilised flowers, are alike thorny and robust. Winter Nelis has given birth to trees all rather delicate in growth, and some among them little thorny bushes, very unlike Pear trees. In contrast to these are some trees raised from Gansel's Late Bergamot (of the late Mr. Williams). They are stout, with large spines and most distinct,.

There is something most marked and interesting in Josephine de Malines Pear—it is so perfectly distinct,

* This term is used throughout in the sense of not fertilised artificially.

not only in its fruit but in its habit; it was raised by what may be called chance, in contradistinction to what was then called the system of Van Mons,* by an old soldier, Major Esperen, then living at Malines, and who about the same time raised that fine late Pear, Bergamotte Esperen. As far as I recollect, the old soldier prided himself on raising these two Pears by chance, thus beating the system Van Mons (reminding one of George Stephenson beating Paxton in Cucumbers), by which no such distinct and good Pears had ever been produced. Several seedlings from the former sort have been raised in England and in Belgium, all much resembling the parent, but, as far as I yet know, all ripening earlier. The uncrossed seedlings raised from it here very much resemble the parent in habit, but two batches, one from Josephine de Malines crossed with Beurré Diel, and another crossed with Grosse Calabasse, are very remarkable for their deviations. I fear I am spinning out my Pear seedling yarn to a tiresome length, but I cannot help noticing some seedlings from the unfertilised or uncrossed flowers of the Seckel Pear, so smooth in its shoots and so upright in growth, which are as full of thorns as the common Hawthorn; and also some from Beurré d'Amanlis and Beurré Hardi, both vigorous growers without the least spiny tendency, yet all the seedlings from them are beset with long sharp thorny spines. It has been often questioned, if a young seedling Pear tree could be brought into giving fruit prematurely by grafting a scion from it on an aged tree. At one time I thought this quite feasible, but from having been lately more careful in my experiments, I am inclined to think that both the seedling growing on its own roots, and the graft taken from it, advance step by step—their culture being equally cared for—towards bearing fruit. Some few years since I had some choice seedling Pears placed in pots, and when they were one year old I had their leading shoots cut off, and grafted into some Pear trees on Quince stocks, two or three years old, also in pots. These trees, their pots plunged, stand in a warm position, and seem to advance *pari passu*. No difference whatever can be seen in the formation of their buds, now large and apparently incipient blossom buds. The two most noticeable sorts are seedlings from Prince Albert and Josephine de Malines.

I have thus far described a few, a very few, of the seedling Pears here that have not yet borne fruit, and I may now perhaps be allowed to devote a few words to trees of various sizes from 10 to 20 years old and upwards that have borne fruit in abundance. They are trees raised from good kinds from unfertilised flowers, and have proved of much interest, although not of much commercial value. Good kinds of Pears may be raised from seed with great facility, but it is not an easy matter to raise better Pears than we already possess, the great advance to be made will, I think, be in seedling Pears raised from flowers judiciously crossed. This has been done here by growing the trees in the orchard-house in pots; and then, under the direction of some one careful and calculating, by having the different kinds crossed. This has been done here, not by my own head or hands, but by one young and full of pleasant enthusiasm as I once was. Reflecting on the culture of Pears in pots under glass till their blossoms and young fruit are safe from atmospheric influences, I venture to prophecy that, ere many years are passed, it will be found to be the only safe mode of cultivating choice Pears with perfect success in England.

I will now proceed to describe some of the seedling Pears alluded to that have borne fruit here. The first group deserving attention consists of about 100 trees about 15 years old, all of most vigorous growth. They proved last season of great interest, for in spite of the severe frosts at the end of May, nearly all of them bore large crops of fruit.

The first rows of the above group are seedlings from the Louise Bonne of Jersey, and are full of interest, for not only is their habit robust and distinct, but their fruit was remarkable for its beauty and goodness; all like the parent sort, none better in quality, but differing in their seasons of ripening, so as to prolong the Louise Bonne season for some weeks, and they were all apparently more hardy than the parent,—for while the May frosts destroyed all the fruit on 3000 trees of the parent sort, the seedlings were unscathed. One tree of this batch attracted my notice to a great extent; it is about 15 feet high, with fine bright leaves and bark, and upright growth, reminding one of a young Cumbrian in vigour. Its fruit was large, handsome, and good. I was so taken with the seedling that I at once adopted it, and called it the Rivers' Louise Bonne. It must have further trial.

Another tree of the same group was so loaded with fruit as to make it pendulous, and its branches are at this time thronged with blossom spurs. The fruit was like the parent sort, not quite so large, but melting and excellent. Several others of the Louise Bonne seedlings bore well, and have been distinguished by letters, so as to be recognised; some few years must elapse before their qualities are fully known. Among this group of trees are seedlings from Winter Nelis and many other good kinds, all chance seedlings, by which I mean from naturally fertilised flowers; all bore good crops, but none were superior to their parents. M. Carrière, in "Revue Horticole," calls such Pears "fruits du hazard," and adds that "un bon hazard est preferable à une mauvaise certitude." Judging from such chance Pears as Doyenné du Comice, Josephine de Malines, and others, chance or "hazard" has done much for Pears, but we have still to learn the results of careful crossing. In the group above described is one seedling from Knight's Monarch, which, till last October, was a most interesting tree; its shoots were smooth and vigorous, and it seemed as if it would prove an improved Monarch. Alas for hope! it bore a full crop, which ripened on the tree in October, and was like an inferior Swan's Egg, one of the reputed parents of the Monarch. In looking over numerous seedling Pears, from 20 to 25 years old, I was struck with the adherence to race of the Beurré d'Aremberg. There are here many seedlings from this fine winter Pear, which have borne fruit, and good fruit, but not one later or larger than the parent sort. I hoped to obtain one as large as a Catillac, which is an old and unrivalled *fruit du hazard*, but I have hitherto been disappointed; it may come, as may a Josephine de Malines, of the Catillac size, and with its present fine quality.

In raising seedling Pears, hope and disappointment, and disappointment and hope run a race, which to the observant horticulturist is of never failing interest—an epitome of life; but I can safely recommend the pursuit, for it keeps the mind in a pleasant state of unrest, hoping to the end, and smiling at disappointment.

Thos. Rivers.

* The theory of Van Mons was that Pears raised from seed, after several generations, became improved, and inclined to give fruit when quite young, so that after a sixth or eighth generation of one variety the seedlings would commence to bear at five or six years old; so that by parity of reasoning, seedlings from one of the latest of his seedlings should produce from its pips trees that would bear when two or three years old. Prince Albert is one of the latest of Van Mons' seedlings, but my young trees raised from it, now some five or seven years old, give no sign. The truth is, it was an illusion, for I have found seedlings raised from the Autumn Bergamot and the Brown Beurré, the oldest of our garden Pears, come into bearing at the same age as those raised from the seventh or eighth generation of the Van Mons Pears, which ought to have borne fruit at three years old, according to the theory of Van Mons.

THE PRUNING OF THE VINE.

If there is any one branch of horticulture in which the gardeners of this country excel more than in another, it is assuredly in their knowledge of, and in their cultivation of, the Grape Vine. The glorious Grapes of Old England, like its roast beef, are celebrated in every part of the globe, and correspondingly so, the skill of the British gardener in producing them. The Vine is not a plant indigenous to this country; yet here its cultivation, its requirements, and its capabilities are best understood, and its fruit is to be seen in its greatest magnificence—a magnificence so great, indeed, as to form the wonder and glory of our own, and the envy of other lands. This great excellence of Vine culture is not a thing of to-day. It has been so for years. Perhaps, however, at no previous time have there been so many fine Grapes grown, or good general cultivation been so widespread as at the present day.

On all that relates to the Vine and its cultivation, book upon book, and treatise upon treatise have been written; and more discussion has been excited than on any other subject of horticulture. To the production of a good crop of Grapes far more interest is attached by nine-tenths of English gardeners than to that of any other crop, for on that principally depends the credit of a gardener in this country with his employer. As remarked to me by the late Dr. Lindley one day, in his usual energetic manner, "A good dish of Grapes on an employer's table makes amends for many shortcomings, yet scarcely any amount of excellence displayed elsewhere serves to compensate for inferior Grapes." One would suppose from all this that in Vine culture we must have attained nearer to a state of perfection than in any other branch; and I believe we have. But yet although our knowledge is great, and much has been done, more may undoubtedly still be accomplished.

Your correspondent "P." (pp. 1229 and 1277) has done good service by boldly directing our attention to what is acknowledged by all as rather a weak part of our system of Vine culture—the reason why our Vines wear out. It is a well known fact that most of our best examples of Grapes are produced on young plants, which after a few years, having filled their allotted space, and produced a certain amount of fruit, begin to fall off; but all do not diminish in the same ratio, some examples continuing for a long time to produce fruit equally good with the first, and others actually improve. Reasoning from this, and supposing all to have been treated alike in respect to pruning—the subject in question—we may infer that other causes than that of close pruning must be made accountable for the difference exhibited. Is it fair then to speak so severely against the adoption of one particular system without sufficient or direct evidence that such has been the cause of the evil? It is perfectly fair to assume so, yet other causes there may be. Borders, for instance, are frequently made of materials which suit the requirements of the plants exceedingly well for a time, yet soon get worn out and completely exhausted. Other soils, again, are slow in action, yet lasting in quality, and in such cases the vigour and constitution of the plants will be found more enduring.

With the main spirit of "P.'s" articles I very cordially agree, and am a warm advocate of what is termed "the extension system of Vine pruning" in certain cases—not altogether indeed after "P.'s" model, figured at p. 1278, 1869, which I must confess I scarcely understand; my physiological knowledge may be at fault, but, like Mr. Pearson, p. 11, I think we shall have to wait a good while ere "P." is enabled to transform an alternate-leaved plant like the Vine to an opposite-leaved one.* I am not very clear either about "P.'s" pruning theories. I should like him to explain it a little more fully. In practice, I have found one good bud at the base of a shoot to be as good as half-a-dozen, and if so, why need we have more? With respect to "the regular succession of young shoots which have not borne fruit," in general practice it is only every alternate shoot that is allowed to bear a bunch, but I have never observed that the shoot which did not bear a bunch increased one whit more or produced better buds for the following season than that which bore the fruit; so that I fail to see the necessity of perplexing one with a rule of thumb precept of that sort. The rule has been and will still be, to preserve the best "shows." What we want to arrive at is a true knowledge of the amount of properly developed leaves required to produce a pound of fruit. That ascertained, and the knowledge how to retain or develop the various organs to the fullest extent, the thing ought to be simple enough.

If it is commanded that our Vines shall attain a patriarchal age, and still produce good Grapes, I know of no plan that will suffice so well as what is called the extension system. From experience I have proved the benefits of that system with some Vines in a very large house, by simply extending the more promising Vines on either side, and taking up young rods in the place of others which were cut out, treating these young rods as independent Vines, all being pruned on the close-spur principle, which, with due deference to "P.," I maintain is the best. In this way every succeeding year these Vines are allowed a greater amount of properly developed leaves, and a greater space than in the preceding, and thus root and branch are made to keep pace together so far; yet there will come a time when further extension will be no longer possible, and then the evil of restriction may be just as great as now with a single-rod Vine, and probably greater, as the greater the framework the more oil will be required to set the machinery in motion each spring; every portion of old wood, every knot, and every scar, has each season to receive its annual coating of woody matter; the more that is required for the old, the less, it is only fair to assume, will in proportion be left for the new.

I have never seen the Vines at Cole Orton, but have often heard of them. If my information is correct, the celebrated Vine at Cole Orton is planted at one end of a small brick pit of 20 or 30 lights, and allowed to ramble there on the "anyhow" system. The Vine is only allowed to bear about a score of bunches, and it is cultivated specially and solely for exhibition purposes. Here is a Vine, then, which has never borne anything like a crop of fruit, held up as an example of first-class culture. I ask, is it a fair one? Or is it one worthy of imitation? I look for something better. It would be interesting to have placed side by side the relative value of the crops produced, &c., by this greatly praised Vine, and those from the much maligned Vines at Bishop Stortford, or anywhere else, grown on the whip-spur style.

The whole gist of the matter turns upon the question of returns. Admitting that the Vine will live longer by gradually allowing it to extend itself—although too much may be done in that way, for Vines, like other plants, have a limit of growth—yet it is a question whether within a course of say 25 years, by the restrictive modern system as now practised in nearly all our good gardens, a greater and a better return would not be secured. I am inclined to think so, considerably; and, if so, then assuredly the present popular method is the best. In most gardens it is an easy matter to renew a Vine border. In my own case I am compelled to adopt the extension plan, through the enormous expense, amounting almost to impossibility, of procuring suitable soil. If the object is the life or size of the Vine, let us have the extension system; but if it is fruit and a good return, then in nine cases out of ten I would recommend the ordinary method,—a short life, and a merry one. I think, contrary to P., that "Le jeu en vaut bien la chandelle."

The importance of a full leaf development to the Vine cannot be overrated: it cannot, indeed, be overdone. This is not, however, the mere production of shoots and leaves, as many seem to suppose. A certain space can only contain a certain quantity, or allow the exposure of a certain leaf-surface to the beneficial effects of light and air. If leaves are crowded the one acts injuriously to the other, the effects or offices of all are interfered with, and half the number would do more good. Mr. Miller's plan of allowing the leading shoot of his Vines to travel down the back of the house is no doubt good, provided the leaves can develop themselves, and perform their function properly. The same may be said of the young shoot from the bottom of the rod every season; all tend to a good end,—increased root action. Space, however, must be found between the rods of the Vines for this shoot, [We have seen it allowed to run over the surface of the border.

* There is some misunderstanding here. It is surely not difficult to find two buds on a short-jointed Vine stem sufficiently near to produce side shoots that for all practical purposes would appear to be opposite in a figure of the small size of that referred to. And this, we presume, is all that is intended. Eds.

EDS.] and the question is, is this space employed to the best advantage? I think not, I am of opinion that this space would be occupied to greater advantage by a more extended development of the side shoots, as recommended by Mr. Pearson (p. 11). Vines in houses must be pinched and pruned; and it is sheer nonsense to talk about its being unnatural to do so. A certain amount of restriction is absolutely necessary. Our duty, then, is to adopt that which our reason makes us believe, and practice has proved, to be the best. Experience has taught me to believe in close spur pruning in winter, and in summer in stopping the side shoots at the second or third leaf beyond the fruit, and again, as Mr. Pearson recommends, at every second leaf as growth proceeds, until the end of the season. By thus just stopping the young tips of the shoots, and never removing any expanded foliage, no decided check is administered, but only a gentle repression of the forces in one direction, leading to their probable evolution in another.

A stranger, unacquainted with our gardens, or with our Grapes, on reading the *Gardeners' Chronicle* of the past few weeks, especially the comments on "P.'s" articles by "David Tell Fact" and others, would naturally suppose, as regards Grape-growing, that we, the gardeners of England, were the biggest ignoramuses possible; and if we cannot cultivate Grapes, but "prune them and whip them to death," like so many savages, what then do we know? I had imagined the case far different, and that in Grape-growing we really did know a little—something. What say our Thomsons, Meredith, Hills, Millers, and Stevenses to this? Wherefore all this nonsense about unnatural pruning and pinching? The Vines must be pruned, the Vines must be pinched, and that perpetually. Leave them to Nature, and wait the result. Is there anything natural in a garden except weeds, &c., or in our cultivation of the Vine, except crops of red spider and mildew, which gardeners in their so-called unnatural way contrive to do without. The produce of the Vine by our cultivation, by darkness—with what results to vegetable life some of the oldest amongst us can remember. Then followed a rebound from darkness into light. Light became the be-all and end-all of cultural success. Like most reactions, this one also ran to excess. Not that any permanent structure for the growth of fruit and flowers can well be too light. From base to summit such buildings should be flooded with light, like that found in the free air—pure and undefiled. Of course the

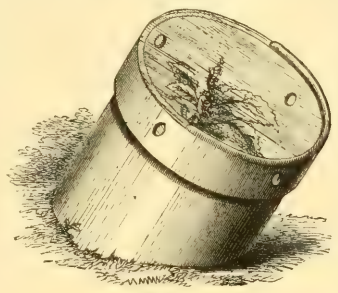

FIG. 30.

presence of so much light involves a great loss of heat, and our heavy coal bills and expensive coverings are the costly offerings we lay before light's golden shrine.

We employ a maximum quantity of glass to afford a minimum amount of protection, and to cover the smallest modicum of space, as was pointed out years ago by your veteran correspondent Mr. Alexander Forsyth, in "Loudon's Gardeners' Magazine." By so doing we

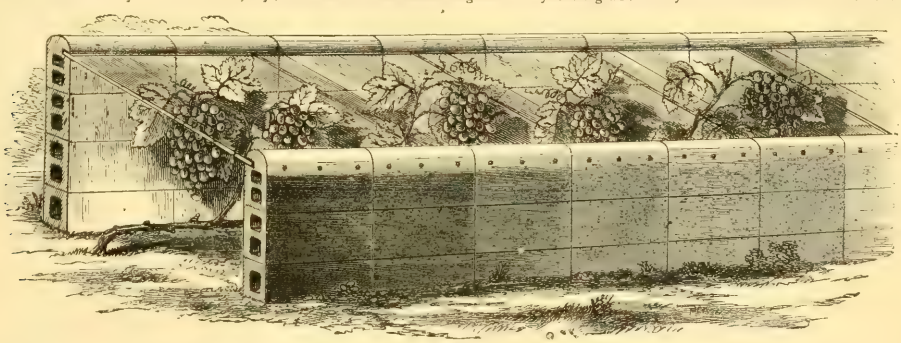

FIG. 31.

our unnatural practices of pruning and pinching, is ten hundred times improved from its natural condition. We cannot alter Nature, it is true; we can only aid, assist, and direct. In Nature plants pinch and prune themselves, yet in a very clumsy manner. We may be said to assist Nature simply by our pinching and pruning, and the results speak for themselves in our crops, and also in the greater size and vigour of the plants. The "extension system," even as advocated by "P.," has no more right to be called "natural" than any others. Indeed, by prosecution of the idea of extension in pruning here, and pinching there, yet not without, a Vine may be grown so much bigger than it can ever be found in a state of Nature, that it is actually more unnatural than the smallest "whip-sticked" Vine in the kingdom.

"P.'s" articles are in the main good, and will, I have little doubt, serve a useful purpose by directing attention to the question raised. They are not above criticism, however, which I have attempted in a friendly manner. *B.*

RENDLE'S PLANT PROTECTORS.

PERMIT me to call attention to the development of a new thought—the application of an old idea to new purposes—that has been making rapid strides towards perfecting itself during the past year. I allude to Rendle's patent Plant Protectors, which have already been noticed in these pages (p. 605, 1868). The idea worked out in these is as old as that which originated the first shelter for plants. Warmth was the first thing thought of. The old gardeners saw that frost killed plants, therefore they made haste to keep that away from them. They did not see that darkness likewise killed plants, more slowly, but with equal certainty, and therefore they were less careful about furnishing plants with light. All the old semi-opaque plant-houses had their origin in an exaggerated estimate of the importance of heat. Caloric was the one thing needful. To this they sacrificed light and air. They early learned the lesson, that both these meant cold; And thus they came to err grievously on the side of waste glass, and throw away heat. Sufficient light for all such plants as early Peas, Radishes, &c., during winter can be admitted through the upper or sky line. Opaque sides would prove cheaper, warmer, safer, stronger, and obviate the necessity for side coverings, unless during the most severe weather.

Such opaque sides, with a transparent roof, constitute the kernel of Mr. Rendle's inventions. He abolishes glass sides, and substitutes brick or earthenware—the old plant dormitories in fact, reduced to liliputian sizes, and converted to new uses. It may be urged that neither is this idea original. As long as 40 years ago a writer in "Loudon's Gardeners' Magazine" propounded the mode of growing the heads of Cauliflowers in garden pots, and covering them over in severe weather with 10-foot lengths of footboards. Possibly Mr. Rendle may never have heard of this; but if he has, he has marvellously advanced upon it. For a thin pot he offers us a thick tile or a portable wall of brick, and for an opaque board, a sheet of 16 oz. glass. The germ of the flower-pot has developed into a series of perfect portable miniature houses, adapted to all purposes, from the growing of Grapes to the keeping up of a daily supply of Mustard and Cress for our bread and butter. There is scarcely a fruit, flower, or vegetable that may not be propagated, raised, grown, forced, or preserved by the use of these plant and fruit protectors.

As they were described in the *Gardeners' Chronicle* last year, I will merely advert to some of the alterations and improvements that the year's experience has suggested.

The original protectors for Grape growing were large semicircular tiles, with the upper side filled in with a sheet of glass laid into a groove in the ends of the tiles. This form was difficult and expensive of manufacture, and took more material than was absolutely needed. This has given place to a protector with the two sides formed of patent tiles or common bricks: if the latter, finished off by a patent groove tile at back and front, for the reception of the glass (see fig. 31, representing a ground vinery as used at Sawbridgeworth during the year). Nothing could look more healthy than the Grapes in this vinery when I saw them last summer. The Trentham Black Grape was literally loaded with fruit, fine in bunch and berry. The figure shows patent tile sides from top to bottom, but common bricks are likewise used, with equal or greater advantage. Most of the protectors for Peas, Lettuces, Potatos, Kidney Beans, Peaches, Strawberry and plant growing are now formed on this plan. They vary in height and width, according to the purposes for which they are applied. They can likewise be made to grow with the growth of the plants. A crop of Peas or Potatos, for instance, grows rapidly, and touches the glass; place another brick or two, or a patent tile, into the sides, and head room is instantly provided.

Fig. 30 shows a new circular form, for the growth of Cauliflowers, or for the protection of tender plants on lawns, flower borders, or pleasure grounds, or the growth of early Rhubarb, monster plants of Strawberries, &c. By turning, the glass face can be made to front the sun, or look towards the North Pole at pleasure. It can therefore be used either to forward or retard plants. It forms also one of the neatest means I have yet seen of sheltering and saving such plants as Pampas Grass, Daturas, and young Pinuses, from winter frosts.

They have some special advantages over all other temporary shelters, such as *cloches*, hand-lights, and curate's vineries. Their sides conduct heat slowly, and radiate little or none. Being strong, they can be protected with litter in severe weather without any risk of breakage. By simply altering the height of the two walls in relation to each other, any pitch of roof may be obtained. By this means the transparent face will always face the source of heat, and never look, in winter or spring, to the chilling east nor heat-stealing north. The flat sides likewise facilitate covering over the glass, and any covering material will lie readily upon the top of these protectors. This quality will be thoroughly appreciated by those who have tried to cover the surface of hand-glasses, *cloches*, or curate's vineries in the teeth of a tearing March wind. Bottom-heat could readily be given to crops in these protectors by digging out a trench of soil, and filling the floor surface with hot dung. I mean to try Melons in them this summer, and report the results. For the blanching of crops, &c., the glass might give place to slates or tiles, and Lettuces and Endive be thus preserved throughout the winter. In fine, I believe, since the Conservative Boiler has collapsed, that probably the palm for originality and usefulness in the field of horticultural invention for the year 1869 must be given to those simple, portable, and useful protectors of Mr. W. E. Rendle. *D. T. Fish.* [We believe the "handiness" of these protectors will shortly be enhanced by a device for the more ready removal of the glass, when necessary. EDS.]

Home Correspondence.

Hardy Clematises.—Allow me to supplement Mr. Westland's excellent remarks on these showy plants (p. 143) by recording the experience we have gained in their cultivation. We plant out of pots into open ground any time from the month of September to the end of April, using a liberal quantity of the very best old rotten manure well mixed with leaf-mould, also a fine mixture of calcareous soil, if this is near at hand. Every season we prune back a portion of the plants in the month of November to within 4 or 6 inches of the surface; these will flower the first week of July. To obtain a succession of bloom we prune some of the plants as above, and the remainder at the end of April; these latter will flower profusely a month later than the others, that is, from August until the November frosts destroy the bloom. After the November pruning we mulch the surface round the plants with good rotten manure, and turn this surface-dressing in by the middle or end of February; or, should this be objectionable, the manure is forked in in November. These varieties, being perfectly hardy climbers, and also permanent bedding plants, it is immaterial which course is adopted, provided they are renovated every season to make up

for the annual "waste of power" accruing from their marvellous inflorescence. We make it a rule to prune back for every purpose, but probably this may to some degree be left to the discretion of the gardener, though even for festooning it would not be desirable to retain more than one-half or two-thirds of the young wood, according to its ripeness, and where it can be done I believe it will be advantageous to cut back to within 2 feet of the base of each plant. When properly cared for, these varieties of Clematis will grow on an average from 10 feet to 15 feet in a season. It is, however, very important to turn in some good old rotten manure about each plant every autumn. *G. Jackman, Woking.*

Hundredfold Pea.—Will you allow me to state, in reply to numerous inquiries I have received, that I know nothing of Hundredfold, or "Cook's Favourite" Pea, which is being catalogued and sold as Laxton's? The distributors allege that it originated from a cross of my Prolific Longpod with Ne Plus Ultra. If this is the case, more than ordinary expeditious means have been resorted to by the enterprising firms who have sent it out, to get a stock of it, as Prolific Longpod did not become their property until 1865, and it is reasonable to presume that cross-fertilisation would not be attempted until after the variety had been seen in the pod, and tried; and if a cross were effected in 1866 it would give a single Pea to start with for growth in 1867. For I have ascertained by many experiments that a single Pea only in a pod resulting from a cross can be relied upon to produce one fixed variety, and that the produce would require several years' selection to attain a true stock, and several seasons' growth to get a bulk for sale. This, however, may be open to the explanation that a cross was attempted and a selection made, in the belief that cross-fertilisation had been effectual; in that case, all the Peas in the pod would probably produce one variety, and a true stock of it would follow without the necessity for much further selection. *Thomas Laxton, Stamford, February* 1.

Grapes: an Explanation.—In explanation of Mr. Cramb's remarks in the latter part of his letter, at p. 144, regarding the Grapes sent by me to the International Horticultural Exhibition of 1865, I wish to say that they were the produce of Vines two years old, and were shown as such; and after travelling many hundred miles, no doubt they had a poor appearance in comparison with those carried by hand to the show. Those I exhibited in Paris at the International of 1867 were the produce of the same Vines, but two years older, or in other words, four years old from eyes, with the exception of the Chasselas Napoléon rod, which I cut down with eight bunches of Grapes on, in order to show what an English Grape-grower could do with one of their own varieties of Grapes, which was only two years old. Dr. Hogg saw this production at the Society's rooms previous to its being taken to the Exposition, and of which he spoke very highly. At eight out of fifteen series of shows I exhibited Grapes, including pot Vines, the finest ever seen in France. For these, principally, and other exhibitions of plants, &c., I was awarded a Silver Medal and a work of art of the value of £30. *H. Knight, Floors Castle Gardens.*

Esparto Grass.—I shall be very much obliged if any of your correspondents would give me any information regarding the culture of Esparto Grass, or Spanish Grass. I wish to know how it is grown, whether from seed, root, or otherwise; the best climate and localities to grow it in; and any advice your correspondents could give me as to whether it could be cultivated on the west coast of India, say from Bombay south to Ceylon. *J. A. W., Glasgow.*

Grafting Vines.—I shall be glad to know the best method of grafting Vines, and when the operation should be performed? Should the Vines be started first? Should they be in full leaf, or should they be grafted before they break? *Inquirer.* [The grafting of plants is literally the placing together of two pieces of living wood in such a manner that the rising sap of the one may mix with that of the other. It is this mingling of the sap which forms the union, as the old wood itself never unites. To succeed, then, in grafting, it must be performed at a time when the sap is in motion, and that is at the commencement of active growth. The Vine is a plant possessed of an enormous supply of sap; so that, if cut just at the commencement of growth it will, as is well known, bleed to such an extent as to materially injure the plant. If grafting the Vine, then, is performed too early, the very exuberance of the sap prevents the union. If performed very much earlier, the sap not being in motion the parts get dried up, and union is again prevented. After the Vines have got into full leaf, the sap becomes more dense (excepting on young growing shoots) and dried up, so that no union can then take place. There is a period, however, just after the full tide has passed, when the first leaves have about become fully developed, and are able to perform their functions of elaboration, when the sap, although still flowing freely, is gradually getting denser, during which grafting may be performed with every success. The precise condition of the stock may be ascertained by inserting the edge of a knife into the bark, when, if it bleeds copiously, wait a few days; if gently, graft at once. When the stock is cut, the sap should exude gently all over; and it is well to have the scion in the same condition, i.e., with the buds just on the move, or (better as it is called, and when cut to show the sap in motion. The sap of each is thus in active motion, the stock in advance of the scion. The grafting of Vines in this condition is a matter of absolute certainty. It is well to leave, when heading down the stock, a shoot with a few leaves beyond or above the graft, to draw up whatever superabundant sap there may be, until the graft itself is strong enough. The scions taken off in winter must be kept at rest until required. It is well, however, a day or two previous to performing the operation, to introduce them to the same temperature as the stocks, so as to excite the required action already described. The best mode of grafting is the common tongue, and it is just as easy to graft on old stems as on young ones, care only being required to join the inner bark of each to each. When the pieces are fitted together, tie them tightly with a piece of matting, and cover over all, to exclude the air, with a coating of Mastic L'Homme Lefort—a cold grafting wax, which is better than clay or Moss, or any other material that can be used. *B.*]

Longevity of the Vine.—There is one point which has not been noticed as, in my opinion it should be, in the discussion of Vine extension, viz., the unnatural feeding in the case of a restricted Vine. What a fellow John Bull is to feed! How strongly he "goes in" for stimulants! His very Vines must indulge in consuming all the stimulants known to operate on plant life. He makes a heap of them; and to make sure work of a thorough intoxication, plants his Vine in the midst of it. The more voracious the plant becomes the better does it please. To make sure work that nothing but stimulating materials come in its way, it is cemented into it. By-and-by the stimulants get "flat," real food is scarce, fresh stimulants are applied, which reach one-third of the fibrils, the others miserably existing, until one after another the roots die for want of moisture or natural food. The soil becoming exhausted, all stimulating material fails to give it the necessary life-giving qualities of the natural soil. The top declines year after year until the system of the Vine is irrecoverable, and it must be removed. Now, I don't think this picture overdrawn; at least, in many instances. The question I wish to bring forward is—Has food—that is, the quality and quantity of nutrition—consumed by the Vine in its youth, had any effect on the term of its existence? Is there such a thing as forcing the Vine into, shall I say, unhealthy fatness?—a condition when all its tissues in very youth are injured by an unnatural and undue influx of feeding matter? May they not—*i.e.*, all the tissues—by this high feeding be placed in such a condition that, when older, through an insufficient amount of the same properties passing through them, they become enfeebled? May not the nerves of the plant, so to speak, be overtaxed in youth so as to refuse in after-life to answer their functions? What if one-half only of the channels through which the sap flows are in use? or what if they are only partially filled? Must not their coatings suffer from want of use, or, it may be, want of cleansing? May not contraction take place, and disease set in in those parts where no human eye can discover it? Then why shall we put so much confidence in extension merely as a cure for the ills of a Vine, or to extend its term of existence? Most if not all the instances noticed in favour of extension, are of Vines carelessly planted—the roots are to be found "nobody knows where." If it were necessary I could bring more evidence of the fruitfulness and health of Vines the roots of which received no other care than good draining. But I think these instances of what may be termed natural planting go to prove that high feeding in youth, with regard to the Vine, is more injurious to its term of life than any restriction can be. A Vine is a hard plant to kill; no plant I know of withstands the battle with "savages" so well. When it is known to us what are the leaf-producing properties of the soil in distinction to fruit-producing properties, or that of wood, we shall know how to make a border, and keep a border expressly for the Vine. While we are in want of this information let us aid Nature as far as our knowledge goes, but not force her into undue activity in youth by the application of artificial manures, which in after life cannot be maintained. For what is the object of growing Vines? Is it to get sensational bunches of fruit at any cost? Is it to make a name at the loss of the Vines? When people find two medium-sized bunches of fruit well ripened are equal if not better than one bunch, which is as heavy as both, this pushing the capabilities of the Vine so as to shorten its existence will end, this everlasting border-making will be discontinued, the whole thing will become more simple and more satisfactory. We shall not be threatened with the reward of a barbarian, on the one hand, or be compelled to have miles of glass roofs on the other. *H. M.*

Gentiana acaulis.—I do not think your correspondent (see p. 108) will find any difficulty in growing the Gentiana acaulis in any garden soil, if when once planted it is left alone, and never disturbed, nor smothered up with other plants. I grew it largely here some years since in the spring garden, but owing to the plant not liking the removal twice in the year, and the short duration of the blooming season, I discarded it from the spring beds, and planted a number of patches in the herbaceous beds. Those patches increase very much like the common Daisy, and have to be cropped in often to keep them within bounds. The beds are well manured every spring with rotten grass and leaves, mixed together, and forked in about the roots. If the spring is warm and dry, with plenty of sun, it is truly a lovely spring plant, but unfortunately the flowers cannot stand the bad weather we so often get in the north of Yorkshire. *William Culverwell, Thorpe Perrow.*

Skeleton Leaves.—About five years ago I observed in the *Gardeners' Chronicle* a recipe for making skeleton leaves, similar to the one quoted for the benefit of your correspondent "Cestrian" (see p. 79), and since that time I have made several experiments, on various kinds of leaves, but always without a particle of success. I have used solutions of different strength, but in each case have met with the same disappointment: Would any of your correspondents who may have successfully tried the experiment, kindly favour me with a little more detailed information as to the strength of the solutions required to bring about the desired result? *A. Eames, Castle Ashby Gardens.*

Gooseberry and Currant-bush Pruning.—My experience of cottage gardens in this neighbourhood leads me to believe that their owners generally understand the cultivation of these fruit bushes very well, with the exception that they are too negligent in keeping up a proper supply of young ones. In ordinary fruiting seasons the price of ripe Gooseberries or Black Currants usually average 1*s.* per gallon, a much lower price than that quoted by your correspondent,—a fact that will show plainly how largely these fruits are grown. I think the tendency amongst Gooseberry bushes to die off in large branches at a time when the trees should be in the height of their growth and productiveness, is due more to hard pruning than to any other cause. It should be borne in mind that both the Gooseberry and Currant propagate or renew themselves naturally by suckers, and, consequently, manifest a great tendency to develop that form of growth after a certain number of years. The maintenance of a clean stem can thus rarely be obtained, except at the expense of life itself. I suspect the 50-yr. old bushes mentioned by "Bush *v.* Brake" (p. 106) must have gone through many of these renewals, and have about as much of the original tree in them as the celebrated gun, that was still the same, but had had a new "lock, stock, and barrel." An old Gooseberry plantation is generally one of the most unsightly objects in a garden, and miserable attempts at renovation are often made by planting young bushes as the old ones die out, failure almost always resulting. No safer plan can be adopted to maintain an efficient supply of clean bushes and fine fruit than the plantation of young trees, in number equal to one-third of the entire number grown. This should be done about every third or fourth year, and in quarters of fresh soil devoted exclusively to them, and not in the old-fashioned and objectionable manner of putting them all round the quarters next the walks. The best manure for bush fruit is to be found in a well-rotted rubbish-heap, stuff that is sufficiently nutritive without developing that coarse growth usually engendered by strong manure. Forking should be done sparingly amongst the roots, except where, when in a young state, the rows are sufficiently far apart to admit of vegetables being grown for a year or two between them; and this is much the wisest plan, as it allows of that after-expansion of growth so essential to the health and production of the trees. I have often been surprised to see the extraordinary quantity of fruit that bushes so cared for will produce, the failure of a crop being a rarity. Perhaps in cottage gardens the better plan is to have these descriptions of fruits planted in rows at wide intervals across the garden, the intervening spaces being cropped with vegetables. This arrangement, however, must depend somewhat upon the shape of the ground; for small gardens it is usually the most economical. Where the bushes are carefully tended, no portion of the garden will yield so lucrative a return. For consumption by the cottager's family, next to the Apple, the fruits of the Gooseberry and Black Currants are the most wholesome and useful. It would indeed be well if every cottage possessed in winter its carefully preserved store of jam made from these fruits, and when we compare the very high price towards which butter is now tending, with the low figure at which sugar can be obtained, it is somewhat a matter for surprise that in our rural cottage homes, nice, wholesome, home-made jam is not more generally consumed. However, the consideration of these things might lead us into questions of domestic economy, that this is not the proper place to discuss; and I will leave it by expressing the hope that in these, as well as in other matters, the people may become yet more "educated." *A. D.*

Judas Tree.—In the grounds adjoining Dulwich College, Surrey, is a tree of this species, probably once larger than the one mentioned at p. 74; it has been greatly reduced in size by the wind, but notwithstanding is still of large dimensions. My attention was drawn to this tree last season by seeing a number of carriages that were *en route* from the Crystal Palace drawn up by the side of the road; the occupants meanwhile were busily engaged in admiring its great beauty. A thought struck me that in such a situation as the backgrounds of the Palace afford, large clumps of this tree intermixed with Laburnums, Pyrus spectabilis,

double-blossomed Cherry, different varieties of Thorns, &c., might be so planted and arranged as to make a grand spring display. Indeed avenues of these trees could, in such extensive public grounds, be planted with good effect, and would certainly create a nine days' wonder every season. I would not recommend the planting of fruit trees in public gardens, otherwise the Apricot, Peach, Almond, &c., are very beautiful when in full bloom, and should be more extensively planted as ornamental trees for the backgrounds of shrubberries and other suitable places in large private establishments. The Judas tree is not half so extensively planted as it deserves to be. There are two varieties, viz., the Canada and common Judas tree, Cercis Siliquastrum; they were both growing in one of the shrubberies near the mansion at Perdiswell Hall, Worcester, eleven years since; but the common one is by far the most beautiful of the two, and is called by the Spaniards the Tree of Love. From this variety Sir Offley Wakeman used to have the flowers picked for flavouring his salads, although I believe they are both equally good for the purpose. This tree differs in the height it attains in different parts. In some they will form fine trees, as stated by your correspondent, whilst in others they will not attain more than from 12 to 14 feet, sending forth young branches irregularly from the very bottom. The stem of the tree is of a dark greyish colour, and the branches, which are few and irregular, have a purplish cast. The leaves are smooth, of a pleasing green on the upper surface, hoary underneath, and grow alternately on long foot-stalks. The flowers are of a fine purple or puce colour; they come out early in the spring, in clusters, form the old wood, growing upon short foot-stalks. They exhibit their flowers in clusters in different colours early in the spring, before the leaves are grown to such a size as to hide them, and are also noteworthy from the difference of the upper and lower surface of the leaves—the one being of a fine green, the other of a hoary cast; so that on the same tree, even in this respect, there is shown variety, as may be seen when the varying direction of the winds causes the upper and lower surfaces to be alternately displayed. The wood is stated to be of great value, for it polishes exceedingly well, and is admirably veined with black and green. I believe there are two or three varieties of this species (the common one), for I once remember seeing almost a white variety and a flesh-coloured one. *Edward Bennett, Osberton, Worksop.* [We fully endorse our correspondent's statements as to the beauty and interest of this tree when in bloom. Out of bloom it is not of "good habit." The stem is often curiously twisted on itself. Close to the Herbarium at Kew is a tree of this species, showing this spiral twist remarkably well. EDS.]

Cyclamens and Primulas.—I beg to enclose for your inspection leaves and blooms of Cyclamen persicum and Primula sinensis, also a Camellia bloom. Relative to the Cyclamen, the leaves and blooms are from a few varieties of persicum, improved by hybridising in three years from what may be termed very common ones. Mr. Turner's letter, at p. 109, reminds me to say a word in their favour. They ought to be plants for the million, and far more extensively cultivated. Where room is not an object, and conservatory or house decoration is carried on to any considerable extent, they are really worth having a house devoted to their entire cultivation—comprising, as they do, almost every tint of colour, and coming into bloom as early as October and lasting till May, "no small oasis in the midst of a desert." To give an illustration of their easy culture, I gave a lady friend of mine at Kensington a small plant three years ago, which has since been treated as a window plant; it is now in flower, and showing five or six dozen blooms. However, a bad plant is not worth house room. The Primulas are two varieties, which have kept constant for the last two years. The white I consider a great acquisition, very hardy and free-flowering, coming into bloom during the winter months without the least assistance. The Camellia bloom is from a sport, quite constant, but I am not satisfied about its being distinct from existing varieties. *George Edgerton, Strawberry Hill.* [The leaves and blooms of Cyclamen were magnificent; the Primulas good; the Camellia not sufficiently distinct. EDS.]

Orchid Culture.—I send herewith two pieces of Orchids to show two different modes of cultivation. No. 1, a piece of Dendrobium nobile, came from a first-class Orchid-house last spring, and was grown under the vapour-bath and shading system. No. 2 are growths from No. 1, without shading, and plenty of air. No. 1 was affected with the spot. As soon as I received them the leaves were painted with a mixture of lime, sulphur, and soft soap, about the consistency of thin paint—the mixture at a temperature of about 75°. I have not observed the spot to spread at all, or the new growths to be affected by it. Allowing for exceptions to any rule, the question naturally arises, with all our splendid glass structures and heating appliances, do we not coddle very many of our plants too much? Many illustrations of this could be given. Camellias treated almost like Laurels make better growth, and seldom or never drop their buds. Take the Pine for example, what our employers want is a Pine to look at, and to eat afterwards with a relish, and not a Pine to look at and send from the table without being eaten. Doubtless there are a great many of the former, but a great many more of the latter. I think that by trying to imitate Nature too closely we often frustrate her designs. *Geo. Edgerton, Strawberry Hill.* [No. 2 was at least twice as large, and showed fully twice the amount of vigour apparent in No. 1. EDS.]

Dolomite.—The annexed is the analysis referred to in my letter on dolomite, printed at p. 43 of *Gardeners' Chronicle*, January 8, 1870:—

Carbonate of lime	51.00
Carbonate of magnesia	44.50
Silicate of alumina	.40
Potash	.02
Phosphate of alumina and iron	.15
Phosphate of lime and magnesia	.20
Free alumina	.40
Peroxide of iron	.42
Protoxide of iron	.30
Oxide of manganese and loss	.53
	100.00

The quarries are situated at a placed called Dog-Kennels, near Worksop, Notts, and were worked by Messrs. W. & J. Holmes, lime burners. The analysis was made by Mr. James Haywood, analytical and consulting chemist, Sheffield, on January 26, 1847. Some eight or ten years ago I called at the Dog-Kennels Lime Works, and was very kindly told what the Messrs. Holmes considered their dolomite was good for, and that it answered admirably on the peaty fen land of Lincolnshire, and on the red marls of the same county there cannot be a doubt; indeed, for inert peat, and still more inert red marl, the fiery character of a carbonate, half lime and half magnesia, would meet its match, and might be allowed to do its worst—the risk of damaging such soils by any reasonable dose of lime would be like that of setting the Thames on fire. *Alex. Forsyth, 9, Islington Square, Salford, Jan. 22.*

Button-hole Bouquets.—On a former occasion (p. 109, 1869) I advocated the use of glass tubes for keeping flowers fresh in the coat. The price of these tubes varies more than that of any article I ever

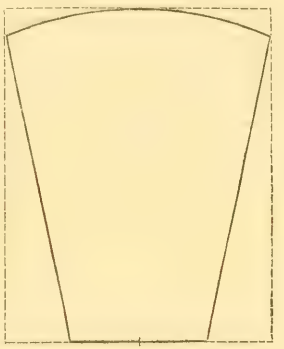

FIG. 32.

bought. In Covent Garden they are 3*d.* each; at some of the glass shops 4*d.* is the price; during the summer boys hawk them near the Royal Exchange at 1*d.* each; while those who will take the trouble to go to a shop in Holborn, at the corner of Fetter Lane, may have the pick out of hundreds of all sizes and colours at 6*d.* a dozen. On the same occasion I gave the dimensions of the most convenient size of tube, for the information of those who might not care to buy their experience (as I have done) by recklessly investing in a dozen "of sorts." But some people have an objection to glass, they cannot handle it without breaking it, it cuts their fingers, or, *horribile dictu*, finds its way through when they sit upon it! To meet these objections, silvered and gilt metal tubes may now be seen in the shop-windows, the hook with which they are to be suspended from the button-hole being an acanthiform leaf of severely architectural proportions. This does not accord with my views of good taste. Those who cannot readily procure glass tubes will find the following plan worth their attention, if they wish to keep flowers fresh in a hot room. Having lightly bound up amongst the stems a few long pieces of Moss, put the bouquet into a glass of water, and when the Moss will not soak up any more water, bind round the stems a small piece of oiled silk (which can be bought at any chemist's), fastening it with thread or fine wire. The annexed engraving (fig. 32) shows the exact size of the piece of oil silk to be used, being the form which I have found to be most convenient to wrap round the stems of any ordinary coat-bouquet. I am thus particular in giving the size, because I have found larger pieces of this silk inconvenient and clumsy to use. *W. T.*

Wild Service Tree.—Professor Buckman should have headed the article on Pyrus domestica (p. 39), "The Service Tree," not the "Wild Service Tree," which is P. torminalis, a totally different thing. As "J. W. K." writes of seeing a score of these "wild" Service trees in a wood in Northamptonshire, he probably refers to P. torminalis, which, I may add, grows wild generally over the southern counties, and is very common about the north of London, where there are some very fine trees, loaded with fruit in the autumn, which is delicious after the first early frosts have set in. I believe it is still exposed for sale in the market places of some southern towns. "Bath" says nurserymen often supply Mountain Ash for the Service, so it may be of "service" for him to know that many botanists consider these two trees to be identical, or, in other words, that the true Service tree is only the Mountain Ash "domesticated."[?] As for P. Aria being sent out for P. domestica, it is probably owing to their popular names, for they are all indiscriminately called "Sorbs." Here P. Aria is common in gardens, and the London boys trespass a good deal in October and November for the delicious "Sorbs." *W. G. Smith.*

Sophora japonica.—If memory can be trusted, a rather large tree of this species was to be seen a few years ago trained on the front of a house in a street at Kew, or between Kew and Richmond. The house was said to be that in which Mr. Alton, formerly superintendent of Kew Gardens, resided. Can any of your readers say if the tree can still be found, and what is its size? *Bath.* [The tree is still there; perhaps some of our Kew friends will furnish the desired information. There is also a fine tree in the Oxford Botanic Gardens, and there was, a few years ago, a fine tree in the Chelsea Botanic Garden, but the sewers have killed it. EDS.]

Raspberry Culture.—These should be planted from 3 to 4 feet apart, if the canes are sufficient in number and in length. One-half of the canes should be taken from one stool, and placed with a half of another stool, and be tied together, a stake driven down in the middle being the support. They will then form an arch, which should be continued throughout the rows. I ought, however, to have first said that five or six stout canes are enough to leave when thinning them out. I find this plan of arching them better than tying them upright. My reasons are—1st, the stake cannot injure the roots when driven down; 2d, the fruit is more easily gathered, and has a better chance of ripening; 3d, the young wood for the next year's supply can be more easily taken away, and will be more exposed for ripening the wood than if growing around the fruiting canes. These plants like good deep soil, and good mulchings with manure from a pigstye. They like to make roots near the surface of the soil; therefore, the less they are disturbed the better. Cottagers who have but little room may do much by a little foresight. For instance, the paths could be covered with fruit, and such as Pears and Apples could be grown over Currant and Gooseberry bushes, in such a way as is shown at p. 106. The soil between them all should receive a good mulching once a-year. These trees, if tied out as they grow, by fastening a stiff twig to the old wood first, and then straightening the young shoot upon it, would eventually become self-supporting, and would require no more attention than pruning, *i.e.*, cutting or pinching back the spurs in summer, and cutting away unsightly knarls in winter. Every bit of wall should be used on every aspect—the Mayduke and its class of Cherries on the south, west, or east walls; the Morello on the north walls. The pruning of these consists in the rubbing off in their young state all foreright shoots, and thinning out those that remain. These will require fastening with shreds, as the slender branches, especially of the latter kind, cannot support themselves. What a pity so many cottages are covered with that greedy plant, the Ivy! Often does this plant cover space which might be occupied by some fruit tree which would at quarter-day show its value by helping to pay the rent. I hope these few remarks may be of some service to the many toiling labourers who have bits of garden, but do not know all about what might be done in it. How they are to get this told them is the next question. If I had the means I would put these remarks in the form of a "tract," and have a few millions printed and circulated amongst them, but I have not. A little more interest in their garden would induce many cottagers to stay at home to make money, instead of going away and spending it. *Bush* v. *Brake.*

Yellow Bedding Calceolarias.—I am afraid your correspondent, at p. 42, will lead many of your Northern readers astray, when he says that Calceolaria cuttings may be put in in October without requiring any covering until frost sets in. I do not doubt for a moment but that such treatment would answer in the South, but I certainly am inclined to think differently if practised in the North. I have found in the north of Yorkshire that the second week in September is quite late enough to put in cuttings of the Calceolaria, and in North Lancashire, the last week in August or the first in September. I have tried them later, but they do not answer so well. I usually shade and keep them close for about a fortnight, then harden them off by degrees, and afterwards take the lights off on mild dry days. I keep them moderately dry during winter, as I find they stand the frost better. I usually plant out in 4-feet beds, about the third week in April if the weather permits, and have hoops and mats thrown over them in case of frost. I have always treated Calceolarias in this manner, and have been very successful with them. *G. S.*

Flowering of Goldfussia anisophylla, &c.—I have never through all my life been able to flower Bougainvillea spectabilis. The principles on which the flowering of plants ought to depend seemed clear

enough, but I could never get this plant to acknowledge their binding force. I have also endeavoured to imitate exactly the conditions under which others have flowered it, but with no better success. I am inclined to ask, do we know much about these principles? Do those who think they know how to flower Bougainvillea have annual success? A principle that will only work occasionally is suspicious. I put these questions from some curious observations on Goldfussia anisophylla. A few years ago I noted that some plants in our collection flowered profusely, while others had no blossoms. Supposing the plants might have been obtained from two sources, we propagated only from the flowering kind. These plants are all grown together, each one under exactly the same circumstances as the others, and yet many of them flower abundantly, the others not at all. I can only come to the conclusion that there are yet some hidden laws which regulate the production of flowers which physiology, with all its wonderful development in modern times, has not revealed to us. *T. M., Philadelphia, United States.*

The Gladiolus Show.—Is it really necessary the Gladiolus show should be held as early as August 17? I can endorse every word of Mr. Tillery's as to the unreasonableness of selecting a time when the plants of three-fourths of the growers will not be in bloom. I have attended the Crystal Palace show for several years, and have there seen Messrs. Kelway's Gladioli from Somerset and Messrs. Downie's from Edinburgh in close competition. Why then fix a time which will only suit the convenience of Messrs. Kelway and a few more from the South, and entirely ignore the claims of the Messrs. Downie, Stuart & Mein, Harrison, and the other eminent Northern and Midland growers? Are the regulations of the Royal Horticultural Society so like unto the laws of the Medes and Persians as to entirely preclude the show being held a week, or, better still, a fortnight later, when all the Gladiolus exhibitors would be able, if so inclined, to join in the fray? But I would add a further suggestion, viz., to put it off to the next meeting, on September 7, at which prizes for Dahlias are given; and as the Hollyhock exhibition, which is also fixed at present for August 17, would be likewise put off to September 7, a magnificent show could be then held of all these superb autumn flowers. I have not yet been an exhibitor of the Gladiolus, but nothing would give me greater pleasure than to break a lance with "D., of Deal." I fear such will be out of the question this season, but I hope I may be spared to do so another; but then if the same early date is again to obtain, Mr. Dombrain, as far as I am concerned, would have to ride the lists in vain, for certainly my flowers would not be there. I repeat, that if the Southern growers will persist in holding this great Gladiolus show in the enforced absence of most of the great growers of the flower, they will be making it a very onesided affair. And now a few words with respect to another flower, with which I am somewhat more conversant, I mean the Hollyhock. The meeting of the Royal Horticultural Society, on August 17, is for Gladioli and Hollyhocks as well; and all I have said of the former is still more applicable to the latter. With the exception of Messrs. Chater, Minchin and Kelway, the Hollyhock growers mostly fail from the frost, and yet, as with the Gladiolus, the exhibition is fixed for a time when all but the South will be kept from the field. Last year, at the Royal Horticultural Society's show on August 17, the only Hollyhock exhibitors were the Messrs. Chater and Kelway among the nurserymen, and, with the exception of myself, the amateurs were conspicuous by their absence. As it was I tried hard to get six spikes for the open class, but could not succeed, and I only just managed to scrape together a dozen blooms, when a week later I should have had scores. I then again ask, why should the Northern and Midland growers be so entirely shut out? If the Royal Horticultural Society is to be deemed simply a metropolitan society, well and good; but if it is to be taken as the representative of the general horticulture of the country, then I say its arrangements are partial and unsatisfactory. In proof that a later date would be much the best, and fair for all, I may mention that at the great Brighton show on September 8, Mr. Chater, of Essex, Mr. Minchin, of Oxfordshire, Mr. Kelway, of Somerset, Mr. May, of Bedale, Yorkshire, and myself, from Lincolnshire, were all engaged in a fierce, yet friendly, Hollyhock tournament—Mr. Kelway, moreover, having at the same time a very tough battle with Mr. Paul, of Cheshunt, for the Gladiolus premiership; whilst at Edinburgh, on the same day, the lovers of both flowers were holding a grand jubilee at the International. Have I not then proved that August 17 is much too early, and a later date the right and proper thing? And now a word for my worthy *confrère*, "D., of Deal." At the meeting on February 16, should any hitch arise, or should he find the Royal Horticultural Society obdurate, then let me beg of him to revert to his last year's scheme of a national Gladiolus show at the Crystal Palace, the authorities of which, I feel certain, he would find both more liberal and accommodating. Let the autumn show be revived, with the exception of the fruit going to the wall for the nonce. Let the exhibition be for the Gladiolus in particular, and for the other autumn flowers, the Hollyhock, Dahlia, Rose, &c., in general. There is no place like the Palace for a floral display, and deep is the regret of all florists at the discontinuance of its autumn show. I trust the above remarks will not be too severely animadverted upon, as they are dictated solely by my old love for the Hollyhock, and my new one for the Gladiolus. *Edward Hawke.*

—— We are glad to learn that there is to be a special exhibition of Gladioli this autumn. The time fixed (August 17) is, however, unfortunate for us Northern growers, being too early. As far as we can understand, this early date was fixed for the convenience of the Continental growers, and it will suit them well, as their flowers will then be in perfection. To them we mainly look for new varieties, and it would be well were the new flowers exhibited at the London meetings. Purchasers could then buy them with more freedom after having seen them; but could special prizes not be got up for these new flowers alone at a time to suit the French growers, and a general exhibition be held later in the season? In our northern climate it is about the end of August before we look for some of our finest spikes to be in full flower. We think it is to be regretted the exhibition should have been fixed at such an early date, being convinced it will keep many of our large growers away. Although we are some 300 miles from the scene of action, had the time been fixed for a later date we would gladly have sent up a stand, and have entered the lists against our Southern and Continental friends. There is no flower we know, better adapted to travel, than the Gladiolus. *Stuart & Mein, Kelso.*

Early Appearance of Wasps.—I killed here on the 22d a queen wasp, and to-day, the 27th January, a second (wasp enclosed); they were both killed in the greenhouse, where we generally every season kill a good many, but I never remember killing any so early. Our favourite songster, the thrush, delighted us for the first time this season with his melody on the 20th. *John Taylor, Rose Hill Lodge, Botcherby, Carlisle, Jan. 27.*

Forcing Seakale.—It happens sometimes, where regular supplies of this vegetable are called for, that difficulty is experienced in procuring continuous quantities equal to the demand, from the open ground, from under heating material, as the case may be, or from the Mushroom-house, where some crowns have been brought to bear under its influence. It happens, too, that occasional uneasiness is felt in keeping going the requirements from the places just named betwixt successional lots, and to supply a want this sort of contrivance may possibly be available to some:—As many crowns as are thought necessary for the object sought should be lifted and planted into pots about 12 inches across, covering them with other ones of a similar size, so as to exclude light. When this is done, let them be removed so as to be under the influence of any heat that can be found suitable for stimulating them into growth. In this manner I have frequently observed a couple of dozen roots placed in a vinery on the "move," and in the course of a few weeks afterwards I have seen very satisfactory results unfolded for the labour entailed. In carrying out the idea it need not be confined to hothouses altogether, either, for the warmth of such as a fermenting manure-heap should answer the same purpose, were the pots properly placed in it at a convenient time. *R. M.*

Ruscus aculeatus.—I was much interested by the report, at p. 146, of the paper read by Mr. M'Nab before the Edinburgh Botanical Society on the flowering of Ruscus. I can speak with certainty of having gathered the plant in full flower during the first half of January on the Holmwood Common, near Dorking, and elsewhere in Surrey, in several successive years, even during the present winter, notwithstanding the severe frost at Christmas. I am not, however, so certain of having gathered other than female flowers. If the male flowers do not appear till March or April under ordinary circumstances, it is a most remarkable fact, as the stigma is to all appearance in a receptive condition in January. I should be exceedingly glad if any of your readers can throw any light on the mode of fertilisation of this interesting plant, a point on which I am very curious. Is it quite certain that Mr. Frere's plant, alluded to by Mr. M'Nab, had "male buds and ripe fruit on the same branch?" [One of our plants has or had. EDS.] The fact that the female flowers have barren filaments would make it very difficult to distinguish the two kinds of flower-buds when in a rudimentary condition, even with the aid of a microscope. As far as I know, the plant is truly dicecious. [Sometimes monœcious. EDS.] *Alfred W. Bennett, 3, Park Village East.*

French *v.* English Lettuce Culture.—Whilst I have to thank Mr. Robinson for his prompt reply to my inquiry regarding the proper use of the *cloche* (see pp. 108 and 145), I am impelled, from the peculiar tone in which he has thought proper to give that answer, to ask a small space to reply to his strictures. It will be fresh in the recollection of the reader, that whilst I dwelt specially on the antiquity of "the *cloches* or bell-glasses," as they are weekly termed in the advertising columns of this Paper, and with Mr. Robinson's name attached—Mr. Robinson says "that I am in error in considering the *cloche* as another name for the same;" I distinctly stated that the French beat us completely in Lettuce culture by their use. I did not "assume that we had ever attempted the culture of this salad with them, and failed, previously;" so that I cannot understand why this and the "Cordon *v.* Espalier" controversy—so foreign to the matter—should have been introduced into the reply. Neither can I see why a weekly reader, or writer, in the *Gardeners' Chronicle* should of necessity be thoroughly posted up in all that Mr. Robinson may have written. Even though I pride myself more in the use of the spade than in my book-lore, I will maintain that hitherto we have been beaten completely in the use of the "*cloche* or old kitchen bell-glasses," which, as Mr. Knight says (p. 145), are as antiquated as the Louis Quatorze epoch, though so modern, according to your correspondent's affirmation, as to be in use around London to-day! Of course their clearness is improved by modern manufacture. Shape is improved by experience, and cheapness through the removal of the duty. In size the alteration is really *nil*. Why Mr. Robinson should say that articles which, in their original manufacture, are necessarily expensive, are consequently devoid of "utility," and not worth trial, I know not. Now, then, as to actual Lettuce culture by the aid of the kitchen garden bell-glass—for there is no necessity for English gardeners to use the term *cloche*. According to Mr. Robinson there is nothing expensive in the production of the beautiful winter Lettuces we see imported into this country, either in the matter of labour, or in the original purchase of the necessary glasses, which are decidedly cheap; hence it becomes a fair speculation to purchase a certain number and prepare for the results. After reading Mr. Knight's communication, I must enter my opinion on the side of transplanting, in preference to sowing them where they are to remain until fully grown. I am inclined to believe that it would take too many bell-glasses to keep up a supply for even a small family. Then there are other considerations regarding the sowing, and never afterwards giving air directly. They need thinning, I have no doubt; weeds will make head if not frequently warred against; and then in the matter of slugs I may ask another question—Have they no slugs in France? Three or four "wee mites" of seedling Lettuces would stand a poor chance boxed or "cloched" up with but a single slug, for months in succession. I cannot see how I can be said to have underrated the fulness of information contained in Mr. Robinson's work, having expressly said that I had only had time to make a "cursory acquaintance" therewith. The subject was mooted by "Anti-cloche" in a spirited manner, and I considered it would prove advantageous to "strike whilst the iron was hot." I do not now despair but that a few valuable "sparks" of information may be forthcoming, as the subject is one of some importance to the British gardener. I send you some Lettuces, which I have pulled up from the open border. No. 1 has had no protection afforded whatever in any form or shape; I have hundreds such. No. 2 has had a frame placed over it for a few weeks. This is attained to by the selection of seed of the more hardy plants and transplanting at intervals apart, so as to insure a firm, hardy growth. They are of the true Old Brown Cos (black-seeded). These, with the aid of bell-glasses, would form fine stuff. Will the Editors give their opinion? *William Earley.* [Admirable examples for the time of year. EDS.]

Notices of Books.

Nouveau Dictionnaire de Botanique, &c. Par E. Germain (de Saint Pierre). Paris and London: Baillière. 8vo. Pp. 1388. Figs. 1640. (New Dictionary of Botany, &c.)

Considering that this work represents the thought and observation of one mind, and the elaboration and compilation of one author's pair of hands, it may truly be looked on as something remarkable. Nevertheless, it has precisely those faults which one would expect to find under the circumstances. It reflects the views and opinions of the author, when it ought to be an epitome of the general condition of the science. Subjects in which the author takes a personal interest, those in which he has thought much and worked much, receive greater attention than do other matters of equal importance, but with which the author is not so personally familiar. Thus the dictionary becomes the dictionary of M. Germain, the botanist, rather than a dictionary of botany. In turning over its pages we are constantly coming upon long articles on certain special subjects—well-written, excellent articles in their way, but out of all proportion to the other articles, and at the same time taking up space which would be better occupied by the insertion of matters of which little or no notice whatever is taken. Let us cite one or two instances as they occur to us in turning over the pages:—"Absorption" occupies in its treatment about a dozen lines containing a most meagre and imperfect account of that important faculty in plant life. True, there is a cross reference to "Endosmosis," to which subject we find five lines devoted! On the other hand, to the theoretical questions connected with the origin of species (*ages du regne végétal*) nine pages are given. The explanation of the term "Aiguillon" takes up half a page, while eight or ten lines suffice for Amentaceæ. Less than half-a-dozen lines are occupied with the definition of tendrils, "cirrus;" a few more to the words "grimpant" and "volubile;" and this is all we find as to climbing plants, and, so far as we have been able

to discover, not a word as to their singular spontaneous movements. Six pages are occupied with the question of spontaneous generation, eight with that of the origin of the vegetable kingdom, more than twenty with an account of the method of making an herbarium, while forty are devoted to the word "herborisation." The word "pith" (*moelle*) receives for its explanation eleven lines, in which very little information is given as to the nature of that substance, while five pages are devoted mainly to an enumeration of the names of the genera of Mosses. The account of the Botanical Society of France occupies four pages, including a list of the rules and regulations, and of the presidents and vice-presidents from its foundation to the present time—information out of place in such a book, at least so far as these details are concerned.

We might cite very many instances of similar disproportionate treatment, were it necessary to do so. But having indicated what we take to be the main defect of the book before us, let us hasten to acknowledge that many of the articles, especially the longer ones, are clearly, correctly, and agreeably written, evidently with the view of satisfying the requirements of general readers desirous of making themselves acquainted with the present state of botanical science, and with the questions most in debate at the present day among its votaries. Several times since the book has been on our table have we, by way of testing its value as a work of reference, turned to it to illustrate some point or another that has occurred to us in our daily occupations, and if we have too often found it wanting in its professed character as an encyclopædia, we have been compensated by the attractive style in which many of the subjects are treated. The style is not so much that of a learned dissertation, as of a readable, yet trustworthy essay. With many of M. Germain's notions we entirely coincide, and though, in the interests of students, we have deemed it right to call attention to the disproportionate treatment of certain subjects as contrasted with that of others, we do not wish to unduly disparage the work or impute to the author any want of accurate knowledge of his subject, or inability to handle it properly. We ought not to conclude without saying that the book is clearly printed and lavishly illustrated with excellent woodcuts.

Lichenes Britannici, &c. Scripsit Rev. Jacobus M. Crombie, M.A. Reeve & Co. Small 8vo, pp. 138.

This is, what its title says it is, an enumeration of the species of Lichens natives of the British isles, together with their synonyms and indications of the habitats and stations wherein the plants grow. The order of arrangement is that of Nylander, the tongue in which it is written is Latin, for the greater convenience of foreign botanists; and we believe that the work has been carefully and conscientiously drawn up, and will therefore prove acceptable to all who study Lichens.

Microscopic Objects; figured and described by J. H. Martin. Van Voorst.

"The design of this work," says the prospectus, "is to supply a want felt by many who possess a microscope, viz., that of a book in which they can find an accurate drawing of any object in their cabinet or which they may readily procure." The work is to be published in monthly numbers, each containing eight plates and eight pages of letterpress. The specimen number before us contains 16 figures of vegetable tissues as seen under the microscope. They are rather roughly executed, but they are faithful representations, and they give the tyro a better idea of what he is to expect to see than more elaborate and artistic representations would do. The distinction between diagrams and transcripts from Nature is not always sufficiently impressed on the student, who is apt to be disgusted because he is not able to see things as clearly as the diagram represents them. We wish well to the present publication, and shall say more concerning it when it has advanced further.

CATALOGUES RECEIVED.—*J. Carter & Co.'s* Gardener's Vade Mecum for 1870, and *Barr & Sugden's* Seed Catalogue; both, as usual, encyclopædic in character. *Sutton & Sons'* Amateur's Guide, and *Wheeler & Son's* Little Book, are more select, and got up in very handsome wrappers.—*J. Veitch & Son's* Garden and Flower Seeds; also List of Gladioli. *H. Bull's* Seed Catalogue.—*W. Paul's* Select Seed List.—*D. Radclyffe & Co.'s* Seed Catalogue; this firm also issues a Sheet of Horticultural Elegancies, such as Fern cases, flower stands, &c., which is worth inspection; and an Album of Carnations, &c., consisting of dried petals of the flowers, by which customers can make their selections.—*C. Turner's* Seed Catalogue.—*H. Cannell's* Illustrated Floral Guide for 1870.—*B. S. Williams'* Seed Catalogue.—*Downie, Laird & Laing's* Seed Catalogue.—*Butler, M'Culloch & Co.'s* Seed Catalogue.—*Lamoureux & Co.'s* Price Current of Seeds.—*R. Parker's* Seed Catalogue.—*W. Cutbush & Son's* Seed Catalogue.—*Wm. Wood & Son's* Seed Catalogue.—*Chivas & Weaver's* Seed Catalogue.—*Jas. Dickson & Sons'* Forest and Ornamental Trees; also Seed Catalogue, and Sheet of Horticultural Implements.—*G. J. Child's* General Nursery Catalogue.—*D. G. McKay's* Seed Catalogue.—*The London and Continental Seed Co.'s* Seed Catalogue.—*W. Thompson's* Descriptive Catalogue of Flower Seeds. *S. Glendinning & Sons'* Seed Catalogue.—*E. G. Henderson & Son's* Seed Catalogue.—*Osborn & Son's* Hardy Trees and Shrubs, a carefully prepared and trustworthy list.—*Wm. Rollisson & Sons'* New Roses for 1870.—*Wm. Drummond & Sons'* Seed Catalogue, also Directions for Sowing and Culture.—*T. Kennedy & Co.'s* Forest and Ornamental Trees and Seed Catalogue. *Smith & Simons'* Cultural Guide and Seed Catalogue—*Joseph Baumann's* Prix-Courant pour le printemps 1870—*C. Huber et Cie.'s* Catalogue de Graines pour 1870, des Végétaux, &c.—*J. Sieckmann's* Pries-Verzeichniss über Georginen (Dahlias), a very full list, extending to 30 pages.—*Vilmorin-Andrieux et Cie.'s* Catalogue Général de Graines et Plantes; also Supplément aux Catalogues.—*Waite, Burnell, Huggins & Co.'s* Seed Catalogue.—*T. Sampson's* Seed Catalogue.—*W. Samson & Co.'s* General Catalogue.—*W. E. Dixon's* Seed Catalogue.—*E. Sang & Son's* Seed Catalogue.—*E. Taylor's* Seed Catalogue.

Florists' Flowers.

THE GLADIOLUS IN 1869.—A visit just paid to my bulb-room reminds me that what may now, I suppose, be considered my annual report on the Gladiolus, is still unfurnished for the year just ended; and my experience as a practical cultivator tells me that, to be of use for the guidance of florists for 1870, the sooner it is before the public the better. To begin then: the year 1869 was, I think, on the whole, unsatisfactory for the Gladiolus. I planted the bulk of my stock in the second week of February, and all were in the ground before the end of the month, in the soil they seem to like best—fresh loam enriched with a moderate supply of old cow-dung, and made friable by the addition of some river sand. Too heavy manuring I have found injurious, as it tends greatly to increase the propensity to rot and melt away which the bulbs of this flower are specially liable to. They showed aboveground in due time, and then for nearly two months had to contend with bitter east winds, and almost nightly frosts; and though I cannot say that I lost a single bulb outright in the early season, the evidence of the struggle for life was plain to the most careless observer, in the stunted growth, and pale, sickly foliage of the entire stock. About the middle of June things began to mend, and thenceforward a rapid growth took place, but the main bloom was later than usual, and there was a marked deficiency in the rich vigorous appearance of foliage and brilliancy of spike, which a good grower is fairly entitled to expect as the reward of his labours.

My note-book tells me also that a large proportion of my stock did not bloom at all, being marked late—that is to say, that the check in the early summer was too much for them, and that all they were able to accomplish was a growth of about 2 feet, but no bloom. In those late cases the bulb has almost invariably come up sound, which is a consolation to a certain extent.

While speaking of taking up, it may be well to state that where a spike is cut while in full bloom, there the chance of the loss of the bulb seems to be greatly increased. This is, I suppose, only natural, as the sudden shock of beheading must be very severely felt; and it is an important consideration for exhibitors whether they will in the first instance submit to the heavy sacrifice of cutting the 50 to 100 fine spikes necessary to put in an appearance, with in all the classes at one of our important shows—which spikes, be it remembered, would continue in all their brilliant glory at home for at least two weeks had they been left uncut,—when they bear in mind that they are not only denuding their gardens of their choicest gems for the moment, but largely increasing the chances of failure of their best bulbs for the time to come. This is a matter I have carefully noted, and I should like to know what growers generally think about it, as any circumstance that tends to increase the great cost of keeping up a first-rate stock of Gladioli cannot fail to be deeply interesting to a considerable section of the floral community.

The novelties of the past season have in several instances proved decided acquisitions, and the following, from our greatest producer, M. Souchet, seem likely to hold a leading position for some years to come; I give them as I meet them in my note-book, not necessarily in the order of merit:—Thomas Methven***, purple shade of crimson, shaded with rose; good spike, and good substance; better than Homire, also a new flower, and rather similar. Monsieur Legouve****, brilliant ponceau, white throat, faint lilac blotch, large solid flower; very like an old favourite of mine, Marshal Vaillant, but finer in all respects, and, what is of great importance, fully a month earlier. Madame Desportes, white, lightly feathered with rosy lilac, blotch of same shade, large flower, and splendid spike. Argus****, rich ponceau, feathered with a darker shade of same, pale straw throat, fine spike. Schiller, splendid pale straw, rich bright velvety crimson throat; very fine spike, quite distinct, and a great gem. This note was taken on August 25, and as a matter for amusing comparison, I next give a description taken on September 27 of another spike of the same variety in a neighbouring bed:—Blush, pale straw throat, with rich blotch of bright velvety crimson, heavy rose feathers, grand spike. Of course the lapse of a month made all the difference, but the two spikes were so unlike that they could have been shown together side by side as two separate varieties had it been possible to have brought them together. Racine****, bright rosy crimson shaded with white, splendid spike. Buffon***, bright crimson and rose shaded, striped with white and crimson flakes. Madame Dombrain, splendid soft rose, bright rosy crimson throat and feathers, good spike and good shape; one of the very best. Virgile****, rich glowing ponceau, crimson blotch, good spike. Marie Stuart****, whitish blush, rosy crimson throat and feathers, grand spike; and a second spike from the same bulb, soft white, faintly tinged with lovely pale pink on throat and feathers; both different but grand in either state. Some few others were late, so I am unable to report on them, but Duc de Montebello I have heard well spoken of.

Of seedlings, a few fine things have been shown, and I am inclined to think "D., Deal," was greatly mistaken when he stated his belief that the number of persons growing seedlings to any extent was limited to two—that is, if he included Old Ireland in his observations on English growers in the *Gardeners' Chronicle* of Jan. 22! We have at least two raisers of seedlings resident near Dublin, and possibly others that I do not know of. There was one splendid flower, shown by Captain Nicholson, of Glenmore, near Drogheda, one of our most successful exhibitors for the past two years, and named Glenmore, after his own place. It was a most brilliant flower, good at all points, and reminding one very much of two of the best varieties John Standish has ever produced—Ensign and Carminata. I also fortunately had two of my best seedlings for the year in bloom at show-time: both are distinct, and quite up to the right standard. Oliver Goldsmith, warm blush, shaded rosy crimson feathers, throat tinged with bronze; very large flower, splendid shape, fine spike. Had this flower been sent out by M. Souchet, I would have said at once that it had come from the same strain of seed as Madame Dombrain and Thomas Moore. The second I have called Earl Spencer, after our present most popular Viceroy: rich orange scarlet, shaded; throat white, with crimson blotch, feathered with very dark claret-brown—a seedling, I think, from Meyerbeer. Those two have been proved for two years, and may, I think, be fairly relied on. If my judgment was as crude today as it was some eight or ten years ago, I should probably be calling public attention to some 40 or 50, in place of two new varieties of my own; but I am not unmindful of the advice of a veteran and kindly critic to young authors:—"Burn more, and print less."

In the taking up and saving of Gladiolus bulbs, the lateness of the season causes great difficulty, as it is scarcely possible to get them out of the ground in detail where there is a large stock. I adopted the plan last season of taking all mine up in one day, as I do my Tulips; I placed them at once in their boxes in one of two new conservatories which I had just built, kept up a smart heat for about 12 days, and then removed them, well saved and in good order, to the fruit and bulb room for the winter. They are now in fine condition, that is, all that came out of the ground healthy. The number of shrivelled up, leathery, dead bulbs is quite as large as usual, and the cause of this great mortality remains still unexplained.

I omitted to state that I planted all my stock about 3 inches deep, and top-dressed them in June and July. I watered gently every day (as soon as the real summer weather set in), from the end of June to the middle of August. I have made a list of about 30 each of those classes of Gladioli, the best, the middle, and the cheapest sorts, and I should have sent them on to you, but that lists of names, though really necessary and useful now and again, look so like *repetita crambe*, from the mere monotony of the thing. However they are available at a short notice, should you care to have them. [Please send them. Such information is useful to many. EDS.].

We have now fine hard sunny weather, with moderate frosts at night, and we are hopeful, consequently, of a genial spring, and fine summer to follow. Our fruit trees give splendid promise, but all depends on the spring. We have commenced the year auspiciously by electing, as our chief magistrate, a gentleman who is a Press-man, an agriculturist, and a florist and pomologist all in one; so let us hope for a prosperous floral year all through. *J. F. Lombard, Dublin, Jan. 26.*

Garden Memoranda.

MILFORD NURSERY, NEAR GODALMING, SURREY.—These extensive and well-known nurseries, which were frequently noticed by Loudon in his "Gardeners' Magazine" some 30 years since, when in the occupation of the late Mr. William Young and his partner, Mr. George Penny, A.L.S., were at that time famous as the first English home of many new plants raised at that period, chiefly from the contributions of Philip Barker Webb, Esq., an eminent botanist, who was proprietor of the grounds. Since the death of Mr. Young, which occurred rather more than six years since, the business has been carried on by his son, Mr. Maurice Young, the present occupier, who has in the interval cleared off a large quantity of overgrown trees, and filled the whole nursery with a young and vigorous stock, much of it of great rarity and value, and now growing rapidly into excellent specimens.

These nurseries are distant about one mile alike from the Milford and the new Godalming station of the Portsmouth Direct railway, where they occupy between 70 and 80 acres of suitable ground in an excellent situation, on either side of the Portsmouth road, as it passes through the interesting and pretty village of

Milford. The entrance is on the northern side of the road, into a rectangular piece of ground 4 acres in extent, and of a deep sandy loamy texture, and which may be termed the propagating and specimen department of the nursery. It is divided across the middle by a broad walk, having wide borders on either side, and which are adorned by many handsome forms of evergreen trees, including Thujopsis, Cupressus, Juniperus, Picea, Abies, and many others, which at this season have a peculiarly rich effect. Associated with these may be noticed many neat examples of Osmanthus and Retinospora, alike in their green and variegated forms. A nice dense form of African Cypress, 4 feet in height, was an attractive object; its singular red-tinted foliage contrasted well with all about it. A magnificent Golden Larch is probably, after the Elvaston specimen, the finest in the country. There were also present several examples of the Golden Chinese Juniper, a beautiful plant, which has originated in these grounds, but which is not yet sent out. The dwarf Irish Juniper, Fortune's variegated Bamboo, the Leopold Sycamore, and Golden Elms, were distributed along the front of these borders, and were further supplemented by Lilium auratum and the varieties of Gladiolus, these latter producing a charming effect during the summer and autumn months. This portion of the ground is belted round by a wide border, on which moderate-sized specimens of evergreen trees are arranged in separate rows, Golden Yews, Cryptomeria elegans, and Euonymus radicans variegatus forming a border to the walk. The ground on the lower side of the main walk is arranged in rectangular brakes, on which coniferous and other evergreen trees are principally grown. Distributed over this portion of the ground are some remarkable forms of fine trees. Tilia alba pendula is more than 30 feet in height, and is very handsome. Picea nobilis, Nordmanniana, Pinsapo and nobilis, are each 27 feet in height, well furnished with branches, and very handsome. The original plant of the Golden Chinese Juniper, which has its home in these grounds, is some 10 feet in height, of a conical form, with a golden head. A variegated silver-margined Chestnut, which was also raised in this nursery, is present in considerable numbers, and is very attractive. Taxodium sempervirens is more than 30 feet in height. Some standard forms of the Weeping Birch, which was first cared for in this nursery, are attaining considerable size, and their pensile weeping branches produce an excellent effect.

The whole of the ground on the opposite side of the main walk is devoted to the various propagating and nursery purposes. A span-roofed propagating stove, 70 feet in length and 14 feet in width, has closely-glazed cases along the centre, for its entire length, and open benches on either side; another stove is 50 feet long and 14 feet wide, a walk runs along its centre, and closely-glazed cases occupy both sides of the house. Both these houses were filled to overflowing with embryo plants of choice trees and shrubs, amongst which we particularly noticed the new Golden Chinese Juniper, Magnolia Campbellii, &c; and the whole of the Japanese novelties, of which this nursery contains probably the most unique collection in the kingdom, were undergoing the process of multiplication, under the care of that indefatigable propagator, Mr. Hurd, under whose unceasing care this collection has increased with great rapidity. Another span-roofed house—like the others, very effectually heated by hot water—is 100 feet long and 15 feet wide. It has a wide bed down the entire length of its centre, and benches on either side. Standing on the floor at the entrance at either end are some compact examples of standard Bays. Fortune's new hardy Palm occupied a considerable portion of the benches on either side. A good specimen of Aralia Sieboldii in flower, and many nice plants of smaller size occupied the benches. Amongst the multitude of Japanese and other beautiful plants which occupied this house we noted a compact specimen of Retinospora plumosa, 3 feet in height; Retinospora plumosa aurea is 2 feet in height and 4 feet 6 inches in circumference, and is very beautiful; Retinospora plumosa variegata is 2 feet high and 4 feet 6 inches in circumference; a compact specimen of Thuja pygmæa is about 2 feet in circumference; Ligustrum coriaceum is also 18 inches in circumference. We also noticed Raphidiophis ovata, Hydrangea Otaksa, and H. paniculata grandiflora. Moreover, there was a great array of seedling Aucubas, the golden character of whose distinct and gorgeous foliage was very telling; many of these beautiful plants were also heavily laden with large coral berries.

Closely adjoining this house a double range of pits, recently erected, 220 feet in length and 7 feet in width, are chiefly filled with plants in pots growing onwards into specimens. We noticed a considerable number of the new Osmanthus rotundifolius, of which Mr. Young purchased the imported plants; the broad-leaved silver Euonymus, several golden-blotched varieties of Cupressus Lawsoniana, also quantities of different species of Retinospora and other Japan novelties, as well as Tea-scented Roses, of which a large stock is grown. A quintuple range of wide pits, each 90 feet in length, is filled with cuttings of hardy Conifers, as well as other trees and shrubs; of the latter there were large quantities of Aucubas and variegated Hollies. Closely adjoining these there are nine other ranges of long pits, filled to overflowing with struck cuttings from the stoves: some of these ranges are covered with glass, others have a protection of dried heath. The whole remaining portion of the ground, unoccupied with the houses and pits, is divided into narrow spaces by lofty well kept hedges of Yew and Chinese Juniper; in the spaces thus formed the whole of the young stock, when sufficiently rooted, is planted and moved onwards until ready to be transferred to the open nursery. Here we noticed vast quantities of Japanese plants, as well as gold and silver-striped Hollies, Aucubas, &c., of which there were large quantities in all stages of growth, many of which were handsome plants, heavily laden with fruit, and well adapted for table and room decoration; there were also large quantities of young Deodars, strong and robust in character.

A somewhat novel mode of shelter is adopted here, when the hedges are wide apart; it is to plant standard Weeping Birches somewhat sparsely across the beds, the branches of which not only break the force of the wind, and in some measure intercept the frost, but are also effective in sheltering the plants from the fierce rays of the summer sun. Protection by dried heath is also extensively and successfully practised in these grounds.

Another portion of the nursery, 41 acres in extent, of excellent land, is in three divisions, again subdivided by walks and paths into rectangular brakes, in which are grown large quantities of green and variegated Hollies, Yews, Atlantic and other Cedars, Aucubas, Yuccas, Yews, Atlantic and other Cedars, Aucubas, Araucarias, Junipers, &c., in large quantities; here, too, evergreen forest trees and coppice plants are well and excellently grown. A portion of this nursery, 13 acres in extent, was added by purchase two years since. The ground was all deeply subsoiled and trenched; a broad walk was formed round the field, and planted with Common and Portugal Laurels, Yews, Araucarias, Douglas, Menzies, and other Firs; and the centre portion was filled with Chestnuts, Thorns, Ash, and similar plants, which are now in process of removal for sale. On the southern side of the road there is a field of 8 acres, in which quantities of Scotch, Larch, and other Firs are well grown. Alder and Hickory are also in great request for renovating Coppices, and are here in quantities. We also noted seed-beds of Portugal Laurels, Mahonias, Scarlet Oaks, &c. Adjoining this field is another of 5 acres in extent, of a deep hazel loam, which is devoted chiefly to the cultivation of fruit trees and Roses. Of the former we observed some excellent examples of Apples, alike in standard, dwarf, and pyramid forms: of the latter there is a large breadth in fine condition, and comprising all the leading sorts worked on strong standards of different heights, as well as dwarfs on the Manetti stock. Another field of suitable land, 3 acres in extent, is employed in raising Hollies, Quicks, and sundry other plants from seeds, and which is required for stocking these extensive grounds. Mr. Young being also engaged in farming operations has the opportunity of changing his rotations occasionally, and substituting a crop of roots in succession to trees.

Another well sheltered field, of suitable soil, and 10 acres in extent, is devoted to the cultivation of American plants; and here are Rhododendrons, in fine young plants of all the best named varieties, in all shades of crimson, white, and purple, besides a large stock of the older varieties, as well as of R. ponticum, for wood and cover planting. *N.*

Obituary.

On January 24, died John Lloyd, gardener, in the 79th year of his age—one of those characters who, without the least attempt at display or effect, could scarcely help being noticed, known, and esteemed pretty extensively by men of his own profession and pursuits. His name and his character were best known among succulent plant growers, and Fern collectors. He had a wonderful success in cultivating both these tribes of interesting plants; and with regard to succulents, he certainly was gifted with a most extraordinary ability in distinguishing species—a quick and penetrating eye to catch at once the points of difference between one species and another: this was more especially observable in his knowledge of Aloes, Agaves, &c., and caused him to be known as the Richard Bradley of our times. This peculiar talent, added to the strictest integrity and upright dealing in all transactions, caused him to be much valued by his employers; and when it was found that his strength was failing, and that no adequate provision for his declining years had been made, several of those who had benefited by his faithful services made up for him a small annuity to help him along in the close of his earthly career. Although he had not had the advantage of any great amount of early education, John Lloyd had made the most of all opportunities to acquire knowledge wherever it was to be got at, and the amount of general knowledge that he possessed was something quite out of the common. This rendered him a valuable companion in a botanising or a garden-visiting ramble, for his information was not only varied and extensive, but it was of a depth which could not very easily be exhausted or drawn dry.

Leaving his native home in Herefordshire in early life, he came to London, and his first employment was in the old Brompton Nursery of Harrison & Co., and nearly the whole of his life was passed in the vicinity of the metropolis, except that for a few years he occupied a subordinate position in the gardens of the Duke of Grafton, at Euston Hall.

That John Lloyd was a keen observer of facts in most branches of natural science besides botany, may be gathered from his occasional contributions to the later volumes of the "Phytologist," and some few communications to our own columns in past years. He had been in his time a capital walker; nothing pleased him more than a good long botanising ramble. A very favourite part with him was that interesting district in Surrey and Hants—south and south-west of Hind Head and the intervening country towards Selbourne, of which the village of Thursley marks about the centre of what may be called Lloyd's wanderings; every yard of it was perfectly known to him—one result of his researches hereabouts being that he actually gathered four out of the six British species of Lycopodium, including the L. alpinum. But very many of the most distant parts of the kingdom had been at one period or other visited by him—Scotland, Ireland, and the Channel Islands; and last of all, and latest in life, the central and most interesting parts of North Wales. In the year 1867 the writer of these lines had the pleasure and the advantage of his companionship, and again in the last year (1869) for several weeks, and his delight at, and admiration of our Merionethshire scenery and vegetation were, so to speak, unbounded. The freshness of the mountain air seemed to have a most invigorating effect upon him, and he made no difficulty of a walk from this village (Llandderfel) across the mountain to Llangynog and back in one day—or over that other noted grand pass to Llan-y-mowddy, besides almost daily excursions more or less distant in other directions—the furthest day's ramble involving a walk of not less than 18 or 20 miles, a rather formidable one for a man who had seen 77 years and 1 more. *W. P.*

Miscellaneous.

The French Frog Eaters.—That the French are a nation of frog-eaters was the firm belief of our grandfathers, and even of our fathers, and the belief still exists, no doubt, among a considerable number of our people. But of thousands of Englishmen who have been to France, those who have seen frogs at table are few indeed. The fact is, that as the French have become eaters of beef and mutton (formerly scarce things among them), they have less need than they had of such flimsy food, and neglect it accordingly. Still, the consumption of frogs, though greatly declined, has not ceased, and the newspapers mention vast quantities being sent in from Luxemburg, saying nothing of the home production. One single dealer in Luxemburg is said to have forwarded 200,000 in three weeks. It is only the legs of the frog that are edible: they constitute a dish very like chicken (I have tasted them). But the journals tell us that of late the heads of the frogs have been employed in hospitals for soup, and the skins sold in restaurants. And how think you do the eating-house keepers utilise the skins? In making turtle-soup! *W. Pass.*

A Rose Show.—As the judge enters, the exhibitor leaves the show, first turning to gaze once again upon the exquisite beauty of the scene,—the long avenues of Roses, the fairest examples which the world can bring of its most lovely flower. The flat surface of the boxes of its most lovely flower. The flat surface of the boxes is pleasingly diversified (or should be) by the stately Palm, the graceful Fern, the elegant Hunnea, by Croton, Caladium, Dracæna, Coleus, and the like, which not only prevent the uniformity from becoming monotonous, and the repetition wearisome, but soften agreeably that blaze of colour which would be, without such contrast and interruption, too bright for mortal ken. These are placed at regular intervals in the centre of the tables, singly or in groups. Pretty specimens of the silver-leaved Maple (Acer Negundo variegatum), about 4 feet in height, were thus freely introduced, and with admirable effect, at the last Birmingham Rose Show. *S. R. Hole, in "Gardeners' Chronicle."*

Whitewash.—The sulphate of baryta is said to possess many advantages over lime as a material for whitewashing walls. Four ounces of glue are soaked for 12 hours in tepid water, and then placed, until boiling, in a tin vessel with a quart of water, the vessel being placed in water, as in the usual process of melting glue; the whole is then stirred until dissolved. Six or eight pounds of sulphate of baryta, reduced to an impalpable powder, are put into another vessel; hot water is added, and the whole stirred until it has the appearance of milk of lime. The sizing is then added, and the whole stirred well together, and applied in the ordinary way whilst still warm. *Builder.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES

Specimens plants of *Fuchsias*, *Heliotropes*, and other similar free-flowering and useful subjects, which are planted out in warm greenhouses, would now be much benefited by being moderately supplied at the roots with tepid water. This will induce the young shoots and flowers to push more vigorously, and so bring them forward at an earlier date than otherwise would be the

case. *Luculias* which have finished flowering will now require direct attention in all instances where they are planted out, especially in regard to keeping the growth well within bounds. This plant does not, as a rule, like very severe cutting in, and yet it will make very rambling growths; the shoots often become so elongated as to reach the full extent of the allotted space, at the same time that the base, or middle of the plant, is left perfectly bare. Where it is not practicable to cut these straggling shoots in, an effort should be made to tie down the head, or at least a portion of it, if this can be done without making the specimen too unsightly. Some few *Orchidaceous Plants* will now be pushing fresh growth, and should accordingly receive every encouragement, especially *Oncidium flexuosum*, *Zygopetalums*, *Epidendrums*, and sundry others of a similar habit. Those plants which require more pot room should be carefully shifted at once; others not needing so much should have all the loose materials which may lie upon the surface of the balls removed, and have a surfacing of fresh materials placed in its stead. These materials should be the best of their kind, porous, fibry, and sweet, and the firmer they can be placed around the base of the plants the better. Such plants as the above should receive moderate root waterings, and should be placed in the most favourable positions in the house for obtaining light. Be very careful, however, not to let the soil become too wet or sodden about the roots. Where there is room, it would be advisable upon the first opportunity to pot off as many as possible of the autumn-struck cuttings intended for summer bedding purposes. Those who have vineries and other similar structures at work may make good use of them, filling them with plants of this description, if they be free from insects. Do not, however, pot off more now than you can find room for, in a cooler position, in a month or six weeks' time, and where they may be somewhat hardened off after the first roots have been made, and a fair start has been given to them.

FORCING HOUSES.

Where the berries upon early *Vines* are so forward as to be swelling, increase the temperature to a mean of from 74° to 76°, allowing a further rise of 7° or 8° by sun-heat alone, with a decrease by night of 8° or 9° from the mean suggested. Give as much fresh air as possible upon all proper occasions, but not in such a manner as to allow it to blow too freely upon the Vines, but endeavour to cause it to gently pervade the whole structure alike, or, in other words, endeavour as often as possible to change the whole body of air for a fresh one. Be careful not to start too early any house of Grapes in which the Vines, from some cause or other, did not ripen their wood early and well last season. The more any Vines may have been taxed in the past season, so much the greater is the necessity for permitting them to break naturally. Give young successional *Pines* an advance of about 3° more heat now that the length of the days, and with it the amount of light, is increasing. By affording air in the morning to fruiting Pines, manage to shut up early with a moist atmosphere, and allow the thermometer at such a time to reach from 88° to 90° by the aid of sun-heat. Do not, however, permit too high a night temperature. *Strawberries*, after the preliminary week or fortnight's housing in an intermediate structure, may now be pushed along freely. They delight in a little bottom-heat at the starting time. Keep them, while in flower, moderately dry, until well set. Have before advised the same treatment in regard to *Peaches* and *Nectarines* in flower. Gently jerk the wire trellis-work, to which these are fastened with the hand when the sun shines, and when air is on freely, and a nice buoyant atmosphere prevails. Pot off young *Cucumber* plants, where required, immediately the third or rough leaf is shown. Use moderately dry, nicely warmed soil, and give a soaking of water, heated to about 95°, on the following day, which will induce them to root freely. In potting them bury the somewhat drawn foot-stalks a little, so that roots may be emitted from them, to aid in forming a vigorous plant. Shade them, if the sun shines freely, for a couple of days, and keep them well up to the glass.

HARDY FLOWER GARDEN.

In continuation of my remarks on ornamental Shrubs, I need only refer to the *Hollies*, so numerous have the varieties become. Of *Junipers* there is also a great variety; the Carpet Juniper (J. prostrata), and the Savin (J. Sabina) are characteristic and distinct, and of moderate growth. I must also notice the *Sweet Bay* (Laurus nobilis), the *Lavender* (Lavandula spica), the many beautiful *Paonies* of recent introduction, *Lilacs*, *Arborvitæ* (Thuja aurea, T. pyramidalis, and T. plicata especially), *Yews*, both golden and plain, the *Laurustinus*, &c., as plants generally known and to be relied on. I cannot here enter into the long list of Conifers. I may however, refer to the very beautiful *Thujopsis borealis*, than which a more handsome one does not exist, and of which there is a variegated variety. The very singular and no less beautiful *Maiden-hair tree* (Salisburia adiantifolia) should not be omitted by any one. The *Tamarisk*, a native of Southern Europe and the Levant, thrives remarkably on or near our sea coast, and really deserves to be planted more extensively. Nor should the *Adam's Needles* (Yucca filamentosa, Y. gloriosa, and Y. recurva) be overlooked, as they grow freely and add variety everywhere. Amongst "bog-earth plants," more commonly called American plants, we have some exceedingly interesting things, such as *Andromedas*, *Ledums*, the pretty little Box-leaved *Milkwort* (Polygala Chamæbuxus), *Rhododendrons*, the lovely evergreen *Kalmias* (which are amongst the most beautiful of North American introductions), the constant summer and autumn blooming *Dabœcias*, or Irish Heaths; and last of the class, the dwarf Heaths, such as *Erica carnea*, an early spring flowering sort, and *E. vagans*, which flowers in autumn. The former of these bloom away in defiance of frost, snow, or any form of weather, very early, the flowers lasting a long time upon the dwarf neat-growing plants. I would also especially call attention to *Daphne Cneorum* as one of the prettiest of bog-earth plants, than which no plant is better adapted for an edging to Rhododendron beds. I may also mention two others suitable for other soils besides peat, viz., the blue-flowered *Lithospermum fruticosum*, and the showy old red and white *Mezereons*. I finish with a reference to the evergreen Oak, *Quercus Ilex*, which is a very effective tree in any landscape.

HARDY FRUIT GARDEN.

Pruning should be strenuously pushed forward immediately the weather becomes favourable, as the sap will soon become active, and make the buds plump, preliminary to bursting. *Bush fruits* may also be pruned with some chance of receiving less injury to the buds which remain from birds than would have been the case had they been pruned earlier. The longer *Gooseberries* are left the better, on this account. In pruning standards, or any form of bushes, always leave the middle of each as open as possible, so that light and air may have free admission throughout the branches. Remove the suckers and similar growths which push from the base of *Filberts* and similar kinds of nuts. Particularly attend to the pruning of *Peach* and *Nectarine* trees at the earliest possible time.

KITCHEN GARDEN.

As soon as the ground is fit to work upon, push forward the preliminary preparations for the general crops which are intended to occupy given quarters. Light soil will require moving but little after having been once thoroughly dug over. Heavy soils, on the contrary, cannot be too freely exposed to the influence of the air by lightening them up. Make a first sowing of *Walcheren Cauliflowers* in a pan, and also sow for the first batch of *Peas* where the practice of trans-planting pot or box-sown plants is carried out. *W. E.*

TOWN GARDENING.

SHOULD the weather continue open, the present is a favourable time for dressing *Lawns* and *Grass plots*. All daisies and other weeds should be exterminated; and a coating of rotten dung or fresh loam should be spread over the surface. This should be well and frequently brushed about, and be well rolled in fine weather. Trim the edgings neatly with the edging iron; and if it is intended to sow *Grass seeds* or lay turf, the ground should now be forked up rough and have all the coarse rubbish picked out. It will be better to defer sowing the seeds or laying the turf until the end of the month. Where edgings to beds or borders are required, they should now be put down. The best kind for small gardens in towns is that made of wood, neatly scolloped at the top and painted. If *Crimson Thrift* or *London Pride* is planted, or seed of the *Virginian Stock* is sown close to this, a lively edging is formed. Ornamental tiles are very neat and effective, but if great care is not taken they are liable to be broken when digging or rolling. For squares and larger gardens *Ivy* makes an excellent edging, if trained on wires, strained about 3 inches from the ground. The *Virginian Creeper*, if treated in the same manner, makes a pretty change during summer, and it will grow almost anywhere. The best of all edgings, if neatly kept, is, however, a Grass verge, about 9 inches wide. *J. D.*

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, JANUARY 29, 1870.

NAMES OF STATIONS	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	46·0	24·0	22·0	42·8	27·5	15·3	34·9	0·09
Blackheath ..	40·8	19·6	21·2	37·4	25·1	12·3	31·6	0·00
Oxer Court (Hextall) ..	41·8	19·4	22·4	38·1	24·7	13·4	31·6	0·02
Birmingham ..	39·4	22·1	17·3	38·1	27·3	11·1	32·5	0·05
Wolverhampton ..	37·7	22·7	14·5	35·6	27·6	8·0	31·3	0·01
Leicester ..	41·5	20·2	21·3	37·7	25·7	12·0	31·9	0·01
Nottingham ..	41·9	23·0	17·9	38·7	28·5	10·2	33·1	0·05
Sheffield ..	43·0	22·6	21·0	39·2	27·7	11·5	33·1	0·06
Liverpool ..	40·9	24·8	16·1	38·6	27·6	10·4	32·5	0·09
Old Trafford ..								
Manchester ..	40·9	22·0	18·0	37·6	26·3	11·3	31·6	0·03
Pendlebury (Salford) ..	40·5	23·0	17·5	39·2	26·8	12·4	32·7	0·02
Hull ..	41·0	17·0	27·0	37·4	24·6	12·8	30·7	0·04
Bradford ..	40·5	23·5	17·0	38·5	27·0	11·5	32·1	0·00
Leeds ..	38·0	22·0	16·0	36·4	28·9	11·5	34·1	0·02
Newcastle-on-Tyne ..	39·0	22·0	17·0	34·5	25·2	9·3	29·5	0·00
Glasgow ..	39·6	25·4	..	..	..	..	31·2	0·04
Edinburgh ..	41·7	28·0	..	..	..	..	34·7	0·00
Dundee ..	39·6	26·0	..	..	..	..	31·1	0·00
Aberdeen ..	41·3	22·6	..	..	..	..	33·8	0·03

STATE OF THE WEATHER AT BLACKHEATH, LONDON,

FOR THE WEEK ENDING WEDNESDAY, JAN. 26, 1870.

1870 MONTH AND DAY	Readings of Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point	Weather
	At 9 A.M.				
January and February	Inc.	Deg.	Deg.	Deg.	Gr.
27. Thurs.	30·11	34·1	27·1	27·3	68	1·4
28. Friday	30·07	39·1	34·1	33·1	84	0·3
29. Satur.	29·58	37·1	32·3	30·2	77	0·3
30. Sunday	29·62	37·1	32·8	30·5	77	0·3
31. Monday	29·51	40·1	39·0	38·1	90	0·1
1. Tues.	29·86	40·8	40·3	39·7	93	0·2
2. Wednes.	29·58	41·6	41·0	40·1	94	0·2

1870 MONTH AND DAY	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range in Day.	Mean.	Difference from Average.	Mean Dew Point.	WIND. Direction.	Force.	RAIN. Fall.
January and February	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	In.
27. Thurs.	44·2	30·8	13·4	37·5	4·5	variable		08	0·00
28. Friday	51·7	39·0	12·7	45·3	3·3	S.E.		11	0·03
29. Satur.	50·5	41·1	9·4	45·8	3·8	S.E.		13	0·00
30. Sunday	41·9	27·0	14·9	34·5	7·0	S.E.		06	0·00
31. Monday	44·7	38·1	6·6	41·4	3·9			00	0·07
1. Tues.	47·5	37·0	10·5	42·0	4·2	S.W.		10	0·01
2. Wednes.	44·1	36·3	7·8	40·2	2·2	S.		15	0·07

January 27.—A very fine day; clouds so, foggy.
" 28.—Generally cloudless and fine during the morning; clouds at night.
" 29.—Cloudless; very fine.
" 30.—Generally cloudless; an aurora at night.
" 31.—Overcast during day, and partly cloudless at night.
February 1.—Generally cloudy; rain fell in the morning, an aurora at night.
" 2.—Overcast; thin cumuli.

The temperature was generally below average; the mean of the 30th and 31st, and 1st, remained 4° below the average, and the mean of the 28th and 29th on the 29th and 30th.

The mean daily temperature of the seven days, compared with the average on the 29th, being the last week on which it has been [illegible] since January 17.

JAMES GLAISHER.

Notices to Correspondents.

BARNES' MEMORIAL.—Subscription received: Mr. G. Ford, West Park, £1 1s.

BOOKS: *E. B. C.* is referred to p. 693 of our last year's volume, for a notice of M. Lemaire's book on Cacti.

CAMELLIA: *C. Aldeu.* Your seedling, Mrs. Baskerville Glegg, is pretty, and, we think, distinct; that the flower is rather undersized: it is full double, with broad smooth petals, and nicely imbricated. The colour is very pleasing—a soft clear blush, sparingly striped with faint carmine. The foliage is bold, and of a good deep green colour.

FENCE: *H. J. C.* Polypodium vulgare.

GRAFTING APRICOTS AND PLUMS: *A Constant Reader.* These may be grafted on the Wild Plum stock. Much being the season for the operation, or budded on the same, which is most suitable for Apricots, in the end of July or beginning of August.

INSECTS: *H. S. S.* The insect is a small, shining, dark chestnut brown mite, named Oribata geniculata (Linn.). Respecting the name geniculata (knee-d), derived from the knees being knobbed and distinct from the thighs, which are thickened. At first sight it is a most minute black dot, which, when it moves, is seen to be an insect, and looks like a round beetle, about half the size of a small pin's head. It is usually found under bark, or stone, and probably feeds on decaying matter of some kind or other. We cannot find that it has been described as destructive to fruit trees; it will then [illegible] be interesting and useful if "W. S. S." will favour it with any details as to the effect its attacks have upon living trees, its periods of appearance, and generally as much information as he can give regarding its habits. *J. M.*

MAKING CUTTINGS OF FIGS: *A Constant Reader.* Cuttings may be made now of any portion of the ripened wood of the past season. The simplest cuttings are the small shoots of last year's growth taken off with a heel of the older wood; the shoots may, however, be cut up into lengths of an inch or so, containing one eye each, in the same way as practised with Vines. To succeed well, they should be plunged in pots in a good brisk bottom-heat of about 70°, and freely watered. Cuttings made of the wood when nearly ripe in autumn, strike more freely.

NAMES OF PLANTS: *H. J. C.* No. 1. Callitris quadrivalvis, a native of Algeria, and not hardy. *A. M.*—*Dido.* The Artillery Plant, Pilea muscosa.—*B. Duffell.* 1. Cotoneaster microphylla; 2. Polypodium vulgare; 3. Saxifraga Geum.

PRUNING TREES: *P. O. R.* The less trees go over old are pruned the better. If it is necessary to cut at all, do it before the sap is on the move, or else defer till midsummer. Limbs "as thick as a man's arm" should not be cut off. This is not pruning, but amputating.

RECTIFICATION OF AN ERROR: — Messrs. Stuart & Mein request us to state that they have received a letter from Messrs. Downie, Laird & Laing relating to an erroneous statement published in the Catalogue of Gladioli issued by the latter firm (see p. 108). The statement in question is acknowledged to be erroneous, and to have been made without the cognisance of the principals.

RIPENING OF PEARS: *A Constant Subscriber.* We have no positive data: the difference cannot be great, however; we should say about a week, not more. With us the Citron des Carmes Pear is generally ripe about the 10th and 12th July: that is, as an open standard. It is useless to grow it on a south wall. In regard to the

Lichen, the general opinion is that it does not do any harm.

TRANSPLANTING LARGE DAMSON TREE: *Ibid.* This should be accomplished at once, or if not done soon wait till October next. Excepting the top is very large and wants pruning, you need not interfere with it. Nothing would be gained by lopping it back now and planting next year. In moving trace out and preserve all the roots you possibly can.

COMMUNICATIONS RECEIVED:—Adams & Grant—P. M.—Thoth. —E. B.—G. H.—T. W. M.—R. M.—Sutton & Sons.—F. R. —P. Wolkenstein.—J. W.—A Sub.—H. J. C.—P. Fry.—T. S. Ricinus.—W. H.—C. A.—Fern.—M. J. B.—A. F.—H. H. C.

Markets.

COVENT GARDEN.—February 5.

There is not much improvement to be noted, the markets nere being generally well supplied, with the exception of good Apples, both dessert and culinary sorts, which are scarce. Foreign imports are well kept up, and salading generally is much improved, both in quantity and quality. St. Michael's and other first-rate descriptions of Oranges have advanced considerably. The Potato trade is still very heavy, with no change in prices. Such flowers as Heaths, Cyclamens, Primulas, Tulips, Cinerarias, and Cytisus racemosa are now plentiful.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	3 0	to 5 0	Lemons, per 100	5 0	to 10 0
Cobs, per lb.	0 0	1 0	Melons, each	1 6	3 0
Chestnuts, p. bush.	8 0	14 0	Oranges, per 100	6 0	12 0
Filberts, per lb.	0 6	0 9	Pears, per doz.	1 0	6 0
Grapes, per lb.	6 0	10 0	Pine-apples, per lb.	8 0	10 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	0 0	1 0	HorseRadish, p.bun.	3 0	to 5 0
Artichokes, p. doz.	3 0	to 6 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 0	2 0
Broccoli, per doz.	1 0	2 6	Mint, per bunch	1 0	1 6
Brussels Sprouts, p. ½ sieve	2 0	3 0	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz.	1 0	1 6	Onions, per bunch	0 4	0 9
Capsicums, p. 100	2 0	2 6	Parsley, per bunch	0 2	0 4
Carrots, p. bunch	0 4	0 8	Potatos, new, p. lb	0 4	0 6
Cauliflowers, p. doz.	1 6	3 0	Salsafy, per bundle	1 0	1 1
Celery, p. bund.	1 0	1 6	Scorzonera, do.	1 0	1 3
Cucumbers, each	1 6	3 0	Shallots, per lb.	0 6	0 8
Endive, per doz.	1 6	2 0	Spinach, p. bushel	2 0	3 0
Garlic, per lb.	0 8	..	Radishes, per doz.	1 0	1 6
Herbs, per bunch	0 2	0 4	Turnips, per bunch	0 4	0 6

Potatos, York Regents, per ton, 75*l.* to 100*l.*; Flukes, do., 75*l.* to 115*l.*

POTATOS.—Southwark, January 31.

During the past week the arrivals coastwise have been very heavy, and the market much glutted. Trade very dull, and prices declining. This day's quotations:—Yorkshire Regents, per ton, 70*l.* to 85*l.*; Lincolnshire do., 60*l.* to 75*l.*; Kent and Essex do., 60*l.* to 75*l.*; Dunbar and East Lothian do., 70*l.* to 95*l.*; Perth, Forfar, and Fifeshire do., 60*l.* to 70*l.*; Ditto Rocks, 60*l.* to 65*l.*; French and Belgian Whites, 50*l.* to 55*l.*

STUART, MACDONALD, AND CO., SEED GROWERS and SEED MERCHANTS, 85, Southampton Row, Holborn, London, W.C.

S., M. & Co.'s WHOLESALE LIST of all the choice Flower Seeds in cultivation forwarded on application.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and IMPLEMENT MERCHANTS,
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excelled Seed Corn and Seeds."

To the Trade.

CATTELL'S ECLIPSE BROCCOLI, 4*s.* per lb.; The HORTICULTURAL SUPERB, 3*s.* per lb. The best and latest Broccolis grown
RINGLEADER PEAS, true, 10*s.* per bushel, 7*s.* per quarter
WM. HORLEY, Toddington, Beds.

PATERSON'S VICTORIA POTATOS won the First Prize at the Staffordshire Agricultural Show; First Prize and Highly Commended for the Second at the Birmingham Show. Price 5*s.* per 56 lb. Also a few MILKY WHITES, 7*s.* per 56 lb
Mr. PEARCE, Measham, Atherstone.

POTATOS, for Planting.—Twenty Tons of Dalmahoys, do. Myatt's Prolific, and a good selection of about 20 useful sorts, at the lowest remunerating prices, for cash. Price Lists on application
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough

Seed Potatos.

H. AND F. SHARPE'S WHOLESALE LIST of all the new and best varieties of Early and Late POTATOS is now ready, and may be had on application. The quality is very fine, and prices low.
Seed-Growing Establishment, Wisbech

Early Rose Potato.

H. AND F. SHARPE have just imported a very true stock of the above extraordinary prolific POTATO, direct from one of the best growers in America, and are prepared to offer it to the Trade at a reduced price
Seed-Growing Establishment, Wisbech

RICHARD WILKER has the following to offer, for cash:—SEAKALE, for planting, 3*s.* 6*d.* per 100; splendid ASPARAGUS, for planting, 15*s.* per 1000. My AMERICAN RED POTATOS have produced over 16 tons to the acre this year, 4*l.* per cwt.
Biggleswade Market Gardens

PEAS.—Maclean's fine Wrinkled Marrows,
Premier, | Early Emerald,
Little Gem, | Advancer
For full description see CHARLES TURNER'S DESCRIPTIVE CATALOGUE, now ready
The Royal Nurseries, Slough.

To the Trade.

SUTTONS' RINGLEADER PEA.
SUTTONS' BERKSHIRE KIDNEY POTATO.
SUTTON AND SONS can supply the above, very true to name, and of their own growth, at moderate prices
SUTTON AND SONS, Seed Growers, Reading

Seed Counties, Suffolk and Essex.

DAVID GOLD MCKAY, SEED GROWER, Sudbury, Suffolk, begs to offer complete Collections of VEGETABLE SEEDS, carriage free.
No 1 COLLECTION .. £3 | No 2 COLLECTION .. £2
No 3 COLLECTION .. £1
Alterations made to suit purchasers.
Any lady or gentleman ordering the above may depend on having really "Pure Home-grown Seeds." CATALOGUES free on application
The "Old" Established Seed Warehouse, Sudbury, Suffolk

WANTED, a PARTNER, in an Old-established and Provincial Nursery of the highest respectability From the position and reputation of the establishment, this would form an excellent opening for a Gentleman of moderate capital, business habits, and knowledge of the Trade
Messrs. PROTHEROE AND MORRIS, The American Nurseries, Leytonstone, N.E.

WANTED, a steady, industrious GENERAL NURSERY FOREMAN or MANAGER, one in whom every confidence can be placed, and who thoroughly understands Budding and Grafting of Fruit Trees, Roses, &c.; a knowledge of indoor work also indispensable. To a deserving man liberal wages will be given.—SAMUEL DYER, Nurseryman, Bridgwater.

WANTED, a WORKING FOREMAN, for a Pig Farm near London.—A person who thoroughly understands the Management of Pigs, as well as Buying and Selling. Liberal arrangement.—F. B, Mr Lighton, Grocer, Brixton Rise, London, S.W.

WANTED, an active Young Man for NURSERY and OUT-DOOR WORK.—Must be a successful Grafter and Budder.—Apply by letter, with reference and wages required, to H. CARRINGTON, Nurseries, Mile End, near Stockport

WANTED, a GARDENER, who understands the Names and Cultivation of Alpine and Herbaceous Plants and Ferns, and the Construction of Rockwork and Alpine Work. He will have the care of a Greenhouse and small Kitchen Garden. To any one having a natural taste for and knowledge of the above subject liberal wages will be given.—Apply by letter to Mr. CLARK, Beechmont, Sydenham Hill, London, S.E.

WANTED, an active industrious Man as UNDER GARDENER. Wife good Laundress. Excellent character indispensable.—Rev. J. B. R., Careby Rectory, Stamford.

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WANTED, as ASSISTANT, a Young Man, of good appearance and address, having a thorough Knowledge of Vegetable and Flower Seeds.—Apply, stating references and expectations of salary, to JOHN B. MCKENZIE AND CO., Seedsmen, 29, Patrick Street, Cork.

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WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose character will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

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JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable reference need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
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COLLECTOR of NEW and RARE PLANTS.—Has had nearly two years' experience in different countries for an eminent London Firm, and has hitherto proved himself successful in all his expeditions.—ERN TUCKER, Nurseries, Faringdon, Berks.

GARDENER (HEAD), age 36, married.—Sir WALTER JAMES is desirous to recommend a Man as above. Thoroughly practical in all departments.—W. H., Betteshanger, Sandwich, Kent.

GARDENER (HEAD). Age 35, married; great practical knowledge in all branches of the profession. Good character.—A. M., Vale Lodge Gardens, Leatherhead, Surrey.

GARDENER (HEAD).—Understands the profession in all its branches. Can be well recommended.—G. K., Post Office, Blandford, Dorset.

GARDENER (HEAD). Middle-aged; with plenty of experience in every department, and a good will to use it in the interest of his employer. Good character.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey.

GARDENER (HEAD).—Age 27, married, no incumbrance; understands Early and Late Forcing, Stoves, Plants, &c., and the profession in all its branches. Can be well recommended.—H. A., Adams's Library, Lee Green, Lee, S.E.

GARDENER (HEAD). Age 35, married, two children; practically acquainted with Vines, Melons, and Cucumbers, Stove and Greenhouse Plants, Flower and Kitchen Gardening.—H. NORRIS, Wandsworth Lodge, Upper Tooting

GARDENER (HEAD), single.—A Gentleman is desirous of recommending his Gardener, a Man of great knowledge in his profession, capable of taking a first-rate situation.—A. Z. (Single), Wm. Wood & Son's Nurseries, Muresfield, Uckfield, Sussex.

GARDENER (HEAD).—Age 38; a successful Cultivator of all kinds of Fruit, Flowers, and Vegetables. Wife as Laundress.—GARDENER, Mr. Bedford, Post Street, Godmanchester, Hunts.

GARDENER (HEAD).—Age 29, married, no incumbrance; thorough knowledge of Early and Late Forcing, Stove and Greenhouse Plants, and Flower and Kitchen Gardening.—E. M., Green, Crickhowell, Brecknock.

GARDENER (HEAD).—Married; thoroughly practical in every department. A good Grape Grower, and Flower and Kitchen Gardener. Character unexceptionable.—J. D., Taplow, Maidenhead.

GARDENER (HEAD).—Married; understands his profession. Wife a good Laundress. Also a Young Man as UNDER GARDENER, age 21. First-class references.—A. M., Post Office, Sonning, Middlesex.

GARDENER (HEAD).—Age 29, married; understands the Management of Vines, Fruit Trees, and Greenhouse; also Kitchen and Flower Gardening. Five years' good character.—GARDENER, Bisbrooke Hall, Uppingham

GARDENER (HEAD). — Age 43; great practical experience in Scotland, England, and Ireland; first-class in Grapes, Fruits, and Flowers. Married. Wife a good Cook, and Dairy. Highly recommended by a Lady, also, three years' good character.—S. D., 4, Green's Cottages, Merton Road, Wandsworth, Surrey.

GARDENER (HEAD).—E. CULLEY, who is now leaving W. W. Baker, Esq., is desirous of obtaining another situation with any Nobleman or Gentleman requiring the services of a superior Gardener, who understands the profession in all its branches, and has been a successful Grower of Orchids. Testimonials of character, &c., of the highest class.—E. CULLEY, The Gardens, Sprete Raleigh, near Exeter.

GARDENER (HEAD), practical working.—Age 39, married; thoroughly understands Stove and Greenhouse Plants, Vines, &c., Kitchen and Flower Gardens. Devoted to his work. Twenty years' unexceptionable character from his present employer, the Advertiser.—FLORIST, Post Office, Long Sutton, Spalding, Lincs.

GARDENER (HEAD), age 29.—Mr. T. EAST, Wolverton Gardens, Dorchester, can confidently recommend his Foreman, he having filled his present situation for four years to his entire satisfaction. He is practically acquainted with Fruit, Flower, and Kitchen Gardening, and is well up in Forcing.

GARDENER (HEAD).—Age 33, married, one child to Garden.—A Gentleman is desirous of recommending his Head Gardener, a steady, industrious man, who well understands every branch of his profession. Six years' character.—T. C. R., care of Wm. Wood & Son, The Nurseries, Muresfield, Uckfield, Sussex.

GARDENER (HEAD), age 29, single.—Mr. J. HOPE, Weston Park, Shifnal, can confidently recommend his Foreman, he having filled his present situation for four years to his entire satisfaction. He is practically acquainted with Forcing of Fruit, Flowers, and Vegetables, and the Management of Kitchen and Flower Gardens.

GARDENER (HEAD), age 36, married.—Mr. W. BROWNBRIDGE, Gardener to W. Martin Edmunds, Esq., Worsbrough Hall, is open to engage with any Lady or Gentleman in want of a Man who understands Gardening in all its branches. Can be highly recommended.—W. B., The Gardens, Worsbrough Hall, Barnsley, Yorkshire

GARDENER (HEAD), middle-aged, single.—Mr. J. RICHARDS being desirous of recommending as Head Gardener, begs to inform Noblemen and Gentlemen that, from his long experience in the Cultivation of Vines, Stove and Greenhouse Plants (Orchids included), Cucumbers, Melons, Flower and Kitchen Garden, &c., he can have first-class testimonials.—All particulars on application to G. H. R., Newton Nurseries, Chester.

GARDENER (HEAD), where three to five men are kept.—Age 29; understands the profession in all its branches. Good references as to character, &c.—E. H., William Trotter, Esq., Gateshead Grange Place, Kelso.

GARDENER (HEAD, WORKING).—Age 30, married; thoroughly understands Flower and Kitchen Gardening; also Forcing of Vines, Cucumbers, Melons, &c. Good character.—H. H., 29, Crane Grove, Holloway Road, N.

GARDENER (HEAD), or GARDENER and BAILIFF; age 42, married.—EDWARD BENNETT, in consequence of the death of his late employer, G. S. Foljambe, Esq., begs to offer his services to any Nobleman or Gentleman requiring the services of a first-class practical Gardener, fully competent in every branch of the profession, including Specimen Plant Growing, Early and Late Forcing, Spring, Summer and Autumn Bedding, Coniferæ, Roses, &c. He has for years a most successful Exhibitor, and a well-known Horticultural Writer. Testimonials of the very highest order, with 11 years' unexceptionable character.—Osberton Hall, Worksop

GARDENER (Single-handed, or otherwise).—Age 24, married. Nine years' practical experience. Good reference from present employer.—J. S., 20, Holly Grove, Balham, S.W.

GARDENER (UNDER), where improvement can be had in Glass-house Forcing. Four years in last situation. Excellent character.—C. C., 5, Wilton Street, Grosvenor Place, London.

GARDENER (UNDER), in the houses preferred. —Willing to make himself useful. Two and a half years' good character.—S. M., Rose Cottage, Halfway Street, near Eltham, Kent.

GARDENER (UNDER), or IMPROVER.—Age 21; has been in the Gardens four years; would make himself useful. Good character.—G. CHEESEMAN, Binstead House, Ryde, Isle of Wight

FOREMAN.—Mr. W. P. AYRES can recommend to any person an experienced and really first-class Plant and General Foreman.—W. P. AYRES, Nottingham, or E. COLE AND SONS, Withington, Manchester.

FOREMAN (Age 25).—WILLIAM STEWART, Gardener to W. H. H. Broadley, Esq., M.P., Welton House, Brough, East Yorkshire, can, with the greatest confidence, recommend his Foreman in the above capacity to any Nobleman's or Gentleman's Gardener in want of the same.—Address as above

PROPAGATOR (GENERAL), or FOREMAN and PROPAGATOR.—Will put up any Hard and Soft-wooded Plants, Azaleas, Camellias, Coniferæ, Roses, Rhododendrons, &c., also an expert and successful Grafter; first class practice.—R. W., 25, King Street, Derby

PROPAGATOR (SOFT-WOODED).—Thoroughly understands the profession. Eight years' good character.—P. P., Worth House, Tiverton, Devonshire.

PROPAGATOR (HARD or SOFT-WOODED).—Southern Counties preferred.—P. G., 28, Camomile Street, Bishopsgate, London, E.C.

PROPAGATOR, of Roses and Rhododendrons.—Age 27, married; a successful Propagator of Roses.—A. B., Wood & Son's Nurseries, Uckfield, Sussex.

To Noblemen, Gentlemen, and Landscape-Gardeners.

LAYING-OUT GARDENS, &c.—Advertiser (age 32, single) offers his services to any one having new Gardens to Lay-out, or old ones to Remodel. Is thoroughly experienced in extensive works, and accustomed to the Direction of Workmen. Good reference.—Y., 24, Brunt Street, Mansfield, Notts.

FARM BAILIFF.—Age 28, single; five years' good references.—A. W., Post Office, Bedford.

FARM BAILIFF and ESTATE OVERSEER.—Age 33, married; has had considerable experience in the above capacity, including Buying and Selling of Stock, the Supervision of all Building Operations, Repairs on a large Estate, Laying-out and Draining of Land, the Felling and Selling of Timber, the Management and payment of all Men and Repairs on the Estate, and is fully qualified to undertake a similar situation.—D. C. P., Mr. Chadwell, Stationer, Peterborough.

BAILIFF.—Age 47, married; active, of energetic habits, respectable, and thoroughly practical in Modern Farming, Steam Cultivation, Draining; good Judge in Stock, Buying, Selling, and a good Accountant; Management of Woods, Repairs, &c.—F. B., Post Office, Furneux Pelham, Buntingford, Herts.

BAILIFF and GARDENER, or BAILIFF only.—Middle-aged, married; thoroughly understands the Culture of both Light and Heavy Land, Buying and Selling of Stock, and likewise Gardening in all its branches. Left last situation in consequence of the Estate being sold.—A. B., Post Office, Bletchley, Bucks.

AGENT and ESTATE BAILIFF (age 38).—A Gentleman wishes to recommend a thoroughly trustworthy Person, who has been in his employ for 12 years in the above capacity. He is an excellent Farmer and most efficient Accountant, and will receive the highest character.—A. B., Messrs. Dalton & Lucy, Booksellers, Cockspur Street, Charing Cross, London, S.W.

AGENT or LAND STEWARD.—A Scotchman; was brought up a practical Farmer, and has had large experience in the Management of Landed Property. Can give the best of references as to character and ability.—A. B., Messrs. Thos. Gibbs & Co., Seedsmen to the Royal Agricultural Society of England, Half Moon Street, Piccadilly, London, W

LAND AGENT.—A Person of great experience desires a re-engagement.—H. A. H., *Gardeners' Chronicle* Office, W.C.

IMPROVER, in the Houses, in a Gentleman's Garden. A Young Man; four years' experience in present situation. Good character.—A. PHIPPEN, The Gardens, Dillington Park, Ilminster.

NURSERY, &c.—A well-educated, clever YOUTH, age 18, accustomed to Gardening, desires a Situation in a respectable Nursery or Private Establishment.—HORTUS, *Gardeners' Chronicle* Office, London, W.C.

JUNIOR ASSISTANT, MESSENGER, or otherwise, in a Seed Establishment.—A respectable Youth, age 16.—J. D., Cook's Post Office, Edgware Road, London, W.

SUTTONS'
GRASS SEEDS
FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for the following Soils and purposes:—

STIFF CLAYS.—To be met with in the London, Kimmeridge, Oxford, and Lias Clays.

HEAVY LOAMS.—Of the same formations as the preceding, but when they have been subject to surface admixtures and cultivation.

GOOD MEDIUM LOAMS.—On the Marls of the Old and New Red Sandstones, the Gault, and the Greensands.

LIGHT LOAMS.—Of the same formations as the preceding, but of somewhat lighter character.

LIGHT SANDY SOILS.—On New Red Sandstone, sands of the inferior Oolite, soils visited by Sand Drifts; also those covering up the stiff Lias and the Tertiary Sands of the Dorset Heaths.

SHARP GRAVELS.—Such as the Flint Gravel drift which overspreads so much of the Southern and Western parts of England.

CHALKY SOILS.—As the Mountain Limestone, the Oolites and the Chalks proper, where not too elevated.

SHEEP DOWNS.—The elevated and more exposed parts of the Oolites, such as the Wolds of Gloucestershire, the Cotswold Hills, and the plains of Wiltshire.

BLACK PEATY SOILS.

The Sorts contained in these Mixtures are grown in different localities, and gathered separately by the hand expressly for this purpose, by which means all noxious weeds are excluded. They consist of the most nutritive kinds of Fescues, Poas, Sweet Vernal, Perennial Clovers, Loliums, &c., and are mixed in such sorts and proportions as are most suitable to the soils to be laid down. In this we use our discretion, in accordance with our many years' experience in all parts of the kingdom, as well as in other countries.

PRICES:—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, Carriage free. 2 bushels Grass Seeds and 12 lb. Clovers supplied per acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

SUTTONS' RENOVATING MIXTURE, **9d.** per lb.; 80s. per cwt. Sow 8 lb. to 12 lb. per acre.

SUTTONS' MIXTURES of GRASSES and CLOVERS For ONE YEAR'S LAY, **13s. 6d.** p. acre, carriage free For TWO YEARS' LAY, **17s. 6d.** p. acre, carriage free. For THREE or FOUR YEARS' LAY, **22s.** per acre, carriage free.

Special estimates given for large quantities.

SUTTONS'
HOME-GROWN FARM SEEDS.

Lowest price per cwt. or bushel on application.

	Per lb.	s.	d.
SUTTONS' CHAMPION SWEDE	..	.. 0	9
HARDY PURPLE-TOP SWEDE	..	.. 0	7
IMPROVED HARDY WHITE SWEDE	..	.. 0	10
SUTTONS' GREEN-TOP YELLOW HYBRID TURNIP	..	.. 0	10
SUTTONS' PURPLE-TOP do. do.	..	.. 0	10
SUTTONS' LINCOLNSHIRE RED GLOBE do.	0	9	
SUTTONS' IMPERIAL GREEN GLOBE do.	0	8	
SUTTONS' POMERANIAN WHITE GLOBE do.	0	9	
SUTTONS' SELECTED YELLOW GLOBE MANGEL	..	.. 0	10
SUTTONS' BERKS PRIZE do.	..	.. 1	0
SUTTONS' YELLOW INTERMEDIATE do.	1	0	
SUTTONS' MAMMOTH LONG RED do.	..	1	6
Other good sorts of MANGEL	..	8*d.* to 1	0
SUTTONS' IMPROVED GREEN KOHL RABI	3	0	
Ordinary GREEN do.	..	.. 2	6

SUTTONS'
FARMER'S YEAR BOOK FOR 1870,

Containing complete List of Prices of genuine Farm Seeds, is now in the press, and may be had Gratis and Post Free on application.

☞ **ALL GOODS CARRIAGE FREE,**

Except very small Parcels. Five per cent. allowed for cash payments.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

SUTTONS' IMPROVED READING ONION, 1*s.* per ounce.
SUTTONS' MATCHLESS BRUSSELS SPROUTS, 1*s.* per packet.
BEDFORDSHIRE CHAMPION ONION, 1*s* per packet.
For illustrations look outside page of this week's Paper.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

TO THE TRADE.—Fine Stocks of the following:—
MANGEL WURZEL.
Yellow Globe. | Long Yellow. | Red Globe. | Orange Globe.
TURNIP.
White Garden Stone. | Stratton Stubble. | Green Round. | Grey Top Stone. Dale's Hybrid.
RADISH, Wood's Early Frame, our original genuine kind.
Lowest prices on application to WOOD AND INGRAM, Seed Merchants, Huntingdon

For Seed.

HALLETT'S

TRADE PEDIGREE MARK.

CHEVALIER BARLEY, which was awarded the First Prize three years in succession (1867, 1868, 1869), at the Birmingham and Midland Counties Show. Yielded, at Brighton, in 1869, 10 quarters per acre, weighing 57 lb. per bushel. Also PEDIGREE BLACK TARTARIAN and PEDIGREE WHITE CANADIAN OATS.

For price and full particulars of above, and of Pedigree Seed Wheats, apply to the Originator of the System, Captain HALLETT, F.L.S., Brighton.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

SEED BUSINESS for DISPOSAL.—Old established and genuine concern, 7 miles from town; long lease. Goodwill, Stock, Fixtures, &c., £150.—F. M. SEARLE, Auctioneer, 6, Bishopsgate Street Without, London, E.C.

FOR IMMEDIATE DISPOSAL, a FLORIST'S BUSINESS in good working condition, and well Stocked, within a short distance of Covent Garden, the Proprietor going Abroad. No reasonable offer refused. For particulars apply to Mr. BRODY, King William Street, City, E.C.

TO BE DISPOSED OF, with immediate possession, a large and influential West-End FLOWER and SEED BUSINESS, old established, and doing a good business in Plants, Cut Flowers, Bulbs, Seeds, and Fancy Goods. This is a chance seldom to be met with. Well situate for the Cut-bloom and Jobbing Business, being near two Railway Stations, in an improving and increasing neighbourhood, and well stocked with established and valuable Plants for Cut Blooms, in addition to the ordinary stock of a Nursery.
Apply to G. W. CROOK, Esq., 50, Moorgate Street, E.C.; or to Mr. JAMES STEVENS, Auctioneer and Agent, 9, Cloak Lane Cannon Street Station, E.C., and Clapham Common, S.W.

TO BE LET, a FARM of 108 Acres, principally Pasture, 8 miles north of the London, affording great facilities for supplying Milk to the Metropolis, together with a Small House adjacent. Any one retiring from business, and fond of Agricultural pursuits, will find this very suitable to him.
For further particulars apply to Messrs EDWIN FOX AND BOUSFIELD, Land Agents, 24, Gresham Street, Bank, E.C.

Devon and Cornwall.

MR. ROBERT SMITH has now on OFFER several really good improvable ESTATES, varying in size from 30 to 200 acres, at the new prices of from 50 to 500 per acre. Buildings and Timber included. Nothing but Draining and better Farming is required to make these valuable properties. Loans for every class of improvements. Purchase of Property, with Plans and Particulars of the above, may be had at Mr. SMITH'S Offices, Harford House, Chew Magna, or St. Stephen's Street, Bristol.—January 31.

SALES BY AUCTION.

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, February 8, at half-past 12 o'Clock precisely, 250 Pens of choice POULTRY and PIGEONS from the yards and lofts of well-known breeders and exhibitors.
On view the morning of Sale, and Catalogues had.

Plants and Bulbs from Ghent and other Parts.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, February 9, at half-past 12 o'Clock precisely, CAMELLIAS, AZALEAS, Standard and Dwarf ROSES, CONIFERS, AUCUBA, LAURUSTINUS, DRACÆNAS, YUCCAS, ERICAS, LATANIAS, Dwarf-trained, Pyramid and Standard FRUIT TREES, choice GLADIOLI and RANUNCULI for spring planting; Rustic Seats, Stools, Vases, Baskets, &c.
On view the morning of Sale, and Catalogues had.

Lilium auratum.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, February 10, at half-past 12 o'Clock precisely, 10,000 fine BULBS of LILIUM AURATUM, just arrived from Japan
On view the morning of Sale, and Catalogues had.

Seeds.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 31, King Street, Covent Garden, W.C., on THURSDAY, February 17, at half-past 12 o'Clock precisely. CALIFORNIAN TREE SEEDS, just arrived.
On view the morning of Sale, and Catalogues had.

Farnley Hall, near Otley.
IMPORTANT SALE of SHORTHORNS

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on THURSDAY, February 24, THIRTY HEAD of very superior and Pure-bred SHORTHORNS, the property of H. Fawkes, Esq., Farnley Hall, near Otley, being a choice selection from his justly famed Herd, which has been long and carefully bred from the best sources, and maintained in the possession at the Royal Agricultural Society of England, the Yorkshire, and other National and County Shows.
Catalogues, with pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. SCOTT, Farnley, near Otley, Yorkshire.

Beaumont Grange, near Lancaster.
IMPORTANT SALE of SHORTHORNS

MR. STRAFFORD begs to announce for SALE by AUCTION, without reserve, on FRIDAY, February 25, THIRTY-HEAD of valuable SHORTHORNS, the property of Mr. W. W. Slye, of Beaumont Grange, near Lancaster, consisting of fine specimens of Bates, Gwynne, Charmer, Knightley, and other noted tribes of Shorthorns.
Catalogues, with Pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or to Mr SLYE, Beaumont Grange, Lancaster.

Berkeley Castle, Gloucestershire.
SALE of SHORTHORN BULLS and HEIFERS

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on FRIDAY, March 11, at the Home Farm, Berkeley Castle, about a dozen very choice pure-bred YOUNG BULLS, by bates' sires, and from well-selected dams, of Messrs. Bowly, Rich, and Holland's stock. Also will be SOLD a number of IN-CALF and NEWLY CALVED SHORTHORN HEIFERS, of great milking properties, and several pure-bred Berkshire PIGS.
Catalogues, with pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London; or of OCTAVIUS LONG, Esq., Berkeley Castle, Gloucestershire.

Spring Grove, Middlesex, W.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the Plantation, Thornbury Road, near the Spring Grove and Isleworth Railway Station on the South-Western and London and Windsor Line, on MONDAY, February 7, at 1 o'Clock precisely, by order of the Proprietor, without reserve, the valuable NURSERY STOCK, comprising choice Evergreen and Coniferous Shrubs, about 2000 Fruit Trees, 500 Standard and Dwarf Roses, a quantity of Deciduous Shrubs, 150 yards Box Edging, Hardy Climbers, &c.
On view, and Catalogues had at the Office on the Estate

Tottenham, N.

PEREMPTORY NOTICE TO QUIT, IN CONSEQUENCE OF THE GREAT EASTERN RAILWAY COMPANY'S EXTENSION OF LINE.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, Brunswick Nursery, Lower Tottenham (five minutes' walk from Park Station on the Great Eastern Railway), on TUESDAY, February 15, and two following days, at 12 o'Clock precisely each day, without reserve, by order of Mr. John Maller, who is compelled to surrender possession of the Land by Lady Day next, the whole of the valuable NURSERY STOCK, comprising thousands of choice Evergreen and Coniferous Shrubs, including 15,000 Chinese Arbor-vitæ, 7000 Junipetus, 5000 bushy Aucubas, 5000 Variegated Hollies, 1 to 6 feet; 6000 Thujopsis borealis, 4000 Cupressus Lawsoniana, 6000 Green Hollies, 1 to 6 feet; 5000 Thuja aurea, 1 to 4 feet; 4000 Rhododendrons, 4000 handsome Cedrus Deodara, 1 to 2 feet, &c.; 6000 Standard and Dwarf Roses of the best kinds; 2000 clean-grown Fruit Trees, Vines in pots, Currants, sorts; Ornamental and Forest Trees, Hardy Climbers, Herbaceous Plants, together with 5000 choice Greenhouse Plants, consisting of choice Double Camellias, Azalea indica, Genista, Acacia, Ericas in flower, Pelargoniums, a matchless stock of Bouvardia longiflora alba; also 5000 Erica hyemalis in thumbs, thriving young stuff, &c.
On view three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers, Leytonstone, E.

Annual Sale of very Handsome English-grown Camellias.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at 38 and 39, Gracechurch Street, E.C., on FRIDAY, February 18, at half-past 12 o'Clock precisely, about 200 choice Double CAMELLIAS, beautifully set with Bloom Buds; AZALEA INDICA, 300 Standard and Dwarf ROSES of the best varieties, Selected FRUIT TREES, Hardy AMERICAN PLANTS, &c.
On view the morning of Sale. Catalogues had at the Rooms, as above, and of the Auctioneers, Leytonstone, N.E.

Edmonton, N.

PRELIMINARY NOTICE of an important CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being immediately required for the Great Eastern Railway Extension on Line.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. C. Woolven & Son to SELL by AUCTION, without reserve, on the Premises, the Long Hedge Nursery, Edmonton, N., on THURSDAY, February 24, and two following days, at 11 for 12 o'Clock precisely each day, the whole of the valuable NURSERY, comprising an extensive assortment of choice Evergreen and Coniferous Shrubs, and about 40,000 clean-grown Fruit Trees; 7000 Standard and Half-standard Roses, &c.
Further particulars will appear in future Advertisements.

The Agricultural Gazette.

SATURDAY, FEBRUARY 5, 1870.

MEETINGS FOR THE ENSUING WEEK.

FEB. 7 { London Farmers' Club (Grass Land—when to be profitably broken up; by Mr. C. Cadle), at the Salisbury Hotel—6 P.M.
— 8 { Central Council of Chamber of Agriculture, at the Salisbury Hotel.

THE AGRICULTURAL RETURNS FOR GREAT BRITAIN for 1869, with abstract returns for the United Kingdom and the British Possessions and foreign countries, have been published during the past week. The summary figures, giving the leading truths which are thus detailed, were before the public last autumn; and now we can read the facts, county by county, over the whole of Great Britain, and country by country over almost the whole of Europe.

There is no more interesting volume in the farmer's library than the octavo blue book of 70 pages, which here represents the year's work of a most valuable department of the Board of Trade. We see that the Norfolk Chamber of Agriculture last week recommended that for the future agricultural statistics should be collected only at decennial intervals. Why should they object to the publication of the truth? What possible good can be achieved by remaining in ignorance for nine years out of ten? Why should any man object to letting the facts be known? They will inevitably meet him. Does he prefer meeting them in the dark? It seems to us to be quite outside the field of argument—to be self-evident and beyond dispute—that whatever the facts, and circumstances, and conditions be, in the midst of which any trade is carried on, any interest is situated, any individual man is placed—it is for the advantage of the trade, the interest, and the individual, that they should be known. Unquestionably the facts may be most important; they may be serviceable, they may be disastrous. Let us learn them, then, and let us help to teach them. Let us urge the continuance of the effort that is being made, each year more successfully, to publish the truth regarding English agriculture as soon after each year's harvest as it can be ascertained.

There are many most important facts taught in Mr. FONBLANQUE'S report which it is extremely desirable to make known; and our readers will find in this and the following numbers of this Journal the successive tables in which they are presented.

Meanwhile we may call attention to the great

reduction of the live stock of the country since 1868, a result no doubt of the diminished supply of food for cattle furnished by both arable and pasture lands in that year. There were 70,000 fewer cattle, 350,000 fewer pigs, no less than 1,110,000 fewer sheep in 1869 than in 1868. The sheep stock, which in 1868 was nearly 21,000,000, was in 1869 less than 20,000,000. Of course this is a blow not only upon the food productiveness of the country, but upon the efficiency of the great machine by which fertility is maintained in this country. The horse stock is this year for the first time enumerated—thanks, we believe, to the remonstrances of Mr. JAMES CAIRD; and we now learn that we have 1,141,996 agricultural horses at work in England, 1,561,061 altogether in Great Britain, and within 2000 of 2,000,000 in the whole United Kingdom.

Turning now to the crop reports — about 340,000 more acres are returned as being in the hands of English farmers in 1869 than in 1868 – 23,370,639 acres in England, and nearly double that amount in the United Kingdom. Confining ourselves to England, the increase in Wheat is about 20,000 acres, in Barley 84,000 acres, in Oats 22,000 acres, in Rye 14,000 acres, in Beans 45,000 acres, in Peas no less than 100,000 acres; the last being a result of the year's inquiry so remarkable that one is glad to have a satisfactory explanation of it. On the whole, there are 7,785,033 acres in corn crops in England in 1869, against 7,499,218 acres in 1868. Of green crops, again, there were in England 2,759,098 acres in 1868 against 2,585,019 acres in 1868, including an increase on every separate crop—Potatos, Turnips, &c., Mangel, Carrots, Cabbages, Vetches, Lucerne, &c. The Clover crop was less in 1869 than in 1868 by no fewer than 365,000 acres, that being no doubt the extent which was ploughed up and sown chiefly with Peas, but also with other crops, in consequence of the failure due to the drought of the year before last.

We refer to another page for that portion of Mr. FONBLANQUE's report which relates to the agricultural statistics of this country—leaving it till the following and successive weeks to present the Tables in detail to which the report refers. One remark may be made here upon a Table which will be observed in the report classing the counties of England under two divisions, the one being grazing counties, and the other corn counties. It will be seen how large a proportion of pasture land nevertheless appears in the corn growing counties, and how large a proportion of arable land occurs in the so-called grazing counties. It appears to us, however, that the facts regarding the stock maintained by these two areas respectively are not likely to be accurately ascertained by the midsummer inquiry which was addressed to them. The sheep stock of arable land would certainly be much greater during the winter and spring season than during the summer and autumn, and we must not, therefore, too hastily generalise upon these returns—or form too confident an opinion as to the relative productiveness of food for man of the two sets of counties respectively.

WE are in the habit of thinking that, in STEAM CULTIVATION at any rate, English agriculturists are a-head of their Northern brethren. And this prejudice is not in the least disturbed by the report and discussion on the subject which took place at the general meeting last week of the Highland and Agricultural Society. The Marquis of TWEEDDALE, himself an authority on the subject of deep tillage, reported that the committee appointed to discuss the question of steam cultivation were of opinion that it would require much more information on the subject before it could be said that steam cultivation would be as suitable for Scotland as England, The SECRETARY then read the following conclusions of the committee:—

"1st. The committee observe that cultivation by steam-power is much more common in England than in Scotland. It cannot be said that the farmers of Scotland do not possess practical knowledge, skill, and economy in the management of the land, and yet they seem to adhere to ploughing the land with horses, which the committee, however, believe is, as a rule, much better done in Scotland than in England.

"2d. The committee are of opinion that before a steam-plough can be advantageously employed, the land should be thoroughly cleared of all large stones and other impediments to the free action of the plough, and that this can be most effectually done by having the land previously ploughed by horses to the depth of 14 inches, in the same manner as the committee saw done at Yester by the Marquis of TWEEDDALE.

"3d. The committee are further of opinion, that where deep cultivation is desired (that is, not less than from 12 to 14 inches) the double engine system of FOWLER appears to be best suited, as the action of the engine is more direct, and a much less extent of rope is required. Deep cultivation must, however, entail a great strain on the implements, and consequently increased risk of breakage.

"4th. Where a shallow furrow (that is, not exceeding 8 inches on ordinary soil) is all that is required, the single engine and movable anchor system of FOWLER, or the roundabout system of HOWARD, but with FOWLER'S balance-plough, seem well adapted. FOWLER'S system requiring a shorter rope and fewer hands to work it, but necessitating the plough to work at right angles, or nearly so, to the engine, is therefore not well suited for uneven sided fields. HOWARD'S system, from the engine remaining stationary, does away with the strain on the engine moving along the soft headland, and the consequent poaching and compressing of the soil, but requires two additional men to work it, and a larger extent of rope. It is also better adapted for fields of an irregular shape, as the plough with the movable snatch-blocks and anchors will work in any position.

"5th. The committee are also of opinion that, on a large farm having a comparatively flat surface, with fields of not less than 20 acres, as nearly square as possible, and free from stones or other obstacles, and where three or four pairs of horses can be dispensed with, steam cultivation will probably be highly beneficial as an auxiliary to horse-power, as the work can be done with greater celerity and the ground cropped at the proper time, whereby an increased return would be likely to ensue. On a smaller extent of land there does not seem to be sufficient scope for the profitable employment of a steam-plough.

"6th. The committee consider that further experience of steam cultivation in Scotland is necessary, in order to ascertain the actual expense of it, and the endurance of the engines and apparatus. On all the farms which they have inspected the machinery is comparatively new, and it is not to be expected that much outlay should be required to keep it in good order."

These gentlemen appear to ignore the evidence which has grown up here, and which is now perfectly conclusive; they are still engaged in learning the alphabet of their subject. If they had condescended to inquire into the experience of many years over thousands of acres which we can point to here, they certainly would not have committed the leading agricultural society of the North to such a lame and hesitating utterance upon the great agricultural success of modern days. Mr. WALDEGRAVE LESLIE'S suggestion about the application of steam-power to the double plough, and his reference to THOMSON'S properly named "road" locomotive as possibly serviceable as a draught power across fields, both betray the same astonishing ignorance of the subject; and we strongly recommend, if the steam-cultivation committee be reappointed, that, if they think there still remains upon the subject anything necessary for the conviction of a reasonable man, they should commit their whole powers to their two best men, and let them take a month's tour among the steam cultivated farms of the South, and report on what they see.

Or let the whole subject be remitted to Mr. WILSON, of Edington Mains, and let the farmers of Scotland abide by his decision founded on personal experience. The following is a short statement of his speech at the meeting:—

"It was now nearly three years since he had worked FOWLER'S double-furrow plough, and it had given him great satisfaction. Before getting it he had made inquiries, and though he had been advised that many difficulties would result from its operation, these had been found to be more imaginary than anything else. With regard to the matters suggested by the hon. gentleman, he must say that, judging from his experience, he had no hope of seeing any good done by steam cultivation with the engine travelling over the ground. He thought it was very desirable that all information that could should be obtained on the subject, but he did not think that the suggestion to attach a movable engine to the plough to go over the surface would give satisfaction."

The upshot, however, is that the Special Committee on Steam Cultivation is renewed, and that the question of double-furrow ploughs drawn by THOMSON'S india-rubber tired wheeled engines is to be considered, and that the committee is also to take into their consideration generally the subject of cultivation by steam!!

—— THE Wheat trade still continues dull, with a downward tendency. Monday's prices have been barely maintained on Friday, in Mark Lane.——In the Metropolitan Cattle Market on Thursday, the supply of all kinds of fat stock was again in excess of the demand.

—— Our readers will find in another page the first of a series of articles on FARM BUILDINGS, in which we propose to give examples of rural architecture of various dates, illustrating the principles by which the landowner should be guided in the equipment of his estate. For the present number we are indebted to Messrs. LONGMAN, who have most kindly permitted us to use the blocks by which their costly work on the PRINCE CONSORT'S FARMS was illustrated, which was published seven years ago. Others of that series of illustrations, together with engravings specially prepared for us, will appear at intervals in the current volume of the *Agricultural Gazette*.

—— Mr. W. E. WELBY, M.P., publishes the following communication from the CHANCELLOR of the EXCHEQUER on the subject of Farm Horse Licences:—

"11, Downing Street, Whitehall, January 29.

"Sir,—In your letter to the CHANCELLOR of the EXCHEQUER dated the 27th inst., you inquire whether farmers will be charged licence duty for their farm horses when used—

"1. To draw coals, which is done in some instances 'with the sole object of relieving the labourers in the farmer's employment, or other poor persons, from the cost of carriage.'

"2. To draw material for repairing the parish roads.

"In reply, Mr. LOWE desires me to inform you that in law farmers would be liable to duty for any of these acts, but in practice.

"1. The Board of Inland Revenue will charge the duty if the horses are 'let out for hire' for the purpose of drawing coals; but if the drawing of the coals is only done occasionally and as an act of charity, without any profit, the liability will not be enforced.

"2. Farm-horses used for drawing materials for the repair of the parish roads will be charged if (as is mostly the case) the farmer receives any remuneration, whether in money or in abatement of his rates.

"I am, sir, your obedient servant,

"Mr. W. E. Welby, M.P. "C. RIVERS WILSON."

—— We publish here the official report on the guano of the Guanapé Islands, which has been forwarded to us with the report of the Monthly Council of the Royal Agricultural Society:—

"The guano of the Guanapé Islands partakes of a composition varying much according to locality and depth. In general, on the North as well as on the South Island, the superficial strata exposed to the vicissitudes of the atmosphere are deficient in soluble salts, and consequently in ammonia, augmenting the proportion of phosphate of lime. In the lower strata, on the contrary, the quantity of ammoniacal salts augments, thus diminishing the phosphate of lime. It is probable that by the action which has dissolved the ammoniacal salts of the superficial strata, it may have penetrated by infiltration into the strata underneath, thus increasing the richness of the latter; so that in the end the ammonia, which forms

ANALYSIS OF THE GUANAPÉ GUANO.

	North Island.										South Island.		
NUMBER OF THE SAMPLES.	1	2	3	4	5	6	7	8	9	10	1	2	3
Hygrometric water	21 250	14 500	22 850	20 150	22 300	20 250	21 400	30 850	20 500	18 500	15 750	24 900	20 850
Volatile matters and salts ..	29 00	40 000	47 650	8 150	43 100	46 250	43 200	44 600	44 000	49 750	32 400	36 900	72 500
Alkaline salts	4 250	4 650	1 500	4 700	5 225	4 100	4 050	6 100	6 [illegible]	3 050	5 300	3 485	1 350
Soluble phosphoric acid ..	420	450	540	750	275	600	550	450	8 000	450	900	[illegible]	150
Tribasic phosphate of lime	41 150	33 450	25 775	14 450	27 500	28 500	29 225	22 600	22 600	27 [illegible]	42 500	32 600	4 900
Sand and clay	2 750	1 950	1 375	1 800	1 600	3 300	1 575	5 750	6 400	1 250	2 [illegible]	1 750	250
	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000	100 000
Ammonia contained in 100 part of guano	£ 730	11 680	16 210	3 870	10 812	10 600	10 735	11 425	10 916	14 184	7 560	8 382	18 820

the most valuable principle of guano, is not lost, being concentrated, as it is, in the deeper layers of guano.

"In the Southern Island the change is manifested in a manner still more evident, as of the three samples that have been analysed the most superficial contains only 7.562 per cent. of ammonia, and in the sample extracted from a greater depth the ammonia contained in 100 parts of guano rises to 18.820,—more than is contained in the best guano of the Chincha Islands.

"This last is formed almost entirely (95.000) of ammoniacal salts soluble in water, consisting in greater part of oxalate and urate of ammonia, and should not be considered as a variety of guano but as a combination of the soluble parts of the guano which appear to have been separated by the action of water.

"This sample, although possessing a strong ammoniacal smell, equal to the guanos of the best quality, differs nevertheless through its other physical characters, presenting itself under the form of a pulverulate homogeneous matter of a more pronounced yellow colour than that of common guano, and with a crystalline structure only to be perceived through the medium of a microscope. If the bed of this material is in reality 7 feet in thickness, according to Mr. Harris, who extracted the samples, it appears to me that a greater advantage could be obtained by selling this material to certain manufacturers of chemical productions as liquid ammonia; oxalate of ammonia or uric acid could be extracted with much facility for the manufacture of the colouring matter called 'murexide.'

"As this sample is very rich in ammonia, and very poor, on the contrary, in phosphate of lime—containing less than 5.100 of this salt—it could not be employed with advantage

in agriculture, one of the principal elements being wanting for plants; and in case it could not be sold, as was suggested, to manufacturers of chemical productions, it could be utilised very well by mixing it with the guano from the Lobos Islands, which in general contains a strong proportion of phosphate of lime, and, *per contra*, is very poor in ammonia. By mixing the material in question this guano would be improved, and would cause the value of the guano of the Lobos Islands to be enhanced, equalising it with the guano of good quality.

"Some of the samples of guano from Guanapé subjected to analysation contain a strong proportion of water, so that when the guano is pounded in a mortar with the object of rendering it more homogeneous before proceeding to analyse it, it collects and forms a sticky paste.

"At first sight it would be said that this guano had been wetted; but recognising the great hygrometric power which guano has, and knowing that the sample in question had been extracted in winter time, when the atmosphere of the coast is almost entirely saturated with water, the great quantity of moisture which it contains is easily explained.

"I myself at another period made some experiments for studying the hygrometric power of guano, by keeping exposed to the open air a certain weighed quantity of guano, and I have beheld it increase or diminish in weight according as the weather was more or less dry.

"The element which is of most value in guano, after the ammonia, is phosphoric acid; but, as is known, almost the whole of the phosphoric acid contained in the guano is found combined with lime, forming a phosphate of lime, tribasic, not very soluble in water, and consequently absorbed with difficulty by plants. Various chemists who busy themselves with the study of guano have thought, and with justice, that by rendering the phosphoric acid contained in guano more soluble in water, and consequently easier to be absorbed by plants, the value of this material would be augmented.

"So for many years Mr. Nesbit advised mixing guano with sulphuric acid, the which, by uniting itself with part of the lime, leaves free a part of phosphoric acid, which forms with the other portion of the lime a phosphatic acid, easily soluble in water. Mr. Richardson put this theory in practice, and even asked for a patent for the transformation and amelioration of guano.

"Now, as not the whole quantity of phosphoric acid contained in guano is found in a state insoluble, under the form of tri-phosphate of lime, I have deemed it necessary in the analysation which I have made to make known likewise the proportion of soluble phosphoric acid which the guano of Guanapé contains, as will be seen by the table giving the result of the analysis."

OUR LIVE STOCK.

CATTLE.

MR. THORNTON has issued a catalogue of a portion of the Berkeley Castle herd, the property of Lord Fitzhardinge, which will be offered for sale on March 11. The catalogue contains the names of 13 young bulls, and 14 cows and heifers. As in the case of most of the famous Gloucestershire Shorthorn herds, Bates' blood predominates, a large proportion of the animals being directly descended from Siddington, Didmarton, and Dumbleton stock. Among the bulls we may mention the following as possessed of very attractive pedigrees:—BARON WAVERLEY, by 13TH GRAND DUKE, long used at Didmarton, and from *Flora M'Ivor* by 3D DUKE OF LANCASTER. The following calves are also likely to command attention:—HARDINGE THE DANE, by 3D DUKE OF WATERLOO, purchased at the last Didmarton sale for 140 gs., and out of Mr. Bowly's *Musical 11th*, a very pretty heifer, bought at Siddington by Lord Fitzhardinge for 70 gs.; HAROLD, by 6TH EARL OF WALTON (26,070), and from *Mincrel 12th*, a Siddington heifer, sold for 100 gs. last April; and lastly, DUKE FAREWELL and LORD CHIEF JUSTICE, both by 2D DUKE OF COLLINGHAM, and of the Ursula tribe. The list of cows and heifers contains the names of *Lancaster 21st*, by PRINCE OF WALES (27,188); *Victoria* and *Virtue*, bred by Earl Ducie, also by PRINCE OF WALES, and descended from *Nena*, by TRAJAN (12,238). The remainder are "principally bred from first-class Yorkshire cows purchased some years ago in Darlington, and since crossed with pure-bred bulls."

—— We are able to give the following news regarding well-known Shorthorn stock bred at Didmarton, and sold at the dispersion of that famous herd to Mr. J. W. Larkings, of Ashdown House, Essex. *Hollyberry* has produced a nice roan bull-calf to 2D DUKE OF COLLINGHAM, and *Florentia 8th*, and *Queen of Tyre*, have each added a heifer calf to the same excellent sire. Many of the cows are in calf to 3D DUKE OF WATERLOO, a bull sold for 140 gs. at the last Didmarton sale, and DUKE OF KIRKLEVINGTON, which as a yearling brought 105 gs., is growing into a remarkably fine animal. The herd now boasts four females by 2D DUKE OF COLLINGHAM. Further, with reference to the same tribe of Shorthorns, we may add that Lord Dunmore's *Waterloo 28th* has produced a roan bull calf to 2D DUKE OF COLLINGHAM.

—— Mr. Bowly has sold his good old bull, 7TH DUKE OF YORK, to Mr. Cheney, of Gaddesby, where we hope he will be useful for some time longer, despite the symptoms of decrepitude he has recently exhibited.

—— Mr. Dixon's new book, entitled "The Saddle and the Sirloin," contains the following information upon the origin of the Duchess tribe:—"BELVEDERE of the Princess tribe (1706) was the bull which Mr. Bates selected to bring out the Duchesses. He was small and plain, and with rather rough shoulders, but as soft as a mole in his touch. The brothers Colling had a most faithful disciple in the Kirklevington philosopher, as his celebrated show bull DUKE OF NORTHUMBERLAND was by BELVEDERE, dam BELVEDERE, and was thus bred on precisely the same principle as four of their leading animals—COMET, THE OX, PUNCH, and BROKEN HORN; rather an instructive comment on the popular timidity which eschews even an approach to in-breeding. Mr. Bates led the Shorthorn ranks of the Royal Agricultural Society, both at Oxford and Cambridge, and it was his lot to breed the second 1000 gs. bull, and to fashion the models of the moulds upon which such cows as *2d Grand Duchess*, *Oxford 15th*, and *Duchess 77th* were duly cast and quickened. Still no one contributed more towards Shorthorn progress than Mason, of Chilton, who got rid of the open shoulders and improved the fore-quarters generally. His sale in 1829 was refreshing to breeders. Earl Spencer bought a bull and 16 cows and heifers, and Captain Barclay, who began in 1822, laid a still more solid foundation with Lot 20, *Lady Sarah*. Such a splendid lot of cows as those at Chilton were seldom seen together, and the one from which Earl Spencer bred most was No. 25 (36 gs.), or *Wiston's dam*. Whitaker of Burley held his first sale soon after. He had always gone for milking tribes, and laid much stress upon the purchase of Magdelina by Comet (155), the only cow kept out of the Ketton sale catalogue."

—— Some excellent stock has recently been purchased for Mr. Bihler, of San Francisco, California, by Mr. Dodds, of Mount Pleasant, Wakefield. It includes CHERRY PRINCE 2D, a yearling Shorthorn bull, bred by Mr. Atherton, of Chapel House, and a 2-year-old heifer, LADY HUDSON BAXTER, bred by Mr. Baxter, of Elslack Hall, and in calf to 2D DUKE OF WETHERBY (21,618). Accompanying these cattle are two very fine entire dray horses, Young Conqueror, rising four years old, and Honest Tom, rising three years old. The first-named of these horses was purchased from his breeder, Mr. John Manning, of Orlingbury, Northamptonshire. Honest Tom was bred by Mr. Turner, of Doncaster, and purchased from Mr. Hoyland, of Wingfield, Derbyshire. Mr. Bihler is the owner of 200 mares, and as the race is rather light in form, he has selected two heavy powerful horses as likely to improve the breed.

POULTRY.

I TAKE the present opportunity of giving you an account of my fowls for the past year. On December 8, 1868, I had eight hens and eight pullets; on the 17th I bought four pullets, on the 22d two hens, and on the 25th one hen and one cock. I had no cock before. This one proved to be a great eater, so I did not keep it long, but killed it. I bought five more hens and one cock, I think in March, but I have no account of it. I sold some barley to the neighbours, so that that is mixed in the account with the eggs.

The following is the Account taken on January 30, and on the last Saturday of each Month following.

1869.		£	s.	d.
Jan	Eggs sold	0	13	9
	Ditto used	0	4	1
	Barley sold	0	4	5
Feb. 27.	Eggs sold	0	17	4
	Ditto used	0	2	2
Mar. 27	Eggs sold	1	0	7
	Ditto used	0	2	4
	Barley sold	0	3	10
April.	Eggs sold	1	4	6
	Ditto used	0	2	0
May.	Eggs sold	1	10	7½
	Ditto used	0	2	5½
	Barley sold	0	4	10
June.	Eggs sold	0	16	4½
	Ditto used	0	2	0
	Barley sold	0	2	6
July.	Eggs sold	1	4	4
	Ditto used	0	2	6
	Barley sold	0	6	8
August.	Eggs sold	0	16	11
	Ditto used	0	2	2
	Barley sold	0	4	4
Sept.	Eggs sold	0	10	0
	Ditto used	0	2	1
	Barley sold	0	0	2
October.	Eggs sold	0	2	5
	Ditto used	0	2	7½
	Barley sold	0	2	1
Nov.	Eggs sold	0	3	6
	Ditto used	0	0	10
	Barley sold	0	3	2
Total sales		£12	13	3

Eggs without the Barley.

		£	s.	d.
Dec. 22.—(No eggs till now				
	Sold, 8 for 1s.	£0	1	6
	Sold, 10 ditto	0	2	6
	Sold, 12 ditto	0	9	9
	Used	0	0	1
Feb.	Sold	0	7	2
	Sold, 14 ditto	0	10	3
	Used, 12 ditto	0	1	2
	Used, 14 ditto	0	1	0
Mar.	Sold, 14 ditto	0	2	4
	Used	0	2	4
April.	Sold	1	4	6
	Used	0	2	0
May.	Sold	1	10	7½
	Used	0	2	5½
	Used	0	16	4½
June.	Sold	0	2	0
	Used	1	2	0
July.	Sold	0	4	4
	Used	0	6	8
Aug.	Sold	0	10	11
	Used	0	2	2
Sept.	Sold	0	16	0
	Used	0	2	1
Oct.	Sold	0	6	5
	Used	0	2	7½
Nov.	Sold	0	3	6
	Used	0	0	10
Eggs sold		£10	17	4

Expenditure for Food.

			£	s.	d.
I do not remember what the first item is for; it is			£0	5	1
1868—Dec. 8 to 1869 Jan. 23.	2 bushels Barley		0	9	6
	2 ,, Buckwheat		0	8	6
	11 lb. graves, at 2d. per lb.		0	1	10
	2 bushels Barley		0	10	3
	Graves		0	5	5
	2 bushels Barley		0	9	6
	2 ,, Buckwheat		0	8	6
Feb. 13.	14 ,, Barley, an odd lot		0	5	0
March 25.	2 ,, Tail wheat		0	11	6
,, 20.	1 sack Buckwheat		0	17	0
May 1.	2 bushels Barley		0	8	0
,, 15.	2 ,, Indian-corn		0	5	0
June 3.	2 ,, Barley		0	8	6
July 3.	2 ,, ,,		0	8	6
,, 28.	2 ,, ,,		0	8	6
August.	Sundry lots of Wheat of gleaners		0	5	0
Sept. 18.	2 bushels Indian corn		0	9	6
,, 29.	Graves		0	3	6
Nov. 19.	A small lot of Barley		0	0	3
			£7	8	7

In the winter I let them out a great part of their time, but when the gardening begins I have to take care that they do not go on my neighbour's ground, as where I keep them is surrounded with gardens; but I like to let them out once a day if I can, for an hour—I must watch them, however; but if they are well fed they do not do so much harm as they would if they were not, for when they are fed with plenty in the house, they seek insects and shells when they are let out. I use graves, because I find they require some animal food when they lay and are kept in; it is the cheapest food. Corn and sheeps' paunch will do very well, if boiled and cut in small pieces. I never used Buckwheat before last winter; the fowls do not like it at first sight, but when they have had a little they like it very well—I think more so when they are laying. When I began to use it I found it better than Barley; they do not require so much animal food as with the Barley, and they lay larger eggs. I use Indian corn with Buckwheat or Barley, but do not think it sufficient of itself unless where the fowls can have a good run on some meadow, or rich grass-land. I forgot to say in the above that I think where persons can have a new laid egg for breakfast it is better than a glass of stout at 11 o'clock. A good sized egg at 1*d.* is as cheap as meat. *Geo. Holder, a Cottager.* [George Holder is a known correspondent. He is a working man, resident in a Gloucestershire village, and has here set an example to the poultry lovers among our readers which we would gladly see followed. Will any one else be good enough to give us their year's experience?]

—— The poultry house should be often cleaned out and the walls limewashed. The floor should be of earth, well rammed down, and covered with loose gravel, 2 inches deep. This is easily kept clean by drawing a broom lightly over it every morning, and if it is raked it is kept even and fresh. There should be an opening towards the west or south-west for the fowls to go in and out, and this should never be closed, as fowls are fond of rambling early in the morning and picking up such food as is to be found at break of day. There should be no poultry allowed to roost in the house but fowls, neither must there be too many fowls, lest the house become tainted and the birds sickly. This last remark applies equally to a farmyard. The house should have three compartments: one, the largest, for roosting; another for laying; and another for sitting. Round the two latter, boxes should be placed on the floor. Where space and economy have to be very closely considered, two houses may suffice by putting the laying boxes in the roosting-house. In this case they should occupy one end of the building and be clear of the perches. The door of the sitting-house must be kept closed, and a window should be provided and kept open in summer only. A wire frame will be found useful in preventing laying hens from intruding. A covered run for chickens will be found advantageous in wet weather.

THE IRISH LAND QUESTION.

THE misfortune of the Irish Land Question is that it has been dealt with so little by practical men, and that the greater part of those who think they are authorised to settle the matter have neither the experience of agriculture nor the knowledge of the country which so intricate a subject requires. It has been a source of regret to me that no paper like your own has thought it worth while to send to Ireland a clever agriculturist, who knows what land is worth, and would give a straightforward account of what he saw. One of those shrewd clear-headed Northerners, who, though anxious to promote the interests of the tenant, wish to deal fairly by the landlord, would have been able in a month to give more solid information about Irish land than all the lawyers, politicians, and literary artists who have been writing during the autumn. The truth is, the Irish land question, while it pretends to be agricultural and economic, is in a great measure social and political. It is the object of a powerful body to maintain in Ireland, for religious and political reasons, a large population, raised above want, and to prevent the independence of character which being too well off in the world often produces. To do this it is essential to put obstacles in the way of the consolidation of farms, and to stop the emigration which has been removing the population that found scanty subsistence at home. If Ireland is to be governed according to the wishes of those who themselves call "the Nation," the employment of capital in agriculture should also be discouraged beyond a certain point; for to them the theories of political economy are repugnant, as well as any attempt to confine the population to a limit measured by a certain standard of living. One thing seems clear, that if a tenant acquires after a time a right of possession in the soil, it is absurd to confine this right to Irishmen, and refuse to the intelligence of Englishmen, or the industry of Scotchmen, what has been conceded to the successful agitation of Irishmen.

In your Paper of Saturday last there is an excellent definition of tenant-right by Mr. Read, and this, the value of unexhausted improvements, should be declared by law to the Irish tenant; and I would also enable him to obtain damages against his landlord for any injury which has been caused him by arbitrary or unnecessary eviction. The assertion that, should fixity of tenure be granted, the small Irish tenants would immediately proceed to lay out a large capital now locked

up in bank shares and old stockings, is not borne out by my experience. I have a large number of small tenants, and their condition is generally very precarious. They have not, in many cases, the means or the knowledge which would enable them to extract from the soil its yearly value, and without indulgence in bad seasons they can hardly hold their own.

The position of the small proprietor on the Continent is often alleged to be one of great comfort. On this point I should be glad to have the opinion of practical men. It may be the case in some instances in the neighbourhood of towns, where the cultivation of the ground is very careful, and the produce sells high; but in the south of France, where I was for some time, the small proprietors were neither well off, particularly industrious, or well educated. One, a man better to do than the others, was firmly persuaded the Oidium was caused by the railway, 10 miles distant; and nothing could be poorer than the labourers.

A very great difficulty in any Irish Land Bill must be the habit of paying considerable sums of money for the good-will, and the right of entrance on a farm or house. The result generally is, that the tenant has spent all his available cash for the right of possession, and begins to farm without enough, if any, capital. It is a very bad practice for both landlord and tenant; but what between Ribbonmen and local prejudice, it is extremely difficult and dangerous to prevent.

Another thing has struck me very much in this discussion on Irish land. It has been taken for granted by a large portion of the Press, that the anxiety to hold land in Ireland must not only be accepted as a fact, but encouraged by the Legislature. In reality, it is not only among those who have no other means of subsistence that this craving for land exists, but among many who would do better without it. The doctor has a farm; the innkeeper leaves his house to a dirty housekeeper, and goes to his farm.

I went the other day to buy some plants of a a nurseryman, who was at his farm, leaving his garden to go to waste. When I asked, lately, what an old coachman was laying up his money for, I was, of course, told it was to get a farm. In Ireland it is thought a man is born a farmer, as he is a poet, and that there is a social dignity in farming that no other trade affords.

A quiet settlement of the Irish Land Question has become now very difficult. If, however, any measure violates the laws that regulate produce and supply, or attempts by artificial means to stay the inevitable movement which capital, intelligence, and science has begun, not only will the prosperity of Ireland be retarded, but those periodical seasons of distress will be certain to recur which owe their origin to bad legislation and national ignorance. *Brinsley Marlay, Feb. 1.*

*FARM BUILDINGS.**

I. The Prince Consort's Norfolk Farm: Windsor Great Park.

The annexed sketch represents the cattle-yards and buildings of the Prince Consort's Norfolk homestead, as seen from the grass-field to the south-west of them.

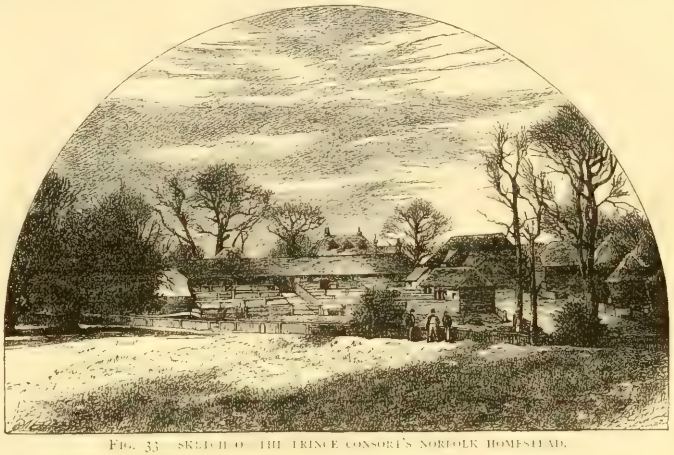

Fig. 33.—Sketch of the Prince Consort's Norfolk Homestead.

Fig. 34.—Map of the Prince Consort's Norfolk Farm.

homestead, across the Great Park and at the farther end of it. Including a large extent of poor, open, and almost unenclosed pasture-land on its eastern side, the Prince Consort's Norfolk farm is a tract of about 700 acres, 200 of which, or thereabouts, are arable. The soil is very light: a great deal of it is a light sand, and while a good deal is a stiffish loam adapted for Wheat and Beans, it is all capable of Turnip cultivation. It is thus adapted to the Norfolk system of management, which was adopted here when George III. was the tenant of the farmr. Since that time a large quantity of the lighter land on the eastern side of the farm, which was cultivated on that plan, has been laid down in permanent Grass. The four-course rotation, with occasional "stolen" crops, as of Trifolium, Vetches, Rape, &c., is still adopted on the heaver portion of the arable land which remains. Probably one-fifth of the land may be in Clover and Beans. Mangel Wurzels and Swedes form one of the regular "breaks" in the rotation; one-half in general being carried off the land and the remainder fed on it with sheep whenever the land will admit of it. Chandler's liquid manure drill is used in putting in both Swedes and Mangels on the lighter soils of this farm, with good effect. A considerable quantity of artificial manure, guano, and superphosphate is thus applied; from £300 to £400 worth in all per annum is used on corn and green crops. The cultivation has hitherto been done with 12 or 13 horses; but it can be cultivated with about eight now that it shares in the work of the steam-plough.

The compact form of the farm, the central position of the buildings, the arrangement of the fields, and their accessibility by roads, are all well shown in the map (fig. 34). The arable fields are numbreed, the following being an ordinary year's cropping of the land:—No. 1, Oats, 38 acres; No. 5, Beans 20, and Clover 15 acres; No. 2, Mangel Wurzel, 39 acres; No. 3, Turnips, 32 acres; Nos. 7, 8, and 9, Wheat, 57 acres; No. 11, winter Barley, 19 acres.

From this list of crops it will be seen that, counting the Bean crop along with the Clover, the place of which it occasionally takes, about one-half of the land is in green crops, and the other half in grain. The large proportion of Turnips and Mangel Wurzel is needed for the maintenance of a flock of some 400 Hampshire sheep, which, with the help of the Flemish Farm, are kept here, as well as of a herd of nearly 100 pure-bred Devon cattle of all ages.

The Devon herd is the principal feature of the farm. It has arisen since 1856, when, contemporaneously with the commencement of the Hereford herd at the other farm, the Prince Consort, through Major-General the Hon. A. N. Hood, now Viscount Bridport, purchased the nucleus of his future stock. They are situated about two miles from the Flemish

* We have to express our best thanks to Messrs. Longman & Co. for the loan of the wood-engravings used seven years ago in the costly work, published by them, on the Prince Consort's farms.

It must suffice to say, that all the best names in the history of the Devon breed are represented in this herd; and it is from the stock of Messrs. Quartly, Halse, Farthing, Turner, and Mogridge that the best things in the Prince Consort's Devon herd have descended. It is simply a breeding stock; there is no dairy; the calves remain with the cows all the summer, and the accommodation for them, in pastures, paddocks with sheds, and the old-fashioned buildings of the farm, is very good.

The drawings represent the arrangement and construction of the several parts of the homestead. They are of the old-fashioned kind, wooden and thatched; barn, stables, and sheds, being arranged around a large quadrangle, of which Mr. Brebner's comfortable residence and its offices occupy one side, while below and on the sunny side lie other sheds and yards for stock.

The homestead has the merit which old thatched buildings often have of comfortable lair and housing for the live stock. They have also the questionable merit of picturesqueness, which is often the result of a rambling arrangement, not to speak of dilapidation and decay. Here, however, everything is kept in good and trim repair; and the picturesqueness is the result of position on sloping ground among trees, of high thatched roofs and gable-ends, rather than of the lack of any plan of arrangement. The plan, however, on which they have been built is not a good one; and it will at once be seen from our drawings how much labour is lost in conveyance of food and litter to the cattle, when the process, as it must be conducted here, is compared with the process as carried out at the Prince Consort's Flemish Farm. The buildings date from the reign of George III., who was for many years tenant of this farm. His Majesty's bailiff, Mr. Hatch, ultimately occupied the farm upon his own account. George IV. again took it into royal occupation, Mr. Ingall being His Majesty's bailiff under Sir Samuel Hawkes. He was succeeded by Mr. Kendall as manager under William IV. Messrs. Kendall and Day and Godwin followed as farm managers, under General Wemyss, who superintended the Royal farms for her present Majesty. After the death of General Wemyss, Mr. Brebner came here from Bagshot, and the farm was then placed under the superintendence of Major-General the Right Hon. Viscount Bridport.

The history is interesting chiefly as showing that the land has nearly always been in the occupation of the Crown.

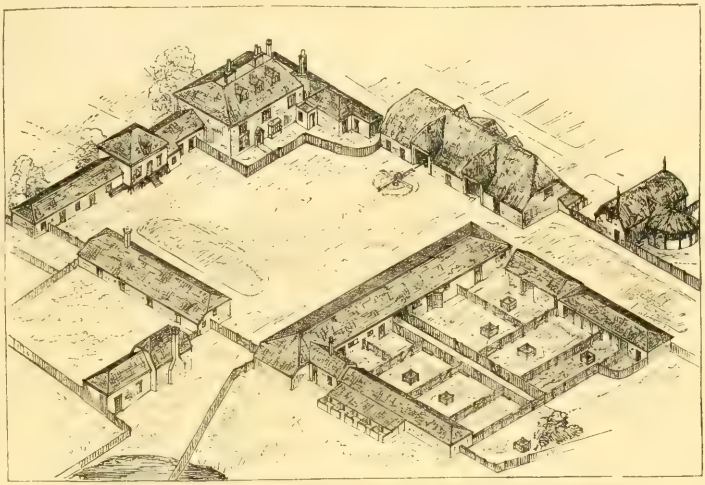

FIG. 35.—ISOMETRICAL PROJECTION OF THE PRINCE CONSORT'S NORFOLK HOMESTEAD.

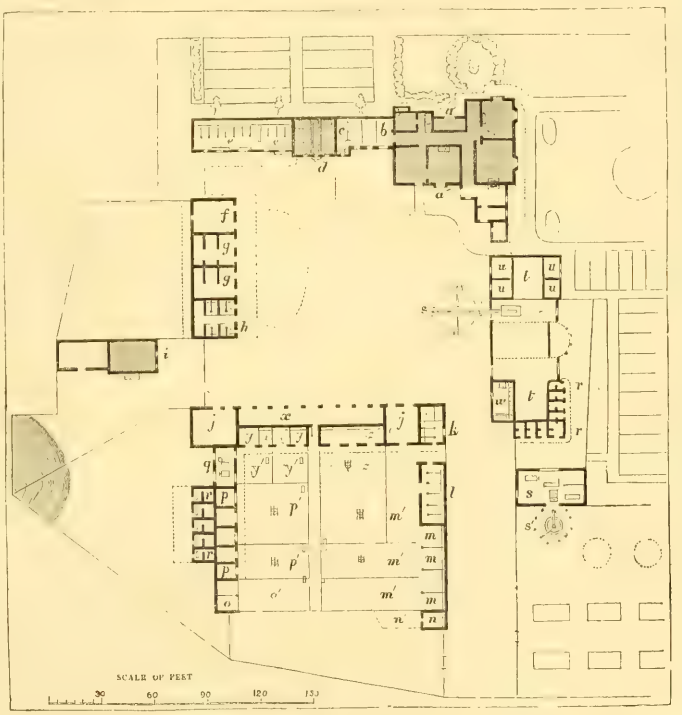

FIG. 36.

REFERENCES TO INDEX LETTERS ON PLAN.—*a*, Farm-house.—*b*, Offices.—*c*, Nag-stall.—*d*, Granary.—*e*, Farm-horse stable.—*f*, Shepherd's house.—*g*, *h*, Boxes and stalls for cattle.—*i*, Carter's cottage and carpenter's shop.—*j*, *j*, Cart-shed and implements.—*k*, *l*, Fatting-sheds.—*m*, *m'*, Cow-sheds and yards.—*n*, *n'*, Sick-bay.—*o*, *o'*, Cow-shed and yards.—*p*, *p'*, Bull-houses and yards.—*q*, Turnip-store and cutter, boiling house, &c.—*r*, *r*, Pigstyes.—*s*, *s'*, Mill-house, with chaff-cutter, &c.—*t*, Barn and threshing-machine.—*u*, *u*, Poultry-houses.—*v*, *v*, Tool-house.—*x*, Cart-shed.—*y*, *z*, Cow-houses and yard.

PLOUGHING BY STEAM.

THE subject of steam-ploughing is evidently one which interests a large section of your readers, and as it has perhaps an equal attraction for myself, I will, with your permission, call attention to one particular system, which has had less favour shown towards it by those using steam-ploughs than in my opinion it deserves—I mean Fisken's plan of a flying rope. Your readers will, of course, take my remarks simply for what they are worth; but I would observe that I have no interest in any way, direct or indirect, in one system more than another. I am simply a spectator. It is possible I put a higher estimate upon this system than it deserves, and that some of your readers have tried it and found it wanting. If so, perhaps they will let us hear about it, and thus the discussion will do good.

I saw the system of a flying rope at work for the first time at the Manchester show in July. I went there prejudiced against it, but I came away satisfied that it was both simple and practicable. In your number for July 24, 1869 (p. 801), you gave a very excellent description of it as worked at Manchester; but as many of your present readers may not have that number of the *Agricultural Gazette* by them, I will re-describe it here.

In Fisken's method the engine (which may be a common portable) is fixed at one corner of the field, or if possible, outside the field, and the fly-wheel is grooved to receive an endless rope band twisted round it. This endless rope (which must be common hemp or manilla, in order to get sufficient adhesion), is about five-eighths of an inch diameter, and is carried on porters 3 feet high all round the field with an anchored pulley in each corner, and a very simple arrangement near the engine for tightening or slackening it according to the state of the weather. When the engine is once started it is never stopped, so that this rope is kept in constant motion at the same speed as the rim of the fly-wheel, say from 25 to 30 miles an hour, and it is therefore called a flying rope.

On two opposite headlands two windlasses are placed facing each other, and the flying rope being twisted round a pulley on the top of each, gives the means of setting the windlasses in motion at pleasure, for of course these pulleys are kept in constant motion by the flying rope. Each windlass has a small drum or pulley, round which a wire rope, stretched along the headland, is twisted, and as this can be put in gear at pleasure, the windlasses can be moved along the headland from time to time, so as to keep them always opposite their work. In addition to this, each windlass has a large winding-drum for working the ploughing rope, and this latter drum is put in motion by a friction-clutch, which the windlass-man screws down each time he starts the plough to a point just sufficient to overcome the resistance of the plough,—a most excellent arrangement, for if the plough should meet a land-fast stone the clutch would slip, the plough stand still, and all the rest of the machinery go on as if nothing had happened. The windlasses pull the plough backwards and forwards between them, and move forward along the headland a few feet as each journey of the implement is completed, in precisely the same way as if they were a couple of traction-engines. There is one man at each windlass and one man at the plough, and of course one man at the engine,—say, three unskilled and one skilled man, instead of one unskilled and two skilled men, as in the double-engine system.

It must not, however, be forgotten that in the flying-rope system there is no carting of coals and water along the headlands, which, in wet weather, in a clay country, becomes almost an impossibility. Neither does it require an elaborate system of telegraphing, which is requisite in the roundabout, where the windlass-man is often nearly half a mile off from the implement.

But if the system has its advantages, so also it has its drawbacks. The flying-rope is running at a great speed, 25 or 30 miles an hour, and is by no means a pleasant neighbour to rub against, but then it is portered fully 3 feet off the ground, and is plainly in sight. The rope, too, has to be altered in length every time the field is changed, but then it is only a hemp rope, and is quickly cut and quickly spliced—any common labourer can learn the way in a few minutes. No

doubt the rope is also perishable, and may require renewing once a year; but if so it is cheap, and I am inclined to think it might be kyanised without injuring its adhesion. On the whole, then, it seems to me the advantages are greater than the drawbacks.

Now let us look at what it actually did at Manchester. At p. 802 (July 24, 1869), you report that a 10-horse engine "hauled during the trials an 8-furrow Fowler balance-plough, going from 7 to 8 inches deep, at a speed of about three miles an hour." I myself saw the implement at work also, and I measured the depth of the furrow in several places on the land side, that is to say, next the unploughed ground, and I found it to be 7½ inches, but I did not think it was going quite so fast as you name. Let us, however, calculate what the speed you name would do. An 8-furrow plough turns over 6 feet or 2 yards wide at each journey, and if it were going three miles an hour, that would be $1760 \times 3 = 5280$ yards; and as this was 2 yards wide, we get $5280 \times 2 = 10,560$ square yards as the quantity turned over in one hour of actual work. But we have to allow for time lost at the headlands in turning the implement, and if we allow one and a half hours for this, and half an hour for breakfast, and one hour for dinner, that would make three hours to deduct out of 12 hours (a whole day's work), and that would leave nine hours during which the plough would be actually running. Now, nine hours at 10,560 square yards would come to 95,040 square yards, or 19 acres 1 rood 29 perches as one day's work, ploughing 7½ inches deep. The field in which this work was done seemed to me to be a Rye-grass and Clover lea two years down and mown shortly before. The soil was light, but very much dried up from the great heat of the summer. From my own observations, however, I think this quantity is exaggerated. I timed the plough twice across the field, and then stopped it, and my impression was that it was going 2½ miles an hour, but from data, as to size of wheels, &c., which I afterwards got from Mr. Fisken, I calculated out the possible speed, and my conclusion was that the plough was going just about two miles an hour. I did not time the strokes of the engine, but allowing what I deemed a fair but quick stroke to the piston, I came to the conclusion that the real speed of the plough was what I say, about two miles per hour. But even at two miles per hour, the quantity of ground ploughed in a day would have been about 13 acres, or as much land as 20 or 22 horses worked in pairs would have done, for I do not think a pair of horses would have ploughed at the utmost more than an acre and a quarter per day of the land I saw. Now I think that any system of steam-ploughing which will enable a 10-horse engine to plough 13 acres per day, and do the work of 20 or 22 horses, is decidedly worth consideration.

I have no doubt the high speed of the flying rope will strike many of your readers as being a serious objection. Nevertheless, one soon gets accustomed to it, and it is the essence of the whole system. If one rope is going 15 miles an hour, and another only one mile an hour, a strain of 100 lb. on the fast rope is equal to a strain of 1500 lb. on the slow rope, and consequently, the fast rope need only be one-fifteenth part as strong as the slow rope, and all the anchors, pulleys, &c., are reduced in the same ratio. To hold the corner pulley of a roundabout, where the strain at the plough is 4500 lb., requires a very strong anchor; but to hold the corner pulley of a flying rope, which is only carrying a strain of 300 or 400 lb., is a very simple affair. This is the principle Mr. Fisken has adopted, and it certainly seems to be an ingenious one. No doubt the flying rope requires an arrangement of anchors and pulleys set up round the field, to be ploughed just as the roundabout does, but then they are of a much lighter description, and more easily fixed, and are never moved until the field is finished. Besides which, they can be used to work the same field several times over with different implements, because the windlasses can be worked back again up the field after having gone down,—a thing which cannot be done with the roundabout without relaying out the rope and refixing the anchors. No doubt the roundabout is much improved by mounting the corner pulleys on movable disc anchors, and to relay it with these would not be very difficult, but still the balance of convenience lies with the flying rope.

As to the right sort of implement to be used in steam cultivation, it has always occurred to me that as yet we have not got the right thing. My idea would be a plough and cultivator combined, to work together.

As to the balance-plough being unsteady from the overhanging weight, there is a very simple way of diminishing that which I am surprised has never occurred to Fowler & Co. I mean a counter-weight (like the counter-weight of a Cornish pumping-engine) which could be turned over each time to the working end of the plough, and would add so much to the ploughman's weight.

There is, however, no reason why the same sort of implement might not be fitted to Fowler & Co.'s new "turn-round" frame, which seems to me an excellent plan, and with which all sorts of implements can be worked.

If any of your readers have actually tried Fisken's flying rope I am sure, if they would give you the results of their experience, it would be conferring a benefit upon us all. Whether the results were in favour of or against the system is quite immaterial; what is required is actual experience. The report of a failure well described is often more favourable to progress than that of a success achieved.

Next week, if you will allow me, I will enter into some calculations as to the cost of steam-ploughing.

C. A. H.

AGRICULTURAL RETURNS OF GREAT BRITAIN.

[The following is the portion relating to our own country of the just published report presented to the Board of Trade by Mr. Fonblanque.]

THE number of returns obtained from occupiers of land in Great Britain is larger in 1869 than in 1868. The increase is chiefly caused by information having been obtained in 1869 from a large number of occupiers of small holdings, in consequence of more precise instructions for the collection of the returns. In 1868 returns were required from "holdings of more than small pieces of garden ground," but in 1869 the returns required were from "holdings of and above one quarter of an acre."

The additional number of returns obtained in 1869, being chiefly from holdings of very small extent, will not account for any considerable portion of the increase in the total acreage returned in 1869 as compared with 1868. The larger part of the increase is due to more complete and accurate returns by occupiers of land in some districts; but the cultivated area is also increasing by the reclamation of waste lands.

In the first two tables, abstract returns are given for each division of the United Kingdom; the figures for Ireland having been furnished by the Registrar-General for Ireland. The figures for the Isle of Man and the Channel Islands, in these and other tables, have been specially collected for the Board of Trade, as upon previous occasions, under the direction of the local authorities.

For the United Kingdom the total number of acres returned as under all kinds of crops, bare fallow, and Grass, was 46,100,153 in 1869, against 45,652,545 in 1868, showing a difference in favour of 1869 of 447,608 acres.

Of the total acreage returned in 1869, there were under corn crops (including Beans and Peas) 12,000,111 acres, of which 9,758,037 were in Great Britain, and 2,207,970 in Ireland; under green crops (including Potatos) there were 5,065,933 acres, of which 3,575,067 were in Great Britain, and 1,468,895 in Ireland; under bare fallow there were 761,369 acres, of which 738,836 were in Great Britain, and 20,981 for Ireland; and under Grass, there were of Clover and other Grasses from seed, 5,149,552 acres, of which 3,448,726 were in Great Britain, and 1,669,800 in Ireland, and of permanent pasture there were 22,811,284 acres, of which Great Britain had 12,735,897 and Ireland 10,046,877 acres.

The acreage under corn crops as returned in 1869, was divided between the different kinds of crops in the following manner:—In Great Britain, of the total number of 9,758,037 acres devoted to corn crops, 3,688,357 acres, or nearly 38 per cent., were under Wheat; 2,251,480 acres, or 23 per cent., were under Barley or Bere; 2,782,720 acres, or 28 per cent., were under Oats; 64,099 acres, or 0.6 per cent., were under Rye; 575,204 acres, or nearly 6 per cent., were under Beans; and 396,177 acres, or 4 per cent., were under Peas.

In Ireland, the land under corn crops was very differently apportioned. Of a total of 2,207,970 acres, Wheat was grown upon 218,117 acres, or to the extent of about 13 per cent.; Barley upon 223,338 acres, or 10 per cent.; Oats occupied as many as 1,684,788 acres, or 76 per cent.; and Rye, Beans and Peas together only amounted to 18,727 acres, or barely 1 per cent of the land under corn. Although so large a difference is shown between the proportionate acreage under corn crops in Great Britain and Ireland, the percentage proportions for the principal crops will be found not to differ very much in Ireland and Scotland.

As regards green crops, the following are the results for each kind of crop in 1869:—In Great Britain, of a total of 3,575,067 acres, 585,211, or 16 per cent., were returned as under Potatos; 2,171,526, or 60 per cent., as under Turnips and Swedes; 292,742, or 8 per cent., as under Mangels; 14,344, or 0.4 per cent., as under Carrots; 145,251, or 4 per cent., as under Cabbages, Kohl Rabi, and Rape; and 365,993, or 10 per cent., as under Vetches, Lucerne, and any other green crop, except Clover or Grass.

In Ireland, of the total of 1,468,895 acres under green crops in 1869, 1,041,837, or 71 per cent., were under Potatos; and 321,880, or 22 per cent., were under Turnips and Swedes.

Upon comparing the returns of 1869 with those of 1868, the total acreage under corn crops in Great Britain shows an increase of 324,505 acres, and as compared with 1867, the increase in 1869 is as much as 473,257 acres. The cultivation of corn crops, as shown by the returns, has been extended in each of the two years since 1867, the result no doubt of the higher prices of corn in 1867 and 1868.

The acreage under Wheat in Great Britain shows an advance in 1869 over 1868 of 36,232 acres, but in 1868 there was an increase of 284,249 acres over 1867. Barley shows an increase in 1869 against 1868 of 100,000 acres, which is only a recovery of the decrease in 1868 as compared with 1867. Oats have not varied much in acreage in the last three years, but in 1869 there is an increase over 1868 to the extent of 25,000 acres. Beans had a larger acreage in 1869 than in 1868 by 45,000 acres, and it was in excess of the acreage under that crop in 1867. Peas were grown upon 100,000 more acres in 1869 than in 1868, and although the acreage under Peas was smaller in 1868 than in 1867, the acreage in 1869 is much above that in 1867.

In Ireland in 1869, as compared with 1868, there was a small decrease in the acreage under Wheat; an increase of 35,000 acres in Barley; and a decrease of 15,000 acres in Oats.

The green crops in Great Britain occupied a larger total acreage in 1869 than in 1868 by 189,000 acres, and by 76,000 acres than in 1867. There is an increase in the acreage under each kind of green crop in 1869. Potatos were more largely grown than in the two previous years; the increase of acreage in 1869 being 43,000 acres over 1868, and as much as 93,000 acres over 1867. But the acreage under Potatos in Great Britain is still only a little more than one-half of the extent of the land devoted to that crop in Ireland.

As regards Turnips and Swedes, the acreage has varied but little in the last three years. In 1869 there is an increase over 1868 of 6000 acres, but the total is below what it was in 1867.

The cultivation of Mangels increased largely in 1869: there was an increase of 43,000 acres over 1868, and over 1867 the smaller though still considerable addition of 34,000 acres. The acreage under Carrots is small, and the fluctuations from year to year are not important. The crops of Cabbage, Kohl-Rabi, and Rape are classed together, and show a larger acreage in 1869 than in 1868 by 30,000 acres, but over 1867 the increase is not more than 11,000 acres. The acreage under Vetches, Lucerne, and any other green crop, except Clover or Grass, in 1869, is larger than in 1868 by 64,000 acres, but it is below the acreage of 1867 by 58,000 acres. Vetches or Tares are the most largely cultivated of this class of crops, and the acreage under them was greater by 48,000 acres in 1869 than in 1868.

The acreage under Potatos and other green crops in Ireland in 1869 differs but to a small extent from what it was in 1868.

The other crops to be noticed are Flax and Hops. In Great Britain, 20,923 acres were returned as under Flax in 1869, against 17,543 acres in 1868. This crop is chiefly grown in England, the acreage under Flax in Wales and Scotland being but small. In every county in England some acres of land are returned as under Flax; but it is only in the counties of York, Lincoln, Suffolk, Norfolk, Cambridge, Somerset, and Dorset, that the acreage of the crop was above or about 1000 acres in 1869. Flax is not nearly so extensively cultivated in Great Britain as in Ireland, where 229,000 acres were under that crop in 1869.

The acreage under Hops in England, to which division of the kingdom the cultivation may be said to be confined, is returned in 1869 at 61,785 acres, against 64,455 acres in 1868, the decrease being attributed to the prevalence of low prices for Hops. About two-thirds of the acreage under Hops is in the county of Kent. The other counties in which Hops are planted to any extent are Sussex, Hereford, Worcester, Hants, and Surrey.

The quantity of land under bare fallow in Great Britain in 1869 is less by 220,000 acres than it was in 1868. The decrease is greatly owing to more correct returns of the land which should properly come under this denomination. The alteration, to obtain this object, made in the heading of the columns for bare fallow in the forms for collecting the returns of 1869, has been previously explained. In Devonshire the decrease in the acreage returned under bare fallow is exceptionally large, and the increase in permanent pasture in that county shows that the land has been more correctly classified. But the increase in the acreage under corn crops in 1869 also contributed to diminish the quantity of fallow land. The quantity of arable land annually allowed a season of rest is a point of much interest in connection with the drainage of land and the rotation of crops as practised in different parts of the country.

The variation in the acreage under Grass remains to be noticed. There is a large decrease in 1869 as compared with 1868 in the number of acres in Grass under rotation, amounting to 511,000 acres for Great Britain, and it is even larger in comparison with 1867. A part of this difference is owing, as in the instance of bare fallow, to more correct classification, which led to the transfer to "permanent pasture" of land which in previous returns was entered as "Grass under rotation:" but the failure of the Clover plant in the dry summer of 1868 caused a large diminution in the acreage of Grass under rotation in 1869.

The acreage under permanent pasture in Great Britain shows an increase in 1869 of 599,000 acres over 1868, and of 768,000 acres over 1867. This increase is more than sufficient to make up for the decrease in the acreage of Grass under rotation. In some of the Grass districts permanent pasture has been more fully returned in 1869, and it has also been increased by the reclamation of mountain and other waste lands.

With respect to the returns of the number of live stock in 1869, it may be observed that, as regards Great Britain, the number of horses is for the first time included. Horses have always been returned in

Ireland, and were also included in the agricultural returns formerly collected in Scotland; but they have been omitted from the returns collected in Great Britain until 1866, when it was considered that the interest so generally taken in the available supply of horses, and their importance as farming stock, rendered it unadvisable any longer to exclude them.

At present the number of horses in Great Britain has only been ascertained so far as they are in the possession of occupiers of land. The total number so returned upon June 25, 1869, was 1,461,000. It is estimated that there may have been at the same date an additional number of 500,000 horses in the metropolis and other towns. The total number of horses in Great Britain would thus amount to about 2,000,000. The number of horses returned for the town and country districts in Ireland in 1869 was 527,000.

As regards the live stock used for food, there was a decrease in the number returned in Great Britain in 1869. The number of cattle and sheep was reduced owing to the failure in 1868 of Turnips and other descriptions of autumn and winter food. The number of pigs was greatly lessened, chiefly in consequence of the continued dearness of corn, but in some parts of the country there were losses from disease in the winter of 1868. Cattle show a reduction in Great Britain of 110,000 in 1869 as compared with 1868, but the number in 1869 is 320,000 above the number of 1867. In Ireland the number of cattle increased in 1869 over 1868, in which year there was a decrease from 1867.

The number of sheep in Great Britain is less by 1,173,000 in 1869 than in 1868, but the number in 1869 is larger by 619,000 than it was in 1867. In Ireland there were 174,000 fewer sheep in 1869 than in 1868. The difference in the relative number of sheep and cattle in Great Britain and Ireland is very great. To every head of cattle there are in Great Britain about 5½ sheep, and in Ireland 1½ sheep. Cattle are, however, kept in larger numbers in Ireland, in proportion to the acreage, than in Great Britain.

The decrease in the number of pigs in Great Britain is 378,000 in 1869 as compared with 1868. There was a much larger falling off in 1868 as compared with 1867. The difference between 1869 and 1867 is rather more than one million, which is equivalent to a diminution of 35 per cent. in the number of pigs in Great Britain in two years. The number of pigs kept in towns, and by cottagers having less than ¼ of an acre of land, are not included in the returns for Great Britain.

There is an increase of 217,000 pigs in Ireland in 1869 as compared with 1868, but that is not equal to the decrease in 1868 as compared with 1867. Pigs are generally supposed to be very numerous in Ireland, but the average number to every 100 acres of occupied land differs but little in Ireland from what it is in Great Britain.

The returns of cattle, sheep, and pigs, taken as they are in the month of June, which is generally considered to be the best period of the year for collecting agricultural returns, show a supply for food short of the actual quantity. The number of calves, lambs, and pigs, born and killed for consumption between the time of collecting the returns from year to year, is not ascertained, and as regards lambs and pigs the number not accounted for is probably considerable.

A comparative table of some of the chief results of the agricultural returns for the counties of England when divided into grazing and corn districts was compiled and published with the returns for 1868. A similarly arranged table, but in greater detail, has been prepared for 1869.

The total acreage returned for counties in the two divisions is so nearly equal in quantity that, of the total acreage returned for all England, 52¼ per cent. is in the grazing or western division, and 47¼ per cent. in the corn or eastern division, but the differences in the agricultural condition of the two divisions are very marked.

Thus of the total acreage in the grazing division, 25 per cent. is under corn crops, against 43 per cent. in the corn division. Green crops occupy 9 per cent. of the total acreage in the grazing and 14 per cent. in the corn division. The land returned as under bare fallow in England is nearly equally divided between the two divisions. But the proportion of fallow to the total acreage, less the permanent pasture, or to the acreage of arable land in each division, is 5.5 per cent. in the grazing against 4.3 in the corn division. This difference leads to the inference that moor or waste land is wrongly returned as fallow in some of the grazing counties. The proportion of the acreage under Clover and Grass under rotation is nearly the same in each division, viz., 9 and 8 per cent. respectively. Permanent pasture occupies 54 per cent. of the acreage in the grazing and 31 per cent. in the corn division.

Of the land under Wheat in England, there is but 39 per cent. in the grazing against 61 per cent. in the corn division. The proportion under Barley varies a little more, being 38 per cent. in the grazing and 62 per cent. in the corn division. Under Oats there is more land in the grazing than in the corn division, the proportions being 52 and 48 per cent. respectively. The proportions of the land under both Beans and Peas are largely in favour of the corn division, viz., for the two crops 72 and 75 per cent. against 28 and 25 per cent. in the grazing division.

The proportion is reversed in the case of Potatos, of which as much as 61 per cent. of the acreage under that crop is in the grazing against 39 per cent. in the corn division. Of Turnips and Swedes 45 per cent. of the acreage is in the grazing, and 55 per cent. in the corn division. The proportions of Mangel and other green crops are largely in excess in the corn division. In the grazing division there is not very much more land under Clover and Grass under rotation than there is in the corn division, the percentage proportions being 54 against 46. Under permanent pasture there is nearly twice as much land in the grazing as in the corn division, the former having 66 per cent. and the latter only 34 per cent. of the permanent pasture in England.

With respect to the relative number of live stock in the grazing and corn divisions, there were, when the returns were made, on June 25, about as many horses in the one as in the other division, but of horses under two years of age there was a larger number in the grazing counties. The cattle were nearly twice as numerous in the grazing division, and the sheep were in nearly equal numbers in the two divisions. There were about the same number of pigs in each division. The relative number of cattle and sheep in the two divisions would doubtless be much altered at a later period of the year, owing to additional stock being then kept in the corn counties to consume the root crops.

The counties grouped in each division are the same as were selected last year, and are arranged for the purpose as far as practicable in geographical order from north to south.

The grazing division includes the counties of Northumberland, Cumberland, Durham, Westmoreland, York (North and West Ridings), Lancaster, Chester, Derby, Stafford, Leicester, Salop, Worcester, Hereford, Monmouth, Gloucester, Wilts, Dorset, Somerset, Devon, and Cornwall.

The corn-growing division includes the counties of York (East Riding), Lincoln, Nottingham, Rutland, Huntingdon, Warwick, Northampton, Cambridge, Norfolk, Suffolk, Bedford, Bucks, Oxford, Berks, Hants, Hertford, Essex, Middlesex, Surrey, Kent, and Sussex.

	In Grazing Counties.		In Corn Counties.	
	Acreage.	Per-centage of Total Acreage of England.	Acreage.	Per-centage of Total Acreage of England.
Total acreage as returned under all kinds of crops, bare fallow, and Grass	12,273,000	52.5	11,098,000	47.5
		Per-centage of Total Acreage in the Division.		Per-centage of Total Acreage in the Division.
Acreage under corn crops ..	3,042,000	25.0	4,743,000	43.0
Do. green crops ..	1,182,000	9.0	1,578,000	14.0
Do. Clover and Grass under rotation ..	1,067,000	9.0	922,000	8.0
Do. bare fallow ..	310,000	2.5*	333,000	3.0*
Do. permanent pasture	6,640,000	54.0	3,457,000	31.0
		Per-centage of Acreage under Crop in England.		Per-centage of Acreage under Crop in England.
Acreage under Wheat	1,308,000	39.0	2,109,000	61.0
Do. Barley	682,000	38.0	1,181,000	62.0
Do. Oats	764,000	52.0	727,000	48.0
Do. Beans	155,000	28.0	393,000	72.0
Do. Peas	98,000	25.0	294,000	75.0
Do. Potatos	210,000	61.0	137,000	39.0
Do. Turnips and Swedes	725,000	45.0	890,000	55.0
Do. Mangel	77,000	27.0	210,000	73.0
Do. Cabbage, Kohl Rabi, and Rape ..	51,000	36.0	89,800	64.0
Do. Vetches, Lucern, &c.	105,000	30.0	241,000	70.0
Do. Clover, seeds, &c., under rotation ..	1,082,000	54.0	923,000	46.0
Do. permanent pasture	6,640,000	66.0	3,457,000	34.0
		Per-centage of Total No. in England		Per-centage of Total No. in England
No. of horses, June 25	575,000	50.4	567,000	49.6
Do. under 2 years ..	79,945	54.6	66,614	45.4
Do. cattle do. ..	2,451,000	65.0	1,255,000	34.0
Do. sheep do ..	10,095,000	51.0	9,727,000	49.0
Do. pigs do. ..	811,000	49.8	818,000	50.2

* These percentage proportions are changed to 5.5 and 4.3 when computed upon the arable land in each division.

At the end of the returns for Great Britain will be found Tables relating to the agriculture of British Possessions and foreign countries. [These will be given in successive numbers of the *Agricultural Gazette*.]

Home Correspondence.

A Ploughing Match.—Referring to your correspondent's letter of last week on the Harton ploughing match, we should like to make a few remarks respecting the time taken by our ploughman, Barker, to complete his half acre. In the first place, he is not accustomed to, nor in practice for, swing-ploughing, and at this match had to contend against the best swing-ploughmen of the district, and of course was subject to the Society's regulations with regard to time. He was also dependent on borrowed horses. Our object was, not to show how much quicker work could be done with a wheel than a swing-plough (only swing-ploughs being able to compete), but simply to show the work our swing-ploughs would do. In this we were successful, inasmuch as the 1st prize and silver medal were awarded to our man. It is well known that swing-ploughing, in spite of there being no wheels to alter, takes much longer than wheel-ploughing, and should of course be resorted to only in very exceptional cases; but for our man to have sacrificed the time allowed him when competing for a prize when others took their full time, would simply have been to thrown away his chance at once. We quite agree with your correspondent that seven and a-half hours is a very long time to take to plough half an acre. Four hours is the usual time allowed in wheel-ploughing, and this loss of time when swing-ploughs are used is a very great argument in favour of wheel-ploughs. *Ransomes, Sims & Head, Orwell Works, January 27.*

Last Words between Woolston and "G.A.H."—Mr. Smith finds fault with my quotation of Mr. Goode's very valuable letter. I quoted it because Mr. Smith was always telling us those traction-engine men hever gave quantities, or cost, or time. I opened the pamphlet to look for an example, and it opened accidentally at p. 62. Mr. Smith says, had I looked at p. 5, I would have seen it was a clip-drum and direct action that did the work. I have looked at p. 5, and can find no such information. But, even supposing it was a clip-drum, what then? Mr. Smith is always condemning these direct actions, and telling us how much better his plan is. As to horse work, horses evidently did nothing for these seed-beds. The whole land was only 505 acres, yet there were 1517 acres of scarifying, that is, three times all over on the average. Besides which, 952 acres were drag-harrowed, or about twice over the whole on the average. Then, 170 acres were ploughed, and 163 clod-crushed with a heavy Cambridge roller. Very little room for horse work after all this, I think. Because Mr. Smith cannot make a seed-bed himself without the aid of horses, he thinks no one else can. Mr. Smith, quoting from some further report (which I have not got) says, Mr. Goode only did 2213 acres in the following three years. I think, to use his own expression, he jumps to a conclusion quite as quickly as his neighbours. His own quotation is, "Cultivating and ploughing," but he does not say how many acres of drag-harrowing or clod-crushing. I am not at all surprised that Mr. Goode reduced his work, because he gave his land such a dressing the first year that it would require a great deal less each subsequent year. Nevertheless, it is plain he did not drop down to the Woolston plan of a single dressing by steam, and then horse work for all the rest. If he had, he would only have done 505 acres instead of 738. "West Indian" asks if I mean Clover for Grass? Most certainly not. There are large tracts of land now where Clover is a very risky crop. He also asks was "G. A. H." at Mr. Smith's, when 23 or 24 gentlemen went by invitation to see the implement work? I was not. I think "West Indian" is quite right about hiring a steam-plough. The only good in the hiring system is for a small farmer to get it to subsoil his land once or twice all over 12 or 13 inches deep. No farmer could leave himself dependant on a hired machine which he may not be able to get when he wants it. If two or three farmers joined it would be as bad—there would be endless disputes as to who was to have it first, and how long he was to keep it, and all that sort of thing. *G. A. H.* [We have a reply from "G. A. H." to "Looker-on," which cannot appear this week.]

—"G. A. H." tells you that my interest sum "is full of mistakes," and then goes on to set one, according to his own fancy, by robbing me of two of my horses, and packing them away with two bundles of interest (interest on men's pay and horse keep) under his "literary" cloak, without even attempting to show that I made a single "mistake." Let him play this trick upon a man driving six oxen along a public road by tucking two of them under his cloak, and telling the man to go on with the four, that being as many as he ought to drive. The man with a detective would soon show him his "mistake," and so will I, for he shall take his slate back and do his sum over again correctly. It is a very simple one: a tenant working six horses sells three of them, and buys a set of steam tackle, paying ready money, and then finds the money for men's pay and horse-keep, expecting interest on all. He is not to pick and cull, but do it as the sum is set. He would have interest, and he shall have it, or take Mr. Mechi's way (my way, and everybody else's as well) of settling the matter. At p. 154, again, he questions my claim to the turn-

round cultivator. Fowler & Co. may to some extent vary the construction of the Woolston smasher, nevertheless their turnround implements are all made upon the Woolston principle, and for this turning-round the Woolston man had a special patent. But "G. A. H." has run away from the main question—interest of money, for he has not a word to say about Mr. Mechi's plan of treating it. Therefore I have now done with him, let him write what he may. *William Smith, Woolston, Bletchley Station, Bucks, January* 31.

Alderney Cows.—In your Paper for April 19, 1862, p. 367, there is a letter from my late brother about a disease, from which many of our Alderney cows have at different times died, and also your opinion of the disease. My brother, in his description, omitted to state that a swelling comes under the lower jaw, or rather under the chin. The labourers, I believe, call it "bottled." Do you, knowing this symptom of the disease, give the same opinion of it, and recommend the same remedy as you did in the Paper mentioned above? Could the disease arise from too much breeding in; from keeping the cows out at Grass day and night up to Christmas in a high and exposed part of the country; or by the so-called "hardening" them when calves by too much exposure? They do not appear to have the disease until they have had at least one calf—sometimes three or four. They sometimes recover, but not generally. *C. P., Stewkley Grange, Bucks.* [The symptoms described indicate chronic disease of the digestive organs due to improper food. The swelling under the jaw is only one of the results of general debility. It would be useless to suggest any treatment without knowing something of the system of management. Channel Islands cattle (except those bred in this country) are delicate, and readily succumb to ordinary causes of disease.]

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, February* 1.—Present: Lord Walsingham, Vice-President, in the chair; the Earl of Lichfield, the Earl of Powis, Lord Chesham, Lord Tredegar, Lord Vernon, Sir Watkin Wynn, Bart., M.P., Mr. Barthropp, Mr. Booth, Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Davies, Mr. Dent, M.P., Mr. Druce, Mr. Edmonds, Mr. Brandreth Gibbs, Mr. Holland, Mr. Hornsby, Colonel Kingscote, M.P., Mr. Lawes, Mr. Leeds, Mr. Milward, Mr. Pain, Mr. Ransome, Mr. Rigden, Mr. Shuttleworth, Mr. Thompson, Mr. Torr, Mr. Webb, Mr. Whitehead, Mr. Jacob Wilson, and Dr. Voelcker.

The following members were elected:—

Baillie, Hugh Smith, Household, Nairn, N.B.
Binney, Charles H., North Cheam, Sutton, Surrey
Botfield, Rev. W. B. Garnett, Decker Hill, Shifnal
Bull, J. H. W., Great Walford, Shipston-on-Stour
Carter, J. Quartly, Arborfield, Reading
Clarke, E. C., Manor Farm, Haddenham, Thame
Clifton, T. Henry, Lytham Hall, Lytham
Cockburn, George, Newcastle-on-Tyne
De Mornay, Alfred, Cold Harbour, Wallingford
Fair, Thomas, Westwood, Lytham
Fisher, E. Knapp, Market Harborough
Fisher, John, Wood House, Cross Hills
Ford, Francis Colville, The Ridges, Hartfield, Tunbridge Wells
Fowler, Richard, Brompton Farm, Aylesbury
Fowler, William, Pauntley, Navent
Franklin, Thomas, Ascott, Wallingford
Franklin, W. Taylor, Ascott, Wallingford
Garrett, Richard, Carleton Hall, Saxmundham
Godwin, John, Troy Farm, Doddington, Oxon
Hall, Marriott, Thorpe Salvin, Worksop
Higgs, John Birch, Brewood, Penkridge
Jackson, James, 6, Chapel Street, Preston
Lane, John, Winslow Hall, Bucks
Latham, Thomas, Wittenham, Abingdon
Little, Herbert J., Thorpelands, Northampton
Manley, Augustus East, Manley Hall, Lichfield
Marshall, James, Low Horton, Cramlington
Marsland, William, Baguley Hall, Northenden
Masters, Albert Edward, Nevenson Hall, Chelmsford
Mitchell, John, The Beacon, Penkridge
Owen, Griffith H., Ymwlch, Tremadoc
Parr, John, Cropwell Butler, Bingham
Phelps, H. G. Hart, Ridley Parsonage, Wrotham
Roberts, Joseph, Caswell House, Witney
Singleton, John, Poulton Le Fylde
Smith, Samuel, Somerton, Deddington, Oxon
Stilgoe, Nathaniel, Manor Farm, Adderbury, Banbury
Thomas, William, Penn Fields, Wolverhampton
Tomlin, J. R., Stoke Field, Newark
Tompkins, John, Town Farm, Irvinhoe, Tring
Tovey, Joseph, Cirencester
Turner, John, The Grange, Ulceby
Wharton, G. Livingston, Grovehill, Beverley
Wheeler, John, Long Compton, Shipston-on-Stour
Whittall, Thomas, Bailey Inon, Llandrindod Wells
Wingfield, John H. L., Tickencote, Stamford
Woodcock, Richard, Wolverhampton
Wyatt, Robert, Acton Hill, Stafford.

FINANCES.—Colonel Kingscote, M.P., presented the report, from which it appeared that the Secretary's receipts during the past two months had been examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on January 31 was £1748 4*s.* 11*d.* The balance-sheet for the quarter ended December 31, 1869, and the statement of subscriptions and arrears, were laid upon the table; the amount of arrears then due being £1150. One hundred and fifty-nine members have given notice during the past year of their withdrawal from the Society.

The committee reported that Mr. Wilkes, the junior clerk, wished to retire, owing to his health failing, and his having an engagement better adapted to him. They wished to express their entire satisfaction with Mr. Wilkes during the nine years that he has been in the employment of the Society; and they recommended that Mr. Hine, who has been employed as temporary clerk for some years past, should be appointed to succeed Mr. Wilkes. The Manchester country meeting account was laid before the Council, by which it appeared that the receipts exceeded the expenditure by £9152 11*s.* 3*d.* It was recommended that the name of Mr. Davies be added to the list of the committee. This report having been adopted, a conversation arose with regard to the award made against the Manchester local committee for compensation to the tenant of the trial-fields; and Colonel Challoner gave notice that, at the next Monthly Council, he would move—"That a sum of £500 be given to the Manchester local committee in aid of the extra expenditure occasioned by the compensation awarded to the tenant of the trial ground."

JOURNAL.—Mr. Thompson (Chairman) reported that the committee recommended the publication of the February Number of the Journal as soon as possible, without waiting for the usual statistics. They also recommended that the annual lists of the Council and committees shall in future be circulated in March instead of February.—This report was adopted.

GENERAL OXFORD.—Lord Walsingham (Chairman) reported the recommendation of the committee that the Oxford Stock Prize-sheet be finally closed.—This report was adopted.

EDUCATION.—Mr. Holland (Chairman) laid before the Council the syllabus of subjects for examination in agricultural chemistry, botany, geology, land surveying, and mechanics; and he reported that the committee recommended them being printed and circulated amongst candidates, together with a syllabus of subjects in general chemistry and in anatomy and animal physiology.—This report was adopted.

CHEMICAL.—Mr. Dent, M.P., reported that the committee had had before them the correspondence between Messrs. Dobell and the consulting chemist and secretary of the Society. They decline to enter into the correspondence between Messrs. Dobell and Howden. They are satisfied that the sample of guano sent to Dr. Voelcker was described to him as "Guano genuine as imported," and that Dr. Voelcker's analysis of the manure was correct.

It is no part of Dr. Voelcker's duty to inquire from the seller the price of an article submitted to him for analysis, but to give a correct analysis; and in cases where the constituents of such articles appear to be agriculturally valueless, this committee recommend the publication of the analysis to be continued. The object of publishing these analyses is not merely to show that the dealer is charging more than the value of the article sold, but to warn the purchaser against buying at any price an article which is of only a nominal agricultural value.

Professor Voelcker reported on a correspondence from the Foreign Office on the subject of guano now being imported from the Guanapé Islands, that he had made analyses of five different samples from bulk, which vary considerably in composition, and generally resemble Peruvian guano damaged by water. The variation in samples is so considerable that purchasers should be careful not to buy this guano without a guaranteed analysis. This is corroborated by the analysis furnished in the official report forwarded by the Board of Trade to the Society, where, out of 13 samples, the amount of ammonia varies from 3.8 to 18.8 per cent.*

It was moved by Mr. Milward, and seconded by Mr. Jacob Wilson, "That Messrs. Bowly and Sanday be paid for their services as judges at Manchester, in accordance with the letters of the Secretary to them." After a discussion on the question whether there existed any rule to the contrary, which was decided in the negative, the motion was put from the chair, and carried unanimously.

Lord Vernon having moved the resolution of which he had given notice, it was seconded by Mr. Milward, and a rider was added, at the suggestion of Mr. Thompson. A discussion then arose as to whether judges were paid for their time, or only a sufficient sum to cover their expenses; and it was stated by Colonel Challoner and Lord Vernon that cases had arisen where members of Council had resigned their seats in consequence of their inability to perform the duties of the office of judge to which they had been elected without the usual payment. Lord Vernon, Colonel Challoner, and Lord Walsingham also commented on the desirability of obtaining the aid of the most competent men whether they are on the Council or not. Ultimately the resolution, as amended, was carried, with one dissentient, as follows:—"That judges who are members of Council may be paid as other judges, by special vote of Council after a month's notice."

The Earl of Lichfield called the attention of the Council to the inconvenience arising out of the conditions of the charter, fixing the date and place of holding the general meeting, and excluding from the Society's meetings the discussion of all subjects having reference to measures pending, or to be brought forward, in either House of Parliament. He sketched the history of the last reference of this subject to a committee; but as that committee had never reported, he wished to refer the matter once more to a committee for consideration. He also stated that many subjects enumerated in the existing charter as objects for which the Society was established, could not be discussed without reference to politics and to necessary legislation. Mr. Thompson stated, that although the time fixed by the charter for holding the annual meeting was very inconvenient, he did not think that alone would justify the expense of obtaining a new charter. He also drew a distinction between the functions of the Legislature in passing laws, and those of the Society in dealing with questions after those laws had been made. After a further discussion, in which Col. Challoner, Mr. Holland, and Mr. Dent, M.P., took part, the question as to the date of the annual meeting was, on the suggestion of Mr. Thompson, referred to the committee for the revision of the bye-laws.

It was moved by Mr. D. R. Davies, seconded by Mr. Jacob Wilson, and carried unanimously, that Sir Watkin W. Wynn be elected steward of live stock. Letters were received from the authorities of Shrewsbury, Stafford, and Wolverhampton, announcing their intention of inviting the Society to hold its country meeting for 1871 at their respective towns; and the Secretary was instructed to forward the usual documents to the mayors of the competing localities. Mr. Jacob Wilson gave notice that at the next Monthly Council he would move—"That the committee for the recommendation of judges be appointed at the March Council, that this committee shall sit in April, and that the absolute appointment of judges shall take place at the May Council."

Letters were read from the Secretary of State for Foreign Affairs, enclosing reports on the cultivation of Flax, received from her Majesty's Representatives at St. Petersburg, Brussels, and the Hague; and from the Secretary of the Board of Trade, enclosing a document entitled, "Notes on a new method of cultivating and increasing the productiveness of the soil." Thanks were ordered for these communications. [The report on Guanapé Island guanos will be found given as a leading paragraph on p. 184.]

* The detailed official report is published on p. 184, having been forwarded to the Society by the Secretary of the Board of Trade, with a request that it should be made public.

Farmers' Clubs.

SMITHFIELD.

February 1.—At the meeting of the Council this day, the Earl of Powis in the chair, the stewards reported on the cases referred to them as to the qualifications of certain animals at the last show. The Hon. Secretary was requested to communicate with one of the exhibitors in reference thereto, and the reply to be laid before a Special Council, which the President was requested to order to be summoned in May.

Mr. R. J. Newton, of Campofield, Woodstock, and Mr. Wm. Sanday, of Radcliffe-on-Trent, were elected stewards of live stock for the ensuing three years. Mr. Joseph Druce and Mr. Robert Leeds were re-appointed stewards of implements for this year.

The Council proceeded to revise the prize sheet for this year's show. In the Scotch horned classes it was determined to substitute the words "West Highland breed," and to establish distinct classes for "other Scotch horned breeds." Steers or oxen of any age, the prize of £10 and Silver Medal to the breeder; heifers or cows of any age, the prize of £10 and Silver Medal to the breeder.

It was resolved to establish in each of the following divisions of sheep, viz., Leicesters, Cotswolds, Lincolns, Southdowns, Hampshire or Wiltshire, Shropshire and Oxfordshire, a new class for pens of three ewes above three years old and that must have had a lamb, the prize of £10 and Silver Medal to the breeder.

It was resolved—

That the prizes for 2-year-old Southdowns be—1st prize, £15; 2d, £10. Also that the 2-year-old class for Hampshire or Wiltshire Downs be discontinued.

Also that in the 2-year-old Oxfordshire class there be only one prize of £10.

Also that the Ryeland, Cheviot, and Dorset divisions stand before the Mountain in the prize sheet; the Champion Prize Plate of £100 for the best beast in the show; the Champion Prize Plate of £50 for the best pen of sheep in the show, be again offered; but that the Champion Plate for the best single sheep be discontinued. In the condition of the Silver Cups in the divisions for Shropshire, Oxfordshire cross-bred, or any other breed, the words 1-year-old be inserted, so as to limit the competition to 1-year-old sheep, as already in the Southdown divisions. That the prizes in extra stock, steers or oxen, and cows or heifers, be increased from £5 to £10. That all the Silver Medals for single sheep in extra stock be abolished; and in lieu thereof a Silver Cup, not exceeding £5 in value, be given for the best wether in the following divisions:—1st. Leicesters, Cotswolds, Lincolns, and Kentish or other Long-wools; 2d. Southdowns, Hampshire or Wiltshire Downs; 3d. Shropshire, Oxfordshire cross-bred, or any other breed not before specified. Also that a Silver Cup, as above, be given for the best single pig in extra stock.

The wording of rule 17 was amended.

It was resolved—

That it be an instruction to the judges' selection

committee not to appoint as judges any persons who will act as judges at the Birmingham Cattle Show the same year.

It was resolved—

1. That more stringent means be taken to prevent exhibitors and others entering the hall previous to the day of judging, and that the attention of the directors of the Agricultural Hall Company be specially called to this point.

2. That the Club shall engage an official of its own, in order to check any persons who may have got past the ordinary door-keeper hitherto appointed.

3. That the exhibitors and attendants in the implement galleries shall not have access to the ground floor, and that they shall have a distinct ticket, and be admitted by a doorway so arranged as to allow of their going direct to the galleries.

4. That the stewards be empowered to incur such expense as may be found necessary to carry out the above.

It was resolved—

That the stewards be requested to revise the classification of breeds to be adjudicated upon by each set of judges.

The report of the showyard committee as to proposed alterations was read, and referred to the same committee to go into further details, to confer with the directors of the Agricultural Hall Company, and to report to the Council to be held in May.

The implement committee was reappointed for the present year, with the same powers as heretofore.

Letters were read and referred to the implement committee, also a memorial respecting the charges and arrangements for cattle conveyances was referred to the stewards.

The Hon. Secretary was requested to communicate with the Privy Council and the Metropolitan Board of Works, to see if the advertisement relative to the licence for holding the Club's show could not be curtailed, by omitting apparently unnecessary details.

The following were elected members of the Club:—Wm. Webb Turner, of Chyngton Seaford, Sussex; Mrs. Gerard Cresswell, Appleton Hall, Sandringham, Lynn, Norfolk.

A vote of thanks was passed to the Right Hon. the Earl of Powis, the President, for his able conduct in the chair.

Notices of Books.

The Irish Land Question. By James Sanderson, Pall Mall East. E. Stanford, 6 and 7, Charing Cross, S.W.

The reader will find here the confident utterance of a practical man after personal inspection of the sister country, after long labours as a land agent in this country, and after early education and experience in the North. There could hardly be a fitter witness, so far as professional accustomedness to the subject is concerned: and Mr. Sanderson's discussion of it has the merit of giving constant proof by quoted instances, and of displaying courageous confidence in those principles which have been illustrated by experience elsewhere.

The following are extracts taken from one or two of his principal chapters:—

Present Condition of Ireland.—"The Irish tenant for many years has had no deficient harvests, no blighted hopes from Potato famines, no vicissitudes from sudden reversions in the prices of his produce, and above all no severe pressure put upon him to pay an exorbitant rent. On the contrary, he has—from raising chiefly stock and dairy produce, by far the most remunerative from the enormous prices it has for a long period realised—reaped, and is now reaping, a larger share of prosperity than the English farmer. This prosperity is doubtless extraneous, and not the result of native industry or of the judicious expenditure of native capital. The condition of the peasant labourer, too, has vastly improved. He now readily gets employment, and during the last 20 years has added 30 per cent, to his earnings.

"With all this prosperity, foreign though it is, the moral and social condition of Ireland is without parallel during the present century. Increasing prosperity breeds only increasing disaffection, and the greater the privileges, the louder the complaints. Almost every day records a foul agrarian crime, and the demon of murder, screened by cowardly witnesses and intimidated juries, stalks openly through the land, choosing for his victims those who are Ireland's greatest benefactors.

"The rent of land is a point of considerable importance, as several practical writers have stated that land in Ireland is over-rented. Having during the last two years valued for rental over 800 farms in England, representing a capital value of about £5,000,000, I may be pardoned for giving my opinion on this subject somewhat confidently. Comparatively speaking, the best land is the lowest rented. I have walked over a large area of land in Tipperary, which fattens a bullock and several sheep per acre, and which is held for the low rent of 30*s.* per acre. In England, the same land would readily realise 70*s.* I do not hold with the general view entertained that land in Ulster is higher rented than in the South. On the contrary, I consider that without reference to the rich grazings in Meath, Limerick, and Tipperary, that land is lower rented in the north than in the South."

Mr. Sanderson then discusses the subject of land tenure, advocating the lease and condemning tenant-right, except under some more rigid and authentic form of it than now generally prevails. He states his objections to the various suggestions of previous writers, discusses the general subject of compensation for improvements, and ends with the following:—

Reforms Necessary for Ireland.—"1st. The suppression of agrarian crime.

"2d. Law to declare that at the expiry of the term contracted for, landlord and tenant shall be alike free.

"3d. The gradual consolidation of holdings.

"4th. The extension of the lease system: the term of lease to be 21 years.

"5th. Compensation for tenants' improvements.

"6th. Government to reclaim the bog area.

"7th. Powers to tenants for life to charge the inheritance for capital expended on improvements.

"8th. A competent court of appeal to settle differences that may arise between landlords and tenants as to rent or improvements. The party who loses to pay the total cost.

"These reforms, I submit, would equally respect the rights of the landlord and protect the interests of the tenant. They would benefit no class at the expense of another, involve no loss of capital to either owner or occupier, cause no sudden or violent changes, and raise no barriers to social progress. On the contrary, with crime repressed, the relation of landlord and tenant adjusted and mutually respected, small holdings which pauperise the occupiers merged into compact farms, the lease system extended, and a fresh avenue, through the conversion of the vast reclaimable area, opened up for labour, Irish agriculture would become worthy of Irish soil, landlords would secure larger revenues, tenants making larger outlays would realise larger returns, labourers getting ample employment would secure higher wages, and an increased supply of food would be supplied for an industrious population."

Farm Memoranda.

NORTH RIDING OF YORKSHIRE: *Jan.* 24.—Farm operations during January have been much impeded by the wet and changeable character of the weather. The ploughing done has been very limited, and though the days have been many in which we have had frost, yet seldom so intense and durable as to allow the cartage of manure to be got on with. Further, the low prices and continued heaviness of the markets afford no inducement for the delivery of grain, and thus reduced to a minimum another branch of useful employment.

For sheep on the Turnip break the weather has been extremely unfavourable, and even on some of our dryest lands they have for several days been removed to the Grass; their progress in the acquisition of mutton has during the month been little, while the ungenial weather rendered the consumption of food more than an average. So much for comfort and the economy of it.

The young Wheats look blanched, and are backward for the season; genial weather would doubtless speedily effect a great change, but there seems little reason to suspect them to be overtaken with the danger last year's plants were threatened with, viz., winter-proud.

The foot-and-mouth disease still lingers amongst us: we have had upwards of 150 head attacked, one case proving fatal. It seemed to attack most severely the fat and other animals highly fed. Milch cows (excepting two or three newly calven) and young stock got over it in a very short time, and in condition very little deteriorated. The newly calven cows were affected in the udder, the milk curdled and difficult to draw, hard swelling appearing first in one quarter and then in another. The only treatment was washing the mouth with alum-water two or three times a day during its soreness, and poulticing the feet of those which showed much lameness.

During the month our markets have been well supplied with fat stock, and though during the past week their tendency has been to heaviness and lower prices, yet prime heifers yet make 9*s.* per stone of 14 lb.

Sheep come to hand in fewer numbers, and do not participate in the dulness; small, well-fed wedders being worth close on to 9*d.* per lb.

Pigs, both pork and bacon, are scarce and dear; the quotations for the former 9*s.* 6*d.*, and the latter 8*s.* 6*d.* per 14 lb. *W. F. M., Jan.* 24.

MERSE OF BERWICKSHIRE: *January* 31.—If not such a hard winter as some we have seen—the minimum air temperature occurred yesterday, 17°—this is certainly a severe one. Saving a few inches of snow about Christmas, our frosts have been of the blackest; and under their influence Turnips of all sorts are reduced to about one-half their original value in feeding and "staying" qualities, so that an inconveniently large crop is now brought within the limits of sufficiency. The intervals of open weather have been too short to admit of any renewing growth; and even Swedes have not, since the first frost in November, been in a condition to keep in store beyond a few weeks; a strong argument for early storing. Live stock of all kinds have done well during the quiet weather, but store sheep are the better for hay or oat-straw, now that Turnips are so hard. Gamekeepers' stock make more of the Swedes; the regulars by night at their own sweet will, and the flying column by day, scarce to be scared by the exhibition of a gun.

Such portion of Wheat as was above-ground looked well during fresh weather: at present it is encrusted with rime, and not a snow-flake to cover it. Ploughing for spring corn is decidedly in arrear, little having been done this year. Of grain markets it need only be remarked that good spring corn is much cheaper than what stood all the weather. *Y. T.*

The Week's Work.

FEBRUARY 5.—*Seed corn* should now be in readiness for early spring sowing. When threshed indoors very great care is necessary to keep the different kinds of any one grain separate. As a rule two kinds should never be in the corn barn at one and the same time, even granting that both are in brand new sacks; and, after being placed in the granary, there are many unseen ways by which they are often mixed. Rats and mice, old threshing machines, and still older barns, floors, skirtings, and walls give a great deal of bother when threshing out seed. The day's wages of a carpenter in the summer time, to close up all the seams and openings in which the grain lodges beyond the reach of the barn broom, is a poor saving; and if the repairs are not done in the summer time they should be so before the threshing of seed corn commences. Dry corn sticks to the wet dirty feet of careless servants, goes into their shoes and clothes, and more harm is done in this way than many imagine.

The vitality of seed corn should always be tested in a flower-pot, or under a sod before sowing, in order to ascertain how much seed will be required per acre; and we believe proof of this kind is more than usually necessary during the current season, especially in some districts. The normal vitality of Wheat, Barley, Oats, Peas, Beans, and the Clovers are far from being uniform year after year, even in our best climates; and it will be found that the harvest of 1869 has a greater number of blanks than its predecessor (1868), generally speaking. There are no doubt many exceptions, but such can only be ascertained by the flower-pot or sod. To sow bad seed—the half of which is dead before it was threshed—and then to blame the coming season for the paucity of braird, with perhaps a large percentage of sickly plants which come to nothing—is short-sighted folly. In examining our flower-pots we have not only to compare the number of seeds brairded with what was sown, but also to note the percentage of healthy plants; and if this is low try another stack, and if it is equally sickly, the prudent course is a change of seed. In most parts of Scotland Clover requires to be bought every year, and in not a few Wheat and Barley; also, in bad years, Oats.

Change of Seed.—We do not think that any difficulty will be experienced in getting good seed, but we should advise those who require a change to look out in time and to deal with men in whom confidence can be placed. Good sound seed is always cheaper in the end than are inferior samples, for although the former may cost a fourth more money, yet if it brairds a third more plants—and these all healthier than those of the latter—the balance in its favour is manifestly much greater, all things considered, than some at first sight may imagine. There is perhaps no subject fraught with greater importance than the proper seeding of the land.

Spring Wheat should now be got into the land the moment a proper seed-bed is obtained, so that it may braird evenly and vigorously. Give to-day no credit for the weather of to-morrow, but let every day begin and finish its own work. The weather, too, is generally very unequal, for there may be "fill dyke" in one place and a tempting seed-bed in another. The thorough drainage of the country has greatly improved its meteorological characteristics, but with an improved climate and cultivation heavier crops are grown, and these require to be earlier sown, in order to avoid lodging and loss at harvest time.

Candlemas Term.—About this time in Scotland married servants who have houses and gardens are re-engaged for another year, *i.e.* from Whitsunday, 1870, to Whitsunday, 1871; and when situations are to be vacated at the ensuing Whitsunday, new engagements take place. Although engaged from year to year, steady hands often "sit out their masters," becoming highly respected members of society in the district; and more encouragement should be given them, by better cottages and gardens, thus to settle in long service.

Young stock of every kind attend to early and late. In breeding districts many time their cows to calve about the beginning of the month, in order that one cow may afterwards bring up three calves—two from this time onward, and one after they are weaned. Some bring up four calves, two at a time, others only two calves, one at a time. The calves bought in are got from small cottage farmers and town dairymen, and very great care requires to be taken just now, and indeed at all times, not to introduce contagious disease with the young calves. Some prefer bringing up their calves with the pail; others putting them to the cows. Calves generally thrive better when fed the latter way than the former, and on less milk, but when fed by hand many additions are made to the milk, as oatmeal gruel, Clover-hay tea, boiled Turnips, &c. There is a great art in feeding with the hand, so as to teach the calf to drink slowly. There is also no little judgment required in feeding the cows both ways, in order to supply wholesome milk; for it is a well-known fact that anything bad, as rotten roots, eaten by the cow, goes to her milk and physics her calf, thereby producing many of those bowel complaints and other maladies so frequently experienced. With the abundant supply of roots and spring forage crops now grown, milch cows kept exclusively for breeding purposes are timed to calve earlier than in former times, in order that the calves may have the full advantage of the summer Grass—so that

February may now be taken for calving time, instead of March, and even April, if we go back to the last century. Stock breeders are alive to the importance of early calves, and cows must be attended to accordingly. This advance in stock management requires more and better household accommodation, for calves require large, well lighted, and well ventilated separate pens. *W. F.*

Notices to Correspondents.

FARM ENGINES. *Cor.* We are unable to recommend manufacturers or tradesmen. Consult the reports of the English Agricultural Society's Judges.

SEWAGE GRASS. *Mr. Richard Hume*, of Ulver Lodge, writes thus:—"Twice lately I have heard complaints of the action of sewaged grass. 1. That butter made from cows fed on it will not keep. 2. That milk from the cows fed on Grass from the Craigentinny meadows is unwholesome. I have little doubt that both assertions are false, but should be glad if you, or one of your correspondents, would inform me, from personal experience, whether there is any truth in them or not?" [There is no truth in either.]

Markets.

ENGLISH WOOL.

No material alteration has taken place. Lustre Wools still continue in demand, and, owing to their scarcity, choice parcels are hard to buy. In lower grades, where sellers make a slight concession, there appears more inclination to buy largely.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.—*s. d.*	*s. d.*
FLEECES—Southdown hoggets	1 1	to 1 2
Half-bred ditto	1 —	1 1
Kent Fleeces	1 3	— 1 4
Southdown ewes and wethers	0 0½	— 1 1
Leicester ditto	1 2	— 1 3
SORTS—Clothing	0 10	— 1 6
Combing	1 0	— 1 8

HAY, per Load of 36 Trusses.

SMITHFIELD, Thursday, February 3.

Prime Meadow Hay	95s. to 120s.	Clover, old	115s. to 130s.
Inferior do.	60 70	Inferior do.	— —
Rowen	40 70	Prime 2d cut	100 120
Inferior do.	— —	Inferior do.	80 90
Straw	25 30	CHARLES JAMES EDWARDS.	

CUMBERLAND MARKET, Thursday, February 3.

Sup. Meadow Hay	84s. to 96s.	Inferior Clover	95s. to 114s.
Inferior do.	70 70	New do.	— —
New do.	— —	Straw	33 36
Superior Clover	116 132	JOSEPH BATES.	

WHITECHAPEL, Thursday, February 3.

Fine Meadow Hay	72s. to 76s.	Prime old Clover	122s. to 126s.
Inferior do.	70 70	Inferior do. do.	95 105
Prime New Hay	— —	Prime 2d cut do.	— —
Inferior do.	— —	New Clover	105 112
Straw	24 28	Inferior do. do.	90 100

METROPOLITAN MEAT MARKET.—Feb. 4.

Best Fresh Butter .. .. .. 19*s.* per dozen lb.
Second do. do. .. .. 17*s.*
Small Pork, 4*s. 8d.* to 5*s. 6d.*; Large Pork, 3*s. 8d.* to 4*s. 4d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, January 31.

We have a good supply of Beasts, and trade is dull; choicest qualities find purchasers at nearly late rates; otherwise prices are lower, and several inferior remain unsold. The number of Sheep is about the same as on Monday last; prices are lower than on that day, but Thursday's quotations are well maintained, and a good clearance is effected. Prices for Calves are lower. Our foreign supply consists of 1407 Beasts, 5210 Sheep, and 170 Calves; from Scotland, there are 170 Beasts; from Ireland, 330; from Norfolk and Suffolk, 1180; and 745 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5	0 to 5 4	Best Long-wools	5	0 to 5 4
Best Shorthorns	4	8 5 0	Do. Shorn	—	— —
2d quality Beasts	3	0 3 8	Ewes & 2d quality	3	8 4 8
Best Downs and Half-breds	5	6 5 8	Do. Shorn	—	— —
Do. Shorn	—	— —	Lambs	—	— —
			Calves	—	— —
			Pigs	4	0 4 8

Beasts, 3,610; Sheep and Lambs, 19,410; Calves, 150; Pigs, 110.

MONDAY, February 7.

The supply of Beasts is small, but it exceeds the demand; there are very few buyers at market, prices are lower, and a clearance cannot be effected. The number of Sheep is also small, but they cannot all be sold. The small amount of business transacted is not about Monday's quotations. Calves are rather lower. Our foreign supply consists of 195 Beasts, 2365 Sheep, and 139 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5	0 to 5 2	Best Long-wools	5	2 to 5 4
Best Shorthorns	4	8 — 5 0	Do. Shorn	—	— —
2d quality Beasts	3	0 — 3 6	Ewes & 2d quality	4	8 —
Best Downs and Half-breds	5	6 — 5 8	Do. Shorn	—	— —
Do. Shorn	—	— —	Lambs	—	— —
			Calves	—	5 6 —
			Pigs	—	— —

Beasts, 642; Sheep and Lambs, 4865; Calves, 177; Pigs, —.

MARK LANE.

MONDAY, January 31.

There was a fair supply of English Wheat to this morning's market, mostly in inferior condition, and to effect sales it was necessary to submit to a reduction of 1*s.* to 2*s.* per qr. upon the prices of this day se'nnight, excepting for the finest dry samples. The attendance was moderate, and sales of foreign Wheat could only be proceeded with at a decline of 1*s.* per qr. Barley was a slow sale, and secondary qualities were 1*s.* per qr. cheaper. Beans were also 1*s.* per qr. lower. The Oat trade was dull, at a decline of 6*d.* per qr. Flour was rather easier.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*
WHEAT, Essex, Kent, Suffolk White	30	40
— — fine selected runs, do.	41	53
— — Talavera	56	59
— — Norfolk	—	—
— — Red	52	53
BARLEY, grind. & dist. 26s. to 30s. Chev.	39	42
Foreign ... grinding and distilling	22	25
OATS, Essex and Suffolk	22	24
— Scotch and Lincolnshire ... Potato	24	26
— Irish	22	25
— Foreign ... Poland and Brew	21	24
RYE	—	—
RYE-GRASS, Foreign	—	—
BEANS, Mazagan	34	37
— Pigeon	36	40
— Foreign	34	36
PEAS, White, Essex, and Kent	40	42
— Maple, 42s. to 43s.	42	43
MAIZE	—	—
FLOUR, best marks delivered ... per sack	43	—
2d ditto	36	40
— Foreign ... per barrel	22	25

	Red	Red	Red	Red	Red
	White	White	White	White	White
	30 to 40	41 to 53	56 to 59	—	52 to 53
	Chev.	Malting	Malting	Feed	Feed
	39 to 42	22 to 25	22 to 24	22 to 24	21 to 24
	Potato	Potato	Feed	Feed	Feed
	24 to 26	22 to 25	21 to 24	21 to 24	21 to 24
	Tick	Harrow	Harrow	Harrow	Harrow
	34 to 37	34 to 37	34 to 37	34 to 37	34 to 37
	Winds	Winds	Winds	Winds	Winds
	36 to 40	36 to 40	36 to 40	36 to 40	36 to 40
	Small	Small	Small	Small	Small
	41 to 42	41 to 42	41 to 42	41 to 42	41 to 42
	Boilers	Boilers	Boilers	Boilers	Boilers
	32 to 42	32 to 42	32 to 42	32 to 42	32 to 42
	Grey	Grey	Grey	Grey	Grey
	32 to 42	32 to 42	32 to 42	32 to 42	32 to 42
	—	—	—	—	—
	—	—	—	—	—
	Country	Country	Country	Country	Country
	28 to 40	28 to 40	28 to 40	28 to 40	28 to 40
	Per sack	Per sack	Per sack	Per sack	Per sack
	22 to 25	22 to 25	22 to 25	22 to 25	22 to 25

FRIDAY, February 4.

The stocks of Grain in our markets have not diminished during January (the arrivals for that month being the largest for many years past), and as those in the Russian and American ports are fast increasing, giving promise of early and considerable further shipments, while our west coast ports begin to be largely supplied with French flour, the trade throughout the markets of the kingdom has been very dull during the past week, and where sales were forced Wheat prices gave way 1*s.* per qr.; this decline not being sufficient to bring buyers forward readily. Excepting fine malting Barley, the value of which remained unaltered, spring corn of all sorts has been neglected, and prices were in buyers' favour. Flour was 6*d.* per barrel and 1*s.* per sack cheaper. Since Friday last 103 Grain and seed laden vessels arrived off the coast, of which, with those left over from last week, there remained for sale last night 107 cargoes. The trade in cargoes arrived off the coast was slow during the preceding week. Buyers waiting for the fresh fleet from the Black Sea, known to be near at hand, the few sales effected show a decline of nearly 1*s.* per quarter, from previous rates, for Wheat. Prices of Maize gave way slightly. Barley met with a slow sale, and for Rye there were only purchasers at a reduction of 1*s.* 6*d.* per quarter. In cargoes on passage and for forward shipment, nothing of interest is to be reported.

The arrivals this week of English and foreign Grain are small. There was a poor attendance at this morning's market, and but little disposition shown to purchase Wheat, the business done in either English or foreign was at less money than on Monday last. Oats were 6*d.* per quarter cheaper; other descriptions of Spring corn un changed in value.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English	2040	1420	—	—
Irish	—	—	—	—
Foreign	8830	4140	5700	5500
	10,890	5560	5700	5500

LIVERPOOL, Feb. 1.—Wheat in very moderate demand, at 1*d.* to 2*d.* per cental decline. Since Friday last Flour has been dull, and nominally unchanged. Beans 3*d.* per qr. cheaper; Saidi, 34*s.* to 34*s.* 3*d.* Oats and Oatmeal neglected. Indian Corn in tolerably fair request, at 3*d.* reduction; round yellow, 26*s.* 6*d.* to 26*s.* 9*d.*

AVERAGES.

	Wheat.		Barley.		Oats.	
Dec.	5 ..	43	8	34	1	21 6
Jan.	1 ..	43	1	35	9	21 11
	8 ..	44	5	35	11	21 1
	15 ..	44	1	36	4	21 4
	22 ..	43	6	36	2	21 10
	29 ..	42	2	35	2	20 4
Average	..	43	8	35	11	21 10

SEED MARKET.

Our seed markets exhibit increased animation, and it appears probable that country buyers will no longer defer making their purchases. There are a few samples of new English red Clover seed offering, the quality of which is for the most part very poor, but for which the holders demand extravagant rates. Home-grown Alsike and white Clover seed are also a very short growth this season; the quality is, however, satisfactory; for these descriptions we are largely dependent upon Germany; the quantity offering thence is small. Best new Trefoil seed is exceedingly scarce and dear, inferior parcels are cheap and plentiful. In foreign Italian we note an advance of 6*d.* to 1*s.* per cwt. Perennial Grasses are abundant, and can be bought on quite moderate terms. Spring Tares are now in improved request. Mustard and Rape seed are firm at the recent advance. During the last two years autumn and early purchases have proved disappointing, consequently very few of the provincial trade have as yet gone into stocks; this year, however, taking into consideration the limited stocks on hand, and the certainly deficient growths, instead of lower quotations we anticipate a speedy enhancement in values.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, February 4.

Messrs. Pattenden & Smith report a steady demand for consumption, late rates being fully maintained.

GENUINE FARM SEEDS

AT VERY LOW PRICES.

James Carter & Co. Seed Growers

Having Harvested their Crops of FARM SEEDS in very fine condition, are prepared to supply their Choice Prize Stocks at the following low quotations:—

CARTER'S PRIZE STOCKS.

Per lb.—*s. d.*

CARTER'S IMPERIAL HARDY SWEDE—acknowledged to be the best in cultivation 0 7

CARTER'S LONDON SWEDE, an immense cropper 0 9

LIVERPOOL SWEDE, and other ordinary varieties .. .. ..7*d.* to 0 10

CARTER'S WARDEN PRIZE MANGEL, remarkable for fineness of quality 1 0

CARTER'S CHAMPION YELLOW INTERMEDIATE MANGEL, the best oval-shaped variety 1 0

CARTER'S MAMMOTH PRIZE LONG RED MANGEL, a splendid variety, grows to a great size 1 0

MANGEL WURZEL, ordinary stocks .. ..8*d.* to 1 0

DEVONSHIRE GREY-STONE TURNIP, of quick growth and good quality 1 0

POMERANIAN WHITE GLOBE TURNIP, the largest and best white Turnip 0 9

LINCOLNSHIRE RED GLOBE TURNIP 0 9

IMPERIAL GREEN GLOBE TURNIP 0 8

CARTER'S CHAMPION HYBRID TURNIP, Green-top or Purple-top, splendid 0 10

CARTER'S IMPERIAL GREEN KOHL RABI 3 0

CARTER'S MAMMOTH PURPLE KOHL RABI 3 0

ROBINSON'S CHAMPION DRUMHEAD CABBAGE 2 6

CARTER'S "PRIZE NURSERY" SUGAR BEET.—This variety, after careful analysis, has been proved to contain two-thirds greater proportion of sugar than ordinary kinds 1 0

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Complete Assortments of Choice VEGETABLE SEEDS, for

A Year's Supply.								
No 1	..	..	£3 3 0	No 4	..	..	£1 1 0
No 2	..	..	2 2 0	No 5	..	..	0 12 6
No 3	..	..	1 1 0	No 6	..	..	5 5 0

Complete Assortments of Choice Continental and English

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No 1	..	..	£2 2 0	No 4	..	..	£0 15 6
No 2	..	..	1 11 0	No 5	..	..	0 10 6
No 3	..	..	1 1 0				

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Their Seeds are all of the most select character, each variety being saved in the most careful manner.

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W. P. LAIRD AND SINCLAIR, NURSERYMEN, Dundee, N.B., have pleasure in offering the above new variety of RHUBARB, which they have confidence in recommending as the earliest and best sort in cultivation. The raiser of it describes it "as one of a batch of Seedlings from Victoria; the Seedling Plant was a fortnight earlier than any of the remainder of the lot, and grown beside Prince Albert and Linnæus, always to days earlier than them, and giving a larger quantity of superior stems to either of these varieties. It forces better than any variety I know, and has a splendid colour."

Strong Roots, 2s. 6d. each. Usual Discount to the Trade.

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Andover—Mr. Wm. Miller	Liverpool—Thos. Davies & Co.
Glasgow—Arnott & Co.	London—Hurst & Son
Dublin—Joseph Berry & Sons	" Fraser, Goad & Ratford.
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York—James Backhouse & Son	Kelso—Stuart & Mein
Kilmarnock—W & J. Samson	Birmingham—Felton & Sons
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Further Names published as received.

GENERAL TRADE NURSERY LIST may be had on application

New Cucumbers.

GEORGE EDWARD has great pleasure in offering seed of the following first-rate CUCUMBERS, feeling satisfied that they will fully maintain the characters that have been given to them.

EBOR—This will prove to be the most useful variety grown, either for Market or Gentleman's Gardener for every day use. In packets of Six seeds, 6d. each, or Twelve, the coupons given in the *Gardeners' Chronicle*, and the "Cottage Gardener:"—

"Your Cucumber, raised from Edward's Eclipse, crossed with Craigg's Prolific, and with the pollen of the strongest constitution and most prolific variety known, belongs to the spined class. The samples of fruit sent are good looking, evenly swelled, of moderate length, and of good average quality."—*Gardener's Chronicle*, Dec. 4, 1869.

"The specimen you sent, which you state is a cross between Edwards's Eclipse and Cragg's Prolific, is very handsome, and of a most useful size."—*Cottage Gardener*, 14th Dec., 1869.

EDWARDS'S ECLIPSE, in packets of six seeds, 1s. each. A trace of the above was sent to the Editor of the *Gardeners' Chronicle*. The following was the response, on December 19, 1868:—

"A handsome variety, of fine shape and flavour, and having the recommendation you mention—it is a desirable variety."

RLYNOLDS'S PERPETUAL BEARING.—The most useful and prolific Cucumber in cultivation for winter forcing, free growing habit, with thin skin, not seedy, size medium. In packets of six seeds, 1s. 6d.

CARNATION and PICOTEE SEED, saved from G. E.'s collection, which contains all the best varieties in cultivation, in packets of 100 seeds, 1s. each

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For prices and full particulars of other mixtures apply to

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LAXTON'S NEW PEAS, ALPHA and SUPREME

HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties; also the HUNDREDFOLD, COOK'S FAVORITE, and the entire stock of McMILLAN'S QUEEN of the MARROW. They have also grown largely other leading varieties. Descriptive List of all in CATALOGUE, which may be had on application. They have at present a good supply of the true RED and WHITE ITALIAN TRIPOLI ONION, and the GIANT ROCCA, all of which are scarce this season.

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Bishop's Longpodded Dwarf.	Champion of England
Early Sangster.	Duke of Wellington's Heir
Essex Rival	Veitch's Perfection.
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The Early Rose } Imported direct { per lb., 1s. 6d.; 7 lb., or
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Peterson's Royal Ashleaf, Cattell's Feeder, per lb., 1s. 6d.; 7 lb., or; 56 lb., 6s.
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Carter's Champion, best for forcing, 5s. per peck.
Myatt's Ashleaf, 4s. per peck.
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Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkable free from disease, while the other varieties have suffered to a considerable extent. 2s. per peck.

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PRINCE OF WALES' KIDNEY, an abundant cropper, shallow eyes, good oval.

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MRS. PATERSON begs to intimate that, having for many years assisted her late husband in the propagation of the Potato Plant and other ways in his business, and having retained all the old assistants, she will now conduct the Potato Seed Business in her own name. All Orders sent to her will be executed with great care and promptitude. It might be well for parties to order direct, as they would be sure to have true seed, as parties are selling a Fine Potato for Ayrshire.

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PRICE LISTS to be had on application.

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HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Reuben Headley, Esq., of Staplehurst. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

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COIN MANURE, for Spring Use

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SUPERPHOSPHATE OF LIME

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With all kinds of produce, Horticultural and Agricultural, its use has been highly satisfactory. The Corporation is prepared to deliver it at the Rochdale Station at £2 per Ton, or to arrange for its delivery where required.

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Second quality cheaper. Reduced rates for more than 10 Acres.

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This valuable mixture for the Destruction of Plant Pests can be very highly recommended; it has received the very highest commendations from some of the leading horticulturists in the country who have given it a fair trial. Testimonials on application.

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"I find it exceedingly useful for Killing the Aphides on Roses and other plants." (Mr.) LYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.

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IRON HURDLES (Silver Medal of the Royal Agricultural Society): SHEEP, 3s. 9d.; CATTLE, 4s. 2d.; OX, 5s. 11d.
List by post. GATES and FENCING of every description.
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THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The planes of sets are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and need not be put down more to further labour and expense, as do "Box" edgings, consequently being much cheaper.

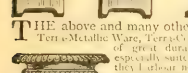

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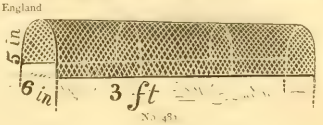

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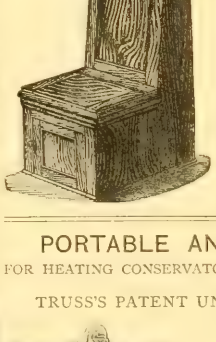

MOULE'S PATENT EARTH SYSTEM.

From Mr. W. GILBERT, *Linford Street, Rugby.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them. "W. GILBERT."

"*January 1, 1870.*

Prospectuses and full information may be obtained at

29, BEDFORD STREET, COVENT GARDEN, W.C.

PORTABLE AND FIXED HOT-WATER APPARATUS,

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

TRUSS'S PATENT UNIVERSAL FLEXIBLE AND LEAKLESS PIPE-JOINTS.

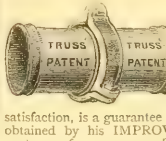

T. S. TRUSS

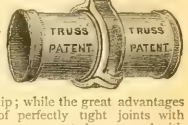

Begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the ROYAL HORTICULTURAL SOCIETY at SOUTH KENSINGTON and CHISWICK, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantages obtained by his IMPROVED SYSTEM cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; EFFECTS A SAVING of 25 PER CENT. on cost of Apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; can be erected by any Gardener; an ordinary size Apparatus erected in one day; and PERFECTNESS of DESIGN SUPPLIED, INSURING NO EXTRAS. Complete Apparatus, of the best materials, delivered to any Railway Station in England, and Erected at the following prices. Erection beyond 25 miles of London, railway fare for one man additional. Considerable reduction on large works.

Two Four-inch Pipes along One Side and One End of House.

Size of House.	Apparatus Complete.	Erection.	Size of House.	Apparatus Complete.	Erection.
20 feet by 10 feet ...	£9 0 0 ...	£2 0 0	50 feet by 15 feet ...	£17 10 0 ...	£3 0 0
30 feet by 12 feet ...	11 15 0 ...	2 10 0	75 feet by 15 feet ...	20 0 0 ...	3 0 0
40 feet by 15 feet ...	15 0 0 ...	2 15 0	100 feet by 15 feet ...	26 0 0 ...	3 5 0

Bath and Gas Work Erected in Town or Country. The TRADE SUPPLIED.

Price Lists, Plans, and Estimates forwarded on application to

T. S. TRUSS, C.E., CONSULTING HORTICULTURAL ENGINEER, &c., SOLE MANUFACTURER, IRON MERCHANT, HOT-WATER APPARATUS MANUFACTURER, AND HORTICULTURAL BUILDER,
FRIAR STREET, BLACKFRIARS ROAD, LONDON, S.E.

T. H. P. DENNIS & COMPANY, PATENTEES,

HORTICULTURAL ENGINEERS AND BUILDERS IN WOOD AND IRON.

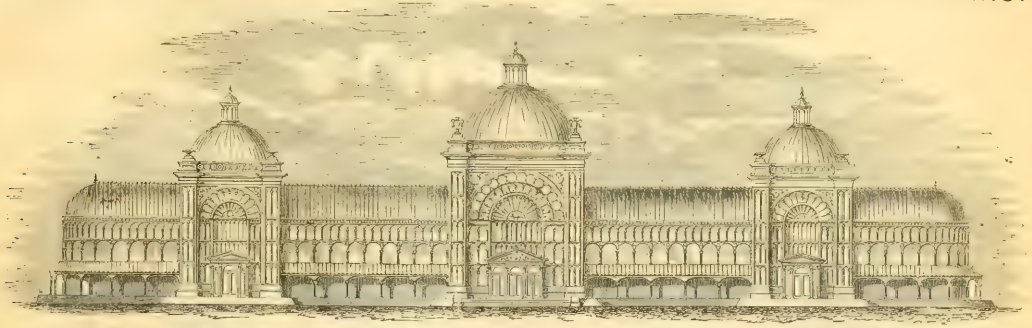

T. H. P. DENNIS AND COMPANY beg to direct the attention of Noblemen, Gentlemen, Nurserymen, and Gardeners, to the many and varied improvements they have made in every description of Horticultural Erections. They continue to Manufacture Buildings of the highest order in Wood, Galvanized Metal, and their HIGHLY APPROVED Patent Wrought Iron Construction. They have much pleasure in announcing that by the aid of modern appliances, in their Manufactory, all kinds of Horticultural Buildings will be supplied at the most moderate prices consistent with the high standard of their workmanship. Every description of Garden Structure arranged, designed, and heated on T. H. P. D. AND CO.'S improved system, will be guaranteed to fully answer the purpose for which they are intended.

Gentlemen waited upon by Members of the Firm to advise and arrange for contemplated Buildings.

Our NEW HOT-WATER BOILER and other Specialities and Patented arrangements are described in other Advertisements, and also in our Catalogue, which may be had on application.

ANCHOR IRON WORKS, CHELMSFORD.

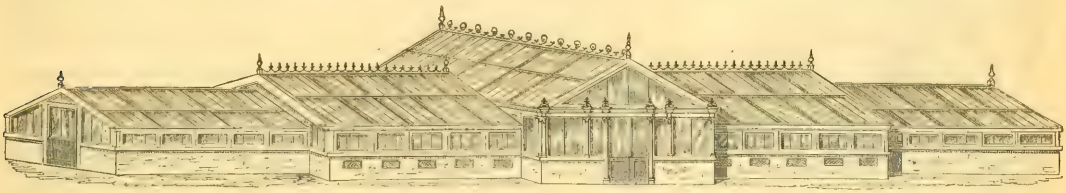

HENRY ORMSON

Is determined, with the aid of **NEW AND VALUABLE MACHINERY,** and an experienced **STAFF AND WORKMEN,** so to improve and facilitate the **MANUFACTURE OF HORTICULTURAL STRUCTURES** that they may be built **OF THE BEST MATERIALS** at a **MUCH LOWER PRICE** than has been possible heretofore.

COMPETITION SOLICITED.

MANY OF ORMSON'S PATENT WELDED WROUGHT IRON BOILERS have been substituted for **CRACKED CAST IRON TUBULAR BOILERS** during the past winter months, and have been found **MUCH MORE ECONOMICAL IN CONSUMPTION OF FUEL.** Prices on application. Please to state length and diameter of pipe to be heated.

THE HEATING DEPARTMENT always engages his especial personal attention, and he feels justified in saying that in simplicity, safety, durability, and economy of fuel, combined with thorough effectiveness, his system cannot be surpassed.

Knowing the absolute necessity for well regulated and properly arranged Ventilation, he makes it a matter of first consideration.

H. O. having competent Draughtsmen and an efficient Office Staff, is prepared and will be happy to forward Plans, Estimates, and Specifications, by post or otherwise, and to wait personally on any Ladies or Gentlemen who may desire to see him on their Grounds.

H. O. is also in the habit of furnishing Estimates, and building from Drawings prepared by Architects, and is kindly permitted to refer to many of the most eminent in the profession. He has also much pleasure in stating that he can refer to many of the Seats of the Nobility and Gentry, in all parts of the kingdom, where he has been employed to build some of the finest and best arranged Glass structures known at the present time.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,

AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.

STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

GREEN'S PATENT BOILER

WITH INVERTED CYLINDER ENGINE COMBINED.

Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
„ Water, 1 Cubic foot „ „ „

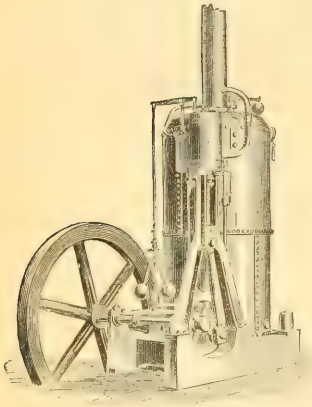

Horse-Power Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.		
1 „	3½ in.	6 in.	„	4 ft. 6 in.	1 ft. 8 in.	.. ..	£40*
2 „	4	10	„	5 „ 0	2 „ 4	.. ..	£55*
3 „	4¾	10	„	5 „ 6	2 „ 4	.. ..	£65*
4 „	5½	12	„	7 „ 0	2 „ 4	.. ..	£85
6 „	6¾	14	„	8 „ 0	2 „ 8	.. ..	£120
8 „	8	16	„	9 „ 0	3 „ 0	.. ..	£100
10 „	9¼	19	„	10 „ 0	3 „ 4	.. ..	£185
12 „	10	18	„	11 „ 0	3 „ 8	.. ..	£200
14 „	11	18	„	11 „ 6	3 „ 10	.. ..	£220
16 „	12	20	„	12 „ 0	4 „ 0	.. ..	£250
18 „	12¾	22	„	12 „ 6	4 „ 2	.. ..	£285
20 „	13¾	22	„	13 „ 0	4 „ 4	.. ..	£310
25 „	15¼	24	„	14 „ 0	4 „ 8	.. ..	£380
30 „	16½	28	„	15 „ 0	5 „ 0	.. ..	£450
35 „	16½	28	„	16 „ 0	5 „ 4	.. ..	£520
40 „	18	28	„	17 „ 0	5 „ 8	.. ..	£585

* 1, 2 and 3 if not fitted with Governor, less £5.

The Fly-wheel Shafts is made suitable for Standard Shafting, which can be procured, which can be supplied along with the Engine any diameter ordered, at an extra charge according to size.

The above Engines and Boilers supply every small power that will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

The Boilers are fitted up with Strong Welded Tubes, intersecting the fire-box (varying in number according to the size of the boiler), and a mud hole is placed opposite each tube for the purpose of cleaning them out. They are tested up to 200 lb. pressure to the square inch.

The Foundation Plate answers the purpose of Feed Water Tank, in which the water is heated before passing into the boiler, and also of an ash pit, and no brickwork or foundation is required.

The Trade supplied [illegible] Fact.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1293 :—

"*Vertical Engines* continue to merit growing patronage. They have their advantages over the horizontal engines, not only in construction as to the working and extra and unequal tear and wear of the piston and cylinder, but in their adaptation to light work—as grinding, chaff-cutting, and root-pulping. The small area of space they occupy is also greatly in their favour. Of late years very great progress has been made in the cattle feeding department of farm practice, hence the growing demand for engines of this class; but this is not all that must be reported, for they are evidently also entering into competition with their rivals in the threshing barn. They have long been in extensive use by builders for hoisting and pumping, being made locomotive by means of rails; and constructed on this plan they are proving equally effective and advantageous in the brick-field, quarry, wood-yard, large dairies for churning, laundries, for driving washing machines, and the like. Add to this the growing use of a heavier class of engines for steam culture, which necessitates as it were the employment of small vertical ones at the homestead, it is easy accounting for the growing popularity of the latter at all our implement exhibitions. In construction there is a close similarity on the whole, but in details of mechanism they are diversified. Something of course depends upon the special purposes for which they have been made, and whether they are to be used outdoors or indoors, and whether they are to burn coal or coke, and so on.

GREEN'S PATENT SILENS MESSORS,

OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

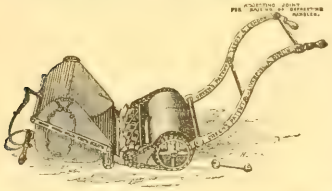

Every Machine is warranted to give entire satisfaction, or if not approved of, can be returned at once at our cost and risk.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition
First Prize Medal at the Leuken Exhibition.
First Prize Medal at the Luxembourg Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features: 1st. Simplicity of construction, every part being free of access. 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

N.B. All Orders are executed on the day they are received.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	13	6
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches ..	..	..	..	..	£4	0 0
20 „ 22 „ ..	..	..	..	..	3	2 6
16 „ 17 „ ..	..	..	..	..	2	10 0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

14, TICHBORNE STREET, REGENT'S QUADRANT, LONDON, W.

SIR J. PAXTON'S HOTHOUSES FOR THE MILLION

Have been proved by 10 years' experience to be the simplest and cheapest made as Lean-to Roofs

FOR COVERING PEACH WALLS OR FOR EARLY VINERIES,

AND AS SPAN-ROOFS FOR ORCHARD HOUSES, VINERIES, GREENHOUSES, FORCING PITS, &c.

Prices given for covering any extent of Wall or Ground, on receipt of particulars as to height, length, and width required. Other systems of construction and ventilation adopted if preferred; but these are usually more expensive and not so readily erected by local carpenters.

"Nothing can be more easy than to build them, nothing more simple than to remove them."—*Daily News*, May 22, 1862.

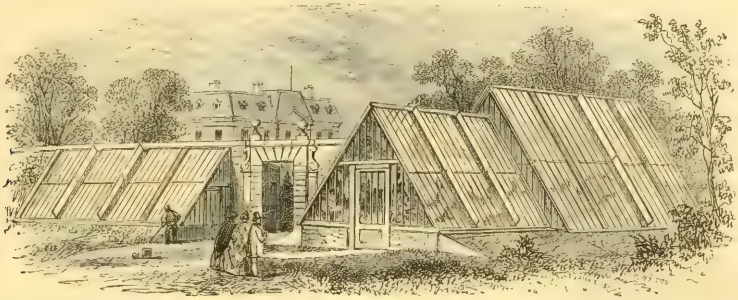

MANUFACTORIES LONDON, GLOUCESTER, COVENTRY, ULVERSTONE, PAISLEY, and ABERDEEN *only*.

ESTIMATES given for ORNAMENTAL CONSERVATORIES, GREENHOUSES, &c., to Designs, Sketches, or Specifications; also for HEATING APPARATUS fixed complete anywhere in the United Kingdom.

REFERENCES can be given to works executed in every county of England, and many in Scotland and Ireland.

A PAMPHLET, with views of various styles of Glasshouses and Conservatories, and PRICE LIST of Patent Roofs, Post Free for 2 stamps.

HEREMAN AND MORTON, 14, TICHBORNE STREET, REGENT'S QUADRANT, W.
(Removed from Pall Mall East.)

HORTICULTURAL BUILDERS AND HOT-WATER ENGINEERS.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

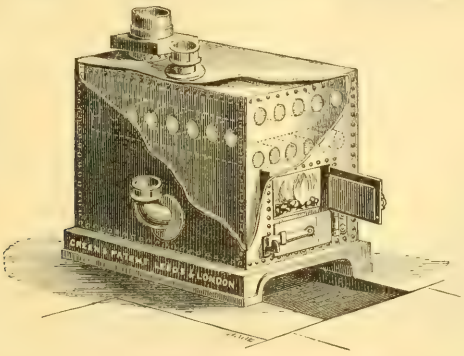

OBLONG BOILER.

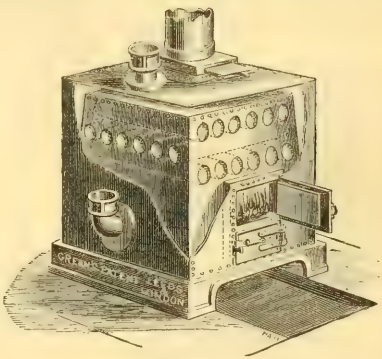

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate, which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of **T**-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS; and
54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application
J. JONES AND SONS, 35, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark

Greenhouses and Conservatories.

H. FREEMAN AND SONS, Horticultural Works, 106, Mare Street, Hackney, E. Established 20 years. Good substantially made GREENHOUSES, glazed, ready for fixing, 42 feet long, 13 feet wide, £90 : 21 feet by 13 feet, £68 : 12½ feet by 10 feet, £45 handsome CONSERVATORY 20 feet high, 35 feet by 15 feet, £110. Nurserymen's LIGHTS. £25 per 100 feet

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or equivalent

HOT-WATER PIPES, Nos. 6 & 7 on illus-	2-inch. s. d.	3-inch s. d.	4 inch s. d.
trated sheet .. .. .. per yard	0 11	1 5	1 11
ELBOWS .. .. No. 12 on do each	1 4	2 1	2 9
TEE PIPES .. .. No. 13 on do ,,	2 0	3 0	4 0
SYPHONS .. .. No. 53 on do ,,	1 9	3 0	4 0
VALVES .. .. ,,	10 0	11 0	12 0

GEORGE ROBINSON, Old Iron Works, Scurlogue
London Warehouse, 16, Grand Junction Wharf, Paddington Basin.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS Each.

6 ft. by 4 ft Lights, 2 in. thick, unglazed.. £0 5 0
,, ,, Primed and Glazed with 16 oz. sheet 0 11 0
,, ,, with stout portable Box, not Painted 1 3 0
,, ,, Painted four coats, and Handles on 1 8 0
,, ,, Packed and Delivered in Railway Van 1 10 0
6 ft. by 8 ft., Double Lights, do. 2 15 0

GREENHOUSES Per ft. superf.
Woodwork only Prepared and Painted 0 0 6
,, Primed and Glazed with 16 oz. Sheet .. 0 0 9
,, Delivered, and Fixed with Ironwork .. 0 1 0
,, Painted four coats, both sides, ready for use. 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

T. G. MESSENGER, MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH.

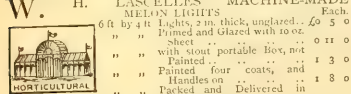

Honourable Mention awarded at the International Exhibition, 1862 and at the Dublin Exhibition, 1865 ; also a First-class Certificate by the Royal Horticultural Society

T. G. MESSENGER, Patentee of many important improvements in Building, and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed.

Any House Glazed, single or double, with or without putty. The mode adopted by T. G. MESSENGER for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented.

HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof and sides as though the glass were entirely removed at once, placing the plants in the eternal atmosphere

T. G. MESSENGER'S BOILER possesses all the advantages of the Tubular and saddle combined, has hollow furnace bars, requires but a shallow stoke-hole, expose a large heating surface to the direct action of the fire as can possibly be obtained, the whole of which can be easily cleaned ; and it is an important fact, that out of upwards of 500 now at work made up in the temporary fire-brick set it has never been fixed

T. G MESSENGER'S VALVE single or double is effective, simple, easy to work, and as durable as the pipe to which it is attached.

Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 13 stamps.

Preserve your Wall-fruit Trees from Spring Frosts.

EVERYONE MAY FIX HIS OWN WALL-COVER.

BEARD'S PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Victoria Works by C. BEARD, Horticultural Engineer, Bury St Edmunds, Suffolk.

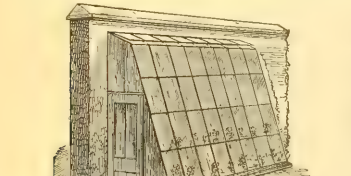

These Screens may be converted at pleasure into Lean-to or Span-houses : full particulars of their adaptation, and price, may be obtained at the Works, by enclosing stamp, where also an Illustrated Catalogue may be obtained for 13 stamps, containing full particulars of the increasing and valuable systems of manufacture in both patent glazing and ventilation

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING AND BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OUTAVIS WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for their genuine, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the world.

Paxton Works, Sheffield. Established upwards of 125 years.

RALPH WALLER AND CO., 45, Dale Street, Manchester, Manufacturers of all kinds of GARDEN NETTING, &c.—The serious injury done every spring to fruit crops by frost has proved to every gardener the absolute necessity of providing some protection to the trees early in the year. If the blossom in its earliest development, be but slightly weakened by frost, the vitality of the fruit germ is destroyed, and the fruit is lost. In this climate, on the average of a century, there is not more than one year in ten when the protection is unnecessary. Many fabrics have been tried for this purpose of protection, with more or less success, and we may now say, without fear of contradiction, that we have succeeded in manufacturing the only fabric which is altogether unobjectionable for this purpose. Without unduly nursing, it effectually protects from frost, germ, and does not impede the ingress of light and the circulation of air. Some other fabrics do this, and thus weaken the vitality of the tree altogether. Almost every large grower in the three kingdoms can testify to these facts.

The Nettings also make a beautiful shading for Hothouses in summer, and are cheaper than other fabrics on account of their great durability.

Netting (qualities) : Nos. 1, 2, 3, in pieces of 50 yards long, 1¼ yard wide. Tiffany in pieces 20 yards long, 30 inches wide.

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FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
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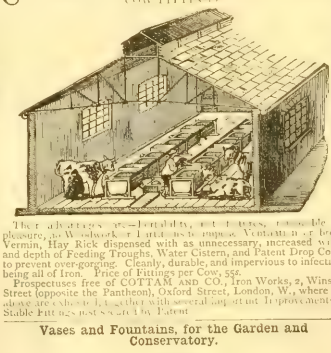

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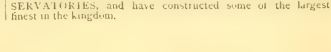

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13 by 11	14 by 11			
13 by 12	15 by 12	15 by 11	16 by 11	
18 by 12	19 by 12	16 by 12	17 by 12	
10 by 13	17 by 13	20 by 12	..	15 0 19 0 18 6
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20 by 15					
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in	in	in	in	in	in	4ths	3ds.	2nds	Best.
6 by 4	7 by 5	8 by 6	9 by 7						
6½ by 4½	7½ by 5½	8½ by 6½	9½ by 7½			11s 3d	12s 6d	14s 0d	15s 6d

Per 100 feet

10 by 8	11 by 9	12 by 9	13 by 10	14 by 10	15 by 10				
10 by 8½	11 by 9½	12 by 9½	13 by 10½	14 by 10½	15 by 10½	11s 0d	11s 9d	13s 3d	17s 6d
11 by 9	12 by 9	13 by 9	13 by 10½	14 by 11	15 by 11				
11½ by 9½	12 by 10	13 by 10	14 by 10	15 by 11					

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in	in. in.	in.	in.	in.	in.	4ths	3ds	2nds.	Best.
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16 by 10	14½ by 12½	17 by 13	24 by 16						
14½ by 11½	15 by 12	23 by 13	20 by 17						
15 by 11	15½ by 12½	18 by 14	22 by 17			12s 3d	15s 6d	16s 9d	18s 0d
15½ by 11½	16 by 12	22 by 14	24 by 17						
16 by 11	16½ by 12½	21 by 14	20 by 18						
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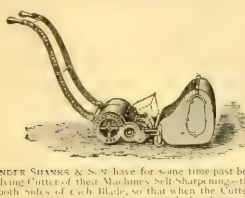

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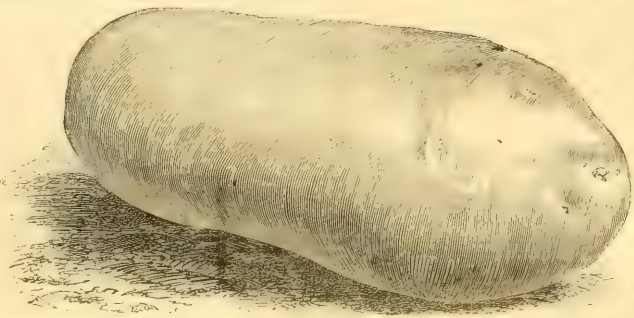

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 7.—1870.] SATURDAY, FEBRUARY 12. { Price Fivepence. *Stamped Edition, 6d.*

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☞ NOTICE.—*The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will, on and after* MARCH 4, *be published on* FRIDAY, *at* 2 P.M., *instead of on* SATURDAY, *as hitherto.*

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Mr. H. Day, Gr., Eridge Green, Epping	1	1	0
Mr J Deadman, Stowe, Bucks	0	5	0
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Mr. J. Donald, Gr., Hamilton Court Palace	1	1	0
Mr. R. Draper, Gr., Seaham Hall	0	10	6
Under Gardeners at Seaham Hall	0	6	6
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Mr. Finlay Dun, Wynyard Park	1	1	0
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Mr H Eckford, Gr., Coleshill House, Highworth	1	0	0
The Under Gardeners at Coleshill House	0	5	0
Mr. G. Edmonds, Gr., Keswick Hall	1	1	0
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Mr. W. Gardiner, Gr., Weston House, Shipston-on-Stour	1	1	0
Two Under Gardeners at Weston House	0	10	0
Mr. J. Gardner, Gr., Heaton Hall, Brigg	0	10	6
Mr George, Gr., Balmore House	0	10	6
Three Under Gardeners at Balmore House	0	5	0
Mr. J. Giles, Gr., Sandy Court, Dublin	0	10	0
Mr. H. Gilvan, Gr., Holkham Hall, Wells	1	0	0
Four Under Gardeners at Holkham Hall	0	7	0
Mr. B. Godbold, Gr., Chipstead Place, Sevenoaks	0	5	0
Mr. C. Gooding, Gr., Grittleton, Chippenham	1	1	6
Three Under Gardeners at Grittleton	0	7	6
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Mr. Gray, Gr., Uplandham, Rochester	1	1	6
Three Under Gardeners at Upleatham	0	7	6
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Mr W. Hall	0	10	6
Mr. J. Harris, Park Wern Gardens	0	5	0
Mr. F. Harrison, Gr., Osmaston Manor	1	1	0
Under Gardeners at Osmaston Manor	1	10	0
Mr. J. Harrison, Darlington	0	5	0
Mr. J. Harrison, Gr., Tyntesfield, Bristol	1	1	0
Mr. J. Hawkins, Abbey Gardens, Scilly	1	0	0
Mr. Hedley, Gr., Dolphin Park	1	0	0
Mr. J. Hendry, Gr., Williamstrip Park, Fairford	1	1	0
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Mr. A. Hunt, Gr., Davenham Bank, Great Malvern	0	10	0
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Mr. T. Jack, Gr., Battle Abbey	1	1	0
Foreman and Under Gardeners at Battle Abbey	1	1	0
Mr. W Jackson, Gr., Keddleston Hall, Derby	1	1	0
Mr. T. James, Gr., Bewley Hall, Coldsdon	1	0	6
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Foreman and Under Gardeners at Glamis Castle	0	15	0
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Mr. H. Jones, Gr., Minterne, Dorchester	1	1	0
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Under Gardeners at Brantingham Thorpe	0	8	0
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The Under Gardeners at Floors Castle	0	11	0
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Five Under Gardeners at Colston Bassett	0	10	6
Mr. G. Lamb, Jun., Colston Bassett Gardens	0	10	6
Mr. Lawrence, Foreman, Rise Park Gardens	0	5	0
Mr. W. Leach, Gr., Chesham Place	1	1	0
Under Gardeners at Bienheim Palace	0	3	0
Mr T Lees, Gr., Tynninghame	0	10	0
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Two Under Gardeners at Marston House	0	2	0
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The Under Gardeners at Newbattle Abbey	1	10	0
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The Under Gardeners at Minley Manor	0	10	0
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The Under Gardeners at Alton Towers	0	15	0
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Mr A J Ramsey, Gr., Castleborough, Enniscorthy	0	10	0
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The Under Gardeners at Penrhyn Castle	1	1	0
Mr. Spencer, Gr., Bangor	0	10	0
Mr J Stanton, Gr., Biddulph Grange	1	1	0
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Mr. R. Webb, Gr., King's Weston, Bristol	1	1	0
Mr. J. Webster, Gr., Penlee Park, Westbury-on-Trym	0	5	0
Mr. C. E. West, Gr., Carton, Maynooth	1	1	0
Mr. A. White, Foreman, Ashton Court Gardens	0	5	0
Mr. J. Whittaker, Gr., The Laurels, Putney	0	2	0
Mr. J. S. Whittem, *per* W. Miller	1	1	0
Mr W. Widdowfield, Gr., Hackthorne Hall, Lincoln	0	10	0
Mr. J. Wilkinson, Gr., Newby Hall	0	10	6
Mr R S Williams, Holloway	1	1	0
Messrs. Williams & Co., City Road, E.C.	1	1	0
Mr. J. Wilson, Gr., Penicuick House	1	1	0
The Under Gardeners at Arundel Castle	0	15	0
Mr. J. Wood, Newport, Isle of Wight	0	10	0
Mr. R. Wood, Bury, Gosport	0	5	0
Mr. W. Wood, Gr., Oldfield Grange, Coggeshall	0	2	6
Under Gardener at Oldfield Grange	0	2	6
Messrs. Wood & Ingram, Huntingdon	1	1	0
Mr. J. Woodward, Gr., Garbrand Hall, Ewell	1	1	0
Under Gardeners at Garbrand Hall	0	5	0
Mr. W. Wright, Gr., Plas Newydd, Bangor	1	1	0
Under Gardeners at Plas Newydd	0	5	0
Mr. G. Young, Gr., Leigh Park	1	1	0
Foreman and three Under Gardeners at Leigh Park	0	6	6
Young Gardeners at Royal Exotic Nursery	1	3	6
The Foreman and Under Gardeners at Battersea Park	0	10	6
The Under Gardeners at Blythswood	0	5	0
Two Under Gardeners at Drayton Manor	0	5	0
Seven Under Gardeners at Keele Hall	1	1	0
Two Under Gardeners at Stoneleigh Abbey	0	10	0
Two Under Gardeners at Warren House, Stanmore	0	10	0
The Under Gardeners at Woliaton Hall	0	7	6

*** *The Subscription List will be closed on March 25.*

Botanic Gardens, Chelsea, Feb. 8, 1870.

THOMAS MOORE, Hon. Secretary.

CUCUMBER, ARMITAGE'S SATISFACTION,

1s. per Packet, Five Seeds.

Having tested this variety at our Nursery, its merits cannot be too highly stated, for it was admitted by all who saw it growing, as one of the most prolific, best in shape, large, smooth, good colour, and quality not surpassed. Recommended with confidence.

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HAVE FINE STOCKS OF

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Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KIDNEY
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" KING
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EARLY FORTYFOLD
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" COCKNEY
" BRITISH QUEEN
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GRYFFE CASTLE, or BLACKSTOUN DON,

In Bags, containing 1 cwt., 10s. 6d.: 2 cwt., 20s., Bag included.

For quality and quantity this variety is pre-eminent, being as early as the Dalmahoy and yielding as heavy a crop as the Regent. It is suitable either for the Garden or the Farm. The "Gardeners' Magazine" says regarding it:—"An excellent Potato, cropping well, free from disease, and elegant upon the table." W. F. Radclyffe, in *Gardeners' Chronicle*, says:—"If you keep three Potatos, buy these—Royal Ashleaf, Gryffe Castle, and Hero; they will carry you from June to June."

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The above are all carefully selected stocks, specially grown for Seed on Peat soil, and well worth the attention of parties desirous of obtaining a pure stock. Price per ton or per sack on application.

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24 plants, in 12 varieties, two of each for 7s.
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When cultivators, who know what they are about, eagerly give 10 Guineas per Tuber for a New Potato, and the possessor of it refuses 100 Guineas for a Peck, we feel bound to believe that it possesses extraordinary merits. Such, however, have been facts connected with the above new kind. It is of American origin, produced by the raiser of the celebrated Early Rose, and FULLY A WEEK EARLIER THAN THAT VERY EARLY VARIETY. Flesh white, cooks well, and is of the best quality for table; also a great cropper. The eyes may be cut out for planting.

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AMARANTHUS ELEGANTISSIMUS (Lee's variety), very handsome.
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" " scarlet, shaded madder-red, very showy.
" " lilac, with white border, quite distinct.
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MELONS, all the newest and best kinds [extra
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BARR & SUGDEN,

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TRIOMPHE DE NICE GREEN-FLESH, a first-class new Melon. From the "Gardener's Year Book."—"Triomphe de Nice: Fruit large, round, very prominently netted. Skin pale yellow or greenish yellow. Flesh green, very thick, firm yet melting, the greater part eatable and possessed of a particularly fine aroma. Flavour rich and excellent.—Barr & Sugden, First-class Certificate, Royal Horticultural Society, 1869." 2s. 6d. per packet.

The above first-class Melons can be had genuine from any of the following Seedsmen :—

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" Veitch & Sons, Nurserymen, King's Road West, Chelsea.
" W. Drummond & Sons, 58, Dawson Street, Dublin.
" Downie, Laird & Laing, Nurserymen, Forest Hill.
" Ewing & Child, 9, Exchange Street, Norwich.
" Edmondson Brothers, 10, Dame Street, Dublin.
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DR. LIVINGSTONE, an exceedingly fine stock of the black seeded Brown Cos, the most hardy, robust, and least-easily affected by heat; when tied up for a few days there is no lettuce equal to it for its fine crisp, rich, nutty flavour; suitable for summer or winter work. 1s. 6d. per packet, 3s. 6d. per ounce.

WILLIAM ROBINSON, a fine globe-formed compact growing Cabbage Lettuce, extremely hardy, and literally all heart, tender, sweet, delicate, and solid; in a collection of 150 other samples it was by far the best in every respect, and throughout the spring months was conspicuous in its distinctness from all others. It is a good summer Lettuce, but as a winter Lettuce it excels from its compactness it may probably be a good "Cloche" variety. 1s. and 2s. 6d. per packet.

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SANTON'S ALPHA, the earliest long-podded wrinkled Marrow, an important acquisition; was awarded a First-class Certificate by the Fruit Committee of the Royal Horticultural Society, being the earliest and most productive of this class; 3 feet. 7s. 6d. per half pint.

HUNDREDFOLD, described in the *Gardeners' Chronicle* as a hybrid, between Laxton's Prolific and Ne Plus Ultra? The sample grown at the Horticultural Gardens, however, had all the appearance of being the green variety selected from Laxton's Prolific. The Pea is also called "The Cook's Favourite," a somewhat homely title which, probably, has been suggested by its well-filled pods; 4 feet. 7s. 6d. per quart.

For full particulars see CATALOGUE, p. 54.

To intending Purchasers, free on application, BARR AND SUGDEN'S DESCRIPTIVE SPRING CATALOGUE for 1870. A useful Manual for the Amateur in the Selection of Flowers for the Adornment of the Garden, and Vegetables for the use of the Table.

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BATTEN'S CRITERION, white spine, dark olive-green, very straight, short-necked, free bearer, fine constitution. 1s. 6d. p pkt

BATTEN'S GEM, black spine, 24 to 30 inches, rapid grower, fine cropper, short handle; an exhibition variety. 1s. 6d. per packet.

DR. HOGG, a new black spine variety, a cross between Eugénie and Imperial, fruit 20 to 24 inches long, very straight and handsome, produced in clusters of three or four. 2s. 6d. per packet

Table Maize.

Placed in our hands by the Rev. T. C. Brehaut, Her Majesty's Commissioner at the Paris Exhibition of 1867, to report on the state of Fruit Culture on the Continent. Twenty varieties of very superior quality, and the new Ten-week Maize from Boston, the latest received.

BARR & SUGDEN, 12, KING STREET, COVENT GARDEN, W.C.

KNAP HILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted April, 1869.

ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d to 10s. 6d each Transplanted August, 1868.

ABIES ORIENTALIS, 5, 6, and 7 feet, 7s 6d. to 21s. Splendid plants, moved April, 1869, 10 to 12 feet high, 25 and 20 feet in circumference.

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s ; to £12 10s per 100

The finest varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbraziliana, &c., large numbers, many of them 20 and 30 years' growth

CEDRUS DEODARA, 5 to 6 feet, 60s per dozen; 7 to 8 feet, 84s per dozen; 10 to 12 feet, 10s 6d to 21s each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869

CEDRUS ARGENTEA, 6 to 7 feet, 42s to 60s per dozen; 8 to 10 feet, 7s 6d. to 10s 6d each. All removed since September, 1868

CEDRUS LEBANON, 6, 7, to 10 feet Moved September, 1868.

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s to 42s. per dozen; 8 to 10 feet, 5s to 10s 6d each

" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s 6d to 10s 6d each

" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s 6d to 21s

JUNIPER, CHINESE, 4 to 5 feet, 42s per dozen, £15 per 100; 5 to 6 feet, 60s per dozen, £20 per 100; 7 to 8 feet, 7s 6d to 10s 6d each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.

PICEA NORDMANNIANA, 6, 8 to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high.

PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 9 feet high. All removed 1868-69.

PICEA MAGNIFICA, 3, 4, and 5 feet.

PICEA PINSAPO, 4, 5, 6, and 8 feet, 21s to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869.

THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed.

THUJA GIGANTEA, 5, 6, to 12 feet high Moved August, 1868

THUJA LOBBII, 8 to 14 feet high, and as much in circumference; transplanted April, 1866

THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s to 60s per dozen; 7 to 8 feet, 7s 6d to 10s 6d each. All removed since August, 1868

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s 6d to 10s 6d each 6, 7, 8, and 9 feet, 21s to 42s each Transplanted in August.

PINUS AUSTRIACA, 3 feet, £5 per 100 Transplanted Sept., 1868

PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft round, 10s 6d to 21s each;

YEWS, the COMMON ENGLISH, 5, 6, 7, 8, 10, and 12 feet high Thousands, all constantly removed; invaluable where immediate effect is sought

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.

YEWS, IRISH, handsome plants 10 to 12 feet high

HOLLIES The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet.

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference.

HOLLY, SILVER QUEEN, 4, 5, and 6 feet.

WATERER'S HOLLY This variety originated in this Nursery; we have hundreds 4, 5, and 6 ft. high, and 15 ft. in circumference.

PERRY'S WEEPING HOLLY Standards, 10s. 6d. to 21s each

HOLLY, COMMON WEEPING The finest specimens we have ever Moved, April, 1869

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand All moved since April, 1868

HOLLIES, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868-9:—

HODGINS' } LAURIFOLIA and SCOTTICA, 4, 5, 6, to 10 feet high.
YELLOW BERRIED, } ANGUSTIFOLIA, 4, 5, 6, and 8 feet high. } ALTAFOLIA, &c.

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 9 feet stems, with heads 6 to 10 feet in circumference A large number

N B —Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better rooted plants cannot be wished for obtained. The prices are fair and reasonable

BOX, Green and Variegated, 4, 5, 6, to 8 feet

BOX, 6 feet, fine pyramids, 5s to 8 feet.

BAYS, standards and pyramids.

LAURUSTINUS, standards.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.

AUCUBA JAPONICA, Berried, hundreds, 2½ to 4 feet high; in the open ground and in pots, from 18s. to 120s per doz and upwards.

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation. Prices will be pleased to supply—

RHODODENDRONS, nice bushy plants, from layers, named kinds £5 per 100, £40 per 1000. A dozen sent as sample on application.

RHODODENDRONS, extra fine, named kinds, by name, from £7 10s. to £12 10s. per 100, and upwards.

RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 20 feet in circumference. These are probably no kind better adapted for standards than that we call roseum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s. per 100. Sample on application. Large and handsome plants by the dozen, 21s 3 feet high

AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.

AZALEAS, common kinds, £5 per 100

AZALEAS, splendid plants of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference.

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £8 to £20 per 100

ANDROMEDA FLORIBUNDA, £5 to £7 10s per 100, and upwards.

HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 42s per 100

ERICA CARNEA, for winter blooming, many thousands

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen.

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Parks, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N B —There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

To the Trade.

SPECIAL OFFER of LAURUSTINUS PYRAMIDALIS (NEW).

WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for stock. It has been seen growing in his Nursery by many eminent Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of striking merit, the habit being robust, compact flowers pure white, nearly twice the size of the old varieties, and very sweet scented, with a continuation of flowers during the most severe weather.

W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 16s.; second size, 3 to 4 feet, do. pair, 10s.; third size, 2 to 3 feet, do. pr.; fourth size, 1½ to 2 feet, do., 5s.

Floral Nursery, Hailsham, Sussex.

Seeds.—Roses.—Gladioli.

FREDERICK PARSONS, Son, and Successor to Mr George Barr, begs to call attention to his SEED LIST for 1870, which will be found to contain all the most useful varieties of Garden and Flower seeds, carefully selected from the leading growers.

F. P.'s complete Collections of Garden Seeds, suitable for gardens of any size.—No. 1, 6os.; No. 2, 40s.; No. 3, 20s.; No. 4, 10s.

Collections of the most approved varieties of Flower Seeds, from 5s. upwards.

German Seeds imported direct by F. B. in sealed collections.

ASTERS.—A splendid assortment of all the most approved varieties.

STOCKS, BALSAMS, PORTULACA, PHLOXES, ZINNIA, LARKSPURS, &c.

First-class strains of CALCEOLARIA, 1s. 6d. and 2s. 6d. per packet; CINERARIA, 2s. 6d. per packet; PRIMULAS, 2s. 6d. per packet.

PARSONS'S NEW WHITE MARGUERITE.—This new Tree Mignonette has no equal; it is robust in growth, of very compact habit, and deliciously sweet. F. PARSONS has been improving it for careful selection for the last six years, and is quite certain it will become a universal favourite. He has grown plants of it 3 feet in height and 8 feet in circumference in nine months from the time of sowing; moderate-sized plants take about five months from the time of sowing. In 50-shilling packets, 5s. 6d.

GLADIOLUS.—A superb collection of named varieties.

GLADIOLUS BRENCHLEYENSIS, by the dozen, 100, or 1000. Price on application.

ROSES.—F. P. has a fine collection of Standard, Half-Standard and Dwarf to offer, at very reasonable prices. Price on application, stating quantity required.

F. PARSONS, 27 and 28, Western Road, Brighton; and Hassocks Gate Nursery, Keymer, Hurstpierpoint.

Post Office Orders payable at the General Office, Brighton.

Beta chilensis.

BUTLER, McCULLOCH, AND CO. are enabled to offer SEED of the true variety of this magnificent foliage plant; it is quite distinct from Beta flavescens, and is fully described in their SPRING CATALOGUE, sent post free on application, or per packet 2s. 6d.

South Kensington Nurseries, Brompton Market, W.C.

Established upwards of a Century.

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (see Dr. Hooker, "Botanical Magazine," No. 28.) Price 10s. 6d. each; in quantity, a special price will be given.

The honour of first introducing this splendid plant, the honour of distribution is due to HARRIS NOBLE, of whom fine plants can be obtained.—Bagshot, Jan. 29.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their splendid strain of TOMARIA BIBRA CRIMSON, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

Cedrus Deodara.

FINE SPECIMENS, 7, 8, and 10 feet, at 1s. per foot

WM. MAULE AND SONS have to offer a large supply of extra fine EVERGREEN TREES and SHRUBS, calculated to give immediate effect to Parks, Cemeteries, and Plantations, and suitable for screening or covering new Buildings, that are springing up daily in the vicinity of all large towns.

The Nurseries, Bristol.

THE GOLDEN VARIEGATED WELLINGTONIA.

First-class Certificate from Royal Horticultural Society of Ireland, 1867.

First-class Certificate from Royal Horticultural Society of Ireland, 1867.

First-class Certificate at Manchester International Exhibition, 1869.

First-class Certificate at Birmingham Exhibition, 1869.

First-class Medal at Hamburgh International Exhibition, 1869.

Plants have been distributed through France, Austria, Prussia, Switzerland, Belgium, Holland, &c.

This splendid tree is raised by the leading Nobility of this kingdom, from whom numerous testimonials have been received.

"It is very beautiful."—*Gardeners' Chronicle.*

"A gymnad of superbly coloured variegation."—Editor of *Gardeners' Magazine.*

"I ever the distinctive characters of a variety seemed fixed, they are in this golden acquisition."—Editor of *Irish Farmers' Gazette.*

"Brilliant compared with Biota aurea—a pillar of beauty."—*Mr. M'Donald, Woodstock, Co. Kilkenny; &c. &c.*

Chromo-lithographs, 21 by 8 inches, by Day & Son, Limited, on superior cards, 21 by 8 inches, very faithful in outline, but deficient in representing the glorious colour of the original. These are sent free by post for 25 stamps, and a larger size, 21 by 27 inches, 5s. 6d.

PRICES.—First size, extra choice, 24 to 27 inches, 5s. 6d.; Second Size, very fine, 15 to 18 inches, 2s. 6d.; Third Size, stout and fine, 12 to 14 inches, 1s. 6d.; Fourth Size, very little plants, 8 to 9 inches, 10s. 6d. to 14 inches, 1s. 6d.

R. HARTLAND, The Lough Nurseries, Cork, January 19.

PICEA NOBILIS.—Suitable for Avenues or Ornamental Planting.—500 Picea nobilis, from seed, finely-furnished Trees, 2½ to 4 feet high, with good leading shoots and splendid roots (This Californian Fine is the most hardy, stands in any constitution, of rapid growth, and very particular to situation if planted in good loamy soil. It takes the very highest rank as a remarkable, noble, and beautiful Tree. The above to be sold very Cheap. Price on application to Messrs. FISHER, HOLMES, AND CO., Handsworth Nursery, Sheffield.

F. H. AND CO. offer GLADIOLI, fine bulbs, cheap varieties, for planting in large masses, viz.—

BRENCHLEYENSIS, intense carmine-scarlet, fine spikes, per doz., 2s.; per 100, 8s.; per 1000, 70s.

GANDAVENSIS, selected roots, per doz., 2s. 6d.; per 100, 18s.

GANDAVENSIS, varmilion, spotted yellow, per doz., 1s. 3d.; per 100, 8s.; per 1000, 70s.

SEEDLINGS from the finest English and Continental named varieties, per doz., 3s. per 100, 20s.

SEEDLINGS, imported, choice mixed, per doz., 2s.; per 100, 14s.; per 1000, 120s.

SEEDLINGS, fine mixed, per doz., 1s.; per 100, 8s.; per 1000, 70s.

Also a fine collection of PRIMULAS, to be ready in September.

The following PRICED CATALOGUES can be had free:—

No. 2 Forest and Ornamental Trees, Evergreen and Deciduous Shrubs, Conifers, American Plants, Climbers, &c.

No. 11. Fruit, with descriptions.

No. 12. Roses, with descriptions.

F. H. and Co. give special personal attention to the VEGETABLE and FLOWER SEED AGRICULTURAL SEED DEPARTMENTS, the Stocks of which are selected from the most reliable sources, for the coming season.

No. 6 Vegetables, including Leguminosæ, and other requisites.

No. 8 Implements, Tools, Utensils, and Rick Thatch Straw.

No. 9 Agricultural Seeds.

All Seeds carriage paid.

Agents for George Hall & Sons' Sheffield-plated Garden Knives.

Messrs. FISHER, HOLMES, AND CO., Nurserymen, Seedsmen, and Florists,

Seed Warehouses: Sheffield and Rotherham

Nurseries: Handsworth, near Sheffield.

Golden Champion Grape.

OSBORN AND SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it. Price 1os. 6d., 21s., and 30s. each

Fulham Nursery, London, S.W.

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.

Price 21s., 42s., and 63s. each.

THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.

L. W.'s system of packing saves nearly half the cost of carriage.

Munro Nursery, Sible Hedingham, Essex.

Grape Vines and Gloxinias.

J. HOUSE offers a large stock of BLACK HAMBURGH, MUSCAT, BARRADE, DOURT, and MRS PINCE. No better Canes in the Trade. Price and size on application.

Also some first-class roots of GLOXINIAS, in 24-size pots, will make fine Show plants for the coming season.

Eastgate Nursery, Peterborough.

LIST AND CATALOGUE of SEEDS is now ready, and will be sent post free on application.

Surplus Stock.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.

Samples, with height and price, on application to

THOMAS PERKINS, 42, Drapery, Guildford

SURPLUS STOCK, at reduced prices.—10,000 fine Dwarf ROSES on Manetti, Pyramid PLUMS of sorts, ARBOR-VITÆ, MAHONIA AQUIFOLIA, RED CEDARS, Portugal LAURELS, EVERGREEN OAKS, SWEET BRIAR, SPRUCE FIR, Standard and Dwarf GILEAD ditto, English OAKS, SYCAMORE, &c. Sizes and price on application to

THOMAS PERKINS, 42, Drapery, Northampton

MELON, GOLDEN QUEEN (STUART & MEIN).—A Fruit of medium size, 2 to 2½ lb. in weight, round shaped, green skinned when ripe, flesh orange-coloured, juicy, tender, melting, and of delicious flavour; a beautiful green-fleshed variety. It has been awarded twenty-four prizes as the best two specimens. In addition it was awarded the Gold Medal of the Royal Horticultural Society's Exhibition, held at Manchester, in September.

General CATALOGUE of VEGETABLE and FLOWER SEEDS, also of HYBRID and other PERPETUAL ROSES, on application.

STUART AND MEIN, Kelso, N.B.

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s. per dozen.

Dwarf-trained 3-yr. Sweet CHERRIES, 10s. leading sorts, 15s. per doz.

Strong cut back extra fine Bushes, 3-yr., per dozen, 15s. per 100.

Rider Trained CHERRIES, 30s. per dozen

PEACHES and NECTARINES, 60s. per dozen.

Half "Standard ROSES, 2 feet, splendid stuff, best sorts, 50s. per 100.

Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.

" Common SWEET BRIAR, 3 feet, 30s. per 100.

W. KNIGHT, Floral Nursery, Hailsham, Sussex.

Leicester Abbey Nurseries.

THOMAS WARNER begs to remind intending Planters and the Trade that, in addition to the extensive General Nursery Stock, he has a large quantity of Fruit Trees, of unsurpassed quality, and offered at most reasonable prices. CATALOGUES, Wholesale and Retail, may be had on application to

APPLES, Standard and Master.

CHERRIES, Standards, Dwarfs, and Pyramids.

CURRANTS, White Dutch.

PEARS, Standards and Pyramids.

PLUMS, Standards, Victoria.

MANETTI ROSE STOCKS.

ROSES, Standard, Half-Standard, and Dwarf, 1½ to 5 feet

APPLE TREES, Standard, Master, Cherry, with other kinds in progress, Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 3 to 5 feet high; also very fine Dwarf-trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best Guide on Fruit Trees in England, price 1s. 6d. in stamps. A printed List or Index sent gratis.

FASTIGIATE FORESTRY of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS, of every variety.

CATALOGUE free on application

Fruit Trees.

WILLIAM PAUL has to offer, of superior quality, STANDARD APPLES, PEARS and PLUMS, very fine, 1s. 6d. to 2s. each

Dwarf trees, of many sorts, at 2s. 6d. to 10s. 6d. each

STANDARD APPLES, PEARS and PLUMS, very fine, 1s. 6d. to 2s. each

PYRAMID APPLES on Paradise and Doucin stocks, 18s. per dozen.

These may be planted the same distance apart as Gooseberry trees, forming fruit-like ropes of fruit.

PYRAMID PEARS on Quince and Pear stocks, 1s. 6d. to 3s. 6d. each

PLUMS, 1s. 6d. to 3s. 6d. each

Dwarf Trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES and NECTARINES, 3s. 6d. each.

RED CURRANTS, 21s. per 100; 3s. per dozen.

PAUL'S Nurseries, Waltham Cross, London, N.

Forest Trees, Fruit Trees, Evergreens, &c.

CHIVAS and WEAVER respectfully invite the practical attention of Planters to their very extensive, healthy, and well-grown Stock of the above.

Their Nurseries being the most exposed in the North-Western Counties, and free from all artificial shelter, render the safe removal of plants almost a matter of certainty.

PRICED CATALOGUES post free on application; estimates and special prices for large quantities.

The Land recently having been largely extended, an entrance is now obtained immediately on reaching Queen's Park by the suspension Bridge.

Chester Nurseries, and 162, Fleetgate Street, Chester.

To Noblemen and Gentlemen engaged in Planting.

THE RED LODGE NURSERY, Southampton, will be found replete with a magnificent collection of hardy CONIFERS of all sizes, which, from frequent removal, will transplant with a certainty of success.

Choice named scarlet and other colored RHODODENDRONS. Also a fine stock of HERBACEOUS, for forming clumps, covers, or large borders, &c.

SHRUBS and ORNAMENTAL TREES of every description; FRUIT TREES of the most esteemed sorts, true to name; STANDARD and DWARF ROSES, &c.

Your early visit is earnestly and respectfully solicited. Priced CATALOGUES and every information may be obtained of the Proprietor,

W. H. ROGERS

RICHARD SMITH'S LIST of all the EVERGREEN FIR TRIBE suitable for Britain, giving size, price, popular and botanical names, derivations, description, form, colour, foliage, growth, timber, use in arts, native country and size there, situation, soil, and other information, with copious Index of their synonymes. Free by post for six postage stamps

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester.

CŒLOGYNE CRISTATA, best variety, for Sale.—Ten magnificent specimens, at 25 guineas each, full of flower and foliage, 6 to 9 flowers on each spike, the grandest of all cool Orchids also 100 other specimen ORCHIDS, in fine condition. Apply to Mr. JACKSON, Cross Lanes, Northallerton.

STRONG SPRUCE FIR, for Coverts and Plantations.

50,000 extra transplanted, 2 to 3 feet.

25,000 extra transplanted, 3 to 4 feet.

Will be Sold cheap. Apply for all particulars to

Messrs. W. JACKSON AND CO., Nurseries, Bedale, Yorkshire.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for 5s. 6d.; 25 Pairs ditto, 10s. 6d.; 12 Pairs POMPONS, 5s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.

Seedsman, Horticultural Builder, &c., Withington, N

AMERICAN ARBOR-VITÆ, good Plants.

1½ to 2 feet, 2s. per dozen, 12s. per 100.
2 to 2½ feet, 3s. per dozen, 15s. per 100.
2 to 3 feet, 3s. 6d. per dozen, 20s. per 100.
2½ to 3½ feet, 5s. per dozen, 30s. per 100.
3 to 4 feet, 4s. 6d. per dozen, 22s. per 100.

See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock.

LARGE ORNAMENTAL TREES for AVENUES. Fine selected Trees of the Scarlet and Common HORSE CHESTNUTS, and other Ornamental Trees, 7 to 8, 8 to 9, 10 to 14 feet.

Extra fine picked PINUS AUSTRIACA, four times transplanted, 10 to 12 feet.

Descriptive Catalogues on application to

WM. WOOD AND SON, The Nurseries, Maresfield, near Uckfield, Sussex.

Planting Season.

DICKSONS AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, call the attention of those about planting to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for removal. They are grown on very open ground, are finely rooted, and their wood is thoroughly ripened. Samples and Catalogues on application. Special prices will be quoted where large quantities are taken.

To Planters.

JOHN NELSON has a splendid stock of the following Trees, which he will supply at greatly reduced prices to effect a clearance:—

ENGLISH OAK, in drills, 12 to 18 inches; transplanted, 2 to 3 feet.
ASH, 3 to 4 ft., transplanted
HORSE CHESTNUT, 3 to 4 ft., transplanted
SYCAMORE, 6 to 8 ft., all the best kinds.
MANETTI STOCKS
MYATT'S ASHLEAF POTATOS.

Terms cash from unknown Correspondents, or satisfactory reference. Prices on application to

JOHN NELSON, St. Michael's Hill Nursery, Bristol.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted, and in large or small quantities, viz.:—

ASH and HOLLY HEDGING PLANTS, 2 feet, per 1000
OAKS, 2 to 3 feet, 5s. per 1000. BEECH, 1½ feet, 12s. per 1000
LAUREL, 1 foot, 2s. per 100; 2 feet, 7s. per 100
FINUS AUSTRIACA and MACEDONICA, 3 feet, 4s. per dozen
ROSES, 2 feet and upwards, 9d. per dozen; less than 2 feet, 6s. per doz.
Fine CUCUMBER SEED, 2s. per lb.; 6d. per oz.

For cash only.

A. WILKIN, Tiptree, Kelvedon, Essex

Wandsworth Common Nursery.

Ten minutes' walk from Clapham Junction,

MR. ROBERT NEAL begs to invite the attention of the Nobility, Gentry, and the Trade in general to his very extensive and healthy STOCK of PLANTS, consisting of a large collection of Standard, Pyramidal, and Dwarf-trained FRUIT TREES, of all sizes; Standard and Dwarf ROSES, Coniferous and other Evergreens, Forest and Ornamental TREES and SHRUBS; also a large stock of RHODODENDRONS, all the very best in cultivation, and are of endless variety, from deep crimson and dark purple (every shade), up to white, and beautifully blended. Seedlings, and all the leading kinds of Scarlet, Spotted, Standard and Dwarf, set with Blooming buds, which he can supply in large quantities at a very low price.

CATALOGUE will be sent on application.

To the Trade.

FRESH CONIFEROUS SEEDS.

ABIES, excelsa, Common Fir, per 100 lb., 50s.; per lb., 8d.
" pectinata, Common Spruce, per 100 lb., 38s.; per lb., 6d.
" Appollinis, per lb., 20s.; per oz., 10d.
" balsamea, per lb., 10s.; per oz., 10d.
" canadensis, per lb., 14s.; per oz., 1s.
" canadensis, per lb., 14s.; per oz., 1s.
" alba, per lb., 18s.; per oz., 1s. 4d.
" nobilis, per lb., 30s.; per oz., 10d.
" Fraseri, per oz., 2s. 6d.
" Khutrow (Morindal), per 100 seeds, 2s. 6d.
" orientalis, per 100 seeds, 2s. 6d.; per oz., 1s. 6d.; nobilis, per oz., 5s.
" Nordmanna, per lb., 20s.; per oz., 1s. 6d.
" Pinsapo, per lb., 16s.; per oz., 1s. 3d.
" Reginæ Amalia, per lb., 10s.; per oz., 10d.
" rubra americana, per oz., 2s. 6d.; Pichta, per oz., 10s.

CRYPTOMERIA, japonica, per lb., 9s.; per oz., 9d.
" Lobbii, per oz., 4s. 3d.

CUPRESSUS, Corneyana, per oz., 9s.; funebris, per oz., 2s.
" Lawsoniana, per lb., 90s.; per oz., 8s. 3d.
" Lambertiana, per oz., 10s. 6d.

CEDRUS, atlantica, glauca, per lb., 12s.; per oz., 1s.
" Libani, clean seed, per lb., 15s.; per oz., 1s. 3d.

JUNIPERUS, cæsia, per oz., 3s. 6d.; africa, per lb., 18s.; per oz., 1s. 6d.; virginiana, clean seed, per lb., 15s.; per oz., 1s.

LARIX, Common Larch, per 100 lb., 100s.; per lb., 1s. 3d.

PINUS, austriaca, per 100 lb., 100s.; per lb., 1s. 3d.
" Cembra, per 100 lb., 380s.; per lb., 6s.
" montana, per 100 lb., 180s.; per lb., 2s.
" Strobus, per 100 lb., 475s.; per lb., 5s. 6d.
" sylvestris, Common Pine, 100 lb., 150s.; per lb., 1s. 6d.
" Benthamiana, per lb., 4s.
" halepensis, per lb., 4s. 6d.; per oz., 6d.
" Lambertiana, per oz., 3s.
" laricio, per lb., 12s.; per oz., 1s.
" Maximowiczii, per 6d.; per oz., 6d.
" insignis, per lb., 1s. 6d.; per oz., 2d.

SALISBURIA, adiantifolia, 100 seeds, 3s.

SEQUOIA, gigantea, per oz., 3s. 6d.

THUJA, aurea, per oz., 3s.; compacta, per lb., 9s.; per oz. 9d.;
" intermedia, per oz., 1s. 6d.; occidentalis, per lb., 3s. 6d.;
" orientalis, per lb., 3s.; occidentalis aurea variegata, per oz., 6s.; pyramidalis, per lb., 7s.; per oz., 6d.

WELLINGTONIA, gigantea, 1000 seeds, 22s.; 12,500 seeds, 250s.

ROBERT NEWMAN, Importer and Exporter of Seeds, &c., begs to offer the foregoing CONIFEROUS SEEDS, in fresh quality, to the Trade. A List of a great many other sorts, with lowest prices, on application. Orders respectfully requested as soon as possible

The Nurseries, Erfurt, Prussia.

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices :—100 plants, distinct sorts, for 10s ; 50 plants for 5os ; or 25 plants, distinct sorts, for 20s ; hamper and package included.
Crown Nursery, Reading.

WILLIAM POTTEN can now supply MADAME LEMOINE, at 6d. per dozen ; Mrs. POLLOCK, at 3s. per dozen, good ; ZONALS, in all sorts, at 20s. per 100. All good plants, in 3-inch pots ; package free. Orders are booked now for April and May.
A priced LIST of most of the new and leading sorts can be had on application to
WILLIAM POTTEN, Florist Sissinghurst, Staplehurst, Kent

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash :—Mrs. Pollock, 2s. 6d. ; Lady Cullum, 6s. ; Sunset, 3s. ; Sophia Dumaresque, 3s. 6d. ; Italia Unita, 3s. ; Picturata, 3s. 6d. ; Gold and Bronze Zonals, Beauty of Calderdale, 3s. 6d. ; Sir J. Henderson, 6s. ; Duke of Edinburgh, 9s. ; Her Majesty, 6s. ; Luna, 2s. 6d. ; Neatness, 2s. 6d. Baskets and Packing, 1s. for a single dozen, and 6d. for every subsequent dozen. Remittances requested from unknown correspondents.
ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire.

Cheap, Cheap, Cheap.

TRICOLOR and other PELARGONIUMS, in good plants, at the following low prices for cash :—Mrs. Pollock, 3s. per dozen ; White Lady, 6s. ; Lady Cullum, 6s. ; Italia Unita, 3s. ; Glen Lyre Beauty, 6s. ; Crystal Palace Gem, 3s. ; Luna, 3s. ; Beauty of Oulton, 3s. ; Perilla, 4s. ; and Lord Derby, 4s. per dozen.
HERBACEOUS CALCEOLARIAS, from seed pans, first-rate strain, good plants, 2s. 6d. per dozen
Hamper and package included.
JOHN BARRETT, St John's Nursery, Bury St Edmund's.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100 ; 5 to 6 feet, at 60s. per100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s per 100 ; 2½ to 3 feet, 50s. per 100 ; 3 to 3½ feet, 60s. per 100 ; 3½ to 4 feet, 80s. per 100.
RICHARD SMITH, Nurseryman, Worcester.

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IS CLEARING GROUNDS of the FOLLOWING STOCK :—
DWARF ROSES, fine plants, finest kinds, 40s., 50s., 60s. per 100 ; £15 to £25 per 1000. (Half Standards and Standards cheap in proportion)

	Per 100.	Per 1000.
SPRUCE FIR, remarkably fine 1 to 3½ ft	30s.	£12 12s.
,, ,, ,, 3½ to 4 ft	35s	15 15s
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LAUREL, Common ,, 1½ to 2 ft	10s 6d.	4 4s.
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MANETTI STOCKS, extra fine ,, ,, 25s.
FRUIT TREES.
Maiden Peaches, Nectarines, Pears, Apples, Cherry, Plums, Pyramid Apples and Pears. Bagshot, Surrey

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants.
60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application.
WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

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WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. The stock of Plants is large and excellent
Paul's Nurseries, Waltham Cross, London, N

Special Offer.

JOHN CRANSTON, having a large surplus stock of the undermentioned articles, will be happy to furnish special quotations, both wholesale and retail.
ROSES.—Standards and Half-Standards, all the leading Perpetuals.
Dwarfs, do., do., very fine plants for bedding or potting.
Dwarf Standard, Tea-rented, Noisette and Chinas, suitable for potting.
Extra tall Standard Roses, 6 to 8 feet stems.
Climbing and Pillar Roses
Roses for forcing, of extra size
New Roses for 1870, 30 varieties. Plants ready early in March.
FRUIT TREES.—Dwarf-trained Apples, Pears, Plums and Cherries, well grown Trees.
Pyramids do. do.
Standard-trained Peaches and Nectarines.
Standard Pears, Plums and Cherries, very fine.
Gooseberries, upwards of 200 varieties, 3 and 4-yr old plants.
Currants.
Vines, strong fruiting and planting Canes
CONIFERÆ.—Handsomely grown specimens, 6 to 10 feet
Pinus australica, all quartered and recently transplanted, 2 to 3 feet, and 3 to 4 feet.
Spruce Fir, quartered, 2 to 2½, and 2½ to 3 feet
Wellingtonia gigantea, very fine, 2 to 2½, 2½ to 3, and 3 to 4 feet
Thuja aurea, beautiful plants, 9 to 12, 12 to 15, and 15 to 18 inches.
Thuja gigantea, Lobbii, Abies Menziesii
Thuyopsis borealis, &c.
LAURELS, Common and Portugal, Mahonia aquifolia, &c
WEEPING ASH, 6 to 10 feet, very fine.
ENGLISH OAK, 2 to 4 feet
ASPARAGUS, 2 to 3-yr ; RHUBARB, SEAKALE, &c.
Nurseries ; King's Acre, near Hereford

AZALEA PONTICUM (Sweet Azalea), 10 to 15 inches, 4s. per dozen, 20s. per 100, 15os. per 1000, 2½ feet, 6s. per dozen
ANDROMEDA POLIFOLIA ANGUSTIFOLIA, nice plants, 3s. per dozen, 15s. per 100.
KALMIA GLAUCA, 8 to 12 inches, 3s. per dozen, 15s. per 100 ; 12 to 15 inches, 4s. per dozen, 20s. per 100
LEDUM PALUSTRE, 8 to 12 inches, 3s. per dozen, 15s. per 100.
All these can be supplied by the 1000 See CATALOGUE
JAMES SMITH, Fir Tree Nurseries, Matlock

BEAUTIFUL SPRING FLOWERS.—Now ready, in strong plants :—
HEPATICAS, sorts, 4s. per dozen
PRIMROSES, double Lilac, 4s ; double White 6s. per dozen
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ROCKETS, double White and Purple, 4s. per dozen
VIOLETS, in 20 distinct kinds (see Catalogue), 4s. per dozen
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AURICULA, Perrin's Red, 3s. per dozen.
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ARABIS ALBIDA VARIEGATA, 2s. 6d. per dozen, 20s. per 100.
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CHRISTMAS ROSE, HELLEBORUS NIGER and others, 6s. per doz.
FUCHSIAS, New 1869, 12 beautiful varieties in pots, 6s ; 24 do., 10s. 6d
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TWENTY NEW CHRYSANTHEMUMS, 1869, 18s. for 10s.
Post-Office Orders on Castle Hedingham.
A CATALOGUE of Choice New Plants of 1869, Roses, Fruit Trees, &c., free on application
WM DILLISTONE, Nurseryman, &c., Castle Hedingham, Essex

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	Per doz.	Per 100.
PONTICUM, twice transplanted, bushy, 12 to 18 in., 4s. 6d.	20s.	
,, ,, ,, 15 to 20 in., 4s. 6d.	22s.	
,, ,, ,, 18 to 24 in., 5s. 6d.	25s	
HYBRIDUM ,, ,, 24 to 30 in., 7s. 6d.	30s	
,, ,, ,, 12 to 18 in., 5s. 6d.	40s	
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MAXIMUM, white ,, ,, 20 to 30 in., 7s. 6d.	50s.	
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HIRSUTUM, dwarf nice plants ,, ,, 3s. 6d.	15s.	

The above can be supplied by the 1000 For named sorts, see CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock

DAVID GOLD MCKAY offers the following at low prices. Carriage free above 20s

	Per doz.—s. d.	Per doz.—s. d.
Cinerarias, named sorts	3 0	Pampas Grass, from	0 6
Dielytra spectabilis	3 0	Pansies, mixed seedlings	3 0
Dwarf Rocket Cytus	3 0	,, yellow ditto	3 0
Hollyhocks, show varieties, from	6 0	Potentillums, named sorts, from	3 0
Herbaceous plants, in great variety, from	4 0	Polyanthus, choice seedlings	2 0
Gladioli Gandavensis, hybrids See Catalogue for new arrangement of colours From	3 0	Strawberries, The Lady, per 100	5 0
		,, large assortment, per 100	2 6
		Violets, in great variety	3 0

CATALOGUES free.
The "Old" Nursery, Sudbury, Suffolk

LILIUM, in 80 superb varieties. Choice selections, 5s ; 9s ; 12s ; 18s ; and 24s per dozen.
GLADIOLI, in superb Gandavensis varieties. Choice assortments, 3s., 5s., 9s., 12 ; and 15s per dozen.

100 roots in 10 varieties	18s.
100 roots in 20 varieties	22s.
100 roots in 30 varieties	30s.
100 roots in 50 varieties	45s.
100 roots in 25 extra varieties	54s.
100 roots in 50 extra varieties	70s.
50 roots in 50 extra varieties	36s.

GANDAVENSIS, 2s. per dozen ; 12s. per 100.
BREVIFLORUS, 2s. per dozen ; 12s. per 100.
BOWIENSIS, very fine dozen 18s. per 100.
CATALOGUES free on application.
HERBACEOUS and ALPINE PLANTS.

100 distinct and showy varieties	30s.
100 superior and new varieties	50s.

Per dozen, 4s ; 6d., 12s ; and 18s.
CATALOGUES free on application.
STEPHEN BROWN, Weston-super-Mare, Somersetshire.

NEW SEEDS, of EXTRA CHOICE QUALITY for EXHIBITION. Per packet—s. d.

ASTERS, New Quilled, Reid's Exhibition, 12 varieties, mixed	2 0
ASTERS, New Globe Quilled, 12 varieties, separate	2 0
ASTERS, New Globe Quilled, 24 choicest varieties, mixed	3 0
ASTERS, Truffaut's French Perfection, 18 varieties, separate	4 0
ASTERS, Truffaut's French Perfection, 12 varieties, separate	3 0
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ASTERS, Truffaut's French Perfection, 24 varieties, mixed	1 0
ASTERS, Dwarf Chrysanthemum-flowered, 12 varieties, mixed	1 0
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ASTERS, French Giant Emperor, 12 varieties, mixed	1 0
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STOCKS, Dwarf German Perfection, 12 varieties, mixed	1 0
STOCKS, Newest large flowered Ten-week, 18 varieties, mixed	1 0
STOCKS, Crimson Dwarf Bouquet, extra	1 0
PHLOXIA, Bijou, extra superb, choicest mixed, double	1 0
PETUNIA, single, extra superb, choicest mixed	1 0
BALSAM, extra superb, choicest mixed, double	1 0
COCKSCOMB, Giant Crimson Dwarf, extra fine	1 0
PHLOX DRUMMONDII, superb varieties, mixed	1 0
LOBELIA, speciosa, True Crystal Palace	6d. and 1 0
MARIGOLD, French, superb, 6 varieties, mixed	6d and 1 0
ZINNIA, flore pleno, superb double, 6 varieties, mixed	6d and 1 0

For all other varieties of new and choicest Flower Seeds, also new varieties and collections of Vegetable Seeds, see J. SCOTT'S convenient Priced CATALOGUE, forwarded on application to
J. SCOTT, The Seed Stores, Yeovil, Somerset.

To the Trade.

GARNSWORTH has to offer a large quantity of the under-mentioned, which are strong, young, and well-rooted. Samples on application at the Nurseries, Matlock :—
BIRCH, 1-yr, 15s. per 1000, transplanted, 30s. per 1000.
LARCH, 9 to 15 inches, 12s.
LIMES, 2 to 3 feet, 20s
SPRUCE, 1 to 1½ feet, 20s ; 1½ to 2½ feet, 25s.
SPRUCE, 2 to 1½ feet, 11s ; 1½ to 2½ feet, 20s.
SYCAMORE, 2 to 3 feet, 20s.
QUICK, strong, 18s.
WHIN, 1-yr, strong, 40s.
PRIVET, 1-yr, 4s.
RHODODENDRONS, 1-yr Seedling, 7s. 6d

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s. ; per 1000, £3

100 Gladioli, by name, to sorts	8s.
100 ,, ,, 25 sorts	11s
100 ,, ,, 50 sorts	10s to 40s.

All in good flowering bulbs.
LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris

LOUIS VAN HOUTTE begs to state that his CATALOGUE, No 1370 to 1381, is still to be had from his Agents, Messrs R. SILBERKAD AND SON, 5, Harp Lane, London, E.C.
This Catalogue contains the HARDY PERENNIALS, ORNAMENTAL TREES and SHRUBS, CONIFERS, ROSES of all kinds ; the favourite GREENHOUSE and BEDDING PLANTS, in dry roots, viz., Achimenes, Begonias, Fuchsias, Pelargoniums, Gesneras, Tydæas, and Gloxinias ; also FRUIT TREES in general
LOUIS VAN HOUTTE'S SEED CATALOGUE for 1870 is now ready, and is sent to his usual Correspondents.
The GLADIOLUS GANDAVENSIS are enumerated in LOUIS VAN HOUTTE'S Catalogue, No 1370 to 1381, but their description can only be found in the Floriculture Complete Catalogue
The Paris 4, 5, and 6 of Vol XVIII of the FLORE have appeared : their contents can be found at p. 490 of the Seed Catalogue. Price of subscription for the Volume of 12 Parts, at 10f. more than One Hundred highly-coloured Plates, Woodcuts, miscellaneous matter, &c.)
Ghent Royal Nursery, January 29

Laurus latifolia.

PAILLET, NURSERYMAN, Chatenay les Sceaux, near Paris, France, is now filling the numerous orders received for this splendid Novelty. Persons wishing to secure good plants are requested to send their orders as soon as possible, for the plants are now getting very limited in number.
M. L. PAILLET has now for Trade a large quantity of FRUIT TREE STOCKS, at the following rates :—

	Per 1000—£ s. d.	Per 10,000—£ s. d.
Pears, extra choice	1 10 0 .. first choice	11 12 0
Quince, do.	0 18 0 .. ,,	8 12 0
Apples, do.	0 18 0 .. ,,	8 0 0
Doucin, do.	1 1 0 .. ,,	8 10 0
Paradis, do.	1 0 0 .. ,,	9 0 0
Plums (real St Julien), do.	1 10 0 .. ,,	0 16 0
Cherries, do.	1 0 0 .. ,,	0 12 0
St Lucie, do.	0 10 0 .. ,,	0 6 0

RUSH, our own best selections :—Standards, good, £3 per 100 ; Half Standards, £2 10s. per 100 ; Low Budded Dwarfs, £10 per 1000 ; on their own roots, £12 per 1000 ; dwarfs, three best sorts, £6 per 1000 ; Moss Rose Bush, on standards, 10s. per dozen.
Young Seedling FOREST TREES and SHRUBS, 1, 2, or 3 yr old, such as Acacia, Alder, Ash, Beech, Birch, Quercus, Thorn, Maple, &c. ; and EVERGREENS of all sorts, Ornamental Trees and Shrubs, at per 1000, 100,000, and 1,000,000
DWARF ROSES. SPECIAL OFFER to the TRADE
M. L. PAILLET has several thousand fine Dwarf Roses he will send carriage free to London, packing included, at £16 10s. per 1000, best selection Cash on delivery.
All orders must be sent to L. PAILLET, as above ; or to his Agents, Messrs SILBERKAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

EAST LOTHIAN INTERMEDIATE STOCKS.—In February is the best month for sowing these celebrated Stocks, unrivalled both for flower gardening and for pot culture. May be had true (scarlet, white and purple, in packets, 1s. each, and 2s. each, from
THOMAS METHVEN, 15, Princes Street, Edinburgh.

Surplus Stock.—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well-grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour For Descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow gauge lines, at a moderate rate, thereby saving delay and expense of packing

At 12s per dozen.

Abies canadensis (Hemlock Spruce), 6 to 9 feet	Laurel, narrow leaved, 2 to 2½ feet
,, excelsa, 3 to 4 feet	,, Portugal, 2½ to 3 feet
Arbor vitæ, American, 5 to 6 feet	Picea balsamea, selected, 4 to 5 ft.
,, Siberian, 3½ to 4 feet	Quercus ilex (Evergreen Oak), 15 to 18 inches
Cupressus, Lawsoniana, very strong	Rhododendron ponticum, 2½ to 3 feet
Hartogia capensis (Cape Laurel), 1½ to 2 feet	Holly, screw-leaved, green, 1½ to 2 feet
	Phillyrea olealefolia, 2 to 2½ feet

At 18s. per dozen.

Abies canadensis, 5 to 6 feet	Phillyrea olealefolia, 2½ to 3 feet
,, excelsa, 4 to 5 feet	Picea balsamea, 5 to 6 feet
Araucaria, broad leaved, 2 to 2½ ft	Pinus austriaca, 3 to 4 feet
Aucuba, American, 2½ to 3 feet	,, pyrenaica, 2½ to 3 feet
,, Siberian, 4 to 4½ feet	Rhododendron ponticum (very bushy), 2 to 2½ feet
Aucuba japonica, 18 to 21 inches	,, hybrids, fine varieties, 18 to 21 inches
Box, green tree (pyramids), very handsome) 2½ by 2½ feet	Taxus japonica (Japan Yew), 12 to 15 inches
Hartogia capensis, 2 to 2½ feet	
Laurel, narrow leaved, 2½ to 3 feet	

At 24s per dozen.

Abies elegans, 18 to 24 inches	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
Arbor-vitæ, Siberian, 4½ to 5 feet	Laurel, Portugal, pyramids, 3 to 4 feet
Aucuba japonica, 21 to 24 inches	Phillyrea olealefolia, very fine, 3 to 4 feet
Cryptomeria Lobbii, 5 to 6 feet	Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Cupressus Lawsoniana, 4 to 5 feet	Taxus japonica, 15 to 18 inches
Holly, screw leaved, green, 2 to 2½ feet	

At 30s per dozen

Abies canadensis, extra fine, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2½ to 3 feet
,, elegans, 2 to 2½ feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ compacta, 2½ to 3 feet	,, drupacea, 18 to 24 inches
Aucuba japonica, very bushy, 2 to 2½ feet	,, glauca, 3 to 4 feet
Cryptomeria Lobbii, 6 to 7 feet	,, densata, 3 to 4 feet
,, viridis, 6 to 7 feet	Pinus austriaca, 4 to 5 feet
	Thujopsis borealis, 4 to 5 feet

At 36s per dozen.

Abies inverta (Weeping Spruce), 2½ to 3 feet	Juniperus Smithiana, 1 to 3½ feet
Arbor-vitæ compacta, 2 to 3½ feet	,, viridis pendula, 3 to 4 feet
,, Siberian (very fine), 5 to 6 feet	Laurel, Portugal (pyramids, very fine), 4 to 5 feet
Cupressus Lawsoniana, 5 to 6 feet	Pinus laricio, 6 to 7 feet
Juniperus chinensis fæmina, 3 to 3½ feet	Taxus elegantissima (gold leaved), 18 to 24 inches
,, densata, 3 to 4 feet	,, hybrida, 5 to 6 feet
,, Schottii, 3 to 3½ feet	

At 42s per dozen.

Abies inverta, fine specimens, 3 to 4 feet	Juniperus phœnicia, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet	,, Schottii, 3½ to 4 feet
,, Siberian (very fine), 6 to 7 feet	,, thuriferæ (very fine Juniper), 4 to 5 feet
Juniperus chinensis, 3½ to 4 feet	,, virginiana, 6 to 7 feet
,, ,, fœmina, 3½ to 4 feet	Picea Nordmanniana, 18 to 24 ins
,, ,, japonica, 24 to 30 inches	Pinus austriaca, 5 to 6 feet
,, Lecana, 4 to 5 feet	,, laricio, 7 to 8 feet
	Thujopsis borealis, 5 to 6 feet

At 48s. per dozen

Abies inverta, 4 to 5 feet	Juniperus Smithiana, 3½ to 4 feet
Juniperus chinensis, 4 to 5 feet	,, thuriferæ, 5 to 6 feet
,, densata, 4 to 5 feet	,, virginiana, 7 to 8 feet
,, glauca, 4 to 5 feet	,, viridis pendula, 4 to 5 feet
,, phœnicia, 4 to 5 feet	Picea laricio, 8 feet
,, Schottii, 4 to 5 feet	Taxus, Irish, 6 to 7 feet
	Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen.

Abies Menziesii, 7 to 8 feet	Juniperus virginiana, 8 to 10 feet
,, monstrosa, 7 to 8 feet	,, viridis pendula, 5 to 6 feet
Arbor-vitæ compacta, 4 to 4½ feet	Laurel, colchic (very fine), 8 to 10 feet
Juniperus chinensis, very fine, 5 to 6 feet	,, Portugal, pyramids (very fine),
,, densata, 5 to 6 feet	Picea Nordmanniana, 2 to 2½ feet
,, glauca, 5 to 6 feet	Pinus Cembra, extra fine, 6 to 7 ft.
,, phœnicia, 5 to 6 feet	Taxus elegantissima, 2 to 2½ feet
,, Smithiana, 4 to 5 feet	Thujopsis borealis, 6 to 7 feet
,, thuriferæ, 6 to 7 feet	Wellingtonia gigantea, 2 to 2½ feet

At 72s. per dozen.

Abies albertiana, 7 to 8 feet, 10s 6d each	Picea lasiocarpa, 2½ to 3 feet, 15s ; 3 to 3½ feet, 21s ; 3½ to 4 feet, 30s 6d ; 4 to 4½ feet, 42s ; 4½ to 5 feet, 60s each
,, Douglasii, 8 to 10 feet, 7s 6d ; 10 to 12 feet, 10s 6d ; extra fine, 12 to 15 feet, 15s each	,, nobilis (best glaucous var.), 18 to 24 inches, 7s 6d ; extra fine, 2 to 2½ feet, 10s 6d ; 2½ to 3 feet, 15s each
,, orientalis, 4 to 5 feet, 6s ; 5 to 6 feet, 7s 6d ; 6 to 7 feet, 10s 6d each	,, Nordmanniana, 4 to 5 feet, 15s ; 5 to 6 feet, 21s ; 6 to 7 feet, 30s 6d ; 7 to 8 feet, 42s 6d each
Araucaria imbricata, 5 to 6 feet, 21s ; 6 to 7 feet, 31s 6d. ; 7 to 8 feet, 42s ; 8 to 9 feet, 52s 6d each	,, Pinsapo, 3 to 3½ ft, 10s 6d. ; 3½ to 4 ft, 15s ; 4 to 4½ ft, 21s ; 5 to 6 ft, 31s 6d ; 7 to 8 feet, 42s each
Juniperus densata, 6 to 7 feet, 6s ; 7 to 8 feet, 7s 6d each	Pinus Cembra, 7 to 8 feet, 6s ; 8 to 9 feet, 7s 6d each
,, thuriferæ, very huc, 7 to 8 feet, 6s ; 8 to 9 feet, 7s 6d each	Wellingtonia gigantea, 3½ to 4 feet, 7s 6d each
Laurel, Portugal, pyramids, extra fine, 7s 6d ; very large, 10s 6d each	Yews, for hedges, about 12 feet high, 46 years old, recently transplanted, 21s each
Picea grandis, extra fine, 5 to 6 ft, 7s 6d ; 6 to 7 feet, 10s 6d each	

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Established 1832.

SAMUEL WATERS, SEED GROWER and MERCHANT, Hilperton, Trowbridge, Wilts, offers the following Collection of VEGETABLE and FLOWER SEEDS for 21s., carriage free :—
Cucumber—Telegraph, 1 packet
,, Ridge, 1 packet
Melon—Eclipse, 1 packet
Cress—Australian, 1 oz
,, Fine Curled, ½ pint
,, Mustard, ½ pint
Endive—Green, 1 packet
,, White, 1 packet
Leek—Henry's Prize, 1 packet
Lettuce—Paris Cos, 1 packet
,, Wiltshire Cos, 1 packet
,, Walters' White Cos, 1 pkt.
,, Drumhead Cabbage, 1 packet
Onion—White Spanish, 1 oz
,, Lemon Keeping, 1 oz
,, Silver Skin, 1 oz
,, Brown Globe, ½ oz
Parsnip—Waters' Improved, 1 oz
Parsley—Extra Curled, 1 oz
Radish—Waters' Prize, 2 oz
,, Long Scarlet, 2 oz
Turnip—Early Stone, ½ pint
,, Snowball, ½ pint
Savoy—Summer and Winter, 1 pkt
Turnip—Early Stone, 4 oz
,, Vegetable Marrow, 1 pkt
Forest—Large Red, 1 packet
12 packets Flower Seeds, of the most useful sorts
Half the quantity at same rate of charge

SUTTONS' GRASS SEEDS FOR ALL SOILS,

CARRIAGE FREE.

PRODUCING ABUNDANT CROPS OF HAY AND SUPERIOR PASTURAGE.

SPECIAL ESTIMATES GIVEN FOR LARGE QUANTITIES.

PARIS, 1867.

SILVER MEDAL.

SUTTONS' PERMANENT PASTURE MIXTURES.

SUTTONS' MIXTURES OF

FINE GRASS SEEDS,

FOR PARK LAWNS AND PLEASURE GROUNDS,

18s. per bushel.

As supplied to the Crystal Palace Company.

SUTTONS' MIXTURES OF

FINE GRASS SEEDS,

FOR GARDEN LAWNS AND CROQUET GROUNDS.

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As supplied to the principal Estates in the Kingdom.

PREPARED FOR EVERY DESCRIPTION OF SOIL.

Complete instructions on sowing and after-management sent with the seeds.

SUTTONS' BEST MIXTURES, 28s. to 32s. per acre. Carriage Free.

SUTTONS' CHEAPER MIXTURES, 20s. to 26s. per acre. Carriage Free.

SUTTONS' BEST QUALITY MIXTURES OF GRASSES AND CLOVERS

FOR ONE YEAR'S LAY. **13s. 6d. per acre.** Carriage Free.

FOR TWO YEARS' LAY, **17s. 6d. per acre.** Carriage Free.

FOR THREE OR FOUR YEARS' LAY, **22s. per acre.** Carriage Free.

CHEAPER MIXTURES CAN BE SUPPLIED.

SUTTONS' RENOVATING MIXTURE FOR IMPROVING OLD PASTURES

Should be sown in the early spring months. It will produce a great improvement in the quality and quantity of the hay, and of the pasturage.

Sow 6 to 12 lbs. per acre. Cost **4s. 6d. to 9s. per acre.**

SUTTONS' PRESENT PRICES OF HOME-GROWN FARM SEEDS,

NEW AND UNADULTERATED. CARRIAGE FREE.

SEEDS DIRECT FROM THE GROWERS THE BEST MEANS OF PREVENTING DISAPPOINTMENT.

MESSRS. SUTTONS' ROOT SEEDS are saved from choice selected and fully developed Bulbs.

Purchasers of large quantities liberally treated with.

SUTTONS' FARMER'S YEAR BOOK FOR 1870,

Illustrated, now in the Press, may be had Gratis and Post Free on application.

MANGEL WURZEL.

Lowest price per cwt. on application.

	Per lb.—s.	d.
GOOD YELLOW GLOBE	.. 0	8
GOOD ORANGE GLOBE	.. 0	8
GOOD RED GLOBE	.. 0	9
GOOD LONG RED	.. 0	8
GOOD LONG YELLOW	.. 0	9
SUTTONS' SELECTED YELLOW GLOBE	.. 0	10
SUTTONS' SELECTED ORANGE GLOBE	.. 0	10
SUTTONS' YELLOW INTERMEDIATE, fine quality	.. 1	0
SUTTONS' MAMMOTH LONG RED (was awarded First Prize, Birmingham, 1869)	.. 1	6
SUTTONS' GIANT LONG YELLOW	.. 1	0
SUTTONS' BERKSHIRE PRIZE, the heaviest Globe variety in cultivation	.. 1	0
FISHER HOBBS' ORANGE GLOBE	0	10
ELVETHAM LONG RED	.. 1	0
YELLOW OVAL, or Common Intermediate	.. 0	9

KOHL RABI.

SUTTONS' LARGE GREEN	.. 3	0
LARGE PURPLE	.. 2	6
LARGE GERMAN GREEN	.. 2	6

TURNIP SEEDS.

Lowest price per bushel on application.

SWEDISH.	Per lb.—s.	d.
SUTTONS' CHAMPION.—The best Swede in cultivation. Very hardy; has gained numerous Prizes again this season	.. 0	9
PURPLE-TOP	.. 0	7
SKIRVING'S	.. 0	7
HARDY WHITE	.. 0	10
KING of SWEDES	.. 0	9
HALL'S WESTBURY	.. 0	9
GIANT TANKARD	.. 0	9
MARSHALL'S PURPLE-TOP	.. 0	9
GREEN-TOP GOLDEN MELON	0	9

YELLOW-FLESHED TURNIPS

SUTTONS' GREEN-TOP YELLOW HYBRID	.. 0	10
SUTTONS' PURPLE-TOP YELLOW HYBRID	.. 0	10
YELLOW SCOTCH PURPLE-TOP	0	9
YELLOW SCOTCH GREEN-TOP	0	9
YELLOW TANKARD	.. 0	9
ORANGE JELLY	.. 1	0
DALE'S HYBRID	.. 0	10
FOSTERTON HYBRID	.. 0	10
WAITE'S ECLIPSE	.. 0	9

WHITE-FLESHED TURNIPS.

Lowest price per bushel on application.

	Per lb.—s.	d.
SUTTONS' RED PARAGON	.. 0	9
IMPERIAL GREEN GLOBE	.. 0	8
HARDY GREEN ROUND	.. 0	8
SUTTONS' PURPLE-TOP MAMMOTH	.. 1	0
POMERANIAN WHITE GLOBE	0	9
TANKARDS, of sorts	.. 0	10
WHITE GLOBE	.. 0	
GREY STONE	.. 0	
SUTTONS' EARLY SIX-WEEKS	1	0

SUGAR BEET.

WHITE SILESIAN GREEN-TOP	0	9
WHITE SILESIAN RED-TOP	.. 0	9
NEW IMPERIAL	.. 1	0

FIELD CARROT.

WHITE BELGIAN	.. 1	0
LARGE GREEN-TOP YELLOW BELGIAN	.. 1	6
RED INTERMEDIATE	.. 1	6
ALTRINGHAM	.. 1	6
LONG RED CATTLE	.. 1	3

COW CABBAGE.

SUTTONS' IMPROVED DRUMHEAD	.. 2	6
ROBINSON'S CHAMPION	do. .. 2	6
OXHEART, NEW EARLY	.. 3	6
LONDON MARKET, and others	.. 3	6
THOUSAND HEADED	.. 2	6
FLAT DUTCH	.. 2	0

CLOVER SEEDS.

Samples and lowest price per cwt. on application.

	Per lb.—s.	d.
COMMON RED, or BROAD, 7½d. to	0	11
YELLOW TREFOIL, or Hop, 4½d. to	0	7
WHITE, or DUTCH	.. 11d. to 1	4
ALSIKE, or HYBRID	.. 1s. to 1	4
COW-GRASS (true perennial) 10½d. to	1	1
GIANT PERENNIAL WHITE, 1s. 4d. to	1	6
MIXED PERENNIAL, for Permanent Pasture	.. 1	3
MIXED CLOVERS, for Alternate Husbandry	.. 1	0
Ditto, for Lawns	.. 1	4

RYE-GRASSES.

Lowest price per quarter on application.

	Per bushel.—s.	d.
PERENNIAL RYE-GRASS, best quality	.. 6	0
Ditto ditto, second quality, 4s. 6d. to	5	0
PACEY'S PERENNIAL	.. 6	6
EVERGREEN RYE-GRASS, or Perennial Devon Eaver	.. 7	0
SUTTONS' DWARF PERENNIAL RYE-GRASS, 50s. per cwt.		
ANNUAL, or Common, best quality	5	6
Ditto ditto, lighter seed	.. 4s. to 5	0
ITALIAN RYE-GRASS, good English Seed	.. 5s. to 6	0
SUTTONS' Improved ITALIAN RYE-GRASS, as supplied to the Metropolis Sewage Company	.. 7	0
FRESH Imported SEED, cleaned	7	0
Do., in bales as imported, 32s. to 40s. p. cwt.		

All Goods Carriage Free, except very small parcels. *5 per cent. allowed for cash payments.*

SUTTON AND SONS, SEEDSMEN TO THE QUEEN, READING, BERKS.

Lilium auratum.

WM. PAUL has to offer a Magnificent Lot of the above, at 1*s.* 6*d.*, 2*s.*, 2*s.* 6*d.*, and 3*s.* 6*d.*, each; 12*s.*, 18*s.*, 24*s.*, and 36*s.* per dozen. The usual discount to the Trade off the dozen rates, when ordered by the dozen.

PAUL'S Nurseries and Seed Warehouse, Waltham Cross, London, N.

Lilium auratum.—Seed and Bulbs.

SUTTON AND SONS can supply fine flowering Bulbs as under:—

Size No. 1 .. 10*s.* 6*d.* each. | Size No. 3 .. 5*s.* each.
Size No. 2 .. 7*s.* 6*d.* each. | Size No. 4 .. 3*s.* each.

Imported Flowering Bulbs, 2*s.* to 5*s.* each; and fresh gathered, well-ripened Seed, 1*s.* and 2*s.* 6*d.* per packet, post free.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

WELCH-POOL HORTICULTURAL SOCIETY, SEPTEMBER 15.—The following (open) PRIZES will be given. The entrance money in each class (to be paid to the Secretary at the time of entrance) will form 2*d* or more Prizes in such class in proportion to the number of entries.

	£ *s.*		*s.* *d.*
Four bunches of Grapes, any sort or sorts ..	10 0	Entrance	10 0
One Pine, any sort	2 10	,,	2 6
Collection of Fruit, 5 kinds distinct (Grapes and Pines excluded)	5 0	,,	5 0
Collection of Vegetables, 8 kinds, distinct ..	5 0	,,	5 0
Cut Roses, 24 distinct, 1 tray of each ..	5 0	,,	5 0
Dahlias, 24 blooms, distinct	5 0	,,	5 0
Hollyhocks, 24 blooms, distinct	5 0	,,	5 0
Gladioli, 48 spikes, distinct	5 0	,,	5 0
Asters, 12 blooms, distinct	2 10	,,	2 6
Most tasteful Table Bouquet	2 10	,,	2 6

All ENTRIES to be made to the Secretary on or before THURSDAY, September 8, stating amount of space required, and all Articles to be ready for the Judges by 12 at noon on the day of Show.

Welch-Pool, Feb. 8. D. F. OWEN, Hon. Sec.

This Advertisement will not be repeated.

The Gardeners' Chronicle

SATURDAY, FEBRUARY 12, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, Feb 16	Royal Horticultural (Fruit and Floral Committee), at S. Kensington	11 A.M.
	Ditto (Scientific Committee) ..	1 30 P.M.
	Ditto (General Meeting) ..	3 P.M.
THURSDAY, — 17	—Linnean	8 P.M.

IF a bomb-shell had fallen into the Council-room of the ROYAL HORTICULTURAL SOCIETY last Tuesday afternoon, it would scarce have caused more astonishment than did the suggestion of the Council, in its report to the annual general meeting, to abandon the establishment at Chiswick on the earliest opportunity. Of course those of the Fellows who know much of the workings of the Society, its embarrassed finances, the comparatively few years the lease at Chiswick has to run, and other circumstances, ought not to have felt surprise at the announcement. But they did nevertheless, and so would the tenants of a house in a besieged city feel consternation if a shell crashed through the roof. Under the circumstances they ought not to feel astonished, but no doubt they would do so. We refer our readers to the third paragraph of the report, published in another column. That paragraph, even now that the report is adopted, does not appear to us to pledge the Council or the Fellows at large to any definite course of action. It merely asserts that a change must be made sooner or later, for various assigned reasons, and that the present time would, owing to the opportune bequest of the late Mr. ALFRED DAVIS, be a convenient season to consider how best the desired change can be made. If it means more than this, then the Council are much to blame for bringing the matter forward without giving due notice of its intention to the Fellows, in order that they might have been enabled to consider so important a matter for themselves, and given or withheld their consent to the proposal after the reasons *pro* and *con* had been properly considered. Having confidence in the honour of the Council, and knowing the interest felt by its members in the promotion of the best interests of the Society and of Horticulture, we certainly do not share the views of those speakers at the meeting who considered that a trap had been laid for the Fellows to fall into; and that it was intended that this matter should be settled quietly and off-hand without giving the general body of the Fellows an opportunity of expressing their views. Be this as it may, the Council to our thinking showed great perverseness in not giving plain answers to plain questions. True, the questioners talked a good deal at random, and introduced matters wholly irrelevant to the subject at issue; but when at length, as was really the case, plain questions were put, they should have received plain answers. But, after all, these are matters of comparatively little consequence in comparison with the fact that Chiswick must be disestablished. We suppress lamentations, for they are idle, and we have not words to express them. Fine writing and sentiment are out of place. The fact stares us in the face that Chiswick must go. The matter of the lease alone determines that point, always supposing the scanty information as yet accorded by the Council to be absolutely correct.

We lay stress on this last clause, because we deem it the bounden duty of the Council, before taking any further steps in the matter, to publish for the information of the Fellows a detailed statement of the reasons why Chiswick must be abandoned. They should state publicly what steps have been taken to secure a renewal of the lease, or whether or no it be not possible to obtain a lease, say, of half the present garden, and let the remainder be given up. Half or a quarter the present area would be ample for the requirements of an experimental garden, and school of horticulture.

We began this article with the notion that we would be very brave, and submit to the inevitable operation. We conjured up in our own minds all the benefits that would accrue to horticulture and science by a smaller establishment, one more under control than Chiswick, but as we write sentiment will get the better hand of our reason. Our pen, nevertheless, shall not be the reflex of our feelings. We reiterate our conviction that Chiswick, with all its glorious memories, must go; but for the sake of those Fellows who have not had such opportunities as we for knowing the facts of the case, and of arriving at an opinion, we beg the Council, if only for pity's sake, to explain tenderly, but fully, the necessity for a change announced with a suddenness that might well shock the members of the Society, young or old.

EVERY one interested in METEOROLOGY—and what gardener, what physiologist is not?—must have experienced a feeling of profound satisfaction at the recent announcement that new arrangements for the registration of meteorological phenomena, as observed at Chiswick, or wherever the future garden of the Royal Horticultural Society may be, are in course of being carried out under Mr. GLAISHER'S superintendence.

For some time past there has been an uneasy feeling that the Chiswick records were not as worthy of credit as they ought to be. We regret to find that this suspicion has been verified in many points, though there is still reason to hope that the discrepancies in some of the tables are not so serious as entirely to destroy the value of the extensive series of observations carried on in the garden of late years. We say of late years, because the earlier records and those made subsequently under the late Prof. DANIEL'S auspices, with good instruments, are probably irreproachable so far as they go, and they have, as our readers know, formed the basis of much that has been written in the "Theory of Horticulture," and other volumes, whereof the application of meteorology to practice forms part.

In applying the data afforded by meteorological observations to physiological or cultural purposes, there is this great difficulty, that we have to deal with living organisms. No one can say what life is. Some of the phenomena we now call vital may possibly be no more than peculiar phases or special combinations of physical forces—that is a question for physicists to decide. But whether or no, every physiologist and every cultivator knows that the indications of the barometer or of the thermometer, or the condition of the hygrometer, are not sufficient of themselves to account for the phenomena witnessed in living beings. The "constitution" of a living organism—we write of necessity vaguely—is in some points more sensitive than mercury or spirit, while, on the other hand, changes which greatly affect the mercurial column have little or no perceptible effect on the organism. This is particularly so in the case of atmospheric pressure, the variations of which have apparently but little influence on plants. If this be true, it follows that many of the observations, so carefully made and so accurately recorded, are for cultural purposes of comparatively little value. In the instance of plants, we have, as it were, to treat every case on its own merits. It is not merely external conditions and local circumstances that we have to consider, but the nature of the plant itself, its condition at any given time, and its power of resisting untoward agencies. The plant which will at one time resist a temperature of 32° Fahr., will at another succumb at a considerably higher degree. Of course this depends upon the stage of growth in which the plant is at the time of exposure—upon its consistence, woody or otherwise—the rarity or density of the fluid it contains—and on a variety of other circumstances well known to practical men and to every physiologist, circumstances dependent more on bygone weather fluctuations than on those now witnessed. The inference from all this is this, that it is not only the existing conditions of the atmosphere that ought to be looked to, but also those which have preceded it. This is a point intelligible and simple enough for all to understand, and yet how very often do we see the gardener or agriculturist tacitly ignore it and attribute the whole of the ill effects he witnesses to present changes. A moment's reflection serves to correct the error, but it is easy to see how the very facility of observing the mercury descend and ascend almost before one's eyes, and of witnessing the corresponding changes on vegetation, may aud does often lead to this exaltation of the present over the past.

This tendency might, we think, be overcome by adopting measures which in themselves would give intelligent gardeners more interest in the observation and record of meterological phenomena, by making them see more clearly than they do now the exact bearing of the fluctuations exhibited by the instruments on the plants they have to take care of. Let us explain ourselves more fully. We have been taught by BOUSSINGAULT, GASPARIN, QUETELET, GLAISHER, and others, that a plant requires a certain amount of heat to exist at all, so much more to perfect its woody structures, more still to enable it to flower and ripen its seeds. As practical men we know that these deductions are in the main accurate; that they correspond with facts which come daily under notice; that they explain why it is that certain plants can, and others cannot, be profitably cultivated in certain countries; why it is that a crop in one country ripens in so many weeks, and why in another it requires so many more.

These facts are patent enough to upper class gardeners, and to persons of any education, but they are not brought home to ordinary workmen as they might be, and as we think they ought to be. We would suggest, therefore, that at the daily observation of the maximum thermometer, not only the actual temperature recorded by that instrument at the time of observation should be recorded, but that the sum of the maxima, observed since any particular date fixed on, should be ascertained and recorded, by the very simple process of adding the maximum degree observed each day to the sum of those recorded on previous occasions. In this way the gardener would have an opportunity day by day of seeing the amount of sun-heat received by his plants, he would see whether the daily increase were above or below the average, and in the case of plants subjected to artificial temperature, he could regulate his fire-heat accordingly.

We would specially desire to see the aggregate amount of heat, as ascertained by a thermometer fully exposed to the sun, recorded in this way, because in the case of plants growing under the shade, in diffused lights, the conditions of the problem become more complex, and the difficulty of ascertaining precisely what are the effects of temperature and what of light are proportionately increased. On the other hand, when we turn to the minimum thermometer and its records we are apt to forget that its indications, below a certain point, are simply useless, as far as regards plants. If the activity of a plant be arrested at a certain degree, as we know it is, still more if it cease to live at all below a certain temperature, wherein for cultural purposes is the advantage of recording those degrees, which are simply inert as far as regards living organisms? A plant can but die—and if it be killed outright, what can it matter to the gardener that the thermometer registered 10° below killing point?—if it only showed a tenth of a degree below that point the result would be the same. We need hardly say the killing point varies very considerably in different plants—each plant, in fact, has a zero of its own, which must be determined by practical experience, and which no thermometer of itself would indicate. The necessity of eliminating useless temperatures from records prepared for the use of the cultivator is insisted on by M. ALPHONSE DE CANDOLLE in his very valuable work, "Géographie Botanique," and it may be illustrated by the fact that certain plants produce their flowers at a time when, according to the meteorological records as ordinarily constructed, the mean temperature, even in comparatively low latitudes, is at or below freezing point. Alpine plants, for instance, even in January receive the benefit of an amount of heat not

estimated by the ordinary records of mean temperature.

Another point of vital importance, of which ordinary meteorological records take little or no notice, is the duration of favourable or unfavourable temperature. We get maximum and minimum and mean temperatures and mean daily range, but we do not get what it is very important we should have, if it be possible, the time of day when the thermometer records highest or lowest, and the length of time that a high or low temperature prevails. When a plant is at rest, it can resist a lower degree than when it is in full activity, and it can often withstand for a short time an intensity of cold which would be fatal were it continued for a longer period. These are truisms, no doubt, but they are all important to the cultivator, and could the phenomena we have mentioned be recorded, this would prove of great value for physiological purposes. We suppose the only method of even approximately determining the points we have mentioned, is by the combination of self-registering and self-recording instruments, such as is effected at the chief observatories by placing the instrument between a gas-light and sensitive paper made to travel by clockwork mechanism with a stated regular movement, so that as the temperature increases or decreases, the mercury in the tube cuts off or admits light to fall on the paper. On this paper is thus traced, minute by minute, throughout the 24 hours, the height of the mercury. It is clear this ingenious process could hardly be applied to the maximum or minimum thermometer, but at least it would give us a valuable document to compare with the records obtained in the ordinary manner from the exposed thermometer.

So far, then, as the temperature of the air is concerned, we, as cultivators, particularly want to know the aggregate amount of useful temperature at different heights above the soil in any given time, the exact period at which favourable or unfavourable changes occur, and their duration. Of certain other matters connected with temperature, and other meteorological phenomena influencing vegetation, we must speak on another occasion.

—— Now that the utility of Bell-glasses (*cloches*) for certain cultural purposes is once more the subject of discussion, we may mention that in a recent Number of the "Compt es Rendus," M. Th. Schlosing points out that the power of absorbing mineral ingredients in solution from the soil is diminished by cultivating plants under glass and thus lessening the amount of evaporation from their surface. A Tobacco plant so grown absorbed 17 per cent. of mineral matter instead of 20 per cent., as it would do under ordinary circumstances. The production of vegetable acids was diminished by one-half—that of resin and cellulose to a less extent, while the nitrogenous ingredients were not materially decreased. Starch was present to the extent of 20 per cent. instead of to 100th per cent. only. Thus when evaporation is reduced in amount, a portion of the starch remains unused, and consequently accumulates in the plant. Assuming the correctness of M. Schlosing's conclusions, the immense importance to cultivators is obvious. If the two staple food ingredients, the nitrogenous matters and the starchy ones, can be augmented by limiting evaporation, Mr. Robinson may indeed cry, *Vive la Cloche!*

—— We have just received the following notice from Dr. F. von Mueller:—"The fungus which causes here (in Australia) the terrible Root Blight in Cereals (Take-all of the colonists) seems a new species of Xenodochus (X. Cerealium) allied to X. ligniperda, which destroys the wood of Firs, Beeches, &c." There surely must be some mistake here. It is an extremely unlikely matrix for a species of Xenodochus, the only known species growing on the leaves of the greater Burnet, while wood is a still more unlikely locality. It is possible, from the last paragraph, that the supposed genus Xylostroma is meant. It is highly desirable to have specimens of both. There was nothing of the kind in the examples submitted last year to the Scientific Committee, by Dr. Gilbert. *M. J. B.*

—— Seeds of Cucumis Anguria (fig. 37), a plant which for some time was a puzzle to botanists, were received at the Royal Horticultural Society's Gardens at Chiswick from Messrs. Vilmorin, and were widely distributed last spring. It bore fruit in a frame at the Chiswick Gardens, from whence it was figured in the "Botanical Magazine," t. 5817, and in our own garden in the open air, and it would doubtless have borne a larger number of fruit had the season been as propitious as that of 1868. The plant is of some interest, not only from its being largely employed in what are called West India pickles, together with ripe and unripe Capsicums and slices of the fruit and portions of the inflorescence of the Papaw, besides being ascertained at Paris to be a useful vegetable when

Fig. 37.

dressed before the integuments of the seeds have become hardened, but also from its being the representative in the Antilles of an African form of the genus. The fact that the species of Cucurbita, C. perennis and digitata, occur in North America may be considered in favour of its being really a West Indian species, but it is possible that it may have been introduced from Africa, like some other plants, by the negros. The species was confounded formerly with Cucumis prophetarum and C. myriocarpa, but Naudin, who has made an especial study of Cucurbitaceæ, is of opinion that the three are distinct. C. prophetarum has extremely bitter fruit and angular stems, and has, moreover, the leaves nearly white or cinereous from the presence of a multitude of short hairs. C. myriocarpa, as the name implies, bears a great quantity of globular fruit about the size of a Gooseberry, which falls off with the slightest shock when ripe. It is, moreover, far more hardy than the other two species, and comes up naturally from the fallen fruit both at Paris and Vienna, when it has once been sown, like the common Squirting Cucumber, and we believe that the same fact has been observed in this country. The leaves in this, as in C. Anguria, are green, and the fruit is not bitter. C. Anguria has less angular stems, the peduncles are stouter, and the fruit oblong and much larger. In all, the fruit is either ornamented with alternate stripes of white, varying from green to yellow, or at least show some indications of them. M. Naudin raised plants not only from seeds communicated by M. Vilmorin, but also from some derived from Algiers, where it is cultivated, and found it very prolific, insomuch that about nine plants yielded a thousand ripe fruits. The species to which it is perhaps most nearly allied is C. Figari, but that has a perennial root-stock, and bitter fruit. We may observe, that in all the three, the distinctive structure of the genus Cucumis is evident, namely, the occurrence of two stamens with two cells each, and a third, dimidiate, with a single cell, the connective in the 2-celled stamens being elongated, bifid, and papillose. The pickle dealers take care to inform us that, as the pickle is prepared abroad, they cannot answer for its purity. It is, however, possible that the green colour may be due to the employment of potash, which is often quite as effective in giving a bright green tint as any deleterious ingredient. *M. J. B.*

—— Our attention has been called to the fact that the statement made in our last issue, to the effect that the Hundredfold Pea was "catalogued and sold as Laxton's," is incorrect. We have also seen a letter from Mr. Laxton, dated July 26, 1869, wherein he offers to the distributors of the Pea in question six varieties of new Peas, the quantity of which is in all 30 quarts and ½ pint, for £550! These new Peas were, we learn, considered by Messrs. Carter and Messrs. Hurst not sufficiently distinct to be introduced to the public as novelties. In this offer the quantities vary from ½ pint, 1 quart, 2 quarts, to ½ bushel; hence if Mr. Laxton disposed of all his new Peas that were sufficiently fixed in character in 1868, it would seem that the new sorts he wanted to sell in 1869 were fixed and considered by him fit to send out in one season. This is the view taken by the raisers of Hundredfold, who feel aggrieved that doubts should be thrown on the origin of the Pea in question, and consider that these doubts were satisfactorily removed by Mr. Laxton himself in the concluding parargaphs of his letter.

—— From the Schedule of the "95th Exposition" of the Société Royale de Flore of Brussels, which has now reached us, we find that the exhibition is to take place on the 24th, 25th and 26th of April, in the Botanic Garden at Brussels, the Special International Exhibition of Roses forming part thereof. Those who are interested in the subject should therefore correct the date of April 27, given at p. 70, on the authority of the Belgian journals. The Rose exhibition extends over 12 classes, while the general exhibition comprises subjects under 93 classes. Entries should be made by intending exhibitors not later than April 19, the particulars being addressed to the Secretary, M. Lubbers, 26-28, Rue du Berger, Ixelles, from whom schedules and all necessary information may be obtained.

—— The first Number of a new Monthly, entitled the Food Journal, is on our table. The newcomer is to be devoted to the subject of "food in every possible aspect and variety, and particularly in its national bearings, such as economising our present resources and obtaining new ones." On the latter point we are promised a speedy consignment of kangaroo sausages. By all means, say we, let us taste and try, and if we find them nice we shall not fail to express our thanks to the "Food Journal." If the "Food Journal" prepare, as we have no doubt it will, a savoury mess of pottage, and leave the public with the spoon, we have no doubt whatever of the success of the publication.

—— Some people affect to disparage gardeners and gardening as ministering rather to the luxuries than to the necessities of life. Such folk would do well to read a lecture of Mr. W. Ingram's on Plants as Sanitary Agents, a full report of which appears in the *Leicester Advertiser* of the 5th inst., and from which we shall, on another occasion, take the liberty of making some extracts.

—— Another new variety of the Tulip tree! M. Gay, of Bollwiller, has obtained a variety with

yellow-edged leaves, the LIRIODENDRON TULIPIFERUM FOLIIS LUTEO-MARGINATIS, the leaves of which are described by M. VAN HOUTTE, to whom examples had been submitted, as being all alike margined with yellow in a very even and regular manner. M. VAN HOUTTE observes, that though the "sugar-plum" (*dragée*) demanded was much beyond his calculations of any probable return by sales, and therefore he failed to acquire the property in the plant, yet he could not abstain from recording M. GAY's good fortune in being the possessor of such a distinguished novelty.

PLANT STAGES.

I AM not about to discuss the vexed question of stage or no stage; that can hardly be considered an open question. Speaking broadly, for decorative and artistic arrangement, stages are mostly ignored. Their obtrusive prominence and unyielding stiffness, make sad havoc with graceful groupings, and the massing together of beauty. But the two arts, those of cultivation and of the display of the things cultivated, are two widely different things. For the former purpose plant stages are often indispensable; for the latter they are worse than useless.

There are many, however, who use stages for effective display who neither seem to know nor admit it. Single plant stands are improvised of stocks of wood and pillars of stone, while pedestals of china ware or cement are placed at different points for the elevation of plants. Such elevators are often exceedingly effective in providing suitable base lines for the exhibition of choice specimens or groups of plants.

All the varieties of plant stages resolve themselves into two general forms, with variations—the flat or table stage, and the tier or stair-shaped one. I consider the stair-shaped stage is generally the most useful. The flat one, however, is not without its advocates, and for many purposes stages of this form are serviceable enough. At best, however, flat plant stages differ from the floor of the house mainly in this, that they raise the plants nearer to the light. The same object might often be secured by simply lowering the roof and sinking the footway, when the base of the house would answer most of the purposes of a plant stage. The matter would thus resolve itself into one of sightliness, convenience, and expense. On the two former grounds stages would be preferable; on the latter, probably, the floor would have it. Brick retaining walls by the sides of the borders would be cheaper than stages, and obviously more durable. By covering the enclosed space with clean shingle or other porous substances it would be rendered cleanly, and perfect drainage would be ensured.

One of the worst drawbacks to flat stages is that, unless for plants of the smallest size, the head of one plant is apt to destroy the base of another all over the area of the stage, unless on the outer edges. It is just possible, should the plants be of a regularly graduated height, to avoid this evil by careful arrangement, but in practice this is seldom done. Even when plants may be of unequal heights, they are often arranged without much regard to the effects of their shadows upon other plants, and the consequence is that a great many specimens are ruined in their youth by overcrowding upon flat stages. It is always a comparatively easy matter to renew the top of a plant, but a fresh base is not so easily laid, and, indeed, can hardly be provided excepting by the very radical process of beheading, and thus sacrificing all previous growth for the sake of a fresh start, which ought not to have been needed.

Further, unless the plants on flat stages are carefully arranged as to stature, they will be placed at most unequal distances from the glass, and this will give rise to great inequalities of strength and capacity for blossoming. Except, then, for the storage of small stock, the growth of standards along with dwarfs, or the cultivation of plants of regularly graduated heights, flat or table stages are hardly to be commended. Where they are used the most common arrangement is a table stage on each side, and a path down the centre of the house. To prevent the best portion of the house from being wasted by such an arrangement, a second stage, or shelf, is generally perched up in the apex of the house, and there used for seed pans and small things. But it is mostly inconvenient of access, and at times the old adage, "out of sight out of mind," is apt to be applied to the roof-shelf with the most disastrous results. One of the surest modes of escaping such provoking catastrophes is the substitution of stained and tiered stages for flat ones. By placing such a stage in the centre of the house, the plants can all be placed at equal distance from the glass, or at a lesser or greater distance at pleasure. The whole of them are under the eye, the chance of neglect thus being reduced to a minimum. Each plant may likewise be subjected to the same intensity of light from base to summit, the bottom of one being elevated so high as to escape the shadow thrown by the top of the next. So placed, and by the aid of frequent turnings, each plant may be moulded into one of those charming models of successful culture, possessing equal strength from base to summit, and being all round alike. In connection with this terraced stage in the centre of the house, tolerably wide shelves may be carried round the sides, and thus the advantages of both forms of staging may be secured.

All details relating to distance from the glass, breadth of shelves, height of rise between them, &c., must be determined by the character and size of the house, the nature of the plants cultivated, and the purposes for which they are grown. The distance from the glass may range from 1 to 10 feet, 4 feet being a useful average; the width of shelf from 6 inches to a yard, and the rise between the shelves from 4 inches to 4 feet. As a general rule, the wider and loftier the house, or the larger the plants grown, of course the further the distance from the glass, the wider the shelves and the greater the distance between them, and *vice versâ*. It must likewise be obvious that where stages are so wide as to render it necessary for men to mount them for watering, &c., they must be further from the glass than where all work upon them can be done from the side.

The leading characteristics of all good stages may be summed up under the heads of strength, cleanliness, lightness, permeability, and durability. The importance of such qualities in plant stages must be so obvious that they need not be insisted upon at any length. There must be no doubt about the strength of a stage. The weight that many of them have to bear is enormous, and the bare possibility of a crash and smash would prove an intolerable nuisance.

Being assured of strength we look next for cleanliness. The stage must not only be clean, but be easily kept so. Few things are more incongruous amid the charms of beauty, the bloom of health, and the pleasures of good culture, than a foul, filthy plant stand. Again, the stage should be light,—so light as not to be obstrusive from its sheer bulk, nor throw shadows by its mass; light enough to be well nigh invisible, and to convey the idea of elegance where it does come into view. It must not be lost sight of in this relationship that stages are, after all, very subordinate things. Their place is under the plants, and as much as may be out of sight, and therefore there is something radically wrong either in the culture or arrangement of that house in which we are arrested by the stage, more than charmed by its occupants.

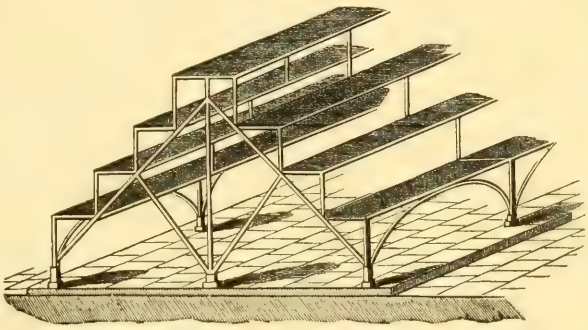

FIG. 38.

Permeability is another characteristic of all good stages. They must afford a free passage for the water from the bottom of the pots; and this egress should be instantaneous. There must be no hindrance, not even for a moment, else ultimately the bottom soil and base roots will become, the former soddened into sourness, the latter afflicted with dropsy, or attacked with rottenness. On some stages the pots fit so closely to the shelves, that a kind of capillary attraction is established between the two; the air is barred out, and consequently the water is shut in the pot. Any amount of internal drainage is useless in the absence of an outlet for water. To plants resting on an impermeable base, disease, death, and decay tread sharp upon the heels of life and beauty. Finally, plant stages ought to be durable. The trouble, turmoil, and expense of renewal are great, and ought to be avoided, therefore whatever material is employed for the making of plant stages it ought to be the very best of its kind.

And this brings us to consider the best material for their manufacture. We are pretty well limited to wood, slate, stone, earthenware, and iron. The first is decidedly the worst material, the last the best, for the purpose. Heat and moisture speedily make sad havoc of the best timbers that may be employed. Oak will indeed last many years more than deal, under such trying conditions; but then its weight, and even its expense, or actual cost, and the labour of making up, are very great. The best deal, favoured with careful coatings of paint, is perhaps the best wood for plant stages; but it certainly lacks durability. Dismissing wood, if possible—it is seldom really possible to do so in practice—let us proceed to slate and stone. These, if freely perforated with holes, make good stages. There is in many quarters a prejudice against them, based on the assumption that they are too cold for the roots of plants. It is needless to say that this prejudice rests upon a mere fallacy—a confounding together of the actual temperature with the conductive forces of different bodies. Slate or stone are neither colder nor hotter than wood within the same house, unless, indeed, they are directly exposed to the direct action of a powerful source of heat or cold; and it has not yet been proved that the roots of plants are one or the other. The different conductive powers possessed by the materials used for plant stages is of little, if any, practical importance. The danger from the employment of slate or stone for stages is not from starvation, but stagnation; and this I propose to remedy by free perforation. Earthern or china ware has seldom been used for plant stages on a large scale. If, however, it could be made of sufficient strength to carry the necessary weight, such materials would form stages of equal beauty and cleanliness.

Iron, however, is doubtless the best of all materials for plant stages. It possesses every needful characteristic in the highest degree. It is strong, clean, light, and durable, and can readily be rendered porous to any extent. In a molten state it can be moulded into the most beautiful forms, and malleable iron possesses sufficient ductility to describe the most elegant patterns. It can be cast, cut, or made up into any length or size, and under the twin forces of heat and skill it is as pliable as clay in the hands of the potter. Its corrosive properties can be checked or rendered innocuous by dressings of paint or varnish, or its rust neutralised or driven out of it by a stream of electricity. Most of us are familiar with cast-iron stages, but wrought-iron has not been so generally employed; the latter, however, either alone or in combination with other substances, forms the best and surest stage. Wrought-iron frameworks impart strength and security, while the frame may be spanned over and formed into shelves with slabs of slate or stone.

One of the most ornamental and useful stages that I have ever seen was of the latter description. It was erected at Lyndford Hall, in Norfolk, by Mr. Beard, of the Victoria Works, Bury St. Edmund's, in the centre of one of the patentee's conservatories, and had a most chaste and elegant effect. It was a four-tiered stage, having a centre and three shelves all round. The accompanying woodcut (fig. 38), showing a cross section through the middle of the stage, will give a clearer idea of its character and appearance than any verbal description. The simple yet strong framework of the stage was made of wrought iron. The sides of the shelves are formed of angle iron, one side forming the upright edge of the stage, and the other a projecting ledge for the support of a slate slab that formed the bottom of the shelf. The indispensable drainage was provided by a layer of fine spar being spread over the surface of the slate, which gave a delicate look of silvery brightness and cleanliness that formed a charming contrast to the bright red pots that rested on its surface. The iron was varnished with white enamel paint, and the whole effect was light and pleasing in the extreme. The very plants seemed conscious of the beauty of their resting-place, and put out their freshest leaves and loveliest flowers accordingly. At the time of my visit, "without spot," was the verdict written upon house, and stage, and the living plants within the one and upon the other. I hear that further improvements have since been effected in these stages. This seems hardly possible. Such an elegant, useful combination of iron, slate and spar seemed all that could be desired, and the most charming thing in stages that could possibly be made. *D. T. F.*

CULTIVATION OF THE CINCHONA UNDER GLASS.

SINCE first I had the satisfaction of raising the C. officinalis from seed sent me from the mountains of Uritusinga, I have devoted some attention to the cultivation of different species of Cinchona under glass. This has extended over a period of about 10 years, during the larger portion of which my experiments have been carried on in a conservatory which I had constructed for the purpose, and which, though on quite a limited scale, enables me to estimate what might be done by means of the appliances at the disposal of the directors of our botanic gardens. I have worked through a fair amount of mistakes and misfortunes, and have now about 20 different forms (species or varieties) of Cinchona in various stages of development; and of these, recently flowering, one

plant of the C. officinalis,* one of the var. Colorado del Rey, and one very forward in bud of the (as yet undescribed) C. Forbesiana. I have also still in blossom a plant of the Howardia caracasensis about 10 feet in height, and covered with flowers for the last two or three months. Such a result, if exhibited to the whole pharmaceutical world, as it might be at Kew, could not fail to excite interest, and, moreover, the possession of living plants gives the opportunity of observing many things not apparent in dried specimens.

The facilities thus afforded for physiological investigation are also very important to those who delight to trace the beautiful contrivances and manifest design everywhere apparent in Nature, and to whom well-observed facts are more interesting than mere mechanical theories of vegetation. As an instance, I was recently examining, together with a botanist well acquainted with the Cinchonæ in their native woods, some beautiful trebly-scrobiculate leaves of my plants, and we agreed that inspection demonstrated the improbability of a theory recently advanced as regards the scrobiculation, which ascribes its origin to an inherited defect derived from the attacks of insects. The truth being, on the contrary (as I have often observed), that insects are not found to attack this part of the leaf in preference, but are much more addicted to some other portion of the plant. The additional beauty of the leaf derived from the scrobicules, and their great regularity, must be seen to be appreciated, presenting an appearance quite unlike that of an accidental monstrosity.

As to the light to be thus thrown on botanical arrangement, I may mention the opportunity afforded of raising the seeds proceeding from the same bunch of capsules, and observing thus, as I am doing at the present moment, the amount of variation to be observed in the children of one parent plant.

The very difficulties to be overcome in imitating, as far as possible, the climate and soil of the mountain regions of the Andes, present many subjects of not unfruitful consideration.

The influence of light upon vegetation will force itself upon the attention in all the varied aspects of the question, as, indeed, presenting some of the most formidable difficulties in the cultivation of plants so sensitive as these are to the deficiency of stimulus in the dreary months of winter, and to the excess both of heat and light in our summer above that to which they have been accustomed. The effect of different coloured rays of polarised light, of a greater or less amount of actinism, necessarily comes into view.

The leaves of many species are particularly sensitive to light, and turn towards the rays of the sun in a manner sufficiently remarkable. In some kinds the structure and colouring are very beautiful, and would quite repay cultivation with this object in view. They are frequently covered with a lustrous epiderm, as described by Dr. Weddell, in reference to the Calisaya. This epiderm seems, as in the case of some other plants, largely composed of wax: when this is removed, either by mechanical injury or by chemical solvents, the leaf suffers, and the oxidation of the juices becomes manifest. It is not easy to imagine from dried specimens the great variety of structure and characteristic peculiarities which the leaves present; but when once well observed, the aspect of the plant fixes itself in the memory.

The respiration of plants, as affected by a too retentive soil or by too abundant application of water to the roots, has to be studied, and it is also necessary to mark the period of hibernation or repose, and to encourage rather than to interfere with rest at this period, a period which seems in India to be very accurately marked, and which, even under glass, it is not difficult to trace.

Then the nutrition of the plants will require much care. It may, at first sight, seem requisite simply to provide the needed soil; and very pure sand, such as Reigate sand, rich loam, and bog earth, in proportions, varying according to the species,—when mixed, as I find desirable, with broken brick,—will sufficiently afford this. But there is more than this; for we shall find, if we study the plant, that it is desirable to supply it at the period of its most active vegetation with food, ministered as much as possible in a liquid form, and therefore more easily assimilated. For as regards the life and growth of the plant we may, in a certain sense, adopt the saying of Thales, that "all things are from water," for all things must be in solution (either aqueous or aërial) before they can be changed into the living substance of the vegetable. Now the natural solvent is rain as it falls from the clouds, and in the normal state (as observed by Weddell and Markham) of the Cinchonæ† the roots spread superficially through a loose mass of earth and decaying vegetation, amidst which they absorb, together with the rain-water, various mineral substances, and also gases, especially carbonic acid, presented to the spongioles in the manner most to their advantage.

M. H. Struve‡ has recently demonstrated the existence, under certain conditions, of nitrate of ammonia, together with ozone and oxygenated water, in rain and snow; and M. Deville has found in snow and rain, collected in the neighbourhood of the hospice of St. Bernard, a similar composition, at least in so far as nitric acid and ammonia being present in greater or less quantities. I learn from Dr. Anderson that some species of Cinchona flourish at Darjeeling, although the rainfall averages 127.30 inches for the year,† of which 82 inches fall in three months of the summer. But then the character of the soil and slope of the hills is such that the rain-water after having bathed the roots, passes away immediately from them; for Dr. Anderson, as everyone else, finds the Cinchonæ to be most impatient of water at the roots. This is difficult to imitate, and the change consequent on the scarcity of rain-water to that derived from springs has (apparently) cost me the health of some valuable plants. Then, again, as the leaves can form chlorophyll only in sunshine, and can only then derive nourishment from the air, it must be remembered that, in dark and gloomy weather, we must supply less water and less nourishment to the roots, or the harmony of Nature will be destroyed, and the consequences may be fatal. From the same considerations it will follow that too much artificial warmth in the night season will be injurious; and, indeed, the plants never seem to thrive better than when a considerable range of temperature between day and night is allowed to exist. I have found great practical benefit from adopting the system of double glazing, leaving a stratum of air about 4 inches in thickness between the sheets of glass. This tends greatly to prevent sudden chills, which are injurious, and also to retain a larger amount of moisture in the air surrounding the plants. This is much required, and best secured by syringing the leaves with tepid water twice in the day, avoiding the collection of water around the roots. It is important to provide well for their drainage by means of broken bricks or tiles; and I find an advantage in conducting the warm water of the return pipes below the level surface of the ground, so as to secure a slight and constant elevation of the temperature. I have a thermometer plunged 18 inches in the bed of earth in which my largest plants grow, and I have not noticed this below 50° F. in winter. I think that the proper range of temperature might be placed at from 55° in winter to 65° in summer.

It is very important to allow as much access of fresh air as possible. It must be remembered that these are mountain plants, loving free air and alternate mist and sunshine, whilst the hot, close atmosphere of the lower valleys is always injurious to their perfection as quinine-producing plants, and generally fatal to their growth.‡ The very condition of life depends on the constituent molecules of an organised body being never all in repose; and whilst these are, on the one hand, received from without, on the other hand effete particles are continually expelled from the plant, whilst others are deposited in the formed tissues, thus building up gradually the solid portions of the structure. In this manner plants live, grow and multiply under the influence of the vital force; and if these phenomena were more constantly under the notice of our writers on Nature, we should perhaps be able nationally to elaborate something better than mechanical theories of life, forced upon our acceptance with an amount of confidence bearing an inverse ratio to the proofs produced. We should, perhaps, not be told that "there is no real difference between vital and physical forces." Even the theory of cell-formation as the origin of all living things, though true as to the manner in which Nature works, yet does not elucidate her mysteries. It seems to solve more than it really does explain, for what is the cell but the boundary within which Nature carries on her operations?§ and, after all, what are these? and what is life? Whoever watches the manner in which Nature acts the ædile with her cells—("diruit, ædificat, mutat quadrata rotundis")—will think little of the cell itself, and much of that which it contains. If I take in my hands a brick, I have a specimen of material by which, through adding brick to brick, the four walls of a house may be constructed; but I should not be able thence to reason out the nature of the stirring active life which those boundary walls might contain. The addition of brick to brick might very well illustrate the phenomena of crystallisation, but the activities of life within the plant much more resemble the course of reconstruction of a great city like Paris, in which an imperial will, availing itself of the all-arranging genius of a subordinate functionary, acts for the good of the whole, and caring little for the four walls, or for any number of them, if standing in the way of its well-devised projects, adapts the materials even of previous structures to the exigencies of the new thing that has to be produced; and who will deny that the result is admirable?

It is thus that practical experience in cultivation leads to the review of theories which must be cast aside when they have served their turn, or demolished when they stand in the way of real science, which means knowledge, and not speculation.

In the address of the President I observe with pleasure the remark that "a country stroll of half-an-hour will yield material for thought and investigation available for many a day;" and may we not extend the application of the lines which he has quoted to the more difficult, but not less remunerative, objects of study presented by the cultivation of plants in circumstances so different to those of their native habitat? The very difficulties we encounter are a source of pleasure in overcoming them, and enable us to appreciate more fully that infinitely varied Wisdom which has appointed everything beautiful in its season, and all things in measure and number and weight. *Ne quid nimis* is a golden rule for everyone that attempts to cultivate the Cinchonæ under glass. To neglect this would be to ensure failure in the undertaking. *J. E. Howard, F.L.S., in the "Pharmaceutical Journal."*

TRADE MEMORANDUM.

INFORMATION is requested respecting the undermentioned firms:—Messrs. Parsons & Co., West Ham Lane, Plaistow; and Messrs. Collier Brothers, 18, Newgate Street.

Home Correspondence.

The Pine Beetle.—I observe in the *Gardeners' Chronicle* a notice of an attack on a plantation of Scotch Firs by the beetle Hylurgus piniperda, and your remarks thereon. Some two or three years ago I reported, in the Journal of the Royal Agricultural Society, an attack (as I concluded) from the same enemy on a plantation of my own of remarkably fine healthy Pinus austriaca. On going to this plantation one day, I was surprised at seeing some inches of the terminal shoot of each branch turned yellow, which was quite unaccountable to me. I pointed this out to a friend, a naturalist, and he at once named the enemy, and asked if there were any moribund Fir trees near at hand, as the embryo of this was usually deposited under the bark of trees in that state. I recollected that a Scotch Fir had been cut down within a few yards of these P. austriacas two years previously, and had not been removed, which my friend considered sufficient to account for, and as probably the source of, this mischief. He advised me to have the shoot of every branch affected cut off just below the part affected, and burned. I adopted his advice, but feared the trees so treated would be permanently disfigured, as this involved cutting off most of the leading shoots at some distance from their origin. I was pleased to see the following summer new shoots proceeding from the points of amputation. The trees have long since been completely restored to their original health and beauty, and no sign of the existence of the enemy has been discoverable since. I send these few remarks, from recollection, for the information of your correspondent, in case you may not have the Journal of the Royal Agricultural Society to refer to. *C. Laurence, Cirencester.*

The St. Petersburg Exhibition.—At p. 1064 (1869), Mr. R. Warner states that the persons who had sent plants to the St. Petersburg exhibition were refused by the railway companies free passes for the return journey, and that the same managers of the exhibition who had declared in print that any one sending plants by railway should have free passes for the return journey, admitted they could not compel the railway companies. To obtain a free return passage, a certificate stating that the plants had really been sent to the exhibition was necessary. These certificates were delivered by myself, and were never refused to the proper persons. The Imperial Horticultural Society has not heard that the railway companies refused free passages to persons who were furnished with the abovementioned certificate. If Mr. Warner has made his statement without any grounds, he will, I hope, acknowledge it; if not, we shall be much indebted to him if he will name the persons who had been deceived, as he mentions, and what railway company refused the free return passage, and who of the managers of the St. Petersburg Exhibition admitted that they could not compel the railway company. *P. Wolkenstein, Secretary of the Imperial Horticultural Society of Russia.*

[Our correspondent is rather late in his inquiries. We live so fast here in England that we have well nigh forgotten the minor incidents pertaining to the exhibition, though the recollection of the cordiality and magnificence of the reception afforded to our compatriots will not speedily be effaced. EDS.]

The Vines at Cole Orton.—If, in the discussions that take place in your columns, correspondents would speak only of what they know

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* This plant was cut down, and the produce of sulph. quinine which I received from it is recorded in my "Quinology of the East Indian Plantations," p. 3. It is now again grown up to a height of 8 feet or more. Mr. Broughton has recently found in five capsules of the fruits, the endants of the sister of the above, from 3 grains of sulphate of quinine to 5 grains per cent.

Or sulphate of quinine (obtained crystallised) 2.40 per cent.
Sulphate of quinidine ,, 1.04 ,,
Also cinchonine.

† It is stated to be perfectly at home in a stronger soil, and, perhaps, on the whole, one of the easiest to cultivate of the whole genus.

* "Journal de Pharmacie et de Chimie," November, 1869, p. 357.

† Beardmore, "Manual of Hydrology," p. 330.

‡ I have recently had the opportunity of observing the same result as produced by similar causes in India. Two specimens of red bark were sent over for analysis from "Rainadie," a Cinchona plantation belonging to Mr. Rhode. One of these presented the usual appearance of East India succirubra bark. Mr. Broughton informs me that it was grown in a valley adjoining the Neilgherries, at an elevation of about 4000 feet. Mr. B. made an examination of it. Though actually lower in elevation than the site of the lower Crown barks on the Nedwattum plantations, which produce much cinchonidine, it is tolerably rich in quinine. "The climate differs from these latter by this peculiarity, that during the dry season fogs and mist roll up each day from the western coast, and moisten the leaves and shade them from the baking Indian sun. Five other specimens had the aspect of the C. rubra dura of the Germans, and contained less quinine, but more than twice as much cinchonidine. It came "from the hot bottom of the valley."

§ See "Chemismus der Pflanzenzelle," von Dr. H. Karsten. Wien, 1869, pp. 5, 6, &c.

to be facts from their own personal experience, much valuable space, and much stormy argument, would be saved. But when a writer begins to argue upon "what he has heard," there is no limit to the curious statements that may be made. I am induced to write the above, after having read a few lines in an article on "the pruning of the Vine," at p. 174, in which the writer says, "I have never seen the Vines at Cole Orton," and adds—"If my information is correct," &c. As the owner of the Vines in question, I beg to inform "B." (with all courtesy) that he has been greatly misinformed. No particular Vine here has been devoted "specially and solely to exhibition purposes," nor is one Vine more "celebrated" than another, as my gardener (Mr. M. Henderson) has taken 1st prizes from every early house I have. There are several other Vines in the "small brick pit," which is about 40 feet long, and the "rambling" has merely been allowed to fill up the space caused by the removal of other Vines which have failed from various causes. Every Vine in all the houses has borne its full share of Grapes as long as I can remember them; and, judging from what I see at other places, I should say they were rather overcropped than otherwise. As "B." adds, "The whole gist of the matter turns upon the question of returns," and with these I have always been perfectly satisfied. I may add that, though only an amateur, I take great interest in Grape growing, and am frequently in the houses, so that I am well able to speak as to the equal cropping of Vines. *George H. Beaumont, Cole Orton Hall.*

Cheap Tobacco.—Mr. H. Beasley, at p. 42, recommends the home growing of tobacco for fumigating purposes, and speaks very favourably of its efficiency. I have grown it for many years, but always found it of little value when used by itself. It required to be mixed with half Tobacco or tobacco-paper to be of any service in destroying green-fly or thrip. And again, there is not one in fifty whom it would pay to grow it, or, who, indeed, has the means to do so, as in the spring every available space is filled with bedding-plants, &c. Mr. Beasley cautions me not to grow too great a quantity. May I ask him what quantity I can grow without infringing the revenue laws? I think 5 square yards only is allowed by the Revenue. Since my letter appeared in your columns at p. 1283, 1869, I have received three letters from well-known tobacco-paper manufacturers, who have tried the mixture which I use, and speak of its efficiency in the highest praise. I hope soon to hear that we are to be supplied with good and cheap Tobacco for fumigating, and also for making tobacco-water when required, which will be a great boon to gardeners and nurserymen. Since writing the above, I have received one of Mr. Appleby's fumigators, and some compound tobacco paper for trial. I find it to be a most efficient means of getting rid of greenfly and thrips. The fumigator is simple in construction, and may be easily used by any one, without injury to the most delicate plants. The compound burns freely, without blowing, or requiring any attention after it is lighted, and soon fills the house with smoke. I fumigated four houses with 2 lb. of this compound, with very good results. I put some red hot ashes in the bottom of the pot, placed the compound (well pulled to pieces) into it, and shut down the lid. The fumigator was left in each house until the latter became full of smoke. I put 1 lb. of the compound into the pan when I commenced, and afterwards added some before putting it into the other houses. I like a wet evening for fumigating houses, as the heavy atmosphere keeps the smoke in them longer than it can be retained when the weather is fine. *William Smythe, the Gardens, Elmham Hall.*

Calceolaria aurea floribunda.—I should like to say a few words about this as a pot plant, for decorating a greenhouse or a conservatory, and also to describe my method of cultivation. Perhaps some may object to it as a conservatory plant, but when it is mixed with the darker sorts, such as C. Victor Emmanuel and the shrubby kinds, it is a sight well worth seeing. About the end of October I select from the border some nice dwarf bushy plants, which I then plant into a turf pit in some good loamy soil, and protect them from frost. Plenty of air is given to them in fine weather. In the month of February I lift them and pot them in 10-inch pots, and tie them out neatly, each shoot to a separate stake. They are then placed in a light airy house, near to the glass, where they are allowed plenty of air and kept free from insects. When they commence to show their flowers I remove them to the conservatory, where they continue in bloom for about three months. I have grown plants in this way 3 feet through and one mass of flower. *Owen Orpet.*

Yellow Bedding Plants.—When I started the subject of yellow bedding plants, I did so with the hope of finding a suitable substitute for the Calceolaria in places where it is found impossible to grow it with any degree of certainty; and I stated I had not met with anything more suitable for the purpose than the yellow Pansies. I have never thought or wrote about substituting the Pansy for the Calceolaria where it could be successfully grown, for I admire the Calceolaria as much as any man, and consider, for flower garden arrangements, as a yellow bedder it has no equal. But though I admire the Calceolaria, it is not to be depended upon in all seasons and places. There are places near here where all sorts of soil and treatment have been tried, but without success; and I may state that in four large establishments near here (Osberton excepted), where bedding is carried on to a great extent, scarcely a Calceolaria (comparatively speaking) is to be seen, while at three of the establishments Pansies are grown by the thousand with good effect, and the fourth relies on the golden foliage of the Pelargonium. Now, as the yellow Calceolaria is not to be depended on in either of these establishments, it is requisite that a proper substitute should be found. And with that view I opened the subject, which has certainly up to the present time led to nothing satisfactory. It is true we have heard how different parties winter and treat their Calceolarias, and no doubt these hints, coming as they do from practical men, will be found of service to some of your readers; but the real question at issue is, putting the Calceolaria out of the question, can any of your numerous readers recommend a better continuous yellow flowering plant than the Pansy suitable for the flower garden? Mr. Quintin Read, in his notes on Thoresby, at p. 78, remarked, "I must not omit to mention the splendid rows of yellow Pansies. Much has been written about yellow bedding plants of late, and it is now an undisputed fact that in many gardens the yellow Calceolaria proves a failure. The yellow-foliaged Pelargoniums considerably aid the flower gardener, and the Golden Pyrethrum has proved a useful foliage plant. But this yellow Pansy fills up a gap which neither Pelargoniums nor Pyrethrums can supply. It produces a profusion of bright golden flowers throughout the season, which alike withstand the evil effects of wind, rain, and drought." This much I stated in my communication after my visit to Thoresby, Rufford, and Sandbeck, where the Pansies are so extensively and well grown. Each has its favourite yellow, which I have previously described in these columns; and I would recommend those who disbelieve in the merits of Pansies for bedding purposes to visit the above named establishments, and I believe they will be convinced by ocular demonstration that I have not over-rated their merits as bedding plants. With regard to the coddling method of wintering the Calceolaria, which some of your correspondents allude to, especially Mr. A. Dean, this is perfectly correct—some people treat them more like exotics than half-hardy plants, which they are. My Calceolarias are all wintered in low span frames, 13 feet long and 5 feet wide: four of these frames are annually used for the purpose—6000 plants being about the number annually propagated. The cuttings are inserted about the end of October, and remain there during the winter; in sharp frosty weather some long litter is thrown over the frames for protection; in the spring, as soon as the weather is considered safe, these frames are entirely removed, and the Calceolarias, with the exception of C. amplexicaulis, are fully exposed. These frames are constructed with movable lights, so that plenty of air can be admitted at any time; this is all the coddling mine get. The yellow varieties I use are:—C. amplexicaulis: this is a grand autumn plant, and always to be depended upon, although more tender than most varieties; beds of this and purple King Verbena mixed are very telling. C. aurea floribunda: this variety is very free-flowering, but if allowed to bloom early, there is towards the autumn nothing to be seen but bloom-stalks and seed-vessels. C. viscosissima: this grows freely, but does not bloom so well. An old narrow-leaved variety, better known now as Gaines' Seedling, is in some seasons very effective and flowers freely, but I have seen it in some parts in a hot season without a flower during the whole season; it rarely dies off with me. Yellow Prince of Orange and Trentham Yellow complete the list of yellows in use here. A variety called Golden Chain proved a decided acquisition at Thoresby last season, and appeared to be certain. There is also a very old variety grown in "the Dukeries," that was sent out many years ago by the late Mr. Widnall, and known now by the name of Dwarf Clumber; this variety I have seen very good, it is very dwarf and compact. *Edward Bennett, Orton.*

Herbaceous Perennials and Biennials.—Now that the rage for ribbon gardening is somewhat abating, and we are harking back again to those grand old herbaceous plants which our ancestors delighted to cultivate, but which a few years since were well nigh doomed to extinction by an universal deluge of scarlet Pelargoniums and yellow Calceolarias, there is one singularly handsome plant which I am astonished to find almost unknown and ungrown—I mean that remarkable and magnificent biennial, Michauxia campanuloides. I do not know why this is, for it comes up freely from seed, will grow in almost any soil, and is perfectly hardy. I had a bed of it last year, each plant being between 4 and 5 feet high, and a perfect pyramid of large, snow-white, Passion-flower like blooms. The effect produced is still more striking if the plants are placed singly in a mixed border, as you would plant a Dahlia, with plenty of room to show themselves off. It is a plant greatly beloved by bees. Your correspondent "A. I. P.," when writing on that beautiful family the Hellebores, has omitted to mention H. trifolius, otherwise called Coptis trifoliata, but a very true-looking Hellebore. It is, I think, second in beauty to none of its race, and to see it growing on my friend Mr. Ellacombe's rockery at Bilton is a sight worth going a long way to see. Helleborus atrorubens is a perfect gem of gems. I have a plant now just coming into bloom with about a hundred flower-stems. Its lovely purple pendent bells, crowded with yellow stamens, make it, I think, one of the prime ornaments of the spring garden. There is another very lovely and desirable little spring plant just now pushing up into bloom, I mean Crocus Sieberi or nivalis. Its beautiful lavender-blue blooms, based with yellow, would make an almost unequalled spring bed, side by side with one of Eranthis hyemalis and the Anemone blanda, about which your correspondent "M. J. B." so eloquently writes, and which I wish he would tell me where to get. [Try Backhouse. Eds.] By-the-by, Anemone ranunculoides is another gem of the spring parterre, which one seldom sees. Some few years since, through the kindness of a friend, I procured a few roots from the wild habitat at Abbott's Langley. They have increased with amazing rapidity, and in a month or two I shall have two or three glorious golden patches. There is a white variety of Anemone apennina, which is indescribably beautiful. I found it growing abundantly near Tivoli, three years ago, and dug up a number of roots, but they unfortunately perished before I got home. Can any reader of the *Gardeners' Chronicle* supply my loss? The Roman Squill, Bellevallia romana, whose spikes of greenish white bells will recal many a saunter in the grounds of the Villa Doria, or the meadows by the banks of the Tiber, is a bulb which every spring garden should have. Trichonema Bulbocodium, another most lovely denizen of the Italian meadows, with large purple Crocus-like flowers, and linear grassy leaves, is a plant which every one should grow. I have a bunch or two which I dug from the hills near Fidenæ, which I treasure with much pride. And then there is that charming little striped Crocus suaveolens, with which the English burial-ground at Rome is studded on the very earliest spring day. I dug up a large bunch when attending poor Gibson, the sculptor's, funeral, but, alas! they were so dry and shrivelled when I got home, that I was baulked of my hope to plant a lasting floral memorial in my Buckinghamshire garden. Who, too, that has driven out into the Campagna, and remembers the pretty pink, star-like flowers of Erodium romanum which studded the banks, will not try to grow it in their gardens at home? It does so well that it becomes a perfect weed, and is no mean companion to its more gorgeous brethren Erodium hymenodes, with its heads of French-white and purple flowers, and E. Manescavi, with its umbels of magenta bloom as big as Geranium sanguineum. Ornithogalum exscapum, too, that beautiful Star of Bethlehem, with its large white flowers scarcely rising out of the ground, with which all the meadows on the Appian Way are so thickly studded; and the yellow and green Gagea lutea, and the white and pale lavender varieties of Muscari botryoides, and the green-tipped white bells of Leucojum vernum, and the exquisite white and pale lilac Triteleias uniflora and alliacea (the latter by some called Leucocoryne alliacea), and those beautiful Fumitories, Corydalis nobilis, capnoides solida, and cava albiflora—how beautiful they are, with a host of others too numerous to mention now—how easily grown, but how seldom seen. What has become of "the great double yellow Cowslip" which old Hill figured, and Miller described a century ago, and which, with a double white Cowslip (not Hose-in-Hose), our forefathers used to grow? Where, O where have these grand old things gone? *H. Harpur Crewe, The Rectory, Drayton Beauchamp, Tring.*

Rendle's Plant Protectors.—With all due respect to Mr. Fish's judgment, I must say that to me these appear as mere toys, which are anything but useful to the gardener. Rendle's plant protectors are all very well as they appear in your columns, but I cannot see that their adoption will fill our vegetable baskets earlier, more abundantly, or more cheaply than by using our old-fashioned hand-glasses and dung-frames; and I am quite sure that those who may use them will find their glazier's bill trebled. Much of the value of protectors consists in the ease with which they are removed from one place to another. Compare the removing of a two-light box or frame with as many of these protectors as will cover the same space of ground. Mr. Fish speaks of raising them on bricks, when necessary, for head room. Has he managed to do this without pulling the whole down? or has he lifted it at one end or otherwise, without breaking glass? If they are perched on the bricks, what is to support the structure on each side? Again, if they are filled with Lettuces, and we will say those best for use first are in the middle, and the protectors are 3 or 4 yards long, how does he get at them without pulling the whole down? The last time I saw them some of the tiles were on the top of the glass as well as the glass on the tiles. How many of the beautiful squares of glass were smashed I will not venture to say. The glass being merely inserted in the grooves of the tiles, if anything causes the latter to give way on either side, the result may be imagined, especially as glass is not the most flexible of things, neither are the plants which it covers. I may be wrong in my estimation of these protectors, and I have no doubt but that they will find favour with some amateurs and lady gardeners; but I do not hesitate to say, that to the practical gardener, who frequently has the £ s. d. question instilled into him, they will be of

the same relative value as Peter Pindar's razor seller's commodity was to Hodge, the carter. *W. P. R., Holwood.*

Forcing Seakale.—A better plan than that suggested by your correspondent, "R. M." at p. 178, to force this desirable esculent, is to head the stools down, cutting them off about 2 or 3 inches below the crown, and to insert them in pans of sand, covering them with pots of the same size, and keeping the sand well saturated with tepid water. Any out-of-the-way corner where heat is available will answer the purpose for growing it. Those who have a Mushroom-house can grow any quantity by placing the pans on the evaporating troughs. Seakale produced in this way will be equally as fine as that recommended by your correspondent, besides being obtained with such a saving of time and labour. This plan also obviates the necessity of destroying the whole bed of roots. *Thos. Turner, Walton, Wakefield.*

The Beechwood Melon.—In Mr. Radclyffe's selection of fruit I was delighted to see that he included the above. If well grown, I have no hesitation in saying it is the finest Melon in cultivation. Some years since I saw a house devoted entirely to it at Bowood. It contained the finest lot of fruit I ever saw. I have been told since that it is a difficult variety to manage, being a shy setter and bad grower; certainly, at the time I saw it, there was not a shadow of this infirmity. Would Mr. Scammell kindly enlighten us on this point? *P. T. T.*

Conservatory Plants.—I am desirous to obtain a list of the plants most suitable for a London conservatory without artificial heat; that is to say, plants which can stand the heat under glass of July and August, and the cold of an exceptionally severe winter, which in a well built conservatory, forming part of a London house, may occasionally be as low as 28° or 26°. In my case I began by having a coil of hot-water pipe, heated by half-a-dozen gas jets, but what between neglect of the servants in not lighting the stove until some days after the December frost had set in, and the injurious effects of the gas once the stove was in use, I came to the conclusion I had better give up the stove, and stick to those plants only which can stand a slight touch of frost once in a way. With me, in the frost of December, or since from the fumes of gas, Tradescantia zebrina is dead, while two Passifloras, Heliotrope, Cobæa scandens, and Adiantum cuneatum, have lost their leaves. On the other hand, Ficus repens [stipulata], on the damp wall of a fountain, is alive, as also are Hoya carnosa, Cissus antarticus, Lapageria rosea, and Bignonia capreolata. In the plant line my wants are:—1. Evergreen climbers with strong foliage, for covering a trellis 10 feet high; 2. Greenhouse Ferns, also evergreen; and, 3. Rockwork plants, such as Sedums, Saxifragas, &c., but able to stand the summer-heat of a glass-house without becoming drawn and spindly. *R.* [Cissus antarcticus is no doubt one of the very best evergreen plants for such a house, and we should try Jasminum revolutum and Wallichianum. Of greenhouse Ferns the Japanese evergreens, as Lastrea opaca, hirtipes, Standishii, erythrosora, and Sieboldii would be suitable; also Woodwardia orientalis, and many of the choice varieties of our native Scolopendrium, with Polypodium vulgare cambricum, omnilacerum, pulcherrimum, and some related varieties; all of these are effective. The Saxifraga sarmentosa will succeed in such a house. Have any of our readers had experience of other plants which meet "R.'s" inquiry? EDS.]

Musa Ensete.—This plant does admirably well, under ordinary care, where it has room enough to expand its lange and splendid leaves. Not long since, in a house of such things, I saw three fine specimens of it, about 15 feet high, with scarcely a blemished leaf on any of them. On an average each of them bore 10 fine leaves, which varied in length from 5 to 10 feet by 2 in breadth. The plants were bought as young ones nearly two years since, and they have stood in the places where I saw them for over a year and a half. They were growing in strong rich soil and out of tubs, and set at regular distances apart, along a central bed of the house where their appearance was as effective as any one could have desired. Some of your readers who know the Musa Ensete can imagine what splendid objects these must be, and how well adapted they are to show off a nice conservatory, especially at a time when flowers of any kind are not over plentiful, and when other foliage has sometimes enough to do to compensate. And besides this, it is worthy of some consideration to know that such noble examples of vegetable life are brought to view by the expenditure of much less labour than is required for some others, that as substitutes would not look so well. *R. M.*

Sophora japonica.—In answer to the inquiries of your correspondent, "Bath," in *Gardeners' Chronicle* of Saturday last, p. 177, respecting the Sophora japonica, I may say that the tree is growing close to, and trained against the wall of the house in which the late Mr. Aiton, Director of the Royal Gardens, Kew, &c., resided. The trunk is about 4 feet in girth, it seems to have grown very freely, and has been frequently headed back to the height of the front wall of the house, about 20 feet. I also send you dimensions of two fine trees growing in the Royal Botanic Gardens, Kew: the one, at 3 feet from the ground, has a trunk girth of 12 feet 5 inches, height 50 feet, circumference of branches 210 feet; the other, girth of trunk 8 feet, height 45 feet, circumference of branches 195 feet. These are fine objects in the gardens when covered with their lovely white flowers. There was also a fine tree, six years ago, in the grounds at Syon House. *John Smith, Curator, Royal Gardens, Kew.*

Vine Soils.—As the loam from the Mansfield magnesian formation has been mentioned by Mr. Forsyth, I may be allowed to state my experience in the use of that soil, and I may say, in the outset, it will not be found to aid Mr. Cramb's theory in any one particular; indeed, so far as I can see, Mr. Cramb has assumed a false position, for though magnesian lime in its burnt or caustic form may be highly injurious to vegetation, I doubt if it can be considered so while in the form of stone. On the contrary, we find it, as Mr. Tillery has explained, producing the finest crops; therefore while it may be perfectly true that the Vines at Tortworth have failed, may it not be equally true that the cause to which Mr. Cramb attributes his want of success is not the real one? — at any rate we have ample proof that loam direct from the face of the magnesian limestone rock has produced Grapes of the finest quality for a great number of years past; and surely a fact of that kind is not to be ignored by one simple failure, unless that is more directly attributable to magnesian limestone than at the present time is made apparent by Mr. Cramb's statement. Now I calculate that during the time I was at Berry Hill I used in the formation of Vine and Peach borders, and for the growth of Pines and other cultural purposes, upwards of 6000 loads of the dolomite loam, and I had no fault to find with it. It all came direct from the quarries. For the cultivation of Vines in pots nothing could possibly be finer. The plants grew in it with a luxuriance not to be excelled, while the permanent Vines, Muscats included, would bear comparison with the best not only in the county but in the country. Now this loam had to be carted two miles, and this fact alone should be sufficient to demonstrate that the expense would not have been incurred if the soil had not been worth the cost, and superior to that which we could have procured from the red sandstone formation close at home. Nothing could exceed the profusion and vigour of the Vine roots when growing in pots, so dense did they become that it was impossible to shake the soil away from them; just the same was it with the Vines in the open borders, they grew with a luxuriance which could not be surpassed, and yet there was no addition of rich manure to the soil, but merely brick rubbish, some charcoal, and half-inch bonedust. For the cultivation of the Vine, Melons, and Cucumbers, and plants of all kinds, I found this soil all that I could desire, so much so that I cannot call to mind a single plant that refused to grow in it. It may not be out of place to remark that the limestone in the neighbourhood of Mansfield does not crop up on the surface, as it does in some parts of the district, but generally it is overlaid by a layer of clay, varying from 1 to 3 or 4 feet in thickness, and then comes the loam; but still in other places where the loam has come direct from the surface of the rock, success in the cultivation of the Vine was not less marked. One fact connected with the use of this loam may be noted. For years two plants of the Royal George Peach had been much infected with mildew, and wash and dress with sulphur as much as we might, still the pest was there, so as to spoil the effect of a very fine wall of trees. Reflecting that diseases in fruit trees, in fact in all trees, arise as much from the want of constitutional vigour as from the liabilities of some special varieties to take them, I determined to lift the trees and replant them in fresh soil. This was done, and the trees were placed in the dolomite loam, and since the removal there has scarcely been a trace of mildew, red spider, thrip, or green-fly upon them, but, upon the contrary, the foliage every season has had a vigorous black-green robust appearance,—demonstrative of the suitableness of the soil, as well as the treatment which the trees had received. From the preceding statement it will be perceived that I cannot join Mr. Cramb in his crusade against the dolomite—on the contrary, I have every reason to be satisfied with it; and therefore, in the interest of Vine cultivation, I think it is pity that Mr. Cramb should have raised the cry of "Wolf, wolf," when, if we may judge of the experience of others in the use of the same kind of soil, he has nothing but very innocent lambs in the fold. Surely when Mr. Cramb speaks of 60 per cent. of lime in the Tortworth soil, he must be in error; a soil nearly two-thirds lime must be a curiosity. *Thomas Speed, Chatsworth.* [Perhaps an analysis of the soil might throw some light on the conflicting and perplexing statements made on this subject. EDS.]

Sericographis Ghiesbreghtiana.—Those of your readers who have to maintain a succession of bloom during the winter months are well aware how few really useful plants there are for this purpose that come into bloom naturally at this period. Allow me to draw attention to the above named plant, which is figured and described in "Paxton's Magazine of Botany," vol. 15, p. 176, and where it is thus spoken of:—"We are unacquainted with the native country of this fine species of a new genus, nearly related to Justicia. It was introduced a few years ago into Belgium by M. Galeotti, of Brussels, and has since found its way into several of the Continental nurseries. In 1846, Messrs. Rollisson, of Tooting, received a plant from M. Makoy, of Liège, under the name of Aphelandra Ghiesbreghtiana." Although it has been introduced so long it does not appear to be generally known, and, apparently, is not much in demand, seeing that it is not mentioned in many trade catalogues. This, perhaps, may chiefly be accounted for, by its having hitherto been grown as a stove plant; for when so treated it has a tendency to assume a loose, straggling habit, giving one but a poor idea of its real merit as a decorative plant. When grown under cooler treatment it is of good habit, and very free flowering. It commences to display its large panicles of bright scarlet flowers early in January, and continues in bloom till the middle of February, requiring no higher temperature than that of an ordinary conservatory. Cuttings of young wood put in when the plants are pruned early in March, strike freely in bottom heat. The young plants should be potted on and grown in a warm frame through the summer months, and should occasionally be pinched back, to produce a nice bushy habit. When the summer is over, the treatment given to tender greenhouse plants will suit it well. *J. W.*

Judas Tree (Cercis Siliquastrum). — In the grounds of the Magdalen Hospital, a very ancient endowed charity in this city (Bath), is a large tree of this species. It is about 40 feet in height. The circumference at 3 feet from the ground is 63 inches, and it continues of the same size nearly up to 10 feet above the roots, when it divides into many large branches, some of which have been lopped and mutilated. It shows little sign of decay, though it is known to be fully of 100 years' growth, and is probably much older. It blossoms freely every spring. *Bath.*

The True Service Tree.—From the interesting correspondence which has succeeded my remarks on the true Service tree, I am led to suppose, not only that the tree in question is very little known, but that there is much confusion with respect to the whole genus, from which it has arisen that we have been referred to the wild Service tree as occurring in different parts of the country, while there is reason to believe that the only apparently wild example was the one I mentioned as having existed in Wyre Forest, but which has been lately destroyed by fire. In order to put the matter in a clearer light it will be well to consider the modern genus Pyrus to consist of two former genera, namely, Sorbus and Pyrus. The first includes:—Plants with simple more or less lobed and notched leaves: 1. Sorbus torminalis, wild Service tree; 2. S. Aria and its varieties, White Beam; 3. S. fennica, Bastard Mountain Ash. Plants with pinnate leaves of from five to six pairs of serrate leaflets; 4. S. Aucuparia, Mountain Ash, Rowan; 5. S. domestica, Service or Witty Pear tree. The last includes: 6. Pyrus communis, wild Pear; 7. P. Malus, Crab Apple. Of these No. 5 is our Service tree, which is further distinguished from the Sorbs by its pyriform fruit; but it will be seen that No. 1 has the trivial name of the "wild Service tree," and it is probably this latter which has been mistaken for the Witty Pear. Hooker calls the S. torminalis the "wild" Service, and the S. domestica the "true" Service, by which I would now designate it. My friend, Mr. Edwin Lees, of Worcester, says that the latter tree was observed by Sir R. Throckmorton in the Pyrenees; but in his own exploration of this chain he failed to find it. Possibly it may be in this case, as in others, that the S. Aucuparia has been mistaken for the true Service, and indeed Bentham says, "The cultivated Service tree (Pyrus domestica, Eng. Bot. t. 350) has precisely the foliage of the Rowan P., of which it is believed by some to be a mere variety produced by cultivation. The flowers are rather larger and the styles often woolly, but the only real distinction is in the fruit, which is very much larger, assuming the form of a little Pear" (Handbook of the British Flora, p. 204). However the mistake has arisen I will not attempt to decide, but I am quite of the opinion expressed by your Bath correspondent: "When I have asked at the nursery, and other gardens, for the true Service tree I have always been shown either the Mountain Ash or some variety of the Beam tree, Pyrus Aria." There is, I think, reason to conclude that the true Service tree is rarely met with in cultivation, and this is perhaps accounted for from the extreme slowness of growth of the tree, so that it would be very long before it would make any show in the nursery grounds or in plantations. Perhaps some of our nurserymen could add a few notes on this interesting question. *James Buckman.* [We believe it is a difficult tree to graft, for want of a knowledge of the proper stock. EDS.]

Orchid Culture.—If it were not too presumptuous, I should like to have called this, my gossiping letter, by the title given by the charming French writer to his little book, "Tour autour de mon jardin." I have been expecting to hear more upon Phalænopsids, as the paper upon this subject at p. 1110, 1869, of your journal said "to be continued;" and I have one that seems to me to be a case in point, that is to say, it has arrived at the stage, according to the writer of that article, which will be its culminating point. It has now seven leaves, the two largest are 14½ inches by 4½ inches, and 13½ inches by 4 inches. It produced me two young ones last year, one of which

is still upon the plant, and now has two flowering shoots, the buds of which are just upon the point of expanding; the largest with 53 flowers, the smallest with 16, making 69 in all. I bought it as quite a small plant five years since—sort, Schilleriana. I have a second I bought a year later, with five large leaves, bearing 43 flowers. Now I was advised to sell both these plants last year, for the reasons given in that paper, but preferred to wait the event; and in the case of the first, I have got for reward two young plants, notwithstanding that it flowered well, though I do not remember the number of the flowers. I do not wish to say that the writer is in error, or that the common belief of gardeners is incorrect; but is it not possible that age may have more to do with such ending than size? Mine has been five years in my possession, say, seven years old in all, should this seventh be its unlucky number. Phalænopsids are not annuals. Take a Balsam: if you carefully prevent its seeding Nature directs that it should still try to work out its mission, and it goes on flowering; but I question its living a second year—is it seeding, then, that kills them? Mr. Stuart Low showed me the dead plants of the importation mentioned, andI am sorry I did not examine them more closely, that I might have seen the size they had grown to. Clearly, if they commence to go back at any certain point, it must be following out a law of their nature; and should we not be able to find out what that law is, that so valuable a class of Orchids should be relieved from the vague fear that surrounds them? For my part I should as soon think that a Vanda would die off; it has the same habit of throwing out roots as it grows taller. I have three plants as tall as myself, and the roots in the pots are as active as those above, and I think this P. Schilleriana seems to be what is called forming a leg. Suppose I get a block from a newly cut down tree, and fix it against it, would not the roots it throws out between the leaves cling to it? If anyone knows of plants being grown thus, or as Mr. Gammie describes finding Vanda Cathcartii, I should be glad to hear. I am told we are to have an importation established on blocks. I have bought some of all the imported Dendrobiums, and have been looking them over, and I find that D. Devonianum, and what I got for D. Wallichianum, but which I think will prove to be D. nobile intermedium, are the only two that have not produced bulbs double the size of the imported ones. To have doubled these last would have required bulbs some 4 feet 6 inches long. I have had D. chrysanthum nearly 5 feet. Odontoglossum Alexandræ and O. Bluntii are advised to be grown on the cool system. Mr. Williams says they produce lovely spikes of bloom when kept quite cool, adding that they grow at Bogota, at an altitude of 7000 to 8000 feet. Santa Fé de Bogota is in the Republic of New Grenada, on a plateau 8958 feet above the sea, in latitude 4° 35′ north. I have not been growing mine on what is called cold treatment, and my strong plants give 12 and 13 flowers, weak ones 7, 8, and 9, and hardly a plant missed flowering. I have been wondering if those ever-bearing Strawberries that require a stove treatment, grow at Bogota. When at the Jardin de la Ville de Paris I saw they carefully covered the pots of Caladiums and Alocasias with Moss, which plan I adopted on returning home, with good effect. Upon reading at p. 1206, 1869, in your journal, a paper on the Aloe, it struck me that it might be the same reason that induced Pines to prefer rooting among the crocks, and that mossing them might be of advantage; I therefore had some tried, and believe it is greatly to their advantage, but being winter time it takes longer to be certain. *G. H.*

Achapesnorricher Hardy Ridge Melon (see p. 1258, 1869).—Since the introduction of this Melon by our house some few years back, we have found a steadily increasing demand for it, and are constantly receiving confirmations of our description of its merits as a hardy Melon from those who have tried it. The name given it by the person from whom we purchased the seed, was the same as that under which he received the original seeds from the Ionian Islands. We know of no meaning for the word, although by this time, from constant use, we have quite mastered its pronunciation. *James Carter & Co.*

Societies.

ROYAL HORTICULTURAL: *February* 8, *Anniversary.*—James Bateman, Esq., F.R.S., in the chair. After the minutes of the last annual meeting had been read and signed, Mr. Fortune and Mr. Booth were appointed scrutineers of the ballot for the election of Council and officers for the ensuing year; these gentlemen subsequently reported that the nominees of the Council had been unanimously elected, namely, the Lord Bishop of Winchester, S. Rucker, Esq., and Dr. T. Thomson, in the room of James Bateman, Esq., D. H. D. Burr, Esq., and Lord Londesborough; while the Duke of Buccleuch, K.G., John Clutton, Esq., and Lieut.-Col. Scott, R.E., were respectively re-elected as President, Treasurer, and Secretary.

The Chairman then proceeded to make some observations on the nature of the report from the Council, which had not arrived from the printers. He first alluded to the change in the days of meeting, from Tuesday to Wednesday, a change upon the success of which he had had his doubts, but he was glad to find that it had been effected with very little trouble, and hitherto with marked success. The nature of the arrangements made between the Society and Her Majesty's Commissioners, in respect to the completion of the gardens, was then commented upon, after which Mr. Bateman completely took the meeting by surprise by stating that the Council had considered it necessary to propose the abandonment of the Chiswick garden—partly on account of the great difficulty of growing plants with anything like success within reach of the smoke of London, and partly on account of the deficiency of funds. It was painful, he said, to think of leaving Chiswick, but sooner or later it must be done, as the lease had only 11 years to run; but it would be by far the better course to meet the difficulty boldly, and look out for another garden within a convenient distance from London; and as a late Fellow, Mr. Alfred Davis, had bequeathed to the Society the sum of £2000, this could be applied in paying the expenses of removing.

The Assistant-Secretary then read the report of the Council which had arrived in the meantime, and from which we make the following extracts:—

"1. Besides the usual account of the routine business of the Society which it is the duty of the Council to give at this time, there are two special subjects which they have to bring before the Fellows, both of them, as they think, important to the welfare, and likely to add to the prosperity, of the Society.

"2. The first has reference to the annual International Exhibitions about to be established on the annexes by her Majesty's Commissioners for the Exhibition of 1851 (see Appendix I.). The communication which has been recently issued to the Fellows will have informed them that the Council have entered into an arrangement with the Commissioners of a mutally beneficial character. A copy of the agreement with them will be found subjoined. These arrangements will, the Council believe, materially benefit the finances of the Society, and also secure to the Fellows personally important privileges as respects the terms on which they can obtain admission to the International Exhibitions. The Commissioners also undertake to finish the gardens without throwing any further liability on the Society.

"3. The second subject of importance relates to the working garden of the Society. For some years past the Council have seen the necessity of changing their experimental garden from Chiswick to some locality better suited for their operations; for the results of the cultivation there, owing to its low, cold, damp position, combined with the gradual increase of smoke and houses around it, are yearly becoming less satisfactory, whilst the expenditure entailed by the establishment is constantly increased. Moreover, the termination of the lease will of itself necessitate a change in a few years. A garden conveniently situated in pure air and with good soil would enable the Council to carry out their horticultural operations with increased efficiency and at reduced cost. An obstacle which would have hampered them in carrying out this change, viz., the expense of establishing a new garden, has been (as they believe) opportunely removed by a valuable bequest to the Society by their late Fellow Mr. Alfred Davis, which will enable the Council to effect this improvement, and at the same time preserve the memory of the bequest, and of Mr. Davis' interest in the Society, in a permanent shape.

"4. As regards the financial condition of the Society, the Council have to report that there has been a slight increase in the number of Fellows, and the number on the books is the largest on record. The actual amount of subscriptions received for 1869 was £7193; in 1868 it was £7113; the number of transferable tickets taken out has considerably decreased since the present monetary depression commenced. The receipts from the exhibitions of the Society were about the same as of 1868, with which those last year are fairly comparable, the number of shows and the amount of money offered in prizes being similar in the two cases. The promenades have been better attended and more productive than in the preceding year.

"5. The country shows having, both at Bury and Leicester, proved to some extent remunerative, the Council anticipated that there might have been a considerable surplus from the exhibition at so large a place as Manchester. In this they have been disappointed. The returns will do no more than meet the expenses. Notwithstanding this, they regard the institution of these country shows with satisfaction. In every instance they have been productive of benefit to horticulture, have spread knowledge among the people, and indirectly benefited the Society.

"6. In their last report the Council mentioned that they were taking measures to secure the more rapid publication of the proceedings of their different committees. This they carried into execution, but as the expense for distributing them to all the Fellows by post would be too great, it was intimated that those who might desire it would receive them on application to the Assistant-Secretary. Accordingly at each successive Tuesday meeting copies of the proceedings of the previous meetings have been distributed to those Fellows who applied for them. Those who have not availed themselves of this privilege will get the back copies on applying at the office.

"7. The success of the fortnightly fruit and floral meetings, hitherto held on the Tuesday afternoon, but now held on Wednesday, has been so marked, and the attendance at them so numerous, that the Council have been induced to make an important change in the Society's working as respects its exhibitions generally. These meetings have been chiefly made successful by the zealous co-operation of the Fellows, but especially of the exhibitors, who have not only brought to them the new and rare productions for which they desired to have the Society's certificate of approval, but large and beautiful collections of flowers, already well established in the estimation of horticulturists, and have thus added such attractions to the meetings as really to convert them into important floral exhibitions. Seeing that they have practically assumed this position, the Council have thought it best to combine the general exhibitions with them. This arrangement, while commending itself to the exhibitors by reducing the total number of floral meetings and exhibitions, will have the effect of adding to the numbers of those which specially attract the great body of the Fellows and the public. By distributing the prizes also over a greater number of days, the exhibitions will be rendered more independent of the weather, and less perilous to the Society.

"8. The Fruit and Floral Committees have worked thoroughly well, and their decisions continue to be accepted by the country with confidence. The Council have under consideration a scheme for improving the mode of election to these bodies, as membership is now an office much prized by the practical horticulturists.

"9. The Council also refer, with the greatest satisfaction, to the working of the Scientific Committee. This committee, at the date of the last annual report to the Fellows, had made a good commencement of their labours. The large attendance of its members at every meeting has now given ample proof that the subjects brought before the Society afford matter of sufficient interest to engage the thoughts and attention of the leaders of the different branches of natural science.

"10. Another effort to promote the advance of horticulture on which the Council look with satisfaction, is their collection of insects injurious to vegetation now forming and housed in the South Kensington Museum. Some of the Fellows have kindly aided their efforts to procure materials for this collection, and as many have it in their power to contribute, the Council trust that ere long the blanks existing in the cases already put up may be filled, and a large accession of material procured. This is a matter in which every one possessed of a field or garden has a personal interest.

"11. The Lindley Library has not received many accessions during the past year, which is probably due to its not yet being deposited in a sufficiently accessible place. The Council expect that as soon as the Royal Albert Hall is completed this deficiency will be supplied, and in the meantime remind the Fellows of the Library, and again invite contributions.

"12. A new Orchid-house has been erected for the reception of a fine collection of cool Orchids which has been presented to the Society by Mr. Bateman. The Council feel that the thanks of the Society are due to Mr. Bateman, not only for this handsome donation, but for the great personal trouble and labour he voluntarily undertakes for the instruction and entertainment of the Fellows at their fortnightly meetings.

"13. The system of examination for young gardeners established by the Society, and carried out partly with the machinery of the Society of Arts, continues to work well.

"14. It will be seen from the report of the Chiswick Board of Directors (Appendix III.) [which we shall publish next week] that unusually large collections of seeds, plants, and cuttings have been distributed among the Fellows during the past and present years, and the ballot lists will show that the plants have been new and valuable: some of these were produced at Chiswick. They have also been able to supply some foreign and colonial establishments with collections of cuttings of fruit trees; the Horticultural Society of Victoria, and of Port Elizabeth, Natal, in particular have especially desired their thanks to be conveyed to the Society for donations which they regard as important.

"15. It will be seen, therefore, that amidst the varied objects to which the Council have had to give their attention, they have not overlooked the importance of horticultural intercommunication with the colonies. The annexed prospectus (Appendix I.) will show that they have also taken the necessary steps to secure the advantage of international competition for horticulture at the approaching annual exhibition of art and industry.

APP. I., referred to above, consists of the programme we have already published at p. 140.

APP. II. *Terms of Arrangement between Her Majesty's Commissioners for 1851 and the Royal Horticultural Society consequent upon the Annual International Exhibitions to be held at South Kensington in 1871 and following Years:*—

"The Society to give to the Commissioners the permission to admit to the gardens all visitors to the proposed International Exhibitions; and the use of the northern arcades from April 1 to October 31, the Commissioners providing in lieu thereof, for the use of the Society, a covered communication on the roofs of these structures between the orchard-house entrance and the conservatory.

"All receipts for admission to the gardens or International Exhibitions from May 1 to September 30 taken at the entrance to be the property of the Commissioners, and out of such receipts the Commissioners to pay to the Society 1*d.* out of each shilling so taken.

"The cost of bands for the horticultural shows and for the promenades during the five months of the International Exhibition to be defrayed by the Commissioners.

"Fellows of the Society to have the privilege of purchasing season tickets for the International Exhibitions with a reduction of one guinea per ticket on the price charged to the public; one such season ticket to be obtainable for every two-guinea subscription paid to the Society.

"Fellows of the Society to have the privilege of purchasing tickets of admission for their friends to the horticultural shows and promenades at a lower price than is charging to the public at the doors, such tickets carrying with them the privilege of admission to the whole of the International Exhibitions.

"The whole proceeds of the sale of such tickets to the Fellows of the Society for the horticultural shows, and 1*d.* in the 1*s.* on the tickets sold for the promenades, to be the property of the Society.

"Two days of the week, as at present, the price of admission to the exhibitions and gardens to the general public to be not less than 2*s.* 6*d.* For horticultural exhibition days, the price of admission to be regulated by the Expenses Committee.

"It is understood that the Commissioners will finish the arcades and make such improvements in the gardens

as may be necessary to provide increased promenade space, now so much required.

"The present exclusive privilege of the use by the Fellows of such portions of the annexes as are not required in carrying out the objects of the Commissioners not to be interfered with.

The adoption of the report having been moved by Mr. Rosher and seconded by Mr. Blenkins, who, at the same time, expressed his regret to hear of their relinquishing the Chiswick gardens, Mr. S. H. Godson proceeded to question the Council on the propriety of deciding the fate of Chiswick, upon which thousands had been spent, at this meeting, without giving the Fellows time to consider the subject, or any sufficient opportunity to express their opinions; and he would put it as a question of prudence whether the Council should not call a special general meeting and submit the whole question to the Fellows, and if they decided to abandon Chiswick, his voice would be only one raised against it. He also asked if the Council had been in communication with the Duke of Devonshire's agent, as to the renewal of the lease, and proceeded to animadvert on the doings of the Council in past years as in the present.

Mr. A. Grote said he thought the Council only contended, in the proposition made in the report, that it was not worth while retaining Chiswick for so short a time as 11 years.

In reply to Mr. Godson, Mr. Wilson Saunders (than whom no more staunch friend of Chiswick could be found) advocated the abandonment of Chiswick on prudential considerations. He considered that they were at present spending much and getting little in return, and that they might spend their money, in the furtherance of good cultivation, and in making scientific experiments, better elsewhere than at Chiswick. The Council had been in constant communication with the Duke of Devonshire's agent, and the only concession which they had obtained—and that not a slight one—was the power to remove, at the expiration of the lease, all the property belonging to the Society that could be removed. Mr. Saunders therefore considered that the time had come to abandon Chiswick, and that now, when circumstances seemed favourable, was the proper time to endeavour to secure a freehold garden of less extent in some more favourable situation, and to which the property at Chiswick could be removed at once. He considered it most essential that the Society should secure a freehold garden, and then whatever happened at South Kensington the Society would still be able to carry out its main object—the promotion of horticulture. This he maintained had hitherto been done mainly through the agency of Chiswick. Chiswick gardens and Chiswick shows had created a general taste for horticulture, the consequence of which was that there was no town or village of any magnitude without its horticultural show, and at which objects of great merit were not exhibited. Chiswick, he said, had done its duty, and had done it well, but the Society must keep up with the times, and now that from various circumstances Chiswick was untenable, it must be given up as soon as possible.

Major Clarke followed in the same strain, greatly lamenting the necessity of abandoning a garden with which so many associations were connected.

Mr. Good expressed his dissatisfaction at the proposed abandonment of Chiswick, and also at the fact that the two-guinea Fellows were designated by the same title as the older members. He would suggest that two grades should be made, the one to comprise the younger Fellows, who should in process of time be draughted off amongst the older Fellows; the younger members to bear the name of Associates. He also considered that the Council had been too liberal with the debenture holders.

Mr. Godson again pressed his question, as to whether the Council would summon a special general meeting to consider the question as to the abandonment of Chiswick.

The Chairman, in reply to Mr. Godson's observations, stated that the present Council were not responsible for what was done 20 years ago, and that they had no objection to call a general meeting, if that appeared to be the wish of the present meeting. He considered that the opportunity afforded by Mr. Davis' legacy was most opportune, and proceeded to speak upon the disadvantages of Chiswick. In reply to Mr. Good, he suggested that a committee of privileges be appointed, with Mr. Good as chairman.

Colonel Scott advocated the necessity of economy, and compared the great outlay at Chiswick with the small number of Fellows who visited it.

Mr. Godson moved that the meeting be adjourned, in order to give the Fellows time to digest the report.

Dr. Masters asked the Council if the report could not be adopted without necessarily pledging the Fellows to the immediate abandonment of Chiswick.

The Chairman said he did not wish to press the point upon the Fellows.

Colonel Scott regretted that Chiswick could not be carried on without great loss, and added, that in consequence of the monetary depression, the sale of transferable tickets had largely decreased, and that the financial embarrassments of the Society, which had, in spite of great efforts to the contrary, persisted since 1830, depended upon the expenses incurred at Chiswick.

The adoption of the report was then agreed to, and a vote of thanks to the Chairman, including a recognition of his donation of Orchids, carried unanimously, concluded the business of the meeting.

Notices of Books.

FOREIGN JOURNALS.

THE periodicals mentioned below, which have accumulated on our table, contain many subjects of interest. We first take up an old friend, the **Flore des Serres**, of which M. Van Houtte has just issued, in one part, the 4th, 5th, and 6th Numbers of his 18th Volume; this contains 18 plates, of which nine are double ones, and all are admirable specimens of chromo-lithography. Let us glance through the book. We have first a very pretty, delicately spotted, purplish-blue *Gloxinia* (speciosa) *Voie Lactée*, a charming flower, of the punctated type. Next comes *Tapinostes Carolina*, a Brazilian Gesnerad, whose large bullate, handsomely shaded, shining leaves, show up the white hairy inflated flowers. *Camellia* (japonica) *Princess Clotilde*, an Italian seedling, obtained from tricolor, looks gay and tempting with its flowers of medium size, quite double, the broad petals freely and boldly striped and spotted with reddish crimson; it seems to be a valuable acquisition amongst the heavily-striped Camellias. *Deutzia ornata flore albo-pleno* is a pure white variety of one of the best of forcing plants for spring use; as *Spiræa palmata* is certainly one of the finest of all hardy herbaceous plants. *Actiniopteris radiata*, a beautiful little Palm-like Fern, is admirably represented. Another plate is devoted to *Begonia roseflora*, one of Messrs. Veitch's recent novelties. *Rhododendron Princess of Wales* takes a double plate; it is a handsome hardy sort, with purplish margins and pale centre, raised in the Milford nursery. Three varieties of *Azalea indica*, which also occupy each a double plate, are, judging from the figures of them, grand acquisitions. The first, *Iösmé Van Houtte*, is a magnificent white, of large size, faultless form, and having the upper segment dotted with green; *Madame Iris le Febvre* is a fine double carmine-crimson, spotted with dark dots towards the centre; and *Marie Van Houtte* is a large white flower, slightly streaked with bright carmine, and having a tuft of small petals in the centre; they all appear to be varieties of first-class excellence. Then we get some more of M. Van Houtte's splendid hybrid Gesnerads. *Plectopoma eucodonioides triumphans* is a most floriferous plant, of branched habit, with moderate sized leaves, and large delicate lilac flowers, thickly spotted in the throat. Another, *Plectopoma nægelioides suave-roseum*, with something of the Nægelia habit, has larger shaded velvety leaves, and large bright rosy pink flowers. *Plectopoma nægelioides Colibri* has green leaves, and bright carmine flowers with white spotted centre, suggestive of some of the large flowered Pentstemons, only far brighter in colour. These hybrid Gesnerads, M. Van Houtte observes, form pyramids of 2 feet high in the adult plant, and are regularly furnished with their showy flowers from the base to the summit. *Rose Rev. Dombrain* is a beautiful picture of a high-coloured Bourbon Rose. The pretty little *Primula intermedia*, an English hybrid, with the habit of P. ciliata, and bearing purplish flowers, is a little gem for the alpine border. *Rhododendron Angli Format*, a Belgian hybrid, must be a very attractive sort; it shows a fine head of bloom, is of a bright and lively light rosy tint, with paler borders, and is spotted throughout, but most heavily so on the upper segments. One of the prettiest flowers in the book is the last—*Achimenes bleu*, of which M. Van Houtte remarks—"a défaut d'un merle blanc (rara avis) voici un Achimenes bleu! et celui-ci n'est pas du 'bleu de jardinier,' mais un vrai bleu, franchement bleu!" Numerous practical papers are interspersed throughout the book.

The 11th and 12th Numbers, completing the 16th Volume of **L'Illustration Horticole**, have just been issued. We here find a good figure of *Odontoglossum triumphans*, a remarkably handsome Orchid from New Grenada. *Vriesia Lindeni*, as here figured, is a totally different plant from that figured as Tillandsia Lindeni by Dr. Regel in the "Gartenflora," the inflorescence in this case consisting of a broad oval distichous spike of densely imbricated rose-coloured bracts, from which issue the violet-blue flowers; it a very interesting and handsome Bromeliad. *Fittonia gigantea* is coloured similarly to F. Verschaffeltii and Pearcei, but has larger leaves, and is altogether of stouter and more erect growth—a really valuable decorative plant. In *Houlletia tigrina*, from New Grenada, we have a handsome Orchid, with pendent racemes of large red-spotted flowers, the petals of which are of a brighter hue than the sepals. Of *Cochliostema Jacobianum*, a reduced figure is given. Finally, *Camellia* (japonica) *Sangalli* is a closely imbricated double white, very regular, of medium size, much resembling the old double white.

La Belgique Horticole completes its volume for 1869, also with a double number, the first illustration of which is the *Tillandsia Lindeni*, with an ovate spike of rosy-coloured cymbiform densely imbricated bracts, just alluded to as figured in "L'Illustration Horticole," under the name of Vriesia Lindeni. It would appear from Dr. Regel's figure that two plants must have been distributed under this name. The second illustration is a pretty plate of *Oncidium cucullatum* var. *nubigenum*, a neat-growing alpine species with white flowers, having the sepals and petals purple. The number also contains portraits of *Gen. Greig*, the President of the Imperial Horticultural Society of Russia, and of *Dr. Regel*.

Of the **Gartenflora**, the Numbers for September, October, and November, 1869, have reached us, and in these we find the following subjects figured:—*Oxalis valdiviensis*, a free-flowering dwarf yellow annual species, recently distributed by Messrs. Veitch. *Lonicera tatarica*, one of our hardiest flowering shrubs, showing six varieties with different coloured flowers. *Lathyrus carnosus*, a perennial species with rosy-coloured flowers. *Fittonia gigantea*, alluded to above. *Mimulus Tilingi*, a dwarf Californian species of Monkey Flower, which Dr. Regel thus distinguishes from its allies:—Stems angular: M. luteus; stems terete—corolla with an open throat: M. rivularis, M. cupreus; stems terete—corolla with the throat closed: M. Tilingi. The new species appears to resemble M. cupreus in size and stature, but has yellow flowers. *Phormium tenax Cookii*, the P. Cookii of gardens, and which, on account of the confusion existing between P. Cookii and P. Colensoi, Mr. Berkeley at one of the Floral meetings proposed to call P. tenax Veitchianum; it is the smaller growing more glaucous variety of the broad-leaved type, not the narrow-leaved species, which is P. Colensoi. *Steudnera colocasiæfolia*, a stout-growing Arad, with peltate ovate leaves. The November number contains a detailed account of the system of horticultural education followed in the agricultural school of Copenhagen; the course of study extends over a year and nine months, and includes physics and meteorology, chemistry, constitution of soils, botany, agriculture, horticulture, levelling and surveying, and drawing: an examination in which subjects is held annually; also some other interesting papers.

The more recent Numbers of **L'Horticulteur Francais** contain coloured figures of *Cypripedium spectabilis*, of which we learn from the "Flore des Serres" that an importation of living plants has just been received from its native country, Canada; *Lespedeza bicolor*, a slender purple-flowered Mandchurian leguminous shrub; and *Camellia* (japonica) *Contessa Tozzoni*, a new Italian sort, with very pale rose-coloured flowers.

In the first Number of a new Portuguese horticultural publication, the **Journal de Horticultura Pratica**, got up after the model of the French "Revue Horticole," is a coloured plate of the North American *Hibiscus speciosus*, a showy plant, with palmatifid leaves, and large scarlet flowers.

The issues of the **Revue Horticole** for the present year contain coloured illustrations of the *Pêcher a bois jaune*, a yellow-wooded as well as a yellow-fruited Peach, and therefore an ornamental tree as well as a dessert fruit; and *Hebeclinium urolepis*, a somewhat coarse-looking Brazilian composite. The woodcut figures represent *Androlepis Skinneri*, a new Bromeliad; two species of *Amplopsis*, with tuberous and napiform roots respectively; the *Secateur a tenant*; and some illustrations of M. Grin's method of pinching the leaves of Peach trees.

The principal articles in **Otto's Hamburger Garten und Blumen Zeitung** are the following:—On the cultivation of "market plants" for the Berlin and Potsdam flower market, by Herr A. Schaper; Brazil as represented at the recent international horticultural exhibition at Hamburg, by G. Wallis; fruit-tree culture in pots; on garden flower-beds; culture of Asparagus, by C. A. J. Kruse.

Obituary.

IT is with great regret that we have to announce the death of BENJAMIN DANN WALSH, one of the most scientific as well as practical entomologists of America. Born at Frome on September 21, 1808, and educated at Trinity College, Cambridge, his love of American institutions led him to migrate to the New World in 1838, leaving several brothers and sisters in England, one of the former of whom, J. H. Walsh, "Stonehenge," is the present Editor of *The Field*. Selecting Illinois as the scene of his labours, he ultimately settled at Rock Island, and having obtained a sufficient competency in business, he entirely devoted himself to entomology during the last 12 years of his life, which was closed on November 18 last by a lamentable railway accident. His chief writings are to be found in the publications of the Boston Natural History and Philadelphia Entomological Societies. They exhibit profound thought, and have a far wider bearing than merely descriptive memoirs. His articles on Phytophagic species and on Phytophagic varieties are especially important, although strongly tinged with Darwinism; indeed, we are informed that he was a schoolmate with Darwin, and though he took up the latter's work on the Origin of Species with great prejudices against the development hypothesis, yet he became a thorough convert to Darwinism after he had once studied it. In 1867 he was appointed State Entomologist of Illinois, with a salary of 2000 dollars per annum, and his first annual report was published as an appendix to the State Horticultural Transactions for that year. He was also the chief Editor of the two excellent and eminently useful works, the "Practical Entomologist" and the "American Entomologist." His style of writing and comments were extremely pithy and decisive, reminding us constantly of those of the late Dr. Lindley. *J. O. W.*

Miscellaneous.

THE MULBERRY TREE.—It would almost seem as if a good song were not appreciated now, if we may judge from the wretched trash one hears in these days. Subjoined is one of a better stamp, but of whose authorship we are not aware. Our copy is headed by a sketch of Cruikshank's (1808), showing three country squires in frilled shirts and hessian boots, one of whom

is singing beneath a very apocryphal-looking Mulberry tree, while the audience, glass in hand, and pipe in mouth, is listening with rapt attention :—

"THE MULBERRY TREE.

"The Sweet Brier grows in the merry green wood,
Where the Musk Rose diffuses his perfume so free,
But the blight often seizes both blossom and bud,
While the mildew flies over the Mulberry tree.

"In the nursery reared, like the young tender Vine,
Mankind of all orders and every degree,
First crawl on the ground, then spring up like the Pine,
And some branch and bear fruit like the Mulberry tree.

"To the fair tree of knowledge some twine like a twig,
While some sappy sprouts with its fruit disagree ;
For which we from Birch now and then pluck a sprig,
Which is not quite so sweet as the Mulberry tree.

"The vast tree of life we all eagerly climb,
And impatiently pant at its high top to be ;
Though nine out of ten are lopp'd off in their prime,
And they drop like dead leaves from the Mulberry tree.

"Some live by the leaf, and some live by the bough,
As the song or the dance their vocation may be ;
And some live and thrive, though we know no more how
Than the dew that flies over the Mulberry tree.

"But like Weeping Willows we hang down the head,
When poor wither'd Elders we're destin'd to be ;
And we're minded no more than mere logs when we're dead,
Or the dew that flies over the Mulberry tree.

"Yet like Lignum-vitæ we hearts of Oak wear,
Or the Cedar that keeps from the cankerworm free ;
While the Vine-juice we drain to dissolve every care,
Like the dew that flies over the Mulberry tree."

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

AMONGST stove Ferns, that handsome and useful old favourite, *Adiantum cuneatum*, if well grown, is the most serviceable to the gardener. To grow it well it should be allowed a season of rest every year, or otherwise be given such treatment as would suit a deciduous species, which I believe it to be. Those plants from among the main stock which are showing signs of ripening may now be placed upon their sides on a moderately cool moist bottom ; in this position the fronds will ripen, and become of a yellowish hue ; these, when they subsequently die, should be neatly cut down as close as possible with a sharp knife. After this operation is performed another six or eight weeks' rest may be allowed. Pour a little water occasionally over the outer sides of the pot, should the plant show symptoms of being too dry. Do not pot them until a little fresh growth is formed ; but should the young fronds start into growth sooner than is intended, give them every encouragement, for to check or endeavour to keep them back afterwards is certain to cause much injury to the plants. Many other kinds of stove Ferns will now require some alteration in the matter of potting, &c., especially the hardier kinds, such as *Blechnum*, *Pteris*, *Nephrolepis*, *Davallia*, *Asplenium centarum*, *Didymochlæna*, &c. The three former of these, as is well known, make roots plentifully, and unless the balls are somewhat reduced at the time of potting, very large pots will be required before the plants become of large dimensions ; hence it will be necessary to reduce them, and especially if the plants are intended for household decoration, for which purpose they are extremely useful. Those who require *Fuchsias* to flower early, whether successional or otherwise, should now place some plants in a position which will encourage them to break, after having been first pruned, shaken out of the old soil, and repotted in a fresh compost, which should be rich and light in its nature. They should be potted in the smallest sized pots which the roots can be got into. Heat is not absolutely required to cause them to break. Care must be taken to afford only a scanty supply of water until fresh young roots are formed. Where the plants are wanted to grow away quickly they should have both bottom and top heat. Where there is a scarcity of *Salvia patens*, cuttings may be induced to form by placing the old crowns in heat. The upright *Scarlet Lobelias* of the fulgens type may also be increased, where the stock is too limited, by potting and encouraging them to grow, and subsequently dividing them. Seeds of this very showy plant are now attainable, which afford very pleasing variations of colour. Sow a few *Balsams* for the earliest bloom.

FORCING HOUSES.

Persistently remove all unnecessary side shoots from *Vines*. Commence and finish the thinning of all Grapes at the earliest moment, when they are sufficiently advanced in size. Always encourage as good a leaf-surface as possible, nevertheless with the consideration and understanding that there must be a limit according to the size of the structure, &c., or, in other words, that excess of foliage is injurious if so densely packed that each leaf may not be able to perform its necessary offices perfectly and uninterruptedly. Air may now be given to *Pines* on fine mornings as early as 9 A.M., increase it by 10 A.M., and take it wholly off at 2 P.M. The mean temperature should now be by fire-heat alone : 68° by day and 60° by night, with an increase of 5° or 6° by sun-heat when practicable. Still keep to the winter rule a few weeks longer, *i. e.*, only expend so much atmospheric moisture as will just carry through the early part of the night, so that the artificial heat will consume it by the morning. *Peaches* and *Nectarines* should now have air afforded them daily, to endow them with such vigour as will tend not only to produce a good crop of fruit this year, but also give firm, well-built wood for next year's crop. Let the heat rise proportionately to the sunshine, and give air proportionately to both. Let the day heat rise freely without fear if these points are well attended to, but don't allow the night temperature to be high. A maximum artificial night heat may push things forward, and would do so in fact, but in a weakly, sickly, and unhealthy manner.

HARDY FLOWER GARDEN.

Preparations should now be made for planting beds of *Ranunculuses*. I stated early last autumn that the beds should then be prepared. Where this was not done, a piece of ground should now be trenched and well manured below the planting depth. No fresh manure should be so placed that it comes into immediate contact with the roots. The bed should be well settled down before planting. A rich loam suits them best. They may be planted in rows about 6 inches apart, and about 4 inches apart in the rows. They should not be placed deeper than 1½ inch in the soil. The following are good old sorts :—Mélange des Beautés, Henriette, Nègre (syn. Naxara), Téméraire, Queen Victoria, Coronation, Grace Darling, Duke of Sussex, Felix, Eliza Giles, No Mistake, and Charlotte. Those who intend flowering any in pots, will do well to place the roots in layers into some moderately moist soil for a fortnight previously to potting. The sooner the Turban varieties are planted the better, if the weather proves favourable, February and early in March being the proper time for planting all the kinds when early spring plantings are to be made. *Ranunculus seeds* may now be sown.

KITCHEN GARDEN.

Where there is not a sufficiency of early plants *Cabbages* should now be sown along with *Celery* for a first crop, and, where not already done, *Cauliflowers*, to succeed the latter winter-stood autumn-sown ones. Turn over the ground on a warm sunny aspect for the first out-door sowing of short or French horn *Carrots*. Freshen up the soil between plantations of *young Cauliflowers* in frames, &c., and keep a look-out after mice and other nocturnal depredators, both in regard to these and to sown *Peas*, *Broad Beans*, &c., as they sometimes cause great havoc before they are found out. Give air to *Cauliflowers in frames* both night and day after this date, unless very severe weather ensue. These will soon be wanted for planting out, and should undergo, by proper gradation, the preliminary hardening process. *W. F.*

TOWN GARDENING.

TREES and Shrubs may be safely removed any time this month, if the weather is open. The operation of planting requires care, for on it depends future success in towns. In the first place the ground should be dug about 2 feet deep, and holes should be opened sufficiently large to take 6 inches of fresh mould all round the roots. The plants should be removed with as much soil about their roots as possible. The next thing is to place the tree in the hole, in such a manner that the roots may be about the same depth in the ground as they were before being taken up ; then fill up with fresh mould from the country, and see that it is well let in amongst the fibrous roots. After filling in the earth, tread it down firmly all round the tree, and then drive down by the side of each a strong stake, to prevent them from being disturbed by the wind. Occasionally water them as the summer advances. The following shrubs and trees will all do well in town if thus treated :—*Evergreen Shrubs:* Aucuba japonica, Alaternus, Box, Hollies, Rhododendrons, Hypericum, St. John's Wort (most of the hardy species do well under trees), and the Ligustrum latifolium, or broad-leaved Privet, which is one of the freest growing shrubs. The *Deciduous Shrubs* are—Althæa frutex, Bladder Senna, Daphne Mezereum, Gum Cistus, Guelder Rose, Ribes sanguineum, Lilacs (especially the Persian), and the Viburnum Lantana, or Wayfaring tree, a very showy shrub when in flower ; for covering walls and trellis work, Irish Ivy, Virginian Creeper, white Jasmine, Jasminum nudiflorum, and Periploca græca : the latter is a very fine climber for wirework. The following are *Standard Trees*, and should either be planted at the back of the shrubbery, or singly :—Ailantus glandulosa, the Common and Weeping Ash, Almonds—the Sweet and Bitter, Mountain Ash, Upright and Weeping Birch, Catalpa syringæfolia, Thorny Acacia, Double-blossomed Cherry, English and Wych Elms, Laburnums, Mulberry, the Balsam and Lombardy Poplars, Sycamore, Common and Silver Maples, most of the Cratægus or Thorns, and the Oriental Plane—this tree is quite at home in town, growing luxuriantly in the most confined places. I may here remark, from the experience which I have had of planting trees in town, that to amputate the limbs of a tree, at the time of planting, is extremely prejudicial to their well-doing, because it exposes every orifice to the drying influence of the smoky atmosphere, and they not only break feebly, but many die in consequence of the operation. I would recommend that limb pruning, if necessary, be left till the following season, when there will be quicker action from the roots to start the tree into growth. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, FEBRUARY 9, 1870.

1870 Month and Day	At 9 A.M. Readings of Barometer reduced to 32° Fahr	Dry Ther.	Wet Ther.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air
February	Ins.	Deg.	Deg.	Deg.		Gr.
3 Thurs	29.56	43.6	43.1	42.9	68	3.2
4 Friday	29.50	43.7	42.8	40.6	88	2.9
5 Satur.	29.57	43.3	42.5	41.5	91	3.0
6 Sunday	29.85	42.2	40.5	38.3	87	2.7
7 Monday	29.61	41.5	40.3	38.2	89	2.7
8 Tues.	29.30	42.4	41.5	40.4	92	2.9
9 Wednes	29.64	39.5	37.0	29.5	71	1.9

1870 Month and Day	Temperature of the Air Highest	Lowest	Range in Day	Mean	Departure from Average of 35 Years	Wind Direction	Rain. Measured Movement	Rain. In Inches.
February	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
3 Thurs	48.0	42.7	6.3	44.6	+ 6.3		268	0.02
4 Friday	49.2	41.9	7.3	44.8	+ 6.8	S S W	257	0.2
5 Satur.	50.4	38.0	12.4	42.6	+ 4.8	S S W	165	0.06
6 Sunday	47.9	37.8	10.1	42.4	+ 4.5	S	174	0.07
7 Monday	48.7	40.0	8.7	43.1	+ 5.0	S	215	0.08
8 Tues.	45.4	32.0	13.4	38.3	+ 0.0	S E	260	0.0
9 Wednes	32.0	25.0	7.0	28.1	- 10.8	N E	310	0.0

February 3—Generally overcast. Thin rain fell during the morning.
" 4—The amount of cloud varied greatly throughout the day.
" 5 Overcast, and rain fell during the morning. Cloudless and fine at night.
" 6—Fine morning : cloudy at night with rain.
" 7—Overcast throughout ; thin rain fell during the day.
" 8—Cloudy : rain fell frequently.
" 9—Generally cloudy ; a little snow fell in the early morning.

The temperature went below 32 deg. about midnight of the 8th, and still continues below that point.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, FEBRUARY 5, 1870.

Names of Stations.	Temperature of the Air Highest	Lowest	Range of Temp.	Mean of all Highest	Mean of all Lowest	Mean Daily Range	Mean	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	53.8	27.0	26.8	50.2	32.0	18.2	40.4	0.03
Blackheath ..	50.4	27.0	23.4	49.0	36.1	12.8	42.0	0.25
Open Country (Bristol) ..	51.8	26.7	25.1	48.4	27.6	20.8	42.7	0.17
Birmingham ..	48.5	21.8	26.7	46.1	25.3	20.5	41.8	0.74
Wolverhampton ..	47.5	32.8	14.7	45.3	30.7	14.6	42.4	0.24
Leicester ..	50.5	25.0	25.5	48.8	27.8	21.1	40.5	0.59
Norwich ..	47.7	25.5	22.2	44.1	35.1	9.3	39.4	0.10
Nottingham ..	48.0	25.1	22.9	44.3	34.8	9.5	39.2	0.41
Sheffield ..	49.7	29.0	23.7	45.1	32.0	13.5	40.3	0.17
Liverpool ..	51.0	31.4	20.2	47.0	39.6	10.5	43.5	0.56
Manchester ..	51.0	29.0	22.0	47.0	35.3	12.3	41.2	0.34
Eccles (Salford)	51.7	28.1	23.4	45.7	37.5	10.2	42.2	0.28
Bradford ..	48.0	23.0	25.0	45.2	35.8	9.4	40.5	0.21
Leeds	48.0	25.0	23.0	44.3	35.1	9.2	39.6	0.09
Hull	47.0	23.0	24.0	43.0	33.1	9.9	37.8	0.11
Newcastle-on-Tyne ..	46.0	25.0	21.0	43.5	34.2	9.3	38.5	0.17
Edinburgh ..	46.7	25.0	21.7	..	..	..	39.8	0.10
Glasgow ..	47.3	31.5	15.8	..	..	..	41.0	0.19
Dublin	44.0	26.0	18.0	..	..	..	37.5	0.01
Aberdeen ..	44.2	28.1	16.1	..	..	..	39.5	0.38
Greenock ..	48.0	31.0	17.0	..	..	..	41.6	1.10
Perth	47.0	31.0	16.0	..	..	..	41.0	1.12

JAMES GLAISHER.

Notices to Correspondents.

ABIES DOUGLASII : *T. F.* asks if any of our correspondents who have had experience with this tree, will have the goodness to give their opinion of its merits as a timber tree.

CREAKY BOOTS : *J. W. B.* Here is an answer from the "American Agriculturist," which will just suit you. "Soak the soles of the boots thoroughly with warm water, and while wet apply a liberal coating of oil or grease, and dry it in. This will add considerably to the wear of the boots, and cure all but the most inveterate cases of creaking."

GRAPES : *D.* The Royal Muscadine of English catalogues (if true) is the same as the Chasselas de Fontainebleau alluded to by Mr. Robinson.

IRIS RETICULATA : *F. H.* There is some doubt as to the plant being rightly named. We are making inquiries.

LIQUID MANURE : *T. W. J.* To form a liquid manure of sulphate of ammonia for watering such plants as Hyacinths, dissolve a quarter of an ounce in a gallon of water.

MANGANESE PAINT : *T. W. M.* asks if any of our correspondents, who have used this for painting hot-water pipes, will inform him "how it is prepared ? or if it is sold ready for use, and if so, by whom ?"

MESEMBRYANTHEMUMS : *Ricinus.* The annual species sown now will of course flower this year, and if properly treated, but not the others. Some of the annuals, as M. pyropæum and M. pomeridianum, are very pretty, the former especially so. They require to be raised in a warm pit, and hardened off to bear greenhouse treatment in summer. The Ice plant is an interesting species, on account of its crystalline leaves, though it is not showy.

MULCHING CONIFERS, &c. : *C. C.* First question No. ; second, dip them once or twice in tobacco-water.

NAMES OF PLANTS : *Fern, Dublin.* 1, 6, and 8, Doodia caudata ; 2, Adiantum asimile ; 3 and 4, Adiantum

Capillus-Veneris ; 5, Adiantum formosum ; 7, Lastrea Filix-mas ; 9, Goniophlebium appendiculatum ; 11, Adiantum cuneatum ; 12, Diplazium decussatum.—*F. H.* Acrostichum aleicorne.—*J. H.* 1, Lycopodium clavatum ; 2, Lycopodium Selago ; 3, a Sedum, not recognisable.—*New Sub.* 1, Cyrtomium falcatum ; 2, Pteris cretica albo-lineata ; 3, Asplenium flaccidum var.

New Roses : *W. B. Smale.* The only complete list we know of is that published a month or two since in the "Florist."

Plums on Blackthorn : *W. S.* asks for replies to the following questions :—How far does the Blackthorn dwarf the Plum ? What sorts of Plums succeed best on Blackthorn ? and what sort of Blackthorn is most suitable for the purpose ?

Pot Vines : *D.* They are generally considered not worth forcing the second year. You may, however, obtain a few bunches from them.

Primulas : *Windebank & Kingsbury.* An excellent and varied assortment, of first-rate quality.

Propagating Roses : *A Subscriber.* You will have small chance of success with Rose cuttings planted in a hotbed this or next month, unless the cuttings are wood of this year's growth—that is, forced cuttings. You would probably not root one out of 60 cuttings of last year's wood ; of forced cuttings you might root 90 per cent.

Ricinus : *R.* For a greenhouse we recommend the varieties called R. sanguineus and R. africanus. These plants are, however, much more suitable for the open air during summer, and, in sheltered situations and good soil, grow into grand objects. Canna Bihorelli and Warscewiczii.

Erratum.—At p. 180, col. *a*, 38 lines from the top, for "nobilis," read "Cembra." In the tenth line of the last paragraph but one, for a "broad walk," read a "broad belt."

Communications Received :—A. D. X. Y. Z.—B.—D. P. H. - Holkham.—W. B. C.—A. P.—J. C. H.—H.—J. F. McE. - W. M.—W. B. S.—J. H.—J. M.—R. S.—A.—A. J. P.—G. S. —A. McK. next week).

Markets.

COVENT GARDEN.—February 12.

There has been a very short attendance here, owing to the change in the weather, which had a marked influence on some articles, and a continuance of which will materially affect the prices of all outdoor produce grown in the market gardens round London. The supplies from Cornwall and the Channel Islands and Continent continue regular, and rather on the increase.

Fruit.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	to 5 0	Lemons, per 100	5 0	to 10 0
Cobs, per lb.	1 0	to 1 6	Melons, each	1 6	to 3 0
Chestnuts, p. bush.	8 0	to 14 0	Oranges, per 100	6 0	to 12 0
Filberts, per lb.	0 6	to 0 9	Pears, per doz.	3 0	to 6 0
Grapes, per lb.	1 0	to 12 0	Pine-apples, per lb.	8 0	to 10 0

Vegetables.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p bund.	3 0	to 5 0	Leeks, per bunch	0 2	to 0 4
Artichokes, p doz.	1 0	to 3 0	Lettuces, p. score	1 0	to 2 0
Beet, per doz.	2 0	to 3 0	Mint, per bunch	1 0	to 1 6
Broccoli, per doz.	1 0	to 2 6	Mushrooms, p pott.	1 0	to 1 6
Brussels Sprouts, p. ½ sieve	1 0	to 2 0	Onions, per bunch	0 4	to 0 9
Cabbages, p. doz.	1 0	to 1 6	Parsley, per bunch	0 2	to 0 4
Carrots, p. bunch	0 4	to 0 8	Potatos, new, p. lb.	0 4	to 0 6
Cauliflowers, p. doz	1 6	to 3 0	Salsafy, per bundle	1 0	to 2 0
Celery, p. bund.	1 0	to 1 6	Scorzonera, do.	1 0	to 1 3
Cucumbers, each	1 6	to 3 0	Seakale, p. punnet	2 0	to 2 6
Endive, per doz.	1 6	to 2 0	Shallots, per lb.	0 8	to —
Garlic, per lb.	0 8	to 1 0	Spinach, p bushel	2 0	to 3 0
Herbs, per bunch	0 2	to 0 4	Radishes, per doz.	1 0	to 1 6
Horse Radish, p bun.	3 0	to 5 0	Turnips, per bunch	0 4	to 0 6

Potatos, York Regents, per ton, 75*l.* to 100*l.* ; Flukes, do., 75*l.* to 120*l.*

POTATOS.—Southwark, February 7.

During the past week the arrivals both coastwise and by rail are still in excess of the demand. The trade continues very dull, and prices declining. Quotations :—Yorkshire Regents, per ton, 70*l.* to 85*l.* ; Lincolnshire do., 60*l.* to 75*l.* ; Kent and Essex do., 60*l.* to 75*l.* ; Dunbar and East Lothian do., 70*l.* to 95*l.* ; Perth, Forfar, and Fifeshire do., 60*l.* to 70*l.* ; Ditto Rocks, 60*l.* to 65*l.* ; French and Belgian Whites, 50*l.* to 55*l.*

MOUNTAIN ASH, a most Ornamental and Profitable Tree for Underwood. It will grow upon soil too poor for Hazel and most other plants used for a similar purpose. We can supply good plants—1½ to 2 feet, at 16*s.* per 100 ; 2 to 3 feet, at 20*s.* per 100 ; 3 to 4½ feet, 22*s.* per 100 ; 4½ to 6½ feet, at 45 per 100, or 27*l.* 6*d.* per 1000 See CATALOGUE
JAMES SMITH, Darley Dale Nurseries, Matlock.

DOUBLE WHIN, GORSE or FURZE, ULEX EUROPEA FLORE PLENO.
Excellent plants, all extra, transplanted—package included :—
9 to 12 inches, 2*s.* per dozen, 12*s.* per 100
12 to 18 inches, 3*s.* per dozen, 13*s.* per 100.
15 to 20 inches, 3*s.* 6*d.* per dozen, 16*s.* per 100
18 to 24 inches, 5*s.* per dozen, 20*s.* per 100.
The above can be supplied in the 100, in pots 9 to 12 inches, 5*s.* per dozen, 22*s.* 6*d.* per 100 See CATALOGUE
JAMES SMITH, Darley Dale Nurseries, Matlock.

Spring Grove, Isleworth, W.

TO BE SOLD, a large and valuable stock of choice EVERGREENS and DECIDUOUS SHRUBS, including FORTUNE and COMMON LAURELS, HOLLIES, LILACS, LABURNUMS, SNOWBERRY, &c. &c.
Application to be made at the Office opposite the Spring Grove Station.

PARIS, 1867. SUTTONS' GRASS SEEDS for ALL SOILS. The PREMIER PRIX SILVER MEDAL for GARDEN SEEDS, GRASSES, and GRASS SEEDS, was Awarded to
SUTTON and SONS, Seedsmen to the Queen, Reading, Berks.

NUNEHAM PARK ONION SEED (true), 1*s.* per oz., 12*s.* 6*d.* per lb. ; WHITE SPANISH ditto, 1*s.* per 4 oz., 3*s.* 6*d.* per lb. post free. Remittances to accompany all orders.
RETAIL LIST of GARDEN SEEDS on application.
CHRISTMAS QUINCEY, Seed Grower and Seedsman, Peterborough.

To the Trade.

WINDSOR and LONG-POD BEANS, SANGSTER'S No 1, and BADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

POTATOS, for Planting.—Twenty Tons of Dalmahoys, do Myatt's Prolific, and a good selection of about 20 useful sorts, at the lowest remunerating prices. Send for Price Lists on application.
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough

To the Trade.

MYATT'S PROLIFIC POTATOS, 125*s.* per single ton ; 4 ton lots, 120*s.* per ton. DALMAHOYS, 90*s.* per single ton ; 4 ton lots, 80*s.* per ton. EARLY SHAWS, 120*s.* per single ton
Samples on application. Remittances to accompany all orders
CHRISTMAS QUINCEY, Seedsman, &c., Peterborough

CRAIG'S PROLIFIC EARLY CUCUMBER, kept true by isolation and continual selection, remains unrivalled for earliness, quality, beauty, and quantity ; equally good all the year round, and although "perpetual" attempts are being made it has never been "eclipsed." One packet by post for 13 stamps. To the Trade as usual. JAMES CRAIG, Hewortb, York.

CUCUMBER PLANTS, Wholesale and Retail.—Telegraph, Walkling's Prolific, Sion House Improved, Victory of Bath, Kirklees, Hall's Defiance, and Long Gun.
Likewise Choice TRICOLOR GERANIUMS and STRAWBERRY PLANTS.
G. WALKLING, Nurseryman, High Road, and College Park, Lewisham, S.E.

PARTNER (or Otherwise).—An active Young Man, with some practical experience, would be glad to join a Nursery-man's Market Gardener where his services and a small capital could be made available.—E. J., Post Office, Prestwich, near Manchester

WANTED, HEAD GARDENER.—For particulars apply to Mr. HIRD, Capernwray, near Burton, Westmoreland.

WANTED, a GARDENER, used to Growing Geraniums and Soft-wooded Plants ; also a MAN to Work in the GROUNDS and HOUSES.—Apply at the Orchard Nursery, Mortlake, Surrey, S.W.

WANTED, a GARDENER, to take the Charge of a Garden, Vinery, &c., on a Builder's premises, and who would not object to fill up his spare time in the Office. Must be a good Scholar.—Apply by letter to X. Y. Z., Mr. Doncaster, Silver Street, Lincoln

WANTED, a GARDENER, to Manage Kitchen and Flower Garden, Conservatory, Grapery, and Pleasure-ground of short Grass, all on a small scale, close to Bath ; also to Milk a Cow, and look after a Horse and Trap. If married, without family, his Wife may have suitable employment in House-work, or they may occupy a two-roomed Cottage in Garden—State full particulars, including wages, previous employment, and age, addressed to No. 10, Post Office, Bath

WANTED, an efficient WORKING GARDENER ; Wife as Laundress.—Rev. W. B. B., Wicken Rectory, Bishop Stortford.

WANTED, a Young Man, who can be well recommended ; experienced in Potting, Watering, and Tying Plants. Apply in one, bondwriting, to R. H. WRIGHTSONS, Chad Valley Nurseries, Birmingham

WANTED, HEAD PROPAGATOR.—A thoroughly experienced Hard-wooded Propagator. None but those of undeniable character and ability need apply.—X. Y. Z., *Gardeners' Chronicle* Office.

WANTED, a PROPAGATOR and SALESMAN at an old established Nursery.—He must be of unexceptionable character, and well versed in the Raising and Growing of Plants ; terms on application.—Apply M. M., *Gardeners' Chronicle* Office.

WANTED, a WORKING BAILIFF and WIFE, without encumbrance, as good Dairy-woman, to Farm well understand Poultry. Land 35 acres, principally Pasture.—Apply, stating wages, &c., and full particulars of former situations (written character not accepted), G. COOPER, Esq., Southwood, Hildenborough, Tonbridge.

WANTED, two GARDEN BOYS, in a first-class Garden, under an English Gardener Ages 16 or 17, strong and active, and of good appearance. Will have to attend as Servants when required—State terms (with furnished house, attendance, and fuel), to HENRY MERVYNE D'ARCY IRVINE, Castle Irvine, Irvinestown, Ireland.

WANTED a SHOPMAN. — Must have a thorough knowledge of the Seed Trade ; one acquainted with the Florist and Nursery Business preferred.—Apply, in own hand-writing, H. W., R. Amer, Esq., Law Bookseller, Lincoln's Inn Gate, Carey Street, W.C.

WANTED, in a Wholesale London Seed Warehouse, a young man as ASSISTANT SHOPMAN.—Apply, in own hand-writing, stating age, salary required, and experience, to ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

WANT PLACES.—Letters to be Post Paid.

To Gardeners and Bailiffs (Head, Foremen, or Under)

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send their NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

MR. WM. PAUL begs to announce that he has made arrangements that will be retained in future for Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, and GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. Particulars as to services required and wages given should be forwarded with application :—PAUL'S Nurseries, Waltham Cross, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N

COLLECTOR of NEW and RARE PLANTS.—Has had nearly five years' experience in different countries for an eminent London Firm, and has hitherto proved himself successful in all his expeditions —JOHN TUCKER, Nurseries, Farningdon, Berks.

GARDENER (Head), age 38, small incumbrance.—G. G. SELL, six years' Head Gardener at Newnham House, Wallingford, offers his services to any Gentleman or Lady in want of a good Gardener and a thorough good Grape Grower ; has also had many years experience in Ornamental, Forest, and Woodland Planting. Leaving entirely on his own wish.—Address as above.

GARDENER (Head), middle-aged, single.—G. R. RICHARDS being desirous of an engagement as Head Gardener, begs to inform Noblemen and Gentlemen that, from his long experience in the Cultivation of Vines, Stove and Greenhouse Plants (Orchids included), Cucumbers, Melons, Flower and Kitchen Garden, &c., he can have first-class testimonials—All particulars on application to G. H. R., Newton Nurseries, Chester.

GARDENER (Head).—Understands his profession in all its branches. Can be well recommended.—G. R., Post Office, Bentley, Farnham, Surrey.

GARDENER (Head).—Age 30, single ; has a thorough practical knowledge of the profession in all its branches. Good character.—A. B., Hookfield Grove, Epsom, Surrey.

GARDENER (Head).—Age 30, married ; thoroughly practical in all branches of the profession. Good character.—Y. Z., Mr. W. Barron, Elvaston Nurseries, Borrowash, near Derby.

GARDENER (Head), single. – A Gentleman is desirous of recommending his Gardener, a Man of great knowledge in his profession, and capable of taking Charge of Gentleman's SINGLE, WM. WOOD and SON'S Nurseries, Maresfield, Uckfield, Sussex

GARDENER (Head).—Age 27, married ; thoroughly understands the profession in all its branches, also well up in Forcing, and can be well recommended.—T. M., Oatlands Park, Weybridge, Surrey.

GARDENER (Head).—Age 35, married, two children ; practically acquainted with Pines, Vines, Melons, and Cucumbers, Stove and Greenhouse Plants, Flower and Kitchen Gardening.—H. NORRIS, Wandsworth Lodge, Upper Tooting.

GARDENER (Head).—Age 29, married, no incumbrance ; thorough knowledge of Early and Late Forcing, Stove and Greenhouse Plants, good Flower and Kitchen Gardening.—E. M., Green, Buckland Gardens, Cricklewood, Brecknock.

GARDENER (Head).—Age 28, married ; thorough knowledge of Stove and Greenhouse, Early and Late Forcing, Flower and Kitchen Gardening, and Grounds. Leaving on own account.—HEAD GARDENER, Watford House, Exeter.

GARDENER (Head).—Age 33, married, no incumbrance ; thoroughly understands his profession in all its branches. Capable of taking a first-class place. Testimonials all that can be required.—A. GOODWIN, Barvins Park, Northaw, Herts.

GARDENER (Head).—Married ; thoroughly practical in every department. A good Grape Grower, and Flower and Kitchen Gardener ; well up in the general Work of an Estate. Unexceptionable character.—J. D., Taplow, Maidenhead

GARDENER (Head).—Middle-aged ; with plenty of experience in every department, and a good will to use it in the interest of his employer. Good character.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey

GARDENER (Head). Age 36, married, small incumbrance ; Winner of over 200 Prizes (42 within the last two years), for Pines, Grapes, Orchids, Stove and Greenhouse Plants, &c. Good character from late and previous employers —A. J. ASHMAN Selly Oak, Birmingham.

GARDENER (Head).—Age 35, married, one child ; has a thorough practical knowledge of Gardening in all its branches, including Peach-houses, Vines, Pines, Stove and Greenhouse, and Land and Stock. A good family character.—G. A., 12, Rolland Grove, Upper Sydenham, Kent, S.E.

GARDENER (Head), age 32, married, one child.—A Gentleman honestly recommends a Man practical in all branches of Gardening ; first-class Grape and Rose Grower, and can handle Meadow Land. First-rate highest character.—A. B., Tadhunter, High Street, Dartford, Kent.

GARDENER (Head). Age 33, married, no incumbrance ; is at liberty to treat with any Nobleman or Gentleman requiring a thoroughly practical man ; is well acquainted with all branches of the profession. Unexceptionable character from present employer.—J. HORNBY, J. Pulleine, Esq., Clifton Castle, Bedale, Yorkshire.

GARDENER (Head), or GARDENER and FORESTER.—Mr. R. T. Veitch, Exeter, can confidently recommend to the above to any Nobleman or Gentleman desirous to engage a proficient Gardener. A first-class practical Man, thoroughly up in the profession. Twenty years experience in extensive places —R. T. Veitch, Nurseryman, &c., Exeter.

GARDENER (Head), or GARDENER and BAILIFF.—Age 35, no encumbrance ; well understands his profession, also Land, Stock, and Poultry. Wife a first-class Laundress, or Dairy.—A. B., No. 4, Dagmar Road, West Green, Tottenham.

GARDENER (Head), or GARDENER and BAILIFF.—Age 37, married ; thoroughly understands the profession in all its branches, also Management of Woods. Many years experience. Satisfactory reasons for leaving present situation Total Abstainer. Three years good character.—R. INCH, The Cottage, Garratt's Hall, Banstead, Surrey, Surbiton.

GARDENER (Head), or GARDENER and BAILIFF.—Middle-aged, married, no incumbrance ; is well experienced in both capacities ; is a thoroughly practical Gardener and Farmer, an excellent Florist, well up in Forcing, and thoroughly understands the routine of a Gentleman's Establishment. Can be highly recommended. Satisfactory reasons given for leaving present situation.—I. W. 7, Bond Street, Sandfields, Swansea.

GARNENER (Head, or Single-handed).—Age 26, single ; understands Gardening in all its branches. One year and nine months character from last employer.—W. P., East Peckham, Tonbridge, Kent

GARDENER (Single-handed, or otherwise).—Age 21, single ; six years' practical experience in two last places. Good character.—G. R., Post Office, Upway, Dorset.

GARDENER (Single or Second Hand).—Age 23 ; good experience and good references.—H. K., Gothic Cottages, Upper Edmonton, N.

GARDENER (Second), or FOREMAN.—Age 23, single ; has a practical knowledge of Pines, Melons, Cucumbers, with Vines, Orchids, and the Propagation of Hard and Soft-wooded Plants, &c. Three years' character.—G. MARSHALL, High Street, Tenterden

To Market Gardeners and Others.

FOREMAN, or HEAD KITCHEN GARDENER.—Age 36 ; thoroughly understands Fruit and Vegetable Growing, also all kinds of Forcing Good character —J. B., Post Office, New Brentford

FOREMAN, in a Large and First-class Garden.—Age 28 ; 12 years' practical experience in every branch of the profession Highly recommended.—G., Mr. Smith, White Horse Hotel, Park Street, Walsall, Staffordshire.

To the Nursery Trade.

FOREMAN and GENERAL MANAGER, in a Provincial Nursery.—Age 39, married, one child ; highly respectable Well versed in each branch of the profession —NURSERYMAN, Messrs. F. & A. Dickson & Sons, Seed Merchants, 106, Eastgate Street, Chester.

PROPAGATOR and GROWER.—Age 24 ; understands Stove, Greenhouse, and Soft-wooded Plants, &c. Good reference. —G. FIELD, Grove House, Sands' End, Fulham.

LAND AGENT.—A Person of great experience desires a re-engagement -H. A. H., *Gardeners' Chronicle* Office, W.C.

BAILIFF.—Age 47, married ; active, of energetic habits, respectably connected. Thoroughly practical in Modern Farming, Steam Cultivation, Draining ; good Judge in Stock, Buying, Selling, and a good Accountant ; Management of Woods, Repairs, &c.—F. B., Post Office, Furneux Pelham, Buntingford, Herts.

Hothouses, Building, or Repairing.

A THOROUGH PRACTICAL WORKMAN.—Fitter of any description of Hot-water Work, good Painter and Glazier, also understands all kinds of Horticultural Building, Rockwork, Laying Ornamental Tiles, and Brickwork if required. Terms moderate.—E., 33, Kirby Street, Hatton Garden, London, E.C

SHOPMAN.—Age 26, Scotch ; ten years' experience in all branches of the Seed Trade, with part knowledge of Plants. No objection to go abroad Good reference —F. A. B., Post Office, Newcastle-on-Tyne

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AGRICULTURAL EDUCATION.

The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

THE SECOND ANNUAL EXHIBITION and SALE of SHORTHORNS will be held in BINGLEY HALL BIRMINGHAM, on THURSDAY, March 3.

The ENTRIES CLOSE on SATURDAY, February 12.

JOHN B. LYTHALL, Secretary.

Offices of the Society, 39, New Street, Birmingham.

ROYAL AGRICULTURAL COLLEGE, CIRENCESTER.—The PROFESSORSHIP of NATURAL HISTORY is VACANT, by the appointment of William T. Thiselton Dyer, B.A., late Junior Student of Christ Church, Oxon, to the Chair of Botany in the College of Science, Dublin. The Council will be happy to receive APPLICATIONS from Gentlemen desirous of succeeding Mr. Dyer. Letters may be addressed to the Principal.

RIBES ATROSANGUINEA, dark flowering Currant. Fine plants, 2½ to 3½ feet, 3s. per dozen; 14s. per 100; double flowering, 2½ to 3½ feet, 3s. per dozen; 15s. per 100

BROOM, White Portugal, 1½ to 2 feet, 2s. 6d. per dozen; 12s. per 100; 3 to 4 feet, 3s. per dozen; 18s. per 100

BROOM, Common Yellow, 2 to 3 feet, 3s. per dozen; 12s. per 100.

See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited), CORN, SEED, MANURE, AND OILCAKE MERCHANTS.

Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.

Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for Essential Oil of Linseed Cake.

NOTICE to PURCHASERS of FARM SEEDS.—Unfavourable weather for the Turnip and other Roots standing for Seed having set in since Messrs. SUTTONS' LIST of Reduced Prices was sent to press, Messrs. SUTTON respectfully advise their friends to observe the NOTICE in the last page of the NEW FARM LIST, limiting the time for which the present low prices are binding.

This Notice is offered to prevent disappointment or misunderstanding in respect of Orders which may be sent when the season is more advanced.

The CATALOGUE will be ready on or about the 14th instant.

Royal Berkshire Seed Establishment, Reading.—Feb. 10.

Improvement of Grass Lands, at from 4s. 6d. to 9s. per acre.

SUTTONS' RENOVATING MIXTURE should now be sown, 6 to 12 lb. per acre.

SUTTON AND SONS, Seed Growers, Reading.

Mangel Wurzel Seed.

H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED LONG TOP YELLOW GLOBE, The Stocks are very fine, and all of 1869 growth. Prices very low.

Seed-Growing Establishment, Wisbech.

Choice Farm Seeds.

BOLTON AND CO. offer their choice stock of ORANGE GLOBE MANGEL WURZEL, price 4s. per cwt. Fine stocks of LONG YELLOW MANGEL, LONG TOP YELLOW and INTERMEDIATE YELLOW; also their extra selected stock of PURPLE-TOP SWEDE TURNIP, the distinguishing features of which are its handsome form and great weight producing qualities; price 4s. per bushel

BOLTON AND CO., Seed Merchants, Wood Green, London, N.

TO the SEED TRADE.

HAMILTON'S INVINCIBLE CUCUMBER.
CURTIS'S BLACK SPINE CUCUMBER.
OSBORNE'S WINTER WHITE PRICKLY BROCCOLI.
DOUBLE CRESS.
IMPERIAL LONG YELLOW MANGEL (superior stock).

All new of 1869, and true, of own growth, offered cheap.

STEPHEN BROWN, Seedsman, Weston-super-Mare, Somerset.

Seed Counties, Suffolk and Essex.

DAVID GOLD MCKAY, SEED GROWER, Sudbury, Suffolk, begs to offer complete Collections of VEGETABLE SEEDS, carriage free.

No. 1 COLLECTION ... £1 | No. 2 COLLECTION ... £2
No. 3 COLLECTION ... £1

Alterations made to suit purchasers.

Any lady or gentleman ordering the above may depend on having really "Pure Home-grown Seeds." CATALOGUES free on application.

The "Old" Established Seed Warehouse, Sudbury, Suffolk.

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.

Exotic Nursery, Tooting, Surrey, S.W.

PEAS.—Maclean's fine Wrinkled Marrows,
Premier, | Early Emerald,
Little Gem, | Advancer.

For full description see CHARLES TURNER'S DESCRIPTIVE CATALOGUE, now ready.

The Royal Nurseries, Slough.

The Forwardest Pea known is

"SUTTONS' RINGLEADER."

Price 2s. per quart; cheaper in large quantities

"The Earliest of All was

"RINGLEADER." Vide Royal Horticultural Society's report on Early Peas.—For description, illustration, and testimonials of this Pea, see p. 138 of this Paper (Jan. 29).

SUTTON AND SONS, Seedsmen to the Queen, Reading.

To Market Gardeners and Others.

SUTTON and SONS having grown largely of the following excellent PEAS, can supply them, very true to name, at low prices for large quantities:—

Suttons' Ringleader — the forwardest known	Champion of England.
Dickson's Favourite.	Veitch's Perfection
Princess Royal.	Hair's Dwarf Mammoth.
Blue Prussian.	Yorkshire Hero
	Prizetaker Green Marrow.

For lowest prices, apply, stating quantities required, to

SUTTON AND SONS, Seed Growers, Reading

Notice to the Trade.

LAXTON'S NEW PEAS, ALPHA and SUPREME.

HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties; also the HUNDREDFOLD or COOK'S FAVORITE, and the entire stock of MCMILLAN'S QUEEN of the MARROW. They have also grown largely of LAXTON'S PROLIFIC Descriptions of all in CATALOGUE, which will be forwarded on application. They have present a good supply of the true RED and WHITE ITALIAN TRIPOLI ONION, and the GIANT ROCCA, all of which are scarce this season.

HURST AND SON, 6, Leadenhall Street, E.C.

To Purchasers of Farm Seeds.

CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices.

JAMES CARTER AND CO., the Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

SUTTONS' HOME GROWN FARM SEEDS, carriage free. Present prices will be found on p. 208 of this week's Paper. Special quotations given for large quantities

SUTTONS' FARMERS' BOOK for 1870 (illustrated), containing much useful information on Agricultural Crops, may be had gratis and post free on application.

SUTTON and SONS, Seedsmen to the Queen, Reading, Berks

For Seed.

HALLETT'S

TRADE PEDIGREE MARK.

CHEVALIER BARLEY, which was awarded the First Prize three years in succession (1867, 1868, 1869), at the Birmingham and Midland Counties Show. Yielded, at Brighton, in 1869, 10 quarters per acre, weighing 57 lb. per bushel. Also PEDIGREE BLACK TARTARIAN and PEDIGREE WHITE CANADIAN OATS.

For price and full particulars of above, and of Pedigree Seed Wheats, apply to the Originator of the System, Captain HALLETT, F.L.S., Brighton.

W. M. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

FOR IMMEDIATE DISPOSAL, a FLORIST'S BUSINESS, in good working condition, containing 20,000 feet of Glass, more or less, all erected within the last ten years.—Apply on the Premises, G. WELLS, Grove Nursery, Coleman Street, Camberwell, S.

SALES BY AUCTION.

Tottenham, N.

PEREMPTORY NOTICE TO QUIT, IN CONSEQUENCE OF THE GREAT EASTERN RAILWAY COMPANY'S EXTENSION OF LINE.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, Brunswick Nursery, Lower Tottenham (five minutes' walk from Park Station on the Great Eastern Railway), on TUESDAY, February 15, and two following days, at 12 o'Clock precisely each day, without reserve, by order of Mr. John Maller, who is compelled to surrender possession of the Land by Lady Day next, the whole of the valuable NURSERY STOCK, comprising thousands of choice Evergreen and Coniferous Shrubs, including 15,000 Chinese Arbor-vitæ, 7000 Junipers, 5000 bushy Aucubas, 5000 Variegated Hollies, 1 to 6 feet; 6000 Thujopsis borealis, 4000 Cupressus Lawsoniana, 6000 Green Hollies, 1 to 6 feet; 5000 Thuja aurea, 1 to 4 feet; 4000 Rhododendrons, 4000 handsome Cedrus Deodara, 1 to 9 feet; 6000 Standard and Dwarf Roses of the best kinds; 2000 clean-grown Fruit Trees, Vines in pots, Currants, sorts; Ornamental and Forest Trees, Hardy Climbers, Herbaceous Plants, together with 5000 choice Greenhouse Plants, consisting of choice Double Camellias, Azaleas, Epacrisis, Acacia, Ericas in flower, Pelargoniums, a matchless stock of Bouvardia longiflora alba; also 5000 Erica hyemalis in thumbs, thriving young stuff, &c.

On view three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers, Leytonstone, E.

Annual Sale of very Handsome English-grown Camellias.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at 28 and 39, Gracechurch Street, E.C., on FRIDAY, February 18, at half-past 12 o'Clock precisely, about 200 choice Double CAMELLIAS, beautifully set with Bloom Buds; AZALEA INDICA, 300 Standard and Dwarf ROSES of the best varieties, Selected FUCHSIAS, HARDY FERNERIES, and PLANTS, &c.

On view the morning of Sale. Catalogues had at the Rooms, as above, and of the Auctioneers, Leytonstone, N.E.

Plashet Park, E.

CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being required for other purposes.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. John Frost to SELL by AUCTION, without reserve, on the Premises, Plashet Park Nursery, Green Street, near Stratford, Essex, on SATURDAY, February 19, at 12 o'Clock precisely, the whole of the Valuable NURSERY STOCK, including 400 bushy Aucubas, 300 Chinese Arbor-vitæ, Common and Portugal Laurels, Evergreens, Hollies, &c.; handsome Standard and Dwarf Roses, of the best varieties; clean grown Fruit Trees, some double and round Gooseberries, Currants, &c.

On view the day prior to the Sale. Catalogues had on the premises, of Mr J. FROST; and of the Auctioneers and Valuers, Leytonstone, E.

Edmonton, N.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being immediately required for the Great Eastern Railway Extension.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs C. Woolven & Son to SELL by AUCTION, without reserve, on the Premises, the Long Hedge Nursery, Edmonton, Middlesex, N., on THURSDAY, February 24, and two following days, at 12 o'Clock precisely each day, the whole of the valuable NURSERY STOCK, including 20,000 Chinese Arbor-vitæ, 1 to 6 feet; 5000 Cupressus Lawsoniana, 4000 Upright Cypress, 1500 fine Irish and English Yews, 1000 Retinospora ericoides, 1 to 8 feet; 1000 Araucaria imbricata, 2000 Cupressus pyramidalis, 1500 Thuja Lobbii, 3000 common Laurels, 500 Green Hollies and Portugal Laurels, 1000 Sweet Bays, 3500 Ligustrum ovalifolium, 8000 Pines, sorts; 1200 Euonymus, 1 to 3 feet; Wellingtonias, Thujopsis, and thousands of other useful and effective Shrubs; also 40,000 clean-grown Fruit Trees, particularly worthy the attention of Market Gardeners and others engaged in extensive planting; likewise 7000 Standard Roses and 10,000 Standard Briers, and 2000 Manetti Stocks in dormant bud; together with 4000 Lombardy Poplars, 1200 Hedge-cut Elders, and a large quantity of other Ornamental Trees; 30,000 strong Quick, thousands of Perpetual Roses in pots, Wistarias, Ivies, and other Hardy Climbers, &c.

On view three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B. All the Greenhouse and Stove Plants will be sold at a later date, of which due notice will be given.

Turnham Green, W.

MESSRS. PROTHEROE AND MORRIS have received instructions from Messrs S Glendinning & Sons to SELL by AUCTION, without reserve, on the Premises, The Chiswick Nursery, Turnham Green, Middlesex, on MONDAY, February 28, and following day, at 12 o'Clock precisely each day, a portion of the valuable NURSERY STOCK, comprising an extensive and choice Assortment of EVERGREEN and CONIFERÆ SHRUBS, FRUIT TREES, &c.

Further particulars will appear in future Advertisements.

To Gentlemen, Florists, and Gardeners.

BEDDINGTON CORNER, MITCHAM.

MR. W. FULLER will SELL by AUCTION, as above, on TUESDAY and WEDNESDAY, February 22 and 23, at 11 for 12 o'Clock each day, the valuable BUILDER'S STOCK, PLANT, and MACHINERY; a Span-roofed GREENHOUSE, 40 ft. by 15 ft.; a Lean-to Greenhouse, 25 ft. by 10 ft. 8 in.; a Ridge and Furrow Greenhouse, 24 ft. by 16 ft.; and CUCUMBER-HOUSE, 16 ft. by 10 ft., each fitted with Hot-water Apparatus; and Four Pit Frames with Lights, measuring respectively 20 ft. by 8 ft. 6 in., 14 ft. 8 in. by 7 ft. 6 in., 25 ft. by 6 ft., and 9 ft. by 5 ft.. Also 2000 Specimen FRUIT TREES.

Catalogues of the Auctioneer, Croydon

Seeds.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 32, King Street, Covent Garden, W.C., on THURSDAY, February 17, at half-past 12 o'Clock precisely, CALIFORNIAN TREE SEEDS, just arrived.

On view the morning of Sale, and Catalogues had.

Orchids, Seeds, and Lilies.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, February 17, at half-past 12 o'Clock precisely, an importation of ORCHIDS from New Grenada, consisting of Odontoglossums, Oncidium Weltoni and Krameri, &c., in very fine condition; 5000 LILIUM AURATUM from Japan; 300 lb. of CEDRUS DEODARA SEED, and various other Coniferous Seeds.

On view the morning of Sale, and Catalogues had.

Eastdown Park, Lewisham.

IMPORTANT SALE of NURSERY STOCK.

MR. EPPS is instructed to SELL, by AUCTION on WEDNESDAY and THURSDAY, February 16 and 17, at 12 o'Clock precisely, on the Grounds of Mr. Saville, Eastdown Park, Lewisham, 10,000 very choice and handsome TREES, SHRUBS, and PLANTS, consisting of handsome specimens of Coniferæ, Thuja Lobbii, gigantea; Thujopsis borealis, Cupressus Lawsoniana, very handsome large Thuja aurea, Araucaria imbricata, Irish Yew; Pinus Cembra, austriaca, excelsa; Picea nobilis, Arbor-vitæ, of sorts; Common Yew, Common and Portugal Laurels, Aucubas, Berberis, fancy and gold blotched; Hollies, Rhododendrons; Deciduous Shrubs, Ornamental Trees, 10 to 12 feet; Poplars, Chestnuts, Birch, Lime, Mountain Ash, Maple, Sycamore, &c.; Irish Yews in pots, large quantity of well-grown FRUIT TREES of the leading kinds, Standards, Pyramids, Dwarf and Dwarf-trained, consisting of Apples, Cherries, Plums, Pear, Peaches, Nectarines, and Filberts, Gooseberries, Currants, &c.; 15 large trained Plums in a bearing state, of the best sorts, warranted to remove A large quantity of Standard and Dwarf ROSES of the newest and best kinds, true to name; also a large quantity of Herbaceous Plants, Picotees, Carnations, Pansies, &c. Several One and Two-light Garden Frames, nearly new; an excellent Nursery or Builder's Cart, new.

Gentlemen and others will find this an excellent opportunity of purchasing some of the choicest things that can be had, all of which are well-rooted, compact, and handsome.

May be viewed four days prior to the Sale. Catalogues to be had on the Premises; and at the Office of Mr EPPS, Practical and Consulting Landscape Gardener, Horticultural Valuer, Surveyor, and Auctioneer, 9, Blessington Villas, Lee Road, Lewisham, S.E.

Burghley Park, Stamford.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has the honour to announce that he is favoured with instructions to offer for SALE by AUCTION, without reserve, on THURSDAY, March 17 next, at the Dairy Farm, Burghley Park, about THIRTY HEAD of SHORTHORNS, the property of the Most Hon. the Marquis of Exeter, including some Young Cows in Calf, Heifers in Calf, Cows and Heifers. The Sires used are principally of Kirklevington descent.

Catalogues, with pedigrees, are now in preparation, and will be announced, with further particulars, in future Advertisements.

London: 14, Euston Square, February 10, 1870.

The Agricultural Gazette.

SATURDAY, FEBRUARY 12, 1870.

WHAT is the single thing in the habits and circumstances of AGRICULTURAL LABOURERS to which more than any other—to which, indeed, more than *every* other put together—one must attribute their misfortunes? We presume there is not an employer, not even a mere neighbour, hardly, indeed, a fellow labourer, but must say that it is the constant and excessive use of intoxicating drinks which is the bane of their life, the ruin of their serviceableness, the blight of their families and homes. There is no other class of society where the extremes of character are at once so wide apart, and seen so close together. One might even say in hardly any are the extremes of outward condition separated by a greater interval than is often seen in adjoining cottages among country labourers. The very heights of unselfish excellence are occupied by cottagers, and so are the utmost depths of miserable worthlessness. The decent comforts of a well-ordered household are to be seen in almost every village close to the rags and misery of reckless poverty. And it is to the destruction of time, and means, and strength, and self-respect, which is due to drunkenness (often, indeed, merely to habitual drinking), that the difference is generally due.

A very striking report to the Council of the Society of Arts has been lately published, in which Mr. PAYNTER ALLEN contrasts the condition of Ealing and Brentford, near London, and attributes, apparently with justice, the unfortunate plight of the latter to the excessive drinking habits of the labouring population there. The evil probably exists in its worst forms in the lower suburbs of our great towns, but in every country village, and almost on every farm, the contrast is equally obvious, and its cause is constantly at hand.

The discouragement of a vice so widespread and so miserable in its results would tend, we believe, more than anything that can be named to the progress of agriculture, to the advantage of all interested in farming, and even to the fertility and productiveness of the land. Even, then, if on this lower ground alone, we cannot too heartily applaud the step which has been lately taken in connection with this subject by a number of Kentish clergymen. They have circulated a memorial in which a county association is suggested, having for its object the counteraction of the temptations and facilities by which drinking habits are formed. They justly say that these habits largely prevail; that among the causes of these habits is the frequency of the

houses which are licensed for the sale of drink ; * and that drinking habits tend deplorably to impoverishment, disease, curtailment of industry, crime, and irreligion.

They do not suppose that there is any specific remedy which will banish a disease of such deep root and extensive ramifications, but they think that if earnest-minded men would act together, they might at least curtail its sources and weaken its power.

They suggest, therefore, the formation of an Association, having for its object the counteraction of the temptations and facilities by which drinking habits are formed.

The operations of such an Association would be determined by its members. And they do not anticipate them.

The following, however, will occur to many as offering themselves for adoption :—

To watch against, and, where possible, to restrain the further multiplication of drinking houses in localities where there is, obviously, no demand for them.

To stimulate a more efficient control by the police of existing houses in which the law is evaded.

To take measures—for the establishment of sound benefit societies unconnected with public-houses—for the promotion of village flower and industrial shows—for the extension of the allotment garden system—and for the assistance of parochial efforts of various kinds to win people to sobriety, and rational amusements.

This is the substance of the address, to which we gladly give whatever publicity we can. The proposed association ought to exist in every county. It ought to include landlords, farmers, and labourers as well as clergymen. It ought especially to consider, with regard to their influence on this subject, the existing kinds of wage and methods of payment for agricultural labour. No one can make a more influential contribution to the welfare of the agricultural labourer in this respect than the agricultural employer.

* In the 20 parishes in which they minister, with a population of 19,463, the number of public-houses and beer-houses is 152 ; giving one drinking-house for every 25½ dwelling-houses

MR. CADLE, of Gloucester, read a capital paper on the CONVERSION OF GRASS LANDS to arable cultivation before the London Farmers' Club last Monday. We are not able to give the report in full, but our readers will see from the extracts in another page that the subject was well handled by a practical and trustworthy man. The proportion of grass-land which a farm, according to Mr. CADLE, ought to have, in order to the best management of it and of its live stock, is one acre to every three under the plough. It is only, or almost only, when the quantity exceeds this proportion that he would entertain the proposal to break it up. And there are large areas wholly Grass of certain specified kinds which he would retain in Grass, whether any arable land existed on the farm or not. It is a curious confirmation of Mr. CADLE'S judgment, that on farms, described elsewhere, in such admirable hands as those of Mr. TORR, of Riby, where we may suppose the will of the tenant to have reigned almost undisputed, the proportion of pasture is very nearly that which Mr. CADLE recommends. When the proportion in an essentially arable district is much larger than this, Mr. CADLE would recommend all the lighter soils adapted for sheep husbandry to be broken up, in order to the reduction of the Grass to the specified proportion. And he very ably urges on the landlord the considerations which are most likely to overcome his prejudices against such a course. He calls the landlord's attention, for example, to the great improvements made in arable land farming within the last 30 years, as compared with what has been observed in pasture. There are numbers of arable farmers who spend a sum more than equal to their rent in artificial foods and manures, so there is little fear of such men running their land out. He compares a large district of arable farms with one of pasture, and is struck with the marked difference of the tenantry : the comparison in every case being in favour of the arable farmer. He quotes a practical farmer writing in the *Mark Lane Express* of June 24, 1867, who, after showing the value of the Turnip crop, says :—

"If then the Turnip, or rather the root crop is so valuable, why are farmers to be so closely restricted to certain courses or rotations of cropping? and why are such large breadths of moderate, not to say inferior grass-lands to remain under pasturage? If modern culture and modern applications of manures and feeding stuffs are worth anything beyond the old order of management—and no one disputes their worth—they would tell surprisingly upon the conversion of such lands into arable culture. They would thus be made to produce immense crops of roots, artificial grasses, and corn. Vast breadths of these soils would yield capital crops : first, of Potatos, then of Wheat, next Turnips or Mangels, Swedes, Carrots, and Cabbages for stock ; again Potatos, again Wheat, and then Clover or seeds, followed by a corn crop, to be further supplemented by roots again, and so on continuously. This little island of ours ought to be the standing ground for fatting stock enough to feed the nation, and would grow more roots, more Grasses, and more animal food. Scotland grows splendid root crops. Who can tell to what amount our home supplies of animal food might be made to extend?"

Mr. CADLE'S paper was listened to throughout with the greatest attention by a large agricultural audience, and an interesting discussion ensued upon the subject of it. Mr. C. S. READ, M.P., took his standpoint on the personal interest of the tenant-farmer. Grass-land when broken up must pay the farmer better than it did as Grass, otherwise its breaking up cannot be justified. Examples were referred to, where farmers had broken up grass-lands with promising hopes, and yet were losers in the end, although the land was well drained, subsoiled, and manured. On the other hand, "ugly beggarly cow pasture" was quoted, which, although far from promising in appearance, nevertheless yielded plenty of fine rich butter. Mr. READ also strongly recommended the improving of grass-land by sheep-folding.—Mr. SMYTHIES, whose experience lies in the opposite quarter of the compass from Norfolk, in the warm moist climate and fine grazing lands of the West, also advocated very great caution in breaking up paying grass-land to aëration. He does not think grass-land can be overdrained, even if the drains be only one yard asunder. The better the land is drained the more available moisture it absorbs from the atmosphere and retains for the supply of the roots of the Grass ; whereas the stagnant water of imperfectly drained land is poison. He agreed with Mr. READ that manure is the true agent in improving grass-land, a plentiful supply soon restoring very poor worn-out grazings to their original fertility.—Mr. H. TRETHEWY put more stress upon climate than the previous speakers—contrasting the dry, cold, east winds of Norfolk with the moist warm winds of the West, so favourable to the growth of Grass. He reprobated any attempt to reverse the order of things which climate had thus established. He doubted the propriety of robbing arable land by sheep-folding on the Grass—a practice becoming too common in Bedfordshire and the Midland Counties. The most advisable course is to give both pasture and arable land fair play. He did not advise the breaking up of grass-land that was capable of improvement by a more generous system of manuring. He took exception to Mr. SMYTHIES on draining ; did not think wet grass-land required much draining so long as the Grass was rich ; but where water-plants make their appearance, then drain, not so close, however, as for arable land. Certain districts have Grasses peculiar to them, and if others are sown they will die out, and be supplanted by the natural sorts.

Mr. COUSSMAKER repeated an advice of caution relative to breaking up grass-land, an advice in which landlord and tenant are generally at one. Our live stock are the finest in the world, and they are the produce of our pastures. We don't want foreign stock, but we want to improve our pastures, so as to rear and fatten more stock for the shambles.—Mr. BRADSHAW, on laying down arable land to Grass, considers that a thin seeding of corn affords shelter from the sun during summer, and that the stubble affords shelter during winter. If without corn, he would sow Grass seeds in July, so as to get the Grass established before winter. He agreed with Mr. CADLE and Mr. TRETHEWY as to drainage, and the Grasses natural to the land. Bone-compost he considers the best top-dressing for grass-land, quoting the example of Cheshire on the subject.

Mr. NEALE seconded the maxim of C. S. READ, Esq., M.P., that profitableness to farmers is the proper test of the practice. He drew attention to losses sustained by those who had broken up their grass-land, in consequence of the cattle plague. He suggested that agricultural societies and farmers' clubs should give more encouragement to this branch of farming than they now do. Mr. NEALE criticised the paper and discussion, on the ground that sufficient prominence had not been given in either to the importance of dairy farming.

Mr. DRING took a corn-paying view of the subject, *i. e.*, recommending to break up grass-land only when Wheat is at a paying price The practical difficulty in breaking up Grass is the uncertainty that attends corn tillage.

Mr. CONGREVE considered the possibility of farming grass-land at a loss. He objected to the too common idea that grass-land requires less capital than arable land to farm successfully, mentioning examples in Leicestershire of £20 per acre being invested in stocking grass-land. He referred to the expense of dressing with bones in Cheshire 30 years ago, at the rate of 1 ton per acre, and noticed the injurious effect of bones on the milk of cows and on the cheese made from it.

Mr. HOWARD, M.P., summed up the discussion given to the subject by the several speakers from the different parts of the great grass-field of England. He also gave a *résumé* of his own experience, and concluded by showing Mr. NEALE that the Farmers' Club had given a greater prominence to dairy affairs than to almost any other agricultural subject.

—— NOTWITHSTANDING short supplies of English Wheat on Monday last at Mark Lane, sales could be effected only at a reduction of 2s. a quarter ; and the trade has been lifeless during the week.——In the Metropolitan Cattle Market on Thursday trade was firm at Monday's reduction of price.——The seed market partakes somewhat of the general depression in Mark Lane.

—— On Wednesday evening, in the House of Commons, Rord ROBERT MONTAGU asked the Vice-President of the Committee of Council whether the Government had determined that there shall be a foreign cattle market in the metropolis, and, if so, whether a site has been fixed upon. In reply, Mr. FORSTER explained that the Government have endeavoured fully to carry out the Act passed last session. By that Act the Corporation of London have power to make such market, and if it shall not be made by the end of next year, then the Corporation of London will lose certain advantages, and especially the market monopoly. The Government have been in constant communication on the subject with the City authorities, and have every reason to believe that the Corporation will undertake the duty imposed upon them.

—— At the Council meeting of the Central Chamber of Agriculture on Tuesday last, under the presidency of Colonel TOMLINE, M.P., the following resolutions, on the "Best Mode of Providing for the Future Maintenance of Turnpike Trusts and Highways," were introduced by Mr. JABEZ TURNOUR, of the Peterborough Chamber :—

"That the Council is of opinion that all Turnpike Trusts should be abolished simultaneously, and that the maintenance of all public roads should be settled on a permanent and equitable system."

"That, as the interests of the whole community have been promoted by the existence of the improved means of traffic, it will be unjust to charge the remaining debts upon rateable property only, and that these debts ought to be liquidated by the national Exchequer."

"That the Council considers indispensable either a revision of the rating system, so as to bring under contribution the general wealth of the districts through which the roads pass, or the alternative of part payment of the road expenditure out of the Imperial revenue."

After a lengthened discussion, Mr. KNATCHBULL-HUGESSEN, Under-Secretary of State for the Home Department, addressed the Council, not so much, he said, as a member of the Government, but as a landowner and agriculturist, who wished to learn and to take counsel rather than to declare a policy. He asked the forbearance of agriculturists if the Government, in the overwhelming pressure of business, did not find it possible to redeem literally the promises they had given of agricultural legislation. He declared himself personally in favour of a general road system, which, in its local management, should distinguish between highways and turnpike roads ; the former of which should depend for their maintenance on highway districts, while the latter, as being main arteries of communication, should be maintained by rates levied over a wider district. A large majority of the Highway Boards with which the Government had been in communication, had declared emphatically in favour of the Highway Act, with the working of which they expressed themselves as entirely satisfied. The fault of the Act was, that it was of a permissive character, permissive legislation being inconclusive and unsatisfactory. He would advise the Chamber to keep to what is practicable, and then an issue might be arrived at which would be gratifying to them.—Mr. CORRANCE, M.P., objected that the reports of the working of the Highway Act are procured from the secretaries of the Highway Boards, who of course are interested in giving a good account of themselves.—It was agreed that it would be better to wait to see the proposals of the Government before proceeding actively in the matter ; and, on the suggestion of Sir MASSEY LOPES, an amendment which Sir GEORGE JENKINSON had proposed to the original resolution and the resolutions themselves were withdrawn.

—— The annual Birmingham show and sale of Shorthorn cattle will take place this year at Bingley Hall

on Thursday, March 3, being a month earlier than the show was held last year. Prizes of £50, £15, and £5 are offered for bulls above 12 and under 20 months old, and £20, £10, and £5 for bull-calves between 6 and 12 months old. There are also two prizes of £10 each, one for the best male and the other for the best female, in two other classes. Since the establishment of the Royal Agricultural Society, probably no exhibition has been started which is calculated to have a more important influence on the herds of the Midland Counties, which cannot fail to be greatly improved by the introduction of the class of well-bred sires such as intending purchasers are enabled to select at Bingley Hall, and by whom the advantage of these exhibitions cannot be too highly esteemed. As an instance, we have known one tenant-farmer travel 2000 miles and spend £70 before meeting with a sire to his mind: ultimately he secured one at 80 gs., but of course the expenses should be added to the cost, thus bringing it over £150. The only restrictions with reference to the animals sent for exhibition are that they shall have at least four crosses of pure blood, and must be for absolute *bonâ fide* sale, if any price is offered exceeding the reserve of 20 gs. Exhibitors are reminded that the entries close on Saturday, February 12.

—— The annual AGRICULTURAL EXHIBITION of PARIS is announced to open on the 14th and to close on the 23d inst. We have not yet received the programme, but understand that the *concours* will include not only cattle and implements, but also poultry and other domestic animals (alive and dead), roots, seeds, &c., butter, cheese, and dairy produce, and implements of all kinds. The show was held last year, as our readers will remember, at the new cattle market of La Villette, but the attendance was so poor that the authorities determined to hold it this year in the heart of the town, at the Palais de l'Industrie, in the Champs Elysées. For many reasons an unusually fine show may be looked for.

—— Another letter on FARM HORSE DUTIES:—Mr. RUTHERFURD, of Easton, near Grantham, put the following case to the CHANCELLOR of the EXCHEQUER:

"The tenants on the estate under my management are bound by their agreements to 'furnish a waggon, with a team of horses and a driver, one day in each year for every £75 of rent, for any purpose the landlord may think fit, without charging any satisfaction for such team.' The occupiers of farms on the property have for many years discharged this obligation by carting coals to the mansion on the estate occupied by the landlord, and I beg respectfully to inquire if I am correct in assuming that the horses so employed are still exempt from duty, on the ground that the service thus given by the tenants is, in fact, an equivalent for rent, and must, therefore, be held to be a 'purpose of husbandry?'"

The following is the reply:—

"Inland Revenue, Somerset House, London, W.C.
Feb. 3, 1870.

"Sir,—The Chancellor of the Exchequer having forwarded to this Department your letter to him of the 27th ultimo, I am desired by the Commissioners to acquaint you that they will not insist upon payment of duty for a horse kept solely for agricultural purposes, which may occasionally only be employed in drawing coals, bricks, &c., to its owner's house, or to the house of the farmer's landlord, in conformity with any provision in that behalf contained in the lease under which the farm is held.

"I am, sir, your obedient servant,
"W. M. ROSSETTI, Assistant Secretary.

"John T. Rutherfurd, Esq."

—— At a recent meeting of Dorchester Agriculturists, Mr. STANHOPE'S report on the condition of the agricultural labourer in that county was discussed.—Lord ASHLEY dwelt on the advantage of paying the labourer in money instead of in kind, and recommended sanitary supervision with regard to sanitary matters. He was perpetually travelling over England, and saw labourers who earn from 10*s.* to 15*s.* weekly, but they are not as stiff-backed or broad-shouldered as the Dorsetshire labourers, who earned, it was said, only 9*s.* weekly.—Professor BUCKMAN held that the Dorsetshire labourer is as well, if not better, qualified for work than the labourer of any other county in England. He expressed his disbelief of the statement that his earnings are only 9*s.* weekly. He denied that in Dorset, as a rule, men do the work of boys; he thought that, with few exceptions, it is just the contrary. Regarding the Dorset cottages, they are not worse than those in other parts of the country; generally speaking they are better. The landlord had, however, no encouragement to improve them, so indifferent were the labourers in keeping them tidy. Then, again, the rent, often 1*s.* per week, does not warrant his expending money in repairs, and as he has disproportionate burdens in the shape of taxes to bear, it was not likely that he would thus spend his money. He thought sanitary matters should receive attention by the appointment of parish supervisors. Respecting wages, he recommended the total abolition of the system of payment in kind. Better cottages, better schools, and parish supervision were, he considered, three great wants in respect to improving the condition of the agricultural labourer.—Mr. JOHN FLOYER, M.P., pointed out that sanitary matters have received the attention of boards of guardians, who have effected great improvements in the parishes. Regarding the state of the cottages, he thought that agricultural societies do much towards their improvement by the system of offering prizes for the best cottages. If any age is fixed for prohibiting the working of boys in the field, under 10 years he thought to be suitable; up to that age they should receive the best education possible. Improved cottage accommodation is, he considered, only a question of time. At no distant day the labourers of this county will, he held, be housed as they ought to be.

—— Mr. ALLNUTT'S meteorological report for January points out the singular division of the month into two contrasted halves; the former stormy, the latter calm; the former warm, the latter cold. The columns of mean temperature (one for the past month and the other for 50 years), with the deduced diurnal results, show how persistently high and persistently low have been the thermal manifestions of January in its first and second moieties. From the 1st to the 15th the night temperature but once sank to the freezing point of Fahrenheit. The range during this period was from 29° to 45°. From the 18th to the 30th the temperature was consecutively depressed. On the 27th and 28th the minimum night register was respectively 23°, and these are the lowest temperatures of the month on the southern coast. During the month there were 13 frosts, some of considerable severity, but the unusual heat at the commencement of the new year so penetrated the ground that the subsequent cold made but slight impression, except on the very superficies.

OUR LIVE STOCK.

CATTLE.

THE small herd of Shorthorns at Lune Bank, late the property of Mr. Houseman, were sold by auction on Tuesday (the 1st inst.), Mr. Vince officiating as auctioneer. The 10 animals sold realised on an average only £28 each. *White Strawberry*, the first on the list, is a 12-year-old cow, bred by the late Mr. Troutbeck, of Blencow, and is four months gone in calf to KNIGHT OF THE HAREM; she brought 21 gs. *Wild Rose*, a 10-year-old cow, by a Warlaby bull, DUKE OF BUCKINGHAM (14,428), and of the *Wild Eyes* tribe, made 29 gs.; *Hartforth Strawberry*, by BARON HARTFORTH (23,361), a Lune Bank bull, and descended from *Old Strawberry* by CHORISTER, and *Strawberry* by WELLINGTON, made 34 gs.; *Pride of the Harem*, by KNIGHT OF THE HAREM, and of the *Medora* family, was sold for 30 gs. KNIGHT OF THE HAREM is also of the *Medora* by AMBO tribe, and was got by LORD OXFORD (20,214), a pure Duchess and Oxford bull imported from America, and bought by the Duke of Devonshire for 400 gs. This animal, now four years old, was purchased for the small sum of 34 gs. HARTINGTON, by KNIGHT OF THE HAREM, and boasting a long pedigree on the female side, back to *Wild Eyes* by EMPEROR (1975), combines in his lineage some of the best strains of Booth and Bates blood, and he is own brother of KNIGHT OF BUCKINGHAM, the property of Messrs. Hampton, of Appleham, near Shoreham, Sussex. He brought 40 gs., the highest price obtained. Lastly, two young bulls, BLENCOW and CLOTH OF GOLD, both by KNIGHT OF THE HAREM, and respectively of the *Strawberry* and *Wild Eyes* sorts, made 22 and 12½ gs. each.

—— The seventh issue of Thornton's Circular fully equals, and in some points excels, its predecessors in interest. A reprint of the result of the Barmpton sale after the decease of Robert Colling gives us the opportunity of comparing the past with the present, and the general average of £94 12*s.* 10*d.* over 107 head disposed of in 1818 and 1820, at a time of great agricultural depression, is certainly well worthy of notice. Taking the highest average during the past season, that obtained by Mr. Bowly, of £72 16*s.* over 39 animals, we see how far it falls short of the sum obtained at the dispersion of the great parent herd. Next follows a continuation of the history and transactions of the earlier Shorthorn breeders, in which much interesting information is given respecting the first proprietors of our most noted tribes. Thus Mr. Robert Colling's cattle are stated for the most part to have been descended from four families, a detailed account of each of which is given. The Circular is then continued and concluded in the usual manner, with notices of past and future sales, births, private sales and lettings, an obituary of eminent agriculturists, and lastly, a long catalogue of Shorthorn cattle for private sale, comprising 109 head of pure-bred stock.

—— The catalogue of the late Mr. Mann's herd, so long bred at The Asps, near Warwick, is before us. The herd, we are informed, has been in existence for nearly 40 years. It was commenced with purchases from Mr. Bellamy, one of the earliest introducers of Shorthorns into Warwickshire. Nearly one-half the animals trace their pedigrees through the Dido family, to Mr. Bellamy's Stock, which was full of Colling blood. The Dido family was brought prominently into notice at the Milcote sale in 1868, when *Edith* was reserved by Mr. Adkins, and her daughter *Diana* was sold for 120 gs. One animal bred at Fawsley will also be noticed in the list, namely, *Sylphide*, now nearly 12 years old, by SARAWAK, dam *Pintail*, by JANIZARY. There are 13 female and 5 male representatives of the Messrs. Collings' *Bright Eyes* by FAVOURITE, dam *Old Bright Eyes*, by FAVOURITE tribe, and tracing directly back to HUBBACK (319) and the STUDLEY BULL (626). Among the bulls used since the commencement of the herd we may mention PHŒNIX (6290), and METEOR (10,526), after which Knightley bulls were principally employed, as IVANHOE (9240), REBEC (15,132), RUBENS (15,209) and AMIENS (14,095). "The two last sires, BULL'S BAY (lot 60), and GENERAL BRAGG, are of the same blood, and were the last two bulls sold at the final Fawsley sale in 1865." This extensive and well-got-up catalogue contains the pedigrees of 83 animals, 23 of which are bulls. The sale, which will be conducted by Mr. John Thornton, will take place on March 1, at The Asps, one mile from Warwick.

"G. A. H." AND MR. SPEARING.

THE IRISH LAND QUESTION.

MR. SPEARING is not pleased with my criticism of his letter, which I termed "Communism," and tells me I should read more attentively, and not put constructions on words and sentences they are not intended to convey. Here are his own words:—

"Proprietors think generally that if a fair and equitable measure be passed, giving the tenant on quitting his land compensation for effectual drainage, fencing, buildings erected by him, and any other unexhausted improvement he may have made, he ought to be satisfied, and it is all he ought to expect. So he would under certain circumstances; but the question is, will the tenant be satisfied with this *in the present state of affairs?* [Italics are mine.] I think not; *he well knows that such a measure would give to many a landlord a better claim than he has at present to the land* [italics are mine], and get rid of some of his difficulties; while other landlords would avail themselves of the powers there given, and take possession of the soil themselves."

Now, will Mr. Spearing kindly tell us what is the meaning of this sentence, if the meaning I have put upon it is not the correct one? No measure such as he speaks of could give a landlord with a "good" title "a better claim than he has at present," so far as I can see. Will Mr. Spearing show how it could? As to Mr. Spearing's assertion about what proprietors think generally, I venture to differ with him. I do not think proprietors expect at all to be called on to pay for "fencing, or building, or other unexhausted improvements," executed without their sanction or consent, and I cannot see that my "suppositious Paddy" in any way exceeds the claims that would really be made if any such silly and unjust law were passed. Mr. Spearing says that he spoke of "efficient" work, but I refer him to his own letter. He only uses the word "effectual" as applied to drainage. What is an "efficient building," and what is "efficient fencing?" Will Mr. Spearing be good enough to say? Paddy no doubt thinks his cabin a very efficient shelter, and the fence round his Potato garden a very efficient fence, and so they are to him and to men of his class, but they are very inefficient and totally useless to the landlord if he, the tenant, leave them and no other tenant of the same class is ready to take them. Now, are Mr. Spearing and those who have so recklessly thrown down this apple of discord prepared to advocate that landlords should be bound to pay for such things when done without their consent?

"G. A. H." is not so ignorant of the present state of Ireland as Mr. Spearing supposes. As far as "the law" is concerned "G. A. H." is quite sure that if he bought an estate in Ireland he could go and take possession of it, and turn all the tenants off unless they had leases, and these leases must have been brought under his notice before he bought, or if not, then the vendors would have a difficult question to settle with him. Whether "the law" in the present state of the country could be carried out or not is a different question, and we may thank wild speaking and writing for having brought the country to the present pass. If Mr. Spearing knows Ireland, he must know right well that there is not one tenant in a hundred—nay, I think I might safely say, one in a thousand—who ever attempts to improve his land. He must know that the great bulk of Irish tenants belong to a class who have no idea of improvement whatever, who have not anything like the same knowledge of farming that an English labourer has, for the simple reason that in most parts of England now the labourers see pretty good farming going on around them, whereas an Irish tenant is surrounded by men as poor, as ignorant, as reckless, and as improvident as himself. If the farmers of England and of Scotland were swept away, and if instead of them the land was given over to a parcel of men no better educated and no more intelligent than English and Scotch farm labourers were 100 years ago, and with almost no capital to work their farms, and each man occupying only from 5 to 10 acres of land, does Mr. Spearing suppose that English and Scottish agriculture would thrive as it does now? This is the plain English of the question, this is it stripped of the fine feathers in which politicians think fit to dress it up in order to gain their own party ends. And supposing such a change to be effected, what would Mr. Spearing think if a measure were to be proposed that these men and their descendants were to remain "for ever" the occupiers of the land they happened to hold at the moment the Act passed! Or what would he say if another Act were proposed

and passed, authorising these men, mere ignorant peasants, entirely unacquainted with any system of farming except the rudest, to do what they please with the land, to subdivide it into miserable patches and run up huts and pigstyes thereon, to make ditches and banks and fences of any sort or description as pleased their fancy, or otherwise to "improve" the land in the extremely scientific way their great agricultural knowledge fits them for?—and then, after it was all done, and their own mismanagement and idle and indolent habits had brought about a grievous famine, they were to be entitled to turn round on the landlords and say, "Oh, we are going away from this miserable country, which will support us no longer, but we want from you the cost of our improvements; and if you do not pay us our full demands we will leave it to a jury to decide?" I wish your readers to consider whether this is an over-statement of the case or not. And now I come back on Mr. Spearing, and ask him the question I asked him before, "From what class are the jury to be drawn?" for I put aside as simple rubbish the suggestion that Government are to buy up estates in different parts of the country and set the people to work upon them at fair wages.

Mr. Spearing objects to my assertion that Irish labourers combine. It is a pity he cannot persuade all the manufacturers of England to be of the same opinion, for I presume he is well aware there are many works in which Irishmen will not be employed at any price, simply because of their character for plotting. And after all, what else is to be expected of them, when their whole life is one continued membership of some secret society or another?

"T. C." who is most unmistakably an Irishman, and apparently one of those who, having finished their education in the school of St. Omer's, come over to this country to carry out the principles so well indoctrinated into them by their clever instructors, tells me I am one of those who excite class against class, while he is plainly seeking to enlist the sympathies of the tenant-farmers of England in favour of the same class in Ireland. Every one who knows Ireland, and knows of what stuff (with a few brilliant exceptions) the tenantry of Ireland are composed, knows what folly it is to talk of them in the same breath with the bold and manly race who occupy the soil of England and of Scotland. It is about as reasonable to compare the one to the other, or talk of them as belonging to the same class, as it would be to liken the Red Indians of the backwoods to the proud descendants of the Pilgrim Fathers of New England, because they both happen to be denizens of the great North American continent. And now as to setting class against class, I venture to tell "T. C." that the men who set class against class are those who say to an ignorant and excitable people that they are the finest peasantry in the world, that the island they live in is an emerald, but unfortunately "set in the crown of a stranger;" that the land they occupy is rightfully their own, and that their landlords, although they and their predecessors have possessed the land for more than 300 years, are only Saxon oppressors, whom to "go out and tumble with a revolver" is a great and godlike act, worthy even of commendation from the minister of a religion which ought to be a religion of peace and goodwill. There are those who, when a man has skulked behind a hedge, watching in safe security the approach of his victim unconscious of his coming doom, and then shooting him as he would some noxious beast, who, when the cowardly assassin has made his escape, talk of him merely as one who has carried into execution "the wild justice of revenge." These men, who preach this wretched balderdash to their ignorant and poorer fellow countrymen, I beg to tell "T. C.," are they who set class against class.

But lest "T. C." should think of claiming me for his fellow countryman, let me assure him, that although I was born in Ireland, and lived there long enough to know it well, not a drop of Irish blood flows in my veins. It happens that I come of a Scottish and an English stock, although, if I had been the descendant of one of the early English settlers, I most assuredly would not have looked upon myself as an Irishman. A man is not a horse because he happens to be born in a stable, not even if his forefathers before him had been born in the same stable for many generations.

If "T. C." would allay the feeling of class against class, let him go back to Ireland and tell his brethren that in England we think it the act of cowards for a whole country-side to look on and see an assassin skulk behind a hedge to shoot an unconscious victim, and then, when the deed is done, not to move a finger to arrest the villain. *C. A. H.*

AYLESBY, RIBY, AND ROTHWELL.

PRELIMINARY GEOLOGICAL NOTICE.

[The following is Mr. H. M. Jenkins' account of Mr. Torr's farms, given in the Journal of the Agricultural Society. We have to acknowledge with thanks the use of the Society's wood engraving.]

Two of the farms now to be described have long held, either collectively or separately, a prominent position in the history of British agriculture. Aylesby and Riby, like Skipworth and Torr, are names which will always be associated with advanced ideas of good farming and successful breeding.

Aylesby was held successively by the two Skipworths, father and son, in the days of the Bakewell Ram Club, when Leicester sheep-breeding was a contest for giants. It consists of 940 acres, and is held under Mr. T. T. Drake, of Amersham, Bucks, at an annual rental on a Ladyday entry, with a very liberal tenant-right agreement, and no outgoing crop.

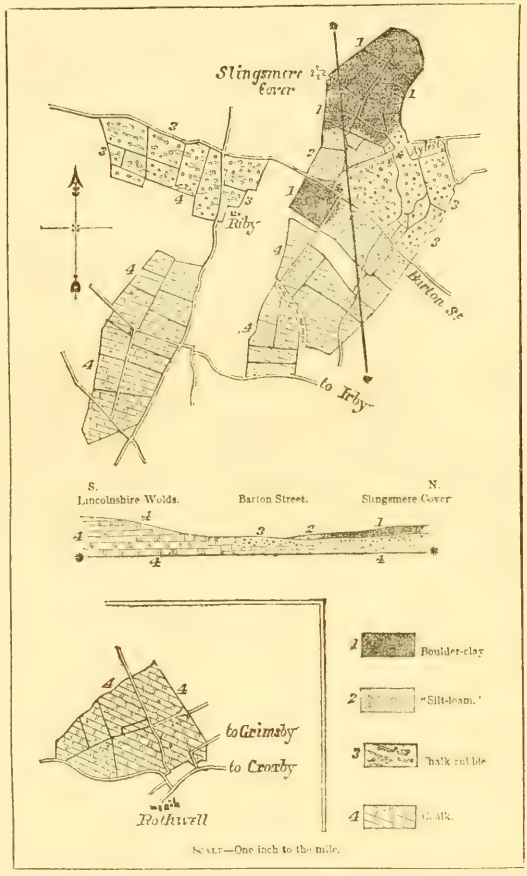

FIG. 39.—GEOLOGICAL MAP OF FARMS AT AYLESBY, RIBY, AND ROTHWELL.

The Riby farm has been in Mr. Torr's family for about a century and a-half; it measures 720 acres, and is held under Colonel Tomline, M.P. for Grimsby, at an annual rental, on a Mayday entry, with an outgoing ocrop. Rothwell consists of 420 acres, and, being a parsonage farm, is held under the present rector, who, it is almost unnecessary to say, has only a life-interest in it. Mr. Torr also occupies 200 acres of marsh-land, mostly his own property, at Immingham and Stallingborough, on the banks of the Humber. The whole of the land at present in Mr. Torr's occupation therefore measures 2280 acres. The proportions of Grass and tillage are the following:—

	Tillage.	Grass	Total.
Aylesby ..	.. 700 ..	240 ..	940
Riby ..	.. 610 ..	110 ..	720
Rothwell ..	.. 404 ..	16 ..	420
Marsh land	.. — ..	200 ..	200
	1714	566	2280

Aylesby is about five miles west of Great Grimsby, and the village is situated just on the commencement of the chalky gravel or rubble which stretches as a kind of fringe along the foot of the Wolds. North of the village, as may be seen in the map, lies a mass of clay, which forms the subsoil of the great portion of the strong land on the farm; and there is an outlier of the same subsoil south of the road called Barton Street. This road may be taken as a very convenient, and it is certainly a very natural, line of division, to assist us in describing the physical features of the district. It runs along the line of a dry valley, and divides almost completely the strong land from the light, the only exception being the outlying patch of clay just mentioned. This clay is one of those glacial drift-deposits to which geologists now give the name of boulder-clay, but which in former days were known by various names, such as till, erratics, diluvium, and so forth. It is the same as that termed "plastic clay" by Mr. John Algernon Clarke in his prize essay on the "Farming of Lincolnshire" in the 12th volume of this Journal. The section beneath the map of Aylesby and Riby shows the configuration of the surface on the Aylesby farm. The slope of the valley from Barton Street towards the clay-land on the north is seen to be very gradual, while on the south, after the intervention of a very narrow plain of chalk, the surface rises somewhat abruptly and boldly to the true Lincolnshire Wolds.

Most of the gravel, or, as I prefer to call it, chalk rubble, is covered with a good depth of from 2 to 4 feet of loam, which is simply a washing from the clay-land above. The other peculiarity to be noticed is the occurrence of a patch of "silt loam" between the principal masses of clay and the outlier. This is very poor land, and owes its poverty to its geographical position having formerly contracted the mass of water which washed the loam from the clay, and thus, by increasing its velocity, prevented its depositing those coatings of "old warp" to which the rest of the chalk rubble now owes its fertility. The clay portion of the Aylesby farm consists of about 300 acres, in a dozen fields. It is a very cold subsoil, and has a covering of only 6 or 7 inches of loam; but it has recently been subsoiled by steam-cultivation. It is all thoroughly under-drained at a depth of 4 feet. The chalk portion, or Wold land, consists of 340 acres, and has a top soil consisting of from 12 to 18 inches of marly loam. The "chalk rubble" and "silt loam" comprise about 300 acres, 210 of which, having the deep loamy soil just mentioned, are in permanent Grass.

The Riby farm may be divided into two nearly equal portions, one of which (the Home Farm) runs for nearly two miles along the southern side of Barton Street. With the exception of a very small patch of chalk (marked 4 on the map) it consists entirely of the same "chalk rubble" as that at Aylesby; is similarly covered with from 3 to 4 feet of strong fine loam, and is the best land farmed by Mr. Torr. The remaining portion, or the Riby Wold Farm, is a little larger than the Riby Home Farm, and consists entirely of chalk covered with about 18 inches of marly soil. It slopes to the east and south, and the harvest here is about a week earlier than at Rothwell, also a Wold farm, in consequence of its better aspect and lower elevation; but there is no artificial shelter to increase these natural advantages.

At Rothwell the subsoil is also chalk, which is here covered with from 16 to 18 inches of a light marly loam. It is situated at the extreme height of the North Lincolnshire Wolds, and forms an elevated "hog's back." Formerly, and not many years ago, it was a rabbit-warren, and a warren sod-wall may even yet be seen, though it is in process of demolition by the present occupier. The only bit of pasture on this farm is a little field of 16 acres, situated, as may be seen on the map, where the road from the village of Rothwell branches, on the one hand to Grimsby, and on the other to Croxby. It is used principally as a "city of refuge," a sanatorium, or such like. While describing this farm, it may be worth mentioning that it is dixided into seven fields, exclusive of the small pasture. One of these is nearly 100 acres in extent, and the other six are worked in pairs (of one small and one large field), each pair making up about the same acreage. The four-field shift at Rothwell is therefore a very simple matter to arrange.

The only peculiarity of climate which it is necessary to mention is, that the north-east winds from the German Ocean in the spring very much retard spring cultivation.

[Mr. Jenkins' description of these farms occupies several pages of the Society's "Journal," and must be given in several successive numbers of the *Agricultural Gazette*. The above, meanwhile, will serve for an introduction.]

ONE-HORSE REAPERS.

BURGESS & KEY'S NEW HAND-DELIVERY MACHINE.

CONSIDERABLE improvements in mowers and reapers have been recently made by Messrs. Burgess & Key, of London and Brentwood. At the Plymouth meeting the judges reported their direct thrust on the knife unquestionably "a permanent improvement," and Messrs. R. Hornsby & Sons, who met with so much success at Manchester last summer, have, very much to their credit, adopted it under licence. But the direct thrust, as it has popularly been termed, with the self-lubricating apparatus which accompanies it, forms only a part of the patent system under notice as applied for the first time to a 1-horse hand-delivery reaper for corn crops and Clover or other forage plants. The system, apart from self-raking and swathing apparatus, track clearers and dividing shoes, consists of three parts, each subject to various modifications as field-demands, &c., may render necessary, viz. (1), self-lubricating apparatus; (2), "direct thrust;" (3), crank gearing and apparatus for altering the angle and elevation of cut, and for throwing in and out of gear. The former two have been in use for some time, but they have been greatly improved in mechanical detail since the Manchester meeting. The annexed illustration of their 1-horse reaper will enable us the better to describe its construction and the advantages of the new system generally. The engraving represents a right-hand machine with shafts, the width of cut being 5 feet, but they are made either right or left-handed, and with shafts or pole, as ordered.

The gearing and driver's seat, it will be seen, are carried outside the main or motor wheel. By this construction (1) the motor wheel can work close up to the standing crop. Under good driving the angular strain upon the cutter bar is thus reduced by a reduction of side leverage to the extent of 6 inches. (2) The weight or pressure on the outside or land wheel is reduced; consequently, (3), the horse-power is reduced, and also the tear and wear upon the working parts. It will further be seen that the driver's seat is behind the main axle, which both relieves the horse's back of pressure, and equalises the angle of draught. It is a well known fact, that when the shafts press heavily on the back of the horse the rise and fall are great, however elastic may be the step and free the movement; but when the pressure is *nil*, the angle of transition is nearly uniform. In cutting Clover the sparred platform is removed, and a track-clearer put on; and the main wheel, standing close up to its work, permits of the width of the track-clearer being reduced to a minimum, which will further reduce the horse-power, especially when the crop is heavy. As the resistance here is at the extremiy of the side leverage, a saving of 2 or 3 inches is very important. At one time the broad track-clearers of mowers so increased draught as to surprise their manufacturers when they first entered the grass field; but sound mechanism is now better understood, and the small reduction in the breadth of the track-clearer under notice further reduces horse-power and the tear and wear upon the machine.

Such is a general outline of the new 1-horse reaper, and we shall now notice the details under the three parts of the system already mentioned.

The patent for the self-lubricating apparatus covers various forms of construction, and the principle is so simple that it is surprising how it was not discovered and reduced to practice sooner. It is applied to all the bearings of the machine under notice, and consists of a cotton wick, supplying to each bearing oil from a well, as fast as required—no more, no less—one supply being sufficient to last a whole day.

The "direct thrust" is a popular and very convenient technical term, but seems the reverse of what it implies. It means that the three dead points are in a line when crossing centres, and it is a well-known fact that when the crank-pin crosses centres, as it does twice during every rotation, there is no thrust on the connecting rod, hence the technical term dead-points. Thus in the annexed printer's rule diagram—if the four cyphers

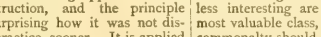

(numbered 1, 2, 3, 4) represent the dead-points, and the line *z* the connecting rod, then 1 is the dead-point at the knife; 2, the dead-point or crank-pin at the other end of the connecting rod; 3, the crank-shaft; and 2 and 4, the two positions of the crank-pin at the extremity of the to-and-fro movements. What, then, is the improvement made? Simply this. The angular thrust of the crank-pin on each side of the line of centres is equal, performed in equal times and nearly at an uniform velocity of cutting stroke, when the connecting rod is of sufficient length. In other words, the to-and-fro movements of the knife are performed in equal times, and nearly at a uniform velocity and cutting power throughout their length. It is otherwise when the centre of the crank-shaft, 3, is above the line, which is shown in the diagram, for then the to-and-fro strokes of the knife are unequal as to time, velocity, and cutting power, while the friction from the greater obliquity of stroke is excessive. Even when the dead-points are in a line, if the connecting rod is too short the velocity and cutting power of the knife during the to-and-fro strokes are unequal. Engineers have long been familiar with the fact that the velocity of the piston is not uniform throughout the length of the barrel. By increasing the length of their connecting rod, the Messrs. Burgess & Key have greatly reduced the angularity of the stroke of the crank-pin, the friction and tear and wear of the knife, and the power required to drive it, while the velocity and cutting powers of the knife during the to-and-fro movements are very nearly uniform.

From the clear position in the driving of the crank-shaft and the motor gear on the main axle, that of the spindle of the driven gearing or pinion will readily be understood. It will also be seen that the axle of the main wheel is not in a line with the axle shown to which the shafts and framing are connected. In other words, there is a crank movement with two centres, which constitutes the most important feature in this part, as by means of a lever close beside the driver's seat the driver can raise and lower the cutter-bar, and throw the crank-shaft out of and into action, by working the lever backward or forward, as the case may be—the one way in raising and throwing out of gear, and the other in lowering and throwing into gear. The vertical drop-lever with rachet into which it works, as shown at the side, will readily be recognised from its ring or key handle, and by means of it the finger-bar

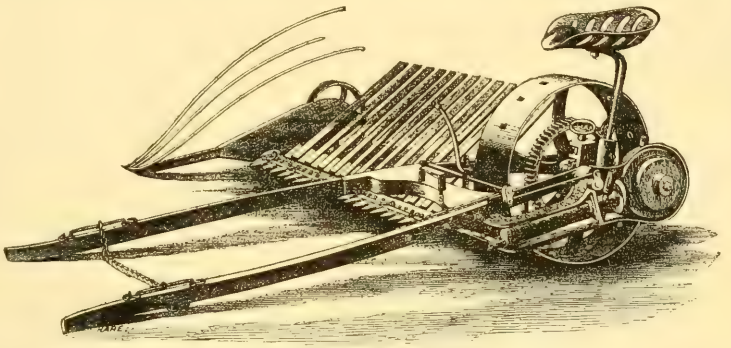

FIG. 40.—NEW ONE-HORSE REAPER.

frame can be regulated for cutting at any length of stubble, parallel to the surface or obliquely at any angle the state of the crop may require. It will also be seen that the cutter-bar is free to follow the undulations of the land, both in cutting corn and Clover. There is much novelty under this head no less simple than promising. We have long been familiar with the crank movement in raising and lowering our cultivator, and although the mechanism is totally different, the principle is sufficient to command attention. *W. Burness.*

OUR TENANT FARMERS.

MR. JOHN FORD.

WE take great interest in our live stock; scarcely less interesting are our tenant-farmers! They are a most valuable class, to whom the landlords, clergy, and commonalty should feel obliged. The county of Dorset is much blessed with a great number of worthy men of the class of tenant-farmers. I propose, however, to speak now of my esteemed friend, Mr. John Ford, without disparagement of the many other distinguished agriculturists in the county. He rents a farm at Rushton, near Blandford, of Mr. Sturt, of Crichel; and during my 14 years' tenure of the living of Rushton he rented my glebe lands, and farmed both excellently. He is highly esteemed by Mr. Sturt and by all classes, and specially by the labourers. During the time I was at Rushton I do not remember any unpleasantness between him and his labourers. Some masters are always changing servants, and some servants are always changing masters. When this is the case I always know where the fault lies. All the servants and all the masters cannot be bad. As a stock and crop farmer I know none superior to Mr. Ford. His management, as a stall-feeder of Herefords and Devons, is excellent. I always observed that his fat animals, ready for Baker Street, would eat gladly a handful of straw—a proof to me of judicious feeding. I believe that the only medicine he used, when very fat animals lost their appetites, were sulphur and Epsom salts, a half a pound of each. He is also a good judge of stock, and an honest one too. A patchy animal will not pass with him over a level animal, though the former be fatter in certain points. He looks to lean as well as to fat. He knows that it takes the best points of two good animals to make a Gold-medaller! He is not a breeder of "bovines," but buys chiefly, though not only, his fatting stock from Hereford fair. When they arrive at home, he does not at once put them into hot byres, but allows them to remain at Grass for some little time till they have recovered from their journey.

Mr. Ford has an admirable South Down flock—the same may be said of Mr. Farquharson, Mr. Sturt, and Mr. H. Fookes,—550 of which are breeding ewes. It is one of the purest South Down flocks in England, Mr. Ford having bred for many years from the stock of the late Mr. Jonas Webb. He has now a quantity of pure-bred Webbs, very handsome, and of great substance and small bone. He has also hired very good rams of the Duke of Richmond and Mr. Ellman. It is his opinion, that however good a flock may be, it is good to change the blood. He sold, on the 9th of September last year, 100 of his outgoing ewes to Mr. John Strange, the well-known dealer, for 53*s.* per head, who took them to Chichester Market, and sold 30 of them to a Surrey breeder to breed rams from them, the remainder being sold for a similar purpose. Mr. Strange has bought them for many years, which shows that they answer a good purpose. His wether lambs, sold out annually in August or September, go to the butcher. Mr. Mr. Ford is a high feeder, both in the stall and out; and a great quantity of fat beef and mutton is sold out every year. This is the true way to farm. When I was at Rushton he used oilcake, corn and rape cake. The last he has much given up, as some animals do not like it. After the ewes have lambed he gives them oilcake, corn, and chaff at four times in the day, instead of once a day, as is the custom on some farms. These greedy feeders sometimes die from gorging too much at one time.

Mr. Ford is a regular feeder throughout the year. He considers "good luck" and "bad luck" to mean often good and bad management. He also considers it a bad plan to give too many Turnips—specially frozen Turnips—to sheep in the last period of gestation. This and a lack of dry victuals he deems to be one of the causes of dead lambs and an "unlucky" lambing season.

Mr. Ford is not a frequent competitor in London, but when he sends an animal it is one that arrests the attention of the judges. During my residence at Rushton I remember three successful Baker Street competitors, which I often handled. The first was a Hereford steer, which ran 2d to Mr. Heath's ox, which won the gold medal at Birmingham the previous year, and had the advantage in age. The next was a Devon cow, 1st prize in her class, bought of Lord Portman, who, as breeder, got the medal. She was a real beauty. Mr. Ford has got the portraits of both. It is curious, but true, that Lord Portman, who is a capital judge, offered this cow to the agent of the late lamented Prince Consort, but the agent did not think her good enough; a more expensive animal was bought, but fell to second honours. The other 1st prize Devon heifer was a pure Quartly, and a great beauty. Mr. Ford bought her and three other yearlings of Mr. Louch, tenant to Mr. Bankes. As regards country honours, I will only speak of last year. At Blandford, Sturminster, Southampton, and Dorchester he won with every animal and every commodity sent. At Blandford he won the 1st and 2d prizes for steers, the 1st and 2d prizes for heifers, the 1st and 2d prizes for chilver lambs, the 2d prize for working oxen, and the 1st prize for the best sack of Barley. At Sturminster he won the 1st prize of £7, with his Hereford ox, bred by Mr. Taylor, of Herefordshire, lately deceased; hence he could not get a breeder's certificate, which prevented this noble animal from going to Islington. It weighed over 81 scores, and was sold by weight at 14*s.* per score. Mr. Ford sent also a Devon ox, which was placed 2d to the above ox; but as, according to the rules, no exhibitor could take more than one prize in the same class, the prize fell to Mr. Coates, whose ox was placed 3d. At Southampton two shows were held the same day. At the cattle market show the above Devon ox won the 10-guinea goblet. At Mr. Perkins' auction and sale-yard show the above Hereford ox won the 10-guinea prize and silver medal for the breeder. He also won the Mayor's 10-guinea prize for the best animal of any kind or breed in the yard. Mr. Ford also won the 1st prize for the best fat lamb, and also for the best fat calf. At Dorchester the same Devon won the 1st prize. These pre-Christmas shows brought to Mr. Ford £54 12*s.*

I need enlarge no more on this head. I will conclude by saying that I highly value the friendship of Mr. Ford and his excellent wife, and beg leave to acknowledge their many kindnesses to me during my 14 years' rectorate; and I hope that the above account may stimulate other tenant-farmers to "go a-head," and cause them so to act as that the labourers under their care may say of each of them, during failing health, as I have often heard the labourers of Rushton say of Mr. John Ford, "Ah! sir, he will not only be missed, but wanted." *W. F. Radclyffe, Okeford Fitzpaine, Dorset.*

AGRICULTURAL STATISTICS, 1868-9.

Population, Area, Abstract of Acreage under Crops, &c., and Number of Live Stock, in Each Division of the United Kingdom.

	Years.	England.	Wales.	Scotland	Total for Great Britain.	Ireland.†	Isle of Man.	Channel Islands. Jersey.	Channel Islands. Guernsey, &c.	Total for United Kingdom.	Years.
Total population ..	1869	20,658,599	1,211,008	3,205,481	25,075,088	5,536,217		148,259*		30,759,555	1869
Total area (in statute acres)	....	32,590,397	4,734,486	19,639,377	56,964,260	20,322,641	180,000	28,717	17,967	77,513,585	....
Abstract of acreage : —											
Under all kinds of crops, bare fallow, and Grass ..	1868	23,038,781	2,503,646	4,413,267	29,955,694	15,575,270*	88,561	28,716	14,304	45,652,545	1868
	1869	23,170,502	2,530,639	4,438,137	30,339,278	15,643,701*	84,537	19,028	13,619	46,100,153	1869
Corn crops (including Beans and Peas.	1868	7,499,218	547,871	1,386,441	9,433,532	2,192,785	27,888	3,453	2,197	11,659,855	1868
	1869	7,725,033	555,628	1,417,176	9,758,037	2,207,970	28,595	3,411	2,098	12,000,111	1869
Green crops	1868	2,385,019	128,292	672,555	3,385,866	1,446,307	13,310	5,766	3,808	4,865,057	1868
	1869	2,759,098	127,452	688,517	3,575,067	1,468,895	12,406	5,836	3,729	5,065,933	1869
Bare fallow	1868	709,739	83,720	74,762	958,221	24,017	439	740	829	984,246	1868
	1869	644,107	58,786	35,943	738,836	20,981	420	520	612	761,369	1869
Grass : —											
Clover, &c., under rotation ..	1868	2,170,638	328,232	1,961,138	3,960,008	1,691,797	32,525	5,204	784	5,690,318	1868
	1869	2,064,902	269,899	1,182,925	3,448,726	1,761,800	26,256	4,069	701	5,149,532	1869
Permanent pasture ..	1868	9,703,884	1,415,327	1,016,825	12,136,036	10,003,918	14,731	3,553	6,686	22,164,584	1868
	1869	10,096,094	1,527,514	1,111,209	12,735,897	10,046,877	16,860	5,182	6,468	22,811,284	1869
Abstract of live stock returned : —											
Total number of horses (returned by occupiers of land only in Great Britain	1869	1,141,966	132,162	186,900	1,461,061	527,248	5,488	2,427	1,923	1,998,147	1869
Total number of cattle	1868	3,770,691	592,173	1,050,917	5,423,981	3,620,352	19,727	12,225	7,111	9,083,416	1868
	1869	3,726,641	559,108	1,017,724	5,313,473	3,727,794	18,158	11,758	7,099	9,078,282	1869
„ of sheep	1868	20,930,779	2,668,505	7,112,112	30,711,396	4,822,444	72,116	504	1,355	35,607,812	1868
	1869	19,821,560	2,720,941	6,995,337	29,538,141	4,648,158	69,428	598	1,177	34,250,272	1869
„ of pigs	1868	1,581,606	187,319	139,614	2,308,539	862,443	5,271	7,135	5,779	3,139,167	1868
	1869	1,629,550	171,675	129,227	1,930,452	1,079,793	4,468	7,176	6,348	3,028,394	1869
Number to every 100 acres under crops, fallow, and Grass :											
Horses	1869	4.9	5.2	4.2	4.8	3.4	6.5	12.8	14.1	4.3	1869
Cattle	1868	16.4	23.7	23.8	18.1	23.2	22.3	65.3	49.9	19.3	1868
	1869	15.9	23.3	22.9	14.0	23.8	21.5	61.8	52.1	19.7	1869
Sheep	1868	90.8	106.6	161.2	102.5	31.0	81.4	2.7	9.5	78.0	1868
	1869	84.8	107.5	157.6	95.8	29.7	73.6	3.1	8.6	74.3	1869
Pigs	1868	8.6	7.5	3.2	7.7	5.5	6.0	38.1	40.4	7.9	1868
	1869	7.0	6.8	2.9	6.3	7.0	5.5	37.7	46.3	6.6	1869
Number of returns obtained : —											
From occupiers of land ..	1868	385,577	55,283	89,111	529,971	594,241	2,459	—	—	—	1868
	1869	400,264	56,751	75,811	532,826	—	2,361	—	—	—	1869
From owners of live stock only ..	1868	6,572	447	2,392	9,411	—	141	—	—	—	1868
	1869	5,382	322	2,453	8,157	—	128	—	—	—	1869

* Including under Flax, 200,446 acres in 1868, and 229,178 acres in 1869.

† The detailed returns for Ireland will be found in the Annual Reports prepared by the Registrar-General and laid before Parliament.

INTEREST ON FARM CAPITAL.

Cost of Steam Cultivation.

Your intelligent and pungently amusing correspondent, "G. A. H.," is very lucid and exact on the cost of steam cultivation, and has mercilessly smashed up Mr. Smith's 6*d.* 8*d.* seed-bed. If the latter had prudently confined himself to a statement that steam cultivation is, on large farms, more economical and beneficial than horse-power, some of which it displaces, he would have spared himself that refutation. I see that Mr. Smith endeavours to take shelter under my balance-sheet. I, therefore, at once "plead guilty," and say that I ought to have stated that the available balance was for interest and profit, which I shall always state in future, although it is scarcely ever done by farmers in general. In the 300 and odd pages of vol. 3, pt. 1, of the "Royal Agricultural Society's Journal" (new series), devoted to steam cultivation, we have reports (which every farmer should read) of the actual working and cost of steam culture on 140 farms, comprising 60,000 acres of land in various counties, which were visited by the Society's committees. Here we have trustworthy data for a correct conclusion as to cost of the various operations under differing circumstances. The steam cultivating apparatus, like our drills and some other machines, being only in use for a small portion of the year, it becomes necessary to charge a whole year's interest on their cost. This has been done in every instance by the committees, who have also very properly added 7½ per cent. for depreciation. These two items (together 12½ per cent.), divided among the number of working days, give a daily charge on the work done, varying with the cost of the apparatus, the area and depth of cultivation, the nature of the soil, and the style of management. Its average may be about 6*s.* per acre of ploughing—repairs, coals, oil, water-cart, and labour, costing also about 6*s.* per acre. Where the engine is used for threshing or other purposes this goes in diminution of the interest. Unlike horses, which are available and required almost every day, the cultivating apparatus must lie idle nine months out of the twelve.

The average capital which I employ in my horses (seven) is £152, as follows, extracted from my stock-taking account. My land, 170 acres, is all arable, except 14 acres in permanent pasture :—

1864. Seven horses, value	£124
1865. „ „	154
1866. „ „	180
1867. „ „	167
1868. „ „	179
1869. „ „	170
	£1024

Average annual horse capital, £132; average value of each horse, £19.

Amount of Work done in 1869.

Ploughed	Acres. 135
Double or trench ploughed with seven horses, 154 acres, equal to	„ 50
Broadsharing or cultivating	„ 84
Acres	269

It appears to me that I have to charge the 269 acres ploughed and cultivated with the cost of keeping seven horses for 65 working days and 10 Sundays—total 75 days, at £50 per annum for each horse and its attendants, which brings my cost of cultivation to 6*s.* per acre, the drilling, harrowing, and rolling being an extra charge. Our horses are employed only about 65 days in ploughing and cultivating, but during the rest of the year they are fully employed in harrowing, rolling, drilling, hoeing, carting on manure, and carting off the crops of hay, corn, and roots—carting corn, hay, and straw to market—carting coals for fixed engine, cake and food for stock, and working reaping machine: our horses have very few days' rest in the year. In fact they are very severely worked, but as soon as their work is done, they are kept quiet in their stables, their food all prepared in their mangers, corn ground, hay and straw cut into chaff, roots (when they have any) pulped, and sometimes some oilcake. They are scarcely ever turned out, except, perhaps, a few days in harvest. I see that last year they carried to the land nearly 800 loads of manure, and brought to the homestead 300 tons of corn and straw, also the hay and roots and green crops, probably 500 tons; besides the recarting of Mangel from clumps, and hay and straw from stacks, carting food to sheep in fields, and many other necessary jobs. It must be remembered that all my land has been broken up very deeply—some 20 odd years ago—some of it being broken up with nine horses, and other portions dug deeply. One-tenth is ploughed deeply annually with seven horses, so that my land is in a very different condition from the ordinary shallow ploughed soil with a pan 6 inches below the surface. It does not appear, therefore, in my case, that I should be a gainer by using the steam-plough, except by hiring for a short time immediately after harvest to save time; but then I am not like your correspondent, "An Old File," who has 200 gates. Surely his fields can scarcely average 5 acres each!

Judging from the Society's report, one-half the cost of steam cultivation arises from a year's interest and depreciation (12½ per cent.) being concentrated upon so small a portion of the year as 70 days. In my case the whole year's interest and depreciation on my motive power (horses) would only amount, at 12½ per cent. annually on £132, to £16 10*s.*, or 1*s.* 1½*d.* per day for 300 working days, or under 3*d.* per acre. The time may probably come when a farm of 640 acres shall be in form one square mile—where a fixed engine in the centre shall be able not only to pump its own water but do all the cultivating, by means of a mile or so of rope; or, better still, when Mr. Thompson's india-rubber tired engine, or "G. A. H.'s" engine, with flat-footed wheels, shall do all that horses are required to do, and so be constantly employed. It appears to me that on a small farm where a certain number of horses are required for drilling, harrowing, and rolling at seed time, and also for harvesting, it is best to hire; and that a steam apparatus pays best where it can displace horses as cultivators without inconvenience to the other requisite operations. This was also the opinion of the committees of investigation. There is a time immediately after harvest when it may be necessary or desirable to thresh corn and cart it to market. It is at this time particularly that the steam cultivator is required, even on small farms, and a hiring for such purposes will pay. I know of a market gardener who, with 50 acres of ground, has a fixed engine for cultivating in the centre of it: so rapid is his succession of crops that it is economy of time that caused him to purchase the engine; although he has an abundant supply of hands for digging, he finds the engine most expeditious and profitable. The breaking up of ill or shallow-ploughed land where there is a pan under the ploughed soil, is always best done by steam-power. All my land was very deeply disturbed 25 years ago, having been drained two or three years previously. Great loss arises from being behind with one's work. Steam-cultivators hired or bought will remedy this evil. As we double-plough or trench-plough in the spring or summer, as soon as any ground is clear of Tares, &c., our horses have seldom much slack time. I observe by the committees' reports that steam-cultivation does not show equal results where the land has been previously deeply cultivated and well farmed. This is what might be expected.

Another reason why a steam cultivator on my farm would not pay, is that I have a fixed engine for grinding, threshing, chaff-cutting, root-pulping, cake-breaking, sack-lifting, pumping, and seed-crushing.

I see by the committees' reports that the price for hired steam cultivation is as follows:—Breaking up stubbles once, 12*s.*; with plough or digger, 17*s.* 6*d.*; the farmer finding coals, water-carting, and extra hands. In my neighbourhood the charge per acre is about 12*s.* for a single cultivation, or 20*s.* for a double cultivation, on the same field—besides coal, water-carting, &c. To this we should add the cost of several harrowings and rolling—before our seed-bed is complete.

My success as a farmer depends mainly on the fact that the farm has been put into a condition favourable for the employment of capital.

Although I strongly advocate very deep cultivation for roots or green crops, it is not desirable immediately preceding the Wheat sowing. *J. J. Mechi, Feb. 7.*

Home Correspondence.

Belgian Agriculture.—I have been over to France, and on my return my attention is called to the letter of Mr. T. Carroll, of Coalville, Leicester, which appeared in your columns on the 29th ult. I have read this and the former communication of that gentleman. With a great deal that is advanced by Mr. Carroll I cordially agree, so I will only take up one or two points. Mr. Carroll says that I "looked at everything agricultural from a stand-point rather English," without regarding "the circumstances which may have given existence to such systems." I suppose every one in forming a judgment is necessarily more or less influenced by his previous experience and pursuits, so that it is probable Mr. Carroll is not altogether wrong in bringing the charge; but I say on the other hand that I faithfully described what I had seen, and further I have given, both in my paper and in the appendix, a number of facts and opinions from eminent men long resident in Belgium. The agricultural papers in Belgium admit, moreover, that they cannot gainsay the shortcomings I pointed out in their farming. That Mr. Carroll's opinion should not exactly coincide with my own is not to be wondered at. He has a perfect right to draw different conclusions from his experience of Belgium, but Mr. Carroll has not attempted to prove that I have in any one particular misrepresented facts.—One word

on the main question raised—*la petite culture*. Mr. Carroll says that in conclusion I make "a rather awkward statement, and ask a not very logical question upon it," viz., "I have arrived at the conclusion that with the land cut up into small farms, a greater number of people can manage to live or exist upon it. The question then arises which is the more desirable state of things, a system under which the greatest population can subsist upon a given area, or a system upon which the greatest amount of food can be raised?" Mr. Carroll, although he very unnecessarily casts a sneer at "the bucolic mind," has altogether failed to grasp the obvious meaning of the very plain passage he quotes. In this I admitted the argument put forward by the advocates of *la petite culture*, that under such a system a larger population is maintained upon a given area, but by this I did not for a moment admit what Mr. Carroll concludes. He supposes that I intended to admit that the minute "subdivision of land is followed by an increase of its capability of supporting human beings." That is quite another point, and one I altogether deny. I maintain that on the small farms of Belgium and France the produce of both corn and meat is far below that of the large farms, and in this opinion I am fortified by Professor Voelcker and eminent landowners and agriculturists in Belgium and France. The minute subdivision of land, although it leads to high rents leads also to poverty, not only among those who farm the land, but to the deepest poverty among the class below—the peasantry. I believe that its general adoptipn in this country would prove most disastrous, and as so little stock is raised by these *petits cultivateurs* meat would soon be at famine prices. Our great population can be supplied with grain from every part of the world, but for its beef and mutton it is dependent upon a comparatively small area; hence it is a subject of the highest national importance that a system of farming should be pursued which leads to the greatest production of meat. *James Howard, Bedford, February 7.*

The Potato Plant.—Of late years a great deal has been done for the improvement of the Potato plant, and I believe no man has done so much as the late William Paterson, of Dundee, who devoted many years of his time and much of his means to that cause. By adopting his method of propagation, so simply shown forth by him in his report on the Potato plant, for which the Highland and Agricultural Society awarded him their gold medal, the Potato may still be kept amongst us as an article of food. Leaving out the numberless varieties of seedling Potatos he propagated and gave to the world, Paterson's Bovinia, or Cattle Feeder, at least deserves a few remarks. Messrs. Hooper & Co., of Covent Garden, London, say—"It is a gigantic Potato, extraordinary in its dimensions, a complete disease resister, and heaviest cropper known." I also add Mr. Wm. Paterson's report on his Cattle Feeder—"Taking Victoria and all the endless varieties of Potatos I have propagated, the so-named Bovinia, or cattle feeding Potato, brought out by me in 1864, and to be given out this season, is the most valuable tuber and most prolific of all my productions, and will be a most valuable boon to the nation." It is extraordinary in constitution, and vigorous enough to combat successfully both atmospheric and insectivorous adversaries, in fact a complete disease resister; a magnificent cropper, contains a large amount of farinaceous matter, and greatly supasses all former cattle feeding Potatos: being much less coarse in its nature it will keep good for 12 months, and is also excellent in the spring for table use. The enormous quantity of 20 tons per acre can be grown on land where "finger-and-toe" destroy the Turnips, also on land where Mangel cannot be profitably grown. With extra culture the quantity of 40 tons per acre have been grown [Where? and When? ED.], many of the tubers weighing from 1 lb. to 6 lb. weight. A fact worth knowing:—Care should be taken after lifting the "Bovinia," as well as all other seedling Potatos, after being pitted and properly covered with straw and a slight covering of earth, to allow the air to circulate freely through the pit sufficiently to dry them before covering them for the winter. The reason of this care is the enormous size of the tubers. Should the late William Paterson's system of Potato propagation be carried out, I would recommend it being done by some public body, as it is an experiment far too costly for an individual in ordinary circumstances, even when Potato-plum seed is now to be had in almost any district from Paterson's seedling Potatos. *X.*

The Treatment of Breeding Ewes.—In the *Agricultural Gazette* of January 22 appeared an article on the treatment of breeding ewes, during the time of their being in lamb, and a request was made that some of your correspondents would give your readers some account of their experience. I hoped to have seen in last week's issue that some able writer would have taken the matter up, but as no sign has been made, I venture to send you a short letter, describing the system I have adopted for the last 25 years, with my own flock, consisting usually of about 300 Lincoln ewes, 200 of which are generally shearlings, and the others 2-shear and older sheep. The plan that I adopt is by no means singular, in fact I may say that it is the ordinary practice of the flock-masters of the Isle of Ely. By referring to my farm diaries I find that for many years past I have always put the rams with the ewes the last week in September, and I invariably place each shearling ram with 80 ewes, and each 2-shear ram to not more than 60 ewes, but as the whole flock run together during the autumn and winter I cannot tell which ram is best. After these ovine Sultans have been with their Sultanas about five weeks the harem is broken up, and the ladies are distributed over the pastures for the winter, to the extent of about two to the acre; prior to this, however, they are all [subject to the process of being dressed with the mercurial ointment, which effectually kills the "tick" and makes the sheep rest easily throughout the winter and spring; the ointment also promotes the growth of the wool, and, provided the work is carefully performed, no fear of salivation need be apprehended. The plan I carry out with regard to this dressing is to have about 30 to 35 sheep brought up from the rest of the flock in the evening, and placed in a covered yard for the night (this shelter helps to dry the wool) for the man to dress the following day. The wool is parted along each side of the back, avoiding the centre, as, if wet weather follows the operation of smearing, the rain falls upon the parted surface, and the animal is very liable to take cold, and ill effects will follow; also along each side across the ribs, and again on each side about 6 or 8 inches lower down, and one long seam from the collar over the breast, along the belly to the paps, then down each shoulder and thigh—the ointment being smeared all along the various partings as they are separated, to the extent of about 1 lb. to six sheep. When the shepherd has finished his day's work the sheep are returned to their former pasture, for I believe it is highly imprudent to change the food of the animals directly after the application of the ointment; and I have heard of a case in which a number of sheep thus dressed were driven from Grass to a piece of wet Coleseed, and nearly the whole flock died—in my opinion, merely from the change of diet and the damp lair. The sheep remain on Grass up to the time of their lambing, receiving no corn or artificial food unless the snow falls heavily, and then hay is taken to them daily until the weather is less inclement. During the lambing season, which with my flock generally lasts nearly a month, the shepherd and his "page" are constantly in attendance upon the ewes, the sheep being driven up every night to a large fold near the out-buildings, and as the lambs are dropped each ewe is driven under cover into small pens composed of four sheep "trays" or hurdles "wattled" with straw, and the lamb placed with her for about 24 hours, or until it can follow at the ewe's foot, the ewe receiving Mangels during the time she is shut up. In very bad weather the ewes receive a little gin with some laudanum in it as a cordial directly after lambing; and as the shepherd mixes the medicine himself, I generally find that there is an immense quantity of the spirit used at this time; but as the poor fellow and his boy are up nearly all night in the cold of early spring, I think this little self-indulgence is to be excused. By this time (the middle of March) the Grass should be growing, with plenty of which the ewes and lambs require no artificial food; in fact, I seldom or never use corn or cake for my flock. By this it will be seen I am rather old-fashioned in my notions, and by no means a "high" farmer; however, I have always managed to pay my debts in full, and can offer my friends a fair glass of wine "when they come my way," and these comforts are derived in a great measure from the money made by sheep breeding. *Nemesis, Feb. 1.*

Steam Cultivation: "G. A. H." and "Looker-on."—I am somewhat surprised, and not a little disappointed at the reply which "Looker-on" vouchsafed (p. 121) to my answer to his challenge, and I venture to think that some of your readers, too, will sympathise in my disappointment. I thought, and I have no doubt they thought, that I had met with some professional pugilist, who was quite determined to knock me into the middle of next week, for he told me, quite with the air of a practised bruiser, sure of his victim, that if I felt anxious for a little further discussion he would pay me the most polite and prompt attention. I accepted the challenge, a somewhat bold proceeding on my part, for there were two to one (and at that time I little knew "West Indian" was going to come up so usefully to the rescue, exposing several of "Looker-on's" fallacies, and retorting back upon him some of his own advice, which I had no space to attend to), but my acceptance of the challenge seemed to be the very last thing "Looker-on" looked for. Like Bob Acres, his valour forthwith oozed out at his fingers' ends, and, like a well-known and valiant knight, Sir Andrew Aguecheek, to whom he bears a very remarkable resemblance, he blurts out, "An I had known he was so cunning of fence, I had seen him hanged ere I had foughten him." It is a pity that "Looker-on" had not gauged his courage and his intellect more correctly before troubling you with his grand flourish of trumpets, and making you the bearer of a cartel which was to end in so ignominious a retreat. Where is that polite and prompt attention he promised me? Alas! two-thirds of a column on p. 121 is all he can show for it, and your readers can judge of its quality. To me it looks more like the rush of a bull at the red flag a matador holds up before him than the onset of the polite and valiant Paladin he professed to be. The first half of his letter might be summed up in three words, which he repeats I know not how often, "I deny it." He calls my definition of interest twaddle. But, instead of calling names, why does he not confute it, and point out to your readers the fallacies which make it twaddle? He tells me I have not denied a single proposition he has made. So, lest there might be anything I had overlooked, I went back and read his previous letter over very carefully, and I am sorry to say I cannot see a single proposition he has laid down which requires any attention from me except the one to which I have alluded, and which I fear I have answered only too soundly to meet his approval. Shall I repeat it to him? Here are his words:—"He ('G. A. H.') says, 'What have horses to do with the question?' I ('Looker-on') say they have a great deal to do with it, in the opinion of all practical men. Such persons when contemplating the introduction of steam-ploughing or cultivating on their farms will, as a matter of course, calculate whether they can dispense with any horses." This was what "Looker-on" said, and a very specious proposition it was, and very likely to mislead many a practical man who could not see through the sophistry of it, because it mixed up two questions together. I exposed the fallacy by a simple *reductio ad absurdum*, or, in plain English, by running it to a point that showed the utter absurdity of it. I gave the case, not of a farmer already at work with horses—which only confused the case—but of a farmer just going to begin, and who was free either to use or not to use a steam-plough as pleased him, and I called upon "Looker-on" to reply. But the polite and prompt attention I was promised only produces the following:—"'G. A. H.' winds up by putting a case, but it is such a case as never has been, nor is likely to be, reduced to practice. *I do not suppose any man will ever find heart so to do the work of another's farm.*" (The italics are mine). Now, let me tell "Looker-on" that within a radius of three miles around my farmyard I could find nearly two dozen small farmers, occupying from 5 to 30 acres of land, who keep no horse, and whose whole horse-work is done by their neighbours, and paid for at certain well understood rates, sometimes in money and sometimes in labour at sheep-shearing, or harvest, when labour is hard to get. Perhaps "Looker-on" will say these are mere cottars and not farmers; nevertheless they, as a general rule, are owners of their own little places, and grow their own little crops, and keep their cows and sheep, quite as well as their wealthier neighbours. Nay, more, I was about three months ago walking by one of these little places, and I pointed out to my companion the number of sheep and cattle upon it—and which both of us knew to be the usual stock kept on that place, which as to quality of land was scarcely equal to the average of my own farm; and I said if my land kept as much in proportion, I ought by the rule of three to have more than twice as much stock on it as I had. However, passing this by, let us admit that these are cottar farmers; well, I will give him another case. I myself for a year and a half worked a farm of 286a. 3r. 27p. of heavy clay land without a single horse of my own, or a single horse fed upon the farm. I hired my own horses, and ploughs, and implements from several neighbours, at so much per acre, and so much per day, according to the sort of work, and more than half that land was arable. Now then I have shown "Looker-on" that it is possible to meet with persons "who will find horses to do the work of another's farm" for hire. And therefore (as this was his only excuse for not replying) I now again call upon "Looker-on" to give me an answer to the case I put, and to the questions I asked in my first letter to him on page 84. If he fail to give me an answer, then I leave your readers to judge what is the reason of his silence, and, to use his own simile, to say which is the lion and which the unicorn. And if, failing to give me an answer, he also fails to admit he is unable to do so, I will take leave to tell him that he had better leave Mr. Smith in future to fight his own battles; for he is most assuredly the better and the pluckier swordsman of the two. *G. A. H.*

Farm Experiments.—There has been a great deal written lately, both interesting and uninteresting, about smashers, ridgers, &c., and likewise a good many instructive balance-sheets published—subjects of great moment to all farmers. But now I want to enlist the sympathy and aid of some of your correspondents in a subject less profitable, but perhaps equally amusing, namely, a series of experiments with different kinds of grain of the harvest of 1869, to ascertain the amount of vitality, &c. I have had in my possession for several years a small quantity of Wheat, and also of Oats and Barley, given me by Professor Oliver. The names of the different growers and the weights are attached. I should like to try them now, and keep a part for future trials, and I have sufficient to give a small portion of each to two or three others who would like to conduct an experiment with them. I purpose sowing a certain number of seeds of each kind, and registering the proportion that germinate, afterwards planting them out and watching the result; but as some have better opportunities, and are better qualified for the task than myself, I should be pleased if they would co-operate with me. Any suggestions, too, that may be offered regarding the best mode of procedure would be welcome. Any gentleman wishing to have seeds should apply to the Editors of this Paper, to whom I shall send what I have to spare. *H.* [Not yet received.]

Farmers' Clubs.

LONDON.

February 7: Grass-lands.—At the first monthly meeting of the Farmers' Club, the Chairman of the year, Mr. J. Howard, M.P., presiding, the question fixed for consideration was "Grass-land—when to be profitably broken up, and when more profitably kept in pasture;" the introducer being Mr. CLEMENT CADLE, of Gloucester. The following are extracts from the introductory paper:—

The subject has not been brought before the Club for 15 years, when Mr. J. Wood, of Ockley, Sussex, introduced, "The expediency of converting grass-land into tillage." The result of that meeting was that the following resolution was adopted, viz., "That this Club is of opinion that grass-land of fair quality will be found most profitable in that state, but that inferior pastures would yield more profit to the occupier, a greater rent to the landowner, and more food to the community, if converted into tillage." Mr. Wood, by very elaborate figures, showed the profits of plough land over those of Grass to be £1 18*s.* 9*d.* an acre per annum, and said that cattle may be profitably kept under cover; and in the course of the discussion Mr. Paine drew the line at 25*s.* per acre rent, under which value land might be profitably converted to tillage. In 1847 the subject was also before your Club, when it was introduced by Mr. Shaw, jun.; and the chairman, the late Mr. Fisher Hobbs, in opening the meeting, amongst other remarks, said:—"Amongst practical men there can, I think, be but one opinion of the importance of the subject. Those gentlemen who live in arable districts will agree with me that in travelling throughout the country we cannot but feel surprised at the vast extent of grass-land we see, in comparison with the arable land. The greater portion of the grass-land of this kingdom is moreover very badly managed. One-third of those grass-lands are of decidedly inferior quality, and might be advantageously broken up and converted into arable land, thereby employing more than double the number of labourers, producing more stock—that is to say, more beef and mutton—and at the same time go through its rotation in growing green crops." Mr. Shaw brought forward some very conclusive arguments in his paper, followed by a good discussion, in which the late Mr. Hudson stated that he had a good deal of experience, and that such land broken up would produce more beef and mutton in two years than it would as pasture in four. Mr. Turner also stated that he had broken up land that had produced more of the necessaries of life in three years than it had previously in 20 as pasture land. The following resolution was arrived at:—"That it is the opinion of this meeting that a large portion of the inferior grass-land of this country might be broken up and brought into cultivation to the advantage of the landlords, the cultivators, and the labourers of England, by greatly increasing the employment, food, and wealth of the kingdom." In 1846 the subject was also before the Club, introduced by the late Mr. R. Baker, of Writtle, when it was decided "that many descriptions of grass-land would be best brought into cultivation by the system of paring and burning, provided root crops be first taken; but upon the richer soils it is doubtful whether the object may not be effected by the ordinary method of cultivation." As will be gathered from the resolution, the paper and the discussion turned principally upon the best way of breaking the land up, but during the discussion Mr. Hobbs said he had a field for which he could afford to pay the landlord double rent, if allowed to break it up. I will now endeavour to give you my views, and it is with the desire and expectation of hearing your more experienced and practical opinions that I venture to address you this evening.

Lands most Profitable in Grass.—The class of land that may be most profitably kept in Grass is—first, the feeding or fattening lands, where cattle or sheep will become fat during the summer months without the aid of artificial food; secondly, where the grass-land is not more than one-fourth the area of the farm; thirdly, stiff heavy soils that will not carry sheep to consume the roots on the land if converted to arable; fourthly, some of the shallow pasture land having only a few inches of soil; and, fifthly, those hilly fields that would be so expensive to work as tillage.

(1). The feeding and fatting lands, where cattle and sheep will become fat during the summer months, without the aid of corn or artificial food. This class of land is no doubt the most profitable that a farmer can have, as it yields him a greater return, with less trouble and expense. It is more sought after, and commands a higher rent than any other class of land similarly situated, and therefore I would not propose breaking it up; but a good deal may be done in the way of its improvement. Perhaps the greatest evil this class of land (taking all districts) has to contend with is floods; and, although much has been done by the passing of the Land Drainage Act (1861), which enables landowners to combine together to remove water-wheels and other obstructions to the free passage of the water, and the land on streams and rivers had been improved thereby, still we want more facilities to be given, so that it may become more general. Drainage is also a means of great improvement, although much care must often be exercised not to over-drain it—it is sufficient to remove the stagnant water. It is not requisite to dry it quickly, as in the case of arable land; therefore the deeper the drains, and the wider apart they are—provided the stagnant water is removed—the better. Many thousands of acres of this class of land have not been drained for want of an outfall; but this can now be generally provided, as far as adjoining proprietors are concerned; and where sufficient fall is not supposed to exist, on careful examination more is often obtainable than was thought possible to be got. Where the expense is too great to remove mills, the land above might often be underdrained, and arrangements made for a portion of the water-power to be used in pumping such under-drained land. Irrigation may also sometimes be adopted for improving this class of land, and many other modes, which would extend my paper to too great a length, if entered into, such as renovating with fresh Grass seeds, manuring, &c.

(2). Where the grass-land is not more than one-fourth the area of the farm. Here a good deal of caution is requisite before coming to the conclusion that any may be profitably broken up, although in some cases it may. I should prefer in this case to try and improve it in its present state by manuring, renovating with fresh Grass seeds, consuming roots upon it, irrigation, and other modes of treatment, but in some places the land is so light, and has such a tendency to grow Couch-grass, that even this small portion of Grass may be reduced with profit. One of the best ways of improving meadow land is to haul the roots and fold the sheep upon the meadows, in the same way as the arable land farmer would upon his tillage, giving them a fresh pen every day. By this means the meadows will be regularly dressed, instead of the sheep lying on those portions of the field that least require dressing, or in a road or some old hedgerow. This, with the consumption of plenty of corn or oilcake, is a certain way of improving meadow land. If straw is plentiful, it may be cut into short litter, and strewed about the pen each day, when it will be trodden into the land by the sheep; and if by this means the arable land is robbed of some of its manure, the increase in the hay crop will more than counterbalance it.

(3). Stiff heavy soils that will not carry sheep to consume the roots on the land if converted to arable. It is not desirable to break up and convert to arable this class of land, except under particular circumstances; and sometimes it may be more profitably managed by a medium course of treatment, such as I will notice presently. Of course the great drawback to stiff, heavy soils is that you are so dependant on season for working the land to the best advantage; and if you grow much of that improving crop —roots, you have such difficulty and expense in hauling off the roots that it makes a material difference—so much so, that I should recommend trying to improve it as meadow land. Some fields of this class can be profitably broken up (if very well adapted) for Wheat and Beans, and also growing good Mangels. The consumption of roots as before mentioned, renovating with fresh Grass seeds, boning, and other manuring may be adopted to improve it. Another mode is planting Apple and Pear trees; for, if the farmer could manufacture the materials he produces without restriction (sugar and spirits, for instance), a new era would dawn upon this class of pasture land. It appears to me that sugar can in no way be so cheaply produced in this country as upon the Apple or Pear tree. No seeding, hoeing, ploughing, manuring, &c., is required as in growing Beet; the only expense is to plant the trees and pick the fruit. The principal drawback is that you cannot insure a crop every year; but 10 or 12 tons of Apples to the acre are no uncommon crop, and the value of these fruits are continually increasing, in consequence of the demand in the manufacturing districts.

(4). Some of the shallow soils having only a few inches of soil. A good deal of the Down land comes under this head, and of this class of land I cannot say I have had much experience; but of course if only 3 or 4 inches of soil are available, it is useless to attempt to make good tillage, although some of these light soils make very fair Turnip and Barley land, as on the oolite (Cotswold Hills), for instance; and here the preferable system seems to be to lay it down to Sainfoin for a term of years, and the quantity of Sainfoin hay sometimes produced per acre is astonishing.

(5). Those hilly fields that would be so expensive to work as tillage. I have a good deal of experience as to the expense of working hilly arable land, and my belief is, that the difference in the expense is never estimated high enough, for besides the extra labour to the horses, you cannot get anything like the quantity of work of any kind done as you can where the land is level, especially in ploughing, hauling on manure, couching, and cleaning the land; but circumstances often do arise where this hilly land is so poor and bad that something must be done, and I will not take upon myself to say it may not sometimes be profitably broken up, especially where the larger proportion of the farm is pasture, but in all probability the medium course is preferable.

Lands most Profitable as Arable.—The following may be enumerated as the most important sorts of land that may be profitably broken up:—1st. The high and dry land that will carry sheep well, especially where the pasture land is more than half the area of the farm. 2d. Where the pasture exceeds one-third or one-fourth the area of the farm. 3d. The alluvial deposits or loamy soils by the river and brook sides, where the stream runs so rapidly that in the formation of the land only the coarser sand and gravel is deposited, and consequently the finer particles of clay, so necessary to make up a good fatting soil, are taken on by the floods to a more level space. 4th. Some of the loamy soils that will not carry sheep, where the land is convenient for buildings, and the pasture exceeds half or one-third the area of the farm. 5th. The clay lands that will not carry sheep, but, when drained, grow the best of roots and plentiful crops of corn, and where the pasture exceeds half the farm.

(1). The first on the list of pasture lands that may be profitably broken up is the high and dry inferior pasture land that will carry sheep well, especially where the pasture land exceeds half the area of the farm. Here much of the class of pasture is poor and dry, and principally grazed with sheep, which bite the few fine Grasses so closely that they are gradually lost, and from its tendency to grow Couch-grass the grazing with sheep increases this tendency and thus retards improvement, as they do not like to eat it unless it is kept very closely grazed, consequently it gradually kills the finer Grasses. This is the class of land that may be most profitably converted to tillage, for roots can be grown and consumed on the land, and 1 acre of roots and 1 acre of Clover or seeds, with the Wheat and Barley straw, supposing it to be farmed on the four-course system, will keep a good deal more stock than 4 acres of the original pasture, and surely the acre of Wheat and the acre of Barley will pay for extra labour and capital. If the pasture land is one half the area of the farm, there can be no question as to the desirability of breaking up, especially as the roots can be consumed on the land by sheep.

(2). Where the pasture land exceeds one-third or one-fourth only of the area of the farm. Here a little more consideration is necessary, for I consider one-third pasture to two-thirds tillage the most advantageous proportions to make the most of a farm. Still there are many cases that have come under my notice where even if only one quarter of the farm is pasture, some of that quarter may very profitably be converted, if the land is very good for growing roots and corn and bad for Grass. Where sheep are the principal stock kept, there is not the necessity for so much pasture, as they can be kept in the summer on the Clover and artificial Grasses eked out as their keep now is by Mangels, corn, and Cabbage during the summer months.

(3). The alluvial deposits or loamy soils of the river and brook sides, where the stream runs so rapidly that in the formation of the land only the coarser sand and gravel is deposited, and consequently the finer particles of clay so necessary to make up a good fatting soil are taken on by the floods to a more level place. I have had some experience of this class of land, and where it is not very liable to floods it makes some of the best tillage obtainable. On the banks of the river Wye, which is a very rapid river, there is a good deal of this class of land, especially between Hereford and Ross, combining all the requirements for growing corn and keeping sheep, but which will not fat cattle, and would be doubled in value by being converted into arable land. Since writing the above, I am informed that a large landed proprietor, below Hereford, is extensively breaking up exactly the class of land to which I am alluding, but, I believe, more with the view of laying down again than as making tillage.

(4). Some of the loamy soils that will not carry sheep, where the land is conveniently situated near buildings, and the pasture exceeds one-half or one-third the area of the farm. This is a little different from the last class of land, inasmuch as the farmer has the expense of carting off the roots; still, under the circumstances mentioned above as to buildings and with a sufficiency left, some of the pasture may be profitably broken up to tillage, but more care is requisite than in the former cases.

(5). The clay lands that will not carry sheep, but when drained grow the best of roots and plentiful crops of corn, and where the pasture exceeds one-half the farm. This is the most difficult class to define, as to converting it into tillage for a permanency or not; still, if the pasture exceeds one-half the farm, it may often be profitably done where it is well adapted for stock and convenient to the homestead, and a further advantage may be gained by breaking some up and growing roots, these roots to be taken and consumed by sheep on the other pasture land.

Having now disposed of the land that may not be broken up, as also that which may be profitably converted into tillage, I come to a very large class of land that has been to some extent passed over—viz., the poor heavy clay pasture, Down lands, hilly and mountainous tracts of land, and numerous other lands that will suggest itself to your minds that is not first-class for growing corn, and still may be made to produce greatly increased crops of Grass by the medium course already alluded to, which is its being simply broken up to tillage for two or three years, and relaid to Grass. The great drawback to this not being more successfully carried out than it is at present is, that sufficient attention is not paid to the selection of those Grass seeds suitable for the locality, and other circumstances attendant on the case, and also to the fact that Grass seed is not put on in sufficient quantity; for we not only want to get a plant for stock, but a very thick one, if you want to get the full benefit the land is capable of producing, and I have never yet seen a fresh land pasture field too thick. Instances have come under my notice of land, laid down to Grass in April, cutting more than a ton of hay an acre in September.

Treatment of Newly Broken-up Grass.—Before concluding my paper, I will refer to one subject that you will, no doubt, have observed that I have scarcely touched upon, and that is, how the land should be treated in breaking up. A few years ago I should have had no hesitation in giving my opinion on the course to be pursued; but having been since engaged in making a detailed valuation of the Clun Union, in Shropshire, consisting of some 85,000 acres, 15,000 to 20,000 acres of which has probably been enclosed within the last 20 years, I had special opportunities of witnessing a great variety of ways in which this land was treated in being broken up to tillage, and when I saw that the owners of, perhaps, three adjoining fields would each adopt a different course, I came to the conclusion that no one system could be much better than another as to be indiscriminately recommended. There are three common modes of treatment, and it must be left to the farmer himself to decide which he considers best for his particular case:—1st. To breast plough and pare and burn,

2d. To pare and store the turf up in heaps to rot. 3d. To double plough. Where the land is very spongy, and infested with insects, perhaps the first is preferable, especially if there is any difficulty in getting it firm enough to grow Wheat; but as by this means you lose vegetable matters, if you can do without the burning it is better, while if stored in heaps you always have a reserve of manure either for that field or any other; but at the same time there is the expense in both these systems, which is considerable. The first seems to be preferable on the oolite and lias formation; on the latter, especially, is burning to be recommended. Mr. Randell, of Chadbury, near Eversham, has done wonders with his arable land by burning it, but on the sandy and lighter soils burning would no doubt be wrong. Whatever system is adopted it will almost always be necessary to lime heavily with fresh quicklime, for old turf appears to get in a kind of acid state, and these acids sometimes require neutralising before the land will grow corn well. Mustard and Rape, seeded on newly broken up land, I have seen recommended, but as I have had no experience in this, perhaps some gentleman who has will give us the result. I will now conclude, as I have given you the class of land that ought not to be broken up, that which may be, and also a medium course, which I believe might be very often profitably adopted on each class of land, and be the means of doubling the increase of food now obtained from much of the inferior pasture even on hill and mountain land, and which I have every confidence in recommending to your notice from what has come immediately under my own observation; and if from our discussion to-night we can show that even one-half the 22,000,000 acres of grass-land in Great Britain and Ireland can be improved to the extent of 10s. per acre per annum, we prove that a saving would be effected to the country equal to £5,500,000 every year; and therefore I think our labours will not have been in vain.

Farm Memoranda.

WEST SUSSEX: *February 7.*—The winter season is passing away, and has upon the whole been mild. The root crops are lasting out well, and the hay ricks are looking better than we could have expected. We have not till now had much rain, though generally damp, but now we have had 24 hours' steady downfall, and the ditches and drains run full, and it will be some time before the land can be worked, and we are getting rather behind; Peas and Beans ought to be in, but must wait a few days longer.

The most forward of the down ewes have now lambed, and upon the whole the crop of lambs has been good, and the flocks are healthy. There have been a good many couples sold in our market at about the usual prices, or perhaps rather higher, and all stock sheep are very dear, but in good supply, and the best mutton sells at about 6*s.* per stone, while beef is scarce and dear. The foot-and-mouth disease has been rather prevalent, but is now nearly gone; great precautions were taken to ward it off for a time, with partial success, but complaints were made that the expense of doing so was too much, so official inspection was put a stop to, perhaps not the most judicious thing to do, but no harm has yet happened on that account, and, as there is still a danger in bringing diseased stock to the market, no one is likely to do so knowingly. But it is a pity that cattle dealers do not give their cattle a little more time on the road, and a little better treatment, as they would come to market in better order than they do, would fetch more money, and be worth much more to the buyer, as they take about a fortnight to get into a healthy state after travelling so much; and should any of them get unwell when in so weak a state, there is a great chance of losing them. We had the condition of lean stock much better after the cattle plague than for many years before, and I have no doubt they gave more satisfaction to both buyers and sellers then. There is very little now doing upon the farm except top-dressing pastures and ploughing when the weather permits, but we hope soon to get a little more forward.

There is a very large supply of Wheat and other corn in our market, and, as everywhere else, it is a dull sale; and though the crop has been good in some places, in others there is a deficiency, and the farmer is not likely to reap a very large profit this year.

There are a great many hands unemployed, and so the rates are heavy, but not quite so high as last winter; but as we hardly ever find good hands out of work, it follows that the character and abilities of the working classes would pay for being improved, and we hope that the legislation now in view may have that effect. *G. S.*

The Week's Work.

FEBRUARY 12.—*Autumn Wheats.*—In early spring it may be well to fill up blanks in the Wheat field, taking care to leave the newly-sown seed in a proper seed-bed for brairding vigorously. Now also, except in frost and snow, is a good time for sowing guano, or any of the salts of ammonia, &c., should the land require manuring. Some prefer delaying the application of spring fertilisers to the time of hoeing; but the hoes will do no harm, and if the plants require food, the sooner they get it the better, for the Wheat ear is formed at a very early period of life. If grub appears, sow salt liberally.

A proper Seed-bed is the "watchword" of the farmer at this season, and "early to bed and early to rise" his "sheet anchor," without which it is hopeless to carry on high farming successfully in our fickle climate. It is certainly interesting to contemplate how the land under steam tillage and artificial manuring is influenced by the ups and downs of the barometer, but if the seed can be got into the land so as to come away evenly, healthy, and strong, but not over-proud, the rest may be left to Nature and the coming months.

Thick and Thin Seeding is one of the controversial topics of the season, but if farmers would study and test the vitality of their seed, the philosophy of a good seed-bed, and the arithmetic of their bushel and broad acres, the equinoctial gales so common would be hushed into a calm. The number of seeds vary—for easy calculation say 500,000 is a bushel of Wheat, which at 2 bushels of seed per acre would give 1,000,000 plants, if they all sprout and grow. There are 6,272,640 square inches and 43,560 square feet in an acre. Throwing aside the odd 272,640 square inches, this would give one plant to every 6 square inches, or 24 plants to every square foot, thick seeding. But if half the seed is dead, and if half the plants from the remainder are sickly and die after brairding, what is the difference between thick and thin seeding? Obviously bad seed, with perhaps a worse seed-bed at this season!

Clumping Turnips, to clear the land for Wheat, Barley, or Oats, is an important work, seldom done in our southern districts, but it is common in the North, where more difficulty is experienced in storing before winter. The present severe weather indicates the need of the work. The Turnips as they are pulled are thrown into carts with as little earth as possible. They are next planted on some piece of Grass or stubble land near the homestead, very often in the empty part of the stackyard, as close to each other as they can be placed, the roots on the ground and the green tops uppermost, which form a close covering sufficient to protect the bulbs from the weather. Set the large bulbs first, and then place the smaller ones above and between them so as to make a close thick covering of green top. In this way a large field of Turnips may be stored on a small area of land, and warm growing weather is more to be dreaded than frost and snow. Should the large bulbs offer to run to seed, begin at the side you left off planting, and replant, tailing the roots, this time to check vegetation.

Storing Turnips may be done in early spring as in autumn, when they begin to run to seed. The operation in the latter case is the same as in the former, and it should be done the moment an exuberant vegetation commences; and as a healthy growth is the index of sound roots, dead ones should be thrown aside for immediate use. This mode of storing is to be preferred to that of clumping—for green top at this season is produced chiefly at the expense of the bulbs; and this is not all, for unless clumped Turnips are very carefully cleaned, the half-rotten and etiolated tops and tails prove bad physic for the cattle, which practically means that you should top and tail close the greater part of the clumped roots. In wet, soft, but growing weather, when carting would do harm to the land, some open up a narrow trench with a double turn of the plough, top and tail the Turnips into the bottom of the trench, and then cover with another turn of the plough. This way growth is checked, and the bulbs preserved for the time being, and carted home when the land dries; others cut off the tops close with a scythe, but although this is soon done, it is but a penny-wise expedient. If the land at the time is too soft for carting, the better plan is to top and tail, and with baskets collect into heaps of a cart-load each, then cover with earth, and cart home when the land dries.

Milch Cows, whether newly calved or heavy in calf, require careful attention to their respective wants. It is an old saying and a true one, that "a good milch cow is never dry; for when she ceases to fill the pail it is that she may supply the wants of her calf," and the truth of the adage should be practically exemplified just now; the plain truth is simply this, that the cow should be as well fed, and kept in as good condition when she is supplying her calf, as when she is filling the pail. Milk and butter dairymen, who have to supply large towns daily all the year round require to keep their cows accordingly, some going dry while others are coming into milk—the calves being fattened for the shambles with the exception of animals of promise, kept on for breeding and milk. Cows require a larger proportion of roots than fattening cattle, and steamed roots, mashed with chaff and meal, is generally considered to yield a richer quality of milk and better flavoured than pulped roots. Cabbage and Gorse are fine cow feed; but sewage Grass, and the early cuttings of other forage plants, are far better, and should always be used as soon as they can be had.

Cattle of all sorts continue to require the most vigilant attention. The increase of light and temperature gives a stimulus to animal life, bone, nerve, and muscle, so that care requires to be taken that the daily demands of each find a suitable supply in the food consumed, otherwise the upshot will be unfavourable. None of our domesticated animals enjoy more the invigorating influence of the lengthening day than the pigs and poultry. If neglected hitherto lice begin to grow amazingly, a perfect torment to animals of all kinds, pigs and poultry not excepted. Various washes have been proposed, but the best is an improved diet with the free use of the currycomb and brush. Keep fattening sheep-pens dry. Give an increase of cake, corn, and hay-chaff to sheepfolds as they require it. In wet seasons sheepfolding is a barbarous practice, and should be given up for pens under cover. *W. B.*

Notices to Correspondents.

FRAMLINGHAM FARMERS' CLUB: *Farm Capital.* The discussion reported at p. 155 as having taken place at Lavenham, really took place after Mr. Mechi's paper *here.* Lavenham was printed accidentally instead of Framlingham.

TREATMENT OF EWES: *G J M.* Article received, and appears in another page.

Markets.

ENGLISH WOOL.

CURRENT PRICES OF ENGLISH WOOL. Per lb.—

	s. d.	*s. d.*
FLEECES—Southdown hoggets	1 1 to 1	2
Half bred ditto	1 2 — 1	2½
Kent Fleeces	1 3 — 1	4
Southdown ewes and wethers	0 0½ — 1	1
Leicester ditto	1 2 — 1	3
SORTS—Clothing	0 10 — 1	6
Combing	1 0 — 1	8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, February 10.

Prime Meadow Hay	75*s.* to 80*s.*		Clover, old	..	115*s.* to 120*s.*
Inferior do.	 60	70	Inferior do.	..	100 110
Kowen	 50	65	Prime 2d cut	..	100 110
Inferior do.	.. .. —	—	Inferior do.	.. ..	80 90
Straw	 26	30	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, February 10.

Sup. Meadow Hay	84*s.* to 90*s.*		Inferior Clover	..	86*s.* to 105*s.*
Inferior do.	 70	76	New do.	.. ..	— —
New do.	.. .. —	—	Straw	.. ..	32 36
Superior Clover	.. 120	130	JOSHUA PARKER.		

WHITECHAPEL, Thursday, February 10.

Fine Meadow Hay	72*s.* to 78*s.*		Prime old Clover	..	122*s.* to 128*s*
Inferior do.	 60	70	Inferior do. do.	..	95 105
Prime New Hay	.. —	—	Prime 2d cut do.	..	— —
Inferior	.. .. —	—	New Clover	..	105 112
Straw	 24	28	Inferior do.	.. ..	90 100

HOPS.

BOROUGH MARKET, February 11.

Messrs. Pattenden & Smith report a continued steady demand for all descriptions, late quotations being fully maintained. Yearlings have been rather more inquired after this week, but prices remain nominally unchanged.

COALS.—February 9.

Holywell Main, 15*s.* 3*d.*—Ships at market, 8; sold, 7; at sea, 20.

METROPOLITAN MEAT MARKET.—Feb. 11.

Best Fresh Butter .. .. .. 19*s.* per dozen lb
Second do. do. .. .. .. 16*s.*
Small Pork, 5*s.* 0*d.* to 5*s.* 8*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 8*d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, February 7.

Although we have a very short supply of Beasts, trade is in such a depressed state they cannot all be sold; in the early morning a few choicest descriptions were fairly sold, but prices soon declined, and on the average they are no better. The number of Sheep is about the same as last week, and there is scarcely any alteration in the trade. Calves are lower. Our foreign supply consists of 675 Beasts, 6860 Sheep, and 92 Calves; from Scotland, there are 195 Beasts; from Ireland, 301; from Norfolk and Suffolk, 1020; and 564 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5 0 to 5	2	Best Long-wools	5 4 to 5	6
Best Shorthorns	4 8	4 10	Do. Shorn	.. —	.. —
2d quality Beasts	3 0 — 3	6	Ewes & 2d quality	3 8 — 4	8
Best Downs and Half-breds	5 8	6 0	Do. Shorn	.. —	.. —
Do. Shorn	.. —	.. —	Lambs	.. —	.. —
			Calves	3 6 — 5	8
			Pigs	4 0 — 6	0

Beasts, 2755. Sheep and Lambs, 19,775; Calves, 95; Pigs, 100.

THURSDAY, February 10.

We are but moderately supplied with Beasts, and the weather is very favourable for slaughtering; the choicest qualities are readily disposed of, at fully Monday's quotations, and a fair clearance is effected. The number of Sheep is small; there is a good demand for them, and in a few instances prices are rather better. Choice Calves are very scarce, and much dearer. Our foreign supply consists of 114 Beasts, 1090 Sheep, and 105 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c	5 0 to 5	2	Best Long-wools	5 4 to 5	8
Best Shorthorns	4 8 — 4	10	Do. Shorn	.. —	.. —
2d quality Beasts	3 0 — 3	6	Ewes & 2d quality	3 8 — 5	0
Best Downs and Half-breds	5 8 — 6	0	Do. Shorn	.. —	.. —
Do. Shorn	.. ..	..	Lambs	.. —	.. —
			Calves	3 8 — 6	4
			Pigs	4 0 — 6	0

Beasts, 831; Sheep and Lambs, 4505; Calves, 130; Pigs, 15.

MARK LANE.

MONDAY, February 7.

There was a short supply of English Wheat to this morning's market, mostly out of condition, and sales

could only be effected at a reduction of 2s. per qr. upon the prices of this day se'nnight. For foreign there was a limited inquiry only, and the business done was in retail, at a decline of 1s. to 2s. per qr. Barley and Peas were 1s. per qr. cheaper. The Oat trade was dull, and prices must be quoted 6d. to 1s. per qr. lower. Flour was sold at a reduction of 6d. per barrel and 1s. per sack.

PRICE PER IMPERIAL QUARTER.	s. d.		s. d.
WHEAT, Essex, Kent, Suffolk. White	37—47	Red.....	34—46
— — fine selected runs..do.	39—51	Red.....	37—48
— — Talavera	54—56		
— — Norfolk	—	Red.....	—
— — Foreign	38—53		
BARLEY, grind. & dist. 36 to 39s. . Chev.	39—42	Malting ..	34—38
— Foreign .. grinding and distilling	22—25	Malting ..	30—40
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire.. Potato	24—26	Feed	—
— Irish ..... Potato	23—25	Feed	21—24
— Foreign .....Poland and Brew	21—24	Feed	19—21
RYE	32—38	Foreign ..	33—36
RYE-MEAL, Foreign	—		
BEANS, Mazagan.... 29s. to 37s. Tick	31—49	Harrow ..	31—49
— Pigeon ....50s. to 56s. . Winds.	—	Longpod. .	—
— Foreign..... Small	41—43	Egyptian ..	38—40
PEAS, White, Essex, and Kent.. Boilers	32—42	Suffolk ..	35—43
— Maple, 41s. to 45s. .....Grey	32—42	Foreign ..	33—37
MAIZE	—	Foreign ..	29—31
FLOUR, best marks delivered.. per sack	39—43		
— 2d ditto ..... ditto	38—40	Country ..	38—40
— Foreign ..... per barrel	22—25	Per sack..	29—55

FRIDAY, February 11.

Up to the 9th inst. the weather continued mild and wet, but on that day frost returned, and has since continued. During the past week the trade has been lifeless, and where sales of Wheat were pressed holders had to submit to a decline of 1s. per qr. on foreign Wheat, and 1s. to 2s. per qr. on home-grown throughout the markets of the kingdom, the condition of our new Wheats being much complained of. Birmingham reports of yesterday advise rather more firmness. Excepting a few of the Scotch markets, where former values were slightly exceeded for Barley, this article has been neglected, and prices were 1s. per qr. lower in most of the east coast ports. Oats moved off slowly with prices against sellers. Beans and Peas declined 1s. to 2s. per qr. in the early part of the past week, but the return of frost seems to harden prices again. Flour was written 6d. per barrel and 1s. per sack cheaper. Since Friday last 1857 grain and seed laden vessels arrived off the coast, of which, with those left over from last week, there remained for sale last night 130 cargoes. The floating trade, in spite of large arrivals, has been steady during the past week, the business done in Wheat off the coast was on a fair scale at improving rates; Maize and Rye participated in the better tone, but Barley was neglected and cheaper to sell.

The arrivals of grain during this week of both English and foreign have been very small. There was a poor attendance at this morning's market, but the English Wheat on sale was taken readily at Monday's quotations, and the business done in foreign was at the extreme prices of that day. Barley, Beans, and Peas were unchanged in value, but Oats brought rather more money.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs	Qrs.	Sacks.
English ..	1440	1020	—	—
Irish ..	—	—	—	—
Foreign ..	5200	2180	8460	230 (4070 brls
	6640	4137	8460	

LIVERPOOL, Feb. 8.—There was a fair attendance today. Wheat in moderate consumptive demand, at about Friday's rates. Flour very dull and drooping. Indian Corn in limited demand, at about 3d. to 6d. decline. Oats and Oatmeal dull. Peas inactive. Beans slow.

AVERAGES.

	Wheat.	Barley.	Oats.
Jan. 1	43s 8d	35s 9d	20s 10d
— 8	44 5	35 11	20 1
— 15	44 1	36 4	21 4
— 22	43 6	35 2	20 10
— 29	42 8	35 7	20 4
Feb. 5	42 2	35 3	20 8
Average	43 5	35 10	20 8

SEED MARKET.

We have a slightly improved inquiry for Clover seeds, but, considering the time of year, the business done has been somewhat limited, the majority of the country dealers having apparently resolved to defer their purchases until the consumptive demand has actually arisen; the weather has moreover been very unfavourable. The inactivity which has now so long characterised our seed markets is, we believe, attributable to a great extent to the long-continued and unprecedented depression in the grain trade, with which the seed trade is closely allied. The corn business has now for some months been so thoroughly bad, that buyers seem quite disheartened, not to say disgusted, and consequently men who used in former years to buy five or ten tons of seed at a time will now, even if they buy at all, take only one or two. The impression, nevertheless, prevails, that there must be a great demand this season for agricultural seeds, and this opinion gains strength from the general determination at which farmers have arrived, owing to the unprofitable and low prices now current for grain, to have less land in Wheat, and more in seed and pasture. Mustard and Rape seed continue to advance in value. We have quite a revived demand for winter Tares; these are selling on our market at from 8s. to 10s. per bushel; Koenigsburg spring Tares having become scarce, and being in better request, must be noted fully 2s. per qr. dearer; foreign Italian is quoted 1s. per bale higher. In other things we have no change to report.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

Suttons' Home-grown Seeds.

SEEDS DIRECT FROM THE GROWERS, THE — BEST MEANS OF PREVENTING DISAPPOINTMENT

SEEDSMEN TO THE QUEEN.

SUTTONS' COMPLETE COLLECTIONS for the FLOWER and KITCHEN GARDEN, carriage free.

FOR THE KITCHEN GARDEN.

No 1 COLLECTION, for a large Garden, Carriage Free	£3	3	0
No 2 COLLECTION, for medium sized do., Carriage Free	2	2	0
No 3 COLLECTION, for medium sized do., Carriage Free	1	11	6
No 4 COLLECTION, for an ordinary sized do., Carriage Free	1	1	0
No 5 COLLECTION, for a small do., Carriage Free..	0	15	0
No 6 COLLECTION, for a very small do.	0	12	6

FOR THE FLOWER GARDEN.

No 1 COLLECTION, Free by Post or Rail	£2	2	0
No 2 COLLECTION, Free by Post or Rail	1	11	6
No 3 COLLECTION, Free by Post or Rail	1	1	0
No 4 COLLECTION, Free by Post or Rail	0	15	0
No 5 COLLECTION, Free by Post or Rail	0	10	6

Particulars of the above Collections may be had on application, and any articles not required will be excluded, and others included according to the wish of the purchaser

Priced LISTS of Garden Seeds, Grass Seeds, and Farm Seeds, post free on application

SUTTON and SONS, Seedsmen to the Queen, Reading, Berks.

Special.—To the Trade.

THE UNDERSIGNED can offer to the Trade, at very moderate prices, the following SEEDS of CROP 1869; all saved from true stocks, carefully selected, and specially grown for seed:—

PEAS—Champion of England.
" Advancer.
" Climax.
" Eugénie, or Alliance.
" Harrison's Perfection.
" McLean's Wonderful.
" Princess of Wales.
ONION—Brown Globe
" White Globe.
" White Spanish.
LEEK—Musselburgh, true Scotch stock.
MANGEL WURZEL—Orange Globe.
" Oval or Intermediate.
" Elvetham Long Red.
TURNIP—Bangholm Purple-top Swede
" Skirving's Purple-top Swede.
" Westbury Purple-top Swede.
" Improved Green Globe
" Dunfermain White Globe
" Aberdeen Green-top Yellow
" Bullock Purple-top Yellow
" Osterton Hybrid, extra fine
" Quotations on application.

MITCHELL, ARNOTT, AND CO., 59, Mark Lane, London, E.C.; 3, South Hanover Street, Edinburgh.

RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds. Carriage free

Peas—The Earliest, 1 quart.
Princess Royal, 1 pint.
Sangsters' No. 1, 1 pint
Prizetaker, 1 pint
Advancer, 1 pint
Blue Scimetar, 1 pint
Veitch's Perfection, 1 pint.
Harrison's Glory, 1 pint.
Beans—Taylor's Imperial Windsor, 1 pint
Early Longpod, 1 pint
Johnson's Wonderful, 1 pint.
Green Windsor, 1 pint
Royal Cluster, 1 pint
French Dwarf, 1 pint
Scarlet Runners, 1 pint.
Beet—Nutting's fine Red, 1 oz
Borecole—New Hardy Green, packet
Scotch Curled, packet
Brussels Sprouts, finest, packet
Broccoli—Early white, packet.
Purple Sprouting, packet
Walcheren, packet
Worcester, late white, packet.
Cabbage—Early Nonpareil, pkt.
Worcester Incomparable, pkt.
Wheeler's Imperial, packet.
Red Dutch, packet.
Curled Savoy, packet.
Carrot—Early Scarlet Horn, 1 oz.
James's Intermediate, 1 oz
Imperial Altringham, 1 oz
Cauliflower—Early London, pkt.
Celery—Incomparable white, pkt
Fine Giant Red, packet
Cress—Australian, 1 oz.
Plain, 4 oz.
Cucumber—Smith's fine Frame, packet
Stockwood Ridge, packet
Endive—French Curled, packet.
Leek—Musselburgh, packet
Lettuce—Champion Cabbage, packet
Paris White Cos, packet.
Bath Cos, packet
Drumhead, packet.
Mustard—White, 4 oz
Melon—Those kind, packet
Onion—Reading or Spanish, 1 oz
James's Keeping, 1 oz.
Blood Red, 1 oz
Silver Skinned, 1 oz.
Parsley—Double crowned, 1 oz
Parsley—Fine Garnishing, per pkt
Radish—Wood's Early Frame, 2oz
Early Scarlet, 2 oz.
Turnip, mixed, 2 oz.
Spinach—Summer, 1 pint
Winter, 1 pint.
Turnip—Early Six-Weeks, 1 oz
Early Greentop, 1 oz
Orange Jelly, 1 oz.
Tomato—Large Red, packet
Vegetable Marrow, packet
Pot Herbs, 4 packets.

For large and small Collections and Prices of other Garden Seeds, see DESCRIPTIVE LIST, free on application to
RICHARD SMITH, Seed Merchant, Worcester.

New Golden Blossom Kidney Potato.

Very fine Flavour, excellent Cropper, a good Keeper

SUTTON AND SONS can supply the above new and distinct variety, having a peculiarly ornamental appearance when in bloom, at 4s. per peck, 14s. per bushel.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

Seed Potatos.

GEORGE SIBBALD, Drumgeath, by Dundee, has for Sale a large stock of the following kinds of his own growing, true to name:—Paterson's Victoria, Veitch's Early Rose, Ashton's, Early Oxford, Daintree's, Early Fluke Kidney, Royal Ashleaf Kidney, Myatt's Kidney, Sutton's Racehorse Kidney, Sutton's King of Kidneys, Early Rose Kidney, Mona's Pride Kidney, Sutton's Berkshire Kidney, Ashleaf Kidney, Early Red Kidney. Also about 4 cwt. superfine Early Dwarf York CABBAGE SEED.

Prices on application.

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford, Notts, and never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of August, it has the habit of keeping perfectly sound and fit for use until August in the following year.

OPINIONS OF THE PRESS.

"R Headley Your seedling Potato is were quite first-rate; white, mealy, and excellent flavour."—*Gardeners' Chronicle*, Oct 30, 1869.

"White Kidney. A very fine variety; a heavy cropper; uniform in size; ripening (if all at once quickly and completely; flesh yellowish, dry, mealy, and of excellent flavour. Having the variety crop was harvested July 14."—*Gardeners' Magazine*, Jan 30, 1869.

"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are like those also in flavour, but are more mealy."—*Journal of Horticulture*, Jan 13, 1870.

Price 5s. per peck. The usual discount to the Trade

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

BROCCOLI, ELLETSON'S NEW SURPRISE. Large late White Protecting.—A great improvement upon the Mammoth Cauliflower. Broccoli sent out 20 years ago by those eminent Market Gardeners, J & J Elletson, of Thorngumbald, who have for many years been so successful in the cultivation of Broccoli, and who by great industry have so far improved upon the old kind as to produce the above variety, which equals the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth Cauliflower was sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.

CUCUMBER, FOSTER'S XL, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet. Trade supplied

EDMUND PHILIP DIXON, the Yorkshire Seed Establishment 57, Queen Street, Hull.

For the Coming Season.

TO POTATO GROWERS.—For SALE, the following excellent varieties:—Rivers' Royal Ashleaf, Wheeler's Milky White, Paterson's Victoria, Suttons' Early Ten-week or Golden Globe, Walker's Regent, Early Shaw, Ox Noble, Red Rock, Dunbar Regent, Shepherd's Kidney, St. Anne or St. Agnes, a most productive round red Potato, from Cornwall. ESSEX RIVAL PEA, new Seed in any quantity.

The above have been selected with great care, and may be had in large or small quantities to suit purchasers. Prices on application to THOS. ELEY, Tower Mill, Side Hedingham.

To the Trade.

MONA'S PRIDE KIDNEY POTATO; about Two Tons of this excellent variety of Ashleaf Kidney to Dispose of. The above are fine Sold Sample, have been well kept, and have not sprouted, but are now just beginning to move. Also a few Sacks of WRINKLED MARROW PEA, Prince of Wales, very true; about One Bushel of INVINCIBLE SWEET PEAS; and about 40 lb. of LONDON WHITE COS LETTUCE, a very select variety. Appliation for the above to be made to

JAMES MYATT, Offenham, Evesham

To the Trade, Market Gardeners, and Others.

THE ADVERTISER has to offer a lot of WHEELERS' MILKY WHITE, EARLY OXFORD, WEBBS' PEARL, and PATERSONS' BLUE POTATOS, all true and in finest condition for planting. Cash price for not less than 10 sacks, on application to

ROBERT WARD, Seed and Corn Factor, Crickhowell.

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The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has the following to offer, for cash:—SEAKALE, for planting out, 2s. 6d. per 100; splendid ASPARAGUS, for planting out, 2s. per 100, or 15s. per 1000; TRUMPHEAD CABBAGE PLANTS, extra fine, 2s. 6d. per 1000; WHITE SPANISH ONION SEED, 2s. per lb.; all new and genuine.

Notice to the Trade.

JAMES FAIRHEAD AND SON, 7, Borough Market, London, S.E., beg to offer

PEAS:—	PEAS—
Suttons' Ringleader, or Carter's First Crop	Radman's Imperial
Dillistone's Early Prolific.	Harrison's Glory
Sangsters' No 1, or Daniel O'Rourke.	Burbidge's Eclipse
Dickson's Favourite.	Denyer's Havelock.
Bishop's Longpodded Dwarf	Champion of England
Early Surprise.	Climax, or Napoleon
Essex Rival	Dickson's Yorkshire Hero.
Early Prizetaker.	Veitch's Perfection.
Laxton's Prolific.	McLean's Little Gem.
All of Crop 1869	McLean's Advancer.

Advantageous Prices on application.

Johnstone's St. Martin's Rhubarb.

W. P. LAIRD AND SINCLAIR, NURSERYMEN, Dundee, N.B., have pleasure in offering the above new variety of RHUBARB, which they have confidence in recommending as the earliest and best sort in cultivation. The raiser of it describes it "as one of a batch of Seedlings from Victoria; the Seedling Plant was a fortnight earlier than any of the remainder of the lot, and grown beside Prince Albert and Linnæus, always to days earlier than them, and giving a larger quantity of superior stems to either of these varieties. It forces better than any variety I know, and has a splendid colour."

Strong Roots, 2s 6d each. Usual Discount to the Trade.

For Testimonials see previous Advertisements.

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May be had true from

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PERUVIAN GUANO, £13 10s per ton

Report and Analysis by DR. A. VOELCKER, *Consulting Chemist to the Royal Agricultural Society of England.*

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"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. The results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent of moisture, and fully the same quantity of soluble and reverted phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,

(Signed) "AUGUSTUS VOELCKER.

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REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO can be obtained of the undermamed, in any quantity, from one bag upwards

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The Biphosphated Peruvian Guano combines the stimulating power of Peruvian Guano with the nourishing properties of the Superphosphate. It is sent out in Sealed bags, and each bag is guaranteed by Sellers. Price £11 per ton; discount for cash.

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WHOSE IS THE BEST BOILER?

The most practical answer ever given to this all-absorbing question is, the New Apparatus in operation at the above.

It is considered the "largest" and "most perfect" ever erected, being a "wonder" in heating.

It works like a model, and is unequalled in Great Britain.

NOTE THE CONTENTS.

Reference No.	Name.	Quantity of Piping.	Reference No.	Name.	Quantity of Piping.
1	Hall	260 feet.	29	Orchid House	230 feet.
2	Corridor	90 „	30	Gymnogramma House	210 „
3	Closet	30 „	31	Plant Hospital	180 „
4	Picture Gallery	360 „	32	Gleichenia House	436 „
5	Sculpture Gallery	110 „	33	East India House	240 „
6	Conservatory (1st series of pipes)	720 „	34	West India House	240 „
7	Conservatory (2d „ „ „)	640 „	35	Span-roofed Plant House	260 „
8	Conservatory (3d „ „ „)	570 „	36	Heath House	260 „
9	Store Room	60 „	37	Late Vinery	280 „
10	Fernery (1st series of pipes)	380 „	38	Late Vinery	295 „
11	Fernery (2d „ „ „)	310 „	39	Peach House	310 „
12	Fernery (3d „ „ „)	380 „	40	Pit with Top Heat	150 „
13	Coach House	120 „	41	Croton House	360 „
14	Drying Room	60 „	42	Bottom Heat Tank in same	158 „
15	Harness Room	50 „	43	Forcing House	360 „
16	Coachmen's Rooms	30 „	44	Bottom Heat Tank in same	158 „
17	Living Rooms	75 „	45	Pit with Top Heat	160 „
18	Stables	380 „	46	Foliage Plant House	255 „
19	Passage	40 „	47	Bottom Heat Tank in same	110 „
20	Carriage Washing House	50 „	48	Ixora House	260 „
21	Entrance to Stable Department	60 „	49	Bottom Heat Tank in same	108 „
22	Fine Foliage Plant House	394 „	50	Flowering Stove	270 „
23	Bottom Heat Tank in same	80 „	51	Bottom Heat Tank in same	108 „
24	Palm Stove	394 „	52	Pit with Top Heat	160 „
25	Bottom Heat Tank in same	80 „	53	Rose House	360 „
26	Orchid House	345 „	54	Mushroom House	96 „
27	Orchid House	364 „	...	Mains, various	1800 „
28	Orchid House	225 „			

Total, 54 Compartments, containing 14,471 feet of Piping, equal to nearly 3 miles, all heated on

WEEKS'S ONE-BOILER SYSTEM.

No other but WEEKS'S UPRIGHT TUBULAR BOILER has ever approached such an extraordinary achievement.

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GENUINE FARM SEEDS

AT VERY LOW PRICES.

James Carter & Co. Seed Growers

Having Harvested their Crops of FARM SEEDS in very fine condition, are prepared to supply their Choice Prize Stocks at the following low quotations :—

CARTER'S PRIZE STOCKS.

Per lb.—*s. d.*

CARTER'S IMPERIAL HARDY SWEDE—acknowledged to be the best in cultivation 0 9

CARTER'S LONDON SWEDE, an immense cropper 0 9

LIVERPOOL SWEDE, and other ordinary varieties .. .. .. *7d.* to 0 10

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Special low quotations for large quantities.

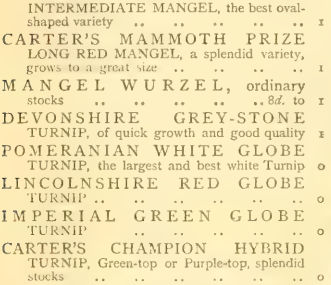

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JAMES CARTER AND CO., having completed their stocks of Grass Seeds, are prepared to execute orders from carefully cleaned samples of the choicest quality. The arrangements made by Messrs. CARTER to provide Mixtures of Grass Seeds, so as to suit the particular nature of the soil to be sown, materially lessen the possibility of failure. To Agriculturists who intend Seeding Down Land to Grass, Messrs. CARTER would specially recommend the valuable ESSAY on the subject, published in CARTER'S ALPHABET OF FARM for 1870 (see pages 71 to 80), sent Post Free for One Shilling, or Gratis to purchasers.

When ordering Grass Seeds from J. C. & Co. it is only necessary to give a general description of the soil and position of the land, when a suitable Mixture will be prepared.

CARTER'S GRASS SEEDS

For LIGHT SANDY SOILS	For ALLUVIAL SOILS
For LIMESTONE SOILS	For HIGH LYING CLAY SOILS
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For SANDSTONE SOILS	For FERTILE CLAY SOILS

28s. to 32s. per acre.

Special low estimates for quantities of more than 10 acres.

LOOK TO YOUR GRASS LANDS.

CARTER'S RENOVATING MIXTURE should be sown on Meadows that have suffered from the past dry seasons. The Mixture includes the most desirable Grasses and Clovers for Hay Crop, and succeeding Green Feeding, and will soon restore a first-rate Permanent Pasture. Sow 8 to 12 lb. per acre. **9d. per lb., 80s. per cwt.**

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SEED GROWERS,

GLOUCESTER; and 59, MARK LANE, LONDON, E.C.

J. C. WHEELER AND SON'S CELEBRATED SEED POTATOS.

WHEELERS' GLOUCESTERSHIRE KIDNEY

We can recommend for earliness, flavour, size, and crop. In comparison with the Ashleaf it is as early, whilst it produces nearly double the crop, and is altogether superior to that variety. We can recommend it with the most perfect confidence, and have much pleasure in referring to the annexed letters, speaking in high terms of its earliness and excellence.

3s. 6d. per peck; 12s. per bushel (56 lb.)

"I have grown your Gloucestershire Kidney here for the last five years with all other early kinds, and find yours to be much the earliest."—W. SEED, *Gardener to the* Right Hon. Lord Penrhyn, *Penrhyn Castle*

"Your Gloucestershire Kidney, which I had from you last year, turned out so well that I feel I cannot do better than have some more this year. I had not a diseased one among them, and double the crop from any I have had for the 14 years I have planted on these premises."—NATHANIEL TREASURE, *Tredethaw Manor.*

"I grew last year more than 120lb. of Gloucestershire Kidneys per perch and of first rate quality. My man says 140lb., and I think he is right."—Rev. JAMES L. MAY, *West Putford, North Devon*

WHEELERS' MILKY WHITE.

4s. per peck; 14s. per bushel (56 lb.)

"I was greatly delighted with the Milky White Potato last year. It was the best sort I ever grew, and just what suited me."—JOSEPH ROBINSON, *Wykhamstead, Bedford.*

"Your Milky White Potatos are all you say of them, and more. I was rather shy of them at first, as one of your correspondents said they were rather liable to disease. I have now tried them three years, and could not wish for a better Potato in every way. They have been very free from all disease, and came off the ground before the autumn rains set in. The sort we have never baked some of the larger ones should do so. The name you have given them suits them to a nicety. I have been thanked again and again for recommending them."—Rev. A. WOOD, *Castlenorton.*

WHEELERS' GUINEA COLLECTION OF GARDEN SEEDS.

1 quart Wheelers' First Early Peas	1 oz. Early Horn Carrot
1 quart Early Green Marrow Peas	1 oz. Altringham Carrot
1 quart Dickson's Favourite Peas	1 oz. James' Green-top Carrot
1 quart British Queen Peas	1 packet Early London Cauliflower
1 quart Taylor's Windsor Beans	1 packet Wheelers' extra fine Celery
1 quart Early Longpod Beans	1 oz. Curled Cress
1 pint Green Longpod Beans	1 packet Australian Cress
1 pint Scarlet Runners	1 packet Wheelers' Long Ridge Cucumber
½ pint Dwarf French Beans	1 packet Stockwell's Ridge Cucumber
1 packet Wheelers' extra fine Beet	1 packet Bromham Hall Melon
1 packet Green Curled Borecole	1 packet Moss Curled Endive
1 packet Sprouting Kale	1 packet Henry's Tiffin Leek
1 packet Brussels Sprouts	1 packet Wheelers' Tom Thumb Lettuce
1 packet Walcheren Broccoli	1 packet Giant White Cos Lettuce
1 packet Snow's Superb Winter Broccoli	1 packet Hardy Hammersmith Lettuce
1 packet Ellerslie Mammoth Broccoli	1 oz. Mustard
1 packet Adams's Early White Intermediate	1 oz. White Spanish Onion
1 packet Wheelers' Improved Cabbage	1 oz. Improved Reading Onion
1 packet Green Coat Cabbage	1 oz. Tripoli Onion
1 packet Red Pickling Cabbage	1 oz. Silver Skin Onion
1 packet Myatt's Garnishing Parsley	
1 oz. Student Parsnip	
2 oz. Wood's Frame Radish	
1 oz. Olive Radish	
1 oz. Mixed Turnip Radish	
1 packet Savoy	
2 oz. Summer Spinach	
2 oz. Winter Spinach	
1 oz. Snowball Turnip	
1 oz. American Red Stone Turnip	
1 oz. Orange Jelly Turnip	
1 packet Summer Savory	
1 packet Capsicum	
1 packet Chili	
1 packet Tomato	
1 packet Vegetable Marrow	
1 packet Sweet Marjoram	
1 packet Sweet Basil	
1 packet Thyme	1 packet Gourds

"I am much pleased with your Guinea Collection of Garden Seeds received to-day; they are peculiarly well and liberally selected."—Rev. J. JERVIS, *Portlemellan, Penzance*

"I take this opportunity of expressing my great satisfaction with the polite attention you have paid to my small orders, and also to say that your seeds have fully borne out your recommendation in many cases exceed it. I shall at all times feel great pleasure in recommending my friends to you, as the very best house I have dealt with, as they will receive you attend to genuine and reliable seeds, at a reasonable price."—HENRY BAKER, *Stroud*

"The seeds I had from you before were the cleanest I ever sowed and when grown to maturity were acknowledged by everyone who saw them to be one of the cleanest and best crops in the parish of Llauri an."—P. M. G. WILLIAMS, M.R.C.S., *Treyarchel, Letterstone.*

"The seeds reached me safely on Thursday morning, and I have to thank you for so literally meeting my request. Nothing can exceed the excellent way in which your seeds are put together, and I never lose an opportunity to mention you to my friends. Year after year your seeds maintain their excellent character, and I have never experienced any disappointment in the matter of seeds, either failing or not coming true to name, since I first dealt with you, now some few years ago."—Captain W. H. TYRRELL-PATTESON, *Saltdean*

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"Your 'Little Book' is a very great help to us. I don't believe that ever I saw a catalogue put together so orderly."—JOHN JAMES, *Marazion*

"I say with confidence that your 'Little Book' is the best catalogue of seeds out: it pleases everyone."—F. J. HILES, *Brigg, Lincolnshire*

"Last year you supplied me with seeds. They gave me much satisfaction."—Captain WAVEY, *Healey Grove*

"I consider your seeds excellent. For the last two or three seasons I have used no others."—Captain H. ST. JOHN, R.N., *Thornbury.*

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THE COCOA-NUT CABBAGE IS A NEW AND VERY EARLY VARIETY, PERFECTLY DISTINCT, OF MOST EXCELLENT FLAVOUR.

It should be planted 18 inches apart.

Will yield an early and continuous supply.

This Cabbage is a decided novelty, and a great acquisition.

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Large packet, 1s.; Smaller packet, 6d., Post Free.

"Your Tom Thumb Lettuce is a wonderful favourite with my family and friends. For a summer Lettuce I have never seen its equal."—GEORGE F. A. FLOWER, *Stafford Farm.*

"Wheeler's Tom Thumb Lettuce is a capital variety for winter and early spring."—THOMAS RIVERS, *Sawbridgeworth*

"Your Tom Thumb Lettuce is a very good sort; it is the best I ever had."—F. YOUNG, *Gardener to* Baron de Rutzen.

"Major WARRY would thank Messrs. Wheeler to send him another packet of their celebrated Tom Thumb Lettuce."—*Woodbine Hill.*

"Be good enough to send me another packet of the best Lettuce grown, Wheelers' Tom Thumb."—H. P. WEBB.

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This extraordinary Melon was raised during the last summer (1869) at Pontypool Park, by Mr. Paterson, Gardener to Mrs. Hanbury Leigh; it weighed 24 lb., and measured 42 inches in circumference. It was raised from the Netted Scarlet-fleshed, crossed with the Black Rock; of exquisite flavour, and very handsome, with fine rich scarlet flesh; and, as seen by the dimensions given, of extraordinary size and weight. It produced 159 seeds, and this is all the stock there is of it. Paterson's Superb Melon can only be obtained true of

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THE LONDON MANURE COMPANY
(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES OF LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
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LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. NITRATE of SODA supplied ex Ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices.

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LAWES'S PATENT TURNIP MANURE.
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LAWES'S WHEAT, BARLEY, GRASS, and MANGEL MANURES.
LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
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GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb. Bags, at 6d per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application.
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This invaluable mixture for the Destruction of Plant Pests can be very highly recommended; it has received the very highest commendations from some of the leading horticulturists in the country who have given it a trial.—Testimonials on application
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GENUINE TOBACCO PAPER, of the finest quality, 10d per lb., or 8½ per cwt.
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TOBACCO CLOTH and PAPER.—The cheapest and best article for Smoking Greenhouses and Destroying the Fly. Price, 2s 6d per lb.; over 28 lb., 2s 4d. Tobacco Paper, 1s. per lb.; £4 4s per cwt. Post office Orders payable at Fleet Street.
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Genuine TOBACCO PAPER, 8 in 2 lb. and 4 lb. Packets.
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TOBACCO TISSUE, for FUMIGATING GREENHOUSES. Will destroy all the Insects, and not injure the Plants, and Burns without the assistance of Blowing. Price 3s 6d per lb, carriage free. A reduction in price for large quantities.
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The Cheapest and best Insecticide.
DUVERGER'S FUMIGATOR
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s 6d., and 5s.
Powder Distributors, 2s 6d and 3s 6d each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. FRASER, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY Bonded Warehouse, Sussex Wharf, Wapping, E

GISHURST COMPOUND.
Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blights, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 6 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
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Wholesale by
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Red Spider
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THORLEY'S HORSE and CATTLE SPICE will Cure the Appetite when all other compounds have failed. In Penny packets only. To be had of all Corn Chandlers in London, and of all Grocers, Druggists, and Corn Dealers in the Country.

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SHEEP, 3s 6d; CATTLE, 4s 2d.; OX, 5s 11d.
List by post. GATES and FENCING of every description.
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4/4 Scrim, from 2d. to 5d per yard, advancing ½d
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The only Cure for Damp Walls, Preserving Stone, Brick, and Cement from Decay is the SILICATE ZOPISSA COMPOSITION, used in the Houses of Parliament, and manufactured by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 393, King William Street, London, E.C.

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Britannia Foundry, Derby. | 32, Walbrook, London.
The Britannia Iron Works have for the last 40 years been well known for the production of fine Iron Castings. The use of Cast-iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra-cotta. Cast-iron Vases, if occasionally painted, are imperishable, and will not crack when exposed to wet or frosty weather.

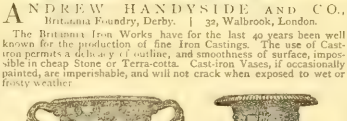

Five large Sheets of Designs and Price Lists post free for 6 stamps
A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom.

SHANKS'S PATENT LAWN MOWERS for 1870,
The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The unprecedented Sale for 1868, notwithstanding the Dryness of the Season, forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reverse at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
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There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application.
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A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

Indestructible Terra-Cotta Plant Markers.
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SAYNOR AND COOKE'S WARRANTED PRIZE BUDDING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, CERTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make, and of which they warranted both the sellers and Makers.
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market
Paxton Works, Sheffield. Established upwards of 125 years.

Rosher's Garden Edging Tiles.

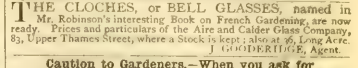

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GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
F & G ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists forwarded post free. Other Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded free.
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SILVER SAND (REIGATE), at the above addresses—
14s per Ton, 1s 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.
FLINTS and BRICK REFUSERS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

Preserve your Wall-fruit Trees from Spring Frosts.
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These Screens may be converted at pleasure into Lean-to or Span-houses. Full particulars of their application, and price, may be obtained at the Works, by enclosing stamp, where also an Illustrated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable systems of manufacture in both patent glazing and ventilation.

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H. FREEMAN AND SONS, Horticultural Works, No. 106, Mare Street, Hackney, E. Established 30 years. Good substantially made GREENHOUSES, ready for fixing, 42 feet long, 13 feet wide, £50; 21 feet by 13 feet, £78; 12½ feet by 10 feet, £15 handsome CONSERVATORY on hand, 35 feet by 15 feet, £110. Nurseryman's LIGHTS, £25 per 100 feet.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or

equivalent	2-inch.	3-inch.	4-inch.
HOT-WATER PIPES, Nos 6 & 7 on illustrated sheets	s. d. per yard	s. d.	s. d.
ELBOWS	No 12 on do. each	1 4	2 1	2 9
TEE PIPES	No 33 on do. ,,	2 0	3 0	4 0
SYPHONS	No 23 on do. ,,	1 9	2 6	3 3
VALVES	,,	10 0	11 0	12 0

GEORGE ROBINSON, Dial Iron Works, Stourbridge
London Warehouse, 16, Grand Junction Wharf, Paddington Basin.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each
6 ft. by 4 ft. Lights, 2 in. thick, unglazed... £0 5 0
,, ,, ,, Painted and Glazed with 10 oz. Sheet... 0 11 0
,, ,, ,, with stout portable Box, not painted... 1 3 0
,, ,, ,, Painted four coats, and Handlessen... 1 8 0
,, ,, ,, Painted and Delivered in Railway van... 1 10 0
6 ft. by 8 ft., Double Lights, do... 2 15 0
GREENHOUSES... Per ft. super.
Woodwork only Prepared and Fitted... 0 0 6
,, Primed and Glazed with 16 oz. Sheet... 0 1 0
,, Delivered, and Fixed complete... 0 1 3
,, Painted four coats, two sides, ready for use...
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

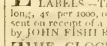

IRON GREENHOUSES CHEAPER THAN WOOD
Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.
Victoria Works, Bury St. Edmund's

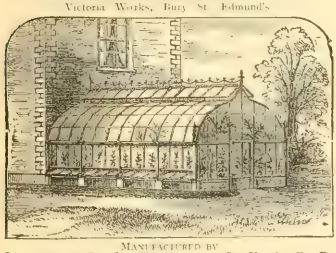

MANUFACTURED BY

CHARLES BEARD,

Senior Partner in the late Firm of Sanders, Brewer & Co., which Firm was dissolved by mutual consent.

The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866;

The First-class Certificate at the Grand Manchester Horticultural Show, 1867;

The Three First-class Certificates at the Royal Horticultural Show, at Bury St. Edmund's, 1867, viz.:—One Prize for Patent Glazing without Putty; One Prize for Best System of Patent Ventilation; One Prize for S., F. & Co.'s Improved Flower Stands.

These much-approved Patent Systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c., &c.

Full particulars and Prices of the Patent Houses, glazed with 26 oz. Sheet Glass from 1*s* 2*d* per foot super and upwards; as also Illustrated Catalogues for 12 postage stamps; may be obtained on application to CHARLES BEARD, Victoria Horticultural Works, Bury St. Edmund's.

PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelop

ST. PANCRAS IRON-WORK COMPANY.

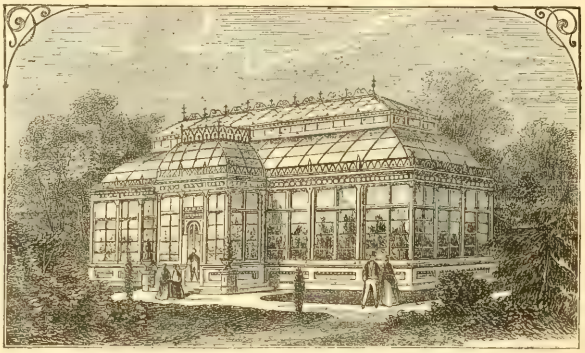

CONSERVATORIES, GREENHOUSES, &c.

ARCHITECTS' DESIGNS CAREFULLY CARRIED OUT.

APPLY FOR ESTIMATES TO

OLD SAINT PANCRAS ROAD, LONDON, N.W.

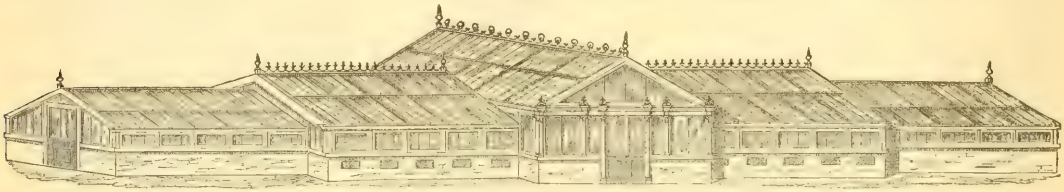

HENRY ORMSON

Is determined, with the aid of **NEW AND VALUABLE MACHINERY**, and an experienced **STAFF AND WORKMEN**, so to improve and facilitate the **MANUFACTURE OF HORTICULTURAL STRUCTURES** that they may be built **OF THE BEST MATERIALS** at a **MUCH LOWER PRICE** than has been possible heretofore.

COMPETITION SOLICITED.

MANY OF ORMSON'S PATENT WELDED WROUGHT IRON BOILERS have been substituted for **CRACKED CAST IRON TUBULAR BOILERS** during the past winter months, and have been found **MUCH MORE ECONOMICAL IN CONSUMPTION OF FUEL.** Prices on application. Please to state length and diameter of pipe to be heated.

THE HEATING DEPARTMENT always engages his especial personal attention, and he feels justified in saying that in simplicity, safety, durability, and economy of fuel, combined with thorough effectiveness, his system cannot be surpassed.

Knowing the absolute necessity for well regulated and properly arranged Ventilation, he makes it a matter of first consideration.

H. O. having competent Draughtsmen and an efficient Office Staff, is prepared and will be happy to forward Plans, Estimates, and Specifications, by post or otherwise, and to wait personally on any Ladies or Gentlemen who may desire to see him on their Grounds.

H. O. is also in the habit of furnishing Estimates, and building from Drawings prepared by Architects, and is kindly permitted to refer to many of the most eminent in the profession. He has also much pleasure in stating that he can refer to many of the Seats of the Nobility and Gentry, in all parts of the kingdom, where he has been employed to build some of the finest and best arranged Glass structures known at the present time.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,

AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.

STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

GRAY'S OVAL TUBULAR BOILER.

INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

PORTABLE AND FIXED HOT-WATER APPARATUS,

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

TRUSS'S PATENT UNIVERSAL FLEXIBLE AND LEAKLESS PIPE-JOINTS.

T. S. TRUSS

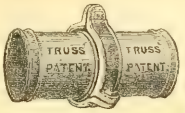

Begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the ROYAL HORTICULTURAL SOCIETY at SOUTH KENSINGTON and CHISWICK, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantages obtained by his IMPROVED SYSTEM cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; EFFECTS a SAVING of 25 PER CENT. on cost of Apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; can be erected by any Gardener; an ordinary size Apparatus erected in one day; and PERFECTNESS of DESIGN SUPPLIED, INSURING NO EXTRAS. Complete Apparatus, of the best materials, delivered to any Railway Station in England, and Erected at the following prices. Erection beyond 25 miles of London, railway fare for one man additional. Considerable reduction on large works.

Two Four-inch Pipes along One Side and One End of House.

Size of House	Apparatus Complete	Erection	Size of House	Apparatus Complete.	Erection
20 feet by 10 feet	£9 0 0	£2 0 0	50 feet by 15 feet	£17 10 0	£3 0 0
30 feet by 12 feet	11 15 0	2 10 0	75 feet by 15 feet	20 0 0	4 0 0
40 feet by 15 feet	15 0 0	2 15 0	100 feet by 15 feet	29 0 0	5 5 0

Bath and Gas Work Erected in Town or Country. The TRADE SUPPLIED.

Price Lists, Plans, and Estimates forwarded on application to

T. S. TRUSS, C.E., CONSULTING HORTICULTURAL ENGINEER, &c., SOLE MANUFACTURER, IRON MERCHANT, HOT-WATER APPARATUS MANUFACTURER, AND HORTICULTURAL BUILDER,
FRIAR STREET, BLACKFRIARS ROAD, LONDON, S.E.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Green-houses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
J. JONES AND SONS, 35, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark

Established Fifty Years.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS,
353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong ZINC HAND GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England.

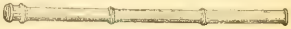

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating
GREENHOUSES,
HOTHOUSES,
CONSERVATORIES,
CHURCHES,
PUBLIC BUILDINGS, &c.
HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.

WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED PEILLE'S, also Elliptic, Boilers, from 24s. each.

PEILLE'S CONICAL TUBULAR BOILER
Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 63s. 6d. each.
CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60s. each.
Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.
INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly watertight.
Goods, of the very best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE,
(Old Barge Iron Wharf, Upper Ground Street, London, S.E., Surrey side Blackfriars Bridge).

PORTABLE BOILER. ELLIPTIC BOILER.
Price List on application.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

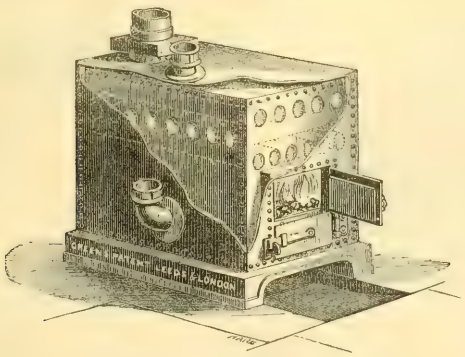

OBLONG BOILER.

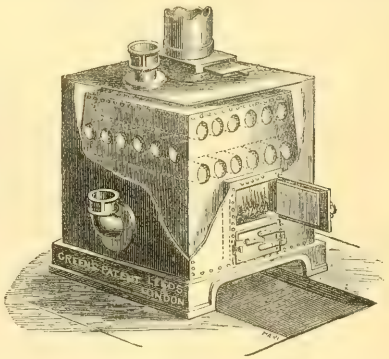

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate, which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS; and
54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

W. S. BOULTON AND CO.'S NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

These Machines possess important advantages By the introduction of a Radial Link, the adjustment of the various parts is rendered exceedingly simple Breakages are entirely avoided, by making the handles and all other light parts of malleable iron They adapt themselves to inequalities of the ground, and suit persons of any height by means of the handles working loose This arrangement also admits of their being used as a Roller, by folding back the front or cutting end Every Machine is warranted to give entire satisfaction to the purchaser, and if not approved of can be returned An Illustrated Catalogue, with prices, sent free by post on application

Rose Lane Works, Norwich

W. S. BOULTON & CO.'S DOUBLE CYLINDER and BALANCE-HANDLE GARDEN ROLLS.

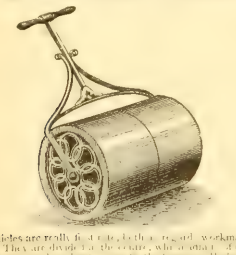

These articles are really first-class, both as regard workmanship and materials They are divided to the centre, which admits of the rollers turned with ease, and without noise to the Corners of Walks, the ends being rounded off The prices to customers are as follow

Carriage paid to any Station in England

20 in. long by 18 in. in diam £2 15 | 22 in. long by 22 in. diam £3 15
22 " 20 " " 3 7 6 | 24 " 22 " " 4 7
SINGLE CYLINDER ROLLS Carriage paid
18 in. long by 18 in diam £1 15 | 22 in. long by 22 in. diam £2 0
20 " 20 " " 2 5 | 24 " 24 " " 3 15

Rose Lane Works, Norwich

PROTECT YOUR CROPS.

First-class Machine-made

WIRE GAME NETTING, GALVANISED after MADE, sent carriage paid to any station in the Kingdom at the following very low prices

2 feet high, 2-inch mesh, No 19 guage, price 3½d per yard
3 feet high, ditto, ditto, price 5¼d per yard
2 feet high, 1½-inch mesh, No 19 guage, price 5¼d per yard
3 feet high, ditto, ditto, price 7¾d per yard

All Netting failing to give entire satisfaction can be returned at once

A full Descriptive Priced Catalogue sent gratis on application

W. S. BOULTON AND CO., Rose Lane Works, Norwich

W. S. BOULTON AND CO.'S 36-gallon SWING WATER BARROW Oak Tub

Carriage paid to any station in England.

Price, £2 5s ; Ditto, with two tubs, £3 15 ; Spreader and valve, 15s extra

SWING WATER BARROW, with galvanised iron tank To hold 18 gallons, price £1 15s ; Ditto, 30 gallons, £2 5s

Rose Lane Works, Norwich.

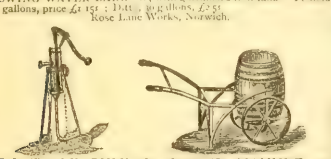

PORTABLE PUMP for LIQUID MANURE or WATER, 45s ; 10 feet india-rubber suction pipe, 10s Carriage paid.

W. S. BOULTON AND CO.'S NEW SWING WATER or MANURE CART, with galvanised iron tank.

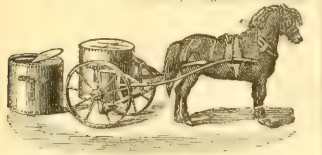

Carriage paid to all the principal Stations in England

To hold 80 gallons, price £8 ; to hold 100 gallons, price £9 ; Valve and Spreader for ditto, price £1

Rose Lane Works, Norwich.

W. S. BOULTON AND CO.'S IRON WATER or LIQUID MANURE CART.

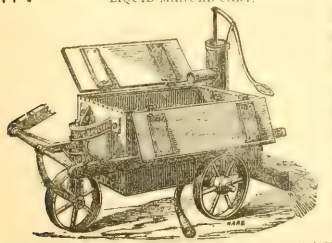

Carriage paid to the principal Railway Stations in England. To hold 140 gallons, price £10 ; 200 ditto, £12 ; £250 ditto, £14

Galvanised Iron Pump and 10 feet india-rubber suction pipe, price £3 10s Spreaders, 15s each

Rose Lane Works, Norwich.

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to Submit their REDUCED PRICES as follows :-

PROPAGATING GLASSES

	Each —s d		Each —s d
2 inches in diameter	0 4½	12 inches in diameter ..	1 0
3 " "	0 4½	13 " " ..	2 0
4 " "	0 5½	14 " " ..	2 6
5 " "	0 6½	15 " " ..	3 0
6 " "	0 8	16 " " ..	3 6
7 " "	0 10	17 " " ..	4 0
8 " "	1 0	18 " " ..	5 0
9 " "	1 2	19 " " ..	6 0
10 " "	1 4	20 " " ..	7 0
11 " "	1 8		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter ..	0s 6d	9 inches in diameter ..	1s 8d
5 " " ..	0 8	10 " " ..	2 0
6 " " ..	0 10	11 " " ..	2 6
7 " " ..	1 1	12 " " ..	3 0
8 " " ..	1 4		

Either flat or conical tops.

CUCUMBER GLASSES.

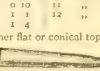

24 inches long	2s 0d	16 inches long	1s 4d
22 "	1 10	14 "	1 2
20 "	1 8	12 "	2 6
18 "	1 6		

HAND GLASSES, WITH OPEN TOPS.

	Each —s d		Each —s d
12 inches	0 6	20 inches	10 6
14 "	7 6	22 "	11 6
16 "	9 0	24 "	12 6
18 "	10 6		

Trade Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE

PATENT OILS, Genuine WHITE LEAD, PARSON'S PAINTS, PAINTS, Dry or Ground in Oil, Colours, &c.

SHEET and ROUGH PLATE GLASS, STAINS of all sizes, BRITISH PLATE, LAYERS, and CROWN PLATE GLASS, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms Lists of Thousand Testimonials and other information forwarded on application to

JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IRA WHARF) are prepared to supply WROUGHT IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application to

F. BRABY AND CO., Limited, Tavern Works, Euston Road, London ; or through all respectable Ironmongers

N.B. Open Tanks of different sizes packed one in another to save carriage

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

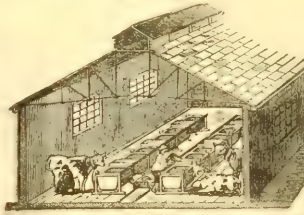

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and inspervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W ; where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in.	in	4ths	3rds	2nds	Best.
20 by 12					
20 by 13					
20 by 14	Per 100 feet	15 0d	123 3d	153 6d	164 9d 183 0d
20 by 15					
20 by 16		121 0d	188 0d	203 0d	222 0d 243 0d

SMALL SHEET SQUARES, 15 oz , per 100 feet

in.	in	in.	in	in	in	in	4ths	3ds	2nds	Best
6	by 4	7	by 5	8	by 6	9	by 7			
64	by 42	74	by 54	84	by 64	94	by 74	111 3d	122 6d	144 0d 153 6d

Per 100 feet.

10	by 8	12	by 9	9	124	by 10¾	14¾	by 10¾		
10¾	by 8¾	12¾	by 9¾	11	by 10	15	by 10	115 0d	145 0d	155 3d 172 6d
11	by 9	13	by 9	13¾	by 10¾	13	by 11			
11¾	by 9¾	13¾	by 10¾	14	by 10	14	by 11			

LARGE SHEET SQUARES, 15 oz , per 100 feet.

in	in	in.	in.	in.	in.	in.	4ths.	3ds	2nds	Best
15¾	by 10¾	14	by 12	22	by 12	22	by 16			
16	by 10	14¾	by 12¾	17	by 13	24	by 16			
14¾	by 14¾	15	by 12	23	by 13	30	by 17			
15	by 11	15¾	by 12¾	18	by 14	22	by 17			
15¾	by 11¾	16	by 12	22	by 14	23	by 17	122 3d	152 6d	162 9d 182 0d
16	by 11	16¾	by 12	23	by 14	24	by 17			
21	by 11	17	by 12	22	by 15	22	by 18			
13	by 12	18	by 12	24	by 15	23	by 18			

The above Prices are only for the Sizes stated ; if a quantity of any other Size be required, a Special Price will be given.

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super

15 oz 21 oz

4ths quality, 1,200 feet case, 36s		4ths quality, per 200 feet case, 36s	
3ds " " 42s		3ds " " 42s	
2nds " " 62s		2nds " " 62s	
Best " " 75s		Best " " 75s	

SHEET GLASS is made only in the following substances, 15 oz , 21 oz , 29 oz , 32 oz , 36 oz , and 42 oz

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 130 in. each in length and 48 in. and 52 in. in breadths

BRITISH PLATE GLASS for Windows, Silvered for Looking Glasses, Coloured Glass, Glass Shades, Sashes, Colours, &c , &c.

PAINTS, COLOURS, VARNISHES, &c

STUCCO PAINT, 24s. per cwt. This Paint adheres firmly to the Walls, keeps the weather out, is free from the glossy appearance of Oil Paint, resembling in stone surface, and can be made any required shade It is mixed with common pots every water

WHITE ZINC PAINT, 48 per cwt One hundredweight of pure Zinc Paint, with proper quantity of Oil and Driers, will cover as much as one hundredweight and a half of White Lead and six gallons of Linseed Oil Special Process for Inside Work

IMPROVED WASH PAINT, 28s to 34s per cwt. Any required Paint is ever made, good for all kinds of work in exposed situations, on Brick, Stone, Compo, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and easily laid on by any ordinary workman Prepared Oil for ditto, 4s. per gallon.

	Per cwt —s d		Per gallon —s d
GENUINE WHITE LEAD	30 0	LINSEED OIL	2 9
SUGAR OF LEAD	28 0	BOILED OIL	3 2
GROUND PATENT DRY-		TURPENTINE	4 9
ERS, 30s to 34s per lb		LINSEED OIL PUTTY,	
" OXFORD OCHRE, 30s.		8s per cwt.	
to 34s per lb		Fine OAK VARNISH, 10s to 12	0
" RAW UMBER, 34s to		" CABRIAGE do , 12s to 14	0
60s per lb		" PALE do 16s to 18	0
" BURNT do., 60s to 90s		" COPAL do	16 0
GREEN PAINT, all shades,		KNOTTING	10 0
20s to 60s	0	Patent GOLD SIZE ..	10 0
BLACK PAINT 24s to 60s	0	" BRONZE, JAPAN ..	12 0
RED PAINT .. 28s to 36s	0	GLAZIERS DIAMONDS and TOOLS.	
GROUND BRUSHES,		MILLED LEAD and PIPES.	
DUSTERS, SASH TOOLS.		OLD LEAD Bought or taken in	
DISTEMPER BRUSHES		Exchange	

The above are Nett, for Cash, and as such cannot be booked.

Lists of any of the above on application

Reduced Price, January 18, 1870.

REYNOLDS' PEA GUARDS (Ninth Season), 9s. per dozen; two dozen carriage paid to any Railway Station in England.

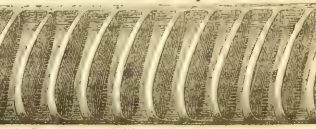

No. 480.

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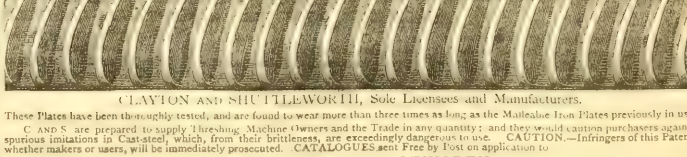

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ROYAL SCHOOL of MINES, Jermyn Street, W.—Professor RAMSEY, LL.D., F.R.S., will COMMENCE a COURSE of THIRTY-SIX LECTURES on GEOLOGY, on TUESDAY NEXT, February 15, at 2 o'Clock, to be continued on each succeeding Wednesday, Thursday, Monday, and Tuesday, at the same hour. Fee for the Course, £3. Professor GOODEVE, M.A., will COMMENCE a COURSE of THIRTY-SIX LECTURES on APPLIED MECHANICS on TUESDAY NEXT, February 15, at 12 o'clock, to be continued on each succeeding Wednesday, Thursday, and Friday, at the same hour. Fee for the Course, £3.
EDWARD HARBORD LUSHINGTON, Registrar.

LONDON and COUNTY BANKING COMPANY.
Established 1836. Subscribed Capital, £2,500,000, in 50,000 shares of £50 each. Paid up capital, £1,000,000. Reserve fund, £500,000

Directors

Nathaniel Alexander, Esq. | Frederick Harrison, Esq.
Thos. Tyringham Barnard, Esq. | Lord Alfred Hervey.
Philip Patton Blyth, Esq. | William Champion Jones, Esq.
John William Barmester, Esq. | Edward Harbord Lushington, Esq.
Thomas Cooke Cowie, Esq. | James Morley, Esq.
Frederick Francis, Esq. | William Nicol, Esq.

General Manager—William M'Kewan, Esq.
Chief Inspector—W. J. Nottidge, Esq.
Inspectors of Branches—H. J. Lemon, Esq., and C. Sherring, Esq.
Chief Accountant—James Gray, Esq.
Secretary—F. Clappison, Esq.
Head Office—21, Lombard Street.
Manager—Whitbread Tomson, Esq.
Assistant Manager—William Howard, Esq.

At the Annual General Meeting of the Proprietors, held on Thursday, the 3d February, 1870, at the City Terminus Hotel, Cannon Street Station, the following Report for the year ending the 31st December, 1869, was read by the Secretary. William Champion Jones, Esq., in the chair.

In presenting to the Proprietors the balance-sheet of the Bank for the half-year ending the 31st December last, the Directors have the pleasure to report that, after paying interest to customers, and all charges, allowing for rebate, and making provision for bad and doubtful debts, the nett profits amount to £87,669 19s. 10d. This sum, added to £56,225 17s. 7d. brought forward from the last account, produces a total of £143,895 17s. 5d.

The usual dividend of 6 per cent. for the half-year is recommended, together with a bonus of 2½ per cent., both free of income-tax, which will absorb £85,000, and leave £8,895 17s. 5d. to be carried forward to profit and loss new account. The present, added to the June dividend, will then be 12 per cent for the year 1869.

The Directors have to announce the retirement of John Fleming, Esq., from the board, and the election of Edward Harbord Lushington, Esq., in his stead.

The Directors returing by rotation are:—
Frederick Francis, Esq.,
Thomas Stock Cowie, Esq., and
Frederick Harrison, Esq.,
who, being eligible, offer themselves for re-election.

The dividend and bonus (together £1 14s. per share), free of income-tax, will be payable at the Head Office, or at any of the branches, on and after Monday, the 14th instant.

BALANCE-SHEET OF THE LONDON AND COUNTY BANKING COMPANY, 31ST DECEMBER, 1869

To Capital paid up		£1,000,000 0 0
To Reserve Fund		500,000 0 0
To amount due by the Bank for customers' balances, &c.	£13,305,079 11 10	
To liabilities, on acceptances, covered by securities	2,068,856 17 11	
		15,374,536 12 9
To profit and loss balance brought from last account	6,225 17 7	
To gross profit for the half-year, after making provision for bad and doubtful debts, viz	250,478 6 0	
		256,704 3 7
		£17,131,240 16 4
By cash on hand at Head Office and branches, and with Bank of England	£1,995,538 14 3	
By cash placed at call and at notice, covered by securities	1,846,023 16 1	
		£1,841,562 10 4
Investments, viz :—		
By Government and guaranteed stocks	1,376,628 0 7	
Other stocks and securities	61,073 10 4	
		1,431,701 10 11
Discounted bills and advances to customers, in town and country	9,402,260 8 8	
Liabilities of customers for drafts accepted by the Bank, as per contra	2,068,856 17 11	
		11,471,117 16 7
Freehold premises in Lombard Street and Nicholas Lane, freehold and leasehold property at the branches, with fixtures and fittings		241,342 4 4
Interest paid to customers		44,416 3 7
Salaries and all other expenses at Head Office and branches, including income-tax on profits and salaries		101,101 0 7
		£17,131,240 16 4

PROFIT AND LOSS ACCOUNT.

To interest paid to customers, as above		£44,416 3 7
To expenses, ditto		101,101 0 7
To rebate on bills not due, carried to new account		17,291 2 0
To dividend of 6 per cent. for the half-year		60,000 0 0
To bonus of 2½ per cent.		25,000 0 0
To balance carried forward		8,895 17 5
		£256,704 3 7
By balance brought forward from last account		£6,225 17 7
By gross profit for the half-year, after making provision for bad and doubtful debts		250,478 6 0
		£256,704 3 7

We, the undersigned, have examined the foregoing balance-sheet, and have found the same to be correct

(Signed) WILLIAM NORMAN, } Auditors
R. H. SWAINE, }

London and County Bank, January 27, 1870

The foregoing report having been read by the Secretary, the following resolutions were proposed, and unanimously adopted:

1. "That the report be received and adopted, and printed for the use of the shareholders."

2. That a dividend of 6 per cent., together with a bonus of 2½ per cent., both free of income-tax, be declared for the half year ending December 31, 1869, payable on and after Monday, the 14th instant, and that the balance of £8,895 17s. 5d. be carried forward to profit and loss new account."

3. "That Frederick Francis, Thomas Stock Cowie, and Frederick Harrison, Esquires, be re-elected Directors of this Company."

4. "That William Norman, Richard Hinds Swaine, and William Jardine, Esquires, be elected auditors for the current year."

5. "That the thanks of this meeting be given to the Board of Directors for the able manner in which they have conducted the affairs of the Company."

6. "That the thanks of this meeting be presented to the auditors of the Company for their services during the past year."

7. "That the thanks of this meeting be presented to the general manager, and to all the other officers of the Bank, for the zeal and ability with which they have discharged their respective duties."

(Signed) W. CHAMPION JONES, Chairman

The Chairman having quitted the chair, it was resolved and carried unanimously,

8. "That the cordial thanks of this meeting be presented to William Champion Jones, Esq., for his able and courteous conduct in the chair."

(Signed) WILLIAM NICOL, Deputy Chairman,

Extracted from the minutes

(Signed) F. CLAPPISON, Secretary.

LONDON and COUNTY BANKING COMPANY.—Notice is Hereby Given that a DIVIDEND on the Capital of the Company, at the rate of 6 per cent. for the half year ending December 31, 1869, with a BONUS of 2½ per cent., will be PAID to the Proprietors, either at the Head Office, 21, Lombard Street, or at any of the Company's Branch Banks on and after MONDAY, the 14th instant. By order of the Board,

W. M'KEWAN, General Manager.

21, Lombard Street, February 4, 1870.

THE LANDS IMPROVEMENT COMPANY.—(Incorporated by Special Acts of Parliament.)

DIRECTORS.

John Clutton, Esq., 9, Whitehall Place, S.W.
Frederick D. Dickinson, Esq., Kirtlington Park, Oxford
Henry Farquhar, Esq., (Messrs. Herries, Farquhar & Co.), 16, St James Street, S.W.
Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
John Horatio Lloyd, Esq., 1, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.

The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.

The whole outlay and expenses are liquidated by a rent-charge upon the land, carrying principal and interest, over 25 years.

No investigation of title is required.

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THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.

DIRECTORS

Thomas Chapman, Esq., F.R.S. | The Right Hon. Viscount Combermere
Geo. Thomas Clark, Esq. | Colonel Dent
John C. Colquhoun, Esq. | Sir John Hutchings, Esq.
Henry W. Currie, Esq | Sir William Tite, M.P.

J. BAILEY DENTON, Principal Engineer.

Agricultural Improvements of any kind are executed by the Company, or the outlay thereon is repaid to Landowners who prefer executing the work by their own Agents.

Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.

The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term.

No investigation of title necessary, and no legal expenses incurred.

Application to be made to HORACE BROKE, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

LEGAL and GENERAL LIFE ASSURANCE SOCIETY, 10, Fleet Street, Temple Bar, London, E.C.

TRUSTEES.

The Right Hon. the Lord Chancellor.
The Right Hon. the Lord Cairns.
The Right Hon Sir W. Boyd, Lord Chief Justice, C.P.
The Right Hon Sir Edward Vaughan Williams.
The Right Hon. Lord Penzance.
Thomas Webb Greene, Esq., Q.C.
John Osborne, Esq., Q.C.
Jatwood Smith, Esq.
Robert Bayly Follett, Esq., Taxing Master in Chancery.

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Existing Assurances and Bonus	£4,660,000
Annual Income	200,000
Invested Funds	1,540,000
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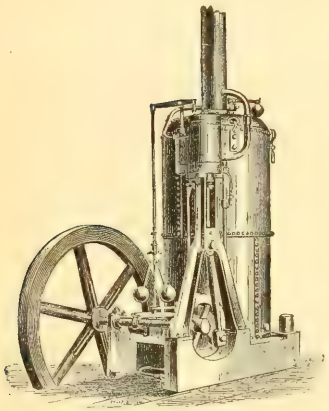

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3	"	4¾	10	"	5 " 6	2 " 4	£65*
4	"	5⅝	12	"	7 " 0	2 " 4	£85
6	"	6½	14	"	8 " 0	2 " 8	£120
8	"	8	16	"	9 " 0	3 " 0	£160
10	"	9¼	16	"	10 " 0	3 " 4	£185
12	"	10	18	"	11 " 0	3 " 8	£200
14	"	11	18	"	11 " 6	3 "10	£220
16	"	12	20	"	12 " 0	4 " 0	£250
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The Fire-box is so constructed that Coal, Coke, or Wood can be used as Fuel.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1293 :—

"*Vertical Engines* continue to merit growing patronage. They have their advantages over the horizontal engines, not only in construction as to the working and extra and unequal tear and wear of the piston and cylinder, but in their adaptation to light work—as grinding, chaff-cutting, and root-pulping. The small area of space they occupy is also greatly in their favour. Of late years very great progress has been made in the cattle feeding department of farm practice, hence the growing demand for engines of this class; but this is not all that must be reported, for they are evidently also entering into competition with their rivals in the threshing barn. They have long been in extensive use by builders for hoisting and pumping, being made locomotive by means of rails; and constructed on this plan they are proving equally effective and advantageous in the brick-field, quarry, wood-yard, large dairies for churning, laundries, for driving washing machines, and the like. Add to this the growing use of a heavier class of engines for steam culture, which necessitates as it were the employment of small vertical ones at the homestead, it is easy accounting for the growing popularity of the latter at all our implement exhibitions. In construction there is a close similarity on the whole, but in details of mechanism they are diversified. Something of course depends upon the special purposes for which they have been made, and whether they are to be used outdoors or indoors, and whether they are to burn coal or coke, and so on.

GREEN'S PATENT SILENS MESSORS,

OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

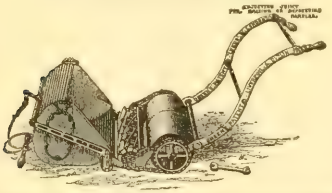

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First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
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N.B. All Orders are executed on the day they are received.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length	£	s	d
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	13	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
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30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

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PRICES.

24 inches	by	26 inches	..	..	..	..	..	£4 0 0
20	"	22	"	..	..	..	..	3 2 6
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THOMAS GREEN AND SON,

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 8.—1870.] SATURDAY, FEBRUARY 19. {Price Fivepence. / Stamped Edition, 6d.

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☞ NOTICE.—*The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will, on and after* MARCH 4, *be published on* FRIDAY, *at* 2 P.M., *instead of* SATURDAY, *as hitherto.*

ADVERTISEMENTS *for the* CURRENT WEEK *must reach the Office* NOT LATER *than* THURSDAY MORNING.

ROYAL BOTANIC SOCIETY, Regent's Park.—SPRING EXHIBITIONS, March 30 and 31, April 27 and 28. SUMMER EXHIBITIONS, May 25 and 26, June 22 and 23, July 6 and 7. Schedule of Prizes, containing several novelties for all the Exhibitions, may be obtained on application by post. Tickets are being issued.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870, JUNE 3 to 10: ONE THOUSAND POUNDS in PRIZES. To be held in the BOTANIC GARDENS, MANCHESTER. Schedules are ready, and can be had on application to the Undersigned.
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NATIVE SCOTCH FIR; seedlings and transplanted, 1½ to 3 feet, and under; offered at very reduced prices by WILLIAM URQUHART AND SONS, Dundee.

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TRADE ANNOUNCEMENTS,
Gardeners' Chronicle, page 205.
New MELONS, p. 205.
New LETTUCE, new BROCCOLI, &c., p. 205.
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CARTER'S VEGETABLE SEEDS. See page 239. 237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 262. 237 and 238, High Holborn, London, W.C.

CARTER'S NEW PEAS for 1870. See page 239. 237 and 238, High Holborn, London, W.C.

CARTER'S SELECTED SEED POTATOS. See page 239. 237 and 238, High Holborn, London, W.C.

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To the Trade.

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American Early Rose Potatos (true).

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SUTTONS' BERKSHIRE KIDNEY. Very prolific, fine quality, free from disease. Price 5s. per peck, cheaper by the bushel or sack.
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Excellent plants, all extra, transplanted—packages included—
9 to 15 inches, 2s 3d per dozen, 10s per 100
12 to 18 inches, 3s per dozen, 15s per 100
15 to 20 inches, 4s 6d per dozen, 30s per 100
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The above can be supplied by the 1000, in pots 9 to 12 inches, 5s per dozen, 22s 6d per 100. See CATALOGUE
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Established upwards of a Century.

CHOICE 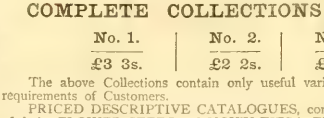 SEEDS.

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" FRUTESCENS	1 0
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BORECOLE, Variegated.—An extra choice strain, with beautifully variegated foliage, of all shades	1 0

CANNAS.

The following are selected as the best and most distinct varieties, but many other sorts can be supplied. For descriptions see Seed Catalogue, page 31.

ANNEI ORANGE	GRANDIFLORA	FLORI-	PERUVIANA
" ROSEA	BUNDA	[ZOIDES	PREMICES DE NICE
" SUPERBA	HYBRIDA	WARSCEWIC-	PURPUREA HYBRIDA
BIHORELLI	KETELERERI	[ZII	RENDATLERI
CHATELSANGUINEA	KRELAGEA DISCOLOR		SITTOWII
DISCOLOR FLORIBUNDA	LEMONEI		WARSCEWICZII
EXIMIA	MAGNIFICA		" ROSEA
GABONENSIS	MUSÆFOLIA		" WARSCEWICZOIDES
GIGANTEA MAJOR	NIGRICANS		ZEBRINA

Per packet, 3d. to 1s.

CANNABIS GIGANTEA (Giant Hemp).—A very ornamental and graceful plant, of rapid growth, with handsome cut foliage; excellent for small groups or as single specimens	0 3
CERASTIUM BIEBERSTEINII, very fine foliage (excellent for edgings)	0 6
" TOMENTOSUM, silvery foliage	0 6
CENTAUREA BABYLONICA.—A handsome plant, with large silvery foliage	1 0
" CANDIDISSIMA, a splendid silvery foliaged plant	1 0
" FENZLII, leaves large, of a glaucous-green colour, flower-stem 3 feet high, producing a large and fine canary coloured flower	1 0
" GYMNOCARPA, silvery foliage, very graceful and fine	1 0
CHAMÆPEUCE CASSABONI.—(Plants of very striking appearance, with handsome spiny)	1 0
" DIACANTHA (Highly valued for subtropical gardens)	1 0
CINERARIA MARITIMA, a very elegant silvery foliaged plant	0 6
" PLATANIFOLIA, large and very handsome glossy green foliage	1 0
CRAMBE CORDIFOLIA.—One of the finest of perfectly hardy large-leaved herbaceous plants; fine for beds or borders	1 0
CUCUMIS PERENNIS.—A perfectly hardy trailing plant, with bold rough leaves of a glaucous-green colour, excellent for covering rough banks or training on trellis-work, &c.	0 6
DAHLIA IMPERIALIS.—A magnificent foliage plant, of noble appearance, attaining a height of 12 feet. See *Gardeners' Chronicle* of April 11, 1868, page 369	1 0
DATURA FASTUOSA HUBERIANA fl.-pl.—A splendid plant, growing 3 to 5 feet high; stem and branches dark purple, flowers very large and double, of a deep lilac, edged and streaked with purple	1 0
ECHEVERIA METALLICA.—A magnificent succulent plant, with large and beautiful leathery bronzy pink coloured foliage, having a metallic lustre; excellent for associating in centre of background to the smaller sorts of Echeverias, Sempervivums, Sedums, &c.	1 6
ECHEVERIA PUMILA (Handsome dwarf-growing plants, with silvery foliage, producing a grand effect. It is probable that the best of the large-leaved Solanums yet introduced	1 0
" SECUNDA	1 0
" " GLAUCA (become very popular for edgings	1 0
ERYTHRINA CRISTA-GALLI (the Coral Tree).—A splendid shrub, with handsome shining foliage, and having beautiful bunches of crimson-scarlet flowers	0 6
EUCALYPTUS GLOBULUS.—A quick-growing plant, of upright branching habit, and distinct aspect. The branches when young are of a square form, and have a winged or feathered appearance, and they, as well as the young leaves, are of a peculiar whitish glaucous colour, which changes to a dark green as the plants grow older	1 0

	Per packet—s. d
FERDINANDIA EMINENS.—One of the tallest and noblest of subtropical plants, sometimes attaining a height of 12 feet, in large leaf	1 0
FERULA COMMUNIS (Giant Fennel).—Elegant plants, of noble aspect, with graceful deep green foliage; very useful during the spring and early summer	0 1 / 0 3
GERANIUM CANARIENSE.—A very graceful and ornamental plant. Its large bright green leaves (regularly cut in a length of 15 to 20 feet), and being deeply cut have a most elegant appearance	0 6
GOURDS, ORNAMENTAL (Collections of 24 finest varieties / Collections of 12 finest varieties)	3 0 / 2 0
GYNERIUM ARGENTEUM (Pampas Grass).—A well-known large and very effective ornamental grass; fine for specimens on lawns	1 0
HELICHRYSUM GARDNERIANUM.—A noble looking plant, somewhat resembling a Canna in growth, and producing a large spike of yellow, sweet-scented flowers	0 6
MELIANTHUS MAJOR.—Fine large cut glaucous foliage, a very handsome and ornamental subtropical plant; fine for the centre of a bed or group	0 6
NASTURTIUM OFFICINALE VARIEGATA.—A beautiful and very bright golden variegated variety of the common Water Cress, suitable for edgings and marginal lines, and reproducing itself perfectly true from seed; it should be grown in poor soil	1 0
NICOTIANA GLAUCA (Magnificent varieties of Tobacco, with large foliage and ornamental flowers; excellent plants for subtropical work) / GRANDIFLORA PURPUREA / MACROPHYLLA GIGANTEA / WIGANDIOIDES	0 6 / 0 6 / 0 6
PERILLA NANKINENSIS.—A well known purple foliaged plant	0 3
PHORMIUM TENAX (the New Zealand Flax).—Long and narrow, Iris-like foliage, very distinct, and fine either for groups in the flower garden or room decoration	1 0
POLYMNIA GRANDIS (Magnificent subtropical plants, of rapid growth, with handsomely cut foliage; fine for massing) / MAXIMOWICZII	1 0 / 1 0
PYRETHRUM GOLDEN FEATHER.—A superb dwarf bedding plant, of close compact habit, with beautiful yellow foliage; excellent for groups or lines	1 0

RICINUS.

These are splendid plants for making bold and noble beds, when well grown attaining a height of 12 feet, with leaves nearly a yard in width; very ornamental and easily grown. The following embrace the best sorts in cultivation—

AFRICANUS	BRAZILIENSIS VIRIDIS	OBERMANII
" ALBIDUS	COMPACTUS	PURPUREUS CINARESCENS
BELOT DE FOUGERES	INSIGNIS	SANGUINEUS TRICOLOR
BOURBONENSIS	MACROCARPUS	Species from the Philippine Islands

Per packet, 3d. to 6d

RUDBECKIA NEWMANNII (resembling a Helianthus, with fine showy foliage) / SPECIOSA	0 6 / 0 3
SALVIA ARGENTEA, beautiful large silvery foliage	0 6
" CHIONANTHA, a fine variety, with lanceolate glaucous woolly leaves, 9 to 12 inches long, and large white flowers; fine, recommended	1 0
" PRATENSIS LUPINOIDES, large green foliage, very showy	1 0

SOLANUMS.

The following comprise the more beautiful of the class remarkable for their fine foliage, which, in most instances, is covered with various coloured spines, formed on both sides of the leaves. They are all very suitable for subtropical work, and the flowers of some of the sorts are very attractive.

ACANTHOCARPUM	LACINIATUM	PYRACANTHUM
BALBISII / BETACEUM	MARMORARIUM	ROBUSTUM
GIGANTEUM	MARGINATUM	VERBASCIFOLIUM

Per packet, 3d. to 6d

SOLANUM WARSCEWICZII.—A magnificent plant, with immense lobed leaves of a deep green colour. It attains an average height of 6 to 8 feet, and when planted in masses produces a grand effect. It is probably the best of the large-leaved Solanums yet introduced	1 0
STACHYS LANATA.—Foliage white and woolly, fine for planting in shade or under trees, and for edgings or lines in borders	0 6
UHDEA PYRAMIDATA.—An excellent large-leaved plant, producing a rich mass of handsome cut green foliage, of a slightly silvery hue	1 0
VERBESINA SERRATIFOLIA.—Very useful, producing a mass of handsome leaves, and growing fresh and vigorously through the autumn	1 0
VERONICA GLAUCA (candida).—An excellent dwarf compact-habited plant, with small whitish Sage-like foliage; very fine for edgings	0 6
WIGANDIA CARACASANA (macrophylla).—A noble plant with magnificent leaves; one of the best and most effective of sub tropical subjects, and fully entitled to hold a place among the finest plants of the flower garden	1 0
" URENS (Two excellent varieties of great beauty, resembling the above in style of growth, but not of such robust habit) / VIGIERI	1 0 / 1 0
ZEA JAPONICA VARIEGATA (Striped Japinese Maize), with variegated foliage per oz., 1s.	0 3
" CURAGUA, and several other large varieties	0 6

ROYAL EXOTIC NURSERY, CHELSEA, S.W.,

NEW LARGE
ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED. | **No. 3. LARGE FLAT WHITE.**
No. 2. GIANT ROCCA, the largest Onion known. | **No. 4. EARLY WHITE,** earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS,
SOUTHWARK STREET, LONDON, S.E.

SEED POTATOS.
H. & F. SHARPE
HAVE FINE STOCKS OF
THE FOLLOWING VARIETIES OF SEED POTATOS,
Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KIDNEY
" MYATT'S PROLIFIC KIDNEY
" AMERICAN ROSE KIDNEY
" RIVERS' ROYAL ASHLEAF KIDNEY
" DAINTREE'S EARLIEST
" KING
" DRUMMOND'S PROLIFIC ROUND
" DALMAHOY
" FOXE'S SEEDLING
" OXFORD

EARLY FORTYFOLD
" FLOUR BALL
" COCKNEY
" BRITISH QUEEN
" MARTIN'S GLOBE
PATTERSON'S VICTORIA, true
WEBB'S IMPERIAL KIDNEY
BARRON'S PERFECTION
WALKER'S EARLY REGENT
TUCKL KIDNEY | ROCKS

SEED GROWING ESTABLISHMENT, WISBECH.

TO THE TRADE.
MESSRS. STUART & CO.,
WHOLESALE SEED MERCHANTS, 5, TAVISTOCK ROW, COVENT GARDEN, W.C.
SEED GROUNDS—NICE, FRANCE.

AMARANTHUS ELEGANTISSIMUS (Lee's variety), very handsome.
CALCEOLARIA HYBRIDA, tigred and spotted, extra choice.
CARNATION, from finest show flowers
CENTAUREA CANDIDISSIMA, true, English saved seed.
" FENZLII, very ornamental foliage.
CINERARIA HYBRIDA, choicest English named sorts.
CYCLAMEN PERSICUM, Wiggins' superb strain.
ECHEVERIA METALLICA, splendid foliaged plant.
GERANIUM ZONALE TRICOLOR, from the finest collection in Europe.
LOBELIA LITTLE GEM, pure white, with blue margin.
" MISS MURPHY, beautiful white variety.
PERILLA NANKINENSIS VARIEGATA, saved from selected plants.
PETUNIA HYBRIDA, choicest named French varieties.
PINKS, finest laced English show flowers
PRIMULA FIMBRIATA (Hayes' Covent Garden strain), white, ex.ex
" " " red, ex ex.
" " Fern-leaved, white, splendid.
" " " red, splendid.
" " scarlet, shaded madder-red, very showy.
" " lilac, with white border, quite distinct.
" " VILLAGE MAID, white, striped crimson,
MELONS, all the newest and best kinds [extra
CUCUMBERS, all the newest and best kinds.

PRICES, TO THE TRADE ONLY, ON APPLICATION.

STUART AND CO., NICE and LONDON.

CALCEOLARIAS, Herbaceous, of fine strain, nice plants, out of pots, 2s 6d per dozen; good plants, in 48 size pots, 4s per dozen, free by post. Special quotations per 100.
GLOXINIAS, new named varieties, 5, 12 for 8 , 24 for 16s.; free by post.
ACHIMENES, in 20 choice varieties, 3 tubers of each for 10 ; 10 varieties, 5 of each, 5s : free by post
DAHLIAS, young pot roots of show, fancy and flower, 20 packets free, 50 varieties for 15s, 25 for 8s, 12 for 4s. Any 12 for 3 . If more than one of a sort is taken, they will be supplied one third less.
H. AND R. STRAKER, Seedsmen and Nurserymen, Leeds, Yorks.

To the Trade.
SPECIAL OFFER of LAURUSTINUS PYRAMIDALIS (NEW)
WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for Stock. It has been seen growing in his Nursery by many eminent Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of sterling merit, the habit being robust, compact; flowers pure white, nearly twice the size of the old varieties, and very sweet scented, with a continuation of flowers during the most severe weather
W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 10s; second size, 3 to 4 feet, do, 10s; third size, 2 to 3 feet, do 7s; fourth size, 18 to 2 feet, do, 5s
Floral Nursery, Hailsham, Sussex.

RHODODENDRONS.

		Per doz.	Per 100.
PONTICUM, twice transplanted, bushy,	12 to 18 in ,	4s 6d	20s.
" " "	15 to 20 in ,	9s 6d	22s
" " "	18 to 24 in ,	6s 0d	25s
" " "	24 to 30 in ,	7s 6d	40s
HYBRIDUM "	12 to 18 in ,	5s 0d	30s.
" " "	18 to 24 in ,	6s 0d	40s
" " "	30 to 36 in ,	7s 6d	50s.
MAXIMUM, white "	15 to 20 in ,	5s 0d	30s.
" " "	18 to 24 in ,	6s 0d	40s
HIRSUTUM, dwarf nice plants		2s 0d	15s

The above can be supplied by the 1000. For named sorts, see CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

Gladioli—Seedlings, and by Name.
GLADIOLI SEEDLINGS (first-class), per 100, 7s.; per 1000, £5
100 Gladioli, by name, 10 sorts .. .. .. 8s.
100 " " 25 sorts .. .. .. 14s.
100 " " 50 sorts .. .. .. 20s. to 40s.
All in good flowering bulbs.
LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

Ranunculuses, Anemones, Flower Seeds, &c.
C. TYSO, FLORIST, &c., Wallingford, Berks., offers large or small assortments of these Beautiful Flowers, which can be sent safely by post.
RANUNCULUSES, 25 choice named sorts, 10s.
" 100 mixtures, from 8s to 15s.
Double ANEMONES, 25 choice sorts, 5s 6d
Single ANEMONES, 100 seedlings, mixed, 5s
GERMAN and other FLOWER SEEDS, in assortments, 1s to 5s each. CATALOGUES sent gratis on receipt of passage stamp.
TREATISE on RANUNCULUS, seven stamps; ditto on ANEMONE, four stamps.

TYNAN'S UNIQUE COLLECTIONS of ASTERS, STOCKS, &c.—The advantages offered to purchasers of these unique Collections are shown by the following, selected from a large number of unsolicited Testimonials from all parts of Great Britain.
"Swinton Amateur Floral Society, March 16, 1868
"SIR,—You will oblige by forwarding the following seeds for the above Society at your earliest convenience, the same time I must congratulate you on the quality of seeds the Society has received from you at former periods. Trusting the present will be as good,—I remain, yours, &c.,
"S. WALLIS, Secretary."
"Cwm Avon, Taibach, March 16, 1868
"DEAR SIR,—Annexed I beg to hand you a small order for seeds Post-office Order to cover enclosed. Your florists' and other seeds last year proved to be of first-class quality, so they have always hitherto done. I may also add that your peculiar system of selling small packets of choice foreign flower seeds is a boon to persons, like myself, having only a small garden.—Yours faithfully, "THOMAS WELCH."
10 vars. TRUFFAUT'S ASTER, 2s 8d.; 12 vars. Dwarf Chrysanthemum do., 2s
10 vars. VICTORIA do., 1s 8d.; 8 vars. Globe do., 1s 4d; 6 vars. Crested do., 1s.
6 vars. ROSE do., 1s; 6 vars. Boltze's Bouquet do., 1s.
12 vars. DWARF GERMAN TEN WEEK STOCK, 2s; 10 vars. large flowering do., 1s 8d.
6 vars. GERMAN BROMPTON do., 1s; 12 vars. Double Wallflower, 1s 8d
For other Collections see CATALOGUE, free by post.
All Flower Seeds in packets post free.
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THE ROYAL SEEDSMEN. The Advantages of Procuring Seeds Direct from the Growers cannot be Overestimated. THE ROYAL SEEDSMEN.

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COLLECTIONS OF VEGETABLE SEEDS
(NEW AND UNADULTERATED), AS HARVESTED ON THEIR OWN SEED FARMS.
THESE COLLECTIONS PRODUCE A PLENTIFUL SUPPLY OF CHOICE VEGETABLES ALL THE YEAR ROUND.

COLLECTION of VEGETABLE SEEDS No. 1, price 12s. 6d., packing included, suitable for a small Cottage Garden.

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PATERSON'S BOVINIA, or CATTLE FEEDER POTATO, the heaviest cropper known. Per lb., 9d.; 14 lb., 7s. 6d.; per bushel, 21s.

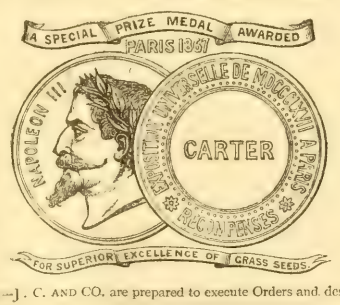

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For detailed Table of these Collections, see CARTER'S SPECIAL ORDER SHEET for 1870, forwarded Gratis and Post Free.

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Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

Vines, Pines, Fruit Trees, &c.

B. S. WILLIAMS has a very fine stock of all the best kinds, true to name, and in splendid condition. SHRUBS, FOREST and ORNAMENTAL TREES of every description. Prices on application

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THOMSON'S WHITE LADY DOWNE'S GRAPE. —Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.

Price 21s., 42s., and 63s. each.

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Vines, Five Shillings each.

LEWIS WOOD, THORPE, Norfolk, has an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.

L. W.'s system of packing saves nearly half the cost of carriage.

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Golden Champion Grape.

OSBORN and SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it. Price 10s. 6d., 21s., and 30s. each.

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Grape Vines and Gloxinias.

J. HOUSE offers a large stock of BLACK HAMBURGH, MADRESFIELD COURT, and MRS PINCE. No better Canes in the Trade. Price and size on application.

Also some first-class roots of GLOXINIAS, in 24-size pots, will have shoo plants for the coming season

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SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Quinces, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnut, Spruce Fir, Laburnum and Hedge Quick.

Samples, with height and price, on application to

W. VIRGO and SON, Wonersh Nursery, Guildford.

MELON, GOLDEN QUEEN (STUART & MEIN).—Fruit of medium size, 2 to 2½ lb. in weight, round shaped, irregularly netted, extremely early, handsome, delicate in quality, melting, and of delicious flavour; a beautiful green-fleshed variety. It has been awarded many first prizes during the past two seasons. In July, 1869, it was awarded the very highest honour by the Horticultural Society's Exhibition, held at Manchester. 1s. per packet.

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SURPLUS STOCK, at reduced prices.—10,000 fine Dwarf ROSES on Manetti, Pyramid PLUMS of sorts, ARBOR-VITÆ, MAHONIA AQUIFOLIA, RED CEDARS, Portugal LAURELS, WEEPING OAKS, SWEET BRIAR, SPRUCE FIR, and BALM of GILEAD ditto, English OAKS, SYCAMORE, &c. Sizes and price on application to

THOMAS PERKINS, 42, Drapery, Northampton

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s. per dozen.

Dwarf-trained 3-yr. Sweet CHERRIES, ten leading sorts, 15s. per doz.

Strong cut-back stocks for budding or grafting, 3-yr., 5s. per dozen, 35s. per 100.

Rider Trained CHERRIES, 30s. per dozen.

" PEACHES and NECTARINES, 60s. per dozen.

Half "Standard H.P. ROSES, 2 feet, splendid stuff, best sorts, 50s. per 100

Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.

" Common LAURELS, 6 to 8 feet, 45s per 100

" WIGHTI, Florist and Nurseryman, Waltham, Sussex

STRONG STANDARD APPLES and PEARS.—Large horizontal Trained and Pyramid Apples and Pears; fine Standard and Dwarf-trained PEACHES and NECTARINES; fine bushy LAURELS and LAURUSTINUS, 3 feet and up to 4 feet; extra bushy LAURUSTINUS and PORTUGAL LAURELS, 4 to 5 feet; a large collection of Standard and Dwarf Perpetual, Dwarf China, and climbing ROSES of the leading sorts; deciduous flowering SHRUBS, 3 years; CEDRUS DEODARA, SPRUCE, AUSTRIAN FIRS, and all kinds of FOREST TREES; strong Evergreen PRIVET and THORN QUICK for Hedges. All the above have been regularly transplanted, and are well rooted. Prices on application to

CHARLES BURGESS, The Nurseries, London Road, Cheltenham.

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THOMAS WARNER begs to remind intending Planters and the Trade that, in addition to his extensive General Nursery Stock, he has the following fine, large quantities, of unsurpassed quality and offered at most reasonable prices. CATALOGUES, Wholesale or Retail, may be had free on application.

APRICOTS, Standard Maiden, Moor Park.

CHERRIES, Standard, Dwarfs, and Pyramids.

CURRANTS, White Dutch.

PEARS, Standards and Pyramids

PLUMS, Standards, Pyramids, Victoria

MANETTI ROSE STOCKS

ARBOR-VITÆ (of sorts), single specimens, 1½ to 5 feet.

AUCUBA JAPONICA, single specimens, 1 to 2 feet

BOX, Tree (of sorts), 1½ to 3 feet

CHESTNUTS, Scarlet and White, Standards, 5 to 8 feet

ELM, Golden, Ornamental (of sorts), Standards, 4 to 12 feet

LABURNUM, English, 4 to 8 feet.

POPLAR, New Silver, 1½ to 8 feet.

OAK, English, Transplanted, extra fine, 3 to 5 feet.

SPRUCE FIR, single (strong), 1½ to 3 feet.

ROSES, Dwarf, most of the leading and newer kinds.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonyms, peculiarity, quality, size, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do of APPLES, 300 do. of PLUMS, 200 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 3 to 5 feet high; also very fine Dwarf-trained Trees of all kinds, of superior quality, are offered. These Trees are described in the "Orchardist," the best work on Fruit Trees in England, price 1s. 6d. in stamps. A printed List or Index sent gratis

J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety.

CATALOGUE free on application.

Fruit Trees.

WILLIAM PAUL has to offer, of superior quality, Half-standard and Standard trained PEACHES and NECTARINES, 5s. to 7s. 6d. each.

Ditto, bearing trees, of many sorts, 2l. 7s. 6d. to 10l. 6d. each.

STANDARD APPLES, PEARS and PLUMS, very fine, 1s. 6d. to 2s. each

PYRAMID APPLES on Paradise and Doucin stocks, 18s. per dozen.

These may be planted the same distance apart as Gooseberry trees, bearing fruit like cups of thrums.

PYRAMID PEARS on Quince and Pear stocks, 1s. 6d. to 3s. 6d. each.

PLUMS, 1s. 6d. to 3s. 6d. each

Dwarf "trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES and NECTARINES, 2s. 6d. to 5s. each.

RED CURRANTS, 21s. per 100; 3s. per dozen.

PAUL'S NURSERIES, Waltham Cross London, N.

FOREST TREES, which we can offer in quantity, well rooted and cheap —Ash, Sycamore, Birch, Elm (Wych), Oak, Poplar (*B. Italiani*, Limes, Chestnut (Horse), Hazel, Maples, Privet, Willows, in sizes of 1½ to 2 feet, 2 to 3 feet, 3 to 4 feet, 4 to 5 feet Ash (Mountain), 5 to 6 feet, 6 to 8 feet; Spruce Scotch, Silver and Austrian Firs, from 1 to 1½ foot, 1½ to 2 feet, 2 to 3 feet; Chestnut (Spanish), 1½ to 2½ feet Also large stocks of other sorts

CATALOGUES on application.

H AND R. STIRZAKER, Skerton Nurseries, Lancaster.

AMERICAN ARBOR-VITÆ, good Plants, 1½ to 2 feet, 2s per dozen, 12s. per 100.
2 to 2½ feet, 3s. per dozen, 15s. per 100
2 to 3 feet, 3s. 6d. per dozen, 16s. per 100.
2½ to 3½ feet, 4s. per dozen, 20s. per 100.
3 to 4 feet, 4s. 6d. per dozen, 22s. per 100

CATALOGUES on application.

JAMES SMITH, Darley Dale Nurseries, Matlock.

LARGE ORNAMENTAL TREES for AVENUES. —Fine selected Trees of the Scarlet and Common HORSE CHESTNUTS, and other Ornamental Trees, 7 to 8, 8 to 9, 10 to 14 feet.

Extra fine picked PINUS AUSTRIACA, four times transplanted, from 3 to 4 feet Price on application.

WM. WOOD and SON, The Nurseries, Maresfield, near Uckfield, Sussex.

COVERT PLANTS.—Spruce, 2, 3, and 4 feet, thrice transplanted, Mahonia aquifolia, 1, 2, and 3 feet, twice transplanted; Evergreen Privet, 3, 4 and 5 feet, twice transplanted; Rhododendrons, 1, 2 and 3 feet, transplanted, and with balls; Berberis vulgaris, and *B. dulcis*, 2, 3 and 4 feet, strong; Gorse, 1½ to 2 feet, transplanted last April; Yellow and White Broom, 3, 4 and 5 feet, ditto; Dwarf and Mountain Pine, twice transplanted; Snowberry, Sweet Briar, and Spiræa, 2, 3 and 4 feet; and all other desirable plants for forming Game and Fox Coverts, of superior quality and capitally rooted. Samples and special low prices upon application.

JAMES DICKSON and SONS, "Newton" Nurseries, Chester.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do. SILVER, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in the usual sizes.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester.

To Planters.

JOHN NELSON has a splendid stock of the following Trees, which he will supply at greatly reduced prices to effect a clearance:—

ENGLISH OAK, in drills, 12 to 18 inches; transplanted, 2 to 3 feet

ASH, 3 to 4 ft. transplanted; HORNBEAM, 3 to 4 ft., transplanted

Standard ROSES, of all the best kinds

MANETTI STOCKS Strong THORN QUICK

MYATT'S ASHLEAF POTATOS

Terms cash from unknown Correspondents, or satisfactory reference. Prices on application to

JOHN NELSON, St. Michael's Hill Nursery, Bristol.

SYCAMORES or PLANES, 7 to 9 feet, 3s. per dozen. 9 to 12 feet, 6s. per dozen. 12 to 15 feet, 9s. per dozen.

ASH and HORSE CHESTNUT, 3 to 4 feet, 30s. per 1000.

OAKS, 2 to 3 feet, 5s. per 1000 BEECH, 1½ feet, 12s. per 1000

LAURELS, 1 foot, 9s.; 2 to 3 feet, 30s.; 3 to 4 feet, 45s. per dozen

PINUS AUSTRIACA, 2 to 3 feet, 30s.; 3 to 4 feet, 45s. per dozen.

ROSES, 2 feet and upwards, 9s. per dozen; less than 2 feet, 6s. per doz.

Fine CUCUMBER SEED, 7s. per lb.; 6d. per oz.

Address

A. WILKIN, Taptree, Kelvedon, Essex

HARDY HEATHS, in 50 varieties, free of package:—

24 plants, in 12 varieties, two of each for 7s.

48 plants, in 24 varieties, including choicer varieties, for 18s.

100 plants, in 12 varieties, for 25s

100 plants, in 24 varieties, for 35s

100 plants, in 50 varieties, for 50s.

Many varieties can be supplied by the 1000. See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, near Matlock.

SURPLUS STOCK.

		Per 1000—£	s.	d.
500,000 THORN QUICKS, 2-yr		0	12	0
200,000 " 3-yr		1	4	0
10,000 HORSE CHESTNUT, 1-yr, 6 to 12 inches		4	0	0
10,000 " 2-yr, 12 to 18 inches		4	0	0
50,000 OAK, 1-yr		2	0	0
50,000 " 2-yr, strong		4	0	0
10,000 TURKEY OAK, 2-yr		0	8	0
20,000 SPRUCE FIR, 9 to 12 inches		10	0	0
20,000 " 12 to 18 inches		15	0	0
10,000 " 2 to 3 feet		25	0	0
5,000 ASH, 3 to 4 feet		30	0	0
3,000 SWEET BAY, 1-yr		20	0	0
3,000 BEECH, 6 to 7 feet	Per 100	7	0	

R. PENNESSY and SON, Waterford Nursery.

ON SALE, 500,000 RHODODENDRONS, hybrids, 18 to 2 feet, fine bushy plants, 50s. per 100; 2 to 2½ feet, fine bushy plants, 70s. per 100

RHODODENDRON MYRTIFOLIUM, fine bushy plants, 9s. per doz.

AZALEA PONTICUM, fine bushy plants, 1 to 2 feet, 50s. per 100.

	Per 100.—£	s.	d.
20,000 Ash, Common, 4 to 5 feet	7	0	
40,000 Poplar, Italian, 6 to 7 feet	10	0	
2,000 " 8 to 9 feet	10	0	
2,000 Lombardy Poplar, 5 to 6 feet	12	0	
2,000 Ontario Poplar, 5 to 7 feet	12	0	
2,000 Hazel, 4 to 5 feet	8	0	
2,000 " 3 to 4 feet	7	0	
4,000 Spruce Fir, 2 to 2½ feet	5	0	
2,000 Scarlet Palm Willow, 10 feet	40	0	
1,000 " 7 feet	25	0	
200 Dutch Willow, 6 to 8 feet	14	0	
2,000 " 3 to 5 feet	8	0	
1,000 Huntingdon Willow, 6 to 7 feet	16	0	

Apply to B. WHITHAM, Nurseries, Reddish, near Stockport.

PICEA NOBILIS.—Suitable for Avenues or Ornamental Planting—500 Picea nobilis, from seed, finely-furnished Trees, 2½ to 4 feet high, with good leading shoots and splendid roots This Californian Pine is thoroughly hardy, sound in constitution, of rapid growth, and will grow to size in almost any soil or situation if planted in loamy soil. It takes the very highest rank as a remarkable, noble, and beautiful Tree. The above to be sold very Cheap. Price on application to Messrs. FISHER, HOLMES, AND CO., Handsworth Nursery, Sheffield.

F., H. AND CO. offer GLADIOLI, fine bulbs, cheap varieties, for planting in large masses, viz.:—

BRENCHLEYENSIS, intense carmine-scarlet, fine spikes, per doz., 2s.; 100, 12s.; per 1000, 100s.

GANDAVENSIS, vermilion, spotted yellow, per doz., 1s. 3d.; per 100, 8s.; per 1000, 70s.

GANDAVENSIS, selected roots, per doz., 2s. 6d.; per 100, 16s.

SEEDLINGS, from the finest English and Continental named varieties, per doz., 3s. per 100, 20s.

SEEDLINGS, imported, choice mixed, per doz., 2s.; per 100, 14s.; per 1000, 120s.

SEEDLINGS, fine mixed, per doz., 1s. 3d.; per 100, 8s.; per 1000, 70s.

A fine collection of named varieties, 3s. to 12s. per dozen.

The following PRICED CATALOGUES may be had, post free.

No. 2. Forest and Ornamental Trees, Evergreen and Deciduous Shrubs, Coniferæ, American Plants, Climbers, &c.

No. 3. Fruits, with descriptions.

No. 12. Roses, with descriptions.

F., H. AND CO. devote special personal attention to the VEGETABLE, FLOWER, and AGRICULTURAL SEED DEPARTMENTS, the Stocks of which are selected from the most reliable sources; for Catalogues see—

No. 6. Vegetable Seeds, Garden Implements, and other requisites.

No. 8. Imported Collections, and other select Flower Seeds.

No. 9. Agricultural Seeds.

All Seeds carriage paid.

Agents for George Hall & Son's celebrated Garden Knives.

Messrs. FISHER, HOLMES, AND CO., Nurserymen, Seedsmen, and Florists.

Seed Warehouses: Sheffield and Rotherham.

Nurseries: Handsworth, near Sheffield.

KNAP HILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 6 feet, 30s. to 60s. per dozen. Transplanted April, 1869.

ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868.

ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference.

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5 per 100, £40 per 1000.

The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbraziliana, &c., large numbers, many of them 20 and 30 years' growth.

CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869.

CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868.

CEDRUS LEBANONICA, 5, 6, to 10 feet. Moved September, 1868.

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 10s. 6d. each.

" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each.

" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet in circumference, 21s. each.

JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Many thousands may select from a stock of many thousands of this fine plant, 5 to 8 feet high.

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.

PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high.

PICEA PINSAPO, 4 to 5 feet, 42s. per dozen; most beautiful plants, 4, 5, 6, 8, and 9 feet high. All removed 1868-69.

PICEA MAGNIFICA, 3, 4, and 5 feet.

PICEA MORINDA, 4 to 5 feet, 21s. to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869.

THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed.

THUJA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868.

THUJA LOBBII, 8 to 14 feet high, and as much in circumference; transplanted April, 1869.

THUJOPSIS BOREALIS, 5 to feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868.

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each. Transplanted in August.

PINUS AUSTRIACA, 4 to 5 feet, 30s. per 100. Transplanted Sept., 1868.

PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft. round, 10s. 6d. to 21s. each.

YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 6 feet of gold, and up to 20 feet high.

YEWS, IRISH, handsome plants, up to 10 feet high.

HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in England; in extraordinary masses, as well as ordinary sizes, together, many thousands of the following varieties:—

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet.

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference.

HOLLY, SILVER QUEEN, 3, 4, 5, and 6 feet.

WATERER'S HOLLY.—The variety originated in this Nursery; we have hundreds 4, 5, and 6 ft. high, 10 and 15 ft. circumference.

PERRY'S WEEPING HOLLY.—Standards, 10s. 6d. to 21s. each.

HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869.

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved April, 1869.

HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868-9:—

LAURIFOLIA and SCOTTICA, 4, 5, 6, 7, 8, 10 feet high.

HODGINS', ANGUSTIFOLIA,

YELLOW BERRIED, MYRTIFOLIA, &c.

4, 5, 6, and 8 feet high.

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number

N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better rooted plants cannot be wished or obtained. The prices are fair and reasonable.

BOX, Green and Variegated, 4, 5, 6, 7, 8 feet.

BOX, do. do., fine pyramids, up to 8 feet.

BAYS, standards and pyramids.

LAURESTINUS, standards.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.

AUCUBA JAPONICA, Berried, hundreds, 18 to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards.

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, the finest and most extensive in England; anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—

RHODODENDRONS, nice bushy plants, from layers, named kinds, £6 per 100, £40 per 1000; 2 feet, same sample as sample application

RHODODENDRONS, the finer kinds, by name, from £7 per 100 to £12 per 100, and upwards.

RHODODENDRON PONTICUM, good plants for Cover, from £1 to £15 per 1000.

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference. There is probably no kind better adapted for standards than the Rhododendron, many thousands of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 per 100. Sample on application Large and handsome plants by the 1000, 4 to 8 feet high.

AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.

AZALEAS, common kinds, £5 per 100

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference.

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100.

ANDROMEDA FLORIBUNDA, £5 to £7 per 100, and upwards.

HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100.

ERICA CARNEA, for winter blooming, many thousands.

ERICA MEDITERRANEA HYEMALIS, remove from October to May, and smells like new-mown hay—indispensable for Winter Gardening

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s to 18s per dozen

As well as the above, the Knap Hill Nursery contains upwards of 300 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same cart, without package, from Woking to almost any Railway Station in England.

WILLIAM POTTEN can now supply MADAME LEMOINE, at 6s per dozen; Mrs. POLLOCK, at 3s per dozen, good; ZONALS, in sorts, at 20s per 100. All good plants, in 3-inch pots; package free. Orders are booked now for April and May.

A priced LIST of most of the new and leading sorts can be had on application to

WILLIAM POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2s 6d; Lady Cullum, 6s; Sunset, 3s; Sophia Dumaresque, 3s 6d; Italia Unita, 3s; Picturata, 3s 6d; Gold and Bronze Zonals—Beauty of Calderdale, 3s 6d; E. G. Henderson, 6s; Duke of Edinburgh, 9s; Her Majesty, 6s; Luna, 3s 6d; Nestaway, 2s 6d. Baskets and Packing, 1s. for a single dozen, and 6d. for every subsequent dozen. Remittances requested from unknown correspondents.

ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire.

Cheap, Cheap, Cheap.

TRICOLOR and other PELARGONIUMS, in good plants, at the following prices, for cash:—Mrs. Pollock, 3s per dozen; White Lady, 6s.; Lady Cullum, 6s.; Italia Unita, 3s.; Glen Eyre Beauty, 6s; Crystal Palace Gem, 3s.; Luna, 3s.; Beauty of Oulton, 3s.; Perilla, 4s.; Lord Derby, 4s.; Leonidas, 4s.

HERBACEOUS CALCEOLARIAS, from seed pans, first-rate strain, good plants, 1s 6d. per dozen

Hamper and package included

JOHN BARRETT, St. John's Nursery, Bury St. Edmund's

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show Pelargoniums is now ready, at the following low prices:—100 plants, distinct sorts, for 50s; 50 plants for 30s; or 25 plants, distinct sorts, for 20s, hamper and package included.

Crown Nursery, Reading.

RICHARD WALKER can supply, for cash, SEAKALE, for planting out, 3s. 6d. per 100; ASPARAGUS PLANTS, for planting out, 2s. per 100, or 15s. per 1000: SCARLET and CRIMSON CLOVES, per 100, 10s.: MIXED LACED PINKS, 4s per 100: DOUBLE GERMAN WALLFLOWERS, 5s. per 100; HOME-GROWN WHITE SPANISH ONION SEED, at 2s. per lb.; all new and genuine.

The Market Gardens, Biggleswade, Beds.

CHARLES TURNER begs to call attention to his extensive COLLECTIONS of CARNATIONS and PICOTEES, 21s. per dozen pairs; PINKS, 6s. to 12s. per dozen pairs; Tree CARNATIONS, 18s. to 24s. per dozen plants; and CLOVES, 6s. to 12s. per dozen plants: THE BRIDE, pure white, extra fine, 2s. each. A DESCRIPTIVE CATALOGUE on application.

The Royal Nurseries, Slough.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping small and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success.

RICHARD SMITH, Seed Merchant, Worcester.

RIBES ATROSANGUINEA, dark flowering Currant. Fine plants, 2½ to 3½ feet, 3s. per dozen; 14s. per 100; double flowering, 2½ to 3½ feet, 3s. per dozen; 15s. per 100

BROOM, White Portugal, 1½ to 2 feet, 2s. 6d. per dozen; 12s. per 100; 3 to 4 feet, 3s. per dozen; 18s. per 100.

BROOM, Common Yellow, 2 to 3 feet, 3s. per dozen; 12s. per 100.

See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock.

£6000 Worth of Trees, Evergreen Shrubs, &c,

OFFERED for SALE by

MARTIN AND SON,

Cottingham, and 7, Market Place, Hull.

ARBOR-VITÆ, 2 to 3 feet, and very bushy, 40s. per 100.

" 3 to 4 feet, fine bushy plants, 50s. per 100.

ALDER, fine, 7 to 9 feet, 16s. to 25s. per 100.

ASH, Weeping, 7 to 9 feet stems, 21s. per dozen.

CHERRY, double flowering, 12s. per dozen.

CUPRESSUS LAWSONIANA, 2 to 3 feet, 12s. per dozen.

ELM, Weeping, 7 to 9 feet stems, 21s. per dozen.

" English, grafted, 8 to 14 feet, 9s. to 18s. per dozen.

" broad-leaved, 10 to 12 feet, 10s. to 15s.

HOLLY, Weeping, green, 5 to 6 feet stems, 7s. 6d. to 21s. each.

" variegated, 5 to 7 feet stems, 15s. to 60s. 6d. to 42s. each.

JUNIPERUS "SINENSIS," 2 to 3 feet, 18s. per dozen.

LIMES, 6 to 8 feet, 12s. per dozen.

LABURNUMS, 6 to 8 feet, 40s. per 100.

POPLARS, 8 to 14 feet, 16s. to 30s. per 100.

PRIVET, Evergreen, 2 to 3 feet, 30s. per 1000.

THUJOPSIS BOREALIS, 2 to 2½ feet, 18s. per dozen, £5 per 100.

" 3 to 4 feet, 30s. per dozen.

AMERICAN WEEPING WILLOWS, 5 to 7 feet stems, 12s. per doz

WELLINGTONIA GIGANTEA, 6 to 8 feet, 21s. each.

ACER, Silver Variegated, Standards and Dwarfs, 12s. to 30s. per dozen.

AUCUBA JAPONICA, 2 feet, 7s. per dozen.

BERBERIS JAPONICA, 1 to 1½ foot, 100s. per 100.

DARWINII, 2 feet, 25s. per 100

DEUTZIA GRACILIS, fine for forcing, 30s. per 100.

" SCABER, 4 feet, 25s. per 100.

ELDER, gold-striped, 6 feet, 30s. per 100.

EUONYMUS JAPONICUS, 2 feet, 8s. per dozen.

VARIEGATED HOLLIES, price according to shape, &c

IVIES, Irish, fine, 10s. to 16s. per 100.

LAUREL, Common, 2s. 6d. to 10s. per 100; fine, £5 per 1000

" Portugal, very fine and bushy, extra, 40s. per 100.

" Caucasian, very hardy, 40s. per 100

" Colchic, pyramidal, 40s. per 100.

" Rotundifolia 2 feet, 10s. per 100; 4 feet, £10 per 100

LILAC, Purple, 3 to 4 feet, 30s. per 100

" White, 3 feet, 50s. per 100

" Saugeana, 2 feet, 40s. per 100

LIGUSTRUM OVALIFOLIUM, 3 to 6 feet, 30s. to 60s. per 100

" LUCIDUM, 2 feet, 25s. per 100

OAK, Evergreen, English, very fine, 18s. per dozen

PHILLYREA, broad-leaf, 18s. to 30s. per 100

RIBES SANGUINEA, 2 feet, 30s. per 100

RHODODENDRONS, 2 to 2½ feet, bushy, 30s. per 100.

ROSES, Dwarfs and fine kinds, H. P. and B., 40s. per 100.

" Standards, 100s. per 100.

SYRINGAS, 3 to 5 feet, 30s. per 100.

VIBURNUMS, 5 feet, 30s. per 100.

YEWS, English, very fine, 80s. per 100.

" Irish, 3 feet, 25s. per 100.

CLEMATIS, fine strong, 4s. per dozen, 25s. per 100.

HONEYSUCKLE, strong, 25s. per 100.

CLIMBING ROSES, strong, 3s. to 4s. per dozen, 25s. per 100.

ARAUCARIA IMBRICATA, fine specimen, 3 to 6 feet high, 3s. 6d. to 30s. each

CRYPTOMERIA JAPONICA, fine, 1 to 1½ foot, 30s. per 100

PICEA NORMANNIANA, fine, 2½ per dozen.

" GRANDIS, fine, 2½ per dozen.

PINUS CEMBRA, fine, 80s. per 100.

THUJA GIGANTEA, 1½ to 2½ feet, £10 per 100

" DOMBEYA, 1½ feet, 25s. per 100

CHESTNUTS, 6 to 16 feet, 4s. to 30s. per dozen.

ASH, Mountain, 6 to 9 feet, 4s. to 10s. per dozen

QUICKWOOD, about 3 feet, 10s. per 1000. 4 feet 20s.

KITCHEN GARDEN SEED.

Our CATALOGUES may be had on application, Wholesale and Retail, and the prices are lower than any offer in the trade.

GARDEN TOOLS of every description, and from the best makers.

Gardeners' Lead Pencils, Thermometers, Mats, Gloves, Gishurst Compound, Nails and Shreds, Hyacinth Glasses, Mushroom Spawn, and every requisite required by Gardeners.

NURSERY CATALOGUES may be obtained on application to MARTIN AND SON, Seed Growers, Merchants, and Nurserymen, Cottingham, and 7, Market Place, Hull.

AZALEA PONTICUM (Sweet Azalea), 10 to 15 inches, at 4s. per dozen, 20s. per 100; 15 to 20 inches, 5s. per dozen.

ANDROMEDA POLIFOLIA ANGUSTIFOLIA, nice plants, 5s. per dozen, 15s. per 100.

KALMIA GLAUCA, 8 to 12 inches, 3s. per dozen, 15s. per 100; 12 to 18 inches, 4s. per dozen, 25s. per 100.

LEDUM PALUSTRE, 8 to 12 inches, 3s. per dozen, 15s. per 100

All these can be supplied by the 1000. See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock

Caution.—Viola cornuta, var. Perfection.

B. S. WILLIAMS, having purchased the entire Stock of this beautiful new Bedding Plant from Mr. Jobson, of Rotherfield Park, begs to inform the Public, that although it will not be offered for Sale until the end of April, he is compelled to draw their attention to it thus early, in consequence of a printed Advertisement which has been issued and circulated by Mr. R. Dean, of Ealing, in which he offers Viola cornuta, var. Perfection, and claims for his own plant the Certificate awarded to Mr. Jobson's, and also applies to his own plant the high encomiums of the reporters to the various horticultural Papers when describing that at Rotherfield Park. In answer to which, Mr. Jobson says, "Not a plant or cutting of Viola cornuta, var. Perfection (exhibited by me at Kensington, Sept. 21, 1869, when it was awarded a First-class Certificate by the Floral Committee) has ever left the gardens here, with my knowledge or consent." So that Mr. R. Dean's Advertisement, to say the least of it, is a gross misrepresentation, evidently intended to mislead the Public with respect to the superb Plant which B. S. W. intends distributing.

B. S. WILLIAMS, Victoria and Paradise Nurseries, Upper Holloway, London, N.

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS,

NURSERYMAN and SEED MERCHANT,

Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 10s. 6d., 21s., 42s., 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	Per packet.—s. d
Backhouse's Winter White Protecting BROCCOLI	1 6
Dell's fine dark-leaved BEET	1 0
Wilhams' Matchless RED CELERY	1 0
Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Webb's Climax MELON, new (The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	2 6
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2 6
Earley's Defiance TOMATO, new (The earliest and best variety in cultivation.)	2 6

NEW and CHOICE FLOWER SEEDS.

Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
BALSAM, Williams' superb strain	1s. 6d and 2 6
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d., and 3 6
VERBENA, Eckford's finest varieties, mixed	1 0
Williams' Improved Hybrid SOLANUMS	2s. 6d. and 3 6
CENTAUREA CANDIDISSIMA	1s. and 2 6
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	1 0
Parsons' New Tree Mignonette	1 0
PERILLA NANKINENSIS VARIEGATA, new	1 0
Williams' Improved French MARIGOLD, beautifully striped, and very large	1 0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours	2 6
VIOLA CORNUTA ALBA, new	1s 6d and 2 6
ZINNIA ELEGANS PUMILA flore-pleno, new	1 0

B. S. W.'s DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, post free on application.

DAVID GOLD McKAY offers the following at low prices. Carriage free above 20s.

	Per dor.—s. d
Cinerarias, named sorts	3 0
Dielytra spectabilis	3 0
Dwarf Rocket Cactus	3 0
Hollyhocks, show varieties, from	6 0
Herbaceous plants, in great variety, from	4 0
Gladiolus Gandavensis, hybrids. See Catalogue for new arrangement of colours From	3 0
Pampas Grass, from	6 0
Pansies, mixed seedlings	2 0
" yellow ditto	3 0
Pentstemons, named sorts, from	3 0
Polyanthus, choice seedlings	2 0
Strawberries, The Lady, per 100	5 0
" large assortment, per 100	3 0
Violets, in great variety	3 0

CATALOGUES free.

The "Old" Nursery, Sudbury, Suffolk.

SCOTT'S NEW and GENUINE SEEDS.

Post Free

Per packet.—s. d	Per packet.—s. d
Scott's Crimson Dwarf fleet Egyptian Turnip, dark red do	1 0
Scott's Eclipse Brussels Sprouts	1 0
Snow's Winter White Broccoli	1 0
True Selected Erfurt Early Dwarf Cauliflower	1 6
Merveille de Gretz Carrot	1 0
Mammoth Pumpkin, extra	1 0
Victoria White Cos Lettuce	1 0
Davis' Giant Green Cos Lettuce	1 0
Dell's Favourite Cabbage do	1 0
The two largest Lettuces grown	
Golden Queen Melon	1 6
Bailey's Prize Eclipse do.	1 6
Bedfordshire Champion Onion	1 0
Nuneham Park do	0 6
Giant Rocca (large) do	1 0
Champion Superb Curled Parsley	1 0

COLLECTIONS of VEGETABLE SEEDS, from 6d. to £5

For all particulars see Descriptive Catalogue, free

Per packet.—s. d	Per packet.—s. d
Aster, New Quilled, 12 sorts, mixed	1 0
Reed's Exhibition, 12 do	1 0
French Fringy flowered Perfection, 18 do	1 0
Dwarf Chrysanthemum-flowered, 12 do	1 0
Crown flowered, 6 do	1 0
French Giant Imperial, 12 do	1 0
Newest Victoria, 12 do	1 0
Stock, dwarf German 12 week, 24 do	1 0
Large-flowered do., 18 do	1 0
Balsam, extra choice double	1 0
Cineraria, choicest strain	1s and 2 6
Cockscomb, Giant, crimson	1 0
dwarf	1 0
Pyrethrum Golden Feather	1 0
Lobelia speciosa (true)	6d and 1 0
Marigold, French, extra choice	6d. and 1 0
Mignonette, new Giant Pyramidal	1 0
Petunia, fl.-pl., extra double	1 0
Extra choice single	1 0
Primula sinensis, fl. pl. vars., mixed	1s and 2 6
Zinnia, fl.-pl., including the new varieties, Pumila and Tagetiflora	1 0

Collections of FLOWER SEEDS, post or carriage free, from 1s 6d to 42s. See p. 21 of DESCRIPTIVE CATALOGUE.

For full descriptions of the above and other desirable varieties of GARDEN SEEDS, also of AGRICULTURAL SEEDS, see J. SCOTT'S PRICED CATALOGUE, free on application

J. SCOTT, The Seed Stores, Yeovil, Somerset.

Beta chilensis.

BUTLER, MCCULLOCH, AND CO. are enabled to offer SEED of the true STOCK of this magnificent foliage plant; it is quite distinct from Beta chilensis, and is fully described in their SPRING CATALOGUE, sent post free: 1s. and 2s. 6d. per packet.

South Bank Row, Covent Garden Market, W.C.

Established upwards of a Century.

JOSEPH SMITH, SEN., Tansley Nursery, Matlock, Derbyshire, begs to intimate that his CATALOGUE of GENERAL NURSERY STOCK is now ready, which he will be happy to forward on application. It contains a large Stock of Forest Trees, Hardy Evergreens, Ornamental Trees and Shrubs, American Plants, &c.

The Nursery is in a very exposed situation, the soil of a fibrous nature, and the Plants take up with excellent roots so as to ensure the best success on their removal.

To the Trade.

G. FARNSWORTH has to offer a large quantity of the under-mentioned, which are strong, young, and well-rooted. Samples on application at the Nurseries, Matlock:—

LARCH, 9 to 18 inches, 12s.

LIMES, 2 to 3 feet, 70s.

SCOTCH, 1½ to 2 feet, 20s.; 1½ to 2½ feet, 23s.

SPRUCE, 1 to 1½ feet, 11s.; 1½ to 2½ feet, 20s.

SYCAMORE, 2 to 3 feet, 20s.

QUICK, strong, 18s.

WHIN, 3-yr., double, 40s.

PRIVET, 1-yr., 4s.

RHODODENDRONS, 3-yr. Seedling, 7s. 6d.

ASH, MOUNTAIN, 3 to 4 feet, 27s. 6d. per 1000.

EVERGREEN HEDGES.

AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.

RUSSIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100; 2½ to 3 feet, 50s. per 100: 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100.

RICHARD SMITH, Nurseryman, Worcester.

Surplus Stock.—Very Cheap

SPECIMEN CONIFERS and EVERGREENS, handsome and well grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For Descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow guage lines, at a moderate cost, thereby saving time and expense of packing.

At 12s. per dozen.

Abies canadensis (Hemlock Spruce), 4 to 5 feet	Laurel, narrow leaved, 2 to 2½ feet
" excelsa, 3 to 4 feet	" Portugal, 2½ to 3 feet
Arbor-vitæ, American, 5 to 6 feet	Picea balsamea, selected, 4 to 5 ft.
" Siberian, 3½ to 4 feet	Quercus ilex (Evergreen Oak), 15 to 18 inches
Grass, double, in pots, strong	[21 inches
Hartogia capensis (Cape Laurel), 1½ to 2 feet	Rhododendron ponticum, 21 to Holly, scarlet berried, green, 1½ to Phillyrea oleafolia, 2 to 2½ ft. [2½ ft.

At 18s. per dozen.

Abies canadensis, 5 to 6 feet	Phillyrea oleafolia, 2½ to 3 feet
" excelsa, 4 to 5 feet	Picea balsamea, 5 to 6 feet
Abietnus, broad leaved, 2 to 2½ ft.	Pinus austriaca, 3 to 4 feet
Arbor-vitæ, American, 6 to 7 feet	Quercus ilex, 2 to 2½ feet
" Siberian, 4 to 4½ feet	Rhododendron ponticum (very bushy), 2 to 2½ feet
Aucuba japonica, 18 to 21 inches	" hybrids, fine varieties, 18 to 21 inches
Box, green tree (pyramids, very handsome) 3½ to 4½ feet	Taxus japonica (Japan Yew), 12 to 15 inches
Hartogia capensis, 2 to 2½ feet	
Laurel, narrow leaved, 3 to 3 feet	

At 24s. per dozen.

Abies elegans, 18 to 24 inches	Ivy, green tree, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet	Laurel, Portugal, pyramids, 3 to 4 feet [feet
Aucuba japonica, 21 to 24 inches	Phillyrea oleafolia, very fine, 3 to 4
Cryptomeria Lobbii, 5 to 6 feet	Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Cupressus Lawsoniana, 4 to 5 feet	Taxus japonica, 15 to 18 inches
Holly, screw leaved, green, 2 to 2½ feet	

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet	Ivy, green tree, extra fine and bushy, 2 to 2½ feet
" elegans, 2 to 2½ feet	Juniperus chinensis, 3 to 3½ feet
Arbor-vitæ compacta, 2½ to 3 feet	" glauca, 3 to 4 feet
Aucuba japonica, very bushy, 2 to 2½ feet	" Lecana, 3 to 4 feet
Cryptomeria Lobbii, 6 to 7 feet	Pinus austriaca, 4 to 5 feet
" viridis, 6 to 7 feet	Thujopsis borealis, 4 to 5 feet

At 36s. per dozen.

Abies inverta (Weeping Spruce), 3½ to 4 feet	Juniperus Smithiana, 3 to 3½ feet
Arbor-vitæ compacta, 3 to 3½ feet	" virginiana pendula, 3 to 4 feet
" Siberian (very fine) 5 to 6 feet	Laurel, Portugal (pyramids, very fine), 4 to 5 feet
Cupressus Lawsoniana, 5 to 6 feet	Pinus laricio, 6 to 7 feet
Juniperus chinensis femina, 3 to " densata, 3 to 4 feet [3½ feet	Taxus elegantissima (gold leaved), 18 to 24 inches
" Schottii, 3 to 3½ feet	" Irish, 5 to 6 feet

At 42s. per dozen.

Abies inverta, fine specimens, 3 to 4 feet	Juniperus phœnicia, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet	" Schottii, 3½ to 4 feet
" Siberian (very fine), 6 to 7 feet	" thurifera (Incense Juniper), 4 to 5 feet
Juniperus chinensis, 3½ to 4 feet	" virginiana pendula, 6 to 7 feet
" fœmina, 3½ to 4 feet	Picea Nordmanniana, 18 to 24 ins.
" druparea, 2½ to 3 feet	Pinus austriaca, 5 to 6 feet
" Lecana, 4 to 5 feet	" laricio, 7 to 8 feet
	Thujopsis borealis, 5 to 6 feet

At 48s. per dozen.

Abies inverta, 4 to 5 feet	Juniperus Smithiana, 3½ to 4 feet
Juniperus chinensis, 4 to 5 feet	" thurifera, 5 to 6 feet
" densata, 4 to 5 feet	" virginiana, 5 to 6 feet
" glauca, 4 to 5 feet	" viridis pendula, 4 to 5 feet
" Lecana, 5 to 6 feet	Pinus laricio, 8 to 9 feet
" phœnicia, 4 to 5 feet	Taxus, Irish, 6 to 7 feet
" Schottii, 4 to 5 feet	Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen

Abies Menziesii, 2 to 8 feet	Juniperus virginiana, 8 to 10 feet
" monstrosa, 7 to 8 feet	" viridis pendula, 5 to 6 feet
Arbor-vitæ compacta, 4 to 4½ feet	Laurel, colchic (very fine), 8 to 10 feet [5 to 6 feet
Juniperus chinensis, very fine, 5 to 6 feet	" Portugal, pyramids (very fine),
" densata, 5 to 6 feet	Picea Nordmanniana, 2½ to 3 feet
" glauca, 5 to 6 feet	Pinus Cembra, extra fine, 6 to 7 ft
" phœnicia, 5 to 6 feet	Taxus elegantissima, 2 to 2½ feet
" Smithiana, 4 to 5 feet	Thujopsis borealis, 6 to 7 feet
" thurifera, 6 to 7 feet	Wellingtonia gigantea, 3 to 3½ feet

At 72s. per dozen.

Abies albertiana, 7 to 8 feet, 100s. 6d. each	Picea lasiocarpa, 2½ to 3 feet, 15s.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d. each
" Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each	" nobilis (best glaucous var.), 18 to 24 inches, 7s. 6d.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
" orientalis, very fine, 6 or 7 to 8 feet, 7s. 6d.; 6 to 7 feet, 5s. 6d. each	Pinus Cembra, 7 to 8 feet, 7s. 6d. each
Araucaria imbricata, 3 to 4 feet, 18s.; 4 to 5 feet, 30s.; 5 to 6 feet, 42s.; 6 to 7 feet, 63s.; 7 to 8 feet, 84s.; 8 to 9 feet, 105s.; 9 to 10 feet, 126s. each	Thujopsis borealis, 4 to 4½ ft., 15s.; 4½ to 5 ft., 21s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. each
Juniperus densata, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each	Wellingtonia gigantea, 4 to 4½ ft., 15s.; 4½ to 5 ft., 21s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. each
" thurifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each	Yews, for hedges, about 12 feet high, 46 years old, recently transplanted, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each	
Picea grandis, extra fine, 5 to 6 ft., 15s.; 6 to 7 feet, 21s. each	

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Paul's Rose Catalogue.

"A very complete and able catalogue."—*Floral World.*

WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application The stock of Plants is large and excellent.
Paul's Nurseries, Waltham Cross, London, N.

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants
10,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application
WM WOOD and SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

Charles Noble

Is CLEARING GROUNDS of the FOLLOWING STOCK :—
DWARF ROSES, fine plants, finest kinds, 40s., 50s., 60s. per 100; £15 to £25 per 1000. (Half Standards and Standards cheaper in proportion)

	Per 100.	Per 1000.
SPRUCE FIR, remarkably fine .. 7 to 8½ ft	60s.	£12 12s
,, ,, ,, .. 5½ to 7 ft	35s.	15 15s.
,, ,, ,, .. 4 to 4½ ft	40s.	18 18s.
,, ,, ,, .. 3 to 5 ft.	45s.	20 0s.
,, ,, ,, .. 2 to 3½ ft.	50s.	24 0s.
LAUREL, Common .. .. 1½ to 2 ft.	10s 6d.	4 4s.
,, Colchicum .. .. 1½ to 2 ft.	15s.	6 0s.
,, Portugal .. .. 3 to 5 ft.	£12 10s.	—
MANETTI STOCKS, extra fine		25s.

FRUIT TREES
Maiden Peaches, Nectarines, Pears, Apples, Cherry, Plums, Pyramid Apples and Pears Bagshot, Surrey.

Special Offer.

JOHN CRANSTON, having a large surplus stock of the undermentioned articles, will be happy to furnish special quotations, both wholesale and retail :—
Rhododendrons, Standard and Half Standards, all the leading Perpetuals
Dwarfs, do. do., very fine plants for bedding or potting.
Dwarf Standard, Tea-scented, Noisette and Chinas, suitable for potting
Extra tall Standard Roses, 6 to 8 feet stems
Climbing and Pillar Roses.
Roses for forcing, of extra size.
New Roses for 1870, 20 varieties Plants ready early in March
FRUIT TREES—Dwarf-trained Apples, Pears, Plums and Cherries, in all good sorts
Pyramids do. do.
Standard-trained Peaches and Nectarines
Standard Pears, Plums and Cherries, very fine
Gooseberries, upwards of 200 varieties, 1 and 2 yr. old plants.
Currants.
Vines, strong fruiting and planting Canes.
CONIFERÆ. Handsome specimens, 6 to 10 feet.
Pinus austriaca, all quartered and recently transplanted, 2 to 3 feet, and 3 to 4 feet
Specimen, quartered, 2 to 2½, and 2½ to 3 feet
Wellingtonia gigantea, very fine, 2 to 2½, 2½ to 3, and 3 to 4 feet.
Taxodium, Deodar, Cedrus, Araucaria, Cupressus, Retinospora, Thuja gigantea, Lobbii, Abies Menziesii.
The finest stock of
LAUREL, Common and Portugal, Magnolia grandiflora, &c
WEEPING ASH, extra fine, very fine
ENGLISH OAK, 2 to 4 feet, very fine
ASPARAGUS, 2 to 3 yr. ; RHUBARB, SEAKALE, &c
Nurseries, King's Acre, near Hereford

Seeds.—Roses.—Gladioli.

FREDERICK PARSONS, Son and Successor to Mr George Parsons, begs to call attention to his SPECIALITIES for 1870, which will be found to contain all the most useful and varied Garden and Flower Seeds, carefully selected from the leading growers.
F. P.'s complete Collections of Garden Seeds, suitable for gardens of any size.—No. 1, 60s. ; No. 2, 40s. ; No. 3, 20s. ; No. 4, 10s.
Collections of the most approved varieties of Flower Seeds, from 5s. upwards.
German Seeds imported direct by F. P. in sealed collections.
ASTERS A splendid assortment of all the most approved varieties
SPORTS, BALSAMS, PORTULACA, PHLOXES, ZINNIA, LARKSPURS
First-class strains of CALCEOLARIA, 1s. 6d. and 2s. 6d. per packet CINERARIA, 1s. 6d. per packet, PRIMULA, 1s. 6d. per packet
PANSIES (Fancy), Show and Bedding, NEW HYBRIDS.—This new Tea Mignonette has to equal it for best in growth, of very robust habit, and sheboom sweet. F. Parsons is been improving it by careful selection for the last 10 years, and he is quite certain it will be found unrivalled in value, as the plants of only 4 feet in height and 8 feet in circumference in nine months from the time of sowing : moderate-sized plants take about two months from the time of sowing. Packet, 1s. 6d.
GLADIOLUS.—A superb collection of named varieties
GLADIOLUS BRENCHLEYENSIS, in the finest, 100, or 1000.
Descriptive catalogue
ROSES. F. P. has a fine collection of Standard, Half Standard and Dwarf tree, at very reasonable prices. Prices on application, stating quantity required.
F. P. has been appointed Western Road Inspector, and Hassock's Gate Nursery, Keymer, Hurstpierpoint.
Terms cash. Orders passed at the General Office, Brighton

BEAUTIFUL SPRING FLOWERS.—Now ready, in strong plants :—
HEPATICAS, white, 4s. per dozen ; double, 6s. per dozen
PRIMROSES, double Lilac, 4s. ; double White 6s. per dozen
,, ,, Yellow, 4s. ; double Purple, 6s. per dozen
,, ,, Red, 9d. ; Crimson, 1s. ; Striped, 12s. per dozen.
ROCKETS, double White and Purple, 4s. per dozen.
VIOLETS, in 20 distinct kinds (see Catalogue), 4s. per dozen.
POLYANTHUSES, the finest strain in the world, 2s. 6d. per dozen, 15s. per 100
PANSIES, finest border varieties, 2s. 6d. per dozen, 15s. per 100
DAISIES, 20 distinct varieties, 4s. per dozen
AUBRIETIA DELTOIDEA, 1s. 6d. per dozen
HOLLYHOCKS, 24 distinct kinds, to name, 9s. per dozen
PAMPAS GRASS, 2s. per dozen, 20s. per 100
LEUCOJUM AESTIVUM, 1s. 6d. per dozen
AURICULAS, 30 sorts, 4s. per dozen
ADONIS VERNALIS, 1s. per dozen
MYOSOTIS DISSITIFLORA, 1s. per dozen, 8s. per 100
ALOPECURUS PRATENSIS AUREO VARIEGATUS (New Golden Grass), 1s. each, 9s. per dozen
HOLCUS LANATUS VARIEGATUS (New Striped Grass), 1s. each, 9s. per dozen.
FOXGLOVE, finest Spotted, 3s. per dozen, 20s. per 100
WALLFLOWER, 3s. per dozen
DIELYTRA SPECTABILIS, 6s. per dozen.
ARABIS ALBIDA VARIEGATA, 2s. 6d. per dozen, 20s. per 100.
ROSE, old Crimson China, 3s. per dozen.
,, ,, Blush
CHRISTMAS ROSE, HELLEBORUS NIGER and others, 6s. per doz.
FUCHSIAS, New 1869, 12 beautiful varieties in pots, 6s. ; 24 do. 10s. 6d
GERANIUMS, Zonal, New 1869, 12 of the best ever raised, 9s. per doz.
,, Double, New 1869, 12 of the best ever raised, 9s. per doz
,, Madame Lemoine, 6s. per dozen.
TWENTY NEW CHRYSANTHEMUMS, 1869, 12 of 1869, for 10s.
Post-Office Orders on Castle Hedingham.
A CATALOGUE of Choice New Plants of 1869, Roses, Fruit Trees, &c., free on application.
WM. DILLISTONE, Nurseryman, &c., Sible Hedingham, Essex.

MOUNTAIN ASH, a most Ornamental and Profitable Tree for Underwood It will grow upon soil too poor for Hazel and most other plants used for a similar purpose We can supply good plants—1 to 2 feet, at 10s. per 1000 ; 2 to 3 feet, at 20s. per 1000 ; 2½ to 3½ feet, at 25s. per 1000 ; 3½ to 4½ feet, at 40s. per 1000 ; or 25s. 6d. per 1000 SEE CATALOGUE
JAMES SMITH, Derby Dale Nurseries, Matlock

To Noblemen and Gentlemen engaged in Planting.

THE RED LODGE NURSERY, Southampton, will be found replete with a magnificent collection of hardy CONIFERS of all sizes, which, from frequent removal, will transplant with a certainty of success.
Choice named scarlet and other coloured RHODODENDRONS. Also the Pontica and Hybrid varieties, for forming clumps, covers, or large plantations
SHRUBS and ORNAMENTAL TREES of every description ; FRUIT TREES of the most esteemed sorts, true to name ; STANDARD and DWARF ROSES, &c.
A visit to the Nursery is earnestly and respectfully solicited. Priced CATALOGUES and every information may be obtained of the Proprietor, W. H. ROGERS.

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most critical and choice Seeds are either home saved or have been saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

YELLOW-LEAVED CALADIUMS,

RAISED AT THE GARDENS OF

THE ROYAL HORTICULTURAL SOCIETY.

MESSRS. JAMES VEITCH & SONS,

Having made arrangements with the Council of the Royal Horticultural Society to take all the available stock of the above striking and very distinct novelties, have much pleasure in OFFERING for SALE the Plants, which will be ready for distribution on the 1st of May next.

The following descriptions, published by the Society, may be relied on as being exact ; and J. V. & S. feel they need add nothing to recommend to the Public these Novelties, which they are confident will be eagerly sought after by all lovers of this popular and useful class of Decorative Plant. They would only say, that the splendid golden tint of those now offered renders them perfectly distinct from any others previously in cultivation.

CALADIUM PRINCESS ROYAL.
Hybrid R.H.S.

Leaves large, of a pale green or yellow, with crimson centre, in the style of *C. Brongniartii* ; very handsome.

CALADIUM PRINCE OF WALES.
Hybrid R.H.S.

Leaves large, similar to the preceding, with the addition of several deep spots and splashes of crimson ; very handsome.

CALADIUM GOLDEN QUEEN.
Hybrid R.H.S.

Leaves large, pale green or yellow, uniform in colour ; very handsome and of a remarkably chaste appearance.

CALADIUM PRINCESS OF WALES.
Hybrid R.H.S.

Leaves large, similar to the preceding, with the addition of some bright spots of colour ; very handsome.

The Set of Four Plants, £1 10s.

The usual Discount to the Trade ; and special terms will be quoted where several Sets are taken.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

BARR & SUGDEN,

12, KING STREET, COVENT GARDEN, LONDON, W.C.

New Melons.

GILBERT'S BURGHLEY PARK GREEN FLESH.—A much new Melon raised by Mr Gilbert, of the Marquess of Exeter's, on September 21st last it was awarded a First-class Certificate by the Royal Horticultural Society. It has been placed in our hands for distribution, and we feel confident in recommending it to our customers. From the "Gardeners' Chronicle" :—"Burghley Park Green Flesh. Fruit of medium size, roundish oval, smooth, of but slightly netted surface, greenish white flash green, thick, firm, yet very melting, with a very rich and excellent flavour. A hybrid raised by Mr Gilbert, botanist to the present Duke of Cornwall and Victory of Bath. First-class Certificate, Royal Horticultural Society, 1869." 2s. 6d. per packet.

TRIOMPHE DE NICE GREEN FLESH, a first-class new Melon. From the "Gardeners' Chronicle" :—"Triomphe de Nice Green Flesh, raised very prominently netted Skin pale yellow, of greenish-yellow Flesh green, very thick, firm yet melting, the green part delicate and possessed of a partly shaly fine aroma Flavour rich and excellent Barr & Sugden, Bystedian Nurseries, Royal Horticultural Society, 1869." 2s. 6d. per packet.

The above first-class Melons can be had genuine from any of the following Seedsmen :—
Messrs. Jackson & Son, Nurserymen, Kingston-on-Thames
,, Veitch & Sons, Nurserymen, King's Road West, Chelsea.
,, W. Drummond & Sons, 58, Dawson Street, Dublin.
,, Downie, Laird & Laing, Nurserymen, Forest Hill.
,, Ewing & Child, 9, Exchange Street, Norwich.
,, Edmondson Brothers, 10, Dame Street, Dublin.
Mr. Robert Sim, Nurseryman, Sidcup Hill, Foots Cray.

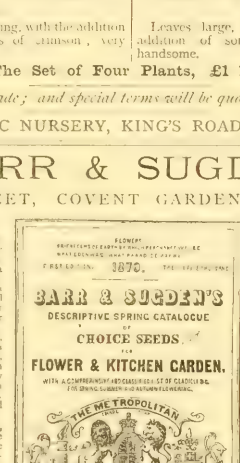

New Lettuce.

DR. LIVINGSTONE, an exceedingly fine stock of the black-seeded Brown Cos, the most hardy, robust, and least-easily affected by heat ; when tied up for a few days there is no Lettuce equal to it for its fine crisp, rich, nutty flavour ; suitable for summer or winter work 1s. 6d. per packet, 2s. 6d. per ounce

WILLIAM ROBINSON, a fine globular-formed compact growing Cabbage Lettuce, extremely hardy, and literally all heart, tender, sweet, delicate, and solid In a collection of 150 other samples it was by far the best in every respect, and throughout the spring months was conspicuous in its distinctness from all others It is a good summer Lettuce, but as a winter Lettuce it excels. From its compactness it may probably be a good "Cloche" variety. 1s. and 2s. 6d. per packet.

New Peas.

LAXTON'S ALPHA, the earliest long-podded wrinkled Marrow, an important acquisition ; was awarded a First-class Certificate by the Fruit Committee of the Royal Horticultural Society, being the earliest and most productive of this class ; 3 feet. 2s. 6d. per half pint

HUNDRED-FOLD, described in the *Gardeners' Chronicle* as a hybrid, between Laxton's Prolific and Ne Plus Ultra ? The sample grown at the Horticultural Gardens, however, had all the appearance of being the green variety selected from Laxton's Prolific. The Pea is also called "The Cook's Favourite," a somewhat homely title, which, probably, has been suggested by its well-filled pods ; 4 feet. 2s. 6d. per quart.

New Broccoli.

BARR'S CHAMPION, one of the most distinct Broccolis in cultivation, and one of the hardiest, is uninjured by the most severe weather ; the flower is well protected, and when allowed to attain its full size, with good culture has produced heads as much as 4 feet in circumference. Sow in March, or, in warm localities, in April 2s. 6d. per packet

New Cabbage.

BARR'S NEW DWARF, a very superior hardy early variety, with close compact small heads, of delicate flavour ; if successional sowings are made it will yield a valuable supply during the autumn and winter months. 1s. per packet.

New Cauliflower.

KNICKERBOCKER, a most valuable late variety, possessing the fine qualities of Snowball, but with a shorter stem and shorter leaves, producing large, compact, snow-white heads, and resisting the heat and drought of summer the best of any. 1s. 6d. per packet, 3s. 6d. per oz

New Carrot.

NEW EARLY FLANDERS SCARLET, this variety is longer than the Early Scarlet Horn, quite as early, and possesses exceedingly fine qualities. 4d. per packet, 1s. per oz.

New Onions.

IMPROVED BROWN SPANISH, an exceedingly fine, firm, large, flat, brown-skinned Onion, of superior keeping qualities, fine flavoured, and a heavy cropper 1s. per oz

GIANT MADEIRA, FLAT, } These attain an immense size if
,, ,, GLOBE, } sown in autumn, and the largest of any sown in spring, they are exceedingly mild, but do not keep long 1s. per oz.

MADEIRA SANTA ANNA, imported from the island, an exceedingly fine variety 1s. per oz

GIANT ROCCA, a very large variety of Flat Tripoli, for spring and autumn sowing 1s. per oz

New Cucumbers.

BARR'S INTERNATIONAL, white spine, the best and the handsomest Cucumber for exhibition purposes, being long and straight, carrying its blossom when the fruit is 30 inches long. 2s. 6d. per packet

BARR'S METROPOLITAN, very solid, fine flavoured, and productive, 20 to 30 inches long, dark green, somewhat prominent black spine, and slightly ribbed ; a fine exhibition variety 2s. 6d. p. pkt.

BATTEN'S CRITERION, white spine, dark olive-green, very straight, short necked, free bearer, fine constitution 1s. 6d. p. pkt.

BATTEN'S GEM, black spine, 24 to 30 inches, rapid grower, fine colour, and a capital exhibition variety. 1s. 6d. per packet.

DR. HOGG, a new black spine variety, a cross between Eugénie and Imperial, fruit 20 to 24 inches long, very straight and handsome, produced in clusters of three or four. 2s. 6d. per packet

Table Maize.

Placed in our hands by the Rev T C Bridaut, Her Majesty's Commissioner at the Paris Exhibition of 1867, to report on the state of Fruit Culture on the Continent Twenty varieties of very superior quality, and the new Ten-week Maize from Boston, the latest received.

The DESCRIPTIVE SEED CATALOGUE sent Free on application to intending purchasers.

BARR AND SUGDEN, 12, KING STREET, COVENT GARDEN, W.C.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

Established 1806.

THANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application.
Seed Warehouse: 24, Cockburn Street, Edinburgh.
Nurseries: Brunstain Glen, Musselburgh.

New Catalogues.

DOWNIE, LAIRD, AND LAING, Frederick Street, Edinburgh, and Stanstead Park, Forest Hill, London, beg to intimate that their DESCRIPTIVE PRICED CATALOGUES of Garden, Flower, and Agricultural Seeds, Gladiolus, Florist Flowers, and New Plants are now ready, and may be had free on application.

Seed and Nursery Establishment, Dumfries.
ESTABLISHED 1787.

THOMAS KENNEDY AND CO., Dumfries, N.B., will be glad to send Copies of their DESCRIPTIVE PRICED CATALOGUES of Vegetable and Flower Seeds, &c., Farm Seeds, &c., and Forest, Fruit, and Ornamental Trees, &c., to any address, post free, on application

Seeds.

CHARLES TURNER'S CATALOGUE of KITCHEN GARDEN, FARM and FLOWER SEEDS is now ready, and may be had on application. This List contains only such varieties as may be depended on, after trials and comparisons
The Royal Nurseries, Slough

ECHEVERIA SECUNDA GLAUCA.—This charming succulent plant, which is so much used in the London Parks, can be easily raised from Seed. THOS S WARE has a quantity to offer of 1869 growth, which has been proved. A packet will be sent free for 13 stamps.
Hale Farm Nurseries, Tottenham, N.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

Try a Scotch House for Your Seeds.

W. P. LAIRD AND SINCLAIR, SEEDSMEN, NURSERYMEN, and FLORISTS, Dundee, N.B. Seeds pure, moderate in price, and true to kind.
LISTS free on application

The Forwardest Pea known is

"SUTTONS' RINGLEADER."
Price 2s per quart; cheaper in large quantities

"The Earliest of All was

"RINGLEADER." Vide Royal Horticultural Society's report on Early Peas.—For description, illustration, and testimonials of this Pea, see p. 138 of Jan. 29.
SUTTON AND SONS, Seedsmen to the Queen, Reading

PEAS.—Maclean's fine Wrinkled Marrows, Premier, Little Gem, Early Emerald, Advancer.
For full description see CHARLES TURNER'S DESCRIPTIVE CATALOGUE, now ready.
The Royal Nurseries, Slough

LEEDS HORTICULTURAL SOCIETY.
The SEVENTH ANNUAL SHOW will be held in the Cardigan Fields, Kirkstall Road, [illegible] 4, 5, and 7, 1870.
PRIZES NEARLY SEVEN HUNDRED POUNDS, including the use offered for

Collections of Plants	£170
Pelargoniums	£70
Orchids, Azaleas, and Heaths	£120
Roses in Pots and Cut Blooms	£100
Fruit, &c.	£80
Bouquets and other Cut Flowers	£25

NOTE.—The North-Eastern, Great Northern, Midland, Lancashire and Yorkshire, and London and North Western Railway Companies will convey Plants, Flowers, Fruits, &c., at ordinary rates to the Show, and return them free if they remain the property of the Exhibitor.
The Committee undertake to receive Boxes of Fruit, Cut Flowers, and Vegetables for Exhibition.
The Committee provide assistants and horses for exhibition vans coming by rail; also covered spring vans to convey Plants, &c., between the Railway Station and the Exhibition Grounds, close at hand.
Schedules, with Forms of Entry, forwarded on application.
JAMES BIRBECK, Secretary, Crossgates, near Leeds.

The Gardeners' Chronicle

SATURDAY, FEBRUARY 19, 1870.

MEETING FOR THE ENSUING WEEK.

MONDAY, February 21—Entomological .. .. .. 7 P.M

GRAFTING the VINE is not a modern discovery, it having been practised perhaps for centuries, but whether any direct notice had been taken of the influence which the stock has upon the graft is not quite so clear. The notion has long prevailed amongst us that the Black Hamburgh was the best stock for black Grapes, and the Muscat of Alexandria or Chatsworth Tokay for the white section, because all these are good, and not likely to impart any bad quality to the produce of the kind grafted upon them. These we began to regard as established facts until a few days back, when a friend, one of the first Grape authorities in Europe, sent us a sample of Mrs. Pince's Black Muscat, with the object of demonstrating the worthlessness of that variety. This, as the Grape is, and has been, of excellent quality under our own cultivation, we could not understand; but upon tasting we found the berries left a nasty astringent smack on the palate, something akin to Tamarind and Bitter Aloes. Had the Grape come from a stranger, we should have suspected a trick had been tried upon us, but we knew our correspondent would be above such a subterfuge; and upon referring to his note, we found that the variety had been grafted upon the Champion Hamburgh, while other samples grafted upon the Muscat Hamburgh were equally offensive to the taste.

From plants growing upon their own roots, under our own care, and as we have tasted it in other places, we consider that Mrs. Pince's Black Muscat, as a winter Grape, is second only to the Muscat of Alexandria, and therefore we can only attribute this deterioration to the influence of the stock upon which it was worked. This fact, if it be one, opens up a wide and very interesting field of investigation.

That finest of all black Grapes, the Black Muscat of Alexandria, or, as it is often called, Muscat Hamburgh, planted in the same house, and subject to the same treatment upon its own roots, is worthless, the produce being small irregular bunches of badly coloured berries, while grafted upon the Hamburgh nothing can be finer—prolific as Miller's Burgundy, and setting and swelling its fruit in the same temperature as freely as the Black Hamburgh. This is an important fact to know, and we do not speak from an isolated experiment, but after taking regular handsome bunches, year after year, from the grafted Vines, and poor irregular ones from the Vines growing upon their own roots.

Here, then, we have the cause why the Black Muscat of Alexandria is so rarely seen in good condition, and why so many gardeners have ceased to grow it. At Wrest Park, we have reason to know, long before the late Mr. SNOW went to reside there, there was an unknown Vine in an old greenhouse in the flower garden, which produced small irregular bunches, the berries, when they got sufficient heat to ripen them, being of exquisite flavour. This, it is fair to conclude, was the origin of the Muscat Hamburgh. Mr. SNOW seldom produced the Grape in first-rate condition. The best bunches we ever saw were growing at Baron Hill, near Beaumaris, under the care of Mr. JOHN MAYOR, but they did not colour thoroughly; indeed we have never seen this superb Grape perfect in bunch, berry, and colour, except when grafted upon the Hamburgh. Hence we would say, always plant grafted Vines of the Black Muscat, and if you cannot obtain them, plant the Hamburgh, and inarch or graft the Muscat upon it.

There is another grand old Grape which one rarely sees, and which it is difficult to purchase—the Black Damascus. This is undoubtedly the finest of all black Grapes, the berries being of immense size and matchless flavour. But it is shy, and requires a high temperature to bring it to maturity. What effect would grafting have upon this variety? We shall try the experiment, and we hope some of our friends will do the same, and *Chronicle* the result. To discover the method of bringing that splendid Grape into general cultivation would be an immense gain to our forcing gardens, something, indeed, which would be well worth living for.

If any of our readers should hear any evidences of the deterioration of Mrs. Pince, or any other variety of Grape, in consequence of grafting, we hope they will report it—of course naming the kind of stock used. What says our friend "B.," who is not unacquainted with grafting wax, in reference to this question. *P.*

IN a remarkable paper, read before the American Association for the Advancement of Science, Mr. THOMAS MEEHAN, the Editor of the "Gardeners' Monthly," discusses the LAWS REGULATING THE PRODUCTION OF THE SEXES IN PLANTS. "From information received," as our police would say—from facts observed, Mr. MEEHAN concludes that it is "only in the best conditions of vegetative vigour that female flowers are produced, while with a weakened vitality comes an increased power to bear male flowers." The author cites several instances in support of his proposition, amongst them this, which we give in his own words:—

"Clearly, then, earliness of pushing forth leaves is a test of vigorous vitality. Now, some Norway Spruces push forth earlier than others. There is as much as two weeks' difference between them, and it is remarkable that those which push out the earliest—may we not say, those which have the highest powers of vitality—are most productive of female blossoms. Arboriculturists may make good use of this fact. Norway Spruces which have a drooping habit are the heavy cone-bearing forms. No way has before been discovered to detect them until they get to a bearing age. Now it will be seen the earliest to push forth in the spring will be the cone-bearing or weeping trees.

"It is not so easy to see the influence of vigour or other forms of vitality, as affecting the sexes in hermaphrodite plants, as in monœcious ones, yet here are some remarkable facts of a similar character. In some flowers the forces which govern the male and female portions respectively seem nearly equally balanced. Then we have a perfect hermaphrodite—one with the stamens and pistils perfect, and one communicating its influence to the other—a self-fertilising flower. In many species, however, we notice a tendency to break up this balance. It becomes either a pistillate or a staminate, either by the suppression or greater development of one force or the other. If the force is in the female direction, it begins by requiring the pollen from some other flower to fertilise itself; if in the male direction, by increasing the number of stamens, or converting the stamens into petals. The interest for us in this sexual question is to note that just in proportion as the sexes diverge in this manner, in just the same ratio do vigour and strong vitality follow the female in the one case, and weakness the male in the other.

"In the male direction, for instance, when the flower becomes double by the conversion of stamens into petals, or the number of either increased, growth is never so strong, and life is more endangered. Double Camellias, Roses, Peaches, and other things have to be grafted on single ones, in order to get more vigorous growing plants, and every florist knows how much more difficult it is to get roots from a double-flowered cutting than from a single one. Sometimes the male principle, which loves to exhibit itself in the gay colouring of the petals, seems to influence the leaves also; and they also become coloured or variegated; and here we see also a weakened vitality follows. Variegated Box, variegated Euonymus, or any of similar character, never grow so freely, or endure the winter's cold or the extremes of climate like the green-leaved forms.

"On the other hand, when the balance goes over in the female interest, we see it characterised by greater vigour than before. It has long been noted that pistillate varieties of Strawberries are more prolific of fruit, but this rule is not always good, as sometimes the runners, which are parts of the feminine system—a form of viviparous flower shoots, in fact—regulate the amount of fruit. But it is a fact, universal, I believe, in its application, that the production of runners and fruit combined is always accompanied by a vigorous vitality.

"So in Viola, where we have female influence variously expressed, from the underground stolon or creeping runner, which reproduces without impregnation, to the apetalous flowers which mature abundant seeds on the smallest possible quantity of pollen, up to the perfectly favoured hermaphrodite flowers of spring—all regular grades of one identical female principle, in contrast with those species which maintain throughout a closer connection with the male principle, by maintaining pure hermaphrodite flowers through their whole stages, we find those possessed of the highest types of vitality which are evidently the most under the laws of female influence."

In other words, "it is the highest types of vitality only which take on the female form."

Mr. MEEHAN'S theory certainly commends itself to our acceptance. The female flower in an inflorescence, when there are flowers of both sexes, is usually placed in the direct line of the sap's flow. Its work—the ripening of the fruit and maturation of the embryo plant—is of a character demanding both high vitality and ample means of supporting the same. Again, as in the case of the Palm trees mentioned by Dr. SPRUCE (p. 1092, 1869), the trees seem to husband their resources, as it were, to produce female flowers one year, and the next to take comparative rest by forming male flowers, whose development is a less tax on the energies of the tree. We commend Mr. MEEHAN'S theory to the attention of our readers, and urge them to test it for themselves by observation. Probably, like all general rules, there are exceptions—for instance, in the case of the Araucaria imbricata. We believe at Bicton, where trees of both sexes have produced their inflorescence, no difference in vigour has been observed between the male and the female trees.

—— A GREAT Exhibition is to be held by the LEEDS HORTICULTURAL SOCIETY during Whitsun week. It seems unfortunate that the same date as that of the Manchester show should have been fixed upon, for though these great centres of population may furnish visitors enough for both, it is quite possible that, viewed as exhibitions, there may in consequence be a falling off in both cases,—a matter of regret, not only in the interests of the respective Societies, but of Horticulture.

—— Respecting a storm which took place a few weeks since in Collioure, in the Eastern Pyrenees, M. NAUDIN stated at a sitting of the Academy of Sciences in Paris, that the snow began falling on January 21, and continued to fall, without interruption, for 44 hours. The whole valley of Roussillon experienced more or less of this infliction, and nothing like it has been seen since 1804 or 1805. The layers of snow were in some places two mètres in depth, and the shallowest layer was from 86 to 94 centimètres thick. The Olive and Orange trees suffered very much. The PALM TREES offered a strange resistance, as M. NAUDIN observed in the case of those in his own and his neighbours' gardens. Crushed under the weight of the snow, these trees were flattened like weeds on the bed of snow which separated them from the ground; this snow caked on the under-surface of the Palms, and remained there in the form of ice. They remained in this state for a period varying from eight to twelve days, after which, a thaw supervening and the snow melting, they raised themselves again, resuming their usual attitude. Neither leaves nor branches seem to have suffered

from this long trial. The Palms, therefore, have the power of resisting cold, and it would seem that their presence in pliocene strata does not prove that the climate in which they lived was tropical.

—— A frequent correspondent of the *Press and St. James' Chronicle* writes as follows :—

"The paltry petty economies of the Government elicit laughter, though sometimes they are serious enough in their consequences. When the cat's meat of the dock-yard cats is cut down, the affair is merely ludicrous : the wholesale discharge of dockyard men is a matter of heavier moment. That the 28 Ritual Commissioners are allowed only two bottles of sherry at a sitting is unimportant : 'my lords and gentlemen' can refresh themselves when they reach home. Of greater importance is Mr. AYRTON'S determination to cut off the supply of flowers and plants to Victoria Park, by reason of their costing too much money. As STERNE remarks, 'they order this matter better in France.' I quote the 'Period' : 'All the magnificent semi-tropical vegetation which adorns the various squares and places of the French capital during the summer months is carefully sheltered during the winter in immense greenhouses situate near the Arc de l'Etoile, and such is the gigantic scale and econonomical principle on which these establishments are conducted, that the mere sale of the surplus stock to nurserymen, florists, &c., at wholesale prices, not only suffices to cover all expenses, but leaves a margin for profit; whilst by thus confining all transactions to the wholesale market, no opposition is made to private trade.' Is not this example worth imitation by a professedly economical Government?"

We, too, noticed the statement in the "Period," but we ask, is it true? We strongly suspect not. We do not find in Mr. ROBINSON'S "Parks, Promenades, and Gardens of Paris" any such statement, and the author of that book would, we are sure, be one of the first to adduce so potent an argument in favour of town gardening could he consistently do so. Nor in the magnificent publication of M. ALPHAND, wherein financial details are given at some length, do we find any passage bearing out the statement made in the "Period." The fact we believe to be, that the accounts of the State expenditure and those of the Municipality proper, are so mixed up, that it would be very difficult for an outsider to ascertain precisely the proportion paid by the State and by the Municipality towards the maintenance of La Muette. In any case, it is the taxpayer who pays. If the Municipality of Paris manages to get a profit out of the Imperial or Governmental departments for the supply of what may be required for decorative purposes—as it is possible they do—it is still the taxpayers who ultimately have "to pay the piper;" for we have no evidence to show that the sale of surplus stock to nurserymen, &c., suffices to cover expenses, not to speak of profit; and in the absence of evidence we take the liberty of doubting.

—— It is singular that this country, which first set the example of a CHEAP POSTAGE, should now be behind Continental nations. Printed matter abroad is carried at very much lower rates than in this country, to the great benefit of the community. Circulars, newspapers and books, and even small parcels, are transmitted by the post in foreign countries at rates which should put Englishmen to shame. The Government, last session, expressed itself favourable to a reduction of the rates, and the Post Office officials, it is well known, are quite ready to undertake the service. In the multitude of other pressing duties it may be overlooked, and the Council of the Society of Arts of London has therefore appointed a committee to take steps for urging upon the Cabinet the great importance to all classes of reducing the postage on printed matter to one-halfpenny instead of a penny, as at present, for every 4 oz. weight. Whilst the question of the education of the people is exciting an all-absorbing interest at the present time, it must not be forgotten that the cheap circulation of printed matter is no unimportant item in its advancement. All classes should give their support and influence on behalf of this committee, which sits at John Street, Adelphi, London.

—— On the occasion of the visit of the English Mayors to BRUSSELS a short time since, and at the express desire of the QUEEN of the BELGIANS, M. LINDEN made a special DISPLAY of ORCHIDS. There were no less than 350 flowering Orchids exhibited, 240 of which were Cattleyas, several among them being new varieties from Choco. Vandas, Saccolabiums, Phalænopsids, Odontoglots, &c., filled up the tale. Who wouldn't be a Mayor?

—— The following particulars respecting the cultivation of the beautiful ACTINIOPTERIS RADIATA, from the pen of Mr. W. CROSS, are taken from the "Florist and Pomologist," to which publication we are also indebted for the annexed block (fig. 41) :—

"On receiving from India two small dry stems about the size of a horse-bean, and some spores, I potted the one and sowed the other, and placed them in the Indian division of the Orchid-house. To my great delight, both plants and spores germinated, leaves were formed, and they grew well. The spore plants, 47 in number, were 'potted off' in Fern fashion; the two old plants were watered sparingly, but soon some of their first-made leaves began to die. I still watered carefully, but the leaves continued to turn brown and die, till one plant appeared to be gone to rest for ever. The other kept its fronds better, probably owing to its having a little more moisture, perhaps from a small piece of Sphagnum Moss or loam having found its way into the pot. In a week or two the leafless plant threw up again, and as quickly went down; this was repeated three or four times during the winter. In spring I satisfied myself the plant was quite exhausted and dead, and I was as perfectly satisfied that it was owing to a want of knowledge on my part. The young plants also began to die rapidly, so that I began to fear our collection would soon be minus the Actiniopteris altogether. I resolved, therefore, to adopt a moister treatment, the result of which was very satisfactory. By this time I had lost 40 of my 47 young plants, and one of the two old ones, while the remaining seven were quite healthy. I broke up some crocks and charcoal in equal parts, and small as Peas, and put with them a good bit of silver sand, and a very small portion of loam and peat, only sufficient to set this rough sharp compost; and half-filling some tall 'thumb-pots' with small crocks, I potted the plants singly into them, and placed them into the same house, in a mean temperature of 73°. This was done in March, and I never afterwards allowed them to get dry at the root, and syringed them two or three times a day, taking care to keep plenty of moisture between the pots. The temperature was increased to a mean of about 78° or 80° as the season advanced, and through the summer no part of the house was allowed to get dry, but each day fresh air was admitted. The division is the north end of a span-roofed house standing due north and south. The plants were so placed that no direct sun could reach them, till about an hour and a half before setting. This treatment was continued through the summer, the temperature being allowed to fall to 68° during the night, and to 73° by day as the light grew less. The plants rested a little through January and part of February, when, as the light increased, they began to throw up fronds, and in March I shifted them into 3-inch pots, half filled with small crocks. A small piece of Sphagnum Moss was placed on the crocks, and the compost used nearly as before, namely, crocks and charcoal in equal parts, a good portion of white sand, and a very little soil, mostly little bits of turfy loam. On June 2 the plants were exhibited at the Royal Horticultural Society's show, in a state of perfect health and vigour."

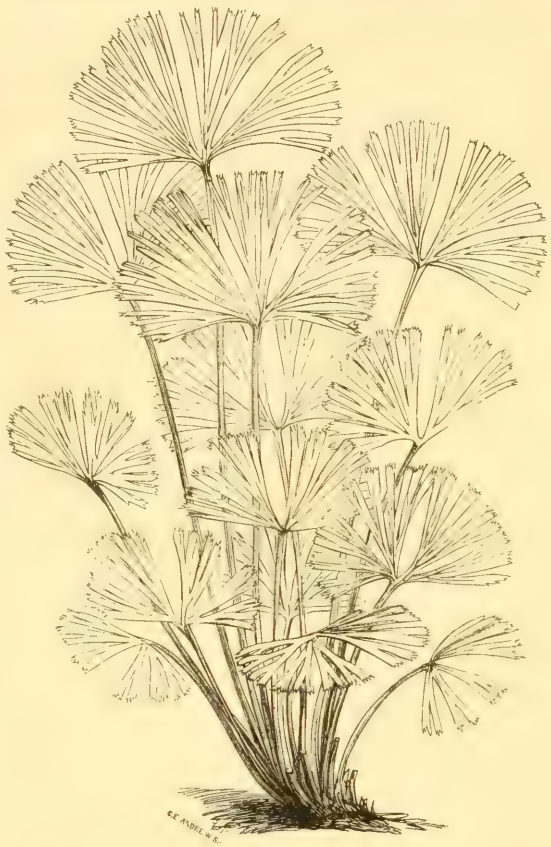

FIG. 41.

—— The issue of certain blank FORMS for the ENTRIES of NEW PLANTS and Seedlings, at future meetings of the Floral Committee, is a step in the right direction, since it directly invites attention to the supply of information which it would often be most desirable the committee and the public should be in possession of. The ostensible object of introducing these forms, we learn, is that of saving time in issuing the cards before the commencement of the meetings, and on this ground we are sure that all exhibitors will heartily co-operate with the authorities. But there may also, at the same time, be secured another important advantage, and it is with the view to invite attention to this, and to urge exhibitors freely to co-operate in this also, that we specially refer to the subject. A note states that the three columns for Name, Native country, origin or raiser's name, and Date of introduction or production, are to be filled up by the exhibitor. In the first of these columns the grower is asked to state, with the name of the plant, that of the authority for its use; and if he will only take the little trouble necessary to supply this piece of information, much will be done towards removing one fertile source of confusion in plant nomenclature, much uncertainty too often existing between names given after proper botanical examination by competent authority, and those which are simply used as a matter of garden convenience. All such as the latter should have the word *Hort.* appended as the authority, to indicate that they are mere garden names. We urge it upon all exhibitors of new plants to bear this in mind. With florists' flowers this is a less important matter, but the authoritative record of the raiser's name and date may sometimes prove highly valuable, especially as, in the case of hybrids, it is requested that the parentage should be stated.

—— We have been requested to state that at a meeting of gentlemen interested in the cultivation of GLADIOLI, held at South Kensington on Tuesday last, the schedule for the Exhibition to be held on August 17 next, was modified as indicated below. It was also decided that the above date, having been fixed on and announced, should be adhered to for the present season, it being an understanding that the convenience of the northern growers should, if possible, be met another year. In addition to the £23 15*s.* already offered by the Society, upwards of £40 had, through the exertions of the Rev. JOSHUA DIX, been subscribed for extra prizes,—namely, MM. Vilmorin-Andrieux & Cie., £5 5*s.*; M. Souchet, £6; M. Eug. Verdier & Cie., £1 1*s.*; M. Ch. Verdier, £2 2*s.*; Messrs. Paul & Son, £2 2*s.*; Messrs. Kelway & Son, £2 2*s.*; Mr. Stukeley, £1 1*s.*; Mr. Marshall, £1 1*s.*; Messrs. Bunyard, £2; Messrs. Downie, Laird & Laing, £2 2*s.*; Messrs. Standish & Co., £1 1*s.*; Messrs. Barr & Sugden, £2 2*s.*; Messrs. Cutbush & Son, £1 1*s.*; Mr. W. Whitburn, £1 1*s.*; Mr. Laxton, 10*s.* 6*d.*; Lieut.-Col. Scott, £1 1*s.*; Mr. W. Paul, £1 1*s.*; Mr. Tillery, £1 1*s.*; Rev. H. Dombrain, £1 1*s.*; Messrs. Veitch & Sons, £5 5*s.* (specially reserved for prizes to foreign growers); Messrs. E. G. Henderson & Son, £1 1*s.*; and John Clutton, Esq. The schedule as rearranged stands as follows :—

For Foreign Growers.

Class 1.—36 Gladioli, cut spikes, distinct—£10, £6, £4.

For Nurserymen.

Class 2.—36 Gladioli, cut spikes, distinct prizes offered by his Grace the Duke of BUCCLEUCH and G. F. WILSON, Esq., F.R.S.)—£7, £5, £3.

Class 3.—18 Gladioli, cut spikes, distinct (for exhibitors not showing in Class 2)—£5, £3, £2.

For Amateurs.

Class 4.—12 Gladioli, cut spikes, distinct—£5, £3, £2.
Class 4 *a*.—9 Gladioli, cut spikes, distinct—£3, £2, £1.
Class 4 *b*.—6 Gladioli, cut spikes, distinct (for exhibitors not showing in Classes 4 and 4 *a*)—£2, £1 10*s*., £1.
Class 4 *c*.—4 Gladioli, cut spikes, distinct, being new varieties sent out in the autumns of 1868 and 1869—£2, £1.

The Classes numbered 5 to 11, in the original schedule for the meeting in question, have not been altered. It is to be hoped that this special exhibition will give an impetus to the culture of the Gladiolus.

—— The schedule of the ROYAL BOTANIC SOCIETY, which has just come to hand, indicates considerable change in the material of which the Great Summer Shows are to be made up. The first class, both in May and June, is a group of miscellaneous plants (unlimited), arranged for effect; and the second a group of bedding plants, also arranged for effect—the highest prize for the former being £15, and for the latter £7. Liliaceous plants seem to be in favour, as there is a group of 12 invited to each show; and though, as they are to be in flower, it may be feared that the group may prove either not as varied or as effective as might be desired, especially in May, we are glad to see any attempt to bring fresh material to the front. Another new class is for 3 climbing plants, trained on chains or wire to their full extent. The small pot movement is met by classes for greenhouse plants, Heaths, Pelargoniums, Roses, &c., in 8-inch pots, while Rhododendrons, Roses, Azaleas, and Fuchsias, are invited in 13-inch pots. We find also some larger groups than usual provided for, as 20 greenhouse plants (these in 8-inch pots), 20 Pelargoniums, 20 Roses, &c. There is, however, surely a little incongruity in the value of the prizes respectively offered for Orchids and Azaleas—6 exotic Orchids, £5; 6 greenhouse Azaleas, £10. Fruit is invited at the June and July shows, the latter consisting mainly of garden furniture rather than plants, as Fern cases, hanging baskets, epergnes, rustic stands, &c., supplemented by bouquets. Botanical Certificates of Merit and Floricultural Certificates of Merit are to be respectively given to new plants of botanical interest, not necessarily ornamental, and to seedlings and "other ornamental plants usually termed florists' flowers"—two classes that are hardly sufficiently defined, and between which really ornamental new introduced species will, as it seems to us, scarcely get justice done to their merits.

—— From the meteorological table given in another column, and recording the state of the weather in several of the towns of England and Scotland, it will be seen that the cold NORTH-EAST WIND, whose effects we have been experiencing, was confined to the eastern coast and a belt of country proceeding thence inland. In the north-east of Scotland the fortunate inhabitants have been enjoying a comparatively genial climate, while we have had an opportunity of studying icebergs in the Thames.

HARDY HEATHS.

How seldom it is that we see in private establishments a good collection of Hardy Heaths; and yet, what can give a more continuous bloom than a well assorted collection of such denizens of the parterre, encircling as they do the entire year with Flora's girdle? The innocent and modest character of their flowers, together with their cheerful green foliage and particularly neat growth, cannot fail to give the most unobservant an interest in them; for some of them, both in flower and habit, even rival those from the Cape, while they have the great advantage over the latter, that they are hardy.

What can eclipse the neatness of growth of such as Erica mediterranea and its varieties, and especially that of the numerous varieties of E. vulgaris—Allportii, Hammondii, Searlii, and stricta? In E. vulgaris aurea we have the young shoots beautifully "tipped with gold," and in variegata with pink and white. Then see what charming flowers E. Tetralix alba and rubra, Mackaiana, and the varieties of the Cornish Heath give us. Neither are they sparingly produced, every branch being laden in its season with tiny bells, which in some varieties are delightfully fragrant, and preferred before many other plants by the honey-seeking bee. Moreover, they last, most of them, from three to five months.

Hardy Heaths will for the most part do well in any open border, and are not over particular as to soil, providing it is not of too calcareous a nature; but to see them at their best they must have a bed or border to themselves, made to a depth of 2 feet with sandy peat; or should that not be a come-at-able article, a very liberal dressing of well decayed leaf soil with a mixture of sand well incorporated with garden soil, should be used instead. The taller growing varieties, such as E. arborea, mediterranea, and stricta, should be selected for the centre, and for the intermediate spaces multiflora, vagans, scoparia, and others; while such as australis, carnea, ciliaris, vulgaris aurea, variegata, densa, and pygmæa, would be gems for the outside. The Irish Heath, Dabeocia polifolia and its varieties, should not be omitted, being so distinct and beautiful.

Subjoined is a monthly list, which cannot fail to please the most fastidious. I should observe that they may be easily increased in quantity by sinking the plants a little, so that the side-shoots may be in contact with the soil. They will then readily emit roots, when they may be taken off, and used where required. Some of them will require cutting back after blooming to rid them of their flowers, which trimming will also improve some few of the varieties.

TIME OF FLOWERING.

January.—E. carnea, herbacea.
February.—E. arborea, carnea, c. herbacea.
March.—E. arborea, australis, carnea, c. herbacea, mediterranea, m. alba. m. rubra, m. hibernica.
April.—E. arborea, australis, carnea, c. herbacea, mediterranea and varieties, scoparia.
May.—E. arborea, australis, mediterranea and varieties, scoparia, umbellata, viridis purpurea.
June.—E. australis, cinerea alba, c. atro-purpurea, c. coccinea, c. rubra, c. Waterii, multiflora alba, m. rubra, Tetralix, T. alba, T. rubra, Mackaiana, umbellata, viridis purpurea, vulgaris, v. alba, v. Allportii, v. aurea, v. elata, v. decumbens, v. flore-pleno, v. Hammondii, v. spuria, v. variegata.
July.—E. ciliaris, cinerea and varieties, multiflora, m. alba, m. rubra, Mackaiana, Tetralix, T. alba, T. rubra, umbellata, vagans, v. alba, v. carnea, v. rubra, viridis purpurea, vulgaris and varieties.
August.—E. ciliaris, cinerea and varieties, multiflora, m. alba, m. rubra, Mackaiana, stricta, Searlii, Tetralix, T. alba, T. rubra, vagans, v. alba, v. carnea, v. rubra, vulgaris and varieties.
September.—E. ciliaris, cinerea and varieties, multiflora, m. alba, m. rubra, Mackaiana, stricta, Searlii, vagans, v. alba, v. carnea, v. rubra.
October.—E. multiflora, m. alba, m. rubra, vagans, v. alba, v. carnea, v. rubra, v. stricta.
November.—E. multiflora, m. alba, m. rubra.
December.—E. carnea, c. herbacea.

J. R.

DEAN'S PATENT FUMIGATOR.

DESPITE our being told that it is the result of bad gardening to have the plants in our houses infested with green-fly and other equally obnoxious pests, it unfortunately happens that this is very frequently the case, so that we are compelled to take measures for the destruction of our enemies without injuring the plants. For this end what a number of concoctions have from time to time been brought forward, all warranted to do their duty, and to answer their intended purpose in every way! All, however, have given place, so far as the destruction of green-fly, to tobacco smoke, whenever it can be applied.

Again, to raise this tobacco smoke cheaply, yet abundantly and effectually, we have had the materials presented to us in all manner of forms. We have the pure tobacco itself (at least as prepared) which would seem to be the best. It is, however, rather expensive, as it burns too freely, and at times goes too fast in an apparently miraculous sort of way. We have also old rags, old tow and brown paper steeped in tobacco juice, besides tobacco tissue, tobacco powder, &c., and various other mixtures wherein more or less of tobacco is contained, each form having its patrons, and being more or less used throughout the country. For some years we have used thick paper in rolls, steeped in tobacco juice, as supplied by Messrs. Griffith & Aviss, and this we have found to serve every purpose.

We have also been supplied in a corresponding degree with instruments, known as fumigators, wherein to burn the tobacco and wherewith to raise the smoke of destruction. It seems to be a favourite source of experiment with many gardeners and nurserymen to invent and distribute new fumigators. Almost every season brings us a new form, which, seemingly because it is new, receives its regular amount of praise and notice until the next one comes. The number of patent fumigators which are to be found knocking about the country is enormous; each is used for a time while novelty is upon it, after this it is cast aside, and the common flower-pot, with a hole in the bottom, is again appealed to, It would be idle to say that all the fumigators introduced are failures, a great majority, however, are mere practical toys, displaying a little ingenuity in construction, but altogether impracticable for the purpose intended. I have tried many, indeed scores, of patent fumigators, including "Drechsler's Patent," figured and described in your columns at p. 72, and I recommend "Dean's Patent" (fig. 42)—supplied by Messrs. Lawson & Sons—as the most practicable and generally useful which has come under my observation. It was noticed and reported on in these pages at p. 409, 1868.

The duty of a fumigator is to raise smoke speedily without wasting the tobacco, and this "Dean's Patent" does, and any sort of material can be used. We filled some of our largest houses with smoke in the space of five minutes by using one machine. We tried, comparatively, at the same time, "Dean's Patent," "Birkett's Patent," "Drechsler's Patent," and the common flower-pot, when Dean's Patent far surpassed them all, doing its work in one-third of the time it took Drechsler's. The tobacco paper used was that supplied by Messrs. Griffiths & Aviss. The construction of Dean's Patent is very simple, being that of an iron pot or hopper, 10 inches deep, and 6 inches in diameter at the top, fixed perpendicularly on the point or nozzle of the tube of a bellows, the air being propelled by revolving fans, turned with a small handle. In using the machine, live embers are placed in the hopper, and the tobacco above; the simple revolutions of the fans keep up a steady smouldering, and a volume of smoke is produced equal in diameter to the mouth of the hopper. The action of the fans is extremely rapid, and the air may be regulated at pleasure. It may also be used without subjecting the operator to "be smoked" by taking off the hopper and inserting the nozzle through an aperture of the house. Excepting for frames and pits, this however is scarcely requisite, as there are few good gardeners who object to performing the work inside. It is done much more satisfactorily; and unless the operator is inside the house, the density or sufficiency of the smoke, in large houses especially, is not easily ascertained.

I have tried "Drechsler's Patent," and found it wanting, and own to some surprise in seeing it so favourably noticed at p. 72. The ordinary tobacco paper it will not burn, but only specially prepared very dry material, and this is a serious objection, tobacco paper being the principal article used in most gardens for the purpose. *B.* [Common tobacco paper, moderately dry, was used in the case alluded to, and burnt without difficulty. We believe, however, that some improvements have been made since the apparatus was first exhibited, and this may account for the disparity between "B.'s" experience, and our own. We, too, have a very high opinion of Dean's Fumigator, which is the quickest in action we have used, though not so readily worked from the outside as Drechsler's. EDS.]

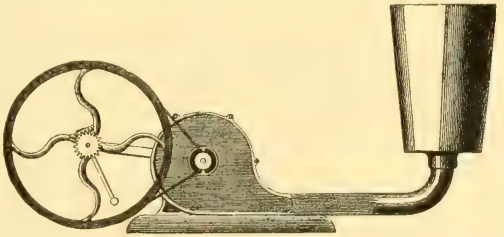

FIG. 42.

PALMS FOR DINING-ROOM DECORATION.

IN a leading article you have advocated the use of Palms for purposes of decoration generally. Perhaps it may interest some of your readers, if you will allow me space to record the manner in which I have recently had an opportunity of using them for the ornamentation of a dining-room. The room was 36 feet by 24, and 18 feet pitch, lighted by a sun-burner in the ceiling. The dinner-table was 21 feet long by half that width, the ends being semicircular; and as the top was deal, there was no objection to cutting round holes in it with a key-hole saw, which thus afforded an opportunity of "plunging" the pots until the rims were on or below the level of the table. Vacant spaces between the pot and the sides of the hole were made good with sheets of common card; and by using tray-cloths and finger-napkins, nicely ironed, between the sunken plants, the very natural objections of Mrs. Housekeeper to have nasty great ugly holes cut in her best damask cloths were happily obviated.

The great width of this dining-table naturally permitted the use of much finer plants than could generally be adopted; nevertheless, it may not be undesirable to give details of what these particular decorations consisted, since on smaller tables smaller plants of the same or allied species might be stood in the usual way. In the middle of the table was sunk a fine graceful plant of Areca aurea, more than 7 feet high. Arranged in a square around this were two plants of Areca lutescens and two lovely plants of Seaforthia Veitchii, all sunk, and rising to about 4 feet in height. On either side of the central plant, down the middle of the table, was a plant of Areca rubra, about 3 feet high; beyond them were similarly placed two noble plants of Seaforthia Cunninghamii, and one end of the table had a pretty plant of Euterpe edulis, while at the other end was placed the most graceful Palm in the collection, Calamus adspersus.

The plants last named being only 2½ feet high were each of them slightly raised in the middle of a large shallow pan about 2 feet in diameter, with a half-inch rim; a pyramid of moss concealed the pot in each case, and in the moss were plunged little pots, inclining outwards, of Palms about a foot high, broad-leaved and narrow-leaved kinds being arranged alternately; in one were four of a species of Livistonia and four of Areca sapida; in the other were two each of Geonoma pumila and G. speciosa, and four of Phœnix dactylifera. Upon the table were also two very elegant Areca Verschaffeltii, two of equally graceful plants of Seaforthia elegans, these four being rather more than 2 feet high;

together with two Chamærops humilis and two Elais guineensis, averaging about 18 inches. Notwithstanding that there were so many plants in use, the view across the table was, owing to the slenderness of their stems, not interrupted to the prejudice of conversation, and there was plenty of room left for vases of flowers and dishes of fruit, for which bright colours were naturally selected, to balance this extent of foliage.

In one corner of the room was raised up a beautiful specimen of Oreodoxa regia, a Cuban species, quite 7 feet high. Around the room were placed, in clumps or singly, the following plants, and the general effect of such a grove of Palms was exceedingly pleasing; six Latania borbonica, 2½ feet; four Corypha australis, 2 feet; two Arenga Westenhouttii, 2½ feet; six Chamædorea Hartwegii, and two C. Caspariana, ranging about 2 feet high; four Rhapis flabelliformis, and two Chamærops stauracantha, all nearly 3 feet in height; and two of the singular Cocos Romanzorphiana, with flat erect leaves 3 inches wide and nearly 4 feet long. By placing them upon tables, sideboards, and other high furniture, the guests while sitting round the table were able to look over or through the upper leaves of the more elegant kinds which were on the table, and to contrast their delicate foliage with the bolder fan-shaped leaves of the bright green Latanias, the pale apple-green of the two species of Chamædorea, and the bushy compact growth of Corypha.

While I confess myself much pleased with this my first attempt at using Palms only for dinner-table decoration, it is but just that I should mention that I am indebted to Mr. Wills, the manager of the Ashburnham Park Nursery, at Chelsea, for this opportunity of spending a very pleasant afternoon in arranging so fine a collection of Palms, comprising, as you will observe, no less than 25 species, several of them being valuable plants. I cannot doubt that, when nurserymen begin to make collections of small plants, whether for sale or for hire, they will find a great demand for them for various kinds of decoration. *W. T.*

FERNS AND THEIR CULTURE.

The apparatus which Ferns possess for leading to reproduction is technically called a "spore." This is a body nearly on the most reduced scale compatible with life, but though so exceedingly simple and minute, germination discloses the fact that it comprehends some highly curious microscopic contrivances. It is well known that spores under circumstances calculated to set in motion their dormant life develop into little green "prothalliums" (fig. 43, A), and it is on these that the plants originate, but not before certain definite performances have been gone through. In short, at this stage we begin to discover that spores are of the nature of floral receptacles rather than of seeds, containing, as they do on their expanded surfaces, two organs, called respectively "antheridia" (B), and "archegonia (C)."

The antheridia are charged with spiral filaments (D). These represent pollen grains, and have a capacity for liberating themselves from their original place of confinement, and of getting into the hollow cavities of the archegonia, which seem to have more in common with pistils or ovaries than anything else. Now, curiously enough, any amount of prothalliums may be produced, but if communication does not take place in the way just described, sterility is the invariable result, in the same way as, elsewhere, fertilisation of the ovule can only take place by means of pollen. On the other hand, let there be communication, and what may be called seedlings are the issue.

These are raised in various ways. The preparation for sowing should be made with a view to render watering overhead unnecessary. A very convenient method, at least for those species which do not lie long before coming up, is to get a saucer without any hole in the bottom, to fill it nearly to the rim with stiff loam, leaving only a very small space in the centre destitute of anything. Into this empty area a suitable amount of water may be poured from time to time, always taking care to let one lot be used up before another is furnished, so that souring may be avoided. When everything is ready, the ripe spores may be distributed thinly over the surface of the soil on which they are to expand. The whole operation ought to be concluded by covering with glass, so as to prevent a mixture.

The period of the year at which the spores should be sown depends entirely on the kinds. As a general rule, so soon as they are ripe on healthy regularly-produced fronds they are ready for use. An exception must be made, however, in favour of the few which do not mature before late in autumn. These had better be kept back till the spring. Very great care is needed to prevent an over-moist or an over-dry atmosphere from acting continually on the tender constitutions of the newly germinated spores, as the one can bring ruin just as readily by its decomposing power as the other can by its capacity for exhaustion. The way to hit a happy medium is to shade when the sun is out, and to prop the bell-glass slightly upon one side, so that a gentle circulation of air may go on both night and day. If these things are attended to there is little chance either of damping or withering. Another danger to be guarded against is that of overcrowding, for the crop is sometimes so heavy that it threatens all the smaller individuals with ruin. The remedy for this catastrophe is careful pricking off, which may be proceeded with shortly after, or if necessary before, fronds begin to appear.

Many Ferns may be increased by division as well as by spores, but the way to go about multiplying by such means is so self-evident that it needs no description. We have at last reached the question of compost. Successful cultivators use peat with very little loam, whilst others produce equally satisfactory results by making loam the principal and peat the secondary element. The former seems preferable for such as derive their nourishment from near the surface, and the latter for those that are deep rooting, or of a robust habit. Clearly, however, it is not so much the mere proportions in which a few kinds of earth are mingled, as the skilful after-treatment that brings prosperous results. Whatever mixture is used, it should be rendered porous by the use of sand, which need not always be white.

Let us now return to our seedling, which by this time we may suppose is ready for a position by itself, being furnished with one or two nice young fronds. The first shift should be into a very small pot, and as soon as the roots reach the side of their enclosure they ought to be furnished with new scope for activity. This course should be persisted in according to necessity until the specimen begins to form but one normal growth per year. Ever after this stage is reached, an annual repotting is quite sufficient, and ought to be given immediately before a recurrence of activity, which takes place with considerable regularity. This points to the importance of noticing the time at which a Fern comes into frond, as well as indicates the waste of precious material, which frequently takes place through a neglect of this matter.

In the case of young plants not remaining long in one pot, drainage need not be seen to with such a degree of care as in the case of veteran subjects, whose roots receive no change of surrounding circumstances for 12 months. Still every precaution should be taken to insure the delicate fibres of both old and young against the stagnation of moisture. No amount of drainage crocking, however, will be of much avail if an indiscreet use of the watering can is allowed. It is no doubt correct that Ferns require a vast amount of nutrition whilst development is doing its utmost, but still

Fig. 43.

a person of skill will take care not to heedlessly wash out of the mould the organic substances which it contains. What a gardener of the present day has to do is not to dictate, or hastily decide, what any member of the vegetable kingdom under his charge should require, but to endeavour like a genuine student to find out what it actually does require, and to administer accordingly. To act thus is to be guided by the inquiring spirit of the age, but to act otherwise generally ends in making cultivation, and starvation or stunting, synonymous terms.

Another thing an unpractised person must guard against is that of being led astray by tales from the tropics. We hear of Orchids growing delightfully on bare rocks being quite capable of supporting the exhalation demanded by a scorching sun, and some fine morning we may be told that Ferns are quite as invulnerable. Setting aside the fact, that for one that survives in a wild state thousands must perish, there still remains the probability that those who concoct such stories only see for once, as they pass along, the objects about which they write. At any rate, instances taken separately and not collectively are seldom things of great practical importance, and it is just about as wise to say that a hot summer which burns up the herbage is worthy of all praise and imitation, as it is to say, that because plants are reduced to a cinder in India, they had better be reduced to the same in England. It is Nature's plan of doing things best, and not her method of doing things worst, we want; and if those who visit the regions adjoining the equator could be got to see this, they would very likely cease to confound facts illustrative of extremes, with laws.

I trust that it is not yet obsolete to recommend that Ferns should be protected from the fierce rays of the sun by shading or other means. In this paper there are general rules only. It is intended to devote the next to the more striking exceptions. *John Duncan.*

Home Correspondence.

Solanum Capsicastrum.—I am surprised that S. Pseudo-Capsicum and S. Capsicastrum are not more generally grown for table and conservatory decoration than they are at present. I prefer the latter to the former for table work, on account of its more compact habit. I have some plants in small 32-sized pots, 18 inches in height and the same in diameter, furnished with foliage down to the pot, with an average of 100 berries on each. My system of culture is more simple and less tedious, and I think equally as successful, as that given by "W. B. U." at p. 141. Of course the method of culture adopted is applicable to both kinds. I sow my seeds early this month, and prick them off about an inch apart as soon as they are large enough to handle. When they have made a little growth I pot them off singly into 60's, and allow them to become well established before they are gradually hardened off, like bedding plants. I then plant them out, in the latter part of May, in an open piece of ground, 18 inches apart each way; they require no other attention than keeping them free from weeds, and occasionally watering them during the summer, should it prove very dry. About the middle of September I lift them carefully, and put them into pots just large enough to hold the roots. Pot them firmly, and stand them in the shade until they become established, during which time they must be frequently syringed to prevent them from flagging. They may then be gradually exposed to the sun, and finally be removed to the greenhouse or conservatory, where they make a fine display if judiciously grouped with other plants. If the cultivator has a cold pit to spare at the time of lifting, they would establish themselves sooner by being nursed in it, instead of being put in the open air. *W. Hills, Sunbury, Middlesex.*

Raspberry Culture.—I differ so much from the views of "Bush *v.* Brake" (p. 177) respecting the making of a fresh plantation of Raspberries, that I feel it would be improper to let his remarks pass without comment. A plantation of Raspberries should remain as such for many years, but to attain this, care must be taken that a successional growth is maintained and preserved. What chances of getting a young and robust growth the next year after planting should I have, if I allowed the newly planted canes to stand and bear fruit to their full extent? Just little or none. The sacrificing of the fruiting canes the first year is absolutely necessary to obtain a strong permanent growth, but that end once attained the success of the plantation is certain. I know that practical gardeners do not want to be told this, but amateurs and cottagers might be misled by what "Bush *v.* Brake" has penned. It is much wiser to secure small but well-rooted canes for planting, rather than strong canes with but a moderate amount of roots; in either case the canes should be cut back nearly to the ground, when strong growth will be the result. As to training commend me to rows of canes, in which they stand 1 foot from each other, and the rows 3 feet apart, with a stout post at either end of the rows, and two strong wires running through to fasten them to. No arrangement is neater or safer than this. *A. D.*

Ground Vineries.—I have always failed to recognise the utility of these, so-called, ground vineries for the purposes of growing Grapes, and a visit to Mr. Rivers' nursery, the other day, further satisfied me that they will never become so popular as some people have predicted. They may afford an agreeable amusement to the amateur who has nobody to please but himself, but to the gentleman's gardener they are utterly worthless, so far as Grape growing is concerned. When I first made the acquaintance of these ground vineries I was of opinion that they might prove useful for the raising of kitchen-garden plants, and for the protecting of Cauliflowers, Lettuce, Parsley, and the like, through the winter, and certainly for this purpose they far surpass the hand-light. They might also be employed for Strawberry beds, and would answer the twofold purpose of keeping away blackbirds and accelerating the ripening of the fruit; by this means I anticipate that Strawberries might be ripened 10 days earlier than in the natural bed—a very important and desirable thing in both large and small gardens. They could be equally well employed, too, for the harvesting of Onions where frames are scarce, for the ripening of Tomatos where grown in rows (for want of a wall), for the striking of autumn cuttings, for the hardening off of spring bedding stuff, and the like; and thus they might be turned to a profitable account the greater part of the year. Allow me, therefore, to recommend them for the purposes I have here indicated, and in future let them not be termed "ground vineries," but "Strawberry, salad, or plant preservers." *T. Simpson, Broomfield Lodge Gardens, Chelmsford.*

Abies Douglasii.—Your correspondent "T. F." asks for an opinion of the merits of this tree as timber. I am afraid that it is impossible to answer his query from results in England, as the tree has been so recently introduced that no specimens have attained maturity, and the point to be solved is, whether the difference of climate and soil will alter its constitution and wood. In its native habitat, on the Fraser River, Vancouver's Island, &c., we know that it grows the very best wood for domestic building, shipping, &c., and masts of it are reckoned the best in the world. So impressed were Her Majesty's Commissioners of Woods and Forests with its value, that a few years since they sent an order to Governor Douglas for a ton weight of the seed for propagation in our forests, and for distribution. It is now to be purchased very cheaply; plants which, 20 years since, cost five guineas each, may now be purchased at 1*s.* each. I should think that this tree is admirably suited to the Highlands of Scotland, as it is proved to resist all severity of frost; but when

grown for ornamental purposes, and given sufficient room to expand, no Conifer can surpass it in grace and beauty; it is far superior to the Sequoia or Wellingtonia, the timber of which is quite worthless, while the tree is ugly and formal when young, reminding beholders of May Day and "Jack in the Green." I think one of the oldest specimens of Abies Douglasii is to be seen at Dropmore. *K.*

The Gladiolus Show.—Absence from home prevented me from seeing the *Gardeners' Chronicle* in time to answer Mr. Hawke's letter at p. 178, and before your next issue the decision about the Gladiolus show will have been made; however, before that I will just venture to give my opinion on the matter alluded to by him. 1. With regard to the time fixed for the show, I believe it is utterly impossible to name a day that would suit both North and South. We tried it once with Auriculas, and found it impossible; and as one great object is to get Continental growers over, it would be useless to name a day much later than that proposed. I know, too, that in the South blooms may be cut in September, but they are the very last of the beds, and by no means to be depended on. I am sure that no Southern grower could compete in good credit after August, and that the best of our bloom is from 13th to 25th. The blooms of Downie & Co. which Mr. Hawke saw at the Crystal Palace were probably grown at Stanstead, not at Edinburgh. 2. As to place, Mr. Hawke would like to see the autumn show of the Crystal Palace resumed: so would I; but it must be borne in mind that the Crystal Palace Company must look to what will pay; they are not supposed to be a horticultural society, although they have done much to benefit horticulture; and that jit was because they found it did not pay, that they gave it up. Although, therefore, they were to found a Gladiolus show, I feel that my decision was a just one, and that it must be held at Kensington if held at all. A word as to my friend Mr. Lombard's reference to me about seedlings. I did not mean that in the kingdom there were only two raisers that I know, but in the South of England. I cannot but rejoice at the stir that is being made about this noble flower, and hope we shall have a good display this autumn. *D., Deal.*

Fungus on Roots of Trees.—I am aware that in this discussion I am in a minority; but this admitted, I am not prepared to yield. How am I to believe that Mr. Gardiner's tree contracted Fungus by contact with dead roots and decayed bits of stick, when Mr. Gardiner himself informs us (p. 1308, 1869) that neither of those have as yet been found? Yet the tree thrives. To what, then, are we to attribute its recovery? Mr. Gardiner in his first article tells us, that his tree is planted in a "strong dark-coloured loam on the lias formation;" on this information I based my argument, and supposed the tree to have met with something deleterious in that formation. Now, he tells us that the tree is planted on a plateau of foreign mixture, so deep that the imaginary roots which are supposed to have originated the Fungus cannot conveniently be dug for. Why, then, if such a body of made earth lay underneath the tree, mention lias at all? We are thus debarred from imputing any further mischief to contact with the lias formation, while for want of evidence the decayed root theory has broken down. Both are, therefore, dismissed, and we are again set adrift for more tangible and substantial evidence. Intelligent practitioners are taunted for their disregard of bits of wood in their Vine borders; but why bits of wood, more than the roots of cut-down Vines? And yet some recent leading articles in the *Gardeners' Chronicle* expressly advise us to cut away some of our Vines to allow for the extension of those left. These high practical authorities seem not to be much affected by dread of Fungus, and if I may be allowed to judge from this, I may not after all be in so great a minority as I imagined. If such direful effects as we are taught to believe result from contact of healthy roots with dead ones, may I be allowed to appeal to our forests of British timber for evidence in support of my argument? Periodically they are subjected to a severe thinning for the commercial produce—bark, timber, and underwood. On the occasion of these falls, the roots are not grubbed up and burned, but left in the ground to decay. If therefore decaying roots are so susceptible of Fungus, and these in turn convey the attack to healthy roots, how is it that the roots of the remaining live trees of the forest do not also contract Fungus, and ultimately perish and die? In this case the roots of the trees left standing and those cut away must have been ramifying and interlacing in the same stratum from which they were individually and collectively fed. How is it that the trees left, and whilst feeding from amongst the decaying roots of their departed companions, escape Fungi? I suppose I may anticipate opponents, and answer, that because "possession forms nine-tenths of the law, Fungus must keep aloof from the roots of the trees left." The deadly effects of Fungus must be very slow indeed, for even assisted by the trampling of animals, denudation at the hands of man, and devastating fires, our planet is yet most gorgeously dressed with vegetation of every description, as at once to form the pride and glory of man. If we except geologic periods such as revealed to us in the coal measures, where Club-Mosses are represented as rising from 50 to 70 feet, and other forms of vegetation occur of correspondingly gigantic proportions, we can yet cut, at this remote period of creation, as good timber as we are led to believe existed within the last 6000 years. Reflection on these facts, and which are too palpable to be overlooked, has taught me to believe that it is possible to look upon fungus-destroying theories with unnecessary alarm. In my present state of belief, were I allowed to hazard an opinion, I should say that as regards the creation of Fungus in Great Britain we have more to fear from seasons of drought than from all the bits of wood and tree roots existing between the Land's End and John o' Groats. We had a dry season in 1864, which affected trees, the Beech in particular, and many died; those which suffered had scarcely recovered when, in 1868, we were again visited by even a more severe drought, which killed the suffering ones, and reduced many more to a state which can only end sooner or later in total dissolution. These are instances which, in my opinion, show the primary cause of decay, and then Fungus follows as a consequence. During the last 12 months I made an experiment respecting the creation of Fungi, and which was as follows:—At the back of one of our Pine stoves is a bed of leaves, 40 feet long, 3 feet wide, and about 5 feet deep; in a chamber along the bottom are two rows of 4-inch pipes, over which the leaves are placed as a plunging material for the Pines, which are in pots. At one end of the bed is a water-tank, which has its overflow conducted into a trough 9 feet long, and which is situate in the chamber next to the tank. Over this pipe, where the vapour permeated through the leaves, there was no Fungus, the leaves being clean, sweet, and having a healthy moisture; but beyond this limit of vapour, and over the dry pipes, the leaves were one mass of mildew and fungus spawn, penetrating through the joints of the bricks to the side of the path, and there developing itself into myriads of miniature Fungi. From this experiment we learn that, had all the troughs on the hot-water pipes underneath the leaves been supplied with water, and had the vapour permeated the mass of leaves, there would have been neither mildew nor Fungus—strongish evidence in support of my theory, that drought or induration has much to do with it. If Pelargoniums are taken up, boxed off, and left dry, for the very good reason that growth at the time is not wanted, the drying is conducive to the formation of Fungi, and it will assuredly come. But let a corresponding box be judiciously managed for a continuity of growth, the Fungus in this case will be less apparent, and its effects, at least, of so little consequence, that it matters not whether it is either present or absent. In the adorning of our lawns we often commit grievous errors. Fine specimens of Conifers or other rare trees are selected from our sheltered nursebeds; for these, holes are dug in the turf, into which the tree is planted, watered, and then left. The snows and rains of the following winter convert the hole into a sort of well—the loam becomes waterlogged. Spring arrives, followed by a droughty summer (and these have been frequent lately), the over-saturated lump is converted into a mass of dry clay, which parts from the sides and cracks through its body. Between these extremes, the plant ultimately refuses to put forth roots and leaves, and prematurely sickens and dies. The blue-aproned doctor holds a *post-mortem* examination, and finding a bit of Fungus spawn on some, or perhaps all of its roots, he has no difficulty in coming to the verdict, "Died from an attack of Fungus." Experience has taught us that this system of planting, more especially in heavy soils, is wrong, and an opposite extreme is resorted to, and one which I have myself many times practised. Instead of digging out any hole, the surface of the ground where the tree is to be planted is merely dug over—the tree placed thereon, adding a sufficient quantity of earth to cover the roots and to blend gracefully into the adjacent surface. This system, if not carefully watched, is just as likely to end in disaster as the deep mode of planting. I have been moving and transplanting trees more or less all my life, and have also been tolerably successful, and when engaged in the operation I am fond of it; yet I am compelled to admit that there is nothing like planting trees whilst they are young. Adult age, whether in the plant or animal, approves but indifferently of being tossed about. Could the early planting system be more attended to, we should hear less of the disasters in these days imputed to Fungus spawn; but whilst it is the way of the world that men spring up into affluence, even with the quickness of the Mushroom itself, and that they build villas and plant the grounds thereof with large trees for immediate effect—whilst this goes on, I fear we are yet far from the time when we are to hear the last of that "horrid Fungus." *Wm. Miller, Combe Abbey Gardens.* [The publication of this communication has been unavoidably delayed. EDS.]

The Apple-bark Louse.—You lately (p. 74) requested your readers to try and report upon two American remedies. I have tried paraffin, applied in winter, and it seems successful. *G. S.*

The Abandonment of Chiswick.—The news so unexpectedly and so suddenly forced upon us regarding the abandonment of all that horticulturists understand by the simple word—"Chiswick!" will ill accord with the sentiments of those who wish the gardeners' art God-speed. This we do not wonder at when we consider how rich these gardens are in associations which are much valued by the gardening community—when we think of the great assistance which they have rendered, under a lengthened able management, towards placing us in the vanguard of all the horticultural communities of the world. Profitless sentiment ill becomes any one who is bent on further practical advancement. Necessity gives no choice, even with such facts as we have before us. "But 11 years of unexpired lease," "an offer to remove all the property that can be removed," seems sufficient to stamp the fact on the face of it, that the Council have acted wisely in bringing the matter forward, and in advising the Society to make the necessary change at the earliest time possible. It should be borne in mind that the Council and their advisers have launched their ship on to these troubled waters of themselves, even when they might have ridden calmly on over a few more years. Taking these facts and the liberal bequest of £2000 into consideration, I fully believe that the Council will do all that is in their power to increase the prestige of the Society, even at much personal inconvenience. I do not hesitate to say that all possible support ought to be accorded them, and this I believe will be the case. The undertaking, commence when it may, will be an exceedingly arduous and trying one, both to the Council and the individual officers of the Society. No one knows better than themselves what a numerous garden-loving fraternity expect from such a society, and how difficult it is to meet those expectations with the revenue at their command. The expense of removing such an establishment will, indeed, be great; but as compared with the formation of a garden worthy the scientific experiments and high culture of the leading society of this country, the cost should be a minor consideration. We freely give our mites towards memorialising those whom we consider deserving of our thanks for having helped to further the common cause, and therefore I think the Society should not want such assistance towards bringing to a successful issue the formation of "a new garden," to further and to foster the higher branches of the gardener's art. Let the new garden be formed where it may, it should bear the name of "New," or "Modern Chiswick," as a daily remembrancer of the glorious past. *Opus.*

The Leeds and Manchester Horticultural Exhibitions.—Allow me to draw your attention to the fact that the above exhibitions are both arranged to be opened at the same time, viz., on June 3. Surely this is an oversight on the part of the managers of the Leeds Society, seeing that the date chosen for holding the Manchester exhibition had previously been advertised for some time. I need not point out how very inconvenient this arrangement will be for all classes of exhibitors, and also how prejudical it will be to the interests of both Societies. I hope, for the benefit of all parties, the Leeds committee will reconsider its plans, and alter the date for holding the show. I have hitherto, in conjunction with many others, been an exhibitor at both places, but shall certainly not be able to be so this year if the present arrangements are carried out. *D.*

Harbingers of Spring.—The following six bulbous plants were in flower in the open ground on February 10:—Anemone blanda is the first in flower of this numerous and interesting family, and although it is so dwarf as to be beneath the notice of many, yet on account of its early flowering propensities, it deserves a place in every collection. As a notice of this plant has recently appeared at p. 140, I cannot do better than refer my readers to it, for a more minute description. Bulbocodium vernum is an old plant, having been introduced into this country 200 years since, and yet, surprising as it may appear, it is only known by a few persons. It was formerly grown in small patches, and then no one could form any idea of its beauty, or of its merits; but when it is planted in masses either as edgings to small beds, or in alternate groups with plants of a similar character, it has a very pleasing and effective appearance. Its large purple flowers are produced very freely, at this season of the year, and it will thrive in almost any soil or situation, and increase very rapidly. As this plant can be procured at a nominal price, and is very useful during the early spring, it should be found as abundant as the Snowdrop or Crocus. Crocus chrysanthus, syn. Aucheri, is a beautiful plant from the mountains of Greece, of very recent introduction. Although coming from a more genial clime than our own, it is quite hardy, and throws up its dwarf foliage and pretty flowers in spite of frost and snow. It requires, however, plenty of drainage, and succeeds best in a dry sheltered position, where it will flower much more freely and much earlier than it will in the open ground. It is admirably adapted for the rockwork, where it forms pleasing groups during the winter months. It grows from 3 to 4 inches in height, and the flowers are of a bright orange colour. Crocus nivalis, syn. Sieberi, is a rather pretty species, and a charming companion for C. chrysanthus. It is very similar in habit, and was introduced from the same locality. The flowers are of a rich violet colour, and the plant succeeds in a similar situation with its yellow congener. Eranthis hyemalis is a charming little plant found growing wild in some parts of this country, although it is said to be a native of Italy. It forms low bright green masses of foliage, which is literally covered with its bright yellow flowers. It is very seldom we meet with a fine mass of this pretty plant, for it generally gets disturbed by digging around

it, and too often, alas! dug completely up by the inexperienced gardener, who has no patience with these little plants with long names. If perchance one of the roots should find its way into the beds, and there grow, it is called a weed, and sooner or later will find itself upon the rubbish heap. This plant requires a permanent resting-place, where it will soon put on a very interesting appearance. Scilla sibirica: This is not yet in full bloom, but sufficiently so to form an idea of its beauty. When this charming little bulb is planted in masses, it forms one of the most beautiful sights that can be imagined. Its numerous dense spikes of azure blue flowers are produced in great abundance, and will last in bloom until the end of March. It increases very rapidly, and a few bulbs if not disturbed would soon make a pretty mass. It requires a light sandy soil to grow it well, but it does not matter about the situation you choose for it. A few bulbs should be grown every year in pots, as it bears forcing well. *A. I. P., Tottenham.*

Hellebores in Sussex.—"A. I. P." is in error as to the latter part of the sentence, when he says that H. fœtidus "is found growing in many parts of this country, especially in the woods of Sussex;" for, although plentiful enough in the two or three localities where it does occur, it is far from being common enough to be rooted out for cultivation. Moreover, it is not considered to be a native of this county. The few known habitats, and the rapidity with which it increases, furnish ample data, without any reference to its general distribution, to support this theory. Your correspondent cites Derbyshire as abounding in H. viridis; this species likewise occurs in similar localities in Sussex, but with perhaps less pretension to a place in our native lists. But whether indigenous or not, I must raise my voice against their being extirpated. I do not wish to intrude my knowledge upon "A. I. P.," nor to undervalue the service he is doing by bringing these early flowering plants into more general notice; but a British botanist is naturally jealous when his rare favourites are recommended for cultivation, and their native habitats quoted. Here in the southern counties we are gradually losing many of our rarer and more attractive species, and it is quite irritating to see the quantities of Ferns, Orchids, and other interesting plants that are every year uprooted and carried into our watering places, where they do not survive the season. *H., Sussex.*

Heating an Amateur's Conservatory.—If your correspondent "R." could have a boiler fixed at the back of his sitting-room grate—and there are some which are made to fit into the back of register stoves which warm small greenhouses, shops, or bath-rooms, &c., and do so admirably and economically—he would find that, if a good fire was kept up during the evening, it would warm the interior of the conservatory sufficient to keep out frost. If the room is situated on a lower level than the plant-house, so much the better. When the boiler is not wanted, you have only to draw off the water, or have a false back made to the grate, and the thing is done. I have seen one in this way which acts first-rate, and if "R." would like to try one I will send particulars as to where they can be obtained, but I do not recollect at this moment where the one I saw was procured. *Rustic.*

Botanical Saints.—After reading Mr. Ingram's article on St. Fiacre, I turned up an old French almanac connected with gardening, and was surprised at the number of saints' names in a gardener's almanac. I have often heard it said that every dog has its day, but I think there are more saints in France than there are days in the year. I think the gardeners of Britain and Ireland need not go to France for a patron saint when they might have one nearer home—I mean St. Dabeoc. I have been turning over some books in order to find out his history, whether he was a Scotchman, like St. Patrick, but I cannot find his name in the almanacs nor among the numerous churches of Rome dedicated to the saints; from the church of St. Adrien to that of St. Urban, I do not meet the name of St. Dabeoc. All my information respecting him is found in works of gardening and botany, and there we are informed that he founded a priory at a very early date on an island called St. Dabeoc's Island, in the celebrated Lough Dearg, county Donegal. I have been trying to find his name in Irish history, and went as far back as the days of Carbre Lifachair, who lived six generations before St. Patrick. I thought it was no use going farther in search of Scotch and Irish saints. So I suppose that St. Dabeoc must have been a gardener or botanist, from the honour of having the Irish Heath named after him — Erica Dabeocia; but modern botanists have not allowed him to wear his honours. In English Botany the old saint is united to an Ethiopian princess, and thus we have Andromeda Dabeocia; then again a separation takes place, and Andromeda is sent to Heaven to take her place among the constellations, but I do not know where they have sent the good old saint, for it is now Menziesia [or Dabeocia] polifolia for the Irish Heath. I have a great regard for these old worthies, for they were useful in their day. I sometimes wonder how many of the clergy "o' a' denominations" know something about systematic botany, and obey the command of our blessed Lord when He said, "Consider the lilies of the field, how they grow." St. Patrick must have studied native plants, which enabled him, with the Shamrock of Ireland, to explain God's words with God's works, and it does not matter much whether the Shamrock was a Trifolium or the Oxalis Acetosella. Mr. Ingram, when writing about a cup of brose scented with roses, surely meant "a cog o' brose," for it would be an insult to offer a Scotchman a "cup" of brose even with a saint's blessing upon it and scented with roses. *Peter Mackenzie, Plean, Stirling.*

Rendle's Plant Protectors.—It is hardly to be supposed that an invention which is likely to make so great a change in gardening as Mr. Rendle's plant protectors should run its course without meeting with opponents; the more successful it is the more likely are we to find people decrying it. Your correspondent, "P. W. N.," has found fault with it, because he has seen the glass broken, and I can quite understand it; we have had a great deal of wet and frost lately, and we all know what a disturbing effect this has on the ground; consequently, if the protectors had not been properly put up, I can quite believe that the glass was broken, because the bricks have sunk in the ground, and the glass has been thrown out of gear. If, however, the directions sent with them had been adhered to, this could not have happened; and if people will do this in their own way they must not find fault with the inventor. If wire or a thin batten be run through the perforated bricks these accidents could not happen. Another advantage that these protectors have is the protection they afford from the depredations of hares and rabbits. The Duke of Abercorn's gardener has just told me that all his winter salading has been eaten off: with the protectors it would all be safe. I rather imagine after this severe frost, people would wish that they had had some of these protectors. *D., Deal.* [Mr. Rendle has placed the following particulars, with cut (fig. 44) into our hands for publication, to show the manner in which the protectors are secured when in position. This, however, does not answer the question: how to take out the centre pane of glass without removing one half of the rest?] "The patent tiles are made hollow for several reasons—they are lighter for carriage, they heat better in the kiln, and in elevated or exposed situations pegs or binders of wood can be introduced to join them together. An excellent plan for holding the protectors together in very exposed situations is to run a piece of galvanised iron wire or tarred rope through the holes, and fasten them to wooden pegs at each end, just in the same way as ordinary fence wire is fixed."

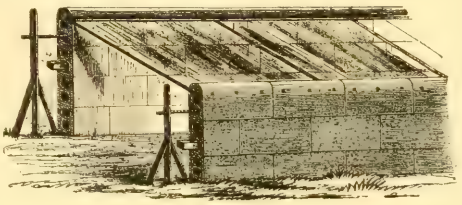

Fig. 44.

The Hundredfold Pea.—The following extract from the catalogue of a Covent Garden firm, "Laxton's Hundredfold, or Cook's Favourite, the most promising," &c., and from a letter to me, describing Hundredfold Pea as Laxton's, will show that my name has been somewhat unfairly mixed up with that Pea; and I think Messrs. Carter & Co.'s admission of my explanation that a selection from an "attempted" cross only had been made, justifies me in objecting to "father" it. As Messrs. Carter & Co. think it good taste and business-like to publish their clients' offers, I have merely to say, in reply to their statement, that the Peas were declined because they were not sufficiently distinct; that some of the varieties offered had been previously selected especially as distinct when had previously been endeavouring to purchase part at a very much higher proportionate price; and that the offer of all was solicited by the firm, who had made two journeys to Stamford on purpose to secure them. I therefore leave your readers to judge for themselves for what reason the Peas were declined. As to the query about the varieties not being fixed, I can show by records that all the varieties had been grown and selected more or less for several years, and it will hardly be expected that a stock consisting of one half pint, or even a half bushel, would be sent out for some years. With regard to the price, a good article should command a good price, and there are those of your readers who know how many varieties are yearly grown here to select a few therefrom; and, when I state I have for several years grown acres of trial Peas (varieties in quantity), and have discarded most of them as indistinct, I think neither Messrs. Carter nor the public will complain of the price; indeed, I can safely say I am never likely to be, nor do I seek to be, remunerated for the mere outlay except by the pleasure the experiments afford me. I also naturally object to undertake the paternity of varieties either sent out, exhibited, or named as mine, without authority; for, although Messrs. Carter & Co. have not directly announced Hundredfold as mine, others have by some means been led into this error, and Messrs. Carter and Co. took the unwarrantable liberty of naming and exhibiting two varieties at Manchester as "Laxton's," without ever acquainting me, before or afterwards, of the fact. *Thomas Laxton, Stamford, February* 15. [We can insert no more on this subject, save in our advertising columns. Eds.]

London Parks and Thoroughfares.—You have done me the honour to review my little *brochure* entitled—"The Parks, Open Spaces, and Thoroughfares of London." Some obliquity of vision has, however, led you to conclusions which the text in no way warrants, and I must therefore ask you to afford me space to reply to your remarks. My idea of "improving the British metropolis" was not limited to the parks and open spaces situated in the purely urban districts; indeed, as the metropolis comprises an area of some 60 square miles, and most of the commons which I have enumerated are within its boundary, it is patent that I could not exclude them from my consideration, had I been disposed to do so. You represent that I assure you "that the total extra cost of keeping up these places as public parks [irrespective, we presume, of the laying-out with lakes, gymnasium, cricket grounds, shrubberies, and all the usual paraphernalia, except flower beds] would not exceed the cost for the maintenance and keeping up of the London parks at present under the Crown—[a faint reflection, we conceive, on the Office of Works;] and that I believe that 11 additional parks could be added to the metropolis without any excess of expenditure beyond that already voted by the House of Commons for the maintenance of the London parks. It would have been true if you had stated that I suggested the preservation of these commons for "public use," and that I would not advise any great expenditure on the decoration of the London commons; and felt convinced that "if Government would take a considerable sum from the unnecessary outlay upon the parks, and apply it to the commons, the total future expenditure on both would not much exceed the present cost." Although I have not, as you say, supplied the data by which you may test the accuracy of my estimate, I have at least suggested a revenue from "the outer margin being let for building purposes, which would go far towards the improvement of the enclosure." The red flag [rag] has no doubt attracted your attention from this paragraph. The faint reflection on the Office of Works is therefore purely your own, as is also the assumption that I contemplated converting these suburban commons into rivals of the urban parks. I felt that I should tread on dangerous ground when I proposed "the abolition of all private rights in London squares;" but, in my opinion, no better argument can be used in favour of the necessity of such a measure than your fear that "the squares . . . . . would probably become popular play-grounds for the children of the adjoining alleys and [mews]." That is exactly what I should wish to see. I can conceive no more beneficent act than would be perpetuated in dedicating these valuable breathing spaces to the recreation and enjoyment of the toiling multitudes, and stunted children, who find unwholesome abiding places in the courts and alleys situated near, and belonging to the same proprietors as, the squares in question. That there is no insurmountable difficulty in this, may be seen by a reference to Euston Square at the present moment, where a considerable portion is being converted from private to public use. The means adopted by the Metropolitan Board in reference to Leicester Square, if not in accordance with your views, were at least in accordance with the Act of Parliament intended to meet such cases, and afforded me a good illustration of the difficulty in dealing with the neglected portions of London. You express wonderment that I [some beneficent genius] did not "abridge the remarks advising the absence of flowers from our public promenades." What I said was, that "in all public parks there should be some spots dedicated to Flora, but while these should be excellently kept, it is only necessary that they should be of moderate extent." I have not advised the "entire absence" of flowers, but my proposition is a very different matter to the lavishly extravagant display of continuous masses of colour to be witnessed from Hyde Park Corner to the Marble Arch. In conclusion, you say that "the great object of this pamphlet . . . is to advocate the transference of all public works in the metropolis from the Office of Works to the Metropolitan Board." You are of course at liberty to express your opinion, but not to misrepresent my words. This is what I said, and what I adhere to:—"I cannot but feel that the appointment of a permanent Minister of Public Works throughout the country, properly qualified for the position, and entirely exempt from political influence, is rapidly growing to be regarded as one of the questions of the day. An enlightened Chief Commissioner of Public Works, or, still better, a permanent Public Minister, specially appointed to the department, and acting in conjunction with the Metropolitan Board, could have no difficulty in realising not only such improvements

as those which I have suggested, but others of far greater magnitude." I trust you will give publicity to this explanation in the next Number of the *Chronicle*. *The Author of "The Parks, Open Spaces, and Thoroughfares of London."* [We shall recur to this subject on some future occasion. EDS.]

Societies.

ROYAL HORTICULTURAL: *February 16.*—G. F. Wilson, Esq., F.R.S., in the chair. The usual preliminary business having been concluded, and the chairmen of both committees having read the awards, and made some comments upon the various productions exhibited, the Rev. M. J. Berkeley proceeded to address the meeting, first directing attention to a magnificent group of Orchids from the gardens of Lord Londesborough, who, said Mr. Berkeley, deserved the thanks of the meeting for affording such a rich treat at this season. Two specimens amongst them, which, as he had been informed by Mr. Bateman, had never before been exhibited, were then alluded to, *i. e.*, Oncidium splendidum, a beautiful species, almost rivalling in beauty O. macranthum, and Stenia fimbriata; and attention was directed to Vanda cœrulescens from Messrs. Veitch, a plant which was described by Lindley 30 years ago, though only recently introduced to this country. Several other "fashionable Orchids" were then noticed, notably a flowering spike of Goodyera Dawsoniana, which it appeared did not want so much nursing as was generally accorded to it, being found to be a tolerably hardy stove plant. Mr. Berkeley then alluded to some Sarracenias, a difficult class of plants to cultivate, and said that the best grown plants he had ever seen were in the gardens of Lady Dorothy Nevill at Dangstein. A new hybrid between Sericographis Ghiesbreghtiana and Libonia floribunda was next alluded to, as partaking of the characters of both parents, but being an improvement on the Libonia. Mr. A. Waterer's two new kinds of Cupressus then came under review, the excessive greenness of the foliage in C. Lawsoniana erecta viridis being especially pointed out. Some abnormal forms of plants were commented upon, including a young Primula, which had red and white flowers on the same plant—those on one side of the truss being red with reddish stalks, and on the other partly red and partly white, with white stalks, —which, said Mr. Berkeley, was a very curious physiological fact. The subject of the new Vine disease, which is making such havoc in the vineyards in France, was then brought up. The nature and habits of the insect having already been given in our columns some time back, we may here only mention a remedy suggested by Mr. Berkeley, which was to cut off the gall-like bodies on the leaves and burn them, and also to apply gas-water. It was then announced that forty essays on the Management of Cottage Gardens and Window Gardening, had been sent in for competition for the prizes offered by Mr. W. E. Hubbard, Jun.

Mr. Andrew Murray said, in reference to Mr. Waterer's two forms of Cupressus Lawsoniana, that he had first described and introduced this species, which was found by his brother some years ago on the banks of a waterfall in California. It was, he said, a plant that would grow to a good height, and was, moreover, hardy. It had been by some thought to be the same as Cupressus fragrans, of which a large and beautiful bush had been sent to an exhibition in San Francisco, in order to show the size to which the tree attains. As a great portion of the specimens of C. macrocarpa had been destroyed by the frost in 1866 the propagation of this variety, which was of similar habit, should be pushed on to take its place, as it was perfectly hardy.

Mr. Berkeley said that it was an undisputed fact that nearly all the specimen trees of C. macrocarpa growing in the valley of the Thames had been killed during that memorable frost, but that was not the case throughout the country, for he had lately seen some beautiful examples in the Marquis of Huntley's pleasure-grounds at Orton Hall, in Huntingdonshire, and the tree was found to succeed well in localities free from damp; indeed the latter, and not cold, appeared to be the cause of their death.

Scientific Committee.—A. Murray, Esq., in the chair. A piece of Oak, with an iron rail so completely imbedded in it that no traces of it could be seen externally, was exhibited, and led to a conversation, in which several similar instances were alluded to.

Mr. Standish sent the bud of a Vine perforated by an insect, a species of Athoüs.

Rev. M. J. Berkeley stated, with reference to the Date stone exhibited at the last meeting, that the excrescence was not of a fungoid nature, but was due to a morbid formation of cellular tissue. He also exhibited specimens of Bridgesia spicata, showing peculiar growths, on which more will be said at the next meeting.

Mr. Woodford sent shoots of Peach trees affected in the same manner as those previously exhibited. The trees had been received in good health, but were now diseased. No further explanation was, however, forthcoming as to this mysterious disease.

Mr. Glaisher reported on the meteorological observation carried out at Chiswick from 1826 to the present time. The earlier records were correct, but the later ones, especially those after 1860, were not trustworthy; nevertheless, by checking the observations with those made on the same days at Greenwich, and applying the necessary corrections, he hoped to be able to deduce some valuable results. Mr. Glaisher also exhibited specimens of the new instruments proposed to be used in future. Similar instruments, expressly designed for horticultural purposes, will be manufactured at a low rate by Messrs. Negretti & Zambra, with the understanding that each instrument shall be verified by Mr. Glaisher before being sold. Any instrument which shall be in error more than 3-10ths of a degree will not receive Mr. Glaisher's certificate. The instruments exhibited comprised a dry and wet bulb thermometer, which is to cost from 10*s.* to 12*s.*, and a thermometer for ascertaining the temperature of the soil, and of the roots of plants, the bulb of which is of a pointed ovoid form. Mr. Glaisher attached very great importance, and rightly so, to the temperature to which the roots of plants are subjected at various depths.

Mr. Glaisher then called attention to the meteorological reports from various towns in England and Scotland now published under his superintendence in the *Gardeners' Chronicle*, and alluded to the great value of such a table. Further remarks on this subject will be found in another column.

Dr. Gilbert called attention to the experiments to be carried out this season at Chiswick, and the sub-committee was re-appointed to consider the subject.

The chairman exhibited specimens of an insect attacking Oats at Port Philip, which presented a very close outward resemblance to the Oat itself. The chairman also showed specimens of the Tsetze or African fly.

Floral Committee.—Rev. J. Dix in the chair. On this occasion a table at the end of the Council-room was occupied by a splendid bank of Orchids, from Mr. Denning, gr. to Lord Londesborough, and Messrs. Veitch & Sons. The first place must undoubtedly be given to his lordship's superb group of plants, which was admired by all present. To bring this collection in such excellent condition from Yorkshire to South Kensington, in the face of such weather as was experienced at the time, was indeed "a bold stroke." The plants were brought in a van heated by hot water, expressly made for the purpose, and much praise is due to Mr. Denning for the care bestowed on them during the journey. Special Certificates were given to the collection; to a magnificently flowered specimen of Dendrobium speciosum with 15 spikes; to Cœlogyne cristata more than a feet over, and covered with blooms; and to Odontoglossum Alexandræ, with splendid almost pure white flowers; while a First-class Certificate was given to Oncidium splendidum, a noble habited, large-flowered species, with smallish brown-barred sepals and petals, and large flat reniform orange-yellow lip. This is probably the first time that this species has been exhibited. In addition to the above were a pale-flowered variety of Cattleya Trianæ, very fine; Oncidium nebulosum, a spike 4 feet long; Dendrobium moniliforme, most beautifully coloured; some grand spikes of Phalænopsis Schilleriana and grandiflora; the beautiful tawny-flowered, deliciously-scented Epidendrum Karwinskii, and cut flowers of a fine deep orange and black-spotted species of Stanhopea. Messrs. Veitch & Sons stood next with a fine group, consisting of six admirable specimens of Lycastes, being choice varieties of L. Skinneri, including a specimen of the wax-like variety alba, which group took the 1st prize offered by the Society. The flowers of these plants were especially fine in size and colour. With the above came a collection of Dendrobiums, comprising a splendidly-flowered example of D. crassinode, to which a Special Certificate was given; also D. moniliforme, heterocarpum, and nobile; small flowering specimens of Odontoglossum Rossii and Cervantesii; the pretty Oncidium nubigenum; a pretty new small-flowered Vanda, named cœrulescens, with lilac petals and violet-coloured lip, which is likely, when further grown, to turn out an acquisition. A Special Certificate was awarded to the collection. To E. Salt, Esq., a Special Certificate was awarded for a very fine collection of cut blooms of Orchids, which were afterwards distributed among the ladies present; and from Mr. Lawrence, gr. to Bishop Sumner at Farnham Castle, came some magnificent cut blooms of Cattleya Trianæ var. Lawrenciana, which also received a special award; this variety was remarkable for the intense rosy purple pervading all the front portion of the richly fringed lip. The same distinction was also awarded to an excellent specimen of Cœlogyne cristata, with about 15 good spikes, from Mr. Bennett, gr. to W. Terry, Esq., Peterborough House, Fulham, and to Mr. Hubberstey, gr. to O. O. Wrigley, Esq., Bridge Hall, Bury, Lancashire, for a collection of cut blooms of Cattleyas, Lycastes, Goodyera Dawsoniana, &c. The first and only prize awarded for six Primulas was taken by Messrs. F. & A. Smith, Dulwich, with a very choice collection of single and double-flowered varieties: a Special Certificate was also awarded to another group, comprising flowers of great variation in colour, from the same firm. To Mr. J. Stevens, of Ealing, a similar award was made for a group of well-grown Cyclamens. From Mr. S. Ismay, gr. to the Hon. W. O. Stanley, Penrhos, Holyhead, came a new hybrid Libonia, called Penrhosiensis, to which a Second-class Certificate was awarded. It is the result of a cross between Sericographis Ghiesbreghtiana (male parent) and Libonia floribunda (female parent). It has the habit of the latter, but has somewhat larger, darker, more acuminate leaves, and flowers of a deep rich crimson at the base, orange at the tip. It is a decided improvement upon the Libonia, and of better habit than the male parent, so that it will be very acceptable as a winter-flowering plant. Some other seedlings from the same batch were also sent, some of them partaking of the character of the male parent, and others of the female. Mr. Ware, Hale Farm, Tottenham, sent a small collection of hardy winter-flowering plants, comprising Hoteia japonica, Iris reticulata (true), the pretty mauve-flowered Primula Fortunei also called erosa, Cheiranthus Cheiri flore-pleno, and a nicely-flowered plant of the charming Cyclamen Atkinsii, which had been grown in a cold frame. Mr. Anthony Waterer, Knap Hill, exhibited hand some specimens of Cupressus Lawsoniana erecta viridis, one of the finest of all evergreen shrubs, tall and close-growing in habit, and forming beautiful pyramidal specimens as upright in growth as an Irish Yew. With this came C. Lawsoniana gracilis, a very neat growing bushy kind, with slightly pendulous branches. Both varieties are very handsome, and a First-class Certificate was awarded to each. Mr. D. T. Fish, gr. to Lady Cullum, Hardwicke, sent specimens of Myosotis dissitiflora, which had been in bloom since the middle of January.

Fruit Committee.—G. F. Wilson, Esq., F.R.S., in the chair. At this meeting prizes were offered by the Rev. George Kemp, a member of the committee, for the best collection of winter dessert Apples and Pears, three dishes of each. The 1st was taken by Mr. Parsons, gr. to W. J. Blake, Esq., Danesbury, Welwyn, with fine-flavoured examples of Josephine de Malines, Nec Plus Meuris, and Knight's Monarch Pears, and Cockle Pippin, Wyken Pippin, and Flat Nonpareil Apples; and the 2d, by Mr. Garland, gr. to Sir T. Dyke Acland, Bart., Killerton, Devon, with excellent specimens of Winter Nelis, Glou Morceau, and Bergamotte Esperen Pears, and Sturmer Pippin, Royal Russet, and Hubbard's Pearmain Apples, all fine in size and condition. The competition in this class was well sustained, the names of Cox, Earley, Ford, and Gardiner being amongst those who contributed. It was, however, the classes for the same fruits singly, for prizes offered by the Society, which brought together the greatest quantity — a fact which must be very gratifying to the Society. The 1st prize for three dishes of Apples was taken by Mr. C. Ross, gr. to C. Eyre, Esq., Welford Park, Newbury, with remarkably fresh and well kept specimens of Scarlet Nonpareil, White Nonpareil, and Stone Pippin; and the 2d, by Mr. Saul, gr. to Lord Stourton, Stourton Park, Yorkshire, with good dishes of Aromatic Russet, Ribston Pippin, and Margil. Mr. S. Wells, Holme Lacey Gardens, was 1st for Pears, with excellent dishes of Bergamotte Esperen, Beurré Rance, and another; and Mr. J. Garland, 2d, with good examples of the two former varieties, and a fine dish of Winter Nelis. Fine specimens of the above and other well known kinds were numerously shown by other exhibitors. Mr. Meredith, the Vineyard, Garston, again showed a splendid basket of late keeping Grapes, and also a very large bunch of his "Child of Hale." A Special Certificate was awarded to the collection; and to Mr. Bray, gr. to E. A. Sandford, Esq., Mynehead Court, Somerset, the same award was made for an excellent dish of forced Asparagus. Messrs. E. G. Henderson & Son sent some specimens of the Wellington Long Red Beet, which was of excellent quality, and considered to be a good stock; and examples of the Egyptian Red Beet, a small Turnip-rooted variety, which, with further selection, was thought likely to become an acquisition. One of Messrs. Adams and Grant's new Sulphur Distributors was shown at the meeting, and elicited great praise from many of the gentlemen present. The new appliance is being practically tested, and we hope shortly to report more fully upon its merits.

The following is the Report of the Chiswick Directors, forming Appendix III. to the Report of the Council to the Annual Meeting, and referred to at p. 215:—

APP. III. *Extracts from the Report to the Council from the Chiswick Board of Directors.*

"January, 1870.—The orchard-house is well filled by a large and valuable collection of Peaches, Nectarines, Apricots, and other fruit trees, some of which are planted in the borders and others in pots. The great bulk of these was presented by Messrs. Rivers & Son, of Sawbridgeworth; Mr. Pearson, of Chilwell, near Nottingham; Messrs. Veitch & Son, J. & C. Lee, and Osborn & Son, of London; while a large number of seedling Peaches, raised from carefully hybridised stones, were presented by the Rev. W. Kingsley, of South Kelvington, and from these it is anticipated that some valuable acquisitions will be obtained.

"An important alteration has been made in the Vine border of the large conservatory. The Vines, which were planted thickly to admit of as many varieties being proved as possible, had attained their full limit of space and become somewhat crowded. Some of these were planted inside and some outside of the house; and as those on the outside had succeeded better than the others, the inside border has been entirely done away with, and that on the outside very much enlarged by removing the walk from the top of the terrace to the bottom. By this arrangement there will be a great saving of labour, and a larger space will be available inside the house.

"The usual distribution of seeds, plants, and cuttings has been made, of which the following is a list:—50,000 packets of vegetable seeds, 15,420 plants of Strawberries, 150 cuttings of figs, 424 cuttings of Vines, 3086 cuttings of other fruit trees.

"A very successful exportation of some hundreds of cuttings of fruit trees was sent to the Horticultural Society of Victoria; and though nearly nine months elapsed between the time the cuttings were taken from the trees and the time they were grafted, a very large percentage of them grew, and some of all the varieties were secured. Another collection of upwards of 500 varieties has been sent off, and it is gratifying to know that these contributions are highly valued by the colonists.

"The usual distribution of flower seeds and plants has received attention, a portion of the Chiswick grant being set apart for this particular object. During the past season 70,000 packets of seeds have been sent out to the Fellows, and to the Societies in union; whilst, of the more or less valuable and important plants allotted by ballot, the large number of 11,800 has been distributed.

"In the ballots for the forthcoming season, the new golden-leaved Caladiums raised at Chiswick will be distributed. The directors believe that of these a sufficient number will be obtained, not only to supply such of the Fellows as may desire to possess them, but also to afford materials for exchanges with the commercial cultivators of new plants. One or more of the new hybrid Dieffenbachias will also be distributed in the course of the season, and the directors believe that no falling off in this department will be experienced.

"In the distributions of the present year, moreover, seeds of a considerable number of ornamental trees grown in the garden, such as species of Cratægus, Pyrus, and allied genera have been included. About 200 sets of these seeds have been made up, and are at the disposal of such of the Fellows as may apply for them in preference to the usual packets of flower and vegetable seeds annually sent out. These tree seeds the directors recommend should be sown as soon as received.

"The collection of bedding Pelargoniums had grown up to consist of the large number of 870 varieties, the number planted out last year. Of these, while many were altogether rejected, comparatively few were approved as additions to the certificated sorts of former seasons. A collection of double-flowered Pelargoniums was very

successfully grown in pots under glass, for which purpose they are exceedingly well adapted. A report of the results of the examination by the committee of both these collections will appear in the 'Proceedings' of the Society.

"Some experiments were instituted, though not till somewhat late in the season, in reference to the effects of certain chemical manures on the leaf-colouring of the variegated Pelargoniums, and the flower development of the ordinary bedding kinds. Some account of these experiments has been already laid before the Scientific Committee, and will appear in the report of the 'Proceedings' of that body.

"A large collection of recent varieties of Pentstemons and Phloxes has been procured, with the view to their comparative culture and trial during the ensuing season, it being now some years since these flowers were made the subjects of floral scrutiny, while great advances have been made in the interval which has elapsed. It is hoped that these collections, together with those of the Pelargoniums and subtropical plants, will afford subjects of interest in the floral department during the ensuing summer and autumn.

"A series of experiments on the effect of different manures on certain selected plants which usually occur in pastures, or are cultivated as objects of profit, has been diligently carried on at Chiswick during the year. It is proposed to continue these experiments during 1870, and to defer the publication of the report till the experience of another season has enabled the sub-committee to arrive at some trustworthy results.

"A valuable series of observations has been made on the effect of different stocks on grafts. The ultimate influence cannot be ascertained in the course of a few months only; but as far as the experiments go the result has been laid before the Scientific Committee, and will be published in the 'Journal.'

"A plot of ground has been selected in the garden, and planted with a view to carry out the experiments suggested by Mr. Andrew Murray illustrative of the comparative effects of pruning and non-pruning on forest trees. Some time must necessarily elapse before any result can be obtained."

LITERARY AND PHILOSOPHICAL OF MANCHESTER.—*Ordinary Meeting, December* 28, 1869.—J. P. Joule, LL.D., F.R.S., &c., President, in the chair. The following is an abstract of a paper "On Pollen, considered as an Aid in the Differentiation of Species," by Charles Bailey, Esq.:—There are four points, in one or other of which pollen grains of plants belonging to the same genus may be found to differ from each other, viz., form, markings, dimensions, and colour.

1. *Form.*—It has long been noticed that certain types of pollen are characteristic of the natural order to which the plants which produce them belong, as for instance, the peculiar pitted polyhedral pollen of the Caryophyllaceæ, the spherical spiny pollen of the Malvaceæ, the large triangular pollen of the Onagraceæ, the peculiar pollen of the Coniferæ, or the elliptical pollen of the Liliaceæ and other monocotyledonous orders; in fact, most orders possess a type sufficiently marked to be characteristic of each. This statement, however, must be accepted with limitations; the Compositæ, for instance, have three or more well-marked types, represented by the beautifully sculptured pollen of the Chicory, the minute oval spiny pollen of the Asters, Calendulas, Cacalias, &c., and another form wholly destitute of spines, as in the Centaurea Scabiosa. There are, besides, other natural orders where similar variety occurs. But differences of form are met with in plants of the same genus, by which the one species or the other is readily marked off by its pollen; thus the pollen grain of Anemone sulphurea is roundish, but that of Anemone montana is elliptic; the pollen of Aronicum Doronicum is much more elongate than that of A. scorpioides; and while the grains of Ranunculus philonotis are round and yellow, those of R. platanifolius are elliptic, white and smaller.

2. *Markings.*—Here, again, there is endless diversity, and a boundless field lies open for the researches of tired-out dot-and-line hunters of diatom-valves. A few instances only of the more striking differences can be given here. The pollen of the Geraniaceæ and Campanulaceæ is for the most part globular, but while some of the grains are quite smooth, others are covered with spines; thus the pollen of Campanula Medium has a number of short spines sparsely scattered over the surface of the grain, but C. rapunculoides is wholly destitute of them. In other plants these spines are replaced by tubercles, and both spines and tubercles vary greatly in length and number; for example, in Valeriana tuberosa the spines are only half the length of those on the pollen of V. montana, the grains being also slightly smaller. The pollen of the Liliaceæ is often covered with a more or less prominent reticulation, which is subject to much variation; compare, for example, the coarse network which invests the pollen of Lilium croceum with the finer reticulation of L. canadense, the grains of the latter species being much more globose and smaller.

3. *Dimensions.*—Some instances of the differences observable in the size of pollen grains have already been published by Professor Gulliver, whose measurements of the pollen of various species of Ranunculus show the help that may be derived from this character; R. arvensis is nearly twice the size of R. hirsutus, their dimensions being respectively 1-47oth and 1-888th of an inch. While there is considerable variation in dimensions between the pollen of one species and that of another, they are tolerably constant in size in the same species.

4. *Colour.*—This is not so reliable a character for differentiation as the others noticed, since species differ amongst each other according to the soil, &c., of the place where they have grown. I remember gathering some years ago, near Ashbourne, Derbyshire, a variety of Stellaria Holostea having a dark purple pollen instead of the ordinary pale yellow. An example or two under this head will suffice. The pollen of Ajuga genevensis is yellow, but that of A. pyramidalis is usually white; again, while the grains of Orontogalum umbellatum are large and yellow, those of O. nutans are small and white.

Florists' Flowers.

SELECTIONS OF GLADIOLI.—Subjoined are the lists of commendable varieties, referred to in my communication at p. 179:—

I.—List of good old varieties, which should not cost more than about 1s. a bulb all round.

1. Archimède.
2. Rebecca.
3. Pline.
4. Maria Dumourtier.
5. Comte de Morny.
6. Mons. Lebrun d'Albane.
7. Ophir.
8. Madame Binder.
9. Adonis.
10. Rebecca.
11. Solfaterre.
12. Madame de Vatry.
13. McMahon.
14. Madame Lésèble.
15. Calendulaceus.
16. Marie.
17. Napoleon III.
18. Victor Verdier.
19. Clémence.
20. Mdme. Eugène Verdier.
21. La Quintinie.
22. Oracle.
23. Madame Basseville.
24. Le Poussin.
25. Berenice.
26. Madame Souchet.
27. Lord Raglan.
28. Lord Granville.
29. Brenchleyensis.
30. Duc de Malakoff.
31. Vulcain.
32. Dr. Andry.
33. Isoline.
34. Velleda.
35. Theresa.
36. Cuvier.
37. Jeane d'Arc.
38. Mars.

II.—List of fine flowers procurable at about 30s. per dozen.

1. Antonius.
2. Circé.
3. Carminata (Standish).
4. Isis.
5. Ensign (Standish).
6. Montaigne.
7. Picciola.
8. Achille.
9. Bertha Rabourdin.
10. Cherubini.
11. Prince of Wales.
12. Anais.
13. Princesse Clotilde.
14. Bernard Palissy.
15. Fulton.
16. Apollon.
17. Roi Leopold.
18. Pluton.
19. Dr. Lindley.
20. Madame Adèle Souchet.
21. Impératrice Eugénie.
22. Charles Dickens.
23. James Carter.
24. John Waterer.
25. Ceres. (Standish).
26. Samuel Weymouth
27. Cardinal.
28. James Veitch.
29. Edulia.
30. Belle Gabrielle.
31. Noémi.
32. Madame de Sévigné.
33. Charles Smith.
34. Madame Furtado.
35. Madame Rabourdin.
36. Flora.
37. De Candolle.
38. Lady Franklin.
39. Madame Pereire.
40. Félicien David.

III.—List of the cheapest gems in cultivation, worth from 3s. to 5s. each single specimen.

1. Argus.
2. Duc de Montebello.
3. Homère.
4. Madame Desportes.
5. Madame Dombrain.
6. Marie Stuart.
7. Monsieur Legouvé.
8. Racine.
9. Romulus.
10. Schiller. [bridge.
11. Princess Mary of Cam-
12. Semiramis.
13. Thomas Methven.
14. Newton.
15. Rossini.
16. Lord Byron.
17. Rev. M. J. Berkeley.
18. Thomas Moore.
19. Norma.
20. Virgil.
21. Shakespeare.
22. Adolphe Brongniart.
23. Maréchal Vaillant.
24. M. Barillet-Deschamps.
25. Eurydice.
26. Princess Alice.
27. La Fiancée.
28. Ulysse.
29. Empereur Napoléon.
30. Bernard de Jussieu.
31. Eugène Scribe.
32. Milton.
33. Marie Verdier.
34. Meyerbeer.
35. Benoiton.
36. Sir Joseph Paxton.
37. Fénélon.
38. Etendard.
39. Oscar.
40. Mehul.

J. F. Lombard, Dublin, Feb. 8.

Garden Memoranda.

NEWTON NURSERIES, CHESTER.—The old-established nurseries of Messrs. James Dickson & Sons are situated within 10 minutes' walk of the Chester Railway Station, by traversing a new road which the Messrs. Dicksons have recently made, by the Ermine Inn. This route brings the visitor in a few minutes to the main entrance to the grounds in Brook Lane. Leading from this point to a central position, where the plant-houses, packing-sheds, &c., are situate, is a long broad walk, which is bordered on either side with a good collection of choice specimens of ornamental trees and shrubs. The first tree which claims attention in these borders is a beautifully-grown specimen of the Weeping Holly, and near to it a noble pyramidal bush of Taxus adpressa, from 8 to 9 feet in height, and over 30 feet in circumference of the branches near the ground. This kind, we believe, was originally found in a seed-bed in these nurseries. It is a very distinct and handsome variety, with dark glossy green foliage, and very compact in habit. There are also in these borders many other noticeable specimens of Conifers, Hollies, Portugal Laurels, Aucubas, &c., for planting for immediate effect.

Most noticeable in this part of the grounds are the large quarters of Aucuba japonica, of which an immense quantity is grown—as many as 15,000 being raised annually—to meet the demands for this plant from the smoky districts around the large manufacturing towns, for which purpose it is admirably adapted. being found able to stand smoke well. To the right of these is another brake devoted to the growth of Ivies, Clematises, and other climbing plants, in pots, and next to it comes a large collection of Yuccas, amongst which Y. flexilis, a very graceful and hardy variety, and another good equally hardy kind, named pendula, are considered the best. Then comes a choice selection of about 50 species and varieties of hardy Heaths, a beautiful class of plants, with great variety of colour, which continue in bloom from early spring until late autumn. There is also a large collection of herbaceous and border plants, but from these we must pass to the Rhododendrons, merely noting by the way that good use is being made of the ditches in the grounds by first thoroughly draining them and filling them up with soil, and ultimately using them for the propagation of the hardier kinds of shrubs, which do remarkably well in this otherwise waste ground.

The soil in that part of the nursery in which the Rhododendrons are grown is naturally a rich sandy loam, and in it they thrive with a vigour that would do credit to Bagshot. R. ponticum, for which there is a great demand for game cover, in particular makes a fine growth in a short time. There is here a great quantity of this plant about 6 years old, from 18 inches to 2 feet in height, and the same in width, with a mass of roots, growing in the natural soil, without having received any manure whatever. Of hybrid Rhododendrons, there are many varieties, principally grafted on the common one, about 6000 being propagated every year in this manner. Several varieties of the fragrant and beautiful spring flowering Daphnes, of which that old favourite D. Cneorum makes a fine growth; another excellent variety is D. Van Houttei, which has deep purple leaves. Hollies are a great feature in the nursery, about 90 varieties being grown, principally as standards and pyramids; amongst them are some beautiful golden variegate d forms, of which Gold Queen appears to be the best; of this variety, we remarked a quarter containing about 5000 budded plants, about 2 feet in height. Ilex balearica is also largely propagated for planting near the sea-side, as it stands the sea breeze well at Holyhead and other points along the Welsh coast. I. altaclerense and nobilis are both good varieties for making pyramidal plants, as with very little trouble they may be grown into handsome specimens. I. maderensis and its variety atrovirens, and I. nigricans, are very distinct. The yellow-berried form is very pretty, as is the true orange-berried variety,—which latter, however, is very scarce. The old silver-leaved kind is also exceedingly pretty in winter, when covered with its rich crimson fruit. Of seedling Hollies, coming on to replace the specimen plants, there are here about 200,000.

Of the Cedrus Deodara there are some very handsomely furnished specimens, with balls about 5 feet through, and most of which have been transplanted within the last 18 months. In a large collection of Abies there are a few specimens of the true A. amabilis. The variety generally sold for this plant appears to be A. nobilis robusta, which bears considerable resemblance to, but is perfectly distinct from the former, as seen growing side by side here. Of A. lasiocarpa and A. Nordmanniana we noticed some fine groups, principally of plants about 12 inches high and about 3 feet across, beautiful thrifty specimens. In a bed of A. Alberti we remarked a fine new form in the shape of a seedling, more upright in growth, and with denser shorter leaves, and more glaucous on the under side, than in the type. Cupressus Lawsoniana stricta is also comparatively new, and is moreover one of the handsomest of its class, being quite distinct in growth, and forming beautiful pyramidal trees, in the style of the Irish Yew: a fine subject for planting as single specimens on lawns. Pinus austriaca is another good tree for the sea coast, and is largely grown for that purpose. P. Lambertiana grows well, and makes a fine specimen. The quantity of forest trees covering acres of ground here is something enormous, and when we consider the quantities grown by other firms it is surprising where all the trees go to. Of transplanted Larch there are about 2,500,000, and of Quick about as many.

A good useful tree for planting in damp situations is the common Alder. It is largely grown in some districts for its wood, which is used for the manufacture of clogs, and also for that of gunpowder. Fruit trees make a fine clean growth in the Newton soil. A large quantity of Pears, grafted on the Quince and on the French Paradise, are grown in various forms. Rabbits seem to be very partial to the bark of the cordons, but a very simple and effective method of checking them is adopted, that of running three rows of tarred string, about 6 inches apart, near to the ground, around the quarters in which they are planted. Fresh string is put down when required, and that taken away is used for packing.

Roses occupy a considerable amount of space, as may be imagined from the stock consisting of about 50,000 standards and half-standards, and the same quantity on the Manetti stock, besides a great number upon their own roots. Oaks, Limes, Elms, and Sycamores, also receive special attention, the latter for planting in bleak districts in Wales, and the Elms, principally the true broad-leaved English variety grafted on the Scotch Elm, all straight thrifty trees, for making avenues. Limes are propagated by layering from the old stools to the extent of about 20,000 annually. They are found to make a better and more regular growth when increased in this manner. Amongst Weeping plants, the Weeping Elm and the American Weeping Willow are the most extensively grown, and very handsome trees they make.

The collection of Nuts also claims attention, being for the most part grafted on the Spanish Hazel, which greatly increases their fruit-producing powers. The common Spruce Fir, a quick growing tree for game covers, is largely grown; as also the Austrian Pine for hill-sides

Standard Yews and Portugal Laurels are well grown, the specimens generally being well-formed and fit for giving immediate effect. The same may also be said of the American Arbor-vitæ, an excellent plant for making garden hedges. In Junipers the Chinese variegated form is very pretty, though it is not by any means so plentiful as it deserves to be. One of the best of the class is Juniperus drupacea, a distinct variety, quick in growth, and with an excellent constitution. Wellingtonia does remarkably well here, grown principally from seeds. The Silver Poplar, a tree which grows well in the light sandy soil at Ormskirk, and along the Lancashire coast, is also largely grown for that purpose. Spiræa salicifolia makes capital hedges and good game cover. It is largely used for the former purpose on the mountains, where the Quick will not grow, and it makes a good hedge or barrier against sheep. Two other good plants, which make excellent game cover, are the Box and the evergreen Berberis, being dwarf and bushy in habit. In addition to the usual quantity of Gooseberry and Currants that are annually raised, we must not omit to mention the Cherry Currant, for which there is a great demand in America.

To attempt to mention all the things which are to be seen in bulk in these grounds, which with outlying fields occupy about 200 acres (not including the branch establishments in Montgomeryshire and Carmarthenshire) would be to make a catalogue, which is not our purpose. It remains for us to notice the careful manner in which the Conifers and specimens of other ornamental trees are grown. They are regularly transplanted, and each tree is planted at such a distance from its neighbour as to be perfectly clear and free from crowding, which allows each individual plant its full portion of light and air, and consequently increases the beauty of the plant and its value as a specimen for decoration. This is a point in the culture of young plants especially which is deserving of attention, as on the health, vigour, and symmetry of growth of these depend the character of the tree when full grown. The houses consist mainly of span-roofed erections and pits, which for the most part contain the usual description of nursery plants, including a good batch of specimen Azaleas in excellent health, young stocky plants of Camellias, Heaths, a collection of Orchids, Ferns, &c. One house is devoted to orchard-house trees, and another to the growth of pot Vines, which appear to be well done. At the back of one of the houses is an old plant of Chimonanthus fragrans, which has fruited more or less for the last ten years, and from which many seedlings have been annually raised.

The seed business is also carried on by the Messrs. Dicksons on a large scale, at Eastgate Street, in the ancient city, the principal stocks of seeds, comprising several favourites of Messrs. Dicksons' own selection, and which are stored in commodious warehouses near to the old cathedral, which, by-the-by, is being restored, certainly not before the old red sandstone edifice wanted it. In one of the seed warehouses we noticed a well arranged tool room, containing an excellent assortment of gardening tools, where any one in want of such things will find the process of selection a comparatively easy one.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

PRACTICAL attention as to potting and watering will now be necessary in the case of *Herbaceous Calceolarias*, if they are required to grow into good large showy specimens. If late flowering specimens are in request, the small plants from the last sowing should now be pricked out into shallow pans. The soil which these plants prefer consists of three parts nice sandy yellow loam, one part moderately decomposed leaf-mould, and one part of thoroughly decomposed cowdung, with a good proportion of either clean river or silver sand. It should be observed in regard to the formation of fine specimen plants that the sooner they require potting on or shifting into their blooming pots so much the finer are they likely to become, as they are now better able to make a good base than when they are potted later and the flower-spikes are "on the move." Those who propagate good varieties from cuttings, and have by them such plants as were struck in the autumn, should pot them on as soon as possible. Though they are not likely to require this operation until the first week in March, it is as well to keep such considerations as the above always in mind. Should flowering shoots commence forming upon any of the latter, they should be pinched off as soon as perceived. If side shoots can be spared from any of the best varieties, they may now be placed in as cuttings, with the chance of getting a succession of bloom later in the autumn. Keep the stock of these as cool as possible, comparatively speaking—say, to a mean of 44° or 46°—by artificial means, during frosty weather. They should always be kept up to the glass as closely as possible, and be allowed air liberally. Look carefully through all *Greenhouses* to see if any young plants which may be starting into growth somewhat earlier than the main collection are in want of a shift into larger pots; for though, whilst I write, the weather is very severe, it must not be forgotten that the season is fast advancing, and that the heat from the sun during bright intervals will begin to be felt. In fact, the spring season is at hand, so far as the inmates of our plant-houses are concerned, and we should make our preparations accordingly. This should especially be acted on in regard to the housing and preparation of soils which will shortly be required for the general potting.

FORCING HOUSES.

More humidity will now generally be required by *Pines*, therefore damp the floors and other cool surfaces more frequently. Attend particularly to the tan or other beds of fermenting materials, which, after the past sharp weather, and the consequent greater amount of artificial heat in the flues, &c., may have fluctuated more than was anticipated. *Peach* and *Nectarine houses* now in full action should have almost hourly attention. See that no insects are forming amongst the young growths, and, should such be the case, fumigate the house as early as possible. For this purpose I would recommend good tobacco only. Manufactured tobacco paper is very useful if used carefully in plant-houses, but it can hardly be depended upon where valuable crops of fruit are at stake. Syringe the trees over between 2 and 3 o'clock P.M. every day, after the fruit is well set. Let the water average 65° or 70° at least, and ply it freely amongst the foliage both top and bottom. *Strawberry plants* which are being forced, the pots containing which are plunged into a bed of fermenting materials, will make roots if an agreeable amount of warmth is kept up in the bed—in some cases through the bottoms of the pots into the material, and aided thereby will be induced to make a very free growth, so much so, that one feels anxious to have them there as long as possible. In all such instances, treat the benefit derivable from this fresh rooting with suspicion. Pull up every pot frequently as long as they remain plunged, and so discourage all such root action, which, in fact, will have to be disallowed at a later date, when the fruit is actively forming, and more support will be wanted. Increase the heat slightly in *Fig-houses* where active growth is being forwarded, and sow for successional crops of *French Beans* more frequently than before.

HARDY FRUIT GARDEN.

I suggested some months ago that out-door Vines should be pruned; those who have not performed this necessary operation should therefore do so at the earliest possible moment. Late pruning in the case of Grape Vines is always objectionable, and especially in this case, in regard to such as have to withstand the numerous vicissitudes of our variable climate.

KITCHEN GARDEN.

If the present weather continues, and meteorological authorities inform us that the wind is likely to be easterly for some time, then all we can do is to bring up any arrears of trenching which have yet to be done. The men's time may be profitably spent in cutting shreds for wall fruit trees, or sorting and cleaning the nails, &c., which were removed in the autumn, if this be not already done. Old sheds, and indeed nails, before being used again, should be placed in such an amount of heat that any insects adhering to them may be destroyed. *Peas* sown in boxes, on turves, or the like, to be transplanted out shortly, must receive all the light and air possible; they must not be coddled up so that no breath of cold air can reach them. The hardier they become at this time—short of actual freezing of course — the better will they withstand the variations of weather they will have to submit to in future. *W. E.*

TOWN GARDENING.

WHILST I write the ground is hard with frost. As soon as it disappears carefully remove the surface covering from off the *Tulip* and *Hyacinth beds*, and to bloom them in perfection have some hoops fixed over them, and in frosty, windy, or wet weather, cover them with mats or canvas. If they are planted in patches in the borders, cover them when requisite with pots or hand-glasses, for, though they are hardy, if they are protected from smoke and inclement weather during this and next month they will bloom much finer than if exposed. With fresh soil, and this attention, a beautiful display may be had in the most confined situations. *Gladiolus Brenchleyensis* flowers and increases freely with me in the Middle Temple, and I believe it will do well in any open space if at once planted in the following manner:—Dig a hole 9 inches deep and 9 inches square, and fill it up with soil composed of three-fourths of sandy loam and one-fourth of rotten dung; plant three roots in each hole in the form of a triangle, 4 inches apart and 4 inches deep, with a little silver sand over each root, pressing the soil closely round them; place a small stick in the centre, which will indicate the whereabouts of the bulbs and show where to put in a stake to support them when in flower without injuring the roots. I have tried several other varieties but with no success, and I am glad to see we are promised a first-class list from a practical cultivator, and from which I hope to find other varieties that will do well in town [see p. 250]. The *Iris germanica*, in endless and beautiful varieties, is an invaluable plant for town gardens, thriving in almost any soil. It will flower in May, if now removed in lumps, and it may be propagated freely in the autumn. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, FEBRUARY 16, 1870.

1870. Month and Day	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition		
February.	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer.	Dew Point	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air
	Ins.	Deg.	Deg.	Deg.		Gr.
10. Thurs.	29·93	24·8	22·8	11·8	85	0·9
11. Friday	30·09	24·9	22·9	18·0	81	1·3
12. Satur.	30·20	22·4	21·0	11·9	63	0·9
13. Sunday	29·99	26·9	24·4	12·6	53	1·0
14. Monday	29·91	30·2	28·7	24·0	77	1·5
15. Tues.	30·11	29·8	28·2	23·1	75	1·5
16. Wednes.	29·98	32·2	31·2	28·8	87	1·9

1870 Month and Day	Temperature of the Air					Wind		Rain
February.	Highest	Lowest	Range in Day	Mean	Departure of Mean from Average of 30 Years	Direction	Horizontal Movement	In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
10. Thurs.	32·9	22·0	10·3	25·9	—12·9	N.E.	375	0.00
11. Friday	30·5	19·4	11·1	24·9	—11·9	N.E.	405	0.02
12. Satur.	27·7	20·3	7·4	23·9	—14·5	N.E.	630	0.00
13. Sunday	28·7	26·0	2·7	26·9	—11·4	N.E.	800	0.00
14. Monday	31·8	27·0	4·5	28·9	—10·0	N.E.	700	0.00
15. Tues.	38·0	25·4	13·5	31·8	— 6·3	N.E.	440	0.00
16. Wednes.	38·9	28·2	10·7	33·2	— 4·9	N.E.	250	0.00

February 10—Generally cloudless; a very fine day.
" 11—Cloudy; a little snow fell occasionally; aurora at night
" 12—Overcast, snow; heavy gale from N.E.
" 13—Overcast, occasional sleet; gale still prevalent
" 14—Overcast throughout; occasional snow; strong wind
" 15—Cloudy in the morning; generally cloudless afterwards.
" 16—Generally overcast; a little snow at night.

The temperature of the air 4 feet above the ground was almost constantly below 32 deg. from the 10th to the 14th.

The readings of a thermometer, with its bulb placed 1 inch below the surface of the ground, ranged between 31 deg. and 35 deg.; and of one at the depth of 3 feet below the surface, between 39 deg. and 41 deg. during the week ending February 16.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, FEBRUARY 12, 1870.

Names of Stations	Temperature of the Air: Highest.	Lowest.	Range of Temp.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	55·1	19·8	35·3	41·7	28·6	13·1	34·8	1·31
Blackheath ..	47·9	19·4	28·5	37·3	28·4	8·9	32·4	0.25
Over Court (Bristol) ..	48·3	19·6	28·7	37·6	29·2	8·4	33·0	1·07
Birmingham ..	49·4	18·1	31·3	38·1	28·4	9·7	33·2	1·19
Wolverhampton ..	46·2	17·9	28·3	35·6	29·1	6·5	31·9	1·24
Leicester ..	45·2	20·0	25·2	35·8	27·1	8·7	31·0	1·33
Norwich ..	44·0	21·0	23·0	34·5	27·0	7·5	30·8	0.49
Nottingham ..	48·9	20·8	28·1	37·0	29·3	7·8	33·8	0.74
Sheffield ..	49·0	18·7	27·3	35·9	28·7	7·2	31·9	1·03
Liverpool ..	47·5	22·5	25·0	39·9	29·5	7·4	32·8	0.48
Manchester ..	48·8	20·0	28·8	..	..	9·6	34·1	0.16
Eccles (Salford) ..	48·0	20·2	27·8	38·0	29·9	8·7	33·9	0.16
Bradford ..	47·0	21·4	26·2	38·0	26·8	11·2	32·0	0.55
Leeds	48·0	20·0	28·0	38·0	29·0	9·0	33·5	0.68
Hull	41·0	15·0	26·0	35·7	26·3	9·4	30·6	1.17
Newcastle-on-Tyne	44·0	25·0	19·0	35·7	29·0	6·7	31·9	0.93
Edinburgh ..	47·7	25·0	22·7	..	..	..	35·0	0.40
Glasgow ..	46·5	24·5	22·0	..	..	..	35·0	0.62
Greenock ..	47·9	28·0	19·9	..	..	..	39·6	2.00
Leith	50·5	26·7	23·8	..	..	..	36·3	0.24
Perth	47·0	27·0	20·0	..	..	..	37·7	1·51
Aberdeen ..	43·5	28·1	15·4	..	..	..	36·1	1.38

JAMES GLAISHER.

Notices to Correspondents.

BARNES' MEMORIAL. Subscription received: Mr. Low, Clapton, £1 1s.

BOOKS: *Amateur.* Thomson's "Handy Book of the Flower Garden," Blackwood & Sons. *E. S. N.* "Thomson's Practical Treatise on the Grape Vine," Blackwood & Sons.—*Young Nurseryman.* 1, "Grigor's Arboriculture;" 2, "Paxton's Botanical Dictionary."

CUCUMBER ROOTS DISEASED: *Holkham.* Your Cucumber roots are attacked by a species of Vibrio. There is no better remedy than to remove the soil entirely, and burn it, and to obtain fresh soil from an entirely new source.

HOLLY TREES FLOWERING: *A Subscriber.* The Holly often bears male stamen-bearing flowers only. These, of course, produce no berries.

POT-CASES FOR WINDOW PLANTS: *Mrs. S.* We do not know.

SALT AS A MANURE: *Old Reader.* The effects of simple salt as a manure have never been well ascertained. Some farmers steep their Wheat in lime before sowing, and others apply sea-sand to their land. In nearly all manures there is more or less of saline properties. We know of no instance where Hoare's recommendation of applying salt to Vine borders has been tried, and we should be sorry to try it to any extent.

VINES BLEEDING: *Novice.* Apply some of Thomson's Styptic, which may be procured of almost any seedsman. Replies to your other questions will be given next week.

CATALOGUES RECEIVED.—T. Dixon & Co. (Seeds).—W. Armitage & Sons (Seeds).—Hooper & Co. (Seeds).—G. J. Child (Seeds).—A. Legerton (Seeds).—Raynbird & Co. (Grasses).—J. Jefferies & Sons (Seeds).—W. Rollison & Sons (Seeds).

COMMUNICATIONS RECEIVED:—J. D.—R. M.—S. G.—E. B.—R. G.—W. S. (France).—Sheen.—W. H.—T. W.—G. C.—J. D. D.—A Forester.—W. H. C.—W. J.—W. J. C.—N. W. S.

Markets.

COVENT GARDEN.—February 19.

We have but little change to notice in respect either of supply or price. Hothouse Pines are in somewhat better request, and some good fruit from the Azores have been sufficient, with Cayenne varieties, for which fair prices have been obtained. Grapes are quite sufficient, comprising Muscats, Alicante, Barbarossa, and Lady Downe's. Continental imports include the usual varieties of salading, Artichokes, Carrots, &c. The Potato market contines dull; and in consequence of the severe weather plants in flower are rather scarce.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3 0 to 5 0		Lemons, per 100 ..	5 0 to 10 0	
Cobs, per lb. ..	0 9 — 1 0		Melons, each ..	1 6 — 3 0	
Chestnuts, p. bush. .	8 0 — 14 0		Oranges, per 100 ..	6 0 — 12 0	
Filberts, per lb. ..	0 6 — 0 9		Pears, per doz. ..	3 0 — 6 0	
Grapes, per lb. ..	6 0 — 12 0		Pine-apples, per lb.	8 0 — 10 0	

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6 to 5 0		Leeks, per bunch ..	0 2 to 0 4	
Artichokes, p. doz. ..	3 0 — 4 0		Lettuces, p. score ..	1 0 — 2 0	
Beet, per doz. ..	2 0 — 3 0		Mint, per bunch ..	1 0 — 1 6	
Broccoli, per doz. ..	1 0 — 2 6		Mushrooms, p. pott.	1 0 — 1 6	
Brussels Sprouts, p. ½ sieve ..	2 0 — 3 0		Onions, per bunch ..	0 4 — 0 9	
Cabbages, p. doz. ..	1 0 — 1 6		Parsley, per bunch .	0 2 — 0 4	
Carrots, p. bunch ..	0 4 — 0 8		Potatos, new, p. lb.	0 4 — 0 6	
Cauliflowers, p. doz.	1 6 — 3 0		Salsafy, per bundle .	1 0 — 1 3	
Celery, p. bund. ..	1 0 — 1 6		Scorzonera, do. ..	1 0 — 1 3	
Cucumbers, each ..	1 6 — 3 0		Seakale, p. punnet..	2 0 — 2 6	
Endive, per doz. ..	1 6 — 2 0		Shallots, per lb. ..	0 8 — ..	
Garlic, per lb. ..	0 8 — ..		Spinach, p. bushel.	2 0 — 3 0	
Herbs, per bunch ..	0 2 — 0 4		Radishes, per doz ..	1 0 — 1 6	
HorseRadish.p bun.	3 0 — 5 0		Turnips, per bunch .	0 4 — 0 6	

Potatos, York Regents, per ton, 75*s.* to 100*s.*; Flukes, do., 75*s.* to 120*s.*

POTATOS.—Southwark, February 14.

During the past week the arrivals coastwise have been small, but quite equal to the demand, owing to the large quantity left over from the late glut. Quotations:—Yorkshire Regents, per ton, 70*s.* to 85*s.*; Lincolnshire do., 60*s.* to 75*s.*; Kent and Essex do., 60*s.* to 75*s.*; Dunbar and East Lothian do., 70*s.* to 95*s.*; Perth, Forfar, and Fifeshire do., 60*s.* to 75*s.*; Ditto Rocks, 60*s.* to 65*s.*; French and Belgian Whites, 50*s.* to 55*s.*

WEBB'S NEW GIANT POLYANTHUS, Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the varieties, with double PRIMROSES of different colours; AURICULAS, both Single and Double; with every sort of Early Spring Flowers. LIST on application.—Mr WEBB, Culcot, Reading.

EAST LOTHIAN INTERMEDIATE STOCKS. February is the best month for sowing these celebrated Stocks, unrivalled both for flower gardening and for pot culture. May be had true (scarlet, white and purple), in packets, at 2*s.* 6*d.*, and 5*s.* each, from THOMAS METHVEN, 15, Princes Street, Edinburgh.

Dahlia Roots.

CHARLES TURNER can supply the leading varieties in sound pot roots, 6*s.* to 12*s.* per dozen.

PELARGONIUMS—Extra strong plants of large flowering French and fancy varieties, that will give a fine head of bloom in May and June. 12*s.* to 21*s.* per dozen

The Royal Nurseries, Slough

Lilium auratum.

WM. PAUL has to offer a Magnificent Lot of the above, at 1*s.* 6*d.*, 2*s.*, 2*s.* 6*d.*, and 3*s.* 6*d.*; each; 12*s.*, 18*s.*, 24*s.*, and 36*s.* per dozen. The usual discount to the Trade off the dozen rates, when ordered by the dozen

PAUL'S NURSERIES and SEED Warehouse, Waltham Cross, London, N

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (See Dr Hooker, "Botanical Magazine," No 5851.) Price 10*s.* 6*d.* each; in quantity, a special price will be given.

The honour of importation is due to Mr. Fortune; the honour of distribution to Mr. Enoch to CHARLES NOBLE, of whom fine plants can be obtained.—Bagshot, Jan. 20.

STUART, MACDONALD, AND CO., SEED GROWERS and SEED MERCHANTS, 85, Southampton Row, Holborn, London, W.C.

S., M. & Co.'s WHOLESALE LIST of all the Choice Flower Seeds in cultivation forwarded on application

Common Yews.

H. AND F. SHARPE have a fine stock of the above, 4 to 5 feet high, bushy and well rooted, which they offer at a low figure

Seed-growing Establishment, Wisbech

Strong Transplanted Quick.

H. AND F. SHARPE have a fine stock of 3-yr. transplanted QUICK, which they are prepared to offer to the Trade at a low figure, in order to effect a clearance

Seed-growing Establishment, Wisbech.

Coniferæ Seeds.

E. COOLING has to offer fine new seed of PICEA NOBILIS, ABIES CANADENSIS, CUPRESSUS LAWSONIANA, &c. Price and copy on application.

Mile Ash Nurseries, Derby

To the Trade.

FOR SALE, a small quantity of GLOXINIA SEED, from finest named Flowers; about 1 lb. of DELPHINIUM FORMOSUM; and about ½ lb. of BEDFORDSHIRE SURPRISE RIDGE CUCUMBER

W W, the Post Office, Southborough, Tunbridge Wells, Kent

Transit Agency for Plants, Seeds, &c.

CHAS. JOS. BLACKITH, only surviving Partner of the late Firm of BLACKITH AND BLACKITH, begs to announce that he intends in future to conduct Business at the same address, under the style of CHAS. JOS. BLACKITH AND CO., and hopes to receive a continuance of the favours of the Trade.

Cock's and Hammond's Quays, Lower Thames Street, London.—Jan. 3

PARIS, 1867. SUTTONS' GRASS SEEDS for ALL SOILS. The PREMIER PRIX SILVER MEDAL for GARDEN SEEDS, GRASSES, and GRASS SEEDS, was Awarded

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

Improvement of Grass Lands, at from 4*s.* 6*d.* to 9*s.* per acre.

SUTTONS' RENOVATING MIXTURE should now be sown 6 to 12 lb. per acre

SUTTON AND SONS, Seed Growers, Reading

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer, for cash, GIANT KING POTATO; it is the finest Potato out, has a beautifully clear skin, small eye, and when boiled very flowery; it is the earliest Potato in cultivation, and a very heavy cropper; price per cwt., 20*s.*; or smaller quantities at the same rate. My AMERICAN RED POTATO has produced over 16 tons to the acre this year. Price per cwt., 20*s.*; or smaller quantities at the same rate. True WHEELER'S MILKY WHITE POTATO, 2*s.* per peck; MYATT'S PROLIFIC POTATO, 1*s.* 6*d.* per peck.

WANTED, HEAD PROPAGATOR.—A thoroughly experienced Hard-wooded Propagator. None but those of undeniable character and ability need apply.—X. Y. Z., *Gardeners' Chronicle* Office, W.C.

WANTED, a GARDENER.—One who thoroughly understands the Growing of Vegetables, and has had experience in a Market Garden preferred.—Apply to HENRY CLARKE AND SONS, 39, King Street, Covent Garden, W.C

WANTED, a steady, active MAN, used to Nursery Ground-work and Jobbing; to live in house as one of the family.—Apply, stating wages and testimonials, to J. W. COLE, Nurseryman, Alston Holgate, Spilsby, Lincolnshire

WANTED, a GERANIUM and SOFT-WOODED PLANT GROWER. One used to Market-work preferred.—Apply at The Orchard Nursery, Mortlake, Surrey, S.W.

WANTED, a good PLANT GROWER, for a Provincial Town or Nursery. Demand chiefly for Plants in Bloom and Cut Flowers.—W. DILLISTONE, Horticultural Agent, Sible Hedingham, Essex

WANTED, ONE or TWO YOUNG MEN, who know, or have a natural taste for, Herbaceous Plants.—THOS. S. WARE, Hale Farm Nursery, Tottenham, Middlesex, N.

Seed Trade.

WANTED, as ASSISTANT CLERK, a Young Man, with sufficient Knowledge of the Trade to enable him to Invoice Goods. He is indispensable, and must be a very Neat and Quick Writer, also be well recommended.—Apply, stating age, salary expected, and all particulars, to B. B. B., *Gardeners' Chronicle* Office

Seed Trade.

WANTED, a Young Man as SECOND COUNTER-MAN, and to Travel occasionally. Must have a good knowledge of Farm Seeds.—THOMAS PIERPOINT, Seedsman and Seed Grower, Bridge Street, Warrington.

WANT PLACES.—Letters to be Post Paid.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, and GARDENERS and BAILIFFS, of various qualifications, who are open to engagements. Particulars as to wages required and wages given should be forwarded with application.—PAUL'S Nurseries, Waltham Cross, London, N

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars (free) on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the services of MEN that he has in his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c.; so that suitable Men may be selected.—Highgate Nurseries, London, N

Gardeners Wanting Places.

JOHN HARRISON begs to inform Noblemen and Gentlemen that he has at present a number of FIRST-CLASS GARDENERS on his BOOKS, many of whom have served in some of the highest Families in the North of England, and whose characters and abilities are of the highest description.—North of England Rose Nursery, Darlington.

Bedford, February, 1870.

Business Agency.

FARM, ESTATE, or GARDEN.

MR. T. BOWICK has the pleasure of introducing good MEN to fulfil any duties in connection with the above. No one is recommended whose antecedents have not been thoroughly inquired into. HOME REGISTER OPEN.

To Gardeners and Bailiffs (Head, Foremen, or Under)

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY into their REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon JAMES CARTER & CO. adopting the most stringent regulations in reference to character, ability, honesty, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

GARDENER (HEAD).—Age 29, married, no incumbrance; thorough knowledge of Early and Late Forcing, Stove and Greenhouse Plants, and Flower and Kitchen Gardening.—E. M., Green, Bush Hall Tables, Hertford, Herts

GARDENER (HEAD).—Middle-aged; with plenty of experience in every department, and a good will to use it in the interest of his employer. Good character.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey.

GARDENER (HEAD).—Age 30, married; thoroughly practical in all branches of the profession. Can be highly recommended.—T. S., 5, Blythe Terrace, Stanstead Road, Forest Hill, Kent, S.E.

GARDENER (HEAD).—Understands the Growth of Orchids, Stove and Greenhouse Plants, also Fruit and Vegetables. Has been in some of the largest places in the country. Good character from present and former employers.—A. B., Mr. Robson, Seedsman, Bowdon.

GARDENER (HEAD).—Age 28, married, no incumbrance; thoroughly practical. Fully competent in every branch of his profession, including Specimen-plant growing, Early and Late Forcing, &c. Best references.—G. H., Cheshire's, 14, Grove Road, Holloway, N

GARDENER (HEAD).—Age 33, married, one child; has a thorough practical knowledge of the profession. Four years' good character from the Place he is leaving. Mr. Hutcheson, Gardener, Quex Park, Margate, will be glad to answer any inquiries.—G. PECKHAM, Rushett, Faversham, Kent.

GARDENER (HEAD), to any Nobleman or Gentleman requiring the services of a first-class practical Gardener in every branch of his Profession, including Pines, Vines, Peaches, &c.—Age 41; ten years in last situation. Character will bear the strictest investigation.—G. FLETCHER, 23, Perry Street, Wolverhampton.

To Noblemen and Gentlemen.

GARDENER (HEAD); age 31, married, no incumbrance.—DOWNIE, LAIRD & LATHAM will have much pleasure in recommending as Head Gardener a thoroughly trustworthy Man, well qualified to manage all the branches of the profession successfully.—Shanstead Park, Forest Hill, London, S.E.

GARDENER (HEAD).—Middle-aged; a practical Man in Forcing of Pines, Vines, and Peaches; a good Cultivator of Orchids, Ferns, Stove and Greenhouse Plants; is well acquainted with Growing of Vegetables and Hardy Fruit, and has had extensive practice in the Flower Garden, Pleasure Ground, and Arboriculture. Has held a situation in this country 10 years. Recommended for ability and integrity.—Address, in the first instance, Mr. PORTER, Cross, Oswestry.

GARDENER (HEAD), age 44, married, one child, 10 years of age.—Mr. HAZEL, late Head Gardener to the Right Hon. the Earl of Stradbroke, Henham Hall, begs to offer his services to any Nobleman or Gentlemen requiring a first-class Gardener. Was 13½ years Farm Bailiff and Gardener to Mrs. Miles, Firbeck Hall; five years Head Foreman to Mr. Barron, Elvaston Castle; and two years with Mr. Barnes, at Lady Rolle's, Bicton. Mr. H. can have first-class testimonials from all the above.—61, Eversfield Place, St. Leonards-on-Sea, Sussex.

GARDENER (HEAD).—Age 29, married, one child; understands the profession in all its branches. Good character.—J. W., 1, Rosemont Cottages, North End, Finchley, N.

GARDENER (HEAD).—Understands the profession in all its branches. Can be well recommended.—G. R., Post Office, Bentley, Farnham, Surrey.

GARDENER (HEAD).—Age 28, married, no incumbrance; thorough knowledge of Vines, Stove and Greenhouse Plants. Five years' good character from last employer.—J. H., Post Office, Hill Street, Upper Clapton, E

GARDENER (HEAD),—Age 30; has practised in good Establishments, both in Scotland and England; experienced in the Culture of Pines, Vines, Peaches and Melons, and in Stove and Greenhouse Plants; tasteful in Flower Garden Decoration, also in the Formation and Alteration of same. Can be well recommended.—R. CHAPMAN, Woolley Park, Wantage, Berks.

GARDENER (HEAD, WORKING).—Age 37; 16 years' experience; understands Vineries, Conservatories, Greenhouses, Pits, Flower, Fruit, and Kitchen Gardening. Leaving owing to Gentleman giving up his Establishment. Unexceptionable character for honesty, industry, and sobriety.—R. R, Upper Shirley, Croydon, Surrey.

GARDENER (HEAD), where two or more are kept.—Age 40, Scotch; thoroughly experienced. Unexceptionable references.—B. A., Garrick's, Stationer, Dulwich, S E

GARDENER (HEAD), to a Nobleman or Gentleman, where two or more are kept.—Married, one child; has a thorough practical knowledge of the profession. Good character.—P. BRIGHTMAN, Keen's Cottage, Half Moon Lane, Dulwich, S.E.

GARDENER (HEAD), where one or two are kept—Age 30, married; understands Stove, Greenhouse, Flower and Kitchen Gardening, Forcing, &c. Good character.—H. H., 29, Crane Grove, Holloway Road, N.

GARDENER (HEAD), where two or more are kept.—Age 33; practically acquainted with Early and Late Forcing, the Growth of Stove and Greenhouse Plants for Exhibition, and Flower, Fruit, and Kitchen Gardening. Three years' excellent character.—R. K., Post Office, Barford, near Warwick.

GARDENER (HEAD), where one or more are kept.—Age 40, married, no incumbrance; thoroughly understands Vines, Peaches, and the Forcing of Fruit and Flowers generally, also a good Kitchen Gardener. Eight and a half years' character, and most satisfactory testimonials.—F. C., Mr. Maurice Young's Nurseries, Mulford, near Godalming.

GARDENER.—Age 38, married, two children, one 13 and the other 11; understands Vines, Cucumbers, Melons, Kitchen and Flower Gardening.—L. D., Post Office, Great Tey.

GARDENER (THOROUGH).—Middle-aged, married; practical experience in Flowers, Fruit, Vegetable Forcing, Pasture Land, &c. One years' character, six previous.—A. C., 3, Richmond Cottages, St. Andrew's Hill, Ipswich, Essex.

GARDENER (PRACTICAL, WORKING).—Age 35, married, no incumbrance; has a thorough knowledge of Farming and the Management of Stock. Good personal character.—E. F., Stevens, Stationer, Leytonstone, N.E.

GARDENER (WORKING), or Single-handed.—Married; Wife good Laundress, if required.—A. B., Guiles' Gate, Pirbright, Surrey.

GARDENER (SINGLE-HANDED, or otherwise).—Age 22, married; understands the Management of Vines, Melons, Cucumbers, Greenhouse and Conservatory; also Kitchen and Flower Gardening. Nine years' experience. Good reference.—GARDENER, Aston Rectory, Wallingford.

GARDENER (SECOND).—Age 21; has been used to the Houses and Flower Garden. Can have five years' good references.—THOS. WELLS, Jun., Watts' Cross, Hildenborough, Tunbridge, Kent.

GARDENER (UNDER), in a good Establishment, where Horticulture is cherished.—Age 20; good character and reference.—A. WEBB, Daylesford Gardens, Chipping Norton, Oxon.

GARDENER (UNDER).—In the Houses preferred. Willing to make himself useful. Two-and-a-half years' good character.—S. M., Rose Cottage, Halfway Street, near Eltham, Kent.

GARDENER (UNDER, OR IMPROVER).—Age 19; three years' practice. Can be highly recommended by the Gardener, also employer.—T. P., The Gardens, Cranham, Surrey, near Bedford.

IMPROVER, in the Houses, in a Nobleman's or Gentleman's garden.—Age 21; would give a Premium. Good references.—A. M., Post Office, Sunbury, Middlesex.

FOREMAN, in a Gentleman's Garden, where five or six are kept.—Has a good practical knowledge of Forcing Vines, Pines, Peaches, &c. Five and a half years' character from last situation.—W. S., 10, Elgin Terrace, Maida Vale, London, W

FOREMAN.—A steady, active, young Man; six years' good character. Four years under Mr. Fleming, at Cliveden, and two years in present situation.—W. J. B., Newsells Park, near Royston, Herts

FOREMAN (WORKING).—Age 48, married; good Manager of Stock. Good Accountant. Can be well recommended by last employer.—W., 7, Shakespeare Terrace, Shakespeare Road, Stoke Newington, London, N.

GENERAL NURSERY FOREMAN, or HARD-WOOD PROPAGATOR.—Age 28; thoroughly experienced in all branches of the trade; first-class Propagator.—J. S., 8, Cornwall Street, Moorpark, Fulham, S.W.

PROPAGATOR (HEAD).—A successful Propagator of Roses, Rhododendrons, &c. Can be well recommended.—WM. WOOD AND SON, the Nurseries, Maresfield, near Uckfield, Sussex.

FORESTER, or LAND-STEWARD and FORESTER.—Age 29, Scotch; has had good experience in the Breeding, Rearing, Buying and Selling of Young Trees, and thoroughly understands the Management of Land, being the son of an extensive farmer in Perthshire; has been thoroughly trained as a Forester on some of the best Estates in Scotland, and can give first-class references. First-class references given, and nothing but a good situation will be accepted.—Apply, stating terms, to D. S., Messrs. Veitch & Sons, Royal Exotic Nursery, King's Road, Chelsea, London, S.W.

BAILIFF.—Age 47, married; active, of energetic habits, respectably connected. Thoroughly practical in Modern Farming, Steam Cultivation, Draining; good Judge in Stock, Buying, Selling, and a good Accountant; Management of Woods, Repairs, &c.—F. B., Post Office, Furnival's Inn, Holborn, London

AGENT and ESTATE BAILIFF (age 38).—A Gentleman wishes to recommend a thoroughly trustworthy Person, who has been in his employ for 13 years in the above capacity. He is an excellent Farmer and most efficient Accountant, and will receive most highly first characters.—T. B., Messrs. Dalton & Lucy, Booksellers, Cockspur Street, Charing Cross, London, S.W.

To the Seed Trade.

TRAVELLER.—The Advertiser requires a re-engagement. Can give satisfactory references.—ALPHA, *Gardeners' Chronicle* Office, W.C

SHOPMAN, or GENERAL MANAGER, in a Seed and Nursery Business.—J. T., Post Office, Ross.

SHOPMAN.—Age 26, Scotch; ten years' experience in all branches of the Seed Trade, with part knowledge of Plants. No objection to go abroad. Good reference.—F. A. B., Post Office, Newcastle-on-Tyne.

To Noblemen and Gentlemen.

ESTATE CARPENTER (FOREMAN).—Age 34, married; thoroughly practical, experienced, and energetic; capable of taking the entire Management in the Erection of Farm Buildings, Cottages, and the usual work of a Gentleman's Estate. First-class references both as to character and abilities, and satisfactory reasons given for leaving present situation.—T. C., Woolley Park, Wantage, Berks.

SUTTONS'
GRASS SEEDS
FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS,

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for the following Soils and purposes:—

STIFF CLAYS.—To be met with in the London, Kimmeridge, Oxford, and Lias Clays.

HEAVY LOAMS.—Of the same formations as the preceding, but when they have been subject to surface admixtures and cultivation.

GOOD MEDIUM LOAMS.—On the Marls of the Old and New Red Sandstones, the Gault, and the Greensands.

LIGHT LOAMS.—Of the same formations as the preceding, but of somewhat lighter character.

LIGHT SANDY SOILS.—On New Red Sandstone, sands of the inferior Oolite, soils visited by Sand Drifts; also those covering up the stiff Lias and the Tertiary Sands of the Dorset Heaths.

SHARP GRAVELS.—Such as the Flint Gravel drift which overspreads so much of the Southern and Western parts of England.

CHALKY SOILS.—As the Mountain Limestone, the Oolites and the Chalks proper, where not too elevated.

SHEEP DOWNS.—The elevated and more exposed parts of the Oolites, such as the Wolds of Gloucestershire, the Cotswold Hills, and the plains of Wiltshire.

BLACK PEATY SOILS.—The sorts contained in these Mixtures are grown in different localities, and gathered separately by the hand expressly for this purpose, by which means all noxious weeds are excluded. They consist of the most nutritive kinds of Fescues, Poas, Sweet Vernal, Perennial Clovers, Loliums, &c., and are mixed in such sorts and proportions as are most suitable to the soils to be laid down. In this we use our discretion, in accordance with our many years' experience in all parts of the kingdom, as well as in other countries.

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, Carriage Free. 2 bushels Grass Seeds and 12 lb. Clovers supplied per acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. Mechi, Esq., *Tiptree Hall, near Kelvedon.*
February 5.—"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

From J. L. Williams, Esq., *Boyne View, Navan, Meath, Ireland.*
March 30.—"Last year I got from you Permanent Pasture Grass Seeds for 10 acres, with which I laid down one-half of a 20-acre field (Irish). I am very much pleased with the way the Grass Seeds have answered, and I now want to lay down the other half of the field in the same manner."

From Thos Levett Prinsep, Esq., *The Beacon, Kingswear, Dartmouth.*
December 24.—"Mr Levett Prinsep must speak in the highest terms of the Grass Seed supplied to him by Messrs Sutton & Sons in the spring, and which has stood the past burning summer better than much of the old turf."

From J. Ward, Esq., *Round Oak, Greenham, Newbury.*
July 4.—"The permanent Grass Seeds for about 29 acres, supplied by you last year (the greater part sown with Barley), have given me great satisfaction, and produced a crop (this dry season) of about 40 tons of good hay—four and a half acres of which have fed five head of cattle during the spring."

From E. H. Nickson, Esq., *Foxby, Wem.*
March 9.—"The field I laid down with your Permanent Seeds is looking admirable."

From Rev. J. Leighton, *Bisham Vicarage, Fleetwood.*
May 2.—"The Pasture I laid down with your Seeds last year has done beautifully, and seems to have attracted the notice of several of the farmers who live near."

SUTTONS' RENOVATING MIXTURE, for Improving Pastures, at from 4*s.* 6*d.* to 9*s.* per acre, should be sown in the spring.

This Mixture consists of the finest kinds of Permanent Grasses and Clovers, and will greatly increase the quantity and quality of succeeding Hay crops. The Pasture should be harrowed with heavy iron harrows previous to sowing, and bush-harrowed after sowing, and in some cases of top-dressing of manure will be found beneficial. Sow 6 to 12 lb. per acre, according to the condition of the Pasture. Price 9*d.* per lb., 8*os.* per cwt. ; Carriage Free.

SUTTONS' MIXTURES of GRASSES and CLOVERS,

so prepared as to produce very large crops for the specified periods they are to remain down :—

For ONE YEAR'S LAY, 13*s.* 6*d.* per acre, Carriage Free.
For TWO YEARS' LAY, 17*s.* 6*d.* per acre, Carriage Free.
For THREE or FOUR YEARS' LAY, 22*s.* per acre, Carriage Free.

Special estimates given for large quantities.

For full particulars on Laying down New and Improving Old Grass Lands, see

SUTTONS'

FARMER'S YEAR BOOK FOR 1870,

Containing complete List of Prices of GENUINE FARM SEEDS, now ready, and may be had Gratis and Post Free on application.

☞ **ALL GOODS CARRIAGE FREE,**

Except very small Parcels. Five per cent. allowed for cash payments.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AGRICULTURAL EDUCATION.

The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

CENTRAL CHAMBER of AGRICULTURE.—A COUNCIL MEETING will be held at the Salisbury Hotel, Fleet Street, on TUESDAY, March 8, at 11 o'Clock in the forenoon.

AGENDA.

To transact General Business.

To consider "The Report of the Mode of Providing for the Extension and Maintenance of the Education of the Industrial Classes."

To appoint a Deputation to the Chancellor of the Exchequer on the Malt Tax.

A SPECIAL GENERAL MEETING of the SUBSCRIPTION MEMBERS of the CENTRAL CHAMBER will be held at the same place and on the same day, at 20 o'Clock in the forenoon, to amend Rules 4 and 13, so that the Accounts may be audited at an earlier period.

Central Chamber of Agriculture, The Salisbury Hotel,
Fleet Street, London, E.C., Feb. 15, 1870.

Bingley Hall, Birmingham.

THE SECOND GREAT CENTRAL EXHIBITION and SALE of YOUNG BULLS and other PURE-BRED SHORTHORNS will be held on THURSDAY, March 3 next. Upwards of 100 Head of highly descended Cows, Heifers and Bulls are entered. The whole of the Animals exhibited will be offered for SALE by AUCTION, without any further reserve than entering them at 20 guineas each. Admission, from 9 to 4 o'Clock, 1*s.* Judging will commence at 9, the Auction at 11 o'Clock. Catalogues, 6*d.* each, are ready, and may be had on application.

JOHN B. LYTHALL, Secretary.

Offices, 39, New Street, Birmingham.

HIGHLAND and AGRICULTURAL SOCIETY. CERTIFICATE and DIPLOMA in AGRICULTURE.

The EXAMINATION of CANDIDATES for the SOCIETY'S AGRICULTURAL CERTIFICATE will be held in Edinburgh, in the HALL, No. 3, George IV. Bridge, Edinburgh, on WEDNESDAY and THURSDAY, March 30 and 31.

Candidates for Certificate must be 18 years of age ; those for the Diploma must be 21.

CERTIFICATES in FORESTRY.

The Society having resolved to grant First and Second-class CERTIFICATES in FORESTRY, the First Examination will take place on March 30 and 31.

Candidates must possess :—1st, A thorough acquaintance with the Details of Practical Forestry ; 2nd, A knowledge of the Outlines of Botany, more particularly as these bear on Forestry ; 3rd, A general knowledge of the Nature and Properties of Soils, Drainage, and Effects of Climate ; 4, Land and Timber Measuring, Surveying, Mechanics, and Construction, as applied to Fencing, Draining, Bridging, and Road-Making, so far as these apply to woods ; also Implements of Forestry ; 5th, Book-keeping and Accounts.

The Examination will be written and in Candidates of any age.

Further information to be had on application to the Secretary, who will receive the names of Candidates up to March 23.

3, George IV. Bridge, Edinburgh, February 9, 1870.

WM. DILLISTONE, Horticultural Auctioneer and Valuer, Sible Hedingham, Essex.

Camden Nursery, Southampton Street, Camberwell.

TO BE DISPOSED OF IMMEDIATELY, the LEASE and STOCK of the above old-established Nursery, in consequence of the death of the Proprietor, the celebrated Horticulturist, Mr. W. Barnes.

For particulars apply to Messrs PROTHEROE and MORRIS, Auctioneers and Valuers, Leytonstone, Essex, N. E.

SALES BY AUCTION.

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, Feb. 22, at half-past 12 o'Clock precisely, 200 PENS of VALUABLE POULTRY and PIGEONS, comprising many Prize Birds, from well-known Breeders and Exhibitors

On view in the morning of Sale, and Catalogues had

Lilium auratum, and Seeds.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, February 24, at half-past 12 o'Clock precisely, 7000 fine Bulbs of LILIUM AURATUM, just arrived from Japan ; also, just arrived from California, 100 oz. of ABIES DOUGLASSII, 20 oz. of PINUS MONTICOLA, ABIES MENZIESII, and other Coniferous Seeds.

On view the morning of Sale, and Catalogues had.

Farnley Hall, near Otley.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on THURSDAY, February 24, THIRTY HEAD of very superior and Pure-bred SHORTHORNS, the property of F. R. Fawkes, Esq., Farnley Hall, near Otley, being a choice selection from his justly famed Herd, which has been long and carefully bred from the best sources, and maintained a high position at the Royal Agricultural Society of England, the Yorkshire, and other National and County Shows. The Cows and Heifers are in a fine healthy breeding state of condition. The Bulls are very promising, rich in colour, with massive frames on short legs, and of excellent symmetry, as well as of the best quality of flesh and hair.

Catalogues, with pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W. ; or of Mr. SCOTT, Farnley, near Otley, Yorkshire.

Beaumont Grange, near Lancaster.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce for SALE by AUCTION, without reserve, on FRIDAY, February 25 next, THIRTY HEAD of Valuable SHORTHORNS, the property of Mr. W. W. Slye, of Beaumont Grange, near Lancaster, consisting of fine specimens of Bates, Gwynne, Charmer, Knightley, and other noted tribes of Shorthorns, the Sires of which have been first-class Bulls, and mostly of the Kirklevington strain, or closely allied to such. The colours generally are rich and good, with excellent quality of flesh and hair, as well as dairy properties ; and are well worthy the attention of purchasers

Catalogues, with Pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W. ; or to Mr. SLYE, Beaumont Grange, Lancaster.

Very Important Sale of Shorthorn Cattle.
At SHOLEBROOKE LODGE, TOWCESTER.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve, on WEDNESDAY, April 13, at Sholebrooke Lodge, Towcester, the FIRST-CLASS HERD of SHORTHORNS belonging to R. R. Oliver, Esq., retiring. The Sale will comprise the whole of this very celebrated and fashionable Stock, with the exception of the Grand and Cherry Duchesses and Dukes, Lady of the Lake, 14 years old, and Four Calves. Among them will be found the Lalages and Wild Eyes, two Kirklevington tribes ; the Sweethearts, Frills, Baronesses, Bracelets, Oranges and other excellent families, the originals of which were some of the finest animals in the first-class sales from which they were carefully selected. Grand Duke 7th (10,877) is the sire of a large number of the animals, and some of the cows and heifers are in calf to him, and Cherry Grand Duke 2nd (25,758.)

Catalogues with pedigrees will be issued in due time and announced.

London : 15, Langham Place, Regent's Street.

Extensive Sale of Pure-Bred Shorthorns.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve, on TUESDAY, March 1, at 10 o'Clock, at The Asps, one mile from Warwick, the entire Herd belonging to the late Mr. Henry Mann. It consists of about EIGHTY HEAD of BULLS, COWS, and HEIFERS, bred for a period of 40 years from some of the oldest stock in the county. About one-half the Herd is now of the celebrated "Dido" tribe. Pure-bred Bulls from Sir Charles Knightley's herd have been used for several generations.

Catalogues, with pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, or at The Asps Farm

Edmonton, N.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being immediately required for the Great Eastern Railway Extension.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs C. Woolven & Son to SELL by AUCTION, without reserve, on the Premises, the Long Hedge Nursery, Edmonton, Middlesex, N., on THURSDAY, February 24, and two following days, at 12 o'Clock precisely each day, the whole of the valuable NURSERY STOCK, including 20,000 Chinese Arborvitæ, 10 to 16 feet ; 10,000 Cupressus Lawsoniana, 4000 upright Cypress, 1500 fine Irish and English Yews, 1000 Retinospora fœtoides, 1 to 8 feet ; 1000 Araucaria imbricata, 2000 Cupressus pyramidalis, 1500 Thuja Lobbii, 3000 common Laurels, 3500 Green Hollies and Portugal Laurels, 1000 Sweet Bays, 3500 Ligustrum ovalifolium Hedging, 500 sorts ; 1200 Euonymus, 1 to 3 feet ; Wellingtonias, Thuyopsis, and thousands of other useful and effective Shrubs ; also 40,000 clean-grown Fruit Trees, particularly worthy the attention of Market Gardeners and others engaged in extensive planting ; likewise 7000 Standard Roses and 10,000 Standard Briers, and 2000 Manetti Stocks in dormant bud ; together with 3000 Lime Trees, 1200 Standard-worked Thorns, and a large quantity of other Ornamental Trees ; 30,000 strong Quick, thousands of Perpetual Roses in pots, Wistarias, Ivies, and other Hardy Climbers, &c.

On view three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B. All the Greenhouses, Pits, and Pot Plants will be sold at a later date, of which due notice will be given.

Turnham Green, W.

IMPORTANT UNRESERVED SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Messrs. Glendinning and Sons to SELL by AUCTION, without reserve, on the Premises, The Chiswick Nursery, Turnham Green, Middlesex, on MONDAY, February 28, and following day, at 11 for 12 o'Clock precisely each day, a portion of the VALUABLE NURSERY STOCK, comprising an extensive and choice collection of useful Evergreen and Coniferous Shrubs, viz. : 5000 Chinese Arbor-vitæ, 1 to 8 feet ; 3000 Spruce Firs, 1 to 5 feet ; 500 Thujopsis borealis, 2 to 6 feet ; 1000 English and Irish Yews, 2 to 6 feet ; 6000 Cupressus Lawsoniana, 3 to 8 feet ; fine Thuia gigantea, 4 to 6 feet ; Cedrus Deodara, 1 to 2 feet ; Cupressus, sorts, Wellingtonias, Thujas, Junipers, Pinus, Picea, Cedrus, Taxus ; also many handsome specimen Conifers, admirably adapted for effective planting ; 3000 bushy Common Laurels, 2 to 4 feet ; 2000 Portugal Laurels, 3 to 3 feet ; 3000 green and variegated Hollies ; 2000 Berberis, 1 to 2 feet ; 2000 Hybrid Rhododendrons ; 700 standard Portugal Laurels ; 3000 Aucubas ; 1500 Laurustinus, Arbutus, Evergreen Oak, Lilacs, Guelder Roses, Ribes, &c. ; 5000 clean grown Fruit Trees, Vines in pots, a large quantity of ornamental Trees, including 1500 strong Limes, 2000 Laburnums, Poplars, Elms, &c.

May be viewed three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers, Valuers, and Valuers, Leytonstone, E.

Annual Sale of very Handsome English-grown Camellias.

MESSRS. PROTHEROE and MORRIS will SELL by AUCTION, at 38 and 39, Gracechurch Street, E.C., on WEDNESDAY, March 2, at half-past 12 o'Clock precisely, about 200 choice PLANTS, CAMELLIAS, handsomely set with bloom-buds ; AZALEA INDICA, 300 Standard and Dwarf ROSES of the best varieties, Selected FRUIT TREES, Hardy AMERICAN PLANTS, &c.

On view the Morning of Sale. Catalogues had at the Rooms, as above, and of the Auctioneers, Leytonstone, N.E.

Brixton, S.

CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being required by Lady Day next for the Erection of a New Church.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, the Triangle Nursery, Loughborough Park, Brixton, Surrey, on MONDAY, March 7, at 11 for 12 o'Clock precisely, by order of Messrs Rowland & Son, a portion of the Valuable NURSERY STOCK, comprising an extensive and choice assortment of Evergreen and Coniferous Shrubs, Fruit Trees, &c., 2000 fine Limes, &c.

Further particulars will appear in future Advertisements.

Bagshot, Surrey.

EXTENSIVE UNRESERVED SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from Mr. Charles Noble to SELL by AUCTION, on the premises, Sunningdale Nursery, Bagshot, Surrey, five minutes' walk from the Sunningdale Station, on THURSDAY, March 10, and two following days, at 11 for 12 o'Clock precisely each day, without reserve (the Ground being immediately required to be cleared), the valuable NURSERY STOCK, including an unlimited variety of Evergreen, Coniferous, and Deciduous Shrubs of considerable growth and symmetrical form and beauty, including 15,000 Common and Colchic Laurels, 1 to 3 feet ; 2000 bushy Portugal Laurels, 2½ to 5 feet ; 1000 handsome Pyramidal Portugal Laurels, 6 to 8 feet ; 2000 Cupressus Lawsoniana, 3 to 10 feet ; 10,000 Spruce Firs, 2 to 5 feet ; 10,000 Larch, 1½ to 3 feet ; 6000 Retinospora ericoides, squarrosa, obtusa, and pisifera, 2 to 5 feet ; 400 Thuja gigantea and Lobbii, 5 to 8 feet ; 1000 Thuyopsis borealis, 3 to 8 feet ; 200 Araucaria imbricata, 4 to 8 feet ; 150 fine Wellingtonia gigantea, 4 to 7 feet ; 800 Junipers ; magnificent specimen Abies Douglassii, Juniperus argentea, Pinus excelsa and Abies Menziesii, 10 to 20 feet ; also 15,000 hybrid seedling Rhododendrons, 1 to 4 feet ; 10,000 R. ponticum, 1 to 3 feet ; 5000 Erica carnea, 5000 Deutzia crenata fl.-pleno, 1 to 5 feet ; 5000 Spiræas, 2 to 5 feet ; 5000 Berberis, 1000 Spartium junceum, 3 to 4 feet ; 2000 Poplars, of sorts ; 1000 Crimean Ash, 3 to 4 feet ; 5000 Standard, Half-standard, and Dwarf Roses ; 75,000 Manetti Stocks ; 5000 Maiden and Trained Peaches and Nectarines, and Pyramidal and Dwarf-trained Pears and Plums, 500 Gynerium argenteum, &c.

May be viewed until the Sale ; Catalogues may be had on the Premises, and of the Auctioneers and Valuers.

☞ NOTICE.—*The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will, on and after* MARCH 4, *be published on* FRIDAY, *at* 2 P.M., *instead of* SATURDAY, *as hitherto.*

ADVERTISEMENTS *for the* CURRENT WEEK *must reach the Office* NOT LATER *than* THURSDAY MORNING.

The Agricultural Gazette.

SATURDAY, FEBRUARY 19, 1870.

REPORTS OF ANALYSES made for farmers' clubs are happily becoming as common as they are useful. We have lately received the annual sheet, containing information of this kind, which Mr. Alfred Sibson, F.L.S., addresses to the Newbury Farmers' Club. Among the instances which he reports is an example of a "superphosphate" containing more than half its weight of insoluble matter, with only traces of biphosphate of lime ; and there is a nitrate of soda containing 35 per cent. of common salt. It will

thus be seen that the Berkshire farmers, like those of other counties, are liable to be victimised.

In Essex, too, we learn from the report of a very excellent paper read by Mr. A. JOHNSTON, M.P., before the County Chamber of Agriculture, that need of "Protection" of the kind which science gives is fully realised. A discussion, commenced by the Secretary of the Farmers' Supply Association, who seems to have been hardly equal to the task of confronting an unfriendly audience (though why they should not have made him welcome is hard to say), soon degenerated into a discussion of the advantages of malting home-grown grain for cattle food; but the following resolution was at length adopted:—

"That in the opinion of this meeting the formation of county associations, or committees of the existing county agricultural societies, for the purpose of testing by analysis the manures and cake purchased by their members, is the best method of preventing adulteration."

The association recommended is no doubt desirable; so also is a co-operative association which shall buy carefully tested goods upon a large scale, and distribute them among subscribers; so also is that next best thing, a "Farmers' Supply Association," whose business depends entirely upon its reputation, and whose officer may be expected therefore to take especial care to deliver well authenticated materials. Why Mr. SPENCER, the secretary of just such an association, should have been almost hustled into silence by the company assembled to hear Mr. JOHNSTON'S paper, one does not understand. He may have been advocating not only a practicable way of meeting the farmers' liability to adulteration, but the interests of his own company as well; he was, however, at any rate addressing gentlemen some of whom were, in anything they said on such a subject, liable to the very same imputation; and, for our own part, if the preference came up for discussion at all, we would rather look for a disinterested statement from the paid officer than from the shareholder of such a company or society.

Mr. SPENCER, however, stood up a stranger, without an introduction; he proposed to read a statement instead of coming prepared to speak; he promised and asserted too much for his society, and should have been more modest; and, on the other hand, he was reticent when he should have been frank; and thus, owing to his want of tact, a discussion on the adulteration of manures and cattle foods to which he could have contributed very serviceable argument and experience, wandered off into assertions of the Malt-tax iniquity, and other declarations still more difficult of belief, and equally beside the subject of Mr. JOHNSTON'S lecture. Mr. SEAMAN, for example, told us that he had offered "a challenge of £500 that he could produce more mutton in a given time by using malt as he should direct (semi-malted grain) than Mr. LAWES could produce from double the quantity of raw material with double the number of sheep." Bravo! Mr. SEAMAN. At the same time we do not quite see how this remarkable proposition connects itself with a lecture on the adulteration of manures. The lecture is given in another page, and our readers will find it well worth their while to read it. Meanwhile we cordially endorse Mr. CLAYDEN'S acknowledgment, on the occasion, of the services of the Royal Agricultural Society of England in connection with this subject.

WHETHER we look to the effort or the result, there never was a better justification of the sarcasm—"HOW NOT TO DO IT"—than was afforded by last week's meeting of the Council of the Central Chamber of Agriculture. And the example was all the more remarkable for the contrast offered by another agricultural meeting on the previous day.

The Farmers' Club, a company of practical farmers and land-agents, with one or two landowners, had assembled on Monday to discuss an important department of farm practice, and they proved their competency throughout—both lecture and discussion being full of serviceable information and trustworthy guidance.

On the Tuesday a monthly meeting of the Central Chamber of Agriculture, including nearly a score of members of Parliament, and gentlemen deputed by two dozen provincial chambers, assembled to consider resolutions which had been properly arranged for discussion by a previous "business committee," after a sort of previous digestion, which, as we understand the somewhat complicated procedure, the various topics undergo in the country before they come up for final decision in town.

The two principal subjects which were thus arranged for discussion at the latter meeting were Road Maintainance and Agricultural Statistics. On the first of them, resolutions were offered affirming the policy of the simultaneous abolition of turnpike trusts, their debts being liquidated by the national exchequer, and the future maintenance of the roads being made to fall upon "the general wealth of the districts through which they pass." These resolutions and an amendment to them having been submitted to the meeting, Mr. KNATCHBULL-HUGESSEN, M.P., made a speech, in which the intentions of the Government on the subject were to some extent announced; and it was thereupon immediately proposed by Sir MASSEY LOPES, Bart., M.P., that as "Government are going to take up local taxation, to be followed by the road question," it was inexpedient for the Chamber to adopt or recommend any proposal until the Cabinet had announced their promised scheme. So "Sir G. JENKINSON withdrew his resolution, and Mr. JABEZ TURNER withdrew his resolution;" and, although Captain CRAIGIE urged that they had met that day to give an opinion, and Mr. HUGESSEN had stated he was anxious to know what were the opinions of the delegates on the subject, the whole plan arranged by the "business committee" fell through and disappeared, and the great organisation for urging the views of agriculturists upon Government obviously failed of its intended purpose.

What, then, was done in connection with Agricultural Statistics? This, too, had been everywhere discussed and rediscussed for years, and must, we should think, at length be ripe for a definite and conclusive utterance.

Mr. LEAMON moved, in accordance with the arrangements of the "business committee," "That agricultural returns, as at present collected, are unreliable and unsatisfactory; that it is desirable for such returns to be made once in ten years, and that they should then be compulsory."—Mr. ARKELL seconded the motion.—Mr. LONG believed the returns only kept down prices at home.—Mr. NEILD thought having the returns once in ten years was burking the whole question. They should be collected once in three years, but in deference to Mr. READ he would move that it be once in five years.—Capt. CRAIGIE seconded the amendment. Mr. C. S. READ, M.P., asked how it was possible that the simple publication of the fact that so many thousands of acres were under Wheat cultivation, could affect importations or regulate the transactions of merchants? It was not the number of acres, but the yield that was to be looked to, and at present no statistical information as to that was asked for.—Mr. ARKELL said his objection to giving statistics was the purpose for which they were obtained.—Mr. PELL, M.P., said that the collection cost £16,000, and if it took place only once in five years, £64,000 would be saved to the country. At present many thousands of pounds were sacrificed to a senseless theory.—Mr. SMITHIES then moved that the returns be *annual* and compulsory; and this proposition, too, was seconded.—The first amendment was rejected by a considerable majority; the second was lost by 11 to 7; and finally the original motion was lost by a majority of *one!* Here, again, we submit, is a remarkable example of the failure of the elaborate organisation which was to have urged the opinions of agriculturists upon the attention of the Government.

But, really, the kind of reasoning and argument which appeared to command attention at this meeting is even more significant than the result to which it led. If the leading men of the Central Chamber of Agriculture, members of Parliament included, are afraid of knowing the facts of the case—or afraid of letting them be known—if they must be sure beforehand of what the facts will teach before they will consent to any attempt at their collection!—if they think with Mr. ARKELL that "the purpose" for which information regarding facts is sought has any bearing whatever upon the policy of letting truth be known—if the idea that knowledge is power is to be considered, as Mr. ALBERT PELL, M.P., appears to think it, "a senseless theory"—then we may congratulate the Central Chamber on their discussion of the agricultural statistics question. It has landed them in just the sort of weak and helpless muddle in which those who hold such notions must feel themselves at home. To an outsider, however, who believes, upon the contrary, that all attempts to make men know their actual circumstances are to be encouraged—that the truth should be sought for, utterly regardless of what it may turn out to be—and made known, never minding what it is—and that the love of ignorance is a great mistake,—it appears as if the Chamber of Agriculture was discovering the agricultural mind to Government in a very unfortunate way indeed.

However, let us hope for the best. They are to discuss the policy of *Agricultural Education* at their next meeting!

—— PRICES have rather risen in the Corn market during the past 10 days. Supplies were short on Monday, and Wheat was worth 1*s.* per quarter more money.——Trade has been very dull in the Cattle market, and prices are lower.——The Wool market exhibits somewhat "hardening" prices, and hopes are entertained that "the turn for the better is at hand."

—— The following short abstract of Mr. GLADSTONE'S speech on the IRISH LAND QUESTION, last Tuesday, is taken from the columns of the *Pall Mall Gazette*:—Mr. GLADSTONE began by referring to the assertion that it was the land which lay at the root of Irish grievances. He went on to dissipate some of the misapprehensions which prevail as to the condition of Ireland—such as the notion that the Irish are a Celtic race, prone to disorder; that the land laws are the same in Ireland as in England, and ought to produce the same results in both countries; that Ireland has been prospering for the last 20 years, and that the people have no occasion to exhibit feelings of discontent. Under this last head he showed that, on the contrary, the rate of wages had not risen within the last 10 years, the number of persons receiving poor relief had increased, the cost of subsistence had risen, and some of the most imprudent and violent interferences with the fixed usages of the country had occurred. He showed, too, that the course of legislation for the last half century, though intended, no doubt, in a beneficial spirit, had possibly been detrimental to the interests of the occupiers. Premising next that the Bill would reverse the presumption of law in favour of yearly tenancies, and would not leave owners and occupiers full freedom of contract, he laid it down that the great evil to be dealt with was insecurity of tenure, which paralysed the occupier's industry and vitiated his relations with his landlord, with the State, and with society at large. Discussing the various remedies which had been suggested, Mr. GLADSTONE pronounced emphatically against "perpetuity of tenure." Passing then to the actual provisions of the Bill, he divided them under two heads—the acquisition and the occupation of land. With regard to the first, it proposed to increase the power of limited owners with regard to the sale and lease of land, and assistance would be given by Treasury loans, through the Irish Board of Works, to tenants desiring to purchase the cultivated lands they now occupy, either by private contract or through the machinery of the Landed Estates Court. There were also provisions for loans for the reclamation and purchase of waste lands, and for assisting landlords to pay compensation to tenants giving up their holdings of their own free will. Dealing next with the provisions as to the occupation of land, he explained first the judicial machinery for carrying them out, which would be of two kinds—either a Court of Arbitration or the Civil Bill Court—from which last there would be an appeal to the Judges of Assize; and under a clause which he described as the "equities clause" the Courts would be able to take into consideration not merely the legal aspects of each case, but all the circumstances bearing equitably upon it. The main provisions of the Bill fell under four heads, corresponding to the four descriptions of Irish holdings, viz., those held under the Ulster custom, those held under analogous customs in other parts of the country not having the same traditionary authority, yearly tenancies which enjoyed no kind of protection from custom, and tenancies under lease. With regard to the Ulster custom, the Bill would take it as it existed, and give it at once the force of law. With regard to tenants at will, the Bill established a scale of damages which the Courts would be able to award to evicted tenants. This scale did not include compensation for reclamation of land and permanent buildings, which would be awarded separately. Mr. GLADSTONE asked, "What is an improvement?" and his definition was, that it must be something which shall add to the letting value of the land, and must be suitable to the holding. The Bill would presume all improvements to be the property of the tenant, and it would be for the landlord to prove the contrary. Retrospective improvements would be included, but only so far back as 20 years, except in the case of permanent buildings and reclamations of lands. With regard to the fourth division—holdings under lease, Mr. GLADSTONE said any owner might exempt his lands from the custom, always excepting the Ulster custom, which would be legalised, and from the scale of damages, by giving to his tenant a lease for 31 years, provided that the lease were approved by the Court, and gave the tenant at the close of it a right to compensation for manures, permanent buildings, and reclamation of land. With the full knowledge that

the measure was far from perfect, Mr. GLADSTONE invited suggestions for its amendment from all sides.

—— When introducing the Government measure on EDUCATION, on Thursday evening, Mr. FORSTER referred to the question of compulsion. The Bill gives power to the local "school authority" to frame bye-laws—subject to the revision of the Government and Parliament—to compel the attendance of all children in their districts between the ages of five and 12. The limit of the fine on the parents for the non-attendance of their children is to be 5*s.*; but the magistrate will be able to remit the fine on reasonable excuse being urged.

—— There is useful and, it seems from the Maidstone experience, profitable work for cottage improvement societies. The Maidstone Society now possess 85 cottages; their share capital amounts to £5760. According to the seventh annual report before us the nett rental of the company's cottages has been £350 15*s.* 5*d.*, which, with £12 10*s.* dividend on the reserve fund, makes the total income for the year amount to £363 5*s.* 5*d.* The sum of £44 5*s.* 8*d.* has been spent on repairs, and the whole of the company's Maidstone property is now in good condition. The expenses of management have not increased, and have amounted only to the very small sum of £7 17*s.* 5*d.* The dividend proposed, at the rate of 5 per cent. per annum, free of income-tax, will take £247 12*s.* A balance of £53 12*s.* 8*d.* will remain to be added to the reserve, whereby that fund will be increased to the sum of £303 13*s.* 1*d.* The company's cottages are well tenanted, and the loss of rent has been very small. This shows that, even in a year like the present, the company's cottages are sought after and appreciated as moderate in rental and comfortable for occupation; and the whole history shows, we think, that there is both useful and profitable work before cottage improvement societies elsewhere.

—— The following are the chief clauses of Mr. WYKEHAM MARTIN'S Game Laws Amendment Bill:—From and after September 25, 1870, it shall be lawful for any tenant, or any person employed by him, and having his authority or permission, to kill rabbits on the lands occupied by him, any agreement or covenant to the contrary notwithstanding; and any agreement reserving the sole or exclusive right to kill rabbits shall be null and void. Any person who shall kill any rabbits in pursuance of this Act shall not thereby becomeliable to pay any assessed taxes, nor shall he be bound to take out any licence under the Act passed in the 23d and 24th years of the reign of Her most Excellent Majesty, chapter 90. The provisions of this Act shall not apply to any lands held under any lease which was originally granted for a term of years not less than five, during the term or currency of such lease.

—— The first part of the Journal of the Royal Agricultural Society for 1870 has just been issued. Of 250 pages no fewer than 127 are from the pen of the Editor. In them he gives a very interesting and instructive account of Belgian agriculture, being the result of a journey made at the request of the Council by Dr. VOELCKER and himself. He also reports on Cheshire Dairy Farming, and on the American Cheese Factory System. In addition to these there is an elaborate report on Village Sanitary Economy, by Mr. BAILEY DENTON; a substantial essay on Farm Labourers, their Friendly Societies, and the Poor Law, by the Rev. J. Y. STRATTON, of Ditton, Kent; three useful reports by Dr. VOELCKER, and shorter papers by Mr. JONAS, of Cambridgeshire, Mr. SNOWBALL, of Northumberland, and Mr. WELLS, M.P. We hope to give some further account of its contents next week. Meanwhile, we may say that it is evidently full of interesting matter—more accessible, too, than heretofore, for we are not now put to the trouble of cutting open the leaves! It is also well illustrated. Being a good book, one has hardly any right to criticise the authorship. Nevertheless, it must be noted as unfortunate, that so few practical men have contributed to its pages. Agricultural editorship is perfectly successful only when, by means of it, agriculturists are induced to instruct each other.

NOTEWORTHY AGRICULTURISTS.

MR. JOHN HUDSON.

THE subjoined portrait, engraved from a photograph with which Mrs. Hudson has been good enough to supply us, represents Mr. Hudson as he was during the last years of his life.

We take the following particulars of his career for the most part from a short memoir of him which appeared in the *Farmer's Magazine* of September last:—

John Hudson was born at Grinston, near Lynn Regis, in the county of Norfolk, on June 14, 1794. He was educated at Lynn in 1809, and acquired his knowledge of farming by going through the practical part of it under the tuition of his father, who, the previous year, had taken a farm of light land called Walton Field, at East Walton, near West Acre, on the estate of the late Mr. Anthony Hammond.

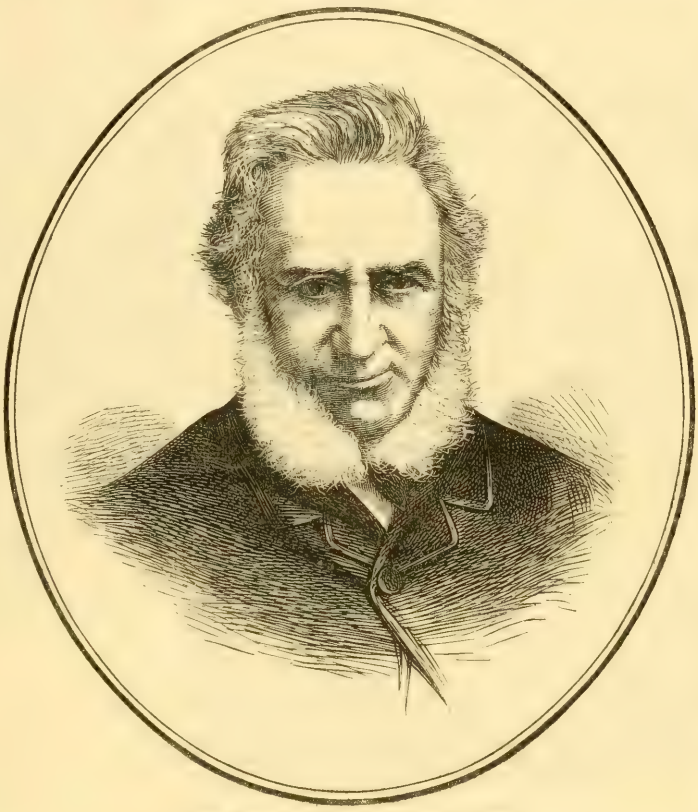

JOHN HUDSON, LATE OF CASTLE ACRE.
[Born June 14, 1794: died July 26, 1869.]

The Holkham sheep shearings had commenced, and these Mr. Hudson and his father constantly attended, profiting much by all they saw and heard. They zealously and perseveringly put in practice all those improvements they considered adapted for the farm they then cultivated; and in a few years Walton Field, which had been little better than a rabbit warren, produced a large and rapidly increasing yield of Wheat; so that the original 50 quarters of the first two years of the lease were succeeded in the last four by an average of 600 quarters, with a proportionate increase in the stock kept upon the farm.

In the year 1820 Mr. Hudson married the only daughter of Mr. Thomas Moore, of Warham, near Holkham, a much esteemed tenant of Mr. Coke. In 1822, when many farms changed occupiers, Mr. Coke offered to Mr. Hudson the farm of Castle Acre; and the same year Mr. Hudson, sen., hired the one adjoining, called The Village Farm. In 1834, advancing years incapacitated the father from those active exertions in which he had long delighted, and induced him to surrender "The Village" to his son, since when both farms have been united.

These farms, and their management, were thus described in the Journal of the Royal Agricultural Society:—"The two farms at Castle Acre, occupied by Mr. Hudson, contain about 1500 acres, the soil being a sandy loam on clay or chalk. He also has a farm of low land, at Seech, near Lynn, about 200 acres. When he first took the land at Castle Acre, in 1822, he only kept about 30 head of cattle and 800 sheep: he now grazes about 200 beasts, and from 2500 to 3000 sheep annually. He has doubled the produce of Barley, and nearly doubled the produce of Wheat. To account for this change he uses yearly about 100 tons of rape-cake and bones for manure, and about 200 tons of linseed-cake for fattening cattle and sheep; the whole of the land has been clayed or marled, and, where necessary, drained."

Mr. Hudson was one of the original members, as he long sat on the Council, of the Royal Agricultural Society. Declining health, however, compelled him a short time since to resign his seat at this board, where he has been succeeded in turn by Mr. Sewell Read and Mr. Robert Leeds on behalf of the Norfolk farmers. He was also one of the promoters of the Farmers' Club, in the proceedings of which he continued up to the last to take a strong interest.

There was no more thoroughly representative man than Mr. Hudson of Castle Acre, and for a very long period he kept open house to all comers and all countries. Not a foreigner or an American anxious to know anything of English agriculture, but provided himself with an introduction to Mr. Hudson. Highly, however, as he might rank abroad, he was never seen to so much advantage as when you met him on his own threshold and followed him round his own farm. There was something so simple, but at the same time so attractive in his manner as to give his society a peculiar charm, and add a zest to the lesson he was inculcating. A near neighbour and also distinguished Norfolk farmer thus writes of his old friend: "Mr. Hudson was 20 years since far in advance of his neighbours, as I believe one of the finest crops ever grown on his farm at Castle Acre was in the year when the Royal Society visited Norwich. He was always one of the first to buy any new machinery, which was, or course, of great advantage to his neighbours. Two years since he commenced cultivating by steam, having purchased a single set. I know of no farm in Norfolk or out of it where so much capital per acre has been employed. Many years since, Mr. Hudson purchased an estate in Gloucestershire, which he greatly improved by adopting the Norfolk system of husbandry, and by breaking up all the inferior grass-land, and converting it into tillage, whereby he has grown a very large quantity of corn."

We add that, long before his death, he was known as one of the most successful practical farmers of the day, representing more strikingly probably than any of his contemporaries the good policy of the very "highest" farming in the interest of the tenant, as well as of the landowner and labourer. And many years ago, when three or four distinguished men were asked to speak on the several branches of English agriculture on the occasion of Mr. Hoskyns' paper on Agricultural Progress, read before the late Prince Consort in the rooms of the Society of Arts, he was selected by the Society, as its best living representative, to speak of the actual practice of the farmer in field, farmyard, and fold, and its wonderfully increased productiveness in the food manufacture of the country.

OUR LIVE STOCK.

CATTLE.

NEXT Friday will witness a very important sale of high-bred Shorthorn stock at Beaumont Grange. The catalogue issued by Mr. Strafford contains the names of 15 bulls and the same number of cows and heifers, and a richer collection of pedigrees it would be difficult to find. The Bates, Gwynne, Charmer, and Knightley blood of the female portion of the herd has been enriched by the importation of such sires as GRAND DUKE OF LANCASTER (19,883), OXFORD (20,450), ROYAL GWYNNE (22,784), and BARRINGTON OXFORD (25,607). The first of these famous bulls was bred at Beaumont Grange; he is by 3D GRAND DUKE, and from *Csarina* (sold by Mr. Bolden for 300 gs.), by 2D GRAND DUKE, one of the few 1000-gs. bulls which the world has seen. It is stated that the same sum was refused for the 3D GRAND DUKE. OXFORD'S name reveals his lineage. He is by 2D GRAND DUKE, and from *Maid of Oxford*, and previously descended from a line of Oxfords, tracing back to *Oxford 2d* by SHORT-TAIL. ROYAL GWYNNE also proclaims his FAVOURITE origin, and BARRINGTON OXFORD is the result of a union between BARON OXFORD (23,375), and *Lady Bates 3d*, the mother of lot 15. Turning to the first portion of the catalogue we find it headed by *Nell Gwynne*, now ten years old, by REX (16,833). This cow is the mother of *Lancaster Gwynne* by GRAND DUKE OF LANCASTER, and closely related to the yearling bull GRAND DUKE OF OXFORD 2D (No. 11). This famous family, known also as the Princess tribe, is one of noted origin, boasting of many splendid alliances, at the foundation of which is the famous *Princess* by FAVOURITE dam by FAVOURITE cross. The following diagram shows the more recent pedigree of the family as it exists at Beaumont Grange:—

FAVOURITE (252) (R. Colling).
- *Princess* — PHENOMENON 491 (R. Colling).
  - *Nell Gwynne* — LAYTON (366).
    - *Nell Gywnne* — MERLIN (430) Seymour).
      - *Daphne Gwynne* — MARMION 406 (Seymour).
        - *Cripple Gwynne* — PRIME MINISTER (2456) W. Raine.
          - *Sall Gwynne* — ST. THOMAS (10,777) (S. Watkin.
            - *Sophia Gwynne* — YOUNG BENEDICT (15,641) (Troutbeck.
              - *Sophy Gwynne* — REX (16,833) (Troutbeck).
                - *Nell Gwynne* (lot 1).

On further examination of this pedigree it will be seen that PHENOMENON and LAYTON were both by FAVOURITE, and that MERLIN was descended from the same noted sire. REX, the last bull used, was by DUKE OF CAMBRIDGE, and from *Sukey Gwynne* by ST. THOMAS. No breeding could therefore be closer, and we hear that the result has been excellent, at all events so far as *Lancaster Gwynne* is concerned. *Royal Charmer 2d*, by GRAND DUKE OF LANCASTER, and her brother, CHARMER'S GRAND DUKE, will command much attention as representatives of the famous Milcote *Sweethearts*, as will also THE CARDINAL by BARRINGTON OXFORD, and of the same noted family on the female side. These and the other members of the "Charmer" family in Mr. Slye's sale are numbered in the following Table:—

Sunrise, by MAMELUKE (13,289):
- *Royal Charmer*, by 2D D. OF CAMBRIDGE (12,743).
  - (2) *Royal Charmer 2d* (1866), by GR. D. OF LANCASTER (19,883).
  - 6) CHARMER'S GRAND DUKE by GR. D. OF LANCASTER (19,883).
- *Sweetheart 2d*, by GR. D. OF LANCASTER (19,883).
  - (11) *Sweetheart 3d* (1868), by SIR W. GWYNNE (22,921).
- *Sweetheart*, by GR. D. OF LANCASTER (19,883).
  - (9) THE CARDINAL (1869, by BARRINGTON OXFORD (25,607).

They are all, it will be seen, descended, in the second generation, from *Sunrise* by MAMELUKE. No. 11, a 2-year-old heifer, is thus described by our contemporary, *Bell's Messenger*:—

"The most beautiful heifer in the whole lot, and by many judges considered the best female Mr. Slye ever bred, not excepting even the two heifers bought in September '68 by Mr. Saville, of Ingthorpe, is *Sweetheart 3d* by SIR WALTER GWYNNE (22,021), from *Sweetheart 2d* by GRAND DUKE OF LANCASTER (19,883). She is an eminently beautiful animal, and a high credit to any breeder to have bred. By a grey roan sire, and from a white dam, she is herself covered with the deepest and richest purple maroon. Her symmetry is not less exquisite than her colour; and the flesh, of which there is plenty, is evenly laid on. Her head, breast, and shoulders, are gracefully moulded; her twist and flank are heavy; she is straight-topped and straight underneath, has a wide back, and is short in the leg. As her like is not met with every day, she may be expected to leave Beaumont Grange at a more than every-day price; and we congratulate the man, whoever he may be, to whose bidding she may fall at the auction."

The admirers of Knightley stock will be also on the *qui vive* regarding SIR REYNOLDS by SIR WALTER GWYNNE and GRAND DUKE OF FAWSLEY by BARRINGTON OXFORD, both of the famous Fawsley Fillet tribe, and the immediate descendants of *Chrysalis*. Mr. Slye claims the privilege of one bid only, and that in the case of (lot 15) *Lady Thornhill Bates*, by 4TH DUKE OF THORNDALE (17,750). This cow is the result of a union between two first-class Shorthorn strains, her sire being a Duchess bull, while she is of the *Lady Bates* and *Lady Barrington* tribe.

—— We extract the following memoranda on the Duchess tribe of Shorthorns from the *Albany Cultivator*:—

"The exact whereabouts of the Duchesses and Oxfords are always of interest to Shorthorn breeders. In our recent notice of the sale by Mr. James O. Sheldon, of one-half of the White Spring Farm herd to Messrs. Walcott & Campbell of New York Mills, near Utica, it was not specified which of the animals were sold and which retained. We now learn that the purchase of Messrs. W. & C. comprised the following:—

"*3d Duchess of Thorndale*, by DUKE OF GLOSTER; *9th Duchess of Thorndale*, by 3D DUKE OF AIRDRIE; *12th Duchess of Thorndale*, by 6TH DUKE OF THORNDALE; *6th Duchess of Geneva*, by 3D LORD OXFORD; *8th Duchess of Geneva*, by 3D LORD OXFORD; *13th Duchess of Geneva*, by BARON OF OXFORD; *7th* and *10th Lady of Oxford*, and *2d Maid of Oxford*. The following will still be found at Geneva as heretofore:—

"*10th Duchess of Geneva*, by 2D DUKE OF GENEVA; *2th Duchess of Geneva*, by BARON OF OXFORD; *4th Duchess of Geneva*, by imported GRAND DUKE OF OXFORD; *8th Duchess of Thorndale*, by 3D DUKE OF AIRDRIE; *13th Duchess of Thorndale*, by 10TH DUKE OF THORNDALE; *3d Maid of Oxford*, and *2d Countess of Oxford*.

"Since the sale, Mr. Sheldon's herd has been increased by a heifer-calf from *3d Maid of Oxford*, and one or two more from cows of less note.

"A few days since the New York Mills herd was enriched by the addition of a red and white c. c. from *7th Lady of Oxford*, and by 10TH DUKE OF THORNDALE, and a capital white c. c. from imported Booth cow *Merry Peal*. This last calf is named *Merry Bride*, and is full of Booth points and promise.

"We learn on good authority that Messrs. Walcott & Campbell have had the pleasure of refusing an offer of 11,000 dollars for their *8th Duchess of Geneva*.

"Mr. Cochrane reports a very favourable season in Shorthorns. Considering that it is but five years since Mr. Cochrane commenced his herd at Hillhurst, the large sum invested in lands, buildings, and improvements, and in the large herds and flocks, it must be very gratifying to the owner that he is able to say that receipts have paid current expenses of all kinds and a good interest on the capital. The herd has been well increased by births during the season.

"Mr. Robert George Dun, London, O., writes us that he proposes hereafter to adopt the New York plan of giving every animal on his estate a good stable, instead of following the old-fashioned Madison County way of turning to Grass all winter, or feeding out corn in the shock in a wood lot. This course in a mild winter, as they usually have, does very well—that is, stock will gain if heavily fed, but now and then a rough winter is very hard on breeding stock. Mr. Dun now stables most of his choice Shorthorns, and finds his account therein."

POULTRY.

Feeding Chickens.—Having constituted myself inspector—I suppose I might say spy—I get a look when I can into my neighbours' yards. The view is not encouraging. I find chickens of six months old and upwards no bigger than bantams, and the birds in general by no means satisfactory. I inquire the cause; I cannot get a reply; I then have to go into cross-examination, and find lack of food the chief cause in many cases, and especially the want of soft food. Keepers say they give every other thing *ad infinitum*, but lack this essential. Chickens will not thrive as they ought on hard grain. They must be kept growing from the moment they can run. In the long nights of the early spring, if required for summer shows, they must be fed at night. But say they are not intended for anything but market, the sooner you get them there the better they pay; and if not fed in their earlier stages they never make good fowls afterwards. You never can put on in shape, constitution and frame, what you spoilt by not feeding the fowls early. Chickens should be fed very often, and all birds should have a ration of soft food at least once in 24 hours. Noonday is the best meal time. It is a well acknowledged fact that feeding is the secret of the great weights—a little and often, varied as much as possible, is the way to ensure success. Now, if exhibitions serve no other end, they are of great use by causing comparison in this way, for I am certain that had a show of chickens been held this fall, some of our best exhibitors would have seen how lamentably deficient in size their birds of this year would have been, compared with many others better attended to and of younger growth. *Canada Farmer.*

THE IRISH LAND QUESTION.

YOUR correspondent, who signs "Brinsley Marlay," has written one of the most sensible and temperate letters that have appeared upon this subject. It is a letter which your readers would do well to study. There is one clause, however, of his letter to which I desire to call attention: "It has been a source of regret to me (B. M.) that no Paper like your own has thought it worth while to send to Ireland a clever agriculturist, who knows what land is worth, and would give a straightforward account of what he saw."

Now, at p. 191 you give a review of Mr. James Sanderson's view of the "Irish Land Question," and you very justly speak of it in these terms:—"The reader will find here the confident utterance of a practical man, after personal inspection of the sister country, after long labours as a land-agent in this country, and after early education and experience in the North." Now, here is the very thing which Mr. Marlay pined for, here is the published and deliberate opinion of a practised land-valuer, who tells us, when giving his opinion, that he has during the last two years valued upwards of 800 farms in England, representing a capital of about £5,000,000; and what does he say? "I have walked over a large area of land in Tipperary, which fattens a bullock and several sheep per acre, and which is held for the low rent of 30*s.* per acre. In England the same land would readily realise 70*s.* I do not hold with the general view entertained that land in Ulster is higher rented than in the South. On the contrary, I consider that, without reference to the rich grazings in Meath, Limerick, and Tipperary, land is lower rented in the North than in the South." Could there be evidence more distinct? Conjoined with this you point out that Mr. Sanderson condemns "tenant-right," a condemnation in which everyone who has witnessed it in a "poor" country will join. Tenant-right may do in places where there are rich and enterprising men ready to go in and occupy land out of which money is to be made by a judicious expenditure of capital, and who have the money, the skill, and the enterprise to expend it the moment they are offered fair terms that will secure its return together with the just reward their speculation entitles them to; but it is wholly useless and even injurious in a country where the farmers are poverty-stricken and, comparatively speaking, destitute of agricultural knowledge. To illustrate what I say, let me point to a county in England where the farmers, even the very smallest of them, are much higher in the social scale, more wealthy, and more independent than even the best of the farmers of Ulster, which is spoken of as a pattern on which the rest of Ireland might be modelled—I mean the county of Sussex. Now, in Sussex tenant-right 50 years ago was universal, and was even more stringent than in Ulster; for if a tenant left his farm, the landlord was bound to stand in the place of the incoming tenant, and to pay the out-going tenant for everything which, by the custom of the country, the incoming man would take to. Now, the result of all this in Sussex was that a tenant in taking even a very moderate sized farm would find himself out of pocket to the extent of £500 or more before he had entered upon his occupation, and before he had supplied himself with a single head of stock or a single implement with which to work his farm. He was consequently crippled to that extent, and as the tenant had seldom an overplus of capital, the result was that the farm was most inefficiently worked. The landlords for a long time looked on this system of tenant-right with a favourable eye, they considered the outgoing valuation as a security for arrears of rent, and so were content. But of late years many of them have opened their eyes, they have now seen that this valuation is only a crippling of the tenant by diminishing his little capital, already too small for his holding, and so numbers of them as changes have occurred have seized the opportunity to purchase up these valuations, and have relet their farms to the new tenants under stringent conditions that prevent all valuations, but reserve a right to themselves or their incoming tenant to go in and prepare the land for the various crops in the proper seasons, when a tenant is going to quit. In consequence of this change the tenant's capital has been relieved of this heavy drain, agriculture is improving, and leases for 7 or 14 years are becoming more general.

In regard to leases, however, let me observe that unless a tenant has capital, or the means of obtaining capital, a lease is a perfect farce. What is the use of giving a lease to a man who has not a penny to spend upon the land? If a tenant has some available capital, and will come under an engagement to use artificial manure, or to feed stock with bought food, or to do some other act of good husbandry by which the value of the land will be increased year by year, then there is some reason for giving a lease, so that he may enjoy for a reasonable time the fruits of his own industry; but if he does nothing to improve the land, why should a tenant have a lease? For a landlord to give a lease to a non-improving tenant seems to me like playing pitch and toss on the very pleasant and sensible principle of "heads the tenant wins, tails the landlord loses."

In this country, at least, there are certain things which are always recognised as "landlord's outlay," and if a landlord will not make this outlay he cannot expect to get a fair rent for his land unless he lets it on lease. If he makes this outlay, and consequently gets his land let at a fair rent, then the tenant may feel pretty safe that he is not the least likely to be disturbed in his tenancy, because he is paying a fair value for his farm. It is a very singular thing that in Scotland, where leases for farms are the rule, leases for houses are altogether the exception. Why is this? Simply because the tenant makes no outlay on his house, and as he pays its market value he is pretty sure of not being turned out capriciously. Now the great drawback to the land in Ireland is that where the occupations are small (and small occupations prevail almost universally) there is positively no outlay which can be honestly called "landlord's outlay." Would it be reasonable to expect that the landlord is to keep in

repair the cabin of a man who occupies from 2 to 10 acres of land—which cabin is built with mud walls, a thatched roof, and an old basket for a chimney? Would it be reasonable to expect him to make fences round patches of land varying from a quarter of an acre to 2 or 3 acres? No doubt he might drain the land—and many of them do drain the land where there is the least prospect of the tenant paying a reasonable interest on the outlay—but beyond this there is positively no outlay that I can see which can be fairly called landlord's outlay, which is possible in Ireland so long as the present race of small tenants remain. It is well known that in England money spent on cottages will not pay unless such cottages are a mere adjunct to a large farm, just as cowhouses or any other farm-buildings are. Well, the whole land of Ireland, with some small exceptions, is let to cottars, and if it ever became the rule for the landlords to keep the cottages, or rather the "cabins" in repair, it does not require any great gift of prophecy to foretell what would be the result.

Mr. Gladstone, no doubt, will attempt some measure, but I venture to predict that unless his proposed measure interferes with the rights of property in a way that England and Scotland will not for a moment submit to, that measure will fail to give satisfaction to the party of movement in Ireland. And if it does interfere with the rights of property in such a way as to give satisfaction to the Irish malcontents, I think there is very little doubt it will raise such a storm of indignation in England as will sweep himself and his colleagues out of office. In fact, he seems to me between the horns of a dilemma, from which escape is all but impossible. *G. A. H.*

FARM BUILDINGS.

II. "City Fields:" Henlow, Beds.

The farm-house and homestead illustrated above has been recently erected at Henlow, in Bedfordshire, on the property of the Rev. Henry Addington, of Henlow Grange, near Hitchin. We know of no more noteworthy example of energetic estate improvement than is to be seen on this property—which has only recently come into the hands of its present owner. Several new homesteads, and a large number of cottages are being erected. Other old homesteads are being largely altered and improved. Drainage operations and road-making, too, are being carried on, under the superintendence and on the plans of Messrs. Bailey Denton, Son & North.

The buildings here represented are placed in the centre of a newly-formed farm of 350 acres, of which 275 are arable and 75 are pasture. It is essentially a tillage farm; the land being, when drained, good stock land, and capable of maintaining a fair sized flock of sheep.

The City Fields Farm is situated, geologically speaking, on the upper greensand formation, the subsoil at some depth being the gault upon which the greensand proper, with coprolites in it, is found.

The following index shows the accommodation afforded:—

1. Waggon shed; 2. Root store; 3. Chaff; 4. Mixing floor (cutting floor over); 5. Barn; 6. Implement house (granary over); 7, 8, 9. Shelter sheds; 10. Calf pen; 11. Cow-house for six cows; 12, 13. Loose boxes; 14, 15. Poultry houses; 16. Fatting stalls for eight beasts; 17. Piggeries; 18. Meal house; 19. Loose box; 20. Chaff; 21. Stable for 10 horses; 22. Gig house; 23. Nag stable; 24. Bake and brew house; 25. Scullery; 26. Kitchen; 27. Parlour; 28. Living room; 29. Dairy; 30. Scullery; 31. Living room (the two latter cottages).

It will be seen, on an examination of this plan, how that great rule for the economy of labour is observed which requires the neighbourhood, in fact, of those parts which depend upon one another in usefulness.

Thus 2, 3, 4, 7, 8, 9, and 16, 20, and 21, indicate the cutting chamber with mixing floor below are connected with them, so that the chopped straw or hay may at once be mixed with the cut or pulped roots. The farmhouse contains besides the living room, parlour, kitchen, scullery and other offices, on the ground floor, four bedrooms for the family, and two for the servants.

The house, cottages, and farm buildings have all been built with white perforated bricks, and covered with slates; and special care has been taken to provide a water supply and drainage.

The Henlow Grange estate has been recently readjusted, and the farms relet to the tenantry residing on the estate when Mr. Addington succeeded to it. The homesteads throughout the estate are all being put into excellent order, additional accommodation being supplied where required, and the old buildings repaired where retained.

Thirty cottages are in course of construction upon various approved designs, prepared by Messrs. Bailey Denton, Son & North, for the General Land Drainage and Improvement Company, who are carrying out all the works, including drainage and road making.

These cottages well deserve inspection as capital specimens of design and workmanship. Nowhere

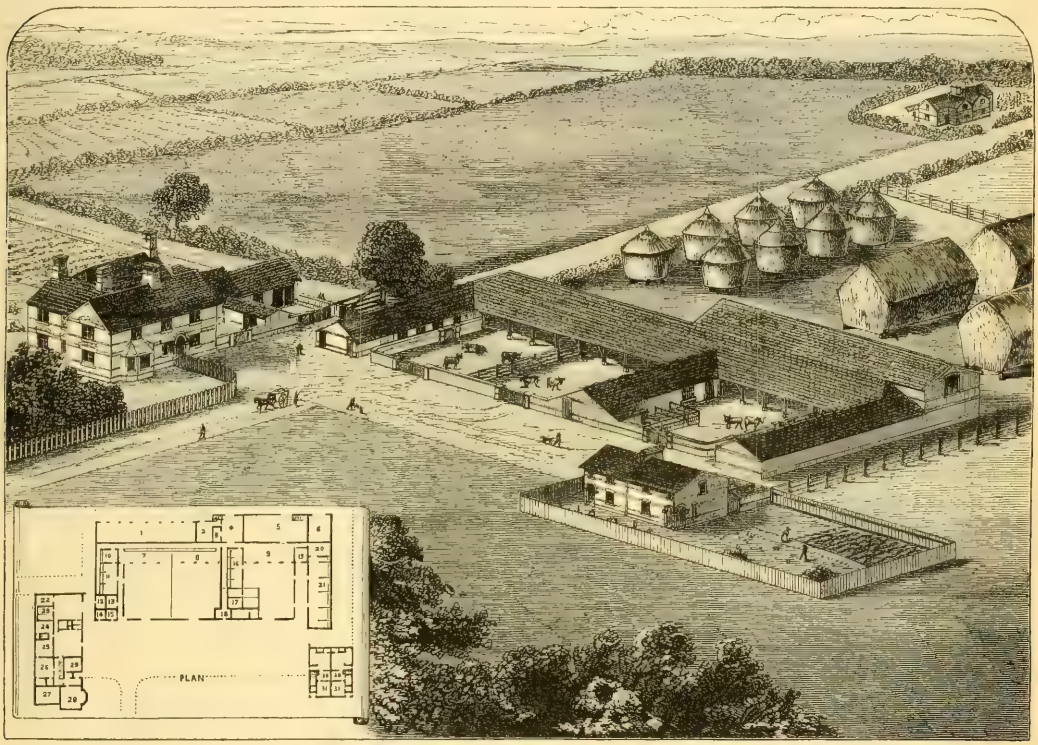

Fig. 46.—The "City Fields" Homestead, Henlow, Bedfordshire.

have we seen better work. And nowhere is there a more capital example of the advantages arising out of recent land improvement legislation.

how close the food stores are to the live stock to be fed. The aspects of buildings, too, are well arranged—the cart and implement shed towards the north—the yards under shelter of barn towards the south. The granary is well placed in connection with the barn on one side, and with the shed (where corn can be loaded) below it.

The farmhouse is well placed and commodious, and the cottage accommodation is good.

There are two pairs of cottages on the farm, both of which are shown in the view, one pair being situated at the entrance from the public road, and the other, for the carter and stock-keeper, at the south-east corner of the homestead. Three of these cottages contain three bedrooms each, and the fourth two only.

The stabling at the homestead is designed to accommodate 10 horses, besides which there is a loose box for an extra or sick horse. The dairy accommodation is small, only three or four cows being kept.

Provision is made for fatting 12 beasts in stalls, and for rearing from 30 to 40 stores of different ages.

The buildings have been designed for the housing, mixing, and distributing of the food for the whole of the stock in the most convenient way, the first object being to afford means of conveying it as directly and conveniently as possible from the floor on which it is prepared to the mangers in the different buildings.

The straw-barn with the root-store occupies a central position in the northern range of the buildings; and

Home Correspondence.

La Petite Culture.—I see Mr. Carroll's strictures upon the statements concerning "petite culture," in the lecture of Mr. James Howard, M.P., are not answered in your last issue. Will you allow me, as having some knowledge of Continental agriculture, to make a few observations on the subject? The question is, which system produces most food, "petite culture," or "culture intensif?" and this naturally involves the other question, viz., under which system can the largest population be supported? Now, supposing an active, intelligent, hard-working labourer with a knowledge of the theory and practice of scientific farming to have 1½ acre of land of his own, and that he cultivates it deeply and diligently with spade and fork, that he has a command of farmyard and artificial manures, that his rotation of crops is well suited to the soil, his land drained—in short, that he has every proportionate advantage that a large tenant-farmer has—then I believe, notwithstanding he can use no steam-ploughs (whether Howard's or Fowler's, it matters not, both are good), no reaping and mowing machines, horse-rakes, hay-

making machines, drills, horse-hoes or steam-threshers, he will produce more food per acre than the large farmer, just as, to quote parallel cases, a Spitalfields weaver can weave a better silk fabric than a steam loom, or a Clerkenwell watchmaker make a better chronometer than a Swiss steam factory. But, what are the facts, as shown in the appendix to Mr. Howard's paper, and from actual experience? It is clear that the "petit cultivateur" has but very few of the advantages above enumerated, therefore the "cultivateur intensif," who does possess them, beats him hollow. To quote again from Mr. Howard's lecture, the large farmer can afford "two restorative crops for one exhaustive." He can also keep more beasts, make and buy more manure, set out his land to the best advantage, use machinery on his large fields and in his large barns: he pays one house-rent for, perhaps, 600 times the extent of land, and has innumerable opportunities for working his land economically over his lesser brother, which will readily suggest themselves to every practical farmer. It is clear that as long as the present condition of things lasts, *i. e.*, until the co-operative system has been much more extensively developed, large farms will produce more food than small ones; therefore it is particularly the interest of this country, with its large centres of manufacturing population, to deprecate "petite culture" as a system of general adaptation. Nothing can beat intelligent hand-labour, its fault is, in the present stage of civilisation, that it is too dear—too dear. In fact, I believe that "petite culture," universally practised in this country, would bring us back to the days of woad and coracle. In conclusion, let me attribute all honour to the Flemish boor. He shows what diligence can do, even when weighted with all the disadvantages of high rent, want of science, lack of capital, and bad tools. *Viator, February* 10.

The Irish Land Question.—I have been amused, and at the same time sorry, in reading articles from "G. A. H.," Mr. Spearing, &c. Suppose I say neither are right—a moderate or medium course is best—there is some truth on both sides. And, as an Englishman living in Ireland for more than 12 years, I may say "G. A. H." is certainly too severe to charge the whole country with acts which, I feel assured, 9-10ths [999 thousandths] are ashamed of, even if, as he says, the guilty parties are not found out? Unfortunately Englishmen are given to laugh at any time anything connected with this country is spoken of; and the Irish being a quick, shrewd, proud people, to be laughed at ever and always, or to be found fault with, they neither like nor can they well bear. I am not a tenant-farmer, nor owner of any land, but I have lived long enough in Ireland to form an opinion. I can live here as an Englishman and be respected by Irishmen, of no matter what creed, and I think it is a great pity Englishmen in general do not know more of this country and Irishmen of England; I feel assured it would greatly benefit both countries: sympathy is good at times, not contempt. Now, with respect to good and bad farming: in general farms are very small—so they are, and for the present must remain—not that I entirely approve of them, would rather see them getting larger, which by degrees I have no doubt they will; at the same time I would like to see the country prosperous. I say "G. A. H." is wrong when he makes such sweeping assertions about "not one in 100," and with all their faults I consider there are many moderately good farmers, at least, on an average one-fourth, and some of them not so ignorant as "G. A. H." supposes. The National Schools are doing a great deal of good among the peasantry, among whom I include parties holding 10 English acres and downwards. To liken Irish and English farmers to the Red Indians and the Pilgrim Fathers, is really too bad. Nor do I wish to convey that the landlords as a class are all wrong, far from it, as I feel assured 19-20ths are both humane, kind and good to their tenantry, as far as they are able: and to speak of them as felonious to an excitable people is very wrong: we must all learn to live and let live, and vindictiveness in either landlord or tenant is not the way to prosper. I live in southern Ulster, but do not approve of what is called tenant-right here. But I suppose ere this reaches you, Mr. Gladstone will have unfolded his Tenant-Right Bill, as it is called, and I hope it will respect landlord-right as well. I would advise "G. A. H." not to be so severe, or so much prejudiced; he may have suffered wrong in some bygone days or other, and perhaps is still a little sore respecting it, but it is not noble or generous to never forgive. Let us forget the past as much as possible, begin anew, and all—English, Irish, and Scotch—do our best to make this country our common country, prosperous, contented, and happy. *G. E. H.*

"G. A. H." and the Irish Land Question.—As regards my nationality I suppose I must blushingly admit I am an Irishman, and one who knows pretty well the failings and virtues of his countrymen, for they have both in an extreme degree. I do not come from the school of St. Omar's, nor am I on the same mission as were its brave English emissaries. I have seen a fair share of life, but I have as yet failed to discover an elysium which has not its proportion of bad characters. Even the "noble Pilgrim Fathers" could not guarantee that their descendants should not be too free in the use of the bowie and derringer. "G. A. H." must know that the opponents and abominators of assassination may be reckoned by the million, in Ireland, just as they are in England. The outrages alluded to take place generally in the same district: and where there are landowners who are considerate towards their tenantry there also may be found occupiers who respect and would yield anything in reason to their landlords. As regards the allusion of "G. A. H." to the "ministers of religion," I may tell him what he, professing as he does such knowledge of Ireland, ought to know. The ministers of religion of all denominations oppose as they best can the system of agrarian outrage; and we must hope for further effort in this direction from one section since the notice of anathema against secret societies has been received from Rome. As mentioned in my last notice of "G. A. H.'s" lucubrations, such effusions are now rare, and emanate only from the diseased brains of malcontents, who will not see good in anything. If "G. A. H." will only come down from the platform of invective and recrimination to which he has raised himself, I will discuss the present state of the country with him in a way becoming the columns of your Paper, and I shall have no fear of consequences if I place the case in the hands of your readers; but mere calumny, such as that contained in his last letter, I will no longer notice. *T. C.* [We have taken the liberty to cancel a portion of our correspondent "T. C.'s" letter, in which he makes a personal reply to what he takes to be the personal invective of our correspondent "G. A. H." The sweeping criticism of the latter, in which, however, we saw no personal intention, ought to have been also cancelled. And now that the discussion may be considered purged of personality, we hope it may usefully proceed.]

Steam Cultivation at Tiptree.—Mr. Mechi has just stepped in to tell us that "G. A. H." "has mercilessly smashed Mr. Smith's 6*s.* 8*d.* seed-bed." I must have a word with our old friend, to show that he is mistaken. Let Mr. Mechi look to your paper of December 11, 1869, p. 1288; he will there find all the particulars as to my start in 1855 and 1856, showing how I made my estimate of 1*s.* 6*d.* an acre for extras, and he may also there see how matters stood under my altered position in 1869; then let him look to January 8, 1870, p. 55, and see the heavy load of interest that "G. A. H." would have clapped upon his back, and then let him look at January 15, 1870, p. 86, and see interest calculated according to Mr. Mechi's plan, and everybody else's. Those sums "G. A. H." has never smashed, neither will he, not even by the aid of Mr. Mechi. Therefore my seed-bed for 6*s.* 8*d.* an acre does stand, and will, let Mr. Mechi write as he may. His reference to the Royal Agricultural Society's Journal does not help him a bit. Mine are facts. Their estimates are of no use against me. My seed-bed is obtained upon the direct plan, which "G. A. H." prefers. The true "roundabout plan" consists in going some half-a-dozen times over the land to make a seed-bed (see February 5, 1870, p. 189). I have just planted some Beans on some heavy land, the seed-bed costing only 4*s.* 8*d.* an acre, extras and all included, one smashing only, and on land that the steam-smasher has never been worked upon before. I like the direct road; for 14 years it has given me cheap and clean seed-beds, and at the end of that period my land is in a state, for cleanliness and depth of working, fit to be shown against any in England. Mr. Mechi tells us a "reason why a steam cultivator on his farm would not pay is, that he has a fixed steam-engine." He had that when he tried the "rabbit scratcher" by Mr. Romaine. He did not succeed with his scratcher, and it blighted his attempt at steam culture. Now, I fancy it would pay to have steam-power culture upon his farm. Some horses might be sold off. If he is as good and fleet a worker as his friend "G. A. H." is, I should think four might go. The good old fixed engine, surely, would make £100. These two items would bring the total cost at starting down to £340, and he would have a good new 10-horse engine to start off with. The keeping saved of the four horses sold off at the end of the first year would be another £100, and every year after another £100 might be thus saved. Mr. Mechi would do well to reflect a bit before he jumps to the conclusion that it would not pay on his farm, especially if he would be guided and work upon the direct seed-bed-making plan—the Woolston plan; it is not only a simple plan, but it is a practical one on any lands. In conclusion, I should be very glad if Mr. Mechi would tell us all about his 63*s.* 9*d.* 1868 Wheat. "G. A. H." has tackled me very fairly about my 6*s.* 8*d.* seed-bed, and I have explained all about it, substantiating the 6*s.* 8*d.* to the letter. Now let Mr. Mechi substantiate his 63*s.* 9*d.* Wheat, or his balance-sheet December 30, 1868, is not worth a rap. *William Smith, Woolston, Bletchley Station, Bucks, February* 14.

Drinking Habits of the Agricultural Labourer.—I saw with much satisfaction that in your leading article of the 12th inst. you stated that "a number of Kentish clergymen have suggested the formation of an association" to counteract the temptations and facilities by which drinking habits among agricultural labourers are formed. May I suggest to these gentlemen that the payment of wages in beer is the temptation which leads to drinking habits more than the beershop itself, and it is that which may be most easily put down. On a small farm, with a staff of five labourers in continual employment, I have for many years not given a drop of beer. I was told that I could not get the work done without it, but I have never met with the least difficulty. Though I pay a liberal equivalent for the value of the beer, I believe I save money. When I gave beer there were continual quarrels in the field, now I have peace and quietness, and my staff of labourers is superior to that on any farm in the parish. They are willing and obliging, and when by chance I have a vacancy I have no difficulty in engaging the best and most trustworthy in my service. If this sad mistake among employers of agricultural labour could be corrected, and nothing can be easier, we should take an important step towards the discouragement of intemperate habits among our rural population. *J. C. C., Feb.* 12.

Foreign Correspondence.

GALICIA: *Austrian Agriculture.*—The land in my immediate neighbourhood (district of Cracow) is divided into large farms of 120 to 450 acres, and peasant farms of 3 to 45 acres. In my district the largest farm is 450 acres, and 120 acres the least. Peasant proprietors farm 3 to 45 acres. In my environs farms consist mostly of 300 acres arable and 45 to 75 acres meadow. For each farm of 300 to 375 acres there are in proportion 30 to 40 peasant farms.—The average rents of the larger farms in Austrian Galicia, second to third quality soil, is 11*s.* to 14*s.* per acre. The rent of small plots of 1½ to 3 acres ranges from 32*s.* per acre for best quality to 5*s.* for the poorest. Peasant farms, the property of former serfs, are held by the class, and are not let.—The small farms are the properties of the peasants. The farming of the peasants is in a very poor state. There is no industrial manufacture in this district, consequently there is no capital; if there were capital the farming would be better, and it would also be to their advantage under such circumstances to be owners of their land. The lease of large and small plots of land is from three to six years. They are in writing, and contain reciprocal conditions. The tenant is not allowed to sell straw from the same, but must make it into manure. Rotation of crops is not specified; but for small plots of land no conditions whatever are named. Large farms of medium quality can be bought at £7 to £8 per acre. There are laws relating to the preservation of game. When there is any quantity of game, it is generally let with the land. The following are the crops commonly cultivated:—Wheat, Rye, Barley, Oats, Rape, Potatos, and Carrots. The Potatos and Carrots are not grown upon the small farms. The usual rotation is—1st, Green crop, manured with 3 cwt. of artificial manure per acre; 2d, Rape; 3d, Wheat; 4th, Clover; 5th, Rye, with 1½ cwt. of artificial manure, or 3 cwt. of bone-meal; 6th, Oats. Another rotation is—1st, Roots, manured; 2d, Barley; 3d, Clover; 4th, Wheat; 5th, Rye, with 3 cwt. of human manure or bones; 6th, Oats. Guano is rarely used with us, it is too dear. We mostly use human manure in powder, at 6½ cwt. per acre, or bone-meal, at 5½ cwt. per acre. The usual depth for white crops is 6 to 7 inches, and for roots 8 to 9 inches. A subsoil plough is seldom used. Farm labourers receive in summer 9*d.* per day, and in winter 6*d.* They have no provisions. In harvest they only receive from 1*s.* to 1*s.* 2*d.* per day. There is plenty of labour with us since forced labour ceased, some 20 years ago. Wages have somewhat increased. The field labourers do not get a house. They are mostly small peasant farmers who possess a house, or pay 10*s.* to 16*s.* a-year for one. They have no land given them by their employer, but frequently possess a piece of their own. Not only my cattle, but that of the whole neighbourhood, have suffered from the mouth disease. Pigs had small-pox and diseased feet. Sheep are very little bred in my district, they had foot-rot. It was the first time my cattle had foot-and-mouth disease. Rinsing with acids, but principally with cold water, had a good result. I had my beasts driven four times a day into the water, in eight days the disease began to disappear, and in four weeks the beasts were quite well. *Communicated by Professor Fuchs of the Imperial Agricultural Society, to Mr. J. Howard, M.P.*

Societies.

ESSEX CHAMBER OF AGRICULTURE.

February 5: *Adulteration of Manures and Cattle Food.*—At a general meeting of this Chamber at Saffron Walden this day, Mr. ANDREW JOHNSTON opened a discussion upon this subject. He said: The subject divides itself naturally into the evil and its remedy. The latter will probably be much the same in the case of feeding stuffs and in that of manures, but the former is somewhat different in each case, and I will therefore, in the few remarks I have to offer, treat of them separately, and begin with feeding stuffs.

Feeding Stuffs.—The main difference between the two is that in the case of feeding stuffs a fairly intelligent purchaser can to a great extent judge of the purity of the article by eye and taste, which he cannot do in the case of manures with any accuracy. To begin with oilcake. If the purchaser will take 100 grains weight and mix with four ounces of water, a rich jelly will be the result (if the cake is pure), agreeable to the smell,

and so nice to eat that it is said one "longs to be a cow." If, on the other hand, the cake is impure the jelly is absent, and the smell and taste more or less nasty, according to the degree and kind of the adulteration. This adulteration may be roughly divided into three kinds.

(1). The first and most innocent is that which results from carelessness and bad farming on the part of the grower of the seed; and here we come on another class whom we may benefit by a severe scrutiny of our purchases, for while our first object is to farm to the best advantage ourselves we may be unconsciously, but most beneficially, raising the standard of farming among Hindoo Ryots and Western Americans, thousands of miles away, by insisting upon having a pure article. At the present time it is considered very good if the proportion of foreign seeds can be got down to 5 or 6 per cent.; but seed has been sent from Bombay with only 1¼ per cent. of foreign seeds, so that we may hope to raise the standard even of what is ordinarily considered the best.

(2). The second and far more reprehensible kind of adulteration is that of mixing other seed with Linseed in the process of manufacture, and this is carried on to such an extent that even 70 or 80 per cent. is said to be not uncommon. Some of the seeds that are used are more or less nutritious, some are harmless, some are poisonous. Of the two former classes are beech-nuts, hemp-seed, locust-beans, and cotton-seed. The latter is easily detected by its colour. The common idea that it is heating and dangerous is, I believe, a delusion; but I shall treat of that subject when we come to cotton-cake. All the above have a large proportion of woody fibre, and have no business in oilcake, but it is little too much of a good thing when we find Castor-oil beans and the still more drastic bean from the Cape de Verde Islands, known as the "Curcas," administered to our innocent animals as pure Linseed.

(3). This brings us to the third and worst kind of adulteration—that of mere rubbish and dirt. Among the cheerful mixtures found in cake are palm-nut dust, barley dust, rice, meal, and other things, to an almost incredible extent. I have read of a gentleman who purchased a quantity of remarkably cheap cake, at the price of which he, no doubt, was vastly pleased. In attempting to use it, however, he found it anything but economical, for in two days it killed 14 sheep, three horses, and a pony; and on sending it to be analysed he had the comfort of hearing that his cheap cake was entirely composed of the "sweepings of an oil mill and of a general dealer's warehouse," and that its rather decided effect on the animals was caused by the presence of germs of a poisonous Fungus, one of those which we call "mould," and which develop themselves very rapidly where cake is not kept perfectly dry. The harder the cake the less likely to go mouldy, and I believe the main reason why American cake has such a good name is that it is so carefully dried in the manufacture. Now, however, that English manufactures are beginning to cry out for protection, under the thin veil of a desire for "reciprocity," it is time for agriculturists to look sharp to their own interests. We are told that not more than 10 per cent. of the English crushers sell pure cake, and no doubt the other 90 will be forward enough in the good time coming in demanding an import duty on foreign cake. You are called on, rightly in my opinion, to face the competition of the whole world, and will not tamely submit, as the "reciprocity" mongers would have you, to be taxed right and left for the articles you require in carrying on your business; and also for the articles, now become all but necessities, on which your profits are spent. So much for the linseed-cake. Cheaper kinds of cake are of course not equally worth adulterating, but rape-cake is often largely mixed with mustard-seed, owing to the rapid growth of wild Mustard in the field in India. The effect of this seed on the health of animals is well known to be injurious.

Cotton-cake is very little adulterated, but often contains far too great a proportion of husk, which is indigestible, and is even apt to get into lumps in the stomachs of animals, causing stoppages, and giving rise to the idea that cotton-cake given without admixture of Linseed is poisonous. There is good testimony, however, that this cake has very greatly improved in that respect. Now the question arises, When and where does this adulteration take place? Who is the culprit? I have before stated that only about 10 per cent. of the crushers sell pure cake. The excuse given is that they cannot obtain pure seed; but I fancy they would find a way if agriculturists sternly refused to buy anything but pure cake, and the demand for a pure article would spread backwards to the original grower of the seed. But if it be really impossible to procure pure seed, it is very easy to do what is already done by makers of pure cake, viz., to sift out the foreign seeds and make them into a cake by themselves, which is sold as siftings cake. When this is not done, the siftings are quietly taken out to sea in vessels, which are run alongside those laden with pure seed, and mixed then and there. Who pockets the profit on this ingenious transaction, whether the shipper or shipowner, or the captain, or the consignee, or all four, I don't know, but there is no doubt that it takes place, and I fear the port of Hull is as great a sinner in this respect as that of Liverpool is said to be in the case of manures. The best way for a buyer to protect himself is to buy no cake which does not at any rate profess to be pure. Of course mixtures are good, but the mixtures should be made at home. Firstly, because mixed cake is apt to be very "mixed" indeed, and secondly because the farmer can take into account in mixing conditions with which he is perfectly acquainted, but of which the manufacturer can know nothing—such as soil, climate, and different kinds of stock.

Adulterated Manures.—I shall now deal briefly with the subject of adulterated manures, and then pass on to discuss the best remedies in that case and also in that of feeding stuffs. The adulteration of manures must be looked on as much the most serious of the two. Firstly, as being much more difficult of detection, without the aid of a chemist, when purchased; and, secondly, because the ill effects of bad feeding stuffs make themselves manifest at once and with certainty, whereas those of bad manures can only be observed after the lapse of months by the failure of crops, and even then without any certainty that such failure is due to that cause.

When artificial manures were first introduced they were not practically believed in, and their success was doubtful. There was, therefore, no temptation for men of substance and capital to embark in their importation or manufacture. The trade fell very much into the hands of adventurers with little money and no character to lose, and fraudulent dealing with the article was the inevitable consequence. In this state of things the analytical chemists were of the greatest service. They came forward and published price lists of the constituent parts of each article, so that farmers could judge at once of the real value of what the manure professed to be, while by offering to analyse all samples they afforded the farmer the opportunity of knowing whether it really was what it professed. The result of this very soon was that a new and better class of men went into the trade, which has now come tobe a well-regulated business, carried on by men of substance, character, skill, commercial knowledge, and enterprise. To come to particulars.

Guano is chiefly adulterated with gypsum, which has the advantage of being found largely in the neighbourhood of the port of debarcation, which I have already mentioned has a sad character—Liverpool. This substance is handy for the fraudulent dealer, but it is utterly worthless to the farmer, who, however, has the means of detecting its presence by weight. Pure guano should never weigh more than 70 lb. to the bushel, and if it exceed that it is certainly adulterated. It may also be tested by burning. If pure, the residuum of the ash will only be about 33 per cent. If impure, it will vary from that to 66 per cent., and its colour will be more or less red, whereas that of pure guano is white. Another safeguard is to avoid buying guano sold by auction, as, for one reason or another, it is always, I believe, frightfully impure. I fear, however, that even the best guano, pure from its mine, is not nearly so strong as—for instance—ammonia than—what we used to be imported, and that we must be prepared, sooner or later, for a total cessation of the supply of this article. What shall we have to fall back on?

Nitrate of soda is often extensively adulterated with chloride of sodium—sulphate of ammonia is mixed with sulphate of soda and sulphate of magnesia. Then there is bone-dust, which of course cannot well be adulterated, but if fine is diluted with gypsum and parings of vegetable ivory; and it is a curious fact the turners and button-makers of Birmingham (that old sinner of a town!) have a ready market for these shavings at 50*s.* or 60*s.* per ton, the article being useless for any other purpose than mixing with bone-dust, and of no value whatever as manure. Lastly, the "blood manures"—I speak in the presence of a high authority on this subject—in which it is well known there is not much blood of any kind, but when good, plenty of animal matter of one sort or another. The inferior kinds, however, are found with an admixture of leather, and though we all know there is nothing like leather, this can only apply to the farmer when it is "green," or "raw," as it is utterly valueless as manure after going through the process of tanning.

Prevention of the roguery.—We now come to the important question, how can all this roguery be best prevented? I have already suggested ways by which each purchaser can protect himself, but these are partial and unsatisfactory, even when properly applied, and useless to careless or ignorant men. Beyond these we want an organised attack on the polluters of these articles, which shall not only assist us in getting them pure, but which shall be so effective as to place importers and manufacturers of adulterated goods on the same level as coiners and "smashers," and brand them as rogues and vagabonds.

We ought to be able to do this. Surely it cannot be said of the most practical class of a practical nation that they will tamely submit to be fleeced, and remain helplessly unable to obtain pure articles, without which it is impossible to carry on their business in the best style. One notion that has gained some currency I must here protest against. It is said to be the farmer's own fault if he gets impure goods, because he will not pay a "fair" price, and that if you seek to buy cheap you deserve to be cheated. This, to my mind, is utter nonsense. Who shall say what is a "fair price?" The fair price is the lowest price that you can possibly get a good article for, and you are a fool if you pay any more. Depend upon it you must seek other guarantees than giving a "fair price." Of course if you find you are buying cake or manure much below your neighbours, it should make you prick up your ears and find out the reason; but, on the other hand, you must not go to sleep in fancied security because you are paying a high price, as we have it on very good authority that the high priced articles are often adulterated. Now, it is not much use having samples analysed, as they are frequently not fairly sampled, or the bulk is adulterated after sampling. Instances are on record of samples worth £9 and £10 per ton being taken from the bulk which proved to be worth not more than £2 or £3. The analysis should therefore be accompanied with a written guarantee of the bulk. Here, however, I have somewhat got back to individual action, when I meant to have confined myself for the remainder of this paper to the question of organised action.

Two methods are open to the farmers. Either they may become members of the Royal Society, which gives them the privilege of having the seller's analysis checked and exposed by Professor Voelcker at small expense, or they may form county associations. I incline to thinking the latter the best course. The Royal Society are doing a work of immense general utility. In their quarterly reports they are gibetting the sellers of impure manures in famous style, and it is to be hoped that these reports will be freely quoted by county newspapers in the localities where the culprits reside and exercise their trade. I have here one of these reports, from which I will quote an instance. I am glad to see none of the firms named have a connection with the eastern counties. The Royal Society will scotch the snake. I believe it is the business of county associations to kill it. The honest manufacturer cannot deliver in small parcels up and down the county. That is the province of the dealer. You are therefore in his hands. Now, the county associations take the place of the dealer, purchasing in large quantities for their members, and analysing for those members who choose to buy for themselves; in those cases where the seller's analysis is found to be false he is "posted" all over the county, which of course soon becomes too hot to hold him, as his trade is destroyed. He has killed the goose which laid the golden eggs. The subscription to these associations need be very small. I do not know if they exist in many counties, but that in Berwickshire is said to have done great good, as has the one in Kelso, of which I have the rules by me. As usual, the Scotch are a little ahead of us. I do not know whether these associations are constituted *ad hoc*, or whether they are departments of the County Agricultural Societies, but I should think they might well be the latter, and that nothing would be more germane to the objects of a county Chamber of Agriculture than discussing the means of bringing them to bear. Whatever may be done will not, however, relieve every man who is a member of such an association from his individual responsibility. In proportion as each member is alive to his own interests will be its activity and usefulness. Each member must watch how it is carried on, and be ready with curb or spur when needed. The light that has been turned on to the question has already done great good. Year by year improvement is found to take place all over the country. It remains for agriculturists to persevere, and by making fraud more dangerous than profitable, to cut at its root, and destroy it for ever. Gentlemen, I thank you for your kind attention. I am very far indeed from claiming either originality or exhaustiveness for these remarks. I have rather endeavoured to put together a few heads for discussion on a subject which I regard as of the first importance to the agriculturist; and through him, to the nation at large. I cannot conclude without thanking those to whom I am indebted for information on the subject, particularly Professor Voelcker and Mr. Jenkins. I trust you will treat any errors I have fallen into, as well as many omissions, with the same kind and patient indulgence with which you have listened to what I had to say.

Notices of Books.

Ireland in 1839 and 1869. By H. S. Thompson, late President of the Royal Agricultural Society of England. Dorrell & Son, Charing Cross.

Mr. Thompson is in the position of having recently re-visited Ireland that he might learn its agricultural and social condition after a 30-years' interval. He spent some months of 1839 endeavouring to make himself acquainted with the peculiar usage known as Ulster tenant-right; and believing that by repeating his visit after a 30-years' absence he would be enabled to give a comparative view of Ireland in 1839 and 1869 which might throw some light upon the important questions connected with land tenure, he has devoted the last few months to visiting the sister country, in order that the impressions made upon a practised agricultural observer after so long an interval might be laid before the public. In the course of his tour he passed through every county in Ireland, and personally visited estates the aggregate extent of which considerably exceeded 1,500,000 statute acres. His journey of some thousand miles has made it impossible to doubt that in the last 30 years there has been generally throughout the country a great development of all the elements of national prosperity. Whether he looks to the character of the dwelling-houses, the progress of trade, the increase of bank deposits, the condition of the agricultural labourer, or the advance in practical agriculture, this conclusion is happily inevitable. The agricultural progress of the past quarter of a century is illustrated by statistics of agricultural produce, live stock, and bog reclamation. The general lesson of all these items in the total of agricultural improvement is not, however, without important exceptions; but Mr. Thompson will not admit that the improvement in the condition of the labourer has received any check, even within the last 10 years, to which Mr. Gladstone alluded in a different sense last Tuesday; and he endeavours to explain the fact that pauper relief has increased of late, without admitting that pauperism is advancing.

The latter half of the volume is devoted to the discussion of the relationship of landlord and tenant. And the various forms of tenancy, with their several tendencies and results, are described by one who has evidently closely studied them; and who, moreover, if ever he had any, has most successfully concealed any prejudices which, as one of the land-owning class, he might be expected to exhibit.

The literature of the subject is decidedly enriched by Mr. Thompson's contribution to it. He, with Mr. Caird and Mr. Sanderson, may together be taken to have exhausted the subject in its agricultural relations; and an unprejudiced student under their guidance cannot stray very far from a sound judgment on the many questions at issue.

Mr. Thompson's volume contains a very graphic and readable statement of the argument, and of all the cir-

cumstances of it. Its pages are enlivened by frequent touches of humour, and by the evidences which the author often gives of his sympathy with the people whom he describes. The work concludes with the following rhetorical peroration :—

"One last suggestion the writer ventures to offer, in all sincerity and earnestness. It is, that the sons of Erin should with one consent resolve to turn their backs upon the dark features of their past history, and with their accustomed energy devote themselves to working out a glorious future for the Rose, Shamrock, and Thistle. England will furnish solidity, Scotland constancy and perseverance, but the Irish element will be required to supply the brilliancy which will make the confederacy complete and irresistible. Without changing their ancient banner, or discarding their favourite motto, let them but inscribe above 'Erin go bragh' the noble word 'Excelsior.'"

Suttons' Farmers' Year Book *and Select List of Farm Seeds.* Sutton & Sons, Reading.

This is much more than a mere trade list. The notes on the cultivation of the different crops whose seeds are offered, are very well written indeed. Under the heads "Seeds," "Time of Sowing," "Manure," "Culture," and "Storing," a quantity of serviceable information is conveyed, which seems to have been provided by an experienced and practical man. There are one or two memoranda which appear to be dictated by prejudice rather than enlarged experience : but a little spice of old-fashioned maxim will be taken by the majority rather as a guarantee of the goodness of the remainder, than as at all deteriorating from the merits of the work. We have yet to learn, for example (italicised for emphatic utterance although the statement be), that "merely mineral superphosphate will not grow roots for *storing*—they will not keep." It might be truer to say there is no superphosphate that is not "merely mineral." Whether the phosphate of lime which is acted on by acid be bones or coprolites, the result in either case is a merely mineral superphosphate, and in no case is superphosphate by itself a complete manure. We extract the following as a sample of the kind of information which is given :—

"*Cultivation of Mangel Wurzel.*—Seed : 6 to 8 lb. per acre. A late sown crop might be allowed to stand thicker than an early sown—and thus a larger number of medium-sized roots would in some measure compensate for the absence of heavier roots. Time of Sowing : The Mangel is an annual, yet it likes its year to be made as long as possible. In a kind spring, those generally succeed best who sow earliest. Some bulbs, it is true, may run to seed ; but the increased weight of the remainder more than counterbalances this. And if pulled when the seed-stalk is just shooting, pigs do well upon them. The middle of April generally suits, unless in elevated districts where the climate is late and spring frosts prevail. Should the month of April be unusually cold or very wet, it would be wisest to wait till the first week of May before sowing —for Mangel seed will not germinate in a low temperature, but the weeds will, and they are apt to get ahead. Manure : Superphosphate does not tell so well on this crop as on Swedes. But apply as much of rich ammoniacal dressing as you please, and also 2 cwt. of salt per acre. Like the swine, Mangel is a gross feeder ; you can hardly overdo it. Indeed, by thoroughly liberal treatment, it is as easy to grow 50 or 60 tons on 1 acre, as upon 2 indifferently treated. But that needs a large outlay in manures. Generally speaking, however, good moderate roots are the more solid. It fattens on liquid manure in any form, and an occasional dose of guano during the season, applied in wet weather, pays well. Be sure to keep the salt from contact with the seed, or you will prevent germination. Cultivation : A friend of ours, J. C. Adkins, Esq., Milcote, Stratford-on-Avon, who is a most successful grower, and whom we have had the pleasure of supplying with seed for years, adopts the following plan :—Wheat is always the preceding crop. The farmyard manure, previously drawn, and slightly fermented in a heap, is spread, and the land ploughed before Christmas if possible ; but at any rate soon enough to ensure a frost for the thorough disintegration of the surface deep enough to form a good bed of free mould. So soon in April as weather permits, the land is well harrowed as deep as it will work freely. By this plan the moisture is retained, and thereby the seed induced to vegetate. By deeper cultivation and evaporation, the soil is often rendered so dry that the germination of the seed is dependent on rain. Many a plant of Mangel has been lost in a dry spring by giving the land what is well described as 'the orthodox amount of spring tillage,' instead of permitting it to remain in the state which a Warwickshire farmer would call 'stale furrow.' The seed (about 7 lb. per acre) is drilled on the flat at 28 inches from row to row, and deeper than is usually recommended—fully an inch. As soon as the Thistles appear, dig them to the depth of the plough, and the after cultivation of the crop is the usual one of repeated hoeings by hand and horse labour. Mr. Adkins has hardly had a blank in his extensive Mangel fields for years ; yet a little Swede seed is mixed with it, in case of a vacancy occurring."

Letters on the Land Question of Ireland. By William O'Connor Morris, the *Times* Special Commissioner. Longmans.

It is perhaps sufficient to announce the republication, in the form of an octavo volume, of these letters which have already been more widely read than falls to the lot of book publication. We extract, however, the following passage from the preface, giving an interesting account of the fitness of the author for his task :—

"The fact that I was selected by the *Times* to write upon a great social subject might afford a presumption that I am not altogether unfitted to do it justice. Yet I may be permitted to say that the accidents of life ought to have enabled me at least to treat the Land Question of Ireland in a reasonable manner. I am an Irish landlord myself : almost all my kindred are of that order ; I was brought up amidst associations that belong to Irish landed property ; I have long managed my ancestral estate ; I am not unfamiliar with the ways and sentiments of the Irish peasantry. In very early life I took part in the local administration of relief during the awful period of 1846-8 ; I acted afterwards for some time as a magistrate and grand juror of my county ; and, as a member of the Irish Bar, I have not only made the law my study and profession, but I have had numerous opportunities of investigating and seeing the practical working of the relations of landlord and tenant in Ireland."

Atchley's Price Book *for Architects, Engineers, Contractors, Builders, &c.*, 1870.

The title of the book is its sufficient introduction to the very considerable number of our readers who are specially interested in works of this class. The present edition is carefully revised in accordance with altered prices of materials, and a great deal of new matter appears in it.

Farm Memoranda.

AN ESSEX FARM.—It contains 320 acres, about 280 of it under the plough, and the remaining Grass, buildings, &c. The top soil is rich in vegetable mould, yet poor in lime. I had a good chance of seeing the subsoil (for Mr. Bailey Denton's men were at work in four fields on several parts of the farm draining it 4 feet deep). It is generally yellow clay, with here and there a small patch of fine sandy soil. The undrained portion of the farm showed the water standing in its furrows and water furrows, yet the land recently drained showed none, and the reason why could be seen by looking at the outflow of the main drains, a large flow of water pouring from them after having passed through the soil ; and we all know that as it passed through the soil air would force its way into the soil to nourish the young growing Wheats. This proves that the Essex men generally are wasteful with both water and air,—that is, they keep the door of their land shut against both. Fourteen horses are kept to work the farm, and the cropping recommended by the tenant is as follows :—Roots, Barley, Clover, Wheat, Barley, Beans, and Wheat. This appears to me to be a suitable cropping for this soil, and under steam-power culture it would work well. The land is generally clean, and in a very fit state upon that point for the adoption of steam culture. It is flat, and there is nothing in the way in the shape of a hedge, for the landlord allows all needless ones to be cleared away. The tenant tells me that he pays from £40 to £50 a-year for threshing his corn.

If steam-power culture is adopted on this farm, seven horses may be sold off, for the remaining seven will be enough to cart the corn at harvest (and easily, too, for there are, besides the yards and barns, &c., at home, two field barns and yards, &c., at two different points on the farm) and do all the ploughing that is needed,—the cross cultivating, seeding, &c., and all the job work throughout the year. This in the winter and summer months will not half employ them.

Now let us look at the cost of starting steam culture on this farm upon the Woolston plan. A 10-horse power engine, £300 ; a set of tackle with all the implements needed, £220 ; coal for the year, £20. Total, £540.

The half of the engine, £150, may be charged to threshing, for the £40 or £50 a-year paid by the tenant will soon clear that off with the cost of a threshing machine. The seven horses that may be sold off at £30 each give a sum of £210. The keeping of seven horses sold off for a year at £25 each gives a sum of £175. These three items together make a total of £535 saved ; therefore it may be seen that in this case the tenant may make the change from one system to the other with only £5 additional tenant's capital on steam culture the first year, and that every year afterwards he would make a clear saving of £155 in horse keeping, after allowing £20 for the year's coal.

Now let us see what steam-power work there would be needed on this farm with the Woolston system strictly carried out.

First year, for roots after Wheat, say 40 acres. The Wheat stubble should be manured in October. The ridger and subsoiler should be set to work by the steam-engine to work it a foot deep, and put it in ridges for the winter. In the March following, when the land is dry, a subsoiler should be drawn by four horses along each ridge to split them ; after this, if intended for Mangels, it may be harrowed once and the seed drilled in, but if for Swedes, it should be scuffled across once, either in April or May, and then harrowed, and when seed time comes the seed may be drilled in.

Second year, Barley after roots, 40 acres. The horses may do this in the ordinary way in the spring, for they will have nothing else to do at that season, excepting job work.

Third, Clover, 40 acres. This does not need an operation of any kind.

Fourth, Wheat after Clover, 40 acres. The horses may plough the Clover lay over, for they can do it better than steam-power can, and they will have nothing else at that season to do, excepting the cross cultivating, drilling, and job work.

Fifth, Barley after Wheat, 40 acres. This must be ridged and subsoiled by steam-power a foot deep in October, and laid up for the winter. In the spring the ridges must be split by horses drawing the subsoiler along them ; after this it may be cross-cultivated once across with horses, or harrowed, according to circumstances, and then drilled.

Sixth, Beans after Barley, 40 acres. This must be ridged and subsoiled by steam-power, and it may also be split by horses in the spring, and then planted with Beans, one row on each side the ridge, placing the row from 18 to 20 inches from row to row, or in wet seasons it may be planted without the splitting in the spring with horses.

Seventh year, Wheat after Beans, 40 acres. This must be smashed by steam-power, then cross-cultivated once over with horses, and the Wheat drilled in ; and I would advise the drill rows to be 12 inches from row to row for Wheat on all occasions.

By this it may be seen that the steam-engine would get four fields, or 160 acres, a-year to do. If we fix 2 cwt. of coal as the quantity needed per acre, 16 tons a-year would be the consumption. This shows that by allowing £20 a-year for coal I allow ample upon that point. It may also be seen that the horses get only the Barley seeding in the spring after roots, and the ploughing of Clover ley in the autumn with the cross-cultivatings, drilling, and job work, and that would be all ; therefore the seven would but get but lightly employed throughout the year. Such being the case, young growing horses may be kept and sold out at a profit, instead of getting worked to death upon the farm.

As this land is deficient of lime, I would recommended a light dressing of superphosphate on at least three of the crops during the seven years. This, with the aid of steam-power for culture and drainage, must increase the production on this farm vastly.

This shows how to apply steam-power to culture on many of our best soils, and that the adoption of it is not so costly as many people fancy it is. If you think this worth a corner in your paper you will publish it, and thus show to the Essex men, both landlords and tenants, that their young Wheat plant at this season is like a man in deep water with his head only up, struggling for life, crying "help, help." Drainage is the help needed by the Essex farmer, and deep drainage, too. Steam culture stands next ; the two together must vastly increase their produce. *William Smith, Woolston, Bletchley Station, Bucks, in the "Times."*

Miscellaneous.

THE NATURAL AIDS TO FARMING.—Experience proves that in agriculture, as elsewhere, it is a wasteful process to attempt to overcome the natural tendencies of things, trying to gain your end while the natural tendency is unpropitious. The whole art of the farmer consists in so timing all his doings, that the natural tendency may come into useful operation just when he wants it. It is thus that he performs his fallow operations chiefly before winter, whose frosts are the best fallow-implements he has ; and it is thus that all the processes of seeding and manuring are timed, so that the season shall be a help and not a hindrance.

ON CHURNING.—I think a careful examination will show that everybody does not know how to churn, or rather how to produce butter from cream, or we should have less growling from the "gudewife" because the butter would not "come." All who have had any experience in the matter know the apparently perverse nature of butter ; at times it will come (that is, separate from the buttermilk) in a few minutes, and sometimes will not come at all. This and many other curious facts may be made clear by a little careful investigation in the matter, which, with thy permission, friend Editor, I propose to make. The butter exists in the cream in the form of minute globules, surrounded by a thin film of casein, and to obtain the butter we must first break this film. This may be done in two ways, either by agitating it or by heating it. There are several conditions which influence the time required for separating the butter by churning ; and if these are thoroughly understood and complied with, there will be little or no trouble in getting butter to come. The main and most important condition is the temperature of the cream when it enters the churn ; there seems to be a certain medium established, and it seems to make but little difference whether the temperature of the cream is above or below it, there will still be the same trouble in breaking the casein which envelopes the globules of butter. The cream when poured into the churn should not have a higher temperature than 55°, nor a lower one than 53° ; when put in at this temperature, it will rise from 5° to 10° during the operation of churning. Another important condition which does much to influence the time required for separating the butter, is the state of the cream when it is put into the churn ; if sweet, it will require much longer than if sour—and it is an established fact that before butter can be made the cream must be sour, and if it does not reach this state before it goes into the churn, it must and will afterwards, or no butter will be obtained.

Some of those who always take the premium at our county fairs, always churn sweet cream to obtain it, and I have often had this thrown in my teeth when advocating the above doctrine, but that does not controvert my argument, for before the butter separates it does get sour. A thermometer hanging in the room where the cream is kept will indicate the temperature of the cream at the time, and this may be either raised or lowered to about 54° after it goes into the churn, by adding cold or hot water, as the case may require, while the churn is in motion. The time occupied in churning has a great effect upon butter, and also upon the temperature of the cream in the churn; if the cream is at 55° when put into the churn, very fast churning will raise it too high, and soft, light-coloured butter will be the result, especially in warm weather; in cold weather the motion should be faster, in order to keep up the proper temperature. I have known entire churnings to be thrown into the hog-tub because one or two of these necessary conditions were not complied with. Even when the churn fails to separate the butter, we have one unfailing agent left in the form of heat, which never fails to burst the film of casein, but will not produce an article fit to be called butter, but it can be put to uses known to every good housekeeper. Some are in the practice of churning the whole milk; in this case it should have a temperature of at least 65° before going in the churn.—*Dairyman, in "Germantown Telegraph."*

PAPER MANUFACTURE.—A few gentlemen interested in the manufacture of paper met a few days ago at the Imperial Chambers, Adelaide, at the invitation of Mr. Edmund W. Wright, as the *Advertiser* reports, "to inspect various specimens of paper manufactured in the neighbouring colonies, and to consider whether the fibrous grass which grows so abundantly on our own sea coast would not be suitable for paper-making—either as raw material to be shipped to the other colonies, or to be worked up by a South Australian mill. A general conversation as to colonial paper, its price, quality, &c., took place, and it was eventually decided to collect a couple of bales of the South Australian material for shipment to the New South Wales and Victorian paper mills, in order that its adaptability to paper-making might be thoroughly tested, and also with a view to ascertain whether the paper makers in those colonies would be inclined to buy the material, and at what price. We believe the price now paid by our neighbours for Esparto Grass is £7 per ton, and it will be of interest to learn if we cannot supply them with a useful material at a lower price." *The Overland Telegraph.*

The Week's Work.

FEBRUARY 19.—*Parsnips* may be sown in suitable weather on soils adapted for them. Should the frost leave without rain, there will be a fine season both for sowing and smashing dry land; but should rain fall it may be otherwise. The crop requires a deep, rich, loamy but friable soil, in the highest state of cultivation. On such soils heavy remunerating crops may be grown in our southern districts for the supply of our large towns, but for cattle feeding the Parsnip is inferior to the Belgian Carrot in more ways than one. Land intended for Parsnips should be deeply stirred up in the autumn, thoroughly cleaned, and dunged with manure sufficiently rotten to be wholly incorporated by this time, so that when deeply smashed up before sowing, nothing shall be brought to the surface. About 6 lb. of seed are drilled, in rows 18 inches apart, into an acre.

Peas may be sown on calcareous soils, to which they are especially partial, and on the lighter kind of loams, as soon as the frost is out of the land. The land should be clean and in good heart. The old rule of sowing on any worn-out field full of weeds is out of date. Sow in drills sufficiently far apart for deep horse-hoeing, and in a good seed-bed, otherwise the young plants will rise slowly and feeble, grow slowly, and thus become liable to disease when the drought of summer sets in.

Beans.—Sowing may be done as soon as the land and weather will permit. They prefer a stiffish soil with plenty of lime in it—the crop, like Peas, being a large consumer of this earth; but with careful management may be grown on soils of a comparatively light texture. The land should be deeply cultivated and well cleaned and manured the previous autumn, and if this has been done, nothing more will be required at this season than to dibble or drill in the seed. Heavy land, if the drills or stetches are too high, may get a stroke of the harrows, the weather being dry, which will make a fine seed-bed. Light land should be rolled, as the more solid it is the better. Some split the drills, sow the seed with a hand harrow or horse drill, and cover up again, but all this work is worse than superfluous if the land was properly smashed up in autumn. Grown on the flat, the practice is similar, the land being cultivated and manured on the flat in autumn, so that nothing remains but to dibble or drill in just now. Care should be taken in both operations that the seed is properly covered, and no holes or ruts left for water to stagnate in; for although the Bean is a strong and deep-rooted plant, it is singularly obnoxious to stagnant water about its roots.

Spring Vetches may be sown for sheep feed or soiling in July. For this crop the land is prepared as for Peas and Beans, deep autumn tillage, thoroughly cleaned and manured on the flat, being essential to obtain a heavy remunerating crop. Naturally the Vetch prefers a rather stiffish clayey soil reduced by high manuring and labour to a fine mould, but weighty crops can be grown by high farming on any soil, but on friable land they require a bushel of Rye or Oats per acre to keep the crop from lodging and rotting, and when clayey land is in high order most farmers mix a handful of Rye with their seed Tares for this purpose. No pains should be spared to get the crop into a promising seed-bed, for as it comes in when southern pastures begin to get scorched and brown, the green forage it supplies is invaluable for all sorts of stock, and the crop may be followed by one of Turnips, which makes it all the more valuable on stock farms.

Cabbage Seed should be sown in seed-beds now for transplanting in May. The Cabbage nursery requires special management, so as to produce healthy hardy plants, free from club and liability to leaf disease. For this purpose the land should be deeply cultivated in autumn, thoroughly cleaned, limed, and manured with well-made stable dung, rich in ammonia, otherwise sulphate of ammonia should be applied; common salt is also necessary, with bone-earth and potash. All these are required by the Cabbage, while they are noxious to club beetles and their larvæ. Thus prepared and laid up to winter, it is seldom that more is required at this season than to harrow in the seed, about 1 lb. to the acre. In less nurseries 2 or 3 oz. may be sown on each square perch, and raked in, the plants being carefully thinned out in time to the proper distance, so as to acquire health and strength for transplanting.

Spring Fallows.—In places where the stubble lands cannot be autumn-fallowed, owing to the lateness of harvest and the early setting in of winter, soils adapted for Belgian and other field Carrots may be smashed up just now across the winter furrow. It may get a second turn lengthways, should it so require, to bring up Twitch and other weeds to the surface. Spring manuring does not suit Carrots, but better apply well made manure than sow on a poor soil without it, and the sooner in spring it is applied the better, as it very quickly incorporates with sandy soils at this season. Such soils may generally be worked in dry weather, the drills being opened and the manure carted, spread and covered in in the usual way. In this state the land may lie until the time of sowing. The lighter class of soils intended for Mangel Wurzel, Kohl Rabi, Swedes, and Turnips may be fallowed in the same way, in order to retain sufficient sap in the ground at the time of sowing to set up and support healthy plants. When worked and manured at the time of sowing soils of this class dry to such a degree in scorching weather that it is next to impossible to get a healthy braird, for two reasons—the absence of moisture and dry rotting of the manure. Hence the reason for fallowing at this season, so as to retain sap in the land and to get the manure incorporated as much as possible with it by the time of sowing, so as to supply food in the best way to the young plants.

Irrigated meadows, up to this date, are watered or sewaged in the usual way as during the previous months, but if the weather is at all favourable those divisions intended for early soiling or first mowing should soon be laid dry in our southern districts, and northward as the season advances; and this applies to early forage crops of every kind forced forward for the indoor feeding of stock. The first cutting should always be short, in order to avoid rotting in those places where the Grass is rankest, and, indeed, the rule to "mow short and often" is the safest and most profitable one, as it avoids harm, and at the same time secures the greatest weight of produce.

Grass-land.—Finish top-dressing as soon as practicable, renovating with fresh seeds where the finer Grasses have died out. Different kinds of soil require each suitable top-dressing prepared for it, and such should always be ready for application when the season permits. The Grasses and Clovers extract largely from the soil the phosphates and sulphates of lime, soda, and potash, and when they can no longer get the food which they require to support them they die out. Such substances, therefore, must be supplied, and instead of the old cumbrous plan of top-dressing such substances are now applied in the form of artificial manure with broadcast sowing machines—other artificial fertilisers being carefully mixed with ashes, as for Wheat sowing.

Lambing of breeding flocks now commences in our southern districts, and continues progressing northwards, ending about midsummer in the highlands of Scotland. Ewes and lambs require the most unwearied attention of the shepherd night and day, especially during cold frosty eastern winds, such as were experienced last week. Our improved breeds, which constitute the general stocks of our southern counties, are not perhaps the best mothers and nurses; and when their noisy followers begin to demand more milk than they have to give, they are liable to eat voraciously more Mangels and green forage than they are able to digest, which physics both themselves and their little ones. The old nostrums for curing scouring of ewes and lambs are out of date, prevention being the more advisable rule, by giving an increase of hay chaff, and meal, with less green food whenever ewes begin to eat too greedily; every attention being paid at the same time to shelter and warmth, such being essential to the secretion of healthy milk. *W. B.*

Notices to Correspondents.

*** We must beg for the indulgence of numerous correspondents, for whose communications we have not yet been able to find room.

AGE OF CATTLE FOR EXHIBITION: *Junior.* It dates from the day of birth.

GRASS-LANDS: *R. E.* A full report of both paper and discussion appears in the "Farmers' Club Journal," which is issued to members, and may perhaps be had separately at The Farmers' Club, Salisbury Square, Fleet Street, E.C. Full reports of the discussion and paper appeared on Monday last in the *Mark Lane Express* and *Bell's Weekly Messenger.*

MANURE: *C. Parsons.* Dr. Voelcker has taught us that there is much less loss from farmyard manure laid in heaps, and even spread in the field, than we have been accustomed to think. There has been no harm done, though you have during the frost carried the fresh manure from the boxes about the fields, provided you plough it in as soon as you have the chance.

SHELL MARL: *Bromley.* Judging from the specimens sent, we should conclude that you have a very valuable bed of shell marl; but it is impossible to state anything definitely without an analysis. It would be worth while to learn from a chemist how much lime and how much phosphoric acid it contains. It will probably be the best possible dressing for any light land you may have.

Markets.

ENGLISH WOOL.

We have had a better market, with somewhat hardening prices, and hopes are entertained that the long-expected but long-deferred turn for the better is now about to set in. The Colonial Wool sales opened in London on the 17th inst. with spirit, at somewhat enhanced rates, and low foreign wools have also been in more request, everything thus showing the same tendency.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.—s. d.	s. d.
FLEECES—Southdown hoggets	1 1	to 1 2
Half-bred ditto	1 2	— 1 2½
Kent Fleeces	1 3	— 1 4
Southdown ewes and wethers	0 03	— 1 1
Leicester ditto	1 2	— 1 3
SORTS—Clothing	0 10	— 1 6
Combing	1 0	— 1 8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, February 17.

Prime Meadow Hay	75s. to 80s.	Clover, old ..	..115s. to 120s.
Inferior do.	60 70	Inferior do. ..	..100 110
Kowen	50 65	Prime 2d cut	..100 110
Inferior do.	— —	Inferior do.	80 90
Straw	26 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, February 17.

Sup. Meadow Hay	84s. to 90s.	Inferior Clover ..	86s. to 110s.
Inferior do.	79 76	New do.	— —
New do.	— —	Straw	32 36
Superior Clover ..	123 130	JOSHUA BAKER.	

WHITECHAPEL, Thursday, February 17.

Fine Meadow Hay	78s. to 86s.	Prime old Clover..	120s. to 130s
Inferior do.	65 75	Inferior do. do. ..	90 100
Prime New Hay ..	— —	Prime 2d cut do.. ..	— —
Inferior	— —	New Clover	106 112
Straw	24 28	Inferior do.	85 95

COALS.—February 16.

Cowpen Hartley, 15s. 3d.; West Hartley, 15s. 3d.; Walls End Pittington, 19s. 6d.—Ships at market, 4; sold, 4; at sea, 20.

HOPS.

BOROUGH MARKET, February 18.

Messrs. Pattenden & Smith report a continued steady inquiry for both English and foreign, late rates being fully maintained. Yearlings are without change.

METROPOLITAN MEAT MARKET.—Feb. 18.

Best Fresh Butter .. .. .. 19s. per dozen lb
Second do. do. .. .. 16s. "
Small Pork, 5s. 0d. to 5s. 8d.; Large Pork, 4s. 4d. to 4s. 10d. per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, February 14.

There are a few more Beasts than on Monday last, but the supply is still small; trade is not brisk, yet there is a demand for choicest qualities at a small advance. The number of Sheep is not quite so large as last week; trade is scarcely altered, except that some few lots of choicest qualities realise a trifle over our top quotations. The very few Calves on offer are sold dearer. Our foreign supply consists of 3340 Sheep, and 11 Calves; from Scotland, there are 244 Beasts; from Ireland, 480; from Norfolk and Suffolk, 1340; and 809 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5 0	05 4	Best Long-wools	5 6	05 8
Best Shorthorns ..	4 8	—5 0	Do. Shorn	..	— ..
2d quality Beasts ..	3 0	—3 6	Ewes & 2d quality	4 0	—5 0
Best Downs and Half-breds ..	5 10	—6 0	Do. Shorn ..	..	— ..
Do. Shorn	..	— ..	Lambs	..	— ..
			Calves	4 8	6 4
			Pigs	4 0	6 0

Beasts, 2873; Sheep and Lambs, 18,180; Calves, 19; Pigs, 60.

THURSDAY, February 17.

We have, for a Thursday, a very large supply of Beasts, and nearly all English; the trade is very dull, and they cannot all be sold, although prices are lower. The number of Sheep also very much exceeds the demand; our top quotations must be considered extreme. Calves

very scarce, and dear. Our foreign supply consists of 49 Beasts, and 210 Sheep.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools	5 4	05 6
fords, &c. ..	4 10	05 2	Do. Short ..	..	.. —
Best Shorthorns..	4 6	—4 10	Ewes & 2d quality	4 0	—4 10
2d quality Beasts	3 0	—3 4	Do. Short ..	..	.. —
Best Downs and			Lambs ..	..	.. —
Half-breds ..	5 8	—5 10	Calves ..	4 8	—6 6
Do. Short ..	..	.. —	Pigs ..	4 0	—6 0

Beasts, 1201 ; Sheep and Lambs, 5890 ; Calves, 38 ; Pigs, 5.

MARK LANE.

MONDAY, February 14.

The supply of English Wheat to this morning's market was short, and factors succeeded in obtaining an advance of 1*s*. per qr. upon the prices of this day se'nnight. There was a fair attendance, and spring American was 1*s*. per qr. dearer, but we observe no change in the value of other descriptions of foreign. Barley, Beans, and Peas brought fully late rates. Oats sold at an improvement of 6*d*. per qr. Flour was unchanged in value.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	37	—47	Red.....	34	—46
— — fine selected runs..do.	39	51	Red.....	37	—48
— — Talavera	54	—56			
— — Norfolk			Red.....		—
— — Foreign	38	53			
BARLEY, grind. & dist.,26*s* to 30*s*. Chev.	39	—42	Malting ..	34	—38
— Foreign .. grinding and distilling	22	—25	Malting ..	30	—40
OATS, Essex and Suffolk	22	—24			
— Scotch and Lincolnshire.. Potato	24	—26	Feed		—
— Irish ..... Potato	23	—25	Feed	21	—24
— Foreign .....Poland and Brew	21	24	Feed	19	—21
RYE	32	—38	Foreign ..	33	—36
RYE-MEAL, Foreign					
BEANS, Mazagan .. 29*s*. to 32*s*. Tick	31	47	Harrow ..	31	—47
— Pigeon ....50*s*. to 56*s*...Winds.		—	Longpod..		—
— Foreign ..... Small	41	—43	Egyptian ..	38	—40
PEAS, White, Essex, and Kent...Boilers	32	—42	Suffolk ..	35	—43
— Maple, 41*s*. to 45*s*. .....Grey	32	—42	Foreign ..	33	—37
MAIZE			Foreign ..	29	—31
FLOUR, best marks delivered..per sack	30	—43			
— 2d ditto ..... ditto	28	40	Country ..	28	—40
— Foreign ..... per barrel	22	—25	Per sack..	29	—55

FRIDAY, February 18.

Heavy gales from the E. and N.E. have prevailed during the week. Foreign supplies having been moderate, and the news of the Sound being blocked up by ice promising to prevent arrivals from the Baltic for some time, the trade has assumed a more healthy tone, and in many instances prices of Wheat were in sellers' favour ; the business transacted, however, was by no means extensive, and we do not observe any confidence in higher rates. Prices of spring corn of all descriptions were against buyers, an advance of 6*d*. to 1*s*. per qr. being quoted in a few instances of the east coast. Flour moved off more freely than of late, but we cannot report any improvement in its value. The supplies off the coast consisted this week of 24 cargoes, of which with those left over from last week there remained for sale last night 50 cargoes. The floating trade exhibited firmness throughout the week, arrived cargoes of Wheat were in fair demand at about 1*s*. per qr. more money for selected cargoes, the advanced rates asked by holders interfering with business ; during the last two days there has been less inquiry, and no Wheat sale was reported yesterday ; Maize and Barley realised a fractional advance ; of Rye there was none off the coast. In cargoes on passage and for forward shipment, business remains suspended.

The arrivals of Grain of all descriptions during the week have been small. This morning's market was badly attended, and no disposition shown on the part of buyers to do business, the value of all articles remained nominally as on Monday.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	—	200	—	—
Irish ..	—	—	470	—
Foreign ..	2400	2800	7670	130
				— brls.
	2400	3000	8140	

LIVERPOOL, Feb. 15.—There was a fair attendance at the grain market. Wheat was rather a slow sale, at 1*d*. per cental advance over Friday's rates on both red and white. Flour is in better request at late rates. Beans dull ; Saida, 32*s*. Oats and Oatmeal without change. Indian Corn in moderate demand at former prices ; round yellow, 27*s*.

AVERAGES.

	Wheat.	Barley.	Oats.
Jan. 8	44*s* 5*d*	35*s* 11*d*	20*s* 1*d*
— 15	44 1	36 4	21 4
— 22	43 6	36 2	20 10
— 29	42 8	35 7	20 4
Feb. 5	42 2	35 3	20 8
— 12	41 9	34 6	19 10
Average ..	43 1	35 7	20 6

SEED MARKET.

The seed trade still rules quiet, partly on account of the severe weather, and partly on account of the apparent determination of the country houses to defer their purchases until the sowing season has actually commenced. Values of all descriptions of Clovers continue very firm, but in the absence of business there is no change to report. White Mustard seed is scarce and advancing in value. Rape seed is 1*s*. to 2*s*. per qr. dearer. Spring Tares are rapidly tending upwards. The stocks here are now reduced quite low, and the frost cuts off all further supplies. There are one or two parcels of large Scotch Tares offering ; the crop of last year is reported to be very short.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

To Purchasers of Farm Seeds.

CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices

JAMES CARTER AND CO, the Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

NOTICE TO PURCHASERS OF FARM SEEDS.—Unfavourable weather for the Turnip and other Roots standing for Seed having set in since Messrs SUTTONS' LIST of Reduced Prices was sent to press, Messrs. SUTTON respectfully advise their friends to observe that the NOTICE on first page of the NEW FARM LIST, limiting the time for which the present low prices are binding.

This Notice is offered to prevent disappointment or misunderstanding in respect of Orders which may be sent when the season is more advanced. The CATALOGUE is now ready.

Royal Berkshire Seed Establishment, Reading.—Feb. 10.

Mangel Wurzel Seed.

H. AND F. SHARP'E are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL TOP YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low.

Seed-Growing Establishment, Wisbech.

For Seed.

HALLETT'S TRADE PEDIGREE MARK

CHEVALIER BARLEY, which was awarded the First Prize three years in succession (1867, 1868, 1869), at the Birmingham and Midland Counties Show. Yielded, at Brighton, in 1869, to quarters per acre, weighing 57 lb. per bushel, and of PEDIGREE BLACK TARTARIAN and PEDIGREE WHITE CANADIAN OATS.

For price and full particulars of above, and of Pedigree Seed Wheats, apply to the Originator of the System, Captain HALLETT, R.N.S., Brighton.

Seed Counties, Suffolk and Essex.

DAVID GOLD MCKAY, SEED GROWER, Sudbury, Suffolk, begs to offer complete Collections of VEGETABLE SEEDS, carriage free, for

No 1 COLLECTION .. £3 | No 2 COLLECTION .. £2
No 3 COLLECTION .. £1

Alterations made to suit purchasers.

Any lady or gentleman ordering the above may depend on having really "Pure Home-grown Seeds." CATALOGUES free on application.

The "Old" Established Seed Warehouse, Sudbury, Suffolk.

FARM SEEDS of all sorts, best quality, extra clean.—PRICED LIST on application.

James Dickson & Sons.

Seed Growers, 102, Eastgate Street, Chester.

Grass Seeds for Laying-down Land to Permanent Pasture, Lawns, Bowling-greens, &c.

PETER LAWSON AND SON, The QUEEN'S SEEDSMEN, 20, Dublin Row, Lothian Road, Edinburgh, and at Edinburgh, offer their celebrated MIXTURES of the above, suitable for all soils and situations. Their extensive successful EXPERIENCE and CLOVERS have been most carefully selected, thoroughly cleaned, and cannot be surpassed in quality. Prices and full particulars on application.

Tables of Mixtures, and 65 pp. information is given in their "Agrostographia ; a Treatise on the Cultivated Grasses and other Herbage and Forage Plants," price 11 shed town, gratis to customers.

Genuine Farm Seeds at very Low Prices.

James Carter & Co

Seed Growers

Having harvested their Crops of FARM SEEDS in very fine condition, are prepared to supply their Choice Home Stocks at the following low quotations :—

CARTER'S PRIZE STOCK. Per lb. s. d.

CARTER'S IMPERIAL HARDY SWEDE. Acknowledged to be the best in cultivation 0 9

CARTER'S LONDON SWEDE. Immediate upper layer of the above 0 9

CARTER'S WARDEN PRIZE MANGEL. Remarkable for fineness of quality 1 0

CARTER'S CHAMPION YELLOW INTERMEDIATE MANGEL, the best oval-shaped variety.. .. .. .. 2 0

CARTER'S MAMMOTH PRIZE LONG RED MANGEL, a splendid variety, grows to a great size 1 6

DEVONSHIRE GREY-TOPPED TURNIP, of quick growth and good quality 1 0

IMPERIAL GREEN GLOBE TURNIP 0 8

☞ SPECIAL NOTICE.—J. C. & Co. wish it to be understood that the above low quotations are not binding after April to next.

Quotations for large quantities on application.

CARTER'S GRASS SEEDS.

JAMES CARTER AND CO., having completed their stocks of Grass Seeds, are prepared to execute orders from carefully cleaned samples of the choicest quality. The arrangements made by Messrs. CARTER to provide Mixtures of Grass Seeds, so as to suit the particular nature of the soil to be sown, materially lessen the possibility of failure.

When ordering Grass Seeds from J. C. & Co., it is only necessary to give a general description of the soil, and position of the land, when a suitable Mixture will be prepared.

CARTER'S GRASS SEEDS for EVERY DESCRIPTION of SOIL, 28*s*. to 32*s*. per acre.

Special low estimates for quantities of more than 10 acres.

LOOK TO YOUR GRASS LANDS.

CARTER'S RENOVATING MIXTURE should be sown on Meadow that have suffered from the past dry seasons. The Mixture includes the most desirable Grasses and Clovers for Hay Crop, and succeeding Grazing. Price 24*s*. per acre. Also a suitable Mixture for Grass Pasture ; Sow 8 to 10 lb. per acre. Price 16*s*. per acre.

For full instructions for Sowing and after-treatment, see CARTER'S ILLUSTRATED FARMER'S CALENDAR for 1870, post free 6*d*., gratis to purchasers.

JAMES CARTER AND CO.,
The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS
Address, 26, Seed Market, Mark Lane, E.C. ; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat ; 1862, for "Excellent Seed Corn and Seeds."

Vegetable, Agricultural, and Flower Seeds.
MISCELLANEOUS HARDY BEDDING PLANTS, SWEET PEAS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The Stocks of BULBS have all been procured from the best possible sources ; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the Catalogue and Prices with other houses.

Exotic Nursery, Tooting, Surrey, S.W.

Genuine Seeds of Superior Stocks.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

Complete Assortments of Choice VEGETABLE SEEDS, for

No 1	.. .. ..	£3 3 0	No 4	.. .. ..	£1 1 0
No 2	.. .. ..	2 2 0	No 5	.. .. ..	0 12 6
No 3	.. .. ..	1 1 0	No 6	.. .. ..	5 5 0

Complete Assortments of Choice Continental and English FLOWER SEEDS

No 1	.. .. ..	£2 2 0	No 4	.. .. ..	£0 15 6
No 2	.. .. ..	1 1 0	No 5	.. .. ..	0 10 0
No 3	.. .. ..	1 1 0			

Also Smaller Collections, from 5*s*. to 7*s*. 6*d*., free by post.

CATALOGUE of Vegetable and Select Vegetable and Flower Seeds, Potatoes, &c., for 1870, with practical Cultural Directions, will be sent Post Free upon application.

Their Seeds are all of the most select character, each variety being saved from the best stock known of its kind.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Potatos, &c., excepted.

Flower Seeds by Packet or Ounce.

CUCUMBER PLANTS, Wholesale and Retail.—Sorts : Telegraph, Walkling's Prolific, Sion House Improved, Victory of Bath, Kirkleet, Hall's Defiance, and Long Gun.

Likewise Choice TRICOLOR GERANIUMS and STRAWBERRY PLANTS.

G. WALKLING, Nurseryman, High Road, and College Park, Lewisham, S.E.

CUCUMBER, DICKSON'S FAVOURITE, or ALL THE YEAR ROUND.

We can confidently recommend this as one of the best Cucumbers grown, while it is second to none for general purposes. In Winter it grows about 1 foot long, and in Summer from 15 to 18 inches, is of deep green colour, very handsome, delicate in flavour, and particularly tender, crisp, and juicy. It very rarely fails, showing two to three fruit at every joint, and turns these out in full supply. Has done Cucumbers during the Winter, Spring, and Summer months. Per packet, 1*s*. 6*d*. and 2*s*. 6*d*., post free.

FRANCIS & ARTHUR DICKSON & SON,
The Old Established Seed Warehouse, 106, Eastgate Street, Chester

To Market Gardeners and Others.

SUTTON and SONS have in growth largely of the following excellent PEAS, and can supply them, very true to name, at low prices for large quantities :—

Suttons' Ringleader — the forwardest known	Veitch's Perfection.
Dickson's Favourite	Hair's Dwarf Mammoth.
Princess Royal.	Yorkshire Hero.
Blue Prussian.	Prizetaker Green Marrow.

For lowest prices, apply, stating quantities required, to SUTTON AND SONS, Seed Growers, Reading.

Notice to the Trade.
LAXTON'S NEW PEAS, ALPHA and SUPREME.

HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties ; also the HUNDREDFOLD, CHORUS, LAXTONII, and the entire stock of MORTIMER'S SURPRISE, CROWN PRINCE, and BROOM. They have also grown largely of LAXTON'S PROFUSION. Descriptions of all in CATALOGUE, which may be had on application. They have at present a good supply of the true RED and WHITE ITALIAN TRIPOLI ONION, and of the GIANT ROCCA, all of which are scarce this season.

HURST AND SON, 6, Leadenhall Street, E.C.

POTATOS.—Ashleaf Kidney Early, Handsworth, Golden Dwarf Early, Dalmahoy and Fluke, nice selected seed, can be offered cheap. Also the IMPROVED PEARL Forcing-house variety, for present use, or Seed, can be offered in quantity. Also SEAKALE, two years.

H. AND E. STIRZAKER, Skelton Nurseries, Doncaster.

NEW ROUND POTATO, UNION. NEW KIDNEY POTATO, BEACONSFIELD NEW PEA, EARLY EMERALD

For description see CHARLES TURNER'S CATALOGUE of SEEDS, which will be sent on application.

The Royal Nurseries, Slough.

To the Trade.

MONA'S PRIDE KIDNEY POTATO : about Two Tons of this excellent variety of Ashleaf Kidney to Dispose of. The above are a fine bold Sample, have been well kept, and have not sprouted, but are now just beginning to move. Also a few Sacks of WRINKLED MARROW PEA, Prince of Wales, very true ; about One Bushel of INVINCIBLE SWEET PEA ; and about 90 lb. of LONDON WHITE COS LETTUCE, a very select variety. Application for the above to be made to

JAMES MYATT, Officeham, Evesham

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Sleaford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

OPINIONS OF THE PRESS.

"R. Headley. Your Seedling Potatos were quite first-rate ; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 30, 1869.

"White Kidney. A very handsome ; a heavy cropper ; uniform in size ; ripening off all at once quickly and completely ; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 14."—*Gardeners' Magazine*, Jan. 30, 1869.

"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are like those also in flavour, but are more mealy."—*Journal of Horticulture*, Oct. 21, 1869.

Three Sacks per Cwt. The usual discount to the Trade.

ALFRED FRYER, The Nurseries, Mansfield, Nottinghamshire

BROCCOLI, ELLETSON'S NEW SURPRISE, Large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, J. & J. Elletson, of Thorngumbald, who have for many years been so successful in the cultivation of Broccolis, and who by great industry have got up at last well upon the old kinds as to produce the above variety, which possesses the hardiness of the parent, and surpasses it in every other point. Large, compact, close heads, giving the same distinctive character as given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to offer the above at 1*s*. per packet, or 10*s*. per pint.

CUCUMBER, FOSTER'S XL, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1*s*. per packet. Trade supplied.

EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

1870—SELECTED VEGETABLE and FLOWER SEEDS, SEED POTATOS, &c. (Carriage free). Fully DESCRIPTIVE PRICED LIST post free on application.
Carefully assorted Collections of VEGETABLE SEEDS, at 12s. 6d., 21s., 31s. 6d., 42s., 63s., and 105s.
Choicest assortments of Continental and other FLOWER SEEDS, from 5s. upwards. See List.
CATALOGUES of Forest, Fruit, and other Trees and Plants, also post free on application.

James Dickson & Sons.

(Old Established Nursery and Seed Business),
"Newton" Nurseries, and 102, Eastgate Street, Chester.

RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds. Carriage free.

Peas—The Earliest, 1 quart.
Princess Royal, 1 pint.
Sangsters' No. 1, 1 pint.
Pryetaker, 1 pint.
Advancer, 1 pint
Blue Scimetar, 1 pint.
Veitch's Perfection, 1 pint.
Harrison's Glory, 1 pint.
Beans—Taylor's Imperial Windsor, 1 pint.
Early Longpod, 1 pint.
Johnson's Wonderful, 1 pint.
Green Windsor, 1 pint
Royal Chelsea, 1 pint
French Dwarf, 1 pint
Scarlet Runners, 1 pint
Best Nutmegs, fine Red, 1 oz
Lonicelle, New Bearing, packet
Scotch Curled, packet
Brussels Sprouts, packet.
Broccoli—Early white, packet.
Purple Sprouting, packet
Walcheren, packet
Worcester, late white, packet.
Cabbage—Early Nonpareil, pkt.
Worcester Incomparable, pkt.
Wheeler's Imperial, packet.
Red Pickling, packet
Curled Savoy, packet
Carrot Early Scarlet Horn, 1 oz.
James's Intermediate, 1 oz
Imperial Altringham, 1 oz.
Cauliflower—Early London, pkt.
Celery—Fine solid white, pkt.
Fine Giant Red, packet.
Cress—Australian, 1 oz.
Plain, 4 oz.
Cucumber—Smith's fine Frame, packet
Stockwood Ridge, packet
Endive—French Curled, packet.
Leek—Musselburgh, packet
Lettuce—Champion Cabbage, packet
Paris White Cos, packet.
Bath Cos, packet.
Drumhead, packet.
Mustard—White, 4 oz.
Melon—Choice kind, packet.
Onion—Reading or Spanish, 1 oz.
James's Keeping, 1 oz
Blood Red, 1 oz
Silver Skinned, 1 oz.
Parsnip—Hollow Crowned, 1 oz.
Parsley—Fine Garnishing, per pkt.
Radish—Wood's Early Frame, 1 oz.
Early Scarlet, 2 oz
Turnip, mixed, 2 oz.
Spinach—Summer, 1 pint.
Winter, 1 pint
Turnip—Early Six-Weeks, 1 oz.
Early Green top, 1 oz.
Orange, 1 oz.
Tomato—Large Red, packet.
Vegetable Marrow, packet.
Pot Herbs, 4 packets.
For larger and smaller Collections and prices of other Garden Seeds, see DESCRIPTIVE LIST, free on application to
RICHARD SMITH, Seed Merchant, Worcester.

TO THE TRADE.—
2 yr. SEEDLING HOLLY (very stout).
ARBOR VITÆ, 6 to 9 inches, 1 to 1½ feet
SCOTCH FIR, 9 to 18 inches
PINUS LARICIO, 9 to 18 inches
PINUS AUSTRIACA, 9 to 18 inches
PINUS RIGIDA, 2 to 3 feet. A very fast growing Pine, and safe mover. Price on application to.
J. THORNTON, Heatherside Estate, Bagshot, Surrey.

GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb Bags, at 6d. per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application to
JOSEPH ELLIS and SONS, Sparkenhoe Works, Leicester.

NIGHTSOIL, MANURE CONCENTRATED.—Prepared under the direction of the Corporation of Rochdale. The above Manure is in the state of a Powder, so that it can be used with the Hand, Spade or Drill, and is free from the objectionable smell of Nightsoil.
In the preparation fire heat is not used, and all the natural properties of Nightsoil and urine are retained. It is at least eight times stronger than the nightsoil and ashes collected in towns; and the Purchasers may rely on the Manure being of an uniform strength, the purpose of the Corporation, in the experiments it has made, and in the manufacture, not being purely a money profit, but the improved Sanitary state of the Town, and also to solve the problem of the best practical Nightsoil so as to make it convenient for carriage and not offensive to use.
With all kinds of produce, Horticultural and Agricultural, its use has been highly satisfactory. The Corporation is prepared to deliver it at the Rochdale Station at £1 per Ton, or to arrange for its delivery where required.
Address Mr. HARESCEUGH, Town Hall, Rochdale.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is the only true Artificial Manure not produced. Its base is Peruvian Government Guano; it contains 24 per cent. of Soluble Phosphates, 6 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Nixon. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
Agents for the North of England—Messrs. Keighley, Maxsted & Co., Hull.
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Agents for South-West of England—Messrs. Wm. Smith & Co., Bristol.
Agent for Kent, Surrey, Sussex, Essex, Herts, and Middlesex—Mr. John G. Barry, 8, Old Jewry, London.
Agents for Scotland—Messrs. Richard Connon & Co., Glasgow and Aberdeen.
Messrs. Breyssig & Co., Leith, for Berwick, Roxburgh, Selkirk, and Fife.
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Agents for Ireland—Messrs. R. P. Gladstone & Co., Dublin.
Price £11 per ton, delivered free to Rail or Wharf in London.
REES and CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.
PERUVIAN GOVERNMENT GUANO, £13 10s. per ton.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. The results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. You generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
"To the Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."
Augustus Voelcker.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO can be obtained of the undernamed, in any quantity, from one bag upwards.
Address, JOHN G. BARRY,
8, Old Jewry, London, E.C.,
London Agent for "Rees & Co.'s Biphosphated Peruvian Guano Company, Limited."
The Biphosphated Peruvian Guano combines the stimulating power of Peruvian Guano with the nourishing properties of Superphosphate. It is sent out in sealed bags, and each bag is guaranteed by Sellers Price £11 per ton; discount for cash.
Write for Copy of Analysis by Dr. Voelcker, Consulting Chemist to the Royal Agricultural Society of England; Professor J. T. Way, of London; and other leading Chemists.

LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. NITRATE of SODA, supplied ex Ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices.

JOHN BENNET LAWES.
Offices: 59, Mark Lane, London.
Branch Offices: Market Street, Shrewsbury; 22, Eden Quay, Dublin; Womanby Street, Cardiff.
LAWES'S PATENT TURNIP MANURE.
LAWES'S DISSOLVED BONES.
LAWES'S SUPERPHOSPHATE of LIME
LAWES'S WHEAT, BARLEY, GRASS, and MANGEL MANURE
LAWES'S CONCENTRATED CORN and GRASS MANURE
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures.
AMERICAN and other CAKES at market prices.

THE LONDON MANURE COMPANY
(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE for Spring Crops
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
Offices, 116, Fenchurch Street, E.C.

SILVER SAND and PEAT, from Bedfordshire, in any quantity. This sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, Somers Town, Camden, N.W. Small orders executed at the Wharf, Maria Lane, Northern and Western Railway Depot.

STEVENSON'S ABYSSINIAN MIXTURE.—This most effectual remedy for Preventing and Destroying Plant Insects yet introduced, especially Mealy bug, Brown and White Scale, Thrip, Red Spider, Green and Black Fly, &c., without injuring the most tender foliage.
This invaluable mixture for the Destruction of Plant Pests can be very highly recommended; it has received the very highest commendations from some of the leading horticulturists in the country who have given it a fair trial. Testimonials on application.
Sold in bottles, at 1s. 6d., 3s. 4d. 6d., and 5s. 6d. each, with directions for use on each bottle. May be had of all Seedsmen, Nurserymen, and Seedsmen Sole Manufacturer, F. STEVENSON, Lark Hill, Timperley, Cheshire AGENTS WANTED.

GENUINE TOBACCO PAPER, of the finest quality 10d. per lb., or 8½ per cwt.
WILLIAM RUSHFORTH, Nursery man and Seed Merchant, Leeds.

GENUINE MEDICATED TOBACCO PAPER.—The most effective of all Fumigators. Terms, circulars and particulars on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

APPLEBY'S REGISTERED FUMIGATOR and COMPOUND TOBACCO PAPER (requires no Blowing).—Price upon application. For Testimonials see *Gardeners' Chronicle*, February 5, 1870, p. 104. Also GENUINE TOBACCO PAPER, in 2 lb. 10d. lb. packets.
HY. APPLEBY, Foreman to Messrs. Ivery & Son, Dorking, Surrey.

TOBACCO CLOTH and PAPER.—The cheapest and best article for Smoking Greenhouses and Destroying the Fly. Price, 12. 4d. per lb.; over 10 lbs., 12. 1d. Tobacco Paper, 12. per lb.; £4 4s. per cwt. Post-office Orders payable at Fleet Street.
JOSEPH BAKER, 11, Nelson Square, Blackfriars Road, S.E.; and 10, Gough Square, E.C.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Florists, &c.
In Tins at 1s., 2s. 6d., and 5s.
Trade Distributors, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—KEANE, Esq., Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY Bonded Warehouse, Sussex Wharf, Wapping, E.

GISHURST COMPOUND.
Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea, London, S.W.

COLIN PULLINGER'S newly-invented SULPHUR DISTRIBUTOR for VINES, PLANTS, &c., is acknowledged by every Gardener who has seen it to be the most simple and effectual machine invented for the purpose. Price, complete with bellows, 4s. Retail of all Ironmongers and Nurserymen.
Sole Wholesale Agents, ADAMES and GRANT, Chichester.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all Ironmongers, Wholesale of CHARLES J. BLACKITH and CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

RALPH WALLER and CO., 45, Dale Street, Manchester, Manufacturers of all kinds of GARDEN NETTING, &c. The serious injury done every spring to fruit crops by frost has proved to every Gardener the absolute necessity of providing some protection to the trees early in the year. If the blossom, in its earliest development, be slightly withered by frost, the vitality of the fruit germ is destroyed, and the fruit lost. In this climate, on the average of a century, there is not more than one year in 10 when the protecting influence of Netting, Mats, Canvas, &c., has been used for this purpose of protection, with more or less success; and we may now say, without fear of contradiction, that we have succeeded in manufacturing the only Netting which fully answers the requirements of this purpose. Without unduly nursing, it effectually protects the young germ, and does not impede the action of light and due circulation of air. Some other fabrics do this, and thus weaken the vitality of the tree altogether. Almost every large grower in the three kingdoms can testify to these facts.
The Nettings also make a beautiful shading for Hothouses in summer, and are cheaper than other fabrics on account of their great durability.
Netting (qualities): Nos. 1, 2, 3, in pieces of 30 yards long, 1½ yard wide. Tiffany, in pieces 30 yards long, 3 inches wide.
For prices, &c., apply to the above address—45, Dale Street, Manchester.

FOR SALE, a large, handsome GLASS HOUSE, 33 feet by 12, and 15 feet high
On View at 134, Queen's Road, Bayswater

First Prize,
ROYAL AGRICULTURAL SHOW, 1869,
Also 22 other PRIZES FOR LIQUID MANURE CART AND PUMP

BONE OR STONE CRUSHER FOR HAND OR POWER

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Tivoli Works, Cheltenham.

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F. BRABY AND CO., having laid down more extensive and Improved Machinery on their Deptford premises (Iron Wharf), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices and at very short notice

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.
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N.B. Open Tanks of different sizes packed one in another to save carriage

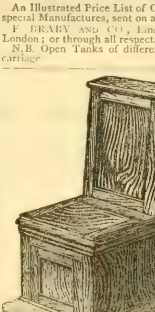

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From Mr. W. GIBBER,
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"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty, the supply of Dried Earth—to be no obstacle: as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have to-day had the finest Blooms this summer I ever had in my life. They have been admired by every one who has seen them."
"W. GILBERT.
"January, 1870."
Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

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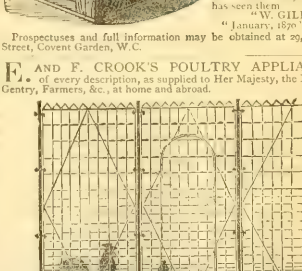

Improved make, extra strong GALVANISED "IRON-WIRE POULTRY RAILINGS (to be fixed to wood uprights or iron standards). Price 10s. per panel of 6 feet square. Doorways, 4s. 6d. each.
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The best Shading is "Frigi Domo" Netting.

White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS,
"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
"FRIGI DOMO" CANVAS.

Two yards wide	.. ..	1s. 9d. per yard run.
Four yards wide	.. ..	3s. 6d. per yard.
An improved make, 2 yards wide	..	1s. 6d. per yard.
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Scrim Canvas, 72 inches wide, 70 yards long, 5¼d., 6¾d., 7½d., 7¾d., and 8¼d. per yard
Hessian Canvas, 54 and 72 inches wide, 6¾d. and 8¼d. per yard; 4½ yards for lights.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom

THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for Flatting ever manufactured, as it is cool in working, takes at least five hours in going down, has comparatively little smell, can be washed, and will cover all sunk parts.
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Vases and Fountains, for the Garden and Conservatory.
ANDREW HANDYSIDE AND CO., Britannia Iron Works, Derby; and 37, Walbrook, London.
Five large Sheets of Designs and Price List free for six stamps.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO, 71, Cornhill, London, E.C; and Steam Plough Works, Leeds.

IRON HURDLES (Silver Medal of the Royal Agricultural Society):
SHEEP, 7s 6d; CATTLE, 4t 2d; OX, 5t 11d
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Caution to Gardeners.—When you ask for
SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.
S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years

GREEN'S
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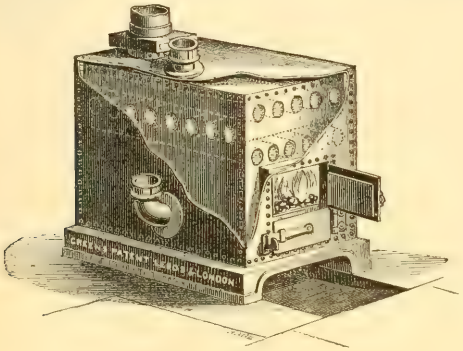

OBLONG BOILER.

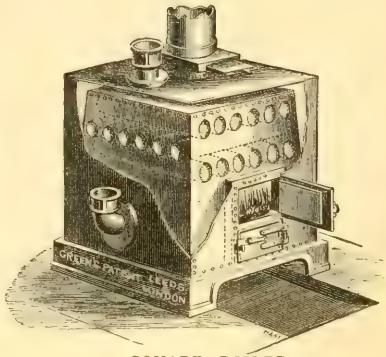

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast Iron Sole-plate, which answers the purpose of Foundation and Ashpit.
From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.
They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

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54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

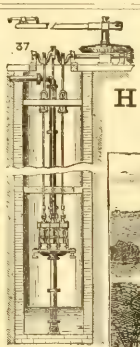

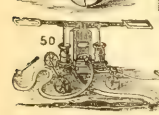

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HYDRAULIC ENGINEERS,
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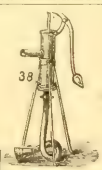

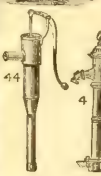

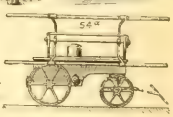

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

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No. 49a. GALVANIZED SWING WATER CARRIERS, for Garden use.
No. 50 and 54a. FARM and MANSION FIRE ENGINES of every description.
No. 38. PORTABLE LIQUID MANURE PUMPS, on Legs, with Flexible Suction.
No. 49. GARDEN ENGINES, of all sizes, in Oak or Galvanized Iron Tubs.
No. 54b. THE CASSIOBURY FIRE EXTINGUISHER, as designed for the Right Hon. the Earl of Essex.
No. 44. WROUGHT-IRON PORTABLE PUMPS of all sizes.
No. 4. CAST-IRON GARDEN, YARD, or STABLE PUMPS.
No. 39b. IMPROVED HOSE REELS for Coiling up Long Lengths of Hose for Garden use

S. OWENS AND CO. Manufacture and Erect every description of Hydraulic and General Engineers' Work for Mansions, Farms, &c., comprising PUMPS, TURBINES, WATER WHEELS, WARMING APPARATUS, BATHS, DRYING CLOSETS, GAS WORKS, Apparatus for LIQUID MANURE distribution, FIRE MAINS HYDRANTS, HOSE PIPES, &c., &c. *Particulars taken in any part of the Country. Plans and Estimates furnished.*

ILLUSTRATED CATALOGUES CAN BE HAD ON APPLICATION.

GREEN'S PATENT BOILER

WITH INVERTED CYLINDER ENGINE COMBINED.

Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
" Water, 1 Cubic foot " " "

UPWARDS OF FIVE HUNDRED OF THESE ENGINES AND BOILERS ARE NOW AT WORK, GIVING ENTIRE SATISFACTION.

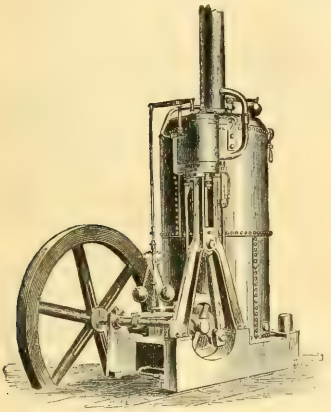

Horse Power	Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.		
1	"	3¼ in.	8 in.	"	4 ft. 0 in.	1 ft. 8 in.	.. ..	£35*
2	"	4	10	"	5 " 0	2 " 4	.. ..	£50*
3	"	4¾	10	"	5 " 6	2 " 4	.. ..	£60*
4	"	5½	12	"	7 " 0	2 " 4	.. ..	£85
6	"	6½	14	"	8 " 0	2 " 8	.. ..	£120
8	"	8	16	"	9 " 0	3 " 0	.. ..	£160
10	"	9½	16	"	10 " 0	3 " 4	.. ..	£185
12	"	10	18	"	11 " 0	3 " 8	.. ..	£200
14	"	11	18	"	11 " 6	3 " 10	.. ..	£220
16	"	12	20	"	12 " 0	4 " 0	.. ..	£250
18	"	12¾	20	"	12 " 6	4 " 2	.. ..	£285
20	"	13½	22	"	13 " 0	4 " 4	.. ..	£310
25	"	14½	28	"	14 " 0	4 " 8	.. ..	£380
30	"	15½	28	"	15 " 0	5 " 0	.. ..	£450
35	"	16¾	28	"	16 " 0	5 " 4	.. ..	£520
40	"	18	28	"	17 " 0	5 " 8	.. ..	£585

* The 1-Horse Power, if fitted with Water-Tank Sole-Plate and Governors complete, £5 extra. The 2 and 3-Horse Power, if fitted with Governors, £5 extra.

The Fly-wheel Shaft is made sufficiently long to admit a drum being fixed on if required, which can be supplied along with the Engine any diameter ordered, at an extra cost according to size.

The above Engines and Boilers occupy a very small space, and will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

The Boilers are fitted up with Strong Welded Tubes, intersecting the fire-box (varying in number according to the size of the boiler), and a mud hole is placed opposite each tube for the purpose of cleaning them out. They are tested up to 200 lb. pressure to the square inch.

The Foundation Plate answers the purpose of Feed Water Tank, in which the water is heated before passing into the boiler, and also of an ash pit, and no brickwork or foundation is required.

The Fire-box is so constructed that Coal, Coke, or Wood can be used as Fuel.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1293 :—

"*Vertical Engines* continue to merit growing patronage. They have their advantages over the horizontal engines, not only in construction as to the working and extra and unequal tear and wear of the piston and cylinder, but in their adaptation to light work—as grinding, chaff-cutting, and root-pulping. The small area of space they occupy is also greatly in their favour. Of late years very great progress has been made in the cattle feeding department of farm practice, hence the growing demand for engines of this class; but this is not all that must be reported, for they are evidently also entering into competition with their rivals in the threshing barn. They have long been in extensive use by builders for hoisting and pumping, being made locomotive by means of rails; and constructed on this plan they are proving equally effective and advantageous in the brick-field, quarry, wood-yard, large dairies for churning, laundries, for driving washing machines, and the like. Add to this the growing use of a heavier class of engines for steam culture, which necessitates as it were the employment of small vertical ones at the homestead, it is easy accounting for the growing popularity of the latter at all our implement exhibitions. In construction there is a close similarity on the whole, but in details of mechanism they are diversified. Something of course depends upon the special purposes for which they have been made, and whether they are to be used outdoors or indoors, and whether they are to burn coal or coke, and so on.

GREEN'S PATENT SILENS MESSORS,

OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

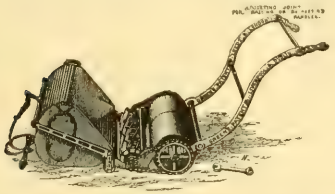

Every Machine is warranted to give entire satisfaction, and if not approved of, can be returned at once unconditionally.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—1st. Simplicity of construction, every part being free of access. 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

N.B. All Orders are executed on the day they are received.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	..	..	..	..	..	..	£4	0	0
20 "	22 "	..	..	..	..	..	3	2	6
16 "	17 "	..	..	..	..	..	2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

THOMAS GREEN AND SON,
SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application
J. JONES AND SONS, 25, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each.

6 ft. by 4 ft. Lights, 2 in thick, to glaze £0 5 0
" " Painted and Glazed 16 oz Sheet 0 11 0
" " with 16 oz portable Box, not painted 1 3 0
" " Painted four coats, and Handles on 1 8 0
" " Packed and Delivered in Railway Van 1 10 6
6 ft. by 8 ft., Double Lights, do 2 15 0
GREENHOUSES Per ft. sup.
Woodwork only Prepared and Painted 0 0 6
" Primed and Glaz'd with 16 oz. Sheet 0 0 9
" Delivered, and Fixed with Ironwork 0 1 6
" Painted four coats, two sides, ready for use 0 2 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

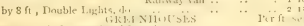

HOT-WATER APPARATUS
Complete, or the Materials supplied for Heating
GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c
HOT-WATER PIPES at wholesale prices: Elbows, T-Pieces, Syphons, and other Connections kept in stock.
WROUGHT and CAST-IRON CONICAL SADDLE, and IMPROVED PEILL'S, also Elliptic, Boilers, from 24s. each

Peill's Conical. *Tubular Boiler*

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Pans, from £5 10s. each.
CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from £10 each.

Portable Boiler

Patent THROTTLE and other VALVES. FURNACE DOORS, BARS, and FURNACE WORK of every description and size.
INDIA-RUBBER RINGS for Pipe Joints; *Elliptic Tubular.*
Sockets require no other packing, and are perfectly water tight

Goods, of the very best manufacture, delivered at Railway or Wharf in London
LYNCH WHITE,
(Old Barge Iron Wharf, Upper Ground Street, London, S.E. Surrey Side, Blackfriars Bridge)
Price List on application.

IRON GREENHOUSES CHEAPER THAN WOOD
Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.
Victoria Work, Bury St. Edmunds.

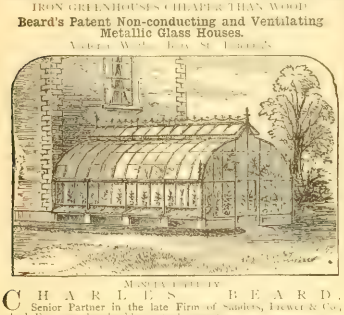

MANUFACTORY

CHARLES BEARD,
Senior Partner in the late Firm of Sanders, Drewer & Co.
which Firm was dissolved by mutual consent.
The Patentee wishes to announce his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866:
The First-class Certificate at the Grand Manchester Horticultural Show, 1867;
The Three First-class Certificates at the Royal Horticultural Show at Bury St. Edmund's, 1867, viz.—One Prize for Patent Glazing, without Putty; One Prize for Best System of Patent Ventilation; One Prize for S., F. & Co.'s Improved Flower Stands.
These much-approved Patent Systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c., &c.
Full particulars and Price-lists of Patent Houses, glazed with 26 oz Sheet Glass from 12s. 2d. per foot super and upwards; as also Illustrated Catalogues for 12 postage stamps, may be obtained on application to CHARLES BEARD, Victoria Horticultural Works, Bury St. Edmund's.
PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelop.

T. G. MESSENGER,
MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH.

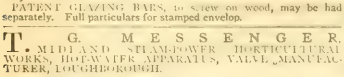

Honourable Mention awarded at the International Exhibition, 1862, and at the Dublin Exhibition, 1865, also a First-class Certificate by the Royal Horticultural Society.
T. G. MESSENGER, Patentee of many important improvements in Buildings and Implements employed in Horticulture, and which meet with unqualified approbation, is prepared to undertake the hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed.
Any House Glazed, single or double, with or without putty. The mode adopted by T. G. Messenger for Heating and Ventilating Forcing Houses is pathetically successful, drop lights entirely prevented.
HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof, or any part, through glass or entirely removed, at once placing the plant in the external atmosphere
T. G. MESSENGER'S BOILER possesses all the advantages of the Tubular and Saddle combined, has hollow transom bars, requires but a shallow stokehole, exposes as much surface to the direct action of the fire as can possibly be obtained, the whole of which can be easily cleaned; and it is an important fact, that out of upwards of 500 now at work made upon the improved principle not one has cracked
T. G. MESSENGER'S VALVE is single or double, is effective, simple, easy to work, and as durable as the pipe to which it is attached.
Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended. A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 33 stamps.

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	2 inch	3 inch	4 inch.
HOT-WATER PIPES, Nos. 6 & 7 cast in lengths	s. d.	s. d.	s. d.
trated sheet ... ... per yard	0 11	1 5	1 11
ELBOWS ... ... No. 12 on do each	1 4	2 1	2 9
TEE PIPES ... ... No. 3 to 10 on do "	1 8	3 0	4 0
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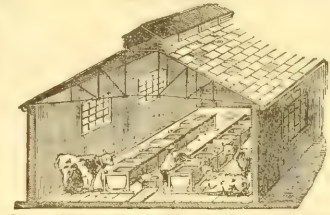

Their advantages are—Durability, not liable to, removable at pleasure, no Woodwork or Putty to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Channel, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, £5.
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Rosher's Garden Edging Tiles.

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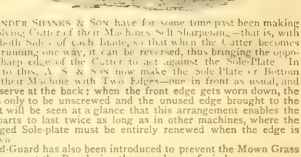

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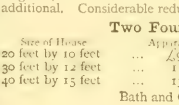

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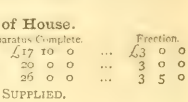

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Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15.

	16 oz. to the foot.	21 oz.
Fourth quality	15 0d.	19s 6d.
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Seconds	18s 0d.	26s 0d.
English	20s 0d.	27s 0d.

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Stock sizes, 16 oz., in 100 feet boxes, boxes included.

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11 by 0	12 by 0	13 by 9	14 by 0	s. d.	s. d.	s. d.
12 by 10	13 to 10	14 by 10	15 by 10	13 6	15 6	17 0
13 by 11	14 by 11	15 by 11				
14 by 10	15 by 12	15 by 11	16 by 11			
18 by 12	19 by 12	16 by 12	17 by 12			
16 by 13	17 by 13	18 by 13	..			
16 by 14	20 by 13	18 by 11	..	15 0	16 0	18 6
	17 by 14	18 by 14	..	16 10	17 0	to the foot
	20 by 15					

SMALL SHEET SQUARES (in 100 feet Boxes).

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in.	in.		4ths.	3rds	2nds.	Best.
20 by 12						
20 by 13			15 0z	12s 3d	15s 6d	16s 9d 18s 0d
20 by 14	} Per 100 feet	}				
20 by 15			21 0z	18s 0d	20s 0d	22s 0d 24s 0d
20 by 16						

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in.	in.	in.	in.	in.	in.	4ths.	3ds.	2nds.	Best.
6 by 4	7 by 5	8 by 6	9 by 7						
7 by 4	8 by 5	9 by 6	10 by 7	11 by 8	12 by 9	11s 3d	12s 6d	14s 0d	15s 6d
				12 by 10	13 by 10				

Per 200 feet.

10 by 8	12 by 9	12 by 10	14 by 10	14 by 12					
10 by 9	12 by 10	13 by 10	15 by 10						
11 by 8	13 by 9	13 by 10	14 by 11	15 by 11		11s 0d	14s 0d	15s 3d	17s 6d
11 by 9	13 by 10	14 by 10	15 by 11						

LARGE SHEET SQUARES, 15 oz., per 100 feet.

in.	in.	in.	in.	in.	in.	4ths	3ds	2nds	Best
15 by 10	14 by 12	22 by 12	22 by 19						
16 by 10	14 by 14	17 by 13	23 by 12	20 by 16					
14 by 11	15 by 12	23 by 13	20 by 17						
15 by 11	15 by 13	18 by 11	22 by 17			12s 3d	15s 6d	16s 0d	18s 0d
15 by 11	18 by 12	22 by 11	22 by 18						
16 by 11	19 by 12	21 by 14	20 by 18						
21 by 11	17 by 12	22 by 15	22 by 18						
13 by 12	18 by 12	24 by 15	24 by 18						

The above Prices are only for the Sizes stated; if a quantity of any other Size be required, a Special Price will be given.

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In Sheets for Cutting up, averaging from 6 to 9 feet super.

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4ths quality, per 300 feet case,	36s	4ths quality, per 200 feet case,	36s
3ds " "	42s.	3ds " "	42s.
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	Per cwt.—s. d.		Per gallon—s. d.
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SECONDS WHITE LEAD	28 0	BOILED OIL	3 9
GROUND PATIENT DRY.		TURPENTINE	3 9
8s. per cwt.		LINSEED OIL PUTTY,	
„ OXFORD OCHRE, 3d.		8s. per cwt.	
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„ RAW UMBER, 3½d. to		„ COACH VARNISH, 12s. to 14	0
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AND
AGRICULTURAL GAZETTE.

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☞ NOTICE. *The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will*, NEXT WEEK *and in* FUTURE, *be published on* FRIDAY *at* 2 P.M., *instead of* SATURDAY, *as hitherto.*

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JOHN CRANSTON'S ROSE CATALOGUE for 1869 is now ready, and will be sent post free on application.
The Nurseries, King's Acre, near Hereford.

To the Trade

STANDARD ROSES, £3 10*s*. per 100; dwarf, strong, 20*s*. per 100, best kinds. OLD ASHLEAF POTATO, 7*s* per cwt; RIVERS' EARLY ASHLEAF, 7*s* per cwt, fine and good.
W JACKSON, Blakedown Nursery, Kidderminster.

MANETTI STOCKS.
For immediate use, 30*s*. per 1000.
For summer use, second size, 25*s*. per 1000.
THOS. CRIPPS AND SON, Nurserymen, Tunbridge Wells.

Verbenas, Verbenas.

PHILIP LADDS is now sending out 30 new varieties of VERBENAS of 1869 at 3*s*. per dozen, in pots; also 24 New FUCHSIAS of 1869 at 3*s* per dozen, in pots.
Nursery: Bexley Heath, Kent

WANTED strong Cuttings of MRS. POLLOCK and CLOTH of GOLD GERANIUMS. State lowest Cash price per 100 or 1000.
C. WHITEHOUSE, Brereton Nursery, Rugeley, Staffordshire.

WANTED, Strong CLEMATIS FLAMULA. State size, and price per 100 or 1000, to
CHARLES NOBLE, Bagshot.

ACUBA POLLEN.—One dozen flowers for 1*s*., four dozen for 2*s*., sent post free on receipt of stamps by JOHN STANDISH AND CO., Royal Nurseries, Ascot.

Larch, Larch, Larch.

WITTY AND SON have still on offer a few Thousands of the above. Price and samples may be had on application.
The Nurseries, Cottingham, near Hull

Common Yews.

H. AND F. SHARPE have a fine stock of the above, from 5 feet high, bushy and well rooted, which they offer at a low figure
Seed-growing Establishment, Wisbech

NATIVE SCOTCH FIR; seedlings and transplanted, 1½ to 3 feet, and under; offered at very reduced prices by
WILLIAM URQUHART AND SONS, Dundee.

WANTED, EXTRA STRONG QUICKS; must be 5 feet in height. State quantity and price to
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

STRONG TRANSPLANTED LARCH, and all other Forest Trees, for present planting, quality superior; prices upon application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

TREES and SHRUBS, &c., strong, healthy, and well-grown. Priced CATALOGUES sent free on application.
MITCHELL, ARNOTT, AND CO., Nurserymen and Seed Merchants, Edinburgh; and 59, Mark Lane, London.

R. M. STARK, in consequence of changing his residence, offers his HERBACEOUS and ALPINE PLANTS, &c., containing many rarities, at greatly reduced rates.
LISTS on application
York Road, Trinity, Edinburgh, Feb. 23.

New Hardy Tree, Imperial Crab.

PAUL AND SON beg to offer, of this fine novelty, strong Standards 5 to 6 feet stems, or feathered Pyramids, 7*s*. 6*d* each; Dwarfs, 5*s*. each.
Old Nurseries, Cheshunt, N.

To the Trade.

L. T. DAVIS offers a large quantity of 2 and 3-yr. SEEDLING THORN QUICKS at very moderate prices, carriage paid to Belfast.
Ogle's Grove Nursery, Hillsborough, Co. Down.

FRESH SEED of CUPRESSUS LAWSONIANA and THUJA LOBBII, in any quantity. For prices, see pages 74 and 75 of our TRADE CATALOGUE, which may be had post free.
THOS. CRIPPS AND SON, Nurserymen, Tunbridge Wells.

Berberis, Berberis.

BERBERIS AQUIFOLIA.—Fine twice transplanted Berberis aquifolia, 1 to 1½ foot, 30*s*. per 1000; cheaper if 10,000 to 20,000 taken. Apply to
JOHN PERKINS, Sen., 52, Market Square, Northampton.

ALTERNANTHERA PARONYCHIOIDES.—Fine stock plants, full of cuttings, 12*s*. per dozen; smaller ditto sent free, 2*s*. 6*d*. per dozen.
H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich.

SUTTONS' COLLECTIONS of GARDEN and FLOWER SEEDS. For prices of various sized Collections see page 271 of this week's Paper.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

SUTTONS' HOME GROWN FARM SEEDS.
For present prices see p. 285 of this week's Paper.

SUTTONS' FARMERS' YEAR BOOK for 1870 is now ready, gratis and post free.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouses, 237 & 238, High Holborn, London.

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E

Seeds Direct from the Grower.

S. WALTERS, SEED GROWER and MERCHANT, Hilperton, Trowbridge Wilts See his 21*s*. Collection of VEGETABLE and FLOWER SEEDS in the *Gardeners' Chronicle*, Feb 12, p 207

Try a Scotch House for Your Seeds.

W. P. LAIRD AND SINCLAIR, SEEDSMEN, NURSERYMEN, and FLORISTS, Dundee, N B
Seeds pure, moderate in price, and true to kind
LISTS free on application

Transit Agency for Plants, Seeds, &c.

CHAS. JOS. BLACKITH, only surviving Partner of the late Firm of BETHAM AND BLACKITH, begs to announce that he intends in future to conduct Business at the same address, under the style of CHAS JOS BLACKITH AND CO, and hopes to receive a continuance of the favours of the Trade
COVE and Hammond's Quays, Lower Thames street, London.—Jan. 3.

Garden Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown from carefully selected stocks.

Farm Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks.

VEGETABLE and FLOWER SEEDS.—Select and comprehensive LIST of all the best varieties in cultivation, now ready, post free on application
MITCHELL, ARNOTT, AND CO., Nurserymen and Seed Merchants, Edinburgh; and 59, Mark Lane, London.

Carter's Index, February 26.

CARTER'S GENUINE SEEDS. See pages 272 and 274.—237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See page 272.
237 and 238, High Holborn, London, W C

CARTER'S GRASS SEEDS. See page 274.
237 and 238, High Holborn, London, W C

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 274.—237 and 238, High Holborn, London, W C

CARTER'S NEW ONIONS. See page 272.
237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES.
237 and 238, High Holborn, London, W.C.

For Seed.

HALLETT'S | TRADE PEDIGREE MARK. | BARLEY and OATS.

See Advertisement on page 293 of this Paper.

SUTTONS' GRASS SEEDS for ALL SOILS.
For present prices see p. 285 of this week's Paper.

Improvement of Grass Lands, at from 4*s*. 6*d*. to 9*s*. per acre.

SUTTONS' RENOVATING MIXTURE should now be sown 6 to 12 lb per acre
SUTTON AND SONS, Seed Growers, Reading.

PARIS, 1867. | SUTTONS' GRASS SEEDS for ALL SOILS. The PREMIER PRIX SILVER MEDAL for GARDEN SEEDS, GRASSES, and GRASS SEEDS, was Awarded to
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

GRAYSON'S GIANT ASPARAGUS, very fine 2-yr. roots, 2*s*. 6*d*. per 100, 21*s*. per 1000.
STEPHEN BROWN, Seedsman, &c., Weston-super-Mare.

JOHNSTONE'S ST. MARTIN'S RHUBARB (new).—Strong roots 2*s*. 6*d* each Usual discount to the Trade For description, testimonials, and List of Agents, see previous advertisements
W. P. LAIRD AND SINCLAIR, Nurserymen, Dundee, N B

SURPLUS STOCK of VICTORIA and LINNEAS RHUBARB and SEAKALE Roots, China ROSES, White and Yellow BROOM, strong Field-grown Privet Prices low, given on application to ISAAC DAVIS, Nursery, Ormskirk.

The Forwardest Pea known is

"SUTTONS' RINGLEADER."
Price 2*s*. per quart; cheaper in large quantities.

"The Earliest of All was

"RINGLEADER." Vide Royal Horticultural Society's report on Early Peas For description, illustration, and testimonials of this Pea, see p. 138 of this Paper (Jan. 29).
SUTTON AND SONS, Seedsmen to the Queen, Reading.

To the Trade.

WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and BADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

SEED POTATOS (SELECTED). PRICED LIST on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

BOVINIA, or New Cattle-Feeder Potato.—For price, &c., apply to the specially appointed agents
JAMES DICKSON AND SONS, 102, Eastgate Street, Chester.

True Early Rose Potato.

CHARLES SHARPE AND CO., Sleaford, have received a large consignment of the above from America, and are able to offer them in quantity. Price on application.

KNAPHILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTII, 5 to 6 feet, 30s. to 60s. per dozen. Transplanted April, 1869.

ABIES DOUGLASII, 6, 7, 8 to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868.

ABIES ORIENTALIS, 5, 6, and 7 feet, 5s. 6d. to 21s. each; splendid plants, moved April, 1869, 12 to 15 to 12 feet high, 15 and 20 feet in circumference.

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, 7 to 8 feet high, £5, £7 10s., £10 to £12 10s. per 100

The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbrazilliana, &c., large numbers, many of them 20 and 30 years' growth

CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 7s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869.

CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868

CEDRUS LEBANON, 6, 7, 8 to 10 feet. Moved September, 1868

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 12s. 6d. each

" " ARGENTEA, 2 to 4 feet, and as much in size, in numbers, 2s. 6d. to 10s. 6d. each

" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.

JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of some thousands of the finest plants, 5 to 8 feet high

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. Some are grafted

PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high

PICEA LASIOCARPA, handsome, most beautiful plants, 3, 4, 5, 6, 7, 8, and 9 feet high. All removed in 1868-69

PICEA MAGNIFICA, 3, 4, and 5 feet

PICEA PINSAPO, 4, 5, 6, and 7 feet, 21s. to 60s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869.

THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in the Nursery, and our stock is unequalled

THUJA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868

THUJA LOBBII, 8 to 10 feet high, and as much in circumference; transplanted April, 1869

THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet (small), 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868

WELLINGTONIA GIGANTEA, 5 to 6 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each. Transplanted August

PINUS AUSTRIACA, 4, 5, 6, 7, and 8 feet, £5 per 100. Transplanted Sept., 1868.

PINUS CEMBRA, 5 to 6 feet, 10 to 12 feet, 21s. to 42s. each

YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 5 feet of clear stem to 10 feet high

YEWS, IRISH, handsome plants, up to 10 feet high

HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe. Purchasers may select from all the ordinary sizes, together, many thousands of the following varieties:—

HOLLY, VARIEGATED SILVER and GOLD, 4 feet, 4 to 5 feet

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference

HOLLY, SILVER QUEEN, 4, 5, and 6 feet

WATERER'S HOLLY.—This variety originated in this Nursery; we have hundreds 5, 6, and 6 ft. high, 10 and 15 ft. in circumference.

PERRY'S WEEPING HOLLY.—Standards, 5s. 6d. to 21s. each

HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved April, 1869

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All removed since April, 1868

HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868:—

LAURIFOLIA and SCOLIMOIDES. Various, 6 to 8 feet high

HODGINS'. LATIFOLIA MAJOR.

YELLOW BERRIED. MYRTIFOLIA, &c.

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number.

N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 50 acres of ground, and for better rooted plants cannot be wished or obtained. The prices are fair and reasonable.

BOX, Green and Variegated, 4, 5, 6, to 8 feet.

BOX, do. do., fine pyramids, up to 8 feet

BAYS, standards and pyramids

LAURUSTINUS, standards.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.

AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 60s. per doz., and upwards.

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to the fruit and plants. We shall be pleased to supply—

RHODODENDRONS, in all the fishy plants, from layers, mixed kinds, £5 per 100, £40 per 1000. A dozen sent as sample on application.

RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s. per 100, and upwards.

RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000.

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 20 feet in circumference. There is probably no lot better adapted for standards than that we call nobilis elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of various other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s. per 100. Sample on application. Large and handsome plants by the 1000, £10 to £15 per 100.

AZALEAS, the very best kinds, nice plants, £10 per 100, upwards

AZALEAS, common kinds, £5 per 100.

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with flower-buds, £5 to £7 per 100, and upwards

ANDROMEDA FLORIBUNDA, £5 to £7 per 100, and upwards

HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in this spring, from 20s. to 42s. per 100

ERICA CARNEA, for window gardening, 30s. per 100, upwards

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay. Indispensable for Winter Gardening.

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes

N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS,

Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

CUPRESSUS LAWSONIANA GRACILIS,

Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen. A few fine Specimens, 10s. 6d. to 21s. each.

These two distinct and very beautiful hardy Evergreens were exhibited at the Royal Horticultural Gardens, London, on the 16th inst., and unanimously awarded First-class Certificates. They have been purchased by nearly every one who has seen them growing in the Nursery, and are fearlessly recommended to all admirers of first-class hardy plants.

ANTHONY WATERER, KNAPHILL NURSERY, WOKING, SURREY.

TO THE TRADE.

MESSRS. STUART & CO.,

WHOLESALE SEED MERCHANTS, 5, TAVISTOCK ROW, COVENT GARDEN, W.C.

SEED GROUNDS—NICE, FRANCE.

CALCEOLARIA HYBRIDA, tipped and spotted, extra choice.
CAMPANULA, fine forest species flowers.
CENTAUREA CANDIDISSIMA, true, English saved seed
" LYNDLEI, very ornamental foliage
CINERARIA HYBRIDA, choicest French named sorts
" " " " " "
" " " " " "
GERANIUM ZONALE TRICOLOR, from the finest collections in Europe
LOBELIA LITTLE GEM, pure white, with blue margin.
" MISS MURPHY, beautiful white variety
PERILLA NANKINENSIS VARIEGATA, saved from selected plants

PETUNIA HYBRIDA, choicest named French varieties
PINKS, finest forest English show flowers
PRIMULA FLORIBUNDA (Sweet Garden strain), white, extra
" " " " " tipped, extra
" " Dean leaved, white, splendid
" " " rose, splendid
" " scarlet, shaded, splendid, very showy.
" " blue, with white centre, quite distinct.
VILLAGE MAID, white, striped crimson extra
MELONS, all the newest and best kinds.
CUCUMBERS, all the newest and best kinds.

PRICES, TO THE TRADE ONLY, ON APPLICATION.

STUART AND CO., NICE and LONDON.

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most critical and choice Seeds are either home saved or have been saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

Now Ready, Free by Post,

GEO. JACKMAN & SON'S

DESCRIPTIVE PRICED CATALOGUE

(With Five Engravings of Clematis)

OF FRUIT and ROSE TREES, CLEMATISES, AMERICAN PLANTS, CONIFERS, EVERGREEN and DECIDUOUS TREES, SHRUBS, and FOREST TREES, &c.

"This Establishment, long favourably known for its fine collection of Hardy Plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*

WOKING NURSERY, SURREY.

CAREFULLY SAVED GARDEN SEEDS.

ARTHUR HENDERSON & CO.'S

CATALOGUE OF CHOICE VEGETABLE AND FLOWER SEED NOVELTIES

Is now Published, and can be forwarded Post Free on application.

The VEGETABLE SEED SECTION contains—

Selected LISTS of the best varieties of each kind most worthy of cultivation, also some excellent new sorts of both VEGETABLE and FLOWER SEEDS of sterling merit; attention is also directed to the Pine-apple Compact-top BEET (the finest and richest flavoured variety extant), carefully saved, true from the original stock. Also the new DWARF WATERLOO BEET; top leaves rich metallic crimson; growth true, even, and regular. This beautiful foliaged variety may with advantage be cultivated in the flower garden as a border, ribbon, or edging plant; its root is a trifle larger than the Pine-apple Compact-top, flavour excellent, full of a sweet saccharine juice, colour crimson, texture tender and uniform throughout.

The FLOWER SEED SECTION contains—

Imported GERMAN FLOWER SEEDS in Collections; Choice Strains of FLORISTS' FLOWER SEEDS; a careful LIST of FLOWER SEED NOVELTIES of the season; HORTICULTURAL REQUISITES of every kind, KNIVES, PROTECTING MATERIALS, HORTICULTURAL MANURES, &c., &c.

N.B. Everything in this Catalogue is priced.

PINE APPLE PLACE, MAIDA VALE, LONDON, W.

☞ **All Seeds Carriage Free.**

THE FIFTY DOLLAR POTATO.

JAMES CARTER & Co.

HAVE IMPORTED A LIMITED QUANTITY OF

BRESEE'S KING OF THE EARLIES POTATO.

"Ten guineas were paid for one tuber in America." Much earlier than any other American variety.

Price 6s. per lb.; 7 lb. for 40s.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, W.C.

SEED POTATOS.

H. & F. SHARPE

HAVE FINE STOCKS OF

THE FOLLOWING VARIETIES OF SEED POTATOS,

Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KIDNEY
" MYATT'S PROLIFIC KIDNEY
" AMERICAN ROSE KIDNEY
" RIVERS' ROYAL ASHLEAF KIDNEY
" DAINTREE'S EARLIEST
" KING
" DRUMMOND'S PROLIFIC ROUND
" DALMAHOY
" FOXE'S SEEDLING
" OXFORD

EARLY FORTYFOLD
" FLOUR-BALL
" COCKNEY
" BRITISH QUEEN
" MARTIN'S GLOBE
PATERSON'S VICTORY, true
WILES'S IMPERIAL KIDNEY
BARRON'S PERFECTION
WALKER'S EARLY REGENT
DUKE KIDNEY " ROCKS.

SEED GROWING ESTABLISHMENT, WISBECH.

J. C. WHEELER & SON'S

CELEBRATED SEED POTATOS.

WHEELERS' GLOUCESTERSHIRE KIDNEY

We can recommend for earliness, flavour, size, and crop. In comparison with the Ashleaf it is as early, whilst it produces nearly double the crop, and is altogether superior to that variety. We can recommend it with the most perfect confidence, and have much pleasure in referring to the annexed letters, speaking in high terms of its earliness and excellence.

3s. 6d. per peck; 12s. per bushel (56 lb.)

"I have grown your Gloucestershire Kidney here for the last five years with all other early kinds, and find yours to be much the earliest."—Mr. SELLS, *Gardener to the* Right Hon. Lord Penrhyn, *Penrhyn Castle*

"Your Gloucestershire Kidney, which I had from you last year, turned out so well that I feel I cannot do better than have some more this year. I had not a diseased one among them, and double the crop from any I have had for the last seven. They finished in these premises."—NORMAN CUTHBERT, *Tredegar Cottage*

"I grew last year more than treble of Gloucestershire Kidneys per perch, and of first rate quality. My main say: Early and I think he is right."—Rev. JAMES I. MAY, *Vicar Pulborough, North Devon.*

WHEELERS' MILKY WHITE.

4s. per peck; 14s. per bushel (56 lb.)

"I was greatly delighted with the Milky White Potato last year. It was the best sort I ever grew, and just what suited me."—JOSEPH ROBINSON, *Washamstead, Bedford*

"Your Milky White Potatos are all you say of them, and more. I have now tried them three years, and could not wish for a better Potato in every way. They have been very free from all disease, and came off the ground before the autumn rains set in. Those who have never baked some of the largest ones should do so. The numerous have given them sorts them to a man. I have no thanks I again and again for recommending them."—Rev. A. WOOD, *Castlemorton*

COCOA-NUT CABBAGE. 1s. per packet, Post Free.

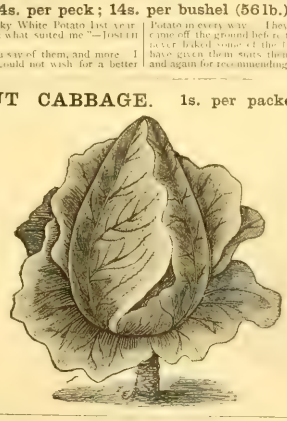

THE COCOA-NUT CABBAGE IS A NEW AND VERY EARLY VARIETY, PERFECTLY DISTINCT, OF MOST EXCELLENT FLAVOUR.

It should be planted 18 inches apart.

Will yield an early and continuous supply.

This Cabbage is a decided novelty, and a great acquisition.

WHEELERS' TOM THUMB LETTUCE.

Large packet, 1s.; Smaller packet, 6d., Post Free.

"Your Tom Thumb Lettuce is a wonderful favourite with my family and friends. For a summer Lettuce I have never seen its equal."—GEORGE F. A. FLOWER, *Stafford Farm*

"Wheeler's Tom Thumb Lettuce is a capital variety for winter and early spring."—THOMAS RIVERS, *Sawbridgeworth.*

"Your Tom Thumb Lettuce is a very good sort; it is the best I ever had."—T. YOUNG, *Gardener to* Baron de Rutzen

"Manor WARRY would thank Messrs. Wheeler to send him another packet of their celebrated Tom Thumb Lettuce."—*Westbrae Hill.*

"Be good enough to send me another packet of the best Lettuce I grown, Wheelers' Tom Thumb."—H. P. WEBB.

PATERSON'S SUPERB MELON. 1s. per Seed.

This extraordinary Melon was raised during the last summer (1869) at Pontypool Park, by Mr. Paterson, Gardener to Mrs. Hanbury Leigh; it weighed 24 lb., and measured 42 inches in circumference. It was raised from the Netted Scarlet-flesh, crossed with the Black Rock; of exquisite flavour, and very handsome, with fine rich scarlet flesh; and, as seen by the dimensions given, of extraordinary size and weight.

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HOME-GROWN SEEDS

FOR THE KITCHEN GARDEN. FOR THE FLOWER GARDEN.

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Will produce a succession of useful Vegetables and choice Flowers for One Year's Supply.

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N.B.—Particulars of these Collections may be had on application, and any article not required can be omitted, and others substituted, according to the wish of the Customer.

The best Potato for the Main Crop is

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Raised and selected from among 40 Seedlings of the Fluke. Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed.

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CONTENTS.

1 quart Suttons' Kingfeather Pea
1 do. Dickson's Favourite do.
1 do. Veitch's Perfection do.
1 do. Sumetar do.
1 do. Victoria do.
1 pint Longpod Beans
1 do. Taylor's Windsor do.
1 do. Green Windsor do.
1 do. Monarch do.
1 do. Scarlet Runner do.
½ do. Dwarf do.
½ oz. Beet, Suttons' Dwarf Red
1 packet Kale, Curled Scotch
1 do. do., Cottager's
1 do. Brussels Sprouts
1 d.. Broccoli, Superb Early White
1 do. do., Dilcock's Bride
1 do. do., Purple Sprouting
1 do. do., Walcheren
½ oz. Cabbage, Suttons' Imperial
¼ do. do., Wheeler's do.
¼ do. do., Nonpareil
¼ do. do., Hill's Incomparable
1 packet do., Pickling
1 do. Couve Tronchuda
4 oz. Mustard, White
2 do. Cress, plain
1 do. do., Curled
1 packet do., American
1 do. Savoy, Green Curled
1 do. do., Drumhead
1 do. Cauliflower, Londan
1 do. Celery, Superb White
1 packet Celery, Superb Pink
1 do. Cucumber, Stockwood
1 do. do., Best Frame
1 oz. Onion, Improved Reading
1 do. do., Brown Globe
¼ do. do., Silver Skin
¼ do. do., Blood Red
1 packet Melon, best flavoured
1 oz. Carrot, Early Horn
1 do. do., Long Red Surrey
1 do. do., Intermediate
2 oz. Parsnip, Student
1 packet Endive, Green Curled
1 do. Leek, Musselburgh
1 do. Thyme
1 do. Winter Savory
1 do. Lettuce, Suttons' Superb White Cos
1 do. do., Black Seeded Bath Cos
1 do. do., finest mixed
1 do. Vegetable Marrow
1 oz. Parsley, fine Curled
1 do. Turnip, Suttons' Short top Stonevale
1 do. do., Green-top do.
1 do. do., Orange Jelly
1 packet Tomato, mixed
2 oz. Spinach, Round
2 do. do., Prickly
2 do. Radish, Beck's Short-top
2 do. do., Scarlet Olive
2 do. do., Mixed Turnip

Should any of the above not be required, Messrs. SUTTON will be pleased to substitute others in the place of those omitted.

For further particulars of SUTTONS' HOME-GROWN SEEDS SEE

SUTTONS' SPRING CATALOGUE

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COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 15s. 6d., 21s., 42s., 63s. and 84s. each

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Cash with Order.

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LOUIS VAN HOUTTE begs to state that his CATALOGUE, 1870-131 H J, is ready for hand from his Agents, Messrs. R. SILBERLING & SON, 7, Harp Lane, London, E.C. This Catalogue contains the HARDY PERENNIALS, ORNAMENTAL TREES and SHRUBS, CONIFERS, ROSES of all kinds; the favourite GREENHOUSE PLANTS, in dreams, in roots, ACHIMENES, WEIGELAS, EUCODOMAS, PLECTOPOMAS, GESNERAS, TYDÆAS, and GLOXINIAS; also FRUIT TREES in general.

LOUIS VAN HOUTTE'S SEED CATALOGUE for 1870 is now ready, and is sent to his usual Customers.

The GLADIOLUS LEMOINEI is enumerated in LOUIS VAN HOUTTE'S Catalogue, No. 130-131 H J, but their description can only be found in the French issue of the same Catalogue.

Parts 4, 5, and 6 of Vol XVIII of the FLORE have appeared: their contents can be found at p. 1009 of the Seed Catalogue. Price of subscription for the Volume of 12 Parts, £1 10s. (more than One Hundred highly-coloured Plates, Woodcuts, miscellaneous matter, &c.)

Parts 7, 8, and 9, will appear in the first week of March, and contain the Chronological List of the best Belgian Plants, their Merits and Winners, and many other Miscellaneous Matters; also highly-coloured Plates, Descriptions and Mode of Cultivation of CALADIUMS, enclosed. Your florists' and others' friends John Gould Veitch (double plate), × Imantophyllum cyrtanthiflorum, Gloxinia Isis, Cypripedium barbatum grandiflorum, Campanula soldanelle flore-pleno, Pentstemon Hendersonii, Alstroemeria tricolor and pallida, Datura Brugmansiai sanguinea double plate), Gloxinia Louis, quite of novel colour; Antigonon Leptopus (double plate), Deschampsia caespitosa, the Tufted Hair-grass, Barbarea praecox, Wall-flower (double plate); Hydrangea stellata prolifera, Hemerocallis disticha flore pleno, Cattleya labiata (double plate), Eucodoma (Achimenes) purpurea, nana, multiflora (double plate), Gunnera scabra (double plate), Lelia pracstans.

Ghent Royal Nursery, February 26.

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"SIR,—You will oblige by forwarding the following seeds for the above Society at your earliest convenience—at the same time I must congratulate you on the quality of seeds the Society has received from you at former periods. Trusting the present will be as good,—I remain, yours, &c.,

"Cwm Avon, Taibach, March 16, 1868. "C. WILLIS, Secretary.

"DEAR SIR,—Annexed I beg to hand you a small order for seeds. Post-office Order to cover. The seeds I received and others you sold last year proved to be of first-class quality, as they have always hitherto done. I may also add that your peculiar system of selling small packets of choice foreign flower seeds is a boon to persons, like myself, having only a small garden.—Yours faithfully, "THOMAS WELCH."

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4,000 Silver Fir, 2 to 3 feet	5 0
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Apply to B. WHITHAM, Nurseries, Reddish, near Stockport.

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Half-standard and full Standard trained PEACHES and NECTARINES, 5s. to 7s. 6d. each.

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Raspberries, Evergreens, &c.

ROBERT CORNWELL AND CO. offer RASPBERRIES, Cromwell's Seedling, per 100, 12s.; Carter's Prolific, 10s.; Red Antwerp, 10s.; Fillbasket, 10s.; Double Bearer, 10s.; Leaves White, 20s.; Yellow ditto, 20s.; Black Cap, 20s.; WHERRY'S EARLY ASPARAGUS, 2, 3, 4, and 5 yr.; RED and WHITE CURRANTS, Bushy LAURELS, PRIVET, Variegated and Green BOX, LAURUSTINUS, ARBOR-VITÆ, ROSES, &c., Cheap.

Opposite Red Lion, Barnet

SURPLUS STOCK, at reduced prices.—10,000 fine Dwarf ROSES on Manetti, Pyramid PLUMS of sorts, ARBOR-VITÆ, MAHONIA AQUIFOLIA, RED CEDARS, Portugal LAURELS, EVERGREEN OAKS, SWEET BRIAR, SPRUCE FIR, and BALM of GILEAD ditto, ENGLISH OAKS, SYCAMORE, &c. Sizes and price on application to

THOMAS PERKINS, 42, Drapery, Northampton.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated Hollies, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.

Samples, with height and price, on application to

JAMES VIRGO AND SON, Nonesuch Nursery, Guildford

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s. per dozen

Dwarf-trained pear sweet CHERRIES, ten leading sorts, 15s. per doz.

Standard Black Tartarian and Bigarreau, 3 yr., 5s. per dozen, 35s. per 100

Rider Trained CHERRIES, 30s. per dozen.

PYRAMIDS and STANDARDS, 6s. per dozen.

Half-standard HIGH BUSHES, 2-foot, splendid stuff, best sorts, 50s. per 100

Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen

" Common LAUREL, 6 to 8 feet, 45s. per 100

THOS. KNIGHT, Florist, Ryecroft Nurseries, Hoddesdon, Sussex

MELON, GOLDEN QUEEN (STUART & MEIN).—Fruit of medium size, 2 to 3¼ lb. in weight, round shaped, irregularly netted, extremely thin-skinned, juicy, tender, melting, and of delicious flavour; a beautiful green-fleshed variety. It has been awarded many first prizes during the past two seasons. In July, 1869, it was awarded the 1st prize at the Royal Horticultural Society's Exhibition, held at Manchester. 2s. per packet.

Second CATALOGUE of VEGETABLE and FLOWER SEEDS, also of HYBRID GLADIOLUS, may be had on application.

STUART and MEIN, Kelso, N.B.

Leicester Abbey Nurseries.

THOMAS WARNER begs to remind intending Planters and the Trade that, in addition to his extensive General Nursery Stock, he has the following in large quantities, of unsurpassed quality, and offered at most reasonable prices. CATALOGUES, Wholesale or Retail, may be had free on application.

APRICOTS, Standard Maiden, Moor Park.

CHERRIES, Standards, Dwarfs, and Pyramids.

CURRANTS, White, Red, and Black.

PEARS, Standards and Pyramids.

PLUMS, Standards, chiefly Victoria

MANETTI STOCKS, 3 and 4 feet.

ARBOR-VITÆ (of sorts), single specimens, 1½ to 5 feet.

ACUBA JAPONICA, single specimens, 1 to 2 feet

BOX, 1 foot (of sorts), 15s. per 100

CHESTNUTS, Scarlet and White, Standards, 5 to 8 feet.

ELM, Ornamental (of sorts), Standards, 4 to 12 feet

LARCH, Common, English, 4 to 8 feet

POPLAR, New Silver-leaved, 8 to 10 feet

OAK, English, Transplanted, extra fine, 3 to 5 feet

SPRUCE FIR, single specimens, 1½ to 3 feet

ROSES, Dwarf, in most of the new and newer kinds

Juniperus hibernica.

H. LANE AND SON, having a splendid lot of beautiful-shaped trees (unsurpassed for symmetry), 4 to 5 feet high, transplanted spring, 1869, beg to offer them to the Trade at £7 10s. per 100.

The Nurseries, Great Berkhamsted, Herts

Araucaria imbricata.

H. LANE AND SON, having a very large stock, beg to offer them at the following greatly reduced prices, viz.: 5 to 6 feet, 7s. 6d. each; 4 to 5 feet, 5s. each; 3 to 4 feet, 3s. 6d. each; 12 to 15 feet, 10s. An inspection is earnestly solicited

The Nurseries, Great Berkhamsted, Herts.

ECHEVERIA SECUNDA GLAUCA.—This charming succulent plant, which is so much used in the London Parks, can be supplied in quantity, 2s. per 100; 3 to 12 feet, 8s.; 12 to 14 feet, 10s. An inspection is earnestly solicited

The Nurseries, Great Berkhamsted, Herts.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester.

DOUBLE WHIN, GORSE or FURZE, ULEX EUROPÆA FLORE-PLENO.

Excellent plants, all strong, transplanted, specimens included—

9 to 15 inches, 2s. 3d. per dozen, 12s. per 100

12 to 18 inches, 3s. per dozen, 13s. per 100

18 to 29 inches, 4s. per dozen, 16s. per 100

18 to 24 inches, 5s. per dozen, 20s. per 100

The above can be supplied by the 1000, in pots 9 to 12 inches, 5s. per dozen, 25s. 6d. per 100. See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock.

COVERT PLANTS.—Spruce, 2, 3, and 4 feet, thrice transplanted, Mahonia aquifolia, 1, 2, and 3 feet, twice transplanted; Evergreen Privet, 3, 4, and 5 feet, twice transplanted; Rhododendron, 2, 3, and 4 feet, extra bushy, and with buds; Berberis vulgaris, and B. dulcis, 2, 3 and 4 feet, strong; Gorse, 1½ to 2 feet, transplanted last April; Yellow and White Broom, 3, 4 and 5 feet, ditto; Dwarf and Mountain Pine, twice transplanted; Strawberry, Sweet Brier, and Spiræa, 2, 3 and 4 feet; and all other desirable plants for forming Game and Fox Coverts, of superior quality and capitally rooted Samples and special low prices upon application

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

GRASS SEEDS, FOR LAYING DOWN LAND

TO PERMANENT PASTURE, LAWNS, BOWLING-GREENS, &c.

PETER LAWSON & SON,

THE QUEEN'S SEEDSMEN,

20, BUDGE ROW, CANNON STREET, LONDON, E.C., and at EDINBURGH,

Offer their celebrated MIXTURES of the above, suitable for all soils and situations. Their extensive Stocks of GRASSES and CLOVERS have been most carefully selected, thoroughly cleaned, and cannot be surpassed in quality. Prices and full particulars on application.

Tables of Mixtures and every information is given in their "AGROSTOGRAPHIA; a Treatise on the Cultivated Grasses and other Herbage and Forage Plants;" price Half-a-Crown, gratis to customers.

CARTER'S "PRIZE MEDAL" FARM SEEDS

AT VERY LOW QUOTATIONS, FOR IMMEDIATE PURCHASE.

THE ROYAL SEEDSMEN

CARTER'S PRIZE SWEDE and TURNIP.

	Per lb. s. d.
CARTER'S IMPERIAL HARDY SWEDE, (acknowledged to be the best in cultivation) ..	0 9
CARTER'S LONDON SWEDE, an immense cropper	0 6
LIVERPOOL SWEDE and other ordinary varieties .. ..7d. to	0 10
DEVONSHIRE GREY STONE TURNIP, of quick growth and good quality..	1 0
POMERANIAN WHITE GLOBE TURNIP (the largest and best White Turnip)	0 9
LINCOLNSHIRE RED GLOBE TURNIP ..	0 9
IMPERIAL GREEN GLOBE TURNIP ..	0 8
CARTER'S CHAMPION HYBRID TURNIP, green-top or purple-top, splendid stocks ..	0 10

Ordinary stocks cheaper.

THE ROYAL SEEDSMEN

CARTER'S PRIZE MANGEL.

	Per lb. s. d.
CARTER'S WARDEN PRIZE MANGEL, remarkable for firmness of quality	1 0
CARTER'S MAMMOTH PRIZE MANGEL, the finest long red variety	1 6
CARTER'S NEW CHAMPION INTERMEDIATE MANGEL, the best oval-shaped variety	1 0
ELVETHAM LONG YELLOW MANGEL ..	1 0
IMPROVED RED GLOBE MANGEL	1 0

Ordinary stocks cheaper.

SOLANUM CAPSICUM, PRINCE OF WALES.

This charming addition to our Plants for decorative purposes is introduced by Mr. W. Carmichael, Superintendent to H.R.H. the Prince of Wales's Gardens, and from whom we have received the entire stock for distribution. The foliage is of a beautiful Euphorbia-like green shade. The fruit, of a bright golden-yellow, hangs in the greatest profusion at every possible point of the plant—as will be seen by the Illustration. The habit of the plant is singularly striking, and the general appearance very beautiful. We are not surprised to learn from Mr. Carmichael that this pretty novelty is a most popular favourite on the Royal Dinner-table.

Price, per packet, 2s. 6d.

Now being sent out by JAMES CARTER AND CO.

This charming addition to our Plants for decorative purposes is introduced by Mr. W. Carmichael, Superintendent to H.R.H. the Prince of Wales's Gardens, and from whom we have received the entire stock for distribution. The foliage is of a beautiful Euphorbia-like green shade. The fruit, of a bright golden-yellow, hangs in the greatest profusion at every possible point of the plant as will be seen by the Illustration. The habit of the plant is singularly striking, and the general appearance very beautiful. We are not surprised to learn from Mr. Carmichael that this pretty novelty is a most popular favourite on the Royal Dinner-table.

Price, per packet, 2s. 6d.

CARTER'S "PRIZE MEDAL" GRASS SEEDS.

The germinating quality of MESSRS. CARTER'S GRASS and CLOVER SEEDS (after most careful testing) is assured to be first-rate; and, from the great pains taken to adapt the Mixtures of Grasses to suit the particular nature of the soil intended to be laid down, the possibility of failure can scarcely be entertained. It is only necessary when ordering to give a general description of the soil, situation, &c.

CARTER'S GRASS SEEDS FOR PERMANENT PASTURES (CHOICEST QUALITY).

For HEAVY SOILS, 28*s.* to 32*s.* per acre. | For LIGHT SOILS, 28*s.* to 32*s.* per acre. | For MEDIUM SOILS, 28*s.* to 32*s.* per acre.

Second quality cheaper. Reduced rates for more than 10 *acres.*

CARTER'S GRASS SEEDS AT HILSEA LINES.

J. EDWARDS, Esq., writes as follows:—

"I am pleased to say that the Grass Seeds you supplied for the Hilsea Fortifications, upwards of 2 miles in length, gave [illegible] satisfaction."

N.B. These Seeds were sown under most adverse influences, both of soil and situation.

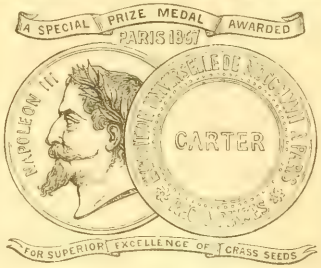

CARTER'S GRASS SEEDS AT ALDERSHOT CAMP.

We are favoured with the following evidence of the superior quality of our Grass Seeds from COL. LAFFAN, R.E.

"Col. LAFFAN is happy to inform Messrs. Carter & Co. that the 60 acres of Grass grown from the Seed supplied by them last Autumn look extremely well, and promise a good crop of Hay."

N.B. These Seeds were sown under most adverse influences, both of soil and situation.

For the fullest information to ensure successful Seeding-down Land to Grass, see

CARTER'S ILLUSTRATED FARMER'S CALENDAR FOR 1870.

Post Free, Sixpence; Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

New Double Geraniums.

H. CANNELL has more of the above than he requires for his regular business, and will send Twelve of last year's English and Continental varieties, established plants, and package included, for 18s; or Six for 10s.
New Florist Flower and Florist Flower Seed Merchant, Woolwich.

Pelargoniums for the Million.

JAMES HODDER'S unrivalled Collection of French, Fancy, and Show Zonals, is now ready, at the following low prices: 100 plants, distinct sorts, for 50s; 50 plants for 30s; or 25 plants, distinct sorts, for 20s, hamper and package included.
Crown Nursery, Reading.

WILLIAM POTTEN can now supply MADAME LEMOINE, at 6d. per dozen; Mrs. POLLOCK, at 3s. per dozen, good: ZONALS, in sorts, at 20s per 100. All good plants, in 3-inch pots; package free. Orders are booked now for April and May.
A priced LIST of most of the new and leading sorts can be had on application to
WILLIAM POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2s; Lady Cullum, 2s; Sunset, 2s; Sophia Dumresque, 2s 6d; Italia Unita, 3s; Picturata, 3s 6d; Gold and Bronze Zonals—Beauty of Calderdale, 2s 6d; F. G. Henderson, 6s; Duke of Edinburgh, 9s; Her Majesty, 9s; Lucy, 2s 6d. Packages, 2s 6d. Baskets and Packing, 1s. for a single dozen, and 6d. for every subsequent dozen. Remittances requested from unknown correspondents.
ALFRED DRYER, Florist, Fenstanton, Cambridgeshire.

Cheap, Cheap, Cheap.

TRICOLOR and other PELARGONIUMS, in good plants, at the following prices, for cash:—Mrs. Pollock, 2s. per dozen; White Lady, 6s; Lady Cullum, 6s; Italia Unita, 3s; Glen Lyon Beauty, 6s; Crystal Palace Gem, 2s; Flower of Spring, 3s; Beauty of Oulton, 3s; Perilla, 4s; Lord Derby, 4s; Leonidas, 4s.
HERBACEOUS CALCEOLARIAS, from seed pans, first-rate strain, good plants, 12s. per dozen or 90s. per 100.
Hamper and package included.
JOHN BARRETT, St. John's Nursery, Bury St. Edmund's.

NEW GERANIUM, BOQUET BLANCHE.—This Geranium is the finest white ever grown, and, unlike any other variety, retains its purity in any situation. The trusses are large and abundant, and the compact habit, beauty of foliage, and hardiness, renders it a striking and valuable bedding plant. Fine autumn-struck plants 18s. per dozen or 90s. per 100.
Address, EDW. PIERCE, Park Nursery, Yeovil, Somerset.
N.B. As the public are so often deceived and disappointed in ordering new advertised plants, a Photograph of this Geranium will be sent on receipt of 13 postage stamps. The stock being small, early orders are requested.

CHOICE TRICOLOR GERANIUMS.
The following Twelve splendid Varieties are offered, in strong autumn-struck plants, for 20s.; carriage paid: Mrs. Richard Mitchell, Mrs. Pearce, Humming Bird, Lucy Grieve, Queen of Crimea, Grandis, Defiance, Mrs. J. Clutton, Mrs. Dix, Sophia Cusack, Meteor, and Imperatrice Eugenie.
PRICED LIST of TRICOLOR, BICOLOR, NEW ZONAL, and DOUBLE GERANIUMS sent free on application.
Fine Stock Plants of the following, in 60-inch pots. These have been taken off this year, and will make fine specimens. Price, from 42s. to 84s. per dozen, viz.: Lady Cullum, Sophia Cusack, Meteor, Queen Victoria Perkins, Defiance, Mrs. Dix, Sophia Dumresque, Edwina, Leopoldina, Crystal Palace Gem, Imperatrice Eugenie, Louisa Smith, Defiance, Countess of Haven, &c.
J. ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants.

Established 1806.

THANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application.
Seed Warehouse, 24, Cockburn Street, Edinburgh.
Nurseries: Broughton Glen, Musselburgh.

Spring Planting.—To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Azaleas, and other hardy Trees, Shrubs, and Evergreens, is just published, and can be had on application. Milford Nurseries, near Godalming.

Garden Seeds.

BOLTON AND CO. offer fine New GARDEN SEEDS, of all kinds, both for the Kitchen and Flower Garden, at moderate prices.
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his collection of Chrysanthemums; CARNATIONS and PICOTEES, 10s 6d; 25 Pairs POMPONS, 10s 6d; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
Brunswick Nursery, Stoke Newington, N.

CHRYSANTHEMUMS, CHRYSANTHEMUMS.—25 good named varieties, including Japanese, large-flowered and Pompons, for 5s.; 50 sorts for 9s.; 15 new varieties of 1869 for 5s.; cuttings, 25 pairs, 5s.; 50 pairs, 9s. Carriage paid. Named sorts will be sent which purchasers possess. The above in thumb pots package free, or shaken out post free.
Twenty fine varieties of Bicolor, Double and Zonal, and Nosegay PELARGONIUMS, in thumb pots, package free, or out of pots post free, for 5s. 6d. Terms cash.
WM. CLIBRAN AND SON, Millbank Nursery, near Warrington.

CHARLES TURNER begs to call attention to his extensive COLLECTIONS of CARNATIONS and PICOTEES, 21s. per dozen pairs; PINKS, 6s. to 12s. per dozen pairs; Tree CARNATIONS, 12s. to 24s. per dozen plants; and CLOVES, 6s. to 12s. per dozen plants. THE BRIDE, pure white, extra fine, 5s. each. A DESCRIPTIVE CATALOGUE on application.
The Royal Nurseries, Slough.

MOUNTAIN ASH, a most Ornamental and Profitable Tree for Underwood. It will grow upon soil too poor for Hazel and most other plants used for a similar purpose. We can supply plants—1½ to 2 feet, at 20s per 100; 2 to 3 feet, at 30s per 100; 2½ to 3½ feet, at 22s per 100; 3½ to 4½ feet, at 45s per 100, or 27s. 6d. per 1000. See CATALOGUE.
THOS. JAMES SMITH, James Dale Nurseries, Matlock.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

IRESINE LINDENI.—This is undoubtedly the finest dark crimson leaved plant ever introduced, and is really the finest bedding and decorative plant of the year.
Received a First-class Certificate at Kensington. Pot-full sized plants, 4s. per dozen; smaller sent free for 2s. 6d.
IRESINE ACUMINATA, splendid variegated; smaller sent free for 2s. 6d.
H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich.

The most Beautiful Aster Grown is

TRUFFAUT'S REINE MARGUERITE, containing Nine Perfection, Double, and Pyramidal Asters, 6s. Seed of the above in double colours, mixed, for 1s. A fine selection of Foreign STOCKS, PHLOX, BALSAMS, ZINNIAS, &c., at equally moderate prices. CATALOGUES on application.
ALFRED HAMPSON, Importer of Foreign Flower Seeds, Bedford Street, Salcombe.

CALCEOLARIAS, Herbaceous, of fine strain, nice plants, out of pans, 2s. 6d. per dozen; good plants, out of single pots, 3s. per dozen, free by post. Special quotations per 100.
GLOXINIAS, good named varieties, 12 for 3s., 24 for 10s.; free by post.
ACHIMENES, in 20 choice varieties, 1 tubers of each for 10s.; 10 varieties, 3 of each, 5s.; free by post.
DAHLIAS, young pot roots of Show, Fancy and Bedding—package free, 50 varieties for 15s.; 25 for 7s. 6d.; and 12 for 4s. If more than one of a sort is taken, they will be supplied one third less.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

Lilium auratum.

WM. PAUL has to offer a Magnificent Lot of the above, at 1s. 6d., 2s., 2s. 6d., and 3s. 6d.; 10s.; 12s.; 18s.; 24s.; and 36s. per dozen. The usual discount to the Trade off the dozen rates, when ordered by the dozen.
PAUL'S Nurseries and Seed Warehouse, Waltham Cross, London, N.

WEBB'S NEW GIANT POLYANTHUS, Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the varieties, with double PRIMROSES of different colours; AURICULAS, both Single and Double; with every sort of Early Spring Flowers. LIST on application.—Mr. WEBB, Calcot, Reading.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I., British Ferns and their varieties, 50 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

Beta chilensis.

BUTLER, McCULLOCH, AND CO. are enabled to offer SEED of the TRUE variety of this magnificent foliage plant; it is quite distinct from Beta chilensis, and is fully described in their SPRING CATALOGUE, sent post free.—1s. and 2s. 6d. per packet.
South Row, Covent Garden Market, W.C.
Established upwards of a Century.

STUART, MACDONALD, AND CO., SEED GROWERS and SEED MERCHANTS, 85, Southampton Row, Holborn, London, W.C.
S., M. & Co.'s WHOLESALE LIST of all the Choice Flower Seeds in cultivation forwarded on application.

To Seed Importers, Nurserymen, &c.

BETHAM AND SON, Custom House, Shipping and General Forwarding Agents, beg to inform them that they receive and forward SEEDS, PLANTS and GENERAL MERCHANDISE, from and to all parts of the world, at charges as low as possible.
Office, 9, Lower Thames Street, London, E.C.

LEEDS HORTICULTURAL SOCIETY.—The SEVENTH ANNUAL SHOW will be held in the Cardigan Fields, Kirkstall Road, JUNE 2, 3, 6, and 7, 1870.
PRIZES NEARLY SEVEN HUNDRED POUNDS, including those offered for
Collections of Plants £170
Pelargoniums £170
Orchids, Azaleas, and Heaths £120
Roses in Pots and Cut Blooms £100
Fruit £80
Bouquets and other Cut Flowers £45
NOTE.—The North Eastern, Great Northern, Midland, Lancashire and Yorkshire, and London and North Western Railway Companies will convey Plants, Flowers, Fruits, &c., at ordinary rates to the Show, and return them free if they remain the property of the Exhibitor.
The Committee undertake to receive Boxes of Fruit, Cut Flowers, and Vegetables for Exhibition.
The Committee provide assistants and horses for exhibitors' vans coming by road; also covered spring vans to convey Plants, &c., between the Railway Stations and the Show Grounds. Copies of Rules, Schedules, with Forms of Entry, forwarded on application.
JAMES BIRBECK, Secretary, Crossgates, near Leeds.

NOTICE.—*The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will*, NEXT WEEK, *and on* ITS FUTURE, *be published on* FRIDAY, *at* 2 P.M., *instead of* SATURDAY, *as heretofore*.
ADVERTISEMENTS *for the* CURRENT WEEK *must reach the Office* NOT LATER *than* THURSDAY MORNING.

The Gardeners' Chronicle

SATURDAY, FEBRUARY 26, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, March 2 — Royal Horticultural (Fruit and Floral Committee) at S. Kensington . . 11 A.M.
Do. Scientific Committee . . 1 P.M.
Do. Council Meeting . . 3 P.M.
THURSDAY, — 3 — Linnean . . 8 P.M.

THE state of affairs at the ROYAL HORTICULTURAL SOCIETY is apparently so critical, that it behoves all who love horticulture to be on the alert, lest the Society become horticultural in name only. We do not overlook the advantages of South Kensington, but we cannot look upon the establishment there as the representative of practical or scientific horticulture. We earnestly press on the Council the desirability of making a vigorous and determined effort to retain at least a portion of Chiswick, and to avoid the frightful sacrifice that must ensue if the houses and splendid collections of fruit trees are removed from thence.

If the fates are unpropitious, we must of course submit; but, in looking for a substitute, we trust the Council will not fix on a spot for their garden as far removed from London as Weybridge, where we learn inquiries have been made. We would at this crisis urge the formation of a Vigilance Committee to watch the proceedings of the Council, to co-operate with them in all their efforts for the advancement of the best interests of the Society, and to support them in resisting any attempt to curtail the practical utility of the Society, and to reduce it to the level of a fashionable lounge. If our suggestion be considered a good one, we trust no time will be lost in giving effect to it. The future of horticulture, considered apart from the opportunity it affords of money-making, depends much on what is done now by those who love gardening for gardening sake.

AT a recent meeting of the Society of Arts, Mr. JAMES COLLINS read a paper on "India-rubber, its History, Commerce, and Supply," which naturally involved the question whether CAOUTCHOUC could be cultivated with profit in any of our tropical possessions. The interest generally felt in the subject was evident from the crowded state of the rooms, and the attentive ear the audience lent to the paper, and the discussion that followed it. Mr. COLLINS advocated the acclimatisation of the different species of the genus Hevea (Siphonia) in the East Indies, because this was known to yield the best caoutchouc. But it might be desirable, if any steps be taken in that direction,—will our colonial gardens take the hint?—to make not only a trial with the species indicated, but also with all other plants known to yield that substance. After all, the superiority of the Hevea caoutchouc may be owing in a great measure to the fact that the extraction and preparation of it is better conducted and organised than that of other kinds; and perhaps it may turn out to be more profitable, if we should have to resort to cultivation, to grow other caoutchouc species rather than those of the genus Hevea. The chairman (Dr. SEEMANN), in opening the discussion of the paper, held that the cultivation of these trees might prove remunerative, the price of some kinds of india-rubber having nearly doubled since 1861; and since the trees grow with rapidity, the tapping of them for milk could, under regular treatment, be resorted to every two or three years without destroying their vitality; indeed, a plantation once established, would last for years, and require but little care. One thing which renders caoutchouc expensive is, that the trees yielding it do not form forests exclusively by themselves as our Beeches, Pines, and Oaks do, but they are scattered in isolated groups or as individuals amongst other kinds of trees, and much time is necessarily lost by collectors in looking for them, and in removing their camp and workshops from place to place. All this would be in favour of a plantation; but, although it might be cheaper to cultivate caoutchouc than to gather it in the depths of the virgin forests, Dr. SEEMANN remarked he had no fear, even with the advancing prices staring him in the face, that there would be a deficiency of supply for some years to come. From the southern parts of Mexico to the lower parts of Brazil, America might be termed a huge virgin forest, through which there was only one regular thoroughfare—the Panama Railroad. The whole of this enormous territory, only partially explored as yet along the course of rivers, abounds in india-rubber trees belonging to several genera; and every newly made road brings to light fresh supplies. Asia, Africa, and even Australia, will also be able to meet part of the enormous and daily increasing demand, and there are many milk-yielding plants throughout tropical and sub-tropical regions to which we might look for help: the genus Ficus alone consists of several hundred species.

It appears to us to be simply a matter of prudence to look forward to the time when india-rubber will be all but extinct in countries easily accessible, either by their proximity to the coast or through their river systems; and it is now considered a truism that all plants which man largely requires either for food or manufacturing purposes must ultimately be cultivated, the supply yielded spontaneously by Nature not being sufficient. A glance at the history of this article shows that the demand for it advances at a ratio that makes it impossible to calculate what quantity our manufacturers will require twenty, nay, even ten years hence, to say nothing about the Chinese, who also begin to use it to a large extent. Caoutchouc does not seem to have been known to the ancients, though it abounds in the Eastern hemisphere; and it was reserved for COLUMBUS to discover it in the possession of the American Indians, who had made footballs of it, which arrested his attention. CORTES found the clowns of MONTEZUMA'S Court dancing in shoes made of it before the emperor and Mexican nobles, and the Spanish conquerors protected themselves against the rain by smearing their cloaks over with it, and thus anticipated the invention of MACINTOSH. But though many witnesses came forward to vouch for the extraordinary qualities of caoutchouc, it was only towards the end of the last century that it was recommended for rubbing out pencil marks on paper—hence one of its English names; and it is only within the last thirty years that, through the experiments of HANCOCK and others, the real value of the substance became fully appreciated, and at the same time its future supply began to be regarded with that anxiety and fear which some think may be removed by calling in the help of the gardener.

WE desire to call the attention of our readers to the circumstance, that, on and after March 4, the PUBLICATION of this Journal will take place on Friday, at

2 P.M., instead of on Saturday morning as heretofore. The change will, we trust, be acceptable, especially to our readers north of the Tweed, in Ireland, and on the Continent.

—— We have recently received a very interesting memoir by Professor DICKSON on the development of the FLOWERS in PINGUICULA and the affinities of the natural order of Lentibulariaceæ. It is not easy to follow out the matter in dried specimens, but, after an attentive examination of the species contained in the Kew Herbarium, it appears to be pretty generally, if not universally, the case in the genus, that the flowers are produced from a winter or resting bud. This circumstance has been investigated with great care in the case of our commonest species, Pinguicula vulgaris, where we have just beyond the axillary bud of the last developed rudimentary leaf, two, and ultimately three, little elevated points, which are the first indications of the position of as many flowers. It would be interesting to learn in the case of those species which have more numerous flowers, whether they are all the creations of one or of several leaves. The little knob is soon slightly elevated, the elevation ultimately elongating into the leafless peduncle. The first indication of the formation of the flower is the development of a little ring at the top of the still very short peduncle. This ring soon exhibits five elevations, which are the rudiments of as many sepals; within this a second ring appears, the rudiment of the petals, then the two perfect stamens and staminodes, within which a horse-shoe-shaped prominence appears, which gradually is developed into the two-lipped pistil, with the free central placenta studded with centrifugal ovules without the slightest appearance of any dissepiment. This latter character, notwithstanding a certain resemblance in the calyx, corolla and bilobed capsule, seems to exclude the order from a very close affinity with Scrophulariaceæ, and to bring it near to Primulaceæ. Professor DICKSON has studied the nature of the embryo in four of the species, and finds a minute character which seems to separate P. grandiflora from P. vulgaris, viz., that the base of the two cotyledons, which are united into one except at the very tip, encloses the plumule (punctum vegetationis). We cannot consider this as a single cotyledon any more than he two soldered cotyledons in Clintonia and some other cases. It would be interesting to follow out in a similar way the development of other plants which produce leafless peduncles from a swelling in the leaf, as for example in the one-flowered form of Streptocarpus Rexii, on the stem of which there are merely two minute bracts, as also the comparison of the large and small cotyledon in Streptocarpus with what Treviranus* records in "Botanische Zeitung," 1848, as to the germination of Pinguicula vulgaris. *M. J. B.*

—— Mr. FOWLER, says the *Pall Mall Gazette*, has certainly undertaken an Augean task in the CLEANSING OF THE SERPENTINE. Forty acres of foul water, and more than 40 acres of fouler mud, 11 feet deep, are large quantities to be dealt with. Altogether, when the water was run off, there were some 250,000 tons of black liquid mud at the bottom of the Serpentine. Many methods have of course been proposed for getting rid of this, the most simple apparently being to cart it all away, and fill in with concrete to a uniform depth of 4 feet. This, no doubt, would have been a very effectual job, but the cost of cartage and filling in would simply have been enormous—more than the price of a new park; so it was not to be thought of. Mr. FOWLER, therefore, was consulted, and his plans were chosen. In general terms, these may be stated thus:—First to draw off all the water, which has been done some time; next to allow the mud to consolidate by exposure to the atmosphere, and this, in spite of the wet winter, it is very rapidly doing; then about 120,000 tons of the surface mud is to be removed till the firm mud beneath is reached, when the whole is to be covered over with a coating about 2 feet deep of a mixture of stiff clay and gravel. This mixture is almost perfectly impervious to water, and possesses the advantage over concrete that it does not encourage the growth of weeds, as the lime in the concrete most certainly does. These may be said to be the main features of Mr. FOWLER's plan, but there are other details connected with it of interest to the public. Thus the whole space to the end of the lake, west of the pretty bridge, is to be so filled in as to give it an average depth of 4 feet 10 inches—that is to say, about 4 feet 6 inches at the sides, and 5 feet in the middle. Over this part, therefore, skaters and sliders may venture with impunity from all risk but that of a ducking. East of the bridge the water will be much deeper, sloping from 8 feet near the bridge to 14 feet at what is proposed to be its outfall. The great expense of carting away the mud has been got rid of in a very simple manner. Within about 300 yards of the edge of the large lake "spoil" holes are dug of considerable extent and some 5 feet deep. A railway is constructed leading from the lake to these extensive pits, and on this run the waggons laden with mud which is shot into the holes. The gravelly earth which is taken from these excavations is being used for mixing with the strong clay, which is hereafter to form the bottom of the lake. Thus, about 120,000 tons of mud will have to be disposed of, and about 80,000 tons of gravel mixed with clay laid in the place of the slime. These "spoil" holes, when the mud has reached a sufficient height from the surface, will be covered in with slight mounds of earth, to allow for the sinking, and turfed over as before. That this vegetable refuse would prove a valuable manure to the soil of the park there is no reason to doubt, and from a merely agricultural point of view it would do the whole land good to have it spread over it. Another improvement which Mr. FOWLER has arranged to be carried out is that of keeping the water when it is once clean always clean. For this purpose, instead of the driblets which have heretofore flowed from St. James's Park, there is to be a very large pipe of nearly 3 feet diameter, which is to be supplied by the Grand Junction Waterworks, and which will pour a vast volume of water into the lake whenever required.

—— At the meeting of the Scientific Committee at South Kensington, in January, a DATE STONE was produced by Mr. WILSON SAUNDERS which was apparently attacked by a Fungus while within the uninjured sarcocarp. We have submitted the specimen to microscopical examination, and have failed to find anything showing that the little elevations on the seeds which so closely resemble some Sphæria are really due to the action of a Fungus, though, after all, it is possible that this may be the case. In the accompanying woodcut (fig. 47) we have given a sketch of the structure of the albumen of the Date, as it appeared in the specimen transmitted, though not as it is found in a perfectly sound specimen which we have examined for the sake of comparison. The line of division of the component cells, many of which are arranged in longitudinal series, is altogether indistinct, the walls showing no trace of radiating tubes, and the cells themselves are filled with a dense endochrome, which does not exhibit any

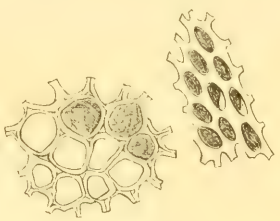

FIG. 47.

trace of starch when treated with iodine. On the contrary, in a thin horizontal slice taken, that is in the same direction as the above-mentioned section, from the little Fungus-like pustules, the cells are much dilated, the line of division distinctly indicated, with not unfrequent intercellular spaces, and the cells themselves are filled or nearly filled with a brownish endochrome, similar to that which occurs in so many cases of vegetable disease. It is very true that in several Fungi belonging to the genus Sphæria, taken in its widest sense, the cellular tissue of the matrix is so incorporated with the mycelium of the Fungus as to make it very difficult to say what belongs to the Fungus and what to the plant in which it is developed, but we see nothing of the kind in the present case, and we are therefore obliged, without further information as to any possible future development of the pustules, to pronounce an opinion that the appearance on the Date stone is due to some organic disease, and not to a Fungus. *M. J. B.*

—— Botanists, especially those devoted to the study of Fungi, will learn with regret of the decease of Dr. LEVEILLÉ, in his 73d year. Dr. LEVEILLÉ's acquaintance with Fungi and other lower Cryptogams was very extensive, but his modesty and retiring disposition prevented him from being much known outside the circle of Cryptogamic botanists. One of Dr. LEVEILLÉ's latest contributions to science consisted in the account of the Fungi contributed to DECAISNE and MAOUT's "*Traité Général de Botanique*."

—— The first Number of the new series of the ILLUSTRATION HORTICOLE, now edited by M. E. ANDRÉ, is before us. It opens with a graceful tribute to the services of its former Editor, M. LEMAIRE. We shall revert to this publication on a future occasion.

—— Among the objects of more than usual interest at the Chrysanthemum Show of the Liverpool Horticultural Society last autumn, were some superbly grown dwarf specimens of POINSETTIA PULCHERRIMA. These specimens were little more than 15 inches in height, pot included, and yet each carried three heads of bloom, the floral bracts being 14 inches across. Older specimens, 18 inches to 2 feet high, had three to four heads of bloom, the bracts being 18 to 21 inches across, and the foliage in perfect condition. These plants were grown by Mr. W. BIGGS, gardener to JOHN ARNOTT, Esq., Sandfield Park, West Derby, and certainly reflected great credit upon the grower. From a note received from Mr. BIGGS, we find that the plants were treated as follows:—

"The compost made use of is turfy loam two portions, turfy peat and decayed cowdung one portion, with a liberal sprinkling of sand, and some small pieces of charcoal, charcoal also being used as drainage. For the dwarf plants, cuttings of the old wood 3 to 4 inches long are taken the end of April, and, after being dried for a few days, are placed in the cutting-pots in the usual manner, of course giving them the advantage of a nice bottom-heat. When sufficiently rooted, the cuttings are potted in the usual manner into 4-inch pots, and kept close for a short time to encourage the formation of roots. When established in the pots it will generally be found that one shoot is taking the lead. To prevent that, stop it at the third or fourth leaf, and from each shoot so stopped you will get two, if not three, shoots. The stopping of the leader also encourages the growth of the secondary shoots, so that we obtain a more evenly balanced plant. To keep the plants dwarf, tie them down from the commencement, especially the strongest shoots, so as to get them all of as nearly the same strength as possible. When the shoots from the stopped branch are thoroughly established, the plants will be ready for a second shift, when they may go at once into 6 or 7-inch pots, in which they will bloom. At this potting keep the plants well down in the pots, so as to admit of a liberal top-dressing of rich soil, for it is found the roots come readily to the surface. [It is to this fact, together with the liberal use of rich manure-water, made from sheep and cowdung, soot and guano, that Mr. BIGGS attributes his success.] Of course a brisk growing temperature must be maintained from the time the plants start into growth, and the plants, to keep them compact, must be placed close to the glass; but from the middle of August to the end of September a free circulation of air is allowed, so as to get the wood ripened and the flowers set. As soon as the plants begin to show flower increase the temperature, and give plenty of warm liquid manure; and if the pots are well filled with roots the plants may stand in feeders of manure-water with decided advantage. After blooming the plants are kept dry, and in a temperature of 45° to 55° until the following April, when each branch is spurred back to two or three eyes, and a little water is given to start the plants into growth. When the young shoots are fairly developed, shake the plants out and pot into fresh soil, keeping them in a moist atmosphere until such time as they are re-established, then continue the same treatment as the preceding season, stopping the leading shoots to encourage the secondary ones, and thinning out those weakly shoots which are not likely to produce fine bracts. In this way six to eight shoots may be had the second year, and with strict attention such stools may be formed as will make the brightest specimen Zonal Pelargonium pale its ineffectual fire before the brilliant glare of a well-trained and well-grown Poinsettia."

It is a source of gratification to find that this fine old midwinter decorative plant is once more coming into notice. Were as much attention devoted to it as is given to forcing exhibition specimens of scarlet or other Pelargoniums, there is no reason why plants of Poinsettia, as compact and profuse in colour, should not be produced.

—— The schedule of the GRAND YORKSHIRE GALA FLORAL EXHIBITION has just been issued, and shows that the managers know how to cater for a good show. Indeed the show held at York is usually one of the most successful of the greater floral gatherings of the year. This season it is to take place on June 15, 16, and 17, in the Bootham Field, York. There are some good prizes to be competed for, among others £15 for 12 stove and greenhouse plants; £12 for 12 show Pelargoniums; and £15 for 15 Roses in 8-inch pots. The Messrs. BACKHOUSE & SON offer two prizes for six distinct Palms suitable for table decoration, and other special prizes are awarded.

—— We are requested by Mr. MARNOCK, late Superintendent of the Royal Botanic Society's Garden, Regent's Park, to state, for the information of exhibitors at the Society's shows, that at his own request the Council have kindly released him from all future responsibility and care in the management of these exhibitions. He therefore ventures to hope that the exhibitors who for so many years bestowed on him their willing and valuable aid will kindly continue it to his successors, Mr. WILLIAM SOWERBY, the Secretary, and Mr. DON, the Garden Superintendent.

—— We are informed that the premium of 30 gs. offered in December last for the best plan for laying-out the PEOPLE'S PARK and Recreation Ground at Luton, Beds, has been awarded to Mr. J. H. CARRINGTON, landscape architect, &c., Mile End, Stockport.

—— We may state that PICEA LASIOCARPA produced cones last year in the Knaphill Nursery. This is, we believe, the first instance of this species coning in this country; at least it is the first which has come to our knowledge.

—— We are requested to state that the WEST OF ENGLAND ROSE SHOW will be held at Hereford on Tuesday, July 5.

—— The DEATH of Mr. J. E. SOWERBY, the illustrator of the new edition of the "English Flora" and other similar works, is announced.

—— M. EDOUARD MORREN has contributed to the Royal Academy of Belgium a paper on the CONTAGIOUS PROPERTIES OF VARIEGATION as exemplified in the case of the Abutilon Thompsoni and other

* It appears to us very clear from Treviranus' figures that the supposed second cotyledon is merely the development of the plumule. The notion that the seed is without cotyledon is quite annihilated by a comparison with the seeds of other species

plants (see p. 308, 1869). We may add that Mr. LAING, of the Stanstead Park Nurseries, has obtained variegated sports of Abutilon megapotamicum, through grafting it on A. Thompsoni.

ENDIVE CULTURE.

ENDIVES, whether used simply for salads or cooked the same as other green vegetables, are essentially the gardener's friends, as they may be cultivated so easily and are so readily blanched, for making good salads in the mid-winter season when Lettuces are scarce. To produce fine heads in summer they must be grown in deep rich soil, which, if somewhat light in texture, should be made moderately firm after the last digging and before the seed is sown. A cool open quarter should be chosen, in a not too shady position, and as far as convenient from walls or other erections which attract and retain heat. I prefer planting, sowing, &c., in drills across a chosen quarter. For the earliest, or first spring-sown batch, which is intended to succeed the winter plants, seeds should be sown in a frame, &c., at the same time as the earliest Lettuces, in or about the first week in March. These, when sufficiently large, should then be dibbled out about 18 inches apart in rows previously marked out with the line and hoe. If the line is drilled about an inch deep so much the better, as it will induce the water from spring showers to flow more freely down to the roots of the plants, and tend besides to keep more moisture around them during hot weather.

The next sowing may be made about the middle of April, in the open ground, in rows similarly made to the above. To aid this and succeeding summer sowings, which may be made about every fourth week if a constant supply is wanted, it is an excellent plan to place a thin mulching of small but thoroughly decomposed manure along the rows, some 6 or 12 inches in width. This will afford material benefit to the plants at the most trying period in summer, by keeping the ground moist immediately over the young rootlets, which emanate from the main root near the surface of the ground. By making moderate sowings at properly regulated intervals, it will be seen that fine large plants may be had late in September. These may be taken up and placed in frames before the early October frosts arrive. From the summer culture we pass to the autumn, winter, and spring treatment. Commencing with the first week in August, small sowings should be made once a fortnight for three successive times, upon a warm sunny southern aspect. A good large planting of the plants produced from the first of these sowings should be made to furnish a supply, when the larger plants in the frame are consumed. For this sowing no variety surpasses the Batavian, if cultivated in the ordinary way, and the sort known as Fraser's Batavian is by far the best. As a green curled variety, especially if treated as I shall describe, the now well-known "Digswell Prize Endive" is not to be surpassed for general hardihood and hearting qualities.

In dibbling these plants into a nice southern aspect at this particular season, be careful in planting to place the crown, or real heart of each plant, about an inch and a-half or two inches below the surface, pressing the roots firmly into the soil with the point of the dibble, which should be a long one, without in any way closing the top of the hole, through which the young leaves from the crown may push up. If this simple process is carried out on a properly drained border, nicely blanched hearts of moderate size will form, and withstand much hard weather, often proving very useful at an unusually rough season. It will be advisable to make a successional planting from the produce of the second autumn sowing, to succeed the above in the early spring. These should likewise be planted moderately deep, though not so deeply as the former. The last or third sowing should be permitted to stand upon the seed-bed until about the second week in March of the succeeding year, when they should be dibbled into good rich soil, to precede the spring-sown crop. Endive in process of blanching may be placed in moderate successional quantities in a moderately dry soil in any shed where frost cannot penetrate. Here it will grow and blanch nicely, though it certainly has not that amount of crispness which the more natural frame or border grown plants possess. The plan is, however, a good one in severe weather, and especially if a Mushroom-house or similar place is at command, wherein they may be forced to grow somewhat larger. I may say that the French moss-curled variety is an excellent one for summer use, but not for winter, being too tender. Endive is frequently used stewed in soups, for garnishing, and for use with game. It is also much liked by some if cooked as greens are during the summer months. *William Earley, Digswell, Welwyn.*

New Garden Plants.

ONCIDIUM VARICOSUM, *Lindl.* var. ROGERSII.

Floribus maximis, cristulis circa cristam principem rarioribus.

This beautiful Oncid (fig. 48) made its appearance at London in November or December, 1868, under the name of Oncidium Rogersii. The flowers are quite as splendid as those of Oncidium pectorale and O. Marshallianum. The habit, we are informed, is similar to that of the old Oncidium bifolium, and the number of flowers produced on a single panicle is, in well-grown examples, not less than 170! There can be no doubt that it is one of the best of recently introduced Orchids, and all the more valuable for its flowering season. It has recently bloomed in a high state of perfection with Messrs. Veitch. *H. G. Rchb. fil.*

FIG. 48.

PALMS.

[With the following letter, which, unlike the orange peel therein referred to, we prefer to leave *au naturel*, we lay before our readers the first of some articles on Palms, with the view of affording additional information on these noble plants, and of fostering the growing taste for their cultivation. We esteem ourselves fortunate in having induced Dr. Seemann to draw up these articles for us, as he brings to the task not only the knowledge derived from his special study of the order as a botanist, but also an intimate acquaintance with many of the members of this noble group, made in their native haunts. EDS.]

"A MAN of speculative turn of mind issued the following advertisement to 'marmalade manufacturers,' never venturing to doubt that the article offered was really desired by them:—'Having lately contracted on advantageous terms for the sweepings of several large theatres, I am in a position to offer orange peel at very reduced prices.' I have a lurking suspicion that you may possibly think I am treating you as the advertiser treated the manufacturers of that peculiar compound, popularly supposed to be made of Turnips, and to be an excellent substitute for butter, as long as you don't attempt to use it for frying, as the Irish cook is said to have done. In fact, without inquiring whether such articles are at all required, I beg to advise you, that, having lately swept through several public gardens and the great nurseries of Messrs. Bull, Veitch, and Williams (observing a strictly alphabetical order, so as not to hurt anybody's feelings), I am now in a position to inflict upon your readers a few gossiping articles about Palms, illustrated by woodcuts. Of course, it is no more my business than it was that of the orange-peel seller with his ware, to inquire too closely into what you may do with them, and how you dress them up before you issue them to your customers. All that is your task. I have done mine."

To the few favoured individuals whose means enable them to form complete collections of Palms we may give the summary advice, "Endeavour to get as many species as you possibly can, and cultivate them as best you may." But we cannot be quite so laconically brief with that much more numerous class who have a fancy for these plants, and are compelled to content themselves with a judicious selection. In all large natural orders, tribes, and genera, there is, physiognomically speaking, a considerable body of species presenting the average or normal look of those groups, and imparting to any large aggregate of them a certain sameness which, whatever may be their effect collectively, renders them uninteresting objects to look at, because they are devoid of much variety. However beautiful may be individual Orchids when in flower, a whole house filled with Orchids, unmixed with other kinds of plants, is not calculated to gratify an æsthetic eye. Ferns, notwithstanding their matchless delicacy and elegance, are too frequently, as collections, less effective than they might be, by an undue predominance of that class of which our Lady Fern is the type. Similar remarks apply with more or less force to the Heaths, the Cactuses, the Aloes, Agaves, and other extensive groups under cultivation; and in selecting our sets we should bear these objections steadily in view, aim as much as possible at variety in form, size, and colour, and avoid the overcrowding of our places with those species which share certain prominent peculiarities with too many of their kindred.

Palms have the advantage over many other groups, that they admit of an easy application of these principles. True, the bulk of them have pinnated leaves of a uniform green colour, and inconspicuous flowers supported on an axillary branched inflorescence, of which Areca Catechu, the Betel-nut tree, an old inmate of our gardens, is an instance. But there are besides numerous species presenting appearances altogether so different, that we have it completely in our power to make one species serve as a foil to the other, and *vice versâ*, thus setting off their mutual beauty to the best advantage. Care should be taken to select good species with simple leaves, of which the genus Geonoma will furnish examples ready to hand, and many beautiful additions to which will be forthcoming as soon as a brisker demand for Palms shall have fairly set in, one of the most striking being the Teysmannia altifrons (Pholidocarpus Ihur), which has leaves like the Banana and fruits resembling those of Manicaria, and which may possibly yet survive in some gardens, as Macgillivray sent it from New Caledonia, and Teysmann from Sumatra. The simple-leaved kinds, of which Verschaffeltia splendida, Phœnicophorium sechellarum, &c., are further examples, are best contrasted with the pinnated ones, represented by the genera Ptychosperma, Areca, Kentia, Raphia, Wettinia, Gaussia, Deckeria, Cocos, and a host of others. But even amongst these kinds there are two subdivisions to which attention ought to be directed, viz., those in which the segments or leaflets are entire and pointed at the end (as in Cocos mucifera), and those in which they are more or less præmorse, resembling the fins and tails of fish. Ptychosperma vitiensis (of which we noticed fine specimens at Messrs. Veitch's) several Iriarteas, Iriartellas, &c., exhibit this peculiarity; but it is best developed in Wallichia (Harina), Martinezia, and above all in Caryota, the last-named being further distinguished by its being the only genus of Palms which has double pinnated leaves. Again, Palms with fan-shaped leaves present a striking contrast with those already alluded to. The best known representative of this set is Chamærops humilis, of southern Europe and the Mediterranean borders, the leaves of which, from their resemblance to the human hand (distant though

it be) has given the name to the whole of the natural order of this type. Many genera of singular grace and beauty present themselves for selection, such as Corypha, Livistona, Licuala, Thrinax, Borassus, Hyphæne, Copernicia, Brahea, Sabal, Trithrinax, Rhaphis, Pritchardia, &c.

In making our selection the size of the whole plant must in a great measure be left out of consideration. The space at our command for cultivation may allow us to see such lilliputian species as are comprised in the genera Malortiea, Geonoma, or Chamædorea assume their full natural dimensions, but where, except in tropical gardens or in buildings which as yet do not exist for the purpose, can we hope to behold in all their grandeur species attaining 200 feet in height, or having climbing trunks more than 500 feet in length? It is rather with fear and trembling than with unalloyed joy that we perceive our Palms raising their feathery heads above certain prescribed limits, touching the glass, forcibly pushing their way through it, and some fine summer morning proclaiming their escape from prison by boldly waving their leaves in the air. In the Edinburgh Botanic Gardens there was a case of this nature. Repeatedly had the authorities at that establishment asked for a grant to build a larger Palm-house than they had. It was steadily refused until things had come to the "push" described, and Professor Balfour hit upon the expedient of photographing the same. The effect of the positive picture upon the negative purse-holders is said to have acted like an electric shock. The money was forthcoming immediately, and Edinburgh thus obtained what it ought to have had long ago—a good Palm-house.

It follows from what has preceded that for our purposes of contrast we have to dispense with the character afforded by the trunk of the different species. When in nine cases out of ten we never have any chance of seeing the development of that organ, it is but a light consolation to know that we have under cultivation a Palm which (in its native country) has so very straight a trunk as fully to justify those poets who describe it as "an arrow shot from heaven;" or that the trunk of another Palm, also in our charge, has a most beautiful polish, and presents a striking contrast with a third, ditto, ditto, so densely clad with long black spines that even monkeys, leave alone human beings, have been puzzled to get up it? By having in our gardens to content ourselves mostly with young plants, we have to forego the pleasure of seeing the real habit of our favourites fully developing itself. Only in the smaller Cane Palms and others do we get a foretaste of it. In Chamædorea we have the ringed and polished stem, in Bactris the spiny one, whilst in Desmoncus we behold the New World representative, and in Calamus and its allies the Old World representative of the climbing Palms. That it should be so, that we should not be able to see more of the forests, is the more to be regretted, as the true majesty of these plants can never be fully appreciated, unless trunk and leaves are seen together; and it has been noticed that the more acute the angle formed by the leaves with the upper part of the trunk, the nearer the leaves approach the perpendicular, the bolder and nobler is the aspect of the individual species.

The considerations of size to which we have to direct attention in making our selections must necessarily be that of the leaves of the different species. But even here we cannot indulge our fancy to its fullest extent, for are there not species, of which a single individual would fill up the entire space at our command? Are there not plants, such as Corypha umbraculifera, having leaf blades 6 feet long and 13 feet broad, supported on stalks 7 feet long, and boasting from 90 to 100 segments, or still more stupendous giants, such as Raphia tædigera, with foliaceous expansions each covering a superficial area of 200 square feet? By fighting shy of such vegetable monsters as these we obtain more room for the large number of species with leaves of more manageable dimensions, varying in size from that of a crown piece to that just indicated.

Colour is another peculiarity to which attention must be given in aiming at the object under discussion. The bulk of Palms have foliage of a uniform green colour; this is the chief reason why any species showing a deviation in this respect possesses particular value, and why we ought to make it a point to embody it in our collections. Nurserymen are now offering several, more or less afflicted with albinism—in common parlance variegated kinds, such as Rhaphis flabelliformis aureo-variegata; but independent of these we encounter most acceptable deviations from what may be called the normal coloured type of the order. The most notable is no doubt a prickly Mauritia, which Humboldt and Bonpland discovered on the Rio Atabapo, and which is as yet not introduced into our gardens. The leaves of this remarkable species are adorned with concentric bands of yellow and blue, in the manner of a peacock's tail. What a sight it must be! It would make the fortune of any one who chose to bring it to Europe. A striking effect is produced by the silver Palms, of which there are several inmates in our gardens, such as Acanthorrhiza Warscewiczii, Calamus dealbatus, Œnocarpus dealbatus, Thrinax argentea, and others, all having the under side of their graceful leaves of a silvery white. Not less singular are the pinkish tints presented by the young leaves of Geonoma Martiana (Seemanni), from Central America; the bronzy hue afforded by those of the two species of Welfia, especially W. regia, and by Dæmonorops plumosus, and the various colours observable in the petiole and costa of Hyophorbe amaricaulis, Areca aurea, &c., or the pretty markings of Pinanga maculata.

In Palms we have all the more to take none of the colour of the foliage, as their flowers, unlike that of most phanerogamic plants, do not display any very brilliant hues, but are generally dirty white, pale yellow, or greenish, and in this respect do not add materially to the beauty of the respective species. But what the flowers want in brilliancy of colour they often seem to make up, as it were, by their abundance, a single tree having been counted to possess no less than 624,000 at one time, and a single inflorescence being more than a load for a couple of men. But as we cannot hope to grow such giants as these in Europe, we have once more to fall back upon the smaller kinds, and these are sufficient to teach us the singular nature and constitution of their flowers.

Palms, according to the way in which their flowers are produced, may be divided into two groups, viz., those which flower only once in their life, the monocarpous ones, represented by the genus Sagus, and those which flower many times during their course of existence, the polycarpous ones, represented by Chamædorea. In the former group, the flowers are necessarily terminal, and as Palms have not the power to form true branches, the appearance of the inflorescence foretells the death of the entire plant. In Sagus the ripening of the fruit of the terminal inflorescence happens at the same time as the trunk begins its course of decay; but in Caryota the life of the plant is prolonged until every latent bud of the axils of the leaves of the whole trunk has developed its flowers, and it is only after the lowermost bud is thus developed that the individual plant dies off—a process which may last several years, but which is, nevertheless, only to be regarded as one flowering. In the second group into which the mode of flowering divides the Palms the flowers are never terminal, but always developed from the axils of the leaves, or from latent buds below the crown of leaves, the lowermost bud or axil of leaves being the first to develop, and not the last, as in the case of Caryota.

Much more colour is found in the fruit than in the flowers of Palms, bright orange, yellow, scarlet, red, purple, olive, and many other tints being by no means uncommon, and greatly adding to the effectiveness of the various species. It must be confessed, however, that in our conservatories we have as yet but few species upon which we can count for such a regular exhibition of fruit as we see in Chamædorea Ernesti Augusti and its allies. In most cultivated species we have as yet to forego the sight of their fruiting state.

But form, size, and colour, though the cardinal points which ought to be kept in view in making a proper selection, are not the only points to be attended to; they ought to be supplemented by a due exercise of such taste as one is able to bring to bear on the subject, and about which it is absolutely impossible to lay down any serviceable canon. *B. S.*

MARKET GARDENING IN ALGERIA.

SINCE the publication of my "Flora of Algeria" in 1847, in the preface to which I gave a short account of the culinary vegetables in common use, I am not acquainted with any printed account of market gardening in that country. The observations I offer at present, are the results of notes and personal recollections during a sojourn of 25 years in Algeria.

The gardeners who supply the markets are of several nationalities, viz., French, Genoese, Arabs, Moors, Spanish and Mahonese. Although the Mahonese are Spaniards from the island of Minorca, their system of gardening differs widely from that of the Spaniard of Valencia or Malaga, and it is they who principally supply the markets near Algiers, the Spaniard from the kingdom of Valencia those of Oran, and the Genoese and Maltese have fixed themselves in the western provinces near Bona and Constantina.

Algeria depends on Spain in a great measure for its supply of early fruits and vegetables, for, although some degrees further north, the coasts of Andalusia and Valencia ripen their produce quite a month sooner than Algiers. Thus, the Barley harvest rarely begins in Algeria before the middle or end of May, while Barley is generally cut near Valencia in the middle of April. The Paris markets, and through them Covent Garden, are supplied with early vegetables from Algeria, Potatos being sent there in January, which are followed by green Peas and Artichokes a little later. I have gathered green Peas in my garden near Algiers on Christmas Day, but they were planted in a sheltered situation on a southern slope, and they fetched 24 sous (1*s.*) a pound in the market. Hoar frosts cause much injury to early vegetation, and they are frequent in early spring even on the coast; but they only last about half an hour before sunrise, and are always the prelude of a very hot day.

At a distance of 20 or 30 miles inland the frosts are more severe, and the Vines suffer frequently from their effects, and snow lies on the mountains of Kabylia until the month of June. It seems strange that the nearer you approach the desert of Sahara the colder are the winters, and at Milianah, about 40 miles from Algiers, the Orange tree and Barbary Fig (Opuntia Ficus indica) are killed by the cold in winter; and the houses are covered with roof tiles, instead of flat terraces as at Algiers, on account of the great weight of snow falling on them. During my lengthened sojourn in Algeria I never but once saw the snow lie on the ground near the coast, and that was in February, 1845, and it then remained three days without melting; and on March 17 of the same year the thermometer stood at 25° Centigrade.

Tomato.—This vegetable is the most useful of all the products of the kitchen garden. It is eaten by all classes, both in a raw state and cooked invarious ways. It comes to market about July, and is sold at from a halfpenny to a penny per pound. The seeds are sown in a sheltered place any time from December to March, and the beds covered with litter during severe weather; the young plants are pricked out when about 3 inches high during April. The Tomato cannot be successfully cultivated without irrigation, it is therefore planted in beds about 9 feet square, at a distance of about 3 feet apart, and the borders of the bed being elevated, they are flooded with water from a reservoir about once a fortnight. A sub-spontaneous variety is found frequently near houses in the country, with fruit of an oval shape, about the size of a small Olive: they are supposed to grow from seeds of the cultivated Tomato, which had been accidentally thrown away with the refuse of the house. [Possibly the plum-fruited variety. EDS.]

Melons are cultivated very extensively, and great quantities are imported from Spain. They are sown in April where they are intended to remain. Square patches of ground are prepared by being well dug and richly manured, and the borders are raised about 4 inches in order to retain the water used for irrigation. About four or five seeds are placed at distances of 3 feet apart on little hillocks, which are raised a few inches above the level of the bed, so that the water which fills the bed at the time of irrigation shall not touch the plants. Only one plant is finally left on each hillock, and requires no further care than watering and hoeing to keep the bed free from weeds: no pruning is used. The fruit ripens about the middle or end of July. The first Melons which are brought to market are sold at about 30 sous (1*s.* 3*d.*) each, but the price falls to about 6 sous (3*d.*) in the full season. The only kind grown or imported is the green-skinned Melon; the Cantaloup or French Melon is seldom seen, and thought to be unwholesome. The jackals commit great depredations in the Melon fields, which are sometimes of considerable size. I once had a tenant who cultivated a field of 5 acres entirely with Melons. It is a common practice, especially amongst the Arabs, to build a hut generally perched in the boughs of large trees, from which they command a view of the whole plantation; whence the expression in the Holy Scriptures—"Like a lodge in a garden of Cucumbers." I had a patch of half an acre of Melons in 1845 entirely destroyed by locusts. The fruit was already of the size of hens' eggs. In the morning I was admiring the beautiful green colour of the field from my house, and in the evening nothing was left but the bare earth. Such visitations are luckily very rare, occurring about every twenty years. An old Moor, a neighbour of mine, told me that he once knew them to devour the bark of the Fig trees.

Cucumbers are sown at the same time as Melons, and receive exactly the same treatment. I have only seen one kind in cultivation, which appears to be the same as the common ridge Cucumber of the English gardens. The Spanish gardeners have a firm belief that a Cucumber (fruit) completes its growth in one night. In the neighbourhood of Oran a species of Cucumber is cultivated whose fruit is entirely circular; it is always eaten raw without condiment, and the skin is not peeled off; it is called, *alipicora:* its flesh is much harder than that of the common Cucumber.

Water-melons are cultivated in the same way as Melons and Cucumbers, but single seeds are often sown in dry vineyards, and, if the soil is sandy, they succeed very well without being once watered, either naturally or artificially, but the plant will, in such cases, only ripen 1 or 2 Melons, which are, however, generally as large and juicy as those cultivated in irrigated ground. Paradoxical as it may appear, the fruit of the Water-melon is placed for a quarter of an hour in the heat of the sun, in order to cool it before being eaten. The Arabs cultivate both Melons and Water-melons; the first is called *betika* and the second *delaa*. They also bring to the market at Algiers the fruit of Cucumis Dudaim, or Mandrake of the Scriptures, which is only used as a perfume; it is of the size and shape of an Orange, and retains its fragrance until decayed.

Onions are grown very extensively in the neighbourhood of Algiers. I once let a field of 10 acres to two Mahonese, who devoted one-half to Onions and the other half to Potatos exclusively. Onion seed is sown in small beds about Michaelmas day; they are covered with branches to prevent evaporation from the soil, and are frequently watered. When the plants show above-ground the protection is removed, and the only care they require is to keep them free from weeds. When the ground has been well moistened by the autumnal rains, which generally happens in the month of November, the Onions are planted out in the fields, which have been previously well manured, and dug with a large hoe, the use of the spade or digging fork being unknown both amongst Spaniards and Genoese. They are planted about 9 inches apart on ridges, which

contain three plants across; they are diligently hoed several times during the season, and are ready to gather in the month of June, having had their leaves broken down by a stick about a fortnight previous to ripening. The only kind I have seen cultivated is the Portugal Onion, and I have grown them weighing 5 lb. each. The Arabic name for Onion is *bessol*.

Potatos.—Although young Potatos are exported to the Paris market in January, Algeria is almost entirely dependent on England and France for the supply of ripe Potatos. The Spaniards seldom eat them, and the Moors of Algeria only use the very smallest, about the size of a Hazel-nut. Two crops are usually obtained from the same ground in one year, and where irrigation is used a third crop is produced. The first crop is planted about Michaelmas Day, and affords the early Potatos which are sent to Paris in January: this crop is liable to be injured by frosts in winter. The second planting takes place in March, and is gathered in the beginning of June. Where water is available a third crop is put in in June, and is ready in September. Potatos are always heavily manured, and as the market produce is generally taken to town by donkeys, the clearing of stables and sweepings of the streets are brought back to the garden by these animals. Seed Potatos are stored in dry lofts, and laid singly on the floor, and are very much shrivelled by the heat of the climate. The Arabic name is *batatas*.

Artichokes.—The Artichoke plant, Cynara Scolymus of Linnæus, and later authors who have copied him, I believe to be nothing more than a cultivated variety of Cynara Cardunculus, which is one of the commonest plants in the clayey grounds of Algeria, especially the corn-producing tract of land which runs parallel to the sea coast about 30 miles inland. Although Artichokes are grown in every kitchen garden in Algeria, yet the neighbourhood of Algiers furnishes the large quantity annually exported to Paris, and from thence to London. One gardener at the Maison Carrée, about six miles from Algiers, exports every year £400 worth. Two varieties of Artichoke are cultivated, one of which has small heads of a violet colour, and the scales bifid at the extremities, without sharp points. This kind is eaten raw, with oil and vinegar, or sometimes cut into four quarters, and stewed in gravy, or fried in batter (*beignets d'artichauts*). The other kind has a larger head, and the scales are undivided, and furnished with a sharp spine, being the same as that cultivated in English gardens. The young shoots are much used by the natives and Spaniards, being boiled or stewed like Cardoons. The cultivation of the Artichoke offers no feature different to the English method; they are generally grown in rich garden ground, and abundantly manured; they do not require much water, as their growth takes place when the ground is soaked by the winter rains, but if grown in irrigated soil the produce is prolonged until the middle of summer. They are brought to market in February, and fetch on an average about a halfpenny a head.

Cardoons.—These are extensively cultivated by Europeans, but the Arab contents himself with the plants that Nature provides him in the cornfields and meadows. It is a very common thing to see an Arab cut a leaf or two in the spring months, then trim off the sharp prickles, and chew the midrib of the leaf with as much gusto as any native-born donkey. The Europeans, and particularly the Genoese, cultivate them in their gardens, and the latter use a very primitive method of blanching them, by tying up the leaves with old rags to the height of about a foot from the ground. A bed of Cardoons tied up in this way with different coloured rags may be more picturesque, but does not look so neat as a well earthed up bed of Celery in an English garden. The Arab name for both Artichokes and Cardoons is *khorchef*. *Giles Munby, Alice Holt.*

(To be Continued.)

CUPRESSUS LAWSONIANA ERECTA VIRIDIS.

No one who saw the examples of this new Conifer exhibited at South Kensington, by Mr. Anthony Waterer, on the 16th inst., still less any one who has had the good fortune to inspect the parent plant growing in the nursery at Knaphill, will for a moment dispute the assertion that it is one of the finest—ay, one of the very finest—hardy coniferous evergreens which has been introduced to our gardens. And, as indicating one of its most prominent characteristics, we must reiterate, that it is, in every sense, an evergreen, for despite any amount of cold or heat, damp or drought, it maintains throughout, from the circumference to the centre, a hue of the freshest green. This constancy in a plant of this character is one of the highest recommendations it can bear.

But its truly evergreen character is not its only merit. Its narrow, erect, slightly pyramidal, almost columnar mode of growth, is quite unapproached for symmetry and beauty by any other plant we know; while the slender ramifications of its close set compact branches and branchlets give it a degree of refinement which is not seen in any other variety of this grand hardy species, numerous and varied as are its forms, and elegant as are some of their number. Unlike some other choice Conifers, this Knaphill Cypress, though dense as an Irish Yew, is moreover green to the very stem; a circumstance which is perhaps attributable in some measure to the regularly radiating character of the flattened spray of which the columnar mass is made up. We have ourselves watched this plant for several seasons, and can bear testimony to the fact that in the Knaphill climate, where Araucarias have perished by thousands, it is utterly unaffected, both as to vitality and hue, by the severest frosts.

The history of this valuable introduction, as we learn from Mr. Waterer, is as follows:—It was a seedling raised at Knaphill, and selected from the original batch of Cupressus Lawsoniana imported from California. The original plant, which is consequently about 16 or 17 years old, was grown on for several years, with the object of fully testing its merits before it was distributed, and eventually, when its character was satisfactorily established, it was propagated and partially sold under the name of C. Lawsoniana erecta. Of late years, however, and especially since the destructive frost of 1867, its great merit has been more distinctly recognised, and examples of it submitted at the last meeting of the Floral Committee were unanimously awarded a First-class Certificate. On this occasion, and in order to distinguish it from some other dissimilar forms which bear the designation of erecta, the Committee give it the name we have adopted at the head of this notice, as marking one of its most distinctive features of merit.

The parent plant, represented in the accompanying woodcut (fig. 49), reduced from a photograph, is about 9 feet high, and 3 feet through its widest part. The growth is strictly erect, and so close and dense as to form a solid mass of branchlets, which are flattened, and set in a direction radiating with remarkable regularity from the centre or axis of the plant, the wood being perfectly clothed, and the branchlets green to the very centre.

Fig. 49

This tree has never been protected in the slightest degree. In the symmetrical outline of the tree itself, in the regularly radiating vertical ramifications, in the slender graceful character of the everywhere erect spray, there is about this plant an air of refinement rarely met with, and which, combined with its bright and enduring verdure, stamp it as a gem of the first order amongst hardy evergreens. *M.*

Home Correspondence.

Raising Ferns from Seed.—"A Constant Reader" will find the following a good plan to adopt for the purpose of raising spores of Ferns:—Procure some bricks or stones—bricks would be best, as they have an even surface, and are also porous, rendering them capable of holding water. These would be best if found covered with Moss which has naturally grown on them. If not thus covered it can be very easily done. The Moss must not be thick; it can be clipped with a pair of scissors if thick, and well washed before using, to get rid of any seeds that may have fallen into it. These bricks should be placed into the pot or pan, so that their upper surface may come level with the soil used to steady them and to fill up the pot. Sow the spores in the Moss, and with a pepper dredge dust over the Moss very lightly with burnt soil, and then, with a very fine-rosed watering-can, wash down the soil and spores into the Moss. Place the pot into a saucer of water, which must be kept full. Place a bell-glass over; those which have a hole in near the top I prefer, as they prevent damping, affording an escape to the great evaporation which takes place; they can be left alone for a week without disturbance. There will be no necessity for surface-watering until the seedlings appear; even then it is not advisable, if soaking the pot up to the rim can be quickly done. I should before have said that the bottom of the pot should be filled one-third of its depth with broken crocks. The pot should not see the sun until the seedlings are well up; even then shade is necessary. The soil used should be previously burnt, otherwise numberless seedlings will appear, which will choke those wanted, and be a cause of mischief in the operation of weeding. This plan I have proved, and can recommend it. *H. M.*

Ailantus as a Timber Tree.—There is here a specimen of Ailantus glandulosa which does not sustain its reputation as a very fast growing tree. I cannot say when it was planted, but judging from its size when I first saw it, nearly 22 years ago, it must be more than 30 years old. The height of the tree now is 30 feet, and the girth of the bole 6 inches above ground is 31 inches. It stands just outside the gardens. The ground was formerly enclosed, but has been thrown into the park for some years. The tree is fully exposed, but it is well sheltered from the north and east. The situation is, I consider, a favourable one; the soil is a sandy loam on a dry gravelly subsoil. Ash, Elm, Sycamore, Beech, Chestnuts, and Oaks flourish in the same locality. I never saw the wood injured in the slightest degree by the frost; this I attribute to the dryness of the situation, and, in consequence, to the tree only making moderate growth, which is always sufficiently matured to withstand the frosts. The tree here has been very much spoiled by the west winds. We seldom have any strong storms during the latter part of summer without its losing some of its branches. It suffers more in this way than any of our common timber trees. Altogether, I consider it a tree that will never be of much value either for ornamental purposes, or for timber. *M. Saul, Stourton, Yorkshire.*

Vine Soils.—I crave a small space to reply to a few of Mr. Cramb's statements at p. 144. I am not disappointed at the result of this controversy, but on the contrary. In the severe remarks which called forth my replies, Mr. Cramb defied proof to the contrary of his opinion, defied contradiction and alike conviction; so that, as I stated, I did not in the least expect to convince him, because I know that

> "He that complies against his will,
> Is of his own opinion still."

"'B.'s' strictures," he says, "are doubtless to some very conclusive, but when thoughtful minds begin to investigate with the sole object of eliciting truth, there is no truth." "There is no truth," because he himself has not so spoken. This is a greater admission than expected; some, he believes, are convinced of his errors, but a few thoughtful remain stedfast. Mr. Cramb, however, although he in words vehemently protests against all I have written, virtually admits I am right, for instead of protesting against the presence of all calcareous matters, he now says, "only increase the calcareous matter to 80 per cent., and see the result." And he further gives us an instance of an old border wherein he found dead roots when the calcareous matter formed 60 per cent. Now, I ask, what sort of argument is this?—to leave his own decided protest against the presence of all calcareous matter, and to adopt my own words and that of common-sense, wherein calcareous matter was alike objected to, but only, as here, when it greatly exceeded in proportions the other two primitive soils, silex and alumina. The most fertile soils, as I have stated, are those where the three great elements are the most intimately blended. Although good Grapes may be grown by superior skill in soils where one element greatly exceeds the other—as stated by Mr. Cramb in silicious, by myself in calcareous, by others in aluminous—no one having the choice would select 60 per cent. of either, not even of silica. I did not, as Mr. Cramb tries to make out, advocate the introduction of coal clinkers to our Vine borders, I only gave it as an illustration, as I did the case of Mr. Drewett's Grapes, and those of Mr. Knight and others; neither did I "traduce the cultural ability of the French gardeners,"—I only attempted to guard myself against Mr. Cramb's desire to do so, by stating that they do not pay much attention to them—a fact one would have supposed was known even to Mr. Cramb, who apparently believes in nothing he has not himself written or seen. He even disputes the fact of Mr. Drewett's and Mr. Knight's Grapes being meritorious. Well, some people say black is white, and Mr. Cramb might just as well do so. I ought to have given, it appears, 20 instances or more of their successful exhibition to satisfy Mr. Cramb. Now, if he would take the trouble to look up the records of the metropolitan shows he would find Mr. Drewett's name a good many times reported. (See also Mr. Knight's letter, p. 176.) Mr. Cramb takes exception to Mr. Drewett's Grapes, because I have told him of their being exhibited so very good only once, and to Mr. Knight's, because he saw them, after travelling many hundred miles, not so very good on one occasion. Mr. Cramb thinks "B." was hard pressed to introduce the Trebbiano Grape, which, as he says, "stands more ill-treatment than any others, and still produces large bunches, as is its nature to." Well, yes, it produces large bunches, it is true; but I, like many

other gardeners, have found it about one of the worst for "shanking," if in the least neglected, and seldom is it to be seen in such perfection as with Mr. Drewett. Mr. Cramb still persists in talking of caustic lime in his soil, whereas chemistry tells us that such a thing does not exist, excepting it be made so artificially. The illustrations he gives us to support this, that of finding dead roots in an old calcareous Vine border, and living roots in a silicious one two years old, are mere nothings. Who would expect to find anything else, of whatever kind the soil might be? As to the lime eating holes in a lead pipe, it does certainly "surprise me." It must have been very disappointing to Mr. Cramb, for many years, not to have been able to produce a good bunch of Grapes, despite all his efforts. I am pleased to think of his success now, and how gratifying it must be to have that "bugbear" lime to bear all the blame. Yet the best of soils will not produce good Grapes, if the inside or leaf management is radically bad. That will even counteract the influences of the soil. Therefore, I am not inclined to accept Mr. Miller's (Combe Abbey) low estimate of himself as a cultivator of the Vine it is so different from what we have been led to believe from Mr. Miller's own writings in these pages, and what I have seen at Combe myself. The soil is undoubtedly good, and so is the cultivator. It is a strangely curious theory of Mr. Cramb's, and not at all complimentary, to bestow all the merits of cultivation on the soil, and none on the cultivators. But Mr. Cramb has fired his last shot, and written his last line "on this subject, and will not recur to it again, at least until he has acquired more information;" and considering, as he tells us, it has taken him "14 years' incessant inquiry," and altogether "30 years' study of Vine soils" (although he declines to let me call it his pet subject) to find out what little he has told us, the present generation will in all probability hear no more about it, at least from Mr. Cramb. We should ill perform our duty if we did not in some way recognise such unwearied perseverance. I therefore, for myself and others, write that short but expressive word—"Thanks." *B.*

The Nationality of St. Fiacre.—At p. 74, Mr. Ingram has been at some pains to supply a want (as the writers of new books would say) that has long been felt, viz., that of a patron saint for gardeners; and with a piety that does him credit, offers to send his hat round to get the shrine of St. Fiacre put in thorough repair. Mrs. Pallisser, in her "Britanny and its Byways," says St. Fiacre was an Irishman, and Mr. Ingram throws down the gauntlet, and maintains that the saint was the King of Scotland's son, that he travelled into France as a missionary, and died there in the odour of sanctity. Mr. Ingram further hints, as belonging to the theory of probabilities, that St. Fiacre may have left a large family of horticulturally-disposed children, whose descendants are famous to this day for fruit and flowers, notwithstanding their northern clime. To account for the name Fiacre being given to the hackney-coach in France, and eke to "coachee," it is stated that sick persons were conveyed by these vehicles to the shrine of St. Fiacre, and so the coach and coachman got the name of Fiacre. John of Tinmouth records that St. Fiacre told Faro, Bishop of Meaux, that "Ireland, the island of the saints, gave me and my progenitors birth." Du Plessis confirms Mr. Ingram's opinion that hackney-coaches got the name of Fiacre because they were first used to convey pilgrims from Paris to the shrine of St. Fiacre, and because the inn from which they were hired was known by the sign of St. Fiacre. Now, "if ancestry can be in aught believed," when the saint arrived in France he waited upon the Bishop of Meaux, and the good bishop gave him out of his own patrimony a patch of ground in a forest, at a place called Breuil, for a garden and a cell, and the saint built an oratory there in honour of the Blessed Virgin. We further read that he tilled his garden, led an austere life, and, as the poet has said—

"Remote from man with God he passed his days,
Prayer all his business, all his pleasure praise."

He is said to have built a hospital, and to have served the poor with his own hands, but it is further related that he never suffered any woman to enter the enclosure of his hermitage. Now this is rather against Mr. Ingram's theory of his having left a large family to inherit his virtues, and particularly his inclinations to the harmless art of horticulture. St. Fiacre, being an anchoret, was in nowise singular in this way, for Tom Moore has told us of one who vowed thus:—

"But I have said this sainted sod,
Shall ne'er by woman's foot be trod."

And that when his lady-love had found out his retreat and arrived late he ordered her away. But such was the temptation that Moore *naïvely* adds:—

"But legends hint that had the maid
Till morning light delayed,
And given the saint one rosy smile,
She ne'er had left his lonely isle."

Hector Boethius, David Camerarius, and Bishop Leslie relate that St. Fiacre, being eldest son of a king of the Scots, in the reign of Clotaire II. in France, was invited by ambassadors sent by his nation, to come and take possession of that kingdom. He is said to have died about the year 670, on August 30, but this circumstance is not mentioned in the ancient histories of his life. Part of his relics were translated to the Cathedral at Meaux in 1568, and part remained at Breuil, or St. Fiacre's. This saint is said to be patron of the province of Brie, and titular saint of many churches in France, and his name has been famous in that country for upwards of a thousand years. He is nowhere noted for gardening by any of the authors named by Butler in his lives of the Fathers, Martyrs, and other principal saints. That St. Fiacre must have been a person of some note is evident from the fact that persons of high rank and even royal personages went pilgrimages on foot to his shrine, not to speak of the invalids who hired the hackney-coaches where the sign of St. Fiacre adorned the hostelry in Paris, to visit the shrine of the saint at Breuil, two leagues from the city. In regard of Scottish gardeners accepting a patron saint, I think I may answer for at least nine-tenths of my brethren of the blue apron natives of "mine ain countrie;" that the "Kirk" does not "fash" with making saints; that even the English Church service finds no favour in the Scottish Kirk; but that for anything beyond that, and dating deep into Popery 1200 years back, you could not get a hearing, for the nearest equivalent to the love of God in North Britain is an honest and conscientious hatred of Popery. Whilst the Bishop and people of the diocese of Meaux and the Monks of Breuil have St. Fiacre for their patron saint, and keep holiday in his honour on August 30, I would suggest the following *finale* to this new subject in your columns,—that gardeners take for their patron One in whom all the circumstances of sanctity are placed beyond cavil on both sides of the Tweed, as well as on both sides of the Channel. When the late Sir Walter Scott wanted to show how well the Palmer graced the character he had assumed, he said—

"Poor man, the mother that him bare
If she had been in presence there,
In his wan cheek and sunburnt hair
She had not known her child."

And so well did our Saviour assume the dress and the character of a gardener after He had risen from the dead, that when His blessed mother met him it is stated that she thus addressed him:—"She, supposing him to be the gardener, saith unto him, Sir, if thou have borne him hence," &c. I maintain that such honour as this bestowed on the primæval art of horticulture was never given to any other trade or calling under Heaven, from the time that our first parents walked with God in the garden of paradise up to the date hereof. Here then, brethren, is the saint of saints for your patron, pattern, and protector in life: love Him and serve Him, and trust your best interests in His blessed hands. Remember that the second Adam assumed the time-honoured dress of a gardener, and so well did it become our Lord, that His blessed mother did not know her child. *Alex. Forsyth.*

Chiswick Doomed.—Presuming that you are correct in your statement that Chiswick must go, it may be well to inquire into the mitigating circumstances connected with its loss. Almost the first thought that occurred to me in connection with the loss of Chiswick is that it perishes in virtue of its success. I know there are many who are constantly asserting that the Horticultural Society has been and is a failure. I cannot believe it. The fact is, it has succeeded, beyond all reasonable expectation, in arousing an interest in horticulture throughout the country. Almost the first school of horticulture, it has raised up so many other schools, that, relatively, it has necessarily lost prestige and power. Had it still maintained its past pre-eminence, that would have been a misfortune for horticulture and a proof of its uselessness. But to-day we see the parent society has reproduced itself throughout the country and all over the world. Everywhere societies with more or less of its likeness abound. Directly or indirectly its legitimate progeny are to be met with everywhere. An honoured parent that can count descendants by the hundred can never be said to have lived in vain; neither is there any need for the parent, because the children live. There is room enough in the horticultural school for the teaching of all the societies; still, when large schools are opened in numbers of places, such as Kew, the Crystal Palace, the public parks, South Kensington, &c., the question naturally, and almost logically, occurs, whether the first school might not be remodelled and curtailed to the mutual benefit of all concerned. Thus changes at Chiswick might be desirable, independent of financial embarrassments. It is no longer necessary to preserve it as an arboretum, pleasure-ground, or promenade. In either of these respects Kew, the Crystal Palace, and most of the public parks would far excel it. The fact is, Chiswick has educated the nation into the pursuit and appreciation of the beautiful in Nature, and the national purse is freely opened to the purchase of plants, and the embellishment of public places. The natural result is, that societies can hardly be expected to beat the nation on its own ground. Neither is the contest wise. The success of the Society in this direction is proved by the public taking the matter into its own hands—and with all the parks so beautiful, the mere pleasure-grounds at Chiswick must of necessity be comparatively neglected. Even gentlemen will hardly pay two guineas a year to walk about Chiswick, while Battersea Park—and all the others—and Kew, are free. Another field that used to be occupied with great usefulness by the Royal Horticultural Society, has now been fully taken possession of by our plant merchant princes, the nurserymen. They ransack the world for novelties, and also to a very large extent teach their customers how to grow them. A day spent in visiting our chief London and provincial nurseries will teach more useful knowledge about cultivation than can be learned in any single school of horticulture in England—not even excepting Kew, although there is a great deal to be learned there. But the skill of the nurseryman is quickened to the utmost by self interest. And it is certain that our nurseries are practical schools of plant culture and propagation of the highest order. The growth of the seed trade to its present giant dimensions—the improvement in the quality, and the cheapening of the price of seeds—also relieves the Society, or ought to relieve it, of a most burdensome duty, that of furnishing its members with a supply of common seeds. For many years after its establishment this was a most important part of the duty and business of the Society. At that time seeds of some varieties of common things were scarce and dear, but now when the price of collections of choice seeds ranges from 10s. to 10 guineas, it is beneath the dignity of a great society to grow common seeds for its members. Perhaps of late years this has been the weakest part of the Society's proceedings, and it will be no loss to its prestige and usefulness, but the reverse, if the loss of Chiswick deprives it of the power of furnishing its Fellows with common, often very common, seeds. It will still have the power of doing good work for horticulture in two directions. It may hold shows at South Kensington and throughout the country, and thus reward intellectual and cultural merit. It might likewise prove, test, and report upon all new fruits, vegetables, and, probably, flowers. All the best fruits in cultivation should also be preserved, and several exhibitions of fruit in season, from the Society's garden, be held at South Kensington during the season. On such occasions the Fellows might be permitted to judge by tasting for themselves, and such shows could hardly fail to draw. A very small garden would suffice for these purposes. The furnishing of Kensington is a different matter, and could probably be managed on the spot. But as far as practical horticulture is concerned, it need not suffer by the loss of Chiswick. Suppose, for instance, a piece of ground to be chosen near Reading, it would be almost as accessible to Fellows as the present gardens, while everything would thrive better away from London. By the change the Society would be rid of the huge millstone of debt that has long hung like a nightmare upon its energies, and would doubtless be more able and willing to devise and execute fresh plans for the advancement of horticulture. It is quite possible that from the loss of Chiswick it may date a new career of success and prosperity. *A Fellow of the Royal Horticultural Society.*

Rhus Cotinus, the Venetian Sumach.—I am not sure whether the Venetian Sumach has not as much claim upon our notice as the Judas Tree (see p. 176). It is true it does not flower in the spring, but the singular and ornamental appearance of its elongated feathery fruit-stalks render it an object worthy of more extensive cultivation; indeed, it is one of those interesting shrubs which, when well grown, cannot fail to please. A large specimen planted on the open lawn is always very attractive, and an object of much interest. It grows to the height of from 10 to 12 feet, and it has many valuable properties to recommend it. The bark on the older branches is of a light brown colour, whilst that on young shoots is smooth, and of a purple hue; the leaves are nearly of an oval shape, and stand singly on long footstalks on the branches. They are of a delightful green colour, are smooth, and when bruised emit a strong scent, which to some people is very agreeable. The flowers are produced in a singular manner at the ends of the branches in July. The end of the last year's shoot will about that time divide itself, and produce hair-like bunches of greenish-purple flowers, so as to cover the tree; and in the autumn, although they do not perfect their seeds with us, these tufts will still remain, be of a darker colour, and almost cover the entire tree. The bark is useful for tanning, and the leaves for dyeing. *E. Bennett, Osberton.*

Are Privet Berries Poisonous?—I shall be glad to learn whether or not the berries of our common Privet are poisonous? A friend of mine let a field adjoining his house to Mr. S., and for the last 20 years at least his sheep and cattle have grazed there without having eaten anything to injure them. Last Christmas, however, Mr. S., not requiring the grass for his own cattle, let it to Mr. L., a large farmer, and two or three days after his sheep were turned into the field in question, some were taken ill, three have died, and two others had to be killed. A farrier was called in, and on his examining the contents of the stomach of the first sheep that died, Privet berries were discovered, and were at once stated to be the cause of death. Now Loudon tells us that cows, sheep, and goats eat the plant, but that horses refuse it; and as Privet is not quoted in my books on poisonous plants, I am inclined to doubt the farrier's verdict. In some parts of our county (Devon) there are miles of hedges full of Privet. *G. A.* [A friend of ours tells us that his son was once all but poisoned through eating Privet berries. Eds.]

Richard Antony Salisbury.—Can any of your correspondents give reliable information about Richard

Antony Salisbury, who published "Prodromus Stirpium in Hort. ad Chapel Allerton Vigentium," in 1796; and of William Salisbury, who published in 1816 two separate works—"Hints addressed to Proprietors of Orchards and to Growers of Fruit in General," &c., and "The Botanist's Companion," in 2 vols. 8vo. I want to know what other works (if any) they published, and when; where they were natives of, when born, where they died, and when. I shall esteem it a great favour if this information, or indeed any information respecting these gentlemen, can be given to me through your columns. *E. G. S.* [R. A. Salisbury is well known as a very acute botanist, who for some time held the post of Secretary to the Horticultural Society. Some interesting particulars as to his life are given in the preface to the fragment of the "Genera of Plants," lately published by Dr. J. E. Gray. All those who have had occasion to go over any of Salisbury's botanical work must admit the great accuracy of his observations, even though they demur to his conclusions. He paid great attention to garden plants, and was thus enabled to detect peculiarities of structure often (necessarily) overlooked by herbarium botanists. EDS.]

Pink "Coffins."—Can any of your floricultural readers explain what the old florists meant by the term "coffin," as applied to the petals of a Pink. The word occurs in the following connection in an old work, bearing date 1727:—"*Adjusting:* A term in use amongst florists, who say, 'I will adjust a Pink,' and to do this is no other than to range the leaves in such a manner, that for want of natural order, each of them shall be so disposed that the Pink becomes larger thereby, because the extremities of their coffins have been a little curved; and they apply themselves to this work when the flower is quite blown, and that Nature has not disposed of it in good order." If any light can be thrown on the subject, I shall be thankful for it. *G.* [We have searched in vain through many old gardening books without meeting with any information on this subject. Perhaps some of our readers may be able to explain the matter about which "G." inquires. EDS.]

La Muette, Paris.—The statement about the gardens of the City of Paris at La Muette, which has appeared in the "Period," and to which you referred last week, viz., "that the mere sale of the surplus stock to nurserymen, florists, &c., at wholesale prices, not only suffices to cover all expenses, but leaves a margin for profit," is, to say the least of it, scarcely warranted by facts, for the administration does not allow, and will not entertain, any proposition concerning the sale of plants at La Muette. Surplus stock, however, may be exchanged for plants which the administration does not possess. And in support of this I quote the rules which were at least in force in the establishment up to August last:—"Afin d'en vulgariser l'emploi, elle offre ces végétaux, à titre d'échange, contre une valeur égale en plantes qui lui paraitront utiles ou qu'elle ne possède pas. Les horticulteurs qui ne pourraient offrir, par voie d'échange, des plantes convenant aux cultures de la ville, auront la faculté de faire fournir par un de leurs confrères une valeur égale de végétaux que l'administration désignera. Aucune proposition d'achat, payable en argent, ne sera admise par l'administration." There can be no two opinions, however, as to the economy of having an establishment like La Muette to supply the enormous quantity of plants required for the parks, squares, and public gardens of Paris; generally close upon 3,000,000 plants being sent out yearly. This garden also supplies the plants for the decorations of the apartments in the Tuileries, the balls at the Hôtel de Ville, and at the houses of the Ministers of State. Without a doubt La Muette costs a good round sum yearly, but were it to be abolished and the administration to purchase their yearly supply of plants to keep the Parisian parks, squares, and balls up to the same mark as formerly, the taxpayer would have to "pay the piper" double what he now pays. *D. M.*

A New Button-hole Flower.—Imagine a pure white, very double, and well-formed Camellia, of so small a size that seven blooms will lie upon a shilling; conceive that each bloom has a pale green stalk, ¾ of an inch long, of the thickness of a horse-hair, and slightly bending under the weight of the flower; suppose these hair-like peduncles to grow in clusters of four or five, and that these clusters are disposed at distances of a quarter to half an inch apart, towards the apex of a straight brown twig of the size of a hair-pin, and you have the portrait of one of the prettiest little button-hole flowers that you ever wore in the month of February. Euphorbia jacquiniflora works up capitally with it. I send you a piece of it, and should be obliged to you for its name. *W. T.* [Spiræa prunifolia fl.-pleno, a beautiful hardy deciduous shrub, introduced to our gardens by Mr. Fortune, and a most eligible plant for early forcing. EDS.]

Iris reticulata.—In reply to "F. H." respecting the above plant, I must still adhere to my assertion, that I have found it of the easiest cultivation. I have successfully grown this plant for several years, both indoors and outdoors, and I have never found any difficulty with it. The foliage of this plant will average 15 inches in length, the specimen enclosed is 17½ inches. I have some bulbs potted and plunged in ashes, which have been fully exposed to wet and frost the whole of the winter. The bulbs are not more than 1¼ inch deep, consequently have been repeatedly frozen through; yet I have no doubt about these flowering this season; the foliage is quite fresh and healthy, and about 2 inches in height. Another clump I have planted close under a south wall, the foliage of this is about 6 inches in height, and every bulb showing flower. I have tried this plant in various places, and I find it succeeds best in a hot, dry situation, such as would be found on a south border. I believe continual moisture is the principal cause of failure, and if "F. H." will try some bulbs in a similar situation to that which I recommended, I think he will succeed far beyond his expectations. I have never seen foliage out-of-doors exceed 9 or 10 inches in height, but if grown in heat it will frequently exceed 15 inches. *A. I. P., Tottenham.* [The specimens fowarded were true to name. EDS.]

Electric Bells and Hothouses.—In a recent Number of the "Field," there is an interesting communication from a gentleman who has had fitted up between his gardener's dwelling and the various hothouses under his charge, wires connected with thermometers in the houses and with bells in the dwelling, which ring whenever the temperature is above or below the allowed range. Of the thermometer, he writes that "it is in a very simple form, and perfectly effective, and does not cost much more than a common thermometer, of which it takes the place." Of the battery, he says that it is "very inexpensive, and requires to be charged once in six months." (What a blessing it would be to gardeners, if furnaces, clocks, and under-gardeners, only required to be charged once in six months!) As an instance of the benefit to be derived from the adoption of this plan, he mentions that "during a very windy night the door of my stove (being imperfectly shut) was blown open, and at once the gardener received notice by the bell. As he had left all right less than an hour previously, he was puzzled to understand the cause of the ringing, till he went out and found the door open, and several valuable foliage plants overturned and injured." As the night afterwards became so frosty that all the plants would have been destroyed before morning but for this timely warning, and as this happened only a few days after the apparatus was put up, he may fairly recommend this plan of "insuring the life" of plants at a "small premium." The designer is Mr. Sax, of 108, Great Russell Street, Bloomsbury, London. Have any of your correspondents any information to give on this subject? If so, they would doubtless oblige many head-gardeners by giving their experience. *W. T.*

Cool Treatment of Cattleyas.—It is evident these plants will bear a lower temperature during the resting season than that to which they are generally subjected. I have now the fine broad mauve-winged variety of C. Trianæ in bloom, and others set well with bloom-buds, which have been kept since October last in a temperature ranging from 45° to 53°, the latter having been the maximum warmth; but the atmosphere of the house has been kept very dry, and the application of water or moisture of any kind to the plants withheld. With the above I have many unnamed species, imported about a year ago; also maxima, Mossiæ, superba (a fine plant with eight breaks), and the lovely Dowiana, a plant of which flowered in this temperature in December last. All are looking happy, and are in fine condition for starting into growth with an increased temperature, which I give as soon as the days are sufficiently advanced to secure some amount of solar light and warmth to assist Nature. I think many labour under an impression that a high temperature is necessary for the successful maintenance of these lovely plants throughout the winter months, and are thus deterred from embarking upon their culture. It would be very interesting to read the records of others who advocate the extreme cool system. *Ransley Tanton, Epsom.*

Rendle's Patent Plant Protectors.—I now send you the mode of removing the panes of glass:—"If it is necessary to remove panes of glass in the middle, it will be necessary to leave openings 5 or 6 feet apart, 'front and back,' merely to allow space for a finger to be placed under the glass. The glass, with this simple arrangement, can be taken out or moved to and fro at pleasure, for ventilation, for watering purposes, or for gathering fruit, &c." In the winter months the small opening can be closed by a small piece of wood, or wedge, fixed in the opening. In the summer months the space can be left open if desired. I have another plan for removing the glass, and this is by means of an air exhauster, or sucker. This useful contrivance is placed on the pane of glass, the air is exhausted by a simple screw, and a single pane of glass can be removed at any point. *Wm. Edgcumbe Rendle.*

The Pine Beetle.—Many thanks to your correspondent, C. Laurence, Cirencester, for his remarks and information concerning the Pine Beetle. The damage done to the trees growing in the wood, to which I drew attention, is such that I fear they will never recover. Besides the whole of the side branches and tops, so far as I can see, being affected, the extent of ground, upwards of 10 acres, would make it an endless work to have all the diseased twigs cut off; the trees are not, however, very regular on the ground,—on some parts they are excessively close, while on other portions there is only a tree here and there. Hitherto, we could not overtake the thinning of the wood in question, to which circumstance, together with there being so little frost last winter to kill the larvæ of these insects, in this quarter, I attribute the serious attack made on the trees. I should have mentioned, perhaps, that the wood is on two of its sides closed in by old woods of about 70 years of age, in which there are many hundreds of decayed roots of Scotch Fir. Both in the young and old woods there is an immense quantity of rough herbage, keeping the ground in rather a damp state. Within the last few days I have been shown many trees of the rarer Coniferæ injured by these insects in my neighbourhood, and out of many varieties scarcely a tree has escaped; they were attacked at all stages of growth. The trees I saw were from 2 to 18 feet high: from this it appears a mistake to say that their ravages are confined to the nursery. I enclose twigs cut from P. austriaca and monticola, the latter with the insect in the cones. *A Forester.* [On examining the specimens sent we find that two enemies are at work. From the first bud that we opened we obtained a specimen of Hylurgus piniperda in the perfect state. From two of the others we obtained two caterpillars, both of the same kind, but not the larvæ of the Hylesinus. They are lepidopterous larvæ, but we do not know the species to which they belong. They are about one-third of an inch in length, dirty white, with a broad band down each side, and a narrow one down the middle of the back, of a reddish-fawn colour. We shall submit them to the next meeting of the Horticultural Society's Scientific Committee, when we shall probably ascertain their name. Their mode of attack is different from that of the Hylesinus. They have obviously begun at the bud, and were busy eating their way down the heart of the young shoot. There are several Fortices which carry on their operations in this way, and this is, no doubt, one of them. We have put the specimens in spirits, but it would be desirable that we should have fresh specimens to show at the meeting of the Scientific Committee, on March 2. Will "A Forester" kindly try to supply us? Another point to which we direct his attention is the relative amount of damage done to his plantation by the Pine Beetle, and by this moth. It will not be fair to the former to charge, as we have been doing, the whole of the mischief to it, when, perhaps, in point of fact, the most serious part of it is the work of the latter. *A. M.*]

Vine Pruning.—Being, I believe, the first to direct attention to the pruning of the Vine as practised by Mr. Henderson, of Colesorton, and to point out the advantage of his system, I am unwilling to allow "B.'s" remarks at p. 174 to pass without comment from a gardening point of view. First I would observe that I may claim to know more of the Cole Orton Vines, and the crops they have borne, than any other gardener, with the exception of Mr. Henderson himself, having been a neighbour to Mr. Henderson for the last 15 years, during which time I have been in the habit of seeing the Vines in their various stages of growth; and I can say with truth that I have seen heavier crops of Hamburgh Grapes of fine quality at Cole Orton than I have seen anywhere else. To state that Mr. Henderson keeps any Vine lightly cropped for exhibition purposes, is the reverse of fact; and I believe the market value of the crops of early Grapes, grown by Mr. Henderson, to be equal to any, and double the value of those where the Vines have succumbed to the close spur-pruning. It is not by light crops that we secure colour and well swelled berries, but it is by keeping a balance of power that Mr. Henderson has been so successful, and his extension, or cut-to-the-best-eye, system has given him that power of balancing that he could not possibly have had by pruning to the latent eye. I am willing to admit, from what knowledge I have of the cut-to-the-best-eye system, that it requires a thorough knowledge of what I may term vegetative force, or great mistakes may be made. That we grow fine Grapes and other fruit in England, is no proof that we have the best system; but rather I should say, by the encouragement of the wealthy, we make the best of a bad case; for often our existence as gardeners depends upon the production by us of fine fruit. It is not only the Vine that I think we restrict too much, but also our Peaches, Apricots, Pears, and Plums. I cannot but think that we shall soon pause and alter our course, and begin to learn that somewhat like a natural development of size in our fruit trees is not incompatible with the production of fine fruit. *Emanuel Sage, Gopsall Hall, Atherstone.*

Michauxia campanuloides.—Under this name the Rev. H. Harper Crewe writes (p. 213) in glowing terms of this "almost unknown and ungrown, remarkable and magnificent biennial," and describes its flowers as "snow white." Loudon refers to a figure of it in "Bot. Mag.," 219, and calls its colour "light blue." Paxton (1868) describes it as "pale red." If all three be right, verily its name should be at once changed to chameleonides! Ware, E. G. Henderson, and Barr & Sugden, all give the flowers as "white." Now it occurs to me as just possible that the plant under consideration may be wrongly named, and that it may prove to be the white-flowered Persian species, M. lævigata (syn. decandra). When the plants are in bloom next July, perhaps Mr. Crewe will kindly determine this nomenclature. M. decandra is

amongst the list of hardy plants grown in the Hamburg Botanic Garden in 1831, and recommended as decorative; no other species is mentioned. *W. T.* [The flowers are white, shading off into pale rose. The plant is now seldom met with in gardens, but is well worthy of cultivation. EDS.]

Foreign Correspondence.

NOTE UPON THE VINEYARD MADE AT CHAMPERION (LOIRE-ET-CHER), BY M. JULES CORNU, JUDGE OF THE CIVIL TRIBUNAL OF CHATEAUROUX (INDRE) FRANCE.—The first idea of this mode of planting occurred about 20 years ago, when M. Cornu had the opportunity of remarking accidentally, by the growth of a field of Lucerne (which had prospered during eight years), the surprising fertility obtained on his domain of Champerion by the imbedding of maritime Pine faggots in addition to manure. Similar effects were manifested by the monstrous growth of some Grapes, seeds of which had been sown by accident at the same time as the Lucerne. This had struck the attention of M. Damas, then Minister of Agriculture, who felt it to be his duty, after having obtained an account of the operation, to reward the inventor of this process by a gold medal, struck with this inscription "To M. Cornu, for his agricultural improvements in the Sologne."

As regards the application of this process to Vine cultivation, the peregrinations of M. Cornu as magistrate did not permit him, during 15 years, to profit by his discovery; but towards the end of 1865, acting upon his first observations, and impelled by the publications and advice of Dr. Guyot, M. Cornu formed the idea of applying this mode of fertilising the soil to the culture of the Vine in the Sologne.

The soil of Champerion is silicious clay, with a subsoil of clay. It had been marled several times, at the rate of from 30 to 40 cubic mètres the hectare (2½ acres nearly). In planting, M. Cornu had dug trenches about 50 centimètres (20¼ inches) in width and breadth, with larger collecting trenches from 70 to 80 centimètres in depth, and one mètre (40¼ inches) in breadth, through all the undulations of the ground, these collecting trenches abutting on the running ditches open to the surface. In order perfectly to drain his plantation, he filled the whole with faggots of Heath and marine Pines, marine Thorn, Broom, Oak, &c., always employing specially for this purpose the above and other unsaleable trimmings of Pines and Oaks, these faggots being covered with half of the earth taken out of the ditches. He planted a variety of plants, generally of one or two years old, and sometimes three years, but some years simply shoots, and these were covered with the remainder of the earth taken from the trenches, so that the ground was brought to a level surface. He did not add manure or any other fertilising matter, either from the farm or the market; and as the growth during these four years continues to be excellent, the Vines presenting uniformly the aspect of plants already in full bearing, the proprietor has no intention of manuring or amending his vineyard, as long as no considerable falling off manifests itself.

M. Cornu has planted in this fashion, by way of experiment, and with much hesitation at the beginning, the following:—In 1865 above 1 hectare in "côts," "Meunier," "Gamai," "Epinette," "Blanches de Champagne," which were sold to him under the name of "Gatinais," white "Jurançon," or "Quillard," or "Quillot." In 1866 about another hectare in "Carbinet," Sauvignon, got directly from the "Medoc," and in small "Syrra," called "Hermitage," got direct from Tairs, department of Drôme, with some "côts." In 1867, about 4 hectares upon the trenches, separated one from the other about 2 mètres 33 centimètres, in "côts." In 1868 about 1 hectare, in the lowest and most inferior part of the ground, in "Auvernat Meunier." In fine, in 1869 he planted without trenches, not having faggots (from a motive of economy, perhaps wrongly understood, but which might be of use by way of comparison) "Meunier," "Gamai," "côts" and "Carbinet Sevignon," in a line inserted between each of the ranges, distant from each other 22 mètres 33 centimètres, of the young plants of 1867 and 1868; so that in this new piece (of about 5 hectares) the lines would be only about 1 mètre 20 centimètres distant, the plants in the line remaining always, and in the whole vineyard, at about 1 mètre distant from each other.

As to the return in wine, the 2 hectares planted in 1865 and 1866 are the only ones which have produced enough to make wine in any degree of abundance. The hectare planted in April, 1865, has given, in October, 1866, 7 hectolitres (1 hectolitre = about 22 gallons) of white wine; and in October, 1867, 5½ "pièces" of wine of 228 litres the pièce, viz., 4½ pièces of white wine, and one pièce of red wine. At the last vintage of September, 1868, the 2 hectares planted, one in 1865 and the other in 1866, have given together 14½ pièces of wine of 228 litres the pièce, viz., 10½ pièces of red wine and 4 pièces of white wine. The white plants had suffered from frost. The precocity and abundance of these returns in the Sologne have surprised not only the proprietor himself, but the neighbouring population.

The share of expenses and returns between the proprietor and the tenant have been hitherto very unequal. The proprietor has incurred all the expense of the purchase of the Vines, whether obtained at home or from a distance, and of putting them into the "nursery;" the purchase and transport of the faggots, the making of the ditches, the planting and tying of the Vines, the purchase of the poles, the cleaning between the plants after the tillage of the ground; and half of the expenses of the vintage and the making of the wine, for which he has furnished vessels. The tenant has worked the land with a plough, then with a horse-hoe, several times in the year, between the lines; he has put in and taken up the poles, has practised the pruning the best way he could, in the absence of the proprietor, and according to his instructions; and has furnished the half of the labourers for the vintage; and he has had the whole of the faggots of Vine branches. The wine has been shared half and half, whether taken from the vat or from the wine-press, as well as the wine made from the skins of the Grapes after the last pressing. The proprietor, feeling that he could assure himself of success by extending a scheme into which he had been led, principally for the benefit of his country, first charged himself with the principal expenses; and after four years of experiments, his tenant, convinced by the facts, has expressed his willingness, in the vintage of 1869, to take an equal share with the proprietor of the profit and expenses.

M. Cornu believes that by his process he has replaced advantageously the ordinary drainage by clay tiles, and at the same time by providing artificial means of giving to the Vine the alimentation best suited to its constitution. In truth, the ordinary draining by means of clay tiles in silicious soils is rapidly stopped up by the sand, or obstructed by the roots of the plants, and whilst the drainage by faggots offers vertical penetration and a horizontal flow for the water, it also favours the escape or production of fertilising gases, even until the last branch of the buried faggot, in a state of complete decay, has been replaced by the last root of the Vine which absorbs it. Moreover, this underground work favours in a striking manner the roots of the Vine, and consequently the vegetation of the branches. It favours also the production of fruit, by putting in contact the argillaceous and calcareous matter, contained in an argilo-silicious soil, with the azote resulting from the decomposition of the woody matter. By the natural operation of rainwater, which penetrates the soil vertically, and runs horizontally under the subsoil, there is a continual production of nitrate of potash, which is appropriated by the Vine, and, according to the measure of its production, makes itself apparent by the roots which interlace and implant themselves in the faggots. It is supposed the good effects of this treatment will last as long as the faggots, and experience seems to show that the decomposition of the ordinary marine Pine faggots, or Oak tops, when buried in the earth, takes about 10 years. At the end of this time it will probably be necessary to renew them, in the line of the plants for another 10 years. [What about that horrid Fungus? EDS.]

M. Cornu is convinced that Vine husbandry will be the future riches of France, and in the meantime that its natural cultivation is destined to give to those regions which include the Vine, population, health, and comfort. But this system of planting appears to him to be in every respect suitable to the state of a country already wooded and likely to become more so. Indeed this system, which, thanks to the use of the plough, does not require immediately the increase of population, admits the annexation of Vine husbandry to all kinds of farms and even of small holdings, and is capable moreover of turning to an advantageous use the numerous unsaleable products of forests, which are often lost to the proprietor for want of buyers.

M. Cornu solicits examination and criticism of his process; and though it may be defective in some particulars, yet he will be satisfied if, in the main, it is found good and useful to the country.

Obituary.

MR. W. WILKIE died recently, at his residence, Whitefields, Phœnix Park, Dublin, in the 77th year of his age. He had during the last 35 years filled the important office of Bailiff of the Phœnix Park, and during the previous 17 years was head gardener to the Under-Secretaries residing in Phœnix Park. Before he came to Ireland, Mr. Wilkie was employed at Woburn Abbey, and assisted to place the specimens of grasses in the books of the few beautiful copies of "Gramineus Woburnensis," which were published with the dried grasses inserted in them. He was a distant relative of the famous Sir David Wilkie, and like his kinsman was possessed of original and refined taste in the branches of art he cultivated. This notice will no doubt bring to the recollection of many readers the beautiful and rather remarkably constructed rockwork at Whitefields, and the many fine specimens of plants, particularly Conifers, which the late Mr. Wilkie cultivated in his own private department, as well as the extensive improvements lately made by him in beautifying the Phœnix Park. With refined taste he had also refined and urbane manners, accompanied with great kindliness of heart, which, combined, made him beloved by all who knew him, high and low, and of the former grade there were very many. By this death the Dublin Board of Works, and the horticultural public generally in Ireland, have lost a valuable officer. *M.*

Miscellaneous.

DUTCH BULBS.—The far-famed Dutch bulbs are chiefly cultivated near Haarlem and Lisse, and owe their superiority as much to the suitable texture and position of the soil—a calcareous sand resting on peat—as to the lavish use of manure obtained from neighbouring dairy stables. An area of 125 acres, devoted to Hyacinth growing near Haarlem, is estimated to bring in a revenue of nearly £30,000. In 1859 bulbs were exported to the value of £12,700; and in 1862 the village of Bloemendal, "the Valley of Flowers," sent forth no less than £200,000 worth [?]. Where bulb culture is the main object of attention, the routine is frequently as follows:—First year—The soil is broken up and dug to a depth of 5 or 6 inches, a heavy dressing of cowdung is applied, and a crop of Potatos taken. In the autumn the bulbs are planted, and the beds remain covered with reeds until the month of May. Second year—About midsummer, the bulbs having been collected, Grass is sown on the paths between the beds, and in the autumn Tulips, Crocuses, and occasionally different kinds of Narcissus and Ranunculus, are planted on the green sward. Third year—Cauliflowers occupy the ground as soon as the bulbs have been removed. *Field.*

DRY EARTH FOR WOUNDS.—Some remarkable cures of obstinate wounds by the simple application of dry earth have been related. Amongst them is that of a gentleman at Mount Gambier, Mr. James Pratt, who about six years ago received a kick from a horse below the knee of his right leg. The wound was healed partially, but after a time it broke out again and spread until the whole of the lower part of the leg was affected. Mr. Pratt, having heard of the success of the earth treatment in other cases, procured some virgin soil taken from below the roots of the grass, and applied it to the wound, which at the time was as large as his hand, and caused the leg to be very much swollen. The result was that the swelling was reduced in the girth measurement 3 inches upon the first application. The treatment was continued for three weeks, at the end of which time the wound was quite healed. *Overland Telegraph.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE mean temperature of *Orchid-houses* proper should now be increased from 4° to 6°, with an additional amount of humidity. The temperature, with this rise, will be from 64° to 67°, and should the sun come out at all strong, the thermometer should be allowed to show an advance of 6° or 8°. As much light as can possibly be given should be afforded to specimen plants. The weakest of these when commencing to make young growth should be kept in as cool a place as the house best suited to them will afford, so as not to hurry them forward too quickly, or to induce them to grow beyond their strength. These remarks are equally applicable to *Stove Plants* in general. Some of the early blooming *Ericas* and *Epacrises* will now have done flowering, and should therefore have their roots kept quiet for a week or two, when they may be pruned back, preliminary to their being started into fresh growth. Where a successional supply of *Mignonette* in small pots is required, another sowing should now be made. Many other seeds may also be sown to produce the main supply, especially *Balsams* and such *Bedding Plants* as Lobelias of the dwarf blue or speciosa section, and Pyrethrum Golden Feather, if a sufficient quantity was not sown in the autumn. Cuttings of *Salvia fulgens* should now be put in, and be treated in a similar manner to those of Chrysanthemums. These will grow into blooming plants for indoor decoration in the autumn. Bring all old roots of *Dahlias* forward now, and place them where light and a moderate amount of moisture can be assured.

FORCING HOUSES.

Amateurs who have simple structures in which *Vines* and *Pot Plants* in general are of necessity grown together, should endeavour as soon as possible to give the canes a good dressing with some suitable kind of paint, which will destroy any insect life that is likely to come forth at the growing period. I would particularly advise that this be done in all instances where there were any symptoms of mildew during the past season, because, as is well known, this Fungus is capable of forming myriads of spores where it has once established itself successfully, and these are emitted from the parents and wafted around into every conceivable crevice, even to the rough bark, coating the canes, the soil in pots, &c., where they reproduce their kind by the aid of the warmth and moisture of returning spring. Therefore where mildew gained a lodgment last season let the rougher and looser bark be removed from the old wood upon the Vines—a process I would not recommend under other circumstances—and let the stems be well brushed or coated over with a mixture composed of the following ingredients, which should be made as

directed into paint of suitable consistency:—Half a pound of soft soap, 1 lb. of flowers of sulphur, and half an ounce of black pepper; put into four gallons of water and boil together for 20 minutes or until moderately thick, adding when boiled sufficient soot to darken the colour of the paint when dried. Where the crops in *Early Vineries* are so forward as to require thinning, let this be done without further delay. This being done, encourage a good maximum amount of heat—say 85° or 88°—by closing up early in the afternoon, and giving a good damping over all the internal surfaces, with the exception of the pipes or flues, as the case may be. I can add but little to what has already been said in former calendars in regard to *Pines*. Whilst the present searching easterly winds prevail, it will not be advisable to open any houses or pits for the purpose of renovating the tan-beds, &c. The morning part of a nice warm day should be chosen for this operation, and where new tan is not obtainable close at home, some of the old should be mixed with the new, and if the old is rather small or too much worn, run it through a sieve before mixing the two together. When a job of this kind is on hand, put all hands to the task, so that it may be performed as quickly as possible.

ORCHARD HOUSES.

Fruit trees in pots should now be placed permanently in their blooming and fruiting quarters. Give such an amount of space to each tree as will enable it to grow freely without let or hindrance from its neighbours. It often occurs that the possessors of orchard-houses of small dimensions require too much, and by overcrowding their trees they not only materially damage the whole crop as it forms, but so deteriorate the bearing wood which is forming for next year's crop, that the structure is actually not allowed to produce such fine fruits as would be the case under more favourable circumstances. Commence watering the roots of all such trees which it is desirable to start into growth. Give only a little water at a time, and by three or four such applications, given at intervals of two or three days, manage to soak the balls thoroughly in about a week's time from the period when the first allowance was given. The change thus brought on from a dormant to an active state will be gradual, and in keeping with the requirements of the trees.

HARDY FLOWER GARDEN.

If the present severe weather gives place to a more genial period, we may be able to remove the most obvious evidences of its harsh misdoings. *Polyanthuses, Arabis, Aubrietias, Pansies*, even our usually very hardy *Myosotis, Silenes*, and others, are much cut up. Poor things, it grieves me to see them. Every dead leaf should be removed, and each plant should be pressed firmly into the soil, so loosened by the action of frost. Then, on the first fine day, when the surface soil has become sufficiently dried to "work" without sticking to the tools, let it be neatly hoed over so as to freshen up the ground, so that the warmer air and sun may exert their influences anew. Carefully move the soil in like manner around the crowns of *Tulips*, and other similar subjects, the tips of which are pushing through the ground.

KITCHEN GARDEN.

The date is sufficiently advanced to transplant artificially reared *Peas*, and as soon as the weather becomes favourable for working the soil let this be done. So much has the late frost stayed our operations, that we should do our utmost to bring up arrears at the first favourable moment. A row or two of *wrinkled Marrow Peas* should also be sown for succession. Champion of England, and Ne Plus Ultra are good useful sorts, and can be depended upon. Sow *Parsley*, and upon a warm aspect *Radishes* for succession—Wood's Early Frame being a desirable sort. I find it also desirable to sow a patch of the *Red American Turnip* thus early on a south border; it comes in well, being early and useful. When sown lay hurdles or long sticks over it, and nets to keep the birds away. When the seed is up remove the nets, but let the sticks remain, they keep the keener gusts of wind from the young seedlings. Sow *Celery* for main crop—Williams' Matchless Red is one of the best. *W. E.*

TOWN GARDENING.

CHRYSANTHEMUMS should now be planted in the borders, and as there are no plants to my knowledge that do so well in town if properly treated, I give the mode of cultivation which I have practised for many years with great success within half-a-mile of St. Paul's Cathedral. In the first place take up all the old roots, and divide them into separate plants, cutting away all the old roots, and leaving only the fibres that are attached to the young shoots. The ground having been well trenched, and a good dressing of dung being forked in, the shoots should be planted three in a patch, and the patches 3 feet apart in the borders, which will be sufficient to make a great display, if judiciously planted with regard to height and colour. Tall-growing kinds predominate, but when plants are wanted for the front rows they can easily be introduced, and by twisting and pegging them down they may be regulated as to height. By no means pinch them back when growing in the borders, for this operation is very apt to retard their flowering at least a fortnight, which will bring their blooming season too near to winter for any chance of success. The Pompons, which are interesting from the smallness and abundance of their flowers, are admirably adapted for planting in front rows of borders, or for bedding-out on the lawn. If the stock of large-flowered kinds is somewhat scarce, cuttings should be immediately put in in a cold frame, that can be shut close for some days; they will strike readily, and make good plants for this purpose. The Pompon varieties do not require to be started so early; I therefore propose to give their cultivation at the proper season. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,

FOR THE WEEK ENDING WEDNESDAY, FEBRUARY 23, 1870

1870. MONTH AND DAY.	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition		
February.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
17. Thurs.	29.92	33.0	29.4	25.9	82	1.7
18. Friday	29.86	28.6	26.8	20.9	69	1.3
19. Satur.	29.77	31.8	32.0	28.8	82	1.9
20. Sunday	29.97	35.7	31.7	30.7	81	2.0
21. Monday	29.55	36.9	32.9	27.3	69	1.7
22. Tues.	29.67	28.3	25.2	12.8	51	1.0
23. Wednes	29.48	30.6	32.9	27.7	79	1.7

1870. MONTH AND DAY.	Temperature of the Air.					Wind		Rain
February.	Highest	Lowest.	Range in Day	Mean	Departure of Mean from Average of 50 Years	Direction.	Horizontal Movement.	In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
17. Thurs.	32.0	28.8	3.2	29.9	-8.3	N.E.	305	0.04
18. Friday	31.2	27.8	3.4	29.4	-8.9	N.E.	170	0.00
19. Satur.	38.2	30.1	8.1	34.1	-4.3	N.N.E.	190	0.00
20. Sunday	41.5	32.0	9.5	36.7	-2.0	S.W.	310	0.00
21. Monday	41.7	33.6	8.1	37.7	-1.0	N.W.	505	0.01
22. Tues.	35.6	24.8	10.8	29.7	-9.1	N.W.	505	0.00
23. Wednes	42.7	28.2	14.5	35.0	-4.2	S.W.	350	0.00

February 17. Overcast; a little snow fell during the morning
" 18. Overcast; occasional snow
" 19. Overcast, occasional snow
" 20. Generally cloudy; foggy
" 21. Overcast during the day; cloudless for a short time at night; snow fell in the night between 9 P.M. and 10 P.M.
" 22. Generally cloudless; a very fine day
" 23. Generally cloudy; a little rain fell at night

The temperature of the air, 4 feet above the ground, was almost constantly below 32° on the 17th and 18th

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, FEBRUARY 19, 1870

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Temperature.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth	44.1	19.5	24.6	39.0	24.0	15.0	31.6	0.00
Blackheath	38.9	26.0	12.9	34.3	28.0	6.3	31.2	0.05
Osler Court (Bristol)	38.5	21.9	16.6	35.3	27.4	7.9	30.9	0.69
Birmingham	39.4	21.4	18.0	35.9	28.8	7.1	31.9	0.17
Wolverhampton	37.4	19.7	17.8	34.5	28.1	6.4	30.9	0.12
Leicester	39.0	21.0	18.0	35.4	28.1	6.8	31.2	0.29
Norwich	38.5	23.0	15.5	34.6	28.2	6.7	31.2	0.00
Nottingham	39.8	21.4	18.5	34.9	28.8	6.1	31.5	0.21
Sheffield	40.0	22.5	17.5	37.0	27.3	7.7	32.2	0.15
Liverpool	40.4	29.1	11.3	36.7	32.1	4.6	34.4	0.09
Manchester	41.4	25.0	16.4	...	...	7.6	34.0	0.01
Eccles (Salford)	42.7	27.0	15.8	37.9	29.7	8.2	33.8	0.07
Bradford	40.5	21.6	18.9	36.8	27.8	6.7	32.3	0.11
Leeds	42.0	25.0	17.0	37.0	31.6	5.4	34.0	0.15
Hull	42.0	21.0	21.0	37.6	27.6	10.0	32.2	0.58
Newcastle-on-Tyne	40.0	23.0	17.0	38.2	31.5	6.7	34.1	0.67
Edinburgh	41.7	26.0	15.7	...	...	...	33.9	0.20
Glasgow	42.0	29.0	16.0	...	...	...	34.3	0.61
Aberdeen	42.0	27.0	15.0	...	...	...	35.5	0.20
Dundee	41.0	27.0	14.0	...	...	...	34.4	0.25
Paisley	42.0	28.0	16.0	...	...	...	34.2	0.45
Greenock	42.0	27.0	15.0	...	...	...	34.6	0.09
Leith	40.0	26.9	13.1	...	...	...	35.9	0.12
Perth	42.0	28.0	14.0	...	...	...	34.6	0.14
Dublin	49.0	29.5	19.5	...	...	...	37.5	0.05

Erratum.—In report of last week, *for* 31°7 mean temperature at Perth *read* 36°7

As in last week, the extreme low temperature has taken place at Southern stations. The mean temperature of the air at all stations south of and including Nottingham, was 31°4; at all Stations from Sheffield to Newcastle, both inclusive, was 34°5, and of all stations in Scotland was 34°6. The mean temperature of Scotland for the whole week was more than 3½° warmer than stations in the South of England JAMES GLAISHER.

Notices to Correspondents.

ADVERTISING: *Veritas.* Apply, stating real name, to the Publisher, who will furnish you with the information you require.

AXIS AND AXIL: *W. T. C.* The term axis in botany is a general term applied to the stem and the root with their respective branches; the term axil is applied to the point on the stem whence the leaves emerge. In the quotations you mention for axis read axil.

FRUIT-ROOM: *D. P. H.* In the construction of a fruit-room the conditions under which fruit has been found to keep best have first to be taken into consideration. These conditions, as stated in Thompson's "Gardener's Assistant," a good authority, are, "a dry atmosphere, a cool steady temperature, and darkness." Now, to insure these conditions, the room must be in a dry and airy situation; a cool steady temperature is best maintained by having the walls built hollow, and air should also have access underneath the floor as well. We do not recommend the use of a flue. As a low temperature only is required, say 50° in winter, no more light should be admitted to the fruit than is absolutely necessary to admit of its being seen; and although means should be provided for the admission of a current of air, it should but very seldom be admitted, as both light and air coming immediately in contact with the fruit serve to hasten decay. If the air of the fruit-room is impure, of course air must be admitted for purification. With hollow walls, double ceiled roof, and close-fitting shutters to the windows, &c., little fear need be entertained of the entry of frost. To ripen Pears in winter they require to be placed in a warm temperature; that may be done as required, and a regular succession of ripe fruit maintained. When the light is excluded the fruit need not be covered. For shelves simple laths, 3 inches wide, with ½ inch mesh, we have found answer very well. Fruit should be as little handled as possible, and, if possible, one fruit should not touch another, but this would be too particular for any but the best specimens; all decayed fruit should be removed, as, although it may not come exactly in contact with the others, it serves, by polluting the air, to hasten decay. The Pear and Apple, in regard to keeping, require exactly the same treatment.

FUNGUS: *W. D. C.* The Fungus in your Carnation leaves is very curious, and probably new. We shall shortly give an illustration of it. We are fearful that no external dressing will avail, as it is clearly at first developed within the leaf. We should be glad of one or two more specimens, directed to Rev. M. J. Berkeley, Sibbertoft, Market Harborough. *M. J. B.*

INSECTS: *L. H. H.* 1. The name of the insect is Zeuzera Æsculi, or the Leopard Moth (figured at p. 42). 2. The supposed cast skin is the empty chrysalis case, from which a moth proceeded last summer. 3. Of course it proceeds from an egg. 4. The only treatment (remedy there is none) likely to be of use, is to destroy as many of the grubs and moths as possible. It seems rather common this year. This is the second time within a few weeks that we have had to give the above information.—*X. Y. Z.* The insect is a Chermes Adelges Strobi, now widely spread in this country. No satisfactory mode of dealing with it has yet been hit upon, although many—such as painting the trees with lime, &c.—have been tried. *A. M.*

MESSRS. ADAMS & ADAMS: *W.* If you will refer to No. 10, p. 254, of our volume for 1869, you will find that these gentlemen then stated their ability to pay "not only Twenty shillings in pound, but five Hundered or one Thousand Shillings in pound on all the owe."

METEOROLOGICAL INSTRUMENTS: *J. R.* If you had read your *Chronicle* before writing, you would have seen that your questions have all been answered. The whole matter is in the hands of Mr. Glaisher. We shall give particulars of the new instruments in due time.

NAMES OF FRUITS: *J. B. Pear* Beurré Rance. *Apple:* Formosa Pippin. *C. B. Kenyon.* 1, Easter Beurré; 2, Jonathine de Malines; 3, not known; 36, Beurré Rance; 37, long-fruit Vicar of Winkfield; 39, large-fruit Catillac; 39, Beurré Bretonneau. Others unknown, quite out of character.

NAMES OF PLANTS: *A. P.* 1, Phillyrea media; 2, Myrtus communis mucronata.—*W. Armitage.* 1, Begonia insignis; 2, B. malabarica; 3, B. manicata; 4, too young for identification; 5, probably Asplenium marinum, but insufficiently developed; 6, indeterminable.—*Shem.* Oxalis variabilis, Jacq., a Cape species.—*H. P. D.* 1. Epacris pungens; 2. E. longiflora var.; 3. Tempeltonia retusa; 4. Dendrobium moniliforme, as far as can be determined in the absence of stem.—*B. and McC.* The Kangaroo Vine is Cissus antarctica, which your plant may be.

PLANTING VINES: *Novice.* You may plant out your Vines in the bed as you describe. We should recommend you to turn them right out of the pots, but do not do this until the Vines have set their fruit. You may grow your young Vines on in the other side of the house until once the fruit is ripe on the other, when you might remove them to the south side, in order to ripen them off well. Place your fruiting Vines about 2 feet apart; leave as many branches as you can find room for, *i. e.*, without crowding the leaves, as the more leaves you have fully developed the better. The number of bunches must be regulated according to their size and the strength of your Vines. We should say six or eight at a guess. You started your Vines too soon after pruning them, hence the cause of their bleeding.

VIOLA CORNUTA VAR. "PERFECTION." We have received from Mr. R. Dean a letter complaining of an imputation made on him in an advertisement which appeared in our columns. We must decline to insert Mr. Dean's letter, but we may state that he repudiates the imputation of "gross misrepresentation," and asserts that the Pansy shown at the Floral Committee, and which he procured from Mr. Warren, of Salisbury, under the above name, is identical with that shown, on the same day, and under the same name, by Mr. Jobson, of Rotherfield Park, and which, it appears, is in the hands of Mr. Williams.

COMMUNICATIONS RECEIVED.—J. T. W.—W. J.—J. A. W.—St. J. T.—J. S.—C. L. W.—H. C.—R. I. Z. Z. Z.—J. R. H. P. P.—R. B.—D. T. F.—R. (Wimbledon).—E. A. C.—E. A.

Markets.

POTATOS. Southwark, February 21.

During the past week the arrivals coastwise have been very limited, owing to contrary winds; the few that were at this market went off at better prices, but there is a large fleet on passage, which has begun to arrive during the last two days. The following are the quotations:—Scotch Regents, per ton, 70s. to 100s.; Yorkshire Flukes, Yorkshire Regents, per ton, 70s. to 100s.; Lincolnshire Regents, 70s. to 85s.; Dunbar and East Lothian do., 80s. to 100s.; Perth, Forfar, and

Fifeshire do., 70s. to 90s.; Ditto Rocks, 65s. to 70s.; French and Belgian Whites, 60s. to 65s.

COVENT GARDEN.—February 26.

We have experienced a slight improvement in the general trade of the markets, most of the best goods having been cleared from the growers' stands at a better price. Of forced vegetables there is a better supply, comprising Asparagus, Seakale, French Beans, and frame Potatos, the latter realising from 2s. to 3s. per lb. All the Continental shipments arrived in better condition this week since the frost has broken up. Flowers consist principally of Heaths, Primulas, Cinerarias, Hyacinths, Tulips, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	3 0 to 5 0		Lemons, per 100	5 0 to 10 0	
Cobs, per lb.	0 9 — 1 0		Melons, each	1 6 — 3 0	
Chestnuts, p. bush.	8 0 — 14 0		Oranges, per 100	6 0 — 12 0	
Filberts, per lb.	0 6 — 0 9		Pears, per doz.	3 0 — 6 0	
Grapes, per lb.	6 0 — 12 0		Pine-apples, per lb.	8 0 — 10 0	

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6 to 5 0		Horse Radish, p. bun.	3 0 to 5 0	
Artichokes, p. doz.	3 0 — 6 0		Leeks, per bunch	0 2 — 0 4	
Beet, per doz.	2 0 — 3 0		Lettuces, p. score	1 0 — 2 0	
Broccoli, per doz.	1 0 — 2 6		Mint, per bunch	1 0 — 1 6	
Brussels Sprouts, p. ½ sieve	2 0 — 3 0		Mushrooms, p. pott.	1 0 — 1 6	
Cabbages, p. doz.	1 0 — 1 6		Onions, per bunch	0 4 — 0 9	
Carrots, p. bunch	0 4 — 0 6		Parsley, per bunch	0 2 — 0 4	
Cauliflower, p. doz.	2 0 — 3 0		Potatos, new, p. lb.	0 4 — 0 6	
Celery, p. bund.	1 0 — 1 6		Salsafy, per bundle	1 0 — 1 3	
Cucumbers, each	1 6 — 3 0		Scorzonera, do.	1 0 — 1 3	
Endive, per doz.	1 6 — 2 0		Seakale, p. punnet	2 0 — 2 6	
French Beans, p. 100	4 0 — 6 0		Shallots, per lb.	0 8 — ..	
Garlic, per lb.	0 8 — ..		Spinach, p. bushel	2 0 — 3 0	
Herbs, per bunch	0 2 — 0 4		Radishes, per doz.	1 0 — 1 6	
			Turnips, per bunch	0 4 — 0 6	

Potatos, York Regents, per ton, 75s. to 100s.; Flukes, do., 75s. to 120s.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for preparing well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. Sent free by post for one stamp. Seeds direct from the Growers, the surest way to success

RICHARD SMITH, Seed Merchant, Worcester.

EVERGREEN HEDGES.

AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s per 100; 8 to 6 feet, at 60s per100

SIBERIAN ARBOR VITÆ, 2 to 2½ feet, 40s per 100; 2½ to 3 feet, 50s per 100; 3 to 3½ feet, 60s per 100; 4 to 4 feet, 84s per 100

RICHARD SMITH, Nurseryman, Worcester.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do. SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes.

FOREST TREES, which we can offer in quantity, well rooted and cheap:—Ash, Sycamore, Birch, Elm (Wych), Oak, Poplar (B. Italian), Limes, Chestnut (Horse), Hazel, Maples, Privet, Willows; Sizes of Ash, Sycamore, Elm, 10 to 14 feet, 8 to 10 feet; Ash (Mountain), 5 to 6 feet, 6 to 8 feet, Spruce Scotch, Silver and Austrian Firs, from 1 to 1½ foot, 1½ to 2 feet, 2 to 3 feet; Chestnut (Spanish), 1½ to 2½ feet, also large sizes well transplanted for sorts.

CATALOGUES on application.

H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

FOR SALE, 200 ACER PLATANOIDES (Norway Maple), 12 to 16 feet. In autumn the foliage of this charming tree becomes bright yellow, making a showy striking ornament for Avenues The above are handsome and well rooted Price on application to ROBERT F. DARBY, The Nurseries, Cirencester

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (See Dr. Hooker, "Botanical Magazine," No. 5851.) Price 5s. per root, or one guinea per dozen, carriage paid. The honour of importation is due to Mr. Fortune; the honour of distribution (in England) to CHARLES NOBLE, of whom fine plants can be obtained.—Bagshot, Surrey.

To Nurserymen and Others.

WANTED, a price for 100 or 200 SYCAMORE TREES, from 10 feet to 12 feet high, with good bushy heads and good roots. Delivered to Broadstairs Station, on the London, Chatham, and Dover Railway. Apply to RICHARDSON, St. Paul's Lodge, St. Paul's Road, Camden New Town.

Planting Season.

DICKSONS AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for Transplanting They are growing on very good ground, and have been well exposed to the thoroughly ripened. Samples and Catalogues on application. Special prices will be quoted where large quantities are taken

Seed and Nursery Establishment, Dumfries.

ESTABLISHED 1787.

THOMAS KENNEDY AND CO., Dumfries, N.B., will be glad to receive Orders for their RECEIPTED PRICED CATALOGUES of Vegetable and Flower Seeds, &c., Farm Seeds, &c., and Forest, Fruit, and Ornamental Trees, &c., to any address, post free, on application.

New Scarlet Runners, Dwarf Kidney Beans,

VICTORIA ROUND and MONA'S PRIDE KIDNEY POTATOS.

EDWARD TAYLOR, Seed Merchant, Malton, Yorkshire, will be glad to make special offers of the above to the Trade.

Market Gardens, Biggleswade, Beds.

RICHARD WILKES can supply, for cash SEAKALE for planting out, 3s. 6d. per 100; ASPARAGUS PLANTS, strong, for planting out, 2s. per 100, or 15s. per 1000; MIXED LACED PINKS, 4s. per 100; WHITE SPANISH ONION SEED, at 2s. per lb. All new and genuine

WANTED, a YOUNG MAN, to Grow a good Collection of Stove and Greenhouse Plants, Vines, &c. He must also be a good Budder and Grafter.—Apply, stating full particulars, to E. COOLING, Mile Ash Nurseries, Derby.

WANTED, a steady, active, SINGLE MAN, used to Jobbing, and General Nursery Work —Apply, stating wages, &c., to W. M., Mercury Gardens, Romford, E.

WANTED IMMEDIATELY, TWO active YOUNG MEN, who understand Potting Plants and Cucumber Growing. Wages 18s. per week, and Lodging.—JOHN MUNRO, Potter's Bar, N.

WANTED, ONE or TWO YOUNG MEN, who know, or have a natural taste for, Herbaceous Plants.—THOS. S. WARE, Hale Farm Nursery, Tottenham, Middlesex, N

WANTED, a respectable YOUTH, from 16 years of age. He must be a good scholar, able to read and write French; one who has just left school preferred. This is a rare opportunity for parents who want to place a boy into such a position, to see Business and good Management carried on. Wages, liberal and progressive, according to intelligence and attention. Apply, first in own handwriting, both English and French, H. CANNELL, New Florist Flower and Florist Flower Seed Merchant, Wolwich

WANTED, a Single-handed GARDENER, who understands Forcing Vines, and Fruit, Flower, and Kitchen Garden —Married, no incumbrance; to live in the lodge. Unexceptionable references required as to character and ability.—H. GODFREY, Karenza, Cheltenham.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs E G HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send their ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W C

ROYAL HORTICULTURAL SOCIETY.—The Society have one or two good HEAD GARDENERS and UNDER GARDENERS who they can recommend to any Gentlemen requiring their services —Apply to Mr BARRON, Royal Horticultural Society Gardens, Chiswick, W.

MR. W. PAUL begs to announce that he has made arrangements by which he will be enabled further to assist Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, and GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. The most particulars as to services required and wages given should be forwarded with application.—PAUL'S Nurseries, Waltham Cross, London, N

GARDENER (HEAD).—Married; has a thorough practical knowledge of Gardening, also the Vinery, Stove, Orchids, Fernery, Grapery, and Bedding. Has 3 years' testimonials —H. W., Stratton Post Office, near Northampton.

GARDENER (HEAD).—Married, one child; thorough practical knowledge of Gardening in all its branches. Good character from the Nobleman by whom lately employed, and previous employers.—A. N., Fern Cottage, Ewell.

GARDENER (HEAD).—Age 29, married, no incumbrance; thorough knowledge of Early and Late Forcing, Stove and Greenhouse Plants, and Flower and Kitchen Gardening.—E. M., Green, Buckland Gardens, Crickhowell, Brecknock.

GARDENER (HEAD), married, two children, 9 and 6 years old.—JAMES ORSMAN, late Head Gardener to the Right Hon. Wilmot Sydney, offers his services to any one requiring a thorough practical Gardener First class references.—JAMES ORSMAN, Whitewell, Welwyn, Herts

GARDENER (HEAD).—Understands the Growth of Orchids, Stove and Greenhouse Plants, also Fruit and Vegetables. Has been in some of the largest places in the country. Good character from present and former employers.—MR. ROBSON, Seedsman, Bourdon

GARDENER (HEAD).—Age 29, married; practically acquainted in every branch of the profession North or Midland Counties preferred. Three years' excellent character from the Gentleman he is now leaving, also character from previous employer F. J., Godstone Post Office, Surrey.

GARDENER (HEAD).—Age 30, married, no incumbrance has had considerable experience in fruit and Late Forcing of Fruits, Culture of Plants, and the Management of Kitchen and Flower Gardens No single handed place accepted Good character —J. M., Gardener, Silver Street, Masham, near Bedale, Yorkshire

GARDENER (HEAD).—Age 35, single; practical, and thoroughly trustworthy Has had long experience in Early and Late Forcing, Fruits, Flowers, and Kitchen and Flower Gardening; is a good Grape and Pine Grower, also Melons and Cucumbers. Two years' good character.—C. ROBINSON, Sutton, Thirsk.

GARDENER (HEAD).—Thoroughly acquainted with every department of a good garden, especially successful in Forcing the Pine tribe, and as Designer and Ornamental Flower Garden Worker. Will be highly recommended for efficiency and good conduct.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey.

To Noblemen and Gentlemen.

GARDENER (HEAD), age 34, married, no incumbrance —DOWNIE, LAIRD & LANG will have much pleasure in recommending as Head Gardener a thoroughly trustworthy Man, well qualified to manage all the branches of the profession successfully.—Caledonian Nursery, Leith Walk, N.B.

To Market Growers and Others.

GARDENER (HEAD).—Age 36; thoroughly understands Forcing, Early and Late Strawberries, Grapes, Melons, Cucumbers, and Mushroom Growing; Fruit Stock, Vegetable, and Flower Growing Good character —A B., Post Office, Kew Green

GARDENER (HEAD), age 36, married.—W. BROWNRIDGE, Gardener to W Martin Edmunds, Esq., Worsbrough Hall, is open for engaging with any Nobleman or Gentleman in want of a Man who thoroughly understands Gardening in all its branches. Can be highly recommended —The Gardens, Worsbrough Hall, Barnsley, Yorkshire

GARDENER (HEAD).—Age 30, married, three in family, Scotch; thoroughly practical in Vines, Peaches, Greenhouse Stove, and Cool Plants, and Kitchen Gardening; can understands Land, Wood, and the general Management of an Estate Sixteen years' recommendation, and from a Nobleman in England —Wm. E., Fyfe Gardens, Auchtermuchty, N.B.

GARDENER (HEAD).—Middle-aged, married, no incumbrance; has a thorough practical knowledge of Forcing Fruit, Flowers, and Vegetables, and Management of Kitchen, Fruit, and Flower Gardening. Can take the Management of an Estate, Farm, Wood, and Gardening. Character and recommendations satisfactory —J. W., 232, King's Road, Chelsea, S W

GARDENER (HEAD), age 42.—EDWARD BENNETT, in consequence of the death of his late employer, G. S. Foljambe, Esq., begs to offer his services to any Nobleman or Gentleman requiring a first-class practical Gardener, fully competent in every branch of the profession, including Specimen Plant Growing, Early and Late Forcing, Spring, Summer and Picturesque Gardening. Has had extensive experience as a first-class Exhibitor, and has for years been a most successful Exhibitor. Testimonials of the very highest order, with 11 years' unexceptionable character.—Osberton Hall, Worksop.

GARDENER (HEAD), age 44, married, one child, 10 years old.—Mr. HAZEL, late Head Gardener to the Right Hon the Earl of Stradbroke, Henham Hall, begs to offer his services to any Nobleman or Gentlemen requiring a first class Gardener Was 13½ years Farm Bailiff and Gardener to Mrs. Miles, Firbeck Hall; five years Head Foreman to Mr. Barron, Elvaston Castle, and two years with Mr. Barnes, at Lady Rolle's, Bicton. Mr. H. can have first-class testimonials from all the above.—63, Eversfield Place, St. Leonards-on-Sea, Sussex

GARDENER (HEAD).—Married, two children, youngest 12; a practical Man in Forcing of Pines, Vines, and Peaches; has a thorough knowledge of Stove and Greenhouse Plants, also Flower and Kitchen Gardening. Eight years testimonial from the Gentleman he last lived with; four years in present place. Character will bear the strictest inquiry. Satisfactory reason given for leaving. Any Lady or Gentleman wishing to engage the Advertiser can see the place he is about leaving —J. B. SOUTH, The Gardens, Great West Hatch, Chigwell, Essex

GARDENER (HEAD), where neatness and taste are required.—Age 43, married highly recommended. No single-handed place accepted.—W. W., Post Office, Dulwich.

GARDENER (HEAD).—Age 30, married; good practical knowledge in all branches of the profession. Good character. Y. Z., Mr. W. Barron, Elvaston Nurseries, Borrowash, Derby.

GARDENER (HEAD).—Age 35, married, no incumbrance; understands the Management of Vines, Melons, and Cucumbers; also Kitchen and Flower Garden Cattle or Land if required. Good character.—G. S., Anderson's, High Street, Acton, W.

GARDENER (HEAD), to any Nobleman or Gentleman requiring the services of a first-class practical Gardener in every branch of the profession, including Vines, Pines, Peaches, &c.—Age 44; ten years' last situation. Character will bear the strictest investigation. — G. FLETCHER, 23, Perry Street, Wolverhampton.

GARDENER (HEAD, WORKING).—Age 39, married, no incumbrance; thorough practical knowledge of the profession Excellent reference.—H. P. G., 15, Ruston Street, Birmingham

GARDENER (HEAD), or GARDENER and FORESTER.—Mr. R. H. VEITCH, Exeter, can confidently recommend the above to any Nobleman or Gentleman desirous to engage a proficient Gardener. A first-class practical Man, thoroughly up in the profession Twenty years' experience in extensive places.—S. W. L. MR. R. H. Veitch, Nurseryman, Exeter.

GARDENER (HEAD), where one or more are kept.—Thoroughly practical in all branches of the profession. Highest testimonials.—G. P., The Nurseries, Withington, near Manchester

GARDENER and BAILIFF.—Thoroughly understands both branches.—A. B., Post Office, Bromley, Kent

GARDENER and BAILIFF.—Age 39, married, no family; thoroughly understands the profession in every branch; accustomed to all kinds of Machinery, and a good Judge of Stock.—T. H., 56, West Street North, Spa Road, Bermondsey

GARDENER, or IMPROVER, in a Gentleman's establishment.—Age 21; will pay a small Premium. Would make himself useful. Good character.—G. C., Acrise Rectory, near Canterbury, Kent.

GARDENER (SECOND), in a Nobleman's or Gentleman's family —Good recommendations —E. D., 5, Downer Place, Pavement, Clapham Common, S.

GARDENER (SECOND), or FOREMAN.—Age 23; seven years' experience; good character.—D. D., Post Office, Sheffield, Yorkshire

GARDENER (SECOND), or FOREMAN, or good Single-handed.—Age 35, married, no incumbrance; well understands Vines, Pines, Stove and Greenhouse Plants, Orchids, Melons and Cucumbers, Wall-trees, &c. Good character.—G., Tunstall Vicarage, Lancaster.

FOREMAN, in a Nobleman's or Gentleman's Garden. —Age 20, single; experienced in all branches Three years' good character —L. M., Post Office, Wavertree, Liverpool.

FOREMAN.—Age 25, single; understands the profession Can be well recommended.—J. E., Post Office, Caister, West End, Great Yarmouth.

FOREMAN, in a Nursery.—Age 32, married; thoroughly understands in and out-door work. Fifteen years' experience in Town and Country Nurseries.—A. B., 27, Speke Road, Clapham Junction, Battersea, S W

FOREMAN (Age 25).—WILLIAM STEWART, Gardener to W. H. H. Broadley, Esq., H. P., Welton House, Brough, East Yorkshire, can with confidence, recommend his Foreman in the above capacity to any Nobleman's or Gentleman's Gardener in want of the same Address as above

FOREMAN, on an Estate, or UNDER PLANTER, &c., Abroad.—Has a general knowledge of Land Irrigation, and could keep Accounts. First-class testimonials. Character—C. A. D., Post Office, Croydon, Surrey.

PROPAGATOR (HEAD).—A successful Propagator of Roses, Rhododendrons, &c. Can be well recommended.—WM. WOOD AND SON, the Nurseries, Maresfield, near Uckfield, Sussex.

Propagator to the Trade.

PROPAGATOR (GENERAL).—Thoroughly conversant with the Propagation of all Hard-wooded Plants, having had experience in some of the largest Continental and London Nurseries.—F. L., Mr. A. Henderson, Nurseryman, Croydon.

IMPROVER, in the Houses, or in a Nobleman's Gentleman's Garden.—Age 21; would give a Premium Good reference —A M., The Cedars Lodge, Sunbury, Middlesex

IMPROVER, under a Gardener or in a Nursery.—Age 17; two years in the Garden. Could make himself useful. To sleep on the premises preferred —W P., Post Office, Sudbury, Middlesex, N.W.

FORESTER, or LAND-STEWARD and FORESTER. —Age 29, Scotch; has had good experience in the Breeding, Rearing, and Selling of Stock, &c., and thoroughly understands the Management of Land, being the Son of an extensive Farmer in Perthshire; has been thoroughly trained as a Forester on some of the best Estates in Scotland, England, and Ireland. First-class references given, and nothing but a good situation will be accepted — Apply, stating terms, to D. S., Messrs. Veitch & Sons, Royal Exotic Nursery, King's Road, Chelsea, London, S.W.

LAND AGENT.—Practical; well qualified in Agriculture, Arboriculture, Architecture, Surveying, Draining, &c. Salary moderate. Good testimonials and references —M., Mr. Gibson's, Land Surveyor, Clement's Terrace, York

A PRACTICAL FARMER, with high testimonials, and great experience in the Management of Sheep and Light Soils, Breeding, Rearing, and Feeding, all of which he is a good judge, Dairying, Draining, &c., requires a situation as BAILIFF.—J. M., Messrs Carter, Seed Merchants, Holborn, London, W.C.

MANAGER (ASSISTANT).—A Farmer's Son is desirous of obtaining an appointment as above in a Farm or Estate.—Willing to make himself useful, and would not object to roughing it with his superior; has a knowledge of Farming, and can keep Accounts.—W. G., Post Office, Tottenham, Middlesex.

HOTHOUSES, BUILDING or REPAIRING (Labour only).—Thorough practical Workman, Fitter of any description of Hotwater Work; good Painter and Glazier; understands all kinds of Horticultural Buildings, Rockwork, Brickwork, &c. Terms moderate—Contract Preferred. Good reference —E., 33, Kirby Street, Hatton Garden, London, E.C.

To the Seed Trade.

TRAVELLER.—The Advertiser requires a re-engagement. Can give satisfactory references.—ALPHA, Post Office, Margate.

SHOPMAN, or GENERAL MANAGER, in a Seed and Nursery Business.—T., Post Office, Ross

To the Seed Trade.

SHOPMAN, &c.—W. CLARKE (Age 22), three and a half years in the Seed Shop of the late Mr. W. Barnes, Camden Nursery, Camberwell, is open to an engagement.—Address as above.

SHOPMAN.—Age 26, Scotch; ten years' experience in all branches of the Seed Trade, with part knowledge of Plants. No objection to go abroad. Good reference.—F. A. B., Post Office, Newcastle-on-Tyne

SHOPMAN or WAREHOUSEMAN.—A Seedsman of 14 years' experience and good references desires a situation, as above, annuals, from March 1 to September 1; has a Business of his own, which he can dispose of the remaining six months. Wages, 28s. per week.—A. B., care of Mr. Fowler, 32, Reverdy Road, Blue Anchor Road, Bermondsey, London, S.E.

SUTTONS'

GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS,

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils :—

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, Carriage Free. 2 bushels Grass Seeds and 12 lb. Clovers supplied per acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. Mechi, Esq., *Tiptree Hall, near Kelvedon.*

February 5 —"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

From J. L. Williams, Esq., *Boyne View, Navan, Neath, Ireland*

March 30.—"Last year I got from you Permanent Pasture Grass Seeds for 10 acres, with which I laid down one-half of a 20-acre field (Irish). I am very much pleased with the way the Grass Seeds have answered, and I now want to lay down the other half of the field in the same manner."

From Thos. Levett Prinsep, Esq., *The Beacon, Kingswear, Dartmouth.*

December 24 —"Mr. Levett Prinsep must speak in the highest terms of the Grass Seed supplied to him by Messrs Sutton & Sons in the spring, and which has stood the past burning summer better than much of the old turf."

From J. Ward, Esq., *Round Oak, Greenham, Newbury.*

July 4.—"The permanent Grass Seeds for about 20 acres, supplied by you last year (the greater part sown with Barley), have given me great satisfaction, and produced a crop (this dry season) of about 45 tons of good hay—four and a half acres of which have fed five head of cattle during the spring."

From E. H. Nickson, Esq., *Foxby, Wem.*

March 9.—"The field I laid down with your Permanent Seeds is looking admirable."

From Rev. J. Leighton, *Bisham Vicarage, Fleetwood.*

May 2 —"The Pasture I laid down with your Seeds last year has done beautifully, and seems to have attracted the notice of several of the farmers who live near."

SUTTONS' RENOVATING MIXTURE, for Improving Pastures, at from 4*s.* 6*d.* to 9*s.* per acre, should be sown in the spring.

This Mixture consists of the finest kinds of Permanent Grasses and Clovers, and will greatly increase the quantity and quality of succeeding Hay crops. The Pasture should be harrowed with heavy iron harrows previous to sowing, and bush-harrowed after sowing, and in some cases a top-dressing of manure will be found beneficial. Sow 6 to 12 lb. per acre, according to the condition of the Pasture. Price 9*d.* per lb., 80*s.* per cwt. ; Carriage Free.

SUTTONS' MIXTURES of GRASSES and CLOVERS,

so prepared as to produce very large crops for the specified periods they are to remain down :—

For ONE YEAR'S LAY, 13*s.* 6*d.* per acre, Carriage Free.
For TWO YEARS' LAY, 17*s.* 6*d.* per acre, Carriage Free.
For THREE or FOUR YEARS' LAY, 22*s.* per acre, Carriage Free.

Special estimates given for large quantities.

SUTTONS'

HOME-GROWN FARM SEEDS.

Lowest price per cwt. or bushel on application.

	Per lb —*s* *d*
SUTTONS' CHAMPION SWEDE	0 9
PURPLE-TOP SWEDE	0 7
IMPROVED HARDY WHITE SWEDE ..	0 10
SUTTONS' GREEN-TOP YELLOW HYBRID TURNIP	0 10
SUTTONS' PURPLE-TOP do. do. ..	0 10
SUTTONS' LINCOLNSHIRE RED GLOBE do.	0 9
SUTTONS' IMPERIAL GREEN GLOBE do.	0 8
SUTTONS' POMERANIAN WHITE GLOBE do.	0 9
SUTTONS' SELECTED YELLOW GLOBE MANGEL	0 10
SUTTONS' BERKS PRIZE do.	1 0
SUTTONS' YELLOW INTERMEDIATE do.	1 0
SUTTONS' MAMMOTH LONG RED do. ..	1 6
Other good sorts of MANGEL	8*d.* to 1 0
SUTTONS' IMPROVED GREEN KOHL RABI	3 0
Ordinary GREEN do.	2 6

Special estimates given for large quantities.

SUTTONS'

FARMER'S YEAR BOOK FOR 1870,

Containing complete List of Prices of GENUINE FARM SEEDS, now ready, and may be had Gratis and Post Free on application.

☞ **ALL GOODS CARRIAGE FREE,**

Except very small Parcels. Five per cent. allowed for cash payments.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AGRICULTURAL EDUCATION.

The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870.

STOCK and IMPLEMENT PRIZE SHEETS are now ready, and will be forwarded on application to H. M. JENKINS, Sec.

12, Hanover Square, London, W.

CENTRAL CHAMBER of AGRICULTURE.—A COUNCIL MEETING will be held at the Salisbury Hotel, Fleet Street, on TUESDAY, March 8, at 11 o'Clock in the forenoon precisely.

AGENDA.

To transact General Business.

To consider "The Best Mode of Providing for the Extension and Maintenance of the Education of the Industrial Classes."

To appoint a Deputation to the Chancellor of the Exchequer on the Malt Tax.

A SPECIAL GENERAL MEETING of the SUBSCRIPTION MEMBERS of the CENTRAL CHAMBER will be held at the same place and on the same day, at 10 o'Clock in the forenoon, to amend Rules 2 and 13, so that the accounts may be audited at an earlier period.

Central Chamber of Agriculture, The Salisbury Hotel, Fleet Street, London, E.C., Feb. 15, 1870

Bingley Hall, Birmingham.

THE SECOND GREAT CENTRAL EXHIBITION and SALE of YOUNG BULLS and other PURE-BRED SHORTHORNS will be held on THURSDAY, March 3 next. Upwards of 100 Head of Specially descended Cows, Heifers and Bulls are entered. The whole of the Animals exhibited will be offered for SALE by AUCTION, without any further reserve than entering the Ring. Admission, from 9 to 4 o'Clock, 1*s.* Judging will commence at 9, the Auction at 11 o'Clock. Catalogues, 6*d.* each are ready, and may be had on application

JOHN B. LYTHALL, Secretary.

Offices, 39, New Street, Birmingham.

WM. DILLISTONE, Horticultural Auctioneer and Valuer, Sible Hedingham, Essex.

To Market Gardeners and Others.

WANTED, to HIRE, about ONE ACRE of good GARDEN LAND, to be used as a "Trial Ground." Must be within 30 miles South of the City. A good price would be given for the accommodation. Apply to "ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

To Market Gardeners and Others.

TO BE LET, in the town of Haslemere, ten minutes' walk from the station on the Direct Portsmouth line, a WALLED GARDEN of ONE ACRE, suitable for a Market Gardener, and where there is a good opening for a Jobbing Gardener; also a small EIGHT-ROOMED HOUSE near, but not joining. The above to be Let together or separately.—G. J. H., Post Office, Haslemere.

PURE-BRED SHORTHORNS, of first-class Blood, for PRIVATE SALE.—The CHOICE HEAD of BULLS, COWS, and HEIFERS, belonging to E. H. Cheney, Esq., Gaddesby Hall, are now on Sale.

Catalogues, prices, and further particulars can be had of Mr CHARLES BLAND, Gaddesby, Leicester

SALES BY AUCTION.

Plants and Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, March 2, at half-past 12 precisely, first-class Standard and Dwarf ROSES, Herbaceous and Common LAURELS, AUCUBAS, HOLLIES, BERBERIS, CONIFERS, RHODODENDRONS, Pyramid PEARS, RASPBERRY CANES, ASPARAGUS, &c., from Norfolk; choice GLADIOLI and RANUNCULI, Rustic Seats, Stools, Vases, Baskets, &c.

On view the morning of Sale, and Catalogues had.

Hardy Plants from Surrey.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, March 3, at past past 12 o'Clock precisely, CONIFERS, LAURELS, LARUSTINUS, HONEYSUCKLES, QUICK; Standard, Pyramid, and Dwarf FRUIT TREES; AMURIAN, IVIES, Standard and Dwarf ROSES, HOLLIES, PAMPAS GRASS, YUCCAS, and other Plants, from Surrey : CARNATIONS, GOOSEBERRY and CURRANT TREES, RASPBERRY CANES, ASPARAGUS, &c., from Norfolk; choice GLADIOLI and RANUNCULI, Rustic Seats, Stools, Vases, Baskets, &c.

On view the morning of Sale, and Catalogues had.

Extensive Sale of Pure-Bred Shorthorns.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve, on TUESDAY, March 1, at 1 o'Clock, at The Asps, one mile from Finchley Road Station, belonging to Mrs. M. Henry Mann. It consists of about EIGHTY HEAD of BULLS, COWS, and HEIFERS, bred for a period of 40 years from some of the oldest stock in the country, and comprises one-half the Herd is of the celebrated "Dido" tribe. Pure-bred Bulls from Sir Charles Knightley's herd have been used for several generations.

Catalogues, with pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, or at The Asps Farm

Sale of the Celebrated Osberton Herd.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve (by order of the Executors), on WEDNESDAY, April 27 (2 o'Clock), at the Scofton Farm, Osberton, Worksop, the celebrated and very FIRST-CLASS HERD of SHORTHORNS, bred by the late George Saville Foljambe, Esq., M.P., belonging to Mrs. M. Henry Mann. It consists of about 40 head, among which will be found the famous Prize animals, Lady Pauncefote, Rose of Windsor, and Flora; also Knight of the Crescent, Knight of the Thistle, Knight of the Whistle, and Robin. The Herd is entirely descended from the late Earl Spencer's noted cow Lady Sarah, and two animals, Flora and Alexina, bred by the late Mr Booth Mr Carr's Imperial Windsor (18,086) and Knight of the Garter (22,062) have been used : but the young animals are mostly by Mr Peel's Lord Lyons (6,567). The Knights of the Bath, Crescent, and Whistle, winners at the Royal and Yorkshire shows, as bull-calves and yearlings, have been and are still in service. The large number of premiums awarded to the Osberton animals at the Royal, the Yorkshire, and Lincolnshire shows, as well as the magnificent oxen exhibited at Birmingham and Smithfield, is the finest evidence of the capabilities and high standing of the stock.

Catalogues, with pedigrees, will soon be ready.

15, Langham Place, Regent's Street, London, W.

Turnham Green, W.

IMPORTANT UNRESERVED SALE of VALUABLE NURSERY STOCK

MESSRS. PROTHEROE AND MORRIS have received instructions from Messrs. S. Glendinning and Sons to SELL by AUCTION, without reserve, on the Premises, The Chiswick Nursery, Turnham Green, Middlesex, on MONDAY, February 28, and following day, at 11 for 12 o'Clock precisely each day, a portion of the Valuable NURSERY STOCK, comprising an extensive and choice collection of useful Evergreen and Coniferous Shrubs, viz.: 2500 Chinese Arbor-vitæ, 1 to 8 feet; 1000 Spruce Firs, 1 to 5 feet; 700 Thujopsis borealis, 2 to 6 feet; 1000 English and Irish Yews, 2 to 10 feet; 1000 Cupressus Lawsoniana, 3 to 8 feet; 500 fine Thujopsis gigantea, 4 to 6 feet; Cedrus Deodara, 1 to 2 feet; Cupressus, sorts, Wellingtonias, Thujas, sorts, Pinus, Picea, Golden Yews; also many handsome specimen Conifers, admirably adapted for effective planting; 3000 bushy Common Laurels, 2 to 4 feet; 2000 Portugal Laurels, 1 to 3 feet; 3000 green and variegated Hollies; 2000 Berberis, 1 to 2 feet; 2000 Hybrid Rhododendrons, 700 standard Portugal Laurels; 3000 Aucubas; 1500 Laurustinus, Arbutus, Evergreen Oak, Lilacs, Golden Roses, Ribes, &c.; 5000 clean grown Fruit Trees, Vines in pots, a large quantity of ornamental Trees, including 1500 strong Limes, 2000 Laburnums, Poplars, Elms, &c.

May be viewed three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, N.E.

Annual Sale of very Handsome English-grown Camellias.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at 38 and 39, Gracechurch Street, E.C., on WEDNESDAY, March 2, at half-past 12 o'Clock precisely, about 200 choice Double CAMELLIA, beautifully set with bloom-buds; AZALEA INDICA, 300 Standard and Dwarf ROSES of the best varieties, Selected FRUIT TREES, Hardy AMERICAN PLANTS, &c.

On the morning of Sale. Catalogues had at the Rooms, as above, and of the Auctioneers, Leytonstone, N.E.

Brixton, S.

CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being required by Lady-Day next for the Erection of a New Church.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, the Triangle Nursery, Loughborough Park, Brixton, Surrey, on MONDAY, March 7, at 11 for 12 o'Clock precisely, by order of Messrs. Ponsford & Son, a portion of the Valuable NURSERY STOCK, comprising a choice assortment of Evergreen and Coniferous Shrubs, viz.: Green Box, Chinese Arbor-vitæ, 1 to 6 feet; Aucubas, 1 to 3 feet; 700 bushy Common Laurels, 4 to 5 feet; English Yews, 2 to 4 feet; Euonymus, 1 foot, &c. A large quantity of FRUIT TREES, many of which are in fine bearing condition, including Standard, Pyramid, and Dwarf-trained Plums, Apples, Pears, and Cherries; also Dwarf-trained Peaches and Nectarines, Raspberry Canes of sorts, choice Lancashire Gooseberries, Currants; some handsome Standard Roses; 2000 fine Limes, 4 to 10 feet; Poplars, and Ornamental Trees.

On view two days prior to the Sale. Catalogues had on the Premises and of the Auctioneers and Valuers, Leytonstone, N.E.

Bagshot, Surrey.

EXTENSIVE UNRESERVED SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from Mr. Charles Noble to SELL by AUCTION, on the premises, The Bagshot Nursery, Bagshot, Surrey, five minutes' walk from the Sunningdale Station, on THURSDAY, March 10, and two following days, at 11 for 12 o'Clock precisely, each day, without reserve (the Ground being immediately required to be cleared), the valuable NURSERY STOCK, including an unlimited variety of Evergreen, Coniferous, and Deciduous Shrubs of remarkable growth and symmetrical form and beauty, including 15,000 Common and Colchic Laurels, 1 to 3 feet; 2000 bushy Portugal Laurels, 2½ to 5 feet; 3000 handsome Picea Nordmanniana, 2 to 4½ feet; 2000 Cupressus Lawsoniana, 3 to 10 feet; 10,000 Spruce Firs, 2 to 5 feet; 5000 Larch, 1½ to 3 feet; 5000 Thujopsis borealis, 2 to 6 feet; squarrosa, obtusa, and pisifera, 1 to 5 feet; 1500 Thuja gigantea and Lobbii, 3 to 8 feet; 1000 Thujopsis borealis, 3 to 8 feet; 200 Araucaria imbricata, 2 to 6 feet; 150 fine Wellingtonias, 4 to 12 feet; 500 Standard Junipers; magnificent specimen Abies Douglasii, Juniperus argentea, Pinus excelsa and Abies Menziesii, 5 to 12 feet; also 15,000 hybrid seedling Rhododendrons, 1 to 3 feet; 2000 bushy Portugal Laurels, 2½ to 5 feet; 5000 Erica carnea, 5000 Deutzia crenata fl.-pleno, 1 to 5 feet; 5000 Spiræas, 2 to 5 feet; 3000 Berberis, 1000 Spartium nincum, 3 to 4 feet; 5000 Privet, of sorts; 1000 Standard Roses, 5000 Standard and Half-standard, and Dwarf Roses; 75,000 Manetti Stocks; 5000 Maiden and Trained Peaches and Nectarines, 2000 Pyramidal and Dwarf-trained Apples and Pears, 500 Vines in pots, &c., &c.

May be viewed until the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers.

Halam Nursery, near Southwell, Notts.

PRELIMINARY NOTICE of a very important SALE of choice and valuable SPECIMENS of CONIFERÆ (Fir trees), well known as the finest grown in Britain, also a considerable surplus stock of other TREES and SHRUBS, the whole of which have been frequently and regularly transplanted, and are in the best possible condition for removal

MR. WHITE has received instructions from Richard Bradley & Sons, who have transferred the main portion of their Business to Kainworth, near Mansfield, to OFFER by PUBLIC AUCTION, about the middle of March next, of which due notice will be given, a large quantity of superior NURSERY STOCK, on the Premises above

Catalogues are in course of preparation, and will be forwarded on application to RICHARD BRADLEY AND SONS, Halam, near Southwell, Notts, or to the Auctioneer, Swan Hotel, Mansfield, seven days prior to the sale.—Swan Hotel, Mansfield, Feb. 21.

Burghley Park, Stamford.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has the honour to announce that he is favoured with instructions to offer for SALE by AUCTION, without reserve, on THURSDAY, March 17 next, at the Dairy Farm, Burghley Park, about THIRTY HEAD of SHORTHORNS, the property of the Most Hon. the Marquis of Exeter, including some superior Young Bulls, and a choice selection of Cows and Heifers descended from the original herd, so long and carefully bred by the late Marquis of Exeter, as well as others from the stocks of the earliest breeders and improvers of Shorthorns. The Sires lately used have been principally of Kirklevington descent.

Catalogues, with pedigrees, may be had on application to Mr. STRAFFORD, 19, Euston Square, London, N.W.; or of Mr. WALTON, Burghley Park, Stamford.

☞ NOTICE.—*The* GARDENERS' CHRONICLE *and* AGRICULTURAL GAZETTE *will*, NEXT WEEK *and in* FUTURE, *be published on* FRIDAY, *at* 2 P.M., *instead of* SATURDAY, *as hitherto.*

ADVERTISEMENTS *for the* CURRENT WEEK *must reach the Office* NOT LATER *than* THURSDAY MORNING.

The Agricultural Gazette.

SATURDAY, FEBRUARY 26, 1870.

MEETINGS FOR THE ENSUING WEEK.

MARCH 2—Agri. Society of England (Council Meeting)—Noon.
— 5 { Norfolk Chamber of Agriculture (Education of Agricultural Labourer), at the Norfolk Hotel, Norwich—12 30 P.M.

THE long and interesting report on the agriculture of Belgium with which the current volume of the Society's Journal commences, does not at all shake the opinion which has been often enough expressed in these columns, that but a small part of any English agricultural Journal need be set apart for the discussion of Conti-

nental agriculture. Not that our agriculture is necessarily always superior to that of many a Belgian, French, or German farmer; still less that it is ever faultless, but that it includes its own correctives, and furnishes its own warnings and its own encouragements much more perfectly than any other system can supply them. Mr. JENKINS' report, whether of the small farms or the large farms of a country whose climate is so nearly the same as our own, is just an extract from the journal of a traveller, which we read to be amused rather than instructed by the contrasts which it presents to the familiar experience of everyday life among ourselves. It is pleasant reading, and will, we hope, be read by the English farmer; but they will not benefit by it, as they will by the reports, for which we shall look in the ensuing "Part" of the Society's Journal, of Mr. MASON'S prize farms in Oxfordshire. There are one or two particulars in Flemish husbandry wherein we learn a useful lesson. But this description of the agriculture of Belgium, upon the whole, is not likely to shake English farm practice; perhaps it is more likely to confirm it.

The same cannot be said of any other paper in the volume. Mr. STRATTON'S account of the agricultural labourer certainly exposes a very weak point in our system. There is real pathos in the biographies which he sketches of his average specimens: and we cannot doubt that useful fruit will yet be gathered as the result of this particular "seed," sown, let us hope, in the good soil to which the Journal will give it access.—Mr. JONAS again gives currency to the useful practice of wholesale chaffing straw as fodder, and storing it away in mass salted or mixed with a sufficient proportion of green stuff to cause the whole to ferment.—Dr. VOELCKER lays before the English agricultural reader his researches into the feeding value of Beet pulp from the sugar factory; and the results of field experiments, in which it seems proved that Mangel Wurzel crops benefit by the application of potash salts in the manures applied to them.—Mr. JENKINS' report on Cheshire dairy farming, including a particular account of Mr. JACKSON'S farm at Tattenhall, is a very explicit and useful report of characteristic English farm management.—There are in the history of Potato farming in Jersey and bogland farming at Whittlesea some good pictures of local management.—And at the close of the volume Mr. BAILEY DENTON elaborately discusses the possibilities of village sanitary economy—a subject which, in connection with cottage building, water supply, and drainage, he has long since made his own by much actual practice, and still wider observation. There is no large estate owner in the country who will not benefit by the perusal of his pages.

On the whole, the volume maintains the character of the series; and it is no disparagement of it to point out how large a space is devoted in it to the consideration and discussion of the interests of the labourer.

MR. FORSTER'S exposition of THE GOVERNMENT EDUCATION BILL on Thursday of last week has made its provisions known throughout the country. It is therefore unnecessary to do more than point out those particulars in which tenant-farmers and other country people will be especially interested. The Government propose to ascertain the educational circumstances of every district throughout the country by inspection. Where there are schools enough, and the education is adequate, and the means are being used, they do not interfere. When the report in any of these particulars is unfavourable, a year will first be given to the district in which voluntarily to correct its deficiencies; and if, at the end of that time, the report be still unfavourable, then a School Board must be elected and appointed—in towns by the municipal authorities, in the country by the parish vestries. These boards, of from 3 to 12 members, will be expected, if there be insufficient school accommodation or inadequate instruction, or imperfect school attendance, to supply the deficiency, or correct the imperfection, or enforce the attendance. And if they fail of their duty in any of these particulars, Government will step in and do it for them. In the first instance, at any rate, therefore, the Country School Board—to which, by the way, *any one* is eligible whom the vestry may choose to appoint—is made solely responsible for the attainment of the end which Mr. FORSTER proposes, viz., the elementary education of every English child.

It is left to the School Board to appoint school managers; to prescribe fees for school attendance, or in exceptional cases to dispense with them; to provide adequate school accommodation, and to borrow money on the rates (to the extent of a 3*d.* rate for thirty years) for this and other school purposes; to give pecuniary assistance to existing public elementary schools; to provide free schools, or industrial schools, if they can satisfy the Educational Department of Government that they are required; and, with the approval of the Education Department, to frame bye-laws for all or any of the following purposes:—(1). Requiring the parents of children above the age of five years and under the age of twelve years to cause such children (unless there is some reasonable excuse) to attend school; (2). Determining the time during which children are so to attend school, provided that no such bye-law shall be contrary to anything contained in any Act for regulating the education of children employed in labour. (3). Providing for the remission of the whole or any part of the fees of any child where the parent satisfies the School Board that he is unable from poverty to pay the same; (4). Imposing penalties for the breach of any bye-laws; (5). Revoking or altering any bye-law previously made.—Any of the following reasons shall be a reasonable excuse, namely: (1). That the child is under efficient instruction in some other manner; (2). That the child has been prevented from attending school by sickness or any unavoidable cause; (3). That there is no public elementary school open which the child can attend within one mile, measured according to the nearest road from the residence of such child. Any proceeding to enforce any bye-law may be taken, and any penalty for the breach of any bye-law may be recovered, in a summary manner; but no penalty imposed for the breach of any bye-law shall exceed five shillings for each offence, and such bye-laws shall not come into operation until they have been laid before Parliament for at least forty days. It is the fourth of the above clauses by which compulsion is to be directly brought to bear on elementary education. Every parent will be liable to a fine of five shillings on refusal, except for "reasonable excuse," to send any child under twelve years of age to school. The indirect method of compulsion adopted in the Factory Act, by which no child of specified age is allowed to work except under a certificate of school attendance, neglects all the children of reckless parents who send their children out to beg rather than to work, and the plan of the present Bill is no doubt to be preferred.

The system of school fees, together with voluntary contributions, is to be maintained, and Parliamentary grants are to be supplementary as heretofore; not, however, as heretofore, so strictly contingent on the contribution of the locality. Ample provision is made for the entire religious freedom of the parents and children. And after March 31, 1872, no grant of moneys provided by Parliament will be made to any school which is not a "public elementary school" within the meaning of the Act.

—— TRADE has been hardly so brisk during the last ten days in the corn market, and prices have been barely maintained. —— In the Metropolitan Cattle Market, Monday's higher prices were fully maintained on Thursday.

—— The PARIS AGRICULTURAL EXHIBITION opened, according to last week's announcement, on Saturday last, and remained open till Wednesday evening. The central area of the Palais de l'Industrie was occupied by cattle, live poultry being placed along the sides. There were 350 entries of cattle. The race least represented was the Charolaise; of pure Durhams there were but two, but the number of crosses between the Durham and French races were very numerous. In spite of the opinions of many French agricultural writers against the fitness of the Durham breed for France, it seems to be growing in favour. The show of sheep was small, crosses with the Southdown being the most numerous. The pigs were in great force, there being 200 entries. The exhibition, it should be mentioned, was not international. The live poultry, rabbits, &c., made an admirable show, there being no less than 700 lots, the famous races of Crèvecour, Houdan, La Flèche, and La Bresse making a great show. The collection of dead poultry prepared for the market was not so fine, we think, as we have seen in Paris. There were 1400 lots of grain, seed, roots, &c.; 700 of cheese, and more than 100 lots of butter. There were 600 entries of machines and implements. This portion looked thoroughly English, or rather Anglo-American, and was in fact an international show, a number of British makers having branches or agencies in Paris, including Aveling & Porter, Crosskill, Fowler, Hornsby, Howard, Coleman, Wood, Samuelson, and Smyth & Sons.

—— The many agricultural friends of Mr. HALL DARE, the late Secretary of the Royal Agricultural Society of England, will hear with pleasure of his appointment to the Under-Treasurership of the Inner Temple.

—— The Reading Implement Company's one-tined subsoil plough has been altered, and very materially improved, by Mr. H. J. MORGAN, of the Metropolis Sewage Company, who now manages the irrigation farm near Barking. It is made at once a more efficient implement and much more easily held at work, capable, when drawn by three horses, of stirring the hard gravel subsoil of the company's farm about 12 inches below the furrow of the preceding plough; and travelling when at work, almost without being held, like a well-balanced wheel plough. Side tines are added, and improvements are made in the means of regulating the draught.

—— At a recent discussion on ROADS AND HIGHWAYS before the Cirencester Chamber of Agriculture, the following illustration of the wastefulness of the turnpike system was given by Mr. HENRY PLAYNE, of The Downs, near Minchinhampton. Mr. RUCK had spoken of the way in which a miller paying £50 a year to the turnpike would escape his contribution where the costs of road repairs were levied by a general tax:—

"Mr. H. PLAYNE said that when Mr. RUCK alluded to the miller who paid £50 at turnpike gates, and who Mr. RUCK thought should in any new scheme pay an equivalent sum to the repair of the roads, it had occurred to him that he should like to know how much of the £50 at present went towards the actual repair of the roads? People who were not acquainted with turnpike trusts were not aware of what was done with the money. His own experience was that, out of the £50, perhaps £15 would go towards the repair of the roads; and probably the miller may be rated to that amount, so that he will still pay his share if the cost be thrown on the rates!"

—— The *Mark Lane Express* has published the following summary of returns as to the PRODUCTIVENESS OF LAST YEAR'S HARVEST:—

Classification	Wheat.	Barley.	Oats.	Beans	Peas.
Failure and three fourths under average	1	—	3	32	42
Two-thirds under average	—	—	—	10	
Half " "	3	10	7	30	46
One-third " "	27	31	18	19	65
One-fourth " "	25	16	4	11	26
One-fifth " "	3	20	—	1	1
One-sixth " "	5	1	8	—	—
Under average	231	199	210	138	120
Average	133	155	209	167	98
Over average	27	27	22	18	9
One-sixth over average	—	—	—	—	—
One fifth " ..	—	—	—	2	—
One-fourth " ..	3	—	—	4	1
One-third " ..	—	—	0	—	—
One-half " ..	3	—	1	—	—
Two thirds "	—	—	—	—	—
Total	511	489	491	452	498

Put into the form in which our returns appeared last autumn, the above will read as follows:—

RETURNS OF LAST HARVEST—*Mark Lane Express*, Jan. 1870.

Classification.	Wheat	Barley	Oats	Beans	Peas.
Under average	295	277	250	261	300
Average	183	135	209	167	98
Over average	33	27	32	24	10
Percentage					
Under average	58½	56½	51	57⅞	73½
Average	36	38	42½	37	24
Over average	5½	5½	6½	5⅛	2½

These results are compared with those of harvest time last year in our own columns in the following table:—

RETURNS OF LAST HARVEST—*Agricultural Gazette*, Aug. 1869.

Classification.	Wheat.	Barley	Oats.	Beans	Peas.
Under average	96	63	94	28	68
Average	80	82	76	97	61
Over average	24	35	22	26	8
Percentage					
Under average	48	35	48½	64½	49½
Average	40	43½	40	18½	45
Over average	12	19½	11½	17	5½

It will be seen on comparing the percentage columns in the two cases, that the worst anticipations of harvest time have been more than realised.

—— At a recent meeting of the Committee of the British Association on the Treatment and Utilisation of Sewage, it was announced that in answer to a circular addressed to 663 Corporations and Boards of Health, replies had been received from 245, and 81 towns had subscribed £786 towards the expense of a practical and comprehensive inquiry into the treatment and utilisation of sewage, including Manchester £100, Halifax and Plymouth £30 each, and others 20, 10, and 5 guineas apiece. The Metropolitan Board of Works had declined to contribute, on the ground that the Act or Parliament under which it was constituted the representative body of a population equalling one-sixth of that of the entire country, does not contemplate such a use of ratepayers' money. The committee, after a careful consideration of the matter, were of opinion that the amount already subscribed was sufficient to justify the commencement of the inquiry, but that

unless a larger number of places joined in contributing, the inquiry would not be sufficiently extended. It was therefore determined first to forward to every town and district, subscribing or not, the list of subscriptions with this statement of the intentions and views of the committee; and, secondly, to request the authorities of the subscribing towns to state the nature of the difficulties under which they severally suffer.

OUR LIVE STOCK.

CATTLE.

WE are favoured with a proof catalogue of the coming exhibition and sale of stock to be held in Bingley Hall, Birmingham, on Thursday next. Already 102 entries have been made, and we hear the list is not complete. The cattle will be divided into the following sections:—

Class 1. Bulls exceeding 12 and not exceeding 20 months old—1st prize, £20; 2d, £10; 3d, £5.
Class 2. Bull-calves exceeding 6 and not exceeding 12 months old—1st prize, £20; 2d, £10; 3d, £5.
Class 3. For the best cow-heifer, or heifer-calf, £10.
Class 4. For the best bull exceeding 20 months old, £10.
Extra stock.

The collection of animals will embrace representatives of many good tribes, bred by men well known in the Shorthorn world. Among these we may mention the following as likely from their pedigrees to attract attention:—No. 4, exhibited by Mr. Wm. T. Wakefield, Fletchampstead Hall, was bred by Mr. Willoughby Wood. This animal is already entered in the Herd-Book as LORD OXFORD WILD EYES, a rare combination of Bates' names. He is by BARON WILD EYES (25,604), dam *Wild Oxford*, by LORD OXFORD 2D. Mr. Willoughby Wood exhibits (No. 9) DUKE OF LANCASTER, by a thoroughly good sire of the *Place* family and full of Oxford and York blood, namely DUKE OF ATHELSTANE (21,562), dam *Oxford's Ada* by LORD OXFORD 2D; also lot 60, *Iris 2d* by LORD LIVERPOOL (22,168), and descended on the female side from *Victoria* by USURER; and lot 61, *Commemoration 3d*, by LORD WILD EYES 2D, and grand-daughter to *Commemoration* by TITAN. No. 27, CHAMPION, is a yearling bull from the herd of Mr. Curtler, of Bevere House, and possesses an attractive pedigree. He is by Mr. Graham's WILD BOY (23,219), a bull by TOUCHSTONE (20,986), and from a cow of the Wild Eyes sort; his mother *Camilla* is also a TOUCHSTONE cow, and thus he is very closely allied to the best Knightley blood. Tracing this pedigree a little further, we find the name of *Fillet* by FAWSLEY, of redoubtable memory, and afterwards two Arbuthnot crosses take us back to Mr. Jobling's stock, and finally to Charles Colling's WINDSOR and OWN BROTHER TO NORTH STAR (489). We cannot pass over SOLITUDE (lot 42) without remark. This yearling bull was bred at Milcote, and is exhibited by Mr. Adkins. He is by MONITOR (24,615), and from *Nancy* by ROWFANT 1ST, a son of 4TH DUKE OF THORNDALE; his grand-dam was the celebrated *Surmise*, by DUKE OF GLOUCESTER (11,382), of Tortworth memory; and previously we find the pedigree passing through *Silena*, the dam of Mr. Robart's cow *Fancy, Secret* by SHORT TAIL, and back among the best strains of what Mr. Thornton calls "ancient Shorthorns." CLARO'S GRAND DUKE (lot 43), by Captain Gunter's 3D DUKE OF CLARO, dam by 7TH DUKE OF YORK, g.d. by 4TH DUKE OF OXFORD, g.g.d. by ECONOMIST, and further backed by the names of Mr. Bowly's SOL and the late Lord Ducie's LEO (4208), may well claim attention, if his appearance credits his ancestry. Mr. Bowly exhibits LORD WATERLOO 6TH, a son of 3D DUKE OF WATERLOO, and a cow of the Siddington Gazelle tribe, once known at Tortworth. Colonel Kingscote shows a 4-year-old bull, KNIGHT OF WETHERBY, by 2D DUKE OF WETHERBY (by 3d Duke of Clarence, 19,611), and a descendant of *Kelstern*, by STUDLEY (628). Lot 75, DUKE OF JAMAICA by DUKE OF TOWNELEY (21,615), and from *Jubilee* by CYNDRIC (19,542), comes of a good old tribe known as the Zinc and Roguery family, and previously boasting a TRUNNELL and two FAVOURITE crosses. Lot 76, FASHION by POTENTATE (22,537), of Milcote origin, represents on the female side the *Young Frill* by BROUGHTON HERO strain, doubly allied, through COMBATANT and CHANTER (19,423), with the Charmers. Lot 77, 12TH BARON WETHERBY, was bred at Siddington, and is by the Duchess bull 7TH DUKE OF YORK, and from a cow by 4TH DUKE OF OXFORD; previously he springs from a goodly line, commencing with four Colling crosses, followed with Charge, Booth, Bates, and Whittaker blood. There are many other familiar names in the catalogue, but want of space compels us to desist. Cattle must be at the Hall before 9 o'clock on Thursday morning, but the yard will be open during the whole of Wednesday.

—— We extract the following from a contemporary:—

"On Tuesday, the 8th inst., the herd of 100 Longhorn cattle, the property of the late Mr. Thomas Gulliver Judge, of Crossredy Lawn, near Banbury, Oxfordshire, was sold by auction by Messrs. Margetts and Son, of Warwick. A large company assembled, and there was a spirited competion for some of the best specimens of this noble old breed, and which, some 80 years ago, were the native stock of the whole county of Oxford. It was in this district where the famed Rollright herd of Mr. Robert Fowler made such high prices in 1791—some of the cows and bulls averaging 200 guineas. There were Longhorn breeders at the Crossredy sale from various counties, and amongst them Messrs. Warner, Satchville, Chapman, Burbery, Watts, Godfrey, Rose, Hawkes, &c. In offering this large and well-known herd, the auctioneer observed that he believed no breed of animals possessed more useful properties than the Longhorns, and he sincerely believed they were well deserving of the esteem in which many breeders, graziers, and dairymen held them."

—— An interesting paragraph has found its way into our scientific journals, which informs us that Prince Pless, the owner of large estates in Siberia, has succeeded in raising hybrids, the result of a cross between the common red deer and the Wapiti (Cervus Canadensis), and further that the hybrids are to some extent fertile. Such a fact is of interest to all who make the breeding of animals their special study. Both popular and scientific opinion agree, that sterility in the offspring is the general result of crossing distinct species. That it is the invariable result is however scarcely to be believed, and the case just quoted is an additional evidence that a fertile hybrid is a probability. In connection with this fact we may observe that M. Rafinesque has stated (Moll and Gayot, "Connaissance du Bœuf"), that the American bison crosses freely with ordinary cattle. The result is an animal intermediate in character between the two, and exceedingly useful in the country. M. Rafinesque states that these hybrids breed without difficulty, *inter se*, and with the two species from which they were derived. This statement of M. Rafinesque has been also affirmed by M. Bosc.

SHEEP.

—— Is a cow old in milk or newly calved the best source of milk for lambs? If we can do without this artificial assistance, and trust to the supply furnished by the ewe, we shall find our lambs thrive best; but cow milk must be resorted to more or less every season. We have been struck with the direct contradiction of opinion expressed by shepherds upon this subject. Quoting from Mr. Wilson, of Edington Mains, we find that "to give the milk of a recently calved cow to a young lamb is usually equivalent to knocking it on the head." On the other hand, a very experienced shepherd of a Southdown flock, numbering 600 ewes, has repeatedly assured us that the newly calved cow is fittest for the purpose. Which is the true answer to our question? Or are we to assume that this is a matter of indifference?

—— From time to time we have directed attention to various schemes for preserving meat. The following information from the *Melbourne Economist* is interesting, taken in connection with the present state of this important question:—"The building operations of the Warranambool Company are now nearly finished. The company started about a fortnight since at Hamilton is making satisfactory progress, and applications for shares are coming in by tens and twenties at a time. No less than five new companies have been started during the past month. It is intended to establish one at Albury with a capital of £10,000, in 2000 shares of £5 each. The plant, &c., for treating 3000 sheep weekly is expected to cost £1100, and the supply of sheep is unlimited. Melbourne is also to have another company: the capital is to be £6000, raised in shares of £5 each. It is to be called the Australian Felix." This activity of our colonial brethren in providing us with what has hitherto been so essentially a home production is worthy the attention of the landed interest. In connection with this subject we would recommend the perusal of a very admirable paper on "The Meat Question of 1870," in the first issue of the "Food Journal," just published.

THE COST OF STEAM PLOUGHING.

IN an article which you inserted at p. 187 I showed the quantity of land which a 10-horse engine working a flying rope would plough up in a day. If the plough was running 3 miles an hour, as your reporter thought it was, then 19½ acres was the quantity, but if running only 2 miles an hour, as my observations and inquiries lead me to fix upon as the real speed, then 13 acres a day was the quantity. Now this land was a light soil in a very dried up state, and was a Rye-grass and Clover ley two years down. Every practical farmer knows how much of such land he could turn over in a day, 7½ inches deep. If then we can come at the cost of doing it with steam, it will give a very good basis for comparing the actual cost of steam against horses. I will assume that 13 acres per day was the quantity, and not 19½ acres. But it must be remembered that the tackle has to be shifted from field to field and reset up, and the time in so doing has to be allowed for, and will materially reduce the quantity of work done in an average working day. I think it would be a fair allowance if we took 10 acres per day instead of 13 acres, that is to say, that out of every five days we lost one whole day in shifting and setting up the apparatus. Thus, five days at 10 acres would be 50 acres, but four days of actual work at 13 acres would be 52 acres, leaving us one clear day for shifting. I think most persons will allow this is ample to cover waste of time in removals. Now let us look at the cost. The ploughing apparatus, exclusive of the engine, would cost about £350, and it ought, if possible, to be worked by a traction-engine suitable for ploughing, for carting, and for threshing, therefore only one-third of the cost of the engine should be put down to ploughing. If, then, it cost £450, the ploughing department should only be charged with £150. Supposing an ordinary portable engine employed, it would cost at least £250, and then half the amount, or £125, would have to go towards ploughing, but then the apparatus would require a number of horses to move it from field to field, which is often inconvenient. I shall therefore adhere to the traction-engine estimate, and with it the amount of capital exclusively engaged in ploughing would be £350 for the tackle and £150 for the share of the engine, making £500 in all. Now, this sum must undoubtedly be charged with 5 per cent. interest for the whole year, and also with 5 per cent. per annum to replace the capital when the machine was worn out, making in all 10 per cent., or £50 per annum. In addition to this, there are the annual repairs, and I do not think that 5 per cent. is a fair allowance to cover them. If the machine stood idle altogether the repairs would plainly be nothing at all; if it ploughed only 100 acres the repairs would be something, but if it ploughed 1000 acres the repairs would evidently be much more. I consider, then, that repairs ought to be estimated at a certain sum per acre, and not by a percentage on the capital. One shilling per acre would be only £5 per year on 100 acres, and that seems to me too little, for there is the risk of an accident as well as actual wear and tear. My estimate would be, for any quantity under 200 acres, 1*s.* 6*d.* per acre; for any quantity from 200 acres up to 500 acres, 1*s.* 3*d.* per acre: and for any quantity above 500 acres, 1*s.* per acre.

Now, let us consider the cost of coal, of water, of oil, and of wages. As to wages, we require one engine-driver, two windlass men (not skilled men), one ploughman (who is an unskilled man), and two boys to move the rope-porters. I reckon that the engine-driver, although only receiving 3*s.* 6*d.* per day, would cost quite 5*s.* per day while the engine was at work, because there are not many other jobs he can be put to about a farm, and the engine will not work more than half the working days in a year. The other men I put down as ordinary farm labourers, say at 2*s.* per day, and the boys at 1*s.* per day. A good engine would not burn more than 6 cwt. of coal, costing, say, 1*s.* per cwt. on the spot, and oil would cost 1*s.* per day. I allow nothing for water, because the engine, being a traction-engine, ought to go and fetch its own water every evening after it got too dark to plough. Now let us recapitulate these expenses for one average day's work of 10 acres:—

	s.	*d.*
Engine-driver	5	0
Two windlassmen, at 2*s.*	4	0
One ploughman	2	0
Two boys, at 1*s.*	2	0
Coals	6	0
Oil	1	0
One day, or 10 acres, cost	20	0

or 2*s.* per acre. To this we must add 1*s.*, or 1*s.* 3*d.*, or 1*s.* 6*d.* per acre for repairs, according to the extent of land we cultivate, and also a very considerable sum to make up the £50 per annum which is required for interest and replacement of capital when the machinery is worn out. The sum per acre necessary to make up this varies with the extent of our work: 100 acres would require 10*s.*; 200 acres, 5*s.*; 300 acres, 3*s.* 4*d.*; 400 acres, 2*s.* 6*d.*; 500 acres, 2*s.*; 600 acres, 1*s.* 8*d.*; 800 acres, 1*s.* 3*d.*; and 1000 acres only 1*s.*

Let us take five different farms where the quantity of actual plough land was respectively 200, 400, 600, 800, and 1000 acres. Then the cost would be as follows per acre:—

For	200	400	600	800	1000
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
Wages, &c	2 0	2 0	2 0	2 0	2 0
Repairs	1 6	1 3	1 0	1 0	1 0
Interest, &c.	5 0	2 6	1 8	1 3	1 0
Totals ..	8 6	5 9	4 8	4 3	4 0

That is to say:—

200 acres of plough would cost	8*s.* 6*d.* per acre
400 "	5*s.* 9*d.* per acre
600 "	4*s.* 8*d.* per acre
800 "	4*s.* 3*d.* per acre
1000 "	4*s.* 0*d.* per acre

It will be seen from the table how rapidly the expense runs down as the farm increases in size. A farm with only 100 acres of plough, if calculated out as above, would cost 13*s.* 6*d.* per acre, whereas 200 acres only cost 8*s.* 6*d.*, and 400 acres 5*s.* 9*d.*

Now one pair of good horses and one man would plough an acre and a quarter of such land, but the cost of two horses, one plough, and one man would be quite 7*s.* 6*d.* per day, including wear and tear, and interest and depreciation. Therefore with horse-power this land would cost 6*s.* per acre to plough. If, then, a farmer had 400 acres to plough every year, steam-power would be cheaper than horse-power; but if he had less than 400 acres, horse-power is the cheapest. It must not, however, be forgotten that steam-power now will do several other things besides plough; it will ridge, harrow, scuffle, clod crush, and drill. And if all these things be done with it, then the extent of land that is necessary to make steam-power a paying operation to apply to the soil falls rapidly. In ridge-

ploughing a pair of horses, no doubt, go over nearly treble the ground, but it is very heavy work. In heavy land, too, a single ploughing with horses will not produce a seed-bed, the cultivator or the drag-harrow and the clod-crusher must be set to work, and all of them take a great deal of horse-power. Therefore if all these things are done with steam, the charge for interest and depreciation or replacement of capital will fall to be divided over a larger area, and that is the heavy item in the cost of steam-power on small occupations. If a farmer makes up his mind he will do all these things with steam-power, then I think smaller occupations than what I pointed out above will do. I think that on heavy land 200 acres actually broken each year would pay for steam-power, because those 200 acres besides being once ploughed ought to be once scuffled and once clod-crushed, both which operations can be done at once, and would cost pretty nearly as much as a second ploughing,—but call it two-thirds; then it has to be once harrowed before sowing and twice harrowed after sowing, which three operations can be done with one setting up of the machinery, and are certainly equal to one-third of a ploughing. Consequently on 200 acres of heavy land broken up, if steam is used for all the operations, it will absorb as much power and time as 400 acres only once ploughed, and therefore will pay. Again, on light land, I think that 280 to 300 acres actually broken up would pay, because one-fourth of that, or say 70 acres, would require to be ridged for roots, but we always harrow immediately before ridging. But to harrow 70 acres is equal to about 10 acres of ploughing, and to ridge-plough 70 acres is about equal to 25 acres of ploughing, making together 35 acres, which can all be done at one setting up of the apparatus. Then to sow the remaining 210 acres requires three harrowings (one before sowing and two after), and these can all be done at one setting up of the apparatus, and are equal to about 70 acres of ploughing; and these two quantities added on to 280 acres would bring the whole up to about 400 acres or thereby.

Now, the conclusion I come to is, that it will pay a man to buy a flying-rope steam-ploughing tackle, provided he occupies a light land farm, of which not less than 280 acres are actually broken up every year, or provided he occupies a heavy land farm, of which not less than 200 acres are broken up every year. Your readers, most of whom are practical men, can see my calculations, and test them for themselves, for they are very plain and very simple. But they must bear in mind that I come to these conclusions solely on the condition that the steam-power is applied not merely to ploughing up the land once only, but also to all succeeding operations, of scuffling, clod-crushing, ridge-ploughing, and harrowing. No doubt, if they only went once over the land, in accordance with the Woolston fiat, they could not possibly pay interest and depreciation on their outlay, unless they had a much larger occupation. At p. 1192 of *Agricultural Gazette* for November 13, 1869, Mr. Smith says:—"I never go twice over my land by steam-power for a crop * * * * I condemn such practice when carried out by others." Nevertheless, Mr. Smith is not infallible. He may have been before his age in 1855, but he is desperately behind it in 1870. Like Rip Van Winkle, he has fallen asleep, and a new generation has grown up during his slumbers.

Although in the foregoing calculations I have taken Fisken's flying-rope system as my basis, there is no doubt that a good roundabout, worked by a traction-engine, would give pretty nearly the same results. As to the double-engine system, it does not seem to me to be available at any reasonable rate unless the occupation be very much larger, because it adds on at once £450 to the capital, and the whole of that extra capital must be charged against ploughing. It would, in fact, very nearly double the charge for interest and depreciation, which on small farms comes very heavy.

In conclusion, let me observe that the quantities I have given are the actual "break up" of each year. For instance, in a heavy land farm worked on the four-field system 200 acres of actual break up each year represent 267 acres under rotation. Again, in a light land farm, which most probably would be worked on the five-field system (two years in Grass), 300 acres of actual break up would represent 500 acres under rotation. Therefore, the results I arrive at are that a farm of heavy land of 267 acres under the four-field rotation, or a farm of light land of 500 acres under the five-field rotation, could profitably employ either a flying rope or a roundabout steam-plough worked by a traction-engine. All farms beyond that size would unquestionably save money by the change, without reckoning anything at all for increased crops arising from the deeper cultivation of the soil. *G. A. H.*

*THE FARMER'S CALENDAR.**

This book, based on Arthur Young's "Farm Calendar," was first published under its present Editorship in 1862. The present edition has been revised especially with regard to its chapters on steam cultivation and reaping by machinery, which are the two features in English agriculture in which there has been most growth and change since 1862. We extract from the introduction the following passages on light and stiff land cultivation respectively:—

"It is proper to add a remark on the contrast presented by agricultural practice and experience generally, now, and a quarter of a century ago, when the last edition of Arthur Young's 'Farmer's Calendar' was published.

"At that time the best management consisted almost exclusively in making use of the inexpensive natural means of improvement. Growing green crops and consuming them upon the land was then the only profitable way of enriching the lighter soils, and long rest in fallow was almost the only profitable method of enriching the heavier soils. Mr. Middleton, who edited the twentieth edition of this book, wrote then of the lighter lands as follows:

"'Much has been said of late years on the means of increasing our resources for manuring the soil, as that is the only means of obtaining a more speedy succession of valuable crops. Papers have been written on this subject till it has become ascertained that arable land may be made as rich as is any way desirable by a succession of green and root crops, provided they be properly applied to the rearing and fattening of cattle, sheep, and hogs. I repeat that such a fact has been ascertained, and it is now known to every agriculturist who has the merit of aspiring to be at the head of his profession. Therefore, I only refer the reader to what has been said in the former parts of this volume, under the several heads of Vetches, Turnips, Cabbages, Rape, and Rye. In these places it may be seen that such a selection of plants may be made as will enable any agriculturist to bring two of these crops to maturity annually, and continue to do so for any length of time. And provided they be applied to the rearing and fattening of animals, such great quantities of manure will be made as cannot fail of advancing most arable land to the highest degree of fertility.

"'What has been said will probably induce many agriculturists of energy to try the cultivation of two crops annually, and they may be assured that such a practice, on a scale proportioned to the capital they employ in it, may be the means of their acquiring very considerable wealth.'

"So entirely was Mr. Middleton convinced of the results of his double culture, that he added the following vigorously-written passage:—

"'That very numerous class of supine persons, whose minds are so weak as not to adopt this practice, which is the most improved that is known, will certainly continue to complain of hard landlords and bad times; such characters do not succeed in any profession, neither can they in agriculture, and I had nearly said they deserve to be poor; but whether they deserve it or not, their destiny is to be so.'

"The present Editor, with the advantage of 25 years of additional agricultural history in retrospect, has to record, not the increasing prevalence of the practice thus strongly advocated—not the exclusively natural method, though in the most active form of it thus recommended—but a more energetic use of artificial means; the use of richer manures from purchased cattle foods; and, above all, the use on an extraordinary scale of purchased manures, both manufactured and imported; so that the fertility which *came* with profit formerly under the best management in two or three years, is now *achieved* with greater profit almost at once.

"And still greater is the contrast in the agriculture of clay lands. They are naturally wet, intractable, and expensive; but it is not now the practice to sit down and let Nature almost unassisted fertilise them. They are drained (perhaps burned), and cultivated by steam-power; and as the cost of labour, and its inefficiency on such soils when conducted by horse-power, has been hitherto the great drawback to the cultivation of the clays, so now that the cheaper, more efficient power of steam has been successfully applied, we may expect to see them take that precedence in value and productiveness which agricultural improvements hitherto have given to the sands and lighter loams."

We add that the work is fully illustrated, and we are enabled, through the kindness of Messrs. Warne & Co., to give, in this and our next issue, illustrations from its pages of the grasses most commonly used in mixtures for permanent grass-lands:—

Fig. 50

In Fig. 50, No. 1 is a sketch of Dactylis glomerata, Cocksfoot Grass, one of the most useful of our common grasses. No. 2, Alopecurus pratensis, or Foxtail Grass, is another bulky, succulent, and nutritious Grass, introduced generally into mixtures for sowing in all rich soils. No. 3, Anthoxanthum odoratum, the Sweet-scented Vernal Grass, is one of our earliest and most common grasses; not in itself very nutritious, but useful for the pleasant smell it gives to hay. No. 4, Arrhenatherum avenaceum, Tall Oat-grass, is of very little service in mixtures for laying down land to permanent pasture. Its natural habitat is on dry, rough, hill-side soils. It is not a very nutritious Garss, nor is it very palatable.

In Fig. 51, No. 5 is a species of one of the most valuable of British grasses. Festuca rubra is a short sandy-soil Grass, adapted for sheep pasture. No. 6, Phleum pratense, Catstail Grass, is a productive and nutritious Grass, found on all first-class clay-land pastures. No. 7, Poa trivialis, Rough-stalked Meadow Grass, is adapted for moist pastures. No. 8, Cynosurus cristatus, is a short Grass, very commonly met with, but of no great value as food. No 9, Festuca elatior, one of the larger Fescue grasses found in all coarse dry-land pastures; a palatable food for cattle and horses, and yielding abundantly.

FENCES AND ENCLOSURES.

A Paper by J. Scott, Hermoskers Farm, Rudgwick.

Where fences are at all necessary, good fences must be regarded as indispensable to good farming, and the condition of the fences may very often be accepted as affording a correct indication of the skill and attention bestowed upon the cultivation of the ground which they enclose. If the fences are not good and substantial of their kind, a good farmer will at least always have them in a state of efficient repair.

There are several objects to be attended to in the formation of a good fence, but the first and most important requirement is that it shall be impenetrable, and of sufficient strength to resist the destructive pro-

* Describing the work to be done on various kinds of farms during every month in the year. By John Chalmers Morton. New edition. Frederick Warne & Co., Bedford Street, W.C.

pensities of sheep, cattle, and horses, or of such other animals as are required to be retained in the enclosure. It may present every other possible advantage, but if it does not fulfil this condition, it is not a fence, and is practically useless.

The size of enclosures must be regulated by the system of cultivation pursued, and by the extent of land undergoing the rotation; but these requirements should be made to harmonise as much as possible with the local considerations affecting the utility of fences, particularly the conditions of climate and shelter. Shelter is required both against heat and cold, and its attainment should be studied in the formation of enclosures. Trees form the best protection, and where they are obtainable no other shelter is required, and the advantages in such situations will always preponderate in favour of large enclosures and open fences. In elevated districts, exposed to the force of the wind, and destitute of trees, a compact fence is all the means of shelter at command, and therefore within a certain limit their increase will prove beneficial. But in low-lying ground, well sheltered by trees, or by the natural configuration of the surrounding country, there is practically no other object requiring the formation of a fence than its primary use of providing an efficient enclosure for grazing purposes. In such districts, the utilisation of fences for shelter should be carefully guarded against, both because they are unnecessary for such a purpose, and because their effects are hurtful alike to the climate and to the surrounding soil, and, consequently, injurious to the crops. This is especially the case when the enclosures are of small extent.

The broad hedgerows which are to be seen in many parts of England, composed of a belt of trees, flanked on each side by a hedge, and having a dense growth of underwood, are positively injurious to the land. No doubt the object in cultivating these hedgerows (if there is any definite purpose in view at all) is the double one of providing for the growth of firewood and of securing shelter. But, if the intention is good, the results of making a plantation out of a fence are neither satisfactory nor profitable. They prevent the soil from drying quickly if it is naturally damp, and, by the stagnation of the air which they induce by obstructing the free flow of the atmospheric currents, they poison all the surrounding Grass and crops. They are also complete nurseries for weeds, and afford shelter for insects, vermin, and such birds as are destructive to crops. From which cause the headlands of the field are generally quite lost to the farmers; and there is the additional loss of the ground occupied by the superfluous width of the hedgerows themselves.

A fence should always be as narrow as possible consistent with due fitness for its purpose. The space required will, of course, vary according to the different kinds of fences used; but in a hedge, for example, which occupies more space than other systems of fencing, there is seldom any reason or necessity why the width should exceed 3 feet. The economy of guarding against excess of width in fences is very apparent by a simple calculation. If we allow a hedge to occupy a width of 2 feet, and cultivate the ground on each side to the distance of 3 feet from the centre of the fence—which allowances are certainly very far short of the real practice throughout the country—we shall find that on a farm of 250 acres, laid out in 25 fields of 10 acres each, there is an area of more than 4½ acres, or a 55th part of the whole, entirely lost to cultivation through the use of fences.

It is generally admitted that fields which are surrounded by hedges are more fertile than those which are unenclosed; but this is not universally true without limitations. In dry situations, and on light sandy soils, they are undoubtedly of great benefit from their effects in preventing the escape of moisture, and therefore, in such places their value will, in some measure, increase in proportion with their number. But, on the other hand, these same effects must be injurious to a soil which is naturally damp and moist if the hedges abound in number.

There are a great variety of plants used in the cultivation of hedges, such as Hazel-nut tree, common Birch, narrow-leaved English Elm, Beech, Prickly Broom, and Privet. Hedges are sometimes formed of one of these species only, but often of several mingled together, as of Beechwood and Privet. None of the above mentioned plants make a good hedge. The plant which is best adapted to the purpose is White Thorn or Hawthorn (Cratægus oxyacantha). It is almost the only one which produces a good fence of compact growth; and, of all others, its use is attended with the fewest disadvantages. It can be managed so as to form a very compact and equal fence, and yet occupy very little space; its roots do not throw out new ramifications into the surrounding soil; and, on account of its thorns, it is avoided by all animals, and does not harbour birds and insects, unless it is allowed to spread out its branches to an unnecessary extent.

Thorns are planted in a hedge from autumn, when the leaves drop off, till spring, when the buds begin to swell, unless in frosts and heavy rains. When planted about October the plants are said to be more healthy than if put in at any other time, and there is undoubtedly this to be said in favour of planting them then, that if the winter prove mild new roots are produced which form a good preparation for a vigorous growth in spring. But this is a point on which all are not agreed, as some think that it is safer to defer the final transplantation till the spring, when there is no danger of the plants being injured by frost.

The plants should be put in the ground immediately upon their removal from the nursery bed. The roots

Fig. 51.

should be left as entire as possible, but the ragged parts should be cut away with a knife, and the head lopped off to make the plant grow bushy. If the wounded parts of the roots be cut into small pieces, and sown in a bed prepared for them, they will produce Thorns in the same year; and such a method of propagation is more expeditious than that of growing them from the seed.

A hedge should be planted on the flat, because the Thorns when planted erect grow sooner into a useful fence, and much less ground is wasted when they are placed in their natural position than when laid sloping. There should be no ditches about a hedge, unless they are actually needed for drainage.

The land must be carefully prepared during the summer before the hedge is planted, so as to loosen the soil to a good depth, and rid it thoroughly of weeds. The trench in which the young plants are placed is made about a foot in depth, and it will be found of great benefit to apply a little garden mould or well-prepared compost above the roots before filling in the poor soil taken from the trench. The Thorns should be planted at distances of from 6 to 10 inches asunder, according to the quality of the soil. In a good soil there is less difficulty in rearing them, and, consequently, fewer plants are necessary.

Weak plants should not be mixed with the strong ones in a hedge, but kept separate, so that special care can be devoted to them. When the two are mixed, the weaker are impoverished and choked up by the stronger.

It is a pernicious practice that of planting trees in the line of a hedge. Most trees (such as the Oak, Beech, and Elm) grow faster than Thorns, and when grown in the midst of a Thorn hedge spread their roots in all directions, robbing the Thorns of their proper nourishment, and soon overshadow them, and deprive them of the benefits of sun and air.

During the first few years the top of the hedge should be moderately pruned, and the lateral branches suffered to grow untouched. It afterwards becomes necessary to cut them, but they should be left as bushy as possible at the lower part, and gradually tapered towards the top. The triangular section is proved by experience to be the best form of a hedge, as it approaches most nearly to the natural form of the Hawthorn tree, and may be grown to a height of 4 or 5 feet without ceasing to be thick and well clothed to the very bottom; and such a hedge forms a pleasing, impenetrable, and most durable fence. The hedge while young must be properly fenced to protect it from injury by animals, and its roots should be kept carefully clean, and the soil around it occasionally stirred.

Since hedges are not available for use as fences until they are several years old, they must be left out of account where an immediate fence is wanted. Moreover, in those districts where the greatest proportion of land has to be reclaimed, both soil and climate are unfavourable to the satisfactory rearing of hedges. In such places, however, stone is generally abundant, and can be used in the construction of dykes, which are better adapted to a high country than any other description of fencing. Lime-built walls, owing to the great expense of them, can only be of limited application on the farm, but dry-stone dykes can be erected at a moderate cost. Where lime is abundant it is a good plan to set the cope-stones in mortar, for if the wall is well constructed the top stones, which are the most liable to be moved, are thus firmly secured.

A dry-stone dyke may be considered a permanent fence because the materials never decay, and it has this advantage as compared with a hedge, that it is of immediate use. A well-built dyke will stand many years without requiring any repairs, and with a little expense in later years to keep it in order it will last a whole generation without requiring to be rebuilt.

When the stones are dug out of the ground, especially if they are of a gritty or brittle nature, and show a tendency to split, they should be carted to the site of the dyke in the autumn, and left unbuilt until the spring. They will thus be subjected during winter to the influence of frosts and of the atmosphere, the effects of which will be the disintegration, complete or partial, of the undurable stones, which can be thrown aside at the time of building. The neglect of this precaution often shows itself in the crumbling down of comparatively new-built dykes, and the builder is generally blamed for carelessness in neglecting to pack or pin his work sufficiently, when, in reality, the blame consists in providing him with bad and untried stones.

A dry-stone dyke on arable ground is generally built about 4 or 4½ feet in height. On hilly ground, where it is intended as a fence for sheep, and shelter is much needed, it should not be less than 5 or 6 feet high. The dimensions for a dyke 5 feet in height are about 27 inches broad at the base and 14 inches at the top. The foundation stones should be large, and the inequalities of the ground should be smoothed with a spade, so as to provide a solid bed before they are laid. A selection of stones is not always possible, but where they are available, those of a flat shape with a rough surface should be chosen, as they are laid on their natural beds and do not require pinning. Small stones are useful, and, indeed, necessary, where materials are undressed, but the builders should not be allowed to pack them all into the heart of the wall; such a practice leaves the wall without bond, and unfit to stand for any length of time. The large and small stones should be uniformly mixed throughout the wall, so that in every part of it they may break bond as much as possible. There should also be one or more through bond stones in the height of the wall, built in at every few feet of the length. The body of the wall is surmounted by a flat cover, on which the cope-stones are set on edge.

The quantity of stone required to build 1 lineal yard of a dyke, 5 feet in height, is 0.95 cubic yards, or 95

cubic yards of stone to 100 lineal yards of dyke. The building alone, which is all the cost incurred when the stones have to be taken off the land, can be done for 3*s.* 6*d.* to 4*s.* per rood of 6 lineal yards; but the total cost, when the stones have to be specially provided (including quarrying, or digging them out of the ground when they cannot be obtained on the surface, carting them to the site, and building the wall), is about 10*s.* or 11*s.* per rood of 6 lineal yards. One man can build 6 yards of dyke in a day, working by himself, but the work is best done by two builders working together on opposite sides of the wall, as by this method a better bond can be obtained than when the two sides are alternately raised.

Post and rail fences are less suitable to a high, open country, than hedges or stone dykes, but in a low country they have many advantages to recommend their use. They occupy very little space, and are favourable to a free ventilation; two points which deserve special attention, where land is valuable and in thickly wooded districts. The chief objection to their use lies in their temporary character, which arises from the liability of the materials to decay, and often also from defective and unsubstantial construction. A paling of larch wood, having posts 4 feet apart, and four rails in height, can be erected at a cost of about 4*s.* per rood of 6 yards.

The construction of wire fences has of late been greatly extended, and promises to increase; the portability and durability of the wire rendering its employment more convenient and profitable than the use of wooden rails. The system of wire fencing most in use has all the straining and intermediate posts of wood, and the wires are strained by a portable strainer. This system can never be a satisfactory one, because the wires are seldom well strained, and when the posts begin to decay the whole fence gets loose and worthless.

Several systems of self-straining iron pillars have been tried, but none of those produced have attained the standard of simplicity and cheapness necessary to warrant its adoption as a general method of farm-fencing. If the qualities of simplicity and cheapness could be combined in the production of a suitable iron straining pillar, the objection against wire fences, arising from decay, would be obviated, and the fence rendered almost a permanent one. A plain wire fence with wooden posts 4 feet apart, and having six single wires in height, costs about 4*s.* or 4*s.* 3*d.* per rood of 6 lineal yards. The latter estimate includes coating with coal tar after the fence has been erected.

Home Correspondence.

Cotswold Ram Breeders.—I have just heard such a remarkable version in Worcestershire of my challenge to show 70 rams for £1000, which Mr. Hewer accepted, that I am tempted to give the agricultural public the true account. My friends, after it was arranged, came to me and said, You, who have always set your face against gambling, are now become a leviathan gambler. I inquired, Do you look upon it in that light?—they answered they could in no other. I then said, though I felt sure of winning, no earthly power should induce me to show. I went to Mr. Hewer, mentioned the verdict of my friends, and offered him the £1000. He would not take it, as he said others had more to do with it than he had. They afterwards took £500, but to show my good feeling, I went to Mr. Hewer's sale, and bid for nearly half his sheep to help his sale. He came to mine, and I believe never bid for one. I did the same, when last year he sold his flock, but I do rather complain that it was not mentioned that the large sheep there, which was the admiration of every one, was my blood, got from one of my tenants. I have sold 142 rams this year at remunerative prices, though scarcely one has been bought on the Cotswolds. One great breeder told me he should like one or two, but it would be his ruin if he bought one. Such opposition is both childish and wicked. *T. Beale Browne, Salperton Park, Andoversford, Feb.* 17.

Exhibition Pigs.—I suggest that as "mouthing" pigs is a disagreeable operation, and productive of great annoyance to the judges of other cattle by the "harmonia discors porcorum," that pens of pigs should be simply weighed without reference to age. I would have a weight for small breeds and also for large breeds. Moreover, I would not confine the exhibitor to the product of one sow. By these arrangements a great many difficulties would be got rid of, and I suppose, in some cases, frauds too. What can it signify, if a pen of pigs is good and the best, whether they are out of one or more sows? I merely suggest the above for consideration. *W. F. Radclyffe.*

Farmers' Clubs.

BOTLEY.

Treatment of Woods.—The following is the first part of a capital paper read before this Club some weeks ago by Mr. J. BLUNDELL, one of its most active members, land agent, of Southampton, the subject being "Woods and Wastes:"—

Let us inquire how profitable usage of the land can be obtained, either by retaining it as coppice, or by conversion into arable or pasture-land; and I propose to bring to your notice, the better to illustrate our subject, a certain number of woods and plantations, with the view of showing, by calculation, whether they are advantageously to be retained as woods or otherwise; and in doing this I shall select some pieces with which I am somewhat acquainted, and which, at various times, have come under my notice during my business engagements in different parts of the country.

No. 1 is a piece of woodland, of about 20 acres, the soil being a good loam on chalk. There is no timber, but it is well stocked with Ash and Hazel underwood, used for hop-poles, hurdle-making, &c. The produce is usually cut at 12 years' growth, and is worth about £16 per acre; the adjoining land is arable, and worth, to rent, 28*s.* per acre, thus showing that but little, if any, advantage could be derived by bringing this woodland into cultivation, except it were for the improvement or the better laying-out the adjoining fields, which latter points must always be viewed as an important matter.

No. 2 is a precipitous piece of woodland, of about 35 acres, in a western county, on a sandstone formation, with very little timber, but a good plant of underwood, chiefly of Oak stems, which grow very quickly in their moist climate, and is usually cut at 12 years' growth, the time of cutting the largest stems being deferred until April and May, the wood being commonly stripped for the sake of bark. In this particular wood the land is so steep that the men employed in cutting can scarcely keep their footing. This wood, after being barked, is used for making hurdles and other purposes, and yields a return which could not be surpassed by any other known means of usage, the land being too hilly and too near the naked stone for cultivating or planting.

No. 3 is a level piece of woodland, in a southern county, and situated a long distance from chalk or marl, contains about 16 acres, is surrounded on three sides by arable land, the value of which to rent is 20*s.* per acre. The woodland is of the same description of soil, which is strong and gravelly, but does not require draining. There is a good plant of timber, principally Oak, about 160 trees per acre, a large proportion having been left from stemmers. It is only those which have proceeded direct from the acorn that make any perceptible growth. The underwood is very rough and bushy, not worth more than 40*s.* per acre at 10 years' growth. These trees do not make in measurement more than 4 feet of timber, and do not increase annually more than 1¼ per cent. on their value. The following calculations will show the propriety and profit of taking the crop of timber and converting the land into arable:—

	£	*s.*	*d.*	£	*s.*	*d.*
Expenses—Grubbing, per acre	12	0	0			
,, Chalking	4	0	0			
Outlay	14	0	0			
Interest on, at 4 per cent	..	..	..	0	10	0
Value of 80 trees, 4 feet meetings, 64 feet, at 6*d.*	21	6	8			
Annual increased value on the same, at 1¼ per cent	..	..	..	0	6	6
Value of underwood	4	0	0			
	£23	6	8			
Annual value of the underwood	..	..	..	0	4	0
Total annual value of woodland in present state				1	1	6
Value of land to rent per acre, after grubbing, being tithe free				1	4	0
Gain by interest on value of timber and underwood sold off, £21 6*s.* 8*d.* at 4 per cent ..				0	18	6
Value after grubbing				2	2	6
Value before ditto, deduct				1	1	6
Actual advantage of converting into arable				£1	1	0

No. 4 is a piece of woodland of about 11 acres, on the same description of soil as No. 3. The timber is, for the most part, Oak, about 100 trees to the acre, at 6 feet meetings. The underwood was of the same inferior description and value as No. 3, say 4*s.* per acre per annum. This coppice of timber was much more growing than No. 3, and would increase in value about 2 per cent. per annum. This wood is introduced to notice for the purpose of showing the advantage or otherwise of a plan which obtains in some parts of England,—viz., stubbing or grubbing the underwood, with the view of obtaining pasture. In this coppice, however, the grubbing between the timber which is left has cost £6 per acre. The feed of this land is of the poorest description, and not worth more than 7*s.* per acre rent. The timber, I estimate, instead of paying 2 per cent in its growth, is so much injured by letting in the wind, that it will not now increase at the rate of more than 1¼ per cent. It will, therefore, be readily seen that this coppice has not been properly treated. Had it, however, been brought into cultivation it would have paid as well as No. 3, and, being surrounded by arable land, would have greatly improved the adjoining fields, especially as the boundaries are of an irregular and zig-zag description.

No. 5 is a good piece of woodland, of about 24 acres, in a southern county; the land is level, consisting of a fine hazel loam, surrounded entirely by arable fields of the like soil, and worth to rent 35*s.* per acre. There are about 80 trees to the acre of 8 feet meetings, and all Oak. The underwood is worth £4 per acre, at 10 years' growth. These trees have been nearly all let up together, and they should stand or fall together. I, however, estimate that they annually increase in value about 3 per cent. only. This land, under cultivation, would be worth 40*s.* per acre rent, being tithe free. In this case also we must not lose sight of the immense benefit to adjoining lands by the removal of this wood. Let us now calculate the advantage of bringing this land into cultivation:—

	£	*s.*	*d.*	£	*s.*	*d.*
Expenses—Grubbing, per acre	10	0	0			
,, Chalking	4	0	0			
Outlay	14	0	0			
Interest on, at 4 per cent	..	..	..	0	10	6
Value of 80 trees, 8 feet meetings, 640 feet at 1*s.* 3*d.*	40	0	0			
Annual increased value on the same, at 3 per cent.	..	..	..	1	4	0
Value of underwood	4	0	0			
	£44	0	0			
Annual value of the underwood	..	..	..	0	8	0
Total annual value of the woodland in its present state				2	2	6
Value of land to rent per acre after grubbing, being tithe free				2	0	0
Gain by interest on value of timber and underwood sold off, £44 at 4 per cent.				1	15	2
Value after grubbing				3	15	2
Value before ditto, deduct				2	2	6
Actual advantage by converting into arable				£1	12	8

No. 6 is a poor soil, being a mixture of sand and gravel, with a blue pebble in it. This wood is also in a southern county, extends over about 34 acres, and is bounded on two sides by good roads. There is no underwood, but Ferns grow strong. Some 50 years ago it appears to have been planted in an irregular and careless way with Scotch Firs, some of which having been cut at intervals, there are now only a few trees left, probably about 40 to the acre. They are now quite fit to cut, and it is easy to see how little gain has been, or can be, derived from timber left in the manner described; and it should be borne in mind that although this land is too poor for corn growing, yet it is such as would be profitable under a course of cropping for timber upon a plan which I intend presently to explain. In the immediate neighbourhood of this woodland there are large tracts of land, belonging to different proprietors, exhibiting precisely the same state of neglect.

No. 7 is a poor hillside on a chalk soil, and contains about 17 acres; is well planted with Beech wood, there being about 160 trees to the acre, and, of course, no underwood, as the Beech, like the Upas tree, suffers nothing to exist under it. This timber is nearly arrived at maturity—that is, it would pay better to cut than remain, because the interest of money would pay double that of the growth of timber, and under the plan to be offered to your notice the land may be planted with Firs and continue to be more remunerative.

No. 8 is a plantation of Scotch Firs on some of the poorest soil in Hampshire, with a regular plant of about 200 trees to the acre. This plantation is deteriorating every year; the trees were planted about 55 years ago; therefore the crop should be taken for what it will fetch, when the land may be planted again with superior kinds of Fir, to be hereafter alluded to; and I would here remark that it would be just as reasonable to allow our crops of corn to stand in the field for months after they were ripe as it is to allow plantations like this to remain when they may be sold to the best advantage, and the land cleared for another crop.

(*To be Continued.*)

Notices of Books.

Report of Rivers Pollution Commission. *First Report of the Commissioners appointed in* 1868 *to inquire into the best Means of Preventing the Pollution of Rivers.* Her Majesty's Stationery Office.

The report just issued relates primarily to the Mersey and Ribble basins; but much of its information will apply to the pollution of rivers generally. It is only with what may be called the agricultural remedy for river pollution that we are interested in these columns. There are other remedies. Filtration—not the mere action of a sieve upon suspended filth, but filtration of the same kind as venous blood undergoes in its passage through the lungs—is a remedy. Organic filth in sewage can thus be oxidised—virtually burnt up and rendered harmless. But it is a very slow and tedious process, and it is destructive. It needs, according to the experiments described in this report, an acre of land, 6 feet deep, of which one-half shall be alternately flooded and laid dry intermediately with the other, so that a sort of respiratory process shall be conducted—in order to deal effectually with the drainage of 2000 or 3000 people. London would need 1000 acres of filter bed, if its sewage were to be in this way rendered harmless; but the result would not only be the defecation of a great mass of filth, it would also be the destruction of a very valuable property. We extract a passage in which the value of that property is discussed:

"Every one is familiar with the fact that the fertility of a farm depends very much on the quantity of live stock kept upon it. It is an established maxim in agriculture that, apart from the use of imported and manufactured fetilisers, the maintenance of fertility depends very much upon the live stock which the farmer keeps upon the land, and the quantity of manure which he can thus apply to it.

"The fertility of the 23,370,502 acres in the hands of English farmers is thus dependent on the 19,821,863 sheep, 3,706,641 cattle, and 1,629,550 pigs which, according to the statistical returns just issued by the Board of Trade,* are kept on English farms; a number which, calculated wholly as sheep,† amounts in food-consuming and therefore manure-producing power to as nearly as possible two sheep per acre over the whole area of the enclosed land in England. Taking 1,141,996 agricultural horses into account, we may say that the whole farm stock of this country is less than five sheep to every 2 acres in the hands of English farmers.

"We have, however, omitted all reference to another resident animal of the greatest food-consuming power, for whose maintenance indeed all these acres and all this live stock are owned and cultivated. Nearly one-third of the live stock of this country is mankind! In 1869 there were in England 20,658,599 of 'man;' and he consumes not only the produce of all these acres, and of all these cattle, sheep, and pigs which are maintained upon them, but imported food as well, to the extent of two-fifths of the estimated quantity of our home-grown Wheat, and probably one-twentieth or more in excess of our home-grown meat. A creature of such great powers of consumption ought, according to all the analogies, to be of corresponding agricultural value as a fertiliser. If, leaving out of consideration the products of respiration, excrement be just the food of an animal minus its growth, then on the ground of both these elements of the calculation, man ought to be the very best farm stock we have. He is not only a much better fed animal than a sheep, but he takes much less out of his food. Bread and beef are better food than Grass and Turnips; and the growth taken out of these several rations is much less in the former case than in the latter. The population fed on bread and beef does not increase in number, and that is virtually in total weight more than 2 per cent. per annum, whereas the 'population' fed on grass and turnips increases in weight at least 30 to 50 per cent. within the year. A sheep builds its whole weight of body out of the food of 18 months. The average age of man in England is rather more than 40 years, and the weight of his body at death is all that he has saved out of all the food he has consumed during the whole period of his life. On every ground, therefore, we ought to anticipate the superiority of man to sheep as a manure-producing animal for farm use.

"And it is worth while to compare the two species further. So far as England is concerned, although the sheep population varies considerably from year to year, they are upon the whole as nearly as possible alike in number; and in the month of June, when the agricultural returns are made up, and when lambs are not above half grown, they are probably also very nearly alike in weight. The average carcase weight of the sheep sold at Smithfield is barely 80 lb., which would correspond to a live weight of 140 lb.; and that may be considered also as the average weight of the adult man. Comparing, then, their respective rations, their relative wastefulness of food, their weight and number, we might reasonably expect that English men ought at the very least to be as efficient as English sheep in the maintenance of English fertility. But what is the fact? The sheep is the very best live stock known to English agriculture, and man is virtually good for nothing. What would the English farmer do without his flock? Over all the oolitic, chalk, and gravel soils—the light land districts of the country—to be deprived of the assistance of the sheep would be the ruin of the agriculturist. Man, on the other hand, is, as live stock, we repeat it, virtually useless to him. The excrement of a sheep is worth, at least, 5*s.* a year to the farmer. In South Lancashire the excrement of man does not realise 5*d.* per annum individually. The following, extracted from a former table, shows, as regards the leading towns of which returns have been given to us, (1) the population—deducting the estimated number using waterclosets; (2) the tonnage of manure removed from privies, more than three fourths of which must be ash and cinder waste; (3) the value annually received for it at the depot from the farmer; and (4) the value thus received per head of the population annually:—

Quantity and Value of Town Manure.

Name of Town.	Population using Privies.	Tons of Manure annually.	Money received.	Value per head.
			£	*s.*
Liverpool	350,000	138,777	8,000	5 5
Widnes	12,000	1,800	150	2 6
Salford	120,000	36,600	4,000	8
Manchester	300,000	73,594	6,749	5 4
Bolton	75,000	22,406	1,567	5
Bury	29,000	7,000	100	6 8
Oldham	77,000	50,000	2,000	6 2
Ashton-under-Lyne..	37,000	6,637	95	3 2
Southport	15,000	9,000	740	8 8
Total	1,015,000	347,573	23,392	5 5

"The sum of £23,392, which is here quoted as representing the money value of all the house waste of about 1,000,000 people, is indeed all that is received from 1,236,000, that number being the whole population of the towns named, and that sum being all that is received for what the scavenger collects; so that the annual value individually of man as farm stock in Lancashire may be put down as less than 4½*d.*; and this supposes the ash and cinder waste with which the excrement is mixed to have no share in the valuation.

"If, indeed, in place of taking all England as our field, we thus confine ourselves to the Mersey basin, the agricultural worthlessness of the immense stock of man here 'folded on the land' becomes a perfect scandal. The area of the district whose drainage runs past Liverpool is 1,103,520 acres, of which, according to the proportion between the total and the occupied acres of Cheshire and Lancashire given in the agricultural returns, we may suppose that 685,000 acres are in the hands of farmers. The whole farm stock (excluding horses) of this district counts, upon the data already quoted, as 1,750,000 sheep, equal to rather more than 2½ sheep per acre,—considerably above the average farm stock of England. The population, on the other hand, was in 1861, 2,307,788, and in 1868, according to the experience of its growth during the last 30 years, it must have been 2,650,000, one-half more than the actual farm stock of the district.

"One-eighth of the population of England is congregated here; one-eighth of the food produced in England or imported to it is here consumed. The growth waste of all that population, the *débris* of all that consumption, which ought to fertilise the land, go to pollute the river. Nowhere is fertility more wanted, nowhere is pollution more injurious; nowhere, it may be safely said, in the contrast between the means of fertility and their result so shameful.

"Three hundred and forty thousand tons of dirty ashes are carried out from a population of one and a quarter million, living in the nine towns mentioned in our table. If all the houses in the river basin are equally productive with those of Liverpool and Manchester, there must be nearly 600,000 tons produced within the area, equal to a dressing of manure over probably about 20,000 acres, less than 1-30th of the acreage occupied by the farmers of the district. No doubt the general fertility is to some extent benefited by this contribution from the towns, though, as it is used chiefly in Potato cultivation, its produce is sold off the farms, and adds but little, therefore, to their permanent fertility; but the result, even on the most liberal estimate, is ridiculously small when contrasted with what all the agricultural analogies would lead us to expect. The existing plan of scavenging is, in fact, an utter failure agriculturally. That which is the especial opprobrium of the water-closet system is almost equally true of the privy and the ashpit. Not one-seventh of the excrement of man is carried to the field: the liquid part drains directly to the sewer or sops the land on which the houses stand; and even the solid part, mixed with the ash waste with which it is carried to the manure depot, first receives a washing which soaks most of its valuable part away. And all this is permitted, and indeed defended, in a district containing thousands of acres of waste moss land and peat bog on its lower levels, large tracts of second-rate pasture land below the level of many of its towns, and abundance of poor land higher up, all of which would well repay the application of manure."

* The above are the published returns for 1869. In 1868 there were in England 23,038,781 acres returned as occupied; there were 3,779,691 cattle, 20,930,779 sheep, and 1,981,669 pigs,—numbers which calculated wholly as sheep amount to 47,572,137 sheep, corresponding to a very little more than two sheep per acre of the enclosed land in this country. No returns of the horses employed on farms were obtained in 1868. We publish the returns of both years in illustration of the very considerable variations which take place from year to year in the farm live stock of the country, while mankind steadily increases in number every year.

† That is, putting cattle of all ages as equal to six, pigs as equal to two, and horses equal to eight, sheep apiece.

Farm Memoranda.

BANFFSHIRE, BOYNE DISTRICT: *February* 21.—Farming operations on the coast-side are, in most cases, now in a forward state,—at least, lea-ploughing is mostly finished; but in the upper districts it is little more than begun; so much frost has not occurred for many years, and while I write a snowstorm blows violently, which we hope may not last long.

Turnips will be all required; so much bare frost has injured them considerably in some places. About one-third remains on the ground, rotten. Straw appears to stand out well. Grain is still low in price, but some good prices have been paid for seed saved before the bad weather in harvest.

Cattle have gone back a little in price, but fair prices can be had yet for good fat, and we have still the satisfaction of thinking that the county is free of disease. Farm horses are very high in price, and half-worn ones, to plough for a few months, can scarcely be had for what a first-class horse would have fetched a year ago.

Mr. Hannay, factor for the Earl of Fife, having given up his farms of Corskie and Kirkside, to enable his lordship to commence farming on a larger scale, and make improvements in the vicinity of Duff House, a grand ploughing-match was held on Corskie, under the auspices of the Banffshire Agricultural Society, when 110 ploughs came forward; and never before were so many fine horses and harness brought together in the county. We also hail with satisfaction that his lordship is to commence farming here, as we sadly want a few men of influence to give their countenance to our agricultural meetings and exhibitions; but, as your able correspondent, Mr. Radclyffe, said last week, "All honour to our tenant-farmers." So say we; and to the tenant-farmers is Banffshire indebted for its honours in cattle breeding and feeding, and specially would I mention one in this district who has a great claim on the gratitude of his brother farmers,—viz., Mr. Longmore, Rettie, who for the last half century has been reckoned among the foremost in every department of agriculture in this county, and his Shorthorns have more than a local name and habitation. Had Mr. Longmore been located in the sister county of Aberdeen, he very likely would have been feasted and *fêted* after some of his high achievements; but Banffshire seems to be slow to recognise so much merit.

The United Banffshire Society also owe him their best acknowledgments, as he has done much for them by his advice and support, and at their meetings "Mr. Longmore in the chair" is the general phrase. At his residence at Rettie an inspection of his stock is a treat of no ordinary kind, and many avail themselves of the privilege; while nothing pleases him better than a few of his brother farmers making an afternoon call to inspect his stock and partake of his hospitality, which is unbounded. Mr. Longmore, unlike many breeders of fine cattle, has an excellent stock of all kinds, both feeding and breeding. I lately had the satisfaction of an inspection of his stock, and was particularly struck with the appearance of his cows, which are an admirable lot; and his bull calves, which are to be sold on the 5th of March, are the best, he says, that he ever bred, and they are not forced for sale, no artificial food being allowed them but one pound of linseed-cake, to keep them growing. It is to this circumstance, I think, that Mr. Longmore owes his success, and that his bulls invariably turn out well after they are taken home.

The sires chiefly used last season, and by which are most of the calves, are Hilliday by Viceroy (19,054), and Royal Blossom, by Prince Imperial (22,595), also a son of the famous Forth, purchased at Sittyton last year. For the present I must conclude, but I may give you, on some future occasion, an account of what I saw in the farming line; also, with your permission, an account of Mr. Longmore's Angus stock, at his farm of Baldavie. *W. J.*

Miscellaneous.

ANALYSIS OF THE GOVERNMENT LAND SCHEME (IRELAND).—*Loans of public money* will be given: 1. To enable tenants to purchase cultivated land in their actual occupation, provided the landland be willing to sell his rights. 2. To enable landlords to prepare waste lands for cultivation. 3. To enable persons to purchase such reclaimed lands. 4. To enable a landlord to defray the charge of improvements when a tenant voluntarily retires from his holding. These loans will be under the management of the Irish Board of Works. *The judicial machinery* for the administration of the purposes of the Act will be twofold: 1. A Court of Arbitration, to be chosen by the parties, whose decision shall be without appeal. 2. A Civil Bill Court, consisting of the civil side of the sessions court, in which the Assistant-Barrister alone is judge. 3. An Appeal Court, having under an "equities clause" power to take into consideration the conduct and circumstances of the parties. *The Bill is limited to agricultural holdings*, of which there are four categories—Ulster custom, other customs analogous to that of Ulster, tenancies at will, and leases. 1. Ulster Tenant-right, including compensation for improvements and goodwill, shall receive legal sanction in Ulster only, subject to the following conditions:—(*a*) Where a landlord has bought up the Ulster tenant-right it shall not be pleaded against him. (*b*) Where a tenant has proved the existence of the Ulster custom, and obtained compensation accordingly, he shall not be entitled to compensation under any of the other clauses of the Act. 2. Customs analogous to Ulster tenant-right to be legalised subject to the following restrictions:—(*a*) A tenant may claim a customary right only when disturbed in his holding by an act of the landlord. (*b*) A tenant shall not be allowed to claim the benefit of any custom if evicted for non-payment of rent, but the Court may award a sum for compensation if it think fit. (*c*) A tenant shall not have the benefit of custom if he sublet or subdivide his holding, after the passing of the Act, without the consent of the landlord, except for the purpose of providing cottages for labourers. (*d*) All arrears of rent and damages to the farm may be pleaded by the landlord as a set-off. (*e*) A landlord may bar the pleading of a custom if he gives a tenant a lease of not less than 31 years. *A scale of damages is prescribed for evictions*, subject to the foregoing limitations. In the case of all holdings above £50 the parties may contract themselves out of this part of the Act if the landlord will give and the tenant accept a lease for not less than 21 years, the landlord contracting to execute improvements. The following scale of maximum damages is given for his guidance:—

Holdings valued at	£10	7 years' rent.	
,, ,,	10 to £50	5 ,,	,,
,, ,,	50 to 100	3 ,,	,,
,, ,,	100 and upwards ..	2 ,,	,,

These damages are subject to the equitable jurisdiction of the judge, and are exclusive of what he may see fit to award for permanent buildings and reclamation of land. Among the "equities" of the case he may consider the refusal of a tenant to pay a just increase of rent, or to accept another holding in exchange for one in his occupation, &c. *The definition of an improvement* under the Bill requires that it shall be such as to add to the letting value of the holding, and further that it is suitable to the character of the holding. The existing rule of law presuming all improvements to be the landlord's shall be reversed, the proof that they are not the tenant's resting on the landlord. Compensation will be allowed for past improvements subject to three conditions:—(*a*) No claim to be allowed for any improvement made more than 20 years before the passing of the Act, unless in the shape of permanent buildings or reclamation of land. (*b*) Or by a tenant under a lease or contract by which he is excluded from compensation for improvements. (*c*) The court will take into consideration the time for which, and the terms on which, the improvements have been enjoyed by the tenant. The

rules as to future improvements are as follow:—(*a*) No claim to be allowed for improvements contrary to any contract, and not required for the due cultivation of the farm. (*b*) Or for any valuable consideration when the landlord underlets a farm on the understanding that the tenant shall make improvements. (*c*) Or for improvements by a tenant if the landlord has undertaken himself to make them, and has not failed in his undertaking. When an in-coming tenant has paid to an out-going tenant any sum with the sanction of the landlord, he must be allowed the benefit of it. *Leases:* A landlord may exempt his lands from being subject to any custom, except that of Ulster, or to the scale of damages, if he agree to give a tenant a 31 years' lease, leaving at the close a right to the tenant to claim compensation for improvements under three heads:—1st, tillages and manures; 2d, permanent buildings; 3d, reclamation of land. Further, the lease must, in regard to rent, terms, and covenants, be approved by the Court. Where the landlord undertakes improvements a 21 years' lease will suffice to exempt him from the customs. Every man is to be held absolutely responsible for every covenant into which he enters. *Notices to Quit:* Notices to quit shall be for twelve instead of six months, beginning from the last gale day on the estate, and must bear a stamp duty of 2*s*. 6*d*. *County Cess:* This tax is to be paid in equal parts by landlord and tenant; in old tenancies under £4 the occupier is to be at once relieved.

The Week's Work.

FEBRUARY 26.—*Spring Ploughing* keep in advance. Sheepfolds should be laid out so as to leave as little of the manured land behind exposed to the weather as possible. If the fold can be made to extend the length of the Turnip field, then the ploughs can work close up to the nets or hurdles at every shift. If the Turnips have not been stored in autumn they should be so whenever they begin to run to seed; for nothing is worse for fattening sheep than the washy green sprouts of spring—while the bulbs lose more and more of their fattening properties as they run to seed. To correct the tendency the young growth has to scour by an additional allowance of corn and hay, and the waste upon the bulbs by so much more cake daily, is a short-sighted economy, and where such a practice is followed it need not surprise any one to hear farmers complain "it does not pay." All Turnip lands for cattle should be cleared and ploughed without delay.

Barley may be sown on warm dry soils of the South, in order to get the crop forward before the summer sun burns up the land, as it is very liable to do if not covered in time. If the crop covers the land in April and beginning of May it keeps a sufficiency of sap in the ground to mature the process of ripening. Barley requires a well cultivated and dry seed-bed. Hence, in the olden time, before drainage, the heavier class of soils had to be ploughed and cross-ploughed, before it was fit for the seed furrow, and on lands not yet drained the same practice is followed. For seeding from the middle to the end of March the land would be cross-ploughed, or "middle-furrowed," as it is in some places technically termed, about three times. It is then allowed to lie in the rough furrow, exposed to the weather; but soils liable to bake require to be watched when dry weather sets in, otherwise the clod-crusher must be used to assist the harrows in breaking down the clods. But where the land is properly drained and cultivated, seldom more than one furrow is required to prepare the land for seed, a turn of the scarifier being sufficient to smash up, loosen, and break the clods in exceptional seasons; and so requisite is it to have a good seed-bed for Barley, that according to the old rule, "better wait until March winds dry the land than sow in a bad seed-bed in February."

Hedges should now be finished for the spring season in our southern counties, so as not to interfere with early vegetation. Furze seed may be sown on mounds for fences, and on ridges for shelter, and northwards as the season progresses.

Highland Sheepwalks experience throughout February one of the most trying months of the year. On many walks not a sheep is to be found, the flocks being all in the lowlands, and in those lying at a lower altitude or further south, where the ewe flock is kept at home, the weaker ewes should be fed indoors in bad weather; and even in open weather the flock requires hay daily, for the alternate heavy rains and frosts bleach and deaden the hill pastures in a manner not easily described. Happily the so-called Cotton-grass, so little thought of in the low country, affords a fresh bite at this inclement season highly prized by shepherds. Some of the Lammermoor shepherds clothe their hogs, both Cheviot and black-faced, in woolen jackets 22 inches long by 16 inches broad, sewed on to the wool to keep them dry and warm; and the plan, we are told, has proved eminently successful. Long ago we saw this successfully done on weakly sheep.

Artificial Manures should now be in store, ready for application. Those intended for drilling or sowing broadcast along with the seed require to be thoroughly mixed with sifted ashes or dry mould. Some mix beforehand—others sift, weigh, and mix as the work of sowing requires. We have tried both, and give the preference to the latter. The mixing requires to be carefully done, otherwise the manure will not be equally distributed. It is one of those manipulations not easily taught by book rule, as a moist atmosphere and a dry one have their respective requirements. Practically speaking, the person who does the work must thoroughly comprehend what suits the machine. Much depends upon the uniform dryness of the ashes and guano, and for obvious reasons we have found it advisable to make the person who prepared the ashes last summer do the work of mixing at this season. *W. B.*

Notices to Correspondents.

*** We have received communications from Messrs. Arkell, Carroll, Brinsly Marlay, G. A. H., G. M., "Looker-on," and others, which we are unable to publish this week. They shall appear next week.

OLD SEEDS: *H.* We have received small parcels of Wheat, Oats, and Barley, of 1860, referred to by "H." on p. 225. If any one desires a few seeds, we will send them.

TOP-DRESSING FOR WHEAT: *A. K.* A mixture of nitrate of soda and common salt, 1 cwt. of the former to 2 cwt. of the latter, sown in wet weather, half in March and half in April, is as good as any.

Markets.

ENGLISH WOOL.

Wool has been in good demand, and prices show an upward tendency, though so far no actual advance has been realised except for skin Wool, which appears to be wanted, and of which the supply is limited.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.—*s. d.*	*s. d.*
FLEECES—Southdown hoggets	1 1	to 1 2
Half-bred ditto	1 2	— 1 2½
Kent Hedges	1 3	— 1 4
Southdown ewes and wethers	0 0½	1 1
Leicester ditto	1 2	— 1 3
SORTS—Clothing	0 10	— 1 6
Combing	1 0	— 1 8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, February 24.

Prime Meadow Hay	75*s.* to 82*s.*	Clover, old	..	..	115*s.* to 120*s.*
Inferior do.	 60	70	Inferior do.	..	.. 100 110
Rowen	 50	65	Prime 2d cut	..	.. 100 110
Inferior do.	.. .. —	—	Inferior do.	..	.. 80 90
Straw	 26	30	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, February 24.

Sup. Meadow Hay	84*s.* to 90*s.*	Inferior Clover	..	90*s.* to 114*s.*	
Inferior do.	 70	76	New do.	.. .. —	—
New do.	.. .. —	—	Straw	 32	36
Superior Clover	.. 123	130	JOSHUA BAKER.		

WHITECHAPEL, Thursday, February 24.

Fine Meadow Hay	78*s.* to 86*s.*	Prime old Clover	..	120*s.* to 130*s.*	
Inferior do.	 65	75	Inferior do.	..	90 100
Prime New Hay	.. —	—	Prime 2d cut do.	..	— —
Inferior do.	.. .. —	—	New Clover	..	160 112
Straw	 24	28	Inferior do.	..	.. 85 95

COALS.—February 23.

Holywell Main, 16*s.* 3*d.*; West Wylam, 16*s.*; Walls End Gosforth, 17*s.*; Walls End Harton, 17*s.*; Eden Main, 17*s.*; Walls End Braddyll's Hetton, 18*s.* 3*d.*; Walls End Elliot, 18*s.*; Walls End Hetton, 19*s.* 6*d.*; Walls End Hetton Lyons, 17*s.*; Walls End Hawthorn, 16*s.* 9*d.*; Walls End Pittington, 17*s.*; Walls End Caradoc, 18*s.* 6*d.*; Walls End Hartlepool, 18*s.* 6*d.*; Walls End Deaf Hill, 19*s.* 6*d.*; Walls End Original Hartlepool, 19*s.* 6*d.*; Walls End Tees, 19*s.*; Branceperth Cannel, 18*s.*—Ships at market, 236; sold, 167; at sea, 10.

HOPS.

BOROUGH MARKET, February 24.

Messrs. Pattenden & Smith report that the market, though quiet, is firm, with a very bare supply of home-grown samples. Yearlings are without change.

METROPOLITAN MEAT MARKET.—Feb. 25.

Best Fresh Butter .. .. .. 19*s.* per dozen lb.
Second do. do. .. .. .. 17*s.* "
Small Pork, 5*s.* 0*d.* to 5*s.* 6*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 8*d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, February 21.

We have a large supply of Beasts, and of average good quality. Prices generally are lower; a few choicest descriptions make rather over our top quotations. There are also a few more Sheep; trade is very dull for them, and they cannot all be sold. Calves continue to be very scarce and dear. Our foreign supply consists of 692 Beasts, 4000 Sheep, and 22 Calves; from Scotland, there are 210 Beasts; from Ireland, 420; from Norfolk and Suffolk, 1340; and 627 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	4 10	to 5 0	Best Long-wools	5 4	to 5 6
Best Shorthorns ..	4 6	— 4 10	Do. Shorn ..	..	— —
2d quality Beasts	3 0	— 3 8	Ewes & 2d quality	4 0	— 4 10
Best Downs and Half-breds ..	5 8	— 5 10	Do. Shorn ..	..	— —
Do. Shorn ..	..	— ..	Lambs ..	..	— —
			Calves ..	4 8	— 6 6
			Pigs ..	4 0	6 0

Beasts, 3289; Sheep and Lambs, 18,580; Calves, 39; Pigs, 50.

THURSDAY, February 24.

Although the supply of Beasts is much smaller than on Thursday last, it exceeds the demand; prices average about the same as on Monday. The number of English Sheep is small, but we are well supplied with foreign; trade is excessively dull, and prices are lower. There are very few Calves on offer, and they consequently realise high rates. Our foreign supply consists of 340 Beasts and 3230 Sheep.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	4 8	to 5 0	Best Long-wools	5 2	to 5 6
Best Shorthorns ..	4 6	— 4 8	Do. Shorn ..	..	— —
2d quality Beasts	3 0	— 3 6	Ewes & 2d quality	4 0	— 4 8
Best Downs and Half-breds ..	5 6	— 5 8	Do. Shorn ..	..	— —
Do. Shorn ..	..	— ..	Lambs ..	..	— —
			Calves ..	4 8	— 6 8
			Pigs ..	..	— —

Beasts, 844; Sheep and Lambs, 6270; Calves, 44; Pigs, —.

MARK LANE.

MONDAY, February 21.

There was a very small supply of English Wheat to this morning's market, which was sold at the prices of this day week. The attendance was good, but the business done in foreign limited to needy purchasers at about last week's rates. Fine Barley brought late quotations, but secondaries were difficult of sale. Beans and Peas were rather dearer. Oats were slow at about last week's prices. Flour unchanged in value.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	37	47	Red	34	46
— — fine selected runs..do.	39	51	Red	37	48
— — Talavera	54	56			
— — Norfolk	—		Red	—	—
— — Foreign	38	53			
BARLEY, grind. & dist., 26*s.* to 30*s.* Chev.	39	42	Malting	34	38
— Foreign .. grinding and distilling	22	25	Malting	39	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire.. Potato	24	26	Feed	—	—
— Irish Potato	23	25	Feed	21	24
— Foreign Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan .. 29*s.* to 37*s.* Tick	31	49	Harrow	31	49
— Pigeon .. 50*s.* to 56*s.* Winds.			Longpod	—	
— Foreign			Small	41	43
PEAS, White, Essex, and Kent.. Boilers	32	42	Suffolk	35	43
— Maple, 41*s.* to 45*s.* Grey	32	42	Foreign	33	37
MAIZE			Foreign	29	31
FLOUR, best marks delivered. per sack	29	43			
— 2d ditto ditto	28	40	Country	28	40
— Foreign per barrel	22	25	Per sack	29	55

FRIDAY, February 25.

Throughout the markets of the kingdom inactivity has been the prevailing feature of the Corn trade, and with the exception of Hull, where English Wheat brought a slight advance, prices remained about the same as last quoted, the tendency being slightly against sellers. We have hardly any alteration of consequence to note in the value of spring Corn of all descriptions, excepting Oats, which were 6*d.* per qr. cheaper here and fully 1*s.* per qr. lower at Newcastle, where large arrivals from Scotland had taken place. Flour prices were tending downwards. The supplies off the coast consisted this week of 20 cargoes, of which, with those left over from last week, there remained for sale last night 32 cargoes. The trade in cargoes off the coast, of which there was but little choice, has been very quiet during the past week, and where sales of Wheat were effected a decline of nearly 1*s.* per qr. had to be accepted; Maize sold at late rates; Barley was but little inquired for, and of Rye there was no cargo off the coast. Linseed and Rapeseed were steady. In cargoes on passage and for forward shipment, nothing doing.

The arrivals of grain, both English and foreign, during the week have been very small.

There was a fair attendance at this morning's market, but the business done in Wheat of any description was confined to needy purchasers, at about Monday's quotations. Spring corn was a dull sale, and unchanged in value.

ARRIVALS.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	1870	1530	1030	—
Irish ..	—	—	—	—
Foreign ..	860	2500	6700	110 / 4410 brls.
	2730	4490	7730	

LIVERPOOL, Feb. 22.—The corn market was well attended. Wheat in more general request, at full rates of Friday last. Flour in steady demand, at late rates. Beans 6*d.* per qr. lower; Saidi, 31*s.* Oats and Oatmeal a slow sale; prices unaltered. Indian Corn, owing to hard weather, is in improved demand, at extreme prices of last market day; round yellow, 25*s.* 9*d.* to 27*s.*

AVERAGES.

	Wheat.	Barley.	Oats.
Jan. 15	44*s.* 3*d*	36*s.* 4*d*	21*s.* 4*d*
— 22	43 6	36 2	20 10
— 29	42 8	35 7	20 4
Feb. 5	42 2	35 3	20 8
— 12	41 9	34 6	19 10
— 19	40 8	34 2	19 10
Average ..	42 6	35 4	20 6

SEED MARKET.

Our markets have been fairly attended during the past week, but owing to the unfavourable weather the business transacted has been limited. In the value of Clover seeds there is no change to report. Foreign Italian continues to advance in price; the stocks in France are now reduced quite low. Sainfoin seed is in fair request. White Mustard and Rape seed are scarce and dear. For spring Tares there is a good demand, at the late enhanced currencies. The Linseed trade is steady.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

NOTICE to PURCHASERS of FARM SEEDS.
Unfavourable weather for the Turnip and other Roots standing for seed having set in since Messrs. Suttons' List of Reduced Prices was sent to press, Messrs. SUTTON respectfully advise their friends to observe the NOTICE on first page of the NEW FARM LIST, limiting the time for which the present low prices are binding.
This Notice is offered to prevent disappointment or misunderstanding in respect of Orders which may be sent when the season is more advanced. The CATALOGUE is now ready.
Seed Warehouse for the Million, Reading.—Feb 10.

SUTTONS' CLEANED CLOVER SEEDS,
NEW and UNADULTERATED.
Red or Broad | Alsike | Trefoil
White or Dutch | Cow Grass | Giant White
Samples and prices on application to
SUTTON AND SONS, Seedsmen to the Queen, Reading.

Early Feed for Sheep and Cattle.
SUTTONS' IMPROVED ITALIAN RYE-GRASS, the Earliest and most Productive in Cultivation. Should be sown in March to produce a succession of valuable Cuttings during the year. If sown alone, 3 bushels are required per acre
Price 7s per bushel, cheaper by the quarter. Carriage free
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

Choice Swede Seed.
BOLTON AND CO., offer their choice selected Stock of PURPLE-TOP SWEDE, at £2 per bushel. The distinguishing features of this Swede are its handsome form and great weight-producing qualities
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

Mangel Wurzel Seed.
H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S PEDIGREE LONG-RED and YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low
Seed-Growing Establishment, Wisbech.

Vegetable, Agricultural, and Flower Seeds.
MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.
ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, Surrey.

Seed Counties, Suffolk and Essex.
DAVID GOLD MCKAY, Seed Grower, Sudbury, Suffolk, begs to offer complete Collections of VEGETABLE SEEDS, carriage free.
No 1 COLLECTION .. £2 | No 2 COLLECTION .. £1
No 3 COLLECTION .. £1
Alterations made to suit purchasers.
Any lady or gentleman ordering the above may depend on having really "Choice Home-grown Seeds." CATALOGUES on application.
The "Old" Established Seed Warehouse, Sudbury, Suffolk.

Peas.
BOLTON AND CO., have to offer in quantity the following varieties of PEAS:—
PRIZE TALL MARROW. | DWARF MARROW.
CHAMPION of ENGLAND.
At moderate prices, to be had on application
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

Notice to the Trade.
LAXTON'S NEW PEAS, ALPHA and SUPREME
HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties; also the HUNDREDFOLD or COOK'S FAVORITE, and the entire stock of MCMILLAN'S QUEEN OF MARROW. They have also grown largely of LAXTON'S PROLIFIC. Descriptions of all in CATALOGUE, which may be had on application. They have at present a good supply of the true Purple and WHITE ITALIAN TRIPOLI ONION, and the GIANT ROCCA, all of which are scarce this season.
HURST AND SON, 6, Leadenhall Street, E.C.

BROCCOLI, ELLETSON'S NEW SURPRISE.
Large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by the eminent Market Gardeners, J. & J. Elletson, of Thorngumbald, who have for many years been successful in the cultivation of Broccoli, and who by great industry have so far improved upon the old kinds as to produce the above variety, which possesses the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction to those who may grow it when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s 6d per packet.
CUCUMBER, ELLETSON'S NEW, for long Ridge.—Is remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. Only a few of the finest fruits are allowed to grow on it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s per packet. Trade supplied.
EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

NEW ROUND POTATO, UNION.
NEW KIDNEY POTATO, REACONSFIELD
NEW PEA, EARLY EMERALD.
For description see CHARLES TURNER'S CATALOGUE of SEEDS, which may be had on application.
The Royal Nurseries, Slough.

POTATOS.—Ashleaf Kidney, Early, Handsworth, Golden Dwarf Early, Malmaison, and Fluke, nice selected seed, can be offered cheap by the Ton. ARTICHOKE, Jerusalem, fine quality, for present use, or Seed, can be offered in quantity. Also SEAKALE, two years.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

NEW EARLY POTATO, RINIOULX'S NEW EARLY WHITE DON.—This is a great improvement on the variety sent out by us some years ago, being pure white both outside and inside, perfectly round, with a smooth skin, is about ten days earlier than the red variety, an extraordinary cropper, and of first-rate quality. Whether for Field or Garden purposes we feel assured this Potato will give satisfaction. Price 10s per bushel; 5s per cwt.
DOWNIE, LAIRD, AND LAING, Nurserymen and seedsmen, 17, South Frederick Street, Edinburgh, and Stanstead Park, Forest Hill, London, S.E.

HEADLEY'S SEEDLING POTATO.—
This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.
JOHNSONS OF THE TRADE

"R. Headley. Your Seedling Potatos were quite first-rate; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 30, 1869.
"White Kidney. A very fine variety; a heavy cropper; uniform in size; ripening off all at once quickly and completely; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 11."—*Gardeners' Magazine*, Jan 30, 1869.
"Seedling Potatos (R. Headley). In shape the tubers resemble those of the Fluke. They are like those also in flavour, but are more mealy."—*Journal of Horticulture*, Oct. 21, 1869
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AZALEA PONTICUM (Sweet Azalea), 10 to 15 inches, 3s per dozen, 20s per 100; 15 to 20 inches, 5s per dozen
ANDROMEDA POLIFOLIA ANGUSTIFOLIA, nice plants, 3s per dozen, 15s per 100
KALMIA GLAUCA, 8 to 12 inches, 3s per dozen, 15s per 100; 12 to 15 inches, 4s per dozen, 18s per 100.
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All these can be supplied by the 1000 See CATALOGUE.
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To Purchasers of Farm Seeds.
CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices.
JAMES CARTER AND CO., the Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent seed Corn and Seeds."

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FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester
TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character
CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.
MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21s. to 28s. per acre. These mixtures are composed of the best varieties, and cannot be surpassed
Seeds of the value of £2 and upwards (Grain, Vetches, and Potatoes excepted), carriage free to any railway station in the kingdom
Special estimates for large quantities. Samples and prices on application.
PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis on application.

Genuine Seeds of Superior Stocks.
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Complete Assortments of Choice VEGETABLE SEEDS, for a Year's Supply.

No 1	..	..	..	£3	3	0	No 4	..	..	£1	1	0
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Choicest assortments of Continental and other FLOWER SEEDS, from 5s. upwards. See List.
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Likewise Choice TRICOLOR GERANIUMS and STRAWBERRY PLANTS.
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We can confidently recommend this as one of the best Cucumbers grown, while it is second to none for general purposes. In Winter it grows about 1 foot long, and in Summer from 15 to 18 inches, is of deep green colour, very handsome, delicate in flavour, and particularly tender, crisp, and juicy. It is very prolific, showing two to three fruit at every joint, and furnishes a continual supply of handsome Cucumbers during the Winter, Spring, and Summer months. Per packet, 1s. 6d. and 2s. 6d.; post free.
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Per packet	s.	d.	Per packet	s.	d.
Beet, Scott's Crimson Dwarf	1	0	Pumpkin, Mammoth, extra	1	0
Egyptian Turnip, dark red	1	0	Lettuce, Victoria White Cos	1	0
Brussels Sprouts, Scott's			Davis' Giant Green Cos	1	0
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Broccoli, Snow's Winter White	1	0	The two finest Lettuces grown,		
Cauliflower, True Selected Erfurt Early Dwarf	1	6	Snow's Prize Ellsge	1	6
Carrot, Merrott Green top	0	6	Onion, Bedfordshire Champion	1	0
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Dwarf Chrysanthemum-flowered, 12 do	1	0	Marigold, French extra dwarf, 6d and	1	0
Crown-flowered, 6 do.	1	0	Mignonette, new Giant Pyramidal	1	0
French Giant Emperor, 12 do	1	0	Petunia, fl.-pl. extra double	1	0
Newest Victoria, 12 do	1	0	Extra choice single	1	0
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Cineraria, choicest strain	1	0			
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The White Queen CELERY		0	6
Snow's Winter White BROCCOLI		1	0
Smith's Incomparable CABBAGE		0	6
Worcester Champion Cos LETTUCE		0	6
Improved Telegraph CUCUMBER		1	0
Early Dwarf Erfurt CAULIFLOWER		1	0
New Giant Rocca ONION		1	0
Ayton Castle LEEK		0	6
Worcester Late White BROCCOLI		1	0
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Fren'h Breakfast RADISH		0	6
Golden Perfection MELON		1	0

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CYCLAMEN PERSICUM, mixed		1	6
ASTER, New Peony-flowered Globe		1	0
" Truffaut's Peony-flowered		1	0
PYRETHRUM, Golden Feather		1	0
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VIOLA CORNUTA ALBA		1	0
PANSY, Cliveden Yellow		1	0
AMARANTHUS HIPANTISSIMUS		1	0
PRINCESS FEATHER, New Golden		0	6
BALSAM, splendid rose-flowered		1	0
Sweet Pea MIGNONETTE		1	0
MARIGOLD, New French, miniature, striped		0	6

For Prices of other Seeds, see RICHARD SMITH'S DESCRIPTIVE LIST, free by post on application
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THE NEW APPLE of the season, ANNIE ELIZABETH, was awarded a First-class Certificate by the Royal Horticultural Society, and illustrated in "Florist and Pomologist, November, 1869. A most valuable late keeper, of excellent quality; should be in every collection of Fruit See previous Advertisements. It has already been supplied to

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ASH, 1½ to 2 feet, 15s.; 2 to 2½ feet, 18s.
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ALDER, 1½ to 2 feet, 15s.; 2 to 2½ feet, 17s.
ELM, 1½ to 2½ feet, 15s.
FIR, LARCH, 1½ to 2 feet, 40s.
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" SPRUCE, 1 to 1½ feet, 12s.; 1½ to 2 feet, 20s.; 2 to 2½ feet, 28s.
MAPLE, NORWAY, 4 to 6 feet, 40s.
PINUS MARITIMA, 1 to 1½ feet, 12s.; 1½ to 2 feet, 30s.
SYCAMORE, 1½ to 2 feet, 15s.; 2 to 3 feet, 22s.; 3 to 4 feet, 30s.
GORSE, 1½ feet, 6d.; 2 feet, 8s.
BERBERIS AQUIFOLIA, 9 to 12 inches, 20s.
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CYPRESS, EASTER, MICROPHYLLA, 1½ to 2 ft., 60s.
RHODODENDRONS, PINUS AUSTRIACA, &c., &c.
See CATALOGUE, free on application

LARGE ORNAMENTAL TREES for AVENUES, &c.—Fine selected Trees of the Scarlet and Common HORSE CHESTNUTS, and other Ornamental Trees, 7 to 8, 8 to 9, 10 to 11 feet.
Extra fine picked PINUS AUSTRIACA, four times transplanted, from 9 to 4 feet. Prices on application.
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TO GENTLEMEN, FARMERS, and OTHERS.—100 choice Standard and Pyramid Apples, £3; 100 do. PEARS, 100 do. CHERRIES, £12 10s. strong GOOSEBERRIES or CURRANTS, £1; selected collection of 50 sorts, the choicest Hybrid Perpetual, Hybrid Bourbon, Moss, and other ROSES, £8; strong CUTTICKS, 2 per 100; 2 gold HOLLIES, for hedges, £12 per 1000. The Fruit Trees and Roses are all true to name.
FREE, a quantity of Cuttings of small Plants of GERANIUMS, VERBENAS, and other BEDDING PLANTS
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GEO. SMITH has much pleasure in offering Three SEEDLING FUCHSIAS, not excelled by any others in continuation, viz:—

AVALANCHE (G. S.), this acquisition stands pre-eminent, being the finest Fuchsia ever offered, having very double, compact, and beautifully formed flowers; corolla pure white; calyx of the purest, with long carmine shanks; and a brilliant carmine scarlet tube. The splendid flower contains in one bloom 25 petals; fine habit and free grower. Plants 10s. 6d. each

OPINIONS OF THE PRESS.

Report from "Gardeners' Magazine," October 2, 1869.

"Avalanche is a large flower, bell in outline, and massive, though elegant; the tube and sepals are of a brilliant carmine-scarlet; very double corolla, pure white, with a touch of carmine at the base; in the samples sent the stamens and petals are quite distinct, which is a decided merit, for when intermediate forms are produced, as they too often are, in double flowers, symmetry is lost."

TRIPLEX (G. S.), this is a most extraordinary bold and handsome variety; tube and sepals waxy carmine-scarlet, corolla rich violet, flower extra size, fine free habit; surpasses all other double purple varieties. Plants 10s. 6d. each

OPINIONS OF THE PRESS.

Report from "Gardeners' Magazine," October 2, 1869.

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SULTAN (G. S.), tube and sepals waxy scarlet, breed and well reflexed; corolla deep violet; of the same habit, and one of the finest dark flowers in cultivation. Plants 10s. 6d. each.

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The following Fuchsias have been raised and the Novelty GERANIUMS, Clara, Harry Gaze, and Isabella, which have taken First-class Certificates.

Beautiful Coloured Drawings of Claudius and Soleil, by Mr. James Andrews, in two separate Plates, 12s. 6d. each.

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FOR SALE, the following splendid specimens:—
A magnificent Tree FERN, with a noble crown of fronds (5 feet 6 inches high), and 1 more 5 feet 12 inches in diameter, with 28 fronds, and 2 of 18 inches.
A MAKINEIA CARYOTIFOLIA, 5 feet 6 inches high, with four stems, fine bushy specimens.
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Besides a number of very fine, large, and middle-sized FERNS.
PALMS and other Ornamental Plants, all well suited for Exhibition
Apply by prepaid letter to Mr. ALFRED SERDOBBEL, Faubourg d'Ancre, Gand, Belgium

£6000 Worth of Trees, Evergreen Shrubs, &c,
OFFERED for SALE by
MARTIN SON,
Cottingham, and 7, Market Place, Hull.

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ASH, Weeping, 7 feet stems, 21s. per doz.
CHERRY, double flowering, 15s. per doz.
CUPRESSUS LAWSONIANA, 2 feet, 12s. per 100
ELM, Weeping, 7 feet stems, 21s. per doz.
" English, 2 to 3 feet, 6s. to 8s. per 100
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SYRINGA, 4 feet, 25s. per 100
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QUICKWOOD, about 3 millions, 10s. to 30s. per 1000
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SEEDLINGS from the finest English and Continental named Catalogues, per doz., 2s.; per 100, 15s.
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A large choice of named varieties, 3s. to 12s. per dozen.
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F. H AND CO devote their personal attention to the VEGETABLE, FLOWER AND AGRICULTURAL SEED DEPARTMENTS, the Stocks of which are selected from the most reliable sources, and of unexcelled purity
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All seeds carriage paid
Agents for George Hall & Son's celebrated Garden Knives.
Messrs FISHER, HOLMES, AND CO., Nurserymen, Seedsmen, and Florists
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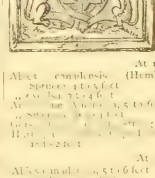

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At 12s. per dozen.

Abies canadensis (Hemlock Spruce), 4 to 5 feet
" excelsa, 12 to 15 feet
" Menziesii, 5 to 6 feet
" Siberian, 4 to 5 feet
Araucaria imbricata, 2 to 2½ ft
Arbor-vitæ, American, 2 to 3 feet
" Siberian, 4 to 5 feet
" Chinese, pyramidalis
Box, green tree pyramids, very fine, 4 to 5 feet
Hollies, many kinds, 2½ to 3 feet

At 24s. per dozen.

Abies Menziesii, 7 to 8 feet
" excelsa, 11 to 15 feet
" Douglasii, 8 to 10 feet
" Webbiana, 7 to 8 feet
Cupressus Lawsoniana, 2 to 3 feet
Cryptomeria Lobbii, 6 to 7 feet
" viridis, 6 to 7 feet

At 36s. per dozen.

Abies morinda, 7 to 8 feet
" pectinata, 3 to 4 feet
Arbor-vitæ, compacta, 3 to 3½ feet
" Ellwangeriana, 3 to 4 feet
" aurea, 3 to 4 feet
" Chinensis, 4 to 5 feet
" Siberica, 4 to 5 feet

At 42s. per dozen.

Abies excelsa, fine specimens, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet
Cupressus Lawsoniana, 6 to 7 feet
Juniperus communis, very fine, 5 to 6 feet
" Hibernica, 4 to 5 feet
" Recurva, 4 to 5 feet

At 48s. per dozen

Abies excelsa, 11 to 15 feet
Juniperus chinensis, 4 to 5 feet
" oblonga pendula, 4 to 5 feet
" glauca, 4 to 5 feet
" Irish, 5 to 6 feet
" Sabina, 3 to 4 feet
" thurifera, 6 to 7 feet

Abies albertiana, 7 to 8 feet, 6s. each
" Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 12s. 6d. each
" Webbiana, 15 to 18 feet, 15s. each
" 6 feet, 7s. 6d.; 6 to 7 feet, 10s. 6d. each
Arbor-vitæ, 5 to 6 feet, 5s. each
" Ellwangeriana, 5 to 6 feet, 5s. each
" aurea, 5 to 6 feet, 5s. each
Cupressus Lawsoniana, 9 to 10 feet, 10s. 6d. each
Juniperus communis, 6 to 7 feet, 5s. each
" thurifera, very fine, 7 to 8 feet, 10s. 6d. each
Laurel, Portugal, extra fine, 5 to 6 feet, very large sorts of each
Picea nobilis, extra fine, 6 to 6½ feet, 12s. 6d. each
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

Laurel, narrow-leaved, 2 to 2½ feet
" Portugal, 4½ to 5 feet
Juniperus Sabina, 2 to 2½ feet
" Virginiana, 2 to 2½ feet
Phillyrea oleafolia, 2½ to 3 feet
Picea balsamea, 5 to 6 feet
" Nordmanniana, 4 to 5 feet
" " 2½ to 3 feet
Rhododendron ponticum (very fine), 2½ to 3 feet
Retinospora ericoides, 10 to 12 inches
" plumosa, 12 to 15 inches
Taxus baccata, 2 to 3 feet
" " 3 to 4 feet
Thuja occidentalis, 2½ to 3 feet
" " 3½ to 4 feet

At 24s. per dozen.

Laurel, Portugal, pyramids, 3 to 4 feet
" " 4 to 5 feet
Rhododendron, fine, 1½ to 2 feet
" " 2 to 2½ feet
" " 2½ to 3 feet
Thuja gigantea, 4 to 5 feet

At 36s. per dozen.

Juniperus communis, 4 to 5 feet
" glauca, 4 to 5 feet
" Irish, 6 to 7 feet
Pinus Austriaca, 4 to 5 feet
Thuja gigantea, 5 to 6 feet

At 42s. per dozen.

Juniperus Sabina, 4 to 5 feet
" virginiana, 4 to 5 feet
Laurel, Portugal (pyramids, very fine), 5 to 6 feet
" " 6 to 7 feet
Pinus Austriaca, 5 to 6 feet
Rhododendron, 3 to 4 feet
Thujopsis borealis, 5 to 6 feet

At 48s. per dozen

Juniperus chinensis, 4 to 5 feet
" Sabina, 4 to 4 feet
" thurifera (in sense Juniper), 4 to 5 feet
" virginiana, 5 to 6 feet
Picea Nordmanniana, 3 to 4 feet
Pinus Austriaca, 6 to 7 feet
Rhododendron, 5 to 6 feet
Thujopsis borealis, 5 to 6 feet

At 60s. per dozen.

Juniperus virginiana, 8 to 10 feet
" viridis pendula, 5 to 6 feet
Laurel, colchic (very fine), 8 to 10 feet
" Portugal, pyramids (very fine), Picea Nordmanniana, 2 to 2½ feet
Pinus Cembra, extra fine, 6 to 7 ft
Taxus baccata, 2 to 2½ feet
Thujopsis borealis, 6 to 7 feet
Yellow-leaved Holly, 3½ to 4 feet

Laurel (fine large), 2½ to 3 feet, 15s.; 3½ to 4 feet, 21s.; 4 to 4 feet, 30s. 6d.; 4 to 4½ feet, 42s. each
Pinsapo, 3 to 3½ ft., 10s. 6d.; 3½ to 4 feet, 21s.; 4 to 4½ feet, 30s. 6d.; 5 to 6 feet, 42s. each
Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 10s. 6d. each
Weeping ash, standards, 5 to 6 feet, 42s. each
Yews, Irish, fine, about 12 feet high, 42s. each
Laurels, fine specimens, about 12 feet high, transplanted, 31s. 6d. each

AMERICAN ARBOR-VITÆ, good Plants.
1½ to 2 feet, 2s. per dozen, 12s. per 100
2 to 2½ feet, 3s. per dozen, 15s. per 100.
2½ to 3 feet, 4s. per dozen, 20s. per 100.
3½ to 4 feet, 6s. per dozen, 25s. per 100
4 to 4½ feet, 9s. per dozen, 35s. per 100
5 to 6 feet, 18s. per dozen, 70s. per 100
Special CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock

To the Trade.

G. FARNSWORTH has to offer a large quantity of the undermentioned, which are strong, young, and well-rooted. Samples on application at the Nurseries, Matlock:—
BIRCH, 1 to 4½ feet, 20s. per 1000; transplanted, 30s. per 1000
ASH, 1 to 3½ inches, 12s.
LIMES, 2 to 4 feet, 70s.
SCOTCH, 1½ to 2 feet, 20s.; 1½ to 2½ feet, 25s.
SPRUCE, 1½ to 2 feet, 12s.; 1½ to 2½ feet, 20s.
SYCAMORE, 2 to 3 feet, 20s.
OAKS, strong, 15s.
ASH, 1 to 3½ feet, 15s.
PRIVET, 1 to 2 feet, 4s.
RHODODENDRONS, 3 to 5 seedling, 7s. 6d.
ASH, MOUNTAIN, 1 to 2 feet, 10s. per 1000

SYCAMORES or PLANES, 7 to 9 feet, 3s. per dozen.
LABURNUMS, 6 to 7 feet, 2s. per dozen.
ASH and HORSE CHESTNUT, 2 to 3 feet, 30s. per 1000
OAKS, 2 to 3 feet, 5s. per 100. BEECH, 1½ to 2½ feet, 15s. per 1000
ALDER, 2 to 3 feet, 5s. per 100. 3 to 4 feet, 7s. per 100
PINUS AUSTRIACA and LAURUS, 3 feet, 4s. per dozen
ROSES, 2 feet and upwards, 9s. per dozen; less than 2 feet, 6s. per doz.
Fine CUCUMBER SEED, 2s. per lb.; 6d. per oz.
Terms cash.
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HARDY HEATHS, in 50 varieties, free of package:—
24 plants, in 12 varieties, 10s.
48 plants, in 24 varieties, 20s.
96 plants, in 24 varieties, 40s.
1 cupful, in 12 varieties, 1s. 6d.
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1 cupful, in 50 varieties, 5s.
Many varieties can be supplied by the 1000. See CATALOGUE.
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WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS having now grown it for five years past for Stock. It has been seen growing in his Nursery by many eminent Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of medium habit, with dense, dark, leathery foliage, robust, and of a pyramidal form. In truth, the second edition of the old Laurustinus, and is not surpassed, if not excelled, in all its characteristics, and is very successful with a considerable number of flowers during the most severe weather.
W. K. has great confidence in offering it in fine specimens, 4 to 5 feet, finely furnished, 16s.; second size, 3 to 4 feet, do., 10s.; third size, 2 to 3 feet, do. 7s.; fourth size, 1½ to 2 feet, do., 5s.
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Choice Mangel Seeds.

BOLTON and CO. offer their choice Stock of ORANGE GLOBE MANGEL WURZEL at £3 per cwt; also very fine stocks of
LONG RED MANGEL
LONG YELLOW
YELLOW INTERMEDIATE do.
Prices and Samples may be had on application to Seed Merchants, Corn and Hay Salesmen, &c.
Farm Seeds of all sort, best quality, extra clean.
TRIED FIELD ROOTS.

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Have now ready, delivered in London in fine condition,
COOK'S MANURE (Liquid), 12s.
DITTO (VEGETABLE), for Raising Pasture Lands
SUPERPHOSPHATES and LIME.
PREPARED GUANO
MANGEL and TURNIP MANURES
Also, Peruvian GUANO, and NITRATE of SODA
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PERUVIAN GOVERNMENT GUANO, £13 10s per ton

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"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high commercial character of this valuable artificial manure. The sample examined by me contained only 10 per cent of moisture, and fully the percentages of soluble and insoluble phosphates which I understood you to furnish, and was in a fine state of preparation. The more generally this manure will become known to cultivators, the more I am convinced it will it be appreciated by them.—Believe me, Sir, yours respectfully,
"A. VOELCKER, Ph.D."
"To Messrs. [illegible]"

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London Agent for "Rees & Co.'s Biphosphated Peruvian Guano Company, Limited."

The Biphosphated Peruvian Guano combines the stimulating power of Peruvian Guano with the nourishing properties of Superphosphate. It is sent out in Sealed bags, and each bag is guaranteed by Sellers. Price £11 per ton; discount for cash.
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REIGATE SILVER SAND, best quality, 7s. 6d. per Ton, delivered into trucks at Reigate; best quality PEAT, LOAM, Prepared COMPOSTS, in Bags, GRAVELS, &c.
Apply to W. SHORT, Horticultural Depot, Redhill, Reigate

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APPLEBY'S REGISTERED FUMIGATOR and COMPOUND TOBACCO PAPER (requires no Blowing). Price upon application. For Testimonials see Gardeners' Chron. & Tobacco 5, 6, 8, 9, 11, 16, 18, 20, 21, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64,

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RENDLE'S PATENT GROUND VINERIES and PLANT PROTECTORS

Copy of Letter from MR. W. INGRAM, *Gardener to* His Grace the Duke of Rutland, *Belvoir Castle Gardens, Grantham, Leicestershire.*

"Belvoir Castle Gardens, near Grantham, Jan. 26, 1870.

"Dear Sir,—I have employed your Plant Protectors for growing Lettuces during the winter, and no plan that I have tried has answered so well.

"The tiles are placed to allow glass 22 in. by 14 in. to slide in the grooves. This gives a space for three rows of Lettuces, and forms a convenient little pit. The protection given is greater than I expected, for although we have had 12 deg. of frost, the growth of the plant does not appear to have been checked.

"The successful application of your plan for securing a supply of Cos Lettuce struck the gentleman (W. B. Ferrand, Esq.) who write to you, and led to the order you refer to.

"The few examples of the semicircular tiles came too late in the season for the purpose you recommend them, but I made use of them for ripening some Tomatoes, which they did completely.

"I will give your tiles a fair trial, as I promised, and send you the result later in the year.—I am, yours truly,

"Mr W. L. Rendle." "W. INGRAM."

Preserve your Wall-fruit Trees from Spring Frosts.

EVERYONE MAY FIX HIS OWN WALL COVER.

BEARD'S PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Victoria Works by C. BEARD, Horticultural Engineer, Bury St. Edmunds, Suffolk.

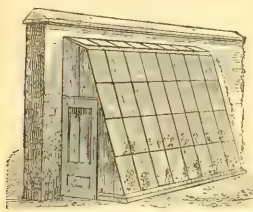

These Screens may be converted at pleasure into a Lean-to or Span-house. Full particulars of their adaptability, and price, may be obtained at the Works, by enclosing stamp, which also on ill strated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable systems of manufacture in both patent glazing and ventilation

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Green houses, Conservatories, Tanning Pits, &c.
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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong ZINC HAND-GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England.

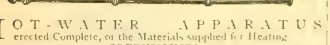

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Victoria Works, Bury St. Edmund's

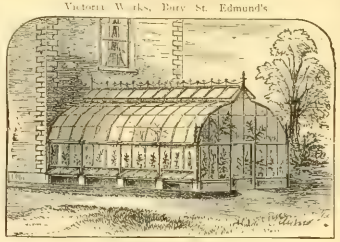

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Sole Partner in the late Firm of Sanders, Fraser & Co., which Firm was dissolved by mutual consent.

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These much approved Patent systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c., &c.

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W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

		Each.
6 ft. by 4 ft. Lights, 2 in. thick, unglazed	£	5 0
" " Primed and Glazed with 10 oz. Sheet		0 11 0
" " with stout portable Box, not Painted		1 3 0
" " Painted four coats, and Handles on		1 8 0
" " Packed and Delivered in Railway van		1 10 0
6 ft. by 8 ft., Double Lights, do.		2 15 0
GREENHOUSES		Per ft. super
Woodwork only Prepared and Fitted		0 0 6
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" Painted four coats, two sides, ready for use		0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

National Flower Show, June, 1867.

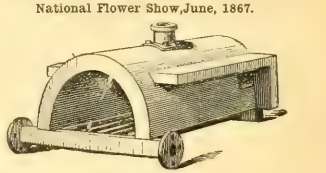

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HAND WATER CART AND GARDEN ENGINE.

This Cart is particularly suited for use in Gentlemen's Gardens and Grounds, and will save immense labour in the conveyance of water for garden purposes. The delivery valve can be worked at the outlet when filling a watering pot. It holds 35 gallons.

It is also fitted with a Spreader for Watering Lawns, Paths, or Carriage Roads, which can be removed at pleasure, and is easily managed by a lad.

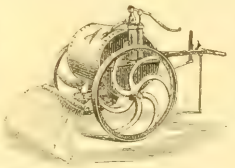

Each Cart is arranged for the attachment of a powerful Garden Engine which will throw water a considerable distance, and is specially adapted for watering trees, &c., or for use as a small fire engine.

Price, with Spreader, £5 5s.: Force Pump, extra, £2 2s.

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HORTICULTURAL TOOLS, &c.

GARDEN ENGINES from 52s. 6d.

DEANE & CO.,
46, KING WILLIAM ST.,
LONDON BRIDGE.

LAWN MOWERS . . from 15s.
GARDEN BARROWS . . 21s.
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SPADES, FORKS, SCYTHES, &c.
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FLOWER STANDS, IRON and WIRE.
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HOT-WATER FITTINGS for GREENHOUSES, CONSERVATORIES, &c.

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GRAY'S OVAL TUBULAR BOILER.

INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be portable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a flange being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and the heating so, the change, though a slight one, is not without an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

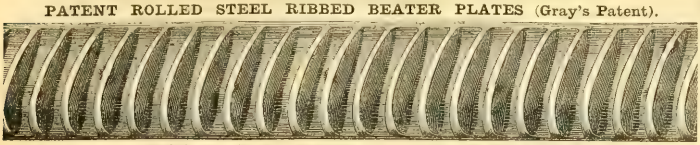

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.

These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

C AND S are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

CLAYTON AND SHUTTLEWORTH,
STAMP END WORKS, LINCOLN, or, 78, LOMBARD STREET, LONDON, E.C.

DEAN'S PATENT FUMIGATOR.

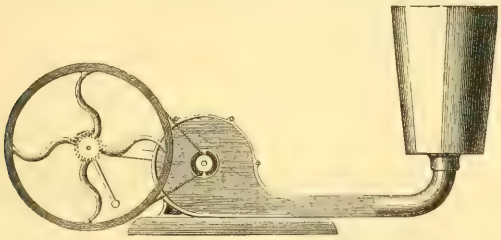

PETER LAWSON & SON,

20, BUDGE ROW, CANNON STREET, LONDON, and EDINBURGH,

Can supply this excellent FUMIGATOR, of which a full description is given at p. 245 of the *Gardeners' Chronicle* of February 19, 1870.

Price £1 11s. 6d. Box 2s. 6d.

Can also be ordered through the leading Nurserymen and Seedsmen.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark "SAYNOR," also the Corporate Mark, "CROWN WORKS," without which none are genuine.

S & C regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S & C'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

Vases and Fountains, for the Garden and Conservatory.

ANDREW HANDYSIDE AND CO., Britannia Foundry, Derby [32, Wilbrod, London

The Britannia Iron Works have for the last 30 years been well known for the production of fine Iron Castings. The use of Cast-iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra-cotta. Cast of our Vases, if not specially painted, are unpretentious, and will not crack when exposed to severe frosty weather.

Five large sheets of Designs and Price Lists post free for 6 stamps.

A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom.

GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

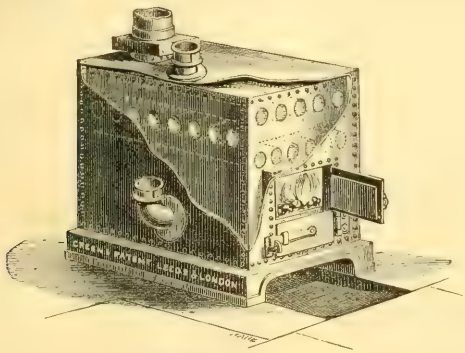

OBLONG BOILER.

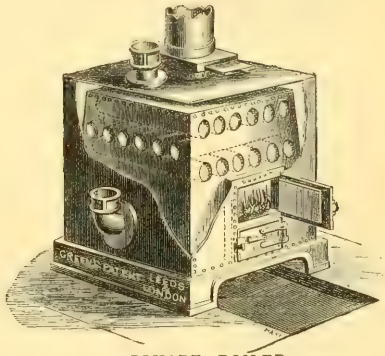

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate, which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS; and
54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW and CO., 20, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

BROWN'S FLORAL SHADING, a protection from Frost and Sun. Samples and prices on application to CHARLES BROWN, Greenhithe, Kent, Maker to the Trade.

No. 1, Peel Street, Manchester, 1870.

OUR HORTICULTURAL SHADINGS form a thorough Protection from Hail, Frosts, and Hail, whilst at the same time they admit Light and Sun. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the kingdom, as they are the efficient principle (and pronounced the only "proper shadings" ever offered to the public against Birds, Wasps, Blight, &c. Awarded one of Strawberries, Tulips, Hyacinths, Seed-Beds, Greenhouses, &c., they have no rival. The price being very reasonable, brings them within the reach of every one. With ordinary care they will last for many years. Samples post free on application. DANIEL COLLINGE AND SON.

No. 1—54 inches wide . . . . . at 8½d. per yard run
No. 2—54 inches wide . . . . . at 7d. per yard run.
No. 3—54 inches wide . . . . . at 5½d. per yard run
No. 4—36 inches wide . . . . . at 4d. per yard run
No. 5—54 inches wide . . . . . at 3½d. per yard run

In pieces of about 30 yards each, or any longer lengths when specially ordered. Nett cash in 30 days from date of Invoice.

"Every Cottage should be provided with a Water Tank." *Dioscuri.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IDA WHARF), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices and at very short notice.

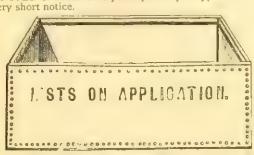

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.
F. BRABY AND CO., Limited, Lavender Works, Euston Road, London; or through all respectable Ironmongers.
N.B. Open Tanks of different sizes packed one in another to save carriage.

SHANKS'S PATENT LAWN MOWERS for 1870, The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower
PATENT DOUBLE-EDGED STEEL PLATE, WIND GUARD, &c.
The annually increasing Sales bear the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, pending all the Exhibitions of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

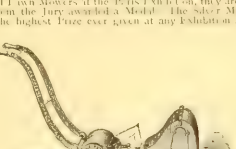

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Blade to bear against the Shear Bar. In addition to this, A. S. & SON now make the Side Blade or Bottom Blade of their Machine with Two Edges—one in front as usual, and one transverse at the back—so that when the front edge is dulled the plate may be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Solo-plate must be entirely renewed when the edge is worn down.
A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be returned.
Illustrated Circulars, with full particulars, sent free on application.
ALEXANDER SHANKS AND SON, Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.
N.B.—A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

Rosher's Garden Edging Tiles.

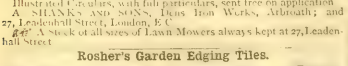

THE above and many other PATTERNS are made in Terra-Metallo Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The former sorts are recommended for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and can be put down in a moment by the Labourer and Amateur. Edgings, Coneaments, &c., of every description.
GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, Terra-Cotta, and superior Fireclay, in the newest and best designs.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W. Kingsland Road, Kingsland, N.E.
Illustrated Price Lists sent by Post on application.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability. Dairy, Coal, and Ornamental Chimney Pots. Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—50 tons per Truck, 12s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.
FLINTS and BRICK RUBBERS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for Flatting ever manufactured, as it is cool in working, takes at least five hours in going down, has comparatively little smell, can be washed, and will resist all soak parts.
Sold only by the GRANITIC PAINT COMPANY, 394, King William Street, London, E.C.
Prospectuses and Testimonials free on application.

NO MORE DAMP WALLS.—The only Cure for Damp Walls, Preserving Stone, Brick, and Cement from Decay is the SILICATE ZOPISSA COMPOSITION, used in the Houses of Parliament, and manufactured by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 394, King William Street, London, E.C.

MOULE'S PATENT EARTH SYSTEM

From Mr. W. GILBERT,
Hereford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble or additional outlay. I have used Moule's Manure to my Rose Trees on a couple of spadesful put into a two-bushel Tub of soil, and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT.
"January, 1870."

Prospectuses and full information may be obtained at 23, Bedford Street, Covent Garden, W.C.

COTTAM'S PATENT PORTABLE UNITED COW LITTING

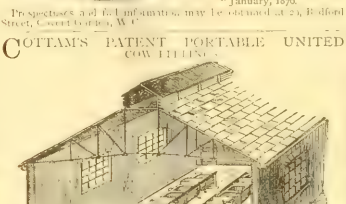

Their advantages are economy, cut fodder, removable at pleasure, no waste of Manure, no Partitions to impede Ventilation or breed Vermin, how Pens may be altered in width unnecessary, increased width and depth at Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent overfeeding. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, £5.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above and other Specialities and important Improvements in Stall Fittings are exhibited and Patented.

REGISTERED HAND GARDEN SEED DRILL.
[illegible] At the Great German International Agricultural Exhibition, Hamburgh (1869), the First-class Silver Medal was awarded to CHARLES BUTT for his Manufactures: also at the Great German International Horticultural Exhibition, Hamburgh, 1869, the Silver Medal was awarded. By this machine seeds of all kinds can be distributed correctly in rows, at any distance apart, and at any depth required. One machine will do the work of many men with the ordinary implements. Almost every Nurseryman, Market Grower, Farmer, Park, and Gardener should have one. It is a most useful implement for Market Gardeners, as they will be found to save their cost in a few days' work. Prices, Plain, £1 15s.; Flat, and Grooved, £2 2s. Illustrations of the implement can be forwarded on application. Testimonials from Messrs. Paul, Waltham Cross; Lee, Hammersmith; Cutbush, Barnet; Peed, Mitcham; Turner, Slough; and other eminent Nurserymen and Market Gardeners, and it will be found to save its cost in a few days' work. Prices where the machine is not known will be forwarded on receipt of P.O.O. for the amount. Can be worked by a boy.
Full directions sent with each machine.
Drill sent carriage paid to any Railway Station in the United Kingdom on receipt of P.O.O. for £1 12 6d. The name of the nearest station should be given.
Address CHARLES BUTT, Manufacturer of the Champion Hoe, Bacon Street, Bethnal Green, London, E.

REUBEN HUNT, MANUFACTURER of IMPROVED HAND SEED DRILLS, Atlas Works, Earl's Colne, Essex.

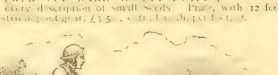

IMPROVED BARROW SEED DRILL.
Per Sowing every description of small Seeds. Price, with 12 feet Lever, as shown in the cut, £7 5s.; extra for each set of Coulters, 5s.

ONE ROW CUP DRILL, No. 1
For sowing Turnip and Mangold Seeds on flat Ridge . . £2 10 0
Extra cups for different sizes of seed 0 2 0
ONE ROW CUP DRILL, No. 2 . . . . . 3 15 0
TWO ROW CUP DRILL 5 15 0
ONE ROW TURNIP and MANURE DRILL 5 10 0
Extra coulters for flat work 0 3 6
ONE-ROW BEAN and PEA DRILL 2 10 0
ONE-ROW BRUSH DRILL 1 5 0
Illustrated Catalogues post free on application.

RENDLE'S PATENT GROUND VINERIES and PLANT PROTECTORS.
Copy of Letter from W. FLEMING, Esq., *late M. P. for Devonport.*
"Belvoir Castle, Grantham, Jan. 24, 1870.
"Sir,—Mr. Ingram, of these Gardens, has shown me your Patent Ground Vineries and Plant Protectors, which 'answer admirably.' Be so good as to send to my Gardener, Mr. Shoosmith, St. Ives, Bingley, Yorkshire, 300 feet at once by Midland Railway. Yours faithfully,
"Mr. Rendle." "W. FLEMING."

Glass for Garden Purposes.
JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

Each	s	d.		Each	s	d.
2 inches in diameter	..	0	3½	12 inches in diameter	..	1	9
3 " "	..	0	4½	13 " "	..	2	0
4 " "	..	0	6½	14 " "	..	2	6
5 " "	..	0	9½	15 " "	..	2	9
6 " "	..	0	8	16 " "	..	3	6
7 " "	..	0	10½	17 " "	..	4	0
8 " "	..	1	0	18 " "	..	4	6
9 " "	..	1	2	19 " "	..	6	0
10 " "	..	1	4	20 " "	..	7	0
11 " "	..	1	6				

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	..	or 6d	9 inches in diameter	..	1s 8d
5 " "	..	0 8	10 " "	..	2 0
6 " "	..	0 10	11 " "	..	2 6
7 " "	..	1 0	12 " "	..	3 0
8 " "	..	1 4			

Either flat or conical tops.

CUCUMBER GLASSES

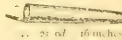

21 inches long	..	.. 2s 6d	36 inches long	..	4s 3d
22 "	..	1 10	14 "	..	1 5
20 "	..	1 12	12 "	..	1 2
18 "	..	1 6			

HAND GLASSES, WITH OPEN TOPS.

Each	s	d.		Each	s	d.
12 inches	..	.. 6	6	20 inches	..	10	6
14 "	..	.. 7	6	21 "	..	11	6
17 "	..	.. 8	6	24 "	..	12	6
18 "	..	.. 9	6				

London Agents for HARTLEY'S IMPROVED PATENT ROLLED PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS, PAINTS of various colours ground ready for use.
SHEET and ROLLED GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, at the Lowest Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Horticultural Glass Warehouse.
THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.
NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in	in	4ths.	3rds	2nds.	Best.
20 by 12					
20 by 13					
20 by 14	Per 100 feet	15 oz	12s 3d	15s 6d	16s 9d 18s 0d
20 by 15		21 oz	18s 0d	20s 0d	22s 0d 24s 0d
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

in	in	in	in	in	in	4ths.	3ds	2nds	Best.
by 4	7	by 5	8	by 6	9	by 7	11	12s 3d	14s 0d 15s 6d
04 by 45	72 by 51	81	84 by 61	93	96 by 71				

Per 100 feet.

10 by 8	12	by 9	12	10 by 10	13	14	by 20	15s 0d	17s 6d 18s 0d 19s 6d
10 by 8	13	by 9	13	10 by 10	14	15	by 20		
11 by 9	13	by 9	13	10 by 10	13	14	by 11		
11 by 9	14	by 10	13	10 by 10	14	15	by 11		

LARGE SHEET SQUARES, 15oz., per 100 feet.

in	in	in	in	in	in	4ths	3ds	2nds	Best
15	by 10	14	by 12	22	by 12	22	by 16		
19	by 14	18	by 12	17	by 13	23	by 13		
14	by 14	18	by 12	20	by 12	24	by 12		
15	by 11	15	by 12	18	by 14	22	by 17	12s 3d	15s 6d 16s 9d 18s 0d
15	by 11	16	by 12	22	by 14	24	by 12		
16	by 11	16	by 12	21	by 15	22	by 15		
21	by 11	17	by 12	22	by 15	22	by 18		
13	by 12	18	by 12	24	by 15	21	by 18		

The above Prices are only for the Sizes stated; if a quantity of any other Size be required, a Special Price will be given.

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super.
21 oz.

4ths quality, per 300 feet case, 76s.			3ds quality, per 200 feet case, 36s.		
3ds	"	42s.	2ds	"	42s.
2ds	"	62s	21s	"	62s
Best	"	75s	Best	"	75s

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.
HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 3-8th in. substances.
BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 25s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is mixed with rain or pure fresh water.
ZINC PAINT. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a half of White Lead and six gallons of Linseed Oil. Special Prices for this Paint.
IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Bridges, Iron Fences, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 4s. per gallon.

Per cwt.—s	d		Per gallon.—s	d
GENUINE WHITE LEAD	0	LINSEED OIL	..	2 9
SECONDS WHITE LEAD	28 0	BOILED OIL	..	2 9
GROUND PATENT DRY-		TURPENTINE	..	2 9
ING, 24s. to 28d. per lb		LINSEED OIL PUTTY,		
" OXFORD OCHRE, 3d.		8s. per cwt.		
to 4½d. per lb		Fine OAK VARNISH, 10s to 12		0
" RAW UMBER, 4½d to		" CARRIAGE do, 12s to 14		0
6d. per lb		" PALE do 10s to 12		0
" BURNT do, 6d to 9d.		" COPAL		16 0
GREEN PAINT, all shades,		KNOTTING		10 0
28s to 60	0	Patent GOLD SIZE ..		10 0
BLACK PAINT 24s to 36	0	" BLACK JAPAN ..		12 0
RED PAINT .. 28s. to 36	0	GLAZIER'S DIAMONDS and		
		TOOLS.		
GROUND BRUSHES.		MILLED LEAD and PIPES.		
DUSTERS. SASH TOOLS.		OLD LEAD Bought or taken in		
DISTEMPER BRUSHES.		Exchange.		

The above are Nett, for Cash, and as such cannot be booked.
Lists of any of the above on application.

W. S. BOULTON & CO.'S

NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

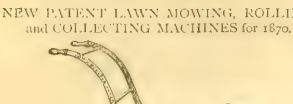

These Machines possess important advantages. By the introduction of a Radial Link, the adjustment of the various parts is rendered exceedingly simple. Breakages are entirely avoided, by making the handles and all other light parts of malleable iron. They adapt themselves to unevennesses in the ground, and suit persons of any height by means of the handles working loose. This arrangement also admits of their being used as a Roller, by folding back the front or cutting end. Every Machine is warranted to give entire satisfaction to the purchaser, and if not approved of can be returned. An Illustrated Catalogue, with prices, sent free by post on application.

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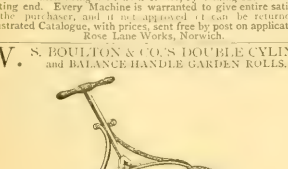

These articles are really first rate, both as regards workmanship and materials. They are divided in the centre, which admits of their being turned with ease, and without injury to the grass or Walks, the chain being rendered unnecessary. The price is also very low.

Carriage paid to any Station in England

20 in. long,	18 in. diam.	£2 17 0	30 in. long,	27 in. diam.	£4 17
22	20	3 7 10	32	21	4 7
SINGLE CYLINDER ROLLS Carriage paid					
18 in. long,	12 in. diam.	£1 15 0	22 in. long,	21 in. diam.	£3 0
21	29	2 8 2	24	21	3 14

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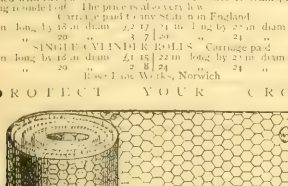

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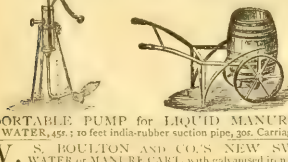

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Galvanised Iron Pump and 10 feet india rubber suction pipe, price £3 10s. Spreaders, 15s. each.

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Annual Income ..	..	200,000
Invested Funds ..	..	1,540,000
Claims paid, Bonus paid ..	..	1,650,000

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Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
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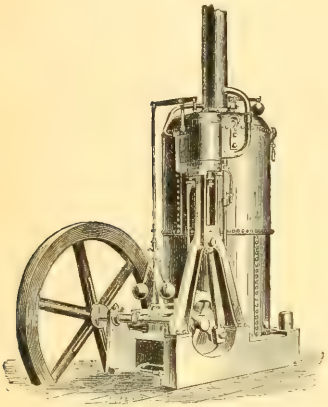

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3	„	4¾	10	„	5 „ 6	2 „ 4	£60*
4	„	5½	12	„	7 „ 0	2 „ 4	£85
6	„	6½	14	„	8 „ 0	2 „ 8	£120
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40	„	18	28	„	17 „ 0	5 „ 8	£585

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The above Engines and Boilers occupy a very small space, and will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

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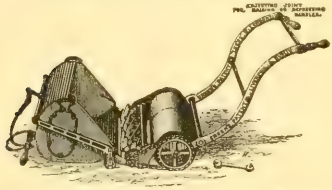

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FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

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30 in.	32 in.	7	10	0
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SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 10.—1870.] SATURDAY, MARCH 5. Price Fivepence. *Stamped Edition, 6d.*

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ROYAL BOTANIC SOCIETY, Regent's Park.—SPRING FLOWERS, First Exhibition, March 30 and 31. EXHIBITIONS of PLANTS, FLOWERS, FRUIT, and SPECIAL WORKS of ART, May 25, 26; June 22, 23; July 6 and 7. Tickets and Schedule of Prizes are now being issued.
AMERICAN PLANTS, June 1 to 14.
Next Meeting for Election of New Fellows, March 12.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870, JUNE 3 to 10. ONE THOUSAND POUNDS in PRIZES. To be held in the BOTANIC GARDENS, MANCHESTER. Schedules are ready, and can be had on application to the Undersigned.
Botanic Gardens, Manchester. BRUCE FINDLAY.

SPALDING HORTICULTURAL FETE—FLOWER, FRUIT, &c., SHOW.—The ANNUAL EXHIBITION will be held in the Grounds of Ayscough-Fee Hall, on THURSDAY, June 23. Band of the Royal Horse Guards attends. Schedules on application to GEO. F. BARRELL, Hon. Sec.

HORTICULTURAL SOCIETY of LIVERPOOL.—The EIGHTH GREAT EXHIBITION of HYACINTHS and SPRING FLOWERS will be held in St. George's Hall on WEDNESDAY, March 16. For Schedules, &c., apply to
6, Basnett Street, Liverpool. R. WILSON KER, Hon. Sec.

LEEDS ROYAL PARK.—A GRAND CANARY SHOW will be held on SATURDAY, March 19; MONDAY, March 21; TUESDAY, March 22; WEDNESDAY, March 23; and THURSDAY, March 24. FIFTY POUNDS will be given in PRIZES. The Show will be held in the Large Conservatory.
ENTRIES will CLOSE on TUESDAY, March 15.
Schedules and all particulars can be had on personal application at the Park, or by letter. THOMAS CLAPHAM.
Leeds Royal Park, February, 1870.

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BETTERIDGE'S SUPERB QUILLED ASTERS, in 13 distinct varieties, 5s., which includes the beautiful new Oxonian. CHARLES TURNER, The Royal Nurseries, Slough.

Lily of the Valley.
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PETER LAWSON AND SON, 20, Budge Row, Cannon Street, London.

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A PRICED LIST of TRICOLOR, BICOLOR, ZONAL, and DOUBLE GERANIUMS can be had on application to
WM. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

Carter's Index, March 5.
CARTER'S GENUINE SEEDS. See pages 305 and 306.—237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See page 305.
237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 306.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 306.—237 and 238, High Holborn, London, W.C.

CARTER'S NEW ONIONS. See page 305.
237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES.
237 and 238, High Holborn, London, W.C.

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LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.
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PARIS, 1867. | SUTTONS' GRASS SEEDS for ALL SOILS. The PREMIER PRIX SILVER MEDAL for GARDEN SEEDS, GRASSES, and GRASS SEEDS, was Awarded to
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Good Clover Seeds at Market Prices.
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BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

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„ STANDARD and HALF STANDARD, of the most imposing varieties, CLAY'S, SHERWOODII, &c., from 21s. to 63s. to 105s. each.
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„ LATIFOLIA, 18s. to 30s. per dozen
ANDROMEDA FLORIBUNDA, fine plants, 12s. to 18s. per dozen

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYREA, &c.

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BAGSHOT, SURREY.

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WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

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Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

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PETER LAWSON & SON,

THE QUEEN'S SEEDSMEN,

20, BUDGE ROW, CANNON STREET, LONDON, E.C., and at EDINBURGH,

Offer their celebrated MIXTURES of the above, suitable for all soils and situations. Their extensive Stocks of GRASSES and CLOVERS have been most carefully selected, thoroughly cleaned, and cannot be surpassed in quality. Prices and full particulars on application.

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VIOLA CORNUTA, VAR. PERFECTION.

B. S. WILLIAMS

Has much pleasure in now offering this superb new BEDDING PLANT to the Public, and from the manner in which it has been tested, both in dry and exposed positions, as well as moist and shady places, he has no hesitation in asserting its superiority over any and every VIOLA previously offered, and also is fully persuaded that it will be for many years a Standard Bedding Plant. It is of free growth, yet seldom exceeding six or eight inches in height; the leaves are much larger than those of V. cornuta, which is one of its parents; whilst the flowers, still bearing the characteristic horns of that species, are borne well above the foliage, but three times the size and of good substance: the colour is shaded blue, the eye orange-yellow, with a dark purple disc round it, from which proceed radiating lines of still deeper purple. Indeed, it may be said to be like a gigantic V. cornuta in habit, retaining its qualities as a profuse bloomer, and bearing large flowers which almost rival our Florist Pansies for size and substance.

This plant was awarded a First-Class Certificate by the Floral Committee when exhibited before them (Sept. 25, 1869) by Mr. Jobson, of Rotherfield Park, its raiser, which no similar Viola has received. And no plants but those which come from this stock are true in character.

The names of all Nurserymen purchasing this plant will be duly advertised, to enable the Public to secure the genuine article. Orders are being booked and will be executed, in strict rotation, the first week in May.

Price.—Single Plants, 2s. 6d. Per Dozen, 24s. | **50 Plants, 70s. 100 Plants, 100s.**

Trade Price upon application.

B. S. WILLIAMS, VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

NEW LARGE ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

SEED POTATOS.

H. & F. SHARPE

HAVE FINE STOCKS OF

THE FOLLOWING VARIETIES OF SEED POTATOS,

Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KIDNEY
" MYATT'S PROLIFIC KIDNEY
" AMERICAN ROSE KIDNEY
" RIVERS' ROYAL ASHLEAF KIDNEY
" DAINTREE'S EARLIEST
" KING
" DRUMMOND'S PROLIFIC ROUND
" DALMAHOY
" FOXE'S SEEDLING
" OXFORD

EARLY FORTYFOLD
" EIGHTBALL
" COCKNEY
" BRITISH QUEEN
" MARTIN'S GLOBE
PATERSON'S VICTORIA, true
WEBB'S IMPERIAL KIDNEY
BARRON'S PERFECTION
WALKER'S EARLY REGENT
FLUKE KIDNEY } ROCKS.

SEED GROWING ESTABLISHMENT, WISBECH.

J. C. WHEELER & SON'S

CELEBRATED SEED POTATOS.

WHEELERS' GLOUCESTERSHIRE KIDNEY

We can recommend for earliness, flavour, size, and crop. In comparison with the Ashleaf it is as early, whilst it produces nearly double the crop, and is altogether superior to that variety. We can recommend it with the most perfect confidence, and have much pleasure in referring to the annexed letters, speaking in high terms of its earliness and excellence.

3s. 6d. per peck; 12s. per bushel (56 lb.)

"I have grown your Gloucestershire Kidney here for the last five years with all other early kinds, and find yours to be much the earliest."—Mr. SPEED, *Gardener to the* Right Hon. Lord Penrhyn, *Penrhyn Castle.*

"Your Gloucestershire Kidney, which I had from you last year, turned out so well that I feel I cannot do better than have some more this year. I had not a diseased one among them, and double the crop from any I have had for the 11 years I have planted on these premises."—SARAH HALL, *Tenbleston, Lymm*

"I grew last year more than 150lb. of Gloucestershire Kidneys per perch, and of best table quality. Mr. Bunyard says 'pots,' and I think he is right"—Rev. JAMES L. MAY, *West Pulford, North Devon.*

WHEELERS' MILKY WHITE.

4s. per peck; 14s. per bushel (56 lb.)

"I was greatly delighted with the Milky White Potato last year. It was the best sort I ever grew, and just what suited me."—JOSEPH ROBINSON, *Wishampstead, Bedford.*

"Your Milky White Potatos are all you say of them, and more. I have now tried them three years, and could not wish for a better Potato in every way. They have been very free from all disease, and came on the ground where the Autocrats set in. Those who have not tried should send for the larger ones. Should they do so the time will have given them 5s. in their pockets. I have been thanked again and again for recommending them"—Rev. A. WOOD, *Castlemorton.*

COCOA-NUT CABBAGE. 1s. per packet, Post Free.

THE COCOA-NUT CABBAGE IS A NEW AND VERY EARLY VARIETY, PERFECTLY DISTINCT, OF MOST EXCELLENT FLAVOUR.

It should be planted 18 inches apart.

Will yield an early and continuous supply.

This Cabbage is a decided novelty, and a great acquisition.

WHEELERS' TOM THUMB LETTUCE.

Large packet, 1s.; Smaller packet, 6d., Post Free.

"Your Tom Thumb Lettuce is a wonderful favourite with my family and friends. For a summer Lettuce I have never seen its equal."—GEORGE F. A. FLOWLE, *Stafford Farm*

"Wheeler's Tom Thumb Lettuce is a capital variety for winter and early spring"—THOMAS RIVERS, *Sawbridgeworth.*

"Your Tom Thumb Lettuce is a very good sort; it is the best I ever had."—F. YOUNG, *Gardener to* Baron de Rutzen

"Major WARRY would thank Messrs. Wheeler to send him another packet of their celebrated Tom Thumb Lettuce."—*Headstone Hall.*

"Be good enough to send me another packet of the best Lettuce grown, Wheelers' Tom Thumb."—H. P. WEBB.

PATERSON'S SUPERB MELON. 1s. per Seed.

This extraordinary Melon was raised during the last summer (1869) at Pontypool Park, by Mr. Paterson, Gardener to Mrs. Hanbury Leigh; it weighed 24 lb., and measured 42 inches in circumference. It was raised from the Netted Scarlet-flesh, crossed with the Black Rock; of exquisite flavour, and very handsome, with fine rich scarlet flesh; and, as seen by the dimensions given, of extraordinary size and weight.

J. C. WHEELER AND SON, GLOUCESTER, and 59, MARK LANE, LONDON, E.C.

KNAPHILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALLERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted April, 1868.
ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868.
ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference.
ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s., to £12 10s. per 100
The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbrasiliana, &c., large numbers, many of them 20 and 30 years' growth
CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869.
CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868.
CEDRUS LIBANON, 6, 7, to 10 feet. Moved September, 1868.
CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 10s. 6d. each
" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each
" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.
JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Farmers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.
PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.
PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved April, 1868, 10 to 15 feet high
PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 10 feet high. All removed 1868 69.
PICEA MAGNIFICA, 3, 4, and 5 feet.
PICEA PINSAPO, 4, 5, 6, and 8 feet, 21s. to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869
THUJA AUREA, beautiful spec. mens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed.
THUJA GIGANTEA, 5, 6, to 10 feet high. Moved August, 1868.
THUJA LOBBII, 8 to 12 feet high, and as much in circumference; transplanted April, 1869.
THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868
WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, 2nd 10 feet, 21s. to 42s. each. Transplanted in August.
PINUS AUSTRIACA, 3 feet, £5 per 100. Transplanted Sept., 1868
PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft. round, 10s. 6d. to 21s. each
YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all of most unity removed; invaluable where immediate effect is sought
YEWS, GOLDEN and ELEGANTISSIMA.—We have these in huge numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of stem, and up to 10 feet high.
YEWS, IRISH, handsome plants, up to 10 feet high.
HOLLIES.—The Stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—
HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet
HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and are much in demand for Avenues.
HOLLY, SILVER QUEEN, 4, 5, and 6 feet.
WATERER'S HOLLY.—This variety originated in this Nursery we believe hundreds, 5, and 6 ft. high, and 6 ft. in circumference.
PERRY'S WEEPING HOLLY. Standards, 10s. 6d. to 21s. each
HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 12 feet high, by the thousand. All moved since April, 1868.
HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868:—
LAURIFOLIA and SCOTTICA, 4, 5, 6, to 10 feet high
HODGINSII, | ANGUSTIFOLIA,
YELLOW BERRIED, | MARGINATA, &c.
4, 5, 6, and 8 feet high
STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number
N.B.—Purchasers of Hollies may select from a stock occupying at the present no more considerably over 6 acres of ground; finer or better rooted plants cannot be wished or obtained. The prices are fair and reasonable.
BOX, Green and Variegated, 4, 5, 6, to 8 feet.
BOX, do. do., fine pyramids, up to 8 feet.
BAYS, standards and pyramids.
LAURUSTINUS, standards.
AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high
AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 6s. to 42s. per dozen, and upwards.
AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—
RHODODENDRONS, nice bushy plants, from layers, named kinds, £5 per 100, £40 per 1000. A dozen sent as sample on application.
RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 per 100, and upwards.
RHODODENDRON PONTICUM, good plants for Cover, from £1 to £15 per 1000.
STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 4 to 10 feet in circumference. There is probably no kind better adapted for standards than that we call roseum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.
RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £40 to 100 per 100. Sample on application. Large and handsome plants by the 1000, 4 to 8 feet high.
AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.
AZALEAS, common kinds, £5 per 100.
AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference.
KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100.
ANDROMEDA FLORIBUNDA, £5 to £7 10s. per 100, and upwards.
HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100.
ERICA CARNEA, for winter blooming, many thousands.
ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.
SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen.
As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.
A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.
The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.
N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

LARCH, 1-yr. Seedling, in quantity, also bedded, can be offered; SCOTCH, native, LARICIO and AUSTRIAN PINES, 1 and 2-yr. Seedlings, also 1 and 2-yr. bedded; PEAR, CHERRY and PLUM STOCKS, 1-yr.; IVY, Irish, 1 and 2 yr. bedded; ASH and QUICK, 2-yr. bedded. For prices, apply to
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

WHEELER'S SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELER'S ILLUSTRATED BOOK on GRASSES, which may be had gratis and post free.
J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

SELECT VEGETABLE SEEDS,
free by post
Per pkt.—s. d.
Smith's fine long frame CUCUMBER 1 0
The White Queen CELERY 0 6
Snow's Winter White BROCCOLI 1 0
Smith's Incomparable CABBAGE 1 0
Worcester Champion Cabbage LETTUCE 0 6
Improved Telegraph CUCUMBER 1 0
Early Dwarf Erfurt CAULIFLOWER 1 0
New Giant Rocco ONION 1 0
Ayton Castle LEEK 0 6
Worcester Late White BROCCOLI 1 0
Backhouse's Winter White BROCCOLI 1 6
French Breakfast RADISH 0 6
Golden Perfection MELON 1 0

SELECT FLOWER SEEDS, free by post
PRIMULA SINENSIS, finest fringed .. .. 1s. and 2 6
CALCEOLARIA, finest spotted .. .. .. 1s and 2 6
CINERARIA, from prize flowers .. .. .. 1s and 2 6
CYCLAMEN, PERSICUM, finest 1 0
ASTER, New Paeony-flowered Globe 1 6
,, Trifaut's Peony-flowered 1 0
PHLOX DRUMMONDII, finest 1 0
ZINNIA, finest double, mixed 0 6
VIOLA CORNUTA ALBA 1 0
PANSY, Cliveden Yellow 1 0
AMARANTHUS ELEGANTISSIMUS 1 6
PRINCESS FEATHER, New Golden 1 0
BALSAM, splendid rose-flowered 1 0
New Tree MIGNONNETTE 1 0
MARIGOLD, New French, miniature, striped 0 6
☞ For Prices of other Seeds, see RICHARD SMITH'S DESCRIPTIVE LIST, forwarded on application.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

New Fuchsias.

GEO. SMITH has much pleasure in offering Three SEEDLING FUCHSIAS, unequalled by any others in cultivation, viz —

AVALANCHE (G. S.), this acquisition stands pre-eminent, being the finest white Fuchsia ever raised, having very double, compact, and beautifully formed flowers; corolla pure white; of extra size, with long carmine filaments; tube and sepals brilliant carmine-scarlet This splendid flower comes true, as one bloom 25 petals; fine habit and free grower. Plants 10s. 6d. each.

OPINIONS OF THE PRESS

Report from "Gardeners' Magazine," October 2, 1869.

"Avalanche has a large flower, bold in outline, and massive; though elegant; the tube and sepals are of a brilliant carmine-scarlet: very double corolla, pure white, with streaks of carmine at the base; in the samples sent the stamens and petals are quite distinct, which is a decided merit, for when semi-double forms are produced, as they too often are, in double flowers, symmetry is lost."

PURPLE PRINCE (G. S.), this is a most extraordinary bold and handsome variety; tube and sepals waxy carmine-scarlet, corolla rich violet, flower extra size, fine free habit; surpasses all other double purple varieties Plants 10s 6d each

OPINIONS OF THE PRESS

Report from "Gardeners' Magazine," October 2, 1869.

"Purple Prince is bold and handsome, tube and sepals shining carmine-scarlet, corolla very large, expanding boldly, colour a very rich tone of pucy purple."

SURPRISE (G. S.), tube and sepals waxy scarlet, broad and well reflexed; corolla deep violet; of fine habit, and one of the finest dark Fuchsias in cultivation Plants 10s 6d each

NEW DOUBLE WHITE.—These three kinds, in one handsome coloured Plate, by Mr. J Macfarlane, 1s 6d each.

G. S is now booking orders for three extra large and fine NOSEGAY GERANIUMS, viz.—Claudius, Harry George, and Soleil, which he has taken First class certificates.

Beautiful Coloured Drawings of Claudius and Soleil, by Mr. James Andrews, in two separate plates, 1s 6d each.

For descriptions of above see CATALOGUE, forwarded on application

Tollington Nursery, Hornsey Road, Islington, London, N.

MESSRS. J. STANDISH AND CO., The Royal Nurseries, Ascot, Berks, are now prepared to execute orders for the following NEW AND CHOICE PLANTS, to which they wish to call special attention :—

IXORA DIXIANA.—This magnificent plant is of very free growth, carrying fine foliage; the trusses of flowers are large, and of a bright orange colour, and remain in bloom a long time; it has proved itself of very strong constitution, and little affected by change of temperature, consequently is admirably adapted for exhibition purposes. Plants 6d. to 21s. each; with five or six spikes of bloom set, 25s. each.

ANTHURIUM SCHERZERIANUM.—Fine young plants, two to three crowns, 10s. 6d. each; three to four crowns, and stronger, 15s to 21s. each.

TODEA PELLUCIDA COMPACTA.—A very dwarf and compact variety. As it does not give seed fronds until the plant is very old, its beautiful transparent fronds are preserved to it for ever.

STRUTHIOPTERIS JAPONICA.—A magnificent hardy Fern from Japan It was exhibited at South Kensington on May 4 last, when it was awarded a First-class Certificate For full description, see *Gardeners' Chronicle*, May 8, 1869. In April next, 5s. 6d.

FICUS MACROPHYLLA.—From New Zealand, where such is its luxurious growth, it is said at times to cover an acre of land. It is undoubtedly the best Subtropical Plant of its kind, growing freely in a very low temperature, even withstanding 7 or 8 degrees of frost; hence it is not a subject for the warm tan-bed alone, but if put out in the middle of May is sure to succeed 5s. each.

ABUTILON THOMPSONI.—This has also proved itself a very fine Subtropical Plant, and, under favourable circumstances, the bright marbled colour of its leaves producing a very striking effect It will do well up to the end of October, as a few degrees of frost do not appear to hurt it Plants, 1s. each; 9s. per dozen; 60s. per 100.

COPROSMA BAUERIANA VARIEGATA.—This is a perfect gem for small beds, or for edging Being a New Zealand plant it will thrive well in our climate, retaining its beauty until late in the autumn 2s. 6d. each; 24s. per dozen.

TREE FUCHSIA ASCOT VELVET.—This is of the most robust habit and a thought perpetual. The colour an intense yellow, deeply edged with lake; flowers very large and finely shaped. A few strong plants, now, 5s. each; in April next, 2s. 6d. each

ROYAL ASCOT VINE.—This variety proved itself beyond doubt the most prolific of all the Vines yet set out, and ripens its fruit to perfection in a cold house. Plants, 7s. 6d. to 15s. each, and a few strong three-year old canes, that would carry a good crop this year, 21s. each

NEW PEACHES.—The "Marquis of Downshire" and the "Earl Ascot." These have been awarded First-class certificates by the Noblesse Peach, partaking of both parents in equal degrees, their flavour surpasses anything we have previously tasted; of good size, very deep colour, and a fortnight earlier than the Royal George Very clean, strong growers Fine plants, 7s 6d to 15s each.

ABIES OBOVATA.—A beautiful new Conifer from Japan We have proved it perfectly hardy, of very fast growth, with foliage of the most lovely glaucous green 10s. 6d to 21s each.

JUNIPERUS JAPONICA ALBO-VARIEGATA.—By far the finest of all the Junipers 21s each.

ACER RUFINERVE ALBO-LIMBATUM.—This large and beautiful variety of Maple is an introduction from Japan. It is quite distinct from other varieties, and in summer the leaves, which are nearly covered with white, have a crystallised or frosted appearance. 21s to 42s. each.

ACER POLYMORPHUM PECTINATUM RUBRUM. We have a nice stock of this very charming Maple The leaves are beautifully cut, and are coloured with green and red 10s 6d to 21s. each.

AUCUBAS, Males, 1s 6d. to 5s. each; and other varieties. See our CATALOGUE.

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS,

NURSERYMAN and SEED MERCHANT,

Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 10s. 6d., 21s., 42s., 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	Per packet.—s.	d.
Backhouse's Winter White Protecting BROCCOLI	1	6
Dell's fine dark-leaved BEET	1	0
Williams' Matchless RED CELERY	1	0
Williams' Matchless WHITE CELERY, new	1	6
Telegraph CUCUMBER, Woolley's improved variety	1	6
Wheeler's Tom Thumb CABBAGE LETTUCE	1	0
Webb's Climax MELON, new	2	6

(The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)

Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new .. 2 6

Earley's Defiance TOMATO, new 2 6

(The earliest and best variety in cultivation.)

NEW and CHOICE FLOWER SEEDS.

Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and	5 6
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and		5 6
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &		5 0
BALSAM, Williams' superb strain	1s. 6d. and	2 0
CYCLAMEN, Wiggins' Prize strain ..	1s. 6d., 2s. 6d., and	3 0
VERBENA, Eckford's finest varieties, mixed		1 0
Williams' Improved Hybrid SOLANUMS	2s 6d and	3 6
CENTAUREA CANDIDISSIMA	1s and	2 6
LOBELIA ERINUS GRACILIS ERECTA ALBA, new ..		1 0
Parsons' New Tree Mignonette		1 0
PERILLA NANKINENSIS VARIEGATA, new		1 0
Williams' Improved French MARIGOLD, beautifully striped, and very large		1 0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours		2 6
VIOLA CORNUTA ALBA, new	1s. 6d. and	2 6
ZINNIA ELEGANS PUMILA flore-pleno, new		1 0

B. S. W.'s DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, post free on application.

Leicester Abbey Nurseries.

THOMAS WARNER begs to remind intending Planters and the Trade that, in addition to his extensive General Nursery Stock, he has the following in large quantities, of unsurpassed quality, and offered at most reasonable prices. CATALOGUES, Wholesale or Retail, may be had free on application.

ARBICOTS, Standard Maiden, Moor Park
CHERRIES, standards, Dwarfs, and Pyramids.
CURRANTS, White Dutch.
PEARS, Standards and Pyramids.
PLUMS, Standards, chiefly Victoria.
MANETTI BUDDED STOCKS.
ARBOR-VITÆ (of sorts), single specimens, 1½ to 5 feet.
AUCUBA JAPONICA, single specimens, 1 to 2 feet.
BOX, Edging, 12 to 15 inches high.
CHESTNUTS, Scarlet and White, Standards, 5 to 8 feet.
ELM, Ornamental (of sorts), Standards, 4 to 12 feet.
LARCH, Scotch, 4 to 8 feet.
POPLAR, New Silver, 1½ to 8 feet.
OAK, English, Transplanted, extra fine, 3 to 5 feet.
SPRUCE, Finest Norway, 1½ to 3 feet.
ROSES, Dwarf, most of the leading and newer kinds.

THE NEW APPLE of the season, ANNIE ELIZABETH, was awarded a First-class Certificate by the Royal Horticultural Society, and illustrated in "Florist and Pomologist, November, 1869. A most valuable late keeper, of excellent quality, should be in every collection of Fruit See previous Advertisements. It has already been supplied to

Abrahams, W., Sen., Woking
Bunyard & Son, Maidstone
Barnes, T., Thirsk
Cutbush & Son, Highgate
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Williams, B. S., Holloway.
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Wheeler, C., Warminster
Watson, J., St Alban's
Warner, T., Leicester
HARRISON AND SONS, Royal Midland Seed Warehouse, Leicester.

LOUIS VAN HOUTTE begs to state that his CATALOGUE, for 1870 is now ready, and can be had from his Agents, Messrs R. SILBERRAD & SON, 5, Harp Lane, London, E.C. This Catalogue contains the HARDY PERENNIALS, ORNAMENTAL TREES AND SHRUBS, ROSES, ROSES of all kinds; the favourite GESNERACEOUS PLANTS, in dry roots, viz.: ACHIMENES, NÆGELIAS and ECCODONIAS, PLECTOPOMAS, GESNERIAS, TYDÆAS, and GLOXINIAS; also FRUIT TREES in general

LOUIS VAN HOUTTE'S SEED CATALOGUE for 1870 is now ready, and is sent to his usual Customers

The GRANDIFLORA CANARIENSIS are enumerated in LOUIS VAN HOUTTE'S Catalogue, No. 130-131 H 1, but their description can only be found in the French issue of the same Catalogue

Parts 4, 5, and 6 of Vol. XXII. of the FLORE have appeared; their contents can be found at p. 409 of the Seed Catalogue. Price of subscription for the Volume of 12 Parts, 41 10s. (more than One Hundred highly-coloured Plates, Woodcuts, miscellaneous matter, &c.)

☞ Parts 7, 8, and 9, will appear in the first week of March, and contain the Chronological History of the Best Belgian Pears, their Merits and Winners, and many other Miscellaneous Matters; also highly-coloured Plates, Descriptions and Mode of Cultivation of Lachenalia luteola, Spigelia marylandica, Clematis John Gould Veitch (double plate), Imantophyllum cyrtanthiflorum, Gloxinia Ida, Cypripedium barbatum grandiflorum, Campanula soldanellæflora, Tropæolum tricolorum, Alstrœmeria tricolor and pallida, Datura (Brugmansia) sanguinea (double plate), Gloxinia Lucy, quite of novel colour; Antigonon Leptopus (double plate), Desmodium penduliflorum, the richest flowering hardy shrub of the day (double plate); Hydrangea stellata prolifera, Hemerocallis disticha flore-pleno, Calceya labiata (double plate), Eucodonia (Achimenes) nægelioides nana multiflora (double plate) Gunnera scabra (double plate), Lælia præstans, × Anthoceras sorbiolia, &c.

Ghent Royal Nursery, February 26.

STRONG STANDARD APPLES and PEARS.—Large horizontal Trained and Pyramid Apples and Pears; fine Standard and Dwarf-trained PEACHES and NECTARINES; fine bushy LAURELS and LAURUS COLCHICUM, up to 4 feet; extra bushy LAURUSTINUS and PORTUGAL LAURELS, 1½ to 3 feet; a large collection of Standard and Dwarf Perpetual, Dwarf China, and climbing ROSES of the leading sorts; deciduous flowering SHRUBS; ASH, 2 to 5 feet; SCOTCH, SPRUCE, and AUSTRIAN FIRS, and all kinds of FOREST TREES; strong Evergreen PRIVET and THORN QUICK for Hedges. All the above have been regularly transplanted, and are well rooted. Prices on application to
CHARLES BRUNTON & SON, The Nurseries, Bonner Road, Cheltenham.

Raspberries, Evergreens, &c.

ROBERT CORNWELL AND CO. offer RASPBERRIES, Cromwell's Seedling, per 100, 12s.; Carter's Prolific, 10s.; Red Antwerp, 10s.; Fishwick, 10s.; Double Bearer, 10s.; Eaves White, 10s.; Yellow Antwerp, 10s.; and SUPERB RASPBERRIES, 2s.; ASPARAGUS, 2, 3, 4, and 5 yr., RED and WHITE CURRANTS, Bushy LAURELS, PRIVET, Variegated and Green BOX, LAURUSTINUS, ARBOR-VITÆ, BOX EDGING, Cheap

Opposite Red Lion, Barnet

AZALEA PONTICUM (Sweet Azalea), 10 to 15 inches, 4s. per dozen, 20s. per 100; 15 to 20 inches, 5s. per dozen
ANDROMEDA POLIFOLIA ANGUSTIFOLIA, nice plants, 3s. per dozen, 15s. per 100.
KALMIA GLAUCA, 8 to 12 inches, 3s per dozen, 15s. per 100; 12 to 15 inches, 4s. per dozen, 18s. per 100
LEDUM PALUSTRE, 8 to 12 inches, 3s. per dozen, 15s. per 100.
All these can be supplied by the 1000. See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do. SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUT, and YEW; also an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, at 20s. per 100; 2½ to 3 feet, 30s. per 100; 3 to 3½ feet, 40s. per 100; 3½ to 4 feet, 84s. per 100.
RICHARD SMITH, Nurseryman and Seedsman, Worcester

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.
RICHARD SMITH, Nurseryman and Seedsman, Worcester

TO THE TRADE.—
1-yr. SEEDLING HOLLY (very stout)
ARBOR-VITÆ, 6 to 9 inches, 12s. per 1000.
SCOTCH FIR, 9 to 18 inches.
PINUS LARICIO, 9 to 18 inches
PINUS AUSTRIACA, 9 to 18 inches
PINUS RIGIDA, 2 to 3 feet A very fast-growing Pine, and safe mover Price on application to
J. THORNTON, Heathfield Nursery, Bagshot, Surrey.

SYCAMORES or PLANES, 7 to 9 feet, 3s. per dozen.
LABURNUMS, 6 to 7 feet, 2s. per dozen
ASH and HORSE CHESTNUT, 4 to 4 feet, 30s. per 1000.
OAKS, 2 to 3 feet, 8s per 1000 BEECH, 1½ feet, 12s. per 1000.
LARCH, 3 feet, 5 to 4½ feet, 6s. per 100.
PINUS AUSTRIACA and EXCELSA, 3 feet, 4s. per dozen.
ROSES, 3 feet and upwards, 9s per dozen; less than 2 feet, 6s. per doz
Fine CUCUMBER SEED, 2s. per oz.; 7s. 6d. per ½oz.
For cash only.
A. WILKIN, Tiptree, Kelvedon, Essex

COVERT PLANTS.—Spruce, 2, 3, and 4 feet, three transplanted, Mahonia aquifolia, 1, 2, and 3 feet, two transplanted, Evergreen Privet, 3 and 4 feet, transplanted; Rhododendrons, 1, 2 and 3 feet, extra bushy, and with balls; Berberis vulgaris, and R. dulcis, 2, 3 and 4 feet, strong; Gorse, 1½ to 2 feet, transplanted last April; Yew and Holly, 2 feet, transplanted; Spiræa Douglasii Dwarf and Mountain Pine, twice transplanted; Snowberry, Sweet Briar, and Spiræa, 2, 3 and 4 feet; and all other desirable plants for forming Game and Rabbit Coverts, consistently and capitally rooted. Samples and special low prices upon application
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

AMERICAN ARBOR-VITÆ, good Plants.
1½ to 2 feet, 21 per dozen, 12s per 100
2 to 2½ feet, 30 per dozen, 15s per 100
2 to 3 feet, 3s 6d per dozen, 16s per 100.
2½ to 3½ feet, 4s per dozen, 20s per 100.
3 to 4 feet, 4s 6d per dozen, 25s. per 100
See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

PICEA NOBILIS.—Suitable for Avenues or Ornamental Planting.—500 Picea nobilis, from seed, finely-furnished Trees, 2½ to 3 feet high, with fine fibrous and well-rooted roots. This Californian Pine is thoroughly hardy, sound in constitution, of rapid growth, not very particular to situation if planted in good loamy soil. It takes the very healthy appearance of a dense, noble, and beautiful Tree. The above to be sold very Cheap. Price on application to Messrs. FISHER, HOLMES, AND CO., Handsworth Nursery, Sheffield

FIFTY THOUSAND COMMON OAK, from 3 to 6 feet, very fine, and well rooted, prices as follows:—

TO THE TRADE	TO AMATEURS.
3 to 4 feet, 20s per 1000	25s per 1000
4 to 5 feet, 25s. per 1000	32s per 1000
5 to 6 feet, 32s per 1000	40s per 1000
6 feet, 36s. per 1000	50s per 1000

A. F. BARNARD, Nurseryman, Veoclehangg by Haarlem, Holland; or his Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

DOUBLE WHIN, GORSE or FURZE, ULEX EUROPÆA FLORE PLENO.
Excellent plants, all extra, transplanted—package included :—
9 to 15 inches, 2s. per dozen, 12s. per 100.
12 to 18 inches, 3s. per dozen, 13s. per 100.
15 to 20 inches, 3s. 6d. per dozen, 16s. per 100.
18 to 24 inches, 4s. per dozen, 20s. per 100.
The above can be supplied by the 1000, in pots 9 to 12 inches, 5s. per dozen, 22s 6d. per 100; 18 to 24 inches, 7s. per dozen
JAMES SMITH, Darley Dale Nurseries, Matlock.

FOREST TREES, which we can offer in quantity, well rooted and cheap:—Ash, Sycamore, Birch, Elm (Wych), Oak, Poplar (B Italian), Limes, Chestnut (Horse), Hazel, Maples, Privet, Willows, 2 years of age, 1 to 2 feet, at 4s. per 1000; 2 to 4 feet, 5s. per 1000; Ash (Mountain), 5 to 6 feet, 6 to 8 feet; Spruce (South, Silver and Austrian Firs, from 1 to 1½ foot, 1½ to 2 feet, 2 to 3 feet; Chestnut Trees (Spanish), 4 to 5 feet; Berberis aquifolia, 18 to 24 inches; Pæonia Trees, strong blooming plants, 3s. per dozen or 20s. per 100; Laurel (Common), 1½ to 2 feet, 2 to 2½ feet, 2½ to 3 feet; Yew (English), 1 to 1½ foot, 1½ to 2 feet, 2 to 2½ feet, 2½ to 3 feet; Yew (English), 1 to 1½ foot, 1½ to 2 feet, 2 to 2½ feet, 2½ to 3 feet; Yew (English), 1 to 1½ foot, 1½ to 2 feet, 2 to 2½ feet, 2½ to 3 feet; To 6 feet, very fine and well rooted. GOOSEBERRIES, Warrington, &c., 2 to 3 feet bushes, 3 and 4 yr.; RASPBERRIES, Northumberland Filbasket, nice canes.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

JOSEPH SMITH, Jun., Moore Edge Nursery, Tarsley, near Matlock, offers at the following prices per 1000, viz: ASH, 1½ to 2 feet, 15s; 2 to 2½ feet, 18s.
ASH, MOUNTAIN, 1½ to 2 feet, 16s; 2 to 3 feet, 18s.
ALDER, 1½ to 2 feet, 15s; 2 to 2½ feet, 17s.
ELM, 1½ to 2½ feet, 15s.
FIR, SILVER, 1½ to 2 feet, 40s.
,, SCOTCH, 9 to 15 inches, 12s.; 1 to 1½ feet, 16s.; 1½ to 2 ft., 20s.
,, SPRUCE, 1 to 1½ foot, 12s.; 1½ to 2 feet, 20s.; 2 to 2½ feet, 28s.
MAPLE, NORWAY, 4 to 5 feet, 40s.
PINUS MARITIMA, 1 to 1½ foot, 12s.; 1½ to 2 feet, 15s.
SYCAMORE, 1½ to 2 feet, 15s.; 2 to 3 feet, 22s.; 3 to 4 feet, 30s.
GORSE, 1-yr., 1s. 6d.; 2-yr., 2s.
BERBERIS AQUIFOLIA, 9 to 12 inches, 20s.
BROOM, white, 1½ to 2 ft., 30s.; yellow, 1½ to 2 ft., 15s.; 2 to 3 ft., 20s.
COTONEASTER MICROPHYLLA, 1 to 1½ foot, 40s.
RHODODENDRONS, PINUS AUSTRIACA, &c., &c.
See CATALOGUE, free on application.

MOUNTAIN ASH, a most Ornamental and Profitable Tree for Underwood. It will grow upon soil too poor for Hazel and most other plants used for a similar purpose. We can supply good plants—1½ to 2 feet, at 16s per 1000; 2 to 3 feet, at 20s. per 1000; 2½ to 3½ feet, at 22s per 1000; 3½ to 4½ feet, at 4s. per 100, or 27s 6d per 1000. See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock

Suttons' Home-grown Seeds.

SEEDS DIRECT FROM THE GROWERS, THE BEST MEANS OF PREVENTING DISAPPOINTMENT.

SEEDSMEN TO THE QUEEN.

SUTTONS' COMPLETE COLLECTIONS for the FLOWER and KITCHEN GARDEN, carriage free.

FOR THE KITCHEN GARDEN.

No. 1 COLLECTION, for a large Garden, Carriage Free	£1 3 0
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No. 3 COLLECTION, for a medium sized do., Carriage Free	1 11 6
No. 4 COLLECTION, for an ordinary sized do., Carriage Free	1 1 0
No. 5 COLLECTION, for a small do.	0 15 0
No. 6 COLLECTION, for a very small do.	0 12 6

FOR THE FLOWER GARDEN.

No. 1 COLLECTION, Free by Post or Rail	£2 2 0
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No. 3 COLLECTION, Free by Post or Rail	1 1 0
No. 4 COLLECTION, Free by Post or Rail	0 15 0
No. 5 COLLECTION, Free by Post or Rail	0 10 6

Particulars of the above Collections may be had on application, and any articles not required will be excluded, and others included according to the wish of the purchaser.

Priced LISTS of Garden Seeds, Grass Seeds, and Farm Seeds, post free on application.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

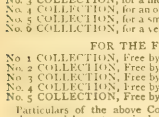

Surplus Stock—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well-grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow guage lines, at a moderate cost, thereby saving delay and expense of packing.

At 12s per dozen.

Abies canadensis (Hemlock Spruce), 4 to 5 feet
„ excelsa, 3 to 4 feet
Arbor-vitæ, American, 5 to 6 feet
„ Siberian, 3 to 4 feet
Gorse, double, in pots, strong
Hartogia capensis (Cape Laurel), 3½ to 2 feet
Larel, narrow leaved, 2 to 2½ feet
„ Portugal, 2½ to 3 feet
Picea balsamea, selected, 4 to 5 ft
Quercus ilex (Evergreen Oak), 15 to 18 inches
Rhododendron ponticum, 2½ to 3 feet
Holly, screw-leaved, green, 1½ to 2 feet
Phillyrea oleafolia, 2½ to 2½ ft [2 ft.

At 18s. per dozen.

Abies canadensis, 5 to 6 feet
„ excelsa, 4 to 5 feet
Abutilons, broad leaved, 2 to 2½ ft.
Arbor-vitæ, American, 6 to 7 feet
„ Siberian, 4 to 4½ feet
Aucuba japonica, 18 to 21 inches
Box, green tree (pyramids, very handsome) 2½ by 2½ feet
Hartogia capensis, 2 to 2½ feet
Laurel, narrow leaved, 2½ to 3 feet
Phillyrea oleafolia, 2½ to 3 feet
Picea balsamea, 5 to 6 feet
Pinus austriaca, 3 to 4 feet
Quercus ilex, Evergreen Oak), 21 to 24 inches
Rhododendron ponticum (very bushy), 2 to 2½ feet.
Rhododendrons, fine varieties, 18 to 21 inches
Taxus japonica (Japan Yew), 12 to 15 inches

At 24s. per dozen.

Abies elegans, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet
Aucuba japonica, 21 to 24 inches
Cryptomeria Lobbii, 5 to 6 feet
Cupressus Lawsoniana, 4 to 5 feet
Holly, screw leaved, green, 2 to 2½ feet
Ivy, green tree, 18 to 24 inches
Laurel, Portugal, pyramids, 3 to 4 feet [feet
Phillyrea oleafolia, very fine, 4 to 5
Rhododendrons, hybrids (fine varieties), 21 to 24 inches
Taxus japonica, 15 to 18 inches

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet
„ elegans, 2 to 2½ feet
Arbor vitæ compacta, 2½ to 3 feet
Aucuba japonica, very bushy, 2 to 2½ feet
Cryptomeria Lobbii, 6 to 7 feet
„ viridis, 6 to 7 feet
Ivy, green tree, extra fine and bushy, 2 to 2½ feet
Juniperus chinensis, 3 to 3½ feet
„ glauca, 3 to 4 feet
„ Lecana, 3 to 4 feet
Pinus austriaca, 4 to 5 feet
Thujopsis borealis, 4 to 5 feet

At 36s per dozen

Abies inverta (Weeping Spruce), 2½ to 3 feet
Arbor-vitæ compacta, 3 to 3½ feet
„ Siberian (very fine) 5 to 6 feet
Cupressus Lawsoniana, 5 to 6 feet
Juniperus chinensis (comma), 3 to 4 feet [3½ feet
„ densata, 3 to 4 feet
„ Schottii, 3 to 3½ feet
Juniperus virginiana, 3 to 4 feet
„ virgata pendula, 3 to 4 feet
Laurel, Portugal (pyramids, very fine), 4 to 5 feet
Pinus Laricio, 6 to 7 feet
Taxus elegantissima (gold leaved), 18 to 21 inches
„ Irish, 5 to 6 feet

At 42s. per dozen.

Abies inverta, fine specimens, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet
„ Siberian (very fine), 6 to 7 feet
Juniperus chinensis, 3½ to 4 feet
„ (comma), 3½ to 4 feet
„ drupacea, 2½ to 30 inches
„ Lecana, 4 to 5 feet
Juniperus Smithiana, 3½ to 4 feet
„ thuriferа, 5 to 6 feet
„ virginiana, 7 to 8 feet
„ viridis pendula, 4 to 5 feet
Pinus Laricio, 8 to 9 feet
Taxus, Irish, 6 to 7 feet
Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen.

Abies Menzesii, 2 to 8 feet
„ monstrosa, 7 to 8 feet
Arbor-vitæ compacta, 4 to 4½ feet
Juniperus chinensis, very fine, 5 to 6 feet
„ densata, 5 to 6 feet
„ glauca, 5 to 6 feet
„ phœnicia, 5 to 6 feet
„ Smithiana, 4 to 5 feet
„ thuriferа, 6 to 7 feet
Juniperus Smithiana, 3½ to 4 feet
„ thuriferа, 5 to 6 feet
„ virginiana, 7 to 8 feet
„ viridis pendula, 4 to 5 feet
Pinus Laricio, 8 to 9 feet
Taxus, Irish, 6 to 7 feet
Wellingtonia gigantea, 2½ to 3 feet
Picea Nordmanniana, 2 to 2½ feet
Pinus Cembra, extra fine, 6 to 7 ft.
Taxus elegantissima, 2½ to 2½ feet
Thujopsis borealis, 6 to 7 feet
Wellingtonia gigantea, 2 to 3½ feet

At 84s. per dozen.

Abies albertiana, 7 to 8 feet, 10s. 6d. each
„ Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each
„ orientalis, 4 to 5 feet, 6s.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. each
Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s.; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 63s. to 84s. each
Juniperus densata, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each
„ thuriferа, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each
Picea grandis, extra fine, 5 to 6 ft., 15s.; 6 to 7 feet, 21s. each
Picea balsocarpa, 24 to 3 feet, 15s.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d. each
„ nobilis (best glaucous var.), 18 to 24 inches, 7s. 6d.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
„ Nordmanniana, 4 to 5 feet, 15s.; 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each
„ Pinsapo, 3 to 3½ ft., 10s. 6d.; 3½ to 4 ft., 15s.; 4 to 4½ ft., 22s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. ea.
Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Pinus Cembra, 2½ to 3 feet, 3s.; 3 to 4 feet, 7s. 6d. each
Yews, for hedges, about 12 feet high, 40 years old, recently transplanted, 31s. 6d. each

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

"Economy.—Seeds Direct from the Growers."

James Carter & Co
Seed Growers

CARTER'S
GENUINE SEEDS for the GARDEN,
HARVESTED on their OWN SEED FARMS.

NEW ONIONS—Carter's Select Stocks:
NEW GIANT ROCCA ONION of NAPLES, 1s. pkt.
EARLY WHITE NAPLES ONION, 1s. per packet.
ITALIAN RED TRIPOLI ONION, 1s. per packet.
NEW GLOBE TRIPOLI ONION, 1s. per packet.
Post Free.

NOTICE to COUNTRY PURCHASERS.
JAMES CARTER & CO. have made such extensive arrangements that enable them to guarantee immediate execution of all Orders (weather permitting).

CARTER'S COLLECTIONS
OF
VEGETABLE SEEDS.

The following Collections are assorted for the convenience of those purchasers that do not wish to make their own selection, and will insure a plentiful supply of choice Vegetables all the year round.

CARTER'S COLLECTION OF VEGETABLE SEEDS
No 1, price 12s. 6d. packing included, suitable for a Small Cottage Garden.

CARTER'S COLLECTION OF VEGETABLE SEEDS
No. 2, price 21s., packing included, suitable for a Small Garden, containing—

Beans, Nonpareil	1 qt.	Endive, French curled	lg. pkt.
„ Broad Windsor	„	Leek, Ayton Castle	„
„ best French	1 pt	Lettuce, Carter's Giant White	„
„ Scarlet Runners	„	„ Drumhead	„
Beet, St. Osyth	lg. pkt.	„ Victoria	„
Borecole or Kail, Cottagers'	„	Mustard, White	4 oz.
Kail, new, Asparagus	„	Melon, Carter's Excelsior	pkt
„ Dwarf Scotch	„	Onion, Giant Madeira	lg. pkt
Brussels Sprouts, best	„	„ Reading	„
Broccoli, Carter's Champion	„	Parsnip, Student	1 oz
„ Snow's Winter	„	Parsley, Dunnett's Gar nishing	lg. pkt
„ Adam's Early White	„	Peas, Carter's Early	1 qt
„ Purple Sprouting	„	„ Perfection	1 pt
Cabbage, Carter's Early	„	„ Bishop's Long-pod	„
„ Enfield Market	„	„ Pritchaker	„
„ Dwarf Nonpareil	„	„ Carter's Surprise	„
„ Tom Thumb	„	„ Champion of England	1 qt.
„ Savoy, best curled	„	„ Carter's Victoria	1 pt.
Carrot, Early Horn	1 oz.	„ Veitch's Perfection	„
„ James's Green-top	„	Radish, Wood's Frame	2 oz
„ selected Scarlet	„	„ Early Scarlet Short-top	„
Cauliflower, Carter's Dwf. Mammoth	lg. pkt.	„ Mixed Turnip	„
Celery, Incomparable Dwarf White	„	Spinach, Summer	1 pt.
„ Manchester Giant Red	„	„ Winter	„
Cress, plain	1 oz	Turnip, Early Six week	1 oz
„ Australian	1 oz	„ Yellow Malta	„
Cucumber, Carter's Champion	pkt	Tomato	pkt.
		Vegetable Cream, Mussel	„
		Pot Herbs	„

CARTER'S COLLECTION OF VEGETABLE SEEDS
No. 3, price 42s., package included, suitable for a Garden of half an acre.

CARTER'S COLLECTION OF VEGETABLE SEEDS
No. 4, price 63s., package included, suitable for larger Gardens.

For full particulars see CARTER'S ILLUSTRATED GARDENERS' and FARMERS' VADE MECUM for 1870, Post Free, 1s.; Gratis to Purchasers.

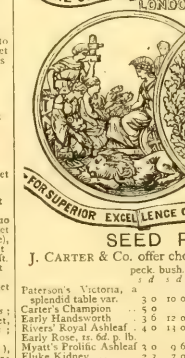

SEED POTATOS.
J. CARTER & Co. offer choice stocks of the following:—

	peck bush. s d	s d	peck bush. s d	s d
Paterson's Victoria, a splendid table var.	3 0	10 0	Forty fold	3 0	9 6
Carter's Champion	3 0		The Fava, 9s. per lb	21 0	
Early Handsworth	3 6	12 0	The Fifty Dollar Potato, 6s. per lb		
Rivers' Royal Ashleaf	4 0	11 0	Carter's Snowdrop Fluke, a splendid Potato		15 0
Early Rose, 6s. 6d. p lb.			Shaw	3 0	9 6
Myatt's Prolific Ashleaf	3 0	9 6	York Regent	2 0	6 0
Fluke Kidney	2 3	7 0	Walker's Regent	2 3	7 0
Lapstone Kidney	3 0	9 0	American Climax, 3s. per lb		
Bresee's Prolific, 3s. p lb.			Daimahoy	2 6	8 0
Red Ashleaf Prolific	4 0	13 0	Prince of Wales Kidney	4 0	13 0
Gloucestershire Kidney	3 0	11 0	"The Queen's"	12 0	
Wheeler's Milky White	4 0	11 0			
King of the Potatos	3 6	11 6			
Flourball	2 6	8 0			

CARTER'S PRIZE MEDAL FARM SEEDS.
See page 306 of this day's *Gardeners' Chronicle*.

JAMES CARTER AND CO.,
THE ROYAL SEEDSMEN,
237 and 238, HIGH HOLBORN, LONDON, W.C.

ON LAYING DOWN LAND to PERMANENT PASTURE.

"For getting up the subject of Grasses we cannot conceive a handier book than Miss Plues', which is furnished with ample and accurate illustrations; while for putting her data to the proof, and testing the value of hints and suggestions, it may be well to make acquaintance with that really scientific *brochure*, Messrs. WHEELER'S Illustrated Book on Grasses."—*Saturday Review*

A Copy will be forwarded free on application to
J. C. WHEELER AND SON, Grassseed Merchants, Gloucester; and 69, Mark Lane, London, E.C.

Early Feed for Sheep and Cattle.

SUTTONS' IMPROVED ITALIAN RYE-GRASS, the Earliest and most Productive in Cultivation. Should be sown in March to produce a succession of valuable Cuttings during the year. If sown alone, 3 bushels are required per acre.
Price 7s. per bushel, cheaper by the quarter. Carriage free.
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

Grass Seeds.

BOLTON AND CO. beg to offer NEW SEED of the best GRASSES.
FOREIGN ITALIAN RYE-GRASS
HOME-GROWN do.
ANNUAL RYE-GRASS
PERENNIAL do.
EVERGREEN do.
And all the best kinds of Natural Grasses, Mixtures for Permanent Pastures and Meadow Lands, to suit the different varieties of Soil
Mixtures of Grass Seeds also made up for all situations for—
CEMETERIES CROQUET GROUNDS
RAILWAY BANKS ORCHARDS
And SHADY PLACES.
Prices, either per Bushel or per Acre, to be had on application
BOLTON and CO., Seed Merchants, Station Road, Wood Green, London, N.

FARM SEEDS of all sorts, best quality, extra clean.
PRICED LIST on application

James Dickson & Sons.

Seed Growers, 107, Eastgate Street, Chester.

Vegetable, Agricultural, and Flower Seeds.
MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, Surrey, S.W.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply, for cash, SEAKALE for planting out, 3s. 6d. per 100; ASPARAGUS PLANTS, strong, for planting out, 2s. per 100, or 15s. per 1000; MIXED LACED TULIPS, 2s. per 100; WHITE SPANISH ONION SEED, at 2s. per lb. All new and genuine.

To the Seed Trade.

THE ADVERTISER has 12 cwt. of True White SPANISH ONION SEED, growth and stock of which can be warranted good; also 2 cwt. of True Drumhead Early White BROCCOLI SEED, and a few ounces of Conqueror of the West CUCUMBER SEED.
JOHN MITCHINSON, Seed Merchant, Truro.

NEW SCARLET RUNNERS,
PATERSON'S VICTORIA ROUND POTATOS,
MONA'S PRIDE KIDNEY POTATOS,
MYATT'S PROLIFIC KIDNEY POTATOS,
YORKSHIRE KIDNEY POTATOS,
RUSSIAN SHALLOTS.
1, 2, and 3 years GIANT ASPARAGUS ROOTS.
Special Wholesale Prices of the above Stocks on application to
EDWARD TAYLOR, Seed Merchant, Malton, Yorkshire

Notice to the Trade.

LAXTON'S NEW PEAS, ALPHA and SUPREME.

HURST AND SON beg to state that they are holders of half the stock of the above valuable varieties; also the HUNDREDFOLD PEAS, EARLY PROVENCE, and the entire stock of MCMILLAN'S QUEEN of the MARROW. They have also grown largely of LAXTON'S PROLIFIC. Descriptions of all in CATALOGUE, which may be had on application. They have at present a good supply of the true RED and WHITE ITALIAN TRIPOLI ONION, and the GIANT ROCCA, all of which are scarce this season.
HURST AND SON, 6, Leadenhall Street, E.C.

Suttons' Prize Cucumber Seeds, Post Free,

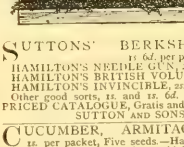

SUTTONS' BERKSHIRE CHAMPION, 1s. 6d. per packet.
HAMILTON'S NEEDLE GUN, 2s. 6d. per packet.
HAMILTON'S BRITISH VOLUNTEER, 2s. 6d. per packet.
HAMILTON'S INVINCIBLE, 2s. 6d. per packet.
Other good sorts, 1s. and 1s. 6d. per packet, as see SUTTONS' PRICED CATALOGUE, Gratis and Post Free on application.
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

CUCUMBER, ARMITAGE'S SATISFACTION, 1s. per packet, Five seeds.—Having tested this variety at our Nursery, its merits cannot be too highly stated, for it was admitted by all who saw it growing, as one of the most prolific, best in shape, large, evenly good colour, and quality not surpassed. Recommended with confidence.
WILLIAM ARMITAGE AND SON, Seed Merchants, Huddersfield

CUCUMBER, DICKSON'S FAVOURITE, or ALL THE YEAR ROUND.
We can confidently recommend this as one of the best Cucumbers grown, while it is second to none for general purposes. In Winter it grows about 1 foot long, and in Summer from 15 to 18 inches, is of deep green colour, very handsome, delicate in flavour, and particularly tender, crisp, and juicy. It is very prolific, showing two to three fruit at every joint, and furnishes a continual supply of handsome Cucumbers during the Winter, Spring, and Summer months. Per packet, 1s. 6d. and 2s. post free.
FRANCIS & ARTHUR DICKSON & SON,
The "Old" Established Seed Warehouse, 102, Eastgate Street, Chester

BROCCOLI, ELLETSON'S NEW SURPRISE, Large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by those eminent Market Gardeners, J. & J. Elletson, of Thorngumbald, who have for many years been successful in the cultivation of Broccolis, but no great industry have so far improved upon the old kind as to produce the above variety, which possesses the hardiness of its parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s. 6d. per packet.
CUCUMBER, FOSTER'S XL, fine long Ridge.—Is a remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s. per packet.
Trade supplied
EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

"Economy.—Seeds direct from the Growers."

CARTER'S "PRIZE MEDAL" FARM SEEDS

THE ROYAL SEEDSMEN

AT VERY LOW QUOTATIONS, FOR IMMEDIATE PURCHASE.

THE ROYAL SEEDSMEN

CARTER'S PRIZE SWEDE and TURNIP.

	Per lb.—s.	d.
LIVERPOOL SWEDE	0	7
Other ordinary varieties .. .. .. 7d. to	0	10
CARTER'S IMPERIAL HARDY SWEDE, (acknowledged to be the best in cultivation) ..	0	9
CARTER'S LONDON SWEDE, an immense cropper	0	9
DEVONSHIRE GREY STONE TURNIP, of quick growth and good quality	1	0
POMERANIAN WHITE GLOBE TURNIP (the largest and best White Turnip)	0	6
LINCOLNSHIRE RED GLOBE TURNIP ..	0	9
IMPERIAL GREEN GLOBE TURNIP ..	0	8
CARTER'S CHAMPION HYBRID TURNIP, green-top or purple-top, splendid stocks ..	0	10

Lowest price per Cwt. on application.

CARTER'S GRASS SEEDS AT ALDERSHOT CAMP.

We are favoured with the following evidence of the superior quality of our Grass Seeds from COL. LAFFAN, R.E.

"Col. LAFFAN is happy to inform Messrs. Carter & Co. that the 60 acres of Grass grown from the Seed supplied by them last Autumn look extremely well and promising a good crop of Hay."

N.B. These Seeds were sown under most adverse influences, both of soil and situation.

CARTER'S NEW CHAMPION INTERMEDIATE MANGEL.

The best oval shaped variety.

1s. per lb., cheaper per cwt.

CARTER'S PRIZE MANGEL.

	Per lb.—s.	d.
Ordinary YELLOW GLOBE MANGEL ..	0	8
CARTER'S WARDEN PRIZE MANGEL, remarkable for firmness of quality	1	0
CARTER'S MAMMOTH PRIZE MANGEL, the finest long red variety	1	6
CARTER'S NEW CHAMPION INTERMEDIATE MANGEL, the best oval-shaped variety (see Illustration)	1	0
ELVETHAM LONG YELLOW MANGEL ..	1	0
IMPROVED RED GLOBE MANGEL	1	0

Lowest price per Cwt. on application.

CARTER'S GRASS SEEDS AT HILSEA LINES.

J. EDWARDS, Esq., writes as follows:—

"I am pleased to say that the Grass Seeds you supplied for the Hilsea Fortifications, upwards of 2 miles in length, gave me great satisfaction."

N.B. These Seeds were sown under most adverse influences, both of soil and situation.

CARTER'S "PRIZE MEDAL" GRASS SEEDS.

The germinating quality of MESSRS. CARTER'S GRASS and CLOVER SEEDS (after most careful testing) is assured to be first-rate; and, from the great pains taken to adapt the Mixtures of Grasses to suit the particular nature of the soil intended to be laid down, the possibility of failure can scarcely be entertained. It is only necessary when ordering to give a general description of the soil, situation, &c.

CARTER'S GRASS SEEDS FOR PERMANENT PASTURES (CHOICEST QUALITY).

For HEAVY SOILS, 28s. to 32s. per acre. | For LIGHT SOILS, 28s. to 32s. per acre. | For MEDIUM SOILS, 28s. to 32s. per acre.

Second quality, 4s. per acre. Reduced rates for more than 10 acres.

LOOK TO YOUR GRASS LANDS.

CARTER'S RENOVATING MIXTURE should be now sown on Meadows that have suffered from the past dry summer. The Mixture includes the most desirable Grasses and Clovers for Hay Crop, and succeeding Green Feeding, and will soon restore a first-rate Permanent Pasture. Sow 8 to 12 lb. per acre.

Price 9d. per lb., 80s. per cwt.

CARTER'S GRASS SEEDS

FOR ALTERNATE HUSBANDRY,

Including the greatest Food and Hay producing Grasses and Clovers, in such proportions as the particular rotation may require.

	Per acre.—s.	d.
For ONE YEAR'S LAY, best quality	13	6
For TWO YEARS' LAY	17	6
For THREE or FOUR YEAR'S LAY	22	0

EVIDENCE OF QUALITY OF

CARTER'S MANGEL SEEDS.

From W. GALPER, Esq., *Duddleston, Nov 1, 1869*

"You will be pleased to hear that I have again won the Cup for Red Mangels, grown from your seed. This is the fifth year in succession that I have taken this prize."

From Mr. R. BUTCHER, *Kelmarsh, Oct 25, 1869*

"Mr. Beamish took First Prize at our show with Carter's Warden Mangel, and Carter's Imperial Swede."

A. A. MEARNS, Esq., *writes—Millend Farmery, Oct 26, 1869*

"There is nothing like the Warden Mangel in the County of Pembroke. They are most handsomely shaped."

For full descriptions of Carter's Prize Medal Farm Seeds, see

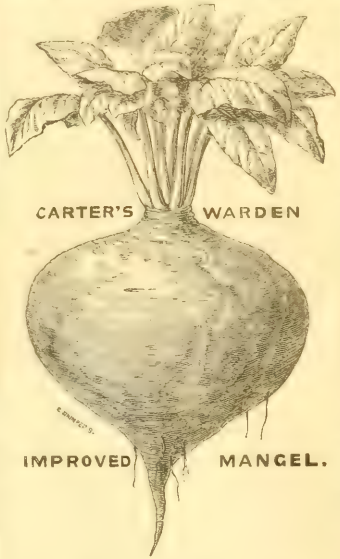

The best Globe in cultivation.

1s. per lb., cheaper per cwt.

CARTER'S "ROYAL MIXTURE"

OF FINE GRASS SEEDS FOR LAWNS, &c.

20s. per bushel; second quality, 18s.

CARTER'S FINE CLOVERS,

Free from weeds and dirt.

	Per lb.—s.	d.	s	d.
BROAD-LEAVED RED	0	7½ to	0	11
PERENNIAL RED or COW GRASS	0	10½ to	1	1
WHITE DUTCH	0	11 to	1	4
ALSIKE HYBRID	1	0 to	1	4
YELLOW TREFOIL or HOP ..	0	4½ to	0	7

Lowest price per cwt. on application.

CARTER'S "LORD'S MIXTURE"

OF FINE GRASS SEEDS FOR CRICKET GROUNDS.

18s. per bushel. (3 bushels per acre.)

EVIDENCE OF QUALITY OF

CARTER'S MANGEL SEEDS.

A. HUTELY, Esq., *Tirling, writes—Oct 7, 1869.*

"Your Mammoth Long Red Mangel is first-rate, so true that I could not find one that did not match with the rest."

From W. GUTTY, Jun., Esq., *The Laurels, Radway, Oct 11, 1869.*

"Allow me to inform you the Mangel seed you sent was first-rate. I gained the First Prize for the best Two Acres awarded by N.W. Bucks Agricultural Association."

From T. TAPLEY, Esq., *Langley Farm, Oct 27, 1869.*

"I grew a very fine crop of Mangel from your seed; the shape and quality is all that can be desired."

For the fullest information to insure successful Seeding-down Land to Grass, see

CARTER'S ILLUSTRATED FARMER'S CALENDAR FOR 1870.

Post Free, Sixpence. Gratis to Purchasers.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

Dahlia Roots.

CHARLES TURNER can supply the leading varieties in sound pot roots, 6s. to 12s. per dozen.

FELARGONIUMS.—Extra strong plants of large flowering French and fancy varieties, that will give a fine head of bloom in May and June, 12s. to 24s. per dozen.

The Royal Nurseries, Slough

Established 1806.

T. HANDASYDE AND DAVIDSON have to intimate that the FCATALOGUE for NURSERY STOCK is now ready, and will be forwarded on application.

Seed Warehouse, 71, Clerk Street, Edinburgh.

Nurseries: Brunstane Glen, Musselburgh.

HALF of a £2 2s. COLLECTION of finest VEGETABLE SEEDS, 15s.; choice FLOWER SEEDS (Carter's), 10s.6d.; 12-inch LAWN MOWER, £2 10s.; a HYDROPULT, £1 1s.; both quite perfect

A. D., *Gardeners' Chronicle* Office, W.C.

To Gentlemen, Gardeners, &c.

WANTED, all the year round, FLOWERS, FRUITS, and VEGETABLES, in large or small quantities. Distance no object. Cash promptly returned.

W. C. WATSON, Florist, &c., 8, Sutherland Gardens, Harrow Road.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. of his CATALOGUE of rare varieties, 50 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No 7

Foot's Cray Nursery, Sidcup Hill, Kent.

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (See Botanical Magazine," No. 5885.) Price 10s. 6d. each; in quantity, a special price will be given.

The honour of importation is due to Mr. Fortune; the honour of distribution (in England) to CHARLES NOBLE, of whom fine plants can be obtained

Bagshot, Jan. 29.

Juniperus hibernica.

H. LANE AND SON, having a splendid lot of beautiful-shaped trees (unsurpassed for symmetry), 4 to 5 feet high, transplanted spring 1869, beg to offer them to the Trade at £7 10s. per 100.

The Nurseries, Great Berkhamsted, Herts

Araucaria imbricata.

H. LANE AND SON, having a very large stock, beg to offer them at the following greatly reduced prices, viz., 5 to 6 feet, 21s.; 4 to 5 feet, 15s.; 3 to 4 feet, 10s.; 2 to 3 feet, 5s.; 12 to 14 feet, 10s. An inspection is earnestly solicited

The Nurseries, Great Berkhamsted, Herts

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer, in addition to his best varieties, from his great collection of Chrysanthemums, for £2: 25 Pairs ditto, 10s. 6d.; 25 Pairs POMPONS, 10s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 10s. 6d. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.

Brunswick Nursery, Stoke Newington, N.

CHRYSANTHEMUMS, CHRYSANTHEMUMS.—25 good named varieties, including Japanese, large-flowered and Pompone, for 5s.; 50 ditto for 9s.; 100 ditto for 15s.; 200 for 25s. cuttings of same 5s., cuttings of 20 older sorts 2s. 6d. No varieties will be sent which purchasers possess. The above in thumb pots package free, or shaken out 5 per cent. free.

Twenty-five varieties of Bicolor, Double and Zonal, and Nosegay PELARGONIUMS, in thumb pots, package free, or out of pots post free, for 5s. 6d. Terms cash.

WM. GIBRAN AND SON, Millbank Nursery, near Warrington.

CALCEOLARIAS, Herbaceous, of fine strain, nice plants, out of pans, 2s. 6d. per dozen; good plants, out of single pots, 3s. per dozen, free by post. Special quotations per 100

GLOXINIAS, good named varieties, 12 for 2s., 25 for 10s.; free by post.

ACHIMENES, in 20 choice varieties, 3 tubers of each for 10s.; 10 varieties, 3 of each, 5s.; free by post.

DAHLIAS, young pot roots of 50 sorts, Fancy and Bedding—package free, 50 varieties 5 for 5s., 25 for 2s. 6d., and 12 for 1s. If more than one of a sort is asked for, they will be supplied none the less.

H. AND R. STOCKER, Seedsmen, Cirencester.

VINES, from Eyes, 2-yr. old, warranted true to name and to fruit this summer, 7s. 6d. each, or the following varieties:—Black Hamburgh, Golden Hamburgh, Barbarossa, Mrs. Pince, Buckland Sweetwater, General De la Marmora, Alicante, Royal Vineyard, Black Prontignan, Foster's Seedling, Burchard's Prince, Flowering Cannes (the above, very strong, 5s. 6d. each; the 20 for £5). The kinds are

J. PEED, Edna Nursery, Brixton, S.W.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Beech of all the weaker kinds; Standard Roses, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolii, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oaks, Horse Chestnuts, Quicks, and Hedge Quick.

Samples, with height and price, on applicati n to

W. VIRGO AND SON, Wonersh Nursery, Guildford.

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, per dozen.

Dwarf-trained 3-yr. Sweet CHERRIES, ten leading sorts, 15s. per doz.

Strong cut-back extra fine Bushes, 3-yr., 5s. per dozen, 35s. per 100

Rider Trained CHERRIES, 3-yr., 5s. per dozen.

" PEACHES and NECTARINES, 60s. per dozen.

Half Standard HP ROSES, 2 feet, splendid stuff, best sorts, 60s. per 100

Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.

" Common LAUREL, 6 to 8 feet, 25 per 100

W. KNIGHT, Floral Nurseries, Hailsham, Sussex.

Strawberries for 1870.

MRS. NICHOLSON begs to say that the List of Additions to her Stock is now ready, and will be forwarded on application. Amongst the Novelties are AVOCET FINE APPLE 20s. "Hero of Lockinge," KEEN'S SEEDLING, and SOUTHGATE PINE, TRIOMPHE DE PARIS, &c. Also a List of the best of the older sorts, as DR. HOGG, MR. RADCLYFFE, &c., at reduced prices.

Eaglehurst, near Yarm

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, and Cropping Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees are all worked on the roots of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 5 to 6 feet high: also very fine Dwarf-trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12. 6d. in stamps.

The unrivalled Early Prolific Potato, 10s. per bushel.

J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety.

CATALOGUE free on application.

Fruit Trees.

WILLIAM PAUL has to offer, of superior quality, Half-standard and full Standard trained PEACHES and NECTARINES, 5s. to 7s. 6d. each

Dwarf-trained ditto, 3s. 6d. to 5s. each

STANDARD APPLES, PEARS and PLUMS, very fine, 12. 6d. to 2s. each

PYRAMID APPLES on Paradise and Doucin stocks, 1s. 6d. each

These may be planted the same distance apart as Gooseberry trees, bearing fruit like espaliers.

PYRAMID PEARS on quince and Pear stocks, 1s. 6d. to 3s. 6d. each

PLUMS, 1s. 6d. to 2s. 6d. each

Dwarf-trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES and NECTARINES, 2s. 6d. to 5s. each

RED CURRANTS, 25s. per 100; 3s. per dozen

PAUL'S Nurseries, Waltham Cross, London, N.

Paul's Rose Catalogue.

"A very complete and reliable catalogue."—*Floral World*

WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. It contains a full and excellent

Paul's Nurseries, Waltham Cross, London, N.

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants.

60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application.

WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

Charles Noble

Is CLEARING GROUNDS of the FOLLOWING STOCK:—

DWARF ROSES, fine plants, finest kinds, 40s. 50s., 60s. per 100; £15 to £25 per 1000 (Half-standards and Standards cheap in proportion)

		Per 100	Per 1000
SPRUCE FIR, remarkably fine	3 to 3½ ft	30s	£12 12s
" "	3½ to 4 ft	35s	15 15s
" "	4 to 4½ ft	40s	18 18s
" "	4 to 5 ft	45s	20 0s
" "	5 to 6½ ft	60s	24 0s
LAUREL, Common	1½ to 2 ft	10s 6d.	4 4s
" Colchicum	1½ to 2 ft	15s.	6 0s
" Portugal	3 to 5 ft	£12 10s	—
MANETTI STOCKS, extra fine			25s.

FRUIT TREES.

Maiden Peaches, Nectarines, Pears, Apples, Cherry, Plums, Pyramid Apples and Pears. Bushes, Currants, Gooseberry

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s.; per 1000, £3

100 Gladioli, by name, 10 sorts .. .. .. 8s.

100 " " 25 sorts .. .. .. 14s.

100 " " 50 sorts .. .. .. 10s. to 30s.

Highly good Mixture Bulbs

LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris

Ranunculuses, Anemones, Flower Seeds, &c.

TYSO, FLORIST, &c., Wallingford, Berks, offers a large or small assortments of those beautiful flowers, which can be sent safe to any part of the world.

RANUNCULUSES, 25 choice named sorts, 1s.

" 100 mixtures, from 3s. to 15s.

Double ANEMONES, 25 choice named sorts, 1s.

" Single ANEMONES, fine seedlings, mixed, 5s.

GERMAN and other FLOWER SEEDS, in assortments, 12. to 5s. each. CATALOGUE of seed collections, and of plants, sent free.

TREATISE on RANUNCULUS, seven stamps; ditto on ANEMONE, four stamps

JOSEPH SMITH, SEN., Tansley Nursery, Matlock, Derbyshire, begs to intimate that his CATALOGUE of GENERAL NURSERY STOCK is now ready, which he will be happy to forward on application. It contains a large Stock of Forest Trees, Hardy Evergreens, Ornamental Trees and Shrubs, American Plants, &c.

The Nursery is in a very exposed situation, the soil of a fibrous nature, and the Plants take up with excellent roots so as to ensure the best success with them.

To the Trade.

SPECIAL OFFER of LAURUSTINUS PYRAMIDALIS (NEW).

WM. KNIGHT solicits orders for the above new variety of LAURUSTINUS, having now grown it for five years past for Stock. It has been seen growing in his Nursery by many eminent Nurserymen, by whom it has been pronounced a fine, hardy, compact plant, of sterling merit, the habit being robust, compact; flowers pure white, nearly twice the size of the old varieties, and very sweet-scented, with a continuation of flowers during the most severe weather.

W. K. feels great confidence in offering it in fine specimens, 4 to 5 feet, full of bud, per pair, 15s.; second size, 3 to 4 feet, do., 10s.; third size, 2 to 3 feet, do., 7s. 6d.; fourth size, 18 inches to 2 feet, do., 5s.

Floral Nurseries, Hailsham, Sussex

RHODODENDRONS.

		Per doz.	Per 100
PONTICUM, two-year plants, 1 to 1½ ft		4s. 6d.	25s.
"	"	1½ to 2 ft	5s. 6d.	35s.
"	"	2 to 2½ ft	7s. 6d.	55s.
"	"	2½ to 3 ft	9s. 6d.	70s.
HYBRIDUM	"	1½ to 2 ft	6s. 6d.	45s.
"	"	2 to 2½ ft	9s. 6d.	70s.
"	"	2½ to 3 ft	12s. 6d.	90s.
MAXIMUM, scarce	"	1½ to 2 ft	5s. 6d.	40s.
"	"	2 to 2½ ft	7s. 6d.	55s.
HILLII, fine	plants	3 ft	15s.

Descriptive and Priced CATALOGUE (sent by the 100). For Hybrid sorts, see CATALOGUE.

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ON SALE, 5,000,000 RHODODENDRONS, hybrids, 1½ to 2 feet, fine bushy plants, 50s. per 100; 2 to 2½ feet, fine bushy plants, 100s. per 100.

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FOREST TREES.	Per 100.—s. d.
20,000 Ash, Common, 1 to 2 feet	7 0
40,000 do. do. 2 to 3 feet	10 0
5,000 do. do. 3 to 4 feet	16 0
2,000 Lombardy Poplar, 5 to 6 feet	12 0
2,000 do. do. 6 to 7 feet	15 0
5,000 Hazel, 1 to 2 feet	8 0
2,000 do. 2 to 3 feet	12 0
4,000 Spruce Fir, 1 to 2 feet	5 0
2,000 Scotch Fir, 1 to 2 feet	4 0
1,000 do. do. 2 to 3 feet	8 0
500 Dutch Willow, 5 to 6 feet	11 0
2,000 do. do. 3 to 5 feet	32 0
1,000 Huntingdon Willow, 5 to 7 feet	16 0

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Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Tom Thumb, and Fancy PELARGONIUMS, in the following low prices:—100 plants, distinct sorts, for 50s.; 50 plants for 30s.; or 25 plants, distinct sorts, for 20s., hamper and package included.

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TRICOLOR PELARGONIUMS.—In strong plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2s. 6d.; Lady Cullum, 6s.; Italia Unita, 3s.; Glen Eyre Heroine, 2s.; Crystal Palace Gem, 2s.; Sophia Dumaresque, 3s. 6d.; Italia Unita, 3s.; Richardsii, 3s. 6d.; Gold and Bronze Zonals—Beauty of Cadenham, 2s. 6d.; E. G. Henderson, 6d.; Duke of Edinburgh, 2s.; Mangles, 2s.; Sophia Dumaresque, 2s. 6d. Baskets and Packing, 1s. for a single dozen, and 6d. for every subsequent dozen. Remittances requested from unknown correspondents.

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CHAS. JOS. BLACKITH, only surviving Partner of the late Firm of BLACKITH AND CO., begs to announce that he has RESUMED the TRANSIT BUSINESS at the same address, under the style of CHAS. JOS. BLACKITH AND CO., and begs to receive consignments of Plants, Seeds, &c., for Shipment to Cox's and Hammond's Quays, Lower Thames Street, London.—Jan. 3.

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Lilium auratum.

WM. PAUL has to offer a Magnificent Lot of the above, at 12s. 6d. per 25 of 2nd size, each; 12s., 18s. 24s., and 36s. per dozen. Special quotation for the Trade off the dozen and 100. Can be forwarded by the dozen.

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Established upwards of a Century.

The Gardeners' Chronicle

SATURDAY, MARCH 5, 1870.

MEETING FOR THE ENSUING WEEK

Monday, March 7 [illegible] 7 PM

"WHAT is all this building going on just now about the Horticultural Gardens? What mean these forests of poles rearing their heads on each side behind the arcades? Is the Horticultural Society going to build something, or has the Commissioners of 1851 carrying out some new scheme?"

Such are very common inquiries put to us when we meet some friend from the country, or for that matter some friend from any quarter of London but the immediate vicinity of South Kensington. The denizens of that favoured region probably know all about it, but so many of the general public seem still in'ignorance of the matter, that we imagine we shall gratify more than we shall weary by assuming ignorance on the part of the public, and telling what to some may be a twice-told or only partially forgotten tale. The preparations in question are for an erection which Her Majesty's Commissioners for the Exhibition of 1851 are making on the annexes of the Horticultural Society's garden for the purpose of holding annual exhibitions of art and industry of the nature of the Great Exhibitions of 1851 and 1862, but so modified as to run over a series of years, instead of being crowded into one.

When the last Great Exhibition was held at Paris it was generally felt and expressed that it was likely to be the last of these monster gatherings—they could only be produced by a large expenditure, not only by the nation holding them, but also by the other nations contributing to them, and it seemed very doubtful whether the latter would continue to bear that expense. Things had reached that stage when the whole subject had to be reconsidered. The proper persons to do so in this country were obviously the Commissioners for the Exhibition of 1851. They held a large amount of property realised from the profits of that Exhibition, and the purposes for which they hold it are the promotion of objects similar to those which produced it. They represent the original promoters

of that Exhibition, and have been largely identified with every subsequent movement of the same kind at home or abroad.

With a tribunal or council so composed it was almost a foregone conclusion that the first point that they would in effect have to consider, viz., whether the holding of exhibitions should be continued or not, would be decided in the affirmative. The very reason of their existence was conclusive on this point. It is only on the assumption that the past exhibitions were of national importance and advantage that the Commission exists at all; and if of national importance in 1851, 1855, 1862, and 1867, there is no reason for holding that they have now ceased to be so, or that their work is done. If they had work to do in 1862 there is like work for them still in 1871.

This decided, there could only remain the question of the mode of holding them; and if, as seemed likely, there would in future be a difficulty in obtaining from Government the requisite funds for holding great exhibitions, the question became limited to some substitute for the great ones.

The reader will, of course, not suppose that we mean to say that such deliberations by the Commissioners actually took place. We only mean that some such considerations must have passed through the minds of those who had to deal with the subject, and that by whatever apparent route the conclusion was arrived at, the above are the considerations which must necessarily (whether consciously or unconsciously) have determined the result. Limited to a modification and diminution of past procedure, the course became comparatively simple. One thing must have risen as a gigantic beacon, or rather we should say like two gigantic beacons, to direct their path. It was plain that whatever building might be erected, it should be erected on such a plan and in such a place that it should not have to be pulled down again as soon as the exhibition was over. But if a permanent building were to be erected, and exhibitions only held at long intervals as hitherto, another difficulty would present itself. An exhibition building is not like any other building; it has peculiar requirements not easily adaptable to other purposes, and a tenant would not be easily procured, still less a tenant liable to be turned out for a year on the recurrence of every tenth year. How escape the loss of having a large building standing empty for nine years in order to use it on the tenth?

The happy idea occurred to our neighbours in Paris after the last Exhibition of breaking up the Exhibition into sections, and holding one each year instead of all in one year. This gets rid of the main difficulty. It is manifest that by dividing our decennial exhibitions into ten sections, and holding one section in each year, we should have as much exhibited as in a single great exhibition. The expense of arranging and looking after the contents would be the same in both. The general public during the ten years would get as much, nay more, because more recent and more continuous, information: and to the different trades and branches of art and manufacture, it would make no difference, because their turn would come round once in every ten years as before. The general expenses of preparing and advertising the exhibitions and maintaining the building, &c., would no doubt be largely increased, for instead of only being in operation for a year or two at the end of each decennial period they would be constantly at work; but on the other hand there should be a corresponding saving in the expense of the building, or, what is the same thing, a corresponding improvement in it. If of the same fitness as before, one a tenth part of its size would do. If the other was insufficient, then one a tenth part of the size of what ought to have been its size will suffice.

This is the plan which the Commissioners have adopted, and it is in its execution that the present forest of scaffolding has been erected. It seems well contrived to meet the special difficulties of the case to which we have above referred; but a great question remains, which experience alone can decide, viz., whether a proportionate number of visitors can be attracted to a smaller exhibition spread over a longer time as to a great one of shorter duration. We greatly doubt it. Like everything else in Nature, crowds increase in the proportion of the square of the number. The larger they are the more rapidly they grow and so diminish—and unless some unusual additional attraction be found, we should say that the scheme would prosper for a year or two, and then gradually dwindle away. There are days when its most formidable rival, as no doubt it is, although also its most powerful friend, the South Kensington Museum, itself is guiltless of humanity. A certain following it will always have—in the jewellers' year there will be jewellers, in the manufacturers' year cotton spinners, and so on; but unless something always varying and always new be found to attract the general public, it will have an uphill task before it. But such an attraction, ever varying and ever new, we think the Commissioners have found in International Exhibitions of paintings. An exhibition of the best and newest works of the best artists both at home and abroad, which the prizes offered by the Commissioners will secure, seems to us just the attraction that will save the rest. This exhibition will be perennial. The cream of art will be skimmed every year from the milk of the whole world. In every exhibition it will hold its ground; and keeping in mind the immense attraction which the paintings are to the South Kensington Museum, and the crowds that fill the halls of the National Gallery and of the Royal Academy, there seems good ground to expect that such an exhibition of the works of artists from all countries will not only be frequented by those who understand art, but on cheap days will be equally attractive to the multitude, and have an important effect in educating and improving the minds of the people.

—— The various instincts exhibited by different species of animals for the due protection and nourishment of their eggs and newly hatched young, afford some of the most interesting peculiarities for the notice

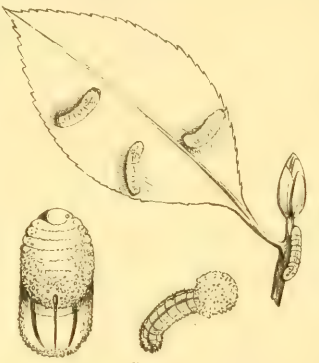

Fig. 52.

of the lover of Nature. These instincts are nowhere displayed under so many and such diversified forms as among the multitudinous tribes of insects. From the dragon-fly, which simply drops its eggs into the pond of water from which it has but recently emerged in the winged state, and in which its young as soon as hatched will be sure to find an ample supply of food, to the gnat, which glues them together and also deposits her eggs in water, but arranges them so as to form a little floating boat; or to the scarabæus, which encloses its egg in a mass of excrement which serves its young for food, and which it rolls into a perfect ball coated with sand and then buries beneath the surface of the ground; thence to the ichneumon, which bores through solid wood with its ovipositor, in order to deposit its eggs in the body of a living wood-boring larvæ, upon the fatty matter of which its young will feed; and onwards to the bee or wasp, which rear most wonderful structures for the reception of eggs and storing of food for the community, there is a successive development of mental activity, so to speak, which cannot fail to rivet our attention. Others, again, envelop their eggs in extraneous matters for their protection; thus a not uncommon species of British moth, which is remarkable for a large tuft of hair at the extremity of the body, forms a nest with these hairs, in the midst of which she deposits her eggs; whilst some of the species of Coccidæ actually develop, out of the pores of the exterior integument of their bodies, a waxen matter having a cottony appearance, which they employ in the same manner. This brings me to the subject of the present article. My attention was directed in the early part of last July to certain white objects upon the leaves and stem, and even upon the sticks used for support of the twigs, of a Camellia. They were oblong, generally curved, about one-third of an inch long, and had all the appearance of the droppings of some small bird, one end being thickened and rounded. Their appearance is represented of the natural size upon the leaf in the accompanying cut (fig. 52). On examination I at once detected them to consist of the waxy, cotton-like secretion of a species of Coccus, of which I had previously met with no notice in works of economic entomology; and on carefully looking at the thickened end of the mass, I found the minute, shrivelled-up, and brown remains of a female scale insect. The elongated floccose mass was convex on its upper surface, having a slight depression running along the middle of the back, and also a fainter one along each side; it had also the appearance of transverse but curved impressions, so that it might almost be taken for the body of a footless caterpillar. On examining the tree more closely, I fortunately found a female individual still alive, and in the act of forming its floccose mass. The form of the female is broadly ovate and depressed, the head tolerably distinct, without any appearance of antennæ or legs visible from above. Having only found this single female in the act of forming its mass, I was unwilling to disturb it to examine the underside of its body, in order to see the structure of its legs, antennæ, and sucker. The hind part of the body is covered with minute particles of exudation, giving it the appearance of having been powdered with minute grains of moist sugar. The insect was of a pale greyish buff colour, the hinder part of the body having a slight fleshy tinge, and the lateral parts being freckled with fine dark lines meeting and forming cells. From the hind part of the body of the female was protruded a mass of the floccose white matter above mentioned, extending backwards about half the length of the insect, and exhibiting a few of the transverse compressed lines, evidently formed by the downward pressure of the extremity of the insect's body upon the soft waxy matter. Hence it is evident that the mass is gradually protruded backwards until it is three or four times larger than the whole body of the insect itself. On carefully examining the floccose mass with a microscope, an immense number of minute eggs were found embedded in it, and which were hatched within a few weeks after my discovery of the animal. This event took place during my absence abroad, and on my return I found the bottom of the box in which I had placed the insect covered with minute powder, which proved to consist entirely of the dead bodies of the extremely minute young, which, having no means of escape, and wanting a due supply of food, had died. Although I had nowhere before seen this insect in any English conservatory, I detected it shortly afterwards on Camellias in the gardens of my friend Dr. Verboren, at Hooghtlands, near Utrecht, in Holland, where however it had not previously attracted attention. From the preceding remarks it will be evident that these beautiful trees ought to be carefully examined in the middle of the summer, at which time the parasite is especially visible, on account of its size and white colour, and the earlier the floccose mass is discovered and burnt the safer, as the eggs are deposited in the midst of the mass, and are hatched very shortly afterwards, the period of hatching of course depending on the heat of the weather at the time. We have still to speak of the early states of the insect, and its mode of attacking the Camellia, but in the meantime propose for it the name of Coccus flocciferus. *J. O. W.*

—— We understand that the Council of the Royal Horticultural Society have awarded a Silver Medal to Miss Eleanor A. Ormerod, Sedbury Park, Chepstow, in recognition of the assistance she has given the Society's collection of Economic Entomology.

—— We have before us samples of a very useful Cheap Sectional Paper for plan-drawing, prepared by Messrs. Letts, Son & Co., of New Cross, which we can recommend as being likely to prove of great utility to those who are engaged in designing garden plans and buildings, flower-beds, &c., or in roughly tracing out or copying any such designs. The paper is ruled into uniform squares, of various sizes in different samples, by faint lines, which, while sufficiently legible to serve all the purpose of a scale, are not so obtrusive as to confuse the drawing. The paper is kept in stock of foolscap and post 8vo sizes, and also in the form of note-books, and the squares vary in measurement from an eighth of an inch to an inch, so that they may be taken to represent any scale of measurement fixed upon. The manufacturers do not claim for this ruled paper any superior merit as regards mathematical exactness, but they introduce it rather as a useful and cheap paper on which rough plans can with great facility be drawn to scale, and which can be coloured, without the ruled lines being objectionably prominent. They have also a tracing paper, similarly ruled.

—— We learn from *Nature* that a Royal Commission to inquire into the present state of Science in England is to be instituted. Much good will certainly follow from such an inquiry, especially at a time when the arrangements for the prosecution of science in this country are acknowledged on all hands, not only to be "chaotic," but detrimental to the national interest.

—— The discovery in Middlesex of Cotula coronopifolia, a plant entirely new to Britain, which has made its appearance in a brickfield opposite the new church at Highbury, has recently been announced in the *Field* by Mr. Edward Newman. "The plant," says Mr. Newman, "was found last autumn covering a large patch of ground, growing most luxuriantly and flowering abundantly. I am well aware that the locality would at once preclude the idea of its being introduced into our lists as an indigenous species; but how comes it in its present locality? It

has never been noticed as an accidental introduction, and has never been cultivated as a garden plant; nor is it likely to be, for it has nothing whatever to recommend it to the florist. A rather especial interest attaches to the European appearances of this species, for it is supposed to have been originally brought from the southern hemisphere, perhaps the Cape of Good Hope, by the Dutch, about the time of Linnæus, and has since shown itself in Holland, Denmark, and North-western Germany. A second time it seems to have been introduced, perhaps from South America into Spain. It would, therefore, appear to have established two European centres, from which it may possibly spread, and it would be exceedingly interesting if anything could be ascertained about its introduction at Highbury. The 'Flora of Middlesex,' by Messrs. Trimen and Dyer—a very industrious and complete compilation of all botanical memoranda attached to the county—contains no notice of the Cotula. I am indebted to Mr. Peter Gray, a well-known botanist, for specimens and this notice of the discovery at Highbury, and to Mr. Watson for the geographical details given above."

New Garden Plants.

MONOLENA PRIMULÆFLORA, *Hooker, in Bot. Mag.*, t. 5818.

Glaberrima, rhizomate crasso tuberoso, foliis petiolatis late ellipticis acuminatis coriaceis obscure sinuato-dentatis ciliatis 3-5-plinervis, supra læte viridibus, subtus petiolisque rubro-purpureis, pedunculis ex apice rhizomatis numerosis petiolo subæquilongis 2-3 floris, calycis tubo globoso lobis inæqualibus rotundatis, petalis roseis basi albis.—*Bertolonia primuleflora*, Hort.

This remarkably beautiful stove-plant was introduced by Mr. Bull, F.L.S., from New Granada, and a flowering specimen was presented by him to the Royal Gardens, Kew, in November, 1869, from which the accompanying drawing was made. It appears to flower very freely, and whether for the number and delicate tints of the flowers, or the brilliancy of the green upper and purple under-surface of the leaves and petioles, it certainly may take rank with the best plants of its class.

There is a very similar, and probably identical plant in the Hookerian Herbarium, collected by Lechler in Peru, and also in woods about Monterico, at an elevation of 3000 to 4000 feet, by Pearce, who describes the leaves as fleshy, subacid, and astringent. Lechler's plant is labelled Monolena Sprucei, by Triana, but that name being unpublished, I have adopted that of primulæflora, which has been already applied to it.

Description.—Rootstalks crowded, as large as a hazel nut, scarred. Leaves, 4 to 6 inches long, elliptic acuminate, three to five-nerved from above the base, margins sinuate-toothed, ciliate, upper surface bright glossy green, lower and petiole red-purple. Peduncles, variable in length, two to three flowered. Flowers, 1 inch diameter, deep bright pink, with a white eye and yellow anthers; bracts orbicular; pedicles very short. Calyx, tube bluntly trigonous, globose, lobes short, rounded. Petals obovate or obcordate. Anthers, with a club-shaped, erect appendage. Style, swollen above the base. *Bot. Mag.*

The plant above described is the one to which we alluded in our summary of the new plants of the past year at p. 38, under the name above adopted. It was catalogued and exhibited by Mr. Bull, under the name of Bertolonia primulæflora, but it belongs more properly to the genus Monolena, a genus published from M. Triana's indications, in the last issued part of the "Genera Plantarum." Our illustrations (figs. 53, 54) are from the pencil of Mr. W. G. Smith, and serve to give an excellent idea of the plant, though for the beauty of the colouring, both of flowers and leaves, we may refer to Mr. Fitch's figure in the "Botanical Magazine" above quoted, or to that of Mr. Smith in the "Floral Magazine." Fig. 54, A represents a vertical section of part of the flower, showing the singular stamens, the receptacular cup surrounding the base of the spindle-shaped style, &c.; B and C represent detached flowers, of the natural size; C shows also the petals twisted in the bud.

Pearce, in his memorandum attached to the specimens in the Kew Herbarium, calls attention to the sub-acid taste of the leaves, like that of Begonias, to some of which plants there is also a superficial general resemblance in the stock and leaves. It is one of the most beautiful novelties, and is sure to be a favourite with gardeners.

FIG. 53.

MARKET GARDENING IN ALGERIA.

Concluded from p. 270.)

Asparagus.—The market is supplied principally with wild Asparagus, the cultivated kind not being much used. There are five species of Asparagus common in Algeria, the sweetest being Asparagus acutifolius, but the young shoots are not much thicker than a crow's quill. The shoots of Asparagus albus are much thicker, but they possess a rather bitter taste. This last named species forms a prickly bush about 4 feet high, and is covered with white sweet-smelling flowers in the month of September.

Chick Peas.—These are the seeds of Cicer arietinum, and are held in great esteem by the natives, who call them *hamous*. Large quantities are imported from Spain, and the plant is extensively cultivated in Algeria. The leaves exude pure oxalic acid, which indelibly stains the clothes of any person walking through a field of this plant. They are cultivated in rows, like Haricots, and do not require irrigation.

Gesses are the seeds of Lathyrus sativus. They are much used by the poorer Spaniards, and do not require irrigation. They are sometimes used for fattening swine.

Lentils are also grown, but the greatest portion consumed is imported from France and Spain.

Peas.—The Paris markets are supplied with green Peas from Algeria about the middle of March, but the time in which they are most abundant is in April and May. The climbing sorts are grown in fields, but have no support provided for them. They are sold in the market by weight in their pods, the lowest price being about a halfpenny a pound. A variety is cultivated the pods of which have no stringy filaments, and are eaten without being shelled: the French call them *mange-tout*. There is nothing peculiar in the cultivation of the Pea: they are called *djilbane* by the Arabs.

Beans.—These are extensively cultivated by the natives and settlers: they come in a little later than Peas, and are called *foule* by the Arabs.

Haricots.—These are cultivated chiefly by the French settlers, for although the Arabs and Moors are acquainted with them, they seldom make use of them. There is a variety advertised by the London seedsmen under the name of Haricot d'Alger, but I doubt very much its Algerian origin, as it was cultivated in France before the French took possession of Algeria. It is one of the kinds known by the name of *mange-tout*, as they are gathered when the seeds are fully formed and both pods and seeds are eaten together. The dwarf kinds are sown in dry ground, and require no water, but the climbing varieties are always irrigated. The former are sown in rows about 3 feet apart (frequently in young vineyards); the seeds are placed very shallow in holes, about 9 inches apart. There is a French proverb, which says that the Haricot ought always to see its master leave the field, by which is meant that it should be covered so lightly with earth as that one should be able to see through it. They are sown in April, as the slight hoar-frosts which occur frequently in March would destroy them. In Algeria the common

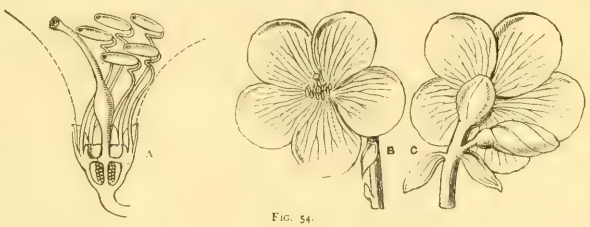

FIG. 54.

—— We are informed that, as part of the scheme for the instruction of women in science and art, Professor OLIVER will commence his lectures on BOTANY on Friday, March 11, at 11 A.M., in the lecture theatre, South Kensington Museum. Tickets may be obtained at the catalogue sale hall, South Kensington Museum. The Hon. and Rev. Francis Byng, Treasurer.

—— We have on our table the 1st Number of what is practically a new series of the JOURNAL of BOTANY, edited by Dr. SEEMANN, in conjunction with Mr. J. G. BAKER, of the Royal Herbarium, Kew, and Dr. H. TRIMEN, of the British M^us^eum. We are very pleased to see the Journal in its new guise, and wish it every success, as in none of the existing periodicals are the interests of botany sufficiently cared for. The present Number is a great improvement on its predecessors, and contains a great deal of original matter of interest, besides full summaries of the progress made in various departments of botany. We trust it may be carried on in a broad, liberal spirit, so as to cater, not for one particular class of botanists, or one special branch of the science, but that all departments of the science, not forgetting physiology, may receive their due share of attention. The names of the Editors afford sufficient guarantee that their work will be done well; and hence we trust they will receive the support and encouragement of all classes of plant lovers. We shall make further allusion to the contents of the present Number, merely adding now that the annual subscription has been reduced to 12*s.*, payable in advance.

—— The WEATHER in England during the WEEK ending FEBRUARY 26 was a great contrast to that of the preceding week. The mean temperature of the air at all places in the Southern and Midland Counties was fully 5° warmer; it was about the same as in the preceding week in the Northern Counties, but in Scotland it was fully 2° lower in temperature. The fall of rain was small in the Southern and Midland Counties of England, it amounted to about four-tenths of an inch in the Northern Counties, and in Scotland it was a heavy fall. Vegetation at all places was subjected to a temperature below 32° on every night to the 25th.

—— We learn with much regret that the celebrated botanist, Prof. Fr. UNGER, died suddenly on February 13th, at Gratz.

fruit trees, such as Apples, Pears, &c., are as backward in March as they are in England.

The *Scarlet Runner* is only cultivated as an ornamental plant, as the pods are not eaten by the French.

Capsicum.—Only two varieties of Capsicum annuum are cultivated, one of which is of the size and shape of an Apple, with the eye very deeply marked. It is used in its green state, and is placed on hot charcoal or wood embers, by which process the skin is blistered, and can be peeled off. The seeds are then taken out, and the flesh cut into strips, and when mixed with raw Tomatos sliced, it makes an excellent salad. There is not the slightest acridity in this fruit. The other variety in cultivation is very hot and fiery; it is of a conical shape, about 3 inches in length, and very pointed at the extremity; it is frequently ground into powder, and used by the Spaniards to colour and flavour their dishes of rice; for although the Spaniards of the south of Spain eat rice every day, they would not touch it unless coloured with either saffron, or red pepper, as this powder is called. Capsicum is first sown on a seed-bed, and then planted out in April or May; it requires a large amount of irrigation, and its treatment is the same as that of Tomatos. The Arabs use large quantities of the hot variety, and call it *filfil ahmeur* (red pepper).

Egg Plant.—The fleshy fruit of this Solanaceous plant is held in great estimation both by the Europeans and natives. They are cultivated in the same manner as Tomatos, and require irrigation. The French call them *aubergines*, and the Spaniards *beringenas*. They are generally fried in slices, having been previously scored and sprinkled with salt, which causes the sap to exude abundantly, and which is considered to be of a poisonous nature.

Coriander.—The leaves of Coriander are much used by the Moors as seasoning in their sauces. They have a very powerful smell of bugs, and are called *kasbar*.

Parsley is in great request for the same purposes as used in England; it is called in Arabic *madenouss*.

Fennel, in Arabic *besbass*, grows wild in great abundance; it is not cultivated, but is gathered wild and brought to market; it is only used by the natives, who eat the stems before they come into flower. There is a plant nearly allied to Fennel which covers the hills near Algiers: it is Ferula communis. The flowering heads before expanding are as close set as Cauliflower buds, and covered with membranous sheaths. The Arabs roast these heads under wood ashes, and esteem them very highly, but their powerful resinous taste forbids their use to Europeans. They are called *guelkha*.

Thyme, Sweet Marjoram, Tarragon, Savory and Sweet Basil are grown in most gardens for the same purposes as in England and France.

Garlic is very largely used by the natives and Spaniards. It is principally imported from Spain, but is also abundantly cultivated in Algeria. *Leeks* are also common.

Carrots, Turnips, Lettuces, Salsify, Beetroot, Radishes, and *Jerusalem Artichokes* are grown as in Europe, but neither Turnips nor Mangel Wurzel are ever grown in fields for the consumption of cattle, as they require too much water in summer to allow of their culture being profitable.

Sweet Potatos are the tubers of Convolvulus Batatas, and although a few are cultivated in the gardens of the curious, the great quantity sold in Algiers is imported from the southern provinces of Spain.

Yams are only cultivated in a few gardens, and are very seldom seen in the market.

Chayote.—This is the fruit of a Cucurbitaceous plant, Sechium edule. It grows very readily, but is very rarely brought to market. It is cut in slices and fried in oil. This fruit is very common in Madeira, from whence it is yearly exported to London in small quantities.

I know of no vegetables peculiar to Algeria, but there is a plant cultivated in the Levant and southern shores of the Mediterranean under the name of Gombo. It is the seed-pod of a Malvaceous herb, Hibiscus esculentus, and is a native of South America. It is brought to market by the Moorish gardeners, and is only used by the natives. The pods are stewed with meat, and are very mucilaginous and tasteless.

Cabbages and *Cauliflowers* and other similar plants are cultivated as in France, and call for no special observation. The Genoese gardeners excel in the production of immense heads of Cauliflowers.

Capers grow wild: I have never seen them cultivated in gardens. Nearly all the Capers used are imported from France. It is a vulgar error to suppose that Capers are the fruit of the plant; they are the unopened flower-buds, the fruit being fleshy, and of the size of a sparrow's egg. They are called in Arabic *alcapara*.*

Sorrel and *Spinach* are cultivated by the French. The Spaniards supply the place of the latter by the leaves of wild Beetroot, which they consume in large quantities, under the name of *acelga*. The last plant I shall mention is the *Purslane* (Portulaca oleracea), the leaves of which are either used in soup or made into a salad with Cucumbers.

On the whole the reader will perhaps be surprised to find such a similarity between the productions of Algerine and European gardens, but it must be borne in mind that the latitude of Algiers is not lower than some parts of the southern coast of Spain. *Giles Munby. Alice Holt Forest, Hants.*

* Capers are very abundant on the walls of Valetta, the chief town of Malta, and I recollect in 1840 seeing a notice posted up, that no one was allowed to "cut Capers on the walls."

AURICULA CULTURE.

The Auricula, thanks to Mr. Turner, of Slough, and a few others who have not discontinued its cultivation, bids fair again to hold a prominent position as a florist's flower. Many of your readers no doubt will remember the glorious Auricula shows that used to be held in years gone by at the Horns Tavern, Kennington, where we used to stage our pairs of plants with as much delight and importance as though we were possessed of the greatest treasures in the land. There the southerners and northerners met, discussed the merits of the plants, show, &c., shook hands, and generally parted good friends. I use the word generally, because there was always a rival feeling between the northern and southern growers. The opinions held by the northerners as to what constituted perfection in some of the florists' flowers, were not exactly admitted by the southern growers; yet, as a rule, these meetings were very convivial, and did much good.

The Auricula must have abundance of air, and be carefully watered, or it will not thrive. It is easily propagated by offsets or suckers, which should be taken off when sufficiently strong for the purpose, which is about potting season. If required, they should be stripped of their bottom leaves, and then be inserted in a well-drained pot, or wide mouthed pan, filled with a mixture of leaf-mould, loam, and sand, and placed in a shaded situation in a cool frame, or under a hand-glass, shaded from the midday sun, and carefully watered. If not planted too thick in the pans, they may remain in them until the general potting season has arrived, but they should be wintered along with the old established plants. Potting should take place soon after the plants have gone out of bloom, although some growers prefer shifting their stock in August. At this shift the young plants as well as the old ones should be turned out of their pots, and have the mould shaken from their roots, in order that they may be thoroughly examined, to see that the fibres are sound. Any roots that are growing too vigorously should be shortened, and all decayed or yellow leaves should be removed. In potting, bear in mind that the pots should be thoroughly drained, this being one of the most essential points in their culture; and if it is not attended to they will not flourish as they should do, and may even possibly prove a complete failure. The collar of the plant should be kept well up, in order that water may not lodge in the lower leaves; for if not very skilfully watered this often happens, and the plants rot off.

After the potting is finished, they may either be removed into a frame for a few days, in order to get the mould thoroughly settled, or placed in their summer quarters, which should be under a north wall. They should be set on a bed of coal-ashes, keeping a sharp look-out for slugs. If convenient, a temporary framing should be erected, in order that some protection may be thrown over them to screen them from heavy rains, and care should be taken to keep the offsets free from drip. They may remain in this situation until the end of October, and besides gathering seed, carefully watering, and in hot weather syringing them occasionally, little else will be required up to that period, when they should be removed to their winter quarters.

A pigeon-holed brick pit will be found suitable for them, as they delight in an abundance of air, and should on no account be kept close, unless the frost is very severe. But little water will now be required, as the plants will be in a semi-dormant state; what they do have should be given very cautiously. About the end of February remove a portion of the old soil from the pots, top-dress them with rich compost, and remove any early blossoms that may happen to have been thrown up; keep also a sharp look out for green-fly. As spring advances give them more air and water. As the truss grows, and previous to the pips expanding, remove those that are deformed or overcrowded; sharp-pointed scissors will be found most suitable for the purpose, bearing in mind that the less they are handled the better; and at this stage of growth they should be slightly protected from the hot sun. While in blossom they may be removed to any shady and airy situation most suitable for prolonging their beauty, but care must be taken not to drop any water on them at this stage, or their blooms will be partially spoiled; they should also be protected from rough winds.

The soil best suited for the culture of the Auricula is rich loam, rotten cowdung, and river sand, well mixed together previous to using it, and should be employed only when in a proper state. Manure-water, with occasional applications of soot-water, will be found beneficial during the growing and blooming season. The month of January is the best time for sowing the Auricula seed. The pots or boxes intended for the purpose should be well drained, and then filled to within an inch of the top with a good compost, as recommended above, sifted moderately fine; shake it well down, that it may not sink after the seed is sown, and level the surface. On this must be placed the compost for the seed to be sown in, which should be composed of three parts leaf-mould and one silver sand sifted fine; fill the pot or box with this compost to within a trifle of the top, and carefully level, and slightly press into a smooth surface; then sprinkle the seeds regularly over the surface, and gently press them into the soil. This done, sift through a very fine sieve some of the leaf-mould and sand over the seeds as thinly as possible. The seeds of Auriculas are extremely small, and require a soft fine soil of an open quality, for their tender roots cannot penetrate compost of a close texture; thousands of Auricula seedlings are lost for want of this precaution.

As soon as the young seedlings appear, keep a sharp look-out for woodlice, which often prove very destructive to them. When the plants are sufficiently strong, plant them in boxes, or whatever may be most convenient, in good rich compost thoroughly drained. They may remain there until they flower, when the best should be selected and the remainder discarded. Many of the weaker plants will doubtless not flower until another season, but they should be kept and receive good treatment until they do bloom; the remainder of their treatment should be the same as that already recommended for established plants. The alpine varieties may be successfully cultivated in the open borders. *Edward Bennett, Osberton.*

TRUFFLES.

The Truffle plays in gastronomy too considerable a part not to have been the object of numerous studies. M. Henri Bonnet gives the catalogue of them at the end of his work [La Truffe: études par les Truffes comestibles, au point de vue botanique, entomologique, forestier, et commercial. Par M. Henri Bonnet, Vice-Président du Comice Agricole, et Membre de la Chambre Consultative de l'Arrondissement d'Apt. Paris: Delahaye, 1869], commencing with the writings of Theophrastus, who lived in the fourth century before our era. But a more serious consideration has moved the greater part of the works which M. Bonnet enumerates, and especially that which he himself publishes: it is the kind of mystery which surrounds the nature and the production of this Cryptogam, on which science is yet much less advanced than on what concerns the Mushroom. For a long time it has been thought that it was formed spontaneously in the earth under the influence of heat, moisture, and especially the forces which are put into action during storms. No doubt that this production requires, in fact, as generally do all plants, heat and moisture; but moisture must be moderated, supplemented by the coolness produced by the foliage of trees on wooded land, without, however, the rays of the sun being too much intercepted. The influence of the electric forces which produce or accompany storms, seems also to be proved by a great number of observations; but this influence is probably only indirect, and is restricted to the action of the ammoniacal products to which the sparks, which then wander about the atmosphere, give rise. These ammoniacal products, carried into the soil by the rain, are very necessary to the Truffle, which contains much nitrogen, and which, buried to a certain depth, can only with difficulty borrow this element from the atmosphere. But, if it is incontestable that these diverse influences are either useful or indispensable for the development of the Truffle, it would be necessary to set aside all our ideas of the most elementary laws of Nature in order to imagine that they alone can produce a plant.

A theory less irrational, and which has still some partisans, gives to the Truffle an origin analogous to that of the Gall-nut. According to this system, a fly, penetrating into the soil, pricks the rootlets of certain trees, especially the Oak, to deposit its eggs, and thus provokes an accumulation of nutritive juices, whence results the Truffle. The falseness of this theory is shown by the anatomical study of the Truffle, by that of the fly to which its formation is attributed, by the position of the Truffles relatively to the roots and rootlets of the trees, and lastly, by the fact that, more than once, Truffles have been found in localities where there was not a single tree.

M. H. Bonnet, adding his own observations and the results of his long experience to those which several eminent naturalists had obtained, establishes incontestably a theory, of which the following is a *resumé*:—The Truffle contains a multitude of spores, which, when they come to be dispersed by the putrefaction of a tubercule, or by any other cause, give rise, if circumstances are favourable, to the formation of a product analogous to the spawn (*blanc*) of Mushrooms, and which is composed of numerous white cylindrical threads, of extreme tenuity, adhering to the earthy particles only by the slender extremities of their branches, and end in a hybrid mycelium, becoming less and less apparent. This product is to be regarded as properly constituting the plant, of which the tubercule—the Truffle itself—is, after some sort, the fructification. This is the conclusion arrived at, in his important work, by M. Bonnet. *Les Mondes.*

AËRIAL ROOTS UPON VINES.

Some little time ago a very interesting discussion was carried on in the pages of the "Florist," respecting the formation of air-roots on the Vine, which elicited a good deal of valuable practical opinion. I do not wish to revive the question as to their cause or origin, but simply to show how I prevent them. I may, however, in preface to my remarks, be allowed

to state what I think of the presence or creation of those roots; and firstly, I believe of Vines that "it is their nature to produce them," and they are produced more plentifully, as Mr. Cramb states, "when circumstances are favourable to their production." [!]

Although I do not like to see them, I am not of opinion that their presence on Vines either indicates good health or the reverse, as they come more or less from Vines both well ripened and otherwise. Neither can we build much on the fact that, of several Vines growing together, and having precisely the same treatment, some are "bearded," whilst others are not. I am further of opinion that such occurrences can be but as poorly accounted for. To account for the presence or absence of either beards in men, or horns in cattle, is in my opinion beyond all human ken; and so with the beards or aërial roots on Vines, gardeners may rest assured that in the cultivation of the Vine there are far worse enemies to contend against than air-roots. These may be got rid of in an hour or two; but not so red spider or mildew, a severe attack of either of which generally ends in the partial destruction of both leaves and fruit, and a weakening of expectations for the following year.

It is now eight years since I planted the Vines at Combe. The borders were made, drained, and finished according to the desire of my heart, and the Vines have grown, and shown by their productions that they delighted in the borders prepared for them. Two of my early vineries I bestowed great attention upon, by warming their roots, and otherwise caring much, as I thought, for their comforts, but this I soon found to be mistaken kindness. The Vines spoke out, and requested that the heat applied to their "bottoms" should be removed. Being desirous to attend to their wants, so far as I knew them, the heat complained of was altogether withdrawn, and for which attention they were very grateful.

Once again we had occasion to come to an understanding respecting a system which I introduced on a Vine or two, called the "extending system," leaving for a year or two some lengthened arms upon them, and which system was threatened to be continued. They asked me one morning whether "I meant them to produce Grapes or timber?" Never having given it a thought to what use their timber could be applied, I was somewhat taken aback. I blushed, and somewhat sheepishly replied that "I wanted Grapes." They told me "I should have them, but I was not to expect them to grow large bunches and timber besides; take them singly, we will do either for you well, but both together very indifferently." There was sense, I thought, in their reasoning, and for which I thanked them. I ignored on the spot the heavy timber, and clung to the Grapes, and ever since they have borne me both big bunches and good ones, and these in abundance, for every day throughout the year.

I come now to make a few remarks on aërial roots:—My young Vines produced them as plentifully and as healthily as any Vines could do; I let them grow, and there they were for any one to look at. Visiting gardeners would often remark after this manner—"Air roots! something wrong with your border;" and nothing I could say altered their opinion—the new borders at Combe were set down as "being no better than anybody else's." This latter observation I did not wish to dispute. There is nothing in gardening I detest more than, when showing a friend round, to have my attention drawn to points of the weakness of which I am already too well aware; but I suppose it is inherent in our nature to be continuously looking for holes in our neighbours' coats. I therefore resolved to have no more air roots, and following up the thought with the action, I denuded my Vines of every air root that I could see; and to the young men, when pinching and tying, I gave strict injunctions that all air roots should be rubbed off immediately on their appearance. This was diligently followed up throughout the season, and having got rid of them, so far as visible, I also got rid of the unpleasant duty of answering the inquisitive questions of visiting friends.

The Vines divested of their aërial roots made no complaint to me; but I was informed that amongst themselves they admitted that in this case I was reasonable; and that as they were allowed a sufficiency of length, breadth, and depth of border, and also in it as much good feeding material as they could desire, they would for the future allow their aërial roots to be rubbed off, and draw their supplies direct and only from the legal sources allotted to them; and, continued they, "Our leaves in the houses are well cared for; we ought not to insist in projecting our roots where it is very evident they are not wanted; we did so only because it was our nature to do so, and also because circumstances were favourable."

After this I was acknowledged to be their "lord and master." Things now go on smoothly. All their grievances and disputes amongst themselves are at once submitted to my arbitrament; my decision is accepted and bowed to respectfully in all cases.

"A king can mak' a belted knight,
A marquis, duke, and a' that,"

but it is something of which to be proud, that by kind attentions to such princely inhabitants of our vegetable kingdom as the Grape Vine, one can by them be acknowledged as a real "lord of Nature." *Wm. Miller, Combe Abbey Gardens.*

THE "ARCHIMEDEAN" LAWN MOWER.

We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement, but for our benefit, and for the benefit of mankind generally. We owe to them many thanks for many wonderful inventions, appliances, and improvements amongst our garden implements, whereby laborious toil has been much lessened, and the art of gardening much improved. Twenty years ago mowing-machines were but coming into notice, and but very little believed in. Now they are all but universal, and the time-honoured scythe (to learn the use of which was a severe trial on many a young gardener) is rapidly disappearing from our sight, and giving place to the "patent mower." What a revolution! what a saving of time! and how much more neatly are our lawns kept under the new than the old system! Our English makers have long enjoyed the prestige in this particular line, and their "mowers" have, deservedly, achieved a world-wide celebrity. Our "Greens" and our "Shankses" and others, have continued to supply us with their "improved patents"—so much improved too, and so excellent in their workings, that their action has always exceeded our expectations. We have been so supplied, in fact, and so

well satisfied, that we had no desire for change. We were inclined to believe—as, indeed, seems to have been generally believed, seeing the hosts of imitations all much after the same principle—that while slight improvements might be effected here and there, the general principle of our lawn mowers could not be altered, and was as near perfection as anything could be. The astute Yankee, however, thought not, and forthwith introduces to our notice "The Archimedean Lawn Mower," of which a representation is given in the accompanying woodcut (fig. 55.)

This is of an entirely novel and peculiar construction, differing materially from all others yet extant. The general principle may be said to be the same, in so far that the grass is cut by a revolving cutter set in motion by a roller propelled by the operator in the usual way. The knife or cutter itself is, however, different, being of the form of the Archimedean screw, and revolves with great rapidity. Another peculiarity is the absence of the roller in front of the knife, which is thus allowed to take hold of the "grass as Nature grows it;" and in this there is a point or two gained, as whatever comes within the range of the knife, whether "Bent" or Daisy, is cut clean off. In the ordinary mowers with the rollers in front the tall grass is bent down in front of the knife, so that it cannot touch it, but passes over, which then has to be cut down with the scythe. In place of the roller in front there is on each side a flat iron sole or skid, upon which it slides along very smoothly and evenly, and by the adjusting of which the height of the cutter is easily regulated. It may thus be set to cut the grass either close to the surface or an inch or more above it; and this, we think, is an improvement, as some mowers seem to us not exactly to cut, but to force the grass out by its very roots.

The chief peculiarity, however, and one on which opinions are apt to be somewhat divided as to its merits or desirability, is that "the grass when cut, instead of being gathered up is scattered over the ground it passes over." And further, it is not intended by its promoters that the grass should be gathered up. To quote from the circular—"By the action of the revolving cutters the grass is cut in small particles, and evenly scattered on the ground where it is cut, never looking untidy, and should never be taken away, as it serves as a mulch to protect the roots of the grass from heat or drought, leaving the lawn always green and fresh, making a rich sward, and in a short time so enriches the sod that fertilisers are not wanted." We can only say that, having used the Archimedean lawn mower on our lawns during the past summer that they never looked better; the grass, being cut up so fine, is never observed if the lawn is cut as it ought to be, once a-week or so. We believe also that it serves somewhat as a protector from drought, &c., and therefore approve of the principle.

This machine will cut grass equally well when wet as when in a dry state, and a much heavier sward of grass, even of the length of 6 or 8 inches, if requisite, may be cut down with this mower at one operation, than with any other machine known to us, even by passing over the ground two or three times.

It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is from thence reported on in the most favourable terms, as being the quickest, most simple, and most efficient mower ever used. The cut of the mower is 14 inches, and it is easily worked by a mere boy. There being no stoppages required whatever, the quantity of work done within a given time is thus considerably greater than that of any other mower. Such is the opinion formed on it by the authorities at Chiswick, and such is ours.

ORCHID CULTURE.

I have not the pleasure of knowing the writer of the article on Ferns, at p. 246. I have no doubt he speaks with some authority on the subject of the culture of Orchids in England, and that he has had great and extended practical experience, yet unless he has visited the tropics and seen these plants growing in their own climate, I do not consider he is justified in a sceptical and disparaging way to ridicule the information of others who have seen Orchids growing under the rays ("fierce") of a tropical sun. Certainly a dry summer which burns up the herbage in England is not worthy of imitation. It is exceptional, unnatural, and should not be taken in support of an argument; on the contrary, we should be guided by general principles, the majority of facts coming under notice.

I have for several years at different times been engaged in the collection of Orchids in Burma. I have lived in the jungles for weeks, I may say for months, and tons of different kinds have passed through my hands, mostly either gathered by myself or in my presence. Under the above circumstances I may perhaps be bold enough to consider myself as a person who has for more than "once" seen different Orchids growing in a tropical climate at different seasons and under different circumstances. I have then no hesitation in confirming the truth of the statement that Orchids, during the hot season, are exposed to the fierce rays of a tropical sun, and become scorched.* As these Orchids are found invariably under the same climatic influences, I believe it to be both natural and best suited to their constitutional wants. In the tropics there are a great variety of climates, and in each variety of climate we find that variety of Orchid which it best suits.

Some Orchids have a wide range of distribution; others, again, are restricted to particular localities. For instance, I have never found Saccolabium giganteum at Moulmein or Rangoon, or south thereof—I presume simply because there is too great moisture in the atmosphere; but travelling northward, beyond the extreme influence of the S.W. monsoon, the plant puts in an appearance, first in small quantities and of small size; but as you approach the drier climate of Prome and Thayetmyo, where hot winds blow, and the thermometer is usually in the dry season about 112° Fahr. in the shade, the plant is found in great profusion and luxuriance growing on trees in a deciduous jungle exposed to the rays of a tropical sun, and in most cases with its leaves in a scorched state. I could give numbers of similar examples, as Vanda Bensoni, Saccolabium ampullaceum, &c.,† but it appears to me to be unnecessary to do so at present. Most Orchids love light, air, and water, good free drainage and ventilation. The Burmese Orchids I have seen in England are, although well-grown, deficient in brilliancy of colour, and this I attribute to want of light—the rays of a tropical sun.

* In using the word "scorched," I do not mean thereby that plants are "burnt to cinders."

† Dendrobes during the hot season are leafless, standing like dried sticks on the trees. Their cylindrical form offers but a small surface to the rays of the sun in comparison to Saccolabium giganteum.

The culture of tropical Orchids in England cannot be other than artificial or unnatural, and in the absence of a tropical climate it remains only for growers to apply the different resources artifice can devise; in fact, such treatment as best suits the plant in its altered condition. To scorch a plant in England would, I have no doubt, be injudicious, and I have no wish to dispute the question. But I do desire to protest against the information of others (essentially true) being in a most unbecoming manner termed "tales from the tropics," concocted stories, "to confound facts," and similar polite contradictory expressions, so freely used by your correspondent. *R. Benson, Lieut.-Col.*

Home Correspondence.

Diospyros costata of *Carrière*.—At p. 39, M. Decaisne accuses me of doing an injury to science by the commission of a number of errors, of which these are the principal:—1. That I have confounded Diospyros Schi-tse with the Diospyros Kaki of L. fil.; 2. that after having given it the name of D. Kaki I have re-considered the matter and named my plant D. costata. Now in order to show that my plant is not the same as that mentioned by M. Bunge, I may compare his description with that given by M. Decaisne. The translation of M. Bunge's description of Diospyros Schi-tse (Enum. des Plantes du Nord de la Chine, No. 237, p. 42) is as follows:—"Diospyros with branches, flower-stalks, and base of the calyx tomentose; leaves broadly obovate, oblong, acute, pubescent on the upper surface, rather villose below; flowers axillary, solitary; peduncles with two bracts; berry very large, depressed, few-seeded. Almost wild at the base of the mountains, and frequently cultivated. Flowers in May. This does not agree entirely with any described species; it seems to be allied to D. oryxensis. It differs from D. Kaki in its solitary flowers. The tree has the habit of a wide-spreading Apple or Pear tree. The leaves are large, the flowers four times larger than in D. Lotus. The berry is handsome, of a reddish-yellow colour, the size of a large Apple, generally destitute of seeds." Now it is difficult, if not impossible, to reconcile the description given by Bunge with that of Decaisne. Where, in M. Bunge's description, is it stated that "the tree comes from the warm parts of China;" that "the leaves are nearly elliptical and almost glabrous?" Where has M. Decaisne seen in the description of Diospyros Schi-tse, "that the fruit is of the size of a Peach, that it contains eight to twelve seeds, and that it is of a brown colour," that it requires to be "completely bletted before being eaten, or that it may compare with the marmalade of Plums or Apricots?"*—that they are "much eaten at Pekin," where the D. Kaki cannot ripen?—and many other things of which M. Bunge has said nothing, and yet M. Bunge is the only author who has seen and described this species. Had ribs been present on the fruit of M. Bunge's plant, they would in all probability not have been overlooked by that observer; and to escape from this difficulty, M. Decaisne assumes that the ribs are exceptional. But what is M. Decaisne's authority for this statement? I am of a different opinion, and believe that the character in question is not exceptional, but constant. In his letter M. Decaisne asserts that I have confounded a species from the warm climates with the species from the north of China. This, again, is an assumption; and Thunberg, who lived in Japan, says that D. Kaki is wild there, and is also frequently cultivated, that it grows in the environs of Nagasaki, a fact confirmed by most writers who have visited Japan. [M. Carrière here adds a lengthened description of his plant, with a view of showing how different it is from the Schi-tse, but which we are compelled to omit, and refer our readers to the "Revue Horticole," where a description will be found.] It now remains for me to show why, after having considered my plant to be the true D. Kaki, I altered my opinion, and applied the name costata to it. I may remark that in the herbarium of the Museum is a specimen gathered at Formosa by Oldham, No. 299, and which is almost exactly like my plant, and that the descriptions made by Thunberg and other authors applied so well to my plant that I considered myself justified in retaining the name Kaki—(see Thunberg's "Flora of Japan," p. 157, wherein is a description which corresponds very closely with that which I have given of Diospyros costata); but as on the one hand different authors have already given this name to very different plants, and as on the other hand the name Kaki in Japan and in China is a generic name applied to all the species of Diospyros, and that even the fruits of these plants are called Kaki (in the same way that fruits of all the Apple trees are called Apples by us), and as there is great confusion in the different kinds, it results that the word Kaki not only has no precise signification, but that it gives rise to the greatest perplexity. I have therefore thought it better, in order to put an end to this state of things, to adopt the name costata, which has the advantage of being appropriate to my plant and to one of the forms of D. Kaki described by Thunberg. Another consideration which led me to reject the name Kaki given by the younger Linnæus was that that author did not himself know the plant to which he gave the name, as is evident from the meagre description he gives, which is quite insufficient to characterise the species, and would apply equally well to most of the species of the genus. See Linn. fil. Suppl., p. 439. From what has been said, then, it is evident that, 1st, instead of complicating the matter, I have elucidated it. 2. Instead of injuring horticulture and misleading amateurs, I have rendered a service in clearing away difficulties, and have thus advanced both science and horticulture. 3. That, contrary to what M. Decaisne has reproached me with doing, I have not committed any errors, but have corrected some which others have made. 4. That the Diospyros costata Carr., is not the same as the D. Schi-tse of Bunge, as M. Decaisne asserts, but a new plant, and one which does not exist in any other part of Europe, except in the Jardin des Plantes. 5. That the two names which I have given to my plant are not only explained but justified. 6. That the characters (the ribs on the fruit) on which I have relied to establish the species, instead of being exceptional, as M. Decaisne has affirmed, are normal and constant. 7. That there are several sorts of Kaki in Japan which have been confused one with the other, and as the word Kaki is employed generically in Japan there is no reason to retain it as characterising a species; that these are plants originally from the cold and temperate parts of Japan, and not from the warmer parts of China, and thus, contrary to what M. Decaisne has said, they may be cultivated in the North of Europe. What has led M. Decaisne into error, is that he has considered as Diospyros Kaki a species which is found under that name in some gardens, although it is very different from it in all its characters; it is very tender, and does not bear the climate of Paris in the open air, and even in the South of France, at Antibes, it scarcely ripens its fruits. This so-called Diospyros Kaki is probably a species from Nepaul; I shall endeavour to show this hereafter, as I intend to publish a description accompanied by a figure [on which account we do not think it necessary here to cite M. Carrière's description]. Hence, then, although I have arrived at conclusions quite contrary to those of M. Decaisne, I believe that he will feel obliged to me for having attempted to assist him in the difficult task he has undertaken and pursues so actively, of serving science by opposing all the errors which trammel it. *E. A. Carrière.*

The Black Damascus Grape.—At p. 243 mention is made of the Black Damascus as one of the finest of all Black Grapes. Having grown this variety very extensively at one time, I can quite endorse this opinion, for no Black Grape I have ever tasted equals it for rich vinous flavour, and, when grown well, for its enormously large round berries. It is a very distinct variety, and is easily known by its large succulent leaves and sturdy bunches. The flowers before opening are like little berries, but it is a bad setting variety unless the capsules of the flowers are rubbed off at the flowering time to set the pollen free. It likewise labours under the same disadvantage as the Kempsey Alicante and other bad setting Grapes, of having a little viscid juice on the top of the stigma, which requires disturbing at the setting period. This I always did by drawing the hand when dry over the bunches at the warmest time of the day, and especially if the sun shone. By attending to this process I had always a fair crop in a good sized vinery planted entirely with this variety, and during its season of ripening, October and November, no other Grapes were called for till it was done. Being a thin-skinned Grape, it will not keep late. The perfect berries have only one stone, and the smaller ones are seedless, but they are nearly as large as many Black Grapes, with seeds in. I doubt if grafting would have any effect upon this variety in making it less shy in fruiting or setting. I have never tried it upon any stock but the Black Hamburgh, and the experiment was not favourable, for I found it did better on its own roots. The original Black Damascus Vine at Worksop Manor was found to have pushed its roots into an old heap of coal ashes, and bore good crops every year. *William Tillery.*

Sericographis Ghiesbreghtiana.—Your correspondent "J. W." could not have employed his time better than by writing a line in favour of this plant. It is really most handsome and effective for decorative purposes. There is no plant that will enliven a stove more in the winter months, as it has such a pleasing colour; another great point in its favour is that it will endure the confinement of a room with impunity. Therefore to those who employ any quantity of plants for this purpose I would specially recommend it. House decoration makes sad havoc in our collections of exotics; nevertheless it is a rule now for our employers to expect something of the sort to be carried out, let the consequence be what it may. Our only course in meeting this requirement will be to find out what plant will bear the close atmosphere so obnoxious to most forms of vegetation. I shall be most happy to forward you periodically the names of those plants I have proved most suited for this purpose, if you think it worth while. [Please do, such information is always valuable. EDS.] With regard to the treatment of the above, I must differ somewhat from "J. W.," inasmuch as I have always found it to do best in an intermediate stove, encouraging a free growth by giving it liberal treatment during the summer—which is its growing season—and not checking it in any way if possible. In winter the temperature should not be lower than 60°. It is surprising that a plant coming into flower at the time this does, when cut flowers and blooming plants are so scarce, is not more generally grown. The best specimen I ever saw was in the plant-house at Rockend, Torquay. Mr. Edmund Turner, the gardener there at that time, had succeeded in growing a famous specimen. *T. P. H.*

—— I can fully endorse all that your correspondent "J. W." has said of the above most useful winter-blooming plant, and would strongly recommend it to all who have to furnish a supply of cut flowers, or keep a conservatory gay in the dull months of December and January. It is of easy growth, and flowers profusely, if treated as your correspondent recommends. Justicia flavicoma is equally serviceable, and contrasts well with its light feathery yellow flowers. It requires the same treatment as the Sericographis, with the addition of a little more heat while in bloom. A *jardinière* of this and bright coloured plants of Iresine, with a few heads of variegated Cyperus, have formed a very pleasing group in the conservatory here. Iresine and Deutzia gracilis are just now equally telling. *J. Sheppard, Woolverstone.*

Heating an Amateur's Conservatory.—From the description of the house which your correspondent "R." refers to at p. 214, I should say it is similarly situated to my own, but his is no doubt larger. Mine is joined to the dining-room window, facing the south-east, and at this season of the year, owing to adjacent buildings, only has about an hour's sun daily. I use a small boiler, heated by one gas-burner, with 2-inch flow and return pipes along one side of the house. The air to supply combustion of the gas comes to the bottom of the stove by a pipe from the outside of the house, and the gas fumes are carried away by a tight fitting chimney. The only opening into the house is a small door to enable me to light the gas, and this door screws on air-tight. With this arrangement I can maintain a temperature of 13° above that outside, which I find sufficient for ordinary winters. This year my lowest registered temperature during the night has been 36° without using any mats. The size of my house is 12 feet by 7 feet by 8 feet, and I can flower Acacias, Azaleas, Camellias, Chorozemas, Genistas, Passiflora grandiflora, Epacrises, Fuchsias; and, of course, all kinds of bulbs do admirably. I should recommend "R." to try and arrange his gas apparatus on some such plan, as there is not the least smell of gas or the fumes thereof. I have a small dish for water fitted on the top of the boiler, which counteracts the dry heat from the metal. *Wm. Johnstone, Liverpool.*

Grafting the Muscat Hamburgh on the Black Hamburgh.—There was a good deal said on this subject some years since, and then I was of the same opinion that "P." seems (by his letter at p. 243) now to be. In 1864 I planted a small house with canes of Muscat Hamburgh on their own roots, not being able to obtain grafted Vines, one plant only of the number being grafted. All the Vines in this house produce profusely, ripen and colour well, with little fire-heat; but the one grafted Vine has the smallest bunches and berries of the lot. One of the Vines purchased, ungrafted, being over the required number, was put into the soil, or, rather, clay, at one end of a pit used for wintering bedding plants. This pit has a deeply sunk walk with brick sides up the centre, and gets, I should say, rather dry in summer. Now, strange to say, this Vine, put into the clay subsoil with which the brick-work was filled up, does, if possible, better than those in the Muscat House—the bunches and berries are magnificent, and no fire-heat is used. The house, or rather pit, is low, and gets very hot in summer, from sun-heat, and is hardly ventilated. *R.*

Fungus.—I was much interested on reading Mr. Miller's article on Fungus at p. 247, to see that some of our practical gardeners hold views in regard to this pest so much opposed to the opinions of some of the writing fraternity, and I suspect that the latter believe what they may have sometimes read of, without having practice to judge for themselves. My opinions quite coincide on this point with those of Mr. Miller. I shall notice what experience I have had in the matter. First, then, the kitchen garden here is of a very stiff clay or marl, lying very low, having a lake of 14 acres on the south, a river about 11 feet wide on the north, with rising ground at each end, so that drainage is almost impossible. But in order to raise early vegetables, for the past 10 or 12 years I have adopted a system of raised beds, about 7 feet wide, sloping to the south, and from 15 to 18 inches high on the north. I cleared out one bed entirely, wheeling the mould to the south end of the quarter. In order to keep the soil dry, I laid about a foot of branches all over the beds, any size that came to hand, and over the branches I placed about 9 inches of half-rotted leaves, then another trench was thrown up, and so on to the end. The plan has answered my purpose so well that I still continue it. At the end of three or four years I trench the whole level again, and by that time very few of the branches

* M. Decaisne's opinion as to the nature of the fruit has probably been suggested by the observation that he has made on those gathered from Diospyros costata; it cannot have been from the fruit of D. Schi-tse, which he has not seen, and which no author has yet described.

remain, and I have never seen any trace of Fungus to give annoyance. In my low-lying situation and stiff soil I feel so much the necessity of thorough pulverisation, that in ordinary trenching I have buried in one of the quarters, which is about 20 yards square, as much as 10 to 12 cartloads of branches, without any bad result, but the reverse; so that with small fruits, and the ordinary class of vegetables, I have no fear of Fungus from decayed bits of wood. *R. Farquhar, Eyne Castle Gardens.*

Service Tree, or Chequers.—The correspondence in your columns upon this tree (P. torminalis) recalls vividly to my mind the annual gathering we made from a tree in the woods at Redleaf some thirty years since, when a boy in the gardens there. The late W. Wells, Esq., would have a few dishes of fruit gathered and sent to his table for dessert. I have never to my recollection seen or tasted any since that time. They reminded me more of Medlars in flavour than any other fruit. The tree was growing among Oak, upon the borders of a wood, and we had some difficulty in collecting the fruit, owing to the height of the tree. *Charles E. Wells.*

—— The following extract, which is taken from Evelyn's "Sylva," may be of use to those who are seeking information regarding the Pyrus domestica:—"Sorbus, the Service tree (of which there are four sorts), is raised of the chequers or berries, which, being ripe, that is rotten about September, may be sown like Beech-mast. The torminalis is the kind most frequent with us, for those of the narrower and less indented leaf is not so common in England as in France, having a sort of berry of the pear shape, and is there called the 'cormier.' This tree may be grafted either with itself or on the White Thorn or Quince." Will the following notice apply to the common mountain Ash?—"The Quick Beam (Ornus, or as the Pinax more peculiarly, Fraxinus bubula, others the wild Sorb), or, as some term it, the Witchen, is a species of wild Ash. It is an excellent fuel, but I have not yet observed any other use, save that the blossoms are of an agreeable scent, and the berries such a tempting bait for the thrushes that as long as they last you shall be sure of their company." Upwards of 60 years ago, Wade, on noticing some of the rather scarce and valuable plants found in Ireland, tells us that the Sorbus domestica, true Service tree, grows by the wayside in a copse between Maryborough and Mount Melick, and also at River Lyons. *P. Mackenzie.*

Drainage of Flower-pots.—Frequent complaints are made of flower-pots holding damp, &c., when placed on the conservatory floor. I would suggest that a rim might be moulded round the bottom of the pot, which would allow a hollow space for ventilation. *P. S., Chepstow.* [Another plan to abate the evil complained of, is to set the pot on a surface of finely broken spar. EDS.]

Black Muscat of Alexandria.—Having noticed the article on grafting the Black Muscat at p. 243, I beg to say that I have here a Vine of that sort on its own roots, which I planted nine years ago, and which annually yields fine crops of large well-formed bunches, with large berries; and the bunches so compact that one berry could not move for another. The bunches vary in size from 1 to 2¼ lb., and occasionally I have had them a little over 3 lb. I have never aimed at large bunches especially, but at a good crop, or I doubt not I could have had them heavier. The judges at the Doncaster Horticultural Exhibition in August, 1865, may perhaps remember seeing two bunches of that variety which weighed 5½ lb., when I was awarded a 1st prize for a complete dinner service, consisting of flowers, fruit, and vegetables. Although I give my experience on this subject, I do not maintain that the Black Muscat is a free setter, for although I have never failed in getting a good crop of well set bunches, I have observed it has that tendency, but not more so with me than the White Muscat of Alexandria or Bowood Muscat, which occupy the same house. I do not consider the Vine in question growing under the most favourable circumstances, as I have plants of various descriptions to treat all the year round in the same house. I am quite certain the Vine is on its own roots, having raised it myself from an eye or bud. It is a first-rate keeper. It generally ripens here about the end of August, and I have only a few days ago cut the last in good condition; and as regards flavour I consider it the highest flavoured Black Grape I know, very little inferior to the White Muscat of Alexandria. *James Tindall, Gr. to Sir J. W. Copley, Bart., Sprotbrough Hall, Doncaster.*

The Deodar and Abies Morinda.—Some of your correspondents have recently recommended these trees for planting for timber, for both of which I should require good proofs of the situation suiting them before I planted to any extent, and then the value of the timber is not sufficiently known to recommend them. It is an exception rather than a rule for them to grow satisfactorily, particularly the latter. Yet I have planted it in low and damp situations, where it has grown very freely, and promises to make timber. I well remember, when at Elvaston some years since, Mr. Barron telling me it would not grow there. In preference to the foregoing Conifers I would plant, when an opportunity offered, upon high and dry ground, the Pinus Laricio and ponderosa; they may be had in quantities, and at a cheap rate, from most of the large nurseries where Conifers are grown to any extent; they may be depended upon for excellent timber, are perfectly hardy, and of quick growth when fairly started. In large quantities I would plant them freely at from 6 to 8 yards distant, fill between with Larch, and thin as growth proceeds. To make the plantation more interesting, and for effect in landscape, around the border Abies Douglasii and Wellingtonia might be introduced, with here and there among the Pinus a group of three or four Cedrus atlantica. All the foregoing may be had at a cheap rate, from 9 to 18 inches in height, the best size for planting for timber where game is scarce rather than abundant. It would also add materially to the interest of the spot to plant a few Piceas, say in groups of three, of such as amabilis, grandis, lasiocarpa, nobilis, and Nordmanniana: plant these groups from 50 to 100 yards distant, as circumstances may dictate, and allow the Pines to show themselves between and behind them. All I have named are perfectly hardy and free growers, and may be depended upon to make handsome timber trees. I may add "valuable" to the two species of Pinus, I believe also to Abies Douglasii, and probably a favourable opinion may be expressed respecting the timber of the Piceas. *Charles E. Wells.*

Muscan Tree.—In old Scottish histories we are told that one of the kings of Scotland, "by solemn banquet within his palace royally entertained his nobles until dark night; after they were brought to several chambers within the palace, and when they were in a profound sleep, the king caused sundry men to pass to every several bed (where the nobles did ly) clad with fishskins, having in their hands a club of Muscan tree, which, with the fishskins, in the dark, did show a marvellous glance and light all at one time." I have been looking for the Muscan tree amongst my lists of plants, but cannot find it. *P. M.*

Rendle's Plant Protectors *v.* Bell-Glasses.—What a disparity of opinion there is amongst practical men respecting subjects which by their appearance bespeak their usefulness or otherwise. Staid practitioners of the Fish and Ingram type extol to the skies Mr. Rendle's device for protecting delicate plants—Mr. Fish even going so far as to say how useful they would be to protect young Pinuses, which by-the-by should be made to stand every winter as it comes, if they are to be brought up truly hardy; and he says, if I remember rightly, that they would protect Daturas, which is good news if true. Now there is no doubt these improvements in out-door protections may be very suitable in large gardens, where there is plenty of labour at command, and where the rule can be used in their building, squaring into line, &c.! But how will the amateur and gardener with a too limited supply of labour do with them? Why, no how. The bell-glasses must beat them for usefulness, and they lose little by contrast in appearance. I am told that bell-glasses of modern manufacture have no handles or nobs at their apex, which I hope is not true, even admitting that they can be packed better together, and may be cheaper. *Opus.*

The Pine Beetle.—On reading "A. M.'s" remarks on the Pine Beetle, I went directly to the wood in which these insects have done so much injury, and after carefully examining and splitting many dozens of twigs, to ascertain if there were any caterpillars, such as I formerly sent, all that I could find were three. Two of these I enclose, the third was injured in splitting the twig in which it was imbedded. From the large number that I could so easily find of the Pine Beetle, compared with the few that could be procured of the caterpillars, I think it is quite clear that the former is not only the most numerous, but is also the most destructive to the Scotch Fir trees. I also send naked twigs, which will convey to the mind, without seeing the trees, an impression of the general appearance of those which have been worst attacked. However, it is difficult to form a correct opinion of how badly they really look. *A Forester.* [See report of Scientific Committee. EDS.]

Appleby's Fumigator.—I see a good deal has been said lately about fumigators. I have not seen or used either Drechsler's or Dean's, but their price rather precludes most people of small means from buying what may not, after all, be worth the money. I am using a very simple contrivance registered by Mr. Appleby, of Dorking; it cost only a few shillings, and I can bear testimony to its complete efficiency, as tried with the compound tobacco paper supplied by him; the paper cannot flare, and the house is in a few minutes completely filled. *D., Deal.*

The Abandonment of Chiswick.—Since writing the few remarks at p. 247, it has been suggested to me that in the neighbourhood of Kew a valuable site for a new garden could probably be found. This idea I think needs no confirmation. Considering that it is the province of the Royal Horticultural Society to elevate the tastes of the humbler classes, and their endeavour to make horticultural and floricultural pursuits more popular, the Society being really a national one, has it not a just claim upon the national resources? and may it not fairly ask Government for some practical assistance in the form of a few acres of land at Kew? For an experimental garden at such a place a large area would not be required, whilst the expense of its formation would be vastly reduced, insomuch that all matters appertaining to botany and its study by the students may be carried on perfectly in the Kew Gardens proper. What a centre of horticulture might not this then become? We hear much of the vaunted liberality of our Government: will not the Council put this to the test? Much may be hoped for if the proper machinery be put in motion, but nothing lost. *Opus.*

—— I cannot help thinking that when Chiswick is given up, the Royal Horticultural Society may be considered defunct. To members living in the country the vast expenditure on the Kensington Garden is no advantage. They will hardly continue to pay two or four guineas that the inhabitants of Kensington may have a garden to walk about in, or a reading-room to lounge in. To be able themselves to see once or twice a year a garden that strongly reminds them of a tea garden on a large scale, will hardly appear a valuable privilege. To any one really interested in horticulture, a few hours spent in discussing and comparing new fruits and flowers with Mr. Barron was really worth a subscription, and the large and valuable collection of trees and plants was always worth looking over carefully. Then to many a cutting of a plant new to them, or a packet of seed they could not otherwise procure, was an advantage. The meetings of the Fruit and Floral Committees had always an interest for the lovers of a garden. An experimental garden, like Chiswick, and a large room to hold the committee meetings in, with a really intelligent, enthusiastic gardener, like Mr. Barron, have always appeared to us the necessities of a horticultural society. When Chiswick is given up what shall we as members get who do not live near Kensington? *J. R. Pearson, Chilwell.* [We are glad to learn that negotiations are in progress with the view to retain a portion of the Chiswick garden, sufficient for all practical ends. EDS.]

Vine Grafting.—In reference to this subject, and also that of the influence of stock on scion and *vice versâ*, I may state that we have here in a late vinery two canes of the Black Prince Grape growing side by side. In 1868 I inarched Lady Downe's Seedling on a shoot of one of the former canes, which bore six bunches of fruit of first-rate quality in 1869. But to my surprise what a change in appearance it effected on the old Vine! In the first place it did not commence growing so early by 14 days, as the other cane of Black Prince; the leaves were smaller; the shoots much shorter; and the bunches were not nearly so long as usual. The fruit was smaller, and altogether the cane was so much altered in character that had I not witnessed the change I could not have recognised it. Many gardeners who saw them in fruit were as much surprised as myself. I have left both kinds on the cane, and shall be happy to send you specimens of fruit and leaves, when the former is ripe. [Please do.] Nine years ago I inarched a Barbarossa on an old cane of Muscat of Alexandria, with good results. The former produces better fruit than when on its own roots; and the foliage does not turn red when ripening. It crops more abundantly, and produces large bunches and berries of excellent quality. I have budded Mrs. Pince's Black Muscat on three distinct kinds, viz.:—Muscat of Alexandria, Black Hamburgh, and White Frontignan, and shall report the results in due course. I prefer inarching vines to budding or grafting them, as it is much quicker and safer. *Wm. Smythe, The Gardens, Elmham Hall, Norfolk.*

Leeds Horticultural Society's Exhibition.—Referring to the remarks of your correspondent, "D.," at p. 247, I wish to assure him and all other exhibitors that the committee did not fix the day for holding the show this year without careful consideration and first communicating with the officials of the Manchester and other societies long before any advertisements appeared. They regret very much that the dates of the two societies clash, but the following explanation will show it is unavoidable. Manchester takes Whitsuntide, fall it is unavoidable. Manchester takes the only time their exhibition will pay, thus shifting every year to meet that season. For several years the Leeds Show has been held in the first whole week in June; it was so fixed as a rule of the Society to avoid other shows, and by keeping to that time they can only come in contact with Manchester once in five or six years. If Leeds this year had taken Wednesday, Thursday, and Friday in the week previous to their usual time it would not have been any advantage to exhibitors desirous of attending both, as the last day of Leeds would then have been the first day of Manchester, and the plants would have had to be there even the day before that. If Leeds took the week after their usual time they would come in contact with the show of their friends at York, which they certainly would not like to do; and to hold it later still would not suit at all, as one of the great features of the Leeds Show (Pelargoniums) would be far gone. Moreover, Whit Monday and Tuesday are general holidays at Leeds and the populous districts adjoining, and falling this year in the first whole week in June, the committee selected those days for the same reason as Manchester, viz., to make it pay; but as a large number of the annual subscribers, including the principal gentry of the neighbourhood, might not like to attend with the thousands of the holiday visitors, the Friday previous has been appointed for them, thus extending the show to a fourth day with a Sunday between. This, the committee feel, will be an incon-

venience to exhibitors, and in consequence they have increased the prizes by upwards of £150, and will not object to make some allowance to exhibitors from a distance for the additional expense they and their assistants may be put to. *James Barbeck, Secretary.*

Spring Flowers.—I have already mentioned (see p. 247) several charming little bulbs which are still in flower. I have now another to add, which is quite as interesting as any of those mentioned, viz., Scilla bifolia. This is a beautiful little bulbous plant, and is, according to Paxton, "a native of this country." There are many varieties of Scilla bifolia, all more or less differing from one another—each of these is well worth growing. The variety I have before me is called S. bifolia pallida, the flowers of which are of a lavender-blue colour; these are produced very freely upon racemes, from six to nine flowers upon each, and about four inches in height. This plant is admirably adapted for almost any position, and forms a very attractive object at this season of the year. It grows very freely in almost any soil, but prefers that of a light sandy nature; in this it will soon form a dense mass, and no one can form any idea of its beauty unless they have seen it in perfection. *A. I. P., Tottenham.*

Muscat Hamburgh Grapes.—Your correspondent "P.," at p. 243, has taken so broad a view of the Muscat Hamburgh and its worthlessness, as grown on its own roots, that I feel called upon to make a few remarks as to my own experience as well as what came under my observation in several other cases. I am well aware that this superb Grape is difficult to grow, but I am of the opinion that by far the finest samples that ever were seen of the Muscat Hamburgh were the productions of Vines growing on their own roots. I have upwards of 200 permanent Vines under my care, and at the time of planting—as the Muscat Hamburgh had such a bad character—I thought that one per cent. of a bad thing would be quite sufficient, therefere I planted only two canes of this variety. I am happy to say the whole of my Vines have grown remarkably well, and the Muscat Hamburgh is about the most vigorous Vine I have. Nothing could be finer than the appearance and quality of the fruit—the bunches are large, perfectly developed, and in colour equal to that of a Black Prince. I may remark that I have obtained three first prizes in two years with fruit cut from one of these Vines, and on its own roots. Mr. Dryden, of Lochryan House, exhibited a bunch of this variety in a collection of four sorts at the late International Fruit Show at Edinburgh, which was pronounced by all who saw it to be quite "a marvel of perfection." Mr. Morrison, of Inchmartin, exhibited at the same time and place some truly magnificent bunches, for which he justly obtained the first prize in its class. Mr. Fowler, of Castle Kennedy, exhibited the Muscat Hamburgh for many years in succession, and those who have seen his productions will not soon forget the sight. Now, to my own knowledge, all the above named gentlemen grow the Muscat Hamburgh on its own roots. I could name many others who also grow it successfully on its own roots; but I think the above sufficient to show that grafting has not quite so much to do with the Muscat Hamburgh as "P." would make it appear, and I question if ever there were such fine samples produced by grafted plants as those I have named; if so, I shall be glad to hear of them and where they are to be seen. For my own part, I came to the conclusion that a well made border, with thorough drainage and dry bottom, along with good management, is all that is necessary for the well-being of even the Muscat Hamburgh. *Vineyard.*

Pink "Coffins."—Your correspondent "G." (p. 281) asks the meaning of the term "coffins" as applied to the petals of Pinks. Considering their peculiar hollow form, it seems possible—though, perhaps, the conjecture may be too fanciful—that the explanation might be found in the old English use of the word coffin—to signify a basket. An illustration of this use is given in the reference under "coffin" in "Todd's Johnson's Dictionary," 1818, to the miracle of Loaves and Fishes in Wicliffe's Bible, "and how many coffyns ye taken?" The petals of the large Pinks frequently resemble a basket, in all but the handle, which is not a necessary part; and though we do not keep up the quaint floral names, which are so striking in the descriptions of our early travellers, still even now we retain some in our scientific notices. For instance, we still have keel, wings, and standard, in the description of leguminous plants, and possibly the baskets or "coffins" of the Pink may be one of the same class of terms. *E. O.*

Yellow Bedding Calceolarias.—Your correspondent, at p. 177, seems to think that Calceolaria cuttings put in in October will not answer in the north of Yorkshire, I beg to state that I never put in cuttings sooner than the middle of October, and sometimes the last week. They never require shading. I strike them in a turf pit, which I cover with old lights, and protect with straw in severe weather. I have always been successful by adopting the above treatment. *R. Sowerby, Newburgh Park, North Riding, Yorkshire.*

—— Your correspondents have omitted to mention one very important point in their remarks on this subject, viz., the attacks of green-fly. They are very subject to it, and once they gain a lodgment the plants never appear to thoroughly recover from their ravages. I am very suspicious that they attack the roots also. I believe there are more lost from this cause than from all other causes put together. Another very essential thing at the planting-out time is to have them well watered a short time before they are taken up, and when they are planted a dish should be left round each plant, and be well watered. As soon as the water has soaked away, the loose soil should be drawn round the plants. If the weather is dry, damping the foliage with a syringe every afternoon about 4 o'clock, until they get roothold, will assist them very much. *J. M.*

—— I think your correspondent, "G. S.," at p. 177, is mistaken if he believes Calceolaria cuttings will not do well further north than Yorkshire after the second week in September. I have known and helped to put them in from the last week in that month up till near the middle of October, and found them do better than in August. This was on several years, as far north as Mid-Lothian, and with as much success as could have been desired. *R. M.*

Raspberry Culture.—I fully agree with "A. D." that freshly planted Rasberry canes should not be left all their length, and also with what he has said respecting the state of the plants best suited for planting. I am indebted to him for setting me right with those who, like himself, misinterpret my words. But in speaking of training or tying I spoke of an established plantation. Those who would wish, however, to pick clean fruit in a clean way, to preserve the leaves of the canes which grow around those bearing fruit—which have not a little to do with the next year's supply—will think twice before adopting "A. D.'s" wire plan. *Bush* v. *Brake.*

Notes on the Vine.—Having recently superintended the pulling down of two very large orchard-houses, I was much struck with the position in which I found the roots of the Vines. I should state that one of the houses was a span-roof, 104 feet long, 40 feet wide, and 20 feet high, the roof being supported on iron columns. There was a 6-foot border on each side, and a gravel path 4 feet wide all round, leaving 20 feet for the centre bed. Vines were planted at intervals all round in the 6-foot border, and one against each column; these centre Vines were grown on what may be called a mild form of the extension system, over all the girders and braces. Those in the 6-foot border were trained up the rafters in the usual way; they had been planted eight or nine years, and had entirely covered the immense roof, producing a fine supply of late Grapes, which would hang until February. There were several kinds planted in the house, and though no artificial heat was applied each of them ripened and coloured well, and were of good flavour—the Muscat Hamburgh being especially fine, having the full musky flavour. This variety seems well deserving of a place, being hardy, prolific, and an excellent keeper. The very name of Muscat seems to have determined every one who has tried it to give it a strong heat, which it does not like. Several who have so treated it have discarded it as worthless, but have determined to give it a place in a late house. On pulling down the walls the roots from the Vines in the 6-foot border were found interlaced in the brickwork, filling up every crevice with masses of the most beautiful and healthy rootlets, and clinging to the bricks exactly as we see Ivy do. This was the case from one end of the wall to the other, occasionally a fine root had forced itself through the brickwork, and had spread into the gravel path outside. To do this many of them were crushed perfectly flat, and were as much as 2 inches wide, but immediately on issuing from the wall had resumed their usual shape, and quite filled the gravel path with masses of the finest roots it is possible to imagine. The curbs to the paths were formed of five courses of brickwork, which on being pulled to pieces was found one mass of roots, many having gone under the brickwork and turned upwards into the gravel path, which, like the one outside, was as full of healthy roots as possible. The rough concrete and brickwork on which the centre columns were placed were in like manner full of roots in splendid condition, while in the borders, which had been made for them on the most approved principles, and at great expense, there were scarcely any to be found, and those poor and sickly-looking. Thus we see in the case before us the Vines leaving the matter prepared for them, and luxuriating in a mixture which, to say the least, it is contrary to all practice to plant them in. I think a very practical lesson is to be derived from the above facts, but as every one who has a Vine border to make, proceeds on independent principles, there is little use in offering advice; though as there has been so much written on the Vine lately in the pages of the *Gardeners' Chronicle*, I cast in my mite amongst the rest. *S. T. T.*

Skeleton Leaves.—Having seen an inquiry at p. 176, relative to making skeleton leaves, I think it may be a help to the inquirer to state the plan which I have found to succeed very well, and which is as follows:—Select mature and perfect leaves, steep them in rain-water until the pulpy part separates readily from the fibres, this generally takes several weeks, and succeeds best in warm summer weather. When all the soft part has been carefully removed [by the aid of a soft camel's hair brush], steep the skeletons in a weak solution of chloride of lime to bleach; the more delicate may become white in a few hours, but some will require a day or more. Next, place those that are flat, such as Ivy, between sheets of blotting-paper, and press them with a moderately hot iron. I have found the leaves of Holly, Ivy, Poplar, and Pear, suit best for making skeletons. A strong cement made of isinglass and vinegar is useful in setting them up. *S. Grubb, Glenam, Clonmel.*

Botanical Saints.—Admirably has Mr. Forsyth closed his researches into the legendary history of this Popish "saint," by directing our love and honour and confidence to that Blessed One, who is "King of Saints." May his faithful counsels find a hearty sympathy in many readers, as well as those who wear the worthy "blue apron!" But has he not fallen into a little error of fact? For it was Mary Magdalene, not Mary the mother of Jesus, who supposed Him to be the gardener; as will be manifest on the most cursory reading of John xx. 1—18. This, however, was a mere *lapsus memoriæ*, of slight importance, in one to whom the memory of his Lord is dear. *P. H. G.* [Undoubtedly there was a *lapsus calami* here. EDS.]

Vine Budding.—The following I take from my note-book, copied from the *Gardeners' Chronicle* for 1844, p. 54, signed "W. G.," by which it appears that the advantages of budding over inarching are very considerable:—"Wishing to preserve the number of Muscat of Alexandria and Canon Hall Grapes, I cut down a few Vines; one-half of them was budded, and the other inarched. To test the merit of each method fairly, both budding and inarching were done at one period. The result is that, by the former method, bearing wood has been produced nearly double the strength of that by the latter. In budding the following is the method I pursued:—The old Vines were cut down in the autumn of 1842; they were laid in March, 1843; as soon as they had made shoots, a few inches long, two were selected on each Vine, and all the others were taken off. These were tied in, and laterals were pinched regularly off them until May. The young shoots were then about two-thirds up the rafters, and nearly full grown in thickness at the base, but not ripened or turned brown. At that period the buds taken from young shoots, with leaves not larger than 2 inches in diameter, were put on; the wood was left in the buds, they were inserted in the usual way, and tied firmly with a piece of matting. In the course of 10 days or a fortnight they were united, the matting was undone, and the shoots were cut down to the buds; all shoots below the buds were taken off as they made their appearance. After this was done they grew away very strongly and rapidly. Some of the buds showed fruit, but this was pinched off. The leaves attached to the buds never flagged." I have heard of Vines making 30 feet of strong wood in a season by budding, but I have never practised this method myself. *Edwd. Bennett, Osberton.*

Foreign Correspondence.

THE PAPYRUS ON THE CYANE STREAM, SYRACUSE.—Starting from Syracuse in a small boat, I crossed the magnificent harbour which bears its name, from the mouth of the Anapo. During the passage my mind was crowded with recollections of the past, reminding me of the glorious times when this harbour was almost filled with thousands of ships, and when Siracusa, the largest of the Grecian colonies, was encircled by its walls of 30 miles, with 2,000,000 of inhabitants within. The mythological traditions connected with the foundation of the town, the long and disastrous siege by the Athenians under Demosthenes, the glory of Hiero and Dionysius, the ever lamented murder of Archimedes, the dilapidations of Verres stigmatised by Cicero, awakened the more vividly before the mind by the monotonous passage across the now deserted harbour, in face of the modern town, which covers scarcely the twenty-fifth part of the space occupied by the ancient metropolis. Winding up the course which slowly carried to the sea a large volume of excellent water, I soon reached the confluence of the Cyane stream amidst a solemn silence, broken only by the blowing wind in the dense herbaceous vegetation hanging over my head, and thickly covering the two banks. Gliding, more than rowing, on the deep blue water (Cyane, indeed, means blue, and the fable says it was the name of a nymph, Proserpine's follower, changed by Pluto into this ever-pouring fountain), I arrived where the stream, widening into spreading marshes, is covered as far as the eye can reach with dense bushes of Papyrus. Nothing can equal the elegance of these plants, their roots drowned in the tepid water which slightly agitates the feathery foliage which crowns their slender stems. It was indeed a pleasing sight!

The Papyrus grows here to the height of from 12 to 15 feet, and under such a favoured climate new suckers are continually growing up to take the place of the older stems, which may be either broken by the wind, or exhausted after their seeding. It has been a matter of discussion among botanical writers whether the Papyrus was to be considered spontaneous on the Cyane river or imported from Egypt. Certain it is that this is the only botanical station for it in Europe; but no doubt it may be spontaneous here as well as in Egypt, the identical conditions of half-tropical climate and constant immersion in pure tepid water

occurring in both countries. It is generally known that paper was obtained by splitting into thin layers the stems of this plant; now a cicerone of Syracuse alone alone sells for a few pence some sheets of this paper to strangers as an object of curiosity.

Naples Botanic Garden.—In No. 31 of last year's Transactions of the Edinburgh Botanical Society is a detailed abstract from a communication by Dr. Cleghorn, upon the history and actual conditions of the Botanical Garden at Naples. The subject is widely developed with scrupulous exactitude, and plenty of particulars. I will only ask Dr. Cleghorn's leave to complete his account by a few notices about the most remarkable trees that are to be found in that interesting garden.

Acacia melanoxylon, R. Br.—Three magnificent trees, some forty years old. Height, about 80 feet, the biggest trunk measuring 6 feet 11 inches in girth, the two others 6 and 5 feet.

Eucalyptus salicifolia, Cav.—Girth, 6 feet 6 inches; height, about 80 feet, like the preceding Acacias, of which it has the age. Some larger Eucalypti are scattered in the gardens of Naples, belonging mostly to the globulus species, but they are all deformed by the action of winds, and perhaps by accidental cold. One of the finest, if not the biggest, stands at the entrance of Pompeii; it is nearly eighteen years old, and about 50 feet high, forming a strange contrast, as the solitary sentinel of a new world at the gate of that city—emblem of the past.

Pinus canariensis, Sweet.—A fine group of vigorous specimens, attaining 50 to 60 feet, and looking quite at home.

Enterolobium Timboiiva, Mart.—Height, 76 feet. A noble and rare Brazilian tree, belonging to the family of Mimoseæ, which has proved quite hardy, only losing its foliage in winter. It has bloomed and fructified since 1862.

Taxodium mucronatum, Ten.—Height, 56 feet. On this specimen Tenore founded this new species, differing chiefly from the deciduous Cypress (Taxodium distichum, Rich.,) by its persistent foliage, partially, however, turning brown in winter and reassuming in spring its primitive colour. A native of Central Mexico, but quite hardy, even in the climate of Florence.

Pinus Laricio var. calabra, Ten.—Height, 75 feet. Perfectly distinguishable from the true Pinus Laricio of Corsica. It forms extensive forests in Calabria, and I remember having seen a large number of them growing in the grounds of the Forestal School des Barres (Dep. du Loiret, France), formerly belonging to Vilmorin, who considered this variety as the most valuable Pine tree for southern climates, where the true Riga Pine does not succeed.

A few more trees follow, of which I can give you only the height:—Carya olivæformis, Nutt., 75 feet; Casuarina quadrivalvis, Labill., 48 feet; Cedrus Deodara, Loud., 65 feet; Cordia martinicensis, R. S., 56 feet; Eugenia Berteriana, D.C., 50 feet; Laurus Camphora, Linn., 50 feet; Liriodendron tulipifera, Linn., 70 feet; Phytolacca dioica, Linn., 45 feet; Pinus Brutia, Ten., 75 feet; Pinus Laricio, Poir., 75 feet; Planera Richardi, Mich., 65 feet; Quercus Brutia, Ten., 68 feet. *E. O. Fenzi, Florence.*

Societies.

Royal Horticultural: *March* 2.—W. W. Saunders, Esq., F.R.S., in the chair. The usual preliminary business being concluded, Mr. Moore, in the absence of the Rev. J. Dix, announced the awards of the Floral Committee, and Mr. Geo. F. Wilson those of the Fruit Committee. The Chairman then proceeded to make some comments upon some of the productions sent to the meeting, and first elicited the thanks of the Society to Mr. Fernyhough, a member of the Floral Committee, for his handsome present to the Society of a series of coloured sketches of tropical fruits; and then directed attention to several forms of variegation in Abutilons, of which further notice will be found in our report of the Scientific Committee; and to several of the Orchids exhibited. A species of Agave was alluded to as belonging to a class of plants well adapted, when grown as specimens, for placing on pedestals. Some few years ago, said Mr. Saunders, we were contented with about 10 or 12 species of Agaves, but he had since increased his collection to about 120 species or varieties. The curious Stangeria paradoxa, a Cycadaceous plant from Natal, was then referred to as having been thought to be a Fern when first introduced into this country, but afterwards was properly described by Mr. Moore. The usefulness of Ivies for decoration in winter was commented upon, and the Chairman concluded his remarks by stating that he was glad to see that this class was being taken in hand by several horticulturists. Major Trevor Clarke, said he had examined all the Cyclamens in a collection from Mr. Wiggins, and had not found one that was fragrant, he thought that, as a matter of floral criticism, fragrance should be thought as much of as form.

[Our report of the proceedings of this meeting is not so perfect as it might have been but for the rudeness of the visitors, a continuous line of whom blocked out the speakers from the view of those seated in the room. It is to be hoped that some better arrangements will be made for the convenience of the better behaved among the Fellows and visitors, and for inculcating a lesson of politeness to those who need it.]

Scientific Committee.—W. W. Saunders, Esq., F.R.S., in the chair. The minutes of the last meeting having been read, a report of the sub-committee appointed to superintend the experiments carried on with various manures at Chiswick was read and adopted. Dr. Gilbert spoke on the same subject, and it was agreed that the carrying out of certain details, as to the proportion of the ingredients to be used in the several boxes, should be left to Drs. Gilbert and Voelcker. The question of the employment of a special assistant to superintend the experiments for the ensuing season was discussed, and the Chairman promised to bring the subject under the notice of the Council for its determination at its next meeting.

Dr. Masters exhibited, on the part of Messrs. Downie, Laird & Laing, a number of grafted Abutilons, showing the effect of stock on scion, and scion on stock. Thus, A. megapotamicum (green) grafted on A. Thomsoni (variegated) had become variegated like the stock; A. Thomsoni grafted on A. megapotamicum had caused the production of variegated shoots from the originally green stock as well as from the scion; A. Thomsoni grafted on A. megapotamicum and then pinched back had the effect of inducing the buds on the stock to break, and these two produced variegated leaves. Another green Abutilon, "Duc de Malakoff," grafted on A. Thomsoni, also became variegated in consequence. So that the variegated plant, whether used as a stock or as a scion, has the faculty of imparting its variegation to the leaves and buds subsequently produced. Great interest was manifested in these specimens, and Dr. Masters called attention to the remarkable experiment of M. Van Houtte, where the variegation ceased after the accidental removal of the variegated graft (see p. 554, 1869), and to a paper of Professor E. Morren's, lately published, recording several cases of this kind mentioned in this and other journals, and also to the circumstance that the mere insertion of a detached leaf of A. Thomsoni into a slit in the bark of a green Abutilon, was sufficient to inoculate the latter, even though the inserted leaf speedily perished. Dr. Masters stated that, at a future meeting, he would direct attention to other recorded cases of this interesting phenomenon.

A specimen of a curious excrescence from the bark of a Camellia, sent by Mr. Mills, of Enys Gardens, Penryn, was then shown. The excrescence had much of the aspect of a Polyporus, but seemed to be an excrescence from the bark, from which it was with difficulty separated. In one case two branches had become united together, and the point of union was covered with this shell-like excrescence. None of the members of the committee, nor any of the Camellia-growers present at the general meeting, had ever seen anything similar. The only suggestion was that the adventitious growth was the result of some injury to the plant. Dr. Masters undertook to submit the growth to microscopic examination, and report more fully at a future meeting; as also on a curious specimen resembling the "burrs" seen on Birch trees, but in this case stated to be formed on the roots of a Currant bush. Dr. Masters further reported as follows, on the Bridgesia spicata exhibited at the last meeting:—

"The peculiar out-growths of this plant are protruded from the young shoots above the axils of the leaves, and above the branch proceeding therefrom. In the fully developed state they are about the size of a large pea, of a yellowish colour, and have a general resemblance to the tufts of hairs found in similar situations in Pereskia.

"In the youngest condition the excrescences occur in the form of small, smooth, conical projections, covered with an outer layer of small oblong cells, the outer walls of which are thickened; subjacent to these are four or five rows of small, spheroidal, densely packed cells, also cortical in their nature. These overlie a mass of ordinary cellular tissue, the cells of which contain chlorophyll. Running into this conical cellular projection are two rows of small spiral vessels, which converge towards the apex of the cone, and form a loop. These spiral vessels are continuous with those of the vascular circle of the branch, and are surrounded on all sides by oblong thin-walled cells, whose long diameter is parallel to that of the spiral vessels, and more or less at right angles to the direction of the parenchymatous tissue of the cortex and also of the medulla. The constituent cells of the medulla are spheroidal, and destitute of chlorophyll. Here and there spiral vessels traverse the medulla, quite isolated from the general vascular circle. In the more fully developed excrescences the appearances are similar, except that the outer epidermal cells now show themselves in the form of long cylindrical cells (hairs), some of which are club-shaped at the extremity. Some of these hairs appear to be uni-cellular, while others show one or two transverse partitions. The hairs in question are rather thick-walled, and contain a few scattered small highly refracting granules (starch?) resembling the granules found in autumn when the leaves have assumed their autumnal tints in consequence of the decay of the chlorophyll.

"From these appearances the inference seemed to be that the growths in question were of the nature of adventitious roots covered by hypertrophied epidermal hairs."

An Arum from Chiswick with an adventitious leaf attached to the spadix, and white, like the spathe, was then shown. A similar illustration was forwarded some time since by Mr. D. T. Fish.

Mr. A. Murray read a communication relating to the presence of a larva in the tubers of certain herbaceous perennials. The larva in question was that of the Ghost Moth or Golden Swift, Hepialus sp., and did much damage. Mr. Murray then showed a dipterous larva which was attacking Seakale roots and doing much mischief. This was referred to Professor Westwood, for further examination.

Specimens of the Pine Beetle and of a species of Tortrix, referred to in a letter of "Forester" published in another column, were then shown. A "Rose scale," supposed to be new, was also shown by Mr. Murray, who also alluded to the curious mite, Oribata geniculata, already referred to in these columns.

Mr. G. F. Wilson exhibited a series of water-colour drawings of tropical fruits which had been presented to the Society by Mr. Fernyhough, and the meeting then adjourned.

Floral Committee.—Charles Lee, Esq., in the chair. This was in all respects a very successful meeting, the following prizes being offered for competition:—(1) 6 Camellias in pots; (2) 12 Camellias, cut blooms; (3) 6 forced or unforced shrubs in flower; and (4) 6 pots of Lily of the Valley. The 1st prize in class 1 was taken easily by Mr. Turner, of Slough, with healthy pyramidal specimens of Mexicana nova, Madame Lebois, Constituzione, Il Cygno, Sacco1 nova, and De Notaris; Mr. Wilkie, Addison Road, Kensington, being 2d with tall, straggling, or sparsely grown specimens of well known kinds. In class 2, for cut blooms, which as a rule were not good, Mr. Wilkie was placed 1st with a collection of very fair blooms, including Benneyi, Alba plena, Chandler's Elegans, Jubilee, Belle-nana, &c. Mr. Turner came 2d, and Mr. Howard, Bedford Hill, Balham, 3d. Mr. Cox, Redleaf, Kent, and Mr. C. Osman, gr. to R. Holland, Esq., Great Stanmore, also exhibited. The only contributor in class 3 was Mr. Wilkie, to whom the 2d prize was awarded for six very ordinary greenhouse plants. Mr. Howard sent the best six pots of Lily of the Valley, which were remarkably fine, and took the 1st prize; Mr. Wilkie coming in 2d with a well-flowered lot, though rather thin in the pots. From Messrs. Veitch came a collection of cut blooms of Camellias, withdrawn from competition, in the above class, to which a Special Certificate was given; a collection of Crocuses, and a group of Orchids, comprising Dendrobium cucullatum giganteum, a splendid specimen, which received a First-class Certificate; Dendrobium aggregatum majus, with three spikes of pretty lemon-coloured flowers; Mormodes colossus, a curious chocolate and orange-coloured flower; a white variety of Lælia Pilcheri, named alba, which also was honoured with a First-class Certificate; Phalænopsis Schilleriana, a beautiful spike; and Cattleya Warscewiczii delicata, &c. A Special Certificate was awarded to the collection. Mr. B. S. Williams also sent a fine group, which received the same award. In this collection were fine specimens of Phaius grandifolius, very fine; Vanda gigantea and V. tricolor var. insignis, Lycastes, Odontoglossums, Dendrobiums, &c. From the same exhibitor also came a group of the new, improved, hybrid, fruiting Solanums, to which a special award was made. Mr. Green, gr. to W. W. Saunders, Esq., exhibited male and female forms of Stangeria paradoxa, the latter being in fruit; a fine specimen of Dæmonorops plumosa, a very graceful Palm, of which we hope shortly to give a figure; and Agave cuspidata, a distinct form, to both of which latter First-class Certificates were awarded, and also a Special to the collection. Mr. Denning, gr. to Lord Londesborough, again produced a nice collection, comprising a fine specimen of Dendrochilum glumaceum; some fully coloured Odontoglossum triumphans; Dendrobiums, Cypripediums, Vandas, Phalænopsids, &c. To the first-named a Special Certificate was given, and also to the collection. From Mr. Pilcher, gr. to S. Rucker, Esq., West Hill, Wandsworth, came a most magnificent example of Dendrobium nobile, about 5 feet through, covered with blooms. A Special Certificate was awarded. The same distinction was also made to an exceedingly well-grown pan of Anæctochilus Lowii, from Mr. Burnett, gr. to W. Tyler, Esq., Fulham. From Mr. Wiggins, gr. to W. Beck, Esq., Isleworth, came a splendid group of Cyclamens, beautifully flowered, and a collection of Primulas, consisting of a pretty strain of striped flowers, and red and white fine-leaved varieties, &c. A Special Certificate was awarded to both groups. Mr. Wilson, gr. to W. Marshall, Esq., Enfield, sent a beautiful specimen of Odontoglossum Warneri roseum, with about two dozen finely expanded flowers; also cut blooms of ten varieties of Cattleya Trianæ. A Special award was made to the former. To Messrs. J. Dobson & Son, Woodlands Nursery, Isleworth, a Special Certificate was given for a collection of 18 well-grown and flowered Primulas, including amongst them some very fine flowers. From Mr. Turner came a group of Dracænas, comprising nice sized plants for table decoration of D. Cooperi, congesta, rubra, terminalis, ferrea, nobilis, &c.; three baskets of profusely-flowered Primulas, and a collection of garden Ivies in pots. To each of the above groups a Special Certificate was awarded, and to a new Rose, named Marquise de Mortemart, a finely cupped variety, with a blush centre and pink exterior petals, from the same exhibitor, a First-class Certificate was given. Messrs. J. Waterer & Sons, Bagshot, exhibited specimens of Retinospora obtusa erecta, a handsome, close-growing, neat-habited form; and Cupressus Lawsoniana aurea, a deep golden variegated form, to both of which First-class Certificates were awarded.

Fruit Committee.—George F. Wilson, Esq., in the chair. Prizes were offered on this occasion by the Society for new and late kept Grapes, and for a collection of forced vegetables, comprising Seakale, Rhubarb, and Asparagus. No early Grapes were produced. The 1st prize for a single bunch was awarded to Mr. Bannerman, gr. to Lord Bagot, Blithfield, with good bunches, and finely-flavoured Lady Downe's Seedling. Smaller bunches of this variety were also sent by Mr. J. Woodward, gr. to Mrs. Torr, Garbrand Hall, Ewell, which took the 3d prize, being very inferior in flavour. The 2d prize was taken by Mr. G. Johnstone, Glamis Castle Gardens, Forfar, with richly-flavoured Muscat of Alexandria, which was ripe in the beginning of August, the bunch being cut from the Vine on November 2 last. A Special Certificate was given to Mr. Meredith Garston, for a basket of Lady Downe's Seedling and Black Alicante Grapes, grown in a house with a north aspect, and which is also partially shaded with Elm trees. They were fine, both in bunch, berry, and flavour. The only collection of vegetables came from Mr. T. Bray, gr. to E. A. Sandford, Esq., Mynehead Court, Somerset; and to him the 1st prize was given for very fair examples of Rhubarb, Asparagus, and Seakale. Mr. Hebblethwaite, gr., Acklam Hall, Middlesbro'-on-Tees, sent a collection of Apples, including Striped Beefing, the local name of which is Knaggs' Pippin or Robin Knaggs; Dumelow's Seedling, Large Hunthouse, White Loaf, large; Cotard, a long, angular-shaped fruit; and good specimens of Glou Morceau Pears. A Special Cer-

tificate was given. The same award was also made to a collection of Apples from Mr. G. Craddock, gr., Compton Verney, Warwick, comprising very fine Dumelow's Seedling, Blenheim Orange, rather small; Hanwell Souring, Margil, Summer Pippin, and Ribston Pippin, all in a good state of preservation. Mr. G. Beech, Castle Ashby Gardens, Northampton, sent some specimens of variegated Brussels Sprouts, very pretty for garnishing, and, as suggested by a member of the committee, might be useful for church decoration, the "buttons" having a singular resemblance to rosettes.

LEICESTER: *February* 5.—The following is an abstract from Mr. Ingram's paper on "Plants regarded as Sanitary Agents," referred to at p. 210:—

"Where life is most active, there the waste and impurities of animal existence most abound, and the necessity for the corrective activity of vegetation is more pressing, but unfortunately in the great centres of civilised life it is less practicable to employ the sanitary means Nature has provided for the conversion of animal waste. It is indisputable that dirt is a concomitant of town life, and it is equally so that it is an evil to be got rid of; and, admitting my argument that trees are consumers of dirt, I hope I shall be able to convince your authorities of the advisability of planting trees wherever there is a chance of them growing in Leicester. It is not surface dirt that has to be dealt with, but that underground filth which is most poisonous, and which the roots of trees are most happy in ferreting out. The existence of impurities, and the necessity for their removal either by natural or artificial means, will be readily admitted; their continued presence vitiates the air, and impure air poisons the life-springs of health. The water we drink is rendered dangerous by the admixture of corrupt matters which are often carried by the rain to the wells and water springs. That we have not, either in town or country, secured those essentials of existence in their pristine purity, I need not assure you.

"We have a great polluting power in animal life. The pollution of the surface of the earth by the continued residence of man or beast would be more intolerable were it not for vegetable action, and it is in cases where this corrective power cannot be applied that consequences so fatal to human life so often ensue. Matters corrupt and offensive, which have once formed part and parcel of the animal economy, cannot be applied again without infecting with their inherent corruption any living animal that may again absorb them. As the passage of animal life in the world results in an addition to its impurities, so death, which chemically may be called the residuum of life, gives another stratum of dirt to it. The penalty exacted by death is not merely the extinction of life, but the disorganisation of structure. On the heels of death treads decomposition; the dead matter that has once lived is distributed anew, and the fragments pollute the air, the water, or the earth. Here vegetation interposes. In life, the animal subdues the plant; when the former perishes the plant reasserts its power. Here we have an example of two great dependent forces, mutually destructive, yet mutually regenerative; the one fixed to the soil would exhaust its resources of fertility, but the destruction of animal life restores its exhausted powers, and vegetable action goes on with renewed vigour.

"There is something more than sentiment in the custom, observed from remote ages, of planting trees in our graveyards and cemeteries. Trees are quickeners of decay—are the scavengers provided by Nature for absorbing that which is corrupt in the ground, and quickening it into the life that gladdens our eyes in summer time in green leaves and bright flowers. Who would not rather that this 'mortal coil,' bereft of the life that gave it power, should re-appear in verdure in the stately tree, the Cedar, the Pine, or the Oak? How much better than to contaminate the earth, or to poison the water springs? The ancient Egyptians sought to perpetuate the names and famous deeds of their great men by embalming their bodies, and placing them in almost impenetrable tombs. What have they gained, but that destruction which Nature has ordained, and which, though protracted, is nevertheless inevitable? Who knows or cares for the voiceless mummy? The men of ancient Rome destroyed their mighty dead by fire, and reverently placed their ashes in urns and tombs of sculptured marble, putting with the relics of their friends a small tear bottle or lacrymatory. If we continue to follow the custom of our forefathers, and return dust for dust, let us not omit to plant a tributary tree. Why should not our disused churchyards be planted? I am sure many persons would esteem it a privilege to be permitted to plant a tree on the grave of a dear friend. If this were done, our churchyards in time would become shady groves, and would be so purified as no longer to be sources of disease to the living congregated around them.

"We have glanced at two polluting causes. Life and death. In the decomposition of various matters we have another great cause of dirt. 'The humblest life has sufficient power to resist the force of decomposition, but no sooner is life extinguished than these forces have fresh play, and they work on with alarming energy to distribute animal and vegetable matter in a state of decomposition throughout the *pabulum* of our lives. The air we breathe, the water we drink, the land we live upon, all are polluted by our dead, and freighted heavily with rottenness and corruption.'

"The more the period of delay is prolonged, the more widely the seeds of disease are scattered amongst the living, and Nature, ever provident and conservative, has endowed a countless number of vegetable organisms with a power and ubiquity that can scarcely be estimated, the purpose of which is to hasten decomposition. This active vegetable power is possessed by the Fungi. The mould that springs from an old neglected crust of bread, the Mushroom we eat, and the toadstool we avoid, and the polyporus now before you, are all members of the same family. This example was detached from an Oak tree; its appearance is a sure precursor of decay in the tree on which it is found; the natural progress of decay is in such instances very materially advanced. The predatory and destructive character of Fungi on all failing organisms is only beginning to be understood. The apparent insignificance of many of the forms presented is perhaps the reason, yet the Oidium Tuckeri, a very minute Fungus, found the Vine exhausted by long culture, and fastening upon it, almost destroyed the vineyards of Europe, and another equally obscure Fungus made a famine in Ireland by destroying the Potato. It thus appears that although Fungi prey on dead organisms, the living are by no means safe, if in any point their powers are defective. We sometimes hear that the timbers of a ship, or a house newly built, are suffering rapid decay from what is known as dry rot. The fact is that an active little Fungus has found its way into the unseasoned wood, and eaten away the fibres that gave it strength, leaving only crumbling boards. George the Fourth amused himself towards the end of his reign, in building a royal lodge in Windsor Great Park. It was still incomplete on that monarch's death, and shortly after the accession of King William the greater part had to be pulled down, owing to the destructive presence of our active little friend the dry rot Fungus. We can understand and follow without much difficulty the distribution of the seeds of trees and shrubs, for they have blossoms and their fruits can be seen, but the Fungi do not produce flowers, and the spores by which they are perpetuated are so minute as to be almost inappreciable. One thing is certain, that no organism that shows decrepitude escapes the attacks of Fungi. High up in the lofty tree the Fungus finds a weakly branch. In deep excavations, if decayed roots or a buried block is found, there a Fungus is sure to be busy. A king builds a palace, and places porters and gold-sticks, and guards of soldiers, but in spite of these royal watchers our active and prying little Fungus penetrates even the sanctum of royalty, and in very wantonness eats up the rafters that hold up the royal rooms. Deep down in the earth in quarries, in mines, and even in carefully guarded and double locked cellars, members of this ubiquitous family are found, and I have known instances of rare old wine, in carefully corked bottles, and in secure bins, abstracted by Fungus, which had thrown its delicate filaments through the cork and into the rich juice of the Grape within the bottle.

To be Continued.

Notices of Books.

Report of the Thirty-ninth Meeting of the British Association for the Advancement of Science, *held at Exeter in August*, 1869. London: Murray. 8vo, pp. cv, 438, and 266, with 5 plates.

The report of the Exeter meeting of the British Association, which has just been distributed to the members, is not behind its predecessors in interest or importance. The Reports of Researches in Science which it embraces are numerous, and extend over upwards of 400 pages, those of them of most interest to our readers being devoted to the following subjects:—The Plant-beds of North Greenland; the Chemical Reaction of Light; the Fossils obtained at Kiltorkan Quarry; the Marine Fauna and Flora of the South Coast of Devon and Cornwall; the Practicability of establishing a "close time" for the Protection of Indigenous Animals; the Rate of Increase of Underground Temperature; the question—Does there exist in the United Kingdom sufficient provision for the vigorous prosecution of physical research? If not, what further provision is needed?—the Treatment and Utilisation of Sewage; the Rainfall for 1868-9; Agricultural Machinery. The Notices and Abstracts of Miscellaneous Communications to the Sections, extend over an additional 200 pages or more.

The first of the foregoing reports, that on the Plant-beds of North Greenland, read (as we learn from a footnote) at the Norwich meeting, contains an interesting preliminary report on the fossil plants collected by Mr. E. Whymper, drawn up by Professor Heer, from which we shall make some extracts on a future occasion. That relating to the establishment of a "close time" contains the following passages in support of the movement for the preservation of Small Birds:—

"Many of our smaller birds are entirely insectivorous, and are undoubtedly useful at all seasons of the year; and of these we may in particular refer to the woodpeckers and titmice, the latter of which feed largely on the eggs of *Bombyx pini*, which is so destructive to the Pine forests. Every female of this moth will lay from 600 to 700 eggs, and were it not that they are kept down in number by the tits, they would increase enormously. Count C. Wodzicki in a small work, on the influence of birds in destroying injurious insects, published at Lemberg in 1851, calculates that a single tit will devour 1000 insect's eggs in a single day; and besides, the tits feed their young chiefly on insects' eggs and caterpillars. Count Wodzicki mentions in particular Sitta europæa, Certhia familiaris, and the Regulidæ, as being very useful in destroying Bombyx pini. He also mentions that the woodpeckers are of great utility in destroying the following insects, *viz.*, *Noctua pinastri*, *Geometra piniaria*, *Sphinx pinastri*, *Tenthredo pini*, and *T. septentrionalis*, *Bostrichus typographus*, and *B. chalcographus*. M. C. Von Heyden also remarks that in the winter Sitta europæa and Parus major feed on the larvæ of Cecidomyia fagi, the Beech-gall insect, and states as follows:—'The well-known conical gall of this insect is often found in larger numbers on the upper side of the Beech leaves. In the autumn it becomes hard, like wood, and falls off the leaf. These birds then search carefully on the ground, under the trees, for the galls; and after pecking a hole, generally in the side of the point of the gall, pick out and devour the insect. The hole is generally so small that the insect cannot be extracted with the beak, and the bird must use its tongue for that purpose. It is curious that the bird should bore a hole at the hard point of the gall, when the base is merely closed by the thin paper-like web of the insect.'

"Professor Buckman has also recently observed that the Blue Tit (Parus cæruleus) destroys the flies which make the Oak-galls, which, in many parts of the country, threaten to ruin the young Oak plantations.

"Many of our seed-eating birds are useful, not only because they feed on the seeds of injurious weeds, but also on destructive insects; and our common Yellowhammer (Emberiza citrinella) feeds with avidity on the caterpillar of the white butterfly (Pieris rapæ).

"Mr. Mewes, the well-known Swedish naturalist, states that at Borgholm, in Sweden, he found the Oak woods near the castle almost stripped of their leaves by Tortrix viridana, and that numbers of birds were feeding on the larvæ of this insect, amongst which he names the common Crossbill (Loxia curvirostra), which though in general a seed-eater, was in that instance doing good service in eating insects. He states, that flocks of these birds were busily employed in destroying this insect.

"The much persecuted sparrow (Passer domesticus) is also a good friend to the agriculturist, and amply repays him for the little corn he may take, by destroying many injurious insects, and in eating the seeds of many rank weeds.

"During the winter the Tree Sparrow (Passer montanus) feeds chiefly on the seeds of Urtica dioica, Chenopodium album, and Polygonum aviculare, all of which are injurious weeds.

"It is true that the House Sparrow is a grain-eating bird, but its nestlings are fed chiefly on insects. M. Berthold Wicke examined the contents of the stomachs of 118 sparrows, procured between April 21 and June 24, and gives the following as the results of his investigations:—Of these birds 45 were adults, and 73 young, ranging from the small naked nestling to the full fledged bird. In the stomachs of three of the adult birds he found only grain, in one nothing but the remains of a few beetles; one had the stomach and crop so full of grain that he counted 50 grains; one stomach contained the seeds of weeds, pieces of Peas, and seeds of Stellaria media; and the rest contained corn, with the remains of beetles; and in one was the entire skin of a Melolontha vulgaris.

"Whereas, however, the stomachs of the adult birds contained chiefly grain, and but a small proportion of insect remains, it proved to be entirely the reverse as regards the young birds. Out of the 73 he examined, the stomachs of 46 contained insects, larvæ, caterpillars, &c., and only nine contained vegetable matter alone. Of the remaining stomachs 19 contained the remains of insects, mixed with a few seeds, seven contained chiefly seeds, with a small proportion of insect remains, and one contained egg-shells and small stones, without traces of anything else.

"Our American cousins have recognised the utility of the sparrow, and have introduced it into New York, where it is now found comparatively numerous, and has been most useful in keeping the trees free from caterpillars, which before its introduction threatened seriously to injure them.

"Our thrushes and blackbirds are also most useful to the gardener, from the quantity of slugs and snails they destroy, and our rook is universally acknowledged to be a most useful bird."

Much information as to the nature of the food of birds is however yet needed, in order to judge correctly of the amount of good or harm they do; and it would be well if the question were fully ventilated in the newspapers, and naturalists resident in different parts of the country encouraged to make investigations on the nature of the food of the different species of birds, and compare the results of such investigations."

The Council may be congratulated on the greater promptitude with which these valuable annual reports are now issued, and also on the improved form in which they appear.

Obituary.

WE regret to record the decease of Major RICHARD SYKES, of West Ella, near Hull, Yorkshire, in whom the horticultural world has lost a true patron. In early life he served in the East York Militia, where he attained the rank of Major, but retired on the conclusion of the Napoleonic Wars. He subsequently spent many years in Italy, principally in Rome, where he possessed a handsome villa. In that country he doubtless acquired that refined taste in landscape gardening and architecture, which he afterwards turned to such excellent account in beautifying his own village and estate. On inheriting his demesne of West Ella in 1832 he commenced a work which became the principal occupation and delight of his life. From a poor dingy country village he transformed that of West Ella into one of the prettiest and most picturesque in the country, every cottage, barn, or shed being changed into a "thing of beauty." The gardens are not very extensive, but yet comprise every needful requirement—hothouses, stove, and conservatory, with a very neat Italian garden, tastefully arranged with flowers. His arboretum was his especial delight, and he spared neither trouble nor expense in procuring the choicest and rarest specimens, both deciduous and evergreen. He planted a fine selection of Coniferæ, many of which he lived to see attain great size and perfection, more particularly Abies Douglasii, Araucaria imbricata, Cedrus Deodara, Pinus Pinsapo, &c. He was always mindful of our beautiful old herbaceous and alpine plants, and was not a willing follower of the present bedding out system. For a circuit of nearly two miles he transformed what was either very ordinary plantation, or bare pasture, into the beautiful sylvan scenery, with the assistance only of his labourers, and consulting only his own admirable taste and skill in the arrangement

and disposition of the trees and shrubs. Old stone quarries, ponds, and roads, yielding to his hand, became objects of special beauty, and the result has been an extent of exquisite woodland scenery such as is rarely seen. He attained, amid the affection of all who knew him, a tranquil and happy old age, and died peacefully, without disease or suffering, on February 24, 1870, in his 87th year.

Miscellaneous.

CORNISH HEATH: ERICA VAGANS, L.—We have been shown specimens of this, said to have been gathered last August, in a perfectly wild state, in North Wales, between Dolgelly and Machynlleth. This species has been recorded from Glamorgan, and many other counties besides Cornwall, where alone it is undoubtedly native. It appears to be readily established in suitable situations. *Journal of Botany.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE long-continued severe weather which we have experienced will have necessitated a somewhat prolonged use of artificial heat in plant-houses. The ill effect of this could not be remedied in any great degree by the admission of fresh air, though it will have induced the thoughtful practitioner to keep the temperature as low as possible. Now with these considerations in view it will not be judicious to raise the temperature so high as would be advisable in ordinary seasons, even if the weather change from "foul to fair" all at once. Therefore, instead of ensuring heat in *Stoves* a mean temperature of 72° or 74°, let another week or two be spent in gradually bringing it up to that point. Potting will now become general in regard to *Plant-houses*. I have not space to dilate fully upon each genus, hence the principles and practices which I have frequently advocated must be followed as general principles, with all alike. Considering the manner in which it has been necessary to maintain a proper warmth in *Heath-houses*, it is questionable whether these have not suffered somewhat from the confined artificial heat. Even more than ordinary attention should therefore be given them in regard to giving air. The coverings which I suggested should be placed over structures containing these plants, to assist in maintaining the necessary degree of warmth by night should now alone be requisite, all fire-heat being dispensed with. Night air should be admitted freely when a nice soft external temperature prevails. Turn all pot plants round often at this season from one side to the other, as this simple practice seems to imbue all parts alike with renewed vigour. Sow seeds of such plants as *Thunbergias*, *Impatiens*, *Ipomœas*, *Mimosa pudica* (Sensitive plant), and *Clianthus Dampieri*, &c., if these are required.

FORCING HOUSES.

As soon as the heat in tan-beds requires renewing *Pines* will need a thorough revision. Let this be done thoroughly at once, choosing a warm day for the operation. I have before suggested that the beds in which the main bulk of fruiters are should be attended to as soon as symptoms of a decline in the bottom-heat are felt. Now, however, distinct divisional treatment will have to be studied, somewhat in the following order:—1, fruiters; 2, largest successionals intended to show next, and the young stock generally; when the bottom-heat has undergone renewal, care should be taken not to allow too great fluctuations between the top and the bottom-heat. To regulate this a little fire-heat may be allowed early in the morning until about 9 o'clock. Syringe the plants sparingly, but keep all the cool surfaces well moistened. Such young successionals as have been fresh potted will need a little extra nursing until fresh roots are formed, by keeping a close atmosphere, more frequently and lightly damping them over, and by shading when the sun happens to shine out freely. Amateurs and others, not well versed in garden operations may now make up a hot-bed with any fermenting material they may have that is moderately sweet. The rank odour and steam is subdued, by successive heatings, the heap being turned over between each heating, so that all parts may come under the process of fermentation. This, I scarcely need say, is done by placing the outside into the middle when the materials are being turned over. Make the bed according to the quantity of material, and the purposes for which it is intended; if for *Cucumbers*, then a lining will be wanted. In that case, the bed should not exceed in width or length the size of the frame intended to cover it by more than 3 inches each way. It will be high enough at 5 feet if the stuff is well shaken out as it is laid on, and beaten down regularly with the fork. It will not require lining for a week or so. In instances where no lining is requisite, the frames being intended to strike cuttings in, to forward tender kinds of bedding-out plants, or to raise seedlings of half-hardy annuals, &c., then the material should not, when formed into a bed, exceed the height already given, and if it exceed by a foot or so the size of the frame so much the better, as a greater and more enduring heat will be insured. The bed after being built and the frame being put on at once should lie a week before any further progress is made, when it will be necessary to take the lights off and turn the inner surface of the Cucumber bed over to sweeten it, air being given plentifully. This applies also to the frame intended for cuttings, which it will not be safe to put in for 10 or 14 days at least. To hasten the matter a layer, 1 foot deep, of spent Hops can be obtained and placed on the surface of the bed; then the cuttings may be put in in about a week, but a little air must be regularly afforded to insure safety from any excess of steam which may arise within. Seeds may also be sown in a week's time from the time when the frame was made up. These comprise such things as *Perillas*, *Amaranthus*, *Ovalis*, *Violas*, *Chamæpeuces*, *Daturas*, *Solanums*, and a host of similar decorative plants, besides such specialities as the amateur may wish to cultivate.

KITCHEN GARDEN.

Look carefully over all plantations of *Globe Artichokes*. These, with all their coverings, will have been punished somewhat during the past severe weather. It will be well to remove the protecting materials from around them, so as to freshen the soil, and to place a lighter covering of dung material around the stools. All warm sunny positions should now be made use of by planting *Potatos* for the earlier outdoor supply. Where *Leeks* are required early in the autumn a batch should now be sown. Bring to a close the peparation of the ground, and the planting of *Jerusalem Artichokes;* they should be planted in the same way as Potatos, and in any out-of-the-way place. *W. E.*

TOWN GARDENING.

WE must now be up and doing, if we wish to give our gardens a good appearance during the forthcoming summer. Sweep and roll the grass-plots and lawns. Stir up and level the soil under trees, and on all bare places where grass is required. Sow the grass seeds pretty thickly, as the sparrows will have a large share. Perennial Rye-grass and Poa trivialis should be mixed with it. Cover it with a light coating of fresh mould, and tread it well in; then level it with the back of a rake, and give it a good rolling. This is the best time for laying turf, which should be obtained if possible from off a common that has been closely eaten by cattle. This, if laid close, and well beaten and rolled, will make a good lawn at once. The sooner the transplanting of trees and shrubs is completed the more likely they are to succeed. Loosen with a Dutch hoe the surface of those beds and borders that have been dug some time, taking care to leave undisturbed those plants that are coming up. Remove all rubbish and large stones, to give the beds a neat appearance and prepare them for sowing. *Carnations* and *Pinks* should now be planted where they are intended to flower. The *Virginia Stock* is one of the very best annuals for town, and will flower early if sown now in rings round the Crocuses, which latter will protect the young plants from the cold winds. It also makes a gay bed if sown to represent a design—such, for instance, as the groundwork of red with figures of white and yellow introduced. Old *Gravel Walks* should now be turned, and new gravel laid on where required. Attention should also be paid to laying the walks firmly and highest in the centre, so that the surface water may drain off freely. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, MARCH 2, 1870.

1870 Month and Day	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition		
February and March	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air
	Ins	Deg	Deg	Deg		Gr
24 Thurs	29.20	42.7	41.3	39.6	89	2.8
25 Friday	29.51	38.5	36.6	28.0	81	1.8
26 Satur	29.39	41.3	39.6	37.8	87	2.6
27 Sunday	29.47	45.6	43.2	39.6	83	2.9
28 Monday	29.49	50.2	47.5	44.8	83	3.4
1 Tues	29.50	52.1	49.7	46.1	86	3.6
2 Wednes	29.36	54.9	51.8	48.7	79	4.0

1870 Month and Day	Temperature of the Air					Wind.		Rain.
February and March	Highest.	Lowest.	Range in Day	Mean	Departures of Mean from Average of 32 years	Direction.	Horizontal Movement.	In Inches.
	Deg	Deg	Deg	Deg	Deg		Miles	
24 Thurs	49.0	36.3	13.0	42.0	+ 2.6	S W	360	0.00
25 Friday	48.9	27.3	18.6	38.3	— 1.3	S S W	199	0.00
26 Satur	52.0	34.9	18.9	41.9	+ 2.1	S W W	200	0.00
27 Sunday	54.9	37.7	17.7	45.9	+ 6.0	N N E	240	0.00
28 Monday	55.6	41.5	14.1	50.3	+ 10.2	S S W	309	0.00
1 Tues	55.1	45.1	9.8	49.6	+ 9.1	S S W	555	0.15
2 Wednes	61.0	47.3	13.7	53.6	+ 13.4	S W	560	0.00

February 24 —Cloudy during the day; cloudless at night; very fine.
" 25 —Generally cloudless and fine; solar halo visible.
" 26 —Generally cloudy; a little rain fell in the morning; solar halo.
" 27 —Cloudy during the day; cloudless at night.
" 28.—Overcast during the day; cloudless at night.
March 1 —Overcast; rain fell heavily at night.
" 2 —Generally cloudy during the day; cloudless at night.

The readings of a thermometer with its bulb placed 1 inch below the surface of the ground, ranged between 34° and 50°, and of one at the depth of 3 feet below the surface, between 38° and 41° during the fortnight ending March 2.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, FEBRUARY 26, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range.	Mean of Highest and Lowest.	Mean Daily Temperature.	Mean Temperature.	Fall of Rain.
	Deg	Deg	Deg	Deg	Deg	Deg	In.
Portsmouth	50.6	30.8	19.8	40.7	42.0	41.1	0.19
Blackheath ..	52.0	34.8	17.2	43.4	44.0	43.6	0.05
Over Court ..	51.1	25.0	22.2	44.6	42.0	41.6	0.12
Birmingham ..	47.8	23.7	24.1	43.7	42.0	41.7	0.10
Wolverhampton	46.5	24.9	21.6	43.0	41.1	41.0	0.16
Liverpool ..	47.5	25.2	22.3	43.5	40.6	42.5	0.00
Norwich ..	48.0	25.5	22.5	42.1	40.6	42.5	0.29
Nottingham ..	48.4	23.6	24.8	41.0	39.2	41.0	0.10
Sheffield ..	45.8	21.7	24.1	41.8	41.5	41.3	0.24
Liverpool ..	45.6	20.0	16.6	42.9	41.5	43.8	0.21
Manchester ..	47.9	28.9	21.0	41.1	43.8	41.5	0.37
Eccles (Salford)	45.3	25.0	20.3	42.2	40.6	42.2	0.45
Bradford ..	44.8	24.3	20.5	41.0	40.6	41.3	0.32
Leeds ..	41.0	20.0	18.1	41.2	41.1	40.2	0.23
Hull ..	45.9	22.0	23.0	41.0	41.1	40.6	0.51
Newcastle ..	41.0	24.0	17.0	41.1	40.1	39.8	0.24
Edinburgh ..	44.7	19.0	25.7	..	..	..	31.6	?
Glasgow ..	48.8	15.6	30.2	..	..	..	41.9	2.18
Aberdeen ..	45.2	20.1	21.8	..	..	..	41.9	0.32
Greenock ..	45.8	24.5	21.0	..	..	..	41.5	1.59
Leith ..	41.3	19.0	25.0	..	..	..	34.4	1.10
Dublin ..	44.8	25.5	22.0	..	..	..	40.1	0.27

JAMES GLAISHER.

Notices to Correspondents.

AMERICAN NURSERYMEN: *F.* See the "American Horticultural Annual," published by Orange Judd & Co., which can be had from Trübner & Co., Paternoster Row, for a small sum.

BORDER FOR VINES: *H. Chrimond.* A 4 feet border inside the house will grow Grapes tolerably well to a certain extent, if well made and oft top-dressed; but why not make a border underneath the gravel walk? We have seen borders so made answer admirably. When once set agoing the roots will soon get beyond the walk, if anything good is to be found elsewhere.

CHISWICK DOOMED: *F. R. H. S.* writes:—"At p. 280, I am made to say:—'Neither is there any need for the parent, because the children live.' It ought to have been:—'Neither is there any need for the parent "to die" because the children live.' The idea, as the context shows, was not that Chiswick might now depart in peace, but that it might be curtailed, or modified. Still there was room enough for all the societies, old and new."

CUTTING BOX EDGINGS: *S. B.* In the month of June, during showery weather.

FERNERY: *Subscriber.* The rough plate glass is very suitable for the roof of a Fernery, or ordinary clear sheet glass may be used if the roof is carefully shaded. Many stove Ferns succeed in a night temperature of 55°, rising 5° or 10° by day, according to the season; but for a general collection, 60° by night, and 70° by day, with a moist atmosphere and shade when necessary, would be suitable. The hot-water system of heating is the most reliable.

FERNS DAMPING OFF: *Ten Years' Subscriber.* Probably the rockwork pockets are not sufficiently drained, and the plants die off from accumulated moisture at the roots.

HELLEBORUS TRIFOLIUS: *R. H. C.* The true Helleborus trifolius of Linné (figured in "Amœnitates Academicæ") is certainly the American plant now known as Coptis trifolia, Salisb. It is not an uncommon species in herbaceous collections. Messrs. Stark, of Edinburgh, would probably be able to send it you. If you send a specimen of your H. trifolius we will give you its correct name. Anemone nemorosa Robinsoniana is not known to us; it is scarcely likely to be the same as A. blanda, as the flowers of that and A. nemorosa differ considerably in appearance, A. blanda having narrower and more numerous sepals.

INSECTS: *J. Taylor.* The Pine Beetle, Hylurgus piniperda.—*W. H. P.* The larva attacking your Seakale root is probably that of some dipterous insect. We fear you can do nothing but destroy all your roots, and make a fresh plantation in a distant part of your garden with plants from another place.

VIGILANCE COMMITTEE: *H.* You will be glad to hear that the state of affairs is more promising than it was. The committee will not necessarily be antagonistic to the Council; quite the reverse.

COMMUNICATIONS RECEIVED: E. B.—A. B. C.—J. D. G.—N. H. P.—J. R.—W. H. P.—S. B.—J. W.—J. T.—W. P. R.—R. M.—Prof. C. C.—H. P.—A. Sub—Novice—W. C.—J. G.—W. D. F.—Hortus—E. J. W.—W. S. W.—H. T.—T. S. P.—W. P.—F. R. (Wales)—W. M.—D. T. F.—R. D.

Markets.

POTATOS.—Southwark, February 28.

During the past week the arrivals coastwise have been very large, particularly towards the end of the week, which has caused a reaction in the trade, and prices are looking down. The following are this day's quotations:—Yorkshire Regents, per ton, 70s. to 100s.; Yorkshire Flukes, 90s. to 110s.; Lincolnshire Regents, 70s. to 80s.; Dunbar and East Lothian do., 80s. to 100s.; Perth, Forfar, and Fifeshire do., 70s. to 80s.; Ditto Rocks, 65s. to 70s.; French and Belgian Whites, 60s. to 65s.

COVENT GARDEN.—March 5.

The leading growers have not attended this market above once or twice weekly, and consequently our supplies are not beyond the required quantity. The improvement noticed last week has been fully maintained, good articles being in better request. Continental supplies comprise

Asparagus, Cauliflowers, French Beans, Carrots, and the usual variety of salading. New Potatos have arrived from Malta, Algiers, and the West Indies. Flowers consist principally of Heaths, Primulas, Cinerarias, Hyacinths, Tulips, &c., which have become plentiful during the last few days.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3 0 to 5 0		Lemons, per 100 ..	5 0 to 10 0	
Cobs, per lb. ..	0 9 .. 1 0		Melons, each ..	1 6 .. 3 0	
Chestnuts, p. bush. ..	8 0 .. 14 0		Oranges, per 100 ..	6 0 .. 12 0	
Filberts, per lb. ..	0 6 .. 0 9		Pears, per doz. ..	3 0 .. 6 0	
Grapes, per lb. ..	6 0 .. 12 0		Pine-apples, per lb.	8 0 .. 10 0	

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6 to 15 0		Horse-Radish, p. bun.	3 0 to 5 0	
Artichokes, p. doz..	3 0 .. 6 0		Leeks, per bunch ..	0 2 .. 0 4	
Beet, per doz. ..	2 0 .. 3 0		Lettuces, p. score ..	1 0 .. 2 0	
Broccoli, per doz. ..	1 0 .. 2 6		Mint, per bunch ..	1 0 .. 1 6	
Brussels Sprouts, p. ½ sieve ..	1 0 .. 2 0		Mushrooms, p. pott.	1 0 .. 1 6	
Cabbages, p. doz. ..	1 0 .. 1 6		Onions, per bunch ..	0 4 .. 0 6	
Carrots, p. bunch ..	0 4 .. 0 8		Parsley, per bunch ..	0 2 .. 0 4	
Cauliflowers, p. doz.	1 6 .. 3 0		Potatos, new, p. lb.	0 4 .. 0 6	
Celery, p. bunch ..	0 3 .. 0 6		Salsafy, per bundle .	1 0 .. 1 3	
Cucumbers, each ..	1 6 .. 3 0		Seakale, p. punnet..	2 0 .. 2 6	
Endive, per doz. ..	1 6 .. 2 0		Shallots, per lb ..	0 8	
French Beans, p. 100	4 0 .. 6 0		Spinach, p. bushel .	2 0 .. 3 0	
Garlic, per lb. ..	0 8		Radishes, per doz..	1 0 .. 1 6	
Herbs, per bunch ..	0 2 .. 0 4		Turnips, per bunch .	0 4 .. 0 6	

Potatos, York Regents, per ton, 75*l.* to 100*l.*; Flukes, do., 75*l.* to 120*l.*

SIXTY THOUSAND TEA-SCENTED and NOISETTE ROSES, in pots, of all the best sorts, at 9*s.*, 12*s.*, 18*s.*, 24*s.*, and 30*s.* per dozen

WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with the novelties as can be recommended.
Highgate Nurseries, London, N.

RIBES ATROSANGUINEA, dark flowering Currant. Fine plants, 2½ to 3½ feet, 3*l.* per dozen; 14*l.* per 100; double flowering, 2½ to 3½ feet, 3*l.* per dozen; 15*l.* per 100.
BROOM, White Portugal, 3 to 4 feet, 2*s.* 6*d.* per dozen; 12*s.* per 100; 3 to 4 feet, 3*s.* per dozen; 18*s.* per 100
BROOM, Common Yellow, 2 to 3 feet, 3*s.* per dozen; 12*s.* per 100
See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

HARDY HEATHS, in 50 varieties, free of package:—
24 plants, in 12 varieties, two of each for 7*s.*
48 plants, in 24 varieties, including choicer varieties, for 15*s.*
100 plants, in 12 varieties, for 25*s.*
100 plants, in 24 varieties, for 30*s.*
100 plants, in 50 varieties, for 50*s.*
Many varieties can be supplied by the 1000. See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, near Matlock.

POTATOS.—Ashleaf Kidney Early, Handsworth, Golden Dwarf Early, Dalmahoy and Fluke, nice selected seed, can be offered cheap by the Ton ARTICHOKE, Jerusalem, fine quality, for present use, or Seed, can be offered in quantity. Also SEAKALE, two years
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

The best Potato for the Main Crop is

SUTTONS' BERKSHIRE KIDNEY, raised and selected from upwards of 30 varieties of Potatos, all grown and placed it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very handsome in shape, and of a dark clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed. Price 2*s.* per peck, or 7*s.* per bushel.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

Notice.

PURCHASERS of LARGE QUANTITIES of FARM or GARDEN SEEDS will be supplied liberally by SUTTON AND SONS.
For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for Excellent Seed Corn and Seeds.

Mangel Wurzel Seed.

H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL-TOP YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low.
Seed-Growing Establishment, Wisbech.

Turnip Seed.

BOLTON AND CO. offer NEW SEED of all the most approved varieties of FIELD TURNIPS, including their own selected stock of Swede.
Prices moderate, to be had on application.
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

On Laying Down Land to Permanent Pasture.

"These enterprising seedsmen (Messrs. MINTER & SON), in introducing a new element into their calculations for laying down land, have undoubtedly a good idea."—*The Field*.

MESSRS. WHEELER AND SON supply the FINEST and BEST GRASSES and CLOVERS (all included) for laying down land—

For One Year ..	..	at 13*s.* 6*d.* per acre
For Two Years ..	..	17*s.* 6*d.* per acre.
For Four Years ..	..	22*s.* 0*d.* per acre.
Permanent Pasture ..	..	from 26*s.* to 32*s.* 0*d.* per acre.

All Carriage free. Inferior qualities cheaper.
J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

WANTED, ONE or TWO active YOUNG MEN, to assist in the Houses.—State wages, &c., required, to C., *Gardeners' Chronicle* Office.

WANTED, an active YOUNG MAN, to make himself generally useful, where Fruit, &c. is grown extensively for Market. Wages 15*s.* per week, without perquisites.—SANDERS, Vine Cottage, Peckham Rye, Surrey.

WANTED, an intelligent, steady, young or middle-aged Person, with a good knowledge of LAYING OUT and PLANTING, and who is a tolerable Scholar.—Mr. LEE, Landscape Gardener, &c., 2, Blessington Villas, Lewisham, S.E.

WANTED, an active, industrious young Man, for the general OUT-DOOR NURSERY WORK. Must be a successful Budder and Grafter.—Apply, in own handwriting, with reference and wages required, to FRANCIS & ARTHUR DICKSON & SONS, "Upton" Nurseries, Chester.

WANTED, a GARDENER, to Grow Flowers and Plants for Market. Good wages given to a Man who understands the profession.—D. D., *Gardeners' Chronicle* Office, W.C.

WANTED, a GARDENER.—Will be required to attend to Horse and Trap; must have good recent character. Wages, 18*s.* per week, with lodging after three months' service.—Mr. H., care of Mr. Gulderson, Coach Builder, Romford, Essex

WANTED, a YOUNG MAN, to take charge of the Houses, where a good collection of Soft-wooded Plants, &c., are grown. Must be a good Propagator and Budder. Wages, to begin with, 18*s.* per week. Also a LAD, to Assist the above.—EDWIN HILLIER, Nurseryman, Winchester

WANTED, an active YOUNG MAN, of good address, with knowledge of the Seed and Plant Trades.—Apply, with full particulars, to R. P. KER, 6, Basnett Street, Liverpool.

WANTED, an active young Man, for NURSERY and WILDERNESS WORK; must be a successful Budder and Grafter.—Apply by letter, with reference and wages required, to E. & T. PERKINS, Leamington Nursery, Leamington.

WANTED, a YOUNG MAN accustomed to Potting, Tying, and ordinary work.—Apply, stating age, where last employed, and wages expected, to SHUTTLEWORTH AND SON, The Westbourne Nursery, Hammersmith Road, W.

A LANDSCAPE GARDENER, in full practice, will TAKE a YOUTH, about 18, as PUPIL, for a term. Will have to study Land Measuring, Drawing, &c. Premium moderate.—ALPHA, Post Office, Wimbledon, S.W.

WANTED, in the Seed Trade, a CLERK and TRAVELLER. Apply, in own handwriting, stating amount of experience, where previously employed, and salary required, to W., *Gardeners' Chronicle* Office, W.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times their Books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon JAMES CARTER AND CO. adapting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with LISTS of PERSONS, Out of SERVICE, of GARDENERS and GARDENERS and BAILIFFS, of various qualifications, who are open to Engagements. The fullest particulars as to services required and wages given should be forwarded with application to PAUL'S Nurseries, Waltham Cross, London, N.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.
Bedford, February, 1870.

Business Agency.

FARM, ESTATE, or GARDEN.

MR. T. BOWICK has the pleasure of introducing good MEN to fulfil such duties in connection with the above. No one is recommended whose antecedents have not been thoroughly inquired into. HOME, COLONIAL, FOREIGN.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen. Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (Head).—Age 43, married; good practical knowledge in all branches of the profession. Cattle and Land if required.—C. B., Post Office, Dulwich, S.E.

GARDENER (Head). — Middle-aged, married; understands the profession. Wife can undertake the Laundry if required. Good references.—A. M., Cedars Lodge, Sunbury, Middlesex.

GARDENER (Head).—Age 30, married; thoroughly practical in all branches of the profession. Can be highly recommended.—T. S., Blythe Terrace, Stanstead Road, Forest Hill, Kent, S.E.

GARDENER (Head).—Age 27; thoroughly understands Early and Late Forcing, Stove and Greenhouse Plants, and Flower and Kitchen Gardening. Good character.—GARDENER, Mr. W. Watson, High Street, Huntingdon.

GARDENER (Head).—Middle-aged, married, no incumbrance; understands Gardening in all its branches. Dwelling in a house. Good character from the Lady he is now living with.—E. H., 17, Dr. Johnson's Buildings, E.C.

GARDENER (Head).—Age 45, married, no incumbrance; the highest testimonials of the profession in all its branches. Testimonials can be had of—C. M., Mr. Robinson, Nurseryman, &c., Stockwell.

GARDENER (Head), to any Nobleman or Gentleman requiring the services of a practical and experienced Gardener in every branch of the profession. The Management of Land and Stock if required. Character will bear the strictest investigation.—G. R., Epsworth, Thorne.

GARDENER (Head).—Middle-aged, married, no incumbrance; has a thorough practical knowledge of Forcing Fruit, Flowers, and Vegetables, and the Management of Kitchen, Fruit, and Flower Gardens.—HORTUS, 25, Lant-in Grove, Lower Norwood, S.

GARDENER (Head).—Age 44; understands Gardening in all its branches, including Vines, Pines, Peaches, Cucumber, Stove and Greenhouse Plants, and Flower and Kitchen Gardening. Excellent testimonials for years as last situation.—GLOBE, FLETCHER AND CO., Cheapside, Peterborough.

GARDENER (Head), age 28, married.—A Gentleman is desirous of recommending his Head Gardener to any Nobleman or Gentleman requiring the services of a practical industrious Man. Over three years' character.—X. Y., Mr. Ewing, Curator, Botanic Garden, Sheffield.

GARDENER (Head), to any Lady or Gentleman requiring a thorough practical Gardener.—Married, no incumbrance. Had and Soft-wooded Plant Grower, for Exhibition or otherwise. Flower and Kitchen Gardener, Early and Late Forcing. Eleven years' good character from last situation.—T. TODMAN, 129 Clapham Park Road, Clapham, London, S.W.

GARDENER (Head), age 44, married, one child, 10 years of age.—M. HAZEL, late Head Gardener to the Right Hon. the Earl of Strafford, Chilton Hall, begs to offer his services to any Nobleman or Gentleman requiring a first-class Gardener. Was 13½ years Farm Bailiff and Gardener to Mrs. Miles, Firbeck Hall; five years Head Foreman to Mr. Barron, Elvaston Castle; and two years with Mr. Barron, at Lady Rolle's, Bicton. M. H. can have first-class testimonials from all the above.—63, Eversfield Place, St. Leonards-on-Sea, Sussex

To Noblemen and Gentlemen

GARDENER (Head), Age 28, single, has a thorough knowledge of the profession in all its branches, including the Growing of Pines, Grapes, Cucumbers, &c.; Flower and Kitchen Gardening, Early and Late Forcing of Flowers, Fruits, and Vegetables. Can take the Management of Land and Stock if required. Three years in last situation, but through employer changing his residence is anxious to obtain the charge of a Gentleman's Garden. Can be highly recommended by Mr. H. J. Mr. W. Lambert's, Tyer Tooting, S.

GARDENER (Head, WORKING), where two or more are kept.—Age 34; thoroughly understands Vines, Greenhouses, Forcing, &c. Ten years' character.—W. E., Post Office, Hockly Heath, near Hermit Inn.

GARDENER (Head). or GARDENER and BAILIFF.—Age 38, married, no family; has had good practical experience in Gardening, Farming, and Estate work. Highly recommended.—J. A., Maids Moreton, Bucks.

GARDENER (Head, or SINGLE-HANDED).—Married; thoroughly understands the profession. Wife could undertake the Laundry and manage Poultry.—W. R., Harewood Terrace, Norwood Green, Middlesex.

GARDENER (Head, or good SINGLE-HANDED).—Middle-aged, married, no incumbrance. Good references. Single, Good characters from previous employers.—J. C. H., Post Office, Sherborne, Dorset.

GARDENER, to any Lady or Gentleman requiring a skilful young Man.—Age 25. Well recommended from the establishment he has lived at nearly four years.—G. G., Mr. Cutbush, News-agent, High Street, Highgate, London, N.

GARDENER (SINGLE-HANDED).—Age 28, single; understands Stove, Greenhouse and Bedding plants; Cucumber and Melons, and ordinary Forcing; also Hardy Fruit, Kitchen, and Flower Gardening; Gardening only preferred. Five years' good character.—W. H., Mrs. Freebody, Wargrave, Henley-on-Thames

GARDENER (SINGLE-HANDED, or GOOD UNDER).—A young Man, respectable. Nearly three years' good character from present employer.—GARDENER, Post Office, Great Warley, Brentwood

GARDENER (SECOND), or IMPROVER in a good Establishment.—Age 21; experienced in various branches. A liberal Premium given. Five years' good character.—C. R., Post Office, Waltham Abbey, Essex.

GARDENER (UNDER).—Age 21; has had several years' experience in good Gardens. Good character.—G., Mr. W. Watson, High Street, Huntingdon.

GARDENER (UNDER), in a Nobleman's or Gentleman's Garden, or Nursery.—Three years' good character. H. F., Moore's, Stationer, Harrow, London, N.W.

GARDENER (UNDER).—Age 20; four years' experience. Would not object to pay a small Premium under a good Gardener. First-class character.—A. WEBB, Daylesford Gardens, Chipping Norton, Oxon

GARDENER (UNDER), in the Houses preferred.—Willing to make himself useful at Outdoor Work if required. Two and a half years' character.—H. BOWMAN, Sidcup, Foot's Cray, Kent

GARDENER (UNDER), or IMPROVER, in a Nobleman's or Gentleman's Garden.—Age 20, respectable. Good character.—A. B., Post Office, Richmond Road, Twickenham, S.W.

GARDENER (IMPROVER), in a Gentleman's Establishment.—Age 21. Small Premium given. Would make himself useful. Good character.—C., Acrise Rectory, near Canterbury, Kent

GARDENER (IMPROVER), in the Houses.—Age 18; five years' good character. Wages 12*l.*—W. BOWMAN, Sidcup, Foot's Cray, Kent

TO HEAD GARDENERS.—HENRY SURMAN, Florist, High Street, Witney, Oxon, has TWO SONS, age 14 and 16, he wishes to place under the above. A Premium will be given.

IMPROVER, under Glass.—Age 18; liberal wages expected. Three and a-half years' good character.—T. M., The Point, Newick, Uckfield, Sussex

IMPROVER, in a Nobleman's or Gentleman's Garden.—Age 18; an adequate Premium given.—State terms and particulars to JOHN ENTWISTLE, 4, Oxford Street, Staley, Cheshire.

TO SEEDSMEN, &c.—A young Man (age 20), accustomed to the Nursery and Seed Business in the country, would be glad of a Situation of employment in a Nursery or Seed House, or as UNDER GARDENER to a Gentleman. Understands his Work.—H. H., Hurst & Son, 6, Leadenhall Street, City, E.C.

FOREMAN, in a Nobleman's or Gentleman's Garden.—Age 26, single; experienced in all branches. Three years' good character.—L. M., Post Office, Wavertree, Liverpool.

FOREMAN, in a good Establishment, or a single-handed place not objected to.—Married; good references.—A. B., Mr. Hutton's, Grocer, Parson's Green, Fulham, S.W.

FOREMAN, in a good Establishment.—Age 24; has filled a similar situation. Good testimonials from several good establishments.—J. M., Nurseries, Bath Gardens, Oxford.

PROPAGATOR (FOREMAN), or SOFT-WOODED PLANT GROWER.—H. WORSAM is now open to an engagement as above; has filled a similar situation for the last 20 years with Hugh Low & Co., Upper Clapton, and T. Rivers, Sawbridgeworth, Herts, and Sir John's Wood Nursery preferred.—H. W., Mr. Jones' Post Office, Upper Clapton

PROPAGATOR, or PROPAGATOR and FOREMAN.—Good reference.—A. Z., 19, Turner Street, Suffolk Street, Commercial Road, London, E.C.

PROPAGATOR (HEAD).—A successful Propagator of Roses, Rhododendrons, &c. Highly recommended.—WM. WOOD AND SON, The Nursery, Maresfield, near Uckfield, Sussex.

BAILIFF and STEWARD.—Age 45, married, no incumbrance; highly recommended.—A. B., 97, Westbourne Park Road, Paddington, London, W.

BAILIFF.—Age 40, married, no incumbrance; sober and industrious. Well up in Farming and the Management of Cattle. Wife to Manage Dairy. Good reference as to character. Situation required by March 25.—R. T., Marlborough Post Office, Wilts

To Landed Proprietors.

LAND AGENT, or FARM BAILIFF.—A married Man (Scotch), of great experience in Buying and Selling Stock, and in many Cultivated or Feeding districts, refers as to character and ability.—W. W., 18, Bishopsgate Street Without, E.C.

MANAGER (ASSISTANT).—A Farmer's Son is desirous of obtaining an appointment in Canada on a Farm or Estate.—Willing to make himself useful, and would not object to roughing it with the superior. Has a knowledge of Farming, and can keep Accounts.—W. G., Post Office, Tottenham, Middlesex.

To the Seed Trade.

TRAVELLER.—The Advertiser requires a re-engagement. Can give satisfactory references.—ALPHA, Post Office, Margate

TRAVELLER, or SALESMAN with charge, combined with Book-work, in the Nursery and Florist Trade.—Age 30; can be well recommended.—T. C., Robertson & Scott, Advertising Agents, Edinburgh.

SHOPMAN.—Age 26, Scotch; ten years' experience in all branches of the Seed Trade, with part knowledge of Plants. No objection to go abroad. Good reference.—F. A. B., Post Office, Newcastle-on-Tyne.

SHOPMAN, &c.—Age 22; three and half years in the Seed Shop of the late Mr. W. Barnes, Camden Nursery, Camberwell, is open to an engagement.—W. CLARKE, 29, Downing Street, Farnham, Surrey.

To Gentlemen and Nurserymen.

CARPENTER and JOINER.—A middle-aged, married Man, is desirous of an engagement to undertake the General Repairs; can do Painting and Glazing, and make himself generally useful in the different branches of the Trade. Low wages for constant employment.—P. B., 2, Esther Road, Leytonstone, Essex

COWMAN and POULTRYMAN, or to take Charge of a small Farm, where Cottage is found.—Age 25, one child. Good character from present employer. None but principals treated with.—E. H., Post Office, Dulwich, Surrey.

DAIRYMAID, in a Nobleman's or Gentleman's Family.—A thorough experienced Person; good character.—M. B., 1, Derby Street, May Fair, W.

SUTTONS'
GRASS SEEDS
FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS,

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils:—

PRICES:—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, Carriage Free. 2 bushels Grass Seeds and 12 lb. Clovers supplied per acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. Mechi, Esq, *Tiptree Hall, near Kelvedon.*

February 5.—"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

From J. L. Williams, Esq., *Boyne View, Navan, Neath, Ireland.*

March 30.—"Last year I got from you Permanent Pasture Grass Seeds for 10 acres, with which I laid down one-half of a 20-acre field (Irish). I am very much pleased with the way the Grass Seeds have answered, and I now want to lay down the other half of the field in the same manner."

From Thos. Levett Prinsep, Esq., *The Beacon, Kingswear, Dartmouth.*

December 24.—"Mr. Levett Prinsep must speak in the highest terms of the Grass Seed supplied to him by Messrs. Sutton & Sons in the spring, and which has stood the past burning summer better than much of the old turf."

From J. Ward, Esq., *Round Oak, Gresham, Newbury.*

July 4.—"The permanent Grass Seeds for about 29 acres, supplied by you last year (the greater part sown with Barley), have given me great satisfaction, and produced a crop (this dry season) of about 45 tons of good hay: four and a half acres of which have fed five head of cattle during the spring."

From E. R. Nickson, Esq., *Foxby, Wem*

March 9.—"The field I laid down with your Permanent Seeds is looking admirable."

From Rev. J. Leighton, *Bisham Vicarage, Fleetwood.*

May 2.—"The Pasture I laid down with your Seeds last year has done beautifully, and seems to have attracted the notice of several of the farmers who live near."

SUTTONS' RENOVATING MIXTURE, for Improving Pastures, at from 4*l.* 6*d.* to 9*l.* per acre, should be sown in the spring.

This Mixture consists of the finest kinds of Permanent Grasses and Clovers, and will greatly increase the quantity and quality of succeeding Hay crops. The Pasture should be harrowed with heavy iron harrows, previous to sowing, and bush-harrowed after sowing, and in some cases a top-dressing of manure will be found beneficial. Sow 6 to 12 lb. per acre, according to the condition of the Pasture. Price 6*d.* per lb.; 8os. per cwt.; Carriage Free.

SUTTONS' MIXTURES of GRASSES and CLOVERS,

so prepared as to produce very large crops for the specified periods they are to remain down:—

For ONE YEAR'S LAY, 15*s.* 6*d.* per acre, Carriage Free.
For TWO YEARS' LAY, 17*s.* 6*d.* per acre, Carriage Free.
For THREE or FOUR YEARS' LAY, 22*s.* per acre, Carriage Free

Special estimates given for large quantities.

SEPARATE NATURAL GRASS SEEDS,
CAREFULLY CLEANED.

Alopecurus pratensis	..	..	Meadow Foxtail
Anthoxanthum odoratum	..	..	Sweet Vernal
Agrostis stolonifera	..	..	Creeping Bent
Avena flavescens	..	..	Yellow Oat Grass
Cynosurus cristatus	..	..	Crested Dogstail
Dactylis glomerata	..	..	Rough Cocksfoot
Festuca duriuscula	..	..	Hard Fescue
Festuca elatior	..	..	Tall Fescue
Festuca heterophylla	..	..	Various-leaved Fescue
Festuca pratensis	..	..	Meadow Fescue
Festuca ovina	..	..	Sheep's Fescue
Festuca rubra	..	..	Reddish Fescue
Festuca tenuifolia	..	..	Fine-leaved Fescue
Festuca loliacea	..	..	Darnel-leaved Fescue
Lolium perenne Suttoni	..	..	Sutton's Perennial Rye-grass
Lolium perenne Paceyanum	..	..	Pacey's Perennial Rye-grass
Lolium perenne semperirens	..	..	Evergreen Rye-grass
Phleum pratense	..	..	Timothy
Poa pratensis	..	..	Smooth-stalked Meadow Grass
Poa trivialis	..	..	Rough-stalked Meadow Grass
Poa nemoralis	..	..	Woodside Meadow Grass
Poa sempervirens	..	..	Evergreen Meadow Grass
Trifolium repens perenne	..	..	Perennial White Clover
Trifolium pratense perenne	..	..	Perennial Red Clover
Trifolium hybridum	..	..	Alsike Clover
Medicago lupulina	..	..	Yellow Trefoil

Lowest price per cwt. or bushel on application.

SUTTONS'

HOME-GROWN FARM SEEDS.

SUTTONS'

FARMER'S YEAR BOOK FOR 1870,

Containing complete List of Prices of GENUINE FARM SEEDS, now ready, and may be had Gratis and Post Free on application.

☞ ALL GOODS CARRIAGE FREE,

Except very small Parcels. Five per cent. allowed for cash payments.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AGRICULTURAL EDUCATION.

The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

Present Prices of Farm Seeds.—See SUTTONS' FARM SEED LIST, with low Prices for orders received previous to April 7, which will be sent post free. Royal Berkshire Seed Establishment, Reading.

To Purchasers of Farm Seeds.

CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices.
JAMES CARTER AND CO., 238 Seedsmen, 237 and 238, High Holborn, London, W.C.

WM. DILLISTONE,
Horticultural Auctioneer and Valuer,
Sible Hedingham, Essex

MR. CHANDLER, Horticultural Agent and Valuer, undertakes all kinds of VALUATIONS connected with Horticulture.
N.B. Mr. C., having for many years acted as Judge at various Metropolitan and Provincial Flower Shows, is open to engagements for the ensuing season.—10, Wynell Road, Forest Hill, S.E.

To Market Gardeners and Others.

WANTED, to HIRE, about ONE ACRE of good GARDEN LAND, "Market Ground." Must be within easy reach of the City. A good price would be given for the accommodation. Apply to
ALFRED J. LEGERTON, Seed Merchant, 5, Aldgate, London, E.

FOR DISPOSAL, at a Rental, or otherwise, a FLORIST'S BUSINESS, within three miles of Covent Garden, in full working order, with a connection for carrying on a large and lucrative business, being all ready money.
For particulars apply to Mrs. BARBER, St. George's Tavern, Coleman Street, Camberwell, S.E.

SALES BY AUCTION.

Brixton, S.

CLEARANCE SALE of VALUABLE NURSERY STOCK, the Land being required by Lady-Day next for the Erection of a New Church.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, the Triangle Nursery, Loughborough Park, Brixton, Surrey, on MONDAY, March 7, at half-past 12 o'Clock precisely, by order of Messrs. Fonsford & Son, a portion of the Valuable and NURSERY STOCK, comprising a choice assortment of Evergreen and Coniferous Shrubs, viz., Green Box, Golden Privet, vine, 2 to 6 feet; Aucubas, 3 to 4 feet; 700 bushy Common Laurels, 4 to 8 feet; Euonymus, 2 to 4 feet; Bicolymus, 1 foot, &c. A large quantity of FRUIT TREES, many of which are in fine bearing condition, including Standard, Pyramid, and Dwarf-trained Plums, Apples, Pears, and Bush Berries; also Dwarf-trained Peaches and Nectarines, Raspberry Canes of sorts, choice Lancashire Gooseberries, Currants; some handsome Standard Roses; 2000 fine Limes, 4 to 10 feet; Privet, 2 to 3 feet; Evergreen Thorn, 2 to 4 feet.
On view two days prior to the Sale. Catalogues had on the Premises and of the Auctioneers and Valuers, Leyton-stone, N.E.

Bagshot, Surrey.

EXTENSIVE UNRESERVED SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are honoured with instructions from Mr. Charles Noble to SELL by AUCTION, on the premises, Sunningdale Nursery, Sunningdale Station, five minutes' walk from the Sunningdale Station, on THURSDAY, March 10, and two following days, at 11 for 12 o'Clock precisely, each day, without reserve (the Ground having been required to be cleared), the valuable NURSERY STOCK, including an unlimited variety of Evergreen, Coniferous, and Deciduous Shrubs of remarkable growth and symmetrical form, and in fine condition, including 15,000 Common and Colchic Laurels, 1 to 3 feet; 2000 bushy Portugal Laurels, 2½ to 5 feet; 3000 handsome Picea Nordmanniana, 2 to 4½ feet; 2000 Cupressus Lawsoniana, 2 to 6 feet; 10,000 Spruce Firs, 2 to 5 feet; 10,000 Larch, 1½ to 3 feet; 6000 Retinospora ericoides, squarrosa, obtusa, and pisifera, 2 to 5 feet; 1500 Thuja gigantea and Lobbii, 4 to 8 feet; 1000 Thuja Boujonis borealis, 3 to 8 feet; 200 Araucaria imbricata, 4 to 8 feet; 500 Irish Yews, Taxus baccata, 3 to 5 feet; 5000 Standard, Half-standard, and Dwarf Roses; 75,000 Manetti Stocks; 5000 Maiden and Trained Peaches and Nectarines, 2000 Pyramidal and Dwarf-trained Pears and Plums, of various sorts, &c., &c.
May be viewed until the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers.

Annual Sale of very Handsome English-grown Camellias.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at 38 and 39, Gracechurch Street, E.C., on TUESDAY, March 15, at half-past 12 o'Clock precisely, about 200 choice Double CAMELLIAS, beautifully set with bloom-buds; AZALEA INDICA, 300 Standard and Dwarf ROSES of the best varieties, Selected FRUIT TREES, Hardy AMERICAN PLANTS, &c.
On view the morning of Sale. Catalogues had at the Rooms, as above, and of the Auctioneers, Leytonstone, N.E.

Stoke Newington, N.

CLEARANCE SALE of VALUABLE NURSERY STOCK, GREENHOUSES, the ERECTION of SHOP, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. James Kirtland, to SELL by AUCTION, on the Premises, the Albion Nursery, Albion Road, Stoke Newington, Middlesex, on MONDAY, March 21, at 11 for 12 o'Clock precisely, without reserve, the ground being sold, and required immediately for building purposes, the whole of the Valuable NURSERY STOCK, comprising a varied assortment of choice Evergreen and Deciduous Shrubs, peculiarly adapted for the London suburbs; also a quantity of fine Fruit trees, two Greenhouses, each 45 feet long; the Erection of Shop, 22 feet long by 14 feet wide; Hot-water Piping, a Coil Boiler, &c.
Further particulars will appear in future Advertisements.

To Gardeners.

SALE of OLD VASES, FOUNTAINS, and FIGURES, in consequence of the Dissolution of the late Partnership of Austin, Seeley & Co.

MR. BULLOCK will SELL by AUCTION, on the Premises, 369 to 376, Euston Road, on TUESDAY, March 22, at 12 for 1 o'Clock precisely, a quantity of old stock of GARDEN SCULPTURE and Out-of-door ORNAMENTS of all kinds. They will be on view one week prior; and Catalogues price 6*d.* each, may be obtained at the Auctioneer's Offices, 211, High Holborn, W.C.
N.B. The Business will be continued as heretofore under the Firm of "Austin & Seeley," by Mr. Seeley, the surviving Partner

Berkeley Castle, Gloucestershire.

SALE of SHORTHORN BULLS and HEIFERS

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on FRIDAY NEXT, March 11, at the Home Farm, Berkeley Castle, about a dozen very choice pure-bred YOUNG BULLS, by Baby's Grace, and from well selected dams, of Messrs. Bowly, Rich, and Holland's stock. Also will be SOLD a number of IN-CALF and NEWLY CALVED SHORTHORN HEIFERS, of great milking properties, and several pure-bred Berkshire PIGS.
Catalogues, with pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London; or of OCTAVIUS LONG, Esq., Berkeley Castle, Gloucestershire.

PURE-BRED SHORTHORNS, of first-class Blood, for PRIVATE SALE.—THE HERD of BULLS, COWS, and HEIFERS, belonging to E. H. Cheney, Esq., Gaddesby Hall, are now on Sale.
Catalogues, prices, and further particulars can be had of Mr CHARLES BLANDY, Gaddesby, Leicester.

Biddenham, near Bedford.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has received instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, May 3 next, at Biddenham, the entire and very superior HERD of PURE SHORTHORN CATTLE, belonging to Charles Howard, Esq., which have been long and carefully bred from some of the most fashionable blood, and consist of nearly 60 head of Cows, Heifers, and Bulls, about half of which are of the renowned Gwynne family, as well as several from Lady Spencer, with some very superior Flowerley, Sweetheart, and other noted tribes. Nearly all of the very first class have been used, such as 3d Duke of Thorndale (17,748), Grand Duke 5th (19,875), Lord Claret (24,376), and others of kindred blood. The whole now in service or engaged to Grand Duke of Lightburne (26,299).
Catalogues, with Pedigrees, will shortly be issued, and further particulars given in future Advertisements.

Edenbridge, Kent.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without reserve, on THURSDAY, May 5 next, the entire and valuable HERD of HIGHLY-BRED SHORTHORNS, the property of G. Murton Tracy, Esq., of Edenbridge, Kent, comprising the members of the Cleopatra, Surmise, and Sylph tribes; the famous Cow, Sweetheart 3d, purchased at the Milcote Sale in 1866, with nearly 40 of her descendents, constitutes the distinguishing feature of the Sale. The principal Bull used have been the Prize Bull The Baron (13,833), himself a descendant of Sylph, Duke of Albemarle (21,560), Count Leinster (23,648), and latterly Master Britain (24,778), all possessing the choicest blood, also purchased at the Milcote Sale of 1868, and whose dam was then sold for 345 guineas.
Catalogues, with Pedigrees, will shortly be issued, and announced, with further particulars, in future Advertisements.
London: 13, Euston Square, March 3.

Hardy Plants and Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, March 12, at half-past 12 o'Clock precisely, HARDY TREES and SHRUBS, consisting of Laurels, Berberis, Privet, Poplars, Spiræas, Syringas, Box, Arbor-vitæ, Rhododendrons, Hollies, Yuccas, Lilacs, Arbutus, Cypress, Standard, Trained, and Pyramid Fruit Trees; Standard and Dwarf Roses, Gooseberry and Currant Trees, Pansies, Violets, Carnations, choice Gladioli and Ranunculi, Rustic Seats, Stools, Vases, Baskets, &c.
On view the morning of Sale, and Catalogues had

Plants and Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, March 14, at half-past 12 o'Clock precisely, choice Dwarf, and Climbing ROSES, Standard and Pyramid FRUIT TREES, WALNUTS, Scarlet THORNS, FILBERTS, RASPBERRY CANES, LILIES, Arbutus, Cypress, Standard, Trained, and Pyramid Fruit Trees; Standard and Dwarf Roses, Gooseberry and Currant Trees, Pansies, Violets, Carnations, choice Gladioli and Ranunculi, Rustic Seats, Stools, Vases, Baskets, &c.
On view the morning of Sale, and Catalogues had.

Consignment of Plants from Ghent.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, March 9, at half-past 12 o'Clock precisely, choice AZALEAS, Indian AZALEAS, CAMELLIAS, DRACÆNAS, SPARAXIS, RUSTINUS, CHAMÆROPS, LATANIAS, KALMIAS, DELPHINIUMS, AUCUBAS, ARABIS, ORANGE TREES, Pyramid PEARS, ROSES, Dwarf Named PEACH and CHERRY TREES, LILIUM LANCIFOLIUM, from Gheni, Specimen CONIFERS, and Standard and Dwarf ROSES, choice GLADIOLI and RANUNCULI, Rustic Seats, Stools, Vases, Baskets, &c.
On view the morning of Sale, and Catalogues had.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, March 10, at half-past 12 o'Clock precisely, an Importation of very fine ORCHIDS, viz., ODONTOGLOSSUM CRISPUM, O. TRIUMPHANS, O. HASTILABRIUM, O. NÆVIUM, ANGULOA CLOWESII, ONCIDIUM SUPERBIENS, and other fine species; CATTLEYA SCHILLERIANA, CYPRIPEDIUM SCHLIMII, MAXILLARIA VENUSTA, M. GRANDIFLORA, TRICHOPILIA Species, and other choice and probably new ORCHIDS from New Granada.
On view the morning of Sale, and Catalogues had.

The Agricultural Gazette.

SATURDAY, MARCH 5, 1870.

MEETINGS FOR THE ENSUING WEEK.

March 7 { The Farmers' Club (Mr. Bailey Denton on Sewage), at the Salisbury Hotel—6 P.M.
— 8 { The Central Chamber of Agriculture (Education of Labourer—11 A.M.; Deputation to the Chancellor of the Exchequer on the Malt Tax at 3 P.M.).

THE angry letter in another column, on the CENTRAL CHAMBER OF AGRICULTURE and the FARMER'S CLUB, from Mr. THOMAS ARKELL, of Swindon, will probably be read with interest. We have endeavoured, at the close of it, to make whatever apology the mistakes which it points out required; but on the main point to which it refers as being blameworthy we do not yield. Neither do we yield to Mr. ARKELL in our cordial appreciation of the Chamber of Agriculture movement. This Journal can speak with as little of the bias of self-interest as any agricultural periodical in the country when discussing the conduct of agricultural societies or organisations; and it is its duty to criticise that conduct whenever criticism is required.

If personality must be imported into the discussion, we may congratulate the Chambers of Agriculture on having for their champion Mr. THOMAS ARKELL, to whose services as a good agriculturist and public-spirited man the *Agricultural Gazette* has more than once done justice, as he with his "twenty-five years'" acquaintance with it must already know, notwithstanding

that only now has he discovered the misleading ambition of its Editor, who nevertheless is exactly as old in connection with this Journal as the very oldest of its readers.

There is, however, no need of any personal discussion whatever. The thing lamented in our last, and discussed with a little wholesome ridicule in connection with the last meeting of the Central Council of the Chambers of Agriculture, was perfectly unquestionable. An organisation designed expressly to represent the opinion of agriculturists upon public questions completely failed to do so. On the question of road-maintenance, all the resolutions offered were withdrawn; and, having met expressly to express an opinion, it was virtually resolved that no opinion should be expressed. On the question of agricultural statistics, every attempt to express an opinion broke down. A resolution was offered, and two successive amendments to it were proposed: all three were lost, and here too, therefore, the machine broke down. No doubt the "little" bits of sarcasm which we flung at this display were aimed rather at the modesty or reticence of those who dispute the policy of publishing the truth of English agriculture, than at the general competency of the Central Chamber as the representative of the English tenant-farmer on this subject. But Mr. ARKELL very properly considers this to be an important subject too, and we entirely agree with him. He doubtless remembers, and so do we, when the ordinary farmers' club was a much more active energetic institution than it has since been. Local farmers' clubs gradually died out upon the discovery that questions of public and political interest were somehow excluded from their jurisdiction. Chambers of Agriculture are the product of a generation more advanced. The tenant-farmers who have thus associated themselves properly believe that the public and political questions which professionally affect them, are the most of all deserving their attention, and that their opinion on such questions ought to influence the Government. We wish that noble lords and baronets, and landlords generally, whose presence bids fair to swamp the tenant-farmer class at the meetings of these Chambers, were of the same opinion. Certainly it is not desirable that they should take no interest in such an organisation, and, indeed, no fear need be entertained of such a possibility; but neither is it to be desired—and least of all, we think, by them—that Chambers of Agriculture should lose their foremost claim upon the good wishes of the public, which depends on their efficiency as exponents of the voice and judgment of the tenant-farmer class upon country questions—an efficiency, by the way, which the Central Council certainly failed to exhibit at its last meeting.

Returning, however, to the policy of collecting and publishing the statistics of English agriculture, we may as well at once declare to Mr. ARKELL and all others that we do not mean to cease the use of whatever means are readiest, whether of illustration, argument, or ridicule, for urging (seeing that some still need it to be urged) that light is better than darkness—that knowledge is better than ignorance—that it is not necessarily foolish to be without a purpose in even arduous labour for acquiring information—that it is not necessarily foolish even to be without an expectation while working hard for knowledge—that, on the contrary, it is the fool who hath no delight in understanding—true manhood through mere "desire" seeking and intermeddling with all wisdom. Nor shall we cease to argue—for that, too, is involved in the question—that a share in the general prosperity of the country is always better for a "great interest," such as agriculture is, than anything like the jealous assertion of privilege or the exclusive maintenance of monopoly.

We are accused of petty ridicule and little sarcasms, but we shall continue to laugh, and to the extent of our ability make others laugh, at whatever is agriculturally ridiculous, as well as agriculturally mischievous; and such we believe the arguments of Messrs. ARKELL, LONG, and PELL, M.P., at the last meeting of the Central Chamber of Agriculture to have been. To this end accordingly we make another little contribution, by reproducing, with the smallest possible alteration, from Mr. LAYARD'S pages, the following letter from the chief magistrate of an Oriental town, to whom an English traveller had addressed statistical inquiries. Reading it, however, after Mr. ARKELL'S communication in another page, we cannot be quite sure whether after all it is of Oriental or of Western origin. The following is the letter—it may be taken as a completely stated argument against the policy of statistical inquiries, whether agricultural or commercial:—

"MY ILLUSTRIOUS FRIEND, AND JOY OF MY LIVER!—The thing you ask is both difficult and useless. Although I have passed all my days in this place I have neither counted its houses nor have I inquired into the number of its inhabitants; and as to what one person loads on his mules, and the other stows away in the bottom of his ship, that is no business of mine. But, above all, as to the previous history of this city, GOD alone knows the amount of dirt and confusion that the infidels may have eaten before the coming of the sword of Islam. It were unprofitable to inquire into it.

"O my soul! seek not after the things which concern thee not. Thou comest unto us,—we welcomed thee—go in peace! Of a truth thou hast spoken many words, and there is no harm done, for the speaker is one and the listener another. After the fashion of thy people thou hast wandered from one place to another until thou art content and happy in none. We (praise be to GOD) were born here, and never desire to quit it. Is it possible, then, that the idea of a general intercourse among mankind should make any impression on our understandings? GOD forbid!

"Listen, O my son! There is no wisdom equal to the belief in GOD. He created the world, and shall we liken ourselves unto Him in seeking to penetrate into the mysteries of His creation? Shall we say, behold this star spinneth round that star, and this other star with a tail goeth and cometh in so many years? Let it go. He from whose hand it came will guide it and direct it.

"But thou wilt say unto me:—Stand aside, O man, for I am more learned than thou art, and have seen more things! If thou thinkest that thou art better in this respect than I am, thou art welcome. I praise GOD that I seek not that which I require not. Thou art learned in the things I care not for; and as for that which thou hast seen, I defile it. Will much knowledge create thee a double belly? or wilt thou seek Paradise with thine eyes? . .

(Signed) "The Meek in Spirit
IMAUM ALI ARK-EL!"

WE some weeks ago referred, possibly with too much confidence, to the impossibility of using traction-engines in the direct draught of tillage implements at work. So at any rate one of our northern agricultural contemporaries believes: and, judging from the extraordinary performances chronicled in last Monday's *Times* of THOMPSON'S road-engine, described in our last year's volume (p. 1215), it might well call upon us to recant. This is what we are told it has accomplished:—

"A 3-horse power engine drew a boiler weighing 13 tons up an incline of 1 in 12, the ground being so slippery at the time from frost that horses could not keep their feet. The engine was run through a grass field without leaving a track, and again through a field covered to a depth of 2 feet with loose earth. A 10-horse power engine, weighing 8 tons, ran with four waggons attached to it out to a colliery 12 miles from Edinburgh; there received a load amounting, with the four waggons, to 32 tons, making the weight of the whole 40 tons; and then returned up inclines of 1 in 16 to Edinburgh. It wended its way, with its train of 90 feet, with perfect facility through the narrow streets of the old town, which chanced on the occasion to be thronged with vehicles carrying people to some open-air festivity. It turned all manner of sharp corners, ran down the steep hill to Leith, entered a lane, and drove in through the gates of the factory, where it delivered its load. An engine was driven into a newly dug Potato field, and there ran about in every direction, leaving the soil quite undisturbed."

Again:—

"Till within the last few months the advantages of the road-steamer had been regarded as consisting entirely in its carrying powers, but during the past summer a new field of action opened out to it, which eminently enhances its value. The judges of the Royal Highland and Agricultural Society have held, on a farm at Liberton, near Edinburgh, a trial of the ploughs, reaping, and mowing-machines exhibited by them at their last show, and in their presence, and that of a large assemblage of farmers and engineers, the road-steamer accomplished what has been so much desired, but had hitherto been considered unattainable—ploughing by direct traction. With two double-furrowed ploughs attached, it commenced its operations, and without a single hitch, difficulty, or impediment, drew four wide, deep, even furrows. It went straight from one end of the field to the other, then turned far more easily, and in less space, than the horses were doing, and ploughed its way back again, having on its return journey to plough up a hill with gradients of 1 in 12. It was a 6-horse power engine, but its strength was greatly in excess of its work, so that it was requisite to keep the furnace-door open, and it was evident it would have drawn six furrows instead of four. The surprising capabilities of the road-steamer are due to the fact that, owing to the indiarubber tires, the wheels do not sink in the least degree on the softest grass-land, and at the same time they bite the surface with such extreme tenacity that not the slightest slip was visible, even when passing up the steepest incline. The engine runs in front of the ploughs on the unploughed land, whereby all possibility of compressing or poaching the soil after it is turned over is avoided, while on the unploughed land no indentation whatever is made, as the soft indiarubber cushions preserve it from all pressure. When the road-steamer had completed its work all present expressed the greatest gratification, and the benefits to be derived by farmers from this new implement were eagerly pointed out."

This report is evidently the work of an enthusiast, and we suppose no one is surprised to hear that it does not convince us that a 6-horse power engine, even on wheels with india-rubber tires, will pass without the slightest indentation over the softest grass-land!

When subjecting Mr. FOWLER'S balance-plough to dynamometrical tests, near Swindon, some years ago, we were struck with the mischievous effect of the broad wheel track of their plough, weighing about 27 cwt. Although it, too, ran wholly on the unploughed land, the lines of hardened clod yielding imperfectly to the harrow were plainly to be seen on the fallows, months after the autumnal ploughing by which the land had been turned up for the winter frost.

We have also yet to learn that the road-steamer does not waste more power, as well as effect this mischievous induration, by itself passing over unploughed arable land, than it would waste if, like one of FOWLER'S or one of HOWARD'S engines, it were fixed at the end of the furrow it was working on, and only had to draw 300 or 400 yards of wire-rope properly supported upon carriers. Notwithstanding its proved efficiency as a traction-engine, we do not at all anticipate that Mr. THOMPSON'S steamer will displace either Messrs. FOWLER'S or Messrs. HOWARD'S steam cultivators.

—— PRICES have remained unchanged in Mark Lane. There was a short supply of Wheat from Essex and Kent on Monday, which met a fair demand at the quotations of the previous week, and no alteration took place on Wednesday.——The prices in the Metropolitan Cattle Market were rather higher on Monday, but the rise was not maintained on Thursday. Notwithstanding the shortness of the supply in the Cattle Market it was quite equal to the demand.—— A steady business continues to be done in the Wool market.——And in Seeds an improved demand creates a brisker trade.

—— Our readers will learn with pleasure that Her Majesty the QUEEN has been pleased to appoint JAMES CAIRD, Esq., one of the Inclosure Commissioners, to be a Companion of the Most Honourable Order of the Bath.

—— No fewer than 22 Oxfordshire farms have been entered in competition for the prizes offered by Mr. MASON, High Sheriff of Oxfordshire, and the Royal Agricultural Society of England. Mr. KEARY, of Bridgnorth; Mr. GIBBON, of Burnfoot, Cumberland; and Mr. TORR, of Riby, are named as Judges, and a better selection could hardly have been made.

—— Mr. LOCH'S GAME LAW (Scotland) Bill was withdrawn on Wednesday, in answer to an appeal from the Home Secretary, who stated that the Government had undertaken to deal with the difficult question of the Game Laws of Scotland; but that although their Bill was in a forward state, it was not yet in a condition to be laid before the House. He undertook, on the part of the Government, that the Hon. Member should lose nothing by consenting to this withdrawal.

—— On Wednesday of last week, Mr. W. HOPE, V.C., read a capital paper, on the use and abuse of TOWN SEWAGE, before the Society of Arts, taking for his text two passages from the *Times*, in one of which it had been stated that human bones are being collected in Egypt for the manure manufacturers of England; and in the other, that about 370,000 tons of sewage are poured daily into the Thames out of London sewers. Of course, the extraordinary contrast between the two statements was vigorously exposed; and the urgent demands of English agriculture to which the one bore witness, were shown to be in no way capable of such satisfactory supply as through the utilisation of that now wasted material to which the other refers. Mr. HOPE'S own experience at Romford, where he has taken a sewage farm, was quoted in illustration of the enormous folly of the wastefulness which is thus condemned.

—— In the House of Commons on Friday last Mr. GOLDNEY called attention to a bit of agriculture which deserves a place in our column for "Farm Memoranda." A farm of about 63,000 acres yields in official hands not a mere rent but an aggregate of rent and profit amounting to less than 4*s.* an acre in a southern county. The New Forest, which is the district referred to, is at the same time the scene of vigorous agriculture, which yields under Mr. DICKENSON'S management as abundantly as good farming yields anywhere else in the island. The disgraceful contrast which the bulk of the estate presents to this exceptional example of what it might produce was strongly insisted on; and we hope that the exposure to which Mr. GOLDNEY with Mr. C. S. READ, M.P., thus contributed, may result in the better management of what ought to be a valuable estate.

—— Professor CHURCH thus writes on the relation of the Sugar-Beet manufacture to the fertility of the soil in which the crop has been grown:—

"In the ordinary course of Beetroot-sugar manufacture abroad, four products are obtained. These are pulp,

sugar, spirit, and potash salts. If the pulp were eaten on the land, and the potash salts, which are contained in the waste liquors of the still, were returned to the fields, there would be little or no injury to their fertility. But if, on the other hand, the still liquors are thrown away, two most important manurial elements are lost to the land, viz., nitrogen and potassium. On the Continent the farmer does not buy back these elements to return them to his fields, but they are manufactured into the potash compounds so largely employed in the useful arts. That there is a very large amount of nitrogen as well as of potassium in the expressed Beet-juice is evident from the observation often made that when the waste still-liquors are being boiled down to recover their saline matters a sort of deflagration occurs in the pan, owing to the large quantity of nitre present acting with sudden violence upon and burning up the vegetable matters contained in the extract. Half the mineral matters of the Sugar-Beet is potash, and the greater part of this valuable manure is lost to the soil if the pulp only be eaten on the land; much of the nitrogen, a still more costly and fertilising element, is likewise withdrawn. The phosphoric acid, however, is in great measure returned to the land when the pulp is consumed at home."

—— The following particulars are extracted from Messrs. SHAW & SONS' annual circular on THE SEED TRADE:—

"This season's Red Clover seed is saved from seed sown in the spring of 1868; and as, owing to the excessive drought of the following summer, a large proportion of that failed, the acreage left was very small, and the plants being unusually poor and thin, the yield of 1869 has consequently been very deficient. The English growth of Red has accordingly been exceedingly short, and the quality for the most part very indifferent. These remarks may also be applied to Germany and the North of France. The Germans have actually been competing with us in the French markets for their own home consumption. America has shown she has but little old stock on hand, and a very small crop of new, by the large orders which have been transmitted to this country for seed of American growth; such seed to the extent of several thousand bags, although two or three years old, has been recently re-shipped to New York; no other description, except the produce of the States, being admissible without the payment of a heavy import duty. The only parts whence any supply of Red Clover seed may be expected are Brittany and the South of France; and the English and Continental demand has now nearly exhausted the growth of these districts, and occasioned an advance there to prices relatively higher than those ruling here. The yield of Alsike and White Clover seed is small, but the quality is satisfactory. We are largely dependent upon Germany for our supply of these sorts. Trefoil is a very deficient crop both at home and abroad. Fine new seed is exceedingly scarce, but there is a considerable stock of old seed. The growth of French Italian Rye-grass is moderate, and stocks are light. Its great superiority over English, Scotch, and Irish seed, causes its use yearly to increase. Scotch and Irish grasses are this year very cheap and plentiful."

OUR LIVE STOCK.

CATTLE.

MR. W. W. SLYE's sale at Beaumont Grange took place on Friday, the 25th ult. The array of Gwynnes and Charmers were sure to attract breeders, and accordingly we find most of the leading names in the Shorthorn world among the purchasers. An average of £45 2s. 3½d. for 30 animals, including five calves below six months old, is certainly encouraging, and 300 gs. given for a six months' old heifer is a remarkable occurrence. The 15 cows and heifers brought an average of £60 18s.; 15 bulls averaged £29 6s. 7d.; and the total sum realised was £1353 9s. Without further comment we add the following list:—

Name of Animal.	When Calved.	Price.	Purchaser.
		Gs.	
Females.			
Nell Gwynne	1859	27	Mr. J. P. Foster.
Strawberry	1864	31	Mr. Moore.
Selina 5th ..	1864	41	Lord Dunmore.
Lady Stamford.. ..	1864	28	Lord Dunmore.
Moss Rose 4th	1865	40	Mr. R. Jefferson.
Cherry Kyle	1865	26	Mr. Parker.
Lancashire Gwynne ..	1865	46	Mr. Moore.
Hawthorn	1866	50	Mr. Taylor.
Royal Charmer 2d ..	1866	32	Mr. T. Rigby.
Countess 7th	1866	21	Captain Gandy.
Sweetheart 3d	1866	80	Mr. J. P. Foster.
Pawsley Duchess ..	Mar., 1869	105	Mr. J. P. Foster.
Selina 10th	June, 1869	19	Mr. Parker.
Cherry Duchess ..	July, 1869	18	Mr. Parker.
Lady Thorndale Bates .	Oct., 1869	300	Lord Dunmore.
Bulls.			
ROYAL COUNT	April, 1868	24	Mr. Haslam.
CHERRY DUKE	June, 1868	30	Mr. Kirk.
FARNLEY DUKE ..	Sept., 1868	45	Mr. Parker.
SIR RAINALD	Sept., 1868	105	Mr. Haslam.
GD. DUKE OF FARNLEY	Nov., 1868	100	Reserved.
CHARMERS GD. DUKE ..	Feb., 1869	28	Mr. Ray.
GRAND DUKE OF CAMBRIDGE 3D ..	Mar., 1869	50	Mr. Grice.
LORD BARRINGTON SPENCER	Aug., 1869	30	Mr. Saunders.
THE CARDINAL	Aug., 1869	26	Mr. Biddle.
LORD BURLEIGH ..	Aug., 1869	15	Mr. Thorn.
GD DUKE OF OXFORD 2D	Oct., 1869	24	Mr. Smith.
THE ROAN DUKE ..	Oct., 1869	15	Mr. H. Sayer.
GRAND DUKE OF FARNLEY 2D	Nov., 1869	25	Mr. Tindal.
CHERRY GRAND DUKE..	Dec., 1869	36	Mr. Lethbridge.
GD. DUKE OF FARNLEY	Jan., 1870	23	Mr. Gibbon.
GRAND DUKE OF FARNLEY 3D	Nov., 1869	18	——.

—— The Farnley Hall sale, on the 24th ult., cannot be looked upon as having been successful. Nineteen cows and heifers made an average of £30 7s. 10d., and ten bulls brought the higher figure of £37 13s. 10d., the average over the 29 animals disposed of being £32 18s. 3d., and the total amount realised £945 9s. *Blue Cap* by ROYAL OAK, and from a cow of the Medora tribe, made 51 gs., the highest price given for females, and *Lady Betty* by LORD COBHAM brought 48 gs. LUCKY BOY by LORD COBHAM, and of the same family as *Lady Betty*, was purchased by Mr. Graves for 55 gs. LORD LYONS, also by LORD COBHAM, dam *Lowes* by SIR EDMUND LYONS, was purchased by Mr. Metcalfe for 61 gs., and his brother, LORD LEOPOLD, brought 42 gs. LORD BLOOMFIELD, by the sire already named, and out of *Blue Cap* by ROYAL OAK, and more remotely descended from *Medora* by AMBO, was purchased by Mr. Ridley for 65 gs.

—— "The only breed of Herefords we know of in Aberdeen and Banff shires," writes Mr. James Black, "is at Auchry, in the parish of Monquhitter, near Turriff. Mr. Lumsden, the proprietor, has cultivated them for upwards of twenty years, but has never exhibited them very largely at cattle shows. His theory is that they stand the cold better than Shorthorns, and that they can be fattened more easily without "artificial" food. He introduced high-bred animals to breed from, and has very often drawn long prices from the butchers for his young stock; but they have never spread in the district to any extent.

SHEEP.

IN parts of Northumberland, and perhaps also in other districts, a custom prevails of rousing up fatting sheep or Turnips from time to time through the day. The shepherd walks through among the lazy tegs as they lie on the ground, and causes them to rise to their feet. The object of this is to cause the sheep to pass water, which they seldom fail to do immediately after being disturbed. Our attention was recalled to this circumstance a few weeks ago in Derbyshire when examining a well-known Shropshire flock, and we were informed that the plan was adopted with advantage to the sheep, and, as far as we remember, with a diminished rate of mortality. In Northumberland it is considered safer to adopt this little precaution when sheep are on Turnips, and there it is considered to diminish the death rate. The same practice is generally adopted with advantage in the case of yard-fed and home-fed sheep. In the case of a flock of 200 fatting shear-hogs on a Gloucestershire farm, fed during the winter in littered pens within a yard, a dog was shown in the yard every day, and it was believed that the disturbance was beneficial.

POULTRY.

THE current number of the "Transactions of the Highland and Agricultural Society" contains a paper on poultry, by Mr. Robert Hutchinson, of Carlowrie, Kirkliston. The author, after lamenting the small amount of attention devoted to the subject, informs us that we annually expend £1,105,653 in eggs, and that this enormous sum is increasing at the rate of 40 per cent. per annum.

We hope on a future occasion to extract some hints on the management of fowls from this valuable paper. At present we may mention that, after insisting on "careful attention to all details" in the treatment of poultry, we are told that the best varieties for general purposes are probably the coloured Dorking, the Brahmapootra, and the Houdan. The great difficulty with poultry breeders in this country is damp, and for wet soils the Houdan is recommended, and the Brahmapootra is next in hardihood. The Dorking, on the other hand, is suitable for light and gravelly soils. When poultry are well managed, and allowed in a great measure to forage for and keep themselves, the expense, including light grain, diseased Potatos, and other offal food, is not estimated at more than 2s. per head annually. If, however, they are kept in confinement the cost will rise as high as 6s. per head. A very interesting balance-sheet is appended, showing the expenditure and receipts in the case of two yards, where the poultry lived entirely on purchased food, and kitchen and garden refuse, given to them in confinement.

No. 1. *Brahmapootra yard, containing, February 1, 1866, 1 cock and 6 hens.*

Dr.		
To cost of 1 cock at 25s.	£1	5 0
To cost of 6 pullets, at 10s. 6d.	3	3 0
To cost of one year's keep of above on purchased food, at 6s. each	2	2 0
To share of cost of management and rent and maintenance, at 3s. per pair	0	10 6
	£7	0 6
To balance, being 40 per cent. profit	2	16 0
	£9	16 0
Cr.		
By 65 eggs, equal to five settings, sold at 10s. 6d. each	£2	12 6
By 69 7-12ths dozen eggs, at average market price, 10d.	2	13 0
By value of manure	0	4 0
By value of feathers cast, at 6s. per stone	0	2 0
By value of seven fowls on hand at close of year ..	4	0 0
	£9	16 6

Or assuming that the eggs produced by this pure breed are hatched and not sent to market, we find the following result:—

Dr.		
To cost of 1 cock and 6 hens	£4	10 0
To cost of one year's keep, at 6s. per head ..	2	2 0
To cost of share of management, &c.	0	10 6
	£7	2 6
To cost of four months' keep of 560 young chickens till sold, at 1s. per head per annum	56	0 0
	£63	2 6
To balance or profit	36	19 0
	£99	1 6
Cr.		
By 5 settings of eggs, sold at 10s. 6d.	£2	12 6
By 57 cockerels, sold at 5s. 6d.	15	13 6
By 150 cockerels, at 2s.	15	0 0
By 275 pullets, at 2s. 6d.	34	7 6
By 78 pullets, at 6s.	23	8 0
By manure, at 1½d. per head	3	10 0
By value of feathers, say	0	10 0
	£95	1 6
By value of 7 fowls on hand	4	0 0
	£99	1 6

We may add that these accounts are not chosen from any one individual "good" year for the sake of argument, but are the average of several years.

AGRICULTURAL ESTIMATES.

I TERMED "G. A. H.'s" talk on interest "twaddle;" not that I regarded it as containing a fallacy, but because it seemed hardly necessary to fill your columns with a proof of what every person who knows that two and two make four must know as well as himself. Your readers will, however, gather no advantage from a mere bandying of words, and as there is really nothing in "G. A. H.'s" long letter (p. 225), setting aside his challenge, worth notice beyond its amusing raciness, I will without further parley tell him that I cannot answer the questions which he has based on a purely imaginary case. His own case of actual fact, in which we are told that for a year and a-half he worked his farm with hired horses, is more tangible; and I say unequivocally that had he purchased a set of steam-ploughing apparatus and placed it thereon, the balance, if any, between the cost of horse-hire and steam cultivation would clearly go to the credit of the latter. I assume, of course, that interest, wear and tear, &c., would first be charged. Whether such a small farm would justify the purchase of tackle is another question: I should say not, unless extra work were found elsewhere.

A neighbour of mine, with less than 100 acres, some years ago ventured on one of Smith's cultivators, trusting to getting work for hire. He has annually done some hundreds of acres in this way, and at present himself occupies 600 or 700 acres. As "G. A. H." has been good enough to make us acquainted with some particulars of his management with and without horses, I will trouble him with my experience with horses alone and with horses and steam together. One fact from actual practice will always go further with me than a host of logical deductions. Possibly "G. A. H." might argue logically and be able to tell us the smallest quantity of food which would support human life, but we should have to take his word for it. I do not expect he would find anybody willing to try the experiment, neither do I suppose he will ever find anybody who will take a farm of 100 acres and put a steam cultivator on it, to be exclusively used thereon without horses. Had he told us the result of his experiment of hiring all his horse-power, it might not have appeared very satisfactory; but on this point, as he vouchsafes no information and appears soon to have dropped it, we may draw our own inferences. To return to my own case. In 1857 I found myself in possession of a farm, the portion of actual plough being 222 acres. On this farm 10 horses had usually been kept by my predecessor, but as one was frequently used for other purposes than were connected with the farm, I will say nine. Well, I started with nine. The land is chiefly of a clayey and very sticky character, and I soon found that if the autumn and winter were at all wet it was very difficult to plough; in fact, at times, it was not ploughing at all, the furrow slice, if such it could be called, would, instead of turning from the mouldboard, roll up, and after clinging to it in this fashion some distance drop off in a heap. I confess I did not like the look of it, but there was no alternative but to go on or to let the work all fall into arrear. In 1858 I resolved to set up a steam cultivator; but now comes the rub. "G. A. H." says horses have nothing to do with the question; I say they have. As he has taken the trouble to quote the passage from my first letter bearing on this point, I suppose I may take an equal liberty. Here it is. "I say that they (horses) have a great deal to do with it, in the opinion of all practical men. Such persons, when contemplating the introduction of steam-ploughing or cultivating on their farms will, as a matter of course, calculate whether they can dispense with any horses, or how many." I abide by the passage, and further, I acted on its principles. I at once banished a pair of horses, and some time after a third, and ever since my horse-power has varied from six to eight. Five has been the effective number during the past winter, and they have not been more than half worked. Why I sometimes have more may be explained as follows. I have a fondness for good horses, and usually sell one or two each year, at from 40 to 60

guineas. Consequently when I have a large number it includes two or three colts, which are not equal to the strain of constant or heavy work, especially in the shafts. I felt on commencing steam-power that my farm was small, but I trusted to getting work on hire, and I was not disappointed. Now I have laboured under the supposition that I only increased the capital stock on my farm by the difference of the amounts made by the sale of the horses and the purchase of the tackle. Still further, I have considered that the amount saved in the stable was clearly to the credit of the steam-power. If I had two servants whose wages were £10 each, and I got rid of the pair for a better one who would do the work of both for £15, I am foolish enough to think that I should save £5 in hard cash by the exchange. "G. A. H." will, I dare say, call this only sophistry, and after dazzling the eyes of your readers with a shower of crackers, run off to the bull-ring at Madrid, or elsewhere, for a literary dagger wherewith to stab it.

"West Indian's" remarks I did not consider worth notice, but as "G. A. H." is of a different opinion, and regards him as a valuable ally, we will see what they are worth. He expresses some surprise that I do not know how many quarters my Wheat stacks contain, seeing I have grown the Wheat. I will endeavour to enlighten him. The work of carting and cutting corn on this farm often goes on simultaneously, and is led from any field where it happens to be ready. The stacks as well as the barns are often made up from corn obtained from two or three different fields. I have threshed two stacks, and the contents of two barns which consisted of corn got together in the way I have described. I have six stacks remaining. The whole was grown on 75 acres. Now, if "G. A. H.," or his friend, can tell me of any rule by which I can know with any degree of accuracy how many quarters I have left, and at what price I shall sell them, I shall feel obliged. I can tell them that they may very easily make themselves (on paper) very rich men on the 1st of January, but the result may terribly falsify their calculations. In this part of the country we pay our rents in hard cash, and not with balance-sheets. Fallacies may be sought for in valuations, but the fact will be ascertained only when the produce is realised. I have now shown "G. A. H." that in one respect, at all events, I am unlike Sir Andrew Aguecheek, to whom he was good enough to say I bore a resemblance. I have not sent him my horse, or even my ass, to let the matter slip. I said at the commencement of this he had not answered me fairly; neither has he; for he has fastened on me a set of questions which I might in all fairness have refused to notice, as not a single line in either of my communications rendered me responsible, and they are apart from the line of argument I had chalked out. "G. A. H." is, however, like the cabman who, when he thinks he has found out a tender place in his horse, keeps flogging away at it. In one respect, though, he differs from "cabby;" he does not seem to know whether he is hitting the right horse.

I have now, however, thrown off the "old man of the sea," whom "G. A. H." determined whether or no to fasten on me, and I feel relieved by the operation, as we now meet on fairer terms. "G. A. H." tells your readers that, after looking carefully again over my letters, he could see nothing calling for notice from him except the proposition he feared he had answered too soundly for my satisfaction. I will relieve him from the difficulty. I could point out several matters, but one will be sufficient for the present. I therefore challenge him to show, as a fact, that on 100 acres of land the true charge for interest, wear and tear, depreciation, &c., amounts to 12*s.* an acre, the cost of the tackle being £375, the sum on which we are both agreed. If he fail to do this in a manner which shall be satisfactory to your readers—and here let me tell him to copy "Old Dagger Brief," without his preambles, and not rummage his book-shelves for sarcasms to fling at my head, but answer the question in plain straight-forward language,—if he fail to do this, I will fling back his own advice, and say: "G. A. H." humble yourself at once before the public you have been trying to deceive. Tell them you have been guilty of a monstrous fib, and if forgiven you will be more careful for the future. Unless he does one or the other, I shall take leave to tell him that, like his great prototype of old, the sling and the stone he so affected to despise have been too much for him. *Tookerem.*

THE FARMER'S CALENDAR.

We add the other engravings of grasses from the pages of this book, to which we referred last week.

In Fig 56, No. 10 is Agrostis alba, one of the grasses growing on dry sandy soils; of no value, except perhaps for sowing a rabbit warren, or on light sands which will yield no useful pasture. No. 11, Festuca duriuscula, Hard Fescue, generally sown in mixtures for good pasture—early, sweet, and nutritious. No. 12 is Festuca loliacea, Darnel-leaved Fescue; a very nutritious and excellent species of the same genus. No. 13, Lolium italicum, Italian Rye-grass, has been already often described in these columns. It is distinguished from the common perennial Rye-grass by its armed spikelets and more vigorous growth.

In Fig 57, No. 14 is Poa alpina, or Broad-leaved Mountain Poa. It has latterly been recommended for upland pastures, as yielding a good and sweet pasturage. No. 15, Festuca pratensis, Meadow Fescue, is probably, on the whole, the most useful of all our British grasses, and finds a place in all good pastures, and in all mixtures for laying them down. No. 16 is Poa nemoralis sempervirens, Wood Meadow-grass, is adapted for shady places, orchards, and the like. No. 17, Festuca ovina, Sheep Fescue, a sandy-soil Grass; short, but useful in sheep pastures. No. 18, Poa pratensis, Smooth-stalked Meadow-grass, is found in almost all good dry pastures, and is generally added to mixtures for laying down grass-land, though it does not rank with the most nutritious and productive of British grasses. No. 19, Lolium perenne, perennial Rye-grass, is one of our best meadow grasses. A great many varieties exist, which are sold under different names, and possess very different properties, both as to their perennial character and as to the bulk and nutritiveness of their produce. Lolium perenne finds a place in all mixtures for laying down land to permanent pasture.

THE CENTRAL CHAMBER AND THE FARMER'S CLUB.

I had supposed from the alteration lately made in your paper—viz., the leaving out the newspaper part, and confining yourself to the theory and practice of agriculture and horticulture, with their scientific accompaniments,—that you meant to drop politics altogether, but, judging from two or three *little* remarks in your last week's *Gazette*, it is not your intention to lose the opportunity of sarcasm and ridicule when you think an opportunity offers, by first giving a partial and unfair statement of what takes place, and then holding these "pests of society," agricultural politicians, up to the ridicule of your theoretical and scientific readers.

An old proverb says, "comparisons are odious," but as you have thought fit to draw one between the two meetings held in London on the 7th and 8th ult., you cannot object to a comparison between the two societies.

I am afraid your readers will behold the cloven foot of envy peeping out of the articles about to be alluded to.

It is not necessary to say how many years the London Farmer's Club has been established, but I think I have read its proceedings and debates for the last 30 years, and I will take it for granted, as you state, they are a company of practical farmers and land agents, with a few landowners; and is it not a fact that the land agent element has been much more numerous, in comparison to their numbers, than the farming? and is it not notorious they have failed to enlist the support, and I may almost say the sympathy, of the farmers of this country? I can only account for this by the suspicion of the agency element, and the old cry of nearly all farmer's clubs of "no politics, no politics," whose company it appears to me you are about to join, and become their mouthpiece. Now look at the support the Chambers of Agriculture have received throughout the country in the first three years of their life, and the rally round the Central, in comparison to the London. I will say no more, for if I had belonged to, or been one of the nursing fathers of the latter, I might, like many others, have envied the former.

I have said, that you first give a partial and unfair statement of what takes place, and then turn it to ridicule.

1. In your editorial remarks on the Essex Chamber you say the discussion "degenerated into a discussion of the advantages of malting home-grown grain for cattle food," then further on you say "you cannot see how Mr. Seaman's remarkable proposition of feeding sheep on malted grain connects itself with a lecture on adulterated manure," leading your readers to suppose the lecture was on adulterated manures alone, instead of "On Manures and Cattle Food." What more reasonable, or indeed better, than to recommend farmers to get rid of the Malt-tax, so that they could supply themselves with a better food than adulterated oilcake for their sheep and cattle? I can only suppose that it is editorial ignorance on the subject which designates such discussion as degenerate.

2. In regard to your observations on the meeting of the Central on the "Abolition of Turnpikes," and the future maintenance of turnpike roads, your reporter must have been the only person present who thought "the whole plan of the business committee fell through and disappeared, and the great organisation for urging the views of agriculturists upon Government obviously failed of its intended purpose." The direct contrary was the fact,—everyone appearing satisfied with the reasons given by Mr. Hugessen for not pressing the resolutions at the present time; and very naturally so, for what the Chambers had most to fear was, that the future maintenance of the turnpike roads, with their bonded debts, might be saddled on the present ratepayers, and under the present system of rates. What then could be more satisfactory than a declaration that Government was going to broach the subject of local taxation in the present session. And, previous to going into the road question, of course we were ready to wait and see the alteration proposed in local taxation; but as the meeting consisted of a considerable number of farmers, your reporter might consider them a set of simpletons, and therefore very easily gulled.

3. On the subject of agricultural statistics, you ridicule the idea of farmers being afraid of the truth being known, or being suspicious of the motives of those so very anxious for agricultural statistics; and there is a sort of sneering pity of the weak and helpless muddle such notions must land us in at home. "Poor farmers, poor creatures, how long will you continue to reject the advice so often given for your good by the most amiable philanthropists, by the most cunning speculators, by the most aspiring editor for fame, by the most plausible statistician." Who but us poor dolts are expected to turn ourselves inside out for the good of other people, for the good of the nation, for the satisfaction of inquisitive minds into other people's business?—no one. Who ever heard of a manufacturer being expected to

inform his neighbour of what he intends doing for the next twelvemonths. Is not all our business carried on in open day, open to the eyes of the world? We never put up "No admittance except on business."

I admit I am very suspicious as to the motives of those parties so very anxious for agricultural statistics.

First there are those who wish, and perhaps believe, that, with correct returns, prices could be so regulated that let whatever would occur they should vary but very little. Now prices always have varied, and no doubt will continue to do so, but suppose they could always be kept at present prices, say 5*s.* per bushel, would not that be inflicting injury, nay, ruin, on many when blighty and unfavourable seasons come round.

Then there is the speculator: is it worth while to assist him? His very intentions are bad, his only object is to get money between the producer and consumer; he goes into the market when prices are rising, or there is a probability of a rise, and helps make corn dearer by withholding it from consumption; what cares he for ruined farmers, or famine prices, so that he can realise large profits?

Then the statistician, whose curiosity and love of figures and comparisons are so great that he works himself up almost to the belief that without statistics some great calamity will happen, we shall be all starved, or nearly so, and as a matter of course come to an end as a nation.

Now for the last quarter of a century I have read your *Gazette*, with all the arguments you have been able to produce in favour of agricultural statistics, but they have failed to convince me of any necessity for them, either as beneficial to me as a farmer, or as to any injury occurring to the country for lack of them; but whether it be my thick head or your weak argument that is at fault I will leave you to judge. However, I seconded Mr. Leamon's proposition for them to be taken every ten years, with the census, so that future generations may judge of the changes taking place in the proportion of grass-land to arable.

One other error you made I wish to rectify. The subject for discussion next month is the best mode of Providing for the Extension and Maintenance of the Education of the Industrial Classes. *Thos. Arkell, Swindon, Feb.* 24.

[Mr. Arkell is right in several things, and wrong in two or three. He is right as to the business before the Essex meeting. The subject of cattle foods was properly discussed by Mr. Seaman. The discussion, therefore, did not "degenerate," even in our sense of the word—*i.e.*, it did not wander out of its proper field,—for that is all that the word originally conveys; and we were wrong in supposing Mr. Seaman out of order. Mr. Arkell is, however, wrong in supposing that the abandonment of our newspaper has any political significance. There never was a more purely historical record of events, or one more entirely free from political bias, than that which, for a quarter of a century, had been one of the leading features of the *Gardeners' Chronicle and Agricultural Gazette*. We have discontinued it, simply because for most of our readers the space can now be better occupied. Mr. Arkell is also wrong in supposing that we do not cordially sympathise with the success of the Chamber of Agriculture movement. It has our heartiest goodwill. Other points in our correspondent's letter are referred to in a leading article. Ed.]

BELGIAN AGRICULTURE.

[Mr. Carroll's letter has been delayed by press of other correspondence. We can hardly suppose much good to arise from an *agricoles* discussion of the subject—but if he or "Viator" or Mr. Howard could of personal knowledge describe a given area of land in the hands of one or more Belgian farmers as against a similar area in England, our readers would be obliged.]

The letters of Mr. James Howard, M.P., and "Viator," bring the points raised by me within narrow compass, and as Mr. Howard agrees with me in many of the questions taken up, I suppose I may take it as granted that he did not intend the perusal of his paper should cause us to consider the Belgian peasantry were so very discontented and miserable as his readers supposed.

The question having resolved itself into "petite culture," I may say I never for a moment thought of advocating the general introduction of Belgian systems of farming to this country. I set out with the statement that there was no parallelism between the objects of agriculture in England and Belgium. I believe the agriculture of this country is advancing to a state very near perfection, but I also am inclined to think that the estimate which Mr. Howard formed of Belgian farming was very far below its value. I think if we take a similar class of soil in this country to what we find over a large extent of Belgium—and we have in Yorkshire a considerable district of such—and compare the systems of farming and quantity of produce raised on each, we will find the Belgians are very much our superiors as regards careful management, &c.

Where shall we find such careful utilisation of manurial matters? where shall we find such attention to minutiæ? where shall we find such good results from small beginnings as in Belgium?

But to general principles. As regards "petite culture," I must concede that a farmer holding a large extent of ground, with all necessary appliances for its proper cultivation, will, if a good manager, raise more disposable produce than the cultivators of microscopic holdings. Applying this to Belgium, the question is, whether would it be better for the country to have it under its present system, or that there should be a consolidation of farms? Granting that there would be more disposable produce, whence would come a demand for it? The same number of people now engaged in farming would not be required in "la grande culture." The manufacturing interest could not absorb the unemployed agricultural labourers, so that depopulation would ensue. Now, as already mentioned, the object of agriculture is the production of food for human beings; and if human beings are lessened, the consequent decrease in the demand for the products of agriculture would, of course, cause a downward tendency in farm profits, and so it might be proved that rents would become lower. I am now dealing with Belgium in the abstract; I do not consider its contiguity to England.

The evidence of "les grands cultivateurs" is scarcely admissible as regards the management or well-being of "les petits cultivateurs." It has been proved that the former class always looks with eyes of jealousy on their more humble fellow-workers. One great cause of this jealousy is the readiness with which the small farmer pays a rent higher than the large farmer.

"Viator" admits more than does Mr. Howard when he says the small farmer, aided by sound knowledge and industry, will raise more produce than the large farmer. This will, I think, be very generally admitted, and if it is so, does it not follow that a country whose chief industry is its agriculture will be more prosperous with a large admixture of small farms? Mr. Howard does not give the Belgian small farmer credit for the large quantities of meat supplied by the inferior animals of his farm. Poultry, rabbits, and pigeons are not a small contributory to the meat manufacture of the country.

To show how the small farmer in Belgium "gets on" I give a quotation from a recent writer on the state of that country:—

"The Flemish small farmer picks up grass and manure along the roads. He raises rabbits, and with the money they fetch he buys first a goat, then a pig, next a calf, by which he gets a cow, producing calves in her turn. But of course he must find food for them, and this he does by staking all on fodder and roots, and in this way the farmer grows rich, and so does the land. The institution in Flanders in aid of agricultural credit is the manure merchant, who has founded it in the best of forms; for money lent may be spent in the public-house, but a loan of manure must be laid out on the land. The poor labourer goes with his wheelbarrow to the dealer in the village to buy a sack or two of guano, undertaking to pay for it after harvest. The dealer trusts him, and gives him credit, having a lien on the crops produced by the aid of his manure. In November he gets his money; the produce has been doubled, and the land improved. The small farmer does as the labourer does, each opens an account with the manure merchant, who is the best of all bankers.

"The large farmers of Hainault and Namur do not buy manure, fancying they would ruin themselves by so doing. The Flemish small farmers invest 15 to 20 millions of francs in guano every year, and quite as much in other kinds of manure. When does large farming make such advances?"

But if England may not, with advantage, adopt generally Belgian small farming, I think I may safely say the Sister Isle would be improved by a lesson from that country; and I fully believe that encouragement to the establishment of many of the institutions of Belgium would have a considerable effect in improving the condition of Ireland.

A writer in the January number of "Blackwood" exults in Mr. Howard's *exposé* of the miseries of Continental labourers, and in a sensational article asks—"What have foreign labourers that can be put upon a level with the workhouse, varied as it so frequently is by outdoor allowances?" I reply, the thrift of the Belgian labourer is of more national value than is the workhouse of this country. Fully believing, as I do, in the good effects of the Poor Laws under the existing circumstances of Great Britain and Ireland, I am inclined to think the incentives to thrift which are offered to the Continental peasant are socially more valuable.

"Blackwood's" correspondent says: "To toil from 4 in the morning till 8 in the evening, to live on the most scanty fare, to be destitute of the comforts of civilisation, solely to have some prospects of acquiring an increase of property in land, is a state of existence scarcely to be envied." Does our critic forget—

> "The glorious privilege
> Of being independent?"

T. Carroll, Feb. 21.

Fig. 57.

IRISH LAND QUESTION.

Had I seen Mr. Sanderson's pamphlet when I wrote the article you did me the favour to publish on the Irish Land Question, I should not have expressed a wish that some practical agriculturist would state from personal observation his opinion of the condition of Ireland. Mr. Sanderson, with Mr. Caird and Mr. Thompson, have, as you say, examined the subject carefully and well; they possess the necessary qualities, and have given, I believe, an honest account of the agricultural position of Ireland. I can only regret that the opinions of two of these gentlemen, at least, have been so lately published, and that they are very likely not to obtain the notice they deserve. It is now somewhat late to discuss the Irish land question. Mr. Gladstone's measure will certainly be carried; and, with some alterations, which I trust may be made in committee, will be, considering the political circumstances under which it was introduced, one that a fair landowner ought not to oppose.

But there is one clause in it to my mind fraught with danger—the one which enables a farmer to allot a portion of land to any labourer without the consent of the landlord. I fear this provision will be used as a device to enable a farmer to establish his family

around him, and lead to deadly quarrels when any change of tenancy takes place, besides the increase of a pauper population, to which it may give rise. In another point, too, I believe Mr. Gladstone to be wrong. My own experience, as well as that of persons older than myself, is directly opposite to the assertion that the peasantry, as a body, are less well off than they were, and that their condition, instead of improving, has retrograded. In my own neighbourhood wages have considerably risen within the last 10 years, and are still rising; food is better, and good clothes much more common. The labourers' dwellings have also improved, but still, as is the case in England, leave much to be desired. The Royal Agricultural Society of Ireland has, however, taken the matter in hand, directed public attention to the necessity of housing labourers well, and offered prizes, for which I and others have competed. There is, I am sorry to say, no doubt that in many parts of Ireland a system of intimidation exists, which, unless it is checked, will have disastrous results. I believe the greater number do not join in it; but as it is almost impossible to obtain evidence, and as one of the chief defects in the Irish disposition is strong unwillingness to assist openly the law, it is at present very difficult to stop its progress, and it is not wonderful that a great many give way to perhaps unnecessary terror. I cordially agree with one of your correspondents that it is a matter of no small importance that Englishmen should have a fuller personal acquaintance with Ireland than they generally possess. Many prejudices would be rubbed off, and the warm hospitality of Irishmen seldom fails to leave among Englishmen very pleasant memories. The management of Irish workmen, as of Irish tenants, requires certainly tact and judgment. But firmness, just dealing, and strict integrity win their respect, and when they understand they are fairly treated they become, with few exceptions, contented. Is it wonderful that the Irish should be in many respects behind their English brethren? Recollect the miserable education they have long had — treated at one moment with gross and absurd injustice, at another their imagination dazzled by the most detestable flattery, and the poison of such newspapers as the *Irishman* supplied to them without control. If education, untainted by narrow bigotry, could be united with that practical instruction Scotchmen seek and spread with unsparing hand over the country, Ireland would soon be a prosperous land.

Agricultural schools are also very necessary. When the principles of agriculture are more widely understood, and it is better known that capital and knowledge are necessary to extract from the soil its full value, the quarrel about large and small farms will cease, for each will have found the conditions under which it can flourish. Ireland must become independent of any influence, social, territorial, or religious, which withstands her progress. And if the eloquent words of the Prime Minister are to be realised, if "settled and cheerful industry are to diffuse their blessings over a smiling land," respect for the law must be unbroken, the differences of creed and party must be forgotten, and that mutual forbearance must be observed which the true spirit of charity teaches. *Brinsley Marley, Feb. 22.*

Home Correspondence.

"T. C.," the Irish Land Question, and "G. A. H."—Your correspondent tells me I must know that the opponents and abominators of assassination may be reckoned by the million in Ireland, just as they are in England. I beg to say I know nothing of the sort. I judge of men by their acts. If the Irish peasantry abominate assassination, how comes it that they screen and conceal the perpetrators of it? I venture to assert that if any cowardly assassin set himself down behind a hedge in England to shoot an unconscious victim, and if there were hundreds looking on, the hand of every man would be upon him; and if they failed to prevent the deed, at all events the villain would be taken red-handed in the act, and forthwith lodged in gaol. How comes it, then, if the Irish people abhor assassination, that none of these atrocious outrages and murders are ever successfully traced and punished? We know that unarmed men are ruthlessly shot down by a concealed assassin hid behind a hedge, and we know that these deeds are done in open daylight and in most populous neighbourhoods; but still not one of the assassins is ever caught, or a single whisper of information given to guide the officers of justice to the criminal. Some twenty years ago assassination was a common crime in Italy, but the people as a people had no sympathy with it. The assassin was forced to perpetrate his cowardly act in some dark and unfrequented lane at midnight, away from all risk of detection, because he knew that the people abhorred assassins as the most cowardly and most despicable of beings. How comes it, then, I ask "T. C." that the same rule does not hold in Ireland? *G. A. H.* [We have omitted the latter half of "G. A. H.'s" letter.]

Irish Crime.—The following, which appeared in the *Pall Mall Gazette* of the 10th ult., may not be without interest to many of your readers. Your correspondent "G. E. H." advocates a better acquaintanceship between the people of this country and Ireland. I fully agree with him in the view that such would be mutually advantageous. *T. C.* [We must refer our readers to the columns of the Paper thus named. The article calls attention to the power of the priesthood, arising out of the constant active faith of the people in the supernatural—and the practice of confession, which gives the priest this check upon the growth of mischief, that their patients are obliged to disclose to them the premonitory symptoms. And if this practice does not prevent altogether the "potting" of the landlords, no doubt it does so to a great extent. But it is a practice with the assassins to perform their work in distant parishes, exchanging places for the purpose when the job is to be got over, and probably when an agrarian outrage is committed the parties to it leave the country. The writer goes on to contrast England and Ireland as to other forms of crime and wrong-doing, referring in particular to concubinage and suicide, in which the latter country contrasts favourably with the former. We can insert no further letters on this subject.]

Cattle Disease.—On Feb. 5, p. 190, you were kind enough to answer a letter of mine about a disease from which some of my father's Alderney cows have at different times died. You say that "it would be useless to suggest any treatment without knowing something of the system of management." During November and December the cows are turned into a field that has had nothing in it since the hay was cut early in the previous July. They remain out all night, and have nothing but the Grass to eat, with a little hay or straw at milking-time. After Christmas they are either kept in the yard or tied up, and are fed on hay and straw (not cut into chaff), with a few whole or sliced Turnips and Mangels. Early in May they are turned out to Grass, and remain out day and night till Christmas. All the cows that have died have been bred on the farm, and not imported. The bulls are also bred on the farm, and are perhaps too nearly related to the cows. They are generally in use from the time they are one year old (sometimes before) till they are nearly two and a-half years old, when they are sold. They do not serve more than 10 or 12 cows in a year. I shall be glad to know how to cure as well as how to prevent the disease. *C. P., Stewkley Grange.* [It is probable that the original disease is scrofula, a tendency to which is fostered by breeding from close relations. The digestive derangement might arise from ordinary causes. Treatment will be of little avail; but great care must be exercised in breeding, not to select any animals which show the slightest symptoms of the disease.]

Traction Engines Drawing Ploughs.—Your contemporary *The Farmer* takes you to task for ridiculing the idea of a traction-engine being set to travel backwards and forwards across a field dragging a plough after it in the same way as a pair of horses do, and goes on to say "to our thinking there need not be any question, for we saw it dragging two double ploughs at the Highland Society's trial ground last great show in Edinburgh, with ease, and apparently quite as much under command as the best trained horses." If your contemporary be a farmer, at all events he is not an engineer, or he would know why such an application of steam-power is pure folly. The simple reason is that the engine has not only to move the plough which turns over the soil, but also has to move itself in addition. The traction strain necessary to draw an ordinary plough varies from 250 lb. up to 350 lb., but the traction strain to draw one ton on an ordinary cart (the weight of the cart included in the ton) over soft sandy or gravelly ground is about 200 lb. Now a 10-horse traction engine will weigh something like 10 tons, and to move that engine over a soft field will take a traction strain of about 2000 lb. In fact, as much power will be absorbed in moving the engine alone as would drag six or eight ploughs. But this is not all; for if there is the slighest hill to surmount the effect of gravity comes in aggravation of the difficulty. To raise an engine weighing 10 tons up an incline of 1 in 10 would require an additional power of 2240 lb. traction strain. Now, a rise of 1 in 10 is a very simple hill, and would not look at all steep, and yet to force a 10-ton engine up such a hill would take 4240 lb. traction strain in a ploughed field. At what result, then, do we arrive? Why, that if we have a hilly field which rises 1 in 10 the power expended by the engine in moving itself along is equal to the power necessary to drag from 12 to 16 ploughs; so that if it draws four ploughs after it in such a field, it is expending four times the power requisite. Now there is, no doubt, a considerable amount of friction in the ploughing ropes, windlasses, and usual adjuncts to steam ploughing, but the power requisite to overcome that friction is nothing like half the power necessary to move an engine on the level across a ploughed field, and certainly is not one-fourth of the power requisite to move the engine up an incline of 1 in 10. I hope, then, your contemporary will see that Mr. Waldegrave Leslie's suggestion was really a very thoughtless one, and displayed, as you justly said, an ignorance of the subject as astonishing as that displayed by the sub-committee of the Highland and Agricultural Society upon the subject of steam cultivation generally. *G. A. H.*

Foreign Correspondence.

PARIS: *Agricultural Penitentiaries of France.*—Two grand problems are before the world — the reclamation of young offenders and outcasts, and how to give agricultural instruction to the working classes. Our neighbours of France have done much during the last few years towards the solution of both these momentous problems, and promise to do much more; and their agricultural colonies for juvenile offenders are especially interesting, as they meet both questions at once, and touch particularly the subjects proper to our Journal.

The task of reclaiming unfortunate lads by means of agricultural schools, in place of prisons, was taken up many years since by benevolent individuals; and the colony of Mettray, well known to all agriculturists who have visited France for practical or philanthropic purposes, was the result of such efforts. At the present moment the agricultural colonies are sufficiently numerous to receive not only all the boys taken before the tribunals, and acquitted on account of their youth or want of discernment, but also those who are sentenced to detention for not more than two years.

There are 33 such colonies now in France, some of which only are maintained by the State, capable of receiving 10,000 children, and giving them sufficient instruction to enable them to gain their own living hereafter. Of the young delinquents sent to these colonies in the year 1864, more than three quarters were totally illiterate, or could read imperfectly only. Of the boys sent to the old correctional schools, 30 per cent. fell back into their former vicious courses, while in the case of the agricultural colonies the proportion of failures resulting does not amount to more than 3 per cent. The average time that the boys remain in the colonies is 3 years; so that the new agricultural penitentiaries make useful members of society of about 900 children, who would otherwise become thieves and perhaps assassins.

One of the most remarkable of these colonies is that of Gentilly, near Nancy, founded in 1863 by Monsieur and Madame de Suzainnecourt. Here there are no black or white holes, no cells, no bolts or bars: the boys not only work in the open fields but are often sent in gangs to assist on the neighbouring farms. The number who have run away from the place in four years is only 13, and most of these returned after an absence of a few days; they felt themselves "out in the cold." But a little stronger proof of the value of such correctional schools is the fact, that not a single boy that remained at Gentilly since the foundation of the colony has been condemned for a second offence.

The conduct of the boys is generally excellent; in collecting the manure of the towns money and other objects are frequently found by them, but always carried to the officials; the fruit and flowers are never touched, although entirely unprotected. The Minister of the Interior allots 6*d.* or 7*d.* per day for each boy in a colony, and private charity supplies the rest. Naturally, the instruction is not of a high order; the boys learn reading, writing, and arithmetic, to dig, to hoe, and to do all the ordinary work of a farm labourer consistent with their strength: the grand thing is that honest, hardworking lads are produced out of the most unpromising materials.

Societies.

ROYAL AGRICULTURAL OF ENGLAND,

MONTHLY COUNCIL: *Wednesday, March 2.* — Present: the Duke of Devonshire, K.G., President, in the chair; the Earl of Lichfield, the Earl of Powis, Viscount Bridport, Lord Chesham, Lord Tredegar, Lord Vernon, Lord Walsingham, Sir Massey Lopes, Bart., M.P., Sir A. K. Macdonald, Bart., Sir H. Vane, Bart., Sir Watkin Wynn, Bart., M.P., Mr. Barthropp, Mr. Cantrell, Colonel Challoner, Mr. Clive, Mr. Davies, Mr. Dent, M.P., Mr. Druce, Mr. Edmonds, Mr. Brandreth Gibbs, Mr. Holland, Mr. Hornsby, Mr. Wren Hoskyns, M.P., Colonel Kingscote, M.P., Mr. Leeds, Mr. Milward, Mr. Pain, Mr. White Ridley, M.P., Mr. Staller, Mr. Torr, Mr. Wells, M.P., Mr. Whitehead, Major Wilson, Mr. Jacob Wilson, Professor Simonds and Dr. Voelcker.

The following new members were elected:—

Arnold, James, 35 and 36, West Smithfield, E.C.
Bather, Thomas, Maesbury Hall Mill, Oswestry
Bond, A., Huntstill, Bridgwater
Brown, Benjamin, Thursford, Thetford
Case, James, Upton, Reading
Castle, George, Sutton, Stanton Harcourt, Eynsham
Cole, W. Douglas, Bicester
Dickers, S. S., Golder Manor, Tetsworth
Dodd, F., Rush Court, Wallingford
Ellershaw, Charles, Bossall, York
Garratt, R. L., Thorpe Malsor, Kettering
Gillett, Charles, Lower Haddon, Ilkeringdon
Greenslade, John, Batham, Tiverton
Hale, Bernard, Holly Hill, Hartfield
Hammond, John, Bale, Thetford
Harland, H. S., Malton, York
Humby, J. H., Ashley, Stockbridge
Jones, John, Pike's End, Ellesmere
King, J. Pittman, North Stoke, Wallingford
Kirk, Charles, Sleaford, Lincoln

Labalmondiere, George, 32, Craven Street, W.C.
Lloyd, Robert, Offmore, Kidderminster
Mace, Thomas, Sherborne, Northleach
Newton, S. C., The Downs, Croxton, St. Neots
Niecolls, W. H., Newnham, Shrewsbury
Owen, C. N., Walton House, Oxford
Paddison, Edward, Ingilby, Lincoln
Parsons, Herbert, Elsfield, Oxford
Parsons, John, Iffley, Oxford
Perkins, W. H., Westfield House, Amesby, Thedding-worth, Rugby
Rusher, W., High Street, Banbury
Statter, John, New Brighton, Chester
Toder, Edward, Little Carlton, Newark
Topham, Thomas, The Twemlows, Whitchurch
Vaughan, G. L., Belmont Villa, Leicester
Walker, James, Bushy Lodge, West Firle, Lewes
Warden, T. S., Sedbergh, Kendal
Willows, J. G., Rushton, Kettering

FINANCE.—Viscount Bridport (Chairman) presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on February 28 was £1724 0s. 8d. It was also reported that the committee had had under their consideration two cases of members in arrear with their subscriptions, namely, Mr. S. W. Nayne, of Newcastle-on-Tyne, and Mr. Joseph Chesworth, of Longslow, Market Drayton, and they recommended that these cases be referred to the Society's solicitors, with instructions to take the necessary legal proceedings to recover the arrears of subscriptions due to the Society. The committee recommended that a new valuation be made in the fixtures and furniture of the house, in consequence of recent changes made in the Society's property.—This report was adopted.

JOURNAL.—Mr. Dent, M.P., reported that an application had been made by the Editor of the "Geological Magazine" for the loan of the stone from which the geological map of Belgium, in the last number of the Journal, had been printed; and that the committee recommended that this application be granted on payment of the necessary expenses, with the proviso that due acknowledgment be made of the source whence the map was derived. This report having been adopted, and the committee having announced that the February Number of the Journal had been published and delivered to members in the middle of the month, Lord Vernon expressed his regret that the article on cheese factories had not been published earlier, so as to have assisted the dairy farmers of Derbyshire by the information which it contains, in their endeavour to establish cheese factories in England.

FARM PRIZES.—The committee recommended that Mr. Keary, of Bridgnorth, Salop; Mr. Gibbons, of Burnfoot, Cumberland; and Mr. Torr, of Aylesby, Lincolnshire, be appointed the judges to adjudicate on the prizes offered by Mr. Mason, late High Sheriff of Oxfordshire, and by the Society, for the two best managed farms in the district round Oxford, to compete for which 22 farms had been entered. It was also recommended that the first inspection should commence as soon as possible, and that Mr. Keary be requested to write the report of the judges.—This report was adopted.

CHEMICAL.—Mr. Wells, M.P. (Chairman), drew attention to the following analyses of bone manures, which have been submitted to the committee by the consulting chemist in his usual quarterly report:—

I. Composition of a sample of so-called bone manure, sent by Mr. S. Bacon, Jun., Ratcliffe Culey, Atherstone.

Water	25·69
*Organic matter	21·04
Mineralsic phosphate of lime †	·74
Free sulphuric acid	1·78
Oxide of iron and alumina	·69
Sulphate of lime, gypsum	47·07
Magnesia and alkaline salts	·78
Insoluble silicious matter	1·51
	100·00
*Containing nitrogen	1·11
Equal to ammonia	1·34
†Equal to bone-phosphate rendered soluble	1·17

It will be noticed that this example of so-called bone manure contained only 1 per cent. of phosphate of lime, and 1 per cent. of nitrogen. It contained 20 per cent. of water, and consisted mainly of gypsum and some cheap organic refuse, impregnated with sulphuric acid, and is not worth more than 30s. to 35s. per ton as a manure.

Mr. Bacon informs me that he bought the manure from a Mr. Ralph Potts at £4 10s. per ton, and invoiced at £4, and that it was guaranteed to be bone manure, prepared by Mr. George Birch, manufacturer of all kinds of bone and special manures for every crop, Woodcock Street Works, No. 1, Heneage Street, Birmingham.

II. A second sample of bone-dust was sent for analysis by Mr. J. Borlase Tibbets, Barton Seagrave, Kettering, who bought it at £7 7s. from Messrs. Ellis & Everard, Leicester, as ½ inch bones.

The following is the composition of this bone-dust:—

Moisture	9·94
*Organic matter	7·74
Tribasic phosphate of lime	40·19
Carbonate of lime	17·66
Oxide of iron and alumina, magnesia, &c.	6·25
Insoluble silicious matter (sand	18·22
	100·00
*Containing nitrogen	·66
Equal to ammonia	·80

It will be noticed that these bones were very poor in nitrogenous organic matter, and contaminated with a good deal of carbonate of lime and fine sand. Their real value does not exceed £5 per ton.

III. The following is the analysis of another sample of bone-dust sent to me by Mr. E. D. Broughton, Wislaston Hall, Nantwich, who bought it from Messrs. Bradburn & Co., of Wednesfield, near Wolverhampton, through Mr. Thos. Wittingham, their agent at Nantwich, at £7 per ton:—

Moisture	13·52
*Organic matter	22·03
Phosphate of lime	41·49
Sulphate of lime	13·75
Carbonate of lime	2·42
Alkaline salts and magnesia	3·17
Sand	3·32
	100·00
*Containing nitrogen	2·71
Equal to ammonia	3·29

Genuine bone-dust contains about 48 per cent. of phosphate of lime, and yields about 4½ per cent. of ammonia and no appreciable amount of sulphate of lime. Good bone-dust at present, I believe, cannot be bought for less than £8 8s. per ton. The bone-dust sent to me by Mr. Broughton was mixed with boiled bones, to which frequently sulphuric acid is added for the purpose of arresting decomposition.

The committee recommended that the foregoing reports be published in the minutes of the Council meeting. They also recommended that the usual annual grant for experiments be awarded to Dr. Voelcker.

VETERINARY.—Major-General Viscount Bridport (Chairman) reported that, in the opinion of the committee, the portion of the grant to the Royal Veterinary College (£50), which, by the resolutions of 1862 was to be appropriated for researches into the diseases of cattle, sheep, and pigs, has not hitherto been sufficiently set apart for that purpose. They therefore recommend that for the future the annual veterinary grant of £200 be divided under two heads:—(1) That £150 shall be paid to the Royal Veterinary College for the general advancement of veterinary science in reference to cattle, sheep, and pigs, as heretofore; and (2) That £50 be retained under the control of the Council for the purpose of being applied to experiments on the diseases of cattle, sheep, and pigs. They further recommend, that in consideration of the general grant from the Society the Governors shall undertake that the Professor of Cattle Pathology shall carry out such experiments at the College as the Council shall require, the cost not to exceed the above-named amount; that the result be communicated to the Council immediately on the conclusion of the experiments; and that a detailed account of the expenditure of the £50 shall be furnished each year with the annual report.—This report was adopted.

GENERAL, OXFORD.—Lord Walsingham reported the recommendation of the committee that advertisements be issued inviting tenders for the supply of refreshments to the showyard at Oxford.—This report was adopted.

It was moved by Col. Challoner, seconded by Lord Walsingham, and carried unanimously, after some conversation respecting the exceptional nature of the circumstances which led to the proposition—

"That a sum of £500 be given to the Manchester Local Committee, in aid of the extra and exceptional expense occasioned by the compensation awarded to the tenant of the trial-ground."

Col. Kingscote, C.B., M.P., having called attention to the incomplete state of the Society's library, suggested the desirability of a grant of money, for the purpose of bringing its contents up to the present time, and of an annual grant for the purchase of books from time to time being placed at the disposal of the Journal Committee. Lord Walsingham thereupon drew attention to the absence of accommodation for a large library in the Society's house, and Lord Bridport suggested the desirability of building a reading-room. Ultimately, at the instance of Mr. Torr, supported by Colonel Kingscote, the whole question was referred to a joint committee, to consist of the House and Journal Committees.

It was moved by Mr. Jacob Wilson, seconded by Lord Chesham, and supported by Mr. Milward:—

"That the committee for the recommendation of judges be appointed at the March Council, that this committee shall sit in April, and that the absolute appointment of judges shall take place at the May Council."

This resolution having been carried unanimously, a committee was appointed for the selection of judges, consisting of the Implement and Stock Prizes Committees.

Mr. Torr gave notice that at the next monthly Council he should move "that judges of live stock be provided with catalogues in the same manner as judges of implements now are."

It was proposed by Mr. Milward, seconded by Mr. Torr, and carried unanimously, that Mr. W. J. Edmonds, of Southrop, Lechlade, be nominated as steward elect of implements.

A letter from Messrs. Holt and Glazier, on the utilisation of town sewage, was referred to the Journal Committee.

Farmers' Clubs.

LAVENHAM.

The Breeding and Feeding of Lambs.—At the January monthly meeting of the Club, Mr. GREENE, M.P., read a paper on this subject.

Mr. GREENE said: First and foremost is the selection of your ewe. I myself have bred from several different classes of ewes, and have found no animal gives me so good a lamb as a well-bred Hampshire ewe crossed with a Lincoln or one of Aylmer's tups; but from the necessity of frequently purchasing the ewes at a high price, I am about to test the merits of the Shropshire sheep, and for that purpose have selected some of the best bred ewes and tups I could find, combining the aptitude of the fattening of the Down with more size, and I expect to be able to carry, on the same food, more sheep than of the half-bred kind. Should this be the case, I shall be able to keep up my own flock without going to market. In my remarks on sheep it must be borne in mind that my experience applies chiefly to light land suitable to sheep. I believe the dry seasons we have had for two or three years previous to this has led many heavy land farmers to attempt breeding sheep, and unless they have a fair acreage of pasture saved up after the hay is cut to winter upon, they cannot breed to a profit on a large scale, they being unable to keep their sheep on the land in winter. I have observed that ewes on cold land require much more expensive feeding than on light—on heavy land I should graze in summer.

Having judiciously selected the ewe and tup, I am in favour of putting the tups with the ewes in the third week in August, or first week in September, so as to have most of your lambs born in February. My reason is, that an early lamb is always a superior animal to those that come later, and I am about to state that which at first sight will, I know, be questioned, and that is—you are better off for food at that season than when you lamb in March; as every gentleman in this room will allow that in February and the early part of March his white Turnips are better than later on, and, moreover, they ought to be fed off, and the Barley sown early in March. Having fixed the third week in August or first week in September, and having previously got my ewes into good condition,—which I think very important, as I find a ewe in high condition in the autumn is wintered very much cheaper and with less loss than a poor one,—I then, if possible, divide them into lots of from 50 to 80, and prefer having only one tup with them at a time. I tup on early sown Turnips, or Colesed and young layers, according to the seasons. My ewes having been tupped, I have a bit of Mustard and a run on some old Grass, and as soon as my Mangel is off I fold the land, having two rows of Swedes and one row of Cabbages to every 10 rows put in with my Mangel, and this with a run out for an hour or two on Grass and a little chaff carries me on until lambing time. One thing I have found very important is to avoid allowing them to eat food with the frost upon it. I believe food of that kind is very injurious to ewes in lamb. I may say, in passing, I am against stuffing ewes with a lot of straw chaff. My 12 score ewes have four bags, of eight bushels each, daily of cut Pea-straw this year; and when that is done, I shall mix one-third hay with straw. I put a bushel of bran into each bag; and my ewes are looking well. The Mangel land will be finished about a fortnight before the ewes lamb, as I like to put them on white Turnips for a short time—it helps their milk. I always now plant a few acres of Cabbages in June ready for lambing, as they are invaluable to put in the pens when ewes first lamb, and to strew about under hedgerows for the ewes until the lambs are strong enough to go to Turnips. I give my ewes artificial food—either cake, malt-dust, or Oats—for the first few weeks after lambing, at a cost of 3*d.* or 4*d.* per head. When my ewes leave the Turnips, I have provided after harvest on a Wheat stubble a mixture of Rye, Wheat, Tares, Colesseed, and green round Turnips; from that I go to Rye, and then on to a bit of Rye-grass sown in the Wheat, and this, with a very few acres of layer, say ten—as I mow all I can—carries my sheep on until after the feed is ready.

Now, having bred your lambs right, comes the point, how are they to be managed in the most profitable manner? I believe, by never allowing them to go back so as to lose their lamb fat. My shepherd teaches my lambs to feed as soon as possible, with a little bran, crushed Oats, and linseed-cake for a few weeks; then Cotton and Linseed; and I spend about 1½*d.* to 2*d.* per head a-week upon them until September or October, when I increase it to 3*d.* until the end of December, and then for a few weeks up to 6*d.* per head for artificial food, seldom exceeding that sum. The lambs, of course, run forward through lamb hurdles, and I do not cut them young, but scar them in May or the first week in June, when I clip the ewes and take off the lambs. I have also tried the experiment of clipping lambs in June, and if you wish to force your lambs to an early market in January, I believe it will thoroughly answer. I find the clipped ones grow faster on the same food. I tried a few lambs, and when I sold my lambs to a gentleman I now see in the room, I think he will bear me out that they were certainly not the worst among them. The lambs being off, the ewes are

then folded on the layers, and I generally grow a bit of Coleseed as a change of food, which is very essential. I need not remark I am very careful not to put the lambs on layers that have been mucked or folded, as that will surely kill or injure them. Great care is required that the lambs have always water by them in the summer. If you depend upon driving them to water, they may miss drinking one day, and the next will take more than is good for them. They should also have rock salt. It is important when the sun is hot that the lambs should be put into the shade in the middle of the day. Besides the advantage to your land, and to your lambs generally, of giving them artificial food, you make a good price of your refuse. I sold three score of my refuse, not leaving one behind, last September, at 24*s.* each, and I am sure, had they had no assistance, they would not have fetched more than 16*s.*, so that in that lot alone I had £24 for cake.

Layers, Mustards, &c., being done, I begin with a few acres of white Turnips, and then, about Dec. 1, get on to Swedes, having them clamped on the land: they are cut by Gardner's cutter, and I never give Swedes whole. Judgment is required, on every change of food, not to overdo your lambs. I always have a double fold and double set of troughs, so that the lambs are shut back, and all the food put in the troughs first, which gives every lamb a fair chance, and prevents the strong ones pushing the weaker ones aside. I think 10 score is the outside number that ought to be in one fold. In the middle of February I sell my hoggets, many of them fat; some one buys them to finish, and, as "the proof of the pudding is in the eating," I shall probably sell them to a gentleman I see in this room, and you will most likely see them in Bury market and judge for yourselves. I do not see how a farmer is to pay his rent and expenses off a light land farm unless the gross price of his lambs come up to the rent. I believe the advantage, both in corn, meat, and money, is in favour of keeping your lambs and sheep well. I never sell my crones and old ewes at less than from 35*s.* to 42*s.*—fresh, not fat—and take lambs, treated as I have described, on August 1 to be worth 32*s.* each. Spend 3*d.* per head per week for artificial food up to December 21 (20 weeks), 5*s.* per head; from December 21 to February 21, is nine weeks at 6*d.*, 4*s.* 6*d.*, which brings the cost price up to 41*s.* 6*d.*, and you may reckon on the average of years they will be worth 50*s.*, leaving £8 10*s.* per score for Turnips, &c., the breeder having been well paid on the value of his lambs on August 1. If I were going to clip my hoggets, and feed them off in summer, I should treat them as described, but at less expense for artificial food; but always bear in mind with every animal for meat, never to lose its young fat. Every pound of meat lost costs money to replace—a loss of 1 lb. at 9*d.*, costs 8*d.* to put on, which makes 1*s.* 5*d.* I must say on riding about the country I have observed in many instances a great want of management in sheep; but by keeping a strict eye to their well-doing, they must pay. Mind, I am against extravagance in feeding animals. I believe much money is wasted in giving too much artificial food to both sheep and bullocks. They require a diversity of food, and can only assimilate profitably a certain quantity; but the more you mix cake with other descriptions of grain, in my opinion, the better; and though you may say I am recommending my own wares, a few grains will be found to assist lambs very much. Times are now not very cheery for farmers. The dry summer of 1868, and the light crop and low price of Wheat in 1869, will prove trying to many; but put on a good heart, look well to your stock and land—both are grateful for good treatment. I have had 40 years' experience in business, and have witnessed frequent changes of depression and prosperity; but have generally found the persevering succeed. In conclusion, I can only say plough and sow, tend well your stock, and look with humble faith to Him who always blesses honest labour. If I have only caused by these remarks further thought on the subject amongst you, I shall feel amply repaid.

Mr. BIDDELL said his experience was very much in favour of the Southdown ewes. Some years back he had the misfortune to have his stock afflicted with the cattle-plague, and by necessity he was compelled to turn his attention to sheep. He enlarged his flock so that he kept a little more than a ewe to the acre, viz., 20 score on 380 acres of land. He was highly gratified at the result, and some persons went so far as to say that his sheep more than made up what he had suffered from the cattle-plague, but he was not at all sure they were right in that. It, however, led him to think what he could do with keeping ewes on heavy land. He had the advantage of a good deal of pasture, nearly all of which he used to mow, but he thought it was quite possible to keep sheep with profit on heavy land. Ever since what he might call the discovery of Beetroot (for it had been introduced within the memory of the present generation) they had been placed in a much more favourable position in reference to keeping sheep than formerly. Till then they had nothing to give their sheep in April and May, for Turnips would not keep so long, and if they had had to depend upon hay he was sure the balance would have been "over the left," for he did not think they could find a more expensive thing to feed sheep upon. But since they had had Beetroot they could dispense with hay.

Mr. GREENE: How do you keep sheep on heavy land in wet weather?

Mr. BIDDELL said when he could not keep them on the land he took them off and put them in the yard. He suggested that if they could grow some rows of Turnips or Cabbages with their Beet, and so get some sheep feed on the land, the land would be greatly improved. With regard to the time of tupping, if the object was sell the lambs, no doubt the sooner they were dropped the better; but if they intended keeping them, he doubted whether it was advisable to tup so early as Mr. Greene had stated. Though they came early they would be found to have very large appetites when food began to run short. With regard to artificial food, he quite agreed with Mr. Greene that while mutton sold as it had done the last few years, they must not grudge 5*s.* a score per week for food of that description, and he believed they would be amply repaid; at the same time he had found a very nice balance-sheet without such assistance when food had been plentiful. With respect to layers, he considered that on heavy land they were the most expensive food they had. His practice had been to have very little layer, but to get a piece of Rye-grass early, and then he could put them on to a meadow; or if he put in Coleworts in May he got a very good crop in July and August; and he was persuaded that with attention they might be got by that time on heavy land. Some people got two crops of Colewort, and if they could not do that they might get Mustard, which was a good preparation for Wheat, and between the two he thought they would have much better feed than by feeding on layers. With regard to clipping lambs, his experience was very limited. He never clipped but two, one of which died, and the other was as near death as possible. After they were shorn there came some scalding hot weather, and the sun took such an effect upon their skins as to make them peel. At the same time, he had fancied that some of his long-woolled sheep were greatly incommoded by having to carry their wool till March. As to cutting Turnips, he was an advocate for allowing the sheep to cut their own food, provided they were white Turnips. Swedes required cutting, and he thought all Turnips should be cut after the animals' teeth began to loosen. He quite endorsed Mr. Greene's opinion that the sheep ought to pay the rent on a light land farm, and he was of opinion that, even in that locality, they might do more towards making the sheep pay the rent than they now did, and he strongly recommended the members of the Club to try.

Mr. TALBOT said: As to keeping sheep on heavy land, where could they have been put during such weather as had been experienced during the last two or three months? They could not have sheds to keep them in the dry, and if they had been put on pastures they would be ruined. The Suffolk pastures were not particularly good nor particularly well farmed; but if ever so well farmed, the Grass would be materially injured in an unkindly spring by sheep being put upon them. With regard to the supply of food in the spring, if they were to carry out what had been said by Mr. Greene, and save up all their pasture in the autumn, ready for the spring, he was afraid they would not keep so much stock. They must provide certain food to keep their sheep in the winter and spring, but every practical farmer would agree with him that it was impossible to spare all their pastures for that particular purpose; if so, they must very materially reduce the number of animals kept on the farm, and that he did not think was altogether the thing in the present day. As Mr. Biddell had observed, if there was anything of a paying nature connected with farming, it was sheep, and to these they must turn their attention. As far as corn was concerned, and especially Wheat, they must never expect a very high average for it again; they had the whole world to go to, and even at the present price, 41*s.* a quarter, large quantities were constantly arriving. Therefore it behoved every tenant-farmer to keep the greatest number of sheep he could, and that could only be done by using a certain amount of artificial food with the products of the farm, for there was a vast proportion of heavy land that would not graze sheep without food of some other kind.

Mr. HAWKINS said: Being a heavy land district, that locality was not much adapted for breeding sheep; but he was very fond of them, and was satisfied that if he dispensed with sheep he should have to shut up, for were it not for his sheep he did not believe he should have any profit on his stock. He generally set seven score of ewes, and bred fat lambs; he got his ewes in as good condition as he could, and kept the lambs as high as possible. To show them that he was not far wrong, he might state that his lambs generally brought him 35*s.* to 37*s.* each in the month of July. He felt quite sure that heavy land farms might be improved by keeping an increased number of sheep, and when they looked at the price mutton had made of late, he felt sure it paid them better than any other stock they could graze. His being a heavy land farm, he could not fold upon the land; but he found no difficulty in keeping his ewes and rearing and fatting his lambs. The only difficulty was to get the money to buy the food, but he grew everything except cake. He had found that the lambs obtained more benefit from giving the ewes cake than from giving it to the lambs themselves. He always used Mr. Aylmer's sheep, which produced most beautiful lambs. Sheep, he was convinced, were the mainstay of a light land occupation, and half the mainstay of a heavy land farm.

Mr. GREENE, in replying, said he quite agreed with Mr. Biddell about the Southdowns, and he was inclined to think farmers deserted them too soon. Mr. Kersey Cooper, who would have been there that evening if he had been able, had often laughed at him because he had tried almost every description of sheep. He had now bought some Shropshires, and he had got his nearly like the Downs, but with more size. He thought if the Downs had the same chance as the half-breds, and they let them have the best food, farmers would be able to carry more sheep per acre. This, however, was speculation, for he had not tried it. On heavy land he was sure sheep would pay if they could only keep them about on the pastures, and in the yards at night, and have Mangels to give them. But that was a matter he must leave to heavy land farmers. With regard to clipping lambs, he was there only to tell them what he had done himself. He clipped only a few, neither the best nor the worst, and when he sold the lot he believed the clipped lambs were worth 7*s.* 6*d.* each more than the others in the lot. He would not recommend them to clip those they were going to keep, as at clipping time they would lose some wool—he did not know what amount. The lambs clipped about 3 lb. in May, and he should think on the average they would clip about 3 lb. The wool made about 9*d.* per lb., that would be 2*s.* Mr. Biddell's experience was with two; his was with three score, and he had not lost one. Last June, after clipping, there was some extraordinarily cold weather, and he lost three ewes, although they had cake, but the lambs did not appear to suffer, and he never lost one. He had not fed the clipped ones differently to the unclipped. He selected five of the largest, and sent them to market, just to see what they were worth, and although he contended that they did not fetch within 4*s.* of what they were worth, they made 53*s.* 6*d.* each; they might judge they were pretty fair hoggets to fetch that, and yet they had not half a pound of cake a-day. He thought he should force his clipped lambs more than the others, and he believed they would bear it, and he should get them to market when mutton was dear. He wanted to impress upon them the importance of early tupping. He was speaking now of a light farm, because, as he had said before, he had never farmed heavy land, and he hoped he never should. He liked land over which he could ride without dirtying his horse or splashing his boots. He must recommend early lambing, and one failure was no proof against it. They failed in one thing, but in how many did they succeed? If he farmed heavy land he should be inclined to follow Mr. Hawkins' plan, and fat both ewe and lamb every year. If they forced a ewe well they could do it, but they must put their hand into their pocket, for without that they could do nothing. He believed February or March was the best time for lambing, and it suited the land best, too. He once passed a piece of land belonging to a man who did not spend much on his ewes, and he believed through not putting his hand in his pocket for some cake that man lost three coombs an acre of Barley on 20 acres of land. Although he never let his lambs be without cake or bran, yet depend upon it the cake to the ewe was the secret of making the lamb look well; and then, besides, if one of their ewes did not please them, they could sell her at a very good price. Still they must not be extravagant, for they would also lose by that.

BOTLEY.

Conversion of Woodland.—We now give the remainder of Mr. BLUNDELL'S paper on this subject; see p. 290:—

Having endeavoured to show that wherever the land is adapted for arable or pasture in the majority of cases the most profitable treatment is to cut the timber, and invest the money to grub and cultivate the land, except in cases where the land is too poor for corn or Grass produce, I will now proceed to state several plans or systems of planting Firs, Pines, Cedars, &c., for profit. First is a method of planting Larch Firs for a quick and profitable return. The land should be trenched or steam cultivated not less than 18 inches in depth; the use of fresh, strong manure should be avoided, although good vegetable mould may be applied with advantage on very poor and stony soils. The plants should not be too large—say about from 24 inches to 30 inches high; and if they have been grown and previously transplanted on poor soil, so much the better, if they are healthy, clean grown, and well rooted. The first two years after planting the land should be kept clean by hand-hoeing. Particular attention should be paid during their growth by the removal of diseased or decaying plants, and as soon as the poles are marketable (which they will be by taking the best at the end of 11 years) commence by thinning and selling, looking only for a quick return; and I believe a great mistake is made by many, who allow the plantation to go on unnoticed until the plants are neither fit for one purpose or the other,—not large enough to pay for sawing into rails, pales, &c., yet having passed the size called poles. It often happens also that the plants are set at too great a distance from each other; the consequence is they do not grow so fast, neither do they make such handsome poles. When planted close they protect each other, the winds take less hold of them, and they

gather more moisture from the atmosphere in the summer months. They cover the land quicker, keeping in check both Grass and weeds. Again, instead of growing boughs, the growth centres in the poles, which come earlier for use in consequence. In following the above plan the plants should be set at 36 inches by 30 inches apart. I will now furnish a statement of the cost of planting, &c., and also the mode of taking, and the value of the crop per acre :—

Expenses—Trenching 18 inches deep, at 1s. 6d. per rod	£14	0 0
,, 5250 plants, at 25s. per thousand	6	11 3
,, Planting by spade	2	10 9
,, Hoeing	1	0 0
	£24	2 0
Interest on the outlay of £24 2s., at 4 per cent., for 16 years	15	9 4
Failures allowed, at 10 per cent.	7	15 0
Total expenses of plantation	£47	6 4

Commence cutting, taking the best at the—

11th year cut 600 poles, at 9d. each	£7	10 0
12th year ,, ,, ,,	7	10 0
13th year ,, ,, ,,	7	10 0
14th year ,, ,, ,,	7	10 0
16th year cut the remaining 2850 poles, at 4d. each	47	10 0
Value	£77	10 0
Cost	47	6 4
Profit	£30	3 8

Annual profit, 38s. per acre.

As, however, the plan of quick returns, as just stated, by the growth of only Larch Firs, requires a great deal of constant attention, some parties may object to it for that reason or others, I will therefore allude to a plan whereby a less number of plunts may be set, and take the crop at the end of 25 years, and in this case, if required, rows of Sweet Chestnut, Hazel, Ash, &c., may be planted, with the view of remaining for the growth of underwood after the crop of poles has been sold off. Planting is advised in the following way :—Larch Fir plants at intervals of 3 feet and 6 feet alternately, and at 3 feet apart in the lines, the 6 feet space being planted with underwood plants at 3 feet apart. Then, at some intermediate time, each line of poles at 3 feet apart may be cut and sold, as also half the poles in the remaining line, thus leaving the lines of Firs standing for the main crop at 6 feet apart each way, and the underwood plants will be found standing also at the same distance. According to this plan there would be left at the end of 25 years about six poles to the rod, which, at 1s. each, would give £48 per acre, being a large return, in addition to the valuable plant of underwood left on the land. There is yet another system of planting Firs and Pines or Cedars to which I wish to call attention, more particularly where it is intended that large trees be the object to be attained. In such cases I should plant three sorts in alternate rows, or rather at right angles. The sorts I recommend are the Cedrus Deodara, the Douglas Fir, and the Common Larch Fir, the first row to be Cedrus Deodara, with Larch alternately at equal distances; the second line all Larch; the third line Douglas Fir, with Larch alternately, at the same distance apart; and the fourth line with all Larch plants. Then proceed with Cedrus Deodara and Larch as for the first row, and so on throughout the plantation, the distance recommended for the plants being about 6 feet apart each way. In thinning out the Larch they may remain until worth about 1s. each, which they would be at about 18 years' growth, thus leaving the Cedrus Deodara and the Douglas Fir for the main crop, these sorts being calculated to grow to an immense size and height if properly set out at the right distance, which distance, as proposed above, would be 12 feet from plant to plant each way. The Cedrus Deodara and the Douglas Fir, as I believe, have not been cultivated for profit in this country, but only used for ornamental purposes. In the latter respect they are comparatively well known, and I am only justified in introducing them to your notice as profitable timber producers though the high encomiums passed on them by a work called "Pinacea," which is the soundest practical treatise on Fir and Pine culture now extant.

I, therefore, to justify my recommendation for planting, quote from this work the writer's opinions on their growth in their native habitats, and his experience as to their adaptation to our soils and climate in England for timber growing purposes; and, relying upon these statements, we are justified in assuming that their growth here would be profitable, not only as regards the bulk of produce in timber, but its utility for all ordinary purposes. In order, however, to obtain plants of these Cedars and Pines, they must be raised from seed, as they cannot now be obtained from the nurseries except at a very high charge, they being grown for ornamental purposes only; and in growing plants for own use they should be grown in soil and climate similar to that where they are to be planted.

In conclusion, I wish to make a few general observations. Trees for timber in woodlands should never be lopped or shrouded, nor should trees be ever left within 20 feet of the boundary fence adjoining arable lands. In making plantations upon land which is too wet, instead of underdraining, as for corn land, it is best done by opening trenches from 2 to 3 feet in depth, and from 20 feet to 30 feet apart, according to soil, as pipe tile draining in woodlands would soon become choked and useless. Steam cultivation I have seen successfully done in bringing heath-land into cultivation, at a cost of about 30s. per acre. It is also recommended with sufficient power as the means of grubbing ordinary coppice land, including the lifting of tree stools, at a cost of from £3 10s. to £5 5s. an acre. In the foregoing pieces of woodland noticed I have made no statement of draining such lands as require it, because it is only to add the cost of draining to the other expenses, and charge interest upon, which would still leave a large profit.

Notices of Books.

The Photographer's Annual and Almanac for 1870 : *a Practical Manual for the Professional and Amateur Photographer, the Beginner, the Colourist, and the Photographic Mechanic.* Edited by A. H. Wall. J. W. Green, 54, Paternoster Row.

This is an extremely complete and well illustrated collection of practical hints and instructions connected with the art of photography. It is arranged under Technical, Chemical, Optical and Artistic heads, with Hints for Colourists and Amateur Mechanics, besides a miscellaneous division, from which we extract the following agricultural scrap :—

"Pencil sketches of prize animals at the cattle shows are usually furnished by some artist specially invited; and the value of such pictures to cattle-breeders and farmers is not merely as a *souvenir* of the exhibition, but instructive, because they show a standard by which to judge the perfectness of their stock. Of infinitely more worth, because infallibly correct, are photographs of the animals; and at most of the American cattle shows a photographer attends whose province it is to take pictures of the selected beasts. This is a practice to be recommended, and worthy the attention of all interested in cattle-rearing and agriculture in this country. The issue of a shilling photograph of the prize animal would be found remunerative to the Society, and would satisfy the farmer better than the pencilled representation of the sketcher, distorted as it often is by the flurry of the hurried wood engraver."

Carter's Farmer's Calendar. Illustrated. 1870.

This, like Messrs. Suttons' corresponding publication, referred to a week or two ago, is a good deal more than a mere trade publication. It is a satisfactory indication of the relations subsisting between our leading seedsmen and their customers that the advertising circulars which they send out are thus really capital agricultural treatises. The present pamphlet contains a very complete and excellent essay on the best mixture of permanent pasture grasses adapted to particular localities. The cultivation of other crops and plants and seeds is also very well discussed.

Farm Memoranda.

HAMPSHIRE.—It is much to be feared that the recent extremely severe frost will have injuriously affected vegetation of various kinds. If we recollect the light and dry season for Wheat sowing and the recent flooding rains, succeeded by frost almost as suddenly as the shifting of scenes at a theatre, we can but expect that the early sown Wheat, together with Swedish and other Turnips, may be somewhat seriously damaged. Let us hope, however, that in due course the spring seed time will be favourable, although deferred for a time. This is now an anxious time for flockmasters on the hill farms, Hampshire Down flocks about this time being in the midst of the lambing season. The early Down flocks on the vale farms have suffered more losses, both in ewes and lambs, than for several years past, and the flocks on the hill farms up to the present time cannot be reported as over an average as regards the number of lambs saved. Many losses have occurred in some flocks from the lambs coming dead. It is difficult to account for this; there are, however, two causes to which we hear it attributed, viz., the epidemic still lurking in the blood of the ewes, and when they do not fall lame as in former seasons they are more likely to bring dead lambs. The "ergot of Rye" is also stated to be an exciting cause of abortion, both in ewes and dairy cows, to prevent which it is advised to cut off the bents on the old leys and pasture lands during the month of July.

The supplies of both beef and mutton have of late exceeded the demand. Prices have, in consequence, receded. This extra supply, no doubt, has been caused by the root crops not having turned out so well as expected. At the same time the consumption has rather diminished, for the price of meat is still high for those classes who can only find partial employment. The prices of Wheat and other grain is now very low, and we think that the world's price delivered in this country will rule upon an average of years, and the only mode of meeting low prices is to cultivate for full crops at the lowest possible cost, and certainly there has been now for some years artificial manures available for use of such varied kinds as to greatly assist farmers, as compared with former times before they became so plentiful and cheap.

The spring seed time is fast approaching, and the seeding of grasses in the Lent corn is a matter of much importance. Owing to the succession of crops alternation seems to be generally considered as the best means of success, and on land under the four-course rotation it is recommended to seed with 10 lb. broad Clover and 4 lb. of Alsike per acre on one-half the lain, and with 10 lb. of the large-blossomed suckling, and 4 lb. of long-haulmed Dutch on the other half. The ordinary sorts of Rye-grass are not so much used as formerly, particularly where the land comes in for Wheat out of lea. The Rye-grasses are often sown for the purpose of filling up and making a crop, whereas it is much oftener found they starve and damage the Clover crops, and are the positive cause of failure and loss of plant, besides which they come into bloom before the Clovers, and thus hasten the hay season prematurely. The seeding, however, of light and thin soils, recommended especially when intended for two year's lea, is 9 lb. of suckling, 3 lb. of Dutch, with 1½ to 2 bushels of perennial Rye-grass per acre.

It is also advised that seedings for Sainfoin, Lucerne, and such like crops, should be drilled at 14 inches apart, except on very stony soils, in order that the land may be kept clean by horse-hoeing between, and dragging across the drills, as these crops are commonly so much infested with Lop, Couch, and other injurious grasses, which reduces the crop in quantity, and damages the hay for consumption on the farm by propagating and seeding the land with weedy grasses in future years. *Joseph Blundell, Southampton.*

The Week's Work.

MARCH 4.—Come what may as to weather, the sowing of spring corn must now, generally speaking, be somewhat later than ordinary in our southern counties. At the same time, if the seed is well got into a favourable seed-bed, ordinary weather may overtake past arrears long before the usual time of harvest.

Spring Wheat sowing, if not already finished, should now be brought to a close as fast as the season will permit. If to be drilled in a stale lea furrow with prospects of wireworm, or Clover stubble with clubworm, sow half a ton of salt per acre immediately before harrowing, so that it may be harrowed into the seams between the furrow slices. Some apply the salt ten days or a month before sowing, preferring wet moist weather, in order to wash it down to the roots of the Grass and Clover, where the wire and club worms lodge. The salt will not only help to kill insect life, but to rot the roots of the Grass and Clover, and all effete matter in the soil. Specific Wheat manures may be drilled in at the time of sowing in the usual way, should the land so require, to force forward a rapid vegetation. There is an old saying that "a late season requires more seed than an early one;" but under the old practice of sowing Wheat on land newly ploughed, much of the seed sank to the bottom and was lost in late bad seasons. Spring Wheats often suffer much in dry weather before the roots get below the influence of solar heat, and unless the seed in such cases possesses constitutional vigour normally the plants grow sickly, tiller badly, and yield but poorly in harvest. Again, as spring Wheat is merely an habitual effect of the time of sowing, a very important practical question arises for solution this year, viz., if the early part of February has hitherto been the time of sowing spring Wheat in the South, and the early part of March the time farther North; and if the early part of March is the period of sowing in the South this year, would not seed from the latter (the North) be preferable for sowing in the former (the South), provided the quality of the seed is equally good?

Oats may be sown as soon as there is a proper seed-bed for them. In the north of England, and throughout the whole of Scotland, the place for Oats is on a stale lea furrow, so that under the thorough drainage and improved cultivation of the present day there is seldom much difficulty experienced in getting a proper seed-bed by the close of February and beginning of March, much better than was got a month later prior to such improvements. Throughout the southern and midland counties of England, the Oat crop can hardly be said to have any very definite place in the rotation, the breadth sown being comparatively small. But, although the Oat is the hardiest of our cereals, it is very wrong to suppose that it may be sown on any sort of seed-bed or soil. On the contrary, it requires a dry seed-bed in land properly cultivated and in good heart before a profitable return can be expected in harvest. It has even been said that "fewer farmers are up to growing Oats than Wheat or Barley." The varieties of this cereal are very numerous, and no little skill is required to select the sort best adapted for this and that and the other soil and climate. The common rule, "late sorts for the South, and early ones for the North," is anything but trustworthy. Where wireworm is dreaded, or where the Turnip crop is subject to finger-and-toe, sow salt as directed for Wheat, and it is preferable to harrow the land well and then drill in the Oats than to sow broadcast before the harrows. By drilling there is also a great saving of seed, whilst the young plants tiller and come away more evenly for harvest.

Early Potatos are now planted in much larger breadths than formerly, in order to supply the increasing demands of our large towns, railways affording every facility for conveyance. The crop requires what are locally known as early dry soils, in situations which are free from liability to spring frosting. The land

requires to be prepared as for Parsnips, deep thorough tillage and ample manuring in autumn being essential to success. At this season it must again be deeply smashed up with a fine working season, for however dry the soil may be naturally, it must not be worked wet for Potatos at the time of planting. Indeed, this is an absolute rule for all our cultivated crops. The sets should be cut from properly matured tubers some time before planting, spread thinly on the floor, sprinkled with hot lime, and turned over two or three times, so that a fresh skin may be equally formed over the whole wounded surface. The sets may then be planted either in stetches by a double mouldboard plough, or on the flat in every third furrow with the common plough, or they may be dibbled in on the flat with a Potato dibble. Several new varieties have recently been introduced, but as yet the price is too high unless for the purpose of growing "seed" for next year's crop.

Kohl Rabi is now mostly sown as Swedes, but it may be well to sow a bed or two for filling up blanks, not only in the seed-sown crop, but in Swedes and Mangel, as those sown at this season transplant much better than the younger plants taken from thick parts of the drill at the time of hoeing. The preparation and seeding of the land are the same as for Cabbages.

Spring Vetches.—Sow weekly for the successive foldings and cuttings of summer, as directed last month. To obtain a heavy crop the land requires to be properly prepared and richly manured with farm-yard manure. Sow three bushels of seed per acre, with about two pecks of Oats or Rye to keep up the crop.

Hop Gardens find plenty of employment to all hands daily at this season, both in dry weather and wet—in trenching and digging, in throwing and sorting the poles, and in collecting and making manure. The use of artificial manure has greatly reduced the latter work, the manufacture of hop manure. The rags, fish, bones, and other etceteras that used to be chopped up during wet weather about this time are now converted into manure by more improved processes. Nevertheless all Hop-growers continue to make less or more of their manure on the old plan. In fine weather the manure may be carted and dug into the drier class of soils. The heavier lands may be loosened with the fork or smashed up to let in the warm drying air, so as to fit them for manuring and digging. The Hop delights in calcareous soils, and where there is a deficiency, and a supply to be had, calcareous sand, &c., may be carted when the land is not in season for working. The annual supply of new poles may also be procured and got ready.

Farm Horses are now on a full allowance of ground oats and beans mixed in their chaff. If the hay has not been salted at the time of stacking, ½ cwt. to the load, the chaff should be salted when cut. A cooling diet daily is also necessary, as a bran mash—boiled barley, carrots, or, what is better than any of them, the first cuttings of sewage Grass, which we are afraid will be later than usual this season.

Dairy Cows for supplying towns with milk and butter yield as well just now as at any season of the year, and from the improvements made in the dietary, the quality of the milk they yield is rich and free from any obnoxious taste. Some cheese dairies, too, keep the cheese press going all the winter over. These are great triumphs, and the pity is that they are not more general. If the fattest and heaviest cattle, sheep, and pigs are sent to the shambles about Christmas time, why is it that milch cows and their milk are both in the depth of poverty? Just because milch cows are starved on improper food, and housed in cold and wretched hovels. It can hardly be said that any discovery has recently been made in cooked food for milch cows, the great advance made being merely an extension of a very old practice long ago taught by Arthur Young and other authorities of the last century. It is, therefore, rather surprising that so many milch cows continue to be cared for so much to the disadvantage of their owners. No little blame, doubtless, rests upon landowners for not erecting proper cow buildings, including cooking apparatus, &c., for the proper preparation of food.

The steam tackle should now be in readiness for spring smashing. We know the full value of steam in our stubble fields at the close of harvest, but it is very questionable if half its value is yet known experimentally at this season. All are familiar with the immense harm done by the trampling feet of horses in heavy clay land, however well underdrained it may be, and the necessity there is for working it between the wet and the dry, keeping the fine weather-made soil upon the surface if intended for Mangel Wurzel, and indeed for almost every spring and root crop grown; but steam does not trample the land, and the practical question arises, How much sooner can steam-smashers enter into heavy soils than horse-smashers? Another practical question arises, namely, Are our steam-smashers, which do their work so effectively after harvest, when the subsoil is comparatively dry and hard, adapted for smashing up heavy soils at this season when comparatively dry above, but soft and wet below? We do not believe it; on the contrary, we aver that a diversity of soil so great requires a corresponding difference in the construction of the implement, and the season we aver is favourable for bringing experiments to bear upon the solution of the question. In difficult seasons like this the horse rule is to smash up before the land is actually ready, in order to dry the bottom, this being done purposely that the next smashing across will break up the land between the wet and dry. In other words, the land requires one turn more smashing in difficult seasons than in favourable ones, and this can be far more effectually done with the steam implement in its present imperfect form, for soft-bottomed work, than by horses. There is a difference in the effect produced by the implement when moving at a quick speed than when going at a slow pace—the tines in the former being more apt to strip. By slackening the speed of the steam implement, therefore, it will smash up the bottom, when otherwise it will strip through. *W. B.*

Notices to Correspondents.

MARL AT BROMLEY: *C. C.* The following analysis of the subsoil to which your former question refers, indicates a very good and useful marl:—

	Per cent.
Moisture	20 693
Organic matter, &c.	2 948
Silicious matter	25 372
Oxide of iron and alumina	13 053
Phosphoric acid	0 178
Hydrated sulphate of lime	4 558
Carbonate of lime	31 767
Carbonate of magnesia	1 431
	100 000
Nitrogen (equal to)	0 045
Ammonia	0 055

Apply it before a winter's frost to any sandy or peaty soil you have, at the rate of 50 cubic yards an acre.

PEDIGREE IN LIVE STOCK: *C. P.* It has been often the subject of Journal articles, but never that we know the subject of a formal treatise.

TESTING BOILERS IN FRANCE. *Messrs. H. P. D. & Co.* No boiler can work in France without being tested. To have one tested we write to the Ingenieur des Mines, asking him to come and test a boiler of —— horse-power, made by ————, and going to be delivered at ————. In Paris there are three days a-week for testing. You have to provide pump and everything necessary; the engineer simply applies his meter. If he accepts the boiler he gives it a number, and stamps it on a copper plate. You say what pressure you wish it to work to—if 4 atmospheres it is tested to 9, and so on. The boiler must be uncovered, so as to show all the rivets, &c.

TRIFOLIUM INCARNATUM: *T. N.* Sow 20 lb. of seed per acre broadcast over an unploughed clean corn stubble, after the first rain it receives, and harrow it hard in. There is nothing requires less "cultivation."

Markets.

ENGLISH WOOL.

A steady business has been done, and stocks continue to diminish, but for all that trade continues lifeless, and though consumption is very large profits are cut very close, and therefore any advance in price is very reluctantly conceded.

CURRENT PRICES OF ENGLISH WOOL.	Per lb	s. d	s. d
FLEECES. Southdown hoggets		1 1 to 1 2	
Half-bred ditto		1 2 — 1 2½	
Kent Fleeces		1 3 — 1 4	
Southdown ewes and wethers		0 9½ — 1 1	
Leicester ditto		1 2 — 1 3	
SORTS. Clothing		0 10 — 1 0	
Combing		1 0 — 1 8	

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, March 3.

Prime Meadow Hay	75s. to 80s.	Clover, old	110s. to 120s.
Inferior do.	60 70	Inferior do.	80 100
Rowen do.	50 70	Prime 2d cut	100 110
Inferior do.		Inferior do.	60 80
Straw	24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, March 3.

Sup. Meadow Hay	84s. to 90s.	Inferior Clover	90s. to 114s.
Inferior do.	70 76	New do.	—
New do.	— —	Straw	32 36
Superior Clover	123 130	JOSHUA BAKER.	

WHITE CHAPEL, Thursday, March 3.

Fine Meadow Hay	78s. to 86s.	Prime old Clover	120s. to 130s
Inferior do.	65 75	Inferior do. do.	90 100
Prime New Hay	— —	Prime 2d cut do.	— —
Inferior do.	— —	New Clover	106 112
Straw	24 28	Inferior do.	85 95

COALS.—March 2.

Cowpen Hartley, 15s. 3d.; Hastings Hartley, 15s. 3d.; Walls End Haswell, 18s.; Walls End Hetton, 18s.; Walls End Russel's Hetton, 16s.; Walls End Deaf Hill, 18s.; Walls End Kelloe, 16s. 3d.; Walls End Tees, 17s. 9d.—Ships at market, 49; sold, 32; at sea, 45.

HOPS.

BOROUGH MARKET, March 3.

Messrs. Pattenden & Smith report the market without change. English continue to move off steadily at firm rates, but foreign are somewhat dull of sale. Yearlings command very little attention.

METROPOLITAN CATTLE MARKET.

MONDAY, February 28.

The number of Beasts on offer is considerably smaller than on last Monday; trade is not by any means brisk, yet there is a demand for choicest qualities at rather higher rates; a very fair clearance is effected of all kinds. There are a few more Sheep, and on the average trade is scarcely as active as of late, but prices generally are not lower. Choice Calves are still scarce and dear. Our foreign supply consists of 515 Beasts, 4480 Sheep, and 54 Calves; from Scotland, there are 117 Beasts; from Ireland, 324; from Norfolk and Suffolk, 1140; and 489 from the Midland and Home Counties.

	s. d. s. d.		s. d. s. d.
Best Scots, Hereford, &c.	4 10to5 2	Best Long-wools	5 4to5 6
Best Shorthorns	4 8—4 10	Do. Shorn	— —
2d quality Beasts	3 4—3 8	Ewes & 2d quality	4 4—4 10
Best Downs and Half-breds	5 8 6 0	Do. Shorn	— —
Do. Shorn	— —	Lambs	— —
		Calves	4 4 6 4
		Pigs	4 0 6 0

Beasts, 2585; Sheep and Lambs, 19,180; Calves, 76; Pigs, 100.

THURSDAY, March 3.

We have a very short supply of Beasts, but it is quite equal to the demand; indeed, they cannot all be sold; prices are lower for all descriptions. The number of Sheep is large for the day, and there is scarcely any trade for them; our highest quotations are only reached in a very few instances. Calves are also lower. Our foreign supply consists of 205 Beasts, 2175 Sheep, and 62 Calves.

	s. d. s. d.		s. d. s. d.
Best Scots, Hereford, &c.	4 8to5 0	Best Long-wools	5 2to5 4
Best Shorthorns	4 6 4 8	Do. Shorn	— —
2d quality Beasts	3 0—3 6	Ewes & 2d quality	4 4 4 8
Best Downs and Half-breds	5 6—5 10	Do. Shorn	— —
Do. Shorn	— —	Calves	4 0—6 0
		Pigs	4 0 6 0

Beasts, 596; Sheep and Lambs, 5555; Calves, 103; Pigs, 25.

METROPOLITAN MEAT MARKET.—March 3.

Best Fresh Butter .. .. .. 18s. per dozen lb
Second do. do. .. .. .. 15s. "
Small Pork, 4s. 8d. to 5s. 4d.; Large Pork, 4s. 2d. to 4s. 6d. per 8 lb.

MARK LANE.

MONDAY, February 28.

There was a very short supply of Wheat from Essex and Kent to this morning's market, which met a fair demand at the quotations of this day week. The attendance was thin, and the business done in foreign was in retail at last Monday's rates. Barley, Beans, and Peas were steady, without change in price. Oats were a slow sale and rather cheaper. Flour unchanged in value.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	37	47	Red	34	46
— — fine selected runs	39	51	Red	37	48
— — Talavera	54	56			
— — Norfolk			Red		—
— — Foreign	38	53			
PARSLEY, grind. & dist. 36s. to 39s. Chev.	39	42	Malting	34	38
Foreign grinding and distilling	22	25	Malting	30	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire	24	26	Feed	—	—
— Irish	23	25	Feed	21	24
— Foreign Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan 29s. to 37s. Tick	31	49	Harrow	31	49
— Pigeon 29s. to 36s. Winds.	—		Longpod.	—	
— Foreign Small	41	43	Egyptian	38	40
PEAS, White, Essex, and Kent. Boilers	32	42	Suffolk	35	43
— Maple, 41s. to 45s. Grey	32	42	Foreign	33	37
MAIZE			Foreign	29	31
FLOUR, best marks delivered per sack	39	43			
— 2d ditto ditto	28	40	Country	28	40
— Foreign per barrel	22	25	Per sack	29	65

WEDNESDAY, March 2.

Coastwise as well as by land carriage the receipts of Wheat from Essex and Kent were only moderate. There was a fair attendance of millers, but the demand was inactive for both red and white produce. In prices no alteration took place. The show of foreign Wheat was moderate. The transactions were in retail at about late rates. Moderate supplies of Barley were on the stands; the inquiry was restricted at late rates. Malt was dull, on former terms. The supply of Oats was moderate; the trade was dull at late rates. Beans and Peas were neglected, but unaltered in value. Flour sold slowly at previous quotations.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English	680	30	—	—
Irish	—	—	—	—
Foreign	—	400	1450	240 — brls.
	680	430	1450	

LIVERPOOL, March 1.—Wheat was in fair demand. Red sells at the full rates of Friday last, white rather easier. Flour quiet, at barely late rates. Beans 6d. cheaper; Saidi, 32s. Oats and Oatmeal slow of sale, and nominally unaltered in value. Indian Corn in moderate demand at Friday's prices; sound yellow, 27s.

AVERAGES.

	Wheat.	Barley.	Oats.
Jan. 22	43s 6d	36s 2d	20s 10d
— 29	42 8	35 7	20 4
Feb. 5	42 2	35 3	20 8
— 12	41 9	34 6	19 10
— 19	40 8	34 2	19 10
— 26	40 7	33 9	20 7
Average	41 11	34 11	20 4

SEED MARKET.

The fine weather causes an improved demand for agricultural seeds. Samples of new English red Clover come forward very slowly, and the quality is for the most part very indifferent; foreign qualities are firm at recent currencies; French Italian continues to advance in price. For spring Tares we have a more active demand. Canary seed is without alteration. Hemp seed is dear and scarce.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

WHEELER'S SUPERIOR GRASS and CLOVER SEEDS are forwarded carriage free to all railway stations in the Kingdom
QUALITY—Excellent, and unadulterated
PRICES—(Which vary from 13s. 6d. to 32s. per acre, according to soil and situation) extremely moderate.
TERMS—Five per cent. discount for Cash.
J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

Mangel Wurzel Seed.

BOLTON AND CO. have to offer choice stocks of all the varieties of MANGEL WURZEL. Their
ORANGE GLOBE,
LARGE RED,
INTERMEDIATE YELLOW, and
LONG YELLOW
are particularly good, and are offered at moderate prices
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

Improvement of Grass Lands, at from 4s. 6d. to 9s. per acre.

SUTTONS' RENOVATING MIXTURE should now be sown 6 to 12 lb. per acre
SUTTON AND SONS, Seed Growers, Reading.

SUTTONS' CLEANED CLOVER SEEDS, NEW and UNADULTERATED

Red or Broad	Alsike	Trefoil
White or Dutch	Cow Grass	Giant White

Samples and prices on application to
SUTTON AND SONS, Seedsmen to the Queen, Reading.

GARDEN SEEDS. To the TRADE.

PEAS—Jackson's Prolific
Semmer
Champion of England
Veitch's Perfection
Yorkshire Hero
Daniel O'Rourke
Emperor
Prizetaker
Victoria
Advancer
Hair's Dwarf Mammoth

BEANS—Johnson's Wonder
Windsor
Long pod
French, of sorts [and others

BROCCOLI, Purple Sprouting
LETTUCE, Drumhead or Malta
CAULIFLOWERS, of sorts
ONIONS, of sorts
RADISH, of sorts
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1870—SELECTED VEGETABLE and FLOWER SEEDS, SEED POTATOS, &c. (Carriage free.)
Fully DESCRIPTIVE PRICED LIST post free on application
Carefully assorted Collections of VEGETABLE SEEDS, at 12s. 6d., 12s., 1l. 6d., 1l. 12s., 2l., 3l. 3s., and 10l. 10s.
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Genuine Seeds of Superior Stocks.

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Complete Assortments of Choice VEGETABLE SEEDS, for a Year's Supply

No 1	.. ..	£1 3 0	No 4	.. ..	£1 1 0
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Complete Assortments of Choice Continental and English FLOWER SEEDS

No 1	.. ..	£2 2 0	No 4	.. ..	£0 15 6
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CATALOGUE of New and Select Vegetable and Flower Seeds, Potatos, &c., for 1870, with practical Cultural Directions, will be sent Post Free upon application
Their Seeds are all of the most select character, each variety being saved from the best stock known of its kind.
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CHEVALIER BARLEY, which was awarded the First Prize three years in succession (1867, 1868, 1869), at the Birmingham and Midland Counties Show. Yielded, at Brighton, in 1869, 10 quarters per acre, weighing 57 lb. per bushel. Also PEDIGREE BLACK TARTARIAN and PEDIGREE WHITE CANADIAN OATS.

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SUTTONS' HOME-GROWN FARM SEEDS, Saved from fully developed roots. Lowest price per cwt on application.

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NORMANTON GLOBE MANGEL WURZEL.

From W. HOPE, Esq., *Parsloes, Barking, Essex.*

"At the Smithfield Show last year I selected 10 different varieties of Mangel Wurzel which appeared to possess special merits, and have this season grown them in an experimental field. Of all these, your Normanton Globe is undoubtedly the best bred; it is very regular, and from the remarkable smallness of top will yield the greatest weight per acre."

The best in cultivation.

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"I have again great pleasure in bearing testimony to the superior quality of your Normanton Globe Mangel over every other variety I have grown; its small top, and having but one root, allows it to be grown very closely together, which is the secret of a heavy crop, and certainly does not exhaust the land anything like so much as other kinds."

The best in cultivation.

We are now able to execute Orders for this splendid variety, and regret our inability to supply all demands last season. The seed is of excellent growing quality, and we solicit early orders.

1s. 6d. per lb., cheaper by the cwt. or half-cwt., carriage free.

We beg to caution our friends against purchasing an inferior kind under the name of "NORMANTON," having heard of many disappointments last season through substitution.

SELECTED YELLOW GLOBE MANGEL, 10*d.* per lb.
RED and YELLOW GLOBE, of good stocks, 8*d.* per lb.
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Suttons' Yellow Intermediate Mangel.

SUTTONS' SELECTED YELLOW GLOBE MANGEL, 10*d.* p lb
SUTTONS' BERKS PRIZE do., 1*s.* per lb
SUTTONS' YELLOW INTERMEDIATE do., 1*s.* per lb
SUTTONS' MAMMOTH LONG RED do., 1*s.* 6*d.* per lb.
Other Good Sorts of MANGEL, 8*d.* to 9*d.* per lb.
SUTTONS' IMPROVED LARGE GREEN KOHL RABI, 3*s.* p lb.
ORDINARY LARGE GREEN do. 2*s.* 6*d.* p lb.

Those marked thus (*) were the varieties so much admired on our Stand at the last Smithfield Club Cattle Show.

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ANNOUNCED TO TAKE PLACE AT THE

SUNNINGDALE NURSERY, on March 10th, 11th, and 12th, next THURSDAY, FRIDAY, and SATURDAY.

It contains SPECIMEN CONIFERS scarcely to be equalled.
It contains RHODODENDRONS such as were never before offered at a Public Sale.
It contains SELECTIONS and COLLECTIONS of SHRUBS, &c.,
especially suitable to Gentlemen planting largely, Builders, &c.

IT IS AN OPPORTUNITY WHICH SHOULD BY NO MEANS BE LOST.

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New and Select Farm Seeds.

1870. 1870.

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FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.
TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.
CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.
MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years lay, from 12s. to 20s. per acre.
MIXED GRASS Seeds and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21s. to 28s. per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.
Seeds of the value of £2 and upwards (Grain, Vetches, and Potatos excepted), carriage free to any railway station in the kingdom.
Special estimates for large quantities. Samples and prices on application.
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RICHARD SMITH'S 21s. Collection of VEGETABLE SEEDS contains the following approved kinds. Carriage free.

Peas—The Earliest, 1 quart
Princess Royal, 1 pint
Sangsters' No. 1, 1 pint
Prizetaker, 1 pint
Advancer, 1 pint
Blue Scimetar, 1 pint
Veitch's Perfection, 1 pint.
Harrison's Glory, 1 pint
Beans—Taylor's Imperial Windsor, 1 pint
Early Longpod, 1 pint
Johnson's Wonderful, 1 pint
Green Windsor, 1 pint
Royal Cluster, ½ pint
French Dwarf, 1 pint
Scarlet Runners, 1 pint
Beet—Nuttings fine Red, ½ oz.
Borecole—New Hearting, packet.
Scotch Curled, packet.
Brussels Sprouts—finest, packet.
Broccoli—Early white, packet.
Purple Sprouting, packet
Walcheren, packet
Worcester, late white, packet
Cabbage—Early Nonpareil, pkt
Worcester Incomparable, pkt.
Wheeler's Imperial, packet.
Red Pickling, packet.
Curled Savoy, packet.
Carrot—Early Scarlet Horn, 1 oz.
James's Intermediate, 1 oz.
Imperial Altringham, 1 oz
Cauliflower—Early London, pkt
Celery—Fine solid white, pkt
Fine Giant Red, packet
Cress—Australian, 1 oz
Plain, 4 oz
Cucumber—Smith's fine Frame, packet
Stockwood Ridge, packet.
Endive—French Curled, packet.
Leek—Musselburgh, packet
Lettuce—Champion Cabbage, packet
Paris White Cos, packet.
Bath Cos, packet
Drumhead, packet.
Mustard—White, 4 oz.
Melon—Choice kind, packet
Onion—Reading or Spanish, 1 oz.
James's Keeping, 1 oz
Blood Red, ½ oz.
Silver Skinned, ½ oz
Parsnip—Hollow Crowned, 1 oz
Parsley—Fine Garnishing, 1 pkt
Radish—Wood's Early Frame, 2 oz
Early Scarlet, 2 oz
Turnip, mixed, 2 oz
Spinach—Summer, ½ pint.
Winter, ½ pint
Turnip—Early Six-Weeks, 1 oz.
Early Green-top, 1 oz.
Orange Jelly, 1 oz.
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Vegetable Marrow, packet.
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Per packet.—s. d.			Per packet.—s. d.		
Beet, Scott's Crimson Dwarf	1	0	Pumpkin, Mammoth, extra	1	0
Egyptian Turnip, dark red	1	0	Lettuce, Victoria White Cos	1	0
Brussels Sprouts, Scott's Eclipse	1	0	Davis' Giant Green Cos	1	0
			The Favourite Cabbage..	1	0
Broccoli, Snow's Winter White	1	0	The two largest Lettuces grown.		
Cauliflower, True Selected Erfurt Early Dwarf	1	6	Melon, Golden Queen	1	6
			Bailey's Prize Eclipse	1	6
Carrot, Merriott Green-top	0	6	Onion, Bedfordshire Champion	1	0
Parsley, Champion Superb Curled	1	0	Nuneham Park	0	6
			Giant Rocca (largest)	1	0

COLLECTIONS of VEGETABLE SEEDS, from 10s. 6d. to £5. For all particulars see Descriptive Catalogue, free.

Per packet—s. d.			Per packet—s. d.		
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Reid's Exhibition, 12 do.	1	0	Pyrethrum Golden Feather	1	0
French Paeony-flowered Perfection, 18 do.	1	0	Lobelia speciosa, true 6d. and	1	0
Dwarf Chrysanthemum-flowered, 12 do.	1	0	Marigold, French extra choice 6d. and	1	0
Crown-flowered, 6 do.	1	0	Mignonette, new Giant Victoria	1	0
French Giant Emperor, 12 do.	1	0	Petunia, double, extra double	1	0
Newest Victoria, 12 do.	1	0	Extra choice single	1	0
Stock, dwarf, German Ten-week, 24 do.	1	0	Primula fimbriata, 6 vars., mixed	2	6
Large-flowered do., 18 do.	1	0	Zinnia, fl.-pl., including the new varieties, Lilacea and Pure white	1	0
Balsam, extra choice double	1	0			
Cineraria, choicest strains &	2	6			

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J. SCOTT, The Seed Stores, Yeovil, Somerset.

To the Trade.

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Prices on application.
FRANCIS AND ARTHUR DICKSON AND SONS, The "Old Established" Seed Warehouse, 106, Eastgate Street, and The "Upton" Nurseries, Chester.

To the Trade.

MONA'S PRIDE KIDNEY POTATO: about Two Tons of this excellent variety of Ashleaf Kidney to Dispose of. The above are a fine bold Sample, have been well kept, and have not sprouted, but are now just beginning to move. Also a few Sacks of WRINKLED MARROW PEA, Prince of Wales, very true; about One Bushel of INVINCIBLE SWEET PEA; and about 40 lb. of LONDON WHITE COS LETTUCE, a very select variety.
Application for the above to be made to
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Choice Seed Potatos.

HOOPER AND CO. have still choice Stocks of the undermentioned:—
EARLY ROSE.—1s. 6d. per lb.; 7 lb., 9s.
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CATALOGUES ready. Liberal terms to the Trade.
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HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

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POTATO, BERKSHIRE KIDNEY.—This Potato is raised from seedlings of the Fluke, upon which it is a great improvement: it is a fortnight earlier, and a remarkable cropper, has a clear, tender skin, and has hitherto been free entirely from disease.
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CORN MANURE, for Spring Use
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Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c. E. PURSER, Secretary.
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(Signed) "AUGUSTUS VOELCKER.
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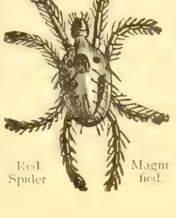
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DUTY FREE TOBACCO
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Sold by Nurserymen, Seedsmen, and Florists,
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Plans and Estimates on application.
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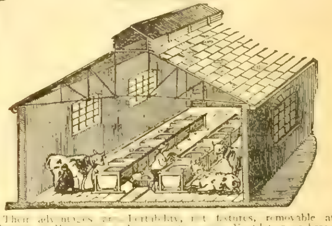

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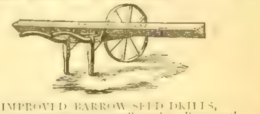

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Extra cup plate for altering quantity of seed	0	2	0
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TWO-ROW CUP DRILL	5	15	0
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ONE-ROW BRUSH DRILL	1	5	0

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THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for Flatting ever manufactured, as it is cool in working, takes at least five hours in going down, has comparatively little smell, can be washed, and will cover all sunk parts.
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	Each.
6 ft. by 4 ft. Lights, 2 in. thick, unglazed	£0 5 0
" " Painted and Glazed with 10 oz. Sheet	0 11 0
" " with Stout portable Box, not Painted	1 3 0
" " Painted four coats, and Handles on	1 8 0
" " Packed and Delivered in Railway van	1 10 0
6 ft by 8 ft, Double Lights, do.	2 15 0
GREENHOUSES	Per ft. super.
Woodwork only Prepared and Fitt	0 0 6
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Greenhouses and Conservatories.

H. FREEMAN AND SONS, Horticultural Works, 106, Mare Street, Hackney, E. Establish'd 20 years. Good substantially made GREENHOUSES, glazed, ready for hxing, 42 feet long, 13 feet wide, £50; 21 feet by 13 feet, £78; 12½ feet by 10 feet, £15; handsome CONSERVATORY on hand, 35 feet by 18 feet, £110. Nurserymen's LIGHTS, £25 per 1000 feet.

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CONSERVATORIES, GREENHOUSES, VINERIES, FORCING HOUSES, PITS, and every description of Horticultural Building, manufactured in Wood or Iron by Steam-power Machinery, and erected in any part of the United Kingdom. Manufacturers of Hot water Apparatus for Heating Churches, Mansions, Warehouses, &c. Plans and estimates on application.

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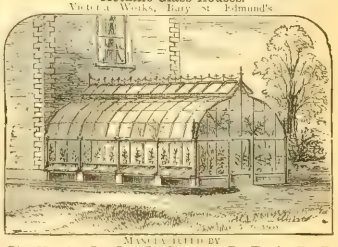

MANUFACTURED BY

CHARLES BEARD,

Late Partner in the late Firm of Sanders, Trewer & Co., which Firm was dissolved by mutual consent.

The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866.

The First-class Certificate at the Grand Manchester Horticultural Show, 1867.

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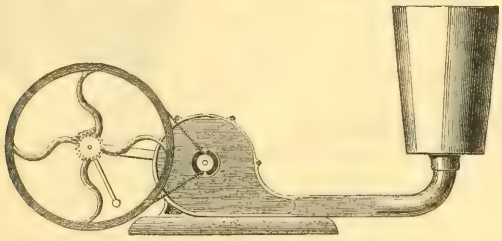

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Can supply this excellent FUMIGATOR, of which a full description is given at p. 215 of the *Gardeners' Chronicle* of February 19, 1870.

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Can also be ordered through the leading Nurserymen and Seedsmen.

HOTHOUSES FOR THE MILLION.

AWARDED A PRIZE MEDAL, 1862.

INVENTED and PATENTED by the late SIR JOSEPH PAXTON.

MANUFACTORIES:—LONDON; COVENTRY; GLOUCESTER; NEAR ULVERSTONE; PAISLEY, and ABERDEEN, only.

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COMBINE SIMPLICITY, CHEAPNESS, AND DURABILITY.

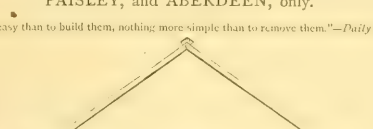

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A HANDBOOK of VINE and FRUIT TREE CULTIVATION, with 28 Illustrations of Glass Houses, &c., Hints for Heating, carefully selected Lists of Fruits and Vegetables for Orchard-house Culture (by S. Hereman, of Chatsworth), Post Free, 13d. Third Edition.

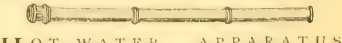

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at wholesale prices; Elbows, T Pieces, Syphons, and every other connection kept in stock. WROUGHT and CAST-IRON CONICAL SADDLE and IMPROVED PEILLS, also Plunge Boilers, from 25s. each.

Pull's Conical *Tubular Boiler*

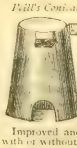

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Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.

INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water-tight.

Goods, of the very best manufacture, delivered at Railway or Wharf in London.

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Will forward Cost on application.

IRON GREENHOUSES CHEAPER THAN WOOD.

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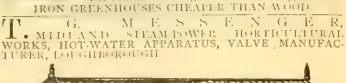

Honourable Mention awarded at the International Exhibition, 1862, and at the Bulbs Exhibition, 1865; also a First class Certificate by the Royal Horticultural Society.

T. G. Messenger, Patentee of many important improvements in Boilers, and Implements connected with Horticulture, and which meet with unqualified appreciation, is prepared to give reference to hundreds of works executed by him and pre-eminently answering the purpose for which they were constructed.

Any House Glazed, single or double, with or without putty. The mode adopted by T. G. Messenger for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented.

HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof and sides as though the glass were entirely removed, at once planting the plants in the external atmosphere.

T. G. Messenger's Patent Boiler, as shown in the above Engraving, of the Tubular and saddle combined, has hollow fire-bars, requires but a shallow stoke hole, exposes as much surface to the fire as does any of the low sets generally so admired; the ashes of which are easily cleaned; and it is a simple fact, that coals burnt on it will do a certain work made upon the unpatented principle and on bars cracked.

HOUSES can be constructed on his Patent Ventilating principle, simple, easy to work, and adjustable to the pitch which is set to the roof.

Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended. A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 13 stamps.

PORTABLE AND FIXED HOT-WATER APPARATUS,

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

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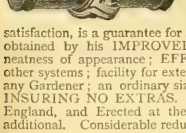

T. S. TRUSS

Begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the ROYAL HORTICULTURAL SOCIETY at SOUTH KENSINGTON and CHISWICK, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantages obtained by his IMPROVED SYSTEM cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; EFFECTS a SAVING of 25 PER CENT. on cost of Apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; can be erected by any Gardener; an ordinary size Apparatus erected in one day; and PERFECTNESS of DESIGN SUPPLIED, INSURING NO EXTRAS. Complete Apparatus, of the best materials, delivered to any Railway Station in England, and Erected at the following prices. Erection beyond 25 miles of London, railway fare for one man additional. Considerable reduction on large works.

Two Four-inch Pipes along One Side and One End of House.

Size of House.	Apparatus Complete.	Erection.	Size of House.	Apparatus Complete.	Erection.
20 feet by 10 feet	£9 0 0	£2 0 0	50 feet by 15 feet	£17 10 0	£3 0 0
30 feet by 12 feet	11 15 0	2 10 0	75 feet by 15 feet	20 0 0	3 0 0
40 feet by 15 feet	15 0 0	2 15 0	100 feet by 15 feet	26 0 0	3 5 0

Bath and Gas Work Erected in Town or Country. The Trade Supplied.

Price Lists, Plans, and Estimates forwarded on application to

T. S. TRUSS, C.E., Consulting Horticultural Engineer, &c., Sole Manufacturer, Iron Merchant, Hot-Water Apparatus Manufacturer, and Horticultural Builder,

FRIAR STREET, BLACKFRIARS ROAD, LONDON, S.E.

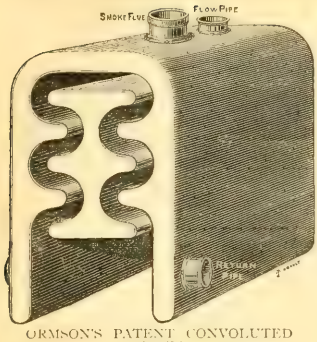

ORMSON'S PATENT CONVOLUTED BOILER.

ROYAL GARDENS, KEW.

The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by

HENRY ORMSON

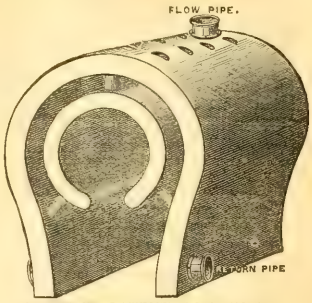

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

as a specimen of his first-class and substantial style of building Horticultural Structures. Also his Patent Wrought-iron Boilers, by which the new Hothouses, and many other Buildings are heated on a very extensive scale in the above great establishment.

Confidence in Cast-iron Boilers is now, to a very great extent, lost in consequence of their continual cracking and failing, and are being replaced by **ORMSON'S PATENT WELDED WROUGHT-IRON BOILERS**, which are not only free from all danger of cracking, but have proved themselves far more economical in consumption of fuel.

HOTHOUSES MANUFACTURED BY STEAM MACHINERY. BEST MATERIALS AND LOWEST PRICES.

Plans, Specifications, and Estimates for Erecting Conservatories, Hothouses, and Hot-water Apparatus of every description in all parts of the country and abroad.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,

AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.

STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

GREEN'S

PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

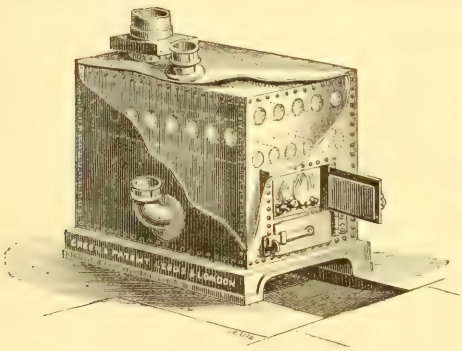
OBLONG BOILER.

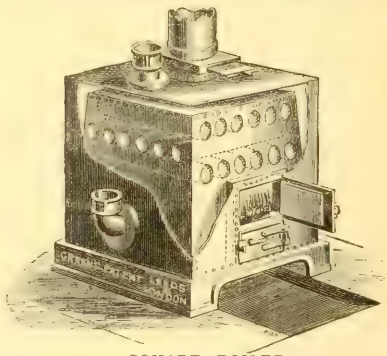
SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate, which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

GREEN'S PATENT BOILER

WITH INVERTED CYLINDER ENGINE COMBINED.

Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
" Water, 1 Cubic foot " " "

UPWARDS OF FIVE HUNDRED OF THESE ENGINES AND BOILERS ARE NOW AT WORK, GIVING ENTIRE SATISFACTION.

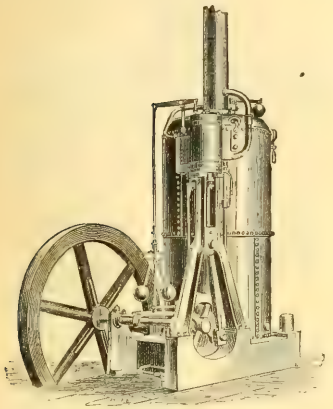

Horse Power Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.		
1 "	3¼ in.	8 in.	"	4 ft. 0 in.	1 ft. 8 in.	.. ..	£35*
2 "	4	10	"	5 " 0	2 " 1	.. ..	£50*
3 "	4¾	10	"	5 " 0	2 " 1	.. ..	£60*
4 "	5½	12	"	7 " 0	2 " 4	.. ..	£85
6 "	6½	14	"	8 " 0	2 " 6	.. ..	£120
8 "	8	16	"	9 " 0	3 " 0	.. ..	£160
10 "	9½	16	"	10 " 0	3 " 4	.. ..	£185
12 "	10	18	"	11 " 0	3 " 8	.. ..	£200
14 "	11	18	"	11 " 6	3 " 10	.. ..	£220
16 "	12	20	"	12 " 0	4 " 0	.. ..	£250
18 "	12½	20	"	12 " 6	4 " 2	.. ..	£285
20 "	13½	22	"	13 " 0	4 " 4	.. ..	£310
25 "	14½	28	"	14 " 0	4 " 8	.. ..	£380
30 "	15½	28	"	15 " 0	5 " 0	.. ..	£450
35 "	16⅝	28	"	16 " 0	5 " 4	.. ..	£520
40 "	18	28	"	17 " 0	5 " 8	.. ..	£585

* The 1 Horse Power, if fitted with Water-Tank Sole Plate and Governors complete, £5 extra. The 2 and 3-Horse Power, if fitted with Governors, £5 extra.

The Fly-wheel Shaft is made sufficiently long to admit a drum being fixed on if required, which can be supplied along with the Engine any diameter ordered, at an extra cost according to size.

The above Engines and Boilers occupy a very small space, and will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

The Boilers are fitted up with Strong Welded Tubes, intersecting the fire-box (varying in number according to the size of the boiler), and a mud hole is placed opposite each tube for the purpose of cleaning them out. They are tested up to 200 lb. pressure to the square inch.

The Foundation Plate answers the purpose of Feed Water Tank, in which the water is heated before passing into the boiler, and also of an ash pit, and no brickwork or foundation is required.

The Fire-box is so constructed that Coal, Coke, or Wood can be used as Fuel.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1203:

"*Vertical Engines* continue to merit growing patronage. They have their advantages over the horizontal engines, not only in construction as to the working and extra and unequal tear and wear of the piston and cylinder, but in their adaptation to light work—as grinding, chaff-cutting, and root-pulping. The small area of space they occupy is also greatly in their favour. Of late years very great progress has been made in the cattle feeding department of farm practice, hence the growing demand for engines of this class; but this is not all that must be reported, for they are evidently also entering into competition with their rivals in the threshing barn. They have long been in extensive use by builders for hoisting and pumping, being made locomotive by means of rails; and constructed on this plan they are proving equally effective and advantageous in the brick-field, quarry, wood-yard, large dairies for churning, laundries, for driving washing machines, and the like. Add to this the growing use of a heavier class of engines for steam culture, which necessitates as it were the employment of small vertical ones at the homestead, it is easy accounting for the growing popularity of the latter at all our implement exhibitions. In construction there is a close similarity on the whole, but in details of mechanism they are diversified. Something of course depends upon the special purposes for which they have been made, and whether they are to be used outdoors or indoors, and whether they are to burn coal or coke, and so on.

GREEN'S PATENT SILENS MESSORS,

OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

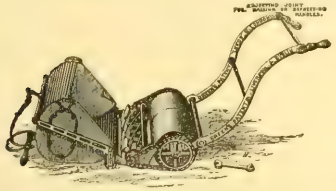

Every Machine is warranted to give entire satisfaction, and if not approved of, can be returned at once unconditionally.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lincene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features:—1st. Simplicity of construction, every part being free of access. 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

N.B. All Orders are executed on the day they are received.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

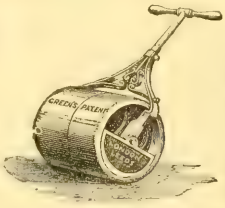

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches ..	..	..	..	..	..	£4	0	0
20 "	22 "	..	..	..	..	..	..	3	2	6
16 "	17 "	..	..	..	..	..	..	2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c MAW AND CO., Jackfield Works, Broseley

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—True or Floral Labels, punched parchment, 4 inches long, 4s. per 1,000, or 9,000 for 35s.; cash with order. Sample Label sent on receipt of 2 postage stamps. Orders of the value of 1 free to London by JOHN HASLAM AND CO., Label Works, Boston, Lincolnshire

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.

The above could be had, on all sizes, when needed of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen Prices on application.

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SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine

S & C regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted by the Sellers and Makers

S & C'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield Established upwards of 125 years

COLEMAN AND MORTON'S HAND WATER-CART and GARDEN ENGINE

For use in Gentlemen's Gardens and Grounds The delivery valve can be worked at the same time as watering pot. It holds 18 gallons

The Spreader for Watering Lawns, &c., can be fitted at pleasure. Price with spreader £5 5 0

Force Pump for Watering Trees, &c. £2 0 extra

COLEMAN and MORTON, London Road Iron Works, Chelmsford

Preserve your Wall-fruit Trees from Spring Frosts.

EVERYONE MAY FIX HIS OWN WALL-COVER.

BEARD'S PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Victoria Works by C. BEARD, Horticultural Engineer, Bury St Edmunds, Suffolk.

These Screens are recommended at present in Lean-to Greenhouses—Full particulars of cost and application may be obtained at the Works, in London, and where also an Illustrated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable systems of manufacture in both parent glazing and ventilation.

THE REGISTERED HUMANE LAMB HURDLE.—The *Times*, in noticing the meeting of the Bermondsey and Southwark Cattle Show, says:—"Amongst other useful novelties is a Lamb Hurdle, manufactured by Mr. LE BUTT, Implement Maker, Bury St. Edmunds, which is so arranged and fitted with rollers, that it is not possible for the Lambs when passing in and out of the fold to obtain fattening foods to injure themselves, or pull the wool off; and the open ing can be instantly increased

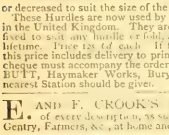

or decreased to suit the size of the Lambs."

These Hurdles are now used by most of the principal Sheep Breeders in the United Kingdom. They are adapted for two Lambs, are easily fixed to suit any height, and, being made of Iron, will last a lifetime. Price 12s 6d each If four or more are ordered at a time, this price includes delivery to principal Stations. Post Office order or cheque must accompany the order, and made payable to JOSEPH LE BUTT, Haymaker Works, Bury St. Edmunds. The name of the nearest Station should be given.

E. AND F. CROOK'S POULTRY APPLIANCES of every description, as supplied to Her Majesty, the Nobility, Gentry, Farmers, &c., at home and abroad

Best quality Machine made WIRE NETTING, Galvanised after making, in rolls of 50 yards long, 1 every width, strength, and mesh

Land and Premises Inspected, and Estimates submitted for the Erection of Aviaries, Yards, &c., to any extent Full Illustrated Lists upon receipt of Stamped and directed envelop

5, Carnaby Street, Regent Street, London, W.

"Every Cottage should be provided with a Water Tank." *Dezradi.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (Ida Wharf), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices and at very short notice.

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.

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N.B. Open Tanks of different sizes packed one in another to save carriage

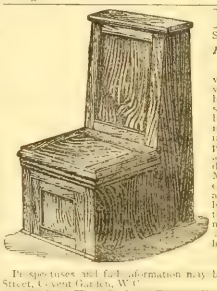

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From Mr W GILBERT, *Liverpool Street, Rugby.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying in a few loads of earth in the Summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure on Rose Trees, a couple of potfuls of water, and I believe never to have seen finer blooms than this Summer I ever had in my life. They have been admired by every one who has seen them

"W. GILBERT

"January, 1870."

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UNIVERSAL PORTABLE PLANT PRESERVER.

After looking at the Illustration it is unnecessary to give a long description. This new and neat Structure is made so that it can be used without Putty and constructed of Wood and Iron. Watering to be done externally. The Ventilation is perfect, and the Lights are arranged to open on either side. It can be moved in lengths

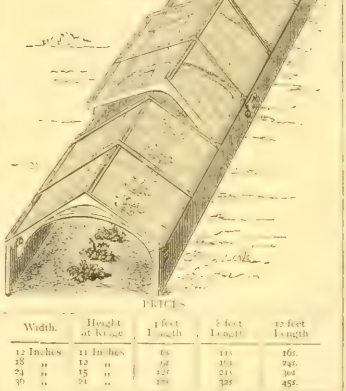

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Width.	Height at Ridge	3 feet Length	6 feet Length	12 feet Length
12 Inches	11 Inches	6s	11s	16s.
18 ,,	12 ,,	9s	15s	24s.
24 ,,	15 ,,	12s	21s	30s
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Doors ends extra, 6d., 1s., and 1s 6d each

Larger sizes can be had to order. For Potting Lots, 4, 5, and 6 feet wide.

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SHEEP, 6s 6d.; CATTLE, 7s 6d.; OX, 5s 11d.

List by post. GATES and FENCING of every description.

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Vases and Fountains, for the Garden and Conservatory.

ANDREW HANDYSIDE AND CO., Britannia Foundry, Derby. 32, Wallbrook, London.

The Britannia Iron Works have for the last 40 years been well known for the production of fine Iron Castings. The use of Cast-iron permits a delicacy of outline, and smoothness of surface, impossible to be had in Stone or Terra-cotta. Cast-iron Vases, if occasionally painted, are imperishable, and will not crack when exposed to wet or frosty weather

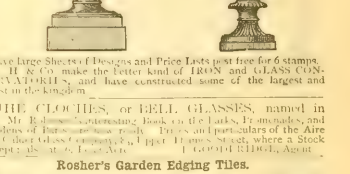

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THE CLOCHES, or BELL GLASSES, named in Mr Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris are now ready. Prices and particulars of the Aire and Calder Glass Company's, 1 Post Office Street, where a Stock is kept, also at Leeds Aire.

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Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The thinner sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as no "grown" Edgings, consequently much cheaper

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

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ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded free on application

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To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—

15s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 14s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.

FLINTS and BRICK RUBBS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates

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N.B. Orders promptly executed by Railway or Vessel.

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PENDANTS, GARDEN SEATS, EDGING TILES,

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For Samples and Prices apply to
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BROWN'S FLORAL SHADING, a protection from Frost and Sun. Samples and prices on application to
CHARLES BROWN, Greenhews, Manchester

No. 1, Peel Street, Manchester, 1870.

OUR HORTICULTURAL SHADINGS form a thorough Protection from Winds, Frost, and Hail, whilst at the same time they admit Light and Rain. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the kingdom, as well as on the Continent; in fact, are pronounced the only "Safe for shadings" ever offered to the public against Birds, Wasps, Blight, &c. As a covering for Strawberries, Tulips, Hyacinths, Seed-Beds, Greenhouses, &c., they have no rival. The price being very reasonable, brings them within the reach of every one. With ordinary care they will last for many years. Samples post free on application. DANIEL COLLINGE AND SON.

No. 1—54 inches wide .. .. at 8½d. per yard run
No. 2—54 inches wide .. .. at 7d. per yard run.
No. 3—54 inches wide .. .. at 5½d. per yard run.
No. 4—54 inches wide .. .. at 4d. per yard run
No. 5—54 inches wide .. .. at 3½d. per yard run.

In pieces of about 30 yards each, or any longer lengths when specially ordered Nett cash in 30 days from date of Invoice.

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom

ORCHARD-HOUSE SIZES.

in. in	Per 100 feet	4ths	3rds.	2nds	Best.
20 by 12					
20 by 14					
20 by 14		15 0	17s 6d	18s 6d	16s 6d 18s 6d
20 by 15		21 0	17s	19s	21s. 23s
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet

From	To	4ths	3rds	2nds	Best
6 in. by 4 in. ..	9 in. by 7 in. ..	11s 6d	12s. 6d	13s 6d	15s 6d
9 in. by 7 in. ..	13 in. by 10 in. ..	11s 6d	13s 6d	15s 6d	17s 6d
14 in. by 10 in. ..	20 in. by 12 in. ..	12s 6d	14s 6d	16s 6d	17s 6d
20 in. by 12 in. ..	22 in. by 14 in. ..	12s 6d	14s 6d	16s 6d	18s 6d

Lists on application.

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz.	
4ths quality, per 200 feet case, 24s		4ths quality, per 200 feet case, 34s.	
3ds "	"	42s	3ds " " 42s.
2ds "	"	60s.	2ds " " 60s
Best "	"	75s.	Best " " 75s.

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 29 oz., 32 oz., 36 oz., and 42 oz

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 3-8th in. substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Sparkling Glasses, &c., &c.

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STUCCO PAINT, 21s per cwt This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paints. Any colour, tint, shade, or tone be made any required shade. It is mixed with rain or pure river water

WHITE ZINC PAINT, 36s per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight of White Lead and six gallons of Linseed Oil. Special Dryers for this Paint.

IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, as Iron Bridges, Coal Trucks, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 3s. 6d. per gallon.

	Per cwt.—s. d.		Per gallon.—s. d
GENUINE WHITE LEAD	39 0	LINSEED OIL	2 9
SECONDS WHITE LEAD	28 0	BOILED OIL	3 2
GROUND PATENT DRYING OIL	39 0	TURPENTINE	2 9
" OXFORD OCHRE, 3d. to 4d. per lb.		LINSEED OIL PUTTY, 8s. per cwt	
" RAW UMBER, 4½d to 6d. per lb.		Finest VARNISH, 10s to 12	0
" BURNT do., 6d to 9d		" CARRIAGE do., 12s to 14	0
GREEN PAINT, all shades, ...	28s. 32s. 36s 0	" PALER do. 10s. to 12	0
		" COPAL	16 0
		KNOTTING	10 0
BLACK PAINT	24s to 36 0	Patent GOLD SIZE	10 0
RED PAINT	28 to 36 0	" BLACK JAPAN	12 0
GLAZING TACKS, 12s. 6d., 15s., 18s., 21s. each.		BRUNSWICK BLACK	12 0
GROUND BRUSHES		MILLED LEAD and PIPES.	
DUSTERS. SASH TOOLS.		OLD LEAD Bought or taken in	
DISTEMPER BRUSHES.		Exchange.	

The above are Nett, for Cash, and as such cannot be booked.
Lists of any of the above on application.

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—
GLASS for ORCHARD HOUSES.
As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each Box contains 100 feet. The prices only apply to the sizes stated

Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15.	16 oz. to the foot.	21 oz.
Fourth quality	15s 0d.	19s 6d.
Third quality	16s 0d	22s 6d.
Seconds	18s 6d	26s. 0d.
English	21s 0d	27s 0d

The above prices include the boxes, which are not returnable.

HORTICULTURAL GLASS.
Stock sizes, 16 oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated.

				4ths	3rds	2nd
11 by 9	12 by 9	13 by 9	14 by 9	s. d.	s. d.	s. d
12 by 10	13 by 10	14 by 10	15 by 10	13 6	15 6	17 0
13 by 11	14 by 11	..	..			
14 by 12	15 by 12	16 by 11	..			
18 by 13	16 by 12	17 by 12	..			
16 by 13	17 by 13	20 by 12	..	15 0	16 0	18 6
16 by 14	20 by 13	18 by 13	..			
	17 by 14	18 by 14	..	16 to 17 0		to be fixed
	20 by 14	..	..			

SMALL SHEET SQUARES (in 100 feet Boxes)

6 by 4	6½ by 4½	7 by 5	7½ by 5½	.. 12s. 6d.
8 by 6	8½ by 6½	9 by 7	9½ by 7½	
		10 by 8	10½ by 8½	.. 13s. 6d.

Boxes 2s. each, returnable at full price.

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
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Elastic Netting and Tiffany, for Protecting Fruit Trees and SHADING GREENHOUSES

J. SHAW AND CO. beg to inform inquirers that their ELASTIC NETTING and TIFFANY may be procured from any respectable Seedsman in Manchester, March 2.

WIRE NETTING (Galvanised after made) for GAME and POULTRY. CROGGAN AND CO., Albion Wharf, 19, Upper Thames Street, London, E.C.
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TANNED GARDEN NETTING, for Seed Beds and for the Protection of Fruit Trees from Frost, Blight, and Birds, or use as a Fence for Fowls, &c.; 2, 4, and 6 yards wide, at one penny per square yard; 100 yards, 7s. 6d.; 500 yards, 35s.; 1000 yards, 65s. Remittances to accompany all orders.
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NETTING for FRUIT TREES, SEED BEDS, RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3d. per yard, or 100 yards, 20s.; 4 yards wide, 6d. per yard, or 50 yards, 20s. NEW YARNISH NETTING, used for any of the above purposes, or as a Fence for Fowls, 2 yards wide, 6d. per yard; 4 yards wide, 1s. per yard; ¾-inch mesh, 4 yards wide, 1s. 6d. per yard. Can be had in any quantity
EATON AND DELLER, 56 and 7, Crooked Lane, London Bridge, E.C.

Preserve your Trees from Frost.
TANNED NETTING for FRUIT TREES.
COTTON NETTING and BUNTING, FRIGI DOMO, SCRIMS for GREENHOUSE BLINDS, &c.
Samples and Price List free on application to
BENJAMIN EDGINGTON, TENT and RICK CLOTH MAKER to the Queen and Prince of Wales, 2, Duke Street, Southwark, S.E. A large stock of NEW and REPAIRED NETTING, and other material for the Protection of Fruit Trees, Strawberry Beds, &c. MARQUEES and TENTS of all dimensions on Sale or Hire.
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E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Lodge, His Grace the Duke of Northumberland, Duke of Devonshire, Lord Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Donio" Netting.
White Bean, made of prepared Cotton and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS, "FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
"FRIGI DOMO" CANVAS.

Two yards wide	1s 9d per yard run.
Four yards wide	3s 6d per yard
An improved make, 2 yards wide ..	1s 6d per yard
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Hessian Canvas, 54 and 72 inches wide, 6¼d. and 8¼d. per yard; 44 canvas Tilts.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom

RALPH WALLER AND CO., 45, Dale Street, Manchester, Manufacturers of all kinds of GARDEN NETTING, &c. Many serious injury done every spring to fruit crops by rost has proved to every Gardener the absolute necessity of providing some protection to the trees early in the year If the blossom, in its earliest development, be but slightly weakened by frost, the vitality of the fruit germ is destroyed, and no fruit will be formed. To calculate, on the average of a century, there is not more than one year in to when the protection is unnecessary Many fabrics have been tried for this purpose of which none possess so much merit as Netting, as they may now say, without fear of contradiction, that we have succeeded in manufacturing the only fabric which is altogether unobjectionable for this purpose. The Netting admits the genial influence of the sun's rays to the young germ, and does not impede the action of light and due circulation of air. Some other fabrics do this, and thus weaken the vitality of the tree altogether. Almost every large grower in the three kingdoms can testify to these facts

The Nettings also make a beautiful shading for Hothouses in summer, and are cheaper than other fabrics on account of their great durability

Netting quoted:—Nos. 1, 2, 3, in pieces of 10 yards long, 12½ yard wide Tilting in pieces 20 yards long, 54 in. wide

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The Company find all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term
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The whole outlay and expenses are liquidated by a rent-charge upon the land, repayable by instalments and interest, over 25 years.
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TOTAL FUNDS on December 31, 1869 ..	£2,515,629
LIFE DEPARTMENT.	
POLICIES in force for	£4,865,823
(exclusive of Bonus Addition.s)	
INCOME—PREMIUMS	£161,381
INTEREST	58,324
	£219,705
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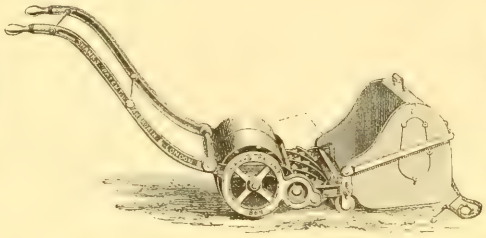

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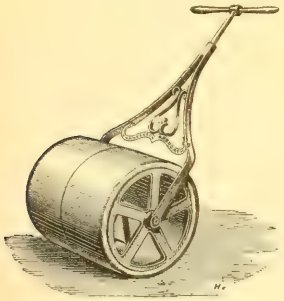

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CARTER'S VEGETABLE SEEDS. See page 340. 237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 342. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 342.—237 and 238, High Holborn, London, W.C.

CARTER'S NEW ONIONS. See page 340. 237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES. 237 and 238, High Holborn, London, W.C.

To Growers.
WANTED, in the Trade, MANGEL and TURNIP SEEDS.—Address, first to A. D., Mr. John Blomfield, 276, Southampton Street, Camberwell, London, S.

SUTTONS' FARMERS' YEAR BOOK for 1870 is now ready, gratis and post free.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

SUTTONS' GRASS SEEDS for ALL SOILS. For present prices see p. 355 of this week's Paper

WANTED, HORSE RADISH.—State quantity and price per cwt. to
DICKSONS AND CO., 1, Waterloo Place, Edinburgh.

GRAYSON'S GIANT ASPARAGUS, very fine 2-yr. roots, 2s. 6d per 100, 21s per 1000.
STEPHEN BROWN, Nurseryman, Westcombe-park, Blackheath.

JOHNSTONE'S ST. MARTIN'S RHUBARB (new).—Strong roots 2s 6d each. Usual discount to the Trade. For description, testimonials, and List of Agents, see previous advertisements
W. P. LAIRD AND SINCLAIR, Nurserymen, Dundee, N.B.

TWENTY TONS of MYATT'S PROLIFIC in large or small quantities, wholesale and retail.
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough

SEED POTATOS (SELECTED). PRICED LIST on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

BOVINIA, or New Cattle-Feeder Potato.—For price, &c., apply to the specially appointed agents.
JAMES DICKSON AND SONS, Eastgate Street, Chester.

SEED POTATOS.—Wheeler's Milky White, 12s. per cwt.; Suttons' Berkshire Kidney, 18s. per cwt.
HENRY MINCHIN, The Nurseries, Hook Norton, Oxon.

American Early Rose Potatos (True).
SUTTON AND SONS have received an importation of the above. Lowest price per bushel may be had on application.
SUTTON AND SONS, Seed and Potato Merchants, Reading.

CHRISTMAS QUINCEY, SEEDSMAN, &c., Market Place, Peterborough, offers to the Trade or others, DALMAHOY POTATOS, Early SHAWS, the SULTAN KIDNEY (new), REGENTS, and PORTYFOLDS. Prices on application.

To the Trade.
WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and BADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

Market Gardens, Biggleswade, Beds.
RICHARD WALKER can supply, for cash, SEAKALE for planting out, 3s. 6d. per 100; ASPARAGUS PLANTS, strong, for planting out, 2s. per 100, or 15s. per 1000; MIXED CLACED PINKS, 4s per 100; WHITE SPANISH ONION SEED, at 2s. per lb. All new and genuine.

KNAPHILL NURSERY,
WOKING, SURREY.

ANTHONY WATERER

Subjects th[illegible] CONIFERS [illegible] all of which [illegible] and [illegible]

ARBUTUS [illegible]

ARTEMISIA [illegible]

AUCUBAS [illegible]

BERBERIS [illegible]

CEDRUS DEODARA [illegible] each.
CEDRUS LIBANI [illegible]
CUPRESSUS LAWSONIANA, [illegible]
" " ARGENTEA, [illegible]
" " GRACILIS, [illegible]

JUNIPER, CHINESE [illegible]

PICEA NOBILIS [illegible]

PICEA NORDMANNIANA, [illegible]

PICEA PINSAPO [illegible]

PICEA WEBBIANA, [illegible]

PINUS [illegible]

PINUS LAMBERTIANA [illegible]

PINUS PINEA [illegible]

PINUS PONDEROSA [illegible]

PINUS TUBERCULATA [illegible]

PRUNUS LAUROCERASUS [illegible]

RETINOSPORA [illegible]

THUIA ALBO-VARIEGATA [illegible]

THUIA GIGANTEA, [illegible]

THUIA LOBBII, [illegible]

THUIA LOBBII-LOBBIANA [illegible]

WELLINGTONIA GIGANTEA, [illegible]

YEW, COLLIN[illegible]

YEWS, [illegible]

HOLLY [illegible]

HOLLY, SILVER [illegible]
WALTERS'S HOLLY [illegible]

PERRY'S WEEPING HOLLY [illegible]
HOLLY, COMMON WEEPING [illegible]

HOLLYHOCKS [illegible]

HOLLYHOCKS, [illegible]

HOLLYS, [illegible]

LAURELLIA [illegible]
HODGINS, [illegible]
YELLOW FERRIDI, [illegible]

STANDARD, WALTERS'S [illegible]

RHODODENDRONS [illegible]

RHODODENDRON PONTICUM, [illegible]

STANDARD RHODODENDRONS [illegible]

RHODODENDRONS, [illegible]

AZALEAS, [illegible]

AZALEAS [illegible]

KALMIAS [illegible]

ANDROMEDAS [illegible]

ERICAS [illegible]

SKIMMIA [illegible]

Nurseries [illegible] Waterloo to Woking [illegible]

Station [illegible]

Now Ready, Free by Post,

GEO. JACKMAN & SON'S
DESCRIPTIVE PRICED CATALOGUE

(With Five Engravings of Clematis)

OF ROSES and ROSE TREES, CLEMATISES, AMERICAN PLANTS, CONIFERS, EVERGREEN and DECIDUOUS TREES, SHRUBS, and FOREST TREES, &c.

[illegible] is now likely to attain [illegible] Hardy Flowers, [illegible]

WOKING NURSERY, SURREY.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS,

Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

CUPRESSUS LAWSONIANA GRACILIS,

Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen.

A few fine Specimens, 10s. 6d. to 21s. each.

These two distinct and very handsome hardy Evergreens were exhibited at the Royal Horticultural Gardens, London, on the 16th inst., and unanimously awarded First-class Certificates. They have been purchased by nearly every one who has seen them growing in the Nursery, and are fearlessly recommended to all admirers of first-class hardy plants.

ANTHONY WATERER, KNAPHILL NURSERY, WOKING, SURREY.

GENUINE SEEDS.

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

SELECT DESCRIPTIVE LIST OF SEEDS

Is now ready, and will be forwarded Free by Post on application.

Many of the most valued and choice Seeds [illegible] saved specially for him, and can be recommended with the fullest confidence.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

VIOLA CORNUTA, VAR. PERFECTION.

B. S. WILLIAMS

Has much pleasure in now offering this superb new BEDDING PLANT to the Public, and from the manner in which it has been tested, both in dry and exposed positions, as well as moist and shady places, he has no hesitation in asserting its superiority over any and every VIOLA previously offered, and also is fully persuaded that it will be for many years a Standard Bedding Plant. It is of free growth, yet seldom exceeding six or eight inches in height; the [illegible] are much larger than those of V. cornuta, which is one of its parents, while the flowers, still bearing the [illegible] heads of that species, are borne well above the foliage but three times the size and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc round it, from which proceed radiating lines of the deepest purple. Indeed, it may be said to be like a gigantic V. cornuta in habit, retaining its qualities as a profuse bloomer, and bearing large flowers which almost rival our Florist Pansies for size and substance.

This plant was awarded a First-class Certificate by the Floral Committee when exhibited before them (Sept. 25, 1869), by Mr. Jolliffe, of Rotherhead Park, as a seedling, which no similar Viola has received. And no plants but those which come from this stock are true in character.

The names of all Nurserymen purchasing this plant will be duly advertised, to enable the Public to secure the genuine article. Orders are being booked, and will be executed, in strict rotation, the first week in May.

Price.—Single Plants, 2s. 6d.	**50 Plants, 70s.**
Per Dozen, 24s.	**100 Plants, 100s.**

Stock. Price upon application.

B. S. WILLIAMS, VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

VIOLA CORNUTA, BLUE PERFECTION.

GEORGE SMITH

BEGS TO SAY THAT HE HAS

AN IMMENSE STOCK OF THIS SUPERB BEDDING PLANT,

Which is equally suitable either for the Spring or Summer Garden, as it produces an abundance and continuity of blossom from the end of March to the end of October.

It has been thoroughly proved for both purposes, at Wilton House Gardens, for the last three years, where it has been seen and admired by thousands of visitors. It thrives equally well either in shady or exposed situations, and withstands the drought of the driest summer.

Its habit is dwarf yet free, and its foliage is a dark rich green: the flower, which is as large as an ordinary Pansy, is in colour a clear blue, inclining to mauve, and of great substance.

G. S. having grown it for several years, has obtained a very large stock, and is thereby enabled to offer it at a moderate price.

G. S. will be prepared to send out Plants early in April, at the following prices.

All Orders will be executed in the strictest regularity, and a guarantee given that every plant is the same as those exhibited at South Kensington from his Nursery.

Price—Per Plant, 2s.	**Per 100, £4.**
Per Dozen, 18s.	**Per 1000, £25.**

GEORGE SMITH, WILTON ROAD NURSERY, SALISBURY.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. [illegible]
Foot's Cray Nursery, Sidcup Hill, Kent.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1; 25 Pairs ditto, 10s. 6d.; 25 Pairs POMPONS, 10s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
Brunswick Nursery, Stoke Newington, N.

CHRYSANTHEMUMS, CHRYSANTHEMUMS.—25 good named varieties, including Japanese, large-flowered and Pompons, for 5s.; 50 sorts for [illegible]; 25 new varieties [illegible] cuttings of same [illegible], cuttings of 20 older sorts 2s. 6d. No varieties will be sent which purchasers possess. The above in thumb pots package free, or shaken out post free.
Twenty-five varieties of Bicolor, Double and Zonal, and Nosegay PELARGONIUMS, in thumb pots, package free, or out of pots post free, for 5s. 6d. Terms cash.
WM. CLIBRAN AND SON, Oldfield Nursery, near Warrington.

CALCEOLARIAS, Herbaceous, of fine strain, nice plants, out of pans, 2s. 6d. per dozen; good plants, out of single pots, 3s. per dozen, free by post. Special quotations per 100.
GLOXINIAS, good named varieties, 12 for 8s., 24 for 16s.; free by post.
ACHIMENES, in 20 choice varieties, 3 tubers of each for 10s.; 10 varieties, 3 of each, 5s.; free by post.
DAHLIAS, young pot roots of Show, Fancy and Bedding—package free, 50 varieties for 15s., 25 for 7s. 6d., and 12 for [illegible]. If more than one of a sort is taken, they will be supplied one-third less.
H. AND R. STEIGAKER, Scotton Nurseries, Lancaster.

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct sorts, for 50s.; 50 plants, for 30s.; or 25 plants, distinct sorts, for 20s., hamper and package included.
Crown Nursery, Reading.

BEDDING GERANIUMS, Double and Single, well established plants in single pots:—Waltham Nosegay, [illegible] 2s. 3d. per dozen; Madame Vaucher, 1s. 8d.; [illegible] Thumb, true variety, 1s. 6d.; [illegible], 1s. 6d. per dozen. Finest Show, Fancy, and bedding DAHLIAS, sound pot roots 2s. 6d. per dozen, [illegible] two dozen, 4s. 6d. 50 Named CHRYSANTHEMUMS, in pots, [illegible]
H. CATER, 10, Abersham Road, Dalston.

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2s. 6d.; Lucy Cullum, 6s.; Sunset, 3s.; Sophia Dumaresque, 3s. 6d.; Italia Unita, 3s.; Pictunia, 3s. 6d.; Gold and Bronze Zonals, Beauty of Calderdale, 3s. 6d.; F. G. Henderson, 6s.; Duke of Edinburgh, 9s.; Her Majesty, 6s.; Luna, 2s. 6d.; Neutmes, 2s. 6d. Baskets and Packing, 1s. for a single dozen, and 6d. for every subsequent dozen. Remittances requested from unknown correspondents.
ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire.

Cheap, Cheap, Cheap.

TRICOLOR and other PELARGONIUMS, in good plants, at the following prices, for cash:—Mrs. Pollock, 3s. per dozen; White Lady, 6s.; Lady Cullum, 6s.; Italia Unita, 3s.; Sir Eyre Beauty, 6s.; Crystal Palace Gem, 3s.; Luna, 3s.; Beauty of Oulton, 3s.; Perilla, 3s.; Lord Derby, 3s.; Leonidas, 3s.
HERBACEOUS CALCEOLARIAS, from seed pans, first-rate strain, good plants, 1s. 6d. per dozen.
Hamper and package included.
JOHN BARRETT, St. John's Nursery, Bury St. Edmund's.

Special Notice.

THOMAS PERKINS, 45, Drapery, Northampton, holding large quantities of the following articles, offers them at very low prices. All are strong, healthy, and well established:—

GERANIUMS, Double	Per doz.—s.	d.	ZONALS	Per doz.—s.	d.
Madame Lemoine	6	0	Clipper	4	0
Emile	12	0	Tom Thumb	2	0
Gloire de Nancy	3	0	Lord Derby	6	0
Triomphe	6	0	Stella	2	0
Triomphe de Lorraine	8	0	Bijou	3	0
Triomphe de Thumesnil	4	0	With many others.		
Madame Rose Charmeux	3	0	CALCEOLARIAS, Herbaceous, Parson's, Dobson's, and Thompson's strains	2	6
Victor, &c.	12	0	Aurea floribunda	2	0

Also in stock many other varieties of Soft-wooded Plants, at low prices.

CHOICE TRICOLOR GERANIUMS.—The following Twelve splendid Varieties are offered, in strong autumn-struck Plants, for 20s., terms cash:—Edward Milner, Florence, Humming Bird, Lucy Grieve, Countess of Craven, Grandis, [illegible], Mrs. J. Clutton, Mrs. Dix, Sophia Cusack, Meteor, and Impératrice Eugénie.
PRICED LIST of TRICOLOR, BICOLOR, NEW ZONAL, and DOUBLE GERANIUMS sent free on application.
Fine Stock Plants of the following, in 6-inch pots. These have many Cuttings on them, and would make fine specimens. Prices, from 30s. to 42s. per dozen, viz.: Lady Cullum, Sophia Cusack, Meteor, Queen Victoria (Perkins), Florence, Mrs. Dix, Sophia Dumaresque, Edwina Fitzpatrick, Grandis, Lucy Grieve, Impératrice Eugénie, Louisa Smith, Defiance, Countess of Craven, &c.
J. ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants.

New Tricolor, Gold and Bronze, and other Pelargoniums.

KIRK ALLEN has the following new and choice varieties to offer, at the undermentioned low prices, for cash only:—TRICOLORS—Mrs. Dunnett, 21s.; Sir Robert Napier, 12s.; Mabel Morris, 2s.; Beauty of Dunmow, 3s. 6d. each. GOLD and BRONZE—Cleopatra, 3s.; Prima Donna, 3s.; St. John's Wood Star, 3s. 6d.; Goldfinder, 5s.; Arab, 5s.; Black Knight, 5s. 6d.; Crown Prince, 5s.; Red Ring, 4s.; Harrison Weir, 7s. 6d. each. NEW WHITE-EDGED—May Queen, 3s. NEW IVY-LEAVED—Willsii Rosea, 3s. 6d. each, or the 18 varieties, one of each, for £4 4s., package included. Also the following, at per dozen:—Mrs. Pollock, 2s. 6d.; Crystal Palace Gem, 3s.; Beauty of Oulton, 2s. 6d.; Beauty of Calderdale, 3s.; Her Majesty, 4s.; Sophia Dumaresque, 3s.; Glowworm, 2s. 6d.; Lady Constance Grosvenor, 3s.; Rose Stella, 3s. 6d.; Dr. Lindley, 4s.; William Underwood, 6s. Remittances requested from unknown correspondents.
The Nurseries, Brampton, Huntingdon.

HENRY CANNELL'S AMATEURS' and NURSERYMEN'S ILLUSTRATED FLORAL GUIDE, giving [illegible] particulars of all the newest and best Zonal, Bicolor, Tricolor, [illegible] Pelargoniums, Fuchsias, Verbenas, Petunias, Chrysanthemums, Dahlias, Calceolarias, [illegible] and all the most popular bedding Plants, &c., [illegible]

GOLDEN FEATHER in the hand of those that [illegible] See H. CANNELL'S DESCRIPTIVE CATALOGUE, with full particulars, and 150 New SEEDS, sent free for [illegible] stamps.

Echeveria.

H. CANNELL has perhaps the finest and largest blooming lot of Plants of METALLICA in the kingdom, [illegible] SECUNDA, SECUNDA GLAUCA, and [illegible]
H. CANNELL, F.R.H.S., New Road, Swanley, and [illegible]

RHODODENDRONS.

			Per doz.	Per 100
PONTICUM, [illegible]			[illegible]	[illegible]
"	"	"	[illegible]	[illegible]
"	"	"	[illegible]	[illegible]
"	"	"	[illegible]	40s.
HYBRIDUM	"	"	[illegible]	[illegible]
"	"	"	[illegible]	[illegible]
"	"	"	[illegible]	[illegible]
MAXIMUM, [illegible]		"	[illegible]	[illegible]
"		"	[illegible]	[illegible]
HIRSUTUM, [illegible]			[illegible]	[illegible]

[illegible]
JAMES SMITH, Darley Dale Nurseries, Matlock.

New and Genuine Seeds (Carriage Paid).

B. S. WILLIAMS, NURSERYMAN and SEED MERCHANT, Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, [illegible] 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	s.	d.
Per packet		
[illegible] Winter White Protecting BROCCOLI	1	0
[illegible]	1	0
Williams' Matchless RED CELERY	1	0
Williams' Matchless WHITE CELERY, new	1	6
[illegible]	1	6
[illegible] LETTUCE	0	6
[illegible] MELON	2	6
[illegible]		
Williams' [illegible] MELON, [illegible], excellent flavour, and 12 days earlier than any other known kind, new	2	6
[illegible] TOMATO, new (The earliest and best variety in cultivation.)	2	6

NEW and CHOICE FLOWER SEEDS.

	s.	d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed ... 2s. 6d., 3s. 6d., and	5	0
CALCEOLARIA, [illegible] strain, 2s. 6d., 3s. 6d., and	5	0
CINERARIA, [illegible] strain, 2s. 6d., 3s. 6d., &c.	5	0
BALSAM, Williams' [illegible] ... 1s. 6d. and	2	6
CYCLAMEN, Williams' Prize strain ... 1s. 6d., 2s. 6d., and	3	6
VERBENA, [illegible]	1	0
Williams' Improved Hybrid SOLANUMS ... 2s. 6d. and	3	6
CENTAUREA CANDIDISSIMA ... 1s. and	2	6
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	1	0
Parsons' New Tree Mignonette	1	0
PERILLA NANKINENSIS VARIEGATA, new	1	0
Williams' Improved French MARIGOLD, beautifully striped, and very large	1	0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours	2	6
VIOLA CORNUTA ALBA, new ... 1s. 6d. and	2	6
ZINNIA ELEGANS PUMILA flore-pleno, new	1	0

B. S. W.'s DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, post free on application.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed selections from their general stock, every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 to 8 to 12 feet.
CUPRESSUS LAWSONIANA, 3 to 4 to 6 to 10 feet.
" LAWSONIANA ARGENTEA (JOHN WATERER'S var.).—By far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each.
" MACROCARPA, 4 to 6 feet, 12s. per dozen.
THUJA AUREA.—Beautiful plants, about 2 feet, 12s. per dozen; larger, 5s. to 21s. each.
" GIGANTEA.—An unequalled stock of hundreds of seedlings, 4 to 6 to 8 feet, 3s. 6d. to 5s., 7s. 6d., and upwards.
We would remark, that unless plants are on their own roots of this tree [illegible] they are quite worthless.
THUJOPSIS BOREALIS, 3 to 4 feet, [illegible] per dozen; extra fine, 5 to 6 and 8 feet, 5s. to 10s. 6d. each.
" DOLABRATA.—Fine plants, 5s. to 7s. 6d. each.
" " VARIEGATA, 5s. to [illegible] 6d. each.
WELLINGTONIA GIGANTEA.—Good plants, 30s. per dozen; [illegible]; larger, up to 10 feet, 7s. 6d. to 63s. each.
ABIES NOBILIS, handsome plants, from [illegible], 7s. 6d., and upwards.
" NORDMANNIANA, 2 to 3 feet, 7s. 6d. to 10s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 10 feet, 31s. 6d. and upwards each.
" LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each.
" GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to [illegible] each.
" PINSAPO, 2 to 3 feet, 5s.; 3 to 5 to 8 feet, 7s. 6d. to 63s.
" DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 10 feet, 3s. 6d. to 7s. 6d. and upwards.
" MAGNIFICA, 3 to 4 feet, 31s. 6d. to 42s.
" ORIENTALIS, 3 to 5 to 8 feet, very beautiful examples, 21s. and upwards each.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; larger up to 12 feet.
YEWS, COMMON.—Immense quantities, 2 to 3 to 4 to 6 feet, from 18s. to 60s. per dozen.
" IRISH.—Perfect columns, up to 12 feet.
" GOLDEN, as Standards on Irish stems, perfect globes, 31s. 6d. to 42s. each.
HOLLIES, GREEN COMMON.—Many thousands, of all sizes, from 1 foot up to 10 feet.
" the best GOLDEN, WATERERS', and SILVER varieties, in any quantity, and of all sizes.
STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each.
" " WATERERS' variety, many hundreds of symmetrically grown specimens, perfectly straight stems, [illegible] to 105s. per pair.
" WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each.
" PORTUGAL LAURELS.—Very close grown handsome plants, 10s. 6d. to 21s. each, very large imposing specimens, 42s. to 63s. each.

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, for undercover or shrubberies, strong established plants, £10 10s. per 1000; larger, 25s. to 63s. per 100.
" CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 50s. to 75s. per 100.
" better class (SEEDLINGS) and named varieties for extensive planting, £5 per 100.
" of superior kinds, many on own roots, £7 10s. to £10 per 100.
" very superior, leading, crimson, rose, white, £12 10s. to £15 per 100.
" STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each.
AZALEAS, common kinds, 50s. to 75s. per 100.
" very best, in fine plants, £10 per 100.
KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen.
" LATIFOLIA, 18s. to 30s. per dozen.
ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen.

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYREA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

NEW AND UNADULTERATED SEEDS.

PRIZE MEDALS, 1851 AND 1862.

BUTLER, McCULLOCH, & CO.'S

COMPLETE COLLECTIONS FOR ONE YEAR'S SUPPLY.

No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
£3 3s.	£2 2s.	£1 10s.	£1 1s.	10s. 6d.

The above Collections contain only useful varieties, the quantities of which may be varied to suit the requirements of Customers.

PRICED DESCRIPTIVE CATALOGUES, containing details of Collections; also carefully selected LISTS of choice FLOWER SEEDS and NOVELTIES in FLOWERS and VEGETABLES sent Post Free on application.

Orders amounting to 21s. sent Carriage paid. All packets of Flower Seeds sent Post paid. No Charge for packages.

SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.

Established upwards of a Century.

To the Trade and Others.

A QUANTITY of fine BULBS of GLADIOLUS BRENCHLEYENSIS and GLADIOLUS GANDAVENSIS to be sold cheap. Price upon application to
THOS. SHERMAN, Seedsman, &c., 59, Newington Butts, London, S.E.

ALTERNANTHERA PARONYCHIOIDES. —Fine stock plants, full of cuttings, 9*s.* per dozen; smaller ditto sent free, 1*s.* 6*d.* per dozen.
H. CANNELL, Jun., Exmouth, New Florist Flower and Florist Flower Seed Merchant, Woolwich

H. CANNELL has more of the above than he requires for his regular business, and will send Twelve of last year's English and Continental varieties, established plants, and package included, for 10*s.* 6*d.*
New Florist Flower and Florist Flower Seed Merchant, Woolwich

IRESINE LINDENI.—This is undoubtedly the finest dark crimson leaved plant ever introduced, and is really the finest bedding and decorative plant of the year.
Received a First-class Certificate at Kensington Established plants, 2*s.* per dozen; smaller sent free for 2*s.*
IRESINE ACUMINATA, 1*s.* per dozen, smaller sent free for 1*s.*
H. CANNELL & SONS, New Florist Flower and Florist Flower Seed Merchant, Woolwich

GENOTHERA MARGINATA.—"A magnificent hardy species, admirably adapted for rock ery," border, or pot culture. Figured in "Botanical Magazine," for March. A well rooted plant, per post, for 13 stamps, offered by the introducer,
ROBERT M. STARK, Trinity, Edinburgh. March 9.

Beta chilensis.

BUTLER, MCCULLOCH, AND CO. are enabled to offer SEED of the true variety of this magnificent foliage plant; it is quite distinct from Beta brasiliensis, and is fully described in their SPRING CATALOGUE, sent post free: 1*s.* and 2*s.* 6*d.* per packet.
South Row, Covent Garden Market, W.C.
Established upwards of a Century.

SPIRÆA PALMATA.—By far the handsomest species hitherto imported. (See Dr. Hooker, "Botanical Magazine," No. 285.) Price 10*s.* 6*d.* each; in quantity, a special price will be given.
The honour of importation is due to Mr. Fortune; the honour of distribution (in England) to CHARLES NOBLE, of whom fine plants can be obtained.—Bagshot, Jan. 20.

Juniperus hibernica.

H. LANE AND SON, having a splendid lot of beautiful-shaped trees (unsurpassed for symmetry), 4 to 5 feet high, transplanted spring 1869, beg to offer them to the Trade at £7 10*s.* per 100
The Nurseries, Great Berkhamsted, Herts.

Araucaria imbricata.

H. LANE AND SON, having a very large stock, beg to offer them at the following greatly reduced prices, viz.: 5 to 6 feet, 7 to 8 feet, 48*s.*; 4 to 5 feet, 60*s.*; 3 to 4 feet, 40*s.*; 2 to 3 feet, 30*s.*; 1½ to 2 feet, 18*s.*; 12 to 14 feet, 10*s.* An inspection is earnestly solicited
The Nurseries, Great Berkhamsted, Herts.

Good Spruce Fir for Coverts and Plantations.

FIFTY THOUSAND, nicely transplanted, 2 to 3 feet, and 3 to 4 feet, certain to grow, and will be sold cheap For particulars, apply to
W. J. & SON AND CO., Nurseries, Bedale, Yorkshire.

WALNUTS, WALNUTS. Five Hundred of the above to be disposed of; straight, well-grown Trees, from 8 feet to 10 feet high. Price, &c., address
H. ASHFORD, Aldervale Nursery, Muckingford, Romford, Essex

Verbenas, Verbenas.

PHILIP LADDS is now sending out 30 new varieties of VERBENAS of 1869 at 3*s.* per dozen, in pots; 24 varieties of FUCHSIAS of 1869 at 3*s.* per dozen, in pots; 24 varieties of BRONZE GERANIUMS, 6*s.*; 12 new varieties of GERANIUMS, 1869, 6*s.*; 12 GERANIUMS (CRYSTAL PALACE TYPE), 6*s.*; 12 GERANIUMS, 1868, 6*s.*; GERANIUM VESUVIUS, best bedding scarlet, 20*s.* per 100.—Nursery: Bexley Heath, Kent.

CHARLES TURNER begs to call attention to his extensive COLLECTIONS of CARNATIONS and PICOTEES, 21*s.* per dozen pairs; PINKS, 12*s.* per dozen; Tree CARNATIONS, 12*s.* to 24*s.* per dozen plants; and CLOVES, 6*s.* to 12*s.* per dozen plants; THE BRIDE, pure white, extra fine, 2*s.* each A DESCRIPTIVE LIST on application
The Royal Nurseries, Slough.

To Seed Importers, Nurserymen, &c.

BETHAM AND SON, Custom House, Shipping and General Transit Agents, beg to inform them that they receive and forward SEEDS, PLANTS and GENERAL MERCHANDISE, from and to all parts of the world, at charges as low as possible.
Office, 9, Lower Thames Street, London, E.C.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and beautiful VICTORIA CUBEA CRIMSON, to be sent out the first week in May, at 10*s.* 6*d.* each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

RICHARD SMITH'S SEED CATALOGUE for 1870, a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Relative Qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success
RICHARD SMITH, Seed Merchant, Worcester

The most Beautiful Aster Grown is

TRUFFAUT'S REINE MARGUERITE, containing Fleur Perfection, Bombée, and Pivoine varieties; 500 Seeds in 16 fine double colours, mixed, for 12. A choice selection of Foreign STOCKS, PHLOX, BALSAMS, ZINNIAS, &c., at equally moderate prices. CATALOGUES on application.
ALFRED HAMMOND, Importer of Foreign Flower Seeds, Bedwin Street, Salisbury.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 1000, 7*l.*; per 1000, £4
100 Gladioli, by name, 10 sorts .. .. .. 8*s.*
100 ,, ,, 20 sorts .. .. .. 15*s.*
100 ,, ,, 50 sorts .. .. .. 10*s.* to 30*s.*
All in good flowering bulbs
LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris

RIBES ATROSANGUINEA, dark flowering Currant. Fine plants, 2½ to 3½ feet, 3*s.* per dozen; 14*s.* per 100; double flowering, 2½ to 3½ feet, 3*s.* per dozen; 15*s.* per 100
BROOM, White Portugal, 2 to 3 feet, 3*s.* per dozen; 12*s.* per 100; 3 to 4 feet, 3*s.* per dozen; 18*s.* per 100.
BROOM, Common Yellow, 2 to 3 feet, 3*s.* per dozen; 12*s.* per 100.
Special Terms for Large Quantities.
JAMES SMITH, Darley Dale Nurseries, Matlock

New Indian Azalea Bijou de Ledeberg (J. Versch.).

JEAN VERSCHAFFELT is now enabled to offer the above beautiful and distinct variety, which, through its charming and novel appearance, and its fine velvet variegated leaves, makes an attractive contrast in a collection. Flowers beautiful rose, fine round model like form, and good substance. Beautiful plants covered with buds may now be had at 10*s.* each; strong young plants, 5*s.* each, free of carriage to any part of the kingdom. The usual discount to the Trade, and one plant over where four are ordered. Apply at once to
JEAN VERSCHAFFELT, Nurseryman, Ghent, Belgium
J. V. C. CATALOGUES for all times have had free of his Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

Early Feed for Sheep and Cattle.

SUTTONS' IMPROVED ITALIAN RYE-GRASS, the Earliest and most Productive in Cultivation. Should be sown in March to produce a succession of valuable Cuttings during the year. If sown alone, 3 bushels are required per acre
Price 2*s.* per bushel, cheaper by the quarter. Carriage free
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

"The advantages of Procuring Seeds direct from the Growers cannot be Over-estimated."

CARTER'S

GENUINE SEEDS for the GARDEN.

CARTER'S COLLECTIONS OF

CHOICE VEGETABLE SEEDS,

READY FOR IMMEDIATE DELIVERY.

No. 1. COLLECTION for COTTAGE GARDENS, 12*s.* 6*d.*
No. 2. COLLECTION for SMALL GARDENS, 21*s.*
No. 3. COLLECTION for LARGER GARDENS, 42*s.*
No. 4. COLLECTION for GARDENS of 1 Acre, 63*s.*

These Collections will produce a plentiful supply of choice Vegetables all the year round.

No Charge for Packing.

J. C. & Co. have made extensive arrangements that all orders shall be executed immediately.

TESTIMONIAL *from* GEO. TAYLOR, Esq., *Heath House, Leighton Buzzard.*—"The Collection of Kitchen Garden Seeds I had of you last spring turned out remarkably well."
TESTIMONIAL *from* W. JEYNES, Esq., *Sudbury.*—"I cannot speak too highly of your seeds."

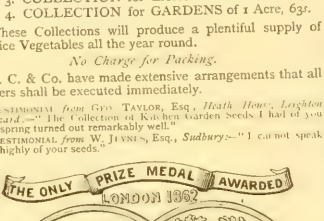

CARTER'S COLLECTIONS OF

CHOICE FLOWER SEEDS,

READY FOR IMMEDIATE DELIVERY.

"A" COLLECTION, Price 10*s.* 6*d.* (post free 11*s.*)
"B" COLLECTION, Price 15*s.* (post free 15*s.* 6*d.*)
"C" COLLECTION, Price 21*s.* (post free 21*s.* 6*d.*)
"D" COLLECTION, Price 42*s.* (post free 42*s.* 6*d.*)

These Collections will ensure a permanent and pretty display in the Flower Garden.

Catalogues Gratis and Post Free.

J. C. & Co. allow, off all accounts paid within fourteen days, a discount of five per cent.

TESTIMONIAL *from* W. BROUGH, Esq., *Cossington.*—"I have a bed of Double Stocks raised from your seed, the admiration of everyone; certainly the finest bed I ever saw."
TESTIMONIAL *from* Mrs. D. HALL, *Nottingham.*—"Mrs. D. Hall has much pleasure in telling Messrs. Carter that the Petunia seed sent by them has produced many beautiful varieties of Petunias."

THE FIFTY DOLLAR POTATO.

JAMES CARTER AND CO. have imported a limited quantity of BRESEE'S KING of the EARLIES POTATO. "Ten guineas were paid for one tuber in America." Much earlier than any other American variety.

Price 6s. per lb.; 7 lb. for 40s.

THE NEW GIANT ROCCA ONION OF NAPLES.

JAMES CARTER AND CO. offer their choice selected stocks of the following:—

NEW GIANT ROCCA ONION of NAPLES, 1*s.* per packet. Post Free.. (See Messrs. CARTER'S Advertisement and Illustration in the *Gardeners' Chronicle* of February 5, 1870, page 170.)
EARLY WHITE NAPLES ONION, large, with beautiful silver skin, 1*s.* per packet, Post Free.
ITALIAN RED TRIPOLI ONION, 1*s.* per packet, Post Free.
NEW GLOBE TRIPOLI ONION, 1*s.* per packet, Post free.

For full descriptions, see Carter's Illustrated

GARDENER'S AND FARMER'S

VADE MECUM FOR 1870.

Post Free, One Shilling; Gratis to Purchasers.

JAMES CARTER AND CO.,
THE ROYAL SEEDSMEN,
237 and 238, HIGH HOLBORN, LONDON, W.C.

Established 1806.

T. HANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application
Seed Warehouse: 24, Cockburn Street, Edinburgh.
Nurseries: Brunstain Glen, Musselburgh.

VEGETABLE and FLOWER SEEDS.—Select and comprehensive LIST of all the best varieties in cultivation, now ready, post free on application.
MITCHELL, ARNOTT, AND CO., Nurserymen and Seed Merchants, Edinburgh; and 59, Mark Lane, London

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, and free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

Spring Planting.—To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Conifers, Shrubby and other hardy Trees, Shrubs, and Evergreens, is just published, and can be had on application
Milford Nurseries, near Godalming

Try a Scotch House for Your Seeds.

W. P. LAIRD AND SINCLAIR, SEEDSMEN, NURSERYMEN, and FLORISTS, Dundee, N.B.
Seeds pure, moderate in price, and true to kind
LISTS free on application.

Dahlia Roots.

CHARLES TURNER can supply the leading varieties in sound pot roots, 6*s.* to 12*s.* per dozen.
PELARGONIUMS.—Extra size and large flowering French and fancy varieties, that will give a fine head of bloom in May and June. 12*s.* to 21*s.* per dozen
The Royal Nurseries, Slough.

Turnip Seed.

BOLTON AND CO.'s fine NEW SEED of all the most approved varieties of FIELD TURNIPS, including their own selected stock of Swede.
Prices, moderate, to be had on application.
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

To the Trade.

L. T. DAVIS offers a large quantity of 2 and 3-yr. SEEDLING THORN QUICKS at very moderate prices, carriage paid to Belfast.
Ogle's Grove Nursery, Hillsborough, Co. Down.

DOUBLE WHIN, GORSE or FURZE, ULEX EUROPÆA FLORE-PLENO.
Excellent plants, all extra, transplanted—package included:—
9 to 15 inches, 2*s.* 3*d.* per dozen, 12*s.* per 100.
12 to 18 inches, 3*s.* per dozen, 15*s.* per 100.
15 to 20 inches, 3*s.* 6*d.* per dozen, 16*s.* per 100.
18 to 24 inches, 5*s.* per dozen, 20*s.* per 100.
The above can be supplied in larger sizes, in pots 9 to 12 inches, 5*s.* per dozen, 22*s.* 6*d.* per 100.—See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

Spring Flowers.

LEWIS S. WOODTHORPE will be happy to forward, free, his CATALOGUE, containing a list of all the most lovely of the early Spring-blooming Plants, Violets, Primroses, Hepaticas, Daisies, Rockets, &c., &c.; also the best new and choice Plants of the Season, with LISTS of Roses, Fruit Trees, Seed List, and a general and well-grown Nursery Stock.
Munro Nursery, Sible Hedingham, Essex.

MESSRS. J. STANDISH AND CO. are now prepared to execute orders for the following New and Choice Plants, to which they wish to call special attention. See larger Advertisement in last week's issue of *Gardeners' Chronicle*.
IXORA DIXIANA.—Plants, 7*s.* 6*d.* to 21*s.* each; with five or six spikes of bloom 5*s.*, 25*s.* each
ANTHURIUM SCHERZERIANUM.—Fine young plants, with two to three crowns, 10*s.* 6*d.* each; with three to four crowns, and stronger, 15*s.* to 63*s.* each
TODEA PELLUCIDA COMPACTA.—2*s.* 6*d.* to 5*s.* each
STRUTHIOPTERIS JAPONICA.—In April next, 10*s.* 6*d.* each.
FICUS MACROPHYLLA.—5*s.* each.
ARUM OR THOMSONIA MUSAICUM.—each; 9*s.* per doz.; 60*s.* per 100
COPROSMA BAUERIANA VARIEGATA.—2*s.* 6*d.* ea.; 24*s.* per doz.
TREE PIONEE ASCOT YELLOW.—A few strong plants, now, 5*s.* each; in April next, 2*s.* 6*d.* ea.
ROYAL ASCOT VINE.—7*s.* 6*d.* to 15*s.* and 21*s.* each
PEACH, EARLY ASCOT.—Fine plants, 7*s.* 6*d.* to 15*s.* each
MARQUIS of DOWNSHIRE.—Fine plants, 7*s.* 6*d.* to 15*s.* ea.
ARIES ODORATA.—10*s.* 6*d.* and 21*s.* each
JUNIPERUS JAPONICUS ALBO VARIEGATA.—2*s.* 6*d.* to 21*s.* ea.
ACER RUFINERVE ALBO LIMBATUM.—2*s.* to 42*s.* each.
,, ,, SUMORHITUM PECTINATUM RUBRUM.—10*s.* 6*d.* to 21*s.* each.
AUCUBA, Males.—1*s.* 6*d.* to 5*s.* each Other varieties See our CATALOGUE.
Royal Nurseries, Ascot, Berks.

New Gladioli, New Fuchsias.

FELTON AND SONS having purchased the whole of the valuable GLADIOLI Seedlings of the late Mr. J. Sladden, the well known exhibitor and successful raiser of the much favourite flower, have a few bulbs to part with of varieties which have obtained a Special Certificate from the Royal Horticultural Society's Floral Committee in August, 1868. The stock is limited and the orders will be executed strict rotation.
FELTON AND SONS have great pleasure in offering also eight varieties of New Double FUCHSIAS, which they feel assured will give satisfaction through their distinctness, size of flower, and general good habit of growth. These will doubtless become standard market and exhibition flowers, and maintain a good position for years.
DESCRIPTIVE LISTS of GLADIOLI and FUCHSIAS, post free on application
Birmingham Nursery, 56, Harborne Road, Birmingham.

New Fuchsias.

GEO. SMITH has much pleasure in offering Three SEEDLING FUCHSIAS, unequalled by any others in cultivation, viz:—

AVALANCHE (G. S.), this acquisition stands pre-eminent, being the finest Fuchsia ever offered, having very double, compact, and beautifully formed flowers; calyx of extra size, with long carmine filaments; tube and sepals brilliant carmine-scarlet. This splendid flower contains in one bloom 25 petals; fine habit and free grower. Plants 10*s.* 6*d.* each

OPINIONS OF THE PRESS
Report from "Gardeners' Magazine," October 2, 1869.
"Avalanche is a large flower, bold in outline, and massive, though elegant; the tube and sepals are of a brilliant carmine scarlet; very double corolla, pure white, with streaks of carmine at the base; in the samples sent the stamens and petals are quite distinct, which is a decided merit, for when intermingled, as they often are produced, as they too often are, in double flowers, symmetry is lost."
PURPLE PRINCE (G. S.), this is a most extraordinary bold and handsome variety; tube and sepals waxy carmine-scarlet, corolla rich violet, flower extra size, fine habit; it surpasses all other double purple varieties. Plants 10*s.* 6*d.* each.

OPINIONS OF THE PRESS
Report from "Gardeners' Magazine," October 2, 1869.
"Purple Prince is bold and handsome, tube and sepals shining carmine-scarlet, corolla very large, expanding boldly, colour a very rich tone of puey purple."
SULTAN (G. S.), tube and sepals waxy scarlet, broad and well reflexed; corolla deep violet; of fine habit, and one of the finest dark Fuchsias in cultivation. Plants 10*s.* 6*d.* each

NOTICE.—The above three Fuchsias, in one handsome coloured Plate, by Mr. J. Macfarlane, 1*s.* 6*d.* each.
G. S. is now booking orders for three extra large and fine NOSEGAY GERANIUMS, viz.:—Claudius, Harry George, and Soleil, which have taken First-class Certificates.
Beautiful Coloured Drawings of Claudius and Soleil, by Mr. James Andrews, in two separate plates, 1*s.* 6*d.* each.
For descriptions of above see CATALOGUE, forwarded on application
Tollington Nursery, Hornsey Road, Islington, London, N.

Rare Tree and other splendid Ferns.

JOHN HEALEY, NURSERYMAN, Croydon, S., has pleasure in being able to offer to his Patrons and the Public, the following collection of FERNS, which have never been sold before at such low prices. All very fine plants, 9 to 12 inches high, 2 to 3 inches long, excepting Leptopteris superba, which are more little Seedlings. The Set, hamper included, for 21s 6d. Should any of them be already possessed, others equally good will be substituted. Cheilanthes princeps, Lygodium superbum, Alsophila australis, A. excelsa, Balantium culcita, or antarctica; Todea arborea, or pellucida.

Just Received, from Algiers, a small quantity of SEEDS of ABIES BABORENSIS, a rare and beautiful Conifer, quite peculiar to a single peak of the Atlas Mountains.—This Seed was collected last autumn, and the trees in its wild home, as yet unknown in England, though well worthy of being carefully cultivated. It grows at an altitude of about 6000 feet. Also some of the ATLAS CEDAR (Cedrus atlantica).

Trees, 50 to 100 inches, 5s per packet; Cedrus atlantica, 2s 6d per packet

HOOPER AND CO., Covent Garden, London, W.C.

PICEA NOBILIS.—Suitable for Avenues or Ornamental Planting.—500 Picea nobilis, from seed, finely furnished Trees, 30 to 36 inches high, with good leading shoots and splendid roots. This Californian Pine is thoroughly hardy, sound in constitution, of rapid growth, not very particular to situation if planted in good loamy soil. It takes the very highest rank as a remarkable, noble, and beautiful Tree. The above to be sold very Cheap. Price on application to Messrs FISHER, HOLMES, AND CO., Handsworth Nursery, Sheffield.

MOUNTAIN ASH, a most Ornamental and Profitable Tree for Underwood. It will grow upon soil too poor for Hazel and most other plants used for a similar purpose. We can supply good plants—1½ to 2 feet, at 16s per 1000; 2 to 3 feet, at 20s per 1000; 2½ to 3½ feet, at 30s per 1000; 3½ to 4½ feet, at 4l. per 100, or 27s 6d per 1000. See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock

TO THE TRADE.—

1 yr SEEDLING HOLLY (very stout)
ARBOR VITÆ, 6 to 9 inches, 1s to 1½ foot.
SCOTCH FIR, 9 to 15 inches
PINUS LARICIO, 9 to 18 inches
PINUS AUSTRIACA, 9 to 18 inches
PINUS STROBUS, 2 to 3 feet. A very fast-growing Pine, and safe mover. Price on application to
J. THORNTON, Heatherside Estate, Bagshot, Surrey.

EVERGREEN HEDGES.

AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s per 100; 5 to 6 feet, at 60s per 100
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100.
RICHARD SMITH, Nurseryman, Worcester.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do SPRUCE, do SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and WYCH; and extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the leading sorts.

SYCAMORES or PLANES, 7 to 9 feet, 35s. per dozen.

LABURNUMS, 6 to 7 feet, 25s. per dozen.
ASH and HORSE CHESTNUT, 7 to 8 feet, 25s. per 100.
OAKS, 2 to 3 feet, 5s. per 1000. BEECH, 1½ foot, 12s. per 1000.
LAURELS, 1 foot, 5s.; 1½ foot, 6s.; 2½ feet, 7s. per 100.
PINUS AUSTRIACA and LARICIO, 1 foot, 5s. per 100.
ROSES, 2 feet and upwards, 9s. per dozen; less than 2 feet, 6s. per doz
FINE CUCUMBER SEED, 7s. per lb.; 6d. per oz.
For cash.
A. WILKIN, Tiptree, Kelvedon, Essex.

FOREST TREES, which we can offer in quantity, well rooted and cheap.—Ash, Sycamore, Birch, Elm (Wych), Oak, Poplar (Black Italian), Chestnut (Horse), Hazel, Maples, Privet, Willows, in sizes of 1½ to 2, 2 to 3, 3 to 4, 4 to 5, 5 to 6, and 6 to 8 feet; Ash Alders, 5 to 6 feet, 6 to 8 feet; Spruce Scotch, Silver and Austrian Firs, from 1 to 1½ foot, 1½ to 2 feet, 2 to 3 feet; Chestnut (Spanish), 1½ to 2½ feet; Thorns, 2 to 3 feet, 3 to 4 feet; Arbutus Trees, strong blooming plants, by the dozen or 100; Laurel (Common), 1½ to 2 feet, 2 to 2½ feet, 2½ to 3 feet; Yew (English), 1 to 1½ foot, 1½ to 2 feet, 2 to 2½ feet, 3 to 5 feet, 5 to 6 feet; very fine and well rooted. GOOSEBERRIES, Warringtons, &c., a few thousands, 3 and 4 yr.; RASPBERRIES, Northumberland Filbasket, nice canes.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

To the Trade.

G. FARNSWORTH has to offer a large quantity of the under-mentioned, which are strong, young, and well-rooted. Samples on application at the Nurseries, Matlock.

BIRCH, 3 to 4½ feet, twice transplanted, 30s per 1000
LARCH, 9 to 15 inches, 12s.
LIMES, 2 to 3 feet, 70s.
SCOTCH, 1½ to 2 feet, 20s; 1½ to 2½ feet, 21s.
SPRUCE, 1 to 1½ feet, 12s.; 1½ to 2½ feet, 20s.
SYCAMORE, 2 to 3 feet, 25s.
QUICK, strong, 18s.
WHIN, 1-yr, double, 40s.
PRIVET, 1-yr, 15s.
RHODODENDRONS, 3-yr Seedling, 7s. 6d.
ASH, MOUNTAIN, 3 to 4 feet, 27s. 6d. per 1000.

JOSEPH SMITH, Jun., Moore Edge Nursery, Hansley, near Matlock, offers at the following prices per 1000, viz.
ASH, 1½ to 2½ feet, 18s.
ASH, MOUNTAIN, 1½ to 2 feet, 16s; 2 to 3 feet, 24s
ALDER, 1½ to 2 feet, 15s; 2 to 3 feet, 24s
ELM, 1½ to 2½ feet, 18s.
FIR, SILVER, 1½ to 2 feet, 40s
" SCOTCH, 9 to 15 inches, 12s; 1 to 1½ feet, 16s; 1½ to 2 ft., 20s.
" SPRUCE, 1 to 1½ feet, 12s; 1½ to 2 feet, 20s; 2 to 2½ feet, 28s.
MAPLE, NORWAY, 4 to 5 feet, 40s.
PINUS MARITIMA, 1 to 1½ foot, 12s; 1½ to 2 feet, 15s.
SYCAMORE, 1½ to 2 feet, 15s; 2 to 3 feet, 22s; 3 to 4 feet, 30s.
GORSE, 1-yr, 16d.; 2-yr, 2s.
BERBERIS AQUIFOLIA, 9 to 12 inches, 20s
BROOM, 2-yr, 9 to 12 inches, 20s; 1 to 2 ft., 15s; 2 to 3 ft., 20s.
COTONEASTER MICROPHYLLA, 1 to 1½ foot, 20s
RHODODENDRONS, PINUS AUSTRIACA, &c., &c.
See CATALOGUE, free on application

LOUIS VAN HOUTTE begs to state that his CATALOGUE, for 1870, is now ready, and can be had from his Agents, Messrs R. SILLEBAUD & SON, 5, Harp Lane, London, E.C. This Catalogue contains the HARDY PERENNIALS, ORNAMENTAL SHRUBS and TREES, GREENHOUSE PLANTS, in all kinds; the favourite GESNERACEOUS PLANTS, in dry roots, viz., ACHIMENES, NÆGELIAS and EUCODONIAS, PLECTOPOMAS, GESNERIAS, TYDÆAS, and GLOXINIAS; also FRUIT TREES in general.

LOUIS VAN HOUTTE'S SEED CATALOGUE for 1870 is now ready, and is sent to his usual Customers.

The GLADIOLUS VAN DAVENSIS are enumerated in LOUIS VAN HOUTTE'S Catalogue, No. 130-131 R. J., but their description can only be found in the French issue of the same Catalogue.

Parts 4, 5, and 6 of Vol. XVII. of the FLORE have appeared; their contents can be found at p. 409 of the Seed Catalogue. Price of subscription for the Volume of 12 Parts, £1 10s. (more than One Hundred highly coloured Plates), Gloxinia Fancy, Gloxinia Lucy, and quite of novel colour; Antigonon Leptopus (double plate), Desmodium penduliflorum, the richest flowering hardy shrub of the day (double plate); Hydrangea stellata prolifera, Hemerocallis disticha flore pleno, Cattleya labiata autumnalis (double plate), Eucodonia (Achimenes) naggelioides nana multiflora (double plate) Gunnera scabra (double plate), Lælia præstans, x Anthoceras sorbifolia, &c.

Ghent Royal Nursery, February 26.

FIFTY THOUSAND COMMON OAK, from 3 to 6 feet, very fine, and well rooted, prices as follows:—

TO THE TRADE.	TO AMATEURS
3 to 4 feet, 20s per 1000	25s per 1000
4 to 5 feet, 25s per 1000	32s per 1000
5 to 6 feet, 32s per 1000	40s per 1000
6 feet, 40s per 1000	50s per 1000

See CATALOGUE.

A. E. BARNAART, Nurseryman, Vogelenzang by Haarlem, Holland: or his Agents, Messrs R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

AMERICAN ARBOR-VITÆ, good Plants, 1½ to 2 feet, 25s per dozen, 12s. per 100.
2 to 2½ feet, 35 per dozen, 15s per 100.
2½ to 3 feet, 45s per dozen, 20s per 100.
3½ to 3½ feet, 4s. per dozen, 20s. per 100.
3 to 4 feet, 4s. 6d. per dozen, 22s. per 100
See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock

Leicester Abbey Nurseries.

THOMAS WARNER begs to remind intending Planters and the Public that, in addition to his extensive General Nursery Stock, he has the following in large quantities, of unsurpassed quality, and offered at most reasonable prices. CATALOGUES, Wholesale or Retail, may be had free on application.

ABIES, Standard Maiden, Moor Park
CHERRIES, Standards, Dwarfs, and Pyramids.
CURRANTS, White Dutch
PEARS, Standard and Pyramids
PLUMS, Standards, chiefly Victoria.
MANETTI ROSE STOCKS
ARBOR VITÆ, Golden Pyramidalis, single specimens, 1½ to 5 feet.
AUCUBA JAPONICA, single specimens, 1 to 2 feet
BOX, Tree (of sorts), 1½ to 3 feet
CHESTNUTS, Scarlet and White
ELM, Ornamental (of sorts), Standards, 4 to 12 feet.
LABURNUM, English, 4 to 8 feet
POPLAR, New Silver, 1½ to 8 feet
OAK, English, Transplanted, extra fine, 3 to 5 feet.
SPRUCE FIR, single specimens, 1½ to 3 feet
ROSES, Dwarf, most of the leading and newer kinds.

Surplus Stock—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well-grown, for Lawns, Pleasure Grounds, and Parks, have been recently transplanted, and are full of health and vigour. For Descriptions, also Prices of other sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through to any Railway Station on the narrow gauge lines, by a moderate cost, thereby saving delay and expense of packing.

At 22s. per dozen.

Abies canadensis (Hemlock Spruce), 4 to 5 feet
" excelsa, 3 to 4 feet
Arbor vitæ, American, 5 to 6 feet
" Siberian, 3½ to 4 feet
Gorse, double, in pots, strong
Hartogia capensis (Cape Laurel), 2½ to 3 feet

At 18s. per dozen.

Abies canadensis, 5 to 6 feet
" excelsa, 4 to 5 feet
Alaternus, broad leaved, 2 to 2½ ft
Arbor vitæ, American, 6 to 7 feet
" Siberian, 4 to 4½ feet
Aucuba japonica, 18 to 21 inches
Box, green tree (particularly very handsome) 2½ to 3 feet
Hartogia capensis, 2 to 2½ feet
Laurel, narrow leaved, 2½ to 3 feet

At 24s. per dozen

Abies elegans, 18 to 24 inches
Arbor vitæ, Siberian, 4½ to 5 feet
Aucuba japonica, 2 to 2½ inches
Cryptomeria Lobbii, 5 to 6 feet
Cupressus Lawsoniana, 4 to 5 feet
Holly, screw leaved, green, 2 to 2½ feet

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet
" elegans, 2 to 2½ feet
Arbor-vitæ compacta, 2½ to 3 feet
Aucuba japonica, very bushy, 2 to 2½ feet
Cryptomeria Lobbii, 6 to 7 feet
" viridis, 6 to 7 feet

At 36s. per dozen.

Abies inverta (Weeping Spruce), 2½ to 3 feet
Arbor vitæ compacta, 3 to 3½ feet
" Siberian, very fine, 4 to 5 feet
Cupressus Lawsoniana, 5 to 6 feet
Juniperus chinensis fermina, 3 to 4 feet
" densata, 3 to 4 feet
" Schottii, 3 to 3½ feet

At 42s. per dozen

Abies inverta, fine specimens, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet
" Siberian (very fine), 6 to 7 feet
Juniperus chinensis, very fine, 4 feet
" fermina, 3½ to 4 feet
" drupacea, 2½ to 30 inches
" Lecana, 4 to 5 feet

At 48s. per dozen.

Abies inverta, 4 to 5 feet
Juniperus chinensis, 4 to 5 feet
" densata, 4 to 5 feet
" glauca, 3 to 4 feet
" Lecana, 5 to 6 feet
" phœnicia, 4 to 5 feet
" Schottii, 4 to 5 feet

At 60s. per dozen

Abies Menziesii, 7 to 8 feet
" monstrosa, 7 to 8 feet
Arbor vitæ compacta, 3½ to 4 feet
Juniperus chinensis, very fine, 5 to 6 feet
" densata, 5 to 6 feet
" glauca, 5 to 6 feet
" phœnicia, 5 to 6 feet
" Schottii, 5 to 6 feet
Abies albertiana, 7 to 8 feet, 10s. 6d. each
" Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each
" orientalis, 4 to 5 feet, 6s.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. 6d. each
Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 63s. to 84s. each
Juniperus densata, 6 to 7 feet, 5s.; 7 to 8 feet, 7s. 6d. each
" thurifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each
Picea grandis, extra fine, 5 to 6 ft., 15s.; 6 to 7 feet, 21s. each
Laurel, narrow leaved, 2 to 2½ feet
" Portugal, 2½ to 3 feet
Picea balsamea, selected, 4 to 5 ft
Quercus ilex (Evergreen Oak), 15 to 18 inches, 12s inches
Rhododendron ponticum, 21 to Holly, screw leaved, green, 1½ to Phillyrea oleafolia, 2 to 2½ ft. [2ft. each

At 18s. per dozen.

Phillyrea oleafolia, 2½ to 3 feet
Picea balsamea, 5 to 6 feet
Pinus austriaca, 1 to 2 feet
Quercus ilex, 3 to 4 feet
Rhododendron ponticum (very bushy), 2 to 2½ feet
" hybridis, fine varieties, 18 to 21 inches
Taxus japonica (Japan Yew), 12 to 15 inches

At 24s. per dozen.

Ivy, green tree, 18 to 24 inches
Laurel, Portugal, pyramids, 3 to 4 feet
Phillyrea oleafolia, very fine, 3 to 4
Rhododendrons, hybrids (fine named sorts), 21 to 24 inches
Taxus japonica, 15 to 18 inches

At 30s. per dozen.

Ivy, green tree, extra fine and bushy, 2 to 2½ feet
Juniperus chinensis, 3 to 3½ feet
" drupacea, 18 to 24 inches
" glauca, 3 to 4 feet
" Lecana, 3 to 4 feet
Pinus austriaca, 4 to 5 feet
Thujopsis borealis, 4 to 5 feet

At 36s. per dozen

Juniperus Smithiana, 3 to 3½ feet
" viridis pendula, 3 to 4 feet
Laurel, Portugal (pyramids, very fine), 4 to 5 feet
Pinus laricio, 6 to 7 feet
Taxus elegantissima (gold leaved), 18 to 24 inches
" Irish, 5 to 6 feet

At 42s. per dozen

Juniperus phœnicia, 3 to 4 feet
" Schottii, 3½ to 4 feet
" thurifera (Incense Juniper), 4 to
" virginiana, 6 to 7 feet [5 feet
Picea Nordmanniana, 18 to 24 ins.
Pinus austriaca, 5 to 6 feet
" laricio, 7 to 8 feet
Thujopsis borealis, 5 to 6 feet

At 48s. per dozen.

Juniperus Smithiana, 3½ to 4 feet
" thurifera, 5 to 6 feet
" virginiana, 5 to 6 feet
" viridis pendula, 4 to 5 feet
Pinus laricio, 8 to 9 feet
Taxus, Irish, 6 to 7 feet
Wellingtonia gigantea, 2½ to 3 feet

At 60s. per dozen

Juniperus virginiana, 8 to 10 feet
" viridis pendula, 5 to 6 feet
Laurel, cochie (very fine), 8 to 10 feet [5 to 6 feet
Laurel, Portugal, pyramids (very fine), Picea Nordmanniana, 2 to 2½ feet
Pinus Cembra, extra fine, 6 to 7 ft
Taxus elegantissima, 2 to 2½ feet
Thujopsis borealis, 6 to 7 feet
Wellingtonia gigantea, 3 to 3½ feet

Picea lasiocarpa, 2½ to 3 feet, 15s.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d.; 5 to 6 feet, 63s. each
" nobilis (best glaucous var.), 18 to 21 inches, 2s. 6d.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
" Nordmanniana, 3 to 5 feet, 15s.; 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each
" Pinsapo, 3 to 3½ ft., 10s. 6d.; 3½ to 4 ft., 15s.; 4 to 4½ ft., 21s.; 5 to 5½ ft., 31s. 6d.; 5½ to 6 ft., 42s. ea.
Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Wellingtonia gigantea, 3½ to 4 feet, 7s. 6d. each
Yews, for hedges, about 12 feet high, 6s. each; 15 feet, 10s. 6d. each; transplanted, 31s. 6d. each

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBERS, and TWINERS, PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester

AZALEA PONTICUM (Sweet Avalea), 10 to 15 inches, 4s per dozen, 20s per 100; 15 to 20 inches, 5s per dozen
AMŒNUM DA POLI OLIVA ANGUSTIFOLIA, nice plants, 3s per dozen, 15s. per 100
KALMIA GLAUCA, 8 to 12 inches, 3s per dozen, 15s per 100; 12 to 15 inches, 4s per dozen, 18s per 100
LEDUM PALUSTRE, 8 to 12 inches, 3s per dozen, 15s per 100
All these can be supplied by the 1000. See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock

Planting Season.

DICKSONS AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for Transplanting. They are growing on very exposed ground, are finely rooted, and their wood is thoroughly ripened. Samples and Catalogues on application. Special prices will be quoted where large quantities are taken.

Cabbage Plants, Cabbage Plants.

W. VIRGO AND SON can supply strong DRUMHEAD CABBAGE PLANTS, 6d per 100; EARLY BATTERSEA, ENFIELD MARKET, NONPAREIL, and EAST HAM, 5s. per 1000. Reference required from unknown correspondents.

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1870—SELECTED VEGETABLE and FLOWER SEEDS, SEED POTATOS, &c (Carriage free)

Fully DESCRIPTIVE PRICED LIST post free on application.

Carefully assorted Collections of VEGETABLE SEEDS, at 5s. 6d., 12s., 21s. 6d., 42s., 63s., and 105s.

Choicest Strains of Continental and other FLOWER SEEDS, from 5s upwards. See List

CATALOGUES of Forest, Fruit, and other Trees and Plants, also post free on application

James Dickson & Sons.

(Old Established Nursery and Seed Business),
"Newton" Nurseries, and 102, Eastgate Street, Chester

Suttons' Home-grown Seeds.

SEEDS DIRECT FROM THE GROWERS, THE BEST MEANS OF PREVENTING DISAPPOINTMENT

SEEDSMEN TO THE QUEEN

SUTTONS' COMPLETE COLLECTIONS for the FLOWER and KITCHEN GARDEN, carriage free.

FOR THE KITCHEN GARDEN.

No 1 COLLECTION, for a large Garden, Carriage Free £1 3 0
No 2 COLLECTION, for a medium sized do, Carriage Free 2 2 0
No 3 COLLECTION, for a medium sized do, Carriage Free 1 1 0
No 4 COLLECTION, for a smaller sized do, Carriage Free 1 1 0
No 5 COLLECTION, for a small do 0 15 0
No 6 COLLECTION, for a very small do 0 12 6

FOR THE FLOWER GARDEN.

No 1 COLLECTION, Free by Post or Rail £2 2 0
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No 3 COLLECTION, Free by Post or Rail 1 1 0
No 4 COLLECTION, Free by Post or Rail 0 15 0
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Particulars of the above Collections may be had on application, and any articles not required can be excluded, and others included according to the wish of the purchaser

Price of THE Seed Garden Seeds, Grass Seeds, and Farm Seeds, post free on application

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

Genuine Seeds of Superior Stock.

SEEDSMEN TO THE QUEEN

FRANCIS & ARTHUR DICKSON & SONS, Limited, "Royal Scotch" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nursery, Chester.

Complete Assortments of Choice VEGETABLE SEEDS, for a Year's Supply.

No 1	£4 4 0	No 4	£1 1 0
No 2	2 2 0	No 5	0 12 6
No 3	1 11 6	No 6	5 5 0

Complete Assortments of Choice Continental and English FLOWER SEEDS.

No 1	£2 2 0	No 4	£0 15 6
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No 3	1 1 0		

Also Small Collections, from 5s to 7s 6d, free by post.

CATALOGUE of New and Select Vegetable and Flower Seeds Potatos, &c, for 1870, with practical Cultural Directions, will be sent Post Free upon application.

These Seeds are all of the most select character, each variety being saved from the best stock known of its kind.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Potatos, &c., excepted.

Flower Seeds free by Post or Rail.

SCOTT'S NEW and GENUINE SEEDS.

Per packet	s. d	Per packet	s. d
Beet, Scott's Crimson Dwarf	1 0	Pumpkin, Mammoth, extra	1 0
Egyptian Turnip, dark red	1 0	pine, Canadian Golden	1 0
Brussels Sprouts, Scott's	1 0	Dean's Giant Green Cos	1 0
Eclipse	1 0	The Favourite Cabbage	1 0
Broccoli, Snowdon White	1 0	Hammond's Dwarf	1 0
Cabbage, Scott's	1 0	Melon, Golden Gem	1 6
Cauliflower, True Selected	1 0	Bailey's Prize Eclipse	1 6
Trifurcate Dwarf	1 6	Onion, Bedfordshire Champion	1 0
Carrot, Scott's Intermediate	1 0	Nuneham Park	0 6
Parsley, Champion Superb	1 0	Green Rocca (largest)	1 0
Curled	1 0		

COLLECTIONS of VEGETABLE SEEDS, from 10s 6d to £5

For all particulars see Descriptive Catalogue, free

Per packet	s. d	Per packet	s. d
Aster, New Quilled, 12 sorts, mixed	1 0	Cockscomb, Grant, crimson dwarf	1 0
French, Paeony flowered Perfection, 18 do.	1 0	Pyrethrum Golden Feather	1 0
Giant, Chrysanthemum flowered, 12 do.	1 0	Lobelia speciosa (true)	1 0
Crown flowered, 6 do	1 0	6d and	1 0
French Giant Emperor, 12 do	1 0	Marigold, French extra choice 6d and	1 0
Newest Victoria, 12 do.	1 0	Nasturtium, new Giant Pyramidalis	1 0
Stock, dwarf, German Tenweek, 24 do.	1 0	Petunia, fl. pl., extra double	1 0
Large flowered do., 18 do	1 0	Extra choice single	1 0
Balsam, extra choice double	1 0	Pansies, extra, very large, new variations, Pumila and Tagetiflora	1 0
Canterbury bells, mixed	2 6	Collections of FLOWER SEEDS, post or carriage free, from 10s 6d to 42s	

See p. 22 of DESCRIPTIVE CATALOGUE.

For full descriptions of the above and other desirable varieties of AGRICULTURAL SEEDS, see GARDEN SEEDS, also of SCOTT'S PRIZED CATALOGUE, free on application

J. SCOTT, The Seed Stores, Yeovil, Somerset.

"Economy.—Seeds direct from the Growers."

THE ROYAL SEEDSMEN

CARTER'S "PRIZE MEDAL" FARM SEEDS

THE ROYAL SEEDSMEN

AT VERY LOW QUOTATIONS, FOR IMMEDIATE PURCHASE.

CARTER'S MAMMOTH PRIZE LONG RED MANGEL.

THE FINEST VARIETY IN CULTIVATION.

EVIDENCE OF QUALITY.

A. HUTLEY, Esq., *Tirling, writes—Oct. 7, 1869.*

"Your Mammoth Long Red Mangel is first-rate, so true that I could not find one that did not match with the rest."

CARTER'S PRIZE MANGEL.

	Per lb.—s. d.
ORDINARY YELLOW GLOBE MANGEL	0 6
CARTER'S WARDEN PRIZE MANGEL, remarkable for firmness of quality	1 0
CARTER'S MAMMOTH PRIZE MANGEL, the finest long red variety (see Illustration)	**1 6**
CARTER'S NEW CHAMPION INTERMEDIATE MANGEL, the best oval-shaped variety	1 0
ELVETHAM LONG YELLOW MANGEL	1 0
IMPROVED RED GLOBE MANGEL	1 0

Lowest price per Cwt. on application.

CARTER'S GRASS SEEDS AT ALDERSHOT CAMP.

We are favoured with the following evidence of the superior quality of our Grass Seeds from COL. LAFFAN, R.E.

"Col. LAFFAN is happy to inform Messrs. Carter & Co. that the 60 acres of Grass grown from the Seed supplied by them last Autumn look extremely well, and promise a good crop of Hay."

N.B. These Seeds were sown under most adverse influences, both of soil and situation.

LOOK TO YOUR GRASS LANDS.

CARTER'S RENOVATING MIXTURE should be now sown on Meadows that have suffered from the past dry summer. The Mixture includes the most desirable Grasses and Clovers for Hay Crop, and succeeding Green Feeding, and will soon restore a first-rate Permanent Pasture. Sow 8 to 12 lb. per acre.

Price 9d. per lb., 80s. per cwt.

CARTER'S GRASS SEEDS

FOR ALTERNATE HUSBANDRY,

Including the greatest Food and Hay producing Grasses and Clovers, in such proportions as the particular rotation may require.

	Per acre.—£ s. d.
For ONE YEAR'S LAY, best quality	13 6
For TWO YEARS' LAY	17 6
For THREE or FOUR YEARS' LAY	22 0

THE FINEST VARIETY IN CULTIVATION.

EVIDENCE OF QUALITY.

From W. GAPPER, Esq., *Duddlestone, Nov. 1, 1869.*

"You will be pleased to hear that I have again won the Cup for Red Mangels, grown from your seed. This is the fifth year in succession that I have taken this prize."

CARTER'S PRIZE SWEDE AND TURNIP.

	Per lb.—s. d.
LIVERPOOL SWEDE	0 7
Other ordinary varieties, *7d.* to	0 10
CARTER'S IMPERIAL HARDY SWEDE, (acknowledged to be the best in cultivation)	0 9
CARTER'S LONDON SWEDE, an immense cropper	0 9
DEVONSHIRE GREY STONE TURNIP, of quick growth and good quality	1 0
POMERANIAN WHITE GLOBE TURNIP (the largest and best White Turnip)	0 9
LINCOLNSHIRE RED GLOBE TURNIP	0 9
IMPERIAL GREEN GLOBE TURNIP	0 8
CARTER'S CHAMPION HYBRID TURNIP, green-top or purple-top, splendid stocks	0 10

Lowest price per Cwt. on application.

CARTER'S GRASS SEEDS AT HILSEA LINES.

J. EDWARDS, Esq., writes as follows:—

"I am pleased to say that the Grass Seeds you supplied for the Hilsea Fortifications, upwards of 2 miles in length, gave me great satisfaction."

N.B. These Seeds were sown under most adverse influences, both of soil and situation.

CARTER'S

"ROYAL MIXTURE"

OF FINE GRASS SEEDS

FOR LAWNS, &c

20s. per bushel; second quality, 18s.

CARTER'S FINE CLOVERS,

Free from weeds and dirt.

	Per lb.—s. d.	s. d.
BROAD LEAVED RED	0 7½ to	0 11
PERENNIAL RED or COW GRASS	0 10½ to	1 1
WHITE DUTCH	0 11 to	1 4
ALSIKE HYBRID	1 0 to	1 4
YELLOW TREFOIL or HOP	0 4½ to	0 7

Lowest price per Cwt. on application.

CARTER'S "PRIZE MEDAL" GRASS SEEDS

FOR PERMANENT PASTURES (CHOICEST QUALITY).

The germinating quality of MESSRS. CARTER'S GRASS and CLOVER SEEDS (after most careful testing) is assured to be first-rate; and, from the great pains taken to adapt the Mixtures of Grasses to suit the particular nature of the soil intended to be laid down, the possibility of failure can scarcely be entertained. It is only necessary when ordering to give a general description of the soil, situation, &c.

For HEAVY SOILS, 28s. to 32s. per acre. | **For LIGHT SOILS, 28s. to 32s. per acre.** **For MEDIUM SOILS, 28s. to 32s. per acre.**

Second quality cheaper. If not less than 10 acres.

For the fullest information on Laying-down Land to Grass, see

CARTER'S ILLUSTRATED FARMER'S CALENDAR FOR 1870.

Post Free, Sixpence. Gratis to Purchasers.

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Delicious New Grape.

MR. WILLIAM BULL has a large stock of good, strong, well-ripened CANES of MADRESFIELD COURT BLACK MUSCAT, at 15s. and 21s. each.

Thousands of LILIUM AURATUM, of all sizes, to offer.

Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

Golden Champion Grape.

OSBORN AND SONS can supply good CANES of the above named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it. Price 10s. 6d., 21s., and 30s. each.

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Pines, Fruit Trees, &c.

B. S. WILLIAMS has a very fine stock of all the best kinds, true to name, and in splendid condition. SHRUBS, FOREST and ORNAMENTAL TREES of every description. Prices on application.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.

Price 21s., 42s., and 63s. each.

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Vines—Vines.

JOSEPH MEREDITH can supply all the best varieties, both for fruiting and planting. DESCRIPTIVE CATALOGUE post free on application; also CIRCULARS of MEREDITH'S Vine, Pine, Peach, and Plant MANURE.

The Vineyard, Garston, Liverpool.

Vines, Five Shillings each.

LEWIS WOODTHORPE having an enormous stock, begs to offer strong Fruiting and Planting CANES of all the leading sorts, at 5s. each.

L. W.'s system of packing saves nearly half the cost of carriage.

Munro Nursery, Sible Hedingham, Essex.

VINES, from Eyes, 2-yr. old, warranted true to name and to fruit this summer, 7s. 6d. each, of the following varieties:—Black Hamburgh, Golden Hamburgh, Barbarossa, Mrs. Pince, Buckland Sweetwater, General De la Marmora, Alicante, Royal Vineyard, Black Frontignan, Foster's Seedling, Burchard's Prince. Planting Canes of the above, very strong, 3s. 6d., sent to any part of the kingdom.

J. PEED, Effra Nursery, Brixton, S.W.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.

Samples, with height and price, on application to

W. VIRGO AND SON, Wonersh Nursery, Guildford.

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s. per dozen.

Dwarf-trained 3 yr. Sweet CHERRIES, ten leading sorts, 15s. per doz.

Strong cut-back extra fine Bushes, 3 yr., 5s. per dozen, 35s. per 100.

Rider Trained CHERRIES, 30s. per dozen.

" PEACHES and NECTARINES, 60s. per dozen.

Half Standard H.P. ROSES, 2 feet, splendid stuff, best sorts, 50s. per 100.

Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.

" Common LAURELS, 6 to 8 feet, £5 per 100.

W. KNIGHT, Floral Nursery, Hailsham, Sussex.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 3 to 5 feet high; also very fine Dwarf-trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 1s. 6d. in stamps. A printed List or Index sent gratis.

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WILLIAM PAUL has to offer, of superior quality, Half-Standard and full Standard trained PEACHES and NECTARINES, 5s. to 7s. 6d. each.

Ditto, bearing trees, of many sorts, at 7s. 6d. to 10s. 6d. each.

STANDARD APPLES, PEARS and PLUMS, very fine, 1s. 6d. to 2s. each.

PYRAMID APPLES on Paradise and Doucin stocks, 18s. per dozen.

These may be planted the same distance apart as Gooseberry trees, bearing fruit like ropes of Onions.

PYRAMID PEARS on Quince and Pear stocks, 1s. 6d. to 3s. 6d. each.

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RED CURRANTS, 21s. per 100; 3s. per dozen.

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TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants.

60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application.

WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Paul's Rose Catalogue.

"A very complete and able catalogue."—*Floral World.*

WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. The stock of Plants is large and excellent.

Paul's Nurseries, Waltham Cross, London, N.

To the Trade.

STANDARD ROSES, good Stems and Heads, £3 10s. per 100; DWARFS, on Manetti, fine, £2 per 100, best kinds only.

W. JACKSON, Blakedown Nursery, near Kidderminster.

Roses suitable for Climbers or Stocks.

ROBERT PARKER begs to state that he can supply, in large or small quantities, extra fine plants of BOURSAULTS, AMADIS, INERMIS, and MANETTI ROSES, at very reasonable prices, or in EXCHANGE for Hardy Shrubs or Trees. Prices forwarded on application.

Exotic Nursery, Tooting, Surrey, S.W.

Dwarf Roses for Bedding.

PAUL AND SON beg to recommend the present favourable season for PLANTING BEDDING ROSES. Magnificent plants of the following, the best in their respective colours, can be supplied at 75s. per 100; if Whites and Yellows be taken separate, 100s. per 100.

CRIMSONS.	PINKS and ROSES.
lfred Colomb	Comtesse de Chabrillant
Général Jacqueminot	John Hopper
Madame Victor Verdier	Jules Margottin.
Maurice Bernardin.	Madame Caillat.
Marie Rady.	Mad me J. Levet
Marie Baumann.	Marguerite de St. Amand.
Sénateur Vaisse	Victor Verdier

WHITES.	YELLOWS.
H. P., Madame Rivers	Noisette, Triomphe de Rennes
Bourbon, Souvenir de la Malmaison	" Maréchal Niel
Noisette, Annie Vibert	Tea, Gloire de Dijon
	" Madame Falcot

The Old Nurseries, Cheshunt, N.

Notice.

PURCHASERS of LARGE QUANTITIES of FARM or GARDEN SEEDS will be supplied liberally by SUTTON AND SONS.

For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

Pinus Fremontiana, Pinus Torreyana.

W. THOMPSON, SEEDSMAN, Tavern Street, Ipswich, begs to inform the Trade that he has just received a small consignment of CONES and SEED of the above rare Californian Conifers, prices of which he will be glad to supply on application.

HARDY HEATHS, in 50 varieties, free of package:—
24 plants, in 12 varieties, two of each for 7s.
48 plants, in 24 varieties, including choicer varieties, for 18s.
100 plants, in 12 varieties, for 25s.
100 plants, in 24 varieties, for 36s.
100 plants, in 50 varieties, for 50s.
Many varieties can be supplied by the 1000. See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, near Matlock.

LEEDS ROYAL PARK.—A GRAND CANARY SHOW will be held on SATURDAY, March 19; MONDAY, March 21; TUESDAY, March 22; WEDNESDAY, March 23; and THURSDAY, March 24. FIFTY POUNDS will be given in PRIZES. The Show will be held in the Large Conservatory.

ENTRIES will CLOSE on TUESDAY, March 15.

Schedules and all particulars can be had on personal application at the Park, or by letter. THOMAS CLAPHAM.

Leeds Royal Park, February, 1870.

TUNBRIDGE WELLS HORTICULTURAL SOCIETY.—The ANNUAL GRAND EXHIBITION of FLOWERS and FRUIT will take place on FRIDAY, July 1.

PRIZES OPEN to ALL ENGLAND.

Prizes for Hand-Bouquets, and for Single Pieces or Groups for Table Decorations.

Also Prizes for best kept Cottage Gardens, and for Cottage Garden Productions.

Schedules may be obtained on application to the Secretary,
Mr. E. F. LOOF, 26, Parade, Tunbridge Wells.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—NOTICE is HEREBY GIVEN, that an addition to the LIST of PENSIONERS will take place in JULY NEXT. All persons desirous of becoming Candidates are required to transmit their Certificates and Testimonials to the Committee on or before the 16th April next, after which day they will not be received.

By order, EDW. R. CUTLER, Sec.

14, Tavistock Row, Covent Garden.—March 9, 1870.

N.B. Printed Forms of Application may be had upon requisition to the Secretary.

The Gardeners' Chronicle

SATURDAY, MARCH 12, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, March 16	Royal Horticultural (Fruit and Floral Committee), at S. Kensington	11 A.M.
	Ditto (Scientific Committee)	1.30 P.M.
	Ditto General Meeting	3 P.M.
THURSDAY, — 17	Linnean	8 P.M.

LIGHT in its influence upon VEGETABLE DEVELOPMENT is a phenomenon of Nature about which we possess too little positive information. We know that without it plants pine and die, and quickly resolve themselves into their original atoms; and we also know that under an excess of light they burn up and perish. Perhaps, judged from Nature's standpoint, the plants of every country and climate enjoy that amount of light which is necessary for their proper development; but it is when the plants of different latitudes, stretching from the frigid to the torrid zones, are brought under the care of the culturist, that his difficulties commence, and he feels almost inclined to exclaim, "Oh, that I knew your native habitat, and its elevation and distance from the sea line: they would afford me some little clue to your cultivation." So far as our country is concerned we get, on the average, sufficient light to bring certain of the fruits of the earth to perfection, so long as they are sown at the proper time, and are cared for afterwards; and sometimes, as in 1868, we get a little more than with our possibly defective systems of cultivation is consonant with the most complete results. To illustrate this let us take a glance at poor and shallow cultivation under such conditions. The plant is unable to extract sufficient nutriment from the earth to fortify it against excessive heat, and hence it perishes; but with a rich deep staple of earth to work in, the roots dive deep into the soil, and luxuriate accordingly. Here we see the chief cause of the failures of our root crops in the year before mentioned. It was not that the season was too hot, but it was just because our cultivation was too shallow, and hence the plants perished for want of pasture.

Light and heat, so far as open-air cultivation is concerned, may be considered in connection one with the other. We cannot have one without the other, and hence Nature works harmoniously. When we come to indoor cultivation we have a command of heat without the corresponding advantage in the case of light, and hence as we use what opportunities we have depends to a great extent the success of our methods of cultivation or plant treatment. All gardeners are agreed that a high night temperature is not conducive to sturdy and healthy growth, whilst most good cultivators confess that even in dull weather in daylight a few degrees less temperature may be indulged in without any perceptible loss in the progress of the plants. In our hot-houses, however, we have to deal with the denizens of various climes, some that are accustomed to long days and bright light, and others that may be natives of climes where night and day are of the same length the whole year through, and where the transition from bright day to dark night is rapid. Again, in their native habitats, some may be subject to the slight but constant shade of an overgrowth of arboreal and taller vegetation, while others may be exposed to the full glare and brilliant light of vertical sunbeams, and enjoy it luxuriously. To take plants of such opposite natural conditions into our comparatively murky climate, and into our hot-houses—to swathe them in an atmosphere little removed from that of a vapour-bath, and to shade them "all the year round" from every ray of sunshine, appears to be, and must be, very questionable treatment.

We are aware that in making the last assertion we are treading upon delicate ground; that those who have tied themselves in horticultural "red tape" will hug their bonds more closely and cry "No Surrender." Well, we cannot help it. Nature—and she never was wrong yet—admonishes us that our ways are not her ways, and although we are aware that under diverse physical conditions it may not be wise to follow Nature's teachings too implicitly, and that we must bend to circumstances and do what is expedient under artificial conditions; yet we are sure one great law must be proclaimed, that to shade plants in this country which are exposed to every ray of sunshine at home, and at the same time to expect them to bloom, is folly. Shade and complete maturation are antagonistic terms. You may as well try to cook a joint of meat in a cold oven as to get flowers from a plant which does not get its full share of light. Light is life in the vegetable kingdom, and without the free admission of it to our plant-houses, perfect cultivation is impossible.

Take, for example, one of our best known Orchids, Renanthera coccinea; how rarely have the *habitués* of our great exhibitions seen it exhibited? The only cultivator who ever presented it season after season in flower at our shows was the late Mr. FALCONER, of Cheam. And how did he do it? The block upon which it grew was fixed upon the back wall of a plant stove under a fixed sash; and there, close to the glass, with the sun pouring its fiercest rays full upon it, the plant matured its growth, and produced flowers, while those who coddled it in the general Orchid-house rarely bloomed it at all. Passing through the tropical conservatory at Chatsworth in the early part of last December, we were delighted to see a fine specimen growing upon a branch some 12 or 15 feet from the glass; upon this a spike of flowers, 2 feet long, with side spikelets a foot in length, was casting its flowers, having been in bloom upwards of two months, while a second spike upon the same branch has now been some time in bloom and will probably continue until April. Now, this plant has known no shade, as it stands in a perfectly open part of the house; neither had it been scorched by heat, the house in question having no fire lighted from the end of May to the beginning of September. Still, for all this, it was as green as a Leek, and had made, as may be concluded from its blooming, strong well matured growth. So convinced is Mr. SPEED of the importance of full bright light for all plants, that it is not unlikely that some of the duplicate plants of Vandas, in which Chatsworth is so rich, as well as other plants, will be tried next season in the large house.

When Mr. SPEED went to Chatsworth, nearly two years ago, many of the Orchids had been shaded nearly to death; they were covered with spot, and the Cattleyas especially were almost irrecoverably injured. Now the disease has almost entirely disappeared, the remedies being perfect cleanliness both in plants, pots, and houses, free ventilation with warmed air, and not a minute's more shading than what may be necessary to prevent scorching by the fierce rays of the sun. A large plant of Vanda teres growing upon the forked branches of a tree 4 feet through, yellow as the leaves of Aucuba japonica two years ago,* is now as green and healthy as it can be; while, to conclude, a plant of Vanda Roxburghii placed in the cool house at a temperature of 45° to 50° is growing superbly, the young rootlets being as fresh and transparent at the points as if growing in the

temperature generally considered necessary for them.

Such facts as these should, we think, set growers thinking, and then we have no doubt they will discover that even Orchids do not require to be coddled; and though to prevent scorching it may be necessary to shade them a little, the more light they are exposed to, especially during the latter part of their growth, the more certain must be the development of the flowering principle.

—— The Imperial and Central Horticultural Society of France announces a General Exhibition of Horticultural Products, to be held from May 27 to June 1, as also one of objects of art and of industry used for gardening purposes or for the decoration of parks and gardens, from May 27 to June 20. These exhibitions will take in Paris, in the Palais de l'Industrie, in the Champs Elysées, at the same time as the exhibition of fine arts. All horticulturists, amateurs, and manufacturers are invited to take part in these exhibitions. Persons wishing to exhibit are requested to apply from May 1 to May 15, at the latest, to the President of the Society, 84, Rue de Grenelle, St. Germain, and to mention at the same time the space they will require. There will be no classes (*concours*). All objects mentioned in the above list will be available for exhibition if considered of sufficient merit; if otherwise, the authorities have the right of declining them. The same persons will have charge of the placing of articles to be exhibited, and will, if necessary, curtail, or enlarge the space originally asked for. Plants, fruits, and vegetables will be received on May 25 and 26, from six o'clock in the morning until four in the afternoon; cut flowers will only be received on the 27th, before eight o'clock in the morning. The members of the jury (24 in number), must assemble on May 27, at eight o'clock in the morning, at the Palais de l'Industrie, in the place which will be ultimately made known to them. Prizes, consisting of medals in gold, silver gilt, silver, and bronze, will be awarded to exhibitors, according to the merit of articles exhibited. The awarding of prizes will be left to the jury. As in previous years, the Society will give various prizes for services rendered to horticulture, to gardeners, authors of special works on horticulture, to inventors of instruments or of apparatus considered deserving of encouragement; in fact, to any one who has contributed in any way to the progress of horticulture.

—— With reference to the beautiful Monolena primulæflora figured in our last Number, we learn that it was originally introduced into Europe in 1867 by M. Wallis, who discovered the plant in the southern districts of Ecuador, on the banks of the River Zamora (and not, as stated in our extract from the "Botanical Magazine," in New Granada). It was first of all exhibited as a Bertolonia, and the stock was subsequently sold under the name of Monolena primulæflora. The mere publication of a name in a trade catalogue or otherwise, without a technical description, does not in botanical law constitute *bonâ fide* publication; hence, although as it appears M. Linden originally, and we ourselves subsequently (see p. 38), spoke of the plant under the above name before it was described by Dr. Hooker—it is to the latter gentleman that the right of priority belongs, he having been the first to publish a description. In this case the plant seems to have fallen into the hands of several botanists, all of whom at once recognised the genus, and agreed with rare unanimity as to the name to be given to the species.

—— We are informed that the Right Honourable the Earl of Derby has kindly consented to preside over the Anniversary Dinner of the Gardeners' Royal Benevolent Institution, to be held at the London Tavern, on June 29. We are glad to learn that the affairs of this useful Institution are such that it will shortly be possible to make further additions to the list of pensioners. Much more might be done if greater support were given to it by the class for whose special benefit the Institution was founded.

—— His Grace the Duke of Buccleuch, K.G., President of the Royal Horticultural Society, has nominated the following gentlemen for Vice-Presidents of the Society for the present year, viz.:—H. S. H. The Prince of Teck, the Lord Bishop of Winchester, Lieut.-Gen. Hon. C. Grey, W. Wilson Saunders, F.R.S.

—— From Mr. Glaisher's weather tables for the week ending March 5, it will be seen that the extreme southern counties of England have enjoyed a considerable increase of warmth, the temperature rising to 60°; but proceeding northwards it became gradually less, till at Edinburgh the highest temperature reached was less than 51°, and it was generally below 50° throughout Scotland. The temperature at night descended to about 32° at most places in England, but to a lower point at all stations in Scotland. The mean temperature of the air for the week at southern stations was 45½°; at midland stations about 41¾°; at northern stations 40¾°; and for the whole of Scotland 38½°; being 6½° of lower temperature than in the south of England. The fall of rain in England was, with the exception of the eastern counties, pretty evenly distributed, and was little more than 1 inch in depth. In Scotland, however, it was very variable in amount, being nearly 4½ inches at Perth, whilst at Leith it scarcely exceeded a quarter of an inch. At Glasgow it amounted to over 2⅜ inches, whilst at Edinburgh and Dundee it hardly exceeded three quarters of an inch. The mean temperature of the ground at the depth of 1 inch was 45°; at 3 feet 41°, being at about its lowest temperature for the year at this depth; at 6 feet it was 44°, being also at about its lowest temperature; at 12 feet it was 46½° decreasing; and at 24 feet 51° nearly, decreasing as it has been since attaining its maximum in January, as recorded at the Royal Observatory, Greenwich.

Fig.

New Garden Plants.

Dracontium elatum, *Masters, sp. nov.*

Cormo oblate-sphæroideo, fibras radicales carnosas superne tantum emittente; foliis radicalibus synanthis, solitariis vel binis, petiolatis, pedatisectis diametro 3 4 pedalibus, segmentis primariis 3 vel 5, obovatis impari, interrupte, decursiveque pinnatipartitis, lateralibus interdum apice dichotome divisis, segmentis ultimis oblongo-lanceolatis, acuminatis glabris costatis, arcuato-nervosis, petiolis 5—6 pedalibus et ultra, teretibus, apicem versus sensim attenuatis, pone basin tuberculatis maculisque violaceis annulosis undulatis notatis; scapo tereti 5- 6 pollicari; spatha 8—9 pollicari coriacea, purpurea, fornicata, convergenti-nervosa, longiuscule acuminata acumine inflexo; spadice cylindraceo bipollicari breviter stipitato, ab apice deorsum florente; floribus numerosissimis ebracteatis monochlamydeis, hermaphroditis, arcte approximatis; perianthio 6—7—9 partito, segmentis spathulatis apice cucullatis æstivatione imbricatis, staminibus perianthii segmentis numero æqualibus, iisque oppositis demum exsertis, filamentis latis; antheris dorsifixis, bilocularibus, loculis oblongis, apicem versus rimâ porosa extrorse vel lateraliter dehiscentibus; ovario supero, sub 3-lobo, 3-loculare; stylo crasso subconoideo; stigmate tri radiato; ovulis in quovis loculo solitariis, placentæ axili, mediante funiculo brevissimo, affixis, campylitropis; fructu adhuc ignoto.—Habitat in Africa occidentali; e Sierra Leone elata. V. V. in Hort. Bull.

The Aroid of which a technical description is above given will not vie in size with the Godwinia gigas (see p. 1330, 1869) of Seemann, but it is very much like it in aspect, as handsome if the element of size be disregarded, closely allied to it in the construction of its flowers, and on botanical grounds equally interesting. Like the Godwinia, this Aroid was first grown in this country by Mr. W. Bull, in one of whose stoves we saw the plant in bloom in January, 1870. Its nearest ally seems to be the old Dracontium polyphyllum, from which it differs in one or two important points. Our plant has leaf-stalks 5—6 feet in length, and leaf-blades large in proportion; the scape supporting the spathe and spadix is 5 or 6 inches long, and is produced at the same time as the leaf. In D. polyphyllum the leaf-stalk scarcely attains 2 feet; the scape bearing the spadix is only an inch or two in length, and is produced after the flowers (hysteranthous), not simultaneously with them (synanthous). The flowers also seem destitute of that overpowering fœtor characteristic of D. polyphyllum at certain times; and there are other minor differences in structure. The native country of our present plant is Western tropical Africa, while D. polyphyllum is a native of Surinam. This of itself is an interesting point as regards the geographical distribution of plants. From Godwinia our plant differs in the simultaneous production of leaf and flower, in the stamens being equal in number to the segments of the perianth, not twice their number, &c. Other points of difference may be seen by comparing the description of that plant with that we now subjoin.

Root-stock or corm of the size of a small Turnip, of a depressed spheroidal form, giving off fleshy roots from its upper surface only, exactly as in some Cyclamens. Leaves one or sometimes two, arising from the stock. Leaf-stalk erect, 5—6 feet high and upwards, terete or nearly so, as thick as a man's thumb or thicker at the base, gradually tapering upwards, covered by an epidermis which is smooth and pinkish above, but from the middle downwards is marked by small, scattered, conical asperities, and wavy bands or blotches of a purplish colour mottled with white. The interior of the leaf-stalk is traversed by a great number of longitudinal air-canals, somewhat symmetrically disposed, the larger in the centre, the smaller at the circumference. The upper extremity of the leaf-stalk divides into three primary branches, which are bent horizontally nearly at right angles to the main stalk, and each of which is terete and slightly channelled on the upper surface; the central branch is undivided, but each of the two lateral ones divides about 4 inches from its base into two widely divergent branchlets. The blade of the leaf spreads horizontally, measures 3—4 feet across, and is pedately divided into three (or into five) main subdivisions, one central and four lateral, two on each side; of these latter the uppermost pair are again dichotomously divided towards the apex. Each of the main subdivisions measures from 12—15 inches in length, is obovate in general outline, dark green above, paler beneath, perfectly smooth, unequally and uninterruptedly pinnatipartite. The central lobes of each of these main subdivisions are opposite to each other and larger than the rest, which are alternate and decurrent at the base along the upper side of the rachis, thus connecting all the segments together. The ultimate segments or partitions are in all cases oblong-lanceolate, acuminate, entire, perforated here and there by irregular holes, D, and traversed by a central rib, prominent on the under surface, and from the sides of which are given off arcuate secondary veins, which become confluent into an intramarginal nerve running round the segment. The scape or peduncle is erect, terete, 5—6 inches high, as thick as a swan's quill, smooth, rosy pink, and having precisely the same anatomical structure as the leaf-stalk, but with smaller cells and air-canals. The spathe is erect, boat-shaped, leathery, convolute at the extreme base, prolonged above into a long incurved acumen, externally convex, smooth, purplish brown, traversed by 7—9 prominent nerves, converging at the apex; internally concave, smooth, rich purple in colour. The spadix is supported within the spathe on a short cylindrical rosy stalk, ¼ inch long, as thick as a goose quill. The spadix itself is erect, cylindrical, about 2 inches long, as thick as a swan's quill, and densely covered with ebracteate, monochlamydeous, hermaphrodite flowers expanding from above downwards. The perianth, A, consists of 6—7—9 distinct spathulate segments, hooded at the top, imbricate in æstivation, and marked by purplish spots. The stamens are equal in number to the perianth segments, and opposite to them. The filaments are erect, flat, ribbon-like, pale rose-coloured, ultimately projecting beyond the segments of the perianth, and attached to the back of the anther below the middle. The anthers are oblong obtuse, extrorse, yellow, 2-lobed, lobes obtuse, bursting at the sides by a terminal pore, which sometimes lengthens into a fissure. Pollen elliptical. The ovary is superior, sub-sphæroidal, obscurely 3-lobed, 3-celled, with an axile placenta, dissepiments sometimes complete, in other flowers partially deficient. Style terminal, longer than the ovary, and protruding beyond the perianth, conical, thick, fleshy, curved, purple, terminated by a three-rayed brownish papillose stigma. Ovules solitary in each cell of the ovary, kidney-shaped, attached to the placenta by a very short funiculus.

On first opening the spathe it appears as if the upper part of the spadix were covered by stamen-bearing flowers and the lower part by female flowers, the styles of which are directed upwards. In reality all the flowers are hermaphrodite in structure, though not so in function; the stamens in the upper flowers, A, protrude and shed their pollen upon the upturned stigmas of the lower flowers, B, whose own stamens are still immature and enclosed within the perianth. Obviously this is a provision for a division of labour, as the

pollen of the upper flowers impregnates the stigmas of the lower ones. These questions, then, arise: how (if at all) do the upper flowers get fertilised? and what purpose does the pollen of the lower flowers serve? The answers to these questions are not at present forthcoming.

This arrangement of the stamens and styles has been noticed in Dracontium polyphyllum, for in the "Botanical Register," tab. 700 A, B, where that plant is figured, the following passage occurs:—"The stigma is necessarily placed beyond the influence of its own corolla (pollen?). To counteract this seeming defect the style is bent connaturally in such a way as to bring the stigma at its summit into the midst of the anthers of an adjoining flower, and when these have shed their pollen, that organ is seen to relax gradually from its flexure to a nearly upright position within its proper flower."

In our plant the style seems always bent; we have seen no instance of its assuming a vertical direction. In any case the plant is remarkable for its appearance, its structure, and its life-history, on which account we may congratulate Mr. Bull on this new addition to his "wonderful Aroids." In the accompanying woodcuts (fig. 58), the entire plant is shown much reduced in size; A is a flower from the upper part of the spadix; B, from the lower part, with the style protruding; C is a vertical section through the ovary, showing the attachment of the ovules, D one of the terminal leaf-lobes with its perforation. *M. T. M.*

SPRING-FLOWERING PLANTS.—No. IV.

Resuming from p. 41 my remarks on spring-blooming perennials, I come first to the *Dodecatheon*, or American Cowslip, a charming group of plants, nearly allied to the Primula. The whole of the species and varieties are of the freest growth, perfectly hardy, and exceedingly interesting when in bloom. They naturally grow in peat, but they seem to thrive in almost any situation or soil. D. Meadia and its varieties, D. integrifolium, and D. Jeffreyanum, constitute the cream of the family, but there are several more quite as interesting, and all deserve a place in every collection. I ought to mention several more good spring flowers, such as the *Draba*, *Doronicum*, and many others, but want of space urges me on to the *Epimedium*. This is a group of elegant little plants, succeeding best in peat, and therefore well adapted for planting round Rhododendron beds. The whole of the species are very beautiful, both in foliage and flowers. The young foliage of several will equal the Caladiums of our stoves. The best of this group are E. alpinum (white), E. diphyllum (lilac), E. grandiflorum (white), E. Musschianum (red), E. colchicum (yellow), and E. versicolor (white and lilac.) These are quite sufficient to represent this group, although there are many more quite as beautiful as those mentioned.

Eranthis hiemalis, the Winter Aconite, is a favourite with us all; its bright yellow flowers, peeping through the snow in January and February, have a very attractive appearance. It increases very rapidly, and flowers much freer if not disturbed. The *Erinus* is another very interesting plant, but cannot be recommended for general purposes; its home is on the rockwork, and there it becomes a very attractive object.

The *Erythronium dens canis*, or Dogstooth Violet, must not be omitted from this selection of spring flowers. They are bulbous plants, producing spotted foliage, and very delicate flowers of various colours; they are perfectly hardy, and increse very rapidly if left alone. Clumps of these have a very pleasing appearance in the borders during the early spring months. They may also be used most advantageously in a similar position to the Snowdrop; for if planted near the Box edging they are not likely to get disturbed.

The double yellow and single white varieties of the common Pilewort (*Ficaria ranunculoides*) are also very pretty, especially underneath trees, when hardly anything else will grow. The *Fritillaria imperialis*, commonly known as the Crown Imperial, is one of an old-fashioned but noble group of bulbous plants. For planting in groups at prominent points of the shrubbery, for the centres of spring beds, or for the back of a mixed border, these plants are admirably adapted, their beautiful green foliage and large coronets of flower rendering them exceedingly attractive. The variegated forms are gems of the first water, and are among the best of the hardy variegated plants in cultivation. F. græca is a fine species from Greece, growing about 8 inches in height, with large campanulate flowers of a brownish-red colour, and striped inside with yellow. F. latifolia is a larger species, producing large pendent bell-shaped flowers of a rich brown colour striped with purple. F. Meleagris and its varieties are admirably adapted either for pot or outdoor culture. They are perfectly hardy of course, and produce lovely drooping flowers. F. tristis is a very dwarf species with blackish-brown flowers. Those mentioned are not one tithe part of the known species of this beautiful family. They are all very interesting, and deserve unlimited cultivation.

The *Hellebores* or *Christmas Roses* next claim our attention, but these having been recently dealt with (p. 142), I will not say much about them. H. niger blooms in January, and will continue until February or March. H. olympicus is a much taller species, producing large pure white flowers. H. olympicus ruber is a red flowering variety of the above, very showy. H. orientalis, H. purpureus, and H. fœtidus are also well worthy of cultivation. The whole of the family grow very freely if not disturbed, and form very interesting subjects during the early spring months.

Of the *Hepatica* little need be said, we are all so familiar with them that any attempt to describe them would be useless; they form one of the most attractive objects a garden can possibly possess, they are all of the freest growth, and seem to thrive in almost every situation. H. angulosa is the largest flowering species, producing flowers as large as half-crown pieces.

Iberis.—This is one of the best of the spring-bedding sections, blooming simultaneously with the Arabis and Alyssum. It is a genus of dwarf-growing evergreen shrubs of very compact growth, producing during the entire spring dense masses of pure white flowers. The species grow very freely, and can be moved into the spring beds without any fear of injuring them, or preventing them from flowering in the spring, and can again be removed to make room for the summer bedding. They are easily propagated by cuttings or by division, but the former is the best mode. I. gibraltarica is the finest of this class, producing immense heads of white flowers slightly tinted; it is very vigorous in growth, and very free flowering. I. coriacea and I. semperflorens are both very pretty, and form capital beds. There is also a variegated form of I. semperflorens, which is very striking. A bed of I. gibraltarica, edged with the variegated Iberis, would have a most beautiful appearance.

Among the numerous species of the *Iris* there are some which command attention in these papers. Iris pumila (the Crimean Iris) is a dwarf evergreen species blooming early in the spring; from its dwarf, uniform growth it would make a good edging plant, and would also have a pretty neat appearance in the border. There are numerous varieties, some of which are exceedingly pretty, they are all of very free growth, and very profuse flowering. Iris persica is a hardy bulbous species, freely producing fragrant light blue and yellow flowers; but the best of all the Irises is reticulata. It is a charming little gem for the select border, or on the rockwork, its flowers are produced very freely, and are of a dark purple colour, marked with blue and yellow; this and I. persica both bear forcing well, and make pretty pot plants. Iris tuberosa (Snakeshead Iris) is a very curious and beautiful species, it has very long foliage, and produces in the spring rich violet-black flowers.

Leucojum vernum, the "Spring Snowflake," is a beautiful plant, which every one should grow; it is much like a monster Snowdrop, with pure white flowers; L. æstivum is a summer flowering species. *Muscari botryoides* and its varieties are very pretty adjuncts to the spring garden; they flower very freely, and have a very lovely appearance: the white variety is exceedingly attractive, it is generally known as the Grape Hyacinth. M. racemosum, the Starch Hyacinth, and M. moschatum, the Musk-scented Hyacinth, are both well worth cultivating.

Narcissus.—I cannot attempt to describe individually the forms of this numerous family, as it comprises nearly 150 species and varieties, more or less differing from one another. Many of this class of plants are old and popular flowers, some of which are fully appreciated as "pot plants;" but for spring decoration they are almost discarded. What can be more inviting in the early spring months than some of the better kinds of the Daffodil, either in beds or in the borders, or they can be used with advantage in forming clumps round the shrubberies, where they succeed remarkably well. The whole of the species are perfectly hardy, exceedingly fragrant, very free in growth, and produce abundance of bloom when flowers are comparatively scarce; these qualities alone entitle them to more extensive cultivation than they have hitherto had. There are some of the species, too, admirably adapted for the rockwork, such as N. juncifolius, N. Bulbocodium, N. nanus, and many others, but the majority of the species are best adapted for general spring decoration. The Polyanthus section is well suited for pot cultivation; for, although perfectly hardy, yet the beauty and fragrance of their flowers, combined with their early-flowering propensities, entitle them to a little more care in their cultivation. This section is very useful for growing among Hyacinths, as they supply a colour which is not yet found among the varieties of that popular flower.

The *Orobus* is a very pretty group of dwarfish early flowering plants. They form neat bushes, growing from 1 to 1½ foot in height, producing in great profusion pretty pea-shaped flowers. The light pleasing green foliage of some will well repay for their cultivation. The best of this group for general decoration are O. vernus and its varieties, O. sylvaticus, O. flaccidus, and O. angustifolius; the latter from its dwarf growth is well adapted for the adornment of the rockwork. The whole of the species thrive in any ordinary border, and are easily increased by dividing the roots in spring.

Phlox.—The alpine section of this popular flower contains some of the most charming subjects for the adornment of the spring garden. They are principally natives of North America, and are therefore perfectly hardy in this country. They will not, however, succeed in every situation, the one most congenial to their requirements, is a hot dry soil, fully exposed to the sun, and in this situation they form most striking objects during the early spring months. They are also valuable on account of their colour—as red, rose, and purple are very scarce at the season when the Phlox blooms, white and yellow predominating. Phlox canadensis is a beautiful species, differing in foliage from most of the others. It grows about 1 foot in height, and produces pretty purplish-blue flowers; these are produced very freely, and continue in bloom in some situations much longer than any of the other kinds. P. procumbens is a dwarf trailing evergreen species, of exceedingly free growth, and very profuse in flower. These are produced in trusses of three or four together, and are of a purplish-lilac colour. This species invariably flowers in the autumn, but in the early spring it forms sheets of colour. P. nivalis is one of the most beautiful of this section. It is not so vigorous in growth as many of the others, nor will it thrive in all situations; its home is on the rockwork, where it can receive plenty of drainage, which is very essential to many plants of this character. It forms pretty clumps of light green foliage, which is almost covered by innumerable pure white flowers. P. stolonifera is another beautiful species, forming dense, prostrate masses of dark green foliage, scarcely exceeding 3 or 4 inches in height. This is one of the freest in growth of this section, and seems to thrive best in a damp stiff soil. Its flowers rise 3 or 4 inches above the foliage, with from three to six upon a stalk, and are of a rosy purple colour, deepening towards the centre; this species is also known under the names of P. verna and P. reptans. P. setacea is another pretty trailing species, very distinct in growth from any previously mentioned. It is of a loose straggling habit, producing light pink flowers; it is admirably adapted for the rockwork, or for the front of the herbaceous border. P. setacea var. amœna is a very deep flowered variety of above, and one worthy of a place in every collection. P. subulata is a dense-growing species, forming pretty neat cushions of foliage, and produces very freely lively blush-coloured flowers. P. subulata var. frondosa is a charming variety, and certainly one of the best for forming masses. It grows about 4 inches in height, and forms dense masses of foliage smothered with bright pink flowers; so profuse is this variety in flowering that it generally covers the plant with bloom, so that the foliage cannot be seen. P. subulata var. Nelsoni is a white-flowered variety of the above, of similar habit, and very free in growth, and forms a most charming companion to P. subulata var. frondosa. P. pilosa is a very close compact-growing species, producing pretty purple-coloured flowers; it is very much like P. frondosa in appearance. There are a great many more of this section, which deserve notice here, but I must leave them for another occasion. *A. I. P., Tottenham.*

BOUGAINVILLEAS.

Having read the observations on the blooming of Bougainvilleas, at p. 177, I give you a few particulars of the successful treatment which is adopted here, and which has scarcely ever failed for the last ten years to furnish us with Bougainvillea blooms at all seasons of the year. I am inclined to think that the main cause of failure in most cases arises from the want of a knowledge of the different species. B. spectabilis being the oldest, the other kinds are generally known by that name. But few of the nurserymen having bloomed them, they are as much at a loss to know one from the other as the persons who purchase them, and it is from this cause that I think so many people fail in cultivating them. As we have here bloomed five species within the last ten years, I may give a short notice of each of them for the information of those who feel interested in them.

B. speciosa.—I place this species first, because it is the most beautiful. A small plant was received here in 1857 in a 3-inch pot, with about two leaves upon it. I succeeded in keeping it alive, and grew it on as rapidly as possible. In 1860 it bloomed profusely, causing perhaps more sensation than any other plant that was ever bloomed in England. This plant, at the present time, covers a portion of the roof of a house, and has appropriated to itself about 800 superficial feet, although it has been pruned as much as possible to keep it within due bounds; the stem is like the stem of an old Oak, and measures near the surface of the ground 16 inches in circumference. This plant has never failed for ten years to produce a mass of bloom, and is now (Feb. 16) showing bloom all over its branches. To distinguish this species, it may be well to state that it has very dark green leaves, covered on the upper surface with small hairs; the colour of the bracts is what would be called dark mauve, but it is difficult to define the colour, as in different lights it appears of various shades,—the bracts being transparent, the light acts in a variety of ways upon them. This kind generally, comes into bloom about the beginning of March, and from its long endurance, will continue in great beauty till June.

B. glabra.—This species is next in importance to the above, being the more free flowering of the two. It is much hardier, and will bloom in a lower temperature. This plant was first received here in November, 1861; being then about 2 inches high. It was grown on in a Cucumber pit in the following spring, and by June had well filled an 11-inch pot with roots. It was

then placed in a cool greenhouse, and in September showed bloom on every shoot. It was then returned to the stove, and was a mass of bloom till Christmas. The following year it was planted out at the coolest end of the house as a companion to B. speciosa, and it has not failed to produce a mass of bloom for eight or nine months in the year ever since. Last summer the roof of the house was taken off to be repaired, and it continued to bloom in the open air without the least check through the month of August. This plant has reached nearly the same proportions as B. speciosa. The colour is a light pink, and contrasts beautifully with the former. I always prune this plant close to the old wood, in the same way as I would a Vine, in the month of January. As soon as it begins to grow it will bloom, and continue to do so from April to Christmas, not in small quantities, but in such a mass that the glass cannot be seen through it.

B. splendens.—This was bloomed here in 1866. It is very handsome, the flowers and bracts being much larger than those of either of the preceding kinds. In colour the flowers are of a very bright pink, shaded with crimson. As far as I have observed, the plant does not produce flowers in such profusion as the two former, but the individual blooms are quite as handsome. In consequence of not having room for it to develop itself, I destroyed it after blooming, not being able to find room for more than two plants in a house 60 feet long.

B. spectabilis.—This I have obtained under different names from Australia and Madeira, and from several establishments in England. I have now a nice plant of it in bloom, but would not recommend it. The colour is of a dull brick-red shaded with scarlet, not at all equal to any of the before-mentioned, either in colour or freedom of bloom. This is the kind that for a century past has defied all the efforts of English gardeners to bloom satisfactorily. Being a winter blooming plant, I have no doubt that is very much against it. The bracts begin to show in November, and consequently, from want of sun at that dull season, they generally drop off. It is said to bloom beautifully in Australia, which I have no doubt is the case, as, the seasons being reversed, the plant has a powerful tropical sun to assist in developing its bloom. I very much doubt if we shall ever succeed in making it bloom satisfactorily in our short days, and it does not seem disposed to change its season of blooming. It does not fail to form its bracts freely, but many of them die away, apparently from the want of solar light.

B. Wassiana.—This is another variety that has bloomed here. Like the last-mentioned, it flowers about Christmas, and on that account is also very shy to bloom, but is, I think, one of the finest of them all. The bracts are nearly double the size of any of the others, of a beautiful pink colour, richly tinged with crimson. This, like the last, I have no doubt would bloom splendidly at the Antipodes, where its season of flowering would be when the sun has great power. None of them, however, appear to alter their natural season of flowering with us.

I will now proceed to give a few plain directions for their treatment, which, if followed out, will not fail to produce blooms. If they are to be seen in their full beauty, they must be planted out, and allowed to fully develop themselves. Then we can get beautiful branches of bloom from 3 to 6 feet long. I would recommend any one receiving a young plant to proceed as follows:—If small give it a shift, and plunge it in a Cucumber or Melon house, or a Pine pit, with plenty of bottom-heat. Shift on as often as the pot becomes filled with roots. It will fill a 13-inch pot with roots in the course of one summer. Train out the branches to their full length, and withhold water about August for the purpose of thoroughly ripening the wood. Stand the plant away in a warm corner of the stove for the winter, only giving sufficient water to prevent its leaves from dropping off. Early in the spring prepare a pit for it, 3 feet wide and 6 feet long, and larger in proportion if more than one are to be planted in it. This may be prepared just in the same way as a pit for Cucumbers or Melons, with a hollow chamber under it, and two or more pipes running underneath for bottom-heat. Plant out in this bed in good friable soil, consisting of leaf-mould, rotten dung, and sandy loam, with a little sand and peat, and charcoal if obtainable. Water sufficient to settle the soil, which keep a little moist through the growing season. Be careful to dry off and ripen the wood thoroughly before autumn, then keep the plants dry till January, when they will begin to show bloom, and when they may be gradually moistened by giving water in a sufficient quantity to wet all the soil. I have never seen them bloom better than in several cases where they have been planted out at one end of a Cucumber or Melon house, and where they have been subjected to about the same treatment as those plants, with their roots growing in the same bed with them. *John D. Daniels, Swyncombe Gardens, Henley on-Thames.*

THE CLEMATIS FOR EXHIBITION.

We are glad to notice that in the revised schedule of the Royal Horticultural Society a class has been provided at the Oxford Show, for "4 Hardy Clematises in pots or tubs." What they are capable of being made as exhibition plants is well shown in the accompanying portrait of one of a series of plants which we saw growing at the Woking Nursery, where Mr. Jackman has been very successfully trying his hand upon their culture in this particular form. We know of nothing so likely to create a sensation at a flower show as a group of these hybrid Clematises, brought out with their normal garniture of a profusion of gorgeous violet-coloured blossoms.

We are informed that their cultivation as exhibition plants, after the plan of the accompanying model (fig. 59), offers no difficulties whatever. It suffices to plant good vigorous plants in pots or tubs (properly drained, of course) filled with a rich light loamy soil;

Fig. 59.

to prune down close the first and each succeeding year; and to favour the free and healthy growth of the branches during the summer by a judicious use of stimulants—top-dressing or liquid manuring, as may be most convenient in each particular case. Good examples may even be expected the first season after potting, since in the case of these useful and highly floriferous plants, to secure vigorous healthy growth is to ensure abundant flowers, though established plants, provided they are in vigour and not exhausted, necessarily have some slight advantage over those more recently started.

We shall hope to see a fair representation of these noble plants at Oxford, as well as some other novelties introduced into the schedule, such as pot specimens of Antirrhinums, Lobelias, Pentstemons, Phloxes, Delphiniums, and such like. *M.*

MUSHROOM CULTURE.

The numerous failures in the culture of Mushrooms which we see and hear of, induce me to offer a few remarks for the benefit of those who may think fit to make use of them. My first lesson in the culture of this esculent was received from Mr. Pass, of The Fence, Macclesfield, who always managed to land heavy cargoes, and my impression then was that all must be plain sailing. But the wrecks I have since seen have made me almost dread being a captain myself where Mushrooms would be one of the essentials of the freight of the horticultural ship. Such, however, was my fate. Mushrooms must be had, and like anything else that you may not happen to have, you will be daily told how extremely fond my lord or my lady is of it.

Having indulged in the above maritime similes, I hope the following remarks will not be considered watery, and furthermore that they will be the means of enabling some poor fellow to keep his head above water, especially if he has been subject to the roasting of the kitchen fire, *i. e.*, the cook. I well remember the first bed I made. I watched it attentively, and six anxious weeks passed away, but no Mushrooms came, nor the signs of any! My only consolation was, that they had always been a failure. On examining the bed I was pleased to find that the spawn was still alive. Two or three gentle doses of water were applied until it reached the manure, which I found had got too dry; I afterwards covered the bed with a foot of hay, and availed myself of an old ironing-stove to warm the place occasionally, and, with these helps, in four weeks more the first sign of Mushrooms was visible, and they did very well, but did not last so long, perhaps, as they would have done if the bed had not been quite so dry—much of the virtue being lost in excessive drying or fermenting.

Beds Nos. 2 and 3 were also made, the house being then filled, and to my delight they did well. By making use of an old shed and a fireplace which is not used after May, I manage to make six beds during the year—yielding a supply as late as the end of July. The reader will perceive from my mentioning the ironing-stove that the house is not heated either by flue or hot-water pipes, and I have lately found it best to keep up the temperature with manure, which is done as follows:—As soon as the temperature declines in the top bed the manure is collected daily, and put on the second shelf, turning it over occasionally; it is necessary sometimes to move some of it to make room for fresh. The same course is pursued with the other bed, No. 3 having the manure laid by its side on the floor. The thickness of the beds is about 15 inches. Those in the shed and stoke-hole are 2 feet thick; these produce fine Mushrooms, and last some time. They are entirely dependent on a covering of hay to keep up the temperature.

I will endeavour as briefly as possible to describe the various operations:—1st, making the beds. The manure is thrown out of the bed on to the floor, excepting a layer 4 inches thick, which is beaten down or trod where it is convenient; another 4 inches is thrown in, and so on, until the be discompleted, or to within 4 inches of the final thickness. It is allowed to remain thus for a few days, and a thermometer is inserted in it. If it has a tendency to go above 90°, the upper 4 inches must be loosened again. I seldom find it rise above 85°, and when it is on the decline to 70°, it is ready for the second operation—spawning. The spawn is placed on the top, and covered over with manure which has been but slightly fermented; the fresher the better, providing it is not too wet. The whole is beaten down, and the lumps of spawn will partially sink into the already beaten part. There will now be about 2 inches left for soil, which is the third operation, having previously satisfied oneself by leaving the thermometer in for about three days that the temperature will not rise above 70°. The driest soil that can be procured is used for a covering, and left in a loose state for a few days, when it will be found to have got moist enough to be beaten down. I contend that the moisture absorbed from the manure by the soil, is so much food stored for the use of the Mushroom. Sometimes it is necessary to give a sprinkling of water to enable us to beat it to a smooth surface, thus giving it the apppearance of being plastered.

Turfy loam is considered the best for soiling the beds; circumstances have compelled me to use the richest soil of the garden lately, and I do not find much difference, having covered one-half of the bed with one sort and one-half with the other. Those who may have cow-dung, especially that of stall-fed beasts, will not regret using about one inch of soil, and an inch of manure on the top. The thermometer will be again in requisition; occasionally the temperature will rise 2° or 3°, which is of no consequence; but when it gets down to 65° cover over with fine hay, and use the best means at command to maintain a temperature of 55° at the lowest, though there is no danger at 50°, but there is a delay—and cold and damp is certain death to the spawn, though slight frosts will not kill it if dry. The after-management of the beds is very simple, and the early beds give us little trouble beyond adding or changing the manure on the floor. The covering of hay sometimes requires changing, or a fire to be lighted in the stove to dry the place, for the steam from the dung saturates everything. The water

required for the three beds would not amount to more than 5 gallons from beginning to end.

Woodlice are sometimes troublesome; the only remedy is to begin at the lowest made bed, removing the hay, at the same time shaking it over the bed. The woodlice will quickly make their way generally to the back of the bed, and descend between it and the wall. By the application of boiling water, their destruction is as rapid as their escape. All the beds must be served alike; it is useless to do one and leave another undone. I have now given the details of my process under present circumstances, which of course would be slightly varied if I had a properly constructed house.

To the young beginner I would say—1st. Never allow the excrement to become wet; if it does, throw it away. 2d. Do not over-ferment it, the less the better, providing you can get it dry enough, which may be ascertained by taking a handful and squeezing it; if the moisture oozes out in quantity it is too wet; if a little only appear there is no danger. 3. Leave all the short straw amongst the manure; there is no danger of having too much, it assists the drying process, and is easily shaken out after. 4. Beat a little at a time in making the beds, firmness being a consideration, especially where they are not thick. 5. Be sure to maintain the proper temperature in the beds; do not mind the atmospheric heat so much. 6. Think twice before watering once, and until you have confidence in your skill, water one half of the bed and leave the other. Watering is unnecessary except with summer beds, and then a good sprinkling over a thin covering of hay is sufficient, placing dry hay on the top. 7. In making summer beds get below ground if you can. 8. When the fruit of your labour is fit for use pull them up, or rather twist them off, in preference to cutting.

I have lately thought that some of the lowest of our railway arches might be converted into excellent places for Mushroom culture, especially close to towns, where manure can be obtained for a mere trifle. Here I believe it would cost 12*s.* per load, in London not so many pence, with straw and all. I have seen in the *Gardeners' Chronicle* the account of the Mushroom caves of Paris, but have no recollection of anything being said as to what formed the beds. I should like to know if it was manure, and whether it was prepared in a similar manner to that practised in England. *W. P. R., Holwood.*

GINGER CULTURE.

Since I came to reside in the "Dukeries" I have not visited a single establishment where Ginger is cultivated for preserving to any great extent. When living in Worcestershire it was extensively grown with much success in several large establishments—notably by Mr. T. Markham, Hewell, near Bromsgrove; by your late respected correspondent, Mr. J. Smith, of Hadzor, near Droitwich, better known in your columns as "Alpha;" and by your humble servant, when at Perdiswell.

In the cultivation of the Ginger plant (Zingiber officinale) I have adopted two methods, viz.:—(1) In pots, placed on shelves in front of a Pine stove; and (2) planting out into open beds. Where room is plentiful I prefer the latter mode, although the plant succeeds very well when grown in pots. The most essential requisites are heat and moisture. When growing them on the pot system I place a large tuber [rhizome] into a 32-size pot, or two smaller ones into a 24 ditto, in a rich compost of loam, leaf-mould, and well-rotted manure, plunging the pots into a brisk bottom-heat, and watering very sparingly at first. As soon as the roots begin to fill the pots they are again potted, the single tubers into 24-size pots, and the double ones into 12's. They are then removed to the fruiting Pine pit, and are either plunged again, or placed on the front shelves of the pit. At this stage they require great heat, plenty of atmospheric moisture, and a liberal supply of water at the roots; and, should all things go on favourably, the crop will be ready for gathering by the end of July.

The method of growing Ginger in the open beds is as follows:—First start the tubers into growth by placing them singly in small pots, and plunging them into bottom-heat; water must be used very sparingly at first, otherwise the tubers are liable to rot. As soon as they have fairly pushed into growth I plant them out into a well-drained bed, previously prepared. It is requisite that there should be a good amount of bottom-heat, which should be maintained if possible during the whole growing period. The compost should be the same as that before mentioned, with the addition of a little sand. The depth of the soil should not be less than 15 to 18 inches. The sets should be planted from 12 to 15 inches apart each way, according to their strength, which will leave ample room for their growth. The pit should be almost constantly closed, and on bright hot days a slight shading will be requisite until the plants become free in growth. After which, scarcely too much heat and moisture can be given, with a liberal supply of water. There should be at least 5 feet between the surface of the soil and the glass, for the growth, if the plants are properly treated, will be vigorous. The crop will be ready in September, and, if well managed during the growing season, the tubers will weigh from 3 to 5 ounces each.

The oldest parts of the tubers should be kept for planting again. They should be slightly dried and packed away in some cool dry place, in boxes of sand, until wanted in the following spring. To those who have plenty of heat and moisture at command I would recommend its culture, but to those who have not such convenience it would perhaps be useless to attempt to grow it with the hope of success. Preserved green Ginger, we all know, is very much esteemed at our employers' tables, and as a rule home-grown things are generally more appreciated. I think the Fruit Committee of the Royal Horticultural Society would act wisely by offering a prize for the best dozen tubers at one of the autumn monthly meetings; the tubers to be shown as grown; and a second prize should be given for the best home-grown preserved tubers. This would be the means of extending its cultivation, which at the present time is very limited. *Edw. Bennett, Osberton.*

LOOKER'S PATENT CAPPED FRAMES.

We have received from Mr. Looker a specimen of his new patent capped garden frame, of which we give an illustration (fig. 60). In reference to this new-comer Mr. Looker says:—

"This invention consists of two parallel rows of earthenware chairs or slabs, placed at any convenient distance apart. On the top of these chairs rest sheets of glass in a sloping direction towards each other. A

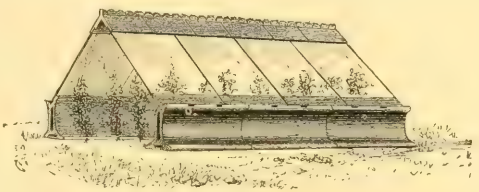

Fig. 60.

space is preserved between the upper edges of the glass, which is fitted with movable earthenware caps, having grooves at the bottom. The top of the chairs or slabs is so constructed that the glass rests securely on them without any other support, and the frame or case is made thoroughly firm by the addition

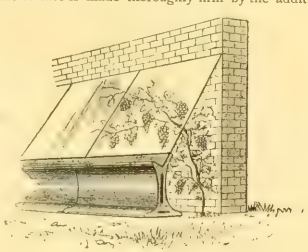

Fig. 61.

of the caps. Ventilation is obtained by removing any or all of the caps, which can be placed across the top of the glass. When bottom ventilation is required spaces can be left between the chairs. While possessing all the uses of ordinary garden frames, hand-glasses, and *cloches*, the patent capped frames have the advantages of being more durable, promoting the healthier growth of plants, &c., being far more ornamental, and of being considerably less in price."

Home Correspondence.

Proposed Horticultural Congress at Oxford.—Is it not possible to have the help of some of the college Dons at a horticultural congress? Nearly all our great thinkers, from Bacon downwards, have been fond of gardening, and Flora's light and graceful garland has lightened up and gladdened many a brow oppressed with the magnitude of mighty thoughts. Could no professor or student bring back these great thinkers, and show in an informing paper their indebtedness to horticulture? A paper on Oxford horticultural worthies, or of great Oxford men who have found solace or pleasure at Flora's altars, would prove a graceful welcome to the Royal Horticultural Society; the sphere of the congress might also be enlarged to include botany, which is an important branch of education at the universities. And here Professor Lawson, the Professor of Botany, and others of the professors, could enrich the practicals with their learned lore. Again, gardening as a fine art would be a grand theme for the tongue or pen of a Ruskin; while gardening as a means of culture and refinement would hardly be beneath the dignity or ability of the best Oxford men to do it justice. But I must beg pardon for suggesting to those great masters of thought themes worthy of their learning and eloquence. If they will only entertain the project of filling us hungry practicals with greater sweetness and more light, doubtless they will speedily find materials in plenty. The weak part of the Manchester programme was its fulness. Ten or twelve subjects at a sitting must not be repeated. It was little short of cruelty to both readers and listeners. It was a waste of intellectual and physical force, resulting in a minimum of effective good. I do not find fault with the papers—all of them were creditable, but there was a wonderful deal too much of a good thing; and this abundance destroyed the most useful feature of such meetings, that of leisurely, full, and free discussion. I have no hesitation in saying that Mr. Cramb's paper, well threshed out, would have proved more fruitful of benefit than all the other papers that succeeded it at the first sitting. The same remark is true of the thoughtful and suggestive paper of Mr. Wm. Paul, on the improvement of plants by selection, cross-breeding, &c. Another mistake at Manchester was the absence of reporters. To this day there has never been a full report given of the proceedings of these two days' meetings. I know this was a great disappointment, alike to those who were not and to those who were present. One of the chief advantages of such gatherings, under whatever name they may be held, is to provoke thought and originate discussion. The direct contact of mind with mind is calculated to reveal and make manifest the best thoughts of all. And these flashes of genius or cultured powers ought to be fixed by reporters, and distributed to a wider circle. In this way the entire craft might, as it were, meet in council, either bodily or through the press, and the interest of horticulturists in the questions under review be stirred to its deepest depths. It is in the spontaneity and thoroughness of the discussion that such *viva voce* meetings can so greatly exceed in usefulness mere printed papers. Everything should therefore be done to excite expressions of assent or dissent. Time in plenty should be allowed, and the inducement of a report added to provoke free and full speaking. The presence of reporters would likewise prove a useful check upon foolish utterances. Few things sober sensible men more than the sight or sound of the reporter's pencil. But if the discussions are to be more than mere formalities the number of subjects must be limited to two or three at a sitting. Perhaps one would be better still. This brings me to the last question, that of the choice of subjects, and the proper parties to choose them. We have tried one plan, with doubtful results. Permit me now to suggest another. It is that the Council of the Royal Horticultural Society should offer prizes for the best essays on two or more popular subjects—these essays to be sent in, say by the 1st of June. By the middle of July the awards could be made, and the prize essays alone be considered and discussed in Congress. Resolutions could then be proposed, approving of the prize essay or essays. They would then be thoroughly discussed, and if the resolutions were passed the essays would go forth to the world with a double value—the approval of the Royal Horticultural Society, and of a congress of practical men. Should the resolution of approval fail to pass, the essay might still be published, with this fact, however, stated. The knowledge that the essays had to pass through this second ordeal would make the first jurors extremely cautious in making their awards. Under the stimulus of the prize essay system something good would be sure to be provided for the congress. Two motives would be at work to develop the talent of the writers: one the money prize offered by the Society, and the other and more valuable, the approval of their compeers. Under such a system no charge of favouritism in selecting the papers could be brought against the Society. The best papers would be almost sure to win, and the labourers who wrote them be accredited worthy of their hire. Neither would the Royal Horticultural Society be going beyond its proper sphere in thus encouraging intellectual merit. From every department of horticulture comes the urgent cry for more, higher, deeper knowledge. It is only by this that we can maintain our supremacy over or equality with Continental nations in the race of cultural skill or success. Therefore the times are opportune for applying the stimulus of the prize essay system for the providing of the best mental food for our Horticultural Congress. If any of your readers have a better mode of making equally good provision for these meetings I hope they will now declare it. *D. T. Fish.* [We have serious doubts as to the value of prize essays in general. Eds.]

Diseased Pelargoniums.—All our Pelargoniums are dying from a complaint, which a gardener of celebrity pronounces to be vegetable gangrene. Many of them are strong plants, two or three years old. We potted them in good time last autumn under favourable circumstances, and placed them in a cool house. Air has been given, except during frost, when the flues were heated to prevent the temperature getting too low. No

water has been given, and they have been perfectly dry. All apparently went on well till about New Year's Day, when this complaint began to show itself. In some instances the points of the young shoots were attacked first, but generally speaking the disease would show itself lower down, very frequently on the young, mostly on the short vigorous shoots; the extremities remained to all appearance in perfect health until the lower part of the branch was completely decayed. The specimens enclosed may probably give some idea of the character of this attack, and I shall be greatly obliged if you can give me any information respecting it. During the last fortnight the house has been moderately heated, and a little water given, but without any good effect whatever. The complaint appears first to attack the skin or bark, then extend inwards, and creep rapidly down to the root. I may observe that the plants made more growth the last fortnight they remained in the beds than they had done all the summer; the young wood was in consequence very free of moisture. The cuttings, taken in August before this rapid growth commenced, have nearly all suffered the same as older plants. *S. B., Gatehead Hall, Durh.* [Our experience is precisely the same as yours. Where cuttings were taken early enough in the autumn, every plant at once struck root, and not one has perished since; but where the later late autumn shoots were used, very few rooted, and of those which rooted many have died. The decay in almost every case began either in the portion sunk into the ground, or just above it, the upper part remaining to all appearance in perfect health. After a time, however, the leaves began to flag, which called attention to the cuttings, which were then found to be quite dead at the base and often covered with mould. Your own interpretation is undoubtedly the right one, and you will have come to the conclusion, as we have ourselves, that one must not trust to late cuttings. Those which we had from other quarters are just in the same condition as those which we ourselves selected in our own garden. *M. T. M.*]

The Fairy Apple.—Will the holders of this gem, so beautifully delineated and fully described in the "Florist" for the month, be good enough to state the price for standards, dwarfs, and maidens. It will prove a grand thing for shrubberies and pleasure-grounds, and many will be anxious not to lose a season if it is ready for distribution. *D. T. F.*

Vine-growing at Champerion and Fungus.—It is a singular fact that whilst in England we stand staring at and disputing one with another respecting the mischievous and non-mischievous effects of Fungus spawn, said to arise from decaying roots and bits of stick, our neighbours the French are not waiting to hear the end of our cavil, are meantime shooting far ahead of us, and instead of burning their faggots and bits of stick as we are recommended to do in England, they are, like sensible people, buying and collecting them when they can, and using them for a three-fold purpose, viz., for drainage, aëration, and manures for Vines. In England, if a gardener attempted such a thing, or even suggested it, he would instantly be set down as half mad. Not so in France: a man there, an author of agood idea, is promptly and kindly acknowledged by a Minister, by the award of a gold medal. The system of Vine-growing now being carried on by M. Jules Cornu, at Champerion (see p. 282), not only shows "how much better they do these things in France," but it also shows that if we, through dread of Fungus, are at a standstill, the French people, and also their Vines, move onwards and take no notice of it. It appears, according to M. Cornu, that the invigorating effects of the faggot will last for a period of about ten years; by that time the last of the faggot will have been absorbed by the roots of the Vines, or, in other words, at the end of ten years the faggot is entirely eaten up by the Vine. In England we are taught to believe quite the contrary, viz., that the dead faggot would in less or more time than ten years entirely eat up the live Vine. A strange theory certainly to be asked to believe, "that the dead shall devour the living." Yet in France so admirably does this scheme appear to work, that, on the strength of the exuberant growth of the field of Lucerne and the monstrous growth in the seedling Vine, several acres are planted after this manner—a quantity of wine has been produced—nay, more, it is even said to bid fair to add much to the future riches of France, and in Vine growing districts to revolutionise, to the profit of their entire system of farming. The scheme has common sense on the face of it, and we should be guilty of great uncharitableness towards the promising idea of M. Cornu if we neglected to wish both it and himself every success in the world. Only imagine our clays to be similarly aërated and pulverised by buried faggots. Contrast this system against our from 4 to 6-inch deep ploughing, and in this country 95 per cent. of the land is no deeper tilled. England is undoubtedly an engineering country, but hitherto its knowledge of mechanics has been but thinly diffused over our agricultural districts. Mr. Gladstone knew this, for in his speech on the occasion of his introducing the Land Bill for Ireland he says, that "the management of the agriculture of this country is in the main left to the care of the least intelligent of men." How would gardeners comport themselves had Mr. Gladstone cast such a stigma upon them? Hitherto, as Grape growers at least, we have beaten the French; but let us take heed from what has been said of our farmers, and the lesson read to us of the system of Grape culture now being carried on by M. Cornu, that, whilst we are too fastidious, we may be found at an early day lagging far behind, asleep and dreaming of that "horrid Fungus"—a death of which we shall never die. The proper place for faggots and decaying vegetable matter is neither in nor upon a fire, but spread when it has sufficiently decayed over the surface of the ground; it is given to us by an established law of Nature to help to elevate the floor on which we stand. *Wm. Miller, Combe Abbey Gardens.*

Goldfussia anisophylla.—The best way to treat this plant is to dry it off after the blooming season, and when well ripened cut it down in the same way as a Pelargonium. Stand it on a shelf to break, and when it has done so shake it out of the soil, reduce its roots if necessary, and replace into a smaller pot. Shift on when required, and grow it in a greenhouse during the summer; take care that the pot is well filled with roots before autumn, and then place it in the stove. Treated thus, I have never known them fail to bloom. *John M. Dunn, Scotsman's Garden, Hendon, Middlesex.*

Botanical Saints.—I find that Mr. Mackenzie has succeeded in discovering another saint for the Gardeners' Calendar. Let St. Dabeoc stand by the side of his brother St. Fiacre by all means. In the words of Longfellow, describing the revel of the monks of Croyland:

> "And the yule-log cast into the chimney,
> And the abbot bowed his head,
> And the lamplets flared, and paled, and flickered,
> But the old monk said never a word.
>
> Yet still on the pallid features
> There sat that look of the golden bowl,
> In which, like a pearl dissolving,
> Had sunk and been lost the soul.
>
> But not for this their revels
> The jovial monks forbore;
> For they said: 'Till the Lenten season
> We can make us merry once more.'

Having already bewailed my misfortune in not being able to claim by right of birth the special grace of good St. Fiacre, a privilege belonging only to true-born Scotsmen, Mr. Mackenzie might, had he been less critically disposed, have pardoned the error of an Englishman, who could hardly be supposed to possess an intimate acquaintance with the vernacular of the North; however, I thank him for correcting me on the matter of cups and cogs, and I will take care, should Mr. Mackenzie, or any of his countrymen, do me the honour of a visit, not to convey an insult by offering a cup, but cog of brose. But to enable me to be thus polite will Mr. Mackenzie be so very good as to enlighten me as to the shape, make, or construction of a cog, and tell me further how to obtain the article? The substantive cog, in plain English, is the tooth of a wheel. The verb "to cog" is "to flatter," to "obtrude by falsehood." Troilus in his fight with Ajax and Diomedes, exclaims, "Come both you cogging Greeks." As Mr. Mackenzie is evidently given to literary research, he will, I make no doubt, be well able to give me, root and branch, the information I desire. Referring to my former article, will you permit me to correct an error. The word "unwillingly" should have been printed "unwittingly." It was far from my thought to convey such an imputation as the word implied. We all know that our good friends in the North are never unwilling to possess a good thing. I make this correction lest some other keenly sensitive Scot should unearth another saint, and, using him as a stalking horse, taunt me for my ignorance of national character, as well as dialect. *Wollaton Avenue, Beeston.* [Our Printers' Devil suggests the following:—The tonic wood, Laurus Chloroxylon, was at one time termed Cog-wood. Did the wood give the name (and the "tone") to the Scotch beaker of whisky? Again, "quaich" is Celtic for little goblet—is "cog" a corruption of that word? Also, we have "cog" as French for dice: the French were at one time "great friends" of the Scotch, and many French words crept into the "rich Doric of the North,"—was this word "cog" (closely allied to dice-box) used to signify a deep, narrow beaker; in fact, did dice and drink take alternate possession of the box? That "cogs" are not alone used for holding oatmeal "brose" (termed somewhere "porridge in embryo")—that they may serve for "Athole brose"—is evident from a sort of drinking song (P. D. quotes from memory), where it is said:—

> "I wadna gie my three-gir'd cog
> For a' the cogs in Bogie"

where "three-gir'd" refers to the triple hoop of a wooden drinking-cup, and "Bogie" is diminutive of Strathbogie.]

—— I feel much obliged to your friendly critic for correcting me in the affair of Mary Magdalene, as related by St. John (xx., 15). If he will turn to St. Matthew xxviii., 1, he will find that along with Mary Magdalene was another Mary, who came to see the sepulchre. St. Mark (xvi., 1) says Mary Magdalene and Mary the mother of James the Less, and in verse 3 of the same chapter the plural number is used—"And they said among themselves, Who shall roll us away the stone," &c. St. Luke (xxiv., 10) names "Mary Magdalene, and Joanna, and Mary the mother of James, and other women that were with them;" and in chapter xxiii., 49, it is stated that "all his acquaintance, and the women that followed him from Galilee, stood afar off beholding these things," *i. e.*, the Crucifixion. In St. John (xix., 25) we read that "there stood by the cross of Jesus, his mother, and his mother's sister, Mary the wife of Cleophas, and Mary Magdalene." Mary Magdalene is put last in order by St. John, as she was not the chief mourner, neither was she a relative like the other Mary, who was his mother's sister. We have the clearest evidence that Mary Magdalene was not alone when she came to the sepulchre with the spices; and the Gospel narrative breaks at the Crucifixion, and leaves the three Marys and other women to rest on the Sabbath, and prepare spices as soon as the Sabbath was over, opening anew at the Resurrection with the astounding fact that one who had been "possessed" should be the first to witness the greatest event that mortal eye had ever seen; and as Mary Magdalene was the chief actress, the other women, who were certainly there, are never named. I was literally in error when I said that our Lord's mother, supposing Him to be the gardener, said unto Him, &c.; but I am still very far from thinking that Mary his mother was not there. The minor details of this great event are related with a high hand. Thus St. Matthew, St. Mark, and St. John tell us the angel or angels sat, whilst St. Luke says that they stood. St. Matthew and St. Mark name only one angel, whilst St. Luke and St. John name two. How many angels were there that no eye could see? This question does not detract from the truth of the holy women seeing one at one time and two at another, or affect the posture assumed by spirits who have neither flesh nor blood. *Alex. Forsyth.*

Palestine Arum.—I have in flower here a fine Arum, which is new to me. It was brought from Palestine by my employer. It resembles Caladium esculentum in habit and growth, but the leaves, of which it has five, are more rounded at the point, 10 to 12 inches in length, and from 5 to 6 inches in breadth. The leaves rise 18 inches from the pot. The flower comes from the centre, and rises above the leaves; it very much resembles the Calla æthiopica, but differs in colour; the spadix is 8½ inches long, stands erect, and is jet black in colour; the spathe is 10½ inches long, by 3½ broad at the base, and tapers to the point, which is recurved—the underside of a lightish green, the upper a very rich dark crimson, and smelling like old port wine. The bulb is of a rather curious form, being exactly like a large-sized Hyacinth bulb turned upside down, but of a whitish colour; the principal roots come from the top of the bulb, the care of a few round the bulb, but more on the underside. *A. Watt, Dunlop Gardens, Newmains.* [This is probably the Arum palæstinum, figured in 1865 in the "Botanical Magazine," t. 5509. The leaves of this are somewhat hastate. Eds.]

Patent Fumigators.—In reference to the article in the *Gardeners' Chronicle*, p. 245, will you allow me to state that between 1855 and 1868 no patent for a fumigator has been taken out under the name of Dean. This does not, indeed, affect the quality of the article; but why call it a patent, if it is not one? Will those who so designate it tell us the year and the number of the patent? "B.," the writer of the article referred to, states that he has tried, comparatively, "Dean's," "Birkett's," "Drechsler's," and the common flower pot, when "Dean's far surpassed them all." My best machines are only just leaving the factory, so that they could not have been used by "B.," and they are now going to large plant growers who never used fumigators before, some of whom will no doubt give you their experience ere long. Will "B." allow me to call upon him with my apparatus as now manufactured, and try it—not against this or that fumigator (for he says himself they are all failures), but against whatever means he may consider the best for fumigating a house, and will he then draw up a report answering the following questions:—What is the price of each fumigator, and the size, weight, and space it occupies? What quantity of tobacco or other material does each consume? What was the temperature of the smoke at 2 inches from the apparatus? How long can each be used without stopping? How long does it take to start each? What kind of constructions have been smoked—plant-houses or pits, inside or out, and of what size? Which apparatus can be most readily moved from place to place? Last, but not least, which is the least apt to scorch plants? *F. J. Drechsler.*

Sewerage for Pot Plants.—In watering plants, such as Roses, &c., in pots, I employ a considerable amount of sewerage in liquid. The great objection in its application is, that it generates on the surface of the soil a species of green Moss. Can you suggest anything that would destroy this weed without dispelling the ammonia? If so, I should feel obliged. *Q. D. G.* [Is the liquid used in a clear state? The growth of Moss seems to indicate the reverse, and that the pores of the soil are closed up by sedimentary matter. For the present break up and remove the surface, and give a topdressing of rough open compost, and for the future use the liquid clarified and diluted. Eds.]

Plants for a Rockery.—Will you kindly oblige me by giving a list of plants that you would recommend for a rockery, on which the sun shines in the fore part of the day, and which, in consequence, is apt to get dry in summer? Also what flower seeds should be sown,

and when, in the border of a shrubbery walk, rather shaded with trees on both sides? *A. B. C.* [A complete list of suitable plants would be too long for us to insert, as it is, by merely mentioning a few in each genus the list is not a short one: for this list we are indebted to Mr. Duncan. Thalictrum alpinum, Anemone nemorosa, and others: Adonis vernalis, Trollius europæus, Helleborus atropurpureus, Aquilegia alpina, Epimedium alpinum, Papaver nudicaule, Meconopsis cambrica, Dielytra eucullaria, Corydalis solida, Cheiranthus alpinus, Arabis albida and alpina, Cardamine trifolia, Aubrietia deltoidea, Alyssum saxatile, Iberis sempervirens, Viola cornuta, V. lutea, Erpetion reniformis, Dianthus alpinus, Tunica Saxifraga, Silene alpestris, Lychnis alpina, L. Viscaria and vars., Arenaria montana, Cerastium tomentosum, Linum alpinum, L. austriacum, Geranium sanguineum, Erodium Reichardi, Coronilla varia, Hippocrepis comosa, Hedysarum obscurum, Orobus vernus, Dryas octopetala, Waldsteinia geoides, Rubus Chamæmorus, Potentilla pyrenaica, Alchemilla vulgaris, Circæa alpina, Hemiaria glabra, Sedum spectabile, Saxifraga crassifolia and others, Linnæa borealis, Asperula odorata, Valeriana dioica, Centaurea montana, Doronicum caucasicum, Antennaria alpina, Achillea tomentosa, Campanula carpatica, Pyrola media, P. minor, Gentiana acaulis, Polemonium cæruleum, Phlox frondosa, P. subulata, P. stolonifera, Convolvulus lineatus, Lithospermum purpureo-cæruleum, Pulmonaria saccharata, Anchusa sempervirens, Myosotis azorica, M. dissitiflora, Omphalodes verna, Linaria dalmatica, L. vulgaris var., Wulfenia carinthiaca, Veronica fruticulosa, V. spicata, Thymus Marschallianus, Teucrium hyrcanicum, Lamium longiflorum, Betonica grandiflora, Nepeta Mussinii, Scutellaria alpina, Primula grandiflora, Zapania nodiflora, Soldanella minima, Primula nivalis, P. cortusoides, Androsace Chamæjasme, Trientalis europæa, Lysimachia nummularia, Armeria maritima, Cypripedium Calceolus, &c. The only annuals we know of likely to thrive in the sort of place mentioned by our correspondent are—Delphinium Ajacis, Eschscholtzia californica, Platystemon californicum, Arabis verna, Ionopsidium acaule, Iberis umbellata, Malcolmia maritima, Kœnigia maritima, Heliophila amplexicaulis, Schizopetalon Walkeri, Silene pendula, Hibiscus Trionum, Tropæolum majus, Limnanthes Douglasii, Impatiens fulva, Lasthenia glabrata, Claytonia sibirica, C. perfoliata, Centaurea Cyanus, Convolvulus tricolor, Borago officinalis. All of these should be sown some time next month at the very latest. Eds.]

Privet Berries.—In reply to the query at p. 280, about Privet Berries, I beg to say of my own knowledge that they are poisonous; at all events in some stages of their growth. Two children died with symptoms of the most virulent poisoning some years ago. The cases are referred to in the admirable work of Dr. Taylor on Poisons. The symptoms were vomiting and purging, with most violent convulsions. *A Surgeon.*

Cutting Box Edgings. Should your correspondent, "S. B.," p. 317, live anywhere south or west of the line from Birmingham to Woolwich, he will find that by clipping his Box edgings so late as the first or second week in June he will produce for himself and friends an eyesore for the next six or eight weeks by the bruising and mutilation of the young growth and leaves; better clip them the beginning and middle of May as sharp as he pleases; then the young growths take the place of that cut off, and grow intact and regular, and form a lovely fresh green edging, beautiful to look on. *Robert H. Poynter, Taunton.*

White Lady Downe's Grape.—Last month I put in 86 eyes of the above-named Grape, but, strange to say, not one of them have shown any signs of life. Can any of your readers throw any light upon the matter; or give the result of their experience with eyes of this particular Vine? I put in at the same time nearly 3000 eyes of other varieties, which have done very well, very few having failed. The canes from which I took the eyes were received direct from the nurseryman who is sending out this new variety. *A. Z.*

The Anti-Fungus Crusade.—Bravo, Mr. Miller, for taking the Fungi bulls, the toadstools, by the horns. I don't believe in the destructive power of Fungi alone, unless in rare instances. In most cases they succeed, not precede, weakness, disease, or death. Healthy roots mostly set Fungi at defiance. As for wood poisoning wood, it is simply absurd. What is there in dead roots to hurt living ones? Is not Fungus mostly a means of decomposition, and is it not the order of Nature for life to master and appropriate death? It seems almost natural for some roots to be laden with Fungi, the roots of the Fir tribe especially. Dig down around a plantation of old Scotch Firs, and the ground will probably be found to be a bed of Fungus spawn. But root and branch continue healthy. Even the bad effect of leaf-mould upon Vines and other fruit trees that so many cultivators have adverted to, is due less to Fungus probably, than to an excess of humus or some peculiar or noxious acid amid the mass. Besides, at one time leaf-mould was constantly used as a restorative to diseased roots. The roots were often affected with Fungi, or a prey to weakness, before the leaf-mould was applied. Under such conditions of course it furnished a good medium for the distribution of the spawn. And where rotten roots and leaf-mould were found together it was too hastily inferred that they were always cause and effect. Not that I would advocate rotten leaves in fruit-tree borders; I think them a mistake; but still there are Fungi and Fungi, and there are more things in leaves than toadstools, large or small. It is possible for leaves to be hurtful to roots, whilst wood, roots or stems, would prove innocuous or useful. In France, as is shown from the work of M. Jules Cornu, p. 282, they are not afraid of wood under the Vines. Pine faggots, above and beyond all others, are fruitful of Fungi, and yet they, as well as Oak tops, are recommended as at once drainage and food for the Vine until the last root of the Vine absorbs the last stick of the faggot! This is a wonderful contrast to the careful picking out of each morsel of wood by so many Fungi-fearing cultivators. *Observer.*

New Potato.—I have read with great interest many reports upon various new Potatos in the *Gardeners' Chronicle* and other magazines, but I am not aware that any notice has been taken of a Potato imported from America, in 1865, by Mr. Walker, of Biggleswade, Bedfordshire, which he calls "American Red." It is a late variety, which I consider makes it all the more valuable, as there are already a great number of early ones in the market; in fact it is just the sort of Potato wanted in the country, as most of the older varieties appear to be worn out. I was fortunate in obtaining 7 lb. in the spring of 1869, which I cut into single eyes and planted in the usual way, without any extra culture, and from which I obtained 6¼ pecks of the finest and best flavoured Potatos I ever ate, some of which weighed 1¼ lb. each, and the tubers are remarkable for being all of full size, there being no small ones amongst them. They boil beautifully white and floury, are good keepers, and have shown no sign of disease. This will be the Potato which will be sought after and grown extensively by the cottager and labouring man so soon as he becomes acquainted with it, and the price must soon be within his reach, as from their productiveness they will soon be very plentiful. *John Hickson, Stanton-by-Dale.*

International Exhibitions at Kensington.—In the leading article at p. 308, relating to the proposed exhibition at Kensington, the substitution of little exhibitions for great ones is made to appear as if it hinged upon "the difficulty in obtaining from Government the requisite funds for holding great exhibitions in future;" but the fact is that the Government never contributed one farthing to either of the two international exhibitions held in London. On the contrary, the exhibitions were made to pay many thousand pounds even for the police in the streets, in the years 1851 and 1862. On the same page you say "the happy idea occurred to our neighbours in Paris, after the last exhibition, of breaking up the exhibition into sections and holding one each year, instead of all in one year." If by "neighbours" you mean French neighbours, I beg leave to inform you that no Frenchman took any part in the resolutions on this subject which were passed by the Exhibition Commissioners for England, North Germany, Austria, Italy, Russia, and the United States, as you will find by reference to the Appendix of the 1st volume of the "English Reports on the Paris Exhibition," p. 196. You speak of "decennial exhibitions," the present plan adopted provided for septennial exhibitions. You doubt if the varying industrial exhibitions each year will attract the general public; the same doubt might apply to the annual exhibition of agricultural implements with greater force, as the class of objects is the same every year; and, curiously enough, the part of *Hamlet* is left out in the play, for you make no allusion in your article to the International Horticultural Shows connected with these exhibitions, which I believe will prove to be most popular. *H. C., South Kensington.* [*Hamlet* does not appear in every scene of the play. The horticultural part of the exhibition has been previously alluded to. Eds.]

Muscan Tree.—The following may, perhaps, answer the inquiry of "P. M.," at p. 313. Jamieson, in his "Scottish Dictionary," gives the meaning of "Muskane, Muscane—1, Mossy, Mossgrown. . . . 2, Putrid, Rotten. 'Than to ylk Lordis bed past ane of thir men al at ane set hour, ylkane of theme had in thair hand ane club of Muscane tre, quhilk kest an vncouth glance with the fische scalis in the myrk."—Bellend. Cron. b. 10, c. 9. . . . Baculum putri ligno excussum. Boeth." No doubt the clubs were of "touchwood," and the phosphoric light from them, and the ancient fish skins, must have been almost alarming to the Royal guests. The sense of smell would, however, prevent them thinking that the sudden light was supernatural. *G. E. O.*

Propagation of the Bramble.—In reply to your correspondent "H. T. M." (see p. 42), allow me to inform him that there is no better method of propagating this plant, than that of assisting the plant in its natural manner of reproducing itself by means of layers. In almost all places where the plant has been allowed to grow undisturbed young-rooted plants may be found, which have so grown from the tips of the old shoots having come in contact with the ground. By cutting these off, and removing them with as many roots as possible, a stock may soon be raised. In planting them, the soil should be somewhat firmly pressed around them. *Opus.*

Pink "Coffins."—The small triangular pieces of paper in which grocers were or are accustomed to wrap up pepper, &c., were called coffins, and it is very probable that the same name was applied to the petals of Pinks from their wedge-like form. *M. J. B.*

Raspberry Culture.—"Bush *v.* Brake" must permit me to tell him that "my suggestion," as he terms it, about the use of strained wires to which to secure the fruiting canes of the Raspberry, is something more than a suggestion—it is the result of many years' experience, during which I never found that the growing wood in the slightest degree interfered with the proper perfecting of the fruit, of which I gathered large quantities every season of the finest quality. I am certain that any gardener having once adopted this plant would not wish to return to the bother of stakes. *A. D.*

Magnolia grandiflora.—I lately paid a short visit to the old established nurseries of Messrs. E. P. Francis & Co., Hertford, and was very much struck with the extent and excellence of the stock of young plants of the true Exmouth variety of Magnolia grandiflora, which is propagated and grown there annually. There are about 100 "old stools," planted in rows across a nice sheltered quarter, and propagation is carried on by means of layering the young shoots. About 1000 strong layers are potted up from them—the process of layering and subsequent rooting being complete—every two years. These average from 3 to 5 feet in length, and are sold at a comparatively low retail price. Now my chief object in referring to these is to point out what very beautiful objects they are, grown and flowered in pots for conservatory or indoor decoration. No plant possesses more noble foliage, or which diffuses a more grateful perfume in the early autumn months, when something uncommon in this way would prove so acceptable for placing in sheltered verandahs, front halls, and similar places. That they will flower freely in pots I am able to testify, for here I saw many beautiful blooms expanding upon them at the time of my visit. *Opus.*

Electric Bells and Hothouses.—We must congratulate Mr. Sax on his highly ingenious invention of electric bells to communicate with the houses and the head gardener's residence, but is it not more necessary for the person who attends to the fires and the heating of the houses to receive the intelligence from the battery than the gardener? If it is not absolutely necessary for the two places it should certainly be to the latter, as it would require constant attention, and would also be advantageous to the journeymen of our profession. We wish to put one question to the designer of this invention, that is, with regard to the temperature of day and night. Mr. Sax is no doubt aware that most gardeners are acquainted with the variation of heat, therefore we should be pleased to know if the electric battery should be regulated for day heat, as the day temperature with sun will rise considerably more than night temperature with artificial heat? *Hortus.*

The Talking Vines at Combe Abbey.—The revelations made by the Laureate's talking Oak are now fairly eclipsed by those made by the talking Vines at Combe Abbey (p. 311). True, these Vines are juveniles, not being in their teens yet; but their precocity is marvellous, both as regards showing aërial roots (or beards), and for their reasoning powers. In the two early vineries with bottom heat the Vines no doubt got their toes burnt, which accounts for their petitioning their "lord and master" to discontinue it. The other Vines on the "extending" system, which wanted to know whether they were to produce Grapes or timber, have, I think, been premature in their aspirations. According to Mr. Cannell's theory of Vine pruning, there is a critical stage in the life of close-jointed Vines, when both timber and Grapes fail. By-the-by, Shakspeare must have known about the restrictive system of Vine pruning, for in the "Tempest" he makes *Iris* say to *Ceres*—

"Thy pole-clipped vineyard."

Should things not go on so smoothly as at present amongst these Combe Abbey Vines, I hope they will speak out again, and let their "lord and master" know their wants, for him to promulgate to the readers of the *Gardeners' Chronicle.* *Theta.*

The Fungus Question.—Mr. Miller's somewhat ingenious statements on this subject (see p. 247) do not in my opinion demonstrate that decayed wood existing amongst roots of trees is not a dangerous thing when the conditions favourable to the existence of fungous matter are present. Now, as one of the chief elements necessary to the development of Fungi is a certain state of dryness, it is not easy to conceive, independently of proofs, that under such a condition decayed wood would be liable to engender the mycelium of Fungi and by contact affect the roots of trees? This is analogous to Mr. Miller's theory relative to drought-affected tree-roots and consequent Fungus affections. Neither is it difficult to conceive the reason why Mr. Farquhar (see p. 312) failed to detect Fungus amongst the wood and leaves buried in his naturally moist soil

—a condition favourable to the decomposition of vegetable matter, thereby converting the buried branches, leaves, &c., into a *pabulum* eminently adapted for the assimilation of plants growing amongst it. But under a diverse state of circumstances I apprehend a different state of things would occur; and of which, were it necessary, I could adduce numerous incontrovertible instances, one of which, I may mention, as it has recently come under my own observation, in the shape of two or three young Peach trees which had been planted inadvertently in a layer of half-decomposed leaves, containing a large percentage of decayed bits of stick. These leaves, doubtless owing to the drought of last year, had fostered Fungus spawn, which I found had attacked the roots of the Peaches in a most serious manner. It is almost needless to add that every visibly diseased vestige was carefully cut away, and the trees replanted in pure sandy loam, with an admixture of burnt rubbish ashes, so that I am in hopes of the eventual re-establishment of the roots. Here, then, I submit, is an instance sufficient in itself to convince the most sceptical, that decayed wood and the like are to be regarded as dangerous, owing to their property of fostering Fungi, and hence I also aver that Messrs. Miller and Farquhar's *dictum* should be accepted with a considerable amount of reserve. "Facts are chiels that winna ding." *Wm. Gardiner, The Gardens, Eatington Park.*

Viola cornuta "Blue Perfection."—From the report of the Floral Committee of the Royal Horticultural Society, September 7, 1869, it appears that Mr. Jobson, of Rotherfield Park, exhibited cut blooms of what was said to be a seedling blue Viola, and at the next meeting (September 21) Mr. Jobson again exhibited cut blooms and a plant, to which a First-class Certificate was awarded. Mr. Warren, of Salisbury also exhibited cut blooms of a blue Viola at the latter meeting, which were said by the Committee [?] to be identical with Mr. Jobson's variety. Mr. Warren obtained these blooms from me, although I had no knowledge at the time of the use he intended to make of them. I have had this variety in my possession for some years, and have during that time supplied it to numerous persons; in short, I may safely say, to every one who possesses it in this neighbourhood. I can also trace its history for several years prior to having it in my possession. I therefore feel justified in saying, that if the Floral Committee was right in its decision respecting the two being identical, it is at least no seedling of recent date. Having stated these facts, which I am fully prepared to substantiate, I think I may fairly claim the merit of being the first person who introduced this plant to the public. *Geo. Smith, Wilton Road Nursery, Salisbury.*

Societies.

EDINBURGH BOTANICAL: *Thursday, January* 13. Robert Brown Esq., V.P., in the chair. The following communications were read:—

I. *Notes on the Embryo of Ruscus aculeatus.* By Professor Dickson. Dr. Dickson made some remarks on the embryo of this plant, which he had examined from fruits sent to the Botanic Garden by Mr. Frere, of Roydon Hall, Norfolk. The embryos were remarkable for their great variability in size, general form, and more particularly in the orifice of the cotyledon. Regarding the last point, the majority of the specimens exhibited the lips of the cotyledonary orifice as approximated, thus forming a "slit," this being evidently the normal arrangement, and corresponding to the ordinary type of cotyledonary orifice in monocotyledons. In some cases the lips of the orifice were seen to gape in a remarkable manner. In these embryos the plumule is always small, rudimentary, and pretty deeply sunk in the cavity of the cotyledon; but in one case Dr. Dickson observed it to be very much enlarged, completely filling up the cotyledonary cavity, and appearing externally between the lips of the cotyledon. Dr. Dickson's observations were illustrated by specimens under the microscope, and by drawings.

II. *Notes of Plants collected in Spitzbergen and Nova Zembla in the summer of* 1869. By William Livesay, Esq.

III. *Notice of some Botanical Excursions with Pupils during the summer of* 1869. By Professor Balfour.

IV. *On the Botany of the Dominion of Canada and adjacent parts of British America* (Part I., Ranunculaceæ). By Professor Lawson, Dalhousie College, Halifax, Nova Scotia. In this paper the author gives the general characters of the natural order Ranunculaceæ. Of Clematis, he says, we have two species, one local and the other general in its distribution, viz., C. virginiana, which grows around the rifle range at Bedford, and also at Windsor, Nova Scotia; it extends to Lake Winnipeg. Isle Verte being its last point north-eastwardly. Pulsatilla is confined to the north-west, whence numerous specimens have been received from Governor McTavish. The common form of the species named P. Nuttalliana, is now known to be identical with P. Wolfgangiana of the Russian botanists, which is itself a variety of the European P. patens. Two forms from the north-west are described, one of which does not accord with Regel's Wolfgangiana. Anemone dichotoma is shown to be the proper name for the plant, hitherto known as A. pennsylvanica. Of A. nemorosa, the Windflower of English forests, four varieties are described as inhabiting the dominion, one a small northern form, and another found at Belleville by Mr. Macoun. A. Richardsoni has been received only from the Hudson's Bay Territories. A. Hepatica is shown to be essentially an Ontarian and New England plant, although found to extend into Nova Scotia, having been gathered at Windsor by Professor How. A. acutiloba is restricted and more northern in range. A. narcissiflora is not known to exist within British America, although it occurs in the United States in the Rocky Mountains. A. parviflora is a north-western plant, picked also at Gaspe, by Dr. Bell, of Montreal, and on Anticosti, and is found to have usually five, not six petals as described. A. multifida has not yet been collected in Canada, except on the Gulf shore and in the north-west, but will probably reward some diligent searcher in Ontario. A. pennsylvanica has a wide and southern range. A. cylindrica, a sand-hill plant, is confined to central and western Ontario. Syndesmon is a curious little plant, a link between the Windflowers and Meadow Rues, but has only been found in two localities, although in the adjoining States it is not rare; its Canadian habitats are St. David's and Hamilton. Thalictrum cornuti is a stately plant, with large masses of showy white blossoms, rendering it conspicuous along the Sackville River, and on the meadows at Beaver Bank, and is of general distribution throughout the dominion. T. purpurascens, differing in its sessile stem-leaves, greenish flowers and drooping anthers, is to be looked for in dry situations; its record as Lower Canadian is, however, a mistake, and possibly it does not reach so far north as the St. Lawrence. T. dioicum has a wide range, but there are two distinct forms about Kingston which require further investigation, one growing near Kingston Mills and the other at the Penitentiary. T. alpinum, an arctic European plant, is confined with us to Anticosti and Newfoundland; it is general within the arctic circle, and runs down the Rocky Mountains to low latitudes, as arctic plants are apt to do. T. clavatum is a York Factory plant, remarkable for its pod-like stipitate carpels, without furrows, but with embossed veins. Of Ranunculus, eighteen species are described, and one excluded. R. repens is the most common, as a weed, but rare as an indigenous plant, in which character it grows near Toronto. R. bulbosus has been frequently reported as Canadian, but the evidence is doubtful. R. ovalis, R. breviculis, and R. cardiophyllus are referred to R. rhomboideus. R. auricomus does not belong to the flora, and R. affinis, here considered as a variety of it, is confined to the Arctic Sea and the north-west Hudson's Bay Territories. Of R. abortivus two varieties (pratensis and sylvaticus) are described. R. nivalis was found by Dr. Rae at Repulse Bay, and the specimens agree with R. sulphureus of Solander. R. cymbalaria is a seashore plant. The numerous varieties of R. multifidus and R. aquatilis still require careful comparison in the living state with European forms. R. digitatus is a Rocky Mountain plant, approaching R. Ficaria of Europe. Trollius laxus has not been recently found in Canada. Aquilegia canadensis presents two forms, and abounds in Ontario, but becomes scarce eastward and northward; it will probably be found in Annapolis, if anywhere in Nova Scotia. A. brevistyla is quite western, and does not come so far east as to enter the province of Ontario. A. vulgaris, on the other hand, is confined to Nova Scotia, but is only an introduced plant, one of the wild flowers of England, brought, many years ago, by the Duke of Kent, and now widely spread through the woods and along railway banks and roadsides. Delphinium exaltatum is from the Youcon and Clear Water River, although in the States its distribution is decidedly southern. D. zuræum is also from the Youcon; D. Consolida, an introduced European plant, found at Prescott, and D. Ajacis, an excluded species, not permanently naturalised. Aconitum delphinifolium is kept distinct from A. Napellus, of which Dr. Regel describes no fewer than forty varieties and forms, all named and classified. A. semigaleatum, not previously noticed as American, is considered a distinct variety of A. delphinifolium; the specimens of both are from Governor McTavish. A. Napellus is merely a naturalised plant. Cimicifuga is confined to Cayuga, in the extreme south-west of Canada, where it was found by Dr. Philip W. Maclagan. Actæa rubra is widely spread throughout the whole dominion, but A. alba is south-western. Hydrastis canadensis is confined to Ontario, and Adonis is excluded, as the specimens sent to Hooker from Labrador, thirty or forty years ago, had no doubt sprung from seeds dropped there by accident, and the plant has not been heard of or seen since.

V. *On the Introduction of Ipecacuanha Plant* (Cephaëlis Ipecacuanha). By Mr. M'Nab. Since reading a notice on the Cephaëlis Ipecacuanha at the last meeting of the Botanical Society, I have learned that the Government intend to carry out in earnest the cultivation of this plant in India. This being the case, no time should be lost in securing a quantity of the Ipecacuan plant for the purpose of making a fair start. In the notice read to the Botanical Society at last meeting, I explained experiments how this plant might be increased by means of root-division, but as this will be a slow process, on account of the comparatively few established plants in this country to work upon, it is necessary that the Government should take immediate steps to procure a quantity of plants or roots (rhizomes) from the native habitats in Brazil, and thus enable cultivators to get a stock to propagate from. For this purpose, I beg to offer a few observations for the introduction and extension of the Ipecacuan plant. Various ways may be suggested for this end. The first, and perhaps the most expensive, method, would be to have the plants brought home in Wardian cases, and on their arrival in this country, or in India, they could be subjected to root propagation. If the tops come home alive, they also could be placed in positions to secure a new growth of leaves and roots. The cheapest, and perhaps the safest, method of procuring plants would be to collect a quantity of roots from their native soil, and after sealing up the cut extremities, to place them longitudinally in a close fitted box made of wood (not less than one inch thick), having layers of fresh pulled Sphagnum Moss placed between each layer of roots. If the Moss is firmly packed, it ought to keep the roots in a plump and perfect state for many months, or until such time as they reach their destination. If white Sphagnum Moss cannot readily be obtained, Moss of any kind, moistened, and the excess of moisture thoroughly squeezed out, will perhaps answer the purpose as well. If it should so happen that no Moss of any kind can be had, heavy soil taken 6 or 8 inches under the surface, with the natural moisture in it, may be used, although not so suitable as Sphagnum. Rose bushes have been sent from this country to Australia, packed entirely in layers of Sphagnum Moss, and have reached their destination in safety. Some years ago I packed in the backwoods of Canada, during the month of August, a quantity of roots and plants in Sphagnum, and unpacked them in Edinburgh during the month of January, all perfectly fresh, and I have also brought home many species of American tree seeds in Sphagnum Moss in a fit state for growing; while portions of the same seeds, brought home in canvas and paper bags, were incapable of germination. From my knowledge of the preservative powers of fresh Sphagnum Moss, and the nature of the wood and roots of the Ipecacuan plant, I have no hesitation in saying that roots, or plants with roots (the plants being previously divested of their foliage), might be sent home alive in the manner described. It is a curious fact, that Sphagnum Moss, of one kind or another, is to be found in almost every quarter of the globe. A few weeks ago, some plants of Anæctochilus, packed in Sphagnum at Singapore, reached this country in good condition, thus showing the wonderful preservative powers of the Moss.

VI. *Notice of Sicana odorifera*, Naudin (*Cucurbita odorifera*), Velloso, Flor. Flum. By Senhor Joaquim Correa de Mello, Camprinus, Province of St. Paulo, Brazil. Communicated by Daniel Hanbury, Esq. The fruits of this plant (Cucurbita odorifera, Velloso, Flor. Flum), as well as the plant itself, are commonly known by the name of Coroá or Curuá. Their odour is very agreeable, and excites a longing to eat them; the taste is sweet, and at first not unpleasant, but it soon nauseates, and to me is intolerable. Notwithstanding this, there are some persons, but not many, who eat them. The fruits may be kept for four or five months without decaying, and I therefore send them without preparation, hoping they may arrive in good condition. I have never seen Sicana odorifera truly wild, but always in cultivation, and I am uncertain in what province of Brazil it is indigenous. There are two plants of it in my garden, with stems about an inch in diameter, which are seedlings of last year, and which, this year, have flowered and borne fruit, and are still growing. A neighbour of mine, who also cultivates this plant, informs me that it lasts for many years. The description of Sicana as *herba annua gracilis* . . . given in the "Genera Plantarum" of Bentham and Hooker (i. 429), is not, therefore, very correct, at least for the plant as seen in this province. [A specimen of the fruit was exhibited at the last meeting of the Edinburgh Botanic Society, and presented to the Museum.]

VII. *Hints for Collecting Cryptogamia.* By Professor Dickie.

VIII. *Miscellaneous Communications.*

1. *Flowering of Eranthis and Leucojum.* A note was read from Dr. W. R. M'Nab, in which he said:—"I send a diagram showing the dates of flowering of Eranthis hiemalis and Leucojum vernum, in the Royal Botanic Garden, Edinburgh, for 20 years. In 1850 they flowered within four days of each other, in 1851 within five days—but one month earlier than 1850—in 1852 Eranthis was 15 days later, while Leucojum was one month; in 1853 Eranthis was one day behind 1852, while Leucojum was one month (February 21 to March 21); in 1854 Eranthis was a few days earlier, while Leucojum was more than a month earlier; in 1855, both very late, but within a day of each other; 1861, 1862, 1863, and 1864, are peculiar; in 1863, Leucojum flowered before Eranthis, while in 1864 Eranthis was in flower on January 1, much earlier than in 1863, Leucojum being three days later; in the other years they flowered pretty closely. The difference in the year 1860 are much less than in 1850." Mr. M'Nab, in making some remarks on Dr. M'Nab's communication, stated that owing to the frost being still in the ground, none of the spring flowers were at this date in bloom.

2. *Ruscus aculentus.*—Mr. M'Nab stated that Mr. Frere, Roydon Hall, Diss, had recently sent to the Botanic Garden a plant of the Ruscus aculeatus in flower and fruit. In a letter accompanying the plant, Mr. Frere remarks:—Sowerby said of Ruscus, in 1799, "the root is perennial, the plant itself is biennial, and for one winter evergreen." And Bentham writes:—"Stems said to be biennial, though apparently shrubby." It is possible that the flowers one year may be female, the next year male. On the question of sex, I find Linnæus ("Genera Plantarum") writes:—"Species datur floribus hermaphroditis," &c. And Irvine, "Introduction to Botany" (London, Nelson & Son, 1858), pp. 307, 308, gives as generic character:—"Flowers lateral, monœcious or dicœcious;" and as specific character, "Flowers dicœcious by abortion."—Professor Balfour remarked that he and Mr. Sadler had lately examined the flowers of Ruscus very carefully, and had found male and female flowers on the same plant, and male flowers alone on other plants.

3. *Cones of Abies.*—Mr. William Gorrie exhibited and presented branches and cones of (1.) Abies rubra, taken from a group of trees growing on the railway banks near Tynehead Station, in Midlothian, at an altitude of about 800 feet. The trees have been about 15 years planted, and are from 12 to 18 feet high. (2.) Abies rubra, from a group of trees growing in drained and improved ground, which must have once been marshy, in Dunmore Park, near Stirling, not 50 feet above high-water mark, seemingly about the same age as the last, and from 15 to 20 feet in height. (3.) Abies alba, from near Tynehead Station. (4.) Abies nigra, from Dunmore Park. Mr. Gorrie remarked that Abies rubra, the Red Spruce Fir, or Newfoundland Red Pine, is found in Nova Scotia, some parts of Lower Canada, and northward to Hudson's Bay, but is not included in Dr. Asa Gray's Flora of the Northern United States. It is said to be a taller and finer timber tree than either of its allies—the black and white American Spruces, from which it further differs in being entirely devoid of that glaucous green by which the leaves of these two are distinguished. It is, in fact, exactly like the common Norway Spruce in the colour both of its

foliage and young branches, but differs from it in its thinner and more slender growth, shorter leaves and much smaller cones. From this close resemblance in colour of the Abies rubra and A. excelsa, Americans call the latter the Red Spruce of Europe. Like the A. alba, the A. rubra drops its cones in the course of the first winter and succeeding spring, while those of A. nigra are retained on the tree for two or more years. Like its two American associates, A. alba and A. nigra, A. rubra seems to delight in moist soils containing a proportion of peat, and moist upland climates. Those now growing at Tynehead were reared from seeds gathered in Newfoundland, and a portion of the plants which were planted on good, dry, heavy soil, within from 2 to 3 miles, and at half the altitude, dwindled away after the first few years, till they entirely perished. The trees at Dunmore are no doubt growing at a low altitude, but they are sheltered by a high wooded bank on the south, and are on a damp bottom. Mr. Andrew Murray, a distinguished member of the Botanical Society, and recognised authority on Coniferæ, has ignored the existence of Abies rubra, but he has probably never seen it growing, as, although long introduced, it is still scarce in Britain.

LEICESTER: *February* 5.—Abstracts from Mr. Ingram's paper on "Plants regarded as Sanitary Agents" (*concluded from p.* 310):—

In my opinion there are few human ailments that are not attended and intensified by fungoid action, sent to prey upon all decaying substances or on any living things that show an impaired vitality. They may be reckoned as amongst the most active of Nature's scavengers, but as they are destructive in action, they are beneficient in conception; and we are taught by them that it is the Divine plan that evidences of decay and death should be quickly removed from the face of the earth. Combustion is an agent of great energy, but, generally controlled by human direction, its destructive agency is mitigated. Fire dissipates matters, and renders them in one sense innocuous. In our great centres of industry, where combustion is most active, and where accumulations of its products, dirt and ashes, are most extensive, vegetable action cannot be called into play. Fire lends wings to carbon, and the leaves, the lungs of plants, are choked by it. Fire leaves a residuum of carbon, which though not unwholesome is not productive as soil. Ground up, mixed and amalgamated, the ashes of our cities may some day do good service to our heavy lands, but this is one of the exchanges that town and country will have to make in the future. As a deodorising agent ready to hand, the ash from our household fires may often be usefully employed. The last polluting power to which I shall call your attention in my endeavour to estimate the extent and influence of the various causes, either natural or artificial, which tend to alter the form of primitive substances and leave a film of dirt is, labour. It has been said, 'It is scarcely so true that in all labour there is profit, as that in all labour there is dirt.' It seems impossible to alter the form, modify the quality or change the place of matter without a residuum of filth. We enjoy the results of labour in a thousand useful and elegant articles, but the chips, the dust and scraps, thrown off by the operation of the industrial arts, we do not so often see, but in the aggregate their bulk must be great. The collected waste of a large town like Leicester must be considerable: your staples, wool and leather, are borrowed from the country, and thus taken from the land: whatever waste remains should be restored to it. We are, at present, ransacking the world for stimulating manures. Sooner or later the necessity of more strictly economising all substances calculated to restore fertility to the earth will be more apparent.

Having thus considered some of the causes which contribute their quota of dirt to the world I will briefly advert to those sanitary agents which are found in the vegetable kingdom, to which Nature appears to have assigned the task of assimilating and reconverting the matters resulting from the waste of the animal creation. The beneficial action of trees and shrubs in a town consists not only in the work the roots perform of removing decaying matter from the ground, but they effect a further good. Plants absorb carbonic acid, and give out oxygen, and as in towns the air is vitiated by carbonic acid and other products of combustion, the multiplication of trees, shrubs, and plants, large and small, increases the volume of oxygen, which is the vital principle of the air, and so adds to the salubrity of every street or square in which they grow.

Trees are not alike, in taste or constitution, adapted by Nature to suit the varying circumstances found in the world, some thrive best in a rich, others in a poor silicious soil, some delight in a calcareous soil, others abhor it; hence all trees are not equally suited for planting in towns. Accustomed to the pure and freshening breezes of the mountain side, some of the Pines and Firs fail to grow in an atmosphere not altogether pure. The Cedar of Lebanon is a tree of wonderful adaptability, and should be introduced in the new plantations on the race-ground. The Wellingtonia appears to thrive everywhere, as do the Deodar and Lawson's Cypress. Deciduous trees with large woolly or hairy leaves are not suited for towns, the particles of carbon that float in the air resting on the leaves often destroy them. The smooth-leaved Lime, the Oriental Plane, the Sycamore, Elm, Ailantus, Chestnut, and Acacia are amongst the trees best suited for planting in towns. The Evergreen Oak is a noble tree, and it might be planted experimentally. The Aucuba, Holly, Laurustinus all do well in town gardens, and recent experience shows that many plants do exceptionally well, even in the smoke of great cities like London —the Chrysanthemum is an example. There are many climbing plants that while they embellish a house purify it, sending roots about its walls, where impurities are often found, and thus assisting to check all unwholesome exhalations, amongst which may be enumerated Ivy, Virginian Creeper, Clematis. Fruit trees planted against the wall of a house do more than embellish it; although the Vine is sufficiently handsome to grow even without hopes of fruit, it is one of the most valuable sanitary plants that can be employed, its roots travel far in search of the *pabulum* they love, and nothing is too gross for a hungry and healthy Vine.

We speak of the impurities of a town, and although the causes actually arise within it, the effects extend beyond its limits, and particularly when a river passes near which has been made a common sewer. Towns are as often injured in sanitary respects by the accumulation of matters which have been permitted to increase around them as by internal pollution. The palliative immediately suggested by the proximity of low lands surcharged with sewage is heavy cropping. I would intersect the fields with trees such as Willows, Poplars, and Alders, abolish permanent meadows, and grow Mangel Wurzel, Turnips, Beet, Italian Rye-grass, Cabbage, and such quick-growing vegetables, and keep the land constantly cropped. The poor sandy wastes of Barking Creek, in spite of the counter predictions of Liebig, have, when irrigated by London sewage, grown wonderful crops of Rye-grass.

A remarkable instance of the power of plants to divert malarious inhalations was lately related to me. Washington Observatory, U.S., is situated in a deadly marsh; the observer's assistants were killed off wholesale. Sunflowers were sown all round, and the period of greatest luxuriance was about the time when fever was most rife; the happy result was that fever disappeared, the plants luxuriating on the poison that had killed the unfortunate astronomers.

Trees draw up from the depths of the earth moisture that, charged with animal or other impurities, would otherwise appear in miasmatic exhalations; the moisture oxygenised by vegetable action is liberated into the air free from taint, and fit for human lungs. Trees present in their myriad leaves an immense evaporating surface, and the influence they exert on climate is greater than is commonly supposed. However animate and instinct with life the outward or aërial development of a living tree may appear, its terrestrial action is not less interesting. Although we cannot see, we may imagine the eager progress of the roots in search of food, penetrating the dark recesses of the soil, or rising to the surface where the ground is warm and rich, or stretching wide, led by some wonderful instinctive power towards soil more congenial than it found near the tree. The root action of a tree is not only wonderful in the mechanical force it exhibits in feeding the hungry living thing it sustains, but in the power of selection and repulsion possessed by these functions. It has occurred to me that trees or their roots might be employed as filtering machines about wells open to the suspicion of being tainted by the percolation of foul matters into the water within them; a network of roots round the well would probably keep everything of a nature calculated to render the water impure from passing in. Southey in describing the Well of St. Keyne and the efficacy of its waters, gives us a good practical fact with his beautiful poetry.

As we have seen, vegetable life is stimulated by the application to it in the soil of the various waste and refuse substances, the wrecks of humanity, the decay of animal matter, the results of the attrition of civilised life with the forces of the world. The solution of the question as to the disposal of the sewage may appear more practicable; we have hungry ground that might profitably be enriched by the waste of cities; we have plants the produce of which might be increased by being fed on the same substances; but that obstacle to ponderable bodies, space, intervenes, the collection, transport, and distribution of manurial matters from our great cities to our hungry soils is surrounded with difficulties, but as these are great so must our exertions be to overcome them. The earth is ready to absorb and deodorise matters up to a certain extent. The plants are ready to seize the substances placed in the earth and prepared by it for their food. Let, therefore, the earth and the plant as the means provided by Nature be employed both in town and country as far as practicable. The result will be purer air, better water, and enriched soil, that will give our teeming millions greater resources of food, which may be regarded more highly when it is considered the result of native skill, intelligence, and industry."

ROYAL INSTITUTION.—Dr. Maxwell T. Masters gave on the 1st inst. the first of two lectures on Plant Life as Contrasted with that of Animals. In his introductory remarks he stated that his object was to show what were the resemblances and the differences between the two kingdoms, not concerning himself with an exact definition of life or vital force, or of what constitutes a plant and what an animal. Even supposing that the so-called vital force be, as modern research tends to show, merely a form of physical force, that circumstance does not in the least destroy its marvellous character, or negative its divine origin. The lecturer then proceeded to contrast the mechanism of plants and animals respectively, and the manner in which that mechanism acts in the two cases. While there are very great differences between the higher animals and the higher plants, these differences vanish when we come to the simpler organisms, so that, either from their very simplicity, or from the fact that the lowest plants present the characteristics of the lowest animals, or *viceversâ*, it becomes impossible to draw any line of demarcation between them; and some naturalists have even preferred to make a third kingdom to include these intermediate organisms. With a view of showing how the same peculiarities of organisation occur in both animals and plants, Dr. Masters explained the nature of protoplasm, a substance common to both, and probably assuming animal or vegetable form in accordance with different conditions; and he then described the organisms, such as Bacteria, Amœba, Æthalium (a Fungus which overruns tan-beds, and which has extensile and retractile movements like the Amœba); the Gregarinæ (animals parasitic in the intestines of lobsters and other creatures), and the Protococcus. Some of these organisms are decidedly animal, and others as decidedly vegetable, but yet possess identical outward conformation, and, as in the case of the processes of 'segmentation' and of 'conjugation,' identical modes of reproduction. The main differences between plants and animals consist not so much in their mechanism, or in the way it acts, as in the results of its action. Thus plants and animals alike possess sensation, contractile properties, the power of movement of their organs, as well as locomotion: as is shown in the opening and closing of flowers, the movements of sensitive and climbing plants and of 'zoospores,' these movements being effected either by the contractile power of the protoplasm, by alternate turgescence and exhaustion of certain parts of it, or by ciliary motion. These movements are, as a general rule, excited by the same stimuli in animals and in plants. Although the processes of nutrition in plants and animals are essentially similar, the results are very different. The great distinction between them really consists in the chemical and physical nature of their food, and in the use they make of it. Animals alone have the power of digesting solid substances, and of improvising, if needs be, an internal digestive cavity or stomach for that purpose (as in the case of the Amœba). Plants have no internal stomach, and no power of digesting solid food within their body. Plants, again, are far less cannibal in their natures than animals; for while the latter derive their albuminous and fleshy constituents either from other animal tissues or from the nitrogenous parts of plants, plants have a power of fabricating albuminous substances from the constituents of atmospheric air, carbonic dioxide, water, and ammonia. This led to the subject of the gaseous food of plants, the consideration of which was deferred till the lecture on the 8th inst., our report of which we must postpone till next week.

Notices of Books.

Proceedings of the American Pomological Society.

The report of the twelfth session, 1869, of this enterprising Society, held in September last at Philadelphia, under the presidency of the Hon. Marshall P. Wilder, of Massachusetts, is now before us, and we are pleased to learn from it the deep and increasing interest taken in the raising and cultivation of all kinds of fruits. Everything would appear to be done on a gigantic scale in America, hundreds of new varieties of fruits, native and foreign, being yearly submitted for the opinion of the committee of this Society, and we feel bound to say that they appear all to be dealt with in a very careful and candid manner, and none but those well proven to be meritorious are admitted to the catalogue of fruits, which is indeed a model one, considering the great expanse of territory for which the different varieties are recommended.

In the raising of new hybrid Grapes our cousins are doing much, and making some decided advances. The native American Grape being of a much hardier and more robust constitution, is not nearly so liable to suffer from mildew as the European varieties, which, however, have the finest fruit. The object is to have the good fruit of the one with the constitution of the other; and this, which seems about to be realised, will be one of the greatest of acquisitions. A very interesting letter on experiments in hybridising the Grape appears from Dr. A. P. Wylie, of South Carolina.

A good many new Apples are noticed and spoken well of, figures being given of a few of them. There are also discussions on the fruits. Amongst the Strawberries, we observe that the Mexican Everbearing comes under notice. This variety has created some attention, and has been noticed in our columns at p. 1231, 1869. Mr. Meehan, who examined it at Detroit, considered it not a new species, but a variety distinct from the Monthly Red Alpine, and this opinion was generally confirmed, so that in this we shall have no decided acquisition. Wilson's Albany seems to be the favourite variety, while British Queen is almost struck off the rolls. We know not if in our damp climate the following can be turned to any account by our Plum cultivators:—"Dr. Underhill said he had grown the Plum, embracing the best varieties, quite successfully for many years by planting his trees so that their limbs hung over water. He created ponds purposely to surround them with Plum and Nectarine trees, because in so doing he had found by a sixteen years' trial a certainty of a crop." These precautions, it would appear, are taken to ward off the attacks of the curculio, which destroy the fruit; but it should be stated that in other parts of the Union no such results have been arrived at. A very good paper appears from the pen of Dr. Emerson, of Philadelphia, on "Agencies operating in the Atlantic States upon Fruit Culture." The Peach especially, it would appear, is yearly becoming more difficult of cultivation in the Northern States. "At one time the Peach tree seems to have been regardless of latitude, but now the region in which it is found to flourish in the older settlements is comparatively limited." Dr. Emerson argues that "when the first clearings were made, the Peach, a native of a warmer clime, had the shelter of the surrounding woods, which acted the part of the glasshouses and fruit-walls of Northern Europe. But after this natural protection had been removed, so as to let in the extremes of cold, the Peach was no longer able to resist the uncongenial influences." And in this we believe the doctor to be about right. In the opening address of the President a good deal is said about the deterioration and wearing out of varieties of fruit, a subject which we would have thought that as yet would not have to be mooted in the New World,

but so it is. Even the famed "Catawba and Isabella Grapes seem now to be failing." Who shall be able to tell us the cause of this? The facts, in many cases, we can ourselves confirm.

On the Medicinal Properties of Culinary Vegetables, and Esculent Fruits and Seeds. By B. Clarke, F.L.S., M.R.C.S., and L.S.A. Nichols & Son: Long Acre.

In this pamphlet Mr. Clarke relates an incident of his having been cured of indigestion and bilious disorder by having partaken of some Scorzonera, and then of his having distinctly observed the same property in leguminous seeds, especially in Lentils and Haricot Beans. He finds the same property in Asparagus, the Onion, and the Salsafy, and in many other vegetables [Taraxacum]; and he assures us that, taken in the way he recommends, they may be regarded as among the best remedies for indigestion and bilious complaints. Although Scorzonera had been known as useful in cases of indigestion or other disorders of the stomach, yet Mr. Clarke is probably the first to recognise this acknowledged fact as part of a general principle, including a large number of our esculents. He has particularly described certain methods of keeping vegetables so as to preserve their medicinal properties, and also of cooking them without injury to these properties; and, what perhaps is quite new, he has told us what quantity by weight or otherwise, a patient should take at one meal—as for instance, of Scorzonera, a quarter of a pound is sufficient. On fruits he has not said much, but those with whom Figs disagree will find some useful remarks on the subject.

Though not a total abstainer, he recommends the substitution of soups for ale and porter at dinner during the winter season, but they are to be made and taken in the manner directed, not at the commencement of the meal as is the custom.

Some stringent observations occur on the use of tobacco, with the effects of which he has become practically acquainted, through having tried it for a nervous affection; and he traces, as he believes, its injurious effects to the salivation it produces, thus confirming and extending the observation of Mr. Abernethy.* We recommend those who suppose that tobacco may be injurious to health, to consult what it here said on the subject. The *brochure* is inexpensive, and may, we believe, be generally perused with advantage to the public health, even though some of Mr. Clarke's notions may not stand the test of extended experience.

Florists' Flowers.

When at Edinburgh in September last, a good opportunity was afforded of inspecting the new Dahlias of the year at the Pinkhill Nurseries of Messrs. Downie, Laird & Laing. What this firm of noted florists is able to do with the Dahlia as an exhibition flower was abundantly proved at the International Horticultural Show held at Edinburgh, on which occasion they staged Dahlias scarcely inferior in quality to those usually seen at the London exhibitions. Though Dahlia exhibitions have to a great extent died out in the South, they are by no means wanting in the North, and a firm which exhibits largely, has to grow a great quantity of plants. Generally speaking, the Dahlia did well in the North during the past summer, and a pretty accurate estimate could thus be made of the usefulness of many of the new varieties for exhibition purposes. It will remain an exhibition flower for a long time to come, for there is scarcely a provincial exhibition of any note at which the Dahlia is not found to form an important feature, and as a general rule it is well grown. Even at some of the leading horticultural shows in Ireland, where, for many reasons easily understood, floriculture moves onward with less rapid strides than it does in England, the Dahlia was found to be generally as well done as anything else; and in contrast with some things that one would have thought could with comparative ease have been pushed on to a much higher level of cultural skill, the Dahlia was a decided gainer, though, as an invariable rule, the Irish exhibitors have yet to learn how important it is that the flowers should be cut younger than they are in the present stage of Dahlia exhibiting.

But to our floral review: and here it may be stated that while the general sum of results is obtained from trials of florists' flowers made in the South, it is as well to go northward as opportunity offers, so that cultivators there may learn something of the varieties best adapted for their district.

The style of cultivation adopted at Edinburgh is similar in character to that one is accustomed to see at Slough, Salisbury, and elsewhere; and when inspecting the well-grown plants on the traditional "quarters" at the Pinkhill Nurseries, it was easy to perceive that all that skill could devise was there put into operation to produce good flowers, and good flowers were produced that would have done no discredit to either of the above-named localities.

All the new flowers of 1869 were not represented, but there had been a large selection made from them, which embraced all the flowers that had obtained honours,—quite sufficient to supply a fair test of their worth as a season's productions. Taking the show flowers in their alphabetical arrangement, they come as follows:—Annie Neville (Keynes), pure white, good substance and form, and close full centre; an improvement on Miss Henshaw; does not require much disbudding, but rather late to flower. Commander (Bragg), bright golden-buff ground, the backs of the petals rosy salmon; a flower of good quality, and a most useful exhibition variety, to be depended upon, but of somewhat tall growth. Countess (Fellowes), pale ground, heavily tipped with magenta; a very showy flower, but comes so deficient in substance as to be unreliable as an exhibition variety. Eclipse (Turner), dark puce or plum, richly shaded; a fine shade of colour much wanted among Dahlias, and may be pronounced to be the best dark flower of the season. Emperor (Rawlings), bright claret, shaded with crimson, and tinted with purple; has excellent outline and finish, very useful, being pretty constant, and always usable, but does not stand strong growing, and should not be disbudded. Firefly (Turner), pale orange-red, vivid in colour, but comes too coarse, and cannot be depended on. Formosa (Fellowes), peach-blush, becoming suffused with purple as the flowers age; very poor, and cannot be depended on. Golden Fleece (May), golden yellow; a large, coarse, yellow flower, destitute of refinement, and not to be depended on, though reported to be constant. Heroine (Keynes), pale ground, suffused with rosy lilac; a good useful flower, colour good, and very pleasing; late flowering, and of dwarf habit. Hon. Mrs. Gerald Wellesley (Bragg), heavily tipped with dark purple on a pale ground, a great improvement on Harriet Tetterell; a nice medium-sized flower, very constant, and requires no disbudding. Indian Chief (Rawlings), claret-crimson, shaded with violet; a fine dark flower, very constant, and dwarf in growth. James Bennett (May), blush ground, veined and tipped with purple; very constant, and will prove a useful show flower; somewhat tall in growth. James Hunter (Keynes), golden ground, laced on the edges with orange-lake: in the North the golden ground was very bright, and the lacing much darker than when the flower was exhibited by Mr. Keynes at South Kensington; a very good flower, and wants disbudding, as it is so very free in blooming. Julia Wyatt (Keynes), creamy white; a flower of good build but wanting refinement, useful at times, but cannot be depended on at all seasons. King of Primroses (Rawlings), soft primrose, very pleasing; a variety that should not be disbudded but allowed to carry plenty of flowers; very free growth and capital habit, would make a good bedder. Lord Napier, a flower not to be depended on, flat on the surface, and so inclined to be coarse as to be useless as a show flower. Dawn (Turner), cream ground, tipped with bright rosy purple; a very pretty though somewhat small front-row flower, very constant and dwarf in growth. Goldsmith (Fellowes), primrose; poor, and not to be depended on; petals very rough, and tall growth. Iona (Fellowes), sulphur ground, suffused towards the edges with buff, and tipped with crimson-lake; useful as showing some novelty in colouring, but only second-rate in quality. Memorial (Eckford), pale rose, a very pleasing shade of colour; very fine in quality, and very constant; dwarf growth. Mrs. Dix, vivid deep crimson, a fine hue of colour, reported to be a beat on Lord Palmerston; comes pretty good, early in the season. Mr. Brunton (Eckford), white ground, with heavy lacing of deep purple; comes very fine in the early part of the season, but requires severe disbudding. One in the Ring (Keynes), pale ground, the petals slightly suffused and laced with bright purplish maroon; comes self-coloured towards the end of the stem, generally very constant, but somewhat tall growth. Purple Queen, a very pleasing shade of deep black purple; flower of good outline, but sunken in the centre, dwarf growth. Queen of Beauties (Fellowes), the ground colour blush, edged with bright magenta; very pretty and useful, but not of first-class quality. Redan (Fellowes), buff, but in the colder district of the North it comes considerably tinged with orange-lake; a fine flower, and promising to be useful to exhibitors, but must not be disbudded freely. Unique (Turner), sent out as "the flower of the year;" a very beautiful and pleasing flower, not over large in size, but of fine quality, and requires good growth.

Turning now to the fancy flowers, which are much less numerous than the show varieties, the following estimate may prove of service to cultivators:—Galaten (Fellowes), identical with a flower received under the name of Aline, so Mr. Downie informed me; white, flaked with rosy purple, a pleasing and distinct flower, of very good quality. Hero of York, very fine, constant, and novel in character, free, and of dwarf growth; a most useful exhibition flower. Lady Dunmore (Turner), sides of petals saffron, with bright crimson stripes, and distinctly tipped with white; good, distinct, and pretty; a flower to be depended on. Magdala (Fellowes), fawn ground, striped and spotted with maroon; a very coarse flower, useless. Mazeppa (Perry), scarlet, shaded and striped with deep crimson; a very good useful flower, quite constant and free, and of dwarf growth. Miss Annie, yellow ground, tipped with white, in the way of Miss Ruth, but not so good; flowers large and rough. Mrs. Pochin, very pretty and useful, remarkably free, and of dwarf growth. Monarch (Perry), bronze-buff ground, striped with crimson; a very useful flower, but inclined to be coarse; must not be grown too well or disbudded too much. Punch: this variety betrays a tendency to come without the purple stripe, which constitutes its fancy character; free and constant, but as so many of the flowers come self-coloured, not to be depended on as a fancy. Tabby Cat, a confused flower, very apt to come half self-coloured; good when caught in character, but hardly to be depended on. Triton (Fellowes), buff, heavily striped and tipped with maroon; not first-rate in quality, but to be caught good sometimes, though inclined to come hard-eyed.

So far as the North is concerned it may be safely stated that the new Dahlias of last year have well borne the test of a season's cultivation, and that some flowers of good qualities have been added to the lists of varieties in cultivation. Those who admire and grow the "lumpish and inelegant Dahlia," and cleave to it at a time when it appears to have sunk in public estimation, have reason to be proud of those who are constantly engaged in raising new varieties, and who do produce novelties in spite of those detractors, who assert that during the past ten years they fail to perceive any improvement in the Dahlia. Another writer, taking a more hopeful view, asserts that "when Dahlias are well grown, they are one of the most beautiful flowers in cultivation, but to grow them well they must have an anxious and industrious master, for their wants are rather craving from June to September." And there are hundreds of patient, laborious cultivators who grow for exhibition purposes, and love the Dahlia with a deep unswerving affection, who will heartily endorse the paragraph just quoted; and it is for the guidance of these that a criticism on the new Dahlias of 1869 is now set down. *R. D.*

Miscellaneous.

Poinsettia pulcherrima.—Among the various matters that engage a gardener's attention through the different seasons of the year, the providing a large and constant supply of plants for conservatory and indoor decoration during the winter months is one that requires a good deal of forethought and labour. There are a great number of plants now-a-days well adapted for this purpose, and among them Poinsettia pulcherrima has a strong claim on our attention. Its bright scarlet bracts are very effective, and they remain perfect for a very considerable time, which is a matter of some consequence. The floral envelops of this plant are generally largest and finest on young plants with only one stem, and as these are generally most useful for indoors, a number of young plants should be grown every season. These are easily raised from eyes from the previous season's wood, like Vines, put in early in April and plunged in a nice bottom-heat. As soon as they are rooted they should be potted off singly into small pots, using a compost of peat and loam, mixed with plenty of silver sand. When potted they should be returned to the frame or pit, and again plunged in a nice bottom-heat, and kept rather close for a few days until they begin to grow, when air should, at every favourable opportunity, be freely admitted. They should be freely sprinkled overhead with water when they require it; but care must be taken not to give them too much water at the root, particularly whilst they are plunged. Towards the end of June, or early part of July, they will be nice little plants, and will, if they have done well, require a shift into a larger-size pot about that time. After they are shifted into larger pots they will do very well in any of the vineries, if not too shaded, until September; but should be kept near the glass, that they may not be drawn. In September they should be put into the stove, and should be carefully watered and freely syringed overhead. In due time they will unfold their brilliant scarlet bracts. They should have every attention paid them whilst in flower. When they begin to go out of flower, water must be gradually withheld from them, and the plants should be rested in a dry part of the stove. In the spring the branches of the previous year should be cut down to within three or four eyes of the old wood. Shake off all the soil from the roots, and repot them into as small pots as possible, then plunge them in a nice bottom heat. When they have grown a little, and made some fresh roots, shift them into larger pots, and return them to a situation where they may enjoy a supply of bottom-heat. They will then grow rapidly, and in the course of a few weeks will again require a large pot. After that they will do in a vinery, if not too shaded, or they may be put into a stove. These large plants will bear several heads of flowers, and are very ornamental and showy, but the bracts will not be so large as those on young plants that only bear a solitary flower-head. —*M. Saul, in "Florist and Pomologist."*

Japan Chestnut Trees.—A shipment of 5000 of these valuable trees was received at this port a short time since, which are selling at 25 dols. per 100. This is the second large shipment of these useful trees. California will soon be stocked with the finest Chestnut trees in the world. *San Francisco Mining Press.*

Coffee a Disinfectant. — Experiments have proved that Coffee is a valuable disinfectant—a most powerful means, not only of rendering animal and vegetable effluvia innocuous, but of actually destroying them. A room in which meat in an advanced degree

* Mr. Abernethy, after receiving a guinea from a chewer of tobacco, who wanted to know how to cure a stomach complaint, added to him, "Keep your pills in your mouth," so it is related.

of decomposition had been kept for some time, was instantly deprived of all smell on an open coffee-roaster being carried through it, containing a pound of Coffee newly roasted. In another room, exposed to the effluvium occasioned by the cleaning out of a manure-pit, so that sulphuretted hydrogen and ammonia in great quantities could be chemically detected, the stench was completely removed in half a minute, on the employment of 3 oz. of fresh-roasted Coffee, whilst the other parts of the house were permanently cleared of the same smell by being simply traversed with the coffee-roaster, although the cleansing of the pit continued for several hours after. The best mode of using the Coffee as a disinfectant is to dry the raw bean, pound it in a mortar, and then roast the powder on a moderately-heated iron plate, until it assumes a dark brown tint, when it is fit for use. Then sprinkle it in sinks or cesspools, or lay it on a plate in the room to be purified. Coffee-acid or Coffee-oil acts more readily in minute quantities. *Illustrated Midland News.*

HYDRAULIC CEMENT. — An improved cement, which perfectly resists the action of water, and is designed for the ornamentation of buildings, has been proposed by Mr. J. A. Dubus, of Paris. The principal component parts are lime, silica, and alumina, the two latter being extracted from refractory clays. In order to bring about the formation of the double silicate of lime and alumina, sulphuric and boracic acid are added in small quantities. The proportions of the constituents are varied, according as the cement is required to set slowly or quickly. The proportions of the substance in the anhydrous state are—fat lime of first quality, 67.96 to 74.65 ; refractory, 27.18 to 42.89 ; sulphate of lime, 4.76 to 9.06 ; and boracic acid, 0.10 to 0.40. These set with varying rapidity, but are of equal quality, and ultimately attain the same degree of hardness. The substances are mixed, after being ground to a fine powder ; they are then made into bricks with water, baked at a white heat, and reduced to an impalpable powder, which is mixed with water, and used as cement.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

SIMILE as it may appear, it may be well to state that most plant cultivators make a great distinction between plants which are at this time in a condition to flower, and others which have finished flowering, or are now starting into fresh growth previous to their next blooming season. These ideas, if properly acted on, may assist the uninitiated in arriving at the proper mode of treating many subjects, because the blooming period may be greatly accelerated or retarded, according to the previous treatment. To illustrate the matter, we will take *Gardenias*, which, supposing they bloomed at a late period in the autumn, and to have since made a nice growth, will now again be showing flower buds rather prominently. These will, therefore, not need potting now, but should have alternate waterings with wholesome manure-water. Other Gardenias, however, which flowered about the middle of December, will not have made much growth if they have been kept since in a cool temperature. They will, therefore, be greatly benefited at this time by being shifted into larger pots and into fresh soil. All freshly potted plants should be kept in a nice warm moist growing temperature, if belonging to the stove or to the intermediate house. No plant, whatever structure it may properly belong to, should be kept in so cold a position that it would be at a standstill in the matter of growth. Fresh potting and immediate activity should be inseparable in practice, even if it is necessary to raise the temperature to attain that end. The fragrant *Gardenia citriodora* will just have finished its spring flowering, and should be treated in accordance with such considerations as the above. Train and properly regulate the young growths now forming upon *Stove Climbing Plants ;* if neglected at this time they soon become so entwined together, that it will not be possible to release and train them properly at a later date. *Tropæolums* of the tuberous or tricolorum section should have particular attention as greenhouse plants in this respect, as their growth will soon have been completed, and much of their beauty as specimens depends upon this. *Camellias* and similar *Evergreen plants* may now be occasionally syringed, if they have done flowering. Give more moisture to the inmates of *Stoves*, by syringing the plants, and by damping the floors, &c.

FORCING HOUSES.

Let me remind those intending to plant *Grape Vines* that the latter part of the present month. or the beginning of the next, is the best time to do so. The sooner, however, they are planted out into permanent quarters, the better, before there is the least activity either in root or brach. Besides, an early start now will insure a better summer's growth. Let the preparation of all borders be completed forthwith. Pot off young Vines struck from eyes into an open fibrous loam, with good rich dung. Give both top and bottom a mean temperature of 75° with a densely humid atmosphere, and pick off all tendrils as they form. *Vineries*, in all stages of active growth, should have an increasing degree of warmth commensurate with the increase of light. Those vineries which are just started, and which have outdoor borders, should be covered over with light dry litter by night, removing it every morning if the sun shines, or the temperature is at all warm, as by these means, simpleas the practice may appear to some, warmth will be collected by day and retained by night, to the great benefit of the plants within. In regard to *Pines*, as the sun has now gained considerable power, a corresponding increase of atmospheric moisture must be insured. Be careful in giving air not to let cold winds blow on to the plants. The average mean temperature should now be 63° by night, 71° by day, with an increase of 9° only by sunheat. *Peach* and *Nectarine houses* will now take up much time. The borders will, in many instances, want a good watering. The quantity of water they require can only be determined by those in charge. Avoid occasional surface sloppings, which are sometimes called waterings, and endeavour to deluge every fibre whenever water is required at the root. Syringe the trees twice daily. Let the day temperature by sunheat run up freely to 85° with plenty of air. I would advise that Peach and Nectarine borders—in houses where the fruit is now set and swelling—should have a good mulching of rich open manure at once, and previous to the root watering. Warm the water a little before applying it to the roots ; it should not be colder than 75°. Give *Strawberry Plants*, which are swelling their fruits, an abundance of water and liquid-manure alternately. *Fig trees* should now be syringed copiously. *Forced Beans* cannot well be damped too frequently, or have too moist a temperature, with air in proportion.

HARDY FLOWER GARDEN.

Grass-sward should now be rolled as much as possible, with frequent applications of the birch-broom to clean the grass. Beds of *Polyanthus* and garden *Primroses* which have not been freshly planted, should have a good mulching with sifted leaf-mould. Dig over all *American beds* where this has not previously been done. *Tulips* are looking well, considering the severe weather. Move the surface of the beds with the hoe, when dry enough, after all heavy showers. Bring *Rose-pruning* to a close with all despatch. Transplant *Seedling Hollyhocks* into permanent blooming quarters, and finish the removal of *Phloxes* of the decussate tribe so soon as the ground is fit.

HARDY FRUIT GARDEN.

Get ready all the necessary materials for the protection of *Wall-fruit trees*, especially *Apricots*, which will soon need such attention. The "Frigi-Domo" is the most useful for this purpose. Mulch all newly planted fruit trees where this has not already been done.

KITCHEN GARDEN.

Upon heavy tenacious soils little can be done unless a very drying period quickly follows. After the recent rains sow, when practicable, a succession of *Broad Beans*, such as Johnson's Long-pod ; also *Skirret* and *Lamb's Lettuce*, or Corn Salad. Finish transplanting autumn-sown, or what are often termed Winter *Onions*. Finally, prepare the *Asparagus beds* for planting when such an operation is intended. Where seed is to be sown in lieu of plants, it may be sown so soon as the beds are prepared. The plants should not be transplanted until their crowns begin to grow. *W. E.*

TOWN GARDENING.

PERENNIAL plants should now be divided, and be transplanted to the spots where they are intended to flower. The following sorts do well in towns, if the soil is fresh :—Asperula odorata (Sweet-scented Woodroffe) forms pretty tufts for front borders ; Epilobium angustifolium (Willow Herb) is valuable in shrubberies, as it thrives under trees ; Fraxinella alba flowers in spikes about 2 feet high, emitting an odour like that of lemon peel ; Hemerocallis flava (the Day Lily) has fine foliage and beautiful flowers ; Tradescantia virginica (common Spiderwort) is a showy blue flower, opening in the morning and closing in the afternoon ; Catananche cærulea, a very showy bright blue flower, about 18 inches high, which continues in bloom from July to October ; Iberis sempervirens (Evergreen Candytuft), a showy white flower in April ; Rudbeckia columnaris, a yellow flowering plant, very showy in the autumn ; Helleborus niger (Christmas Rose), a pleasing flower in January, if covered with a glass ; the double perennial Sunflower, a very hardy plant, 3 feet high, which will thrive where few other plants can exist ; Michaelmas Daisy, or Starwort, of which there are several varieties, flower freely and are very showy in autumn ; Golden Rod flowers freely in the most confined situations. The red and white varieties of Thrift do well in towns, and are fine things for edgings ; Veronicas grow freely and flower profusely ; garden Valerian will thrive under the shade of trees ; the double variety of Yarrow flowers freely from June to October. Where it is intended to furnish balconies and windows with plants, boxes should now be prepared for their reception. For strong growing plants, such as Ivy, and Virginia Creeper, the boxes should be not less than 18 inches deep and 9 inches wide. For ordinary window plants they may be made 7 inches wide and 7 deep, which will be quite large enough. These should be raised on short legs, and have the bottoms perforated and covered with broken pots, to secure good drainage. They should then be filled with three-fourths of sandy loam and one-fourth of rotten dung. Ivy should be planted in such boxes at once, and be secured to wirework ; flowering plants may afterwards be turned in at pleasure. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON, FOR THE WEEK ENDING WEDNESDAY, MARCH 9, 1870

1870. Month and Day.	At 9 A.M. Readings of				Hygrometer. Deficiency of Dew-point below Temperature of Air.		Weather at 9 A.M.	Rain in 24 hours.
March	Barometer reduced to 32° Fahr.	Dew-Point Temperature.	Wet-Bulb Thermometer.	Dew-Point.	Humidity.	Elastic Force of Vapour.		
	Ins.	Deg.	Deg.	Deg.		Gr.		
3 Thurs.	29.57	17.8	24.1	15.0	93	1.4		
4 Friday	29.60	37.0	40.7	10.1	87	3.5		
5 Satur.	29.05	37.0	35.3	32.7	88	2.2		
6 Sunday	29.51	37.1	35.3	32.6	82	2.1		
7 Monday	30.15	31.9	34.1	29.7	84	1.9		
8 Tues.	30.07	37.8	40.3	34.7	89	2.4		
9 Wednes	30.02	39.0	42.2	37.1	89	2.6		

1870. Month and Day.	Temperature of the Air				Wind		Rain
March	In the shade at 9 A.M.	Lowest in the Night.	Range in the Day.	Mean of the Day.	Mean Temperature of the Night.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
3 Thurs.	40.0	29.0	11.0	34.4	+ 2.2	E. to N.E.	228	0.09
4 Friday	43.0	34.0	9.0	38.9	+ 6.7	N.E.	520	0.03
5 Satur.	43.1	32.8	10.3	37.5	+ 5.6	N.E.	485	0.08
6 Sunday	40.8	30.1	10.1	34.8	+ 3.1	N.E.	190	0.00
7 Monday	42.1	31.1	11.0	36.7	+ 5.0	E.N.E.	160	0.00
8 Tues.	42.8	30.1	12.7	38.5	+ 7.0	N.E.	191	0.00
9 Wednes	47.8	37.7	10.1	42.0	+ 10.6	N.	265	0.02

March 3.—Generally cloudy and dull

" 4.—Overcast during early part of day, heavily during the early morning, and more or less throughout the night

" 5. Generally overcast, but fine

" 6.—Fine in the morning ; overcast all the afternoon, and rain during the night

" 7. Generally cloudy, with rain full during the afternoon

" 8.—Generally overcast ; slight rain at night.

" 9. Generally cloudy, rain very full during the afternoon

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, MARCH 5, 1870.

Names of Stations.	Temperature of the Air							Fall of Rain.
	Highest.	Lowest.	Range.	Mean of the Highest.	Mean of the Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth	50.1	35.5	14.6	45.0	37.7	7.3	41.3	0.00
Blackheath	49.7	33.5	16.2	44.6	34.1	10.5	39.3	0.00
Great Coxwell	50.2	42.1	8.1	50.9	41.5	10.4	45.1	0.03
Cirencester	51.1	42.0	9.1	49.7	40.5	9.2	45.0	0.02
Worcestershire	50.4	40.1	10.3	47.1	37.1	10.0	42.1	0.00
Leicester	47.0	29.7	17.3	44.1	27.5	16.6	35.8	0.01
Nottingham	46.0	32.2	13.8	43.2	30.7	12.5	36.9	0.00
Bawtry, Yorks	48.0	29.5	18.5	45.7	27.1	18.6	36.4	0.00
Sheffield	43.0	30.0	25.0	46.2	30.2	9.9	42.2	1.60
Liverpool	49.7	40.7	8.6	45.9	38.7	9.2	42.7	0.05
Manchester	50.2	39.0	11.2	46.8	36.7	10.1	41.7	0.00
Lancaster	55.8	41.1	14.7	52.5	39.5	13.0	46.0	0.10
Scarborough	53.8	39.5	14.3	48.7	35.5	13.2	42.1	0.10
Hull	49.0	36.0	13.0	46.1	33.7	12.4	39.9	0.11
Newcastle	52.0	44.0	8.0	45.0	39.0	6.0	42.1	0.48
Edinburgh	50.7	35.0	15.7	..	..	..	38.0	0.80
Glasgow	44.1	30.2	13.9	..	..	..	37.0	2.85
Perth	48.0	24.0	24.0	..	..	..	37.4	0.60
Aberdeen	38.2	28.0	23.2	..	..	..	33.1	1.09
Leith	44.5	28.9	21.5	..	..	..	37.7	1.42
Greenock	44.5	32.0	16.5	..	..	..	37.7	1.69
Leith	41.0	28.0	20.0	..	..	..	34.1	0.89
Perth	51.0	29.0	22.0	..	..	..	39.7	4.44
Dublin	53.0	31.5	21.5	..	..	..	40.1	1.51

JAMES GLAISHER

Notices to Correspondents.

BOOKS : *Amateur.* Grigor's "Arboriculture," published by Edmonston & Douglas, Edinburgh. *E. K.* Consult "Plan of Flower Gardens," published at 171, Fleet Street.

FLOWER BEDS : *T. S. P.* The beds may be broken up effectually and enlivened, after the Rhododendrons have passed blooming, by planting a few good Hollyhocks in the background and choice Phloxes or Gladioli towards the margins. The latter may be used very freely, and with very good effect.

FUMIGATING : *T. S. M., Thirsk.* We cannot tell you how much tobacco would be required "to destroy the green-fly and black thrip in a Vinery 33 feet long and 15 feet broad." You should be the best judge of that yourself. All depends upon the strength of the enemy, and the condition of the weather at the time of "smoking." Fill the house with smoke two or three times, at intervals of a day or two, choosing a still, damp evening for the operation.

FUNGI : *H. F.* Your Fungus is one of the most common forms of Xylaria Hypoxylon, Grev., the old Sphæria Hypoxylon, which occurs in almost every part of the world. *W. G. S.*

HOWEA BELMOREANA : *J. I.* This plant, as well as H. Forsteri, thrives well under the ordinary treatment of stove plants. It must be well drained, and not be kept too wet at the root.

INSECTS : *J. W.* The insect is a Coccus (Coccus Persicæ ?). You seem to have tried most of the plans which have been recommended for the destruction of this and similar pests. We do not believe that any insecticide has yet been found efficacious against them. Perhaps the best plan of any is to clean the bark of the trees as thoroughly as possible by a brush of as firm and hard consistency as can be used without injury to the bark. A horse-hair brush glove, such as is used for rheumatism, may do for the tender wood, and a bunch of heather or twigs may do for the harder and closer lying species. *A. M.*

MIXTURE OF SOIL FOR VINE BORDER: *Robt. Assur.* No exact proportion of materials for the growth of Vines can be given, as all, or nearly all, depends upon the quality of the materials to be used. Loam, being the principal material required, is such a variable article, ranging from sand to clay, from rich to poor, that the proportions of all the other ingredients must be regulated accordingly. The more clayey the loam, the more brick rubbish, &c., is required to give porosity; and the richer the loam, the less bones or other fertilising agent is required. If, as your loam is somewhat sandy, you add to three parts loam one part of brick rubbish, and to every cubic yard half a bushel crushed bones and rough charcoal, you will not be far wrong. The depth, 3 feet, is greater than need be. See to having the drainage perfect, or all will fail.

NAMES OF FRUITS: *Bucks.* Apples smashed to a jelly, in coming through the post. Apples and pears decayed.

NAMES OF PLANTS: *H. T. M.* 1, Nephrodium molle; 2, Lastrea dilatata; 3, Pteris scaberula; 4, Davallia tenuifolia; 5, Asplenium cuneifolium; 6, Asplenium bulbiferum; 7, Polystichum angulare proliferum; 8, Polystichum capense; 9, Pleopeltis Billardieri.—*H. F.* Asplenium dimorphum; increase by dividing the crown, or by spores.—*J. Hudgebb.* 1 to 6, Mosses and Hepaticæ, which, being horticultural, we do not undertake to name; 7, insufficient. The Polystichum is P. angulare proliferum.—*F. C. B.* (*Liverpool*). Aloe variegata, L.—*H. P.* Possibly Tropæolum brachyceras; but the leaf alone is insufficient.—*A. B.* One of the many Gesneras of the zebrina and cinnabarina section; but it is impossible to say which without flowers.

PEACH TREES NOT SETTING. *E. J. W.* If, as you say, the blossom on your trees is very abundant, it will be good policy to thin it a little now, before it expands. It was chiefly owing to the long protracted cold spring of last year that the loss of the Peach crop is to be attributed.

POTATO WATER: *A. B.* We do not think that water in which Potatos have been boiled is poisonous to any extent, at the same time we would not recommend you to drink it.

SOLANUM PSEUDO-CAPSICUM. *A. B.* asks if the berries of Solanum Pseudo-Capsicum and S. Capsicastrum are poisonous, and, if so, to what extent? Will they kill or injure poultry or children? Can any of our readers supply the information?

UNFRUITFUL VINES: *A Novice.* From what you say, it appears to us that your loss of fruit is to be attributed to immaturity of the buds, *i.e.*, badly ripened wood, or continuous excitement through bad forcing. A longer period of rest would be beneficial. Vines forced early, like yours, are apt to get weakened in condition after a course of years.

COMMUNICATIONS RECEIVED:—W. P. A.—T. C. B.—D.—A. D.—X.—J. H. M.—J. A. B.—A. P.—W. S.—J. H.

Markets.

COVENT GARDEN.—March 11.

The markets are but thinly attended, and the supplies of produce generally are quite equal to the demand. Cornish Broccoli is abundant and good. The rough descriptions of vegetables are, however, scarcely so good as usual, prime descriptions realising very good prices. Some new hothouse Grapes are offered at 21*s* per lb., and Strawberries remain at last week's quotations.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve ..	3 0	to 5 0	Lemons, per 100 ..	5 0	to 10 0
Cobs, per lb. ..	0 6	0 9	Melons, each ..	0 2	0 4
Chestnuts, p. bush. ..	8 0	14 0	Oranges, per 100 ..	6 0	12 0
Filberts, per lb. ..	0 6	0 9	Pears, per doz. ..	3 0	6 0
Grapes, per lb. ..	6 0	12 0	Pine apples, per lb.	8 0	10 0

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Asparagus, p. bund.	3 6	to 5 0	Horse-Radish, p. bun.	3 0	to 5 0
Artichokes, p. doz. ..	1 6	2 0	Leeks, per bunch ..	0 2	0 4
Beet, per doz. ..	2 0	3 0	Lettuces, p. score ..	1 0	2 0
Broccoli, per doz. ..	1 0	2 6	Mint, per bunch ..	1 0	1 6
Brussels Sprouts, p. ½ sieve ..	2 0	3 0	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz. ..	1 0	1 6	Onions, per bunch ..	0 4	0 6
Carrots, p. bunch ..	0 4	0 8	Parsley, per bun. h.	0 2	0 4
Cauliflowers, p. doz.	1 6	3 0	Potatos, new, p. lb.	0 4	0 6
Celery, p. bund. ..	1 0	1 6	Salsafy, per bundle .	1 0	1 3
Cucumbers, each ..	1 6	3 0	Scorzonera, do. ..	1 0	1 3
Endive, p. doz. ..	1 6	2 0	Seakale, p. punnet..	2 0	2 6
French Beans, p. 100	4 0	6 0	Shallots, per lb. ..	0 8	..
Garlic, per lb. ..	0 8	..	Spinach, p. bushel .	2 0	3 0
Herbs, per bunch ..	0 2	0 4	Radishes, per doz..	1 0	1 6
			Turnips, per bunch .	0 4	0 6

Potatos, York Regents, per ton, 75*s.* to 100*s.*; Flukes, do., 75*s.* to 120*s.*

POTATOS.—Southwark, March 7.

During the past week the arrivals coastwise have been limited, and towards the end of the week trade and prices improved for all good qualities. Quotations as follow:—Yorkshire Regents, per ton, 70*s.* to 100*s.*; Yorkshire Flukes, 90*s.* to 110*s.*; Lincolnshire Regents, 70*s.* to 80*s.*; Dunbar and East Lothian do., 85*s.* to 110*s.*; Perth, Forfar, and Fifeshire do., 70*s.* to 85*s.*; Ditto Rocks, 65*s.* to 70*s.*; French and Belgian Whites, 60*s.* to 65*s.*

WANTED, an ACTIVE PARTNER, in a small Nursery, Florist, and Jobbing Business in Islington. Long lease; £50 cash. Rent £35.
Apply to G. R., 35, Rotherfield Street, Islington, N.

Nurseryman, Florist, and Seedsman.

WANTED, by the Advertiser, a young and active Man as PARTNER in an old established Business near London.—Apply by letter only, to J. H., W. Bristow, Esq., 25, Laurence Pountney Lane, Cannon Street, London, E.C.

LANDSCAPE GARDENER. The Undersigned will shortly REQUIRE the services of a respectable, intelligent, active MAN, thoroughly experienced in Laying out Grounds and in all Measurements and Calculations connected therewith. Must be able to Draw neat and Accurate Plans to Scale. Good appearance and manners indispensable.—Apply, stating age, fullest particulars of experience, references and salary expected, to FRANCIS AND ARTHUR DICKSON AND SONS, Seed Merchants and Nurserymen, Chester.

WANTED, a steady, active, middle-aged Man, of good character, as WORKING FOREMAN in a small Nursery.—Apply, stating experience, age, family, and wages required, to WILLIAM PRITCHARD, Nurseryman, Shrewsbury.

WANTED, in a small Nursery, near London, a GENERAL WORKING FOREMAN.—One who understands Growing Plants and General Nursery-work. Must have a good character from last employer.—Apply, without delay, to MR. THOS. SURMAN'S, Lavender Hill Nursery, Wandsworth Road, S.W.

WANTED, a GARDENER, to grow Flowers and Plants for Market; must understand Budding, Grafting, and Glass-work.—Apply by letter, with references, to Mr. FOWKE, Heathrow House, Heathrow, near Hounslow, W.

WANTED, a GARDENER.—Must understand Vines, and Flower and Kitchen Gardening. Churchman and communicant preferred. Under-Gardener kept. State age, family, and wages required.—Apply to Mr. CLAYTON, at the Rectory, Washingborough, Lincoln.

WANTED, as GARDENER, a married Man, without children, to take charge of a small Kitchen and Flower Garden, with Vinery and Orchid House. Must thoroughly understand Forcing, Vegetables, and Fruit. Wages £1 per week.—R. H., Post Office, Kibworth, Leicester.

WANTED, in a Gentleman's Family, near London, a married GARDENER, without incumbrance. Wife as Laundress, both to reside and board in the house.—Address, with particulars, E. R., care of W. H. Smith & Son, Bookstall, Cannon Street Station, London, E.C.

WANTED, a YOUNG MAN accustomed to Plants, &c., and as Budder of Roses. One accustomed to Market Plants preferred.—M. Z., *Gardeners' Chronicle* Office, W.C.

WM. E. DIXON, Norwood Nursery, Beverley, Yorkshire, is in IMMEDIATE WANT of a YOUNG MAN who has served some little time amongst Specimen Plants, Orchids, &c.

WANTED, an active young Man, for NURSERY and OUTDOOR WORK; must be a successful Budder and Grafter of Roses, with reference and wages required, to E. & T. PERKINS, Leamington Nursery, Leamington.

WANTED, a good PROPAGATOR and PLANTSMAN; also FOUR MEN, accustomed to Nursery and Market Garden-work.—ADDRESS, MANAGER, Aldervale Nursery, Muckingford, Romford, Essex.

Seed Trade.

WANTED, as ASSISTANT CLERK, a young Man, with sufficient knowledge of the Trade to enable him to Invoice correctly. It is indispensable that he be a very neat and quick Writer. Also be well recommended.—Apply, stating age, salary expected, and all particulars, to Messrs JAMES DICKSON & SONS, Chester.

WANTED, a COWMAN, in a Gentleman's family; married, without family; a cottage found on the place.—Apply by letter to H. F., 43, South street, Grosvenor Square, W.

WANT PLACES.—Letters to be Post Paid.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, beg to state that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & Co. adopting the most stringent regulations in reference to testimonials as to character, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

MR. WM. PAUL begs to announce that he has made arrangements by which he will be enabled in future to furnish Gentlemen with the NAMES, ADDRESSES, &c., of GARDENERS, and GARDENERS and BAILIFFS, of varied qualifications, who are open to Engagements. The fullest particulars as to services required and wages given should be forwarded with application.—PAUL'S Nurseries, Cheshunt, Herts, England.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend, having personal knowledge of them.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, and wages required, so that suitable Men may be selected.—Highgate Nurseries, London, N.

GARDENER (HEAD).—Age 28, married; thoroughly practical, and fully competent in every branch of the profession. Good references.—H. D., Cheshire's, 14, Grove Road, Holloway, N.

GARDENER (HEAD).—Age 35; thorough practical knowledge of Gardening in all its branches. Two years character from last place.—A. Z., Post Office, High Street, Hampstead, N.W.

GARDENER (HEAD).—Married; has a thorough practical knowledge of the profession. Unexceptionable references.—A. Z., R. H. S. Gardens, South Kensington, W.

GARDENER (HEAD).—Age 37, married, no incumbrance; well skilled in all branches of the profession. Highest references.—B., 14, Wellington Square, Hastings, Sussex.

GARDENER (HEAD).—Age 33, married, 3 children; thoroughly and practically acquainted with the profession in all its branches. The highest references as to moral character, age.—A. Z., Mr. Coldrey, 62, High Street, Portland Town, St. John's Wood, N.W.

GARDENER (HEAD).—Age 32, married, one child; understands Vines, Pines, and Kitchen and Flower Gardening. Unexceptionable reference.—W. H. Y., Commercial Coffee House, Goswell Road, London, E.C.

GARDENER (HEAD).—Age 26, single; eleven years' experience in all branches of the profession, including Early and Late Forcing.—Gardener, Greenhouse Plants, and Flower and Kitchen Gardening. Unexceptionable references.—C. G., Post Office, Leicester.

GARDENER (HEAD).—Age 30; understands the profession in all its branches; also the Management of Land. Three and a-half years' good character. Good testimonials as to ability and qualification.—A. T., Post Office, Hayes, Kent.

GARDENER (HEAD).—Age 30, married; thoroughly practical in all branches of the profession. Can be highly recommended.—T. S., 5, Blythe Terrace, Stanstead Road, Forest Hill, Kent, S.E.

GARDENER (HEAD).—Age 36, married; thoroughly understands Early and Late Forcing, a good Plant Grower, and Kitchen and Flower Garden. Highest references and satisfaction of good character.—C. D., Mr. Jno. Christie, Leatherhead, Surrey.

GARDENER (HEAD), to any Nobleman or Gentleman requiring the services of a first-class practical Gardener in every branch of the profession, including Pines, Vines, Peaches, &c.—Age 44; ten years in last situation. Character will bear the strictest investigation.—G. FLETCHER, 23, Perry Street, Wolverhampton.

GARDENER (HEAD), age 38.—A Gentleman is anxious to recommend his Head Gardener (Scotch) to any Nobleman or Gentleman requiring the services of a practical industrious Man. Has a knowledge of Farming and Accounts.—A. C., Mr. Barron, Royal Horticultural Society Gardens, Chiswick, W.

GARDENER (HEAD), to any Lady or Gentleman requiring a thorough practical Gardener.—Married, no incumbrance; Hard and Soft-wooded Plant Grower, for Exhibition or otherwise; Flower and Kitchen Gardener, Early and Late Forcing. Eleven years' good character from last situation.—T. TODMAN, 120, Clapham Park Road, Clapham, London, S.W.

GARDENER (HEAD).—Middle-aged, married, no incumbrance; has a practical knowledge of Forcing, Fruit, Flowers, and Vegetables, and Management of Kitchen, Fruit, and Flower Gardens, and Pleasure Grounds. Can take the Management of Land if required. Character satisfactory.—T. S., Messrs. Osborn, Fulham Nursery, London, S.W.

GARDENER (HEAD).—WM. E. DIXON is desirous of recommending to any Lady or Gentleman a young Man as above, who thoroughly understands the Cultivation of Orchids, Stove and Greenhouse Plants, Ferns, the Forcing of Fruit, &c.; also the general routine of the Flower and Kitchen Garden.—Norwood Nursery and Seed Establishment, Beverley, Yorkshire.

GARDENER (HEAD).—Age 43, Scotch; great practical experience in Scotland, England, and Ireland; first-class in Grapes, Pines, Fruits, and Plants. Wife good Cook and Dairywoman, if wanted. Highly recommended by a Lady. Four years' good character.—S. D., 2, Burrow Row, Merton Road, Wandsworth, Surrey, S.W.

GARDENER (HEAD).—Age 30; 15 years' experience in Noblemen's and Gentlemen's establishments. Thoroughly experienced in the Culture of Stove and Greenhouse Plants, Pines, Vines, and all kinds of Forcing, and Flower and Kitchen Gardening. Good character from last situation.—A. B., Post Office, Hemyock, Wellington, Somerset.

GARDENER (HEAD), age 29, married, one child.—J. WRIGHT offers his service to any Nobleman, Lady, or Gentleman requiring the services of a first-class practical Gardener. Great experience in every branch of the profession, including the Management of Vines, Pines, Peaches, Cucumbers, Mushrooms, Forcing, Mushrooms, &c.; also Kitchen and Flower Gardening.—J. WRIGHT, Aston Rowant, Tetsworth, Oxon

GARDENER (HEAD).—EDWARD BENNETT, Osberton, Worksop, begs to offer his services to any Nobleman or Gentleman requiring a thorough practical Gardener, fully competent in every branch of the profession. Mr. Bennett's reputation for very extensive Improvements, and the Management of first-class Gardens. Leaving in consequence of the death of his late employer. Testimonials of the very highest order, with 11 years' unexceptionable character.

GARDENER (HEAD), age 44, married, one child, 10 years of age.—M. HAZEL, late Head Gardener to the Right Hon. the Earl of Stradbroke, Henham Hall, begs to offer his services to any Nobleman or Gentleman requiring a first class Gardener. Was 8½ years Farm Bailiff and Gardener to Mrs. Miles, Firbeck Hall; five years Head Foreman to Mr. Barron, Elvaston Castle; and two years with Mr. Barnes, at Lady Rolle's, Bicton. M. H. can have first-class testimonials from all the above.—63, Eversfield Place, St. Leonards-on-Sea, Sussex.

GARDENER (HEAD), or STEWARD and GARDENER.—Married, no incumbrance; Protestant, an Englishman. Great experience in every department of Gardening; thoroughly practical. Has had the charge of first-class Establishments in Ireland.—ALPHA, Mr. Whalley, 1, Queen Street, Dublin

GARDENER (HEAD, or SINGLE-HANDED).—Age 32, married, one child; understands Fruit, Vines, and Hothouses; also Flower and Kitchen Gardening. Good references from employer or Rector.—W. C. BROWNINGS, Burwash, Sussex.

GARDENER.—Married; understands every branch of the profession, with the Management of Vines, especially Hot and Greenhouse Plants, Forcing, &c.; skilful in Laying-out Pleasure Grounds. Good references.—GARDENER, Mr. Bacon, Newton Cottage, Grosvenor Street, Cheltenham

GARDENER (SECOND), or FOREMAN.—Age 23, single; has a practical knowledge of Vines, Pines, Melons, and Cucumbers, with the Management of Hard and Soft-wooded Plants.—Three years in last place.—G. MARSHALL, High Street, Tenterden, Kent.

GARDENER (SECOND), in a Nobleman's or Gentleman's Garden.—Age 26; understands Vines, Pines, Stove and Greenhouse plants. Good character.—A. B., 15, St. Anne's Terrace, Harlesden Green, N.W.

GARDENER (SECOND).—Age 30; has had several years' experience in Nursery-work; desires an Engagement in a Nobleman's or Gentleman's Establishment, where the whole routine of Gardening is carried out; well up in Propagating. First-class reference.—ALPHA P., Post Office, Brompton Road, London, W.

GARDENER (SINGLE-HANDED, or good UNDER not objected to).—Age 25; used to the general routine of a Gentleman's Garden for the last 4 years. Seven years' good character.—State wages, &c.; to C. M., Post Office, Stapleton, near Bristol.

GARDENER (UNDER), in a good Garden Establishment, under the Foreman.—Age 19; strong and active.—G. R. H., Post Office, Wolverstone, Ipswich.

GARDENER (UNDER), in a Nobleman's or Gentleman's Garden.—Age 25; well recommended. Two years' character.—T. J., Argyll Cottages, Richmond Green, Surrey.

GARDENER (SINGLE-HANDED), or COACHMAN and GARDENER.—Age 30, married; can be well recommended. Seven years' character from the situation he is now leaving.—A. B., Mr. Melady, Barn Elms Park, Barnes, S.W.

PROPAGATOR (FOREMAN), in a Nursery.—Has had great experience in the Propagation of Heaths, Azaleas, Camellias, Ixoras, Allamandas, Dipladenias, Hard-wooded Greenhouse Plants, Coniferæ, &c. Good references.—A. B. C., Mr. Joseph Lundy, Odd Fellows' Arms, Pockington, Yorkshire.

PROPAGATOR (GENERAL), or FOREMAN PROPAGATOR and SALESMAN.—Well up in Azaleas, Camellias, Coniferæ, Roses, Rhododendrons, &c., also out-door Budding; an expert Graftsman, &c.—M., North Street Nurseries, Bridgewater.

PROPAGATOR (SOFT-WOODED, &c.).—A young Man wishes to engage himself to a Nurseryman as above.—A. B., 8, Upper St. Michael's Hill, Bristol.

PROPAGATOR (HARD or SOFT-WOODED).—Age 27; suburbs of London preferred.—L. K., 21, New Street, Portland Town, Islington, N.W.

ESTATE AGENT (age 38).—A Gentleman wishes to recommend a thoroughly trustworthy Person, who has been in his employ for 13 years in the above capacity. He is an excellent Farmer and Wood Measurer, Valuer, and will receive the highest character. Salary £200 a year, with house.—A. B., Messrs. Dalton & Lucy, Booksellers, 28, Cockspur Street, London, S.W.

To Landed Proprietors.

LAND AGENT, or FARM BAILIFF. — A married Man (Scotch), of great experience in Buying and Selling Stock, and in Cultivation. Highest references as to character and ability.—W. W., 48, Bishopsgate Street Without, E.C.

FARM BAILIFF.—Age 40, married, respectable; practical and experienced, also understands the Cultivation of Hops. Wife understands Dairy and Poultry. Good reference.—M. MABBUTT, Langford Farm, Mid Lavant, Chichester, Sussex

BAILIFF.—Middle-aged, married, no incumbrance; can take the entire Management of a Farm, thoroughly understands the Management of Cattle, Sheep, Land Drainage, and Improvements generally, also Buying and Selling of Stock. Five years in last situation (first through whom he came being sold. Good reference.—F. D., West Brook Farm, Newton Longville, Bletchley, Bucks.

TRAVELLER, or SALESMAN with charge, combined with Book-work, in the Nursery and Florist Trade.—Age 30; can be well recommended.—T. C., Robertson & Scott, Advertising Agents, Edinburgh.

SHOPMAN.—Thorough practical knowledge of the Seed Trade in all its branches, combined with a knowledge of the Nursery Business. Nine years' experience.—G. H., Mr. McKeay, Walnut Street, Donegall Pass, Belfast.

SHOPMAN (or UNDER).—Age 26, single; good knowledge of the Seed and Plant Trades. Accustomed to Book keeping.—A. B., Post Office, Garston, Liverpool.

SUTTONS'
GRASS SEEDS
FOR ALL SOILS, CARRIAGE FREE.

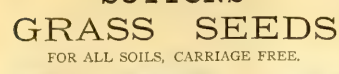

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS,

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils :—

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, Carriage Free. 2 bushels Grass Seeds and 12 lb. Clovers supplied per acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. MECHI, Esq., *Tittree Hall, near Ketsedon.*
February 5.—"Your Grass Seeds are so pure and well-selected that I have often spoken of them to those who required them."

From J. L. WILLIAMS, Esq., *Boyne View, Navan, Neath, Ireland.*
March 30.—"Last year I got from you Permanent Pasture Grass Seeds for 10 acres, with which I laid down one-half of a 20-acre field (Irish). I am very much pleased with the way the Grass Seeds have answered, and I now want to lay down the other half of the field in the same manner."

From THOS. LEVETT PRINSEP, Esq., *The Beacon, Kingswear, Dartmouth.*
December 24.—"Mr Levett Prinsep must speak in the highest terms of the Grass Seed supplied to him by Messrs. Sutton & Sons in the spring, and which has stood the past burning summer better than much of the turf."

From J. WARD, Esq., *Round Oak, Greenham, Newbury.*
July 4.—"The permanent Grass Seeds for about 29 acres, supplied by you last year (the greater part sown with Barley), have given me great satisfaction, and produced a crop (this dry season) of about 45 tons of good hay—four and a half acres of which have fed five head of cattle during the spring."

From E. H. NICKSON, Esq., *Foxby, Wem.*
March 9.—"The field I laid down with your Permanent Seeds is looking admirable."

From Rev. J. LEIGHTON, *Bisham Vicarage, Fleetwood.*
May 2.—"The Pasture I laid down with your Seeds last year has done beautifully, and seems to have attracted the notice of several of the farmers who live near."

SUTTONS' RENOVATING MIXTURE, for Improving Pastures, at from 4*s.* 6*d.* to 9*s.* per acre, should be sown in the spring.

This Mixture consists of the finest kinds of Permanent Grasses and Clovers, and will greatly increase the quantity and quality of succeeding Hay crops. The Pasture should be harrowed with heavy iron harrows previous to sowing, and bush-harrowed after sowing, and in some cases a top dressing of manure will be found beneficial. Sow 6 to 12 lb. per acre, according to the condition of the Pasture. Price 9*d.* per lb., 80*s.* per cwt ; Carriage Free.

SUTTONS' MIXTURES of GRASSES and CLOVERS,

so prepared as to produce very large crops for the specified periods they are to remain down.

For ONE YEAR'S LAY, 13*s.* 6*d.* per acre, Carriage Free.
For TWO YEARS' LAY, 17*s.* 6*d.* per acre, Carriage Free.
For THREE or FOUR YEARS' LAY, 22*s.* per acre, Carriage Free.

Special estimates given for large quantities.

SEPARATE NATURAL GRASS SEEDS,
CAREFULLY CLEANED.

Alopecurus pratensis	..	..	Meadow Foxtail
Anthoxanthum odoratum	..	..	Sweet Vernal
Agrostis stolonifera	..	..	Creeping Bent
Avena flavescens	..	..	Yellow Oat Grass
Cynosurus cristatus	..	..	Crested Dogstail
Dactylis glomerata	..	..	Round Cocksfoot
Festuca duriuscula	..	..	Hard Fescue
Festuca elatior	..	..	Tall Fescue
Festuca heterophylla	..	..	Various-leaved Fescue
Festuca pratensis	..	..	Meadow Fescue
Festuca ovina	..	..	Sheep's Fescue
Festuca rubra	..	..	Reddish Fescue
Festuca tenuifolia	..	..	Fine leaved Fescue
Festuca tobacea	..	..	Darnel leaved Fescue
Lolium perenne Suttoni	..	..	Sutton's Perennial Rye-grass
Lolium perenne Pacey anum	..	..	Pacey's Perennial Rye-grass
Lolium perenne sempervirens	..	..	Evergreen Rye-grass
Phleum pratense	..	..	Timothy
Poa pratensis	..	..	Smooth stalked Meadow Grass
Poa trivialis	..	..	Rough stalked Meadow Grass
Poa nemoralis	..	..	Woodside Meadow Grass
Poa sempervirens	..	..	Evergreen Meadow Grass
Trifolium repens perenne	..	..	Perennial White Clover
Trifolium pratense perenne	..	..	Perennial Red Clover
Trifolium hybridum	..	..	Alsike Clover
Medicago lupulina	..	..	Yellow Trefoil

Lowest price per cwt. or bushel on application.

SUTTONS'

HOME-GROWN FARM SEEDS.

SUTTONS'

FARMER'S YEAR BOOK FOR 1870,

Containing complete List of Prices of GENUINE FARM SEEDS, now ready, and may be had Gratis and Post Free on application.

ALL GOODS CARRIAGE FREE,

Except very small Parcels. Five per cent. allowed for cash payments.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

BATH and WEST of ENGLAND SOCIETY (Established 1777), and SOUTHERN COUNTIES ASSOCIATION.

ANNUAL MEETING at TAUNTON, June 6, 7, 8, 9, and 10, 1870.

President—The Right Hon. Sir S. H. NORTHCOTE, Bart., C.B., M.P.

STOCK and IMPLEMENT ENTRIES close April 20; POULTRY, May 16.

Prize Sheets, Regulation Papers, and Forms of Entry may now be had from the Secretary.

JOSIAH GOODWIN,
4, Terrace Walk, Bath.

*** For the Arts Department application to be made to the Hon. Secretary, R R M. DAW, Exeter.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AGRICULTURAL EDUCATION.

The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.

DIRECTORS.

Thomas Chapman, Esq., F.R.S.
Geo. Thomas Clark, Esq.
John C. Cobbold, Esq.
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The Right Hon. Viscount Combermere.
Edward John Hutchins, Esq.
William Tite, M.P.

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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.

Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.

The Money, with all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term.

No investigation of title necessary, and no legal expenses incurred.

Application to be made to ARTHUR MILMAN, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

THE LANDS IMPROVEMENT COMPANY.—(Incorporated by Special Acts of Parliament.)

DIRECTORS.

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Frederick L. Dashwood, Esq., Kirtlington Park, Oxford.
Henry Farquhar, Esq., (Messrs. Herries, Farquhar & Co.), 16, St. James Street, S.W.
Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
John Horatio Lloyd, Esq., 1, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.

The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.

The whole outlay can be repaid, or liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.

No investigation of title is required.

For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING and COMPANY (Limited), CORN, SEED, WOOL, HAY, MANURE, and OIL MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C. ; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

Seed Barley from the Chalk.

PEDIGREE CHEVALIER BARLEY, grown from Hallett's Seed, 50*s.* per quarter, or 7*s.* per bushel, free on rail. New Sacks, 1*s.* 3*d.* each

Also selected Samples from the best Growers of PAGE'S PROLIFIC and GOLDEN DROP BARLEY; PRINCE ALBERT BLACK TARTARIAN, BLACK POLAND, WHITE CANADIAN, WATERLOO, and WHITE TARTARIAN OATS.

SHIRREFF'S WHITE, RED CHAFF WHITE, and APRIL SPRING WHEAT.

Seed and Prices free on application.

RAYNBIRD AND CO. (Limited), Basingstoke, or Seed Market, Mark Lane, London, E.C.

Mangel Wurzel Seed.

H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL-TOP YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low.

Seed-Growing Establishment, Wisbech

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

FOR DISPOSAL, at a Rental, or otherwise, a FLORIST'S BUSINESS, within three miles of Covent Garden, in full working order. Every convenience for carrying on a large and lucrative business. All ready money
Mrs. BARBER, St. George's Tavern, Coleman Street, Camberwell, S.E.

To Florists and Others.

TO BE SOLD or LET, on long Lease, a fine FREEHOLD PLOT of about 2 Acres, with Dwelling House, Stabling, &c., fronting the main road, situate at Maidenhead ; well adapted for a Florist.
Apply to Mr. R. TANTON, The Nurseries, Epsom.

Camden Nursery, Southampton Street, Camberwell.

TO BE DISPOSED OF IMMEDIATELY, the LEASE and STOCK of the above old-established Nursery, in consequence of the death of the Proprietor, the celebrated Horticulturist, Mr. W. Barnes.

For particulars apply to Messrs. PROTHEROE AND MORRIS, Auctioneers and Valuers, Leytonstone, Essex, N.E.

SALES BY AUCTION.

Halam Nursery, near Southwell, Notts.

MR. R. WHITE will SELL by AUCTION, on the Premises at Halam, as above, on MONDAY, TUESDAY, and WEDNESDAY NEXT, March 14, 15, and 16, at 11 o'Clock each day, choice and valuable TREES and SHRUBS.

Particulars in Catalogues, which may be had post free by applying to RICHARD BRADLEY AND SONS, Halam, near Southwell; or, to the Auctioneer, Swan Hotel, Mansfield. An Omnibus will wait the arrivals at Southwell Station of the 7.55 and 8.50 morning trains, and convey passengers free to the place of sale, returning in time for the 4.22 afternoon trains

Hardy Plants and Bulbs,
FROM ENGLISH AND FRENCH NURSERIES.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, March 12, at half-past 12 o'Clock precisely, 2000 Standard and Dwarf ROSES, from the South of France; Standard, Pyramid, and Trained FRUIT TREES, fine THUJOPSIDES, PERISTERIA ELATA, LAUREL, BERBERIS, AUCUBAS, HOLLIES, BOX, CLEMATIS, RASPBERRY CANES, AURICULAS, CYCLAMENS, LABURNUMS, MAPLES, Choice GLADIOLI and RANUNCULI; Rustic Seats, Stools, Vases, Baskets, &c.

On view the morning of Sale, and Catalogues had

Consignment of Saccolabiums from India;

BARKERIAN, LYCASTE SKINNERI, ODONTOGLOSSUM GRANDE, &c., from GUATEMALA; PESCATOREA LEATA, EPIDENDRUM STAMFORDIANUM, from PANAMA; all in the best possible health, and many of them fine masses.

MR. J. C. STEVENS is instructed to SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, March 15, at half-past 12 o'Clock precisely, a very fine lot of SACCOLABIUM, believed to be the true S. Reedii, in excellent condition; also splendid plants of BARKERIA SKINNERI and SPECTABILIS, LYCASTE SKINNERI, EPIDENDRUM VITELLINUM and ODONTOGLOSSUM CITROSMUM, together with EPIDENDRUM STAMFORDIANUM and PESCATOREA ELATA, and other well-known and popular kinds, the whole quite free from frost

On view the morning of Sale, and Catalogues had

Burghley Park, Stamford.
IMPORTANT SALE OF SHORTHORNS.

MR. STRAFFORD has the honour to announce that he is favoured with instructions to offer for SALE by AUCTION, without reserve, on THURSDAY next, March 17, at the Dairy Farm, Burghley Park, about THIRTY HEAD of SHORTHORNS, the property of the Most Hon the Marquis of Exeter, including some superior Young Bulls, and a choice selection of Cows and Heifers, descended from the original herd, so long and carefully bred by the late Marquis of Exeter, as well as others from the stocks of the earliest breeders and improvers of Shorthorns. The Sires lately used have been principally of Kirklevington descent.

Catalogues, with pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. WALTON, Burghley Park, Stamford.

Important Sale of Shorthorns and Sheep in Notts.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on THURSDAY, April 7, at 1 o'Clock precisely, at Morton Grange, Retford (on the farm recently reviewed in the Royal Agricultural Society's Journal), the entire HERD of very superior SHORTHORN CATTLE belonging to Mr Hodgkinson, all pedigreed, and including Cows, Heifers, and Bulls, bred for many years from the stocks of Mr John Hall, Mr J. Armstrong, and Mr. G. Bland; Bulls, combining the blood of Earl Spencer's and Messrs. Bates' and Booth's noted animals, have of late been used. The Cattle are in healthy condition, the herd being excellent milkers.

Also will be offered, about THIRTY very choice LONG-WOOLLED RAM HOGGS, some well trained SETTER DOGS, and a few YOUNG PUPPIES, all of Prize Blood.

Catalogues, with Pedigrees, may be had of Mr. JOHN THORNTON, 15, Langham Place, Regent Street, London; or of Mr. HODGKINSON, at the Farm.

Very Important Sale of Shorthorn Cattle,
At SHOLEBROOKE LODGE, TOWCESTER

MR. JOHN THORNTON will SELL by AUCTION, without any reserve, on WEDNESDAY, April 13, at Sholebrooke Lodge, Towcester, the FINE and VALUABLE HERD of SHORTHORNS belonging to R. F. Oliver, Esq. The Sale will comprise the whole of this very celebrated and fashionable Stock, with the exception of the Grand old Cherry Duchesses, and the Heifer and Bull Calf of 1869, 14 years old, and Four Calves. Among them will be found the Lady and Wild Eyes, two Kirklevington tribes; the Sweethearts, Frills, Baronesses, Hearsleets, Oranges and other excellent families, the exquisite Bull of which the sons and daughters have been the highest sales from which they were carefully selected. Grand Duke 7th (19,877) is the sire of a large number of the animals, and some of the cows and heifers are in calf to Mr. Bates' Grand Duke 3rd (23,845).

Catalogues with pedigrees will be issued in due time and announced.

London: 15, Langham Place, Regent's Street

Stoke Newington, N.
CLEARANCE SALE of NURSERY STOCK, GREENHOUSES, the ERECTION of SHOP, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by James Kirtland, to SELL by AUCTION, on the Premises, the Albion Nursery, Albion Road, Stoke Newington, Middlesex, on MONDAY, March 21, at 12 for 12 o'Clock precisely, without reserve (the ground being sold, and required immediately for building purposes), the whole of the valuable NURSERY STOCK, comprising 3000 Aucubas, Standard and Dwarf Green Box, 3000 Rhododendrons, Euonymus, Berberis, Ligustrums, and thousands of other useful Evergreens; 2000 Limes and Poplars, Mountain Ash, Chestnuts, Willows, Almonds, and thousands of clean-grown Fruit Trees, many in fine fruit-bearing condition; 1000 Ivies and other Hardy Climbers, together with 3 Greenhouses, measuring respectively 60 feet by 12 feet long; also the Erection of Seed Shop, Hot-water Piping, Coil Boiler, Nest of Drawers, &c.

May be viewed three days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

N.B. The remaining portion of the Ground must be cleared in May next, when another Sale will be effected of the 7 Span-roof Greenhouses, Iron Frames, Hot-water Pipes, Fittings, &c.; also the whole of the choice Greenhouse and Bedding Plants, including specimen Camellias 20 feet high.

Alteration of Date.

MESSRS. PROTHEROE AND MORRIS respectfully inform the Public that their ANNUAL SALE of CAMELLIAS, AZALEA INDICA, Standard and Dwarf ROSES, FRUIT TREES, SHRUBS, &c., advertised to take place at the City Auction Rooms, 38, King Street, City, on Tuesday, March 15, is POSTPONED to TUESDAY, March 22, to commence at half-past 12 o'clock precisely

On view the morning of Sale. Catalogues had at the Rooms, as above, and of the Auctioneers and Valuers, Leytonstone, N.E.

The Agricultural Gazette.

SATURDAY, MARCH 12, 1870.

IT seems from the recently published Report of the Rivers Pollution Commission, that there are in England just about the same number of "man" as of sheep. Surely this is a fact which ought to awaken agriculturists to the importance of a subject which they have hitherto neglected. The fertility of the light lands of this country depends mainly on the sheepfold ; and the sheepfold is so efficient chiefly because the whole excrement of the animal is deposited on the soil. There is no reason why "man" should not be as useful a sort of farm stock as sheep. The whole excrement of a well-fed animal is in his case, in all watercloset towns, laden on a vehicle which will carry it to the plants it is to feed. Mr. MECHI has pointed out that the manure of our farms, amounting on the average of England to that of less than three sheep per

acre, spread abroad throughout the soil by the rainfall, is really taken up and distributed by a greater quanty of water than that which in sewage dilutes the excrement of a corresponding number of better fed animals.

The subject is in fact being pushed home to the convictions of those who occupy the land, and accordingly one of their best representatives in this country—the Farmers' Club—has again discussed it, under the guidance of such trustworthy men as Mr. BAILEY DENTON, Mr. HOPE, V.C., Mr. MECHI, Mr. C. S. READ, M.P., Mr. J. THORNHILL HARRISON, C.E., Mr. EDMUNDS, of Rugby, and Mr. JAMES HOWARD, M.P.

Mr. J. BAILEY DENTON'S excellent paper on the subject last Monday met with a most favourable reception, and the general impression obviously was that progress was being made in this new branch of farm practice. At any rate it was made plain to the audience that whatever farmers may think of the subject, townspeople are beginning to think more and more of their property in town drainage.

A letter from Mr. BALDWIN LATHAM preceded the discussion, in which attention was drawn to the mine of wealth which the sewage of towns will prove to their inhabitants. At Croydon the authorities have recently refused the very handsome offer for their sewage farm at Beddington of £3000 a year, or £11 per acre, because they contemplate making more of it themselves. Mr. LATHAM expressed his opinion, however, that the growth of cereal crops under sewage will not pay, but that Italian Rye-grass, and a variety of root crops, will yield highly remunerating returns.

Mr. HOPE, V.C., although agreeing with Mr. DENTON'S paper in the main, yet differed from it in two particulars—as to the number of persons whose sewage was required to manure an acre—and as to the degree of dilution of the sewage most advantageous for application. He found it advisable, for example, to dilute the sewage of Romford, because too strong in its ordinary condition. He also referred to the greatly diluted state of the North London sewage used at the Lodge Farm, Barking, and the success which followed its application. Mr. HOPE put great stress upon the adoption of a proper succession of crops for turning to the best advantage the sewage of a given number of inhabitants, thus extending the area over which a given quantity of sewage could be used. He also pointed out the crops best suited for sewage farming. The quantity of Italian Rye-grass which could be grown in ordinary seasons was 70 tons, at ten cuttings, per acre; and this would, when converted into milk under good management, yield 15*s.* per ton at 2*d.* per quart: 50, 60, and 70 tons of Mangel Wurzel could be grown per acre, and the extra weight, as compared with crops grown by farmyard manures, was easily accounted for by the irregularity of growth and wide gaps which he had often measured under ordinary management. Mr. HOPE then drew attention to the high market value of Cabbages, and other market-garden crops, grown by sewage, as compared with crops grown in the usual way—quoting an example where he had obtained nearly double the price for sewaged Cabbages that he had realised for those grown by farmyard manure; and he concluded by stating that he commenced sewage farming at Romford with every confidence and promise of success—both to himself and the inhabitants.

Mr. SMITH followed with remarks upon his Mangel Wurzel-cake, with which, however, not being directly related to the subject on the card, he did not proceed.

Mr. MECHI took for his standpoint the national importance of the subject—which he had persistently advocated for the last 27 years, during 20 of which he has himself practised the liquid manure system of hydrant, hose, and jet. He drew from the report of the Rivers Commission a contrast relative to the droppings of 2½ sheep per acre, diluted with a rainfall of 26 inches, or of 2600 tons of water to the acre, as compared with the sewage of 2½ persons, diluted with 60 tons of water apiece per acre, equal to 150 tons dilution, corresponding to only 1½ inch of rainfall per acre. How was it that farmers objected to the latter dilution—150 tons per acre—as being enough to render the manure worthless, if not ruinous to the land, but did not object to the former? He also called attention to the small area of land yet under sewage-farming, and the small returns yielded by the sewage of a population of 30,000,000 of inhabitants. It was, however, satisfactory to find how popular the subject of sewage-farming is becoming as compared with what it was when he first advocated the cause. No doubt the time was coming when the sewage of towns will be sent to the country as some compensation for the enormous draught upon the country which they now make.

Mr. C. S. READ, M.P., spoke highly of the moderation of Mr. BAILEY DENTON'S paper. He thought that sewage-farming was a much more comprehensive subject than appeared to be contemplated by those who placed its mainstay upon market gardening. Attention ought to be turned, he believed, to the possibility of artificially drying Italian Rye-grass, and he referred to Mr. GIBBS' drying machine as an example of high promise. It was a well-known fact to those who farmed grass-land, that unless they could convert a fair proportion of their Grass into hay they could not farm profitably, and the growth of Grass under sewage farming would be found no exception to this familiar rule.

Mr. J. T. HARRISON, C.E., entered upon a long £ *s. d.* criticism, chiefly of the report of the Rivers Commission, which, upon the whole, was not in favour of sewage farming yielding much profit to the farmer. He thought more land was needed for the utilisation of sewage than Mr. HOPE had stated. He then advocated the dry-earth system at some length, showing that night-soil paid the farmer better than liquid sewage, and arguing that the dry-earth system had a far more extended applicability to the circumstances of towns than was generally admitted. He entered upon a searching examination of the Rivers Commission Report, recently issued, drawing from it conclusions as to the practical value of town sewage, both to the farmer and the ratepayer; and his estimate was much below that of any of the previous speakers. The expenses of sewage farming were indeed greater, and the profits less, than were generally admitted. It was probable that market gardening might mend the matter to some extent, but if all went in for market gardening he was doubtful if a paying market would be found for the produce. He did not think the Rivers Commission had made out a satisfactory balance-sheet either for farmers, the town, or the country generally.

Mr. EDMUNDS laid before the Club his rather unfavourable experience at Rugby as to farm profits, declaring, however, that it was perfectly satisfactory from a sanitary point of view.

The CHAIRMAN had inspected the Edinburgh meadows and those of Milan before recommending the application of the sewage of Bedford to land. Bedford was greatly to increase the area of its land in the utilisation of its sewage, and he thought that would be a very general experience. He differed from Mr. HOPE as to the dilution of sewage, thought Mr. HARRISON'S conclusions illegitimate, and agreed with Mr. READ as to the importance of Mr. GIBBS' drying process. As to the dry-earth system it was only suitable for small places, and could never be effectually controlled in large towns.

Mr. J. BAILEY DENTON very briefly replied to Mr. HOPE and Mr. MECHI, maintaining his assertion that effluent drainage with greatly diluted sewage would be found more and more a difficulty as we advanced in sound sewage practice. Turning next to Mr. HARRISON'S deductions, Mr. DENTON directed attention to the fact that throughout his paper he had clearly shown that sewage farming is now an established practice, and that therefore it formed a branch of practical education in which we were improving every day. It was illogical to hold up the results of a mere childhood from which to infer the possibilities of future years. Past experience could never be laid down under such circumstances as the rule of our guidance; and for a similar reason the Rugby shortcomings, brought under notice by Mr. EDMUNDS, fell through. No failure in the past could be a conclusive proof of failure ultimately. He fully agreed with the opinions of Mr. READ and Mr. HOWARD, that GIBBS' process of drying deserves attention. He had indeed professionally drawn the attention of the Royal Agricultural Society of England to its merits at the Manchester Meeting.

The reader will find in other columns not only Mr. DENTON'S paper, but other communications on the same subject. We make no apology for filling so many of our pages with the discussion of a subject which is just now of foremost agricultural importance.

—— THERE was an advance of 1*s.* per quarter on Wheat in Mark Lane on Monday, owing to a short supply of English Wheat.——In the Metropolitan Cattle Market the supply was in excess of the demand, and trade was dull.

—— At the meeting of the Central Chamber of Agriculture on Tuesday, a resolution on the Government Education Bill was adopted, in which the proposed 12 years' school age was condemned as likely to inflict great hardship in country districts. Ten years was preferred as the age beyond which children might leave school.

—— On Tuesday afternoon a very large number of gentlemen, deputed by the Chambers of Agriculture throughout the country, waited upon the CHANCELLOR of the EXCHEQUER, to urge questions connected with the malt duties upon his consideration. Colonel TOMLINE, M.P., introduced the deputation. Mr. J. A. CLARKE stated that a meeting had that day been held of the Central Chamber of Agriculture, which represented 72 Chambers of Agriculture in 40 counties of England and Wales, with a constituency of 17,000 members, and at this meeting the deputation had received instructions to lay before the CHANCELLOR of the EXCHEQUER certain points with reference to the Excise duty on malt. These points he proceeded to adduce. The Malt-tax was prejudicial to the agricultural interest because (1) it interfered with most remunerative rotations of crops, and limited the growth of Barley—(2) it discouraged the growth of medium classes of Barley, for, owing to the payment of a heavy duty, which was not on an *ad valorem* scale, the maltster could not afford to give for that Barley anything like so much as its value. This virtual bounty upon first quality Barley operated as a fine upon high farming; for the production of very heavy and prolific crops was incompatible with the preservation of the most superior quality for malting purposes. —Then (3) by the Excise restrictions, farmers were deprived of a source of their profit in their business from the use of malt and grain as food for animals. But for these restrictions, by the simple and inexpensive process of germinating, farmers could convert their medium and inferior classes of Barley into a valuable food, containing 20 per cent. more of flesh-forming constituents and 100 per cent. more of sugar than the raw grain, while it was calculated this most nutritious food would cost the farmer only one-half as much as the same Barley made into malt and charged with duty. The farmer was prohibited from using his own germinated grain, and thus protecting himself to a large extent against the adulterated feeding stuffs which now victimised him in the market.—The English farmer, too (4), was placed at a disadvantage as compared with the foreign farmer, who was free to use the germinated grain without payment of duty, and to compete in our meat markets against home produce which the English farmer was not allowed to rear and fatten by the same means as the foreigner. Mr. GLADSTONE'S "Malt for Cattle" Act was inoperative, because of the expensive and wasteful character of the feeding mixtures which it alone permitted to be used, and because of the obstructive and vexatious conditions which were imposed by it.—The incidence of the tax fell (5) with peculiar pressure upon the labouring classes by artificially enhancing the price of the national beverage, thereby encouraging the use of unwholesome and deleterious compounds, and, by interfering with cottage brewing, acted injuriously upon the comforts, habits, and morals of the poorer families.—Mr. CLARKE then showed that the total of malt duty paid amounted to £9,425,000 for £6,500,000 received by the revenue, there being thus an absolute loss of 45 per cent. upon the duty collected. — The agriculturists maintained that the question of freeing the malt liquors from taxation should be entirely disassociated from that of lightening the taxation upon spirituous liquors, and in the absence of an important reduction or total repeal of the Malt-tax, great relief would be afforded to agriculturists by transferring the incidence of the burden from malt to beer.—Mr. ROWLEY, of Cheshire, then advocated the repeal of the malt duties on the ground that such a course would encourage agriculture in Ireland, the soil in that country being only fitted for Oats and Barley; while the continued imposition of the tax would operate as a bar to the growth of Barley in that country, as only second quality Barley would grow there.—Mr. MAY, of Staffordshire, pointed out that, as the shilling duty had now been taken off Wheat, England would have supplies of grain from all parts of the world, and that it would be impossible for the English farmer to compete against this importation. If Mr. LOWE could see his way to taking off the whole of these duties he would be benefiting the farmers by doing it.—Mr. SEAMAN proceeded to detail the results of experiments made in feeding stock with Barley, and declared that with untaxed Barley he could keep his sheep, even when the pastures were dried up by such a drought as that of 1865, at no higher price than at present, but at that period when, as the *Times* then said, "as far as meat is concerned, a famine is at our doors," he had notice from the Excise that he was not to use Barley for feeding sheep.—Mr. GARDINER, of Essex, created some laughter by producing small parcels of various substances which he laid before Mr. LOWE, and declared that of such "stuff" the farmer was supplied with

"feeds" for his cattle, while Barley, which was a little more than £7 a ton, was enhanced to a price of upwards of £13 a ton by the imposition of a duty of £6 1s.—Mr. Whitwell, of Peterborough, urged that the repeal of the tax would be beneficial to the agricultural labourer.—Mr. Lowe asked if it were possible to transfer the collection of the tax—he did not say that doing so would be so good as taking it off altogether—but supposing that it could be transferred from the maltster to the brewer, would that be considered a relief—[The other words of the speaker were lost in the loud cries of "Yes," mingled with loud cheers].—Mr. Latimer, amid laughter, in which Mr. Lowe joined, urged that, as the brewers had complained of the Hop-tax of 3*d.* in the 40*s.* as too insignificant to put upon the consumers, an opportunity should be given to that class of producers to recoup themselves by adding the malt duties to the Hop-tax in the shape of a brewers' licence, to be levied upon all brewers alike.—Mr. Lowe, in reply, said, it was impossible to levy a tax upon one article of produce which brought to the revenue £7,000,000 without an interference of a most embarrassing character. He would also say that he considered it most undesirable that so large, important, and respectable a portion of the population as that represented before him, should live in a state of chronic discontent. It was not for him to suppose that their feelings were exaggerated upon the subject of these duties, but, as to taking off the duties, he must say that the thing was impossible. All these duties on spirits and liquors hung together as a whole, and to take off one would unsettle all. If he had the power he should not recommend the abolition of the duties, but whether the Government would be able to reduce the tax was a question which, with the other points placed before him, would receive very careful consideration. The whole subject was being looked into by the Government, but there were difficulties in levying the duties when the produce reached the maltster. How could this be done with the private brewer? The matter was being looked into, and without making any promise he might say that the complaints of the deputation seemed reasonable and fair, and it would not be for want of good will towards them if he could not assist them.

—— Lord Kinnaird has published a statement of his experience in Steam Cultivation, which he asserts to be all in favour of the economy as well as efficiency of steam-power as compared with horses.

"The difference between steam machinery (one engine) and stocking with horses would, in the first instance, be about a-half more for steam; but taking into account the fact that at the lowest estimate all the horses would require to be renewed at least once during a nineteen years' lease, the difference is not so great as would at first appear:—

Assuming the cost of engine, 14-horse power, and the implements at	£1100
The saving in stocking a farm would show thus:—	
A fixed engine and buildings	£150
On a large farm requiring seven or eight pairs of horses four pairs at least may be saved.	
This cost price with harness, at £50 per pair	360
And a second set during a 19 years' lease	360
	870
Excess for steam cultivation with single engine ..	£230
Excess with two engines	730

In a larger farm the saving in cost of horses would be greater, taking into account the very important item that the steam horse does not eat when not at work. The wear of wire rope is much greater with the clip-drum, and in stony ground than in clay. My present rope has been in use for three years, and is perfectly good. To replace this, and to keep the steam machinery in repair throughout a whole lease, so as to leave it at the end in good condition, my experience of nine years enables me to state that a sum of from £25 to £30 per annum would be sufficient, and this bears no comparison to the wear of horseflesh, without taking into account casualties which frequently occur from horses standing idle in frosty weather, and then being hard wrought in the spring. Thus the steam-power, though at first apparently more expensive, is in fact more economical. The machinery is managed by one intelligent labourer, with a man and two boys under him."

A statement of costs and of performances is appended, from which we gather that 390 acres were ploughed, dug, or grubbed, and 256 were harrowed or rolled in 67 days, with a consumption of 76 tons 18 cwt. of coal, during 1869. The daily wages, with horse for watercart, were 14*s.* 2*d.*; oil, 1*s.* 6*d.*; price of coal, 12*s.* per ton; cost of lost time, tradesman's time, and repairs, altogether £26 11*s.* 7*d.* The total cost of implements, double engines, &c., was £1550.

—— Mr. Waller, Secretary to the Home Cattle Defence Association (81, Fenchurch Street, E.) thus describes the objects of the Society:—"Concisely stated, they are the establishment of safety markets. We hold (1) That experience has shown that no precaution can render it certain that animals imported from the Continent shall not have come from or passed through infected districts. (2) That there is consequently nothing to prevent the re-introduction of contagious disease among the herds and flocks of the United Kingdom if these are exposed to contact with animals so imported. (3) That to prevent contact it is absolutely necessary that separate waterside markets shall be established at the various ports at which foreign animals are imported, where all animals intended for immediate consumption shall be at once slaughtered, and all others quarantined. These are the articles of our belief. To get them carried out is our business."

OUR LIVE STOCK.

CATTLE.

The number of animals of all classes exhibited at Birmingham on the 3d inst. was 102, or some 30 fewer than those brought forward last year. In the first class, of bulls over 12 and under 20 months old, there were only 19 competitors for the £50 prize. Surely this is an indication that breeders do not approve of the rule which obliges them to sell for any price over the entry of 20 gs. It seems unfair that a breeder should not have the option of placing his own value upon his stock. If he considers a bull, for example, worth 400 gs., why should he be obliged to sell it for 25 gs. any more than a dealer is to take three guineas for a silk dress which he knows to be worth double that sum? There is no more harm in putting a reserve upon farm produce than there is in putting a fixed price upon drapery or upholstery goods, provided it is done openly. We think that at this show it would be quite fair to allow breeders, if they thought well, to fix their own reserve price, charging five per cent. over the present entrance fee when that reserve was over the 20 gs. Nor do we think that this would deter purchasers from attending. Everyone knows that he must pay more highly for fashionable pedigree and superior quality than for an ordinary animal. Purchasers, therefore, must be aware that even when there is no reserve, it is only by accident as it were that they are able to pick up a superior bull for less than his real value. And, as a rule, breeders are unwilling to incur the risk of valuable animals being thrown away. This is the conclusion which we consider must be drawn from the present exhibition, as compared with that of last year. We should regret if an excellent idea should miscarry in practice, owing to an error in detail.

The two best bred bulls were Nos. 4 and 9, both bred by Mr. Willoughby Wood; the former, Duke of Lancaster, being the winner of the £50 prize. Though of Bates' blood he is as neat as if he were of Booth lineage, with excellent forequarters, but his back might have been slightly wider. He was, however, generally considered to merit the distinction conferred upon him. Many good judges were surprised, on the other hand, that Mr. Wakefield's bull should only have obtained the reserve number and a high commendation. If less neat and compact than the 1st prize bull, he had great length, abundant hair, and fine masculine character. The 2d prize bull, Vulcan No. 2, bred by Mr. Charles Bayes, though neat and deep is scarcely long enough, and is somewhat deficient in hair. The 3d prize bull, White Satin, bred by Mr. Swingler, though he has a good coat and a deep frame, is somewhat shelly, and also deficient in style. The prizes made by these animals show the comparative value placed upon them by the public. Duke of Athelstane was purchased by Messrs. Perry, of Acton Pigott, for 96 gs., and is well worth that sum. Mr. Bradburn gave for Lord Oxford Wild Eyes 81 gs., while the 2d prize bull, Vulcan, only realised 54 gs.

Class 2, for bull calves not exceeding 12 months' old, contained many animals of superior pedigree, yet on the whole we were rather disappointed with their appearance. No. 38, Bruce, bred by Mr. Robotham, near Tamworth, well deserved the 1st prize, being symmetrically formed, and belonging to an old Mason tribe. The 2d prize fell to Mr. Wakefield's Marquis, and the 3d to Messrs. Garne's Blondin. We must confess that we preferred Mr. Bowly's commended calf, Lord Waterloo, and Mr. Harris's Towcester, also commended, to either the 2d or 3d prize in this class. Solitude, bred by Mr. Adkins, by Monitor from an old Bates tribe, which produced *Fancy*, for which Mr. Robartes gave 300 gs., only realised 42 gs., and we think must prove a bargain to the purchaser.

Could not the committee contrive two separate classes for cows and heifers? If not, cows have but little chance against heifers in high condition, which have never produced a calf. In this class we unreservedly concur with the judges in awarding the prize to Lord Beauchamp's beautiful roan heifer *Coronet*, not far behind which in merit is his lordship's *Emblem*; and well worthy to be classed with them are Mr. Wakefield's pair, which won the 1st prize at the Staffordshire show last autumn—Nos. 64 and 66, and which well deserved the high commendation they obtained on the present occasion. Lord Beauchamp's prize heifer only made 47 gs., and Mr. Wakefield's prize pair of heifers 78 gs. Is it not a question whether the public do not in the present day run too exclusively after certain lines of blood, disregarding the merit of the individual animals? After all, the best place to judge of cows and heifers is at home, and it may be doubted whether, unless under very exceptional circumstances, it is advisable to offer them for sale at a public mart.

The class of aged bulls does not call for particular comment, and several of them were disposed of at prices below their value as beef. Among the bulls sent as extra stock, Duke of Catton, bred by Mr. Wakefield, drew our attention as a promising young animal, and one which does credit to his sire, Duke of Essex 5th (26,286).

On the whole the two first classes realised satisfactory prices, and we have reason to believe that every animal which professed to be sold was *bonâ fide* disposed of. Mr. Lythall conducted the sale in his usual business-like style, and was assisted in the latter part of it by Mr. Thornton, of London, whose Circular contains so much information valuable respecting Shorthorns, and whose knowledge of their history is so extensive.

—— The Biddenham herd at present consists of 56 head of cattle, 40 of which are females. Above 30 of these are of the celebrated Gwynne or Princess tribe, and the rest are representatives of the Fawsley, Sweetheart, and Lady Spencer families. There is every prospect of these animals being brought out in good healthy condition at the coming sale, when the entire herd will be disposed of without reserve.

—— We have received an exceedingly neat catalogue of the Carperby Shorthorns, with a frontispiece of *Rose of Lucknow*, the winner of so many honours at Birmingham in 1868. The following changes have taken place in this herd since the publication of the catalogue:—Shirley Fitz-Windsor, a roan by Windsor Fitz-Windsor, dam *Charlotte Brontë* by First Fruits, has been sold to the Messrs. Close, of Kirby Stephen, Westmoreland: he is the third bull the Messrs. Close have purchased from Carperby. Royal Windsor, a white yearling, has become the property of Mr. Outhwaite, of Bainesse, Catterick, the exhibitor of the 1st prize Shorthorn steer in the aged class at Smithfield in 1869. Windsor Colling, also by Windsor Fitz-Windsor, and from *Royal Lily* by Fitz-Clarence, has been sold to Mr. H. Sharpley, Acthorpe, near Louth; and Lord of the Dale to Mr. Vernon, of Willington, Tarporley. Four females have also been sold—*Rose of Mona*, *Rose of Windsor*, and *Cestus*, all by Windsor Fitz-Windsor; and lastly the fat cow, *Rose of Lucknow*. The number of the herd, as stated in the last catalogue, has been kept up to within two by the following births:—

Lucy Colling, a red and white b.c., by Windsor Fitz-Windsor (12,248).
Rose of Gwynne, a roan b c, by do.
Rose of Town, a roan b c., by do.
Charlotte Brontë, a dark roan b c., by Belligerent.
Rose Blossom, a white c.c., by do.
Bride of the Valley, a r an c c, by do

Several more births are daily expected. Windsor Fitz-Windsor is the bull at present in service. He was bred by Mr. Carr, late of Stackhouse, and is by Imperial Windsor; and on the female side of the Booth, "Bliss," or "Broughton" tribe, the same family as *Lady Fragrant*, the Royal Agricultural Society's prize cow two years in succession; and as his sire and dam were both by Mr. Booth's Royal prize bull Windsor (14,013), he is believed to possess more of the pure blood of that extraordinary sire than any other bull in existence. At Carperby particular attention is bestowed upon the milking as well as grazing properties of the cattle. Mr. Willis is fully persuaded that large milking powers are not incompatible with the rapid formation of flesh, and that any cow which cannot support her own calf is not fit to breed from. Consistent with this idea, "nurse" cows are unknown at Carperby.

—— The sale of the late Mr. Mann's herd at The Asps took place on the 1st inst. The animals were brought out in low condition, and the modest average of £25 over 59 head was obtained. The large number of calves and bulls no doubt in a great measure was the cause of this somewhat low figure. *Sylphide*, by Sarawak, a 12-year-old cow, out of *Pintail* by Janizary, was purchased by Mr. J. K. Fowler for 42 gs.; *Dahlia*, the first of the Didos, was bought by Mr. J. C. Hutton for 35 gs.; and others of the same excellent strain made from 31 to 38 gs. each. The highest figure, 42 gs., was given by Mr. J. Lane for *Diomed* of this family.

—— Next Thursday Mr. Strafford will dispose of a selection from the Burghley Park Shorthorns, the property of the Marquis of Exeter. Fifteen females and twelve bulls will be offered.

SHEEP.

We have received a photograph of a Lincoln sheep carcase, bred and fed by Captain Catlin, of Needham Hall, and slaughtered by Mr. Harrison, butcher, Wisbeach. The weight of the dressed carcase was 274 lb., and its history is as follows:—Captain Catlin sold some two-shear sheep last year out of their wool at £5 each, reserving five to show at the local Lincolnshire shows. Three of them took 1st prizes at the East Norfolk and at the South Lincolnshire meetings, and also a 1st prize at the South Cambridgeshire show for the best pen of any age. One of them is the animal in question. The Needham Hall flock never looked better; two-thirds of the ewes had lambed up to the 3d inst., and nearly half of them had produced pairs.

—— The following news may be interesting to stock owners as indicative of the progress of an important movement:—

On Tuesday the first of a series of sales of Australian

meat, which are to take place on the first Tuesday in each month, took place at the Hop and Malt Exchange in Southwark Street, under the management of Mr. Tallerman, the agent of the Australian Meat Company, who also acted as auctioneer. The quantity of meat submitted was 100 tons, consisting chiefly of mutton cured in carcase, hind-quarters, hams, and rolls, packed in pure fat, which realised 3½*d.* to 6*d.* per lb.; barrels of sheeps' tongues, packed in pure fat, realised 8*d.* per lb.; 1000 smoked sheeps' tongues realised from 1*s.* to 1*s.* 1*d.* per dozen, and 300 smoked ox tongues averaged from 1*s.* 1*d.* to 1*s.* 2*d.* each; 60 cases of mutton, in tins of 7 lb. each, fetched 6½*d.* per lb. The attendance of buyers was, on the whole, pretty numerous, and the auctioneer expressed himself satisfied with the experiment. The reports which the Admiralty have received with reference to the supply of Australian preserved meat to the fleet have been so satisfactory that they have contracted for 200,000 lb. at, in round numbers, 6½*d.* per lb.

LA PETITE CULTURE IN ITALY.

FLORENCE, *Dec.* 26.

MY DEAR GEO.,—Here is the account of produce on 2 acres [*sic*—qy. "20 acres." ED.] in this valley for the year ending November 1 :—

Wine, 153 barrels (of 60 bottles), at 12 fr. for the barrel	1836 fr	
Oil	100	,,
Wheat, 25 sacks of 3 bushels, at 20 fr. the sack ..	500	,,
Milk (three cows)	600	,,
Fruit, vegetables	100	,,
	3336	,,
At exchange of 25 fr to the pound sterling ..	£133	9 0
Less expenses	12	0 0
Nett	£121	9 0
Of this sum the landlord takes in fixed rent (for a six years' lease)	48	0 0
Leaving the farmer	£73	9 0

Besides sundry other advantages, such as fuel, vegetables, milk, &c., neither is he called upon to pay any rate, cess, or tax of any sort or kind.

You will perceive that the staple crop is wine, the manufacture of which might be so much improved as to produce treble the amount of profit now received, so rough and rude is the process. The quantity of Grapes is certainly surprising, but you must bear in mind that we have considerable advantages from our proximity to the city of Florence, which sends us large quantities of manure, without which we certainly could not produce the crops we do.

In order to understand the system pursued, I will describe the method of farming, and the application of labour.

Method.—We have a family of seven souls on 2 acres, all hard-working, able-bodied labourers, five men and two women. They are divided into two squads, one of which goes every night to the city to fetch manure of three sorts—1st, from the latrines: into this no water is admitted, and it is reserved for Vines, Indian Corn, Cauliflowers, Beans; 2d, stable manure, well rotted, for vegetables in general; 3d, street sweepings, one year old, for Wheat, Oats, Clover, Lupins, &c. This manure is carried in baskets to the place where it is required, and is spread by hand, and dug in with the Tuscan spade of 10 lb. weight, with a 5-foot handle, cutting a double spit, *i. e.*, the first cut is at an acute angle, and cuts the superficies, which is thrown into the trench. The second cut is made by the labourer putting his foot on a side plate of iron in the spade handle, holding the handle straight up, and then standing on the side plate, his weight, and the action of his body, drive the spade down to the level of the bottom of the trench, and the lump thus dug out is then, by the leverage of the long handle, thrown on to the top of the former spit.

The Tuscans laugh at our ploughs. They say, "the point of the spade is tipped with gold," and that our ploughs are only fit for a country where there are few trees and fewer labourers. Considering that their Vines are 4 yards apart, and stand in 5-yard rows, and that the plough often damages the roots, there is much truth in what they say. But this brings us by a natural process to the consideration of

Labour.—If you transport yourself in imagination to the summit of one of the hills overlooking the valley of the Arno, you will see for 60 miles, right and left, little white specks all over the plain, looking as though pins heads had been shaken out of a sieve. Those little minute white dots are farm-houses; small, compact, capable of holding, say, seven human beings, with kitchen and good bedrooms, and stabling for five horned cattle, and a horse.

To each of these small houses is attached a small farm, cultivated sometimes on the *métayer*, sometimes on the fixed rent on lease system. This system conduces to several benefits to the State. It conduces to early marriages; to spade cultivation; to abundance of corn, wine, and oil; to the absence of poor-rates; to the absence of pot-houses. We have no poor-rate, and I have not seen a professional beggar for months. As the population lives in detached houses, the farmers know each other; help each other in many ways; and give with discretion, but never to a "vagabondo," as they term the professional mendicant.

The landlord helps a young man starting in life provided he marries (alas! poor Malthus). He advances money to purchase a couple of bullocks, and one year's manure. Suppose, then, this man raises a family of three sons and two daughters, he finds no difficulty in this valley in giving his landlord £36 14*s.* 6*d.* an acre for a six years' lease, paid half-yearly and in advance—[*i. e.*, we presume 12 half-yearly payments of £3 1*s.* 2½*d.* per acre. ED.]

The landlord keeps the farm buildings in repair. The tenant is allowed for improvements according to valuation, and on previously obtaining the landlord's consent.

When taking a farm the landlord and incoming tenant each appoints a valuer who choose an umpire or referee, and the three go carefully over the farm, of which they make an exact inventory, not a plant escapes them. The tenant is bound to leave the same quantity and quality as he found when he took the farm.

The outgoing tenant is allowed half the crop, and six months' possession after warning. The tenant is not bound to follow any particular system, save that grain must not follow grain; and generally the rule is—after Wheat, spade-digging for Beans, Lupins, or Vetches. After these spade-diggings, grain, of Wheat, Oats, or Barley. After these, plough or spade for Indian Corn, and then back to Wheat.

With regard to food the men are extremely frugal, but on one point they are unbending. They will have the best bread that can be produced, and they are excessively particular in the quality of the Wheat. For instance, the bread eaten by the small farmers and day labourers in this valley is made from corn, part of which comes from near Bologna, part from near Pistoja. They detect a change in their favourite Wheat directly, and woe betide the baker.

FIG. 62. ITALIAN FARM-HOUSE.

Their breakfast hour is at 8 o'clock, their dinner at 1 o'clock, their supper when stable-work is finished. Their staple food bread and wine; they eat meat twice a week on the average; their working hours are before and after the sun; lying by, according to the season, in the middle of the day, but they are by habit very early risers, and do much work whilst other nations are in bed.

The notion that an Italian contadino is habitually lazy is erroneous. He had done more than half his day's work before you were up. I see from my window three families of peasants; they are never idle. Wages for spade labour :—Lowest, 30 sous (1*s.* 3*d.*); best, 50 sous (2*s.* 1*d.*); masons and carpenters, 60 sous (2*s.* 6*d.*). They are the best dressed and best shod labouring population in the world on holidays; on working days they are bundles of patches, with clouted shoes; they are never neatly dressed on working days, as are the French, nor are they solidly clad in fustian and corduroy, like our men; they just huddle on any garments that will hang together, and seem to dislike sitting down to a regular meal. They walk about with a huge loaf of delicious bread under one arm, and have half a flask of wine in some cool corner to which they occasionally resort. But they never tipple, nor waste their time and money in wine shops; they spend their time on their "dear" farms, or with their families, nor do they loiter on market days. Their wives generally have some occupation which brings in money; they rear poultry, spin flax and hemp, and most of them are good weavers, and make their own linen.

With regard to their mode of rearing, planting, training, and pruning the Vine, it differs little from that which obtains in the northern part of Italy. Here the Vine is generally planted out as a three-year-old, and is trained to a Maple, set 4 yards apart, which, in its turn, is trained to receive the Vine, and is pruned to the shape of a gigantic candelabrum of five arms. The Vine at full bearing is allowed from eight to ten leaders, which are twisted together in pairs, cut to eight eyes, and tied by willow twigs to each branch of the Maple.

The French system of low pruning does not succeed in this country as well as the Italian. The sun is so much more powerful here that the plant is vigorous in proportion, and it absolutely requires a safety-valve in the main leaders, which are cut, as I have said, to eight, ten, or twelve eyes; all other subsiding branches are cut to two eyes, but the leading shoot of the side branches is always left for the plant to expend the full force of the flow of sap: else if you "cut in" your plant too much you produce a gigantic bush of thick leaves, but little fruit. Whereas, by the Italian system you will see fruit from top to bottom of the tree—one bunch of Grapes touching another for 20 or 30 feet. Many of my trees had half a barrel of wine, of 30 bottles, on them last vintage.

You will ask why, if we can grow so large a quantity of Grapes and make so much wine, we do not improve its manufacture—so as to enable us to export a larger quantity than we now do? The answer must, I fear, be found in the same reason which renders all agricultural improvement so slow—the habits, education, and immediate requirements of all farmers. For, how is a farmer, of a sudden, to turn chemist?—and in the hope of doubling his crops find himself bankrupt. All agricultural progress has been, and must be, necessarily slow—quicker in England than anywhere else, for wealth can experiment; but a man whose capital lies in his sinews has never had time, probably, to go to school, and is constrained to follow the lead of his father before him. He is sure of his crop by the old method. He is told he may improve it by a new method; but the risk is too great, and he is alarmed—at this point in England the capitalist steps in and does it for him. But we have no such capitalists here, and this is why Italy makes but slow progress in the preparation of her wine for foreign markets. Under the old Government the rule was to maintain the people in crass ignorance. In my parish of 13,000 souls, 80 per cent. cannot read or write: the peasants go now to school after work—grown-up men of 50 go to school. But how backward must be the country where its late Government was systematically opposed to letters, and how many generations will it require to place Italy on the level with other more favoured nations?

However, the schoolmaster is now abroad, and the advances made by the middle class are most marked. Activity is now the rule, not the exception—and in the matter of wine the great landed proprietors are moving, and rapidly, in the right direction.

Whilst treating this matter of farming in Tuscany, perhaps it will be right to notice an error which has crept into a work called "The Irish Land," by Mr. Campbell. At p. 22 he says :—"In Italy we are told that the *métayers* are by custom irremovable, so long as they duly render the prescribed share of the produce." This is not correct. Six months' notice to quit can always be given to the *métayer* by his landlord, on just and sufficient ground. A case in point occurred here this year. A *métayer*, and his family before him, had occupied the same farm for 120 years. His landlord gave him notice to quit in November, 1868; in March, 1869, he left his farm. The meighbouring *métayers* took up his case; but when it was proved to them by ocular demonstration that the farm was being ruined, and only produced two-thirds of what it had done, and might do if properly managed, not a word was said in his favour.

The consolidation of farms is in this country the exception, with you it is the rule. I saw in passing through the Tuscan Maremma a short time ago, a very large estate being cut up into small farms. The whole estate was parcelled out like a chess-board, with a new farmhouse on each square plot of (as far as I could judge) about eight acres; and I have no doubt the proprietor will recoup himself in 20 years for the very heavy expenses he has been put to for farm buildings, roads, drains, &c.; for oil, wine, and corn, soon pay expenses, and those products explain the reason why the small farm system is so much in vogue in Italy—for those three staples, which pay so well, require numerous hands to be ready on a given day to get each crop housed and manufactured without loss of a day. And although I have visited many very large farms in this country, I am bound to say that, in proportion, the small farmer, with his family, gets more off the ground than he who farms many acres, and has to hire his labour. *Jem.*

THE BANBURY SEWAGE FARM.

THE sewage is conducted from the town sewers into one or other of two tanks which are under the yard of the works, each tank being about 10 square perches, more or less, and 7 feet deep, and they are arched over by brickwork so as to be invisible; and as the sewage flows abroad in them almost free from current, the

gravel, ashes, or other coarse silt washed into the sewers from the streets are thus allowed to subside, and such silt is afterwards thrown out by a man who enters each large tank as it becomes empty in its turn for that purpose.

The filters are composed of coarse gravel, about 6 inches deep, laid upon wooden rails, the latter being about 3 inches wide by 1 inch thick, placed on edge, and leaving half an inch space between them.

The sewage flows from one of the large tanks to under its own filter, through which it is imperfectly filtered up, but leaving the muddy or thicker portion of it to flow downwards into the lower tanks, which are about 15 feet deep.

When each large outside tank becomes empty the sludge collected in the lower inside tank under its filter is thrown into a large box by a man who descends amongst it for that purpose, and to scrape the sludge from under the filters; and when full the box is hoisted by a crane and emptied into shoots, by which it is conducted outside over ashes and other products of the town dustcart, the ashes, &c., being first spread a few inches thick over a sufficient space of land adjoining the canal for receiving the sludge. Another covering of ashes and street-sweepings is then laid upon the sludge so thrown out, and the whole is mixed together as sand is mixed with lime for mortar, and the united matter is then conveyed in barrows upon the boats of the contractor as they lie in the canal. The contractor buys it of the Town Commissioners, and he sells it as manure amongst farmers elsewhere.

These latter stages of the process appear to be susceptible of improvement, both in the saving of labour and in being made less unhealthy to the labourers who have to descend into the tanks, by so constructing the under-tanks that all the filthy matter collected in them may fall into such wells that a dredging-machine may work in them to elevate the sludge to a sufficient height that it may descend into a pug-mill, and therein be mixed with the dust-cart produce, and be conducted from thence by its own gravity into the boats.

But to return to the partially-filtered sewage which after rising through the filters is conducted to an adjoining shallow well. It is thence pumped or injected into a strong 14-inch pipe or main by a 10-horse steam-engine, by which it is forced on to the most elevated land of the farm, about 21 feet above the sewage in the well, and one mile from the works.

Banbury contains about 10,000 inhabitants, of whom say 3000 contribute to the sewage; and its ordinary sewage requires the 10-horse engine to work about six hours a day in pumping it; but when heavy rains or storms so dilute it with water as to nearly or quite deprive it of impure smell, the whole of such storm-water, after passing through the first large tank to deposit the sand, gravel, or other coarse silt contained in it, is allowed to run off into the river without entering the filters.

Not much smell was observed at the works, but at the highest level, where the sewage emerges into the channels which conduct it over the farm, there was some foul smell for over 100 yards, from the main-pipe outlet, though but little beyond that distance.

The trenches which conduct the sewage over the farm appear to be from 12 to 15 inches wide and deep; and they separate the land into parcels of 5 acres, or more or less each. The soil dug out for making the trenches has been laid on both sides of them, thereby forming a bank around each parcel of land, and by opening channels in those banks the sewage flows over the whole surface of the adjoining parcel of land, and is allowed to remain there until a satisfactory portion of the fertilising matter contained in it has subsided. And it is then let off into another channel, to be conducted by it over a second parcel of land; and by a similar process over a third parcel also.

After covering a third piece the water has then become so clear and free from impure or fertilising matter as to be worthless for manuring purposes, and it is then runs off by a proper channel into the river, it being by that time nearly or quite freed from obnoxious or unwholesome impurities.

The extent of land over which the sewage is conducted is about 90 acres, nearly all of which is under Italian Rye-grass; and as the latter becomes infested with Couch-grass it is broken up, and planted with Mangel Wurzel or Swede Turnips, after which it is again restored to Rye-grass, as being the most rapid marketable produce.

The produce is sold by auction as it arrives at maturity. At three previous sales last year £4 per acre each time was realised; and at the last sale the average price was £2 15s.; and a member of the Board of Health "expected they might yet raise a fifth crop of the Grass," making altogether, say £16 per acre. As the produce was cut and taken off by the purchasers, the sewage was again conducted upon the land.

The Mangels were not so productive as the Rye-grass. A respectable farmer who resides near, and who had bought a quantity of them, stated that "he had himself grown finer Mangels, but that he never saw so large Swedes as those which had been planted where the Mangels had failed to grow."

The nutritious value of the sewage Rye-grass was displayed by a well-fed horse belonging to the Board of Health, the fat appearance of which equalled that of the average of the fine London dray-horses, and which horse the carter who was driving it stated lived upon no other food than the Rye-grass and half a bushel of Beans per week. Here, therefore, is practical evidence of the great money value of the same sewage matter which in most large towns has been, and still is, suffered to run waste to the sea as a worthless nuisance, but which, as the sewage works of Banbury prove, may be applied to important agricultural profit. Thus, for instance, to be worth £4 per acre previous to any expense for mowing, carting, and other labour, and with the risk of unsettled weather also, the Grass ought to be equal to 2 tons of dry hay; or, in all, 8 tons, for £16; and as one milking cow consumes on an average equal equal to 2 cwt. of dry hay per week, when fed on hay only, for 40 weeks while giving milk, but less during 12 weeks previous to calving, that 8 tons, as the total produce of 1 acre, must be equal to 2 acres for supporting three good milking cows throughout the year.

And as, according to "J. C. Morton on Dairy Husbandry," and other writers, "each dairy cow, to be well kept, consumes the produce of three acres of fair average pasture land," that gives a proportionate supply of produce of one acre of sewaged land as being equal to that of 4½ acres of average pasture land for supporting dairy cows.

Or in plain figures—by the before-mentioned authority (omitting a few of the highest returns as being the effects of extra food), as the milk supplied by 20 cows in various parts of the United Kingdom was ascertained to average 630 gallons a-year for each cow, these statements show that the annual produce of milk from 30 acres of fair average pasture land amounts to 6300 gallons; and that 30 acres of sewaged land would supply 38,350 gallons of quite as good, if not better, milk, by the same proportion of Rye-grass which the sewaged land near Banbury now produces over that of average pasture land. "The cost of sewering the town of Banbury, including the expense of the engine and a small part of the works, was £7000; and the remainder of the works, including the strong cast-iron pipe, about 1 mile long, making the channels, &c., on the farm, £5000.

And this increased supply of produce by sewaged land is not confined to Rye-grass only, as the writer has known for more than half a century that such sewage is especially available for nearly all descriptions of kitchen-garden produce. *E. West, Saltford, near Bristol.*

THE IRISH LAND BILL.

In the course of the debate on the Irish Land Bill which has occupied the House of Commons during the past week, Mr. C. S. Read, M.P., made a capital speech on the general subject of the relation of landlord and tenant, which we reproduce here from the report of it in the *Times*:—

He had never doubted, when once he had heard the principle on which the Bill was founded, that it would be his duty as well as his desire to support the second reading. He knew that under the Bill certain rights of the landlord were abrogated, but those rights had been so long in abeyance, that they were of little pecuniary value, and if you could not enforce your rights it did not signify whether you possessed them or not. New rights, however, would be created, and the remedies of a good landlord against a bad tenant were so simple that he believed, on the whole, landlords in Ireland would be gainers rather than losers by the Bill. As to the Ulster tenant-right, he thought the Government had used a merciful consideration in not extending it all over Ireland. As a tenant-farmer, he knew no right so stupid and, at the same time, so unjust. It was stupid because it professed to give a man an interest in the land, whereas it really made him bury his capital during the whole time of his occupation, and in all probability prevented him from cultivating the land as he should cultivate it. Then, too, in selling the goodwill of the farm he was selling that which he had no right to sell, and, therefore, the custom was unjust. It was wise, also, on the part of the Government not to attempt to define that which they really could not define. There were so many varieties of the custom, not only in the province but in the same parishes, and even on the same esfates, that it would have been impossible to define what Ulster tenant-right is. He supposed the Bill left things exactly as they were; but if leases had been given at a reasonable rent for the express purpose of abolishing the right, that stipulation should not be made void; and, again, if a landlord had bought out the tenant-right, a new tenant should not be able to claim a right of seven years' occupation as he would do, if ejected, under clause 2. He hoped, also, that if a tenant had made a bad bargain, by giving twice or thrice as much for the tenant-right as it was worth, he would not be at liberty to turn round upon his landlord, and so recoup himself. Cordially approving the definition of what was to be regarded as an improvement, he was glad that the presumption in favour of the landlord as to improvements should cease, and that there should be compensation for retrospective improvement; but there should be some limit of time as to these, and, even in the case of reclamation of land and buildings, 20 years back ought to be sufficient to recoup anyone for what had been done. Moreover, the tenant and not the landlord should be called upon to prove who was at the expense of retrospective improvements.

His sympathies were, of course, with the Irish farmer; but he could not see the justice of the clause under which the Irish farmer was to be paid for interruption of tenancy. If the tenant had expended any money, and his prospects were interfered with, he should be paid to the full; but it was not easy to see why he should be paid for interruption of occupancy, and, admitting that he should, there was a chance, as the Bill stood, that he who lost most would get least. For example, if one man rented a cheap farm at £5 a year, and another rented a similar farm at double the money, the one man would be paid £70 and the other only £35. As to a small farmer, he would receive much less injury than a large farmer. A holder of 3 or 4 acres of land would be all the better for being made an agricultural labourer, whereas there was no more miserable being than a broken-down farmer of 100 or 200 acres. In England, if you did not make him relieving officer or surveyor to one of the new Highway Boards, or put him into some other office for which he was not at all fit, he speedily became a candidate for the Royal Agricultural Benevolent Institution. Under the Bill the small holder, if ejected, would receive money with which he might emigrate or seek employment elsewhere; and as it was now the almost universal rule in Ireland to give money to an ejected tenant of this description, the Bill merely legalised a custom. The hon. member (Mr. Samuelson) had quoted from Dr. Voelcker as to small farmers in Belgium; but he should have quoted the conclusion of the writer, that their earnings were lower than those of an agricultural labourer. He (Mr. Read) was greatly in favour of agricultural leases, which ought to be given in all cases where you could find an enterprising and a wealthy tenant; but indiscriminate leases in small holdings would be an injury rather than a benefit. He was told that the Irish people repudiated the provision in the Bill that agricultural leases of 31 years were to stop litigation. If that were so, the Irish were the most unreasonable people in the world; and if a landlord said to a man, "I will give you a 30 years' lease, with compensation for unexhausted improvements, at a rent which cannot be extravagant, because it must be submitted to the Court," and the tenant was still dissatisfied, he (Mr. Read) would not try to make him satisfied. Would it not be well that at the expiration of the 30 years those parties should be treated more as civilised beings, and should be allowed to contract themselves out of the provisions of the Bill?

There was one remark which he wished also to make on that portion of the measure which related to the creation of small freeholders. It would not, in his opinion, answer, because it could not be made to pay. Poets, politicians, and philosophers always looked on small freeholders as a very happy class of men, but he regarded them, as a rule, as most miserable; and it would not, he thought, do to try to bolster up a system which was gradually dying out merely because it did not pay. If a man happened to be the owner of 100 or 200 acres of land which he farmed himself he invariably found that he could not make above 3 per cent. on the money which was invested in the fee simple, whereas he could make 8 or 10 per cent. if he invested as a tenant. The result was that he sold his land when he could and became a farmer on a larger scale. He might illustrate his argument by his own case. He was a little freeholder, and he had a small farm which he let while he rented a large one. If it were not for the law of entail he should sell the little freehold, and he might observe in passing that when persons talked about the law of entail operating to keep large estates together they should remember that several small estates were protected by that law from being snapped up by some large proprietor.

He must express his most cordial concurrence with the right hon. and learned gentleman the member for the University of Dublin when he said that what Ireland wanted was not so much the creation of a peasant proprietary as a greater number of landed gentry. It struck him that in that country there was no middle class. There were the owners of very large estates and small squireens; tremendous land agents in Dublin with their offices all over the country, and insignificant, miserable bailiffs who did the work for them. There were also great graziers occupying 2000 or 3000 acres of land, and cottier farmers, but he looked in vain for those men with 200 or 300 acres of land who farmed and who constituted the bone and sinew of England. There were in Ireland large cattle-dealers and little men who dealt in pigs and poultry, immense fortunes in the cities and hardly anything between them and the little retail shops. What was wanted, therefore, in Ireland was, he believed, the creation of a middle class, which could never be created until life and property were more secure in that country. Now, when hon. and learned gentlemen differed about points of law it would be very presumptuous in a practical farmer to pronounce which side was right and which wrong, but he must nevertheless say that the custom as between landlord and tenant in Ireland was, as far as he could learn, precisely the same as in England, the difference, if any at all, being in favour of the Irish tenant. There were, for instance, more leases in Ireland; and when the Attorney-General talked about Derbyshire and Lincolnshire tenant-right, he would merely observe in reply, that in the vast majority of counties in England there was no tenant-right at all, and that in Norfolk no shadow of a custom of that kind existed. Irish members might, however, say, "You have covenants in Norfolk, which we look upon in the light of a compensation for unexhausted improvements." Those, however, constituted simply a reservation which was made by the landlord for his own benefit and the benefit of the estate, so that the outgoing tenant should, at the expiration of his tenancy, leave the roots and hay and straw, to be paid for at a certain valuation. But what did the Irish tenant do? He sold out everything at the full market price, whereas the English tenant was bound to leave those things which he had mentioned on the farm at the consuming price, which was only two-thirds of their value. He did not mean to say that the English system was right and the Irish wrong, but the Irish tenant, he thought, had the advantage at least in that respect. He should like, he might add, when leases were introduced into Ireland, that some little better definition should be given of the rotation of cropping, and that the tenants would be good enough after they had signed a lease to stick to it.

There was one remark in the opening speech of the Prime Minister in which he could not concur, and that was when he quoted the increase of rental in different

parts of England to show how agriculture had prospered in recent years. In a great number of instances it would be found that in consequence of the development of minerals and manufactures the rental had increased, while in other parts of the country the liberal expenditure of capital in the first instance by the landlord, and in the second place by the tenant, had produced a similar result. That was no doubt the case both in England and Scotland, but looking at Ireland he found land there was as cheaply rented as in any country in the South and West of Europe, and infinitely more cheaply than the land either in Scotland or in this country. He believed, on the whole, that the Bill of the Government was calculated to do a great deal of good. He did not suppose it would satisfy the Irish tenant-farmers as a class. He for one should not attempt to give them all or even half they asked, but he should be very happy to give them all they deserved, and the present Bill would in his opinion do them ample justice.

THE MALT-TAX.

THE CASE OF THE PRODUCER.

[The following is a condensed report of those speeches in last week's discussion of the Malt tax in the House of Commons which referred to the interests of the Barley grower.]

COLONEL BARTTELOT said the case of the producer was a very strong case. It was simply this, that by the enormous duty on malt in the stage in which it was taken they were prevented from cultivating the land in the way they should wish, because they could not get the proper value for a second class of Barley which, were there no duty, would be made into beer, and would be largely used for feeding purposes. Moreover, farmers were compelled to cultivate their land by growing Wheat, when in proper rotation they should grow Barley. Then, if they could use malt for the purpose of feeding cattle, they could produce meat much cheaper. Mr. Cobden shortly before his death wrote upon this very subject of the Malt-tax, and his opinion was—"If you go on free trade principles I go with you entirely, and think, if it could be done, that the duty ought to be taken off altogether." Had anything been done for the agriculturists of this country? The Bill of the Prime Minister enabled them to use for feeding purposes what was called Gladstone's mixture; but the Linseed which they had to mix with the malt had to be ground up so small that instead of going down the animal's throat it went up its nose and out into the manger. There was also another Bill, called the Malt by Weight Bill, which was intended as a relief; but on the whole it had done very little good.

Mr. READ said the fact that Barley had of late years commanded so good a price only proved that the soil and climate of England were peculiarly adapted for its growth. The farmers could successfully compete against the whole world in producing Barley, and they ought not to be hindered in the cultivation of so valuable a crop. Whereas Australia sent Wheat to England, we exported a considerable quantity of Barley to Australia, and he believed that if they really had free trade the best Barley would average a higher price than Wheat. It was said that free trade had not hurt the English farmers, but, at any rate, it had done this—their rents were raised, rates were constantly increasing, they had to pay for more labour; notwithstanding all the appliances of science to implements and machinery, the farmers now paid more per acre for manual labour than ever they did, and oilcake and guano were becoming dearer every year. With regard to stock, the profit they derived from high prices was not so great as they would derive if they had lower prices and healthier cattle. After all, had not the Grass farmers benefited from free trade rather than the tillers of the soil? Meat, butter, and cheese were dearer than they used to be, but tillage employed more money and more labour. It was constantly said that they ought not to put so much country into Grass, but should keep it to tillage; but statistics proved that with the present heavy expenses the quantity of arable land was constantly diminishing. It had been proved that the Malt-tax considerably hindered the cultivation of the soil, and even in Norfolk, the best Barley growing county in England, there were not so many acres of Barley as of Wheat, simply for this reason, that with very high farming it was impossible to produce first-class Barley. The evidence given before the select committee dispelled the delusion that the Malt-tax was any protection or advantage to even the very best class of Barley. If Wheat was taxed to the amount of 22*s.* per quarter (which would be 2*d.* on a 4 lb. loaf), would it not limit the consumption of Wheat? The Malt-tax amounted to between £5 and £6 on every acre of malting Barley, and it had been proved many times that when the tax was increased the consumption diminished and the price of Barley became lower. That farmers were exempt from taxation might have been an argument in times gone by, but last year the Chancellor of the Exchequer removed the principal exemption from taxation, which farmers had previously enjoyed. He did not complain of that, because he advocated the abolition of all taxation that was not shared by all. Excepting the tax on horses, he did not know any tax which farmers escaped that was paid by the rest of the community, and as to that matter he desired the abolition of the duty on all horses used for trade purposes. He cordially agreed with the abolition of the tax on fire insurances, and he offered no opposition to the repeal of the shilling duty on corn; but he contended that consumers of bread had not been benefitted by that remission, for before that £1,000,000 of taxes was given up, he had known Wheat to be sold for 38*s.* per qr., and bread at 5½*d.* and 6*d.* the 4 lb. loaf. It had been said that farmers would have fair play when the Corn Laws were repealed. The late Sir R. Peel said the repeal of the Malt tax must follow that of the Corn Laws. Lord Russell said if he were Prime Minister when the Corn Laws were repealed the next tax he would abolish would be the duty on malt—a promise which he feared the noble lord had forgotten. Mr. Cobden said it would be impossible, and unjust if it were possible, to retain the Malt-tax after the repeal of the Corn Laws. Why should malt be the only article exempted from the general remission of taxation which Mr. Cobden proposed? Now, what advantage could it be to the farmers to substitute a brewer's license for the duty on malt? From what the Chancellor of the Exchequer told the brewers' deputation a few days ago he had some hope that the right hon. gentleman would listen to the suggestion of the farmers and free the maltster from the exciseman. Last Saturday he was told by a maltster, who was entirely engaged in making malt for exportation to Belgium, that the forms and ceremonies he had to go through were so galling and annoying that if he had to begin again he would build his malting premises in Belgium and export his coals and Barley. The abolition of the Malt-tax would also set free malt for the purpose of stock feeding. When he was a boy it was a common practice in Norfolk to germinate grain for feeding purposes, but during the last few years farmers had been debarred from doing so, and had had to sell all the appliances which they used for that purpose. But the abolition of the tax would also tend very greatly to check the adulteration of beer, for the simple reason that untaxed malt would be so cheap as to exclude sugar and the drugs which were now used. As to private brewing, it was very common among the cottages of Norfolk and Suffolk during hay time and harvest. Close to his residence lived a poor widow who brewed as little as a quarter of a peck of malt and two ounces of hops at a time, and he could assure his hon. friend the member for Derby that last Sunday she gave him a bottle of beer which was infinitely preferable to the table beer supplied in the dining-room of this House. He did not go entirely with the teetotallers, who believed there was no virtue in beer. He believed that, for the labouring man, now that butchers' meat was so dear, and milk so scarce, beer was a necessity, and that it was better than so much tea, though he could hardly go so far as the old lady who said that London porter was victuals, drink, and clothing. He had found that the man who drank his beer at home was the best agricultural labourer, and he had been told that the artisan who drank his beer with his family was not the man, who, as a rule, frequented public-houses.

Mr. DENT should be glad to hear the Chancellor of the Exchequer intimate that he could deal with this question, but he could not forget that the malt duty belonged to the same class of duties as wines and spirits, and the whole amount of revenue derived from that source was £22,000,000. It was a singular fact that the cries for a repeal of the Malt-tax came chiefly from counties where beer was given in lieu of wages. In Berkshire, Buckinghamshire, and Oxfordshire wages were about 11*s.* a-week, and 2*s.* a week, on the average, was allowed for beer. It did not follow, however, that the neighbourhood was any better for that. The Northumberland labourer did not drink beer; his children sucked the milk bowl instead of their draining the beer jug. In his opinion it would be desirable, instead of stimulating the consumption of beer, to find some means of providing the agricultural labourer with milk for his children. He thought the pressure of the Malt-tax was rather overrated with regard to its being a check on the cultivation of the land. He quite agreed, however, with the hon. member for Norfolk, that farmers ought to have the privilege of feeding their own stock with malt without any restrictions, and he thought that the fact was not sufficiently considered that it was a great adjunct of food.

Mr. DODSON said, while purporting to be a tax only on beer the malt duty became also a tax on beef and mutton, and in that respect, although it injured the public it did not contribute one fraction to the revenue in that shape. As to the Cattle Malt-feeding Act, passed some years ago, it had remained practically inoperative. He knew it would be said that the utility of malt as food for cattle was much exaggerated. Possibly that was the case, but on the other hand he denied that the experiments had been a sufficient test, because those who had made them had formed their conclusions in accordance with their interests. What the farmer wanted was to be able to use malt when most convenient to himself or when other crops failed. Assuming that beer must continue to be taxed for the present, he would take leave to ask the Chancellor of the Exchequer whether he could not devise some means by which the duty on beer might be levied, not upon the raw material, but somewhere near the point of consumption, and in such a manner that it should fall only on the article intended to be taxed, viz., beer.

SEWAGE.

THE following memoranda, taken from a recent number of the Royal Agricultural Society's Journal, relate to the various attempts which have been made (*a*) to estimate and (*b*) to realise the value of town sewage as a manure. The information thus collected has, indeed, the author tells us, been gathered chiefly from the already published papers of Messrs. Lawes and Gilbert; but the substance of these publications seems to be so fairly given in this epitome of them that the leading facts under both of these divisions of the subject may be safely quoted from it. And they may be stated thus:—

(*a*) The results of many analysis by our leading chemists, whether of the food of a mixed population, or of the resultant sewage of a town supplied with water-closets and well drained, teach that nitrogen equal to 200 ounces of ammonia is voided annually in the urine and fæces of every individual: a quantity which, when the waste water of a town amounts to 40, 60, 80, or 100 tons per head per annum, will represent 9.77*l.*, 6.51, 4.88, and 3.91 grains in each gallon of the sewage respectively. And this represents a composition which, so far as this one item (ammonia) is concerned, makes 1000 tons of such sewage equal in agricultural value to 16⅔, 11, 8¼, and 6½ cwt. of guano respectively. Guano is sold at 13*s.* a cwt., or thereabouts, and thus the estimated value of the sewage of these several strengths is 2.44*l.*, 1.67*l.*, 1.25*l.*, and one penny per ton respectively: every grain of ammonia in a gallon of sewage giving about one farthing per ton of the same liquid on this valuation by comparison with guano—a fact which has the advantage of being easily remembered. Perhaps the ammoniacal strength which best represents the average quality of sewage where storm waters have not access to the drains, is that one which corresponds to nearly 60 tons to every individual of a population, or about 7 grains per gallon, which is one in every 10,000 parts; and this, too, is easy to be remembered.

An interesting table is given showing the relationship of the ammonia (or nitrogen) to the several mineral ingredients in the cases both of sewage and of a number of specified agricultural crops. It states that in the Rugby sewage there are 27 parts of phosphoric acid and 42 of potash, to every 100 parts of nitrogen. In ordinary Grass the proportions are 27 and 100, respectively, to every 100 parts of nitrogen; in Clover, 23 and 52; in Wheat (the whole ripe plant), 46 and 57; in Wheat (grain alone, which is all that generally leaves a farm), 48 and 28; in the whole Bean plant, 30 and 50; in beans alone, 25 and 32; in Swedish Turnips, 21 and 63. It thus appears that so far as its phosphoric acid and ammonia are concerned, town sewage is a "well conditioned" food for most of these crops. And the occasional application to the land of some of those cheap German potash salts which Dr. Voelcker has made known, seems all that is necessary to hinder the excessive growth of plants (which it occasions) from exhausting the natural supply of potash in the soil, and from thus acting, as every lop-sided fertiliser does, as a robber of those ingredients of soils in which it is itself deficient. But there are several reasons why we cannot admit that even such a limited disparagement of sewage, as a complete manure, as this amounts to, necessarily follows from the facts. For, in the first place, the quantity of any ingredient present at any time in any plant is no guide to the quantity which that plant may have needed during the processes of growth; and again, as it is certainly in the alkaline ingredients of the sewage of a town that any speciality of composition will most commonly appear, (for they are derived from the wear of its streets as much as from the waste of its households,) so it is quite possible that the sewage of Rugby, which alone is specified in this table, may not be such as to justify the erection of any general rule upon it; and lastly, the quantity of sewage applied to land (equal to from 6 to 16 cwt. of guano for every 1000 tons) is so great that any ingredient, though present in small proportion, must be applied in enormous quantity, and far beyond the requirements of any of the crops named in the table.

These, then, are the leading points to which the attempts to estimate the value of the sewage of a town have led:—200 ounces of ammonia per annum pass through the water-closet from every individual of a population—equal to one part of ammonia in every 10,000 parts of the drainage water of our towns—the actual quantity varying with the water supply so much as to make 1000 tons of it worth as much as from 6 to 16 cwt. of guano, or from 1*d.* to 2½*d.* per ton—the proportions of its other ingredients (potash and phosphoric acid) corresponding fairly with that of its ammonia, or nitrogen, to the wants of most of our cultivated crops; that of potash, however, being generally deficient.

(*b*) But what has experience taught us hitherto through the attempts which have been made to realise these estimates? A tolerably explicit answer is given to this question in the paper before us. We have the results of the experiments performed under the direction of the Royal Commissioners at Rugby, the general results there since, and the general results at Edinburgh, Croydon, Carlisle, Watford, Worthing, and elsewhere. Of these the Rugby results are the most exact, and those

at Edinburgh and Croydon are the most encouraging. The results at Rugby may be stated thus:—On rich adhesive soil in Grass (old pasture), and on comparatively poorer and more open soil (partly in old Grass, and partly in Italian Rye-grass), while £15 worth of milk (exclusive of the cost of oilcake) was got per acre in one season from cows fed on the unsewaged natural Grass, no less than £25 7s. worth, £33 6s. 10d. worth, and £36 1s. 4d. worth of milk were obtained from the same extent of land which had been watered with 3000, 6000, and 9000 tons of sewage per acre respectively. The milk was valued at 1d. per pint; and thus from £3, in the case of the largest dressing, to £4 2s. 3d. and £4 10s. 7d., worth of milk, beyond the natural and unassisted quantity, was obtained from the use of every 1000 tons of sewage; or an average of .931 of a penny per ton. This sewage, moreover, had not been thoroughly exhausted. I have seen it running foul and discoloured off the land at Rugby; and on analysis it has been found to contain still 1 or 2 grains out of its original 6 or 8 grains of ammonia per gallon, justifying an addition to the returns of one or two farthings per ton for value remaining unexhausted, which might have been extracted had it been used a second time. It is only fair to add regarding Rugby, that notwithstanding the facts thus given, none of the tenants of the land over which the sewage flows are very sanguine of the profit or advantage of incurring the cost of steam-power for raising it for use in ordinary irrigation, and "the application by means of steam-power, pipes, hose, and jet will probably soon be entirely abandoned." I understand, however, that some of the difficulty of making its use more profitable here arises from inconvenient arrangements between joint tenants, permitting neither of them to gain the full advantage of its use. Meanwhile it is believed, on the ground of the experience here, that "with 5000 tons of sewage judiciously applied to one acre of Italian Rye-Grass and meadow land properly laid down to receive it, an average of 1000 gallons of milk per annum may be anticipated, which at 8d. per gallon, would represent a gross money return of £33 6s. 8d."

The general result of sewage experience at Edinburgh and at Croydon may be stated as follows:—Over between 300 and 400 acres of grass-land (chiefly permanent and perennial Grass), on all sides of Edinburgh, a quantity not generally exceeding 20,000 tons of foul water per acre per annum, including the drainage of a large part of the city, is poured as in water-meadows, and 4 or 5 crops of Grass are cut in the year. The produce between April and November is annually let or sold (to purchasers who cut and carry it themselves) for prices which average at least £25, and in many cases exceed £40 per imperial acre.

On the shore between Leith and Portobello a slope of sheer sea-sand is thus fertilised: and the Grass produce, averaging four or five cuttings in the year, is sold by auction, generally for over £30 an acre. The highest prices of the whole area have been obtained from this, which is naturally the poorest soil; and the whole of this fertility is due to the waters of the Foul Burn, as it is called, which having been already used over land higher up the valley, are applied in diminished strength to the lands below.

No doubt, when £25 or £30 is put against the 20,000 tons of sewage which produce it there appears but a small return per ton,—much smaller than even the Rugby experiments gave, and this was very much below the estimate founded on the composition of the water. But on the other hand, it must be remembered that the Foul Burn is not the mere drainage-water of the town, but the natural outfall of a large area of open country as well; including, therefore, much mere land and rain water. And again, there cannot be a doubt that a very large proportion of the fertilising matters which it brings with it is carried out to sea. I have seen it running into the tide close by the town of Leith, almost as filthy-looking as when it came upon the land much higher up the valley. And I believe, therefore, it is right to speak of the Edinburgh experience, now of many years standing, even though but a small value is there realised per ton from the sewage used, as by far the most encouraging piece of sewage agriculture that has been yet recorded.

At Croydon, where a seven years' lease of land over which the sewage has been pouring, under the direction of the tenant, is just expiring—and where they say a much higher rent will be easily obtained for the next term of years—the facts of the case cannot, of course, be so confidently given as at Edinburgh, where everyone can read them in the annual price-lists of an open sale by auction; "but it is estimated here that, after making the deduction of £4 rental, the gross returns from the sewage applied is, at the present prices of the produce, with Italian Rye-grass from ¾d., to 1d., and with Meadow-Grass from ½d. to ¾d. [per ton]. The sewage is not applied in any systematic manner to other crops, but it has been applied on a small scale to root-crops. An enlargement of the area of irrigation is contemplated, which will, if carried out, somewhat reduce the amount of fluid and excretal matters available per acre."

The other instances of actual experience given in a recent number of the "Royal Agricultural Society's Journal," from which the above are quoted, are not sufficiently definite, or, I may add, sufficiently well established, to be of much use towards the formation of a fair opinion on the subject; but I believe we may conclude, from the facts already stated, that by the practically unlimited use of foul water, as at Edinburgh, water-meadow fashion, over the poorest land, we may, near large towns where there is a great demand for milk, obtain a nett return of almost £20 to £30 worth of Grass per acre—that being the value per acre of the produce annually sold to purchasers who cut and carry it themselves; and that by applying 5000 tons of true sewage per acre to good grass-land similarly situated we may, as at Rugby, increase the annual value of its produce from £15 (its natural amount) up to £30 or more per acre; thus realising nearly £4 per 1000 tons of the water used, which is nearly 1d. per ton. Even this, however, which is the largest amount yet quotable from experience, is far below the chemist's estimate of value. And I am bound to add that the difference between the value estimated even on unquestionable data (which are used, too, as the basis of what appears to be a fair and reasonable calculation) and the value actually realised from any agricultural use of sewage which has hitherto been quoted, imperfect though the methods used have been, is greater than has been yet accounted for. There seems in the excessive dilution suffered by the fertilising matters, even of the strongest sewage, to be some hitherto unexplained hindrance to the fertilising action which, as for example, in our guanos and superphosphates, they elsewhere exert. At any rate, the quantities of them present in the foul waters of our towns have nowhere yet produced the same fertilising effects which similar quantities of the same materials produce when applied in the solid form. And the explanation is not rendered any the easier by the fact, now well known to farmers, that the serviceableness of any artificial manure depends very materially upon the means taken to distribute it evenly throughout the soil; so that guano, well powdered and mixed with eight or 10 times its weight of soil before application, or guano well mixed with water and distributed through the water-drill, is more efficient as a manure than guano applied by hand along the drills without any special care to divide and distribute it. Nor does another fact, to which experience bears ample testimony, at all contribute to the solution of the difficulty, —that there is evidently greater waste when the sewage comes of unusual strength upon the land than when it comes so weak as at once to lose its smell when poured over the surface of the growing crop. *Mr. Morton's report* (1867) *to the Metropolis Sewage Company.*

Home Correspondence.

Herefords.—I have bought, for the use of the parish, a Hereford bull-calf of my friend Mr. James, of Mappowder, and have given it to Mr. Joseph Hallett, tenant of Lord Rivers. The cows here are of no particular breed. I hope the Hereford bull will do good. I wrote for the pedigree, and received the following:—

"I have enclosed the pedigree of the bull calf. You will see that both sire and dam are descended from the celebrated SIR BENJAMIN, one of the best bulls ever bred in Herefordshire. BATTENHALL and SIR THOMAS were both prize winners at the Royal Show. SIR THOMAS was sold to his present owner for 390 gs. The following is the pedigree:—FAVOURITE, calved February 3, 1870, sire WONDER (3602), g. sire BATTENHALL (2406), g.g. sire SIR THOMAS (2228), g.g.g. sire SIR BENJAMIN (1387), dam *Queen*, by SAMPSON (2208), g. sire of the dam SIR BENJAMIN (1387)."

I have also written to my friend Mr. Sturt, of Crichel, for a boar pig of his Essex sort. There are two sows here, brindled, of great size, that produced the same day eighteen pigs each. These, crossed with the Essex, would combine size and quality. In all crosses the female should be large and the male neat. The Herefordshire cow crossed by a Devon bull is one of the best and most natural crosses. There is a splendid cow here, six years old, so produced. She is red, and whitefaced. She calved nine days before Christmas, and her calf (weaned) is now worth £4. The following is the dairyman's account of five weeks' produce:—Jan. 5th, 13 lb. of butter; 12th, 13 lb.; 18th, 13 lb.; 27th, 13 lb.; Feb. 2d, 13 lb. The cow had some Grass. The butter was sold at 1s. 3d. per lb. There is a very good carthorse sire, and also hack sire, in the parish; let me hope that our cows and pigs also will in due time be improved. Perhaps others may be induced by the above to try and benefit their neighbourhood. *W. F. Radclyffe, Okford Fitzpaine.*

Scientific Book-keeping.—Alluding to this subject on a former occasion, I mentioned having made up an account for my fields showing the ash constituents, or "terrestrial elements," I had removed in the crops reaped, and desiring to ascertain with some degree of certainty that the cropping pursued, and the manurial means taken to restore quantitatively and qualitatively to the soil the elements that are withdrawn, are correct, in lieu of an account from my own farm, I have taken the example placed before us in "Morton's Encyclopædia," vol. i., p. 146:—Oats yield 2.90 per cent. of ashes in the grain and 5.10 per cent. in the straw. The produce of a fair average crop may be taken at 50 bushels, weight 40 lb. the bushel, the produce of the straw being taken at two-thirds more than the grain. In 2000 lb. Oat grain, 56 lb. mineral food; in 3332 lb. Oat straw, 170 lb. mineral food. Now, in my instance I have drawn the following form of account, showing its working in this one acre. It is a crude form, and can no doubt be improved upon; it is with this hope it is submitted. Assuming such an account had previously been in use, and after the harvest the soil was found to contain the following ash constituents or terrestrial elements, see first column:—

Ash Constituents of Soil.	In Foul Land for Analysis.	Added in the Manure.	Total.	Removed in Crop Out.	Decrease.	Increase.
Potash	..	31 66	31.66	17 69	13 97	..
Soda	..	73	2 73	17 18	14 18	..
Magnesia	11	1 50	2 17	10 66	8.49	..
Lime	52.33	31 41	86 74	15.99	..	70 75
Phosphoric acid ..	..	43 11	43 11	14 90	..	28 21
Sulphuric acid ..	..	13 62	13 62	6 89	..	7 73
Silica	126	83 37	83 63	109 62	25 93	..
Peroxide of iron ..	2 80	.69	3 55	9 27	5 72	..
Chloride of sodium ..	..	7.96	7 96	0 11	7.85	..

In the second column it will be observed we add in the manure certain ash constituents of the soil; these are taken, in this case, not as regards the kind of manure really required for the soil, but because the analysis is ready to hand in the work already quoted. In this instance 3 cwt. guano (analysis, vol. i, p. 1012) and 2 cwt. silicate of potash (vol. 2, p. 789) are together represented in column 2. In third column we have total of ash constituents, as contained in soil and manure applied; column 4, ash constituents withdrawn from the soil by the crop (Oats). The fifth and sixth columns register the decrease or increase of the several ash constituents, showing the state the land is left in after harvest. "Johnston's Catechism of Agricultural Chemistry," at p. 37, gives a table of the ash constituents of the various grain grown by the farmer, then follows this question—How would you remedy such special exhaustion?—Answer: By returning to the soil the particular substances my crops had taken—Very true, but here is my stumbling block. The above account shows I have taken from the soil in my crop of Oats, beyond what the ground as per analysis contained, as well as beyond what it received, in the guano and silicate of potash, viz., of potash 10½ lb., of soda 14 lb., of magnesia 8½ lb., of silica 26 lb., peroxide of iron 5¼ lb., chloride of sodium 7¾ lb. The crop intended to follow the Oats is Beans; in general farming this field, from previous treatment, would be considered in "good heart," and with a coating of manure a paying crop of Beans may be expected Q. 195: To make his land better, how much must he put in?—A.: He must put in more than he takes out.—Here, again, I am at a loss, for artificial and home-made manures differ in their composition; and knowing that the Oats left my field weak in potash, soda, magnesia, silica, peroxide of iron, and chloride of sodium, I must dip into my lesson-book again (Morton). The Beans will find in the soil a sufficiency of but two of its constituents, viz., lime and sulphuric acid; and were Peas substituted for Beans, there would be a total deficiency of all the ash constituents,—p. 148. What manure do I require to meet the deficiency?—and, what is required for the succeeding crop of Beans or Peas? No doubt improved mechanical condition of the land will greatly aid to develop the stores of nutritious elementary substances contained in most of our soils. This, aided by atmospheric influences, will convert into active fertilisers substances that hitherto were dormant and not available, thus economising manure. We learn wisdom from failure much more than from success. We often discover what will do by finding out what will not do, and it is most likely he who never made a mistake never made a discovery. It is recorded of a distinguished investigator in physical science, that whenever, in the course of his researches, he encountered an apparently insuperable obstacle, he generally found himself on the brink of some discovery. I hope I may be on the brink of obtaining aid from those that are better informed than *Scientific Training.*

The New Forest.—The discussion upon the royal forests in the House of Commons, on the 26th ult., brought from Mr. C. S. Read a remark upon the amount of rent I pay the Crown for 430 acres of land, £816 per annum—that is, for rent and interest upon capital expended in improvements by the Crown at my request. But as the object of the discussion was whether 60,000 acres of land should be cultivated or not, I am anxious to add a few important facts to his statement, which he could not be in possession of. The staple of many thousand acres round the two farms I hold (four miles apart, and mostly planted with Fir trees) is as fine for agricultural purposes as is usually found in any county; very superior to that round London, and the climate superior to any I have hitherto met with in any other part of England. The land wants nothing but simple, honest farming by resident farmers; I say resident farmers, because both the farms I hold were farmed by the Crown up to the time I took them, and produced, I am told, very little indeed. They now produce heavy crops of the finest grain of all kinds, the finest roots; and growing Grass, 2 feet 9 inches high, was shown at the "Fat Cattle Show," at Christmas, at Mr. Geo. Gibb's stand, dug up from the open field to send there. I have no objection to show the last year's produce of the New Forest farms (Swedes only excepted, as they are eaten)—White Wheat, Red April Wheat, Barley,

Oats, both kinds of Mangels and Carrots—against the produce of any farm in England, not for a money wager, but for the benefit of the public. The highest quotation for last year's Wheat in the London market on the 21st ult. was 48*s.* per quarter, or £12 per load, being 5 quarters; the highest price at Southampton was £11 5*s.* per load. My last sale return from Guildford on the 21st was £13 15*s.* per load; my Barley is equally good, but has not yet been offered for sale. My red and yellow Mangels both got 2d prizes at Birmingham, and my Carrots were commended. The public I allude to are the poor people scattered about the forest, who with great difficulty earn a living, and find some resource in the produce of the forest: they may be driven by hunger—perhaps they are—but there is no doubt cattle and pigs are taken without respect of persons. I have been favoured with the interest they take in my cattle and pigs; I now send out heifers in calf, instead of Scotch bullocks, and never send my pigs out without a person to stay with them during the day and bring them home at night. My newly made hay was taken away with a horse and cart from the field during the night before it was to be carried to the stack; my Wheat was taken from two fields, one at each end of the farm, in the night after it was cut; and there are occasionally prosecutions by the Crown for taking rabbits, pheasants' eggs, &c., and children are prosecuted for damaging trees for firewood. Is it not a scandal? Is it not a sin? Is it not grievous to see children driven out into the forest to pick up what they can find for food and firing, and men half starved for want of work in a country of 60,000 acres of land capable of growing the finest grain and the finest roots in England, but uncultivated, and that because it belongs to the Crown? Had not the Crown better sell the 60,000 acres to be cultivated, employ the increasing population honestly, grow food for them as well as for the country at large? The forest, after paying off the common rights in land or money, would realise to the crown between one and two millions of money, one million of which invested in Consols would produce £32,500 per annum, instead of £1700 as at present. I feel sure Her Majesty would approve this, and that it only need be placed before her to receive her consent. What would be the produce of the 60,000 acres farmed by individuals who would purchase them? In all probability it would be farmed after this manner: 20,000 acres might be in pasture, 10,000 in Wheat, 10,000 in Barley, 10,000 in Oats, and 10,000 in roots. 10,000 acres in Wheat, 3 quarters to the acre, would be 30,000 quarters; 10,000 acres in Barley, 5 quarters to the acre, would be 50,000 quarters; 10,000 acres in Oats, 7 quarters to the acre, would be 70,000 quarters; 10,000 acres of roots, 25 tons to the acre, would be 250,000 tons. 20,000 acres of pasture for sheep, &c., produce to be added by a more competent judge than I am: one sheep an acre for the roots, and one sheep an acre for the pasture, would produce annually 30,000 sheep. *William Dickinson, New Park, Lymington, Hants, March 5.*

Farmers' Clubs.

LONDON.

March 5.—On Sewage Farming.—Mr. BAILEY DENTON opened a discussion on this subject before the Club on Monday evening last—Mr. J. Howard, M.P., President of the Club, occupied the chair. The following is a very condensed report of the most important portions of the lecture. After referring to the great want of technical education of both farmers and labourers, in order to the successful adoption of sewage farming, and quoting the report of the Rivers Pollution Commission to illustrate the extreme improbability of any other than the water system being adopted for the house-scavenging of large towns, Mr. Denton spoke of—

The Possible Extent of Sewage Farming.—I may mention that there are in England alone 12 towns, including the metropolis, with populations above 100,000; 18 towns between 100,000 and 50,000; 137 towns between 50,000 and 10,000; and 360 between 10,000 and 2000.

Now, assuming for our present purpose that half these towns ultimately determine to utilise their refuse by irrigation, then the number of acres of land that will be withdrawn from ordinary farming and applied to sewage farming will swell into a considerable area. It is true that authorities differ upon the number of acres required to purify sewage, and turn it to the most profitable account. My own opinion is that a much more extended experience than we have yet had must be gained before we can draw the line between the necessary sanitary demands for purification, possibly requiring only a comparatively few acres, and the expediencies of profitable farming rendering it wise to spread the sewage over a wide area. What has been already done, however, affords a variety of examples, not very conclusive in result, but very suggestive for future guidance.

At Bedford, for instance, where the surface soil and subsoil are free and open, the sewage of upwards of 16,000 persons is at present applied to 55 acres of land only, which is after the rate of 300 persons to the acre. No fluid passes off the surface: it is all absorbed. Our Chairman will tell us, however, that it is the intention of the town authorities to extend the area of utilisation to 200 acres, not perhaps so much because the sewage is not at present sufficiently purified by the vegetation and filtration due to this limited area, but because the sewer authorities of the town believe a much greater profit may be obtained from a greater number of acres. It is not improbable, too, that there exists at Bedford the natural belief that a narrow area of surface, and limited means of filtration such as quoted, may in time render the effluent water from the subsoil extremely polluted. At present it appears, from the published analyses, that vegetation and filtration together are "sufficient as a sanitary agency," though limited to the extent mentioned.

At Carlisle, where the soil is also very open in character, the sewage of 22,000 people is distributed over about 100 acres of land devoted to permanent pasture. This is after the rate of 220 persons to an acre. The whole of the sewage is absorbed and percolates down to the level of the springs which help to maintain the rivers Calder and Eden.

At Croydon the sewage from about 35,000 persons is applied to 260 acres of free, open soil at Beddington, giving a proportion of 134 persons to the acre; the sewage from about another 4000 persons is utilised on about 30 acres of low-lying clay land at South Norwood, giving a proportion of 133 persons to the acre.

At Aldershot (where the sewage is all derived from the camp, consisting of adults) the sewage of 7000 persons is distributed over 80 acres of poor sandy soil, in which peroxide of iron prevails, or 88 soldiers supply the sewage for an acre of land, which is equal to a much larger proportion of an average population consisting of men, women, and children.

At Tavistock, where the soil is a loam with a subsoil of pebbles, the population is 9000, and the number of acres irrigated 90, or exactly 1 acre to 100 persons.

At Worthing, where the soil is also of a free description, 8000 persons supply the sewage for 95 acres of land, of which 53 are cultivated and 42 are permanent Grass. This is after the rate of 85 persons to the acre.

At Malvern, where the soil is partly a gravel and partly a clay, the sewage from about 5000 persons is applied to 84 acres of land, of which 54 are permanent pasture and 30 arable. This is after the rate of 60 persons to an acre.

At Banbury, where the soil is clay, the number of acres under irrigation is 120, and the population being 11,000 the proportion is 1 acre to 92 persons. The condition of the effluent water here is not so satisfactory as in other cases, but this is no doubt owing to the fact that the under-drainage of the land is imperfect, and allows the sewage only partially filtered to descend into the drain, and so pass into the rivers.

At Rugby, where the soil is of a mixed character, partaking of gravel on a clay subsoil, 65 acres of land have been taken on lease as sufficient to satisfy upwards of 8000 inhabitants; and as this town has long been under treatment for sewage irrigation, past experience has probably had influence in deciding the quantity of land taken. The proportion is 125 persons to the acre.

There are about 30 towns in England where the sewage has been applied by irrigation, but the experience of the before-named towns may be taken as the best examples at present existing by which to arrive at some idea of the quantity of land required, though, as I have stated before, we must trust to future experience to decide the question definitively. To make sewage farming as profitable as it is capable of being made, it is necessary to have something like 33 per cent. of extra land beyond that used for irrigation—that is, 1 acre of unsewaged land to 3 acres sewaged—so as to allow of periodical rests to the sewaged portion by an alternation of cropping. To provide, also, for the gradual increase of population, additional land capable of receiving sewage should be provided. If, therefore, we take 50 per cent. in addition to the amount actually required to meet both these considerations, we arrive at the least extent of land which will sooner or later be abstracted from ordinary and devoted to sewage farming. Upon these data, and supposing that half the towns I have classified by their populations adopt irrigation as the mode of utilising their sewage, the quantity of land required will amount to at least 100,000 acres.

As far as experience has yet gone, the soil most suitable for the production of sewage crops is a light, free soil, though I am disposed to believe that when we have had more practice we shall find the clays equally available. Upon this point, I believe, Dr. Voelcker is of opinion that clays, deeply cultivated and properly drained, may be more productive under sewage treatment than free soils; though we know as a fact that the poor sandy soils to which the sewage of Edinburgh has been already applied have produced herbage which was sold last year at a price ranging from £41 17*s.* 6*d.* to £19 per acre; while in the more repulsive soils of the Bagshot Sands at Aldershot, which are mixed with peroxide of iron, Mr. Blackburn has let land for garden purposes at £5 an acre, while before the sewage was taken on it this was literally not worth half-a-crown. These sandy soils were naturally so sterile that it would appear it matters not what is the quality of the soil which becomes the matrix for the sewage so long as it is easily penetrated by the roots of vegetation. This is an important point where suburban land is very expensive and poor land is within reach.

If free soils naturally drained, and clays pulverised by under-drainage, are equally available, the proximity of the sewage farm to a ready market becomes the first desideratum. It so happens that the vegetation best produced by the use of sewage is that which will find customers in the town from whence the sewage is obtained if within easy reach. Italian Rye-grass, roots, and market-garden produce can be sold as soon as they are fit for use to the townspeople; and it is for this reason that the land devoted to sewage in the vicinity of towns must rank as accommodation land, and the price if purchased, or the rent if leased, rise accordingly.

Value of Sewage.—The value of sewage depends in the first place upon the extent to which the excreta matter voided by the population is diluted by the water supplied to the town for domestic purposes, and by influx of surface and subsoil water into the sewers; next, by the nature of the trades and occupations of the inhabitants; and lastly, by the capability of the land to assimilate the fertilising matter, and to benefit by the quantity of fluid with which it is mixed.

Whilst the quantity of excretal matter per head is constant the quantity of water supplied to different towns varies very considerably. For instance, at Bedford the daily supply is 15 gallons per head, at Carlisle 40 gallons, at Croydon 45 gallons, at Malvern 5 gallons, at Banbury 21 gallons, at Worthing 45 gallons, and at Rugby 25 gallons. The influx of subsoil water varies in different towns, even in a much greater degree than the water supply, and though it varies at different seasons according to the subterranean water pervading the district, it does not change like that entering the sewers from the surface which is directly dependent upon the rainfall, and sometimes overloads the sewers, while at other times there is no influx at all. The great increase due to subsoil water alone is proved by the fact that while at Banbury, with a daily water supply amounting to 230,000 gallons, the dry-weather discharge from the sewers is only 200,000 at Bedford, where the water supply does not exceed 150,000 gallons, and where the surface and storm waters are excluded from the sewers, the daily discharge from the sewers amounts to at least 500,000, and has been reported to be as much as 797,250 gallons daily. The quantity and quality of town refuse, other than and in addition to human excreta, vary also considerably in different towns, almost as much as the quantity of water supplied to the inhabitants and the influx of subsoil water. For instance, in some large towns there may be one prevailing character of industry, such as the woollen, silk, and chemical works of the Lancashire towns, the tanneries of Stockport and Warrington, and the breweries of Burton and Romford. In small towns there may be an extensive brewery, or one special trade which may proportionately affect the discharged refuse quite as much as a general trade in larger towns.

I do not propose to go very deeply into the chemical analyses and chemists' calculations that have been published from time to time showing the value of sewage discharged from different towns. To bring their analyses to bear practically upon the treatment and utilisation of the sewage, engineers and chemists have combined to shift their figures from one denomination to another. Instead of referring to ounces of ammonia and pounds of excretal matter voided by each average member of the population, the whole refuse has been brought into tons of sewage discharged from a town. Having arrived at 8*s.* 4*d.* (which is 100 pence) as the average value per head of the excretal matter voided by a population, Messrs. Lawes and Way assume that by one means or another—by the supply of water for domestic and trade purposes, by the influx of surface-waters, and by the accretion of subsoil waters—the maximum quantity of sewage discharged from a town may reach 100 tons per head per annum. Thus, as 100 pence is the value of the fertilising matter due to each head of the population, 1*d.* is placed upon each ton of sewage as its value also. The simplicity of the calculation would be perfect if experience showed that the excrementitious matter diluted in the proportion of 333 of water to 1 of excretal matter was really worth the money. But it is obviously the fact that, beyond the extent of dilution which renders the sewage most acceptable to vegetation, 20 gallons per head, the sewage undergoes depreciation in proportion as it is further diluted. It stands to reason that there must be a proper limit to the dilution appropriate to different soils, and no species of sophistry in science can make it otherwise, however anxious we may be to utilise the water with which we have to contend under the present sewerage systems. I think that a penny should only rule when the water supply is 20 gallons a-day per person, or 32½ tons per annum, and only then when the acceration of subsoil water does not increase the discharge from the sewers more than 25 per cent., which raises the discharged sewage to 40⅝ tons, the money value being calculated on the water supply (32½ tons), and not on the aggregate discharge (40⅝ tons); for we must always bear in mind that sewage is "the refuse of human habitations," and not the water of drainage or the water of rainfall, and that therefore the measure of "sewage" is the water supply. Upon this view, while Messrs. Lawes and Way's estimate of the theoretical value of sewage is 8*s.* 4*d.*, and Mr. Hope's estimate of the actual value is 4*s.* 2*d.*, that which I have ventured to give will stand at 2*s.* 8½*d.* In fixing this price, I have been guided by results and probabilities, and have regarded sewage simply as manure supplied by sewered towns to their tenants, and have separated the return due to it from that which would arise from the land without it. Mr. Marriage, at Croydon, has shown that the full produce from his 260 acres has yielded a return of 46*d.* per ton for the sewage, or a fraction less than a halfpenny per ton, which is equal to 2*s.* per head of population, and which, after deducting rent, rates, taxes, labour, interest on capital, &c., will represent the value of the sewage (which is much doubted) at less than a farthing per ton. At Aldershot, where there is a return of £1200 from the waste of 7000 adults, the return per head is 3*s.* 4*d.* per annum. It is difficult to arrive at what proportion of this is due to the sewage, independent of the land and expenses, and I leave you to draw your own deductions. At Norwood 3*s.* 9*d.* per head, per annum, represents the return derived from the whole produce, while only 9*d.* per head represents the profit! These instances alone are sufficient to show that a penny a ton on the reduced quantity of sewage, which I have taken as my datum, is quite as much as the sewage, *per se*, is worth in the present state of our knowledge, and that this sum should be divided between the landlord supplying the sewage and the tenant using it. If this is right, 1*s.* 4½*d.* per head may be considered as the payment due for the sewage, and in a town of 10,000 people it would amount to £677 1*s.* 8*d.* This is equal to £6 15*s.* 5*d.* per acre, and represents the pay-

ment of the farmer for the manure of the sewaged portion of his farm. In some soils, where water is available after the land has appropriated a sufficiency of manure, a larger charge may be made for the sewage; but in clay soils, the retentive properties of which cannot be altogether removed by any amount of under-drainage, an excess of water should be met by a reduced charge. This is one reason why both storm and subsoil waters should be kept out of the sewers.

The Preparation of the Land. [Mr. Denton proceeded to discuss the method of laying out the land for the reception of sewage coming to the conclusion that irrigation by means of channels on the surface is the only method open for adoption and then describing in succession the various methods of irrigation practicable.]

The Return from Sewage Farming.—The crop which up to this time has commanded the greatest attention is Italian Rye-grass, which has been generally sown in the autumn, and has lasted two years and more; but experience is beginning now to show that it is more productive if grown for one year only. Its value as a farmer's crop consists in the extraordinary rapidity of its growth.

Mr. Morton has shown that 46 tons can be produced in the year by dressings, amounting to 5520 tons per acre, which is equal to 1 ton of Grass from every 120 tons of sewage; while Mr. Hope states that as much as 100 tons per acre can be produced in the year from nearly the same amount of dressings, which is equal to 1 ton of Grass for 56 tons of sewage. The value of Italian Rye-grass as a means of purification consists in its rapacious appetite for liquid manurial matter, causing it to start into growth earlier in the spring, and remain active later in the autumn than any other known crop. The money value of Italian Rye-grass will, of course, depend upon the market at hand. It has realised upwards of £1 a ton when fresh cut, but the average price will probably be 11*s.* a ton, and then only when there is a constant demand for fresh cut Grass. But a constant sale of Italian Rye-grass is not by any means certain. In the small towns of Rugby, Bedford, Banbury, and Warwick, they have already experienced considerable difficulty in disposing of it, and at Banbury last year they sold it by auction when ready to cut for hay; the price realised in the year for the two cuttings was £11 an acre, which is considerably less than half the amount realised from Mr. Morton's quantity of 46 tons an acre, at 11*s.* a ton (£25 6*s.*). At the Lodge Farm, last year, the Hon. Mr. Petre actually produced and sold 53 acres of Rye-grass for £1350, which is £25 9*s.* 6*d.* to the acre; and he had amongst his customers Messrs. Pickford & Co., the well-known carriers, who had regular supplies for their stables, and who pronounced it to be excellent horse fodder. I understand Mr. Darby, of Rugby, the well-known horse-dealer, has also found Italian Rye-grass excellent food for horses. Hitherto there has been some doubt upon this point, and sewage-produced Grass has been almost entirely devoted to feeding cows and neat cattle. I mention it, therefore, here, as it will go some way to satisfy you that the demand will increase as the production becomes better known. Mr. Marriage, of Croydon, has, I believe, contrived to sell his fresh-cut Grass for 23*s.* a ton when carried into town; but the ordinary price on his farm has been from 13*s.* to 14*s.*, when taken from the ground ready cut and weighed. This, it must be remembered, however, is near the metropolis, and the Grass was therefore more likely of sale than in ordinary instances. At Norwood, last year, the Rye-grass from 28 acres of land was sold in five or six cuttings for £741 0*s.* 6*d.*, which is more than Mr. Petre realised at Barking, being upwards of £26 per acre.

Now that it is pretty well understood that Italian Rye-grass does not remain at full profit more than a year, and that it has not the effect which people believed in purifying sewage during the winter, its pre-eminence as the best sewage crop may cease to be acknowledged. Sewage suits all roots of a succulent character; Potatos, Mangels, Swedes, Turnips, Carrots, Parsnips, Kohl Rabi, and Sugar-Beet, are all equally fond of it. It also suits the leguminous vegetables; Cabbages of every kind seem to luxuriate in it, and vegetables of a less gross habit, such as Celery, Lettuces, Onions, Radishes, &c., all seem to thrive. The superiority of liquid sewage over farmyard or any other dry manure, for the growth of roots and vegetables, is that it allows of transplanting, and thus making good any delay or accidental failure up to a late period of the year. Mangels have been transplanted as late as the end of June, and have produced a heavy crop. In fact, such is the value of a command of water in sewage, that Mangels and most other roots are looked upon as a certainty. It is not over-estimating the average crop of Mangels produced from sewage farming to put it at 35 tons to the acre, which will realise at least £25 at 14*s.* a ton. We have not had sufficient experience in Kohl Rabi to arrive at any average weight of crop, but there is every reason to believe it will turn out to be a most suitable one. The same may be said of Swedes and Turnips. Carrots and Parsnips, if grown in moderate quantities, so as not to overstock the market, will realise between £30 and £40 an acre, assuming the land to be suitable to their growth. The whole of these root crops appear to require very judicious treatment in the selection of time of application, and the quantity of sewage applied, for it is easy to overdo the dressing, and to apply it at the wrong stage of growth. So with Potatos, which will probably be found the most profitable of all roots. Already upwards of £30 an acre have been made, and, considering that it is hardly possible to overdo the market with Potatos, as you may with Carrots and Parsnips, the anticipation will not appear unreasonable. Cabbages of various sorts have realised from £20 to £30 an acre. Onions, though we are told by the Hon. Mr. Petre they are difficult to raise, will repay the efforts to produce them; for he states in his "Notes for the year ending August 31, 1869," that "1¾ acre of White Onions sown early in March, which did not look well until June, realised over £67 for the plot." I desist from further details, being content to point out the fact that in many cases it is possible to take two crops in one year, and that the figures I have given are moderate. Early Peas may be directly followed by Mangel, and Mangel by Celery, the plants being insured by the aid of a sufficiency of water and manure. Moreover, there is a future for Sugar-Beet and Mangels, which renders them of extra value. It is hoped that the one may be made into sugar, and the latter into feeding cake for stock. I place on the table a cake made from a Mangel by Mr. Hugh Smith. The crops which do not satisfactorily respond to sewage treatment are cereals. These crops have seldom exceeded in quantity what has been obtained from ordinary farmed land dressed with yard manure. It will be a very different thing with cereals when they alternate with Rye-grass and roots; then the sewage left in the soil after satisfying the Grass or roots will suffice to produce the heaviest crops of Wheat, Oats, or Beans, without additional manure; and it is not at all improbable that we shall have fallow lands used as filtering beds during the winter in preparation for cereal cropping during the following summer, thus securing a fair proportion of straw. I lay great stress on the growth of straw, as I believe it will ultimately be as highly valued on a sewage farm as any other production; inasmuch as it will only be by the most profitable home consumption of sewage produce, when it cannot be advantageously sold at the proper moment, that sewage farming will reach its full profit.

To bring these various prices of produce into account and put before you the balance-sheet, I will assume that for a town of 10,000 inhabitants a farm of 150 acres is established, on 100 acres of which the sewage will be utilised. Let us further assume that with good management at least one crop is produced every year from the whole farm, and that, for the sake of simplicity of calculation, the whole is sold as it is produced. We shall then have the following figures to deal with:—

Receipts.

40 acres Italian Rye-grass (20 acres sold green at £25 an acre, 20 acres sold for hay at £12 10s.)			£750
20 acres permanent Grass (10 acres for winter irrigation), at £6 an acre average			120
20 acres Mangels	at £24 10s. an acre average		490
10 ,, Potatos .. .	,, £25 ,, ,,		250
5 ,, Carrots ..	,, £32 ,, ,,	}	320
5 ,, Parsnips	,, £32 ,, ,,	}	
10 ,, Cabbages .. .	,, £25 ,, ,,		250
40 ,, Cereals (with straw)	,, £16 ,, ,,		640
			£2820

Outgoings.

Rent, with rates and taxes	£600	
Charge for sewage	77	
Rent-charge for preparing and draining land ..	200	
Labour, horse and hand . ..	500	
Seeds, repair of implements, &c. . ..	800	
Interest on capital	75	
		2252
Tenant's profit		£568

By this statement it would appear that the tenant-farmer's profit and interest on capital would be £643 a year from 150 acres of land; while the sewer authorities of a town acting as their own tenants would realise the same amount in addition to the charge for sewage, making very nearly 2*s.* 8½*d.* a head on the 10,000 persons contributing the sewage.

But this, perhaps, is assuming a favourable view of things: it is supposing the produce all sold, and the money all realised. I will now claim your attention to the disadvantages and drawbacks of sewage farming. In the first place the sewage farmer will be under obligation to receive and dispose of the sewage at all times of the year, whether it be profitable or not to utilise it; and when you consider that, with a town of 10,000 inhabitants using 20 gallons of water a head, there will be delivered to the farmer every day, winter and summer, 9000 tons of sewage which must be so dealt with and discharged in a pure condition, the obligation assumes a very serious aspect. If filtration through land in a fallow state will sufficiently purify sewage during winter when vegetation does not want it, this difficulty is very much reduced, and we should regard sewage farming in a different aspect; and it will become an object of the highest importance so to devise the system of filtration that it shall operate as the best means of placing and storing the manure required for future instead of growing crops. The next drawback is that of being obliged to dispose of your free-growing Grass directly it is fit to cut. If cut for use while green, there must be the customer near at hand to purchase and remove it as soon as it is ready, or it suffers considerable damage, and causes injury to the succeeding crop as well. If there be no customer, the farmer must let it stand for hay; or he may provide stock to consume it in a green state, when he departs from the simple course of disposing of the crop as soon as it is ready for sale, and alters the whole system of arrangement. He has the alternative of selling by auction the Grass when fit to cut for hay, as is done at Banbury and other places, and transfer the risk of making it to the purchasers. These difficulties are very considerable, owing to the fact that the crop is too bulky to dry in the natural way by being spread upon the surface of the ground which has produced it; it must be either wholly or partially removed to an adjacent surface, or it must be artificially dried. Against these drawbacks or difficulties, however, there is the set-off of prospective advantages to be gained by the adoption of a system of cropping more nearly approaching that of market gardening than I have mentioned. If Onions and spring Peas, Lettuces, and such like vegetables are produced, my figures will sink into insignificance; or if milk is produced and sold successfully, the business assumes a different character. This I leave for future development. My remarks have already been too lengthy; and I have only to hope that they have been kept sufficiently close to the point to secure a profitable discussion, and that you will give me credit for placing the details in an unvarnished condition before you.

Farm Memoranda.

Wester Ross: *March* 1.—For three months the frost has been so continuous, that on some northernly exposed farms, and on those much sheltered by wood, the plough during all that time has never been yoked; and yet there has been very little snow, and altogether the winter has been healthy, pleasant, and bracing. During the early part of the autumn the weather was so continously wet, and afterwards the frost set in so early that only a small breadth of autumn Wheat was got down; and although we have had a few days since the new year, which, on the better exposed farms, were taken advantage of for Wheat-sowing, and during which the soil worked admirably, the breadth yet sown is greatly less than usual. Vegetation has been all but dormant. Wheat sown in the middle of November is yet scarcely to be seen aboveground. The soil that would have been sown with Wheat will now be seeded with Barley, which will be more profitable should the relative prices of both continue as they now are. Our spring must now be an exceedingly busy one. Some of the green-crop lot has yet to receive its winter furrow; nearly the whole breadth of lea for Oats has yet to be seed-furrowed, and on the whole there is quite a sufficiency of work for the horses to go through. So far as the cereal crops are concerned, this is not yet the year in which the farmers in this quarter are to grow rich. Grain at its best is bringing a low figure; but much of it with us was so deteriorated by the incessant rain in harvest, that it fetches some 8*s.* or 10*s.* per quarter below the price of the best quality. The rain began about the middle of harvest, and all the grain secured before its commencement is of excellent quality, and fetches a comparatively high price; but what was secured afterwards was much discoloured and partially sprouted, and consequently fetches a greatly reduced price. Some farmers have realised for their whole crop of Barley some 34*s.* or 35*s.* per quarter, while their neighbours, with land equally good, may have realised 25*s.* or 26*s.* With Wheat, however, it has not been so bad, for although all that was overtaken in the field by the rain was carted home in a very bad state, yet the continued frost of winter has been peculiarly favourable for bringing it into condition. In autumn it was supposed that our Turnip crop would scarcely be consumed. The keen demand for sheep for the South brought away more than the usual number from us, consequently a smaller number than usual went on Turnips, but the winter has been severe on the hills, and a good many of the older sheep had to be brought to the low country; and besides, an unusual quantity of our Turnips was destroyed by the frost, so that now they have become so scarce that many of the sheep will have to return too early to the hills, and artificial food will have to be largely drawn on to keep on our cattle. Cattle were bought in cheaply in autumn, and are now selling at a price that leaves a decent profit, while sheep also are selling well. The winter has been unusually severe on the labouring class. Even where there was a sufficiency of work, the weather prevented its accomplishment.

Miscellaneous.

Carriage of Sheep by Rail.—Mr. Beale Browne, of Salperton Park, sued the Great Western Railway Company, before the Cheltenham County Court, for £35, the loss alleged to be sustained by the delay of the defendants in delivering seven sheep. Early in August the Hereford branch of the Great Western Railway was closed for the change of gauge, which, at that date, was carried out. On August 17 the plaintiff, who is well known as a breeder of Cotswold sheep, sent seven tups into Cheltenham, to be conveyed to Hereford by rail, for sale at Hereford fair on the following day. They were delivered at the Cheltenham station at an early hour on the 17th, but they did not reach Hereford until the evening of the 19th, having been on the road, without food or water, for 48 hours. As a consequence of this, not only could they not be sold at the fair, which was then over, but they had much deteriorated in value, and could not be sold at all, some for a fortnight and some for three weeks afterwards. It was admitted that the plaintiff's servant had signed the usual consignment note, which was contended to exonerate the defendants from any consequences of delay, and it was a question whether the conditions of that note were overridden by the general law that conveyance must be within reasonable time, and whether the time was reasonable. The company endeavoured to show that by the breaking up of their rails on the Hereford and Ross branch, they were compelled to take the sheep round by a much longer route; but they did not attempt to prove any special notice to plaintiff of irregularity of conveyance, and the assumption that the general notice had come to the plaintiff's knowledge was resisted. In the end, the Judge put these questions to the jury:—Whether the plaintiff believed he was sending by the direct route when he despatched his sheep; whether, supposing the direct route to have been taken, the delay on the road was a reasonable one; and lastly, supposing the indirect route to be a proper one, the company were then guilty of no unreasonable delay? In the event of the verdict being against the company on these points,

the jury would have to assess the damages. The jury, after a very brief consideration, returned a verdict against the company on all three issues, assessing the damage at £3 10s. each sheep, or £24 10s. in all. His Honour intimated that the legal limit was £2 per head, and the plaintiff's counsel then elected to reduce the damages to £14, for which a verdict was recorded.

The Week's Work.

MARCH 12. *Barley Seed Time.* This is the usual time of sowing Barley in our southern counties. Barley, although it enjoys a wider range of latitude for its natural climate than either the Wheat [?] or Oat, and although it also malts freely when sound, thereby supplying food to the young plants in their first stage of growth, yet a proper degree of warmth and moisture is necessary to successful growth in early life, and a genial temperate atmosphere with plenty of light in the ripening and perfecting of the seed. On some southern exposures in the north of Scotland, here or big, a variety of Barley, is sometimes in favourable seasons in the stackyard some two months after it was sown. In Norway and Sweden this rapidity of growth in the different stages of plant life is common. The Chevalier and other varieties of the South grow more slowly in the South, but in favourable seasons yield heavier crops of a finer quality. But this season, so far as gone, is not favourable for southern varieties in the malting stage of life, and last year (1869) was very exceptional as to the climatic range of Barley generally, some counties of the North yielding a finer and heavier sample of southern varieties than those of the South, because the summer nights last year were warmer in the North than they were in the South. This is true generally, the farther South the colder the summer nights, but the difference last year was greater than usual between certain counties North and South, but less between others. And as the quality of Barley suffers more from cold nights than warm days, there will this year be an unusual diversity in the normal quality of seed Barley unless judicious changes of seed are made. Bad seasons mean much frosted Barley, it may be both at the forming and ripening of the ear—not merely dead grain with black end, but half-dead grain whose normal constitution has been so injured as to unfit it for being sown as seed this year; and a change of seed Barley this year implies, in our southern counties, not merely sound seed, but seed adapted for being sown much later in the season than usual. In the North more Barley is sown in April than in March, purposely to avoid frosting at the formation of the ear. Barley requires a fine seed bed; but of this more when a less unfavourable season for sowing arrives.

Autumn Wheats. Top dress with nitrate of soda, 1½ cwt. to the acre, or 1 cwt. of sulphate of ammonia, or guano 3 cwt., or whatever fertiliser the land may require at this season. The usual time of top-dressing is as soon as spring growth commences, so as to give the young plants the full benefit of an early start; but the present season is so exceptional that it were difficult to say, even at the time we write, if spring growth is yet begun in some districts; but whether begun or not top-dressing should now be applied, as soon as the weather and state of the land will permit. Some prefer deferring the application of spring fertilisers until immediately before the last hoeing; but we see no use in this, for, once in the land, soluble fertilisers cannot be hoed out again. On the contrary, the more deeply you hoe the more vigorously do they force forward early growth.

Peas may yet be sown on early calcareous soils, to which the crop is partial. The land should be well autumn fallowed, but last year this could not be done in many districts, and spring fallowing with a good season, it must be borne in mind, is essentially necessary for a Pea crop, although the contrary is still credited in some out-of-the-way places. No doubt, on naturally rich land, and a good season, the crop is a "smothering one," according to the old rule—killing out weeds and otherwise neutralising the effects of working the land in a bad season, but the old practice is a poor apology for mismanagement.

Beans seldom do well when sown so late as this, but exceptional seasons are not subject to the ordinary rules of time. We have sown even later than this, and reaped a fine harvest; much depends upon getting a fine seed-bed, with a favourable start to the young plants. The Bean is a deep-rooted plant, and therefore requires deep tillage, with a sound bottom. The plant is a large consumer of lime and potash, and these indicate the nature of the specific fertilisers it requires. It occupies a wide range of latitude, growing freely and maturing its seed in our northern counties, and like Wheat, and, indeed, all other cultivated crops, it is affected by the time of sowing, and this normal characteristic requires to be attended in changing seed.

Cabbage-beds, if not sown last month, should be so as early in this as the weather will permit, so as to get up strong plants for transplanting. The later the more forcing they need, and the greater the distance between plants, so as to grow them hardy and healthy.

Hop Gardens. — Finish digging and pruning as soon as the season will permit of the cuttings being bedded for propagation. Plant new hills, and get the poles ready for setting next month.

Artificial Manures.—Late seasons have their peculiar demands upon this class of fertilisers, and although it would be as yet premature to pronounce the present season late—taking the kingdom as a whole—it is, nevertheless, now beginning to be so for a few of the southern counties. Thus crops will require to be forced forward, so as to cover the land before the drought of May sets in, and if May is moist and growing there will be a tendency to too much straw and lodging. To provide for both these emergencies, roasting and lodging, may appear at first sight no easy task, but when we attend to the peculiar functions which the salts of soda and potash perform it is otherwise; for taking common salt and the muriate of potash as the cheapest and readiest fertilisers, they both absorb moisture from the atmosphere in dry weather, while in stronger straw and more corn. Farmers may thus cut the Gordian knot with a two-edged sword, as it were. Both these saline fertilisers should be more largely used than they generally are. Those who burn wood should therefore husband their ashes with the greatest care; and the same may be said of the salts of lime, viz., the phosphates, sulphates, and carbonates, as they conduce to the more solid structure of plants along with carbon, and without which plants, including almost all our cultivated varieties, never show a normal vitality sufficient to cope with an unfavourable season. At one time ammonia was the panacea for everything, but it won't do without the others, and experience begins to teach that the latter above-named require to be in much greater proportion than was then calculated.

Calving is very general this month, and it is a bad plan to shift springing cows when their time is out into a loose roomy box to calve. It is much better to put them there as they go dry, and not to shift them back to their stalls until some time after calving, when they are wholly recovered. Half the difficulties experienced at calving arise from springing cows standing on a sloping stall, knocking against the trevices and the like. The day is not far distant when roomy cow-boxes will be the rule all the year over. *W. B.*

Notices to Correspondents.

BONE. *J. B. C.* You had better apply to Mr. Purser, of the London Manure Company, 110 Leadenhall Street, E.C.

SALT. *Ibid.* It is believed to be a serviceable addition to guano and nitrate of soda and sulphate of ammonia, or possibly to neutralising the urine, where growth these manures promote. Applying 2 to 4 cwt per acre on the driest opportunity to the lighter soil along with the 1 cwt. of nitrate or sulphate of ammonia or the 2 cwt. of guano that you apply as a top-dressing.

Markets.

ENGLISH WOOL.

COMMON PULLED | LONG WOOL | PER lb. | *s. d* | *s. d*
FLEECES—Southdown hoggets .. .. .. | 1 | 1 3/4 | 2
Half bred ditto .. .. .. | 1 | 2 | 2 3/4
Kent Fleeces .. .. .. | 1 | 2 | 1 4
South Down ewes and wethers .. .. | 0 | 1 3/4 | 1 4
Leicester ditto .. .. .. | 0 | 2 | 1 2
SORTS. Clothing .. .. | 0 | 1 0 | 1 6
Combing .. .. | 0 | 1 0 | 1 8

HAY, 56 Loaded to Trusses.

SMITHFIELD, Thursday, March 10.

Prime Meadow Hay	75*s.*	to 80*s.*	Clover, old	100*s.*	to 110*s.*
Inferior do.	60	70	Inferior do.	80	100
Rowen	60	75	Prime do.	100	110
Inferior do.	50	60	Inferior do.	70	80
Straw	24	30			

COMMERCIAL MARKET, Thursday, March 10.

Sup Meadow Hay	75*s.* to 80*s.*	Inferior Clover	90*s.* to 110*s.*
Inferior do.	50 70	New do.	— —
New do.	— —	Straw	35
Superior Clover	110		JOSHUA BAKER.

WHITECHAPEL, Thursday, March 10.

Fine Meadow Hay	76*s.* to 82*s.*	Prime old clover	120 to 130
Inferior do.	60 70	Inferior do. do.	90 100
Prime New Hay	— —	Prime 2d cut do.	— —
Inferior do.		New Clover	105 115
Straw	24 30	Inferior do.	90 100

METROPOLITAN CATTLE MARKET.

MONDAY, March 7.

The supply of Beasts is again short, and the weather very favourable for slaughtering, consequently prices have advanced on all descriptions. The number of Sheep is large, but there is a good demand; a clearance is very nearly effected at rather higher rates. Choice Calves are scarce and rather dearer. Our foreign supply consists of 723 Beasts, 6260 Sheep, and 75 Calves; from Scotland there are 211 Beasts; from Ireland, 295; from Norfolk and Suffolk, 1140; and 382 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5	0 to 5 4	Best Long-wools	5	4 to 5 8
Best Shorthorns	4	8—5 0	Do. Short	—	— —
2d quality Beasts	3	4 4	Ewes & 2d quality	4	4—5 0
Best Downs and Halfbreds	5	8 6 0	Lambs	—	— —
Do. Short	—	— —	Calves	4	0—6 4
			Pigs	4	0 6 0

Beasts, 2761: Sheep and Lambs, 21,110: Calves, 102: Pigs, 65.

THURSDAY, March 10.

We have a fair supply of Beasts, and a slow trade, consequently Monday's quotations are scarcely reached; some few lots remain unsold. English Sheep are plentiful; trade is dull, but prices are not much, if at all, altered. Calves are rather lower. Our foreign supply consists of 205 Beasts, 1730 Sheep, and 96 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5	0 to 5 4	Best Long-wools	5	4 to 5 8
Best Shorthorns	4	8—5 0	Do. Short	—	— —
2d quality Beasts	3	4 4	Ewes & 2d quality	4	4—5 0
Best Downs and Halfbreds	5	8 6 0	Do. Short	—	— —
Do. Short	—	— —	Lambs	—	— —
			Calves	4	0—6 0
			Pigs	4	0 6 0

Beasts, 888; Sheep and Lambs, 6225; Calves, 147; Pigs, —.

METROPOLITAN MEAT MARKET. March 10.

Best Fresh Butter	.. .. ..	18*s.* per dozen lb	
Second do. do.	.. .. ..	15*s.* ..	
Small Pork, 5*s. 6d.* to 6*s. 8d.*; Large Pork, 4*s. 4d.* to 5*s. 6d.* per 8 lb			

MARK LANE.

MONDAY, March 7.

The supply of English Wheat to this morning's market was very small, which brought an advance of 1*s.* per qr. upon the prices of this day se'nnight. There was a good attendance, and a fair consumptive demand for foreign Wheat, American and Russian bringing 1*s.* per qr. more money than on this day week. Barley and Beans were 1*s.* per qr. dearer. The Oat trade was steady at an improvement of 3*d.* to 6*d.* per qr. Flour was unchanged in value.

		s.	*s.*
PRICE THIS MONDAY OF WHEAT,	Essex, Kent, Suffolk	White 38—47	Red..... 35 46
—	— fine selected runs.. do.	49 51	Red..... 38—48
—	— Talavera	54—56	— —
—	— Norfolk	— —	Red..... —
—	— Foreign	48 53	— —
BARLEY, grind. & dist.	36 to 37	Chev. 39 42	Malting .. 34—38
—	Foreign .. grinding and distilling	22—25	Malting .. 39 40
OATS,	Essex and Suffolk	24—29	— —
—	Scotch and Lincolnshire.. Potato	24—26	Feed .... —
—	Irish	Potato 24—25	Feed .... 21—24
—	Foreign	Potato and Brew 24	Feed .... 19—21
RYE		32—33	Foreign .. 33 36
RYE-MEAL, Foreign			24—25
BEANS, Mazagan		36 to 37*s.* Tick 31—49	Harrow .. 31—49
—	Pigeon	500 to 52*s.* ..	Winds Longpod — —
—	Foreign	Small 41 4	Egyptian .. 38 40
PEAS, White, Essex, and Kent..		Boilers 32—42	Suffolk .. 35—43
—	Maple, 41*s.* to 45*s.*		Grey 32—42 Foreign .. 33—37
MAIZE			Foreign .. 29—31
FLOUR, best marks delivered per sack		37 43	
—	2d ditto	ditto 28—40	Country .. 28—40
—	Foreign	per barrel 22—25	Per sack .. 29—55

WEDNESDAY, March 9.

Business in the grain trade to-day has been only moderate, but the tone of the market has been good, and prices have been well maintained. From Essex and Kent the arrivals of Wheat have been limited. The demand has not been animated, but the quotations have ruled firm. The show of foreign Wheat has been good. The trade has been firm, and full rates have been realised. With barley the market has been moderately supplied; business to the moderate extent has been concluded, at full currencies. Malt has been quiet, at late rates. Oats, the show of which has been good, have been in request at full prices. Beans have been firm, and Peas have been fully as dear. Flour has been steady in value, with a moderate inquiry.

AVERAGE OF CORN, &c., IMPORTED INTO AND WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs	Qrs	Qrs.	Sacks.
English	340	1900	—	—
Irish	—	—	—	—
Foreign	—	510	3 300	740 / 1000 brls.
	340	2410	3300	—

LIVERPOOL, March 8.—Market well attended. Large business doing in Wheat, at an advance of fully 2*d.* on red and 3*d.* on white since Friday. Flour in better request, at 6*d.* to 1*s.* advance. Beans steady. Oats and Oatmeal firm, and prices are unchanged. Indian Corn in moderate request; round yellow, 37*s.* 6*d.*

AVERAGES.

	Wheat.	Barley.	Oats.
Jan. ..	42*s.* 2*d.*	35*s.* 7*d.*	20*s.* 4*d.*
Feb. 5 ..	42 2	35 3	20 8
12 ..	41 9	34 6	19 10
19 ..	40 8	34 2	19 10
26 ..	40 7	34 0	20 7
March 5 ..	41 0	33 7	20 8
Average ..	41 0	34 0	20 4

SEED MARKET.

We have to report increased activity in the seed trade. There is now a good demand for Clover seeds, and large quantities have recently changed hands. All descriptions are exceedingly firm, while for some qualities there has been an advance of 2*s.* per cwt.; foreign Italian must be quoted 1*s.* per bale higher. English Rape seed is also dearer. Spring Tares meet with a ready sale at the late enhanced rates.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, March 10.

Messrs. Pattenden & Smith report a retail demand for consumption, late rates being maintained. Stocks of choice are very small of both English and foreign. Good yearlings meet with occasional inquiry, at full quotations.

COALS.—March 9.

Holywell Main, 16*s. 6d.*; Walls End Haswell, 18*s. 6d.*; Walls End Hetton, 18*s. 6d.*; Walls End Tunstall, 15*s.*; Walls End Thorpe, 14*s. 6d.*; Brancepeth Cannel, 18*s.*

—Ships at market, 73; sold, 32; at sea, 30.

GRASS SEEDS, FOR LAYING DOWN LAND

TO PERMANENT PASTURE, LAWNS, BOWLING-GREENS, &c.

PETER LAWSON & SON,

THE QUEEN'S SEEDSMEN,

20, BUDGE ROW, CANNON STREET, LONDON, E.C., and at EDINBURGH,

Offer their celebrated MIXTURES of the above, suitable for all soils and situations. Their extensive Stocks of GRASSES and CLOVERS have been most carefully selected, thoroughly cleaned, and cannot be surpassed in quality. Prices and full particulars on application.

Tables of Mixtures and every information is given in their "AGROSTOGRAPHIA; a Treatise on the Cultivated Grasses and other Herbage and Forage Plants;" price Half-a-Crown, gratis to customers.

SEED POTATOS.

H. & F. SHARPE

HAVE FINE STOCKS OF

THE FOLLOWING VARIETIES OF SEED POTATOS,

Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KIDNEY
" MYATT'S PROLIFIC KIDNEY
" AMERICAN ROSE KIDNEY
" RIVERS' ROYAL ASHLEAF KIDNEY
" DAINTREE'S EARLIEST
" KING
" DRUMMOND'S PROLIFIC ROUND
" DALMAHOY
" FOXE'S SEEDLING
" OXFORD

EARLY FORTYFOLD
" FLOUR-BALL
" COCKNEY
" BRITISH QUEEN
" MARTIN'S GLOBE
PATERSON'S VICTORIA, true
WEBB'S IMPERIAL KIDNEY
BARRON'S PERFECTION
WALKER'S EARLY REGENT
FLUKE KIDNEY } ROCKS.

SEED GROWING ESTABLISHMENT, WISBECH.

J. C. WHEELER & SON'S

CELEBRATED SEED POTATOS.

WHEELERS' GLOUCESTERSHIRE KIDNEY

We can recommend for earliness, flavour, size, and crop. In comparison with the Ashleaf it is as early, whilst it produces nearly double the crop, and is altogether superior to that variety. We can recommend it with the most perfect confidence, and have much pleasure in referring to the annexed letters, speaking in high terms of its earliness and excellence.

3s. 6d. per peck; 12s. per bushel (56 lb.)

"I have grown your Gloucestershire Kidney here for the last five years with all other early kinds, and find yours to be much the earliest."—Mr SPEED, *Gardener to the* Right Hon. Lord Penrhyn, *Penrhyn Castle.*

"Your Gloucestershire Kidney, which I had from you last year, turned out so well that I feel I cannot do better than have some more this year. I had not a diseased one among them, and double the crop from any I have had for the 14 years I have planted on these premises."—NATHANIEL TREASURE, *Tenkesbury Union*

"I grew last year more than 120lb. of Gloucestershire Kidneys per perch, and of first rate quality. My man says 140lb., and I think he is right."—Rev. JAMES L. MAY, *West Pulford, North Devon.*

WHEELERS' MILKY WHITE.

4s. per peck; 14s. per bushel (56 lb.)

"I was greatly delighted with the Milky White Potato last year. It was the best sort I ever grew, and just what suited me"—JOSEPH ROBINSON, *Wishamstead, Bedford.*

"Your Milky White Potatos are all you say of them, and more. I have now tried them three years, and could not wish for a better Potato in every way. They have been very free from all disease, and came off the ground before the autumn rains set in. Those who have never baked some of the larger ones should do so. The name you have given them suits them to a nicety. I have been thanked again and again for recommending them."—Rev. A. WOOD, *Cuttlemorton.*

COCOA-NUT CABBAGE. 1s. per packet, Post Free.

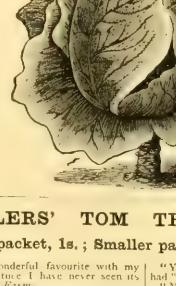

THE COCOA-NUT CABBAGE IS A NEW AND VERY EARLY VARIETY, PERFECTLY DISTINCT, OF MOST EXCELLENT FLAVOUR.

It should be planted 18 inches apart.

Will yield an early and continuous supply.

This Cabbage is a decided novelty, and a great acquisition.

WHEELERS' TOM THUMB LETTUCE.

Large packet, 1s.; Smaller packet, 6d., Post Free.

"Your Tom Thumb Lettuce is a wonderful favourite with my family and friends. For a summer Lettuce I have never seen its equal"—GEORGE F. A. FLOWER, *Stafford Farm.*

"Wheeler's Tom Thumb Lettuce is a capital variety for winter and early spring."—THOMAS RIVERS, *Sawbridgeworth.*

"Your Tom Thumb Lettuce is a very good sort; it is the best I ever had"—F. YOUNG, *Gardener to* Baron de Rutzen

"Major WARRY would thank Messrs. Wheeler to send him another packet of their celebrated Tom Thumb Lettuce."—*Woodbine Hill.*

"Be good enough to send me another packet of the best Lettuce grown, Wheelers' Tom Thumb."—H. P. WEBB.

PATERSON'S SUPERB MELON. 1s. per Seed.

This extraordinary Melon was raised during the last summer (1869) at Pontypool Park, by Mr. Paterson, Gardener to Mrs. Hanbury Leigh; it weighed 24 lb., and measured 42 inches in circumference. It was raised from the Netted Scarlet-flesh, crossed with the Black Rock; of exquisite flavour, and very handsome, with fine rich scarlet flesh; and, as seen by the dimensions given, of extraordinary size and weight.

J. C. WHEELER AND SON, GLOUCESTER, and 59, MARK LANE, LONDON, E.C.

Mangel Wurzel Seed.

BOLTON AND CO. have to offer choice stocks of all the varieties of MANGEL WURZEL. Their
ORANGE GLOBE,
LARGE RED,
INTERMEDIATE YELLOW, and
LONG YELLOW
are particularly good, and are offered at moderate prices
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N

FARM SEEDS of all sorts, best quality, extra clean.—PRICED LIST on application.

James Dickson & Sons.

Seed Growers, 102, Eastgate Street, Chester.

To Purchasers of Farm Seeds.

CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices
JAMES CARTER AND CO., the Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

SPECIAL OFFERS of FARM SEEDS.

	per lb	per cwt.
	s. d.	*s. d.*
NORMANTON YELLOW GLOBE MANGEL (Stock from Messrs. Harrison & Son, Leicester)	0 9	72 0
YELLOW GLOBE MANGEL	0 6	45 0
ENGLEFIELD MANGEL	0 6	50 0
RED GLOBE MANGEL	0 6	50 0
LONG RED MANGEL	0 6	45 0
LONG YELLOW MANGEL	0 6	50 0
CARROT—James' Intermediate	1 0	90 0
Altringham Intermediate	1 0	90 0
Long Orange, alias Surrey	1 0	
White Belgian	0 10	
CABBAGE SEED—Large Drumhead	2 0	168 0
Thousand Head	2 0	
Enfield Market	2 6	
Green Kohl Rabi	2 6	224 0

A large assortment of Swedes 5s.
New 4 lb. bushel sacks, 12 3d. each; 2 bushel, 9d.; 1 bushel, 6d.
Remittances to accompany all orders.
CHRISTMAS QUINCEY, Seed Grower and Seedsman, Market Place, Peterborough.

New and Select Farm Seeds.

1870. 1870.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Union" Nurseries, Chester.

TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.

CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.

MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21*s.* to 28*s.* per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.

Seeds of the value of £2 and upwards (Grass, Vetches, and Potatos excepted), carriage free to any railway station in the kingdom.

Special estimates for large quantities. Samples and prices on application.

PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis and post free on application.

Suttons' Potatos for Planting.

MESSRS. SUTTONS' DESCRIPTIVE LIST is now ready, and may be had gratis and post-free. Their stock of Potatos has been selected with great care, and can be relied on as perfectly true to name. Lowest price per cwt., Sack, or ton, forwarded on application
SUTTON AND SONS, Seed Growers, Reading

The best Potato for the Main Crop is

SUTTONS' BERKSHIRE KIDNEY, raised and selected from among 40 Seedlings of the Fluke. Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed. Price 5*s.* per peck, cheaper by the bushel.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

POTATOS.—Ashleaf Kidney Early, Handsworth, Golden Dwarf Early, Dalmahoy and Fluke, nice selected seed, can be offered cheap by the Ton. ARTICHOKE, Jerusalem, fine quality, for present use, or Seed, can be offered in quantity. Also SEAKALE, two years.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

Choice Seed Potatos.

HOOPER AND CO. have still choice Stocks of the undernoted:—
EARLY ROSE—1*s.* 6*d.* per lb.; 7 lb., 9*s.*
BRESEE'S KING (of the EARLIES ("The Fifty Dollar Potato")—6*d.* per lb.; 2 lb., 10*d.*
BRESEE'S PROLIFIC—3*s.* per lb.; 7 lb., 18*s.* 6*d.*
CLIMAX—3*s.* per lb.; 7 lb., 18*s.* 6*d.*
BOVINIA (enormous cropper)—Reduced price 5*d.* p lb. 7*s.* 6*d.* p peck
PATERSON'S VICTORIA—Prime seed from special culture, direct from raiser, and other kinds
CATALOGUES ready. Liberal terms to the Trade.
HOOPER AND CO., Covent Garden, London, W.C.

NEW EARLY POTATO, RINTOUL'S NEW EARLY WHITE DON.—This is a great improvement on the variety sent out by us some years ago, being pure white both outside and inside, perfectly round, with a rough scaly skin, is about ten days earlier than the striped variety, an extraordinary cropper, and of first-rate quality.

Having secured a quantity of the above from the raiser, Mr Rintoul, East Grange, Cramond, whose name as an early Potato grower is well known, we have every confidence in recommending this variety to all who grow for the early market in either field or garden as decidedly the best Potato out for earliness, crop, and quality.

Price 4*s.* per peck, or 20*s.* per cwt.
DOWNIE, LAIRD, AND LAING, 17, South Frederick Street, Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year

OPINIONS OF THE PRESS.

"R. Headley. Your seedling Potatos were quite first-rate; white, mealy, and excellent in flavour"—*Gardener's Chronicle*, Oct. 30, 1869

"White Kidney. A very fine variety; a heavy cropper; uniform in size; ripening off all at once quickly and completely; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 14"—*Gardeners' Magazine*, Jan. 30, 1869.

"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are like those above in flavour, but are more mealy"—*Journal of Horticulture*, Oct. 21, 1869

Price 5*s.* per peck. The usual discount to the Trade
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

WHEELERS' SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELER'S ILLUSTRATED BOOK on GRASSES, which may be had gratis and post free

J. C WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS, are supplied in large or small quantities, at extremely moderate prices.

J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS are forwarded carriage free to all railway stations in the Kingdom.

QUALITY—Excellent, and unadulterated

PRICES—(Which vary from 13s 6d to 32s per acre, according to soil and situation) extremely moderate.

TERMS—Five per cent discount for Cash

J. C WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

ON LAYING DOWN LAND to PERMANENT PASTURE

"For getting up the subject of Grasses we cannot conceive a handier book than Miss Plues', which is furnished with ample and accurate illustrations; while for putting her data to the proof, and testing the value of mixtures and sauces, it may be well to make acquaintance with that really scientific *brochure*, Messrs. WHEELER'S Illustrated Book on Grasses."—*Saturday Review*

A Copy will be forwarded free on application to

J C WHEELER AND SON, Grass Seed Merchants, Gloucester; and 59, Mark Lane, London, E.C.

On Laying Down Land to Permanent Pasture.

"These enterprising Seedsmen (Messrs WHEELER & SON), in introducing a new element into the considerations for laying down land, have undoubtedly a good idea."—*The Field*

MESSRS. WHEELER AND SON supply the FINEST and BEST GRASSES and CLOVERS (all included) for laying down land :—

For One Year .. .. at 13s 6d per acre
For Two Years .. .. 17s 6d per acre
For Four Years .. .. 22s 6d per acre.
Permanent Pasture .. .. from 26s. to 32s. 6d. per acre.

All Carriage free. Inferior qualities cheaper.

J. C WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

SUTTONS' GRASS SEEDS for PASTURES, 20s to 42s per acre, carriage free.

SUTTONS' GRASS SEEDS for PARK GROUNDS, 12s per bushel, carriage free

SUTTONS' GRASS SEEDS for GARDEN LAWNS, 12s per lb., or 20s per bushel, carriage free. Sow three bushels per acre

SUTTONS' GRASS SEEDS for CROQUET GROUNDS, 1s per lb., or 20s per bushel, carriage free. Sow three bushels per acre

Royal Berks Seed Establishment, Reading

SUTTONS' PERMANENT GRASS SEEDS, 20s to 32s per acre, carriage free.

SUTTONS' MIXTURES for 1, 2, 3, or 4 years, 10s 6d. to 22s per acre, carriage free.

SUTTON AND SONS, Reading, Berks.

PARIS, 1867. SUTTONS' GRASS SEEDS for ALL SOILS. The PREMIER PRIX SILVER MEDAL for GARDEN SEEDS, GRASSES, and GRASS SEEDS, was Awarded to

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

Improvement of Grass Lands, at from 4s. 6d. to 9s. per acre.

SUTTONS' RENOVATING MIXTURE should now be sown, 6 to 12 lb. per acre.

SUTTON AND SONS, Seed Growers, Reading.

Good Clover Seeds at Market Prices.

SUTTON AND SONS can supply the above, of best quality. Samples and prices may be had gratis and post free on application

SUTTON AND SONS, Seed Growers, Reading.

Grass Seeds.

BOLTON and CO. beg to offer NEW SEED of the best GRASSES,
FOREIGN ITALIAN RYE-GRASS
HOME-GROWN do. do.
ANNUAL RYE-GRASS
PERENNIAL do
And SHADY PLACES.

And all the best kinds of Natural Grasses, Mixtures for Permanent Pastures and Meadow Lands, to suit the different varieties of Soil Mixtures of Grass Seeds also made up for all situations :—
CEMETERIES | CROQUET GROUNDS
RAILWAY BANKS | ORCHARDS

Prices, either per Bushel or per Acre, to be had on application.
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

BROCCOLI, ELLETSON'S NEW SURPRISE. A large late White Protecting.—A great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by these eminent Market Gardeners, J. & J. Elletson, of Thorngumbald, who have for many years been so successful in the cultivation of Broccolis, and who the great industry have so far improved upon the old kinds as to produce the above variety, which possesses the hardiness of the parent and surpassing it in size and quality. I have every confidence in its giving the same satisfaction which was given when the stock of Mammoth was originally sent out. Having the entire stock, I am enabled to supply the seed genuine. Price 1s 6d per packet.

CUCUMBER, FOSTER'S.—A fine long, dark-green variety, remarkably fine hardy long dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. 1s per packet. Trade supplied.

EDMUND PHILIP DIXON, the Yorkshire Seed Establishment, 57, Queen Street, Hull.

SELECT VEGETABLE SEEDS,

	free by post	Per pkt.	s.	d.
Smith's fine long frame CUCUMBER			1	0
The White Queen CELERY			0	6
Snow's Winter White BROCCOLI			1	0
Smith's Incomparable CABBAGE			0	6
Worcester Champion Cabbage LETTUCE			0	6
Improved Telegraph CUCUMBER			1	0
Early Dwarf Erfurt CAULIFLOWER			1	0
New Giant Rocca ONION			1	0
Ayton Castle LEEK			0	6
Worcester White BROCCOLI			1	0
Backhouse's Winter White BROCCOLI			1	6
French Breakfast RADISH			0	6
Golden Perfection MELON			1	0

SELECT FLOWER SEEDS, free by post.

PRIMULA SINENSIS, finest fringed	1s and	2	6
CALCEOLARIA, finest spotted	1s and	2	6
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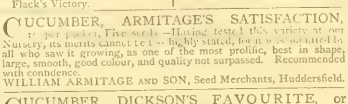

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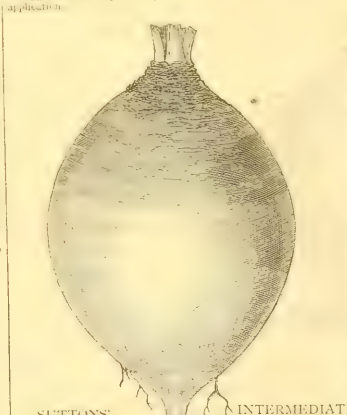

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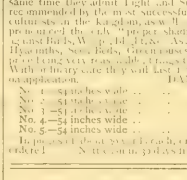

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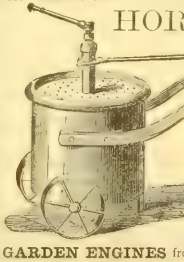

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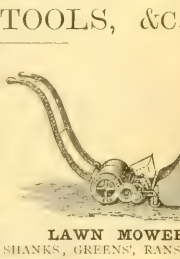

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THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

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PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

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PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

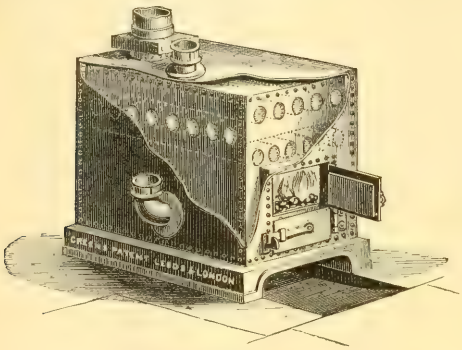

OBLONG BOILER.

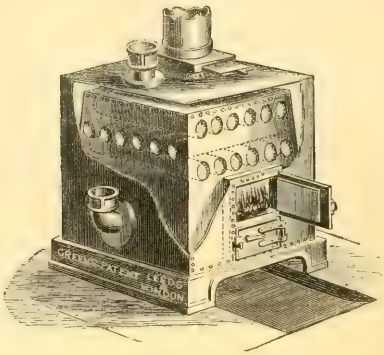

SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast-Iron Sole-plate, which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

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S. OWENS & CO.,

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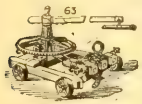

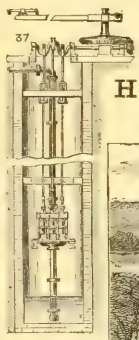

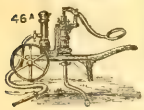

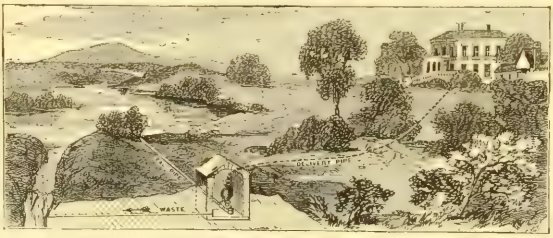

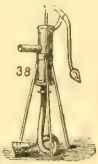

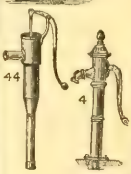

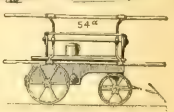

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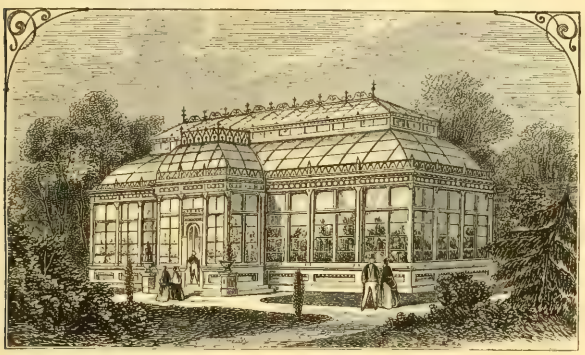

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NEW OVAL TUBULAR BOILER.

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They are made of all sizes, which, with prices, may be had on application.

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PORTABLE AND FIXED HOT-WATER APPARATUS,

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

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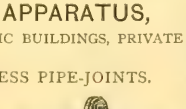

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30 feet by 12 feet	11 15 0	2 10 0	75 feet by 15 feet	20 0 0	3 0 0
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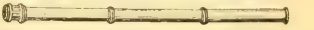

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Tubular Boiler

HOT-WATER APPARATUS at wholesale prices; Elbows, T Pieces, Syphons, and every other connection kept in stock.
WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED PEILL'S, also Elliptic, Boilers, from 24s. each.
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INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water-tight.
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Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.

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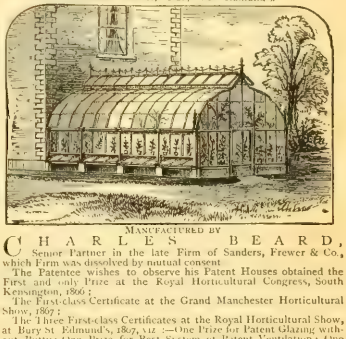

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Senior Partner in the late Firm of Sanders, Frewer & Co., which Firm was dissolved by mutual consent.
The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866;
The First-class Certificate at the Grand Manchester Horticultural Show, 1867;
The Three First-class Certificates at the Royal Horticultural Show, at Bury St. Edmund's, 1867, viz.:—One Prize for Patent Glazing without Putty; One Prize for Rex System of Patent Ventilation; One Prize for S., F. & Co.'s Improved Flower Stands.
These much-approved Patent Systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c., &c.
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PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelop.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace, Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Domo" Netting.

White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS
"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
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Two yards wide	1s. 9d. per yard run.
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Hessian Canvas, 54 and 72 inches wide, 6¼d. and 8¼d. per yard; ¾d. extra for cut lengths.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom

Preserve your Wall-fruit Trees from Spring Frosts.
EVERYONE MAY FIX HIS OWN WALL COVER

BEARD'S PATENT NON-CONDUCTING METALLIC WALL SCREENS, manufactured at the Vulcan Works by C. BEARD, Horticultural Engineer, Bury St. Edmunds, Suffolk.

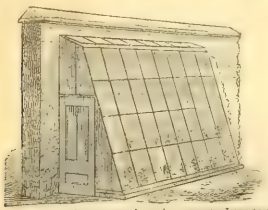

These Screens may be converted at pleasure into Lean-to or Span-houses—Full particulars of their adaptation, and price, may be obtained at the Works, by enclosing stamp, where also an Illustrated Catalogue may be obtained for 12 stamps, containing full particulars of the increasing and valuable systems of manufacture in both patent glazing and ventilation.

Rosher's Garden Edging Tiles.

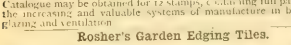

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GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F & G. ROSHER, Manufacturers, 49, Parliament Street, Westminster, S.T. Queen's Road West, Chelsea, S.W.; Kingsland Road, Shoreditch, N.E.
Illustrated Price Lists free by post. The Trade supplied.

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N.B. Orders per Rail to Battersea Railway or Vessel
A liberal discount to the Trade.

REGISTERED HAND GARDEN SEED DRILL.—Four thousand sent out in 1868 and 1869. At the Great German International Agricultural Exhibition, Altona, Hamburgh (1869), the Jurors reported that the Drill was awarded to JOSIAH TURNER for his Manufacturers; also at the Great German International Horticultural Exhibition, Hamburgh, 1869, another First-class Silver Medal was awarded. By simply turning a screw, this Drill can at once be adapted for sowing Peas, Beans, Forage, Cauliflowers, Broccoli, Turnips, Wheat, Sainfoin, Mangel Wurzel, Peas, Rape, Turnips, Peas, and Carrot Seeds, and is adapted for all implements for a Market Gardener, and to all who possess a Kitchen Garden; and for the Potato it will be found useful, for the purpose of filling up the places where the haulm-drill has missed. It can easily be worked by a child.

Full directions sent with each Drill. On receipt of stamps or Post office Orders, made payable to JOSIAH TURNER, Patentee and Manufacturer of the Common Ironmaker, Bury St. Edmunds, a Drill will be sent immediately. Price 12s. 6d. The name of the nearest railway station should be stated.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced into SHANKS'S MACHINE

Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE PLATE, WINDGUARD, &c.

The annually increasing sale forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

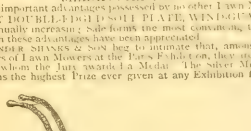

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-sharpening, that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Steel Plate. In addition to this, A. S. & SON now make the Side Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at once that this arrangement not enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Diens Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

W. S. BOULTON & CO.'S

NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

These Machines possess important advantages. By the introduction of a Radial Link, the adjustment of the Knives, &c., is rendered exceedingly simple. The Knives are entirely at all times making the handles and all other light parts of malleable iron. They adapt themselves to irregularities of the ground, and suit persons of any height by means of the handles working loose. This arrangement also admits of their being used as a Roller, by folding back the front or cutting end. Every Machine is warranted to give entire satisfaction to the purchaser, and if not approved of can be returned. An Illustrated Catalogue, with prices, sent free on application.

W. S. BOULTON AND CO.'S DOUBLE CYLINDER and LATAX HANDLE GARDEN ROLLS

These Rolls may be had either as regular Lawn Mowers, and provided with Grass Collecting Boxes, or as Rollers only, the Grass Collecting Boxes being removed. Each Roll is fitted with Latax Handle, which can be instantly folded back for Rolling Grass or Gravel Walks, or Turf, or unfolded for Mowing. Every Roll is fitted with Radial Link, which enables the Knives to be set to any height from 1/4 to 1 inch, and to be instantly adjusted to any height required. Each Roll is also fitted with Patent Scraper, which effectually cleans the Knives when Mowing.

9 in.	Roll	9	9	18	£2 15 0
12 in.	Roll	12	12	24	3 7 0
15 in.	Roll	15	15	30	4 0 0

SINGLE CYLINDER ROLLS Carriage paid to any Railway Station in England.

18 in.	Roll	18	18	36	£4 15 0
20 in.	Roll	20	20	40	5 5 0

Rose Lane Works, Norwich.

PROTECT YOUR CROPS.

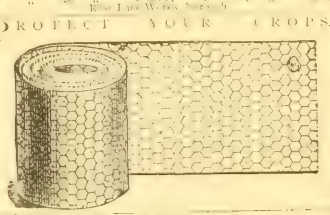

First-class Machine-made
WIRE GAME NETTING, GALVANISED after MADE, sent carriage paid to any Station in the Kingdom at the following Prices, Delivered at Norwich:

2 feet wide, 2 inch mesh, No. 19 gauge, per yard			
3 feet wide,	"	"	"
4 feet wide,	"	"	"
5 feet wide,	"	"	"
6 feet wide,	"	"	"

Any Width and Mesh to order. Prices and Patterns on application.
W. S. BOULTON AND CO., Rose Lane Works, Norwich.

W. S. BOULTON AND CO.'S 30-gallon SWING WATER BARROW COMPLETE.
Carriage paid to any Station in England.
Price, fixed Iron Wheels, £5; with Spreader and Shower, 15s. extra.
SWING WATER BARROW, with 40-gallon Tank. To hold 18 gallons, £4 15s.; Do., 9 gallons, £3 5s.
Rose Lane Works, Norwich.

PORTABLE PUMP for LIQUID MANURE or WATER, 15s.; 10 feet suction pipe, 4s. Carriage paid.

W. S. BOULTON AND CO.'S NEW SWING WATER or MANURE CART, with galvanised iron tank.

Carriage paid to all the principal stations in England.
To hold 80 gallons, price £3; to hold 100 gallons, price £3; Valve and Spreader for either, 30s. each.
Rose Lane Works, Norwich.

W. S. BOULTON AND CO.'S IRON WATER or LIQUID MANURE CART.
Carriage paid to the principal Railway Stations in England. To hold 140 gallons, price £10; 200 ditto, £12; 250 ditto, £14.
Galvanised Iron Pump and 10 feet leather suction pipe, price £3 10s. Spreaders, 15s. each.

ROSE LANE WORKS, NORWICH.

THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring Paint for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for Flitting over unseasoned, as it is free from woodcage, takes at least five hours to cover one yard superficial, has a relatively little smell, can be washed, and will cover all kinds of stains.

Sold only by the GRANITIC PAINT COMPANY, 39a, King William street, London, E.C.

Prospectuses and Testimonials free on application.

NO MORE DAMP WALLS.—The only Cure for Damp Walls is covering Stone, Brick, and Cement from Decay is the SILICATED ZOPISSA COMPOSITION, used in the Houses of Parliament, and manufactured by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 39a, King William Street, London, E.C.

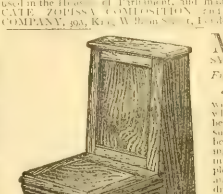

MOULE'S PATENT EARTH SYSTEM

From Mr. W. GILBERT, *Tapeford Street, Rugby.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great deficiency—the supply of Dried Earth—to be no obstacle at all, by laying by a few boxes of earth in the summer, I have a plentiful supply, without any trouble or additional drying. I have used the Moule system on Rose Trees in Cottage-shaped pots, and a more beautiful Tea Rose, and have had the finest blooms I ever saw in summer I ever had to grow. They have been admired by every one who has seen them."

W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford street, Covent Garden, W.C.

"Every Cottage should be provided with a Water Tank." *Duradi*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive Machinery for these Articles, offer Depôts of Premises, Tea Warehouses, are prepared to supply Wrought Iron Tanks, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

An Illustrated Price List of Cisterns sent from, and other of BRABY'S Special Manufactures, on application to F. BRABY AND CO., Regent Road, Lavender Works, Euston Road, London; and Tea Warehouses, 47, Upper Thames street, E.C.

N.B. Upon Lines of Railway, Tanks packed one in another to save Carriage.

ROBERT HUNT, MANUFACTURER of IMPROVED HAND SEED DRILLS, Acre Works, Leek, Staffs.

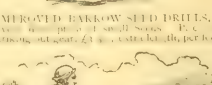

IMPROVED BARROW SEED DRILLS.
For Sowing every description of small Seeds. For 9 inch, 12 feet long and strong, set apart, £4 4s.; extra length, 15s. per foot.

ONE ROW CUP DRILL, No. 1

For sowing Turnips or Mangolds on ridge or flat	Price	£2 10 0
Extra for guano or other manure, quantity of seed	"	0 2 0
ONE ROW CUP DRILL	"	3 15 0
TWO ROW CUP DRILL	"	7 15 0
ONE ROW TURNIP and MANURE DRILL	"	5 10 0
Extra coulters for flat work	"	0 3 6
ONE ROW BEAN and PEA DRILL	"	2 10 0
ONE ROW BRUSH DRILL	"	1 5 0

Illustrated Catalogues post free on application.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

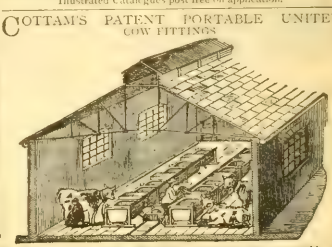

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

Caution to Gardeners.—When you ask for

SAYNOR and COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTS, without which none are genuine.

S & C regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of them make and which are warranted both by sellers and Makers.

S & C'S SPRIGGING and BUDDING KNIVES are the best and the cheapest in the market.

Taylor Works, Sheffield. Established upwards of 125 years.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 81, Upper Thames Street, where a stock is kept; also at 36, Long Acre. | GOODERIDGE, Agent

Belgian Window Glass.

BETHAM and SON, 9, Lower Thames Street, E.C., Importers of the above, beg to inform Florists, &c., that they can supply all sizes suitable for Greenhouses at the lowest possible price.

Horticultural Glass Warehouse.

THOMAS MILLINGTON and CO., 87, Bishopsgate Street Without, London, E.C.

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in	in	4ths	3rds.	2nds.	Best.
20 by 12					
20 by 13					
20 by 14	Per 100 feet	15 oz.	125 oz.	135 oz.	166 oz. 188 oz.
20 by 15		21 oz.	175	195	218	235
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

From		To		4ths	3ds	2nds	Best
6 in by 4 in	..	6 in by 5 in	..	115 oz.	125 oz.	140 oz.	156 oz.
6½ in by 5½ in	..	13 in by 10 in	..	115 oz.	135 oz.	156 oz.	170 oz.
14½ in by 10½ in	..	18 in by 12 in	..	125 oz.	145 oz.	156 oz.	175 oz.
20 in by 12 in	..	22 in by 18 in	..	125 oz.	145 oz.	166 oz.	188 oz.

Lists on application.

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz.			
4ths quality, per 300 feet case,	34s	4ths quality, per 200 feet case,	34s.
3rds	"	42s	3rds	"	42s.
2nds	"	60s.	2nds	"	60s
Best	"	75s.	Best	"	75s

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.

ROLLED IMPROVED ROLLED ROUGH PLATE in 7-8th in., 1 6th in., 1 4th in., and 3-8th in. substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 24s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is laved with pure river water.

WHITE ZINC PAINT, 36s. per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a-half of White Lead and six gallons of Linseed Oil. Special Drs. per cwt. for this Paint.

IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Brick, Stone, Timber, Iron, Tiled Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared out for ditto, 3s. 6d. per gallon.

Per cwt.		Per gallon.—s. d.
GENUINE WHITE LEAD 30 0	LINSEED OIL	2 9
GROUND WHITE LEAD 28 0	BOILED OIL	3 2
GROUND GREEN DITTO	TURPENTINE	2 9
ERS, 3d to 4d per lb.	LINSEED OIL PUTTY,	
to OXFORD OCHRE, 3d.	8s. per cwt.	
to 4d. per lb.	Fine OAK VARNISH, 10s. to 12 0	
„ RAW UMBER, 4½d. to	„ CARRIAGE do., 12s. to 14 0	
6d. per lb. (per lb.	„ PAPER do. 10s. to 12 0	
„ BURNT do., 6d. to 9d.	„ COPAL	16 0
GREEN PAINT 28s. to 60 0	KNOTTING	10 0
BLACK PAINT 24s. to 36 0	Patent GOLD SIZE ..	10 0
RED PAINT 28s. to 36 0	„ BLACK JAPAN ..	12 0

GLAZIER'S DIAMONDS, 12s. 6d., 15s., 18s., 21s. each.

GROOVE BRUSHES. | MILLED LEAD and PIPES.

DUSTERS. | SASH TOOLS. | OLD LEAD Bought or taken in

DISTEMPER BRUSHES. Exchange.

The above are Nett, for Cash, and as such cannot be booked

Lists of any of the above on application.

Glass for Garden Purposes.

JAMES PHILLIPS and CO. beg to submit their REDUCED PRICES as follows:—

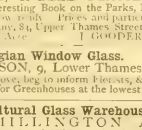

PROPAGATING GLASSES

	Each.—s. d		Each.—s. d
2 inches in diameter ..	0 3½	12 inches in diameter ..	1 9
3 „ „ ..	0 4½	13 „ „ ..	2 0
4 „ „ ..	0 5½	14 „ „ ..	2 6
5 „ „ ..	0 6½	15 „ „ ..	3 0
6 „ „ ..	0 8	16 „ „ ..	3 6
7 „ „ ..	0 10	17 „ „ ..	4 0
8 „ „ ..	0 11	18 „ „ ..	5 0
9 „ „ ..	1 2	19 „ „ ..	6 0
10 „ „ ..	1 4	20 „ „ ..	7 0
11 „ „ ..	1 6 6		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter ..	0s. 6d.	9 inches in diameter ..	1s. 8d.
5 „ „ ..	0 8	10 „ „ ..	2 0
6 „ „ ..	0 10	11 „ „ ..	2 6
7 „ „ ..	1 1	12 „ „ ..	3 0
8 „ „ ..	1 4		

Either flat or conical tops.

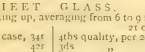

CUCUMBER GLASSES.

24 inches long	2s. 6d.	16 inches long	1s. 4d.
22 „	1 10	14 „	1 2
20 „	1 8	12 „	2 6
18 „	1 6		

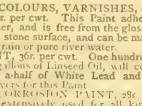

HAND GLASSES, WITH OPEN TOPS.

Each —s. d		Each —s. d
12 inches	6 6	20 inches 10 6
14 „	7 6	22 „ 11 6
16 „	8 6	24 „ 12 6
18 „	9 6	

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to JAS. PHILLIPS and CO., 280, Bishopsgate Street Without, E.C.

WIRE NETTING (Galvanised after made) for GAME and POULTRY.—CROGGAN and CO., Albion Wharf, 19, Upper Thames Street, London, E.C. 2, Grafton Bridge, Liverpool. 50, George Square, Glasgow.

Steam Threshing Machines for Sale.

TO BE SOLD, by Private Contract, TWO very superior 8-HORSE POWER ENGINES and FINISHING THRESHING MACHINES, by the celebrated makers Messrs. Ruston, Procter & Co., of Lincoln. These Machines and Engines are in splendid working order, and nearly equal to new, as they were purchased direct from the makers last year, and not much used.

Application to be sent to Mr. JAMES THOMAS, Red House, Haverhill, Suffolk.

Williams' Patent

"ARCHIMEDEAN"

AMERICAN LAWN MOWER.

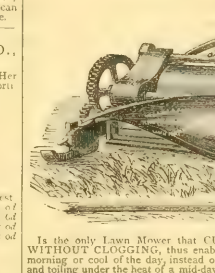

Is the only Lawn Mower that CUTS WET or LONG GRASS WITHOUT CLOGGING, thus enabling the man to work it in the morning or cool of the day, instead of waiting for the Grass to dry, and toiling under the heat of a mid-day sun. It is very easy to work, and will preserve its perfect cut whilst traversing over mounds or sloping banks.

"Far superior to any of ours."—Vide *The Field.*

"The quickest, most simple, and most efficient Mower ever used."—Vide *Gardeners' Chronicle.*

"Remarkably easy to work."—Vide *Gardeners' Magazine.*

"Bids fair to eclipse all English productions."—Vide *Weekly Times.*

"Most perfect Lawn Mower ever manufactured."—Vide *Morning Advertiser.*

Illustrated Catalogues, Opinions of the Press, and Testimonials post free on application

Manufactured and Sold by

WILLIAMS and CO., 1, Cave Road, Finsbury Square, E.C.; and by Ironmongers.

THE SOCIETY of PAINTERS in WATER COLOURS.—The WINTER EXHIBITION of SKETCHES and STUDIES will CLOSE on SATURDAY, March 19, 5, Pall Mall East. Ten till dusk. Admission 1s.

WILLIAM CALLOW, Secretary.

THE LONDON ASSURANCE CORPORATION for MARINE, FIRE, and LIFE ASSURANCES.

Incorporated by ROYAL CHARTER, A.D. 1720.

Offices—No. 7, Royal Exchange, and No. 1, Pall Mall

JAMES BEVAN, Esq., Governor | EDWIN GOWER, Esq., Sub Governor.

DAVID POWELL, Esq., Deputy Governor.

TOTAL FUNDS on December 31, 1869 .. £2,815,629

LIFE DEPARTMENT.

POLICIES in force for £4,865,823

INCOME—PREMIUMS £161,381

INTEREST 58,134

£219,205

Accumulated Premiums .. £73,312, 472

Further information may be obtained on application.

By order of the Board,

LAURENCE PEMBERTON, Secretary.

LEGAL and GENERAL LIFE ASSURANCE SOCIETY, 10, Fleet Street, Temple Bar, London, E.C.

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The Right Hon. the Lord Chancellor.

The Right Hon. the Lord Cairns.

The Right Hon. Sir W. Bovill, Lord Chief Justice, C.P.

The Right Hon. Sir Edward Vaughan Williams

The Hon. Sir George Rose

Thomas Webb Greene, Esq., Q.C.

John Osborne, Esq., Q.C.

Edward Smith Bigg, Esq.

Robert Lowndes Fidler, Esq., Taxing Master in Chancery

FINANCIAL POSITION on January 1, 1870

Annual Income £210,000

Invested Funds 1,530,000

Existing Assurances 4,500,000

Reversionary Bonus thereon .. 500,000

Assurance Claims and Bonus paid .. 1,780,000

Share of capital fully subscribed .. 1,000,000

Paid up 100,000

Annual Accounts have always been published in full detail.

SECURITY.—The Assurance Fund amounts to no less than seven times the total annual income. The further guarantee of a fully subscribed Capital of £1,000,000.

WORLD-WIDE POLICIES granted for a single extra payment of 10s. per £100, where no special Liability to foreign residence then exists. Policies on lives of full age when assured, after five years' existence without incurring extra charge for foreign license, allow unrestricted residence in any part of the world.

NINE-TENTHS of the total Profits divisible every five years amongst the Assured. A valuable provision for Policies becoming Claims between divisions. Very moderate Non-bonus Premiums.

The GENERAL CONDITIONS of Assurance printed thereon are specially framed to secure to Policies of the Society, when once issued, absolute freedom from all liability to future question

LOANS are granted on Life Interests and Reversions.

E. A. NEWTON, Actuary and Manager.

For the best Practical Information

On LAYING DOWN PERMANENT PASTURES with OLD GRASS LAND, see the NEW ILLUSTRATED WORK,

PERMANENT PASTURES: their Formation and Improvement. By M. H. SUTTON, F.R.H.S., &c.

"It will not do to let Grass come of itself in order to good pasture. If you want to grow the right sorts of plants you must sow the right sorts of seed, and you cannot do better than procure and read Mr. Sutton's paper on Laying down Pasture Grass, which you will get by sending to his address at Reading."—*Agricultural Gazette*, Nov. 9, 1869.

Opinion of Professor Buckman—"I do not know of anything to equal it"

Contents:—How to Prepare the Land—How to Sow the Land—Sowing with or without a Corn Crop—The best sorts to Sow—The After Management—The Breaking-up of Grass Land—The Improvement of Pastures—Implements most Suitable. To which is added Notes on the Leading Grasses and Clovers, from personal observation; and 20 beautiful Illustrations of the most useful kinds.

Price 1s., post free.

SUTTON and SONS, Reading, Berks.

Fourth Edition, much enlarged, with 40 Engravings on Wood, coloured Frontispiece, and Six Panoramic Maps, Post 8vo, cloth, 12s.

WINTER and SPRING on the SHORES of the MEDITERRANEAN; or, the Riviera, Mentone, Italy, Corsica, Sicily, Algeria, Spain, and Biarritz, as Winter Climates. By J. HENRY BENNET, M.D.

From the *Times*, December 21.

"The book is a thoroughly good one for its purpose, and should be studied by all who have need of the kind of knowledge that it contains."

JOHN CHURCHILL and SONS, New Burlington Street.

Second Edition, now ready, price 2s. 6d., Part I. of

"THE FIELD" QUARTERLY MAGAZINE and REVIEW, which contains Reviews of the Past Racing, Hunting, Yachting, Rowing, Football, Athletics, Cricket, and Coursing; Farm, Natural History, Garden, Shooting, Fishing, Dogs, Game Laws, &c., &c.

London: HORACE COX, 346, Strand, W.C.

A HANDBOOK of VINE and FRUIT TREE CULTIVATION, with cards for the Selection of Fruits and Vegetables, and Plans of Glasshouses, Hints for Heating, &c. By S. DEBENHAM, Chatsworth. Third edition, post free, 13d.

HERBACEOUS PLANTS. By MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

THE NEW METHOD of GROWING FRUIT (by the Rev. JOHN FOUNTAINE, Southacre Rectory, Brandon), as now carried out in a New House erected for the purpose, in the Gardens of the Royal Horticultural Society at Chiswick. Second Edition, much enlarged.

Free by post 1 or 7 stamps, to the "Journal of Horticulture" Office, 171, Fleet Street; or to the Author, Brandon.

Just published, price 6d., or seven Stamps,

POTATO CULTURE.—Splendid crops of 8 bushels per rod, worth £200 per acre, are grown by the improved systems. R. WILKINS, Bookseller, 9, Hemmings Row, W.C.; or to any Newsagent.

Now ready, with Coloured Plates, price 7s. 6d.

THE HENWIFE'S LATER EXPERIENCE in her OWN POULTRY YARD, in eighth edition of "The Henwife," by the Hon. Mrs. ARDINGTON. Just published

Edinburgh, THOMAS C. JACK; London, SIMPKIN and CO.

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Ditto, with silver ferules	42	35 .	13 6
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Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

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" Water, 1 Cubic foot " " "

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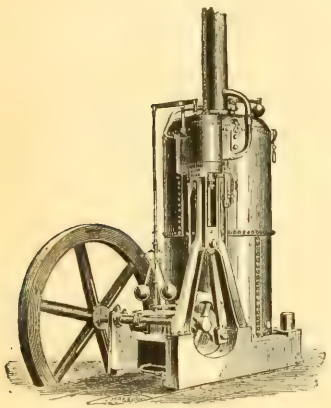

Horse Power	Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.		
1	"	3¼ in.	8 in.	"	4 ft. 0 in.	1 ft. 8 in.	.. ..	£35*
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3	"	4¾	10	"	5 " 6	2 " 4	.. ..	£60*
4	"	5½	12	"	7 " 0	2 " 4	.. ..	£85
6	"	6½	14	"	8 " 0	2 " 8	.. ..	£120
8	"	8	16	"	9 " 0	3 " 0	.. ..	£160
10	"	9¼	16	"	10 " 0	3 " 4	.. ..	£185
12	"	10	18	"	11 " 0	3 " 8	.. ..	£200
14	"	11	18	"	11 " 6	3 " 10	.. ..	£220
16	"	12	20	"	12 " 0	4 " 0	.. ..	£250
18	"	12¾	20	"	12 " 6	4 " 2	.. ..	£285
20	"	13½	22	"	13 " 0	4 " 4	.. ..	£310
25	"	14⅞	28	"	14 " 0	4 " 8	.. ..	£380
30	"	15½	28	"	15 " 0	5 " 0	.. ..	£450
35	"	16¾	28	"	16 " 0	5 " 4	.. ..	£520
40	"	18	28	"	17 " 0	5 " 8	.. ..	£585

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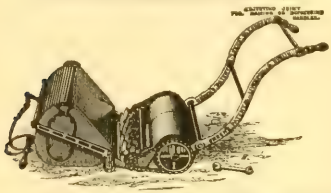

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AND
AGRICULTURAL GAZETTE.

No. 12.—1870.] SATURDAY, MARCH 19. { Price Fivepence. / Stamped Edition, 6d.

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ROYAL BOTANIC SOCIETY, Regent's Park.—SPRING FLOWERS, First Exhibition, March 30 and 31. EXHIBITIONS of PLANTS, FLOWERS, FRUIT, and SPECIAL WORKS of ART, May 25 and 26; June 22 and 23; July 6 and 7. Tickets and Schedules of Prizes are now being issued.
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T. THORNTON, Bagshot, Surrey, has to offer a large quantity of good clean SEED of KALMIA LATIFOLIA, and RHODODENDRON, saved from named varieties. Price on application

AUCUBA POLLEN. One dozen flowers for 1s., four dozen for 2s., sent post free on receipt of stamps by
JOHN STANDISH and CO., Royal Nurseries, Ascot

FRESH SEED of CUPRESSUS LAWSONIANA and THUJA LOBBII, in any quantity. For prices, see pages 74 and 75 of our TRADE CATALOGUE, which may be had post free
THOS. CRIPPS and SON, Nurserymen, Tunbridge Wells

CHOICE BEDDING GERANIUMS.—Strong plants, per dozen, 10s. or 1000
A PRICED LIST of TRICOLOR, BICOLOR, ZONAL, and DOUBLE GERANIUMS can be had on application to
WM. POTTEN, Florist, Sissinghurst, Staplehurst, Kent

To the Trade.—Plants from Store Pots.
GERANIUMS.—Tom Thumb and Stella, 8s. per 100; Christina and Bijou, 12s. per 100.
CALCEOLARIAS.—Aurea floribunda, 8s. per 100. On application to
THOMAS PERKINS, 42, Drapery, Northampton.

Pelargoniums for the Million.
JAMES HOLDERS unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct sorts, for 5s.; 50 plants, for 3s.; or 25 plants, distinct sorts, for 2s., hamper and package included.
Crown Nursery, Reading

ROYAL HORTICULTURAL SOCIETY.
SHOW OF SPRING FLOWERS, &c., March 16
AWARDS of the JUDGES.

CLASS 1.—18 HYACINTHS, distinct (Nurserymen)
1st Prize, Messrs. W. Cutbush & Son, Highgate, N., £1

CLASS 2.—18 BLUE HYACINTHS, distinct (Open)
1st, Messrs. W. Cutbush & Son, £2
2d, Mr. C. Turner, Royal Nursery, Slough, Bucks, £1 10s.

CLASS 3.—9 HYACINTHS, distinct (Amateurs)
1st, Mr. T. A. Steel, Marlesford Lodge, Hammersmith, W., £1.
2d, Miss Wilding, 2, Chesterfield Street, Euston Road, W.C., 15s
3d, Mr. J. Weir, Gr. to Mrs Hodgson, The Elms, Hampstead, N.W., 10s

CLASS 4.—6 HYACINTHS, new kinds, never before exhibited (Open.)
1st, Messrs. W. Cutbush & Son, £1.
2d, Mr. C. Turner, 15s

CLASS 5.—NARCISSI, 6 pots of distinct. (Open.)
1st, Messrs. W. Cutbush & Son, £1.

CLASS 6.—TULIPS, 12 pots of 6 kinds. (Nurserymen)
1st, Messrs. W. Cutbush & Son, £1 10s.

CLASS 7.—TULIPS, 12 pots of, 4 kinds. (Amateurs)
1st, Mr T. A. Steel, £1 10s

CLASS 8.—CROCUSES, Collection of. (Nurserymen.)
1st, Messrs. W. Cutbush & Son, 15s.

CLASS 9.—CROCUSES, 12 pots of (Amateurs)
1st, Mr. T. A. Steel, 15s.

CLASS 11.—Group of 12 MISCELLANEOUS PLANTS in FLOWER. (Open.)
1st, Mr. A. Wilkie, Oak Lodge, Kensington, W., £1 10s.
2d, Mr. T. S. Ware, Hale Farm Nursery, Tottenham, N., 15s.

CLASS 14.—DESSERT APPLES, 3 dishes, distinct. (Open)
1st, Mr. C. Ross, Gr. to C. Eyre, Esq., Welford Park, Newbury, Berks, 15s.
2d, Mr. W. Earley, Gr. to F. Pryor, Esq., Digswell Park, Welwyn, Herts, 10s.

CLASS 15.—KITCHEN APPLES, 3 dishes, distinct. (Open.)
1st, Mr. W. Gardiner, Gr. to E. P. Shirley, Esq., Eatington Park, Stratford-on-Avon.
2d, Mr. C. Ross, 10s.

PRIZES offered by Messrs. W. CUTBUSH AND SON.
CLASS 17.—12 HYACINTHS, distinct, 5 in 10 pots. (Amateurs)
1st, Mr. J. Weir, £3 3s.
CLASS 18.—12 pots of TULIPS, distinct, grown in pots, 2 bulbs in each, pot. (Amateurs.)
1st, Mr. T. A. Steel, £2 2s.

PRIZES offered by Mr. J. H. VEEN, of Haarlem; Mr. F. VAN VELSEN, jun., of Overveen, near Haarlem; Messrs. H. KEERTEN AND CO., of Haarlem; Mr. POLMAN SLOY, of Haarlem; Messrs. J. ROSENKRANTZ AND SON, of Heemstede, near Haarlem; Mr. A. F. BARNAART, Vogelzang, near Haarlem—per Mr. WILLIAM PAUL.
CLASS 19.—25 HYACINTHS in 12 varieties, 3 of each variety. (Open.)
1st, Messrs. W. Cutbush & Son, £6 6s.
2d, Mr. T. A. Steel, £4 4s

MISCELLANEOUS.
Messrs. J. Veitch & Sons, Nurserymen, Chelsea, 24 Roses in pots in bloom, Extra Prize, £2
Messrs. W. Rollisson & Sons, Nurserymen, Tooting, Collection of Plants, Extra Prize, £1 10s.
Mr. B. S. Williams, Nurseryman, Holloway, Collection of Plants, Extra Prize, £1

TWO HUNDRED THOUSAND DWARF HYBRID PERPETUAL ROSES, splendid plants.
60,000 DWARF TEA, NOISETTE, and other ROSES in pots, well-grown, clean, and healthy. CATALOGUES free on application
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Roses suitable for Climbers or Stocks.

ROBERT PARKER begs to state that he can supply, in large or small quantities, extra fine plants of BOURSAULTS, AMADIS, INERMIS, and MANETTI ROSES, at very reasonable prices. EXCHANGE for Hardy Shrubs or Trees. Prices forwarded on application
Exotic Nursery, Tooting, Surrey, S.W.

Spring Flowers.

LEWIS S. WOODTHORPE will be happy to forward, free, his CATALOGUES containing Lists of all the most lovely of the early Spring-blooming Plants, Violets, Primroses, Hepaticas, Daisies, Rockets, &c., &c.; also the best new and choice Plants of the Season, with Lists of Roses, Fruit Trees, Seed List, and a general and well-grown Nursery Stock
Munro Nursery, Sible Hedingham, Essex

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1; 25 Pairs, 10s. 6d.; 25 Pairs POMPONS, 7s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount
Brunswick Nursery, Stoke Newington, N.

CHARLES TURNER begs to call attention to his extensive COLLECTIONS of CARNATIONS and PICOTEES, 21s. per dozen pairs; PINKS, 6s. to 12s. per dozen pairs; Tree CARNATIONS, 12s to 24s. per dozen plants; and CLOVES, 6s. to 12s. per dozen plants; THE BRIDE, pure white, extra fine, 2s. each. A DESCRIPTIVE CATALOGUE on application
The Royal Nurseries, Slough.

JOSEPH SMITH, SEN., Tansley Nursery, Matlock, Derbyshire, begs to intimate that his CATALOGUE of GENERAL NURSERY STOCK is now ready, which he will be happy to forward on application. It contains a large Stock of Forest Trees, Hardy Evergreens, Ornamental Trees and Shrubs, American Plants, &c.
The Nursery is in a very exposed situation, the soil of a fibrous nature, and the Plants take up with excellent roots so as to ensure the best success on their removal.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success.
RICHARD SMITH, Seed Merchant, Worcester

Transit Agency for Plants, Seeds, &c.

CHAS. JOS. BLACKITH, only surviving Partner of the late Firm of BETHAM AND BLACKITH, begs to announce that he intends in future to conduct Business at the same address, under the style of CHARLES JOSEPH BLACKITH AND CO., and hopes to receive a continuance of the favours of the Trade.
Cox's and Hammond's Quays, Lower Thames Street, London.—Jan. 3.

The most Beautiful Aster Grown is

TRUFFAUT'S REINE MARGUERITE, containing Fleur Perfection, Bombée, and Pivoine varieties; 500 Seeds in 16 fine double colours, mixed, for 12s. A choice selection of Foreign STOCKS, PHLOX, BALSAMS, ZINNIAS, &c., at equally moderate prices. CATALOGUES on application.
ALFRED HAMMOND, Importer of Foreign Flower Seeds, Bedwin Street, Salisbury.

New Indian Azalea—Bijou de Ledeberg (J. Versch.).

JEAN VERSCHAFFELT is now enabled to offer the above beautiful and distinct variety, which, through its charming and novel appearance, and its fine white variegated leaves, makes an attractive contrast in a collection. Flowers beautiful rose, fine round model-like form, and good substance. Beautiful plants covered with buds may now be had at 10s. each; extra strong plants, 2 to 3 feet in circumference, 21s. each. The usual discount to the Trade, and one plant over where four are ordered. Apply at once to
JEAN VERSCHAFFELT, Nurseryman, Ghent, Belgium
J. V.'s CATALOGUES may at all times be had free of his Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

NEW AND UNADULTERATED SEEDS.
PRIZE MEDALS, 1851 AND 1862.

BUTLER, McCULLOCH & CO.'S
COLLECTIONS OF CHOICE FLOWER SEEDS (all sent Post Paid).

HARDY ANNUALS, 2s. 6d., 5s., 7s. 6d., and 10s.
,, PERENNIALS, 3s. 6d., 6s. 6d., 12s. 6d., and 25s.
HALF-HARDY PERENNIALS, 4s. and 7s. 6d.
CARNATIONS, 12 superb varieties, 3s. and 5s.
GERMAN STOCKS, 1s. 6d., 2s., 2s. 6d., 3s., and 3s. 6d.
BEDDING ANNUALS, 4s., 7s. 6d., 15s., and 30s.
NEW ANNUALS, 5s. and 10s. 6d.
SWEET SCENTED ANNUALS, 1s. 6d. and 2s. 6d.
GERMAN ASTER, very choice, 1s. 6d., 2s., 2s. 6d., 3s., and 3s. 6d.
COMPLETE COLLECTIONS of VEGETABLE SEEDS for One Year's Supply, 10s. 6d., 21s., 30s., 42s., and 63s.
Orders amounting to 21s. sent Carriage paid. PRICED DESCRIPTIVE CATALOGUE, Post Free on application.

SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.
Established upwards of a Century.

VIOLA CORNUTA, BLUE PERFECTION.
GEORGE SMITH,
WILTON ROAD NURSERY, SALISBURY,

Begs to say that he has a large STOCK of this SUPERB BEDDING PLANT, which is equally suitable either for the Spring or Summer Garden, as it produces an abundance and continuity of blossom from the end of March to the end of October. It has been thoroughly proved by himself for some years, and by Mr. Challis, of Wilton House Gardens, for the last three years, both in the Spring and Summer Garden, in both of which it eclipsed every other blue plant in brightness as well as in abundance of bloom. Its habit is dwarf, yet free, the foliage is dark green, the flower is as large as the well-known Cliveden Blue Pansy, and the colour is a beautiful clear blue, inclining to mauve; the petals are smooth and even, and of great substance.

G. S. begs to state that the blooms of it which were exhibited before the Floral Committee, South Kensington, September 21, 1869, by Mr. Warren, were obtained from his Nursery. They were declared by the Committee to be identical with a variety shown by Mr. Jobson, of Rotherfield Park, as a seedling. As some discussion has taken place respecting it between Mr. Dean and others, G. S. begs to say that he has not only had it in his possession, but has sold it for several years past, and he not only claims the merit of being the first to introduce it to public notice, but also denies that it is a seedling of recent date.

Having a large stock, G. S. will be prepared to send it out in any quantity early in April.

Price—Single Plant, 2s.; Per Dozen, 18s.; Per 100, £4; Per 1000, £25.

All Orders will be Executed as Received.

VIOLA CORNUTA, VAR. PERFECTION.
B. S. WILLIAMS

Has much pleasure in now offering this superb new BEDDING PLANT to the Public, and from the manner in which it has been tested, both in dry and exposed positions, as well as moist and shady places, he has no hesitation in asserting its superiority over any and every VIOLA previously offered, and also is fully persuaded that it will be for many years a Standard Bedding Plant. It is of free growth, yet seldom exceeding six or eight inches in height; the leaves are much larger than those of V. cornuta, which is one of its parents; whilst the flowers, still bearing the characteristic horns of that species, are borne well above the foliage, but three times the size and of good substance: the colour is shaded blue, the eye orange-yellow, with a dark purple disc round it, from which proceed radiating lines of still deeper purple. Indeed, it may be said to be like a gigantic V. cornuta in habit, retaining its qualities as a profuse bloomer, and bearing large flowers which almost rival our Florist Pansies for size and substance.

This plant was awarded a First-Class Certificate by the Floral Committee when exhibited before them (Sept. 25, 1869) by Mr. Jobson, of Rotherfield Park, its raiser, which no similar Viola has received. And no plants but those which come from this stock are true in character.

The names of all Nurserymen purchasing this plant will be duly advertised, to enable the Public to secure the genuine article. Orders are being booked and will be executed, in strict rotation, the first week in May.

Price.—Single Plants, 2s. 6d. Per Dozen, 24s. | **50 Plants, 70s. 100 Plants, 100s.**

Trade Price upon application.

B. S. WILLIAMS, VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

YELLOW-LEAVED CALADIUMS,
RAISED AT THE GARDENS OF
THE ROYAL HORTICULTURAL SOCIETY.

MESSRS. JAMES VEITCH & SONS,

Having made arrangements with the Council of the Royal Horticultural Society to take all the available stock of the above striking and very distinct novelties, have much pleasure in OFFERING for SALE the Plants, which will be ready for distribution on the 1st of May next.

The following descriptions, published by the Society, may be relied on as being exact; and J. V. & S. feel they need add nothing to recommend to the Public these Novelties, which they are confident will be eagerly sought after by all lovers of this popular and useful class of Decorative Plant. They would only say, that the splendid golden tint of those now offered renders them perfectly distinct from any others previously in cultivation.

CALADIUM PRINCESS ROYAL.
Hybrid R.H.S.
Leaves large, of a pale green or yellow, with crimson centre, in the style of C. Brongniartii; very handsome.

CALADIUM PRINCE OF WALES.
Hybrid R.H.S.
Leaves large, similar to the preceding, with the addition of several deep spots and splashes of crimson; very handsome.

CALADIUM GOLDEN QUEEN.
Hybrid R.H.S.
Leaves large, pale green or yellow, uniform in colour; very handsome, and of a remarkably chaste appearance.

CALADIUM PRINCESS OF WALES.
Hybrid R.H.S.
Leaves large, similar to the preceding, with the addition of some bright spots of colour; very handsome.

The Set of Four Plants, £1 10s.

The usual Discount to the Trade; and special terms will be quoted where several Sets are taken.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

E. G. HENDERSON & SON'S

LIST OF NOVELTIES FOR THE SPRING AND EARLY SUMMER OF 1870.

Special Prices for each Set may be had on application, and the Trade quotation for each group as usual. A further List of Novelties will appear in this Paper next week, also a Notice of those kinds to be distributed on or after March 28. In thus selecting at an early date, it will enable the Trade to propagate for the Summer Sale.

Many of the Plants now offered are raised by eminent hybridisers in their respective sections.

Blandfordia aurea.

A very beautiful addition to the already beautiful group of Blandfordia, making a sixth reputed species in the tribe. It forms an evergreen, cool greenhouse or conservatory herbaceous plant, with narrow, linear, attenuate, sub erect, keeled or channelled leaves, from the base of which in the form flower-scapes rise from 1 to 2 feet in height, bearing a terminal umbellate cluster of three to five pure golden yellow drooping bell shaped flowers, 1½ to 2 inches in length, and nearly equal in width. Amongst summer flowering plants of a comparatively dwarf and neat habit it will be found a valuable addition to all select plant selections, and in its own group the most distinct, being unique in its colour, and requiring in its management but a cool greenhouse in winter and a well regulated garden pit in summer, growing freely in any good mixture of heath-mould. The rich gold tint of its flower bells is conspicuously beautiful in contrast with the colour of other species or seedling varieties. 21s. and 31s. 6d. each.

New Verbenas, 1870. 2s. 6d. each.

ARAB STEED.—Brilliant scarlet, with large pure white Auricula like eye, fine bedding habit, free bloomer. The most beautiful and attractive Verbena known.
BRITANNIA.—Orange scarlet, with dark centre, fine upright habit, free bloomer, unique flower tint.
GRANVILLE.—Bright cherry or rose red, with large white eye, extra fine pip, and compact habit.
INDIANA.—Magenta rose, with large white eye, extra fine truss and pip; very distinct.
JONAS.—Self crimson, with very large single blossoms; excellent habit.
MURILLO.—Self-peach colour, with white eye; fine large truss and pip. Extra.
MYSTERY.—Beautiful pink, with rose centre and lemon eye; fine spreading habit. Extra.
ORANGE.—Brise-rose, with fine scarlet centre, and large creamy eye; excellent habit. Extra.
PARSEE.—Mauve, with white centre and dark eye; large truss and pip; fine exhibition.
PRISM.—Violet, with white eye, good truss and pip, fine habit, free bloomer.
STORM KING.—Very rich dark rose, extra large truss and pip; fine free bloom and growth.
VICTORY.—Self-scarlet, extra large pip and truss, fine compact habit and free bloom. Extra.

Golden Leaved Fuchsias.

GOLDEN TREASURE.—This is the most attractive and beautiful bedding variety in its group; leaves pure golden colour, tinted with bronze in the young growth; habit compact, growth free; retaining its foliage well through the season, and forming a very beautiful close bed, ribbon line, or belt. For producing a diversified effect in miscellaneous groups, this elegant plant is a valuable addition for flower-garden decoration generally. 7s. 6d.
CROWN of JEWELS.—A very picturesque variety, leaves clear golden yellow, tipped with rich red crimson, and forming an unique effect for special contrast with miscellaneous green leaf tints. By its compact branching habit and continuous effect through the autumn months, it will be found an ornamental plant where great diversity of picturesque leaf tints are required. 7s. 6d.
GOLDEN MANTLE.—A very rich, self-golden leaved kind, of vigorous, erect habit, the foliage in fine contrast with its brilliant crimson tinted stems. Plants of mature growth, from 1 to 2 feet in height, produce a fine effect by their remarkably fine gold leaf tint, viewed in contrast with miscellaneous plant groups. 7s. 6d.
ORANGE BOVEN.—The small-st variety in the group; forming a neat, dwarf, compact growth; its gold leaf ground being prettily tinted with bronze in the young shoot tips. 7s. 6d.

Dwarf Antirrhinums

(Tom Thumb Section). 2s. 6d. each.

BRUNEL.—French white, speckled and flaked lilac, lemon mouth, 6 to 8 inches.
CORONATION.—White tube with yellow mouth, and rose tinted purple lobes; lower lobe blotched with white, effective. Height, 6 to 8 inches.
CROWN JEWEL.—Crimson, with clouded scarlet centre, and yellow mouth, very bright and showy; 6 inches.
ELEGANTISSIMA.—Pure white, with creamy centre; 6 inches.
ELFRIDA.—White tube, with canary-yellow lobes, very fine.
FIRE KING.—Scarlet, with white tube, lobes blotched with bright yellow, very showy.
GERTRUDE.—Deep rose top lobes, lower rosy buff, with yellow blotch on lower lip, very attractive; 6 inches
GOLDEN DROP.—Yellow and lemon, with rosy scarlet top lobes, fine; 6 inches.
JOSEPHINE.—Light lilac and yellow centre, lobes speckled and banded purple.
MIRABILE.—White tube, and deep rose-top lobes, lower ones white; very effective; 6 inches.
NE PLUS ULTRA.—Golden-yellow, with darker mouth, top lobes speckled with claret; 6 to 8 inches
QUEEN of BEAUTIES.—Scarlet, with purple tint and orange mouth, very bright and showy; 6 inches.

New Fuchsias.

GAZELLE.—Bright scarlet tube and sepals, elegantly reflexed, large violet blue corolla; fine pyramidal habit, free bloomer. 7s. 6d. each
HARVEST HOME.—Long pink tube, broad scarlet sepals, well recurved, large open double corolla, violet, with large flakes of rose from the base, a good medium bush habit. 7s. 6d. each
INIMITABLE.—Scarlet-crimson tube, with broad, finely reflexed sepals, and deep violet corolla; a fine, well proportioned flower; a free bloomer, and of pyramidal growth. 7s. 6d. each
WARRIOR QUEEN.—Sepals scarlet, well recurved and broad, with a large, well proportioned blush violet corolla; growth pyramidal. 7s. 6d. each
WHITE EAGLE.—White corolla, with rich scarlet tube and sepals, recurved, a free blooming variety, with three flowers at each axil; vigorous habit. 7s. 6d. each
IMPERIAL WHITE.—Tube and sepals pure white, corolla rich violet rose, sepals broad, gracefully recurved; growth free, assuming in its mature size an elegant drooping outline; a free bloomer, and delicate variety. 7s. 6d. each
DUCHESS.—Tube and sepals of great substance, blush-white, the latter recurved; corolla violet purple, margins into magenta-crimson; flower trusses large, terminal, and freely produced. 7s. 6d. each

Diplacus (Shrubby Mimulus).

GOLDEN PHEASANT.—Richly tinted buff, shaded with claret, and orange throat. 3s. 6d. each.
LORD DERBY.—Rich red-scarlet, with fringed margin, and yellow throat. 3s. 6d. each.
SUNBEAM.—Golden-yellow, with white throat, and orange-coloured bars. 3s. 6d.

Mimulus Rivularis Pardinus.

LEOPARD-SPOTTED MONKEY FLOWER

(See separate descriptive notes in the "Gardeners' Year Book and Almanac.")

Albus elegantissimus	Aurantiaca splendens
Cupreus speciosus	Exquisite
Immaculatus	Insignitus
Meteor	Orientalis

Rubri ornatus 3s. 6d. each

Canna Musæfolia sanguinea.

This is a highly ornamental variety, having broad and stately Musa like leaves, prominently ribbed or nerved, and of a rich bronze or chocolate and crimson tint, in the style of C. nigricans. Grouped in a conspicuous position on the lawn, with a broad silvery or grey margin of as portable single specimens for temporary designs, it forms a very beautiful and telling effect in contrast with the massive groups of miscellaneous plants in the same order. 5s. each.

Coleus Emperor Napoleon.

A first-class bedding hardy variety, with rich self chocolate-crimson coloured leaves, margined to Perilla nankinensis, for extensive decoration in beds, ribbon-lines, or belts. It forms a slow and densely compact growth of 9 to 12 inches in height, and is so uniform in its habit as not to require stopping. Keeping its leaf under all weathers until late autumn, it is superior to all other plants of its colour. 2s. 6d. each

Thymus citriodorus aurea.

A beautiful rich golden leaved variety of the sweet-scented Thyme, forming a dense, compact, and bushy green evergreen growth of 9 inches. Scutellaria, and other plants of similar habit, and the only companion plant to Antennaria tomentosa, so extensively and beautifully applied at Battersea Park, in surface or groundwork effect in miniature Swiss scenery. By its remarkably dwarf and compact growth it is admirably adapted for imparting a diversified and picturesque feature to miniature slopes and broad margin ground masses of Antennaria. Following, margining, and other parts, a brilliant effect when seen in broad features of contrast with the emerald green and silvery hues of surrounding plants. 3s. 6d. each.

Canna—"Three-Coloured Leaved."

This novel and picturesque variety of Canna forms a very distinct and effective group for decoration. It is intermediate in height, from 2 to 4 feet, of free and compact growth. The stems, with the young terminal growth, and also leaf margins, are tinted with red, which makes an elegant contrast to the general effect of the foliage, which is deeply striped and margined with cream white. It is well adapted for pot culture, and as a bed or group upon the lawn, or pleasure ground entrance; in such positions it is an ornamental feature throughout the summer and autumn months. 7s. 6d.

Scutellaria pulchella (rosy scarlet).

" " purpurea (rosy purple).

The above are two beautiful and neat-habited warm greenhouse or stove plants, for pot culture, producing terminal spikes of brilliant rosy scarlet and purple flowers during the summer months. Being dwarf and compact in growth, adapted for medium or small pots, and of easy culture, they are suitable for all select collections, and very interesting additions to the natural group they represent. 5s. each.

WELLINGTON NURSERY, ST. JOHN'S WOOD, LONDON, N.W.

SEED POTATOS.

H. & F. SHARPE

HAVE FINE STOCKS OF

THE FOLLOWING VARIETIES OF SEED POTATOS,

Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KINDNEY
" MYATT'S PROLIFIC KIDNEY
" AMERICAN ROSE KIDNEY
" RIVERS' ROYAL ASHLEAF KIDNEY
" DAINTREE'S EARLIEST
" KING
" DRUMMOND'S PROLIFIC ROUND
" DALMAHOY
" ROXES SEEDLING
" OXFORD

EARLY FORTYFOLD
" FLOUR-BALL
" COCKNEY
" BRITISH QUEEN
" MARTIN'S GLOBE
PATERSON'S VICTORIA, true
WEBB'S IMPERIAL KIDNEY
BARRON'S PERFECTION
WALKER'S EARLY REGENT
FLUKE KIDNEY | ROCKS

SEED GROWING ESTABLISHMENT, WISBECH.

TRICOLOR PELARGONIUMS.—In 1870; Plants, at the following low prices per dozen, for cash:—Mr. Pollock, 2s. 6d.; Lady Cullum, 6s.; Isabella, 2s.; Sophia Dumaresq, 2s. 6d.; Italia Unita, 3s.; Picturata, 2s. 6d.; Gold and Bronze Zonals—Beauty of Calverdale, 3s.; Lady Cullum, 6s.; Herbert, 2s.; Edinburgh, 6s.; Her Majesty, 6s.; Luna, 3s.; Scarlet, 6d. Baskets and Packing, at the lowest rates. Orders executed by return of post. Remittances requested in advance or reference in correspondents.—ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire.

Cheap, Cheap, Cheap!

TRICOLOR and other PELARGONIUMS, in good plants, at the following low prices, for cash:—Mrs. Pollock, 3s. per dozen; White Lady, 6s.; Lady Cullum, 6s.; Italia Unita, 3s.; Glen Eyre Beauty, 6s.; Crystal Palace Gem, 3s.; Luna, 3s.; Beauty of Oulton, 3s.; Perilla, 4s.; Lord Derby, 3s.; Incendiary, 3s.

HERBACEOUS CALCEOLARIAS, from seed pans, first-rate strain, good plants, 2s. 6d. per dozen.

Hamper and package included.

JOHN BARRETT, St. John's Nursery, Bury St. Edmund's.

Special Notice.

THOMAS PERKINS, 152, Drapery, Northampton, holding large quantities of the following articles, offers them at very low prices. All are strong, healthy, and well established.

GERANIUMS, Double

	Per doz.—s. d.
Madame Lemoine	0 0
Emilie	12 0
Gloire de Nancy	4 0
Dr. Lindley	4 0
Triomphe Lorraine	8 0
Triomphe de Homessel ..	4 0
Madame Rose Charmeux ..	4 0
Victor, &c.	12 0

ZONALS.

	Per doz.—s. d.
Clipper	4 0
Tom Thumb	2 0
Lord Derby	6 0
Stella	2 0
Bijou	2 0

Verbenas, Mixed .. .. 1s. 6d. per 100.

CALCEOLARIAS, Herbaceous

Madame Rose Charmeux	4s
Parson's, Dobson's, and Thompson's strains ..	2 6
Aurea floribunda	2 0

Also in stock many other varieties of soft-wooded Plants, at low prices.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s.; per 1000, £3.

100 Gladioli, by name, 10s. 6d. .. .. .. 8s.
100 " " 25 sorts .. .. .. 14s.
100 " " 50 sorts .. .. .. 16 to 40s.

All in good flowering bulbs.

LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

AZALEA PONTICUM (Sweet Azalea), 10 to 15 inches, 4s. per dozen, 25s. per 100; 15 to 18 inches, 6s. per dozen, 40s. per 100.

ANDROMEDA POLIFOLIA ANGUSTIFOLIA, 6 to 9 inches, 3s. per dozen, 15s. per 100.

KALMIA GLAUCA, 8 to 12 inches, 3s. per dozen, 15s. per 100; 12 to 15 inches, 4s. per dozen, 20s. per 100.

LEDUM PALUSTRE, 8 to 12 inches, 3s. per dozen, 15s. per 100.

All these can be supplied by the 1000. See CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock.

Just Received, from Algiers, a small quantity of

SEEDS of ABIES BABORENSIS, a rare and beautiful Conifer, quite perfect in vitality, per packet. The Atlas Mountains. This species is not yet introduced, and the botanists who know it say it is unknown in England, though such would be of being carefully cultivated. It grows at an altitude of about 6000 feet. Also some of the ATLAS CEDAR (Cedrus atlantica).

Prices:—Abies baborensis, 5s. per packet; Cedrus atlantica, 2s. 6d. per packet.

COOPER AND CO., Covent Garden, London, W.C.

SUTTONS' FRESH IMPORTED FLOWER SEEDS. Free by post.

ASTERS, WALLFLOWERS, STOCKS, ZINNIAS, &c., imported from the most celebrated Continental growers. See SUTTONS' DESCRIPTIVE LIST of FLOWER SEEDS, gratis and post free on application.

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No. 1 Collection of the best English and German varieties, with instructions on cultivation, free by post on rail			£2 2 0
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Small and useful Collections can also be had from 2s. to 7s. 6d., free by post.

SUTTON and SONS, Seedsmen to the Queen, Reading, Berks.

Genuine Seeds of Superior Stocks.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

Complete Assortments of Choice VEGETABLE SEEDS, for a Year's Supply.

No. 1	.. ..	£3 3 0	No. 4	.. ..	£1 1 0
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Complete Assortments of Choice Continental and English FLOWER SEEDS

No. 1	.. ..	£2 2 0	No. 4	.. ..	£0 15 6
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Also Smaller Collections, from 5s. to 7s. 6d., free by post.

CATALOGUE of New and Select Vegetable and Flower Seeds, Potatos, &c., for 1870, with practical Cultural Directions, will be sent Post Free upon application.

Their Seeds are all of the most select character, each variety being saved from the best stock known of its kind.

All Orders for Garden Seeds amounting to £2 value, delivered Carriage Free to any part of the Kingdom, Potats, &c., excepted.

Flower Seeds free by Post or Rail.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station. South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed selections from their general stock; every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 or 8 to 12 feet
CUPRESSUS LAWSONIANA, 3 to 4 or 6 to 10 feet
„ LAWSONIANA ARGENTEA (JOHN WATERER'S var.)—By far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each
„ MACROCARPA, 4 to 6 feet, 42s. per dozen.
THUJA AUREA.—Beautiful plants, about 2 feet, 42s. per dozen; larger, 5s. to 21s. each.
„ GIGANTEA.—An unequalled stock of hundreds of seedlings, 4 to 6 to 8 feet, at 6d. to 9s., 7s. 6d., and upwards.
We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless
THUJOPSIS BOREALIS, 3 to 4 feet, 30s. per dozen; extra fine, 5 to 6 and 7 feet, 5s. to 10s. 6d. each
„ DOLABRATA.—Fine plants, 5s. to 7s. 6d. each.
„ „ VARIEGATA, 5s. to 7s. 6d. each.
WELLINGTONIA GIGANTEA.—Good plants, 30s. per dozen; 2 to 3 feet, 42s. to 60s.; larger, up to 10 feet, 7s. 6d. to 63s. each.
ABIES NOBILIS, handsome plants, from 5s., 7s. 6d., and upwards.
„ NORDMANNIANA, 2 to 3 feet, 7s. 6d. to 10s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 12 feet, 31s. 6d. and upwards each
„ LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each.
„ GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to 63s. each.
„ PINSAPO, 2 to 3 feet, 5s.; 3 to 5 to 8 feet, 7s. 6d. to 63s.
„ DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 10 feet, 3s. 6d. to 7s. 6d. and upwards.
„ MAGNIFICA, 3 to 4 feet, 21s. 6d. to 42s.
„ ORIENTALIS, 3 to 5 to 8 feet, very beautiful examples, 21s. and upwards each.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen: larger up to 12 feet
YEWS, COMMON.—Immense quantities, 2 to 3 to 4 to 6 feet, from 18s. to 60s. per dozen.
„ IRISH.—Perfect columns, up to 12 feet.
„ GOLDEN, as Standards on Irish stems, perfect globes, 31s. 6d. to 42s. each
HOLLIES, GREEN COMMON.—Many thousands, of all sizes, from 1 foot up to 16 feet.
„ the best GOLDEN, WATERERS', and SILVER varieties, in any quantity, and of all sizes.
STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each.
„ „ WATERERS' variety, many hundreds of symmetrically grown specimens, perfectly straight stems, 42s. to 105s. per pair.
„ WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each.
„ PORTUGAL LAURELS.—Very close grown handsome plants, 10s. 6d. to 21s. each; very large imposing specimens, 42s. to 63s. each

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, for underwood or shrubberies, strong established plants, £10 10s. per 1000; larger, 25s. to 60s. per 100
„ CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 30s. to 75s. per 100.
„ better class (SEEDLINGS) and named varieties for extensive planting, £5 per 100.
„ of superior kinds, many on own roots, £7 10s. to £10 per 100.
„ very superior, leading, crimson, rose, white, £12 10s. to £15 per 100.
„ STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each.
AZALEAS, common kinds, 9s. to 15s. per 100.
„ very best, in fine plants, £10 per 100.
„ LATIFOLIA, 18s. to 30s. per dozen.
ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen.

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR VITÆ, PHILLYREA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 30s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100
RICHARD SMITH, Nurseryman, Worcester

Special Notice.

JOHN SALTER AND SON beg to announce that they are about RETIRING from BUSINESS, in consequence of the Metropolitan District Railway Company requiring the whole of their Nursery. They take this opportunity of returning their sincere thanks to the numerous friends who have for so many years favoured them with their orders. They also beg to notify that the whole of their splendid Collection of SUCCULENT, VARIEGATED, and STRIPED PLANTS, ALPINES, VARIEGATED LILIES of the VALLEY, SPECIMEN FERNS, &c., will be shortly Sold by Auction by Messrs. Protheroe or Morris, of which due notice will be given.
Their fine stock of SEEDLING JAPANESE and other NEW CHRYSANTHEMUMS is, by mutual agreement, in the hands of Mr William Holmes, New Plant Merchant, King's Road, Hackney, with arrangement having been made with him to execute all orders for them, including those lasts cast autumn by Messrs. Salter. The Plants will be supplied by Mr. Bull on precisely the same terms as if executed at the Versailles Nursery.
Mr BULL'S CATALOGUE, containing descriptions of these New CHRYSANTHEMUMS, is now in the press, and will be issued shortly. Versailles Nursery, William Street, Hammersmith.

RHODODENDRONS.

	Per doz.	Per 100.
PONTICUM, twice transplanted, bushy, 12 to 18 in., 4s. of	20s	
„ „ „ 15 to 20 in., 4s. of	22s	
„ „ „ 18 to 24 in., 6s. of	25s	
„ „ „ 24 to 30 in., 7s. of	40s	
HYERIDUM „ 12 to 18 in., 5s. of	30s	
„ „ „ 18 to 24 in., 6s. of	40s	
„ „ „ 20 to 30 in., 7s. of	50s	
MAXIMUM, white „ 15 to 20 in., 5s. of	30s	
„ „ „ 18 to 24 in., 6s. of	40s	
HIRSUTUM, dwarf nice plants	...	15s

The above can be supplied by the 1000. For named sorts, see CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

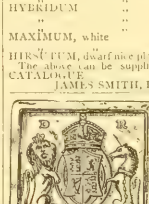

Surplus Stock—Very Cheap.

SPECIMEN CONIFERS and EVERGREENS, handsome and well furnished Trees, from Private Grounds, and Parks, have been recently transplanted, and are full of fibre and young roots. Descriptions, also Prices of either sizes, see RICHARD SMITH'S LISTS.

Trucks for 1 ton and upwards may be sent through the Railway Station on the narrow gauge lines, at a moderate cost, thereby saving delay and expense of packing.

At 12s. per dozen.

Abies canadensis (Hemlock Spruce), 4 to 6 feet
„ excelsa, 3 to 4 feet
Arbor-vitæ, pyramidalis, 5 to 6 feet
„ Siberian, 3½ to 4 feet
Cupressus thuioides, strong
Hartogii elegantissima (Cape Laurel), 1½ to 2 feet

At 18s. per dozen.

Abies canadensis, 5 to 6 feet
„ excelsa, 4 to 5 feet
Alaternus, broad leaved, 2 to 2½ ft
Arbor-vitæ, American, 6 to 7 feet
„ Siberian, 3½ to 4 feet
Aucuba japonica, 18 to 21 inches
Box, green tree pyramids, very high feet
Hartogii capensis, 2 to 2½ feet
Laurel, narrow leaved, 2½ to 3 feet

At 24s. per dozen.

Abies elegans, 18 to 24 inches
Arbor-vitæ, Siberian, 4½ to 5 feet
Aucuba japonica, 21 to 24 inches
Cryptomeria Lobbii, 5 to 6 feet
Cupressus Lawsoniana, 4 to 5 feet
Holly, silver leaved, green, 2 to 2½ feet

At 30s. per dozen.

Abies canadensis, extra fine, 6 to 7 feet
„ elegans, 2 to 2½ feet
Arbor-vitæ, Compacta, 2½ to 3 feet
Aucuba japonica, very bushy, 2 to 2½ feet
Cryptomeria Lobbii, 6 to 7 feet
„ viridis, 6 to 7 feet

At 36s. per dozen.

Abies inverta (Weeping Spruce), 2½ to 3 feet
Arbor-vitæ compacta, 3 to 3½ feet
„ Siberian (very fine), 5 to 6 feet
Cupressus Lawsoniana, 5 to 6 feet
Juniperus chinensis foemina, 3 to
„ densata, 3 to 4 feet
„ Schottii, 3 to 3½ feet

At 42s. per dozen.

Abies inverta, fine specimens, 3 to 4 feet
Arbor-vitæ compacta, 3½ to 4 feet
„ Siberian (very fine), 6 to 7 feet
Juniperus chinensis, 3½ to 4 feet
„ „ foemina, 3½ to 4 feet
„ densata, 3½ to 4 feet
„ oriental, 4 to 5 feet, 6s
„ Lecana, 4 to 5 feet

At 48s. per dozen.

Abies inverta, 4 to 5 feet
Juniperus chinensis, 4 to 5 feet
„ densata, 4 to 5 feet
„ glauca, 4 to 5 feet
„ Lecana, 5 to 6 feet
„ phœnicia, 4 to 5 feet
„ Schottii, 4 to 5 feet

At 60s. per dozen.

Abies Menziesii, 7 to 8 feet
„ monstrosa, 7 to 8 feet
Arbor-vitæ compacta, 4 to 4½ feet
Juniperus chinensis, very fine, 5 to 6 feet
„ densata, 5 to 6 feet
„ glauca, 5 to 6 feet
„ phœnicia, 5 to 6 feet
„ Smithiana, 4 to 5 feet
„ thuifera, 6 to 7 feet

At 72s. per dozen.

Abies albertiana, 7 to 8 feet, 10s. 6d.
„ Douglasii, 8 to 10 feet, 7s. 6d.; 10 to 12 feet, 10s. 6d.; extra fine, 12 to 15 feet, 15s. each
„ orientalis, 4 to 5 feet, 6s.; 5 to 6 feet, 7s. 6d.; 6 to 7 feet, 10s. 6d. each
Araucaria imbricata, 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s.; 8 to 9 feet, 52s. 6d.; 9 to 10 feet, 63s. each
Juniperus densata, 6 to 7 feet, 6s.; 7 to 8 feet, 7s. 6d. each
„ thuifera, very fine, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Laurel, Portugal, pyramids, extra fine, 7s. 6d.; very large, 10s. 6d. each
Picea grandis, extra fine, 5 to 6 ft., 3s.; 6 to 7 feet, 5s. each
Picea lasiocarpa, 2½ to 3 feet, 15s.; 3 to 3½ feet, 21s.; 3½ to 4 feet, 31s. 6d.; 4 to 4½ feet, 42s.; 4½ to 5 feet, 52s. 6d. each
„ nobilis (best glaucous var.), 18 to 24 inches, 7s.; extra fine, 2 to 2½ feet, 10s. 6d.; 2½ to 3 feet, 15s. each
„ Nordmanniana, 4 to 5 feet, 15s.; 5 to 6 feet, 21s.; 6 to 7 feet, 31s. 6d.; 7 to 8 feet, 42s. each
Pinsapo, 3 to 3½ feet, 6s.; 3½ to 4 ft., 15s.; 4 to 4½ ft., 21s.; 5 to 5½ ft., 31s. 6d.; 6 to 6½ ft., 42s. ea.
Pinus Cembra, 7 to 8 feet, 6s.; 8 to 9 feet, 7s. 6d. each
Wellingtonia gigantea, 3½ to 4 feet, 7s. 6d. each
Yews, for hedges, about 12 feet high, 46 years old, recently transplanted, 31s. 6d. each
Yews, for hedges, about 12 feet high, 46 years old, recently transplanted, 31s. 6d. each
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

KNAPHILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted April, 1869
ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868
ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, removed April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference.
ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 4 to 5 feet high, 21s. per 100; 5 to 6 feet, 30s. per 100
The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbraziliana, &c., large numbers, many of them 20 and 30 years' growth
CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these fine plants. All have been removed since August, 1868; many since April, 1869
CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868.
CEDRUS LEBANON, 6, 7, to 10 feet. Moved September, 1868.
CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 10s. 6d. each.
„ „ ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each
„ „ GRACILIS, 5 to 6 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.
JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.
PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.
PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid plants, removed August, 1868, 10 to 15 feet high.
PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 9 feet high. All removed 1868-69.
PICEA MAGNIFICA, 3, 4, and 5 feet.
PICEA PINSAPO, 4, 5, 6, and 8 feet, 21s. to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869.
THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed.
THUJA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868.
THUJA LOBBII, 8 to 10 feet high, and as much in circumference; transplanted April, 1869.
THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 63s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868
WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, 9, and 10 feet, 21s. to 42s. each. Transplanted in August.
PINUS AUSTRIACA, 4 feet, £5 per 100. Transplanted Sept., 1868.
PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft. round, 10s. 6d. to 21s. each
YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. These plants, all constantly removed, are in the finest possible condition for immediate effect in sought
YEWS, GOLDEN and ELEGANTISSIMA. We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.
YEWS, IRISH, handsome plants, up to 10 feet high.
HOLLIES.—The best stock of Hollies in this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together, many thousands of the following varieties:—
HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet
HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference
HOLLY, SILVER QUEEN, 4, 5, and 6 feet
WATERER'S HOLLY.—This variety originated in this Nursery we have hundreds 4, 5, and 6 ft. high, and 15 ft. circumference
PERRY'S WEEPING HOLLY.—Standards, 6 feet to 21s. each
HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869.
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868
HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868-9:—
LAURIFOLIA and SCOTTICA, 4, 5, 6 to 10 feet high.
HODGINS, ANGUSTIFOLIA,
YELLOW BERRIED, MYRTIFOLIA, &c
4, 5, 6, and 8 feet high.
STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number.
N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better moved plants cannot be wished or obtained. The prices are fair as I reasonable.
BOX, Green and Variegated, 4, 5, 6, to 8 feet.
BOX, dwarf, for edging, from 4s. up to 8 feet.
BAYS, standards and pyramids.
LAURUSTINUS, standards.
AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high
AUCUBA JAPONICA, Berried, hundreds, 2½ to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards.
AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—
RHODODENDRONS, nice bushy plants, from layers, named kinds, £5 per 100, £40 per 1000. A dozen sent as sample on application.
RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s. per 100, and upwards.
RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000.
STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 9 to 10 feet high, bushy from top to bottom, and 10 feet in circumference. There is probably no kind better adapted for standards than that we call foseum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.
RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 per 100. Sample on application. Large and fine plants for immediate effect, 4 to 8 feet high.
AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.
AZALEAS, common kinds, £5 per 100.
AZALEAS, splendid plants, the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference
KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100.
ANDROMEDA FLORIBUNDA, £5 to £7 per 100, and upwards.
HARDY HEATHS, a very fine collection, every plant a specimen, and all carefully moved in 1868, from 30s. per 100
ERICA CARNEA, for winter blooming, many thousands.
ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.
SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen.
As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.
A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.
The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.
* N B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

Verbenas, Verbenas.

PHILIP LADDS is now sending out 30 new varieties of VERBENAS of 1869 at 9s. per dozen, in pots; also 24 New FUCHSIAS of 1869 at 9s. per dozen, in pots. 23 varieties of BRONZE GERANIUMS, 6s.; 12 new varieties of GERANIUMS, 1869, 6s.; 12 GERANIUMS CRYSTAL PALACE GEM, 2s.; 12 ZONAL GERANIUMS, 1868, 2s. GERANIUM VESUVIUS, best bedding scarlet, 20s. per 100.—Nursery: Bexley Heath, Kent.

CALCEOLARIAS, Herbaceous, of fine strain, nice plants, out of pans, 2s. 6d. per dozen; good plants, out of single pots, 1s. per dozen, free by post. Special quotations per 100.
GLOXINIAS, good named varieties, 12 for 8s., 24 for 10s.; free by post.
ACHIMENES, in 20 choice varieties, 3 tubers of each for 10s.; 10 varieties, 3 of each, 5s.; free by post.
DAHLIAS, young pot roots of show, Fancy and Bedding—package free, 30 varieties for 15s., 25 for 7s. 6d., and 12 for 4s. If more than one of a sort is taken, there will be supplied one third less.
JAMES AND R. STIRZAKER, Skelton Nurseries, Lancaster.

CHOICE FLOWER SEEDS.

	Post free.	Per packet.—s. d.
AURICULA, extra choice	.. .. ..	2 6
BALSAM, Lee's Camellia-flowered	.. .. ..	2 6
CALCEOLARIA, James' Prize	.. .. ..	2 6
CINERARIA, from named flowers	.. .. ..	2 6
CENTAUREA CANDIDISSIMA	.. .. ..	2 6
„ ARGENTEA	.. .. ..	2 6
CYCLAMEN PERSICUM, extra choice	.. .. ..	2 6
CANNAS, in six choice varieties	.. .. ..	2 6
CHRYSANTHEMUM, new Japanese varieties	.. .. ..	2 6
CLOVE PINK, MARMADUKE	.. .. ..	1 0
DIGITALIS, extra choice spotted	.. .. ..	1 0
ECHEVERIA METALLICA	.. .. ..	1 6
GLOXINIA, extra choice	.. .. ..	2 6
GOLDEN PYRETHRUM	.. .. ..	1 0
HOLLYHOCK, extra choice, mixed	.. .. ..	2 6
MIMULUS, choice, mixed	.. .. ..	1 0
NIEREMBERGIA PROTESCENS	.. .. ..	1 0
PANSY, extra choice, mixed	.. .. ..	2 6
„ CLIVEDEN, Blue, Yellow, and Purple	.. .. ..	each 1 0
„ choice Belgian	.. .. ..	1 0
PELARGONIUM, Gold and Bronze	.. .. ..	2 6
„ Zonal, choice	.. .. ..	1 6
„ Nosegay, choice	.. .. ..	1 0
PETUNIA, double, extra choice	.. .. ..	2 6
„ Single, choice mixed	.. .. ..	1 0
PRIMULA JAMESII, Red and White	.. .. ..	each 2 6
„ „ mixed	.. .. ..	2 6
„ Fern-leaved, mixed	.. .. ..	2 6
RICHARDIA, six choice varieties	.. .. ..	2 6
SOLANUMS, in six choice varieties	.. .. ..	2 6
STOCK, East Lothian, Scarlet, White, and Purple	.. .. ..	each 1 6
TUNICA SAXIFOLIUM	.. .. ..	2 6
WIGANDIA VIDERI	.. .. ..	1 6

IMPORTED GERMAN SEEDS

STOCKS, in 12 distinct colours	.. 2 6
ASTER, German quilled, 12 varieties	.. 2 6
„ Chrysanthemum Dwarf, 12 vars.	.. 2 6
„ Globe flowered, 12 vars.	.. 2 6
„ Truffaut's Pæony, 12 vars.	.. 2 6

JOHN and CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

MR. GEORGE GORDON (Author of the "Pinetum") being engaged in completing an extensive Pinetum, will feel obliged to any Nurseryman who will send his PRICED LIST of CONIFEROUS PLANTS, &c., addressed to him, 13, Wood Street, Exmouth Street, Spa Fields, London, E.C.

Ailantus glandulosa.

CHOICE PLANTS, 6 to 10 feet high, 20s. per 100. "For Parks and avenues it is indispensable; its perfect health and freshness under all circumstances in towns recommend it to the planter. Dust, foul air, or drought have little or no effect upon it." See Robinson's "Parks and Gardens of Paris."
R. TEUTSCHEL, Colchester

Fine Hollies and Spruce.

S. ROBINSON has several hundreds bushy HOLLIES to dispose of, 3 to 7 feet, also well feathered SPRUCE, 2½ to 3½ feet; a small quantity of BIRCH and ELM plants, 5 to 7 feet; a few hundreds of strong GORSE, for filling up Covers. Prices on application.
Lemon Grove, Shaw House, Melbourne, Derby.—March 16.

AMERICAN ARBOR-VITÆ, good Plants.
1½ to 2 feet, 25 per dozen, 125 per 100
2 to 2½ feet, 35 per dozen, 150 per 100
2½ to 3 feet, 3s. 6d. per dozen, 165 per 100.
3½ to 4½ feet, 5s. per dozen, 200 per 100.
3 to 4 feet, 4s. 6d. per dozen, 225. per 100.
See CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

Rare Tree and other splendid Ferns.

JOHN H. LEY, NURSERYMAN, Croydon, S., has pleasure in calling the attention of his Patrons, and the Public, to the following collection of FERNS, which have never been sold before at such low prices. All very fine plants, in 6-inch pots, from 9 to 24 inches long, comprising Leptopteris superba, which are not little seedlings. The Six, hamper included, for 21s. cash. Should any of them be already possessed, others equally good can be substituted.—Cibotium princeps, Leptopteris superba, Alsophila australis, A. excelsa, Balantium culcita, or antarctica, Todea arborea, T. pellucida.

To the Seed Trade, &c.

WILLIAM AND FRANCIS CLARK, four years' sole Managers of the Firm of LITTLE & BALLANTYNE, beg to inform the Trade that they have entered into BUSINESS on their own account, as SEED MERCHANTS, SEEDSMEN, and FLORISTS, at the undernoted address, under the style of CLARK BROTHERS AND CO.; and they will thank them to forward their CATALOGUES when published.
CLARK BROTHERS AND CO., Nurserymen, Seedsmen, and Florists, 36, Lowther Street, Carlisle.

SPECIAL OFFER.—1 ton PRINCE OF WALES' KIDNEY POTATOS, extra fine, sample, and true to name, £10 per ton, or 10s. 6d. per cwt. Nett cash price.

SYCAMORES or PLANES, 7 to 9 feet, 3s. per dozen.
LABURNUMS, 6 to 7 feet, 2s. per dozen.
ASH and HORSE CHESTNUT, 3 to 4 feet, 30s. per 1000
OAKS, 2 to 3 feet, 15s. per 1000; 3 to 4 feet, 30s. per 1000.
LAURELS, 1 foot, 5s.; 1½ foot, 6s.; 2½ feet, 7s. per 100.
PINUS AUSTRIACA and EXCELSA, 3 feet, 4s. per dozen.
ROSES, 2 feet and upwards, 20s. per 100; less than 2 feet, 6s. per doz.
Fine CUCUMBER SEED, 7s. per lb.; 6d. per oz.
For cash only.
A. WILKIN, Tiptree, Kelvedon, Essex

DOUBLE WHIN, GORSE or FURZE, VERY VERY FINE FLORE PLENO.
Excellent plants, all extra transplanted—package included—
9 to 15 inches, 2s. 3d. per dozen, 11s. per 100
12 to 18 inches, 3s. per dozen, 13s. per 100
15 to 20 inches, 4s. 6d. per dozen, 16s. per 100
18 to 24 inches, 5s. per dozen, 20s. per 100.
The above can be supplied by the 1000, in pots 9 to 12 inches, 5s. per dozen, 22s. 6d. per 100; 18 inches, 7s. 6d.
JAMES SMITH, Darley Dale Nurseries, Matlock

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, Surrey, S.W.

Golden Champion Grape.

OSBORN AND SONS can supply good CANES of the above-named remarkable GRAPE, which has again been exhibited, and very much admired, fully sustaining the high character previously formed of it. Price 10s. 6d., 21s., and 30s. each.
Fulham Nursery, London, S.W.

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.
Price 21s. per dozen, applicable to any size.
THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Vines—Vines.

JOSEPH MEREDITH can supply all the best varieties, both for fruiting and planting. DESCRIPTIVE CATALOGUE free by post on application; also CIRCULARS of MEREDITH'S Vine, Fine, Peach, and Plant MANURE.
The Vineyard, Garston, Liverpool.

Delicious New Grape.

MR. WILLIAM BULL has a large stock of good, strong, well-ripened CANES of MADRESFIELD COURT BLACK MUSCAT, at 15s. and 21s. each.
Thousands of LILIUM AURATUM, of all sizes, to offer
Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

VINES, from Eyes, 2-yr. old, warranted true to name and to fruit this summer, 7s. 6d. each, of the following varieties:—Black Hamburgh, Golden Hamburgh, Barbarossa, Mrs. Pince, Buckland Sweetwater, General De la Marmora, Alicante, Royal Vineyard, Black Frontignan, Foster's Seedling, Burchard's Prince. Planting Canes of the above, very strong, 3s. 6d., sent to any part of the kingdom.
J. FEED, Effra Nursery, Brixton, S.W.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; and Standard Plums, Pears, Apples, and Cherries; Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Alaternus, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.
Samples, with height and price, on application to
W. VIRGO AND SON, Wonersh Nursery, Guildford.

Strawberries for 1870.

MRS. NICHOLSON begs to say that the List of Additions to her Stock is now ready, and will be forwarded on application. Amongst the Novelties are ASCOT PINE-APPLE (see "Hogg's Year Book, 1870"), HER MAJESTY, PRINCESS DAGMAR, TRIOMPHE DE PARIS, &c. Also a List of the best of the older sorts, as DR. HOGG, MR. RADCLYFFE, &c., at reduced prices.
Eaglescliffe, near Yarm

STRONG STANDARD APPLES and PEARS.—Large horizontal Trained and Pyramid Apples and Pears; fine Standard and Dwarf-trained PEACHES and NECTARINES; fine bushy LAURELS, and LAURUS COLCHICUM, up to 4 feet; extra bushy LAURUSTINUS and PORTUGAL LAURELS, 2½ to 3 feet; a large collection of Standard and Dwarf Perpetual, Dwarf China, and climbing ROSES of the best sorts; deciduous flowering SHRUBS; ASH, 2 to 5 feet; SCOTCH, SPRUCE, and AUSTRIAN FIRS, and all kinds of FOREST TREES; strong Evergreen PRIVET and THORN QUICK for hedges; all sizes have been regularly transplanted, and are well rooted. Prices on application to
CHARLES BURGESS, The Nurseries, London Road, Cheltenham

SPECIAL OFFER to the TRADE.—Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff, 21s. per dozen
Dwarf-trained 3-yr. Sweet CHERRIES, ten leading sorts, 15s. per doz
Strong cut-back extra fine Bushes, 3-yr., 5s. per dozen, 35s. per 100
Rider Trained CHERRIES, 3-yr. per dozen.
PEACHES and NECTARINES, 60s. per dozen.
Half "Standard H.P. ROSES, 2 feet, splendid stuff, best sorts, 60s. per 100.
Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.
„ Common LAURELS, 6 to 8 feet, 45s. per 100
W. KNIGHT, Floral Nursery, Hailsham, Sussex

Leicester Abbey Nurseries.

THOMAS SAUNDERS begs to remind intending Planters and the Trade that, in addition to his extensive General Nursery Stock, he has the following in large quantities, of unsurpassed quality, and offered at most reasonable prices. CATALOGUES, Wholesale or Retail, may be had free on application.

APRICOTS, Standard Maiden, Moor Park.
CHERRIES, Standards, Dwarfs, and Pyramids.
CURRANTS, White Dutch.
PEARS, Standards and Pyramids
PLUMS, Standards, chiefly Victoria.
MANETTI ROSE STOCKS.
ARBOR VITÆ of sorts, single specimens, 1½ to 5 feet.
AUCUBA JAPONICA, single specimens, 1 to 2 feet.
BOX, Tree of sorts, 1½ to 3 feet.
CHESTNUT, White, Sweet, Standards, 6 to 8 feet
ELM, Ornamental (6 sorts), Standards, 4 to 12 feet
LABURNUM, English, 4 to 8 feet.
POPLAR, New Silver, 5 to 8 feet.
OAK, transplanted, Standard, fine, 3 to 5 feet.
SPRUCE FIR, single specimens, 1½ to 3 feet.
ROSES, Dwarf, most of the leading and newer kinds.

RICHARD SMITH'S FRUIT LIST contains a selection of the best varieties, with directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The following are strong trees:—50 of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7½ Pyramids, 6 to 7½ and Bushes, 3 to 5 feet high; also very fine Dwarf-trained Trees of all kinds, of superior growth, to be offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12s. 6d., in stamps. A printed List or Index sent gratis.
J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety.
CATALOGUE free on application.

LARCH, 1-yr. Seedling, in quantity, also bedded, can be offered; SCOTCH, native, LARICIO and AUSTRIAN PINES, 2-yr. Seedlings, 25s. per 1000; 2-yr. bedded; PEAR, CHERRY and PLUM STOCKS, 1-yr.; IVY, Irish, 1 and 2-yr. bedded; ASH and QUICK, 2-yr. bedded. For prices apply to
H. AND R. STIRZAKER, Skelton Nurseries, Lancaster.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS; FIR, SCOTCH, do. SPRUCE, do. SILVER; OAK, COMMON and TURKEY; POPLARS, SYCAMORE, WILLOWS, WALNUTS, and YEWS; and an extra large breadth of fine HAZEL and strong THORNS; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes.

TO THE TRADE.—1-yr. SEEDLING HOLLY (very stout).
ARBOR-VITÆ, 6 to 9 inches, 1 to 1½ foot.
SCOTCH FIR, 9 to 18 inches.
SPRUCE, 9 to 18 inches
PINUS AUSTRIACA, 9 to 18 inches
PINUS RIGIDA, 2 to 3 feet. A very fast-growing Pine, and sold cheap.
J. THORNTON, Heatherside Estate, Bagshot, Surrey

PICEA NOBILIS.—Suitable for Avenues or Ornamental Planting.—500 Picea nobilis, from seed, finely-furnished Trees, 2½ to 4 feet high, with good leading shoots and splendid roots. This Californian Pine is thoroughly hardy, sound in constitution, of rapid growth, not very particular to situation if planted in good loamy soil. It takes the very highest rank as a remarkable, noble, and beautiful Tree. The above to be sold very Cheap. Price on application to
Messrs. FISHER, HOLMES, AND CO., Handsworth Nursery, Sheffield.

Juniperus hibernica.

H. LANE AND SON, having a splendid lot of beautiful-shaped trees (unsurpassed for symmetry), 4 to 5 feet high, transplanted spring, 1869, beg to offer them to the Trade at £7 10s. per 100.
The Nurseries, Great Berkhamsted, Herts.

Araucaria imbricata.

H. LANE AND SON, having a very large stock, beg to offer them at the following greatly reduced prices, viz., 5 to 6 feet, 21s.; 7 to 8 feet, 42s.; 9 to 10 feet, 63s.; 11 to 12 feet, 84s.; 12 to 14 feet, 105s. An inspection is most cordially solicited.
The Nurseries, Great Berkhamsted, Herts.

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS,
NURSERYMAN and SEED MERCHANT,
Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 10s. 6d., 21s., 42s., 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	Per packet.—s. d.
Backhouse's Winter White Protecting BROCCOLI	.. .. 1 6
Dell's fine dark-leaved BEET	.. .. 1 0
Williams' Matchless RED CELERY	.. .. .. 1 0
Williams' Matchless WHITE CELERY, new	.. .. 1 6
Telegraph CUCUMBER, Woolley's improved variety	.. 1 6
Wheeler's Tom Thumb CABBAGE LETTUCE	.. .. 0 6
Webb's Climax MELON, new	.. .. .. 2 6
(The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	.. 2 6
Earley's Defiance TOMATO, new	.. .. 2 6
(The earliest and best variety in cultivation.)	

NEW and CHOICE FLOWER SEEDS.

Williams' Superb Strain of PRIMULA, Red, White, or Mixed	.. 2s. 6d., 3s. 6d., and 5 6
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and	5 6
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
BALSAM, Williams' superb strain	.. .. 1s. 6d. and 2 0
CYCLAMEN, Wiggins' Prize strain	.. 1s. 6d., 2s. 6d., and 3 0
VERBENA, Eckford's finest varieties, mixed	.. .. 1 0
Williams' Improved Hybrid SOLANUMS	.. 2s. 6d. and 3 6
CENTAUREA CANDIDISSIMA	.. .. 1s. and 2 6
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	.. 1 0
Parsons' New Tree Mignonette	.. .. 1 0
PERILLA NANKINENSIS VARIEGATA, new	.. .. 1 0
Williams' Improved French MARIGOLD, beautifully striped, and very large	.. .. 1 0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for shrubbery borders. Per collection of three colours	2 6
VIOLA CORNUTA ALBA, new	.. .. 1s. 6d. and 2 6
ZINNIA ELEGANS PUMILA flore-pleno, new	.. .. 1 0

B. S. W.'s DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, post free on application.

MESSRS. J. STANDISH AND CO., The Royal Nurseries, Ascot, Berks, are now prepared to execute orders for the following NEW and CHOICE PLANTS, to which they wish to call special attention:—

IXORA DIXIANA.—This magnificent plant is of very free growth, carrying fine foliage; the trusses of flowers are large, and of a bright orange colour. Undoubtedly a Variety that has proved itself of very strong constitution, and little affected by change of temperature, consequently is admirably adapted for exhibition purposes. Plants 6d. to 21s. each; with five or six spikes of bloom set, 75s. each.
ANTHURIUM SCHERZERIANUM.—Fine young plants, two to three crowns, 10s. 6d. each; three to four crowns, and stronger, 15s. to 21s. each.
TODEA PELLUCIDA COMPACTA.—A very dwarf and compact variety. As it does not give seed fronds until the plant is very old, its beautiful transparency is preserved at an early age. Full description, see *Gardeners' Chronicle*, May 8, 1869. In April next, 10s. 6d.
FICUS MACROPHYLLA.—From New Zealand, where, such is its luxurious growth, it is said at times to cover an acre of land. It is undoubtedly the best Subtropical Plant of its kind, growing freely in a very low temperature, even withstanding 7 or 8 degrees of frost; hence it is not a delightful plant for our variable climate, but if put out in the middle of May is sure to succeed. 5s. each.
ABUTILON THOMPSONI.—This has also proved itself a very fine Subtropical Plant, thriving well under adverse circumstances, the bright marbled colour of its leaves producing a very striking effect. It will do well up to the end of October, as a few degrees of frost do not appear to hurt it. Plants, 1s. each; 9s. per dozen; 70s. per 100.
COPROSMA BAUERIANA VARIEGATA.—This is a perfect gem for small beds, or for edging. Being a New Zealand plant it will thrive well in our climate, and its beauty until late in the autumn. 2s. 6d. each; 24s. per dozen.
TREE PICOTEE ASCOT YELLOW.—This is of the most robust habit and thoroughly perpetual, the flowers of extreme yellow, deeply edged with lake; flowers very large and finely shaped. A few strong plants, now, 5s. each; in April next, 2s. 6d. each.
ROYAL ASCOT.—This has now proved itself to be beyond doubt the most prolific of all the Vines yet set out, and ripens its fruit to perfection in a cold house. Plants, 7s. 6d. to 15s. each, and a few extra strong three year old canes, that would carry a good crop this year, 21s. each.
NEW PEACHES.—The "Marquis of Downshire" and the "Early Ascot." These have been raised from Nectarines fertilised by the Noblesse Peach, partaking of both parents in equal degrees, their flavour surpasses anything we have previously tasted; of good size, very deep colour, and a fortnight earlier than the Royal George. Very clean, strong growers. Fine plants, 7s. to 15s. each.
ABIES OBOVATA.—A beautiful new Conifer from Japan. We have proved it perfectly hardy, of very fast growth, with foliage of the most lovely glaucous colour. 10s. 6d. to 21s. each.
JUNIPERUS JAPONICA ALBO-VARIEGATA.—By far the finest of all the Junipers. 2s. 6d. to 21s. each.
ACER RUFINERVE ALBO-LIMBATUM.—This large and beautiful variety of Maple is an introduction from Japan. It is quite distinct from other varieties, and in summer the leaves, which are nearly covered with white, have a crystallised or frosted appearance. 21s. to 42s. each.
ACER POLYMORPHUM PECTINATUM RUBRUM.—We have most lovely plants of this very charming Maple. The leaves are beautifully cut, and are coloured bright red. 10s. 6d. to 21s. each.
AUCUBAS, Males, 1s. 6d. to 5s. each; and other varieties. See our CATALOGUE.

SUTTONS'

MAMMOTH

LONG RED MANGEL,

THE LARGEST SORT IN CULTIVATION.

SUTTON AND SONS had the honour of first introducing this superior new large Mangel IN THE YEAR 1866, the demand for which has rapidly increased as it has become more widely known.

The FIRST PRIZE at

BIRMINGHAM GREAT ROOT SHOW

was awarded in two successive years to

SUTTONS' MAMMOTH LONG RED.

For weight per acre and size of individual roots this variety has surpassed every other sort of Mangel yet introduced.

Specimens weighing 46 lb. were exhibited on our stand at the Cattle Show, 1869, and the following unsolicited Testimonials have been received :—

From Mr. W. C[illegible], Lower Farm, Steeple.

October 29, 1869.—"I beg to say I have the Mammoth Long Red Mangel I obtained from you last year. It was the best plant in my crop, and heaviest cropper. Weighed [illegible] ... We have [illegible] specimen heads, [illegible] and [illegible] each. I think it was the heaviest crop in the county. I think you will receive many orders for seed from this neighbourhood. [illegible] what I have said in your favour."

From W. C. Wilson, Esq., Moreton, Pinkney.

March 31, 1869.—"I had a fine crop of Mangel from your seed of the Mammoth Long Red, notwithstanding the day summer."

From Mr. Thos. E. [illegible], Cattle-feeder, Newbiggin.

October 26, 1869.—"I had decidedly the heaviest crop of your Mammoth Long Red Mangel."

From C. Thomas & Son, Gravesend.

November 2, 1868.—"I am proud to tell you that I have some remarkably fine Mangel Wurzel this season from your Seeds. Mammoth Long Reds, 40 lb. each with their leaves; Orange Globes very large and fine. The Long Reds are very symmetrical in form."

From Mr. Henry Hughes, Hartsbourne, Herts.

February 4, 1869.—"I took the First Prize at the York Root Show with Mangel grown from your Mammoth Long Red; there were none to be compared to them. Much admired."

From Mr. J. [illegible], Cottage, Hedington.

March 4, 1869.—"I had all the First Prizes with your Mammoth Long Red."

From Wm. Sapwell, Esq., Ashbocking, Ipswich.

March 16, 1869.—"I was successful in gaining the prize with your Mammoth Long Red Mangel at the Lanesdale Show last year. The crop was first-rate."

From Mr. P. Bruce, Stewart to Lord Lamington, Baltalie.

March 20, 1869.—"I wish to let you know that I beat all Ireland with your Mangel this year. The like of the Mammoth Long Red was never exhibited before."

From Mr. F. Lessell, Farm to the Earl of Norbury.

November 29, 1869.—"Lord Norbury has desired me to tell you that he is much pleased with the Mammoth Long Red Mangel Wurzel Seed had from you last spring. We had 64 tons per acre, and not on the best of land."

Price 1s. 6d. per lb.

(much cheaper by the cwt.)

For further particulars of

SUTTONS'

HOME-GROWN FARM SEEDS,

SEE

SUTTONS' FARMER'S YEAR BOOK for 1870,

Gratis and Post Free.

SUTTON AND SONS,

SEEDSMEN TO THE QUEEN,

READING.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS,

Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

CUPRESSUS LAWSONIANA GRACILIS,

Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen.
A few fine Specimens, 10s. 6d. to 21s. each.

These two distinct and very beautiful hardy Evergreens were exhibited at the Royal Horticultural Gardens, London, on the 16th inst., and unanimously awarded First-class Certificates. They have been purchased by nearly every one who has seen them growing in the Nursery, and are fearlessly recommended to all admirers of first-class hardy plants.

ANTHONY WATERER, KNAPHILL NURSERY, WOKING, SURREY.

1870.

J. W. WIMSETT'S

NEW PLANT CATALOGUE (108 PAGES)

Is now ready, and will be forwarded, Post Free, on application.

It contains extensive LISTS of ORCHIDS, STOVE and GREENHOUSE PLANTS, TREE FERNS, AZALEAS, CAMELLIAS, NEW BEDDING PLANTS, WILLS' NEW HYBRID and other PELARGONIUMS, SHOW and FANCY GERANIUMS, RHODODENDRONS suitable for cold and exposed situations, and New and Handsome PALMS, suitable for Drawing-room and Dinner-table Decoration.

For descriptions of these see *Gardeners' Chronicle* for February 19, 1870. The plants there mentioned were a portion of Mr. WIMSETT'S extensive collection, and were supplied to the City of London Club, Old Broad Street. These decorations were the most graceful ever witnessed, and the only instance on record where Palms have been used for dining-room decoration.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W., *December* 10, 1869.

SIR,—I am directed by the Council of this Society to convey to you their thanks for the grand display of Flowers you made at the Gardens here on the occasion of the visit of his Majesty the King of the Belgians.—I remain, Sir, yours faithfully,
JAMES RICHARDS, Assistant Secretary.

To J. W. Wimsett, Royal Ashburnham Park Nursery, King's Road, Chelsea.

BALLS and PARTIES furnished with Plants of every description. A large stock of Ornamental-foliaged Plants always kept for the purpose.

CONSERVATORIES furnished, by the year or otherwise, on the most reasonable terms.

All kinds of DINNER-TABLE DECORATIONS sent out to any part of London, and arranged in the most modern and approved style, and of the most choice flowers of the season.

CUT FLOWERS sent out loosely, or arranged into bouquets by competent and tasteful persons.

BRIDAL, OPERA, and other BOUQUETS furnished on reasonable terms.

ASHBURNHAM PARK NURSERY, KING'S ROAD, CHELSEA, S.W.
J. WILLS, F.R.H.S., *Manager.*

GRASS SEEDS, FOR LAYING DOWN LAND

TO PERMANENT PASTURE, LAWNS, BOWLING-GREENS, &c.

PETER LAWSON & SON,

THE QUEEN'S SEEDSMEN,

20, BUDGE ROW, CANNON STREET, LONDON, E.C., and at EDINBURGH,

Offer their celebrated MIXTURES of the above, suitable for all soils and situations. Their extensive Stocks of GRASSES and CLOVERS have been most carefully selected, thoroughly cleaned, and cannot be surpassed in quality. Prices and full particulars on application.

Tables of Mixtures and every information is given in their "AGROSTOGRAPHIA; a Treatise on the Cultivated Grasses and other Herbage and Forage Plants;" price Half-a-Crown, gratis to customers.

SUTTONS' PURPLE-TOP MAMMOTH TURNIP

A large free-growing Globe variety, very firm white flesh, with deep purple top, valuable for early feeding, being very quick in growth, and an extremely heavy cropper. It will stand the winter well if sown late. Price may be had upon application.

Every description of VEGETABLE, FLOWER, and FARM SEEDS.

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ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

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SOUTHWARK STREET, LONDON, S.E.

POTATOS. Ashleaf Kidney Early, Handsworth, Golden Dwarf Early, Dalmahoy and Fluke, nice selected seed, can be offered cheap by the Ton. ARTICHOKE, Jerusalem, fine quality, for present use, or Seed, can be offered in quantity. Also SEAKALE, two years.

H. and R. STIRZAKER, Skerton Nurseries, Lancaster

The best Potato for the Main Crop is

SUTTONS' BERKSHIRE KIDNEY, raised and selected from among 40 Seedlings of the Fluke. Having planted it for sale with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed. Price 5s. per peck, cheaper by the bushel.

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NEW EARLY POTATO, RINTOUL'S NEW EARLY WHITE DON.—This is a great improvement on the variety sent out by us some years ago, being pure white both outside and inside, perfectly round, with a rough skin. It comes about ten days earlier than the striped variety, an extraordinary cropper, and of first-rate quality.

Having secured a quantity of the above from the raiser, Mr Rintoul, East Craigie, Cramond, whose name as an early Potato grower is well known, we have every confidence in recommending this variety to all who grow for the early market in either field or garden as decidedly the best Potato out for earliness, crop, and quality.

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HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1800, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

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We can confidently recommend this as one of the best Cucumbers grown, while it is second to none for general purposes. In Winter it grows about 1 foot long, and in Summer from 15 to 18 inches, is of deep green colour, very hardy, fine, delicate in flavour, and particularly tender, crisp, and juicy. It is very prolific, showing two to three fruit at every joint, and furnishes a continual supply of handsome Cucumbers during the Winter, Spring, and Summer months. Per packet, 1s 6d. and 2s 6d., post free.

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Suttons' Prize Cucumber Seeds, Post Free.

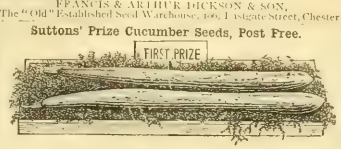

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Other good sorts, 1s and 1s 6d. per packet, as see SUTTONS' PRICED CATALOGUE, Gratis and Post Free on application.

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ASPARAGUS, 1, 2, and 3-yr. old, very fine, 2s 6d. per 100.
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Standard CHERRIES, Mayduke and other leading varieties, 18s. per dozen.

Price to the Trade on application to
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RICHARD WALKER can supply, for cash, SEAKALE for planting out, 3s 6d per 100; ASPARAGUS PLANTS, strong, for planting out, 2s per 100, or 15s per 1000; MIXED LACED PINKS, 3s per 100; WHITE SPANISH ONION SEED, at 2s per lb. All new and genuine.

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RIVERS'S PRODIFIC.—3s. per lb; 7 lb., 18s 6d.
CLIMAX.—3s. per lb.; 7 lb., 18s 6d
BOVINIA (enormous cropper) Reduced price, 9d p lb; 7s 6d p peck.
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"Hammond's Imperial Hardy White Broccoli.—We have received samples of this variety from Mr. W. Hammond, Market Gardener, Birkby, Huddersfield, Yorkshire. The heads are large, even in outline and hemispherical, so close that there is not anywhere for so much as the point of a pencil, the colour creamy-white, average weight when trimmed for cooking, 3 lb.; in quality first-rate, as mild and sweet as a Cauliflower."

Should be grown by every Broccoli Grower.

SPECIAL NOTICE.—J. C. & Co. strongly advise early Orders for Farm Seeds, the late severe weather having greatly injured the young plant growing for next season's supply, and which J. C. & Co. fear will necessitate an advance upon the present low quotations after April 10th next.

"Economy.—Seeds direct from the Growers."

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CARTER'S GENUINE SEEDS FOR FARM AND GARDEN.

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Ready for Immediate Delivery.

No. 1. COLLECTION for COTTAGE GARDENS, 12s. 6d.
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No. 4. COLLECTION for GARDENS of 1 Acre, 63s. 0d.

These Collections will produce a plentiful supply of Choice Vegetables all the year round.

No Charge for Packing.

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Cheaper per cwt.

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Cheaper per bushel or cwt.

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1s. per lb., cheaper per cwt.

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JAMES CARTER AND CO.'S GRASS SEEDS produced the BEAUTIFUL TURFS so MUCH ADMIRED by ENGLISH VISITORS at the late PARIS EXHIBITION; and they have been awarded the First Prize for Grass Seeds.

CARTER'S GRASS SEEDS, as SUPPLIED for the PARIS EXHIBITION GROUNDS, 36s. per acre.

CARTER'S GRASS SEEDS for Fertile Clay Soils, 28s. to 32s. per acre.

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CARTER'S GRASS SEEDS for Loams derived from Old or New Red Sandstone, 28s. to 32s. per acre.

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CARTER'S FINE GRASS SEEDS, for Lawns, 20s. per pushel.

For Cricket and Croquet Grounds, 20s. per bushel.
For Bowling Greens, 20s. per bushel.
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CARTER'S GRASS SEEDS for Marsh Lands, 25s. per acre.

For Churchyards, 18s. per bushel.

Second qualities at reduced rates.

The above Mixtures of Grasses are composed of seeds of the purest quality. For particulars, see "CARTER'S ILLUSTRATED FARMERS' CALENDAR," gratis and post free. Special Estimates for large quantities.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

No. 1 will be Published on March 31, with 34 Engravings, Price 6d.

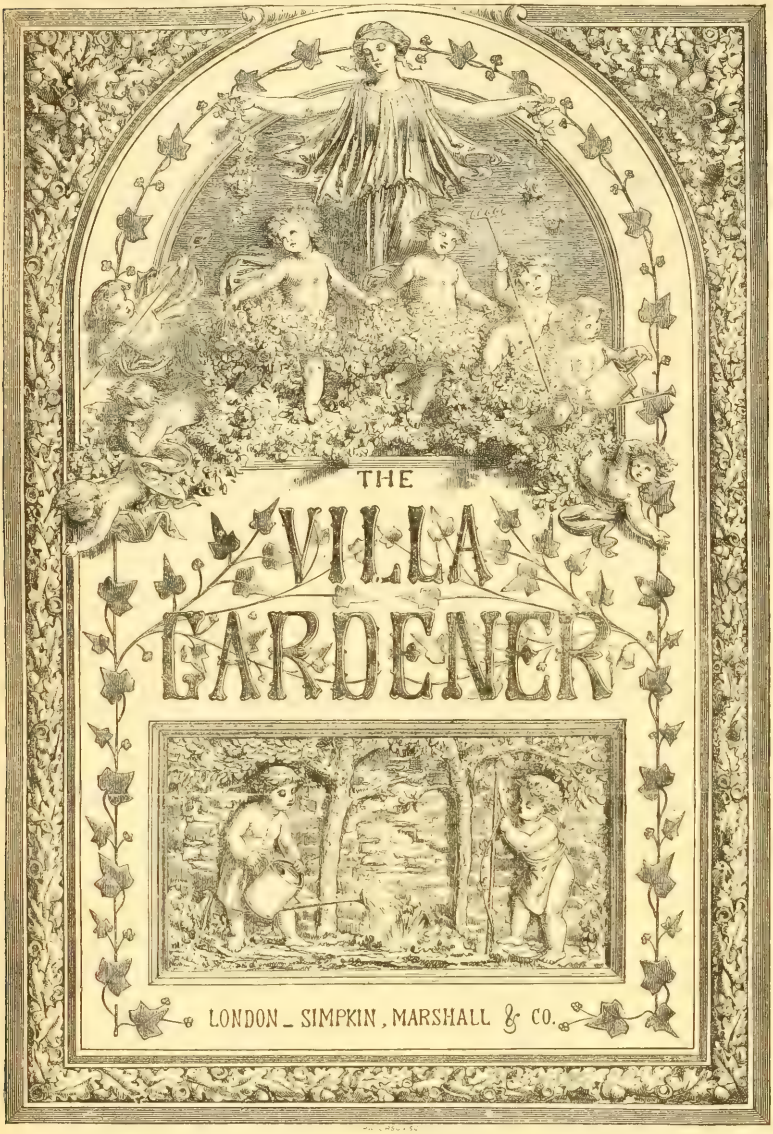

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Fruit Culture adapted for Villa Gardens.

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A Cheap Greenhouse and How to Make It — *Illustrated.*
Cheap Roads and Walks—*Illustrated.*

OUT-DOOR GARDENING.

On Digging and Manuring—*Illustrated.*
Planting of Fruit Trees and Shrubs.
The Culture of Hardy Flowering Bulbs. By JAMES M'NAB, Curator of the Royal Botanic Gardens, Edinburgh.
Pruning and Shelter of Fruit Trees. By D. T. FISH—*Illustrated.*
Alpine Plants that Thrive in Cities. By WILLIAM ROBINSON.
The Mistleto. By WILLIAM GORRIE—*Illustrated.*
Transplanting. By R. BULLEN, Curator of the Glasgow Botanic Gardens—*Illustrated.*
Fruits and Fruit Trees as objects of Ornament as well as Utility in the Villa Garden. By A. F. BARRON, Chiswick.
Home-Grown Tobacco.

GREENHOUSE and HOTHOUSE.

Culture of the Cyclamen. By J. LORIMER—*Illustrated.*
The Greenhouse Fernery.
Variegated Pelargoniums (Geraniums).
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Design for an Aviary and Aquarium—*Illustrated.*

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MISCELLANEOUS.

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Nurserymen's Catalogues.
Warning Words on Watering.
A New Turfing Plant.
Dried Scents for Drawers.

THE VILLA GARDENER is not intended for Professional Gardeners, who are already so well supplied with ably conducted weekly and monthly journals, but for that very large class—the dwellers in Suburban Residences and Villas—who are interested in Gardening simply as a relaxation from other pursuits, who do not employ a regular Gardener, and who have at present no periodical devoted expressly to their interests.

The pages of this new candidate for public favour will be occupied with matter concerning Villa and Town Gardens—to their laying out, planting, and general culture—the management of plants in the open air, the conservatory, greenhouse, dwelling-house, balcony, Wardian case, &c. City gardens, squares, parks, and places of public resort, will also receive some degree of attention, proportionate to the influence they exercise, or may be made to exercise, on the public taste.

Special articles by some of the most competent writers of the day will appear on all gardening operations—as the preparation of the soil, manuring, the sowing of seed, striking plants from cuttings, grafting, layering, pruning, training, watering, and the innumerable other operations which require to be performed in the course of the year, even in the smallest Garden. The Conductors will also have something to say on the best mode of dealing with the Pests of the Garden—insects especially.

Notices of New Flowers, Fruits, Ornamental Plants and Trees, and Culinary Vegetables, so far as these may be interesting to Amateurs, will appear in each Number, and their respective merits or demerits fairly criticised.

Particular attention will be given to the construction, on a scale suitable to Villa Gardens, of Conservatories, Greenhouses, and Hothouses, and of the varied modes of Heating and Ventilating which are continually being brought under Public notice.

Garden Architecture and the proper use of Statuary and other Garden Ornaments will form an important feature of the VILLA GARDENER. Improvements in Garden Tools, Implements, and other appliances will be noticed and criticised.

Practical and plain instructions of what has to be done during the Month, in all the departments of a Villa Garden, will be given; and, in addition, plain directions for what should *not be done*.

It being unquestionable that it is on the Ladies of the household that the general direction of the labour of a Flower Garden falls, as well as the care of Plants in the Conservatory and Drawing-room, it will be the particular study of the Conductors, by imparting their experience on the best mode of management, to make "Every Lady her own Flower Gardener;" and, in doing this, it is hoped to effect a general improvement in the gardening tastes of that large class for which the VILLA GARDENER has been specially projected.

In addition to the subjects mentioned above, a portion of the Magazine will occasionally be devoted to Villa Architecture, and the Management of Aviaries and Aquariums, as adjuncts of the Villa.

The Queries of Correspondents on all subjects connected with Villa Gardening will receive every attention, and be replied to at such length as the general interest of the question demands.

Such is the programme of the VILLA GARDENER; and the Conductors trust that while no effort on their part will be wanting to make it acceptable to the large class for whose special use it has been projected, it is to be hoped that its readers will, from time to time, contribute, for the information of others, any details of management in the growth or culture of any plants that they may consider of importance.

LONDON: SIMPKIN, MARSHALL, AND CO., STATIONERS' HALL COURT, E.C.

Notice.

PURCHASERS of LARGE QUANTITIES of FARM or GARDEN SEEDS will be supplied liberally by SUTTON AND SONS

For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading

Dahlia Roots.

CHARLES TURNER can supply the leading varieties in sound pot roots, 6s. to 12s. per dozen

PELARGONIUMS—Exhibiting plants of large flowering French and fancy varieties, that will give a fine head of bloom in May and June. 12s. to 21s. per dozen.

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Notice.

SPECIMEN ARAUCARIA IMBRICATA.—A pair to match, 8 feet, very handsome; also a magnificent Specimen, 9 feet, all hands me, good colour, and move safely. Will be Sold a Bargain, as the land is required at once. Price on application to

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Established upwards of a Century.

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RICHARD SMITH, Nurseryman and Seedsman, Worcester.

In consequence of a Large Importation,

MR. WILLIAM BULL can offer to the Trade ARAUCARIA EXCELSA, 4 to 6 inches high, by the 100, at 5s. each; and 6 to 8 inches high, by the 100, at 7s. 6d. each. The above have arrived in the most splendid health and condition

Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

MOUNTAIN ASH, a most Ornamental and Profitable Tree for Underwood. It will grow upon soil too poor for Hazel and most other plants used for a similar purpose. We can supply good plants—1 to 2 feet, at 15s. per 100; 2 to 3 feet, at 20s. per 100; 2½ to 3½ feet, at 25s. per 100; 3½ to 4½ feet, at 45s. per 100, or 27s. 6d. per 50.—NOTA BENE Post Office Order.

JAMES SMITH, Darley Dale Nurseries, Matlock.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—NOTICE is HEREBY GIVEN, that an addition to the LIST of PENSIONERS will take place in JULY NEXT. All persons desirous of becoming Candidates are required to transmit their Certificates and Testimonials to the Committee on or before the 16th April next, after which day they will not be received.

By order,

HAWKES TYLER, Sec.

14, Tavistock Row, Covent Garden—March 9, 1870.

N.B. Printed Forms of Application may be had upon requisition to the Secretary.

The Gardeners' Chronicle

SATURDAY, MARCH 19, 1870.

MEETING FOR THE ENSUING WEEK.

Monday, March 21 Entomological .. .. 7 P.M.

THE SCIENTIFIC COMMITTEE of the ROYAL HORTICULTURAL SOCIETY promises to be of use to more branches of science than one. It was to be expected that as a matter of course botany and vegetable physiology would, after the direct technical branches, such as horticulture and agriculture, be the chief gainers by its labours, and so, no doubt, it has proved; but other departments of knowledge less intimately connected with the special aims of the Society are also incidentally benefiting by the establishment of the Committee. Systematic zoology, and more particularly ENTOMOLOGY, are in this case. New exotic species have been already detected in the specimens sent to the Committee for identification; and information regarding their habits and functions, for which we might long have waited from their native country, has been at once obtained by observing the newly introduced species in the hothouses, where they have been met with.

Our importing horticulturists, when they come to unpack their foreign consignments, sometimes find strange "stow-aways" hidden in the recesses of their boxes—sometimes welcome, more frequently the reverse. When the imported plants have come in earth from some outlandish region the wise are wont to sow the earth, and from undetected germs lurking in it sometimes raise an interesting or unknown species—more commonly have their labour for their pains, or only rear some well-known weed: less welcome visitors come in the shape of hurtful beetles, cockroaches, snails, scorpions, &c. We have never heard of the scorpion long surviving, but of the others various species, from countries whose climates should forbid their living here, have established themselves, at least in our hothouses. The common cockroach, Blatta orientalis, as every one knows, has become thoroughly naturalised all over the country.

The large cockroaches, Blabera gigantea and Periplanata americana, are now to be met with in many of our hothouses; and a smaller more beautiful species, with a nearly black shining thorax, Panchlora surinamensis, which is spread over almost the whole world, and is particularly destructive to Orchids, has recently taken possession of some of our chief cultivators' houses. The minute yellow ant, Myrmica molesta, like the common cockroach, has gone further. It is now so widely spread over the world that some doubt exists as its native place, but it is believed to have originally come from Carolina or some other of the Southern States of North America. It has not confined itself to our hothouses, but has invaded our domestic houses. In some parts of London (Bloomsbury, for example) it has become a perfect pest; in summer, not an article of food is safe from it; it is so small that it can creep through a keyhole, and what it wants in size it makes up by numbers; sugar, tea, bread, everthing swarms with it; and, we may remark, the *goût* of formic acid is anything but an agreeable addition as a sauce to one's viands. So at Brighton, it has established itself in force—in such force as almost to expel the legitimate tenants from that part of the borough known as Kemp Town. A few years ago it nearly depopulated it. The common bed-bug is said to be another importation, and a whole host of introduced scavengers could be cited by entomologists; but, confining ourselves to plant destroyers, we may remind our readers of the small black weevil, Centrinus Epidendri, a recent introduction, not long since described in these pages as destructive to soft-hearted Orchids, such as Epidendrum and Dendrobium; and, thanks to Mr. ANDREW MURRAY, we shall shortly be in a position to publish the description of another weevil from South Africa—Phacecorynes funerarius—which has been found still more destructive to an importation of Encephalartos. It has fortunately been observed in time, and entomologists in future will have to get their specimens from South Africa; but it is easy to see how a little carelessness or neglect might have permitted a dangerous enemy to an expensive class of plants to make good a lodgment in their citadel.

The introduction of such species into Britain, where we can watch the progress of their naturalisation and establishment (if they do establish themselves), is invested with peculiar interest at the present time, when the subject of geographical distribution engrosses so much attention. The mode in which lands have been supplied with their present vegetable and animal inhabitants is still the subject of much difference of opinion—whether they have reached lands now widely separated by accidental dispersal, across seas and other barriers, or whether the lands, although now distant, were once united and the same animals lived in both. Until within a recent period the strong authority of Mr. DARWIN and Sir CHAS. LYELL have carried the scientific world with them in favour of the dispersal theory; but there are symptoms that the tide is turning: at all events the continuity theory is listened to with more respect now, and not pooh-poohed as it was wont to be. The fact that a question of such vast importance, as regards the past history of the world, is now in the balance, makes it most desirable that every example of unintentional introduction (even although by man) should be keenly watched and the results recorded. It may be thought that such introductions as those of which we have been speaking can have little bearing on the question, inasmuch as species introduced from a warm climate could not be expected to live except in hothouses—and in a natural condition of things there are of course no hothouses; but this is not wholly so. Nature has hothouses of her own, although they have no glass, that is, she has warm cosy corners; and species which have been introduced from warmer climates *have* established themselves in the open air in this country. Thus, there is the small land-shell, Bulinus Goodallii, which is so fond of our Cucumbers and Melons. It is perfectly established in the gardens in the neighbourhood of London, and yet it came from Jamaica; and even if it were the case that no species from a warmer climate could establish itself in the open air in this country, the experiment of the introduction of such species into our hothouses would not be a whit less instructive, for we should then see what would take place in the case of an interchange of species between two countries of equal temperature and climate.

Horticulturists may be assured, therefore, that communications of this nature have often a much wider interest than the mere details which have first awakened their curiosity, however remarkable these may be in themselves; and we trust that every one who has the opportunity of observing them will place his observations on record.

THE remarks of Mr. GLAISHER at the meeting of the Scientific Committee on Wednesday last, and which are embodied in a communication to the Meteorological Society, and published in a recent Number of the Proceedings of that body, are of such interest to gardeners, and tell their own tale so well, that all that it is requisite for us to do is to call attention to the general results arrived at. The paper in question gives in detail the record of some experiments on the TEMPERATURE and HUMIDITY of the AIR at the heights of 22 feet and 50 feet above the ground, in comparison with the temperature and humidity registered at a height of 4 feet from the surface. It was a very general article of belief that the temperature was always lower at higher elevations, and that on the average a decline of 1° took place for every increase of 300 feet of elevation. Mr. GLAISHER'S balloon experiments showed the fallacy of these assumptions, and proved that the temperature near the earth varies greatly, and is different at different parts of the day. This is shown in the case of the experiments made in the monster "captive balloon," lately to be seen at Chelsea. "On two different days," says Mr. GLAISHER, "I ascended nine times on each day; there was a decrease of temperature with increase of elevation at every ascent, but different in amount at every hour, being less and less as the day advanced towards sunset."

The change of temperature with the increase of elevation was found to be greatest at about mid-day and the early afternoon hours, decreasing till about sunset, at which time, when the sun was free from clouds, there was little or no change of temperature up to the height of several hundred feet. As in these and other experiments it was found that the largest changes take place nearest to the surface, so it became specially desirable that further experiments should be made as to this point, and with this view the observations were made at the same hours on thermometers placed respectively at the heights of 4, 22, and 50 feet above the ground. The result of these observations, extending over some six weeks, from the end of June to the beginning of August, are embodied in the paper before us. The general conclusions are, that during the period of observation in the daytime the temperature at 4 feet was higher than at 22 feet, while at night the conditions were reversed. During the mid-day hours it sometimes happened that the temperature at 4 feet was from 4° to 6° higher than at 22 feet above the surface, while at night the heat at the lower station was sometimes 2° to 3° colder than at the higher elevation.

When the temperature at 4 and at 50 feet above the earth was compared in the same manner similar results were noted. During the day hours the temperature of the air at the height of 4 feet above the ground was sometimes 7° to 8° higher than at 50 feet; while at night it was sometimes 3° to 4° or 5° colder at the lower elevation than at the higher one. In general terms, "for the 12 hours from 5½ A.M. to 5½ P.M., the temperature at 4 feet high was higher than at the higher elevations, and during the remaining 12 hours it was lower than at the higher elevations." That the temperature near the earth is often lower at night in frosty weather is too often proved by the death of the lower branches of shrubs and trees while the upper are unscathed, but it would be most desirable to have these circumstances worked out, and hence we learn, with great satisfaction, that it is intended to extend these observations throughout a whole year, and that we may look for a complete record not only of diurnal but of seasonal changes. Fruit tree growers, once these data were established, could regulate the height of their graft so that a tender scion should not be exposed to the cold thrust near the surface; and numerous expedients would suggest themselves to every practical gardener in availing himself of such information.

As to the degree of moisture in the air, it appears from Mr. GLAISHER'S tables that during the day hours the degree of humidity is greater at the higher than at the lower elevation, that from 6 to 9 P.M. there appears to be but little difference, and that at night the degree of humidity is greater at the lower elevation.

—— WE regret to learn from a Dublin paper that the vote formerly passed of £4000 for the BOTANICAL MUSEUM in the BOTANIC GARDEN, GLASNEVIN, and

which ought to have been built this year, has been omitted on the Civil Service Estimates for 1869-70, which, of course, prevents the work from being carried on at present. This "justice to Ireland" appears to have originated with the Commissioners who were sent to inquire into and report on the advisability of establishing an institution on a similar plan to those at South Kensington and at Edinburgh, in Dublin; yet, so far as we know, the only thing they have effectually done is to get this £4000 struck off the estimates, which had been revoted on three previous years, but could not be taken advantage of, owing to the other three items being, we suppose, more pressing. That such a decision should have been arrived at on the recommendation of a Commission whose stated object appears to have been to inquire into and report in what manner money could be best applied for the encouragement of popular science in Ireland, and not to take away that already voted for this purpose, we believe our readers will join with us in deploring. It certainly did not arise from the establishment being less popular than others of a kindred nature, since, on reference to the Civil Service Estimates for 1868, we observe a foot-note appended to this date, which states the numbers who visited the Royal Dublin Society's lectures and exhibitions during that year were 234,431, of which number 160,353 were visitors to the Botanic Garden on Sundays. The large number of week-day visitors to the garden is not given, but we may readily suppose they made up a very considerable part of the remaining 74,000 of the total number of visitors to all departments of the Royal Dublin Society. We do not know the circumstances which have led to this proposal, but it seems, on the face of it, a monstrous thing to suddenly reverse a course of action affirmed and approved on three separate occasions. That a museum is an all-important part of such an establishment as Glasnevin is beyond all doubt; only a Commissioner with a crotchet would be of the contrary opinion. We trust there may be yet time to reconsider the matter. The names of the Commissioners who have made the recommendation should be made generally known, and their reasons for recommending such a step, so that the public may know whether or no they are persons competent to give an opinion on botanical subjects.

—— We extract the following illustration of the effect of the STOCK on the character of the GRAFT from the Transactions of the Massachusetts Horticultural Society. The history of the case is thus given:—

"NATHANIEL WHITING, originally from Dedham, Massachusetts, then residing on his farm in Amherst, N. H., planted Apple seeds about the year 1820, and within three or four years afterwards procured scions from Dedham with which he engrafted the seedlings; one scion grew and bore the regular Baldwin Apple, becoming a large tree of 12 to 14 inches diameter of trunk in 1854; at which time a small branch, which had started from a limb at a point about 20 feet from the ground, was observed to bear fruit differing from the rest of the tree, and was, in appearance, between a Baldwin and Roxbury Russet; this branch has continued to enlarge and bear these peculiar Apples; and grafts from it have been inserted in other trees, where they grow differently from the Baldwin or Russet tree, and are of upright rapid growth, in fruitfulness about the same as the Baldwin. The fruit presented was borne in 1868, by grafts of this peculiar branch inserted in other trees, five years from cleft grafting, on the same homestead. The keeping quality is evident from the specimens herewith, April 3, 1869, which were taken from a barrel packed the middle of October, in which no decayed ones were found when opened, March 16."

—— At a recent meeting of the Geological Society, Mr. CARRUTHERS read a communication on the STRUCTURE of a FERN-STEM from the Lower Eocene of Herne Bay, in which he described the characters of this fossil stem, which had been obtained by GEORGE DOWKER, Esq., F.G.S., from the beach at Herne Bay, and stated that in its structure it agreed most closely with the living Osmunda regalis, and certainly belonged to the Osmundaceæ. The broken petioles show a single crescentic vascular bundle. The section of the true stem shows a white parenchymatous medulla, a narrow vascular cylinder interrupted by long slender meshes from which the vascular bundles of the petioles spring, and a parenchymatous cortical layer. The author described the arrangement of these parts in detail, and indicated their agreement with the same parts in Osmunda regalis. He did not venture to refer the Fern, to which this stem had belonged, positively to the genus Osmunda, but preferred describing it as an Osmundites, under the name of O. Dowkeri. The specimen was silicified, and even the starch-grains contained in its cells, and the mycelium of a parasitic Fungus traversing some of them, were perfectly represented. Its precise origin was unknown; it was said to be probably derived from the London clay, or from the beds immediately below.

—— It has been suggested to us that the new DRACONTIUM ELATUM, figured at p. 344, and which was imported from Sierra Leone by Mr. Bull, was originally a native of tropical America, whence it may have been introduced into Africa by the slave traders. Certainly, the genus is more American than African, and assuredly it is strange that none of the botanists who have resided at or visited Sierra Leone should have seen so remarkable a plant. But a similar remark may be made if its American origin be assumed. If it were sufficiently common there to have attracted the attention of the slave dealers, and to have been by them transported to Africa, how is it that American travellers have overlooked its existence?

—— We understand that the CENTRAL HORTICULTURAL SOCIETY is taking steps towards the erection, in Nunhead Cemetery, of a memorial over the grave of the late SAMUEL BROOME, of the Inner Temple Gardens. The Secretary, to whom communications should be addressed, is Mr. HUTCHINS, 40, Essex Street, Strand.

—— The usual SPRING EXHIBITION at South Kensington, by Mr. WILLIAM PAUL, opened on Wednesday last, and continues till next Wednesday. It contains a remarkably fine display of Hyacinths, and those who may not have had an opportunity of seeing the Hyacinth show on the 16th inst., will find a very good substitute in an inspection of Mr. PAUL's flowers during the next few days.

—— Many curious matters have turned up from time to time from the queries of correspondents, and not the least curious is the PARASITE which lately has been sent us on the LEAVES of a CARNATION, to which it appears to be doing considerable damage. The leaves are studded with large round white spots, on which a brown mould is developed, arranged in little concentric tufts. The threads are extremely irregular, forming little fascicles slightly branched, the branches often assuming the form of knots, and the upper knots in some cases bearing the spores, while occasionally, as in our figure, they occupy the colourless upper portion of the threads. The spores themselves are cylindrical, with from two to four articulations, slightly constricted occasionally at the dissepiments, and beautifully echinulate, a character which we do not recollect to have seen before in the genus to which it belongs—the

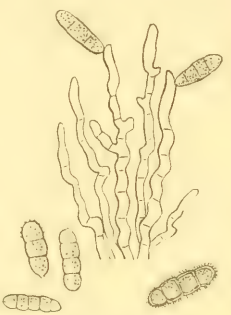

FIG. 63.

spores being considerable in length according to the number of dissepiments; Mr. BROOME, from whom we have a sketch, finds them from $\frac{1}{3}$rd to $\frac{2}{3}$rds of an inch long, and $\frac{1}{2500}$th to $\frac{1}{3000}$th of an inch wide. In some cases we have seen them a little longer where there were four dissepiments. As the mould evidently is developed in the first instance beneath the cuticle, it is almost impossible to apply with effect any remedy. Indeed, the brown moulds appear to be far more obstinate than the white ones, sulphur apparently having no effect on them, except in such a form as will prove destructive to both parasite and plant. Our figure represents a tuft of threads highly magnified, with spores more or less magnified. The species is quite new, and may be characterised — *Helminthosporium echinulatum*: floccis fasciculatis, irregularibus nodosis; sporis hyalinis cylindricis 2—4 septatis echinulatis. It is very probable that it is merely a condition of some parasitic Sphæria. *M. J. B.*

—— Messrs. CUTBUSH's annual exhibition of SPRING FLOWERS at the CRYSTAL PALACE was opened on Saturday last, and will continue open until this day week (March 26). The principal attraction is, of course, the Hyacinths, of which there is a good display of first-rate blooms, of all the leading kinds. Tulips will now be in good condition, as also will be most of the other plants staged, which were scarcely forward enough the first day or two. The exhibition is held in the centre transept, as in former years. The plants are tastefully and effectively arranged, and do the firm great credit.

—— The WEATHER during the week ending March 12 was very uniform over the country (see Mr. GLAISHER's tables in our present issue). The temperature was much lower in the Southern Counties; was lower in the Midland Counties, and was nearly the same in the Northern Counties and in Scotland as in the preceding week. The extreme high temperature in the week varied from 47.7° at Aberdeen to 54.2° at Portsmouth. The mean of all was 50.4°. The extreme low night temperature varied from 22° at Aberdeen to 31.2° at Wolverhampton; the temperature, therefore, fell below 32° at all places. The mean of all temperatures during the week varied from 37.1° at Norwich to 40.9° at Perth. The average of all England and Scotland was 39.4°—the Southern Counties, therefore, experienced a temperature less on the whole week of 6° than they had in the preceding week. The temperature of the ground at Greenwich, at 1 inch deep, varied from 39° to 43°; at 3 feet it was 41.7°; at 6 feet 44.1°; at 12 feet 46.2°; and at 24 feet it was 50.8°. The fall of rain was partial, and to small amounts.

—— The annual *conversazione* of the QUEKETT MICROSCOPICAL CLUB took place at University College on Friday evening (March 11), and was attended by a very numerous assembly of members and visitors. The objects exhibited under the microscopes comprised specimens from nearly every branch of microscopical science, and evinced by their novelty an evident desire on the part of the members to cultivate every source likely to yield instruction.

—— We are informed that a committee has been constituted for the purpose of presenting a TESTIMONIAL to Mr. JAMES FLOOD, who has for several years been officially connected with the exhibitions held at the Royal Botanic Garden, Regent's Park, and who, in consequence of recent changes, is no longer connected with the Botanic Garden. Messrs. DOBSON & SONS, of the Woodlands' Nursery, Isleworth, act as Treasurers.

—— Can any one tell us the legitimate use for CHARLOCK SEED? We ask the question as we have before us a sample of such seed, and a letter addressed to a wholesale seed house, offering 14 sacks of the same. As the letter in question comes from a provincial druggist, we can only surmise that the seed is intended as *destorus stuff*—at any rate we hope it may remain a drug in the market.

TABLE MAIZE.

I RECEIVED, last year, from the Editors of the *Gardeners' Chronicle*, some Ten-weeks' Maize from Boston, for trial with the 20 new varieties from all parts of America, introduced by myself, in 1867, into England. Besides these I had two other varieties of Ten-weeks' Maize; some hybrids from Pau, from seed raised in Yorkshire by the Rev. F. Horner; some seeds of the best Algerian yellow; and some from mutilated plants, produced on a system which has been brought forward by Mr. B. Clarke, of Hampstead, and noticed in these columns.

Such a collection never previously having been grown on the same spot in this country (or in any other, no doubt), joined to the value of Maize as an autumnal vegetable, and the spontaneous mention of it by journals unconnected with horticulture, may be of such interest to many as to merit notice. I have now tried all these varieties, and most of them for two seasons, which being highly dissimilar in climatic influences may be fairly quoted in proof of the possibility of raising Maize in this country. Having also experienced the difficulties of accommodating an untried vegetable to the necessities of our seasons, others may profit thereby.

And first, as to the effects of the seasons. The year 1868 was exceptionally hot, and very dry, and as I did not then know the need of water for Maize plants, the cobs, which were immense (some reaching to 15 oz.), might have been even finer. The best Algerian here, however, only weighed 6 oz. But the year 1869 was very unfavourable, and proved a severe test. The plants, having been forwarded in boxes under glass (without bottom-heat), were put out at the end of April in rows, 15 inches from plant to plant, each being then about 6 inches high; but they were injured by the cold of the May nights, and became yellow, making little growth. July and August here were cloudy months, more so than usual, but the Maize grew rapidly. Seed sown in the open ground late in April also grew well, but the plants were not so forward as to be depended on for ripe seeds, and the produce was chiefly used green. We had thus an abundance. The plants were staked, but insecurely, for, on September 12, when full grown and very fine, they were much injured, and generally levelled by a hurricane of the force of 55 lb. to the square foot. This awful storm, the worst I ever felt, was of a violence rarely known inland in England; but the roots not having been torn up, the plants were laboriously raised and restaked, this time at a height of 3 feet; and, though the foliage was in ribbons, the plants, with some exceptions, matured their seeds perfectly.

After this test there can be no great doubt that Maize can be generally ripened for seed in our gardens. For use in a green state its culture is possible anywhere. Friends in America smile at the notion of raising Maize in boxes under glass, and of staking it, but these varieties being for table use, and not the common yellow field Maize of commerce, are well worth the slight trouble which we also give to other even less valuable vegetables.

As to the various varieties, I have to report that the blue tends to disappear in cold seasons, the red did well, and the purest white, from Georgia (the best of all), in some cobs became more yellow. The size of the cobs in 1869 was smaller than in the hot year of 1868; but the seeds were well ripened, and the "green corn" perfect in flavour.

The Ten-weeks' Maize from Boston is the earliest to ripen, but the cobs are too small, and the grains too yellow. The curious "pop corn" of confectioners, so dear to children, is also a variety which is dwarf, and exhausts the soil very little. The seed from mutilated plants (sent by Mr. Clarke) certainly produce an augmented number of cobs, and the plants are shorter and require no stakes. Circumstances prevented my developing this interesting experiment in mutilating the male flowers this year.

I am told that in Canada the finder of a red cob is entitled to privileges analogous to those of the Mistletoe. This may make this variety a favourite, as the pop corn now is; but for profitable table use, and delicacy, the pure white, the pink, and the long pale yellow varieties are what I prefer. Hybrids we may eventually lose, without regret, and the darker blue, with others, most curious and beautiful as they are. The public is now in a fair way of judging for itself.

I should say that it will be found that to forward under glass during April, to harden out a little, and to watch the season when night frosts are not too severe, to plant out in May, then to water in hot weather, and to plant in rich garden soil, would secure a fine crop. Liquid manure would be valuable, for at the Sewage Farm, Barking Creek, Maize grew 3 inches per night for 33 consecutive nights! Attention is demanded to furnish stakes in windy places. In short, no more care is required than for most other vegetables. The flavour is between that of Asparagus and Peas, with a peculiar aroma. As to nutritious qualities Maize is nearly unrivalled, and, green or dry, is the food of millions. As it would be in use during all October and later, it is something to reproduce the spring flavour of the Pea at that season. Children are immensely fond of green Maize, and the youthful palate is no mean test, as we all are aware, of the value of delicate flavours. By opening the end of the green cob, the proper time for taking is known. It is when the grains are as large and as firm as Marrow-fat Peas. They then require 30 minutes' boiling. Fresh butter is spread over the cobs, and they are served in small portions best. The genteel way is to pick off the grains, but the popular plan is to bite them off, and when in small pieces it has not the unfashionable look we imagine. *Th. C. Bichaut, Richmond House, Guernsey.*

LIANAS, OR TROPICAL CLIMBERS.

I WAS at Valle Menier just when they were clearing a number of exploratory openings preparatory to making roads. The paths were first made wide enough for a man to pass on horseback, then, when the direction was decided on, it was widened to three mètres—the size considered requisite to enable a small cart to pass. The clearances were made by means of the hatchet, which everybody here, and especially the Indian, always carries with him. The *hulero* in quest of caoutchouc, the *savanero* who runs after a stray animal, the cultivator seeking useful timber—everybody uses it to the right hand, or to the left, and notwithstanding, after some weeks (I had nearly said days) if the traffic through the gap be not almost constant, all becomes greener, more knotted together, more impassable than ever. The Liana cut in two does not perish. The end which is embedded in the soil dies, it is true, as do the roots, if there are not several stems proceeding from the same trunk, as often happens, and in which case they become stronger. The end which remains hanging on the tree is weakened. After a time a little above the cut appear sundry prominences, which become lengthened out towards the earth (fig. 64). At first reddish and thread-like, they soon get larger and harder, and when they have reached the soil they become imbedded in it. The plant then recovers all its freshness, and continues to extend until it displays on the green carpet formed by the tops of the trees a mass of entangled branches covered with flowers.

FIG. 64.

I have ascertained that the growth of these aërial roots is at least 20 centimètres a day (8ins.), that is, nearly a centimètre an hour; the number of roots is doubled as they approach the soil, and when it is nearly reached they throw out a series of little protuberances, which grow vigorously, and give life to the plant, whose health seemed previously imperilled. These little growths to which we have just alluded are in the form of a comb, which at the extreme end is always turned towards the old root. From this time the condition of these aërial roots changes; they were before soft, watery, nearly transparent; they now become fibrous, and at the end of six weeks they form a stem, which presents an elbow-like prominence above the oblique wound made by the axe. I have remarked that this only takes place in Lianas whose diameter does not exceed 4 centimètres, that is to say, in young plants. In older and larger ones the stem at some distance from the base is dry, and seems almost rotten. In spite of this the old Liana cut across takes root again, but the phenomenon is produced in a different manner.

If the cut has been made at B (fig. 65), the roots will emerge from a point near A, situated often very far from B, but in a situation where the plant is strong enough to emit new roots. There are also a number of special instances. Thus, as in fig. 66, if the cut is made above a neighbouring U-shaped curve, the root will emerge from the lowest point. If a cut be made at A and at B, the roots appear as in the preceding case. If a Liana of a form represented in fig. 67, supported by a branch at C, is cut at A and at B, the roots emerge from these two points, and a fresh stem will grow at C. The formation of this stem is not a case of metamorphosis, as is the root; it is an ordinary branch, and grows directly—its daily increase, too, is enormous.

If now fig. 67 be compared with fig. 66, it will be seen that from one Liana two may be obtained, and as the operation when it causes the production of roots increases the strength of the plant, it must be concluded that this would be an excellent means of cultivating and multiplying them.

FIG. 65.

If a Liana is cut at A and B (fig. 68), and the two ends are tied together at C, union of the two ends takes place; the roots protrude from the point of union at the same time that a stem springs from the point D. If, instead of uniting the ends they are covered with Spanish wax, or if they are rubbed with phenic acid, a certain portion of each end is dried up, and the roots spring from a point at a little distance from each end. I made two experiments, which I think will be found interesting:—1st, I found a cut Liana from which

FIG. 66.

hung roots a foot long. I recut it, and put on one side the piece with the roots which hung from it. Two days afterwards the Liana had produced other roots of the same length. I again cut it, and it produced roots, but somewhat more weak and thin. I cut again, and continued this proceeding eight times, until at length the roots were so thin and thread-like that I left them. They have now reached the soil, have increased in size, and the plant is in bloom. It is a sweet-smelling Bignonia, with flowers of a pale violet colour.

The second experiment shows better still the strong vitality of Lianas. I found a tree standing alone in the

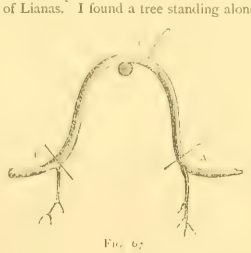

FIG. 67.

midst of a clearance. At the base a Liana had grown, and which had been cut at A (fig. 69), and of which the end (very green), hung over to the other side, B, seeking to come in contact with the trees which were lying on the ground around it. From the point A hung some rootlets which were about to bury themselves in the earth. I drew forcibly to me the end B, and so caused the point A to rise to A', that is to say, to 3 feet above the point where I first found it. The roots had already thrown out those little prominences which do not appear until they touch the ground. They remained stationary, and that which I shall call the mother root began to descend. I repeated the experiment frequently, and finished by having, as it were, a shower of roots, which, springing from the very top of the tree, hung all around it. My intention was to have suppressed them all but one, and to make with this, by means of sticks, a sort of aërial bridge, to see if I could cause it to lengthen indefinitely, but my departure from Valle interrupted this experiment. If one of the aërial roots be broken, a little protuberance is formed above the rupture, and the cut root emits a new root exactly as the stem does. I have remarked also that these roots do not show themselves near the wound except when the plant has a clean cut. If it be ragged or torn, which is not an easy matter to do, the roots push far from the wound, as in fig. 66. If the trunk becomes dry, as is frequently the case, the same thing happens as if it had been cut. It will be seen after what we have said that nothing is more difficult than to destroy a Liana. Only a thorough clearance and burning can put an end to them entirely. Every other means only causes them to increase and multiply. This growth would probably not be witnessed in a conservatory, the climate of the country causing the phenomena in great measure. I think, too, that the most favourable season for making experiments would be in April and May, before the rains, when the plants are in full activity. It seemed to me that during this time the plant itself was at a high temperature. Twining Lianas generally move from left to right. I am told there are some which twine from right to left, but I have never seen them; Bignonias are not of twining habit. I have remarked that they never become interlaced with Lianas of other families, that they do not willingly intertwine themselves with other Bignonias, even of the same species, and that they seldom ever twine round their own branches. They have a nearly rectilinear movement (I do not say vertical), since they pass from branch to branch, following a sort of undulating curve. This is a characteristic trait, and in a forest strikes people most unfamiliar with botany. There, where Lianas, flat, rugose and thorny, are intermingled in a confusion which is quite grotesque, a Bignonia may

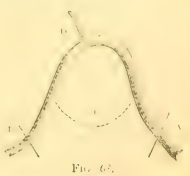

FIG. 68.

be seen that has thrown itself with a single majestic curve to the summit of an adjacent tree; a fact incomprehensible to those unfamiliar with the aërial roots, which have buoyed up this cable from the time when it was only a single thread.

The instinct of monkeys causes them generally to prefer the Bignonias to travel by, as besides their freedom from thorns the animals never find the road

FIG. 69.

blocked up. The Bignonias, too, on account of their perfumes, are the resort of butterflies and hummingbirds, animated flowers, helping to render truly marvellous the aspect of trees covered with the magnificent flowers of the Bignoniaceæ. It is an incontestable fact that there are Lianas which have an affinity for certain trees, and which absolutely refuse to attach themselves to others. They carefully draw themselves away when they encounter one of these objectionable trees. There might be a very interesting series of observations published on the trees preferred or disliked by these plants. The Lianas are used for a variety of purposes, but they are chiefly employed in the construction of houses, where all is bound together, and nails are scarcely ever used. Most of them form excellent cables—even without the necessity of twisting into strands. There are some of them, however, to be preferred, either for the absence of nodes, or their equal diameter throughout a great length, or on account of their smoothness, suppleness, &c., or because when dry they almost equal iron wire in hardness. Basket makers would find them very useful, but here there are none who pursue this trade. The *bejuco de agua* gives, when cut, nearly two litres of a liquid resembling nearly pure water, of great service to the traveller. Some species exude a gum, others a milky juice, one and all are useful for some purpose. Some when pressed and ground give out a coagulating juice used in preparing indigo and caoutchouc.

It has been stated that these juicy Lianas are always met with in the neighbourhood of plants or trees furnishing products, in the preparation of which they may be utilised. There is one however which, treated like the foregoing and mixed with mortar, gives to it valuable agglutinative properties; it also increases its hydraulic powers. As certain Lianas direct

themselves not towards the tree nearest to them, but to that one which they prefer, so there are some Lianas which support certain epiphytes (Tillandsias chiefly), and others on which we never see them. There is also a Fig called Matapalo (Tue-bois) which envelops with its branches the most robust trees and kills them. When the tree before the arrival of the Matapalo is surrounded by Lianas, nothing is more curious than to witness the efforts of the Lianas to disengage themselves and fly from the enemy before he grows large enough to cause them to perish. It is under such circumstances that the most distorted forms of Lianas are found. There are also Lianas which push out very numerous branches, and where the branches become fused together where they cross; thus you may find on a single stem a square, oval, or round outline, and sometimes the most picturesque forms. If perfect Lianas could be obtained there might probably be some very interesting observations made on the proportion of the diameter to the total length—a proportion which seems to me to be constant, whatever length the plant may attain to.

Finally, it is when observing the marvellous construction of the fruits of climbing Bignonias that one is most impressed: the two valves which fall away, the flattened axis from which the wind removes the winged seeds one by one; all this, coupled with the energy which the plant uses to ward off destruction, makes one ask what is the importance of this group of plants in Nature's plan, and what is the part it may be called upon to play, since its preservation is so carefully ensured? *M. Paul Duchartre in "Bulletin de la Société Botanique de France."*

FERNS AND THEIR CULTURE.

Concluded from page 360.

The TRICHOMANES and HYMENOPHYLLUMS are pleasant objects, and no doubt a part of the scene. Their leaves worthy of notice about these plants is their power of maintaining a green tint, not unlike that of certain seaweeds, and that, too, in places almost dark. In fact, they seem incapable of having under exposure to intense sunlight, and consequently an unusual abundance of shade is needed to enable them to maintain health. But this one piece of accommodation will not alone suffice to bring about the result desired by a cultivator. In addition, it is necessary to provide them with an atmosphere largely charged with vapour. To procure the two necessaries just named, much expense need not be gone to, for I remember a grand lot of the two British Hymenophyllums which used to grow in an old Wardian case in the Glasgow Botanic Garden. The glass of that case was so much blackened on the outside as the soot of years could make it, whilst the inside was thickly coated with Confervæ. But still in that lowly abode those tiny Ferns, with no more beneath them than a fragment of rock and a sprinkling of earth, throve apace; besides, a circulation of air was not provided for, and water was not given oftener than once a month.

Those, however, who wish to see every care taken to insure the perfect development of these present subjects, and also a design well worthy of them, should visit the nursery of Messrs. Backhouse & Son. These gentlemen grow their Filmy Ferns in an artificial cave, planned with much skill. When I saw it a few years ago every morsel of frond was loaded with moisture to such a degree that I supposed some person had shortly before I entered been operating with a syringe, but I was mistaken, for the effect in question was entirely due to condensation. No specimen of wretchedness, calculated to excite pity, existed there, for every bit of vegetation looked full of vigour; and passing down the large masses of rocks, which formed the walls of the place, crept roots, from such species as Trichomanes radicans, some of which measured at least a yard in length. Further, no more soil was used than sufficed to fix a new introduction to a given place.

If a case, such as the one described, is considered objectionable, and a cave resembling the above-mentioned is out of the question, still, provided the lessons these two structures inculcate with one accord, be acted upon, there is no need of giving up in despair. Ingenuity can remove whatever difficulty stands in the way by the construction of a neat square box, shallow, and having holes in its bottom, and a glass shade to fit well, so as to insure humidity. On account of the sprinkling of water, almost certain to be in demand here, drainage ought to be looked after especially, and therefore, whatever compost is used, it should be very porous. Such Trichomanoid Ferns as have creeping stems are fond of extending along the dead trunks of their tree-like relatives, and this fact ought not to be lost sight of when planting is being done. The most convenient method of increasing the generality of Filmy Ferns is by parting; this should be seen to before the yearly growth commences, but if gone about with care it may be performed at any time.

Acrostichum aureum, nearly all the Osmundas, and a few other Ferns, are half aquatic, that is to say, they like to have their roots but not their crowns in water, and this inclination ought to be fostered where space is no obstacle. Then, again, the various species of Oleandra, Davallia, and Polypodium are provided with stems, which ramble about, emit roots from one side, and fronds from another, and require far more surface but much less depth for their operations than Ferns, which do not alter their position. Also, it should be observed, that the genus Nephrolepis has scarcely a single representative which can be seen to advantage, unless grown in a suspended basket; whilst Platyceriums always look more entertaining springing out of a perpendicular, or sloping, than a level surface. A small annual, like Gymnogramma leptophylla, ought to have a quiet corner devoted to itself, where it can come up from year to year without being mistaken for Liverwort and destroyed. Although it is not necessary to caution old professionals against the syringing of farinose Gymnogrammas, yet the warning is undoubtedly needed for beginners.

Stove Ferns should be kept during winter at a temperature between 55° and 65°, and in the summer between 75° and 85°. The only thing which need be said about the warming of a temperate Fern-house is, that frost ought to be kept out. Urging Ferns into growth during the short days is a thoughtless proceeding as a rule, because it leads to nothing more admirable than the making of a weak effort followed by a sickly result, which frequently damps off. Importations from distant parts of the world, after they reach this country, ought to be coaxed, rather than violently compelled, to resume their activity.

Before leaving off, I may say a few words on the cultivation in pots of Ferns which, in a wild state, inhabit mountains or cold rocky regions. In the southern plains of this island people often find it a hard task to keep the vital spark within the kinds I refer to. It is often thought that those little savages from within sight of perpetual snow detest captivity, and this they certainly do if the usage they receive is inconsiderate; but if otherwise, they flourish delightfully in a garden. The first thing to be said about alpines collectively is, that though the leaves and parts aboveground stand rapid changes in the air, it is different with the roots, for if these are placed in a medium liable to become speedily very warm during the day, and cold during the night, the unfortunate objects to which the roots belong soon die. But this does not take place if the space allotted to the roots is composed of materials whose temperature alters gradually. Now pieces of stone, particularly if covered up, answer in an eminent degree to this description, because of their being such tardy conductors of heat; and if they are distributed amongst the compost used for the objects whose interests are at present under consideration, auspicious consequences will hardly fail to follow. *John Duncan.*

THE BISHOP STORTFORD VINES.

[PLATE CCXLIX. & FIG. 71.]

FUNGI in the border? We always thought so. Fungus is the parent of shanking. Let this once spawn over them, and paralysis of roots, stunting of top, and shanking of bunch instantly follow. Fungus is ruin to Vines. It was born of that rich porous *pabulum*, that even the late Dr. Lindley was so charmed with, as his walking-stick sunk to the hand in its unknown depths. Of course the decomposition of organic matter was rapid. The Vines grew in the yeasty mass like giants. But Fungi spawned, and now have ruined all! Such are some of the cries that we seem to hear from the *Chronicle*, and above the din of all other voices one catches the clear accents of the veteran fungologist, Mr. Berkeley. It seems such a pity to disturb the general harmony, and to dispel the pleasant illusion. But in truth no Fungus was found on these Vine roots, nor in the soil. I am almost sorry for it. For doubtless the fungoid theory of solving difficulties is most convenient, and withal so philosophical.

Not Fungi? Then it was water in excess, water stagnant, water foul, water souring the rich compost into putrid paste and mud; gorged roots, always full of water, drinking it in during summer, sweltering helplessly and foundering foully amid its mire in winter! Of course the water rotted the spongioles, then the roots that begot the spongioles; and finally the whole Vine became water-logged, like a sinking ship, and fruit, health, and strength, all became gradually submerged beneath a water tide of ruin! Stop, stop; not water. Even now, after all these rains, the borders are none too wet. They are so elevated and so porous that no water can remain within them. It passes through like a sieve. So confident is Mr. Yardley, the old gardener, that there never has been any excess of water, that he attributes the failure of the Vines to the dryness of the border.

Now we have it. The border is good, it is dry, it is free of Fungi, but the roots have all run out of it. What a pity such grand Vines had not been made to feed in rich pastures at home, instead of being allowed to roam abroad to their utter ruin! Here, again, speculation is suddenly reined in by stubborn facts. The Vine roots are found mostly in the borders. True, two very large roots had run under the vinery, and gone no one knows where. But all the other roots were at home, and in admirable condition. It seems impossible to lay the failure to either the paucity or quality of the roots.

The anti-Crambites call out, the Vines had no lime! They grew in Herts, which rests on a stratum of chalk, and the soil is highly calcareous, but it is just possible that special means were used to exclude lime from these borders. Now lime is the one thing most needful for Vines! It gives soundness and vigour of constitution, forms stones and rind, imparts plumpness, and provides finish! Skin the chalk and the dolomite and other limestone formations, say they, for your soil, but shun the rag or the freestone if you would have good Grapes! But, hark, these borders were fully charged with lime. The soil of which they were formed was strong loam and burnt earth stripped off from round a brick-kiln, and to this was added quantities of brickbats and mortar rubbish, 64 bushels of bonedust and 320 bushels of fresh lime! And so the anti-Crambites march off confounded. Neither will the fact that these Vines were the finest in the kingdom for a good many years assist in establishing Mr. Cramb's theory, though their premature failure is a great fact in his favour.

The borders were exhausted? What a pity the toes of these Vines were not fed with fresh matter. The border might easily have been widened, and then the Vines, taking a fresh grip of, and a good bait from the new soil, might have continued till now. Well, this looks reasonable. But it so happens that this very course was taken about three years ago. About 5 feet of the borders were cut off, roots and all—the old soil removed and replaced with new. At the same time an additional width of a yard was given to the border, thus providing a new root run of 8 feet for the Vines. During this surgical operation all the roots that were met with, some of them as thick as a broom-handle, were cut clean off. These amputations were certainly strong and somewhat doubtful measures. Possibly they were carried to excess. It might have been wiser, and practically would have proved a more successful policy, to have merely added to the front of the borders, without cutting off so many roots. It is seldom desirable to root-prune Vines, and it is a surgical operation that demands the utmost skill. Diseased members may have to be cut off, healthy ones raised to a more favourable position, fibreless roots cut back to force the manufacture of fibres; but beyond this it may not be wise to go. Still, root-pruning is practised to a greater or lesser extent in all extensions or top-dressings of Vine borders.

The Bishop Stortford Vines do not seem to have suffered very much from this severe root-pruning. It is certain that they speedily set to work to form fresh roots. The testimony of Mr. Ward—no mean authority—is conclusive upon this point. He says he has preserved a plant of Muscat, and one of Hamburgh, root and branch, to be examined by anyone. These old cut roots have broken freely into the new compost. Each of the cut roots resembles a cat of not simply nine, but fifty or more tails or lashes. The new soil is a perfect network of strong clean healthy fibres. Neither are the old portions of the borders destitute of roots. In fact the roots seem as perfect as the medium in which they grow, and it becomes utterly impossible to attribute the shanking either to faulty roots or borders.

Overcropping? We reach this by a process of exhaustion. If all the other guesses at truth are wrong this must be right. The temptation is often irresistible with pet Vines. Who has the courage or the boldness to cut off Muscat or Hamburgh bunches, weighing from 3 to 5 lb. a-piece? Hence the saying, so full of meaning, "Our worst enemies should reduce the number of our bunches." We can thin berries freely enough, but bunches?—most of us are weak there. We err egregiously on the side of plenty. Excessive cropping drains the Vines dry; it breaks their strength, exhausts their vital force, and is a fruitful source of shanked bunches and berries. Yet in this case no great excess seems to have been indulged in. Considering the width of the houses, and consequent length of rafter, and extraordinary strength of the Vines, 40 bunches per rod per annum was not such an excessive crop. With such bunches it was a good crop; but I appeal to Mr. Meredith and others to say whether it was excessive.

Internal treatment? Much depends upon this. Without care in the admission of air, the distribution of water, and the application of heat, failure to a greater or lesser extent is well nigh certain. It is doubtful, however, whether that failure will take the form of shanking. Rusting, red spider, mildew, want of size, colour, flavour, finish, are much more likely to arise from internal mismanagement than shanking. And it must not be forgotten that these Vines have succumbed to shanking alone. To all appearance the Vines were strong and healthy, and the shows of fruit were promising to the last. But the fair prospects of the grand crops of former days were utterly wrecked by wholesale shanking. Branchlets, shoulders, and whole bunches disappeared year by year, until the weary warfare has ended by the uprooting of the Vines. But more decisive still. It so happens that these Vines have been under the same management from first to last. The same gardener, Mr. Yardley, who planted the Vines, has now uprooted them, and is about to make a fresh start with a new lot. The presumption is therefore irresistible, that the top treatment has not varied. The same skill that earned the approbation of the kingdom, by growing the most magnificent Grapes ever exhibited, is now overmastered and vanquished by the shank fiend.

Having thus endeavoured to prove, by a reference to the carefully noted facts of the case, that the failure of these Vines cannot be attributed to Fungi, an excess of water, the roots outrunning the border, a deficiency of lime, an exhausted border, a paucity or want of quality in the roots, overcropping, or internal mis-

management, I will shortly, with your permission, endeavour to lay bare the cause or causes of failure, by giving, as far as the facts will warrant, a positive answer to the question—Why have these grand Vines failed in their prime? *David Tell Fact.*

MRS. WARD APPLE.

A HIGHLY meritorious seedling, raised by Mr. Nathaniel Lawrence, nurseryman, of Chatteris, in Cambridgeshire, from the old Scarlet Nonpareil. It has the outward appearance and form of the Court of Wick, with the beautifully flushed cheek of its parent, the old and favourite Scarlet Nonpareil, and may be thus described :—Fruit below medium size, roundish-ovate, compressed at the ends, very even and regular in outline, skin of a warm yellow or orange on the shaded side ; deeply flushed with scarlet on the side next the sun, with here and there a little russet, especially about the eye and the stalk. Eye open, set in a shallow, evenly formed cavity. Stalks rather long, slender, deeply set. Flesh pale yellow, firm, juicy. Flavour rich, with a brisk sprightly acid, particularly pleasant and agreeable. It is in season from November to March (see fig. 70).

This is in all respects one of the nicest little winter dessert Apples we have ever tasted, so firm and yet so melting and juicy, so briskly acid and yet rich and sweet. Beautiful in form and colour, like its parent, but much improved in flavour, we heartily welcome it as a pleasant addition to our winter desserts. *A. F. B., in "Florist and Pomologist."*

Home Correspondence.

Prospects of the International Exhibitions.—Of course the results of these projected exhibitions must, even with the most experienced, be very much matter of conjecture. "H. C., South Kensington," instances the success of the annual shows of agricultural implements as an argument for success, and the intended horticultural exhibitions as elements of attraction. But neither of them are strictly to the point. There is no such thing as shows of agricultural implements *per se*. Such a show would be a failure. It is the live stock that brings the crowds. Then there is a great difference between a show for five days, and one for five months. It will need a better horse than "agricultural implements" to stay over that distance. As to the horticultural shows, again, there is no doubt that they will prove an important aid to the exhibitions, but it must be remembered that of late years these exhibitions, not only at South Kensington, but at the Botanic Garden, Regent's Park, and the Crystal Palace, have been conducted at a loss ; and although we know very well that it does not follow that by accumulating items, on each of which a loss might be sustained separately, there will be an increased total loss equal to the sum of the individual losses, still it is a complicated and difficult question to say where the accumulation will reach the point of converting the losses into a profit. One man may say I do not care much for an agricultural show, or much for a horticultural one, and were either by themselves I would go to neither ; but as they are united I shall go. Accumulation in this case secures an additional visitor ; but on the other hand it may lose one, viz., the man who would have gone to both at any rate, and who now pays only one visit instead of two. I agree with you that the addition of the fine arts element is a stroke of the wisest policy ; and I also think that one great point in favour of the exhibitions is their having the advantage of the guiding spirit of Mr. Henry Cole, a gentleman with whom, being neighbours, "H. C., South Kensington," may perhaps be acquainted. I have great faith in his abilities, and if it is in the power of man to make the exhibitions a success, I believe he will do it. *C., Campden Hill.*

Antirrhinums in Pots.—The idea of offering a prize at the Royal Horticultural Society's provincial show in July next, at Oxford, for six Antirrhinums in pots, is certainly a step in the right direction ; we shall now soon see what the Antirrhinum is really capable of doing. It has never yet had the attention bestowed upon its culture that it deserves. The value of such plants in a gardening point of view is universally acknowledged, they are ornaments suitable for almost every situation out-of-doors, for bedding purposes, borders of shrubberies, rockwork, vases, &c., even old decayed walls and ruins may be made charming during the autumn months with them, but their culture in pots I imagine has been very limited, yet how suitable they are for the purpose, and what beautiful objects they form. The variety of colour found in them is almost endless, and some of the sorts are very striking, more especially the striped and mottled varieties, which are indeed very charming. The habit of the plant is also well adapted for pot culture. Their propagation and culture is so simple and well known that any comments on these points would be superfluous. Last spring I potted a few seedlings in 12-inch pots, and plunged them into the open borders ; they were once stopped or pinched in only. They made splendid specimens, and continued in flower for some months. Seed sown in March on a gentle hotbed, or in the open air, will flower finely the following September ; and if a quantity of 32 and 24-sized pots are sown in March, they will be found invaluable for the decoration of the greenhouse and conservatory during the late autumn months. *Edw. Bennett, Osberton.*

Grafting Vines: its Effect upon the Quality of the Fruit.—Now that grafting is beginning to be looked upon as a panacea for most evils of Grape-growing, it is needful to be extremely cautious in the admission of evidence for or against the improving or deteriorating influences of particular stocks. Most Grapes differ wonderfully in quality on their own roots. Inside treatment, the character of the borders, and geological and climatal influences, wonderfully affect quality. In regard to the two Grapes mentioned in your leader (p. 243), the Mrs. Pince and Muscat Hamburgh, I have only tasted the former once at Exeter, and it was first-rate in flavour. It is a wonderful Vine to grow, and it seems about the last variety to need a stock to help it. And so far, even accepting that its bad quality originated in the stocks, there seems no occasion to use them. As to the Muscat Hamburgh, it is a most variable Grape on its own roots. I have hardly ever tasted it twice alike in flavour. At times it is one of the finest flavoured Grapes in cultivation, at others no better than an indifferently ripened Hamburgh. As to setting and swelling, it is equally variable. If I am not mistaken, the finest bunches ever grown of this variety were exhibited by Mr. Fowler, grown upon its own roots ; and I know a neighbour who grows it every year on its own roots in a cool Hamburgh house with a bloom and finish equal to the Black Prince. He takes no trouble with it, and it is as fine as can be to look at ; but while he commiserates my shanked berries, he longs for the flavour of my sound ones. In fact, no one would know the two Grapes to be the same thing. I have met with similar instances with this Grape often. It varies immensely on its own roots, and probably would also do so when grafted. But granting the former fact, it becomes difficult to tell how much of the quality or want of it is due to the stock, or to the soil, situation, or treatment. Another curious fact I have long noticed is, that the sound berries on shanked bunches have been invariably of the highest quality. Whatever may or may not be wanting in shanked Grapes, flavour and sugar seem always plentiful on the sound portions. It almost seems at times as if the quality of the entire bunch had settled on the small portions saved from the wreck. Have other Grape-growers noticed this interesting fact? and if so, can any of them explain it? As to the effect of the stock on the scion, while there may be something in it, I question if the flavour is influenced to anything like the extent stated by "P." At all events a great difference may be found amongst ungrafted plants. *Quercus.*

Fig. 7.

Fungus on Living Tree Roots.—Many years ago I had charge of a Peach-house, and the Peach trees planted in it grew vigorously for a time, but in a few years they gradually failed in making healthy shoots or fruiting well. I had one of the trees lifted, and found the main roots covered with rusty-looking protuberances all over, caused by masses of Fungus. The roots had reached down to the bottom of the border, where I found a layer of old tan had been placed, and hence the Fungus attack. This old tan was not placed there by me, for the border had been made some time before I had charge of the trees. All the trees were lifted, and the roots and branches well pruned in, and the border was cleared of its deleterious components. On planting the trees again in fresh soil, and without manure of any kind, a little salt was dissolved in water to puddle the roots, and on purpose to destroy any germs of Fungus left. The trees, however, never recovered their former vigorous state, and young trees had to be planted to replace them. To satisfy myself that the old tan was the cause of this Fungus attack, I at another time, when shifting some Peach trees on a wall, had one of them planted on a bed of old tan, some of it being mixed in the soil. In a very few years the roots were quite full of Fungus, and made so brittle by it that on handling them they broke off like the shank of a tobacco-pipe. If any gardener tries this experiment in planting Peach trees, he will soon be convinced of the danger of using either old tan, leaf-mould with twigs of dead timber in it, or dead faggots. The Vine, like the Peach, is quite as liable to be attacked in its roots by Fungus on coming into contact with the above materials, and I should be very chary in using them in any quantity in new borders. In making the new kitchen garden here, all the strong red clay from the drains was burnt with faggots of green Oak branches and other trees. Some of these faggots were put on the top of the tiles in a drain close to some pyramid Pears and Apples, but I have never detected any Fungus amongst the roots of these trees, although they run quite amongst the faggots. Perhaps faggots of green timber, buried in the ground and out of the influence of the air, are innocuous so far as regards propagating any of the Fungus tribe. In one of our main garden walks a great quantity of green branches of trees was laid in the bottom before the gravel was put on, and yearly quantities of the common Mushroom push through the gravel in August and September, and in October another edible Fungus (Coprinus comatus) springs up by the Box edging. *William Tillery.*

White Lady Downe's Grape.—In reply to "A. Z.," let me, as the raiser of the above Vine, say that it is very slow to start, but when it does it makes rapid progress. Therefore I advise him to have patience with it. It is essentially a late Vine in every sense, but a very free grower when it does begin. *Wm. Thomson, Dalkeith.* [We have received a similar statement from Mr. Methven. EDS.]

Luculia gratissima.—When the flowering season of our great Luculia comes round, I have numerous inquiries as to how the plant is managed. Many of my own friends have become tired of trying to grow it, and others have given it up in despair. That the plant is difficult to manage from the cutting all must admit, as it is seldom seen, and the price is never low, like other soft-growing plants. I have distributed cuttings by the thousand, both north and south, so that if they were easily managed they ought to be pretty well scattered over the country. I have found the cuttings very impatient of heat and damp, for a few weeks after being put in. The best and only way I have found to root the cuttings is to put a bell-glass over them in a cool pit away from the sun, with just sufficient moisture to keep them from flagging. Let them remain in this position for about three weeks, till they get well callused over. Then plunge the pot into a moderate bottom-heat in the propagating pit, always shading the cuttings from sunlight, for if they are once allowed to flag before they have taken root they seldom do any good. There is no comparison between a plant grown in a pot, and one that is planted out. The latter throws out bunches of blooms as large as summer-grown Cauliflowers, and is deliciously fragrant in a cold house. The plant here is planted in a mixture of calcareous loam, a little leaf soil, and sharp sand, and away from any draught ; a situation and atmosphere suited to greenhouse Ferns is just the place for the Luculia. In the growing season I water freely with guano-water. Before the plant is spurred in, it is allowed to become thoroughly dry to prevent bleeding, as the plant is then in full leaf. Your Calendar writer, at p. 181 says, the Luculia does not, as a rule, like cutting in ; our plant is obliged to submit to this treatment to keep it within bounds. I attribute the cutting process greatly to our success in growing the plant. I spur it on the Vine system, and have known it make shoots a yard in length, and plenty of them. You must allow me to say a word or two in reply to Mr. Allis, who lashed me rather freely at p. 41, about his Heliotrope flowering twelve months, and my Luculia only five months. If the flowering duration of the latter was only a month, I should prefer it to the Heliotrope for planting in the conservatory ; with a little heat the Heliotrope is easily grown in pots for cut flowers. I don't admire the hint Mr. Allis gave us of keeping his Heliotrope in bloom for twelve months, though I must own I like to go "the whole hog" sometimes. When I grew the Heliotrope against a wall, after flowering it the winter and spring, and when we were getting flowers from the beds, I gave my plant a thorough cutting in, and by autumn I got an entirely new stock of healthy foliage and flowers for the winter. Mr. Allis also doubted the usefulness of the Luculia for bouquets. The blooms scarcely last 24 hours in a hot room, with plenty of light, but for hand bouquets on wires I use them freely, as they make a great show among other winter flowers, and the perfume after being cut a short time becomes most agreeable. *William Culverwell, Thorpe Perrow, Bedale.*

Phalænopsis Schilleriana and its Culture.—I received a plant of this seven or eight years since with three leaves, each about 2 inches long, growing on a small block. I at once procured an Oak beam from the sawpit, which was nearly cut through, and made a block for the new plant, chiseled out a place for the

small block to fit in, and fixed on the plant without removing it from its own block. I then placed it in an ordinary flower-pot, and filled in round between the block and pot with broken crocks; the plant has grown as freely as possible ever since; it is still on the same block in an ordinary 12-inch pot, and produces a fine spike annually. In 1866 I exhibited it at the opening of the Albert Museum, Exeter, with a spike on which were 60 flowers. It has now a spike more than 4 feet long, with 81 flowers on it. It branches off six times from the central stem, the lowest again divides into four branches, the next two divide into three, and the next three are single stems with a row of flowers on each side; the flowers barely measure 2½ inches across, but they are beautifully coloured. I kept it in bloom nearly seven weeks last year, in an atmosphere free from damp. It has nine fine leaves, beautifully marbled; the length of the longest is 14½ inches, the width of the widest being 4½ inches. I grow it in a very moist pit, the mean temperature being 60° through the winter, and 75° through the growing season; the shading is never more than single bunting; it has never produced an offset, although I have hitherto left on the flower-stem, hoping it might give one. Are they usually produced from the plant or from the flower spike? *John Gaitand, Gr. to Sir T. D. Acland, Bart., Killerton, Exeter.*

Gentiana acaulis, or Gentianella, is a very old favourite, and deserves unlimited cultivation. It is exceedingly free in growth, in almost any situation; it is fond of gravel, for it seems to flower much more freely when allowed to run into the gravel path. It forms dense masses of foliage of a deep green colour, and is smothered in spring and autumn with large deep blue flowers. From its dwarf compact growth it is admirably adapted for edging, and established masses of it have a most charming appearance. Most of the other species bloom quite late in the spring, and therefore are not fit to associate with this. I might, however, mention G. verna, but I am sure no words of mine could give an adequate description of this gem of Nature. You must see it in its native habitats to form any idea of its beauty. It will not do for general adoption in the ordinary border, therefore I will omit it. *A. I. P., Tottenham.*

Barberries and Blackberries.—At p. 1016 of your last year's volume I saw Barberries recommended as an excellent addition to Blackberries for tarts in autumn. I merely mention this to point out that I do not claim the discovery of the excellence of these berries mixed. In North Wales, at many of the farmers', Blackberry tarts are the only ones you get, and very vapid they are. In Manchester and Birmingham, and doubtless elsewhere, tons of Blackberries are sold daily in the season, and must be even more vapid from being stale. In fact I do not know a more wretched tart than a Blackberry one. But if mingled with about a third or fourth of Barberries it is really delicious—brisk, subacid, all you can wish. Now as all soils which will grow Blackberries will grow Barberries, and especially the poor mountain soils, which will grow little else in way of fruit, I recommend all people fond of a good tart, which will cost them nothing but a little sugar, to plant a few dozen Barberries at once. They make also the best of preserves, and are quite equal to Tamarinds in cases of colds, fevers, &c. Do not be at the trouble of getting stoneless Barberries, at double the price, if the common is obtainable. They will invariably prove common; at least all I have bought from some half-dozen first-rate nurserymen have done. Nay, more than this, I have trees sent me from Westmoreland, which were stoneless there, but in my soil became stoned at once. If you can get them, the stoneless is of course the best. I know some grand old bushes of the stoneless variety scattered about England—in Westmoreland, Dorsetshire, Cheshire, &c.;—which are invaluable, but you must be satisfied, I fear, with the common. Only try the tart next autumn, and state the result. *W. D. Fox.*

Chequers.—I have purposely delayed replying to Mr. Britten's remarks respecting the wild Service tree, thinking I might be able to clear up the point, whether the name Chequers is confined to Pyrus torminalis and Aria, as he assumes, or is also applied to P. domestica. He is probably right, but there is considerable doubt about it; and I must wait till the trees are in leaf and fruit again before I can decide the matter. I hear of two varieties of Chequers, one with spherical and the other with pear-shaped fruits, though none of my informants can remember the foliage. In my list of Sussex plant names, I see I have P. torminalis only as Chequers. I am much obliged to Mr. Britten for his information respecting the origin and application of the word Chequers, though he somewhat needlessly added the dictionary definition. *H.*

Arbutus *versus* Benthamia.—I think it not improbable that seekers after hardy and half-hardy shrubs may often have confounded the true "Strawberry tree" with a much later and very meritorious introduction, the "Strawberry shrub" (Benthamia fragifera). Arbutus Unedo thrives well as a hardy shrub, and if not indigenous, in the strict sense of the word, to Ireland, has become so thoroughly acclimatised to the southern parts of that country—the lakes of Killarney, for instance—that it has become "a weed amongst the weeds." Seeing that "Bentham's shrub" was introduced from such an altitude as Mussooree, amid the Himalayan ranges, we may at least infer that it also is equally hardy, and is really deserving of all popularity. In sheltered positions it has, I believe, already done well in this country, and would certainly thrive against a wall with a moderately sunny aspect. It is well deserving a trial in more exposed situations; but if planted in the open ground it should be surrounded with Rhododendrons or similar plants, to act as nurses until fairly established. The fruit is eaten by the native tribes amongst whom it grows, in its far distant habitat. *William Earley, Digswell.* [Benthamia is not reliably hardy. EDS.]

Tenacity of Wood-lice to Life.—Until last week I had no idea of the tenacity of the wood-louse to life. As an experiment three wood-lice and three garden worms were put into a marine aquarium, as food for the sea anemones (the common Actinia mesembryanthemum). Very soon the worms were absorbed into the stomachs of three of the large Anemones, although it was eating under difficulties, for a small fish, and sundry shrimps, were pulling lustily at the worms. Although the wood-lice were offered to some thirty Actiniæ, they would not accept the proffered bait, but remained in full flower, and the wood-lice crawled round and round the expanded tentacles, and across the mouths of the anemones. The fish and shrimps then tried the interlopers; but soon gave them up as a bad job. These three hardy insects were placed in the aquarium at 4 o'clock in the afternoon, at 10 they were crawling at the bottom of the tank, and at 8 next morning two were still alive when they were taken off the sea-weed. No wonder you have inquiries occasionally how to get rid of these pests when they will live for 16 hours under sea water. *Wm. Voce Cotterell, Hans Street, Chelsea.*

Flower Shows.—The time is now drawing near for horticultural exhibitions, and there is one thing I wish to draw the attention of officials and judges to, *i.e.*, the extra class (articles not named in the schedule). I often think if this class received more encouragement we should always have something new and interesting to look at. I do not mean to say that the societies should give large prizes in this class, but such an amount as would be likely to pay the exhibitor for his trouble and the expense of carriage, &c. I mention judges, because they can do a good deal by explaining the case to the secretaries that such and such things are worthy of notice. I remember at the last York Gala I saw the Scilla peruviana, which I had never seen before—a beautiful plant, worthy of notice. "Well, do you know this?" says one to the other. "No, I never saw it before." This I heard more than once. At the season for ordering the bulbs I named the Scilla peruviana, and I was surprised to find that it was very little known. I applied to several firms for it, but could not get it. Some of them have sent three or four varieties, but I believe that not one of the varieties is the same as that I saw at York. *E. D., Sunderland.*

Hepaticas.—With regard to the Hepatica, a correspondent in your last Number mentions it as a flower which may be grown with the greatest facility everywhere. Wherever the Rhododendron and Heath grow and flourish, there will you find growing Hepaticas an impossibility, unless a bed is made on purpose of clay (limestone clay the best), and in its absence marl and a very plentiful supply of lime. No one ever saw the Hard Fern and Hepatica growing near each other; what is life to one is poison to the other. Amongst the most beautiful of spring flowers you omit two, the Sisyrinchium, "Swine's Snout," a most beautiful mauve colour, and Pulmonaria virginica, a lovely blue colour, which also forces well. There is one plant, the Dictamnus Fraxinella, which should be more grown. The colours are white, pink, and purple. They should be grown in very good compost, and every plant will have, or ought to have, from five to twenty racemes, and they make a great show in June and the whole of July. *E. F.*

The Disputed Viola.—I think the readers of the *Gardeners' Chronicle* will generally agree with me, that enough has been said respecting the identity, or otherwise, of the Viola offered by Mr. Smith, of Salisbury, with that offered by Mr. Williams, of Holloway. The most proper course for each of those gentlemen to adopt would be to agree to send to one of the meetings of the Floral Committee (say that on April 20 next), one or more strong plants in bloom of each of their respective Violas, when the matter might be definitely settled by the Committee. Should the varieties prove to be identical, the statement that it is a seedling of Mr. Jobson's will be disproved; on the other hand, should there be a distinction Mr. Smith can give his stock another name. At all events the most sensible and becoming thing would be to get it decided as soon as possible. I observe that, at the meeting I refer to, there are prizes offered for bedding Pansies in boxes 12 inches square; but, of course, such varieties must be other than seedlings, as, to fill a box of that size, several plants would be required. I should, therefore, like to suggest that the opportunity be taken by all persons who may possess them, to send any good seedling Violas, or bedding Pansies, when no doubt an interesting show of these pretty flowers would result. *A. D.*

Influence of Light upon Plants.—I beg to offer a few remarks in reference to your leading article at p. 343. While agreeing with you on the fact (which no gardener disputes) that light is very important to plant life, I maintain that a wide distinction must be made between plants submitted to the action of bright sun light, and plants placed in a subdued light produced by shading. It by no means follows that because the Kenanthera coccinea will bloom under the scorching sun that therefore all other Orchids will endure, or that they require, similar treatment; and this fact Mr. Speed will find to his cost should he submit some of these fine plants to bright sunshine. According to my experience in Orchid culture, and I have been a successful grower and bloomed them to perfection, I found two distinct methods of treatment suitable for their development: 1st, the growing season, when they require heat, humidity, shade, and judicious ventilation, as a matter of course; 2d, their period of rest or maturation, when less heat, less humidity, less shade and more air, became requisite to perfect and solidify their growths, and prepare flowers. Not to make this distinction appears to me a grave mistake, and likely to mislead those who have no practical knowledge of the subject. *W. Payne, Chester.*

Royal Horticultural Society.—It seems to be generally admitted that the London flower shows are failing to "draw," and in consequence of the fewness of visitors many exhibitors are growing lukewarm. If I mistake not the Royal Horticultural Society's London shows over the last few years have left a balance on the wrong side, and yet the Fellows would not be satisfied without them, or some equivalent in their place. Allow me to suggest for the consideration of the Council a plan for obtaining the necessary displays and avoiding the annual drain on their resources. Now that alterations are going on at South Kensington could not the Council or the Commissioners of the International Exhibition spare a piece or odd pieces of land for the erection of low glasshouses to be built for or by different nurserymen? I, for one, should be willing to hire house or land if offered on suitable terms, and I doubt not others would do the same. Many plants will not flourish permanently at Kensington, but by this means fresh plants and flowers might be brought continually from more favoured districts, and thus a permanent exhibition would be secured. *William Paul, Waltham Cross, N.*

Foreign Correspondence.

BOSTON, U.S.—*Californian Pears.*—Our winter has been very mild even here at 42° N. lat. We have been able to plough almost the whole of January. As to fruits our markets are well supplied from California:—Glou Morceau Pears, weighing 14 oz.; Beurré d'Anjou, 12 oz.; Uvedale's St. Germain, 34 oz.; and Easter Beurré, 18 oz.; the latter far better than ever I tasted of our own growth; and so well do they bear transportation that those now on sale came overland three months since, and are in perfect order. Pears are now becoming an article of export to China and Japan from California, and the Easter Beurré is a special favourite for this purpose. *M. P. W.*

Societies.

ROYAL HORTICULTURAL, *March 10.*—W. W. Saunders Esq., F.R.S., in the chair. The preliminary business of the meeting being concluded, the Rev. M. J. Berkeley, in the absence of the Rev. J. Dix, announced the awards of the Floral Committee, and George F. Wilson, Esq., those of the Fruit Committee. Mr. Berkeley called attention to several monstrosities, which were exhibited at the Scientific Committee, an account of which will be found in the report of that meeting; and also exhibited a cone bearing spray of Abies albertiana, which had been sent to the meeting by Mr. Sandbach. This gentleman had some years ago bought an estate in Denbighshire, which was a wild and uncultivated as could possibly be, and was so unfavourable that Apples and Pears would not ripen without the protection of an orchard-house; but the place had now been so much improved, that he (Mr. Berkeley) thought it one of the most interesting that he had ever visited. Several forms of a species of Ophrys from the Pyrenees, exhibited by Mr. Needle, gr. to H. R. H. the Comte de Paris, York House, Twickenham, were then alluded to as being, with one exception, probably mere varieties of one species. Miscellaneous. The fruits of Eugenia Jambos, or Rose Apple, shown at the Fruit Committee by Mr. Carr, gr. to P. L. Hinds, Esq., Byfleet, were noticed as being quite an acquisition, though the fruit was found to vary very much in quality. Mr. Berkeley then proceeded to make some comments on the subject of Fungus, which has lately been the theme of discussion in these columns by a few practical gardeners, and stated that whatever theorists might think on the subject, he had not made any statement in regard to the deleterious effects of Fungi which was not derived from strict observation, and he therefore cautioned gardeners against Fungi generally. He observed that the first person to draw attention to the danger of using the bits of wood from the faggot heap in potting, &c., was the late Mr. Henderson, gr. to the Earl Fitzwilliam, at Wentworth, who was one of the best practical gardeners he had ever met. Much as has been said respecting the use of wood in the cultivation of the Vine in France, he nevertheless thought that we heard more of the successes of such speculations than we did of their failures, which were seldom mentioned. He had been told by the late Marquis of Huntley, who owned extensive woods at Orton, that it was of no use to make a new plantation on ground which had been cleared of timber until that ground became covered over with Heath, by which time the bits of wood would have

become thoroughly decayed. As an instance, to prove that the dead roots of trees are injurious, Mr. Berkeley mentioned that some years ago two Deodars were planted near to the residence of the late Sir William Hooker at Kew, one of which was placed where a Cherry tree had formerly stood. This one became unhealthy, and it was not until the soil had been thoroughly cleared of the bits of dead wood that the tree grew in a corresponding degree of vigour to the other. The old notion that fungus never grew on healthy trunks, and Mr. Berkeley, has been disproved long ago, and the fact may be proved by anyone who will place some spores of bunt among a few grains of Wheat, which will soon become affected.

Mr. Saunders remarked, in confirmation of Mr. Berkeley's statement, that more causes of failure in cultivation arose from the bad practice of leaving dead roots in the ground than from any other cause, and he thought that practical gardeners were much indebted to Mr. Berkeley for calling attention to the subject.

A letter was then read, relating to the use of methylated spirit to cure American Blight. Mr. Berkeley said that he had found that tar and grease, as used in boats' hoods, were also a cure remedy. Mr. Saunders said that for some time he had used spirit in his plant-houses with great advantage, such as a mixture of half spirits of wine and half water.

Major Trevor Clarke, alluding to the species of Ophrys above mentioned, said that the Society ought to thank the Prince for sending his Orchids to the meeting. He learnt that the Prince had been collecting plants from amongst the rich flora of the Pyrenees, and was cultivating them with much success at Twickenham.

Scientific Committee.—W. W. Saunders, Esq., F.R.S., in the chair. The Rev. M. J. Berkeley, in alluding to some Vine buds mentioned on a previous occasion, stated that he had since detected the presence of a number of a peculiar species of mite, and considered them as the cause of the mischief,

Mr. A. Murray stated that the dipterous larva found in the Snake root alluded to last week had been determined by Prof. Westwood to be that of a species of Sargus, and that it was not the cause of the injuries complained of. The Rose-scale shown at the last meeting proved on closer examination to be only the well-known Rose-scale—

Mr. M. J. Berkeley exhibited several Orchids in which the lip was deficient, and the flower consisted of four nearly equal segments; also a Cypripedium with two flowers proceeding from the same spathe. Mr. Berkeley also exhibited a shoot of Peach, in which each flower, instead of producing a single carpel, had produced several. Dr. Masters stated that similar alterations among Orchids were not uncommon, and that there was a peculiar variety of Cherry, Cerasus Caproniana, of De Candolle's work, in which the carpels were converted into leaves.

Mr. Andrew Murray exhibited petals and perfect stamens of a Dandelion, in one of the heads of which the petals had undergone the transformation mentioned.

Resolutions appointing Dr. Masters to the vacant Secretaryship, to be inserted in our columns, were also passed, and the further business relating to the appointment of Professor Henfrey to the vacant Committee on the introduction of exotic species of insects, &c., into this country.

The Chairman then called attention to the remarkable fall of snow on Saturday night last, when in the neighbourhood of Reigate 8 to 12 inches of snow fell softly, unaccompanied by wind. The Chairman had ascertained that on this occasion a cubic foot of snow had produced only 68-hundredths of an inch of water. On the following evening a hard frost occurred, and at the Chairman's residence, on a plateau on the "burr-stone" (upper greensand), at an elevation of 450 feet above the sea, the thermometer registered 23° ; while in the valley, on the lower greensand, 150 feet below, and within a quarter of a mile, the thermometer registered as low as 8° On the weald clay in the same neighbourhood the thermometer registered 10°, and on the chalk at Dorking, 12° ; so that in the same night, within a very small tract of country, there was a range of more than 8° to 23°. The practical result is, in this case, that evergreens, &c., on the hillside are uninjured while those in the valley are often much hurt.

Mr. Glaisher remarked on the necessity of placing the thermometers at the same height—4 feet above the ground. He considered the circumstances mentioned by the Chairman to be explained by the effects of radiation in combination with temperature. The general rule in the case of snow was that 12 inches of snow corresponded to 1 inch of rain ; at times, however, 8 inches of snow correspond to an inch of rain. At Greenwich on the night in question the snow fell lightly, and the wind guage showed that the air had been very still. Mr. Glaisher then alluded to his experiments on variation in temperature in connection with elevation. The substance of Mr. Glaisher's remarks are given in another column (p. 381). Mr. Glaisher further alluded to the freedom from mist at the higher elevations, which allowed freer access of sun-heat than below, where the mist cut off the sun's heat, though at the same time it hindered radiation from the surface.

The Chairman stated that a ready means of ascertaining approximately the height of a garden near a railway was afforded by an inspection of the railway surveyor's plans, which could be done without much inconvenience. In answer to a question of Dr. Voelcker's, Mr. Glaisher stated his inability at present to explain the facts he had alluded to.

Floral Committee.—The objects brought before the committee were not very numerous, the counter-attraction of a spring show inducing the growers to exhibit their productions in the large conservatory. From Mr. Ware, Hale Farm, Tottenham, came a basket of a new seedling forcing Pink, named Mrs. Pettifer, very sweet-scented and of good form, but small. To Mr. Needle, gr. to H.R.H. the Comte de Paris, York House, Twickenham, a First-class Certificate was awarded for a well-grown collection of Ophrys insectifera, from the Pyrenees ; and to Mr. F. Perkins, Leamington, the same award was made in favour of a fine specimen of Rehmannia angulata. To Mr. Turner, Slough, a First-class Certificate was awarded for Primula sinensis, semi-duplex striata, a very pretty and distinct striped form. From Mr. Wilson, gr. to W. Marshall, Esq., Enfield, came three magnificent forms of Odontoglossum Alexandræ, to one of which, spotted brown on the upper and two lower petals, a First-class Certificate was given, while a Special Certificate was voted to the group for good cultivation. To Mr. B. S. Williams, Holloway, Certificates were given for Pentstemon ringulifolium aureo-variegata, a native of the mountains of Java; and an improved hybrid Solanum Pseudo-Capsicum named compactum. From Messrs. Rollisson, Tooting, came a rose Dog-rose called Guilfoylei, in the way of D. indivisa, but of paler colour veined with blush rose ; and Pyrethrum Herbert-smithii, a showy bright pink tree-flowering variety, to both of which First-class Certificates were awarded. Mr. Veitch again exhibited the new Vanda coerulescens, on the occasion in better condition, and a First-class Certificate was awarded to it. Of Phaleenopsis amboinensis, a free blooming white flowered hybrid, that would appear to be a good kind for forcing, and which had obtained a second class award when originally shown. From Mr. Douglas, gr. to F. Whitbourn, Esq., Loxford Hall, Ilford, came a vigorous growing pot-plant of Lomaria gibba, the form called inermis having been produced on more than one previous occasion from other establishments, and always as a supposed hybrid between L. gibba and Blechnum brasiliense. Mr. A. Dean, Old Shirley, Southampton, sent several seedling Primulas, which had sported in various ways.

Fruit Committee.—Geo. F. Wilson, Esq., in the chair. Several collections of Apples were sent in response to the prizes offered by the Society—the best in the class for dessert kinds coming from Mr. Ross, gr. to C. Eyre, Esq., Welford Park, Newbury, who sent Pitmaston Russet, Sturmer Pippin, and Scarlet Nonpareil. Mr. Earley, gr., Digswell Park, was 2d. In the class for kitchen Apples, Mr. Gardiner, gr., Eatington Park, was placed 1st with fine dishes of Yorkshire Greening, Reinette du Canada, &c. ; and Mr. Ross was next, with excellent specimens of Dumelow's Seedling, Incomparable, and Northern Greening. Good examples also came from Mr. Saul, Stourton ; Mr. Miles, Wycombe Abbey ; Mr. Lynn, Hedsor ; and Mr. Parsons, Danesbury. Mr. Nage, gr. to Earl Brownlow, Ashridge, sent a dish of early Strawberries ; and from Mr. T. Bray, gr. to E. A. Sandford, Esq., Nynehead Court, came excellent dishes of Mushrooms, Seakale, Asparagus, and Rhubarb, to which a Special Certificate was awarded. Mr. Thomson, Dalkeith, sent specimens of Lady Downe's Seedling Grapes, and of the new White Lady Downe's, the latter of which were certainly not so good as the former, and were over-ripe. To Mr. Carr, gr. to P. L. Hindley, Esq., Belfield Lodge, Special Certificates were given for (1) a splendid dish of fruit of the Rose Apple of the East, Eugenia Jambos, and for the very perfect spikes of the Banana fruit.

The Hyacinth Show. This was the first exhibition of Hyacinths and spring flowers proper that has been held this season, and though the flowers in regard to quality were not so good as last year, nor the competition so strong in the principal classes as in former years, owing to the absence from the arena of Mr. Paul, one of this flower's greatest champions, there could be no doubt but what this new scheme in the Society's arrangements was a success, for, though the atmosphere was cloudy and damp, the large conservatory in the afternoon was completely filled with a very fashionable company. Of course when it was found that Mr. Paul was not a competitor, the result in most of the classes was a foregone conclusion in favour of Messrs. Cutbush & Son, of Highgate, which was afterwards verified to the letter by that firm carrying off the 1st prizes in the four open classes, though it must be said without competition in one class, and only the shadow of one in another.

In class 1, for 18 Hyacinths, distinct, nurserymen, Messrs. Cutbush were the only exhibitors, showing in the collection excellent spikes of Nimrod, pale blue ; Florence Nightingale, pale rose ; Grand Lilas, Snowball, very large bells, and a beautifully compact spike ; Charles Dickens, De Candolle, and Princess Charlotte, &c.

In the open class for 18 blue Hyacinths, distinct, Messrs. Cutbush were 1st and Mr. Turner 2d. In the former collection were admirable spikes of Van Speyk, a large semi-double flower of great substance ; Garrick, Charles Dickens, one of the most pleasing spikes in colour and form in the exhibition ; Lord Palmerston, good ; Prince Albert, rich in colour ; De Candolle, &c. Mr. Turner's Pieneman, large bells, but thin on the spike, Orondates, General Havelock, Sir John Lawrence, and Louis Philippe, &c., in very good condition. In the class for 36, in 12 varieties, three of each variety, for the prizes given by the Dutch growers, the 1st prize group contributed by Messrs. Cutbush was an excellent lot, having mostly well finished spikes, and good in colour. In this collection were Charles Dickens, Macaulay, Gigantea, Grand Lilas, Florence Nightingale, Queen of the Netherlands, Haydn, Mont Blanc, Von Schiller, &c. The only other exhibitor in this class was Mr. T. A. Steel, Marlesford Lodge, Hammersmith, who put up a very creditable group for an amateur, and took the 2d prize, contributing in the collection Baron Von Tuyll, Grandeur, Merveille, Grand Lilas, and Von Schiller, in very good condition. Mr. Steel was 1st amongst the amateurs for six, distinct, with Alba superbissima, Grand Lilas, Charles Dickens, Von Schiller, Gigantea, and Baron Von Tuyll, all very fair productions. Mr. Wilding, Chesterfield Street, Euston Road, was 2d, with another fair group, including a finely finished spike of Snowball.

In the amateurs' or gentlemen's gardeners' class for 12 distinct sorts, grown in pots, two collections were shown, neither of which require any special comment. Mr. J. Weir, gr. to Mrs. Hodgson, The Elms, Hampstead, was placed 1st, and Miss Wilding 2d. New kinds, never before exhibited, were very poorly represented, two collections being shown, both a long way from being perfect. Messrs. Cutbush came in 1st, and Mr. Turner 2d. In the collection of the former, La Franchise, a fine white ; Feret Noir, deep blue, said to be striped, but very faintly ; and Regina Victoria, dark red, appeared to be the best.

The best 6 pots of Narcissi, distinct, were contributed by Messrs. Cutbush, who had Grand Monarque, Cedrus, Grandee, Wit Van Rhyn, La Majestueuse, and Parfaite superb. Owing to the absence of bright sunshine the Tulips were scarcely opened, so the splendid effect produced by their brilliant colours was lost. Here the 1st prize for 12 pots of 6 kinds was awarded to Mr. T. Outlaw, who had Rose Perfection, Keizer's Kroon, very attractive, Joseph Vain, Reclinata, Crimson Rose Applede, Belle Jaune, and Perfecta, crimson, with the red bottom, and extended cup and bold outline of colour. Mr. J. Weir was 2d, Mr. Hazard being 3rd. In the amateurs' class for 12 pots, distinct, and 12 pots of four kinds respectively, Mr. T. A. Steel was 1st. Messrs. Cutbush were the only exhibitors of a collection of Crocuses, and to them the 1st prize was given. The best 12 pots of this flower, which were well-bloomed, came from Mr. Steel, who took a 1st prize.

Two collections of miscellaneous plants in flower were staged, and of these the best were contributed by Mr. Wilkie, Addison Road, Kensington, and to him the 1st prize was awarded. In the collection were some well-bloomed plants of Dendrobium nobile, Rhododendron, good, a nice pot of Lily of the Valley, Azaleas, Camellias, &c. Mr. Ware, Hale Farm, Tottenham, sent a collection of hardy blooming plants, comprising Scilla bifolia and bifolia alba [? præcox], S. sibirica, Hepatica triloba cærulea, Hoteia japonica, Primula concolor, and several varieties of Cyclamen Coum. To this collection the 3d prize was awarded.

In the miscellaneous class, which is always an important one at these exhibitions, an extra prize was awarded to Messrs. Veitch for a fine group of plants, the best of which were well done, quite delicious to the eye of sight and smell, and showing some blooms in exquisite form. From the same firm also came a collection of Orchids, &c., including a magnificently flowered spike of Odontoglossum Alexandræ, and the very pretty O. triumphans, Dendrobium Farmeri, white petals and rich orange lip ; × Lælia Pilcheri, and the very showy Hippeastrum pardinum. A Special Certificate was awarded to the collection. From Messrs. Rollisson, Tooting, came a collection of flowering plants, including Dendrobium pulchellum, Oncidium leptotum, O. Cavendishianum, Odontoglossum gloriosum, Vanda tricolor, and V. tricolor plandalbris, splendid blooms of Odontoglossum Alexandræ, &c. An extra prize was awarded. From Mr. J. W. Wimsett, Ashburnham Park Nursery, came a choice collection of table decorative plants, such as elegant little Palms and flowering plants, &c., beautifully set up. This is a feature in Mr. Wimsett's establishment which is being very ably developed by Mr. Wills. A Special Certificate was awarded to the collection. To Mr. B. S. Williams, Holloway, contributed a good collection of plants, including Ferns, and Orchids, &c. ; and to Mr. Denning, gr. to Lord Londesborough, a Special Certificate was given for another fine group of Orchids, consisting of a good specimen pot of Dendrobium macrophyllum, giganteum, D. Farmeri aurea, rich in colour ; the pretty fringed D. Devonianum, Vandas gigantea, suavis, and tricolor, Epidendrum bicornutum, and Cattleya amethystoglossum, &c. Special Certificates were given to a specimen of Phalænopsis Schilleriana with two spikes of fine flowers, from Mr. Burnett, gr. to W. Terry, Esq., Peterborough House, Fulham ; to Mr. A. E. Barnaart, Vogelzang, near Haarlem, and Mr. Gebrolders, Eldering, of Haarlem, respectively, for collections of Tulips grown in Holland ; to a box of perpetual-flowering Picotee, Prince of Orange, from Mr. Perkins, Leamington ; to Mr. Turner, for a beautiful basket of his tricolor Pelargonium Mrs. Headley ; and to Messrs. E. G. Henderson, for a collection of 12 named varieties of Cyclamens. From Mr. A. Forsyth, florist, 120, Mount Street, Grosvenor Square, came three very tastefully arranged bouquets, made up of Orchids, Camellias, Pelargoniums, Ferns, &c., which proved very attractive to the ladies.

ROYAL INSTITUTION. *March* —In the second lecture on Plant Life as Contrasted with that of Animals, Dr. Masters resumed the consideration of the subject of nutrition. Plants, said the lecturer, can form albuminous and proteinaceous matters from the constituents of air, carbonic acid, water, and ammonia, while animals can do so only by feeding upon organic substances.

The assimilation of carbonic acid by plants has only an approximate relation to respiration, and is really a process of digestion. Carbonic acid or dioxide, ammonia, and watery vapour are absorbed by the green parts of plants, especially under the influence of sunlight ; the carbonic acid of the atmosphere being decomposed, the oxygen set free, and the carbon retained. This process is intimately connected with the presence of chlorophyll, the green colouring matter of plants, and which possesses many analogies in function with the colouring matter of the blood of the higher animals ; iron, moreover, being a necessary element in both substances. The true respiration of plants, going on by day and by night, resembles that of animals in all essential points ; and though, in some respects, plants as well as animals render air impure, yet the former purify the air through the power of liberating oxygen possessed by the chlorophyll, while those plants or parts of plants that are not green compensate for their pollution of the atmosphere by acting as scavengers, and by feeding on decaying organic matters. The circulation of the fluids in the lowest plants and animals was shown to be of the same nature, but to be widely different from plants in the higher animals, who possess a heart and a distinct circulatory system.

Having thus alluded to the principal points of resemblance and of difference between the mechanism of plants and that of animals, and to the work done by that mechanism in the two cases, the lecturer proceeded to speak of certain points

distinction between animals and plants. One point of difference consists in the adaptation of different organs to fulfil the same functions, this faculty existing in a much greater degree in plants than in animals; of this the tendrils of climbing plants afford, as remarked by Mr. Darwin, very striking examples—these organs being sometimes modifications of the leaf, stem, flower-stalk, and even of the petals; yet though apparently morphologically diverse, fulfilling the same functions. In the case of animals we have the arm and hand modified, so as form the wing of the bat, or of the bird, or the spade-like hand of the mole; but in these cases it is the same organ adapted to fulfil special purposes. We do not find in animals the stomach modified, so as to exercise the office of the lungs, or the heart adapted to perform the duties of any other organs, and yet among plants such phenomena are of constant occurrence. We have in certain cases the stem acting as a leaf or the leaf as a stem, and even under certain abnormal conditions we have the anther taking upon itself the office of the carpel, and the carpel, and even the ovules in the carpel, that of the anther—a permutation which would be considered next to impossible in the case of animals. Of course, the inference from these facts is that these organs are not so absolutely distinct one from the other as at first sight they appear to be.

Another distinctive peculiarity of plants consists in the greater relative development and importance of bud structures. Bud-like structures, indeed, occur in many of the simpler animals, but not to the same extent as in plants, neither is there so much diversity in their appearance. Many of the Fungi are remarkable for the development, under various circumstances and at different times, of bud-like structures of very varied aspect; so that when found, as they usually are, isolated, they are very liable to be considered as belonging to so many distinct plants or species, and it is only by watching the plant throughout all its stages, and during its whole existence, that the true inter-relation of the various forms of bud-spores can be ascertained. In the higher plants bud-variation also occurs, as in what are termed "sports" by gardeners. The variations so produced have reference not only to external form, but to physiological work, thus a dried specimen was exhibited, showing the greater precocity of certain shoots over others on the same bush, in a Red Currant, one branch of which was in flower, and its shoots 6 inches in length, while the other buds on the same bush were still only commencing to expand. Variations in form and habit were illustrated by the cases of "sports" producing cut-leaved varieties, as in the case of the Hazel, Beech, Maple, &c., or branches of pendulous habit, as in weeping trees, or the reverse condition, as in fastigiate varieties, of which the Lombardy Poplar forms a striking illustration. Variegated shoots are often suddenly produced in this manner, of which excellent example was contributed by Mr. W. Paul of a green-leaved variety of Aucuba, emitting from one side a variegated shoot. Sometimes flowers of different character are produced on the same stem, as in the case of a red "Quatre Saisons" Rose produced on the stem of a white Moss. The well-known Cytisus Adami is an instance of a similar character. Fruit also occasionally varies in the same manner; thus we have sometimes Peaches and Nectarines on the same branch; black and white Grapes issuing from the same or from adjacent buds; illustrations of a similar character occur every season. Usually these bud variations are so far permanent that they may be propagated by grafting or by cuttings, but there are cases on record, in the case of Pelargoniums where a particular sport was propagated by cuttings, and when these latter flowered scarcely two were alike in their blooms. Before alluding to the assigned causes of these variations the lecturer drew attention to the fact that these formations were not deformities; their structure is perfectly normal, except in the case of "variegation," which is the result of disease.

The following are among the assigned causes of bud-variation; but, though they are efficient in some cases, they are not applicable in others:—1. The dissociation or separation of characteristics blended by hybridisation or cross-fertilisation. This may be proximate or remote, so that the characteristics, either of some recent or of some distant ancestor, suddenly re-appear in the descendant. This reversion to parental or ancestral form is common in the case of cross-bred plants, and excellent illustrations of it were shown in some Pelargoniums furnished by Mr. Wills. One was a seedling of the fifth generation, showing three "sports," each one having the characteristics of a progenitor. The three varieties whose characters were reproduced in these sports were "Beauty of Oulton," "Italia Unita," and "Cerise Unique." Another plant, the seed-parent of which was "Beauty of Oulton," the male-parent "Lucy Grieve," presented on different branches the characteristics of either parent. Messrs. Downie, Laird & Laing, also furnished a striking illustration of a similar character in the case of a Coleus. This dissociation of characters blended by crossing is not sufficient to account for the cases of the cut-leaved Beech, or the weeping habited trees, where cross-fertilisation either does not occur, or if it does the parents do not possess the peculiarities shown in the sport. Again, in the case of the Sugar-cane numerous varieties have been raised from bud-sports alone, as the plant rarely produces flowers.

There is no evidence in these cases to show whether they are due to reversion to some possible ancestral form or to progression in a new direction. The mystery is the greater, because other buds on the same plant, apparently under the influence of the same conditions, do not vary in this manner. Graft hybridisation has also been supposed to offer an explanation of some of these cases, previous to the discussion of which the lecturer explained the nature of grafting, stating that though analogous phenomena could be brought about in the animal kingdom, as in the case of the original Taglia-cotian operation for the restoration of mutilated noses, &c., yet that it is to the gardener that the physiologist must look for the most numerous illustrations of this process.

The general principles on which successful grafting depends, and the reasons for its adoption, were briefly alluded to as preliminary to the consideration of the results of the process. These latter were considered first in reference to the influence of the stock on the scion. It is a general belief among gardeners that in most cases but little actual change is produced by grafting either in the stock or in the scion; but the exceptions to this rule are so numerous, and even from a gardening point of view so important, that it seems better to consider that we have not succeeded in tracing the effects in all cases than to deny the existence of such modifications. In illustration of these points the lecturer alluded to the effect of the stock in producing hardiness of constitution in the scion. Grafts of Cupressus macrocarpa on the Red Cedar as a stock had survived the winter, while seedlings from the same species, grown on the same spot, perished. Differences in habit, as produced by grafting, are notorious, especially in the case of fruit trees. This was exemplified on specimens furnished by Mr. W. Paul, of Apples on the Crab and on the French Paradise stock respectively, and Pears on the Pear and on the Quince. The dwarf habit of the Quince and of the Paradise stocks is communicated to the scion, and not only that but a more abundant and much earlier production of fruit-buds is ensured. The flavour, and sometimes the form, of the fruit is influenced by the nature of the stock.

Passing then to the consideration of the influence of the scion on the stock, the lecturer adverted to the practice of renovating or restoring to health a decrepit stock by grafting on it a healthy scion, and to the still more singular changes exhibited when a usually perishable leaf is converted into a persistent stem-like organ by engrafting on it a bud. This has been successfully accomplished in the case of the Orange by Messrs. Thibaut and Keteleer (see p. 386, 1866). Vilmorin, also, by grafting a perennial species of Convolvulus on an annual species, succeeded in making the latter perennial. In these days of artificial adornments it would be not a little inconvenient if, in the case of human beings, similar changes took place either in the nature of the wearer or in that of the thing worn, supposing any real adhesion took place between them.

Passing to the subject of variegation, the lecturer showed, by the interesting series of Abutilons (kindly lent for the purpose by Messrs. Downie, Laird & Laing), how the discoloration might be communicated in some instances, either from stock to scion or from scion to stock, according as the variegated plant is made use of in one capacity or the other. Other instances familiar to gardeners, such as the variegated Jasmine, the Purple Nut, &c., were mentioned, and it was even stated that a new white and green-leaved Pelargonium had originated in this way, from the grafting a scion of "Mrs. Pollock" on a green-leaved variety, "Glendinning's Seedling Scarlet." The most conclusive evidence of the effect of scion on stock is afforded by the case of the Abutilons just referred to, inasmuch as it has been found by M. Van Houtte that if the variegated scion be removed the variegation gradually disappears from the stock, and green leaves only are subsequently produced.

These facts—and a large number of similar ones might be cited—lead naturally to the subject of graft-hybridisation, as a possible cause of the production of bud-variations or sports, in those instances where grafting or budding has been practised; thus it has been found that if a Pear be grafted on the Hawthorn, a fruit intermediate in form and in flavour between that proper to the scion, and that proper to the Hawthorn is sometimes produced. Similar intermediate formations have been found in the case of some Roses, and it is supposed that the occurrence of Roses of different varieties and of different colours on the same stem, such as before alluded to, may be accounted for in this way; as also the Cytisus Adami, whose "motley" character always excites so much astonishment. The Potato, again, has been the subject of similar experiments, and there is good evidence to show that tubers of an intermediate character—"graft hybrids"—may be produced by grafting the bud of one kind on to the tuber of another as a stock A Potato having these blended characters, and produced by Mr. Fenn in the manner indicated, was exhibited.

And thus between the simplest plants and the simplest animals there is a bond so close that none can sever it—none tell where link joins to link; and though when speaking of what we are pleased to call the higher animals and the higher plants, it is possible to lay stress on certain prominent distinctions between them, yet at the same time the fact of their reciprocal dependence is also necessarily brought into prominent relief; the very existence of the one is the consequence of that of the other,

"Useless each without the other;"

and as in the physical world we have heat now emitting light, now generating electricity, and now magnetism, one force evolving other forces, and these reverting to their original condition, so we have a similar transition from inert matter to living vegetable, and through these to living animal organisms, both in their decay restoring to earth and air what they have taken from them in life—a ceaseless round,

—— "A means unto an end,
Beginning, mean, and end to all things—God."

Notices of Books.

THE third part of the new series of **Hooker's Icones Plantarum** (Williams & Norgate) has lately been issued. It contains, *inter alia*, a series of plates, illustrative of the flora of St. Helena, including among them some of the shrubby composites which once formed so peculiar a feature in the flora of this island. As many of the species have no longer any living representatives in the island, or indeed, elsewhere, it is indeed a matter of congratulation that at least some remains of them are to be found in the rich stores at Kew, and that the knowledge of them is perpetuated in this and kindred publications. Other of the illustrations are devoted to plants which either have been, or will be, published in one or other of the series of colonial floras. The flowers of Rytidotus sandvicensis, a rubiaceous plant, with a peculiar enlarged calyx, resemble the flowers of a hose-in-hose Primrose.

Kryptogamen Flora von Sachsen, &c., von Dr. L. Rabenhorst (Leipsic: E. Kummer—London: Williams & Norgate), is a work which must form part of the library of every botanist who deals with cryptogamic plants. The part before us is devoted to Lichens. Excellent woodcuts are given, representing the peculiarities of the several genera, and short descriptions in German, with synonyms, are given of the species. Though nominally confined to Saxony, this work will be found available for the greater portion of Europe.

The German Working Man; *his Institutions for Self-culture, and his Unions for Material Progress.* By James Samuelson. (Longmans.) Any one who wishes to have an idea of what German working men are, how they live, and in what manner they manage their affairs, should read this well-intentioned little book. The author goes into heroics over the beer partaken of by the German operatives, and it certainly has this inestimable advantage that while fresh, brisk, and refreshing, it is not nearly so intoxicating as the vile stuff too often palmed off on our own labourers. To a large extent we share the author's convictions that the man who succeeds in introducing and bringing into general consumption in England a mild, brisk, palatable beer, such as is drunk on the Continent, will do more good in the cause of sobriety than all that has yet been accomplished by the zealous self-denying advocates of teetotalism and of repressive legislation. In any case there is no question that the special curse which stands in the way of progress in this country, is the love of drink.

Miscellaneous.

WOOD PRESERVATION.—In almost every possible respect there is an analogy between the vegetable and animal kingdoms; and this is maintained in attempts to preserve their products from decomposition. Meat smoked, cooked, or salt, resists chemical action of air and water simply because its albumen becomes solidified like the white of an egg. Mr. Moir, of Glasgow, has discovered the same cause and effect in the various attempts to preserve timber. The creosote so used solidifies the albumen of the wood, and thus prevents its slow but certain decomposition by the ordinary atmospheric or other causes. It effectually prevents also the action of fungus and parasitic animals. It also entirely excludes the entrance of an acid moisture into the pores of the wood. *Electric Telegraph Review.*

CYPHOMANDRA BETACEA.—Professor O. Silvestri, of the University of Catania, has recently discovered a great quantity of citric acid in the fruit of Cyphomandra betacea, a plant belonging to the Solanaceæ, which is found scattered in the gardens of Sicily. Its natural habitat is Mexico; and it is also abundantly distributed in Peru and other parts of South America, where it is called *tomate de la paz*. *The Press.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

MANY kinds of stove and greenhouse plants which habitually bloom towards the end of May and June will now commence to accumulate strength for that purpose, and should therefore be specially attended to. I refer to such subjects as *Clerodendron, Aphelandra, Hibiscus, Gesnera, Aphelexis, Pimelea, Boronia, Ixora, Medinilla, Lechenaultia*, and such *Ericas* as E. Cavendishii, E. ventricosa carnea, E. ovata grandiflora, E. vestita coccinea, and a host of others equally distinct. All these plants require to be treated with the utmost regularity in one respect, that is in affording to each the fullest amount of light and sunshine that can be given at this particular season. Good cultivators know full well the value of giving as much light as possible, though its scorching effects may have to be moderated somewhat during the long days of summer, when hard-wooded plants are actively engaged in making their season's growth. This is a subject in connection with the culture of these plants during the summer months which is much overlooked and neglected, for it is by assuring to the young shoots from their earliest formation up to the blooming period the greatest aggregate amount of light, that truly noble spikes of bloom are obtained. And it was to this fact, I believe, that the late Mr. Barnes, of Camberwell, owed much of his success, as he once assured me, when he exhibited a plant of Clerodendron paniculatum with a spike of gorgeous inflorescence some 3 feet in length by 16 or 17 inches in diameter at the base. Overcrowding a modern evil—and uncleanliness, whether amongst the plants or on the glass, are ordinary obstacles to perfect development, which should always be guarded against. As previously suggested, favourable opportunities should not be missed to proceed with the potting of

Stove-plants, which require either a larger pot or fresh compost. In the former case, especially in regard to permanent hard-wooded kinds, the old ball will seldom require to be broken up. As much old soil as possible should be removed from the top and bottom. A little may be picked out from amongst the roots all around the sides with a moderately sharp stick. The hard-wooded stove perennial Ixoras, for example, should have a lasting permanent kind of compost—peat or loam being predominant. These should be potted somewhat firmly. Soft-wooded plants, of which Torenias afford a fair illustration, may have more leaf-mould, and do not require potting so firmly. In the conservatory, immediately any valued plants are past the best period of blooming, remove them from amongst the collection to a position where more light and a less impeded circulation of air can be given them. *Indian Azaleas*, which grow quickly after blooming, afford a good example. If the shoots are pinched back, and they are introduced into a temperature of 70° or 80°, they will succeed better next season. Plants placed in *jardinets* or stands in mansions should now be changed more frequently than heretofore.

FORCING HOUSES.

In this department I can add but little to what has been stated in the last few Calendars, so exceedingly harsh and ungenial has the weather continued up to the time at which I write. The careful forcer, taking the state of the weather into consideration, will not force anything more than is absolutely necessary to secure a safe advance. A minimum night temperature should be maintained while we have to close the houses early on account of the cold northerly winds. If any have to force against time let it be done with a maximum day temperature, only pushing up the heat well at such times as air can be admitted, and when the greatest amount of light is diffused throughout the houses. Keep a sweet moist atmosphere in all forcing structures. Observe scrupulous cleanliness at this particular season. Freedom from insects during the whole of the summer is ofttimes assured by careful supervision at this season, when potting-off is being carried briskly forward. Especial care should be taken in regard to bedding stuff. If this is now introduced promiscuously into forcing houses, very great risk indeed will be run. Taking into consideration the requirements of various establishments, many of which cannot do without a resort to such a medley in the arrangements, and in order that the risk may be run, frequent resort must be had to moderate fumigations which can hardly be undertaken as absolute preventatives. Tobacco alone should be used, pure and simple; so quickly are the young and delicate growths of forced plants injured that a resort to other materials in view of economy, such as tobacco paper, is not advisable, for the tender epidermis of the leaf is often injured, and the crop suffers in consequence, without the reason being discerned by superficial or casual observers.

HARDY FRUIT GARDEN.

Remove all dead or old decaying leaves from *Strawberry plants*, and hoe or otherwise freshen up the soil amongst them. Finish planting all newly-made beds, whether with young plants stored away through the winter, in small pots, or with old plants which have recently been forced, as soon as milder and more settled weather sets in.

HARDY FLOWER GARDEN.

Do not delay permanently transplanting into those places where they are to bloom, all *Autumn-sown Annuals*. Plant out permanently for the summer, any kinds of *Pinks, Carnations, Picotees, Cloves*, &c., which were potted up in the autumn, and protected in cool frames. If these or any such subjects have, however, been kept in greenhouses, or are otherwise not well hardened to the cold, it is better to delay doing so for a week or two. Place them in a cold frame or pit, that they may become somewhat hardened in readiness. There should not be a moment's delay in transplanting *Shrubs* which require it.

KITCHEN GARDEN.

Asparagus beds which require a spring dressing of decayed manure should receive it forthwith. Transplant *Chives* after first dividing them sufficiently, where these are grown for use. Finish planting *Garlic* and *Shallots*—these, like Onions, delight in a good rich border. Hoe well and deeply amongst autumn-sown *Spinach*, which will prevent its bolting quite so readily. Sow for a full crop of *Onions*—the best way is to sow in drill rows 6 inches apart. Tread the bed over firmly after it is sown. Plant *Seakale* out into rows about 2 feet apart, and 6 or 7 inches from plant to plant in the rows. If crowns are wanted to be taken up for forcing in the autumn, a good rich soil and deep is necessary, and if moderately firm so much the better. *W. E.*

TOWN GARDENING.

Dahlias should now be brought out of their winter quarters and laid in close together on a gentle hotbed, under a frame; but as few town gardens have this facility I think the next best plan is to order a collection from a respectable grower in May, as two or three dozen will be sufficient for any moderate place, and for a few shillings a good collection may be obtained which will flower much earlier and stronger. The *Marvel of Peru* is a beautiful old-fashioned but much neglected plant, that does well in town. Seeds of it should be sown at once on a little heat and planted out in June. If the roots are taken up and preserved like those of Dahlias, they will flower perennially, and the older the roots are the more beautiful will be the plants during the months of July, August, and September; there are many shades of colour on the same plant, which grows from 2 to 3 feet high. Where a hotbed cannot be obtained, half-hardy annuals should now be sown in a warm corner, arched over with hoops, which during cold nights and bad weather should be covered over with mats. The sorts that will succeed best by this method are the following:—*German* and *Ten-week Stocks*, French and African *Marigolds*, *Dianthus Heddewegii*, *Phlox Drummondii*, and *Zinnia elegans*. The best method of sowing the seed is to draw shallow drills, 3 inches apart, sowing each sort separate, not too thick, and covering lightly with fine earth. When the plants have come up, give them a little water occasionally on fine days. *Fuchsias* and *Pelargoniums* that have been packed away dry should now be potted in rich sandy loam. All the dead wood should be cut away, and the plants should be shut up in a close frame for a few days till they begin to shoot, when they should have all the air possible in fine weather and a little water. *Crocuses* will now be coming into bloom, and should be protected from the sparrows by placing three small sticks near them, and twisting worsted round them. *F. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON, FOR THE WEEK ENDING WEDNESDAY, MARCH 16, 1870

1870 Month and Day	March	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer	Wet Thermometer	Hygrometrical Deduction from Glaisher's Tables, Saturation: Dew Point	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air
		Ins.	Deg.	Deg.	Deg.		Gr.
10	Thurs.	29.92	39.0	37.5	31.8	82	2.4
11	Friday	29.57	41.3	41.0	37.1	872	2.9
12	Satur.	29.51	37.1	36.3	32.1	88	2.9
13	Sunday	29.51	36.6	35.5	31.0	91	2.3
14	Monday	29.93	32.1	31.4	26.2	77	1.7
15	Tues.	29.80	33.6	33.1	29.2	87	2.1
16	Wednes.	29.47	39.8	38.3	33.8	87	2.5

1870 Month and Day	March	Temperature of the Air: Highest	Lowest	Range in the Day	Mean	Departure from the Mean of 60 Years	Wind: Direction	Horizontal Movement	In the Day	Rain: In Inches
		Deg.	Deg.	Deg.	Deg.	Deg.		Miles		
10	Thurs.	48.0	30.0	18.0	42.2	+ 0.6	N.W.	245		0.00
11	Friday	47.8	32.0	15.8	40.2	- 1.4	N.W.	257		0.00
12	Satur.	47.9	31.3	9.6	43.9	- 7.3	N.W.	365		0.00
13	Sunday.	42.6	26.5	16.1	34.7	- 7.7	N.W.	200		0.19
14	Monday	44.5	23.1	21.4	33.8	- 8.7	S.W.	210		0.00
15	Tues.	49.1	31.1	18.0	37.6	- 4.8	S.W.	170		0.00
16	Wednes.	58.5	30.8	27.7	48.1	+ 6.4	S.W.	189		0.13

March 10 Overcast during the day, clear at night; fog, rain in the morning, overcast at night.
" 11 Overcast; rain at night.
" 12—1 in. amount of cloud prevalent; snow fell in the morning.
" 13—Variable amount of cloud prevalent during the day; rain at night; lightning in the north-west at night.
" 14—A general, but dry, haze over the sky.
" 15 Hazy; sun pretty clear; solar and lunar halos.
" 16—Generally overcast; rain fell during the evening, and occasional showers during the day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, MARCH 12, 1870

Names of Stations	Temperature of the Air: Highest	Lowest	Range of Week	Mean of all Highest	Mean of all Lowest	Mean Daily Range	Mean	Rainfall: Inches
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	54.2	30.2	24.0	48.3	32.7	15.6	39.6	0.10
Blackheath ..	48.0	30.4	17.9	44.3	34.2	10.1	38.4	0.02
Over Court ..	53.1	29.4	23.7	46.9	33.1	11.8	40.0	0.02
Birmingham ..	52.1	31.0	20.1	45.2	35.2	10.0	40.4	0.02
Wolverhampton ..	51.0	31.2	19.8	45.0	35.4	9.6	40.3	0.22
Leicester ..	50.0	28.5	21.5	44.0	34.5	10.1	39.7	0.20
Norwich ..	44.5	29.6	15.9	42.1	31.9	8.1	37.0	0.16
Nottingham ..	51.0	29.9	21.1	46.8	35.4	11.4	40.2	0.02
Sheffield ..	51.0	29.2	21.8	44.9	35.6	9.3	40.3	0.04
Liverpool ..	48.0	30.0	18.0	41.1	30.1	8.2	35.6	0.16
Manchester ..	53.0	31.0	22.0	47.3	35.8	11.5	40.6	0.01
Lancaster (Salford)	50.1	29.2	21.2	46.0	35.7	10.3	40.0	0.02
Bradford ..	49.0	27.0	22.0	45.0	35.0	10.0	40.0	0.02
Leeds	51.0	31.0	20.0	46.0	39.7	9.9	40.7	0.09
Greenock ..	49.0	26.0	23.0	44.9	34.1	10.8	37.6	0.07
Edinburgh ..	49.7	26.0	23.7	..	..	..	38.6	0.00
Glasgow ..	48.9	26.4	22.5	..	..	..	38.1	0.03
Aberdeen ..	47.7	27.0	20.8	..	..	..	39.2	0.18
Dundee	50.0	26.0	24.0	..	..	..	39.0	0.00
Greenock ..	48.5	28.5	20.0	..	..	..	38.6	0.00
Leith	48.8	27.0	21.8	..	..	..	40.4	0.01
Perth	53.0	26.0	27.0	..	..	..	40.9	0.00
Dublin	51.8	27.5	24.3	..	..	..	40.3	0.00

JAMES GLAISHER.

Notices to Correspondents.

ARCHIMEDEAN LAWN MOWER: *H. D. H., Dublin.* Consult our advertising columns.

ÆSCHYNANTHUS CULTURE: *A Sub.* Æschynanthus is a plant generally found growing on the trunks of trees or rocks, and requires perfect drainage, and a very sandy porous soil. We have seen them do well attached to a block with Moss. We have no doubt your soil is too close, perhaps sodden, which would account for the sickly appearance of the plants. More crocks and less soil will also improve the Maranta. Apply dry silver sand to the decayed part to dry up all moisture.

CAMELLIA: *A. S.* Too small and too thin to be of any special value.

GALLEON APPLE: *J. Thomson, Jun.* Probably produced by an Acarus, but fresh specimens would be necessary to enable anyone to speak with confidence as to the genus or species. They look like the work of a Cephalonœon. *A. M.*

GARBUTT'S AMAZON PEAS: *A Working Gardener* asks if any of our readers can tell him where he can obtain this variety, which he has grown for some years, but cannot get this season.

GARDENIAS: *Six-year Sub.* You may safely remove some of these into your Cucumber house, placing them at first in the coolest position that can be found. They will flower continuously for a while, and should then be rested, trimmed or cut back, and grown on briskly for a second flowering. Beware of insects.

GLADIOLUS: *J. B. K.* G. natalensis, or psittacinus, from which the present race of garden Gladioli has descended by hybridisation and selection, was introduced from Natal in 1817.

GOLDEN SEAL: *B. C.* would be glad to learn what the "Golden Seal," of the United States' Dispensary is. Can any of our readers tell him?

INSECTS: *X. Y. Z.* It is not easy to determine Lepidopterous insects from shrivelled-up caterpillars, especially where nothing definite is said about their habits. We have, however, little doubt that the "grubs" which you have sent, and which you say are very thick *upon* some tree Pæonies, are the root-gnawing larvæ of one of the Ghost Moths, Hepialus fuscus or H. Humuli. We know no other remedy than carefully examining the roots and picking out the caterpillars by hand. *W.—W. S. S.* The grub of the Wood Leopard Moth, Zeuzera Æsculi, figured at p. 42 of our present volume. *W. H.* Mealy-bug of the Vine, Chermes vitis.

INSECT ON BEECH: *W. M.* The piece of Beech bark sent is completely covered with the white excrescence of a Coccus, Adelges fagi. We never saw a finer—that is, a worse—specimen, and have sent it to the Royal Horticultural Society's Collection of Economic Entomology at South Kensington. It is as if a snow-storm had beaten against the trunk of the tree. We regret that we can suggest no remedy for this, especially when it has once made good its footing in a grown-up wood. Single trees, or young trees, might perhaps be cleared by rubbing on some of the applications which we have suggested in a former paper on the Apple Bark Louse, p. 74; but to clear a whole wood is beyond the power of man. We believe that most advisers would say that if the whole of it is as bad as the specimen sent, there is no remedy but to cut it down; or, if a portion has as yet escaped attack, to cut down the suffering portion to save the rest. Our advice is rather to pause, and see what relief the change of seasons may bring round. In all probability not a single tree will be found uninfected, and if they go, the result is only the same as if they were cut down; for Beech timber is of little value in this country. We have seen cases where, from some cause beyond our finite perceptions, the Coccus, in certain seasons, has perceptibly diminished, and come again within bearable bounds. *A. M.*

LOOKER'S PATENT CAPPED FRAMES: *C. R. F.* See our advertisement columns.

NAMES OF PLANTS: *P. O. O.* Asplenium lucidum.—*Bucks.* Daphne Mezereum.—*D., Dublin.* Pinus pondérosa var. Benthamiana.—*L. W. S. H.* Picea apulina often has that appearance when grown in such situations.—*B. D.* Apparently Hedera palmata. 1, seedling Cyclamen hederifolium. For replies to your other questions you should read the Calendar of Garden Operations regularly, and adapt the practical hints therein contained to your own case as nearly as you can.

PLANTS IN A CONSERVATORY: *J. C.* Thoroughly cleanse the plants, removing as many infested leaves as possible, and then paint the trellis, if any, and white-wash the wall, using a quantity of black sulphur in the lime-white; and smear the hotwater-pipes also with sulphur.

PROPAGATING FRANCISCEAS: *Sub.* Allow the cuttings of the young growth to get a little hard, or matured, before taking them off; endeavour to get a little heel of the old bark at the base of the cutting, and do not put them in strong heat for a few days, until the base of the cutting has dried.

ERRATUM.—At p. 349 for "Thy pole clipp of vineyard," read—"Thy pole clipp'd vineyard."

Markets.

POTATOS.—Southwark, March 14.

During the past week the arrivals coastwise and by rail have been large, and the prices of the former week were not maintained, except for top samples. Quotations:—Yorkshire Regents, per ton, 70*s.* to 100*s.*; Yorkshire Flukes, 90*s.* to 110*s.*; Lincolnshire Regents, 70*s.* to 80*s.*; Dunbar and East Lothian do., 80*s.* to 100*s.*; Perth, Forfar, and Fifeshire do., 70*s.* to 85*s.*; Ditto Kocks, 65*s.* to 70*s.*; French and Belgian Whites, 60*s.* to 65*s.*

COVENT GARDEN.—March 18.

Business transactions upon the whole are satisfactory, and indicate further improvement, particularly among first-class goods. Large arrivals of foreign produce, comprising the usual varieties, have been received in good condition. Some good late Grapes can still be had, and consist of Barbarossa, Lady Downe's, and Muscats. The Potato trade generally without alteration in prices.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3 0 to 5 0		Melons, each ..	1 6 — 3 0	
Cobs, per lb. ..	0 9 — 1 0		Oranges, per 100 ..	3 0 — 7 0	
Filberts, per lb. ..	0 6 — 0 9		Pears, per doz. ..	4 0 — 10 0	
Grapes, per lb. ..	8 0 — 20 0		Pineapples, per lb. ..	— —	
Lemons, per 100 ..	4 0 to 8 0				

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p bund.	3 6	to 5 0	HorseRadish, p. bun.	3 0	to 5 0
Artichokes, p doz.	2 0	6 0	Leeks, per bunch ..	0 2	— 0 4
Beet, per doz.	2 0	— 3 0	Lettuces, p. score ..	1 0	— 2 0
Broccoli, per doz.	1 0	— 2 6	Mint, per bunch ..	1 0	— 1 6
Brussels Sprouts, p. sieve	2 0	3 0	Mushrooms, p. pott.	1 0	— 1 6
Cabbages, p. doz.	1 0	— 1 6	Onions, per bunch ..	0 4	— 0 6
Carrots, p. bunch ..	0 4	— 0 8	Parsley, per bunch ..	0 2	— 0 4
Cauliflowers, p. doz.	1 6	— 3 0	Potatos, new, p. lb.	0 4	— 0 6
Celery, p. bund. ..	1 0	— 1 6	Salsafy, per bundle .	1 0	— 1 3
Cucumbers, each ..	1 0	— 3 0	Scorzonera, do. ..	1 0	— 1 3
Endive, per doz. ..	1 6	— 2 0	Seakale, p. basket ..	2 0	— 2 6
French Beans, p. 100	3 0	6 0	Shallots, per lb. ..	0 8	— ..
Garlic, per lb. ..	0 8	..	Spinach, p. bushel ..	2 0	— 3 0
Herbs, per bunch ..	0 2	— 0 4	Radishes, per doz ..	1 0	— 1 6
			Turnips, per bunch ..	0 4	— 0 6

Potatos, York Regents, per ton, 75*l.* to 100*l.*; Flukes, do., 75*l.* to 120*l.*

PAUL'S NOVELTIES of 1870.
See WM. PAUL'S SPRING CATALOGUE, now published.

PAUL'S NEW ROSE PRINCESS CHRISTIAN.—Three Hundred Plants ready in May, for 6*d.* each.
For description see WM. PAUL'S SPRING CATALOGUE

PAUL'S NEW ROSE VIRGIL.—Plants ready in May, 5*s.* each.
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S SELECTION of NEW FRENCH ROSES.
For description see WM. PAUL'S SPRING CATALOGUE.
Strong plants in April, price 9*s.* 6*d.* to 15*s.* each.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE.
Fine coloy Certificate. Plants ready in May, 10*s.* 6*d.* each
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PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE.
Plants ready in May, 10*s.* 6*d.* each
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM BRONZE. The brightest and most effective of the variegated Zonals. Plants ready in May, 10*s.* 6*d.* each.
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BEDDING PELARGONIUMS
Beauty's Rarest BONFIRE, the finest of all the scarlet-crimsons and five others. Plants in May, 6*s.* each, or the seven for 30*s.*
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NOVELTIES of 1869.
ROSE PRINCE LEOPOLD, GOLDEN VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c.
For descriptions see WM. PAUL'S SPRING CATALOGUE, just published.

WM. PAUL, Paul's Nurseries and Seed Warehouse Waltham Cross, London, N

DOBSON and SONS' PRIZE FLOWER SEEDS are second to none in quality

CALCEOLARIA—Scaled packets, 1*s.* 6*d.*, 2*s.* 6*d.*, 5*s.* 6*d.*, and 10*s.* First Prizes, Crystal Palace, Horticultural, Botanic and Reading, &c.

CINERARIA—1*s.*, 2*s.* 6*d.*, and 5*s.* Sixty First Prizes in seventeen

PRIMULA SINENSIS FIMBRIATA RUBRA and ALBA. Separate at 1*s.* 6*d.* and 2*s.* 6*d.*; mixed, 1*s.*, 2*s.* 6*d.*, and 5*s.*

BALSAM—A particularly fine strain; eight varieties, separate, 1*s.*

CYCLAMEN PERSICUM and Varieties, 1*s.* and 2*s.* 6*d.*

SCARLET INTERMEDIATE STOCK, very double, and rich in colour, 6*d.* and 1*s.*

SUPPLIED by 300 Leading Seedsmen and the Growers, J. DOBSON and SONS, Woodlands' Nurseries, Isleworth, London, W.

DOBSON and SONS' SEED CATALOGUE, gratis and post free—Woodlands Nurseries, Isleworth, W

Chrysanthemums.

THE CHRYSANTHEMUM, and HOW TO GROW IT. See ADAM TOOSY'S CATALOGUE for 1870, forwarded to all applicants for one stamp

Jerusalem Nursery, Stoke Newington, N., and 120, Mount Street, Grosvenor Square, W.

RIBES ATROSANGUINEA, dark flowering Currant. Fine plants, 2*s.*, to 2½ feet, 3*s.* per dozen; 14*s.* per 100; double flowering, 2*s.* to 2½ feet, 3*s.* per dozen, 15*s.* per 100

BROOM, White Portugal, 1½ to 2 feet, 12*s.* per dozen; 12*s.* per 100; 3 to 4 feet, 24*s.* per dozen; 18*s.* per 100

BROOM, Common Yellow, 2 to 3 feet, 9*s.* per dozen; 12*s.* per 100
See CATALOGUE

JAMES SMITH, Darley Dale Nurseries, Matlock

PARIS, 1867. SUTTONS' GRASS SEEDS for ALL SOILS. The PREMIER PRIX SILVER MEDAL for GARDEN SEEDS, GRASSES, and GRASS SEEDS, was Awarded to SUTTON and SONS, Seedsmen to the Queen, Reading, Berks.

WANTED, an ACTIVE PARTNER, in a small Nursery, Florist, and Jobbing Business in Islington. Long lease; £50 cash. Rent £35
Apply to G. R., 32, Rotherfield Street, Islington, N.

To Seedsmen and Nurserymen.

PARTNER WANTED.—A Partner is required by the Advertiser, to join him in an old-established Seed and Nursery business in a North Western county, having an extensive connection and doing a large trade. A Partner practically acquainted with the Nursery business, and of active habits and business experience, is sought. Capital required, about £2000. Apply, by post-paid letter, to A. B., care of Messrs. Hurst & Son, 6, Leadenhall Street, London, E.C.

Wanted.

PETER LAWSON and SON are in WANT of a FOREMAN to take charge of the Houses. Must be well up in Growing Roses in pots and young Vines. Also a YOUNG MAN of some experience, for the Houses and Pleasure Ground. Apply by letter only, stating wages required, addressed to Bangholm Nursery, Edinburgh

WANTED, as FOREMAN, an active, single young Man, who has had good experience in the Houses. Wages, 25*s.*; no lodging. Those with good character can write to Mr. GODFREY, Ankerwycke, near Staines

WANTED, a FOREMAN and GENERAL PROPAGATOR.—None need apply who cannot give first-class references for ability and honesty. Such a one may secure liberal wages and a comfortable permanent situation. Several references and wages expected. Wanted also a Young Man as IMPROVER under the Foreman; one who can Bud Roses, &c., preferred.—Address, with references and wages wanted, WM. CLIBRAN and SON, Mill Bank Nursery, near Altrincham

WANTED, as PROPAGATOR and FOREMAN, a respectable and active Young Man, of good address, to take charge of a general Stock of Hard and Soft-wooded Plants. State age, wages, and how last employed. Also TWO or THREE YOUNG MEN for HOUSES and good JOBBING HAND.—The MANAGER, Melbourne Floricultural Nursery, Anerley Road, Norwood

WANTED, a GARDENER, who understands Forcing Vines, Kitchen and Flower Gardening. Wages, 16*s.* per week.—Apply, by letter only, to X., care of Housekeeper, 10, Union Court, Old Broad Street, E.C.

WANTED, a GARDENER (SINGLE-HANDED).—One who perfectly understands the Management of Vines, Greenhouse, Wall, and Fruit Trees, as well as Kitchen Garden; and can be well recommended.—Write as to wages and full particulars to G. W., Tunstall, Sittingbourn

WANTED, TWO MEN, used to Potting, Tying, and Growing Plants. Good wages given to industrious men, and constant employment.—Address T. S., *Gardeners' Chronicle* Office

WANTED, an active Young Man for OUTDOOR NURSERY WORK. Must be a successful Budder and Grafter. State wages and references.—H. CARRINGTON, Mile End Nursery, Chester

WANTED, a young Man as ASSISTANT BUDDER and GRAFTER, and to make himself generally useful.—JAMES BIRD, Nurseryman, Downham

WANTED, a BAILIFF, to Manage a Grain Farm of about 550 acres, within 10 miles of Preston, Lancashire, on which Steam Machinery is used. Salary, £50 a year, with a commission of 2½ per cent. upon divided profits; house rent free; vegetables and coals found, and the keep of a cow and pig allowed. Applications, accompanied by testimonials, to be sent on or before the 23rd March instant, to Mr. JAMES ANDREW, 12, Wit. kley street, Preston

WANTED, a YOUNG MAN, to take the Charge of a Branch Establishment in a London Florist's.—He must be able to Serve and have a good address. Honesty indispensable.—9, Queen's Road, Bayswater

WANTED, an APPRENTICE to the Nursery and Seed Business. An opportunity offers for a respectable Youth Small Premium required.—Address, with particulars, to N. S. B., *Gardeners' Chronicle* Office.

Seed Trade.

WANTED, as ASSISTANT CLERK, a young Man, with sufficient knowledge of the Trade to enable him to Invoice correctly. It is indispensable that he be a very neat and quick Writer, also be well recommended; stating age, salary expected, and all particulars, to Messrs. JAMES DICKSON & SONS, Chester

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Gardeners and Under Gardeners.

WM. CUTBUSH and SON beg to state that they have at all times BOOKS MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, and the wages. Any that suitable Man may be selected.—Highgate Nurseries, London, N

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Nurseries, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has been REQUESTED to SUPPLY SEVERAL NEW and EXPERIENCED Establishments, whom he can strongly recommend from his personal knowledge of them

Belfast, February, 1870

Business Agency.

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GARDENER (HEAD).—A first-class Grower of Forced Fruits, Flowers, and Vegetables where required in the year round. Liberal wages expected. Good character.—G. G., Mr. Tedman's Nursery, Eltham, Kent, S.E.

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GARDENER (HEAD), age 29, married, one child.—WRIGHT offers his Services to any Nobleman, Lady, or Gentleman requiring the services of a first-class practical Gardener. Great experience in every branch of the profession, including the Management of Vines, Pines, Orchids, Cucumbers, Melons, Strawberries, Mushrooms, &c.; also Kitchen and Flower Gardening.—J. WRIGHT, Aston Rowant, Tetsworth, Oxon

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GARDENER (HEAD).—Age 28, married; thoroughly practical, fully competent in every branch of the profession, including specimen Plant Growing, Early and Late Forcing, Picturesque Gardening, &c.—W. B., Cheshire, 14, Grove Road, Holloway, N.

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GARDENER (HEAD), or FOREMAN.—Able to carry out New Grounds with proper plans, &c. Thoroughly understands the Management of Men.—H. R. H., 2, Old Church Street, Edgeware Road, W

GARDENER (HEAD), where two or more are kept.—Single; understands the profession. Three years' good character.—A. C., 3, Grove Road, Stamford Hill, Middlesex, N.

GARDENER (HEAD), where two, four, or more men are kept. Middle aged, married, no incumbrance; has a thorough practical knowledge of Forcing Fruit, Flowers, and Vegetables, and the Management of Kitchen, Fruit, and Flower Gardens.—HORTUS, 2, Linton Grove, Lower Norwood, Surrey

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GARDENER (FOREMAN), in a Nobleman's or Gentleman's Establishment.—Has had experience both in Gentlemen's Establishments, and in Plant Departments in London Nurseries. First-class reference.—A. B., Messrs. Rollisson's, the Nursery, Lower Tooting, Surrey

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GARDENER (SINGLE-HANDED).—Age 28, single; has had good practice in the general routine of Gardening. Five years' good character.—H. W., Post Office, Wargrave, Berkshire

GARDENER (THIRD, in a large place, or SECOND, in a small one.—Age 22; good character from present employer.—J. C., The Gardens, Burwood House, Cobham, Surrey.

GARDENER (UNDER).—Age 18, can Milk. Three and a half years' good character.—A. B., Pilgrim's Hall, near Bedwell Park, Hertford

GARDENER (UNDER).—Age 19; has been two and a half years in present situation, principally in the Houses. State wages.—JOSH. JEFFERSON, Gardener, Carlton House, Wessop, Notts

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GARDENER (UNDER), in a Nobleman's or Gentleman's Garden.—Would prefer a situation where everything connected with Gardening is carried out in a first-rate manner. Distance from Metropolis no object.—W. S., 3, Hurst Place, Clapham, S.W.

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PROPAGATOR (FOREMAN), in a Nursery.—Has had great experience in the Growth and Propagation of Heaths, Azaleas, Camellias, Ixoras, Allamandas, Dipladenias, Hard-wooded Greenhouse Plants, Roses, &c. Good references.—A. B. C., Mr. Joseph Lundy, Odd Fellows' Arms, Pocklington, Yorkshire.

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IMPROVER, in the Houses, or in a Gentleman's Garden or Nursery.—Has a slight knowledge of Gardening. Moderate Premium.—G. S., Post Office, Burnham, Maidenhead.

IMPROVER, in a Gentleman's Garden.—Age 19. A small Premium given. Five years' good character. State wages, &c., to G. W. PRIOR, Nether Street, Alton, Hants

IMPROVER, in the Houses, in a Nobleman's or Gentleman's Garden.—Age 18; has had three and a half years' experience in Kitchen and Flower Gardening. Good character.—A. B. C., Post Office, Chichester.

IMPROVER, in the Houses, in a Nobleman's or Gentleman's Garden, where a good Staff of Men are kept.—Age 17; no objection to pay a Premium.—J. E., The Gardens, Crewe Green Court, Taunton, Somerset

ASSISTANT in a Gentleman's Garden, in the Houses, under a Foreman.—Four years' character from present situation. Premium offered for a large place.—A. PRIPPEN, The Gardens, Dillington Park, Ilminster, Somerset

To Market Gardeners and Nurserymen.

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4, Terrace Walk, Bath

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SALES BY AUCTION.

Postponement of Sale.

MESSRS. PROTHEROE AND MORRIS respectfully inform the Public that the SALE by AUCTION advertised to take place on the Premises, Allerton Priory, Allerton Road, Stoke Newington, Middlesex, on MONDAY NEXT, is POSTPONED for the present

Annual Sale of Camellias, &c,

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at 38 and 39, Gracechurch Street, E.C., on TUESDAY, March 22, at half past 12 o'clock precisely, about 500 Choice DOUBLE CAMELLIAS, beautifully set with bloom buds; AZALEAS, 300 Standard and Dwarf ROSES of the best varieties, Selected FRUIT TREES, AMERICAN PLANTS, &c.

On view the morning of Sale, Catalogues had at the rooms as above, and of the Auctioneers, Leytonstone, E.

Versailles Nursery, Hammersmith, W.

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Further particulars will appear in future Advertisements

Sale of the Celebrated Osberton Herd.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve (by order of the Executors), on WEDNESDAY, April 27 at 12 o'Clock), at the Scotton Farm, Osberton, Worksop, the celebrated and very first PRIZE GRASS HERD of SHORTHORNS, bred by the late George Saville Foljambe, Esq The Sale will comprise the entire Herd (with the exception of two Cows, three Heifer Calves, and one Bull), which will be found to contain the blood and strains will be found the famous Prize animals, Gipsy Queen, Rose of Windsor, and Phyllis also Knight of the Crescent, Knight of the Thistle, Knight of the Garter, Knight of the Realm, Knight Templar, and Knight Errant, bred from the late Earl Spencer's noted cow, Lady Sarah, and two animals, Flora and Alexina, bred by the late Mr Booth Mr Carr's Imperial Windsor (18,686) and Knight of the Garter (22,765) have been used but the young animals are mostly by Mr Peel's Second Hubback (22,727) The Knights of the Bath, Cre cent, and Whistle, winners at the Royal and Yorkshire Shows, as bull calves and yearlings, have been and are still in service The large number of prizes awarded to this Herd at the Metropolitan, the Royal, the Yorkshire, and Lincolnshire Shows, as well as the magnificent sum exhibited at Birmingham and Smithfield, is the finest testimony of the capabilities of the Herd to breed stock

Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, Regent's Street, London, W ; or of Mr. WOODS, at Osberton, Worksop.

Consignment of Plants from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W C., on MONDAY, March 21, at half past 12 o'clock precisely, Standard, Pyramid, and Dwarf ROSES, from Holland; CAPE HEATHS, FRUIT TREES, RHODODENDRONS, FOREST TREES, CONIFERS FLOWERING SHRUBS, VARIEGATED HOLLIES, IVIES, EVERGREENS, &c., from Belgium; CANNAS, PIONIES, PINKS, VIOLETS, HERBACEOUS and VARIEGATED PLANTS, RASPBERRY CANES, CURRANT TREES, ASPARAGUS ROOTS, &c., from Various; choice GLADIOLI, ANEMONES, and RANUNCULI; Rustic Seats, Stools, Vases, Baskets, &c.

On view the morning of Sale, and Catalogues had

Coniferous Seeds.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W., on TUESDAY, March 22, at 1 o'clock precisely, 200 ounces of ABIES DOUGLASII and PINUS MONTICOLA SEED, from California

On view the morning of Sale, and Catalogues had

Consignment of Saccolabiums from India;

BARKERIA LYONII and SKINNERI, ODONTOGLOSSUM GRANDE, & c from GUATEMALA; PERISTERIA ELATA, EPIDENDRUM STAMFORDIANUM, from PANAMA; all in the best possible health, and many of them in bloom

MR. J. C. STEVENS is instructed to SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W C., on TUESDAY, March 22, at half past 12 o'clock precisely, a very fine lot of SACCOLABIUM, believed to be the finest Spring Flowering species in cultivation; also very strong BARKERIA SKINNERI and SPECTABILIS, LYCASTE SKINNERI, EPIDENDRUM VITELLINUM, and ODONTOGLOSSUM CITROSMUM, together with LYCASTE CRUENTA, CATTLEYA SUPERBA, and PERISTERIA ELATA, and other well-known and popular kinds, the whole quite free from frost

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Plants and Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W C., on WEDNESDAY, March 23, at half past 12 o'Clock precisely, Choice CAMELLIAS, Hardy and Indian AZALEAS, Standard and Dwarf ROSES, CONIFERS, ARTOCARPUS, CYCAS, DRACÆNAS, ERICAS, LATANIAS, Dwarf Tree and Pyramid FRUIT TREES, &c , from Ghent; Choice GLADIOLI and RANUNCULI; Rustic Seats, Stools, Vases, Baskets, &c

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Established and Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, March 24, at half past 12 o'Clock precisely, Imported and Established ORCHIDS, from Mexico, Ecuador, &c. Many of these Plants, including several examples of the rare ONCIDIUM MACRANTHUM, are finely established, and some have already bloomed A portion of those from Mexico are from a region probably unexplored hitherto The Plants are all in excellent condition

On view the morning of Sale, and Catalogues had

The Agricultural Gazette.

SATURDAY, MARCH 19, 1870.

INDUSTRY and invention are mighty allies in times of peace, and they have done wonders in the past thirty years. New productive forces have been called into operation in every department of enterprise ; and human energy has been rewarded by unparalleled progress in wealth and material prosperity. In agriculture the fertile wastes, both of the New and of the Old World, have been invaded, and a large territory brought under the dominion of the plough. The increased growth of corn has been equal to the increased demand, and the price has generally been moderate, except in a few scarce years and during the Crimean war. Will this nice adjustment of supply and demand continue? Will the future development of industry be accompanied by

the same correlation of the various forces of production? The subject is intricate. Other industries may prove more attractive than agriculture, and the manufacturing populations increasing faster than the rural in Europe (in Germany especially) and even in America, as they do in England, may raise the cost and price of corn. The world is always approaching nearer that distant period when the population of the globe will hardly find standing room! At the present rate of increase it is calculated, according to the rules of geometrical proportion, that in a thousand years there will not be a square yard of terrestrial space for each inhabitant of the globe. But there is a period much nearer at hand, and nearer perhaps than some of us anticipate, when the limited area suited to the cultivation of Wheat will be occupied. Meanwhile the competition of those nations who can afford to subsist on wheaten bread will gradually raise the price.

The public interest in the corn question, formerly so intense, subsided at the repeal of the Corn Laws. The resources of foreign countries were then opened to us, and these were thought to be illimitable. The reaction in public feeling was natural. The question was then settled "for ever" in a political sense. But what was the end of a great party struggle was only the beginning of a new era in the social economy of nations.

It has been said, with truth, that no merely agricultural country can become rich and powerful. On the other hand, a statesman, whose philosophy is more profound than that of any mere advocate of free trade, has declared that "in every country the first creditor is the plough." A few years ago we witnessed the destruction for a time of our cotton manufactures without the resources of the country being seriously impaired. But no such blow could be dealt at agriculture with impunity. Our ancient art is still pre-eminent in importance.

The plough in England needs no protection from the competition of any implement in other parts of the world. But the plough that turns the deep, clean furrow, covering up the thick coat of manure by which poor land is enriched and good land made even more productive—the plough that breaks up poor pastures and turns them into fertile arable land, that brings everywhere a good swathe and a big stock, can only be sent into the field by the man of capital. Security and knowledge are needed to increase the produce of the land. They will be of more avail to the farmer than protection, patronage, or any sort of adventitious encouragement. Such aid may help to bring agricultural improvement to a certain point, but cannot carry it further. The progress of agriculture depends on the gradual spread of knowledge, and especially of a knowledge of physical laws, and on the incorporation of such knowledge into the common practice of husbandry.

THE discussion before the Central Chamber of Agriculture on the GOVERNMENT EDUCATION BILL deserves a more prominent notice than it has yet received in these columns. The leading resolution declared that the Bill merits support in so far as it aims to secure a sufficient amount of public school accommodation throughout the kingdom, and to maintain a good standard of efficiency in schools. It was, however, alleged that adequate opportunities for instruction may be secured by regular attendance at school up to the age of 10 years, supplemented by partial attendance after that age, and that compulsory attendance of children up to the age of 12 years would prove a great hardship to the labouring classes. An adjournment took place of the debate upon the subsequent resolution:—"That giving school boards power to borrow money to be repaid out of local rates, and power to levy a rate of threepence in the pound, would be increasing an injustice already inflicted upon the owners and occupiers of rateable property; and that, as the education of the people is a national object, the whole of the public contribution should come out of the general taxation until there has been a complete revision of the present system of rating." The two resolutions represent the two sides of the subject as it is looked upon by agriculturists; and their thorough discussion is certainly most fit and proper work for the Chambers of Agriculture throughout the country.

It is they who pay the wages and the rates, both of which will be affected by this Government interference. It is they who employ the present and will employ the succeeding generation of agricultural labourers who are to benefit by the education to be provided. The principal question for the father of the cottage family will be—Can I bear the burden which it is proposed to lay upon me in order to obtain the better education of my children whose wages now contribute to the family fund? The principal question for the employer no doubt is—Ought I to bear the burden of this extra rate for the sake of the advantages which will no doubt be ultimately realised of a better educated class of labourers? Whether it is within the province of the Government to take the position of the father or employer, and enforce that upon all which only the public-spirited and self-denying will now take upon themselves, is hardly a subject for discussion here. We may, however, say that no higher testimony to the status of the agricultural class, whether employer or labourer, could be desired than that which would be given if the Bill with all its consequences were cordially accepted in country places, and vigorously worked.

At the meeting of the Central Chamber the other day,

THE REV. E. LYCON WILLES, of Leicestershire, admitted that he did not see how a great national measure of education was to be carried out unless there was compulsion in some form, for it would not be just to the hardworking and industrious labourer, who made sacrifices to obtain education for his children, that his dissolute neighbour should be allowed to send his children into the gutter to learn all the Devil's lessons they could pick up, and the Government do nothing to remove this moral pest. But we should be ten times better off with thorough and complete compulsion than merely partial compulsion, and the Government should be pressed to enforce in the country districts a kind of indirect compulsion by which children should be prevented from going to work up to the age of ten years, in order to secure their regular attendance at school; and after that age, and up to twelve years old, this should be supplanted by a certain amount of education carried on in the slack time of the year, which varied in different counties and parishes, and even on different farms. Another point, in relation to which he was glad the Government had held their own, was the non-establishment of free schools. To have established free schools universally would have been to do a most unwise thing. Free schools, as a rule, were bad schools, and to establish them would be a great injury to the small and industrious class of ratepayers, who had already heavy burdens laid upon them, and would be compelled to pay for their children's schooling, whilst labourers receiving perhaps a larger sum in wages would be left free.

MR. BUNN was inclined to regard the religious question as a difficulty; that and the question of rating were, in fact, the two difficulties which any measure of education must encounter. The school-rate it was proposed by the Bill of the Government should be levied upon the same basis as the poor-rate; and the rate being levied for the schools upon persons of every creed the religious difficulty must inevitably present itself, and thus a controversy tantamount to that on church-rates would be revived. With regard to the limit for attendance at school, the 66th clause of the Bill fixed it at 12 years of age, but in many parts of the country, where the wages of the agricultural labourer were very low, their children from the age of 10 years were able to go out and earn a little towards the common support of the family. That little, therefore, would be taken away if the provision he referred to were in operation and the children were compelled to attend school up to the age of 12. Under these circumstances he thought it would be far better if attendance were made compulsory up to the age of 10, instead of 12, as proposed by the Bill. On the whole, he considered there was reason to be thankful that a Bill so just in principle, and so moderate in its provisions, had been brought in, and that existing school-work was not to be cast away, but as far as possible was to be aided and supplemented wherever it was found defective.

MR. M. W. RIDLEY, M.P., stated that the North of England Chamber, at a recent meeting held at Newcastle, adopted resolutions which expressed a general approval of the Ministerial Bill; and that the objections to the measure were only such as might be removed in committee. One of the great reasons why the Bill was approved of in Northumberland was that they would not be required under its provisions to erect machinery. They courted inspection, and were anxious that their whole system of education should be thoroughly sifted; but they protested against being compelled to erect school boards and other machinery at the expense of the county; that they would indignantly repudiate. The Chamber suggested, as an addition to the 66th clause, which made attendance up to the age of 12 years compulsory, that if the child was certified to have attained a certain standard of education he should not be obliged to attend school. It might be better, however, to provide that the child should be ten years old before he came up for a certificate.

THE REV. E. SMYTHIES could not join in the general chorus of praise with which the scheme of the Government had been greeted. For example, one of the three classes into which the existing schools were divided consisted of those which had done their duty and deserved well of their country, and upon which no restriction had been placed, whether on religious or other grounds. These schools MR. FORSTER said we could not do better than let alone; that was to say, they would continue to be supported as they were at present—one-third from the school pence, one-third from the Government grant, and one-third from voluntary subscriptions. But what was to be done in a parish where there were no voluntary subscriptions, or very few? Where, in that case, was the one-third to come from? Why, one individual—the clergyman—after begging all round the country, would have to put his hand into his pocket and make up the difference. On the other hand, in parishes where nothing had been done to establish good schools, or an efficient education for the children of the industrious classes, the schools were to be placed under school boards and supported by a rate. On that point he should like to know whether the rate was to be levied under the Union Chargeability Act. If it were, the result would be that parishes like his own would be left to struggle on without receiving a farthing from the rates, and at the same time have to contribute to other parishes where nobody had come forward to stop the gap. In that he considered there would be great injustice.

MR. JACKSON, whilst thankful to the Government for their Bill, was doubtful how some of its provisions would act upon the poorer classes of ratepayers, who, in many districts, were the chief supporters of the schools. They paid 6*d.* or 4*d.* a-week for the education of their children; and he wished to know whether, in addition to that, they were to pay the threepenny rate? He objected, moreover, to the fine of 5*s.* being inflicted on the labourer who did not send his child to school, and thought that if a fine were levied at all it should be upon the employer, not the labourer. His own view, however, was that there should be no fines; for that was a retrogressive, not a progressive, policy. The Bill did not try to stimulate by reward, so that it was all penal. In the middle-class and public schools there were scholarships and other prizes open to competition, and at the Universities there were fellowships. But what reward was offered to the poorer schools anywhere throughout the land?

The funds out of which the expenses incurred by the Education Bill were to be defrayed formed the second subject for discussion, but the debate was ultimately adjourned. It was, however, pointed out by MR. A. STARTIN that these expenses ought to be defrayed out of the source to which every one of HER MAJESTY'S subjects contributed to the extent of his ability; for the sum that a man paid in poor-rates was no criterion of that ability, the amount so chargeable being little more than one-fifth or one-sixth of the income of the country. Was it just, then, to lay any further burden upon this limited area? In his opinion the time had arrived when resistance must be offered to the continuance of the practice of adding ever new charges upon the basis of the poor-rate.

MR. GEORGE ANDREWS (Somersetshire) said that already the charges on that basis amounted to £17,000,000 a-year upon a rental of £100,000,000; and the proposed education rate went directly in the teeth of the resolution, which the Chambers had confirmed over and over again, that they would oppose to the utmost any additional burden upon the basis of the existing poor-rate assessment. Moreover, recent additions made to those charges gave increased force in standing upon the ground they had hitherto taken. What was primary education? Simply a means to an end. The object in view was, in fact, the improvement of the mind and the enlightenment of the understanding. Was that to be done with children under twelve years of age only? No; and as they went on they would find that the expenses of education would have to be increased, and that they must continue to educate the boy until he had become a man. If they stopped with primary education, who, when they had educated the boy, was to educate the youth and the man?

The Central Chamber seems upon the whole to be less energetic than its constituents in connection with this subject. On Tuesday afternoon the East Suffolk Chamber of Agriculture gave a general assent to the Government Bill, but it was resolved that the age up to which children should be compelled to attend school should be 10 instead of 12; that schools at which attendance is compulsory should be supported entirely by national funds; that school boards should be established in every district, and that their power to enforce the attendance of children should be compulsory. The last clause was opposed by the Chairman and Colonel TOMLINE, M.P., but carried.

It may also be noted that in the education debate of Tuesday in the House of Commons, the CHANCELLOR of the EXCHEQUER showed that he had caught quite an agricultural tone from his interview with the farmers of the Central Chamber in the previous week. Referring to the opposition which the Bill had encountered on a matter of narrow and inferior importance, he asked, "Would it not be melancholy to see a herd of oxen in a noble field disregarding the magnificent pasturage which was offered them, and fighting angrily over a bunch of nettles in the corner?"

—— ON Monday short supplies in Mark Lane again had the effect of raising prices, and Wheat must be

quoted another shilling a quarter higher.——In the Metropolitan Market trade was generally steady, but dull, and no alteration of prices can be reported.

—— The following is a short report of the conversation between the CHANCELLOR of the EXCHEQUER, last week, and a deputation on the Malt-tax, so far as the interest of cattle feeders in that subject is concerned. Mr. SEAMAN said :—

Experience has taught me that grain in a state of germination just previously to being carried to the malt kiln is by far the most nutritious and the quickest fat former of any substance, whether single or combined food, whatever. During the past 15 years I have conducted experiments on a considerable scale. For the first five years of that period my experiments were confined to horses, and they brought me to the conclusion that if ever Englishmen became hippophagists I should have no difficulty in producing an abundance of horseflesh. In 1861 I turned to feeding sheep with this grain.—The CHANCELLOR of the EXCHEQUER : What grain?—Mr. SEAMAN : This (producing and handing to Mr. LOWE a sample bottle of germinated Barley). I used it for a number of ewes and lambs, and my success was very great indeed, for there was not a single death during the whole of the lambing season, although I have something like 300 ewes, and it is a very common thing for people to lose 10 per cent. of their ewes, and not an uncommon thing to lose 20 per cent. of their lambs, especially in seasons when they have not a supply of suitable food. From 1861 the consumption of germinated Barley increased in my neighbourhood until in the year 1865 there were something like 10,000 sheep feeding upon it within an area of 10 miles of my residence. This was in the summer of 1865, when there was scarcely a blade of Grass to be seen ; when our grass-fields were like ploughed fields, and nothing could be obtained so suitable for the sheep as this. For they fattened upon it, and produced an immense quantity of meat. In the month of June, 1865, mutton chops were worth 15*d.* per lb., and there were scarcely any grasses and roots to be had of any kind, whilst linseed-cake was £12 10*s.* per ton, and Barley was only worth £8 per ton. When this immense quantity of meat was being produced in that neighbourhood—when its price was 15*d.* a lb., and the *Times* wrote that as far as meat was concerned famine was at our door—at that critical juncture I received an order from the Excise not to feed any more sheep upon this grain. About the same time the results of Mr. LAWES' experiments came before the world, and the effect was to lead to the belief that raw grain was superior to malt ; but I must tell you that amongst all Mr. LAWES' experiments there was not one in which malt or Barley was used alone, for if there had been Mr. LAWES would have been obliged to insert an extra column in his report for the sheep which had died from the use of raw grain, because raw grain is a deadly poison for sheep if they are permitted to consume it *ad libitum*.—The CHANCELLOR of the EXCHEQUER : Any sort of grain ?—Mr. SEAMAN : Wheat and Barley. Many farmers said, "Well, if raw grain is as good as malted, it must be as harmless," so they began to use raw grain on the faith of Mr. LAWES' experiment on the feeding of sheep, and the result in many cases a loss of 50 per cent. This germinated grain undergoes a change before it enters the body of the animal.—The CHANCELLOR of the EXCHEQUER : By fermentation ?—Mr. SEAMAN : Yes ; and the noxious element being destroyed, the sheep can feed upon it, as I said, *ad libitum*, and produce an immense quantity of meat. For example, 2 lb. of germinated Barley will produce 3 lb. of mutton per week on each sheep, and that without mixing linseed-cake with it. In fact, no other food is required to be mixed with it ; and now that we have such enormous importations of Maize, Wheat, and Barley, I have no hesitation in saying, should an Almighty fiat go forth to take away from us our green crops, our Peas, and our Beans, there would be Maize, Wheat, and Barley supplied to prevent meat being dearer than it is at present.—Mr. GARDNER (Essex) : I am able to support what my friend says upon every point, and have to hand you a sample of germinated Barley cooked and prepared for food.—The CHANCELLOR of the EXCHEQUER : Is that pure ?—Mr. GARDNER : Yes ; and now I hand you another sample, which you see is composed of leather, rags, fibre, and hair. This shows how we farmers are victimised in the cake we use.—The CHANCELLOR of the EXCHEQUER (holding up what appeared to be a small strip of leather about six inches in length) : Is this what you are supposed to give your beasts to eat ?—Mr. GARDNER : Yes ; and we should not be obliged to do so if we were allowed to make our own cattle food.—The CHANCELLOR of the EXCHEQUER : What is this first sample ?—Mr. GARDNER : That is germinated Barley cooked on the malt kiln.—The CHANCELLOR of the EXCHEQUER : Without Linseed ?—Mr. GARDNER : Without Linseed or anything else. It is "malt," so called, but it would not suit the purpose of the brewers to buy it.—The CHANCELLOR of the EXCHEQUER : It is made from an inferior kind of Barley ?—Mr. GARDNER : Yes ; and the tax on that Barley is not less than £6 1*s.* a ton.—The CHANCELLOR of the EXCHEQUER : The tax on the malt, I suppose, that a ton will produce ?—Mr. GARDNER : Yes ; The Barley this malt is made from I can purchase in the market for £6 1*s.* a ton ; and if I convert it into cattle food at the duty of 21*s.* 8*d.* per qr. the tax brings up the price of this valuable food to £13 15*s.* a ton. What the Malt-tax does, then, is to prevent me and my brother farmers from making use of the grain which we grow for the purpose of producing meat.

—— At the last meeting of the Highland and Agricultural Society, an elaborate scheme of Examinations in the Science and Practice of Agriculture, in Botany, in Chemistry, in Natural History, and in Veterinary Surgery, presided over by five separate examiners, or committees of examiners, was reported and sanctioned for the ensuing examination for the Society's agricultural certificates and diplomas. We quote the syllabus in the cases of Farm Practice and Chemistry, that our readers may judge of the kind of test to which candidates for these honours have to submit in Edinburgh :—

Examiners in Agriculture : Professor WILSON ; Messrs. GEORGE HOPE, Fentonbarns ; ROBERT RUSSELL, Pilmuir ; and JOHN WILSON, Edington Mains.—1. The principle of rotation—rotations of cropping in most common use for heavy and for light soils.—2. Manures in ordinary use—usual quantities applied per acre—time and mode of application—their composition and relative values and uses.—3. Composition and classification of soils—their agricultural treatment.—4. The various farm crops—their cultivation, general treatment, and marketable value—ordinary produce per acre, and the different modes of storing them.—5. The breeding, rearing, and feeding the live stock of the farm—the different breeds—their characteristics—the districts where they are principally met with.—6. Drainage operations.—7. The implements used in agriculture, the points to be attended to in their construction and use, and their prices.

Examiner in Chemistry, Professor ANDERSON. — 1. Chemistry.—The laws of chemical combination. Atomic theory. Chemistry of the non-metallic elements and their more important compounds. Potassium, sodium, calcium, magnesium, iron, and their compounds.—2. Agricultural Chemistry—Composition of plants. Their organic and inorganic constituents. Composition and characters of fertile soils. The principles of manuring. Composition of farmyard manure. Artificial manures—their nature and composition—principles on which they should be used. Feeding stuffs—their composition and value, and the mode in which they may be most advantageously employed.

OUR LIVE STOCK.

CATTLE.

MR. FAVIELL'S sale took place on the 25th ult., the same day as the Beaumont Grange Sale, at Stockeld Park, Wetherby, Yorkshire, Messrs. Waite and Crouch officiating as auctioneers. Forty-one animals were disposed of, and realised the very fair average of £32 8*s.* 9*d.* per head. Taking the animals above six months old, the bulls averaged £69 13*s.* 4*d.* each, and the cows £29 8*s.* The high figure for bulls was entirely owing to the sale of one animal, SHUTTLECOCK, a 3-year-old bull, by Mr. Fawkes' LORD COLSHAM (20,164), dam *Blue Bell*, by REFORMER. He is described by a contemporary as grand in shape, rich in colour, of great frame, well filled up in every point, and full of style and gait. The competition was brisk, and ended in his becoming the property of Mr. Crosse, Blackwell, Surrey, at 240 gs. SHUTTLECOCK 3D, a handsome roan, under one year old, became the property of the Marquis of Aylesbury, at 46 gs. He is out of *Miss Fawkes*, by 22D DUKE OF OXFORD. In this sale the exceptional practice of presenting the bulls for sale before the cows was adopted, the idea being to give the public the opportunity of knowing the estimation in which the sires were held before the cows and young stock were brought out.

—— Thirty-six head of Shorthorns—19 bulls and 17 cows and heifers—the property of Mr. Chalmers, Oldwhat, Aberdeenshire, were also sold on the 25th ult. The general average realised was £25 5*s.* 9*d.*, and the highest price, 36 gs., was given by Mr. Watson for *Rosanna 2d. Gentle Emma* was bought at the same figure by Mr. Gordon.

—— Messrs. Andrew Longmore, of Rettie, and James Longmore, of Hilton, Banffshire, sold 14 bulls and 5 cows and heifers on the 5th inst., Mr. George Reburn auctioneer. The general average of £32 13*s.* 3*d.*, and a total of £620 11*s.*, was obtained. The highest price for bulls was £58 16*s.*, given by Provost Wood, of Banff, for IMPERATOR. Mr. Ogilvie, of Tillynaught, Fordyce, gave £36 15*s.* for *Lady Textle*.

—— Lord Dunmore, who has so often shown his keen appreciation of Bates' blood, has very recently purchased a bull-calf from the Duke of Devonshire for 500 gs. The calf was sold when a day old, and is out of *Lady Oxford 5th*.

—— No great prices were made at Lord Fitzharding's first annual sale, held on the 11th inst. It is to the future, Mr. Thornton told the assembled company, we must look for the fame of the Berkeley stock, and we are encouraged to expect another Tortworth in the county of Gloucester, so long associated with first-rate Shorthorns. The average of both bulls and cows, 13 of the former and 14 of the latter, was close upon 30 guineas, and the total sum realised was £846. The following are a few of the best prices made—BARON WAVERLY, a 2-year-old bull, was purchased by Mr. Monsell, of Gloucester, for 47 guineas ; DUKE FAREWELL, by 2D DUKE OF COLLINGHAM, was sold to Mr. Bybus for 50 gs. Two or three other cattle made from 36 to 40 gs. Lord Fitzharding has recently purchased first-rate stock from Siddington, Didmarton, and other famous stocks.

—— We may mention the following births as of general interest to Shorthorn breeders :—At Warlaby, *Lady Fragrant*, a white c.c. to COMMANDER-IN-CHIEF, on the 27th ult. ; *Soldier's Daughter*, a white c.c. to SIR JAMES ; *Lady Beautiful*, a white b.c. to do. At Towneley, *Baron Oxford's Beauty*, a b.c. to BARON HUBBACK, on the 11th inst. *Lady Beautiful* is own sister to *Lady Fragrant*. Many persons will remember the beautiful proportions of *Baron Oxford's Beauty*, the first prize yearling heifer at Manchester, and will be glad to hear of her again. We would once more ask whether it is wise to breed from animals so young ? *Baron Oxford's Beauty* produced her first calf the day she was two years old. This certainly appears hazardous, as no fact in breeding is better understood than that size and constitution both suffer when cattle are bred from at too early an age. We can well understand a breeder wishing, like other business men, to turn over his capital as often as possible, but how far this method of doing so is consistent with keeping up the vigour of his herd is well worthy of consideration.

—— "During the time rinderpest prevailed," writes Mr. C. J. Whitworth, M.R.C.V.S., of Grantham, "other epizootics were almost unheard of in this district. When the restrictions were removed, the traffic by rail and road re-introduced them, particularly pleuro-pneumonia epizootica, which assumed a most virulent form, and run its course in from three to ten days." This is one of a large number of letters addressed to Mr. George Armitage, of Leighton Buzzard, in answer to inquiries as to the effect of relaxing the cattle plague restrictions. We have selected the above letter as representative of a large number of others written by veterinary surgeons in various parts of the country. This correspondence appears in the current number of the Highland and Agricultural Society's Journal, together with a valuable paper on pleuro-pneumonia. The great lesson to be learnt from both is that our ports should be scrupulously closed against all cattle from infected countries, and that the strictest control should be exercised over the foreign cattle trade.

—— The following interesting extract from "Travels and Adventures in South and Central America," by Don Ramon Paiz, will not be without interest to our readers. The author in describing the well-known exploit of driving cattle into a *corral*, proceeds as follows :—

"To justly appreciate scenes like these, one must himself behold the dusky athlete battling single-handed with a bull just escaping from the corral. Seizing him by a horn with one hand, the Llanero, still holding it, watches his opportunity until he can grasp with the other the animal's tail. The bull is then allowed to run as fast as he will, as the greater his speed the more easily his downfall is accomplished. If the bull moves too slowly, a few impressive jerks generally accelerate his speed, but occasionally he returns the compliment by turning fiercely upon his tail-bearer, who, if not very nimble, risks being gored to death ; yet his skilful antagonist not only usually succeeds in evading his attack, but speedily contrives to throw him. No sooner does this occur than the vanquished one is surrounded by a host of merry, yelling vagabonds, one brandishing a large knife, which he sharpens on the horns previous to performing the operation which transforms the animal into an ox, and if not previously marked, cuts his ear according to the rule of the estate whose property he is ; another holds the red hot brand, which he implants at once upon the quivering hide ; while a third with a small hand-saw cuts off the sharp points of his horns. The whole operation scarcely occupies three minutes. . . . Occasionally, while the men were engaged with one bull, several others effected their escape, in spite of the men whose business it was to prevent it. The situation of the others then became critical in the extreme, being exposed to the attacks of the fugitives on the one hand, and to those of the prisoner on the other : this last they were often compelled to abandon in the midst of their labours. Those who held younger animals formed with their bodies a sort of barricade with which to fend off the aggressors when no other expedient could be resorted to. At times it appeared almost impossible to escape the impetuous charge of the bulls, especially when the men were some distance from the fences ; the only remaining means of safety then consisted in throwing themselves flat upon the ground at the moment the bull aimed a stroke, as in that case the animal invariably jumped over their bodies. It is asserted that bulls in charging always close their eyes, thus missing in blind precipitancy many excellent opportunities of avenging the outrages perpetrated on their race ; but the cows, who are said to keep their eyes fully open when they are bent on mischief, seldom, if ever, turn from their intended victim without leaving some mark of either horn or hoof in token of displeasure."

AGRICULTURAL ESTIMATES.

"LOOKER-ON" AND "G. A. H."

"LOOKER-ON" has again come up to the scratch ; but if I had a bottle-holder behind me I suspect he would be inclined to declare that time was up. As, however, he only comes forward to throw up the sponge I suppose I need not grumble. "Looker-on" admits that he is unable to answer my questions, which were put at the close of my first letter to him. I never expected he could ; and I venture to assert the great majority of your readers never thought he could either, for the very simple reason that my questions were quite unanswerable. Mr. Smith and his backer, "Looker-on," took up an untenable position, and "Looker-on" has now done the only thing he possibly could, he has surrendered at discretion. I think we may now conclude that the 6*s.* 8*d.* seed-beds, alleged to have been made at Woolston, were mere creations of fancy, and as Mr. Mechi very graphically put it, have been "most unmercifully smashed" by "G. A. H."

"Looker-on," however, having abandoned his neighbour and his 6*s.* 8*d.* seed-beds, thinks to make his exit in a grand *jeu de joie* of fiery serpents, squibs, crackers, and what-not, and asks me how I make 12*s.* per acre the true charge for interest, wear

and tear, depreciation, &c., the cost of the tackle being £375. I am afraid "Looker-on" is a very rapid reader, and does not properly digest what he reads. If he will refer back to my first letter to himself (which I am glad to see he now admits to have been "amusingly racy," although it put him terribly out at the time), he will find on p. 84 of your Paper for January 15, that I answered this very question. I pointed out that £60 was the sum named by the Editor of the *Agricultural Gazette* for interest, wear and tear, and depreciation, and that that sum was adopted by Mr. Smith, and upon that adoption I joined issue. The sum which I would put down for interest, wear and tear, and depreciation in a set of tackle costing £375, would be 15 per cent. on that amount, or £56 5*s*., not £60. It was the Editor who showed that Mr. Smith's 1*s*. 6*d*. per acre meant 12*s*. per day, and that for 100 days, said he, would be £60: and Mr. Smith very foolishly adopted this sum. Whereupon I showed that if £60 was a fair amount for it, then he must charge his steam-ploughing at Woolston, not with 1*s*. 6*d*. per acre only, but with 12*s*. per acre, as he had only ploughed 100 acres.

"Looker-on" gives us a page out of his own experience, and tells us that when he set up a steam-smasher he banished two horses, and shortly after a third. It would have been very singular if he had not; but what have these to do with the cost of steam-ploughing? If "Looker-on" had kept accounts (which we know he never does, as he looks upon them as a mark of bad farming) his ploughing account would have been debited with so many days' work of his horses and men. When he set up a steam-smasher his ploughing account would cease to be debited with so much horse-work, and would instead be debited with so much steam-work. "Looker-on" seems unable to distinguish between the "extra cost" of setting up a steam plough, and the actual cost of steam ploughing. The actual cost of steam-ploughing is a certain sum, which is in no way affected by the fact of your having been making or losing money before by ploughing with horses. My *argumentum ad absurdum*, which he has just confessed himself unable to answer, quite illustrates this.

And now one word about "Looker-on" and his 75 acres of Wheat. He had eight stacks of Wheat and two barns full, and he ought to know from what holds the various stacks, &c., were collected. If he mixed his Wheat I should hardly think he will get the top price of the market, as such a fine farmer as he no doubt expects. Well then he knows, or at least might know, how many cubic feet there are in each of his barns, and he knows, or might easily know, how many cubic feet there were in each of the stacks he has threshed; and he knows, or might know, how many cubic feet there are in the six stacks remaining. Now such a grand book-keeper as himself, who understands book-keeping by double and single entry, and who can make up such a very expandible balance-sheet, no doubt understands simple proportion; and as he has threshed a certain known number of cubic feet, and knows how much he got from them, I presume he would have no great difficulty in finding out how much Wheat he is likely to get from the number of cubic feet he has remaining. As to the price he will sell them for I really have no mode of foretelling. I wish I had, for I should soon be the richest man in the world, if no one else had a similar faculty. "West Indian," however, told him that in making a balance-sheet, and valuing stock in hand, people do not expect to know the value of the article three or four months thereafter, but simply its market value upon the day on which the balance is struck; and as "Looker-on" is one who can "tell a bullock by the touch," surely he need have no difficulty in fixing that. In conclusion, let me remind "Looker-on" that an honest man makes a balance-sheet to inform himself as to his then position, and to find out whether he has been making or losing money during the previous twelvemonth. He does not make it to deceive himself, and therefore he marks down each article at the value he honestly believes it would fetch. No doubt if any one desired to deceive, he could in any business, quite as well as in farming, show a balance-sheet made up from high valuations; but even "Looker-on," with all his fine book-keeping, would find it very hard to deceive three years running, because £1000 false valuation the first year must become £2000 the second, and £3000 the third; and I really do not think "G. A. H." would have any great difficulty in sticking a pin through the false entries.

In conclusion, let me congratulate "Looker-on" upon having recovered his temper and his spirit; at the same time I really think he makes a great mistake when he likens himself to David, and me to Goliath. I think his former simile of the lion and the unicorn a much more apposite one, and I have no doubt your readers will be able to say, very correctly, which is the lion and which the unicorn. *G. A. H.*

COTTAGES.

We hope shortly to give a series of illustrations of cottages of various forms and construction, taking the instances chiefly from a sheet prepared by Mr. Bailey Denton, and submitting the various methods of arrangement to the criticism of one who has had large experience in estate management. Meanwhile we take from the series of engravings for which we are indebted to Messrs. Longman, the following example, which may represent the minimum of accommodation—suitable to the circumstances of a Highland cottar—and erected on the estate of Her Majesty at Balmoral.

The drawings represent in plan and in isometrical perspective a cottage for a labourer, four-roomed (*a*, *b*, *d*, *e*), with spaces (*c*, *f*) for a bed-closet in addition, both on the ground floor and above. Built substantially of expensive mason-work, being of granite,

Fig. 71. Balgowkie's cottage at Balmoral. Isometrical view.

they cost about £150 a-piece, though not above £2 or £3 per cent. upon that sum is charged as rent. The wages of an ordinary ploughman in that district are from £16 to £20 per annum, with food, or 2*s*. 6*d*. per day if paid in money only.

In the case of all the cottages the plans were prepared upon the suggestion of his Royal Highness the Prince Consort, receiving corrections from his hands during their design, and receiving superintendence from him during their erection. Moderate rents have been in every case charged—the advantage to the estate being considered, not in the direct addition of annual money return, but in the establishment upon it of a healthy well-conditioned labouring population.

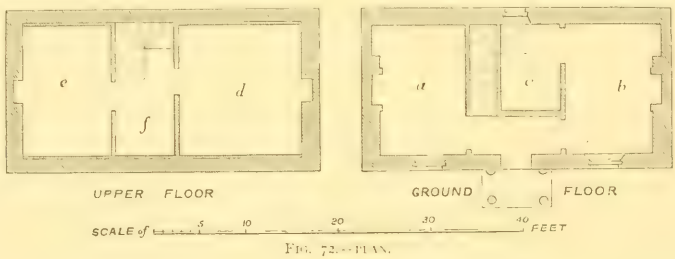

Fig. 72.—Plan.

There can be no doubt that the reduced death-rate in the case of cottage population at Osborne has been due to the intelligent attention paid to their sanitary condition. Mr. Chadwick says:—"If all the cottage property in the United Kingdom were maintained in the same condition as that of Her Majesty and H. R. H. the Prince Consort, the death-rate would be reduced more than one-third, or nearly one-half. It would be as if every third year there were a jubilee, and there was no sickness and no deaths."

POOR RATES—SPADE HUSBANDRY—SMALL FARMS.

All classes seem to agree thoroughly on one point,—that poor-rates have become a national evil, and at their rate of increase they are likely soon to become a most serious political problem; hence, benevolent individuals are taking active steps to get all the working men, women and children, out of the country who are willing to leave it. Beyond doubt, the best intentions are at the bottom of this movement; still, to my thinking—and I know many agree with me—this is a great mistake, at least it is premature. We should first see what may be done to better the condition of the working classes at home before we send them away. That there is vast room for agricultural improvement in England no one will venture to deny, at least, no one who has studied Mr. Mechi's "Agricultural Catechism;" and if there is a farmer in the United Kingdom who has not read that, then, if he can read, the sooner he masters it the better for himself and his land. Well, sir, this agricultural improvement, properly undertaken and carried on, would very soon become what few may now think possible, viz., self-supporting, or very nearly so. If we consider, firstly, its direct effects in the immediate reduction of poor-rates, and indirect effects in vastly increased production of food for the people, I believe the fact will be too evident to be doubted. In proof of this I may state, a friend of mine lately purchased an estate in Surrey, and we walked over the agricultural portion of it with one of the first land agents and surveyors in England. Two tenants pay about £150 a-year rent for, I think, 295 acres of land, the staple of which is really good, but almost ruined by valueless timber and surface-water. This eminent professional gentleman, who is termed a "pessimist valuer," exclaimed:—"If this land was for a year or two in the hands of Mr. Mechi, it would be honestly worth 30*s*. per acre; there is much landlord's work to be done here, and if I was his agent I could find profitable employment for every man, woman, and child in the parish, willing and able to work, for the next two years." Well, sir, I would ask, is this an isolated case? If not, I should like to know of how many parishes in proud wealthy England could the same be as truly said? I think the entire extent of the property referred to is about 700 acres.

To ship off people to the colonies requires a good deal of money, so it does to support them as paupers; but few seem to think of the revolution it would cause in agriculture, to employ the same capital in safe reproductive manual labour in our much neglected green fields. It may be said landlords generally cannot now command the capital necessary—if the work was to be done in China there would be no difficulty whatever in finding it, but as it is for much needed improvement at home of course we can't find the "almighty dollar," so we must go to the Government for it. The State, for political purposes, withdrew protection from the land, to please our wealthy town-dwellers; so now it is but simple justice that the State should assist to improve the land it has despoiled for the public good. By the way, what is termed "Free Trade" has utterly ruined Ireland—a depleted country, that has nothing to depend on but her agriculture and such agriculture!—fostered and "protected" by a cruel system of absenteeism and a stupendous organism of universal quackery. One thing I take to be absolutely certain—any amount of capital necessary for agricultural improvement may easily be had for the asking, if not from the Government from Parliament. Make it a charge, the first charge, on the land, which may easily bear and speedily repay it, without being felt by landlord or tenant. I heartily wish some one would get up an agitation on this most momentous subject, and write letters weekly in your Paper about it; England would then soon come to understand whether her interest lies in employing her sons profitably at home, or sending them abroad as quasi-paupers.

Now a few words about small farms and spade husbandry. I am aware many persons condemn small farms, but without going into the general question, I apprehend they will be found best suited for the profitable production of small things, such as eggs, poultry, honey, tarn, rabbits, &c.—articles for which, in the aggregate, England pays an enormous sum annually to foreigners, though I have never heard it said we could not produce all of them just as well in England. See what is done in Belgium by breeding rabbits alone! Is there any secret, art, or mystery in this? If not, why will not Englishmen follow so good an example? Surely on farms varying from 5 to 50 or 100 acres, rabbits, poultry, and eggs may be made more profitable than bullocks or sheep. I have seen a sensible calculation, proving that the land necessary to support one breeding ewe will well keep eight breeding does, the money value of the produce of the latter, under proper management, being largely in excess. Again, I think it may safely be allowed that a hen, properly fed and looked after, should yield an annual profit of at least 5*s*., while her value may be 2*s*. 6*d*. Will the best ox or dairy cow leave a yearly profit of double its own value? Who are the breeders of pigs and the producers of eggs and poultry in Ireland? The small

farmers. How do these men cultivate their small farms? With the spade. I personally knew a labourer in Ireland who had banked £80 entirely by producing eggs, which he sold at a very low figure. The farmers of England little think—too many of us, I am ashamed to say, never think at all—how their horses are helping—too many of them not only uselessly but injuriously—to consume the food of man, thereby rendering that food scarce and dear in our markets; but the fact is indisputable. We have too many horses, and too few, far too few men, now engaged in agriculture. Few educated farmers—no, not one—will deny that the gross agricultural produce of this country might easily be doubled. Well, I apprehend this will not be done first on the largest farms, 'tis the subsoil plough, followed by the spade and the fork, that will do it. The good work must be commenced and proved on small holdings; I contend, therefore, that if some "society" would go in to illustrate what may be economically done with the spade, it would soon beat all the emigration societies out of the field. I am far from wishing to disparage those benevolent persons who think they are doing good service to their kind and country by sending her best sons away. They mean well, but they really do not understand the work they have undertaken to do, or the wants of the country; they have begun at the wrong end; they should combine to keep the men at home, and to find good employment for them,—and it would be easier to do this than to find money to expatriate them.

I see a work is published, termed "An Acre of Land." No doubt, with a spade, a vast deal may be done, even on one acre, but our ideas in England are too large for acre farms, and we want small, cheap, swiftly paying stock for such little localities. Thousands of horny-handed men could purchase fowls by the hundred, as well as rabbits and bees, to consume the ample produce of a few acres, under spade culture, that could not look at a bullock or a cow. How many head of poultry and rabbits may be profitably fed on the produce of two or three acres? This is a nice question, who can calculate it? Several hundreds, no doubt. What the million want is, work and wages—not charity, not soup kitchens, not transportation. *Nemo.*

AGRICULTURAL STATISTICS, 1868-9.

[We continue the publication of the official tables.]

ACREAGE AND PERCENTAGE PROPORTIONS OF EACH KIND OF CORN AND GREEN CROP IN EACH DIVISION OF THE UNITED KINGDOM.

Description of Crops.	Years.	England. Acres.	England. Per centage proportions of each kind of Corn and Green Crop.	Wales. Acres.	Wales. Per centage proportions of each kind of Corn and Green Crop.	Scotland. Acres.	Scotland. Per centage proportions of each kind of Corn and Green Crop.	Total for Great Britain. Acres.	Total for Great Britain. Per centage proportions of each kind of Corn and Green Crop.	Ireland. Acres.	Ireland. Per centage proportions of each kind of Corn and Green Crop.	Isle of Man. Acres.	Isle of Man. Per centage proportions of each kind of Corn and Green Crop.	Channel Islands. Jersey. Acres.	Channel Islands. Jersey. Per centage proportions of each kind of Corn and Green Crop.	Channel Islands. Guernsey, &c. Acres.	Channel Islands. Guernsey, &c. Per centage proportions of each kind of Corn and Green Crop.	Total for United Kingdom. Acres.	Total for United Kingdom. Per centage proportions of each kind of Corn and Green Crop.
Corn Crops:																			
Wheat	1868	3,396,890	45·3	130,542	24·8	124,683	9·1	3,652,125	38·7	286,740	11·1	8,347	29·9	2,743	79·4	1,013	46·1	3,951,018	33·9
	1869	3,417,054	43·9	135,562	24·4	135,741	9·6	3,688,357	37·8	281,117	12·7	8,748	30·0	2,742	82·0	669	46·2	3,981,989	33·2
Barley or Bere	1868	1,758,201	23·7	131,608	27·7	219,515	15·8	2,151,324	22·8	183,242	8·5	7,563	27·1	278	8·1	951	29·6	2,348,068	20·1
	1869	1,864,088	24·0	137,552	28·4	229,810	16·2	2,231,450	23·1	223,338	10·1	7,692	26·9	198	5·8	869	27·1	2,483,277	20·7
Oats	1868	1,488,470	19·9	257,153	46·6	1,001,476	72·0	2,747,021	29·2	1,699,919	77·5	11,747	41·7	373	10·9	410	18·7	4,459,387	38·3
	1869	1,511,975	19·4	259,692	45·8	1,017,775	71·8	2,789,232	28·5	1,684,788	76·1	11,823	41·3	361	10·6	433	20·6	4,480,125	37·3
Rye	1868	38,397	·5	2,110	·4	6,389	·4	46,896	·5	7,854	·4	12	·1	24		41		54,827	·5
	1869	52,769	·7	2,411	·5	8,750	·6	63,930	·6	8,770	·4	49	·2	31		37		72,986	·6
Beans	1868	503,700	6·7	3,777	·7	22,423	1·5	529,900	5·6	8,813	·4	162	·6	15	1·6	53	5·6	538,943	4·6
	1869	548,257	7·0	3,944	·7	22,003	1·6	574,204	6·0	8,833	·4	130	·5	11	1·6	73	6·1	584,251	4·9
Peas	1868	291,560	3·9	2,673	·5	2,001	·3	296,234	3·2	1,157	·1	177	·6	15		29		297,612	2·6
	1869	389,950	5·0	3,110	·5	2,067	·2	396,177	4·1	1,124	·1	153	·5	12		17		397,483	3·3
Total of Corn Crops	1868	7,490,218	100·0	547,873	100·0	1,386,441	100·0	9,433,532	100·0	2,192,785	100·0	27,888	100·0	3,453	100·0	2,197	100·0	11,659,855	100·0
	1869	7,785,033	100·0	555,828	100·0	1,417,176	100·0	9,758,037	100·0	2,207,970	100·0	28,595	100·0	3,411	100·0	2,098	100·0	12,000,111	100·0
Green Crops:																			
Potatos	1868	327,173	12·7	47,411	37·0	166,939	24·8	541,543	16·0	1,034,833	72·1	4,459	33·5	2,280	30·5	1,078	28·3	1,584,213	32·6
	1869	356,829	12·9	49,107	38·5	170,275	26·0	585,211	16·4	1,041,837	70·9	4,390	35·4	2,736	46·9	1,167	31·3	1,635,347	32·3
Turnips and Swedes	1868	1,605,980	62·1	70,350	54·8	488,812	72·7	2,165,142	63·9	320,666	21·9	8,419	63·3	1,766	30·6	143	3·7	2,495,536	51·3
	1869	1,614,580	58·5	67,090	52·6	489,848	71·2	2,171,526	60·7	321,886	21·9	7,499	60·4	1,489	25·5	118	3·2	2,502,512	49·4
Mangels	1868	244,563	9·4	3,155	2·5	723	·1	248,041	7·4	19,067	1·3	44	·3	443	7·7	185	4·9	268,780	5·5
	1869	287,182	10·4	4,528	3·6	1,012	·2	292,742	8·2	21,029	1·4	57	·5	457	7·8	136	3·6	314,421	6·2
Carrots	1868	11,959	·5	368	·3	938	·1	13,265	·4	3,784	·3	244	1·8	316	5·5	201	5·3	17,815	·4
	1869	13,033	·5	324	·3	987	·1	14,344	·4	4,702	·3	311	2·7	257	4·4	197	5·3	18,831	·4
Cabbages, Kohl Rabi, and Rape	1868	111,156	4·3	709	·6	3,158	·5	115,083	3·4	42,268	2·9	45	·3	45	·8	84	2·2	157,525	3·2
	1869	141,156	5·1	795	·6	3,100	·6	145,051	4·2	42,217	2·9	21	·2	36	·6	122	3·3	187,667	3·7
Vetches, Lucerne, and any other green crop, except Clover or Grass	1868	284,388	11·0	5,419	4·2	11,935	1·8	301,792	8·9	36,264	2·5	99	·8	916	15·9	2,117	55·6	341,188	7·0
	1869	346,318	12·6	5,600	4·4	14,075	2·0	365,993	10·2	38,210	2·6	102	·8	861	14·8	1,089	53·3	407,155	8·0
Total of Green Crops	1868	2,585,019	100·0	128,392	100·0	672,555	100·0	3,385,866	100·0	1,456,307	100·0	13,310	100·0	5,766	100·0	3,808	100·0	4,865,057	100·0
	1869	2,759,098	100·0	127,452	100·0	688,517	100·0	3,575,067	100·0	1,468,895	100·0	12,406	100·0	5,836	100·0	3,729	100·0	5,065,933	100·0

* Acreage under—

		Cabbages.		Kohl Rabi		Rape.
1868	.	21,819	..	13,241	..	80,023
1869	.	24,931	..	17,318	..	103,906

† Acreage under—

		Vetches or Tares.		Beet Root.		Chicory.		Lucerne.		Other Green Crops, except Clover, &c.
1868	..	246,597	..	1,429	..	779	..	7,496	..	45,500
1869	..	294,924	..	2,168	..	624	..	9,043	..	59,234

AYLESBY, RIBY, AND ROTHWELL.

[The following is Mr. H. M. Jenkins' account of farms in the hands of Mr. Wm. Torr, extracted from the Journal of the Royal Agricultural Society.]—*Continued from p. 222.*

Grass-land.—The permanent pasture consists of about 200 acres of marsh-land at Immingham and Stallingborough, 300 acres at Aylesby and Riby, and a small "sanatorium" of 16 acres at Rothwell. It is all old pasture, except about 60 or 70 acres at Riby. This was laid down after two successive crops of Turnips, the land (a light gravelly loam) having been well limed previous to the first crop. The Turnips were eaten off by sheep, and a seedsman's mixture of small seeds was sown the next year with Barley. This new pasture has been much used for lambing ewes, which have eaten on it a large quantity of Mangels, Swedes, corn, and cake; and it is considered that the absence of Mosses is to be attributed chiefly to this treatment.

Some portion of the old pasture is annually top-dressed in rotation with from five to six loads of compost per acre, mixed with foldyard manure; and frequently quantities of Wheat-chaff from the threshing-machine are scattered over it. The marsh-land is chiefly used for grazing and feeding purposes, oilcake being frequently given on it. At Aylesby and Riby the pastures are stocked with the breeding flock. No horses are ever put on Grass.

The permanent meadow land is all old, and consists of from 40 to 50 acres; it is annually top-dressed with five or six loads of foldyard manure, or with compost, and it occasionally receives a dressing of guano, from 2 to 3 cwt. to the acre. Mowing and haymaking machines are used for getting in the crop; and the hay is put up in round ricks. All the hay is chopped before used.

Occasionally the mower is put over some portion of the pastures in June, so as to get better Grass for lamb-keeping.

Arable land.—The shift at Rothwell and Riby is the ordinary four-course system, with the exception that a small portion of the earliest fed-off Turnip land at Riby is sown with Wheat instead of Barley. At Riby Barley is the only spring corn, while at Rothwell Oats are usually grown. At Aylesby the Wold land is managed similarly to that at Riby; but the strong clay land, which has been drained and limed, is, as a rule, sown with Wheat every alternate year.

The following tabular statement of the courses of cropping at the different farms will make the system intelligible at a glance:—

	Rothwell.	Riby.
1st year	Wheat.	Wheat.
2d ,,	Turnips.	Turnips.
3d ,,	Oats or Barley.	Barley or Wheat.
4th ,,	Seeds.	Seeds.
	Aylesby Wold.	Aylesby Clay.
1st year	Wheat.	Wheat.
2d ,,	Turnips.	Roots.
3d ,,	Barley or Wheat.	Wheat.
4th ,,	Seeds.	Seeds or Tares.

It will thus be seen that, out of 1714 acres of tillage, about 500 acres are annually devoted to Wheat.

1. Wheat: Except on the strong land at Aylesby, the seeds are always ploughed and pressed early, and the land is left thus until the end of September or the beginning of October. The strong land seeds are generally broken up by the steam-cultivator at a cost of about 12*s.* an acre, and the land is afterwards ploughed and pressed. Any portion which seemed to require it would have a dressing of summer-made foldyard manure before ploughing; and another portion would probably be top-dressed with 2 cwt. of guano and 3 cwt. of salt early in the spring.

The seed, after having been dressed with arsenic, or preferably with blue vitriol, is drilled with an ordinary corn-drill, from 8 pecks on the strong land to 12 on the Wold land being used to the acre. Oxford Prize (a red Wheat) is the kind usually sown. Sowing commences on the Wold land at the end of September, and finishes on the strong land in the last week in October, except on those portions of the farm where Wheat succeeds early-fed Turnips, as there it cannot be sown until the end of November or beginning of December. There also the seed is drilled with a two-row presser-drill, consisting merely of a common drill attached to an ordinary 2-horse presser. Early sowing is regarded as of the greatest importance on the higher lands, as it enables the plant to resist the severe winter frosts of that climate so much better than it could otherwise do. Spring Wheat is cultivated to a certain extent.

Early in the spring the land is Cambridge-rolled, and the strong land is well harrowed; a large portion of the light land is also gone over with lighter harrows; but hoeing is not much practised.

At the commencement of harvest a reaping-machine is used; and, after a certain portion has been thus cut, the remainder of the Wheat and the whole of the spring corn are cut by the scythe. The Wheat cut by the reaper is harvested as soon as possible, and every endeavour is afterwards made to keep the harvesters as close as possible to the scythe. The harvesting of the machine-cut Wheat commences as soon as the scythe begins to be used to the remainder, and afterwards to the spring corn—harvesting and mowing proceeding together.

Wheat and Barley are sheafed and stooked in the same manner as on the Wolds; and the former is made into round stacks, each of which contains about one day's work for a steam-threshing machine, or on the average from 40 to 50 quarters. The stacks are placed on raised steddles, which are nearly 1 foot in height, and are made of a concrete composed of a mixture of chalk and sand.

The prevailing system of payment is at a certain price per acre for the whole of the white crops on the farm, the prices for 1868 having been 10*s.* 6*d.* per acre for Aylesby, 9*s.* 6*d.* for Riby, and 8*s.* 6*d.* for Rothwell. These prices include mowing, sheafing, stooking, raking, &c.; in short, getting everything carted to the waggons. Threshing is done entirely under a hiring

or letting system, the whole of the corn to be threshed being let out at a certain price per quarter all round, the man who takes the contract performing every operation except stacking the straw and carrying the corn into the barn. When an elevator is required the contractor finds it. The prices paid are 1*s.* 8*d.* per quarter for Wheat, and 1*s.* 5*d.* for Barley; but the whole of the white crops are generally taken at 1*s.* 6*d.* per quarter all round. Grinding is also done at the same price.

2. Roots: Immediately after harvest, Glover's paring plough is extensively used on the stubbles, as the first operation in the preparation of the land for roots. The strong land stubbles are then broken up, in the autumn, by the steam-cultivator; the light land stubbles are ploughed, a 2-horse iron grubber sometimes following the plough. On the land intended for Swedes and Mangels half the manure, viz., five or six 2-horse loads per acre, is put on during the winter, and the same quantity in the ridges at the time of sowing. Upon the stronger land for Turnips about 3 cwt. per acre of guano is drilled in the open ridges upon the dung, and a smaller quantity than in other cases of superphosphate and ashes is drilled with the seed. On the lighter soils the principal artificial manure for Swedes and common Turnips is dissolved bones, which are drilled with the seed at about 4 cwt. to the acre.

The land for Mangel gets, as already stated, half a dressing of farmyard manure; then from 3 to 4 cwt. of salt, mixed with 2 cwt. of guano and dissolved in water, are put on the ridges by the liquid-manure drill; afterwards from 3 to 4 cwt. of superphosphate is drilled with the seed; and, finally, the land receives the remainder of its quota of farmyard manure. The latitude of Aylesby is so far north that it would be impossible to grow Mangels without a deal of encouragement being given them. Mr. Torr gives all his roots a heavy dressing of manure, as he does not, as a rule, manure seeds.

In the spring, cultivation is principally performed by strong Finlayson drags, and another portion of the stubbles is steam-cultivated. By these means the ordinary ploughing of fallows is very materially lessened, and, as a system, Mr. Torr much prefers dragging to ploughing in the spring.

The ridges having been rolled down, root-sowing commences in April with yellow globe Mangels, of which about 20 acres are grown, 6 lb. of seed being used to the acre. Following this, in May, about 120 acres of Skirving's Swedes are sown, as well as some early Rape; and about 20 acres of early white Turnips (grey and Tankard whites), about the same time, for early feeding-off by hoggs. From one-third to one-half of the land devoted to roots is thus sown by the end of May. Early in June hybrid Turnips follow in succession, namely, brown and green top yellows; and the common white, green, and pink globes, in alternate double rows, close the season of Turnip-sowing by Midsummer Day. The first week in July about 20 acres of late Rape is sown, to be fed off by drape ewes. The quantity of seed used is about 3 lb. per acre, of all kinds of Turnips; and all roots are sown on ridges about 27 inches asunder.

As soon as weeds begin to appear a light two-knived horse-hoe of home make is used, the common Turnips being set out to 10 inches apart, and the Swedes to 12. The Rape is gone over with a hoe having two 4½-inch blades, which prevents its becoming too thick and getting mildew. The grubber is then extensively used (two or three times), finishing up with a strong iron 1-horse implement. Hand-hoeing twice, and singling by a man and a boy, are afterwards done at the rate of 6*s.* per acre.

The Rape sown in May is eaten off by the rams and lambs in July, and the July-sown Rape is used for the drape ewes in November. If plentiful it is used for the breeding ewes when put to the ram, as it gives the certainty of a larger flock of lambs.

Towards the end of September the common Turnips are begun to be fed off, and are generally finished before Christmas. All Turnips are sliced by the Banbury cutter, and the original implement, which took the Royal Agricultural Society's prize at Oxford, may still be seen on the Riby Farm. The troughs are placed in the fold of the previous day, and the cutters are therefore outside the nets, not within. All kinds of roots are pulped for stock.

The sheep begin to go on Swedes soon after Christmas, and the later portion, as soon as they begin to show any indication of running, are taken up and put in small pies on the land, a few being occasionally put in pies with Mangels. The sheep generally come off Swedes about the middle of April.

The whole of the Mangels are carted off and put into pies, somewhat late in the season, as so far north it is very difficult to get them ripe enough to take up early. About 1 inch of the top and the whole of the fangs are left on the root, and neither straw nor thatching is then used in the pies, which are left open at intervals along the ridges, wisps of straw being used to stop up the apertures when required. Mangels mixed with Swedes are given to the stock, commencing in January and continued until late in March, when they are given to the ewes in lambing time, for which purpose they are very extensively used. After this they are pulped for cattle, and sliced with the turnip-cutter for ram-hoggs as late as July, or until the May-sown Rape is ready for them.

Cabbages: This crop has hitherto been grown principally for lambs in September, and for the lambing ewes in the spring, to be given with Mangels. Its cultivation is now being extended for earlier keeping and especially for lambs, about 15 acres being planted this year for summer eating, and about 10 acres for spring keep. The Cabbages are partly raised from seed, but a large number of plants are also bought, as in the neighbourhood of Grimsby they are very cheap. The land has a heavy dressing of dung before the plants are pricked out; and the planter is attended by a boy, who puts into each hole a small handful of old rotted bones.

The following is the scheme of Cabbage cultivation which is at present pursued by Mr. Torr:—

I. Seed sown end of July or beginning of August:
- (*a*). Planted out in October, in succession.
  1. Wheelers' Imperial; ready middle of June.
  2. Enfield Market; ready end of June.
  3. Enfield Market; ready beginning of July.
- (*b*). Planted out in March, in succession.
  4. Enfield Market or Late York (first week); ready middle of July.
  5. Sprotboro's (last week); ready middle of August.
- (*c*). Planted out in April.
  6. Drumheads (Scotch); ready in September.

II. Seed sown end of March or beginning of April:
- (*d*). Planted out end of June.
  7. Drumheads (Champions); ready in December.
- (*e*). Planted out middle or end of July.
  8. Drumheads; ready in January.
  9. Thousand-headed Broccoli; ready in March and April.

3. Barley: After the roots have been fed off, the land is ploughed and then gone over with a Finlayson drag, afterwards harrowed, and drilled with 11 pecks of Chevalier Barley to the acre, different varieties being used from time to time. Barley sowing is generally finished by the middle of April, and the land is then Cambridge-rolled previous to putting in the seeds. Barley is grown in a very large proportion at Riby, a smaller quantity at Aylesby, its place being taken by Wheat; and a still smaller quantity at Rothwell, being there replaced by Oats.

Barley is mown with the scythe, sheafed, and stooked, and carried to long stacks, the length of which is gradually increased as the crop comes in. These stacks have rounded or "cullis" ends, which are thus capable of being thatched, the gables being consequently avoided. In North Lincolnshire there is a great objection to gable or square-ended stacks. All the Barley is sold for malting.

Oats: As a rule the spring corn at Rothwell consists entirely of Oats, which are consumed by the cart-horses on the different farms.

Oats are sown about the same time as Barley; but, as they do not suffer so much as the latter from being sown either too late or too early, the period of sowing has a wider range. In other respects their cultivation is precisely the same as that of Barley. About 4 bushels of black Tartarian Oats are sown to the acre. The system of harvesting is also the same as already described above.

4. Seeds: For summer grazing the following quantities, subject to slight variations, are sown per acre:—16 lb. white Dutch, 6 lb. Trefoil, 2 lb. Plantain, 2 lb. Parsley, and on the higher land half a peck of Rye-grass. At Rothwell more Trefoil is sown, and less white Dutch, the high exposed chalk land being considered less favourable for white Dutch Clover than more sheltered and stronger soils. For mowing 14 lb. of Red Clover are sown with a quarter of a peck of Rye-grass. About one-fourth of the seeds only are sown for mowing, so that Red Clover is not grown more than once in 16 years, and Clover-sickness is not prevalent in consequence.

The seeds are drilled across Barley, Oats, or Turnip-land Wheat, the coulters being let down where the land has not been Cambridge-rolled. After sowing the land is lightly harrowed. No manure is put on the seeds, and occasionally Tares are sown in place of them.

The Red Clover is mown with the scythe, the mowing-machine being very little used in consequence of flints and other stones being so abundant; otherwise it is treated and used exactly the same as the meadow Grass, and is similarly put through the chaff-cutter before being used.

Vetches: From 12 to 14 pecks are sown early in the autumn on Wheat stubble instead of seeds, with a little Wheat or Rye to hold up the crop. Most of them are got as soon as ready, and used for the cart-horses, after having been put through the chaff-cutter with a little straw; the remainder are folded off in succession by sheep during the spring and summer.

Beans and Peas are not much grown, but occasionally Beans are grown on the strong land at Aylesby instead of seeds, the drills being 26 inches apart.

MANURES, THEIR MANUFACTURE, COMMERCE AND USE.

THE *Manure Trade* has now acquired an importance second to no other branch of British manufacture. Put the annual increase of all our cotton, linen, woollen, and hardware trades together, and it is questionable if the sum will balance the increase of produce arising from the application of artificial manures to the British soil; and when we add to this the notorious fact that this increase of produce is not half what it should be, something like an approximate estimate may be formed of its potential value to all classes of the public.

Like most other manufactures at the outset, the vast majority of artificial manures are made under patent; and this applies not only to the manures but to many of the raw materials of which they are made, or of processes by which these raw materials are manufactured. Under the heading of "Manure," there are on an average about 20 patents granted annually; and although there are doubtless many more blanks than prizes, yet some are improvements on old ones now successfully worked, of which we may quote No. 258 as an example, while others have promise sufficient to warrant their being reduced to practice. Patents of promise merit the patronage of our Chambers of Agriculture, Agricultural Societies, &c., at the present time, for the demands of the land are far greater than is compatible with the pockets of farmers, the price of agricultural produce, and the large expenditure farmers have annually to make for manure; and it is only by encouraging merited rivalry in the manufacture that lower prices of manure can be obtained. The following synopsis of the patents for 1869 will enable the reader to form some idea of them, and as the specifications are filed in most of our county towns from six to eight months after their date, and are open for examination without charge, those of our readers interested may do so:—

No.	255	Jan.	27	Phosphate manure.
,,	472	Feb.	16	A manure from waste wool, &c.
,,	682	,,	15	Sewage manure.
,,	741	March	11	Refuse yeast.
,,	764	,,	12	Sulphur plug plates.
,,	796	,,	14	Sewage irrigation apparatus.
,,	806	,,	15	Sewage manure.
,,	826	,,	18	Sewage manure.
,,	853	,,	22	Manure from refuse vegetable matters.
,,	980	April	1	Manure from the ashes of furnaces.
,,	1003	,,	4	Peat and manure, &c.
,,	1182	May	3	Steam apparatus for sewage, &c.
,,	2016	July	3.	Sewage manure.
,,	2060	,,	12.	Improvement in 1083.
,,	2081	,,	12.	Nightsoil manure.
,,	2257	August	3.	Manure from gas, &c.
,,	2458	,,	13.	Improvement in 472.
,,	2623.	Sept.	6.	Nightsoil manure.
,,	2771	,,	22.	Preparation of manure.
,,	3000	,,	11.	Peat charcoal.
,,	3221	Dec.	2.	Sewage manure.
,,	3245	,,	7.	Superphosphate of lime.

Gypsum (sulphate of lime) is a native product, costing from 30*s.* to 50*s.* per ton in the form of powder. Its reputed effects are very contradictory. On Clover-sick soils it is generally beneficial; also on Lucerne and Sainfoin. From 2 cwt. to 3 cwt. per acre is sown broadcast on a calm, moist day, purposely that it may adhere to the leaves, as it produces the best effect when a thin crust or film is formed on the surface. It has also been sown successfully on young Potatoes, Turnips, Peas, and Beans, in the same way. In the United States, under the name of "plaster," it is applied at the time of sowing extensively in much larger quantities, but in England this practice is very limited, probably owing to the presence of a sufficient supply of gypsum naturally in the soil. It is used in stables, privies, and strewn over farmyard manure as a weak but safe deodoriser of the ammonia. It contains upwards of 46 per cent. of sulphuric acid, and perhaps the preservation of ammonia (considering the high price of sulphate of ammonia and guano) is the most profitable way the farmer can use gypsum. But its peculiar action on the leaves of Clover and other plants has not been sufficiently investigated.

Sulphate of ammonia, which now sells at from £14 10*s.* to £15 10*s.*, ranged during 1869 from £15 to £17 per ton, and some say that the latter price will again be obtained, owing to the high price of Peruvian guano. But the salts of ammonia are now very largely manufactured, and if farmers would preserve their home supplies by the use of gypsum, rough salt, and dry earth, it would help to keep down the price. The various ammoniacal salts are, however, largely used in the manufacture of most of the artificial manures now in the market, which has a contrary tendency. Sulphate of ammonia is applied to corn and grass crops, and the most profitable way of using it is mixed with rape-cake, cow-dung composts, and farmyard manure generally when deficient of ammonia. In this way rich corn and grass manure may be made and drilled in along with the seed from January to April, or sown broadcast and hoed in or bush-harrowed in upon meadow and pasture lands. Mixed with poor farmyard manure, along with bonedust or home-made superphosphate, it may be used for Potatos and other root croops. But used this latter way, the sulphate of ammonia, bonedust, and superphosphate have to enter into competition, both as to price and quality, with a great many artificial manures subsequently noticed, as phospho-guano, "Biphosphated Peruvian Guano," &c.

Agricultural Salt and *Common Rough Salt*, which can always be had at from 20*s.* to 30*s.* per ton, is perhaps one of the best and cheapest saline manures in use. Its presence is essential to the supply of healthy food for all plants, more especially Turnips, Cabbages, and others whose natural habitat is the seaside. It is also a powerful absorbent of ammonia and deodorant of farmyard manure, nightsoil, &c. Like the salts of the other two alkalies—ammonia and potash—it destroys grub-club and other insects in the land, and in farmyard manure, to which it is applied. It absorbs moisture, and thus promotes the rapid decomposition of animal, vegetable, and mineral substances in the soil, and also

in manure and compost heaps, thereby preventing freefanging and dry rot. And for these purposes it should be used more largely than it is. With most of the manures now used, as farmyard manure, composts, guano, lime, bones, &c., it should be mixed from 5 to 8 cwt. per cartload of the former two, guano half-and-half to twice the weight, one of salt to two parts lime, and so on. Salt is sown in the spring time, at the rate of from half a ton to a ton per acre on young corn, Grass, and Turnip fallows. Cold wet land it does not suit.

Nitrate of Soda has fluctuated during the past year (1869) from £13 to £18 per ton, its present price being quoted at from £15 to £16. The high fluctuation in the price is more due to speculation in the trade than to deviation of supply and demand. It is a very active salt, and from the small quantity used (from 1 to 1½ cwt. per acre) it is generally considered a cheap top-dressing. It is sown on brairded corn crops in spring, from February to May, and also on grass-land, when it rapidly sets up a vivid green leaf. But its action is defective in more ways than one, for even when silica and phosphate of lime are present in the soil it fails to render them available food to plants. To prevent corn crops "lodging" or "falling," common salt is sown along with the nitrate of soda, but the manurial economy of the practice is very questionable, for in many cases it only checks over-luxuriance of green leaf, but does no more, so that a less quantity of nitrate would do as well. Probably the salts of potash would lead to the utilisation of silica and bone-earth. The nitrate of potash (saltpetre) is too expensive (£25 per ton), so is the sulphate of potash (£15 to £17), but the muriate of potash may be had at from £8 to £9 per ton. Wood-ashes, and the ashes from paring and burning, also supply available potash to plants. In districts where wood is used for firing, the ashes should therefore be carefully stored, for the home manufacture of artificial manures, as indicated above.

Muriate of Potash has ranged during the past year from £7 15*s.* to £8 10*s.* per ton, on 80 per cent. Its use in the manufacture of manure is extensively on the increase, and the above quality was recently quoted at £7 15*s.*, free on board ship. As the demand increases, large supplies may be expected from America as well as from the Continent of Europe and the East, and sulphate of potash should be had at a lower figure than quoted above—£15.

Sulphur and Sulphuric Acid. The former (brimstone) is variously quoted, the supply short—2ds from £7 10*s.* to £8 10*s.* per ton; and 3ds from £7 to £7 10*s.* But there are prospects of this article being obtained at less money, as those who use it are getting a plentiful supply of pyrites, and are altering their furnaces to burn them by improved processes. The latter (sulphuric acid) is quoted, concentrated, 1.845 specific gravity, 1*d.* per lb.; brown, 1.712 specific gravity, ¾*d.* per lb.

Phosphate of Lime, native, can be obtained in any quantity from Spain and America, but the imports during 1869 have not been equal to the increased demand, consequently prices rule somewhat higher; but the freight is high, while the profits on the raw material are very low, and probably this has had more to do with the small rise in price than the difference between supply and demand. The American qualities are low, only testing from 55 to 60 per cent., but they work freely in the manufacture, and are liked, and have run from £2 to £2 6*s.* per ton. The Spanish (Estremadura) supplies are richer in quality, and the imports more than double in quantity the others. But past imports can be no rule for the future supply of this article, which can be imported to any extent the requirements of agriculture may demand.

(To be Continued.)

Home Correspondence.

Woolston Facts and "G. A. H.'s" Estimate.—There are a great many "ifs" and "thinks" in "G. A. H.'s" article at p. 287. Yet, upon one point he is positive, *i. e.*, "a good engine would not burn more than 6 cwt. of coal, if we took 10 acres per day." In his second line he says "a 10-horse engine." Now, I should like to know where I could buy a 10-horse engine that would not burn more than 6 cwt. of coal in a day, ploughing 10 acres a-day on an average, to say nothing about fetching its water in the dark; I would allow it extra coal for that. Let "G. A. H." begin work, and tell us what he does do. He may then drop his "ifs" and "thinks." "G. A. H." must have forgotten the number of water-carts he would need to fetch a day's water the night before, the cost for which must add a bit to his interest-of-money question; and it will not do to be short of a cart or two, for to have to knock-off at 4 P.M. for want of water would be about a quarter's loss, for by the time his engine would get up another load the day would be gone; and besides, the want of a quart of water might cause a blow-up. "G. A. H." says, "Mr. Smith . . . may have been before his age in 1855, but he is desperately behind it in 1870." Then I ask "G. A. H." to tell us who it is that I am behind. There are my 31 acres of Wheat after Beans at one smashing by steam and one cross-cultivating by horses, at a total cost of 6*s.* 8*d.* per acre, extras and all included, to be seen and shown against anything to be found in England. Then there are my 20 acres of Wheat (sown after Wheat last year), at one smashing by steam and one crossing by horses, at a total cost of 6*s.* 8*d.* per acre, extras included—as good a plant as that after Beans: this also may be seen; 39 acres of this cropping is on my old heavy land. On the new portion of my heavy land 20 acres of Beans have gone in first-rate after one smashing only, at a cost of 4*s.* 8*d.* an acre, extras and all included. My fourteen acres are now ready for drilling Barley for the fourth white-strawed crop in succession—*i.e.*, Wheat, Barley, Barley, and Barley, after a ridging and subsoiling in the autumn by steam, and a splitting of the ridges this spring by horses, at a total cost of 9*s.* 7*d.* an acre, extras included. This I will show against anything in England for tilth and cleanliness, be its cost for working what it may; and there are to be seen my 12 acres of land ready for roots after one ridging and subsoiling by steam in the autumn, and one splitting of the ridges by horses this spring, at a total cost of 9*s.* 7*d.* per acre ready for planting. These are not "ifs" and "thinks," but facts to be looked at by any man. It will not do for "G. A. H." to put his half-a-dozen-go (for a seed-bed) man in against them, even if he could calculate his extras at a little less per acre each time over. Let "G. A. H." tell me, if he can, who the man is who is a-head of me. All England would be glad to hear of him. He will not be found to be a "Fisken" system worker. On November 16, 1859, Mr. Fisken offered his system to me by letter. It was of no use to me, so I advised him to work out some facts himself, and lay them before the public. A letter of mine, Feb. 14, 1861, in the *Mark Lane Express,* shows this. On Feb. 26, 1861, I showed up the fallacy of Fisken's flying-rope system in the *Mark Lane Express.* My driving-band is a flying one, at the rate of 15 miles per hour, driving a windlass working the implement at three miles per hour. I like a good strong one—not one the size of my finger—that the men can readily splice to suit the size of the fields. I started in 1855 with a hempen rope, and here is what I say of it in my letter above noted:—"It cannot stand; after a little working it tumbles to bits, as though it was rotten." The facts upon the Fisken plan since 1859 are as yet worthless. "G. A. H." is now going in for a trial, we therefore may hope to hear from him. He must not go upon the half-a-dozen-operation system, or he will never push me behind; my figures are 6*s.* 8*d.* an acre for a seed-bed for Wheat, 9*s.* 7*d.* an acre for roots or Beans worked upon the ridge and subsoiling plan, and split in the spring; and 9*s.* 7*d.* an acre for Barley—Barley for ever if I like. The operations at those costs will keep my land clean for ever, and work it a foot deep. Now, "G. A. H.," go at it. *William Smith, Woolston, Bletchley Station, Bucks, Feb.* 28, 1870.

Farmers' Clubs.

LONDON: *Sewage Farming.*—At the close of Mr. Denton's paper on this subject, reported last week, the following discussion took place. We condense the report of the *Mark Lane Express*:—

Mr. HOPE said he rose with great diffidence to speak for the first time to the Farmers' Club, and should have hesitated to do so had not Mr. Bailey Denton called attention to his operations in connection with sewage farming.

The first point he would notice in the most interesting paper which had been read, was the statement made as to the number of persons per acre. As a rule a great deal of misapprehension existed upon this subject. Persons frequently talked of the number of tons of sewage per acre, and the number of persons representing those tons, when they intended to speak of the particular acres under crop in a given season, leaving out of consideration those other acres which either were in crop the year before, or would come into rotation the following year. Mr. Denton had pointed out that a large addition must be made of no less than 50 per cent. to the acres actually under sewage, in estimating the number of acres proportioned to a town. His own experience was that a smaller number of persons should be applied to each acre, his average being not more than 40 or 45 persons per cent., including the land which perhaps received no sewage at all in the given year. Dr. Voelcker was perfectly right, from the chemist's point of view, in saying that clay land was the best of all for the reception of sewage; but unfortunately it was also the nastiest upon which to grow market-garden crops. Cabbages and other similar plants refused to grow at all, and flooding a piece of land in the face of a north wind, in the expectation of getting Cauliflowers, was at the best a disheartening operation.

Dilution he regarded with comparative indifference. Many persons thought town sewage was too diluted, and that in point of fact it was questionable whether it did not do more harm than good. The first thing he did when he took the sewage of the town of Romford was to stipulate for an additional dilution of something like 20 gallons per head per diem at his pleasure in summer. The sewage at Romford, although it had a regular water supply, was so strong and thick that it would injure all young plants, not chemically but physically. Thirty gallons per head per day represented 48 tons per annum, or in round numbers 50 tons. That was approximately the dilution to be expected from the London sewage when the whole system was completed. This was the most suitable quantity, so far as he could discover.

With regard to the estimates formed by chemists of the value of sewage per ton, or per head of the population, he was himself originally much misled by the chemists, who were themselves misled from want of farming experience. They were afraid to trust their own chemical knowledge, and they fancied that by the application of so much "washy stuff," as the farmers called it, they would injure many crops, and they did not see their way to applying it at all times of the year. The explanation was that at that time they had not had sufficient experience. They, therefore, halved their theoretical value, and put it at 1*d.* per ton. He himself had a little skirmishing with his friend, Mr. Mechi, on the matter, and he had now very great pleasure in admitting that that gentleman's estimate of 2*d.* per ton was much nearer the mark. He (Mr. Hope) would repeat what he stated at the Society of Arts, as to the basis of his opinion upon this point. He had samples taken every half hour, night and day, for 203 days on the high and middle level sewers of London in 1865, from March to September, and the average analysis gave about eight grains of ammonia to the gallon, or 2*d.* per ton. It was quite clear that if you put a certain quantity of ammonia and other chemical manures into the ground, and did not somehow get them out again with a proper proportion of profit, it must be the fault of the man who put them in. His experience was that there was nothing in Nature to militate against such an operation. Land should be so arranged that with a proper proportion of Italian Rye-grass common meadow land, and all descriptions of roots and market garden produce, there was always a sufficient proportion of ground in a condition to receive sewage. He received all the sewage from Romford, and had of course to stand his chance of all suits in Chancery for nuisances, and he was not a bit afraid of the result, because he had long become convinced that he could not only apply it without injury or offence to the townspeople, but also with a handsome profit out of every ton of sewage. He was sowing 10 acres of Onions which would not receive any sewage during their growth, the land having been enriched in its fallow state. He himself could see no reason for the belief amongst some chemists that the theoretical value could not be borne out by skilful management on the part of the farmer.

He had gone into a number of very careful calculations as to the returns which might be expected from Rye-grass, that being one crop which must always be used on every sewage farm, and he found that if cows were reasonably well bred, of the right kind—large-framed Yorkshire or half-bred Shorthorns—well tended and housed, and never allowed to waste their milk-producing energy; and if the milk was sold near a railway station at, say, 2*d.* per quart, which was the average price obtained by dairy farmers in the neighbourhood of all large towns, the return to the farmer for his Grass consumed, after deducting interest on the cost of the cows and buildings, and allowing for everything in the most wasteful manner, would be, nett, 15*s.* per ton. When it was remembered that 70 tons per acre had been got in one season from ten crops, the return to the farmer must be even beyond what Mr. Denton had held out. Large crops were always obtained if the Grass was sown at the proper time. It should always be sown in the month of August, and lightly sewaged. One light crop would be obtained that year to pay for the cost of the sowing. There would then be another crop in the ground to come off in the spring. Last year Grass cutting began on January 24. This year that was of course out of the question, but no doubt the price would be proportionately high when the cutting commenced; so that even if a farmer in a bad season got only nine or eight crops, he might realise quite as much money. With regard to Mangel Wurzel and all other crops with similar appetite for manure (such as Drumhead Cabbages), 2000 tons per acre of sewage—equal to forty persons—was enough to produce a maximum crop. Twenty-five to 30 tons was the ordinary yield; but with sewage, 50, 60, and 70 tons, might be counted upon with absolute certainty, irrespective of the season. The plant was pushed forward from the very earliest stages of growth, supposing the soil to be suitable and friable. Nothing seemed to check it; it never flagged in long periods of drought, as was the case in ordinary farming; and, above all, there were no gaps. Even if some of the seed failed, transplanting might be effected with certainty. A field of Mangel produced in the ordinary way showed vacancies equal to a quarter of the whole. This was not the case with sewage, and, irrespective of this, the roots themselves were individually larger.

Market-gardening was a trade which every sewage-farmer must learn. He would be almost always within easy reach of a good market for vegetables, and he could grow better vegetables than anybody else. The quality of vegetables depended upon rapidity of growth. Grown slowly, they are more generally hard and withered; if grown rapidly, they are succulent and crisp. The difference between the two kinds in sale was something extraordinary in the Borough and Covent Garden. Last year he knew of an instance where 600 dozen of Cabbages were sent up, grown by the old and the new method. They went up on the same day, when the top price for Cabbages was 1*s.* per dozen. The 300 dozen of sewage-grown Cabbages were bought up at once at 1*4d.*; the others went off very slowly, first at 8*d.*, then at 6*d.*, and it took many hours to sell them.

A few facts like these ought to convince everybody not only of the value of sewage, but of the necessity of combining market-gardening with farming. It was the ambition of the ordinary farmer to spread his farming capital over a maximum number of acres, and perhaps in some parts of the country where rent and labour were cheap that was right, but where the rent was heavy and labour scarce the best policy was to concentrate capital upon a minimum number of acres. He would quadruple Mr. Denton's estimate for the above, and instead of making the sum £500 a year he would put it at £2000 or £2500, but at the same time he would multiply the returns at least by three. He had only further to add, that he paid £600 a year for sewage, representing 6000 persons, or in round numbers 2*s.* a head, and as now it was worth 8*s.* per head, of the result he was not afraid.

Mr. SMYTH, jun. (Washingtonbury, Baldock), desired

to make some observations on a plan of his own for utilising Mangel, looking at it with the view of utilising sewage.

The CHAIRMAN suggested that Mr. Smyth's remarks would be foreign to the question under discussion.

Mr. MECHI was rather an old sewage customer, it being now 27 years ago since he first wrote against the great folly and wickedness of throwing that away which would yield abundance of food for the people. He had practised it in his small way on his farm for 20 years.

The manurial power of England taken by stock represented 2½ sheep per acre; and he found that the same conclusion had been come to by the Rivers Pollution Commission; and 2½ sheep or 2½ people were about the same in manurial value. (Laughter.) It was a fact, and no laughing question. If they took an alderman's family he would give it in favour of man over sheep; but when they came to the same thing mixed with water they must estimate 50, 100, or 200 people to the acre, and if so the land in England must be very deficiently manured. The average rainfall in England was 2600 tons per acre, and the manurial power of 2½ sheep was mixed with 2600 tons per acre. In towns, taking 2½ individuals, the calculation of value was 60 tons per acre per head, making 150 instead of 2600 tons, and yet no one grumbled. He hoped by-and-by they would arrive at a more reasonable calculation. He believed if they doubled the manurial power of England they would grow a great deal more of everything than they did now—at least that was his experience, and he was glad to see the result wherever the towns had begun to move in the matter.

Mr. C. S. READ, M.P., said they were very much indebted to Mr. Bailey Denton for his paper, which was useful in consequence of its moderation. It was very much better to understate than to overstate the case. It was well known that to apply sewage at a certain period of the year, it would not produce the benefits to be expected from it. With regard to sewage farming, one point which had been hinted at he should like to refer to. Although there might be a considerably increased quantity of ground used for market gardens, he believed that for many years to come the principal produce would be Italian Rye-grass, but the great drawback to growing it was the impossibility in some districts of disposing of it; therefore, every sewage farm should have an apparatus for drying that article. Such an invention had been produced by Mr. Gibbs for drying corn, and was pretty successful. Hitherto all attempts at drying large quantities of Grass by artificial means had failed; but he trusted that the attention of scientific men would be more given to the subject, because, until that was done, they would never get the full value of their sewage produce.

Mr. THORNHILL HARRISON, C.E., said it struck him, after hearing the remarks that had been made, that the area of land required to utilise sewage upon was becoming more and more extensive.

Mr. Mechi had pointed out that we wanted a more extended area, so as to bring about the condition of things existing previously to the introduction of the water-closet and sewage system. Previously to that period the night-soil of the country was collected and carried to an extended district over the country. Doubtless some of the Lincolnshire farmers could give some information as to the value of the night-soil of Manchester, which was carried across the island into Lincolnshire, and purchased at the rate of 3*s*. 6*d*. to 7*s*. per ton, giving as the maximum a return of about 2*s*. 7*d*. per head of the population. That was the sum that the farmer gave for the night-soil. Of course the farmer expected a considerable profit from using it, and the amount of agricultural produce was not at all represented by that sum. He found that at Stockholm the price given by the farmers for night-soil was 4*s*. 5*d*. per head of the population, and at the barracks at Carlsruhe, 2*s*. 4*d*. per head. A disadvantage of night-soil was that it could be distributed over a very large area. As regarded market-gardens as a system through which a maximum value of sewage might be obtained, of course there were near every town market-gardens at present, and by-and-by there might be difficulty in disposing of the sewage for that purpose. The question now was, what had been the experience of sewage farming up to the present time? Upon this point information of considerable importance was given in the report just issued by the Rivers Commission. First of all was given the total value of the crops, per head of the population, derived from sewage farming. At Edinburgh 260 acres of land returned, per head of the population, 1*s*. 5*d*. as the total value of the produce. It was to deduct from the total receipts something like £4 per acre as produce naturally to be expected from the land without any sewage irrigation, and deducting that in the case of Edinburgh, the amount of 1*s*. 5*d*. was reduced to 1*s*. 2½*d*. per head. At the Lodge Farm at Barking the total value of produce per head was 4*s*. 1½*d*., deducting £4 per acre as before, it was 3*s*. 6*d*. At Aldershot the total value was 3*s*. 4*d*.—making no deduction for the crop without sewage, as the land, being sand, was worth nothing. At Rugby the return per head was 1*s*. 4½*d*. (nearly the same as Edinburgh), but the deduction as before reduced the amount to 8¾*d*. The values respectively at Banbury were 2*s*. 4*d*. and 1*s*. 4*d*.; at Worthing, 4*s*. 6*d*. and 3*s*. 8¾*d*.; at Bedford, 10*d*. and 7*d*.; at Norwood, 3*s*. 9*d*. and 3*s*. 1*d*.; at Croydon, 4*s*. and 3*s*. 5*d*. That was the total value of the produce derived from the application of sewage, and compared to 8*s*. per head as the value of sewage it could not be considered satisfactory; but there was another point to be looked to, and that was the commercial result. At Rugby the nett receipts, after deducting the expenses, only gave £86 8*s*., or 3*d*. per head of the population; and there was no allowance for the charge of interest upon £5000, the cost of laying out the land. At Banbury the nett receipts were £89 4*s*., or only 2*d*. per head, and there was no interest charged for £4000 expended. At Worthing the amount was £761 18*s*., or 1*s*. 11*d*. per head of the population, and Mr. Rawlinson said it only returned an interest of 1½ per cent. At Bedford it was only £67 6*s*., or 1*d*. per head, with no allowance for interest. At Norwood it was £149 15*s*., or 9*d*. per head, and no allowance for interest. These facts he gathered from the Rivers Commissioners' Report; and the experience in England up to the present time was therefore not satisfactory to the farmer or to the country. We were by no means getting the maximum of benefits to the farmer, nor the benefit the whole country ought to receive. Probably the experience of market-gardening might mend the matter; but up to the present time the experience was very decidedly against sewage irrigation, as being either a beneficial application of the excrement of man, or a commercial success to the person who tried it.

Mr. EDMUNDS (Rugby) said: That after the glowing accounts they had heard he was afraid there must be something wrong with them at Rugby.

There they had no such results. Last season was an exceptional one—by this time they were cutting their first crop of Grass (this year it had scarcely commenced growing); and then, though the ground was irrigated so soon as the crop was removed, they were only able to get six cuttings. Some difficulty was experienced in disposing of all the Grass, and one piece was mowed for hay. This realised £47 for 9 acres; three other crops were obtained, but they were inferior. He did not think sewage farming would be that very profitable occupation it had been represented. So much depended upon the nature of the land itself, its situation, &c., that he was quite sure those great returns they had heard of were exceptional. No doubt enthusiasts had been the means of carrying out all our great improvements, but it required some one now and then to put the drag on to prevent others being carried too far.

The CHAIRMAN said this was the fifth time the Club had discussed the subject of town sewage.

As early as 1848 Mr. Warren, of Horsley, brought it forward, and it was discussed on three other occasions by Mr. Mechi; so that, as far as the farmers of England were concerned, the Club could not be charged with being behindhand or indifferent to its importance. He had long taken a deep interest in the question, and some seven years ago he travelled half over England and Scotland to inform himself upon the subject before recommending any plan to be adopted in the borough of Bedford. He saw the necessity of separating rainfall from the sewage. This was a cardinal point where sewage had to be pumped; and he differed from Mr. Hope as to the amount of dilution. Then it must be remembered that vegetation, and not so much the earth itself, was the great deodoriser. If the rainfall was taken into the sewers there was great difficulty in dealing with the sewage in winter when the supply was greatest, and when vegetation, being dormant, required least. As to the area required per 1000 of the population, that depended upon circumstances, but mainly on the amount of filtration and screening which the sewage had to undergo. Last week he saw at Croydon an invention by Mr. Latham for screening sewage. A large perforated wheel placed in the sewage tank, in the course of its revolutions, threw out all the more solid matter before the sewage was put on the land; when sewage was so treated a very much smaller area was required for utilising it. When he told them that the land at Bedford had realised as much as £20 an acre, he thought it would be seen that Mr. Harrison's calculations were scarcely tenable. At Edinburgh, too, in open competition, the land had fetched as much as £28, and even £35 per acre.

Mr. HARRISON: I don't deny the immense produce from sewage application.

The CHAIRMAN said he did not base his remarks upon that; but he denied the statement of Mr. Harrison, that towns had hitherto failed to apply their sewage profitably. With respect to the soils best adapted to sewage, the towns had no choice, but must use the soil by which they were surrounded; but towns would do well to remember that the sewage should be applied eastwards of the town, where possible, as, the prevalent winds being west, less effluvia, if any, would be carried to the town than if the sewage were applied on the west side. With regard to the drying machine of Mr. Gibbs, he thought its usefulness would be manifest in cases where towns had a difficulty in disposing of their Rye-grass. With regard to the dry earth system, it had been adopted in the middle-class schools at Bedford and at labourers' cottages he had recently built with marked success, but he did not think it could be adopted in large towns or places where carelessness existed. His experience led him to the conclusion that all sanitary arrangements in cities or towns must be as nearly self-acting as possible. He believed they had arrived at the solution of this difficult problem of town sewage. The plan adopted was not new. At Milan it had existed 500 or 600 years, at Edinburgh for nearly 200 years; and therefore, as Solomon had said, there was nothing new under the sun.

Mr. BAILEY DENTON, in reply to the observations made, said, as regarded Mr. Harrison's remarks they ought to look not so much to the past as to the future, which he hoped would be the case, as it was clearly not right to make the efforts of infancy the criterion of the future. His observations would certainly be very disheartening if they had any influence with the meeting. With regard to Mr. Hope's remarks, he believed the report of the River Commission before referred to would show that an excess of dilution washed out the manurial matter through the soil, and if he (Mr. B. Denton) was right there was a mean to which they ought to direct their attention. He hoped some good would arise out of the variety of opinions that had been expressed on this point. With regard to another remark of Mr. Hope's, as to quadrupling the item of labour, the advantage of sewage irrigation was that the sewage was brought to the land and there distributed with a very great diminution of labour. With regard to Mr. Gibbs' machine, he happened to be one of the judges of it at Manchester, and he advised its application to the drying of sewage produce. As regarded the statement of Mr. Edmunds, of Rugby, that the finer grasses disappeared with sewage irrigation, it had been found at Carlisle to double the value of perennial grasses—land which was rented at £4 an acre there now renting at £8. This was old grass-land.

Notices of Books.

Wheeler's Illustrated Book on Grasses. J. C. Wheeler & Son, Gloucester.

We have noticed Messrs. Carter's and Messrs. Suttons' Trade Annuals, in which, besides the mere advertisement of good seeds for sale, capital instructions on cultivation are given to intending customers. We have now to perform the same office for Mr. J. C. Wheeler. He has here issued a book on grasses, giving trustworthy descriptions, illustrations, and instructions, to any one wanting to buy good Grass seeds, and thereafter cultivate them successfully. It is a good essay on the growth and cultivation of grasses, and we make a short extract from it:—

"The question arises whether it is more desirable to sow grasses for permanent pasture with or without a corn crop. Each plan has its partisans. Knowing by experience that most excellent crops of corn have been harvested without injuring the young grasses, we are unwilling to advise our customers to forego the profit accruing from a valuable crop of Wheat or Barley. Still, if any prefer sowing Grass seeds without a corn crop, we strongly recommend that 2 lb. of Rape seed be sown per acre with the seed; the object being to protect the young grasses and Clovers from the scorching rays of the sun, and at the same time to afford valuable keep for sheep. In all cases we send the Clovers separate from the grasses; and unless ordered to the contrary we take especial care to have the Grass seeds thoroughly well mixed together—it is rather a difficult and tedious process, but a very important one, as the value of the pasture greatly depends on the finer grasses blending with the free growing ones. It is usual in sowing seeds for permanent pasture to go over the ground twice, sowing the heavy (Clover) seed first, and then go over again with the light (Grass) seed. A still, quiet day should be chosen for the operation, as if it is windy or rough the light seed will be blown hither and thither, and so be unequally distributed. After the seeds are sown, the land should be bush-harrowed and well rolled. The more heavily rolled the better.

"We take leave to quote a short paragraph extracted from an article written by the President of the Royal Agricultural Society, H. S. Thompson, Esq.:—

"'I will assume that before laying down land to Grass the land has been well fallowed and limed, that it is clean, in good heart, and sown with seeds adapted to the locality. This is certainly assuming a great deal, but if any parts have been neglected, the failure that will certainly ensue must not be attributed to the inherent difficulty of the operation, but to the farmer's own neglect of the indispensable conditions of success.'"

The Week's Work.

MARCH 19.—*Flax*. Sow in our southern counties, in order to get the ground covered before the dry weather sets in, continuing the sowing northwards until the beginning of May. Flax occupies a wider range of latitude than most of our cultivated crops. In Egypt and other warm countries it is sown before winter, but with us in the spring; and from the fact that it grows more successfully in the Netherlands and in Ireland than in Egypt, Italy, or the South of France, and that it grows wild in our fields, the climate of this country may be said to be natural to the crop. The modern system of autumn fallowing and manuring, and smashing up of the land at this season so as to keep the finely winter-made mould on the top, is well adapted for Flax; and by such means it may be grown on heavier soils than were formerly denominated Flax soils. It requires a rich soil, but the manure in the land should not be in a crude or half-decomposed state. It is common therefore to grow a corn crop between it and root crops after farmyard manure. But artificial manures may be applied early in spring, a month or so before the Flax is sown, if the land otherwise is too poor. It is common in the North of Ireland to sow Wheat after Potatos, and Flax after Wheat, sown out with Clover and Rye-grass seeds. But we are doubtful if this is the best place in the rotation for the drier counties of England; the more promising course being to sow Flax as a bastard crop between Wheat and Turnips. For fine Flax 3 bushels of seed are sown per acre, and bush or chain harrowed in; and very great care it needs in the selection of good seed, as Flax is very liable to be infested with Dodder.

Clover fields clear of stones and every obstruction to the mowing machine. Top-dress where necessary. Where lime is naturally deficient in the soil, gypsum, at the rate of 6 to 8 cwt. per acre, is a good manure for Clover, but it is better to delay the application until moist weather, about the end of April, for it is only when the white powder forms a thin crust upon the leaves that its fertilising action is most beneficial. But there is no arbitrary rule of application as to time; the really practical rule is to apply the gypsum in

moist weather whenever the Clover begins to grow rapidly, be it March, April, or May, and not sooner.

Sainfoin. Sow on calcareous and sandy soils adapted for it. It is sown successfully both in the richer class of such soils, when the Clover becomes sick, and on the poorer when almost none of the other grasses will grow. It requires a clean seed-bed, free from weeds, or rather the seeds of weeds, and therefore it is generally drilled across Oats or Barley, after a fallow crop, as Turnips; or it may be drilled in across winter or spring Wheat or Rye, 8 or 9 inches between the drills. When Sainfoin is laid down for a period of years, the corn crop should be sown thin, purposely to nurse the young plants until they are established in the soil. Fresh sound seed only should be sown, about 4 or 5 bushels of the rough unshelled seed per acre; and in place of the common sort the French and giant varieties may be selected.

The Common Whin, Furze, or Gorse, should now be sown in open weather in our southern counties, so that the plants may be established before the drought of summer sets in; April further north. It grows freely on a great variety of poor ferruginous, gravelly and hilly soils, not adopted for Sainfoin, Lucerne, Clover, or any of the grasses. It is grown both for soiling cattle and for sheep pasturage and shelter, also on mounds for fences. If the plough cannot be yoked, the land may be dug with a spade, and the surface reduced to a fine mould for the seed; about 10 lb. to the acre when sown broadcast, rather less if drilled. Sheep crop Gorse greedily in the winter time; and narrow strips, about a yard wide, and from 50 to 100 yards asunder, so laid out as to afford both food and shelter, are ploughed up, the seed then being sown and harrowed in with a single harrow; or if the plough cannot be yoked, the seed is dropped in behind a spade. Sown on mounds it forms a hedge, and it is better to sow broadcast over both sides of the mound than in a row along the ridge. But some prefer both ways, a row along the ridge, and both sides sown broadcast, and carefully raked in. It is common to calculate 1 lb. of seed to 100 yards of fence—the seed being fresh and sound.

Manuring light dry land for Turnips is sometimes done at this season, so as to retain sap in the ground, and thus avoid scorching at the time of sowing in May and June. The practice is, perhaps, more common in the North, where the land cannot be fallowed and manured in the autumn. Such soils work freely at this season, being easily smashed up from the winter furrow, which should always be deep, and afterwards harrowed, cleaned, and manured in the usual way. The farmyard manure is also easily got into the land at this season without much loss of sap, either on the part of the manure or land. It is common to apply half farmyard manure, half bones, or superphosphate, 4 cwt. per acre, and to these may be added 5 to 10 cwt. of common salt. To leave out the salt, as is too commonly done, is to overlook the peculiar manure wants of the Turnip, which by nature is a seaside plant, and light land of the kind in question requires more salt than heavier soils. The salt, too, induces a healthy decomposition of the manure, and its rapid incorporation with the soil during the ensuing month of April, so that by the time of sowing the seed brairds rapidly, and the young plants find a plentiful and continuous supply of food to force them into rough leaf beyond the ravages of the fly, and the scorching influence of the weather aboveground. The salt also checks insect life in the manure, and has thus a tendency to prevent anbury and finger-and-toe.

Dung-heaps turn for manuring Potato and Mangel Wurzel, Carrots, &c. It is better to manure the land in the autumn, but this cannot always be done. And besides the manure was not perhaps made in the autumn, and to keep on the previous winter's manure for autumn application involves a loss which few farmers like to incur. It is only when manure is made in the summer time by soiling that it can be economically applied in autumn. If the manure has not been salted in the heap, apply 1 cwt. per cubic yard in the turning. Besides killing insect life and the seeds of many weeds, salt exercises a beneficial effect in the process of rotting by preventing dry rot, mould, and waste of manure arising therefrom. It has been said that weeds shake half their seed to sow the land before harvest, the other half going to the dunghill, so as to make sure work in the perpetuation of their species; and that, however clean and free from weeds our seed is, we can only get rid of weeds by proper deep tillage, and the destruction of seed in our dunghills.

The Lambing Season is now very general throughout the breeding districts in England, save in a few of the more elevated northern sheep-walks. Dry frosty east winds and snowstorms like that experienced last week, are trying for ewes both before and after lambing, and in exposed situations ewes and lambs are very liable to be "drifted before the weather away from the shelter provided for them." Shepherds should take care of this in time. In such weather ewes and lambs should be kept close along the fence side. A rainy day followed by a frosty night is another enemy to the shepherds; for, if a ewe or lamb is allowed to get wet to the skin, and then to be exposed to frost, the consequences may prove fatal, and a wet skin without frost is a very serious calamity in a ewe flock at lambing time. It follows that there should be hovel-room for the whole flock in bad weather, the shepherd's house being close by. This, however, is seldom provided, hurdles wattled with straw (*i.e.*, two hurdles with straw between) being set up in various ways, forming separate pens, to afford shelter to the main body of the flock, hovel-room being only provided for ewes taken in to lamb over-night. Large, badly-ventilated hovels sheep do not like, and they do not thunder under the temporary shelter afforded by hurdle pens than in such hovels. Not the least of the labours of the shepherd is to see that the lambs have plenty of milk, and the prudent plan to secure this is to give springing ewes a plentiful supply of rich food to bring on milk; and after lambing to keep up the flow in late seasons like the present, when the growth of spring Grass is several weeks behind, by giving a plentiful supply of Cabbages and Carrots, with an extra allowance of cake and corn in cold, frosty weather, to keep up animal heat. If allowed Cabbages and roots *ad libitum* ewes will eat an extra quantity in cold weather; but this without the extra cake and corn will do harm in the majority of cases to both ewes and lambs. And we have found it better to increase the allowance of corn rather than that of the cake, as many ewes can only manage a limited quantity of cake daily. *W. B.*

Notices to Correspondents.

THE NEW ROOT, THE BOVINIA: *Peruvianator.* It is a big cattle Potato, raised by the late Mr. Paterson, of Dundee, and since largely advertised. You should read remarks on the poisonous properties of Potatos at p. 777 in our volume for 1866. They are mostly due to exposure to light; but they may be eaten raw by cattle and pigs without harm. Steam them. Of course they are safe and good.

GAS LIME: *W. Beale.* You should apply it either broadcast, about two waggon-loads per acre over some stubble before ploughing in autumn, or, if in spring, it should be after many turnings in a compost with turf or hedge and ditch refuse. The purpose is to thoroughly expose it to air before getting it in contact with seeds or young plants. When perfectly exposed to air it becomes a mixture of lime and gypsum, and is perhaps a little more serviceable as a manure than lime by itself.

INCRUSTATION OF BOILERS: *A Farmer.* You should put in the boiler a mixture of slaked lime and soda-ash, or carboniate of lime,—so much weekly per horse-power. This will decompose the gypsum in the water, and any deposit is then a mere mud, to be blown off at intervals. Further next week.

Markets.

ENGLISH WOOL.

With the exception of the better grades of lustres and half-breds, we have had a very flat week, and prices have been a shade against sellers. Trade continues so dull that short time has in some instances been resorted to, and although with light stocks and really moderate prices staplers are not inclined to make concessions, buyers on the other hand only buy from hand to mouth, and say present prospects do not promise them any margin on current rates.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	s. d.	s. d.
FLEECES—Southdown hoggets	.. .. ..	1 1	to 1 2
Half-bred ditto	.. .. ..	1 2	— 1 2½
Kent Fleeces	.. .. ..	1 3	— 1 4
Southdown ewes and wethers	.. .. ..	0 0½	— 1 1
Leicester ditto	.. .. ..	1 2	— 1 3
SORTS Clothing	.. ..	0 10	— 1 0
Combing	.. ..	1 0	— 1 3

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, March 17.

Prime Meadow Hay	75s. to 82s.		Clover, old	..	110s. to 120s.
Inferior do.	 60	70	Inferior do.	 80	95
Rowen	 50	65	Prime old cut	.. 100	110
Inferior do.	 63	76	Inferior do.	 80	90
Straw	 26	30	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, March 17.

Sup Meadow Hay	80s. to 88s.	Inferior Clover	.. 90s. to 110s.
Inferior do.	.. .. 68 76	New do.	.. .. — —
New do.	.. .. .. — —	Straw	.. .. .. 30 34
Superior Clover	..123 130	JOSHUA BAKER.	

WHITECHAPEL, Thursday, March 17.

Fine Meadow Hay	76s. to 82s.	Prime old Clover	..120s. to 130s
Inferior do.	.. .. 60 70	Inferior do. do	.. 90 100
Prime New Hay	.. .. — —	Prime 2d cut do.	.. — —
Inferior	.. .. — —	New Clover	.. .. 105 112
Straw	.. .. .. 24 28	Inferior do.	.. .. 80 90

METROPOLITAN CATTLE MARKET.

MONDAY, March 14.

We have a considerable increase in the supply of Beasts, and the average quality is very good. Prices are lower, and a clearance cannot be effected. There are a few more Sheep; trade is very dull at lower rates. Calves are also lower in price. Our foreign supply consists of 933 Beasts, 5160 Sheep, and 150 Calves; from Scotland there are 173 Beasts; from Ireland, 443; from Norfolk and Suffolk, 1560; and 368 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Hereford, &c.	.. 4 10 to 5	0	Best Long-wools	5	4 to 5 6
Best Shorthorns	.. 4 8	4 10	Do. Shorn	..	— .. —
2d quality Beasts	3 4	— 4 0	Ewes & 2d quality	4	4 — 4 10
Best Downs and Half-breds	.. 5 8	5 10	Do. Shorn	..	.. — ..
Do. Shorn	.. ..	— ..	Lambs	..	.. .. —
			Calves	..	3 8 5 8
			Pigs	..	3 8 5 8

Beasts, 3497; Sheep and Lambs, 22,835; Calves, 157; Pigs, 50.

THURSDAY, March 17.

The number of Beasts is very small; trade is, however, very dull, and it is difficult to obtain Monday's quotations for the choicest descriptions; other kinds are decidedly lower. Sheep are plentiful, and there is very little trade for them; prices are lower for all descriptions. Trade is dull for Calves, at a small reduction. Our foreign supply consists of 243 Beasts, 2750 Sheep, and 191 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	.. 4 8	to 5 0	Best Long-wools	5	4 to 5 6
Best Shorthorns	.. 4 6	4 10	Do. Shorn	.. 4	6 4 8
2d quality Beasts	3 0	3 8	Ewes & 2d quality	4	4 — 4 10
Best Downs and Half-breds	.. 5 6	— 5 10	Do. Shorn	..	.. ..
Do. Shorn	.. 4 8	— 5 0	Lambs	..	.. — ..
			Calves	..	3 6 — 5 6
			Pigs	..	.. ..

Beasts, 622; Sheep and Lambs, 7075; Calves, 251; Pigs,

METROPOLITAN MEAT MARKET.—March 17.

Best Fresh Butter .. .. .. 7*s.* per dozen lb.
Second do. do. .. .. 14*s.* ,,
Small Pork, 5*s.* 6*d.* to 5*s.* 4*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 8*d.* per 8 lb.

MARK LANE.

MONDAY, March 14.

The supply of English Wheat to this morning's market was very small, and brought an advance of 1*s.* per qr. on last Monday's prices. There was a fair attendance at market; foreign was held for a like advance, which rather checked business, and the transactions were confined to needy purchasers. Malting Barley, Beans, and Peas were fully as dear; grinding Barley, Maize, and Oats brought an advance of 6*d.* to 9*d.* per qr. Flour was 1*s.* per sack and 6*d.* per barrel dearer.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	38—47		Red	35—46	
— — fine selected sams. do.	42—51		Red	38—48	
— — Talavera	54—56				
— — Norfolk	—		Red	—	
— — Foreign	38—53				
BARLEY, grind. & dist., 26s to 30s. Chev.	39—42		Malting	34—38	
— Foreign .. grinding and distilling	22—25		Malting	30—4[illegible]	
OATS, Essex and Suffolk	22—24				
— Scotch and Lincolnshire.. Potato	24—26		Feed	—	
— Irish	Potato 23—25		Feed	21—24	
— Foreign	Poland and Brew 22—24		Feed	19—21	
RYE	32—38		Foreign	33—36	
RYE-MEAL, Foreign					
BEANS, Mazagan.... 30s. to 37s. Tick	31—49		Harrow	31—49	
— Pigeon ....50s. to 56s.. Winds.	—		Longpod	—	
— Foreign	Small 41—43		Egyptian	38—40	
PEAS, White, Essex and Kent.. Boilers	32—42		Suffolk	35—43	
— Maple, 41s. to 45s.	Grey 32—42		Foreign	33—37	
MAIZE	—		Foreign	29—31	
FLOUR, best marks delivered.. per sack	39—43				
— 20 ditto	ditto 28—40		Country	28—40	
— Foreign	per barrel 22—25		Per sack	29—55	

WEDNESDAY, March 16.

At Mark Lane to-day the show of English Wheat has been only moderate. With a milder weather the trade for both red and white produce has been less active, but prices have been supported. The show of foreign Wheat has been tolerably good. Sales have progressed slowly, but at steady currencies. With Barley the market has been moderately supplied. As regards prices the trade has been firm, notwithstanding that transactions have been restricted. Malt has been quiet, at late rates. There has been a fair supply of Oats on the stands, for which the demand has been limited, at previous quotations. Beans and Peas have sold slowly. Flour has been steady in value, with a quiet trade.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English ..	130	—	—	—
Irish ..	—	—	—	—
Foreign ..	2600	11,020	12,070	{ 400 / 2520 brls
	2730	11,020	12,070	

LIVERPOOL, March 15.—We had an average attendance at to-day's market, but in Wheat only a slow business took place, at prices about 1*d.* per cental lower than on Friday. Flour quiet, at about previous rates. Indian Corn steady at late prices. Beans firm. Oats and Oatmeal quiet.

AVERAGES.

	Wheat.	Barley.	Oats.
Feb. 5	42*s* 2*d*	35*s* 3*d*	20*s* 8*d*
— 12	41 9	34 6	19 10
— 19	40 8	34 2	19 10
— 26	40 7	33 9	20 7
March 5	41 0	33 7	20 8
— 12	40 9	34 10	20 10
Average ..	41 2	34 2	20 5

SEED MARKET.

Our seed market has during the past week exhibited increased animation, and a continuance of fine weather would without doubt make us very busy. We have a brisk demand for Clover seeds at full rates; there is but little English seed offering, and that mostly of poor quality; one parcel of superfine red seed has been sold at 1*s.* per lb. Fine samples of Trefoil and white Clover seed are scarce. French Italian is in restricted supply, and must be quoted 1*s.* per bale dearer. Sainfoin seed has advanced 2*s.* per qr. Spring Tares are firm at recent currencies. Mustard and Rape seed are still tending upwards in price.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, March 17.

Messrs. Pattenden & Smith report that the demand for all descriptions is of a retail nature, prices notwithstanding rule firm at late quotations. Choice samples of either English or foreign are remarkably scarce, and these command extreme rates.

BY ROYAL LETTERS PATENT.

AN INDESTRUCTIBLE BOILER AT LAST !!!

J. WEEKS AND CO.'S "PATENT DUPLEX COMPENSATING ARRANGEMENTS" of their UPRIGHT TUBULAR BOILER are marvels of SAFETY, SIMPLICITY, DURABILITY, and ECONOMY, and must be seen to be appreciated.

One fact has long been established, viz. : that, for its POWER, WEEKS'S UPRIGHT TUBULAR has never been equalled ; and now, for its SAFETY, "THE PATENT DUPLEX COMPENSATING IMPROVEMENTS" have placed it beyond the possibility of a failure.

In addition to the high standard which WEEKS'S UPRIGHT TUBULAR has always maintained, this Patent has elevated it to a rank and interest quite unattainable by any other Boiler.

NOTE THE ADVANTAGES !—NOTHING EQUALS THEM.

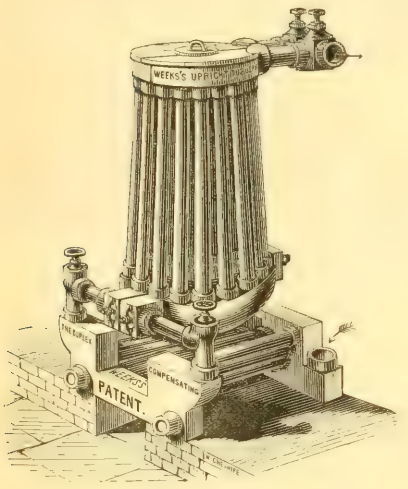

1. The average DURABILITY of this Boiler is 20 years, and we are prepared to issue an INSURANCE POLICY and GUARANTEE its safety for 15 years.
2. A break-down or failure is IMPOSSIBLE.
3. This Boiler may justly be styled INDESTRUCTIBLE.
4. Perfect SAFETY is guaranteed.
5. ALL SEDIMENT can be removed without emptying the Apparatus.
6. This Boiler can be instantly converted into TWO DISTINCT HALVES, one left WORKING and the other taken away.
7. These Boilers being of CAST IRON, are infinitely more durable than Wrought-Iron Boilers.
8. Any ordinary labourer can periodically CLEAN OUT THE BOILER, without displacing a brick.
9. One of Weeks's Upright Tubular Boilers is equal in SAFETY to two ordinary Boilers, and will do the work of a dozen, which has been proved over and over again.
10. In case of repairs to ONE SECTION of the Boiler, the REMAINING PORTION can be left in operation.
11. This Boiler being in SECTIONS can be passed through any doorway 1 foot 6 inches wide.
12. Weeks's Upright Tubular is the ONLY BOILER that offers these advantages, which cannot fail to be of the utmost interest and benefit to the Horticultural World.

J. WEEKS AND CO.,
HORTICULTURAL BUILDERS AND HOT-WATER APPARATUS MANUFACTURERS,
KING'S ROAD, CHELSEA, LONDON, S.W.

☞ WEEKS'S "BOOK of DESIGNS" (12th Edition) free by post.

BOILER INSURANCE and GUARANTEE POLICY issued on completion of contract.

SUTTONS' HOME-GROWN FARM SEEDS,

CARRIAGE FREE.

SELECTED STOCKS at VERY MODERATE PRICES. Special Estimates given for large quantities.

Mangel Wurzel.

	Per lb.	s	d.
GOOD YELLOW GLOBE		0	8
GOOD ORANGE GLOBE		0	8
GOOD LONG RED		0	8
SUTTONS' SELECTED YELLOW GLOBE		0	10
SUTTONS' BERKSHIRE PRIZE GLOBE		1	0
SUTTONS' YELLOW INTERMEDIATE		1	0
SUTTONS' MAMMOTH LONG RED		1	6
SUTTONS' GIANT LONG YELLOW		1	0

Lowest price per cwt. on application.

Swedes and Turnips.

	Per lb.	s	d.
SUTTONS' CHAMPION SWEDE		0	9
SKIRVING'S LIVERPOOL		0	7
PURPLE TOP		0	7
SUTTONS' GREEN-TOP YELLOW HYBRID TURNIP		0	10
SUTTONS' PURPLE-TOP YELLOW HYBRID TURNIP		0	10
SUTTONS' IMPERIAL GREEN GLOBE TURNIP		0	8
SUTTONS' POMERANIAN WHITE TURNIP		0	9
SUTTONS' PURPLE-TOP MAMMOTH TURNIP		1	0

Lowest price per bushel on application

Carrot, Kohl Rabi, &c.

	Per lb	s	d
WHITE BELGIAN CARROT		1	0
RED INTERMEDIATE		1	6
ALTRINCHAM		1	6

Kohl Rabi.

SUTTONS' IMPROVED GREEN	3	0	
LARGE GERMAN GREEN	2	6	
LARGE PURPLE	2	6	

Lowest price per cwt. on application.

For further particulars see

SUTTONS' FARMER'S YEAR BOOK FOR 1870,

Gratis, Post Free on application.

SUTTON AND SONS, SEEDSMEN TO THE QUEEN, READING.

GENUINE FARM AND GARDEN SEEDS.

CARRIAGE PAID. CATALOGUES ON APPLICATION.

Patronised by H.R.H. Prince of Wales and H.I.M. Emperor of the French.

HARRISONS'

NORMANTON GLOBE MANGEL WURZEL.

From W. HOPE, Esq., *Parsdes, Barking, Essex.*

"At the Smithfield Show last year I selected 10 different varieties of Mangel Wurzel which appeared to possess special merits, and have this season grown them in an experimental field. Of all these, your Normanton Globe is undoubtedly the best bred; it is very regular, and from the remarkable smallness of top will yield the greatest weight per acre."

The best in cultivation.

From Mr. E. A. GOWING, *Farm Steward to the* Right Hon. Lord Berners, *Tugby.*

"I have again great pleasure in bearing testimony to the superior quality of your Normanton Globe Mangel over every other variety I have grown; its small top, and having but one root, allows it to be grown very closely together, which is the secret of a heavy crop, and certainly does not exhaust the land anything like so much as other kinds."

The best in cultivation.

We are now able to execute Orders for this splendid variety, and regret our inability to supply all demands last season. The seed is of excellent growing quality, and we solicit early orders.

1s. 6d. per lb., cheaper by the cwt. or half-cwt., carriage free.

We beg to caution our friends against purchasing an inferior kind under the name of "NORMANTON," having heard of many disappointments last season through substitution.

SELECTED YELLOW GLOBE MANGEL, 10*d.* per lb
RED and YELLOW GLOBE, of good stocks, 8*d.* per lb.
MAMMOTH LONG RED and YELLOW, very fine, 10*d* per lb.
GIANT TANKARD SWEDE, immense cropper, the best for sowing with Mangels, 1s per lb
HARRISONS' IMPROVED PURPLE TOP SWEDE, heavy cropper, very hardy, 9*d.* per lb.
SELECTED CHAMPION SWEDE, 8*d.* per lb
WESTBURY PURPLE-TOP do., 9*d.* per lb.
HARRISONS' GREEN BARREL, the best white fleshed Turnip in cultivation, 10*d.* per lb.
SELECTED RED GLOBE, 9*d* per lb.
GREEN-TOP SIX-WEEKS, the best for late sowing, 1s. per lb

HARRISONS' MIXTURES of GRASSES for PERMANENT PASTURES, 20s. to 30s. per acre, carriage free.

Instructions for seeding-down and particulars on application.

CATALOGUES Free per Post.

HARRISON AND SONS,
SEED GROWERS, ROYAL MIDLAND SEED WAREHOUSE, LEICESTER.

Seed Barley from the Chalk.

PEDIGREE CHEVALIER BARLEY, grown from Hallett's Stock.—Price 52*s.* per quarter, or 7*s.* per bushel, free on rail. New Sacks, 1*s.* 3*d.* each.

Also selected Samples from the best Growers of PAGE'S PRO LIFIC, GIANT, GOLDEN DROP, and TRIANLE BARLEY.

BLACK TARTARIAN, BLACK POLAND, WHITE CANADIAN, WATERLOO, and WHITE TARTARIAN OATS.

SHIRREFFS, WHITE, RED CHAFF WHEAT, and APRIL SPRING WHEAT.

Samples and prices free on application.

RAYNBIRD AND CO. (Limited), Basingstoke, or Seed Market, Mark Lane, London, E.C.

FARM SEEDS of all sorts, best quality, extra clean.—PRICED LIST on application.

James Dickson & Sons.

Seed Growers, 102, Eastgate Street, Chester

New and Select Farm Seeds.

1870. 1870.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

TURNIPS, MANGLES, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.

CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior examples, thoroughly cleaned, and free from weeds.

MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years' lay, from 15*s.* to 20*s.* per acre.

MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any kind of situation, from 21*s.* to 28*s.* per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.

Seeds of the value of £2 and upwards (Grain, Vetches, and Potatoes excepted), carriage free to any railway station in the kingdom.

Special estimates for large quantities. Samples and prices on application.

PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis and post free on application.

Wheelers' Superior Grass Seeds.

WHEELERS' SUPERIOR GRASS SEEDS.—One of the most luxuriant Crops of Hay which ever came under our notice was the produce of some Grass and Clover Seeds supplied by us in the Spring of 1869 to Mr. Hurcombe, of Uley.

It was sown early in April on 6½ acres, and yielded the following Summer, 1869, upwards of 24 tons of excellent Hay, which was Sold by Auction for £104, being at the rate of £16 per acre. It was mown twice the same Summer.

The fact that 6½ acres of seeds has produced in one Summer Hay of the value of £104 shows the importance of sowing a good Mixture of superior seeds.

The following are the quantities and sorts which produced that luxuriant crop:—

TABLE OF CLOVER AND GRASS SEEDS FOR TWO YEARS' LAY.

4 lb. Evergreen Rye-grass	Lolium perenne
4 lb Italian Ryegrass	Lolium italicum
2 lb Cocksfoot	Dactylis glomerata
2 lb Timothy Grass	Phleum pratense
2 lb Red Clover	Trifolium pratense
3 lb Cow Grass	Trifolium pratense perenne
3 lb White Dutch	Trifolium repens
4 lb Trefoil	Medicago lupulina

We can supply the above of finest quality at 17*s.* 6*d.* per acre, carriage free, and allow 5 per cent. discount for cash.

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WHEELERS' SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELER'S ILLUSTRATED BOOK on GRASSES, which may be had gratis and post free.

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WHEELERS' SUPERIOR GRASS and CLOVER SEEDS, are supplied in large or small quantities, at extremely moderate prices.

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QUALITY: Excellent, and unadulterated.

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"For getting up the subject of Grasses we cannot conceive a handier book than Miss Price's, which is furnished with ample and accurate illustrations; while for putting her data to the proof, and testing the value of hints and suggestions, it may be well to make acquaintance with that really scientific *brochure*, Messrs. WHEELER'S Illustrated Book on Grasses."—*Saturday Review.*

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For One Year	at 11*s.* 6*d.* per acre
For Two Years	17*s.* 6*d.* per acre
For Four Years	22*s.* 0*d.* per acre.
Permanent Pasture	from 26*s.* to 32*s.* 0*d.* per acre.

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Bedman's Imperial.
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PEAS—Waterloo Marrow
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CLEAN Green Longpod
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Fully DESCRIPTIVE PRICED LIST post free on application.
Carefully assorted COLLECTIONS of VEGETABLE SEEDS, at 12s 6d, 25s, 42s, 63s, and 105s.
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SCOTT'S NEW and GENUINE SEEDS.

	Post Free Per packet.—s. d.		Per packet.—s. d.
Bect, S. ats Crimson Dwarf	1 0	Pumpkin, Mammoth, extra	1 0
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Cauliflower, True Selected Erfurt Early Dwarf	1 6	Melon, Golden Queen	1 6
Carrot, Matchless Green-top	0 6	Baldy's Prize Eclipse	1 6
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		Giant Rocca (Largest)	1 0

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Aster, New Quilled, 12 varts., mixed	1 0	Cockscomb, Giant, crimson	1 0
Reed's Imbrication, 12 do	1 0	Dwarf	1 0
French Pæony flowered	1 0	Perfection, 12 do	1 0
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Dwarf Chrysanthemum, flowered, 12 do	1 0	Larkspur, Dwarf German	1 0
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Stock, dwarf, German Tenweek, 24 do	1 0	Extra choice single	1 0
Large flower Intermediate, 18 do	1 0	Primula fimbriata, 6 varts., mixed	2 6
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HARDY HEATHS, in 50 varieties, free of package:
24 plants, in 12 varieties, two of each for 7s
48 plants, in 24 varieties, including choicest varieties, for 12s
100 plants, in 12 varieties, for 25s
100 plants 24 varieties, for 42s
100 plants, in 50 varieties, for 50s.
Many varieties can be supplied by the 1000. See CATALOGUE
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Smith's fine long frame CELERY	0 6
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Sawyer's White Globe BROCCOLI	1 0
Sawyer's Incomparable CABBAGE	1 0
Worcester Champion Cabbage LETTUCE	0 6
Improved Telegraph CUCUMBER	1 0
Veitch's Dwarf Erfurt CAULIFLOWER	1 0
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Worcester Late White BROCCOLI	1 0
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PRIMULA SINENSIS, finest mixed	1s and 2s 6
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PYRETHRUM, Golden Feather	1s 0
ZINNIA, finest double, mixed	1s 0
AJUGA CORNUTA ALBA	1 0
PANSY, Golden Yellow	1 0
AMARANTHUS SANGUINOLENTUS	1 0
PRINCESS FEATHER, New Golden	0 6
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Princess Royal, 1 pint	Leek, Giant Red, 1 pkt
Suggestes' No 1, 1 pint	Cress—Australian, 1 oz
Tri-cobker, 1 pint	Dwarf, 1 oz
Advancer, 1 pint	Lettuce, Smith's fine Frame, packet
Blue Scimetar, 1 pint	Stockwood Ridge, packet
Veitch's Perfection, 1 pint	Drumhead, packet
Harrison's Glory, 1 pint	Dwarf Green Cos, packet
Beans—Taylor's Imperial Windsor, 1 pint	Dick Master Hearth, packet
Early Long, 1 pint	Lettuce Champion Cabbage, packet
Johnson's Wonderful, 1 pint	Paris White Cos, packet.
Green Windsor, 1 pint	Bath Cos, packet.
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French Dwarf, 1 pint	Mustard—White, 4 oz.
Scarlet Runners, 1 pint	Melon—Choice Kinds, packet
Beet—Nuttings fine Red, 1 oz.	Onion—Reading or Spanish, 1 oz.
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Scotch Curled, packet.	Parsnip—Improved Hollow Crown, 1 oz
Broccoli—Sutton's Protecting, packet	Round, 1 oz
Brussels Sprouts, Dwarf, packet	Parsley—Fine Curled, 1 oz
Cabbage—Early Nonpareil, pkt	Fine Garnishing, per pkt.
Red Dutch, packet	Pea—Early Dwarf, 1 pint
Carrot—Early Scarlet Horn, 1 oz	Radish—Early Scarlet Turnip, 1 oz
James's Intermediate, 1 oz	Long Scarlet, 1 oz
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BOLTON AND CO. beg to offer NEW SEED of the best GRASSES
FOREIGN ITALIAN RYE GRASS
HOME GROWN do do
ANNUAL RYE GRASS
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PERENNIAL do
And all the best kinds of Natural Grasses, Mixtures for Permanent Pastures and Meadow Lands, to suit the different varieties of Soil
Mixtures of Grass Seeds also made up for all kinds of Crops.
CEMETERIES, CROQUET GROUNDS
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"GENUINE PERUVIAN GOVERNMENT," per ton, £14 10s; per cwt., 16s; 56lb., 9s; 28lb., 5s; 14lb., 3s

NITRATE of SODA, per ton, £21; per cwt., 22s.; 56lb., 12s; 28lb., 6d 6d; 14lb., 3s 6d; 7lb., 2s

COCOA-NUT DUST, for Ferneries, Rockeries, Potting, Mixing, &c., per ton, 40s; 112lb., 7s; 56lb., 3s 6d

SULPHURIC ACID, or OIL VITRIOL, SALT, &c.

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London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of Rees and Co.'s Biphosphated Peruvian Guano, which I purchased myself.
"The sample examined by me contained all the constituents of a good superphosphate, a percentage of soluble and insoluble phosphates which I understand is guaranteed to the purchaser, and a state of preparation. The more generally this manure will become known and appreciated, the more extensively will it be employed.
"I remain, Sir, Yours truly,
"A. VOELCKER, Ph.D., F.R.S.E., F.C.S."
"The Secretary, REES AND CO.'s Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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LAWES'S DISSOLVED BONES, GUANO, and MANGEL
LAWES'S CONCENTRATED ORGANIC and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the undermentioned Agents throughout the United Kingdom.
PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures
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GARDEN MANURES are specially prepared for every description of soil, and for Fruit Trees, Forest Trees, Vines, Conifers, Vine Borders, Pot Plants, Lawns, &c. Sold in Packets, 1s, 2s, 3s, 5s, 10s, 20s, 30s, 40s, 50s, 60s, 70s, 80s, 90s, 100s, 120s, 140s, 160s, 180s, 200s, 220s, 240s, 260s, 280s, 300s, 320s, 340s, 360s, 380s, 400s, 420s, 440s, 460s, 480s, 500s, 520s, 540s, 560s, 580s, 600s, 620s, 640s, 660s, 680s, 700s, 720s, 740s, 760s, 780s, 800s, 820s, 840s, 860s, 880s,

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6 ft. by 4 ft. 1¼ ins. 2 m. Thick, unglazed.. £0 5 0
" " Primed and Glazed with 10 oz. Sheet 0 11 0
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HOT-WATER PIPES, Nos 6 & 7 cm illus.	£ d	£ d	£ d
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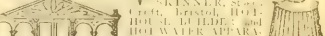

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Portable Boiler. Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.

INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and last for years without renewal. *Elliptic Boiler.*

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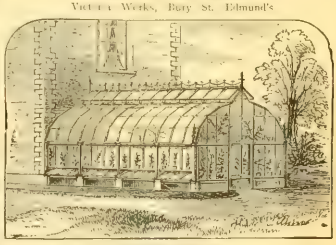

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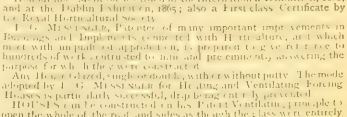

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Sugar-Beet Cultivation for Spirit Making gives a Gross Produce of £16 per acre.

An acre yields in England 20 tons of Sugar-Beet, which produce at least 18 gallons proof of Spirit of Wine, and the pulp of the distilled Beet is most excellent Food for Stock. The cultivation of Sugar-Beet is therefore highly profitable, whether to be sold to distillers (a ton being worth 10s., when containing 9 parts of Sugar) or to be converted into Spirit on the Farm.

Farmers desirous of mounting a Beetroot Distillery must beware of the Stills they adopt. The only Stills thoroughly adapted to Beetroot distillation are those of

MESSRS. D. SAVALLE, FILS, AND CO., PARIS and LONDON.

They are low in price, most easily managed by the greatest novice, and they produce Spirit superior to the finest Grain spirit made in England. The residue or pulp after distillation is most excellent Food for Stock, superior to the residue of Sugar Factories; indeed Beet Distillation far surpasses Beet-Sugar Making in every way.

There is a fine Beetroot Distillery now operating in England; it is that of the Berkshire Distillery Company, at Buscot, near Faringdon (Great Western Railway). It was fitted up by Messrs. D. Savalle, Fils & Co., of 64, Avenue de l'Impératrice, Paris.

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N.B. At the above Office samples of Beetroot Spirit can be had; also of Gin, Liqueurs, Perfumes, &c., produced with such Spirit; which proved to be, in taste and smell, of the finest quality.

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VASES, PEDESTALS, FLOWER POTS, FERN CASES,

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All the TERRA COTTA Manufactured by Messrs. H. D. & Co. is made of the best material, burnt extra hard, and

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PRICE LISTS ON APPLICATION AS ABOVE.

PORTABLE AND FIXED HOT-WATER APPARATUS

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, ETC., WITH

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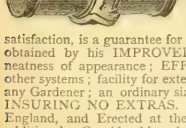

T. S. TRUSS

Begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the ROYAL HORTICULTURAL SOCIETY at SOUTH KENSINGTON and CHISWICK, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantages obtained by his IMPROVED SYSTEM cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; EFFECTS a SAVING of 25 PER CENT. on cost of Apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; can be erected by any Gardener; an ordinary size Apparatus erected in one day; and PERFECTNESS of DESIGN SUPPLIED, INSURING NO EXTRAS. Complete Apparatus, of the best materials, delivered to any Railway Station in England, and Erected at the following prices. Erection beyond 25 miles of London, railway fare for one man additional. Considerable reduction on large works.

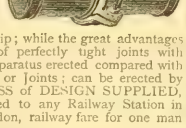

Two Four-inch Pipes along One Side and One End of House.

Size of House.	Apparatus Complete.	Erection.	Size of House.	Apparatus Complete.	Erection.
20 feet by 10 feet	... £9 0 0 ...	£2 0 0	50 feet by 15 feet	... £17 10 0 ...	£3 0 0
30 feet by 12 feet	... 11 15 0 ...	2 10 0	75 feet by 15 feet	... 20 0 0 ...	3 0 0
40 feet by 15 feet	... 15 0 0 ...	2 15 0	100 feet by 15 feet	... 26 0 0 ...	3 5 0

Bath and Gas Work Erected in Town or Country. The TRADE SUPPLIED.

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T. S. TRUSS, C.E., CONSULTING HORTICULTURAL ENGINEER, &c., SOLE MANUFACTURER, IRON MERCHANT, HOT-WATER APPARATUS MANUFACTURER, AND HORTICULTURAL BUILDER, FRIAR STREET, BLACKFRIARS ROAD, LONDON, S.E.

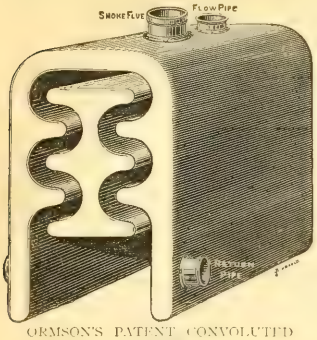

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ROYAL GARDENS, KEW.

The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by

HENRY ORMSON

as a specimen of his first-class and substantial style of building Horticultural Structures. Also his Patent Wrought-iron Boilers, by which the new Hothouses, and many other Buildings are heated on a very extensive scale in the above great establishment.

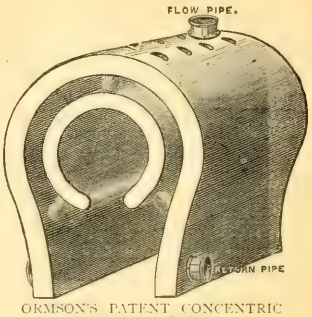

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

Confidence in Cast-iron Boilers is now, to a very great extent, lost in consequence of their continual cracking and failing, and are being replaced by **ORMSON'S PATENT WELDED WROUGHT-IRON BOILERS**, which are not only free from all danger of cracking, but have proved themselves far more economical in consumption of fuel.

HOTHOUSES MANUFACTURED BY STEAM MACHINERY. BEST MATERIALS AND LOWEST PRICES.

Plans, Specifications, and Estimates for Erecting Conservatories, Hothouses, and Hot-water Apparatus of every description in all parts of the country and abroad.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,
AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.
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GREEN'S
PATENT IMPROVED TUBULAR HOT-WATER BOILERS.

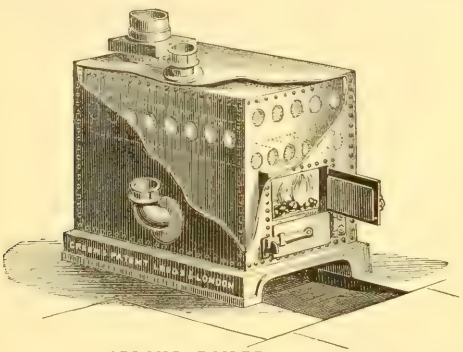
OBLONG BOILER.

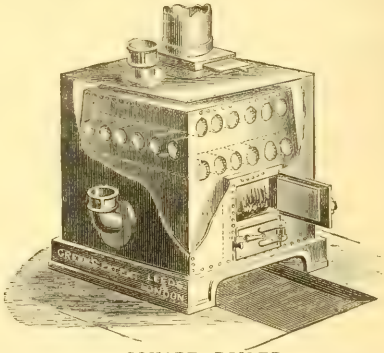
SQUARE BOILER.

THE ABOVE BOILERS ARE

THE MOST EFFECTIVE AND DURABLE EVER INVENTED.

They can be set to work at a nominal cost, inasmuch as no brickwork is required; as will be seen from the above drawing, they are placed upon a Cast Iron Sole-plate, which answers the purpose of Foundation and Ashpit.

From the peculiar and substantial manner in which these Boilers are made, they are warranted to last for years without getting out of order; in fact we guarantee them for ten years, but feel convinced that they will serve all the purposes for which they are intended for a much longer period.

They are specially adapted for Heating Greenhouses, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

THE FOLLOWING ARE THE ADVANTAGES OF THESE BOILERS:

1st, They require no setting in brickwork.
2d, They are complete in themselves, having perfect means of regulation.
3d, They take up little room, and can be put in places inaccessible to other Boilers.
4th, They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th, The fire can be made to last from 12 to 24 hours without attention.
6th, Any number of Flows and Returns can be annexed to the Boilers by means of T-pipes.
7th, By means of mud doors, they can be readily cleaned out when required.
8th, The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

☞ *PRICE LISTS ON APPLICATION.*

THOMAS GREEN AND SON, SMITHFIELD IRON WORKS, LEEDS; and
54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

GREEN'S PATENT BOILER

WITH INVERTED CYLINDER ENGINE COMBINED.

Engines and Boilers fitted with Governors, Equilibrium Throttle Valve, Stop Valve, Safety Valve, Feed Pump, Water and Steam Gauges, &c., &c., complete.

Consumption of Fuel—7½ lbs. of Coal per Horse-Power per Hour.
„ Water, 1 Cubic foot „ „ „

UPWARDS OF FIVE HUNDRED OF THESE ENGINES AND BOILERS ARE NOW AT WORK, GIVING ENTIRE SATISFACTION.

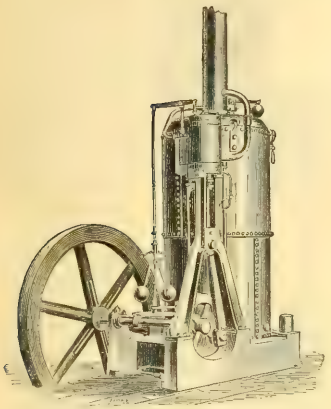

Horse Power	Cylinder.	Diameter.	Stroke.	Boiler.	Height.	Diameter.		
1	„	3¼ in.	8 in.	„	4 ft. 0 in.	1 ft. 8 in.	.. ..	£35*
2	„	4	10	„	5 „ 0	2 „ 4	.. ..	£50*
3	„	4¾	10	„	5 „ 6	2 „ 4	.. ..	£60*
4	„	5½	12	„	7 „ 0	2 „ 4	.. ..	£85
6	„	6½	14	„	8 „ 0	2 „ 8	.. ..	£120
8	„	8	16	„	9 „ 0	3 „ 0	.. ..	£160
10	„	9½	16	„	10 „ 0	3 „ 4	.. ..	£185
12	„	10	18	„	11 „ 0	3 „ 8	.. ..	£200
14	„	11	18	„	11 „ 6	3 „ 10	.. ..	£220
16	„	12	20	„	12 „ 0	4 „ 0	.. ..	£250
18	„	12⅝	20	„	12 „ 6	4 „ 2	.. ..	£285
20	„	13½	22	„	13 „ 0	4 „ 4	.. ..	£310
25	„	14⅝	28	„	14 „ 0	4 „ 8	.. ..	£380
30	„	15½	28	„	15 „ 0	5 „ 0	.. ..	£450
35	„	16⅝	28	„	10 „ 0	5 „ 4	.. ..	£520
40	„	18	28	„	17 „ 0	5 „ 8	.. ..	£585

* The 1-Horse Power, if fitted with Water-Tank Sole-Plate and Governors complete, £5 extra. The 2 and 3-Horse Power, if fitted with Governors, £5 extra.

The Fly-wheel Shaft is made sufficiently long to admit a drum being fixed on if required, which can be supplied along with the Engine any diameter ordered, at an extra cost according to size.

The above Engines and Boilers occupy a very small space, and will be found admissable in places where no other form of Engine and Boiler could be fixed. They are especially adapted for use by Contractors and in Warehouses, Mills, Dyehouses, Workshops, Printing Offices, Farms, &c., &c. For exportation they are invaluable, being sent out in complete Working Order, ready for immediate use. They are made in an exceedingly substantial and simple manner, every part being perfectly easy of access, and consequently can be readily understood and managed.

The Boilers are fitted up with Strong Welded Tubes, intersecting the fire-box (varying in number according to the size of the boiler), and a mud hole is placed opposite each tube for the purpose of cleaning them out. They are tested up to 200 lb. pressure to the square inch.

The Foundation Plate answers the purpose of Feed Water Tank, in which the water is heated before passing into the boiler, and also of an ash pit, and no brickwork or foundation is required.

The Fire-box is so constructed that Coal, Coke, or Wood can be used as Fuel.

Extract from the *Gardeners' Chronicle*, December 11, 1869, p. 1293 :—

"*Vertical Engines* continue to merit growing patronage. They have their advantages over the horizontal engines, not only in construction as to the working and extra and unequal tear and wear of the piston and cylinder, but in their adaptation to light work—as grinding, chaff-cutting, and root-pulping. The small area of space they occupy is also greatly in their favour. Of late years very great progress has been made in the cattle feeding department of farm practice, hence the growing demand for engines of this class; but this is not all that must be reported, for they are evidently also entering into competition with their rivals in the threshing barn. They have long been in extensive use by builders for hoisting and pumping, being made locomotive by means of rails; and constructed on this plan they are proving equally effective and advantageous in the brick-field, quarry, wood-yard, large dairies for churning, laundries, for driving washing machines, and the like. Add to this the growing use of a heavier class of engines for steam culture, which necessitates as it were the employment of small vertical ones at the homestead, it is easy accounting for the growing popularity of the latter at all our implement exhibitions. In construction there is a close similarity on the whole, but in details of mechanism they are diversified. Something of course depends upon the special purposes for which they have been made, and whether they are to be used outdoors or indoors, and whether they are to burn coal or coke, and so on.

GREEN'S PATENT SILENS MESSORS,

OR NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

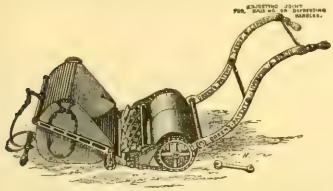

Every Machine is warranted to give entire satisfaction, and if not approved of, can be returned at once unconditionally.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lincene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last five years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—1st. Simplicity of construction, every part being free of access, 2d. They are worked with far greater ease than any other Lawn Mower. 3d. They are the least liable to get out of order.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other. Illustrated Price Lists free on application.

N.B. All Orders are executed on the day they are received.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

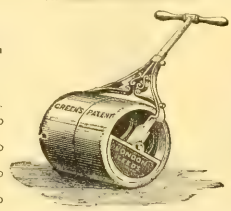

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

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PRICES.

24 inches by 26 inches	..	..	..	..	..	£4	0	0
20 „	22 „	..	..	..	..	..	..	3	2	6
16 „	17 „	..	..	..	..	..	..	2	10	0

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The above can be had of Nurserymen, Seedsmen, and Ironmongers, who should write to
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Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the name SAYNOR, also the Corporate Mark, CROWN, WARRANTED, without which none are genuine.
SAYNOR AND COOKE respectfully inform Gardeners and others, but are compelled to do so, in consequence of an imitation of common quality, having been offered to the public, and which have caused many complaints, to re-mark the Pruning Knives which were made of their make and which are warranted both by SAYNOR and MADE BY SAYNOR & COOKE. PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years.

First Prize,
ROYAL AGRICULTURAL SHOW, 1869.
AWARDED for 12 other PRIZE-MEDALS for LIQUID MANURE and GARLAND for BONE or STONE CRUSHER by HAND or POWER.
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Vases and Fountains, for the Garden and Conservatory.

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The Derwent Iron Works have for the last 30 years been well known for the production of fine Iron Castings, whether for ornamental purposes, or for machinery, and are now prepared to execute orders with the utmost despatch. Also to supply cheap stock patterns of Garden Vases, Fountains, Tazzas, Flower Stands, Chairs, Tables, Hall Lamps, Weather Cocks, Finials, Crestings, Railings, Gates, Hurdles, Wire Netting, &c., &c.
Illustrated Priced Catalogues forwarded on receipt of Six Postage Stamps.

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THE above and many other PATTERNS are made in Terra Metallic Ware, for Edging, Staining, Inlaying, &c., &c.
CHEAPEST, BEST, AND MOST DURABLE EDGING EVER INTRODUCED.
Each tile is 6 inches long, 3 inches wide, and 1 inch thick, and is fastened together by a tongue and groove, and can be laid in a straight line or curve.
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Apply for Illustrated Price List to the Manufacturers,
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Illustrated Price List free on application.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Porches, &c., in various colours, in blue, red, and buff, and can be supplied in Encaustic designs. Also Plain Tiles of the same description of Encaustic Tiles, for Hall, Conservatory, Kitchen, &c., &c.
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F. & G. ROSHER & MARSHALL.—Address as above.
N.B. Orders promptly executed by Rail, Road, or Vessel.
A liberal discount to the Trade.

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TO BE SOLD, by Private Contract, TWO very superior 8 HORSE POWER ENGINES and THRESHING MACHINES, by those well known makers Messrs. Lees, Preston & Co., of Leek. The Machines are in use, and can be seen at work within a few miles of Leek, and have been but a few months only from the makers, and are fitted with all the latest improvements. Applications to be sent to Mr. JAMES THOMAS, Rock House, Haywood, Leek.

"Every Cottage should be provided with a Water Closet."—Punch
Iron Cisterns.
F. BRABY AND CO. having laid down more extensive and Improved Machinery for their Trade purposes than ever, are prepared to supply WROUGHT IRON TANKS, GALVANISED PAINTED, of superior quality, at reduced prices, and at very short notice.

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N.B. Open Tanks of different sizes packed one in another to save carriage.

WILLIAMS'
PATENT
"ARCHIMEDIAN"
ADJUSTABLE
LAWN MOWER.

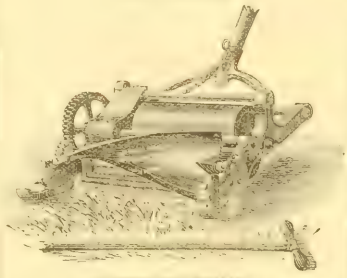

CUTS WET or LONG GRASS without CLOGGING. Does away with the necessity of the mowing ground or lawn being cut instead of waiting for the Grass to dry, and tulling under the heat of a scorching sun. It will cut Grass when the machine cannot cut whilst traversing over mounds or sloping banks.

"The quickest, most simple, and most efficient Mower ever used."—

Manufactured and Sold by
WILLIAMS'
, E.C.;

W. S. BOULTON AND CO.
Rose Lane Works, Norwich

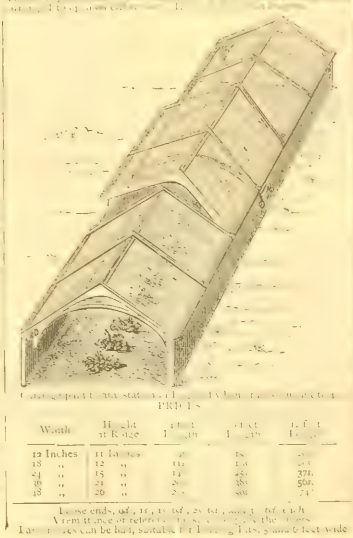

PRICES

Width	Height at Rose	Price	Carriage	Price
12 Inches.	11 Inches.	£	s.	£
18 "	12 "	12	10	22
24 "	15 "	14	12	26
30 "	21 "	20	18	38
18 "	16 "	16	10	26

Loose ends, 9d., 15, 18, and 21 to Foot; 6d. for Cash.
Terms if one of reference in the Trade.
Lawn Mowers can be had, suitable for Pony, Mules, and 6 feet wide

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
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Prospectuses and Testimonials free on application.

NO MORE DAMP WALLS.—The only Cure for Damp Walls, Preserving Stone, Brick, and Cement from Decay is the SILICATE OF SODA COMPOSITION, used in the Houses of Parliament, and patented by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.

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From Mr. W. GILBERT, Harewood Street, Rugby.
"I am perfectly satisfied with the Closets, and find with the dust you supplied last year, with only the supply of Dried Earth to be obtained locally, that by using but a few bags of earth in the Summer, I have a liberal supply without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucket of water), and I can find the Roses this year better than ever I had in my life. I have been careful to apply it as you have directed me."—W. GILBERT.
"January, 1870."
[illegible]

THE REGISTERED HUMANE LAMB [illegible]

[illegible] Cattle Show, [illegible] Mr. [illegible] Market, [illegible] Rollers, [illegible] of the fold to obtain fattening [illegible] ordered at a time, Post Office order or [illegible]

RETURN HUNT, MANUFACTURER OF YIELD HAND SEED DRILLS, Atlas Works, Earl's Colne, Essex.

IMPROVED BARROW SEED DRILLS, For Sowing every description of small Seeds. [illegible]

ONE ROW CULTIVATOR, No. 1

	£ s. d.
[illegible] Price	10 0
[illegible]	0 2 0
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ONE ROW DRILL	3 15 0
ONE ROW TURNIP and MANURE DRILL	5 10 0
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ONE ROW HOE and CULTIVATOR	2 10 0
ONE ROW BRUSH DRILL	1 5 0

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Their advantages are—Portability, not less than 7 movable at pleasure, to Weigh, Shelter Cattle as to improve Condition or breed, Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water System, and Patent Drip Cover to prevent overgrowing. Cowslip, durable coated in preference to infection, being all of Iron. Price of Fittings per Cow, 55s.
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Each Box contains 100 feet. The prices only apply to the sizes stated

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Seconds	.. ..	19s. 6d.	..	..	24s. 6d.
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Sheets, 10 oz., in 100 feet boxes, boxes included

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	4ths.	3rds.	2nds.	Best.
12 by 9	12s. 9	13s. 9	14s. 9	15s. 9
12 by 10	13s. 10	14s. 10	15s. 10	17s. 6
13 by 11	14s. 11	..	..	..
13 by 12	15s. 12	16s. 11	17s. 11	..
15 by 12	17s. 12	..	19s. 12	..
16 by 14	20s. 14	21s. 13	..	..
16 by 15	21s. 14	22s. 13	..	..
16 by 16	22s. 15	23s. 14	..	..
18 by 12	20s. 13	21s. 12	..	..
18 by 14	23s. 13	..	..	..
18 by 15	24s. 13	..	..	..
18 by 16	25s. 13	..	..	..
20 by 14	25s. 13	26s. 12	..	..
20 by 15	26s. 13	27s. 12	..	..
20 by 16	27s. 13	28s. 12	..	..

	15 oz.	21 oz.	26 oz.	32 oz.	42 oz.
20 by 12	15s. 0	17s. 6	19s. 6	21s. 6	23s. 6
20 by 13	15s. 0	17s. 6	19s. 6	21s. 6	23s. 6
20 by 16	15s. 0	17s. 6	19s. 6	21s. 6	23s. 6

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From	To	4ths.	3rds.	2nds.	Best.
6 in. by 4 in.	9 in. by 7 in.	11s. 6d.	12s. 6d.	13s. 6d.	15s. 6d.
6 in. by 8 in.	14 in. by 10 in.	11s. 6d.	12s. 6d.	13s. 6d.	15s. 6d.
12 in. by 9 in.	18 in. by 12 in.	12s. 6d.	13s. 6d.	14s. 6d.	17s. 6d.
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Lists on application.

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In Sheets for Cutting up, averaging from 6 to 9 feet super.

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4ths quality, per 300 feet case, 34s.		4ths quality, per 200 feet case, 34s.	
3ds "	42s.	3ds "	42s.
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" OXFORD OCHRE, 3d. to 4½d. per lb.		8s. per cwt.	
" RAW UMBER, 4½d. to 6d. per lb.		Fine Pale VENETIAN, 10s. to 12 0	
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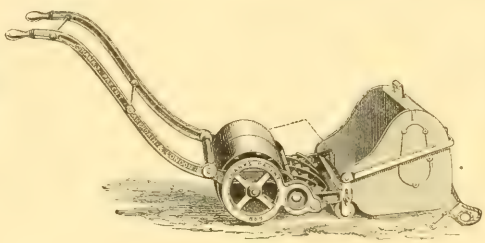

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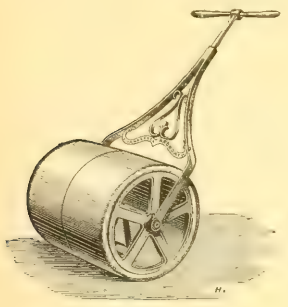

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,, 39 .. .. × 60	15 10 0
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27, *Leadenhall Street is the only place in London where intending purchasers of Lawn Mowers can choose from a Stock of from 150 to 200 Machines. All sizes kept there, whether for Horse, Pony, or Hand Power.*

Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 13.—1870.] SATURDAY, MARCH 26. { Price Fivepence. Stamped Edition, 6d.

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ROYAL BOTANIC SOCIETY, Regent's Park.—The FIRST EXHIBITION of SPRING FLOWERS will take place on WEDNESDAY and THURSDAY NEXT, March 30 and 31. Gates open at 2 o'Clock. Tickets, 2s. 6d. each.

CRYSTAL PALACE FLOWER SHOWS, 1870.—The GREAT FLOWER SHOW, SATURDAY, May 21.
The SECOND FLOWER SHOW, SATURDAY, June 11.
The GREAT ROSE SHOW, SATURDAY, June 25.
Schedules, with List of Prizes, on application to
J. WILKINSON, Superintendent, Crystal Palace, S.E.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870, JUNE 3 to 10. ONE THOUSAND POUNDS in PRIZES. To be held in the BOTANIC GARDENS, MANCHESTER. Schedules are ready, and can be had on application to the Undersigned.
Botanic Gardens, Manchester. BRUCE FINDLAY.

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870. PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, with Forms of Entrance, on application to
F. G. BUCKLE, Secretary, Peterborough.

SPALDING HORTICULTURAL FETE—FLOWER, FRUIT, &c., SHOW.—The ANNUAL EXHIBITION will be held in the Grounds of Ayscough-Fee Hall, on THURSDAY, June 23, Band of the Royal Horse Guards attends. Schedules on application to GEO. F. BARRELL, Hon. Sec.

NEW VERBENAS, Eckford's, unrivalled. CATALOGUES ready.
JOHN KEYNES, Castle Street, Salisbury.

BETTERIDGE'S SUPERB QUILLED ASTERS, in 13 distinct varieties, 5s., which includes the beautiful new Oxonian. CHARLES TURNER, The Royal Nurseries, Slough.

RHODODENDRON PONTICUM.—Beautiful dense globular shaped plants, 2 to 3 feet high. Fit for ornamental planting or for game coverts. For price per 100, apply to
WILLIAM BUCHANAN, Forester, Trentham, Staffordshire.

AUCUBA POLLEN.—One dozen flowers for 1s., four dozen for 3s., sent post free on receipt of stamps by
JOHN STANDISH AND CO., Royal Nurseries, Ascot.

To the Trade.

T. THORNTON, Bagshot, Surrey, has to offer a large quantity of good clean SEED of KALMIA LATIFOLIA, and RHODODENDRON, saved from named varieties. Price on application

To the Trade only.

VIOLA CORNUTA, var. BLUE PERFECTION.—Plants now ready, 15s. per dozen.
THOMAS CRIPPS AND SON, Nurserymen, Tunbridge Wells.

FRESH SEED of CUPRESSUS LAWSONIANA and THUJA LOBBII, in any quantity. For prices, see pages 74 and 75 of our TRADE CATALOGUE, which may be had post free.
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J. MAWKARING, Lowlands, Brenchley, Kent.

To the Trade.

L. T. DAVIS offers a large quantity of 2-yr. SEEDLING THORN QUICKS at very moderate prices, carriage paid to Belfast.
Ogle's Grove Nursery, Hillsborough, Co. Down.

CAMELLIAS and AZALEAS.—A Gentleman, changing residence, has several of the above to part with, for which he will take very moderate prices. Also TWENTY PEACH and NECTARINE TREES in Pots for Orchard-house.—Address at once to Mr. MCKENZIE, Hoddesdon, Herts.

CAMELLIAS and AZALEAS WANTED.—Any Gentleman having large old plants of the above to Dispose of at a moderate price, may hear of a Buyer by sending price, size and names to CAMELLIA, *Gardeners' Chronicle* Office, W.C.

New Roses for 1870.

JOHN FRASER, Lea Bridge Road Nurseries, London, E., begs to announce that his LIST of NEW ROSES for 1870, which contains a selection of the best varieties only, may be had on application. The young plants are healthy and promising.

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CHEAP AND CHEAP.

LEWIS WOODTHORPE has a quantity to dispose of. Particulars upon application.
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Vines, Five Shillings each.

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NOTICE. In reply to the many inquiries respecting the FAIRY APPLE, figured in the "Florist and Pomologist" (March), J. JENNINGS begs to inform his Friends that he intends sending it out in November next
Nurseries, Shipston-on-Stour

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THOS. CRIPPS AND SON have a few Hundreds of the above to dispose of. Price on application.
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Seed Warehouse: 24, Cockburn Street, Edinburgh.
Nurseries: Brunstain Glen, Musselburgh.

Carter's Index, March 26.

CARTER'S GENUINE SEEDS. See page 438.
237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See page 438.
237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 438.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 438.—237 and 238, High Holborn, London, W.C.

CARTER'S NEW ONIONS.
237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES.
237 and 238, High Holborn, London, W.C.

Carnations and Picotees.

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Prices on application. Trade supplied.

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Coleshill, Zonale; Lady Edith, Ivileaf; unrivalled.
JOHN KEYNES, Castle Street, Salisbury.

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Country Branches—Houghton Branch, 80, Kings's Road. Southampton, 178, High Street. Plymouth, 15, Devonshire Terrace.

SUTTONS' HOME GROWN FARM SEEDS.
For present prices see p. 427 of this week's Paper.

SUTTONS' GRASS SEEDS for ALL SOILS.
For present prices see p. 427 of this week's Paper.

SUTTONS' GRASS SEEDS for PASTURES, 20s. to 32s. per bush., carriage free.

SUTTONS' GRASS SEEDS for PARK GROUNDS, 18. per bushel, carriage free.

SUTTONS' GRASS SEEDS for GARDEN LAWNS, 1s per lb., or 20s. per bushel, carriage free.

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To the Trade.

WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and BADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

To the Trade.

SWEDE, SCOTCH, and other TURNIP SEEDS, new and genuine, can be bought at low prices by applying to
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Transit Agency for Plants, Seeds, &c.

CHAS. JOS. BLACKITH, only surviving Partner of the late Firm of BETHAM AND BLACKITH, begs to announce that he intends in future to conduct Business at the same address, under the style of CHAS. JOS BLACKITH AND CO., and hopes to receive a continuance of the favours of the Trade.
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RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to success.

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CENTAUREA CANDIDISSIMA	2 6
„ ARGENTEA	2 6
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CANNAS, in six choice varieties	2 6
CHRYSANTHEMUM, new Japanese varieties	2 6
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DIGITALIS, extra choice spotted	1 6
ECHEVERIA METALLICA	1 6
GLOXINIA, extra choice	2 6
GOLDEN FEATHERFUM	1 6
HOLLYHOCK, extra choice, mixed	2 6
MIMULUS, choice, mixed	1 0
NIEREMBERGIA FRUTESCENS	1 0
PANSY, extra choice, mixed	2 6
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„ choice Belgian	1 6
PELARGONIUM, Gold and Bronze	1 6
„ Zonal, choice	1 6
„ Nosegay, choice	1 6
PETUNIA, double, extra choice	2 6
„ Single, choice mixed	1 0
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„ mixed	2 6
„ Fern-leaved, mixed	2 6
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„ Truffaut's Pæony, 12 vars.	2 6

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„ „ MAJOR.—6s. per dozen.
„ „ ALBA.—6s. per dozen.
„ „ PALLIDA.—1s.
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„ PSEUDO-NARCISSUS (the Wild Daffodil).—2s. 6d. per dozen.
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„ „ ALBUM.—1s. 6d.
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„ AIZOIDES.—Bright yellow. 9d.
ANEMONE PALMATA.—Large orange-yellow; fine. 9d.
GENTIANA VERNA.—1s. to 2s. 6d.
„ PYRENAICA.—Brilliant blue. 3s. 6d.
MYOSOTIS DISSITIFLORA (Montana).—Earliest of Forget-me-Nots; large. 4s. per dozen.
HEPATICA (single blue). 4s. per dozen
„ (double red). 4s. per dozen.
PRIMULA MINIMA.—One of the loveliest of alpines; flowers very large, deeply incised, light purplish carmine. 1s.
„ NIVALIS.—Corymbs of showy white, charming. 1s. 6d. to 2s. 6d.
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A Collection of Six Ornamental varieties of FLOWER SEEDS suitable for Rockeries, 3s.

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Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

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Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen.
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BUTLER, McCULLOCH & CO.'S

COLLECTIONS OF CHOICE FLOWER SEEDS (all sent Post Paid).

HARDY ANNUALS, 2s. 6d., 5s., 7s. 6d., and 10s.
„ PERENNIALS, 3s. 6d., 6s. 6d., 12s. 6d., and 25s.
HALF-HARDY PERENNIALS, 4s. and 7s. 6d.
CARNATIONS, 12 superb varieties, 3s. and 5s.
GERMAN STOCKS, 1s. 6d., 2s., 2s. 6d., 3s., and 3s. 6d.
BEDDING ANNUALS, 4s., 7s. 6d., 15s., and 30s.
NEW ANNUALS, 5s. and 10s. 6d.
SWEET SCENTED ANNUALS, 1s. 6d. and 2s. 6d.
GERMAN ASTER, very choice, 1s. 6d., 2s., 2s. 6d., 3s., and 3s. 6d.

COMPLETE COLLECTIONS of VEGETABLE SEEDS for One Year's Supply, 10s. 6d., 21s., 30s., 42s., and 63s.

Orders amounting to 21s. sent Carriage paid. PRICED DESCRIPTIVE CATALOGUE, Post Free on application.

SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.
Established upwards of a Century.

VIOLA CORNUTA, VAR. PERFECTION.

B. S. WILLIAMS

Has much pleasure in now offering this superb new BEDDING PLANT to the Public, and from the manner in which it has been tested, both in dry and exposed positions, as well as moist and shady places, he has no hesitation in asserting its superiority over any and every VIOLA previously offered, and also is fully persuaded that it will be for many years a Standard Bedding Plant. It is of free growth, yet seldom exceeding six or eight inches in height; the leaves are much larger than those of V. cornuta, which is one of its parents; whilst the flowers, still bearing the characteristic horns of that species, are borne well above the foliage, but three times the size and of good substance: the colour is shaded blue, the eye orange-yellow, with a dark purple disc round it, from which proceed radiating lines of still deeper purple. Indeed, it may be said to be like a gigantic V. cornuta in habit, retaining its qualities as a profuse bloomer, and bearing large flowers which almost rival our Florist Pansies for size and substance.

This plant was awarded a First-Class Certificate by the Floral Committee when exhibited before them (Sept. 25, 1869) by Mr. Jobson, of Rotherfield Park, its raiser, which no similar Viola has received. And no plants but those which come from this stock are true in character.

The names of all Nurserymen purchasing this plant will be duly advertised, to enable the Public to secure the genuine article. Orders are being booked and will be executed, in strict rotation, the first week in May.

Price.—Single Plants, 2s. 6d. | **50 Plants, 70s.**
Per Dozen, 24s. | **100 Plants, 100s.**

Trade Price upon application.

B. S. WILLIAMS, VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

VIOLA CORNUTA, BLUE PERFECTION.

GEORGE SMITH,

WILTON ROAD NURSERY, SALISBURY,

Begs to say that he has a large STOCK of this SUPERB BEDDING PLANT, which is equally suitable either for the Spring or Summer Garden, as it produces an abundance and continuity of blossom from the end of March to the end of October. It has been thoroughly proved by himself for some years, and by Mr. Challis, of Wilton House Gardens, for the last three years, both in the Spring and Summer Garden, in both of which it eclipsed every other blue plant in brightness as well as in abundance of bloom. Its habit is dwarf, yet free, the foliage is dark green, the flower is as large as the well-known Cliveden Blue Pansy, and the colour is a beautiful clear blue, inclining to mauve; the petals are smooth and even, and of great substance.

G. S. begs to state that the blooms of it which were exhibited before the Floral Committee, South Kensington, September 21, 1869, by Mr. Warren, were obtained from his Nursery. They were declared by the Committee to be identical with a variety shown by Mr. Jobson, of Rotherfield Park, as a seedling. As some discussion has taken place respecting it between Mr. Dean and others, G. S. begs to say that he has not only had it in his possession, but has sold it for several years past, and he not only claims the merit of being the first to introduce it to public notice, but also denies that it is a seedling of recent date.

Having a large stock, G. S. will be prepared to send it out in any quantity early in April.

Price—Single Plant, 2s.; Per Dozen, 18s.; Per 100, £4; Per 1000, £25.

☞ *All Orders will be executed as received.*

LEUCOCARPUS ALATUS.

B. S. WILLIAMS

Has much pleasure in offering fresh SEEDS of this extremely useful plant for winter decoration. When well grown it is very ornamental, its long racemes of snowy fruits forming a beautiful contrast to those of the celebrated hybrid Solanums, and for which the Leucocarpus is a most suitable companion. The berries are large, pure white, and produced in great profusion.

Price 1s. 6d. and 2s. 6d. per packet.

VICTORIA NURSERY, UPPER HOLLOWAY, LONDON, N.

YELLOW-LEAVED CALADIUMS,

RAISED AT THE GARDENS OF

THE ROYAL HORTICULTURAL SOCIETY.

MESSRS. JAMES VEITCH & SONS,

Having made arrangements with the Council of the Royal Horticultural Society to take all the available stock of the above striking and very distinct novelties, have much pleasure in OFFERING for SALE the Plants, which will be ready for distribution on the 1st of May next.

The following descriptions, published by the Society, may be relied on as being exact; and J. V. & S. feel they need add nothing to recommend to the Public these Novelties, which they are confident will be eagerly sought after by all lovers of this popular and useful class of Decorative Plant. They would only say, that the splendid golden tint of those now offered renders them perfectly distinct from any others previously in cultivation.

CALADIUM PRINCESS ROYAL.
Hybrid R.H.S.

Leaves large, of a pale green or yellow, with crimson centre, in the style of C. Brongniartii; very handsome.

CALADIUM PRINCE OF WALES.
Hybrid R.H.S.

Leaves large, similar to the preceding, with the addition of several deep spots and splashes of crimson; very handsome.

CALADIUM GOLDEN QUEEN.
Hybrid R.H.S.

Leaves large, pale green or yellow, uniform in colour; very handsome, and of a remarkably chaste appearance.

CALADIUM PRINCESS OF WALES.
Hybrid R.H.S.

Leaves large, similar to the preceding, with the addition of some bright spots of colour; very handsome.

The Set of Four Plants, £1 10s.

The usual Discount to the Trade; and special terms will be quoted where several Sets are taken.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

1870.

J. W. WIMSETT'S
NEW PLANT CATALOGUE (108 pages)

Is now ready, and will be forwarded, Post Free, on application.

It contains extensive LISTS of ORCHIDS, STOVE and GREENHOUSE PLANTS, TREE FERNS' AZALEAS, CAMELLIAS, NEW BEDDING PLANTS, WILLS' NEW HYBRID and other PELARGONIUMS, SHOW and FANCY GERANIUMS, RHODODENDRONS suitable for cold and exposed situations, and New and Handsome PALMS, suitable for Drawing-room and Dinner-table Decoration.

For descriptions of these see *Gardeners' Chronicle* for February 19, 1870. The plants there mentioned were a portion of Mr. WIMSETT'S extensive collection, and were supplied to the City of London Club, Old Broad Street. These decorations were the most graceful ever witnessed, and the only instance on record where Palms have been used exclusively for dining-room decoration.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W., *December* 10, 1869.

SIR,—I am directed by the Council of this Society to convey to you their thanks for the grand display of Flowers you made at the Gardens here on the occasion of the visit of his Majesty the King of the Belgians.—I remain, Sir, yours faithfully,
JAMES RICHARDS, Assistant Secretary.

To J. W. Wimsett, Royal Ashburnham Park Nursery, King's Road, Chelsea.

BALLS and PARTIES furnished with Plants of every description. A large stock of Ornamental-foliaged Plants always kept for the purpose.

CONSERVATORIES furnished, by the year or otherwise, on the most reasonable terms.

All kinds of DINNER-TABLE DECORATIONS sent out to any part of London, and arranged in the most modern and approved style, and of the most choice flowers of the season.

CUT FLOWERS sent out loosely, or arranged into bouquets by competent and tasteful persons.

BRIDAL, OPERA, and other BOUQUETS furnished on reasonable terms.

ASHBURNHAM PARK NURSERY, KING'S ROAD, CHELSEA, S.W.
J. WILLS, F.R.H.S., *Manager.*

SEED POTATOS.

H. & F. SHARPE

HAVE FINE STOCKS OF

THE FOLLOWING VARIETIES OF SEED POTATOS,

Which they offer to the Trade at low prices:—

EARLY SANDRINGHAM KIDNEY
" MYATT'S PROLIFIC KIDNEY
" AMERICAN ROSE KIDNEY
" RIVERS' ROYAL ASHLEAF KIDNEY
" DAINTREE'S EARLIEST
" KING
" DRUMMOND'S PROLIFIC ROUND
" DALMAHOY
" FOXE'S SEEDLING
" OXFORD

EARLY FORTYFOLD
" FLOUR-BALL
" COCKNEY
" BRITISH QUEEN
" MARTIN'S GLOBE
PATERSON'S VICTORIA, true
WEBB'S IMPERIAL KIDNEY
BARRON'S PERFECTION
WALKER'S EARLY REGENT
FLUKE KIDNEY | ROCKS.

SEED GROWING ESTABLISHMENT, WISBECH.

H. CANNELL'S ILLUSTRATED FLORISTS' GUIDE (the leading, or the "Gardeners'" report, the Cyclopedia thus: "This is a descriptive list of new and other florists' flowers, &c., and containing many original papers of interest to all florists."

Mr. G. GLENNY reports it thus in *Lloyd's*, February 6th: "Cannell's Floral Guide.—Although a trade catalogue, it has now assumed the character of a horticultural work." Sent free for seven stamps.

GOLDEN FEATHER, in the hands of those that understand its nature, has proved a decided bedding acquisition all through the year, and ought to be in every garden; but, like all other plants, its beauty and success depend on its proper management. See H. CANNELL'S SEED CATALOGUE, with full particulars, and 400 New SEEDS, sent free for 12 stamps.

Echeveria.

H. CANNELL has perhaps the finest and largest blooming lot of Plants of METALLICA in the kingdom, varying in size from Seedlings to Plants 4 feet high; and H. C. has spared neither expense nor pains in bringing a large quantity of seed to perfection. Each pod contains quite 100 dust-like seeds, and if sown at once will make splendid little plants for this season. One pod sent free for 13 stamps. H. C. has also a fine lot of the three following beautiful edging kinds—SECUNDA, SECUNDA GLAUCA, and PUMILA. A packet of seed of either of these sent free for 18 stamps. Plants of the above from 5s. per dozen to 20s. per plant.

H. CANNELL, JUN., New Florist Flower, and Florist Flower Seed Merchant, Wimbledon.

SUTTONS' FRESH IMPORTED FLOWER SEEDS. Free by post.

ASTERS, WALLFLOWERS, STOCKS, ZINNIAS, &c., imported from the most celebrated Continental growers. See SUTTONS' BEST and FULL LIST of FLOWER SEEDS, gratis and post free on application.

SUTTONS' COLLECTIONS OF FLOWER SEEDS.

				£	s.	d.
No. 1 Collection of the best English and German varieties, with instructions on cultivation, free by post or rail				2	2	0
No. 2 Collection of	ditto	ditto	..	1	11	6
No. 3 Collection of	ditto	ditto	..	1	1	0
No. 4 Collection of	ditto	ditto	..	0	15	0
No. 5 Collection of	ditto	ditto	..	0	10	6

Small and useful Collections can also be had from 2s. to 7s. 6d., free by post.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

EVERGREEN HEDGES, AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 30s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 85s. per 100.
RICHARD SMITH, Nurseryman, Worcester.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.
RICHARD SMITH, Nurseryman and Seedsman, Worcester.

Evergreens.

JAMES DICKSON AND SONS beg to call special attention to their very large and excellent Stock of EVERGREENS, including all the finest sorts and Novelties as well as New varieties, in all or all sizes, at very moderate prices, which will be furnished on application.

☞ The "Newton" Nurseries can now be reached on foot within 10 minutes from the Chester Station, by walking over the Flookersbrook Railway Bridge, entering JAMES DICKSON AND SONS' new road by the Ermine Inn.
"Newton" Nurseries, Chester.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

ORCHIDS.—A small Collection of ORCHIDS (comprising Phalænopsis Schilleriana, with 50 blossoms; Dendrobium Pactoni, with 16 spikes; and other fine and healthy Plants showing for blooming), offered for SALE by the Executors of the late C. B. Warner, Esq. They can be viewed, and all particulars obtained, upon application at Woodlands, Hoddesdon, Herts.

TO BE DISPOSED OF, a CROTON ANGUSTIFOLIUM, in an 18-inch pot, 6 feet 4 inches high, and 4 feet through, forming a good and perfect Pyramid, feathered to the pot. Also, a CROTON VARIEGATA, in an 18-inch pot, 7 feet high, 1 feet 6 inches through, bushy, showy, and fine form. Both plants are perfectly healthy, clean, and well-grown.
C. P., Messrs. Dobson & Sons, 121, Cannon Street, City, E.C.

Leicester Abbey Nurseries.

THOMAS WARNER begs to remind intending Planters and the Trade that, in addition to his extensive General Nursery Stock, he has the following in large quantities, of unsurpassed quality, and offered at most reasonable prices. CATALOGUES, Wholesale or Retail, may be had free on application.

APRICOTS, Standard Maiden, Moor Park.
CHERRIES, Standards, Dwarfs, and Pyramids.
CURRANTS, White Dutch.
PEARS, Standards and Pyramids.
PLUMS, Standards, chiefly Victoria.
MANETTI ROSE STOCKS.
ARBOR-VITÆ (of sorts), single specimens, 1½ to 5 feet.
AUCUBA JAPONICA, single specimens, 1 to 2 feet.
BOX, Tree (of sorts), 1½ to 3 feet.
CHESTNUTS, Scarlet and White, Standards, 5 to 8 feet.
ELM, Ornamental (of sorts), Standards, 4 to 12 feet.
LABURNUM, English, 4 to 8 feet.
POPLAR, New Silver, 1½ to 8 feet.
OAK, English, Transplanted, extra fine, 3 to 5 feet.
SPRUCE FIR, single specimens, 1½ to 3 feet.
ROSES, Dwarf, most of the leading and newer kinds.

KNAPHILL NURSERY,
WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s to 60s. per dozen. Transplanted April, 1869.
ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868.
ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d to 21s. Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference.
ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s., to £12 10s. per 100.
The dwarf varieties of SPRUCE, such as pumila pygmæa, Gregorii, Clanbraziliana, &c., large numbers, many of them 20 and 30 years' growth.
CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these tasteful Deodars. All have been removed since August, 1868, and are fine for Avenue Planting.
CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868.
CEDRUS LEBANON, 6, 7, to 10 feet. Moved September, 1868.
CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen;
" " 8 to 10 feet, 5s. to 10s. 6d. each.
" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each.
" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.
JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.
PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.
PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high.
PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 10 feet high. All removed April, 1868-69.
PICEA MAGNIFICA, 3, 4, and 5 feet.
PICEA PINSAPO, 4, 5, 6, and 8 feet, 21s. to 63s. each. Some grand plants, 10 to 15 feet high. Moved April, 1868.
THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high; 10 to 20 feet in circumference. This plant originated in this Nursery, and our stock is unsurpassed.
THUJA GIGANTEA, 5, 6, 10 to 12 feet high. Moved August, 1868
THUJA LOBBII, 8 to 14 feet high, and as much in circumference; transplanted April, 1869.
THUJOPSIS BOREALIS, 5 to feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868
WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each. Transplanted in August.
PINUS AUSTRIACA, 3 feet, £5 per 100. Transplanted Sept., 1868.
PINUS PINASTRIA, 8 to 10 feet round, 12s. 6d. to 21s. each
YEWS, the COMMON ENGLISH 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought.
YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.
YEW, IRISH, handsome plants, up to 10 feet high.
HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as ordinary sizes, together with many thousands of the following varieties:—
HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet.
HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference.
HOLLY, SILVER QUEEN, 4, 5, and 6 feet.
WATERER'S HOLLY.—This fine variety originated in this Nursery we have hundreds 4, 5, and 6 ft. high, 10 and 15 ft circumference.
PERRY'S WEEPING HOLLY.—Standards, 10s. 6d. to 21s. each.
HOLLY, COMMON SILVER EDGING.—The finest specimens we have seen. Moved, April, 1869.
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868
HOLLY, choice varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868-9:—

	LAURIFOLIA and SCOTTICA, 4, 5, 6 to 10 feet high.
HODGINSII,	ANGUSTIFOLIA,
YELLOW BERRIED,	MYRTIFOLIA, &c.

4, 5, 6, and 8 feet high.
STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number.
N.B.—Purchasers of Hollies may select from a stock occupying at the present moment upwards of 2 acres of ground; finer or better rooted plants cannot be wished or obtained. The prices are fair and reasonable.
BOX, Green and Variegated, 4, 5, 6, to 8 feet.
BOX, do do, fine pyramids, up to 8 feet.
BAYS, Standards and pyramids.
LAURUSTINUS, standards.
AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.
AUCUBA JAPONICA, Berried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 100s. per doz. and upwards.
AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—
RHODODENDRONS, nice bushy plants, from layers, named kinds, £6 per 100, £50 per 1000, for immediate planting.
RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s. per 100, and upwards.
RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000.
STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads carrying from 15 to 30 feet in circumference. There is probably no kind better adapted for standards than that we call roseum elegans, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.
RHODODENDRONS, fine hybrids, of good hardy habit, and great variety of flower, from £5 to £12 per 100. Sample on application. Large and handsome plants by the 1000, 4 to 8 feet high.
AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.
AZALEAS, common kinds, £5 per 100.
AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference.
KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100.
ANDROMEDA FLORIBUNDA, £5 to £7 10s. per 100, and upwards.
HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100.
ERICA CARNEA, for winter blooming, many thousands.
ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.
SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen.
As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.
A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.
The Nursery is readily reached by train from Waterloo to Woking In 40 minutes.
N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

CALCEOLARIAS, Herbaceous, nice plants, free by post, 2s. 6d. and 4s. per dozen.
GLOXINIAS, good varieties, 12 for 8s., 24 for 16s., free by post.
ACHIMENES, in 20 varieties, 3 tubers of each, 6s. per dozen.
DAHLIAS, pot roots, package free, 50 varieties for 15s., 25 for 7s. 6d.
CALCEOLARIAS, bedding, in 12 varieties, our selection, free by post, 2s. 6d. per dozen, 50 for 8s., 100 for 15s.
PELARGONIUMS, in 50 varieties, package free, out of pots, 4s. per dozen, 30s. per 100.
ZONAL, NOSEGAY, and SCARLET GERANIUMS, in 25 varieties, package free, 10s. and 12s. per 100
FUCHSIAS, package free, 12 varieties for 4s., 24 for 8s.
EPACRIS, coming in flower, 30 varieties, 12s. per dozen. AZALEAS, flowering, 12s. to 18s. per dozen. ACACIA ARMATA, flowering, 9s. per dozen. CHEORANTHUS ODORATISSIMA, 6s. per dozen. PRUNUS TRILOBA and ALBO-PLENA, well set for bloom, 9s. per dozen.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

STOVE PLANTS.—For SALE, near London, a well-assorted COLLECTION, containing upwards of fifty sorts, in healthy condition. Some choice and rare specimens. For particulars apply, by letter only, to
X. Y. Z., Leathwait & Simmons, 1, Pope's Head Alley, City, E.C.

JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, begs to offer 100 CAMELLIAS, best sorts, £3, £4, £5, £6
100 RHODODENDRONS, best hardy sorts, £4, £6, £8.
100 AZALEA INDICA, best sorts, £3, £4, £5.
100 HOLLIES, named, £4, £8, £12.

Juniperus hibernica.

H. LANE AND SON, having a splendid lot of beautiful-shaped trees (unsurpassed for symmetry), 4 to 5 feet high, transplanted spring 1869, beg to offer them to the Trade at £7 10s. per 100
The Nurseries, Great Berkhamsted, Herts.

Araucaria imbricata.

H. LANE AND SON, having a very large stock, beg to offer them at the following greatly reduced prices, viz.; 5 to 6 feet, 21s.; 7 to 8 feet, 42s.; 9 to 10 feet, 63s.; 11 to 12 feet, 84s.; 12 to 14 feet, 105s. An inspection is earnestly solicited.
The Nurseries, Great Berkhamsted, Herts.

MALE ACCUBAS, with Flower-buds.—Good Plants, in variety, from 9 inches to 2 and 3 feet high, 12 6d to 10s. 6d. each; Female kinds, 2s. 6d. to 5s. 6d. each, according to size and sort.
THOS. CRIPPS AND SON'S collection of the above comprises every variety of merit.
The Nurseries, Tunbridge Wells.

E. G. HENDERSON & SON'S
LIST OF NOVELTIES FOR THE SPRING AND EARLY SUMMER OF 1870.

Special Prices for each Set may be had on application, and the Trade quotation for each group as usual. The previous notes of New Plants given at page 375 (March 19) is complete with the present List.

On and after the 28th of March, the following in their kinds will be distributed: — BLANDFORDIA, MIMULUS, AGERATUM, SCUTELLARIA, BOUVARDIA ELEGANS, ANTIRRHINUMS (Tom Thumb Section), and IVIES.

On and after the 2d of May all the remaining New Plants of the present List will be supplied, with the exception of the Variegated (Tricolor and Zonal) Pelargoniums, which will be distributed in June.

Caladium "Prince Albert Edward."

A very beautiful and effective new hybrid. Having retained its splendid foliage through the same plant for two years, it is considered to partake nearly equal in degree of the Alocasia and Caladium—of the former in its evergreen character, and the latter in its most picturesque features. The leaf stems are a rich dark ebony hue, streaked and barred with creamy-grey white. The broad leaf-blades are heart-shaped, from 12 to 18 inches in length, and nearly equal in width, of a dark emerald-green ground, with a very beautiful rich crimson midrib, radiating from the centre towards the margins, the intervening leaf-spaces being densely and elegantly spotted with ivory-white. As the leaves advance to maturity the small, thread-like green veins form an elegant tracery over the upper surface. The leaves being of a leathery texture, this noble plant is admirably adapted for permanent effect by culture throughout the year, and amongst other plants in its own group forms one of the most beautiful for miscellaneous selections. 31s. 6d.

Bouvardia elegans.

WINTER-BLOOMING SECTION.

This fine variety is a permanent form, from B. Hogarth, from which it is at once distinguished by its remarkably dwarf, bushy, free growth; but its most valuable feature consists in the truss and individual florets, being nearly double the size of any other known scarlet variety; single trusses of it have been gathered from 4 to 5 inches in width. The colour of its blossom is a pure scarlet tinted carmine. It will prove a valuable kind for Conservatory culture for flower garden groups), producing its large and brilliant flower-trusses during the late summer, autumn, and winter months, being alike valuable for drawing-room basket groups, and winter bouquets. 3s. 6d.

Bouvardia jasminoides compacta.

WINTER-BLOOMING SECTION.

This valuable plant is a selected seminal variety of the original B. jasminoides. It forms a neat freely-branched dwarf habit, producing numerous trusses of small brilliant flower-corymbs during the late summer, autumn, and winter months, being alike valuable for drawing-room basket groups, and winter bouquets. 3s. 6d.

Ageratum Tom Thumb.

A charming miniature dwarf variety of Ageratum mexicanum, forming a densely low and compact growth of 6 to 8 inches in height. Its flowers are the same elegant light porcelain-blue, yielding a very beautiful and unique contrast and relief-tint, with shades of chocolate, dark crimson, and light violet flower-trusses. As a plant for medium-sized beds, or second front row in riband lines, or belts, it forms a most desirable feature, retaining its average growth and effect until the approach of frost, and is for continuous bloom, uniform growth, full habit, and unique blue flower-tint, the Dwarf Ageratum has no rival in the flower garden. 2s. 6d., 18s. per dozen.

New Zonal Bedding Geraniums.

WHITE PRINCESS.—Zonal section; pure white, with a dwarf compact habit, well-formed truss, and profusion of bloom. By its neat growth, effective display, and long-continued season of flowering, it is offered as the best new white bedding variety in cultivation. 7s. 6d

CHERRY LIPS.—A dwarf and free-flowering variety, being a seedling from, and in the style of Christine Nosegay; cerise-scarlet in colour, and an effective flower for bed or belts. This plant was announced to be sent out in spring, 1869, but the stock was so limited that the orders could not be supplied. 7s. 6d.

Lobelia Erinus.

(DWARF, or MINIATURE SECTION.)

ANNIE (hybrid origin), lilac. 2s. 6d.
NELLY (hybrid origin), mauve. 2s. 6d.
HERE [Fairlop], pure white. 2s. 6d.
These varieties are remarkably dwarf, densely compact, profuse in bloom, and desirable in colours, forming beautiful additions to the group, and valuable in summer decoration for front rows, or lines in flower-beds, or artistic scroll-work.

New Ivies.

HEDERA RHOMBOIDEA OBOVATA.—A remarkably neat and distinct species, of trailing habit, of somewhat dense and compact growth; the leaves are a dark rich green tint, assuming bronze or metallic hue during the winter months; in form obovately heart-shaped, with a concave or scoop-like outline, imparting a very unique character to the plant. It is distinct from all other Ivies yet offered.
A First-class Certificate of Merit was awarded to it by the Royal Horticultural Society. 5s.
HEDERA HELIX AUREA SPECTABILE.—A very beautiful climbing variety, of vigorous habit, and bright emerald-green leaf-tint, merging into a rich self or marbled gold colour. In mature growth its leaves are nearly double the size of the English Ivies. It is well adapted for covering front-wall aspects, also for pillars and trellis-work. It is the best golden variety in its group yet offered. 5s. each.

Mimulus Rivularis Pardinus.

LEOPARD-SPOTTED MONKEY FLOWER.

(See separate descriptive notes in the "Gardeners' Year Book and Almanac.")

Albus elegantissimus	Aurantiaca splendens
Cupreus speciosus	Exquisite
Flammulatus	Leopardinus
Meteor	Orientalis
Rubra ornatus.	3s. 6d. each.

E. G HENDERSON AND SON having followed up the means of obtaining beautiful forms by the crossing of the most distinct sorts of Mimulus cupreus with the finest golden garden hybrids, offer the foregoing as the most beautiful selection of Seedlings yet offered by them. The present group is specially adapted for conservatory and greenhouse decoration during the early spring and summer months. With the exception of the first named kinds, these varieties are distinguished by their flowers of fine outline, and of rich golden lemon yellow, and bronze ground colours, most beautifully belted and blotched with rich crimson and bronze on the margins and side lobes, the centre orifice or throat being exquisitely marked with small and larger spots of brilliant crimson on orange ground, and in one or two varieties the large crimson-tipped lobes are conspicuously beautiful by the golden-yellow orb-like spots in the centre of each. Others are strikingly effective by the crimson side lobes being entirely belted with rich gold tint.
Under a course of successful culture, this section of Mimulus is calculated to make a very fine display in the conservatory during the spring season as a connecting group between the bloom of Cinerarias and Calceolarias, in immediate succession to the former, and with a routine of management much resembling that required for the latter.

Pelargoniums (Variegated), Zonal.

ALLAN-A-DALE.—Improvement upon Lady Cullum, with rich flamed-red zone on olive border. 21s
ANTHONY.—A new dwarf, compact growth. 42s.
DREAMLAND.—Handsome variety, with bright orange-tinted zone, merging into a rich flame-scarlet. 21s.
FIERY SERPENT.—Well-defined gold margin, with brilliant flame-coloured zone; dense dwarf habit. 21s.
HOME INFLUENCE.—Improvement on Howarth Ashton in growth, gold margin, finely belted with flamed-scarlet. 42s.
ISLE OF BEAUTY.—Broad gold leaf-margin, with rich carmine-red zone; fine bold habit 31s 6d
LASS O' GOWRIE.—Leaf-margin white, with inner broad zone of brilliant carmine-rose. 63s.
MANDARINE.—Golden leaf-margin, the zone belted with bright carmine-crimson. 21s.
NYDIA.—Broad cream-white leaf-margin, the zone finely belted with pure bright rose. 31s. 6d.
PETER GRIEVE.—Rich gold margin, correct outline, and brilliant zone of flamed-scarlet, blending the beauty of Lucy Grieve with the growth of Mrs. Pollock. 63s.
QUEEN OF HEARTS.—Silver-edged bedding variety, with bright rose zone, fine outline and close compact growth. 42s.
RISING SUN.—An improvement on Sunset, effective for beds in its bright crimson zone and rich green leaf-tint. 21s.
SUNFLOWER, medium, or miniature variety; light gold edge and carmine-scarlet zone; dwarf, compact. 21s.
JEWISH MAID.—Elegant dwarf miniature variety, close compact habit, well expanded leaves, with bright carmine-scarlet zone on golden belt. 31s 6d
MADONA.—Free vigorous leaf growth, on stout habit, showing a handsome broad crimson zone on a gold outer margin. A very effective bedding variety. 21s.

Pelargoniums (Gold and Bronze), Zonal.

ATTRACTION.—Rich dark bronze zone on yellow ground, with broad leaf margin and fine outline. 15s.
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JUBILEE.—Fine red-crimson zone in gold leaf-ground, and broad margin; dwarf, compact, effective. 15s.
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We can confidently recommend this as one of the best Cucumbers grown, while it is second to none for general purposes. In Winter it grows about 1 foot long, and in Summer from 15 to 18 inches, is of deep green colour, very handsome, delicate in flavour, and particularly tender, crisp, and juicy. It is very prolific, showing two to three fruit at every joint, and furnishes a continual supply of handsome Cucumbers during the Winter, Spring, and Summer months. Per packet, 1s. 6d. and 2s. 6d., post free.
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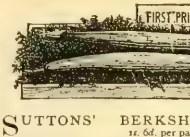

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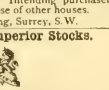

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We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless.
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" better class (SEEDLINGS) and named varieties for extensive planting, £5 per 100.
" of superior kinds, many on own roots, £7 10s. to £10 per 100.
" very superior, leading, crimson, rose, white, £12 10s. to £15 per 100.
" STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each.
AZALEAS, common kinds, 50s. to 75s. per 100.
" very best, in fine plants, £10 per 100.
KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen.
" LATIFOLIA, 18s. to 30s. per dozen.
ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen.

We have likewise immense quantities of the leading kinds of
EVERGREENS OF ALL SIZES,
SUCH AS
AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYREA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and select for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

No. 1 will be Published on March 31, with 34 Engravings, Price 6d.

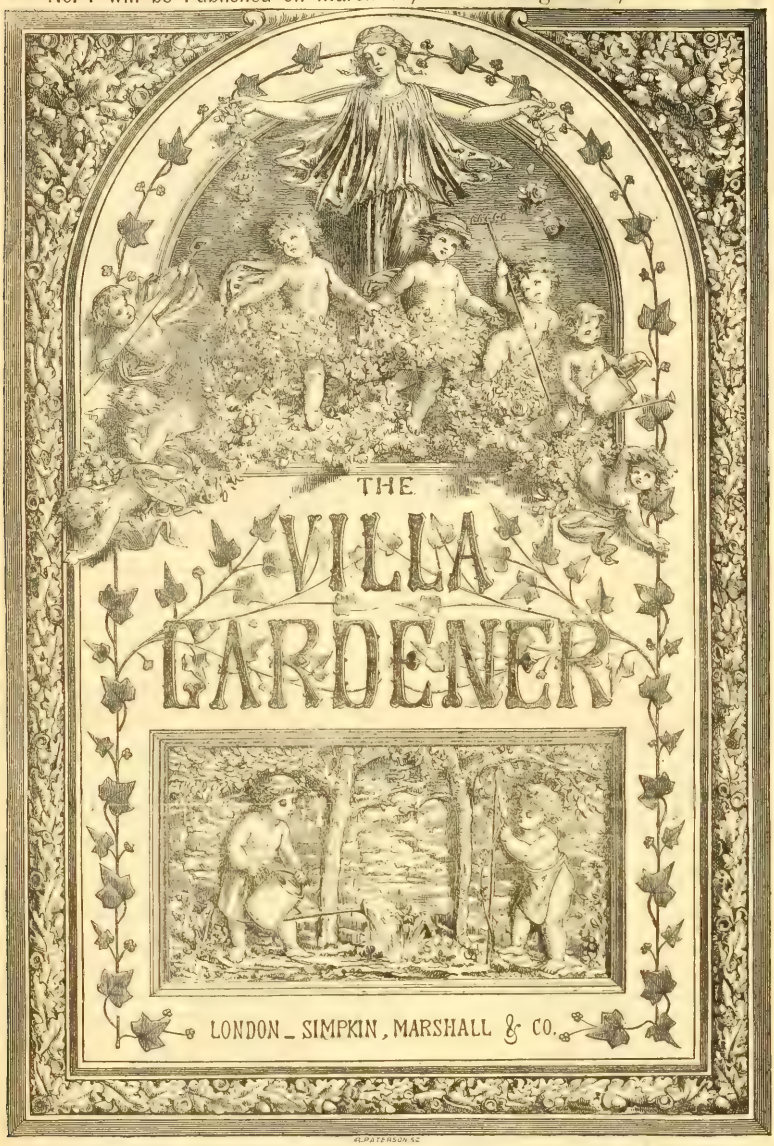

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THE VILLA GARDENER is not intended for Professional Gardeners, who are already so well supplied with ably conducted weekly and monthly journals, but for that very large class—the dwellers in Suburban Residences and Villas—who are interested in Gardening simply as a relaxation from other pursuits, who do not employ a regular Gardener, and who have at present no periodical devoted expressly to their interests.

The pages of this new candidate for public favour will be occupied with matter concerning Villa and Town Gardens—to their laying out, planting, and general culture—the management of plants in the open air, the conservatory, greenhouse, dwelling-house, balcony, Wardian case, &c. City gardens, squares, parks, and places of public resort, will also receive some degree of attention, proportionate to the influence they exercise, or may be made to exercise, on the public taste.

Special articles by some of the most competent writers of the day will appear on all gardening operations—as the preparation of the soil, manuring, the sowing of seed, striking plants from cuttings, grafting, layering, pruning, training, watering, and the innumerable other operations which require to be performed in the course of the year, even in the smallest Garden. The Conductors will also have something to say on the best mode of dealing with the Pests of the Garden—insects especially.

Notices of New Flowers, Fruits, Ornamental Plants and Trees, and Culinary Vegetables, so far as these may be interesting to Amateurs, will appear in each Number, and their respective merits or demerits fairly criticised.

Particular attention will be given to the construction, on a scale suitable to Villa Gardens, of Conservatories, Greenhouses, and Hothouses, and of the varied modes of Heating and Ventilating which are continually being brought under Public notice.

Garden Architecture and the proper use of Statuary and other Garden Ornaments will form an important feature of the VILLA GARDENER. Improvements in Garden Tools, Implements, and other appliances will be noticed and criticised.

Practical and plain instructions of what has to be done during the Month, in all the departments of a Villa Garden, will be given; and, in addition, plain directions for what should *not be done*.

It being unquestionable that it is on the Ladies of the household that the general direction of the labour of a Flower Garden falls, as well as the care of Plants in the Conservatory and Drawing-room, it will be the particular study of the Conductors, by imparting their experience on the best mode of management, to make "Every Lady her own Flower Gardener;" and, in doing this, it is hoped to effect a general improvement in the gardening tastes of that large class for which the VILLA GARDENER has been specially projected.

In addition to the subjects mentioned above, a portion of the Magazine will occasionally be devoted to Villa Architecture, and the Management of Aviaries and Aquariums, as adjuncts of the Villa.

The Queries of Correspondents on all subjects connected with Villa Gardening will receive every attention, and be replied to at such length as the general interest of the question demands.

Such is the programme of the VILLA GARDENER; and the Conductors trust that while no effort on their part will be wanting to make it acceptable to the large class for whose special use it has been projected, it is to be hoped that its readers will, from time to time, contribute, for the information of others, any details of management in the growth or culture of any plants that they may consider of importance.

LONDON: SIMPKIN, MARSHALL, AND CO., STATIONERS' HALL COURT, E.C.

Notice.

PURCHASERS of LARGE QUANTITIES of FARM or GARDEN SEEDS will be supplied liberally by SUTTON AND SONS.

For prices apply (stating quantity required) to SUTTON AND SONS, Royal Berkshire Seed Establishment, Reading.

Hollyhock Seed.

PAUL AND SON can strongly recommend their FIVE SHILLING COLLECTION of 12 varieties, well chosen for colour, as producing flowers nearly or quite equal to named varieties.

A fine stock of plants, 12s. per dozen.

The Old Nurseries, Cheshunt, N.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.

Highgate Nurseries, London, N

Spring Planting. To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Aucubas, and other hardy Trees, Shrubs, and Evergreens, is just published, and can be had on application. Milford Nurseries, near Godalming.

ALTERNANTHERA PARONYCHIOIDES. —Fine stock plants, full of cuttings, 9s. per dozen; smaller ditto sent free for 6d. per dozen.

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich.

New Double Geraniums.

H. CANNELL has more of the above than he requires for his regular business, and will send Twelve of last year's English and Continental varieties, established plants, and package included, for 15s ; or six for 8s

New Florist Flower and Florist Flower Seed Merchant, Woolwich.

IRESINE LINDENI.—This is undoubtedly the finest dark crimson leaved plant ever introduced, and is really the finest bedding and decorative plant of the year.

Received a First-class Certificate at Kensington. Established plants, 4s. per dozen; smaller sent free for 2s.

IRESINE ACUMINATA, 4s per dozen; smaller sent free for 2s.

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich.

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct sorts, for 50s ; 50 plants for 30s ; or 25 plants, distinct sorts, for 15s ; package included.

Crown Nursery, Reading.

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash :—Mrs. Pollock, 2s. 6d ; Lady Cullum, 6s. ; Sunset, 3s. ; Sophia Dumaresque, 3s. 6d. ; Italia Unita, 3s ; Richmond, 3s. 6d. ; Gold and Bronze Zonals :— Beauty of Calderdale, 3s. 6d. ; E. G. Henderson, 6s ; Duke of Edinburgh, 2s. 6d ; Her Majesty, 6s ; Luna, 2s. 6d ; Neatness, 2s. 6d. Basket-like, Bedding, or Golden, and 6d. for every subsequent dozen Remittances requested from unknown correspondents.

ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire.

Bedding Geraniums.

J. HOUSE, Eastgate Nursery, Peterborough, offers good strong plants of WILLIAMS' SUPERB (fine rosy carmine) and MISS KINGSBURY (silver variegated), at 6s. per dozen, both of which received First-class Certificates from the Royal Horticultural Society last season.

GRAPE VINES.

MADRESFIELD COURT, Canes, 7s. 6d. each ; Eyes, 3s. per dozen.

MRS PINCE, Canes, 5s. each ; Eyes, 2s. per dozen.

Sample of Canes on application.

J. HOUSE, Eastgate Nursery, Peterborough.

STRONG BEDDING GERANIUMS.—Tricolor and 5 others :—Lady Cullum, 6s. per dozen; Louisa Smith, 4s ; Sophia Cussack, 6s ; Sophia Dumaresque, 3s. ; Silver Flame, 3s. ; Italia Unita, 2s 6d. Bronze :—A. H. Wills, 3s. ; Beauty of Calderdale, 3s. ; Perilla, 2s 6d ; Kentish Hero, 4s. ; Princess of Wales, 5s. ; Little Golden Chain, 3s. Zonals :—Lucy Grieve, 3s. ; Lord Derby, 3s. Good plants in single 3-inch pots, all package free.—Orders are now booked for April and May.

A PRICED LIST, with nearly 200 Varieties, can be had on application to

W. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

CHRYSANTHEMUMS, CHRYSANTHEMUMS.— 25 good varieties for 5s., 50 for 9s., including large-flowered ; POMPONS and JAPANESE, 15 varieties of 1870, for 5s., in thumb pots, package included. No varieties sent which purchasers possess.

CALCEOLARIA AUREA FLORIBUNDA, 6s. per 100; GLADIOLUS BRENCHLEYENSIS, 6s. per 100. Nowering bulbs.

POLYANTHUS, proved, 2s. per dozen; RED DAISIES, 4s. per 100. PELARGONIUMS—Tom Thumb, Stella, and Cybister, strong autumn-struck cuttings, 1s. 8d. per dozen, 12s. per 100. CATALOGUE of Tricolor Pelargoniums and other Plants for one stamp. Terms cash.

WM. CLIBRAN AND SON, Millbank Nursery, near Warrington.

Special Notice.

THOMAS PERKINS, 42, Drapery, Northampton, holding large quantities of the following articles, offers them at very low prices. All are strong, healthy, and well established.

GERANIUMS, Double.	Per doz.—s. d.	ZONALS	Per doz.—s. d.
Madame Lemoine	2 0	Clipper	4 0
Emilie	12 0	Tom Thumb	6 0
Gloire de Nancy	4 0	Lord Derby	6 0
Triomphe	8 0	Stella	2 0
Triomphe de Lorraine	8 0	Bijou	3 0
Triomphe de Thumesnil	4 0	With many others.	
Madame Rose Charmeux	4 0	CALCEOLARIAS, Herbaceous.	
Victor, &c.	12 0	Parson's, Dobson's, and Thompson's Strains	3 6
		Aurea floribunda	2 0

Also in stock many other varieties of Soft-wooded Plants, at low prices.

New Indian Azalea—Bijou de Ledeberg (J. Versch.).

JEAN VERSCHAFFELT is now enabled to offer the above beautiful distinct variety, which, through its charming and novel appearance, and its fine silver variegated leaves, makes an attractive contrast in a collection. Flowers beautiful rose, fine round model-like form, and produced in great profusion. Plants covered with buds may now be had at 10s each ; extra strong plants, 2 to 3 feet in circumference, 21s. each. The usual discount to the Trade, and one plant over without charge for every dozen taken.

JEAN VERSCHAFFELT, Nurseryman, Ghent, Belgium.

J. V.'S CATALOGUES may at all times be had free of his Agents, Messrs. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

MESSRS. J. STANDISH AND CO. are now prepared to execute orders for the following New and Choice Plants, to which they wish to call special attention. See larger Advertisement in last week's *Gardeners' Chronicle*.

IXORA DIXIANA.—Plants, 7s. 6d. to 21s each; with five or six spikes of bloom set, 25s each

ANTHURIUM SCHERZERIANUM.—Fine young plants, with two to three crowns, 10s. 6d each; with three to four crowns, and stronger, 15s to 63s each

TODEA PELLUCIDA COMPACTA —2s 6d to 5s each

STRETHIOPTERIS JAPONICA.—In April next, 10s. 6d. each.

FICUS MACROPHYLLA —5s each

ABUTILON THOMPSONII —1s each; 9s per doz. ; 60s per 100

CYPERUS ALTERNIFOLIUS VARIEGATUS.—2s 6d each ; 24s per doz.

TREE PICOTEE ASCOT YELLOW —A few strong plants, now, 5s each ; in April next, 2s. 6d. each.

ROYAL ASCOT VINE.—For Pot culture, 15s. and 21s. each

PEACH, EARLY ASCOT.—Fine plants, 7s. 6d. to 15s. each

" MARQUIS of DOWNSHIRE.—Fine plants, 7s. 6d. to 15s. ea.

ABIES OBOVATA.—10s. 6d. to 21s. each.

JUNIPERUS JAPONICUS ALBO VARIEGATA.—2s. 6d to 21s ea.

ACER RUFINERVE ALBO LIMBATUM.—21s to 42s. each.

" POLYMORPHUM PECTINATUM RUBRUM.—10s. 6d. to 21s each.

AUCUBA, Males. — 1s 6d. to 5s. each. Other varieties. See our CATALOGUE.

Royal Nurseries, Ascot, Berks.

THOMSON'S WHITE LADY DOWNE'S GRAPE. —Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.

Price 21s , 42s., and 63s. each.

THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

VINES, from Eyes, true to name, warranted to fruit this season, of the following varieties :—Mrs. Pince, Alicante, Foster's Seedling, 7s. 6d. each, sent to any part of the Kingdom Also Planting do., very strong, of the above varieties, and Black Hamburgh, Mill Hill Hamburgh, Royal Vineyard, and General De la Marmora.

J. PEED, Effra Nursery, Brixton, S.W.

Delicious New Grape.

MR. WILLIAM BULL has a large stock of good, strong, well-ripened CANES of MADRESFIELD COURT BLACK MUSCAT, at 5s. and 21s each.

6d Thousands of LILIUM AURATUM, of all sizes, to offer.

Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples ; Standard Plums, Pears, Apples ; Standard and Half Standard and Dwarf Roses, of all the leading kinds ; Gooseberries, Currants, Manetti, and Crab Stocks ; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.

Samples, with height and price, on application to

W. VIRGO AND SON, Wonersh Nursery, Guildford.

SPECIAL OFFER to the TRADE.— Dwarf-trained Morello CHERRIES, 3-yr., splendid stuff 2s. per dozen.

Dwarf-trained 3-yr. Sweet CHERRIES, ten leading sorts, 15s. per doz.

Strong cut-back extra fine Bushes, 3-yr., 5s. per dozen, 35s. per 100:

Rider Trained CHERRIES, 30s. per dozen.

" PEACHES and NECTARINES, 60s. per dozen.

Half Standard H.P. ROSES, 2 feet, splendid stuff, best sorts, 50s. per 100.

Large LAURUSTINUS, 4 and 5 feet, specimens, 30s. per dozen.

" Common LAURELS, 6 to 8 feet, £5 per 100

W. KNIGHT, Floral Nursery, Hailsham, Sussex.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 100 sorts of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7; Pyramids, 6 to 7; and Bushes, 3 to 5 feet high and well furnished. Dwarf-trained Pears of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12s. 6d. in stamps. A printed list sent post free.

J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety.

CATALOGUE free on application.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Situation, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Improvement of Grass Lands, at from 4s. 6d. to 9s. per acre.

SUTTONS' RENOVATING MIXTURE should now be sown. 6 to 12 lb per acre.

SUTTON AND SONS, Seed Growers, Reading.

Just Received, from Algiers, a small quantity of SEEDS of ABIES BABORENSIS, a rare and beautiful conifer, quite peculiar to a single peak of the Atlas Mountains.—This Seed is very difficult to obtain, and the tree, as far as we know, is as yet unknown in England, though well worthy of being carefully cultivated. It grows at an altitude of about 6000 feet

Also some ABIES ATLANTICA, CEDRUS ATLANTICA, and other botanical.

Prices :—Abies baborensis, 5s per packet; Cedrus atlantica, 2s. 6d. per packet

HOOPER AND CO., Covent Garden, London, W.C.

Beta chilensis.

BUTLER, McCULLOCH, AND CO. are enabled to offer SEED of the true variety of this magnificent foliage plant; it is quite distinct from Beta brasiliensis, and is fully described in their SPRING CATALOGUE, sent post free 12 and 24 6d per packet.

South Row, Covent Garden Market, W.C.

Established upwards of a Century.

Ailantus glandulosa.

CHOICE PLANTS, 6 to 10 feet high, 20s. per 100. "For Parks and avenues it is indispensable; its perfect health and freshness under all circumstances in towns recommend it to the planter. Dust, foul air, drought have little or no effect upon it." See Robinson's "Parks and Gardens of Paris."

R. TEUTSCHEL, Colchester

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s. ; per 1000, £5.

100 Gladioli, by name, 10 sorts .. .. .. 8s.
100 " 25 sorts 14s
100 " 50 sorts .. .. .. 10s to 40s.

All in good flowering bulbs.

LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

The most Beautiful Aster Grown is

TRUFFAUT'S REINE MARGUERITE, containing Fleur Perfection, Bombée, and Picone varieties ; 500 Seeds in 10 finely distinct colours, 2s. 6d. Also a choice selection of Foreign STOCKS, PHLOX, BALSAMS, ZINNIAS, &c , at equally moderate prices. CATALOGUES on application.

ALFRED HAMMOND, Importer of Foreign Flower Seeds, Bedwin Street, Salisbury.

Dwarf Roses for Bedding.

PAUL AND SON beg to recommend the present favourable season for PLANTING BEDDING ROSES. Magnificent plants of the following, the best in their respective colours, can be supplied at 75s. per 100; if Whites and Yellows be taken separate, 90s. per 100.

CRIMSONS.	PINKS and ROSES.
Alfred Colomb.	Comtesse de Chabrillant.
Général Jacqueminot.	John Hopper
Madame Victor Verdier	Jules Margottin.
Maurice Bernardin.	Madame Caillat
Marie Rady.	Modiste Levet
Marie Baumann.	Marguerite de St Amand.
Sénateur Vaisse.	Victor Verdier.

WHITES	YELLOWS.
H P., Madame Rivers.	Noisette, Triomphe de Rennes
Bourbon, Souvenir de la Malmaison.	" Maréchal Niel
Noisette, Aimée Vibert.	Tea, Gloire de Dijon.
	" Madame Falcot

The Old Nurseries, Cheshunt, N.

JOSEPH SMITH, Sen., having a large stock of the following, begs to offer them to the Trade at a low figure :—

RHODODENDRON PONTICUM, 12 to 18 inches, 18s. per 100 ; 15 to 20 inches, 20s. per 100 ; 18 to 24 inches, 25s. per 100—less by the 1000.

Hybrids, 18 to 24 inches, 35s. per 100; 20 to 30 inches, 45s. per 100

RHODODENDRON HIRSUTUM, nice plants, 2 years planted, from layers, 15s. per 100.

RHODODENDRON FERRUGINEUM, planted from layers, 25s. per 100.

Double flowering WHIN, good plants, 12s. per 100.

ARBOR-VITÆ, AMERICAN, 1½ to 2 feet, 4s. per 100 ; 2 to 3 feet, 7s per 100 (less by the 1000) ; 3 to 4 feet, 10s. per 100 ; 5 to 6 feet, 40s. per 100.

SPRUCE FIR, NORWAY, 12 to 15 inches, 10s per 1000 ; 15 to 2 feet, 18s. per 1000.

MOUNTAIN ASH, 2 to 3 feet, 15s. per 1000 ; 3 to 4 feet, 25s. per 1000.

Tansley and Scotland Nurseries, near Matlock, Derbyshire.

PAUL'S NOVELTIES of 1870. See WM. PAUL'S SPRING CATALOGUE, just published

PAUL'S NEW ROSE PRINCESS CHRISTIAN.— Three First-class Certificates. Plants ready in May, 10s. 6d. each. For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW ROSE VIRGIL. Plants ready in May, 5s. each

See WM. PAUL'S SPRING CATALOGUE

PAUL'S SELECTION of NEW FRENCH ROSES. For description see WM PAUL'S SPRING CATALOGUE

Strong plants in April, price 10s. 6d. to 5s. each

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE. First-class Certificate Plants ready in May, 10s 6d each.

See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE. Plants ready in May, 10s. 6d. each

For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM BRONZE. The brightest and most effective of this section yet raised. Plants in May, 10s. 6d. each.

See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BEDDING PELARGONIUMS (BEATON'S Race). BONFIRE, the finest of all the Stella race, and five others. Plants in May, 5s each ; or the six varieties for 25s.

For descriptions see WM. PAUL'S SPRING CATALOGUE

PAUL'S NOVELTIES of 1869.— ROSE PRINCE LEOPOLD, GOLDEN and VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c.

For descriptions see WM. PAUL'S SPRING CATALOGUE, just published

WM. PAUL, Paul's Nurseries and Seed Warehouse, Waltham Cross, London, N.

Spring Flowers.

LEWIS S. WOODTHORPE will be happy to forward, free, his CATALOGUE, containing Lists of all the most lovely of the early Spring-blooming Plants, Violets, Primroses, Hepaticas, Daisies, Rockets, &c., &c. ; also the best new and choice Plants of the Season, with Lists of Roses, Fruit Trees, Seed List, and a general and well-grown Nursery Stock.

Munro Nursery, Sible Hedingham, Essex.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs of CUTTINGS, best varieties, from his great collection of Chrysanthemums, for 15s ; 25 Pairs ditto, 10s. 6d.; 25 Pairs POMPONS, 10s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order for the amount.

Brunswick Nursery, Stoke Newington, N.

CHARLES TURNER begs to call attention to his extensive COLLECTIONS of CARNATIONS and PICOTEES, 1272, per dozen pairs ; PINKS, 6s. to 12s. per dozen pairs ; Tree CARNATIONS, 12s. per dozen ; Selfs, 18s. per dozen ; CLOVES, 6s to 12s. per dozen plants ; THE BRIDE, pure white, extra fine, 2s. each. A DESCRIPTIVE CATALOGUE on application.

The Royal Nurseries, Slough.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.

Foot's Cray Nursery, Sidcup Hill, Kent.

Notice.

SPECIMEN ARAUCARIA IMBRICATA.—A pair to match, 8 feet, very handsome; also a magnificent Specimen, 9 feet, all handsome, good colour, and move safely. Will be sold a Bargain, as the land is required for building on application to

W. KNIGHT, Floral Nursery, Hailsham, Sussex.

PICEA NOBILIS. Suitable for Avenues or Ornamental Planting.—500 Picea nobilis, from seed, finely-furnished Trees, 2½ to 4 feet high, with good leading shoots and splendid roots this California Pine is thoroughly hardy, sound in constitution, of rapid growth, not very particular to situation if planted in good loamy soil. It takes the very highest rank as a remarkable, noble, and beautiful Tree The above to be sold very cheap. Price on application to Messrs. FISHER, HOLMES & CO., Handsworth Nursery, Sheffield.

The Gardeners' Chronicle

SATURDAY, MARCH 26, 1870.

MEETING FOR THE ENSUING WEEK.

WEDNESDAY, March 30] Royal Botanic (First Exhibition
THURSDAY, — 31] of Spring Flowers) .. .. 2 P.M.

THE proposed withdrawal of the grant for building a MUSEUM of ECONOMIC BOTANY at the GLASNEVIN GARDENS, to which we referred lately, has led us to examine a little into some of the official documents relating to this matter. So far as we can see from them, soon after the report made by Mr. GREGORY'S Committee on the Scientific Institutions in Ireland, which was printed by order of the House of Commons in 1864, many of the recommendations made by that committee were carried into effect.

The present Home Secretary, the Right Honourable H. A. BRUCE, M.P., and the Secretary of the Science and Art Department, HENRY COLE, C.B., appear to have visited Dublin in 1865 for the purpose of organising the alterations proposed, and recommended to the Lords of Council on Education that certain sums should be put on the Civil Service Estimates to enable various improvements and alterations to be made in some departments of those institutions. Among others, the following sums were recommended to be expended on buildings in the Glasnevin Gardens :—For a Museum of Economic Botany, £4000 ; doubling conservatories, £3000 ; propagating pits, £1000 ; director's house, £700 ; residence of pupils, £300—altogether, £9000, the disbursement of which it was proposed to spread over several years. These sums appear to have been sanctioned by the Treasury, and voted by Parliament on account, as they appear during subsequent years on the Estimates, to the credit of the Science and Art Department, up to the year 1868, when they are placed to the credit of the Irish Board of Works.

It would further appear from an article in one of the Dublin papers, that these works were carried out at the Gardens in accordance with the arrangements made with the Treasury, except the building of the museum, for which the grant has been removed from the Estimates of last year, consequent on the report of the late Commission on the Science and Art Department, which again visited Dublin in 1868. A Blue-Book contains the evidence given on that occasion, and the principal evidence bearing directly on the matter is that given by the secretary of the Science and Art Department. In reply to the Marquis of KILDARE, who was chairman of the Commission, Mr. COLE states as follows, p. 116, with reference to the site of the museum:—"It has been proposed at least, to put it in the most beautiful part of the Glasnevin Gardens, and I think it would be much to be deplored if the museum were put in the midst of these gardens; and I cannot have any doubt at all that a botanical museum, such as is contemplated, which I suppose would be something analagous to Kew Museum, would be far better connected with the Natural History Museum in Dublin than carried two or three miles out of town to Glasnevin Gardens." "In fact, I have no doubt whatever that, for scientific purposes and for any practical use to be made of it by the citizens and students, its being in Dublin, in connection with the Natural History Museum, would be of manifold greater advantage then if it were taken to Glasnevin."

Now, we freely admit that few men have done more for museums of art, and for diffusing a knowledge of popular science, than Mr. COLE, but we cannot help thinking he is mistaken in the views he has expressed on this matter. What, we would ask, would be thought if a proposition were seriously made to remove the articles in the museum at Kew to South Kensington for the purpose of being nearer the citizens and students, who wished to make practical use of them? Yet there is much analogy in the two cases, with this difference, that Kew is ten miles from the General Post-office in London, Glasnevin not two from the General Post-office in Dublin.

Such articles as series of cones of Coniferous plants, sections of woods, raw fibres of plants, with articles rudely manufactured from them by the untutored natives of foreign countries, are very interesting and valuable attached to a large collection of living plants, both scientifically and educationally, but almost valueless attached to a natural history museum, where a well selected series of type specimens supplies what is most useful.

To be able to show the living plant, and afterwards the raw produce prepared from it, in one shape or other, is to confer a great boon on the student, and brings the importance of botanical research home to the most practical mind. To students, preserved fruits and seed-vessels of plants not easily obtained in a fresh state, with sections of wood and products obtained from them, are much more valuable when placed where the living plants can be studied at the same time with them than they are when detached from such collections. In hastily glancing over the Blue-Book in question, and noting the names of the Commissioners appointed to make the inquiries in 1868, we cannot perceive that any evidence has been given by any person practically acquainted with the working of museums of economic botany, excepting Dr. BALFOUR, whose opinion coincides with our own, that herbaria, &c., should always be placed near to the living plants. The Director of the Glasnevin Gardens, whose evidence we should have deemed most valuable, does not appear to have been examined, at least we miss his evidence from among the rest. Among the Commissioners we observe the names of two eminent naturalists, but not that of any botanist. In such a case as this, where the withdrawal of £4000 depended on the report of a Commission, it might have been expected that the opinion of some botanist, such as Dr. HOOKER, who is thoroughly acquainted with this department of the inquiry, would have been asked.

There is no need for a museum on the scale of that at Kew to be erected at Glasnevin, but a small suitable building for holding such articles as we have enumerated, with room enough to enable them to be properly arranged, would be a very important educational adjunct to the Glasnevin Gardens. We therefore trust this matter will be reconsidered before any outlay is made from the public purse for a system of art museums in Ireland, and an adequate sum again be placed on the Estimates for Glasnevin. This would not clash with any other of the museums contemplated in the report of the Commissions, as the articles we have mentioned are not suitable to be exhibited in them.

WHATEVER may be thought of the accuracy of the conclusions to which Dr. HALLIER has arrived in the course of his numerous investigations on the nature of diseases caused, or supposed to be caused, by PARASITIC FUNGI, we must at least give him credit for the zeal with which, in spite of much opposition, he has persevered in his researches, and the cleverness of some of his suggestions. In no case is this more striking than in his investigation into the cause of the disease in silkworms known under the name of gattine, a synonym of catkin, as muscardine is of a little cylindrical cake, or a kind of pastile, which the dead caterpillars somewhat resemble.*

The two diseases have doubtless been confounded, but the latter is at once distinguished by the fact that the dead caterpillar is scarcely altered before it assumes its ultimate dry condition, while in the former, the caterpillar shrivels up, and at length putrefies. The muscardine, moreover, is well known to be attacked by a parasitic mould to which the name of Botrytis Bassiana was given by MONTAGNE, while the object of Dr. HALLIER is to ascertain to what parasite the gattine may be ascribed, or what remedial remedies may be suggested.

Certain extremely minute bodies are found within the diseased caterpillars, but not in those which are sound, and these submitted by Dr. HALLIER to the treatment which has been so much discussed in other cases of disease produced—if, as is assumed, there was no delusion in the case, and every form produced was really a sequent of the other—a Cladosporium, closely resembling C. herbarum, though differing slightly in the shape of the spores.†

A series of experiments was then conducted with a view to ascertain what might be the effect of inoculating insects with the contents of diseased eggs, abounding in the bodies in question; when it was seen that the true C. herbarum grew from the wounds, or from the matter washed on the thorax, while the same minute bodies appeared in the insects themselves; and the Cladosporium sprang from the particles broken off from the thorax, on the leaves on which the worms were placed. These minute bodies, which are much less than the so-called yeast Fungi, might possibly act as a ferment both in the vegetable and animal structure, a suggestion which is well worthy of attention in cases of vegetable pathology. We know, for example, that vinous fermentation may take place within ripe uninjured Grapes, and other forms may obtain in other cases, but we conceive that the chemical action will only be carried on where the vital energies are either decayed or wholly extinct.

No Fungus is more widely diffused, whether as to the regions or the substances which it affects, than Pleospora herbarum, of which Cladosporium herbarum is one only of the multitudinous forms which it assumes. Animal and vegetable substances are equally affected, and like Fumago it not unfrequently occurs on leaves which have a sugary deposit from aphides or from exusion, and we know from the case of the parasite, as it occurs within the substance of decaying Gourds, that it is capable of making its way into the cellular tissue; but whether it can penetrate in any form the tissues of living leaves, like those of the Mulberry, is at present doubtful.

We cannot, therefore, consider Dr. HALLIER's notion that any care as to the removal of decaying shoots from the Mulberry will be effectual as to prevention of the disease; and if Pleospora herbarum is really the cause, we should be inclined to think that the caterpillar had eaten spores scattered over the surface of healthy leaves, rather than that it arose from the contamination of the juices. The spores of so general a mould as Cladosporium herbarum must needs be carried everywhere by the wind.

The subject is extremely interesting and worthy of our close examination, as its bearings on the question of disease in general, as depending on parasites, are at once obvious. *M. J. B.*

* See "Zeitschrift für Parasitenkunde," band i. p. 302, &c.

† Dr. Hallier's figures of Pleospora herbarum are not quite satisfactory, and will not for a moment bear comparison with those of Tulasne. It is a great defect in all his figures, and one which detracts greatly from their usefulness, that they are not accompanied by absolute measurements. It should be observed, however, that to obtain Hallier's Cladosporium sprang from the Pleospora.

—— WE are informed that Mr. W. EGERTON HUBBARD'S Prizes, offered through the medium of the Royal Horticultural Society, have been awarded as follows:—For an Essay on COTTAGE GARDENING the prize of £5 to Mr. E. W. BABCER, *Midland Counties Herald*, Birmingham. For an Essay on WINDOW GARDENING, the price of £3 to Mr. H. BUTTERY, Clapham. For the former prize 34 Essays were sent in, of which number those from Mr. W. P. AYRES, Nottingham, and Mr. E. LUCKHURST, Egerton House Gardens, Kent, were HIGHLY COMMENDED; and those from Mr. D. T. FISH, Hardwicke House, Bury St. Edmund's; Mr. A. MEIKLE, Read Hall, Whalley; Mr. P. GRIEVE, Culford; and Mr. W. EARLEY, Digswell, were severally COMMENDED. For the Window Gardening Prize, 18 Essays were contributed, that from Mr. D. T. FISH being HIGHLY COMMENDED, and those from Mr. E. LUCKHURST, Egerton House Gardens; Mr. A. MEIKLE, Read Hall; and Mr. W. Moss, Shelfield, Wickham, Hants, were COMMENDED. We believe that in several other cases, under both heads, really good practical papers were sent in.

—— Sulphur, as is well known, is the only effectual remedy yet discovered against the attacks of mildew on the leaves of our plants—especially that form of it which attacks our Vines. We have it presented to us in various forms, and mixed with various other ingredients variously disguised. For the destruction of the mildew on Vines, Roses, &c., under glass, and for red spider, &c., it has been found most serviceable when applied in the form of powder *i. e.*, what is known as the flowers of sulphur. As but a very small quantity is required, and it has to be distributed finely and evenly both on the upper and under surface of the leaves, the work of distribution is not a little difficult, and requires some care and dexterity for its proper accomplishment. For the purpose of distributing the sulphur, various contrivances have been brought under notice from time to time, yet we have never found any of them to answer the purpose so well as a piece of thin gauze or muslin formed into a sort of bag into which the sulphur was put, and then dusted over the plants by vigorously shaking it in one's hand. The worst of this is, however, that the operator is dusted fully as much as the plants, which is not particularly pleasant. We have had submitted to us by Messrs. ADAMS & GRANT, of Chichester, a SULPHUR DISTRIBUTOR, which is one of the most simple contrivances that can be imagined, yet it appears to us a most effectual one. It is simply a little box with two glass sides, into which the sulphur is put. It is 5 inches long by 3 inches wide, and a little more than 1 inch in depth. On one side there is a small aperture for the sulphur to pass out, and on the opposite another which is fitted on to the nozzle of a common household bellows. By blowing the bellows the sulphur is made to issue through the small aperture on the opposite side like fine dust in a most effectual manner. It is the simplest and best sulphur distributor we have seen, and having used it frequently we must say that we like it.

—— Our readers have heard of the atrocity of GIRDLING some 1500 FRUIT TREES, near St. Joseph, Michigan, last spring, says the *Canada Farmer*, and how the neighbourhood turned out in a body and bandaged them up, so as to save them. It will be interesting and gratifying to learn that every one of these trees is living, and that Mr. GREEN, the owner, has realised an immense crop of fruit from them in the past season. In this case the damage was remedied by bandaging the trees with strips of cloth dipped in wax. Mr. LEMUEL TOWN, of New Hampshire, is said to graft five or six scions as large round as a goose-quill, and long enough to reach over the girdled place into the tree. The live bark is first notched above and below the girdle, the sprouts sprung into place, and the ends fastened with wax. These scions grow rapidly, and in time spread over the whole girdled surface.

—— The following invention for preventing INSECTS from INJURING FRUIT TREES has been patented in America by CYRUS FISHER, Leesville, Ohio (Sept. 12, 1865). We make it known as a piece of information which, having encountered, we do not like to withhold, but we know nothing about it, and should be very sorry to vouch for its success. The reader must judge for himself. It consists in first washing the body of the tree with soft soap, after which a wash of turpentine is applied, and a solution of boiling lye is then applied to the roots of the tree.

—— From a very interesting article, communicated to the *Field* by a gentleman who has visited the Indian tribe of Igorrotes, "probably the remnant of an aboriginal race," now "inhabiting the higher declivities of the mountain (the extinct volcano of Isarog, in the island of Luzon), and not coming down below 1500 feet elevation," we extract the following particulars concerning the culture of the SWEET POTATO:—

"Their food principally consists of BATATAS, with some Gabi (Caladium). They also cultivate a little Maize, Labi (Dioscorea), and a small quantity of Sugar-cane for chewing. In order to prepare the ground for the growth of a crop of Batatas, the forest trees are cleared, the surface is then hoed, or rather slightly furrowed, with the blunt weed knife. In these furrows the eyes of the

Batatas root are planted, and in three or four months the crop is ripe, and continues productive, for the creeping plant strikes new roots and matures fresh bulbs. After two years the yield falls off, and the old exhausted plants are rooted up to make room for new ones from the runners. They never think of manuring the field or cleaning new ground, nor do they plant any alternate crops, but Batatas keeps possession of the soil."

—— Attempts are being made in France to cultivate the CHINESE PRIMROSE in the OPEN AIR. It is known that the plants grow freely in China and Corea, in colder latitudes than those of France, the sloping sides of the valleys being in many cases covered with them. An amateur gardener in order to try the robustness of this Primrose left a root out against the foot of a north wall, during the whole of the month of January last, which was not at all warm, and it was not destroyed. This of course does not prove much, but it just holds out a hope of the possibility of acclimatising this very charming and early flower; and if horticulturists succeed in growing it out-of-doors in the north or centre of France, those of the south of England may do the same.

—— During the week ending March 19 the EXTREME HIGH TEMPERATURE OF THE AIR rose to above 60° at Portsmouth and Dublin, at all the other stations in England it ranged from 53.5° to 58.9°. The mean of the highest temperature in England was 55.6°. In Scotland it varied from 50.4° at Glasgow to 56° at Aberdeen; the mean of all in Scotland was 5°, or 3.1° lower than in England. The LOW NIGHT TEMPERATURES were several degrees below 32° at every station, and varied from 21° at Hull to 28.3° at Liverpool; the mean of all the lowest temperatures was 24.6°. The general RANGE OF TEMPERATURE in the week at stations south of Leicester was 33½°, and north of this station was 30°, and in Scotland was about 27½°. The MEAN TEMPERATURE OF THE AIR at the height of 4 feet varied from 38.6° at Hull to 43° at Bradford. The average of all England and Scotland was 41.2°, or only ¼° warmer than in the preceding week, instead of 12½°, which ordinarily is the increase in the corresponding week of the preceding year.—The FALL OF RAIN was variable, the smallest fall in England was at Leicester and Newcastle, viz., 0.18 inch; and the largest at Manchester, a little less than 1 inch. In Scotland the extremes were 0.15 inch, and 1 inch (see Mr. GLAISHER'S Tables in this issue). The average fall of rain over England and Scotland was 0.4 inch nearly.—The TEMPERATURE OF THE GROUND AT 1 INCH in depth varied from 38° to 48.7°; at the depth of 3 FEET, from 40.9° to 42.8°; at 6 FEET, from 44.3° to 44.1°; at 12 FEET, from 46.2° to 46.1°; and at 24 FEET, from 50.7° to 50.5°. The temperatures below 12 feet are decreasing; at 6 feet, are nearly stationary; and within 3 feet are increasing.

—— The negotiations to which we alluded at p. 313 have, we are glad to find, been successful, and a portion of the old CHISWICK GARDENS, comprising the ground occupied by the glasshouses, and extending sufficiently eastwards and southwards to include the large vinery and the fruit-room, is to be retained by the Royal Horticultural Society, upon what we cannot but regard as very favourable terms. We shall have more to say on this subject; meanwhile, it must be matter of general satisfaction that the Society has not to waste its scanty means in an attempt to establish a new garden elsewhere.

New Garden Plants.

ODONTOGLOSSUM LIMBATUM, *Rchb. fil., sp. n.*

Panicula ampla multiflora sepalis triangulo-lanceolatis petalis rhombeo-ovatis lanceolatis dentatoque-lobatis unguiculatis columnæ adnatis, labello a basi cordato oblongo attenuato crenulato-serrulato apice aristato, carina unguis in cornum curvatum, media simplicem ovato-subrotundum in lobulos rhombeo-lanceolatos dentatos serrulatos, columna incurva basi obtuse angulata, alis latera.

A very interesting novelty, with a richly-flowered panicle with six flowers, which are milk-white, the sepals richly adorned with lilac, and the lip with numerous violaceous dots around the tip, and with yellow lamellæ and a few streaks at the base. Some violet blotches stood outside the column near the wings, some brown blotches inside the wings, and on the anterior side of these is the whitish yellowish column. The narrow parts of the flower, as well as the plate-like ends of the lateral keels of the lip, bring it near Odontoglossum gloriosum, with, however, the general appearance of the now well-known Odontoglossum crispum, Lindl. One may suggest its being a mule between these two species, i. e., *crispo-gloriosum*. Odontoglossum Andersonianum is easily distinguished by the falcate wings of the column, and by the calli. We have a second variety of it from J. Day, Esq., to whom we are also indebted for the above described great and lovely curiosity. *H. G. Rchb. fil.*

MILTONIA WARSCEWICZII, *Rchb. fil.*

It is quite wonderful how many variations of colour this beautiful plant assumes. We have at hand a fresh flower, and a most faithful sketch from the pencil of W. Wilson Saunders, Esq., he having obtained it from Director Linden, of Brussels, whose excellent traveller, Wallis, gathered the plant. It is quite a gem. The colours are of a deep rich lilac; sepals and petals with whitish ends, the very broad lip with the little four-angled yellowish spot at the base. The wide shining mirror on the disc is light purple, the anterior part is very light purple; the borders around the shining middle part are mostly dark purplish. The representation in M. Van Houtte's "Flore des Serres" (vol. xviii., p. 3) shows another variety with a yellowish shining disc, and very much white. It is a wonderful thing. Both these varieties are by far superior to that which first blossomed in Mr. Linden's collection, who may be glad to have introduced such a glorious thing through the instrumentality of his keen-sighted traveller, Wallis. The plant has, however, in the meanwhile been gathered by an adventurous son of Albion (Mr. Welton ?), as we learn from Mr. Williams, of Paradise Nursery, who sent a very neatly dried specimen (alas! no other dried species), with a good English description, and the name, Odontoglossum Weltoni. That is also a new variety, showing a most beautiful limitation of the white ends of sepals, petals, and lip from the other parts of the flower. It was gathered at a new locality, which would appear to have never been visited before—a little secret, of course, between the collector, Mr. Williams, and the writer. The moral of the tale would be, that amateurs should apply to Director Linden, or to Mr. Williams, not for one, but for a dozen, or at least half-a-dozen of plants. *H. G. Rchb. fil.*

DENDROBIUM CRASSINODE, *Benson and Rchb. fil.* [Ante, 1869, 164].

We have lately received from Messrs. Veitch two fresh flowers, more than half as large again, and much richer in colour than those we obtained last year. Ah! these Orchids are like the ladies, who suffer so much from travelling, that a long rest is necessary for the re-establishment of their original beauty. Last year the knotty travellers showed some lovely charms, now the established fays make us the admirers of their full beauty. Will they, can they, go on improving? *H. G. Rchb. fil.*

PLANTING PARK SCENERY.

FROM what has been stated (see p. 285), in describing American park scenery, it will be seen that it is on the whole what is termed gardenesque, a style comparatively modern, and now employed in all countries in which civilisation has made much progress. Downing, an American writer, whose authority in matters of taste relating to rural embellishment has seldom been disputed, states that "this style is produced by outlines whose curves are flowing and gradual, surfaces of softness and growth, of richness and luxuriance. In the shape of the ground it is evinced by easy undulations melting gradually into each other; in the form of trees, by well-shaped trunks, and full, round, symmetrical heads of foliage,—a result attainable by planting and grouping, so as to allow free development, and by selecting trees of suitable character; in walks and roads by easy flowing curves, following natural shapes of the surface, with no sharp angles or abrupt turns; in water, by the smooth lake with curved margin, embellished by flowing outlines of trees, and full masses of shrubs, or in the easy winding curves of a brook. The keeping of such a scene should be of the most polished kind, grass mown into a softness like velvet, gravel walks scrupulously firm, dry, and clean; and the most perfect order and neatness should reign throughout."

On the Continent this is called the English style, but French critics assert that we borrowed it from the Chinese. Whatever may have been its origin it is certainly well adapted for the natural configuration of the surface of the ground in most countries. In good old times, when our varieties of trees were comparatively scanty, and when much less attention was paid to rural embellishment than at present, parks were laid out in what is called the picturesque style, which may be briefly defined as Nature assisted a little by Art, more especially as regards planting, which was either in the form of massive breadths of plantation, or in the shape of noble avenues of trees. For examples of the latter we have the Long Walk at Windsor, with its still beautiful though decaying Elms: the magnificent Horse Chestnut Avenue in Bushy Park; the broad Beech glade in front of Hampton Court Palace; and numbers of others that have as yet no equal on the other side of the Atlantic—parks in America being of comparatively recent date. Of the picturesque Hyde Park affords a familiar example, though even on this noble public recreation ground the gardenesque is making little incursions in the shape of a floral fringe, small subtropical gardens, little highly kept inclosures of flowering shrubs, and, it must be admitted, miserable attempts at rockwork. Against all this, however, there can be no possible objection, provided these innovations are not permitted to encroach too much on the wide expanse of open central recreation ground.

The naturally picturesque appearance of old England has been attained by a judicious thinning and careful breaking up of her old woods; and in America the forests of the country, with their magnificent beauties, the growth of centuries, must soon receive Government conservation, in order to prevent the indiscriminate cutting down to which they have hitherto been subjected. In Virginia, which is so rich in fine timber and ornamental trees, this interference is specially needed, in order to secure to that favoured State such a distribution of its woods as shall produce what is termed picturesque scenery. Virginia may now be said to be about half cleared of timber, and therefore what remains should be jealously cared for, else her sylvan beauty runs the risk of being seriously impaired, a circumstance to be regretted on account of the great variety as well as fine growth of her trees, so charmingly overhung in places with creeper possessing foliage of the richest and most varied hues. Of Oaks alone the State can boast of many varieties, the leaves of which vary from the form of those of a Willow to the size of those of a Tulip tree. With an aspect on the whole thoroughly English, an excellent climate, and a naturally rich soil, Virginia, with a little care bestowed in the way of securing picturesque beauty now, could not fail to rank in every respect first among American States.

In England we have no lack of arborescent material in which may be found even a large number of Virginian trees, noble examples of which may be seen at Fulham Palace and at Kew; but with all this at command the scenery in some of our finest parks is not always arranged in the best of styles. Among Acers alone we have in Hyde Park and Kensington Gardens some 30 species and varieties, and these include some strikingly handsome trees. Foremost among them stands A. macrophyllum, which for avenues is one of the most useful of trees, and it also answers well in masses and for planting singly in park. One of the finest examples of this species to be found in the country is a specimen growing in the arboretum of the Royal Horticultural Society's Garden at Chiswick, near the Superintendent's residence. Douglas, who discovered this species of Maple, considered that it would prove to be one of the most ornamental of trees for English scenery, and his prediction has been fully verified by the specimen at Chiswick, which was planted in the spring of 1828. Seven years after planting it had attained the height of 25 feet, while in 1845, or 10 years later, it was 50 feet in height. In 1864 it had reached the height of 80 feet, an altitude concerning which the planter (Mr. Gordon) exclaimed in my presence, "Who would have thought that the man who planted that tree would have been alive now!" a fact sufficiently proving that the Acer will arrive at full stature even in little more than half a lifetime. The Silver Maple (A. Wagerianum) also makes a fine tree, with which most of the streets in American towns are planted. Of this a good example may be seen at Kew, and another at Chiswick. Of Chestnuts Hyde Park contains several, and of the value of these trees for groves and avenues little need be said after alluding to the noble specimens of them in Bushy Park. Mixed in a group with Pavias, or smooth-fruited Chestnuts, they have a fine appearance. Among the Pavias one of the best is P. californica, which is an extremely ornamental shrub or low tree. It was found by Hartweg, on Santa Cruz mountains, in Upper California, and also on the elevated banks of the Sacramento river, in company with Platanus californica, Negundo californica, some Oaks, Poplars, and Birches. The flowers, which at first are white, afterwards change to a delicate pink, and they are borne in dense spikes often a foot in length. Oaks, evergreen and otherwise, are very plentiful, as are also Elms, Limes, Planes, Walnuts, Poplars, Tulip trees, and Ashes. Of the last I have counted upwards of 30 sorts, which, when grouped together, are very effective. One of the best masses of this tree with which I am acquainted is in Kensington Gardens, not far from the late Prince Consort's monument, and when seen in full leaf this group has a most interesting appearance, owing to the great variety of foliage which it presents. There it stands, a living monument of the value of planting the different members of one genus in the same group in public parks,—all interested in acquiring a knowledge of trees being able—from the juxtaposition of the different kinds, to compare their merits and demerits under the most advantageous circumstances.

This remark leads me to notice some new public gardens that have been formed in Milan, in which massing together of different kinds of trees and shrubs belonging to one genus is carried out in a most instructive style. I visited these gardens in 1865, and was well pleased with their general appearance, the masses being set out on grass raised from British seed. Here I noticed masses of Magnolia, Judas tree, Salisburia, Barberry, Ailantus, Gleditschia, double-blossomed Peach, Bird Cherry, Spiræa, Poplar, Beech, Oak, Elm, Birch, various Conifers, and other trees. I also noticed a bed of double-blossomed Furze. Water is likewise to be found in these gardens, in which there is an island tastefully planted with deciduous Cypress, Alders, Magnolias, and Weeping Willows. A similar mode of treating public parks is followed about Turin.

Returning to Hyde Park, as many as 50 varieties of Thorns may be found in it, and it is perhaps superfluous to say that, whether in flower or fruit, Thorns are most interesting. Mixed with Laburnums and Rhododendrons they form groups with the beauty of which we have few things that can compare. One of the best of Thorns is Layi, the foliage of which is large and fine, and it dies off a beautiful scarlet. The fruit, too, is large and very ornamental: of this some good examples may be found in Kensington Gardens. Stricta, on account of its upright growth, is also a useful Thorn in park compositions, in which care should be taken to have a fair proportion of scarlet-flowered sort, and of other with different

coloured fruits. There are many other flowering trees and shrubs to which allusion might be usefully made – such as Pyruses, Amelanchiers, double-flowering Peaches, and Almonds; but enough has, I imagine, been said to show that if we do not produce good pictorial effects, it is not for want of materials. *J. Newton.*

PALMS. No. II.

WHEN in 1856 I published my "Popular History of the Palms and their Allies"—the allies being held to be, in those benighted days, Nipa and Phytelephas, genera now known to be genuine members of the order—reviewers were rather hard upon me for daring to arrange my genera in alphabetical order, beginning with Acrocomia and ending—sure enough—with Zalacca. Was this the Alpha and Omega of my knowledge? Why couldn't I follow Von Martius, who had contrived a very clever classification of these plants? My answer then, as now, is this. The classification proposed by Martius is not clear even to scientific minds, and it was hopeless to attempt to render it intelligible to those likely to read a popular book. Since then the defects of Martius' classification have been generally recognised, and various attempts made to replace it by a better one. In 1864, Prof. Grisebach, in his well-known "Flora of the British West Indian Islands" (London: Reeve & Co.), divided the whole order into two tribes, the Arecineæ (of which Areca Catechu is the type), and the Cocoineæ (of which Cocos nucifera is the type), and these again into sub-tribes. In September of the following year Mr. Hermann Wendland submitted to the meeting of the German Naturalists, at Hanover, a "New Classification of Palms," which was subsequently published in the "Journal of Botany" for 1865, p. 382. Here Grisebach's division of the order into two primary groups, respectively termed Arecaceæ, and Cocoineæ, is upheld, but a somewhat different definition is given of them. A Palm, in order to be admitted into Arecaceæ, must have the seed attached to the endocarp, or inner shell of the fruit, by the hilum or raphe only, otherwise it will belong to the Cocoineæ, wherein the seed is either entirely, or with the exception of a narrow line at the back, connected with the endocarp. All the scaly-fruited Palms are grouped with the first, whilst Nipa and Borassus are referred to the second.

In one respect a new classification is like a new Act of Parliament—it may look well on paper, but it is only when it passes into daily practical use that its merits or demerits are discovered; and, though Wendland's scheme was well received, we must wait to see how it will work. Owing to the difficulty there is in studying Palms scientifically, few botanists have the opportunity of really putting it to the test, and it is therefore a matter of regret when those who have such an opportunity let it pass by. I must own to a feeling of disappointment when, on reading Dr. Spruce's valuable paper on the "Palms of Equatorial America," in the Journal of the Linnean Society, 1859 (vol. xi., pp. 65—183), I found that, when looking out for general characters for a systematic arrangement to replace that of Martius, he was unaware of Grisebach's and Wendland's classifications. But perhaps our greatest botanical South American traveller may yet be induced to give us his criticism on this part of Grisebach's and Wendland's labours, a criticism all the more valuable where so much independent thought and observation can be brought to bear upon the subject, and perhaps, also, all the more willingly entered into on the part of Dr. Spruce, as he seems by no means satisfied with the divisions of the orders which he was able to hit upon. Dr. Spruce found that all Palms may be brought under two nearly equal but somewhat artificial divisions, by attending to the æstivation of the female flowers; but also that they are more naturally divided by means of the spathes into Spathifloræ and Spathellifloræ, and that the tribes and genera of Palms, it may be of all other plants, are imperfectly characterised if the structure of the leaves is not taken into consideration. In the Spathifloræ the spadices are either simple or vaguely branched, never truly pinnate; if compound then paniculate, and if simply branched, often scopæform; whilst the spathes, one or more, are inserted on the peduncle, at first fusiform, entire, and completely including the young spadix, but subsequently bursting for the emission of the spadix. In the Spathellifloræ the spadices are pinnately branched, the branches are distichous and alternate, and if again divided then the branchlets also are distichous, whilst there are usually no spathes, but the peduncles, rachis and branches are completely hidden by tubular distinctly imbricated bracts called spathellæ, which are oblique and sometimes widened towards the free end. The Spathellifloræ include all the fan-leaved Palms, whether Borassineæ or Coryphineæ, and some fan-leaved and pinnate-leaved genera with scaly fruit. All other Palms belong to the division Spathifloræ. This would be an acceptable division of the order, but unfortunately it breaks down on application, as there are two genera in the Eastern hemisphere—Ceratolobus and Dæmonorops—which have complete spathes, as well as spathellæ. After all, then, the arrangement of Martius being found unsatisfactory, Grisebach's and Wendland's classification not having been tested by a stringent application to all existing genera, and Spruce's divisions not being founded, according to his own showing, upon absolute characters, I do not think I was so very far wrong when, fourteen years ago, I took refuge on that neutral ground supplied by the A B C.

The genera of Palms have of late years very much increased in number, not only by the discovery of absolutely new types, but also by the subdivision of older genera, so that we now know about 100. Many of them are so extremely natural, and have so striking a habit, that it seems to me highly objectionable to lump together, as Karsten wishes to do, such well-marked genera as Bactris and Desmoncus—the former an erect, the latter a climbing set of plants, though the absolute technical characters of the two may be sufficiently slight to justify in some degree this innovation. But in dealing with this subject, the question, what characters are sufficiently important to serve as the landmarks of genera, at once presents itself. It is of the greatest possible importance that this should be well considered before we disturb any further the existing generic distribution of the species, and thus create an endless number of new synonyms, objectionable enough to the botanist, but perfectly unendurable to the gardener, who often wonders what all the changes are about, and why people can't leave old, well-established names alone. To all who attempt to deal with the Palms, the Ferns ought to be a fair warning, many of these having such a load of synonyms to carry that it seems a wonder they don't sink under it. Dr. Spruce has recorded it as his opinion that the number of complete spathes is of great importance in defining the genera of Palms, but that neither the degree of excentricity of the fruit, nor the position of the embryo in the seed, is to be relied on in the formation of large natural genera; and again, that the separation of the sexes affords characters of but slight value for generic or specific purposes. Indeed in this latter respect he goes so far as to advance it as a fact that there is an "alternation of function" in some genera of Palms,—that is to say, that the male and female relieve each other in their respective duties. It would be as if a wife said to her husband, "I have now borne you several children, and am tired of nursing; suppose you take a turn at it, and let me attend to your business till I am tired of that, and then return once more to my natural duties." Such an interchange of positions actually takes place in Palms, according to the statement of Dr. Spruce, which was copied into the *Gardeners' Chronicle*, 1869, p. 1092, and made the round through several other class journals. Dr. Spruce found on the Rio Negro a plot of ground covered with Geonomas, all the plants being female, and bearing young fruit. On revisiting the spot the following year he found to his astonishment the very same plants all bearing male flowers alone. "But," he continues, "the mystery disappeared when, on examination, I made out that male and female spadices must have alternated all the way up the stem. Afterwards I found that the same, or a similar alternation of function existed in many other Palms, and that plants exercising (*pro tem.*) the male functions stood rarely far apart from others exercising the female functions." He then quotes several Geonomas and Maximiliana regia as examples, and adds various speculations about the ultimate development of the sexes of Palms. Of course, if this observation was strictly correct, it would go a great way towards unhinging our present notions about the limits of the genera; but there seems reason to believe that Dr. Spruce has been led into error. Eleven years ago Wendland correctly described (Bot. Zeitung, 1859, p. 73) the nature of Geonoma; and since the appearance of Spruce's paper he has once more referred to it. He says (Bot. Zeit., 1869, p. 791):—"The fact that Geonoma is monœcious and not dicecious has already been published by me. Of the three flowers, deeply imbedded in the rachis, the central one is female, the two lateral male. The latter (*i.e.*, males) invariably flower several days or even weeks before the female; they last but a single day, and then drop off; very seldom they remain shrivelled up in the foveolæ. Although I have seen hundreds of spadices, both in their native country and in cultivation, I never have found any essential deviation, never any unisexual spadices. Wherever the latter seemed to exist, the female flower was behindhand in development, but still normal, or the male had done flowering and had already dropped off. That flowers had been present was proved by the bracteolæ remaining in the foveolæ. That the Geonomas which Dr. Spruce saw should differ so essentially from other species I am not inclined to accept, and much less do I believe in an alternation of the development of diclinous flowers, based upon the statements of Dr. Spruce with regard to the genus Geonoma. Maximiliana regia and Leopoldinia I have not seen in a fresh state. Chamædorea, Willd. (Nunnezharia, R. et Pav.) is a strictly dicecious genus, and, moreover, the flowers are never in threes, but always isolated. Until, therefore, further proofs be adduced I must hold Dr. Spruce's observation to be erroneous."

Not only have the genera, but also the species of Palms, much increased during the last 25 years, and these additions are not obtained, as is frequently the case with other plants, by subdividing old-established species, but by *bonâ fide* discoveries with which th

names of Oersted, J. D. Hooker, Wallace, Wendland, Spruce, Purdie, Mann, Welwitsch, and others are honourably associated.* Indeed there is every reason to believe that, large as is the number of known Palms, it will yet be more than trebled when the tropical regions are more closely examined than they hitherto have been. Every district, every little island, seems to have Palms peculiarly its own, and the few species that were formerly thought to enjoy an extensive geographical range turn out on closer examination to be perfectly distinct species. Kentia sapida of New Zealand is now known to be altogether different from the K. Baueri of Norfolk Island, though at one time they were held to be the same. Phytelephas, the genus embracing the Vegetable Ivory Palms, was supposed to be composed of only one species, but there are good grounds for believing that Gaudichaud was on the right scent when, with the limited material at his disposal, he indicated about a dozen species, only one or two of which are to be found in our gardens. The continent of Australia was credited with only one species of Ptychosperma (Seaforthia), viz., P. elegans, thought to be spread over a large tract of country. But since the matter has been gone into more fully, it turns out that we have not even this old P. elegans in our gardens, and some say we shall never have it, as the destruction of the native vegetation in that part of New Holland where it once grew, as the Yankees would say, "improved it off the face of the earth." What goes by the name of P. (Seaforthia) elegans in our gardens, and is even figured as such in the "Botanical Magazine," t. 4961, is P. Cunninghami, an old-established garden plant. Moreover, we have from the same country P. Alexandræ of Dr. von Müller, and P. Veitchii of Wendland, both recent acquisitions to our living collections. Jubæa spectabilis was until recently regarded as a species, ranging from the south of Chili to the northern parts of New Granada, say over more than 40° of latitude, until this delusion was dispelled by Philippi, who showed that the New Granadian and the Chilian plants were not only different species, but belonged to altogether different genera, one of them undescribed, and therefore distinguished by him as Micrococos chilensis. In short, the little "lumping" that has been attempted in this vast natural order has not been confirmed by recent researches, and has mostly to be undone again. Palms, as I stated before, are, with few exceptions, extremely local, and every newly explored tropical district is sure to yield a harvest of new types. Look, for instance, at those small islands on the east coast of Africa. Every trip made to them is productive of noble and singular forms. Think of Lodoicea, Verschaffeltia, Phœnicophorium, Deckenia, Acanthophœnix, and Hyophorbe. One could go into raptures about such a species as Hyophorbe Verschaffeltii, with its elegant pinnated foliage, narrow gracefully drooping leaflets, and the fine contrast their dark green colour forms with the yellowish petiole. A single specimen, such as fig. 73, imparts a finish to drawing-rooms with which few tricks of the upholsterer could venture to compete.

In speaking of the different species met with in our gardens, which I shall have to do in a subsequent article, I wish I could in all instances give their correct names; but that is wholly beyond my power. Few nurserymen, when raising newly imported Palms, have the forethought to preserve even one or two of the seeds, to enable the botanist to determine the genus. Most of them have nothing to offer except very young specimens, which in many instances do not allow even the genus to be guessed at. However, to render the plant commercially valuable it must have a name, for, notwithstanding the doubt thrown by Shakespeare upon the use of such a contrivance, there is a great deal in a name; and a name all garden novelties do get. Sometimes one is able to check the name imposed, for instance, when a Ptychosperma, which is an Old World genus, is announced from the New World, or a spiny species palmed off as a member of an unarmed one: but in many other instances the botanist can do nothing more than express doubts about the correctness of a name—which doubts, however, he had better keep to himself till he can substitute certainties for them. *B. Seemann.*†

VINE CULTURE.

England *v.* France.

It would be difficult to find in the gardening periodicals of any other country than England so much written upon the Grape Vine, and why is it? The question may be answered thus—the climate of England is not favourable enough to produce the fruit of the Vine in sufficient perfection in the open air to suit the palates of those who partake of it. It is, therefore, necessary to resort to the use of glass erections to ripen the fruit; and, in order to have it in anything like perfection, one must also employ a gardener, which, more or less,

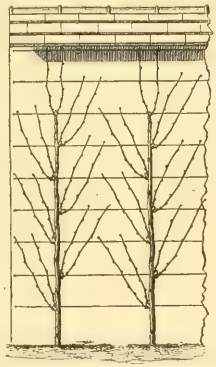

Fig. 74.

means expense. The cultivation of the Vine under glass has lately been very ably treated on in your columns, but this system is never likely to produce

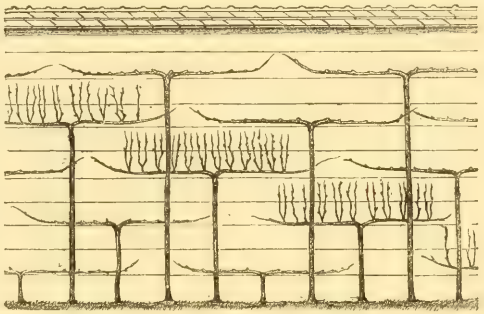

Fig. 75.

fruit so plentifully and so cheaply as to be partaken of by the "million."

The following remarks are, strictly speaking, upon

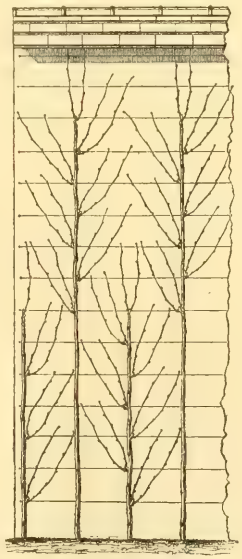

Fig. 76.

the cultivation of the Grape Vine against walls and in the open air, for the benefit of those that cannot afford otherwise. It is true, no doubt, that the climate of England is rather damp and sunless, compared with those countries where the Vine ripens its fruit with very little trouble in the open air. But still, when we see how well the Vine grows in England, I cannot but think that such healthy growth would produce good fruit if some such system of culture was followed as would enable the English grower to obtain as much benefit as possible from what sun-heat he does get. The system that I wish to bring to the notice of your readers is one which has been recommended more or less by writers on gardening for a long time past, still we see nothing of it in English gardens. This system is known in France as the "Vigne à la Thomery," and is that which is practised at the village called Thomery, near Fontainebleau, to produce most of the Grapes (Chasselas de Fontainebleau) that are to be had in the Paris market, at from 2*d.* to 8*d.* per lb. It is in fact practised everywhere in France where it is necessary to grow the Vine against a wall for its eatable fruit.

Although I shall describe the exact manner of planting a wall altogether with Vines, as it is done at Thomery, still it may be understood that wherever a piece of wall exists, of whatever description or height, as long as it faces the sun at mid-day, a Vine or Vines (according to the space to be covered) may be planted, and the same system followed as with the Vines on a wall to themselves.

The walls at Thomery are a very rough affair compared with those generally seen in England; they are built of roughly hewn stones, which are cut with as even a face as can be given with a kind of hatchet; these are laid with a quantity of mortar, and when the wall is built the crevices are filled with the universal "platre"—and this even constitutes the better class of wall, as many are to be found made of clay. They are built about 2 mètres 50 centimètres (8 feet) in height, and finished off with a coping, sometimes of stone, planks, or straw, and projecting about 28 centimètres (11 inches): this as a protection from frost and rain, and to keep the topmost *cordon* from making too much wood. The wall being built, it is garnished with a trellis, having the *montants* at 55 centimètres (22 inches) distance, and the *horizontales* at 25 centimètres (10 inches). In France borders in front of fruit-tree walls are never wide, generally about 1 mètre 60 centimètres to 2 mètres (5 to 6½ feet); this border, which is well manured, is trenched, and slightly inclines from the wall to the path. The preparation for making the plantation is as follows:—A trench is opened 1 mètre 60 centimètres from the wall, 65 centimètres wide and 25 to 28 centimètres deep; a quantity of cuttings (*marcottes*) are prepared and planted in the bottom of this trench, at 55 centimètres distance from each other, with their heads inclining to the wall; these are covered with 4 to 6 inches of soil, and made solid at the heel with the foot. If the soil in the trench is covered with a little manure, it will keep it cool and fresher for the young roots—much to their benefit; the rest of the soil can be spread on the border, which may be planted with whatever may seem best.

The future cultivation consists in keeping them well watered, and in tying the strongest and best shoots to a small stake as they grow, and in stopping the rest. The following spring all superfluous shoots are cut off, and the best shoot cut back to good wood, which in its turn is laid down and covered in the soil towards the wall, leaving only one or two eyes aboveground. The same treatment must be followed the second year, and again the following year, by which time they will have reached the wall. The third spring the training on the wall commences, but before pruning for that purpose a little consideration must be made, viz., let the length of the wall be whatever it may, find the centre Vine; mark this to be one of the topmost cordons,* every fifth on either side of this will be for the same purpose; and again for each of the other heights (fig 75). When the shortest are come to, mark them; prune all the others to one or two eyes above the soil. Those left to form the lowest or the first cordon in the fourth year must be pruned thus the third year—the description of which will suffice for the rest. With a wall the height above stated, the first cordon is formed 16 centimètres (6 inches) above the soil, the four others are 50 centimètres (20 inches) one above the other. If there is a double eye exactly the height of the cordon prune to it, if not, prune to the one nearest above it; this topmost eye is to form the branch on one side, and the one below it that on the opposite side. If either of the shoots produced appear to be gaining greater force than its neighbour, it must be equalised by tying the point downwards and the weaker shoot more upright. In thus taking a little extra trouble at the early stage of its existence, it will seldom be very troublesome after, and the Vine will present an equality which cannot be obtained otherwise. The second cordon can be started the following year, and each of the others one year after its predecessor; but in the meantime many bunches of fruit may be obtained from the superfluous side branches as the Vine grows up, the saving of which will greatly fortify the Vine for the better support of the main branches when formed.

* Dr. Seemann modestly omits his own name in the list, though many of the noblest Palms were introduced by him. Eds.

† If the nurseryman would take care to append the syllable *Hort.*, or adopt some other contrivance to show the provisional character of the name he gives, all would be well; commercial morality would prevent, or at least resent, intentional misapplication of a name, and botanical registrars would not concern themselves with names given for trade purposes.

* For the use of the cuts illustrating this article we are indebted to Mr. Robinson.

Each year a few of these side shoots must be suppressed till none are left whatever; the wall will by that time be covered with its main branches; the pruning of the shoots these produce is all that remains to be stated "pour avoir un mur des Vignes comme ils ont à la Thomery." As each of these *mère* branches are produced it is best not to leave the last year's wood too long at each winter pruning, only sufficient to produce each year two fruiting spurs 10 to 16 centimètres (6 inches) apart, and one eye for carrying the cordon further on; this to be repeated till each branch each side obtains a length of 1 mètre 30 centimètres (about 4 feet 4 inches), when the last eye at that length becomes a fruiting spur. The pruning of these spurs may be better understood perhaps by referring to figs. 74, 76, where it will be seen that two shoots are allowed to be produced from each spur every year, and at the winter pruning the topmost shoot is cut clean out, and the lowest to two good eyes which are to produce the two fruiting shoots the following year; and this being rigidly adhered to every year, the Vines of 20 to 30 years' standing have not spurs more than 1 inch or 1¼ inch long.

A wall thus covered with Vines has been calculated to have 80 fruiting spurs on a space of 2 mètres 50 centimètres square, which when pruned to two eyes gives each spur two shoots; and each shoot allowed two bunches of fruit (the usual number allotted to each), makes in all 320 bunches on a surface of 2 mètres 50 centimètres square.

All these measurements are such as are followed at Thomery, and generally in France where the Vine is thus cultivated; but as the climate of England cannot be considered so good as that of France for Grape growing outside, it would appear better to give more space in every way, and for that purpose I would prefer the following arrangement in adapting the Vigne à la Thomery to the climate of England, viz., a wall 10 feet high, Vines 3 feet apart, four cordons, the lowest 8 inches from the ground, and the others 28 inches apart, with spurs 9 inches from each other.

Much time might be saved by planting young Vines instead of cuttings, and it is really not necessary to plant them at such a distance from the wall as 1 mètre 60 centimètres, for after a few years all the roots at that distance die and rot off, and those that are produced closer to the wall become the main support, and it is from this part that all the main roots proceed in search of nourishment. Again, in England, where most walls are made of brick, no trellis is required, and by doing away with this the walls will be left more completely at liberty to absorb sun-heat. It may be interesting to many of your readers to know that it is very seldom a system of disbudding the Vines early is carried on here, at any rate as far as I have seen, and I have been to a good many places where Vines are grown. When I have asked why they did not disbud, I received the answer that I wanted too much attention given them. Last year, while I was disbudding, several gardeners chanced to call, and said the same thing; and so, for that reason, I left a part, as is usually done about here, and thus I proved to these gentlemen that it took less time to do it so, than to leave it to be done in the usual manner, viz., when the Grapes are formed,—not mentioning that I cut Grapes 15 days earlier off those that had been disbudded than from those that had not. *W. S., France.*

THE CROCUS.

Since, a few years ago, I turned my attention to the growing of hardy herbaceous and bulbous plants, nothing has pleased and interested me more than the various species of that beautiful, but, since the palmy days of Mr. Herbert, most neglected genus, the Crocus. I am too young a hand to pretend to any very accurate knowledge of this large and very confused family, but I have become so enamoured of their beauty that I am determined to try and grow every procurable species; and shall be only too glad of the co-operation and assistance of any ardent and kind-hearted florist at home or abroad: and I think if a few of us join together with a will a good deal may be done towards surmounting the somewhat tangled specific web of this beautiful genus, and a great deal of additional pleasure may be thus given to all lovers of spring gardens. I will briefly mention, by way of information, the species which I at present possess.

Crocus Aucheri (*chrysanthus*).—This very neat and pretty little golden species I procured from Messrs. Backhouse, and it seems to be growing and increasing. It is just now in bloom.

C. biflorus.—Every lover and possessor of an old-fashioned garden is familiar with this large and handsome species, the old Scotch Crocus of our horticultural ancestors. I know nothing more lovely than a large clump of this flower, whether showing their snow-white expanded inner petals to the bright sun, or exhibiting their delicately-striped exteriors to the closing shades of night. Its three inner petals are always pure white.

C. aureus (Sibth.).—This pretty little species, which is closely allied to C. lagenæflorus, is peculiarly interesting to English florists from the fact of its having been for many years naturalised in Barton Park, Suffolk, the seat of Sir Charles Bunbury, through whose kindness I have been promised some bulbs.

C. Boryi.—This pretty little white autumnal, or rather winter Crocus, is now being pretty generally distributed through the medium of Messrs. Backhouse, and seems to make itself very comfortably at home in our British soil.

C. lagenæflorus.—This pretty, and, from its flagon-shaped blossoms, easily known species, I have obtained through the kindness of my friend, Mr. Ellacombe, who has done more perhaps to work out this interesting genus than any other modern florist.

C. maximus.—Mine are bright yellow, but where is the lovely, pale, sulphur-coloured species figured by the older authors under this name?

C. minimus.—This interesting little species, by some considered a variety of C. biflorus, grows in company with C. aureus at Barton Park. It has generally all its petals, outer and inner, more or less striped.

C. multipictus.—This autumnal purple species I have received from Messrs. Backhouse, but it has not yet bloomed. It is, I believe, by some considered to be a variety of C. nudiflorus.

C. nivalis (Sieberi).—This beautiful little Crocus, pale lavender, with a yellow base to the petals, is one of the most ornamental of the family. It comes in with the Aconites, but lasts in bloom till the end of March. It seems to accommodate itself very well to our climate.

C. nudiflorus.—This rather short-lived but very showy autumnal Crocus grows wild in several parts of my native county of Derby. I have succeeded in establishing two or three strong clumps in my garden here.

C. reticulatus albicans.—I have this Crocus under its old name, the Cloth of Silver, from the garden of a friend, but am not at all sure that it is true.

C. sativus.—This beautiful autumnal species comes up with me very strong in the leaf, but is very shy of bloom.

C. speciosus.—The handsomest of all the autumn-flowering species. It does not, however, increase with me.

C. suaveolens.—This very pretty, and, as its name denotes, most fragrant species, I found in abundance in the environs of Rome some three winters ago, but the bulbs are, alas! all dead.

C. sulphureus striatus.—This very ornamental little Crocus, like a pale variety of the old Cloth of Gold, is just now in great beauty. It was largely grown by our forefathers, but has of late become rare.

C. Susianus.—Every one knows this pretty little flower, one of the very first harbingers of spring, under its more familiar name, the Cloth of Gold.

C. vernus.—This pretty species, with its numerous varieties, is too well known and appreciated to need any comment.

C. versicolor.—A very pretty and fragrant species, of the biflorus type. I had it, but alas! have lost it.

C. obscurus.—Under this name I observed a clump of Crocus allied to versicolor, but more suffused with purple, in the Botanic Garden at Oxford. I afterwards found it in the garden of a friend, whose flowers were of very ancient origin, and procured a few roots. I know no more about it. *H. Harpur Crewe, The Rectory, Drayton-Beauchamp, Tring.*

Home Correspondence.

Horticultural Congress at Oxford. Mr. D. T. Fish writes enthusiastically, and aims, too, at being a philosopher; but on reading his remarks on a supposed Congress at Oxford I felt that he was afraid of the poverty of the craft appearing before the Oxford dons. I am staggered with his notion of confining the Congress to one or two prize essays, stamped with "R. H. S." Mr. Fish seems to ignore the Manchester Congress. Now on that occasion I mixed with the listeners, and was delighted to hear favourable remarks passed on the papers read in the tent. True, there were some "clever" gardeners who laughed at the patient folks who sat to hear "such stuff," and possibly Oxford will be favoured with the "flashes of genius" that despised to teach the plebeians at Manchester. I do not think it good taste to name special papers as claiming distinction at the Manchester meeting. I listened with profit to those read by Messrs. Cramb and Paul, and I should think Mr. Cramb is well satisfied with the "threshing" his paper has since got. I have repeatedly heard the papers of Mr. Barron, and of Mr. Grieve, spoken of by excellent judges as being of sterling merit. It must be allowed that a Congress would be a contemptible affair if confined to one or two ideas. For many years I have been in the way of meeting horticulturists of good standing, fairly educated and intelligent men, yet I could not name three who would undertake to stand up at an Oxford Congress and discuss off-hand the details of a prize essay stamped with "R. H. S." Gardeners in this country are engaged in an extremely practical business, and in most cases have little opportunity to cultivate public speaking. It is much more useful to learn to write carefully and concisely [Hear! hear!] on practical subjects, which become valuable aids or incitements to younger men or those working in more limited fields. If gardeners are to be allowed to partake in the pleasing interest of a Congress, let them do what they are capable of doing well, under good regulations—read short practical papers on subjects they understand: so says *Manchester Congress.*

—— The schemes which float about the world have generally for their attendants three sets of people—admirers, detractors, and passive spectators. This being so, we should be very cautious how we find fault either with one or the other of the parties, until we have tested the ground on which they respectively stand. Many schemes, now-a-days, fall under the cognomen of crotchets, and the actors under that of crotchet-mongers. All would go on very well if it were not for the fact that the crotchet-mongers very often talk at random, and hence become bores, seldom or never failing at last to be cried down as nuisances. This, of late, has become of frequent occurrence at our Social Science Meetings. The lukewarmness which greets projects of a kindred nature should not induce surprise, nor tempt us to weaken our endeavours. Had the Horticultural Congress of last year been more successful as a whole, perhaps it might have interested a few more of the mere spectators; but, however successful, it could never have banished all detraction. One of the main points urged against the success of that meeting is, in my estimation, a very paltry one. Even Mr. Fish, with all his friendliness to the project, has been led into ground which is untenable, when he says of the meeting "that it was little short of cruelty to both readers and listeners." Now I am at a loss to see wherein that cruelty lay. It certainly does not dwell in a self-imposed task. And on the part of the listeners, what cruel hand bound them to their seats? Could they not go to and fro, free as the wind which passed through the tent? There was no compulsion, unless it was on the part of the chairman, and others officially engaged; and I have yet to learn that they felt the cruelty of the moment. With regard to the shortcomings and lengthiness of the various papers that were read at the meetings, I think the writers ought to be exonerated from all blame. They were invited to send something, that something was sent a considerable time previous to the meeting; and I, for one, came to the conclusion that the selected papers would pass through an ordeal something akin to an editorial examination, and come back to the authors in an amended form; but such was not the case. [Nor was it ever the intention. Eds.] On the contrary, when I again received my paper, there it was as I had sent it, pure from the mint. It cannot be denied but that a certain coldness pervaded the meetings. This, however, could scarcely be otherwise, considering that the affair was an experiment, and that the whole of the actors were almost entire strangers to each other; but it was uncalled for and ungentlemanly for any one subsequently to fall foul of the affair. If—as I venture to hope may be the case—a similar meeting is to be held at Oxford, I would impress upon the authorities the importance of giving timely notice of all intended operations. If the experiment of last year gave doubtful results, let us hope for better doings at Oxford, and a greater amount of cordial co-operation. *Andrew Meikle, Read Hall, Whalley, Lancashire.*

The Disputed Viola.—I acquiesce most readily in the suggestion thrown out by "A. D." in the last week's *Gardeners' Chronicle*, that plants of the disputed Viola be submitted in bloom to the Floral Committee as soon as possible, for the final decision of that body. I will take mine on April 20 next, and should like to meet Mr. Jobson there with his. *George Smith, Wilton Road Nursery, Salisbury, March 22.*

Hothouse Heating.—We have built the walls of a hothouse, 22 yards long, with an incline of 11 inches, and we are at a loss to know whether we could raise the flow-pipe 11 inches to correspond with the top of the wall, or whether the rise would cause too great a pressure on a Messenger's tubular boiler. We intend the boiler to be at the lower end of the house—our own mechanic is fitting up the pipes, but he is too inexperienced as to the effect such an ascent might have on the boiler. If the ascent is not practicable, we might have the pipes to run side by side, or not one above another; if so, are they to run on the level, or have the usual rise of about ¼ inch to 9 feet? *Reader.* [The proposed rise of 11 inches will do no harm to the boiler. Eds].

Scotch Firs.—Can any of your numerous readers inform me of the cause of the sap from Scotch Firs oozing out, and thereby causing the death of the trees? This oozing of sap has been observed in trees of various ages, on a poor soil, and when the black place formed upon the bark by this eruption of the sap appears below the boughs on the pole, it is a sure sign that it will die off in a few months, and lose some of its value as timber. *A. T. Draper, Parkside, Windsor.*

The Bishop Stortford Vines.—I hope that the following observations on the Bishop Stortford Vines will not anticipate Mr. D. T. Fact's tremendous secret respecting them and their failure (see p. 384). On reading the rhapsodical article in question one is bewildered by the bursts of imagination, which bring into view all the ills which Vines are heir to, but it is never mentioned that the too free use of carrion or garbage in Vine borders is one of the great causes of Vine roots failing. It struck me at the time when these Bishop Stortford Vines were first puffed up in the *Gardeners' Chronicle*, that their lives would be short, and this opinion was formed by the description given of the rich garbage put in when the borders were first made. We had at the same time a vivid account of the late Dr. Lindley's adventure with his walking-stick, in probing the borders to the bottom to show

their porosity and richness. We have all heard, too, of the wonderful Vines at Raby Castle, which grew in carrion-made borders. Their appearance was so luxuriant for three or four years, that Mr. Roberts, their planter, thought he could challenge all England to produce their equals. But a "change came o'er the spirit of his dream," for the soil in the borders soon got to the consistence of black putty, the roots rotted, and of course these grand Vines soon went to the rubbish heap. I have known many gardeners of the old-fashioned school who never could pass a dead deer, sheep, or dog, without trying to get it buried in their Vine borders, and of course to the detriment of their Vine roots. Gardeners now-a-days seldom split on this rock, but some amateurs still think they cannot make their Vine borders too rich, and therefore have often to deplore their bad success in Grape growing. *Thoth.* [It seems there was no lack of roots in the case of the Vines in question. EDS.]

—— I'm generally considered a good-tempered sort of fellow, but really I begin to feel a little "riled" upon the above subject. In your last, "David Tell Fact" was again to the fore, and as I took up the paper I mentally exclaimed, "Now for the grand fact!" but as I read on and on, I came to the conclusion that "D. T. F." was not true to his assumed cognomen, but, on the contrary, his facts were all fancies, a sort of negative evidence, which ill-natured people might call raising a difficulty in order to knock it down again, and concluding with the oracular announcement, "I will shortly, with your permission, endeavour to lay bare the cause of failure." Endeavour, you see. It is only to be an endeavour, with, perhaps, as is the case this week, no fact at the end of it. As an old stager in blotology, I wonder that "David Tell Fact" has not discovered the fact that "brevity is the soul of wit." Had he doneso he would have gone straight to his subject, and have told us what he knew of the malady of the Vines instead of wire-drawing a yarn, the length of which he confessedly does not know. In these days of railways and "thought flashes," when we live by heart-throbs and not by minutes upon a dial, it is necessary that all fights, whether civil or pugnacious, be short, sharp, and decisive; and those writers who cannot realise that fact run a fair chance of "wasting their sweetness on the desert air," as their lucubrations will go unread. So far as I am individually concerned, I can tell the yarn-spinners, and wire-pullers in general, and "David Tell Fact" in particular, that in future I shall read heads and tails. If the former looks likely, and the latter any way seductive, I shall read it; but if I have to wade through a sack of chaff to extract a single grain of corn, I shall conclude the light may not be worth the candle, and I shall not waste time in seeking for it. Now, in all seriousness, Messieurs Editors, I will ask you a question. You have recently added a third to your professional intelligence by dispensing with the News of the Week; do you not think you might add another third by applying your pruning-shears, strictly on the "restrictive system," and thus get rid of a lot of superfluous verbiage, which pleases no one but the writers? Of course you will thank me for this hint, and if you do not act upon it, I hope your correspondents will. *Brevity.* [Our scissors wear out very fast. EDS.]

Gardeners' Royal Benevolent Institution.—From an advertisement in the *Gardeners' Chronicle* of the 12th inst., I perceive that the above mentioned institution will have an addition made to its list of pensioners in July next; and an editorial paragraph in the same paper very justly remarks, that "if greater support were given to the institution by the class for whose special benefit it was founded, much more might be done by way of adding pensioners to the list." No one can rejoice more than I do at the prospect of some one less fortunate than myself receiving the benefit that this society can give, still I have grave doubts if the present plan of filling up the vacancies by non-subscribing candidates is the way to induce the "class for whose special benefit the institution was founded" to become subscribers. I am aware that such a plan will make no difference to all true friends of the society, but there are many others who will think to themselves they need not subscribe, as they will be elected without, should they require it. It appears to me that some check should be put to this system of electing non-subscribers: either the society should be content with fewer on the list, and increase the amount of the pension—which is not by any means an extravagant one at present, or they might require the friends of non-subscribers to pay a premium to the society, say of ten guineas, and in return for that amount they would become life subscribers, and vote at all elections. *G. T.*

A Cure for American Blight.—In my garden the Apple and Cherry trees have been nearly destroyed by American blight, and I have tried all the remedies I could hear of without success. An experienced gardener told me he knew of no cure, but that he had heard of a Scotchman using whiskey. [How?] Thinking the insects would not be particular about the genuine "Mountain Dew," I tried last June methylated spirit, and no blight has since appeared. If the brush used to clean the branches is kept moderately damp, so that the spirit is not splashed about, a little will answer the purpose, and the expense is not great. I found it also useful for cleaning insects off Plum trees, and having a dog that a veterinary surgeon failed to cure of mange, I tried the methylated spirit on the dog, and it appears to me to have cured it. *G. B. Moore, Plumstead, S.E.*

Habrothamnus elegans.—This plant is quite worthy of being mentioned as suitable for decorating a conservatory in winter, with Sericographis Ghiesbreghtiana, which has been so ably described by your correspondent "J. W." and others. It flowers more or less all the winter, bearing on its spreading shoots beautiful conical heads of purplish red flowers. These show out elegantly among the other plants. I have seen them nearly 5 inches long and over 3 across their broadest part, with four or five heads upon each plant. It is a plant of a somewhat more woody character than the Sericographis. It has the great advantage of flowering in summer, and may be trained to a wall or tied to a pillar, as well as used for pot culture. A compost of turfy loam, having a small proportion of peat, leaf-mould, and silver sand, suits it very well. As soon as the shoots have done flowering they should be cut back, to keep the plant shapely and in order. In summer it may have the same care that is taken with greenhouse plants; and should red spider make its appearance on it, remove it by frequent syringings. It requires no greater care in its culture than ordinary greenhouse plants. *R. M.*

A New Electric Thermometer.—As there seems to be at present a desire to apply the electric thermometer alarm for general use, and at the same time its principles seem little understood, I will endeavour, in reply to "Hortus," and those who feel interested in such matters, to describe a thermometer of this description which I invented two years ago, and which I have had in use for some time. For certain obvious reasons I will not at present note how the following effects are produced, but only explain what this instrument will do. 1st. It will ring a bell if the temperature of the greenhouse rise or fall a degree, and that at any distance. 2d. It will, if required, ring one bell for increase of temperature, and another for decrease of same. 3d. At night it will show the state of the greenhouse (in the gardener's room), either when too hot or cold, in letters of fire. 4th. It can be set to ring the bell, &c., at any temperature, from 45° to 90°. The battery requires little attention, and will work for months without any trouble. *George Rothnie, 5, Cromwell Terrace, Upper Holloway.*

Flower Shows.—In reply to "R. D., Sunderland," let me (as the grower and exhibitor of the Scilla peruviana shown at York Gala last year) say that I hold the same opinion as himself. There should be prizes offered for the extra class. Gardeners would then be more encouraged to try something fresh, which would make the exhibitions much more interesting. Your correspondent was not alone when he heard the remarks quoted in last week's *Gardeners' Chronicle.* I heard the same from several, and not only at the Gala was it admired, but by numbers who saw it here. *John Mitchell, Escrick Gardens, York.*

Fuchsia Venus Victrix.—The entire family of Fuchsia consists of objects of considerable interest and attraction; the growth of the plants is graceful and pleasing, but when ornamented with a profusion of their elegant pendent blossoms, they become objects of peculiar beauty, and possess a superior claim to a situation wherever they can be introduced. Up to the year 1823, I have heard my father say, there were but two kinds grown in this country, viz., F. lycioides and F. coccinea. Since that period they may be counted by the thousand. But probably no variety has created a greater sensation and wonder than F. Venus Victrix, when it was first exhibited. At Tunbridge Wells it created quite a furore amongst those present at the exhibition (myself included, although at the time quite a youth). The variety in question was raised by Mr. Gulliver (not the hero of Gulliver's Travels), gardener to the Rev. S. Marriott, of Horsmonden, Kent, and was sent out by Mr. Cripps, of Tunbridge Wells, about the year 1842. At that time my father was gardener to the Marquis of Camden, Willdernesse Park, Kent, and was a true lover of the Fuchsia: Venus was of course added to his stock as soon as it was procurable, and with an eye to its bedding properties, it was propagated with the utmost despatch. The following season it was bedded out, the surface of the beds being neatly covered with moss. Never since that time have I seen such effective beds of Fuchsias as those composed of Venus Victrix; its fine sturdy, although dwarf habit, small foliage, and profusion of elegant flowers, with white tube and sepals, and a very dark blue or purple corolla, render it very attractive and effective. Indeed, it may be justly styled the queen of bedding Fuchsias, and ranks as such up to the present day. My attention has just been drawn to this old variety by a perusal of Mr. Cannell's Floral Guide. Mr. Cannell there states: "After ten years' continual inquiry and perseverance I have succeeded in getting from a gentleman in Ireland this valuable old variety, and from previous inquiries and advertisements I really should be inclined to credit that this is the only plant perhaps in the world. This is the first true variety with white tube and sepals ever raised and introduced. As this variety must have come by a freak of Nature from the dark purple corolla varieties, consequently it possesses more black in the corolla than any other, with their tube and sepals white. A high price has been frequently offered for this variety for breeding purposes, and great things may be expected from this Fuchsia in a year or two; and by crossing this with some of the new varieties, we may expect before long a first-class Fuchsia with white tube and sepals, and brilliant purple corolla." I certainly anticipate great things from it myself, foreseeing it to be the parent of an entirely new class of bedding Fuchsias. *Edward Bennett, Osberton.*

The Talking Vines at Combe Abbey.—"Thoth" has criticised my dialogue with the Vines at Combe, which is precisely what was wanted. Let me now briefly examine "Thoth's" criticism in detail. Firstly, then, "Thoth" says my Vines, not yet in their teens, are wonderfully precocious, which was freely admitted in my dialogue. Secondly, "Thoth" refers to Mr. Cannell's theory on close-pruned Vines. I was not aware that Mr. Cannell was an author on the Vine, though he has gathered together from the pages of the *Gardeners' Chronicle* certain correspondence on the Vine, which he published in the form of a pamphlet. I have heard that Mr. Cannell lived at a place where the Vines refused to produce either "Grapes or timber," and these may be what "Thoth" refers to when he says, "There is a critical stage in the life of close-pruned Vines." Thirdly, "Thoth" hopes that the "lord of the vineyard" will again communicate to the readers of the *Gardeners' Chronicle* any further conversation he may have with his Vines. The above is an analysis of "Thoth's" criticism, in which I felt somewhat disappointed not to find something original; but there is a certain class of persons, who criticise freely, and, like friend "Thoth," but lamely.

> "Some few in that, but numbers err in this,
> Ten censure wrong for one who writes amiss."

For the information of "Thoth," allow me to say that my precocious young Vines, not yet in their teens, have assisted me in winning three gold medals in three successive years. There are in the country plenty of "lords of Vines" who would like their Vines to speak out in a similar manner. Mine, at least, have spoken plainly. *Wm. Miller, Combe Abbey Gardens.*

Charlock Seed.—In some parts of Northamptonshire, on the stiff clays over the inferior oolite, a great quantity of Charlock was very common a few years since in the corn crops. It occurred in such quantities that it was quite impossible to get rid of it by the hoe or hand-weeders, and after topping the plants with the scythe, to give the corn some chance, a great quantity of seed was always mixed with the grain at harvest. There was a ready sale for any quantity, which we understood was bought to mix with Rape seed for oil. It is perhaps owing to this adulteration that rape-cake has sometimes a hot pungent flavour. I am speaking of what first came under my notice in 1822. Charlock is too common now, but our best farmers have managed to keep it under. The Charlock of Northamptonshire is Brassica Sinapistrum, not the wild Radish, which is very rare in the clay soils. *M. T. B.*

—— The question asked in last week's *Gardeners' Chronicle* with regard to the use of Charlock seed, seems at first sight easy to answer, but upon referring again to the paragraph, I find the question is restricted to the "legitimate uses" of the said seeds. It is probably known to many that the seeds of Sinapis arvensis have the bad repute of being frequently ground up with Mustard as an adulterant, and it is even said that in some rural districts they are used as a substitute for that useful condiment. It has also been said of them that they yield an oil suitable for burning in lamps. The first is certainly not a legitimate use, but the latter may be, and so, to a certain extent, perhaps, qualifies this note. *John R. Jackson, Museum, Kew.*

Barberries and Blackberries.—Three years ago I had jelly made from Blackberries and the fruit of Berberis Aquifolium, more commonly called Mahonia, and found the mixture very palatable. I also had jelly made from the Mahonia berries alone, but it was not nearly so good. The Mahonia, as every one who grows it knows, bears a great profusion of purple berries, and as I happened to be rather short of fruit that year, I thought I would try the Mahonia berries, as I saw my turkeys eating them with considerable relish, and with no bad effects. If used to flavour Blackberries in a tart, I should prefer to use the juice only, as the skin and seeds might not be good. *G. A. H.*

Golden Seal.—In answer to "B. C." (p. 389), who asks what "the Golden Seal" of the United States' dispensary is, allow me to say that the roots of Hydrastis canadensis are known in some parts of North America by the name of Golden Seal, Yellow Root, and Orange Root; these names are derived from the bright yellow colour the roots exhibit upon fracture. When fresh they have a strong narcotic odour, and a very bitter taste. In medicine they have been used in infusion for the cure of ulcers, &c., but chiefly, I believe, in ophthalmia; their medicinal virtues, however, are doubtful. A yellow-coloured juice is obtained from the fresh roots, with which the Indians dye or stain articles of clothing. *John R. Jackson, Kew.*

Meteorological Observations.—In your leader at p. 381 you refer to Mr. Glaisher's interesting remarks made to the Scientific Committee on the thermometer in some cases registering higher on high than on low

ground, a neighbour has pointed out to me that in White's "Selborne," letter lxii., p. 145, edition 1825, the results of Mr. Glaisher's observations, and also those made by Mr. Wilson Saunders, are confirmed in the fullest manner. The following is a copy of the passage alluded to :—

"On the 10th Dec. 1784 . at 11 at night, though the air was perfectly still, Dolland's glass went down to 1° below zero! This strange severity of the weather made me very desirous to know what degree of cold there might be in such an exalted and near situation as Newton. We had, therefore, on the morning of the 10th written to Mr. ——, and entreated him to hang out his thermometer, made by Adams, and to pay some attention to it morning and evening—expecting wonderful phenomena in so elevated a region, at 200 feet or more above my house. But, behold! on the 10th, at 11 at night, it was down only to 17°, and the next morning at 22°, when mine was at 10°. We were so disturbed at this unexpected reverse of comparative local cold, that we sent one of my glasses up, thinking that of Mr. —— must somehow be wrongly constructed, but when the instruments came to be confronted they went exactly together, so that for one night at least the cold at Newton was 18° less than at Selborne, and through the whole part 10° or 12°; and, indeed, when we came to observe consequences, we could readily credit this, for all my Laurustinus, Bays, Ilexes, Arbutus, Cypresses, and even my Portugal Laurels, and (which occasions more regret) my fine sloping Laurel hedge, were scorched up, while at Newton the same trees have not lost a leaf."

Geo. F. Wilson, Heatherbank, Weybridge Heath.

Crocuses.—I have a number of Crocuses in my garden, of different colours, and among them, of course (but not more numerous than the others all together), ordinary yellow Crocuses. Unfortunately there are several hen pheasants in the immediate neighbourhood, and these birds, passing by the other sorts almost entirely, pluck off the flowers of the yellow Crocus. Can it be the pollen that attracts them? Can you suggest a remedy? *W. M.*

Cogs, &c.—It would certainly be a great honour to be the discoverer of another saint for the gardeners' calendar, but I can lay no claim to the distinction Mr. Ingram would confer upon me. It would be something like the discovery I made a few years ago. One day I was botanising on one of the heathery braes of Stirlingshire, when I came upon three long stones, which I was certain were not placed in the position they were in by volcanic agency, nor dropped from an iceberg. I sent a notice of them to the Antiquarian Society of Edinburgh, to ascertain if the stones were known to that body of learned men; they appeared not to be acquainted with them, and they were visited by one of the directors, and pronounced to be Druidical remains—the remains of a cromlech; but when notice was taken of them plenty of people knew about the stones, so that it was not reckoned any discovery at all: but I hope my labour will not be all lost yet, although I was unable, with pick and spade, to get at the bottom of the basaltic boulders, for it is still an unsettled thing with antiquarians whether cromlechs were Druidical altars or places of interment. It seems pretty certain that the Druids were in the country at an early date, for Gaelic scholars tell us that in several places of the Irish version of the New Testament the wise men or priests are translated Druids; and so where the English version saith that the wise men from the East came to worship our Saviour, the Gaelic translation has the Druids. So we are again informed that many of the Druidical priests became converts to Christianity, and were among the first saints of the country long before there was any quarrelling about the keeping of Easter and the wearing of the tonsure; so we may live in expectation of unearthing the relics of a botanical saint, for the Druids were not ignorant about the vegetation of the country. Mr. Ingram wants information about the shape, make, and construction of a cog; I will give it with pleasure, and give him also a sample to choose from. In days of old the royal borough of Stirling kept a hangman to do its own work, and strange work he had to do sometimes, such as putting a Perth cravat about the neck of an archbishop, and hanging him over the bridge of Stirling with as little concern as gardeners would string Onions for winter use. For his work the finisher of the law had certain privileges allowed him; he was provided with a wooden cog or caup, and could take a certain quantity of grain from each sack that was brought to the Stirling market. The state of things is greatly altered now; the hangman is very seldom required, and his cog is now in the Stirling Museum. The cog is a very good piece of work, done by the turner, but I cannot exactly say how much it would hold, but, judging from its appearance, it would contain brose enough to supply Mr. Ingram and a number of Scotchmen besides with breakfast, and I have no doubt they would sing after they were satisfied—

"Gie feckless Spain her weak snail broo,
Gie France her weel spik'd frogie,
Gie brither John his luncheon too,
But gie to us our coggie."

To relish a cog of brose much depends upon the cooking of it. The "merry monarch" of England, we are told, could dance and sing after sermon to the tune of "Brose and Butter," when played on the organ in the chapel by the Laird o' Cockpen. As Mr. Ingram appears to be joking about the information required about the cog and coggie, I will just continue the joke and show him that they are connected with almost every department of rural economy in Scotland. In the "Har'st Rig" we have :—

"But now the parritch comes afield,
Which joy to ilka ane does yield,
For now ilk yap and hungry chield
Fu' blythe does look,
Wi's lass and coggie in the bield
O some high stook."

Burns, in his "Scotch Drink," says :—

"That merry night we bring the corn in,
O sweetly then thou reams the horn in!
Or reekin', on a New Year's mornin',
In cog or bicker."

Even the milking-pail is sometimes called a cog, and it is a common saying that "one shouldna cast the cog, although the coo flings." When Mr. Ingram asks me to give him the root and branch of "cog," he asks more than I can give him; I leave these things to Dr. Jamieson and the "Edinburgh Review." But no doubt any clever philologist, who is acquainted with Grimm's law of the correspondence of consonants in the Teutonic dialects, would soon settle the matter for him, and graft cog upon Gog and Magog. *Peter Mackenzie, Plean.*

A New Plan for Raising Peas.—I send you a sketch (fig. 77) of a very convenient and simple form of trough for raising Peas, until they are sufficiently high to be transferred to the open ground, without much risk of injury from birds and mice. In this way I have utilised a number of superfluous wooden watergutters. The squares fitting diagonally into the ends of the troughs should be of inch stuff. To these diagonal squares (A) are permanently affixed parallelogram pieces (B), and one side-piece board of each trough, of which the end is shown in the section C, is to have one of these "A B C" pieces permanently nailed upon each of its ends. The loose side of the trough is affixed by means of a string tied with a slip loop, and kept from slipping laterally by a notch cut in the apex of the diagonal piece *a*, and three others on the angles of the

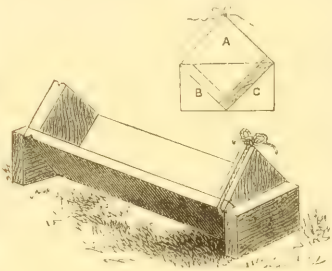

Fig. 77.

side pieces of the trough. My spouts are of inch stuff, and about 5 feet long. I think ⅛ inch stuff would do for the sides, if a string were tied round the middle of the trough. To liberate the contents of the trough without disturbing the roots, the trough must be put into a trench cut to receive it, the strings untied, the loose side drawn out, and the vacancy of its thickness filled in with earth; then the other side, to which the ends are affixed, may be removed, and its place filled in a like manner. *J. H. Maw, Broseley, Salop.*

Foreign Correspondence.

COLONIAL BOTANIC GARDENS — CASTLETON, JAMAICA.—This garden, which has been established only a few years, indeed, only since the giving up of the old Kingston Garden and the pensioning of Mr. Wilson, appears, judging from a recent report of Mr. Thomson, the superintendent, to be in a flourishing and satisfactory condition. At one time, it seems, some doubt was entertained as to the propriety of extending the garden, owing to its distance from Kingston, consequently it has not made such progress as it otherwise might have done. We are told that "as there is now no obstruction to the large importation of a liberal assortment of all plants that are likely to be turned to account as economic products, or as horticultural species, and Dr. Hooker, of Kew Gardens, having kindly offered his assistance and influence, the garden will thus soon be enriched and elevated to a new sphere of usefulness and efficiency."

Mr. Thomson suggests, with a view to utilising the waste lands belonging to the garden, that valuable economic plants should be cultivated in plots of plantations, twenty or thirty acres being allotted to forest trees, and a few acres each to such plants as Cinnamon, Cocoa, &c. Among the plants lately introduced to the garden was the Ipecacuanha; a Wardian case, containing upwards of 600 plants of Assam Tea, arrived in excellent condition from India: a plantation of 2 acres for experiments in the cultivation of these plants was to be established at Markham Hill. Manilla Hemp, which was formerly in cultivation in Jamaica, but which has been lost, has been reintroduced; the Black Pepper and Jalap have been propagated, the former to 30 plants and the latter to 20.

With regard to the Cinchona plantations, Mr. Thomson reports that a run of virgin forest land, containing 600 acres, which was pointed out by him in the beginning of 1867 as suitable for the purpose, was acquired early in 1868. This property in elevation ranges from 4000 to 6000 feet above the sea, and is situate on the southern slope of the Blue Mountain range, on its western declension, distant about 24 miles from Kingston; and embracing as it does a variety of aspects, with several streams or small rivers, and with excellent soil, is admirably adapted to the requirements of the Cinchona. In May, 1868, Mr. Thomson obtained possession of this land, and commenced operations in the felling and clearing of the forest, to the extent of 50 acres, which was ready for being planted out in August. During the lapse of these months a violent drought, such as has been seldom witnessed, prevailed over the higher mountains, but which was most propitious in accelerating the preparation of the land. In September and October upwards of 40 acres were planted of the following species :—C. succirubra, 26 acres; C. officinalis, 7 acres; C. Pahudiana, 4 acres; C. Calisaya, 3 acres; and C. micrantha, 2 acres,—all of which have taken kindly to the soil; indeed thousands have in this short time grown to a height of several inches. At the time the report was written, from which the above is taken, the number of plants permanently planted out was about 20,000, which, it was expected, would be augmented to 35,000 during the financial year.

A neat and substantial greenhouse, capable of accommodating about 8000 young plants, also a hot pit, heated by a furnace and flue, and thus affording the requisite command of bottom-heat, to enable the propagation from cuttings of some 2000 plants per month, have been erected, at a height of 4800 feet above the sea, and placed adjacent to the site intended for the house of the superintendent. A shed, 50 feet long by 12 feet wide, has also been built for the accommodation of labourers.

Seeds of Cinchona succirubra, C. officinalis, and C. Pahudiana have been received from Ceylon through Dr. Hooker. Of the first mentioned species, owing to the large extent already planted, 8000 to 10,000 plants were advertised for sale in July, 1868, to be delivered in the spring of 1869. At the same time, directions for the cultivation of the plant in Jamaica, at the request of the Governor, were written by Mr. Thomson, and printed for circulation. This announcement of sale had not up to the date of the report been generally responded to, hardly 2000 plants having been applied for. Intending planters, no doubt, await the issue of the Government plantations, but this contrasts unfavourably with the first notification of the sale of Cinchonas in India, and at a price of 150 per cent. more than those offered from the Castleton gardens. Mr. Thomson says, that as means are now at his command to ensure rapid and extensive propagation, he will shortly be enabled to produce such a quantity that they may be offered at a low rate. Steps have been, or are about to be, taken by the Indian Government, to commission an agent to proceed to New Grenada to collect all the remaining valuable species not yet introduced into that country; Jamaica will doubtless, as hitherto, share in profiting by this new acquisition of several important kinds.

MAURITIUS.—From this place we have the report of Mr. Horne, the sub-director, and considering the great damage done to the gardens by the hurricane, it would not be surprising if there had been nothing left in the gardens to report upon. Mr. Horne, however, states what has been done, and concludes by giving a list of the plants destroyed. With regard to China Grass, he says, in suitable situations four cuttings can be had from it in the year, and it will yield from a ton to a ton and a-half of fibre per acre. The plant, he says, is more easy to cultivate than Sugar-cane, and he anticipates that the expenses attending the extraction of its fibre, with a proper machine, would be found to be less than those of sugar-making. The only expense attending its cultivation are dressing the ground, planting and weeding, or hoeing once or twice, until the plants have fairly started into growth, and begin to cover the ground. Afterwards it grows so rapidly and so close, that it completely chokes any weeds that attempt to grow. Though Mr. Horne expresses it as his opinion that it will not compete with the Sugar-cane as a plant cultivated for produce, yet he feels confident it will be found a valuable plant for a change of crop with the cane, and will return a fair profit to the planter on the expenses attending its cultivation, and the preparation of the fibre.

A large number of young plants were propagated in the beginning of 1868; but, with the exception of about 2500 supplied to L'Asile, where the cultivation has been entered into enthusiastically, there was no demand for them. About 3000 plants of that year's propagation are still on hand; and, should there be a demand for any more, the number can be very readily increased.

With regard to the injuries caused by the hurricane, it was hoped that many of the Clove trees would recover; it appears, however, that those that were seriously damaged are, with one or two exceptions, all dead, and there are now not more than six good specimens in the gardens.

Of Cinchonas there were at the time the report was

written 950 plants in the nurseries, 920 being those of C. succirubra, and the remaining 30 C. officinalis; besides these there were about 300 cuttings, under bell and hand glasses, which were nearly ready for potting: some plants of this species planted out in a ravine are over 4 feet high, and are strong healthy plants. About 750 plants of Cinchona officinalis were grown from the seed in the gardens in 1867, and having been removed to the nurseries at Curepipe only a few days before the hurricane, 700 of them were then destroyed, 20 have since died, and the 33 that survived were planted in the grounds; they do not, however, grow well, and from their appearance it would seem that the climate is too hot for them. At the same time Mr. Horne advises the attempt at their cultivation to be persevered in.

Societies.

LINNEAN: *Jan.* 20.—G. Bentham, Esq., President, in the chair. Lieut.-Col. Benson, N. L. Austen, Esq., F. P. Balkwill, Esq., J. Goucher, Esq., G. Harrison, Esq., C. A. Robinson, Esq., E. Taylor, Esq., and A. Woodward, Esq., were elected Fellows. The following papers were read:—I. *A revision of the Flora of Iceland*, by Prof. C. C. Babington. After referring to the climate and character of the country, the author gave an historical account of its vegetable productions. It was stated that the number of flowering plants which had been hitherto detected was 467. Of this number none are peculiar to the island, while only about 60 are not natives of Britain, and with three exceptions all the remainder are European, and found chiefly in Scandinavia. The three plants, not otherwise known as European, are arctic, and consist of Epilobium latifolium, Gentiana detonsa, and Pleurogyne rotata. Although woods have existed recently in Iceland, yet they have been destroyed by the carelessness of the inhabitants, and in consequence none are now to be found, though, as greater care appears to be taken of their remains, it is expected they will spring up again. The trees consist entirely of Birch, without trace of Pines. Extensive woods of dwarf Birch trees are found in several places, and some fruticose Willows exist, especially an abundance of Salix lanata. It was stated that no grain of any kind was grown upon the island.—II. *Contributions to British Mycology*, by Dr. Lindberg; communicated by Dr. Hooker.—III. *On new British Spiders*, by the Rev. C. P. Cambridge; communicated by J. Salter, Esq.

Feb. 3.—G. Bentham, Esq., President, in the chair. Dr. R. C. Cunningham was elected a Fellow. The following communications were read:—I. *On Myrocarpus frondosus*, by J. Correa de Mello, of Campañas, S. Brazil, translated from the Portuguese, with a note by the President.—II. *Revision of the genera and species of herbaceous Capsular Gamophyllous Liliaceæ*, by J. G. Baker, Esq.—III. *On a new form of Cephalopodous Ova*, by C. Collingwood, Esq.

Feb. 17.—G. Bentham, Esq., President, in the chair. R. B. Sharpe, Esq., was elected a Fellow. The following papers were read:—I. *Notes on the Tree Ferns of British Sikkim, with descriptions of three new species, and supplemental remarks on their relations to Palms and Cycads*, by Mr. J. Scott, Curator of the Royal Botanic Garden, Calcutta; communicated by Dr. T. Anderson. This paper was illustrated by an extended series of drawings.—II. *On the Commelynaceæ of Bengal*, by Mr. C. B. Clarke, Officiating Superintendent of the Royal Botanic Garden, Calcutta; also communicated by Dr. Anderson.—III. *Extract of a letter from Dr. H. F. Hance to Dr. Hooker, dated Whampoa, Oct.* 14, 1869. This letter gave a highly interesting account of the Botany of the White Cloud (Pakwan) Hills, near Canton.

March 3.—Dr. Hooker, Vice-President, in the chair. A. G. Medwin, M.D., and J. B. Perrin, Esq., were elected Fellows. The following communications were read:—I. *Note on Hybridism among Cinchonas*, by Mr. J. Broughton, chemist to the Cinchona plantations in the Madras Presidency, with introductory remarks by J. E. Howard, Esq. The author, after alluding to the well-known existence of dimorphism among Cinchonas, a fact indicated by the special names of *macho* and *hembra*, given by the Spaniards to the trees according as the male or female organs project from the blossoms, proceeded to state that in the Government plantations, where the valuable febrifuge-yielding species were planted in close proximity, and where they flowered and produced seed in abundance, the seeds being made use of to extend the plantations, it was to be predicated that hybrids would appear; and such had actually been the case. Among young trees raised from Neilgherry seed he particularly referred to one of great beauty, quite distinct from any of the original kinds, having the general aspect, pyramidal habit, and luxuriance of C. succirubra, combined with the velvety appearance and purple tints which characterise the leaves of the Grey Barks. This had been picked up as a natural seedling under a tree of C. micrantha, growing in proximity to trees of C. succirubra, which blooms at the same period. Other instances were found. One variety combined resemblances to the very dissimilar species, C. officinalis and C. succirubra, having the large leaves and habit of the latter, with the texture characteristic of the former. Among the hundreds of thousands of trees of C. officinalis growing on the Neilgherries, very various and numerous differences were said to occur, so that if each of the characteristic forms were to be distinguished by name, they would constitute more than a score of new varieties, possessing as distinct an identity as that attributed to the vars. Bonplandiana, Uritusinga, &c., which are now recognised by botanists. These numerous varieties, however, merge into one another by insensible gradations, and as it would be impossible to keep seedling plants of each separated, they are all mixed in the plantations. Mr. Howard, in his introductory remarks, expressed his belief that the subspecies or varieties of Cinchona are permanent, and his concurrence in the opinion that hybrids can be artificially obtained; but he was doubtful as to the occurrence of hybridism in their native places of growth, since there could not be in general the same favourable conditions for the interference of the pollen of different species, which occured in the cultivated state. In the discussion which followed, Dr. Anderson gave some interesting particulars of the cultivation of Cinchona at the Darjeeling plantations.—II. *Letter from Sir H. Barkly, K.C.B., to Dr. Hooker on the Natural History of Round Island, one of the dependencies of the Mauritius.* This interesting letter gave an account of fauna and flora of Round Island, a very little known dependency of the Mauritius, and which, although it is only about 25 miles from Port St. Louis, and the intervening sea is not more than 400 feet deep, differs most remarkably from the Mauritius, as regards both its plants and animals, not only as to species, but also as to genera. The party, of whose explorations this communication afforded an account, was only in the island one day; but during that time four species of snakes and several lizards were captured, no species of either family being found in the Mauritius. The insects and shells obtained were also peculiar, one of the latter being a Cyclostoma. Of flowering plants only twenty-four species were collected, but of these more than half, including three species of Palms, a Pandanus or Screw Pine, and two species of Ebony, are not found in the Mauritius. One of the Palms grows between 30 and 40 feet high, another is described as being similar to, though differing from, the Mauritian Areca alba, while the third has a most remarkable bottle-shaped or cycad-like stem. Round Island is only about 3 miles in circumference, and 1¼ mile across; and Sir. H. Barkly has been led to adopt the opinion, that the area is one of elevation and not of subsidence. It consists of a mound of tufa about 1000 feet in height, with the vegetation most prolific towards the crown; very little comparatively appearing in the lower parts towards the coast.

Notices of Books.

Chenes de l'Amerique Tropicale, &c. Ouvrage posthume de M. F. M. Liebmann: achevé et augmenté, &c., par A. S. Oersted. Leipsic, 1869. (Williams & Norgate.) Large 4to, plates.

In the introductory portion of this handsome contribution to science we learn certain particulars relating to the botanical traveller Liebmann, and which may be of interest to some of our readers. Liebmann was born at Elsinore in 1813, and died in 1856, leaving his work on the Oaks of tropical America to be completed by Professor Oersted of Copenhagen. In 1841 he went to Mexico, and there met his fellow botanist, Karwinsky. The two sent home to Europe, especially to the Copenhagen Garden, numerous living plants. Among other places Liebmann visited Misantla, the centre of the commerce in Vanilla, which even at headquarters commands a price of 12—18 skilligs for each capsule. On his return to Europe Liebmann occupied himself in the Botanic Garden of Copenhagen, of which establishment he was appointed director on the death of Schouw.

As to the classification of the Oaks and allied groups, MM. Liebmann and Oersted lay considerable stress on a point overlooked by most other botanists: the nature of the style, whether stigmatic at the apex only or along the inner surface, whether short and roundish, or elongated, &c. The nature of the cupule furnishes other points of distinction, and the variations in the mode of ramification may also be made available, thus: Quercus sessiliflora differs from Q. pedunculata in its more erect, less flexuose branches, and by a more gradual passage of the larger into the smaller branches. Q. Suber and Q. occidentalis present analogous differences. We cannot, however, pursue this subject, but may recommend this volume to all whom it may concern as a very valuable contribution to science.

A Geographical Handbook of all the known Ferns; *with Tables to show their Distribution.* By K. M. Lyell. London: Murray. 1870. Small 8vo. Pp. 225.

This little book will be useful to Fern students, inasmuch as it gives them the main facts of the geographical distribution of this order of plants, unmixed with other matter. It is avowedly a compilation, and though other materials have been used, and other works consulted, it is mainly founded on Hooker's "Synopsis Filicum" and Baker's paper on Fern Distribution published in the Linnean Transactions. The book has this peculiarity, that while there is throughout a sprinkling of references to plates representing Ferns, the only references of this kind, so far as we can discover, are to the works of Hooker, and Hooker and Greville. It would have been better had some other of the many figures of Ferns which exist been quoted, even if only to the extent of giving, as far as practicable, one reference of this kind under each species; and this is all the more to be regretted as some of the works which might have furnished them are included in the list of books consulted. For the rest, the work has been carefully worked up, and is clearly arranged and printed, the habitats being brought under six divisions—Europe (with a subdivision for North Africa), Asia with four subdivisions, Australia and Polynesia with three, Africa with two, North America with three, and South America with four subdivisions. A tabular list of admitted species, with columns for their several divisions and subdivisions, given at the end, and occupying some 39 pages, on the general plan of Mr. Baker's Table, serves the place of a systematic index.

A new edition of **Mrs. Loudon's First Book of Botany**, revised by David Wooster (Bell & Daldy), has been issued. It differs from most books of a similar character by containing a fuller account of the several natural orders, while vegetable physiology is almost entirely ignored. It is a useful little book, but should have been more thoroughly revised in respect to eliminating obsolete or incorrect matter, and the insertion here and there of new material. For instance, the account of Cotton at p. 85 is far from correct, and the description of the fertilisation of Orchids, at p. 224, is singularly inaccurate. Such defects are the more to be regretted, as the general plan and execution of the book are good.

Our Ocean Highways, &c., edited by J. Maurice Dempsey (Stanford), will be useful as a condensed summary of information on matters of moment to the traveller; such as the best means of transit to and fro, the fares, cost of telegrams, &c. The list of hotels is unnecessarily meagre, but the book may be commended as containing a great deal of information in a very few words.

Florists' Flowers.

THE HOLLYHOCK.—This is a subject that fifty years ago used to produce flowers as single as some of the common Petunias; but since that date great improvements have been made in it. Amateurs usually consider it a favourite, and gardeners are as a rule rather partial to it. It is used admirably for showing out large beds in the distance, as a back row to riband borders, or perhaps for exhibition purposes. It is a strong and vigorous growing plant. Under good management it often attains to a height of 12 feet and upwards in a season. Therefore a good stimulus becomes necessary to support such active vegetation. It requires a strong, stiff, and rich soil to produce it to perfection. The ground allotted for it should be liberally manured and trenched as early in autumn as possible, so that it may have the full benefit of the winter's frost. And when this is being done it may be beneficially performed on the ridge plan, so as to expose a greater surface of the earth to the influence of the atmosphere.

It should be planted out some time in March or April, but if they are late-struck plants they may be planted in May. This should be done when the ground is in a dry condition, as the soil most suitable to the high cultivation of the Hollyhock should not be worked in a wet and cloggy state. In putting them out, they do well placed 3 or 4 feet apart. In planting them, I should advise their being put deep enough, so that they may be sheltered from the strong winds that usually prevail at the time. Each of the plants may be left in a little basin or hollow, and on severe nights they should have flower-pots, or some other appliance, placed over them for protection. The coverings should be removed again in the morning. After planting, if the weather continues very dry, they may have a watering occasionally, but they seldom require much till late in summer. When 2 feet high they should be staked. The thinnings of young Larch or Spruce, in 7 feet lengths, answer for the purpose. Through all the early stages of growth, care should be taken to destroy injurious insects found on them, and also to be regular in watering them if necessary, so that the flower-buds may form themselves more regularly upon the growing spike. Irregular supplies of water are apt to cause the stems to shoot irregularly; and the misfortune of having unequally set spikes, especially if wanted for exhibition purposes, should always be guarded against. Towards July probably most of the plants will show a disposition to develop lateral branches. These should be preserved for propagating purposes. But so soon as they show symptoms of producing flower-buds at their points, which they will do ere many leaves are developed, they should be topped, so that the growth may be economised in the remaining parts. When flower-buds begin to form in the axils of the leaves they take the place of axillary leaf-buds, and consequently the stem afterwards is not profitable for cuttings. Ere long the side branches will again show an effort to produce secondary ones, and when they do these may be taken off, and looked to for the principal batch of summer cuttings. Many other kinds of plants afford greater facilities for increase compared with the Hollyhock. Suppose then a cold frame is prepared for the undertaking. The cuttings may either be put singly into large thumb-pots in it, or dibbled, rows of a kind, into a bed of soil prepared on purpose therein. Either way I have known to answer admirably,—convenience, as much as anything else, regulating whichever plan was adopted. The compost used may be of the ordinary kind made up for propagating such things as Verbenas and Pelargoniums, being equal parts of loam, leaf-mould, and river sand mixed together, and a layer of the latter only on the surface. The cuttings at this season will be mostly from what are called "eyes," each one being possessed of a young growing bud, with a piece of stem which should be cut across half an inch below the base of the petiole and about an inch above it, leaving also a part of the latter attached. In putting in the cuttings in the soil they

should be inserted so that the eye would be slightly covered with sand. This done they may have a good watering with pot and rose, when little more attendance will be necessary till they are rooted, excepting some shading in sunny weather. Then they may have ordinary young plant treatment.

Till about the beginning of August little requires to be done to them, with the exception, perhaps, of watering. Sometimes they may need tying up and keeping clear from injurious insects; but as soon as the flower-buds are well set and swelling out, then is the right time to fairly commence feeding them. If the weather be parching, water diluted with a little guano may be given them twice a-week, or otherwise, as often as may be deemed necessary from the nature of the place they are growing in. A very good plan at this period is to cover over the soil about them, as it will now be well heated by the summer's warmth, with a layer of old hotbed-dung mixed with earth, about 2 inches thick; or mulch them, as it will keep the roots from being too much affected by the hot sun or other drying influences. This stage of the Hollyhock's advancement will be found a very interesting one to its lover and grower.

When the flowers are beginning to open to show their various colours of well-built beauty, amusement is constantly found noting the peculiarities of different varieties, removing decayed flowers preparatory for seed, and stopping the main spikes when they have attained a desired height. The months of August and September are those in which it reaches its height of perfection. From about the end of the latter it gradually shows signs of less vigour till the season is over. As soon as they have done blooming, and at the approach of frost, they should be cut down and the "roots" lifted and put into pots for the winter. Any place almost in an ordinary greenhouse or cold frame will suit for preserving them. The kind of usage I have observed to be most suitable for both young and old is very similar to what is applicable to the well-being of common Calceolarias; they should be kept cool, moderately moist, and have plenty of air on all favourable occasions. During the winter months comparatively little growth will be made, but at the approach of spring a disposition for growing will soon become manifest, and activity on the part of the cultivator should also be shown for getting more young plants established. February is a very good time for undertaking the work, where a gentle heat can be obtained. At this time of year propagation will be mostly from young stems taken from the base of the old lifted plants. As well as being easily increased at this time in the usual way, they may also be simply and profitably multiplied by grafting, as follows:—Provide some healthy young seedling plants, the stems of which are about the same thickness as the cuttings intended for propagation. Cut over their tops just under where their seed leaves have been developed, then make a cut with a sharp knife down the remaining part of the stocks; prepare the cutting so that it has a wedge-shaped base, and insert the scion into the stock so that both fit nicely, when they may be firmly fixed by tying round the joined parts with matting.

With the assistance of some bottom-heat, I have in this way seen splendid plants established in about a fortnight, and quite as good results produced at the time of flowering. For a period extending over a few weeks from this, anxiety will be felt for getting a good collection of plants well organised for another year. And provided other preparation has been already made, ere much longer another set will be launched into the soil for a future season's interest and enjoyment. *R. M.*

Garden Memoranda.

Eaton Road Nursery, Chester.—The principal entrance to these grounds is situated on the road leading to Eaton Hall, the country residence of the Marquis of Westminster, and about one mile from the Chester Railway Station; but as large additions have recently been made to the nursery grounds, the proprietors (Messrs. Chivas & Weaver) have made another entrance near to the suspension bridge leading into the Queen's Park. Here the grounds are divided from the road by a neat iron fence, along the side of which a belt of evergreen shrubs has been planted. At the former entrance will be found a long broad walk, leading through the old grounds into the new nursery; it is lined with excellent specimens of Conifers, &c. To the left, immediately on entering, is a plantation of fine specimens of Araucaria imbricata, from 5 to 8 feet in height, which entirely escaped the frost of last season. Since the severe frost in 1860, when so many of these beautiful trees were killed, planters seem to have been very guarded in their purchases, hence the stock has somewhat increased in size and quantity. The borders on either side of the walk above alluded to are planted in the main with choice specimens of American plants, at the back of which are long rows of Irish Yews, of various heights. Beyond these are large quarters of Rhododendrons, Aucubas, Irish and other Yews, Portugal Laurels, &c., which in this soil grow freely, and make fine specimens.

Passing from these into the "new nursery," we first notice a large quantity of handsomely grown half-standard Portugal Laurels, with fine, bushy, and symmetrically trained heads, for planting out as single specimens on lawns, or for growing in tubs, &c., for the ornamentation of terraces or other positions where they produce immediate effect. Amongst hardy evergreen plants the Holly stands pre-eminent, and its cultivation here in immense quantities, of all sizes, from the dwarf plants for making hedges to fine single specimens for lawns and shrubberies, is one of the special features of the place. Proceeding from the Hollies we come to a large break occupied with a splendid stock of Rhododendron ponticum, which is largely grown in this neighbourhood for game cover. Next comes Cupressus Lawsoniana, a large batch of nice bushy stuff raised from seed; and a similar quantity of the common Laurel, which thrives amazingly in the rich sandy loam. The next quarter is occupied with about 10,000 Purple and Copper Beech, ranging in height from 2 to 9 feet, and following it a large area covered with Oaks, which are grown to a very large extent.

Forest trees are a great feature in the nursery, on account of the large quantities grown, and these, from being regularly transplanted in very much exposed ground, give them a fine hardy and vigorous constitution. The principal kinds are the common and Mountain Ash, Birch, Beech, the English and Wych Elm, the former grafted and the latter on their own roots; Austrian Pine, beautiful plants ranging in height from 9 inches to 3 feet; the Weymouth Pine; an unusually large quantity of Spruce, mostly twice transplanted and allowed ample room to extend their roots and branches; Turkey Oaks, from 1 to 10 feet in height; and of Poplars, the Black Italian, Ontario, Egyptian, White, and Lombardy varieties, in great quantity, and in excellent condition. Transplanted Larch and Thorns are produced by the million, from one to four years old, of great strength and clean growth, many of the latter being fit for making good permanent hedges at once if well planted.

Of ornamental deciduous trees there are here many kinds, and many of them in large quantities, such as the Purple and Copper Beech—truly handsome trees for landscape planting; and of the Plane, such kinds as P. occidentalis, P. palmata, P. laciniata, and P. acerifolia, &c. Then, again, of the Lime tree, we noticed several kinds, including the true T. mississippiensis, a large-leaved form, and the weeping variety, T. rubra pendula, the latter grown on clean stems from 7 to 8 feet high. In addition to these, there are several quarters devoted to such plants as Syringas, Willows, Robinias, Laburnums, Liriodendrons, Magnolias, &c. Amonst ornamental evergreens, the collections of Coniferæ are very fine, comprising excellent specimens of the Hemlock Spruce (Abies canadensis), from 3 to 6 feet in height; the Mount Atlas Cedar (Cedrus atlantica); and of Cedrus Deodara, a large quantity, transplanted with much success last spring. Of Cupressus, there are robust examples of the well-known useful C. fragrans, C. Lawsoniana, C. macrocarpa, &c.

Climbing plants are represented by the Virginian creeper, Ampelopsis hederacea, a choice assortment of Clematis, Loniceras, Jasminums, and Ivies. Roses, of all the leading kinds of Hybrid Perpetuals, Tea-scented, Noisettes, China, and Bourbons are grown in vast quantities, and appear to be very healthy. Of fruit trees there is a very large stock, comprising standard, dwarf, and pyramidal trained Apples and Pears, in great variety; and the plants, so far as health and fruitfulness are concerned, are all that can be desired. Plums, Apricots, Peaches and Nectarines are also well done. The grounds are very extensive, in an open, exposed position, and to those interested in such trees as we have alluded to, a visit must prove very agreeable. In addition to the nursery, Messrs. Chivas & Weaver conduct an extensive seed business in Eastgate Street, where they have also a fine showroom of agricultural and garden implements.

Miscellaneous.

To Mr. ——, vendor of an Insect Poison.

Good stuff, that will all insects kill,
Cheaper, I buy, than in your bill.
But you announce it in red ink,
As if you meant the world to think
Your insect poison so much better
Than if proclaimed in plain black letter.
Yet call I not your bill a puff,
Though of such things I've seen enough;
With other plans I do not quarrel,
But I prefer to use fresh Laurel,
Which in hot water, in a pail,
Will kill the insects without fail;
But still the process must be watched,
For more fresh eggs are quickly hatched.
This is important, and well proved
By new broods following old removed.
Let others, then, parade their skill;
Life in the eggs 'tis hard to kill.
The deadly fumes must be repeated,
For Nature is not quickly cheated.
'Tis said the eggs bred on a Scot
Will live unhurt in boiling pot;
Though as I am a Scot myself,
This is full strange for me to tell.
But, as for rhymes we words must pick,
We should to rules of grammar stick,
Because we have on such to think
As with the others rightly chink;
Though, as we aim at greater force,
We put the cart before the horse.
But this is written in mere fun,
And heedless how the sense may run,
Just giving out a hasty hint,
Scarce meant to be preserved in print.
So it, you're welcome to look light on,
And I am yours, dear sir, *Jno. Wighton.*

Grape Culture in Canada.—Few people are aware of the extent to which this new branch of agricultural industry is now being carried in Canada. The wonderful success of the Vine on Kelly's Island, and other islands on Lake Erie, has set thousands of farmers on the shores of that lake, on both the Canadian and American sides, to the cultivation of the Vine, and the consequences cannot but be beneficial. All round the shores of Essex and Kent farmers are waking up and cultivating the Vine largely. In the township of Gosfield alone, a few neighbours met a short time since, and clubbed together to give such an order for Vines as would from its extent reduce the cost to the lowest wholesale rate. The consequence was a subscription of 800 dollars, which accompanied the order to one of our leading nurserymen for Vines alone. Thus between 5000 and 6000 Vines were set out in that immediate neighbourhood alone in one season; and as Vines are the most easily propagated fruit trees we have, by cuttings and layers, it may easily be supposed that when once a plantation is established our thrifty farmers will become their own nurserymen. Grapes throughout the Niagara peninsula are becoming as common as Apples, and this may well be imagined when one man this last season had 14 tons of Grapes so injured by frost that he (not knowing that they were really not injured for wine) sold them at two or three cents per pound, for the manufacture of either wine or vinegar. Throughout the present vineyards of Kent and Essex the "Catawba" comes to perfection, as do, also, most of the sorts grown at and about Cincinnati, which was the cradle of Vine culture in America. The sweet kinds, such as the Delaware, and others of that class, yield good wine without additional saccharine matter; but to Grapes more redundant in acid large quantities of sugar are added, so as to give body and strength to the wine. *Toronto Globe.*

Preservation of Telegraph Posts.—A Belgian report on the preservation of telegraph posts, a most important question in telegraphy, decides that chloride of zinc is the best and cheapest agent to employ, though it does not work equally well in all soils. In regard to the preservation of wood generally, some interesting results were published in the *Builder* of January 1. Various descriptions of Pine, Oak, Elm, and Beech, prepared by different processes, were sunk in the Great Western Docks on June 19, 1867, and examined on December 9, 1869. Creosoting, kyanising, and sulphate of copper methods were employed. The timber to be creosoted was dried under a shed, with full circulation of air for six weeks, then creosoted under pressure, from 45 to 50 gallons of oil to the load being absorbed. Timber to be kyanised was dried as above, then steeped in a solution of corrosive sublimate during twenty-four hours for each inch in thickness, 3 lb. of sublimate per load (50 cubic feet) being used. Timber for the sulphate of copper process was dried as above, then steeped for 14 days in a solution of sulphate of copper, 1 lb. to 8 gallons of water being used. Timber unpreserved was also dried as above. Some of the results were as follows:—Creosoted woods of every kind were perfectly fresh and sound. Of all the woods, English Oak alone was entirely protected by sulphate of copper, this agent being comparatively inefficacious with most other woods, possibly owing to its ready solubility in water. *Electric Telegraph Review.*

Garden Operations.

(for the ensuing week.)

PLANT HOUSES.

Those who have aquaria should now attend to them, in the matter of cleaning, &c., preparatory to another summer campaign. In those instances where the tanks have been kept in a state of activity during the winter months, it will be necessary to give the inside of the house and also the tank a good cleaning. When this has been done the dirty water should be drawn off, and a nice coating of new loam (of a dark boggy tenacious nature) should be placed upon the old mounds, around the crowns, and over the roots of those aquatics which are planted out, whether they consist of *Victoria regia*, *Nymphæas*, or other more humble subjects. Plants of either kind which are grown in pots and stood at the bottom of the tank, may also be fresh potted. The same kind of soil is suitable for them. I prefer, after placing one good crock at the bottom, to put on a layer of moderate-sized pieces of charcoal instead of more crocks. A good crocking is essentially necessary, to allow the water to circulate more freely, by which means the roots and soil are kept in a fresher condition. When the potting is done, do not, as is too frequently the case, place the pots carelessly on the smooth floor of the tank itself, but so elevate each upon three pieces of tile that whilst the pot stands perfectly firm the water in the tank may have the freest possible communication with the hole at its base. Those who

depend upon seedlings of *Victoria regia* should procure the seeds at an early date, and have the fresh mounds of soil placed in the tank, and all other preparations completed for their reception by the time intended for sowing. Seedling plants may be obtained at almost any of the large nursery establishments. Those who have kept their *Nymphæas* in pots standing in pans or saucers filled with water during the past winter, should now souse them all over with tepid water at every possible opportunity; they will then make a preliminary start into growth ready for transplanting into the tank as soon as it is ready. In no instances are the observations on plant growing given under this heading last week of greater importance than in regard to *Camellias* and similar subjects. We too often look carelessly upon the primary efforts of a plant until the young shoots have attained to some size, then we commence assisting the roots with stimulants, damping the foliage, &c. These attentions should always accompany, or if possible be given so as to anticipate, the wants of an active growing period, and not follow it. As soon as actual activity is perceptible, and the young shoots begin to push, let attention, in the supply of light, air, surface sprinklings, moderate manure waterings, &c., be at once afforded, that a sturdy and well developed growth may be assured. Those who have not yet made any progress in the matter of *potting stove plants*, through not having a convenient shed close at hand, the weather having been so unfavourable for taking plants to a distance, should make up a temporary potting bench within the stove and proceed with the potting at once. So bad has the weather been that many operations have been delayed. Gardeners must therefore make an early effort to fetch up arrears, for no amount of perseverance or application will bring matters right if a few weeks more are allowed to pass without getting the work well forward.

FORCING HOUSES.

Vineries which are intended for successional or autumn produce may now be started. Proceed slowly at first when starting Vines into growth. Do not neglect the roots of all Vines planted out into indoor borders, and this especially when the berries are thinned and are swelling. Give liquid manure at every other watering, and in either case let the water have the chill taken off. At the earlier stages of a crop in full growth it is a good plan to place a coating of hot dung heated by fermentation all over the border; and having the water all ready to hand, it can be poured over the manure immediately. Carefully guard against chilly air at such a period, indeed air should at all times be given with care and discrimination. Every care will be requisite in this wise when Muscats are in bloom. Fruiting *Pines* in a forward stage will now require rather copious waterings as compared with their requirements a few weeks since. Give wholesome liquid manure waterings oftener and more freely. Keep up a good high bottom-heat in beds containing freshly potted successionals. Do not water them for some days after the potting is performed. Shade them a little if the sun is powerful, and with a free supply of atmospheric humidity induce a vigorous start into fresh growth. Pinch back all unnecessarily strong shoots on *Peach* or *Nectarine trees*, and so equalise all parts of the tree as much as possible. Be careful not to keep *Strawberry plants* in full bloom in too damp or moist an atmosphere, or even at this advanced stage many of them will not set fruit. This is of more importance in connection with those that are placed close up to the glass than to others which are more in the body of the house. Thin the fruits upon these latter if there is too large a crop for the plant to carry well. *Cucumbers* and *Melons* in frames must be kept up to a mean temperature of 75° to 77° by day and about 70° by night; give air where practicable in the forenoon, and shut up as early as possible in the afternoon.

HARDY FRUIT GARDEN.

Those who have not yet finished the nailing, &c., of wall fruits may consider themselves behind, and should make an effort to bring all arrears to a speedy termination. Protection must be given to all, immediately the flowers begin to expand. Where proper materials are not attainable, anything which is at all available must be made use of, such as branches of evergreens. These, if moderate in size, may, be fixed so as to ward off the sharpest frosts by night, and also the warm rays of the sun when it shines brightly after a frost on the following morning. Much good may be done by placing wooden planks securely along the top of the walls in the form of a coping. The spring frosts attack the delicate blooms from above, falling perpendicularly; hence these coping boards, as they project out from the wall, keep the frosts off to a certain extent, besides keeping the blooms drier, which is very important.

HARDY FLOWER GARDEN.

Some few spring blooming plants may still be transplanted, with the object of obtaining a quick show in any desirable positions, especially such things as *Myosotis*, *Nemophila*, *Saponaria*, *Limnanthes*, &c., in instances where they are not pushing prominently into bloom. Not a day, however, should be lost before they are moved to where necessary. Make up all edgings, or otherwise, of *Arabis*, *Aubrietias*, *Bellis*, &c., and do not longer delay the necessary digging or forking over of herbaceous borders, or other mixed beds of a like nature.

KITCHEN GARDEN.

Harsh as the weather is, a batch of autumn-sown *Cauliflowers* should now be transplanted permanently, to succeed those which are being brought on under hand-lights or bell-glasses. Sow more *Peas* and *Broad Beans* as soon as the last sown ones show through the ground. Earth-up *Cabbages*, and any *Peas* or *Beans* which are high enough to require it. Sow a few *Dwarf French Beans* in pots, to be transplanted out on to a sunny border, when all danger of frost is passed. Sow for a successional crop of *Radishes*. Pot off *Chilis*, *Capsicums*, *Tomatos*, &c., and get them well hardened by exposure to all the cold they will stand when established. Sow *Vegetable Marrow* seed, *Sweet Basil*, *Summer Savory*, and the like herbs, which will be for planting out in a few weeks hence. Hoe well amongst all autumn-sown *Lettuces*, and transplant such as need it. If some of the youngest are now dibbled on to a good rich border in a cool situation, they will come in well to succeed the main crop. *W. E.*

ORCHARD HOUSE MANAGEMENT.

[Just at this season, while the occupants of these all-popular and most useful structures are fast opening forth their blossoms and exciting our highest hopes of the coming fruit, a few simple directions regarding their management, as suggested by one of our correspondents, may be welcome to many of our readers. And these we hope to continue from time to time as may seem to be required: and our plan will be this,—simply to direct notice to those operations which require immediate attention.]

Pruning should now be pushed to a close with all possible despatch, especially where the roots or plants are somewhat weak, as by pruning early the buds break stronger than when pruning is done late. Where the trees are young and growing somewhat grossly, as may be the case with those planted out, it is sometimes good policy to defer the pruning purposely to check its luxuriance; but in no other case. In the case of Apricots, the flower-buds of which are mostly produced near to the points of the shoots, very little pruning should now be attempted. It will be better to let them flower first, and if the fruit does not set they can then be shortened to any extent. *Watering.*—It is extremely important just now that all the soil surrounding the roots, whether in pots or planted out, should be thoroughly moistened and kept in a proper condition as regards moisture, as nothing can be more injurious or more likely to cause the blossoms to fall without setting than dryness at the roots at this season. *Temperature and Ventilation.*—Maintain as dry an atmosphere as possible, and as low a temperature as can be obtained, by admitting as much air as possible on all favourable occasions, night and day, so as to retard the opening of the blossoms to as late a period as possible, when less danger will be run of having them injured, as was the case last season. The longer the blooming is delayed the better chance have we of fine weather for the full development of the fruit. This applies especially to unheated orchard-houses. Where the trees have come into blossom admit air freely, but guard against cold, cutting easterly winds, which sometimes do infinite harm; better, however, a few degrees of frost than a stagnant damp atmosphere. If the weather is fine and sunny they will set freely, but if cloudy and dull go over the blossoms carefully with a camel's-hair brush, and impregnate them. Apricots require very full exposure to the air while in flower. If the trees in pots are not situated close to the ventilators, it is a good practice, and will well repay the little labour incurred to carry the plants out to reap the full benefit from the open air during fine days, and to replace them again in the house at night. This practice is beautifully provided for by the Rev. J. Fountaine, in his orchard-house railway, whereby the whole of the trees can be moved out to the open air, and shunted back again at night with great facility. *Insects.*—Look after these as soon as they may appear; for green-fly fumigate, dust with tobacco powder, or syringe with a decoction of quassia chips; for red spider the best remedy consists in the vigorous application of the syringe—the water, while it eradicates the insects, contributes towards the health of the trees. As soon as the fruits are fairly set give the trees a good washing with clear water from the syringe. *B.*

TOWN GARDENING.

I OMITTED to mention last week the *Maize* or *Indian Corn*, which makes a very ornamental town plant, and should be sown in a little heat, two corns in a 60-size pot. They must be protected till May, when they can be turned out of the pots without receiving any check. The *Portulaca Gillissii* is a very beautiful annual in the sun, purple and scarlet, 3 inches in height; it should be sown in pots and turned out in May. The *Beds and Border* should now be loosened with the Dutch hoe, and be raked neatly. Hardy annuals should be sown in rings, thinly, as the plants do not get so crowded. Many may be sown round the bulbs, which will make the most of the borders. Draw a shallow ring with the finger, 4 inches in diameter for small seeds and 6 for large ones, covering it, and patting it down with the back of the hand. Any of the following varieties will be found to do well in towns:—*Ageratum mexicanum*, blue, 2 feet high; *Sweet Alyssum*, white, 3 inches; *Candytuft*, white and red, 1 foot; *Collinsia bicolor*, 6 inches; *Convolvulus minor*, very showy, 18ins.; *Erysimum Perofskianum*, a showy orange flower; *Cape Marigold*, white with dark centre, 9 inches; *Clarkia pulchella* and *alba*, 18 inches; *Hawkweed*, pink, yellow, and white, 18 inches; *Larkspur*, the branching rose and blue kinds do well under trees, 2 feet; *Linum album* and *grandiflorum*, 1 foot; *Love-lies-bleeding*, a showy old annual, 18 inches; *Lupinus nanus*, blue, 6 inches, and the old sweet yellow and blue, 15 inches; *Nemophila insignis* and *maculata*, 6 inches; *Poppies*, the double French make a fine show in beds or large patches, 2 feet; *Nasturtium*, the Tom Thumb variety, 6 inches; *Calceolarias* and *Pyrethrums*, that were struck in frames and boxes in the autumn, should now be potted in 60-size pots, which will facilitate their moving. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, MARCH 23, 1870.

1870. Month and Day.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
March.	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
17 Thurs.	29.59	52.0	51.2	50.4	94	4.1
18 Friday	29.93	49.8	45.0	43.0	87	3.1
19 Satur.	30.25	39.5	35.0	32.7	87	2.1
20. Sunday	30.29	39.6	35.4	33.6	90	2.3
21 Monday	30.11	49.0	46.0	45.3	96	3.5
22 Tues.	29.73	45.4	44.8	44.1	96	3.3
23 Wednes	29.88	32.9	30.3	25.1	72	1.7

1870. Month and Day.	Temperature of the Air.					Wind.		Rain.
March.	Highest	Lowest	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	Direction.	Horizontal Movement.	In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
17 Thurs.	57.0	47.1	10.8	51.7	+9.7	N.W. to N.W.	340	0.10
18. Friday	50.6	39.0	11.6	41.0	+1.9	N.E.	200	0.00
19. Satur.	45.0	30.8	14.2	39.2	−1.6	N.E.	100	0.00
20. Sunday	48.6	32.1	16.5	40.1	−0.8	W.S.W.	115	0.00
21. Monday	52.7	42.9	9.8	49.7	+4.4	W.by S.	200	0.12
22. Tues.	53.6	31.5	22.1	41.5	−0.7	W.by S. to N.	385	0.11
23. Wednes	40.9	28.3	12.6	33.5	−8.7	N.	305	0.00

March 17.—Generally overcast; occasional rain
" 18.—Overcast throughout the day
" 19.—Overcast till noon; variable amount of cloud prevalent during the afternoon; cloudless at night
" 20.—Generally cloudy; hazy; fog.
" 21.—Overcast till 1 P.M., and rain fell in the early morning; fine afterwards.
" 22.—Overcast till 7.30 P.M.; great gloom prevalent at 3 P.M.; rain, hail, and snow fell about 4 P.M.; cloudless after 8 P.M.
" 23.—Variable amounts of cloud were prevalent; generally fine.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, MARCH 19, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	61.4	20.1	35.3	51.6	34.6	17.0	42.1	0.39
Blackheath ..	58.8	21.1	35.7	49.4	33.9	15.5	41.0	0.44
Westmount ..	55.9	22.4	31.5	49.1	33.9	15.2	41.5	0.53
Birmingham ..	55.6	25.0	30.6	48.8	36.0	12.8	41.4	0.75
Wolverhampton	54.2	22.8	31.4	48.2	35.4	12.8	40.8	0.22
Leicester ..	55.7	23.2	32.5	50.4	34.5	15.9	41.5	0.18
Norwich ..	54.0	25.0	29.0	46.8	33.5	13.3	39.1	0.44
Nottingham ..	55.9	21.6	34.3	49.1	34.4	14.7	40.8	0.24
Sheffield ..	54.8	25.9	28.9	49.5	36.7	12.8	42.1	0.25
Liverpool ..	55.4	28.3	27.1	49.4	38.1	11.3	42.8	0.25
Manchester ..	53.5	22.0	31.5	50.5	35.3	15.2	41.9	0.02
Eccles (Salford)	53.5	22.8	30.7	50.2	35.8	14.7	41.8	0.66
Bradford ..	55.3	28.0	27.3	49.2	38.7	10.5	43.0	0.20
Leeds	50.0	28.0	28.0	48.4	37.0	11.4	41.7	0.22
Hull	55.0	21.0	34.0	48.0	31.7	16.3	38.6	0.51
Newcastle ..	54.0	25.0	29.0	49.0	36.7	12.3	41.8	0.18
Edinburgh ..	59.7	22.0	28.7	..	..	..	40.2	0.29
Glasgow ..	50.4	24.0	26.4	..	..	..	41.6	0.50
Dundee ..	53.0	25.0	28.0	..	..	..	39.5	0.15
Aberdeen ..	50.0	27.4	28.6	..	..	..	39.6	0.17
Paisley	52.0	24.0	28.0	..	..	..	40.6	0.42
Greenock ..	51.5	27.0	24.5	..	..	..	41.0	1.00
Leith	51.5	27.2	24.3	..	..	..	41.4	0.40
Perth	55.0	25.0	30.0	..	..	..	41.4	0.19
Dublin	60.8	24.0	36.8	..	..	..	45.3	0.17

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *C. C.* Bentham's "Illustrated Handbook of British Plants" has small figures (woodcuts) of all the species. The new edition (Syme's) of "British Botany" contains coloured figures of all the species, and is approaching completion.—*C. B.* You do not specify what books for the nursery trade you want. You can't learn your business from books alone. Perhaps Thomson's "Gardeners' Assistant," and Grigor's "Arboriculture" will suit you. You will also want such books as day-book, cash-book, and ledger, and a note-book to record your experience.

FLOWER-BEDS: *D. T.* Refer to the figure in p. 379, third column, and enlarge to the size required for your beds.

INSECTS—BEES: *J. P. M.* Except that some of the bees sent were partially mouldy—probably from having lain dead on the floor-board of the hive for some time—there seems no sign of disease amongst them. It was very injudicious to close the mouth of the hive with cotton wool. You should have used perforated zinc. If the comb containing honey is free from mould, it may be used as a nadir when wanted. It is probable the queen has been dead some time. *H.*

MYRMICA MOLESTA: *Fruiterer.* Unfortunately no remedy has yet been hit upon. In the meantime it would be interesting to know the exact limits and extent of its invasion. If our readers generally who know of its presence would communicate the localities where they have observed it, we might ascertain this, and possibly learn something of the conditions that suit it and those that do not, which information might be put to practical use. *A. M.*

NAMES OF PLANTS: *C. & D.* Not recognisable from leaf alone.—*Dytchley.* We cannot undertake to name such fragments.—*A. N. N. C.* Not to be recognised from such indifferent specimens.

PERSIAN GRAPES: *N. B.* A great many varieties of Grapes have been received from Persia, all with glowing characters, and fruited in this country by the Horticultural Society and others; but none of them have been approved of. They are generally too fleshy and thick-skinned, with but little flavour excepting when highly ripened, almost dried up, as they are under the fierce heat of a tropical sun. In our dull climate they do not suit. We should not expect yours to be any better than those already proved.

ROSE APPLE: *W. E.* Eugenia Jambos, of Linnæus. De Candolle made a separate genus for it, under the name of Jambosa vulgaris, but by general consent the Linnæan name is now adopted, De Candolle's genus being retained merely for that section of the genus, Eugenia, whose flowers are arranged in cymes, *i. e.*, those in which the central flowers of each tuft open before those at the circumference.

TREATMENT OF VINES: *Robert Allen.* For your Vines just started, to be ripe in July, you will require to maintain a close moist temperature from now until the berries commence to colour, of between 60° to 70° by night, or greater if without the aid of fire-heat, and giving air early in the morning, and shutting up early in the afternoon. The temperature during the day, if by sun-heat, may rise to 90°, but if by fire-heat, a much lower temperature will be preferable,—just a slight advance on that of the previous night. It will not matter how high the temperature reaches by sun-heat, after being shut up in the afternoon, if sufficient moisture is maintained in the interior. When your Grapes begin to colour, gradually apply more air and less moisture, and maintain a rather dry, cool, bracing atmosphere in your house, by giving air night and day continually, abundantly so in mild weather, and in cold weather apply fire-heat to keep up the temperature if necessary. In short, Vines while growing require heat and moisture; and when the fruit is ripening, air principally. Rub off all the buds which are breaking at each joint, excepting one, and do this as soon as you see how your fruit is situated.

COMMUNICATIONS RECEIVED:—C. C.—R. C.—Z. A. B.—G. Berry.—A. N. N.—E. S. D.—J. R. P.—W. S.—W. P. J. M.—W. H.—J. B.—W. P. A.

Markets.

COVENT GARDEN.—March 25.

The market has been better attended, and an improved tone generally has been imparted, but with no advance worth quoting. Hothouse produce is sufficient for the ordinary trade, and outdoor stuff has met with a fair demand. Flowers are plentiful and good, comprising Azaleas, Fairy Roses, Hyacinths, Cyclamens, Tulips, French and Scarlet Pelargoniums, Heaths, &c.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve	3 0	to 5 0	Melons, each	1 6	3 0
Cobs, per lb.	0 9	1 0	Oranges, per 100	3 0	7 0
Filberts, per lb.	0 6	0 9	Pears, per doz.	4 0	10 0
Grapes, per lb.	8 0	20 0	Pine apples, per lb.	8 0	10 0
Lemons, per 100	4 0	8 0			

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Asparagus, p. bund.	3 6	to 5 0	Horse Radish, p. bun.	3 0	to 5 0
Artichokes, p. doz.	3 0	6 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 0	2 0
Broccoli, per doz.	1 0	2 6	Mint, per bunch	1 0	1 6
Brussels Sprouts, p. ½ sieve	2 0	3 0	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz.	1 0	1 6	Onions, per bunch	0 4	0 9
Carrots, p. bunch	0 4	0 8	Parsley, per bunch	0 2	0 4
Cauliflowers, p. doz.	1 6	3 0	Potatos, new, p. lb	0 4	0 6
Celery, p. bund.	1 0	1 6	Salsafy, per bundle	1 0	1 3
Cucumbers, each	1 6	3 0	Scorzonera, do.	1 0	1 3
Endive, per doz.	1 6	3 0	Seakale, p punnet	2 0	2 6
French Beans, p. 100	3 0	4 0	Shallots, per lb.	0 6	..
Garlic, per lb.	0 8	..	Spinach, p. bushel	2 0	3 0
Herbs, per bunch	0 2	0 4	Radishes, per doz.	1 0	1 6
			Turnips, per bunch	0 4	0 6

Potatos, York Regents, per ton, 75*l.* to 100*l.*; Flukes, do., 75*l.* to 120*l.*

POTATOS.—Southwark, March 21.

During the past week the arrivals coastwise have been moderate, but plentiful by rail. Towards the end of the week top samples of Regents realised a little more money. The following are this day's quotations:—Yorkshire Regents, per ton, 80*s.* to 105*s.*; Yorkshire Flukes, 90*s.* to 120*s.*; Lincolnshire Regents, 80*s.* to 90*s.*; Dunbar and East Lothian do., 80*s.* to 105*s.*; Perth, Forfar, and Fifeshire do., 70*s.* to 85*s.*; Ditto Rocks, 65*s.* to 70*s.*; French and Belgian Whites, 60*s.* to 70*s.*

WANTED, an OUTDOOR FOREMAN, in a Nursery. Must well understand Propagating all kinds of Fruits. Four or five men under care. State wages and reference.—M. S., Post Office, Brenchley, Kent.

WANTED, as FOREMAN, a thoroughly practical Man, who understands the Forcing of Grapes and Pines on a large scale for the London market. An energetic, experienced Man will find this a permanent situation. The strictest references as to ability, &c., will be required.—Mr. J. WILMOT, Isleworth, W.

WANTED, a young Man accustomed to the WORK of GREENHOUSES. One who has been employed for Market Growing preferred, and can Mow short Grass. Any with good character.—Apply, Clapham Road Nursery, Stockwell, S W

To Gardeners.

WANTED, a Man that understands GROWING CUCUMBERS.—Apply at Millshot Farm, Crab Tree Lane, Fulham, S.W.

WANTED, a young Man, as ASSISTANT BUDDER and GRAFTER, and to make himself generally useful.—JAMES BIRD, Nurseryman, Downham.

WANTED, an APPRENTICE to the Nursery and Seed Business. An opportunity offers for a respectable Youth. Small Premium required.—Address, with particulars, to N. S. B., *Gardeners' Chronicle* Office, W C

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would greatly oblige by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N

To Gardeners and Bailiffs (Head, Foremen, or Under).

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GARDENER.—Married, one child; understands Forcing of all kinds, Orchard-house and Flower and Kitchen Gardening. Good character.—N. W., Havering, Romford, Essex.

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FOR ALL SOILS, CARRIAGE FREE.

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This Mixture consists of the finest kinds of Permanent Grasses and Clovers, and will greatly increase the quantity and quality of succeeding May crops. The Pasture should be harrowed with heavy iron harrows previous to sowing, and bush-harrowed after sowing, and in some cases a top-dressing of manure will be found beneficial. Sow 6 to 12 lb. per acre, according to the condition of the Pasture. Price 9*d.* per lb., 8*os.* per cwt.; Carriage Free.

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THE HEAVIEST GLOBE VARIETY.

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From the peculiar shape of this Mangel it can be allowed to stand closer in the rows than other kinds; hence it produces a greater weight per acre. It is of beautiful shape, small neck and leaves, of superior quality. Having only one tap root, it can be pulled with a great saving of labour. This will be found one of the most profitable varieties that can be grown.

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SUTTON AND SONS had the honour of first introducing this superior new large Mangel IN THE YEAR 1866, the demand for which has rapidly increased as it has become more widely known.

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The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to

H. M. JENKINS, Secretary.

12, Hanover Square, London, W

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870

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BATH and WEST of ENGLAND SOCIETY (Established 1777), and SOUTHERN COUNTIES ASSOCIATION

ANNUAL MEETING at TAUNTON, June 6, 7, 8, 9, and 10, 1870.

President—The Right Hon. Sir S. H. Northcote, Bart., C.B., M.P.

STOCK and IMPLEMENT ENTRIES close April 20; POULTRY, May 16.

Prize Sheets, Regulation Papers, and Forms of Entry may now be had from the Secretary,

JOSIAH GOODWIN,
4, Terrace Walk, Bath

*** For the Arts Department application to be made to the Hon. Secretary, R. R. M. DAW, Exeter.

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NEW FARM SEEDS—all the growth of last autumn—can be obtained from the LONDON and CONTINENTAL SEED COMPANY.

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TO BE LET, a large SHOW HOUSE, with other GREENHOUSES, and COACH-HOUSE, and 3 STABLING, in a commanding situation.—16, Maida Vale, Edgware Road, W

SALES BY AUCTION.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on FRIDAY, April 1, at half-past 12 o'Clock precisely, a splendid Collection of choice established ORCHIDS, many of them of a new and exceedingly rare description, some in fine specimens, and all in excellent health and condition

At the same time Mr. STEVENS will also SELL a quantity of DENDROBIUM JAPONICUM, recently imported.

Among the Established Orchids will be—

Cattleya amethystoglossa		Masdevallia species	
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Cypripedium caudatum		,, Forbesi	[rum
,, longifolium		,, Weltoni	
,, micum		Phalænopsis Schilleriana	
Dendrobium Falconeri		,, Luddemanniana	
,, Hilli		Saccolabium guttatum	
,, McCarthiæ		,, violaceum	
,, Bensoniæ		,, præmorsum	
,, crystallinum		,, Blumei Dayi	
Dendrochilum filiforme		Vanda Denisoniana	
Lælia elegans		,, tricolor insignis	

On view the morning of Sale, and Catalogues had.

Ashford, Middlesex.

FREEHOLD LAND, about 11 Acres, near Ashford Station, Village, and Church, with frontages to the Road and Railway (from which a siding could, probably, be arranged for).

MESSRS. DEBENHAM, TEWSON, AND FARMER will SELL, at the Mart, on TUESDAY, April 26, at 2 o'Clock, in three Lots (unless previously Disposed of), 11 acres of FREEHOLD LAND, abutting upon the South-Western Railway, suitable for a Public Institution, School, Cemetery, General Building, Market Garden, or Accommodation Purposes. The Land contains valuable Gravel, which, if a railway siding were obtained, could no doubt be sent up the line in large quantities, and would be a source of considerable income.

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IMPORTANT SALE OF SHORTHORNS.

MR. STRAFFORD has received instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, May 3 next, at Biddenham, a fine and superior HERD of PURE SHORTHORN CATTLE, belonging to Charles Howard, Esq., which have been long and carefully bred from some of the most fashionable blood, and consist of nearly 60 head of Cows, Heifers, and Bulls, about half of which are of the renowned Gwynne family, as well as several from Lady Spencer, with some very superior Fawsleys, Sweethearts, and other noted tribes. Bulls of the very first class have been used, such as 2d Duke of Thorndale (17,748), Grand Duke 5th (10,875), Lord Claret (24,370), and others of kindred blood. The Sire now in service is the Grand Duke of Lightburne (26,290).

Catalogues, with Pedigrees, will shortly be issued, and may be had on application to MR. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. HOWARD, Biddenham, near Bedford.

Edenbridge, Kent.

IMPORTANT SALE OF SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without reserve, on THURSDAY, May 5 next, the entire and valuable HERD of HIGHLY BRED SHORTHORNS, the property of G. Murton Tracey, Esq., of Edenbridge, Kent, comprising members of the Cleopatra, Surmise, and Nylph tribes; the famous Cow, Sweetheart 36, purchased at the Milcote Sale in 1866, with nearly 40 of her descendents, constitutes the distinguishing feature of the Sale. The principal Bulls used have been Prize Bull The Baron (13,813), himself a descendant of Sylph; Duke of Albemarle (21,560), Count Leinster (23,638), and latterly Patrician (24,728), of the renowned Princess blood, also purchased at the Milcote Sale of 1868, and whose dam was then sold for 345 guineas.

Catalogues, with Pedigrees, will shortly be issued, and may be had of Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. TRACEY, Edenbridge, Kent

Important Sale of Shorthorns and Sheep in Notts.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on THURSDAY, April 7, at 12 o'Clock precisely, at Morton Grange, as recently noticed and illustrated in the Royal Agricultural Society's Journal), the entire HERD of very superior SHORTHORN CATTLE belonging to Mr. Hodgkinson. It consists of about 50 head of Cows, Heifers, and Bulls, bred for many years from the stock of Mr. Torr, Mr. J. Armstrong, and Mr. G. Bland; Bulls, combining the blood of Earl Spencer's and Messrs. Bates' and Booth's noted animals, have of late been used. The Cattle are in healthy ordinary condition, the Cows being excellent milkers

Also will be offered, about THIRTY very choice LONG WOOLLED RAM HOGGS, some well BRED SETTER DOGS, and a few YOUNG PUPPIES, all of Prize Blood.

Catalogues, with Pedigrees, may be had of Mr. JOHN THORNTON, 15, Langham Place, Regent Street, London; or of Mr. HODGKINSON, at the Farm.

Sale of First-class Carnations and Picotees, Standard and Dwarf Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, 38 and 39, Gracechurch Street, City, E.C., on TUESDAY, March 29, at half-past 12 o'Clock precisely, a first-class Collection of CARNATIONS and PICOTEES (the surplus stock of an eminent grower), a choice assortment of Standard and Dwarf ROSES, selected American HANDY-bearing grown FRUIT TREES, fine CAMELLIAS with buds, AZALEA INDICA, GLADIOLI, &c

On view the morning of Sale. Catalogues had the Rooms, and of the Auctioneers, Leytonstone, E.

The Agricultural Gazette.

SATURDAY, MARCH 26, 1870.

VARIOUS reasons have been given for the present keen interest in the subject of Education. Foreign competition has taught us that there is a danger of our skilled workmen falling behind their Continental brethren in taste, knowledge of art, and principles of design. Poverty and pauperism have shown us that, to stem the torrent of misery, something more than charitable institutions are needed, and that to tolerate gross ignorance is the sure path to increase our poorrates. The benefits of a good education also induce a wish to confer similar advantages upon those who hitherto have not enjoyed them.

These then are the chief reasons why education has become a prominent question of the day. What place, we would ask, do the farmers of this

country occupy with regard to this movement? and how far are they, as a class, interested in it? In answering these important questions, we fear that the farming body, however steadily it may be progressing in the improvement of its own special avocation, requires awakening to the vital importance of increased knowledge. Agriculturists are to too great an extent unaffected by this question, because they are a non-reading class. Were farmers adequately educated they would be more deeply interested in education, but at present they are too apt to consider the subject as of small practical import. We long for the time when this stigma can no longer be attached to the farming body, when that healthy liveliness so characteristic of the members of other professions shall have more fully imbued agriculturists; when the great questions affecting their body will be intelligently and generally discussed, and when they shall rise to the desire of freeing Agriculture from those trammels which, more than want of skill or want of capital prevent her full development. We may be met here by the objection that Chambers of Agriculture have undertaken this work, and doubtless to a certain extent they have. But surely Chambers of Agriculture require to be impressed with the necessity of rousing the interest of tenant-farmers to the consideration of this question. Chambers must be more widely representative before they can exert an adequate effect, and we think it would not be difficult to suggest means which would enable each Chamber to act as an enlivening centre, from which the spirit of progress might continually emanate. Farmers themselves require a better general and more liberal general education; and until this is accomplished they cannot take a keen interest in the education of either their sons or their servants.

They are as a class very deeply interested in the advancement of knowledge. When we reflect upon the difficulties which at the present moment beset the occupiers of land, we cannot fail to see that a higher standard of education than they have hitherto enjoyed is absolutely required. Briefly let us enumerate some of the topics requiring calm deliberation and united action. First, there is the question of the tenure of land, the unsatisfactory state of which can hardly be better shown than by the fact that we have among us leading agriculturists (although they are usually land-agents) who absolutely advocate yearly tenancies rather than leases. Next we have the game question, which could not remain in its present forlorn condition a week were tenant-farmers alive to their interests. It would be better also if we saw a greater unanimity of action upon the questions of the Malt-tax, local taxation, the state of the land laws, and other politico-agricultural subjects; while if we glance at the present condition of both the corn and meat trades, we see additional reasons why farmers should keep on a level with the progress of the age. These important questions are likely to affect permanently the value of land itself, up to this time the safest of all investments When we add to the foregoing the advance of agriculture, due in a great measure to the application of science to practice, we can only arrive at one conclusion, namely, that a higher education for the farmer is absolutely necessary. The improvement of land, implements, and live stock have been carried to wonderful perfection, but further progress and successful competition with the world at large seems to call loudly for a higher standard of agricultural education. This is required both for the farmer and the labourer, but we would especially urge its positive need for the improvement of the farmer. The scheme of general primary education which now occupies the attention of the Legislature of this country, is an effort to instruct those classes least able to obtain education without assistance. The labourer, therefore, is being cared for. The position of the farmer will, however, remain comparatively unaltered,; and unless he is impressed with the necessity of both primary and technical education his improvement will be slow indeed. *W.*

[We published last week (p. 393) an extract from the syllabus of subjects in which the Highland and Agricultural Society examines the candidates for its agricultural diploma. A corresponding prospectus has now reached us from Hanover Square. The examination by the English Agricultural Society will take place during the week beginning Tuesday, April 25. Forms of entry, duly filled up, including particulars as to general education, must be sent to the Secretary on or before the last day of this month, before which day the candidate must not have completed his 21st year. Every candidate must satisfy the examiners in the chemistry and practice of agriculture and in book-keeping, and also in one of the two following subjects—land surveying, and mechanics as applied to agriculture. And in order to be placed in the first class, candidates must satisfy the examiners in both the above subjects. Any candidate may offer himself for examination in one or more of the following subjects, viz., botany, geology, or anatomy. Any knowledge which he may show of these subjects will be counted to his credit in the general classification, provided that he shall have fulfilled the foregoing conditions, and provided that the knowledge of these subjects does not fall below the standard fixed as a minimum in each of these optional subjects. Each successful candidate obtaining a first-class certificate thereby becomes a life-member of the Society, and there is a prize list besides amounting to £120. Let us hope that the Society will receive before next Thursday a large number of names; and that, dealing with an increasing constituency every year, they may have the satisfaction of feeling that that clause in their charter which directs them to promote the education of the farmer is every year more and more bearing the fruit which the founders of the Society contemplated.]

—— The Corn Market at Mark Lane on Monday last must be reported slack; and notwithstanding short supplies most samples of Wheat were 1*s.* per qr. cheaper. On Wednesday no great quantity of business was done, at Monday's reduced quotations.——In the Cattle Market the top prices of the previous week were retained only for the choicest qualities of stock, and on Thursday trade was very dull and Monday's prices were barely reached.——The Wool trade has been languid for everything except lustre wools and the best half-breds.——In Seeds there has been plenty doing, at somewhat advancing rates.

—— We announce with deep regret the death of Mr. H. H. Dixon, whose racy histories and descriptions of our leading herds in the columns of the *Mark Lane Express* have since been collected and published in the well-known volumes on "Field and Farm," "Saddle and Sirloin," &c. Mr. Dixon was Agricultural Editor of the *Illustrated News*, and was also well known to the readers of the Journal of the Royal Agricultural Society of England.

—— The following summary of the results obtained near Cirencester from the use of a top-dressing of nitrate of soda on Wheat was communicated last week to the *Times* by Professor Wrightson, of the Royal Agricultural College:—

"The effects of nitrate of soda in increasing the yield per acre upon four farms in this neighbourhood are given in the accompanying Table. The figures indicate the amount of increase per 100 lb. of nitrate used:—

Experimenters.	With Dressings per acre equal to— 84 lb.	168 lb.	336 lb.
Earl Bathurst ...	.. 170 ,,	.. 226 ,,	.. ..
The R. Agri. College	.. —	.. 152 ,,	.. 292 ,,
Mr. W. Smith, Bibury	.. 150 ,,	.. 277 ,,	.. ..
Mr. E. Ruck, Braydon	.. —	.. 197 ,,	.. —
Average of 7 plots, 164 lb. of 12, 235 lb. of 3, 292 lb.			

The average increase upon 100 lb. of nitrate of soda was 235 lb., or 3½ bushels of 62 lb. each. Even at the present low price of 5*s.* per bushel, this is equal to a money return of 19*s.*, while the expenditure, at 6*s.* per cent. of the fertiliser used, was 14*s.* 3½*d.* The profit, therefore, at a time when Wheat is low, and nitrate of soda somewhat expensive, is equal to rather more than 30 per cent. on the outlay, and this in grain alone. The addition of superphosphate to nitrate of soda as a top-dressing for Wheat was, in three series out of four, unremunerative, but in the exceptional case the yield was largely increased. Three sets of experiments out of four gave results decidedly in favour of applying the mixture used (superphosphate and nitrate of soda) in spring rather than in winter. The effect of the heavier dressings of nitrate of soda, according to the above Table, was more evident than in the case of the smaller applications."

—— Mr. Milne, of Turriff, has called attention, in the *North British Agriculturist*, to his experience of a wider interval than common between the rows of corn, as determined by the drill at seed-time. The three experiments were on various soils. Each lot consisted of two widths of the drill-machine sown across the field. The lots were all cut during the second week of September. A square pole of each lot was measured, cut with a sickle, and, when dried, put into labelled sacks. The lots were afterwards carefully weighed and threshed by a small hand-mill. The weight of grain deducted from the gross weight gave the weight of straw and chaff. The natural weight of the grain was 42 lb. per bushel, but in the following Tables it is calculated into quarters and bushels of 40 lb. The cold spring and dry July of 1869 somewhat stunted the crop, but the yield is satisfactory. In 1868 the results of the experiments had been in favour of the 4 inches apart rows: in 1869 the 4 and 8-inch, are, on the whole, about equal; while in both years the yield from the 12 and 16-inch is decidedly less than from the 4 and 8-inch rows. The same rate of seed per acre was maintained in all the experiments in 1868, but the crop in the wide-apart rows appeared to be too thick, crowded, and tufted; so that in 1869 the seed sown in the wide-apart rows was reduced to the same quantity in each row as that sown in the 8 inches apart rows. The following are the results, calculated per imperial acre:—

Experiments on Grain Sown at Various Widths.

First Series.

Drilled apart.	Seed per acre.	Straw, chaff, and grain.	Straw and chaff.	Grain.
in.	bush.	lb.	lb.	qr. bsh. lb.
4	4	6890½	3802½	9 3 28
8	4	6187½	3254½	8 1 11½
12	2½	5975	3262½	8 3 32½
16	2	5762½	3289½	7 6 23
Second Series.				
4	4	6272	3539½	8 3 32½
8	4	6175	3387½	8 5 27½
12	2½	6209	3589	8 1 20
16	2	4925	2741	6 6 24
Third Series.				
4	3	5125	2860	7 0 16
8	3	5412½	3059½	7 2 33
12	2	4272	2366	5 7 26
16	1½	4187½	2368½	5 5 18½

Average of Three Experiments.

Drilled apart.	Straw, chaff, and grain.	Straw and chaff.	Grain.	Per cent. of grain.
in.	lb.	lb.	qr. bsh. lb.	
4	6095½	3430½	8 2 25½	43·73
8	5925	3276½	8 3 11½	45·41
12	5448½	3072½	7 4 13	43·68
16	4958½	2799½	6 6 8½	43·75

The crop was Oats.

—— A curious paradox appears reported in a recent address to the Hexham Farmers' Club. Mr. C. G. Gray, President of the Club, pointed out that exposure might be a warmer thing than shelter! Speaking of the farm-workers lodging in bothies:—

"He thought their healthy condition was very much owing to their constant outdoor occupation, and also partly to some of the faults of this very bothy, in being open to the air—the roof being bad, and the windows only stuffed with straw and clouts instead of panes of glass. These hardy people did not suffer so much from cold as people who lead a sedentary life, and they had a constant supply of fresh air. If they shut up a certain number of men in a small room without ventilation they would soon consume the oxygen in it for their breathing, and the system of keeping up the internal fuel would come to an end, and the men would begin to get cold and unable to get heat. He could illustrate it by a story of some Alston miners. The miners took their wallets from Monday till Friday, and they sometimes slept in what was called the shop. In one of these there was no fireplace, it was sealed, and about 12 feet square, and ten or twelve men were sleeping in it. They found themselves very cold in the night, when a bright idea struck one of them, and he made a hole in the roof, and they soon found themselves get much warmer. He firmly believed that fact was borne out by science."

—— The *Pall Mall Gazette* calls attention to the following curious illustration of the entire reversal in the position of north and south country labourers since the commencement of the last century. "Defoe, in his 'Giving Alms no Charity,' makes the following remark:—'Tis plain to any observing eye that there is an equal plenty of provisions in several of our south and western counties, as in Yorkshire, and rather a greater; and I believe I could make it out that a poor labouring man may live as cheap in Kent or Sussex as in the bishopric of Durham; and yet in Kent a poor man shall earn 7*s.*, 10*s.*, 9*s.*, a-week, and in the north 4*s.*, or perhaps less; the difference is plain in this, that in Kent there is a greater want of people in proportion to the work there than in the north.' Defoe, in anticipation of Canon Girdlestone, suggests the advantage of emigration from one district to another, being convinced that in England generally 'there is more labour than hands to perform it, and consequently a want of people, not of employment.'"

OUR LIVE STOCK.

CATTLE.

Mr. Cruikshank's annual draft sale took place on Thursday, the 17th inst., at Sittyton. An Aberdeenshire contemporary thus enumerates the sires of the young stock disposed of:—

"The grand old bull Forth, one of the finest specimens of his race which has ever been seen in this quarter, and now no more, having been slaughtered last year, after a useful and honourable career of nine years in the show-yard and in the pasture, at the age of nine—was the sire of four of the bulls. Champion of England, now eleven years of age, and still hale and in good condition, though beginning to droop slightly in the hindquarters, who has a very numerous family of prizetakers and valuable stock scattered over the country, can count nearly half a score of his own progeny in yesterday's sale, all of which sold well, being, as Mr. Cruickshank says, 'undoubtedly the right sort for a rent-paying farmer,' remarkable for quality and substance, and more useful than showy. Another prolific sire is Allan, winner of the Highland Society's prizes at Inverness and Stirling, and who has been recently sold. He has left very good stock, and one of them, a November calf, of very fine quality, and great substance,

fetched the highest price yesterday—82 gs. Another, a red bull, PEER OF THE REALM, Mr. Cruickshank considered about the best of the herd; he fetched 67 gs. One very fine animal—HONEYCOMB, roan—got by CHAMPION OF ENGLAND, Mr. C. also had a great fancy for, which increased after he saw him in the ring, so much so, that after upwards of 50 gs. had been offered for him, he was withdrawn at 80. Amongst the sires which we have not mentioned were ROB ROY, a prize winner at Kinross, Cupar, and Inverness, &c.; SCOTLAND'S PRIDE, the first-prize yearling bull at Aberdeen in 1867, also the winner of the 50-guinea challenge cup when a yearling, competing with all ages; and SCOTCH ROSE, son of the famous ROCHDALE, the winner of numerous prizes and challenge cups—including two of the value of 100 gs. each. Some of the stock of SCOTLAND'S PRIDE were specially sweet animals; and one in particular, a roan, was greatly admired, and caused a keen competition, being eventually knocked down to Mr. Stewart, Sandhole, at 51 guineas. The bidding for the bulls was, on the whole, very spirited. The total sum realised was 1376 gs. for 38 bulls sold, being an average of fully 36 gs. a-head, and only a few shillings less than last year, when 49 bulls sold averaged £38 5s. The bulk of the heifers were but 'culls' from Mr. Cruickshank's herd—the best being always kept for breeding purposes—and, of course, could not be expected to realise such high prices. The 25 sold brought a total of 536 gs., being an average of about 21 gs. a-head."

We have not space for a complete list of the prices realised, but besides the animals already mentioned we may notice LORD NORTH by FORTH, 50 gs. (Mr. Gordon, of Park Hill); JOHN BRIGHT, by ROB ROY, 73 gs. (Mr. Bruce, Broadland); ALLIANCE, by SCOTLAND'S PRIDE, 51 gs. (Mr. Stewart, Sandhole, Frazerburgh); ARCHBISHOP, by SCOTLAND'S PRIDE, 56 gs. (Major Ramsay of Barra); GOLDEN CROSS, by JULIUS CÆSAR, 53 gs. (Mr. Thomson, Dumbreck); FORERUNNER, by CHAMPION OF ENGLAND, 51 gs. (Mr. Manson, Oldmeldrum); ROYAL BRITON, by SENATOR, 59 gs. (Mr. Marr, Uppermill, Tarves). All the above were yearling bulls. The recent severe weather had proved trying to the herd, several individuals being lame or "crazy," and, in general, the animals were not so fresh and sprightly as usual.

—— The annual sale at Burghley Park took place on the 17th inst., under the direction of Mr. Strafford; 15 cows and heifers and 12 bulls were disposed of, at a general average of £26 18s. 6d., and a total of £727 2s. 6d. The highest figure (47 gs.) was given by Mr. Whitwell, for GRECIAN SAYE, a 2-year-old bull; Sir G. Murgrave gave 45 gs. for GRAND SENESCHAL (26,309), and Mr. Brown bought ROYAL OXFORD (27,380), a 3-year-old, for 40 gs. The highest price for cows was given for *Cecil*, by BRAMBLE, seven years old, which was bought by Mr. Stokes for 40 gs.; and Mr. Wood gave 22 gs. for *Lady Cambridge*, a yearling, by BARON ARCHDALE (25,553). The remaining animals brought the prices of ordinary stock.

—— Several bulls have lately been sold at Kingscote, and the number of the herd has been well kept up by births. 2D EARL OF WALTON (19,672), having finished his term of service in the Ridgway herd, has gone to Sir John Holt's, Ozleworth. LORD RED EYES 2D (24,460) is residing among the Stoneylane herd, and his brother LORD RED EYES (24,459) has left Frocester Court, where he has been employed by Mr. Hayward, and has been engaged by Mr. Butler, of Badminton. VOUCHER, by 3D DUKE OF CLARENCE (23,727), dam *Vizzy*, by CHAFFCUTTER (2572), a really good young bull, has been sold to Mr. Pullen, Chippenham; and DUKE OF SLIMBRIDGE, by 2D DUKE OF WETHERBY (21,618), to Mr. Elwes, of Colesbourne. The following births have been lately registered at Kingscote:—

Fidget 6th, a white b.c., by 3D DUKE OF CLARENCE.
Peach Blossom, by 4TH DUKE OF OXFORD (11,387), a roan b.c., by NORTHERN DUKE.
Princess Helena, by CUPID (14,350), a roan b.c., by 3D DUKE OF CLARENCE.
Dora, by 2D DUKE OF AIRDRIE, a roan b.c., by do.
Duchess of Slimbridge, by CHAFFCUTTER (12,572), a roan b.c., by do.
Honeymoon, by CALEB (15,718), a red b.c., by do.
Newton Lady, a roan b.c., by PRINCE OF CLARENCE 27,163).
Hebetrope, by ARCHDUKE 14,699, a red c.c., by 3D DUKE OF CLARENCE.

The first-named calf was dropped two months before his time, but is doing well. Lastly, we may mention that Lord Spencer's *Grand Duchess* is at Kingscote, on a visit to 3D DUKE OF CLARENCE.

—— The Ariadne, of the London River Plate Company, arrived at Falmouth on the 17th inst. with the first cargo of live cattle ever brought to this country from South America. The consignment consisted of 144 bullocks, 300 sheep, 6 cows, 5 calves, and 7 horses—a less number than might have been accommodated. The weather during the homeward voyage was very bad, and the cattle arrived out of condition. We understand the prices realised were disappointing.

SHEEP.

MR. KIRKHAM, of Audley, has favoured us with the following somewhat unfavourable report upon the condition of sheep stock in the neighbourhood of Caistor:—"The sheep news from this part of Lincolnshire is not of a very cheerful character. We are suffering from the foot-and-mouth disease, and the ewes are in a direful condition, many of them having dead lambs, and others having cast their lambs. Hoggetts will be light in comparison with other years, and those which have recovered some months from the disease have been found deficient in weight. The price of mutton must continue high, but the loss sustained by the farmer, owing to this wide-spread calamity, will render this year of low prices and bad yield very discouraging. There will be a short clip of wool in this county, and, owing to the before-mentioned disease, it is very loose on the sheep, and will be found tender. There is a considerable demand for Lincolnshire sheep for exportation to Australia and Buenos Ayres, and their worth seems to be gradually though slowly appreciated. This is not to be wondered at, when a good Lincolnshire hogg, in his wool, is worth £6, but to arrive at this result they must be well cared for from the first."

POULTRY.

TO ENSURE a profitable result from the extended keeping of poultry on a mixed farm, proper accommodation is indispensable. A wooden "lean-to" put up against any of the permanent buildings, with an enclosed yard in front, both house and front being subdivided according to the number of breeds kept, is all that is requisite. The house for each breed should be 10 feet square, with a sloping roof 6 feet high in front, and 10 to 12 feet high behind. A ventilator should be placed over each division. The yard should be at least 12 feet by 6 feet, and covered with fine gravel, which ought to be changed and refreshed once a-week. The partitions between the yards should be of wooden planking ½-inch thick, and 2½ to 3 feet high, to prevent the cocks from seeing each other. Above that height wire netting is sufficient protection. Each yard should be furnished with a dust-bath, a drinking fountain, and feeding troughs. In the houses, the roosting places should consist of poles of young Larch trees, or other thinnings from the plantations, laid upon tressels about 3 feet from the ground at most, with a ladder leading up to them. The nests and hatching dormitories may be arranged about the same height from the floor in a single tier along the walls of the house. Walls and ceilings should be regularly whitewashed with hot lime, and both houses and outdoor yards carefully cleaned out at least once a week. A very fair breeding stock for an ordinary sized farm would consist of 1 cock and 12 hens of each breed desired to be kept. To prevent "in-breeding," which effectually ruins any yard in a very brief time, the cocks should be changed every second year; and great pains should be taken to select good, healthy, well-formed birds, with all the requisite points purely and distinctly marked. *Abridged from the Highland and Agricultural Society's Journal.*

THE EXPENDITURE OF FOOD BY RESPIRATION.

A HUMAN life has recently been sacrificed to prove that life cannot be sustained without food. At the inquest held a short time ago on the body of the Welsh fasting girl, it was stated that the watching committee were about equally divided in opinion on the facts of the case, some believing that the girl had really lived without food for months or years, whilst others considered that the pretence that she had done so was an imposture. Nor is it improbable that of the great majority of the population who have become acquainted with the case through the newspapers there are as many who believe, as there are who disbelieve, the statement of the father, that the girl had really fasted so long.

Yet, if there is one thing which is more firmly established by scientific inquiry than another, it is that actual waste or expenditure of substance is going on during the whole period of our existence; and that unless this waste be compensated by food, death must quickly ensue.

The nearest approach to the continuance of life without food is in the case of those animals which pass through a period of hybernation. A dormouse, for instance, sleeps through a greater part of the winter; the little animal becomes cold to the touch, shows no sign of respiration, and is to all appearance dead. Nevertheless, careful experiments have proved that slow respiration is going on all the time, accompanied with gradual loss of substance; and if the cold weather be sufficiently prolonged, or the animal be subjected by artificial means to a continuance of low temperature, death will take place; if not from other causes, at any rate as soon as there ceases to be a supply of accumulated fat, or other material within the body, available for the purposes of respiration.

Indeed, the resources of the body itself, unreplenished by food, can supply the necessary material for waste for only a very limited period. The minimum amount of food required to maintain existence will vary for a given live weight according to the description of the animal, the description of the food, the conditions of life, and individual peculiarities. But, to say nothing of other losses, as part of the substance of the body passes off into the atmosphere with every respiration, it is absolutely certain that death cannot be far off whenever the supply of food is stopped.

The fact of a constant expenditure of food by respiration has a very important bearing on the economy of the farm. Every animal that is kept, whether for labour or for the production of meat, requires a given amount of food for the mere maintenance of life. If it receive more than this, the remainder may serve to enable the working animal to perform his labour, or the meat-making animal to increase in substance and in weight, and consequently in value.

It may be mentioned, in passing, that direct experiments have proved that the expenditure by respiration is very much greater within a given time whilst an animal is awake than whilst it is asleep; and again, very much greater when in exercise than when at rest.

Confining attention to the case of the animals fed for the butcher, it will be obvious that the economy of the feeding process will be the greater the less the amount of food expended by respiration in the production of a given amount of increase; and it is equally obvious that one ready and efficient means of lessening the proportion of the waste or expenditure to the increase produced, is to lessen as far as possible the time taken to produce it; in other words, to fatten as quickly as possible.

An example taken from the ordinary practice of the farm will clearly illustrate the point, and show the great importance of bearing the facts in mind. From the results of numerous experiments made at Rothamsted it may be assumed that, on the average, a pig weighing 100 lb. will, if supplied with as much barley-meal as he will eat, consume 500 lb. of it, and double his weight—that is, increase from 100 lb. to 200 lb. live weight—in 16 or 17 weeks. The following Table shows the amounts of dry or solid constituents in the 500 lb. of barley-meal, and how they will be disposed of in the case supposed:—

500 lb. barley-meal produce 100 lb. increase and supply:—

	In Food.	In 100 Increase	In Manure.	In Respiration, &c.
	lb.	lb.	lb.	lb.
Nitrogenous substance ..	52	7·0	59·8	276.2
Non-nitrogenous substance	357	66 0		
Mineral matter	11	0.8	10.2	—
Total dry substance	420	73.8	70.0	276.2

From the figures in the Table we learn that of the 420 lb. of dry or solid substance which the 500 lb. of barley-meal contains, about 74 are stored up in the 100 lb. of increase in live weight, about 70 are recovered in the manure, and 276, or nearly two-thirds of the whole, are given off into the atmosphere by respiration and perspiration—that is to say, are expended in the mere sustenance of the living meat and manure-making machine, during the 16 or 17 weeks required to produce the 100 lb. of increase.

But now let us suppose that instead of allowing the pig to have as much barley-meal as he will eat, we make the 500 lb. of meal last many more weeks. The result would be that the animal would appropriate a correspondingly larger proportion of the food for the purposes of respiration and perspiration, and a correspondingly less proportion in the production of increase. In other words, if the 500 lb. of barley-meal be distributed over a longer period of time, it will give less increase in live weight, and a larger proportion of it will be employed in the mere maintenance of the life of the animal. Indeed, if the period of consumption of the 500 lb. of meal be sufficiently extended, the result will be that no increase whatever will be produced, and that the whole of the food, excepting the portion obtained as manure, will be expended in the mere maintenance of the life of the animal.

The conclusion is obvious, that, provided the fattening animal can assimilate the food, a given amount of increase will be obtained with a smaller expenditure of constituents by respiration, the shorter the time taken to produce it. In fact, by early maturity, and the rapid fattening of stock, a vast saving of food is effected. It is true that the flavour and quality of the meat of the 1-year-old sheep, or the 2 or 3-year-old bullock, are not as good as that of the 3 or 4-year-old sheep, or the 4 or 5-year-old ox. But it is obvious that the mutton and beef of the older animals can only be produced with a much greater expenditure of food, and generally at an increased money cost which must put them beyond the reach of the great majority of consumers. *J. B. Lawes, Rothamsted, January 1.*

ON SEWAGE FARMING.

I READ with great pleasure the extracts from Mr. Bailey Denton's paper on Town Sewage, lately laid before the Farmers' Club, which appeared in your journal[1] of March 12, as the views therein set forth proceed from one whose opinions are valued, and are very moderately and intelligibly advanced. All must agree with Mr. Denton that much practical experience is needed, in order to enable us to arrive at anything like the full value of sewage, and it will be only when more minds are given practically to the work that we can expect to obtain results which shall be of a trustworthy nature.

Although there seems no reason why sewage should not eventually take its place with other saleable commodities (its value varying more, I am led to think, from many other attending circumstances than from the intrinsic chemical value which the sewage itself might

possess), at present it is most desirable, in order to affix to it any fair value, that every effort should be made to contribute the minimum quantity of sewage which it is possible to apply to a crop. Until we arrive at this point in the practice of agriculture by sewage, an exaggerated estimate of cost will appear to the debit of each crop, and the real value of sewage in a national sense will be greatly depreciated.

As you are aware, most sewage farms have been laid out with a view to the use of surplus sewage water from higher ground over beds which lie at a lower level. This farm even contemplated a third use of the water before it passed away, but the result of experience has borne out the remarks made by Mr. Morton in his pamphlet published in 1868, and has shown this system to be altogether incompatible with experiments which are intended to test the value of sewage.

We have, therefore, with the object of conveying the sewage without waste to the land to which it is to be applied, replaced by wooden troughing the dilapidated earthen carriers which Mr. Morton speaks of as being so wasteful of sewage; and we have, by cutting off all means of surface escape from each bed, endeavoured to confine the quantity of sewage to only so much as shall be necessary to irrigate it. By these means we shall be able to state with some accuracy the quantities of sewage which each crop has received, and then, by taking following crops without any further dressings, we shall in time be able to judge of the worth of that which the ground still retains.

There is another point which came into the discussion of Mr. Bailey Denton's paper to which I would draw attention as being most important to the question of value, and it is that of the dilution of the sewage by the farmer before using it on the land. It is obvious that if this is allowed to be necessary it will greatly hinder the use of sewage on account of the serious additional cost of pumping (already the *bête noir* of most towns) which the extra volume will entail, since, excepting in very rare instances, the farmer will be quite unable to add water to the stream of sewage as it pours into his carriers. If the dilution is effected before it is delivered from the culvert of supply, who shall regulate the strength to satisfy the farmer who cultivates free loose soil and he who works in stiff clays? If the "water" is a boon to one, it will be cumbersome to the other, for which a reduction in the charge for the sewage in it will not compensate him.

Our experience upon this farm, however—where at times the sewage pours into the tank in a very dark and offensive condition—is that no such dilution is necessary; and as many other farms take the sewage of towns just as it is delivered to them, I hope that such cases will prove to be rare. I confess that I cannot reconcile the propriety of excluding storm water from the sewage drains, whilst the dilution of sewage in protection of crops is prescribed.

The application also of sewage to fallow land in preparation for cropping is more the act of one who is obliged to take sewage daily than that of an experimental farmer, as it is unlikely to add to our knowledge of how few are the tons of sewage which are required to produce a valuable crop of any kind; and for this reason, and also because it was contended that only by application to a growing crop could we really purify the sewage, such a suggestion, made when this farm was first established, was negatived.

Should, however, another reason be necessary I may advance the fact that it is our belief that, under sewage, no land should lie fallow, but that crop should follow crop in quick succession, either in the use of the sewage to be consumed and made into money, or in the exhaustion by following crops of the goodness which remains in the land.

This exhaustive process is here now going on, as crops have been put into land which had been under irrigation since the farm was taken; and the value of the results will, I hope, lessen the charge for sewage which is recorded against it.

I have offered the preceding remarks in the desire to further the practical efforts making for extending the use of town sewage, and I hope that our fellow labourers elsewhere will in like manner afford us the benefit of their experience. *Henry J. Morgan, Lodge Farm, Barking, March* 16.

OAT SOWING.

Oat sowing is concluded before this in our southern and midland counties, but this season is exceptional in this, as in other respects. Oats require a fine seed-bed, and it is a shortsighted policy to throw the seed into the land before it is ready, and this applies with greater force in April than in February; for when sown early March generally corrects the land, but when a bad season in April is followed by the drying weather of May, the Oat crop never comes to much. In Scotland the place for Oats is after lea; and where the lea was not ploughed until last month, it will be no easy matter getting a good seed-bed—according to the usual way of sowing broadcast. In such cases a proper seed-bed should be prepared with the harrows and clod-crusher, and the seed then drilled in. After

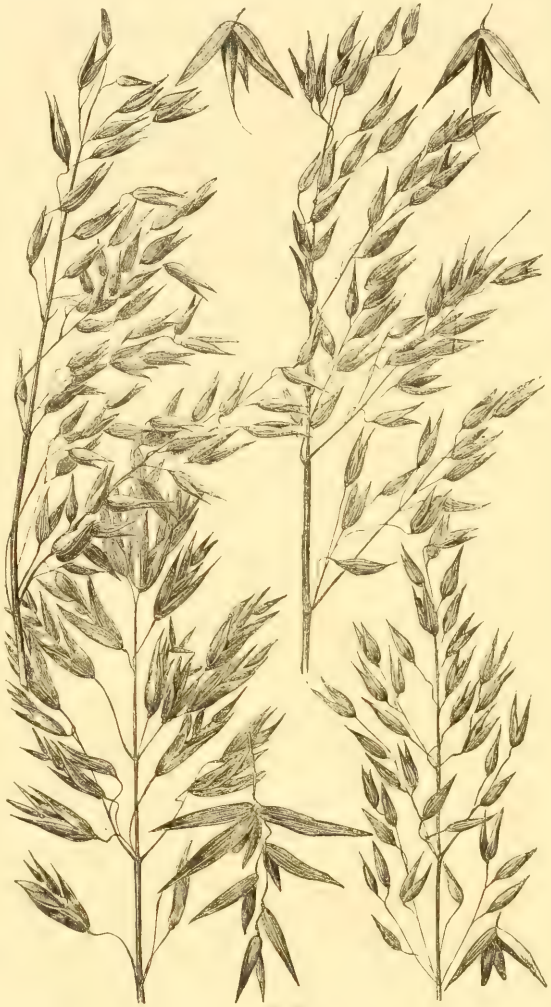

Fig. 78.

Turnips, less difficulty will be experienced in getting a seed-bed. The usual quantity of seed per acre is from 3 to 4 bushels. Where the land is in good heart and likely to produce plenty of straw, the early varieties of the Oat, as the early Angus, should be sown, but on poor soils the late varieties are sometimes preferred, even in late seasons, for the sake of the straw—the adage being "Oats grow on straw." The great variety of Oats is well adapted to seed soils unsuited for Wheat and Barley, and care should be taken to select the variety best suited for this or that soil and climate. Where leas are infested with wireworm, and where Turnips have had anbury, sow salt, as directed last month, with lime, if needful. [The cuts are taken from "Morton's Farm Calendar." They are drawn half the natural size, the single floret, in each case, being the full natural size. The two upper cuts on this page are White and Black Tartarian; the two lower ones are Naked and Hopetoun Oat respectively. On p. 431 we have Sandy Oat and Black Poland Oat above, Potato Oat and Barbachlaw Oat below. In every case the left-hand figure is named first.]

THE FACTORY SYSTEM OF CHEESE-MAKING.

The subject of introducing the factory system of cheesemaking into Derbyshire as now so successfully practised on an extensive scale in America was first brought before the public by J. G. Crompton, Esq., the chairman of the County Agricultural Society, in his speech at the dinner on the occasion of the Society's show meeting last September; thus set afloat, the project was freely discussed both through the local Press and amongst dairy farmers generally. On a careful comparison of the current prices obtained in the English markets for American factory-made cheese with that of our own dairies, it became painfully apparent that unless prompt measures were taken to improve the general quality of the cheese made in our crack dairy counties, and to regain our position as producers of a superior article, however unpleasant and unprofitable to ourselves, we should soon be driven from the market by the enterprise and intelligence of our American cousins, whose cheese are already almost equal to our very best brands, and far superior to our ordinary make. During the last 50 years the art of agriculture has made immense progress in these islands; this progress is in great measure to be attributed to the teachings of science, by whose aid even the rocks themselves have been converted into fertilisers. Science has taught us the use and value of artificial manures and feeding stuffs, which has enabled us to subdue the barren wolds of Lincolnshire and the light sandy warrens of Norfolk, converting them into fruitful fields teeming with flocks and herds. Though arable culture has made such rapid strides, dairy farming is principally confined to a few counties, and the area under this system of management has been even there gradually becoming more circumscribed. Without the enlistment of science as her handmaid the art has made small progress, it has in fact been retrograding instead of progressing to meet the wants of a rapidly increasing population and more luxurious system of living. In making a careful and unbiassed retrospect of our position, we at once arrive at the conclusion that we have not yet advanced much beyond the practices of our forefathers of the middle ages. Possessing all the natural advantages of a soil and climate peculiarly suited to the growth of the best varieties of grasses, and having at our command to select from the different breeds of cattle superior to those of every other country on the globe, with these and the aid of science to guide and enlighten us, we hope successfully to compete with all comers. At the general meeting of the Derbyshire Agricultural Society, on December 24 last, a special committee was appointed to consider the subject and prepare a report. J. G. Crompton, Esq., was unanmously elected chairman, Lord Vernon, the Hon. E. W. Coke, Colonel Wilmot, T. W. Evans, Esq., Dr. Hitchman, and a number of practical farmers constituted the committee. The other day a large and influential meeting of landlords and tenant-farmers was held in the Town Hall, Derby, to receive the report, his Grace the Duke of Devonshire in the chair. The report was read by Mr. J. C. Smith, the secretary, and met with the unanimous approval of the meeting. Mr. Crompton, in an able and exhaustive speech, fully explained all the salient points of the report. In order thoroughly to test the applicability of the factory system and its general adoption in this county it was deemed desirable to establish two factories, one of which shall be in the town of Derby, and the other in a purely rural district.

Cheesemaking on the factory system is entirely a new branch of manufacturing industry in this country, therefore in order to insure the tenant-farmer against any loss that might arise in case of failure through mismanagement, or any other cause, it was thought desirable to call upon the landowners in the county to form a guarantee fund, to insure the contributors of milk a certain fixed price per gallon for their produce. The call has already met

with a most generous response; upwards of £3000 has been subscribed, and further contributions are expected. The milk is to be delivered at the factory by the farmer, and the price guaranteed is 6½*d.* per gallon. The guarantors erect or find the necessary buildings and plant, charging the contributors of milk with the working expenses only. If after paying the sum of 6½*d.* per gallon for the milk and deducting the cost of manufacture there is still a surplus, this will be divided *pro rata* amongst the contributors of milk. This guarantee will extend over a period of three years. Mr. Alderman Roe, of Derby, has supplied a suitable building for the town factory, rent free for the first year. The committee had no small difficulty in selecting the site of the rural factory, as a strong spirit of rivalry was exhibited in several districts, each anxious to obtain it in their own immediate locality; the liberal offer by the Hon. E. K. W. Coke, and the fact of his being able to bring together the produce of upwards of 500 cows, fully justified them in selecting Longford. The services of a fully competent manager have been secured—one who is thoroughly conversant with the American system; he is now on his way to this country. Everything is expected to be in readiness to commence operations by April 1. *G. M.*

MANURES:

Their Manufacture, Commerce, and Use.

(*Concluded from p. 397*)

Bones, Bone-ash, Pottery, and Gelatine refuse supply large quantities of phosphates for manure manufacture; but the consumption at Sheffield and other places for knife-handles, &c., and for animal charcoal in the manufacture of ivory-blacking and animal charcoal filters, &c., create less or more rivalry in the demand; but as old bone handles, &c., eventually find their way to the land, the drawback is less than at first sight seems probable. Upon the whole, however, the supply for agricultural purposes has during the past year been short of the demand, consequently prices rule high. The falling off of the supplies have chiefly been from South America, but if we are to get an increased supply of unboned beef and mutton from the River Plate and our Australian colonies, an increased supply of bones will follow. On the other hand, pottery ash is obtained on rather easier terms, while in the manufacture of gelatine from horn-piths phosphate in a comparatively soluble state, at as high a standard as 70 per cent., can be had at about £5 10*s.* per ton. In our manufacturing districts it is bought by farmers very generally under the name of "bone flour," and may be used economically along with sulphate of ammonia, nitrate of soda, and the salts of potash, or wood ashes, the mixture to be made with dry earth or ashes at the time of sowing, in the usual way of mixing Peruvian guano, so as to avoid fermentation prior to its being put into the land. After it is mixed in the soil there is little fear of harm. The proportions of these articles will depend upon the crop to be grown and the nature of the land, and for such every farmer should be his own judge. But the supply of "bone flour" and pottery ash are both very limited, when compared with the demands of the land, and prices in such cases, it must be borne in mind, always rule according to the demand. Calcined bones have ranged from £7 to £7 7*s.* per ton; pottery ash, from £6 to £6 12*s.* per ton; bone-ash, from £4 17*s.* 6*d.* to £6 15*s.*, and bones from £6 to £7 per ton. Ground half-inch bones are quoted at 22*s.* per quarter, and bone-dust at 24*s.* per quarter for current prices, by Raynbird & Co., of Mark Lane, London, and Basingstoke.

Coprolites supply phosphate of lime, some samples yielding a small quantity of ammonia in a volatile form. The percentage of the former from Suffolk coprolites is quoted in Raynbird & Co.'s list at 56, and the latter at 2.100. Whole coprolites are priced by the above firm at £2 10*s.* to £3 10*s.* per ton, and ground at £3 to £4 current. E. Purser, London Manure Company, quotes Cambridge coprolites—whole, £3; ground, £3 10*s.*; Suffolk—whole, £2 10*s.*; ground, £3. The chief supplies are from the Cambridge chalk and Suffolk clay; but as coprolite dust is deficient of ammonia, soda, and potash, it is an imperfect manure when applied alone, and therefore it should be used in making mixtures to suit crops and land, and unless thus used it is worth more to the manure-manufacturer than the farmer for supplying phosphate of lime, and for this purpose it has to compete with the supplies from America and Estremadura as to price. In point of fact, it was the high price and limited supply of coprolites at home which drove the trade to Spain and the New World for superphosphate of lime.

Fig. 79

Fig. 80.

Peruvian Guano last year declined in supply and rose in price, the then current quotations being from £13 10*s.* to £14 per ton. It were difficult to overestimate the value of this fertiliser, and yet if we are to judge from chemical analysis, or, what is better, the results produced by many of the artificial preparations now used by farmers, the falling off in the supply is not a matter of such deep regret as some may imagine. Used alone it is not suited for the growth of root crops, nor so well adapted for Barley and Oats as some of the specific manures now made, and it is becoming more and more questionable as a specific manure for Wheat. It should always be mixed with common salt, which indicates one of its defects; but this objection is somewhat obviated by mixing it with dry ashes at the time of sowing. Its greatest shortcoming, however, lies in the proportions of ammonia and phosphate of lime which it contains, the percentage of the former being in excess of the demands of most crops, while that of the latter is in the opposite extreme—deficient of the normal supply required by a healthy vegetation. It is not, therefore, economical to use it alone even for a Wheat crop, which stands more ammonia than any of the other cereals. To obviate these and other objections, arising from the mixing of superphosphate of lime, is the subject of several patents; not that we mean to imply that the patent processes of mixing ammonia and superphosphates, in due proportions and in an available form, stand much in the way, but that they are too complicated to be profitably performed by farmers; besides the day of "Jack of all trades" is gone by, and the more advisable course, when prices rule too high, is to encourage competition and rivalry in the trade, as indicated under the head of patents for the past year. Nevertheless, good Peruvian guano can be used successfully by farmers at the rate of from 2 to 3 cwt. per acre, with equal or twice the weight of salt mixed with from 7 to 8 bushels of dry ashes at the time of sowing, or rather dry ashes sufficient to make it work with the drill or broadcast distribution; and also along with bone-dust and salt for doctoring farmyard manure. But it must be borne in mind, that for such purposes Peruvian guano has now to enter into competition with sulphate of ammonia, &c., as to price, while its own value varies from £1 to £3 and upwards per ton, genuine as imported.

Phosphatic and other guanos are those from which most of the soluble salts are washed out and volatile matters wasted. They form the base of some of the artificial compounds, the insoluble phosphate being rendered soluble, the ammonia being supplied in a saline form, chiefly the sulphate of ammonia. The phosphates of some of these guanos are remarkably rich, containing an excess of phosphoric acid, and hence are easily rendered soluble by sulphuric acid, and mixed with the available salts of ammonia. In other cases the samples are of inferior quality, and require often more doctoring than they get to fit them for successful application, but in this respect very great improvements have recently been made in manufacturing processes.

Of the *artificial manufactures* we can only run over a few of the principal examples, with current prices and use.

Phospho-guano (P. Lawson & Son, London and Edinburgh).—This is a rich phosphatic guano, rendered soluble by sulphuric acid, and mixed with the available salts of ammonia. Its composition has been highly praised by Liebig, Dr. Anderson, and Dr. Voelcker, who have analysed it, and pronounced it superior to Peruvian guano, and chemically of very uniform quality, and improving in manufacture mechanically. Its current price is from £12 to £12 10*s.* per ton

delivered free at all railway stations. It is sold in a finely divided state of powder ready for mixing with ashes, at the rate of 2½ cwt. per acre to Wheat, Barley, Oats, and Grasses; 3 to 5 cwt. to Potatos, Mangels, and Swedes; and about 3 cwt. to Turnips and Rape.

Lawes' Patent Manures for different crops are, for Wheat, Barley, Grass, and Mangel, £8 per ton, concentrated £12 per ton, applied at the rate of from 2 to 3 cwt. per acre; Turnip manures for drilling dry, £6 6s.; for the liquid drill, £6 6s. per ton, and at the same rate 2 to 3 cwt. per acre; superphosphate of lime, £5 5s. per ton,—all of which have acquired a standard reputation.

Biphosphated Peruvian Guano.—Rees & Co.'s is guaranteed to contain:—

Soluble phosphates	.. ..	20 to 22 per cent.
Insoluble phosphates	.. .. ..	3 ,, 5 ,,
Alkaline salts	.. ..	3 ,, 6 ,,
Ammonia	.. ..	6 ,, 7 ,,

For top-dressing grain and Grass crops, from 3 to 4 cwt. per acre; for root crops, 4 to 6 cwt. per acre, are the quantities commended. Price £11 per ton, delivered in 2 cwt. sealed bags, free to rail or wharf in London. The following is Dr. Voelcker's analysis, dated Jan. 15, 1870:—

Moisture		10 12
* Organic matter and salts of ammonia		28.81
Biphosphate of lime		14 19
Equal to reduxic phosphate of lime (bones-arth. rendered soluble	22.23	
Insoluble phosphates		5.34
Sulphate of lime		31.30
Oxalate of lime		7.31
Alkaline salts		3.89
Insoluble siliceous matter		4.04
		100.00
* Containing nitrogen	5.63	
Equal to ammonia	6.84	

Odams' Patent Manures (sold by the Blood Manure Company, London) are guaranteed rich in soluble phosphate, animal organic matter, nitrates, &c., yielding ammonia. Nitrophosphate, or blood manure, for Wheat, Barley, Oats, Beans, Peas, Potatos, Grass, &c., £7 10s. per ton, 4 cwt. per acre; ditto for Mangel Wurzel, Turnips, and other green crops, £6 10s. per ton, 4 to 5 cwt. per acre; dissolved bones, £7 per ton, 4 cwt. per acre; superphosphate of lime, £5 5s. per ton, 5 cwt. per acre.

Prentice's Patent Manures (Agricultural Chemical Works, Stowmarket, Suffolk) are as follows:—For corn crops, £8 per ton; Mangel manures, £8 per ton; Turnip manures, £6 10s. per ton; and superphosphate of lime, £6 per ton.

The London Manure Company (E. Purser, secretary) supply "corn manures for spring use, dissolved bones for dressing pasture lands, Mangel and Potato manures, prepared guano, and superphosphate of lime."

The following is from Raynbird & Co.'s prices Current, Mark Lane, and Basingstoke, of January 10, 1870, which includes Prangley's British manures, used at from 2 to 3 cwt. per acre:—

Manures.	Per ton.		Per ton.	
Peruvian guano	£14 11 0	to	£14 0 0	
Upper Peruvian	7 0 0	—	8 0 0	
Nitrate of soda	15 0 0	—	16 0 0	
Sulphate of ammonia	14 10 0	—	15 10 0	
Bones, half-inch, per qr. 22s. ..	6 10 0	—	7 0 0	
Bone-dust, per qr. 24s. ..	7 0 0	—	8 0 0	
Gypsum	1 10 0		2 0 0	
Agricultural salt	1 2 0	—	1 5 0	
Coprolite, whole	2 10 0	—	3 10 0	
Ditto, ground	3 0 0	—	4 0 0	
Lawes' Manures, in London.				
Patent Turnip manure	£6 6 0			
Ditto, prepared for liquid drill	6 6 0			
Superphosphate of lime	5 5 0			
Wheat manure	8 0 0			
Barley ditto	8 0 0			
Grass ditto	8 0 0			
Mangel ditto	8 0 0			
Prangley's Manures, at Bristol or Salisbury.				
Superphosphate of lime	£6 5 0			
Mangel manure	8 0 0			
Blood manure	6 5 0			

In using manures much of the success depends upon the state of the land and how they are applied. It matters not how good a manure may be, if it is thrown carelessly into badly prepared land, and at the wrong season, it will prove a failure. Plants, again, are complex in character, their health depending upon the normal proportions of the several substances of which they are composed, and therefore their food requires to be supplied to them accordingly, and in an available form. The economy of manure is truly no secondary question in farm practice. *W. B.*

Home Correspondence.

"G. A. H." and "Looker-on."—"G. A. H." is indeed hard to please. Sometimes my letters are too short, at others too long; now he complains of my having been so long coming to the scratch. Let me tell him that, with one exception, each of my replies to his letters has been sent off in time for your next publication, but if, owing to the press of more valuable matter, or even to make room for the redundant effervescences of his own lively imagination, my communications have been laid aside for a week or so, I have not felt hurt about it, and I am sure that he has no cause for grumbling. Although we have his own authority that "he is so cunning of fence," he is not cunning enough to tell your readers how he makes the actual cost for interest, &c., come to 12s. per acre on 100 acres of land. Instead of adopting the more manly course, and admitting his inability to do so, which he knows as well as myself, he shirks the matter by clapping it on the back of the Editor, and coolly says, if 12s. per acre was a fair amount to charge, he had a right to adopt that figure. On the other hand, by parity of reasoning, I say that if 1s. 6d. per acre is a fair and proper charge under ordinary circumstances, Mr. Smith has as good a right to adopt that sum. "G. A. H." tells me that I might easily ascertain how many cubic feet are contained in my stacks, and by a rule of proportion tell how many quarters of grain they contained. I admit that I could readily do the former, but the second portion of the task would, for a variety of reasons, be beyond my powers. It would be a very simple task, with the assistance of a measuring tape, to ascertain the number of cubic inches in "G. A. H.'s" head; but to find out how much common sense it contained, would be an altogether different affair: and I think it is quite probable that between his own estimate and mine there would be considerable divergence. To my mind it would be a task somewhat analagous to taking stock of a tumbler of champagne which has been poured out immediately after the cork had bumped the ceiling. Now a word about farm balance-sheets. "G. A. H." appears to think that book-keeping governs the transaction. I say that the transaction governs the book-keeping. An elaborate system of accounts may enable a man to take more readily into his eye his position, but it is skill and diligence in business which make that position. In other words, book-keeping is a mere record of transactions, the success or failure of which does not depend upon the fact of whether they are recorded or not. As to a man being richer or poorer by the fluctuations in value of his floating stock, it's all moonshine. About three years ago sheep were very dear, stock ewes were making £3 or more per head, and lambs from 40s. to 50s. each. A balance-sheet on "G. A. H.'s" fancy plan would have made at the end of that year my profits to have been very great. If taken at the end of the following year my business would, owing to the fall in price, have shown me to have been a loser. But what was the actual fact? My position was not one whit better or worse for the alteration of value, except as affected by that portion of stock which was turned into money. It is in the fact that fluctuations in value do not in any perceptible degree affect the cottier farmer that the chief strength of the system lies. When all, or nearly all, of the produce is consumed by those by whom it is produced, it matters little whether Wheat is 5s. a bushel or 15s., or whether meat is 6d. or 1s. per lb. "G. A. H." has paid me a variety of compliments, and now he calls me a fine farmer. I have always been in the habit of considering myself a very plain matter-of-fact one, and I cannot help but think that a genius such as he describes himself to be, more correctly deserves the appellation. A person who is going to make an engine which is to canter up a steep hill with a load behind it, and after working hard all day in the fields is to draw water all night, while all decent, honest people are in their beds, can be no common man. His next attempt will perhaps be to accomplish the feat described in an old song, and after making his engine work hard day and night for the six days, send it to church on Sunday to preach. In the matter of farming our go-a-head friend is about to kick over all established rule and precedent. As soon as his harvest is finished, or before, he tells us that he intends taking his engine, with his cultivators, drills, harrows, and all other such implements as he may require, and to break up, sow, and dress his land as he goes, finishing all off in one field before he goes to another; and this despite all conditions of the soil, the season, or the weather, which ordinary men are compelled to observe. If this does not entitle him to the epithet of a fine farmer, it certainly shows that he entertains some very original ideas on the subject. If he carry out his programme as chalked out, he must sow not only his Wheat, but his Barley, pulse, and Turnips for next year all straight-a-head. If this is not an indication of genius I know not what is, and I cannot help remarking that he has consulted the "best authorities" to some purpose. In conclusion, I congratulate "G. A. H." on having dropped some considerable amount of swagger, and when he has divested himself of a little more of this undesirable characteristic I have no doubt but we can discuss the subject of steam cultivation with less irony between ourselves, and perhaps with more advantage to your readers. *Looker-on.*

A Question for Vegetable Physiologists.—It is well known that Clover requires much potash as one of its constituents, for which reason I believe sulphate of potash is recommended as a manure for it. But an important question occurs, viz., Is it possible to conceive that by any process of vegetable chemistry not imitable in our laboratories, the Clover plant has the power of expelling the sulphuric acid, which, if it can appropriate the potash, must be the case, inasmuch as the potash in the plant appears only as a carbonate? If the Clover plant can so expel the sulphuric acid, does it remain as free acid in the plant or in the soil? *P. P. C.*

Incrustation in Boilers.—If "A Farmer" will put from 3 to 4 ounces of common washing soda into his boiler every time he gets up steam (provided he does not work for more than a week at one time one supply weekly is enough), he will not be troubled with incrustation. When he has finished work he should blow off his boiler, which takes away all the incrustation in a state of mud. *G. A. H.*

Aylesby and Riby and Glover's Paring Plough.—At pp. 395 and 396 you give us a bit about Mr. Wm. Torr's farming. At "2. Roots" I read thus:—"Immediately after harvest Glover's paring plough is extensively used on the stubbles, as the first operation in the preparation of the land for roots." This is conclusive evidence that Mr. Torr does not keep his land clean. The word "extensively" is dead against him. According to his published evidence his land, after it has grown a crop of Barley or Wheat, then a crop of seeds, and then a crop of Wheat, is overrun with filth, needing a first operation by "Glover's paring plough." Then his mode of working his land is not all perfection, or the land ought not to be in such a state so quickly. He does not tell us the cost of partially getting it out of this filthy state every fourth year, for it never can be more than partly clean to get in such a state as that needing a "Glover" every fourth year. The cost of his preparing land for roots must be considerable. First, the cost of a Glover ploughing, then a forking and burning, and here the seeds are sown for the next crop of filth. The thick is forked up and burnt, and the chaff is left to pass through the next operation. "The strong land stubbles are then broken up in the autumn by the steam cultivator, the light-land stubbles are ploughed." There you are, for in the first case the steam-cultivator plants the chaff or seed, and in the second the plough turns it down to nourish and make it grow. The system upon which Mr. Torr is farming is not all perfection, and he will never get a clean farm so long as he needs a "Glover" to chop his filth into chaff every fourth year. The next operation is by "a horse iron grubber sometimes following the plough," and at the time of sowing the manure is put into the ridges, therefore there must be a ridging and a splitting. The cost of these operations together must be very considerable, yet they do not keep the land clean, nor are they likely to, for the chaff will grow, especially so where it gets well mucked. Let him come to Woolston and get a lesson from the Woolston man as to how to get and keep land clean. The land that I am growing Barley upon every year if farmed upon the "Glover" chaff-cutting system would run to filth as quickly as any in Lincolnshire, yet I can and do keep it clean by a ridging and subsoiling in the autumn by steam, and splitting in the winter by horses, at a total cost of 9s. 7d. per acre, worked a foot deep; whereas Mr. Torr's is not worked over 6 inches deep,—at what cost I cannot tell you, but, according to the report, it must be very considerable. Mr. Torr is a great man with the Agricultural Society, therefore may not condescend to take a lesson from a little man like me, nothing but a little farmer at Woolston, with nothing to commend me but my plain talk and my clean farm, worked at a much less cost per acre than Mr. Torr works his land at. Then he must pay the piper, which he has done hitherto; and his farm practice is not worth following. —— I must have a word upon Mr. J. Howard's summing up of the discussion on the sewage question. He says—"But towns would do well to remember that the sewage should be applied eastward of the town where possible, as, the prevalent winds being west, less effluvia, if any, would be carried to the town than if the sewage were applied on the west side." The "if any" might have been left out, for it is well known that effluvia does fly in the wind from sewage grounds. Take the Bedford one, for instance. It is on the east side of Bedford, and on the south-west side of Goldington, a considerable village near to Bedford. I have seen it, therefore know; and although the Bedford sewage works have been in operation for only a short time, the effluvia driven by the south-west wind at times from its ground into Goldington is fearful. I have this information from the rector of Goldington, therefore I do not get it roundabout. Surely towns must not thrust such a nuisance as this upon villages. Let them at once see to it, for they may as well strangle themselves as their weaker neighbours; and besides, they have no right to strangle their neighbours. They must provide against it. There is a vast value in sewage, but it must be applied without poisoning even village people, before it can be said to be applied practically. *Wm. Smith, Woolston.*

Economical Farm Engines.—Mr. Smith seems surprised at my assertion that a well made engine, doing the work of an ordinary 10-horse engine, should only burn 6 cwt. of coal. Now, in any well made boiler, properly hair-felted and lagged, 1 lb. of coals will boil off at least 8 lb. of water, if the engine is supplied with a water-heater worked by the waste steam. Well, 6 cwt. of coals are 672 lb., and mutiplying by 8 we get 5376 lb. as the water boiled off. But if water is raised into steam at a pressure of 135 into a vacuum, or 120.3 on the square inch of boiler, and if that steam is worked through an engine which expands six times, that is to say cuts off at one-sixth of the stroke, then each pound of water will develop a power of 135,443 foot-pounds, and if we allow three-tenths for friction and waste, then seven-tenths of this are effec-

tive, or 135,443 × 0.7 = 94,810 foot-pounds effective from each pound of water boiled off. Therefore 5376 × 94,810=509,698,560 foot-pounds will be the total effective power. Now, an ordinary 10-horse engine will in reality work up to 20-horse-power, or even 25-horse power if pressed. But a horse-power is 33,000 foot-pounds per minute, or 1,980,000 foot-pounds per hour, and taking nine hours as a full day's work, we get 25 × 1,980,000 × 9 = 445,500,000 foot-pounds as the total effective power developed by a nominal 10-horse engine; and this is less than what I have pointed out above can be got from 6 cwt. of coals in a well-made economical engine. No doubt Mr. Smith will rub his eyes at these figures, and tell us his 10-horse engine will not work with anything like 6 cwt. of coal, and he will tell us a simple fact, but the reason for it is not very far to seek. His engine in all probability has only the barrel of the boiler hair-felted and lagged, the fire-box will be wholly uncovered. His engine, moreover, will not have a water-heater worked by the waste steam, and in consequence I think it is highly probable each pound of coal put into the furnace only boils off 4 or 5 lb. of water instead of 8 lb. Then, again, the boiler will be so weak that it is not fit to work at a higher pressure than 50 lb. on the inch, and his engine will not be fitted with expansive gear, consequently each pound of water boiled off instead of developing 135,443 foot-pounds will only develop about 60,000 foot-pounds, of which only seven-tenths are effective, or 60,000 × 0.7 = 42,000. A pound of coal in his engine then, boiling off only 5 lb. of water will develop a power of 42,000 × 5 = 210,000 foot-pounds, whereas in an engine such as I speak of 1 lb. of coal boiling 8 lb. of water will develop a power of 94,810 × 8 = 758,480 foot-pounds, or more than three and a-half times as much. In fact, his engine would use 21 cwt. instead of 6 cwt. Now, Mr. Smith asks, where he can buy an engine such as I describe. Well, he has not far to go. I am afraid I have no right to use your correspondence columns as a medium for advertising, but as I have no personal interest in the matter, perhaps you will allow me to tell Mr. Smith that if he goes to the house in Nottingham who are building an engine for me, I have very little doubt they will undertake to build him an engine, which will, with 6 cwt. of coals, do as much work as his present 10-horse engine is doing in nine hours of her actual work, that is to say, from six to six, allowing three hours for meals and stoppages. *G. A. H.*

The Road-steamer.—Can you or any of the readers of the *Agricultural Gazette* give me any information as to the capabilities of the road-steamer, the invention of Mr. Thompson, C.E., Edinburgh? If the description of it in the *Times* the other day is accurate, it seems destined to play an important part in the operations of the farm. It is described as combining a cheap motive power, suitable and adapted for ordinary farm haulage, together with the capability of ploughing in a very perfect manner. In the latter operation the engine travels over the land and drags the ploughs, but owing to indiarubber tires, "no indentation whatever is made" . . . "and the wheels do not sink in the least degree in the softest grass-land." "An engine was driven into a newly-dug Potato field, and there ran about into every direction, leaving the soil quite undisturbed." "Up an incline of 1 in 8 the road-steamer, which weighs 6 tons, takes a load of 10 tons." It is said that less power is expended by the engine travelling over the land, and dragging the ploughs after it, than there would be if stationary, and the ploughs hauled to and fro in the ordinary way with wire rope. The weak point of the common steam-cultivating tackle is the larger outlay for plant, which can be employed only during a short period of the year, involving such a charge for interest that the work is frequently cheaper performed by horses; but if all that is said in the *Times* can be substantiated, the road-steamer overcomes this, and after ploughing is done can be profitably employed in hauling out dung, and in the crops, and, in short, any other haulage required on an ordinary farm. *W. J. M.* [See pp. 320 and 324 of the *Agricultural Gazette* for March 5.]

Hedge Plants.—For some years I have had my attention directed to obtaining a substitute for that admirable hedge-plant the White Thorn, and I am inclined to think that amongst seedling Pears which are grown considerably for stock, some variety might be selected of close growth, and bearing spines abundantly, that would, for clay lands at least, be a good substitute for the Thorn, enabling a hedge to be grown to a useful strength many years before those of a Thorn fence. If a good seedling was once selected it should be fruited, and then a race of seedlings raised with the ordinary after-selection. *W. A. Wooler, Sudbrooke Hall.*

The Permanent Fixity of the Tithe Rent-charge.—Thirty-four years have passed away since the Tithe Commutation Bill became law. As modern agriculture progressed, the collection of tithes in kind became a grievance and burthen no longer to be borne by the farming body—hence the passing of the Bill. Although decidedly in favour of the tithe owner, it was a great relief to the farmer. He was no longer compelled to set out his crops in regular rows of shocks, each shook to contain 10 sheaves, and then to wait so many days for the convenience of the tithe owner to come and set a mark on his tithe—*i. e.*, every tenth shock—a sad hindrance in precarious weather. Neither has he the provocation to see him come and take every tenth lamb from his breeding flock, or tenth fleece from his wool-pile for grazing flock, and other like annoyances. All he now has to do is to pay the tithe rent-charge, but even in this he never knows exactly what he has to pay, owing to the fluctuating character of the charge. The question of fixity of tithe rent-charge is now occupying much attention, both amongst payers and receivers. The basis upon which these payments are made is the valuation and apportionment made under the Commissioners appointed by the Act, being the average price of Wheat, Barley, and Oats during the seven years immediately prior to Christmas, 1835; and from that pivot the annual charge was to fluctuate according to the average of every seven years, including the current years, and throwing out the first of the preceding seven years. The Act says: "The apportionment to be of the value of such number of imperial bushels and decimal parts of an imperial bushel of Wheat, Barley, and Oats as the same would have purchased at the prices so ascertained," *i. e.*, in case one-third part of such rent-charge had been "invested in Wheat, one-third part thereof in the purchase of Barley, and the remaining third part in the purchase of Oats." The pivot ascertained from the seven preceding years of Christmas, 1835, gave the value of the bushel of Wheat to be 7*s.* 0¼*d.*; of Barley, 3*s.* 11¾*d.*; and of Oats, 2*s.* 9*d.* For several subsequent years this valuation or pivot appeared equitable, but various causes arose to enhance this average value, so that the imperial bushel ceases to be a true guide. For instance, the general introduction of railways has opened a new mode of conveyance, and by general consent the companies have adopted a uniform rate of carriage, *i. e.*, they will take each sack of Wheat to weigh 18 stones, and charge accordingly, be the natural weight what it may, and Barley and Oats at like assumed weights. We will take Wheat for example. From taking the averages for many years it was proved that the average weight of the Winchester bushel of Wheat was 57 lb.; the imperial bushel would weigh from 2 lb. to 3 lb. heavier. We will take it at 60 lb. per bushel, which is 12 lb. per sack under 18 stones; the railways therefore carry 12 lb. gratis. This difference, small as it is, has led to a change of the custom in buying corn in nearly all our markets. Merchants and millers no longer buy by the sack or quarter, but by the sack or quarter to weigh respectively 18 stones or 36 stones; this instead of the quarter weighing naturally 34 stones 4 lb.: and it is thus returned to the Statistical Department as a quarter of Wheat upon which to strike the averages, by which the annual payment of tithe rent-charge is regulated. It is true if the weight naturally is stated to the Government officer he is bound to regulate the averages according to weight as well as measure, but things have gone on so long, and so quietly, that this is very seldom if ever done now, consequently the tithe owner derives the advantage of the price of 1 stone 10 lb. in every quarter of Wheat, or an additional average value of 1-18th, or about £6 per cent. over and above the natural growth and weight of the quarter of Wheat. The same applies to Barley and Oats, Barley being taken to weigh 16 stones and Oats 12 stones respectively. This inconsistency and injustice to the tithe payer is further proved by the gradual rise of the averages during the last 14 years, the time during which these alterations have taken place. The average annual payment of 33 years has been £100 12*s.* 8*d.*, instead of £100, the pivot; but the average annual payment for the last 14 years has been £104 17*s.* 0¾*d.*, instead of the original £100, arising chiefly from the corn returns being so much above the natural weight. Now, taking these payments collectively, the tithe payers sacrifice nearly a quarter of a million pounds annually. If the time has come for fixing the tithe rent-charge, it must not be upon the fictitious average of the last 14 years; but there is a sufficient and fair basis upon which it may be equitably fixed, and that is to shut out the latter years and take the first 14 years or 21 years. It would lead to many complications, and no little difficulty, to open out a new system of ascertaining averages, although we by no means feel satisfied that Wheat, Barley, and Oats are the sole tests for ascertaining the true value of farm produce. *O. F.*

Native Guano.—Believing the present moment, while time is young and comparatively little mischief has been done in the matter, to be a favourable one for entering the protest roughly set forth in the accompanying letter against what I conceive to be a popular but mischievous fallacy on the subject of sewage utilisation, I beg to hand it you for republication in your widely-circulated columns. In the future interest of our "starved acres," and that of the great body of men who will have to cultivate them under the disadvantage of a rapidly failing supply of the great foreign aid which has hitherto been relied on—guano, as well as in the interest of the consuming public, in short I may say, in the interest of the whole nation, it seems most desirable that a check should be put on the further spread of this fallacy before it is too late. I cannot understand people talking and writing about the enormity of robbing the soil of its wealth, and giving nothing back in return, and then advocating a system which, if allowed to obtain, will effectually perpetuate the very evil they cry out against. Perhaps some of those whose words to this effect have often appeared in your columns will take up the challenge, and tell us in plain terms how the agriculture of the country in its entirety is to be benefited by squandering the sewage of all our large towns on a few small plots of land, and why this system should have preference over one which will admit of some at least of the riches taken from the soil being restored to it at any distance and at any height. I feel assured you will give every facility for the discussion of a question so vitally important to the interests of agriculture as this. *W. E. R.* [The following is an extract from the letter referred to:—

"Upon one point in connection with the matter all are agreed, namely, that it is a crying shame not to return this valuable fertiliser to the exhausted soil instead of allowing it to remain an incumbrance and a nuisance. But as soon as this point is passed, and it becomes a question as to how the thing is to be done, the sewage doctors (and they are many) differ most materially. All of them, however, may, for practical purposes, be divided into two parties—those who advocate its direct application to the land in the gross, and those who are for converting it into some kind of portable manure. At present the former are having it all their own way, for nearly every attempt that is being made, or in contemplation, to utilise sewage on a large scale is on their plan, that is, by carrying it out of the town and pumping it over a small area of ground. By some unaccountable means this plan has obtained a prominence and importance in the public mind which, as can be easily shown, it is far from meriting; for it is open to several minor objections, and to one most serious one, which should be fatal to it. In the first place it involves a heavy outlay in the shape of pumping machinery, pipes for conveyance, and in the compulsory purchase of land, interest upon which outlay must be paid before any profit can revert to the town. Then there is the difficulty, in many cases, of obtaining a suitable tract of land at a convenient distance, and the further one of finding a tenant for it when obtained, for few men at present understand sewage farming sufficiently to be willing to embark their capital in it. These drawbacks, however, dwindle into insignificance compared with the great one which should cause all men interested in the future productiveness of the soil (and who is not?) to raise their voices against it. For this much vaunted system is, after all, only another way of getting rid of the sewage. It does not, and cannot, in any reasonable sense, fulfil the one indispensable condition which should be insisted on in dealing with this question for future time, namely—*that the fertilising ingredients of which sewage is composed should be restored to the land from which they have been drawn.* I say, in any reasonable sense, it does not and cannot fulfil the above condition, for although the ingredients alluded to are by this process certainly restored to some land, it is not the land from which they have been drawn, nor is there any proportion between the two areas. For instance, the richest produce of from 70 to 100,000 acres of cultivated ground annually finds its way into the sewage of Southampton, and if the direct application process were adopted all this would be poured year after year upon 600 or 700 acres only, to the eternal injury and spoliation of all the rest. This is robbing Peter to pay Paul with a vengeance. And yet people have the hardihood to say that it is the best, indeed the only practicable, method of utilising the sewage of our large towns. The only practicable, or in fact possible, way of restoring the fertilising ingredients of the sewage, with any degree of impartiality, to the soil, is by converting it into some form of portable manure; and if all those who acknowledge the justice of the condition above laid down in italics, and are desirous of seeing it enforced, were to confine their attention to the attainment of this point, a vast deal of time, money, and labour would be saved in the settlement of this important question. There are already several plans for the purpose before the public, notably those of the Rev. Mr. Moule, of Dorchester, Dr. Taylor, of Romsey, and the A B C process, now under consideration at Southampton. Of the two former it may be said that they are both good, and from a purely scientific point of view either of them might be adopted with the certainty of a successful result. But practically there is a fatal objection to both, which, it is to be feared, will always stand in the way of their adoption anywhere, except in small villages and isolated dwellings. They both involve house to house collection of the manure, and a tampering with the existing water-closet arrangements, and to this the people, who have got used to the present state of things, show no inclination to submit. The A B C process is not open to those objections. Dealing with the sewage right at the outlet, away from all communication with houses, it converts the solid portions of it into a valuable manure, which, without difficulty, and at very little expense, may be scattered broad-cast over the land, on the highest hills and most shut-in valleys, and leaves the liquid, if not fit for immediate use, at any rate free to mingle with other water without polluting it. That some of the strength of the sewage will still remain in this liquid it is needless to deny, for probably no process, either mechanical or chemical, will ever succeed in extracting the whole of it. But with so large a proportion of solid results to show this is not worth carping over."]

Reclaiming Waste Lands.—As an illustration of this subject, may I call your attention to an expenditure of capital which is at present going on in Lincolnshire for the reclaiming of waste lands? The following account, which appears in a local paper, will, I have no doubt, be interesting to a large number of your readers:—

"In the parish of Tattershall, Lincolnshire, there are hundreds of acres of waste land, producing food neither for man nor beast—a dreary moorland, where wild Grass and Ling grow feebly between the roots of Scotch Fir trees cut down some years since. This land, although

never heretofore worth *6d.* an acre, has been ascertained to be capable of bearing good root crops when properly cleared, drained, and clayed. Small attempts have from time to time been made in this direction with more or less success, the chief obstacle being the great expense of manual and horse labour in digging out and carting away the roots of the trees. It has been reserved for Mr. Bankes, Lord Fortescue's agent, to attempt a bolder experiment by calling in the power of steam to free the land from roots and plough the ground. After a consultation with Mr. Toepffer, of the North Lincolnshire Steam Cultivating Company, Mr. Bankes made a contract with him, and allotted the company a tract of ground on which to commence operations. The work, which has now been going on for some weeks, is of the most interesting character, and is worthy of a brief description. The land, which is of a light, sandy, and gravelly nature, is studded with the stumps of Scotch Fir trees, about 8 or 10 feet apart, in rows at the same distance from each other ; most of the trees have been at the base 12 to 20 inches in diameter. The *modus operandi* is as follows :—Two large ploughing or winding engines, of 20-horse power, are placed about 200 yards apart, with a row of the tree-stumps between them. Each engine is fitted with a drum holding 400 yards of strong steel rope. To start the work, one of the ropes is stretched across to the opposite engine, passed round a sheaf-pulley, and thence returns to the engine, and is fastened to its hind axle. Coupled to the pulley, or snatchblock as it is called, by means of a stout chain, there is a very strong claw-anchor—an enormous and powerful hook, with two flukes. The rope of the second engine is fastened to a chain at the back of the anchor. Four men now lift this anchor, by means of two poles laid underneath its beam, and place it 2 feet behind a tree stump. At a given signal the engine begins to haul in its rope, the anchor quickly draws into the soil, the flukes take firm hold of the roots, and, in less time than it takes to read it, the powerful engine by sheer force tears the stump out of the soil, however firmly rooted. We are told that these 20-horse engines are capable of exerting a strain of 8 tons upon the hauling rope ; by doubling the rope, therefore, a force of 16 tons is brought to bear on the root ; while for very large roots a double snatchblock is used, and a power of 30 to 40 tons exerted : the largest stump is thus extracted with as much ease and expedition as a fanged molar tooth by the forceps of a skilful dentist. As soon as one root is pulled up the second engine slightly hauls back the anchor so as to liberate and disentangle it from the extracted root. The anchor is then quickly laid on its side and drawn forward to the back of a second root, and the process of pulling up begins again. When fairly at work we have seen the roots pulled out at the rate of one a minute. Two other engines of less power are engaged in drawing the released roots off the land into large heaps (to be burnt when the dry weather comes, if not worth removing), and thus preparing the land for the 16-furrow plough which stands close by. Great credit is due to Mr. Bankes for his bold and original idea of bringing large tracts of waste land into speedy and profitable cultivation, and to Mr. Toepffer for his ingenuity and skill."

The work which is here described is what in Sussex we call "grubbing," and the cost there is 1*s.* to 1*s. 6d.* per square rod by piecework, that is to say, from £8 to £12 per acre, and I have no doubt it is the very work which Mr. Toepffer refers to at p. 1263, Dec. 4, 1869, as having taken at £3 10*s.* an acre. If an illustration were wanted to show the saving that steam-power may effect when applied to land, we have it here. We must not, however, jump too hastily to the conclusion that these figures show the difference between horse and steam-power. Manual labour costs £8 to £12 against £3 10*s.* for steam-power ; but manual labour is always much dearer than horse labour. A horse will exert a power equal to six men, so that two horses and their driver to guide them may be reckoned as equal to 12 men ; but 12 men would cost about 24*s.* per day, whereas a pair of horses and one man would only cost 8*s.*, or one third. Now, if we take the average cost of grubbing up old roots to be £10 an acre by manual labour, then horse labour, if it could be applied to it, would only cost one third, or £3 6*s.* 8*d.*, against £3 10*s.* for steam-power. Those who think that steam is to work such wonders for agriculture are, I think, running too fast. Steam undoubtedly will do a great deal, but it will be not so much by cheapening our operations as by enabling us to get things done at the proper moment. It will give us a great reserve of power, lying dormant, at comparatively little expense, and ready to be put forth at the proper moment. A peck of March dust is worth a king's ransom is an old saying, but if we could do all our seed work in a single day an ounce of March dust would serve our purpose. If I might offer so experienced a manager as Mr. Toepffer a suggestion, it would be, make two old stumps mutually pull each other out of the ground ; put an anchor behind each of them and a pair of blocks between. The pull on his engine-wheels will be less, and the battle between the old worn-out stumps would be quite as good fun to look on at as that between Woolston and *G. A. H.*

Societies.

CIRENCESTER.

Top-dressings.—At the last meeting of this Chamber Professor WRIGHTSON presented the report of the experimental committee of the Chamber. We make the following extracts from the report :—

In the autumn of 1868, the sub-committee resolved to undertake experiments upon Wheat cultivation and manuring. In planning these experiments the committee resolved, 1st, that the trials should be of a simple character ; 2d, that the same experiments should be simultaneously carried out upon as many farms as possible ; 3d, that each experiment should be represented by at least two plots ; 4th, that one-twentieth part of an acre was a suitable size for an experimental plot. It was also determined that the experiments should consist of two series—one a comparative trial between manure substances, and the other between two or more methods of cultivation.

These experiments were undertaken by the Right Hon. Earl Bathurst, the Agricultural College, Mr. Ruck, of Braydon Manor Farm ; Mr. Edmonds, of Southrop ; and Mr. Smith, of Bibury. Mr. Iles, of Kempsford, and Mr. Little, of Norcote, undertook similar series of plots upon Barley ; and Mr. Plumbe, of Ashton Fields, subsequently carried out some interesting root experiments. The College undertook to weigh and send out the manures, to provide analyses, and to tabulate the results—the Chamber paying for the manures and other expenses.

Manure Experiments.—It was determined to restrict these experiments to superphosphate and nitrate of soda ; (1) combined and separate ; (2) applied in winter and in spring ; (3) applied separately in two portions, at two distinct periods. Two unmanured and untouched plots were also to be provided for comparison.

Simple as these experiments may appear, no fewer than 18 plots would be required to carry them out, a number entailing a considerable amount of trouble and anxiety. They were proposed with a view of finding the effect of superphosphate when applied in conjunction with nitrate of soda ; (2) of arriving at the proper period for applying these substances to the land ; (3) to accurately determine the effect of such application in this district, and how far they are profitable to the farmer.

The following is a list of the plots required in order to carry out the experiments :—

Two plots dressed at the rate of 3 cwt. per acre of superphosphate and 1½ cwt. nitrate of soda. Applied in winter.

Two plots dressed at the rate of 3 cwt. superphosphate and 1½ cwt. nitrate of soda. Applied in spring.

Two plots dressed with 1½ cwt. of nitrate of soda per acre. Applied in spring.

Two plots dressed with 3 cwt. of superphosphate in winter, and 1½ cwt. of nitrate of soda in spring.

Two plots dressed with ¾ cwt. of nitrate of soda per acre twice, the last dressing to be applied one month after the first.

Several plots on the College Experimental Farm were dressed with similar applications, double the amount per acre being used.

These proposed experiments have, on the whole, been satisfactorily carried out. As might have been expected, the original intention has not in every case been strictly adhered to, but if the Chamber is encouraged to proceed —by the results obtained during the first season — a greater perfection and more systematic manner of carrying out the experiments will be attained.

In these experiments the following questions were put to the soil :—

1. What is the effect of nitrate of soda in increasing the crop?

2. What increase is obtained by adding "superphosphate" to nitrate of soda as a dressing?

3. Does the time of application cause a difference in the effect produced?

4. May nitrate of soda be applied at two periods instead of all at once with advantage?

5. Is a heavy dressing (say of 3 cwt. of nitrate of soda) more effective than a dressing of 1½?—and is 1½ cwt. more effective than ¾ cwt.?

These five questions have to a certain extent been answered by the Chamber experiments : in some cases clearly and definitely, in others with more or less uncertainty. Even the most definite answers must be only looked upon as correct for a particular soil and season, and therefore a repetition of some if not all the experiments is desirable.

Nitrate of Soda results.—The Table shows the main results obtained upon the Oakley Park Home Farm. The plots were 1-20th of an acre each, and each application of manure was repeated in a duplicate plot. The greatest pains were taken to obtain absolute correctness in measuring the land, weighing the manures, and harvesting and threshing the produce. The corn was cut by hand, taken to the barn when dry, and immediately threshed. A list of the plots has already been given. The Table gives the amount of increase per 100 lb. of nitrate of soda used per acre. It will be seen that 1½ cwt. of nitrate of soda is followed by an increase of 220 lb. of Wheat, while an application of ¾ cwt. of the salt has caused an increase of 178 lb. of Wheat per 100 lb. of nitrate used, indicating the greater effect of the heavier dressing. Glancing at the Table showing the results obtained on the College Experimental Farm with the same fertiliser, it will be seen that 166.6, 280, and 309 lb. respectively represent the amounts of increase per acre obtained per 100 lb. of the nitrate when the dressing was at the rate of 168 lb. per acre, the average of these three being 252 lb. for every 100 lb. of nitrate of soda used. In close proximity with these were three plots manured with 336 lb. of nitrate of soda per acre. These show respectively 288.6, 169.6, and 312.5 lb. as the amount of increase per 100 lb. of nitrate of soda used, or an average of 257 lb. Hence in both these cases the heavier the dressing, even up to 3 cwt. per acre, the greater was the relative effect. In the third place, taking Mr. Smith's (Bibury) results from dressings of 168 lb. per acre, three plots in this case give respectively 262, 262, and 309.5 lb., or an average increase of 277.8 lb. of grain per 100 lb. of nitrate of soda employed. Comparing this with a solitary plot, also at Bibury, manured with 90 lb. per acre of the salt, we find an increase of 150 lb. of grain. In all these cases, then, we have a clear answer in favour of 1½ over ¾ cwt., and a fair presumption that even heavier dressings may be applied economically. Lastly, Mr. Edmund Ruck's experiments furnish the results of four plots, each manured at the rate of 168 lb. of nitrate of soda per acre, the increase being as follows :—176, 212, 188, 212 lb. per acre, or an increase of 197 lb. per 100 lb. of the nitrate applied. Gathering these results together, so as to obtain a general view, we are able to construct the following Table :—

PRODUCE PER 100 LB. OF NITRATE OF SODA PER ACRE.

Experimenters.	When 80 to 90 lb. per acre was used.	When 168 lb per acre was used.	When 336 lb. per acre was used.
Earl Bathurst ..	178 lb. Wheat	220 lb. Wheat	....
The College ..	....	252 ,,	257 lb. Wheat.
Mr Smith ..	150 lb. Wheat.	277.8 ,,	....
Mr. Ruck ..	....	197 ,,	....
Average ..	Of 2 plots, 164	12 plots, 234 7.	3 plots, 257.

Mr. Ruck's experiments, it must be remembered, were made upon a stiff Braydon land, and illustrate a fact previously observed—that clay land does not respond to applications of nitrate of soda so freely as land of a lighter character. These results may easily be reduced to a money standard. Taking nitrate of soda at 16*s.* per cwt., then 100 lb. cost 14*s.* 3¾*d.*, and reducing the Wheat increase into bushels of 62 lb. each, we find that for an expenditure of 14*s.* 3¾*d.* Earl Bathurst obtained 3½ bushels of Wheat, which, at 6*s.* per bushel, equals 21*s.* ; the College, for an expenditure of 14*s.* 3¾*d.*, obtained 4 bushels of Wheat, which, at 6*s.* per bushel, equals 24*s.* ; Mr. Smith, of Bibury, for an expenditure of 14*s.* 3¾*d.*, obtained 4½ bushels of Wheat, or 27*s.* ; Mr. Ruck, of Braydon, for the same expenditure, obtained 3½ bushels, or, at 6*s.* per bushel, 19*s.*

Several trials were also made as to the advisability of applying nitrate of soda at two periods, instead of all at once, but without any definite result.

Nitrate of Soda with Superphosphate.—The Oakley Park Farm results were generally unfavourable to the addition of superphosphate. This was borne out by the average results on the College Experimental Farm.

Mr. Moss, Lord Bathurst's bailiff, considered that the superphosphate applied in the spring exerted a prejudicial effect upon the young Wheat, by "burning" it.

Mr. Ruck's experiments upon the Braydon land are generally in favour of the addition of superphosphate. It is worthy of observation, however, that the good result is in a great measure due to the very superior excellence of one plot. This, when removed from the calculation, leaves five plots, the average result of which only gives 58 lb. of corn as the increase over what had been obtained by nitrate of soda alone.

The Bibury land speaks unequivocally in favour of superphosphate as an addition to nitrate of soda. These several observations will be borne out by a careful study of the accompanying Table.

Comparison between Winter and Spring Dressings.—Three out of the four series of experiments are decidedly in favour of the spring application, when compared with the same dressing applied in winter. Mr. Smith, of Bibury, is, however, here again exceptional. Earl Bathurst's results showed that 200 lb. of superphosphate and 100 lb. of nitrate of soda, applied in January, gave an increase of 101 lb. of grain per 100 lb. of nitrate of soda used. The same dressing applied March 5 gave a corresponding increase of 290 lb. ; while a third plot, in which the superphosphate was applied in January, and the nitrate of soda was subsequently applied in March, gave an intermediate quantity of 148 lb. increase. When superphosphate has been added to nitrate of soda, the increase has been calculated upon the nitrate of soda alone, so as to make the results comparable with those in which the nitrate alone was used : the difference in the results obtained by the use of the mixed substances being then clearly traceable to the addition of the superphosphate. Next, taking the College results, it was found that a winter application gave the very feeble increase of 89 lb. per 100 lb. of nitrate of soda used. Unfortunately the result of the duplicate of this plot was lost, but every one who inspected them while growing was struck with the poor effect of the winter-dressed portions, when compared with the beautiful luxuriance of the plots dressed in spring. Two plots which received 3 cwt. of superphosphate and 1½ cwt. of nitrate of soda, in the spring, gave respectively an increase of 417 and 240 lb. of grain per 100 lb. of nitrate used.

Mr. Ruck obtained an increase of 105 lb. from a dressing with these two substances on Feb. 23, again calculating the result upon 100 lb, of nitrate of soda ; but when the superphosphate was applied in the winter and the nitrate of soda in the spriug (April 9), or both substances were applied in the spring, the increases calculated in the same manner as above were respectively 319, 331, 280, and 271, with one exceptional plot, which gave an increase of 712 lb. Mr. Ruck is therefore firmly convinced in favour of the spring application. Not so Mr. Smith, of Bibury, who singularly but most decidedly declares in favour of winter application. In similar experiments which are being carried out in the present season, sulphate of ammonia has been substituted for nitrate of soda, as a better substance for testing the merits between the two periods of application.

Comparison between Nitrate of Soda alone, and Nitrate of Soda with Superphosphate.—While nitrate of soda gave upon an average of two plots an increase of 220 lb. of grain per 100 lb. of nitrate of soda (the dressing being 1½ cwt. per acre), the addition of 200 lb. of superphosphate reduced the above increase to 180 lb. ! This was the result at Oakley Park.

On the College Experimental Farm, the average of six plots (five of which were spring application), manured with the mixture, gave an increase of 268 lb. per 100 lb. of nitrate employed ; or, if we take the average of the five

spring dressed plots, of 303 lb. The nitrate of soda plots gave a comparable increase of 252 lb. This is not, therefore, an inducement to add superphosphate to nitrate of soda.

Mr. Ruck obtained an average of 197 lb. increase from four nitrate of soda plots (respectively 176, 212, 188, 212 lb.) for every 100 lb. of this fertiliser; and from six plots, to which the addition of superphosphate was made, he obtained a comparable increase of 333 lb., but if the one extra good and exceptionable plot be eliminated from the calculation an increase of only 252 lb. The difference according to the latter figure in favour of the additional expense is not satisfactory, scarcely coming up to one bushel of Wheat. Again, the flour spring-dressed plots gave an average increase per 100 lb. of nitrate of 295 lb. The Bibury land appeared to derive special advantage from the addition of superphosphate.

Pecuniary Statement.—In the foregoing remarks the increase due to the superphosphate is clearly indicated when the results obtained by nitrate of soda alone are compared with those obtained by the same substance associated with superphospate. These two substances were combined in the ratio of 1 to 2, usually 1½ of the one and 3 cwt. of the other. It is, therefore, easy to determine whether the additional cost of the superphosphate has been remunerative. Lord Bathurst and the College at once condemn it, so far as one season's trial can decide. Mr. Ruck obtained a further increase (beyond that of the nitrate alone) of 136 lb. for every 200 lb. of superphosphate applied. At 6*s.* per cwt. this 200 lb. cost 10*s.* 8*d.*; 10*s.* 8*d.* has produced 136 lb.—two and one-fifth bushels of Wheat, which at 6*s.* = 13*s.* 2*d.* In this calculation the superphosphate has paid, and if the winter-dressed plot is excluded and the comparison is made with the spring plots alone, it will be seen to have paid very fairly.

Mr. Smith's results, looked at in a money point of view, may be thus stated:—

Average increase of three plots per 100 lb. of nitrate of soda	278 lb.
Average increase of four plots per 100 lb. of nitrate and 200 lb. of superphosphate	517 ,,
Difference due to 200 lb. superphosphate ..	239 ,,

And 239 lb., nearly 4 bushels, at 6*s.* per bushel, equals 24*s.* As the 200 lb. of manure only cost 10*s.* 8*d.*, the profit is very satisfactory in this case, and the addition of superphosphate has well nigh doubled the effect of the nitrate.

Mr. Iles' (Kempsford) Barley Experiments. Mr. Little's (Norcote) ditto.—Experiments on the College Experimental Farm.—It is not often that Barley is top-dressed, the land usually being in high condition when it is sown. From the experiments undertaken last year, as well as in 1868, there appears to be a much greater uncertainty in the results obtained from applying dressings to this crop than to Wheat. Thus, Mr. Iles' experiments consisted of two plots manured with superphosphate, 3 cwt. per acre; and two plots manured with 1½ cwt. per acre of nitrate of soda. These were compared with two unmanured plots, and the results can only be spoken of as puzzling in the extreme. A nitrate of soda plot, and one of the superphosphate plots, give the same return as an unmanured plot, while the duplicates in each case give a moderate increase, favouring the application of superphosphate. Mr. Little's (Norcote) experiments upon top-dressing Barley were also contradictory, and both these indefinite results bear out what I had observed in 1868, namely, that top-dressings applied to Barley after roots are uncertain in their effect—the local disturbances owing to the changes of the weather, while the sheep are upon the land, rendering the soil in some cases worse fitted for the reception of the seed, and thus interfering with the accuracy of the experimental plots, goes far to explain this observation.

Mr. Plumbe's (Ashton Fields) Root Experiments.—These experiments had but one object in view, namely, how far increasing the amount of superphosphate would correspondingly increase the crop. The result shows that when 3, 5, and 7 cwt. of Lawes' superphosphate were respectively applied, no marked increase in crop was obtained by using the larger quantities of manure. This result was on the whole borne out by similar experiments carried out on Earl Bathurst's home farm in 1868, although the results obtained during such a dry season upon Swedes could not alone be considered satisfactory. As confirmatory evidence they have a certain value. In 1867 I tried the effect of heavy dressings upon Swedes, and although I obtained a better result from 6 cwt. of superphosphate per acre than from 5, the crop produced by 8 cwt. of superphosphate was no better than that grown by 6 cwt.

Farm Memoranda.

Banffshire, Boyne District: *March* 11.—The month of March came in true to the old proverb, "roaring like a lion;" but whether it will go out like a lamb remains to be seen. However, the gales have completely taken the frost out of the soil, so that ploughs have worked freely in all districts, and our clays in the Boyne have turned over beautifully, neither too wet nor too dry. Is is a remark here that the clay-land is in a fit state for work when it carries the horses without marking in the clay. Should it continue a few days dry, sowing will commence on the coast side, but farther up the country it will be some time before the land will be ready; but with double furrow ploughs, and the day at the length, a great amount of work can now be done in a short time.

Turnips, where not furred up, are mostly useless with so much bare frost, and some people, who thought they would never consume them, find now that they must draw in a little; but straw and hay will be plentiful. The rot among the Turnips has affected the markets, for store cattle and fat have been stiff for some time. Grain is still low in price, except for prime samples for seeds, and at the Banffshire Society meeting held at Portsoy last week some excellent grain was shown, and high prices given at the auction sale for the prize samples.

At the spring show of this society young bulls and fat cattle are shown. In the class of Shorthorns Mr. Longmore won easily with his Lord Forth. Mr. Shand Ordens, of this district, showed a pair of 3-year-old fat stots and a pair of queys, which were greatly admired. They were out of cross cows and after a bull bred at Rettie, which was descended from Jonas Webb's stock.

Last week Mr. Longmore's sale of bull-calves came off, and although we have seen the bidding more spirited, yet fair prices were obtained. Eleven bulls averaged £33 0*s.* 6½*d.*; four cows and heifers averaged £33 6*s.* 0*d.* The highest price obtained was for the first in the catalogue, 56 gs. Mr. Longmore still retains forty-five of a breeding stock, also twenty 1-yr. and 2-yr. old heifers, and three bulls. Mr. Longmore told the company assembled at his last sale that the first public sale he attempted was at a Cornhill market, when 15 guineas was the highest price that could be got for bull-calves. The auctioneer jocularly remarked, "Well do I remember what you said to me on the occasion, 'That you would rather take them home and cut them.'" But now, such is the demand for pedigree stock among farmers in this district, that a bull-calf with a want in the pedigree on the mother's side, failed to bring an offer of any kind, although a very good beast.

"Perseverance" is the watchword with Mr. Longmore, whether in the breeding and feeding of stock or in the cultivation of the soil; and although now above fourscore years, he displays an energy which would be a lesson to many a young man. As an example: last year, having renewed his lease from the Earl of Seafield, an old wood of twenty acres extent had to be reclaimed, and the appearance of it would have been enough to frighten many a man, but before months were over, after the bargain was concluded, a gang of men were at it—trenching, boring, blasting, dyking, and everything going on at once; and Mr. Longmore had the satisfaction of having it all in crop last summer. By the liberal use of guano one half of it was an excellent crop; the other half, not being got ready so soon, was not so good, as the drought set in before it got up. Since the crop was off he has thoroughly drained every acre of it, and has still to lime and dung it, which he intends to do as soon as he can get at it, when he will have the satisfaction of having added to the national supply for the growth of meat to our hungry millions. And surely if a man be entitled to his country's gratitude for making two blades of Grass grow where only one grew before, Mr. Longmore has earned it for having added acres where nothing grew before. But, meantime, I must conclude, wishing you all a good seed time. *W. J.*

North Riding of Yorkshire: *March.*—The inclemency of the weather during the month of February has been without parallel within the remembrance of the writer. With few exceptional days we had frost during the entire month, and for some time of great intensity. On the 9th we had a cover of snow, which yet lingers on some of the roads and hedge-sides. The fieldwork on the farm has been at a standstill, but the frost presented favourable facility for the cartage of manure to the fields, and a profitable employment for men and horses.

The season has been extremely unfavourable for sheep, more especially for the ewes in lamb, and great care and liberality in feeding has been requisite to keep them in a healthy state and good condition. On our own farm, with a flock of 360 ewes, the staple food has been hay and hay-chaff. However good Turnips or Mangel may be after lambing, experience convinces us that they are by no means proper food before, and that nothing is so good as hay. Oats are recommended by some; like Turnips we have found them excellent after lambing, as encouraging a flow of rich milk, but when used freely before, we have suffered more loss by inflammation after parturition than when not used, and we repeat there is nothing so good as hay.

The foot-and-mouth disease, though considerably abated, yet lingers in the district, and considerable loss has been sustained by individual farmers by its ravages.

The Wheat fields now look as brown as those in fallow, the severe frosts cutting off the blade of the young plants to the soil, and the alternate softening and freezing of the surface has left it in so loose a state that we cannot doubt but that the plant has been much thinned by "showing Oat;" and a free use of the Crosskill is very much required as soon as sufficiently dry.

The frost has been in favour of the fallows and other land intended for spring corn, the latter with a week's dry weather will be in excellent order for the reception of the seed. So far none has been sown, and, indeed, much land intended for Wheat has, owing to the inclemency of the month, been unsown, and will now be seeded with Oats or Barley.

As threshing proceeds the yields of the various crops are shown to be very indifferent. In our own case we find Oats yield less than either Wheat or Barley, according to bulk. Wheat yields less than we expected, Oats very much less, but Barley rather exceeds anticipations.

Fat markets are rather sluggish, the supply of prime fed beef not great, but of half-fat animals large. The demand for mutton is quite equal to the supply. *W. J. M.*

Mr. Pollok's Estate near Ballinasloe.—The estates embrace an area of about 30,000 acres, and were purchased in 1853 by Mr. Pollok for the sum of £250,000. In addition to that sum, Mr. Pollok, for the purpose of getting his contemplated improvements properly executed, paid large sums to the small tenants to go out, although they had no legal claim against him; which, together with the large outlays on improvements, amounted to £350,000, making in all, for purchase, buying out tenants, and improvements, £600,000. The estates, when purchased by Mr. Pollok, were in the most neglected condition. Land almost valueless from stagnant water, gapped fences occupying about one-fifth of the total area, crops scarcely worth the labour that produced them, poor tenants and tumble-down cottages, characterised this estate. On the Lismany estate improvements on the most extensive scale have been carried out. Old fences have been removed, the land has been divided by stone-built and lime-pointed walls into rectangular fields of 50 acres each, homesteads conveniently placed for the economical cultivation of the land attached have been erected in the most substantial manner; new farm roads have been made, and every reclaimable acre, by draining, liming, and boning, has been made available.

The estate is not remarkable only for the magnitude of the improvements, but also for the efficient manner in which every operation has been executed. Drainage is so perfect, that water-grasses and Rushes have been supplanted by the most nutritive grasses. A large area, naturally too soft for cereal cultivation, has been laid down to Grass in the most perfect state; and, from the number of cattle and sheep fattened, and the liberal use of artificial foods and manures, the land is in the highest condition. The Grass area carries a great number of stock, the cereal crops are bulky and productive, and the root crops are unequalled in the richest soils in England. One field, containing 50 acres, on the home farm, was last year under Swedes, and the crop was the largest I ever saw. The yield per acre would not be short of 35 tons. This field, when the estate was purchased, was let at 8*s.* per acre—it is now worth 36*s.* Altogether these estates for efficient culture are not surpassed by any estates in Great Britain. Their magnificent homesteads, richly manured lands, weedless fields, finely pulverised fallows, and pastures teeming with flocks, indicate the most perfect system of agriculture.

I need scarcely add that improvements so perfectly executed could not fail in proving remunerative to Mr. Pollok. The home farm, embracing an area of 4000 acres, yielded last year—after charging interest on the farming capital—a nett profit of £2098. In the twelve months ending November 1, 1869, Mr. Pollok sold 1941 head of cattle, 6358 sheep, and had 385 acres of green crops, 296 acres of Oats, and 346 acres of Wheat.

Mr. Pollok's system of farming has been called an exotic; but it is an exotic in the same sense as civilisation is an exotic in the midst of barbarism, or a fruitful field in a barren waste. Were all the land in Ireland improved in a similar manner to Mr. Pollok's Lismany estate, it would yield one-half more produce than it now yields, and, during the next 20 years, give employment to double the number of labourers now employed. *Mr. Sanderson's pamphlet on "The Irish Land Question."*

Miscellaneous.

Salt for Agricultural Purposes in France.—Some years ago Mr. Corbett, of Stoke Works, in this county, took great pains in making a compilation of the evidence as to the beneficial application of salt as a fertiliser of the soil, and about the time of the negotiation by Mr. Cobden of the treaty of commerce between this country and France, evidence was given on the part of the salt trade of England before a French Commission, sitting in Paris, that the quantity of salt yearly consumed in this country for agricultural purposes was about 100,000 tons. Subsequently Mr. Corbett translated into French the evidence on this subject of several English farmers and writers of authority on agriculture, and had it printed in pamphlet form, with a dedication to the Emperor of the French. A copy of this work, and of the *Moniteur Officiel* (the Government organ), are now before us. The latter contains a report from his Excellency M. Magne, the Imperial Minister of Finance, in which he recommends the abolition of the whole of the duty on native salt used for agricultural purposes. In consequence a decree, bearing the signature of the Emperor, has been promulgated, ordering that the duty on such salt shall be abolished as recommended. *Worcestershire Chronicle.*

Dairy Produce, Ireland.—I am disposed to think that the produce of my dairy does not fall short of what might reasonably be expected upon middling land. The year 1868, of which I sent you the details, was so dry and hot that the produce was diminished,

but the price was higher in consequence. I shall, however, give you the average produce of the three previous years, very accurately kept, and ascertained by measuring the milk of each cow once a month :—

Milk from each cow, 500 gallons.
Butter, as paid for in Dublin, and subject to some loss of tare, 197 lb.
Quarts of milk required to make 1 lb. of butter, 9·95 quarts.

The money produce has been as under :—

						£	s.	d.
Butter	..	..	..	..	..	13	0	
Milk	..	..	..	..	..	1	7	6
Calf (at birth)	..	..	..	..	..	0	7	6
					£	15	7	2
Wages	..	..	..	..	£1	15	5	
Other expenses	..	..	..	..	0	5	8	
Loss on cows	..	..	..	..	0	11	3	
					2	12	1	
				£	10	15	6	

This gives a larger surplus than the statement of last year, but wages and expenses are steadily increasing. I may remark upon this statement that the butter has been sold sweet at the highest price in the Dublin market, and has netted, after paying carriage commission, nearly 1*s.* per lb. I think my produce is not under what is usual in this country, as I know that 3 firkins salt butter, equal to 192 lb. of fresh, is considered a very satisfactory return on middling land, and that 4 firkins, or 256 lb. of fresh butter, is considered the produce of the best dairy land. That this is much about the usual produce, is, I think, proved by the rate at which dairymen hire dairy cows, varying as it does from £10 on middling land to £12 or sometimes £13 on good land—a rate which is diminished to the extent of 25*s.* to 30*s.* a cow by various allowances, such as Potato ground, and the grazing of pigs and geese. At this rate the dairymen make a living by their labour and that of their families ; but not much more, and in a bad season they often lose many. *An Irish Subscriber in the "North British Agriculturist."*

Realisation of the Chemical Valuation of Manure.—All, of course, that the chemist does is to tell us that there are in a ton of ordinary sewage so many ounces of ammonia, phosphorus, and potash,—substances which have a certain market value per pound, a value at which in guanos, superphosphates, and other fertilisers, farmers are generally glad to buy them. But it must be remembered that it is only under certain circumstances that it answers the purpose of the farmer to buy guano or superphosphate and apply it to his crops ; and 20 years or more having elapsed since guano and superphosphate have come into general agricultural use, these circumstances are now perfectly well understood. It is only to certain crops, in certain quantities, to certain soils, and at certain times of the year, that guano can be profitably applied. If given to the land in excessive quantities, at the wrong time, or to the wrong crops, it will not reproduce the 13*s.* given for every cwt. of it,—the price at which, on the chemist's valuation, it was bought. Sixpence worth of the nitrogen or ammonia, whether of guano or of sewage, or of the phosphorus, whether of bone-dust or of sewage, will not necessarily create sixpence worth of additional fertility by its use in agriculture. It may do this or more in skilful hands, but it is quite as possible that it may be thrown absolutely to waste, or even made mischievous and injurious. A plant is a living thing, which must be kept in health by other conditions, as well as by the mere presence in fitting forms of the material it feeds upon, or it will not produce a crop at all ; and I do not think that this is sufficiently borne in mind by enthusiastic believers in the value of town sewage. They seem to think that the twopence worth of fertilising matters which may be in a ton of it must reappear in the form of at least twopence worth additional of the crop to which it is anyhow, or anywhere, or any *when* applied. Whereas it is plain that it is upon the how, the where, and the when that the advantage or the profit of this or any other dressing of manure depends. And great as have been the results of the application of sewage upon Lodge Farm, it is, I believe, in the certainty that they might have been much greater under better management, in the lessons which have been learnt for our future guidance, in the blunders and the losses by which we have been taught something of the how, and when, and where of future sewage applications, that the chief value of the year's experience lies. *J. C. Morton, in a Report to the Metropolitan Sewage Company.*

The Week's Work.

March 26.—*Seed-time.*—The sowing of corn crops should continue to be prosecuted with increasing assiduity as the season advances, until all the land is seeded. The separate sowings of Vetches should also be attended to as formerly directed for the successive cuttings and foldings of summer.

Oats.—On this subject an illustrated paragraph will be found in another page.

Potato Planting is now general in our southern counties for the main crop, the work of planting continuing northwards up to the latter part of April. Some fallow and manure in autumn, but the greater breadth is manured at the time of planting, either on the flat or in 30-inch ridges. The latter plan of manuring is becoming more and more common, with the exception of very dry, open, porous soils. In such the manure is sometimes spread over the whole surface and ploughed into every furrow. In other examples it is ploughed into every third furrow only. In the former case the sets are generally dibbled in, but in the latter they are dropped into every third furrow with the manure, 9 to 12 inches apart, as in ridges. Some diversity of opinion exists as to the degree of rottenness of the dung, but the general practice is to apply it less rotten to Potatos than Turnips, but with sufficient sap to ensure its ready incorporation with the land. Dry rot or firefanging in the land is, on the contrary, highly objectionable, being injurious to Potatos. A mixture of guano and superphosphate, 1½ cwt. each, with 15 cwt. of common salt per acre, would do much to prevent dry rot, and to incorporate the manure with the soil. The ridges are set up and the manure covered in either with a double mouldboard plough, or with a double turn of a common plough ; and the work should not be done in rainy weather, when the land poaches, as the crop is partial to a good working season. In ordinary years the ridges receive a stroke of the harrows some three weeks after, purposely "to let the plants out." But in very dry weather it is common to roll down the ridges flat, more especially in the lighter descriptions of soils, the better to keep in the sap. An exceptional practice is to grow Potatos with compost spread evenly over the surface of the land, the sets being planted also on the surface along the edge of the outcast furrow of the double mouldboard plough, so as to be in the middle of the ridge formed by the next furrow. In Ireland old grass-lands are frequently broken up with a crop of Potatos on the lazy-bed plan. The land is laid out in narrow beds, the sets are then planted on the grassy sward and lightly covered at first with earth dug from the alleys between the beds. Heavy crops are thus raised, but heavier would no doubt be grown were 2 cwt. of guano with an equal dose of superphosphate and 15 cwt. of salt per acre spread evenly over the Grass before planting.

Seed Potatos require to be carefully selected in order to avoid disease, degeneracy, and mixture of kinds. To effect this they should be carefully examined a second time during the operation of cutting, and those showing any rottenness or mouldiness should be thrown aside for the pigs, and only the sound ones used for sets. Small Potatos, that have not attained maturity of growth, and large ones, that are abnormally unshapely and overgrown, are also objectionable for seed. Thin slices, when inadvertently made, should be thrown aside, as they do not supply sufficient nourishment to the young plant in starting. Some plant the sets when newly cut, but the more advisable practice is to allow the cut surface to become covered with a skin, which soon takes place if the sets are spread thinly over the floor and turned once a day. Newly cut sets should never be put into sacks or heaps for any length of time, as they are very liable to heat and thus sustain harm.

Lady-Day is one of the principal English terms, and although fewer changes take place in England than in Scotland and Ireland, changes do take place between both landlord and tenant, and tenant and labourer.

Paring and Burning in breaking up grass-lands not unfrequently follow Lady-Day entries, and in such cases, however unfavourable the season may be for the work, the paring plough must be yoked, the drying and burning of the sods being left to the mercy of the weather to come. Should the sods be beat down with rain they can be raised again by a stroke of the harrows, and so on.

Stifle Burning may be delayed for some time, but there are many exceptions to the general rule which require that the work should be done as soon as practicable ; and the end of March is often better than the end of April for stifle burning.

Wheat Hoeing will perhaps be later than usual, but on the other hand the season requires that the hoes be started as soon as the weather will at all permit, so as to give the young plants the timely benefit of the operation, and thus overtake bygones as much as possible. In other words, if Nature has hitherto been moving at a retarded pace, and is likely to be behind her usual time of tillering and the formation of the ear, keep the hoes going, so as to help her onwards with accelerated speed for the future until she overtakes the past. Much can be done in this way.

Irrigated Meadows.—The weather of the past month has retarded greatly early spring growth, so that the first cutting will be later. But we have always found it advisable in such cases to take time by the forelock and cut as much shorter as the season is later, and then force forward the future cuttings with a little extra doctoring, if needful, by means of soluble fertilisers.

Swine.—Sows are generally timed to farrow their first litter for the season about the close of the month, and sometimes earlier on dairy farms, to consume the buttermilk and skimmed milk when the cows calve early. Keep the pigstye warm and dry, and attend to cleanliness generally, with a nourishing diet by mixing meal in the milk. In dairies where the whole milk is churned the buttermilk will supply a sufficiency of sour food, but where the cream only is churned more sour food will be required than the buttermilk.

Commercial Dairies now supply their customers with milk and butter at this season in equal quantity and quality as in the summer time, and cheese manufactories are also being erected for the making of cheese regularly throughout the year ; but on the old plan very little cheese is made just now.

Highland Sheepwalks.—The breeding flocks from the more elevated sheepwalks continue in the lowlands, on Turnips and rough pasture. With the exception of places where the Cotton Grasses grow, there is hardly any vestige of spring life until about the beginning of April. *W. B.*

Notices to Correspondents.

Alderney Cattle : *C. P.* Look in the index of the "English Agricultural Society's Journal." You will find an essay on Guernsey Cattle in a past volume, which will tell you all you want. Alderney cattle are mostly Guernseys.

To Correspondents : *H. J. M.* We had unfortunately mislaid your letter, and hence the delay of publication.

Top-dressings : *Mr. Sweet Malbank* asks if any of our practical readers will inform him whether he does right in top-dressing a second white crop in succession with a mixture of guano and salt, 2 cwt. of the former to double that weight of the latter? He also asks what top-dressing for Barley is recommended? Sulphate of ammonia, or nitrate of soda, is effective, but these special manures are so very costly—£17 to £18 per ton. Why should not the best Peruvian guano do as well? [No one can answer the former question without knowing the condition of the soil,—without, in fact, knowing the character of the balance to its credit, its quantity and quality. It may be quite possible, and it is *probable*, that a second dressing will get a second crop. Barley has often been benefited by superphosphate, and Peruvian guano will probably do as well as nitrate of soda for it. See, however, the Report of the Cirencester Chamber of Agriculture on Top-dressing.]

Markets.

ENGLISH WOOL.

The trade has been very languid for everything except the best half-bred and lustre wools ; downs and most of the inferior grades, though in only moderate supply, meet no inquiry, and to move off a quantity ½*d.* per lb. reduction must be submitted to off rates current at the beginning of the year.

Current Prices of English Wool.	Per lb.	*s. d.*	*s. d.*
Fleece. South Down hoggets	.. ..	1 1 to 1	2
Half-bred ditto	.. ..	1 2 — 1	2½
Kent Fleeces	.. ..	1 3 — 1	4
Southdown ewes and wethers	.. ..	0 6½ 1	1
Leicester ditto	.. ..	1 2	1 3
Sorts. Clothing	.. .. ..	0 10 — 1	0
Combing	.. .. ..	1 0 — 1	3

HAY. per Load of 36 Trusses.

Smithfield, Thursday, March 24.

Prime Meadow Hay	75*s.* to 85*s.*	Clover, old	..110*s.* to 120*s.*
Inferior do.	.. .. 60 70	Inferior do.	.. 80 95
Rowen	.. .. 80 95	Prime 2d cut	..100 110
Inferior do.	.. ..	Inferior do.	.. 80 90
Straw	.. .. 26 30	Charles James Easton.	

Cumberland Market, Thursday, March 24.

Sup. Meadow Hay	85*s.* to 87*s.*	Inferior Clover	.. 90*s.* to 110*s.*
Inferior do.	.. .. 70 76	New do.	.. .. — —
New do.	.. .. — —	Straw	.. .. 30 35
Superior Clover	..120 128	Joshua Baker.	

White Chapel, Thursday, March 24.

Fine Meadow Hay	86*s.* to 88*s.*	Prime old Clover	..120*s.* to 130*s.*
Inferior do.	.. .. 60 70	Inferior do. do.	.. 90 100
Prime New Hay	.. — —	Prime 2d cut do.	.. — —
Inferior do.	.. .. — —	New Clover	.. ..105 112
Straw	.. .. .. 24 26	Inferior do.	.. 80 90

HOPS.

Borough Market, March 24.

Messrs. Pattenden & Smith report that there is more inquiry for all descriptions, late rates being well maintained. Yearlings are also in better demand.

COALS.—March 23.

Hollywell Main, 15*s.* 6*d.* ; Eden Main, 16*s.* 6*d.* ; Walls End Braddyll's Hetton, 17*s.* ; Walls End Haswell, 18*s.* 6*d.* ; Walls End Hetton, 18*s.* 6*d.* ; Walls End Hetton Lyons, 16*s.* 3*d.* ; Walls End Hawthorn, 16*s.* ; Walls End Pittington, 16*s.* ; Walls End South Hetton, 18*s.* 6*d.* Walls End Hartlepool, 17*s.* 6*d.* ; Walls End Kelloe, 17*s.* ; Walls End Original Hartlepool, 18*s.* 6*d.* ; Walls End Tees, 18*s.*—Ships at market, 50 ; sold, 31 ; at sea, 15.

METROPOLITAN CATTLE MARKET.

Monday, March 21

We have again a good supply of Beasts and a very dull trade ; we retain our top quotations for choicest quality, but it must be considered the extreme. The number of Sheep is much larger than we have had for a long time, and the average quality is very good ; trade is exceedingly dull, and lower prices are taken to effect a clearance. Calves are rather lower. Our foreign supply consists of 677 Beasts, 7620 Sheep, 142 Calves, and 100 Pigs ; from Scotland there are 300 Beasts ; from Ireland, 466 ; from Norfolk and Suffolk, 1670 ; and 216 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	.. 4 8to5 0		Best Long-woods	5 2to5 4	
Best Shorthorns	.. 4 6 4 8		Do. Shorn	.. 4 4—4 6	
2d quality Beasts	3 0—3 8		Ewes & 2d quality	4 0—4 6	
Best Downs and Half-breds	.. 5 0—5 8		Do. Shorn	.. .. — —	
Do. Shorn	.. 4 8—4 10		Lambs	.. .. .. — —	
			Calves	.. .. 3 4—5 4	
			Pigs	.. .. 3 8 5 0	

Beasts, 2320 ; Sheep and Lambs, 27,605 ; Calves, 140 ; Pigs, 200.

THURSDAY, March 24.

The number of Beasts is larger than of late, and the trade is exceedingly dull, consequently Monday's rates are scarcely reached. The supply of Sheep is by no means large, quite equal, however, to the demand; in a few instances choicest qualities have made rather more than on Monday. Trade is dull for Calves, at our quotations. Our foreign supply consists of 391 Beasts, 1900 Sheep, and 180 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4	8to4 10	Best Long-wools	5	4to5 6
Best Shorthorns..	4	6 4 8	Do. Shorn ..	4	0—4 8
2d quality Beasts	3	0—3 8	Ewes & 2d quality	4	4—5 0
Best Downs and Lambs		.. — ..	Do. Shorn ..	3	8—4 4
Half-breds ..	5	8—5 10	Calves	3	4—5 4
Do. Shorn ..	4	8—5 0	Pigs		.. — ..

Beasts, 1036; Sheep and Lambs, 5935; Calves, 223; Pigs, —.

METROPOLITAN MEAT MARKET.—March 24.

Best Fresh Butter .. .. .. 17*s.* per dozen lb.
Second do. do. .. .. 14*s.* ,,
Small Pork, 5*s.* 4*d.* to 5*s.* 8*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 4*d.* per 8 lb.

MARK LANE.

MONDAY, March 21.

The supply of English Wheat to this morning's market was again small. The attendance was moderate, and but little disposition shown to make purchases; good fresh Baltic qualities, being very scarce, brought last week's quotations, but other descriptions were 1*s.* per qr. cheaper. Barley, Beans, and Peas were steady. Oats were a slow sale and rather easier. The nominal top price of town-made Flour was reduced 3*s.* per sack; other sorts were unchanged in value.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	38	—46	Red.....	35	—45
— — fine selected runs..do.	42	—50	Red.....	38	—47
— — Talavera	53	—55			
— — Norfolk			Red.....		—
— — Foreign	38	—52			
BARLEY, grind. & dist. ,26s to 30s..Chev.	39	—42	Malting ..	34	—38
— Foreign .. grinding and distilling	22	—25	Malting ..	30	—40
OATS, Essex and Suffolk	22	—24			
— Scotch and Lincolnshire ..Potato	24	—26	Feed		—
— Irish .....Potato	23	—25	Feed	21	—24
— Foreign .....Poland and Brew	21	—24	Feed	19	—21
RYE	32	—38	Foreign ..	33	—36
RYE-MEAL, Foreign					
BEANS, Mazagan ....30s. to 32s. .Tick	31	—49	Harrow ..	31	—49
— Pigeon ....50s. to 56s..Winds.		—	Longpod..		—
— Foreign .....Small	41	—43	Egyptian .	38	—40
PEAS, White, Essex, and Kent..Boilers	32	—42	Suffolk ...	35	—43
Maple, 41s. to 45s. .....Grey	32	—42	Foreign ..	33	—37
MAIZE			Foreign ..	29	—31
FLOUR, best marks delivered..per sack	36	—40			
— 2d ditto .....ditto	25	37	Country ..	25	—37
— Foreign .....per barrel	22	—25	Per sack..	29	—55

WEDNESDAY, March 23.

The supply of English Wheat at Mark Lane to-day has been only moderate. The business doing has not been extensive, at Monday's reduced quotations. With foreign Wheat the market has been well supplied. Sales have progressed slowly, at the rates previously current. The show of Barley has been moderate; the trade has been firm, and prices have been well supported. Malt has been quiet on former terms. The show of Oats has been moderate; the trade has been firm at full quotations. Beans and Peas have been steady in value, with a moderate inquiry. Flour has sold slowly at stationary prices.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	40	420	—	—
Irish ..	—	—	—	—
Foreign ..	—	1700	3490	—
				300 brls.
	40	2120	3490	

LIVERPOOL, March 22.—There has been a good attendance of millers, and although the market opened with dulness, a fair business was ultimately done in Wheat, chiefly in white descriptions, at 2*d.* to 3*d.* decline on the week. Flour quiet, at a reduction of 6*d.* per barrel and 1*s.* per sack. Beans 3*d.* per qr. in buyers' favour. Indian Corn in improved request at Friday's decline. Oats and Oatmeal without alteration.

AVERAGES.

	Wheat.	Barley.	Oats.
Feb. 12	41*s* 9*d*	34*s* 6*d*	19*s*10*d*
— 19	40 8	34 2	19 10
— 26	40 7	33 9	20 7
March 5	41 0	33 7	20 8
— 12	40 9	33 10	20 10
— 19	41 9	34 4	21 1
Average ..	41 1	34 0	20 6

SEED MARKET.

There is now a good business doing in seeds. For Clover seed we have a brisk demand at advancing rates the stocks of new seed now held in London are undoubtedly very light. A noteworthy feature in this week's trading has been a lively demand for old and yearling seeds. Alsike, white Clover, and Trefoil seed are in fair request, at full currencies. Italian, both home-grown and imported, is dearer. Rye-grasses are also advancing in price. For Rape and Mustard seed values are exceedingly firm. Sowing Flax seed is without alteration. Orders now come to hand for Lucerne seed. Spring Tares meet with a ready sale at last week's rates.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

GRASS SEEDS, FOR LAYING DOWN LAND

TO PERMANENT PASTURE, LAWNS, BOWLING-GREENS, &c.

PETER LAWSON & SON,

THE QUEEN'S SEEDSMEN,

20, BUDGE ROW, CANNON STREET, LONDON, E.C., and at EDINBURGH,

Offer their celebrated MIXTURES of the above, suitable for all soils and situations. Their extensive Stocks of GRASSES and CLOVERS have been most carefully selected, thoroughly cleaned, and cannot be surpassed in quality. Prices and full particulars on application.

Tables of Mixtures and every information is given in their "AGROSTOGRAPHIA; a Treatise on the Cultivated Grasses and other Herbage and Forage Plants;" price Half-a-Crown, gratis to customers.

SUTTONS' HOME-GROWN FARM SEEDS,

CARRIAGE FREE.

SELECTED STOCKS at VERY MODERATE PRICES. Special Estimates given for large quantities.

Mangel Wurzel.

	Per lb. s. d.
GOOD YELLOW GLOBE	0 8
GOOD ORANGE GLOBE	0 8
GOOD LONG RED	0 8
SUTTONS' SELECTED YELLOW GLOBE	0 10
SUTTONS' BERKSHIRE PRIZE GLOBE	1 0
SUTTONS' YELLOW INTERMEDIATE	1 0
SUTTONS' MAMMOTH LONG RED	1 6
SUTTONS' GIANT LONG YELLOW	1 0

Lowest price per cwt. on application.

Swedes and Turnips.

	Per lb. s. d.
SUTTONS' CHAMPION SWEDE ..	0 6
SKIRVINGS LIVERPOOL	0 7
PURPLE-TOP	0 7
SUTTONS' GREEN-TOP YELLOW HYBRID TURNIP	0 10
SUTTONS' PURPLE-TOP YELLOW HYBRID TURNIP	0 10
SUTTONS' IMPERIAL GREEN GLOBE TURNIP	0 8
SUTTONS' POMERANIAN WHITE TURNIP	0 6
SUTTONS' PURPLE-TOP MAMMOTH TURNIP	1 0

Lowest price per bushel on application.

Carrot, Kohl Rabi, &c.

	Per lb. s. d.
WHITE BELGIAN CARROT ..	1 0
RED INTERMEDIATE	1 6
ALTRINCHAM	1 6

Kohl Rabi.

SUTTONS' IMPROVED GREEN ..	3
LARGE GERMAN GREEN	2
LARGE PURPLE	2

Lowest price per cwt on application.

For further particulars see

SUTTONS' FARMER'S YEAR BOOK FOR 1870,

Gratis, Post Free on application.

SUTTON AND SONS, SEEDSMEN TO THE QUEEN, READING.

GENUINE GRASS SEEDS.

JAMES VEITCH & SONS,

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, LONDON, S.W.,

direct the special attention of intending Purchasers to

THE FOLLOWING VERY FINE MIXTURES,

which they GUARANTEE are not to be surpassed in quality and selection.

☞ *In ordering Grass Seeds, a description of the Land to be laid down is very necessary, so that a suitable Mixture may be supplied.*

MIXTURES for PERMANENT PASTURES and MEADOW LANDS, containing only the most suitable GRASSES and CLOVERS, 24*s.* to 30*s.* per acre.
MIXTURES for IRRIGATION or WATER MEADOWS, 24*s.* per acre.
MIXTURES for PARKS, ORNAMENTAL GROUNDS, &c., specially prepared from the finest Evergreen varieties, 32*s.* to 36*s.* per acre.
MIXTURES for SHEEPWALKS and CHALKY UPLANDS, composed of kinds which thrive on poor Soils, 25*s.* to 30*s.* per acre.
MIXTURES for RECLAIMED MARSHES or HEATH LANDS, 20*s.* per acre.
MIXTURES for GARDEN LAWNS, PLEASURE GROUNDS, GRASS PLOTS, BOWLING GREENS, &c., 20*s.* per bushel, 1*s.* per lb. This Mixture has been most CAREFULLY PREPARED from the finest dwarf kinds, and cannot fail to give satisfaction.
MIXTURES for ALTERNATE HUSBANDRY.

These Mixtures are formed of the best Clovers, Fescues, Rye-grasses, &c., according to requirement; and in ordering it should be stated whether it is required for one, two, or three years' lay. Where large quantities are required J. V. AND SONS will feel much pleasure in quoting special prices.

MANGEL WURZEL, TURNIP, KOHL RABI, and all other **AGRICULTURAL SEEDS** of finest quality; full detailed CATALOGUES of which will be forwarded (Post Free) on application.

WHEELERS' SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELERS' ILLUSTRATED BOOK on GRASSES, which may be had gratis and post free.
J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS, are supplied in large or small quantities, at extremely moderate prices.
J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS are forwarded carriage free to all railway stations in the Kingdom.
QUALITY—Excellent, and unadulterated.
PRICES—(Which vary from 13s. 6d. to 32s. per acre, according to soil and situation) extremely moderate.
TERMS—Five per cent. discount for Cash.
J. C WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

ON LAYING DOWN LAND to PERMANENT PASTURE.
"For getting up the subject of Grasses we cannot conceive a handier book than Miss Plues', which is furnished with ample and accurate illustrations; while for putting her data to the proof, and testing the value of hints and suggestions, it may be well to make acquaintance with that really scientific *brochure*, Messrs. WHEELER'S Illustrated Book on Grasses."—*Saturday Review.*
A Copy will be forwarded free on application to
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"These enterprising Seedsmen (Messrs. WHEELER & SON), in introducing a new element into their calculations for laying down land, have undoubtedly a good idea."—*The Field.*
MESSRS. WHEELER AND SON supply the FINEST and BEST GRASSES and CLOVERS (all included) for laying down land:—

For One Year	at 13s. 6d. per acre.
For Two Years	17s. 6d. per acre.
For Four Years	22s. 0d. per acre.
Permanent Pasture ..	from 26s. to 32s. 0d. per acre.

All Carriage free. Inferior qualities cheaper.
J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

FARM SEEDS of all sorts, best quality, extra clean.—PRICED LIST on application.

James Dickson & Sons.

Seed Growers, 102, Eastgate Street, Chester.

Seed Barley from the Chalk.
PEDIGREE CHEVALIER BARLEY, grown from Hallett's Stock.—Price 52s. per quarter, or 7s. per bushel, free on rail. New Sacks, 1s. 9d. each
Also selected Samples from the best Growers of PAGE'S PROLIFIC, GIANT, GOLDEN DROP, and THANET BARLEY.
BLACK TARTARIAN, BLACK POLAND, WHITE CANADIAN, WATERLOO, and WHITE TARTARIAN OATS.
SHIRREFF'S WHITE, RED CHAFF WHITE, and APRIL SPRING WHEAT.
Samples and prices free on application.
RAYNBIRD AND CO. (Limited), Basingstoke, or Seed Market, Mark Lane, London, E.C.

New and Select Farm Seeds.

1870. 1870.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.
TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.
CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.
MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years' lay, from 12s. to 20s. per acre.
MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21s. to 28s. per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.
Seeds of the value of £2 and upwards (Grain, Vetches, and Potatos excepted), carriage free to any railway station in the kingdom.
Special estimates for large quantities. Samples and prices on application.
PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis and post free on application.

To Improve Meadow Land.
RICHARD SMITH'S MIXTURE of the finest GRASSES and PERENNIAL CLOVERS (8 to 12 lb. per acre, at 8d. per lb.), if sown early, will cause a valuable improvement to the crop. RICHARD SMITH, Seed Merchant, Worcester.

Grass Seeds for Permanent Pasture.
RICHARD SMITH'S MIXTURES of the finest PERENNIAL GRASSES and CLOVERS are carefully made to suit all kinds of Soil. Price 26s. to 30s. per acre.
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NATURAL GRASSES: their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c. Free by post.
RICHARD SMITH, Seed Merchant, Worcester.

The North of England Nursery and Seed Establishment.
MESSRS. LITTLE AND BALLANTYNE, Carlisle, (WM. BAXTER SMITH, Manager), are prepared to make SPECIAL OFFERS of FARM SEEDS, at liberal prices, when large quantities are required, and to deliver them free at nearest Railway Station.
They confidently recommend their superior stocks of TURNIP SEEDS, which have been all carefully proved and found to grow about 90 per cent. This will ensure a much stronger braird than seed reduced to grow only from 60 to 70 per cent. Their stocks of MANGEL WURZEL, CABBAGES, &c., are also of excellent quality, and they have been equally careful in proving the quality and growth of their CLOVER and GRASS SEEDS, and their mixture for laying down permanent pasture. PRICED LISTS on application.
44, English Street, Carlisle.

SELECT SEEDS, free by post.

	Per packet—s. d.
MCKAY'S TELEGRAPH CUCUMBER	1 6
INVINCIBLE (New) CUCUMBER	1 0
SUDBURY WHITE SPINE CUCUMBER	1 0
The above are first-class sorts.	
LONGSTANDER CABBAGE LETTUCE	0 6
CHADACRE BATH COS LETTUCE	1 0
NUNEHAM PARK ONION	0 6
SPRINGFIELD WHITE BROCCOLI	1 0
SUDBURY EXCELSIOR MELON	1 0
CALCEOLARIA, from finest strain	1 0
CINERARIA, from named flowers	1 0
GOLDEN FEATHER	0 6
MARIGOLD, French Dwarf Striped	0 3

Other Sorts, see CATALOGUE.
DAVID GOLD MCKAY, the "Old" Established Seed Warehouse, Sudbury, Suffolk.

SPECIAL NOTICE.—J. C. & Co. strongly advise early Orders for Farm Seeds, the late severe weather having greatly injured the young plant growing for next season's supply, and which J. C. & Co. fear will necessitate an advance upon the present low quotations after April 10th next.

"Economy.—Seeds direct from the Growers."

THE ROYAL SEEDSMEN

CARTER'S GENUINE SEEDS FOR FARM AND GARDEN.

THE ROYAL SEEDSMEN

CARTER'S COLLECTIONS OF CHOICE VEGETABLE SEEDS,
Ready for Immediate Delivery.

No. 1 COLLECTION for COTTAGE GARDENS,	12s. 6d.	These Collections will produce a plentiful supply of Choice Vegetables all the year round
No. 2 COLLECTION for SMALL GARDENS,	21s. 0d.	
No. 3 COLLECTION for LARGER GARDENS,	42s. 0d.	
No. 4 COLLECTION for GARDENS of 1 Acre,	63s. 0d.	

No Charge for Packing.

CARTER'S COLLECTIONS OF CHOICE FLOWER SEEDS,
Ready for Immediate Delivery.

"A" COLLECTION ..	Price 10s. 6d. (post free 11s.)	These Collections will ensure a permanent and pretty display in the Flower Garden.
"B" COLLECTION ..	Price 15s. (post free 15s. 6d.)	
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Catalogues gratis and post free.

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J. C. AND CO. have made extensive arrangements that all Orders shall be executed immediately.

J. C. AND CO. allow, off all Accounts Paid within Fourteen Days, a Discount of Five per cent.

CARTER'S PRIZE MANGEL.

	Per lb.—s. d.
ORDINARY STOCKS	8d. to 0 10
CARTER'S WARDEN, the finest Globe variety .	1 0
CARTER'S MAMMOTH, the finest Long Red variety	1 6
CARTER'S NEW INTERMEDIATE, the best variety	1 0
IMPROVED RED GLOBE	1 0
ELVETHAM LONG YELLOW	1 0

Cheaper per cwt.

CARTER'S PRIZE SWEDE AND TURNIP.

	Per lb.—s. d.
LIVERPOOL SWEDE	0 7
IMPERIAL HARDY SWEDE, acknowleged to be the best	0 9
LONDON SWEDE, grows to a large size	0 9
DEVONSHIRE GREY STONE TURNIP ..	1 0
POMERANIAN WHITE GLOBE, the finest white variety	0 9
LINCOLNSHIRE RED GLOBE	0 9

Cheaper per bushel or cwt.

Large purchasers will be liberally treated.

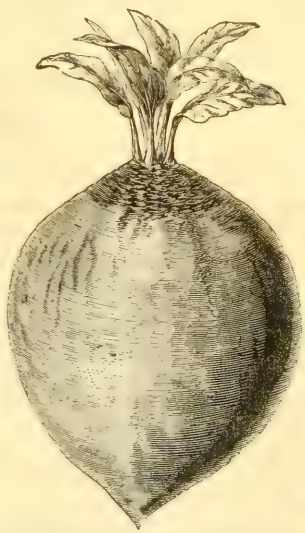

CARTER'S NEW CHAMPION INTERMEDIATE MANGEL.
1s. per lb., cheaper per cwt.

CARTER'S PRIZE MEDAL GRASS SEEDS

JAMES CARTER AND CO.'S GRASS SEEDS produced the BEAUTIFUL TURFS so MUCH ADMIRED by ENGLISH VISITORS at the late PARIS EXHIBITION; and they have been awarded the First Prize for Grass Seeds.

CARTER'S GRASS SEEDS, as SUPPLIED for the PARIS EXHIBITION GROUNDS, 36s. per acre.
CARTER'S GRASS SEEDS for Fertile Clay Soils, 28s. to 32s. per acre.
CARTER'S GRASS SEEDS for Poor Clay Soils, 28s. to 32s. per acre.
CARTER'S GRASS SEEDS for High-Lying Clay Soils, 28s. to 32s. per acre.
CARTER'S GRASS SEEDS for Alluvial Soils, 28s. to 32s. per acre.
CARTER'S GRASS SEEDS for Limestone or Calcareous Soils, 28s. to 32s. per acre.
CARTER'S GRASS SEEDS for Loams derived from Old or New Red Sandstone, 28s. to 32s. per acre.
CARTER'S GRASS SEEDS for Light Chalk Soils, 28s. to 32s. per acre.
CARTER'S FINE GRASS SEEDS, for Lawns, 20s. per bushel.
For Cricket and Croquet Grounds, 20s. per bushel.
For Bowling Greens, 20s. per bushel.
For Parks and Ornamental Grounds, 32s. to 40s. p. acre.
CARTER'S GRASS SEEDS for Marsh Lands, 25s. per acre.
For Churchyards, 18s. per bushel.
Second qualities at reduced rates.

The above Mixtures of Grasses are composed of seeds of the purest quality. For particulars, see "CARTER'S ILLUSTRATED FARMERS' CALENDAR," gratis and post free. Special Estimates for large quantities.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

GIANT ASPARAGUS PLANTS, the best that money can procure, 2s. 6d. per 100. This delicious Vegetable does not require half the expense usually incurred in planting it.
See RICHARD SMITH'S SEED LIST for 1870.
Extra strong SEAKALE, 2s. per dozen.
RICHARD SMITH, Nurseryman, Worcester.

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer, for cash, AMERICAN RED POTATO. It has produced over 16 tons to the acre this year. Price per cwt., 20s. EAST HAM CABBAGE PLANT POTATOS, 100s. per cwt. SWEET WILLIAMS, 5s. per 100: Single Wallflowers, 2s. 6d. per 100: SCARLET KING DAISIES, CROWN DAISIES, WHITE DAISIES, all at 5s. per 100

Seed Potatos.

GEORGE SIBBALD, 27, Wellgate, and Drumgeith, by Dundee, has still on hand a few tons PATERSON'S VICTORIA, FLUKE, KIDNEY, BALMAHOY, and WALKER'S EARLY POTATOS. Also a quantity of Superfine Early DWARF CABBAGE SEED. Prices on application.

A SURPLUS STOCK of POTATOS, at very low prices—Myatt's Prolific, Early Shaws, Dalmahoys, Regents, Flukes, Wheeler's Milky White, Fortyfolds. In large and small quantities. Wholesale and retail. Prices on application.
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough.

Suttons' Potatos for Planting.

MESSRS. SUTTONS' DESCRIPTIVE LIST is now ready, and may be had gratis and post-free. Their stock of Potatos has been selected with great care, and can be relied on as perfectly true to name. Lowest price per cwt., sack, or ton, forwarded on application.
SUTTON AND SONS, Seed Growers, Reading.

The best Potato for the Main Crop is

SUTTONS' BERKSHIRE KIDNEY, raised and selected from among 40 Seedlings of the Fluke. Having planted it side by side with the different varieties of that class, we have proved it to be by far the best of them all, and quite a fortnight earlier. The tubers are of good size, very numerous, and remarkably clear skin. It is most valuable for the main garden crop, and has been remarkably free from disease, while other varieties growing close by were almost destroyed. Price 5s. per peck, cheaper by the bushel.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

SEED POTATOS.—The Subscribers offer the following, which have been grown from pure selected stocks.

Terms, net prompt cash.	Per bag of 2 cwt.	Per ton.
GRYFFE CASTLE ..	20s.	£8 0 0
RED BOG, Early ..	10s.	4 10 0
DALMAHOY, Early ..	10s.	4 10 0
WALKER'S REGENT..	9s.	4 0 0

Sacks 1s. each.
Also, a few bags, OLD ASHLEAF KIDNEY, MYATT'S KIDNEY, WHEELER'S MILKY WHITE and FORTYFOLD, at moderate prices
SMITH AND SIMONS, Seed Merchants, 36 and 38, Howard Street, Glasgow.

NEW EARLY POTATO, RINTOUL'S NEW EARLY WHITE DON. This is a great improvement on the variety sent out by us some years ago, being pure white both outside and inside, perfectly round, with a rough scaly skin, is about ten days earlier than the striped variety, an extraordinary cropper, and of first-rate quality.
Having secured a quantity of the above from the raiser, Mr. Rintoul, East Craigie, Cramond, whose name as an early Potato grower is well known, we have every confidence in recommending this variety to all who grow for the early market in either field or garden as decidedly the best Potato out for earliness, crop, and quality.
Price 4s. per peck, or 20s. per cwt.
DOWNIE, LAIRD, AND LAING, 17, South Frederick Street, Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Staplehurst. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.
OPINIONS OF THE PRESS.
"R. Headley Your Seedling Potatos were quite first-rate; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 2, 1869.
"White Kidney. A very fine variety; a heavy cropper; uniform in size; ripening off all at once quickly and completely; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 14."—*Gardeners' Magazine*, Jan. 30, 1869.
"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are like those also in flavour, but are more mealy."—*Journal of Horticulture*, Oct. 21, 1869.
Price 5s. per peck. The usual discount to the Trade
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

HURST AND SON, 6, Leadenhall Street, offer to the Trade BROCCOLI—HAMMOND'S IMPERIAL HARDY WHITE BROCCOLI, without exception the best Broccoli in cultivation. Read the following Report sent out by William Armitage & Sons, Huddersfield:—
From the "Gardener's Magazine," May 30, 1868.
"Hammond's Imperial Hardy White Broccoli.—We have received samples of this variety from Mr. W. Hammond, Market Gardener, Birkby, Huddersfield, Yorkshire. The heads are large, even in outline and hemispherical, so close that there is not space anywhere for so much as the point of a pencil, the colour cream-white, average weight when trimmed for cooking, 3 lb.; in quality first-rate, as mild and sweet as a Cauliflower."
Should be grown by every Broccoli Grower.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 27 per cent. of Soluble Phosphates, 6 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
Agents for the North of England—Messrs. Keighley, Maxsted & Co., Hull.
Agent for Lancashire and neighbouring Counties—W. S. Gladstone, Esq., 23, Old Hall Street, Liverpool
Agents for Midland, South and West Districts of England—Messrs. Wm. Smith & Co., Bristol.
Agents for Scotland—Messrs. Richard Connon & Co., Glasgow and Aberdeen.
Messrs. Breyssig & Co., Leith, for Berwick, Roxburgh, Selkirk, and Fife
Messrs. Allan, Edwards & Co., Dundee.
Agents for Ireland—Messrs. R. F. Gladstone & Co., Dublin.
Price £11 per ton, delivered free to Rail or Wharf in London.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.
PERUVIAN GOVERNMENT GUANO, £13 10s. per ton.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more extensively, I feel, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. NITRATE of SODA supplied ex Ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices.
JOHN BENNET LAWES,
Offices: 59, Mark Lane, London.
Branch Offices: Market Street, Shrewsbury: 22, Eden Quay, Dublin; Womanby Street, Cardiff.
LAWES'S PATENT TURNIP MANURE.
LAWES'S DISSOLVED BONES.
LAWES'S SUPERPHOSPHATE of LIME. [MANURE.
LAWES'S WHEAT, BARLEY, GRASS, and RANGEL
LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures.
AMERICAN and other CAKES at market prices.

GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb. Bags, at 6d. per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application to
JOSEPH ELLIS AND SONS, Sparkenhoe Works, Leicester.

THE LONDON MANURE COMPANY
(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME.
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
E. PURSER, Secretary.
Offices, 116, Fenchurch Street, E.C.

Guano.

"GENUINE PERUVIAN GOVERNMENT," per ton, £14 10s.; per cwt., 16s.; 56lb., 9s; 28lb., 5s.; 14lb., 3s.

NITRATE of SODA, per ton, £21; per cwt., 22s.; 56lb., 12s.; 28lb., 6s. 6d.; 14lb., 3s. 6d.; 7lb, 2s.

COCOA-NUT DUST, for Ferneries, Rockeries, Potting, Mixing, &c., per ton, 40s.; 112lb., 3s.; 56lb., 2s. 6d.

SULPHURIC ACID, or OIL VITRIOL, SALT, &c.
Orders by post promptly executed.
DANIEL JUDSON AND SON,
Southwark Street, London, S.E.

REIGATE SILVER SAND, best quality, 7s. 6d. per Ton, delivered into trucks at Reigate; best quality PEAT, LOAM, Prepared COMPOSTS, in Bags, GRAVEL, &c
Apply to W. SHORT, Horticultural Depot, Redhill, Reigate

SILVER SAND and PEAT, from Bedfordshire, in any quantity.—The Sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depot.

GENUINE TOBACCO PAPER, of the finest quality, 10d. per lb., or 8s. per cwt.
WILLIAM RUSHFORTH, Tarvin, Cheshire, and Seed Merchant, Leeds.

APPLEBY'S REGISTERED FUMIGATORS.—Large size, 6s. each; second size, for small Greenhouses, 4s. 6d. each
APPLEBY'S COMPOUND TOBACCO PAPER (requires no blowing). Sold in 2 lb. and 1 lb. Packets, 1s. 8d. per lb.
Testimonials, with Directions for use, may be had on application.
N.B. All orders to be accompanied with a Post Order, payable to
HENRY APPLEBY, Foreman to Messrs. Ivery & Son, Dorking, Surrey

The Best and Cheapest Vermin Killer.

Vide "The Gardeners' Magazine," conducted by Shirley Hibberd, Esq., F.R.H.S., of August 15, 1868.
UNDER PERMISSION of the HON. BOARD of CUSTOMS.
THE LONDON GROUND TOBACCO (free of duty), for the Destruction of Blight, 1s. 1d., 2s. 6d., 4s. each, by Seedsmen and Druggists. POWDER DISTRIBUTORS, 2s. each.
Manufacturers: CORBY AND SOPER, at their Bonded Warehouse, Shad Thames, London, S.E. [AGENTS WANTED.]

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s. each.
Powder Distributors, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May, 1868.
Sole Manufacturer, T. A. POOLEY Bonded Warehouse, Sussex Wharf, Wapping, E.

Red Spider

Magnified.

GISHURST COMPOUND.
Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 2s., and 10s. 6d.
Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea, London, S.W.

By Royal Appointment.

TO HER MAJESTY, by Special Warrant, dated December 27, 1865.

TO the PRINCE OF WALES by Special Warrant, dated February 10, 1866.

DAY, SON AND HEWITT, Original and Sole Proprietors of the STOCKBREEDERS' MEDICINE CHESTS, for DISORDERS in HORSES, CATTLE, CALVES, SHEEP, and LAMBS.
No. 1 MEDICINE CHEST, Contains Sixteen different kinds of Compounds, admirably arranged, with Complete Guide to Farriery. Price £6 6s., carriage paid.
No. 2 MEDICINE CHEST, Contains the Extract Gaseous Fluid, Red Drench, and Red Paste, with Shilling Key to Farriery. Price £2 10s. 6d., carriage paid.
☞ Every Stockowner should send for DAY, SON, AND HEWITT'S Work on Farriery. Large Edition, 2s. 6d., or free by post for 33 stamps. Small Edition, 1s., or free by post for 13 stamps.
DAY, SON, AND HEWITT, 22, Dorset Street, Baker Street, London.

GENUINE MEDICATED TOBACCO PAPER.—The most effective of all Fumigators. Terms, circulars and particulars on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

TOBACCO TISSUE for FUMIGATING GREENHOUSES. Will destroy all the Insects, and not injure the Plants, and Burns without the assistance of Blowing. Price 3s. 6d. per lb., carriage free. A reduction in price for large quantities.
To be had of Messrs R. ROBERTS AND SONS, 112, St. John Street, Clerkenwell, London, E.C.; and of all Seedsmen and Nurserymen.

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES. Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Price from 1s. 6d. per foot.
Hooper & Co., Covent Garden; Dixon & Co., 484, Moorgate Street; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road West, Chelsea.
BENJAMIN LOOKER, Inventor and Sole Manufacturer, Kingston-on-Thames.

JOHN WARNER AND SONS, HYDRAULIC ENGINEERS,
8, Crescent, Cripplegate, London, E.C.

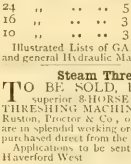

No. 547A.—GARDEN ENGINE.

28 Gallons	£5 13	0	
24 ,, ...	5 1	0	
16 ,, ...	3 16	0	
10 ,, ...	3 0	0	

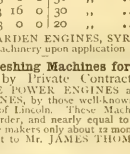

No. 579¾.—SWING BARROW.

50 Gallons	£5 14	0	
38 ,, ...	3 18	0	
30 ,, ...	2 14	0	
20 ,, ...	2 2	0	

Illustrated Lists of GARDEN ENGINES, SYRINGES, PUMPS, and general Hydraulic Machinery upon application

Steam Threshing Machines for Sale.

TO BE SOLD, by Private Contract, TWO very superior 8-HORSE POWER ENGINES and FINISHING THRESHING MACHINES, by those well-known makers Messrs. Ruston, Proctor & Co., of Lincoln. These Machines and Engines are in splendid working order, and nearly equal to new, as they were purchased direct from the makers only about 12 months since.
Applications to be sent to Mr. JAMES THOMAS, Rock House, Haverford West

MOULE'S PATENT EARTH SYSTEM.
From Mr. W. GILBERT, *Lansford Street, Rugby.*
"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
W. GILBERT.
"January, 1870."
Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

GREEN'S PATENT TUBULAR HOT-WATER BOILERS.

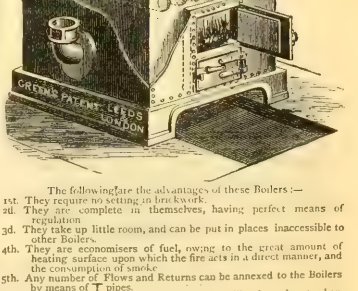

The following are the advantages of these Boilers:—
1st. They require no setting in brickwork.
2d. They are complete in themselves, having perfect means of regulation
3d. They take up little room, and can be put in places inaccessible to other Boilers.
4th. They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th. Any number of Flows and Returns can be annexed to the Boilers by means of T pipes.
6th. By means of mud doors they can be readily cleaned out when required
7th. The chimney is made of cast iron, which can either be taken through a roof or turned into a flue to meet the convenience of the situation that it may be fixed in
They are warranted to be the most Economical Boilers extant.
Price Lists free on application
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

THE Cheapest House in London for PROPAGATING, BEE, or CUCUMBER GLASSES is at the Maker's, E. CHILTON, 1, Thomas Place, Waterloo Road Made to order only.

Belgian Window Glass.

BETHAM AND SON, 9, Lower Thames Street, E.C., Importers of the above, beg to inform Florists, &c., that they can supply all sizes suitable for Greenhouses at the lowest possible price.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 81, Upper Thames Street, where a Stock is kept; also at 36, Long Acre. J. GOODERIDGE, Agent.

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

		4ths.	3rds.	2nds.	Best.
20 by 12	Per 100 feet	15 oz. 12s 6d	14s 6d	16s 6d	18s 0d
20 by 13					
20 by 14					
20 by 15		21 oz. 17s.	19s.	21s.	23s.
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

From	To	4ths.	3ds.	2nds.	Best.
6 in. by 4 in.	.. 9 in. by 7 in.	12s 0d	12s 6d	13s 6d	15s 0d
9 in. by 7 in.	.. 14 in. by 10 in.	14s 0d	15s 0d	16s 0d	17s 6d
14 in. by 10 in.	.. 18 in. by 12 in.	15s 3d	14s 0d	15s 6d	17s 0d
20 in. by 12 in.	.. 22 in. by 18 in.	17s 0d	14s 6d	16s 6d	18s 0d

Lists on application.

SHEET GLASS

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz.	
4ths quality, per 300 feet case, 34s.		4ths quality, per 200 feet case, 34s.	
3ds " " 42s.		3ds " " 42s.	
2ds " " 60s.		2ds " " 60s.	
Best " " 75s.		Best " " 75s.	

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 128th, 96th in., 64th in., and 48th in. substances

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 24s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is mixed with rain or river water

WHITE ZINC PAINT, 36s. per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a-half of White Lead and six gallons of Linseed Oil. Special Prices for this Paint.

IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Bridges, Stone, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 3s. 6d. per gallon.

Per cwt.—s. d.		Per gallon.—s. d.	
GENUINE WHITE LEAD	30	LINSEED OIL	2 9
SECONDS WHITE LEAD	28 0	BOILED OIL	3 2
GROUND PATENT DRYERS, 3d. to 4d. per lb.		TURPENTINE	2 9
" OXFORD OCHRE, 3d. to 4d. per lb.		LINSEED OIL PUTTY, 8s. per cwt.	
" RAW UMBER, 44d. to 6d. per lb.		Fine OAK VARNISH, 10s to 12	0
" BURNT do., 6d. to 9d.		" CARRIAGE do., 12s to 14	0
GREEN PAINT, all shades	28s to 60 0	" PALE do. 10s. to 12	0
BLACK PAINT	24s. to 36 0	KNOTTING	10 0
RED PAINT	28s. to 36 0	Patent GOLD SIZE	10 0
GLAZIER'S DIAMONDS, 12s. 6d., 15s., 18s., 21s. each.		" BLACK JAPAN	12 0
GROUND BRUSHES		BRUNSWICK BLACK	
DUSTERS.		PENCILLED LEAD and PIPES.	
DISTEMPER BRUSHES.		OLD LEAD Bought or taken in Exchange.	

The above are Nett, for Cash, and as such cannot be booked.

Lists of any of the above on application

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES

Each.—s. d.			Each.—s. d.
2 inches in diameter	.. 0 4½	12 inches in diameter	.. 1 9
3 " "	.. 0 4½	13 " "	.. 2 0
4 " "	.. 0 5½	14 " "	.. 2 6
5 " "	.. 0 6½	15 " "	.. 3 0
6 " "	.. 0 8	16 " "	.. 3 6
7 " "	.. 0 10	17 " "	.. 4 0
8 " "	.. 1 0	18 " "	.. 5 0
9 " "	.. 1 2	19 " "	.. 6 0
10 " "	.. 1 4	20 " "	.. 7 0
11 " "	.. 1 6		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	.. 0s. 6d.	9 inches in diameter	.. 1s 8d.
5 " "	.. 0 8	10 " "	.. 2 0
6 " "	.. 0 10	11 " "	.. 2 6
7 " "	.. 1 1	12 " "	.. 3 0
8 " "	.. 1 4		

Either flat or conical tops.

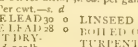

CUCUMBER GLASSES.

24 inches long	.. 2s 0d	16 inches long	.. 1s. 4d.
22 "	.. 1 10	14 "	.. 1 2
20 "	.. 1 8	12 "	.. 2 6
18 "	.. 1 6		

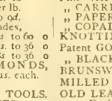

HAND GLASSES, WITH OPEN TOPS.

Each.—s. d.			Each.—s. d.
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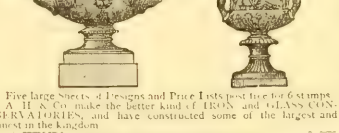

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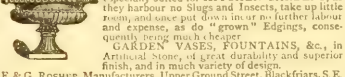

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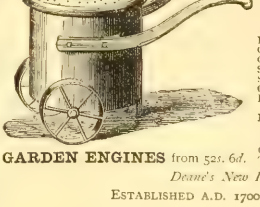

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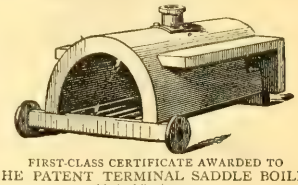

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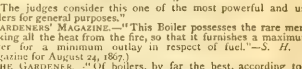

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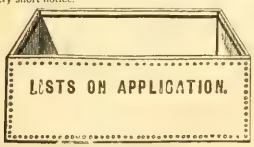

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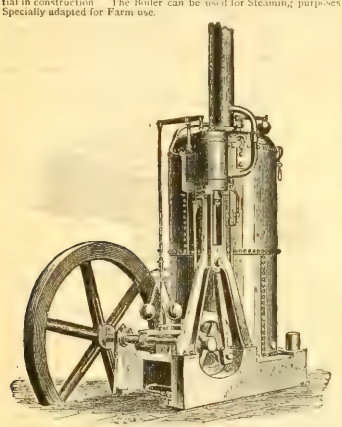

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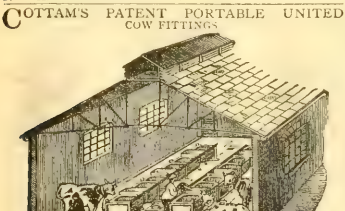

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.
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W. S. BOULTON & CO.'S

NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

These Machines possess important advantages. By the introduction of a Radial Link, the adjustment of the various parts is rendered exceedingly simple. Breakages are entirely avoided, by making the handles and all other light parts of malleable iron. They adapt themselves to inequalities of the ground, and suit persons of any height by means of the handles working loose. This arrangement also admits of their being used as a Roller, by folding back the front or cutting end. Every Machine is warranted to give entire satisfaction to the purchaser, and if not approved of can be returned. An Illustrated Catalogue, with prices, sent free by post on application.
Rose Lane Works, Norwich.

W. S. BOULTON & CO.'S DOUBLE CYLINDER and BALANCE-HANDLE GARDEN ROLLS.

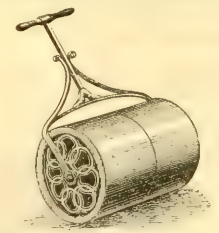

These articles are really first rate, both as regards workmanship and materials. They are divided in the centre, which admits of their being turned with ease, and without injury to the Grass or Walks, the ends being rounded off. The price is also very low.
Carriage paid to any Station in England.

20 in	long by 18 in diam.	£2	17	24 in	long by 22 in. diam.	£3	17
22	"	20	"	3	7	26	"	24	"	4	7

SINGLE CYLINDER ROLLS Carriage paid.

18 in	long by 18 in diam.	£2	15	22 in	long by 22 in. diam.	£3	0
20	"	20	"	2	8	24	"	24	"	3	14

Rose Lane Works, Norwich

PROTECT YOUR CROPS.

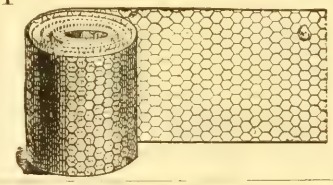

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WIRE GAME NETTING, GALVANISED after MADE, sent carriage paid to any station in the Kingdom at the following very low prices
2 feet high, 2 inch mesh, No. 19 gauge, price 3½d. per yard.
3 feet high, ditto, ditto, price 5¼d. per yard.
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A full Descriptive Priced Catalogue sent gratis on application.
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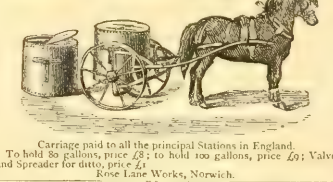

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W. S. BOULTON AND CO.'S IRON WATER or LIQUID MANURE CART.
Carriage paid to the principal Railway Stations in England. To hold 140 gallons, price £10; 200 ditto, £12; £250 ditto, £14.
Galvanised Iron Pump and 10 feet india-rubber suction pipe, price £3 10s. Spreaders, 15s each.

ROSE LANE WORKS, NORWICH.

REUBEN HUNT,
MANUFACTURER of IMPROVED HAND SEED DRILLS, Atlas Works, Earl's Colne, Essex

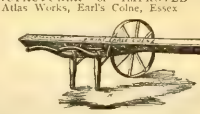

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For Sowing every description of small Seeds. Price, with 12 feet box and striking-out gear, £3 5s; extra length, per foot, 3s.

ONE ROW CUP DRILL, No. 1

For sowing Turnips or Mangels on ridge or flat. Price	£2	10	0
Extra cup plate for altering quantity of seed	0	2	0
ONE-ROW CUP DRILL, No. 2	3	15	0
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ONE-ROW BRUSH DRILL for flat work	0	3	6
ONE-ROW CORN and PEA DRILL	2	10	0
ONE-ROW BRUSH DRILL	1	5	0

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"ARCHIMEDEAN"
AMERICAN
LAWN MOWER,

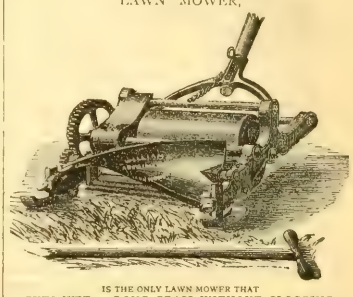

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Thus enabling the man to work it in the morning or cool of the day, instead of waiting for the Grass to dry, and toiling under the heat of a mid-day sun. It is very easy to work, and will preserve its perfect cut whilst traversing over mounds or sloping banks.

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The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The warmly increasing Sale forms the most convincing testimony how much these advantages have been appreciated
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

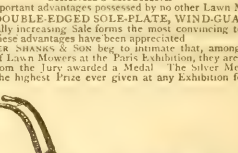

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one inverted at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
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There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
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"PORTABLE PLANT PROTECTORS:" Trade Mark, Registered at Stationers' Hall.

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They are cheap and durable, being made of red Earthenware (same as tiles and garden pots) and the common Orchard-house Glass.

Rendle's Patent Portable Plant Protectors.
They do not require any Paint or Putty.
The Glass can be easily replaced without the services of the Jobbing Glazier.
The Ventilation is perfect and complete.
All Rain is immediately carried off.
The Glass runs perfectly in the grooves.
And the Wind, however boisterous, cannot have any effect on the Glass.

Rendle's Patent Portable Plant Protectors.
They are fixed so low on the ground that they can be easily protected from Frost or Snow, by Mats, Straw, Reed, or Litter.
They can be used to cover a single pet Plant, or they can cover an acre of Fruits and Vegetables.
They are sold at One-sixth of the cost of Hand-glasses.

Rendle's Patent Portable Plant Protectors.
They will produce Early Peas a month or six weeks earlier than in the ordinary manner.
They will produce Strawberries a month or six weeks earlier, when the Fruit is worth from 2*s.* 6*d.* to 3*s.* per ounce in Covent Garden.
They will protect Strawberries or other Fruits from Insects, Birds, Rain, Splashings of Earth, and will produce the Fruit in splendid condition.
They will produce Gooseberries, Raspberries, and Currants a month or six weeks earlier than usual.
Early Potatos will be produced in rows in the open Ground as early as those forced in Pits or Frames.
Lettuces and other Salads will be produced very early, and protection will be afforded from Frost, Snow, and cold, biting Winds.
Grapes.—Fine Fruit can be produced on the Ground Vinery system, without artificial Heat.

Rendle's Patent Portable Plant Protectors.
The Protectors will be found most excellent for protecting all kinds of Half-Hardy Plants during Winter and Spring.
All kinds of Half-Hardy Annuals and delicate Seeds can be raised in the open air, without the use of Hotbeds or Frames.
They will be found most valuable for protecting all kinds of Bedding Plants from early Frosts or heavy Rains.
The Protectors will be most useful for Propagating Purposes, or for raising Seeds, and for Forcing Tender and Delicate Plants inside Greenhouses or Orchard-houses.
For producing early Blooms of Hyacinths, Tulips, and other Bulbous Roots, they will be of great value.

RENDLE'S PATENT PORTABLE PLANT PROTECTORS

NEW TARIFF AND CARRIAGE-FREE TERMS.

In consequence of the increased demand for the Patent Ground Vineries and Plant Protectors, the Patentee has determined to supply them on the lowest terms.

The following prices are for the Patent Grooved Bricks and the Glass:—

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	£ *s. d.*	£ *s. d.*	£ *s. d.*
10 feet in length, Glass 9in. wide for	0 10 0	0 12 6	0 15 0
10 feet in length, Glass 12in. wide ,,	0 12 0	0 15 0	0 17 6
10 feet in length, Glass 18in wide ,,	0 17 0	0 20 0	1 1 0
10 feet in length, Glass 24in. wide ,,	0 16 0	0 20 0	0 25 0
100 feet in length, Glass 9in. wide ,,	4 10 0	5 0 0	6 0 0
100 feet in length, Glass 12in. wide ,,	5 5 0	6 0 0	7 0 0
100 feet in length, Glass 18in. wide ,,	6 10 0	7 0 0	8 0 0
100 feet in length, Glass 24in. wide ,,	8 0 0	8 10 0	9 10 0

Another Tariff is published, containing Prices for the Ground Vineries and Plant Protectors complete, and can be had on application.
The Patent Grooved Bricks can be placed on ordinary Kiln Bricks set on the Flat. Full directions for fixing them will be sent with each Invoice.
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For delivery in London or Bridgewater.

No. 1 P. P.,	6 inches in diameter, with Glass, 10*s.* per dozen.			
No. 2 ,,	8	,,	,,	12*s.* ,,
No. 3 ,,	10	,,	,,	16*s.* ,,
No. 4 ,,	12	,,	,,	24*s.* ,,
No. 5 ,,	16	,,	,,	36*s.* ,,
No. 6 ,,	18	,,	,,	48*s.* ,,

Rendle's Patent Portable Plant Protectors.
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Messrs. Buchan & Son, Glass Merchants, Southampton
Messrs. W. Clarke & Son, Cwmbran, near Newport, Monmouthshire
Mr. Charles Clay, Stennard Works, Wakefield
Mr. John Noakes Coleman, Great Mongeham, near Deal
Mr. W. S. Collins, 11, High Street, Wisbeach
Mr. Thomas Duff, Seed Merchant, India Buildings, Victoria Street, Edinburgh
Messrs. Edmondson Brothers, Seed Merchants, Dame Street, Dublin
Mr. Sabine Ekes, Ironmonger, 71, Mardol, Shrewsbury
Messrs. G. Grahame, Jun., & Co., Ironmongers, High Street, Dunbar
Mr. John Gregory, Seedsman, 38, Market Place, Macclesfield
Messrs. W. H. & F. Grace, Wittersham, near Ashford, Kent
Mr. Joseph Golding, Seedsman, Hastings
Mr. James Goad, Orchard House, Saltash, Cornwall, and Union Street, Plymouth
Messrs. Richard Lowe & Co., Seed Merchants, Queen Square, Wolverhampton
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Proceedings will be taken against all persons infringing his Patent by Manufacturing, or Selling, or using articles in imitation, or colourable imitation, of his Patent Ground Vineries and Portable Plant Protectors.

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WILLIAM S. BURTON, FURNISHING IRONMONGER, by appointment, to H.R.H. the Prince of Wales, sends a Catalogue, containing upwards of 350 Illustrations of his unrivalled Stock, with Lists of Prices and Plans of the 20 large Show Rooms, post free. 39, Oxford Street, W.; 1, 2, 3, 4, and 4, Newman Street; 4, 5, and 6, Perry's Place; and 1, Newman Yard. With the present RAILWAY FACILITIES, the cost of delivering goods to the most distant parts of the United Kingdom is trifling. WILLIAM S. BURTON will always, when desired, undertake delivery at a small fixed rate.

Sauce.—Lea & Perrins'.
THE "WORCESTERSHIRE," pronounced by connoisseurs "the only good Sauce," Improves the appetite and aids digestion. Unrivalled for piquancy and flavour. Ask for LEA AND PERRINS' SAUCE.
Beware of imitations, and see the names of LEA & PERRINS on all bottles and labels.
Agents.—CROSSE AND BLACKWELL, London; and sold by all Dealers in Sauces throughout the World.

BREAKFAST.—EPPS'S COCOA. GRATEFUL and COMFORTING.
The *Civil Service Gazette* remarks:—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided for breakfast tables with a delicately-flavoured beverage which may save us many heavy doctors' bills."
Made simply with boiling water or milk. Sold only in ½ lb., ¼ lb. and 1 lb. tin-lined packets, labelled—
JAMES EPPS AND CO., Homœopathic Chemists, London.

DINNEFORD'S FLUID MAGNESIA.—The best remedy for Acidity of the Stomach, Heartburn, Headache, Gout, and Indigestion and the best mild aperient for delicate constitutions, especially adapted for Ladies, Children, and Infants.
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CockleS ANTIBILIOUS PILLS,
THE SAFEST
FAMILY APERIENT.
In boxes at 1*s.* 1½*d.*, 2*s.* 9*d.*, 4*s.* 6*d.*, and 11*s.*

CockleS ANTIBILIOUS PILLS,
in use the last 60 years for
INDIGESTION.
In boxes at 1*s.* 1½*d.*, 2*s.* 9*d.*, 4*s.* 6*d.*, and 11*s.*

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In use the last 60 years for
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PATENT MEDICINE.
In boxes at 1*s.* 1½*d.*, 2*s.* 9*d.*, 4*s.* 6*d.*, and 11*s.*

IN the SPRING PARR'S LIFE PILLS are used by thousands. They clear from the body all hurtful impurities, promote appetite, aid digestion, purify the blood, and keep the bowels regular. The mild pleasant action and powerful curative properties of PARR'S pure Herbal Medicine have commended it to the most useful remedy for the restoration of sound bodily health and mental vigour.

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(The above is from Mr. Thos. Trattles, Jet Works, Staithes, Yorkshire.)
Dr. LOCOCK'S WAFERS rapidly cure Asthma, Consumption, Coughs, and all Disorders of the Breath and Lungs.
Sold by all Druggists, at 1*s.* 1½*d.* per Box.

INDIGESTION.—Berkeley, Sept. 3, 1869.—Gentlemen,—I feel it a duty I owe to you to express my gratitude for the great benefit I have derived from taking NORTON'S CAMOMILE PILLS. For a length of time I suffered excruciating pain from indigestion and wind in the stomach, having tried nearly every remedy without deriving any benefit at all, but after taking two bottles of your valuable pills I was quite restored to my usual state of health. Please give this publicity for the benefit of those who may thus be afflicted.—I am, gentleman, yours truly, HENRY ALLPASS.—To the Proprietors of Norton's Camomile Pills.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

PATRONIZED BY

HER MOST GRACIOUS MAJESTY THE QUEEN

ON FORTY-FIVE DIFFERENT OCCASIONS.

H.R.H. THE PRINCE OF WALES.

THE KING OF THE BELGIANS.

THE EMPEROR OF THE FRENCH.

THE EMPEROR OF RUSSIA.

AND MOST OF THE NOBILITY, CLERGY, AND GENTRY IN THE UNITED KINGDOM.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last six years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—

1st. Simplicity of Construction, every part being free of access.

2nd. They are worked with far greater ease than any other Lawn Mower. 3rd. They are the least liable to get out of order.

From the fact that these Machines are so well known in Great Britain and Ireland, also on the Continent of Europe, upwards of 56,000 being now in use, T. GREEN AND SON do not deem it necessary to trouble the Public with a List of the numerous Testimonials they have received from time to time, but would add

THEY ARE THE ONLY MACHINES IN CONSTANT USE AT

THE ROYAL HORTICULTURAL SOCIETY'S GARDENS, SOUTH KENSINGTON.
THE ROYAL BOTANIC GARDENS, REGENT'S PARK.
THE CRYSTAL PALACE COMPANY'S GARDENS, SYDENHAM
BUCKINGHAM PALACE GARDENS.
MARLBOROUGH HOUSE.
THE HYDE PARK GARDENS.
THE WINTER PALACE GARDENS, DUBLIN
THE DUBLIN BOTANIC GARDENS.
THE LIVERPOOL BOTANIC GARDENS.
THE LEEDS ROYAL PARK.
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THE BOTANIC GARDENS, BRUSSELS.
THE SUNDERLAND PARK.
THE PRESTON PARK.

AND IN MOST OF THE PRINCIPAL PARKS, SQUARES, ETC., IN THE UNITED KINGDOM.

HORSE, PONY, AND DONKEY MACHINE.

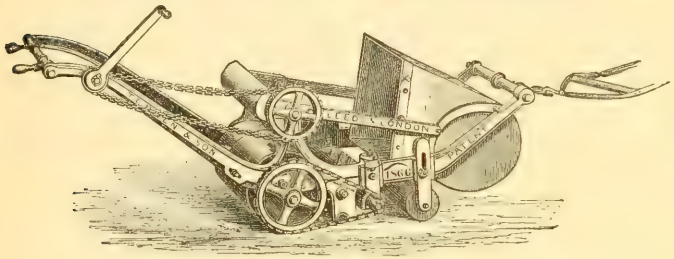

PRICES of HORSE, PONY, and DONKEY MACHINES, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness.

DONKEY AND PONY MACHINES.

To cut 26 inches	.. ..	.. £13	0 0
,, 28 inches	.. ..	.. 15	0 0
,, 30 inches	.. ..	.. 17	0 0
Leather Boots for Donkey	..	.. 0	18 0
Ditto for Pony	.. ..	.. 1	2 0

HORSE MACHINES.

To cut 30 inches	.. ..	.. £21	0 0
,, 36 inches	.. ..	.. 24	0 0
,, 42 inches	.. ..	.. 27	0 0
,, 48 inches	.. ..	.. 30	0 0
Leather Boots for Horse	..	.. 1	6 0

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away, or in any way damaging the Machine.

HAND MACHINE.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned unconditionally.

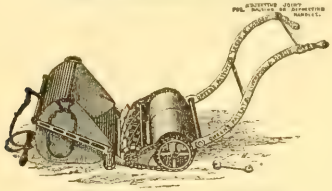

PRICES OF HAND MACHINES.

To cut 10 inches	.. £3	10	0
,, 12 inches	.. 4	10	0

Suitable for a Lady.

To cut 14 inches	.. £5	10	0
,, 16 inches	.. 6	10	0

Suitable for one person.

To cut 18 inches	.. £7	10	0
,, 20 inches	.. 8	0	0
,, 22 inches	.. 8	10	0
,, 24 inches	.. 9	0	0

Suitable for two persons.

Packing Cases are charged at the following Low rates, viz :—for the 10 and 12 inch Machine, 3s; 14 and 16 inch, 4s; 18 and 20 inch, 5s; 22 and 24 inch, 6s. Parties providing themselves with Lawn Mowers are recommended to purchase the cases in which to stow them away when not in use, to prevent them from getting damaged; if returned, two-thirds will be allowed for them.

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Ireland, and Scotland.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Lacken Exhibition.
First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.
T. GREEN AND SON did not exhibit at the Paris Exhibition, 1867.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

N.B. All Orders are executed on the day they are received, either from our Leeds or London Establishment.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	..	..	..	..	..	£4	0	0
20 ,,	22 ,,	..	..	..	..	..	3	2	6
16 ,,	17 ,,	..	..	..	..	..	2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

Every Machine and Roller is warranted to give entire satisfaction, and, if not approved of, can be returned at once unconditionally.

T. G. AND SON have a large quantity of LAWN MOWERS in stock (upwards of 2000) at their Leeds and London Establishments; also various other kinds of HORTICULTURAL and AGRICULTURAL IMPLEMENTS, GARDEN SEATS and CHAIRS, FOUNTAINS, VASES, PLAIN and GALVANIZED WIRE NETTING, &c.

Having very extensive Premises in London, we are in a position to do all kinds of Repairs there, as well as at our Leeds Establishment.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.

Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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AND

AGRICULTURAL GAZETTE.

No. 14.—1870.] SATURDAY, APRIL 2. { Price Fivepence. / Stamped Edition, 6d.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON.
SHOW of CUT FLOWERS, CINERARIAS, &c., on WEDNESDAY NEXT, April 6. Tent, 1 to 5; Admission, 5s.; Non-Subscribers' Tickets bought before the 6th, 10s. 6d.; After the 6th, 21s.
Tickets for all the Fêtes are now ready, and can be had of the principal Musicsellers, or at the Gardens.
*** The Show will be held in the Conservatory.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON.
FLOWER SHOW, FRUIT AND FLORAL COMMITTEE MEETING, on WEDNESDAY NEXT, April 6, at 11 o'clock. GENERAL MEETING at Three. Band of the Scots Fusilier Guards, from 3 to 5. Admission 2s. 6d.

CRYSTAL PALACE FLOWER SHOWS, 1870.—
The GREAT FLOWER SHOW, SATURDAY, May 21
The SECOND FLOWER SHOW, SATURDAY, June 11
The GREAT ROSE SHOW, SATURDAY, June 25
Schedules, with List of Prizes, on application to
J. WILKINSON, Superintendent, Crystal Palace, S.E.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870, JUNE 3 to 10. ONE THOUSAND POUNDS in PRIZES. To be held in the ROYAL GARDENS, MANCHESTER. Schedules are ready, and can be had on application to the Undersigned
Botanic Gardens, Manchester BRUCE FINDLAY

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870. PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, with List of Forms, on application to
F. G. BUCKLE, Secretary, Peterborough.

NEW ROSES for 1870.—Strong plants, ready early in March, in 20 best varieties, price 10s. DESCRIPTIVE LIST free on application
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Rose Catalogue.

JOHN CRANSTON'S ROSE CATALOGUE for 1869 is now ready, and will be sent post free on application.
The Nurseries, King's Acre, near Hereford.

To the Trade.

T. THORNTON, Bagshot, Surrey, has to offer a large quantity of good clean SEED of KALMIA LATIFOLIA, and RHODODENDRON, saved from named varieties. Prices on application

NEW ROSES of 1870. Strong, vigorous plants now ready
DESCRIPTIVE PRICED LISTS on application to
EWING and CHILD, The Royal Norfolk Nurseries, Norwich

New Roses of 1870.

PAUL and SON beg to remind their Trade Friends that the very strongest plants they have ever offered are READY for DELIVERY. The set seems very promising. A few Wholesale Lists still in print.
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SURPLUS STOCK—STANDARD ROSES, 4/- per 100; HALF STANDARD, 3/- per 100. Good plants and kinds.
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New Roses for 1870.

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CHARLES NOBLE, Bagshot.

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Coleshill, Zonale; Lady Edith, Ivyleaf; unrivalled.
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FRESH SEED of CUPRESSUS LAWSONIANA and THUJA LOBBII, in any quantity. For prices, see pages 214 and 276 of our TRADE LIST, which may be had post free
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For present prices see p. 452 of this week's Paper

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The Nurseries, Tunbridge Wells

Carter's Index, April 2.

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CARTER'S VEGETABLE SEEDS. See page 452. 237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 452. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 452—237 and 238, High Holborn, London, W.C.

CARTER'S NEW ONIONS. 237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES. 237 and 238, High Holborn, London, W.C.

Farm Seeds.

CHARLES SHARPE and CO., SEED GROWERS and MR. HANKS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown for many years by selected stocks.

Garden Seeds.

CHARLES SHARPE and CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown on the Farms by selected stocks.

Improvement of Grass Lands, at from 4s. 6d. to 9s. per acre.

SUTTONS' RENOVATING MIXTURE should now be sown, 6 to 12 lb. per acre.
SUTTON and SONS, Seed Growers, Reading.

APRIL WHEAT for SEED, 66 lb. per bushel, grown in the New Forest, a good change for all lands, may be had at 6os. per quarter, of
Mr. WM. DICKINSON, New Park, Lymington, Hants.

GRAYSON'S GIANT ASPARAGUS, very fine 2-yr. roots, 2s. 6d. per 100, 20s. per 1000.
STEPHEN BROWN, Seedsman, &c., Weston-super-Mare.

ASPARAGUS PLANTS, 2-yr. old (strong).—40,000 to be Sold, Cheap. For price and sample apply to
HENRY PAGE, Walham Green, Fulham, S.W.

To the Trade.

WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and LADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

JERUSALEM ARTICHOKE ROOTS. — A quantity of the above for Sale
EDWARD SANG and SONS, Nurserymen and Seedsmen, Kirkcaldy, N.B.

JAMES FAIRHEAD and SON, SEED GROWERS and MERCHANTS, 7, Borough Market, London, S.E., offer EARLY HANDSWORTH, PRINCE of WALES, and other SELECTED POTATOES. Prices on application.

BOVINIA, or New Cattle-Feeder Potato.—For price, &c., apply to the specially appointed agents.
JAMES DICKSON and SONS, 102, Eastgate Street, Chester

To the Trade.

SWEDE, SCOTCH, and other TURNIP SEEDS, new and genuine, can be bought at low prices by applying to
JAMES FAIRHEAD & SON, 7, Borough Market, London, S.E.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply, for cash, SEAKALE for planting out, 3s. 6d. per 100; ASPARAGUS PLANTS, strong, for planting out, 2s. per 100, or 15s. per 1000; MIXED LACED PINKS, 2s. per 100; WHITE SPANISH ONION SEED, at 2s. per lb. All new and genuine

Agricultural Seed.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL SPRING CATALOGUE of TURNIP, MANGEL, and other AGRICULTURAL SEEDS is now ready, and will be forwarded on application. Samples 2s. 6d. and 5s. per bushel.

E. G. HENDERSON & SON'S

LIST OF NOVELTIES FOR THE SPRING AND EARLY SUMMER OF 1870.

The following NEW PLANTS are now ready for distribution.

For the remaining Descriptive Notes, see Advertisements of March 19th and 26th.

Blandfordia aurea (E. G. Henderson & Son).

A very beautiful addition to the already beautiful group of Blandfordia, making a sixth reputed species in the trio. It is a dwarf evergreen cool greenhouse or conservatory herbaceous plant, with narrow, linear, attenuate, sub-erect, keeled or channeled leaves, from the base of which the firm flower-scape rises from 1 to 2 feet in height, bearing a terminal umbellate cluster of three to five pure golden-yellow drooping bell shaped flowers, 1½ to 2 inches in length, and nearly equal in width. Amongst summer flowering plants of a comparatively dwarf and neat habit it will be found a valuable addition to all select plant selections, and in its own group the most distinct, being unique in its colour, and requiring in its management but as old greenhouse in winter and a well regulated cool temperature in summer, growing freely in any good mixture of heath mould. The rich gold tint of its flower-bells is conspicuously beautiful in contrast with the colour of other species or seedling varieties. 15s

Bouvardia elegans (E. G. Henderson & Son).

WINTER-BLOOMING SECTION.

This fine variety is a permanent form, from E. Hogarth, from which it is at once distinguished by its remarkably robust and free growth; but its most valuable feature consists in the trusses and individual florets being nearly double the size of any other known and similarly shaped trusses of it have been gathered from a plant in bloom with the colour of its blossoms is a pure scarlet tinted carmine. It will prove a valuable kind for conservatory culture, as well as garden use, producing its large and bold autumnal trusses during the late autumn, autumn, and winter months, being also invaluable for drawing-room basket groupings, and winter bouquets. 3s 6d

Ageratum Tom Thumb (E. G. Henderson & Son).

A charming miniature dwarf variety of Ageratum most suitable forming a neat, compact, and effective edging for the front of beds or borders. Its flowers are the same elegant light porcelain-blue, yielding a very beautiful and unique contrast and relief to the rich shades of crimson, dark crimson, and violet flowers, as a glowing scarlet tinted carmine. It will prove a valuable kind for conservatory culture, as well as garden use, producing its large and bold autumnal trusses during the late autumn, autumn, and winter months, being also invaluable for drawing-room basket groupings, and winter bouquets. 3s 6d

New Ivies (E. G. Henderson & Son).

HEDERA RHOMBOIDEA ODORATA.—A remarkably neat and distinct species, of trailing or twining habit, of somewhat dense and compact growth; the leaves are quite rich green, assuming a bronze or metallic hue during the winter season, uniform, moderately heart-shaped, with a concave or scoop-like outline, imparting a very unique character to the plant. It is distinct from all other Ivies yet offered.

A First-class Certificate of Merit was awarded to it by the Royal Horticultural Society. 5s

HEDERA HELIX ARGENTEO-SPECTABILE.—A very beautiful climbing variety, of vigorous habit, and bright emerald-green leaf-tint, merging into a rich self or marbled gold colour. In mature growth its leaves are nearly double the size of the English Ivies. It is well adapted for covering front wall aspects, also for pillars and trellis-work. It is the best golden variety in its group yet offered. 5s each

Mimulus rivularis pardinus

(E. G. Henderson & Son.)

Nine varieties, the most elegantly coloured, and most perfect in form and flower of any hitherto offered. 3s 6d each

Scutellaria pulchella.

,, purpurea.

Dwarf stove shrubs, with spikes of brilliant rosy scarlet and purple flowers. 5s each.

Macadamia ternifolia (New Edible Fruit).

The fruit is about the size of a Walnut, which at maturity contains a kernel of a remarkably rich and agreeable flavour, resembling, but much superior to, the Filbert. Judging from its native locality, it is fully expected, with slight protection on cool walls, to produce its desirable fruit in an English climate, and as an ever-green it is a bold and distinct feature in warm or sheltered and interesting subjects to the orchard house, and also for the cool conservatory, border, or wall. As a shrub or small tree, it is stated to be an abundant bearer in mature growth. 10s 6d. to 42s.

Cobæa penduliflora.

A new species, quite distinct from C. scandens and all others. See the figure and description by Dr. Hooker in the "Botanical Magazine," and in other publications. 3s 6d.

Blandfordia Cunninghami.

A beautiful greenhouse or conservatory herbaceous plant, with terminal drooping cluster of bright red bell-shaped flowers, tipped with golden-yellow. 21s to 42s; small, 3s 6d

Dwarf Antirrhinums (Tom Thumb section)

(E. G. Henderson & Son).

Beautiful dwarf group of brilliant parti-colours; growth 6 to 8 inches in height. 2s. 6d. each

Blandfordia (Hybridised Seedling Plants).

B. Cunninghami and B. flammea being two of the most distinct and beautiful species, E. G. HENDERSON & SON beg to offer vigorous 2-yr. seedling plants, in two groups, viz.: B. Cunninghami crossed with B. flammea; and, B. flammea crossed with B. Cunninghami. 7s 6d., or the two, 10s. 6d

Sedum spectabile purpureum.

An ornamental-flowering half-hardy, or greenhouse plant, of an evergreen herbaceous habit, 9 to 12 inches in height; it forms a neat, compact, erect growth, glaucous green oval leaves, on firm succulent stems, each stem bearing a large flat cymose head of flowers 6 to 7 inches across, formed of rich rosy purple florets, densely arranged in the style of the beautiful Crassula falcata, with the difference in colour. This highly interesting plant is the finest in its allied set up. It is admirably adapted for conservatory or greenhouse culture, and equally handsome for planting out in select borders of the flower-garden, in which it is well deserving value for summer effect, by its long-continued display, and remarkably distinct outline of growth and bloom. 3s 6d.

Aichrysum dichotomum.

A very neat and rare green-house shrub of succulent growth, from 6 to 12 inches in height. The leaves diverge horizontally from the stem, each on a narrow petiolate base, the upper expansion being a rounded spathulate outline, 1 inch wide; the whole plant is surfaced with soft hairs, and the leaves studded with minute papillæ. The aspect of the plant somewhat resembles a shrubby species of Sempervivum, and by the leaves forming flat terminal open crowns, it is adapted for flower garden summer designs of succulent plants, associated with Echeveria species, and other allied groups. 3s. 6d.

Bouvardia Jasminoides.

A beautiful species in the way of B. longiflora, but of much freer growth and more branching habit from the base, equal to the best scarlet kinds of Bouvardia. It is also a more ready blooming plant, with larger terminal and axillary racemes of equally fragrant snow white flower-tubes. A most valuable plant for bedding and conservatory groups, vases, and drawing-room bouquets throughout the year. 1s 6d., 2s 6d., and 3s 6d each

Spiræa Japonica aurea variegata

(Syn. Hotera Japonica).

This highly interesting plant is a most beautiful form of the fine green-leaved species (S. japonica), which, for its decorative effect, has been so greatly admired at the various Horticultural Exhibitions during the last few months; the present plant is a hardy herbaceous perennial of remarkably neat erect growth, one to two feet in height, with glossy red tinted stems, and triply three lobed dark green leaflets, richly traced throughout with gold coloured veins. The flowers are produced in large, erect, densely flowered, snow white, plume-like racemes, thus forming an exceedingly elegant object for cut bottle plants, either singly or in groups, and equally beautiful for pot or sunny decoration in the conservatory, drawing-room, or vestibule. 21s

The Dwarf Pitcher Plant of New Holland

(Cephalotus follicularis).

This remarkably novel and interesting species forms a low, compact plant, from 3 to 4 inches in height, producing comparatively large, oblong, pitcher-shaped organs, which are green, tinted with purple or brown. 3s 6d and 5s each

Caladiums.

An extensive collection of the finest new hybrid French varieties, the most beautiful yet introduced. 60s. and 84s. per dozen.

Gladiolus.

A fine collection of the most choice and beautiful kinds. 6s to 24s per dozen

New Azalea Indica.

QUEEN OF SCARLETS.—Bright scarlet, of model form, huge size, and broad, round, overlapping petals, the three upper ones being very conspicuously marked with rich crimson spots on a velvet tinted ground. 10s 6d to 21s

QUEEN OF ROSES.—Of a rosy tint, of an elegant warm rose colour, with broad, rounded flower lobes evenly expanded, and fine outline; the three upper lobes beautifully relieved by a cloud of small crimson tinted spots. 10s 6d to 21s

QUEEN OF BLUSHES.—Pure white, finely fringed, gentle suffusions of white form yet offered, of a model rose-like outline, good substance, and pure colour, the outer guard or ray petals evenly expanded, the inner ones regular and proportionate. 10s. 6d. to 21s

QUEEN OF WHITES.—Pure white, a beautiful pure double white flower, coming elegantly tipped and streaked with rose, of large size, good substance, and evenly expanded round, overlapping lobes. 10s 6d to 21s

SALMON QUEEN.—Rich salmon-tinted rose flowers, of excellent shape, good substance, and large size, with evenly expanded and overlapping lobes. 10s 6d to 21s

The set, 42s and 63s

A Coloured Illustration of 4 varieties will be sent for 1s. 6d., in stamps.

Bedding Calceolarias.

PILLAR OF GOLD.—A first-class rich golden-yellow bedding variety, with a stronger growth and constitution than Aurea floribunda; finely branched, dwarf habit, and large truss, covering the bed with a rich golden mass during a portion of bloom through the summer and autumn months. 2s 6d each, 21s per doz

BRILLIANT.—A beautiful bright bronze red flowered variety, a superior and effective bedding variety, growth vigorous and close, dwarf and uniform, 10 to 12 inches in height, trusses large and firm, yielding an even and effective display during the whole bedding season. 1s 6d each

Bedding Pansies.

IMPERIAL BLUE.—A first-class variety for beds, blooming profusely throughout the spring and summer months. A rich and beautiful colour. 1s. each.

GOLDEN BEDDER.—The most beautiful and effective bedding Pansy in cultivation; flowers large, rich deep golden-yellow, giving abundant bloom from May until October, and diffusing a most delightful fragrance. 1s each

Ivies.

An extensive collection of these most hardy and useful climbers, including the most distinct and beautiful kinds, in the self-green, silver, and golden variegated sections:—

40 varieties, 50s. to 63s. | 20 varieties, 30s. to 42s.

12 varieties, 12s., 18s., and 21s

Bedding Verbenas (E. G. Henderson & Son).

MARQUIS OF BUTE.—Rich bright scarlet, with white eye, truss large, well built, and of fine outline, opening to the centre, 2s 6d ea

LADY ROWLEY.—Pure self rose pink, large truss opening to the centre, fine habit, and effective bedding variety, growth vigorous, free and erect; an elegant variety in colour. 2s 6d each

LORD CHARLES PERCY.—Crimson, shaded with scarlet, maroon centre, and beautifully pencilled with white, of model outline, with broad, even, close flower lobes, opening to the centre, with the free erect branching habit of Purple King. 2s. 6d. each.

Autumn-struck plants are now supplied.

Choice Seeds.

CALCEOLARIA.—Saved from a very fine strain for beautiful colours, habit, and variety. 2s 6d

CINERARIA.—The produce of a choice named collection. 2s. 6d.

Primula sinensis.

MAGNUM BONUM.—E. G. HENDERSON & SON offer this strain as one of the most beautiful and effective yet raised, showing a great improvement, as the result of some years' successful culture. With a fine robust habit, it produces large, compact, growth trusses of very rich violet crimson flowers of good substance, and elegantly fringed. 2s 6d and 5s per packet

FIMBRIATA.—White, and red fringed; separate, or mixed. 2s 6d.

CYCLAMEN PERSICUM.—From a collection of 30 fine varieties. 10s 6d.

PALMS.—Of various species. 2s. 6d.

LOBELIA (Fumila grandiflora).—best blue. 2s 6d

,, (Silver Rain).—Best white. 2s. 6d.

CENTAUREA RAGUSINA COMPACTA.—True from seed. The finest silvery-white leaved plant for bedding. 1s. per packet; 100 seeds, 6s.

FERULA GIGANTEA (Giant Fennel).—An exceedingly fine decorative hardy perennial herbaceous plant, with magnificently large and exquisitely fine lobed leaves. 6s per packet.

NEW RED-FLOWERED MIGNONETTE.—A beautiful variety, with a very robust and compact growth. Its richer coloured and very fragrant flowers render it the most attractive variety yet offered. 6d and 1s per packet.

Stocks.

ALEXANDRIA INTERMEDIATE, white } 6d and 1s per packet
ALBERT ,, purple }
ROYAL SCARLET ,, 1s. per packet.
LONDON ,, 6d and 1s per packet
,, WHITE ,, 6d. and 1s per packet
PURPLE ROCKET ,, 1s per packet

Strong Fruiting-sized VINES still on hand.

The following will be sent out on and after May 2, with the exception of the Variegated (Tricolor and Zonal) Pelargoniums, which will be distributed in June:—

Caladium "Prince Albert Edward."

A very beautiful and effective new hybrid. It has retained its splendid foliage upon the same plant for two years, it is considered to partake nearly equal in degree of the Alocasia and Colocasium of the former in its evergreen character, and the latter in its most picturesque features. The leaf-stems are a rich dark shot blue, streaked and barred with creamy green white. The broad arrow-headed leaf, shaped, from 12 to 18 inches in length, and nearly equal in width, of a dark emerald-green ground, with a very beautiful rich crimson midrib, radiating from the centre towards the margins, the intervening leaf spaces being densely and elegantly spotted with ivory white. As the leaves attain to maturity the small, thread-like green veins form an elegant tracery over the upper surface. The leaves being of a leathery texture, this noble plant is admirably adapted for permanent effect by culture throughout the year, and amongst other plants in its own group forms one of the most beautiful for miscellaneous selections. 31s. 6d.

New Double-flowered Zonal Pelargonium.

PRINCESS TECK.—Fine deep rich scarlet. An improvement upon all foregoing varieties by its large, open, well-formed truss, the individual flowers being proportionately large and regularly expanded. Habit dwarf, and prolific in bloom. Being less crowded in the truss, it is in all respects better adapted for the English flower garden. 15s

Bouvardia Jasminoides compacta

(E. G. Henderson & Son).

A very prolific flowering dwarf plant, of free growth, for garden groups and pot culture. 3s 6d

New Zonal Bedding Geraniums.

WHITE PRINCESS.—The most profuse flowering white bedding Geranium in cultivation.

CHERUBIM.—A very free flowering dwarf bedding variety, large trusses of dense scarlet. 2s 6d each

New Dahlias (Bedding and Bouquet Section).

GOLDEN GEM, NEMESIS, QUEEN VICTORIA, CONFLAGRATION, GOLDEN CANARY, HEBE, FIGARO, and CHERUBIM

Canna musæfolia sanguinea.

A very handsome variety for garden decoration, with broad rich chocolate crimson leaves. An improvement upon C. nigricans.

Coleus "Emperor Napoleon"

(E. G. Henderson & Son).

Remarkably distinct and effective, and superior to Perilla nankinensis for bedding, by its uniformly dwarf dense growth, from 9 to 12 inches in height, requiring no stopping

Canna "Three-coloured leaved."

The most effective of variegated Cannas for bedding, its creamy white mottle and streaked leaves forming a handsome group upon a lawn

Diplacus (Shrubby Mimulus)

(E. G. Henderson & Son).

Three very distinct and ornamental varieties for garden groups, and conservatory pot-culture.

Thymus citriodorus aurea (E. G. Henderson & Son).

A beautiful golden-leaved Thyme, for varied contrast in scroll-work, alpine mounds, picturesque slopes, and ground-surface effect.

Variegated Tricolor Pelargoniums

(E. G. Henderson & Son).

A beautiful selection of 15 new varieties, including improvements in growth and effect upon the well-known favourites, Lady Cullum, Mrs. Pollock, Howarth Ashton, and Italia Unita. Amongst them will be found the Lass of Gowrie, greatly surpassing every other known variety in its section, and exceedingly beautiful in its pure white leaf-margin, in fine keeping with a brilliant carmine-rose belted zone, combining all that is desirable in habit with the most exquisite colouring; also Peter Grieve, a splendid golden tricolor variety, of vigorous, well-proportioned growth, fine symmetry, and brilliant coloured zone. This beautiful plant was awarded the highest Certificate in competition of fifty or more competitors.

Variegated (Gold and Bronze-zoned) Pelargoniums

(E. G. Henderson & Son).

This popular section, including 21 new varieties of great merit, is distinguished by excellence in habit of growth, and rich effective zones upon golden leaf-grounds.

Golden-Leaved Fuchsias (E. G. Henderson & Son).

GOLDEN TREASURE } Beautiful varieties for garden decoration, with rich pure gold tinted
CROWN OF JEWELS } foliage, and pure gold tipped with
GOLDEN MANTLE } bronze crimson
ORANGE BOVEN }

Lobelia Erinus (miniature Section)

(E. G. Henderson & Son).

Three kinds. Beautiful additions to this favourite section for garden decoration

Exhibition Fuchsias (E. G. Henderson & Son).

Seven varieties for exhibition and conservatory decoration, including scarlet sepals, with rose-striped double corolla; white corolla with scarlet tube; white sepals with violet-rose corolla, elegantly reflexed, and rich violet-purple corolla, with blush-white sepals, &c.

New Verbenas (E. G. Henderson & Son).

Many of the offered new Verbenas are best noted for their large trusses. The present selection of 12 includes first-class varieties in habit, for bedding and garden groups, of brilliant colours, with profusion of bloom.

DESCRIPTIVE NOTES and PRICES of the foregoing are given as referred to above.

WELLINGTON NURSERY, ST. JOHN'S WOOD, LONDON, N.W.

BARR & SUGDEN,

12, KING STREET, COVENT GARDEN, LONDON, W.C.

GLADIOLI.—The most beautiful of autumn blooming plants. The most useful and durable to cut for furnishing Vases, Jardinets, &c. Commence planting now and continue successional planting till June. The late plantings if lifted and potted are valuable for Conservatory Decoration, or to Cut for Vases in November and December.

GLADIOLI—Varieties of Gandavensis, as under.

500 in 25 fine varieties	£3 5 0	25 in 25 fine varieties	£0 7 6	25 in 25 splendid varieties ..	10s. 6d. to £2 10 0
250 in 25 ,, ,, ...	2 15 0	12 in 12 ,, ,, ...	0 3 6	12 in 12 ,, ,, ...	5s. 6d. to 1 10 0
100 in 25 ,, ,, ...	1 5 0	100 in 100 splendid varieties ..	63s. to 10 10 0	Fine Mixed, 12s. 6d. per 100; 2s. per dozen.	
50 in 25 ,, ,, ...	0 14 0	50 in 50 ,, ,, ..	25s. to 5 5 0	Splendid Mixed, 21s. per 100; 3s. per dozen.	

GLADIOLI—Varieties of Gandavensis, in Special Mixtures.

Fine Mixed Whites of shades, 21s. per 100; 3s. per dozen.
Splendid Mixed Whites of shades, 30s. per 100; 4s. 6d. per dozen.
Fine Mixed Roses of shades, 21s. per 100; 3s. per dozen.
Splendid Mixed Roses of shades, 30s. per 100; 4s. 6d. per dozen.
BRENCHLEYENSIS, 10s. 6d. per 100; 1s. 6d. per dozen.

Finest Mixed Scarlets and Crimsons in shades, 21s. per 100; 3s. per dozen.
Splendid Mixed Scarlets and Crimsons in shades, 30s. per 100; 4s. 6d. per dozen.
Fine Mixed, from the three foregoing, 21s. per 100; 3s. per dozen.
Splendid Mixed, from the three foregoing, 30s. per 100; 4s. 6d. per dozen.
BOWIENSIS, 15s. per 100; 2s. 6d. per dozen.

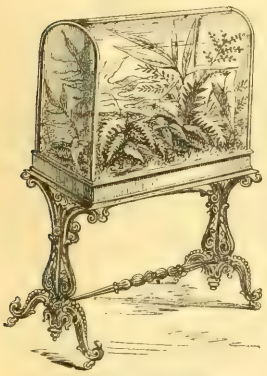

ALBERT PLANT CASE

GLADIOLI SPAWN or OFFSETS,

From BARR AND SUGDEN'S Magnificent Collection, as enumerated at pp. 66, 67, 68, and 69, of their Seed Catalogue, 1870.

They should be sown immediately they are received. If in the open ground, they should have a little protection at first. They soon make flowering rods.

SPAWN, Collected from the first-class varieties of Sections 7 and 8, 10s. 6d. per 100; 63s. per 1000.
Do., do., do. the very fine varieties of Sections 4, 5, and 6, 5s. 6d. per 100, 30s. per 1000.
Do., do., do., the fine varieties of Sections 1, 2, and 3, 3s. 6d. per 100; 21s. per 1000.
Do., do., do. Brenchleyensis, 1s. 6d. per 100; 10s. per 1000.
Do., do., do. Bowiensis, 1s. 6d. per 100; 10s. per 1000.
Do., do., do. Ramosus varieties, 1s. 6d. per 100; 10s. per 1000.
Fine mixed, from all sorts, 1s. 6d. per 100; 10s. per 1000.

GLADIOLI SEED,

Saved from B. & S.'s Magnificent Collection: flower the second season.

First-class, from Sections 7 and 8, 2s. 6d. to 5s. 6d. per packet.
Second-class, from Sections 4, 5, and 6, 1s. 6d. to 2s. 6d. per packet.
Third-class, from Sections 1, 2, and 3, 1s. to 1s. 6d. per packet.
Saved from Mixtures, 6d. to 1s. per packet.

Full particulars, descriptions, prices, and cultural directions given in BARR AND SUGDEN'S SEED CATALOGUE for 1870, pp. 65, 66, 67, 68, and 69.

LILIUMS.

AURATUM, the Great Lily of Japan, the Queen of Lilies, and the most magnificent of recent introductions; perfectly hardy, 18s., 21s., 25s., 30s., 36s., 42s., and 48s. per dozen; 1s. 6d., 2s. 6d., 3s. 6d., 4s. 6d., 5s. 6d., 7s. 6d., 10s. 6d., 12s. 6d., and 15s. each. These latter very large.

DOUBLE SANVITALIA

VEGETABLE SEEDS.

In Collections, 12s. 6d., 15s. 6d., 21s., 31s. 6d., 42s., 63s., and upwards.

FLOWER SEEDS.

In Collections, 2s. 6d., 3s. 6d., 5s. 6d., 7s. 6d., 10s. 6d., 15s., 21s., 30s., 42s., and upwards.
Very Choice GERMAN Double TEN-WEEK STOCKS.
EMPEROR and BROMPTON STOCKS.
Very Choice FRENCH and GERMAN Double ASTERS.
Very Choice Double BALSAM and Double WALLFLOWER SEED.

BARR AND SUGDEN'S CATALOGUE, free to intending purchasers, contains everything requisite in Flower and Vegetable Seeds, with full descriptions and prices.

BARR AND SUGDEN'S HEATED

MULTUM-IN-PARVO PROPAGATING FRAME

For Striking Cuttings, Raising Seeds, and Growing Choice Stove Plants, £4 4s. and upwards, according to size.

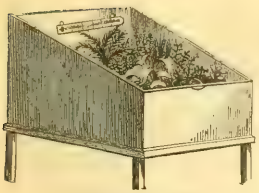

PROPAGATING FRAME.

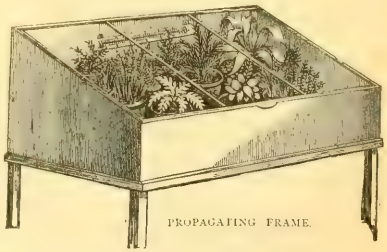

PROPAGATING FRAME.

BARR & SUGDEN'S SUB-ALPINE WINDOW GARDEN, or the Multum-in-parvo Garden.

The woodcut represents a Bay Window with upwards of 100 species of Alpine Plants, which were arranged two years ago, and with very little attention are still effective. Plants for such Windows and also for Sub-Alpine Mounds or Pseudo-Monte Rosas—*a la* Battersea Park—per 100, in 50 varieties, 50s. and 60s.; per 100, in 100 varieties, 60s. to 80s.

ECHEVERIA SECUNDA GLAUCA, 6s. to 9s. per doz.

ECHEVERIA METALLICA, 1s., 1s. 6d., 2s. 6d. each, and upwards.

ECHEVERIAS, fine species, 1s. 6d. each, and upwards.

SEMPERVIVUM CALIFORNICUM, 4s. and 6s. per dozen.

SEMPERVIVUM MONTANUM, and other beautiful species, 9s. per dozen, and upwards.

ANTENNARIA TOMENTOSA, the beatiful Snow plant which caps the Pseudo Monte Rosa of Battersea Park, 6s. per dozen.

Special quotations for large quantities of the above on application.

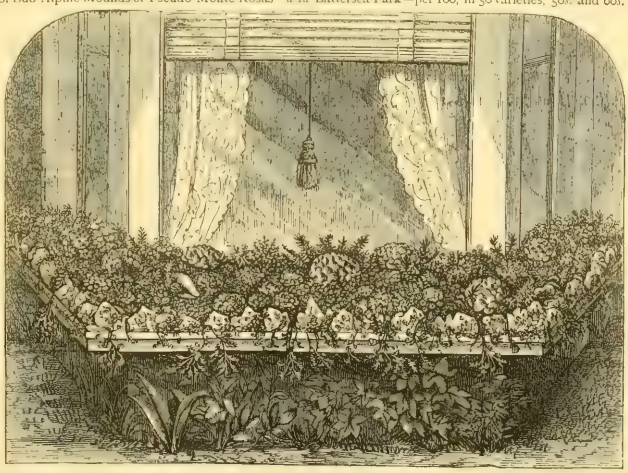

HARDY CLIMBERS, 18s. to 30s. per dozen.

PALMS, for Drawing-room Decoration, 10s. 6d. each and upwards.

HARDY FLOWERING SHRUBS, 18s. per dozen and upwards.

HARDY EVERGREEN SHRUBS, 18s. per dozen, and upwards.

SAXIFRAGES, fine species, 40 to 50 varieties, 63s. per 100.

SEDUMS, 40 varieties, 63s. per 100.

HERBACEOUS BORDER PLANTS, fine species and varieties, 60s. to 80s. per 100.

PLANTS SUITABLE for EDGINGS, 9s. and 12s. per dozen.

CARNATIONS, PICOTEES, PINKS, 9s. per dozen, and upwards.

BARR AND SUGDEN, 12, KING STREET, COVENT GARDEN, LONDON, W.C.

Chrysanthemums.

THE CHRYSANTHEMUM, and HOW TO GROW IT. See ADAM FORSYTH'S CATALOGUE for 870, forwarded to all applicants I rue stamp
Brunswick Nursery, Stoke Newington, N, and 120, Mount Street, Grosvenor Square, W

WEBB'S NEW GIANT POLYANTHUS. Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the varieties, with double PRIMROSES of different colours; AURICULAS, both single and Double; with prices sent of Early Spring Flowers. LIST on application—Mr. WEBB, Oaken, Reading.

Seedling Forest Trees—(Trade).

PETER LAWSON AND SON have still on offer extra fine 1 and 2yr Seedlings of NATIVE SCOTCH, BLACK AUSTRIAN PINE, COMMON PINE, NORWAY SPRUCE, LARCH, and other useful Forest Trees, at very moderate prices per 1000 000

Edinburgh and London

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices —100 plants, distinct sorts, for 5s.; 50 plants for 3os; or 25 plants, distinct sorts, for 20s, hamper and package included
Crown Nursery, Retford

CHRYSANTHEMUMS, CHRYSANTHEMUMS.—12 fine good varieties for 2s., 50 for 3s., including large flowered; POMPONS and JAPANESE, 18 varieties of 1870, for 5s., in thumb pots, package included, or post free No varieties sent which pass losers perfect

CALCEOLARIA AUREA FLORIBUNDA, 6s. per 100; GLADIOLUS BRENCHLEYENSIS, 6s. per 100, all flowering bulbs. POLYANTHUS, 30 s 6d, 2s per dozen, GOLD DUSTS, 4s per 100. PELARGONIUMS Tom Thumb, Stella, and Cluster, strong cut and struck cuttings, 1s 8d per dozen, 12s per 100 CATALOGUE of Tricolor Pelargoniums and other Plants free by stamp. Prices on application
WM CLIBRAN AND SON, Mill bank Nursery, near Warrington

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash Mrs Pollock, 2s 6d; Lady Cullum, 6s; Sunset, 3s; Sophia Dumaresque, 1s 6d; Italia Unita, 3s; Lucretia, 2s 6d; Golden and Bronze Zonales, Beauty of Calcdrake, 1s 6d; E G Henderson, 6s; Duke of Edinburgh, 9s; Her Majesty, 6s; Luna, 2s 6d; Neatness, 2s 6d. Rooting, 1s 6d, for a single Cloud, Reed Derby, 3s. Good goods, subsequent dozen. Remittances requested from unknown correspondents
ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire

STRONG BEDDING GERANIUMS.—Tricolor and others —Lady Cullum, 6s per dozen; Louise Smith, 4s; Sophia Cook, 4s; Lady Pollock, 4s; Golden and Bronze Zonales, 2s 6d; Bronze —A H Wells, 3s; Beauty of Calderdale, 1s; Perilla, 2s 6d; Kentish Hero, 1s; Princess of Wales, 3s; Little Golden Chain, 2s 6d, Zonales, 1s 6d per dozen, Rooting, 1s 6d per 100, in single 3inch pots, all package free Orders are now booked for August to May
A PRICE LIST, with nearly 200 Varieties, can be had on application to
W. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

Choice Bedding Geraniums.

THOMAS PESTRIDGE can now supply in strong Plant of each of the following varieties

	Terms, Cash			Terms, Cash	
	s.	d.		s.	d.
Lady Cullum	12	0	Captain Cuttle	3	0
Lilly Cuttle	4	0	Mr Marriott	2	0
Mrs Pollock	4	0	Hero	4	0
Sophia Cook	2	0	Mrs	8	0
Sophia Dumaresque	8	0	Mrs Holden Pope	8	0
Sunset	8	0	Perfection	2	0
Italia Unity	4	0	Scarlet Gem	2	0
Beauty of Calderdale	6	0	Vivid	8	0
Crystal Palace Gem	4	0	Violet	12	0

Twelve varieties, in Pots chosen from the above, 1 package included. Cash must accompany all orders.
The Gardens, Cambridge, Middlesex

Bedding Geraniums.

J. HOUSE, Eastgate Nursery, Peterborough, offers good strong plants of WILLIAM PENDLEWOOD, the easy coming MRS. SCARLET, Beauty of Calderdale, 4s per dozen, both of which received First-class Certificates from the Royal Horticultural Society last season

GRAPE VINES.

MADRESFIELD COURT Canes, 7s 6d each; Lots, 6 per dozen
MRS PINCE Canes, 5s each; Lots, 4 per dozen
Single of Canes on application
J. HOUSE, Eastgate Nursery, Peterborough

Novelties.

DOWNIE, LAIRD, AND LAING are now offering the following Novelties, which have gained first honours wherever exhibited, and are the admiration of all who have the pleasure of seeing them:

New and unapproached Double Crimson PELARGONIUM
New and unsurpassable Double Rose
New and unrivalled Double Salmon
New and splendid CHROMATELLA CHRYSANTHEMUM
New Double Perpetual Flowering Rose LOSSIANA 1870
New distinct and beautiful CACTUS DAHLIAS
New Golden Bedding ARCHIBALDIA MEGASTACHYA

In progress is our NEW DESCRIPTIVE CATALOGUE of this season, which will be forwarded, post free, to all applicants
Nurseries, Forest Hill, London, S.E., and Edinburgh

Spring Flowers.

LEWIS WOODTHORPE begs to offer the following:—

	Per doz.	
	s.	d.
VIOLA ODORATA PENDULA, the new Weeping Violet of New York, each	1	0
VIOLET—The Queen of Violets	6	0
" The King of Violets	6	0
" Large double Red	6	0
" Double Neapolitan	4	0
" Double Tree—True Indigo Blue	12	0
" " White Tree	12	0
" Giant single Tree, fine and attractive novelty,	12	0
" The Czar, the finest single Violet each	1	0
PRIMROSES—Double White	3	0
" Double Lilac	4	0
" The Giant, Double Yellow	6	0
HEPATICAS—Single Blue, double Red, single Pink	4	0
" Single White	9	0
DAISIES—Bacchus, Magpie, Pink Beauty, Queen of Whites Red Rover and Rosy Gem, The Pet, Bessie	4	0
AURICULAS—Finest Alpines	6	0
" Double Black each	1	0
HELIANTHEMUM — The Dwarf Rock Cistus, named varieties	4	0
ROCKETS Double White and Purple	4	0
POLYANTHUS Superb double varieties	9	0
GENTIANA ACAULIS	6	0
HERBACEOUS PHLOXES	9	0
A Choice and varied Collection of HERBACEOUS and ROCK PLANTS to name per hundred	25	0
DWARF ROSES in Pots per dozen	8	0

A Descriptive CATALOGUE of New and Choice Plants, Roses, Fruit Trees, Seeds, Bulbs, and General Nursery Stock, free on application to
L. S. WOODTHORPE, Munro Nursery, Sible Hedingham, Essex

CALCEOLARIAS, Herbaceous, nice plants, free by post, 2s 6d and 4s per dozen.
GLOXINIAS, good varieties, 12 for 8s., 24 for 16s., free by post.
ACHIMENES, in 20 varieties, 3 tubers of each, 6s. per dozen.
DAHLIAS, pot roots, package free, 50 varieties for 15s., 25 for 7s. 6d.
CALCEOLARIAS, 12 fine varieties, our selection, free by post, 2s. 6d. per dozen, 50 for 8s., 100 for 15s.
PELARGONIUMS, in 50 varieties, package free, out of pots, 4s. per dozen, 20s. per 100.
ZONAL, NONSUCH, and SCARLET GERANIUMS, in 25 varieties, package free, 10s. and 12s. per 100.
FUCHSIAS, package free, 12 varieties for 4s., 25 for 8s.
EPACRIS, coming in flower, 30 varieties, 12s. per dozen. AZALEAS, flowering, 12s. to 18s. per dozen. ACACIA ARMATA, flowering, 9s. per dozen. CHOROZEMA ILICIFOLIUM, 6s. per dozen. TRENTHAM ERICOIDES and ALEXANDRINA, well set for bloom, 9s. per dozen
HUNTSMAN, Florist, Lewisham.

AUCUBA MASCALA, SET WITH BLOOM-BUDS.

MESSRS. VEITCH & SONS

Have much pleasure in offering, at a very reasonable price, nice plants of the true

JAPANESE MALE AUCUBA,

Well set with flower-buds, which will enable Purchasers to fertilise the common variety during the Spring.

Good Plants, 1s. 6d. to 2s. 6d. each; 15s. to 24s. per dozen.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, LONDON, S.W.

NEW PLANTS.

WILLIAM BULL, F.L.S.,

BEGS TO INTIMATE THAT HIS

CATALOGUE OF NOVELTIES FOR 1870

Is now in the Press, and will be issued shortly. It contains descriptions and prices of many New Plants offered for the first time, including the celebrated GODWINIA GIGAS, the new white Cypripedium, C. NIVEUM, the lovely blue-berried PSYCHOTRIAS two new scarlet-flowered VITIS, a new hardy LILY, with variegated foliage, from Japan; new DRACÆNAS, ARISTOLOCHIA RINGENS, &c.

MR. WILLIAM BULL has the pleasure to announce that he has made arrangements with Messrs. John Salter & Son to send out the fine stock of their SEEDLING JAPANESE and other NEW CHRYSANTHEMUMS.

Messrs. John Salter & Son are retiring from business in consequence of the Metropolitan District Railway Company requiring their Nursery, and their entire stock of new CHRYSANTHEMUMS is in the hands of MR. WILLIAM BULL. All orders for them, that have been taken by Messrs. John Salter & Son, will be executed by MR. W. BULL on precisely the same terms as if sent out from the Versailles Nursery.

MR. W. B.'s CATALOGUE of NOVELTIES for 1870 (now in the Press) contains descriptions of the NEW CHRYSANTHEMUMS above alluded to.

ESTABLISHMENT FOR NEW AND RARE PLANTS, KING'S ROAD, CHELSEA, LONDON, S.W.

VIOLA CORNUTA, BLUE PERFECTION.

GEORGE SMITH,

WILTON ROAD NURSERY, SALISBURY,

Begs to say that he has a large STOCK of this SUPERB BEDDING PLANT, which is equally suitable either for the Spring or Summer Garden, as it produces an abundance and continuity of blossom from the end of March to the end of October. It has been thoroughly proved by himself for some years, and by Mr. Challis, of Wilton House Gardens, for the last three years, both in the Spring and Summer Garden, in both of which it eclipsed every other blue plant in brightness as well as in abundance of bloom. Its habit is dwarf, yet free, the foliage is dark green, the flower is as large as the well-known Cliveden Blue Pansy, and the colour is a beautiful clear blue, inclining to mauve; the petals are smooth and even, and of great substance.

G. S. begs to state that the blooms of it which were exhibited before the Floral Committee, South Kensington, September 21, 1869, by Mr. Warren, were obtained from his Nursery. They were declared by the Committee to be identical with a variety shown by Mr. Jobson, of Rotherfield Park, as a seedling. As some discussion has taken place respecting it between Mr. Dean and others, G. S. begs to say that he has not only had it in his possession, but has sold it for several years past, and he not only claims the merit of being the first to introduce it to public notice, but also denies that it is a seedling of recent date.

Having a large stock, G. S. will be prepared to send it out in any quantity early in April.

Price—Single Plant, 2s.; Per Dozen, 18s.; Per 100, £4, Per 1000, £25.

☞ *All Orders will be executed as received.*

1870.

J. W. WIMSETT'S

NEW PLANT CATALOGUE (108 pages)

Is now ready, and will be forwarded, Post Free, on application.

It contains extensive LISTS of ORCHIDS, STOVE and GREENHOUSE PLANTS, TREE FERNS, AZALEAS, CAMELLIAS, NEW BEDDING PLANTS, WILLS' NEW HYBRID and other PELARGONIUMS, SHOW and FANCY GERANIUMS, RHODODENDRONS suitable for cold and exposed situations, and New and Handsome PALMS, suitable for Drawing-room and Dinner-table Decoration.

For descriptions of these see *Gardeners' Chronicle* for February 19, 1870. The plants there mentioned were a portion of Mr. WIMSETT'S extensive Collection, and were supplied to one of the London Club Houses which has long been held in high repute for the elegance of its dinner-table decorations. They were, on this occasion, the most graceful ever witnessed, and the only instance on record where Palms have been used exclusively for the above purpose.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W., *December* 10, 1869.

SIR,—I am directed by the Council of this Society to convey to you their thanks for the grand display of Flowers you made at the Gardens here on the occasion of the visit of his Majesty the King of the Belgians.—I remain, Sir, yours faithfully,
JAMES RICHARDS, Assistant Secretary.

To J. W. Wimsett, Royal Ashburnham Park Nursery, King's Road, Chelsea

BALLS and PARTIES furnished with Plants of every description. A large stock of Ornamental-foliaged Plants always kept for the purpose.

CONSERVATORIES furnished, by the year or otherwise, on the most reasonable terms.

All kinds of DINNER-TABLE DECORATIONS sent out to any part of London, and arranged in the most modern and approved style, and of the most choice flowers of the season.

CUT FLOWERS sent out loosely, or arranged into bouquets by competent and tasteful persons.

BRIDAL, OPERA, and other BOUQUETS furnished on reasonable terms.

ASHBURNHAM PARK NURSERY, KING'S ROAD, CHELSEA, S.W.
J. WILLS, F.R.H.S., *Manager.*

BETA CHILENSIS.

BUTLER, McCULLOCH & CO.

Have great pleasure in being able to offer SEED of the true variety of this magnificent foliage Plant, a specimen of which may be seen at their Establishment; it is also fully described in their SPRING CATALOGUE, sent Post Free on application. **1s. and 2s. 6d. per packet.**

BUTLER, McCULLOCH, AND CO., SOUTH ROW, COVENT GARDEN MARKET, LONDON, W.C.

Established upwards of a Century.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS,

Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

CUPRESSUS LAWSONIANA GRACILIS,

Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen.

A few fine Specimens, 10s. 6d. to 21s. each.

These two distinct and very beautiful hardy Evergreens were exhibited at the Royal Horticultural Gardens, London, on the 16th inst., and unanimously awarded First-class Certificates. They have been purchased by nearly every one who has seen them growing in the Nursery, and are fearlessly recommended to all admirers of first-class hardy plants.

ANTHONY WATERER, KNAPHILL NURSERY, WOKING, SURREY.

LEUCOCARPUS ALATUS.

B. S. WILLIAMS

Has much pleasure in offering fresh SEEDS of this extremely useful plant for winter decoration. When well grown it is very ornamental, its long racemes of snowy fruits forming a beautiful contrast to those of the celebrated hybrid Solanums, and for which the Leucocarpus is a most suitable companion. The berries are large, pure white, and produced in great profusion.

Price 1s. 6d. and 2s. 6d. per packet.

VICTORIA NURSERY, UPPER HOLLOWAY, LONDON, N.

NEW PLANTS FOR 1870.

B. S. WILLIAMS

Has much pleasure in offering the undernamed NEW PLANTS, which will be ready for distribution on May 1, next.

New Summer Bedding Plant.

PERISTROPHE ANGUSTIFOLIA AUREO-VARIEGATA.—This very elegant Acanthad was raised in the mountains of Java, and was awarded a First Class Certificate by the Floral Committee this spring. The leaves are ovate lanceolate, bright orange in the centre, and margined with dark green; in habit it is dwarf and compact, and B. S. W. has all confidence in its becoming a splendid edging plant in the Summer Flower Garden; as a pot plant it is very beautiful, and although the flowers are not remarkable for size, their bright mauve-purple colour forms a striking contrast with the orange colour of the leaves. Price 10s. 6d.

Superb New Bedding Plant.

VIOLA CORNUTA VAR. PERFECTION.—B. S. W. has much pleasure in offering this superb plant to public notice, and from the manner in which it has been tested both in dry and exposed situations, as well as moist and shady places, he has no fear in confidently asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed it resembles a gigantic V. cornuta in habit, and whilst retaining its profuse blooming qualities producing flowers which almost rival our Florist Pansies for size and substance. This plant was awarded a First Class Certificate by the Floral Committee, September 25, 1869. Price 2s. 6d. each, 21s. per dozen, 70s. per half hundred, 100s. per 100.

Azalea Grand Monarch.

A superb new and distinct variety, suitable for exhibition or early forcing purposes; the habit is compact and dense, of medium growth, and a profuse bloomer; flowers 3 inches in diameter, of good substance and perfect outline, the lobes are perfectly round and smooth, and in colour deep pink, shaded with warm rose towards the margins; in addition, the upper lobes are densely spotted. Price 21s. each, a few extra-sized plants, 42s. to 63s. each.

Verbena Mauve Queen.

This very elegant variety possesses a good constitution, and is not subject to attacks of mildew and other diseases, which so many of the new forms of this plant are said with less fed to be almost fatal to the enjoyment of Verbenas from the pottering, in addition to its smooth habit, and as a whole, most profuse, the trusses, which are of good size, are borne well above the young shoots, and the flowers are a beautiful mauve mauve, and yield a most delicate perfume. It can be highly recommended for bedding purposes. Price 2s. 6d. each.

New Fuchsias.

B. S. WILLIAMS has much pleasure in being able to offer the following five varieties of this favourite plant, they are all of good habit, and thoroughly distinct, and cannot fail to give general satisfaction:—

BIRD OF PARADISE.—Tube and sepals scarlet, well reflexed corolla, very regular, and soft, delicate rose in colour. 10s. 6d. each.

FORMOSA.—Tube slender, and, as well as the sepals, bright scarlet; corolla double, very regular and compact, deep violet, the outer petals rosy red, elegantly flaked with light violet. 10s. 6d. each.

HOLLOWAY RIVAL.—This is probably one of the most distinct forms yet sent out; tube and sepals bright red, well reflexed corolla, very long petals of great substance, and rich deep violet in colour. 10s. 6d. each.

STRIATA PERFECTA.—A charming and very effective variety; tube and sepals waxy white; corolla bright carmine, striped with blood-like red pure white. This variety is not only exceedingly handsome, but totally different from any other variety in cultivation. 10s. 6d. each.

TRIUMPHANS.—A superb double variety; tube and sepals rich crimson, reflexed from the base; corolla large and very regular, petals intense violet, suffused at the base with crimson. 10s. 6d. each. The set, 42s.

BENJAMIN S. WILLIAMS, VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW LARGE ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS AND MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

The most Beautiful Aster Grown is

TRUFFAUT'S REINE MARGUERITE, containing Clear Pink, Rose, Scarlet, and Pure White Flowers; 500 Seeds in Four distinct colours, 2s. 6d.; or Twelve selected Packets of Foreign STOCKS, PHLOX, LARKSPURS, ZINNIAS, &c., of superior merit, for 21s. Carriage Paid.

ALFRED HAMMOND, Bee-keeper and Flower Seeds, Bedwin Street, Salisbury.

SURPLUS STOCK of PLANTS, for Cash.

	Per dozen.	£
GERANIUM LORD DERBY	..	1 0
GERANIUM MADAME LEMOINE	..	1 0
THE NEREIA HARRISII	..	9 0
PRIMULA SINENSIS ALBA FLORE PLENA, in full bloom	..	1 0
FERNS, in variety, in 48 Pots	..	6 0
STOVE and GREENHOUSE PLANTS, in variety	..	9 0
ERICAS, HYEMALIS, CARNEA, and others, mixed	..	12 0
MORELANA	..	6 0
CARNATIONS, Tree, in full bloom	..	12 0
JASMINUM GRANDIFLORUM, strong plants, for forcing	..	1 0
ANTIMONE HONORINE JOBERT	..	4 0
HESPERUS MATRONALIS DOUBLE PURPLE, in full bloom	..	3 0
AUBRIETIA GRANDIFLORA, in pots	..	4 0
PHLOX, NELSONII and DRUMMONDIANA, in pots	..	4 0
ALYSSUM SAXATILE, in pots	..	1 0

E. and J. PERKINS, for their large stock of the above, can make special prices to the Trade by the 100.

Leamington Nurseries, Leamington.

SUTTONS' FRESH IMPORTED FLOWER SEEDS. Free by post.

ASTERS, WALLFLOWERS, STOCKS, ZINNIAS, &c., imported from the most celebrated Continental growers. See SUTTONS' DESCRIPTIVE LIST of FLOWER SEEDS, gratis and post free on application.

SUTTONS' COLLECTIONS OF FLOWER SEEDS.

			£
No. 1 Collection of	the best English and German varieties, with instructions for culture, free by post or rail		2 2 0
No. 2 Collection of	ditto	ditto	1 11 6
No. 3 Collection of	ditto	ditto	1 1 0
No. 4 Collection of	ditto	ditto	0 15 0
No. 5 Collection of	ditto	ditto	0 10 0

Smaller Collections can also be had from 2s. to 7s. 6d., free by post.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

MESSRS. J. STANDISH AND CO., The Royal Nurseries, Ascot, Berks, are now prepared to execute orders for the following NEW AND CHOICE PLANTS, to which they wish to call special attention:—

INORA DIAMANA.—This magnificent plant is of very free growth, easy to cultivate, the trusses of flowers are large, and of a bright orange-red colour. It flowered freely in a 48-pot, is of very strong constitution, and will succeed in a variety of temperature, consequently is admirably adapted for exhibition purposes. Plants 7s. 6d. to 21s. each, with five or six spikes of bloom set, 25s. each.

ANTHURIUM SCHERZERIANUM.—Fine young plants, two to three crowns, 10s. 6d. each; three to four crowns, and stronger, 15s. to 21s. each.

TODEA PELLUCIDA COMPACTA.—A very dwarf and compact variety. As it does not give seed fronds until the plant is very old, are not inclined to grow tall, it is admirably adapted for table decoration, see *Gardeners' Chronicle*, May 8, 1869. In April next, 10s. 6d.

FICUS MACROPHYLLA.—From New Zealand, where, such is its luxuriant growth, it is said to attain the size of a forest tree. It is undoubtedly the best Subtropical Plant of its kind, growing freely in a very low temperature, even withstanding 7 or 8 degrees of frost; hence it is not a doubtful plant for our variable climate, but if put out in the middle of May it sure to succeed. 5s. each.

ABUTILON THOMPSONI.—This has also proved itself a very fine Subtropical Plant, thriving well under adverse circumstances, the bright marbled colour of its leaves producing a very striking effect. It will do well up to the end of October, as a few degrees of frost do not appear to hurt it. Plants, 1s. each, 9s. per dozen; 60s. per 100.

COPROSMA BAUERIANA VARIEGATA.—This is a perfect gem for small beds, or for edging. Being a New Zealand plant it will thrive well in our climate, retaining its beauty until late in the autumn. 2s. 6d. each; 24s. per dozen.

TREE PICOTEE ASCOT YELLOW.—This is of the most robust habit and a thorough perpetual. The colour an intense yellow, deeply edged with lake; flowers very large and finely shaped. A few strong plants, now, 5s. each, in April next, 7s. 6d. each.

ROYAL ASCOT VINE.—This has, in a few years, proved itself to be beyond doubt the most prolific of all the Vines yet set out, and ripens its fruit to perfection in a cold house. Plants, 7s. 6d. to 15s. each, and a few extra strong three year old canes, that would carry a good crop this year, 21s. each.

NEW PEACHES.—The "Magnificent Downshire" and the "Early Ascot." These have been raised from Noblesse, and may be described as the Noblesse Peach, partaking of both parents in equal degree, their flavour surpasses anything we have previously tasted. A good size, very deep red, and of a more hardy character than the Royal George. Very clean, strong grafted trees. Fine plants, 3s. 6d. to 5s. each.

ABIES OROVATA.—A beautiful new conifer from Japan. We have proved it perfectly hardy, of very fine growth, with foliage of the most beautiful glaucous green. 5s. 6d. to 21s. each.

JUNIPERUS JAPONICA ALBO-VARIEGATA.—By far the finest of all the Junipers. 2s. 6d. to 10s. 6d. each.

ACER RUBRUM PRAVE ALBO-LIMBATUM.—This large and beautiful variety of Maple is an acquisition from Japan. It is quite distinct from other varieties, and in summer the leaves, which are nearly covered with white, have a crenulated or fringed appearance. 21s. to 42s. each.

ACER POLYMORPHUM PECTINATUM RUBRUM.—We have a fine stock of this very charming Maple. The leaves are beautifully cut, and are coloured with green and red. 10s. 6d. to 21s. each.

APUCARIAS, Myles, 10s. 6d. to 15s. each; and other varieties. See our CATALOGUE.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed selections from their general stock; every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 to 8 to 12 feet

CUPRESSUS LAWSONIANA, 3 to 4 to 6 to 10 feet

„ LAWSONIANA ARGENTEA (John Waterer's var.)—By far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each

„ MACROCARPA, 4 to 6 feet, 42s. per dozen.

THUJA AUREA—Beautiful plants, about 2 feet, 42s. per dozen; larger, 5s. to 21s. each

„ GIGANTEA.—An unequalled stock of hundreds of Seedlings, 4 to 6 to 8 feet, 3s. 6d. to 5s., 7s. 6d., and upwards.

„ N.B.—We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless

THUJOPSIS BOREALIS, 3 to 4 feet, 30s. per dozen; extra fine, 5 to 6 and 7 feet, 5s. to 10s. 6d. each

„ DOLABRATA.—Fine plants, 5s. to 7s. 6d. each.

„ „ VARIEGATA, 5s. to 7s. 6d. each

WELLINGTONIA GIGANTEA.—Good plants, 30s. per dozen; 2 to 3 feet, 42s. to 63s.; larger, up to 6 feet, 7s. 6d. to 15s. each

ABIES NOBILIS, handsome plants, from 5s., 7s. 6d., and upwards

„ NORDMANNIANA, 2 to 3 feet, 7s. 6d. to 10s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 12 feet, 31s. 6d. and upwards each

„ LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each.

„ GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to 63s. each.

„ PINSAPO, 2 to 3 feet, 5s.; 3 to 5 to 8 feet, 7s. 6d. to 15s.

„ DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 10 feet, 7s. 6d. to 21s. and upwards.

„ MAGNIFICA, 3 to 4 feet, 31s. 6d. to 42s.

„ ORIENTALIS, 3 to 5 to 8 feet, very beautiful examples, 21s. and upwards each.

CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; larger, up to 12 feet

YEWS, COMMON.—Immense quantities, 2 to 3 to 4 to 6 feet, from 18s. to 60s. per dozen

„ IRISH.—Perfect columns, up to 12 feet.

„ GOLDEN, very handsome Irish stock, perfect columns, 5s. 6d. to 42s. each

HOLLIES, GREEN COMMON.—Many thousands, of all sizes, from 1 foot up to 10 feet.

„ the best GOLDEN, WATERERS', and SILVER varieties, in any quantity, and of all sizes.

STANDARD HOLLIES, GREEN, 30s. 6d. to 21s. each

„ „ WATERERS' variety, many hundreds of symmetrically grown specimens, perfectly straight stems, 42s. to 63s. per pair

„ WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each.

„ PORTUGAL LAURELS.—Very close grown handsome plants, 10s. 6d. to 21s. each; very large imposing specimens, 42s. to 63s. each

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, for undercovering shrubberies, strong established plants, £10 10s. per 1000; larger, 25s. 30s. per 100

„ CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 30s. to 63s. per 100

„ better class (SEEDLINGS) and named varieties for extensive planting, £5 per 100.

„ of superior kinds, many on own roots, £7 10s. to £10 per 100

„ very superior, leading, crimson, rose, white, £12 10s. to £15 per 100.

„ STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each.

AZALEAS, common kinds, 50s. to 75s. per 100.

„ very best, in fine plants, £10 per 100.

KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen

„ LATIFOLIA, 18s. to 30s. per dozen.

ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen.

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBORVITÆ, HOLLY, YEA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

SUPERB DOUBLE HOLLYHOCKS.—Now is the time for planting to ensure good spikes and blooms this season. WILLIAM CHATER'S CATALOGUE of his unrivalled collection may be had upon forwarding one postage stamp. Those blossomed seedlings with colours attached, extra fine, 42s. per 100; unblossomed seedlings from finest varieties, 25s. per 100.

Seeds saved only from first-class flowers in packets and collections, from 1s. to 10s. 6d. each.

Special prices for quantities to the Trade on application.

WILLIAM CHATER, The Nurseries, Saffron Walden.

Dwarf Roses for Bedding.

PAUL AND SON beg to recommend the present favourable season for PLANTING BEDDING ROSES. Magnificent plants of the following, the best in their respective colours, can be supplied at 75s. per 100; if Whites and Yellows be taken separately, 60s. per 100

CRIMSONS.
Alfred Colomb
Général Jacqueminot.
Madame Victor Verdier
Maurice Bernardin.
Marie Rady
Marie Baumann.
Sénateur Vaisse.

PINKS and ROSES.
Comtesse de Chabrillant
John Hopper
Jules Margottin
Madame Clatat
Madame I. Leveet
Marguerite de St. Amand
Victor Verdier

WHITES
H. P., Madame Knors
Bourbon, Souvenir de la Malmaison
Noisette, Aimée Vibert

YELLOWS.
Noisette, Triomphe de Rennes
„ Marèchal Niel
Tea, Gloire de Dijon.
„ Madame Falcot.

The Old Nurseries, Cheshunt, N.

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS,

NURSERYMAN and SEED MERCHANT,

Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 10s. 6d., 21s., 42s., 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	Per packet. s. d.
Backhouse's Winter White Protecting BROCCOLI	1 6
Dell's fine dark-leaved BEET	1 0
Williams' Matchless RED CELERY	1 0
Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Webb's Climax MELON, new	2 6
(The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2 6
Barlee's Delicate TOMATO, new	2 0
(The earliest and best variety in cultivation.)	

NEW and CHOICE FLOWER SEEDS.

Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 5s. 6d., and 5 6
CALCEOLARIA, Neill's extra large strain, 2s. 6d. and 5s. 6d.	5 6
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
BALSAM, Williams' superb strain	1s. 6d. and 2 0
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d. and 3 0
VERBENA, Eckford's finest varieties, mixed	1 0
Williams' Improved Hybrid ANNUALS	2s. 6d. and 3 0
CENTAUREA CANDIDISSIMA	1s. and 2 6
LOPEZIA ERINUS GRACILIS ERECTA ALBA, new	1 0
Parsons' New Tree Mignonette	1 0
PERILLA NANKINENSIS VARIEGATA, new	1 0
Williams' Improved French MARIGOLD, beautifully striped, and very large	1 0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours	2 6
VIOLA CORNUTA ALBA, new	1s. 6d. and 2 6
ZINNIA HAAGEANA PUMILA fl. pl. mixed, new	1 0

B. S. W.'s DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, post free on application.

CHOICE FLOWER SEEDS.

	Post free. Per packet. s. d.
AURICULA, extra choice	2 6
BALSAM, Lee's Camellia-flowered	2 6
CALCEOLARIA, James' Prize	2 6
CINERARIA, from named flowers	2 6
CENTAUREA CANDIDISSIMA	2 6
„ ARGENTEA	2 6
CYCLAMEN PERSICUM, extra choice	2 6
CANNA, most choice varieties	2 6
CHRYSANTHEMUM, new Japanese varieties	2 6
CLIANTUS DAMPIERI	2 6
DIGITALIS, extra choice spotted	1 0
ECHEVERIA METALLICA	1 6
GLOXINIA, extra choice	2 6
GOLDEN PYRETHRUM	1 0
HOLLYHOCK, extra choice, mixed	2 6
MIMULUS, choice, mixed	1 0
NIEREMBERGIA FRUTESCENS	1 0
PANSY, extra choice, mixed	2 6
„ CLIVEDEN, Blue, Yellow, and Purple	each 1 0
„ choice Belgian	1 0
PELARGONIUM, Gold and Bronze	2 6
„ Zonal, choice	2 6
„ Nosegay, choice	1 0
PETUNIA, double, extra choice	2 6
„ Single, choice mixed	1 0
PRIMULA FIMBRIATA, Red and White	each 2 6
„ „ mixed	2 6
„ Fern-leaved, mixed	2 6
RICINUS, six choice varieties	2 6
SOLANUMS, in six choice varieties	2 6
STOCK, East Lothian, Scarlet, White, and Purple	each 1 6
TACSONIA MANICATA LINDLEXMEI	2 6
WIGANDIA VIGIERI	1 6

IMPORTED GERMAN SEEDS.

STOCKS, in 12 distinct colours	2 6
ASTER, German quilled, 12 varts	2 6
„ Chrysanthemum Dwarf, 12 varts	2 6
„ Globe-flowered, 12 varts	2 6
„ Truffaut's Perony, 12 varts	2 6

JOHN and CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

KNAPHILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

Solicits the notice of intending Planters to the following LIST of Specimen CONIFERS, &c., all of which he believes are as handsomely grown, as carefully managed, and as finely rooted as can be desired.

ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted August, 1868.

ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d each. Transplanted August, 1868.

ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, to 12 feet high, 15 and 20 feet in circumference

ABIES NOVÆ-ZELANDIÆ, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s., to £12 10s. per 100

The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbrardiana, &c., large numbers, many of them 20 and 30 years' growth.

CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 30s. to 42s. each, 15 years' growth. We have several thousands of these large Deodars. All have been removed since August, 1868; many since April, 1869.

CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868

CEDRUS LIBANON, 6, 7, to 10 feet. Moved September, 1868

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 10s. 6d. each.

„ „ ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each.

„ „ GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.

JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high.

PICEA NOBILIS, handsome bushy plants, 3 feet, 5s.; 4, 5, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.

PICEA NOBILIS VARIEGATA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, to 15 feet high

PICEA LASIOCARPA. Hundreds of most beautiful plants, 4, 5, 6, 8, and 10 feet high. All remarkably fine.

PICEA MAGNIFICA, 3, 4, and 5 feet.

PICEA PINSAPO, 4, 5, 6, and 8 feet, 21s. to 63s. each. Some grand plants, 10 to 15 feet high, transplanted April, 1869.

THUJA AUREA, beautiful, bushy plants, 3 feet high; 10 to 12 feet in circumference. This paint originated in this Nursery, and our stock is unsurpassed

THUJA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868

THUJA LOBBII, 8 to 14 feet high, and as much in circumference; transplanted April, 1869.

THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each. Transplanted in August.

PINUS AUSTRIACA, 3 feet, £5 per 100. Transplanted Sept., 1868.

PINUS CEMBRA, 3 feet to 4 feet, 10s. 6d. to 21s. each.

YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.

YEWS, IRISH, handsome plants, 5, 6, 7, 8, 9, and 10 feet high.

HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe; it comprises, as well as immense sizes, together, many thousands of the following fine trees.

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet

HOLLY, HOLDEN'S GOLDEN, magnificent plants, 4 to 8 feet high, and as much in circumference

HOLLY, SILVER QUEEN, 4, 5, and 6 feet.

WATERER'S HOLLY.—This variety originated in this Nursery we have hundreds 4, 5, and 6 ft. high, 10 and 15 ft. circumference

PERRY'S WEEPING HOLLY.—Standards, 10s. 6d. to 21s. each.

HOLLY, COMMON SWEEPING.—The finest specimens we have seen. Moved, April, 1869.

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868

HOLLY, Green varieties.—The following kinds An immense stock of splendid plants, all transplanted in 1868-9:—

LAURIFOLIA	ANGUSTIFOLIA,
HODGINSII,	MYRTIFOLIA, &c.
YELLOW BERRIED,	

4, 5, 6, and 8 feet high.

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number

N.B.—Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better rooted plants cannot be wished or obtained. The prices are fair and reasonable

BOX, handsome, transplanted, 4, 5, 6, to 8 feet.

BOX, dwarf, fine pyramids, up to 5 feet.

BAYS, standards and pyramids.

LAURUSTINUS, standard.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.

AUCUBA JAPONICA, Berried, hundreds, 18 to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards.

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine and extensive as any in Europe, anything of its kind can be met with in England, considerably over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—

RHODODENDRONS, nice bushy plants, from layers, named kinds, 5s. per dozen, £2 per 100; £15 per 1000. Sample on application

RHODODENDRONS, the finer kinds, by name, from £7 10s. to £12 10s. per 100, and upwards.

RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000.

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 20 to 30 years old, with heads varying from 15 to 30 feet in circumference. There is probably no kind better adapted for standards than that we possess, many of which we supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 per 100. Sample on application. Large and handsome plants by the 1000, 4 to 8 feet high.

AZALEAS, the very best in separate plants, £10 per 100, upwards.

AZALEAS, common kinds, £5 per 100.

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100

ANDROMEDA FLORIBUNDA, £5 to £7 10s. per 100, and upwards.

HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100.

ERICA CARNEA, fine white, blooming, many thousands.

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new mown hay—indispensable for Winter Gardening.

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s. to 18s. per dozen

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N.B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

CHARLES TURNER recommends The BRIDE, a beautiful new CLOVE, pure white, smooth edge, large and full, 1s 6d each
CARNATIONS and PICOTEES, named, and in fine variety, 21s per dozen plants
PINKS, do. per dozen plants
CLOVES, do. do. 6s per dozen plants
This is the best season for planting the above in borders or large pots for blooming. No description and full LISTS, now ready
Line Drawings, &c., by Post through

CHATER'S AGERATUM, IMPERIAL DWARF. —This is admitted to be the greatest acquisition for modern Flower Gardening that has been offered for many years. Awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society, see report of meeting, August 17, 1869; also opinions of the Press.
This beautiful New Bedding Plant will be sent out after May 1.
1 plant .. .. 1s | 12 plants 10s
6 plants .. 18 0 | 24 plants 40 0
WILLIAM CHATER, Nurseries, Saffron Walden.

JOSEPH SMITH, SEN., Tansley Nursery, Matlock, Derbyshire, begs to intimate that his CATALOGUE of GENERAL NURSERY STOCK is now ready, which he will be happy to forward on application. It contains a large Stock of Forest Trees, Hardy Evergreens, Ornamental Trees and Shrubs, American Plants, &c.
The Nursery is in a very exposed situation, the soil of a fibrous nature, and the Plants take up with excellent roots so as to ensure the best success on their removal.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s. ; per 1000, 45.
100 Gladioli, by name, 10 to 15 sorts 8s
100 ,, ,, 25 sorts 14s
200 ,, ,, 50 sorts .. .. .. 10s to 40s.
All in good flowering bulbs.
LEVÊQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

SPRING FLOWERS, &c.—Double White Primrose, 12s. per 100, 2s. per dozen; Double Blood Wallflower, 14s. per 100, 3s. per dozen; Double Black Wallflower, 14s. per 100, 3s. per dozen; Double Red Hepatica, 12s. per 100, 2s. per dozen; Double Purple Rockets, 10s. per 100, 2s. 6d. per dozen; Double Rose Rockets, 16s. per 100, 3s. 6d. per dozen. New Double Scarlet Sweet-williams, 15s. per 100, 2s. 6d. per dozen; Pansies, in seven fine varieties, 8s. per 100, 1s. 6d. per dozen; Sweet Williams, from fine crimson seed, 6s. per 100, 1s. per dozen; Double White Pinks, 12s. per 100, 2s. per dozen. All the foregoing are fine strong plants
A. LAMB, Peartree Hill, Lisburn

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of—

Achimenes	Miscellaneous plants
Aurealas	bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Calceolaria	Rockets
Dahlias, in 3 classes	Roses
Fuchsias	stove plants
Gloxinias	Verbenias

The Royal Nurseries, Slough

PANSY SEED.—The Subcriber has a limited quantity of his SHOW PANSY SEED to offer, saved with the utmost care from his splendid collection of named varieties, and can confidently recommend it as being the finest ever offered to the Public, and sure to produce a large percentage of first-rate flowers. During the last few years he has gained a large number of valuable Prizes at Edinburgh, Glasgow, and the leading Horticultural Exhibitions in the West of Scotland; amongst others, a Silver Cup at the West of Scotland Horticultural Society's Exhibition in Glasgow, in July, 1869, and a Silver Teapot at the Scottish Pansy Society's Exhibition in Edinburgh, in June, 1869. Price, with directions for treatment, 1s., 2s. 6d., and 5s. per packet; post free
MATTHEW TODD, Newmilns, Kilmarnock, N.B.

New Double Fuchsias.

FELTON AND SONS have great pleasure in offering the following eight varieties of double FUCHSIAS, as they feel assured they will give satisfaction, from their distinctness, size of flower, and general habit of growth. They will doubtless become standard Market and Exhibition Flowers, and maintain a good position for several years.
DREADNOUGHT.—Tube and sepals bright crimson, well reflexed, corolla very regular and compact, of a remarkably beautiful purple colour. 5s.
ELEGANT.—Remarkably bright red tube and recurved sepals, of extraordinary waxy substance, corolla very bright purple, flamed carmine at base 5s
GEORGE FELTON.—Probably the best yet sent out, tube short and thick, sepals elegantly reflexed, corolla a beautiful bright purple, large, full, and handsomely marked. 7s. 6d.
MAJESTIC.—Very stout and waxy scarlet tube and sepals, well reflexed, corolla purple flamed carmine, very large, full and expanded, very showy. 5s. 6d.
MAY FELTON.—A free-flowering, very pretty and distinct variety, light red tube and sepals gracefully reflexed, corolla mauve, double and regular, the petals slightly edged with light mauve 7s 6d
MODEL.—Very bright red tube and sepals, the latter very broad and elegantly reflexed, very large, full and regular, very dark purple, flamed with brilliant carmine, extra 5s
ROYAL PRINCE.—Very bright tube and sepals handsomely recurved, large corolla, very bright purple of royal carmine, fine 5s
The set of eight for £2 2s. Strong plants will be sent out the first week in April. The usual discount to the Trade
Birmingham Nurseries, 99, Harborne Road, Birmingham.

TO THE TRADE.—
1 yr. SEEDLING HOLLY (very stout).
ARBOR-VITÆ, Pyramidalis, 1 to 1½ foot.
SCOTCH FIR, 9 to 18 inches
PINUS LARICIO, 9 to 18 inches.
PINUS AUSTRIACA, 9 to 18 inches
PINUS RIGIDA, 2 to 3 feet. A very fast-growing Pine, and safe mover. Price on application to
J. THORNTON, Heatherside Estate, Bagshot, Surrey

To the Trade.

EDWARD HOLMES, Whittington Nurseries, Lichfield, begs to offer to the Trade the following Seedlings :—
ACACIA, COMMON, 1-yr.
ARBOR-VITÆ, CHINESE. 1-yr.
CHESTNUT, SPANISH, 1-yr.
,, HORSE, ,,
CRYPTOMERIA JAPONICA, 1-yr.
CRABS, 1-yr.
OAK, SCARLET, 1-yr.
,, 2 yr
SYCAMORES, 1 yr
WALNUTS, 1-yr.
Price on application, and samples sent free if required.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples ; Standard Plums, Pears, Apples ; Standard and Half Standard and Dwarf Roses, of all the leading kinds ; Gooseberries, Currants, Manetti, and Crab Stocks ; Austrian Pine, Berberis aquifolia, Common Laurel, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seedling Hazel, and Hedge Quick.
Samples, with height and price, on application to
W. VIRGO AND SON, Wonersh Nursery, Guildford.

SEEDLING LARCH, SCOTCH and AUSTRIAN PINE, QUICK, in quantity ; 1 and 2 yr. ASH, bedded 2 yr., fine, cheap.
10,000 PRIVET, evergreen, strong, 3 to 4 feet
10,000 POPLAR, Black Italian, 2 to 4, and 5 feet
20,000 BIRCH, 2½ to 3, and 3 to 5 feet
20,000 HAZEL, 2½ to 3, and 3 to 5 feet
20,000 SILVER FIR, 1 to 2, and 2 to 3 feet.
20,000 SYCAMORE, 3 to 4, and 4 to 5 feet
5,000 WEYMOUTH PINE, 2 to 3, and 4 to 5 feet
10,000 LAUREL, Common, in healthy condition, 1½ to 2, 2 to 2½, 2½ to 3 feet
3,000 YEW, English, 4 to 5 and 6 feet, well-rooted and fine pyramidal shaped, with good leaders.
PORTUGAL LAUREL, in fine healthy condition, 3 to 4 to 5 feet ; very bushy, and well rooted, in quantity ; prices on application.
POTATOS of DALMAHOY and FLUKE, nice seed, in quantity
ASPARAGUS and SEAKALE, 1 and 2-yr.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

Prime Nursery Stock.

J. SCOTT, Merriott, Somerset, has to offer the above, well transplanted, and well rooted, in large or small quantities, consisting of ALDER, ASH, BEECH, CHESTNUT, ELMS ; FIR, SCOTCH, do. SPRUCE, do. SILVER ; OAK, COMMON and TURKEY ; HOLLY, HORNBEAM, SYCAMORE, WILLOWS, WALNUTS, and YEWS ; and an extra large breadth of fine HAZEL and strong THORNS ; an immense stock of Evergreen and Deciduous Shrubs, at low prices, and in all the usual sizes

JOSEPH SMITH, Sen., having a large stock of the following, begs to offer them to the Trade at a low figure :—
RHODODENDRONS, LARGE BUSHY, 18 inches, 18s. per 100 ; 15 to 20 inches, 20s. per 100, 18 to 24 inches, 25s. per 100—less by the 1000
Hybrids, 18 to 24 inches, 35s. per 100 ; 20 to 30 inches, 45s. per 100.
RHODODENDRON HIRSUTUM, nice plants, 2 years planted, from layers, 15s. per 100.
RHODODENDRON FERRUGINEUM, planted from layers, 25s. per 100
Double flowering WHIN, good plants, 12s. per 100.
ARBOR-VITÆ, AMERICAN, 1½ to 2 feet, 4s. per 100 ; 2 to 3 feet, 7s. per 100—less by the 1000 ; 3 to 4 feet, 10s. per 100 ; 5 to 6 feet, 40s. per 100.
SPRUCE FIR, NORWAY, 12 to 15 inches, 10s. per 1000 ; 1½ to 2 feet, 18s. per 1000
MOUNTAIN ASH, 2 to 3 feet, 15s. per 1000 ; 3 to 4 feet, 25s. per 1000
Lansley and Scotland Nurseries, near Matlock, Derbyshire

To the Trade.

MORRISON BROTHERS, Aberdeen, still hold large stocks of the following, of good quality, and true to name

SEEDLINGS.	Per 1000	s.	d.
ABIES ORIENTALIS, 1-yr.	40	0	
,, NIGRA, 2-yr.	20	0	
HORSE CHESTNUT, 1-yr., 4s. ; 2-yr. ditto	5	0	
COTONEASTER SIMONSII, 1-yr.	15	0	
HORNBEAM, 1-yr., 4s. 6d. ; ENGLISH MAPLE, 1-yr. ..	2	0	
ENGLISH OAK, 3-yr., 15s. 6d. ; SCARLET OAK, 2-yr. ..	30	0	
PICEA PINSAPO	20	0	
PINUS LARICIO, 1-yr., 6d. ; PINUS MONTANA, 2-yr. ..	15	0	
,, PYRENAICA, 2-yr., 20s. ; PINUS TAURICA, 1-yr. ..	20	0	
SCOTCH FIR, 2-yr., 12s. 6d. ; NORWAY SPRUCE, 2-yr. ..	10	0	
TRANSPLANTED.			
BALM of GILEAD FIR	10	0	
HORSE CHESTNUT, 2 to 3 feet	30	0	
CRAB APPLE, 1½ to 3 feet	15	0	
PINUS LARICIO, 1 yr.	4	0	
,, twice transplanted, 9 to 15 inches	20	0	
,, CEMBRA, 2 yr.	25	0	
SCOTCH FIR, 2-yr.—1-yr.	3	0	
AMERICAN ARBOR-VITÆ, 2 to 3 feet, bushy	40	0	

American Arbor-vitæ forms the best of Evergreen Hedges, and, at the above price, compares favourably with the plants being bushy, they form a cheaper Hedge than either Beech or Thorn.
DWARF ROSES, most of the finest varieties still on hand. See names and prices in CATALOGUE. Special quotations to large buyers, and samples sent on application.

1870—SELECTED VEGETABLE and FLOWER SEEDS, SEED POTATOS, &c. (Carriage free.)
Fully DESCRIPTIVE PRICED LIST post free on application.
Carefully assorted Collections of VEGETABLE SEEDS, at 12s. 6d., 12s., 21s., 42s., 63s., and 105s.
Choicest assortments of Continental and other FLOWER SEEDS, from 5s. upwards. See List.
CATALOGUES of Forest, Fruit, and other Trees and Plants, also post free on application.

James Dickson & Sons.

(Old Established Nursery and Seed Business,
"Newton" Nurseries, and 102, Eastgate Street, Chester

SELECT SEEDS, free by post.

	Per packet—s.	d.
MCKAY'S TELEGRAPH CUCUMBER	1	0
INVINCIBLE, New CUCUMBER	1	0
SUDBURY WHITE SPINE CUCUMBER	1	0
The above are first-class sorts		
LONGSTANDING CABBAGE LETTUCE	0	6
CHADACRE BATH COS LETTUCE	1	0
NUNEHAM PARK ONION	0	6
SPRINGFIELD WHITE BROCCOLI	1	0
SUDBURY EXCELSIOR MELON	1	0
CALCEOLARIA, from finest strain	1	0
CINERARIA, from named flowers	1	0
GOLDEN FEATHER	0	6
MARIGOLD, French Dwarf Striped	0	1
Other Sorts, see CATALOGUE.		

DAVID GOLD MCKAY, the "Old "Established Seed Warehouse, Sudbury, Suffolk.

SCOTT'S NEW and GENUINE SEEDS.
Post Free

	Per packet—s.	d.
Beet, Scott's Crimson Dwarf	1	0
,, Egyptian Turnip, dark red	1	0
Brussels Sprouts, Scott's Eclipse	1	0
Broccoli, Snow's Winter White	1	0
Cauliflower, True Selected Erfurt Early Dwarf	1	6
Carrot, Mammoth Long Red	1	0
Parsley, Champion Superb Curled	1	0
Pumpkin, Mammoth, extra	1	0
Lettuce, Victoria White Cos	1	0
,, Paris Giant Green Cos	1	0
,, The Favourite Cabbage	1	0
,, The two largest Lettuces grown		
Melon, Golden Queen	1	6
,, Bailey's Prize Eclipse	1	6
Onion, Bedfordshire Champion	1	0
,, Nuneham Park	0	6
,, Giant Rocca (largest)	1	0

COLLECTIONS of VEGETABLE SEEDS, from 10s. 6d. to £5.
For all particulars see Descriptive Catalogue, free

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Aster, New Quilled, 12 vars., mixed	1	0
Reed's Exhibition, 12 do	1	0
French Pæony-flowered Perfection, 18 do	1	0
Dwarf Chrysanthemum, flowered, 12 do	1	0
Crown-flowered, 6 do	1	0
French Giant Emperor, 12 do	1	0
Newest Victoria, 12 do	1	0
Stock, dwarf, German Ten week, 24 do	1	0
Large-flowered do., 18 do.	1	0
Balsam, extra choice double	1	0
Cineraria, choicest strain	2	6
Cockscomb, Giant, crimson dwarf	1	0
Pyrethrum Golden Feather	1	0
Lobelia speciosa (true) 6d and	1	0
Marigold, French extra choice .. 6d and	1	0
Mignonette, new Giant Pyramidal	1	0
Petunia, fl.-pl., extra double	1	0
Extra choice single	1	0
Primula Sinensis, 6 vars., mixed .. 1s and	2	0
Zinnia, fl.-pl., including the new varieties, Pumila and Tageteiflora ..	1	0

Collections of FLOWER SEEDS, post or carriage free, from 1s. 6d. to 42s. See p. 21 of DESCRIPTIVE CATALOGUE
For full descriptions of the above and other desirable varieties of GARDEN SEEDS, also of AGRICULTURAL SEEDS, see J. SCOTT'S PRICED CATALOGUE, free on application.
J. SCOTT, The Seed Stores, Yeovil, Somerset.

Fruit Trees for Sale.

J. SCOTT, The Nurseries, Merriott, Somerset, will be glad to receive orders for the above, which will be carefully attended to. The Trees consist of 1000 sorts of PEARS, 700 do. of APPLE, 170 do. of PLUM, 150 do. of CHERRY, with other kinds in proportion. Standards, 6 to 7 ; Pyramids, 6 to 7 ; and Bushes, 3 to 5 feet high ; also very fine Dwarf Trained Trees of all kinds, of superior growth, are offered. The above are described in the "Orchardist," the best work on Fruit Trees in England, price 12. 6d. in stamps. A printed List free on application.
J. S. also offers a splendid stock of FOREST TREES, DECIDUOUS SHRUBS and EVERGREENS in every variety
CATALOGUE free on application.

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources ; all are warranted genuine, and are offered at the lowest possible price. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, Surrey, S.W

GIANT ASPARAGUS PLANTS, the best that money can procure, 2s. 6d. per 100. This delicious Vegetable does not require half the expense usually incurred in planting it.
See RICHARD SMITH'S SEED LIST for 1870.
Extra strong SEAKALE, 2s. per dozen.
RICHARD SMITH, Nurseryman, Worcester.

Peas.

EDWARD HOLMES, Whittington Nurseries, Lichfield, offers to the Trade :—
CHAMPION of ENGLAND
LAXTON'S SUPREME
McLEAN'S LITTLE GEM
WATERLOO DWARF BRANCHING
IMPERIAL WONDER
Price (low) on application.

EDWARD HOLMES, Whittington Nurseries, Lichfield, begs to offer the following CUCUMBERS, post free :—
BATLEY'S TELEGRAPH, the original and best variety, 3s. per dozen seeds
WILSON'S PROLIFIC, one of the best for early forcing, 1s. per dozen seeds
HAMILTON'S NEEDLE GUN, 1s. 6d. packet of five seeds
,, INVINCIBLE, 1s. 6d. packet of five seeds
,, GOLIATH, 2s. packet of five seeds
,, BRITISH CHALLENGE, said by the raiser to be the finest Cucumber for length and form he ever sent out, 5s. packet of five seeds, 2s. 6d.

New Broccoli.

EWING AND CHILD beg to intimate they are now sending out their new BROCCOLI, CHILD'S EXCELSIOR. Having proved the value of this Broccoli they can, with the greatest confidence, recommend it as the best late variety ever introduced ; it is thoroughly protected, and comes on for cutting when other sorts are finished, producing close white heads, of an enormous size. This variety will prove quite an acquisition to the Kitchen Gardener.
To be had only in sealed packets bearing our name, and sent free to any address on receipt of 30 stamps.
The Royal Norfolk Seed Establishment, 9, Exchange Street, Norwich.

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer, for cash, AMERICAN RED POTATO. Has produced over 16 tons to the acre this year. Price per cwt., 20s. Double GERMAN WALLFLOWERS, 5s. per 100. Single Wallflowers, 2s. 6d. per 100. SCARLET KING DAISIES, CROWN DAISIES, WHITE DAISIES, all at 5s. per 100.

Seed Potatos.

GEORGE SIBBALD, 27, Wellgate, and Drumgeith, by Dundee, has still on hand a few tons PATERSON'S VICTORIA, FLUKE, and SCOTCH QUEEN, and WALKER'S EARLY POTATOS. Also a quantity of Superfine Early DWARF CABBAGE SEED. Prices on application.

Suttons' Potatoes for Planting.

MESSRS. SUTTON'S NEW DESCRIPTIVE LIST is now ready, and may be had gratis and post-free. Their stock of Potatos has been selected with great care, and can be relied on as perfectly true to name. Lowest price per cwt., sack, or ton, forwarded on application.
SUTTON AND SONS, Seed Growers, Reading.

NEW EARLY POTATO, RINTOUL'S NEW EARLY WHITE DON.—This is a great improvement on the variety sent out by us some years ago, being pure white both outside and inside, perfectly round, very handsome, and is about ten days earlier than the striped variety, an extraordinary cropper, and of first-rate quality
Having secured a quantity of the above from the raiser, Mr. Rintoul, East Craigie, Cramond, whose name as an early Potato grower is well known, we have every confidence in recommending this variety to all who grow for the early market, either in field or garden as decidedly the best Potato out for earliness, crop, and quality.
Price 4s. per peck, or 20s. per cwt.
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HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.
OPINIONS OF THE PRESS.
"R. Headley. Your Seedling Potatos were quite first-rate ; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 30, 1869.
"Wisley. A very fine variety ; a heavy cropper ; uniform in size ; ripening off all at once quickly and completely ; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 13."—*Gardeners' Magazine*, Jan. 30, 1869.
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Price 5s. per peck. The usual discount to the Trade
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

SELECT VEGETABLE SEEDS, free by post. Per pkt.—s. d.

Smith's fine long frame CUCUMBER	1 0
The White Queen CELERY	1 0
Snow's Winter White BROCCOLI	1 0
Smith's Incomparable CABBAGE	0 6
Worcester Champion COS LETTUCE	0 6
Improved Telegraph CAULIFLOWER	1 0
Early Dwarf Erfurt CAULIFLOWER	1 0
New Giant Rocca ONION	1 0
Ayton Castle LEEK	0 6
Worcester Late White BROCCOLI	0 6
Backhouse's Winter White BROCCOLI	0 6
French Breakfast RADISH	0 6
Golden Perfection MELON	1 0

SELECT FLOWER SEEDS, free by post.

PRIMULA SINENSIS, finest fringed	1s. and 2 6
CALCEOLARIA, finest spotted	1s. and 2 6
CINERARIA, from prize flowers	1s. and 2 6
CYCLAMEN PERSICUM, mixed	1 0
ASTER, New Pæony-flowered Globe	1 0
,, Trufaut's Pæony-flowered	1 0
PYRETHRUM, Golden Feather	1 0
ZINNIA, finest double, mixed	1 0
VIOLA CORNUTA ALBA	1 0
PANSY, Cliveden Yellow	1 0
AMARANTHUS ELEGANTISSIMUS	1 0
PRINCESS FEATHER, New Golden	1 0
BALSAM, splendid rose-flowered	1 0
New Tree MIGNONETTE	1 0
MARIGOLD, New French, miniature, striped ..	0 6

☞ For Prices of other Seeds, see RICHARD SMITH'S DESCRIPTIVE LIST, free by post on application.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

"Economy.—Seeds Direct from the Growers."

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FOR

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CARTER'S GRASS AND CLOVER SEEDS

For PERMANENT PASTURES.

Carefully mixed to suit every description of Soil.

For Heavy Soils.

Finest quality .. .. 28s. to 32s. per acre
Second quality .. .. 20s. to 26s. ,,

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Carter's New Champion Intermediate Mangel. (1s. per lb. Cheaper per cwt.)

CARTER'S PRIZE MANGEL.

	Per lb. s. d.
ORDINARY STOCKS	0 4 to 0 6
CARTER'S WARDEN, the finest Globe variety .	1 0
CARTER'S MAMMOTH, the finest Long Red variety	1 0
CARTER'S NEW INTERMEDIATE, the best variety (see Illustration)	1 0
IMPROVED RED GLOBE	1 0
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Cheaper per cwt.

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LIVERPOOL SWEDE	0 7
IMPERIAL HARDY SWEDE, acknowleged to be the best in cultivation..	0 6
LONDON SWEDE, grows to a large size ..	0 9
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POMERANIAN WHITE GLOBE, the finest white variety	0 9
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Cheaper per bushel or cwt.

Large purchasers will be liberally treated.

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Post Free, *6d.*; Gratis to Purchasers.

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THE ROYAL SEEDSMEN,

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HAVE FINE STOCKS OF

THE FOLLOWING VARIETIES OF SEED POTATOS,

Which they offer to the Trade at low prices :—

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A VERY LARGE AND EXCELLENT STOCK, IN THE BEST POSSIBLE CONDITION for safe removal.

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CLOVERS, MANGELS, | GRASSES, TURNIPS,

of the most genuine quality.

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Old Established Nursery and Seed Business.

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VINES, FRUIT TREES,
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CATALOGUES upon application.

GORSE for FOX COVERTS, strong, transplanted, 30s. per 1000.

SUTTONS' HOME-GROWN FARM SEEDS,

CARRIAGE FREE.

SELECTED STOCKS at VERY MODERATE PRICES. Special Estimates given for large quantities.

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	Per lb. s. d.
GOOD YELLOW GLOBE	0 8
GOOD ORANGE GLOBE	0 8
GOOD LONG RED	0 8
SUTTONS' SELECTED YELLOW GLOBE	0 11
SUTTONS' BERKSHIRE PRIZE GLOBE	1 1
SUTTONS' YELLOW INTERMEDIATE	1 0
SUTTONS' MAMMOTH LONG RED ..	1 0
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Lowest price per cwt. on application.

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SUTTONS' CHAMPION SWEDE ..	0 6
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SUTTONS' IMPERIAL GREEN GLOBE TURNIP	0 8
SUTTONS' POMERANIAN WHITE TURNIP	0 6
SUTTONS' PURPLE-TOP MAMMOTH TURNIP	1 6

Lowest price per bushel on application.

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	Per lb. s. d.
WHITE BELGIAN CARROT ..	1 0
RED INTERMEDIATE	1 6
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	Per lb. s. d.
SUTTONS' IMPROVED GREEN ..	3 0
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New and Select Farm Seeds.

1870. 1870.

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TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.
CLOVERS, RYEGRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds
MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years' lay, from 12*s* to 20*s* per acre
MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21*s* to 28*s* per acre These mixtures are composed of the finest Grasses, and cannot be surpassed
Seeds of the value of £2 and upwards (Grain, Vetches, and Potatoes excepted), carriage free to any railway station in the kingdom.
Special estimates for large quantities Samples and prices on application
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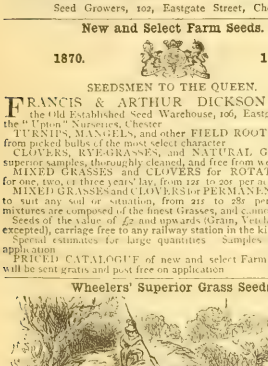

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It was sown early in April on Clayey Ground, and weighed the following Summer, 1865, upwards of 24 tons of excellent Hay, which was sold by Auction for £204, being at the rate of £16 per acre It was mown twice the same Summer
The fact that 6½ acres of seeds has produced in one Summer Hay of the value of £204 shows the importance of sowing a good Mixture of suitable Seeds.
The following are the quantities and sorts which produced that luxuriant Crop —

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4 lb.	Evergreen Rye Grass	Lolium perenne
4 lb.	Italian Rye grass	Lolium italicum
2 lb.	Cocksfoot	Dactylis glomerata
2 lb.	Timothy Grass	Phleum pratense
2 lb.	Red Clover	Trifolium pratense
3 lb.	Cow Grass	Trifolium pratense perenne
3 lb.	White Dutch	Trifolium repens
4 lb.	Trefoil	Medicago lupulina

We can supply the above of finest quality at 17*s*. 6*d*. per acre, carriage free, and allow 5 per cent. discount for cash
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WHEELERS' SUPERIOR GRASS and CLOVER SEEDS are forwarded carriage free to all railway stations in the Kingdom
QUALITY—Excellent, and unadulterated.
PRICES—(Which vary from 15*s*. 6*d*. to 32*s*. per acre, according to soil and situation) extremely moderate.
TERMS—Five per cent. discount for Cash.
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"For getting up the subject of Grasses we cannot conceive a handier book than Miss Pluet, which is furnished with ample and accurate illustrations; while for putting her data to the proof, and testing the value of hints and suggestions, it may be well to make acquaintance with that rarely scientific *brochure*, Messrs. WHEELERS' Illustrated Book on Grasses."—*Saturday Review*.
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For One Year	at 13*s*. 6*d*. per acre.
For Two Years	17*s*. 6*d*. per acre.
For Four Years	22*s*. 6*d*. per acre.
Permanent Pasture	from 26*s*. to 32*s*. 6*d*. per acre.

All Carriage free. Inferior qualities cheaper
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Suttons' Prize Cucumber Seeds, Post Free.

SUTTONS' BERKSHIRE CHAMPION, 1*s*. 6*d*. per packet.
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Other good sorts, 1*s*. and 1*s*. 6*d*. per packet, as see SUTTONS' PRICED CATALOGUE, Gratis and Post Free on application.
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GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb. Bags, at 6*d*. per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application to
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Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Deck Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
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"GENUINE PERUVIAN GOVERNMENT," per ton, £14 10*s*; per cwt., 16*s*; 56lb., 9*s*; 28lb., 5*s*; 14lb., 3*s*

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COCOA-NUT DUST, for Ferneries, Rockeries, Potting, Mixing, &c., per ton, 40*s*.; 112lb., 3*s*.; 56lb., 2*s*. 6*d*.

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PERUVIAN GOVERNMENT GUANO, £13 10*s*. per ton

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves I need therefore hardly add anything in comment-dation of the high fertilising character of this valuable artificial manure The sample you forwarded contained 20·1 per cent of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of division I am glad to find that no adulterate will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
"To the Secretary, REES AND CO'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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APPLEBY'S REGISTERED FUMIGATORS.—Large size, 6*s*. each; second size, for small Greenhouses, 4*s*. 6*d*.; small, 3*s*.
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The Cheapest and Best Insecticide.
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BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1*s*., 2*s*., 3*s*., and 5*s*. each
Powder Distributors, 2*s*. 6*d*. and 3*s*. 6*d*. each
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. LYLES, Superintendent, Royal Horticultural Gardens, South Kensington May 1, 1868
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Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 10 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
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The Noted French Cold Grafting Wax
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For Grafting, Budding, Healing, &c., may be obtained of
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COLIN PULLINGER'S newly-invented SULPHUR DISTRIBUTOR, for VINES, PLANTS, &c., is acknowledged by every Gardener who has seen it to be the most simple and effectual machine invented for the purpose Price, complete with bellows, 5*s*. Refund of all Money unless approved.
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Elastic Netting and Tiffany, for Protecting Fruit Trees and SHADING GREENHOUSES.
J. SHAW AND CO. beg to inform inquirers that their ELASTIC NETTING and TIFFANY may be procured from any respectable Seedsman—Manchester, March 2

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NETTING for FRUIT TREES, SEED BEDS, RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3*d*. per yard, or 100 yards, 20*s*.; 4 yards wide, 6*d*. per yard, or 50 yards, 20*s*. NEW TANNED NETTING, suited for any of the above purposes, or as a Fence for Fowls, 2 yards wide, 6*d*. per yard; 4 yards wide, 12. per yard; 3½-inch mesh, 4 yards wide, 12. 6*d*. per yard. Can be had in any quantity of
FATON AND DELLER, 6 & 7, Crooked Lane, London Bridge, E.C.

Preserve your Trees from Frost.
TANNED NETTING for FRUIT TREES.
COTTON NETTING and BUNTING, FRIGI DOMO, SCRIMS for GREENHOUSE BLINDS, &c.
Samples and Price List free on application to
BENJAMIN EDGINGTON, Tent and Rick Cloth Maker to the Queen and Prince of Wales, 2, Duke Street, Southwark, S.E. A large stock of NEW and REPAIRED NETTING, and other articles for the Protection of Fruit Trees, Strawberry Beds, &c. MARQUEES and TENTS of all dimensions on Sale or Hire.
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PRODUCING ABUNDANT CROPS OF HAY AND SUPERIOR PASTURAGE.

SPECIAL ESTIMATES GIVEN FOR LARGE QUANTITIES.

Opinion of the late Professor LINDLEY, *Royal Horticultural Society:* – "We have already made trial of your Grass Seeds, and it is only justice to say that they are the best we have sown for many years."

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Complete instructions on sowing and after-management sent with the seeds.

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FOR ONE YEAR'S LAY. **13s. 6d. per acre.** Carriage Free.

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Should be sown in the Spring Months. It will produce a great improvement in the quality and quantity of the Hay, and of the Pasturage. Sow 6 to 12 lb. per acre. Cost **4s. 6d. to 9s. per acre.**

SUTTONS' "CRYSTAL PALACE" MIXTURE

OF

GRASSES AND CLOVERS FOR PARK GROUNDS.

This Mixture has been used with great success at the Crystal Palace, Sydenham, and the principal Parks and Public Gardens in the Kingdom. None but fine growing varieties are included, and the sward will at all times present a luxuriant verdure, while it will give good Crops of Hay and excellent Pasture if required for those purposes.

Price 18s. per bushel. 2½ bushels should be sown per acre. Special estimates given for large quantities.

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FOR CHURCHYARDS, CEMETERIES, BOWLING GREENS, AND CRICKET GROUNDS.

We have had the honour of supplying His Grace the Archbishop of Canterbury and many others of the Clergy with Grass Seeds for Churchyards and Cemeteries, which have given great satisfaction. We have also supplied the Marylebone Cricket Club, for Lord's Cricket Ground.

Price 18s. per bushel. Sow 2½ or 3 bushels per acre.

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As these Grasses are of small neat growth, and do not spread so much as other kinds, it is necessary they should be sown thickly. For forming New Lawns or Croquet Grounds, 3 bushels or 60 lb. is the quantity required per acre; or 1 gallon to 6 rods (or perches) of land.

Price 2s. 6d. per gallon, 20s. per bushel.

SUTTONS' COMPLETE COLLECTIONS OF CHOICE FLOWER SEEDS.

FREE BY POST OR RAIL.

We would call special attention to the following COLLECTIONS of FLOWER SEEDS, which contain choice assortments of ANNUALS, BIENNIALS, and PERENNIALS, saved by eminent German and English Florists, and which will produce an excellent display during the entire Summer and Autumn:—

Collection No. 1, price 42s., contains—

12 vars. New Globe German Aster
12 do. Truffaut's French Pæony-flowered do.
12 do. Choice Chrysanthemum-flowered do.
12 do. Finest Dwarf German Ten-week Stock
6 do. Bromton Intermediate do.
6 do. Suttons' Exhibition Hollyhock.
6 vars. Double Camellia-flowered Balsam
6 do. New Double Zinnia
6 do. Double German Wallflower
10 do. Dwarf Stock-flowering Larkspur
8 oz. Mixed Sweet Peas
1 oz. Sweet Mignonette
12 vars. Showy Hardy Annuals
24 choice vars. of Half Hardy Annuals, to be sown in frames, and then transplanted into the open ground
12 vars. of Hardy Perennials
6 do. of Ornamental-foliaged Plants
6 choice vars. of Seeds for greenhouse and conservatory cultivation
6 vars. of Everlasting Flowers, suitable for winter bouquets
6 do. of Hardy Climbers, suitable for covering Trellis-work, &c.

Collection No. 2, price 31s. 6d., contains—

12 vars. Truffaut's French Pæony-flowered Aster
12 do. Dwarf Chrysanthemum-flowered do.
12 do. Finest Dwarf German Ten-week Stock
6 do. Double Camellia-flowered Balsam
6 do. New Double Zinnia
6 vars. Double German Wallflower
10 do. Dwarf Stock-flowering Larkspur
4 oz. Mixed Sweet Peas
½ oz. Sweet Mignonette
12 vars. of Showy Hardy Annuals
12 choice vars. Half Hardy Annuals, to be sown in frames, and then transplanted into the open ground
12 vars. of Hardy Perennials, for growing in the open borders
9 choice vars. of Seeds for greenhouse and conservatory cultivation
6 vars. of Everlasting Flowers, suitable for winter bouquets
6 do. of Ornamental-foliaged Plants

Collection No. 3, price 21s., contains—

12 vars. Truffaut's French Pæony-flowered Aster
12 do. Finest Dwarf German Ten-week Stock
6 do. New Double Zinnia
6 do. Dwarf Rocket Larkspur
2 oz. Mixed Sweet Peas
½ oz. Sweet Mignonette
12 vars. Showy Hardy Annuals
12 choice vars. of Half Hardy Annuals, to be sown in frames, and then transplanted into the open ground
6 vars. of Hardy Perennials
6 choice vars. of Seeds for greenhouse and conservatory cultivation
6 vars. of Everlasting Flowers, suitable for winter bouquets

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FLOWER GARDEN,

OF CHOICEST QUALITY, AS HARVESTED ON

J. C. CARTER AND CO.'S SEED FARMS,

As supplied to H.R.H. THE PRINCE OF WALES, &c.

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Consisting of showy varieties of easy growth, which will impart a gay appearance to the Flower Garden at a very moderate cost.

Collection A., price **10s. 6d.** (Post Free for **11s.**), contains—

An assortment of 12 choicest varieties French Aster.
An assortment of 16 choicest varieties German Stock.
12 Showy hardy Dwarf Annuals, including Tom Thumb Nasturtium, Saponaria, Blue Nemophila, &c.
12 Showy tender Annuals (to be sown in frames, and then transplanted, or sown in the open borders at the end of April), for Summer and Autumn blooming, including choice Phlox Drummondi, Balsam, Celosia, Amaranthus ruber, Perilla nankinensis, Zinnia, &c.

Collection C., price **21s.** (Post Free for **21s. 6d.**), contains—

An assortment of 12 choicest varieties French Aster.
An assortment of 16 choicest varieties German Stock.
An assortment of 10 choicest vars. Dwarf Stock-flowered Larkspur.
6 Choicest Everlasting Flowers and Ornamental Grasses for Winter Bouquets
6 Showy New Annuals, for bedding.
12 Showy hardy Dwarf Annuals, including Tom Thumb Nasturtium, Saponaria, Blue Nemophila, &c.
15 Showy tender Annuals (to be sown in frames, and then transplanted, or sown in the open borders at the end of April), for Summer and Autumn blooming, including choice Phlox Drummondi, Balsam, Celosia, Amaranthus ruber, Perilla nankinensis, Zinnia, &c.
6 Hardy Perennials for Autumn and Spring blooming, including Hollyhock, Wallflower, Gaillardia, Alyssum saxatile, &c.

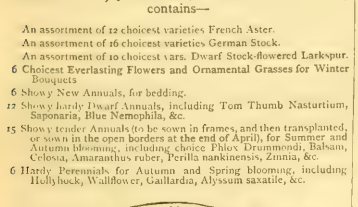

Collection D., price **42s.** (Post Free for **42s. 6d.**), contains—

An assortment of 12 choicest varieties French Aster.
An assortment of 8 choicest vars. Dwarf Chrysanthemum Aster.
An assortment of 16 choicest varieties German Stock
An assortment of 10 choicest vars. Dwarf Stock-flowered Larkspur.
An assortment of 12 choicest varieties Camellia Balsam.
An assortment of 12 choicest varieties Double German Wallflower.
12 Choice Everlasting Flowers and Ornamental Grasses for Winter Bouquets
6 Showy new Annuals for bedding.
12 Showy hardy Dwarf Annuals, including Tom Thumb Nasturtium, Saponaria, Blue Nemophila, &c.
25 Showy tender Annuals (to be sown in frames, and then transplanted, or sown in the open borders at the end of April) for Summer and Autumn blooming, including choice Phlox Drummondi, Balsam, Celosia, Amaranthus ruber, Perilla nankinensis, Zinnia, &c.
12 Hardy Perennials for Autumn and Spring blooming, including Hollyhock, Wallflower, Gaillardia, Alyssum saxatile, &c
12 Choice varieties of Seeds for greenhouse cultivation, including the choicest Calceolaria, Cineraria, Primula, Thunbergia, Cobæa, &c.

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GARDENER'S AND FARMER'S

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RICHARD SMITH, Seed Merchant, Worcester.

Spring Flowers.

LEWIS S. WOODTHORPE will be happy to forward, free, his CATALOGUE, containing full and accurate descriptions of the early Spring-blooming Plants, Violets, Primroses, Hepaticas, Daisies, Rockets, &c., &c.; also the best new and choice Plants of the Season, with Lists of Roses, Fruit Trees, Seed List, and a general and well-grown Nursery Stock.
Munro Nursery, Sible Hedingham, Essex.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of chrysanthemums for £1; 25 Pairs ditto, 10s. 6d.; 25 Pairs POMPONS, 10s. 6d.; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s. Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
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Beta chilensis.

BUTLER, MCCULLOCH, AND CO. are enabled to offer SEED of the TRUE variety of this magnificent foliage plant; it is quite distinct from Beta brasilinensis, and is fully described in their SPRING CATALOGUE, sent post free: 1s. and 2s. 6d. per packet.
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Established upwards of a Century

Ailantus glandulosa.

CHOICE PLANTS, 6 to 10 feet high, 20s. per 100. "For Parks and avenues it is indispensable; its perfect health and freshness under all circumstances in towns recommend it to the planter. Dust, foul air, or drought have little or no effect upon it." See Robinson's "Parks and Gardens of Paris."
R. TEUTSCHEL, Colchester.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 56 pages, including notes on Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

Verbenas, Verbenas.

PHILIP LADDS is now sending out 30 new varieties of VERBENAS of 1869 at 2s. per dozen, in pots; also 24 New FUCHSIAS of 1869 at 3s. per dozen, in pots. 24 varieties of BRONZE GERANIUMS, 6s.; 12 new varieties of GERANIUMS, 1869, 6s.; 12 GOLDEN QUEENS Hardy Exotic Ferns of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7. Foot's Cray Nursery, Sidcup Hill, Kent.

12 ZONAL GERANIUMS, 1868, 2s. GERANIUM VESUVIUS, best bedding scarlet, 20s. per 100.—Nursery, Bexley Heath, Kent.

THE FLOOD TESTIMONIAL.—It is proposed to CLOSE the LIST of SUBSCRIPTIONS to this FUND on WEDNESDAY, April 13. Exhibitors at the Royal Botanic and other Fêtes are invited to send in their Subscriptions forthwith to the Treasurers, Messrs. DOBSON AND SONS, Woodlands Nursery, Isleworth, who have received from Mr. Fairbairn, £5 5s.; Messrs. Downie & Sons, £5 5s.; Messrs. Paul & Sons, £2 2s.; Mr. R. Marnock, £5 5s.; Mr Chapman, £1; Dr. Barnes, 10s. 6d.; Mr. W. Dobson, 10s. 6d.; Mr. Stone, 5s.; Mr. George, 2s. 6d.

The Gardeners' Chronicle

SATURDAY, APRIL 2, 1870.

MEETINGS FOR THE ENSUING WEEK.

MONDAY,	April 4—	Entomological	7 P.M.
WEDNESDAY,	— 6	Royal Horticultural (Fruit and Floral Committee), at S. Kensington	11 A.M.
		Ditto (Scientific Committee)	1.30 P.M.
		Ditto (General Meeting)	3 P.M.
THURSDAY,	— 7—	Linnean	8 P.M.

AMONG the stereotyped incidents which annually come up to breathe in the daily papers, and then dive out of sight for another twelvemonth, is an attack upon the management of the TREES in the PUBLIC PARKS of London. The shot fired, and no notice wisely taken of it by the citadel, which in this instance seems deeply penetrated with the wisdom of the axiom that it takes two to make a quarrel, the subject drops, not to be revived until next year, when the same farce is again gone through. Then once more a momentary spark of dissatisfaction, again extinguished by the vacuous indifference of the authorities—no flame will live in a vacuum. This has been going on for a long series of years, and we scarcely think that such a persistent and long-continued, though intermittent, fault-finding would have occurred without some foundation. There must be fire somewhere to account for such repeated outbreaks of smoke. Although the public is always sufficiently ready to find fault, especially with those in authority, we do not see it constantly recurring to the same subject unless there is something festering in it to draw its attention thereto. And although we may be sure, from the readiness with which the grumble is dropped, that the public do not feel it as a substantial grievance, we may be equally satisfied that it recognises some blunder which, if really felt as a grievance, it would not be long in pulling up by the roots. The truth is, the matter is not big enough to be a grievance; it is merely a very slight qualification to much enjoyment. The general pleasure derived from the parks obliterates and atones for some slight critical objections. Moreover, it is nobody's business. Few feel sufficient interest in the matter to bestir themselves about it, and fewer still see the motes in the management's eye. It is only some one who has a liking for scribbling, and nothing better to scribble about, who sets himself to give expression to the feeling that there is something wrong somewhere, if he only knew where.

Curiously enough, too, these amateur criticisms are usually written by people who do not understand what they are writing about, and who in consequence carp and find fault in the wrong places. They, and the general public, rightly enough divine that there is "something rotten in the state of Denmark," but they fall foul of the very efforts to cure the evil. Last year, for example, a complaint was made of some trees having been cut down in Kensington Gardens. The fault was not in cutting these down, but in not cutting down many more. Another and a very unnecessary piece of folly (we can call it nothing else, for it is always folly to invite criticism and objection, however triumphant your reply may be) is to allow (as seems the practice) the cut trees to lie exposed for weeks, if not months, on the spot where they are felled. If they were removed immediately, no one would notice their absence, or notice it only to observe it as an improvement.

Recently, we observed a correspondent of the *Standard*, under the pseudonyme of "Sylvanus," complaining of the topping of the dead branches of the old trees in Kensington Gardens. This is another example of dilettanti criticism guided by feeling, but destitute of knowledge. "Sylvanus" discerns the ugliness of top branches cut right across, like amputated limbs sticking up in the air, and condemns them all. But the treatment is wrong, only because it is indiscriminate and applied to all alike. Wherever there is a reasonable ground for belief that the amputated branch will soon be covered with fresh foliage, the treatment is right, but wherever this is not to be expected, it is wrong. Now, every forester knows, or ought to know, that there are some trees, as the Oak and Lime, that even when old will throw out fresh shoots and foliage from branches headed back to sound wood, while there are others, as the Elm and Spanish Chestnut, which will not do so at all, or only with difficulty. We believe that the Plane will generally do so, although that is the tree against the amputating of which in Kensington Broad Walk the complaint of "Sylvanus" is specially directed. What particular tree he may have meant to designate under the head of the Plane we cannot guess, because in the neighbourhood of the Broad Walk all sort of old trees that are growing there are so amputated—Oaks, Elms, Limes, Horse Chestnuts, and Spanish Chestnuts, but no Planes, for there are none there; indeed, unless we are greatly deceived, there is not a single old Plane tree in Kensington Gardens. There are plenty of young ones near the Lancaster Walk, but these have not been touched.

There are other matters which we should like to see altered in the management, but all are small compared with one vital point, on which it is impossible to avoid feeling serious distrust and dissatisfaction, viz., the total absence of preparation for what is fast approaching—the wholesale extinction of the greater part of the present timber. In ten years many places which are now well clothed will be absolutely denuded. We are perhaps wrong to say the total absence of preparation; we should say the total absence of efficient preparation. There is a kind of preparation which only inspires the more dismay, to see that the emergency is so little appreciated, and is attempted to be met in so erroneous a manner. The preparation consists in the thrusting in of single young plants among the old trees, to supply the place of those which have died, or been felled or blown down.

Of course we cannot tell who is to blame for this. One naturally would blame the officer in charge, whoever he may be, for whenever the subject is mooted in Parliament the excuse is, that Government is acting under the advice of officers in whom it has confidence. But for ought we can tell he may have advised the proper measures, viz., to cut down a certain space of the worst trees, to trench, clean, and manure the soil, and then to begin *de novo* to plant young trees; then by and by, when these have made some progress, to cut down another acre or two and treat it in the same way; and so to go on until the whole that is dying is replanted. He may have advised this and been told that the public would not bear such stringent steps, and that the old moribund trees must not be cut down but left to die a natural death. In such a case what is a poor officer to do? We suppose pretty much what has been done, viz., to try the hopeless task of growing fresh young trees under the shade and in the midst of old ones: but in that case there is no need to add to the natural difficulty of the situation by putting in long.

weedy, drawn-up plants that would thrive nowhere. It looks as if the planter knew so far what he was about—that nothing would grow, and it did not matter what he put in.

If that is not the explanation of the course followed, and it really is the deliberate and intentional plan of the officer in charge, then we would most urgently press upon Government to call in more advice. It is no slur upon a medical man to call in additional advice when his patient is in a critical state, or likely to slip through his fingers. The trees in Kensington Gardens are like patients tottering on the brink of the grave. Every gale strews the glades with prostrate rotten giants. The case is becoming extreme, strong measures must be taken, and the public will make up its mind to submit to an operation when advised by the consultation of higher authorities, which it would spurn if it emanated merely from the parish doctor's assistant.

WITH writers on the rural characteristics of this country the COTTAGE GARDENS of ENGLAND have always been a deservedly favourite topic. It is quite true that in many favoured villages where the squire or clergyman is personally interested in the matter there are well-kept gardens and picturesque cottages, which are a source of pleasure to the occupants and to "the powers that be." It is equally true, unfortunately, that there are many other villages where a properly cultivated garden is scarcely to be met with, and where untidiness and unthriftiness prevail instead. Now, wherever such a state of things exists, there we desire to awaken the interest of the "powers" to the importance of producing a change by which all concerned will be benefited. Our remarks are addressed particularly to country clergymen and local residents of influence. One of the best steps to bring about such a change as we have in view is the establishment of cottagers' flower, fruit, and vegetable shows. The expense need in no case be a matter for consideration; for, first of all, a small sum of money will suffice, and next, there are but few spots in this favoured land where the funds will not be readily forthcoming when the need is pointed out, and a properly constituted organisation set on foot. A village garden show should properly be a *fête* day for all classes, and those who have taken part in or been present at one of these pleasurable gatherings will need no recommendation of ours to induce them to do all in their power to secure one for their own locality, if such does not already exist. The clergyman seems to be the proper person to take the initiative step. He may easily interest a few of his influential parishioners so as to secure the aid of willing and powerful helpers. A preliminary meeting should then be held, to which the cottagers should be invited. The "provisional committee," if prudent, will have ready before the meeting a well digested set of rules, simple, suitable, and comprehensive. They should be based on sound principles, so as to prevent dissatisfaction and provide against trickery. These once agreed upon should be rigidly adhered to. Every cottager should be encouraged to become a member, and should pay a small subscription; the amount may be so small—not only without disadvantage, but with absolute advantage to the members—that no one shall be able to plead poverty as a ground for non-membership.

An immediately satisfactory result of such a step will be seen. An impetus will be given at once to all the villagers, except the very laziest, and even some of these will be induced by emulation to join the band of competitors. Now, one of the most important things to be done to insure satisfactory results is the dissemination of sound information on the cultivation of the soil, what crops should be grown, and the proper modes of growing them. Many publications are alreay issued more or less suitable for distribution among cottagers, though it is to be hoped that one or other of the essays recently sent in competition for Mr. EGERTON HUBBARD'S prize, to which we alluded in last week's *Gardeners' Chronicle* (p. 416), may prove to be "words in season" exactly suited for this purpose—the object which we understand Mr. HUBBARD to have had in view in offering the prize. No one at all acquainted with the haphazard modes of cultivation which are generally in use among the ignorant—the class which it is desired to educate—but will acknowledge the need for a sound, easily understood code of directions; autumn cultivation, deep digging, judicious and plentiful manuring, seed sowing, rotation of crops, varieties to be selected, &c., are all points to be explained. It must not be expected that great results will be produced the first season. The main thing, however, is to make a start, and that done, with perseverance and practice, every succeeding year will see a rapidly growing increase in the results.

We heartily commend this subject to the thoughtful consideration of all who are interested in the welfare of our rural population, and, with the aid of some contributors specially qualified by experience, we shall take an early opportunity of recurring to the subject, and will give some suggestions as to rules for the government of cottage gardeners' societies, and to other points requiring consideration.

—— So the Council of the ROYAL HORTICULTURAL SOCIETY has had its joke. It assured us, with tear in eye and hand on heart, that Chiswick *must* be given up, and assigned sundry and numerous reasons for the abandonment. These reasons reminded us of those used by that deputation to Queen ELIZABETH who apologised to her Majesty for not welcoming her with a merry peal to the town she was then entering, and assigned nobody knows how many reasons for the omission, with which, says the story, Her Majesty was graciously pleased to dispense after she had heard the first, which was, that there were no bells to ring. In the present instance the Council seem to have assumed there were no bells, and not to have made any inquiries whether there were any or no till they had harrowed their own and our feelings, and compelled us to assume a stoicism we didn't feel. However, we are so satisfied with the present state of affairs, which is as good as could be expected under the circumstances, that we can afford to excuse the fright which the Council subjected us to, and confine ourselves to recommending that the next annual meeting be held on the first of April, when we shall be in a condition to receive any announcement the Council may make in a fitting manner. The present arrangements are these:—The arboretum is to go; the Wilderness is to be a wilderness no longer; the orchard is to be abandoned; of the 30 acres 10 only are to be retained as an experimental garden; the council-room, large conservatory, and fruit room, and all the other houses will be retained. Though the old orchard is to be abandoned, young trees have been secured on dwarf stocks, so that space will thus be gained without much loss. A lease of the 10 acres will be granted for 50 years, at a rental of about £100 a year, through the liberality of the Duke of DEVONSHIRE, who has not proved the stern landlord the Council made him out to be. It is estimated that by these new arrangements the Society will be able to reduce its expenditure by a thousand a year. How vastly better is this arrangement than the absurd proposal to establish a new garden afar off in the country. The greatest losses will be the arboretum, the Peach wall, and the Wilderness. Probably, if the matter be properly represented to the Duke, some of the fine Maples and other trees may yet be spared, to form the chief attractions of the villa gardens which may in the future be there constructed. As to the Wilderness, the struggle for existence has been so sharp there of late that many of the most interesting things have succumbed. Doubtless before the land is cleared an accurate survey will be made, and everything that can be removed will be taken care of. The pleasure-grounds at Kew now contain so much larger collections that the loss in this particular will not be so serious.

—— We are glad to learn that Mr. E. BENNETT, whose success as a plant grower at Osberton and elsewhere is so well established, has received the appointment of Head Gardener at Enville Hall, the seat of the Earl of STAMFORD and WARRINGTON.

—— On Friday, the 25th of March, an interesting and instructive lecture on SPRING FLOWERING BULBS, was delivered in the Rotundo, Dublin, by Mr. RICHARD DEAN, of Ealing, the Right Hon. the LORD MAYOR presiding. The subject was illustrated by a number of diagrams, paintings, &c., and also by growing specimens of Hyacinths, Tulips, Crocuses, &c., and appeared to give much satisfaction to the audience.

—— M. CHIRON, in the Bulletin of the Société d'Agriculture et d'Horticulture of Vaucluse, describes a method of shearing HAWTHORN HEDGES, by means of which they are kept bushy, and well furnished at their base, where they are somewhat apt to get bare. He carries out the operation while the shoots of the Hawthorn are still in the herbaceous condition, and by means of a well-sharpened scythe he cuts down to their base all the new shoots. If the hedge is vigorous, it speedily produces new shoots, which are cut down in their turn; and sometimes a similar cutting is practised even a third time. After these operations, the plants produce from their lower parts a greater number of branches, which render the fence thick and impenetrable. The tender green shoots can easily be buried as a manure at the foot of the hedge.

—— Amongst recent losses which horticulture has sustained amongst our neighbours, the Belgians, the death of M. VICTOR VANDEN HECKE DE LEMBEKE is specially to be lamented. He died at Ghent on the 24th of January last, in his sixtieth year, after a long and painful illness, which manifested itself immediately after his return from Russia last spring. He was president of the Société Royale d'Agriculture et de Botanique de Gand, and also of the Société Pomologique; vice-president of the Federation of the Belgian Horticultural Societies, &c.; and he was moreover one of the most distinguished Belgian amateurs of horticulture. His Government had for many years confided to him the Presidency of the Conseil de Surveillance of the State School of Horticulture, a function, observes M. VAN HOUTTE, which he filled up to his last hour with as much benevolence and amenity as zeal.

—— We learn from the "Court Circular" that her Majesty the QUEEN, accompanied by the Princess LOUISE and the Princess BEATRICE, and attended by the Duchess of ROXBURGHE and Lord ALFRED PAGET, visited the ROYAL HORTICULTURAL GARDENS on the 24th ult., the day on which our last week's *Chronicle* went to press. Her MAJESTY on this occasion specially inspected Mr. WILLIAM PAUL'S Exhibition of Spring Flowers, and bouquets of Roses were presented to the Queen and the Princesses by Mr. PAUL'S children.

—— Rumours from India assert that it is in contemplation to appoint either a MINISTER for AGRICULTURE in INDIA, or a Government Secretary in the Agricultural Department. This official would have rule over all botanists, forest officers, superintendents of Cotton and Cinchona plantations, and the like. Government agricultural experiments are to be carried out on a large scale. All this looks like progress.

—— We learn with satisfaction that Dr. MCNAB, son of Mr. MCNAB, of the Royal Botanic Garden, Edinburgh, has been appointed to the Chair of Botany in the ROYAL AGRICULTURAL COLLEGE, CIRENCESTER, and congratulate the College on having secured the services of so able a Professor.

—— In answer to an inquiry as to the JAPAN CHESTNUT mentioned at p. 352, Mr. FORTUNE obligingly sends us the following:—The Chestnut is a common tree both in Japan and in the central provinces of the Chinese Empire. I first met with it in 1853, when travelling in the province of Chekiang, near Ningpo, and wrote the following notice of it in my "Residence amongst the Chinese," p. 51:—"There are two species cultivated on these hills; one is somewhat like the Spanish, and, although probably a different variety, it produces fruit quite equal in quality, if not superior, to the Spanish Chestnut. The other is a delicious little kind, bearing fruit about the size, and in the form, of our common Hazel-nut. Large quantities were procured in the autumn of this year, sown in Ward's cases, and sent on to India. Part were sent to the Government and part to the Agri-Horticultural Society of India. They vegetated freely during the voyage, and many hundreds of nice healthy young plants reached India in the most perfect condition. The Chestnut may now be considered naturalised on the hills of India, and in a few years will no doubt make its appearance in the markets amongst the fruit." I find on referring to my last book, "Yeddo and Pekin," that I have called the Chestnut Castanea japonica, but I do not now remember my authority for the specific name. Probably it was Von Siebold, whom I used frequently to meet at Yokohama. Castanea chinensis (Spreng.) is probably the same plant; but whatever the species may be, one thing is certain—the fruit is excellent, and the tree is well worth introducing to any country in which it will flourish. I believe I introduced it to England some years since, and it may still be found in some of our gardens, but our summers here are not hot enough to render it fruitful.

—— Another new gardening publication, entitled the "VILLA GARDENER," is announced for the special behoof of villa and suburban gardeners. The programme is attractive.

—— The London public, says the *Pall Mall Gazette*, will owe the Duke of BUCCLEUCH some gratitude if he is successful in his attempt to substitute an EVERGREEN SCREEN for the ordinary blank wall in front of his town mansion. "The plan adopted is simple and effective. A series of iron posts, some 8 or 10 feet high [and in double line, each line some 6 inches distant from its fellow] are connected together by numerous thick wires, and over the trellis-work Ivy is being trained. Well watched and watered the plants will doubtless thrive, and the weary eye of the passer-by will have at all seasons a cheerful leafy screen to look upon. There is no reason why other plants of similar habits should not be introduced, as the close texture of the leaves of most evergreen creepers would prevent them from suffering much from London smoke and London dust [our contemporary should name, we can't]. In fact, a little more public spirit and judicious expenditure on the part of the occupiers might make Whitehall Gardens worthy of their name, and encourage us to hope that the long line of the Thames Embankment may be broken by other objects than lamp-posts and pillar letter-boxes." Other preparations of a more questionable character are being carried out in the court-yard of the mansion above-mentioned. The soil is being removed and its place filled with peat, with a view to the growth of Rhododendrons. Considering what wretched scarecrows evergreen shrubs speedily become in London, this part of the scheme seems ill-

considered, unless, indeed, it be intended to remove the old plants and introduce blooming plants annually. Perhaps the Duke is going to show his fitness for the post of President of the Royal Horticultural Society. Our contemporary, above quoted, is rather at fault in respect to evergreens and London smoke, the fact being that plants which retain their leaves during the winter sustain the greatest injury from that villainous compound; but it may, nevertheless, be possible—with "a judicious expenditure," in the shape of washing and carefully tending the plants—scarcely without it—to realise the refreshing verdure for which the *Pall Mall* is longing, and most gladly shall we hail any successful efforts made in this direction.

MEAN TEMPERATURE of the air at the height of 4 feet above the soil, excepting at Hull and Newcastle, was from 37° to 40° both in England and Scotland. The average temperature of all England and Scotland was 38¼°, being less than that in the preceding week by 2¾°. The temperature of the air of the 12th week in the year should be 0.5° warmer than in the 11th week. The progress of vegetation is completely stopped by the continuance of this cold weather. —The FALL OF RAIN was smallest in amount in the South of England, and largest in the North of England. For the several falls, see the last column in Mr. GLAISHER'S Tables in this week's issue.—During the week the temperature of the earth, at the depth of 24 feet, decreased by 0.2°; at 12 feet was nearly unaltered; at 6 feet increased by 0.4° nearly; at 3 feet increased by ¾°, and at one inch varied during the week from 40° to 45½°

—— Professor OLIVER continues his lectures on BOTANY to the LADIES' CLASS at South Kensington Museum. The schedule plan is adopted, each pupil being provided with a printed form, which she is expected to fill up with a description of the particular specimen. This is an excellent method of calling attention to the main characters of a plant, and supplemented as it is by the lecturer's remarks, enables the learner to gain rapidly and accurately a knowledge of the conformation of plants.

—— We perceive that Mr. SHIRLEY HIBBERD has been appointed English correspondent of the "American Horticulturist," and made his *début* in the last number of that journal in the shape of a letter *de omnibus rebus*.

—— M. EUGÈNE GOUET, a gardener at Brinches, adopts the following simple means of keeping his MELONS free from the ATTACKS of INSECTS. After having made up his beds to a thickness of 7 or 8 inches with strong but well prepared earth, he carefully washes the frames and sashes, and afterwards paints them on the inside with a coat of hot lime wash. When the Melons are planted, the surface of the bed is lightly sprinkled with inert lime, or lime which has been some time slacked. Under this treatment he assure us, says a writer in *L'Horticulteur Français*, that insect pests do not invade his Melons.

—— M. WEISS, of Montreuil, submitted to the Société Impériale d'Horticulture de Paris, at one of its recent meetings, plants of his new ERICA HIEMALIS SUPERBA, in order to show how much it is to be preferred to the type usually cultivated. The plants are altogether more vigorous, and are furnished with stronger branches, and larger and more numerous flowers.

—— The WEATHER during the week ending March 26 was cold and with very little sunshine, and, with the exception of the 21st day, was several degrees below the average of the season on every day. The 21st was warm, the temperature reaching to about 50°, or above 50° at most places in the Southern and Midland Counties. The wind was West, or a compound of the West; on the 22d the wind changed to the North, or a compound of the North; and the temperature at night descended below 32° at all places excepting near the West Coast, and the highest temperature reached this day was from 10° to 15° below that of the preceding day. — The

FIG. 81.

—— Among the more important of the metropolitan exhibitions of flowers during the present season, we find Mr. WILLIAM PAUL announcing that he will

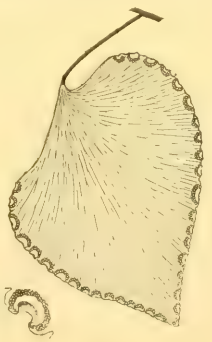

FIG. 82.

hold, at the Crystal Palace, Sydenham, by permission of the Directors, a SPECIAL SHOW OF ROSES, and of plants suitable for grouping with them. The show is to open on May 28, and to continue to June 4, and great efforts are to be made to render it *the* Rose Show of the season.

—— We are informed that the University of St. Andrews has conferred the degree of LL.D. on Mr. J. T. BOSWELL SYME, the well-known Editor of the "British Flora."

—— It would seem that France can boast the largest WELLINGTONIAS in EUROPE. According to the published records of the height of specimens of Wellingtonia gigantea in the United Kingdom, the largest would appear to have attained a height of 30 feet, but from a statement in *L'Illustration Horticole*, it appears that there are in France two examples, one belonging to M. DURAND, of Bourg-la-Reine, the other to M. COCHET, of Suisnes, which are nearly 37 feet high, and of the greatest beauty. They have only been planted 12 years.

New Garden Plants.

ADIANTUM PERUVIANUM, *Klotzsch*, *Linnæa*, xviii. 555; *Hooker, Sp. Fil.* ii. 35, t. 81 C; *Hooker and Baker, Syn. Fil.* 116.

Fronde ramosa glabra; stipite rachibus et petiolis atro-fuscis, nitidis, glabris; pinnulis magnis trapeziformibus, angulis omnibus obtusissimis, obsolete serratis; soris magnis, indusiis suborbicularibus. *Klotzsch, l. c.*

This noblest of all known species of Maidenhair Fern, which rivals if it does not excel the well known Adiantum trapeziforme in the size of its pinnules, and far surpasses that grand old Fern in the elegance of its large compound drooping fronds, was first made known from Peruvian specimens in the herbarium of Ruiz and Pavon, and was afterwards gathered by the collector Mathews. It is a plant which at once rivets attention, and commands admiration, not alone on account of its unusual pendent habit, but also by reason of its bold and strongly marked character. From a stoutish decumbent slowly-extending caudex it throws up, to a height of 12 or 15 inches, the stout black erect polished stipites, supporting the ample fronds, which are between 2 and 3 feet long, the nearly simple elongated branches, as well as the apical portion of the frond spreading out and hanging as gracefully dependent as the boughs of a Weeping Willow. Four or five of these pinnæ or branches are produced, the lower ones being fully a foot in length, and again branched near the base. The pinnules are numerous, of a stoutish papery texture, and of large size, opaque green, quite smooth, and attached by slender petioles, varying from three-fourths of an inch to an inch in length; they have the base more or less wedge-shaped, the apex being acute or rarely acuminate, and the side angles rounded, so that the pinnules become unequally ovate or somewhat trapeziform according to the degree of obliquity in the two sides. The pinnules measure in ordinary well-grown mature fronds about 2 inches long by 1¼ inch broad, some of those on the less divided fronds being fully 3 inches long and 2 inches broad. The sori are large, produced along the whole of the two anterior margins of the pinnule, oblong, varying in length, but generally shortish and somewhat rounded. The veins are flabellately-forked, without trace of midrib.

Our attention has been called to this noble plant by the Messrs. Veitch & Sons of Chelsea, who hold the entire stock. It is, of course, a stove Fern, not, however, requiring a very high temperature; and it appears to be of free and vigorous growth, so that it will be invaluable both as a decorative and an exhibition plant. The accompanying figures (81, 82), which have been prepared from Messrs. Veitch's plant, will give some idea both of the bold character of the pinnules, and the remarkable pendent habit of the entire plant, which must certainly claim to stand in the first rank in a genus which can already boast of including some of the most charming ornaments of the fernery, *e. g.*, farleyense, cardiochlæna, Capillus-Veneris magnificum, cuneatum, concinnum, and many others. *T. M.*

REPORT ON DOUBLE-FLOWERED PELARGONIUMS.

[We copy the annexed Report from the sheet of the Royal Horticultural Society's Proceedings, distributed at the meeting of the 16th ult. Eds.]

A COLLECTION, consisting of 40 varieties of these novel and useful plants, was grown at Chiswick during the past year. They were all, with one or two exceptions indicated below, presented to the garden by Mr. William Bull, of Chelsea, and formed one of the features of interest in the garden during the late summer months. Having been received in the spring in the shape of small plants, it was decided to cultivate them in pots under glass, for which purpose these Pelargoniums seem especially useful. They were accordingly grown with much success in moderate-sized pots, and bloomed remarkably well in one of the span-roofed greenhouses, their healthy character reflecting much credit on Mr. Barron and his assistants. The accompanying notes indicate the condition as to habit and inflorescence which these plants assumed, and may be regarded as recording as fair a verdict on their respective merits as could be arrived at from the growth of a single individual of each kind. The certificated sorts, indicated by asterisks in the subjoined descriptive list, were the following :

FIRST-CLASS CERTIFICATES : — Marie Lemoine, Madame Lemoine, Victor Lemoine, Gloire de Nancy.

SECOND-CLASS CERTIFICATES :—Sparkhill Beauty, Impératrice Eugénie, Andrew Henderson, Victor, Wilhelm Pfitzer, Memnon, Le Vésuve, Triomphe de Thumesnil, Triomphe de Lorraine, Signet.

The following is a transcript of notes made at intervals during the season :—

Albina.—Vigorous, with faintly zoned leaves, the trusses small ; the flowers of a deep rose-pink, rather darker in colour than those of Madame Lemoine.

*Andrew Henderson***.—This variety is of moderately vigorous growth, with faintly zoned leaves, and compact trusses of orange-scarlet flowers very freely produced. It is an ornamental variety well worth growing.

Ascendancy.—Moderately vigorous in growth, with faintly zoned leaves, but too near Gloire de Nancy in the flowers.

Capitaine l'Hermite.—A vigorous-growing sort, now superseded, with faintly zoned leaves, and loose cerise-scarlet flowers.

Conquerer.—A vigorous-growing variety, with green leaves and poor scarlet flowers.

Consul.—A vigorous-growing sort, with faintly zonate leaves ; the flowers light scarlet, in a loose truss.

Cottington.—A dwarf-growing small-leaved bedding variety, with quite the habit and general character of the old Tom Thumb ; the flowers scarlet, semi-double, loose, larger than those of Madame Rose Charmeux, and forming larger and more showy trusses.

Delight.—Dwarf and moderately vigorous in habit, with indistinctly zonate leaves, and fair trusses of large thin flowers, but too closely resembling those of Gloire de Nancy.

Emile Lemoine.—A variety of moderately vigorous habit, having the leaves marked by an indistinct zone, and the flowers of a cerise colour, ragged, but forming dense trusses. An inferior variety.

Emulation.—A vigorous-habited green-leaved sort, with indifferent scarlet flowers.

Firebrand.—A coarse-habited green-leaved sort, with carmine-scarlet flowers of inferior quality.

*Gloire de Nancy****.—A handsome and moderately vigorous-growing variety, still retaining a high position in the double class. It has green leaves, and good bold trusses of well-formed, full double, rosy carmine flowers. This proves to be also a good bedding plant.

*Impératrice Eugénie***.—A variety of remarkably vigorous growth, which, in the case of the Chiswick specimen, scarcely proved itself to be a free bloomer. The leaves are indistinctly zonate, and the rosy pink flowers are full, and sufficiently good to render the variety deserving of further trial. It is reported to have been good in other collections.

Latona.—A vigorous-growing sort, with green leaves ; the flowers of a light scarlet, in small compact trusses.

*Le Vésuve***.—A vigorous-growing variety, of erect habit, with faintly zoned leaves, and fine trusses of large, well-formed, full, double flowers, of a light orange-scarlet colour. A very promising sort.

*Madame Lemoine****.—One of the very best of the varieties in the whole collection. It is dwarfish in habit, with faintly zoned leaves, and large, full double, bright rose-pink flowers, freely produced in good showy trusses.

Madame Rose Charmeux.—A dwarf-growing slender variety, of the habit of the old Tom Thumb, producing numerous small trusses of loose bright scarlet flowers. A bedding variety, in the way of Cottington.

*Marie Lemoine****.—A variety of first-class excellence. It is of dwarf stocky habit, with flat faintly zoned leaves, and large-sized flowers, forming abundant, bold, and effective trusses. This variety is much like Madame Lemoine in the colour and general aspect of its flowers ; but it is of dwarfer habit, distinct in its foliage, and producing better flowers.

Martial de Champfleur.—A variety of moderately vigorous habit with green leaves, and thin double scarlet flowers ; now quite superseded.

Mary Elizabeth.—A dwarf-growing variety, with faintly zonate leaves and rose-pink flowers, paler than, but not equal in merit to, those of Madame Lemoine.

*Memnon***.—This is a meritorious variety of moderately vigorous growth, with faintly zoned leaves ; the trusses are of fair size and compact, consisting of close, well-formed, light scarlet flowers. Distinct and promising.

Monsieur E. G. Henderson.—A dwarf-habited variety ; the leaves with an indistinct zone ; the truss good, bearing large flowers, but too near to Gloire de Nancy.

National.—Vigorous in growth, with faintly zonate leaves, and good double flowers in close trusses, but in colour too much resembling those of Gloire de Nancy.

Navarino.—Of dwarf habit, with indistinctly zonate foliage ; the trusses apparently small, and the flowers rosy carmine, rough. A very inferior form of Gloire de Nancy.

Revieto.—A rather vigorous and straggling-growing sort, with the leaves green, and the flowers of a light scarlet colour, growing in small trusses.

Rosetta.—Of vigorous growth, with green leaves, and small trusses of scarlet flowers, which are rather deeper tinted than in other scarlet-flowered varieties ; but they are too narrow-petalled and ragged.

*Signet***.—A rather desirable variety, of moderately vigorous growth, with the leaves faintly zonate, the trusses well filled, and the colour a rosy carmine, in the way of Emile Lemoine ; but the individual flowers are of better form.

*Sparkhill Beauty***.—This variety is of moderately vigorous growth, with faintly-zoned leaves, and close trusses of bright rose-pink flowers, very much resembling those of Madame Lemoine ; superior to that sort as regards smoothness of petal, but, taking other points into consideration, the preference must be given to Madame Lemoine.

Splendour.—A coarse-habited tall-growing sort, with green leaves, and scarlet flowers in loose trusses.

Sunshine.—Of vigorous growth, with the leaves green, the flowers deep rose-coloured.

Surpasse Gloire de Nancy.—A variety of moderately vigorous habit, with green leaves ; the flowers too nearly resembling those of Gloire de Nancy, but not equal to that variety either in truss or in the quality of the individual blossoms.

Tom Pouce Cerise.—A dwarfish-growing variety, with faintly zonate leaves, and compact trusses of pale cerise-scarlet flowers.

Tom Pouce Rose.—A dwarf-growing variety, with faintly zoned leaves and dense habit ; the flowers are of a rosy pink, loose and rough, and by no means equal in quality to those of Marie Lemoine.

*Triomphe de Lorraine***.—A variety of some merit, being of moderate growth, with faintly zonate leaves, and close trusses of carmine-scarlet flowers, of the same colour as those of Emile Lemoine.

*Triomphe de Thumesnil***.—A vigorous-habited sort, of some merit ; the leaves are green, not zoned ; while the flowers, which are scarlet with a faint tinge of cerise, are large and full.

Triumph. — Coarse-growing, with faintly zonate leaves, and large loose flowers of an orange-scarlet colour, similar in tint to those of Le Vésuve, but of inferior quality.

Troubadour.—A tall coarse-growing variety, with indistinct zones and poor trusses of light scarlet flowers.

Victor.—A coarse-growing sort, with faintly zonate leaves, and orange-scarlet flowers in good-sized trusses, but not equal to Le Vésuve.

Victor (G. Smith)**.—Dwarf and free-blooming in habit, with the leaves faintly zoned, and the scarlet flowers in compact trusses. The flowers are of the same colour as those of Wilhelm Pfitzer, and closely resemble those of that variety, but the foliage is smaller. A variety well worth growing. Received from Mr. G. Smith.

*Victor Lemoine****.—One of the finest of the varieties in the whole collection. The plant is of a rather vigorous habit of growth ; the leaves are marked with an indistinct zone, and the flower-trusses are large. The flowers themselves are somewhat rough, having serrated petals ; but they form a fine head, and are of a rich orange-scarlet, brighter than Le Vésuve.

Vivian.—A variety closely resembling Gloire de Nancy in every respect, but scarcely equal to it in merit ; the leaves are very indistinctly zonate.

*Wilhelm Pfitzer***.—One of the useful second-class sorts, of moderately vigorous growth, with indistinctly zonate leaves, and fair-sized trusses of good full flowers of a light scarlet colour. Received from Messrs. Carter & Co.

Zelinda.—Dwarf in habit, with indistinctly zonate leaves. The flowers are small and poor, scarlet, resembling those of Triomphe de Thumesnil, but not so freely produced.

THE HAWTHORN,

WORKED ON THE PEAR OR QUINCE.

IN the summer of 1866 I budded the double Scarlet Thorn upon the Pear and on the Quince, and in the spring of 1867 I grafted this Thorn upon the Pear. The buds grew with extreme vigour in 1867, and not only flowered in 1868 but bore haws abundantly, which however were not single-seeded, but each haw contained two to four stones. These haws had large open eyes, and were thus of a flattened form. The parent trees from which I cut the buds and grafts, although they had flowered previously for several years, had never before produced a haw. The budded plants, after they had ripened their fruit, lost their vigour, and not only died themselves but the Pear stocks upon which they grew also succumbed. I, however, thought that the excessive heat of the weather at least expedited this result. The grafts on the Pear pushed away most splendidly in 1868, and formed magnificent leaves, I should think at least 8 inches across, with fine strong shoots having clean bark ; they flowered in 1869, bore haws less abundantly, and seed similar to the budded plants, and then died, both Thorn and stock. In 1868 I obtained a rather small plant of Paul's fine new Scarlet Double Thorn, and was able to cut from it about half-a-dozen small weak grafts, three of which I worked upon Pear stocks, which were at least an inch in diameter. These came away as well as could be wished, and during the summer pushed fine healthy shoots 2 feet long ; and as my object in working these upon the Pear was chiefly to obtain a large supply of scions of this most splendid flowering Thorn, I was fully rewarded, for one small graft, not above a twelfth (if so much) of an inch in thickness and 3 inches in length, grew me, I should think, fully 60 fine strong healthy grafts, which were taken in the spring of 1869—and in fact fully three times the quantity the original plant could give, even if it had been more severely cut down. Working the Thorn upon the Pear yields this practical result,—that when Thorn scions are wanted in abundance, one year will be sufficient to produce them either by budding or grafting, but particularly by the latter process. Having scrubbed the pulp off the haws, I planted them in a pot, which although ticketed has been lost. If anyone wishes to work out an idea, he must watch and almost exclusively attend to the whole process himself. Subsequently, I planted the more recently obtained haws in the open border, after removing the pulp. Two out of three grafts of Paul's Thorn I cut down for scions in 1869, and the third I allowed to remain, and it flowered most gloriously ; and although I am under the impression that the colour of the blossoms was not quite so intense as those produced in the neighbourhood of Darlington upon Thorn stocks, yet the size of each individual blossom was very much larger ; and it struck me that, for exhibition purposes, the grafting on the Pear offered very tempting advantages. I may add that, even considering the above result, I am not thoroughly convinced that the Thorn may not, under certain circumstances, be advisedly grown upon the Pear. Obviously, the excessive luxuriance of the growth of the Thorn grafts and buds might lead to fear for the results. Had the Pear stocks been of less size, and been root-pruned—which mine had not been for at least four years previous to working — more favourable results might have been anticipated. I have a few of the old double-flowering Thorn budded in 1868 upon the Pear, some of which have not grown so vigorously, and which flowered and bore haws last year, but are still alive. The two of Paul's Thorns cut down for scions in 1869 are still alive, and from one of them I procured the other day a handful of twigs for grafting, but although quite alive they did not appear quite so healthy as ordinary Thorn shoots do. The one which flowered and was not cut at all in 1869 is still alive. In 1866 I put in a bud on a Pear stock of a large-fruited variety of the Whitethorn, which I had marked in a hedge. This did not grow so vigorously as the double-flowering variety, and did not flower till 1869, and only bore one haw, but it died last autumn. In 1868 I put in a bud of that variety which the Continental nurserymen send over to this country as "the Weeping Thorn," but which with me seems to be vastly too proud to weep, and will persist in gleefully holding its head erect. This upon the Pear is still alive, and I believe quite healthy, and although lopsided it weeps in the most graceful curve desirable.

My experience of the old double Crimson Thorn worked upon the Quince is most satisfactory. Here, I think, is afforded a means by which this beautiful May bush may be adapted to many situations from which its strong growth now precludes it. I have plants budded on the Quince in 1866 quite healthy, and I believe they will remain so. They are, however, dwarfed, bear pinching-in with all endurance, and will make handsome small profuse-blooming plants for the front of shrubberies. Mine did not flower till last year, being then within a month or so of three years from the time of budding. I shall follow out with these Mr. Rivers' practice with Pears. When he finds certain varieties of Pear do badly upon the Quince, he grafts a variety of Pear upon the Quince, which does well, and then grafts the other varieties upon the Pear grafted on the Quince. The American Thorn, I find, takes also well upon the Quince, comes into flowering and bearing the second year (the fruit, I think, being enlarged), grows into a nice pyramid, and bears summer pruning well. I have been desirous to see if the haw, by cultivation, working upon the Pear, could be improved, so as to be made deserving notice as an article of domestic use ; and I incline to think the object may be attained by working the best varieties, which may be occasionally found in the hedges, upon

the Quince, or on the Quince worked upon the Pear, and then upon this Pear-graft, or perhaps upon the American Thorn. Cratægus Layi seems to stand well upon the Pear. I have a graft, put on in 1868, looking well, but it did not flower like Paul's Double, although worked on the same afternoon.

In conclusion, I may add that the plan of grafting I adopted as a boy is the simplest method of all. An old Scotchman was my first instructor in grafting, and his method was to head down the stock, make a slit up the bark, which he raised with a small thin piece of bone, and then inserted the scion, cut splicewise as usual. I at once saw that by inserting the piece of bone the rind was separated a greater distance than the space required for the scion, and thus more violence was inflicted than need be. To avoid this, after making the first cut up the back of the stock, I placed the already prepared scion against the stock, and made a second cut up the bark, and thus just raised enough to allow the scion to fit in cosily, by which I avoided punishing the stock more than was unavoidable, while by placing the scion against one edge of the cut rind the sap had immediate access to it. I have found this method very successful, and for an amateur most easy. Even with smallish stocks it can be adopted, while with small ones, instead of cutting a slice and then seeing that a portion of the inner rind of the graft fits on to a portion of the inner bark of the stock, one side can be a little cut away, and the graft placed against the edge of the bark on one side and on the sap-wood, from which the bark had just been removed. *W. A. Wooler, Sadberge Hall.*

THE OLIVE.

The Olive is a tree which seldom exceeds 20 feet in height, and produces a hard and beautifully marked wood, which is used for making various ornamental articles, as well as for cabinet work. The tree is of very slow growth, and is very tenacious of life, some at present existing to which are ascribed a great antiquity. There are two distinct varieties of the Olive tree, one known as the wild and the other as the cultivated Olive, the former having its branches somewhat four-sided and spiny, and bearing a small and valueless fruit; while the latter has numerous sub-varieties, varying in the form, size, or colour of their fruits, all of which are valuable, either for the purpose of expressing the oil or for pickling. The oil is contained in the fleshy part of the fruit, and is obtained by pressure. Though the processes by which the oil is expressed are somewhat different in different countries, the principle is the same in all.

The mills in which the ripe fruits are first placed are so constructed as to bruise the pulp without crushing the stone or kernel. After this bruising the mass is put into bags, and submitted to the pressure of a screw press. The oil so obtained has a greenish tint, and is termed virgin oil. The cake, or *marc*, which is the residue of the crushed Olives, is then broken up by hand, moistened with boiling water, and again subjected to pressure, by which oil of a second quality is produced, but this time, owing to the moistening process, much water is also expressed; this, however, separates by standing. A third quality of oil is sometimes obtained in France by crushing the whole mass, including the stones and kernels, boiling it, and again submitting the whole to pressure; this oil, however, is of a very inferior quality, and is either used for burning in lamps or for soap-making.

Though the Olive crops are among the most important of the natural products of Italy, the means generally employed in that country for extracting the oil are very imperfect, and lead to a considerable waste, ; indeed, until within the last five or six years, after the Olives had been crushed by the peasants, the husks were abandoned as worthless; but in a few places steam machinery has been introduced to turn to account the husks so thrown away, and which it is now known represent a considerable portion of the value of the oil crop. The British Vice-Consul at Oneglia says the Italians have now established there a steam mill for the purpose of extracting the oil from these husks. The process is very simple; the husks are placed in tubs, and worked with water by machinery until the water has carried off all the remaining oily matters, which rise to the surface after the water has been allowed to remain still. The husks are then put in a steam press, which squeezes out all the moisture, and after they have gone through these different processes they are either used in the country for fuel, or sold to Marseilles firms, who pay for them at the rate of about 8*s.* per ton, free on board at Oneglia. The oil thus extracted from the husks is called "Olio lavato," and is worth about 40*s.* per cwt.; it is used for the manufacture of soap.

The first product, or virgin oil, made in the district of Oneglia, is of better quality than that of Southern Italy, and large quantities are refined before being exported. The process of refining the oil is very simple; large shallow tin boxes are made with small holes pierced in the bottom, this is then covered with a thin sheet of wadding. Four, five, or more of these boxes are placed on frames one over the other, and the oil being poured into the top box, is allowed to soak through the wadding and drop into the next box, and so on until it gets into the last, when it runs off into the tanks. The wadding absorbs all the thick particles contained in the oil when it comes from the mills, and leaves it perfectly clear and tasteless. The oil thus refined is almost exclusively exported to Nice, where it is put in bottles, and sent all over the world as "Huile de Nice." With regard to the utilisation of the Olive husks in Italy, Mr. Consul Grant writes from Brindisi: "I have to notice, respecting this article, that foreign as well as native industry is turning its attention to the Olive husks, which, as left by the common oil-presses of the country, have hitherto been abandoned, or used as fuel by the peasants. A French speculator has for some time past been buying them up in large quantities and shipping them to Marseilles, where, after undergoing a certain chemical process, they are put into a steam-press, and yield as much as 20 per cent. of oil. The highest price paid for the husks here has been about 20 francs per ton."

The Italians seem now disposed to take the matter in hand. A steam oil-press of 22-horse power is shortly to be started at Brindisi, capable, it is said, of pressing about 70 tons of husks per day; but it is not expected to extract more than 8 per cent. of oil from them—a much smaller percentage than that obtained by the Marseilles establishment, which owes its superiority, it is said, to the chemical process before alluded to. Here the husks are to be washed or soaked in salt water before being pressed. There seems, then, every probability of what may be called a new branch of the oil manufacture taking root in Italy, so that it is possible we may soon have a new kind of Olive oil in commerce. *John R. Jackson, Museum, Kew.*

Fig. 83.

*DAHLIA IMPERIALIS, Roezl.**

On hearing of a Dahlia 12—14 feet high, with large spreading panicles 4—5 feet across, and bearing hundreds of white bell-shaped flowers, each little less in size than those of the common White Lily, and equally pure in colour, some little scepticism might have been pardoned as to whether the plant so described were really a Dahlia. On hearing of it for the first time from a friend, who described the plant in general terms, we concluded that it was some Aralia that was intended. However, after a time, the figure and description in the "Gartenflora" cited below seemed to set the question at rest. There really was such a plant, and it was a Dahlia. Next we heard of it in the south of France; and those who saw it there said, and said truly, that the figure in the "Gartenflora" gave no idea of the magnificence of the plant. Then Mr. Bateman, in the course of his wanderings, fell in with the plant, made it the subject of a short lecture at the Royal Horticultural Society, exhibited a dried specimen of the flowers (wretched mummy), and, better still, presented the Society with some tubers which were grown on in the orchard-house at Chiswick, and when the plant showed signs of bloom it was moved into the stove, where it produced its magnificent pyramidal panicles of dazzling white flowers, some of which were exhibited at one of the meetings of the Society, and were ample to show that the descriptions of the plant had—rare event indeed—not equalled the reality. The tubers, stem and foliage, are quite those of a Dahlia, but the large pyramidal inflorescence, like that of a large Yucca, but more spreading, is quite unlike that of our ordinary Dahlias. The bell-shaped flower-heads, again, are different in form from the flat disc-like single Dahlias, still more so from the flattened spheroids which constitute the *beau-idéal* of a florists' Dahlia. Nevertheless, a Dahlia it is to all intents and purposes, and closely allied in habit and general appearance to another species of the same genus also growing in Mexico, D. arborea. There appears to be at least two varieties, differing in the width of the petals and the intensity of the crimson spot at their base. One great objection to the plant as grown under glass in this country is the habit it has of making a long bare "sticky" stem, which is not only not pretty, but which also brings the head into proximity with the glass, and thus arrests growth before the plant has attained full proportions. Some have tried to remedy this state of things by laying the plant down sideways, and allowing it to grow in that fashion, which we need scarcely say is hardly satisfactory. It was reserved for Mr. Alfred Salter to overcome this tendency to produce a long naked stem, by the ingenious device of grafting a young shoot into the tuber of one of the Liliputian Dahlias. The result was the formation of a stem of moderate height, surmounted by the elegant leafy pyramid of flowers above described, and of which we shall shortly give an illustration. Fig. 83, borrowed from the "Florist and Pomologist," shows the leaf, and a detached flower.

* Caule solido versus apicem fistuloso 4-sulcato, ramoso, elato, internodiis pilis adpressis subtomentosis; foliis 2-sub 3-pinnatisectis foliolis ovatis, acuminatis serratis pilis sparsis obsitis, subtus ad nervos pilosis, petiolo sulcato basi cymbiformi amplexicauli aptero; inflorescentia terminali, pedunculis multifloris, pedicellis ternis, cymosis, bracteatis; capitulis late campanulatis, nutantibus; ligulis absolute neutris, albidis, lanceolatis, apice 2-sub-3 fidis, 0·007 long., 0·002 lat.; involucri squamis exterioribus 5 patulis, rotundato-ovatis, interioribus 8 pellucidis. Crescit in Mexico, legit Roezl—*Roezl in litt.; Regel Gartenflora*, 1863, p. 243, tab. 407: 8 *Bot. Mag.*, t. 5813.

Home Correspondence.

The Weather in March.—At this date in March (the 26th) the weather has been of the most wintry

character, for in this locality snow and hail showers have been falling for the last few days, and 5° to 6° of frost have been registered in the mornings. Apricots, Peaches, and Nectarines on the open walls are not quite in bloom yet, being at least a month later than last year; they will therefore stand a better chance of setting a good crop this spring. All kinds of hardy fruits will likewise be benefited by the lateness of the season; they all show abundance of bloom on well-ripened wood, owing to the dry warm summer of last year. The fall of rain here up to this date has been about the average, and as it nearly all fell in the first week of the month, the soil since has been dry and dusty, and sowing of early seeds has been proceeded with without interruption until the last few days. It has often struck me how a good collection of bush or pyramid Pears, Apples, Plums, and Cherries could be grown in pots and without the protection of an orchard house, yet be made to bear well in frosty or bad springs. This could be done by placing them by the side of a south-east or west wall, and by protecting them when in bloom with old mats, canvas, or any materials at hand, till the fruit was set and safe. In the daytime, when the sun was out or the air mild, the pots could be drawn away from the wall to get all the air and sun to set the fruit, and placed back again at night for protection. When all danger was over and the fruit set, the pots could be plunged in the borders, or in rows in the kitchen garden, and an interesting display of fruit might be made every year on these dwarf bushes. *William Tillery.*

Trade Ethics.—Will you kindly inform me if it is "actionable" for a nurseryman to call knowingly a plant by the same name as that applied to one already sent out. For instance, A. sends out a Scarlet Geranium, Prince of Wales, which gains rapid renown; B. then sends out one nearly similar, neither better nor worse than A.'s. [We do not think there is any law but that of custom and good feeling to prevent the appropriation of a name in the manner indicated. Only a "snob" would do so wilfully. Eds.] Also, is it in any way wrong for a nurseryman to add the words—"Awarded a First-class Certificate by the Royal Horticultural Society" to the description of a plant in his catalogue or advertisement—the same plant really having been thus distinguished when exhibited by some other firm? *W. T. C.* [The certificate is awarded for the plant, not to the exhibitor. Eds.]

Crocus.—I hope Mr. Harpur Crewe's letter on Croci will stir up some of the cultivators of that genus to examine and report on those they have. I hope he may have got the Cloth of Silver, but I fear it is a lost plant. The nurserymen often advertise it, but theirs is only a Dutch variety of C. vernus. I have no doubt that his C. multifidus is identical with C. nudiflorus; mine certainly is. Besides those mentioned by Mr. Harpur Crewe, I grow the following, which I consider distinct and true to name:—C. odorus, a good autumnal species; C. byzantinus, a beautiful autumnal species, very distinct in autumn from its purple style, and now from its remarkably broad green leaves; C. sativus I find to be an extremely shy bloomer; C. Imperati, the earliest of all the spring Croci, often flowering in January; C. lacteus, very distinct, with cream-coloured petals, and very pale anthers and stigma. Besides these I grow C. pusillus, C. tulipaceus, C. sibiricus, C. variegatus, C. nubigenus, C. marathoneus, C. adriaticus, C. obesus, C. argenteus, C. grandis, C. concinnus, C. obovatus; but I do not feel sufficiently certain that the names are true, so I say nothing about them. I should be glad to hear that any of the following (among many others) are now in England:—C. suaveolens (true), Cloth of Silver (Bot. Reg., 1847), C. mæsiacus (*ibid.*), and C. insulari (*ibid.*). *H. N. Ellacombe, Bitton Vicarage, near Bristol.*

Early Peas.—I can fully endorse all Mr. Maw states in your last issue on the raising of early Peas, and that I described the same method in your Paper two or three years ago (see p. 378, 1867). Peas sown in the troughs as described generally come into use three weeks earlier than those sown in the open ground. *W. S.*

Vine Growing in Crates.—In January, 1870, I had occasion to make a vinery into a Peach-house, and *vice versâ*: I planted some of the old Vines permanently in the Vinery, the others were left in a cool shed to be thrown away, and it then struck me that I might make them useful. One wet day I set a handy garden labourer to make some rough crates about 2½ feet square, and into them I planted six of the Vines; they were then plunged in a nice bottom-heat in a pit used for forcing large shrubs, Roses, &c. They broke well and showed plenty of fruit, of which they ripened a good crop, and by August the Vines were in a proper state to be turned out-of-doors, which was done. I then had the pit at liberty for bringing on plants for the conservatory and other houses. I have every year since made fresh crates from any old wood, and followed the same plan; and from 1867 to the present time the Vines have kept improving. The pit is 12 feet wide, 8 feet high at the back, and 2 feet in front. The front wall is on arches, and I keep a dung lining to it. It is also well heated with hot-water pipes. I have never used any manure in the soil, but I get the best loam I can find on the estate. In 1868 I used it from what had been an old marl pit; but I could see no difference in the result. I use principally rain-water with a little of the best guano occasionally. In 1867 they had one rod each, and since then I have kept working in a little fresh wood every year. I have no doubt but that under the same treatment they will continue to do well for years to come. *Richard Carr, The Gardens, Tuxeham Hall.*

Luculias on the Spur System.—Mr. Culverwell, writing under no form of responsibility, criticisingly finds fault with the writer, who advocates a judicious amount of pruning only in regard to Luculias; he does not directly speak of young, one, two, or three years old Luculias, struggling under an artificial regimen to the attainment of a bushy, fairly cultivated specimen, but would inferentially lead your readers to believe that annual pruning alone (and on the spur system), is suitable and requisite in this particular case. He has himself planted in the open border a Luculia, which, simply because it never had been pruned, has uninterruptedly and quickly reached the top of the house. Now, however, as there is no more room something must be done; this grand plant must either submit to the ordeal of severe pruning or die. It is no choice, no great advance in the art, that suggests the act, but dire necessity. The tree has attained to somewhat of a tree's size. The main stem, combined with abundant roots, acts as a reserve, in case of an unusual tax; just the same as our old pollards do, which never would have become such had they been "spurred back" from the tree's infancy; and it so happens the plant lives! But does Mr. Culverwell remove every leaf? Does he really spur every branchlet back home like one would a Vine? and with such treatment, has he truly divulged to me, and the thousands of other readers of this Journal, a great secret that evergreen trees will stand an annual lopping, in all respects, as well as deciduous plants? Those who have young plants of Luculia will do well (until we hear more), to prune sparingly *W. E.*

Saxifraga oppositifolia.—I have not seen any notice in particular taken of this as a hardy spring flowering plant, and I hardly know a prettier one for an herbaceous collection or a rockwork at this season. It is procumbent in habit, and its flowers, which are of a purplish colour, are large in proportion to the plant. Although a "native," do you not think it highly worthy of a place amongst the very choicest collections? I send for your inspection a small specimen. *R. M.* [It is indeed a gem. There is a large-flowered variety even better. Eds.]

Fungus on Living Roots.—Mr. Berkeley is reported to have said that the late Marquis of Huntley told him it was not safe to plant trees where a wood had been cut down till the ground had become covered with Heath. Is this not a mistake for Gorse? I know the land about Orton well, and have shot in most of the woods, but never saw a bit of Heath growing, and as the soil is oolite, I should not expect to to find any; indeed, I never saw Heath growing where much lime was in the soil. But whatever the plant the Marquis mentioned, I think Mr. Berkeley is quite right to caution gardeners against Fungus; and those who believe the dangers from this source chimerical, are very likely to be undeceived in a way they will not like. I saw some weeks since a paper from Mr. Reade, formerly the gardener at Orton, saying that the Wellingtonias there were planted by him, and that a quantity of rubbish from a stick heap was placed about the roots. If this was intended to throw doubts on Mr. Berkeley's theory of the dangers of Fungi, I think it possible it may have the opposite effect, and may perhaps account for the miserable condition of some of those Wellingtonias. I saw them only yesterday, and whilst some are glorious specimens others are in a most unhealthy condition. Knowing that the same stuff was mixed in the Vine borders I have always expected to hear of the Vines being injured, and intended asking about them had I met with Mr. Davey, under whose management the gardens have been so much improved. Those who like may bury sticks in the neighbourhood of valuable trees, but I should be sorry to do so. A few years since, a large and valuable specimen of Gold Yew in my garden became unhealthy, and was taken up. I found its roots almost covered with white Fungus, and this was clearly owing to a large quantity of soil having been formerly spread where it grew, which soil had been from time to time wheeled out of the potting shed, and contained a large number of old wooden pegs and other refuse from pots. The little pegs were covered with Fungus, and were clearly the cause of unhealthiness in the tree. After the soil was shaken from the roots no other precaution was taken, except to remove the tree to another situation, and it is now in good health again. That any argument is necessary to prove the danger of Fungi is to me most surprising. Have not plenty of nurserymen and gardeners experienced its effects where cocoa-nut refuse has been largely used amongst soil? Has no one seen it where tan has been used? I was once asked, when in company with Mr. Ingram, of Belvoir, to account for Strawberries dying off in large numbers, and before I had time to form an opinion he said at once, "killed by Fungi," and so it proved, for some old tan had been buried in the soil. Is it wise, because some one writes that somewhere in France faggots are used for drainage in a wet and stiff soil, at present without ill effects to the Vines, for us, ignoring all previous experience, to rush to the conclusion that we have nothing to fear from the presence of decaying wood in the soil?—or, with another authority, that because Nature adds to the fertile soil of a forest by decaying branches and falling leaves, we may safely bury such substances near living roots? In Nature they are not buried, but left on the surface to decay. Let us copy Nature; she does not bury sticks and leaves. *T. R. Pearson, Chilwell.*

St. Dabeoc.—Dr. Husenbeth informs me that St. Dabeoc is probably identical with St. Dabius, confessor, whose feast in the Irish calendar is on July 22. St. Adelard and St. Agnes are also patrons of gardeners. *James Britten.*

The Talking Vines at Combe Abbey (see p. 421).—One often comes in contact with persons who practise to the uttermost the system of their forefathers, and refrain from asking themselves the question, whether or not they are in so doing acting in accordance with Nature and common sense? It is only necessary to look back 20 or 30 years to find many absurd practices in almost every branch of gardening. Just imagine one of the old "Blue Aprons" mowing all the foliage off the Rev. Mr. Radclyffe's Strawberries, and then, with all his might and main, trying to pull them up with the strongest iron rake he can find, under the pretence of cleaning the beds. I could mention many strange notions belonging to those days, but I refrain, in deference to those who still cherish a respect for antiquities. I had no intention of saying another word on the subject of Vine extension, but as Mr. Miller has again been carrying his Grapes on a pole, and making mis-statements concerning me, I wish to put him right. Vine extension never was a matter of theory with me, but one of ocular demonstration. That it is the system to get quality and quantity of Grapes as well as to secure durability of Vines, I have no hesitation in saying is the candid opinion of three parts of the Grape growers in the United Kingdom, while on the Continent the system is fast gaining favour, as few care for monstrous size, with coarse quality. Allow me to tell Mr. Miller that he has been wrongly informed about Grape Vines refusing to produce Grapes or timber with me; there has never been a Vine in my nursery, certainly none were ever planted by me, although I was ardently fond of studying the nature of the Vine when I served as a gardener. I have strong faith that time will yet change Mr. Miller's opinion, especially when he sees his once famous Vines carted to the wood-yard, and lying there as curiosities, like the poor tortured Vines of Bishop Stortford. I have known instances of our best Grape growers being elated by their success for a time, but what say these gentlemen to the Cole-Orton Vines, that have won their victories over and over again for 30 years on the extension system, and that under competition in a "three bunches" class, not in "collections of fruits," like the Combe Abbey Grapes? *H. Cunnell, F.R.H.S., Woolwich.*

Cottage Gardening Essays.—Permit me, in answer to inquiries received since your notice in the *Gardeners' Chronicle* of Saturday last, to state that a portion of my essay is already in type; and that the whole, with considerable additions and some illustrations, will be published in the course of the ensuing week. *Wm. P. Ayres, Nottingham, March* 29.

The Bishop Stortford Vines.—"Brevity" tells us that he intends only to read heads and tails in future; I wish him joy of this intelligent mode of rendering sense into nonsense. But perhaps you will allow a very ancient reader to ask him what modicum of information his readers would have lost, supposing they had skipped his heads and tails, and all that lies between the two? I have sifted his six and forty lines of chaff for one grain of corn, and could not find it. *A Very Ancient Reader.*

The Fifty Dollar Potato.—The modest sum of ten guineas, we are informed, was the price paid for tubers of Bresee's King of the Earlies Potato last year in New York, and this is now reduced to 6*s.* per lb., at which price it may be purchased plentifully enough in England. Now 6*s.* per lb. certainly appears to be a startling and absurd price for Englishmen or Irishmen to pay for Potatos, but nevertheless such is the price advertised and charged for this new Potato, which in outward appearance very much resembles the King. Those parties who have been tempted to pay so dear for their whistle will doubtless be anxious to pipe a good tune, and so turn the amount laid out on its purchase to profitable account. The old methods usually employed of planting whole sets, or even dividing the sets into quarters, will ensure but a poor percentage for the outlay the first season, and therefore a different method of forming sets must be resorted to. Indeed, in these fast times, fast ways must be the order of the day; and as the method I employed last season with the American Rose proved most successful, I submit it to your readers, and would recommend them to do likewise. In April last I purchased 1 lb (four tubers) of the Early Rose, from which I made 132 sets. The following is the method I adopted:—The Potatos were cut into halves, planted into small pots, and placed in a Cucumber frame; when the shoots attained the length of about an inch, I gently pulled them off, and placed

them singly in small pots, and this practice I continued until I made the quantity stated above; 68 sets were planted out by the end of May, and were totally destroyed by frost on June 1, before they had commenced to tuber. The remainder were planted at the end of June, and from these I had upwards of 100 lb. of tubers, some of them being very large. Some of these were exhibited in my collection of eight varieties that obtained the 1st prize at Worksop, on Sept. 3, and were greatly admired. I have no doubt that had my first row not been destroyed by frost, I should have had more than 200 lb. weight from a single pound of tubers. The quality is very good, but, as with other Potatos, this will vary according to the nature of the soil. *Edward Bennett, Osberton.*

Fuchsia Venus Victrix.—Permit me to add my testimony to that of Mr. Bennett as to the merits of this elegant old Fuchsia. It seems but yesterday that it was the pride of the conservatory, the gem of the garden; and yet Messrs. Cannell and Bennett must be right, for on looking back and comparing dates it must be nearly 20 years since I have seen Venus Victrix. I quite believe it will prove invaluable for hybridising purposes. It was always somewhat weakly in habit and tender in constitution, but in form and colour it was good and pure. Intermixed with the coarser growers and larger flowers of to-day it will, doubtless, yield many new and striking strains. It is long since I have seen the true old Globe Fuchsia—one of the handsomest and most elegant of all; but it does not seem to have been fruitful in reproducing its special good qualities, as we have very few of the same exquisite drooping habit, nor, indeed, of the same formed flower. Perhaps Universal, among doubles, approached nearest to the form of the old Globe flowers; and speaking of bedding Fuchsias reminds me that Venus de Medicis, and nearly all the Cornellissens, form good and striking beds in most localities. Fuchsias grown out-of-doors during summer are also invaluable for vases and for dinner-table decoration. Some of the most striking effects in the latter direction that I have ever seen were produced by the old Fuchsias Fulgens and Corymbiflora, sorts that are now comparatively little grown. But I must refrain, as my object was merely to confirm Mr. Bennett's high estimate of an old favourite, and not to unearth our buried sorts of from 20 to 30 years ago, though many of these are entitled to rank almost as high among the moderns as the old favourite whose day of popularity and favour was all too brief. *Venus Victrix.*

Conifers in Ireland.—A good deal haing been lately written in the *Gardeners' Chronicle* about Cedrus Deodara, and its suitability for forest timber, I beg to give you my experience with it. Many years ago a package of seeds was sent here by one of the Brothers Maude from the Himalayas; amongst the seeds were some of the tree in question, Pinus insignis, and many other things foreign to Europe. All were sown in a frame, and otherwise cared for until they were fit to plant out; some I planted in sheltered situations as single specimens, but by far the greater portion was used in forest planting, in a situation much exposed to the west. The forest had been planted some years, and the young Scotch Spruce, Larch, &c., were then 5 feet high, and, being thick, formed a close and compact shelter, to the height of 4 or 5 feet. I planted out irregularly some of the new things amongst the Scotch Firs, and they have now attained the height of from 20 to 25 feet. The Deodar is in its growth so far a few feet ahead of Pinus insignis, but from the way in which the latter has grown lately I think it will ultimately outstrip the Deodar. P. insignis has not only held its own with the Scotch, &c., but in some cases has overreached many of them. I need scarcely say that neither of the above mentioned would grow so well for more than a season or two, if they were deprived of the protection of their more hardy neighbours, but as they now stand they are by far the most lovely trees that I have ever seen, and form a most pleasing contrast to the general run of forest trees. I consider it useless to predict what they may turn out to be as an article in the timber trade a century or two hence; at present I can say in truth that the trees in question are a very great acquisition to plantations in general. I think the experiment proves beyond question that both trees and plants will flourish here in the West with very slight protection, which otherwise would be annihilated by the unbroken, unsubdued winds of the Atlantic, as there is scarcely any timber in a line from this place to the western seaboard. Wheat seems to suffer considerably each year, owing to the Atlantic side of the ear being in a great measure abortive. The great frost in 1865-6, did us but little harm beyond killing the whole of the Brassica tribe; it is the cold, chilling, saline blast that ruins us here in the West. Another proof of what shelter can do here is, that I have had the Pampas Grass growing for the last 10 years above the grey heath line of mountain, and it would flourish were it not for trespassing cattle, that seem to prefer it to any other kind of herbage. If we could ward off the western winds by planting, we should have less reason to complain of blighted heads of grain, and many other evils that we are at present liable to. Ireland lies as a kind of break-wind to Britain, consequently the worst of the blast is spent on the west side of this island, and it becomes mild ere it reaches the British coast, so that few Englishmen can know the effect of such bitter winds as we experience. *William Jones, Killoy.*

A Fly-Trap.—The apparatus figured below (fig. 84) is composed of a six-sided thick glass bottle, rounded at the top, and having a hollow spherical glass stopper. On three sides of the bottle is a hole, in which is placed a curved zinc tube in the form of a horn. The tubes are movable, and can be easily withdrawn. To make use of the fly trap, place in the bottle something to attract the insects; fruit generally answers perfectly, meat also in some cases. Attracted by the smell, the insects enter the tubes, and are unable to escape from the bottle. This little instrument may be used in gardens, dairies, pantries, &c., and either placed upon the ground without any support, or suspended by means of a string or wire, passed round the neck of the bottle. When it requires cleaning, the stopper and tubes can be removed, and the contents of the bottle taken out with a stick. M. M. Rommelin, the inventor of the fly-trap, has had them constructed of different sizes, the price varying accordingly. Any one wishing to procure them should apply to the inventor, 193, Quai de Valmy, or at the depot, 194,

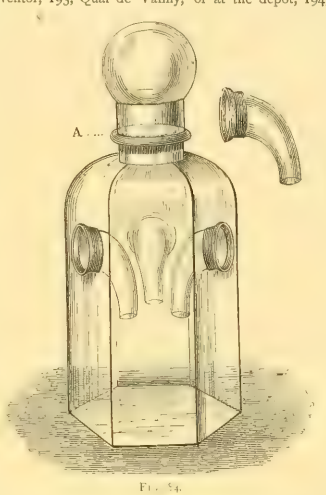

Fig. 84.

Faubourg St. Martin, à Paris. Our account of this useful apparatus is taken from the "Revue Horticole," while for the illustrative woodcut we are indebted to M. Van Houtte.

Foreign Correspondence.

TORONTO, CANADA.—In your paper of January 15 you notice in two places the scarlet-berried Elder, Sambucus racemosa, and one of your correspondents seems to consider that it is not hardy. In reply, I may say that the plant lives and flourishes in Canada, and is very plentiful as a native shrub. It is what we call a "second growth," and never appears in the original forest, but springs up along the borders of the newly felled forest, and particularly on the stumps of uprooted trees. It grows as a shrub, from 5 to 6 feet high, and in its season is covered with its handsome bright scarlet berries. It is here generally considered poisonous, and is never used.

We have also the common black-berried variety, Sambucus nigra. It is very fruitful, and stands the climate well, but never reaches the dignity of a tree here; the berries are equally good for wine as they are in the old country, and afford to home-made wines the "true port-wine flavour." Query, is not this suggestive of the origin of the flavour of that particular vintage? I recollect reading of an edict made in Spain or Portugal for the cutting down of all Elder bushes, and the forbidding of the use of the berries as a colouring or flavouring matter, but the Government soon found out that red wine without Elderberries was not port wine, and the Elder bushes were allowed to grow again.

Whilst on this subject, I may mention that I once saw some white-berried Elder trees, and as in the course of a long life I have never seen any others either in the old country or America, the whereabouts of the trees may be interesting to your readers.

They grew at Alton, in Hampshire, England, on the west side of the main street, about half-way between the turnpike-gate, near "the butts," and the principal inn, but the latter was on the other side of the street; there were two large trees in front of some cottages, which stood back from the street. Your correspondent used to make wine of the berries, and excellent it was—about the colour of Madeira, or, rather, pale sherry; the trees were very large, and profuse bearers.

We have in some parts of Canada a great curiosity, namely, a white Blackberry, or, rather, Brambleberry; it is exactly like the ordinary Blackberry, both in form and wood, colour of course excepted; it grows in stony and rocky lands, is a dead sweet, and apparently without any acid whatever. It refuses to be domesticated; great pains have been taken with that intent, but without effect.

Our American cousins have gone extensively into Blackberry culture, and have searched the Continent for new kinds, both as seedlings and native sorts; they have succeeded in obtaining berries of enormous size, and very prolific kinds, but the best of them are not in flavour superior to your common hedge Blackberry; they are handsome and large, but flat in flavour, and although greatly "run upon" in places, are scarcely worthy of room in a garden where good fruit of other kinds would be raised if they were not.

There is another matter I see mooted in your paper at times, namely, new sorts of the Virginia Creeper (Ampelopsis quinquefolia). Your readers may not be aware that there are two kinds—the ordinary five-leaved kind, and a kind with three leaflets instead of of five (the botanical name is "Rhus Toxicodendron"); the latter is here called "poison Ivy," and although perfectly harmless to some, is to others most frightfully poisonous. Some time since we were collecting trailing Vines for the shrubberies in the woods in the early spring season, and unknowingly got some of the suckers; it grew and was very handsome, and never affected any of our family, but a friend who had been more than once poisoned with it mentioned its dangerous qualities, and we of course destroyed it; the fact, however, led to inquiry, and the truth of the accusation was fully ascertained. My friend on two occasions was very ill with it from swellings and boils on the skin, which would not yield to ordinary medical remedies; he got relief by the prescription of an old backwoodsman—he got the ordinary garden Chickweed, put a mass of it into a frying-pan over the fire without grease or water, until it was boiled down in its own juice into a mass; this was applied hot as a poultice, and afforded immediate relief after weeks of illness. It is an excellent poultice in other complaints.

The New Englanders are also well acquainted with the poisonous nature of the plant; they cure the ill effects with a tea made from the heads of Timothy Grass when in full flower (Phleum pratense) [Qy. *post non propter*], and a poultice made of the boiled Grass. Ordinary medical drugs, or bread, or other meal poultices, are of no effect. *Vectis, Toronto, Canada.*

Societies.

ROYAL HORTICULTURAL SOCIETY OF IRELAND: *Early Spring Show, March 24.*—This was a gallant, and in so far as the exhibition itself was concerned, a successful attempt to establish a Hyacinth show in Dublin. When originally suggested, the scheme did not appear to find much favour with the Council, but by means of pressure from without a show of this character was eventually arranged. The high price demanded for the use of the exhibition building necessitated holding the show in the large room of the Rotunda, a spacious place, but too dark for exhibitions of this character. Rain set in at mid-day, which made the dull room darker, and considerably diminished the receipts at the doors.

The show of Hyacinths was highly creditable to the Dublin district. In extent it was considerably in advance of the show held at South Kensington on March 16; and while the leading trade growers are not a great way behind Messrs. Cutbush and Paul as cultivators, the specimens staged by amateur growers were far ahead of anything seen at South Kensington staged by the same class of exhibitors. Would that the long, deep, unsightly pot could be substituted by a 32-sized pot plunged in a larger one, and covered with moss, as in the case of the London exhibitions; the appearance of the collections would he much enhanced thereby.

The two principal prizes were a silver cup, given by E. P. Wright, Esq., M.D., Professor of Botany, Trinity College, Dublin, for 18 single Hyacinths, and a silver cup given by the Society, for 24 Hyacinths. The possession of the former was attempted by seven competitors, and was taken by S. M. Tandy, Esq., Appian Way. The next best came from Mr. Walsh, gr. to Henry Roe, Esq., Mount Anville, and contained some very fine spikes, but the foliage of some of the plants was much drawn, while there was a great lack of deep coloured flowers.

The Society's cup was taken by Messrs. A. Campbell & Sons, Glasnevin, Dublin, with a fine 24, including a few highly finished examples. S. M. Tandy, Esq., was next in order of merit; Messrs. Dickson & Sons, Dublin and Edinburgh, being placed third. Messrs. A. Campbell & Sons were the only exhibitors in the nurserymen's class for 18, these being but an ordinary lot; they were also the only exhibitors of six new kinds, viz., Grand Alexander, a pale-coloured single blue of no merit; Osmar, dark purple, single; Elise, a little darker than Cavaignac, single, red; Grand Vainqueur, double, pure white; Milandillo, single, white, with large stout bells, like Snowball; and La Franchise, blush, with large sized bells.

The leading prize for 12 kinds was also taken by Mr. Tandy, there being five competitors. L. G. Watson, Esq., was 2d, and E. P. Westley, Esq., 3d; the last-named was 1st with nine kinds, Mr. Tandy being 2d; but Mr. Tandy again came to the fore with six kinds, Mr. Guilfoyle, gr. to G. Nicholson, Esq., Drogheda, being 2d.

Tulips were but poorly represented; they were badly grown, notwithstanding that good sorts were used for the purpose. It was a pity 1st prizes were awarded in any of the classes for them. But one group of Polyanthus Narcissus was staged by Messrs. A. Campbell & Sons. Notwithstanding that there was only one bulb in a pot,

they made a very nice display, and were well grown. Gloriosa, the white Grand Monarque, and Soleil d'Or, were particularly fine.

Lily of the Valley was not shown nearly so well as seen in London; Cyclamens were badly grown, though some pretty varieties were staged; Chinese Primulas were numerous, effective, and good.

In the way of miscellaneous things, Mr. Moore, gr. to Robert Gray, Esq., Blackrock, had a very fine stand of 12 cut Camellias, of large size, including Jubilee, a very large blush flower, of great substance; Chandleri, a fine mottled white and crimson flower, in the way of Kelvingtonia, Colvilii, Triumphans, &c., which were recommended for a special 1st prize for their beauty. Mr. Webley, gr. to Lord Gough, St. Helen's, had some examples of a capital variegated hybrid Cabbage of the Fearnought type, very dwarf in growth, and likely to be useful for spring gardening, being very hardy. From Mr. M. Dunn, gr. to Viscount Powerscourt, County Wicklow, came three very fine and well-preserved bunches of Trebbiano Grapes, of unusually good quality, which had been cut from the rods only the day previously, and a similar number of bunches of Lady Downe's from the same house. To these an extra 1st prize was awarded.

The Gardeners' Cup, value £5, subscribed for by gardeners, and to be held by the gardener winning the greatest number of prizes at the exhibition, became the property of Mr. Brannigan, gr. to S. M. Tandy, Esq.

ROYAL BOTANIC: *First Spring Show, March 30 and 31.*—This exhibition was held as heretofore in a long tent at the back of the conservatory, and, notwithstanding the paucity of Hyacinths, it was very well filled with gay spring flowers, as was also the conservatory with Hyacinths, Azaleas, Camellias, Rhododendrons, &c. The best 12 greenhouse plants in flower were staged by Mr. Wright, gr. to C. H. Crompton Roberts, Esq., Sunnyside, Regent's Park, who put up nicely bloomed examples of Azaleas Eulalie Van Geert and Semi-duplex, Erica elegans, pretty rose; Boronia pinnata, a good specimen, but scarcely forward enough; Chorozema Chandleri, orange and warm rose; and Eriostemon neriifolius, a small specimen but well flowered. The second best came from Mr. G. Wheeler, gr. to Sir F. Goldsmid, Bart., St. John's Lodge, Regent's Park, who showed in very fair condition specimens of Azalea Prince Albert and A. Triumphans, Aphelexis purpurea, a large and fairly bloomed Chorozema cordatum splendens, Tetratheca ericifolia, Imantophyllum miniatum, &c.; Mr. Wilkie, gr., Oak Lodge, Kensington, had an extra prize, being disqualified by showing several stove plants. In his collection were well-bloomed specimens of Azaleas Iveryana and Flower of the Day, the former with a fine bushy head on a clean stem, 5 feet in height, and the latter a dwarf-trained bush, covered with bloom; a good example of Rhynchosperum Jasminoides, nicely bloomed, and well set off with rich green foliage; two Epacrises, a Rhododendron, two examples of Bletia Tankervilliæ, and a nicely flowered Dendrobium nobile.

Two collections only of 12 forced hardy herbaceous plants were shown, the best coming from Mr. Ware, Hale Farm Nurseries, Tottenham; the 2d prize being awarded to Mr. G. Wheeler. In Mr. Ware's collection, which was tastefully staged, were variegated Fritillaria imperialis, double-flowered Cheiranthus Cheiri luteus, the well-known double yellow Wallflower, Trillium grandiflorum, a very showy plant, with large green foliage and large beautiful white flowers; Scopolia carniolica, with a dense tuft of large pale green foliage, with numerous dark purple, pendent, bell-shaped flowers; Lily of the Valley; specimens of the new forcing Pink, Mrs. Pettifer, &c.

Mr. G. Wheeler exhibited the best 6 forced hardy hard-wooded plants, and took the 1st prize with the double-flowering Peach, Deutzia gracilis, Kalmia latifolia, double flowering Prunus, &c.; Mr. Wright being placed 2d, with ordinary greenhouse specimens of Weigela rosea, Laurustinus, Guelder Rose, Hydrangea japonica, Rhododendron Alaric, &c. Mr. Wilkie was 3d.

Mr. Ware, Tottenham, was the only contributor of 12 Liliaceous plants, not less than six varieties, and to him the 1st prize was awarded. He showed a very uniform group, consisting of pans of Scilla bifolia, S. præcox alba, and S. sibirica; Erythronium dens canis (the Dog's-tooth Violet), the blue flowered Muscari botryoides, and M. botryoides pallida, the pretty Triteleia uniflora, and Convallaria bifolia, &c.

Of Azaleas the display was very poor, the best six being staged by Mr. Wright. These were fairly bloomed pyramidal bushes, about 2 feet in height, comprising Marie Vervaene, Flora, Triumphans, Magnifica, Reine des Belges, and Godfrey de Bouillon. Mr. Wheeler was placed 2d, and Mr. Wilkie 3d, with very ordinary examples. Mr. Turner sent a nice group of his new variety, Mrs. Turner, which is much improved since it was last exhibited, and on this occasion a First-class Certificate was awarded to it. Of Cyclamens there was a good display, some very large and remarkably well-bloomed plants being shown by Mr. James, gr. to W. F. Watson, Esq., Isleworth, who took the 1st prize for 12. The second best in the same class were furnished by Mr. C. Edmonds, nurseryman, Hayes; and as regards dwarfness and neatness of finish these were in no way inferior to the 1st prize group. The 3d prize was awarded to Mr. Stevens, of Ealing. Messrs. Dobson & Son, Isleworth, also exhibited. In the class for a single specimen, Mr. James was also 1st, and to Mr. Stevens and Mr. Edmonds, who exhibited nice collections in the miscellaneous class, extra prizes were given.

The best six Chinese Primroses were exhibited by Mr. Edmonds, Hayes, and they were excellent in every respect. Mr. James, who took the 2d prize, had some fine flowers, but a little past their best; the 3d prize was given to Mr. J. Tibbles, gr. to A. Haines, Esq., Harrow Road. Mr. Edmonds was also 1st in the class for single specimens. Some very good Cinerarias were shown by Mr. J. James, who took the 1st prize in the class for six, and for a single specimen. Messrs. Dobson & Son were 2d, and Mr. Wright 3d, in the former class.

There were only three exhibitors of Hyacinths in the amateurs' class for 12, and the productions of those were not very remarkable. The best single specimen of Deutzia came from Messrs. Reeves Brothers, florists, Notting Hill, and to it the 1st prize was given.

Cut blooms of Camellias were well and numerously shown in the amateurs' class, the best 12 coming from Mr. Wilkie, who had large blooms of great substance of Alba plena, Mathotiana, Jubilee, Imbricata variegata, Benneyi, Countess of Orkney, &c.; Mr. James was placed 2d with smaller but exceedingly well-finished blooms of Valtevareda, General Lafayette, Mathotiana alba, Augusta Delfosse, Roi Léopold, &c.; the 3d prize being taken by Mr. J. Wheeler, gr. to J. Philpot, Esq., Stamford Hill. A capital collection was shown by Messrs. A. Henderson & Co., of Pine-apple Nurseries, Edgeware Road, in the nurserymen's class for 12, comprising grand blooms of Chandleri elegans, Alba plena, De la Reine, Mathotiana, Henri Favre, Carswelliana, Sarah Frost, Princess Baciocchi, Napoleon III., &c. The 1st prize was taken by the above, and the 2d by Messrs. Dobson & Sons.

In the miscellaneous class a fine collection of 36 evenly and regularly grown Hyacinths was shown by Messrs. Rollisson & Sons, Tooting; also a collection of flowering Orchids, Palms, &c., to which an extra prize was given. Extra prizes were also awarded to Mr. Wm. Paul for a fine collection of garden Ivies in pots, and a rich group of the new double scarlet-flowered Thorn (Cratægus Oxyacantha coccinea fl.-pl.); to Messrs. Paul & Son for a fine group of Roses in pots, in which were splendid blooms of Horace Vernet, Elie Morel, Sénateur Vaisse, Marie Baumann, Antoine Ducher, Princess Mary of Cambridge, Madame Victor Verdier, &c., and also for a collection of Citrons and Lilacs; to Mr. Wright, for a group of 6 well-grown plants of Spiræa japonica; and to Mr. Ware, Tottenham, for a collection of alpine Primulas, neatly sent up in baskets in the form of a miniature rockery, which had a very pleasing appearance. The group was mainly composed of P. pubescens, rosy purple; P. nivalis, white; P. denticulata, pale lilac; P. marginata, P. concolor, lilac; and P. erosa.

First-class Certificates were awarded to Rose Princess Christian, of which Mr. Wm. Paul exhibited some beautiful plants in flower; to Epacris hyacinthiflora carminata, from Messrs. Rollisson & Sons; to Cupressus Lawsoniana erecta viridis, from Mr. Anthony Waterer; to the golden foliaged Euonymus flavescens from Mr. Wm. Paul; to Dæmonorops plumosus, a graceful Palm, from Mr. B. S. Williams; to Picotee Prince of Orange, from Mr. Perkins, Leamington; to Reseda odorata var. eximia, a very fine large flowered variety, from Mr. Parsons, Western Road, Brighton; and to Mr. Turner's beautiful tricolor Pelargonium, Mrs. Headley.

Notices of Books.

Letters of Sir Charles Bell, *selected from his Correspondence with his brother, George Bell.* Murray, 8vo, pp. 434.

To medical men and physiologists the name of Charles Bell, and his researches into the functions of the several parts of the nervous system, are familiar enough. It may, however, be doubted whether the general public knows even as much of the famous anatomist as it does of Harvey; and yet the fact that the one lived in the time of Charles II. and the other in that of Victoria, coupled with the greater diffusion of useful information now-a-days, would seem to offer cogent reasons why Bell and his discoveries should be better known than those of Harvey. The present volume will do much to remedy this state of things. It consists of a series of letters extending over nearly 40 years, and forming as perfect a piece of autobiography as can well be conceived. The letters, indeed, are models of epistolary correspondence, and though not intended originally for the public eye, they hold the reader's attention and interest from first to last. We have the young Scotch surgeon fighting his way in London with difficulty, though from the first his talents as an anatomist and a surgeon were recognised by the chiefs of the profession, and the value of his lectures acknowledged. This, it must be remembered, at a time when the fame of the Hunters (recently deceased) was still at its height, and when Abernethy, Blizzard, and Astley Cooper were at the full tide of their successful career. How much Bell's heart was in his work is told in a few graphic letters, recording how he offered his services as a surgeon after the battle of Corunna, and still more so, when he tells us how he posted to Brussels after Waterloo, not stopping to procure passports, but shaking his surgical instruments in the faces of the officials who had wisdom enough to see in them the best passport such a man as Bell under the circumstances could have had; and so we find him engaged in his ghastly but merciful work from daylight till sundown, thinking first three or four hours' and then an hour and a half's sleep sufficient after days of the most painful excitement and bodily exertion. At home, in the midst of all the harass of a London surgeon's life, with lectures, hospital duties, consultations, and the ordinary work of a busy practitioner, Charles Bell found time to prosecute his favourite pursuits of painting and his investigations into the functions of the nervous system. His "Anatomy of Expression" is a book too well known to need comment here. The general reader will find some specimens of Bell's powers as an etcher in the volume before us. His great work in reference to the nervous system consisted in his demonstration of the particular uses of certain parts of the brain and spinal cord, till then unknown. Amongst other things he proved beyond dispute that the spinal nerves have a duplex use. Each nerve issues from the spinal cord by a double "root." The two branches soon unite to form apparently one nerve. Bell's great discovery consisted in demonstrating that the office of the posterior root was to convey sensation, that of the anterior to induce motion. The one transmits sensation to the brain from which the order to move is propagated through the other division to the muscles, whose office it is to carry out that order. Besides this, our author discovered the special office of certain portions of the brain to which we can only allude, as their explanation involves anatomical details for which this is not the proper place. Bell sought recreation in the charms of the country; fly-fishing was a passion with him; and he tells us the best passages in his book were thought out and concocted on his fishing expeditions. His eminence as an artist, a surgeon, and an anatomist, brought him necessarily into contact with many of the best spirits of his time,—not only among his professional brethren, but also with such men as Brougham, Jeffrey, Christopher North, Scott, &c. Pleasant glimpses at these celebrities are afforded in the pages of the volume before us, and render it one of the most readable bits of biography lately published. Here, by way of finale to our notice, is an extract which will interest the craft:—

"When Maton was living there (in the Palace), being in the garden, the Princess Elizabeth had got a dark apron on, and was working among the Grapes with her pruning-hook—puffing and blowing. In the meantime an old gardener stood looking at her and resting on his spade. 'What are you looking at?' said she; 'am I not right?' 'Oh! I dare say perfectly right,' said the old rogue; 'but I was just thinking what a nice wife you would make for a poor man.' Such a gardener would thrive, plant him in any soil."

—— Messrs. Longmans announce the publication of a translation of MM. La Maout and Decaisne's "Traité Général de Botanique," already noticed by us. The translation is to be made by Mrs. Hooker, and the work is to be edited by Dr. Hooker. Dr. Hooker has also in the press, and approaching completion, an entirely new "British Flora," intended for the use of students. Mr. Van Voorst announces the publication of a new edition of the late Professor Henfrey's "Elementary Course of Botany," revised and in part re-written by Dr. Maxwell T. Masters. From the Messrs. Churchill we may shortly expect a new edition of Professor Bentley's "Manual of Botany." Professor Oliver has recently superintended the publication, for schools and classroom purposes, of a number of coloured illustrations by Fitch, representative of the several natural orders of plants. Descriptive letterpress accompanies the plates. Drs. Thomson and Anderson, the former and present superintendent of the Botanic Garden at Calcutta, have in preparation a "Flora of India" on the same model as the "Flora of Australia," &c. Dr. Stewart is engaged in the preparation of a "Flora Sylvatica" for India, descriptive of the principal timber trees and other economic plants of that country. The fifth volume of the "Flora of Australia," by Mr. Bentham, is approaching completion. It will comprise, *inter alia*, an account of the Proteaceæ. Mr. Baker's account of the Ferns of Brazil from Martius' magnificent "Flora Brasiliensis," is in the press. The monographs of the orders Hydroleaceæ, &c., by Mr. A. W. Bennett, and of Passifloraceæ, &c., by Dr. Masters, for the same publication, are also in a forward condition.

FOREIGN JOURNALS.

Of the **Gartenflora** we have before us the numbers for December and January, in which the following subjects are figured:—*Homalonema rubescens*, an Indian Arad, with an erect stem, surmounted by a few long-stalked sagitate-cordate leaves, purplish beneath, and producing purplish red subcylindrically convolute spathes, scarcely exceeded by the spadix, which is covered with white anthers at the top. *Calanthe Sieboldii*, a Japanese terrestrial Orchid, with broadly lanceolate plaited leaves, and an erect raceme of pretty yellow flowers. *Spathiphyllum Minahassæ*, a handsome tropical Arad, producing long-stalked ovate-oblong acuminate leaves, and flat leaf-like elliptic-oblong white spathes, which are cuspidate at the apex and decurrent at the base, and large enough to rival those of the popular Richardia; the spadix is short, oblong, and white. *Oncidium dimorphum*, a Brazilian Orchid, with small yellow-spotted flowers, allied to O. lancifolium, with singular vermilion-coloured flowers. *Begonia boliviensis*. *Agave heteracantha*, a narrow-leaved species, having the marginal spines varied in size and direction, and the terminal one long and awl-shaped, while the flowers are borne in a long cylindrical spike; a double plate is devoted to this plant.

The numbers of **L'Horticulteur Francais** for the present year contain plates representing *Cobæa pendulifiora*, *Palava flexuosa*, and *Tacsonia evantha*.

In the issues of **Revue Horticole** for February are coloured figures of *Vallota grandiflora*, and of a *Cherry* called *Grossede Verrières*, a variety which is much grown at Verrières and its neighbourhood, is very productive, and is preferred by confectioners to any other variety. The woodcuts represent *Ananassa bracteata*, an ornamental Bromeliad; *Hortensia Madame Mézard*, a rosy-

tinted variety of Hydrangea, here and there striped with green, and in which a second flower, either stalked or sessile, is developed hose-in-hose fashion, always irregular, sometimes almost rudimentary, but sometimes well developed—a development evidently similar in character to that of the recently introduced Hydrangea stellata prolifera. It appears to have originated as a sporting bud, with M. Mézard, of Rueil. *Boutures of Vines*, illustrating an article on the multiplication of the Vine. *Sécateur facile*, an instrument which presents increased facilities for opening and shutting with one hand. *Episcia tessellata*, a tall Drymonia-like Gesnerad, introduced by Mr. Wallis from Maynas, and cultivated by M. Linden; it has oval-lanceolate bullate leaves, of a very deep bronzy varnished green, with salmony reflections.

The **Journal de Horticultura Pratica** for February contains an uncoloured lithograph of *General Totleben Pear*, and figures of *Wigandia caracasana*, and of the *Wardian Case* as designed for sea voyages.

Miscellaneous.

LINES TO THE "SHANK FIEND" (see p. 384).

DREAD FIEND!—For "Tell Fact" now defines
'Tis you that kill'd the Stortford Vines—
Tell us if mildew on the shoots,
With damp, or Fungus at the roots,
Red spider, rust, or carrion soil,
All act conjointly for thy spoil,
And make thee riot night and day
Till bunch or shoulders all decay;
Or if by one especial cause,
Tell us, O "Shank-fiend!" of its laws,
And how to fight it in all shapes,
To save in time our much-prized Grapes.
That thou can'st talk we make a claim,
For Vines at Combe can do the same.

O, may our "David Tell Fact" find
The question settled to his mind,
"Why have the Stortford Vines so fail'd,—
And in their prime, too, as detail'd?"
This will be known, without a doubt,
As soon as his great secret's out.
In his endeavour to lay bare
The facts committed to his care,
May he the well-known warning take
That great discoverers often stake
Their peace of mind in bringing new
Thoughts or discoveries into view.
But lately, the hot fight on Lime,
That raged so strongly for a time,
Show'd how we gard'ners take a side,
And one another's views deride.
For though the philosophic "Cramb"
Bore all his "lashings" like a lamb,
E'en vanish'd with the parting threat
That his opponents were well beat,
Yet now and then he must wax wroth
To read "B.'s" strictures, and these lines by *Thoth*.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Orchidaceous plants will now generally be assuming a state of activity. Many Epiphytes, such as *Aerides*, if they do not produce actual growth in the form of foliage, will nevertheless be silently pushing into sight their spikes of bloom, and are, therefore, actively engaged in collecting their strength for that purpose. Now it should be borne in mind that such plants as these, together with *Saccolabiums*, *Phalænopsids*, *Vandas*, and *Renantheras*, which do not possess those reservoirs of vegetable life called pseudo-bulbs, will at this season need by far the greater amount of attention, which will consist in frequently and slightly damping over the surface of the foliage with clear tepid water, in such a manner that the materials containing the roots shall not be made too moist. In all instances where Orchids are cultivated amongst miscellaneous stove plants, these and similar considerations will require to be acted upon, more particularly because by keeping the house fresher, through giving fresh air, less humidity will of necessity prevail. In the case of Orchids, grown in this manner, it is an excellent plan just to run a moist sponge over the surfaces of the leaves occasionally. Those Orchids growing on logs of wood, or in hanging baskets, will also want damping over frequently, and in instances where actual growth is taking place, they should never be permitted to become very dry until they have fairly finished growing, hence they should be frequently dipped into water of an average warmth of 70° to 75°. The temperature of *Mexican* or *Cattleya houses* should now average about 58° in the early morning, rising gradually 10° higher by 10 o'clock, with a further advance of 5° or 6° with sun-heat. In *Indian Orchid-houses* the temperature should be 60° in the morning, with a similar advance in the daytime. Finish potting all plants that require this operation. Prepare the necessary material for shading such plants, and have them fixed in the proper places forthwith. If *Hydrangeas* are wanted in flower early, they should now be potted and placed in a temperature somewhat warmer than that of the ordinary greenhouse. Push forward the propagation and potting-off, &c., of all plants intended for bedding-out, with the utmost dispatch; especially as it is necessary to pot off quickly those foliage plants raised from seed, such as *Cannas*, *Wigandias*, *Ricinus*, *Solanums*, &c., as these only succeed well when grown on and thoroughly established before planting them out.

FORCING HOUSES.

In all *Vineries* in which the Grapes are fairly swelling let the thermometer run up freely to 55° or 57°, with sun-heat, and maintain a good growing temperature by keeping the atmosphere moist. Do not, however, keep the temperature too high at night—about 65° will be ample at this stage. Those *Pines* which are swelling their fruits freely, and especially such as are nearing the last stage of growth preliminary to ripening off, may have a mean range of temperature from 88° to 91°, with abundance of moisture. Be careful not to over-water any of them at the root for a week or two previous to the first symptoms of ripening. Remove the gills from all fruits at the earliest possible moment. Snap them off by pressing them sharply downward with the hand. Be particular not to keep the atmosphere too close around fruiters which have just finished the flowering period at this particular season, as this is conducive to the formation of large ungainly crowns. Where forcing against time is not absolutely necessary, proceed with all moderation, in view of keeping on the safe side of a steady advance—an advance of 4° or 5° more heat in both *Fig* and *Cherry houses*, and a freer use of the syringe in regard to the latter especially.

HARDY FRUIT GARDEN.

Apricots do not look so well as I could wish; I fear the late frosts have destroyed many of the bloom-buds, and such as are only checked in part are still further crippled by the present unkindly weather. All that can be done is to give the utmost attention in the matter of covering and uncovering, according to the state of the weather. If easterly winds and a sunless sky prevail, it will be better not to remove the protection at all. If from any cause a vacancy is likely to occur on any wall, it will be possible to plant a tree even now, late in the season though it be.

HARDY FLOWER GARDEN.

Again stir the surface soil amongst plantations of *Pansies*, *Pinks*, *Carnations*, &c., after the late frosts and snow. Press each plant firmly into the soil at the base. I have before recommended that the former of these should have a nice mulching of sifted leaf-mould. Where this has not been done, do not longer delay. Those who have a fancy for a bed or so of summer blooming Pansies in admixture with their summer bedding stuff, should now strike cuttings of any desirable variety, and forward them, so as to be able to transplant at the earliest time possible.

KITCHEN GARDEN.

Cucumber frames, which may fairly come under this heading, will even now need as much attention as they ordinarily require a month or so earlier. Those who have made up their beds, and planted out their plants, must therefore renew some portion of the lining periodically, so as to afford a renewal of heat, which should be maintained at this time at not lower than 68°. It will not do to renew the whole of the linings at one and the same time; for to do so will cause the heat to fall too suddenly and to too low a degree. Those who have not yet turned out their plants should not delay longer at this advanced date, as fine weather must sooner or later make its appearance. In potting off Cucumber plants which have attained to the rough leaf, and which is the third (or first following the cotyledons), it will not be judicious to take them out of the frame through the cold air; but this should be done by taking the pots, &c., and, bending down, doing it in the frame itself. Immediately the fourth leaf is formed pinch back the points, to induce a more branching basis to start with, and to secure additional fertility. Sow *Broccoli* of the following sorts in pans, in all instances where this has not been done, *i. e.*, Snow's Winter White and the Walcheren. *W. E.*

TOWN GARDENING.

Hyacinths that have flowered in glasses and pots are worth saving for the borders next season; therefore bury the bulbs in the ground 3 inches deep till the tops die down, when the bulbs should be taken up, dried, and kept for next season's planting. Where it is intended to grow specimen flowers of *Chrysanthemums*, the plants that were struck in the autumn should now be potted in 32-size pots, in a compost of two-thirds loam and one rotten dung and leaf-mould. They should be neatly tied to sticks. This is of the utmost importance, for if the leading shoot gets broken, the flowers will only be second-rate. *Shrubs* may still be removed, care being taken to lift them with good balls of earth. They should be well watered when planted. *Rockwork* should now be planted with *Ferns*, as they are pushing up their fronds, and will move well, and should be disposed as directed at p. 147. The bulbs of the very beautiful *Tigridia Pavonia*, if treated as directed below, will do well in any town garden. In the first week in April the bulbs should be planted 5 inches apart and 3 inches deep in a compost of rich loam and leaf-mould, with a good mixture of sand, placing a little silver sand under and around each bulb; and if the weather be very dry when they come through the ground, water occasionally with manure-water. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, MARCH 30, 1870

1870. MONTH AND DAY.	At 9 A.M.						
	Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition			
March.	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air	
	Ins.	Deg	Deg	Deg		Gr.	
24. Thurs.	29.77	38.9	33.7	26.8	63	1.7	
25. Friday	29.62	38.0	36.9	35.4	89	2.1	
26. Satur.	29.61	41.7	38.0	31.7	72	1.7	
27. Sunday	29.43	37.5	35.1	32.2	82	2.1	
28. Monday	30.28	34.9	33.0	30.0	84	2.0	
29. Tues.	30.25	33.7	33.0	28.9	78	1.8	
30. Wednes.	30.14	38.8	36.9	32.1	78	2.1	

1870. MONTH AND DAY	TEMPERATURE OF THE AIR.					WIND		RAIN
March.	Highest.	Lowest.	Range in Day	Mean.	Departure of Mean from Average of 30 Years	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg	Deg	Deg.		Miles	
24. Thurs.	45.2	30.1	14.8	36.0	— 8.1	N.W.	300	0.01
25. Friday	41.9	28.1	13.8	35.0	— 9.3	N.E.	150	0.00
26. Satur.	41.5	29.0	12.5	34.0	— 8.5	N.E.	380	0.13
27. Sunday.	41.9	33.7	8.2	36.6	— 6.1	N.N.E.	280	0.00
28. Monday	37.9	33.6	4.3	34.6	— 8.6	N.E.	255	0.00
29. Tues.	41.0	33.6	7.4	36.1	— 7.5	N.E.	290	0.00
30. Wednes	42.7	30.5	12.2	35.4	— 8.0	N.E.	255	0.00

March 24—Generally cloudy; rain and snow fell occasionally at night.
" 25—Generally cloudy during the day; cloudless at night; snow fell about 8 P.M.
" 26—Large amount of cloud prevalent; snow fell heavily between 8 A.M. and 11 A.M.; depth 1 inch
" 27—Overcast during the day; clear at night.
" 28—Overcast throughout; occasional snow.
" 29—Overcast till 7 P.M., afterwards variable
" 30—Generally overcast till evening, then clear

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, MARCH 26, 1870.

NAMES OF STATIONS	TEMPERATURE OF THE AIR							Fall of Rain
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	58.3	25.8	32.5	49.2	30.8	18.4	38.9	0.05
Blackheath ..	51.9	28.1	23.5	40.8	24.7	15.1	38.1	0.17
Bristol	50.8	27.5	23.3	46.4	33.0	13.1	38.6	0.01
Birmingham ..	55.0	26.3	28.7	47.5	33.2	14.1	39.2	0.24
Wolverhampton ..	55.4	27.3	28.1	46.6	33.7	13.4	38.8	0.27
Leicester	55.0	25.5	29.5	49.7	31.3	15.4	37.9	0.21
Norwich	53.0	27.0	26.0	44.6	32.1	12.5	37.3	0.65
Nottingham ..	56.2	26.0	30.2	48.6	32.2	15.1	39.8	0.24
Sheffield	55.0	26.5	28.5	46.5	34.9	11.6	39.6	0.23
Liverpool	51.4	30.0	21.4	45.3	34.8	10.5	39.0	0.23
Manchester ..	51.7	27.0	24.7	47.0	32.4	12.6	39.5	0.18
Salford	51.5	24.0	27.6	47.1	33.1	14.0	38.9	0.17
Bradford	54.2	29.5	27.7	46.7	31.8	14.9	38.2	0.17
Leeds	52.0	28.0	24.0	47.3	34.0	13.3	39.5	0.23
Hull	55.0	24.0	31.0	41.6	29.6	15.0	36.0	0.25
Newcastle ..	53.6	25.0	28.6	41.7	29.7	12.0	34.9	0.73
Edinburgh ..	50.7	29.0	21.7	..	..	..	40.1	0.09
Glasgow	51.4	29.5	21.9	..	..	..	37.8	0.22
Dundee	50.0	23.0	27.0	..	..	..	38.4	0.50
Aberdeen	52.1	26.2	26.2	..	..	..	38.7	0.32
Paisley	53.0	25.0	28.0	..	..	..	40.4	0.33
Greenock	50.0	29.0	21.0	..	..	..	38.9	0.09
Leith	52.0	30.0	22.0	..	..	..	38.1	0.84
Perth	51.0	29.0	21.0	..	..	..	39.3	0.27
Dublin	56.5	26.0	..	..	..	..	41.3	0.10

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *J. H. C.* We suppose you mean "Johnson's Gardeners' Dictionary," published by Bell & Daldy. You can get it through any bookseller.

NAMES OF PLANTS: *P. M.* Acacia armata; not uncommon. The plant produces both male and hermaphrodite flowers, the styles of the latter being soon exceeded by, and hidden by, the stamens.—*E. G.* Euonymus japonicus.—*B. D.* Cannot tell, specimen smashed.

SUGGESTIONS: *S. R., Clapham Park.* Thank you, we will endeavour to carry out your hint.

SWITZERLAND: *G. H.* Accepted with thanks.

WELLINGTONIA: *W. H.* This tree (Sequoia Wellingtonia) was introduced by Mr. W. Lobb in 1853.

COMMUNICATIONS RECEIVED: J. M.—H. B.—C. L.—M. J. B. —R. W.—J. S.—K. B.—D. S.—W. G.—W. B. H.—Thoth.—Alderman Wide-awake.—D. T. F. next week.—A. B. C.—E. W. B. (next week).—W. P. A.

Markets.

POTATOS.—Southwark, March 28.

During the past week the arrivals were light the first three days, but large towards the end of the week. Trade good for all top lots, but still dull for second-rate or inferior samples. The following are this day's quotations:—Yorkshire Regents, per ton, 80s. to 110s.; Yorkshire Flukes, 90s. to 120s.; Lincolnshire Regents, 80s. to 90s.; Dunbar and East Lothian do., 90s. to 110s.; Perth, Forfar, and Fifeshire do., 70s. to 90s.; Ditto Rocks, 70s. to 80s.; French and Belgian Whites, 65s. to 70s.

COVENT GARDEN.—April 2.

Supply and demand are about balanced, and we have little to report beyond ordinary transactions. Foreign produce comes to hand in excellent order, the cool weather

suiting its transit. St. Michael Oranges are falling off rather in quality, but the season for them is now far advanced. An importation of Pines from Africa is to hand this week, but they are worthless things. Flowers are plentiful and good, comprising Azaleas, Fairy Roses, Hyacinths, Cyclamens, Tulips, French and Scarlet Pelargoniums, Heaths, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3 0 to 5 0		Melons, each ..	..	..
Cobs, per lb. ..	0 9	1 0	Oranges, per 100 ..	3 0	7 0
Filberts, per lb. ..	0 6	0 9	Pears, per doz. ..	4 0	10 0
Grapes, per lb. ..	10 0	20 0	Pine-apples, per lb.	8 0	10 0
Lemons, per 100 ..	4 0	10 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6	10 0	HorseRadish, p. bun.	3 0	5 0
Artichokes, p. doz. ..	3 0	6 0	Leeks, per bunch ..	0 2	0 4
Beet, per doz. ..	2 0	3 0	Lettuces, p. score ..	1 0	2 0
Broccoli, per doz. ..	1 0	2 6	Mint, per bunch ..	1 0	1 6
Brussels Sprouts, p. ½ sieve ..	2 0	3 0	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz. ..	1 0	1 6	Onions, per bunch ..	0 4	0 9
Carrots, p. bunch ..	0 4	0 8	Parsley, per bunch ..	0 2	0 4
Cauliflowers, p. doz.	1 6	3 0	Potatos, new, p. lb.	0 4	0 6
Celery, p. bundle ..	1 0	1 6	Salsafy, per bundle ..	1 0	1 6
Cucumbers, each ..	1 6	3 0	Seakale, p. punnet ..	2 0	2 6
Endive, per doz. ..	1 6	2 0	Shallots, per lb ..	0 8	..
French Beans, p. 100	3 0	4 0	Spinach, p. bushel ..	2 0	3 0
Garlic, per lb. ..	0 8	..	Radishes, per doz ..	1 0	1 6
Herbs, per bunch ..	0 2	0 4	Turnips, per bunch ..	0 4	0 6

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CEMETERIES | CROQUET GROUNDS
RAILWAY BANKS | ORCHARDS
PARKS AND SHADY PLACES
Prices, either per Bushel or per Acre, to be had on application
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RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND STOCK MERCHANTS.
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Mangel Wurzel Seed.

H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL TOP YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low.
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BOLTON AND CO. have to offer choice stocks of all the varieties of MANGEL WURZEL. Their
ORANGE GLOBE,
LARGE RED,
INTERMEDIATE YELLOW, and
LONG YELLOW
are particularly good, and are offered at moderate prices.
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PEDIGREE CHEVALIER BARLEY, grown from Hallett's Stock.—Price 52*s.* per quarter, or 7*s.* per bushel, free on rail. New Sacks, 1*s.* 3*d.* each.
Also selected Samples from the best Growers of PAGE'S PROLIFIC, GOLDTHORPE, HALDEN DROP, and THANET BARLEY.
BLACK TARTARIAN, BLACK POLAND, WHITE CANADIAN, WALKER'S, and WHITE TARTARIAN OATS.
SHIREFF'S WHITE, RED CHAFF WHITE, and APRIL SPRING WHEAT.
Samples and prices free on application.
RAYNBIRD AND CO. (Limited), Basingstoke, or Seed Market, Mark Lane, London, E.C.

The North of England Nursery and Seed Establishment.

MESSRS. LITTLE AND BALLANTYNE, Carlisle, (Wm. Baxter Smith, Manager), are prepared to make SPECIAL OFFERS of FARM SEEDS, at liberal prices, when large quantities are required, and to deliver them free at nearest Railway Station.
They confidently recommend their superior stocks of TURNIP SEEDS, which have been all carefully proved and found to grow about 90 per cent. This will ensure a much stronger braird than seed reduced to grow only from 60 to 70 per cent. Their stocks of MANGEL WURZEL, CABBAGES, &c., are also of excellent quality, and they have been equally careful in proving the quality and growth of their CLOVER and GRASS SEEDS, and their Mixtures for laying down Permanent Pasture. PRICED LISTS on application.
44, English Street, Carlisle.

Special Notice to Purchasers of Farm Seeds.

JAMES CARTER AND CO. recommend early orders for FARM SEEDS, the late severe weather having greatly injured the young plants growing for next season's supply, and which J. C. & Co. fear will necessitate an advance upon the present low quotations after April 10 next.
JAMES CARTER AND CO., Seed Farmers, 237 and 238, High Holborn, London, W.C.

NOTICE to PURCHASERS of FARM SEEDS.—Unfavourable weather for the Turnip and other Roots standing for Seed having set in since Messrs. SUTTON'S LIST of REDUCED PRICES was sent to press, Messrs. SUTTON respectfully advise their friends to send their Orders immediately, and thus avail themselves of the present low prices.
Royal Berkshire Seed Establishment, Reading.

W. M. DILLISTONE,
HORTICULTURAL APPRAISER AND VALUER,
Sible Hedingham, Essex.

MR. CHANDLER, HORTICULTURAL AGENT and VALUER, undertakes all kinds of VALUATIONS connected with HORTICULTURE
N.B. Mr. C., having for many years acted as Judge at various Metropolitan and Provincial Flower Shows, is open to engagements for the ensuing season.—15, Wynell Road, Forest Hill, S.E.

WANTED, some EGGS of the AILANTUS SILKWORM.
Apply to JOHN POTTLE, Bealing's Grove, Woodbridge, Suffolk.

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (frontage), DWELLING HOUSE, STABLING, &c., situate at Maidenhead.
Apply to Mr. R. TANTON, The Nurseries, Epsom.

TO BE LET, by TENDER, from Michaelmas next, a CORN and STOCK FARM, in North Hants, of between 400 and 500 acres of Arable Land, well situate for Railway Transit. The Shooting over the Farm, together with that over an adjoining Covert, can also be rented. None need apply without ample capital. Particulars and Forms of Tender can be obtained from
Mr. HUGH E. RAYNBIRD, Estate Agent, Basingstoke; and by whom offers will be received till Wednesday, April 20 next.

SALES BY AUCTION.

Sale of First-class Carnations and Picotees, Standard and Dwarf Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, 38 and 39, Gracechurch Street, City, E.C., on WEDNESDAY, April 6, at half-past 12 o'clock precisely, a first class Collection of CARNATIONS and PICOTEES (the surplus stock of an eminent grower), a choice assortment of Standard and Dwarf ROSES, selected American PLANTS, clean grown FRUIT TREES, fine CAMELLIAS with buds, AZALEA INDICA, GLADIOLI, &c.
On view morning of Sale. Catalogues had at the Rooms, and of the Auctioneers, Leytonstone, E.

Important Sale of Shorthorns and Sheep in Notts.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on THURSDAY, April 7, at 1 o'clock, at Morton Grange, Retford (on the farm recently reviewed in the Royal Agricultural Journal), the entire HERD of very superior SHORTHORN CATTLE belonging to Mr. Hodgkinson. It consists of about 50 head of Cows, Heifers, and Bulls, bred from very superior Stock of Mr. Stephenson Hall, Mr. J. Armstrong, and Mr. G. Bland; Bulls, combining the blood of Earl Spencer's and Messrs. Bates' and Booth's noted animals, have of late been used. The Cattle are in healthy ordinary condition, the Cows being excellent milkers.
Also will be offered, about THIRTY very choice LONG-WOOLLED RAM HOGGS, some well-bred SHEARLING EWES, and a few YOUNG PUPPIES, all of Prize Blood
Catalogues, with Pedigrees, may be had of Mr. JOHN THORNTON, 15, Ingham Place, Regent Street, London; or of Mr. HODGKINSON, at the Farm.

SALE THIS DAY AT HALF-PAST TWELVE O'CLOCK.
Plants and Bulbs from Holland and Ghent.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, April 2, at half-past 12 o'clock precisely, fine Specimen Variegated and Green HOLLIES, Standard and Dwarf ROSE TREES, CONIFERS, FRUIT TREES, SHRUBS, &c., from Holland; choice Camellias, Indian Azaleas, Dracænas, Orange Trees, Laurustinus, Palms, Aucubas, Bays, Pyramid Box Trees, Magnolias, Delphiniums, Maples, Rhododendrons, Liliums, Dwarf trained Fruit Trees, &c., from Ghent; choice Gladioli, Ranunculi, and Anemones; Rustic Seats, Stools, Vases, Baskets, &c.
On view the morning of Sale, and Catalogues had.

The Agricultural Gazette.

SATURDAY, APRIL 2, 1870.

MEETINGS FOR THE ENSUING WEEK.

April 4 { London Farmers' Club (Mr. J. B. Lawes on Exhaustion of Soil in relation to Landlord Covenants, and the Valuation of Unexhausted Improvements), at the Salisbury Hotel—6 P.M.
— 5—Central Chamber of Agriculture, at Salisbury Hotel—Noon.
— 6—Agri. Society of England, at Hanover Square—Noon.

THE possibility of ripening Maize (the most prolific of cereals) in this climate has been lately revived by Mr. W. HOPE, of Parsloes, near Barking. We do not trouble Mr. HOPE with any description of the unsuccessful attempts to grow Maize profitably on the banks of the Thames, which are noticed by that great agricultural and horticultural genius, Mr. LOUDON, because we acknowledge the force of his probable reply, that in those days the sewage was not used to expedite the preliminary vegetative process. But let us call the attention of those who intend to run a race against climate, to a few facts which will perhaps induce them to try their experiments on a small scale.

Maize is cultivated in the New World from 52° North to 46° South latitude, so that the area of the Maize district is about 6000 miles long by the breadth of the continent. No other bread corn was known on the first visit of COLUMBUS.

Ceres bestowed on the Old World Wheat, Rye, Barley, Spelt, Oats, Millet, and Buckwheat, and she gave only Maize to America. It was a peculiarity of the nations of the Western Hemisphere that they refused milk as an article of food. The buffalo, the musk ox, the lama, and the alpaca, are not remarkable for the development of the lacteal organs, and the nutriment which they were doubtless compelled to yield in some abundance when they cropped the juicy leaf and stem and the rich green cob of the Maize, was superstitiously rejected. So milk and Maize were not in close alliance. If they become so at Barking, by the agency of sewage, it will only be another sign of the times in an age of unsparing innovation.

Cereals are, no doubt, extremely flexible in their habit, or Wheat would not have spread over the Old World, except only the regions of excessive heat and cold; and the Maize would not have travelled from its supposed home among the Rocky Mountains to Europe and the Eastern continents. This general law of variability, however, which has clothed the earth with its many forms of vegetable life, is of wonderfully limited application in the practical cultivation of plants. We saw a crop of Wheat last year, the seed of which was obtained from a warm part of Italy, and it had blossomed a fortnight earlier than our earliest varieties. How persistent, agriculturally, are habits! And how arbitrary are the requirements of plants too! Fruits and seeds, the Grape, the Gooseberry, Maize, Wheat, Rye, &c., require a certain degree of heat to ripen them. In a good map showing the distribution of plants, we are afraid Barking would be beyond the limits of Maize cultivation. Below are the average temperatures, in certain months and seasons, of places where Maize ripens readily, and of one place where we think it would not ripen in average years, because the summer temperature at Greenwich is the lowest on our scale, and the July and August temperatures are from 10° to 15° lower than in those American States where Maize thrives best and yields the largest crops. The four seasons are divided into Winter, viz., December, January, and February; Spring—March, April, and May; Summer—June, July, and August; and Autumn—September, October, and November.

	Winter (Dec. to Feb.)	Spring (March to May).	Summer (June to August).	Autumn (Sept. to Nov.)	Year.
Greenwich ..	37.72°	48.38°	60.29°	49.45	48.96°
Erfurt (Germany) ..	31.13	47.74	65.52	49.01	48.35
Cincinnati (Ohio) ..	31.93	53.37	73.20	52.70	52.80
Venice	38.06	54.76	73.06	55.86	55.44
Marseilles ..	45.22	55.91	72.93	59.21	58.32
Paris	37.77	50.43	64.82	52.33	51.34

The following are the summer temperatures:—

	June.	July	Aug.	Sept.
Greenwich	58.55°	59.63°	62.66°	58.02°
Erfurt (Germany)	64.06	67.03	65.48	60.69
Gotha (Germany)	64.83	69.82	65.98	59.16
Hungary (average of three stations)	63.	65.	63.	58.
Buda (Hungary)	64.42	66.58	66.34	59.54
Basle (Switzerland)	63.19	65.95	65.12	58.54
Halifax (Nova Scotia)	63.	70.		51.
Cincinnati (Ohio)	70.8	75.6	73.2	61.8
St. Louis (Illinois)	73.1	78.1	77.6	66.9

The ordinary yield of Maize in the United States, under good cultivation, is enormous, and the occasional crops, when a happy combination of circumstances produces the maxima results, surpass anything recorded of the earth's yield even in its young days when it was cultivated by able men and philosophers, as we used to be told by our friend the "Parson of Wix." The highest recorded yield per acre is, we believe, 166 bushels (20⅝ quarters); the soil was a calcareous mould of great and enduring fertility, in Kentucky, resting on the Trenton limestone, in the heart of the best Grass and Maize district. The finest grazing and Maize lands are found on the limestone moulds; and on these lands, as well as on a certain "green shale," of still greater and more lasting power, a long succession of corn crops has been taken without rest or manure. The quantity of seed sown is as little as a peck per acre.

The average prices per bushel of Wheat and of Maize, at the nearest market towns, from 1840 to 1846, were:—

	North-East States.	Southern States.	Western States.
	s. d.	s. d.	s. d. s. d.
Wheat, per bushel	4 8	4 2	1 8 to 2 3
Maize ,, ..	2 9	1 0	7d., 10d., 1 0

These figures, although of old date, show the comparative facility with which Maize and Wheat can be grown in different parts of the United States.

In the hot climate of Alabama, in the Southern States generally, and especially on the rich alluvial soils of Georgia and Louisiana, moisture and heat develop a great growth of stem and leaf, and the yield of seed is only half as much as on the fertile soils of North Kentucky. In the State of Ohio, with a climate almost too dry for the Potato, Indian Corn is the staple grain, and yields 41½ bushels per acre. New York yields only 25 bushels, the difference being due, to a great extent, to climate. The average yield of Wheat in the two States is 15¼ bushels in Ohio, and 14 bushels in New York. In Indiana a "good crop" of Maize is 75 bushels, and of Wheat 18 bushels per acre. There is the same disparity in the production of the two grains almost everywhere in the States. Their Maize-producing capabilities are "boundless," and their Wheat-growing capabilities are very limited. The average crop of Maize straw is about 3 tons, and occasionally twice as much in the South, where the stem grows 12 feet or 14 feet high. The crop may be left standing through the winter, as the seed does not shed; it is cut as wanted, and carried to the cattle that find shelter during the winter in the wood pastures of Kentucky. The animals are wintered on this food and on hay; pigs run with them as a save-all. The stalks are usually burnt. In J. F. W. JOHNSON'S "Notes on North America," we are told:—

"A very wasteful practice exists in many parts of North America of reaping the Indian corn very high, so as to leave as much as 2 ft. of the stalk in the ground; and in others of altogether rejecting the stalks when reaped, using them neither for food nor in making manure. But cattle eat the corn-stalks very willingly; they are said by some to be equal to the best hay in feeding, and to produce more milk than hay does. Thus, in addition to the grain, an acre of land yields 3 tons of fodder, which saves much other food; and when cut by means of a chaff-cutter may be made the means of procuring a large supply of manure. Wherever the exhausting system has nearly done its work, and the value of manure has begun at last to be appreciated, attention will by degrees, as is now in some measure the case in New England and New York, be drawn to the great value of the hitherto neglected corn-stalk. Of course the degree of ripeness to which the corn is allowed to attain, the variety sown, the soil on which it grows, the fierceness of the sun beneath which it ripens, and other circumstances, will affect its value as a nutritive fodder, and will in different districts modify the way in which it can most usefully or most profitably be employed.

"Much has been said at different times about the introduction of Indian corn as a field culture into England—an object which, I fear, our feeble summer heats, cloudy days, and early frosts, will prevent us from extensively attaining; but as a green food, to be cut in its unripe state and given green, or dried for winter, it might be introduced with a chance of profitable success."

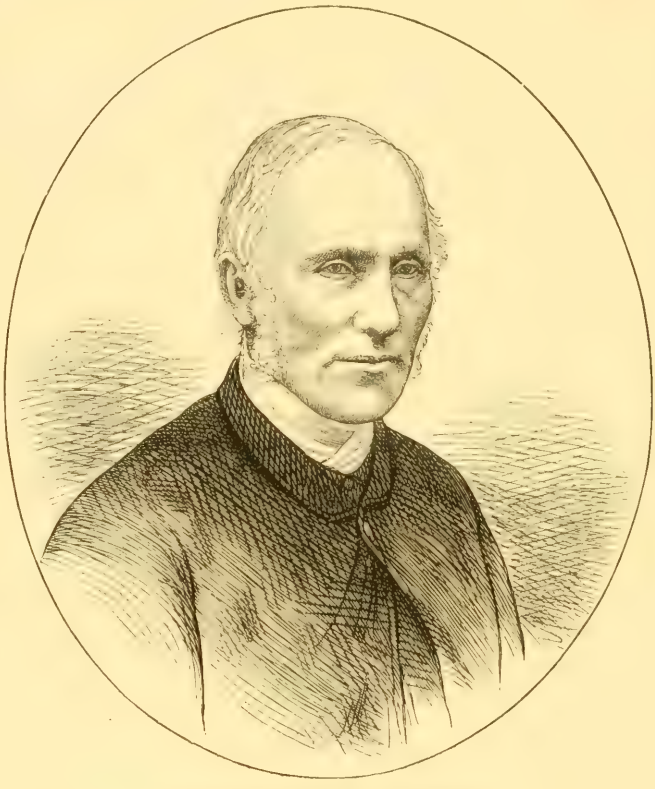

MR. WILLIAM SMITH, OF WOOLSTON.

The sewage farmer will probably succeed in finding forage crops more productive than Maize. The Chinese Sugar Millet (Holcus saccharatus or Sorghum saccharatum) has been estimated to yield from 20 to 50 tons of green fodder. There are specimens at the South Kensington Museum, grown at Putney in 1858, and more than 10 feet high. Several sorts of Maize grown in the same neighbourhood in that year were only 6 feet to 7 feet high, and the stems are much stouter, the nodes coarser, and the whole plant more woody. Sorghum is grown in the north of China for sugar; and it is grown in France, Russia, Italy, and Germany for forage, and for the purpose of making syrup, wine, rum, cider, and vinegar. It is a plant of very robust habit. It has nearly ripened with us on a clay soil, without care, and might no doubt easily be made to do so. It however also needs a warmer climate than ours generally. This Millet is grown in New York and other States, and is called Broom Corn, from the use to which the seed panicle is put when threshed. The ripening is assisted by bending the stem 2 feet or 2½ feet from the top, at right angles, so as to break it and arrest the flow of

sap. This is done at the first appearance of the immature seed.

The cost of carriage obliged the Western farmers to export their Maize in the shape of bacon; and in the great slaughtering districts, of which Cincinnati is the capital, the "hog crop" is an important one. The value of feeding corn in England consists of its worth to make manure and flesh. In the unexhausted tracts of the new States one of these elements of value does not exist as yet, or Maize would not be so cheap. The effect of Mr. HOPE'S persevering labours to utilise sewage will be to lessen the cost of corn in this country by making manure more abundant. No other social change can be conceived which would secure such lasting advantages to the whole community, and especially to the farmer, who would be enabled to compete with the foreign corn-grower, and at the same time to produce more meat at a greatly reduced cost. The cost of manure is a main item in the cost of food.

A VERY instructive paper on the amendments required in the Irish Land Bill now under discussion in the House of Commons, has been issued by Mr. W. BENCE JONES—a resident Irish landowner, whose estate has been growing in prosperity and value during his 25 years of ownership. A history of the improvements effected on that property during the past quarter of a century was given in our columns some years ago, and no one who read that statement will deny to its proprietor his right to a most careful and respectful attention for all the suggestions he has to make upon any proposal for the re-adjustment of the relations of landlord and tenant in Ireland.

Without professedly objecting to the principles of Mr. GLADSTONE'S Bill,—which are taken to be (1), compensation to yearly tenants turned out for other causes than non-payment of rent, subletting, or other great misconduct; and (2), compensation to all tenants for improvements made by themselves and for manures brought on the land,—Mr. BENCE JONES criticises the methods in which these principles are attempted to be carried out, and points out very many particulars in which the Bill, as at present drawn, must fail of its declared purpose. Probably the most generally serviceable of these criticisms—those which will commend themselves most generally to the judgment of Scottish and English readers—are levelled at the possibility of rental valuations by the Courts created or indicated in the Bill, on which really the justice or injustice of their proceedings must for the most part depend. Under section 16 the Court may have practically to fix the terms of the entire contract between landlord and tenant—rent, covenants, everything, not only of cottier tenants holding 10 or 20 acres, but of tenants of hundreds of acres over 80 per cent. of all Ireland.

"Is the Court," we are asked, "(that is to say, really the State) prepared to take such a responsibility as this? Is it true that the mutual workings of self-interest, which regulate all other dealings, and are admitted to be the mainspring of progress in modern trade, can in the dealings with land in Ireland be supplied by an Assistant Barrister who may know nothing about land, and a valuator? The thing is so contrary to all intelligent modern thought that it seems useless to discuss it.

"Much more action of the self-interest of landlords, no less than that of tenants, is what is wanted for improvement in Ireland. Landlord neglect has done ten times the harm of landlord harshness. Nineteen-twentieths of the improvement of the last 25 years have been the work, direct or indirect, of landlords. A great majority of the tenants have no wish to improve. With rare exceptions, they have not yet the knowledge or ideas needful for improvement, and the little they have learnt has been from seeing the doings of improving landlords.

"When I began, 30 years ago, Clover and Turnips as crops were unknown in the district. There was not a plough on the estate that would turn a furrow. There was scarcely a decent dwelling-house. The farms were scattered here and there, sometimes with a field a mile off. Much of the land was inaccessible to manure, unless carried on a horse's back in panniers. If the tenants had been the angels their friends say, they could not have thriven. Yet I had positively to force them to what was for their own good, whilst content to give up all increased return to myself for over 20 years. Had the rule of the Assistant Barrister and his valuator existed, things would have been now much as they were then, except that numbers would have starved who are now considerable and prosperous tenants, or well-paid labourers, and very likely I should have been a richer man.

"It may no doubt be very desirable to tie the hands of bad landlords; but if the hands of good landlords are tied too, it is certain the result will not be what is hoped for. Freedom, even of landlords, is essential to progress, though it may sometimes be used for ill purposes.

"I therefore do not think that the rule of the Assistant Barrister or his valuator will succeed in trying to fix rents and covenants. The rent a farm is worth is not a fact that can be proved. It is only a matter of opinion. It varies from year to year—partly with prices, partly with modes of farming, and with increasing knowledge and skill—with the judgment shown in selecting good tenants, and with the good or bad management of the estate."

The above extract must for the present suffice to show the principle on which Mr. BENCE JONES' criticisms of the Bill proceeds. The details throw useful light upon the relationship of landlord and tenant; and not alone in Ireland. Though unable, therefore, to lay them before our readers this week, we shall call attention to them hereafter.

—— THE Corn trade was rather livelier on Monday at Mark Lane, without, however, any very material rise in prices. In the Metropolitan Cattle Market, also, prices were firmer and sales quicker.

—— From a report read at the last meeting of the North Riding of Yorkshire Chamber of Agriculture, by Mr. KILBY, of Appleton Roebuck, who has long been most laboriously compiling statistics on the subject, it appears that during the past 30 years the loss by lung disease and foot-and-mouth disease in England has amounted to more than £83,000,000, and in Scotland to more than £12,000,000, and (including losses by rinderpest) to more than £100,000,000 in Great Britain. This (the loss of 30 years) is about one quarter more than the value of all the stock at any one time in the country. Of course it is only an estimate — founded, however, on the careful investigation of a very large extent of individual experience; but it may clearly be admitted as true to this extent, that a very great injury, indeed, is suffered by the infective disease generally believed to have been imported, which has at length been brought within the scope of restrictive legislation.

—— Two exhibitions, interesting to British agriculturists, are about to be held in France. First, that of the Société Hippique, for service horses of all kinds, from a cart-horse to a team for four-in-hand, which opens on the 1st, and closes on April 15. The importance of this exhibition may be partly estimated from the fact of there being 70 prizes to be awarded, of the total value of £2570, the Society being well backed, and determined to do all in its power to improve the race of draft and saddle-horses for general, not racing, purposes. The show last year was a great success, the whole of the central area of the Palais de l'Industrie being laid down as a drive, with a bank for leaping on one side, and crowded every afternoon with nags and drags of all kinds, watched by a highly fashionable company. The second exhibition is that of fat cattle, announced to take place at Rouen on April 11 and 12. The excellence of the Norman stock, and the proximity of Rouen to England, will doubtless attract many of our agriculturists.

NOTEWORTHY AGRICULTURISTS.

WILLIAM SMITH, OF WOOLSTON.

THE readers of the *Agricultural Gazette* need no agricultural biography of Mr. William Smith. They are already well acquainted with the man, his doings, and his writings. He has now been 20 years the owner of a small family property near the Bletchley Station of the Great Western Railway—in a country for the most part of stiff clay land. The difficulties of land cultivation by horse-power have been in his case at their maximum. A small plough-land farm of stiff clay is almost impossible of profitable management in that way. For the last 14 years accordingly the problem has been solved by the application of steam-power, and Woolston has been the model farm of England so far as steam cultivation is concerned. Already in 1856 Mr. Smith could say, "I have since harvest ploughed by steam the whole of my farm, excepting a bit of Wheat stubble left to try an experiment on in the spring, and a bit of Clover lea ploughed with horses." In that year he had showed his implements at work at the Chelmsford meeting of the English Agricultural Society; and almost every meeting since has witnessed the exhibition of the Woolston apparatus on the occasion of the great annual agricultural shows. That mode of advertising it, however, soon became unnecessary, for there were soon scores of farms scattered over the country where the plan which Mr. Smith has advocated was adopted. And to the persistent urgency with which, at meetings for discussion and for exhibition, in the columns of our agricultural journals, and on the fields of his own farm, the policy of steam cultivation has been advocated by Mr. Smith, more probably than to any other single agency that can be named, do we owe the present unanimity and confidence of public opinion in the sound policy of cultivation by steam-power.

Mr. Smith has served his generation well, and earned the hearty thanks of English agriculturists. His annexed portrait is a very recognisable likeness.

OUR LIVE STOCK.

CATTLE.

MORE than one eminent breeder has within the last six months enforced the importance of ancestry as an element in judging the merits of animals competing in the showyard, and Mr. Torr, at the next Council meeting of the Royal Agricultural Society, will move that judges should be furnished with stock catalogues. We maintain that this is radically a false and mischievous innovation. A good pedigree *ought* to bring good produce, but when, as often happens, it does not, then the pedigree is a failure, and ancestral greatness becomes a worthless fiction. We maintain that an animal should be worthy of his lineage, and by his quality, symmetry, and carriage should show himself to be of high descent. When these good qualities are wanting, it is fallacious in the extreme to bolster up defects by referring us to the excellencies of former generations. *Apropos* of this point we take the liberty of reprinting a few sentences from our impression of October 30 last:—"A fine pedigree is only valuable because experience has shown that it is accompanied by certain excellencies. If, however, your high-bred animal is inferior in appearance and quality to one of less aristocratic descent, what becomes of the value of your pedigree? We anticipate the answer. His stock will be better. Let him then get stock which will be prizetakers, since he cannot take prizes himself; but why should he be victorious in the showyard because of some latent good qualities which may or may not develop themselves in the next generation?"

—— A fearful outbreak of foot-and-mouth disease in Lancashire is reported as having emanated from the March cattle fair held at Longridge, near Preston, on the 16th ult. Nearly every farm in a direct line from Longridge, right across the Fylch in a westerly direction, have their cattle affected to a greater or less extent, either by the introduction of one or more beasts purchased at the fair, or by having come in contact with cattle infected by them.

—— Mr. Oliver's catalogue, which has very recently been brought out by Mr. Thornton, announces the sale of the Sholebroke herd on the 13th inst. In noticing the contents of this rich list of high-bred cattle, we may mention *Viscountess* and her four daughters, representatives of the "V." family, and descended from Nos. 51 and 6 of the Chilton sale. *Bracelet 2d* (lot 3) is the ancestress of nine females and two bulls. She was bred by Mr. J. B. Stanhope of Revesby, and afterwards became the property of Mr. Graham, of Yardly, from whence with *Lady Wild Eyes 2d* she came to Sholebroke. The pedigree of this cow is worthy of study, and will be made clear by the following diagram:—

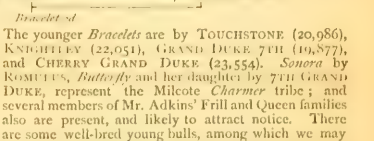

The younger *Bracelets* are by TOUCHSTONE (20,986), KNIGHTLEY (22,051), GRAND DUKE 7TH (19,877), and CHERRY GRAND DUKE (23,554). *Sonora* by ROMULUS, *Butterfly* and her daughter by 7TH GRAND DUKE, represent the Milcote *Charmer* tribe; and several members of Mr. Adkins' Frill and Queen families also are present, and likely to attract notice. There are some well-bred young bulls, among which we may notice LORD OF THE FOREST (20,704), by GRAND DUKE 7TH, and with a pedigree tracing back through many good Bates crosses to *Foggathorpe*, by MARLBOROUGH. CANDIDATE, by 2D DUKE OF CLARO, was bred by Mr. Robarts, of Lillingstone Dayrell, and comes of the *Fuchsia* by 2d CLEVELAND LAD strain; and a similar lineage results in CHORISTER, lot 48. GRAND DUKE 7TH, the sire of most of the young stock, is by 3D GRAND DUKE, and out of *Grand Duchess 4th*; he was bred by Mr. Bolden, and purchased as a calf for 320 gs. He has been a most excellent sire, and is still in service.

—— Mr. Enoch Hodgkinson's catalogue has appeared during the week, announcing the sale of his entire herd at Morton Grange on Thursday, the 7th inst. Mr. Thornton informs us that "the herd has been selected and bred for the last 10 years from stock bred by the late Mr. Hall, of Kiveton Park; Mr. John Armstrong, Palterton; Mr. George Bland, Coleby, and other noted breeders." Lot 1, *Fairy*, by STRONG BOW, of Kiveton origin, is the ancestress of 11 cows and heifers. Her pedigree is therefore of some importance. Omitting the earliest eight crosses, the most remote of which is that of BARNINGHAM (56), we find—

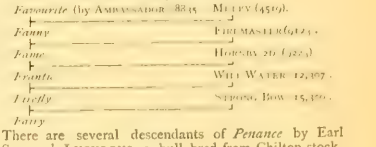

There are several descendants of *Penance* by Earl Spencer's LYCURGUS, a bull bred from Chilton stock, and two representatives of No. 54, Chilton sale, namely, *Susan* by VICTOR ROYAL—a first-rate bull by ROYAL BUTTERFLY 10TH (18,761)—and *Star of the Evening*, also by VICTOR ROYAL. The following bulls have been recently used:—DUKE OF CUMBERLAND (21,585) by PRINCE GWYNNE (20,547), dam *Buttercup* by CHELTENHAM; MAJESTIC (24,510) by LORD of THE HILLS (18,267), and descended from *Zeal* by ROMAN; VICTOR ROYAL, already noticed; VICTORY by VICTOR ROYAL, and RED COMYN by DUKE OF CUMBERLAND.

FARM BUILDINGS.

III. The Prince Consort's Shaw Farm.*

The Prince became the tenant of the Shaw Farm and of the home grounds in 1849. The whole is now a continuous estate, including the royal gardens and the Frogmore grounds, the position of which is shown by shade lines on the annexed map (fig. 85). It was at first, along with the Norfolk and Flemish Farms, under the immediate direction of the late General Wemyss, to whom the credit is due of having advised the Prince Consort both to take the Shaw Farm into his own hands, and to build the new homesteads both there and on the Home or Dairy Farm.

The Shaw Farm includes 308 acres, of which about 120 are arable; and the Home Park amounts to 540 acres, wholly pasture, of which, however, more than 120 acres are occupied by pleasure-grounds, plantations, gardens, buildings, and roads.

The estate includes several varieties of soil. The southern portion is a stiff adhesive soil upon the London clay formation; the Thames-side meadows are good alluvial grazing grounds; the upper pastures of the Home Park next the Castle are on the chalk. For the combined farms a sum upwards of £1000 a year was paid in rent and taxes by the Prince Consort, who took them in a very wild and very unequipped condition. Besides providing, of course, the proper farm capital invested in its cultivation, he also contributed upwards of £6000 towards the two sets of farm buildings which are erected on it, and which we have now to describe:—

A modern homestead is an establishment for the manufacture of mutton, beef, and pork—enabling the feeding of live stock with less expense of labour and of food. The true principles of construction and design have long been known. The connection in fact of all such portions of the buildings as are connected in use saves labour; and covered yards, boxes, stalls, providing a sufficiency of healthful exercise, perfect ventilation, and warm shelter, economise the food of feeding cattle. The combination of these two leading principles is now attempted by all good designers of farm buildings. To these must, however, be added a third consideration, which has latterly come to be considered of almost equal importance—namely, the shelter of the manure which is made in these cattle-houses, and its preservation at once from loss by evaporation and from exposure to the rain.

How are these principles carried out upon the Prince Consort's farms? At his Royal Highness's Norfolk Farm, the homestead represented at pages 186 and 187 was probably the best of those upon the old fashion, which stood when the Prince Consort became the tenant of these estates. Excepting the comfortable dwelling-house, it is built for the most part of wood and thatch, and it includes that leading feature of all the old homesteads—a large, square, working court, containing the dung-pit, and surrounded by a large barn, a dwelling house and offices, cart-sheds, and stables, on the four sides of it. But with all the picturesqueness, roominess, and even comfort of this old style, it is plain enough, from the description of these buildings at p. 187, that there is a great loss of labour in the conveyance of straw and provender to the yards and stables, and a great loss of fertilising matter by the exposure of all the farmyard manure to the weather.

At the Shaw Farm we have an instance of a good modern homestead, retaining to some extent the principle of open yards, providing, however, ample and suitable accommodation for feeding and breeding stock in stalls and boxes, and furnishing good illustrations of nearly all the methods of construction referred to above.

At the Home Farm, exclusively for dairy stock, as being designed for an exclusively pasture farm, the principal features are a magnificent cow-house, for the accommodation of the cows, and a large manure house, to which, for the preservation of its fertilising ingredients, the soiled litter from this cow-house is daily moved. For other stock there is ample provision in calves' houses, yards with sheds, and pigsties.

The Flemish farmery is the most compendious of the series, and perhaps the most of all in accordance with the latest agricultural requirements. A covered yard arranged in either stalls, boxes, or large enclosed spaces, an open yard with shed for breeding stock, and a stable abut upon straw-house, chaff-house, &c., in connection with barns, and threshing-machine, and granary—the whole being under one roof. And there is an open working yard, with implement and cart-shed and cottages close by. These will receive detailed description hereafter. They are the most successful of the series in developing those principles of arrangement and construction already named; and, in fact, the merit of these farmeries appears to increase pretty nearly in the order in which we have named them.

The sketch on the following page (fig. 88) represents the Shaw homestead as seen from the grass-field between it and the royal gardens. On the same page (fig. 89) is given a plan of these buildings, with a scale from which their dimensions may be learned, and an isometrical projection (fig. 87), representing the height, roofing, and arrangement of the different parts.

These buildings were erected in 1853 from the designs of Mr. G. A. Dean, the architect, to whom, under General Wemyss, the Prince Consort communicated his desire on the subject. His commands were that "plain and sub-

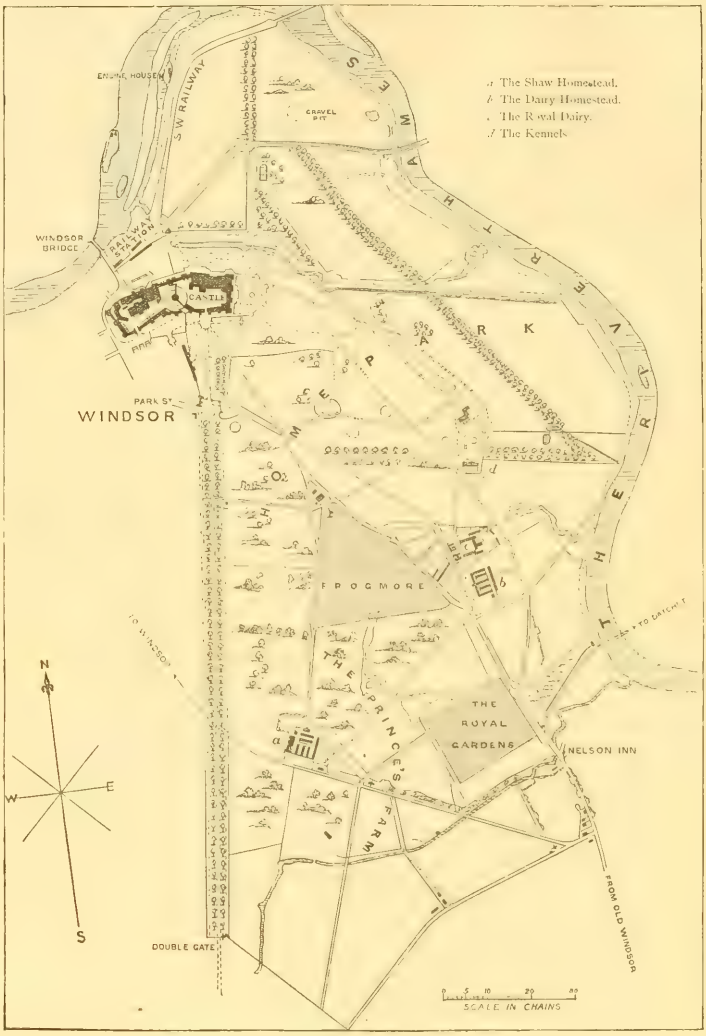

Fig. 85.—Home Park, including Frogmore and Shaw Farms.

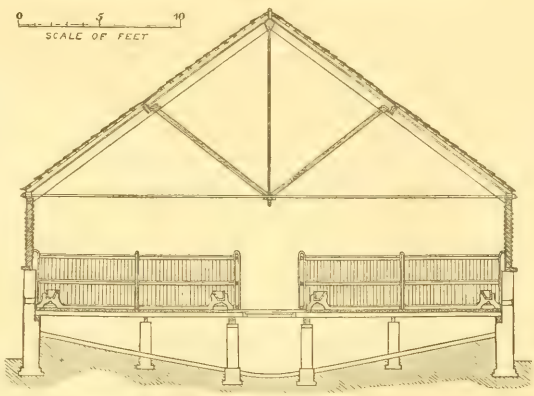

Fig. 86.—Shed-shed.

* We again express our acknowledgments to Messrs. Longman for the loan of blocks illustrating a description of this homestead, taken from their work on the Prince Consort's farms.

stantial buildings should be so arranged that each description of stock might be kept and tended apart from the other, suitable aspects being given to the several parts, and the arrangement being contrived so as to insure the economical performance of all labour to be done within them." The design very fairly carries out the Prince's intention. It will be seen that the poultry, the swine, the feeding cattle, the sheep-shed, the stables, are placed in distinct and separate localities, accessible with the straw-cart, the dung-cart, or the turnip-cart, by roads which intersect the whole. The buildings stand upon a square of ground — the sides running north and south, east and west, respectively.

The row upon the eastern side includes cart-shed at either end, two-storied lodging house in the middle, and farm stables. The row on the western side includes carpenter's yard and shed, threshing-barn and granaries, steam-engine and boiler-house, floor for mixing chaff with pulped roots, and piggeries around three sides of a small square, in the midst of which is the food-house for their supply. Between these two north and south lines, on the east and on the west sides of the square, there are three rows of buildings, with roadways between them, and also between their extremities and the two lines already described. The first on the northern side includes foreman's house, poultry house, and blacksmith's and carpenter's shops. The second row includes a series of boxes, hemels (small yards) facing south, and boxes, with a large root-house for the supply of the whole, where Gardner's and Moody's turnip-cutters are fixed and worked by strap from a shaft, to which motion is given by a small oscillating 1-horse steam-engine standing on the floor, steam being brought for it along a pipe from the threshing-engine boiler-house just across the road. The third row occupies nearly half the width of the square, and its whole length between the two lines of buildings at its east and west ends. It is divided midway by a wide shed, in which shed-feeding of sheep on sparred floors is adopted; and on either side, with sheds at their further ends, are two capital yards for young stock. The sheep-sheds answer the purpose of rapid fattening well. 150 Cheviot wethers are fattened in them every season. The floor is divided into pens about nine feet square, holding six sheep apiece. They receive cut roots and cake, and thrive fast compared with the progress made out-of-doors. The section of the building here given (fig. 86), shows the nature of the accommodation, and the size and depth of the tank beneath into which the manure from the sheep falls. Ventilation is insured, imperfectly however, by the louvre boards in the side walls, and the divisions into pens are shown upon the plan. As many as 100 cartloads of capital solid dung are taken from the tank every spring and used with great effect on the Mangel fields. A principal fault in the arrangement is the imperfect access given to the vault where it accumulates, and from which it has to be lifted through trap-doors in the floor. Owing, in all probability, to this accumulation of manure and imperfect ventilation, the place, though admirably adapted for rapid feeding, does not turn out good mutton.

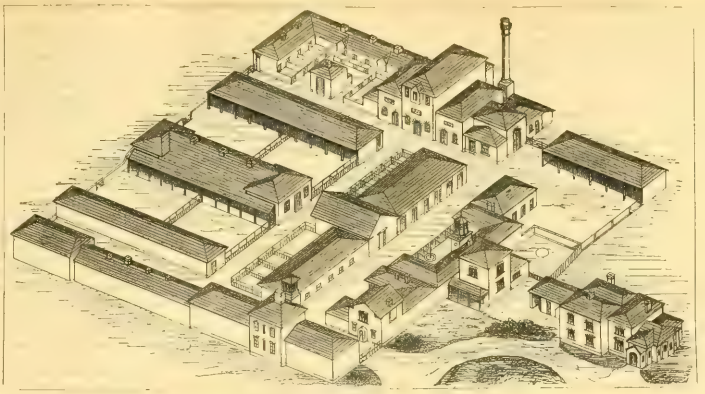

FIG. 87.—ISOMETRICAL PROJECTION.

FIG. 88.—SKETCH OF THE PRINCE CONSORT'S SHAW FARM.

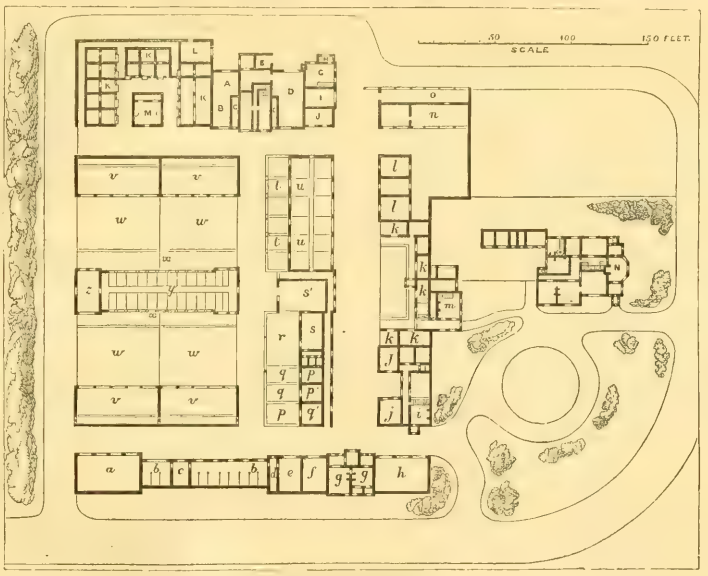

FIG. 89.—GROUND-PLAN.

REFERENCES TO LETTERS ON THE PLAN.

East Range.—*a*, Cart and waggon-sheds.—*b b*, Cart-horse stables.—*c*, Harness-room.—*d*, Chaff and corn-bins.—*e*, Hay and corn-shed.—*f*, Drill-shed.—*g g*, Men's living rooms, with sleeping rooms over, and clock tower.—*h*, Implement-shed.

North Range.—*i*, Foreman's cottage.—*j j*, Steward's stable, gig-house, and hospital for sick stock.—*k k*, Poultry department.—*m*, Poultry-woman's cottage, by the entrance from Her Majesty's rooms to the farm offices.—*l l*, *n o*, Blacksmith's, carpenter's, and other shops, wood-yard, saw-pit, &c.

West Range.—A, Corn bay.—B, Hay bay.—C C, Cut hay and straw.—D, Corn mixing rooms, threshing-machine, and straw bin.—E, Sheds for corn to be thrashed and for chaff from machine.—G, Boiler-room.—H, Coal-shed.—I, Artificial manure-shed.—J, Boiling-house.

Piggery Department.—K K, Open shed, and sties, with yards for store breeding sows.—L, Slaughter-house.—M, Boiler-house with food tank.

Centre Ranges.—*p q'*, Yard and house for stallion.—*q p'*, Yards and houses for bulls.—*r s*, Cow-house and yard with calf-pens.—*s'*, Root store.—*t u*, Hemels, with boxes on the farther side of the gangway.—*v w x*,—Yards and sheds for store stock.—*y*, Sheep-shed, with central gangway and terminal food-house at *z*.

The dwelling house, detached from the homestead, and well seen in the sketch (p. 88), is now the residence of Mr. Tait, the manager of the farm. It contains a suite of apartments (N upon the plan) for Her Majesty's use; they are placed at the end of a fine avenue, and, together with the steward's house, form a very pleasing and picturesque object. From these rooms the Queen can walk in comparative privacy to the poultry department, and thence through the whole range of buildings.

The various departments of the farmery are separate and well defined. The poultry department is managed without any interference with the farm operations, as are also the blacksmith's and carpenter's departments. The barn machinery comprises, besides the threshing-machine, Oat, Bean, and cake-crushing mills, a flour-mill, straw and chaff-cutters, hoisting machinery, &c. The granary is on the third floor, and is furnished with tackle for loading carts outside. The arrangement here is too closely packed for convenience.

In the piggery department, shown at K and M in the plan, the styes surround the boiling-house, at the back of which is a large tank in which the food is fermented.

The central position of this building insures economy in feeding the animals.

The stock yards shown at *v*, *w*, *x*, are divided into four for keeping separate, if it should be so desired, distinct breeds of stock, or stock of different ages. The central range comprises the sheep-shed, including the arrangements just described for feeding on an open floor over a tank for the collection of manure.

The bullock-boxes, in the range shown at letters *u*, *u*, are without

open yards on the north side, while those on the south possess them. This arrangement was carried out by command, as his Royal Highness wished to ascertain which of the two plans was best for fattening bullocks of various breeds. The provision-shed, *s*, in this range, is well placed for supplying food to animals in the various ranges of the building.

The accommodation for cows is small, in consequence of the dairy being at the Home or Dairy Farm. It was therefore intended to keep in this steading only the few breeding animals intended for exhibition. The bull and stallion boxes adjoining the cow-byre are commodious and well fitted up.

The whole of the buildings are well drained and supplied with water. There are various manure tanks having holes with plugs in the topstones, so that on taking out the plugs, portable pumps may be employed for pumping the liquid either into carts or on the manure in the stock yards as may be desirable.

It is proper to add, that the principal defects in the designs of the buildings are the cramped and confined arrangements of the threshing-barn and granary, and the long carriage of straw and food to stables and yards. Defects of construction have since been corrected at considerable expense; those which are inseparable from the design must, of course unavoidably, remain.

Home Correspondence.

Unfavourable Appearance of the Wheat Plant.—But one opinion prevails in this and in some of the adjacent counties, that the young Wheats never looked worse, especially upon lea ground; in some cases the plant has entirely disappeared, and the ground has been reploughed and resown. Farmers are at their wits' end as to the course they shall pursue, with their thin growth; harrowing, redrilling, pressing, and top-dressing are spoken of, and in some quarters active measures have already been taken, but I have not as yet learnt that agriculturists are agreed as to the cause of the extensive and general loss of the Wheat plant within the past winter. All localities appear alike affected: upon the alluvial plains, rich loamy slopes, deep heavy clays, and shallow rocky surface, may be observed the withering out and wholly faded Wheat blade. That the failure does not arise from inferior cultivation or any peculiar treatment of the soil, is clear beyond doubt, seeing that the loss of plant is found where the management of the ground was good and regular. Can the weather of the past season have been the entire cause of this lamentable falling away of our Wheat plant? I am induced to ask this question from a statement which fell from a celebrated agriculturist in this locality, when speaking of the loss of his plant. The more interest attaches to his statement, seeing that the greater part of the Clover lea broken up for Wheat last season on his farm was ploughed by some 30 or 40 teams at the local match. My informant declared that the greatest failure of plant is visible where the "Champion" ploughs acted, and that the fullest plant is seen where his own ploughman turned the furrow. There is a good deal in this, as practical men will see! The man who cultivates the same area for a series of seasons must naturally know the result of certain operations to the soil, and therefore he regulates the depth of the furrow, and is careful not to have a rough uneven face. The agriculturist whose experience I am now writing, does not attribute the appearance of his Wheat crop to the severity of the weather; he, like his neighbours, is at a loss to account for it; but he made a most interesting statement relative to the failure of a large breadth of Wheat, somewhat to the following effect:—That in order to reap the largest benefit from the experimental ploughing, he was most careful to select a superior seed Wheat, which went through the usual course of pickling, viz., 2 lb. of sulphate of copper to 10 bushels of corn. The field was drilled in due course, and the crop appeared much in the condition we have already spoken of—weak and thin, with the exception of one spot, which all along grew vigorously and strong. Upon the occupier seeking information regarding the sowing of this field, he learnt that the whole of the pickled Wheat being run through the drill, they fell back upon a bushel of the same Wheat which had not been pickled, and this corn was drilled on the spot now covered with a healthy promising plant. This is really an important and interesting circumstance, and one which, I doubt not, some of your correspondents will think worthy of observation. I will watch the future of this Wheat field, and report at the proper season the appearance of things at harvest. Maybe a thick crop of smut will destroy the best part of the present healthy grown plant. *J. L. F., Monmouthshire, March 26.*

Economical Engines.—"G. A. H.," after giving us a lot of figures about coal-burning in an engine, refers me to his engine builders by saying that he has very little doubt about their undertaking to build me an engine that would, with 6 cwt. of coal, do as much work as my present 10-horse engine, and thus evades altogether the plain question that I put to him—"Where can I buy one that can plough 10 acres with 6 cwt. of coal?" I am content with my own engine, that did a fortnight ago 22 acres of smashing with 32*s.* of fuel; yet when he talks about an engine ploughing 10 acres a day with 6 cwt. of coal I have a right to ask where they are made, and before he puts out such a statement he ought to have been in a position to have told us without needing the use of the word "doubt." The fact is, he is talking in the dark. Let him get into practice, and beat my 6*s.* 8*d.* an acre seed-bed for Wheat if he can. His figures are of no use. *William South, Woolston, Bletchley Station, Bucks, March 26.*

Highways or Road Repairs.—Much is said about the abolition of turnpikes and the management of highways generally. It is a subject of great national importance, and the sooner the question is fully discussed in Parliament, and a good and comprehensive decision is arrived at, the better. Like the Irish Land Bill now before Parliament it must deal with matters as they are. No specific enactment can deal with the varied phases and present position of the many different trusts. Many of these trusts are out of debt, whilst others are heavily burdened, and their income sadly diminished by competing railroads. Neither will it do to tax a district which by great effort has got out of debt, to relieve another which is heavily loaded. Each district must bear its own burthens, as it was for its peculiar benefit they were laid on, or rather these debts were incurred. There is a very important consideration connected with road repairs that ought to be more frequently brought before the public. It is the obligation imposed upon parishes to maintain roads not used to any extent or generally by the public. In the parish where the writer resides are several miles of roads or lanes which are in reality accommodation roads, that is, they lead only to lands in the occupation of graziers and farmers, chiefly graziers, and have from time immemorial been fruitful green pastures—*i. e.*, green lanes—and carriages are not often seen passing along them. A field is broken up and cultivated; cartage to some extent takes place. The occupier ascertains that upon application to the magisterial bench he can compel the parish officers to put this road he uses into an efficient state of repair. This he does, and the magistrates, as a matter of course, having no discretionary power to do otherwise, order the repairs to be done. Now herein is the injustice and wrong. These roads have always been kept in a fair state of repair consistent with the traffic thereon, but if they are not put into an efficient repair, so as to form a sound, hard road suitable for all Her Majesty's subjects, the magistrates are bound to inflict a fine proportionate to the neglect in carrying out their order. This may be according to law, but it is unjust to the ratepayers. The magistrates ought to have discretionary power to act in accordance with the justness of the case. The writer was, some time ago, a witness at an Assize trial respecting the repairs of one of these roads. The Lord Chief Justice Cockburn decided "that the road must be repaired to the reasonable satisfaction of the complainants, consistent with the traffic thereon, but not necessarily in that expensive and substantial manner customary on public highways." This is as it should be—thus dealing equity to all parties; but to give power to any litigious individual to impose heavy costs, without just cause, upon a body of ratepayers is wrong. In almost every parish in the kingdom there are roads of this character, and the justice of the case could be met by repairing them according to their traffic. These minor public questions are well worthy every attention. In the parish from which I write the highway rates are very heavy, seldom being less than from 2*s.* to 2*s.* 6*d.* in the pound. Granite (broken), the best road-making material, costs 12*s.* per ton at the station. Common gravel and flinty gravel about 6*s.* per ton, all exclusive of cartage and labour in putting the material upon the roads. To add to the yearly costs there are about three miles of "turnpike roads" to repair, as our turnpikes were abolished some years since, and the repairs of the roads thrown upon the respective parishes. We should of course, under these circumstances, think it unjust to be compelled to aid in relieving other turnpike trusts throughout the country. It may be as well to state, that justices have no direct authority to order the kind of material for the repair of roads. They must order the repair, but, upon complaint of inefficient repair, they have the power to levy such a fine as they think will best meet the case. Considerate justices are slow to impose heavy fines upon the partial repair only of those green lanes. Many of those already repaired with stone or gravel are fully covered with Grass, and, as named above, are seldom used for carriage traffic. *O. F.*

Trench Ploughing.—"An ingenious yeoman in this county (Kent) hath two ploughs fastened together so finely that he ploweth two furrows at once, one under another, and so stirreth up the land 12 or 14 inches deep, which in so deep ground is very good. Scholars know that Hen-dia-duo is a very thrifty figure in rhetorick, and how advantageous the improvement of this device of a twin-plough may be to posterity, I leave to the skilful in husbandry to consider."* The above early notice of deep ploughing in England, which I met with in quaint old Thomas Fuller, may interest some of your readers. In the margin is a reference to "Hartlib's Legacie," p. 6.—*W. C. Trevelyan, Wallington, March 28.*

* Fuller's "History of the Worthies of England,"—1662.

Foreign Correspondence.

PARIS.—The French Parliamentary Agricultural Commission which arose out of the discussion upon the commercial treaty with England, has determined, against all precedent in France, that its meetings shall be public, and that they shall commence immediately; it is also announced that the proceedings will be published at the low charge of ½*d.* for eight quarto pages. The inquiry is divided under nine distinct heads:—1, Cotton; 2, Wool; 3, Silk; 4, Other textiles; 5, Mineralogy and metallurgy; 6, Agriculture; 7, Viticulture; 8, Means of transport; 9, Various industries. The inquiry will be conducted on fixed interrogatories—those relating to agriculture are now before us, and are 49 in number. The following subjects present the greatest general interest:—The supply and condition of labour and the rate of wages—natural and artificial manures and their cost—recent improvements in modes of cultivation—the breeding and rearing of stock, the prices of cattle and meat—the profit derived from milk, butter and cheese—the advantages to be derived from the rearing of poultry—the effect of treaties of commerce on prices—the variations in the price of wool during the last three periods of 10 years each, the effect of such variations on sheep farming, the introduction of foreign races, and the prices per head of sheep during the above periods—the produce per hectare of each kind of cereal during each of the last 20 years, and the causes of the variations that have occurred—the development of the flour trade—the selling price of Beetroot, oleaginous seeds, textiles, Tobacco, Hops, &c., during the same periods of 10 years—the progress made in the manufacture of sugar, spirits, and beer—cultivation of the Vine, exports and prices of wine, &c.—importance and growth of the fruit trade—conditions, past and present, of silk production—the importation of foreign timber and the means of increasing the home growth, and effect of commercial treaties on the prices of timber, bark, and resinous extracts—cost of transport of agricultural products by land and water, and means of improvement—effect of recent legislation respecting corn, and of the temporary admission of Wheat to be ground and re-exported in the form of flour on the manufactures depending on cereals and the public revenue. The questions directly relating to the commercial treaties are worded as follows:—What effect have treaties of commerce had on the demand for, and prices of, the various agricultural products? What effect have such treaties had on the value and rents of land so situated as to benefit by the new demands created? What has been the effect of these treaties on foreign importation, and, consequently, on the raw materials employed in agriculture, particularly iron, and thereby on agricultural machinery and implements, manures, or other substances used for the improvement of the soil, fabrics, clothing, &c? The following general questions complete the list:—What are the points in civil and general legislation and in existing treaties requiring to be modified in the interest of agriculture? What modifications in fiscal legislation and customs tariffs are necessary in the interest of agriculture? What are the other causes acting favourably or otherwise on agricultural prosperity? These interrogatories are much shorter than those employed by the late official commission, which seems to have become embarrassed by its wealth of matter, and to have procrastinated until it has been superseded.

HILDESHEIM, *Feb.* 10: *Potato Culture.*—To those who are interested in the culture of the Potato, a short account of some experiments recently made in a new mode of cultivation may prove acceptable, the more so as it seems to offer two great advantages, namely, the appropriation of the poorest soil, and most damp and shady spots in the garden, and at the same time the production with very little increased labour and care of a much larger and finer crop.

In the spring of 1868, a relative, residing in Holstein, informed me that a Mr. Gulich, recently returned from the United States, had made experiments during the previous year with highly successful results; and although my crops were planted, I resolved to try the same upon a small scale, and was rewarded by a yield so abundant that I was induced next year to plant largely. For those who are not already acquainted with Gulich's method, let me describe the plan I pursued:—The soil was moderately manured in autumn (though without such preparation I have had a good yield); in spring, at the usual time, the largest and healthiest Potatos are chosen, each Potato laid upon the surface of the ground and gently pressed in with the eyes uppermost at equal distances, in rows 4 feet apart, and then each Potato separately earthed over to the height of about 4 inches. In planting each row I placed the Potatos in the intervals of those in the previous row: no hole or trench was made. The heaps were raised gradually with the growth of bines till they reached the height of 2 feet. With the height of course the circumference of the heaps is increased, and the bines are forced through the sides of the heaps, and gradually assume a horizontal position—to ensure which they must be gently bent down and lightly covered with soil. Great attention must be paid to this, as the horizontal position prevents the moisture reaching the young tubers,—a great cause of disease and decay. Thus, by a little more outlay of care and labour in the growth, a

crop of Potatos, all large and good, is reaped, and less labour involved in the harvesting; and I can safely recommend this plan for wet soils and shady situations. When the earthing-up is completed, I plant between the rows all kinds of Cabbage, Turnips, Carrots, or Beetroot, which thrive well.

I have grown upon this method an early white kidney, which is fit for use from the middle of July to the end of October; but I can strongly recommend the Five-week Kidney, which has no blossom. It is the earliest sort, and fit for table at the end of May or early in June, and has not the soapy taste which other early new Potatos have, but is much sought after on account of its fine flavour. This Potato has but few eyes, rarely yielding more than 12 to 15 on a root; it ripens early, and is not affected by the Potato disease. This kind I do not plant after Gulich's mode, but in the ordinary way, to combine the growth of Cucumbers with it. Upon lightly manured soil I plant at 1½ foot from the path a row of Potatos, each Potato 1½ foot apart; then a space of 5½ feet is left for the Cucumbers, then four rows more Potatos, Cucumbers again, and so on until one row of Potatos completes the plantation. The space for Cucumbers is again manured early in May, and the seed sown. The Potato bines do not hinder the manuring and digging, nor will they shade the Cucumbers. The Potatos are taken up in June, when the Cucumbers are allowed to run, each row thus having a bed 6 feet wide, with a pathway 1½ foot broad between. The Cucumber being a very profitable crop, the advantages resulting from its growth in connection with early Potatos are evident.

I may mention, in conclusion, that I plant the kidney Potato, which I keep till the middle of August for seed, upon Gulich's plan, leaving, however, only 3 feet between each, and thus obtain what are absolutely necessary for seed, large and fine Potatos. Cabbages, &c., may be grown between these. I feel sure that for the cultivation of the Potato on a large scale by the farmer, Gulich's method presents great advantages; still more sure am I that on damp and shaded soils the Potato can only yield a good crop when grown in this manner. *Rittmeister A. Borchers.*

Societies.

NEWBURY.

March 31: *Causes Discouraging the Application of Capital to Agriculture.*—At this meeting Mr. MECHI read the following paper on the above interesting subject:—

A nation superabounding in population and in wealth, which it loans to foreign nations in hundreds of millions, and yet, with its land half farmed and half capitalled, is dependent on foreign countries for nearly one half of its daily bread, must appear to every reasoning mind a pitiable, dangerous, and reproachful anomaly.

There must be causes for this uncomfortable state of things, and into those causes we are about this evening to inquire. When this subject was proposed to me, I asked of myself the following questions:—

1. Are there practicable remedies?
2. Will they benefit alike landowners, tenants, labourers, and the country at large?
3. Can the necessary capital be found to carry them out?

And I at once, guided by my own long practical experience as landowner and tenant, answered in the affirmative. As to capital, we are all, I believe, agreed, that almost any amount of money may be had on land security; and that is, I know, the experience of the several land drainage and land improvement companies that have been of late years established. I therefore anticipate that to give a security on the land for the cost of improvements effected by these companies will be hereafter looked upon as a commendable and desirable transaction.

The time will come when purchasers of estates will naturally expect to find a considerable annual charge on them for liquidation of principal and interest of improvements effected through these companies. This system will (when legalised on entailed and embarrassed estates) bring into agricultural use and profit the surplus funds of those who, but for these companies, would never have thought of investing their money in agricultural improvements. It will divert millions from foreign loans that would go to strengthen foreign nations as our agricultural and manufacturing competitors, and would bring vast funds for agricultural use and profit. Before I continue my subject, let me say, truthfully and without flattery, that your county is one in the foremost rank of agricultural progress, thanks in great degree to that wise, good, and far-seeing man, the late much lamented Prince Consort, to the late Mr. Pusey, and to other spirited landowners and their tenants—some, alas! no more.

I infer, from your invitation to me, and from the subject which you have chosen, that you are dissatisfied with the present condition of British agriculture, and desire to see it amended, so that we may be enabled, now that we have free trade in corn and meat, to compete successfully with foreign nations in the production of human food.

I therefore ask myself, Could we thus successfully compete?—and I reply, with the confidence resulting from long practical experience, that we certainly could so compete, provided that all the conditions were favourable to the investment of more capital and intelligence in agricultural production. But how important and significant is this last sentence! It may be said to contain the whole future of British agricultural progression. In order to succeed fully, British agriculture should be, both as regards landowner and tenant, as free as air, and released from the numerous trammels which at present cramp its action and hinder its advance. I presume we are all agreed that so long as the average prices of meat and grain are remunerative, we, as farmers, shall not complain, although those prices may be subject to the ups and downs that have ever attended and ever must attend agricultural productions. But while the average prices since the introduction of free trade have been satisfactory to those whose farms are in a proper condition, favourable to capital, thousands of farmers who are deprived of those favourable conditions have had, and continue to have, especially just now, a painful struggle, and are totally unprepared to combat successfully with foreign competitors at the present low prices. Shut up in little ill-shaped fields, with broad hedgerows and timber trees, their land undrained, their roads wretched, their homestead ill-placed, their personal and animal accommodation insufficient and ill-arranged, their leases restrictive and antiquated, and, in some cases, ground game in excess and a deficient capital, theirs, indeed, must be a sorrowful and unprofitable lot, still further aggravated by the uncertainty of annual tenure, and the absence of a valuation for unexhausted improvements. Not only have they to compete with foreigners, but also with those of their own countrymen who, in every one of those respects, may be much more favourably situated than themselves.

When I say that we could compete successfully with foreigners, it is because I know that we have an important natural advantage over them (from our greater proximity to a market) which, I think, may be taken as approaching 15*s.* per quarter on Wheat.

A considerable difference of opinion prevails as to the cost to foreigners of placing their grain in our markets, and that is not to be wondered at, seeing not only how variable at times are the charges for conveyance by land or water, but also how different are our distances from the sources of supply. Estimates run from 8*s.* to 20*s.* per quarter; probably 15*s.* would not be far from the average truth. A friend, well versed in the foreign corn trade, writes to me thus:—"As you put the question, 'Has the British farmer a protection to the extent of 15*s.* a qr. in Wheat?'—coming from the Western States of America and the interior of the south of Russia, perhaps you would be within the mark, but the great bulk of our supplies come not thence direct, although I have little doubt they do by displacement. A large portion of the Wheat shipped at St. Petersburg ascends the Wolga, nearly 2000 miles, and is two years reaching the port of shipment! What are the charges, waste and interest of money?" A Russian gentleman informs me that this tedious transit has been considerably hastened by the use of steam tugs on the Wolga. The absence of local roads and bridges in Russia and other countries that supply us with grain, render its conveyance difficult and costly. They are, however, making railways with English money.

We must not forget, in making our estimate, how numerous and repeated are the charges on transit, such as loading and unloading by land and water, cartage, freight, insurance, commission, difference in weight, waste, damage by damp, heating, or salt water, the latter not recoverable by insurance unless from some accident to the ship.

Now, as a good British farmer will average 5 qr. of Wheat per acre (some years I have averaged 7 qr. per acre) he has thus an advantage, from natural causes, of £3 15*s.* per acre, to which must be added the difference in acreable produce, which is certainly from 1 to 2 qr. per acre. The returns for the quantity of seed Wheat sown are, in southern Russia, 5 for 1; in poor northern land in Russia, 4 for 1; in England, 14 for 1; with good farmers, 25 for 1; on my farm, 40 for 1. In the United States of America it can be scarcely 6 for 1, because their average crops of Wheat are, I have reason to believe, as low as 16 bushels per acre. Ours in England are 28 to 30. In Russia, America, and other foreign countries, the hand and horse-hoe are too generally neglected, and consequently they get a mixed crop of weeds, seeds, and grain. I am sorry to say that some farmers do this, even in England.

Against our advantages, which I have described, must be set off cheap or nominally rented land, and the generally smaller cost of production. Take the extreme case in favour of the foreigner:—

Our rent, rates, tithes, and taxes	£2	0 0
Cheaper labour in Russia	0	10 0
Other charges, manures, &c.	1	0 0
	£3	10 0

—that would still leave a balance in favour of England.

In America, whence we derive so much of our Wheat, labour is double the price of ours, so that our advantage is increased to that extent. It may be useful to consider the present aspect of the foreign grain trade as it affects the foreign farmer, for he is by no means just now in a comfortable position, and if I am not mistaken, these low prices will soon lessen foreign import, and gradually enhance prices here.

Wheat has recently been bought at Chicago (United States) at 20*s.* per quarter, and in Russia at the same price. That Wheat cannot be brought here and sold with any profit much under 40*s.* per quarter, but how much does the farmer get for it, who lives hundreds of miles away from a shipping port?—for we must remember that most of the lands of the old settlements near seaports have been long since exhausted by constant croppings, and that it is only from the distant interior that supplies can be now obtained. Even with our good roads, which are wanting abroad, we cannot convey Wheat to market under 2*d.* per quarter per mile, or 16*s.* 8*d.* per 100 miles. I know of Oats contracted for, free on board at Montreal, in Canada, in May next, at 12*s.* 3*d.* per quarter. How much will the poor farmer get, who is some hundreds of miles distant from the shipping port? A Canadian gentleman assures me that after deducting from the present price paid in London, the charges in London, ocean freight, the transport from Chicago to New York (the port of shipment), and the charges at Chicago, with cost of land transport to Chicago, the grower realises only 13*s.* 6*d.* per quarter for Wheat, or very little more than half the cost of production. He anticipates that supplies to us must greatly fall off. I am assured that exporters and importers of grain have during the last six months suffered a loss equal to £2,000,000 sterling, having ordered and bought too dear, expecting, as many of us did, that corn would realise a high price. The high price of labour in America is sufficiently proved by the fact that last year 120,000 mowing and reaping machines were sold.

Begging pardon for this digression, I now proceed to name the obstructions to agricultural progress:—

1. Want of security of tenure by transferable leases.
2. Want of legalised sanction of valuation for tenants' unexhausted improvements.
3. Want of a more uniform practice in valuations, all other things being equal.
4. The law of entail.
5. The cost, delay, and difficulty of land transfer.
6. The want of drainage, local and arterial.
7. Small irregular fields, with too much hedgerow, timber, and ground game.
8. Unsuitable residential and animal accommodation, misplaced homesteads, and ill-shaped farms.
9. The retention of half the kingdom (22,500,000 acres) in permanent pasture, much of it robbed, starved, poor, and unimproved.
10. The want of education.
11. A dislike to change, and a comfortable belief in antiquated customs.

Security of Tenure is one of the most important means for attracting capital. Human nature is alike in town and country. Who, in a town, would effect an improvement with merely annual tenure, or unsecured by a lease, with power to sell or transfer that lease? Without leases London and other great cities would have remained small and antiquated. The nineteen years' lease and the intelligent education of the Scotch farmer and his labourers, have, together, worked well, especially for the landowner; and only require the valuation of tenant's unexhausted improvements to make the system nearly perfect. Mr. Gladstone, in his able speech on the Irish Land Question, assumed that in England tenures were more certain than in Ireland. By courtesy they are, but not by law or contract. In order to satisfy my mind on this point I made inquiries of several of our most eminent land-valuers, whose replies, so kindly given, are as follows:—

1. "I do not know how to answer your question, there being no data upon which to base an opinion. In the Home and Eastern Counties I should say leases were general; in the Midland and Northern Counties the exception. You may take this fact, however, as indisputable, that by far the larger majority of tenants would accept leases if they had the chance."

2. "I cannot give you from any data the extent of land under lease in England, but I do not think it can exceed one-tenth of the cultivated portion. I am very doubtful indeed whether the majority of farm tenants would have leases if they were offered, but this is owing to the present want of capital. Once get the capital that is wanted and leases would be a *sine quâ non*."

3. "There are no means of arriving at any even approximate conclusion as to the proportion of lease-hold to annual tenure. The difficulty in England is to get the tenant to accept a lease."

4. "I consider that four-fifths of the land in England are held on annual tenure, and the remaining fifth held under all sorts of leases, some for the term of seven years, and again for the term of 12, 14, and 21 years. I very recently gave the tenants of a large estate in Lancashire, for which I am agent, the option of holding on as yearly tenants or of accepting leases at 3*s.* per acre more rent than they were asked to pay as yearly tenants: all the tenants accepted the leases at the additional rent."

It is quite true that on certain noble estates, where it is made a point of honour never to change the tenantry against their will, there tenants do not wish for a lease and would decline taking one. The true reason is that they know that they hold at an unvarying or easy rent

rate, with fixity of tenure, and they also know that under leases landowners obtain higher rents than without them; for while now all is quiet and undisturbed in the tenant's case, had they leases there might and probably would arise at the termination of those leases, revaluations or other reconsiderations. "But," said I to a tenant of 1000 acres on such a well farmed noble estate, "supposing that an unjust or oppressive tenant for life should succeed to the estate?" "Oh," said he, "a few instances of wrong-doing would alarm the tenantry; they would change their high farming for a taking-out system, and the estate would soon become deteriorated in value." Again, he said, "The stewards of the estate are well aware of this; so we see no danger of such a kind." They justly observe that the Scotch 19 years' lease (without valuation of tenants' unexhausted improvements) has enormously increased rents, to the landowners' great advantage; and they thus appreciate their own more favourable position.

Notwithstanding these facts, I am still decidedly of opinion that farming should be treated as a business, and not as a favour, and that leases, with a valuation of tenants' unexhausted improvements, would attract a greater investment of capital, and improve the class of tenants. I would strongly advise every one who feels an interest in these matters to peruse a work which is full of valuable evidence on most of the points of our discussion. The information it contains is far more copious than it is possible for me to lay before you this evening; and it becomes, just now, of great practical value, seeing that Government has recognised and is prepared to legalise tenant-right in Ireland. No one can far a moment suppose but that it must very soon become legalised also in England as well as in Ireland.

In 1849 there occurred the late Mr. Philip Pusey's House of Commons' committee on tenant-right. A digest of the evidence was prepared by Messrs. Shaw and Corbet, of the London Farmers' Club. A republication of that valuable document may now be had at Mr. Tuxford's, 265, Strand; or of Mr. Ridgway, 169, Piccadilly, price 3*s. 6d.* It contains the evidence of 50 eminent landowners, land valuers, and farmers, on the following subjects:—

Tenant-right, customs of the different counties, pp. 1 to 55.
Cultivation of the different counties, pp. 56 to 124.
Tenure, pp. 125 to 133.
The necessity of legislative enactment to secure or create capital invested in the soil, pp. 134 to 163.
The laws of entail, and the policy of giving enlarged powers to holders of life estate, &c., pp. 164 to 172.
The general benefit that would follow from a recognised system of compensation for unexhausted improvements, pp. 173 to 186.
Farm buildings, pp. 187 to 190.
Permanent improvements, draining, chalking, marling, or claying, pp. 200 to 214.
Temporary improvements, pp. 215 to 221.
Dilapidations, and the justice of giving compensation to the landowner for injury, as well as to the tenant for improvement, pp. 222 to 234.
Advantage of breaking up inferior grass-lands, pp. 235 to 240.

In 1849, when the foregoing evidence was taken, we had no land drainage and land improvement companies. Now such companies exist, and have at their command an almost unlimited amount of capital waiting for investment, when the laws of entail shall have been reformed, as suggested in the evidence at p. 164. These companies will form the link that will connect the suplus funds of cities with agricultural improvement.

The Laws of Entail.—One-half of England is owned by 150 individuals, and one-half of Scotland by about twelve. In most of these cases the owners are merely tenants for life, fettered by very limited powers, quite inconsistent with agricultural improvement. Some relaxation has been granted by Parliament, but much more is required. I am glad to see that the succession question will be considered by the Government.

Valuation of Tenants' Unexhausted Improvements.—No doubt we shall have for England a legalisation of tenants' unexhausted improvements, and a general but clear definition of them. We know that we have a body of able men as land valuers and land agents, forming a society called the Surveyors' Association. I hope that they will soon come to an agreement as to the most important questions, such as drainage of stiff clays, covered yards, fixed steam machinery, &c. We want uniformity of valuation, other things being equal. Now, I can find valuers and farmers in Essex who don't believe in the deep pipe drainage of stiff tile clays, although they would decline to stop the holes in their flower-pots. I look upon stiff soil deep pipe drainage as almost a permanent improvement, provided the outlets are kept free. Mine, done 25 years ago, are all perfect, and likely to remain so for another century. In light and springy soils the drains require more attention.

Covered and enclosed yards, with paved floors, I look upon as essential to the successful farming of stiff soils. It is a great mistake to suppose that such farms are not stock farms; they will produce stock food abundantly, and with proper management and suitable winter shelter, plenty of stock may be reared and fattened, as I know by experience.

Modern agriculture, with its chemical and mechanical aids, and artificial foods and manures, has become quite a different affair from the primitive pastoral period of the past century, and requires in respect of tenure, concurrent and suitable conditions and valuations, giving confidence and support to the extra capital that must be now invested. The incongruous and inconsistent state of our valuations for tenants' improvements or investments is, as a system, or rather as a want of system, discreditable to us as men of business. In one county every improvement is by custom allowed for, in another not one is taken account of. A farmer in Essex may have expended £10 an acre in the draining and chalking of stiff clays, yet not one farthing would be received by his family should he die, and the farm be let the very next year after the execution of these costly investments.

The Want of Good Farm Roads.—In this age of locomotive steam-ploughing engines, weighing from 6 to 25 tons, a farm can hardly be said to be in fit condition for capital until it has good internal roads. I know of more than one valuable engine stuck fast in the mud and waiting for a dry time.

Agricultural Residences.—Landowners often complain to me of the difficulty of finding tenants with capital to take their farms, forgetting that modern agriculture, with its greatly increased capital, is entitled to suitable conditions, very different from the antiquated arrangements of too many of our south country farmeries. Men of capital seeking for farms often say to me, "I would take that land, but the house and premises are wretched, the land undrained, and the whole affair unsuitable for the profitable investment of capital." If a tenant is to bring a capital of £15 to £25 per acre (which I recommend on arable land, and which is often the case in Norfolk and Lincolnshire), he must be treated as a gentleman, as I know to be the practice on some of our noble estates, where the tenants and their labourers rank high in comparison with neglected districts. That is the way to improve the landowner's rental and to feed the people. Modern farmers with education and capital do not wear smock frocks and dine in the kitchen with their labourers, as was once, and is now in some districts, the custom.

Poor or Neglected Permanent Pasture opposes a great barrier to the investment of capital, the employment of labour, and the production of food for the people; 22,500,000 acres, being one half of our available land, are in permanent pasture, much of it poor, robbed, and unimproved, yielding a wretched produce of probably only 45*s.* per acre. Under cultivation, with modern improvements, an exactly opposite state of things would prevail. It is a mistake to suppose that arable lands cannot be made stock farms.

Trees and Hedgerows must succumb to steam cultivation and modern improvement. I wish that our Board of Trade would give us a return of the miles of hedgerows, their average length per acre, and the number of trees, and their numbers to each acre. The length of open ditches and watercourses would be also desirable.

Game.—The exclusive privilege of sporting would, in many cases, attract tenants of capital. The detested gamekeeper, and too much ground game, often repel capital.

Education.—The want of it, either for our farmers or their labourers, must be a great impediment to successful agriculture. Scotch farmers and their labourers owe much to their long established and general education, dating from the time of John Knox—300 years ago. In this respect they have stolen a long march upon us south countrymen, hence the general prevalence of Scotch valuers, stewards, gardeners, and bailiffs in England and Ireland. England is, however, at length awakening to the importance of education, and I rejoice to see that the matter is taken in hand by our Legislature. I have been told, more than once, by large practical farmers of the old school, that not only was education not required, but that it would spoil their best labourers. Let us hope that this delusion is gradually passing away. What we require in our agricultural labourers and in ourselves is intelligence; and although it is only the Almighty who can give natural talents, man may cultivate and improve them. Certainly the ability to read, write, and cypher, would afford to the labourer, desirous for information and improvement, the means of acquiring both, and thus of becoming a more useful member of society. Ignorance is not bliss, even in agriculture, but knowledge is power.

Not only will education render the labourer much more valuable to his employer, but it will also enable him, if he has talent and a desire for improvement, to emancipate himself from the mere drudgery of labour, and take a better position in society. Several of my best labourers, aged about 45, who have been with me more than 25 years, can neither read nor write, and they all regret it, especially the one who has managed my steam-engine and machinery for the last 20 years, and who could greatly improve his natural talent if able to read the current engineering literature.

The superior intelligence and rapidly increasing power of our American cousins arises from their passionate love of education, their Government and people having always made ample provision for national education by endowment with lands and by liberal taxation. It has been a paying investment, and, but for their vast area of cheap land, and the consequent high wages of labour, we should have lost ground in the competitive race of manufactures, and perhaps warfare. There are more than 120,000 public schools and colleges in the United States, most of them free. Education would also, no doubt, effect a religious and moral change in our labourers, and much diminish the difficulties of the beer-shop question. At present the uneducated labourer's mind is, comparatively, a blank, receiving no impressions from past or passing events, British or foreign; but educate him, and he, like ourselves, would take a lively interest in the world's affairs. The broadsheets of intelligence in newspapers and books would then give him wholesome excitement, and occupy pleasingly, innocently, and profitably, much of that portion of his time which is now injuriously wasted at the beer-shop. We have already a half-penny newspaper in Essex, and I hope that the postal charges on them will be greatly diminished. Everybody in America reads a newspaper; there, newspapers were produced at a cheap rate long before we attempted it.

We must, both landlords and tenants, expect and prepare for great changes in our agricultural practice. Local and arterial drainage, the utilisation of town sewage, the manufacture of Beetroot-sugar or its distillation for spirits, the extensive use of steam for cultivation, and fixed steam machinery, covered homesteads, &c., will necessitate a considerable relaxation in the stringency of leases, and require large additional investments of landowners' and tenants' capital. General and needful agricultural improvements, both by landowners and tenants, might gradually absorb much more than £500,000,000 of additional capital: it would be a safe and profitable investment. This is no exaggeration; I speak practically on the matter. We have nearly 50,000,000 of available acres, besides uncultivated wastes. The mere drainage of the portion requiring it would, according to our best authorities, absorb more than £100,000,000, to say nothing of many other costly landowners' improvements. The tenants' capital increased by £4 per acre would absorb an additional £200,000,000.

On my farm and on many others the acreable sums expended by landowner and tenant are very much beyond the amounts I have specified. There need be no fear of our arriving too suddenly at the expenditure I have named: a host of prejudices bar the way,—let us try and remove them. The multiplication of our population, now numbering 32,000,000 (which 70 years ago were only 10,000,000), will outstrip, I fear, any attempts we may make to provide them with home-grown food.

What a happy country this would be if, by the freedom of agricultural action and by the investment of ample additional capital and intelligence, we could produce our own food as we manufacture our own clothing and other necessaries, and in the act of so doing employ more of the British people, thus diminishing suffering and pauperism and increasing the wealth, strength, and content of our country. Experience has taught me that all this could be profitably done, and I pray that those who have the power may be moved to encourage, by suitable and improved legislation, and by every other means, so desirable a result.

You will agree with me that the quantity of food we can produce must depend upon the quantity and quality of the manure which we deposit in the soil. Admitting this to be so, our country ought to be one of the most productive in the world, for not only do we consume all that we grow, but in addition some £70,000,000 worth (solid and liquid) of human food which we import from foreign nations, in addition to millions' worth of food for our live stock. The results of all this, which now pollute our streams, would, if applied to the soil, produce food enough without foreign imports, and spare our paying £2,000,000 annually for birds' dung from Peru, and taxing the graveyards of the world for osseous remains.

But if we have not yet made the land fat by sewage, we have evidently succeeded in fattening the bed of the Thames by pouring into it for many years the results of all the good things that we consume. There can be no mistake about this, for a French gentleman has succeeded in extracting fat from Thames mud, and it is reported that he has established a factory at Battersea for that purpose. A series of chemical analyses have shown that there is an ample supply of fat on all the mud banks, both on the north and south side of our once salmon stream. Can there be a more bitter satire than this on our national agricultural intelligence? Need we be surprised at this, seeing how many tons of fat pass daily into our river?

In conclusion, this is an unfavourable time for arable land farmers, and many will suffer heavy losses. My balance-sheet for 1869 shows a considerable decline from those of former years, as you will see at foot. The difference would have been greater, but that I sold much of my corn before the heavy fall in price:—

Balance to pay Rent, also Interest and Profit on Tenant's Capital on 170 Acres.

1867	..	..	..	..	..	£427 13 6
1868	..	..	..	..	..	572 11 6
*1867	..	..	..	..	..	773 5 10
1869	..	..	..	..	..	573 11 6
1865	..	..	..	..	..	543 7 4

Let us, then, resolve to amend our agricultural ways, for our own profit, and for the good of our country.

* In 1867 my Wheat crop averaged 7 quarters per acre.

Notices of Books.

A Journey from Madras, *through the Countries of Mysore, Canara, and Malabar.* By Francis Buchanan, M.D.

The History of Eastern India. By M. Martin.

Memoirs of a Map of Hindostan. By Major Rennell.

Indian agriculture, though it has been little changed or improved for 2000 years, nevertheless, in the most productive provinces, surpasses our own farming in the number it supports on a given area. The fertile plain of the Ganges has a population of 60,000,000, at a ratio of 200 to the square mile, or about 20 per cent. more than Ireland. Agricultural production in the plain watered, and often inundated, by that noble river and its numerous tributaries, is only surpassed in China, where a surprising amount of agricultural skill and economy is practised in a less exhausting climate, by a people more industrious and indefatigable than the Hindoo ryot, and where high manuring and deep culvation accompany the use of water in irrigation. Population in India does not stray far from water. On the soft soil of the delta of the Ganges water is both the manurial agent and the substitute for deep tillage. The character of the alluvial soil adapts it to what may perhaps be properly called water-farming. Major Rennell thus describes it:—"In all the sections of the numerous creeks and rivers in the delta nothing appears but sand and black mould, in regular strata, till we arrive at the clay that forms the lower part of their beds. There is not any substance so coarse as gravel, either in the delta or nearer the sea than 400 miles." In this soil the rivers sometimes shift their place and form new channels. Dykes, estimated at 1000 miles in length, have been constructed round certain tracts to preserve them and regulate the flow of water. Islands, 4 or 5 miles in extent, are continually formed and removed in the main stream of the Ganges: and its annual discharge of mud, or fine sand, into the Bay of Bengal was estimated by Sir C. Lyell at 6,368,077,440 cubic feet, which would weigh more than 60 times as much as the Great Pyramid of Egypt.

The richest portion of the inundated district, nearest the Bay of Bengal, comprising 80,000 square miles, has a population of 300 per square mile; while the central districts of Burdwan and Hooghly (including the city of Calcutta) have respectively 593 and 549 per square mile. In England and Wales the corresponding figures are 400 per square mile; and in Staffordshire, one of the most thickly peopled manufacturing counties, 730 per square mile. But Staffordshire, in the absence of fertilising rivers, and owing to the waste of the remains of human food in the towns, produces only 195,299 quarters of Wheat, while the annual consumption is nearly 680,000 quarters.

The hottest season is during May and June; thence to the beginning of October is the period of tropical rains; the "cold" season corresponds to our winter months. The mean temperature of Calcutta is 80° Fahr. The rivers of Bengal sink lowest in their deep channels by the end of April, and then begin to rise, owing to the rains at their sources in the Himalaya. By the end of June the rise in the lower Ganges reaches 15 or 16 feet, or half the total rise; it then progresses more rapidly, and at the end of July this part of the country is under water. In another month the waters begin to abate; and by the beginning of October, when the rains cease, the inundation, which does not sink with the rivers on account of their high banks, goes off rapidly by evaporation.

In the interior of the country, beyond the reach of inundations and of alluvial deposits, the clay soils and those most retentive of moisture are capable of producing some crops, even in the dry season, without irrigation, and it is said that Wheat and Barley would on clays be injured by watering. On the drier, mixed soils these crops, and almost all others, require artificial watering, and in some districts this is effected by wells 300 or 400 feet deep. The Cicer arietinum, a grain given to horses, has the character of bearing drought better than any other cultivated plant.

It will be remembered that the Hindoos live on vegetable food, milk, butter, and fish when obtainable. Rice is the principal crop in the basins of the Ganges, Brahmaputra, and other rivers. When the floods are deep, the cultivation of this crop becomes an aquatic business, and the labourers are sometimes seen wading up to their necks in the rice fields. Some varieties of this plant have acquired a wonderful power of "keeping their heads above water," but they are destroyed if covered for a short time only, as sometimes happens. As a specimen of rice-growing, and of agriculture generally we may hereafter select for description the central tableland of Mysore, between the southern ghauts, which furnishes, if not direct instruction, at least desirable information to the English agriculturist.

Farm Memoranda.

WEST SUSSEX, *March* 24.—There is not much to report at present, everything is in a state of stagnation, the season is very changeable, and few remember having seen the Wheat plant so backward at this date. Some of it has suffered from the sudden changes of weather, and will be too thin, and it is all very weak, and certainly looks badly; many of the fields are like fallow. But still we may expect it to grow rapidly when the weather gets milder, and we may after all have a fair crop. Peas are not yet up, though some have been sown for a long time. Spring corn is now being put in rapidly, and the land works very freely, so that we shall soon be up to the sheep, and in some cases the roots will be off rather too soon, as the cold dry weather has caused a more than usually rapid consumption. Fat stock are being sent to market rather freely, and prices are lower, and the sale is dull, while lean sheep are not much wanted at present. The Clover plants have stood the winter pretty well, and are now beginning to grow.

I suppose the education question is an agricultural subject, but in this part we do not take much account of any public matter; you never hear of any public meeting on any agricultural question in West Sussex. Our active county member has complained that we won't support agitation on the Malt-tax, and the fact is I think we don't care much about it, and as little about the education question. But if I may put in a word upon the latter subject, it is that Parliament had better leave as little power in the hands of local boards as possible, and also define their duties pretty clearly, otherwise the results will be far from satisfactory. I doubt whether those who would compose local boards in country parishes would be altogether well qualified for much work, and some of them may not be much inclined to enforce compulsion if it is permissory. There are yet a good many among us that don't see any need for improvement in the matter, and who will certainly object to the age of 12 being adopted. *G. S.*

The Week's Work.

APRIL 2.—*Spring or Summer Wheat* may still be sown in places adapted for it. In the northern counties it is sometimes sown as late as May. It ripens early, but in late seasons is then liable to injury from frost, on which account the seed should always be carefully tested in a flower-pot to ascertain its vitality. The usual quantity of seed per acre is 2 bushels, but where the harvest was late last year 2½ bushels may be required. Whether drilled or sown broadcast it should be got into a fine seed-bed, and lightly covered.

Barley Sowing should now be finished in our southern counties with as little delay as possible. The budding of the Birch tree is considered the proper time of sowing Barley in Sweden. In Norfolk the old rule runs:—

> "When the Oak puts on his gosling grey,
> 'Tis time to sow Barley night and day."

But there will be some difficulty in applying these old rules this year. Barley is partial to a dry climate and a comparatively dry seed-bed. So essential is this that when the sowing was followed by a heavy fall of rain, we have ploughed the heavier class of soils and sown a second time, to secure a proper seed-bed at the time of sowing and state of the land at brairding. The quality of seed this year is very diversified, the weight in some places being as high as 58 lb. and even 60 lb. per bushel, whilst in other counties it is below 50 lb. per bushel. The usual quantity of seed per acre is from 10 pecks to 4 bushels, but with such differences in the quality the flower-pot test must be the rule; and in very many examples a change of seed is advisable, and more so for late sowing than early.

Spring Tares continue to sow at intervals, as previously directed, for summer mowings and foldings.

Potato Planting continue northward, as directed last month for the southern counties. Owing to the season being later than usual, and more so in some places than in others, planting will doubtless also be later, but every effort should now be made to overtake the lateness of the season. For this purpose the planting of the sets in a fine seed-bed, and harrowing early, "to let the young plants out," are old familiar rules that should be attended to. The Surinam or Yam variety may be planted on a stiffer soil than the common sorts. The Bovinia, or cattle-feeder Potato, introduced last year, promises to yield heavy crops, over 20 tons per acre; but as yet, the price—21*l.* per bushel of 56 lb.—is too high, unless for the growth of seed Potatos for next year. The Potato is very liable to degenerate, more so perhaps than any of the other cultivated plants; but new varieties are readily obtained, and at present a great many new kinds are being introduced from America, Scotland, and other places, and of these, Bovinia, Flourball, and Victoria, for field culture, require favourable notice.

Carrots are usually sown about the beginning of April. The Belgian varieties (large white, yellow, and orange) are preferred for stock feeding. The large orange is the heaviest cropper and the more nutritious. A deep sandy loam is the best soil; very heavy crops have also been grown on peaty soils. The land should be deeply cultivated in the autumn, and manured with not less than 20 tons of farmyard manure. If manured in the spring, it should be a month before sowing. The Carrot is a large consumer of potash, soda, lime, and phosphoric acid. It is also rich in flesh-forming matter, so that nitrate of potash, common salt, superphosphate and guano, are the artificial manures it requires—3 to 4 cwt., in equal quantities, per acre. It is essential that the seed be of last year's growth and fresh. It should be well mixed in sawdust a day or two before sowing, and a peck of Barley or Rye may be added to show the line of the braird in horse-hoeing the first time. About 8 lb. of seed are sown broadcast, and 6 lb. when drilled in, per acre, either on the flat or in stetches from 18 to 24 inches apart, and the seed should be lightly covered with not more than half an inch of mould and rolled.

Sheep Folding on Turnips should now be finished in our southern counties, and in the northern the roots should be pulled and stored on the field, to prevent their running to seed, thus wasting themselves and exhausting the land to no purpose; and besides the green tops are against fattening wedders, ewes with their lambs, and store sheep. No doubt spring growth this year is later, but it won't apply to Turnips, for they will now either run to seed or rot, let the weather be what it may. The lateness of the season greatly increased the consumption of hay and corn last month, and the effect of this in the first and second week of April will be a shorter bite of Grass than usual, and hence a continuance of more hay, cake, and corn; and, as a rule, flocks must have the extra allowance without a grumble. Outdoor sheep, too, consume a greater quantity of food in late cold seasons than in warm early ones; and what is trying more the patience and skill of shepherds this spring is the sudden changes of temperature—such being very much against the general health of sheep, more especially of ewe flocks. *W. B.*

Notices to Correspondents.

EMIGRATION: *An Old Subscriber* writes as follows:—"Can you, or any of your correspondents, kindly inform me how to help four young agricultural labourers to emigrate,—free of expense, if possible. They would prefer Australia?" [It is possible that the publication of this note may be serviceable; but our correspondent should say what is the nature of the assistance he desires.]

Markets.

HOPS.

BOROUGH MARKET, March 31.

Messrs. Pattenden & Smith report that there is more inquiry for all descriptions, late rates being fully maintained. Choice samples of either English or foreign are difficult to be met with, holders of such in all instances standing out for extreme values.

ENGLISH WOOL.

During the past week there has been a moderate business done in English Wool. The price of many classes of manufactured goods show too little margin to induce spinners to buy freely, but, at the same time, when Wools are wanted, sellers seem disposed to insist on full prices; and every day shows more clearly that stocks are very limited compared to past years.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	*s.*	*d.*	*s*	*d.*
FLEECES—Southdown hoggets	.. .. ..	1	1	to 1	2
Half-bred ditto	.. .. ..	1	2	— 1	2½
Kent Fleeces	.. .. ..	1	3	— 1	4
Southdown ewes and wethers	.. .. ..	0	6½	— 1	1
Leicester ditto	.. .. ..	1	2	— 1	3
SORTS—Clothing	.. ..	0	10	— 1	6
Combing	.. ..	1	0	— 1	8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, March 31.

Prime Meadow Hay	75*s.* to 82*s.*	Clover, old	..	..	110*s.* to 126*s.*
Inferior do.	 60	70	Inferior do.	.. ..	80	95
Rowen	 50	65	Prime 2d cut	..	100	110
Inferior do.	.. .. .. —	—	Inferior do.	.. ..	80	90
Straw	 26	30	CHARLES JAMES EASTON.			

CUMBERLAND MARKET, Thursday, March 31.

Sup. Meadow Hay	82*s.* to 88*s.*	Inferior Clover	..	90*s.* to 110*s.*	
Inferior do.	 70	76	New do.	.. ..	—	—
New do.	.. .. —	—	Straw	.. ..	30	34
Superior Clover	.. 123	128	JOSHUA BAKER.			

WHITECHAPEL, Thursday, March 31.

Fine Meadow Hay	76*s.* to 82*s.*	Prime old Clover	..	120*s.* to 130*s*	
Inferior do.	 60	70	Inferior do. do.	..	90	100
Prime New Hay	.. —	—	Prime 2d cut do.	..	—	—
Inferior ..	.. .. —	—	New Clover	..	105	112
Straw	 24	28	Inferior do.	.. ..	80	90

COALS.—March 30.

Hastings Hartley, 15*s.* 3*d.*; Holywell Main, 15*s.* 0*d.*; Walls End Haswell, 19*s.*; Walls End Hetton, 19*s.*; Walls End Hetton Lyons, 16*s.* 9*d.*; Walls End South Hartlepool, 17*s.* 3*d.*; Walls End Tees, 18*s.* 9*d.*; Brancpeth Cannel, 18*s.*—Ships at market, 28; sold, 21; unsold, 7, at sea, 35.

METROPOLITAN MEAT MARKET.—March 31.

Best Fresh Butter	17*s.* per dozen lb.
Second do. do.	14*s.* "

Small Pork, 5*s.* 0*d.* to 5*s.* 8*d.*; Large Pork, 3*s.* 8*d.* to 4*s.* 4*d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, March 28.

The number of Beasts is about the same as last Monday; the prices of that day are fully realised, being an improvement on Thursday's quotations. The supply of Sheep is considerably smaller; the trade is still very dull, and prices are not better than on Thursday. The very few Calves on offer are sold rather dearer. Our

foreign supply consists of 1116 Beasts, 6430 Sheep, 34 Calves, and 10 Pigs; from Scotland there are 207 Beasts; from Ireland, 296; from Norfolk and Suffolk, 1480; and 240 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4 8to5	0	Best Long-wools	5 4to5	6
Best Shorthorns ..	4 6—4	10	Do. Shorn ..	4 6—4	8
2d quality Beasts	3 0—3	8	Ewes & 2d quality	4 4—5	0
Best Downs and Half-breds ..	5 8—5	10	Do. Shorn ..	3 8—4	4
Do. Shorn ..	4 8—5	0	Lambs	—	—
			Calves	4 0—5	8
			Pigs	3 8—5	8

Beasts, 3339; Sheep and Lambs, 23,895; Calves, 36; Pigs, 70.

THURSDAY, March 31.

The number of Beasts on offer is much smaller than on Thursday last, and prices are better than on that day; trade, however, is not brisk, and Monday's quotations are not easily obtained. There are a few more Sheep; trade is slow, but prices generally remain unaltered. Choice Calves are scarce and dear. Our foreign supply consists of 238 Beasts, 1390 Sheep, and 118 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4 8to5	0	Best Long-wools	5 4to5	6
Best Shorthorns ..	4 6—4	10	Do. Shorn ..	4 6	4 8
2d quality Beasts	3 0—3	8	Ewes & 2d quality	4 4—5	0
Best Downs and Half-breds ..	5 8—5	10	Do. Shorn ..	3 8—4	6
Do. Shorn ..	4 8—5	0	Lambs	5 0—5	8
			Pigs	3 8—5	8

Beasts, 641; Sheep and Lambs, 6635; Calves, 138; Pigs, 10.

MARK LANE.

MONDAY, March 28.

There was a short supply of Wheat from Essex and Kent to this morning's market, and factors commenced asking 1s. per qr. advance, with which millers were unwilling to comply; the stands were ultimately cleared, attendance, and in some instances American brought 1s. per qr. more money. Barley was unchanged in value. Beans and Peas were rather dearer. Oats brought last week's rates. Country Flour was a little dearer.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk	White 38—46	Red.....	35—45
— fine selected runs..do.	42—50	Red.....	38—47
— Talavera	53—55		
— Norfolk		Red.....	—
— Foreign	38—52		
BARLEY, grind. & dist. 26to30	30—..	Chev.	39—42
— Foreign .. grinding and distilling	22—25	Malting ..	30—40
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire..	Potato 24—26	Feed	—
— Irish	Potato 23—25	Feed	21—24
— Foreign .....Poland and Brew	21—24	Feed	19—21
RYE	32—38	Foreign ..	33—36
RYE-MEAL, Foreign	—		
BEANS, Mazagan.... 30s. to 37s.	Tick 31—49	Harrow ..	31—49
— Pigeon ....50s. to 56s.	Winds ..	Longved —	
— Foreign	Small 41—43	Egyptian ..	38—40
PEAS, White, Essex, and Kent..	Boilers 32—42	Suffolk ..	35—43
— Maple, 41s. to 45s.	Grey 32—42	Foreign ..	33—37
		Foreign ..	29—31
MAIZE			
FLOUR, best marks delivered.. per sack	36—40		
— 2d ditto	ditto 25—37	Country ..	25—17
— Foreign	per barrel 22—25	Per sack..	29—55

WEDNESDAY, March 30.

Coastwise as well as by rail the receipts of English Wheat have been only moderate. There has been a fair attendance of millers, but the demand has been inactive for both red and white produce; prices, however, have been well maintained. Fair average supplies of foreign Wheat have been offered; the trade has been quiet, but at full prices. The show of Barley has been moderate, and trade firm on former terms. Malt has been quiet, at previous quotations. Oats have been in increased supply and fair request, at full rates. Beans have been firm, and Peas have been quite as dear. Flour has changed hands slowly, at late currencies.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 400	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	7300
Foreign ..	—	4680	21,240	— brls
	400	4680	21,240	

LEEDS, March 30.—We have a fair consumptive demand to-day for Wheat, at fully Friday's advance, being 1s. improvement from last Tuesday. Barleys are also a steady sale, at quite as much money. Beans and other articles as before.

AVERAGES.

	Wheat.	Barley.	Oats.	Peas.
Feb. 19	40s 8d	34s 2d	19s10d	
— 26	40 7	33 9	20 7	
March 5	41 0	33 7	20 8	
— 12	40 9	33 10	20 10	
— 19	41 9	34 4	21 1	
— 26	42 5	34 5	21 2	
Average ..	41 2	34 0	20 9	

SEED MARKET.

There is now great activity in the agricultural seed trade. In spite of the recent wintry weather we have a brisk demand for Clover seeds, and values of all descriptions continue exceedingly firm. Fine samples of new white Clover and of Trefoil seed are very scarce. Rye-grasses, being in very short supply, have advanced 4s. to 5s. per qr.; foreign Italian must be quoted 2s. per bale dearer. Mustard and Rape seed are held with great firmness. Sainfoin seed meets with a ready sale, at the late enhanced rates. Spring Tares are in good request. We have some inquiry for Lucerne seed.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cork Dusts, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen Prices on application

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir Joseph Paxton for the Crystal Palace, Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.
The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS
"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run
"FRIGI DOMO" CANVAS.

Two yards wide	1s 9d per yard run.
Four yards wide	3s 6d per yard.
An improved make, 2 yards wide ..	1s 9d per yard.
An improved make, 3 yards wide ..	2s 8d per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 5½d., 6½d., 7½d., 7½d and 8½d. per yard.
Hessian Canvas, 54 and 72 inches wide, 6½d. and 8½d. per yard; 4d. extra for cut lengths
ELISHA ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom

No. 1, Peel Street, Manchester, 1870.
OUR HORTICULTURAL SHADINGS form a thorough Protection from Winds, Frost, and Hail, whilst at the same time they admit Light and Air. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the kingdom, as well as on the Continent; in fact, are pronounced the only "proper shadings" yet offered to the public against Birds, Wasps, Blight, &c. As a covering for Strawberries, Tulips, Hyacinths, Seed-Beds, Greenhouses, &c., they have no rival. The price being very reasonable, brings them within the reach of every one. With ordinary care they will last for many years. Samples post free on application. DANIEL COLLINGE AND SON

No. 1.—54 inches wide	at 8½d. per yard run.
No. 2.—54 inches wide	at 7d. per yard run
No. 3.—54 inches wide	at 5½d. per yard run.
No. 4.—54 inches wide	at 4d. per yard run.
No. 5.—54 inches wide	at 3½d. per yard run.

In pieces of 20 yards each, or any longer lengths when specially ordered. Netting made in 30 days from Date of Invoice.

RALPH WALLER AND CO., 45, Dale Street, Manchester, Manufacturers of all kinds of GARDEN NETTING, &c.—The seeds as much done every spring to fruit crops by frost has proved to every gardener the absolute necessity of providing some protection to the trees early in the year. If the blossom, in its earliest development, be but slightly weakened by frost, the vitality of the fruit germ is destroyed, and that fruit lost. In this climate, on the average of seven years, there is not more than one year in 19 when the protection is unnecessary. Many fabrics have been tried for this purpose of protection, with more or less success; and we may now say, without fear of contradiction, that we have succeeded in manufacturing the only fabric which is altogether unobjectionable for this purpose. Without unduly nursing, it effectually protects the young germ, and does not impede the action of light and due circulation of air. Some other fabrics do this, and thus weaken the vitality of the tree altogether. Almost every large grower in the three kingdoms can testify to these facts.
The Netting is also make a beautiful shading for Hothouses in summer, and are cheaper than other fabrics on account of their great durability.
Netting (qualities): Nos. 1, 2, 3, in pieces of 30 yards long, 2½ yard wide. Tiffany: in pieces 20 yards long, 30 inches wide
For prices, &c., apply to the above address—45, Dale Street, Manchester

LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES. Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Prospectus free.
Hooper & Co., Covent Garden; Dixon & Co., 483, Moorgate Street; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road West, Chelsea.
BENJAMIN LOOKER, Inventor and Sole Manufacturer, Kingston-on-Thames.

F. J. BRETSCHLER'S PATENT FUMIGATOR.—16 MEDIUMS 9 inches diameter, 155; 72 inches deep, £15 5; 81 inches .. £16 10; 96 inches .. £18 15; 11 inches deep, £2 2; 13 inches .. £2 10s

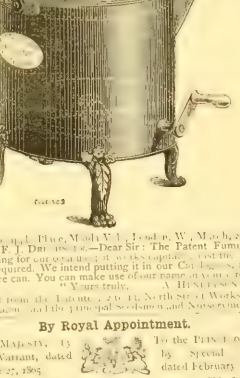

"Pentonville Place, Moorfields, London, W., March 28, 1870.
"To Mr. F. J. Bretschler.—Dear Sir: The Patent Fumigator we intend keeping for our own use, and have ordered another one to-day, and have long required. We intend putting it in our Conservatories, and shall push it all we can. You can make use of our name in any of your circulars.
"Yours truly, A. HENDERSON & SON."
To be had from the Patentee, 9 to 11, North Street Works, Finsbury Square, London, and of the principal Seedsmen and Nurserymen

By Royal Appointment.
TO HER MAJESTY, by Special Warrant, dated December 27, 1865
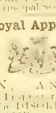
TO THE PRINCE OF WALES, by Special Warrant, dated February 10, 1860.
DAY, SON, AND HEWITT, Medical and Sole Importers of the STOCKBRIDGE'S MEDICINES for DISORDERS in HORSES, CATTLE, CALVES, SHEEP, and LAMBS.
No. 1 MEDICINE CHEST, containing Seven Quart Bottles of the Genuine Compound, admirably adapted for Horses, Cattle, Calves, Sheep, and Lambs, with Complete Guide to their Treatment. Price £2 10s. carriage paid.
No. 2 MEDICINE CHEST, containing the Extract Gascony Powder, Ball Drench, Iron Bowl, and Red Cordial, with Shilling Key to Unlock. Price £2 10s. carriage paid.
Every Stockowner should send for DAY, SON, AND HEWITT'S Work on Farriery. Large Edition, 2s. 6d.; or free by post for 33 stamps. Small Edition, 1s.; or free by post for 13 stamps.
DAY, SON, AND HEWITT, 22, Drury Street, Baker Street, London.

Vases and Fountains, for the Garden and Conservatory.
ANDREW HANDYSIDE AND CO., Britannia Iron Works, Derby, and 32, Walbrook, London.
Five large Sheets of Designs and Price List free for six stamps.

ORNAMENTAL SHELLS (Mother-o'-Pearl), from the China Seas, for SALE: suitable for Shell-Houses, Rockwork, Grottoes, or Garden Walks, &c. On receipt of Post-office Order, or postage stamps for 5s., a Bag, containing about 2500 Shells, weighing 1 cwt., will be delivered free to any address in London.
Address J. M'COLLOUGH, Drury Buildings, Water Street, Liverpool. A liberal allowance on order, for 1 ton and upwards.

CHEAP PAVING TILES.—A Manufacturing Firm have a considerable Stock of PLAIN and ENCAUSTIC TILES, more or less damaged in the process of manufacturing, that they would be willing to DISPOSE OF, at prices below those of the commonest description of Paving materials. To landed proprietors these Tiles are invaluable for the floors of Cottages, Farmhouses, &c., and can be supplied at a very low rate.
Address T., Post Office, Broseley, Salop.

IRON HURDLES (Silver Medal of the Royal Agricultural Society):
SHEEP, 5s. 6d.; CATTLE, 4s. 9d.; OX, 5s. 11d.
List by post. GATES and FENCING of every description.
St. Pancras Iron Work Company, Old St. Pancras Road, London, N.W.

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps. HIRAM AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
J. JONES AND SONS, 35, King Street, Cheapside, London, E.C.
Manufactory, 6, Hatton Wall, Holborn.

JAMES BOYD AND SONS, HORTICULTURAL BUILDERS and HEATING ENGINEERS, Paisley, N.B.
CONSERVATORIES, GREENHOUSES, VINERIES, FORCING HOUSES, PITS, and every description of Horticultural Building, manufactured in Wood or Iron by Steam-power Machinery, and erected in any part of the United Kingdom. Manufacturers of Hot-water Apparatus for Heating Churches, Mansions, Warehouses, &c.
Plans and estimates on application.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or equivalent

	2-inch.	3-inch.	4-inch.
Coiled sheet .. .. per yard	0 11	1 5	1 11
ELBOWS .. .. No. 12 on list, each	1 1	2 1	2 9
TEE PIPES .. .. No. 33 on do. ,,	2 0	3 0	4 0
SYPHONS .. .. No. 23 on do. ,,	1 0	1 9	2 0
VALVES .. .. .. ,,	1 10	11 0	12 0

GEORGE ROBINSON, Dial Iron Works, Stourbridge.
London Warehouse, 16, Grand Junction Wharf, Faddington Basin.

West of England, Ireland, and Wales.

VINCENT SKINNER, Sons & Co., Bristol, HOT-HOUSE BUILDER AND HOT-WATER APPARATUS MANUFACTURER (formerly Partner with J. Weeks & Co.)
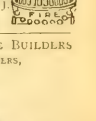

439 BOILERS at WORK

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 353, Old Kent Road, London, S.E.
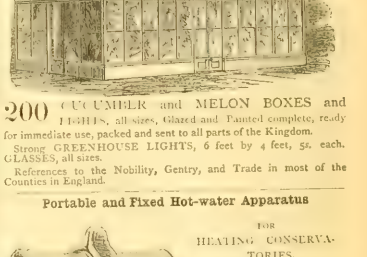

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each. GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England.

Portable and Fixed Hot-water Apparatus
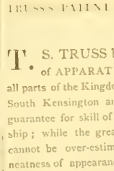

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c., with
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.
T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society a South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras"
BATH and GAS WORK ERECTED in TOWN or COUNTRY
The Trade supplied
Price List, Full Special Estimates awarded on application to T. S. TRUSS, C.E., Sole Manufacturer, Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder, Friar Street, Blackfriars Road, London, S.E.

BY ROYAL LETTERS PATENT.

AN INDESTRUCTIBLE BOILER AT LAST !!!

J. WEEKS AND CO.'S "PATENT DUPLEX COMPENSATING ARRANGEMENTS" of their UPRIGHT TUBULAR BOILER are marvels of SAFETY, SIMPLICITY, DURABILITY, and ECONOMY, and must be seen to be appreciated.

One fact has long been established, viz. : that, for its POWER, WEEKS'S UPRIGHT TUBULAR has never been equalled ; and now, for its SAFETY, "THE PATENT DUPLEX COMPENSATING IMPROVEMENTS" have placed it beyond the possibility of a failure.

In addition to the high standard which WEEKS'S UPRIGHT TUBULAR has always maintained, this Patent has elevated it to a rank and interest quite unattainable by any other Boiler.

NOTE THE ADVANTAGES !—NOTHING EQUALS THEM.

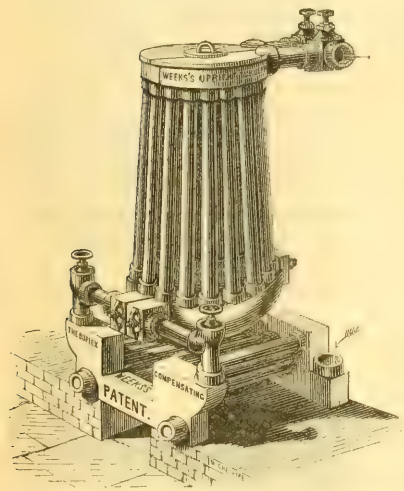

1. The average DURABILITY of this Boiler is 20 years, and we are prepared to issue an INSURANCE POLICY and GUARANTEE its safety for 15 years.
2. A break-down or failure is IMPOSSIBLE.
3. This Boiler may justly be styled INDESTRUCTIBLE.
4. Perfect SAFETY is guaranteed.
5. ALL SEDIMENT can be removed without emptying the Apparatus.
6. This Boiler can be instantly converted into TWO DISTINCT HALVES, one left WORKING and the other taken away.
7. These Boilers being of CAST IRON, are infinitely more durable than Wrought-Iron Boilers.
8. Any ordinary labourer can periodically CLEAN OUT THE BOILER, without displacing a brick.
9. One of Weeks's Upright Tubular Boilers is equal in SAFETY to two ordinary Boilers, and will do the work of a dozen, which has been proved over and over again.
10. In case of repairs to ONE SECTION of the Boiler, the REMAINING PORTION can be left in operation.
11. This Boiler being in SECTIONS can be passed through any doorway 1 foot 6 inches wide.
12. Weeks's Upright Tubular is the ONLY BOILER that offers these advantages, which cannot fail to be of the utmost interest and benefit to the Horticultural World.

J. WEEKS AND CO.,
HORTICULTURAL BUILDERS AND HOT-WATER APPARATUS MANUFACTURERS,
KING'S ROAD, CHELSEA, LONDON, S.W.

☞ WEEKS'S "BOOK of DESIGNS" (12th Edition) free by post.

BOILER INSURANCE and GUARANTEE POLICY issued on completion of contract.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

PATRONIZED BY

HER MOST GRACIOUS MAJESTY THE QUEEN

ON FORTY-FIVE DIFFERENT OCCASIONS.

H.R.H. THE PRINCE OF WALES,

THE KING OF THE BELGIANS.

THE EMPEROR OF THE FRENCH,

THE EMPEROR OF RUSSIA.

AND MOST OF THE NOBILITY, CLERGY, AND GENTRY IN THE UNITED KINGDOM.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last six years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—

1st. Simplicity of Construction, every part being free of access.

2nd. They are worked with far greater ease than any other Lawn Mower. **3rd. They are the least liable to get out of order.**

From the fact that these Machines are so well known in Great Britain and Ireland, also on the Continent of Europe, upwards of 56,000 being now in use, T. GREEN AND SON do not deem it necessary to trouble the Public with a List of the numerous Testimonials they have received from time to time, but would add

THEY ARE THE ONLY MACHINES IN CONSTANT USE AT

THE ROYAL HORTICULTURAL SOCIETY'S GARDENS, SOUTH KENSINGTON.
THE ROYAL BOTANIC GARDENS, REGENT'S PARK.
THE CRYSTAL PALACE COMPANY'S GARDENS, SYDENHAM.
BUCKINGHAM PALACE GARDENS.
MARLBOROUGH HOUSE.
THE HYDE PARK GARDENS.
THE WINTER PALACE GARDENS, DUBLIN.
THE DUBLIN BOTANIC GARDENS.
THE LIVERPOOL BOTANIC GARDENS.
THE LEEDS ROYAL PARK.
THE HULL BOTANIC GARDENS.
THE BOTANIC GARDENS, BRUSSELS.
THE SUNDERLAND PARK.
THE PRESTON PARK.

AND IN MOST OF THE PRINCIPAL PARKS, SQUARES, ETC., IN THE UNITED KINGDOM.

HORSE, PONY, AND DONKEY MACHINE.

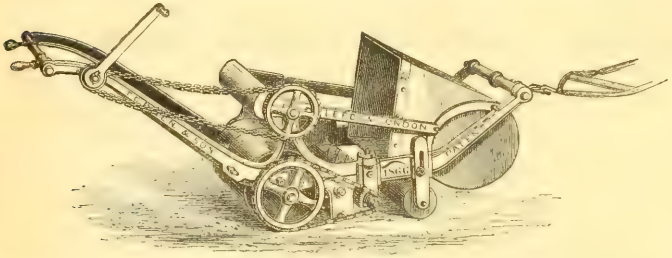

PRICES of HORSE, PONY, and DONKEY MACHINES, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness.

DONKEY AND PONY MACHINES.

To cut 26 inches	.. ..	.. £13	0 0
,, 28 inches	.. ..	.. 15	0 0
,, 30 inches	.. ..	.. 17	0 0
Leather Boots for Donkey	.. ..	0	18 0
Ditto for Pony	.. ..	1	2 0

HORSE MACHINES.

To cut 30 inches	.. ..	.. £21	0 0
,, 36 inches	.. ..	.. 24	0 0
,, 42 inches	.. ..	.. 27	0 0
,, 48 inches	.. ..	.. 30	0 0
Leather Boots for Horse	.. ..	1	6 0

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away, or in any way damaging the Machine.

HAND MACHINE.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned unconditionally.

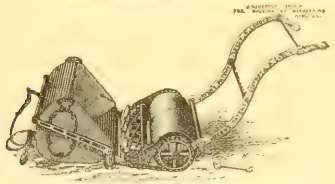

PRICES OF HAND MACHINES.

To cut 10 inches	.. £3 10 0	To cut 18 inches	.. £7 10 0
,, 12 inches	.. 3 10 0	,, 20 inches	.. 8 0 0
Suitable for a Lady.		,, 22 inches	.. 8 10 0
To cut 14 inches	.. £5 10 0	,, 24 inches	.. 9 0 0
,, 16 inches	.. 6 10 0	*Suitable for two persons.*	

Suitable for one person

Packing Cases are charged at the following low rates, viz.—for the 10 inch Machine, 3s; 14 and 16 inch, 4s; 18 and 20 in. 5s; 22 and 24 inch, 6s. Parties providing the Machines with Lawn Mowers are recommended to purchase the cases in which to store them away when not in use, to prevent them from getting damaged; if returned, two-thirds will be allowed for them.

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Ireland, and Scotland.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.
T. GREEN AND SON did not exhibit at the Paris Exhibition, 1867.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again at pleasure, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any description of person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

N.B. All Orders are executed on the day they are received, either from our Leeds or London Establishment.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	.. ..	.. £4	0	0
20 ,,	22 ,, ...	.. 3	2	6
16 ,,	17 ,, ...	.. 2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

Every Machine and Roller is warranted to give entire satisfaction, and, if not approved of, can be returned at once unconditionally.

T. G. AND SON have a large quantity of LAWN MOWERS in stock (upwards of 2000) at their Leeds and London Establishments; also various other kinds of HORTICULTURAL and AGRICULTURAL IMPLEMENTS, GARDEN SEATS and CHAIRS, FOUNTAINS, VASES, PLAIN and GALVANIZED WIRE NETTING, &c.

Having very extensive Premises in London, we are in a position to do all kinds of Repairs there, as well as at our Leeds Establishment.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.

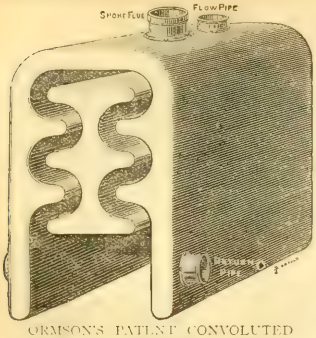

ORMSON'S PATENT CONVOLUTED BOILER.

ROYAL GARDENS, KEW.

The Nobility, Gentry, and Horticulturists generally, about to build new Conservatories and Hothouses, are respectfully solicited to inspect the splendid range of new Hothouses recently erected in Kew Gardens, by

HENRY ORMSON.

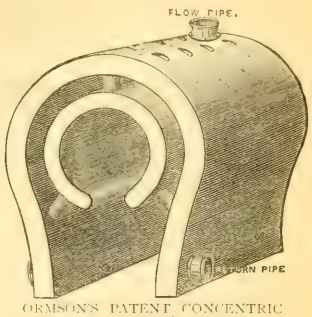

ORMSON'S PATENT CONCENTRIC SADDLE BOILER.

MANY OF ORMSON'S PATENT WELDED WROUGHT IRON BOILERS have been substituted for **CRACKED CAST IRON TUBULAR BOILERS** during the past winter months, and have been found **MUCH MORE ECONOMICAL IN CONSUMPTION OF FUEL.** Prices on application. Please to state length and diameter of pipe to be heated.

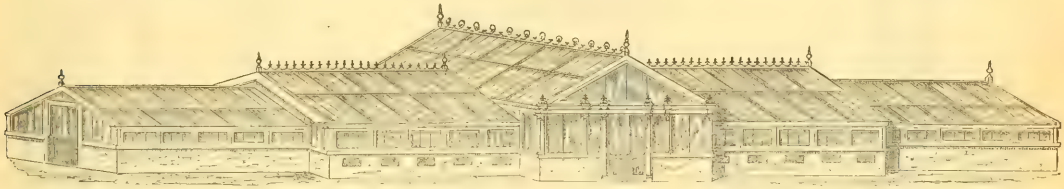

HENRY ORMSON

Is determined, with the aid of **NEW AND VALUABLE MACHINERY**, and an experienced **STAFF AND WORKMEN**, so to improve and facilitate the **MANUFACTURE OF HORTICULTURAL STRUCTURES** that they may be built **OF THE BEST MATERIALS** at a **MUCH LOWER PRICE** than has been possible heretofore.

ROYAL HORTICULTURAL GARDENS, SOUTH KENSINGTON.

TO BE SEEN IN THE INCLOSED ENTRANCE ARCADE,

ORMSON'S DESIGNS FOR WINTER GARDENS, CONSERVATORIES, HOTHOUSES, GREENHOUSES, VINERIES, PEACH CASES, ETC.

TO BE SEEN IN THE OPEN EASTERN ARCADE,

ORMSON'S PARADIGM FRUIT AND PLANT HOUSES,

THE BEST CHEAP STRUCTURES OF THE PRESENT TIME.

SURVEYS MADE

IN ANY PART OF THE COUNTRY,

AND

PLANS PREPARED

FOR THE

GENERAL ARRANGEMENT AND LAYING-OUT OF

STRUCTURAL GARDENS.

APPLY FOR

ORMSON'S

BOOK OF DESIGNS.

SENT BY POST

Henry Ormson
Horticultural Builder &
Hot Water Apparatus Manufact.
Stanley Bridge, Kings Road,
Chelsea, London. S.W.

DESIGNS

AND

ESTIMATES

PREPARED FOR

FIRST-CLASS

CONSERVATORIES,

TO SUIT ANY STYLE OF ARCHITECTURE.

ALSO

ARCHITECTS'

DESIGNS

CARRIED OUT.

JOHN WRIGHT & COMPANY,

MANUFACTURERS OF

SYRINGES, HOSE FITTINGS, AND GARDEN PUMPS,

TO THE TRADE,

30, BROAD STREET, ISLINGTON, BIRMINGHAM.

A liberal Discount to the Trade and Merchants.

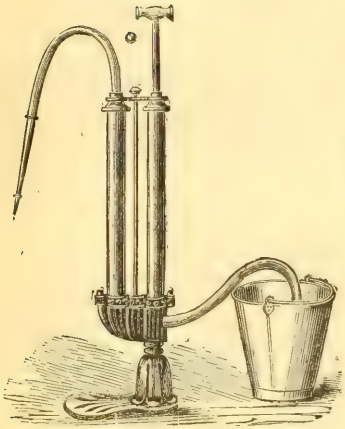

IMPROVED GARDEN PUMP.
Price 30s. each.

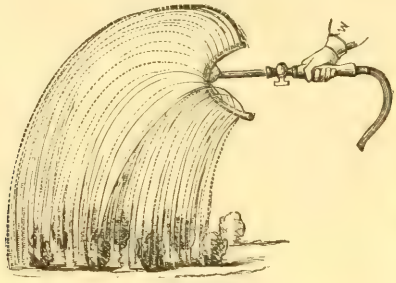

WRIGHT'S
PATENT LEAMINGTON SHOWER,
Waters 6 feet at a time most effectually.
¾-in. price with one 24 in. straight and one 14 in. circular head, 15s.
With one circular head only, 10s. 6d.
⅝-in.—price with one 18 in. straight and one 12 in. circular head, 12s.
With one circular head only, 7s. 6d.

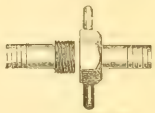

No. 10.
BRASS UNION JOINT.
½ in., 1s.; ⅝-in., 1s. 2d.; ¾ in., 1s. 6d.; 1-in., 2s. 6d.

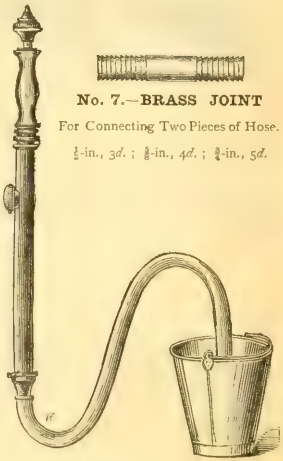

No. 7.—BRASS JOINT
For Connecting Two Pieces of Hose.
½-in., 3d.; ⅝-in., 4d.; ¾-in., 5d.

WRIGHT'S IMPROVED
HYDRONETTE.
No. 1, 12s. 6d. each; No. 2, 15s.; No. 3, 20s.; No. 4, 25s.; No. 5, 30s.

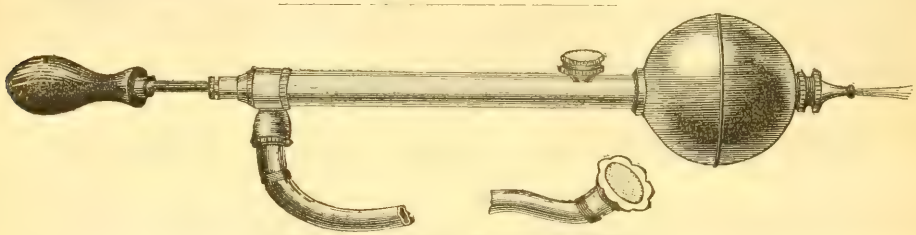

SUCTION PIPE LEADING TO PAIL OR CISTERN.

THE CHELTENHAM GARDEN ENGINE (Page's Patent). Price, in case, 21s.

Is extremely light and portable, weighing only 3lb. 1oz.; and throws a perfectly continuous stream of water a distance of over 35 feet. Very little force is required to work it, and it does not at all wet the dress of the person using it, thereby rendering it better adapted for Ladies' use than any other Engine yet introduced. *Should it at any time work a little stiff take off the Ball and drop a little oil into the Barrel.*

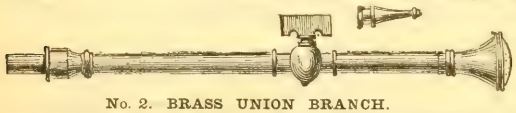

No. 2. BRASS UNION BRANCH.
½-in. × 11 in., 3s. 9d.; ⅝-in. × 16 in., 5s.; ¾-in. × 16 in., 6s.; 1-in. × 16 in., 9s.

No. 1.—BRASS SINGLE BRANCH.
½-in., 2s. 3d.; ⅝-in., 3s. 3d.; ¾-in., 4s. 9d.

IMPROVED GARDEN SYRINGES.

Nos. 11, 12, and 13.
No. 11—1 × 12 in. with 1 Rose and Jet, 4s. 6d.
,, 12—1¼ × 14 in. ditto ditto 6s. 6d.
,, 13—1½ × 16 in. ditto ditto 8s.

No. 15.—BRASS SPRING SPREADER.
½-in., 1s. 6d.; ⅝-in., 1s. 9d.; ¾-in., 2s. 6d.

No. 14.
No. 15.
No. 16.
No. 17.
No. 18.

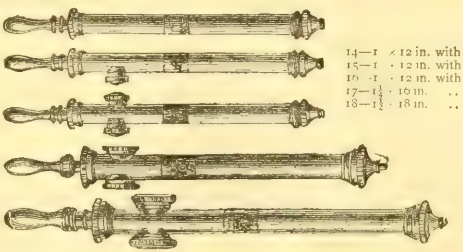

14—1 × 12 in. with Jet only .. 4s. 6d.
15—1 × 12 in. with 1 Rose and Jet, 5s.
16—1 × 12 in. with 2 Roses and Jet, 5s. 6d.
17—1¼ × 16 in. .. .. .. 8s.
18—1½ × 18 in. .. .. .. 10s. 6d.

N.B.—These are recommended as the strongest and best Syringes that are made

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

		Each
6 ft. by 4 ft. Lights, 2 in thick, unglazed	£0	5 6
" " Primed and Glazed with 10 oz. Sheet	0	11 6
" " with stout portable Box, not Painted	1	3 6
" " Painted four coats, and Handles on	1	8 6
" " Packed and Delivered in Railway van	1	10 6
6 ft. by 8 ft., Double Lights, do.	2	15 6
GREENHOUSES	Per ft. super	
Woodwork only Prepared and Fitted	0	0 6
" Primed and Glazed with 16 oz. Sheet	0	0 6
" Delivered, and Fixed with Ironwork	0	1 6
" Painted four coats, two sides, ready for use	0	1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E C

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, BOUDOIRS, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c

Pettit's Conical *Tubular Boiler*

HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in Stock.

WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED SPIRALS, also Elliptic, Bridge, from 24s. each

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 52s. 6d. each

CAST and WROUGHT IRON PORTABLE BOILERS, on Stand, or use without backwork, from 70s. each

Portable Boiler *Elliptic Boiler*

Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size

INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water tight

Coke, of the very best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground Street, London, S.E. Surrey side Blackfriars Bridge. Price List on application

GREEN'S PATENT TUBULAR HOT-WATER BOILERS

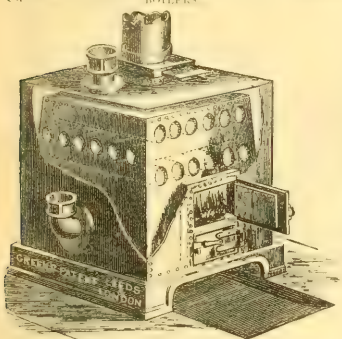

The following are the advantages of these Boilers:—

1st. They require no setting in brickwork.
2nd. They are complete in themselves, having perfect means of regulation.
3rd. They take up little room, and can be put in places inaccessible to other Boilers.
4th. They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th. Any number of Elbows and Returns can be annexed to the Boilers by means of T pipes.
6th. By means of mud doors they can be readily cleaned out when required.
7th. The chimney is made of cast iron, which can either be taken through a roof or turned into a flue to meet the convenience of the situation that it may be fixed in.

They are warranted to be the most Economical Boilers extant

Price Lists free on application

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

T. G. MESSENGER, MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH.

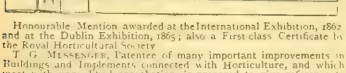

Honourable Mention awarded at the International Exhibition, 1862 and at the Dublin Exhibition, 1865; also a First-class Certificate by the Royal Horticultural Society.

T. G. MESSENGER, Patentee of many important improvements in Buildings and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed.

Any House fitted, single or double, with or without putty. The mode adopted by T. G. Messenger for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented.

HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof and sides, so much the glass were entirely removed, or one placing the plants in the external atmosphere.

T. G. MESSENGER'S BOILER possesses all the advantages of the Tubular and saddle combined, has hollow furnace bars, requires but a shallow stokehole, exposes as much surface to the direct action of the fire as can possibly be obtained, the whole of which can be easily cleaned; and it is an important fact, that out of upwards of 500 now at work made upon the improved principle not one has cracked.

T. G. MESSENGER'S VALVE (single or double) is effective, simple, easy to work, and as durable as the pipe to which it is attached.

Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended. A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 13 stamps.

E. AND F. CROOK'S POULTRY APPLIANCES of every description, as supplied to Her Majesty, the Nobility, Gentry, Farmers, &c., at home and abroad.

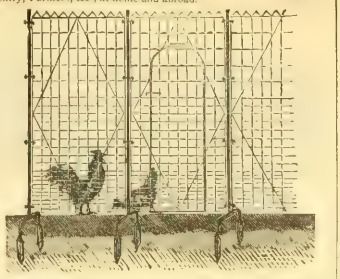

Improved make, extra strong GALVANISED IRON WIRE POULTRY FENCES to be fixed to wood uprights or iron standards. Price 10s per panel of 6 feet square. Doorways, 4s 6d. each

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UNIVERSAL PORTABLE PLANT PRESERVER.

After looking at the Illustration it is unnecessary to give a long description of this new and invaluable article, suffice to say that it is Glazed without Putty and constructed of Wood and Iron. When it is done expeditiously. The Ventilation is perfect, and the Lights are arranged to open on either side. It can be moved in lengths.

Carriage paid to any Station in England when orders amount to £10

PRICES.

Width.	Height at Ridge	4 feet Length	8 feet Length	12 feet Length
12 Inches	11 Inches	9s.	15s.	20s.
18 "	13 "	11s.	19s.	29s.
24 "	15 "	14s.	25s.	37s.
30 "	21 "	20s.	38s.	56s.
48 "	30 "	27s.	50s.	74s.

Loose ends, 9d., 1s., 1s. 6d., 2s. 6d., and 3s. 6d. each

A remittance or reference must accompany the orders.

Larger sizes can be had, suitable for Forcing, Tiles, 5 and 6 feet wide

To Agriculturists.

GREEN'S PATENT HIGH-PRESSURE BOILERS, with Inverted Cylinder Engine combined. Simple and substantial in construction. The Boiler can be used for Steaming purposes, specially adapted for Farm use.

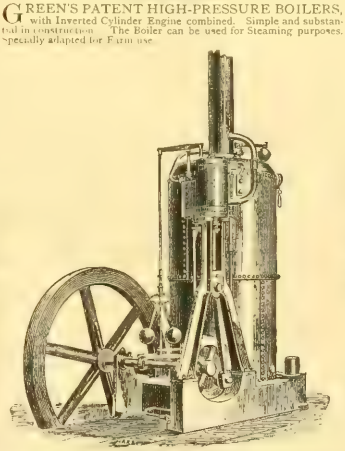

The above Engines and Boilers occupy a very small space, requiring no brickwork or foundation. They are sent out in complete working order, ready for immediate use. From 1 to 40-horse power always in stock or in process of manufacture. Drawings and prices free on application to

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WIRE NETTING (Galvanised after made) for GAME and POULTRY.—CROGGON AND CO., Albion Wharf, 10, Upper Thames Street, London, E.C. 2, Gorse Farm, Liverpool. 50, George square, Glasgow.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax

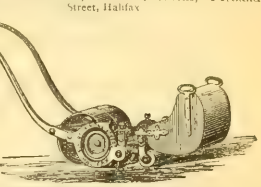

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue, and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

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From Mr W. GILBERT, *Lansford Street, Rugby.*

"I am perfectly satisfied with the Earth, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a kettle of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

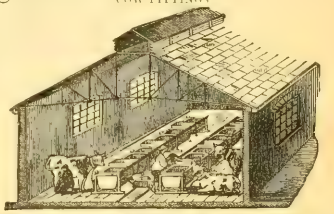

The advantages are—Portability, neat fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

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IS THE ONLY LAWN MOWER THAT CUTS WET or LONG GRASS WITHOUT CLOGGING,

Thus enabling the man to work it in the morning or cool of the day, instead of waiting for the Grass to dry, and toiling under the heat of a mid-day sun. It is very easy to work, and will preserve its perfect cut whilst traversing over mounds or sloping banks.

"Far superior to any of ours."—Vide *The Field*

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Illustrated Catalogues, Opinions of the Press, and Testimonials post free on application.

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"Every Cottage should be provided with a Water Tank." *Dwards*

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N.B. Open Tanks of different sizes packed one in another to save carriage.

PORTABLE ENGINES, from 4 to 30-Horse Power.

THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

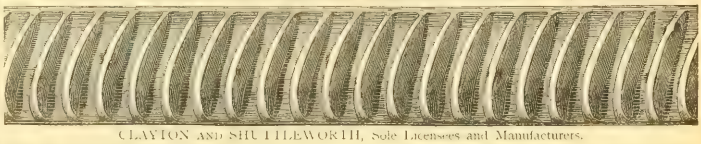

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

CANVASS are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast Steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent free by Post on application to

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BY HER MAJESTY'S ROYAL LETTERS PATENT.

TO MEET A WANT WHICH HAS BEEN LONG FELT BY THE HORTICULTURAL PUBLIC,

MAW & CO.'S PATENT IMPERISHABLE TERRA-COTTA PLANT MARKERS

Are offered as a cheap and permanent substitute for WOODEN and ZINC TALLIES for the Labelling of Plants in Pots and in the Open Border, and for suspending to Roses, Orchids, Ferns, Fruit Trees, &c. These Labels, unlike Wood and Zinc, combine perfect durability with a lasting legible inscription, and form an elegant adjunct to the Garden and Conservatory for the naming of Horticultural and Botanical Collections. They are also invaluable for the labelling of Wine Cellars and for general use in situations where other materials are perishable by damp.

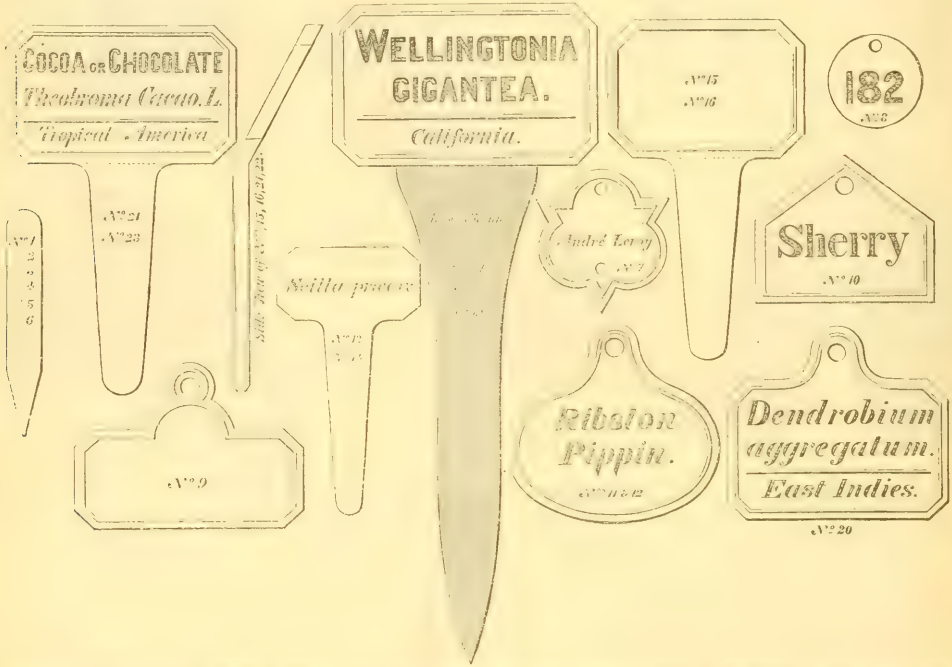

Commended by the Royal Horticultural Society, 14th December, 1869, Royal Horticultural Society's Gardens, Chiswick, July 11, 1870.

Can be procured from the Manufactory, or through any Nurseryman, Seedsman, or Ironmonger.

No. 1	.. .. ..	3¼ by ½ inch.	No. 6	.. .. ..	3 by 1 inch.	No. 11	.. .. ..	3½ by 3 inch.
No. 2	.. .. ..	4½ .. ½ ..	No. 7	.. .. ..	2½	No. 12	.. .. ..	5 .. 4½ ..
No. 3	.. .. ..	5½ .. ½ ..	No. 8	.. .. ..	1 inch diam.	No. 13	.. .. ..	2 .. 4 ..
No. 4	.. .. ..	6 .. ½ ..	No. 9	.. .. ..	3½ by 2½ inch.	No. 14	.. .. ..	3 .. 5 ..
No. 5	.. .. ..	7 .. ½ ..	No. 10	.. .. ..	1 .. 2½ ..			

Can be seen in use at the Royal Gardens, Kew; the Gardens of the Royal Horticultural and Royal Botanic Societies, Battersea Park, the Royal Botanic Garden at Edinburgh; and Botanic Gardens, Glasnevin, near Dublin, &c.

Directions for writing on the Labels with Black-lead Pencil.—Apply a little white-lead paint thinly over the part to be written upon, and *whilst wet*, write with a hard fine-pointed black-lead pencil. The writing will be perfectly indelible and unaffected by wet immediately the paint is set.

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A liberal discount to the Trade.

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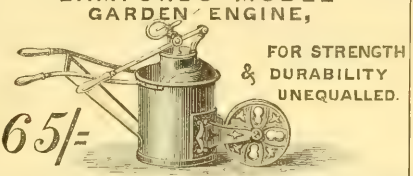

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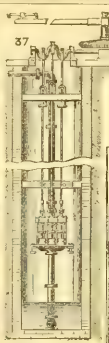

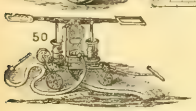

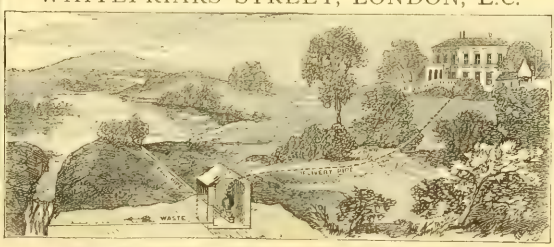

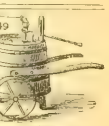

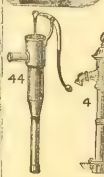

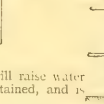

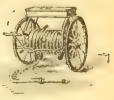

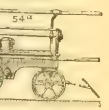

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

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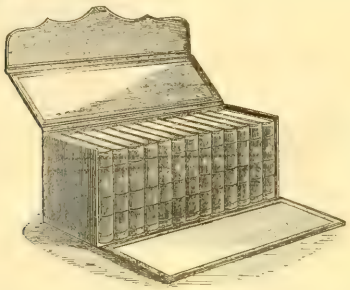

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COAL SCOOPS.—WILLIAM S. BURTON has 400 different Patterns of COAL SCOOPS on SHOW, of which he invites inspection. The Prices vary from 1s. 9d. to 150s. Plain Black open Scoops, from 1s. 9d.; ditto ditto, nine-lined, from 4s. 6d.; covered Box Scoops, from 7s. 6d.; Turnished Box Scoops, from 10s. 6d.; ditto ditto, with fancy gold ornamentation, from 19s.; highly finished and ornamented, and fitted with imitation ivory handles, from 30s. to 150s. There is also a large selection of Wooden Coal Boxes, with iron and brass mountings. WILLIAM S. BURTON confidently asserts this to be the largest, and at the same time the best and most varied, Assortment in the World.

WILLIAM S. BURTON, Furnishing Ironmonger, by appointment, to H.R.H. the Prince of Wales, sends a CATALOGUE, containing upwards of 700 Illustrations of his unrivalled Stock, with Lists of Prices, and Plans of the 20 large Show-rooms, post free.—39, Oxford Street, W.; 1, 1 A, 2, 3, and 4, Newman Street; 4, 5, and 6, Perry's Place; and 1, Newman Yard. With the present RAILWAY FACILITIES the cost of delivery Goods the most distant Parts of the United Kingdom is trifling. WILLIAM S. BURTON will always, when desired, undertake delivery at a small fixed rate

Sauce.—Lea & Perrins'.

THE "WORCESTERSHIRE," pronounced by connoisseurs "the only good Sauce," improves the appetite and aids digestion. Unrivalled for piquancy and flavour.

Ask for LEA AND PERRINS' SAUCE.

Beware of imitations, and see the names of LEA & PERRINS on all bottles and labels.

Agents—CROSSE AND BLACKWELL, London; and sold by all Dealers in Sauces throughout the World.

BREAKFAST.—EPPS'S COCOA. GRATEFUL and COMFORTING.

The *Civil Service Gazette* remarks:—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. EPPS has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills."

Made simply with boiling water or milk. Sold only in ½ lb., 1 lb. and 5 lb. tin-lined packets, labelled:—

JAMES EPPS AND CO., Homœopathic Chemists, London.

COCKLE'S ANTIBILIOUS PILLS, THE SAFEST FAMILY APERIENT.

In boxes at 1s. 1½d., 2s. 9d., 4s. 6d., and 11s.

COCKLE'S ANTIBILIOUS PILLS, in use the last 69 years for INDIGESTION.

In boxes at 1s. 1½d., 2s. 9d., 4s. 6d., and 11s.

COCKLE'S ANTIBILIOUS PILLS, In use the last 69 years for BILIOUS AFFECTIONS.

In boxes at 1s. 1½d., 2s. 9d., 4s. 6d., and 11s.

COCKLE'S ANTIBILIOUS PILLS, in use the last 69 years for LIVER COMPLAINTS.

In boxes at 1s. 1½d., 2s. 9d., 4s. 6d., and 11s.

COCKLE'S ANTIBILIOUS PILLS, THE OLDEST PATENT MEDICINE.

In boxes at 1s. 1½d., 2s. 9d., 4s. 6d., and 11s.

CORNS and BUNIONS.—A Gentleman, many years tormented with Corns, will be happy to afford others the information by which he obtained their complete removal in a short period, without pain or any inconvenience.—Forward address on a stamped envelop to F. KINGSTON, Esq., Ware, Herts.

SHANKS'S PATENT LAWN MOWERS FOR 1870.

UNDER THE PATRONAGE
OF
HER MOST GRACIOUS MAJESTY
THE QUEEN,

AND MOST OF THE
PRINCIPAL NOBILITY
OF
GREAT BRITAIN.

The Patent Improvements recently introduced give Shanks's Machine several important advantages possessed by no other Lawn Mower.

PATENT DOUBLE-EDGED SOLE PLATE, WIND GUARD, &c.

The steady and continued increase in the Annual Sale of Shanks's Lawn Mowers forms the most convincing testimony of the value and success of the Improvements recently introduced.

THE FIRST PRIZE MEDAL
OF THE
INTERNATIONAL EXHIBITION,
LONDON, 1862.

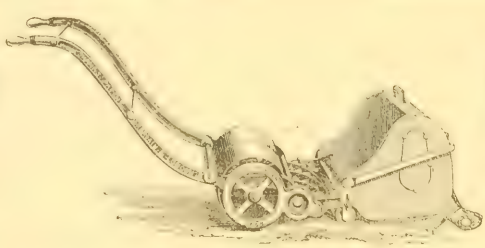

THE FIRST PRIZE SILVER MEDAL
OF THE
UNIVERSAL EXHIBITION,
PARIS, 1867.

ALEXANDER SHANKS AND SON, [illegible] LIST OF LAWN MOWERS [illegible] in intimating that among all the Exhibitors of Lawn Mowers at the Universal Exhibition [illegible] was awarded [illegible] a Medal.

A. S. AND SON have, in addition to the Patent Double-Edged Sole-Plate and Wind-Guard, made great alterations and improvements in their Machine. These alterations, which were introduced two years ago, have now undergone an effectual trial, and the result has been so successful as to enable the Patentees to offer a Machine which far excels any other that has ever yet been offered, whether for ease in working or durability. The new Machine is perfectly silent in working, and has only to be compared with other Machines, when its superiority will be at once seen and understood.

PRICES INCLUDING CARRIAGE TO ANY RAILWAY STATION OR SHIPPING PORT IN THE KINGDOM.

SHANKS'S NEW PATENT HAND MACHINE.

	Light Work		Heavy Work
8-inch Machine..	£3 0 0	10-inch Machine..	£6 10 0
10-inch Machine..	3 10 0 *For a Lady.*	12-inch Machine..	7 15 0 *For a Man and a Boy.*
12-inch Machine..	4 10 0	20-inch Machine..	8 10 0
14-inch Machine..	5 10 0 *For a Boy.*	24-inch Machine..	9 0 0 *For Two Men.*

The Hand Machines are all with Silent Movement.

SHANKS'S NEW PATENT PONY and DONKEY MACHINE.

	Horse Power, Double Cylinder	Pony Power
25-inch Machine..	£12 10 0	.. ..
28-inch Machine..	14 10 0	.. ..
30-inch Machine..	16 0 0	.. ..

Silent Movement, [illegible]

Boots for Pony, 20s. per pair. Boots for Donkey, 15s. per pair.

SHANKS'S NEW PATENT HORSE MACHINE.

	Light Lawn Pattern	Heavy Pattern
30-inch Machine..	[illegible]	.. ..
36-inch Machine..	£26 0 0	£30 0 0
42-inch Machine..	[illegible]	40 0 0
48-inch Machine..	28 0 0	40s. per set.

Silent Movement, 20s. extra. Boots for Horse, 26s. per set.

SHANKS'S PATENT LAWN MOWERS are in daily use in the Royal Gardens at Kew, Windsor, Buckingham Palace, Hampton Court, Osborne, and Balmoral; in the Gardens of the Royal Horticultural Society South Kensington, in the Grounds of the Crystal Palace Company at Sydenham, in Hyde Park, in Victoria Park in Battersea Park, and in many hundreds of the principal Gardens in the Kingdom, as well as abroad, where their merits have been fully proved and their success firmly established. *Every Machine warranted to give ample satisfaction, and if not approved of, can be at once returned.*

GARDEN ROLLERS,

SUITABLE FOR LAWNS, BOWLING GREENS, DRIVES, GRAVEL WALKS, &c.

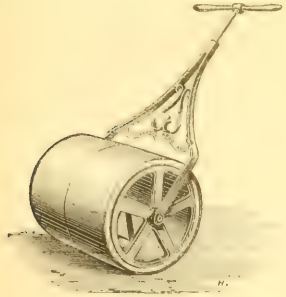

These Rollers are made in halves and are much easier to cart than when cast in one piece. The edges are rounded off to prevent any marks being left on the Walks or Grass, a counterbalance handle is fitted to each Roller.

PRICES.

Roller, 18 Inches Diameter,	24 Inches Long	£3	0 0
.. 20	27	3	10 0
.. 24	30	4	10 0
.. 28	33	6	0 0
.. 30	36	7	10 0

ROLLERS FITTED WITH SHAFTS SUITABLE FOR A HORSE OR PONY.

Roller, 30 Inches Diameter,	33 Inches Long	£10	0 0
.. 30 .. .. ×	36	10	15 0
.. 32	42	11	18 0
.. 36	48	13	0 0
.. 30	60	15	10 0
.. 30	72	17	10 0

ALEXANDER SHANKS AND SON,
DENS IRON WORKS, ARBROATH; and 27, LEADENHALL STREET, LONDON, E.C.

27, Leadenhall Street is the only place in London where intending purchasers of Lawn Mowers can choose from a Stock of from 150 to 200 Machines.
All sizes kept there, whether for Horse, Pony, or Hand Power.

Editorial Communications should be addressed to "The Editor:" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 15.—1870.] SATURDAY, APRIL 9. {Price Fivepence. Stamped Edition, 6d.

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NOTICE.—FRIDAY NEXT being GOOD FRIDAY, the GARDENERS' CHRONICLE AND AGRICULTURAL GAZETTE will be Published the day previous (the 14th inst.), at 2 P.M.

ADVERTISEMENTS for that Week much reach the Office not later than WEDNESDAY MORNING

SAFFRON WALDEN HORTICULTURAL SOCIETY.—By kind permission of the Right Hon Lord BRAYBROOKE, the SUMMER EXHIBITION will be held in the Park, adjoining the Abbey. Agricultural Society's Show, on WEDNESDAY and THURSDAY the 15th and 16th of June, when £112 10s, including Silver Cups, will be awarded in Prizes Open to all England. Schedules forwarded on application to

THOS. D. GREEN, Hon. Sec.

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870 PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, with Forms of Entrance, on application to

P. C. BUCKLE, Secretary, Peterborough

THE GREAT VINE at HAMPTON COURT. Fruiting plants of the true HAMPTON BLACK HAMBURGH GRAPE, 7s. 6d each; good plants, 5s and 3s. 6d. each. T. JACKSON AND SON, Nurseries, Kingston, Surrey.

Grapes the First Year.

FINE CANES, that will bear from 10 to 12 bunches, at once, 6d 6d each

RANSLEY TANTON, F.R.H.S., The Nurseries, Epsom.

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JOSEPH MEREDITH can supply all the best varieties, both for fruiting and planting. DESCRIPTIVE CATALOGUE post free on application; also CIRCULARS of MEREDITH'S Vine, Pine, Peach, and Plant MANURE.

The Nurseries, Turf Hall, Gresford, Wrexham, Liverpool

THOMSON'S WHITE LADY DOWNE'S GRAPE.—Plants of this remarkable White Grape, the latest keeping in cultivation, are now being sent out. The Canes are strong and thoroughly ripened. Immediate orders are respectfully requested.

Trio of 2-yr. canes, 15s.; 1-yr. canes, 6s. each

THOMAS METHVEN, Leith Walk Nurseries, Edinburgh.

Pines, Fruit Trees, &c.

B. S. WILLIAMS has a very fine stock of all the best kinds, true to name, and in splendid condition. SHRUBS, FOREST and ORNAMENTAL TREES of every description. Prices on application.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Delicious New Grape.

MR. WILLIAM BULL has a large stock of good, strong, well-ripened CANES of MADRESFIELD COURT BLACK MUSCAT, at 15s and 21s each

☞ Thousands of LILIUM AURATUM, of all sizes, to offer.

Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

WEBB'S PRIZE COB FILBERTS, and other PRIZE COB NUTS and FILBERTS. LISTS of these varieties from MR. WEBB, Calcot, Reading.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, Vines, and Figs. RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

NEW VERBENAS, Eckford's, unrivalled. CATALOGUES ready.

JOHN KEYNES, Castle Street, Salisbury.

GEORGE EDWARDS'S CATALOGUE of SPRING FLOWERS is now ready, and can be had on application at his Seed Establishment, 1, King Street, Castlegate, York.

NEW DAHLIAS, unrivalled. CATALOGUES ready.

JOHN KEYNES, Castle Street, Salisbury.

Hollyhocks.

MESSRS. DOWNIE, LAIRD, AND LAING have to offer several thousands of the finest varieties in cultivation, at 6s, 12s, and 18s per dozen; or 50s, 75s, and 100s per 100

West Coates Nursery, Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.

Foot's Cray Nursery, Sidcup Hill, Kent.

Rose Catalogue.

JOHN CRANSTON'S ROSE CATALOGUE for 1869 is now ready, and will be sent post free on application

The Nurseries, King's Acre, near Hereford.

NEW ROSES of 1870. Strong, vigorous plants now ready. DESCRIPTIVE PRICED LISTS on application to

EWING AND CHILD, The Royal Norfolk Nurseries, Norwich.

NEW ROSES for 1870.—Strong plants, ready early in March, in 30 best varieties, price 10s. DESCRIPTIVE LIST free on application.

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FRENCH IMMORTELLES in great variety. Lowest price to the Trade on application.

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Crown Nursery, Reading.

Chrysanthemums.

THE CHRYSANTHEMUM, and HOW TO GROW IT. See ADAM FORSYTH'S CATALOGUE for 1870, forwarded to all applicants for one stamp.

Brunswick Nursery, Stoke Newington, N., and 130, Mount Street, Grosvenor Square, W.

WEBB'S NEW GIANT POLYANTHUS, Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the varieties, with double PRIMROSES of different colours; AURICULAS, both Single and Double; with every sort of Early Spring Flowers LIST on application to WEBB, Calcot, Reading.

Golden Feather.

H. CANNELL begs to remind all who wish to have an edging of this elegant yellow, Fern like plant, and so have it in perfection with other bedding plants, that now is the identical time to sow it (not earlier), and to any parent free for 13 stamps.

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich

Verbenas, Verbenas.—6s. per 100; 50s. per 1000.

WILLIAM BADMAN offers PURPLE, WHITE, SCARLET, and CRIMSON, well-rooted Plants, from store pots, 6s. per 100; 50s. per 1000. Terms, cash.

Cemetery Nursery, Gravesend.

JAMES FAIRHEAD AND SON, SEED GROWERS and MERCHANTS, 7, Borough Market, London, S.E., announce to their Friends and Others that their DESCRIPTIVE PRICED LIST of DAHLIAS is now ready, and can be had, post free, on application

MR. R. TEUTSCHEL, Colchester, Importer of Japanese and Australian Plants, Bulbs, Seeds, &c. Consignments on hand of PRIMULA JAPONICUM, AKRIDES JAPONICUM, ADIANTUM, PALM, DENDROBIUM JAPONICUM, &c. AILANTUS GLANDULOSA, choice plants, 6 to 10 feet high, 30s. per 100

VANDA CŒRULEA.—Well established healthy plants, for SALE or EXCHANGE.

WILLIAM MASON AND SONS, Nurseries, Bristol.

To the Trade only.

VIOLA CORNUTA, var. BLUE PERFECTION.—Plants now ready, 15s. per dozen

THOMAS CRIPPS AND SON, Nurserymen, Tunbridge Wells.

To the Trade.

T. THORNTON, Bagshot, Surrey, has to offer a large quantity of good clean SEED of KALMIA LATIFOLIA, and RHODODENDRON, from named varieties. Price on application

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FRESH SEED of CUPRESSUS LAWSONIANA and THUJA LOBBII, in any quantity. For prices, see pages 74 and 75 of our TRADE CATALOGUE, which may be had post free.

THOS. CRIPPS AND SON, Nurserymen, Tunbridge Wells.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

ORNAMENTAL PLANTING.—A large number of Specimen PINES, HOLLIES, and YEWS on Sale, at 50 per cent. under Nurserymen's Catalogue prices.

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SEEDS, of choicest quality. ASTERS: French Perfection, Dwarf Chrysanthemum-flowered, Emperor and Victoria's STOCKS: German Ten-week and Brompton; WALLFLOWER—Double: CINERARIA, CALCEOLARIA, PRIMULA FIMBRIATA, mixed; PETUNIA, double, at 1s. per packet.

See previous Advertisements, or what is better still, J. SCOTT'S PRICED DESCRIPTIVE SEED CATALOGUE, free on application.

J. SCOTT, The Seed Stores, Yeovil, Somerset.

TO THE TRADE. Finest GIANT ASPARAGUS, 4-yr. old, 25s. per 1000

DIELYTRA SPECTABILIS, fine (in pots), 25s. and 30s. per 100.

CLEMATIS JACKMANII (in pots), 75s. per 100

W. CUSHFORTH, Nurseryman, Leeds.

WANTED, CABBAGE PLANTS, in quantity. State kind, and lowest price for cash, to

GEO. J. WOOLLETT, Nurseryman, Caterham.

WANTED IMMEDIATELY, ORCHID FLOWERS, ROSES, GARDENIAS, CAMELLIAS, CALLA ÆTHIOPICA, or any kind of choice CUT FLOWERS. Any one having the above to dispose of should send them to W. F. BOFF, Florist, Holloway, Islington, London.

STOVE PLANTS. Wanted, by a Gentleman who has recently erected a small house, a quantity of well-grown moderate sized plants. Any party whose collection requires thinning or is desirous of disposing of any of the above at a moderate price, will be good enough to write to Mr. G. DEARING, Buckhurst Hill, Essex.

Carter's Index, April 9.

CARTER'S GENUINE SEEDS. See p. 513. 237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See page 513. 237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 513. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 513—237 and 238, High Holborn, London, W.C.

CARTER'S NEW ONIONS. 237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES. 237 and 238, High Holborn, London, W.C.

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to

ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

Established 1806.

T. HANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application

Seed Warehouse, 24, Cockburn Street, Edinburgh.

Nurseries Brunstain Glen, Musselburgh.

To Seed Importers, Nurserymen, &c.

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Office, 9, Lower Thames Street, London, E.C.

Spring Planting.—To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Aucubas, and other hardy Trees, Shrubs, and Evergreens, is now published, and can be had on application. Milford Nurseries, near Godalming.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation; also such novelties as can be recommended.

Highgate Nurseries, London, N.

Farm Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of FARM SEEDS, grown from carefully selected stocks.

Garden Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown from carefully selected stocks

EVERY GARDEN REQUISITE KEPT in STOCK at CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

SUTTONS' HOME GROWN FARM SEEDS. For present prices see p. 501 of this week's Paper.

SUTTONS' GRASS SEEDS for ALL SOILS. For present prices see p. 501 of this week's Paper.

SUTTONS' GRASS SEEDS for PASTURES, 20s. to 32s. per acre, carriage free.

SUTTONS' GRASS SEEDS for PARK GROUNDS, 18s. per bushel, carriage free

SUTTONS' GRASS SEEDS for GARDEN LAWNS, 1s. per lb., or 20s. per bushel, carriage free

SUTTONS' GRASS SEEDS for CROQUET GROUNDS, 1s. per lb., or 20s. per bushel, carriage free.

Royal Berks Seed Establishment, Reading

Agricultural and Garden Seeds.

SPECIAL OFFERS of TURNIP, MANGEL, and other AGRICULTURAL and GARDEN SEEDS on application to

JAS. FAIRHEAD AND SON, Seed Growers and Merchants, 7, Borough Market, London, S.E.

Agricultural Seed.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL SPRING CATALOGUE of TURNIP, MANGEL, and other AGRICULTURAL SEEDS is now ready, and will be forwarded on application.

Samples grown, and prices very low.

MANGEL WURZEL, of extra choice stock, saved from extra selected full grown transplanted roots; and other AGRICULTURAL SEEDS of choicest quality. See Special LIST, free on application to

J. SCOTT, The Seed Stores, Yeovil, Somerset.

APRIL WHEAT for SEED, 66 lb. per bushel, grown in the New Forest, a good change for all lands, may be had at 60s. per quarter, of

Mr. WM. DICKINSON, New Park, Lymington, Hants.

GRAYSON'S GIANT ASPARAGUS, very fine 2-yr. roots, 3s. 6d. per 100, 21s. per 1000.

STEPHEN BROWN, Seedsman, &c., Weston-super-Mare.

JERUSALEM ARTICHOKE ROOTS.—A quantity of the above for Sale.

EDWARD SANG AND SONS, Nurserymen and Seedsmen, Kirkcaldy, N.B.

BOVINIA, or New Cattle-Feeder Potato.—Price, &c., apply to the specially appointed agents.

JAMES DICKSON AND SONS, 102, Eastgate Street, Chester.

Seed Potatos.

JAMES FAIRHEAD AND SON, 7, Borough Market, London, S.E., offer EARLY HANDSWORTH, SHAW, MYATT'S PROLIFIC, PRINCE of WALES, and other POTATOS. Prices on application

Seed Potatos.

H. AND F. SHARPE have still in stock most of the principal sorts of Early and Late SEED POTATOS, which they can offer at low figures

Seed Growing Establishment, Wisbech

To the Trade.

WINDSOR and LONG-POD BEANS, SANGSTER'S No. 1, and BADMAN'S IMPERIAL PEAS, &c., on offer, at advantageous prices.

FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

KNAPHILL NURSERY,

WOKING, SURREY.

ANTHONY WATERER

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ABIES ALBERTUS, 5 to 9 feet, 30s to 60s per dozen. Transplanted April, 1869

ABIES DOUGLASII, 6, 7, 10 to feet, 7s 6d. to 10s 6d. each. Transplanted August, 1868

ABIES ORIENTALIS, 5, 6, and 7 feet, 7s 6d to 21s Splendid plants, moved April, 1869, 10 to 12 feet high, 15 and 20 feet in circumference

ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £5, £7 10s, to £12 10s per 100.

The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbrasiliana, &c , large numbers, many of them 20 and 30 years' growth.

CEDRUS DEODARA, 5 to 6 feet, 60s per dozen; 7 to 8 feet, 84s per dozen; 10 to 12 feet, 10s 6d to 21s each, and upwards We have several thousands of these large Deodaras All have been removed since August, 1868; many since April, 1869

CEDRUS SARGENIA, 6 to 7 feet, 42s to 60s per dozen; 8 to 10 feet, 7s 6d. to 10s 6d. each. All removed last September, 1868

CEDRUS LEBANON, 6, 7, to 10 feet. Moved September, 1868.

CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s to 10s. 6d. each.

" " ARGENTEA, 3 to 4 feet, 21s. and as much in circumference, 7s 6d to 10s 6d each

" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s 6d to 21s

JUNIPER, CHINESE, 4 to 5 feet, 42s per dozen, £15 per 100; 5 to 6 feet, 60s per dozen, £20 per 100; 7 to 8 feet, 7s 6d to 10s 6d each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high

PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, to 10 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.

PICEA NORDMANNIANA, 5, 6, to 8 feet, 21s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, 10 to 15 feet high.

PICEA LASIOCARPA.—Hundreds of most beautiful plants, 4, 5, 6, 8, and 9 feet high. All removed 1868-69.

PICEA MAGNIFICA, 3, 4, and 5 feet.

PICEA PINSAPO, 4, 5, 6, and 7 feet, 21s to 63s each. Some grand plants, 10 to 15 feet high, transplanted April, 1869

THUJA AUREA, beautiful specimens, 3, 4, 5, and 6 feet high: 10 to 20 feet in circumference This plant originated in this Nursery, and our stock is unsurpassed.

THUJA GIGANTEA, 5, 6, 10 to 13 feet high Moved August, 1868

THUJA LOBBII, 8 to 9 feet high, and as much in circumference; transplanted April, 1869

THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s to 63s per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868

WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s 6d to 10s 6d each; 6, 7, 8, and 9 feet, 21s to 42s each. Transplanted in August

PINUS AUSTRIACA, 6 feet, 5 feet round, 7s 6d each; 7 feet, 1868

PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft round, 10s 6d to 21s each

YEWS, the COMMON ENGLISH 4, 5, 6, 7, 8, 10, and 12 feet high

The buds, all constantly removed; invaluable where immediate effect is sought

YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.

YEWS, IRISH, handsome plants, up to 10 feet high

HOLLIES.—The stock of Hollies at this Nursery is, we believe, the largest to be met with in England, and comprises Bushes, as well as ordinary sizes, together, many thousands of the following varieties:—

HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet

HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference.

HOLLY, GOLDEN VARIEGATED, 4, 5, and 6 feet

WATERER'S HOLLY.—The variety originated in this Nursery we have hundreds 4, 5, and 6 ft high, 12 and 15 ft circumference.

PERRY'S WEEPING HOLLY.—Standards, 10s 6d. to 21s each.

HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869.

HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868.

HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868-9:—

HODGINS',	ALTACLARENSIS,
YELLOW BERRIED,	MYRTIFOLIA,

4, 5, 6, and 8 feet high

STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number.

N B —Purchasers of Hollies may select from a stock occupying at the present moment considerably over 6 acres of ground; finer or better rooted plants cannot be wished or obtained. The prices are fair and reasonable

BOX, Green and Variegated, 4, 5, 6, to 8 feet.

BOX, do. do., fine pyramids, up to 8 feet.

BAYS, standards and pyramids

LAURUSTINUS, standards.

AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high.

AUCUBA JAPONICA, Berried, hundreds, 1½ to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards.

AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and far more extensive than, anything of its kind to be met with in England, considerably over 50 acres of land being devoted to their cultivation We shall be pleased to supply—

RHODODENDRONS, nice bushy plants, from layers, named kinds, £5 per 100, £40 per 1000 A dozen sent as sample on application

RHODODENDRONS, the finer kinds, by name, from £7 10s to £12 10s per 100, and upwards

RHODODENDRON PONTICUM, good plants for Cover, from £1 to £15 per 1000

STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 30 to 30 years old, with heads varying from 15 to 30 feet in circumference. There is probably no kind better adapted for standards than that we have of ponticum, plants of which can be supplied to Rotten Row. We have also Rhododendrons, standards, of many other kinds.

RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 10s per 100 Sample on application Large and handsome plants by the 1000, 4 to 8 feet high

AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.

AZALEAS, common kinds, £5 per 100.

AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference.

KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £15 per 100

ANDROMEDA FLORIBUNDA, £5 to £12 10s per 100, and upwards

HARDY HEATHS, a very fine collection, in every plant a specimen, and all removed in 1869, from 20s to 30s per 100

ERICA CARNEA, the winter blooming, or mud, heath

ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening.

SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, several with berries, 12s to 18s per dozen

As well as the above, the Knap Hill Nursery contains upwards of 200 Acres of ordinary NURSERY STOCK of superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.

A PRICED and DESCRIPTIVE CATALOGUE will be forwarded on application. Purchasers to any extent are strongly recommended to make a personal inspection of our stock, and obtain the prices on the spot. No Catalogue can fairly describe many of the plants we offer.

The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.

N B —There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

NEW PLANTS.

WILLIAM BULL, F.L.S.,

BEGS TO INTIMATE THAT HIS

CATALOGUE OF NOVELTIES FOR 1870

Is now in the Press, and will be issued shortly. It contains descriptions and prices of many New Plants offered for the first time, including the celebrated GODWINIA GIGAS, the new white Cypripedium, C. NIVEUM, the lovely blue-berried PSYCHOTRIAS two new scarlet-flowered VITIS, a new hardy LILY, with variegated foliage, from Japan; new DRACÆNAS, ARISTOLOCHIA RINGENS, &c.

Mr. WILLIAM BULL has the pleasure to announce that he has made arrangements with Messrs. John Salter & Son to send out the fine stock of their SEEDLING JAPANESE and other new CHRYSANTHEMUMS.

Messrs. John Salter & Son are retiring from business in consequence of the Metropolitan District Railway Company requiring their Nursery, and their entire stock of new CHRYSANTHEMUMS is in the hands of Mr. WILLIAM BULL. All orders for them, that have been taken by Messrs. John Salter & Son, will be executed by Mr. W. BULL on precisely the same terms as if sent out from the Versailles Nursery.

Mr. W. B.'s CATALOGUE of NOVELTIES for 1870 (now in the Press) contains descriptions of the NEW CHRYSANTHEMUMS above alluded to.

ESTABLISHMENT FOR NEW AND RARE PLANTS, KING'S ROAD, CHELSEA, LONDON, S.W.

NEW PLANTS FOR 1870.

B. S. WILLIAMS

Has much pleasure in offering the undernamed NEW PLANTS, which will be ready for distribution on May 1, next.

New Summer Bedding Plant.

PERISTROPHE ANGUSTIFOLIA AUREO-VARIEGATA.—This very elegant Acanthad is a native of the mountains of Java, and was awarded a First Class Certificate by the Floral Committee this spring. The leaves are ovate-lanceolate, bright orange in the centre, and margined with dark green; the habit is of a dwarf and compact, and B. S. W. has all ready proved it to be a most useful and effective plant in the summer flower garden; as a pot plant it is very beautiful, and although the flowers are not remarkable for size, their bright mauve-purple colour forms a striking contrast with the orange colour of the leaves. Price 10s 6d

Superb New Bedding Plant.

VIOLA CORNUTA VAR. PERFECTION.—B. S. W. has much pleasure in offering this superb plant to the public, and feels in the manner in which it has been tested both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dusky purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed it resembles a gigantic V. cornuta in habit, and whilst retaining its profuse blooming qualities producing flowers which almost rival our Florist Pansies for size and substance. This plant was awarded a First Class Certificate by the Floral Committee, September 25, 1869. Price 2s 6d. each, 24s. per dozen, 70s. per half hundred, 100s per 100.

Azalea Grand Monarch.

A superb new and distinct variety, suitable for exhibition or early forcing purposes; the habit is compact and dense, of medium growth, and a profuse bloomer; flowers 3 inches in diameter, of good substance and perfect outline, the lobes are perfectly round and smooth, and in colour deep pink, shaded with warm rose towards the margins; in addition, the upper lobes are densely spotted. Price 21s. each; a few extra-sized plants, 42s. to 63s each

Verbena Mauve Queen.

This very elegant variety possesses a good constitution, and is not subject to attacks of mildew and other diseases, which so many of the new forms of this plant are (and which has led to the almost total banishment of Verbenas from the parterre); in growth it is somewhat robust, and as a bloomer, most profuse; the trusses, which have a good size, and are well above the young shoots, and the flowers are a beautiful mauve in colour, and yield a most delicate perfume. It can be highly recommended for bedding purposes. Price 2s 6d. each

New Fuchsias.

B. S. WILLIAMS has much pleasure in being able to offer the following five varieties of this favourite plant; they are all of good habit, and thoroughly distinct, and cannot fail to give general satisfaction:—

BIRD OF PARADISE.—Tube and sepals scarlet, well reflexed corolla, very regular, and soft, delicate rose in colour. 10s. 6d. each.

FORMOSA.—Tube slender, and, as well as the sepals, bright scarlet; corolla double, very regular and compact, deep violet, the outer petals rosy red, elegantly flaked with light violet. 10s. 6d. each.

HOLLOWAY RIVAL.—This is probably one of the most distinct forms yet sent out; tube and sepals bright red, well reflexed corolla, very long petals of great substance, and rich deep violet in colour. 10s 6d each.

STRIATA PERFECTA.—A charming and very effective variety; tube and sepals waxy white; corolla bright carmine, striped with broad lines of pure white. This variety is not only exceedingly handsome, but totally different from any other variety in cultivation 10s. 6d. each.

TRIUMPHANS.—A superb double variety; tube and sepals rich crimson, reflexed from the base; corolla large and very regular, petals intense violet, suffused at the base with crimson. 10s. 6d. each The set, 42s

BENJAMIN S. WILLIAMS, VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

1870.

J. W. WIMSETT'S

NEW PLANT CATALOGUE (108 pages)

Is now ready, and will be forwarded, Post Free, on application.

It contains extensive LISTS of ORCHIDS, STOVE and GREENHOUSE PLANTS, TREE FERNS, AZALEAS, CAMELLIAS, NEW BEDDING PLANTS, WILLS' NEW HYBRID and other PELARGONIUMS, SHOW and FANCY GERANIUMS, RHODODENDRONS suitable for cold and exposed situations, and New and Handsome PALMS, suitable for Drawing-room and Dinner-table Decoration.

For descriptions of these see *Gardeners' Chronicle* for February 19, 1870. The plants there mentioned were a portion of Mr. WIMSETT'S extensive Collection, and were supplied to one of the London Club Houses which has long been held in high repute for the elegance of its dinner-table decorations. They were, on this occasion, the most graceful ever witnessed, and the only instance on record where Palms have been used exclusively for the above purpose.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W., *December* 10, 1869.

SIR,—I am directed by the Council of this Society to convey to you their thanks for the grand display of Flowers you made at the Gardens here on the occasion of the visit of his Majesty the King of the Belgians.—I remain, Sir, yours faithfully,

JAMES RICHARDS, Assistant Secretary.

To J. W. Wimsett, Royal Ashburnham Park Nursery, King's Road, Chelsea.

BALLS and PARTIES furnished with Plants of every description. A large stock of Ornamental-foliaged Plants always kept for the purpose.

CONSERVATORIES furnished, by the year or otherwise, on the most reasonable terms.

All kinds of DINNER-TABLE DECORATIONS sent out to any part of London, and arranged in the most modern and approved style, and of the most choice flowers of the season.

CUT FLOWERS sent out loosely, or arranged into bouquets by competent and tasteful persons.

BRIDAL, OPERA, and other BOUQUETS furnished on reasonable terms.

ASHBURNHAM PARK NURSERY, KING'S ROAD, CHELSEA, S.W.

J. WILLS, F.R.H.S., *Manager.*

LEUCOCARPUS ALATUS.

B. S. WILLIAMS

Has much pleasure in offering fresh SEEDS of this extremely useful plant for winter decoration. When well grown it is very ornamental, its long racemes of snowy fruits forming a beautiful contrast to those of the celebrated hybrid Solanums, and for which the Leucocarpus is a most suitable companion. The berries are large, pure white, and produced in great profusion.

Price 1s. 6d. and 2s. 6d. per packet.

VICTORIA NURSERY, UPPER HOLLOWAY, LONDON, N.

Now Ready, Free by Post,

GEO. JACKMAN & SON'S

DESCRIPTIVE PRICED CATALOGUE

(With Five Engravings of Clematis)

Of FRUIT and ROSE TREES, CLEMATISES, AMERICAN PLANTS, CONIFERS, EVERGREEN and DECIDUOUS TREES, SHRUBS, and FOREST TREES, &c.

"This Establishment, long favourably known for its fine collection of Hardy Plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*

WOKING NURSERY, SURREY.

ROSES IN BLOOM.

MESSRS. JAMES VEITCH & SONS

Have now in FULL BLOOM, at their CHELSEA NURSERY,

A BEAUTIFUL COLLECTION OF POT ROSES,

Comprising the best named kinds, which they will have much pleasure in showing to any who may be able to favour them with a visit.

PRICED detailed CATALOGUE of ROSES, including all the best NOVELTIES now being sold for the first time, Post Free on application.

ROYAL EXOTIC NURSERIES, KING'S ROAD, CHELSEA, S.W.

EVERGREENS.

A VERY LARGE AND EXCELLENT STOCK, IN THE BEST POSSIBLE CONDITION for safe removal.

PRICED LIST on application.

FARM SEEDS.

CLOVERS, GRASSES,
MANGELS, TURNIPS,
of the most genuine quality.

PRICED LIST on application.

James Dickson & Sons.

(Old Established Nursery and Seed Business.)

102, EASTGATE STREET, and "NEWTON" NURSERIES, CHESTER.

☞ SPECIAL NOTICE.

The "Newton" Nurseries can now be reached on foot within 10 minutes from Chester Station, by walking over Flookersbrook Bridge, and entering JAMES DICKSON AND SONS' new road by the Ermine Inn, at the foot of said bridge.

FINE COLLECTIONS OF

CHOICE HYBRID RHODODENDRONS,
CONIFERÆ, ROSES,
ORNAMENTAL TREES and SHRUBS,
VINES, FRUIT TREES,
STOVE and GREENHOUSE PLANTS.

CATALOGUES upon application.

GORSE for FOX COVERTS, strong, transplanted, 30s. per 1000.

TURNIP SEEDS.

H. & F. SHARPE

Are prepared to make special offers to the Trade of the following varieties of

TURNIP SEEDS, ALL OF 1869 GROWTH,

And raised from fine selected Transplanted Bulbs, viz. :—

SHARPE'S WEST NORFOLK PURPLE-TOP SWEDE.
HALL'S WESTBURY SWEDE.
CHAMPION SWEDE.
SHARPE'S IMPROVED SWEDE.
MARSHALL'S PURPLE-TOP SWEDE.
SKIRVING'S PURPLE-TOP SWEDE.
IMPROVED GREEN-TOP SWEDE.
LAING'S PURPLE-TOP SWEDE.
GREEN-TOP YELLOW ABERDEEN.
FOSTERTON HYBRID YELLOW.
DALE'S HYBRID YELLOW.
DEVONSHIRE GREY STONE.
LINCOLNSHIRE RED ROUND.
GREEN BARREL.
IMPROVED GREEN GLOBE.
POMERANIAN WHITE GLOBE.
RED TANKARD
GREEN TANKARD.
WHITE NORFOLK.
EARLY WHITE STONE OR STUBBLE.

SEED GROWING ESTABLISHMENT, WISBECH.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed selections from their general stock; every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 to 8 to 12 feet
CUPRESSUS LAWSONIANA, 3 to 4 to 6 to 10 feet
„ LAWSONIANA ARGENTEA (JOHN WATERER'S var.)—By far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each
„ MACROCARPA, 4 to 6 feet, 42s. per dozen.
THUJA AUREA.—Beautiful plants, about 2 feet, 42s. per dozen; larger, 5s. to 21s. each.
„ GIGANTEA.—An unequalled stock of hundreds of Seedlings, 4 to 6 to 8 feet, 3s. 6d. to 5s., 7s. 6d., and upwards
We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless.
THUJOPSIS BOREALIS, 3 to 4 feet, 30s. per dozen; extra fine, 5 to 6 and 7 feet, 5s. to 10s. 6d. each.
„ DOLABRATA.—Fine plants, 5s. to 7s. 6d. each.
„ „ VARIEGATA, 5s. to 7s. 6d. each.
WELLINGTONIA GIGANTEA.—Good plants, 30s. per dozen; 2 to 3 feet, 42s. to 60s.; larger, up to 10 feet, 7s. 6d. to 63s. each.
ABIES NOBILIS, handsome plants, from 5s., 7s. 6d., and upwards.
„ NORDMANNIANA, 2 to 3 feet, 7s. 6d. to 10s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 12 feet, 31s. 6d. and upwards each.
„ LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each.
„ GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to 63s. each.
„ PINSAPO, 2 to 3 feet, 5s.; 3 to 5 to 8 feet, 7s. 6d. to 63s.
„ DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 10 feet, 3s. 6d. to 7s. 6d. and upwards.
„ MAGNIFICA, 3 to 4 feet, 31s. 6d. to 42s.
„ ORIENTALIS, 3 to 5 to 8 feet, very beautiful examples, 21s. and upwards each.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; larger up to 12 feet.
YEWS, COMMON.—Immense quantities, 2 to 3 to 4 to 6 feet, from 18s. to 60s. per dozen.
„ IRISH.—Perfect columns, up to 12 feet.
„ GOLDEN, as Standards on Irish stems, perfect globes, 31s. 6d. to 42s. each.
HOLLIES, GREEN COMMON.—Many thousands, of all sizes, from 1 foot up to 20 feet.
„ the best GOLDEN, WATERERS', and SILVER varieties, in any quantity, and in all sizes.
STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each.
„ „ WATERERS' variety, many hundreds of symmetrically grown specimens, perfectly straight stems, 42s. to 105s. per pair.
„ WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each
„ PORTUGAL LAURELS.—Very close grown handsome plants, 10s. 6d. to 21s. each; very large imposing specimens, 42s. to 63s. each.

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, for undercover or shrubberies, strong established plants, £6 10s. per 1000; larger, 25s. to 63s. per 100
„ CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 50s. to 75s. per 100
„ better class (SEEDLINGS) and named varieties for extensive planting, £5 per 100.
„ of superior kinds, many on own roots, £7 10s. to £10 per 100.
„ very superior, leading, crimson, rose, white, £12 10s. to £15 per 100.
„ STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each.
AZALEAS, common kinds, 50s. to 75s. per 100.
„ very best, in fine plants, £40 per 100.
KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen.
„ LATIFOLIA, 18s. to 30s. per dozen.
ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen.

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYRÆA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

Novelties.

DOWNIE, LAIRD, AND LAING are now offering the following Novelties, which have gained first honours wherever exhibited, and are the admiration of all who have the pleasure of seeing them.

New and unapproached Gold and Bronze PELARGONIUMS.
New and unsurpassed Hybrid Nosegay ditto.
New and unrivalled Double ditto
New and unequalled PHLOXES and PENTSTEMONS.
New Hybrid Perpetual and Tea-scented ROSES for 1870.
New distinct and handsome CLARKIAS.
New Golden Blotched ABUTILON MEGAPOTAMICUM

For prices see our NEW DESCRIPTIVE CATALOGUE for this season, which will be forwarded, post free, to all applicants.

Nurseries, Leith Walk, Edinburgh, S.E., and Edinburgh

SUTTONS' FRESH IMPORTED FLOWER SEEDS. Free by post

ASTERS, WALLFLOWERS, STOCKS, ZINNIAS, &c., imported from the most celebrated Continental growers. See

SUTTONS' DESCRIPTIVE LIST of FLOWER SEEDS, gratis and post free on application.

SUTTONS' COLLECTIONS OF FLOWER SEEDS.

No. 1 Collection of the best English and German varieties, with instructions on cultivation, free by post or rail	£1	2	0
No. 2 Collection of ditto ditto	1	11	6
No. 3 Collection of ditto ditto	1	1	0
No. 4 Collection of ditto ditto	0	15	0
No. 5 Collection of ditto ditto	0	10	6

Small and useful Collections can also be had from 21 to 7s. 6d., free by post.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks

NEW FUCHSIAS.

GEORGE SMITH

Has much pleasure in offering Three SEEDLING FUCHSIAS, unequalled by any others in cultivation, viz. :—

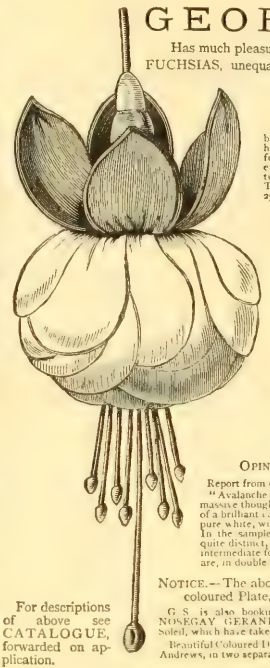

AVALANCHE (G. S.)

This acquisition stands pre-eminent, being the finest Fuchsia ever offered, having very double, compact, and beautifully-formed flowers; corolla pure white, of extra size, with long carmine filaments; tube and sepals brilliant carmine-scarlet This splendid flower contains in one bloom 25 perfect sepals; fine habit and free grower.

Plants 10s. 6d. each.

OPINIONS OF THE PRESS.

Report from *Gardener's Magazine*, Oct 2, 1869

"Avalanche is a large flower, bold in outline, and massive though elegant; the tube and sepals are of a brilliant carmine scarlet; very double corolla, pure white, with streaks of carmine at the base In the samples sent the stamens and petals are quite distinct, which is a decided merit, for when intermediate forms are produced, as they too often are, in double flowers, symmetry is lost."

NOTICE.—The above Three Fuchsias in one handsome coloured Plate, by Mr. J. Macfarlane, 1s. 6d. each.

G. S. is also booking Orders for three extra large and fine NOSEGAY GERANIUMS, viz.:—Claudius, Harry George, and Soleil, which have taken First-class Certificates

Beautiful Coloured Drawings of Claudius and Soleil, by Mr. James Andrews, in two separate plates, 1s 6d. each.

For descriptions of above see CATALOGUE, forwarded on application.

PURPLE PRINCE (G. S.)

This is a most extraordinary bold and handsome variety; tube and sepals waxy carmine-scarlet, corolla rich violet, flower extra size, fine free habit; surpasses all other double purple varieties

Plants 10s. 6d. each.

OPINIONS OF THE PRESS.

Report from *Gardener's Magazine*, Oct 2, 1869

"Purple Prince is bold and handsome, tube and sepals shining carmine-scarlet, corolla very large, expanding boldly; colour very rich tone of pucy purple."

SULTAN (G. S.)

Tube and sepals waxy scarlet, broad and well reflexed; corolla deep violet; of fine habit, and one of the finest dark Fuchsias in cultivation.

Plants 10s. 6d. each.

Good Plants of the above first week in May. *Usual Discount to the Trade*

TOLLINGTON NURSERY, HORNSEY ROAD, ISLINGTON. LONDON, N.

NEW FLORIST FLOWERS FOR 1870.

H. CANNELL, F.R.H.S.,

Wishes to inform all lovers of really improved Varieties that he has purchased from the following well-known Hybridisers, at a high price, the undermentioned Valuable SEEDLINGS.

Nine Fuchsias of E. Banks, Esq.,

Which are certainly the best set ever sent out in one season. SHIRLEY HIBBERD, Esq., the Editor of the *Gardener's Magazine*, reports thus:—"Amongst the seedlings sent occurs one of extraordinary quality; the corolla an immense purple goblet, the scarlet sepals recurved, and the whole flower so perfectly set as a jewel of rare value, that we believe you have in your possession the best seedling Fuchsia of this century. Let this one have a name consistent with its majestic proportions."

Some of them are figured in the "Florist and Pomologist" for April, and the "Floral World" or January

Four of Mr. Bland's.

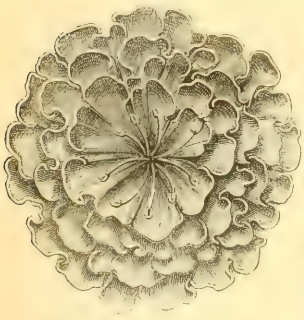

Fuchsia, Champion of the World.

T. MOORE, Esq., Editor of the *Gardeners' Chronicle*, reports a bloom sent as follows:—

"FUCHSIA —H. CANNELL — CHAMPION of the WORLD is a most remarkable variety. It is a full double, with the expanded or crinoline form, and measures fully 2 inches in the expansion of the corolla, without being coarse, the colours being the usual red and violet If the habit is good, it must be a fine thing"

PRINCESS of WALES. — The Editor of the *Gardener's Magazine* reports of it thus —

"H. CANNELL —Your Fuchsia with double white corolla must be a remarkably showy variety. It is at all events the largest and fullest flower of its class we have seen."

FUCHSIA REGALIA.—This is a beautiful or namental foliage variety; and the old Venus Victrix, the first white tube and sepal variety ever raised, is now offered again.

NEW DAHLIA, QUEEN of the YELLOWS (Parks).—This was awarded a First-class Certificate at Kensington last September, as the best yellow ever shown.

Four of Mr. Keeler's

(THE RAISER OF "SAMBO," &c.)

Pelargoniums.

BEAUTY of LEE.—This was awarded a First-class Certificate at Chiswick last season, when planted out with above 800 varieties, as the best Christine-coloured bedder. Doubles the best Geranium of the year.

MRS. KEELER.—A fine improvement on Mrs. W. Paul.

GEANT DES BATAILLES (Bedding Nosegay).—Most abundant bloomer; colour almost equal to the good old Verbena of that name. Also,

MRS. POOLE (Bicolor), the best bedder; and

YELLOW BOY, certainly the best yellow leaf by far ever sent out.

MELTON GEM, raised by Mr. A. Fenn, of Melton Hall, late Foreman to Mr. F. Grieve, of Culford.—This is a fine improvement on Violet Hill Nosegay, and all others of the orange tint of colour.

Seven Verbenas,

Raised by E. Banks, Esq.

PURPLE EMPEROR | RED BEDDER
BEAUTY OF DEAL
CANNELL'S VIOLET PERFECTION
MRS OWEN | MISS STANLEY | CORPORAL

Also, three splendid striped varieties by same raiser—BEAUTY OF SHOLDEN, BANKS' BEAUTY, FIREWORKS; and Three raised by the Rev. — Vine, which are of great merit.

LOBELIA MAUVE QUEEN, raised by Mr Appleby.—This has often been favourably spoken of by the various gardening Papers, and also received a First-class Certificate, both at Kensington and at the Royal Botanic Society, Regent's Park.

Also, two splendid ZONAL PELARGONIUMS, raised by Mr. J. George, viz.:—

MRS. H. CANNELL and KING OF ROSES; with other Novelties of great merit.

☞ A **CATALOGUE** sent Free for One Stamp, with full descriptions.

Princess of Wales.

H. CANNELL, NEW FLORIST FLOWER AND FLORIST FLOWER-SEED MERCHANT, WOOLWICH.

EARLY SPRING FLOWERS.

ANEMONE BLANDA (Greece) —Blooms with the Snowdrop; flowers size of a crown piece; deep brilliant blue, rarely pale blue or white 12 each; 20s. 6d. per dozen
" APENNINA.—Much later. 6d.
" HORTENSIS (stellata) —Ruby, or rich purple. In pots, 6d.
" CORALINA PURPUREA.—Fine. In pots, 9d
CROCUS NIVALIS (Sieben, Greece).—Shaded pale violet; broad petals. 6d
" CHRYSANTHUS (Aucheri, Greece) —Deep orange-yellow. 6d
The two above named precede all others, and may be called Winter Crocuses
CRIMEAN SNOWDROP (G. plicatus) —Fine, 9d.; 7s. 6d. per dozen
HEPATICA ANGULOSA.—Twice the size of the common single blue, and earlier 1s. 6d.; 15s. per dozen
SPRING SNOWFLAKE (Leucojum vernum).—Twice the size of the Snowdrop, and deliciously fragrant Now in bloom 4s. per dozen
NARCISSUS JUNCIFOLIUS.—Very fragrant; dwarf rushy tufts. A perfect gem 4s. per dozen.
" AJAX MAXIMUS.—Largest brilliant deep yellow. 4s. per doz
BULBOCODIUM VERNUM.—Crocus-like, purplish-rose. Now in bloom 6d.
ARABIS BLEPHAROPHYLLA SUPERBA.—Purplish carmine; fine 1s
CYCLAMEN COUM —Dwarf crimson; leaf plain. 1s. 6d. to 2s. 6d.
" YAR. VERNUM.—Leaf variegated 1s. 6d. to 2s. 6d
ARABIS ROSEA.—Like A. albida, tinted with cherry-colour; heads rather less 9d.
SIBERIAN SQUILL.—Bright porcelain-blue pendent bells. 2s. 6d. per dozen. In pots, 4s. per dozen.
SAXIFRAGA OPPOSITIFOLIA VAR. PYRENAICA —New and fine variety, with erect rosulate tufts, and much larger flowers than in the common type. 1s. 6d
" OPPOSITIFOLIA.—6s. per dozen.
" " MAJOR.—6s. per dozen.
" " ALBA.—6s. per dozen.
" PALLIDA.—1s.
NARCISSUS MINOR (the Dwarf Daffodil).—6d. each, 5s. per dozen.
" PSEUDO-NARCISSUS (the Wild Daffodil).—2s. 6d. per dozen.
SISYRINCHIUM GRANDIFLORUM.—Large solitary purple cups. 9d.
" ALBUM —1s. 6d
OMPHALODES VERNA (large Forget me-Not-like) —Vivid blue. 6d. each, 5s. per dozen
IBERIS GIBRALTARICA (true).—Very large flowers, often shaded lilac 1s. (See *Gardeners' Chronicle*, Nov. 27, 1869, p. 1233.)
CHRISTMAS ROSE (Helleborus niger) —6s. per dozen
" ATROPURPUREUS. Brownish purple, in clusters; blooms very freely. 1s.
SCHIEVECKIA PODOLICA (white Arabis-like).—Very early and free 9d
VIOLA PEDATA.—Lovely mauve, large flowers; sunny and sandy places 1s. each, 9s. per dozen
VIOLET, THE CZAR.—Very large; fine for forcing. 6d. each, 4s. per dozen.
QUEEN of VIOLETS.—Largest double white. 9d.
TRITELEIA UNIFLORA.—Waxy-white stars, tinted violet externally. 3s. per dozen.
CORBULARIA BULBOCODIUM Hooped Petticoat Narcissus).—5s. per dozen.
DRABA AIZOON.—Dense spiny rosettes, heads of sulphur colour. 6d.
" AIZOIDES.—Bright yellow. 9d
ANEMONE PALMATA.—Large orange-yellow; fine 9d
GENTIANA VERNA.—1s. to 2s. 6d.
" PYRENAICA.—Brilliant purple. 3s. 6d.
MYOSOTIS DISSITIFLORA (Montana).—Earliest of Forget me-nots; large. 4s. per dozen.
HEPATICA (single blue).—4s. per dozen
" (double red).—4s. per dozen
PRIMULA MINIMA Dwarf of the loveliest of alpines; flowers very large, deeply incised, light purplish carmine 1s.
" NIVALIS (a symbol of snowy white, charming 1s. 6d. to 2s. 6d
ANDROSACE CARNEA Yellow eye; pink clusters 1s. to 2s. 6d
ANEMONE PULSATILLA (Pasque Flower).—1s. each, 9s. per doz
DOGSTOOTH VIOLETS 1s. 6d. per dozen
LILY of the VALLEY.—Tufts, 4s. per dozen; crowns, 6s. per 100.

CHOICE SEEDS FOR SPRING GARDENS.

AUBRIETIA PURPUREA GRANDIFLORA (Belvoir variety).—1s. per pkt.
Improved OXLIP (Belvoir variety).—1s. per packet.
DWARF EARLY-BLOOMING WALLFLOWER (Belvoir variety). 1s. per packet.
A Collection of Six Ornamental varieties of FLOWER SEEDS suitable for Rockeries, 3s.
JAMES BACKHOUSE AND SON, York.

SELECT VEGETABLE SEEDS,

free by post.

	Per pkt.—s.	d.
Smith's fine long frame CUCUMBER	1	0
The White Queen CELERY	0	6
Snow's Winter White BROCCOLI	1	0
Smith's Incomparable CABBAGE	0	6
Worcester Champion Cabbage LETTUCE	0	6
Improved Telegraph PEA	1	0
Early Dwarf Erfurt CAULIFLOWER	1	0
New Giant Rocca ONION	1	0
Ayton Castle LEEK	0	6
Worcester Late White BROCCOLI	1	0
Backhouse's Winter White BROCCOLI	1	6
French Breakfast RADISH	0	6
Golden Perfection MELON	1	0

SELECT FLOWER SEEDS, free by post.

PRIMULA SINENSIS, finest fringed	1s. and	2 6
CALCEOLARIA, finest spotted	1s. and	2 6
CINERARIA, from prize flowers	1s. and	2 6
CYCLAMEN PERSICUM, mixed		1 0
ASTER, New Peony-flowered Globe		1 6
" Truffaut's Peony-flowered		1 0
PYRETHRUM, Golden Feather		1 0
ZINNIA, finest double, mixed		0 6
VIOLA CORNUTA ALBA		1 0
PANSY, Golden Yellow		1 0
AMARANTHUS ELEGANTISSIMUS		1 6
PRINCESS FEATHER, New Golden		0 6
BALSAM, splendid mixed, flowered		1 0
New Tree MIGNONETTE		1 0
MARIGOLD, New French, miniature, striped		0 6

For Prices of other Seeds, see RICHARD SMITH'S DESCRIPTIVE LIST, free by post on application.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

The North of England Nursery and Seed Establishment.

MESSRS. LITTLE AND BALLANTYNE, Carlisle, (WM. BAXTER SMITH, Manager), are prepared to make SPECIAL OFFERS of FARM SEEDS, at literal prices, when large quantities are required, and to deliver them free at nearest Railway Station

They confidently recommend their superior stocks of TURNIP SEEDS, which have been all carefully proved and found to grow about 90 per cent. This will ensure a much stronger braird than seed reduced to grow only from 60 to 70 per cent. Their stocks of MANGEL WURZEL, CABBAGES, &c., are also of excellent quality, and they have been equally careful in proving the quality and growth of their CLOVER and GRASS SEEDS, and their Mixtures for laying down Permanent Pasture. PRICED LISTS on application.
44, English Street, Carlisle.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping well and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one stamp. Seeds direct from the Growers, the surest way to secure them.
RICHARD SMITH, Seed Merchant, Worcester.

CHOICE FLOWER SEEDS,

	Post free.	Per packet.—s.	d.
AURICULA, extra choice		2	6
BALSAM, Lee's Camellia-flowered		2	6
CALCEOLARIA, James's Prize		2	6
CINERARIA, from named flowers		2	6
CENTAUREA CANDIDISSIMA		2	6
" ARGENTEA		2	6
CYCLAMEN PERSICUM, extra choice		2	6
CANNAS, in six choice varieties		2	6
CHRYSANTHEMUM, new Japanese varieties		2	6
CLIANTHUS DAMPIERI		1	0
DIGITALIS, extra choice spotted		1	0
ECHEVERIA METALLICA		1	6
GLOXINIA, extra choice		2	6
GOLDEN PYRETHRUM		1	0
HOLLYHOCK, extra choice, mixed		2	6
LEUCOCORYNE ALLIATUS.—Bears a profusion of snow-white berries in autumn and winter; a charming companion to the hybrid Solanums 1s. 6d. and		2	6
MIMULUS, choice, mixed		1	0
NIEREMBERGIA FRUTESCENS		1	0
PANSY, extra choice, mixed		2	6
" CLIVEDEN, Blue, Yellow, and Purple	each	1	0
" choice Dark Blotched		1	6
PELARGONIUM, Gold and Bronze		2	6
" Zonal, choice		1	6
" Nosegay, choice		1	6
PETUNIA, double, extra choice		2	6
" Single, choice mixed		1	0
PRIMULA FIMBRIATA, Red and White	each	2	6
" " mixed		2	0
" Fern-leaved, mixed		2	6
RICINUS, in six choice varieties		2	6
SOLANUMS, in six choice varieties		2	6
STOCK, East Lothian, Scarlet, White, and Purple	each	1	6
TACSONIA VAN VOLXEMI		2	6
WIGANDIA VIGIERI		1	6

IMPORTED GERMAN SEEDS.

STOCKS, in 12 distinct colours	2	6
ASTER, German quilled, 12 vars.	2	6
" Chrysanthemum flowered, 12 vars.	2	6
" Globe flowered, 12 vars	2	6
" Truffaut's Pæony, 12 vars	2	6

JOHN and CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS,
NURSERYMAN and SEED MERCHANT,
Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 10s. 6d., 21s., 42s., 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	Per packet.—s.	d.
Backhouse's Winter White Protecting BROCCOLI	1	6
Dell's fine dark-leaved BEET	1	0
Williams' Matchless RED CELERY	1	0
Williams' Matchless WHITE CELERY, new	1	6
Telegraph CUCUMBER, Woolley's improved variety	1	6
Wheeler's Tom Thumb CABBAGE LETTUCE	0	6
Webb's Climax MELON, new	2	6
(The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)		
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2	6
Earley's Defiance TOMATO, new	2	6
(The earliest and best variety in cultivation.)		

NEW and CHOICE FLOWER SEEDS.

Williams' Superb Strain of PRIMULA, Red, White, or Mixed 2s. 6d., 3s. 6d., and	5	6
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and	5	6
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5	0
BALSAM, Williams' superb strain 1s. 6d. and	2	0
CYCLAMEN, Wiggins' Prize strain 1s. 6d., 2s. 6d., and	3	0
VERBENA, Eckford's finest varieties, mixed	1	0
Williams' Improved Hybrid SOLANUMS 2s. 6d. and	3	6
CENTAUREA CANDIDISSIMA 1s. and	2	6
LOBELIA ERINUS GRACILIS ERECTA ALBA, new	1	0
Parsons' New Tree MIGNONETTE	1	0
PERILLA NANKINENSIS VARIEGATA, new	1	0
Williams' Improved French MARIGOLD, beautifully striped, and very large	1	0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours	2	6
VIOLA CORNUTA ALBA, new 1s. 6d. and	2	6
ZINNIA ELEGANS PUMILA flore-pleno, new	1	0

B. S. W.'s DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS is now ready, post free on application.

To Improve Meadow Land.

RICHARD SMITH'S MIXTURE of the finest GRASSES and PERENNIAL CLOVERS 98 to 120s. per acre, at 8d. per lb.; if sown early will cause a considerable improvement to the crop RICHARD SMITH, Seed Merchant, Worcester.

Grass Seeds for Permanent Pasture.

RICHARD SMITH'S MIXTURES of the finest PERENNIAL GRASSES and CLOVERS are carefully made to suit all kinds of Soil Price 112s. to 130s. per acre
PRICED LIST on application.
RICHARD SMITH, Seed Merchant, Worcester.

NATURAL GRASSES: their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c. Free by post.
RICHARD SMITH, Seed Merchant, Worcester.

CLEAN CLOVER SEEDS, at market prices, New and Unadulterated:—

RED	WHITE DUTCH.	YELLOW
ALSIKE.	COW GRASS	WHITE SUCKLING.

For samples and lowest prices apply (stating quantity required) to SUTTON and SONS, Seed Merchants, Reading.

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer for cash the CAMPERDOWN RED POTATO: it was produced over 16 Tons to the acre this year DOUBLE GERMAN WALLFLOWERS, 5s. per 100; SINGLE WALLFLOWERS, 2s. 6d. per 100; SCARLET KING DAISIES, CROWN DAISIES, WHITE DAISIES, all at 5s. per 100. Splendid mixed Laced PINKS, 5s. per 100. White SPANISH ONION SEED, 2s. per lb. All new and genuine.

FARM SEEDS of all sorts, best quality, extra clean.—PRICED LIST on application.

James Dickinson & Sons.

Seed Growers, 102, Eastgate Street, Chester.

WANTED, a good Collection of HARDY FERNS and HARDY HERBACEOUS PLANTS; also VERBENAS and other Bedding Plants.
J. TURNBULL, Nurseryman, Bowden, Cheshire.

Wheelers' Superior Grass Seeds.

WHEELERS' SUPERIOR GRASS SEEDS.—One of the most luxuriant Crops of Hay which ever came under our notice was the produce of some Grass and Clover Seeds supplied by us in the Spring of 1869 to Mr. Blackmore, of Ulley. It was sown early in April on 64½ acres, and yielded the following Summer, 1869, upwards of 24 tons of excellent Hay, which was sold by Auction for £209, being at the rate of £3 6s. per acre It was mown twice the same Summer!

The fact that such crops of seeds have produced in one Summer Hay of the value of £3 5s. shows the importance of sowing a good Mixture of Grass seeds.

The following are the quantities and sorts which produced that luxuriant Crop:—

1 bush. CLOVER AND GRASS SEEDS for TWO YEARS' HAY		
4 lb. Evergreen Rye grass	1 drom perenne	
4 lb. Italian Rye grass	Lolium italicum	
2 lb. Cocksfoot	Dactylis glomerata	
2 lb. Timothy Grass	Phleum pratense	
2 lb. Red Clover	Trifolium pratense	
3 lb. Cow Grass	Trifolium pratense perenne	
2 lb. White Dutch	Trifolium repens	
4 lb. Trefoil	Medicago lupulina	

We can supply the above of finest quality at 12s. 6d. per acre, carriage paid, allowing 5 per cent discount for cash

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELERS' ILLUSTRATED BOOK on GRASSES, which may be had gratis and post free

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS, are supplied in large or small quantities, at extremely moderate prices.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS are forwarded carriage free to all railway stations in the Kingdom

QUALITY—Excellent, and unadulterated.
PRICE—(Which vary from 12s. 6d. to 32s. per acre, according to soil and situation) extremely moderate.
TERMS—Five per cent. discount for Cash.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

ON LAYING DOWN LAND to PERMANENT PASTURE.

"For getting up the subject of Grasses we cannot conceive a handier book than Miss Pusey, which is furnished with ample and accurate illustrations, while for putting her data to the proof, and testing the value of hints and suggestions, it may be well to muse acquaintance with that really scientific *rendering*, Messrs. Wheelers' Illustrated Book on Grasses."—*Saturday Review*

A Copy will be forwarded free on application to

J. C. WHEELER AND SON, Grass-Seed Merchants, Gloucester; and 59, Mark Lane, London, E.C.

On Laying Down Land to Permanent Pasture.

"These enterprising Seedsmen (Messrs. WHEELER & SON), in introducing a new element into their calculations for laying down land, have undoubtedly a good idea."—*The Field*

MESSRS. WHEELER AND SON supply the FINEST and BEST GRASSES and CLOVERS (all included) for laying down land:—

For One Year	at 13s. 6d. per acre	
For Two Years	17s. 6d. per acre.	
For Four Years	22s. 6d. per acre.	
Permanent Pasture	from 25s. to 32s. 6d. per acre	

All Carriage free. Information and Estimates free per

J. C. WHEELER AND SON, Seed Growers, Gloucester, and 59, Mark Lane, London, E.C.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS,

Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

CUPRESSUS LAWSONIANA GRACILIS,

Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen.
A few fine Specimens, 10s. 6d. to 21s. each.

These two distinct and very beautiful hardy Evergreens were exhibited at the Royal Horticultural Gardens, London, on the 16th inst., and unanimously awarded First-class Certificates. They have been purchased by nearly every one who has seen them growing in the Nursery, and are fearlessly recommended to all admirers of first-class hardy plants.

ANTHONY WATERER, KNAPHILL NURSERY, WOKING, SURREY.

RENDLE'S PATENT

GROUND VINERIES AND PORTABLE PLANT PROTECTORS.

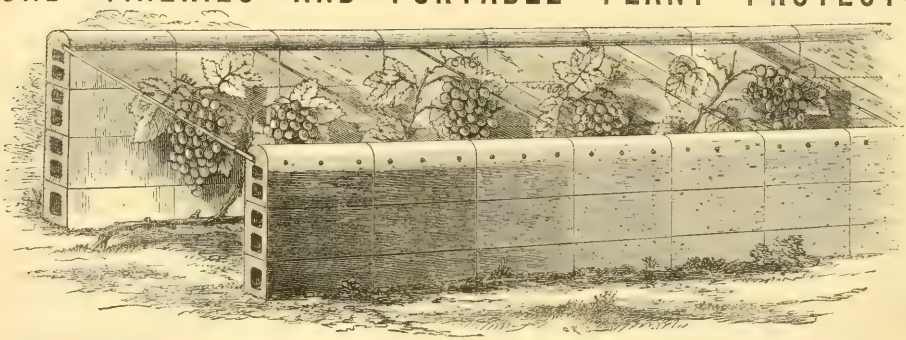

GROUND VINERY, same size as now to be seen at Mr. Rivers', Sawbridgeworth.—10 feet for ONE GUINEA.

NEW TARIFF AND CARRIAGE-FREE TERMS.

In consequence of the increased demand for the Patent Ground Vineries and Plant Protectors, the Patentee has determined to supply them on the Lowest Terms.

The following Prices are for the Patent Grooved Bricks and the Glass:—

GROUND VINERIES AND PLANT PROTECTORS.	For Delivery in London or Bridgewater	Carriage Paid to any Railway Station within twenty miles of London or Bridgewater	Carriage Paid to any Railway Station in England and Wales, Edinburgh, Dublin, Cork, or Belfast
	£ s. d	£ s. d.	£ s. d
10 feet in length, Glass 9 in. wide, for	0 10 0	0 12 0	0 15 0
10 feet in length, Glass 12 in. wide, for	0 12 0	0 15 0	0 17 6
10 feet in length, Glass 18 in. wide, for	0 14 0	0 17 6	0 21 0
10 feet in length, Glass 24 in. wide, for	0 16 0	0 20 0	0 25 0
100 feet in length, Glass 9 in. wide, for	4 10 0	5 0 0	6 0 0
100 feet in length, Glass 12 in. wide, for	5 10 0	6 0 0	7 0 0
100 feet in length, Glass 18 in. wide, for	6 10 0	7 0 0	8 0 0
100 feet in length, Glass 24 in. wide, for	8 0 0	8 10 0	9 10 0

The Patent Grooved Bricks can be placed on ordinary Kiln Bricks set on the Flat. Full directions for fixing them will be sent with each Invoice.

A Reduction of 10s. *per* 100 *feet will be made if* 500 *feet be taken at one time.*

Another Tariff is published, containing Prices for the Ground Vineries and Plant Protectors COMPLETE, and can be had on application.

TESTIMONIALS.

From the "DAILY TELEGRAPH," *March* 17, 1870.

"ROYAL HORTICULTURAL SOCIETY.—The first Spring Show at South Kensington this year was held yesterday. We hesitate, however, to say that the weather was altogether favourable to the occasion, and a generally fine display of early flowers affording cheerful proof that the bleak winds and the late frosts of the season have not destroyed the hopes of our florists, conservatories, and parterres. One of the clever novelties shown yesterday in the western corridor, by the side of a rich growth of Lettuces exhibited by Mr. William Ingram, gardener to His Grace the Duke of Rutland, at Belvoir Castle, was an invention of Mr. Rendle, of Bridgewater, for protecting plants and tender crops in a very cheap and efficient manner. It is a little structure of corrugated zinc and glass, which might be put together by a child, and which, when once up, looks quite manly and as if it had been a contractor's job and some labour by an expert hand."

NOTE.—These Lettuces were very handsome specimens, and "were grown in the 'Protectors,' without the shelter of leaves or litter of any kind; and the only protection the Lettuces have had was a common Russian mat thrown over them in frosty weather." (In letter from Mr. Ingram, dated Feb. 26, 1870.)

Copy of letter from Mr. W. INGRAM, *Gardener to* His Grace the Duke of Rutland, *Belvoir Castle Gardens, Grantham, Leicestershire.*

"Belvoir Castle Gardens, near Grantham, Jan 26, 1870.

"DEAR SIR,—I have employed your Plant Protectors for growing Lettuces during the winter, and no plan that I have tried has succeeded so well.

"The tiles are placed to allow glass 22 in. by 14 in. to slide in the grooves. This gives a space for three rows of Lettuces, and I can assure you a little pit. The protection given is greater than I expected, for such nights as we had (23° of frost, ground covered with the frost powder) appear to have been checked.

"The successful application of your plan for securing a supply of Cos Lettuces struck the gentleman (W. B. Ferrand, Esq.) who wrote to you, and led to the order you refer to.

"The few examples of the semicircular tiles came too late in the season for the purpose you recommend them, but I made use of them for ripening some Tomatoes, which they did completely.

"I will leave you to be a fair trial, as I promised, and send you the result later in the year.

"Mr. W. E. Rendle. "I am, yours truly, W. INGRAM."

From SAMUEL LOWNDES, Esq., *The Home, Charmouth, Dorsetshire.*

"I have tried the 'Plant Protectors' on Peas. One row is covered with them, another is not. The growth of the one with the 'Plant Protectors' is marvellous."

Copy of Letter from W. FERRAND, Esq., *late M.P. for Devonport.*

"Belvoir Castle, Grantham, Jan. 24, 1870.

"SIR,—Mr. Ingram, of these Gardens, has shown me your Patent Ground Vineries and Plant Protectors, which 'answer admirably.' Be so good as to send to my gardener, Mr. Shoesmith, St. Ives, Bingley, Yorkshire, 500 feet at once by Midland Railway. Yours faithfully,

"W. E. Rendle. "W. FERRAND."

NOTE.—Mr. Ingram is gardener to the Duke of Rutland, and son of the Queen's gardener, and is one of the highest authorities in horticulture.

Opinion of SHIRLEY HIBBERD, Esq., F.R.H.S.

"Rendle's Portable Walls and Ground Vineries appear likely to effect a revolution in the whole of that department of horticultural practice, which consists in affording shelter to plants by rough-and-ready means. Brick pits are expensive, however roughly constructed, and when built they are immovable, and, though paid for by the tenant, become for ever the property of the freeholder. Wooden frames at the best are makeshifts; the wonderfully useful, it is true, but perishable and cumbrous, unalterable in form, generally speaking, and more or less unsightly always. Mr. Rendle is, *par excellence*, an inventor, and he now offers us a capital system of pit, frame, and we may even venture to say of house construction, founded on the principle of substituting for solid bricks, that need to be cemented, hollow bricks, that fall together and hold firmly without any cement at all. The annexed figures will explain the system fully. The brick is the chief feature of the scheme. Being hollow, its weight is reduced to a minimum, and its value as a protective agent by so much increased; for inclosed air is more stubbornly resistant of changes of temperature than any solid substance known. Walls may be built with these bricks in 'no time,' and, for all we can see, are as likely to last for ever as the most substantial walls of common brick, though offering the additional advantage of portability. This advantage not only increases their value for practicable purposes—as, for instance, enabling the cultivator to alter the aspect of a pit from south to north (and *vice versâ*) with a very trifling expenditure of labour—but it accomplishes the important end of removing the pits and houses so constructed out of the category of presents made by tenants to freeholders. It will be seen by the figures that the upper course of bricks used is adapted for the reception of glass, by means of a continuous groove, within which narrow slips of glass slide freely, the water being carried away to the outside by means of the perforations in the face of the bricks which form the front.

"It will of course depend upon the cultivator to modify the invention for various purposes. Mr. Rendle appears to consider the formation of ground vineries to be the purpose these bricks or tiles are best adapted for; but it is evident that there can be no limit to their usefulness, provided only cost of carriage does not interfere with their adoption in places far removed from the manufactories. In a letter, in which he invites our attention to the subject, he says: 'I shall be able to supply ground vineries six feet long for half a guinea each, and twelve feet long for one guinea.' This sum will include, we suppose, the glasses as well as the walls, and cost of carriage is the only remaining item, for the mere shadow of constructive skill will be required to put the materials together. In market gardens and nurseries this invention will no doubt prove of immense value, but the amateur gardener may derive from it a large addition to the number of his pleasures at comparatively little outlay, and with the additional satisfaction that in this case at least he is not the victim of the unjust law which secures to the freeholder every scrap of the tenant's property which he has in any way fixed upon the ground."

The Patent Ground Vineries can now be obtained also from the following Agents:—

Messrs. Allen and Willis, 55, High Street, King's Lynn.
Mr. W. P. Ayres, Forest Road West, Nottingham
Messrs. Barron & Son, Nurserymen, Elvaston, near Derby
Messrs. Buchan & Son, Glass Merchants, Southampton
Mr. Geo. Buchan, Bakewell, Derbyshire.
Messrs. W. Clarke & Son, Cwmbran, near Newport, Monmouthshire
Mr. Charles Clay, Stennard Works, Wakefield
Mr. Charles Noakes Coleman, Great Mongehan, near Deal
Mr. W. S. Collins, 11, High Street, Wisbeach
Messrs. Deane & Co., London Bridge [Edinburgh
Mr. Thomas Duff, Seed Merchant, India Buildings, Victoria Street,
Messrs. Edmondson Brothers, Seed Merchants, Dame Street, Dublin
Mr. James Epps, East Down, Lewisham.
Mr. J. C. Fox, Royal Horticultural Society's Gardens, South Kensington.
Mr. James Goad, Orchard House, Saltash, Cornwall, and Union Street, Plymouth
Mr. Joseph Golding, Seedsman, Hastings
Messrs. W. H. & F. Grace, Wittersham, near Ashford, Kent
Messrs. G. Grahame, Jun., & Co., Ironmongers, High Street, Dunbar
Mr. John Gregory, Seedsman, 38, Market Place, Macclesfield
Mr. J. Harper, Seedsman, Hull Row, Weaton
Mr. John Harrison, Nursery, Darlington
Messrs. J. Hooper & Co., Covent Garden Market.
Mr. Samuel Juckes, Ironmonger, 71, Mardol, Shrewsbury
Library Company (Mr. Feist, Manager), 80, King's Road, Brighton
Messrs. Richard Lowe & Co., Seed Merchants, Queen Square, Wolverhampton
Messrs. J. B. McKenzie & Co., Seed Merchants, Patrick Street, Cork
Plymouth Book Society (Mr. Nicholson, Manager), 15, Devonshire Terrace, Plymouth
Mr. W. Quick, Seed Merchant, Barnstaple
Mr. F. Raper, Florist, Leamington.
Mr. Thomas Sampson, Seed Merchant, Yeovil.
Mr. Wm. Sharp, Auctioneer, Canterbury.
Messrs. Joseph Tremble & Sons, Market Square, Penrith.

CAUTION.—RENDLE'S PATENT GROUND VINERIES and PORTABLE PLANT PROTECTORS.—The Public are hereby cautioned against purchasing any article protected by Mr. Rendle's Patent, otherwise than direct from himself or his authorised Agents. Proceedings will be taken against all persons infringing his Patent by manufacturing, or selling, or using articles in imitation, or colourable imitation, of his Patent Ground Vineries and Portable Plant Protectors.

TRADE MARK.—"PORTABLE PLANT PROTECTORS."—This Trade Mark is Registered by Mr. W. E. Rendle, the Inventor and Patentee of the Patent Ground Vineries and Portable Plant Protectors.

FOR FURTHER PARTICULARS, APPLY TO THE INVENTOR AND PATENTEE,

MR. W. E. RENDLE, 68, WELBECK STREET, CAVENDISH SQUARE, LONDON, W.

Superior Seeds for 1870.

J. DOBSON AND SONS offer the following, which are unrivalled for quality, and have an immense sale in all parts of the world, in sealed packets, post free:—
CALCEOLARIA, unapproached by any other strain, 1s 6d, 2s 6d, & 5s.
CINERARIA, prize strain, 1s, 2s 6d, & 5s.
CYCLAMEN, very beautiful, 1s, 2s 6d.
BALSAM, eight Exhibition varieties, 1s; mixed, 1s
PRIMULA SINENSIS FIMBRIATA RUBRA and ALBA, A 1, 2s 6d, & 5s
INTERMEDIATE STOCK, Scarlet Double, 6d, 1s.
Woodlands Nursery, Isleworth.

Chrysanthemums.

ADAM FORSYTH, in answer to numerous applications, begs to offer 50 Pairs CUTTINGS, best varieties, from his great collection of Chrysanthemums, for £1; 25 Pairs ditto, for 10s 6d; 24 Pairs POMPONS, 10s 6d; 12 Pairs best JAPANESE CHRYSANTHEMUMS, 6s Any of the above forwarded post free on receipt of Post Office order or stamps for the amount.
Brunswick Nursery, Stoke Newington, N.

Double White Camellia Blooms for the Easter Decorations.

J. HALLY, Nurseryman and Florist, Lee, Blackheath, S.E., having kept a large stock of the above back for Easter, will be able to supply a few dozen more than he has present orders for. Other varieties supplied in large quantities, sent carefully packed to all parts of the kingdom. Prices and particulars on application as above

CHATER'S AGERATUM, IMPERIAL DWARF.—This is admitted to be the greatest acquisition for modern Flower Gardening that has been offered for many years. Awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society, see report of meeting, August 17, 1869; also opinions of the Press.
This beautiful New Bedding Plant will be sent out after May 1.
1 plant .. .. 3s. 6d. | 12 plants .. .. 25s. 0d.
6 plants .. .. 18 0 | 24 plants 40 0
WILLIAM CHATER, Nurseries, Saffron Walden.

CALCEOLARIAS, Herbaceous, nice plants, free by Parcels Post:—
ACHIMENES, 18 varieties, 3 tubers of each, 6s. per dozen.
DAHLIAS, pot roots, 50 varieties for 15s., 25 for 7s. 6d., package free.
CALCEOLARIAS, bedding, in 12 varieties, 2s. 6d. per dozen, 50 for 8s., 100 for 10s., package free.
GERANIUMS—Scarlet, Zonal, and Nosegay, in 20 named varieties (out of cutting pots), 12s per 100, package free.
PRUNUS ALBA-PLENA and VARIEGATA, well set for bloom, 9s per dozen
DAHLIAS, Bedding CALCEOLARIAS and GERANIUMS we can offer to the Trade by the 1000, at reasonable prices, on application to
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

Notice.—True Fastolf Raspberry.

JAMES HUNT having a stock of fine Fruiting Canes of the above (True), same as sent out by Messrs. Youell & Co., of Kensal Nursery, beg to offer Packages containing 50 for 4s. 6d.; 100, 8s.; 500, 35s.; 1000, £3
GIANT ASPARAGUS, 2-yr., strong, 16s. per 1000; 3-yr., fine, £4 per 1000.
DAISIES of finest kinds, to name, per 100, 10s.
Finest SHOW PINKS, to name, 25 pairs for 10s.; 50 pairs for 15s.; 75 pairs for 20s.; 100 pairs for 25s., packages included
JAMES HUNT, Apollo Nurseries, Great Yarmouth.

SURPLUS STOCK.—Pyramid Plums, Pears, Apples; Standard Plums, Pears, Apples; Standard and Half Standard and Dwarf Roses, of all the leading kinds; Gooseberries, Currants, Manetti, and Crab Stocks; Austrian Pine, Berberis aquifolia, Common Privet, Variegated and Green Box, Privet, Scotch Fir, English Oak, Horse Chestnuts, Seeding Hazel, and Hedge Quick.
Samples, with height and price, on application to
ALEX. SON, Old Wood Nurseries, Guildford.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonymes, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

Larch.

A QUANTITY of 2 to 3 feet LARCH.
A quantity of OAK, 6 to 8 feet.
A quantity of SPRUCE FIR, 3 to 4 feet.
A quantity of HAZELS, 3 to 4 feet.
" " 1 to 5 feet.
Samples and price on application to WM. GROSVENOR, Prospect Nursery, Cheddleton, near Leek, Staffordshire.

EVERGREEN HEDGES.
AMERICAN ARBOR-VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100.
SIBERIAN ARBOR-VITÆ, 2 to 2½ feet, 40s. per 100; 2½ to 3 feet, 50s. per 100; 3 to 3½ feet, 60s. per 100; 3½ to 4 feet, 84s. per 100.
RICHARD SMITH, Nurseryman, Worcester.

RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.
RICHARD SMITH, Nurseryman and Seedsman, Worcester

Beta chilensis.

BUTLER, McCULLOCH, AND CO. are enabled to offer SEED of the TRUE variety of this magnificent foliage plant; it is quite distinct from Beta brasilicnsis, and is fully described in their SPRING CATALOGUE, sent post free, 1s. and 2s. 6d. per packet.
South Row, Covent Garden Market, W.C.
Established upwards of a Century.

TO THE TRADE.—
1-yr. SEEDLING HOLLY (very stout).
ARBOR-VITÆ, 6 to 9 inches, 10 to 12½ foot.
SCOTCH FIR, 9 to 18 inches.
PINUS LARICIO, 9 to 18 inches.
PINUS AUSTRIACA, 9 to 18 inches.
PINUS RIGIDA, 12 to 15 feet. A very fast-growing Pine, and safe mover. Price on application to
J. THORNTON, Heatherside Estate, Bagshot, Surrey.

To the Trade.

MORRISON BROTHERS, Aberdeen, still hold large stocks of the following, of good quality, and true to name;

SEEDLINGS.	Per 1000.	s.	d.
ABIES ORIENTALIS, 1-yr.	40	0	
" NIGRA, 2-yr.	20	0	
HORSE CHESTNUT, 1-yr., 4s.; 2-yr. ditto	5	0	
COLORADO SILVER SPRUCE, 1-yr.	15	0	
HORNBEAM, 1-yr., 4s.; ENGLISH MAPLE, 1-yr. ..	2	6	
ENGLISH OAK, 2-yr., 1s. 6d.; SCARLET OAK, 2-yr.	30	0	
PICEA PINSAPO	20	0	
PINUS LARICIO, 1-yr. 1s. 6d.; PINUS MONTANA, 2-yr. ..	15	0	
" PYRENAICA, 1-yr., 20s.; PINUS TAURICA, 1-yr.	20	0	
SCOTCH FIR, 2-yr., 1s. 6d.; NORWAY SPRUCE, 2-yr. ..	1	6	
TRANSPLANTED.			
BALM OF GILEAD FIR	10	0	
HORSE CHESTNUT, 2 to 3 feet	10	0	
CRAB APPLE, 1½ to 3 feet	10	0	
PINUS LARICIO, 1-yr., 2s. 6d.; 2-yr., 5s.	10	0	
" twice transplanted, 9 to 15 inches ..	20	0	
" CEMBRA, 2-yr.	25	0	
" moved spring 1869, 18 to 24 inches ..	100	0	
SCOTCH FIR, 2-yr.—1-yr.	3	0	
AMERICAN ARBOR-VITÆ, 2 to 3 feet, bushy.. ..	40	0	

American Arbor-vitæ forms the best of Evergreen Hedges, and, at the above price, considering the height, the plants being bushy, they form a cheaper Hedge than either Beech or Thorn.
DWARF ROSES, most of the finest varieties still on hand. See names and price in our TRADE LIST. Special quotations to large buyers, and samples sent on application.

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2s 6d; Lady Cullum, 6s; Sunset, 3s; Sophia Dumaresque, 3s 6d; Italia Unita, 3s; Petunina, 3s 6d; Gold and Bronze Zonals, Beauty of Calderdale, 3s 6d; E. G. Henderson, 9s; Duke of Edinburgh, 9s; Her Majesty, 6s 6d; Luna, 2s 6d; Neatness, 2s 6d. Baskets and Packing, 1s for a single dozen, and 6d. for every subsequent dozen. Orders by letter or telegram from unknown correspondents
ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire.

STRONG BEDDING GERANIUMS.—Tricolor and others.—Lady Cullum, 6s per dozen; Louisa Smith, 4s; Sophia Dumack, 6s; Sophia Dumaresque, 6s; Silver Flower of Spring, 2s 6d; Bronze.—A. H. Wills, 1s; Beauty of Calderdale, 3s; Perilla, 2s 6d.; Kentish Hero, 4s; Princess of Wales, 5s.; Little Golden Chinese, 3s. Zonals:—Leonidas, 3s.; Lord Derby, 3s. Good plants, in single pots, all package free.—Orders are now booked for April and May.
A PRICED LIST, with nearly 200 Varieties, can be had on application to
W. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

Silver Tricolor Pelargonium, Mrs. Col. Wilkinson.

J. JANES will send out the above beautiful PELARGONIUM on and after May 1. This is a great advance on any Silver yet distributed, as it is of a true branching habit, the leaf very flat, margin white, with well-defined zone of crimson-lake and black. First-class Certificate Royal Horticultural Society, October, 1868. Price 31s. 6d. Price to the Trade on application.
North Road, Highgate, N.

HENRY BAILEY begs to call the attention of the Trade to his extensive Stock of PELARGONIUMS, FUCHSIAS, ROSES, HYDRANGEAS, &c., now coming into flower, grown for furnishing purposes, see "The Queen" has a few leaf very flat, margin white, with well-defined zone of crimson-lake and black. First-class Certificate Royal Horticultural Society, October, 1868. Price 31s. 6d. Price to the Trade on application.
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North Road, Highgate, N.

Choice Bedding Geraniums.

THOMAS PESTRIDGE can now supply, in strong Plants, for cash, the following varieties:— Per doz.—s. d.

LADY CULLUM	4	0	
LOUIS SMITH	3	0	
LUCY GRIEVE	2½	0	
SOPHIA CUSACK	6	0	
CHARMING BRIDE	8	0	
GLEN EYRE BEAUTY	6	0	
ITALIA UNITA	3	0	
PRINCE ALANDRA	6	0	
EGYPTIAN QUEEN	8	0	
MODEL	4	0	
KEEVIL GEMS	4	0	
PERILLA	3	0	
ACHIEVEMENT (Turner's)	each 10	6	

Package included. The plants are well-established in 3-inch pots
A List of other choice varieties on application
The Greenway Nursery, Uxbridge, Middlesex.

Choice Variegated Pelargoniums.

J. ELCOMBE AND SON beg to offer the following splendid varieties, at low prices, for cash:—

	Each. Dozen	s. d.	s. d.		Each. Dozen	s. d.	s. d.
Countess of Craven..	1	0 ..	9 0	Impératrice Eugène	1	0 ..	9 0
Defiance ..	1	6 ..	12 0	Italia Unita ..	0	6 ..	4 0
Edward Milner ..	3	0 ..	30 0	Italia Una ..	0	6 ..	24 0
Edward Prestatrick	3	6 ..	42 0	May Queen (Turner)	2	6 ..	24 0
Ibrence	2	0 ..	20 0	Countess ..	0	6 ..	4 0
Grandis	1	0 ..	9 0	Arthur H. Wills ..	1	0 ..	9 0
Humming Bird ..	1	6 ..	12 0	Her Majesty ..	0	6 ..	4 0
Lady Cullum.. ..	0	6 ..	6 0	Egyptian Queen ..	0	9 ..	6 0
Louisa Smith ..	0	9 ..	6 0	Refulgens ..	0	9 ..	6 0
Lucy Grieve ..	2	6 ..	24 0	Rev. Mr. Radclyffe..	0	6 ..	4 0
Meteor	1	0 ..	6 0	Painted Lady.. ..	1	0 ..	9 0
Mrs. Dix	2	6 ..		Model	0	6 ..	4 0
Prince of Wales(Smith)	2	6 ..		Countess of Kellie ..	1	6 ..	12 0
Sophia Cusack ..	1	0 ..	9 0	Beauty of Calderdale	0	6 ..	4 0
Sophia Dumaresque	0	9 ..	4 0	E. G. Henderson ..	1	0 ..	9 0
Sir R. Napier ..	5	0 ..		Duke of Edinburgh	0	6 ..	4 0

NEW ZONAL and NOSEGAY PELARGONIUMS of 1869, 12s each.
Nursery and Seed Establishment, Romsey, Hants

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of

Achimenes	Miscellaneous plants
Auriculas	" bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants } Verbenas

The Royal Nurseries, Slough

RHODODENDRONS.

		Per doz.	Per 100.
PONTICUM, twice transplanted, bushy,	12 to 18 in., 4s. 6d.	20s.	
" " "	15 to 20 in., 4s. 6d.	22s.	
" " "	18 to 24 in., 5s. 6d.	25s.	
" " "	24 to 30 in., 7s. 6d.	40s.	
HYBRIDUM "	12 to 18 in., 5s. 0d.	30s.	
" " "	18 to 24 in., 6s. 0d.	40s.	
" " "	24 to 30 in., 7s. 6d.	50s.	
MAXIMUM, white "	15 to 20 in., 5s. 0d.	30s.	
" " "	18 to 24 in., 6s. 0d.	40s.	
HIRSUTUM, dwarf nice plants		3s. 0d.	15s.

The above can be supplied by the 1000. For named sorts, see CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock.

JOSEPH SMITH, Sen., having a large stock of the following, begs to offer them to the Trade at low prices:—
RHODODENDRON PONTICUM, 12 to 18 inches, 18s. per 100; 15 to 20 inches, 20s. per 100; 18 to 24 inches, 25s. per 100—less by the 1000
Hybrids, 18 to 24 inches, 33s. per 100; 20 to 30 inches, 45s. per 100
RHODODENDRON HIRSUTUM, nice plants, 2 years planted, from layers, 15s. per 100
RHODODENDRON FERRUGINEUM, planted from layers, 25s. per 100
Double flowering WHIN, good plants, 12s. per 100.
ARBOR VITÆ, AMERICAN, 1½ to 2 feet, 4s. per 100; 2 to 3 feet, 7s. per 100 (less by the 1000); 3 to 4 feet, 10s. per 100; 5 to 6 feet, 40s. per 100.
SPRUCE FIR, NORWAY, 12 to 15 inches, 10s. per 1000; 15½ to 2 feet, 18s. per 100.
MOUNTAIN ASH, 2 to 3 feet, 15s. per 1000; 3 to 4 feet, 25s. per 1000.
Tansley and Scotland Nurseries, near Matlock, Derbyshire

MESSRS. J. STANDISH AND CO. are now prepared to execute orders for the following New and Choice Plants, to which they wish to call special attention. See larger Advertisement in last week's *Gardeners' Chronicle*
IXORA DIXIANA.—Plants, 7s. 6d. to 21s. each; with five or six clusters of bloom set, 35s. each.
ANTHURIUM SCHERZERIANUM.—Fine young plants, with two to three crowns, 10s. 6d. each; with three to four crowns, and stronger, 15s. to 63s. each.
TODEA BARBARA SUPERBA.—2s. 6d. to 5s. each
STRUTHIOPTERIS JAPONICA.—In April next, 10s. 6d. each.
FICUS MACROPHYLLA.—5s. each
VITTADENIA TRIPHYLLA.—Strong plants, 9s. per doz.; 60s. per 100
CORDYLINE EXCELSA BAUERIANA VARIEGATA.—2s. 6d. ea.; 24s. per doz
TREE PICOTEE ASCOT YELLOW.—A few strong plants, now, 5s. each; 21s. per doz.; 15s. per 100
ROYAL ASCOT VINE.—7s. 6d. to 15s. and 21s. each
PEACH, EARLY ASCOT.—Fine plants, 7s. 6d. to 15s. each
MARQUIS OF DOWNSHIRE.—Fine plants, 7s. 6d. to 15s. ea.
ARIS OIDATA.—10s. 6d. to 21s. each
JUNIPERUS JAPONICUS ALBO VARIEGATA.—2s. 6d. to 21s. ea.
ACER RUFINERVE ALBO LIMBATUM.—21s. to 42s. each.
" POLYMORPHUM PECTINATUM RUBRUM.—10s. 6d. to 21s. each
ARCUBA, Males.—1s. 6d. to 3s. each. Other varieties. See our CATALOGUE.

PAUL'S NOVELTIES of 1870. See WM. PAUL'S SPRING CATALOGUE, just published.

PAUL'S NEW ROSE PRINCESS CHRISTIAN.—Three First-class Certificates. Plants ready in May, 10s. 6d. each For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW ROSE VIRGIL.
Plants ready in May, 5s. each
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S SELECTION of NEW FRENCH ROSES. For description see WM. PAUL'S SPRING CATALOGUE. Strong plants in April, price 3s. 6d. to 5s. each.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE. First-class Certificate. Plants ready in May, 10s. 6d. each. See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE. Plants ready in May, 10s. 6d. each For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM BRONZE. The brightest and most effective of this section yet raised. Plants in May, 10s. 6d. each See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BEDDING PELARGONIUMS (BEATON'S Race). BONFIRE, the finest of all the Stella race, and five other kinds. Plants in May, 5s. each; or the six varieties for 25s. For descriptions see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NOVELTIES of 1869.—ROSE PRINCE LEOPOLD. GOLDEN VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c. For descriptions see WM. PAUL'S SPRING CATALOGUE, just published.

WM. PAUL, Paul's Nurseries and Seed Warehouse, Waltham Cross, London, N

ROYAL HORTICULTURAL SOCIETY. SHOW of CYCLAMENS, CINERARIAS, &c., April 6, 1870.
AWARDS OF THE JUDGES.
CLASS 1.—CYCLAMENS, Collection of. (Open.)
1st prize, Mr. C. Edmonds, Hayes Nursery, Hayes, Middlesex, £1 10s.
2d, Mr. J. Stevens, 4, Ealing Terrace, Ealing, W. £1.
3d, Mr. J. James, Gr. to W. F. Watson, Esq., Isleworth, W., 10s.
CLASS 2.—6 CYCLAMENS, distinct. (Open.)
1st, Mr. C. Turner, Royal Nursery, Slough, £1.
2d, Mr. C. Edmunds, 15s.
3d, Mr. J. James, 10s.
CLASS 3.—9 CINERARIAS, distinct. (Open.)
1st, Mr. J. James, £1 10s.
2d, Messrs. J. Dobson & Sons, Woodlands Nursery, Isleworth, W. £1.
CLASS 4.—6 AMARYLLIS, distinct. (Open.)
1st, Mr. E. Baxter, Gr. to C. Keiser, Esq., Broxbourne, £1 10s.
CLASS 6.—CUCUMBERS, Black-spined, 1 brace. (Open.)
1st, Mr. T. Lockie, Gr. to F. W. Berger, Esq., Court Gardens, Great Marlow, Bucks, £1.
CLASS 7.—CUCUMBERS, White-spined, 1 brace. (Open.)
1st, Mr. J. Douglas, Gr. to F. Whitbourn, Esq., Loxford Hall, Ilford, £1.
CLASS 8.—CUCUMBERS, Smooth, 1 brace. (Open.)
1st, Mr. T. Lockie, £1
2d, Mr. T. Sharpe, Gr. to A. Savory, Esq., Potter's Park, Chertsey, 10s.
MISCELLANEOUS.
Messrs. J. Veitch & Sons, Nurserymen, Chelsea. Group of Roses and Miscellaneous Plants. Extra Prize, £1
Mr. W. Denning, gardener to Lord Londesborough, Grimston Park, Tadcaster, York. Collection of Orchids, Extra Prize, £1
Messrs. H. Lane & Son, Nurserymen, Great Berkhamstead. Collection of Plants, Extra Prize, £2.
Messrs. W. Rollisson & Sons, Nurserymen, Tooting. Group of Orchids and Palms, Extra Prize, £2.
Messrs. W. Paul, Nurseryman, Chelsea. Collection of Orchids, &c., Extra Prize, £1 10s.
Mr. J. Ware, Nurseryman, Tottenham. Group of Hardy Flowering and Foliage Plants, Extra Prize, 10s

NOTICE.—FRIDAY NEXT being GOOD FRIDAY, the GARDENERS' CHRONICLE AND AGRICULTURAL GAZETTE will be Published the day previous (the 15th inst.), at 2 P.M.
ADVERTISEMENTS for that Week must reach the Office not later than WEDNESDAY MORNING.

The Gardeners' Chronicle

SATURDAY, APRIL 9, 1870.

WASTE anywhere should be reprobated, and if we had to write the history of WASTE in the garden—wanton, ignorant waste, we should point to the STOKE-HOLE, for there, we believe, there is a daily or weekly waste which few have any conception of.

We are not going to write an essay upon boilers, to praise that, or condemn another, but we shall go to the source of heat so far as boilers are concerned, and propound to gardeners, young ones especially, the very simple question: Can you make a fire? Of course we see the contemptuous curl of the lip, and the moustache also, at the absurdity of such a question, and yet, not dismayed by that, we say that in near half a century's experience we never yet had a man who when he came to us could make a fire as it ought to be made, nor manage it afterwards. Hence, we say, waste in the stoke-hole is something of which proper cognisance has not been and is not taken.

The object of burning fuel is to extract the latent heat from it, and by means of steam, heated water, flues, or hot air, to convey it to the atmosphere of our forcing and plant houses. That system of management must therefore be the best which with the smallest consumption of fuel conveys the greatest amount of heat to the atmosphere of the house. Thus what we want is not a large roaring fire, which forces half the products of combustion up the chimney, to be lost in space, but a fire such as, while it may heat the place to the proper temperature, yet wastes nothing in the manner described. To

secure this, it is indispensable that the furnace be properly constructed, that the doors and registers for the admission of air to the fire fit accurately, and so that they can be easily and quickly adjusted, and that the firebars be the best that can be made; not the thick clumsy things commonly used, but thin plates so closely set together that while nothing but fine ashes can pass through them to the ashpit below, air, the life of combustion, may have free access to every part of the fire.

Given a fireplace 3 feet long and 18 inches wide, at the back there will be fire-bars 2 feet long, but so subdivided in the manufacture that instead of seven bars offering eight openings of half an inch each, there will be thrice seven bars offering twenty-one openings of a quarter of an inch each, thus insuring free access of air to the substratum of the fire. These patent bars are manufactured by HUGHES, of the Lean Side, Nottingham, and also by a firm in Birmingham, and, though a trifle more expensive, the saving in fuel will soon cover the original cost. In the front of these bars, which must be supported by proper bearers, place a deadplate, 1 foot wide, and then come the doors.

Now, in point of efficacy and durability, we believe we have nothing equal to SILVESTER'S patent sliding doors, as manufactured by the late firm of BURBIDGE & HEALY, of London. We have had these doors in use for 30 years, and still they are good. The doors fixed properly, and the furnace bricked up, and connected by a flue, which should descend rather than ascend, before it reaches the chimney shaft, the next question which presents itself is—How shall the fire be made?

Before we answer that question we will presume that the furnace has been in use, and therefore requires to be cleaned out before the fire be lighted. This cleaning out is the centre upon which success hinges, and therefore we hold it to be indispensable to clear out entirely the fire or its remains every morning, leaving not a vestige of cinders or ash. To make assurance doubly sure, we would even take a long-spouted watering-pot, and wash the bars into the bargain, which answers the two-fold purpose of cleansing the fireplace, and damping the ashes below. This being done, take a shovelful of clean fire, and place it upon the bars just beyond the deadplate, throw on a handful of wood, and a shovel or two of small cobbles, observing to lay it in front of the fire rather than upon it, close the furnace door, and open the ashpit door sufficiently to give a good draught, and in a few minutes you will have a fresh brisk fire. Before adding fresh fuel take the stoking hoe and push the fire to the back quite clear of the deadplate, and then add fresh fuel in the front, observing never to throw fuel upon the fire, but always in front of it. In this way the coal becomes caked or carbonised before it enters into actual combustion, and hence after the fire is once properly lighted every particle of smoke will be consumed as it passes over the fire, and before it can get to the chimney—that is, so long as the fresh coal lays upon the deadplate, and does not extend beyond it. The whole secret of the consumption of smoke centres upon the fact, that you must first have a fire of sufficient capacity to burn it, and then if the fuel be applied as we have directed, it will be converted into coke before it enters into actual combustion, and a smokeless chimney will be the consequence. None of the smoke-consuming arrangements we have yet seen can act upon any other principle, and hence an attentive fireman, by the proper management of his fire, can accomplish as much as the most elaborate apparatus.

If, however, the common practice of spreading the fire over the whole surface of the furnace, and then throwing fresh fuel upon it, be indulged in, why then you may make the fire vomit forth as much smoke as you please.

The cardinal points of economical stoking are—Firstly, a thoroughly clean furnace to commence with in the morning; secondly, fuel applied before, not upon the fire; and thirdly, no air to be admitted to the fire except through the ash-pit door. Through that the fierceness of the fire may be regulated, and it may be assumed as a principle that no fire can be economical which is obliged to be forced by a strong draught. Dampers in the chimney are entirely unnecessary; they may assist to burst the furnace, or blow the door out by the explosion of accumulated gas, but the consumption of fuel should always be regulated by the admission of air through the ash-pit door, and through that only. A good stoker, who keeps his fire clear of dust, will take nothing from it but fine ashes and a few clinkers; a bad stoker will spend hours daily in clearing away cinders which ought to have been consumed. Hence the accumulation of cinder heaps in gardens—a sure criterion of bad stoking.

IT might well have been imagined, after the masterly and apparently exhaustive memoirs of DE BARY and the TULASNES on the development of the RUSTS and MILDEW with which our cereals and many other plants are affected, that nothing remained for future observers. We have, however, before us a memoir in PRINGSHEIM'S Journal,* by Dr. H. FISCHER VON WALDHEIM, on the Biology and Development of Ustilagineæ, which throws much light upon a subject which is of much interest both in a botanical and, indeed, in an economic point of view, as our best hope of finding some really available remedy for smut, a parasite which is in some years destructive to Wheat, Barley, and Oats—those which are so much vaunted being absolutely useless. Our author has followed out from the earliest stage the development of the more generally diffused species of smut and bunt, both within and without the mother plant, and certainly has cleared up several points which were before obscure. In some species it appears that the spores are produced in necklaces, as in a well known yellow rust on Rose leaves, one being formed behind as soon as the terminal one is perfect. The figures seem to import that they are originally formed within the tube, as in those Fungi, as Sphæria and Peziza, which professedly form their reproductive organs within a closed tube; but it is probable that this is merely apparent, and is a case exactly similar to that of the red mould of cheese (Sporendonema Casei), where the constrictions of the generating thread are not at first visible from its great transparency. Another point of interest is the rapidity with which secondary spores are formed on the germinating threads,—a matter of great importance, as the first-produced threads are too large to enter the stomates.† The facility with which these secondary spores inoculate with others, or with the germinating threads, is also very curious. One of the most interesting points in the memoir, however, is the history of the development of Sorisporium Saponariæ, which undoubtedly exhibits a totally distinct form, and which must evidently be submitted to further investigation.‡ Our author describes the tips of the threads of the mycelium as twisting round in the form of a spiral, and in conjunction with other threads forming a little ball, within which the spores are developed, while other secondary spores are formed on the free threads. This seems to indicate something sexual, such as has been described in Truffles, certain Pezizas, and above all in the moulds (Saprolegniæ), which are developed on flies, fishes, or even on aquatic plants submerged in water. It requires also to be compared with what DE BARY wrote some years ago on the mode of development of the perithecia in that very common little yellow Fungus, Eurotium Herbariorum, which is developed so generally in damp herbaria. The whole memoir is well worth attention, though unfortunately, as it is in German, it will not be available to many of our readers. *M. J. B.*

WE read in the *Wochenschrift* (March 12) that the general secretary of the Prussian Horticultural Society (Professor KOCH) communicated the contents of a paper sent to him by FREDERICK GERHARD, of Cölln, near Meissen, in Saxony, according to which the sender is prepared to sell to the State or to a company, for the sum of 50,000 thalers, a NEW INVENTION for the SUPPLY OF WATER for the good of mankind, and available for purposes of trade, agriculture, and horticulture. The inventor says he can cause any desired quantity of water to fall, from the heaviest to the finest rain, upon a considerable surface of ground, and this at the smallest cost and loss of time; so that in one hour three men can water several "scheffels" of land, from a height of 10 yards or higher, according to pleasure, without laying a blade of gram. According to the inventor, a man may further raise as much water above 5 yards as is required to keep a flour mill in activity. The inventor can heat rooms, hothouses, &c., to any required temperature, and also quickly cool them again. Professor KOCH adds: "We reserve all judgment, but would only suggest that those who promise too much inspire least confidence." We agree with the learned Professor, and should like to know more of the rain-maker's scheme before investing 50,000 thalers in it. It would rather seem, from the description, that the invention is something of the nature of a distributor of water already at hand, in which case £7000 would not be a bad bargain for the inventor. But if it is of a more important character, if he means that he can conjure rain from a thirsty sky, then it is dirt cheap. Prince SEKOMI, or SEKELETU, or any of the South African potentates, would doubtless give, or promise, double the money. M. GERHARD should try them, first making arrangements for getting back again, with or without the money.

—— One of the commonest of MALFORMATIONS occurs in the common Galium Aparine, wherein the usually flat leaf becomes contracted at the edges and depressed in the centre, so as to assume a boat-like form. This, it appears, is due to the presence of a species of Phytoptus. We have before us a paper by Dr. THOMAS, in which he describes a great number of "galls" and other deformities which he attributes to insects of the above-named genus, including some forms of Erineum, concerning the true nature of which there has been much difference of opinion, some considering them as of fungoid nature, others as morbid excrescences from the epidermis. We do not wish to controvert Dr. THOMAS' statements on insufficient grounds, but it certainly appears at first sight as if he attempted to attribute too much and too many malformations of very varied character to the charge of one genus of insects.

—— Another contrivance for fumigating plant-houses, APPLEBY'S REGISTERED FUMIGATOR, claims a few words of commendation as being both simple and efficient. The form of this fumigator, which is unlike that of any of the others to which recent allusion has

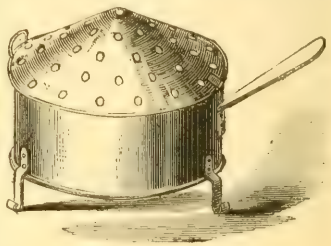

Fig. 90.

been made, will be understood from the annexed cut (fig. 90). It is made of sheet iron, and may be described as a flat iron saucepan set on three legs, with numerous largish holes cut out in the bottom and in the conical lid. When the pan is used, a few red-hot cinders are put in the bottom, the Tobacco-paper (which is a special kind) is pulled in pieces and laid on the cinders, the lid is shut down, and the paper left to burn away, which it does, yielding smoke without flame, and requiring no attention, if the pan is properly charged at the first. Indeed, it is stated that it is not safe to remain in the house while the fumigation is going on. Nothing can be simpler than such an apparatus, or more easy to use. We have tried it with the "Compound Tobacco-paper" sold with it, and found it quite efficacious with the quantity of the latter recommended by the vendor, so far as regards the destruction of green-fly, but we have not yet had a full opportunity of testing it for killing the thrips. The smoke does no injury to ordinary plants, but no doubt it would require using with caution in the case of such delicate plants as some Orchids.

—— Recent researches by Dr. CARPENTER and others on the TEMPERATURE of the DEEP SEA have shown the existence at great depths of an arctic current with a temperature of 32°, and at the same depth and with the same surface temperature of about 52°, an equatorial stream never lower than 46°, running side by side with the cold stream, and constituting part of a great general oceanic circulation which is continually bringing the water cooled down in the polar regions into the deepest parts of the equatorial ocean basins, while the water heated in the equatorial regions moves towards the poles on or near the surface. It has also been shown that a temperature 2½° below the freezing point of fresh water may prevail over the sea-bed in a region far removed from the polar, and that even this extreme reduction is by no means antagonistic to the existence of animal life in great variety and abundance.

—— An interesting report on the ravages of the BORER in COFFEE TREES has just been published by Mr. GEORGE BIDIE. The Coffee plant (we quote from "Nature"), as is well known, is not indigenous to Southern India, but was first introduced into India upwards of two centuries ago, by a Mussulman pil-

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* Jahrbücher für wissenschaftliche Botanik herausgegeben, von Dr. N. PRINGSHEIM, 7 band, 1 and 2 heft, 1869.

† This was pointed out by Mr. BERKELEY in a memoir which appeared in the Journal of the Horticultural Society of London, vol. ii., p. 107 (1847), in which the germination of Tilletia is described, and the tissues of the plant traversed by the threads fifteen days after inoculation. This memoir appears to have escaped the notice of all Continental writers on the subject. In one instance bunt was perfected not only in the seeds, but in the stem of the Wheat.

‡ Sorisporium Saponariæ has not at present been discovered in Great Britain.

grim, Babahooden, who, on his return from Mecca, brought a few berries in his wallet, and taking up his abode in the hills of Mysore, planted them near his tent, and from these the greater portion of the coffee now growing in Southern India has been derived. It is a native of Caffa in Southern Abyssinia. It is now largely cultivated in Mysore, Cuddoor, Coorg, and other parts along the crests and slopes of the Ghauts. It is a remarkably hardy plant, thriving at various elevations, and under the most different conditions of moisture, soil, and temperature. It is, however, liable to the attacks of certain insects, amongst which the Borer is the most formidable. This is shown by Dr. Bidie to be the larva of a beetle belonging to the Cerambycidæ, and termed the Xylotrechus quadrupes. The female lays its eggs in the bark of the plants, hot sunshine favouring their hatching. The larva immediately pierces the bark, and derives its nourishment from the more juicy layers, producing, by the damage it causes, exhaustion of the tree and loss of the crop. The whole duration of the life of the animal from the deposition of the ovum to the death of the beetle does not exceed 12 months. The animal appears to be indigenous, and the causes that have led to the great increase in its ravages during the last few years are drought, want of shade, bad culture, destruction of forest trees in which the insect used to live, and departure of some of its enemies.

—— Mr. W. Earley forwards us some Seed Leaves (cotyledons) of a species of Ipomœa, with Root-Fibrils springing from their base. The circumstance is unusual, but not unprecedented, as witness the following quotation from Dr. Masters' "Vegetable Teratology," p. 159:—"The production of adventitious roots is not limited to the stem or ordinary leaves of the plant, but may be manifested on the cotyledons; thus Irmisch describes cases of this kind in the cotyledons of Bunium creticum and Carum Bulbocastanum;" and in the work above cited a figure is given of similar productions originating from the cotyledon of a Mango.

—— We are glad to hear that Mr. Charles McDonald, head gardener at Woodstock Park, Kilkenny, has been appointed bailiff of the Phœnix Park, Dublin, in place of the late Mr. Wilkie. This is, on all accounts, a highly satisfactory appointment.

—— We learn from the *Builder* that the town trustees of Sheffield have under consideration a scheme for the provision of a Public Park, the funds for the establishment of which shall be derived from the large sum of money left to the town by the late Mr. Samuel Bailey. It is expected that the amount of Mr. Bailey's bequest will reach about £110,000 at least, and of this it is proposed to spend £30,000 on the purchase and endowment of a considerable portion of land belonging to the Sheffield Water Company, and situate close by their supply reservoirs, just outside the town, in a very pleasant and convenient neighbourhood.

—— We are informed that a new edition of Dr. Bevan's treatise on the Honey Bee will shortly appear, revised and enlarged, with copious illustrations by Major Munn, who has for some years paid great attention to the subject. We have seen part of the work in manuscript, and anticipate much pleasure from its publication, containing, as it will, a good deal of new matter, with a *précis* of all that has hitherto appeared of any importance in this country and on the Continent. Proofs of some of the lithographs are before us, illustrating the position and nature of the queen cells and brood combs, which are very instructive.

—— We should be glad to receive from the secretaries of Cottages' Village Flower Shows copies of rules and schedules of such societies, either for the present or last year. These should be sent to our office, addressed to the Editors.

—— In 1874 and 1882 will occur events of extreme importance to astronomers, in the shape of Transits of Venus. Already astronomical expeditions are planned to five stations particularly favourable for the purpose, viz., Oahu, Sandwich Isles, Kerguelen's Island, Rodriguez, Auckland, and Alexandria. At some of these places a staff must be in residence for twelve months beforehand to make the preliminary observations required. A writer in "Nature," "P. L. S.," calls attention to the great desirability of attaching one or more naturalists to these expeditions, so that the natural history and geology of these islands may be well investigated. We heartily endorse the suggestion, and further suggest the desirability of attaching some gardeners to each of the expeditions, who might not only enrich our home stoves by collections in the several islands, but add materially to the resources of the latter by introducing to them useful plants, and lending aid in developing their resources.

—— Stoneless Berberries, Pipless Pears and Oranges, as well as stoneless Grapes, we have seen; but we have never yet met with Stoneless Cherries, either on table or on tree. An old French compendium of recreative science (1792), now lying before us, tells how they are to be obtained:—

"An amateur of gardening (M. Salmont, Curé of Saint Aubin de Loene, in Maine) has tried an experiment which ought to be recorded, because it may furnish us with hints respecting other vegetable objects. The experiment is this. He took from a nursery a young seedling Cherry tree, which had made only a single shoot. The following spring, before the sap was in full action, he split it completely in two, from the upper extremity to the divergence of the roots. Then, with a piece of wood, he scooped out all the pith artistically and gently, for fear of doing too much injury to the organs of the plant. It is good to observe that he took great care not to employ iron for the operation, except at its commencement. He then reunited the two halves of the young tree, bound them together with a woollen thread, and stopped the cleft along the whole of its length with the sort of wax which moulders employ to make their moulds. When the sap had well rejoined the two halves of the tree, he cut the woollen bandage. The tree grew and gave him Cherries as fine and as good as those of other Cherry trees, but they were stoneless, or rather the place of the stone was occupied by a sort of white *fromage de Hollande* without consistence. This experiment, then, would appear to prove that the pith of trees is necessary for their propagation (by seed). But it will be said, we see trees, Apricot trees and others, which have lost with age all the pith of their trunk, and which yet produce fruits containing stones. But it must be observed that the branches of the tree are not deprived of their pith; whereas the operation performed on the young tree above mentioned, must have completely changed the structure of its organs. What views this experiment gives for the acquisition of fruits without stones, and especially of those small fruits which contain a multitude of pips, such as Grapes, Currants, Berberries, &c. It is known that pipless Berberries are found only on very old bushes, in which time has apparently produced a very great alteration in the organs. What curious and useful things of this kind might be obtained by repeated trials skilfully made!"

The sceptical horticulturist will first ask whether such an operation is possible; whether a young tree, completely split in two and joined together again, with or without the pith, can be made to survive and grow. When that is settled in the affirmative it will be time enough to watch the effects of the operation. Other exploded fallacies as to the uses of the pith might be mentioned. But before we laugh too loud at the speculations and credulities of a bygone century, we may remember that equally strange horticultural tricks are believed in by persons who still exist in the flesh. The Black Rose, obtained by budding a Cabbage Rose on a Black Currant bush, was once mentioned in our presence. We stated that the thing was impossible, as the eye of any Rose, budded on such a stock, would refuse to grow. A lady moving in good society contradicted us flatly, without so much as begging our pardon, and concluded her speech with—"I have seen it!" The matter was settled, and we were mute.

—— M. P. Deihérain has recently communicated to the French Academy a note on the Metamorphoses which occur in their Immediate Elements, in Herbaceous Plants. The young leaves of herbaceous plants, he observes, contain in spring besides albumen some tannin and some glucose, the latter being particularly abundant, and probably formed directly in the leaves by the union of the oxide of carbon and hydrogen, produced from the simultaneous decomposition of carbonic acid and water, under the influence of the sun's rays. A little later, when the growth is more developed, the lower leaves become yellow, and destitute both of the immediate elements and of the mineral matters which they previously contained; but these are still met with in the young leaves at the top of the stem, which become not only the laboratories in which the plant refines its immediate elements, but also the receptacles of such as have been refined by the first leaves, and which have not been utilised in the formation of the cellulose and of green matter. Later on the leaves again become empty, but this time to the profit of the stems which are to bear the ears of corn. An important change also takes place, the cane-sugar is partly substituted by the glucose. When the ear is formed, the cane-sugar and the albumen disappear from the stems, the whole plant is impoverished to the profit of the young seeds, which soon enclose all the elements refined by the plant, but profoundly modified,—in fact, all become insoluble; the cane-sugar has become starch, and the albumen transformed into glucose. Evaporation, which goes on more actively in the young than in the older leaves, M. Deihérain believes to be the cause which determines the passage of the immediate soluble elements, glucose, albumen, and phosphates, from one leaf to the other.

—— M. Prillieux, in a note recently presented to the French Academy, makes some further observations on the Movements of the Grains of Chlorophyll in plants under the influence of light. The green matter of plants, or chlorophyll, occurs, it is well known, under the form of grains. Many years since M. Böhm, a German observer, announced that in certain crassulaceous plants he had seen these grains become heaped up in the middle of the cells under the direct action of the sun. More recently a learned Russian, M. Famintzin, has recognised in the cells of the leaves of a Moss (Minium) some very marked movements of the grains of chlorophyll under the influence of light; and his discovery has been confirmed and extended by his compatriot, M. Borodine. The author had carried out confirmatory observations on another species of Moss (Funaria hygrometrica), which he thus described:—

"The action of light on the position of the grains of chlorophyll can be conveniently studied at night, with the aid of a lamp. I will recite some experiments made on December 20 last. At 5 P.M. the plant, kept for several days previous in darkness, showed all the grains of chlorophyll applied along the lateral partitions between the cells. It was exposed to the light of a lamp under the microscope, and several grains moved to the upper face; the movement being very appreciable in the course of an hour, two grains occupying the middle of the upper cell-wall of the cell. The lamp was then put out. At 7.15 the grains which were arranged along the upper partition had mostly regained the lateral partitions. At 11.30 all without exception had become fixed on the lateral cell-walls. The lamp was again lighted, and after a few instants the grains again changed place, and after a quarter of an hour several had glided from the lateral to the upper cell-wall. Their position was successively noted at 11.55, midnight, 12.15 A.M., 12.30, when the displacement seemed finished the grains were distributed on the superficial partitions of the cells; they had taken their diurnal position. Either by the light of the lamp or by daylight I have seen this changing of the grains of chlorophyll from the nocturnal to the diurnal position take place in about an hour."

—— It is an immense relief to find that, thanks to Mr. Glaisher's most laborious and careful investigation, the records of temperature, as kept at Chiswick for upwards of 40 years, will still be available for scientific purposes. The errors which caused suspicion to rest on the records have been eliminated and rectified by comparison with the Greenwich records, and by other means. As in all probability Mr. Glaisher's paper and tables will be published in full in the Society's Journal at an early period, we need now do no more than congratulate the Society on the accomplishment of this task, and express the thanks of all horticulturists to Mr. Glaisher for giving us results likely to be of the highest value not only to meteorologists but to physiologists and cultivators, and for preserving the integrity and enhancing the value of the observations carried on for so many years at Chiswick.

—— We find the *Bookseller* urging on the members of the book-trade greater diligence in the matter of publishing Books on Gardening and natural history generally.

"All gardeners, large and small, amateurs and professionals, are open to the purchase of books. They will feel grateful to any who will assist with advice in procuring their favourite study; and any bookseller who will introduce the right book to such a person will be regarded as a friend, and any book thus sold will probably be recommended to neighbours engaged in like pursuits. We believe that the intelligent bookseller might find half-a-dozen orders a week, at present unsatisfied with one that of Out-door books. If we will adopt our suggestion, he will find farmers ready to purchase books upon the Farm, Crops, Manures, &c.; gentlemen who will buy books on Gardening and Flowers; manufacturers who will be grateful for books on Botany, Ferns, Trees, Shrubs, and Lichens; fathers, or even mothers of families, who, before their animal trap, will be too glad to provide them elves with books descriptive of the sea shore, sea weeds, shells, and marine animals; and, when they return, who will as readily purchase books which will tell them all about croquet, lawn billiards, archery, and other out-door sports. Books of this nature are kept too much in the background. Booksellers allow them to be asked for and ordered, instead of sending them out on approval or placing them in the hands of buyers. We believe that there are a very few members of the trade who might not add largely to their returns by judiciously adapting themselves to the seasons, and to the books which should be in demand.

The success of some recently published gardening books looks as if garden literature were looking up. The booksellers have rivals in the nurserymen now-a-days. Do you want the "Hanging Gardens of Babylon," or the "Turnip Grower's Manual"? Order it of your *nurseryman*.

—— From Mr. Glaisher's tables on the State of the Weather at different stations during the week ending April 2, and which will be found in another column, it will be seen that in the southern and midland districts the temperature was several degrees lower than in Scotland or Ireland; thus, while the mean temperature at Blackheath was 37°, that of Perth was 45°, and that of Dublin 48°.

New Garden Plants.

Gymnogramma tartarea aurata, *var. nov.*

Fronds clothed beneath with a dense yellow or cream powder, bipinnatifid, pinnules with broad blunt rounded apices, as in the type.

This is by far the finest Gold Fern we have yet seen, beautiful as are some of the several forms raised by M. Stelzner, of Ghent. It is a large growing plant, with fronds 3 feet long, and grandly arching after the manner of those of Gymnogramma tartarea, which it also resembles in the broad, blunt-ended, almost obovate and slightly divided pinnules. The stout stipes occupies about half the entire length of the frond, and the lamina is of an elongate, ovate figure, measuring in the larger fronds some 14 inches across the base. The pinnæ are rather unequal in size and form, slightly incised, especially towards the base, which is decurrent, while the apex is dilated, rounded, and scarcely toothed. The lobes in the apical portion of the pinnæ, as well as in the upper part of the frond, are confluent; the upper surface is of a dull green, while the under side is thickly clothed with a deep golden-coloured powder.

This grand addition to our gold Ferns has been introduced from Peru, where it was discovered by their collector, Mr. Pearce, by the Messrs. Veitch & Sons,

of Chelsea, in whose private collection we have on several occasions during the past year seen it growing in great beauty. It will no doubt ere long be ready for distribution, and we look upon it as indispensable in all collections of stove Ferns. *T. M.*

PALMS.—No. III.

In all systematic arrangements of Palms, the Arecineæ are placed first, and I shall therefore not have to apologise when I begin my rapid review of the different genera with that great subdivision, and one of its best known representatives.

Chamædorea (Willd.) is deservedly one of the most popular genera, including, as it does, about fifty species, thirty of which are inmates of our gardens. They are natives of the tropics of the New World, abounding in the cool mountainous forests of Central America and Mexico, where they form a considerable portion of the underwood. Shade, moisture, and coolness, are therefore conditions essential to their well-being, and cultivators should take care to provide these for them. In many respects the genus reminds one of Adiantum amongst Ferns. There is about it the same slim graceful habit and polish — features which, when once impressed on the mind, render it easy for us to recognise the species wherever we may meet them. They are essentially Cane Palms, with a ringed, polished trunk, scarcely thicker than a man's finger, and only in extreme cases attaining as many as 20 feet in height. The leaves are generally pinnatisect, but in a few species entire, and normally of a bright green colour; but in one of the species, which is known in gardens as C. Ghiesbreghtii fol. variegatis, but which is most probably a sport of C. macrantha, and which I had an opportunity of admiring at Mr. Bull's nursery, they are variegated in a striking manner. The flowers are dicecious, and appear below the crown of the leaves; and in Mexico those of several species, notably C. Tepejilote, are eaten as a culinary vegetable, whilst those of several other species—and this we whisper into Mr. Rimmel's ear have a delicious odour. C. fragrans excels in the latter respect. Dr. Spruce, who met it in the highlands of Peru, about Tarapoto, says that it perfumes the forests far and wide with its orange-coloured male flowers, and all through the latter half of the year, but especially in the month of August. The Peruvian girls, who call it "Sangapilla," stick it in their hair, put it under their pillows, and use it largely in decorating the little crosses which they set up at the junction of forest paths. Nor does the scent quickly disappear. Dr. Spruce assures us that specimens, 14 years after they were dried, when hot water was poured over them, gave out their fine odour—an odour of Mignonette with a dash of Primrose. The fruit is a berry, occasionally not larger than a pea, but it has a fine polish, and is generally bright in colour, and highly ornamental. Moreover, many species, as for instance C. Ernesti-Augusti, readily bear fruit. On the whole, Chamædoreas fully deserve their popularity, which, by-the-by, is greater on the Continent than in England, because several species can be grown as window plants; and window gardening, notwithstanding Mr. Godwin's praiseworthy efforts, is, in this country, comparatively a little-known art. They are of manageable size, have a neat, cheerful look, require little heat, and are satisfied with any unoccupied corner that can be assigned to them: and many a cultivator who has succeeded in growing them successfully, has taken heart and tackled the whole order of Palms—an order popularly supposed to be difficult to cultivate, but in reality most easily managed if people will but bear in mind Wendland's advice, not to spare water. For water, and plenty of water, all Palms must have. Even the few kinds that grow in deserts are restricted to the neighbourhood of wells where moisture, both in soil and atmosphere, is ever present; and where the Date Palms have the advantage over genera of Palms growing in humid forests, &c., is that their leaflets are so constructed, by their sides being bent upwards and forming little channels, as to admit of their catching water and moisture. Attempts have lately been made to substitute for the name of Chamædorea, which was given by Willdenow in 1803, that of Nunnezharia, which was given by Ruiz and Pavon in 1794. That according to the right of priority the name of Nunnezharia must be upheld for the Peruvian N. fragrans, and all those species agreeing with it generically, admits of no doubt; but Oersted, Liebmann, and Wendland, have already shown that there are several distinct genera agglomerated under the old genus Chamædorea, and before imposing new synonyms the whole question requires to be studied much more comprehensively than has been done at present. As some of the new names have crept even into gardens, I give the genera adopted by Oersted; they are seven, viz.; Collinia, Liebm.; Eleutheropetalum, Wendl.; Stachyophorbe, Liebm.; Chamædorea, Willd., with the subgenera Euchamædorea, Chamædropsis, Chamædorella, and Nunnezharia, R. et Pav.; Dasystachys, Oerst. (Stachyophorbe, Klotzsch, non Liebm.); and Spathoscaphe, Oerst.

Fig. 68

Manicaria (Wendl., in F. Otto and Dietrich., Allg. Gartenzeit. 1853, p. 201) is closely allied to Chamædorea, and consists of three species, confined to the mountain forests of Central America, where I have frequently met them. The name was given by Hermann Wendland, in honour of M. Unico de Malortie, who until recently was director of the Royal Gardens at Hanover, which he was the means of bringing to a high degree of perfection: but the name will probably have to be exchanged for that of Reinhardtia, Liebm., which enjoys the right of priority. The Malorticas are the smallest of all known Palms, quite liliputian, beginning to flower and fruit when they are scarcely 6 inches high. They are covered with short deciduous scales, have terminal entire or pinnatisect leaves, monœcious flowers arranged on simple-branched racemes below the leaves, and one-seeded berries of dull colour. M. gracilis (Chamædorea fenestrata, Hort.) and M. simplex are to be had in most nurseries. M. latisecta I have not yet seen in gardens. A plant which I introduced from Nicaragua, and which is figured in the "Floral Magazine" as Geonoma lacerata, is a member of this genus.

Synechanthus (Wendl., Bot. Zeit. 1858, p. 143) is represented in gardens by S. fibrosus (Chamædorea fibrosa), a native of Guatemala, and will have to be ranged near Chamædorea and Euterpe. The genus has only one more species (S. Warscewiczianus) from Costa Rica, and, like Chamædorea and Malortiea, is confined to mountain forests. The stem is erect, unarmed, ringed, polished, and cane-like, the leaves pinnate, and the monœcious flowers are arranged in spadices which appear below the leaves, and have remarkably long thin branches, and the berries bright coloured. The small size attained by these plants renders them acceptable acquisitions to our collections.

Podococcus (Mann et Wendl., Linn. Trans. xxiv., p. 426) is an ally of Chamædorea and Synechanthus; it is, however, not of American, but of African origin—the only species, P. Barteri, growing in swamps of the rivers Nun, Bass, and Gaboon of the West Coast. It is an unarmed Palm, 6—8 feet high, clad with a brownish fur in nearly very part. The stem is simple, and crowned by 6—8 pinnated leaves, the leaflets resembling those of Ceratolobus and Ptychosperma Rumphii, being oblong-elliptical, plicate, many-nerved, and at the margin somewhat like the fins of a fish. The flowers are monœcious, and appear in the axils of the leaves in simple spikes (looking like those of Geonoma), whilst the berries are oblong, of a fine orange colour, and edible. Podococcus is distinguished at first sight from all other genera by the pedicellate ovary and by its fruit, which, when mature, stands at almost right angles with the pedicel, and, with the exception of Areca paradoxa (Kentia paradoxa, Mart.), is, in comparison with its diameter, the longest in the whole group of Arecineæ. The leaves are either pinnate or more or less entire; the flowers monœcious, pale yellow, the male with six stamens; the berries violet, resembling Olives in shape.

Morenia (Ruiz et Pav.)—The four species composing this genus of Cane Palms are natives of Peru, Bolivia, Ecuador, and New Granada, where they are confined to wooded mountains. They have pinnated leaves, dicecious flowers, and one-seeded berries. Only one of the species (M. Lindeniana, Wendl.) has as yet been introduced into our gardens. M. Linden obtained it from New Granada, where it is known to the people by the name of "Caña de San Pablo;" and it is just possible that Kunthia montana, which has been held to be a closely allied genus, is identical with this plant. The flowers of M. fragrans are sweetly scented. M. coralocarpa, Hort., is probably referrible to another genus.

Kunthia (Humb. et Bonpl.) has only one representative, viz., K. montana, but I think it is not as yet in the gardens—the plant sold under that name having proved to be, as Wendland has shown, Morenia Lindeniana. K. montana grows in New Granada, its native country, under the name of Caña de la vivora (Snake-cane), and its juice is regarded as a remedy against the bites of venomous snakes, applied either externally or internally; whilst the trunk is used for making blowing tubes, through which the Indians discharge their little poisoned arrows. The plant is from 20 to 24 feet high, has pinnated leaves, roundish, green, one-seeded berries about the size of a sloe, and spadices which bear white flowers, said to be monœcious—in which latter respect Kunthia is supposed to differ from Morenia.

Hyophorbe (Gaertn.).—I gave in the *Gardeners' Chronicle* (p. 418) an illustration of one of the finest species of this genus, H. Verschaffeltii (fig. 73), which Mr. W. G. Smith was permitted to copy from Mr. Bull's rich Palm collection. A still more recent addition to this genus is H. Barklyi, Hook. fil., one of three new Palms found in Round Island, off Mauritius, by Sir Henry Barkly, and which, from a drawing lately handed round at one of the meetings of the Linnean Society, has much stiffer leaflets than H. Verschaffeltii. With the third species, H. amaricaulis, the illustrations in Van Houtte's "Flore des Serres" have made cultivators familiar. A fourth, is the old H. Commersoniana, Mart., of which I have seen numbers of specimens in the Botanic Gardens of Mauritius, with dichotomous trunks. The Round Island species also has a trunk deviating from the normal

state of the genus by a peculiar swelling towards the base, reminding one of the turnip-shaped trunks of the desert plants of which Geo. Bennett in his "Gatherings" gives some illustrations. It was probably from this peculiar swelling, which is occasionally observable in the Chilian Palm, that H. Barklyi had been named Jubæa spectabilis, probably by a person who had seen the latter in its native country, and who was unaware that Jubæa spectabilis was confined to the northern parts of South America. The Hyophorbes are middle-sized trees, with unarmed trunk, terminal pinnated leaves, dioicous, white flowers, and one-seeded berries, resembling Olives in shape and colour.

Gaussia (Wendl., Götting. Gelehr. Nachr. 1865, p. 327). — Several garden catalogues, even those priding themselves on their correctness, enumerate this fine plant under the name of Gansia, as if it were called after Gans, the German for goose, though the man in whose honour it was named was anything but a goose—in fact the great astronomer, C. A. Gauss, of Göttingen, a veritable man of science. The genus is allied to Chamædorea, Morenia and Synechanthus, from all three of which it differs by several technical characters. There is only one species known (G. princeps, Wendl.), a native of Cuba, where it grows in the mountains, and was discovered by Mr. Wright, who distributed it under his No. 3224. It attains the dimensions of a tree, and the trunk is often swollen, but unarmed. The leaves are pinnate, and the leaflets linear-lanceolate, green above and slightly glaucous below. The monœcious flowers are arranged in a panicled spadix, which is surrounded by several spathes; and the berry is elliptical or obovoid, and of a dark violet colour. I have seen fine specimens at Mr. Bull's and at Messrs. Veitch's, but the largest is at Hanover.

Hyospathe (Mart.) is a genus composed of two species, H. elegans, of Brazil, and H. pubigera, of Trinidad, both still desiderata in our gardens. They are small Cane Palms, allied to Chamædorea, with unarmed straight trunks.

Leopoldinia (Mart.) — Four species composing this genus are confined to the forests bordering the Rivers Amazon and Rio Negro, and the product of one species, L. Piassaba (Wallace), forms a portion of the commercial fibre known as piassaba—for the last 20 years extensively used for brooms and street-sweeping machines. This latter species is still a desideratum in our gardens, and was formerly confounded with Attalea funifera, another Brazilian piassaba-yielding Palm. Dr. Spruce tells us that so long as this species does not exceed 10 to 20 feet in height, it has the stem enveloped to the very base with the persistent beard of the petioles (the piassaba of commerce), but when it grows higher the beard usually falls away in a mass, leaving at the top merely the short beard that depends from the crown of the existing leaves. The former state is represented in one of Wallace's plates ("Palm Trees of the Amazon"), which, however, gives the Palm a stunted aspect it does not really possess, in consequence of the leaves being shown only half as long as they ought to be, in proportion to the thickness of the stem; those which Dr. Spruce measured were from 15½ to 16½ English feet long, and had never fewer than 60 pairs of leaflets. The fleshy mesocarp of the fruit has scarcely any of the bitterness of that of the other species of the genus, so that when triturated with boiling water it affords a creamy "wine," said to be even more delicious than that of Assaí (Euterpe edulis). It is a matter of regret that this singular Palm is not as yet in our gardens. The only species of the genus which the nurserymen offer is L. pulchra, a most elegant Palm, frequently going under the name of Cocos Weddeliana. We saw at Messrs. Veitch's a specimen of singular grace and beauty—a perfect gem in its way (fig. 91). In its native country the trunks of this species are much used for railings; and on certain saint days, little altars and avenues are made before the principal houses in Barra do Rio Negro of the bright green and glossy foliage of this Palm; and the "graceful leaves," says Mr. Wallace, "rustling in the evening breeze, fitfully reflecting the light of the wax tapers which burn before the images of the saints, with the blazing torches of the rustic procession, produce a very pleasing effect." L. insignis and L. major, the two other species, remain yet to be introduced,—the latter is easily distinguished by its clustered stems, as many as 24 rising from a single rhizome. Young stemless plants of this species often form a continuous fringe to inundated islands on the South American rivers, and at a distance resemble large aquatic grasses—a feature which would render it most useful for decorative purposes. The species of Leopoldinia are allied to Geonoma in habit, though more robust; and consist of straight, unarmed, erect trees, having pinnate leaves, monœcious flowers, and drupes (not berries, as was formerly thought) of dull colour.

Euterpe (Mart.)—Of the 12 species composing this genus, natives of Central and South America, only a few are as yet to be found in our gardens, among them E. edulis, E. montana, and E. oleracea. All the species are notable for their elegantly pinnated leaves, with pendulous leaflets (except in E. Caatinga, in which they spread horizontally, and merely droop at the points), and for the long, cylindrical, pale green entire leaf-sheaths, which finally fall away completely, along with the rest of the leaf, so that the stems always appear clean and naked up to the base of the lowest remaining leaf, forming a striking contrast to many fan-shaped Palms where the leaves hang about the crown of the tree in every stage of decay. Euterpe generally forms separate groves in the forests, and some of the trees are occasionally 100 feet high. Dr. Spruce cut down one, the trunk of which measured 71 feet to the base of the cylindrical leaf-sheath or "cabbage," which latter was 4 feet long, and the leaves 8½ feet more. But he has seen specimens 10 to 20 feet higher, and Martius affirms that they sometimes reach 100 feet. The flowers are monœcious, and the berries roundish and of a dark purple colour. One of the most favourite drinks of the Amazonians of all castes and colours, known by the name of "Assaí," is prepared from E. edulis, and, according to Dr. Spruce, from several other species of this genus. The name of this drink is the first thing a traveller learns upon landing at Pará, in Brazil, where it is the oft-repeated cry of Indian and Negro girls walking in the streets with small earthen pots on their heads containing the beverage,—one of the greatest delicacies the place produces. In their native country Euterpes are both used and misused,—used as a culinary vegetable or a pickle; and misused as, in order to obtain this "cabbage," as the "heart" of the crown is termed, every time that this dish is required a whole tree, the growth of many years, has to be sacrificed—Palms, as a rule, not having the power of forming branches, as Dicotyledons have. *H. Seemann.*

THE BISHOP STORTFORD VINES.

Probable Causes of Failure.

Among these may be placed excessive porosity of borders—a want of water—amputation of the roots—and the closely restrictive system of pruning and training. It is almost certain the borders were too porous. I have already noticed Dr. Lindley's remark, that a walking-stick could be thrust its entire length into them; that I should consider a bad physical symptom of a Vine border. This also proves that the borders were composed of a great mass of porous substances—bones, brickbats, lime-rubbish, burnt earth—laying on a stratum of porous gravel, 2 or 3 inches thick, for a bottom. This porosity was further increased by a liberal admixture of dung. The borders were, therefore, rich as well as porous.

The doings of the Vines during their early growth were in harmony with the properties of the borders. Their growth was strong and rapid, even to grossness. The stamina developed seemed inexhaustible; but, if I am not misinformed, shanking was not unknown from a very early period of their history. A few berries shanking-off was a common occurrence; but at first, and for some years, they were so few as hardly to mar the general high quality. But the fact is important. The shanking that has ruined these Vines is not the manifestation of a new malady—it is simply the aggravation of an old disease, which very probably had its origin in the excessive porosity of the border. To maintain such fruiting plants as Grape Vines in health throughout a series of years, I believe the pressure of firm soil to be absolutely necessary. Such solidity may be as needful to the buried roots as the pressure of the atmosphere is to the stem and branches in the free air.

Another cause of failure may have been a want of water. Excessive porosity would work in this direction. According to "B." indeed (see p. 43 *b*), porosity and moisture seem almost identical. The roots hug the bricks because they, the bricks, supply moisture. But where do they get it from? They manufacture none. At best they can only return what they have previously absorbed, and universal experience demonstrates that such substances incorporated freely in soils work to the removal, not the storage, of water. The position and pitch of these borders assist their porosity to remove water. They are raised above the original surface, their ends retained with walls, and they have a foot or more pitch from the house outwards. They are 22 feet wide, about 40 inches deep at the back and 30 inches in front. But this difference does not represent the entire pitch of the border. The ground naturally falls from the vineries, and the pitch of the upper surface of the border is probably quite 2 feet. I regret I did not take it exactly, but this is a fact that can easily be verified. It will be remembered that though the subsoil is a strong clay, that this is covered over with a layer of gravel, which forms about the best possible channel for the removal of water. The whole substance of the borders was porous to a fault, while their upper crust shot the water off freely.

The ground falls rapidly away from the Vine borders in front; in a word, the entire surroundings of these borders and their form combined, with their physical qualities, to ensure rapid, thorough, and constant drainage. The borders were made on purpose to lie warm and dry, and there can be no doubt they have continued to do so. But this important point does not rest upon the above sure foundation only. To these certain inferences from such data as the foregoing can be added the testimony of observation and experience. During the removal of the Vines after all these rains and snows—the borders are now comparatively dry—no excess of moisture was met with anywhere. The old gardener, Mr. Yardly, is decidedly of opinion that the whole mischief has arisen from the want of water. Why water was not given, I cannot say, but it seems it has not been the practice to water these borders—their hard, dry, baked appearance was pointed out to me on the spot last summer. In confirmation of the over-dry theory, Mr. Yardly offers a telling fact, and has put the case so pithily as to have carried some of the best Grape growers in the country with him. He points to the largest Muscat Vine in the house, which always carried the heaviest crop and furnished the finest bunches. It was by far the finest Vine, and the last to hoist signals of distress. About two or three years ago he had to cut a drain to lay some pipes into a water-hole, where they used to mix manurial matters. This hole was near the end of the vinery, and the giant Muscat was the end Vine. In making the drain they came across several large roots which ran into this water-hole. These had to be cut off, and from that moment the glory of that Vine departed. Until these roots were cut he had never lost a whole bunch from that Vine, though a few berries had shanked; but from the time the roots that fed in the water-hole were cut, it has shanked as bad or worse than any of the others. Here, then, is a most suggestive fact. In view of such a demonstration, possibly few Grape growers will fail to endorse the cautious verdict of one of the best of modern cultivators, "that he believes more Grapes shank from the want, than an excess, of water."

Another probable cause of failure may have been the severe amputation of the roots. This would apply to this Vine with even greater force than to the others. Up to the moment of amputation it maintained its pre-eminence. It was carrying a fine crop at the time, and that failed. Probably, in the case of this Vine, it might not have had many other roots. Finding what it liked in the dirty water-hole, vital instinct would concentrate its feeding force upon this savoury larder. Hence, it must have felt its deprivation the more; and doubtless, in reference to the whole border, the reduction of roots was excessive. The best, or at least the most efficient feeders, are mostly found in front. It is there that the foraging scouts most do congregate. The large roots are the drains for the conveyance of food, the small ones the receiving-houses. To starve the traffic, you have only to shut up or destroy the latter. This is what was done in this instance, and yet I fear a revenue was exacted from the crippled Vine, for during this transition period, I have not heard that the crop was given up the year succeeding the amputation. Had this been done, I think the severe "surgical operation" would have probably established the pristine stamina of the Vines; but if a crop was taken at once, this must necessarily have drained the Vines well nigh dry of vital force, and it was hardly possible for them to recover. This view of the matter must, however, be accepted with the full recognition of a prior fact of great importance, to a just assessment of the damages arising from the heavy root-pruning. The Vines failed before they were root-pruned. This expedient was adopted as a remedy for the shanking, and therefore it cannot be credited with that malady. The worst that can be said against this severe amputation is, that it failed to cure shanking. Even in regard to the Muscat Vine, it cannot certainly be affirmed whether the loss of the roots or the loss of the water caused it to fail. Probably both had to do with it. Further, the root-pruning was successful in causing a rapid and vigorous multiplication of roots; and had one crop been sacrificed, or a large portion of a crop, possibly the health and vigour of the Vines would have been established. Still it would have been wiser to have added to the extremities of the borders without so ruthlessly slashing off so many of the best roots of the Vines in such a wholesale manner.

Restrictive training and pruning is the last probable cause of failure that I will notice. I still believe that this is an evil, and that close pruning is carried to great excess in many instances; neither can I accept the general practice of a custom as conclusive proof of its worth. Vegetable, like animal life, is pliable and long suffering. Medical men for generations practised bleeding and starving for nearly all maladies; that did not prove depletion to be curative. Now no doctor bleeds, and most even stimulate rather than starve fevers. [The intelligent physician is guided by circumstances.] Patients died and got well on both systems, so the testimony of experience is not conclusive. It is even so with Grape growing. One man reaps a bountiful crop of Grapes from a rod whipped by a sharp knife into a mere walking-stick; another goes in for the best bud, however far it may be off the main shoot. One takes one end only from a root; another, like Mr. Ingram, at Belvoir, allows two roots to a rod, one outside and another inside the house; while a third fills a house with bearing wood from a single root, and good crops have been cut and are now growing on all these systems.

But still they are not all alike good. The testimony of experience being so uncertain, is there no general principle of life development that can render us some assistance in the matter? There is: the great law of reciprocal action and reaction between root and branch comes to our aid. Every extension of top developes a corresponding extension or multiplication of roots. When the top of a growing shoot is arrested there is an interruption of root growth as well. The rebound from the top stoppage arrests the growth of the roots. By circumscribing the top we contract the number and reduce the strength of the roots also. A

striking proof of this was afforded upon the removal of the Bishop Stortford Vines. Two of them were observed to be furnished with many more roots than any of the others. The fact was noted and an explanation requested, in entire ignorance of the real cause of the extra rooting. That cause was, that these two Vines had been allowed to extend as far again as any of the others. While each of the other Vines had been closely confined to a rafter each, these two had been permitted to occupy two rafters apiece. It seems that 14 Vines were originally planted in the house. After a time two of them were cut out, and two of the remaining 12 were trained with double rods to occupy the space. For many years each of these Vines carried 80 bunches each, instead of 40, like the others. And they always seemed to finish their crop with equal ease, and to as great perfection as any of the other ten.

The fact is, as the demands of the tops increased, the roots made haste to meet it by new and wider growth. Mr. Yardley was so convinced of this that he explained the extra rooting as caused by the double tops as a matter of course. "Why these are the double Vines," was his exclamation on the spot. If these two rods to a Vine doubled the number of the roots, it seems only reasonable that 12 rods would have added to the roots in the same ratio; and the extension system not only adds to the number, but to the strength and vigour of the roots. Reciprocity implies proportion; a large top would beget and sustain large roots. It would likewise give these roots work to do, in harmony with their size and power. The extension system keeps root and top in lively exercise, and maintains a health-sustaining balance between them. The restrictive system starts by developing an extraordinary amount of root energy, and forthwith proceeds to set the greater part of it aside as useless. The mere existence of roots is not enough. Their efficiency depends upon the use made of them. There is, for instance, a line of rails from London to Edinburgh, but these will never take us there unless we get into the train, and the steam is used to drag us along. Now what the steam-engine is to the train the top is to efficient root action. It draws the sap forward, and the motion and amount of the nourishing fluid will be mainly determined by the momentum of the advancing top. Stop that by constant pinching and you shut off the steam of life, and the Vine or other train comes to a standstill. If such stoppages are persistent and constant, the powers of life or the ability to move on become weaker and weaker, and finally stop. Inertia gains the victory over Nature. Clear the line of roots with the expansive force of a large new shoot, and all may yet be well. Go on restricting the top and the channels of communication between the expenders, and the collectors of food become finally indurated into semi-impermeability. Is it any wonder that the top prematurely fails under such conditions?

Right or wrong in these inductions, the fact is certain that the double Vines at Bishop Stortford were furnished with roots in proportion to the demands of their double duty, and this furnishes an irresistible argument in favour of the extension system.

I agree with "Thoth's" anti-carrion philippics, both in prose and verse, although they are not *apropos* to these Vines, inasmuch as they have had no such garbage. The nearest approach to it was one load of hide shavings from a tanyard, mixed into the borders when they were first formed. The hides were pickled Russians, and the shavings were consequently deodorised with both salt and lime before they reached the borders. Besides, what was this sprinkling of shavings over so large a surface of porous land, or among so many roots? "Thoth" had much better accept my facts than allow his imagination to conjure up huge carcases from such chips of hair and skin scrapings. Why, fresh unboiled bones, charged with marrow, and bound together by tendons, are infinitely more rich in animal matters than such pickled hair and skin scurf. The quantity was so infinitesimal that it did not seem worth mentioning as a constituent of the border. But lest "Thoth," "B.," or "Brevity" should find, or think they find, any more mare's nests, either at Bishop Stortford or elsewhere, it may be as well thus to assure your readers that this one, about the carrion being the cause of shanking there, is wholly empty; there is not, and never has been, anything in it.

I have heard of a famous house of Vines that were planted at Wrotham Park, near Barnet, by Mr. Wm. Thomson, of Dalkeith, about the same time as the Bishop Stortford Vines, and I understand they are still in good condition. Perhaps Mr. Thomson and Mr. Edlington, the past and present able gardeners at Wrotham, would favour us with their experience of the past and present of these Vines. This will be equally welcome to me, whether it confirms or sets aside any of the theories that I have advanced in connection with the Bishop Stortford Vines. For I have no wish to retain for myself, and to prescribe to others, any rule of action that will not bear the strain of all the facts that ought to determine it; neither are theory and fact opposed to each other, as some of your correspondents seem to suppose. They are but different forms of truth—lines in fragments, and then compacted together; and therefore, whether I present the one, or marshal the other into formal array, I am equally loyal to truth, and consistent with my signature. *David Tell Fact.*

CHURCH AND SCHOOL DECORATION.

TOWARDS the close of last year we gave illustrations (pp. 1255, 1307) explanatory of the mathematical principles upon which single and double triangles and stars of five, six, and seven rays should be constructed, in order that when covered with leaves, flowers, or fruit, they should look well when fixed up.

The *Trefoil* is a design of frequent occurrence, and is too frequently made by putting three circles together in any way that happens to please the eye at the moment. Reference to fig. 92 will show the plan upon which such a design ought to be made. We have already explained how to make an equilateral triangle, and in the present figure it will be seen that portions of circles, of the size of the circle which surrounds the triangle, should be

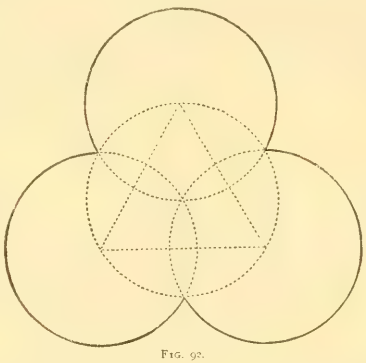

FIG. 92.

described from each angle of the triangle as a centre until those portions or segments meet, and that thus only can a true Trefoil be drawn.

The easiest way to draw a *Latin Cross*, is first to draw two lines at right angles to each other, as represented on fig. 93, by the two dotted lines, and to take measurements for the length and breadth of the cross from the point where these two lines cross each other. The proportionate lengths of the four arms of a cross should be, three of them of one length, and the fourth

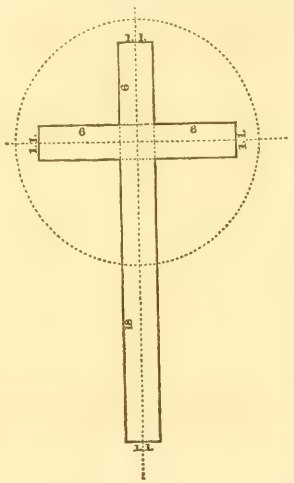

FIG. 93.

of three times that length. (Some prefer that the longest arm should be only two and a half times the length of the other three arms.) In fig. 93, the cross is drawn of the proportions which we recommend, as will be seen by the dimensions there given; in other words the cross is there twice as tall as it is broad. The substance or thickness of the cross, when finished, should be one-third of the length of the shorter arms. Thus, if they are 6 inches long, the thickness should be 2 inches; and this thickness is determined by measuring 1 inch on either side of the dotted line, and ruling lines from the points thus measured.

If there be any doubt whether the two lines first drawn are at right angles to each other, the doubt may be set at rest by describing a circle from the point at which they intersect, and measuring the distances from each other of the four points where the two lines cross the circle, which distances should all be alike.

Another method of determining whether one line is or is not drawn at right angles to another is founded upon the fact that if the three sides of any triangle are in the proportions of 3, 4, and 5, one of its angles must be a right angle. Hence, if two lines are supposed to be drawn perpendicularly to each other, and if from their junction you measure off 3 (inches, or quarter inches, or any other distance) upon one line, and 4 upon the other, those two points will be exactly 5 from each other, if the lines are at right angles; while if they are not, the extent of the error will be at once apparent.

It is most essential to prove the accuracy of this, the first step in making designs for crosses, since an error undetected here will throw all the afterwork into confusion. *W. T.*

Home Correspondence.

Iresine Herbstii.—This plant has failed with me in a very unusual manner this season; it was most successfully cultivated last year under exactly the same mode of treatment in every respect. It has had the greatest care bestowed on it from last autumn to the present time, every kind of soil being used in the pots wherein the cuttings were placed, and exactly the same degree of heat as last year, but now the cuttings have damped off so much that out of 1000 not more than 50 are living. They are placed in the same house (one used for Cucumbers) as last year, when they succeeded so admirably, and treated precisely as then. There appears no difference as to the soil in the pots, all kinds are tried and have failed alike. It is so valuable a plant for edgings that we regret much to lose it, and therefore shall be glad of any information as to the cause of their so damping off, and any means to prevent its recurrence. *C. T.*

The Vines at Raby.—"Thoth" informs us, at p. 421, that these are now "things of the past," but this is an error. Many of the old Vines are still occupying their original "nauseous" borders, and are to this day in excellent health; while during the past five years they have produced ripe Grapes in May, good in quality, both as to size of bunch and berry, and colour, and excellent in flavour. Many of the bunches indeed would be no disgrace to any June exhibition table in the kingdom. It certainly is true that some of the original Vines have been taken to the rubbish heap, most of these having been sent there by myself, not because they did not produce Grapes and timber, and certainly not on account of the black putty having rotted the roots. On the contrary, I found the border a perfect mass of living roots from the surface to the concrete, and in some cases through it. *Richard Westcott, Raby Gardens.*

The Proposed Horticultural Congress at Oxford.—I am somewhat disappointed at the tone of your correspondents' letters on this subject. I have propounded one mode of providing matter for such gatherings, and since "Manchester Congress" and Mr. Meikle take a few random shots at my proposals, I will, with your permission, briefly reply. I am charged with fearing to expose the poverty of the craft before the Oxford dons; desiring to confine the Congress to one or two prize essays, stamped "R. H. S."; ignoring the Manchester Congress; having the bad taste to specify particular papers; and exaggerating the painful effects of the long sittings upon both readers and listeners. To all these charges I offer the short plea—Not Guilty. I have not said that the craft are poor in intellect; I believe just the contrary. But being rich, I protest against their being made to appear poor by attenuating their resources too much, and spreading their wealth over too wide a surface. It looks better to pay our way in sovereigns than in fourpenny bits; and two or three mighty solid papers would do more to establish our reputation than a score or more of those short practical papers so much desiderated by "Manchester Congress." Such little-goes are invaluable in your pages, or in local mutual improvement societies; but at those great annual meetings the craft should speak, if at all, with an authority and power that would command attention. Doubtless clear and concise writing is a good thing, but these Congresses are not held to discharge the functions of writing-masters. This is best done at home, and if we are simply to sit and listen to what has been written, without note or comment upon it, then I should rather do my reading through the Press at home. If, as your correspondent assumes, there are only three gardeners qualified to discuss a prize essay written by one of themselves, then there ought to be a congress every month, until these three grow into three hundred. For the most intensely practical thing in the world is speech, and among no class of men has it a higher social power or a greater pecuniary value than among gardeners. For once that we are called upon to write, we have to address our superiors, inferiors, or equals a hundred times; and much of our success, usefulness, and happiness in life depends upon our mode and manner of doing so. Therefore, if such meetings teach us to speak better, more forcibly, respectfully, gently, or wisely, they will have rendered us a great service. But "Manchester Congress" is frightened at the initials "R. H. S." He is awed by their authority, overshadowed by their

power. He only knows three gardeners who would dare to question anything the Society endorsed with its cabalistic "R. H. S." This ought to comfort the Society in the midst of its trials. I hope it will turn just now for succour and sympathy to this great reverence of the practicals. But 'Manchester Congress" reveals the reason of his dislike for prize essays. It seems such things are one ideaed! "The congress would be a contemptible thing if confined to one or two ideas," he exclaims. Well, perhaps. But who has hinted at thus limiting its range? And yet there are single ideas that could exhaust the wisdom and time of most congresses without making them contemptible. Take, for instance, "Knowledge and its Rewards" to Oxford, and sit in congress for a week upon the two ideas, would either be exhausted at the end thereof? [No, but the hearers would be. Eds.] But I am charged with ignoring the Manchester Congress. May I inquire how, when, where? Certainly not at Manchester nor since. I have never denied that the meeting, all things considered, was good; but I have yet to learn why the Oxford meeting may not be better. As the *Times* lately remarked, we must all be marching on, and I do not see why the rule of congresses should be different from the rule of life—from good to better, from better to best. If a desire to see Oxford in its show and its Congress excel all that has preceded it, is to ignore Manchester, then I am guilty of doing so, not otherwise. Then, as to specifying papers, I simply did it to illustrate my meaning, not to disparage any. Mr. Meikle's criticism is of a milder sort, for I will not do him the injustice of supposing that he includes me in the charges of "paltry objections" and "ungentlemanly and uncalled-for falling foul of the affair." To the sentence he condemns, "that so many papers at a sitting was little short of cruelty to both readers and listeners," I still adhere. Mr. Meikle says, "both were free to come and go as the wind that blew through the tent." I can only answer that many of us enjoyed no such sense of freedom. Those most anxious to render the congress successful felt constrained to listen. The first condition of success was to form and preserve an audience. This rivetted me to my seat from first to last. I almost envied the free and easy manner of some of the readers; they came, they read, they vanished! I could not have done so. Every reader seemed to me doubly bound to become a listener. This was but a simple act of courtesy. And hence, as I listened from first to last throughout one day's sitting,—I could not stay for the second,—I can as a matter of experience affirm that it was too much for the instruction of the mind, or the comfort of the body. But this was the least evil resulting from the superabundance. The number of the papers balked discussion. The question is, not whether or not any of the papers have been threshed out since, but were any of them thoroughly discussed then? It is well known that they were not. They could not be so. The question, then, is narrowed to this. We are to have another congress—on what plan? Shall we have a second edition of the Manchester plan—a heap of papers, and a torrent of reading, with momentary discussions between? Or shall we have few papers, to be thoroughly discussed and adopted or rejected by a resolution at the sittings? These are the chief points—collection or selection. All others, such as who shall select, and on what principles shall the selection be made, are secondary. The prize essay system would, I think, stimulate the writers to do their best. This is all that is wanted—the best raised to the place of honour, and all approving the best in public meeting assembled. This would surely present horticulturists to the dons in a much more honourable and dignified position than to see them squabbling and arguing together over a score or more of disjointed fragments. *D. T. Fish.* [We shall shortly be able to announce the arrangements to be adopted at the Oxford meeting, which are making satisfactory progress. We have reason to believe that the principle of fewer papers and more lengthened discussion will be followed. In the meantime, we are requested to state, that those who may be desirous of submitting papers to the Congress may facilitate the necessary arrangements by communicating with Mr. Moore, Botanic Gardens, Chelsea. Eds.]

Croutting Frogs.—Would any of your correspondnts oblige me by letting me know if there is any way of preventing the croutting of frogs in a small pond, without destroying or hurting Water Lilies? *J. S.*

Bishop Stortford Vines.—Some 15 years ago I sent to the *Gardeners' Chronicle* an account of Fungi on the roots of Vines at Colney House, in Hertfordshire. I went there as head gardener on April 4, at the age of 24, or thereabouts. I succeeded Mr. John Fish, who was a first-class man in his profession. On April 4 the early vinery was colouring, and looked very fine, but shanking had commenced, and my employer told me it had existed for years. My employer told me it was of no use to try and do anything with those Vines, but that I had better make a new border, and plant new Vines, as they had never had Grapes from the old ones. Of course I was young and full of vigour, and I thought I would do something no person had heard of before; so I set to work, pulled out the old Vines and old border, made a new border with hollow chambers underneath, covered over with trees, &c., made new borders on the top, forced my Mushrooms, Seakale, and Rhubarb, underneath in the chambers, of all of which I gave an account in the *Gardeners' Chronicle*. Many did not believe what I said, among them the late Dr. Lindley. The timber, faggots, &c., caused Fungi to spread; they went through all the border and into the Vine roots, and so up through the stems, split the Vines, and killed them as dead as King Harry the Eighth. I paid a visit to Bishop Stortford last year when the Grapes were ripe. They were then condemned. I asked a friend who lives there, if possible to send me one of the old Vines when taken up. I enclose you his letter, saying he had done so, and that he had sent it away. I was at the expense of a truck for itself (for it is a large one, 18½ feet long, 12 inches in circumference), from Bishop Stortford to Potter's Bar, and when I got it home my first thing to do was to look at its roots; and what did I see?—nothing but Fungus, Fungus. I at once sent you a packet of roots from it, that you might see and judge for yourself; they are eaten up with Fungi. I am going to plant the Vine, and if it lives I may tell you the result some day. *John Monro.* [The roots sent are full of Fungus spawn. Eds.]

Burmese Mode of Rat-catching. — Having observed, in a recent number of *The Field*, a plan mentioned for catching rats (a cage trap, if I recollect aright, with a decoy rat therein), I am induced to send you the description of a trap I saw most successfully used in Burmah, where the rats are a perfect pest. Should any of your readers feel disposed to try it, I give you a rough section sketch (fig. 94*), to aid in making my description clear. This jar-trap was set for three nights. On the first occasion I saw 72 rats turned out, on the second night only nine were caught, and on the third night not one was caught. The trap was then put away for some weeks, when it was again successfully used, but I am unable to say to what extent it then succeeded. The common Pegu jar I

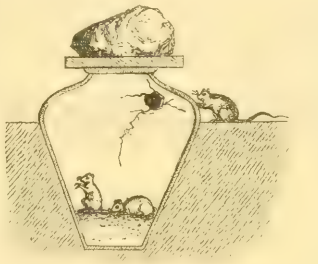

Fig. 94.

used was about 1½ foot or 2 feet deep, and 14 inches or 15 inches broad, and a hole was punched in the shoulder just large enough for a rat to enter. There was about 6 inches or 7 inches of paddy (rice in husk) in the jar, which was then buried to within about 8 inches of the top. The mouth of the jar was then closed with a board and a stone. A quantity of old timber joists and straw were in the outhouse, and no end of rat holes everywhere around. I incline to the opinion that my blue-legged Burman servant very "judiciously" punched the hole with an old nail and a hammer, for, though it was by no means regular or quite round (it seemed at first sight too small), it just admitted a hungry rat. I do not think the rats, after they had eaten all the grain, could have got through the hole, they seemed so filled out; otherwise, with such a lot in the jar, some could have got to the hole and "pulled through," I imagine. A moving mass of frightened, screaming rats is a bad "taking off" for a jump, I admit, but an odd fellow now and then might have hit the hole. I doubt if he could, however, have got through. If this trap is tried in England, pray publish the result. *Beta, in "The Field."*

Myrmica molesta.—In compliance with the suggestion that those who have observed Myrmica molesta should record their observation, so as to contribute to a knowledge of the limits of its invasion, I would add Paddington to the districts in London already mentioned (Bloomsbury and Walworth); I do not speak with absolute certainty, for I never saw it myself there, but I am informed that "the ants" in the houses about the Great Western Station are something terrible. *O.*

Talking Trees.—"Books in the running brooks, sermons in stones, and good in everything," I have heard of, but talking trees are certainly something new. Such phenomena, it appears, have sprung up in the garden at Combe Abbey; and the Vines there—which, be it observed, are no craven subjects—not content with "girdling the year with a glorious garland of Grapes," have ventured to dictate to their foster-parent as to the treatment they ought to receive. Well, in this precocious age it may appear a sign of weakness to wonder at anything; but the, I may say, dictatorial loquacity of Mr. Miller's Vines, reminds me of one of poor John Leech's speaking cartoons in *Punch*. It was Christmas time, and the fond "parient," a City merchant, was speaking to his son, a beardless youth—who, having just shaken off the dust of his minority, was to be admitted a partner—about the title of the new firm; when the budding merchant, with filial delicacy, suggested J. P. Jones & Father. This is one phase of "fast life," and Mr. Miller's "fast" Vines, who assume to be wiser than their preceptor, may be another. These providers of the jolly god are evidently "fast" in their proclivities, and well they may be so, for not only have they won golden opinions in some localities, but even before they weathered seven summers they began to sport beards. Now, I believe there is nothing more essential to good gardening than that the cultivator should be, what the spiritualists call, *en rapport* with his plants—that is, he should understand their requirements, so as to be able at a glance to anticipate their wants, and administer to them in the best manner. This is what I call practical ability, the little something which the experienced cultivator carries in his eye—a sort of sympathy in the objects of his care, which he feels but cannot convey to his neighbour. This is anticipating the wants of the plants, a very different feeling to that which gives way to the advice of juveniles, and allows them to dictate their own requirements. Speaking Vines forsooth! A quarter of a century ago, and for many years subsequently, the Stortford Vines spoke loudly, —so loudly that such horticultural seers as Lindley and McIntosh, Bailey and Glendinning, were taken captive by their performances. But the charmers have ceased to charm, the funeral pile has been lighted, "and now, with your consent," "D. T. F." promises to sing a requiem over their ashes. Now these Vines, which would have been planted 28 years this April, have been treated strictly upon the restrictive, or what Mr. Miller would call the fruit-growing principle. The rod once made and cut to the desired length, to that length has it been confined ever since, never being allowed to produce more timber than was necessary to the production of fruit, and that being cut off, with the feeling that it was an incumbrance, regularly every autumn. The fruit produced, especially the Hamburghs, was such as is coveted for market purposes,—not a few monster bunches, but a regular string from the top to the bottom of each Vine of bunches weighing from a pound to 30 ounces, and these finished in the best possible manner. No Vines could have behaved better than these did for the first half of their short lives, but then they began to fail, and now they are rooted out as mere "cumberers of the ground." This, I believe, has been the fate of all the Vines treated upon Mr. Crawshay's principle. Those at Norwich which, in the quiet days 40 years ago, created quite a sensation, have long ceased to be noted; and the Stortford Vines, after sinking into respectable mediocrity, have been cast to the rubbish pile. Such may be said to be the history of every restricted fruit tree since Adam was a gardener. Go into our fine old gardens, and you find Pear, Plum, and other fruit trees, some covering a perch or two of wall, closely pruned, but without a fruit upon them except at the points of the shoots. Look again at espalier and bush-trained trees in gardens. Do they, as a rule, produce such crops as those trees where the growth is but little restrained, or not restrained at all? If they do, why then Mr. Miller will be able to point us to a "whip-stick" Apple or Pear tree, which will annually produce more fruit than those "timber" trees in orchards which know no restraint, and yet produce sacks of fruit. Precisely the same rule obtains with the Vine. It must succumb to restricted vitality, and until the laws of Nature are changed no tree can long produce fruit which does not at the same time produce timber. Nature may be restrained, controlled, but she will not be subdued, even in the vegetable kingdom, until the wound she has received has become mortal. Mr. Miller has doubtless some fine young Vines, and it is not my wish to derogate from the excellence of his productions, but he is not the first person in the world who has had fine Vines, nor will he be the first who, after going up rocket-like, has stuck in a mud-puddle a few years afterwards. There has been no exception to this rule in fruit culture in our time, nor will there ever be. Trentham, Keele Hall, Garston, Arundel, Heckfield, Castle Kennedy, and many more gardens, have each had to "pale their ineffectual fire" as the Vines got aged, and Mr. Miller must do the same, unless he is wise in time. Already they have been once bearded over with premature old age, and last year an eye-witness informed me the fruit was not good enough for the early shows. These facts are, to say the least of them, symptomatic; and Mr. Miller may depend upon it, that if he continues to listen to the prattling of his juvenile charmers, who crave for fruit without the constitution to support it, he must inevitably be wrecked upon the same shoal as his preceptors and predecessors have foundered upon. Restriction has everywhere failed after the first burst of vigour, and it ever will fail—a dwarfing system cannot be applied to the animal or vegetable kingdom without the constitutional vigour being dwarfed at the same time. One fact more. While all the sensation Vines, from the time of Dowding's 8 lb. bunch of Black Hamburgh, which was

* We are indebted to the Editor of *The Field* for the use of this cut. Eds.

large but not well coloured, only one exhibitor has stood to his guns with the same Vines, and that is—need it be said?—Mr. Montgomery Henderson, of Cole Orton. Facts are stubborn things, and until Mr. Miller can overturn that fact, it is useless for him to write about "fruit and not timber." Whipcord may do something, but whipcord cannot whip a half-starved horse into the first of the flight across a heavy country. *Robin Hood, Sherwood Forest, March* 29.

Dimenuon Thermometer.—Can you tell me what is known of the dimenuon thermometer? I have bought one, and am told it is a French patent. It is something like a Six's laid on its side—two bulbs contain spirit, and a column of quicksilver occupies the bend at the end and part of each column, with a steel index to mark the maximum and minimum, as in ordinary spirit thermometers. But it is so much more sensitive than Casella's, that I doubt its being to be depended on. *T. S. P.* [We have no experience of the working of this thermometer, but shall be glad to record that of any correspondent who has used one. EDS.]

Fungus.—Mr. Pearson says at p. 460 that in my letter in the *Gardeners' Chronicle* I state that the Wellingtonias at Orton Hall were planted in a quantity of rubbish from the stickyard. Now, if he will read my article more carefully, he will, doubtless, find about line 13, on p. 145, that there were only four Wellingtonias planted in the rubbish referred to, and that these very four, up to last year, when I visited Orton gardens, were "glorious specimens." I feel confident at the same time that no one there is able to point out the said four trees, no one being interested in the experiment but the late Marquis of Huntly and myself. The trial was made by especial desire of the Marquis, doubtless showing that he was so far sceptical as to the pernicious effect of such materials as to desire a better proof than up to that time had been afforded him. But, mark, these facts do not convey any doubt of or opposition to Mr. Berkeley's opinions respecting Fungi. I also desire to rectify Mr. Pearson's impressions as to the plants he saw looking "sickly." The true cause I have little hesitation in saying is the result of transplanting, as at my last visit I saw too plainly that whilst those which I planted, and had not been removed, were healthy and vigorous, those that had been transplanted, except in one case, were in some degree stunted. Thus Mr. Pearson will see that his statement that the mixture of sticks and rubbish "may perhaps account for the miserable condition of some of the Wellingtonias," is a deduction altogether beside the mark. But when he comes to say, "Knowing that the Vine borders were made up of the same 'stuff' I expected to hear of the Vines being injured," I must inform him that such affirmations deserve to be met with an equally decided negative. If he makes these assertions on the authority of another, he would do well before retailing them to make sure that his information is trustworthy. *John Reid, Haigh Hall Gardens.*

The Cottage Garden Essays.—I trust I may be permitted to protest against Mr. Ayres' essay when published (see p. 460) being declared to be that which received the "high commendation" of the judges in the recent competition. Mr. Ayres states that it has received considerable additions, and will be illustrated. If so, it is probable that the judges would not again recognise it. I think it would have been fairer to the judges, the other essayists, and the public, that the essays that are published should be reproduced in precisely the same form as that in which they were when sent in. Mr. Hubbard strictly enjoined that the essays should consist of plain directions, so that uneducated people might understand them, and "that the main object was simplicity of language and clearness of expression." If any of these essays are to be published, let us have them as they passed the judges, so that the public may not only have an opportunity of judging the essays, but the judges also. *One who Competed.*

The American Potatos.—Whilst I am willing to give to Mr. Bennett all possible credit for his ingenious method of increasing the produce of his 1 lb. of Early Rose Potatos, I must at the same time protest against such resulting crop being put before unsophisticated persons as a sample of the normal character of its produce. I know that Mr. Bennett is far too honourable a man to do so without telling the public at the same time by what peculiar cultural processes such a result was obtained. But others interested in the sale of these American varieties may not be altogether so scrupulous; and some day we may be informed by trade advertisements that "that eminent practical horticulturist, Mr. E. Bennett, of Osberton [now of Enville], had raised from 1 lb. of the Early Rose Kidney 100 lb. of fine tubers; which great produce, but for the late spring frosts, might have been doubled:" and this instance will be cited as a proof of the extraordinary prolificacy of the American Potatos, but the readers will be left to infer that this enormous crop was obtained by ordinary cultivation. How many good English Potatos have we not that, under the same treatment, would produce the same results, but with this advantage—that the purchaser would get one peck instead of only 1 lb. for his money. Yet at the same time it is probable that our very best or A 1 varieties could not, under any such processes, be made to produce anything like so large a crop. But the reason for this is obvious, and I earnestly commend it to the attention of all Potato cultivators. Our very best kinds are remarkable for the small number of eyes they possess; coarse strong-growing kinds are remarkable for the large number of eyes they develop; and amongst these do I especially class the new American kidneys, of which the Early Rose is a fair example. Contrast it with such kidneys as the Lapstone, Waterloo, Yorkshire Hero, or Beaconsfield, and the difference is at once discernible. You may cut up a tuber of the former kind into a dozen pieces, and have an eye to each; can you do this with the latter kinds? Certainly not. And, moreover, whilst the Early Rose will push out at every eye, the other kinds I have mentioned rarely start more than one if the seed is left uninjured. Some growers may think that an abundance of eyes in a Potato is a desirable feature, but I am sure all our best authorities will agree with me, that the fewer the eyes, and the more they are confined to one extremity, the better. There is another fact of importance to be considered, and it relates to the keeping of the tubers for very late consumption. All Potatos will grow out more or less, those that grow the least are the best for keeping. Now if a tuber pushes at once a dozen shoots, the waste or subtraction from it of nutriment will, of course, be in proportion; but a tuber that pushes out but one shoot subtracts from it but a minimum quantity of nutriment in comparison to the other, and thus it becomes obvious that for keeping purposes the few-eyed sorts are best. And if the necessity should arise, as it too often does, that the store of tubers should be rubbed over, the labour of such a work is immensely increased when the shoots are more than trebled. As to judging Potatos at exhibitions, I should always make an absence of eyes in a dish of tubers a very prominent point in its favour. I have no interest whatever in the American Potato, beyond that which would attach itself to a long and experienced cultivator. I wish to see all these new kinds tested fairly on their merits, but not forced into notice by extraordinary cultural means. In planting this year samples of over 100 kinds, amongst which are several sorts from the "Far West," I have been as careful as possible to select tubers that were equable in size, and to give them the same mode of treatment, such as cannot fail to develop the characteristics of each kind with all possible fairness. This is cultivation under ordinary conditions, and by such conditions must all Potatos be judged. *A. Dean.*

"**Cog.**"—The word cog being under discussion, permit me to say that in Shakspeare's play of "Richard the Third," the Duke of Gloucester is made to say—

"——smile in men's faces, smooth, deceive and cog:"

which word, according to the Glossary, means to lie or deceive. *H. Beasley.*

Effects of the Past Winter on Vegetation.—That the relative character of the severe weather of the past winter, and its effects on vegetation in general, present in some respects a striking anomaly with that of the winters of 1860-4 especially, is proved by the fact that several species of the hitherto reputed hardy evergreens growing in the pleasure-grounds here are at the present time evincing that their foliage has suffered considerable damage, conspicuous amongst which I may particularise Berberis Aquifolium, which is much injured in exposed situations; and Portugal and common Laurels partially so. Our native Yews have also sustained considerable injury of their foliage; and I also regret to add that a fine specimen of Sequoia (Taxodium) sempervirens has had the foliage and numerous terminal growths, from 6 inches to 10 inches long, fatally injured—insomuch as to convey the idea that it had been subjected to the influence of some passing fiery blast. This is the first instance, as far as I am cognisant, of the species growing here being affected by frost or excessively cold east winds. That the prevalence of the east winds, accompanied by frost, has been chiefly instrumental in creating such havoc, there can be no question, inasmuch as invariably the east side of the subjects in question only has been affected. What, however, is the most remarkable is, that the severe weather of the winters above indicated failed to affect to the same degree the subjects here enumerated, whereas, on the other hand, several species that have now escaped injury were seriously affected then—hence the anomaly. I may also observe that the cold east winds prevalent during the past winter have proved somewhat erratic in their influences, inasmuch as in a few apparently sheltered positions its effect on some of the Barberries, Aquifolium especially, has been very apparent; whilst, on the other hand, in more exposed sites they have in some instances passed through the ordeal with impunity. I may add that, as regards the winter's effect on other vegetable subjects here, the Broccolis and spring Cabbages have sustained comparatively little injury; and, in fact, I have seldom known any spring Cabbages do much better, excepting that they are later then usual. Complaints, however, on all sides are rife as to the injury accruing to these vegetables, and the same in several instances applies to the Apricot blossom, where not efficiently protected,—the principal damage apparently having occurred about the middle of the current month, especially on the morning of the 4th ult., preceded by the heavy fall of snow on the 13th; here my thermometer—a Negretti & Zambra's—registered 22° Fahr., and one a few miles distant registered 25°! Fortunately, however, I managed to ward off the destructive influence by means of the indispensable Frigi Domo sheets, and there is a prospect, I am happy to say, of a most abundant crop of fruit, as the buds are multitudinous; few of them, however, are as yet fully expanded—a striking contrast to the blossoming period of the same last year. Of Apples and Pears there is promise of an abundant bloom, and which, I trust, will not be affected by the late spring frosts. *W. Gardiner, The Gardens, Eatington Park.*

The Fungus Theory.—I cannot agree with Mr. Miller and others in the conclusions they draw from certain facts which they adduce, in endeavouring to prove our needless alarm at Fungus. The inferences drawn from these facts are radically wrong (except those of Mr. Smythe), and none but a superficial observer can fail to see the amount of bad philosophy, and especially positive philosophy, that has been brought to bear on the subject. It is utterly fallacious for Mr. Miller or any one else to ridicule the idea (the fact, I should say) that harm comes from certain Fungi generated by "bits of sticks," or to assume that we believe a theory of their creation, viz., "that the dead shall devour the living." Mr. Miller flies to Nature's book, opens her pages, and with scornful glance points his finger to her text on "cause and effect of Fungus." But has he studied that text?—he knew it was there. Has he gone into her laboratory and scanned her various processes? I really very much doubt it. Let us go to the woods for example, says he. Well, let us go. Nature never belied herself. "Here are bits of sticks, old roots, &c., and no Fungus hurts the living. Why be alarmed for your Vine borders? &c." There is no occasion, but here Nature is left to herself. She throws off her decayed garments to the earth's surface, and there by atmospherical agency they are disintegrated into their elemental parts, and slowly and by degrees incorporated with the soil. The roots, also, the moment their functions cease, in their undisturbed position, decompose by virtue of their natural composition, and the healthy disintegrating principle of the surrounding soil, and afterwards become gradually assimilated into living organisms. Where the soil is naturally formed there is little or no danger, but where the soil is mechanically formed or disturbed, much danger is to be apprehended from allowing dried pieces of woody matter being mixed with it. In such circumstances no gardener can be too careful in avoiding "bits of sticks," in whatever shape. The experiment of the leaf-bed, demonstrates in No. 1 that the moisture sustains a healthy fermentation, decomposition rapidly takes place, and so the material is disintegrated. No. 2 experiment, from excessive dryness, suspended natural decomposition, and so generated a hotbed of Fungus. That Fungus succeeds disease may be, but that itself is a disease is a fact; it poisons the soil, and thereby renders it unfit for nutriment to plants whose roots are in time stagnated and poisoned, and the Fungus feeds on its prey. All diseases are living and active, and some of the most virulent and deadly are attributed to Fungus; and I believe it is all moonshine to conclude that a plant or animal must be unhealthy before it is attacked by disease or parasites. On coming to my present situation I had occasion to examine a border where Orange and Camellia plants were dying and dead, and I found the soil one mass of a white composition, the origin of this Dead Sea being traceable to the points of some wooden posts having been left in the soil where a temporary stage had been erected. Again, we had occasion last year to dig in, from the mechanics' department, a quantity of fæces, with which a quantity of wood shavings was mixed. This year, on the soil being trenched up, it was one mass of Fungus. That Fungi poison the soil in which they ramify—that they poison the roots of trees—that they invariably spring from dried woody matter—are facts that "nae chiel can ding." Mr. Miller's lavish praise of the Frenchmen for their advanced practice and notions on this subject, is scarcely borne out by the fact, for they live in dread of "horrid Fungus;" but I will give them credit for what many English gardeners neglect, viz., they make themselves conversant with the fundamental principles and laws that affect the change and action of the materials which they manipulate. That nothing is annihilated is an accepted fact; but that Nature always elevates herself is questionable. *P. Middleton, The Gardens, Wynnstay, N. W.*

Foreign Correspondence.

SUGAR MAKING, &c.—The settlement of a new country by persons without monied means has often led to some interesting results. The first settlers in America, particularly the Germans, and people of German extraction, had their ingenuity taxed to the utmost to make up for the deficiences in comforts, or luxuries, which they had been used to, or which they felt the want of. Thus, in the first instance, and before the introduction of ready means of internal communication, that grand necessary of life, "sugar," had to be provided; the most ready means for obtaining this was from the sap of the Maple tree, and excellent sugar it makes, but being expensive to obtain in regard to labour, was too precious for everyday use. This finally led to the manufacture of a kind of molasses from the stalks of Indian corn, which at one period of their growth abound in saccharine matter: it was not, however, a crystallizable sugar, and consequently fell into disuse as soon

as a better sweet could be had. But the most interesting result to the gardener was the final production of a seedling Apple, in the fruit of which the acid principle is absent, although the sweet principle is present in large quantities; it is wonderfully wholesome, and can be eaten by dyspeptics, who could not touch ordinary Apples. There are now many kinds of these sweet Apples throughout America and Canada, and no "German orchard" is considered complete without a proper proportion of these Apples, of one or other of the sweet kinds, which are used for cooking, and for the making of a kind of preserve, called "apple butter." This is a grand resource to the native American farm cook. It is made in large quantities, keeps well, and is in continual demand. It is made thus:—The juice of apples, as pressed for cider, is boiled down, until it reaches a certain degree of concentration; it is then added to apples—pared, cored, and cut in small pieces—and the whole is stewed down into a mass, taking great care not to burn it. It is very good, is always ready at hand for pies and tarts, or to eat at ordinary meals; it is wholesome when people are used to it (although rather an active cathartic when they are not), and much skill is displayed in the selection of different kinds of apples, both for acidity and flavour; and here come in the sweet kinds, which modify the acidity, and even the acerbity of other kinds, which keep well. Apple butter is made by the barrelful, and rivals "saur-kraut" as a prime necessity of German housekeeping. Speaking of "sauer-kraut," your readers may be interested to know how it is made. There is no good German housekeeping on the continent of America without this article. They take the white hard hearts of Cabbage, the larger and harder they are the better: cut them up small, and ram them hard into a barrel, with a due proportion of salt,—the whole is beaten into the cask with a heavy rammer, like that used by paviours. The cask when full is placed out-of-doors in the sun, and the mass is allowed to ferment and acetify; the barrel gives out a far too powerful smell for indoors. This mixture is eaten fried with bacon fat or butter, and is very wholesome to those who can once overcome their dislike to the disgusting smell. People who use it get so fond of it that they will never be without it—it becomes a necessary of life. It is of course a winter dish, and is the grand winter staple in the way of green vegetable matter. Another method of preserving vegetable matter for winter use is the drying process. Apples, Peaches, Plums, and Cherries are all dried for this purpose, and Apples so dried are now become a staple of merchandise. No doubt both Apples and Peaches in this state are now largely exported to England. The original manufacture was completed by peeling, cutting, and coring the Apples by hand; and for this purpose social gatherings called "Apple bees" were much in vogue. The pieces of Apples were strung on threads by an ordinary needle and strong packing thread or small twine; they were then suspended in the living rooms until dry, and kept well; but they were of a sadly frowsy taste, and much injured by the common house-fly. Now almost all orchards of any size in the United States have regular drying kilns. The Apples are peeled, quartered, and cored by machinery, are quickly and cleanly dried in proper kilns, and are, when the sorts are properly selected, nearly as useful as raw fruit. They are much concentrated so far as room goes; many barrels of the raw fruit will go into a barrel of the dried article, and dried Apples have become an institution.

The backwoods housekeeper not having Apples at hand uses Pumpkins. These are cut into slices, the centre taken out, and the rings so formed are strung on poles and dried, first in the sun, and then stored in the roof of the house. Pumpkins, however, go out of use as fruit can be raised, but still Pumpkin pie made from the ripe fruit is a national American dish, and when well sweetened and flavoured is really very good.

People in general are little aware how many different kinds and flavours there are in Pumpkins, they vary as much as Melons; and of course amongst those with whom it is almost a necessary of life, from having no other fruit, the sweetest and best flavoured kinds are in much request. "The Pumpkin" of the American housekeeper is the large yellow kind, rather flattened, and with a skin almost as hard as a shell. They are grown amongst Indian corn, as a kind of "stolen crop," and do not seem to injure the crop of the corn; although I am well assured, from the enormous extent of the running roots (which spread even farther than the branches), and from the fact that the better and richer the soil in which they grow (a dungheap is not too rich) the more they like it, that they must be a dreadfully exhaustive crop for the land. They are a favourite kind of food for milch cows, and when harvested so as to be safe from the frost will keep a long time.

I observe in the English agricultural papers "Cattle Melons" are extensively advertised; these I suppose are merely Pumpkins. As a farming crop they are going out of use here, as agriculture improves. the Pumpkin as a field crop diminishes. It is chiefly a "makeshift" in early forest farming; like the "Melon proper," it grows wonderfully well in the maiden leaf-mould of the newly cleared forest, and is then a great help both to man and beast.

I do not know whether the Curculio has yet become a serious pest in the English garden; here, for some years past, it has destroyed all the best kinds of Plums and Cherries. We have as many remedies for it as there are for the toothache, and they are about as effectual—the only absolute remedy is jarring the trees every day, first spreading a sheet under them to catch the insect when it falls; the Americans have several inventions for this purpose. Or another cure is the planting the trees in a walk where the soil is so hard that the worm cannot penetrate it when it leaves the destroyed fruit, and where all which falls is swept up every day: the insects seem to shun trees so situated, as if they were aware that their young would be destroyed. A new American plan is to smooth and whitewash the ground; it is well spoken of, and I shall try it next year. There are two native American Plums now coming into notice, which are free, both from Curculio and Black Knot, but they are both inferior fruit—the better the Plum and Cherry, the more the Curculio likes it. *Vectis, Toronto, Canada, March* 3, 1870.

Societies.

ROYAL HORTICULTURAL: *April* 6.—The Bishop of Winchester in the chair. The usual preliminary business of the meeting being concluded, the Rev. J. Dix and Mr. G. F. Wilson announced the awards of the Floral and Fruit Committees.

The Rev. M. J. Berkeley then commented upon several of the plants exhibited, including a curious specimen of Encephalartos giganteus, from Mr. Bull. This had at present produced no leaves, but had thrown up a very curious inflorescence; it must, however, either send out leaves and roots, or else live for a time on the starch in the root stock, and perish when this is exhausted. The glass wall at Chiswick was then alluded to as offering a lovely sight at the present time, the Peach and Nectarine trees forming a sheet of bloom, and, thanks to the manner in which the trees have been treated, there is every prospect of a good crop. Mr. Berkeley then stated, in reference to the Fungus question, that he referred at the last meeting to the Marquis of Huntly's estate in Aberdeenshire, and not to that at Orton, as mentioned in these columns. Some good examples of Mushrooms grown in the open air by Mr. Gilbert, gr. to the Marquis of Exeter, were then noticed, —Mr. Berkeley pointing out several obtained from French spawn, in which the gills were obliterated by some Hyphomycetous Fungus.

The Chairman then commented in eloquent and feeling terms on the great loss which the Society and horticulture had sustained in the death of General Grey, one of the Vice-Presidents of the Society. The deceased General was much attached to horticulture, and succeeded in converting the barren slopes of Windsor Castle into a brilliant garden. Moreover, he took a deep interest in the concerns of the Society. [We believe an address of condolence will be forwarded to the Hon. Mrs. Grey by the Council.]

Scientific Committee.—Dr. Thomson, F.R.S., in the chair. After the minutes of the last meeting had been read, Mr. Miers presented to the Society his newly-published volume of "Contributions to Botany," a valuable addition to his former publications on the same subject.

Mr. G. F. Wilson exhibited specimens of flowers and other objects preserved in glycerine since the year 1855, and which showed the excellence of this fluid as a preservative medium, as the colours were but little changed.

Mr. Blenkins exhibited a double Apple. The stalk was single, and the fruits themselves were partly coherent, but the "eyes" of the Apple were quite distinct.

Dr. Masters exhibited specimens of roots taken from the 72 experimental boxes at Chiswick, with a view to show the effect of the various manures on root development. Considerable difference was manifest in most cases, and the roots in question will be submitted to careful examination, and the results recorded at a future time. The soil in the boxes has been remanured, and a definite number of plants placed in each box, in accordance with the resolution of the sub-committee appointed to determine on the best means for carrying out the experiments in the forthcoming season.

Major Clarke exhibited a combination of white sand and bone charcoal, which he thought would prove useful for striking cuttings.

Mr. Glaisher presented certificates as to the efficiency of the new meteorological instruments to be placed at Chiswick, and read a paper on the "Mean Temperature of Every Day in the Year as observed at Chiswick from 1826—1869." This paper embodied the results of Mr. Glaisher's laborious and searching scrutiny into the meteorological records as kept at Chiswick for that period. Upwards of 80,000 observations had thus been overhauled, with the general result that the Chiswick observations are on the whole not so faulty as they were at one time supposed to be; the errors therein have generally been the result of recording a real reading on a wrong day. Now that Mr. Glaisher's computations and corrections are applied, the Chiswick record will be available for scientific purposes, and its value will be very great. It is proposed that Mr. Glaisher's paper be printed *in extenso* in a special number of the Journal of the Society. The records, among other things, show a gradual rise of winter temperature, our winters now being on the average warmer than they were a century ago.

Rev. J. B. Reade exhibited a branch of a Victoria Plum, covered with a coccus, which will be further reported on at a future meeting.

Floral Committee.—Rev. J. Dix in the chair. The subjects brought before the Committee this day were very few, in consequence of the greater attraction in the conservatory. First-class Certificates were awarded to Dendrobium thrysiflorum, a new species with white petals and rich lemon lip, from Messrs. Veitch; to Primula Contii (Hort.), the curious yellow-flowered Abyssinian Primrose, from the same firm; to Thrinax grandis, a handsome South American species of the Fan Palm; and to Encephalartos mirabilis, an African species, both from Mr. Bull; to Odontoglossum triumphans nigrescens, a very heavily-marked species, from Mr. Wilson, gr. to W. Marshall, Esq., Enfield; to Angræcum Ellisii (Hort.), a small waxy-like flower from Madagascar, sent by Mr. B. S. Williams; to Mr. Edmonds, Hayes, for a very fine Cyclamen of the persicum strain, with large rich rosy purple flowers, named giganteum; to Azalea François de Vos, a large semi-double flower, of a rich crimson colour; and to a new hybrid perpetual Rose named Mdlle. Eugène Verdier, full pink-blush, from Messrs. Paul & Son. To a fine spike of Odontoglossum Hallii superbum, from Mr. W. Wilson, gr. to W. Marshall, Esq., a Special Certificate was awarded. Strange to say no award was made to the beautiful and interesting Vellozia candida exhibited by Mr. Bull, and which we may hope to see in better condition.

Fruit Committee.—George F. Wilson, Esq., F.R.S., in the chair. At this meeting prizes were offered for various kinds of Cucumbers, and for a collection of forced Salading, in which latter class, however, there was no competition. The best brace of black spined varieties came from Mr. T. Lockie, gr. to F. W. Berger, Esq., Court Gardens, Great Marlow, who sent good specimens of Blue Gown, a new kind sent out last year by Mr. Turner. Mr. Douglas, gr. to F. Whitbourn, Esq., Oxford Hall, contributed the best brace of white spine Cucumbers, which were nicely grown fruit of Pearson's Long Gun; Berkshire Challenge, very coarse, and Rollisson's Telegraph, were also shown in this class. Mr. Lockie showed a good brace of the latter in the class for smooth varieties, and took the 1st prize. Special Certificates were awarded to Mr. Gilbert, gr. to the Marquis of Exeter, Burghley Park, Stamford, for three good dishes of Mushrooms, grown on outside beds; to Mr. Westcott, gr., Raby Castle, Darlington; and Mr. Butley, gr. to F. W. T. V. Wentworth, Esq., Wentworth Castle, York, for excellent examples of Lady Downe's Seedling Grapes; and to Mr. Smith, gr., Exton Park, Rutland, for Dumelow's Seedling Apples, which had been kept remarkably well. From Mr. Hallett, gr., Cossington, Bridgewater, came several examples of Hallett's Perfection Cucumber; and from Mr. F. Sharpe, gr. to A. Savory, Esq., Potter's Park, Chertsey, similar specimens of Potter's Park Prolific, a good-looking smooth-skinned kind, to which a Special Certificate was awarded.

The Cyclamen and Cineraria Show.—This was perhaps the most interesting exhibition for the season that has ever been held by the Society. The two special subjects might indeed have been better, as in the case of the Cinerarias, of which only two groups were put up in competition; nevertheless, from the great quantity and high quality of the miscellaneous plants shown, the exhibition greatly surpassed our anticipations. The day was bright and genial, and the attendance satisfactory. The best collection of Cyclamens was contributed by Mr. Edmonds, of Hayes, who staged a grand lot; the next best came from Mr. Stevens, Ealing, a smaller group, but equally good as regards quality; and the third from Mr. James, gr. to W. F. Watson, Esq., Isleworth, who put up a fine group in numbers, but his flowers were rather past their best. The 1st prize, for 6 distinct kinds, was won by Mr. Turner, Slough, they were a particularly well grown lot, and the blooms were in excellent condition; Mr. Edmonds was placed 2d, and Mr. James 3d. The above were all staged in a continuous bank, and the colours being brilliant in the extreme, the effect was most pleasing. As before-mentioned, the class for 9 Cinerarias was poorly filled, two collections only being exhibited; Mr. James took the 1st prize with very fair specimens, amongst which the following varieties may be noticed as being good:—Mrs. Hardman (James), beautiful broad violet-purple edge; William Reeves (James), a fine flower, slightly reflexed, with a broad white ring in the centre, edged with a deep margin of rosy crimson; Uncle Toby (Turner), large, deep blue; Snowflake, white; and Lord Elgin (James), deep purplish crimson. Messrs. Dobson & Sons were 2d with Eclipse, good, broadly margined with crimson-rose; Florence, rosy purple edge; Miss Smith, deep bluish purple edge, &c. Three prizes were also offered for six Amarylli, and six Coleus, neither of which elicited competition, one collection only being staged in the former class. These came from Mr. Baxter, gr. to C. Keiser, Esq., Broxbourne, and were very much damaged by the frost during their transit. The 1st prize was awarded.

In the miscellaneous class, which was the life and soul of the exhibition, was a magnificent group of Orchids, brought by Mr. Denning, gr. to Lord Londesborough, Tadcaster, in which were a splendid specimen of Dendrobium fimbriatum oculatum (Paxtoni of gardens), a very handsome species with flowers of a beautiful orange colour with a dark centre; D. Pierardii, fine white; D. primulinum, white and pink; D. Devonianum, one of the best; D. Farmeri, D. macrophyllum, beautiful pink, tinged with rose; two charming specimens of D. Wardianum, and D. densiflorum, &c.; and a grand specimen of Lycaste Skinneri, on which were upwards of two dozen blooms. An extra prize was awarded to Mr. Denning for this fine exhibition. Messrs. Veitch & Sons contributed a collection of flowering plants, in which were Dendrobium chrysotoxum, beautiful orange; D. Tattonianum, a small-growing species, with singular little flowers, pale orange, with a bluish lip; an excellent specimen of Amarylli Ackermanni pulcherrima, and a large specimen of Rhododendron Countess of Haddington, covered with bloom. The Messrs. Veitch also sent a beautiful group of Roses in pots, and three boxes of cut blooms; amongst the former were some charming blooms of Madame la Baronne de Rothschild, pink blush. An extra prize was awarded. Mr. B. S. Williams sent a nice group of orchids and flowering plants, &c.; and from Mr. J. W. Wimsett came a unique collection of decorative plants, including some very choice specimen Palms, Ferns, and flowering plants, which were effectively and pleasingly arranged. To Messrs. Lane & Son, Berkhampstead, an extra prize was awarded for a capital group of forced Rhododendrons, Azaleas, and Deutzias, &c., and an excellent group of Roses in pots, &c. Mr. Bull exhibited

a choice assortment of new Palms, Orchids, &c., to which an extra prize was given. To Messrs. Rollisson & Sons a similar award was made for a beautiful collection of Orchids, Palms, and a choice group of Vandas and Dendrobiums, &c. Messrs. Standish & Co. sent some nice blooming specimens of Bletia japonica, with pretty mauve-coloured flowers, and which is probably a variety of B. hyacinthina; a good specimen of the new Azalea François de Vos, a fine standard specimen of Duke of Edinburgh Rose, and some forced bouquet-flowered Asters. To Mr. Ware, Hale Farm, Tottenham, an extra prize was awarded for a fine group of hardy-flowering plants, similar to those shown at the Royal Botanic Society last week. Mr. Edmonds, Hayes, sent six good pans of Violets; Messrs. Cutbush & Sons a collection of spring-flowering plants, and Messrs. Lucking Brothers, florists, a series of bouquets and a nice group of flowering plants.

Notices of Books.

FOREIGN JOURNALS.

ANOTHER part, embracing Nos. 7, 8, and 9 of the 18th volume of the **Flore des Serres** is before us, and we proceed to take note of its interesting contents, more especially its illustrations, which are always exceedingly well brought out. Those now issued are as follows:—*Lachenalia luteola*, a charming spring-flowering green-house bulb, by far too little grown. *Spigelia marilandica*, a fine old herbaceous plant, with scarlet flowers, associating in culture with Trilliums, Hardy Cypripediums, &c. *Clematis John Gould Veitch*, the grand double Japanese Clematis, with blue flowers. *Imantophyllum cyrtanthiflorum*, a noble greenhouse hybrid, obtained by M. Van Houtte between I. nobile and I. miniatum, remarkable for its fine heads of rich flame-cloured drooping flowers, and almost perpetually in bloom. *Gloxinia speciosa Ida*, a delicately coloured blue and white drooping flowered variety. *Cypripedium barbatum grandiflorum*, remarkable for the increased size and beauty of its flowers. *Campanula soldanelleflora plena*, a curious dwarf hardy herbaceous plant, as little like a bell-flower as can well be imagined, the blossoms being split up into a multitude of linear segments. *Tropæolum tricolorum*, an old favourite, now too seldom met with, yet a charming plant either for decoration or exhibition. *Alstrœmeria tricolor* and *A. pallida*, two other gay-flowered, old herbaceous subjects, the culture of which we trust these figures may help to revive. *Datura sanguinea*, better known as Brugmansia, one of the finest of conservatory shrubs. *Gloxinia speciosa Lucie*, a handsome dark-shaded mulberry-coloured variety. *Antigonon leptopus*, a charming Polygonaceous conservatory climber, with bright rosy floral bracts. *Desmodium penduliflorum*, a hardy frutescent plant, springing up annually from the base, and producing long pendulous branches, and abundant racemes of reddish purple papilionaceous flowers from July onwards till late in autumn, and, according to M. Van Houtte, one of the finest Japanese introductions of our time. *Hydrangea stellata prolifera*, a very distinct form of Hydrangea, and one which is very suitable for cultivation as a decorative plant; it has roundish ovate leaves, and large dense globose terminal cymes of pink double flowers, formed of numerous spreading elliptic oblong sepals, and was introduced to St. Petersburg by Maximowicz from Japan in 1865. M. Van Houtte describes it as very pretty, but a slow grower. *Hemerocallis disticha flore-pleno*, reproduced from the first volume of the "Floral Magazine," a very showy herbaceous plant with large orange-yellow flowers marked with flame-coloured spots, and having the parts of the corolla about quadrupled as compared with the single or type form. *Azalea indica Maximilien*, a rather small-flowered particoloured variety, with a ground colour of pink, here and there striped with carmine, here and there edged with white, and according to the description given, inconstant; it was derived as a sport from the variety called Reine des Belges. *Cattleya labiata*, a double plate. *Encodonia magdalenæ nana multiflora*, a charming Gesnerad, the dwarfest of its family, 6 or 8 inches in height, with broad velvety bronzy-tinted leaves, the large and numerous flowers yellow below and rosy above, the face spotted with lines of vermilion dots; it is a very handsome plant, which M. Van Houtte now refers to Achimenes, since Dr. Hanstein has recently merged in that genus the groups named Mandirola, Eucodonia, and Locheria. *Gunnera scabra* or *chilensis*, a bold-habited herbaceous plant, tolerably familiar in gardens. *Xanthoceras sorbifolia*, a beautiful, hardy, Sapindaceous shrub, of moderate size, with grey bark, imparipinnate leaves, and terminal racemes of largish, regular, five-petaled, white flowers, having a purple eye; this comes from China and Mongolia. M. Decaisne remarks that it will probably form, when fully grown, a small tree, similar to the allied Kœlreuteria. The flowers appear with the young leaves, and the stain at the base of the petals passes from yellow to reddish brown, and then to violet-purple. *Lælia præstans*, a dwarf Orchid of great beauty, now well known in gardens. We are glad to find M. Van Houtte thus drawing attention to old neglected plants, such as the Lachenalia, Alstrœmeria, and Tropæolum noticed above. There is an interesting paper on the history of Belgian Pears, which we may quote hereafter.

L'Illustration Horticole commences the new series under the editorship of M. André, with a plate of *Aristolochia Duchartrei*, which although not acknowledged is a copy of part of a plate issued a few months since in the "Flore des Serres;" the plant, which is a curious and very ornamental tropical climber, has been already fully described and figured by us. This is followed by *Cissus Lindenii*, another tropical climber from Colombia, with ovately heart-shaped leaves, marked in the spaces between the veins, which are green, with broad silvery patches. *Oncidium Phalænopsis*, a pretty small-growing Orchid from the forests of Ecuador, allied to O. nubigenum, but rather stronger in growth, and producing charming white flowers, having the sepals, petals, and basal part of the panduriform lip heavily spotted with reddish violet, the callus on the lip being deep orange. It appears that another plant is grown in some collections under this name. *Ficus dealbata*, doubtfully referred to Coussapoa by M. André, an ornamental stove plant of shrubby habit, with large oblong-ovate leaves, dark green above and clothed with white silky wool beneath. This comes from the region of the Upper Amazon. An article on the vegetable products of the tropics is devoted to Erythroxylon Coca.

La Belgique Horticole opens its volume for 1870 with a portrait of *Calathea* (*Maranta*) *Lindeniana*, one of the finer species of a remarkably beautiful group of stove plants. The number also contains a plate of the following:—*Abutilon Thompsoni*, illustrating the contagion of variegation by grafting; *Dombeya Mastersii*, a handsome white-flowered, temperate stove plant, belonging to the Byttneriaceæ; and *Gardenia Stanleyana*, a well-known stove shrub. This number contains Prof. Morren's memoir on the contagion of variegation.

—— The managers of the *Field*, aspiring to more than hebdomadal fame, have issued the first part of **The Field, a Quarterly Magazine and Review**, comprising a selection from the articles published in that journal. Assuredly some of the articles are of permanent interest, and justify their reproduction, but these are not the majority in the present selection.

Florists' Flowers.

NOTWITHSTANDING the marked success which has attended the cultivation of the CYCLAMEN in the neighbourhood of London, yet its treatment appears to be very imperfectly understood in many places remote from the headquarters of horticultural enterprise. In journeying about the country the Cyclamen is occasionally met with, but in a condition as unlike that seen at the Royal Horticultural Society's exhibitions as can well be conceived. A short time ago I visited an establishment where spring-flowering plants are, as a general rule, remarkably well done, and here the treatment of the Cyclamen appeared to be altogether misunderstood. The plants had a sad used-up appearance, and similar forlorn sights met my view during a day's perambulations in the same district. It has actually come to be regarded as a plant difficult to manage, very uncertain indeed, and always unsatisfactory.

In marked contrast to such a state of things are the plants which have been exhibited by Messrs. Wiggins, of Isleworth (to whom the lovers of the Cyclamen owe a great debt of gratitude); Stevens, of Ealing; Welch, of Hillingdon; Edmonds, of Hayes; Egerton, of Strawberry Hill, Twickenham, and others; all of whom are successful growers, and have quite redeemed the Cyclamen from the charge of being difficult to manage. And not only have these growers done good service in the way of changing our views as to correctness of the old established mode of cultivating the Cyclamen, but they have also demonstrated in a remarkable degree the capacities of this beautiful spring-flowering plant to vary its character, and year by year to present quite new hues of colouring, combined with those collateral qualities of form, size, and substance the florist so strongly contends for. Nor must the foliage be altogether overlooked. The fine group of Cyclamens furnished by Mr. Stevens at the meeting of the Royal Horticultural Society on February 16 last, was particularly noticeable for the peculiarly rounded shining leaves, some of them marked and marbled in a handsome manner. The dull, deep brown ground of the leaves has changed to a lively green, and this serves to show up the markings in a much more distinct manner.

In Mr. Stevens' group could also be seen quite deep hues of bright crimson, also deep hues of rose, some of the last quite striking in character. On the other hand, some of the flowers were altogether white, some delicately tinted with blush, this had deepened to a distinct flush of pale lilac-pink; some, too, were prettily spotted and striped with rose, in others the stripe had broadened into a distinct flake.

A lean-to house at Worton Cottage, Isleworth, now entirely filled with Cyclamens, furnishes as pretty a spring show as could well be desired. This house contains some 300 specimen plants, about five-sixths of which are in 32-pots, and the remainder in 24's. A rough estimate would give from 20 to 60 flowers on each plant, and the colours being nicely blended, the effect is indeed very pleasing. In the way of novelty Mr. Wiggins can chronicle a decided advance. One had large pure white flowers, the florets regularly fringed and of large size; and there seems no valid reason why a fimbriated edge should not be as admissible in the case of the Cyclamen as that of the Primula. One had a singularly bright and rich crimson belt round the mouth or throat of the flower, the florets pale blush; another had pale pink florets, with a rosy purple throat; one of the most distinct had pure white florets, with a broad band of rosy purple—really purple—round the mouth: this Mr. Wiggins considers one of his best varieties. Distinctly tipped flowers are also putting in appearance; one had blush florets tipped with pale rosy violet—a fine type of what Mr. Wiggins terms C. persicum marginatum. In the case of another good flower the tip was paler than the ground colour, so reversing the order of the previous instance; this had a bright rosy crimson mouth, the base of the florets pale pinkish rose, with paler edges. The habit of the Cyclamen has by no means been overlooked in the efforts to improve it. The spare and lanky growth, at one time so characteristic of the plant, is rapidly giving place to a close dwarf habit; above which there rises up a mass of flowers borne on erect, almost perpendicular flower-stalks. This is also a result of careful selection.

Then, as to the cultivation of the Cyclamen. One of the most successful amateur growers round London (and his plants indicate how well he can grow it), has said,—"I have grown it successfully for some years with less trouble and more satisfaction than any other flower I have ever attempted, although I have had some experience in most of the plants ordinarily shown at exhibitions." What can be so easily performed near London can surely be as readily done elsewhere, what is really required is the knowledge of a better cultivable process. Mr. Wiggins advises that seed should be sown at any time after it is ripe; he generally sows in September or October, using a soil made up of good stiff loam, sand, and dung so rotten that it can be easily pulverised. The seed-pans are placed in warmth, say a stove, forcing pit, or frame, where a temperature of from 60° to 80° can be commanded, and here in about a month the first leaves will soon make appearance. As soon as the plants can be handled, they are pricked off into large 60 or small 48 pots, and placed on shelves close to the glass in a warm house, and every encouragment given them, though during the winter months they make only a slow growth. By the end of March, or earlier or later, as the case may be (the size of the plants will best regulate the time), the plants are potted singly in 60-pots, and placed in a warm frame (if with a slight bottom-heat so much the better); and by the end of May they are removed to a cold frame with a south-east or south-west aspect, and kept close for a few days, though eventually fully exposed during the day-time. When the plants are large enough they are placed in the blooming pots, and still retained in the cold frames. In hot weather they are frequently sprinkled overhead, besides being watered at the roots. A fine rose watering-pot is used, to prevent the leaves from being bent down. The sprinklings should be given early enough in the day to admit of the leaves becoming dry before the lights are closed for the night, supposing they are put on. This caution is given to prevent the growth from becoming lanky. Generally speaking the plants should begin to flower by October.

It will be seen from the foregoing that one of the leading features, if not the leading feature of the more modern system of the culture of the Cyclamen, is that no resting period is allowed; the plants are continuously active, and this is no doubt an indispensable feature in their successful culture. A fine development of flower can be materially aided by the weekly application of some weak liquid manure, and the appearance of the plants will be improved if all dead flowers are removed, supposing seed is not required by the grower. Good cultivators always recommend that the bulb, or "corm" as it is termed, should on no account be seen above the soil, for this apparently excellent reason, that, when buried, roots or feeders are put out from the sides as well as the base of the corm, which must be of great advantage to the plant.

With a little judicious management, the old plants can be made to do excellent service. After they have done blooming, the soil should be partially shaken from the roots, and these repotted somewhat lightly in good soil, and placed in a cold frame, and kept close for a time. It is, however, best to raise a batch of seedlings each year. A most successful cultivator wrote me a few days ago as follows, and I most heartily endorse what he states:—"If you intend saying anything about the Cyclamen, I hope you will most strongly advocate my opinion, that it is not a flower for April, but for November, December, January, and February, being at all other times almost out of season." *R. D.* [It was, however, shown in splendid condition, and in profusion! on the 6th inst., at South Kensington. EDS.]

Miscellaneous.

THERMO-PLASTIC PUTTY.—In a paper read before the Civil and Mechanical Engineers Society, by Mr. R. M. Bancroft, on the renewal of King's Cross station roof, it was stated the glazing putty used in this roof was that known by the above name, and manufactured by Sir W. A. Rose & Co., of London. It is peculiarly adapted for fixing the glass in roofs of railway stations, greenhouses, and other

buildings where plate-glass and iron or wood sash-bars are used. This putty hardens in a few hours after being used, but will, when exposed to sufficient solar heat, to cause expansion of the glass and metal, become plastic, and on cooling, again return to its original firmness, thus preventing the loss by fractures and leakage, which occurs so frequently, in places where the ordinary glazier's putty is employed.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Gardenias should now be occasionally watered with weak, properly clarified liquid manure, and also be frequently syringed overhead. *Forced Roses* which are being pushed forward in pots will be much benefited by an occasional application of guano-water as soon as the flower-buds are formed and commence increasing in size. *Epacrises* and *Heaths* which have finished blooming should be cut down nearly to the base of the young wood of the last season's formation. Thin out any very small shoots, and encourage a vigorous growth from those which were strongest when the plants were cut back. Do not give too much water at the roots until they have made a little growth. *Luculias* will now again commence to grow actively, and should therefore be attended to in the matter of potting, should they require it. Do not give them any advance in temperature: a cool greenhouse is quite warm enough for all their requirements. Pot *Tuberoses* fairly in a rich tenacious loam, and place them in a high temperature. Do not give them any water for a week or two after being potted, keep them full in the sun, and do not shade them by any means. Put in cuttings of *Heliotropes*, fancy *Picotees*, &c., to be eventually grown on through the summer, for blooming in pots early in the autumn. Pot off into single 60-sized pots those cuttings of *Salvia fulgens* which are already struck, to grow on for a like purpose. Freshly potted plants in stoves proper will now be making new roots, therefore give more air in the early part of the day, shut up the house about 3 P.M., and syringe every part freely. At this time as many cuttings as possible should be put in of all varieties of garden *Bedding Plants* which are likely to be in demand at any early date. Pot off as many of those already struck for which room can be found, as by the time they have filled the pots with roots, and have been hardened off, the season for turning them out will be at hand. Sow seeds of *Ipomœa major*, *Tropæolum canariense*, or any other form of summer climbers; also propagate *Dahlias* by means of the young shoots.

FORCING HOUSES.

It is necessary for me to correct a misprint which occurred under this heading in my last. In giving the temperature for vineries, instead of "let the thermometer run freely up to 55° or 57°," read, "up to 85° or 87°"—the difference being important. Particularly attend to all *Grapes* which are making their first swelling, and thin them out well at the earliest possible moment. Continue to stop the points of every lateral and sublateral shoot some two leaves or so from its own base. Give air early to all vineries, so that the condensed moisture resting upon the leaves may evaporate before the rays of the sun become too warm. *Pines* which are intended as forward successionals for early autumn and winter fruiting, will be much benefited by occasional watering with liquid manure, as soon as they have made plenty of roots. Those *Fig trees* on which fruit is swelling freely at the earlier stage should not suffer from the want of a constant supply of root moisture. Syringe them freely also once or twice daily during dull or fine weather, though more copiously on the latter than on the former periods. These remarks indeed bear with some weight upon all forced fruits at such a stage, not forgetting *Peaches*, *Nectarines*, *Strawberries*, &c. The latter, at such a stage, cannot well have too much water, if thorough drainage exists, especially when the plants are elevated upon exposed shelves. *Cucumbers* grown in houses or in pits in which hot-water pipes are placed under the roots at the bottom of the bed, are far more likely to suffer from drought at this season than from an excess of moisture.

HARDY FLOWER GARDEN.

True florists, and all who love the *Auricula*, will now give many spare moments to this old favourite; for already their quaintly marked and strikingly beautiful flower-spikes are commencing to show freely. During fine days water may be given to them pretty freely, due care being taken not to allow it to settle in the hearts of the plants. Where fine trusses of bloom are desiderata, it will be necessary to thin out and remove all the smaller flower-stems, which is best done with a small knife. Water even now must be given them sparingly during damp cool weather. It may be possible, should the weather continue moderately fine, to remove some of the hardier *Bedding plants* into cool pits, or similar places, where moderate protection can be given at any time should severer weather ensue. These comprise such things as shrubby Calceolarias, Verbenas, Salvias, &c. Continue potting off tender *Annuals*, &c., intended for planting out by-and-by. If all other operations are well forward now, vacant flower-beds may be turned over. Those who have not finished planting-out their *Ranunculuses* should not now delay one day longer than they can help, so late is it becoming to do so. Sow another row of *Sweet Peas* as a successional crop, so as to insure an uninterrupted supply of cut blooms throughout the season, as they are very much liked by those who cultivate a taste for cut flowers. Many of the exceedingly beautiful spring Squills, or *Scillas*, especially the varieties of S. bifolia, S. præcox, &c., will now be finishing their blooming. It is important that the old flower-stalks should be removed as soon as they are past their best, as they are rather given to expend some amount of strength in the production of seed vessels, to the impoverishment of the bulbs. Preparations should now be made for transplanting or making edgings of *Cerastium*, in all instances where these are formed of the young shoots of such plants (with few roots attached) as have stood the winter outdoors. The beds having been dug, and the inner edges having been neatly raked over, shallow drill-rows should be made for their reception. Take hold of the young growing tops in the hand thickly, and cut them down as close as possible to the ground; then lay them along the shallow trench neatly, and moderately thick, and press the soil firmly on to either side, so that only the growing points are discernible above the ground line. Water them well if the weather is at all bright and fine. Thin out the young shoots upon old stools of *Hollyhocks*, leaving only two or three of the strongest for future blooming. Newly-planted Hollyhocks should have a good watering, if the weather continues dry. Give a good surface mulching to old specimens of the *Pampas Grass*.

KITCHEN GARDEN.

Proceed at once with the earthing up of *Peas*, *Beans*, spring transplanted *Cauliflowers*, *Cabbages*, *Lettuces*, &c. Stir the soil between the rows of transplanted *Onions*, and bring the operation of *Potato* planting to a close. Transplant on to a warm sunny aspect, and in rows thickly together, such things, as spring sown Cabbages, Lettuce, and Cauliflowers, which are large enough for handling. Sow some more Lettuce and another batch of *Broccoli* in a warm place out-of-doors, and, if not already done as previously recommended, *Spinach*, *Turnips*, *Carrots*, &c. Do not cut off the heads of Broccoli now coming in, as the plants stand, but by pulling them up bodily remove all forms of anything likely to impoverish the ground unnecessarily. *W. E.*

TOWN GARDENING.

CONTINUE to sow *Annuals*, as directed last week. Wallflowers, Sweet William, Canterbury Bells, Polyanthus, double Daisies, Columbines, French Honeysuckle, Greek Valerian, and suchlike *Biennials* will not stand well through the winter in town, but if brought from the suburbs and planted with plenty of fibre, not compressed into a lump, they will flower freely and make a great show for a long time. *Hyacinths* and *Tulips*, which are planted in beds, now deserve particular attention, as heavy rains, cutting winds, and sharp frost will do them much harm, and the mid-day sun, if permitted to shine upon them fully when in bloom, will bring on decay of the flowers in a short time. The hoops must be kept constantly over the beds, and the mat or canvas always in readiness, in order to cover the flowers whenever necessary. Slugs now begin to make free with the Chrysanthemums and sundry other plants, and a little fine lime spread very thinly early in the morning will be of great service in preventing them from doing much damage. The sparrows also want attending to, for if material for building their nests is scarce, they help themselves to the young shoots of plants. A little fine hay, moss, and slips of paper placed close to the plants will prevent this damage. *J. D.*

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, APRIL 2, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR.							FALL OF RAIN.
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	57.1	26.8	30.3	46.1	29.2	18.9	37.4	0.00
Blackheath ..	56.5	26.4	30.1	45.1	29.0	16.2	37.2	0.00
Bristol	57.8	24.9	32.9	50.0	27.9	22.1	37.6	0.00
Birmingham ..	56.2	25.3	30.9	49.7	30.9	18.8	38.0	0.00
Wolverhampton	57.6	26.2	31.4	51.9	32.4	18.6	40.3	0.00
Leicester ..	58.7	22.5	36.2	50.8	30.6	20.2	39.4	0.00
Norwich	55.5	29.0	26.5	45.9	32.5	13.4	37.7	0.00
Nottingham ..	55.3	26.5	28.8	48.9	31.5	17.4	38.0	0.02
Sheffield	51.0	26.7	27.3	48.5	32.4	16.1	39.3	0.05
Liverpool	55.4	29.7	25.7	49.7	34.4	15.3	40.8	0.01
Manchester ..	56.0	25.8	30.2	52.0	31.3	20.7	39.8	0.00
Salford	58.3	25.2	33.1	52.2	32.0	20.2	40.7	0.00
Bradford	55.5	27.8	27.7	48.2	34.9	13.3	40.2	0.00
Leeds	55.9	27.0	28.9	48.2	33.1	14.9	39.1	0.01
Hull	50.9	25.9	25.0	48.0	30.9	17.1	38.1	0.01
Newcastle ..	54.0	32.0	22.0	48.2	36.2	12.0	40.9	0.01
Edinburgh ..	53.7	33.0	20.7	..	..	..	44.1	0.10
Glasgow	56.5	28.5	28.0	..	..	..	41.1	0.24
Dundee	53.0	31.0	22.0	..	..	..	42.5	0.15
Aberdeen	54.5	29.9	24.6	..	..	..	43.5	0.20
Paisley	57.0	27.0	30.0	..	..	..	43.0	0.05
Greenock	55.0	32.0	23.0	..	..	..	44.8	0.15
Leith	53.7	30.0	24.7	..	..	..	43.8	0.11
Perth	56.0	33.0	23.0	..	..	..	45.0	0.00
Dublin	60.0	28.0	32.0	..	..	..	48.1	0.13

JAMES GLAISHER.

*** *Our usual report of the State of the Weather at Blackheath is not having arrived at the time of going to press, we are obliged to postpone it until our next.*

Notices to Correspondents.

APPLES: *B. D.* Sturmer Pippin is a first-rate dessert Apple, coming into use in January and lasting a long time. It may also be used for culinary purposes if necessary.

BOUGAINVILLEAS IN NEW ZEALAND: *L. B.* No doubt you are right.

CACTUS: *J. Fleming.* A pretty and distinct variety; flowers large, colour bright rose-pink, similar to that of C. speciosus, becoming paler towards the centre, where the petals are broader. It wants a little more substance in the inner petals. We have no information as to its style of growth, on which its value would much depend.

GROWTH ON THE ORCHID LEAF: *P. H. Gosse.* This is an exstipulate Jungermannia, with the habit and colour of a minute creeping Hypnum. It approaches in some respects Mr. Mitten's genus Psiloclada, but without fruit it is scarcely possible to say to what genus it belongs. If we obtain any more exact information we will communicate by private letter. *M. J. B.*

HEPATICAS: *A. McF.* Hepaticas grow best in good fat peat soil, and a somewhat shady and sheltered position; but they will also succeed in any good garden soil, and in more exposed positions, provided it is not too hot and dry. They don't like lime, nor do they like to be moved.

INSECTS ON BEECH: *C. W. M.* A note on this subject at p. 389 (March 19) will answer your inquiries.

NAMES: *Lepidoptera.* The Choke Berry is Pyrus arbutifolia; Persimmon is Diospyros virginiana. The true Sassafras is Laurus Sassafras, but the same name is applied to Magnolia glauca and other plants.

NAMES OF PLANTS: *R. B.* Adiantum hispidulum.—*J. Lowe.* Erythronium Dens canis.—*Rob.* Andromeda floribunda.—*M. Sullivan.* Aristolochia cordifolia.

ROSES: *Subscriber.* We have had no experience with nitrate of soda as a manure for Roses. If you wish to try it *sow* it on the top of the soil some showery day, leaving it to be washed in with the rain. In our opinion, however, if your soil is dry, cow-dung will be found a better fertiliser for Roses.

SALTING WALKS AND ASPARAGUS BEDS: *B. D.* You may salt walks and carriage drives at any time when required. If done thoroughly at once it will keep them comparatively free from weeds throughout the summer. Asparagus beds should be salted in spring, before active vegetation takes place. Cast it over the bed, and allow the rain to wash it into the soil gradually. If weeds are troublesome, solutions strong enough to kill them may also be occasionally employed in summer.

TOBACCO: *F. R.* Simmonds, in his "Commercial Products of the Vegetable Kingdom," gives a good deal of information concerning the culture of Tobacco. We don't know of any recent English book on the subject. Apply to O. Judd & Co., publishers, New York.

VINE LEAVES: *A. B. C.* The Vine leaf when it arrived was much injured. It appears, however, to be partially withered, but without more data it is impossible to say whether from radiation, and consequent dryness of the internal air from the action of the sun's rays on the tender leaf, or from some local cause. Its condition does not appear to be the consequence of disease. *M. J. B.*

CATALOGUES RECEIVED.—J. Carter & Co.: Farmers Calendar.—Clark Brothers & Co.: Garden, Farm, and Flower Seeds.—W. Rollisson & Sons: General Seed Catalogue.—J. Whitehead: Catalogue of Carnations, &c.—J. Morse: Catalogue of Cuttings.—Downie, Laird & Laing: Florists' Flowers.—J. W. Wimsett: Stove and Greenhouse Plants.—Hooper & Co.: General Catalogue for 1870.—M. Young: Abridged Trade Catalogue of Trees and Shrubs.—Haage & Schmidt: Haupt-Verzeichniss über Samen und Pflanzen.—Thibaut & Keteleer: Catalogue Général des Plantes.—W. Paul: Spring Catalogue, 1870.

COMMUNICATIONS RECEIVED: S. F. M.—Flea-bane.—Rob.—G. B.—J. E. G. (received with thanks).—T. S.—F. R.—W. C.—W. H. G.—Harold—R. G. A. Y.—H. W. J. B. H. M.

Markets.

POTATOS.—Southwark, April 4.

During the past week the arrivals coastwise have been limited. Trade was good for all best descriptions, and the prices of the former week were fully maintained. The following are this day's quotations:—Yorkshire Flukes, per ton, 90s. to 120s.; Yorkshire Regents, 80s. to 110s.; Lincolnshire Regents, 80s. to 90s.; Dunbar and East Lothian do., 90s. to 110s.; Perth, Forfar, and Fifeshire do., 70s. to 90s.; Ditto Rocks, 70s. to 80s.; Ditto Reds, 70s. to 80s.; French and Belgian Whites, 65s. to 70s.

COVENT GARDEN.—April 8.

The market has been less active during the past week, and prices have barely been maintained, the importations being rather in excess. Foreign goods are offered at a reduction to effect sales. There has been another cargo of Pines from the coast of Africa, somewhat better than the last. Cucumbers, frame Potatos, and French Beans are abundant. Flowers are plentiful and good, comprising Azaleas, Fairy Roses, Hyacinths, Cyclamens, Tulips, French and Scarlet Pelargoniums, Heaths, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	3	0 to 5 0	Melons, each ..	..	.. ..
Cobs, per lb. ..	0	9 – 1 0	Oranges, per 100 ..	3	0 – 7 0
Filberts, per lb. ..	0	6 — 0 9	Pears, per doz. ..	4	0 —10 0
Grapes, per lb. ..	10	0 —20 0	Pine-apples, per lb.	8	0 —10 0
Lemons, per 100 ..	4	0 to 8 0			

VEGETABLES.

	s. d.	s. d.
Asparagus, p. bund.	3 6 to 15 0	HorseRadish, p bun. 3 0 to 5 0
Artichokes, p. doz...	3 0 — 6 0	Leeks, per bunch .. 0 2 — 0 4
Beet, per doz. ..	2 0 — 3 0	Lettuces, p. score .. 1 0 — 2 0
Broccoli, per doz. ..	1 0 — 2 0	Mint, per bunch .. 1 0 — 1 6
Brussels Sprouts, p. ½ sieve ..	2 0 — 3 0	Mushrooms, p. pott. 1 0 — 1 6
Cabbages, p. doz...	1 0 — 1 6	Onions, per bunch .. 0 4 — 0 9
Carrots, p. bunch	0 4 — 0 8	Parsley, per bunch . 0 2 — 0 4
Cauliflowers, p. doz.	1 0 — 3 0	Potatoes, new, p. lb 0 0 — 0 6
Celery, p. bund. ..	1 0 — 1 6	Scorzonera, do. .. 1 0 — 1 3
Cucumbers, each ..	1 6 — 2 0	Seakale, p. punnet.. 2 0 — 2 6
Endive, per doz. ..	1 6 — 2 0	Shallots, per lb. .. 0 8 — ..
French Beans, p. 100	3 0 — 4 0	Spinach, p. bushel .. 2 0 — 3 0
Garlic, per lb. ..	0 6 — 1 0	Radishes, per doz... 1 0 — 1 6
Herbs, per bunch ..	0 2 — 0 4	Turnips, per bunch . 0 4 — 0 6

Potatos, York Regents, per ton, 80s. to 110s. ; Flukes, do., 80s. to 130s.

CHEAP BEDDING PLANTS, shaken out, are offered for cash :—Calceolarias, of sorts, 7s. to 8s. per 100; Geraniums, Tom Thumb, Stella, Chrissie, Rose, Punch, Crystal Palace Gem, 8s. to 12s. per 100. Heliotrope, Alyssum, Lobelenia and Daisies.

W. GROVE, Tupsley Nursery, Hereford.

Gladioli—Seedlings, and by Name.

GLADIOLI SEEDLINGS (first-class), per 100, 7s. ; per 1000, £3.

100 Gladioli, by name, in sorts	..	..	8s
200 "	"	"	14s
100 "	"	50 sorts	10s to 40s.

All in good flowering bulbs

LEVEQUE ET FILS, Nurserymen, 132 and 134, Boulevard de l'Hôpital, Paris.

CHARLES TURNER recommends The BRIDE, a beautiful new CLOVE, pure white, smooth edge, large and full, 18. 6d. each.

CARNATIONS and PICOTEES, named, and in fine variety, 21s. per dozen pairs.

PINKS, 6s. per dozen pairs.

CLOVES, in colours, 6s. per dozen plants

This is the best season for planting the above in borders or large pots for blooming. New and beautiful DAHLIAS now ready.

The Royal Nurseries, Slough.

CHRYSANTHEMUMS, CHRYSANTHEMUMS.—12 25 good varieties for 5s., 50 for 9s., including large-flowered; POMPONS and JAPANESE, 15 varieties for 1s., 50 for 3s., in thumb pots, package included, or post free. No varieties sent which prove worthless, or not as described.

CALCEOLARIA AUREA FLORIBUNDA, 6s. per 100; GLADIOLUS, LEMOINEI, 6s. per 100, all flowering bulbs

POLYANTHUS, pencilled, GEM, FAIRY DAISY, and dwarf zonal PELARGONIUMS.—Tom Thumb, Stella, and Cubister, strong autumn struck cuttings, 1s. 6d. per dozen, 12s. per 100. CATALOGUE of Tricolor Pelargoniums and other Plants for one stamp. Terms cash.

WM. CLIBRAN and SON, Millbank Nursery, near Warrington.

SUPERB DOUBLE HOLLYHOCKS.—Now is the time for planting to ensure good spikes and blooms this season.

WILLIAM CHATER'S CATALOGUE of his unrivalled collection may be had upon forwarding one postage stamp. Choice bloomed Seedlings, with colours attached, extra fine, 40s. per 100, unbloomed Seedlings from finest sorts, 20s. per 100.

Seeds saved only from first-class flowers, in packets and collections, from 1s. to 10s. 6d.

Special prices for quantities to the Trade on application

WILLIAM CHATER, The Nurseries, Saffron Walden.

HARDY HEATHS, in 50 varieties, free of package—

24 plants, in 12 varieties, to cover 6 feet for 21s.

48 plants, in 24 varieties, including choicer varieties, for 18s

100 plants, in 12 varieties, for 25s

100 plants, in 24 varieties, for 30s

100 plants, in 50 varieties, for 50s

Many varieties to be supplied by the 100. See CATALOGUE

JAMES SMITH, Darlaston Green Nurseries, near Millock.

To the Trade.

HURST and SON have to offer a few ounces of RAPHANUS CAUDATUS (Rat-tailed Radish); also 12 packets, RAPHANUS CAUDATUS MIXED

ELCOMBE'S DWARF MAMMOTH BEET

VICTORIA WHITE COS LETTUCE

BROWN COS LETTUCE

HORTEN'S VARIEGATED LEAVED BROCCOLI

Good samples of ADVANCER, LITTLE GEM, CHAMPION, FORTYFOLD, and other Wrinkled Marrow PEAS, can still be supplied.

TOM THUMB NASTURTIUMS.

TROPÆOLUM CANARIENSE.

PYRETHRUM AUREUM.—Golden Feather

NEW HYBRID TREE MIGNONETTE.

AURIETIA GRÆCA.

CHRYSANTHEMUM JAPONICUM and POMPON. from Fortune's Hybrids.

DIANTHUS DIADEMATUS.

" LACINIATUS FL. PL.

GILIA LINIFOLIA

LOBELIA SPECIOSA and COMPACTA ALBA

MALVA MOSCHATA ROSEA

MYOSOTIS AZUREA CŒLESTINA and ALBA

OXALIS VALDIVIANA

PELARGONIUM, choice.

STOCKS.—Victoria Scarlet, Crimson Bouquet, Rose Bouquet, East Lothian, Intermediate (from Scotland), Cottager's Brompton Scarlet.

TAGETES SIGNATA PUMILA

TROPÆOLUM CŒRULEA ROSEA.—Tom Thumb.

" PYRAMIDALIS.

" LOBBIANUM, choice.

VIOLA LUTEA

" CORNUTA ALBA

WALLFLOWERS, choice double German.

ZINNIAS ELEGANS FL.-FL., very fine

6, Leadenhall Street, London, E.C.—April 5, 1870.

SPECIAL OFFER for AGRICULTURAL and GARDEN SEEDS.

NORMANTON YELLOW GLOBE MANGEL WURZEL, small top and single tap root, next growth of 1869. 9d. per lb., 7lbs. per cwt.—Stock direct from Messrs. Harrison & Sons, Leicester

FISHER HOBBS' ORANGE GLOBE, 7d. per lb. 5lbs. per cwt.

ENGLEFIELD YELLOW GLOBE, 6d. per lb. 5lbs. per cwt. (The general satisfaction this Mangel has given for the several years past needs no comment.)

LONG RED, RED GLOBE, YELLOW GLOBE, LONG YELLOW, 6d. per lb. each, 45s. per cwt.

CARROT SEED.—Altringham Red, 1s. per lb.

" James' Intermediate Red, 1s. per lb.

" White Belgian, 10d. per lb.

CABBAGE SEED.—Large Drumhead or Scotch, 2s. per lb

" Thousand Head, 2s. per lb.

" German Red Kelk, the short top variety, next-growth of 1869, 2s. 6d. per lb.

" Cheaper by the cwt.

SWEDE.—Hall's Westbury, a fine selected stock, 6d. per lb., 22s. per bushel of 50 lb., 84s. per four bushels.

" Sutton's Champion, Skirving's Improved, Old Purple-top 6d. per lb.

TURNIP.—Stone or Stubble, 9d. per lb.

" Green Globe or Barrel, 6d. per lb.

" Red Globe, 8d. per lb.

4 lb four bushel sacks, 1s. extra; two-bushel, 9d.; one bushel, 6d.

Remittances to accompany all orders.

A surplus stock of the undermentioned POTATOES very cheap (prices on application).—Myatt's Prolific, Portyfold, Wheeler's Milky White, The Sultan Kidney, new and heavy cropper; Early Shaws, Dalmahoys and Flukes.

CHRISTMAS QUINCEY, Seed Grower, Market Place, Peterborough.

RAYNBIRD, CALDECOTT, BAWTREE, BOWLING AND COMPANY (Limited),

CORN, SEED, MANURE, and OILCAKE MERCHANTS

Address, 26, Seed Market, Mark Lane, E.C. ; or Basingstoke

Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed" and "Cleaning Seeds."

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above Seeds, is now published, and will be forwarded on application. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.

Exotic Nursery, Tooting, Surrey, S.W.

GIANT ASPARAGUS PLANTS, the best that money can procure, 2s. 6d. per 100. This delicious Vegetable does not require half the expense usually incurred in planting it

See GILBERT SMITH'S SEED LIST for 1870

Extra strong SEAKALE, 2s. per dozen

RICHARD SMITH, Nurseryman, Worcester

TO the TRADE and OTHERS.—A Quantity of LARGE YELLOW GLOBE, GLOBE, RED GLOBE, and LONG YELLOW MANGEL WURZEL; WHITE STONE, STRATTON GREEN ROUND, GREY-TOP STONE, and DALE'S HYBRID TURNIPS, SCARLET RUNNER BEANS, and WHITE BELGIAN ONIONS; all next growth of 1869, to be Sold very cheap. Prices on application to

WOOD and INGRAM, Seed Merchants, Huntingdon.

Mangel Wurzel Seed.

H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SUPERB RED SMALL-TOP YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low.

Seed-Growing Establishment, Wisbech.

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Aston Rowant, Oxon. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening in the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

OPINIONS OF THE PRESS.

"R. Headley. Your seedling Potatos were quite first-rate; white, mealy, and excellent flavour."—*Bucks Herald*, Oct. 30, 1869.

"White Kidney. A very fine variety; a heavy cropper; uniform in size, ripening off all at once quickly and completely; flesh yellowish, dry, mealy, and excellent flavour. A heavy crop was harvested July 14."—*Gardeners' Magazine*, Jan. 30, 1869.

"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are of fine flavour, but are more mealy."—*Journal of Horticulture*, Oct. 21, 1869.

Price 5s. per peck. The usual discount to the Trade

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

WANTED, an experienced GROUND FOREMAN. —Must be a good Salesman, and have a thorough knowledge of all kinds of Trees and Shrubs.—R. THORNHILL, Nurseryman, Bowdon, Cheshire

WANTED, as FOREMAN in a London Nursery, a trustworthy, intelligent Man, acquainted with the Cultivation of Plants, their Value and Uses. An unexceptional character required.—L. C., *Gardeners' Chronicle* Office, W.C.

WANTED, PROPAGATOR and HOUSE FOREMAN, with good practice in Soft-Wooded Plants, Roses, Orchids, Stove Plants and Ferns.—STAFFORD'S Nurseries, Hyde, Manchester.

WANTED, an INDOOR and OUTDOOR PROPAGATOR.—Must be an expert Budder and Grafter of Fruit Trees, Roses, Rhododendrons, Conifers, &c.—Address, stating references and salary required, R. THORNHILL, Nurseryman, Bowdon, Cheshire

WANTED, TWO YOUNG MEN accustomed to Budding and Grafting Roses and Fruit Trees, and general Nursery Work.—Apply, stating wages required, to THOMAS MILNER, Nurseryman, Bradford.

WANTED, an active, industrious YOUNG MAN, who understands the Propagating of Soft-wooded Plants, the Budding and Grafting of Roses, Fruit Trees, &c.—DAVID GOLD McKAY, Nurseryman, Swindon, Wilts.

WANTED, a Stout Active LAD, to make himself generally useful in a Greenhouse, Garden.—Apply to A. MEIKLE, The Gardens, Read Hall, Whalley, Lancashire

WANTED, a YOUNG MAN or YOUTH, to assist in the Houses, and make himself generally useful in the Orchard.—Nursery, Mortlake, Surrey.

WANTED, a good BASKET PACKER.—Must be a quick hand. Wages, 20s. per week. None need apply whose character will not bear strict investigation. A personal application is desirable.—Apply to Mr. J. W. WIMSETT, Royal Ashburnham Nursery, King's Road, Chelsea, S.W

WANTED, a SHOPMAN in a Seed Shop.—Must have thorough knowledge of the Wholesale and Retail Trade, with knowledge of plants.—Apply, stating age and wages expected, to C. B., *Gardeners' Chronicle* Office, W.C.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. F. G. HENDERSON and SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH and SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application to them at the time will be immediately furnished with the gardener's name, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under). JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

To Wholesale Seed Merchants and Seed Growers. A GENCY, for the Sale of Seeds and Oil-cakes, required by an Experienced Merchant in Dublin, who has a large connection, and visits all the principal towns throughout the country. First-class references, and security given if required.—Letters to W. K. E., Post Office, Dublin, will receive immediate attention.

GARDENER (HEAD).—Age 35, married, 20 years' experience in first-class places; thoroughly competent in all branches of the profession. Can be highly recommended.—Address, full particulars and amount of salary, to BLASHFIELD, Norton, near Prestetgn, Radnorshire.

GARDENER (HEAD).—Age 30, 15 years' experience in Noblemen's and Gentlemen's establishments; thoroughly experienced in the Culture of Stove and Greenhouse Plants, Pines, Vines, and all kinds of Forcing, and Flower and Kitchen Gardening. Good character from last situation.—F. D., 2, York Street, Bedminster, Bristol.

GARDENER (HEAD).—Married; thoroughly understands the profession. Excellent character.—R. B., Mrs. White, Brentry, near Bristol.

GARDENER (HEAD).—Married, no incumbrance; thoroughly practical and fully competent in every branch of the profession. Good character.—J. H., Cheshire's, 14, Grove Road, Holloway, N.

GARDENER (HEAD). Age 35, married; can be highly recommended as a thoroughly practical and trustworthy Man. Three and a-half years in last situation. Satisfactory reason for leaving.—M. P., Post Office, Abergavenny

GARDENER (HEAD).—Age 45, married, no incumbrance; thorough practical knowledge of the profession in all its branches. Fourteen years' good character.—C. M., Mr. Rollisson, Nursery, Tooting, Surrey.

GARDENER (HEAD).—Age 50, married; has held the place of Head Gardener for many years, and has a thorough practical knowledge of the profession.—J. C., The Gardens, Whitwell, York

GARDENER (HEAD).—Age 32; thorough practical knowledge of Gardening in all its branches. Nineteen years' experience. Four years' character.—T. BALCOMBE, Avon Cottage, Ringwood, Hants.

GARDENER (HEAD).—Age 35, married, no incumbrance; Early and Late Forcing of Pines, Vines, Vegetables, &c.; Stove Plants and Ferns; Meadow Land, &c. Wife, Dairy or Laundry.—GARDENER, East Lodge, Wanstead, N.E.

GARDENER (HEAD).—Age 33, married, no incumbrance; thoroughly understands the profession in every department, and a good Manager of Land, if required. First-class charges, and good reasons for leaving.—G. A., Fisher's Gate Farm, Withyham, Tunbridge Wells.

GARDENER (HEAD, thorough first-class Working). —Specially qualified for Early and Late Forcing, all kinds of Fruit, Flowers and Vegetables; is well versed in Orchard-House Work, the Management of Kitchen Garden, and the Laying-Out and Artistic Arrangement of Ornamental Flower Gardens.—W. MOORE, 2, Linton Grove, Lower Norwood, Surrey.

GARDENER (HEAD, Working).—Age 38, married, no incumbrance; thoroughly understands Forcing of Vines, Peaches, Cucumbers, Melons, Kitchen and Flower and Kitchen Gardening. Twelve years' first-class character.—A. M., Post Office, Esher, Surrey

GARDENER (HEAD, or SINGLE-HANDED).—Age 37, married, understands Flower, Fruit, and Vegetable Growing. Thirteen years' reference.—R. S., 2, Stanhope Cottages, Bromley Common, Kent.

GARDENER (HEAD), Single-handed, or where one or more are kept.—Age 28, single; understands the profession in all its branches. Excellent character.—EDWARD RAYMENT, Nuneham Park Gardens, Oxford

GARDENER (HEAD), where the assistance of one or more is given.—Age 29, single; understands the profession in all its branches. Good references. Three years' Head in last situation.—E. B., West Cliff Cottage, Sittingbourne, Kent

GARDENER (HEAD), where two or more are kept.—No incumbrance; understands the Management of Stove and Greenhouse Plants, Vines, Pines, Peaches, Melons, Cucumbers, Flower and Kitchen Gardening, including Forcing.—GARDENER, Flower and Kitchen Gardening, 10, Grove Road, Stamford Hill, Middlesex.

GARDENER, Age 25, single; could take the Management of Three or Four Houses. Two years' first-class character.—J. S., Mrs. Miles, Fair Mill, Cobham, Surrey.

GARDENER.—Age 27, married, no incumbrance. Leaving through death in the family. Can Milk if required.—G. T., Tower Hamlet, Walthamstow, Essex.

GARDENER (SINGLE-HANDED).—Age 27; understands Kitchen and Flower Gardening. Good character.—A. O., 20, Winslade Road, Brixton, S.W.

GARDENER (SINGLE-HANDED).—Age 26, married; can take the Management of a Greenhouse, &c., and Kitchen and Flower Gardens. Four years' good character from last place.—T. W. F., Post Office, Earley, Reading.

GARDENER, where two or more are kept.—Sixteen years' experience in private establishments; can be highly recommended by a Lady of Gardener as to being well up in the Forcing of Fruits, Flowers, and Vegetables.—B. B. A., Post Office, Leatherhead, Surrey

GARDENER (UNDER), where everything connected with Housework is carried on.—Age 20; has had some experience in the above. A Premium not objected to. Good character.—W. A., 3, Hume Place, Clapham, S.W.

GARDENER (UNDER).—T. SIMPSON, Gardener to H. C. Wells, Esq., Broomfield Lodge, near Chelmsford, will be glad to recommend a young Man, as above, who has lived under him as Journeyman, and has obtained an insight into a first-class system of Gardening, including Fine growing and Forcing generally.

IMPROVER, in a Gentleman's Garden.—Age 19; good references.—H. P., 7, Alma Terrace, Wandsworth Common, Surrey, S.W

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FOREMAN.—Thoroughly competent in the profession. Highest recommendation as to ability, &c.—W. WALTER, Leigh Court Gardens, Bristol

FOREMAN, in a Nobleman's or Gentleman's Garden. —Has a practical knowledge of Vines, Pines, Fruits, &c., and Early and Late Forcing. Good references.—E. BRADLEY, Hagley, Stourbridge, Worcestershire

FOREMAN, in a situation where ability and trustworthiness would be appreciated.—Active, intelligent, and thoroughly practical. First-class references.—M. M. M., Post Office, New Road, Brierley Hill.

FOREMAN, SALESMAN, &c.—Well up in Roses, Camellias, Azaleas, &c.—A. Z., Mr. B. S. Williams, Upper Holloway, N.

PROPAGATOR, or PROPAGATOR and SALESMAN.—Well up in Azaleas, Camellias, Coniferæ, Roses, Rhododendrons, &c. First-class reference. London Nursery preferred.—R. H., Paul's Nurseries, Waltham Cross, London, N.

To Noblemen and Gentlemen.

LAND STEWARD, or BAILIFF.—Age 29; Farming in all its branches, Management of Stock, Marketing, Surveying, &c. Highest testimonials.—W. O., Messrs. Peter Lawson & Son, Southwark Street, London, S.E.

BAILIFF, or STEWARD.—Age 45, no incumbrance; good references.—A. M., 79, Westbourne Park Road, Paddington, London, W.

BAILIFF (FARM).—Age 22; a respectable Farmer's Son; understands Farming in all its branches, Breeding, Buying, and Selling. Can have a good character.—X. Y. Z., Post Office, Arlington, near Fairford, Gloucestershire.

SHOPMAN.—Age 23; seven years' experience; is open to an engagement.—J. T., Post Office, Perth, N.B.

KITCHEN MAID, in a Nobleman's or Gentleman's Family, where a Scullery Maid is kept.—Understands Fish, Game, Dairy, and Baking. Two years' good character as Kitchen Maid. Further recommendation if required.—L. C. A., Trinity Cottages, Middle Street, Stroud, Gloucestershire

SUTTONS' GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

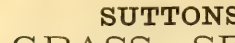

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS,

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils:—

PRICES:—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, carriage free 2 bush Grass Seeds and 12 lb. Clovers supplied p. acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free

From J. J. Mech, Esq., *Tiptree Hall, near Kelvedon.*

February 5.—"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

SUTTONS' HOME-GROWN FARM SEEDS.

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

NOTICE.—*Special quotations given where large quantities of Farm Seeds are required.*

SUTTONS'

Berkshire Prize Yellow Globe Mangel.

The heaviest Globe Mangel in cultivation, price **1s.** per lb., much cheaper by the cwt.

SUTTON AND SONS can also supply

Good YELLOW GLOBE MANGEL, 8*d.* per lb.
Good ORANGE GLOBE MANGEL, 8*d.* per lb.
Good RED GLOBE MANGEL, 9*d.* per lb.
Good LONG RED MANGEL, 8*d.* per lb.
Good LONG YELLOW MANGEL, 9*d.* per lb.
Selected YELLOW GLOBE MANGEL, 10*d.* per lb.
Selected ORANGE GLOBE MANGEL, 10*d.* per lb.
STRATTON'S RED GLOBE MANGEL, 1*s.* per lb.
GIANT LONG YELLOW MANGEL, 1*s.* per lb.
NEW YELLOW INTERMEDIATE MANGEL, 1*s.* per lb
SUTTONS' MAMMOTH LONG RED MANGEL, 1*s.* 6*d.* per lb

Much cheaper by the cwt.

THE BEST SWEDE IN CULTIVATION IS

Suttons' Champion.

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

NOTICE.—*Special Quotations given where large quantities of Farm Seeds are required.*

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation; price **9d.** per lb., cheaper by the bushel.

The numerous Prizes which have been awarded to growing crops, and also to pulled specimen of our Champion Swede, during the past season, together with the unsolicited Testimonials we have received, fully justify our description.

For prices of SUTTONS' GRASS SEEDS for all Soils, and all other FARM SEEDS, see "SUTTONS' NEW FARM SEED LIST," which may be had Gratis on application

All Goods Carriage Free (except very small parcels). Five per cent. allowed for prompt payment

SUTTON AND SON, SEED GROWERS, READING.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

AGRICULTURAL EDUCATION.

The EXAMINATION of CANDIDATES for the Society's PRIZES will take place in the week commencing TUESDAY, April 26, 1870. The age of Candidates must not be above 21 years on March 31.

Copies of the Form required to be sent in by March 31 may be had on application to

H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

BATH and WEST of ENGLAND SOCIETY (Established 1777), and SOUTHERN COUNTIES ASSOCIATION.

ANNUAL MEETING at TAUNTON, June 6, 7, 8, 9, and 10, 1870.

President—The Right Hon. Sir S. H. NORTHCOTE, Bart., C.B., M.P.

STOCK and IMPLEMENT ENTRIES close April 20; POULTRY, May 16

Prize Sheets, Regulation Papers, and Forms of Entry may now be had from the Secretary,

JOSIAH GOODWIN,
4, Terrace Walk, Bath.

*** For the Arts Department application to be made to the Hon. Secretary, R. R. M. DAW, Exeter.

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.

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Geo. Thomas Clark, Esq.
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The Right Hon. Viscount Combermere.
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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.

Tenants may also, by arrangement with their Landlords, procure the execution of such improvements

The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term

No investigation of title necessary, and no legal expenses incurred.

Applications to be made to ARTHUR MILMAN, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

THE LANDS IMPROVEMENT COMPANY.—

(Incorporated by Special Acts of Parliament)

DIRECTORS.

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Frederick Dashwood, Esq., Kirtlington Park, Oxford.
Henry Farquhar, Esq., (Messrs Herries, Farquhar & Co.), 16, St. James Street, S.W.
Lord Garlies, M.P., 86, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
John Horatio Lloyd, Esq., 1, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., O.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.

The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, on the Owners' settled and other Estates, and to the Clergy in respect of their Glebe Lands.

The whole outlay and expenses are liquidated by a rent-charge upon the land, redeemable by Owner or Tenant for life, at 5 per cent. interest, over 25 years.

No investigation of title is required

For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W

Present Prices of Suttons' Home-grown Farm Seeds.

SUTTON AND SONS are still supplying their GENUINE HOME-GROWN SEEDS, at the low prices quoted in their FARMERS' YEAR BOOK (published in February last).

Special estimates given for extra large quantities.

For prices and full particulars apply to

SUTTON AND SONS, Seed Growers, Reading

To Purchasers of Farm Seeds.

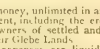

CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices

JAMES CARTER AND CO., the Royal Seedsmen, 237 and 238, High Holborn, London, W.C

New and Select Farm Seeds.

1870. 1870.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character

CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.

MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21*s.* to 28*s.* per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.

Seeds of the value of £2 and upwards (Grain, Vetches, and Potatoes excepted), carriage free to any railway station in the kingdom

Special estimates for large quantities. Samples and prices on application.

PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis and post free on application.

W. M. DILLISTONE,
HORTICULTURAL AUCTIONEER and VALUER,
Sible Hedingham, Essex

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (frontage), DWELLING HOUSE, STABLING, &c., situate at Mottingham.

Apply to Mr. R. TANTON, The Nurseries, Epsom.

TO BE LET, by TENDER, from Michaelmas next, a CORN and STOCK FARM, in North Hants, of between 400 and 500 acres of Arable Land, well situated for Railway Transit. The Shooting over the Farm, together with that over an adjoining Covert, can also be rented. None need apply without ample capital. Particulars and Forms of Tender can be obtained from

Mr. HUGH E. RAYNBIRD, Estate Agent, Easingstoke; and by whom offers will be received till Wednesday, April 20 next.

SALES BY AUCTION.

Sale of First-class Carnations and Picotees, Standard and Dwarf Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, 38 and 39, Gracechurch Street, City, E.C., on THURSDAY, April 14, at half past 12 o'clock precisely, a most valuable Collection of CARNATIONS and PICOTEES (the surplus stock of an eminent grower), a choice assortment of Standard and Dwarf ROSES, selected American PLANTS, Indian grown FRUIT TREES, fine CAMELLIAS with buds, AZALEA INDICA, GLADIOLI, &c.

On view the morning of Sale. Catalogues had at the Rooms, and of the Auctioneers, Leytonstone, E.

Preliminary Notice.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. William Barnes to SELL by AUCTION, without reserve, all the PLANTS in Pots, loose Boxes, and Frames, &c., on the Premises, the Camden Nurseries, Southampton Street, Camberwell, S., on MONDAY and TUESDAY, April 25 and 26, at 11 for 12 o'clock precisely.

Further particulars will appear in future Advertisements

Versailles Nursery, Hammersmith.

IMPORTANT CLEARANCE SALE.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. John Salter & Son to SELL by AUCTION, on the Premises, the Versailles Nursery, Hammersmith, W., on WEDNESDAY, April 27, and following day, at 12 o'clock precisely, without reserve (the land being required immediately by the Metropolitan District Railway Company), the whole of the PLANTS in POTS, comprising large specimen Conifers, 10 feet; Orange trees in Fruit, handsome Araucaria excelsa, and a quantity of other useful plants for furnishing; also 1000 Zonal and Double Geraniums, Cytisus Adamii, the entire stock of Hybrida, one Variety, first-class Certificate; likewise an unrivalled collection of choice and rare SUCCULENTS, comprising 600 Echeverias of sorts, 200 Pachyphitons, Hawarthias, Kleinias, 500 Sempervivum Bollii, and others; 1000 Sedums, Rhipsalis, &c.; large Agave, a quantity of Exotic and Hardy FERNS, including 50 Exhibition Specimens; also an extensive and interesting collection of hardy Orange trees in Fruit, handsome Araucaria excelsa, and a quantity of other useful plants for furnishing; also 1000 Zonal and Double Geraniums, Cytisus Adamii, the entire stock of Hybrida, one Variety, first-class Certificate; likewise an unrivalled collection of choice and rare SUCCULENTS, comprising 600 Echeverias of sorts, 200 Pachyphitons, Hawarthias, Kleinias, 500 Sempervivum Bollii, and others; 1000 Sedums, Rhipsalis, &c.; large Agave, a quantity of Exotic and Hardy FERNS, including 50 Exhibition Specimens; also an extensive and interesting collection of hardy Variegated HERBACEOUS and ALPINE PLANTS, 60 Plants of the new Variegated Viola odorata, a very distinct and beautiful variety, not yet sent out; 600 new gold-striped Lily of the Valley, fine Double Pyrethrums, Penstemons, Aquilegias, Aubrietias, &c., together with 600 named Variegated Ivies, &c.

May be viewed two days previous to the Sale. Catalogues may be had on the Premises of Messrs. SALTER, and of the Auctioneers and Valuers, Leytonstone, E.

Very Important Sale of Shorthorn Cattle

At SHOLEBROKE LODGE, TOWCESTER.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve, on WEDNESDAY next, April 13, at Sholebroke Lodge, Towcester, the FIRST-CLASS HERD of SHORTHORNS belonging to R. E. Oliver, Esq. The Sale will comprise the whole of this very celebrated and fashionable Stock, with the exception of the Grand and Cherry Duchesses and Dukes, Lady of the Lake (14 years old), and Four Calves. Among them will be found the Lalages and Wild Eyes, two Kirklevington tribes, the Sweethearts, Frills, Baronesses, Bracelets, Oranges, and other excellent families, the originals of which were some of the finest animals in the first-class herds from which they were carefully selected. Grand Duke 7th (19,877) is the sire of a large number of the animals, and several of the cows and heifers are in calf to him and Cherry Grand Duke 2nd (25,758).

Catalogues, with Pedigrees, may be had of JOHN THORNTON, 3, Langham Place, London; and Mr. KENNY, at Sholebroke Lodge, Towcester.

Ashford, Middlesex.

Freehold Land, about 11 Acres, near Ashford Station, Village, and Church, with frontages to road and railway (from which a siding could, probably, be arranged for).

MESSRS. DEBENHAM, TEWSON, AND FARMER will SELL, at the Mart, on TUESDAY, April 26, at 2 o'clock, in three Lots (unless previously disposed of), 11 ACRES of FREEHOLD LAND, abutting upon the South-Western Railway, suitable for a public institution, school, cemetery, general building, market garden, or accommodation purposes. The land contains valuable gravel, which, if a railway siding were obtained, could no doubt be sent up the line in large quantities, and would be a source of considerable income

Particulars of T. G. BULLEN, Esq., Solicitor, Range Yard Chambers, Bucklersbury, E.C.; and of the Auctioneers, 80, Cheapside, E.C.

Important Sale of Plants.

TO BE SOLD BY AUCTION, on MONDAY, May 2, and following days, at 9 o'Clock A.M. and 2 P.M., at his residence, 8, Place d'Armes, Ghent, Belgium, the valuable COLLECTIONS of PLANTS, the property of the late Victor Vandenheede de Lembeke, Esq., President of the Royal Horticultural Society of Ghent, and Knight of the Royal Leopold Order. The Collections comprise Stove and Greenhouse Plants, Palms, Orchids, Specimen Camellias and Azaleas, Amaryllis, &c.

Catalogues may be obtained free, on prepaid application to Mr JEAN VERSCHAFFELT, 134, Faubourg de Bruxelles, Ghent, Belgium

Holly Bank, Burton-on-Trent.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, May 17 next, at Holly Bank, near Burton-on-Trent, the entire and very CHOICE HERD of SHORTHORNS belonging to Willoughby Wood, Esq., which are chiefly descended from the famed Kirklevington blood. Amongst them will be found the celebrated cow Oxford's Ada, the dam of the 1st prize Bull at the Birmingham Show, and other superior animals

Catalogues, with Pedigrees, will shortly be issued, and further particulars given in future advertisements.

London, 11, Euston Square, March 28.

NOTICE. FRIDAY NEXT being GOOD FRIDAY, the GARDENERS' CHRONICLE AND AGRICULTURAL GAZETTE will be Published the day previous (the 14th inst.), at 2 P.M.

ADVERTISEMENTS for that Week must reach the Office not later than WEDNESDAY MORNING.

The Agricultural Gazette.

SATURDAY, APRIL 9, 1870.

THE able paper read by Mr. J. B. LAWES, Rothamsted, before the Farmers' Club (Mr. J. HOWARD, M.P., in the chair), last Monday evening, on "Exhaustion of Soil in Relation to Landlords' Covenants and the Valuation of Unexhausted Improvements," was very generally received as a valuable contribution to experimental science. About 1844 Mr. LAWES commenced a series of experiments on plots of land with different kinds of crops and manures, and on some plots with no manure at all; and this extensive course of experiments has, with great ability, been continued up to the present time. The experiments themselves have from time to time, as they were made, been laid

before the agricultural public, and just now, when landlord-rights and tenant-rights have assumed great public importance in Ireland, and are exciting equal, if not greater, interest in the United Kingdom, we have to thank Mr. LAWES for a most elaborate digest of the whole course, showing how his experience bears upon both aspects of the subject. The lecture was illustrated by seven Tables, which showed at a glance the results of each year's crops, and gave the averages for definite periods, with instructive effect. Thus Table I. showed Wheat grown year after year, from 1844 to 1869, with farmyard manure on this plot, artificial manures on that, with the produce of each year, and the averages. Table II. illustrated Barley grown year after year in a similar way, from 1852 to 1869—14 tons of farmyard manure against 200 lb. of artificial manures. The next Table showed the effects of rape-cake with salts of ammonia. Table IV. related to meadow hay from 1856 to 1869—14 tons farmyard manure on one plot, and 400 lb. of mineral manures and ammonia on another, there being an average of 10 cwt. in favour of the latter. Table V. illustrated Manure *v.* No Manure, with averages of corn in bushels and straw per cwt., the course extending over 29 years on the unmanured part. Table VI. illustrated the natural fertility of unmanured land, and the state of exhaustion by cropping during 16 years—1852 to 1867—on a four-course rotation. Table VII. illustrated the estimated values of the manures obtained by the consumption of 32 different articles of food—19 being cakes and corn, seven hay and straw, and six different kinds of roots. This Table we give in full elsewhere, the others we must postpone. In explaining Table V., a specimen of the Wheat grown was shown—fine straw, 3 feet long, with average ear—and also a spit of the soil, nearly 2½ feet in depth, on which it was grown; and on Mr. LAWES stating the weight of corn and straw grown per acre, much merriment was elicited by Mr. MECHI asking: "How much seed?"—"Two bushels per acre" was the reply. The paper was listened to throughout with the most lively interest, and it was no secret that the discussion would turn on the extent to which the Rothamsted experiments apply, the old mode of cultivation, and the increased produce per acre under steam culture in which landlords have a right to share. After a pause of unusual length, as if Mr. LAWES had exhausted the subject—as not a few declared he had—

Mr. MECHI opened the discussion by agreeing generally with the opening paper, but thought different conclusions should be arrived at relative to heavy and light soils. Judging from his own experience and from what had come under his observation, he thought heavy land, if properly drained and cultivated, was more grateful for the manure it received than light land. In cropping heavy land much depended upon drainage and cultivation. The mouths of drains, for example, should be regularly examined, to see that they are running, as a uniform flow was a test of a healthy and productive state of heavy land. There was more difficulty in growing roots on heavy land than growing corn. He fully agreed with Mr. LAWES relative to land full of weeds at the expiry of a lease—both as to heavy and light land.

Dr. VOELCKER passed a very high eulogium on the scientific character of the paper, by saying "it was the best he ever heard," being perfectly sound both as to manuring and cropping, and he thought the majority of the meeting would endorse his opinion. The paper was also perfectly trustworthy as to the natural fertility of land. With regard to compensation and cropping, the best rule for the landlord was to select a good tenant, and then allow him to take out what he put in, but no more—outgoing tenants being tied down to leave the land in as good a condition as they got it. Under such covenants he thought the amount of capital invested would indicate the amount of compensation to which the outgoing tenant would be entitled. Dr. VOELCKER next drew attention to the improved deep tillage of modern times, and the effect which it has on heavy soils, by increasing their fertility and the amount of produce from a given quantity of manure. Mr. LAWES had not yet adopted steam culture, so that his operations did not exactly apply to such circumstances, and thus possibly his conclusions might not apply to crops requiring deep tillage. On the other hand, there were shallow soils of which many examples in Cambridgeshire and other places might be quoted—where the practice of manuring and the results would differ. As to cropping this or that sort of land by any system of rotation, he thought what was best for the tenant would be best for the landlord—although there might be some difficulty, as Mr. LAWES justly observed, in practically applying such a general rule. There was also a difference in the quality of artificial manures and in the duration of their action, and he had found from experiments that their unexhausted influence extended over one, two, and three years; and as the incoming tenant reaped the benefit of these he should pay for them—superphosphate and bones were quoted as examples.

Mr. LEEDS referred to the remark Mr. LAWES made when he had said "he had not yet tortured Rothamsted by any of the huge contrivances of modern times," obviously alluding to steam culture. He thought the experiments thus fell short of the application which they otherwise would have had, whilst they did not illustrate fairly the effects of deep-rooted plants—as Wheat, and shallow-rooted plants—as Barley. He also differed with Mr. LAWES relative to the value of the straw at the expiry of a lease for compensation to the outgoing tenant. He did not think such a rule sound, more especially with respect to the light soils of Norfolk. For many weighty practical reasons such a rule would not meet with general approbation.

Mr. THOMAS expressed himself well pleased with the paper generally, both as to cropping and manuring. He thought landlords might take care of themselves, and yet let their tenants alone; and at the expiry of a lease the latter should have full compensation for unexhausted improvements. In Scotland tenants had long leases, with compensation, and generally did well; but somehow few Scotch farmers did well in England. He thought land-agents should pass an examination, in order to show that they were qualified, before appointment to office. He differed from Dr. VOELCKER as to light land, which under sheep-folding was paying better than growing corn on heavy land at the present prices. He was sick of farming heavy land, and so were many others.

Mr. TRETHEWY concurred with the paper as to the natural fertility of land, and the experiments generally, but took exceptions to those illustrated by Table VI., more especially as to the weight of Swedes. His farm was at no great distance from Rothamsted, and he could grow four times the weight of Mangels and Kohl Rabi he could do of Swedes. He thought the wrong crop was grown, and therefore any conclusions as to exhaustion defective. He also agreed with Mr. LEEDS that the rule as to quantity of straw was not sound, as that often depended more upon wet and dry seasons than upon manure. He believed Mr. THOMAS was wrong as to tenants in Scotland having compensation at the expiry of their leases, and he thought yearly tenancy in England, with compensation for unexhausted improvements, proved better for tenants than long leases; for under long leases, both in England and Scotland, rents were higher and profits less. But much depends upon the disposition of the landlord. He thought a compensation scale, based on the bills paid for manure and feeding stuffs, preferable to the plan proposed by Mr. LAWES. He agreed with Dr. VOELCKER as to the unequal duration of manures, and the differences in the compensation to which such gave rise. Thus, bones will last five or six years, guano only two.

Mr. NEALE agreed with the experiments so far as they went, but thought the mode of tillage defective, and that the question of tillage itself had not been properly discussed. He differed from the conclusion relating to straw, and quoted the years 1868 and 1869 for illustration, as the former yielded short straw, and the latter straw both for its own manure and that of the previous year. He also drew attention to the fact that not a word had been said about town sewage, and how sewage farmers were to be compensated.

Mr. SMITHIES thanked Mr. LAWES for his invaluable paper, but took exceptions to Table VI., and the conclusions deduced therefrom. He was in favour of long leases and compensation, as they encouraged improved husbandry, and said that the increase of produce enabled tenants both to give higher rents, and at the same time to retain larger profits to themselves. He thought the duration of the action of lime, guano, and bones, extended over a much greater number of years than the previous speakers had admitted—for in Cheshire the effect of bones lasted for 40 years.

Mr. BRADSHAW thought the paper supplied data that would form a satisfactory basis for landlords and tenants drawing up leases for their mutual advantage.

Mr. TRASK supported Mr. LAWES' conclusions as to straw, and also as to feeding stuffs, and thought the paper sound throughout.

Mr. CADLE drew attention to the difference between restrictions at the expiry of long leases and those at the expiry of yearly tenancy, and the corresponding effects which these would have on the conclusions of Mr. LAWES.

Mr. NEWTON, who took the chair when the hon. Member for Bedford left, said the summary of what had been said that evening was in favour of greater freedom of cropping and fair compensation for unexhausted improvements.

Mr. LAWES, in reply, said that he had endeavoured to get experiments from soils of a different quality, but was unable to get what could be relied upon. As to the question of manures, those that acted longest acted slowest, and the demand now was for quick returns. And with regard to the objections to the valuation of the straw, he had merely transferred the value of the manure to the value of the crop which that manure had produced; and from the improvements made in the manufacture of artificial manures and their use, he thought the transposition would bear a practical investigation.

——On Monday, in Mark Lane, the corn trade was steady with unchanged prices. In the cattle market prices were lower, and trade was very slack.

—— On Tuesday evening the Government carried by a large majority what may be called the characteristic clause of their Irish Land Bill. It is clear that the enactment of a right on the part of the tenant to compensation, over and above the valuation of his improvements, for mere eviction from the lands which he holds at the will of the landowner, is no matter for discussion in an agricultural journal. It may be defensible on grounds of special State policy, but on no other.

—— The following tabular view embodies some of the most interesting results of Mr. Kilby's labours in the investigation of cattle disease, to which reference was made in a paragraph last week. The figures indicate the total loss during the last 30 years, calculated upon the live stock held at "one time;" and show that in England, during this period, the lung and foot-and-mouth diseases alone have swept away more than one and a half times the entire stock of cattle, and that over the greater part of the country:—

England.	Total loss during the last 30 years, calculated upon stock held at one time.
Counties devoted especially to breeding:—	
From lung disease	21.65 per cent.
,, foot-and-mouth disease	15.51 ,,
,, both diseases	57.18
Counties devoted to feeding, and where interchange of stock at markets is more frequent:—	
From lung disease	90.6 ,,
,, foot-and-mouth disease	78.0 ,,
,, both diseases	168.6

The latter amounts, says Mr. Kilby, in the case of the first-named disease, to quadruple, and in the case of the other to more than double, that sustained in the breeding counties. The total number of cattle in England in 1868 was 3,779,691 (Government returns); the average value per head is about £15 1s. 4d. The total value of the cattle in England is therefore £56,941,073. The losses from the two diseases during the last 30 years may therefore be estimated at £83,616,854, or 5,549,780 cattle. Scotland and Wales have not suffered from the prevalence of these diseases to the same extent as England.

—— On Tuesday, at the monthly meeting of the Council of the Central Chamber of Agriculture, Colonel TOMLINE, M.P., in the chair—the Chairman said they were endeavouring to accomplish three important and difficult tasks—to obtain freedom of trade in agriculture, equal rating, and representation and taxation in the shape of county financial boards; but they had not advanced one step.—On the motion of Mr. NIELD, it was agreed that a petition should be presented to Parliament in favour of the decimal system of weights and measures.—Captain CRAGIE re-opened the discussion on the Elementary Education Bill. He moved a resolution to the effect that the actual attendance of children at school between the ages of 10 and 12 years, as approved in a resolution passed at the last meeting of the Council, would be best obtained by requiring a certificate of efficiency from every

child employed in agriculture, and a discussion followed, which was generally in favour of the proposition. — Mr. GARFIT moved as an amendment—"The Council considers that no compulsory attendance should be required after ten years of age, and after a certificate of proficiency in reading and elementary writing at any age no further attendance should be required."—Mr. HERMAN BIDDELL seconded the amendment. Upon a division, 18 voted for the amendment and 8 against it. After further discussion a resolution was adopted on the general subject of agricultural progress. It was resolved that :—"In the opinion of this Council the application of capital to agriculture is discouraged by the following causes :—1. The undue amount of local taxation upon capital invested in land and its improvement. 2. Uncertainty of tenure. 3. Absence of compensation for unexhausted improvements. 4. Unnecessary restrictions upon courses of cropping. 5. The over-preservation of ground game."

OUR LIVE STOCK.

CATTLE.

THE power of transmitting type and colour resident in pure-bred Shorthorn and Hereford bulls is manifested in a high degree when they are crossed with the cattle of Buenos Ayres. All the accredited colours of the Shorthorn, from pure white through all the grades of roan to red, prevail in a cross-bred herd; and in one case in which three Hereford bulls had been used in a herd of native cows, every animal got by these bulls, from the first cross upwards, was "true" in colour, and possessed in a marked degree the form and features characteristic of the Hereford blood. There were, however, four young animals which formed a singular exception, but an exception which proved the rule; they were the produce of two calvings of two black cows, which by accident got into the herd, and were allowed to remain in it. These young cattle had the white markings of the Herefords well and truly defined, as also the form and features; the one exception was in the colour, which was black instead of red. This observation rests on the authority of Mr. Wilfred Latham, author of "The States of the River Plate."

—— The first pedigree in Lord Walsingham's new catalogue exemplifies the boldness with which our early Shorthorn improvers carried on their system of in-breeding. *Jane*, by EMPEROR, the ancestress of no fewer than 11 cows and heifers now in the Merton herd, is a descendant of *Joy*, by BLYTHE, and retracing the lineage one step further, of *Janette*, by WELLINGTON. Now WELLINGTON was a grandson of PHENOMENON, and by three previous crosses he was at once g., g.g., and g.g.g.gr.son of the famous sire FAVOURITE (252). Still further, *Janette* was out of a cow by PHENOMENON, and PHENOMENON was by FAVOURITE, once more connecting the family still more closely with this highly prized animal. Lastly, we find *Janette's* grandmother, great-grandmother, and great-great-grandmother each were by FAVOURITE. The proportion of Favourite blood in *Janette*, the result of such close breeding, must have been very large, and if this experiment was conducted without loss of size or constitution, it would go far to prove that, in the case of Shorthorns at least, in-and-in breeding may be persistently followed without disastrous results.

—— We have received an interesting catalogue of the Gaddesby herd, in which 7TH DUKE OF YORK occupies the first place. The other bulls now in service are 9TH DUKE OF GENEVA, bred by Mr. J. O. Sheldon, Geneva, U.S.; GENERAL NAPIER (24,023), and his son PRINCE BELVEDERE, both descended from *Moss Rose* by BARON (58). These two last bulls exhibit the same remarkable prevalence of FAVOURITE blood, already noticed in the case of Lord Walsingham's "*J*" family. First among the cows and heifers we notice the names of *11th* and *14th Duchesses of Geneva*, both imported from Mr. Sheldon's herd. Next we find an array of 14 *Waterloos*, followed by representatives of *Princess* by FAVOURITE, and the Bates' *Wild Eyes* tribe. The remainder of the catalogue contains three *Lady Blanches*, descendants of *Blanche* by BELVEDERE, three representatives of *Foggathorpe* by MARLBRO', a *Red Rose* of the Cambridge Rose tribe, *Fancy 2nd*, a grand-daughter of *Surmise* by DUKE OF GLOS'TER, two *Cherry Duchesses*, and two *Cleopatras*, besides others, which we cannot at present notice. We have just heard that 7TH DUKE OF YORK is giving satisfaction to his new owner.

—— Mr. Bowly, of Siddington, has sold *Gazelle* by RATTLESNAKE (20,627), and a grand-daughter of 4TH DUKE OF OXFORD (11,387), to Mr. Canning, for exportation to New Zealand.

—— The Shorthorn intelligence of a valued contemporary contains the following interesting note upon the progress of Durham cattle in our colonies :—

"In the month of December last year, Mr. Robert McDougall, who emigrated to Australia some years ago, and supplied himself, after settling there, with several bulls bred respectively by Mr. Torr, of Aylesby Manor; Mr. Douglas, of Athelstaneford; and Mr. Carr, of Stackhouse; had a sale of male and female Shorthorns, 108 in number, and realized, as the sum total, £6496, making an average of £60 3s. Some of the prices for individual animals were very high. Seven bulls made severally £195, £173, £115, £105, £130, £110, and £152. To the list of sires the Aylesby herd furnished ROYAL HOPE (16,868); that of Mr. Douglas, MASTER OF ATHELSTANE (14,933); and Mr. Carr contributed PRINCE OF THE PURPLE (20,580) and COUNT OF THE EMPIRE (21,497).

SHEEP.

THE remaining portion of Mr. William Hewer's famous flock of Cotswold sheep was disposed of by Mr. Villar, auctioneer, on Wednesday, the 30th ult. This flock had been under the management of the present Mr. Hewer for upwards of forty years, and had attained a world-wide celebrity. A large company assembled, and were hospitably entertained at lunch previous to the commencement of the sale. The catalogue contained a list of 233 ewe tegs, 30 ram tegs, and also a fine herd of Herefords, numbering 69 head. The first pen of five ewe tegs was of rare quality, great size, and famously wooled. A brisk competition sprang up for this lot between Mr. Swanwick, of the Royal Agricultural College Farm, and Mr. Canning, who is desirous of securing some of the very best blood of both sheep and cattle for New Zealand—5, 6, and 7 gs. per head came in rapid succession, and eventually the auctioneer's hammer declared Mr. Swanwick to be the purchaser at 8 gs. a-head, an almost unprecedented price for ewe tegs. The same gentleman secured lot 2 at 4 gs. each; lot 3 was secured by Mr. Canning for New Zealand, at 5 gs., and Mr. Swanwick bought the two next lots at 4½ gs. Mr. Smith, of Bibury, long famous for his grey-faced Cotswolds, took his stand opposite lot 14, five excellent sheep, with just the heads to suit the Bibury flock, and there they went at 5 gs. each. Mr. Canning again came on at lot 15, which fell to him at £6 5s. a-head. Mr. Swanwick, the largest purchaser, secured 65 very good ewe tegs at an average of £3 17s. 4d. each: the nucleus, we hope, of a good ram breeding flock. This is the second importation of Mr. Hewer's blood onto the College farm, as Mr. Swanwick laid in a good stock of Northleach ewes last autumn. The remaining lots sold at prices varying from 40s. to 70s. per head. Ram tegs are always unsaleable at this time of year. The highest price given was 9½ gs., by Mr. Little, of Norcote, and a similar price was paid by Mr. Easton, both for very good sheep. We cannot close this account of a most remarkable sale without a word or two upon the cattle, which were a well bred lot of Herefords. Twelve very grand cows made £29 each, the top price being £42. Fourteen 3-year-old steers, of grand proportions and in fine condition, brought the extraordinary average of £31 14s. 6d. each, and 30 working oxen realised an average of £29 15s. 9d. each, and are intended, we understand, for grazing on Somersetshire pastures.

THE LABOURER IN THE VALE OF GLOUCESTER.

THE number of labourers employed by agriculturists in the Vale of Gloucester varies according to the thrifty habits and tidiness of the farmer, as well as the size of the farms and the proportion of arable land attached to them, which, by the way, is too limited upon many of them. Upon some of these farms few regular hands are kept, except the carter, whose duty is to help milk in the morning, and to go out a few hours in the middle of the day to plough, or to fill and cart out manure, as the case may be; but upon the larger farms, and where there is a greater portion of arable land, there is a more systematic mode of business adopted, and a regular staff of labourers kept. In most of the farmhouses there are one or two boys kept (from 12 to 17 years old), hired at the statute fairs, to assist the maid-servants with the milking, and to feed the pigs, &c., as well as to act under the carter when required.

Milking is a considerable item of labour upon many of the large dairy farms, for which the Vale is famous. As there are often from 30 to 60 cows to milk, this causes a great demand for female labour in cheese and butter making; very few women care to go out to field-work, and it is with very great difficulty that a few can be got in a busy time to pick up stones, Couch, or to help with the hay and corn harvest (they get from 10*d*. to 1*s*. per day); nor can it be much regretted, as a mother can generally find enough to do at home, to keep her family and her house in order, without going out to field-work.

Wages are nearly the same throughout the Vale. Most of the farmers give 10*s*. to 11*s*. per week to their best hands, with three quarts of cider per day, and a meal of bread and cheese occasionally, which would be equal to at least 13*s*. or 14*s*. per week. Labourers have also frequently an opportunity of renting a few perches of land in one of their master's fields, already manured and ploughed up, for 1*s*. per perch, which they plant with Potatos. This certainly is a great help to a poor man with a family, who has not got an allotment to his cottage, as it not only provides Potatos for his own use, but produces a quantity of offal, with which he is enabled to keep a pig, which, when fatted, is a most useful inmate of the larder; or if unfortunately circumstances do not allow of this, it can be sold to pay off the shoe bill and the other calls to which poor men are subject. There is another class of labourers who do not care to have a constant place of work, but prefer the chances of task-work. These often are some of the very best hands, as they can do almost any kind of work, agricultural or otherwise, and they think it a very poor week if they do not earn 18*s*. or 20*s*. Through the winter months they generally find employment in draining, timber felling, grubbing, stone digging, hedging and ditching, &c., and, as soon as the spring work commences, take jobs of Wheat hoeing, Bean hacking, Turnip hoeing, mowing, corn cutting, or any other kind of task-work which farmers have to give who do not keep regular hands sufficient to do their work; very often, however, there is more poverty in the homes of these men than is seen among the families of those who seek regular work, as the former are too often led, on their way home on a Saturday night, to a public-house, where they spend a great share of their week's hard earnings away from their wives, who are anxiously waiting for their return to get the money which is to provide the week's food. Few farmers care to employ boys under 11 or 12 years old, and as education is cheap and schools plentiful the cottagers have a good opportunity of sending their children regularly to school; and thus, thanks to the interest taken in the support of schools by the clergy of all denominations, and the supervision of them by the various landed proprietors, a great boon is conferred on the rising generation, whose parents many of them never had an opportunity of attending a school.

The cottage accommodation has very much improved within the last 20 years, but there is still great room for further improvement. There are unfortunately a number of cottages, or I should say mud huts (for indeed they are nothing better), in the hands of men whose fathers or forefathers pitched them in the night upon the common waste, before the enclosure took place; for these nothing can be done in the way of improvement, as they are mostly freehold, and the owners of them have not even the means of keeping them in decent repair. Some of these huts have but one room, in which the whole family live and sleep. The sanitary condition of them is even worse than the room accommodation, for in some instances there is no privy whatever attached, and the slops are thrown from the door upon the garden plot day after day, and year after year. The pigstye and manure heap also are as handy to the dwelling as they can possibly be made.

But it is only right to say that this is not the case with all these small freeholds, for there are some which have fallen into the hands of industrious men who have saved what they could out of their earnings, and have greatly improved their cottages, and by so doing have not only increased their comforts, but have raised the moral tone of those around him. The improvement of the dwellings and moral condition of the poor has for some time been a matter of much consideration amongst the leading noblemen and gentry of the Vale: much has already been done, and much is being done, by erecting new and commodious cottages, with a view to prevent over-crowding. Attached to these cottages is a good plot of garden ground, the rent of them varying from 1*s*. to 2*s*. per week. An allotment of land from 40 to 80 perches, according to the number in family, can be obtained at an easy rent by those who are industriously inclined; and it is satisfactory to note that where these advantages prevail there the cottagers are the most provident and cleanly. The time is coming when landowners will see the necessity of erecting more cottages upon their farms, in order that their tenants may have the labourers nearer their work. The great distance which at the present time some of them have to walk is very inconvenient to master and man.

The labourers of the Vale, as a rule, are perhaps as provident as in most parts of the country. There are several well conducted benefit societies, including the West Gloucester Club, which is well supported and admirably managed. These societies in cases of sickness allow 8*s*. per week to the sick members for 26 weeks, after that period 4*s*. per week as long as they are ill. Now these men do not meet with the encouragement which they deserve from the Board of Guardians. While they have been pinching a trifle off their weekly earnings in order to pay into a benefit society, to provide for themselves a doctor and a few shillings in cases of sickness, is it right that they should be denied an allowance of bread or a few pounds of meat weekly in their need, simply because they belong to such societies, when a man who, having not been at all provident, on applying to the board in cases of sickness, gets perhaps 6*s*. per week and a doctor, besides bread and other allowances which the doctor may deem necessary for him? I have heard many men say who are in clubs, that it would be much better for them not to be provident, for they would get better keep from the parish than from their clubs. There are also several charitable clothing and coal clubs, established and superintended generally by the ladies of the several localities. These are a great benefit to the poor. There are ample opportunities for the labourers to enjoy the advantages of religion if they had but a stronger inclination to do so; probably one-third of them are Dissenters by profession, but unfortunately there is too much room to spare on Sundays in both churches and chapels. The sermons too often which are preached are not of a character sufficiently simple or practical to touch a poor man's heart, but, on the contrary, they have to do with subjects far too deep for an uneducated person to understand. If our great besetting sins were clearly and distinctly, but in no

harsh spirit, pointed out, churches would become better filled, and religion more palatable and more influential than it is at present. Drunkenness prevails to some extent in the cider districts, but it is to be hoped that the alteration in the law as to granting licenses to the low public-houses will be a great boon, and effectually stop much of the debauchery on Sundays amongst the labouring classes. *J. W.*

FARM BUILDINGS.

IV. The Royal Dairy at Frogmore.

We present the annexed engraving of the Queen's Dairy at the Home Farm, taken by Messrs. Longmans' permission from their work on the Prince Consort's farms, leaving any description of it till we can describe and illustrate the Frogmore Farm Buildings in detail, as we hope to do in a week or two.

ECONOMICAL FARM ENGINES.

What Engine should a Farmer Use?

There are very few matters connected with farm economy on which farmers require more stirring up than that of the sort of steam-engine which they use, and there is no portion of their establishment about which, as a body, they have so little real knowledge. If a manufacturer tells a farmer that such-and-such an engine is 8 or 10 or 12-horse power, and sells it to him at a corresponding price, there is hardly one farmer in fifty who can tell whether he has been cheated or not. Of course I do not suppose that farmers as a body ever can be judges of all parts of an engine. They cannot be expected to know whether it is well made or ill made, whether the valves and passages are properly proportioned, or all the parts of the engine of the requisite size and strength. Nevertheless, there are certain great features about an engine which they ought to know, and about which they should require from the makers a written guarantee. If a man buys a harness horse which he does not know, he generally requires from the seller a warranty that he is sound, free from vice, and quiet in harness. Upon all other matters he follows his own judgment or fancy. Why, then, should he not follow some similar rule in buying a steam-engine? I have often seen at our great agricultural shows steam-engines exhibited and marked, we will say, as 8-horse engines, and priced some £5 or £10 below the price of an 8-horse engine made by one of the best makers; and yet I know those engines not to be so powerful as a 6-horse engine of a first-class maker. This, I suppose, would be termed now-a-days, "clever trading," but I think the plain English term of "cheating" is the fairest title to give it. If any one who knows anything about an engine begins to ask these "fair traders" awkward questions about details, it is surprising how quickly they contrive to give him impertinent answers, with the sole object of driving him away from their stands. His eyes are open, and they know right well he is no customer for them.

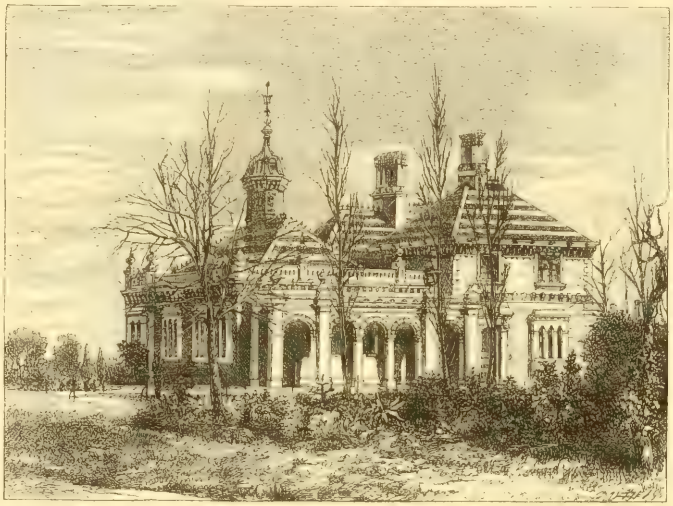

Fig. 95.—The Dairy at Frogmore.

The best makers know all this perfectly, yet they allow it to go on unchecked, although it seems to me they have the remedy in their own hands. They have simply to define and declare publicly what they give for one horse-power, and the fraudulent makers must strike their flags. At present a horse-power means absolutely anything which the maker pleases to call a horse-power; and it is my full belief that if any unscrupulous maker chose to manufacture 4-horse engines and sell them for 8-horse engines, there is no law in the country which could touch him, or give his dupes any redress. But if it was distinctly understood in the trade that a horse-power meant a certain definite thing, then that would become a trade custom; and if any fraudulent maker gave less, the buyer would have his remedy at law. If a baker or a grocer gives you short weight you can recover damages against him, or, if you prefer it, you can have him punished as a fraudulent trader. Why should a different rule hold with regard to steam engines?

Now the boiler is the true test of the power of any engine. The evaporative power of the boiler and the strength of the boiler limit the power of the engine. The size of the cylinder (within reasonable limits) has positively nothing to do with the power that an engine can exert. If I have a common portable engine-boiler, with, we will say, 200 square feet of surface exposed to the action of the fire, and calculated to work with 50 lb. on the square inch of safety-valve, then I may (within reasonable limits) put any sized cylinder on to that boiler, and it will in no way increase or diminish the power of the engine. If I put a 10-inch cylinder on to it (which is the usual thing) the steam issuing from the boiler will drive the piston, which has an area of 100 circular inches, at a certain speed. But if I put on a cylinder twice as large, the piston of which has an area of 200 circular inches, then the steam issuing from the boiler will only drive the larger piston at half the speed; consequently the power is the same, because the large piston cannot be driven faster, as the boiler will not supply steam.

A boiler of the size I name, 200 feet of heating surface, would be called a 10-horse engine by the best makers, because they give 20 square feet of heating surface for each nominal horse-power, and they would put on to it a 10-inch cylinder. Some makers, however, instead of giving 200 feet, would only give 140, or 130, or 120, and some even as low as 100 feet of heating surface for a 10-horse engine, and yet they will put the same sized cylinder (10 inches) on to these small boilers. But I have shown above that the size of the cylinder (within reasonable limits) in no way affects the power of the engine; with a small cylinder you run the piston faster, with a large cylinder you must run the piston slower, because the boiler will not supply steam. Suppose then a farmer, knowing nothing about engines, bought from one of these unscrupulous makers a machine "called" a 10-horse engine, with a 10-inch cylinder, and 120 square feet of heating surface in the boiler, and suppose the price was £5 or £10 less than the price of a 10-horse engine by one of the best makers, he would think he had done a clever thing. Yet in reality the engine he had bought would only do as much work as a 6-horse engine by a first-class maker, and the price, therefore, should be compared, not with their 10-horse but with their 6-horse engine, and then I suspect the farmer would find out he had made a blind bargain.

An ordinary portable engine of the kind now so common in all large farmyards is not the sort of engine I would recommend to any farmer (as I hope to show a little further on); at the same time, as many farmers will no doubt still continue to buy those engines, and will be tempted to buy of other than first-class makers, I would recommend every farmer buying such an engine to require from the maker a written guarantee as follows:—

1. That there are not less than 20 square feet of heating surface in the boiler for each nominal horse-power.
2. That the ordinary working pressure for the boiler is 50 lb. on the square inch of safety valve above the atmosphere, or 65 lb. into a vacuum
3. That the boiler, and all the working parts of the engine and machinery, are of a sufficient strength to bear at least six times the ordinary working strain before they break.

With such a written guarantee the buyer would be pretty safe, but if the maker would not give it then I would certainly buy an engine from some well-known maker of high reputation, even if I had to pay a good deal more money.

I have said, however, before, that the ordinary portable engine, which does not expand the steam, is not the best sort of engine for a farmer to buy. No farmer now-a-days ought to buy any other engine than an "expanding" engine—one in which, by means of a separate cut-off slide, the expansive power of the steam can be utilised. Although the expanding power of steam has been known to engineers, and was actually brought into successful operation in Cornwall nearly 70 years ago by Trevethick, yet it has been comparatively little used in non-condensing engines until very lately. The late Mr. Perkins, the clever inventor of the steam-gun, was a great advocate for high-pressure steam worked expansively, and invented one of the best boilers for raising steam safely to a very high pressure (500 lb. on the inch if wanted) that has ever been brought out; and it is somewhat amusing to see a very rude copy of Perkins' boiler advertised week after week as "patent," as though it were something new, and something which no one else could supply without the advertiser's license.

The enormous additional power to be gained out of high-pressure steam, simply by allowing it to expand, is quite astounding. An ordinary portable farm engine is usually worked with about 50 lb. on the safety-valve, and the slide-valve is so arranged in most of them that it does not shut off the steam until about seven-eighths of the stroke has been completed. Now, if a cubic foot of water be raised into steam at that pressure, and be passed through such an engine, it would raise 3,312,288 lb. 1 foot high if there were no waste and no friction. But suppose, instead of cutting off only at seven-eighths of the stroke, we arrange our engine with a separate cut-off slide, which allows us to shut off the supply of steam when only one-third of the stroke is made; then a cubic foot of water raised into steam at the same pressure (50 lb. above the atmosphere), and passed through such an engine, would raise 5,558,400 lb. 1 foot high, if there were no waste and no friction. But suppose, again, instead of limiting ourselves to 50 lb. pressure, we make a boiler that will bear 120 lb. on the safety valve, and instead of cutting off at one-third suppose we cut off at one-sixth of the stroke, then a cubic foot of water raised into steam at that pressure (120 lb.), and passed through such an engine, would raise 8,438,109 lb. 1 foot high, if there were no waste and no friction. But it is well known that the quantity of coal requisite to turn a cubic foot of water into steam is as nearly as possible the same at all ordinary pressures. In theory it would take a trifle more to raise it into steam at 120 lb. than at 50 lb., but the difference is so very minute we may reject it altogether from the calculation.

What, then, does this amount to? Why, that the same quantity of water and the same quantity of coal used in an expanding engine will raise 8,438,109 lb. 1 foot high, whereas in one of our ordinary engines it would only raise 3,312,288 lb. 1 foot high. But these figures, taken in the inverse ratio, represent the proportionate quantity of water and coal which each engine would require to do a certain amount of work. Suppose, for instance, we had a certain piece of ploughing to do, which with an ordinary portable engine we knew took 1000 gallons of water, and 1500 lb. of coals to do; then, if we set an expanding engine to it, working at 120 lb. on the safety-valve, and cutting off at one-sixth of the stroke, we should only require 392 gallons of water, and 573 lb. of coal to perform the same work! What a contrast—392 instead of 1000 gallons of water, and 573 instead of 1500 lb. of coal! Every farmer knows the trouble and expense there is in supplying water and coal to a ploughing engine; surely, then, such a saving as this is worth looking into.

But it may be said, this is all very nice, but what about the cost of the engine? Well, the first cost of an expanding engine of any given power ought positively to be less than if it were non-expanding! To illustrate this, suppose we confine ourselves to the ordinary pressure, 50 lb., and only cut off at one-third of the stroke. Then a 6-horse boiler, expanding, will do as much work as a 10-horse boiler not expanding, because 1 cubic foot of water not expanded only develops a power represented by 3,312,288; whereas a cubic foot of water where the expansion is three times, developes a power equal to 5,558,400, so that the proportion is 3 to 5 or 6 to 10. No doubt an expanding engine requires a larger cylinder, and the crank-shaft to be a little stronger, but the saving in the boiler far more than makes up for that and for the cost of an extra eccentric. But if this be so with a 50-lb. boiler, then there is no doubt whatever it holds also with the higher pressure, because the higher our steam is pressed the cheaper the machine becomes in proportion to the

power developed. A 4-horse boiler pressed to 120 lb., and the steam cut off at one-sixth of the stroke, will develop more power than a 10-horse boiler that does not expand; and not only should the first outlay be considerably less, but the annual expense for coals and water should only be about 40 per cent., or an annual saving of £60 out of every £100.

But I think I hear some of your readers exclaiming, "120 lb.! why we should all be blown into the next world some fine morning!" They need not be alarmed; if the boiler is going to explode, 5 lb. will blow them into the next world quite as quickly as 120 lb. Railway engines work at a much higher pressure, and engineers suit their engines to the strain they have to bear. If they make you an engine to work regularly at 50 or 60 lb. on the safety-valve, they will give you a boiler the bursting pressure of which is 300 or 360 lb.; but if they supply an engine to work at 120 lb., then they will give a boiler the bursting pressure of which is at least 720 lb.

Every expanding engine should have the boiler thoroughly lagged or clothed in every spot, and should be made with two cylinders, steam jacketed and well clothed, the cranks being set at right angles. The crank shaft should be cut in two, and should have a coupling upon it, so that one cylinder may be thrown out of work when there is only chaff-cutting or some other light work to do. In this way, and with the alteration of expansion, a very powerful engine will accommodate itself to a great variety of work.

The most convenient-sized engine for almost any-sized farm would be an 8-horse boiler (160 square feet of heating surface), with two 6-horse cylinders (8 inches diameter) fitted with separate expansion slides, and a coupling on the crank-shaft. Such an engine would do as much work if wanted as could be got out of a nominal 20-horse engine of the usual non-expanding pattern, and yet by uncoupling one cylinder it could be worked down as low as any ordinary 6-horse engine. It could, in fact, be made to do the work of a single horse, or of forty horses, at pleasure, and, if a portable engine, it ought not to cost more than a 10-horse double-cylinder engine of the present pattern, say about £270: or, if a traction-engine, then the cost would be about the same as a 10-horse road locomotive, say about £400.

I have as yet said nothing as to whether an engine should be a traction-engine or a mere portable. A traction-engine, it must be remembered, costs from £100 to £150 more than a portable of the same power, but then it can move about without the aid of horses, and if a properly constructed machine could do a great deal of farm cartage in hauling out manure and suchlike. This is a question that every man will form his own opinion upon, but for my own part I think a traction engine is worth the extra cost. For a hilly country, however, no traction engine should be used unless it has an upright boiler, the ordinary horizontal boiler being quite unsafe when off the level. *G. A. H.*

Home Correspondence.

Condition of the Wheat Plant.—I have read "J. L. F.'s" letter upon the "unfavourable appearance of the Wheat plant." I have also read unfavourable accounts in other papers. In my own neighbourhood I can see Wheats looking thin, weakly, and bad, and I hear from neighbours that the cry "thin plant" is very general. I look at home and see a good full strong plant on my steam cultivated land; indeed, I may say that I never had a better plant. It is clean, healthy, and strong. Surely this will tell a tale worth knowing to the farmers of England generally. It is pretty extensively known that 6*s*. 8*d*. an acre is the cost of its seed-bed.——Our old friend Mr. Mechi, according to his own showing, at p. 472, has had a very bad year of it: "balance to pay rent, also interest and profit on tenant's capital on 170 acres, for 1869—£427 13*s*. 6*d*." His old rent, according to his own fixing, stood thus:—

45 acres chapel land	£45	0	0
Farm, 128 acres, at 40*s*	256	0	0
House, roads, and hedges, 7 acres	0	0	0
	£301	0	0
Tenant's capital January 1, 1869, stood at £2707 19*s*. 4*d*.; this at 5 per cent. gives ..	135	8	0
	£436	8	0

According to this Mr. Mechi has worked for a whole year for £8 14*s*. 6*d*. less than nothing, after paying his usual rent and interest on his tenant's capital, at 5 per cent., and getting 7 acres of land, with his house, rent free, or rather no rent for it; and "the 63*s*. 9*d*. 1868 Wheat" is unexplained into the bargain. *William Smith, Woolston, Bletchley Station, Bucks, April* 2.

Scientific Book-keeping. — This sounds far-fetched, but in 1855 steam-ploughing was considered the mere theoretical working of an enthusiastic farmer; but it has since turned things upside down. Let us, then, theorise a bit on scientific book-keeping. It still requires the aid of theory! Will it be labour in vain if we urge upon the agriculturist, who desires to be guided by results in the cropping of his land, and the manure and other reproductive agents he uses, that it is desirable he should take an account of the several ingredients and constituents of the soil, as well as of the manures he applies, with the intention of increasing the fertility of his fields? In every department of the farmer's business chemistry is daily playing a more prominent part. It is the foundation of agriculture, and we cannot hope to give a scientific form and basis to this important art without a knowledge of the constituents of the soil and of the substances which constitute the food of plants. It is surely an essential part of a farmer's business to study the nature of his fields, and to discover which of the nutritive substances useful to plants his land contains in preponderating quantity, for then he will know how to make a right selection of such plants as require for their development a superabundance of these constituents, and he will obtain the greatest profit from his fields when he knows what nutritive substances he must supply in due proportion to those which are already in abundance. Thus it is, in the condition and composition of the soil, the law which regulates the quantity of manure required must be sought for, and it will be granted that the quantity must always have a proportionate bearing to the dung constituents already a component part of the land. A field in which they abound will take less manure to give the same increased produce than a field wanting the same. By these means a system of farming exactly suited to the nature and condition of the soil can be carried out. Let not any one be alarmed, I am not going to require of him such a knowledge of chemistry as is only obtainable by study and research, my object is simply to bring to his notice the several aids that are convenient and ready to hand, which he will find in the writings of men eminent in the practice of agriculture. There is no profession or calling, however scientific and learned in appearance, but can gain from the teachings of science most useful hints, and of all pursuits agriculture is most likely to benefit in this way. A chemical debtor and creditor account, or "scientific book-keeping," is not a subject altogether unknown to the British farmer; it has often been, at all events, written upon and suggested in various ways. It will be but putting into practice what every writer on the great advantages that would accrue to agriculture by being guided in our choice of plants by the condition of the land, of kind as well as quantity of manures used, has always made his theme. The farmer who determines to know everything that may tend to increase the value of his holding, as well as to make himself conversant with all the operations and doings on his farm, will find no difficulty in the matter. And let not those who are scarcely conscious perhaps of the educational disadvantages in an agricultural sense they have themselves laboured under, in the experiences of farming life, think this is beyond them; there are aids in all directions. The various constituents of the soil are easily determined. Whatever we put into the soil, in the shape of manure, home-made or artificial, green crops ploughed in or fed off, can be determined in a chemical as well as commercial view. It is here we meet with our only difficulty, as mentioned by "Scientific Training," p. 1338, 1869—that is, in the analysis of manures, at least in such as we have to hand. The several constituents are not given in the several orders, and let us hope that those who are able will come to our aid. At p. 748, 1869, Mr. Lawes gives the memoranda of the Rothamsted Field Experiments, being an advance towards the tables required to enable the farmer to estimate, chemically and commercially, the state of his fields. The article on ashes, in Morton's "Encyclopædia," pp. 141 to 149, also in Wilson's "Farm Crops," vol i., pp. 88 and 159, and in several places in the same works, will give an idea of the subject. In the remarks we have made we have only alluded to the valuable and practical aid chemistry affords the farmer in determining the ash constituents he has abstracted from his fields by the crop he grows, as well as what he returns to the soil in the manure he applies. We might have alluded also to chemistry as bearing on other departments of the farmer's business, and show that not only as growers of food, for man or beast, but as producers of meat also, English agriculturists have ample helps for the application of chemical knowledge. Their indifference to the matter may to a certain degree be accounted for by the absence of tables giving them the necessary information; in fact a ready (scientific) reckoner is required. Having obtained his multiplier, that is the percentage of ash constituents abstracted from the soil, as well as what he returns to the land in manures, &c., he can at once produce the required chemical account. *West Indian.*

Theory of Agriculture.—It is necessary for success that the farmer should know the nature and composition of the crops he raises, of the land on which they grow, and of the manures he uses. Another department of farming is the rearing and fattening of stock, the production of butter and cheese, attention to and a knowledge of the different kinds of food used, the habits and composition of the animals, the properties of milk, and an insight into cheese making, are each of them stepping-stones to success. In dealing with the land, the organic as well as the inorganic food of plants must be familiar to the farmer: he requires to keep in mind the sources from which they obtain their food, and to guide him he must have the key of knowledge of agriculture—chemistry. Thus he is able to contemplate the wonderful working of Nature, as arranged by Nature's ruler, an All-wise Providence. By this means he will be able to understand and act on the principles which have been established by chemistry in connection with the nutrition of plants, the conditions of the fertility of soils, and the cause of their exhaustion. I have read with much pleasure, though I have not obtained that amount of information I had anticipated, the excellent report of the consulting chemist of the Royal Agricultural Society of England, contained in the last number of the Journal, and also the results of the field experiments on Mangels. Let me point out where my disappointment lies. Take examples Nos. 1 and 6, at Iver Moor, Uxbridge: we find the unmanured plots yielding on an average 22 tons 7¼ cwt. of Mangels. No. 8, with 20 tons of rotten dung, yielded 27 cwt. No. 5, with 3 cwt. Peruvian guano, yielded 28 tons; and the remainder of the field, with 5 cwt. of Proctor and Ryland's mangel manure, yielded, on an average, 28 tons. On No. 8 we have an increase of 4 tons 12⅔ cwt. (assuming their value to be 20*s*. per ton), worth 4*l*. 12*s*. 6*d*., in return for 20 tons of rotten dung, which, with cartage, spreading, &c., far exceeded in value what we receive in extra produce, as compared with unmanured plots. No. 5 shows an increase of 5 tons 12½ cwt., worth £5 12*s*. 6*d*., obtained by application of 3 cwt. of guano, value, say, £2 0*s*. 6*d*. A similar increase is also shown on remainder of field, with Proctor & Ryland's manure, costing £2—No. 8, on which the 20 tons of rotten dung was used, showing the worst results. I should like to know (remember we are experimenting) whether the state of the ground had been tested, analysed, and that these 20 tons of dung were applied because it (the rotten dung) contained a certain amount of ash constituents, found wanting in the soil, for the production of a Mangel crop, or might be the means of rendering active some latent manurial quality, known or estimated to be in the land? The largest return was obtained on plot 7. Had the manure used any relation to the state of the soil as ascertained previous to the experiment? One question remains—Was the soil of plot 7 left in as "good heart" as that of No. 8? If the state of the land has been ascertained, will the gentlemen conducting these experiments inform us, as members of the Royal Agricultural Society, of the result? *Scientific Training.*

On Sampling of Cargoes of Phosphatic Raw Materials.—It has now become a settled practice to fix the price to be paid per ton according to the percentage of tribasic phosphate of lime found by analysis. Samples are usually sent to two chemists, and, for their convenience, sent in fine powder. The seller or his agent suggests that, to procure this powder, the material should be passed through millstones; and some manufacturers are unwise enough to consent to such a vicious practice, which goes far to explain the well-known fact that, given a certain quantity of material stated to contain a certain percentage of phosphate of lime, you can never obtain, in the manufactured article, the amount of phosphate you had a right to expect by calculation. In the action produced by the process of grinding great heat is evolved, which heat proceeds from the moisture, which is thus, to a certain extent, used up, and disappears; and thus it is not unfrequently found that 1, 2, or 3 per cent. of moisture disappears, and the phosphates, consequently, are increased in the analysis. We have long expected that analytical chemists, who must have been well aware of the injustice, would have come forward and proposed a remedy, but they have not done so; and lest it may be supposed that it is a necessary evil, and there is no cure, we beg to suggest one or two modes by which the injustice can be removed. 1. While the cargo is being discharged, let one weighing in 50 be placed over a kiln or some convenient drying place, and thus a great portion of the moisture dried off and ascertained. Most manufactories afford convenient means for accomplishing this, which can be done by the sellers' and buyers' agents, and during the discharge of the cargo. Suppose 5 per cent. of moisture is thus driven off, then the phosphate found in 95 grains of such sample will represent that which exists in 100 grains of the cargo. There will then be no objection to passing the dried sample through stones. This mode is particularly suitable for wet cargoes; but, in a case where this drying cannot be conveniently accomplished, plan No. 2 may be adopted, which is either to send rough samples to the chemist, or, if for their convenience a fine sample is wanted, to send a rough sample with it at the same time, from which the chemist should ascertain the moisture. In all cases, as the moisture resides mostly in the fine part of the cargo, it is desirable to pass the sample lot through a screen, and then, by weighing each separately, to ascertain their respective proportions, and then taking care that the sample for analysis should be made up in the same proportion—say one of fine and two of rough, as the case may be. 3. There is yet another mode of dealing with the difficulty, and that is for the seller to allow the buyer 1 or 2 per cent., according to the dampness of the cargo, for the privilege and convenience of allowing the whole to be ground under stones. Here, then, are three methods, each fair to both parties, and vastly preferable, we think, to the unjust system frequently pursued and which often leads to disputes. *Spooner & Bailey.*

Does Mustard Seed pay for Growing?—That there are many cogent reasons for and against the growth of Mustard there can be no doubt, but I shall

endeavour to prove that those in favour of it are of greater weight than those to its disadvantage. In some farm agreements it is considered one of the "pernicious seeds," and the tenant is prohibited from growing it. Of course, under such "pernicious" conditions (for the restrictions placed upon tenants by some landlords and their agents are far more detrimental to the cause of agriculture than the "pernicious seeds" that they are so careful to prevent the tenant from cultivating), nothing can be urged; but as some other landlords are of opinion that the occupiers of their land know best what to grow, no such rules are enforced. Lord Overstone is one of the large landowners in the Mustard-growing districts who takes this liberal view, and none would say that his tenants are not among the best farmers in the country. Presuming, therefore, that the tenant may cultivate Mustard if he chooses, and that the soil is suitable for it, the question arises, is it better to grow Mustard or to take a corn crop? One point in favour of the Mustard is that the cost of seed required per acre is many hundreds per cent. less than that of Oats, Barley, or Peas; and as there is no danger of getting a plant, it certainly has a great advantage over spring corn in that respect, for we are all only too painfully aware of the devastating effects of the wireworm, the crow, and other enemies of the farmer. It is true that it is generally usual to apply a good dressing of artificial manure in growing Mustard, but as the same would be used for the spring corn, nothing can on that head be placed to the debit of the Mustard without placing a similar account to the debtor side of the Oat or Barley crop. Some say, "Don't grow Mustard, you'll never get it out of the land." Now this assertion need not be taken as a fact, for I venture to say that little or no harm need accrue if the land is properly treated. My plan is as follows: give the shelled seed time to grow, and then plough the land a good depth and let it lay all winter; harrow and plough it again in the early spring, and in March set it with Potatos—for good Mustard land will grow good Potatos, and when the Mustard appears among the Potatos it is easily weeded out. The next objection—that it is such a hazardous crop—is of more weight, and so long as the weather is not under the tenant's control it will be a most decided drawback to the extensive cultivation of Mustard; for a wet day, or even a shower of rain, when the crop lies cut and not carried, by rendering the seed grey, will often depreciate its value cent. per cent. Against hailstorms, of course, the farmer has a remedy by insuring his crop, so that no great objection can be raised on that point. But the chief influence that bears against the cultivation of Mustard is the exclusive monopoly that exists in the seed-crushing trade, for under present circumstances there is only one market in the country in which to dispose of the seed, and only about one month in the year in which it can be sold even there; and, worse than all, only about half-a-dozen buyers, who generally lay their heads together, and fix the maximum price before they come into the Exchange at Wisbeach. But even to this dark cloud "there's a silver lining," and it consists in this,—that the merchants always give a remunerative price for a good sample of brown seed; for they rightly judge that, if they did not, the farmers would not grow it for them. Thus, taking all things into consideration, I think the growers of Mustard will find that, in a succession of years, the crop will be found to pay better than those of spring corn. *Nemesis, March* 10.

Societies.

ROYAL AGRICULTURAL OF ENGLAND,

MONTHLY COUNCIL: *Wednesday, April* 6.—Present the Duke of Devonshire, K.G., President, in the chair; Viscount Bridport, Lord Berners, Lord Chesham, Lord Kesteven, Lord Tredegar, the Hon. H. G. Liddell, M.P.; Sir Watkin W. Wynn, Bart., M.P.; Mr. Acland, Mr. Amos, Mr. Baldwin, Mr. Barnett, Mr. Booth, Mr. Bowley, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Clive, Mr. Davies, Mr. Dent, M.P.; Mr. Brandreth Gibbs, Mr. Hassall, Mr. Holland, Mr. Hornsby, Mr. Hoskyns, M.P.; Mr. Jonas, Colonel Kingscote, M.P.; Mr. Lawes, Mr. Leeds, Mr. Milward, Mr. Ransome, Mr. White Ridley, M.P.; Mr. Shuttleworth, Mr. Thompson, Mr. Torr, Mr. Turner, Mr. Webb, Mr. Wells, M.P.; Mr. Whitehead, Major Wilson, Mr. Jacob Wilson, and Dr. Voelcker.

The following were elected members:—

Allnutt, T. A., Watlington Farm, Tetsworth.
Barclay, W. Leatham, Knotts Green, Leyton.
Blyth, James, Weasenham, All Saints, Brandon.
Brough, W. S., Fowlchurch, Leek.
Byrd, Frederick, Dunston, Penkridge.
Callender, Peter, Devonshire House, Birkenhead.
Cooke, Frederick F., Caston Hall, Attleboro.
Corbett, C., Broad Marston, Stratford-on-Avon.
Darby, Alfred, Stanley Hall, Bridgnorth.
Davy, John, Owersby, Market Raisen.
Denton, J. Bailey, 22, Whitehall Place, London.
Dickin, Edward F., Yockingsgate, Whitchurch.
Dudding, Henry, Panton House, Wragby.
Early, Thomas, Witney.
Elwell, Edward, Wednesbury.
Fitzhardinge, Lord, Berkeley Castle, Berkeley.
Gilbert, Joseph, Evesham.
Gillard, Henry, Stafford.
Gunson, John, Hope Field, Lowick, Ulverston.
Hamond, Nicholas, Bridgnorth.
Herring, Henry, Caldwell Farm, Kidderminster.
Hodgson, J. Stewart, Denbigh, Haslemere.
Humphrey, Henry, Ashington, Hurst.
Hunt, R., Earl's Colne, Halstead.
Johnson, John George, Cross, Torrington.
Johnson, Joseph, Sutton by Beckingham, Newark.
Juckes, Thomas, Tern, Wellington.
Kaye, John Edward, Bretton Park, Wakefield.
Kent, George, North End, Portsea.
King, Frederick, 39, Lombard Street, London.
King, Raymond Fuller, 39, Lombard Street, London.
King, William David, 130, Queen's Street, Portsea.
Lipper, George Andrew, Aylesbury.
Lett, William, Rushock, Droitwich.
Mayo, Henry, Cokers Frome, Dorchester.
Mayon, John, Webster, Faceley, Tamworth.
Morley, Edward, Bruze Norton, Bampton.
Newill, Joseph, Lydbury North, Salop.
Park, James, Ulverston.
Page, Thomas Robert, Adderbury East, Oxford.
Parsons, John Philip, 2, Acacia Villa, Putney, S.W.
Parsons, William, Elsfield, Oxford.
Pettiward, Robert John, Finborough Hall, Stowmarket.
Reade, Joseph, Shipton, Chipping Norton.
Rogers, A., Plas-yn-y-pentre, Llangollen.
Roupell, John Stuart, Lee Place, Charlbury.
Rowland, William R., Creslow, Aylesbury.
Scott, Jonathan, Little Crosthwaite, Keswick.
Sheldon, J., jun., Eynsham, Oxford.
Sheldon, Thomas, Osney Mill, Oxford.
Short, A. L. H., East Castle Street, Bridgnorth.
Skelton, Edward, Dunkley, Sutton Bridge, Lincolnshire.
Spencer, John, Villiers Hill, Kenilworth.
Steedman, Edward B., High Ercale Hall, Wellington, Salop.
Stratton, Joseph, Upton Lower Farm, Burford.
Stuart, John Windon, Oldbury Terrace, Bridgnorth.
Stubbs, Richard, Stone, Staffordshire.
Stubbs, Thomas, Teddesley Coppice, Penkridge.
Tallant, Francis, Easebourne Priory, Midhurst.
Taylor, Francis, Church Street, Romsey.
Thompson, Thomas C., Ashdown Park East, Grinstead.
Tildesley, James, Willenhall, Wolverhampton.
Tredwell, William, Elsfield, Oxford.
Twinch, John, 58, Thames Street, Windsor.
Warner, William Henry, 4, Whitehall, London
Wiggins, William, Watcombe Manor, Watlington, Oxon.
Wood, John, Draycott-in-the-Clay, Uttoxeter.
Wright, Thomas, Seaton Barn House, Dudley.
Weatherhogg, George William, Newark.

FINANCES.—Major-General Viscount Bridport presented the report, from which it appeared that the secretary's receipts during the past month had been examined, and were found correct. The balance in the hands of the bankers on March 31 was £1745 3*s.* 1*d.*, £3800 remaining on deposit at interest. The balance-sheet for the quarter ended March 31, 1869, and the statement of subscriptions and arrears were laid on the table, the amount of arrears due being £940. The committee had had under their consideration a number of cases of defaulting members, and they recommended that these cases be referred to the Society's solicitor, with instructions to take proceedings to recover the arrears of subscriptions due to the Society.—This report was adopted.

JOURNAL.—Mr. Thompson (chairman) reported that the committee recommended that a prize of £10 be offered for the best description of the most improved form of kiln for burning lime for agricultural purposes.* It was also recommended that the committee be empowered to spend £25 in obtaining an article for the Journal "On the Latest Improvements in the Management and Cultivation of Hops;" and that a series of experiments be set on foot during the next autumn and winter to test the comparative feeding value of Barley and malt, at a cost not exceeding £100.—This report was adopted.

HOUSE.—Major-General Viscount Bridport (chairman) reported that the attention of the committee had been called to a recent assessment of the Society's house—the previous rating having been on a basis of £80, and the present demand being based on £280. The committee therefore recommended that the secretary be instructed to communicate with the Society's solicitor, with a view to an appeal.—This report was adopted.

LIBRARY.—Major-General Viscount Bridport reported that, with regard to the improvement and the gradual completion of the library, the committee recommended that a grant be made this year of £100 for the purchase of books, and that a future grant of £50 be annually applied for, for the same purpose. The committee suggested that a list of books proposed to be purchased be made out by the Editor, and submitted to the Journal Committee for their approval. As to additional book-cases the committee recommended that the two spaces on each side of the fireplace in the council-room be successively appropriated when required, and that the House Committee be empowered to contract for the same.—This report was adopted.

GENERAL, OXFORD.—Lord Kesteven reported the following recommendation of the committee:—That the secretary put himself in communication with other parties than those from whom refreshment tenders have been received, in order to negotiate with them.—This report was adopted.

On the motion of Lord Kesteven, it was resolved "That the secretary do put himself in communication with the Oxford local committee to secure the required lodgings for the officers of the Society at Oxford."

CHEMICAL.—Mr. Wells, M.P. (chairman), reported that the committee had had before them the correspondence between Messrs. Bradburn & Co., and Professor Voelcker, and that they had nothing to add to their former report.—This report was adopted.

EDUCATION.—Mr. Holland (chairman) reported that only two candidates had entered to compete for the Society's certificates and prizes, and that neither of them desire to be examined either in geology or botany. The committee recommended the following gentlemen as examiners at the forthcoming examination, viz.:—General and Agricultural Chemistry, Professor Liveing and Dr. Voelcker; Land Surveying and Mechanics, Professor Twisden; Book-keeping, Messrs. Quilter, Ball & Co.; Anatomy and Animal Physiology, Professor Simonds.—This report was adopted.

SELECTION.—Mr. H. S. Thompson (chairman) reported that the committee, after full consideration of the question referred to them by the Council, relating to the power of adjournment possessed by the general meeting of the Society, fixed by the Charter to be held on a particular day in May, have to report their opinion that there is an inherent power in such meeting, when once duly constituted, to adjourn to another day for the more convenient transaction of the business of the meeting, within such limits as shall not admit of a departure from the evident intention of the Charter that a general meeting of the Society shall be held in London for the election of officers and other business at the particular time of year named.

JUDGES SELECTION.—Mr. Milward (chairman) presented a list of the names of gentlemen nominated by the committee as judges of stock and implements at Oxford; and he reported the recommendation of the committee that these gentlemen be invited to act in such capacities at the Oxford meeting.—This report was adopted.

VETERINARY.—Mr. Wells, M.P., reported that in order to give effect to the resolution, arrived at by the Council at their last meeting, the committee recommended that a sum of £25 be placed at the disposal of Professor Simonds for making experiments in pleuro-pneumonia, especially with regard to preventive measures. The committee had received the report of the Governors of the Royal Veterinary College, as well as a communication in reference to the resolution passed at the last meeting of the Council. This report having been adopted, the last-mentioned communication was read as follows:—

"Royal Veterinary College, March 23, 1870.

"My Lords and Gentlemen,—The Governors of the Royal Veterinary College having considered the communication from the Council of the Royal Agricultural Society, dated March 3, 1870, beg to express their hope that the amount of the grant of £200 a-year from the Royal Agricultural Society will not be diminished.

"In proof of their earnest desire that the objects of the Royal Agricultural Society shall be attained, they beg to place the £50 a-year, which they have for some years appropriated to the purchase of specimens of disease in cattle, sheep, and pigs, in the hands of the Council, and have made arrangements to the extent of their accommodation for the reception of any specimens the Council may forward to the College; and further,

"The Governors of the Royal Veterinary College request the Council of the Royal Agricultural Society to transmit to them such subjects for investigation to be undertaken in the College, as they may decide upon, and the Governors will instruct Professor Simonds to conduct such investigation.

"The Governors have instructed Professor Simonds to report the circumstances connected with the diseases manifested in such specimens as may be provided by the Council, and the treatment thereof, to each meeting of their 'committee for general purposes,' which meetings take place quarterly, and from which such reports will be immediately transmitted to the Council.

"The Principal is requested to transmit the communication now agreed upon to the Council of the Royal Agricultural Society.—I have the honour to be, my lords and gentlemen, your obedient servant,

"C. N. NEWDEGATE, Chairman.

"To the Council of the Royal Agricultural Society."

It was then moved by Lord Bridport, and seconded by Colonel Challoner, "That the request contained in this communication be complied with." A discussion then ensued, in which Mr. Thompson supported the motion, and Mr. Jacob Wilson explained the views of the committee, and their reasons for not acquiescing in the request of the Governors of the College. On the question being put to the vote, Lord Bridport's resolution was lost by 19 noes to 6 ayes.

The report of the governors of the Royal Veterinary College having been read,* it was moved by the Hon. H. G. Liddell, M.P., seconded by Mr. J. D. Dent, M.P., and carried unanimously, "That this Council call the attention of the Privy Council to so much of the report of the Governors of the Royal Veterinary College as relates to rinderpest, and urge the Privy Council to take this report into their immediate and careful consideration."

Memorials having been received from the authorities of Shrewsbury, Stafford, and Wolverhampton, inviting

* Essays competing for this prize must be forwarded to the secretary of the Society not later than June 15.]

* Extracts from this report are appended.

the Society to hold their country meeting for 1871 in those localities, on the motion of Mr. Jacob Wilson, the following were appointed an Inspection Committee to visit and report on the facilities offered by the competing towns:—his Grace the Duke of Richmond, Sir Edward Kerrison, Mr. D. R. Davies, Mr. B. T. Brandreth Gibbs, and Mr. William Torr.

On the motion of Mr. Cantrell, the following list of competitors for the prizes offered by Mr. Mason and the Society for the two best-managed farms in the district round Oxford was ordered to be published:—

Cother, William, Middle Aston, Deddington, Oxford.
Craddock, Robert, Lyneham, Chipping Norton, Oxon.
Dashwood, Frederick Loftus, Kirtlington, Oxford.
Deane, Thomas, Huttons, Hambledon, Henley-on-Thames.
Denchfield, William, Easington Farm, Banbury, Oxon.
Druce, Samuel, Eynsham, Oxford.
Edmonds, William John, Southrop House, Lechlade, Gloucestershire.
Fowler, John Kersey, Prebendal Farms, Aylesbury, Bucks.
Gibbons, George Thomas, White Hill Farm, Tackley, Oxford.
Gillett, Charles, Cote House, Bampton, Oxon.
Hall, William, Barford House, Deddington, Banbury, Oxon.
Hatton, William, Kingston, Tetsworth, Oxon.
Latham, Thomas, Little Wittenham, Abingdon, Berks.
Millington, Mary Elizabeth, Ash Grove Farm, Ardley, Bicester, Oxon.
Penson, Robert, Foxcott, Chipping Norton, Oxon.
Savidge, Matthew, [Sarsden Lodge Farm, Chipping Norton.
Smith, Samuel, Somerton, Deddington, Oxon.
Smith, Thomas, The Downs, Wootton, Woodstock, Oxon.
Stilgoe, Nathaniel, Manor Farm, Adderbury, Banbury.
Stilgoe, Zachariah, W., Adderbury Grounds, Banbury.
Treadwell, John, Upper Winchendon, Aylesbury, Bucks.

Mr. Torr then moved "That judges of live stock at the Society's country meetings be supplied with a list of the animals entered for the prizes which they have to award, omitting the names of the exhibitors, but giving the pedigrees of the entries," and he explained that his object was to ensure that the prizetakers should be good animals with good descent, stating his opinion that they ought to possess four or five crosses of pure blood.—Mr. Milward, in seconding the motion, expressed his regret that Mr. Torr had not adhered to his original intention, and proposed that the catalogues should be placed in the hands of the judges, and he quoted the case of a prize bull at the Society's Warwick meeting, which no breeder would have dared to use on account of his want of pedigree.—Mr. J. D. Dent, M.P., having stated that he would have voted for the motion of which Mr. Torr had originally given notice, but that he must oppose it in its present form,—Mr. Bowly expressed his dissent from Mr. Torr's views, mentioning particularly that in his opinion prices given for animals at a sale rested on a different basis from that on which prizes were awarded at a show. He also remarked that the great success of the Society's shows was due to the certainty of the awards being made with impartiality.—Mr. Jacob Wilson also opposed the motion, and expressed his opinion that if the object was to guarantee the possession of hereditary qualities Mr. Torr had placed the cart before the horse, for he should have moved that the possession of a certain pedigree be made a condition of entry. Mr. Booth likewise opposed the motion, although personally he felt indifferent whether the judges, if they were honest and independent men, were supplied with catalogues or not; but he felt that many younger exhibitors would object to such information as was proposed being afforded to the judges.—The resolution having been further opposed by Mr. Turner, Mr. Davies, Mr. Webb, and Mr. Jonas, it was withdrawn by Mr. Torr, with the expression of his conviction that the discussion would have a beneficial effect, and that in future years it might be found possible to demand a certificate of pedigree as a condition of entry.

A letter from the President of the "Société des Agriculteurs de France," on the subject of an international agricultural congress was, on the motion of Mr. Brandreth Gibbs, referred to the Journal Committee.

The secretary was authorised to affix the common seal of the Society to the diplomas of recently elected honorary members.

On the motion of Mr. Jacob Wilson, seconded by Mr. Brandreth Gibbs, Mr. Amos was empowered to communicate with intending exhibitors of steam-engines, with a view of ascertaining their respective "speeds" and other particulars, so as to facilitate the forthcoming trials of implements at Oxford.

Extracts from the report of the Governors of the Royal Veterinary College to the Council of the Royal Agricultural Society:—

"During the past year (1869) events have occurred which tend to prove the increasing importance to the members of the profession of a complete and practical acquaintance with the diseases of farm stock, and especially with those which, normally existing in a mitigated form, are likely to assume an epizootic character, and occasion serious loss to the farmer, although they may not be essentially malignant in their nature. Such, for example, is the malady commonly known as 'mouth-and-foot disease.'

"Some interesting cases of disease of the skin of lambs were brought to the notice of the students. The disease possessed all the characteristics of the affection known as Crusta lactea in the human infant. The parts principally affected by the morbid action were the sides of the neck, and even the shoulders were ultimately attacked. Thick crusts of a dark colour covered the skin, which was also much inflamed and cracked. The young animals suffered much from local irritation and symptomatic fever, under which some sank. The cases, however, were not numerous in the several flocks in which the disease appeared, not more than 6 or 8 among 150 to 200 animals. Application of the oxide of zinc ointment proved beneficial, but careful nursing and protection, both from hot and wet weather, were needed as adjuncts to the treatment.

"Some other novel cases occurred in lambs, in which death resulted from parasites existing on the skin. The parasites in question were those commonly known as ticks (Ixodes Ricinus). These parasites abound in most countries, and are met with both on wild and domesticated animals, firmly attached to the skin, from which they draw blood as their food. Until now they have not been found on animals in Great Britain to an extent injurious to health, much less as causing death. In hot countries, however, and particularly in many parts of South America, these parasites attack animals in such vast numbers that even oxen succumb to the irritating and exhaustive effects of their attacks. Specimens of the skin of lambs, thickly covered with these epizoa, were sent from Kent by a veterinary surgeon consulted on the case. In his communication he writes that 'they had attacked the sheep and lambs, both on uplands and marshes, and that one farmer found a large quantity of them on some colts which were at pasture near to the sheep.' There are few parasites more tenacious of life than ticks, but experiments having shown that they can easily be destroyed by carbolic acid, it was recommended that a trial should be given to dipping the sheep and lambs in a diluted mixture of the acid. This proved most effective in the destruction of the ticks, and thereby prevented a further loss of lambs.

"The chief event of the year in connection with cattle diseases has been the remarkable outbreak of the malady known as the mouth-and-foot disease. Few parts of Great Britain have escaped, and in one instance, at least, the disease was ascertained to have been introduced into Ireland by cattle exported from England. In Ireland, however, the malady has been kept far more in check than elsewhere by sanitary regulations, as the executive of the Government in that country was enabled to enforce the orders of Council through the medium of the constabulary.

"Another contagious disease of cattle has excited a good deal of attention—pleuro-pneumonia; and in addition to the legislative provisions for its suppression a revival of the system of inoculation by way of prevention has been resorted to. Experiments for this purpose have been begun in several parts of the country, but chiefly in Norfolk and Cheshire. Some of the results have been published, but in the present state of the inquiry no correct deductions can be arrived at from the data obtained. It may, however, reasonably be doubted whether the results will so far differ from those which were obtained in 1852-53 as to justify the adoption of the system.

"That no fresh introduction of the cattle plague has occurred within the year is a subject of sincere congratulation. The disease, however, has been more than usually rife in many parts of Eastern Europe, and early in the year made its way from Hungary into Lower Austria, showing itself in several places, and among these in some villages near Vienna.

"The latest intelligence which has been received is far from reassuring.

"The plague had entered Silesia from the south-western districts of Poland, and although it was quickly stamped out, the state of things was so threatening that both the Prussian and Austrian frontiers had to be strictly guarded by the military. It may be thus hoped that Western Europe will be protected from further loss through this most malignant and infectious disease; but that Poland, Galicia, Hungary, Transylvania, and Buckowina, will suffer severely from the outbreak cannot be questioned.

"With reference to another foreign disease—the small-pox of sheep—it may be mentioned that the Government measures, which required that all foreign sheep should undergo a quarantine of fourteen days, or be slaughtered within four days at the port of landing, proved most effective in securing the country against the introduction of the malady.

"Passing from foreign to home diseases of a contagious nature, we find that scab in sheep has been exceedingly prevalent during the year. This disease is essentially parasitic in its nature,—the analogue, in fact, of itch in the human subject. It is not difficult of cure, and many of the popular remedies are sufficient for the purpose. These, however, often fail in effecting a cure, as must the best chosen remedies, for want of sufficient care in their application. Each sheep in turn should be well examined, and the agent applied to every spot where the disease is found to exist. In all places where 'scabs' are met with, they must be well broken up with the fingers before the agent is used, otherwise neither the Acari nor their ova will be destroyed."

BATH AND WEST OF ENGLAND.

COUNCIL MEETING: *Bristol, March* 29.—The Council having at their last meeting granted a sum of £100 to the Arts Committee for the Taunton meeting, in June next, in order to encourage artists to exhibit a higher class of pictures than usual at the Society's meetings, the committee, through Mr. R. R. M. Daw, now recommended the following appropriation of the grant:—The £100 to be added to the sum received from the sale of Art Union tickets, thus forming one common fund to be drawn for by the subscribers to the Art Union and the annual members of the Society, and providing the following special prizes: two of £20 each, two of £15 each, and three of £10 each. This recommendation was unanimously adopted.

Southampton Meeting: The Prizes for Hereford Bulls.—A clerical error having been committed by the judges in entering their award of prizes in class 12, at Southampton, whereby Mr. W. B. Simonds, M.P., was represented as entitled to the prize of £20 for the best Hereford bull not exceeding two years old, and Mr. Nathaniel Benjafield, of Short's Green Farm, Motcombe, Shaftesbury, to the prize of £10 for the second best, the error was now rectified by the spontaneous act of Mr. Simonds, who, having satisfied himself that a purely clerical error had been committed by the judges, most handsomely waived his right to the prize money already paid to him; and this, with the sanction of the Council, was directed to be handed over to Mr. Benjafield as the actual owner of the 1st prize animal in his class—Mr. Simonds' animal taking the 2d prize and place.

Vacancy in the Council.—Mr. J. H. Kennaway, of 19, Oxford Square, London, was elected to supply the vacancy in the Council occasioned by the death of Mr. John Woolcombe Sillifant, of Combe, Copplestone, Devon.

The Society's Journal.—A copy of the Society's Journal, vol. i., p. 2, T. S., recently published and distributed among the members, was placed upon the table.

Taunton Meeting: Programme of Proceedings.—The secretary having reported that the time for entering stock and implements would not expire until April 20, brought up the draft programme, which was provisionally agreed to, and ordered to be reported to the Council at their next meeting.

A communication from Mr. E. G. Carew Gibson, of Crofton, Isle of Wight, offering a prize for pheasants at the Guildford meeting, was ordered to be referred to the stewards of poultry.

Farmers' Clubs.

LONDON.

April 4.—Exhaustion of the Soil, in relation to Landlords' Covenants, and the Valuation of Unexhausted Improvements.—The following is a condensed report of the paper on this subject by J. B. LAWES, Esq.

After referring to the practice from the commencement of the present century, Mr. Lawes said:—I propose to direct your attention this evening chiefly to the following questions: 1. Whether, in order to preserve the soil from exhaustion, it is necessary to enforce a fixed rotation of crops. 2. What are the best, or most generally applicable means at our disposal, for the estimation of the value of unexhausted manures? In considering the characters of soil with the view of arriving at some answer to these questions, it will suffice to confine attention mainly to the definition and illustration of those qualities which are commonly known under the term "condition," and to pointing out the distinction between these and those which are due to what may be called the normal or natural fertility of the soil.

The word "condition" is in very common use amongst agriculturists. It is said that a farm is "in condition," or "out of condition," or in "high condition," or in "low condition." These terms are well understood to imply certain states of fertility which it is not easy to define more accurately in a few words. By way of special illustration of such "condition" I will direct attention to some results selected from among those of the numerous field experiments made on my farm at Rothamsted. Mr. Lawes then explained the nature of the Tables I., II., III., and IV. (see leader), and proceeded to say—I will first call attention generally to the fact that, throughout the long periods over which these various experiments have extended, condition has been equally kept up whether farmyard dung or certain chemical mixtures were employed. In the Wheat experiments the average of 26 successive crops grown by farmyard dung was 33¾ bushels; the average on plot 16 of 21 crops grown by artificial manure was 36½ bushels, and the average on the same plot over 13 years, when the artificial manures were increased in quantity, was 39½ bushels. In the case of the Barley, the average over 18 years of farmyard dung was 48 bushels, and over 18 years of artificial manure 47½ bushels. In the rotation experiment, after the removal, on the average of the four courses, of about 13½ tons of Turnips, which had been manured with artificial manure, the average of the four crops of Barley was 48¾ bushels, and that of the four crops of Wheat 36¾ bushels. Lastly, in the 14 years experiments on permanent meadow land, the average produce of hay where farmyard manure was employed was 43 cwt., and where artificial manures were used 45 cwt. It is obvious, therefore, as I have already said, that land can be kept in "condition," whether continually under grain crops, under rotation, or growing natural grasses, equally by farmyard dung or artificial manures. I will now endeavour to illustrate the extent, or limit, of duration of "condition" of soil, under different circumstances of manuring. I will refer first to the experiments on Wheat, the results of which are given in Table I. During the first eight years, from 1844 to 1851 inclusive, plot 16 was variously manured with mineral manure and ammonia salts, and gave an average annual produce of 30¾ bushels. During the next 13 years, from 1852 to 1864 inclusive, it received every year a

mineral manure, composed of salts of potass, soda, magnesia, and superphosphate of lime, and also a largely increased amount of ammonia salts, namely 800 lb. per acre per annum, and the average produce over the 13 years was 39½ bushels. The manuring was then stopped, so that the crops of 1865 and since have been entirely unmanured. The crop of 1865, the first after the cessation of the manuring, was 32⅜ bushels, the second 17⅜, the third 14⅜, the fourth 22¾, and the fifth 16⅛ bushels. It is obvious, therefore, that the "condition" of the land, due to the unexhausted residue of the manures applied during the 21 previous years, was sufficient to yield a fair crop in the first year after the manuring was stopped, but that the produce then rapidly declined. It should be stated, however, that the quantity of ammonia applied in this experiment was very excessive, amounting, in the 21 years, to as much as would be supplied in 10 tons of Peruvian guano. Deducting the amount of nitrogen in the increase of crop in the 21 years, from the amount supplied in the manure during the same period, it appeared that nitrogen equal to more than a ton of ammonia, and to more than would be supplied in the 6½ tons of Peruvian guano, remained unrecovered in the increase of crop. An analysis of the soil to the depth of 27 inches from the surface showed that about one-third of this excess still remained in the soil within that depth, at that period; leaving, however, the remaining two-thirds still unaccounted for. Even the one-third retained within a depth of 27 inches from the surface would appear, from the small produce yielded by it, to be so diffused, and locked up in such states of combination in the soil, as to be available in very small quantities annually. Of the remaining two-thirds, doubtless a part is still retained in the soil below a depth of 27 inches; but probably the largest proportion of it has passed off in the form of nitric acid, in the drainage-water. In the other experiments on Wheat, the results of which are given in the Table, the amounts of ammonia applied were by no means so excessive, only half as much being annually applied, where they were used at all, as during the 13 years of excessive application on plot 16. During the first eight years of the 26, that is, from 1844 to 1851 inclusive, plots 5, 17, and 18, were manured with various but, upon the whole, somewhat similar mixtures of mineral manure, ammonia-salts, and sometimes rape-cake, and gave nearly equal average amounts of produce over the eight years, namely, 29½, 30¼, and 28⅞ bushels respectively. From that date, 1852, to the present time, a period of 18 years, plot 5 has been manured with a mixed mineral manure containing salts of potass, soda, magnesia, and superphosphate of lime; and every year during the same period plots 17 and 18 have been manured with the same mineral manure or ammonia-salts alternately. For example, in 1852 plot 17 received ammonia-salts, and plot 18 the mineral manure. In 1853 plot 17 received the mineral manure, and plot 18 the ammonia-salts, and so on, alternately for the 18 years; thus, plots 17 and 18 have each been manured nine times with ammonia-salts and nine times with the mineral manure during the 18 years, the difference being that when one received ammonia-salts the other received mineral manure, and *vice versâ*; and, accordingly, we have had each year one plot manured with mineral manure following a residue of ammonia-salts, and one plot manured with ammonia-salts following a residue of mineral manure. Over the 18 years the average produce of plots 17 and 18 was exactly the same, namely—24⅜ bushels in each case; but if we take the average of the 18 crops grown by mineral manure alone, whether upon plot 17 or 18, we find it to be only 17⅜ bushels, whilst the average of the 18 crops grown on either plot by ammonia-salts is 31⅛ bushels, or nearly 14 bushels per acre per annum more. Table II. gives some results of experiments on the growth of Barley for 18 years in succession on the same land, very similar to Wheat under Table I. Table III. gives the average produce over four consecutive four-course rotations, in which the Turnips were liberally manured with mineral manure, ammonia-salts, and rape-cake, and the whole crop (roots and tops) carted from the land. On the average about 13¾ tons of Turnips were removed; yet it will be seen that the unexhausted residue from the manures applied for the Turnip crop was such that an average produce over the four courses of 28½ bushels of Barley, 21½ bushels of Beans, and 36⅜ bushels of Wheat was obtained. In the experiments on permanent meadow land, the results of which are given in Table IV., plot 2 was manured with 14 tons of farmyard dung per acre per annum for the first eight years, and has since, that is for six years, been left entirely unmanured. It will be seen that during the eight years of the application of dung the average annual produce of hay was a little under 43 cwt., and that during the six following years it amounted, without any further application of manure, to a little over 43 cwt. of hay, thus showing a very marked effect from the unexhausted residue of the previous heavy dressings of farmyard dung. From the above results, relating to Wheat, Barley, rotation, and permanent meadow, the following conclusions may be drawn:—1. That condition of land may be maintained, either by farmyard manure or by artificial manures. 2. That when active nitrogenous manures, such as Peruvian guano, ammonia-salts, or nitrate of soda, are applied in only the moderate quantities usually employed in practical agriculture, the unexhausted residue left in the soil after the removal of a corn crop has but little effect on succeeding crops. 3. That when rape-cake and other purchased organic manures, which yield up their fertilising elements comparatively slowly, are employed, the unexhausted residue left after the removal of the first crop may yield an appreciable amount of increase throughout a rotation. 4. That when farmyard dung is employed the effects may be apparent for a still longer period. 5. That when mineral manures, such as phosphates, salts of potass, &c., are used, the effects of any unexhausted residue are too slow and gradual to admit of any determination of their value. Admitting that the recognised rotation of any district may be, upon the whole, the most suitable to follow in it, it nevertheless will not be denied that the farmer of intelligence and capital would, if he were permitted to do so, occasionally deviate from it, with profit to himself at any rate. It will be well, therefore, to direct attention to some results illustrative of the extent and limit of the productive capability of a soil of a certain class or character, with a view of forming some judgment of the probability of injury to the land by a deviation from the ordinary course of cropping. I have sought to guage the capability of my soil to yield crops for many years in succession without manure, and even under more exhausting conditions still, and some of the results obtained are recorded in Table V. It should be stated, however, that in no case has any attempt been made to increase the productiveness by either subsoiling or deeper ploughing than usual, though great care has been taken to keep the land as free from weeds as possible without injury to the crop by treading.

The first column of Table V. shows the produce of Wheat obtained for 26 years in succession, from 1844 to 1869 inclusive, on a portion of the experimental Wheat-field which has received no manure whatever since 1839. The average produce, per acre per annum, over the 26 acres, has been rather over 15½ bushels of dressed corn, about 14 cwt. of straw, and 22¾ cwt. of total produce (corn and straw together). The average over the second half of the period is 1¾ bushel of corn and 2¾ cwt. of straw—less than over the first half; showing perhaps a slight, but at any rate no very marked, tendency to decline in annual yield. I hold in my hand a specimen of this unmanured produce grown in 1868, the 25th crop of Wheat in succession, and the 29th crop since the application of any manure to the land. Here also is a section of the soil, taken to the depth of 27 inches; and, so far as can be judged from appearance, certainly no one of experience in such matters would take it to be naturally more fertile than the majority of moderately heavy soils in this country. Nor does the rent of similar land in the neighbourhood (25*s.* to 30*s.* per acre tithe-free), or the condition of the farmers of the district as to wealth, indicate any great fertility of the soil. Table IV. shows the 2d, 3d, 4th, and 5th courses of five consecutive entirely unmanured four-course rotations: the average of the four crops of Swedes, roots and tops, was 18¾ cwt.; of the four crops of Barley, 40½ bushels; of the four crops of Beans, 12⅜ bushels; and of the four crops of Wheat, 34⅛ bushels. To sum up the chief points of these illustrations of the extent or limit of the fertility of a somewhat heavy loam, of by no means extraordinary quality, it has yielded an average annual produce, without any manure at all, of 15⅛ bushels of Wheat for 26 years, of 20½ bushels of Barley for 18 years, of 23⅞ cwt. of hay for 14 years, and, under rotation for 20 years, an average over the last four courses, or 16 years, of 40½ bushels of Barley, 12⅜ bushels of Beans, and 34⅛ bushels of Wheat. I confess that my view of the productive capability of heavy, or even moderately heavy soils, has undergone considerable change since I commenced the various experiments to which I have referred. Formerly I supposed that a very few years of consecutive corn-growing would suffice to reduce the corn-growing capabilities of any ordinary soil to practically nothing. Such, however, is not the case; and a very little reflection will show how essential it is for the well being, if not, indeed, for the existence of man, that the elements of fertility should be so locked up and distributed throughout the soil as to be capable of being taken up by crops extremely gradually, and so to last for an immense period of time.

If needy landlords or indigent tenants could have drawn upon the locked-up elements upon which the maintenance of the natural or standard fertility of the soil depends, how little fertile soil would still remain in England? A soil which would yield only 5 bushels of Wheat would probably bear no rent at all, the whole value of the produce being required to meet the cost of cultivation. The soil yielding 15 bushels would doubtless pay a rent, and the one yielding 25 bushels a considerably higher rent. But now let us assume that all three cultivators were able to go into the market and purchase cattle food and manure; the three soils would be very differently affected by this importation of elements of fertility from without. An amount of money expended in food and manure that would raise the produce on the poorest soil from 5 to 25 bushels would not raise that on the medium soil from 15 to 35 bushels, and still less would it increase the yield on the best soil from 25 to 45 bushels of Wheat. It is obvious, therefore, that the surplus available for rent, dependent on such a use of elements of fertility from without, would be proportionally the greatest on the poorest soil, and the least upon the naturally most productive soil. It is chiefly in the fact here illustrated that is to be found an explanation of the rapid rise in the rent of light soils of late years; compared with heavy land, they are cultivated at a less cost, they are much better adapted to carry stock, and with the aid of purchased food and manures they can now rival in productiveness the natural fertility of clays and loams. Thus, the productiveness of light soils is in a greater degree dependent on the amount of capital expended on food and manure than in the case of the heavier soils. Moreover, the increased fertility, and the increased rent of the lighter soils of late years, are partly due to the accumulations from the past expenditure of the tenant. This increased productiveness is, however, of the character of improved "condition;" and hence it is that the productiveness of such soils may be comparatively easily and rapidly reduced. That, excepting in the case of light soils under the conditions above referred to, the amount of rent paid is, in practice, chiefly dependent on the natural fertility of the soil, and not on the amount of capital employed by the tenant, is evident from the fact that there are, on many estates, highly cultivated farms with abundance of capital invested, adjoining others in a very opposite condition; the poor farmer being able to set apart from the produce of the land as large a surplus in the form of rent as his higher farming neighbour; whilst any demand for an increase of rent, on account of increased capital employed, would be met with the remonstance that the benefits arising from the increased expenditure of capital by the tenant should justly accrue to himself. From the facts and arguments which have been adduced in regard to the natural fertility of the heavier soils, and to the essential conditions of productiveness of the lighter soils, the question naturally suggests itself—whether, or under what circumstances, the more frequent growth of corn than accords with the recognised rotation of a district might be permitted without risk of deteriorating the property of the landlord? The same result, namely, the export from the farm of larger crops within a limited period of time, follows in like manner from the use of the subsoil plough, the steam smasher, and a great variety of implements of modern application. In fact, all these processes, which are regarded with favour rather than otherwise, have the one object and result of causing the soil to yield up its elements of fertility more rapidly.

I believe that whilst a greater freedom from the adoption of a fixed rotation would often be beneficial to the tenant, it would not, if accompanied with proper conditions, result in any injury to the landlord. In saying this I trust it will not for a moment be supposed that I would recommend the abandonment of a rotation of crops, and the continuous growth of corn. To be more specific, what I do think is, that where fallow, or liming, or subsoiling, or steam smashing, and allied processes, are admissible and advantageous, or where root crops cannot be consumed on the land during wet weather without injury to the succeeding crops—that is to say, on the heavier and deeper soils—Barley may often be grown both in larger quantity and better in quality after Wheat than after a root crop. Again, where Mangels are manured, as they often are, with 20 or even 30 tons of dung per acre, I see no objection, either from a scientific or practical point of view, in taking out of the land the large quantity of mineral constituents still remaining available after the removal of the Mangels, by growing two or even three corn crops in succession, with the application of artificial manure for each extra crop. Very generally, indeed, two corn crops might be taken in succession from medium and heavy land, provided it be kept free from weeds, and artificial manures be applied for the second crop. Nor do I think that real injury would be done by the occasional growth of Peas, or even an extra corn crop, on light soils, when the seeds have failed, as occurred after the dry summer of 1868; indeed, as much of some fertilising matters might be washed out of the soil by drainage as would be exported from the land in the extra crop. It will be admitted on all hands that if the tenant were unconditionally free as to his course of cropping, and he were to leave his farm wholly under corn, the landlord would not so readily obtain a tenant for the farm. I would propose, therefore:—

1. That all land should be given up with a fixed proportion under fallow, root crops, seeds, and corn crops; the proportions to be settled according to the custom of the locality; and that the outgoing tenant should pay a compensation to be assessed by competent valuers, for any excess of land under corn over the so fixed amount. 2. That, excepting under special arrangement, and with the purchase of stable dung, no straw or root crops shall be sold off the farm. 3. That the tenant should be required to keep the land free from weeds, and, in default, to pay compensation to the landlord or incoming tenant for the cost of cleaning, such cost to be assessed by competent persons. The cost of cleaning foul land which is in high condition is much greater than that of putting land which is poor in condition, but free from weeds, into good condition. Moreover, the state of the land as to weeds should be one important element in deciding whether an extra corn crop should or should not be taken. It has been shown by reference to direct results, that some important constituents of manure

either leave little or no unexhausted residue in the land, or leave it so combined within the soil, or so distributed throughout it, that it produces little or no appreciable effect on succeeding crops. Some manures, on the other hand, have been shown to produce marked effects for several years after their application. If is obvious, therefore, that it would require a very complicated sliding scale to enable us to estimate the value of unexhausted manures under the many varying conditions that would arise—as to the description and amount employed, the soil, the season, and the crop grown, were it attempted to take as a basis the valuation of constituents already underground. In Lincolnshire and adjoining counties half-inch bones are valued to the incoming tenant the second year after application, and in some instances guano is valued after it has grown a crop. It would, I think, be much more satisfactory that all valuations should, if possible, relate only to what is aboveground. Nor do I see any difficulty in doing full justice to the outgoing tenant without taking into account the value of the unexhausted residue of manures which have already yielded a crop. The three items upon which I would rely as the basis of a valuation in favour of the outgoing tenant are—the farmyard manure made during the last year of the occupancy; the manure from purchased food which has not grown a crop; and the straw of the corn crops of the last harvest. The quantity of straw grown is a pretty sure indication of the condition of the land in regard to recent manuring. To take an extreme case by way of illustration: the continuously unmanured Wheat plot which has been already referred to gave an average of only about 14 cwt. of straw per acre, whilst plot 16 gave, over the 13 years of heavy manuring, 46½ cwt. or 3¼ times as much. Now, if I had entered upon a farm with the straw of the corn crops given over to me not exceeding 14 cwt. per acre, and left it with straw averaging 3¼ times as much, I might surely in justice claim of the landlord or my successor compensation for such an increase in the quantity of straw; indicating as it would the increased condition of the land. In reference to this point, it may further be remarked, in passing, that not more than about 5 per cent. of the weight of the straw is derived from the constituents of the soil itself; by far the greater part being derived from the atmosphere, through the agency of the manures applied, and directly due therefore to the expenditure of the tenant's capital. I propose then, as a part of the compensation to the improving outgoing tenant, that he shall be paid the consuming value of the straw which he leaves in excess of that which he entered upon. The next point to consider is, the valuation of the manure which has been obtained by the consumption of purchased cattle-food within twelve months from the termination of the occupation, and which has not yet yielded a crop. Some years ago I published a Table showing the calculated value of the manure resulting from the consumption of 1 ton of each of the chief standard articles of cattle-food. Those estimates were, at the time, considered by some to be somewhat too high. They have lately been carefully reconsidered; and, taking into account the higher money value of some of the chief constituents at the present time, it has been decided to make but little further alteration than to add a few articles to the list that were not previously included in it. The results are given in Table VII.

TABLE VII.—*Estimated Value of the Manure obtained by the Consumption of different Articles of Food, each supposed to be of good quality of its kind.*

Description of Food.	Money value of the Manure from 1 ton of each Food.	Description of Food.	Money value of the Manure from 1 ton of each Food.
	£ s. d.		£ s. d.
1. Decorticated cotton-seed cake ..	6 10 0	17. Wheat ..	1 13 0
2. Rape-cake ..	4 18 6	18. Malt ..	1 11 6
3. Linseed-cake	4 12 6	19. Barley ..	1 10 0
4. Common cotton-seed cake	3 18 6	20. Clover hay	2 5 6
5. Lentils ..	3 17 0	21. Meadow hay	1 10 6
6. Beans. ..	3 14 0	22. Bean straw	1 0 6
7. Tares	3 13 6	23. Pea straw ..	0 18 9
8. Linseed ..	3 13 0	24. Oat straw ..	0 13 6
9. Peas ..	3 2 6	25. Wheat straw	0 12 6
10. Indian meal ..	1 11 0	26. Barley straw	0 10 9
11. Locust-beans	1 2 6	27. Potatos ..	0 7 0
12. Malt-dust ..	4 5 6	28. Parsnips ..	0 5 6
13. Bran	2 18 0	29. Mangel Wurzel ..	0 5 3
14. Coarse pollard	2 18 0	30. Swedish Turnips.. ..	0 4 3
15. Fine pollard..	2 17 0	31. Common Turnips ..	0 4 0
16. Oats	1 15 0	32. Carrots ..	0 4 0

It will be observed how very widely different is the estimated money value of the manure obtained by the consumption of 1 ton of different articles of cattle food in common use. It is obvious, therefore, that, in settling the amount of compensation to be paid to the outgoing tenant for the value of the manure produced by the consumption of purchased food, it would not suffice to take a fixed proportion of the purchased-food bill, but the value of the manure-constituents of the particular description of food actually employed must be estimated. It would no more be fair to make the valuation irrespectively of the value of the constituents obtained from the different descriptions of food, than it would be to charge the same price for the inferior descriptions of guano as for the best Peruvian. As the value of the constituents obtained as manure from 1 ton of the various foods has been estimated at their market price, if sold in a concentrated, dry, and easily-portable state, some reduction from the amounts given in the Table should be made in the valuation supposed, on account of the risk of loss by decomposition and drainage, and for the extra cost of carriage and application to the field, all of which will be greater in the case of the cattle manure than in that of the dry purchased manure. For these reasons I would propose that one-third or one-fourth less than the amounts shown in the Table should be allowed for all purchased cattle food used within twelve months of the termination of the occupation, provided the manure obtained from it has not yet grown a crop. It is, I believe, the custom in Norfolk, and in some other counties, for the tenant going out at Michaelmas to apply the dung made during the previous winter to the root crop, the incoming tenant taking the crop at a valuation. The objections to this plan are, that the root crop is a very uncertain one, and may, in a bad season, be very much less than the amount of manure should produce; and that if the outgoing tenant has fed his stock upon purchased food, the value of the manure cannot be recovered in the root crop alone, even if the season be favourable. For example, in one of the courses of experimental rotation to which I have referred, after a liberal manuring of rape-cake, salts of ammonia, and mineral manure, less than 4½ tons of roots were removed; and the result was that the succeeding crops amounted, without any further manure, to 60½ bushels of Barley, 43½ bushels of Beans, and 46 bushels of Wheat. It is obvious that, under the system referred to, these heavy crops of Barley, Beans, and Wheat, would become the property of the incoming tenant, whilst he would only have to pay for the manure which had largely contributed to produce them the small value of 4½ tons of roots. I would submit that it would be a much fairer arrangement to value the manure made during the winter by the load or ton, and that the incoming tenant should also pay two-thirds, or three-fourths, the estimated money value of the manure from the purchased food consumed in its production. If, in addition to this, the outgoing tenant were paid the consuming value of the straw of the corn crops of the last harvest, he would receive fair compensation for the capital which he had invested in "condition," whilst the incoming tenant would only have to pay for that which possessed an actual money value. The conclusions arrived at in the course of the foregoing discussion may be briefly summarised as follows:—

1. "Condition" is a quality quite distinct from natural fertility of soil: it is mainly dependent on the amount of capital expended by the tenant in the purchase of cattle food or manures, and is, therefore, his property; it may be easily and rapidly reduced.

2. The natural fertility of a soil, whether high or low in degree, is, comparatively speaking, a permanent quality; it can only be injuriously affected by the continuance of an exhaustive system of cropping for a long period of time; it is the property of the landlord; and, excepting in the case of very light soils, it is the chief element in determining the rent-value of the land.

3. In the case of any rate of the heavier soils, it would generally be beneficial to the tenant of capital and intelligence, if he were allowed much more freedom as to cropping than present customs permit.

4. No injury is likely to result to the landlord from granting the tenant permission to crop as he pleases, provided he be bound to keep the land free from weeds, and to leave a fixed proportion under fallow and green crops at the termination of his occupation.

5. No simple rules, applicable to various descriptions of soil, crop, and manure, can be laid down for the valuation of the unexhausted residue of previously applied manures which have already yielded a crop.

6. By the valuation of so much of the farmyard manure, and of so much of the manure constituents derived from purchased cattle food, as have not yet yielded a crop, and also of the straw of the last harvest, fair compensation may be made to the outgoing tenant, whilst the incoming tenant will only be required to pay for that which has a fixed and easily-ascertainable money value.

If abundant capital is to be attracted to the soil, it is essential that liberal covenants in regard to cropping should be adopted, and fair compensation for unexhausted improvements made. If I have this evening in any degree contributed to the advancement of knowledge which is necessary before we can hope to attain marked improvement in these respects, I shall feel that I have not occupied your time in vain.

Farm Memoranda.

LAMMERMUIR SHEEP FARM: *March.*—We have already at this date (the middle of March) had a long winter, and in many respects a severe one. Never a great weight of snow at any one time, but a succession of intense black frosts, which have withered the sap and freshness out of the herbage, and destroyed an immense quantity of valuable Turnip keep. Not only is a considerable portion (perhaps one-third or one-fourth) of the whole actually rotten, but those which are left have lost in great measure their feeding qualities. Still those who have them, even in this state, may think much of them, as their place is very costly to supply in any other substitute. On several farms artificial feeding has been resorted to from necessity for a considerable time past, and that mostly in the shape of Oats and hay. In one instance we know of, a Richmond and Chandler's chaff-cutter having been attached, the mill power is doing duty in chopping Clover-hay for hill ewes, and this being put into boxes it is considered that the waste of material is less, and also that the sheep, fastidious though they are in regard to what they eat, yet make away with a worse quality of hay when chopped up and mixed together in this way than they would do if it were laid down to them in handfuls amongst which they could pick and choose. The ewes above referred to, which lamb in April, are getting ½lb. of Oats in addition, but given separately from the cut hay. In regard to the machine itself, it is worth mention that several purchasers having been at a loss in regard to a particular part of its working, and having made inquiry in regard to it, the above mentioned firm sent an agent from headquarters to visit the several purchasers and explain the matter. This all the way from Manchester, and to serve and satisfy customers, says much for commercial enterprise. A fine spring season is much to be desired, as very much depends upon the next two months. Such a fine April as we had last year would relieve many anxieties.

Farm work has been often interrupted this winter, and therefore difficult to keep forward. The lea ploughing is now however nearly finished, and part of the Turnip land ridged up for spring sowing. A considerable portion of our own lea break consists this year of land newly broken up out of rough hill pasture, about 12 or 18 months since. Last summer it was harrowed down and Rape seed sown which did not come to much, although the harrowing and tramping of sheep's feet in eating what little Rape there was contributed somewhat to produce a level surface on the tough furrow slices, and so to facilitate the second or cross ploughing, which leaves the land in ridges, rough enough certainly, but still in some measure ready for its first seeding with Oats. In order to procure a more equal and uniform depth of seed-bed we intend to give it one or two turns of the harrow before sowing. Lime was driven for this land during last summer, so far as we could overtake it, laid in large heaps over the fields, and after it was slaked spread upon the land during early winter and ploughed in. It is of the first importance to get the lime spread while still in the powder, as when beyond this stage and wet into mortar the benefit of liming is greatly delayed if indeed it is not very much destroyed. Care should be taken to place the lime heaps upon dry ground, as more lime is damaged by underwater than by the rainfall. When a lime heap is unfortunately damaged from this cause, the best remedy is to drive more hot shell lime and mix with it. This dries it up, and renders the spreading of it an easier matter.

The question has been put, "Is lime a manure?" No one who sees its effects on newly reclaimed land need ask it. We suppose the question might be more correctly put "Is lime a permanent fertiliser?" and the answer to this would be, just so long as it remains in the land and is not removed by cropping or washed by rains into the subsoil. This happens certainly in the course of time, in fact is only a question of time, when a renewal of the application is necessary,—the second liming of arable land being, however, less effective than the first, from the want of decaying vegetable matter on which to act. Thus the best results are obtained from liming land which has lain long in Grass. The action of the lime seems to be mechanical as well as chemical, opening up land that is hidebound, and rendering it free and open in texture. It has only one drawback that we know of, and that is the cost in cartage, which is certainly very heavy in districts situated as this is, far from the limestone rock and with wretched roads to drive it over. We have tried both the Northumberland and East Lothian lime, and are struck with the difference in favour of that from East Lothian in regard to the bulk of the lime after it is slaked,—the latter going much further when it comes to be spread.

The long-continued black frosts have done great service in reducing this rough land, having left plenty of fine mould to work down amongst the turf with the harrows. The first crop that we expect to be a full one on land such as this, is the Turnip crop after the Oats; and could we manage as a rule to eat this Turnip crop on the ground with sheep, a high condition of the land would be secured for after-crops and Grass; but from the system usually followed of allowing the hill sheep only a few hours a day upon the Turnip break, and then a run off to the hill pasture, the land is robbed of a great portion of the manure. There is no doubt a great economy of winter keep by so doing, and a larger number of store sheep brought through the winter, but the injustice to the turnip land is the weak point of the system; and the aggravation is that the manure is carried to the hills, where it is never more seen or heard of, or perhaps accumulated in useless and wasteful amount upon a small plot of ground at the gate of the turnip field, where the flock lie in wait for their turn to get in. No doubt the land has the benefit of the treading of the sheep, but we are inclined to believe that in many cases this is about the amount of it. How to reconcile the conflicting

interests, or rather how to strike the balance of profit and loss, is a difficult question, but one well worth attention.

The whole question of this reclamation of waste land is of course a matter of speculation to the occupiers of such land, and the only point about which there is no question is the enormous cost of the operation. Tenant occupiers who engage in such works should only do so on long leases—a 19 years' lease is too short to accomplish much, and owners of such land whose occupiers have spent the first part of their lease in such work may well dispense with the protection which the one-sided law of hypothec confers by way of security for rent when so much capital is invested in improvements; as whatever befals the tenant, the land in its increased value remains behind.

It is really wonderful to observe the strides that reclamation is making in districts where the use of such land is unfettered, and this, no doubt, at the call of an ever increasing population, and a national demand for increased supplies of food. But still, great as the improvement has been in the last 20 years, the area already overtaken bears a small proportion to the whole waste land of the country which might be made available. And one cannot look at the huge yearly importations of food supplies without wondering that our own national resources are not better or more rapidly worked up, and whether any or what hindrances interfere with a more thorough and perfect cultivation of the lands which lie at our own door. Hindrances and obstacles there must be, else such a demand would surely create a supply. Whether such hindrance is chargeable to the occupier for his want of enterprise, or to the conditions upon which land is to be obtained for agricultural purposes is a matter well worthy of the attention of statesmen. And whether or not our home production of food supplies could not be largely and profitably augmented, is a question of national importance, considering the amount of money which annually goes into the pocket of the foreigner, and one which year after year forces itself more importunately upon the attention of the country. That the home producer should be free to do his best in competition with the foreigner is very necessary, considering the attention which our markets receive from all parts of the globe, and the world-wide anxiety existing that we shall want for nothing that we can pay for—be it live stock from Monte Video, preserved meats from the Antipodes, or Wheat from all quarters. This South American invasion of live bullocks and sheep is a feature in our importations which attracts and merits attention. Of course, if it can be done at a profit it will be done, and the matter seems at present likely to be thoroughly tested. Latham's book on the "River Plate" gives some interesting information upon this subject. He seems to consider that whatever might be done with domesticated animals in the way of exportation, the semi-wild cattle of the prairies could not be brought down to the ports and shipped in good condition or in a manageable state.

N.B. The weather of the last few days is a great and acceptable change from the severities of winter; moist, warm, and spring-like. A green hue is actually perceptible over sheltered and early spots of Grass. March Grass is not very highly spoken of, but it is difficult to find fault with the weather that produces it. *J. S. B.*

Miscellaneous.

To Fatten a Calf.—It has usually been thought impracticable to fatten a calf properly without giving him milk fresh from the cow. Milk is the best type of food for the young animal, because it possesses all the constituents necessary to build up every part of its system, and in the most soluble and digestible condition. Now, any food containing the requisite constituents, in a soluble condition, easily given in a liquid state, may be substituted for the new milk. Hay tea is sometimes used to bring up a calf. This is the soluble constituents of the hay obtained by cooking. But the best food to fatten a calf, without whole milk, is oil meal, molasses and skim-milk for the first two weeks, after which a little oat or barley-meal may be added. We have often made calves weigh 120 to 140 lb. at four weeks old on this food. We have one now that weighs 125 lb. at that age, never having had any new milk after the second day. Molasses may, perhaps, be considered a new food for this purpose, but, when fully understood, must be regarded as an important one. It is very soluble and easily assimilated by the young animal. Liebig is of opinion that starchy food is first converted into sugar before being assimilated by the animal. We all know how rapidly sugar enters into the circulation of the system. Sugar is found to take the place of animal fats in cold climates in keeping up the heat of the body. It may be considered as a substitute for the oil of the milk used in making butter. Oil meal is rich in muscle-forming food and phosphates with some remaining oil. Its constituents are mostly soluble and easily assimilated as food. Oil meal should be scalded, and allowed to form a thick mucilage before being mixed with the skimmed milk. The molasses may be added directly to the milk, and the whole should be blood warm when given. The proper quantity for a young calf is a table-spoonful of oil meal and the same of molasses, divided into three parts, for one day's feed, added to the refuse milk. At the end of the first week each may be increased, and at 10 days a spoonful of molasses and the same of oil meal may be given at each feed. At the commencement of the third week a spoonful of oat or barley meal may be added to each feed, but this should be cooked. This food, together with the skimmed milk of the mother, will make an excellent calf for the butcher at five weeks old. Now the whole expense of this extra food is not more than one-tenth of the value of the butter made from the milk saved. At present prices it will cost less than one dollar for five weeks; and an early calf of the weight mentioned will bring from 10 to 14 dollars. The molasses may be of the cheapest sort, but there is none better than sorghum for this purpose. *Rural New Yorker.*

Essex Farming.—Let me tell you what I saw on my road by rail from London to the farm, some 15 miles below Colchester. The land had been mostly ploughed in stetches upon the well-known Essex plan, with its furrows and water-furrows to keep it dry, or rather to let the surplus water run away. This has not been a wet winter, yet water could be seen either standing or flowing in the majority of these furrows and water-furrows, thereby proving that the land was as full of water as it could hold, and that air was completely barred from entering the soil to warm and nourish the young planted Wheats; and, worse even than that, the rain that falls daily upon this water-clogged land passes away to the sea, carrying with it not only the good contained in rainwater, but all the manure that it can wash out of the land with it, and on recently manured lands that is very considerable. What are the Essex landlords and farmers at in allowing this waste? They cannot have a knowledge that air and rainwater are our cheapest muckcart, for we have nothing to do but to put our land in a proper state to pick up the good fertilising qualities from both. They tell us that draining is of no use on their soil. I will hereafter prove that it is. *Mr. Smith, Woolston.*

The Week's Work.

April 9.—*Flax* sowing in late seasons requires special management. The rule is to wait the season, and not sow before it comes, be it March, April, or May, but in our southern and midland counties the first good season should now be embraced. Further north the latter end of the month and beginning of May may be better. Flax requires a finely pulverised soil, and a comparatively dry seed-bed purposely to get the seed evenly harrowed in, and to braird and grow uniformly of equal thickness and length, otherwise the quality of the fibre or Flax will be unequal and inferior. To effect this, the land should be well smashed, so as to keep the winter-made soil on the surface. It is then harrowed fine, and stones and everything brought to the surface gathered off. The smashing and harrowing are much better done by steam than by horses, the pitting of the horses' feet being very much against the fine, even, smooth surface upon which Flax seed should always be sown. The seed should be fresh, and from 3 to 5 pecks per acre sown broadcast, the former quantity for course fibre and seed, and the latter for fine Flax.

Gorse, if (from the lateness of the season) not sown, should now be so, as directed last month. On mountain sheepwalks it should not be sown at a greater elevation than from 800 to 900 feet above sea level. Some prefer the smooth upright Furze, which grows more luxuriantly than the common sort, and without prickles, so that it requires no bruising. It is propagated both by seed and cuttings of young shoots planted at this season. When sown late rather more seed is required, but the quantity depends much upon the quality. When grown as a close forage crop, 20 lb. to 24 lb. per acre, but for fence and shelter from 10 lb. to 12 lb. per acre are the usual quantities sown.

Sainfoin, if not in the ground, should now be sown, as directed last month. The plant is a native of calcareous soils, and luxuriates where almost nothing else will grow to cover the ground. On Clover-sick soils it is sometimes sown successfully, if the land is dry, instead of Clover; but it is not so well adapted for growing along with Rye-grass for a hay crop as Clover, as the growth of any kind of Grass is obnoxious to it. As a forage plant it should be used for soiling. When grown in drills it is hoed as soon as any weeds begin to grow. If sown broadcast it should be weeded. It is a great consumer of lime and potash, and when the ground is naturally deficient of these, it may be top-dressed towards the close of the month with from 2 to 3 cwt. of gypsum, and 2 cwt. of muriate of potash per acre in moist weather.

Cabbage Seed.—Sow for thinning out, as Turnips, so as to avoid transplanting. Where practicable, the land should be deeply cultivated and manured in the autumn. If in the spring, the land is smashed up and manured in March, or as early in April as the weather will permit. The Cabbage plant is a larger consumer of potash than is generally provided for in the manure, and therefore 3 cwt. of muriate of potash should be added to the usual allowance of 3 cwt. of superphosphate, an equal weight of rough salt, and from 2 to 3 cwt. of guano, or its equivalent. This, along with 20 loads of farmyard dung, may be thought heavy manuring by those who only give half the quantity; but the heavier you intend to grow your Drumhead Cabbage, the more food they require.

Hop Gardens, although later than usual, should be poled, as the bines or runners will now begin to rise rapidly in the more sheltered and forward situations. Of late, the horizontal method of training the bine to wooden bars or galvanised wires stretched between the poles or standards, has been gaining favour. The free use of the hoe and nidget is not only necessary for keeping plantations clean and free from weeds, but also to aerate and otherwise promote a healthy state of the soil. Nursery beds likewise require to be deeply stirred and kept clean with the hoe and fork.

Spring fallowing, for Mangel Wurzel and other root crops, should be well kept forward, weather permitting. Where the land is manured in the autumn for Mangels very little is required in late seasons until the time of sowing, but when it has to be manured at this season the sooner the manure is got into the land the better. Some, however, prefer manuring and seeding at the same time. Much depends upon the weather and the nature of the land. Very dry soils, when manured in March or early in April, retain more sap for brairding and starting Swedes in May and Turnips in June than when manured in the more drying weather at the time of sowing.

Burnet (common) grows naturally on chalky downs, and on poor calcareous, Clover-sick soils, and may be sown along with Rye-grass and other Grass seeds instead of Clover. It stands the winter frost well, and when the crop covers the ground in autumn (rowen), it forms excellent food for sheep in early spring. For a clean crop sow a bushel of seed per acre; for mixing with other grasses, 8 to 10 lb., or 6 to 7 lb., along with an equal quantity of Chicory, on poor sandy soils for pasture. Burnet was more extensively grown in Arthur Young's time than at the present day; but although its cultivation is thus on the decline, its peculiar adaptation to certain soils for early sheep feed ought not to be lost sight of.

Horses feed with Carrots is an old April rule—and although steam-power, with improved implements and modes of tillage, have greatly "eased the shoulder," the current month is still a trying one for the teams. In late situations the backward state of the Grass is against brood mares and young stock, so that more artificial food and attendance than usual will be required. *W. B.*

Markets.

HOPS.

Borough Market, April 7.

Messrs. Pattenden & Smith report that there is more inquiry for all descriptions, late rates being fully maintained. Choice samples of either English or foreign are difficult to be met with, holders of such in all instances standing out for extreme values.

ENGLISH WOOL.

During the past week there has been no alteration to record in the position of English Wool. Consumers are unwilling to purchase except at a reduction, whilst staplers and farmers, owing to the reduced state of their stocks, are very unwilling to give way, as they cannot but see that any revival in trade must be followed by an advance, as manufacturers, stocking themselves at present only from hand to mouth, would then have to come in freely.

Current Prices of English Wool.	Per lb.	s. d.	s. d.
Fleeces—Southdown hoggets	.. .. ..	1 1	to 1 2
Half-bred ditto	.. .. ..	1 2	— 1 2½
Kent Fleeces	.. .. ..	1 3	— 1 4
Southdown ewes and wethers	.. ..	0 9½	— 1 1
Leicester ditto	.. .. ..	1 2	— 1 3
Sorts—Clothing	.. .. ..	0 10	— 1 6
Combing	.. .. ..	1 0	— 1 8

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, April 7.

Prime Meadow Hay	76s. to 84s.		Clover, old	..	110s. to 126s.
Inferior do.	.. 60	70	Inferior do.	..	80 95
Rowen	.. 50	65	Prime 2d cut	..	100 110
Inferior do.	.. —	—	Inferior do.	..	80 90
Straw	.. 26	30	Charles James Easton.		

Cumberland Market, Thursday, April 7.

Sup. Meadow Hay	84s. to 88s.		Inferior Clover	..	90s. to 110s.
Inferior do.	.. 70	76	New do.	..	— —
New do.	.. —	—	Straw	..	30 34
Superior Clover	.. 123	130	Joshua Baker.		

Whitechapel, Thursday, April 7.

Fine Meadow Hay	76s. to 82s.		Prime old Clover	..	120s. to 130s
Inferior do.	.. 60	70	Inferior do. do.	..	90 100
Prime New Hay	.. —	—	Prime 2d cut do	..	— —
Inferior do.	.. —	—	New Clover	..	105 112
Straw	.. 24	28	Inferior do.	..	80 90

COALS.—April 6.

Hastings Hartley, 15s.; Holywell Main, 15s. 9d.; Walls End Braddyll's Hetton, 18s. 3d.; Walls End Haswell, 19s.; Walls End Hetton, 19s.; Walls End Tunstall, 16s. 9d.; Walls End Hartlepool, 18s. 6d.; Walls End Original Hartlepool, 19s. 9d.; Branepeth Cannel, 18s.—Ships at market, 24; sold, 22; unsold, 2; at sea, 130.

METROPOLITAN MEAT MARKET.—April 7.

Best Fresh Butter	.. .. ..	16s. per dozen lb.	
Second do. do.	.. .. ..	14s. ,,	
Small Pork, 5s. 0d.	to 5s. 6d.;	Large Pork, 4s. 0d.	to 4s. 6d. per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, April 4.

The supply both of Beasts and Sheep is about the same as last Monday; the number of English is larger and of foreign smaller. Trade is slow throughout, and prices for all kinds remain nearly the same as of late. There is more demand for shorn Sheep than for those in the wool. Calves are not very plentiful, yet prices are lower. Our foreign supply consists of 928 Beasts, 4250 Sheep, 91 Calves, and 5 Pigs; from Scotland there are 180 Beasts; from Ireland, 114; from Norfolk and Suffolk, 2040; and 107 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4	8 10 5 0	Best Long-wools	5	4 10 5 6
Best Shorthorns	4	6—4 10	Do. Shorn	4	6—4 8
2d quality Beasts	3	0—3 8	Ewes & 2d quality	4	4 5 0
Best Downs and Half-breds	5	8—5 10	Do. Shorn	3	8—4 6
Do. Shorn	4	8—5 0	Lambs	—	— — —
			Calves	4	0—5 6
			Pigs	3	8—5 8

Beasts, 3369; Sheep and Lambs, 23,800; Calves, 98; Pigs, 75.

THURSDAY, April 7.

We have a short supply of Beasts and a very small demand; a clearance cannot be effected, although there is a disposition to take rather lower than we quote. Sheep are more plentiful; trade for them is bad, lower prices are taken, and several lots remain unsold. Calves are lower. Our foreign supply consists of 195 Beasts, 1450 Sheep, and 236 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4	6 10	Best Long-wools	—	to —
Best Shorthorns	4	4 4 8	Do. Shorn	4	4—4 6
2d quality Beasts	3	0—3 8	Ewes & 2d quality	—	——
Best Downs and Half-breds	—	——	Do. Shorn	3	6 4 4
Do Shorn	4	6—4 10	Lambs	—	——
			Calves	3	8 5 4
			Pigs	3	8—5 8

Beasts, 623; Sheep and Lambs, 7610; Calves, 309; Pigs, 5.

MARK LANE.

MONDAY, April 4.

There was a small supply of English Wheat to this morning's market, which realised the prices of this day se'nnight. The attendance was moderate, and there was but little disposition to purchase. Business in foreign was confined to retail purchases, at about late rates. Barley, Beans, and Peas were unchanged in value. Oats 6d. per qr. cheaper. Flour was unaltered in value.

PRICE PER IMPERIAL QUARTER.

	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	38	46	Red	35	45
— fine selected runs, do.	42	50	Red	38	47
— Talavera	—	53	—	—	—
— Norfolk	—	—	Red	—	—
— Foreign	38	52	—	—	—
BARLEY, grind. & dist. 26s to 30s. Chev.	39	42	Malting	34	38
— Foreign grinding and distilling	22	25	Malting	30	40
OATS, Essex and Suffolk	22	24	—	—	—
— Scotch and Lincolnshire. Potato	24	26	Feed	—	—
— Irish Potato	23	25	Feed	21	24
— Foreign Poland and Brew	21	24	Feed	19	21
RYE	32	18	Foreign	33	36
RYE-MEAL, Foreign	—	—	—	—	—
BEANS, Maragan. 30s. to 37s. Tick	31	49	Harrow	31	40
Pigeon 50s. to 56s. Winds	—	—	Longpod	—	—
— Foreign Small	41	43	Egyptian	38	40
PEAS, White, Essex, and Kent. Boilers	32	42	Suffolk	35	43
— Maple, 41s. to 45s. Grey	32	42	Foreign	33	37
MAIZE	—	—	Foreign	29	31
FLOUR, best marks delivered per sack	36	40	—	—	—
— 2d ditto ditto	25	27	Country	25	37
— Foreign per barrel	22	25	Per sack	29	55

WEDNESDAY, April 6.

The attendance at Mark Lane has been limited to-day; for both red and white produce the demand has been inactive, and although no decline has taken place, the tendency of prices has been unfavourable. With foreign Wheat the market has been well supplied. Very little business has been doing, at late quotations. The supply of Barley has been moderate; the demand has been inactive on former terms. Malt has been quiet, at previous quotations. Oats, the show of which has been good, have been in limited request, and prices have had a drooping tendency. Beans have been dull, at late rates. Peas have been unaltered in value, but the demand has been inactive. Flour has been quiet, on former terms.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch	280	940	—	—
Irish	—	—	—	—
Foreign	3340	1860	11,040	820 6170 brls.
	3620	2800	11,040	

LIVERPOOL, April 5. Our market was well attended by buyers, and a fair business was transacted in white, white descriptions having sold freely at last Friday's rates; red descriptions experienced a reduction of 1d. per cental. Flour in tolerable request at a slight decline. Indian Corn in fair demand, at prices ranging 3d. to 6d. per qr. over those of last Friday. Peas held firmly. Oats and Oatmeal quiet and unchanged.

AVERAGES.

	Wheat.	Barley.	Oats.
Feb. 26	40s 7d	33s 9d	20s 7d
March 5	41 0	33 7	20 8
— 12	40 9	31 10	20 10
— 19	41 9	34 4	21 1
— 26	42 5	34 5	21 2
April 2	42 5	35 0	21 5
Average	41 5	34 2	21 0

SEED MARKET.

We have now a good steady demand for agricultural seeds, all descriptions of which are held with considerable firmness. Fine samples of white Clover continue very scarce. In Rye-grasses the recent sudden advance has been well maintained. Foreign Italian has, during the last three weeks, advanced 2s. per cwt. Our advices from France state that the stocks are now nearly quite exhausted. Sowing Rapeseed is 1s. per qr. dearer. Mustard seed is firm. Spring Tares are in good request at last week's currencies.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

Notices to Correspondents.

IMPORTS OF THREE YEARS (EACH ENDING DEC. 31): *Importations.*

Articles.		1867.	1868.	1869.
Oxen, Bulls, and Cows	No.	156,135	114,869	190,674
Calves	,,	21,613	21,819	24,816
Sheep	,,	532,116	323,447	601,472
Lambs	,,	7,400	17,678	18,171
Swine and Hogs	,,	48,479	33,721	69,117
Bones, burnt or not, or ash, animal Charcoal	tons	83,814	75,851	95,979
Corn—Wheat from Russia	cwt	14,025,230	10,053,017	9,156,331
Denmark	,,	418,012	654,419	541,811
Prussia	,,	5,572,263	4,584,742	4,035,111
Schleswig, Holstein, and Lauenburg	cwt.	127,222	454,412	574,454
Mecklenburg	,,	651,884	647,205	696,147
Hanse Towns	,,	709,245	756,654	746,134
France	,,	597,485	564,414	468,274
Illyria, Croatia, and Dalmatia	cwt	842,935	1,004,701	1,030,563
Turkey and Wallachia and Moldavia	cwt.	2,446,638	3,049,088	2,361,873
Egypt	,,	1,451,774	1,211,456	1,004,479
United States	,,	4,188,911	5,908,149	13,181,507
Chili	,,	1,096,227	1,259,573	567,167
British North America	,,	684,127	557,443	2,723,053
Other Countries	,,	1,294,198	792,813	841,079
Barley	,,	5,683,721	7,476,224	8,053,660
Oats	,,	9,407,146	8,112,663	7,916,870
Peas	,,	1,585,129	1,170,247	1,054,367
Beans	,,	1,798,415	2,647,396	1,807,220
Indian Corn or Maize	,,	8,540,429	11,475,226	17,664,213
Wheatmeal and Flour—From Hanse Towns	cwt.	444,710	615,750	647,430
France	,,	1,234,742	632,350	1,143,661
United States	,,	722,976	676,192	1,711,000
British North America	,,	121,503	142,859	538,700
Other Countries	,,	1,661,380	975,869	1,156,298
Indian Corn Meal	,,	7,542	7,189	6,039
Flax and Tow or Caddilla of Flax—From Russia	cwt	1,063,564	1,295,100	1,087,845
Holland	,,	136,078	139,224	117,930
Belgium	,,	169,202	218,658	173,358
Other countries	,,	110,756	163,687	166,120
Guano, from West Coast of Africa	tons	2,876	1,859	3,220
United States	,,	2,182	1	433
Peru	,,	164,112	155,776	109,133
Bolivia	,,	1,609	4,025	1,913
BritishWest India Islands	,,	2,222	188	2,202
Other Countries	,,	14,414	20,567	3,561
Hemp and Tow or Codilla of Hemp—From Russia	cwt	533,796	475,689	560,615
Venetia	,,	138,241	145,496	121,054
Illyria, Croatia, and Dalmatia	cwt	43,182	48,452	43,571
British India	,,	6,076	19,782	42,844
Philippine Islands	,,	88,044	175,118	92,844
Other Countries	,,	66,231	114,261	86,941
Hides, untanned, dry	,,	280,603	305,118	340,441
Wet	,,	615,822	615,794	524,809
Tanned	,,	8,739,604	10,287,768	9,647,757
Hops	,,	237,117	211,720	322,485
Oil Seed Cakes	tons	141,834	162,139	159,295
Potatos	cwt.	1,187,253	2,041,474	1,660,167
Provisions—Butter	cwt.	1,142,262	1,097,539	1,250,088
Cheese	,,	905,476	873,377	971,189
Eggs	No.	197,914,520	383,969,040	442,165,680
Fish, Cured or Salted	cwt.	311,959	297,903	481,732
Lard	,,	246,800	237,260	255,764
Meat, fresh or slightly salted—Beef	cwt	5,970	4,543	14,268
Pork	,,	7,454	6,984	21,930
Meat, salted — Bacon and Hams	cwt	537,114	638,127	740,194
Beef	,,	195,747	240,577	214,603
Pork	,,	142,831	144,176	115,944
Meat, not otherwise described	,,	111,455	58,461	81,943
Saltpetre	,,	214,604	185,922	278,820
Cubic Nitre	,,	1,217,704	1,004,955	891,151
Seeds—Cotton	tons	96,843	94,759	105,646
Clover	cwt	150,968	264,878	231,433
Flaxseed and Linseed—From Russia, Northern Portsages		449,352	629,023	623,698
Ports in the Black Sea	,,	117,725	451,051	384,197
British India	,,	214,166	421,282	390,150
Other Countries	,,	111,327	131,272	100,854
Rape	,,	120,782	336,884	270,755
Tallow—From Russia	cwt.	692,661	414,596	319,861
Australia	,,	211,272	215,418	224,181
South America	,,	281,545	457,002	431,712
Other Countries	,,	157,790	120,130	250,099
Wool, Sheep and Lambs'—Europe	lb.	21,467,092	22,267,637	25,199,401
British Possessions in South Africa	lb.	26,126,750	35,991,572	34,307,882
British India	,,	15,234,620	17,602,442	18,796,578
Australia	,,	133,205,476	155,745,199	158,477,660
Other Countries	,,	24,287,849	19,320,004	18,379,522
Alpaca and the Llama Tribe	,,	3,478,717	1,815,391	3,300,345
Yeast, dried	cwt.	116,261	110,133	120,894

PHOSPHO-GUANO: *Beginner.* It is a perfectly trustworthy and excellent manure. We should, however, prefer Peruvian guano to it if for meadow land.

ERRATA.—In middle column of p. 467, one or two misprints escaped correction. In the 8th line the words should be "Mr. Bence Jones' criticisms of the Bill proceed." In the 3d line from bottom of 2d paragraph the words should be "the infectious disease;" and in the 7th line of Mr. Smith's paragraph, "the North Western Railway."

"Economy.—Seeds Direct from the Growers."

CARTER'S GENUINE SEEDS

FOR

FARM AND GARDEN

CARTER'S GRASS AND CLOVER SEEDS

For PERMANENT PASTURES,

Carefully mixed to suit every description of Soil.

For Heavy Soils.

Finest quality .. .. 28s. to 32s. per acre.
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Carter's New Champion Intermediate Mangel. (1s. per lb. Cheaper per cwt.)

CARTER'S PRIZE MANGEL.

	Per lb.—s.	d.
ORDINARY STOCKS	8d. to 0	10
CARTER'S WARDEN, the finest Globe variety	1	0
CARTER'S MAMMOTH, the finest Long Red variety	1	6
CARTER'S NEW INTERMEDIATE, the best variety (see Illustration)	1	0
IMPROVED RED GLOBE	1	0
ELVETHAM LONG YELLOW	1	0

Cheaper per cwt.

CARTER'S PRIZE SWEDE AND TURNIP.

	Per lb.	s.	d.
LIVERPOOL SWEDE		0	7
IMPERIAL HARDY SWEDE, acknowleged to be the best in cultivation		0	9
LONDON SWEDE, grows to a large size		0	9
DEVONSHIRE GREY STONE TURNIP ..		1	0
POMERANIAN WHITE GLOBE, the finest white variety		0	9
LINCOLNSHIRE RED GLOBE		0	9

Cheaper per bushel or cwt.

Large purchasers will be liberally treated.

For full descriptions of CARTER'S PRIZE MEDAL FARM SEEDS, and Practical Hints on Laying Down Land to Grass, see

CARTER'S ILLUSTRATED

FARMER'S CALENDAR FOR 1870,

Post Free, 6d.; Gratis to Purchasers.

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THE ROYAL SEEDSMEN,
237 and 238, HIGH HOLBORN, LONDON, W.C.

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Messrs. Breysig & Co., Leith, for Berwick, Roxburgh, Selkirk, and Fife.

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Price £11 per ton, delivered free to Rail or Wharf in London.

REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

PERUVIAN GOVERNMENT GUANO, £13 10s per ton.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(signed) "AUGUSTUS VOELCKER.

"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
COMMON MANURE, SUPERPHOSPHATE,
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c. E. PURSER, Secretary.
Offices, 116, Fenchurch Street, E.C.

ODAMS'S NITRO-PHOSPHATE for ROOTS.
ODAMS'S DISSOLVED BONES.
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MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited).
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This Company was originally formed by, and is under the direction of, agriculturists—circumstances that have justly earned for it another title viz.,
"THE TENANT FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures of their own manufacture; consequently, the consumer has the best guarantee for the genuineness and efficacy of the Manures manufactured by this Company.
Particulars will be forwarded on application to the Secretary, or may be had of the Local Agents. C. T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

Guano.

"GENUINE PERUVIAN GOVERNMENT," per ton, £14 10s.; per cwt., 16s.; 56lb., 9s.; 28lb., 5s.; 14lb., 3s.

NITRATE of SODA, per ton, £21; per cwt., 22s.; 56lb., 12s.; 28lb., 6s. 6d.; 14lb., 3s. 6d.; 7lb., 2s.

COCOA-NUT DUST, for Ferneries, Rockeries, Potting, Mixing, &c., per ton, 40s.; 112lb., 3s.; 56lb., 2s. 6d.

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Orders by post promptly executed.

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LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. NITRATE of SODA supplied ex Ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices.

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LAWES'S PATENT TURNIP MANURE.
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LAWES'S WHEAT, BARLEY, GRASS, and MANGEL MANURE.
LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures.
AMERICAN and other CAKES at market prices.

GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb. Bags, at 6d. per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application to
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REIGATE SILVER SAND, best quality, 7s. 6d. per Ton, delivered within trucks at Reigate; also quality PEAT, LOAM, Prepared COMPOSTS, in Bags, GRAVEL, &c.
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The Best and Cheapest Vermin Killer.

Vide "The Gardeners' Magazine," conducted by Shirley Hibberd Esq., F.R.H.S., of August 15, 1868.

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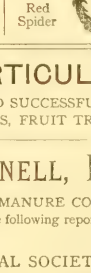

Red Spider — Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has also been many preparations founded to supersede it.

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GENUINE TOBACCO PAPER, of the finest quality, 10d. per lb.; 5 lbs. 4s. per cwt.
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Sold by Nurserymen, Seedsmen, and Florists,
Wholesale, 22, 66, Land
Powder Distributors, 2s. 6d. and 5s. 6d. each
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—C. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. March 7, 1868
Sole Manufacturer, T. A. TOOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

By Royal Appointment.

To HER MAJESTY, by Special Warrant, dated December 27, 1865

To the PRINCE of WALES by Special Warrant, dated February 10, 1866.

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Original and Sole Proprietors of the STOCKBREEDERS' MEDICINES, for the DISORDERS in HORSES, CATTLE, CALVES, SHEEP, and LAMBS.

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Elastic Netting and Tiffany, for Protecting Fruit Trees and SHADING GREENHOUSES.

J. SHAW and Co. beg to inform inquirers that their ELASTIC NETTING and TIFFANY may be procured from any respectable Seedsman.—Manchester, March 2.

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Archangel and Petersburg Mats.

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4-4 Scrim, from 2d. to 5d. per yard, advancing ½d.
54 inch Hessian and Scrim, 3d., 3½d., 4d., 4½d. and 5d.
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No. 1, Peel Street, Manchester, 1870.

OUR HORTICULTURAL SHADINGS form a thorough Protection from Winds, Frost, and Hail, whilst at the same time they admit Light and Air. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the kingdom, as well as on the Continent; in fact, are pronounced the only "proper shadings" ever offered to the public against Heavy Waste, Blight, &c. As a covering for Strawberries, Tulips, Hyacinths, Seed-Beds, Greenhouses, &c., they have no rival. The price being very reasonable, brings them within the reach of every one. With ordinary care they will last for many years. Samples post free on application. DANIEL COLLINGE AND SON.

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No. 2.—54 inches wide . . . . . at 5½d. per yard run.
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In pieces of about 30 yards each, or any longer piece when specially ordered. Nett cash orders from date of Invoice.

PATENT URBAN HORTICULTURAL MANURE,

THE MOST GENUINE, PORTABLE, AND SUCCESSFUL MANURE FOR FLOWERS, ROSE TREES, SHRUBS, FRUIT TREES, ETC.

MESSRS. WAITE, BURNELL, HUGGINS, & CO.,

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ROYAL HORTICULTURAL SOCIETY'S GARDENS,
CHISWICK, LONDON, March, 1870.

Official Report on the Patent Urban Horticultural Manure.

The above Manure has been tried in the Gardens of the Royal Horticultural Society, Chiswick, during the past two seasons of 1868 and 1869, with very satisfactory results. It was applied to the following subjects—*viz.*, Fruiting Vines, in pots; Cucumbers, in frames; Peaches and other orchard-house Trees, in pots; Fuchsias, Pelargoniums, and Strawberries, in pots and in the open ground. 1st, By mixing a little of the Manure with the soil in potting the plants; 2d, By sprinkling some of the Powder on the surface, and watering it afterwards; 3d, By diluting a portion with water, and then watering the plants therewith. In the case of the Vines and Fruiting Trees, in pots, which were watered twice a week with a weak solution of the Manure, the effect was especially decided; and this form of application throughout seemed to have the advantage, and, secondly, that of sprinkling on the surface of the soil. The foliage of the plants, where it was used, assumed a much darker hue, and became of more substance; and the plants, in general, increased much in strength, and the berries of the grapes greatly in size.

The proportions used were those recommended on the canister in which it is sold; and in its general influence it seems to possess greatly the character of Guano, and to be equally as powerful, without incurring so much risk in its application.

Judging by the results, I am justified in stating it to be the best "Patent" Manure we have ever used, and recommend it accordingly. (Signed) A. F. BARRON, Garden Superintendent.

This Manure is Manufactured solely by the PATENT URBAN MANURE COMPANY, LIMITED, and Sold in Canisters, **1s.** each, by all Seedsmen, Chemists, &c. A liberal discount to the Trade.

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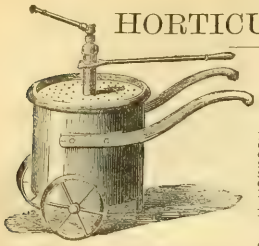

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SPADES, FORKS, SCYTHES, &c.
SYRINGES and PUMPS
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COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

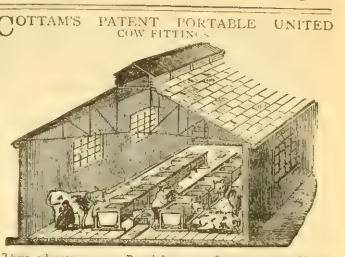

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron Price of Fittings per Cow, 55s

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No. 547A.

GARDEN ENGINE.

28 Gallons	.. ..	£5	13 0
24 "	.. ..	5	1 0
16 "	.. ..	3	16 0
10 "	.. ..	3	0 0

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AQUAJECT.

Useful for every variety of purpose—in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; for Cleaning Carriages or Windows, laying Dust, &c.

Price, complete £1 8 0

Small size for the hand, as an ordinary Syringe .. 0 15 0

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GARDEN or FIRE ENGINE.

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CAST-IRON PUMPS.

2½ inches	..	£1	9 0
3 "	.. ..	2	2 0
3½ "	.. ..	2	7 0
4 "	.. ..	2	15 0

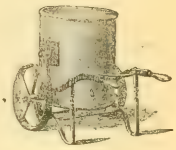

No. 579½.

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WATER BARROW.

50 Gallons	.. ..	£5	14 0
36 "	.. ..	3	18 0
30 "	.. ..	2	14 0
20 "	.. ..	2	2 0

HORTICULTURAL AND FLORAL WIRE WORK.

Suspending Baskets.

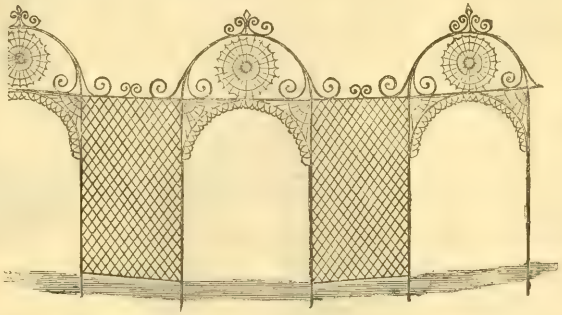

Rose Fence.

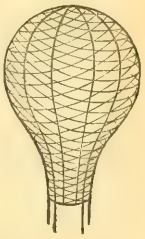

Balloon Trainer.

PAXTON'S STRAWBERRY CRINOLINE.

The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, "Rock Hills," gave his approval of their usefulness. The right to Manufacture them was transferred to

R. HOLLIDAY, PRACTICAL WIRE WORKER,
2A, PORTOBELLO TERRACE, NOTTING HILL GATE, W.

ILLUSTRATED CATALOGUES of HORTICULTURAL WIRE WORK Free on application.

GARDEN ARCHES, ARCADES, VERANDAHS, ORNAMENTAL FENCING, TRELLIS WORK for CREEPERS, FLOWER STANDS, SUSPENDING BASKETS, AVIARIES, PHEASANTRIES, &c. Every description of WIRE WORK for GARDENS, CONSERVATORIES, &c.

THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for Flatting ever manufactured, as it is ready in working, takes at least five hours in going down, has comparatively little smell, can be washed, and will cover all sunk parts

Sold only by the GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.

Prospectuses and Testimonials free on application

NO MORE DAMP WALLS.—The only Cure for Damp Walls, Preserving Stone, Brick, and Cement from Decay is the SILICATE ZOPISSA COMPOSITION, used in the Houses of Parliament, and manufactured by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.

Belgian Window Glass.

BETHAM AND SON, 9, Lower Thames Street, E.C., Importers of the above, beg to inform Florists, &c., that they can supply all sizes suitable for Greenhouses at the lowest possible price.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 83, Upper Thames Street, where a Stock is kept; also at 36, Long Acre

Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.

NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in.	in.	4ths	3rds	2nds.	Best.
20 by 12					
20 by 13					
20 by 14	Per 100 feet	15 0z	12s 6d	14s 6d	16s 6d 18s 0d
20 by 15		21 0z	17s.	19s	21s 23s
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet.

From	To	4ths.	3ds.	2nds.	Best.
6 in by 4 in	9 in by 7 in	11s 0d	12s 0d	13s 6d	15s 0d
9½ in by 7½ in	14 in by 10 in	11s 0d	13s 6d	15s 0d	16s 6d
14½ in by 10½ in	18 in by 12 in	12s 0d	14s 0d	15s 0d	17s 0d
20 in by 12 in	22 in by 18 in	12s 0d	14s 0d	16s 6d	18s 0d

Lists on application

SHEET GLASS.

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz	
4ths quality, per 300 feet case, 34s		4ths quality, per 200 feet case, 34s.	
3ds " " 42s		3ds " " 42s.	
2ds " " 60s		2ds " " 60s	
Best " " 75s		Best " " 75s	

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 18th in., 3 16th in., 1-8th in., and 3 8th in. substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c

STUCCO PAINT, 24s per cwt This Paint adheres firmly to the walls, resists the weather, and is free from the glaring appearance of Oil Paint, resembling a stone surface, and can be made any required shade It is mixed with rain or pure river water.

WHITE ZINC PAINT, 32 per cwt One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a half of White Lead and six gallons of Turpentine Oil. Special Price for Ship Paint

IMPROVED ANTI-CORROSION PAINT, 28s to 34s per cwt Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Brick, Stone, Compo, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is laid on by any ordinary workman. Prepared Oil is ditto, at 6d per gallon.

	Per cwt.—s. d.		Per gallon.—s. d.
GENUINE WHITE LEAD	36 0	LINSEED OIL	2 9
SECONDS WHITE LEAD	28 0	BOILED OIL	3 2
GROUND PATENT DRYERS, 3d to 4d. per lb		TURPENTINE	2 9
" OXFORD OCHRE, 3d. to 3½d. per lb		LINSEED OIL PUTTY, 8s. per cwt.	
" RAW UMBER, 4½d. to 6d. per lb.	(per lb.	Fine OAK VARNISH, 10s to 12	0
" BURNT do., 6d to 9d		" CARRIAGE do., 12s to 14	0
GREEN PAINT, all shades,	28s 60 0	" PALE do. 20s. to 22	0
BLACK PAINT	24s to 36 0	COPAL	16 0
RED PAINT	28s to 36 0	KNOTTING	10 0
GLAZIERS DIAMONDS 12s 6d, 15s, 18s, 21s each.		Patent GOLD SIZE	10 0
GROUND BRUSHES.		" BLACK JAPAN	12 0
DUSTERS. SASH TOOLS. DISTEMPER BRUSHES.		BRUNSWICK BLACK.	
		MILLED LEAD and PIPES.	
		OLD LEAD Bought or taken in Exchange.	

The above are Nett, for Cash, and as such cannot be booked.

Lists of any of the above on application

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

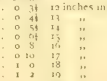

PROPAGATING GLASSES

Each.—s. d.		Each.—s. d.
2 inches in diameter 0 3½	12 inches in diameter	1 0
3 " " 0 4½	13 " "	2 0
4 " " 0 5½	14 " "	2 6
5 " " 0 8	15 " "	3 0
6 " " 0 8	16 " "	3 6
7 " " 0 10	17 " "	4 0
8 " " 1 0	18 " "	5 0
9 " " 1 2	19 " "	6 0
10 " " 1 4	20 " "	7 0
11 " " 1 6		

BEE GLASSES, with ventilating hole through knob

4 inches in diameter	0 6	9 inches in diameter	1s 8d
5 " "	0 8	10 " "	2 0
6 " "	0 10	11 " "	2 6
7 " "	1 1	12 " "	3 0
8 " "	1 4		

Either flat or conical tops.

CUCUMBER GLASSES

24 inches long	2s 6d	16 inches long	1s 3d
22 " "	1 10	14 " "	1 2
20 " "	1 8	12 " "	1 0
18 " "	1 6		

HAND GLASSES, WITH OPEN TOPS.

Each.—s. d.		Each.—s. d.
12 inches	6 6	20 inches 10 6
14 "	7 6	22 " 11 6
16 "	8 6	24 " 12 6
18 "	9 6	

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or equivalent

	2-inch.	3-inch.	4-inch.
HOT-WATER PIPES, Nos 6 & 7 on illustrated sheet per yard	s. d. 0 11	s. d. 1 5	s. d. 1 11
ELBOWS .. .. No. 12 on do. each	1 4	2 1	2 9
TEE PIPES .. .. No. 33 on do. "	2 0	3 0	4 0
SYPHONS .. .. No. 23 on do. "	1 9	3 0	4 0
VALVES	10 0	11 0	12 0

GEORGE ROBINSON, Dial Iron Works, Stourbridge.

London Warehouse, 16, Grand Junction Wharf, Paddington Basin

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each.

6 ft. by 4 ft. Lights, 2 in. thick, unglazed	£0 5 0
" " Primed and Glazed with 10 oz. Sheet	0 11 0
" " with stout portable Box, not Painted	1 3 0
" " Painted four coats, and Handles on	1 8 0
" " Packed and Delivered on Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do.	2 15 0

GREENHOUSES Per ft. super

Woodwork only Prepared and Fitted	0 0 6
" Primed and Glazed with 16 oz. Sheet	0 0 9
" Delivered, and Fixed with Ironwork	0 1 0
" Painted four coats, two sides, ready for use	0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.

Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each GLASSES, all sizes

References to the Nobility, Gentry, and Trade in most of the Counties in England.

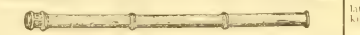

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at a wide choice of prices. T-Pieces, Syphons, and every other description kept in Stock.

Tubular Boiler

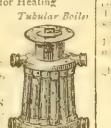

Pell's Conical

WROUGHT and CAST IRON CONICAL SADDLE and TUBULAR BOILERS, also Elliptic Boilers, from 24s. each.

Improved and extra strong CAST IRON TUBULAR BOILERS, with or without Water Bars, from 52s. 6d. each.

CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, or use without brick work, from 60s. each.

Portable Boiler

Elliptic Boiler

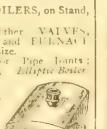

LEAD, TIMMINS AND OTHER VALVES, BUNWELL BOOTHS, BATH, and BURNAC WORK of every description and size.

INDIA-RUBBER RINGS for Pipe Joints; Sheet, Cord, and other packing, and Lubricating Grease.

Circulars of the best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE, Old Barge Iron Wharf, Upper Ground Street, London, S. Store Yard on the Surrey side Blackfriars Bridge Price List on application

GREEN'S PATENT TUBULAR HOT-WATER BOILERS.

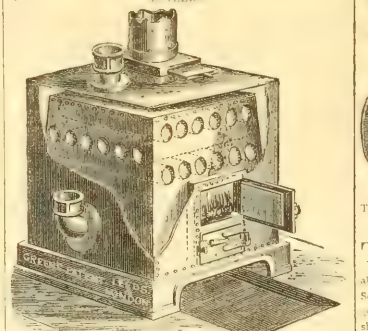

The following are the advantages of these Boilers —

1st They require no setting in brickwork

2d They are complete in themselves, having perfect means of regulation

3d. They take up little room, and can be put in places inaccessible to other Boilers

4th They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consequent small waste.

5th Any number of Flows and Returns can be annexed to the Boilers by means of T pipes

6th By means of mud doors they can be readily cleaned out when required

7th The chimney is made of cast iron, which can either be taken through a roof or turned into a flue to meet the consumer and the smoke thus always be burnt up.

They are warranted to be the most Economical Boilers extant Price Lists free on application

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Finsbury Pavement, London, E.C.

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEREMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

GREENHOUSES, HOTHOUSES, &c., for the MILLION. Before ordering send three stamps for J. LEWIS AND CO.'S Catalogue of Prices. The cheapest in England for good work Stamford Hill, Middlesex

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.

Plans and Estimates on application.

J. JONES AND SONS, 35, King Street, Cheapside, London, E.C. Manufactory, 6, Banksole, Southwark.

POLLARD, JEPHSON, AND CO.'S CONICAL BOILERS for HEATING, by HOT-WATER, Pineries, Greenhouses, Conservatories, Mansions, Churches, Chapels, Halls, Warehouses, &c. Fixed at seats of Duke of Newcastle, Lord Belper, &c. At Viscount Sydney's replaced, after being 30 years in constant use Apply at

Bear Garden, New Park Street, Southwark, London, S.E.

GREENHOUSE for SALE, and about 28 yards of 4-inch HOT-WATER PIPING.

T. M., 16, Leonard's Street, Bromley by Bow.

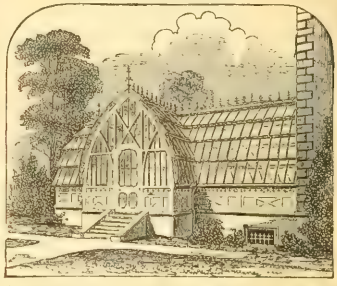

CRANSTON'S PATENT BUILDINGS for HORTICULTURE, Parkfield, Perry Bar, Birmingham

Description Book, fully illustrated with Wood Engravings by the late Orlando Jewitt, from existing houses in various parts of the kingdom Post free for 30 stamps

SPECIAL NOTICE.—NEW PATENT.

The "GARDENERS' GREENHOUSE," (including Conservatory and 12 Lots and Frames), with all metal stages. One structure, all complete, made to stand upon any level space, and not requiring walls Three lengths, 16 feet, 20 feet, and 24 feet, and 21 to 16 feet, are always in stock ready to fill at short notice.

My CLASSLESS Patent Houses are fully open to inspection at his residence, 2 and 11, Pershore Road, Birmingham, and may also be seen by personal application at the Office of the Gazette.

"Perfect ventilation without admitting rain or moving any of the glass."

"Thoroughly sound and dry glazing without the use of putty"

"Glass in large plates with no laps"

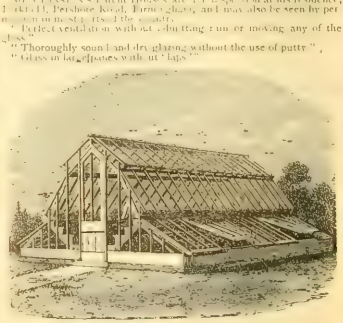

"THE GARDENERS' GREENHOUSE."

Portable and Fixed Hot-water Apparatus

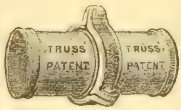

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,

WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skilled design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY. The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to T. S. TRUSS, C.E., Sole Manufacturer,

Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder,

Friar Street, Southwark Bridge Road, London, S.E.

PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

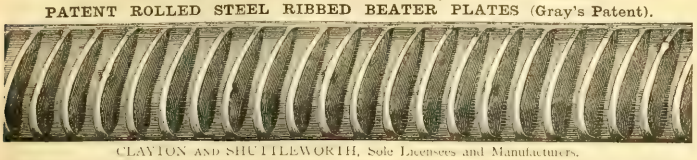

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.

These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use. C. AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

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STAMP END WORKS, LINCOLN, or, 78, LOMBARD STREET, LONDON, E.C.

HENRY DOULTON & CO.,
HIGH STREET, LAMBETH, LONDON, S.E.,
MANUFACTURERS OF
VASES, PEDESTALS, FLOWER POTS, FERN CASES,

PENDANTS, GARDEN SEATS, EDGING TILES,
AND EVERY KIND OF
TERRA COTTA GARDEN ORNAMENT.

All the TERRA COTTA Manufactured by Messrs. H. D. & Co. is made of the best material, burnt extra hard, and

WARRANTED IMPERISHABLE.

PRICE LISTS ON APPLICATION AS ABOVE.

ST. PANCRAS IRON-WORK COMPANY.

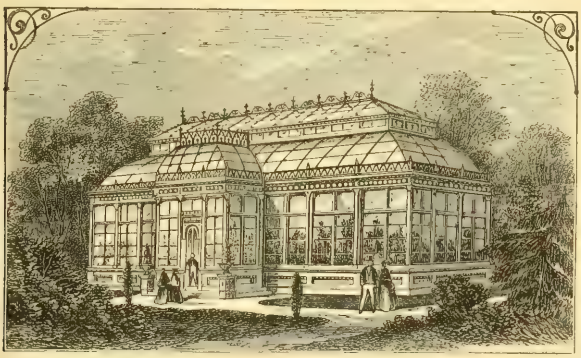

CONSERVATORIES, GREENHOUSES, &c.
ARCHITECTS' DESIGNS CAREFULLY CARRIED OUT.

APPLY FOR ESTIMATES TO
OLD SAINT PANCRAS ROAD, LONDON, N.W.

GRAY'S OVAL TUBULAR BOILER.
INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

To Agriculturists.

GREEN'S PATENT HIGH-PRESSURE BOILERS, with Inverted Cylinder Engine combined. Simple and substantial in construction. The Boiler can be used for Steaming purposes. Specially adapted for Farm use.

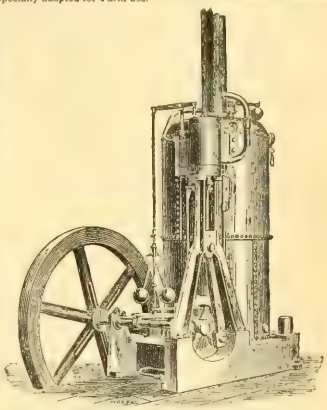

The above Engines and Boilers occupy a very small space, requiring no brickwork or foundation. They are sent out in complete working order, ready for immediate use. From 1 to 40 horse-power always in Stock or in process of manufacture. Drawings and prices free on application to

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

Vases and Fountains, for the Garden and Conservatory.

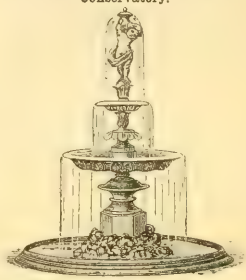

ANDREW HANDYSIDE AND CO., Britannia Foundry, Derby. | 32, Walbrook, London.

The Britannia Iron Works have for the last 40 years been well known for the production of fine Iron Castings. The use of Cast-iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra-cotta. Cast-iron Vases, if occasionally painted, are imperishable, and will not crack when exposed to wet or frosty weather.

Five large Sheets of Designs and Price Lists post free for 6 stamps.

A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The planer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down in ur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

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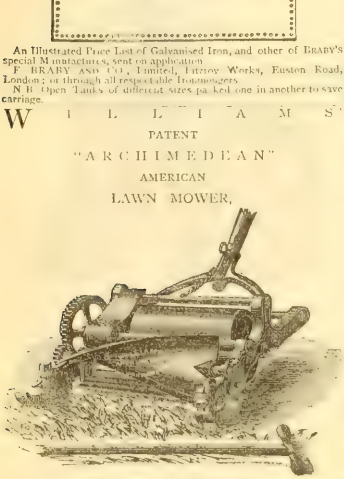

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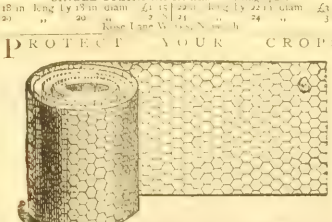

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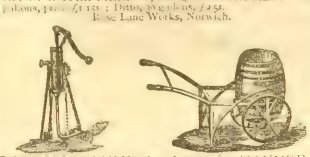

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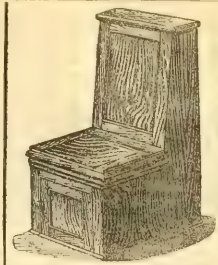

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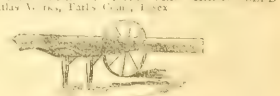

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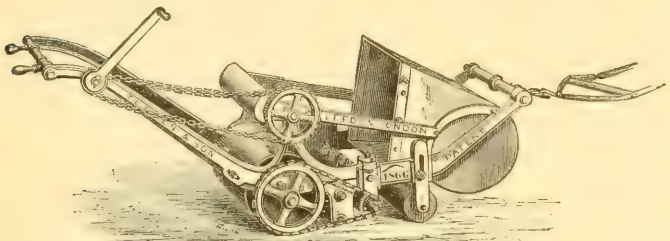

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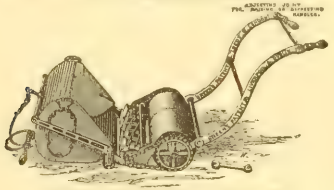

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CHIVAS and WEAVER offer a very fine grown stock of the above, from 3 to 7 feet. Prices (very moderate) on application. Eaton Road Nurseries, Chester.

English Yews.
CHIVAS and WEAVER offer a very fine grown stock of the above, from 2½ to 3 feet. Prices (very moderate) on application Eaton Road Nurseries, Chester.

Orchids.
A SMALL COLLECTION of ORCHIDS (comprising Phalænopsis Schilleriana, with 56 blossoms; Dendrobium Paxtonii, with 16 spikes; and other fine and healthy Plants showing for bloom) is offered for SALE by the Executors of the late C. B. Warner, Esq. They can be viewed, and full particulars obtained, upon applicat at Woodlands, Hoddesdon, Herts.

SUTTONS' HOME GROWN FARM SEEDS.
For present prices see p. 537 of this week's Paper.

SUTTONS' GRASS SEEDS for ALL SOILS.
For present prices see p. 537 of this week's Paper

SUTTONS' GRASS SEEDS for PASTURES, 20s. to 32s. per acre, carriage free.

SUTTONS' GRASS SEEDS for PARK GROUNDS, 18s. per bushel, carriage free.

SUTTONS' GRASS SEEDS for GARDEN LAWNS, 1s. per lb., or 20s. per bushel, carriage free.

SUTTONS' GRASS SEEDS for CROQUET GROUNDS, 1s. per lb., or 20s. per bushel, carriage free.
Royal Berks Seed Establishment, Reading

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

UNRIVALLED BALSAM SEED, saved from plants as exhibited last year, may now be had in 1s. and 2s. 6d. packets.
JAMES PUTTICK, Park Road, Acton, Middlesex, W.

JAMES FAIRHEAD AND SON, SEED GROWERS and MERCHANTS, 7, Borough Market, London, S.E., announce to their Friends and Others that their DESCRIPTIVE PRICED LIST of DAHLIAS is now ready, and can be had, post free, on application.

SPRING PLANT CATALOGUE, 1870, containing all the NOVELTIES, English and Continental, of 1870, post free
JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

Farm Seeds.
CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks

Garden Seeds.
CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUE of GARDEN SEEDS, grown from carefully selected stocks

Genuine Seeds.
WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

Transit Agency for Plants, Seeds, &c.
C. J. BLACKITH AND CO., Cox's and Hammond's Quays, Lower Thames Street, London.
Forwarders to all parts of the World.
N.B.—Mr. BLACKITH is sole Survivor of the late Firm of BETHAM AND BLACKITH.

Established 1806.
THANDASYDE AND DAVIDSON have to intimate that their CATALOGUE of NURSERY STOCK is now ready, and will be forwarded on application
Seed Warehouse 24, Lothian Street, Edinburgh.
Nurseries Brunstain Glen, Musselburgh.

WANTED, 1-yr. SEEDLING LARCH, 1-yr ALDER, 1-yr. BIRCH, 1-yr. BEECH, 2-yr. NATIVE SCOTCH FIR, 2-yr. PINUS AUSTRIACA.
Samples and prices to G. FARNSWORTH, The Nurseries, Matlock, Derbyshire.

Carter's Index, April 16.
CARTER'S GENUINE SEEDS. See page 523.
237 and 238, High Holborn, London, W.C.

CARTER'S VEGETABLE SEEDS. See page 523.
237 and 238, High Holborn, London, W.C.

CARTER'S GRASS SEEDS. See page 523
237 and 238, High Holborn, London, W.C

CARTER'S PRIZE MANGEL and TURNIP SEEDS. See page 523—237 and 238, High Holborn, London, W.C

CARTER'S NEW ONIONS.
237 and 238, High Holborn, London, W.C.

CARTER'S GARDEN REQUISITES.
237 and 238, High Holborn, London, W.C

BOVINIA, or New Cattle-Feeder Potato.—For price, &c., apply to the specially appointed agents.
JAMES DICKSON AND SONS, 102, Eastgate Street, Chester.

Seed Potatos.
JAMES FAIRHEAD AND SON, 7, Borough Market, London, S.E., offer EARLY HANDSWORTH, SHAW, MYATT'S PROLIFIC, PRINCE of WALES, and other POTATOS. Prices on application.

Seed Potatos.
H. AND F. SHARPE have still in stock most of the principal sorts of Early and Late SEED POTATOS, which they can offer at low figures.
Seed Growing Establishment, Wisbech.

GIANT ASPARAGUS PLANTS, the best that money can procure, 2s. 6d. per 100. This delicious Vegetable does not require half the expense usually incurred in planting it
See RICHARD SMITH'S SEED LIST for 1870
Extra strong SEAKALE, 2s. per dozen
RICHARD SMITH, Nurseryman, Worcester

Agricultural Seeds.
ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL SPRING CATALOGUE of TURNIP, MANGEL, and other AGRICULTURAL SEEDS is now ready, and will be forwarded on application. Samples good, and prices very low.

MANGEL WURZEL, of extra choice stock, saved from extra selected full-grown transplanted roots; and other AGRICULTURAL SEEDS of choicest quality. See Special LIST, free on application to
J. SCOTT, The Seed Stores, Yeovil, Somerset.

Agricultural and Garden Seeds.
SPECIAL OFFERS of TURNIP, MANGEL, and other AGRICULTURAL and GARDEN SEEDS on application to
JAS. FAIRHEAD AND SON, Seed Growers and Merchants, 7, Borough Market, London, S.E.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed Selections from their general stock, every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 to 8 to 12 feet

CUPRESSUS LAWSONIANA, 3 to 4 to 6 to 10 feet

„ LAWSONIANA ARGENTEA (JOHN WATERER'S VAR.)—By far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each

„ MACROCARPA, 4 to 6 feet, 42s. per dozen.

THUJA AUREA. Beautiful plants, about 2 feet, 42s. per dozen; larger, 5s. to 21s. each

„ GIGANTEA. An unequalled stock of hundreds of Seedlings, 4 to 5 to 8 feet, at 6d. to 9s.; 7s. 6d., and upwards

We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless

THUJOPSIS BOREALIS, 3 to 4 feet, 30s. per dozen; extra fine, 5 to 6 and 7 feet, 5s. to 10s. 6d. each

„ DOLABRATA. Fine plants, 5s. to 7s. 6d. each.

„ „ VARIEGATA, 5s. to 7s. 6d. each

WELLINGTONIA GIGANTEA. Grand plants, 30s. per dozen; 2 to 3 feet, 42s. to 63s.; larger, up to 10 feet, 7s. 6d. to 63s. each

ABIES NOBILIS, handsome plants, from 3s., 7s. 6d., and upwards

„ NORDMANNIANA, 2 to 3 feet, 7s. 6d. to 12s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 12 feet, 21s. 6d. and upwards each

„ LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each

„ GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to 63s. each.

„ PINSAPO, 2 to 3 feet, 5s.; 3 to 5 to 8 feet, 7s. 6d. to 63s.

„ DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 10 feet, 3s. 6d. to 7s. 6d. and upwards

„ MAGNIFICA, 3 to 4 feet, 10s. 6d. to 42s.

„ ORIENTALIS, 3 to 5 to 8 feet, very beautiful examples, 21s. and upwards each

CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; larger up to 12 feet

YEWS, COMMON. Immense quantities, 2 to 3 to 4 to 6 feet, from 18s. to 60s. per dozen

„ IRISH. Perfect columns, up to 12 feet

„ GOLDEN, an Standard-on Irish stems, perfect globes, 31s. 6d. to 42s. each

HOLLIES, GREEN COMMON. Many thousands, of all sizes, from 1 foot up to 10 feet.

„ the best GOLDEN, WATERERS', and SILVER variegated, in any quantity, and of all sizes

STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each

„ „ WATERERS' variety, many hundreds of symmetrically grown specimens, perfectly straight stems, 42s. to 105s. per pair

„ WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each

„ PORTUGAL LAURELS.—Very close grown handsome plants, 10s. 6d. to 21s. each; very large imposing specimens, 42s. to 63s. each.

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, for undercover or shrubberies, strong established plants, 4s. to 10s. per 100; larger, 25s. to 63s. per 100

„ CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 30s. to 35s. per 100

„ better class (SEEDLINGS) and named varieties for extensive planting, 42s. per 100

„ of superior kinds, many on own roots, 4s. to 5s. per 100

„ very superior, leading, crimson, rose, white, 12s. to 15s. per 100

„ STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each.

AZALEAS, common kinds, 9s. to 15s. per 100

„ very best, in fine plants, 3s. per 100.

KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen

„ LATIFOLIA, 18s. to 30s. per dozen

ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen.

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYREA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of—

Achimenes	Miscellaneous plants
Auriculas	bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Cedrus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants | Verbenas

The Royal Nurseries, Slough.

CHAYTER'S AGERATUM, IMPERIAL DWARF. The FINEST BEDDING PLANT of the SEASON

This is admitted to be the greatest acquisition for modern Flower Gardening that has been offered for many years. Awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society. See report of meeting, August 17, 1869; also opinions of the Press.

This beautiful New Bedding Plant will be sent out after May 1

1 plant	.. ..	3s. 6d.	12 plants	.. ..	25s. 0d.
6 plants	.. ..	18 0	24 plants	.. ..	40 0

WILLIAM CHATER, Nurseries, Saffron Walden

CALCEOLARIAS, Herbaceous, nice plants, free by post, 2s. 6d. to 3s. per dozen.

ACHIMENES, 18 varieties, 1 tubers of each, 6s. per dozen.

DAHLIAS, pot roots, 50 varieties for 15s., 25 for 7s. 6d.; package free.

CALCEOLARIAS, bedding, in 12 varieties, 2s. 6d. per dozen, 50 for 6s.; powder 1s., package free.

GERANIUMS (Scarlet, Zonal, and Nosegay, in 20 named varieties (out of cutting pots), 12s. per 100, package free.

PRUNUS ALBA PLENA and TRILOBA, well set for bloom, 9s. per dozen.

DAHLIAS, Bedding CALCEOLARIAS and GERANIUMS we can offer to the Trade by the 1000, at reasonable prices, on application to

H. AND R. STIRZAKER, Skelton Nurseries, Lancaster

SUTTONS' FRESH IMPORTED FLOWER SEEDS. Free by post.

ASTERS, WALLFLOWERS, STOCKS, ZINNIAS, &c., imported from the most celebrated Continental growers. See

SUTTONS' DESCRIPTIVE LIST of FLOWER SEEDS, gratis and post free on application.

SUTTONS' COLLECTIONS OF FLOWER SEEDS

No. 1 Collection of the best English and German varieties,	with instructions for cultivation, free by post or rail	£2	2 0
No. 2 Collection of	ditto	ditto	.. .. 1 11 6
No. 3 Collection of	ditto	ditto	.. .. 1 1 0
No. 4 Collection of	ditto	ditto	.. .. 0 15 0
No. 5 Collection of	ditto	ditto	.. .. 0 10 6

Small and useful Collections can also be had from 21s. to 7s. 6d., free by post

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

RHODODENDRONS.

			Per doz.	Per 100
PONTICUM, twice transplanted, bushy,	12 to 18 in.,	4s. 0d.		20s.
„	„	„	15 to 20 in., 4s. 6d.	22s.
„	„	„	18 to 24 in., 5s. 0d.	25s.
„	„	„	24 to 30 in., 7s. 6d.	40s.
HYBRIDUM	„	„	12 to 18 in., 5s. 0d.	30s.
„	„	„	18 to 24 in., 6s. 0d.	40s.
„	„	„	20 to 30 in., 7s. 6d.	50s.
MAXIMUM, white	„	„	15 to 20 in., 5s. 0d.	30s.
„	„	„	18 to 24 in., 6s. 0d.	40s.
HIRSUTUM, dwarf nice plants			3s. 0d.	15s.

The above can be supplied by the 1000. For named sorts, see CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock

JOSEPH SMITH, Sen., having a large stock of the following, begs to offer them to the Trade at a low figure:—

RHODODENDRON PONTICUM, 12 to 18 inches, 18s. per 100; 15 to 20 inches, 20s. per 100; 18 to 24 inches, 23s. per 100—less by the 1000

Hybrids, 18 to 24 inches, 33s. per 100; 20 to 30 inches, 45s. per 100.

RHODODENDRON HIRSUTUM, nice plants, 2 years planted, from layers, 15s. per 100.

RHODODENDRON FERRUGINEUM, planted from layers, 25s. per 100.

Double flowering WHITE, good plants, 12s. per 100

ARBOR VITÆ, AMERICAN, 12s. to 2 feet, 4s. per 100; 2 to 3 feet, 7s. per 100 (less by the 1000); 3 to 4 feet, 10s. per 100; 5 to 6 feet, 40s. per 100

SPRUCE FIR, NORWAY, 12 to 15 inches, 10s. per 1000; 18s. to 2 feet, 18s. per 1000.

MOUNTAIN ASH, 2 to 3 feet, 15s. per 1000; 3 to 4 feet, 25s. per 1000.

Tansley and Scotland Nurseries, near Matlock, Derbyshire.

MESSRS. J. STANDISH AND CO., The Royal Nurseries, Ascot, Berks, are now prepared to execute orders for the following NEW and CHOICE PLANTS, to which they wish to call special attention.

IXORA DIXIANA.—This magnificent plant is of very free growth, carrying fine foliage; the trusses of flowers are large, and of a bright orange colour. Unlike most Ixoras, it has proved itself of very strong constitution, and little affected by change of temperature, consequently is admirably adapted for exhibition purposes. Plants 7s. 6d. to 21s. each; with five or six spikes of bloom set, 42s. each.

ANTHURIUM SCHERZERIANUM.—Fine young plants, two to three crowns, 10s. 6d. each; three to four crowns, and stronger, 15s. to 63s. each.

TODEA PELLUCIDA COMPACTA.—A very dwarf and compact variety. As it does not give seed fronds until the plant is very old, it is invaluable to propagators, as it is preserved 21s. 6d. to 63s. each.

STRUTHIOPTERIS JAPONICA.—A magnificent hardy Fern from Japan. It was exhibited at South Kensington on May 4 last, when it was awarded a First-class Certificate. For full description, see *Gardeners' Chronicle*, May 8, 1869. In April next, 10s. 6d.

FICUS MACROPHYLLA.—From New Zealand, where, such is its luxurious growth, it is said at times to cover an acre of land. It is undoubtedly the best subtropical Plant of its kind, growing freely in a very low temperature, even withstanding 7 or 8 degrees of frost; hence it is not a doubtful plant for our variable climate, but if not sold in the middle of May is sure to succeed. 5s. each.

ARUNDINA THOMPSONI.—This has also proved itself a very fine Subtropical Plant, thriving well under adverse circumstances, the bright marbled colour of its leaves producing a very striking effect. It will do well up to the end of October, as a few degrees of frost do not appear to hurt it. Plants, 1s. each; 9s. per dozen; 60s. per 100.

COPROSMA BAUERIANA VARIEGATA.—This is a perfect gem for small beds, or for edging. Being a New Zealand plant it will thrive well in our climate, retaining its beauty until late in the autumn. 2s. 6d. each; 24s. per dozen.

TREE PICOTEE ASCOT YELLOW.—This is of the most robust habit and a thorough perpetual. The colour an intense yellow, deeply edged with lake; flowers very large and finely shaped. A few strong plants, now, 5s. each; in April next, 2s. 6d. each

ROYAL ASCOT VINE.—This has now proved itself to be beyond a doubt the most valuable, of all the kinds yet raised, and ripens its fruit to perfection in a cold house. Plants, 7s. 6d. to 15s. each, and a few extra strong three year old canes, that would carry a good crop this year, 21s. each

NEW PEACHES. The "Marquis of Downshire" and the "Early Ascot." These have been raised from Nectarines fertilised by the Noblesse Peach, partaking of both parents in equal degrees, their flavour surpasses anything we have previously tasted; of good size, very deep colour, and a fortnight earlier than the Royal George. Very clean, strong growers. Fine plants, 7s. 6d. to 15s. each.

ABIES OMORIKA. A beautiful new Conifer from Japan. We have proved it perfectly hardy, of very fast growth, with foliage of the most lovely glaucous green. 10s. 6d. to 21s. each

JUNIPERUS VIRGINIANA ALBO VARIEGATA.—By far the finest of all the Junipers. 2s. 6d. to 21s. each

ACER RUBINERVE ALBO LIMBATUM.—This large and beautiful variety of Maple is an introduction from Japan. It is quite distinct from other varieties, and in summer the leaves, which are nearly covered with white, have a crystallised or frosted appearance. 21s. to 42s. each

ACER PENNSYLVANICUM PECTINATUM RUBRUM.—We have a nice stock of this very charming Maple. The leaves are beautifully cut, and are coloured with green and red. 10s. 6d. to 21s. each.

AUCUBAS, Males, very fine, 6d. to 5s. each; and other varieties. See our CATALOGUE

LEUCOCARPUS ALATUS.

B. S. WILLIAMS

Has much pleasure in offering fresh SEEDS of this extremely useful plant for winter decoration. When well grown it is very ornamental, its long racemes of snowy fruits forming a beautiful contrast to those of the celebrated hybrid Solanums, and for which the Leucocarpus is a most suitable companion. The berries are large, pure white, and produced in great profusion.

Price 1s. 6d. and 2s. 6d. per packet.

VICTORIA NURSERY, UPPER HOLLOWAY, LONDON, N.

TURNIP SEEDS.

H. & F. SHARPE

Are prepared to make special offers to the Trade of the following varieties of

TURNIP SEEDS, ALL OF 1869 GROWTH,

And raised from fine selected Transplanted Bulbs, viz.:—

SHARPE'S WEST NORFOLK PURPLE-TOP SWEDE.
HALL'S WESTBURY SWEDE.
CHAMPION SWEDE
SHARPE'S IMPROVED SWEDE
MARSHALL'S PURPLE-TOP SWEDE.
SKIRVING'S PURPLE-TOP SWEDE.
IMPROVED GREEN-TOP SWEDE.
LAING'S PURPLE-TOP SWEDE
GREEN-TOP YELLOW ABERDEEN.
FOSTERTON HYBRID YELLOW.

DALE'S HYBRID YELLOW
DEVONSHIRE GREY STONE.
LINCOLNSHIRE RED ROUND
GREEN BARREL
IMPROVED GREEN GLOBE
POMERANIAN WHITE GLOBE.
RED TANKARD
GREEN TANKARD.
WHITE NORFOLK
EARLY WHITE STONE OR STUBBLE.

SEED GROWING ESTABLISHMENT, WISBECH.

SEEDS, of choicest quality.—ASTERS: French Perfection, Dwarf Chrysanthemum-fl. Emperor and Victoria; STOCKS—German Ten-week and Brompton; WALLFLOWER—Double; CINERARIA, CALCEOLARIA, PRIMULA FIMBRIATA, mixed; PETUNIA, double, at 1s per packet.
See previous Advertisements, or what is better still, J. Scott's PRICED DESCRIPTIVE SEED CATALOGUE, free on application.
J. SCOTT, The Seed Stores, Yeovil, Somerset.

SELECT VEGETABLE SEEDS,

	free by post. Per pkt.—s. d.
Smith's fine long frame CUCUMBER	1 0
The White Queen CELERY	1 0
Snow's Winter White BROCCOLI	1 0
Smith's Incomparable CABBAGE	0 6
Worcester Champion Cabbage LETTUCE	0 6
Improved Telegraph CUCUMBER	1 0
Early Dwarf Erfurt CAULIFLOWER	1 0
New Giant Rocca ONION	0 6
Ayton Castle LEEK	0 6
Worcester Late White BROCCOLI	1 0
Backhouse's Winter White BROCCOLI	1 6
French Breakfast RADISH	0 6
Golden Perfection MELON	1 0

SELECT FLOWER SEEDS, free by post.

PRIMULA SINENSIS, finest fringed	1s and 2 6
CALCEOLARIA, finest spotted	1s and 2 6
CINERARIA, from pure flowers	1s and 2 6
CYCLAMEN PERSICUM, mixed	1 0
ASTER, New Peony-flowered Globe	1 6
Imbricated Crown-flowered	1 0
PYRETHRUM, Golden Feather	1 0
ZINNIA, finest double, mixed	0 6
VIOLA CORNUTA ALBA	1 0
PANSY, Cliveden Yellow	1 0
AMARANTHUS ELEGANTISSIMUS	1 6
PRINCESS FEATHER, New Golden	0 6
BALSAM, splendid rose-flowered	1 0
New Tree MIGNONETTE	1 0
MARIGOLD, New French, miniature, striped	0 6

For Prices of other Seeds, see RICHARD SMITH'S DESCRIPTIVE LIST, free by post on application.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

HEADLEY'S SEEDLING POTATO.—This unrivalled Potato was raised from seed, in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second early variety, ripening in the middle of July, it has the true merit of keeping perfectly sound and fit for use until August in the following year.

OPINIONS OF THE PRESS.

"R. Headley. Your Seedling Potatoes were quite first-rate; white, mealy, and excellent in flavour."—*Gardeners' Chronicle*, Oct. 30, 1869.

"White Kidney. A very fine variety; a heavy cropper; uniform in size; ripening off all at once quickly and completely; flesh yellowish, dry, mealy, and of the most delicate nutty flavour. A heavy crop was harvested July 14."—*Gardeners' Magazine*, Jan 30, 1869.

"Seedling Potato (R. Headley). In shape the tubers resemble those of the Fluke. They are in the three also in flavour, but are more mealy."—*Journal of Horticulture*, Oct 21, 1869

Price 5s per peck. The usual discount to the Trade.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

Vegetable, Agricultural, and Flower Seeds.
MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of others.
Exotic Nursery, Tooting, Surrey, S.W.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS.
Address, 20, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

TO the TRADE and OTHERS.—A Quantity of LARGE YELLOW GLOBE, ORANGE GLOBE, RED GLOBE, and LONG YELLOW MANGEL WURZEL; WHITE STONE, SWATTON GREEN ROUND, GREY TOP STONE, and DALE'S HYBRID TURNIPS; SCARLET RUNNER BEANS, and WHITE SPANISH ONION; all nett growth of 1869, to be Sold very cheap. Prices on application to
WOOD AND INGRAM, Seed Merchants, Huntingdon

The North of England Nursery and Seed Establishment.
MESSRS. LITTLE AND BALLANTYNE, Carlisle, HAVING PURCHASED (and now occupy) the extensive SPECIAL OFFERS OF FARM SEEDS, at liberal prices, when large quantities are required, and to deliver them free at nearest Railway Station.
They confidently recommend their superior stocks of TURNIP SEEDS, which have been all carefully proved and found to grow about 90 per cent. This will ensure a much stronger braird than seed which may grow only from 60 to 70 per cent. Their stocks of MANGEL WURZEL, CABBAGES, &c., are also of excellent quality, and they have been equally careful in proving the quality and growth of their CLOVER and GRASS SEEDS, and their Mixtures for laying down Permanent Pasture. PRICED LISTS on application.
44, English Street, Carlisle.

New and Select Farm Seeds.

1870. 1870.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.
TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.
CLOVERS, RYEGRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.
MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years' lay, from 12s to 30s per acre.
MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21s to 28s per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.
Seeds at the value of £5 and upwards (Grass, Vetches, and Potatoes excepted), carriage free to any Railway Station in the kingdom
Special estimates for large quantities. Samples and prices on application.
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To Improve Meadow Land.
RICHARD SMITH'S MIXTURE of the finest GRASSES and PERENNIAL CLOVERS (8 to 12lb per acre, at 8d. per lb.), if early sown, will cause a valuable improvement to the crop. RICHARD SMITH, Seed Merchant, Worcester.

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RICHARD SMITH'S MIXTURES of the finest PERENNIAL GRASSES and CLOVERS are carefully made to suit all kinds of Soil. Price 26s to 30s per acre.
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The best Substitute for Grass.
PYRETHRUM TCHIHATCHEWI, a novelty from Asia Minor, forms a carpet equal to the finest Moss. Will grow upon the poorest and hottest soils where Grass will not grow, forming a carpet of the brightest green upon any bare place where everything else refuses to grow. Price 6s. per dozen, 25s. per 100.
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"Economy.—Seeds Direct from the Growers."

CARTER'S GENUINE SEEDS
FOR
FARM AND GARDEN

CARTER'S GRASS AND CLOVER SEEDS
For PERMANENT PASTURES,
Carefully mixed to suit every description of Soil.

For Heavy Soils.

Finest quality	28s. to 32s. per acre.
Second quality	20s. to 26s. ,,

For Medium Soils.

Finest quality	28s. to 32s. per acre.
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CARTER'S PRIZE MANGEL.

	Per lb.—s. d.
ORDINARY STOCKS	8d. to 0 10
CARTER'S WARDEN, the finest Globe variety .	1 0
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Cheaper per cwt.

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LIVERPOOL SWEDE	0 7
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Cheaper per bushel or cwt.
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THE ROYAL SEEDSMEN,
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ABIES ALBERTUS, 5 to 9 feet, 30s. to 60s. per dozen. Transplanted April, 1869.
ABIES DOUGLASII, 6, 7, to 10 feet, 7s. 6d. to 10s. 6d. each. Transplanted August, 1868.
ABIES ORIENTALIS, 5, 6, and 7 feet, 7s. 6d. to 21s. Splendid plants, moved April, 1869, to 10 to 12 feet high, 15 and 20 feet in circumference
ABIES EXCELSA, the Common Spruce Fir, beautifully furnished, 5, 6, to 8 feet high, £8; £7 10s.; to £12 10s. per 100
The dwarf varieties of Spruce, such as pumila pygmæa, Gregorii, Clanbrasiliana, &c., large numbers, many of them 20 and 30 years' growth.
CEDRUS DEODARA, 5 to 6 feet, 60s. per dozen; 7 to 8 feet, 84s. per dozen; 10 to 12 feet, 10s. 6d. to 21s. each, and upwards. We have several thousands of these fine Deodars. All have been removed since August, 1868; many since April, 1869
CEDRUS ARGENTEA, 6 to 7 feet, 42s. to 60s. per dozen; 8 to 10 feet, 7s. 6d. to 10s. 6d. each. All removed since September, 1868
CEDRUS LEBANON, 6, 7, to 10 feet. Moved September, 1868.
CUPRESSUS LAWSONIANA, 6 to 7 feet, 30s. to 42s. per dozen; 8 to 10 feet, 5s. to 6s. 6d. each
" " ARGENTEA, 3 to 4 feet, and as much in circumference, 7s. 6d. to 10s. 6d. each.
" " GRACILIS, 4 to 5 feet high, and 7 and 8 feet round, 7s. 6d. to 21s.
JUNIPER, CHINESE, 4 to 5 feet, 42s. per dozen, £15 per 100; 5 to 6 feet, 60s. per dozen, £20 per 100; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868. Purchasers may select from a stock of many thousands of this fine plant, 5 to 8 feet high
PICEA NOBILIS, hundreds of splendid specimens, 5, 6, 7, 8, 10 to 12 feet high, all recently removed, and are undoubtedly the finest plants to be found in any Nursery. None are grafted.
PICEA NOBILIS NOBILIANA, 5, 6, to 8 feet, 42s. to 42s. each, and upwards. Splendid Plants, moved August, 1868, to 10 to 15 feet high.
PICEA LASIOCARPA. Hundreds of most beautiful plants, 4, 5, 6, 8, and 10 feet high. All removed 1868-69.
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PITUA MENZIESII, A, beautiful specimens, 3, 4, 5, and 6 feet high: 10 to 20 feet in circumference. This plant originated in this Nursery, and our stocks is unsurpassed.
THUIA GIGANTEA, 5, 6, to 12 feet high. Moved August, 1868
THUIA LOBBII, 8 to 14 feet high, and as much in circumference; transplanted April, 1869
THUJOPSIS BOREALIS, 5 to 6 feet, 7 and 8 feet round; 42s. to 60s. per dozen; 7 to 8 feet, 7s. 6d. to 10s. 6d. each. All removed since August, 1868.
WELLINGTONIA GIGANTEA, 4 to 5 feet, 7s. 6d. to 10s. 6d. each; 6, 7, 8, and 9 feet, 21s. to 42s. each. Transplanted in August
PINUS AUSTRIACA, 1 feet, £5 per 100. Transplanted Sept., 1868.
PINUS CEMBRA, 8 to 10 feet, 10 to 12 ft. round, 10s. 6d. to 21s. each
YEWS, the COMMON ENGLISH, 4, 5, 6, 7, 8, 10, and 12 feet high. Thousands, all constantly removed; invaluable where immediate effect is sought
YEWS, GOLDEN and ELEGANTISSIMA.—We have these in large numbers, and of all sizes, as pyramids, globes, and worked as standards, with from 3 to 5 feet of gold, and up to 10 feet high.
YEWS, IRISH, handsome plants, 6 to 10 feet high.
HOLLIES.—The stock of Hollies at this Nursery is, we believe, the finest to be met with in Europe: it comprises, as well as ordinary sizes, together, many thousands of the following varieties:
HOLLY, VARIEGATED SILVER and GOLD, of sorts, 4 to 10 feet
HOLLY, GOLDEN QUEEN, magnificent plants, 4 to 8 feet high, and as much in circumference
HOLLY, SILVER QUEEN, 4, 5, and 6 feet
WATERER'S HOLLY.—The variety originated in this Nursery we have hundreds 4, 5, and 6 ft high, 10 and 15 ft. circumference.
PERRY'S WEEPING HOLLY.—Standards, 10s. 6d. to 21s. each
HOLLY, COMMON WEEPING.—The finest specimens we have seen. Moved, April, 1869
HOLLY, COMMON GREEN, 4, 5, 6, 7, 8, 10, to 14 feet high, by the thousand. All moved since April, 1868
HOLLY, Green varieties of the following kinds. An immense stock of splendid plants, all transplanted in 1868-9
LAURIFOLIA and SCOTTICA, 4, 5, 6, to 10 feet high.
HODGINS, | ANGUSTIFOLIA,
YELLOW BERRIED, | MYRTIFOLIA, &c.
4, 5, 6, and 8 feet high
STANDARD, WATERER'S and GOLDEN QUEEN HOLLIES, 4 to 6 feet stems, with heads 6 to 10 feet in circumference. A large number
N B.—Purchasers of Hollies may select from a stock occupying at the present moment a considerably over 6 acres of ground: finer or better rooted plants cannot be wished or obtained. The prices are fair and reasonable
BOX, Pyramids and Variegated, 4, 5, 6, to 8 feet.
BOX, do. do., fine pyramids, up to 8 feet.
BAYS, standards and pyramids.
LAURUSTINUS, standards.
AUCUBA JAPONICA, thousands of beautiful plants, all moved 1868, 3 and 4 feet high
AUCUBA JAPONICA, flerried, hundreds, 14 to 4 feet high; in the open ground and in pots, from 18s. to 120s. per doz. and upwards.
AMERICAN PLANTS.—The Stock of American Plants at Knap Hill is, we believe, as fine as, and more extensive than, anything of its kind to be met with in England, comprising over 50 acres of land being devoted to their cultivation. We shall be pleased to supply—
RHODODENDRONS, nice bushy plants, from layers, named kinds, £5 per 100, £40 per 1000. A dozen sent as samples on application.
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RHODODENDRON PONTICUM, good plants for Cover, from £10 to £15 per 1000
STANDARD RHODODENDRONS.—Of these we possess a large number of the oldest and finest specimens in the country, many being from 10 to 20 years old, with heads varying from 15 to 30 feet in circumference. There is probably no kind better adapted for standards than that we call Standard Queen, of which we have supplied to Reform Row. We have also Rhododendrons, standards of many other kinds
RHODODENDRONS, fine hybrids, of good hardy habit, and great variety in colour, from £5 to £10 per 100. Sample on application
AZALEAS, the very best kinds, nice plants, £10 per 100, upwards.
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AZALEAS, splendid plants, of the finest varieties, 3, 4, 5, and 6 feet high, and as much in circumference
KALMIA LATIFOLIA, nice plants, bushy, healthy, and covered with bloom, £5 to £10 per 100.
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HARDY HEATHS, a very fine collection, every plant a specimen, and all removed in 1869, from 20s. to 40s. per 100.
ERICA CARNEA, for winter blooming, many thousands
ERICA MEDITERRANEA ALBA, remains in bloom from October to May, and smells like new-mown hay—indispensable for Winter Gardening
SKIMMIA JAPONICA, nice healthy plants, moved April, 1869, covered with berries, 12s to 18s per dozen.
As well as the above, the Knap Hill Nursery contains upwards of 300 Acres of ordinary NURSERY STOCK of a superior class, such as Flowering Shrubs (Deciduous and Evergreen), Roses, Ornamental Trees for Avenues, &c.
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The Nursery is readily reached by train from Waterloo to Woking in 40 minutes.
N B.—There is now no difficulty in sending Plants through in the same truck, without package, from Woking to almost any Railway Station in England.

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CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers) All kinds of Farm Seeds at very low prices.
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SUTTON AND SONS are still supplying their GENUINE HOME-GROWN SEEDS, at the low prices quoted in their FARMERS' YEAR BOOK (published in February last).
Special estimates given for extra large quantities.
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H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL TOP YELLOW GLOBE, The Stocks are very fine, and full of bulb growth. Prices very low.
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FARM SEEDS of all sorts, best quality, extra clean.—PRICED LIST on application.

James Dickson & Sons.

Seed Growers, 102, Eastgate Street, Chester.

Wheelers' Superior Grass Seeds.

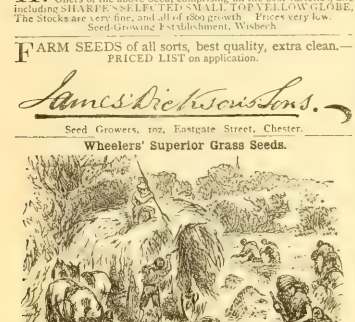

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It was sown early in April on 6¼ acres, and yielded the following Summer, 1805, upwards of 24 tons of excellent Hay, which was sold by Auction for £204, being at the rate of £16 per acre. It was mown twice the same Summer.
The fact that 6¼ acres of seeds has produced in one Summer Hay of the value of £204 shows the importance of sowing a good Mixture of superior seeds.
The following are the quantities and sorts which produced that luxuriant Crop.

TABLE OF CLOVER AND GRASS SEEDS FOR TWO YEARS' HAY	
4 lb Evergreen Rye grass ..	Lolium perenne
4 lb Italian Rye grass ..	Lolium italicum
2 lb. Cocksfoot	Dactylis glomerata
2 lb. Timothy Grass	Phleum pratense
2 lb. Red Clover	Trifolium pratense
3 lb Cow Grass	Trifolium pratense perenne
3 lb. White Dutch	Trifolium repens
4 lb Trefoil	Medicago lupulina

We can supply the above of finest quality at 17s. 6d. per acre, carriage free, and allow 5 per cent. discount for cash
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WHEELERS' SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELERS' ILLUSTRATED BOOK on GRASSES, which may be had gratis and post free.
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QUALITY—Excellent, and unadulterated
PRICES—(Which may run from 12s. to 32s. per acre, according to soil and situation extremely moderate.
TERMS—Five per cent. discount for Cash
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"For getting up the subject of Grasses we cannot conceive a handier book than Miss Plues's, which is furnished with ample and accurate illustrations, suitable for putting her data to the proof, and testing the value of hints and suggestions. It may be well to make acquaintance with that really scientific *brochure*, Messrs. WHEELERS' Illustrated Book on Grasses."—*Saturday Review*.
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"These enterprising Seedsmen (Messrs. WHEELER & SON), in introducing a new element into their calculations for laying down land, have undoubtedly a good idea."—*The Field*

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For One Year	at 13s. 6d. per acre.
For Two Years	17s. 6d. per acre.
For Four Years	22s. 6d. per acre.
Permanent Pasture	from 26s. to 32s. 6d. per acre.

All Carriage free. Inferior qualities cheaper.
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Shell Gravel,

FOR GARDENS, CONSERVATORIES, and TERRACES, clean, dry, and neat in appearance, used in the Paris and the Horticultural and Botanic Gardens. Sold by FRANCIS AND CO., Surrey (foot of Vauxhall Bridge), London, S.W.

GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb. Bags, at 6d per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application to
JOSEPH ELLIS AND SONS, Sparkenhoe Works, Leicester.

THE LONDON MANURE COMPANY
(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN SUPERPHOSPHATE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
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Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
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LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. NITRATE of SODA supplied ex ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices.

JOHN BENNET LAWES,
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LAWES'S PATENT TURNIP MANURE.
LAWES'S DISSOLVED BONES.
LAWES'S SUPERPHOSPHATE of LIME. [MANURE.
LAWES'S WHEAT, BARLEY, GRASS, and MANGEL
LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
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AMMONIACAL SALTS and BONES at lowest prices

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains Soluble Phosphates, 6 to 7 per cent of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. casks, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
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Price £11 per ton, delivered free to Rail or Wharf in London.
REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.
PERUVIAN GOVERNMENT GUANO, £13 10s. per ton

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. It is produced by me continually only to a very small degree of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The high percentage in this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(Signed) AUGUSTUS VOELCKER.
"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

DI-PHOSPHATE of LIME. This Article, manufactured under the Patent of Professor Way, late Consulting Chemist to the Royal Agricultural Society, possesses many advantages over ordinary superphosphate, particularly as being a highly concentrated manure.

SUPERPHOSPHATE acts with great energy during the early growth, and is exhausted before the grain is completed.
The soluble phosphate in Superphosphate is readily dissolved in water, and easily removed from the soil.
Superphosphate contains, on the average, 25 per cent. of soluble phosphate, and 75 per cent of valueless matter.

DI-PHOSPHATE acts steadily but continuously, giving sufficient strength both for the early and the later growth.
The soluble phosphate in Di-phosphate is slowly soluble in water, and less easily removed from the soil.
Di-Phosphate contains 100 per cent. of a soluble phosphate, and is therefore three times the strength of Superphosphate.

Price 20s. per cwt. Trial casks, containing 2 cwt. each, may be obtained from the Manufacturers,
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Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures of their own manufacture; consequently, the consumer has the best guarantee for the genuineness and efficacy of the Manures manufactured by this Company.
Particulars will be forwarded on application to the Secretary, or may be had of the local Agents. C. T. MACADAM, Secretary.
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Requires no blowing. Sold in 2lb and 1lb packets, 1s 8d per lb
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The Best and Cheapest Vermin Killer.

Vide "The Gardeners' Magazine," conducted by Shirley Hibberd Esq., F.R.H.S., of August 15, 1868
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BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
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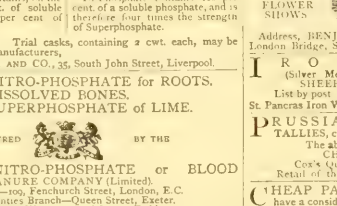

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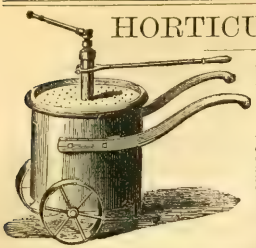

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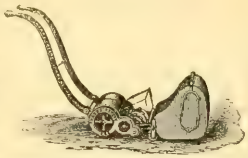

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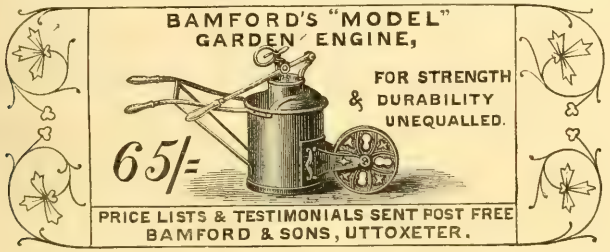

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GARDEN ENGINE.

28 Gallons ..	.. £5	13 0
24 ,, ..	.. 5	1 0
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WARNERS'
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Useful for every variety of purpose—in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.
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Small size for the hand, as an ordinary Syringe .. 0 15 0

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3 ,, ..	.. 2	2 0
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50 Gallons ..	.. £5	14 0
38 ,, ..	.. 3	18 0
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This is the best season for planting the above in borders or large pots for blooming. See descriptive and full LISTS, now ready.
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Seeds saved only from first-class flowers in packets and collections, from 1s. to 10s. 6d
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Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Webb's Climax MELON, new (The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 30, 1869.)	2 6
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CUPRESSUS LAWSONIANA ERECTA VIRIDIS,
Nice Plants, 60s. per dozen, or 7s. 6d. each; a few larger at 10s. 6d. and 21s. each.

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Good Plants, about 2 feet, at 42s. per dozen; do., about 3 feet, at 60s. per dozen.
A few fine Specimens, 10s. 6d. to 21s. each.

These two distinct and very beautiful hardy Evergreens were exhibited at the Royal Horticultural Gardens, London, on the 16th inst., and unanimously awarded First-class Certificates. They have been purchased by nearly every one who has seen them growing in the Nursery, and are fearlessly recommended to all admirers of first-class hardy plants.

ANTHONY WATERER, KNAPHILL NURSERY, WOKING, SURREY.

NEW PLANTS.

WILLIAM BULL, F.L.S.,
BEGS TO INTIMATE THAT HIS
CATALOGUE OF NOVELTIES FOR 1870

Is just issued. It contains descriptions and prices of many New Plants offered for the first time, including the celebrated GODWINIA GIGAS, the new white Cypripedium, C. NIVEUM, the lovely blue-berried PSYCHOTRIAS, two new scarlet-flowered VITIS, a new hardy LILY, with variegated foliage, from Japan; new DRACÆNAS, ARISTOLOCHIA RINGENS, &c.

MR. WILLIAM BULL has the pleasure to announce that he has made arrangements with Messrs. John Salter & Son to send out the fine stock of their SEEDLING JAPANESE and other new CHRYSANTHEMUMS.

Messrs. John Salter & Son are retiring from business in consequence of the Metropolitan District Railway Company requiring their Nursery, and their entire stock of new CHRYSANTHEMUMS is in the hands of MR. WILLIAM BULL. All orders for them, that have been taken by Messrs. John Salter & Son, will be executed by MR. W. BULL on precisely the same terms as if sent out from the Versailles Nursery.

MR. W. B.'s CATALOGUE of NOVELTIES for 1870 contains descriptions of the NEW CHRYSANTHEMUMS above alluded to.

ESTABLISHMENT FOR NEW AND RARE PLANTS, KING'S ROAD, CHELSEA, LONDON, S.W.

NEW PLANTS FOR 1870.

B. S. WILLIAMS

Has much pleasure in offering the undernamed NEW PLANTS, which will be ready for distribution on May 1, next.

New Summer Bedding Plant.

PERISTROPHE ANGUSTIFOLIA AUREO-VARIEGATA.—This very elegant Acanthad is a native of the mountains of Java, and was awarded a First Class Certificate by the Floral Committee this spring. The leaves are ovate-lanceolate, bright orange in the centre, and margined with dark green; in habit it is dwarf and compact, and B. S. W. has all confidence in its becoming a splendid edging plant in the Summer Flower Garden; as a pot plant it is very beautiful, and although the flowers are not remarkable for size, their bright mauve-purple colour forms a striking contrast with the orange colour of the leaves Price 10s 6d.

Superb New Bedding Plant.

VIOLA CORNUTA VAR. PERFECTION.—B. S. W. has much pleasure in offering this superb plant to public notice, and from the manner in which it has been tested both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed it resembles a gigantic V. cornuta in habit, and while retaining its profuse blooming qualities producing flowers which almost rival our Florist Pansies for size and substance. This plant was awarded a First-Class Certificate by the Floral Committee, September 25, 1869. Price 2s. 6d. each, 24s. per dozen, 70s. per half hundred, 100s. per 100.

Azalea Grand Monarch.

A superb new and distinct variety, suitable for exhibition or early forcing purposes; the habit is compact and dense, of medium growth, and a profuse bloomer; flowers 3 inches in diameter, of good substance and perfect outline, the lobes are perfectly round and smooth, and in colour deep pink, shaded with warm rose towards the margins; in addition, the upper lobes are densely spotted. Price 21s. each; a few extra-sized plants, 42s to 63s each.

Verbena Mauve Queen.

This very elegant variety possesses a good constitution, and is not subject to attacks of mildew and other diseases, which so many of the new forms of this plant are (and which has led to the almost total banishment of Verbenas from the parterre); in growth it is somewhat robust, and as a flowerer, most profuse; the trusses, which are of good size, are borne well above the young shoots, and the flowers are a beautiful mauve in colour, and yield a most delicate perfume. It can be highly recommended for bedding purposes. Price 2s 6d. each.

New Fuchsias.

B. S. WILLIAMS has much pleasure in being able to offer the following five varieties of this favourite plant; they are all of good habit and thoroughly distinct, and cannot fail to give general satisfaction.—

BIRD OF PARADISE.—Tube and sepals scarlet, well reflexed corolla, very regular, and soft, delicate rose in colour. 10s. 6d. each.

FORMOSA.—Tube slender, and, as well as the sepals, bright scarlet; corolla double, very regular and compact, deep violet, the outer petals rosy red, elegantly flaked with light violet. 10s. 6d. each.

HOLLOWAY RIVAL.—This is probably one of the most distinct forms yet sent out; tube and sepals bright red, well reflexed corolla, very long petals of great substance, and rich deep violet in colour. 10s. 6d each.

STRIATA PERFECTA.—A charming and very effective variety; tube and sepals waxy white; corolla bright carmine, striped with broad lines of pure white. This variety is not only exceedingly handsome, but totally different from any other variety in cultivation 10s. 6d each.

TRIUMPHANS.—A superb double variety; tube and sepals rich crimson, reflexed from the base; corolla large and very regular, petals intense violet, suffused at the base with crimson. 10s. 6d. each. The set, 42s.

BENJAMIN S. WILLIAMS, VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW LARGE
ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

A Glorious Show of Roses,

TEA, BOURBON, CHINA, and NOISETTE, may be secured and enjoyed all the summer BY PLANTING NOW.

Good plants of finest kinds, established in pots, mostly 48's, are ready to be presented to all in exchange for cash at 40s. per 100: purchasers may choose half the names at 50s. per 100. Packing extra charge. Wholesale. CHARLES NOBLE, Bagshot

Forced Roses, and other Desirable Plants.

ROSES, the best kinds, now coming into bloom, 9s. per dozen; VIOLA ODORATA PENDULA, the new Weeping Violet of New York, the largest Violet in cultivation, 12s. per dozen; ECHEVERIA ATROPURPUREA, blood-red foliage, 12s per dozen; the new Double and Single PYRETHRUMS, 12s. per dozen; the New Giant Tree MIGNONETTE, 6s. per dozen; CLEMATIS, HOLLYHOCKS, CANNAS; the best Bronze, Golden and Silver Tricolor GERANIUMS; the New VERBENAS and PETUNIAS of the season, and all Plants adapted for bedding purposes, at very reasonable rates; Herbaceous CALCEOLARIAS, fine plants, 6s. per dozen. DESCRIPTIVE CATALOGUES free.
LEWIS WOODTHORPE, Munro Nursery, Sible Hedingham, Essex.

The Gardeners' Chronicle

SATURDAY, APRIL 16, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, March 20	Royal Horticultural (Fruit and Floral Committee), at S. Kensington	11 A.M.
	Ditto (Scientific Committee)	1.30 P.M.
	Ditto (General Meeting)	3 P.M.
THURSDAY, — 21	Linnean	8 P.M.

We have on more than one occasion adverted to the difficulties by which the NOMENCLATURE of GARDEN PLANTS is surrounded. If it be a species or a supposed species that is under consideration, there may be the risk of confounding what is avowedly used as a mere provisional appellation, with a name given after due botanical examination by a competent person; and this risk is run when the provisional name given is one constructed after the form of ordinary specific names. We ourselves, admitting the necessity for provisional names, have long since come to the conclusion—a conclusion to which we have on many occasions given expression—that the best safeguard against misunderstanding in such cases, is the use of the abbreviation *Hort.* as the authority for the name; and we particularly urge on those nurserymen who name and distribute new plants, that they should adopt this formula, if only in that portion of their lists or announcements which deals with plants offered for the first time. If this plan were adopted, the names themselves should be as correctly formed and apposite as possible, according to the prescribed model, so that when critically examined they might, in all practicable cases, be absorbed into the system of orthodox scientific nomenclature.

But, this question disposed of, there remains the wider one of the nomenclature of garden varieties—hybrids, it may be assumed, may follow species, since the system of compounding the parental names breaks down entirely in practice. What form should be taken by the names of garden varieties? We think that with the exception of some few of the first breaks from a species, which are generally as good botanical varieties as the varieties so designated in herbaria from introduced specimens, and have doubtless much the same origin—only with an accidental geographical difference—these should unquestionably have a popular terminology, belonging to the country in which they are raised, and not to be translated when they pass into other countries (for that would virtually be to name the plants anew) but to be kept intact wherever the plant is grown. Inconveniences would arise in this, no doubt, chiefly, however, in reference to the use and pronunciation of proper names, which are often, indeed, little better than unpronounceable in a foreign country when imported with the plants which bear them; but such inconveniences are small in comparison with the confusion which would result from any attempt to carry out a system of translating foreign names, or rechristening foreign varieties.

We have been led to make these remarks, on a subject which is by no means unimportant to horticulturists, though it does relate to the "trivial" names of garden plants, from turning up a letter in an old gardening book—*Cowell's Compleat Fruit and Flower Gardener*—bearing the date of 1733, which shows how easy it would be, if the sponsors of garden seedlings would but act on the hint, to make use of names really expressive and descriptive, while preserving their popular character. The particular suggestion is to use names whose initials should indicate the colours of the flowers, and the idea is so feasible that we hope by reprinting the passage in question, and calling special attention to it, to do something towards inaugurating a reform in this particular. The remarks, which are as follows, will be found at p. 46 of COWELL's book:—

"The following letter I received from a curious gentleman, concerning the naming of flowers, whereby not only they may have pompous names, as they generally now receive, but the same names shall likewise express the several colours in every flower: so that without having them painted one may know by each name every colour which is remarkable in each flower, and which colour abounds in it.

"'*To Mr. Cowell, Gardener at Hoxton.*—Mr. COWELL: I have been a lover of flowers above twenty years, the greatest part of which time I have lived in France and Flanders: I am, however, of English birth, and shall endeavour to explain to you the several methods we have abroad of naming our choice flowers, so that one may know, by seeing any of the pompous names we give them, what colours they are of: but 'tis not the way in England, I find, to do so; for they give the flowers names at random, without considering that every flower's name might carry with it a mark of its colours.

"'Abroad our very curious flowerists have lists of all the great personages, castles, and cities by them; and when a good flower happens to come in their garden, they give it a name from them that shall in the two first letters signify what colours it is mark'd with: and so when they read their catalogues over, every name is, as it were, a painting of the flower. The method is to make a table as follows, viz.—For white, put the letter W—or A for argent; for yellow, put Y; for orange, O; for red, R; for crimson, C; for purple of a reddish cast, P; for violet colour, V; for blue, B. And if you have any black in a flower, that is, sable, and may be therefore represented by the letter S, because we have B already for blue.

"'*An Example of Naming Flowers after this manner.*—A flower perhaps with white abounding, and mark'd with crimson, may be called William the Conqueror; the W in William expressing the white abounding, and the C the crimson: or in a different manner, the same flower might be named the Wonder of Constantinople, where the W and the C denote the colours.

"'A flower striped with crimson and purple may be called the Charming Phyllis, or the Curious Ptolemy, the two first letters denoting the colours, always understanding that the prevailing colour is express'd by the first capital letter: so in a flower where the violet prevails, and the other colour is orange, one may name it Victorious Orlando, or the Virtuous Phredia. Where the colours are blue and red, the name may be the Beautiful Rodolinda, or the British Rover; and for yellow and purple, one might name the flower the Young Prince; or white and purple, the Wise Prince, and so on.

"'The curious abroad have now, for the most part, this sort of catalogue; and if they happen to meet with old flowers that are not named after this manner, they add a character which expresses their colour, as in the flower called Duchesse d'Avero, which is white streaked with violet, and which name singly denotes none of the colours the flower bears; but as *blanc* in French signifies white, and the violet is the same in English as in French, so they add to the name, by way of distinction of colour, Homme Veuve, which signifies a good widow, as herself was allow'd to be; and then B, in the French word *blanc*, which is white, expresses that colour; and Veuve, whose first letter signifies violet, is mark sufficient for the flowerist to distinguish by. So may we add a character to any flower already named in England; as for example, the fine Carnation, which is called the Princess Amelia, whose principal is white, and marked with violet. To this might be added the Worthy Virgin, taking the colours of the flower from the two initial letters, which show from the W the chief colour is white, and the other, in Virgin, denotes violet. And by this means you will always know the colours of your flowers, by writing the names of each sort on some piece of wood, &c., and placing them in each pot; so that whenever you see these names you will remember what colours every flower carries with it. One might bring many more examples, which I have from some of the French and French catalogues, but I guess these will be sufficient to inform you of the design; and so I conclude, your most humble servant, P. BELANDINE.'

"As to the naming of flowers in this manner, it is, without dispute, something new to us in England, and carries with it a necessary explanation of the colours of each flower. I believe every flowerist, in the common way of naming flowers with us, is some time or other at a loss to describe the respective colours of each flower when it is out of bloom, and the above letter directs us well enough to know them by looking on our catalogue."

—— WE have before us a "proof" copy of a Report by Mr. MCKENZIE, on the PLANTING and LAYING out of the THAMES EMBANKMENT. Without seeing the plans we are in no position to criticise the details of the scheme, and as in all probability no final decision has yet been arrived at, we content ourselves with one or two extracts which will serve to give some idea of the proposals of Mr. MCKENZIE for the ornamentation of this noble river-walk:—

"The walks are so arranged as to give facility to the public from each of the recognised entrances with a pleasant and diversified plantation on either side, at the same time preserving enough space for Grass, which, in all cases, ought to be well kept.

"The plantations, although nearly continuous, are sufficiently broken to give glimpses from the Embankment roadway at such points as the breadth of the views will justify this being done.

"The nature of the plantations will be more expensive than that at either of the Parks, for two reasons. First, the nature of the surroundings, so far as the Metropolitan Board of Works is concerned, is so much richer than anything surrounding either of the Parks, that a different class of trees and shrubs will be required to dress the ground. Secondly, the variety of trees and shrubs suitable is much reduced, owing to the growth of many varieties being destroyed by the influence of smoke and other causes inseparable from the position.

"The planting should be to a considerable extent of deciduous trees and shrubs, their beauty and brilliancy of foliage in spring will compensate to a great extent for the absence of foliage in winter, which is seldom bright, except after heavy rains. Thus, I should recommend the plantations to consist of groupings of Laburnums, Acacias, flowering Almonds, double flowering Peaches, and other rosaceous trees—of double and single Thorns in groups of colours; also groups of trees conspicuous for their colour or variety of foliage, such as Copper Beech, Acer Negundo variegatum, &c., and filling up between with evergreens, to give variety in winter, so as to afford interest to the plantations at all seasons of the year.

"Generally speaking, the plantations should consist of permanent plants, but I think it will be impossible to give general satisfaction without a few patches of flowers, judiciously and sparingly dotted about.

"In the formation of the ornamental grounds, I think it is of great importance that a water-pipe with hydrants be laid throughout the whole length, so as to be able to water when necessary, and wash and refresh the foliage, as so much depends on the beauty and health of the trees and shrubs in town on this being attended to, and so much depends on the future cost of the keeping, in having arrangements made suitable for the proper performance of these duties in the first instance. As the railway company must have a supply of water to their premises, this need not be an expensive operation, especially if done at the proper time.

"I should also recommend that all the walks be made of asphalte, so that they may be always clean and dry for use in all weathers. Although this will entail a larger expenditure at first, I believe in the end it will be better, and nearly as cheap."

—— M. RAMON DE LA SAGRA recently communicated to the French Academy of Sciences a drawing of the Royal Palm of Cuba (Oreodoxa regia), which presents the interesting peculiarity of being divided into nine branches at the top of its stem.

—— The peculiar markings on the DIATOMACEÆ have been the source of much controversy among microscopists, some asserting that they were elevations, others depressions, all assigning to them a hexagonal, or, at least, an angular outline. By the employment of an equilateral prism, which allows of the passage of a single parallel pencil of light, and obviates conflicting and interfering shadows which create false appearances, the Rev. J. B. READE shows that the markings in question are in reality hemispherical elevations. We allude to the subject here for the sake of pointing out how complete is the correspondence, except in size, between the structure of the microscopic diatom-valve, and the skin of the PETALS of FLOWERS. The soft, velvety aspect of the latter is dependent on the presence of pimple-like elevations, giving the same effect as the velvet pile of a carpet.

—— We hear that a fine specimen of the AMERICAN ALOE (Agave americana) is now showing for blossom in the collection of Mr. JOHN SHAW, of Manchester. The flower-stem has already attained several feet in height.

—— Mr. HUTCHISON, of Carlowrie, continues his useful publications on arboricultural matters. We have before us a report on the varieties of POPLAR best suited to the climate of SCOTLAND, and on FOREST TREES of recent introduction. Mr. HUTCHISON recommends the black Italian Poplar as a substitute for the Larch, the failure of which is so serious a matter. As Mr. HUTCHISON well remarks, though the tree in question may be very serviceable, it can never adequately fill the place of the Larch, nor can its timber be used for the same purposes.

—— Some time since we had occasion to notice favourably a little book by an American chemist—HOW CROPS GROW! An English edition of this work, much improved in all ways, was published in this country by MACMILLAN, under the Editorship of Professors CHURCH and DYER, of the Agricultural College, Cirencester, and constitutes, so far as its limits permit, the best account of vegetable physiology in its physical and chemical aspect that we have in the language. We learn now from the *American Agriculturist* that a corresponding volume—HOW CROPS FEED!—has recently been issued by ORANGE JUDD & Co., and on which it will be our duty to comment by-and-by.

—— In January, while we were shivering with the cold, our friends at MELBOURNE were broiled with the HEAT. Twice in Melbourne during that month the thermometer reached 107° in the shade, and on many other days the mercury stood at 100° and upwards. On one of the hottest of the hot days the thermometer at Echuca stood at 113° in the shade, and at Deniliquin, a town 50 miles farther inland and within the territory of New South Wales, the almost incredible temperature of 117° in the shade was recorded. The colonists seem to be spared two slight evils which cause some inconvenience at home, viz. cold and starvation; for we read that beef is to be had at from 3*d.* to 6*d.* per lb., and mutton 1½*d.* to 4*d.* Butter is 1*s.* 1*d.* to 1*s.* 3*d.* per lb., and bread 7*d.* the 4 lb. loaf. Vegetables are also sold at rates which place them within reach of the poorest. Asparagus is sold at from 1*s.* 6*d.* to 2*s.* 6*d.* per 100; Carrots, 8*d.* to 1*s.* per dozen bunches; Peas, 2*d.* to 3*d.* per lb.; Potatos, 3*s.* to 4*s.* per cwt.; and

fruit may be purchased on reasonable terms, Peaches fetching 1*s.* to 1*s.* 6*d.* per dozen, and Strawberries 6*d.* to 1*s.* per lb.

—— The Weather during the Week ending April 9 underwent a marked change. The direction of the Wind till the morning of the sixth day was a compound of the East; it changed on the morning of this day to a compound of the West, and there was a considerable increase of temperature. By reference to the general Tables in another column, it will be seen that in England the Temperature rose to 64° and to 66° at some places. The range of temperature within the week was large, reaching 40° at Leicester, and exceeding 40° at many places. The mean of all the highest in England was 62.4°, in Scotland it was 57.5°. The mean of all the lowest in England was 29.9°, in Scotland it was 32.8°; the high day temperature in England was therefore nearly 5° warmer than in Scotland, but the low night temperature was no less than 3° colder. The mean temperature of the week in England was 45½°, and in Scotland 44¾°. The fall of Rain was partial, varying from nearly half an inch at Manchester to none at Bradford and Leeds; the average over all England was 0.17 inch, and over Scotland it was 0.23 inch.

—— To Mr. W. Thomson we are indebted for a very perfect funnel, or Pitcher-shaped Leaf in a Pelargonium. In this case the stalk, which ordinarily bears a truss of flowers, has produced instead a funnel-like leaf, the ribs of which correspond to the pedicels or flower-stalks of an ordinary truss. The vascular bundles in the main stalk are arranged in a circle, as they are in an ordinary flower-stalk. The case is interesting, as showing how a leaf may replace a flower, and thus be placed at the extremity of a branch or axis, a position which, under ordinary circumstances, is impossible. A similar instance is figured in Dr. Masters' "Vegetable Teratology."

—— Messrs. Barr & Sugden have introduced a little Frame (fig. 96) which will be of great advantage to amateurs who have no glass structure, and to persons who have only a little conservatory. It is the Waltonian case worked out to a successful issue. In the Waltonian case there was an ugly chimney in the centre, and there

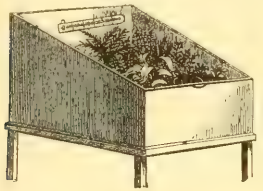

Fig. 96.

was always a difficulty in keeping the lamp alight. The chimney in the present case is done away with, and the lamp burns freely. The heat in the case can be got up to almost any point, and can be kept down to almost any point. It can be worked with gas or oil, or with a candle. Gas and oil, however, are the only things yet tried. We have seen it in operation, and can testify to its simplicity and utility for raising seeds and striking cuttings.

—— A Testimonial, subscribed for by the gardeners of Scotland, was presented to Mr. Councillor Methven on March 30, at the Café Royal Hotel, Edinburgh. The presentation consisted of a large and magnificently wrought silver epergne and a massive silver salver. The design of the epergne took the form of a Vine tree—luxuriantly fruitful in its "green old age." The branches are laden with rich clusters of fruit, and well foliaged, and from four branches on opposite sides of the Vine there depend silver baskets. The whole details are very artistically and delicately worked out. The epergne and salver bore the following inscription:—"Presented to Mr. Thomas Methven, Nurseryman, Edinr., March 29th, 1870, by a few of his Horticultural and Arboricultural friends, as a token of their esteem for him personally, and of the sense they entertain of the many services that he has rendered to cultural science." The company numbered between 30 and 40; and the chair was occupied by Mr. Thomson, Dalkeith.

REPORT ON BEDDING PELARGONIUMS.

[From the Proceedings of the Royal Horticultural Society.]

The Chiswick collection of Pelargoniums comprised in 1869 about 850 varieties, and a very considerable display was made by these during the summer and early autumn months. Of the novelties, as usual, many were received too late and in too weakly a condition to give very satisfactory results, and hence the number of new varieties certificated was but limited. Attention was, however, directed to the reduction of so unwieldy a collection by the elimination of inferior or superseded varieties, and accordingly the sorts which are named below under the respective heads were struck out.

Scarlet Selfs.—In this group a variety named Rainbow, one of the semi-nosegays, a very free bloomer, with orange-scarlet flowers, was sufficiently meritorious to attract considerable notice. The following were discarded:—Atrosanguineum, Chief Justice (*n**), Edith, Eunice, Fame (*n*), Governor, Little David, Little Major, Lord Lyons, Orange Girl (*n*), Punch, Scarlet Christian (*n*), Surpass Orange Nosegay (*n*), Thor (*n*), Vulcan (*n*).

Scarlet Zonals.—In this very extensive group the following varieties were certificated:—

Vesta (First-class Certificate).—A very free dwarf-growing variety, with dark-zoned lobate leaves, and deep scarlet semi-nosegay flowers in abundant trusses of moderate size. Received from Mr. W. Paul.

Vesuvius (First-class Certificate).—A variety of dwarfish compact habit, with small, zonate, moderately lobed leaves and scarlet flowers, rather paler than those of Warrior, of moderate size, freely produced in good trusses. It is a useful bedding sort. Received from Messrs. F. & A. Smith.

William Underwood (First-class Certificate).—This excellent variety, by some accidental oversight, was not contributed to the Chiswick collection till last season. It is of good habit, free, with dark-zoned leaves, and close trusses of orange-scarlet effective flowers. Received from Mr. Davie.

There were some other varieties of high promise, as Louis Van Houtte, remarkable for its very broad dark zone; Rival, a dwarf grower, with finely shaped bright scarlet flowers, better than those of Lord Derby; and among semi-nosegays, Godfrey, a free, broad-petaled orange-scarlet. The following sorts were discarded as being in some point inferior to the other varieties in cultivation:—Abbot, Acme, Adonis, Adolph Poulain, Autocrat, Black Prince (*n*), Bonaventure, Charles Aubrey, Chieftain, Climax, Compactum multiflorum, Constance Hault, Criterion, Director, Donald Beaton, Eblouissant, Editor, Edward Milner, Emily Thorland, Emma Barba, Emperor, Etoile des Massifs, Faust, Fearnought, Firebrand (*n*), Flambeau, Foxhunter, Garibaldi (North's), Glorious, Glory, Harry Hieover (*n*), Henri Lierval, Highland Chief, Huntsman, In Memoriam, James Campbell, Kate Anderson, La Foudre, La Niagara, Little Treasure, Loveliness (*n*), Magna Charta, Magnificent, Manfred, Martin Gireau, Mimas, Miss Parfitt (*n*), Model, Montrose, Mons. Barthière aîné, Mons. G. Natchet, Mrs. Anderson, Mrs. Brock, Mrs. Sinclair (*n*), Napoléon (*n*), Nimrod, Nyanza, Philip Crawley, Pigmy, Prince of Orange, Profusion, Really Good, Red Riding Hood, Red Robin (*n*), Reliance, Robert Fish (*n*), Royalty, Satisfaction, Sunlight, Sunnyside, The Dwarf (*n*), Timothée Trim, Triomphe, Triomphe de Courcelles, Vanquisher, Vercingetorix, Victor, Vivandière, Welcome, William Davis, William Ingram, Woodwardiana.

Rosy Scarlet Selfs.—From this set the following sorts were discarded:—Countess of Breadalbane (*n*), L'Africaine (*n*), Poet Laureate, Prince Teck.

Rosy Scarlet Zonals.—This group, which is a very extensive one, embraces many shades of colour, from the cerise tints approaching to scarlet on the one hand, to the purple or magenta hues on the other. One novelty was certificated, namely:—

Clio (First-class Certificate).—A variety of moderately vigorous growth, having the leaves marked with an indistinct zone; the flowers of a semi-nosegay character, being well formed, and having the upper petals scarlet, and the lower ones of a rosy hue. Received from Mr. W. Paul.

There were besides some varieties of a highly promising character, namely:—The Champion, a large telling cerise-scarlet; Fausta and Demosthenes, bright magenta-rose; Claude Lorraine and Robin Hood, deep purplish magenta, very distinct. The following varieties were discarded as not being now required:—Alexander M'Kay, Alexandra, Andromeda, Blanche Lefevre, Bonnie Dundee, Candidate, Carmine Stella (*n*), Chilwell Beauty (*n*), Christian Deegen, Claude, Clive-den Rose (*n*), Comet (*n*), Crimson Cushion, Derbyshire Hero, Empress, Endeavour, Ephraim, Euchar, Evening Star, Fairy Queen (*n*), Festival, Francois Chardine, Germania, Hermit (*n*), Hero, Illustration, Jules César, Lord Chancellor, Lord Palmerston (*n*), Madame Madeleine, Magnet, Magenta Queen (*n*), Matilda, Meteor, Minnie Petch (*n*), Minnie Rose, Miss Martin, Mrs. Laing, Mons. Martin, Novelty, Olivia, Persian, Pink Pearl (*n*), President Johnson, Prince of Wales, Prime Minister, Roi d'Italie, Rose Queen, Rosy Thorn, Souvenir de Mons. Basseville, St. Pierre, Victor de Puebla.

Rose-pink Selfs.—A dwarf variety in this section was awarded a certificate, namely:—

Advance (First-class Certificate).—A remarkably dwarf free-blooming variety, with fine, self-coloured, bright rosy-pink flowers, apparently having every quality to render it a good dwarf bedder. Mr. Bull.

The following were struck out as being no longer required:—Christine, Improved Pink Lilacinum (*n*), Madame Barre, Madame Evirens, Peach Nosegay (*n*), Pink Pet, Rose Queen, Waltham Lilac (*n*).

Rose-pink Zonals.—Of this group the variety named below was selected for a certificate:—

Beauty of Lee (First-class Certificate).—A vigorous and compact-growing variety, having faintly zonate leaves, and dense trusses of small flowers of the colour of those of Madame Barre, that is, of a bright rose-pink, with white base to the top petals. The peduncles in this variety are remarkably long and stout, throwing the trusses well up above the leaves. Mr. Toole.

The following varieties of this section were discarded:—Amy, Beauty of Dulwich, Belle Rose, Fair Helen, Gloire d'Ecully, Gloire des Roses, Kœtchen Scheurer, Jupiter, Lillie Nevil (*n*), Lord Fitzherbert, Madame Auguste Laloy, Madame V. Nepterre, Mdlle. Emmanuel Guay, Melthes de Marcol, Mary Evelyn, Mons. Leyens, Peach Blossom, Pink Globe, Pink Hermit, Pink Perfection, Pink Rosette (*n*), Premier (*n*), Queen of Pinks, Rose Stella (*n*), Stella's Spouse (*n*), Souvenir de Sir J. Paxton (*n*), Vanquisher, Wiltshire Lass.

Salmon-coloured Zonals.—The following were discarded as not being required, or not suitable for bedding:—Alphonse Karr, Archevêque de Paris, Aurantium striatum, Auricula, Aurora, Baron de Stael (*n*), Beauty of Edmonton, Beauty of Suffolk, Bridesmaid, Britannia, Charles Rouillard, Charles VI., Christabel, Comte de Pourtales, Conspicuum, Cupid, Delicatum, Enchantress, Etienne Henri, Fanty, Fascination, Floribundum, Francois Desbois, Gladiateur, Grussen Nancy, Henry W. Longfellow, Jeanne de Rohan, John Veitch, Lady of the Lake, Lady Hope, Lady Parker, La Fraicheur, Léon Bernum, Lord Vernon, Madame Janvier de la Motte (*n*), Madame Lierval, Madame Loussell, Madame Rachel, Mademoiselle Augustine, Ma Gloire, May Queen, Melanie Duhet, Minnie Gill, Nonsuch, Orange Prince, Pioneer, Princess of Hesse, Princess of Wales, Queen of the South, Rosabella, Rosy Circle, Seraphim, Souvenir de St. Pierre, Souvenir du 8 Juin, Theodore, Venus, Virgile.

Oculate Zonals.—The following sorts were struck out:—Alice, Beauty, Bright Eye, Henri de Beaudot, Madame Dufour, Madame Gauffier, Madame Rudersdorff, Monsieur Lavigerie, Rosebud, Victory.

White Zonals.—The following sorts were discarded:—King of Whites, La Vestale, Madame Barillet, Madame Vaucher, Marie Mezard, Snowball, Sprite (*n*), White Tom Thumb.

Marbled-leaved.—In this interesting little group, of which Sheen Rival is the type, a new variety, called Kentish Fire, a semi-nosegay, with deep orange-scarlet flowers, attracted considerable notice. The following were struck out:—Flossy Fowle, Kingsburyana, Lucy.

Golden Selfs.—The following sorts were discarded:—Andrew Murray, Golden Dwarf, Hybrid Ivy-leaf, Ochroleuca, Pink Beauty.

Gold and Bronze Zonals.—The following varieties were awarded Certificates:—

Rev. W. F. Radclyffe (First-class Certificate).—This variety is valuable for its free yet compact habit of growth, and for the endurance of the colours of its leaves, which are of a bright yellow-green, marked with a narrow vandyked zone of clear chestnut-red. This sort has now been pretty well tested. Received from Messrs. Windebank & Kingsbury.

The Moor (First-class Certificate).—This variety, in the early part of the season, was very fine, but the colours run out at a later period. In its best state it was very effective, the colour being a bright yellow-green with a clear dark chestnut zone. The leaves are somewhat lobed, which is perhaps its chief fault. Received from Messrs. F. & A. Smith.

Plutus (First-class Certificate).—A good deal resembling The Moor, but the ground-colour is greener; the zone is bright and telling. Messrs. F. & A. Smith.

The group is now becoming extensive as to the number of named sorts, but shows comparatively little real variety. The following may be dispensed with on account of indistinct colouring, or want of constitution:—Arab, Aureum, Beauty, Beauty of Oulton, Beauty of Ribbledale, Compactum, Constantine, Crown Diamond, Eclipse, Edward G. Henderson, Egyptian Queen, Electric, Glowworm, Her Majesty, Josephine, Louisa, Luna, Mary Lister, Midas, Minnie, Miss Maule, Mrs. Bass, Mrs. Hugessen, Mrs. J. Todd, Mrs. Maxwell Hutton, Novelty, Oriole, Painted Lady, Pet of the Parterre, Princess Alice, Princess of Wales, Sceptre d'Or, Shakspeare, Sunlight, Viceroy, Viscountess Castlerosse, Yellow Sovereign, Zebra.

Golden-margined.—The following were struck out:—Unique, Golden Fleece.

Golden Variegated Zonal.—The following sorts were awarded Certificates in this class:—*Amy Richards* (First-class Certificate). A variety of the Mrs. Pollock type, and remarkable for its bold vigorous growth, and its large flat highly-coloured leaves. Both in growth and colouring it is far superior to the older variety, and is a real acquisition as a bedder. Raised at Chiswick.

Sir R. Napier (First-class Certificate).—A very distinct variety of this group, remarkable for its very broad and dark zone. Messrs. Carter & Co.

Louisa Smith, *Florence*, *Mrs. Dunnett*, and *Miss Batters* attracted considerable attention from their promising appearance. The following sorts were discarded:—Corona, Dr. Primrose, Fanny, Huntingdonian, Lizzie, Meteor, Mrs. Benyon, Red Admiral, Red Gauntlet.

Silver-margined.—In this group the following variety was regarded as worthy of a Certificate:—

Miss Kingsbury (First-class Certificate).—A most telling variety, of dense compact habit: the leaves, which are quite up to the average of merit as regards flatness, having a broad white margin. The flowers are scarlet. Received from Messrs. Windebank & Kingsbury.

* The letter '*n*' indicates nosegay or semi nosegay varieties.

The following were discarded :—Alma, Annie, Beaton's Variegated Nosegay, Bride, Brilliant, Castlemilk, Cheerfulness, Daybreak, Ellen Smith, Flower of the Day, Hendersoni, Honeycomb, Jane, Minnie Warren, Mrs. Dombrain, Oriana Improved.

SILVER VARIEGATED ZONAL.—The following sorts were discarded :—Countess of Warwick, Fontainebleau, Gaines' Attraction, Little Beauty, Mrs. Chater, Picturatum, Rosette.

New Garden Plants.

VANDA CŒRULESCENS, *Griff., Notul.* p. 352 ; *Icon.* t. 331 ; *Lindl. Folia Orchid.* art. Vanda, 9.

V. caule elongato ; foliis angustis, loratis bilobis ; pedunculis nudis distanter vaginatis erectis multifloris foliis et caule multo longioribus, pedicellis trigonis ; sepalis petalisque basin tortis unguiculatis ovatis obtusis, labello ovato auriculato columnæ adnato, calcare recto conico. *Lindl. l. c.*

We have to thank Messrs. Veitch for a beautiful spike of this lovely Orchid, bearing numerous highly developed flowers, seven being open at one time. It cannot be ranked among the grand-flowered Vandas, but associates with the beautifully-spiked distichous species, the Saccolabiums, and the Aerides, its flowers being in expansion similar to those of Aerides falcatum (Larpentæ), light blue, with the anterior part of the lip very dark blue, and with three callous veins of the fairest lapis lazuli colour we ever saw in the vegetable kingdom. The erect semi-lunar side laciniæ of the lip are white, with violet-brown and yellow streaks. The anther has two large yellow spots, the slender spur is whitish violet, with a green apex. The stalked ovary is purplish yellow. (See fig. 97.) *H. G. Rchb. fil.*

FIG. 97.

PARK SCENERY.

II. PLANTING.

HYDE PARK and Kensington Gardens, taken together, are considered to form one of the most rural, and at the same time one of the most picturesque public parks in Europe. Some of the views to be obtained in this immense wood-clad grassy area are truly beautiful. For instance, let us suppose that the beholder is standing, as I did in 1868, when these notes were taken, on the drive in Hyde Park, between the Bayswater Road and the Serpentine bridge—looking between two picturesque groups of Sweet Chestnuts — the first thing that attracts attention will be the Royal Palace of Kensington, the birthplace of our Queen, in the distance, and of which, owing to its somewhat sunken position, no such favourable view can be obtained elsewhere. It will be seen that the gardens have been originally cut off from the Park by means of a ha-ha, or sunk fence, now for the most part removed

Between this and the palace is apparently a long glade or vista of grass about 60 yards in width, which seems to be unbroken by any intervening object, but in reality this is not so, as sleeping in the hollow, or low level of the middle distance, is the Serpentine, although it is concealed from view from the exact spot from which these observations were made. The treatment of the wood on either side of this vista is good. It consists of some fine timber trees, broken up sufficiently to prevent their giving to the glade under notice the character of a stiff and formal avenue, and yet not so much scattered about as to destroy its unity of expression. In the summer time these gardens are thronged "from early morn till dewy eve," with thousands of fresh-air seekers, who enjoy themselves as much under the shade of the trees as if they were miles in the country. The palace, though perhaps not so appropriately situated as it might have been, is, nevertheless, snug and retired, considering its proximity to so large a city as London. The building, like most structures of its date, had originally the park-like gardens that surround it, coming close up to it ; more recently, however, a small flower garden has been formed in the front. This view constitutes what may be called a prettily wooded picture, with a building in the distance. If we want a water scene we must repair to the bridge that crosses the Serpentine a few paces further on. Here stretches out the larger portion of a fine lake, which altogether covers a space of 50 acres, 30 acres being before us, and 20 behind us on the upper side of the bridge. The banks of this water are suitably ornamented with trees, while over its head in the distance, supported by a woody screen, come into view the Duke of Wellington's statue, the towers of the Houses of Parliament and Westminster Abbey.

From the noble dome on the beautifully built Senate House in Washington I have beheld avenues of many miles in length, and of proportionate width, radiating from this central point in all directions, through the primeval woods, fine examples of tasteful architecture,—here and there charming breadths of open prairie, lakes, and rivers ; from the roof of the cathedral in Milan I have surveyed the most extensive mountain-girt plain with which I am acquainted ; but with no view have I been more charmed than with one of Hyde Park, obtained from the top of Sir Dudley Marjoribanks' new residence in Park Lane. Here, turning one's back for a moment on the mighty Babylon, which lies to the eastward, we have a beautiful bird's-eye view of the Serpentine, of the Palace of which I have been speaking, half hid among trees of ancient growth, the fine central expanse of sheep-cropped grass, the fountains near the Bayswater Road, the new monument to our late much lamented Prince ; and above all, a throng of exercise-loving citizens. But for the presence of these we might easily imagine ourselves miles in the country, so quietly lies the picturesque landscape before us.

Regent's Park may also be said to be in the picturesque style, although here and there Mr. Nesfield has lately been introducing into it little bits of the gardenesque. Of these one of the most conspicuous is what is called the floral avenue, and among recent improvements in the parks few have been more appreciated than this ; showing, as it does, how long narrow strips of ground may be converted into ornamental gardens. As an approach to an elegantly designed Italian residence few more suitable could be found than this floral walk, or it might be drive. It consists of lines of Lombardy Poplars, which serve as a background to borders of gay flowers, bounded in front by the sides of the walk with grass verges. Behind the Poplars are rows of Chestnut trees, the whole making up an excellent avenue.

The planting in general in this park is of the most meagre and ineffective description, and that being the case it offers a fine opportunity for carrying out my plan of arranging trees in family groups. In almost every genus are to be found species exhibiting great diversity of appearance, and the public would naturally be interested in comparing differences by direct contrast, while some of the most ornamental trees of each group might be scattered about in the form of single specimens. Even if the species were unskilfully planted at first, they might be transplanted afterwards to their proper positions, which their relative growth would readily indicate. In this park attempts have been made at varying its surface by raising earth mounds, but nearly the same effect, I imagine, might have been more easily and cheaply secured by means of judicious planting.

In public parks of large size grouping in families might be carried out in a complete way, but in smaller places only the most ornamental and distinct species of the different genera should be employed, while at the same time a similar style of planting might be preserved. We should thus not only have planting in the picturesque style, but also, if the species were properly named, an arrangement of a thoroughly educational character.

In this park, in which are the gardens of both the Royal Botanic and the Zoological Societies, scientific arboriculture ought also, we should think, to find a home. As far as extent will allow, trees of a novel description might be planted here in place of more common kinds, and that in positions in which their true characters might be developed. Thus in connection with the other attractions of this park, would be added specialities in the way of ornamental trees and shrubs.

In Victoria Park the picturesque and gardenesque have been agreeably blended. Looking from the boat-house across the lake to the Pagoda Island, a charming scene presents itself. Willows, both weeping and otherwise, are planted here in profusion in connection with the Pagoda, their branches, drooping to the water, producing an effect not unlike that represented by views taken from Chinese gardens. In this view there are about 6 acres of water, while 80 acres have been devoted to open grass spaces. Shrubby vegetation is well represented here ; the late Messrs. Loddiges' collection of shrubs and trees having been for the most part transferred to it. To colour, in the form of flowering plants, much attention is also bestowed, nor is the subtropical garden neglected, although it is not carried out to so large an extent as it is at Battersea.

From what has been stated it will be seen that the picturesque is the ancient style of park decoration in this country. It is that which associates with the baronial halls and castles of old England, in which parks of large extent cut the buildings off as it were from the outer world. In many of these may be found noble avenues and groups of time-honoured trees, below the spreading branches of which many a fine herd of deer finds shelter, or, it may be, a flock of sheep, the whereabouts of which the tinkling bell discovers. Of these proud seats of our nobility historians have written and poets sung, but it is for us now only to deal with the surroundings to the grandeur, to which successive generations have each contributed something in the way of picturesque planting ; till now, in the nineteenth century, as at Studley Royal and other places, little in that way is left to be done which could be called improvement. The gardenesque, beautiful as it must be admitted to be, falls immeasurably short of the picturesque in point of grandeur, where the ornamentation of extensive acreages is concerned ; and it is on this account that I adopted the

picturesque in the plan which I sent in for Sefton Park, believing, as I still do, that Liverpool requires a public park in which a broad grassy surface, skilfully planted, would be a greater boon to its inhabitants than expensive earthworks, with finely kept surfaces, could possibly secure for them. They have a beautiful example of the gardenesque in Birkenhead Park, and the other smaller parks in connection with the great seaport; and to areas of similar extent this style is well suited. But what our citizens want is plenty of room for grass promenading, and that cannot be had where notices are put up to the effect that "Visitors are requested to keep off the grass." Hyde Park and Kensington Gardens taken together is the park, *par excellence*, for Londoners; and parks of a similar kind, in which there shall be no fear of trespass, should be the accompaniments of all large cities. In America at the present time the case is somewhat different. There, with open prairie and primeval forest opened up by railway communication, something in the gardenesque style is a relief; consequently, the modern Italian style, which is little less floral than that of the French, has been generally adopted, even in the largest parks. At Washington, I understand, the laying out of a park worthy of the American capital is in contemplation. It is stated that it is to contain some 1800 acres. Let us, therefore, hope that that may be the picturesque Hyde Park of America. *J. Newton, Oxford Terrace, Hyde Park.*

NEW ZEALAND FLAX.

THE importation into this country of New Zealand Flax (Phormium tenax) is a subject which has been frequently talked about, and some enthusiasts have even ventured to assert that the plant might be cultivated with advantage, if not in England, certainly in Ireland. No one who has seen the fibre when cleaned, or who has tried its strength, can deny that its appearance and quality are sufficient to recommend it, indeed even to cause it to become a desired article of commerce, either by cultivation or import.

While some few in this country have been urging its introduction in the very soil that grows the well-known commercial Flax (Linum usitatissimum), the New Zealand colonists have been discussing the *pros* and *ons* of its cultivation in its own natural soil.

In the New Zealand House of Representatives a commission was recently asked for "to inquire into and report upon the machinery employed in different portions of the colony for the preparation of New Zealand Flax, as well as upon the varieties of such Flax which it may be most desirable to cultivate; upon the best method of cultivation, and the probable result of the same; and also to make recommendations as to any steps that might with advantage be taken to promote and encourage the cultivation and preparation of Flax within the colony, and its use for manufacturing purposes within and without the colony."

From the debate which followed it appears that the obstacle which has hitherto stood in the way of the general application of the fibre, namely the presence of a large quantity of gum in the leaf, has been got over, and machines are now at work in the colony which thoroughly cleanse the fibre; and experiments are being made with the gum, which it is thought will also prove a useful article. A peculiarity of this gum is that if it is left exposed to the air, for even a quarter of a minute, it becomes so hard that it can scarcely be removed at all. Water has therefore to be kept constantly pouring upon the leaf as it passes through the machine, so that the gum is not exposed to the air.

By the use of the machines, after paying for all labour at the ordinary rates, which in New Zealand are heavy, a clear margin of profit of £10 per ton can be realised on the fibre. Two of these machines driven by water-power would turn out 2 tons of prepared fibre per week, so as to leave a clear profit of from £12 to £20 per week, according to the skill exercised in the work.

The Phormium tenax is being largely cultivated in Auckland, where, it appears, the best Flax is produced, and it is now yielding large returns. From the statistics it appears that in 1866 the exports amounted to £1049; in 1867 to £3575; in 1868 to £5064; and for the first quarter of 1869 to £5480. While, however, the cultivation and preparation of the fibre is increasing in Auckland, the plant, owing to bad collecting, is being rapidly destroyed in Canterbury, the custom there being absolutely to mow the plant down, and this at all times, instead of selecting the mature leaves at the proper season; after this injudicious cutting, the young central parts or fresh buds are readily devoured by the cattle.

The plant seems to be perfectly hardy, and will grow almost anywhere, except in very wet situations. In swampy places the plants are small, but in well-drained land, and where light and air are allowed to circulate freely among them, they spring up into a very luxuriant growth. Swamp-grown Flax is always green, and the fibre has not the same strength as that grown on the hills. The plants are of rapid growth, and fibre 4½ feet long has been obtained from plants only six months old. Two kinds of New Zealand Flax are generally known, one growing to a larger size than the other, yielding a longer and better fibre; but it appears in some districts as many as twenty varieties are known to the natives: one, called the Teori or hill Flax, is much esteemed, and is considered to be three or four times as valuable as the ordinary Flax of the plains. So if this kind were largely cultivated, and the fibre imported into this country, it is reckoned it would fetch three or four times the price of ordinary New Zealand Flax, and that the demand would so greatly increase that, if fair attention and skill were given to its cultivation, preparation, and shipment, it would vastly increase the prosperity of the colony.

While some of the colonists have thus been urging the claims of the indigenous plant to greater care and cultivation in its own soil, others have been using their best endeavours to introduce and extend the growth in New Zealand of our native Flax (Linum usitatissimum). The dearness of labour in New Zealand will no doubt operate greatly against it. *J. R. Jackson, Kew.*

WINDOW GARDENING.

[The annexed essay, one of those which competed for Mr Hubbard's prize, and which was Highly Commended, is printed here by permission of the writer. ED.]

WINDOW GARDENING is within reach of all. There is no house without its window, and therefore there need be none without its garden, high or low, large or small—I had almost written clean or dirty, only that all windows with plants are or ought to be clean. And these gardens must be seen. Those in the house must see the outer world through their beauty; those outside cannot but admire the plants in the windows. Window gardens are thus twice blessed, blessing those that have them, and those that have them not. In fact, the latter often have the best of it; for the window-gardener has a generous pride in putting his best side outermost. The joy of the window-gardener is never so rich and full as when the public most freely and fully share it with him. With the view of increasing the simple pleasure of both, I will proceed to give some simple and plain directions for the furnishing and culture of window gardens throughout the year. These hints may be rendered all the plainer if they are thrown into the following order:—

1. Round about the window.
2. The window itself.
3. Outside the window.
4. Inside the window.
5. The surface of the window, or hanging plants.
6. Window plants for winter.
7. Window plants for spring.
8. Window plants for summer.
9. Window plants for autumn.
10. The procuring of window plants.
11. The culture of window plants; cleanliness, air, water, food, light.
12. The training and stopping of window plants.
13. The propagation of window plants.
14. The storage of window plants in winter.
15. The treatment of winter plants when out of the window.

1. *Round about the Window.*—This is a part of window gardening that has been very much neglected. A great deal may be done for the window by bringing up plants from the ground. Even in towns there are many plants that will grow if merely planted in a hole filled in with good soil under the pavement; and in the country there is no difficulty in getting plants to run up from the ground to the highest windows in a house. There is nothing contributes so much to the richness of window gardening as these earth-rooted fringes of many-coloured beauty. They can be trained round about, or festooned across, or wave in graceful sprays over windows and frames—a rich garden of themselves: they also throw out the beauty of window plants. Here is a short list for running round about the window. The white Jasminum grandiflorum is a queen of beauty for the purpose. It grows like a weed, and flowers as if it had nothing else to do, and as to its sweetness—no pen can write it out. The Jasminum nudiflorum will line the house sides with gold in the middle of winter. The Clematis Flammula forms wreaths of driven snow, and now this may be mixed with any of the large new sorts, such as Jackmanni and its allies, though Flammula must still be the background of them all. Then there are several varieties of Virginian Creeper, which set the window in a frame of glowing scarlet. Nearly equalling this splendid creeper are several varieties of Grape Vine, such as the Claret, which equals it in colour; and the Barbarossa and West's St. Peter's, that die off in the gayest liveries. There are a whole host of green and variegated Ivies, of all sizes, shapes, and shades; Honeysuckles—white, scarlet, and pink, including the beautiful variegated variety; the blue and white Wistaria sinensis, and the white Passion-flower. Among plants that are not climbers we have the Weigela rosea, Calycanthus præcox, Berberis Darwinii, Cratægus Pyracantha, Pyrus japonica, and Magnolia grandiflora. Then the queen of flowers, the Rose, waits with treasures of beauty enough to decorate every window in the land. There are the lovely Banksian Rose, yellow and white; Fortunei, large white; numerous varieties of climbing Roses, such as Félicité Perpétue, Rampant, and several sorts of Boursaults; the Noisettes, just the things for running round and enwreathing the window,—Aimée Vibert is the very best white, and Lamarque is a splendid light straw-coloured Rose; while Céline Forestier, Cloth of Gold, Maréchal Niel, and Solfaterre form rich golden settings for the window; and among the Tea-scented Roses the Climbing Devoniensis, Gloire de Dijon, and Safrano cannot be surpassed. If more colour is needed add the common crimson and pink China Roses, Cramoisie Supérieure, or any of the strong-growing high-coloured Perpetuals. But if these are beyond the reach of the cottager, a good deal may be done for first floor windows by using such plants as the Calampelis scaber, Cobœa scandens (the variegated variety), Lophospermum Hendersoni, and others; Maurandyas of sorts, the Canary Creeper, Sweet Peas, or common Nasturtiums. These planted in rich soil or well watered with sewage will grow fast, and run round the window in a few weeks.

2. *The Window itself.*—This must generally be taken as it is, and made the best of. South and west windows are the best for plants, east next, and north the worst of all. The size is immaterial; the larger it is the more plants it will hold, and the larger and cleaner the squares of glass, and the less wood or iron, the more favourable it will be for the plants. For facility of access to window plants there is no better arrangement for moving the windows than the old-fashioned way of slipping them up and down. As to the form of the window, bow-windows enlarge the space, and so admit more sunlight to the plants. Inside the plant-space may range from 6 inches to 3 or more feet, outside the sill should be 6 inches wide if possible. Broad or narrow, a box of wood, or iron, or earthenware—the last, being the best, should always be firmly secured to its place. This is easily done by means of a stout piece of iron at each end. The box should be at least 6 inches deep. Right above the window a bar of iron should be carried across, and stand out an inch from the wall, or a few strong hooks should be driven in—the object of both arrangements being to hang plants from these holdfasts.* In cases where expense is not an object arrangements might easily be made for having a double window, with a space for hanging plants between the two, and likewise for protecting the outside plants with glass. But I will not incumber my instructions with these arrangements.

3. *Outside the Window.*—It is best not to plant anything out in the boxes: that is if variety is desired all the year round. Window plants too often come and go with the swallows. There is summer beauty and winter bleakness. I will try and remedy this by giving instructions how to keep the windows full at all seasons. Greater variety can easily be given by preserving as much difference as possible between the outside and the inside of the window; and by keeping the plants always in pots, or plunging the latter in moss or cocoa fibre, it will be much easier to have the window always furnished with beauty.

4. *Inside the Window.*—There is nothing so good as a wire or iron basket, with a waterproof tin bottom, or a china box, for the sill or the stand near it. Various means can be used for raising the pots in the centre, and by the use of moss or paper all the pots may be covered. The pots, however, should be clean.

5. *The Surface of the Window.*—This is a part of window gardening that has been very much neglected. It is the most effective and beautiful of all. Wire baskets and earthenware and china suspenders are now so cheap that all may have a few for this purpose. Those used inside must have a false bottom for the reception of water. For the outside ones such precautions will not be needed. Each basket or pan should be supported from the bar outside, or the curtain rod inside, by a chain or strong cord. They look best when these chains are neat and long. In hanging the baskets, too, they should vary in height, and be as carefully hung as a picture for effect; for in fact they are living pictures of the highest beauty, and should be hung with the highest art, to catch the play of light and shade upon them.

There is a great wealth of plants for this purpose. First among them all stand the different varieties of Ivy-leaved Pelargoniums (Geraniums), white, pink, and variegated, as well as several sorts lately introduced. There is also the great family of Fuchsias, nearly all which may be made to droop by carefully training them downwards. Meteor with its red leaves, Cloth of Gold, Pillar of Gold, and a silver-leaved variety, are most admirable for baskets. The varieties of the Globe Fuchsia, Caroline, and such delicate growers and large flowers as Duchess of Lancaster, are splendid for baskets. Petunias, Lobelias, Isolepis gracilis, Tradescantia discolor, Cactuses of sorts, and variegated Begonias are also suitable.

Most of the foregoing will do for outside baskets in summer, while in winter the baskets may be filled with variegated or golden-leaved Ivies, the gold and silver and plain-leaved Periwinkles, the variegated Honeysuckle, small plants of Pyracantha, Neapolitan and other Violets, Winter Aconite, or Sedum carneum variegatum, one of the prettiest subjects for hanging baskets. In shady situations Polystichums, such as proliferum, or lobatum, and the varieties of Scolopendrum vulgare, or Hart's-tongue, are suitable.

6. *Window Plants for Winter.*—Among the best window plants for inside during winter are the Trumpet Lily (Richardia or Calla æthiopica), Chrysanthemums, Aloes, Myrtles, Camellias, late Pelargoniums, Fuchsias, and Forget-me-nots. All these, with the exception of the Camellias, are within the reach of cottagers.

* The *floreten* is just the thing for hanging pots against the wall. EDS.

Plants for the outside in winter may be early flowering or Russian Violets, Christmas Roses, Winter Aconites, Snowdrops, early flowering Anemones and Forget-me-nots. These will give the appearance of fresh active life through the dull winter months. Variegated Yuccas, hardy Ferns, small plants of Laurustinus, Daphne Mezereum, or even young plants of Box, may likewise be used.

7. *Window Plants for Spring.*—As the sun strengthens our list lengthens, but we must keep it within window bounds. Chinese Primroses, Cinerarias, sown each in August, will now be in flower, whilst Snowdrops, Crocuses, Hyacinths, early Tulips, and Cyclamens, will make the window inside a blaze of colour. But these are but sparingly used in cottage windows. The Musk (Mimulus moschatus), is a universal favourite. Fuchsias must now receive more light and be encouraged to grow. The very best dark Fuchsia for window culture is Souvenir de Chiswick; the best double dark is Sir Colin Campbell; the best double white, Marie Cornellissen; and the best single, Rose of Castille. Pelargoniums must likewise be encouraged to grow. The following are among the best for windows:—Rose Celestial, Bride, Crimson King, and Conspicuum; of the spotted varieties, Beadsman and Aspasia; among fancies, Bridesmaid, Acme, Cassandra, Delicatum, and Magnificum. The following are early and perpetual flowering:—Belle Blanche, Album multiflorum, and Valentine. The Trumpet Lily will still be displaying its beauty. These, with a few plants of the following zonal and variegated Pelargoniums, will fill the window—Variegated: Lady Cullum, Mrs. Pollock, Italia Unita, and Sunset. Zonal: Amy Hogg, Indian Yellow, Stella, Lord Derby, Roi d'Italie, Rose Rendatler, Madame Vaucher, Cybister, Clipper, and Tom Thumb. Mignonette sown in the autumn will now be in flower.

Spring plants for outside include Polyanthuses, Violets, Hepaticas, Arabises, Aubrietias, Saxifragas, Primroses, and Forget-me-nots, which will now be in full bloom in the window-boxes, having taken the place of the hardier window plants. Nemophilas and Virginian Stocks sown early may also be had now in flower.

8. *Window Plants for Summer.*—Such plants as Cactuses, when they have done flowering, American and other Aloes, &c., should be moved outside the window. The Calla, and all the other bulbs, Violets, and other spring plants, should be removed to a sheltered place out-of-doors. Mignonette and Lily of the Valley may now take the place of Violets for sweetness. The Lemon plant (Aloysia citriodora) will also be in leaf, and with the Balm of Gilead is indispensable for the window. A few double Wallflowers and early Stocks should be introduced. One or two Heliotropes should also be grown. The Fuchsias and Pelargoniums the will now be coming into flower, and will need all space. The Pelargoniums, plain or variegated, may be placed outside to grow and blossom, with Verbenas, Petunias, or other plants, to hang over the sides of the boxes. Aloes, Ferns, and Cactuses could be moved into a sheltered place for a time, to afford space for these plants. Balsams should likewise be grown.

The outside furnishing of the window in summer has already been pretty freely described. A few plants, such as the Iresine Herbstii, Perilla, and the red or coloured-leaved Amaranthus give a nice variety, and form a rich contrast to the Pelargoniums. *D. T. Fish.*

(To be Continued.)

FLORAL REGISTERS.

SOME short time since Dr. M'Nab, now Professor of Natural History in the Royal Agricultural College, Cirencester, exhibited before the Edinburgh Botanical Society some diagrams representing in a graphic form the dates of flowering for the last 20 years of the Winter Aconite (Eranthis hyemalis), and the Spring Snowflake (Leucojum vernum). These diagrams were founded on the observations made during that period by Mr. M'Nab, the curator of the Royal Botanic Garden, Edinburgh. We are now enabled, thanks to the courtesy of Dr. M'Nab, to lay before our readers transcripts of the diagrams above-mentioned, and also one of Ribes sanguineum. The left-hand column in the accompanying diagrams is divided into spaces corresponding to a week's interval in each case; the upper column of figures shows the respective years from 1850-69 inclusive. From these diagrams it will be seen that the Eranthis (fig. 98) and Leucojum (fig. 99) in 1850 flowered within four days of each other, in 1851 within five days—but one month earlier than 1850; in 1852 Eranthis was 15 days later, while Leucojum was one month; in 1853 Eranthis was one day behind 1852, while Leucojum was one month (February 21 to March 21); in 1854 Eranthis was a few days earlier, while Leucojum was more than a month earlier; in 1855, both very late, but within a day of each other; 1861, 1862, 1863, and 1864, are peculiar: in 1863 Leucojum flowered before Eranthis, while in 1864 Eranthis was in flower on January 1, much earlier than in 1863, Leucojum being three days later; in the other years they flowered pretty closely. The differences in the year 1860 are much less than in 1850. For 1859 there is no record.

In the case of the Ribes (fig. 100), raised from a cutting derived from the original plant of Douglas, the earliest date at which flowers were observed was in 1869, March 1; the latest in 1855, April 19. Mr. McNab has for several years communicated numerous observations of this character relating to various plants to the Edinburgh Botanical Society, and it is to be hoped that he or his son may be induced to co-relate these valuable observations, and thus enable us to ascertain more plainly than has yet been done the causes of the early or late flowering of the several plants observed. These would depend naturally on the weather during the preceding autumn in each case, as well as on that of the particular season and on the condition in which the plant happened to be.

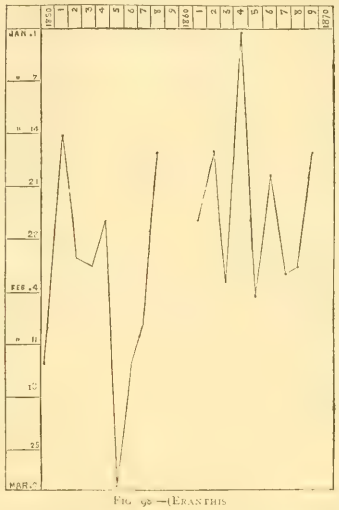

FIG. 98.—(ERANTHIS

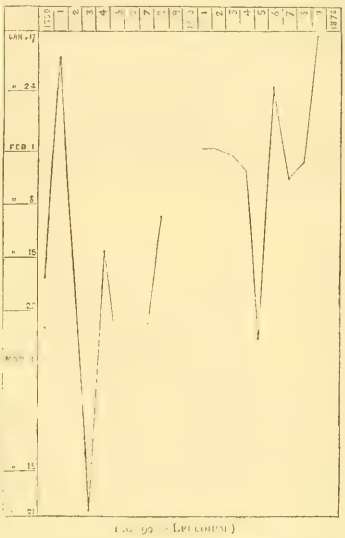

FIG. 99.—(LEUCOJUM.)

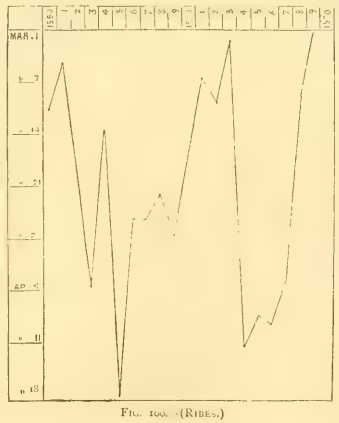

FIG. 100.—(RIBES.)

Home Correspondence.

Luculia gratissima.—Your correspondent "W. E.," at p. 460, says, "Mr. Culverwell writing under no form of responsibility," &c. I take a different view of the writings of your correspondents. I think every writer as honourably responsible, as though he were the writer of your Calendar. "W. E." complains that I do not say whether I recommend a one, two, or three year old Luculia to be spurred. Let me ask "W. E." if he ever saw a one year old Luculia with any pretension to spurring? I never have, and I have grown a great many; with me I think they do well if I get side shoots the second year. My practice with well-established plants in pots is to break off the young shoots that generally grow at the points—with the heads of bloom—to strengthen the latter. When the plant has done flowering, I dry it off for two or three weeks, taking care that the roots do not suffer from being too dry. If the plants are large enough to require cutting at all, I spur them well back. I am not so fast, I must confess. I cannot grow a plant that has any to cut off in the time that "W. E." mentions—one, two, or three years. I have a plant growing in a 12-inch pot that produced upwards of 60 heads of bloom in the past winter. This plant has been spurred in for several winters past without leaving a leaf on it. The old leaves are so porous that it takes all the energies of the plant to maintain the evaporation going on in them on a hot day. The consequence is they seldom make a start from the old wood, but grow on year after year from the extreme points; whereas, if treated as I have stated the plant makes shoots similar to a Gooseberry bush. "W. E." asserts that I planted a Luculia in an open border, which went to the top of the house without any pruning, and then got pruned simply to keep it within bounds. The plant has been spurred every year since it took to the rafters. The open border that "W. E." alludes to is 16 inches wide and as much deep, and requires as much attention as if the plant was growing in a pot, especially in bright weather. With this communication I send you a spur from a pot plant, to show you how freely they break from the old wood when spurred back. *William Culverwell, Thorpe Perrow.* [Very free and strong. EDS.]

The Muscat Vines at Wrotham Park.—I am under the impression that these are the Vines "David Tell Fact" refers to at p. 496. Without the least doubt it was and is still a famous house of Muscats, planted by Mr. Thomson, now of Dalkeith Park, in the year 1847. In 1848 I, who was then acting in the capacity of house foreman, under Mr. Thomson, had the pleasure of thinning the first bunch of Grapes of these remarkable Vines. Alas! how many have been consigned to the rubbish heap since these were planted! For several years I was ignorant, in a certain sense, regarding their condition. Six years ago I was again put in the position of overlooker, and could "D. T. F." see them this season, he would, I think, be both astonished and pleased with their present healthy condition. Two years ago I started several young canes from the bottom of the house to replace some of the old ones, and I find that these have wonderfully strengthened the Vines by importing a large amount of stamina into the system. If at all interesting to "D. T. F.," and your readers in general, I will furnish details as to the size of the house, the number of rods, and the system of cultivation adopted. *John Edlington, Wrotham Park, Barnet.*

Galvanised Iron Frames.—A correspondent having found the wooden frames used to raise plants on dung-beds rot very fast, proposes to adopt frames and lights made of galvanised iron. He has ascertained that the difference in prime cost is inconsiderable. He asks if any of our readers have adopted iron for this purpose; and if so, whether they have experienced any objection to it, as compared with wood, either as respects the frames or lights?

Weather in Cornwall.—It has been for some time very cold here, for the time of the year. On frosty mornings 4° and 5° of frost have been frequent; the days also have been generally clear, and the sun warm in sheltered places; the wind has been chiefly from N.N.E. I see the stigmas of the Peach bloom—those looking upwards—are frost-bitten in many cases before the pollen on the stamens is ripe, although a 10-inch board is over the top of the trees. The blooms are more perfect than last year. No other bloom is out. Early Potatos that were up out-of-doors are cut down in this neighbourhood (Penryn). On April 9 the weather changed, a nice shower from the south having fallen. In the course of a day or so Plum blossoms opened, and Potatos again peeped through the earth. I killed three wasps on the Gooseberry bloom in the space of five minutes, and a few butterflies are seen about. From the abundance of bloom on the Peach

and Nectarine trees I expect plenty of fruit, notwithstanding the frost. Pear bloom is not yet expanded. There is an abundance of bloom on all kinds of trees. *Henry Mills, Ivys, Penryn.*

The Vines at Heckfield.—As your correspondent "Robin Hood" includes Heckfield in his "list of unfortunates" where the Vines have failed, owing to treatment on the restrictive principle, I beg respectfully, though firmly, to contradict it. I write not as an advocate of either restriction or extension, but simply to give the facts, which are, that 14 or 16 years ago Heckfield enjoyed a most enviable notoriety for the production of good Grapes, and why? because the then gardener was (as "Robin Hood" would say) *en rapport* with his Vines; and my impression is, that had he remained at Heckfield, we should have heard nothing about the failure of the Vines. But a change takes place, another gardener succeeds—doubtless a good practical man, though much too negligent; very shortly the Vines begin to show signs of weakness. Yes, the very first season, my employer informs me, a certain house failed. Why fail? Nothing whatever had been done to the roots, they were pruned in the very same way as they had previously been pruned; what then was the cause of failure? I believe it was solely the internal treatment, negligence in watering, airing, and firing. Of this I have proof from my own success with the self-same Vines, all of which have produced Grapes such as no gardener need be ashamed of, and (though I may be accused of egotism in saying it) they still improve. A house of Black Hamburghs, from which we hope to cut ripe fruit about the 20th of the present month, and which has been forced for the last 25 years, six years ago was condemned as "worked up." This season my employer tells me he never saw them better. Now, as these Vines have had nothing done to them, beyond top-dressing of borders, and the best attention I could give them as to internal management, I attribute my success entirely to the latter; and am convinced that many gardeners often blame their borders, &c., for their own mismanagement indoors. My own motto in Vine cultivation is an improvement on that of Mr. Fish, viz., "Sacred to the roots, no quarter to red spider, and no unreasonable fluctuations in temperature during the growing season." If, after reading the above, "Robin Hood" is still sceptical, let him come to Heckfield. I shall be pleased to walk through the vineries with him, as we have still a few Grapes left, and others nearly ready, all grown on what I term the reasonable system. *W. Wildsmith, Gr. to Viscount Eversley.*

Mole Traps.—It is possible that the plan for catching rats with a jar, mentioned in your last number (p. 497), may be new to some of your readers as applied to catching moles in hedge-banks. The jars that I have seen used for this purpose were rather smaller than those described in your paper—about 15 inches by 10, I should say, from memory, and the shoulder was much higher on the jar, otherwise the shape was the same. They were used by digging a hole in the hedge-bank across the run of the mole, sufficiently deep to allow the neck of the jar to stand just beneath the run—a piece of wood fixed with a pivot, and a little bit of lead or iron for a counterpoise, served as a path for the mole, and when he was well over the jar his weight caused the end of the wooden path to sink, he slipped off, and the counterpoise reset the trap as it was before, the mole remaining securely caught. This plan was found to be very successful, but it requires, for the sake of humanity, that somebody should visit the jars daily, otherwise each successful trap is tenanted by a party of moles fighting and starving to death. For this reason the plan was abandoned in the only place where I have personal knowledge of its working, and the jars were gradually used up for mouse traps in a kitchen garden, the jar being buried up to the neck in the earth, and the mice falling in over the edge. *E. O.*

Pinus excelsa.—Your correspondent, who objects to my recommending Abies Morinda, will be surprised to hear that Pinus excelsa has proved more hardy than any new Fir; that whereas in the fearful N.E. gales of a fortnight or more past even Hollies, Yews, and Ivy suffered—when Portugal Laurels were nearly denuded of foliage, this tree was very slightly browned on the south side only. And yet, or perhaps because it was in the very teeth of the wind, looking N.E., without the slightest shelter, but thoroughly drained, one of two can hardly be said to be touched with brown, the other only slightly; they are about 8 and 10 feet high, and nearly 400 feet above the sea, facing the Welsh mountains. *Somerset.*

British Tree Ferns.—I can hardly muster courage sufficient to ask Mr. Moore to read this, after such a never-heard-of expression as my sensational heading will doubtless be considered. Nonsense! he will exclaim; have done with it. I should like to hear, however, what he would say when looking at several plants of Lastrea filix-mas, with straight stems 1 foot 6 inches high and 6 inches through. I have potted some quite that height above the soil. I have mossed the stems, which have roots emitted from them, as is the case with Tree Ferns, and keep them damp, so as to allure the roots down the side. I have no doubt they will grow as high again. Being hardy they cannot fail to be of service in flower gardening, ornamenting either grounds or halls, &c., where tropical plants would suffer. As they are leafless in winter it will doubtless be a drawback to them, but a little heat will get over that difficulty. With a little nursing, as above indicated, any one may grow them. If any of your readers have tried them for any number of years, I should be glad to hear the result. *Henry Mills.*

Vine-growing: Restriction *v.* Extension.—"There is a certain time in the life of close-pruned Vines when they refuse to produce either Grapes or timber." So wrote "Thoth," and assuming that he had found this saying in Mr. Cannell's pamphlet on the Vine, I used it for the purpose of eliciting from Mr. Cannell where and under what circumstances he had obtained that experience; for, being a restrictive grower myself, I was anxious to obtain sufficient information to enable me to guard against the rock on which Mr. Cannell had split. Now Mr. Cannell tells us, "this was no theory, but ocular demonstration." Ocular demonstration, I may note, is hardly sufficient as a means of obtaining a thorough knowledge of the Vine; it is necessary to combine the ocular with the practical. The assertion that "there is a certain time in the life of close-pruned Vines," &c., demands from Mr. Cannell a full explanation; awaiting which I may perhaps be allowed to draw attention to a Vine at Whitley Abbey, near Coventry, the seat of E. Petre, Esq. This Vine has been pruned on the spur system for the last 90 years—nay, worse than this, it has once or twice fallen to the axe; and but last autumn Mr. Wilkins, the gardener there, with three bunches cut from it obtained the 1st prize at an exhibition, held under the auspices of the Warwickshire Agricultural Society. It may be observed, however, that Mr. Wilkins lived four years with me as foreman, and no doubt carried with him much of my method of teaching Vines to "speak out," as "Thoth" has been pleased to express it. I am informed there are some fine old Vines at Mawley Hall, in Shropshire, which have been pruned for 45 years on the spur system. Perhaps Mr. Powell, the gardener there, would kindly give some information whether the Vines are still to the fore, and how they have been managed lately. I have never been to Cole-Orton Hall, but from proof given over and over again, it is clear that Mr. Henderson knows how to manage his Vines. I may, however, be allowed to question what relation his system can have to the "extending system," as I have been repeatedly told that the house where for the last 30 years those Vines have been grown is a small one. If this is the case, I cannot see what it has to do with the extending system, or, on the other hand, what right the "extension" party have to hang their argument on Mr. Henderson's practice. If this argument is to be fought out, let it be fought out manfully, and by the "battle of evidences." I remember going to Leicester two years ago, and winning the Royal Horticultural Society's prize for a collection of fruit. It will be remembered by some what my Grapes were like on that occasion, and in the class for single dishes I believe the whole of the prizes were carried off by Mr. Rabone, then gardener to Colin Minton Campbell, Esq., of Woodseat. I don't remember what Mr. Henderson did, but I remember being told that Ashby-de-la-Zouch was not far from Leicester. *Wm. Miller, Combe Abbey Gardens.*

Sowing Carrots.—A few suggestions as to the mode of sowing Carrots for the main crop on heavy soils, which I have found to answer here, may be useful. I make holes with a crowbar at 8 inches apart, and 1 foot between each row; fill up the holes with sand to within 2 inches of the top, and rake in with a small hand-hoe 1 inch of soil. I then put a small pinch of seed into every hole, and the hole is filled in altogether with a coarse rake. The plants are thinned out, so as to stand singly, one in each hole, and the Carrots are as long and clean as if they had been grown in a light sandy soil, not one in twenty having any tendency to become forked. This plan may not be new to some of your readers, but I have never seen it recommended. *A. J. J., Kent.*

Early Peas.—Your correspondent "W. S." (see p. 460), who indorses all that Mr. Maw stated at p. 422, should consider that three weeks is a long time to be behind one's neighbours. By referring to my notebook, I see that Peas were gathered here last season on June 3. They were grown on the old and the best method—*i. e.*, sown on November 16. I have frequently tried the plan recommended by "W. S.," but have always found that those sown in the open ground fairly beat those started in pots or troughs, &c. I have at this time 36 rows, sown on November 12 last, which are 6 inches in height. Perhaps your correspondent will send some to your office when ready; I will do the same; and we shall then be enabled to form some idea as to which plan is most preferable. *R. G., Stamford.*

Position of Plants in relation to Temperature.—Some comparisons of the temperature in high and low situations respectively were made some time since (see pp. 381, 386). This matter deserves attention, but those who take no other guide than the thermometer in finding a suitable situation for what is termed a rather tender tree or shrub will be very likely to be beaten. There are so many local circumstances in every few yards of hill or valley, that these comparisons, if only general, will be futile. Two plants, enjoying equal advanges as regards elevation and other matters—but having a difference in position of a few yards—will be found after a visitation of frost in a state widely different. I have seen the one killed, the other left unhurt. If these circumstances, of position, aspect, &c., affecting certain plants which have endured an unusual amount of cold, were more frequently made known, it would be found a more certain help than a few trials with the thermometer. In my opinion the time required to ascertain the proper average temperature of a situation, is not less than from 10 to 15 winters. The circumstances above alluded to, and which I have noticed have an influence on the endurance of cold by plants, are those relative to the state of the soil, those relating to aspect, and those relative to the motion of the air. Some plants will endure double the amount of cold in well-drained soil that they would in soil in opposite conditions. This is partly explained by the fact that when the whole plant is more fully matured, it resists the action of the frost; thus it often happens that in a low situation, when well drained, it passes unhurt through a winter, while another of the same kind in a more elevated position succumbs for want of the shelter afforded in the other case. The circumstances relating to aspect are often perplexing. Plants are found killed in what are considered favourable situations as regards aspect, when other plants of the same species outlive the same amount of cold in what are considered unfavourable aspects. Plants, for instance, on a southern aspect have been killed when those on the northern have survived. This is explained when the plant is so situated that the sun shines in its full strength upon it in a frosted state; but in other cases it must be attributable to some other cause. Currents of freezing air do much mischief to plants in low situations. Some plants, for example, the Benthamia fragifera, Taxodium or Sequoia sempervirens, or Laurus nobilis, will endure double the amount of frost without suffering, if unaccompanied with wind. Objects which direct or hinder these currents should be studied. While those plants in the direct line are often punished, those a few feet on either side suffer no harm; thus proving that there are, even in very low situations, nooks and corners more favourable to the growth of plants than on higher ground. *H. M.*

The Vines at Raby.—I was glad to hear that the Vines at Raby are now in a flourishing condition. Never having seen them myself, my information respecting their state, after the late Mr. Roberts left Raby, was received from Mr. Shortt, the then gardener there. Every reader of the *Gardeners' Chronicle* at that time must have seen and read his article respecting their deplorable condition, and the late Dr. Lindley had a leading article on the subject, detailing the ills which follow if carrion, or any other rich garbage is used in Vine borders. If some of Mr. Roberts' original Vines, and the border as he made it, are still in existence at Raby, it will upset some of our notions respecting the longevity of Vines when grown in such rich borders. *Thoth.*

Carriage Roads.—I should be greatly obliged if any of your correspondents would tell me of a practical treatise or pamphlet on the making and repairing of carriage roads, as I have one or two roads on my property which require attention. *G. F. M.*

The Grafting of the Hawthorn.—I have long had Lilacs in flower from Christmas onwards, and have often longed to have the English May, or Thorn blossoms to bear them company, but the size of the plants has proved troublesome. Neither do Thorns on their own roots, or grafted on Thorns, force very freely; but once dwarf them on the Quince, and concentrate a maximum of blossom into a minimum of space, by judicious pruning and careful training, and the May will rank in the first class as a forcing shrub. I long to handle such exquisite materials, and desire heartily to thank Mr. Wooler for directing attention to the Thorn on the Quince. I shall soon have some plants of the scarlet Thorn in bloom in pots. But this is late, and I have feared to force it much, as past experience in forcing Thorns has not been flattering. I find it is worth while to force a few Cherries, Plums, Apples, and Pears, in pots for their blossoms only. Peaches or Nectarines are almost as good as Almonds, always, however, excepting the double scarlet and white Almonds, which force admirably, and produce enormous blooms of the purest colours. But the fruit trees combine beauty with utility, and they are worth growing for their beauty alone, especially the Cherries, Apples, and Peaches. No plant hardly blooms so freely as a Cherry tree. They are literally transformed into long sprays of light, feathery whiteness. And the delicate pinks of the Apple are exquisite—few flowers are more useful for bouquets. Peaches and Nectarines are also most beautiful intermixed with Camellias. Nothing can look more spring-like. All these will also set their fruit freely in a warm light conservatory; and if they fail to do so, the flowers at least have been as beautiful as those of most plants grown for their flowers alone; therefore I most boldly advise the growers of fruit trees in pots to bring some of the best of them when in blossom to the conservatory, where they will give an air of the most exquisite freshness. When the flowers droop or the fruits appear,

they can go back to their own quarters; many of the prettiest fruit trees might, however, come back again when their fruits begin to colour. But this I merely offer as a suggestion; the other I strongly advise, from actual experience of their beauty. Apples will bear forcing pretty well, that is, they will bloom freely; but unless the blossoms are carefully set by artificial means, there will be little or no fruit. *Eastern.* [Paul's new double Thorn forces admirably. EDS.]

Late Grapes.—I saw, some week or ten days ago, at the seat of John Noble, Esq., Berry Hill, a few bunches of Lady Downe's Grapes, as perfect in regard to bloom and plumpness as they could be in October. They had been cut for some time, the wood put into champagne bottles, filled with charcoal and water, and hung up in the house at intervals, like the bunches on the Vine, the wood being cut as for pruning the Vine. Nothing could be more successful, as not one berry was shrivelled or mouldy. The Vines were breaking freely in the house, and I was informed by Mr. Roger, the gardener, that the flavour was in every way equal to that at the time of cutting. How much better this than letting the Grapes hang on the Vine until it breaks, and thus weakening it. I think these Grapes would keep for some time yet, perhaps to the end of this month, perfect. In my opinion, the light and free air have a good deal to do with this success. Mr. Roger will, I have no doubt, give you further information if required. *Vitis.* [It would be interesting to know the details of the experiment above referred to. EDS.]

Arboriculture in the London Parks.—This is doubtless prosecuted under difficulties. The public is lynx-eyed to mark faults, and mostly loud in reprobation in proportion to its ignorance. It is also remarkable how little public writers, of wonderful intelligence on all other matters, know about such subjects. To be ignorant of natural history in general, and horticulture in particular, is held to be a venial fault, and is almost looked upon as something virtuous. All this increases the difficulty of managing trees wisely or well under the keen eyes of such a public; but it also becomes a special reason for good management. True wisdom in the end inspires ignorant men with confidence in its competency. And after all, as you admit, there is just ground of complaint. The trees are dying fast; this is, perhaps, inevitable. Nothing is done worthy of the name to supply their place; this is most reprehensible. I am not at all sure that so many of these old trees need die. Little has been done to save them. I have seen wonderful renovations as the result of top-dressings applied to trees. One of the first things that should be done when any tree hoists signals of distress in the form of withered branches, is to remove the turf right down to the surface roots, pick out all the exhausted soil, soak the ground thoroughly with water if dry, and top-dress with good pure maiden loam a few inches more in thickness than the old soil removed. This earth should be made firm by treading or rolling. Within three years the fresh soil will probably be filled with a mass of new roots, and if so the turf should again be unrolled, and another 4 inches of loam added. Even the removal of the turf is beneficial if no new soil is given, the roots seemingly getting impatient of the close ruck of grass roots over them. But the new soil proves new life generally to the plant. Has this plan been tried in the London parks? If not, I commend it to the attention of the authorities concerned. I know it to be efficient from experience. Contemporaneous, however, with these top-dressings there ought to be extensive replantings. Trees do not last for ever, and most of them are but short-lived at the longest in the stifling smoky atmosphere of great cities. Before replanting at all a general plan of the whole ground should be formed, and the best places for effective planting decided upon. Every step taken in the future would then contribute to fill up a portion of a general design, while it could not fail to add to the richness and grandeur of the park or gardens as a whole. Patchwork planting in such situations is simply a waste of time, material, and money. By thus treating our public parks and gardens as each constituting a single and complete landscape in itself, we should gain other advantages besides those that are purely artistic, one of the chief being an entire change of grounds for our plantations of trees and shrubs. In rearranging the scene, the probability is that, as a rule, new and fresh sites would be chosen. This would prove an immense cultural advantage. Were the maiden earth properly trenched, deepened, and enriched, if needful, and the planting skilfully performed, there seems no reason why the young plantations should not make rapid progress. Single trees hardly ever grow very fast anywhere, and they can hardly be expected to make rapid progress in London parks or gardens; but by grouping and keeping the surface fallow, and by using nurses, the growth would be rapid and healthy. It would be an immense gain to get clean away as much as possible from the set of the present timber. But this could not be done. The plan you suggest of trenching the ground, and manuring it, is probably the next best; unless, indeed, the old soil could be removed bodily, and fresh taken from the turfy surface of the park to supply its place. In planting afresh it would also be a good plan to break up the original surface into easy, small, and bold undulations. These might be so managed as to provide shelter, and a variety of aspects and different depths of soil, all of which are of great artistic or cultural importance. *An Arboriculturist.*

Vine Culture in the Open Air.—"W. S.'s" instructive paper on Vine growing in France, and the woodcuts from Mr. Robinson's work illustrating the mode of training adopted at Thomery, are well calculated to draw fresh attention to the old inquiry—Why is the Grape Vine so little grown in the open air in England? The general answer has been, "The climate is against it." But this answer will hardly bear up against the double testimony of experience and of history. As a matter of experience the Vine will thrive tolerably well in all sheltered localities south of the Trent, while few facts are more clearly established than that, wherever the monks of the olden time established a monastery, they proceeded forthwith to plant a vineyard, and eat and drink of the fruit thereof. Now, the climate was much worse in those times than it is now. Large tracts of land were waterlogged at the mouth of many of our rivers, meres everywhere variegated the dry land with miles of marshy waters—and the art of drainage was unknown. Besides, woods and forests abounded, and as these exert a very sensible influence on the rainfall, it is probable that this exceeded very much the present averages. And yet they went on cultivating their vineyards in England. I am not aware of a single monastic vineyard having been abandoned till the destruction of the monasteries, and many of them retain the name of vineyards or vine-fields to this day. So much for the past. Now, what was done in these far-back years may be done now—yes, and much more than that. The climate is better, and skill has advanced at least a hundredfold, and yet Vine growing in the open air has receded rather than advanced. If the warmest places were chosen for the hardier varieties, such as sunny walls, and they were carefully cultivated and thinned in bunch and berries, I have no doubt that out-of-door Grape growing would hold its own in England. Throughout the larger portion of this country almost every cottager who has a southern or western wall to his cottage may sit under the noble shadow of his Vine, and in favourable seasons eat of the ripe fruit thereof. The Vine is worth planting for its beauty alone; and then who is there who would not be proud of its luscious clusters? Possibly there may be some advantages in the French mode of training and pruning. The preliminary stages pointed out by your correspondent, of planting so far from the wall and making the Vine trail towards it, look like expedients to lose time. Such a mode of inlaying may also suit the Vine in France, but I have a decided repugnance to it in England. Plant good Vines at once, 6 inches from the wall, and never bury up the original collar of the plant. Possibly the passage of the sap through the long, bare stems may be conducive to fruitfulness, but I have never found any difficulty in fruiting Vines out-of-doors in favourable localities, nor seen any better method of covering a wall with Vines, nor keeping covered with fruit-bearing wood through a series of years, than that of having three or four rods occupying the height of the wall, bearing partly upon spurs and partly upon the young wood—one rod, the longest, to be cut out annually. In this way a constant succession of wood is maintained, and the annual extension of the wood preserves the roots in a state of healthy activity. Still I do not advance this as a better method than that adopted at Thomery, but it is one that has been tested and proved successful in England. I have also seen Vines in several towns trained on the Thomery plan, but they have been mostly planted in the pavement or roadway, and had been much neglected in the pruning and general management. The coping is a move wholly in the right direction, and either as temporary or permanent may be put down as a condition of success in the successful culture of the Grape Vine in the open air in England. I should like to hear the opinion of Grape growers as to the influence of that long bare stem, if any, upon the circulation and quality of the sap. *Observer.*

Foreign Correspondence.

MUSHROOM CULTURE IN FRANCE. — As your correspondent, "W. P. R., Holwood," desires to know something of the mode of cultivating the Mushroom in France, I have thought that a description of what I saw and was told in visiting one of the old stone quarries a few miles from Paris about a week ago, where Mushroom culture is carried on to the extent of 10,000 *mètres courant* of beds, would be interesting. Before proceeding any further I may state that, although the French are an ingenious people, I have not heard that they have found the means to cultivate Mushrooms profitably without manure, any more than we have, as "W. P. R." seems to have a conviction they have done.

The manure is carted generally from wherever they can get it, with the exception of from racing stables, for the *champignonist* stated that in the latter places a great deal of the manure is laid in the yards and paths for the horses to walk and exercise upon, and when it has undergone this process it is of no use to him. He is therefore obliged to obtain it from other sources where it is not subjected to this treatment, always giving preference to that from working horses. This manure is taken—rough and raw as it leaves the stable—to a piece of ground, which is hard and clean, close to the entrance of the quarry, and when a sufficient quantity is obtained for the renewal of a series of beds it is carefully turned over, well shaken, and watered wherever it may be dry. It is then made into a heap of any size, but not more than 4 feet thick; it is made solid by treading upon it. It remains in this state for eight days, at the end of which time it is again turned, and again a third time after having lain a second eight days: the third turning is generally sufficient to bring it to the proper state required, viz., not too wet nor yet too dry. The being able to tell when it is all right is one of the principal points to insure the success of the beds. It may be known by taking a handful and squeezing it; if it is slightly unctuous without being wet it will do, but it is better if a little too dry than too wet, as it always takes a little humidity after it has entered the quarry.

The entrance to the quarry is generally, where possible, by a gradual descending winding route—large enough for a horse and tumbril, in which the manure is taken to the place required to make the beds. As to the formation of these beds, I refer "W. P. R." to the figure given in the *Gardeners' Chronicle* at p. 989, 1869, which will give him an idea of the parallel manner in which they are placed. No matter what shape the quarry may be, the beds follow every twist and turn in parallel lines, with just sufficient space to walk between them, and that is all. Mr. Robinson's artist has given too much space between them, and I doubt whether at any one time there would be such a quantity of full-grown Mushrooms to be seen at one time in the space represented. Again, as to the taking of the spawn from an old bed, it is a well-known fact that a *champignonist* takes his spawn from a bed that has never brought forth fruit, or from one that has been made for the sole purpose of furnishing the *blanc vierge*, which is always used in preference to any other.

The beds are built up in a compact, neat manner, from 20 inches to 2 feet wide at the base, and the same in height, narrowing gradually towards the top, until finished off in a rather flattened, rounded form, or, as the French call it, *dos d'ane* (donkey's back). They are left several days, till the heat is on the decline, at about 85°, which may be ascertained by placing a ground thermometer in the bed, an instrument the *champignonist* seldom uses, as by continual practice he judges by time and touch. When fit for spawning the operator opens holes in the sides of the beds about the size of three or four of his fingers, and the same in depth in two rows, into which flakes of fresh spawn are introduced, pressing the manure well all round. The first row is about 4 inches from the bottom, and the second 6 to 7 inches above the first, the flakes being placed about 15 inches from one another in quincunx manner. After several days the beds are examined, to see if the spawn has taken; if some has not, and it begins to turn to a dark colour, it is taken out immediately, and fresh pieces are put in by the side of the place, where the other was taken out. When it is seen to run well, the beds are left till it has attained the summit—an affair of six or eight days: and they are then pressed and patted with the hands, and the operation of soiling commences. The soil is brought in baskets on the back, and dropped in heaps between the beds; men follow with small, flat, short-handled, wooden shovels, and quickly cover the beds with about ½ to ¾ inch of soil; as to this latter, in place of having it rich, as is so often recommended, they give preference to the poorest they can find, and the nearest at hand: this they find in any quantity in the quarries that are used, in the form of powdered stone, which is sifted very fine, and is found to answer admirably.

Other points which a *champignonist* observes in the cultivation of this esculent are these:—When he takes possession of a fresh quarry he establishes the entrance, to make it as easy, convenient, and secure as he can; he finds out where there are outlets: if too many, he stops some up—if not sufficient, he makes some if possible; he builds up, over some outlets, chimneys, where he thinks if there were more draught it would be better, to get off the obnoxious vapours that may occur. The utmost cleanliness is observed about the beds, and it is the duty of certain men to go round every morning and pick up any obnoxious *morceau* that may be laying about. One thing that is particularly observed is, to introduce fine soil, such as the bed is covered with, into the hole left wherever a Mushroom has been gathered; and last, but not least, the manure of the spent beds is sold at 55 centimes (5½*d.*) *le mètre courant. W. S., France.*

Societies.

GLASGOW AND WEST OF SCOTLAND HORTICULTURAL: *March* 30.—This, the first show of the season, took place in the City Hall. As a floricultural display it was not equal to many of its predecessors. As regards Hyacinths, there was not that decided quality nor the quantity of plants sometimes seen. Mr. G. Irvine, gr. to T. Blackwood, Esq., Port Glasgow, and Mr. N. Glass, gr. to J. C. Bolton, Esq., Carbrook, took the leading positions. The nurserymen's class was not so well contested as it should have been. Miss Cook deserves special notice for bringing out a lot of well-managed bulbs, grown in water, and the foliage of which was neither blanched nor drawn up from want of light and air, as is the case with indoor Hyacinths improperly tended. This is a fact that

never ought to be lost sight of by window gardeners for at least a month before the blooming period. It has occurred over and over again that Von Schiller has been singled out as the best spike at exhibitions, and we have again the same fact to note. Among Tulips the chaste white Pottebakker, the effective and well named Vermillon Brillant, and the orange and red Tournesol maintained a front rank position. Of the Narcissus Grand Monarque, a fine white, and Soleil d'Or, a good yellow, were incomparably the best. As to Crocuses none can vie with the whiteness and size of Queen Victoria, or be more captivating than the suffused lavender and white Albion. Another bulb that is gaining in importance is the Hippeastrum section of Amaryllids. They afford such great variety, they are not difficult to cultivate, and the whole of them are so ornamental, that we are surprised they are not exhibited in greater numbers at early shows. The Cyclamens from Messrs. Boyd and Walker were well cultivated. Cinerarias were well grown and shown by Mr. M'Dougall and others. A seedling of decided value in the Messrs. Austin's collection, named Countess of Eglinton, had a blue disc, with a prominent ring of white, and then a deep violet ray. Chinese Primroses are seen everywhere just now enlivening the greenhouse or the entrance hall or boudoir. Lily of the Valley is so much sought after that we do not wonder the fine pots of it shown by Mr. Graham, Garscube, were so great a source of attraction. Camellia plants and Camellia flowers were much beyond the average, Messrs. Walker and Boyd having Mathotiana and Countess of Orkney respectively, in praiseworthy condition. Tree Mignonette was very good, although scant in quantity. Azaleas, as usual, were quite a feature of the show. The Tree Ferns from Oak Park House, Mount Vernon, decorated the orchestra, and it is a pity there were not more of them distributed throughout the hall to tone down bright colours, and to assist in breaking uniformity. Mr. Methven, gr. to Colonel Campbell, Blythswood, sent a very meritorious box of Cherries.

The directors, judges, and a few friends, dined, after the Show, in the Crown Hotel. Mr. James Graham, Garscube, presided, and Mr. Thomas Granger, Patrick, officiated as croupier. After the usual loyal and patriotic toasts, Mr. Anderson, Meadow Bank, proposed the "Glasgow and West of Scotland Horticultural Society;" and remarked that he was glad to see a continual infusion of new blood among exhibitors, and especially of new plants upon the exhibition tables.

ROYAL CALEDONIAN HORTICULTURAL.—*March 29 and 30.*—This exhibition consisted of a general display of spring flowers, which were pretty well represented, though Hyacinths were neither so largely nor so well as on many former seasons. The same exhibitors, Mr. Cowe, Luffness, Mr. Currie, Salisbury Green, and Mr. Young, that took a leading position in former years, maintained their place despite the efforts of some new exhibitors. Scarcely anything new was shown. Tulips, Narcissus, Crocuses, and Lily of the Valley, were fairly shown, the latter particularly well by Mr. Lees, Tynninghame, who never repots his bulbs, and yet the foliage and flowers were of such a massive character as to show that he had hit upon a more excellent way of growing than other competitors. The same exhibitor had a very well bloomed plant of Phalænopsis Schilleriana, with as many as 200 flowers upon it. The plant, however, had lost its centre, through age, and would require to begin a new life with the lateral or laterals that are likely to spring from the base of the old growth. Plants of fine foliage were well contributed by Mr. Thomson, of Dalkeith, and Azaleas and flowering plants generally came in a good state of cultivation from Mr. Paterson, Millbank, and from Mr. Gordon, Niddrie. Cyclamens were shown in grand style by Messrs. Downie & Co. The persicum in its several varieties, from pure white up to deep red, quite captivated the promenaders. Placed beside them were a batch of extraordinary Primulas, with leafy calyces, shown in fine style by Mr. Isaac Anderson-Henry. They are, indeed, exceedingly interesting, not only from a morphological point of view, but from their general decorative appearance. Anything touching upon these things must be exceedingly interesting from the pen of the raisers, and we understand a full narrative has already been placed in the hands of the Scientific Committee of the Royal Horticultural Society. A very fine flowered example of a Himalayan Rhododendron came from Mr. Macintosh. It has somewhat of the general appearance of Falconeri in habit and in leaf, but is a much stronger grower, and a much freer bloomer. The great trusses of flower were uncommonly attractive, being so much bigger than any compeer. Then the flower is faultless, and the colour pure white, with a deep crimson blotch or star at the base of each segment. It was ticketed for sale at 100 gs. Mr. Methven had a splendid sample of that gem of gems among Maidenhairs, Adiantum Farleyense; and Mr. Knight had Acacia Riceana, one of the most graceful among the pendulous leaved Acacias.

The fruit was a capital exhibition. Seldom have we seen such a fine lot of Apples at a northern show, all being well coloured and generally well conserved. Mr. Knight, of Floors, had a remarkably good collection of both Apples and Pears in over 20 varieties. Mr. Anderson, Oxenford, had 13 good sorts of Pears. Mr. Baxter, gr. to Sir W. Gibson Craig, Riccarton, had also a good collection. Mr. Lees and others had beautiful fruit. Mr. Thomson had both black and white Lady Downe's. Mr. Temple, Balbirnie, had some very well kept samples of Lady Downe's. Mr. Mackay, The Glen, Peebles, had the best June Apples; and what with the collections this table was decidedly the most interesting in the exhibition.

Vegetables were in very good order, especially the collection from Dalkeith, which comprised by far the best Mushrooms we ever saw, large, beautifully coloured and solid, so different from the flat, forced-like samples that were shown alongside of them. Mr. Thomson attributes his success chiefly to the use of the Mill-track spawn. In addition to that the same exhibitor had good French Beans, new Potatos, Seakale, Asparagus, &c. The Leeks, as usual, were tremendous in size—so large, indeed, as to justify the remark, *cui bono?* Considering the very inclement season, the display in this department was above an average.

Notices of Books.

The Ferns of Southern India, *being Descriptions and Plates of the Ferns of the Madras Presidency.* By Captain R. H. Beddome, Officiating Conservator of Forests. Madras: Ganz Brothers, 1863-5. (Van Voorst.)

The Ferns of British India, *being Figures and Descriptions of Ferns from all parts of British India, exclusive of those figured in "The Ferns of Southern India and Ceylon."* By Major R. H. Beddome. 2 vols. Madras: Ganz Brothers, 1866-8. (Van Voorst.)

In producing the three quarto volumes whose titles are recited above, Major Beddome has done a good service to students of pteridology, by providing them with a series of nearly 600 plates, which, though here and there somewhat coarse, and in some cases quaint in execution, are, on the whole, very useful and characteristic outline portraits of Indian Ferns. The former of the two works, restricted to South Indian Ferns—the commencement of which was long since noted in our columns — contains 270 full-size quarto plates, accompanied by upwards of 80 pages of text, the specific descriptions being mainly quoted from Hooker's "Species Filicum," and the generic characters and classification from Moore's "Index Filicum." The plates show a general view of the plant figured, or when that is too large for this, represent a sufficient portion to give a fair idea of its aspect and character, this general figure being accompanied by separate enlarged figures, showing the venation and fructification, generally very accurately rendered.

The later work, devoted to Indian Ferns generally, is of the same size and character as the former, with this exception, that the description or descriptive note is brought opposite the plate on a separate leaf, and is thus far more convenient of access. It consists of two volumes, each containing 150 plates, and thus illustrates 300 species.

To those who are engaged in the study of Ferns generally, or of Eastern and Indian Ferns in particular, these volumes are indispensable. They are necessarily somewhat costly, and we fear can scarcely be remunerative. We are therefore glad to take this opportunity of inviting attention to them, and of recommending them as worthy a place in every working botanical library, for full-size figures, like those in question, are invaluable aids in the determination of species, and the occurrence of so full a series renders the present volumes all the more useful and important to this end. If the nomenclature adopted admits here and there of some slight criticism, it may generally be commended as sound and reliable. A few new species are described.

A new edition of Mr. Frederick Edwards' work, **Our Domestic Fireplaces** (Longmans), has recently been issued. It will amply repay perusal, as it contains a large amount of useful information put in an attractive and readable form. Thanks to Count Rumford, Dr. Arnott, and others who, like our author, have devoted much time and consideration to the matter, considerable changes for the better have been made. Our modern stoves, with all their faults, are great improvements upon their predecessors. There are many reasons why progress in this particular is not, and can hardly be rapid; a radical change, such as the introduction of the Continental system of close stoves, could hardly be effected, even were it desirable, which we think not proven. Our author cites several means by which our present style of stove may be retained and improved in many ways, so as to secure to the inmates of our rooms the largest amount of heat at the smallest expenditure of fuel. These suggestions are of a practical nature, and we strongly commend them to those "about to build." Heating by hot water receives somewhat scanty treatment at the hands of our author, and yet the circulation of warm water through halls and passages would do away with many of the objections consequent on the present system of open fireplaces. Moreover, if proper arrangements be made during the building of the house, the extra cost is little in comparison with the comfort and advantages of the system. We are presuming, of course, that the pipes are fixed by some competent person—too often they are arranged by some ignorant workman, and all sorts of inconveniences and discomforts arise, of which this last winter gave ample evidence. Where it is required to keep a fire for a length of time, nothing is simpler than the plan advocated by the *Builder*. A plate of thin sheet iron, or even a sheet of brown paper, is placed at the bottom of the grate, and on this the coal is placed or rather packed somewhat closely. The wood is laid at the top, so that the fire burns from above downwards, giving off no smoke, and remaining a-light for many hours, 8—12 for instance, without needing any attention. For warming bedrooms or rooms not in use this plan answers on the whole admirably, one drawback being, that the fire is somewhat difficult to light, and another, that it does not secure a pleasant-looking fire, as there is no flame; but this is no disadvantage for the purposes we have mentioned.

Messrs. Keith Johnston have issued another of their very low-priced Atlases, in the shape of a series of **Maps of the British Empire.** Though the cost is so very small, the maps are clear and good, and contain far more information of an accurate character than the price would seem to indicate. The accompanying letterpress is not quite so worthy of commendation.

M. Miquel continues to publish his **Nouveaux Matériaux pour servir à la Connaisance des Cycadées.** In his last publication M. Miquel points out certain errors into which M. A. De Candolle has fallen in his account of the order in the "Prodromus," and gives a list of all the recent Cycadeæ, grouped according to their natural affinities. M. Miquel enumerates in all 64 species, of which 23 belong to the genus Zamia, 15 to Cycas, 12 to Encephalartos, 8 to Macrozamia, 5 to Ceratozamia, 1 to Dioon, 1 to Bowenia, 1 to Stangeria. Of these 27 species belong to America, 13 to Africa, 11 to Asia, and 13 to Australia.

The last two parts issued of M. Baillon's elaborate **Histoire des Plantes** are devoted to the Papilionaceæ and the Proteaceæ respectively. The work is encyclopædic in its character, the woodcuts excellent, but the text more and more illustrates the fact that M. Baillon has been too ambitious. The work he has cut out for himself is so vast that it is impossible every part of it can be worked up with equal care. Nevertheless, the publication is a splendid one.

Considering the low price at which they are issued, the series of booklets entitled the **Shilling Peerage, Baronetage, Knightage,** and **House of Commons** respectively (Hardwicke), may be commended as serviceable and accurate.

The Apiary.

I HAVE a small super full of combs and honey. The honey I do not value, as it is not clear or well flavoured, but I think the combs are a prize, if I could only get them emptied. Could I begin now to put the super out in the bee shed, for the bees to feed upon during the hours they are flying about? *Subscriber.*

[There is always a certain amount of risk in exposing honey for the purpose of having it robbed by the bees of an apiary. At this time of the year it is particularly dangerous to do so, as it is very apt to excite the bees of strongly populated but poorly provisioned hives to attack their weaker neighbours. Valuable as a super, more or less filled with clean empty combs, undoubtedly is, yet we think the advantage which it offers may be dearly purchased. Even if the proffered booty does not transform the bees of an apiary from industrious workers into persistent marauders, yet it is very probable that a considerable amount of free fighting will take place in and around the super, and that many deaths will be caused. The life of every bee is particularly valuable now, more so than at any time later in the spring or summer. We generally, under the circumstances above described, cut away the comb holding honey, or contrive to cut or break away the covering of the cells, and then place the super on the stock which is intended to fill it. Most, if not all the honey, will be removed by the bees, the combs repaired, and the cells elongated. We must at the same time confess that we have, before now, given out supers to be cleared of old honey before putting them on the stocks, and often with no very apparent ill effects; but if done at all, the super ought to be placed not less than 50 yards away from the nearest hive, and on no account in or near the bee-house. The afternoon of a fine day is the best time, and by taking care to remove the super the same evening, perhaps but little mischief may accrue. It would be better to unseal as much of the comb as can be got at, that the work of pillage may be more rapidly accomplished.]

Miscellaneous.

WINE-GROWING. — Dr. Wilhelm Hamm, an official of the Austrian Ministry of Agriculture, and well known as the author of the "Weinbuch," has constructed a Weinkarte, published by Costenoble, Jena, exhibiting at a glance the topography, climatology, and statistics of wine-growing in Europe and the islands of the Atlantic. The habitats, climates, and quantities produced; the various growths and qualities of each; and the wine measures, &c., are all indicated in the map. *Nature.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Cape Pelargoniums will now be growing away vigorously. If amongst the growths there are any weak or unnecessary shoots, it would be as well to cut them out at once, and so give more room and root support to those which remain. Their pots will now be more or less filled with roots, so that alternate waterings with wholesome clear liquid manure will benefit them much. Turn each plant round frequently in such a manner that all sides in their turn may have an equal supply of light and air. Bear in mind that, in regard to these, an abundance of room is conducive to a healthy robust growth. Sprinkle the plants freely all over morning and afternoon with clear water, which has been previously warmed in the sun. Keep all

such plants as near to the glass as possible, and proceed with the staking and tying out of all successional plants which require such attention. *Gesneras* and *Achimenes*, the latter especially, will now want almost daily attention. Proceed with the potting of any of these plants as soon as they are sufficiently advanced in growth. A compost formed of leaf-mould and good fibry peat in equal parts, with a moderate quantity of silver sand, will suit them well. Whilst ensuring a thorough drainage do not press the soil down too firmly into the pots, but rather pot lightly. Place them into a position where a temperature ranging from 70° to 75° is maintained. Give abundance of atmospheric humidity and frequent surface sprinklings. Above all things, guard the tender growths from anything like drought, and shade them effectually at all times whilst actively growing. Give *Allamandas* a shift into equal parts peat, loam, and leaf-mould ; keep them as near to the glass as possible, and syringe them freely and frequently. Put in cuttings of such kinds of *Begonias* of the flowering section as are most in demand. B. Veitchii should be more frequently grown for greenhouse decoration. × B. Weltonensis and × B. Digswelliensis are much esteemed for cool stove flowering, being very showy desirable varieties in their respective seasons of flowering. Begonias which have done flowering, and especially those with ornamental foliage which are not grown for their flowers, should now have a shift into pots one size larger, and in good rich fibrous material, composed of peat and leaf-mould, with a sprinkling of silver sand. Give the roots of all climbing plants planted out into borders in any form of structure a copious watering with water that is not too cold. Syringe well during the continuance of fine weather all plants in greenhouses which are not in flower. Pinch back the points of young shoots upon varieties of *Kalosanthes*, if these are wanted to bloom late. If any are required in bloom early, they should not be so treated, but may be placed in a house with a somewhat warmer temperature than the structure they have hitherto been grown in. Shut greenhouses up early during the prevalence of keen winds and cold nights ; leave them open as long as is practicable when the air is soft and balmy.

FORCING HOUSES.

Such varieties of *Grapes* as the Muscat of Alexandria, Lady Downe's, White Nice, Royal Vineyard, and even the Black Alicante, which are now in flower, should have the hand drawn over them, to insure the more perfect fertilisation of every flower. A fine dry period of the day, when a free supply of air can be admitted and the pollen is ripe, should be chosen for the process ; gently jerk each bunch with the hand singly in such a manner that the pollen escapes freely from the stamens and falls plentifully upon the stigma. Gardeners are somewhat divided in opinion as to the amount of aërial moisture which is necessary for the successful setting of the blooms. Some recommend a dry atmosphere, which is the safest plan for an amateur to follow. Others, and they have Nature for their guide, give a nice soft humid atmosphere, by freely damping all internal surfaces at least four times within the 24 hours. Those who have Grapes changing colour should not relax their efforts to keep up a nice warmth in the outside borders. Where no properly heated materials are at hand, let the surface of the border be freely exposed to the sun's warmth by day, and covered up well at night with some warm material, so as to keep in the warmth collected in the daytime, and to allow as little radiation as possible. Give to all *late Vineries* an abundant supply of fresh air and frequent syringings on fine days. Red spider will now commence to make its appearance in all kinds of forcing-houses in which the foliage has become somewhat hardened or advanced in growth. Be assiduous in the use of the syringe. Splash water about freely, and paint the pipes and side-walls over with freshly slaked lime and flowers of sulphur, well mixed up together, in the way of whitewash. In regard to *Pines* be very careful at this season not to force unduly the young stock into making a too drawn or quick growth. If a mean temperature, averaging about 58° or 60° be maintained, with abundance of air at all proper times, and be given carefully, so as to avoid direct draughts, it will be amply sufficient to encourage a good root formation, and a stiff sturdy growth. Thin out the fruits on *Peaches* and *Nectarines* where they are found too thick, after the stoning process is complete. Bear in mind at this juncture that no stint of root moisture should occur, but do not apply water which is colder than about 65°. It is important to notice, that the larger or older the trees of either are so much the more water should be given to the borders, the roots having gone further in search of sustenance than those upon younger plants are likely to have done. Fumigate *Strawberry* plants, which have just set their blooms, as a preventive of insects, which invariably increase quickly at this season.

HARDY FRUIT GARDEN.

Should the weather continue dry, or if there is only a partial soaking of rain, it will be necessary to give all newly-planted *Fruit Trees* a good soaking of water at the root. Afterwards—if not already done—well mulch the surface of the soil at the base, with partly decomposed manure. Destroy every wasp, and hornet also, at this season. Each one that survives the winter becomes the parent of a numerous progeny during the next few months.

HARDY FLOWER GARDEN.

Where the weather continues dry, it will be advisable to give a good watering to all freshly-laid *Turf*, and especially to such as has been laid recently, or late in the season. Give to all plantations of *Ranunculus* which are now showing through the ground, a nice surfacing with finely-sifted rotten leaf-mould. Protect your choicest flowers of *Pansies* from slugs or other nocturnal depredators, which injure them much at times, the mischief being done when too late to be remedied.

KITCHEN GARDEN.

Things are looking more hopeful now amongst our kitchen garden crops. Perhaps the young plants in rows of *Peas*, *Beans*, &c., never looked better than those which were sown somewhat late, or transplanted. Use the hoe freely amongst all such crops now, and by well earthing-up all that need it, induce a quick sturdy growth. The earliest Peas must be staked forthwith. These, as a rule, are dwarf kinds, averaging 3 to 4 feet. Place the sticks somewhat thicker than ordinarily, as an additional inducement to growth, and as a protection against cold winds and spring frost. Cotton or worsted dipped in paraffin, and stretched along the rows, is a sure deterrent of birds, which peck them about unmercifully at this season. Sow a few *Dwarf French Beans* upon a warm sheltered border, with a sunny aspect. Give autumn-sown *Cauliflowers* a copious watering with good thick liquid manure, and draw the soil well up around their stalks. Harden-off *Tomatos*, *Capsicums*, *Sweet Basil*, &c., by full exposure to the air on all proper occasions, and sow seeds of *Herbs*, *Vegetable Marrows*, &c., where this has not already been done. *W. E.*

TOWN GARDENING.

Dandelions, *Daisies*, and other weeds will now be making their appearance in *Grass Lawns*, and should immediately be taken out with as much root as possible, for if any be left in they will be a continual nuisance. A little white Dutch Clover seed should be sown in their place. The lawn should be well rolled, and the edges neatly trimmed with the edging iron. It will then present an agreeable appearance, and render the Grass much easier to mow. *Gravel Walks* that have been newly laid or turned should be rolled once or twice a week, to make the walks firm and easy to walk upon during the summer. Look well to the watering of such trees and shrubs as have been planted this spring, for success in their culture much depends upon this treatment. Plants that have been wintered in frames should now have all the dead leaves picked off. The soil should be stirred, the pots turned round, and the lights taken off in fine weather, to give them as much air as possible to prepare them for turning out. The *Passiflora cærulea*, *Cobœa scandens*, and *Periploca græca*, are all rapid climbers, and are well adapted for growing in town conservatories. They should now be potted into 16-size pots, with plenty of crocks in the bottom for drainage, in soil composed of rich sandy loam. Place them in the position they are intended to occupy, and see that they are well watered, and occasionally syringed over the tops on warm afternoons. *F. D.*

The following Table, showing the State of the Weather at Blackheath for the week ending April 6, was omitted last week, owing to its not having reached us in time for publication :—

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, APRIL 6, 1870

1870 Month and Day.	At 9 A.M. Reading of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
March and April.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
31. Thurs.	30.15	35.2	34.3	32.9	91	2.2
1. Friday	30.09	36.2	35.7	34.9	95	2.4
2. Satur.	30.11	43.4	40.4	36.8	78	2.5
3. Sunday	30.26	48.3	42.1	35.3	61	2.4
4. Monday	30.36	37.4	35.3	32.2	09	2.6
5. Tues	30.32	38.1	36.2	34.0	100	2.5
6. Wednes	30.00	45.5	41.3	39.3	71	2.5

1870 Month and Day.	Temperature of the Air					Wind.		Rain.
March and April.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 50 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
31. Thurs.	47.2	27.9	20.4	37.1	— 7.3	N.E.	100	0.00
1. Friday	48.7	30.8	17.9	37.0	— 6.7	E.N.E.	140	0.00
2. Satur.	67.5	36.1	30.4	41.1	— 3.7	Calm	115	0.00
3. Sunday	54.1	30.0	24.1	40.8	— 4.2	E.N.E.	175	0.00
4. Monday	52.9	26.9	26.0	38.1	— 7.1	E.	105	0.00
5. Tues	50.0	31.8	17.2	44.1	— 1.3	E.	160	0.00
6. Wednes	65.5	28.0	37.5	45.4	0.0	Calm.	140	0.00

March 31.—Variable amounts of cloud were prevalent throughout the day. Generally fine.
April 1.—Generally cloudy till noon ; afterwards cloudless. Very fine. Frosty at night.
" 2.—Cloudless throughout. Haze and fog prevalent about 8 A.M. Frost at night.
" 3.—Cloudless throughout. Very fine. Frosty at night.
" 4.—Cloudy in the early morning ; cloudless afterwards.
" 5.—Overcast till 10 A.M. Cloudless during the remainder of the day. Aurora borealis at night.
" 6.—Cloudless throughout. Very fine day.

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, APRIL 13, 1870.

1870 Month and Day.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
April.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
7. Thurs.	29.98	54.4	46.3	38.2	55	2.9
8. Friday	29.57	57.4	49.0	41.2	59	3.1
9. Satur.	29.46	47.2	40.0	44.7	92	3.4
10. Sunday	29.93	49.4	42.3	37.8	72	2.9
11. Monday	29.95	48.9	46.0	42.8	83	3.1
12. Tues.	30.01	52.5	47.2	41.9	68	3.0
13. Wednes	30.00	52.1	47.8	43.2	77	3.1

1870 Month and Day.	Temperature of the Air.					Wind.		Rain.
April.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 50 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
7. Thurs.	65.4	30.0	29.4	50.6	+ 5.7	S.W.	205	0.00
8. Friday	63.0	41.3	21.7	51.9	+ 6.5	S.S.W.	200	0.00
9. Satur.	58.7	42.5	16.2	46.9	+ 1.6	S.S.W.	325	0.07
10. Sunday	61.6	38.1	23.5	49.4	+ 4.2	W.	215	0.07
11. Monday	60.5	37.8	22.7	47.8	+ 2.7	W.	215	0.00
12. Tues.	60.4	37.0	23.4	47.2	+ 2.2	W.S.W.	280	0.00
13. Wednes	61.8	39.7	22.1	49.2	+ 4.3	W.S.W.	230	0.00

April 13.—Small amounts of cloud prevalent. A very fine day. Hazy. Lunar halo.
" 14.—A fine day. Solar halo.
" 15.—Large amount of cloud prevalent till the evening ; then cloudless. Rain fell heavily about 2 P.M.
" 26.—Variable amounts of cloud prevalent. Showers of rain in afternoon. Thunder heard about 2 P.M.
" 17.—Generally cloudy
" 18.—Variable amounts of cloud. Generally fine. Lunar corona and halo.
" 19.—Generally cloudy, but fine.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, APRIL 9, 1870.

Names of Stations	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	61.4	29.4	32.0	50.7	33.9	22.8	43.6	0.10
Blackheath ..	65.5	26.0	39.5	50.8	31.7	19.4	45.5	0.07
Croydon ..	61.7	20.9	34.8	50.8	24.1	22.7	44.0	0.09
Birmingham ..	63.0	29.7	33.3	48.5	35.4	21.1	45.5	0.03
Wolverhampton	65.1	31.5	33.6	48.7	36.3	22.4	46.1	0.08
Leicester ..	66.2	26.0	40.2	48.2	28.0	20.2	45.0	0.24
Norwich ..	64.2	29.0	35.2	57.9	34.3	21.6	49.2	0.04
Nottingham ..	64.1	27.4	33.9	58.6	33.5	25.1	44.6	0.01
Sheffield ..	64.8	24.6	40.2	58.1	31.8	26.3	46.2	0.36
Liverpool ..	59.5	31.6	24.0	56.0	30.8	17.1	47.0	0.42
Manchester ..	61.1	30.0	34.1	60.8	35.0	24.8	46.5	0.49
Salford ..	62.7	31.1	31.6	59.0	37.3	21.2	46.1	0.47
Bradford ..	58.6	31.5	25.1	56.8	38.2	18.6	46.1	0.00
Leeds ..	62.0	31.0	31.0	58.1	35.7	22.7	45.2	0.00
Hull ..	62.0	31.0	31.0	58.1	30.3	27.8	42.8	0.17
Newcastle ..	58.0	30.0	22.0	54.3	41.3	13.0	47.4	0.08
Edinburgh ..	57.7	33.0	24.7	..	..	..	41.0	0.29
Glasgow ..	60.1	30.5	25.8	..	..	..	43.0	0.27
Dundee ..	56.0	34.0	22.0	..	..	..	43.7	0.50
Aberdeen ..	50.2	27.4	26.8	..	..	..	41.7	0.01
Paisley ..	57.8	31.0	26.8	..	..	..	44.5	0.19
Greenock ..	53.5	34.5	19.0	..	..	..	44.7	0.45
Leith ..	60.2	33.7	26.5	..	..	..	49.0	0.17
Perth ..	50.0	33.0	26.0	..	..	..	43.3	0.05
Dublin ..	61.5	29.0	32.5	..	..	..	46.5	0.12

JAMES GLAISHER.

Notices to Correspondents.

ABYSSINIAN PUMPS. Can any correspondent favor us with their experience of these machines, for garden and hothouse purposes ?

BOOKS : *Harold*. Probably Thompson's "Gardener's Assistant," will suit you.

COTTAGE AND WINDOW GARDENING. We have received so many communications on this subject that we beg leave to state that *we* have not offered prizes for essays on these subjects.

LEAVES : *T. S.* We are not aware of any particular objection to the mould obtained from a heap of leaves, in which there are Laurel leaves.

NAMES OF PLANTS : *M. Sullivan*. Your plant is Aristolochia grandiflora var. Hookeri. It is the A. gigantea, incorrectly so named, of the "Botanical Magazine." Please oblige us with another flower.—*C. W.* Scopolia carniolica.

UNFRUITFUL FRUIT TREES : *B. W.* 1. It is most probably the want of water that is the cause of their not setting and their being hard. Mulch the roots of your trees in summer, and water liberally in dry weather, or if you can add some heavier soil about the roots to your light stuff it will materially improve their fruit bearing. 2. There are many shallow growing plants which would do to ramble and shade the ground amongst your Rhododendrons, such as Vacciniums, Periwinkle, St. John's Worts, &c., but all, instead of preserving the moisture in the soil, absorb it immensely. Plant your Rhododendrons thickly, so that they of themselves may shade the ground, or mulch the ground in summer.

VINES AND PEACHES : *W. Wright*. 1. Yes, you may take off the loose bark from your Vines, but do not scrape them, as is very frequently done. 2. Yes, syringing your Peach trees, which are just coming into bloom, will injure them ; wait until the fruits are set, then do it vigorously, and maintain a moist atmosphere in your house.

VIOLETS : *Young Gardener*. The Neapolitan Violet was

probably obtained from Italy, since it appears to be what the French call the Violet of Parma, but we find no mention of its origin in any book to which we have referred.

COMMUNICATIONS RECEIVED.—W. P.—J. C. C. B. S., St Saviour's, and H. C. (cuttings received, with thanks).—QUO.—F. S. D.—J. T.—H. M.—W. P. A.—L. V. H.—W. H.—J. W.—R. M.—D. T. F.—D. M.—A. V.

Markets.

POTATOS.—Southwark, April 11.

During the past week the arrivals coastwise have been light, and first-rate lots have made more money, but inferior or second-rate samples sell slowly. Quotations:—Yorkshire Flukes, per ton, 100s. to 130s.; Ditto Regents, 90s. to 120s.; Lincolnshire Regents, 90s. to 100s.; Dunbar and East Lothian do., 100s. to 120s.; Perth, Forfar, and Fifeshire do., 80s. to 100s.; Ditto Rocks, 80s. to 90s.; Ditto Reds, 75s. to 85s.; French and Belgian Whites, 65s. to 75s.

COVENT GARDEN.—April 14.

We have had a quiet week, and there is an increased supply. Strawberries and hothouse Grapes are more than sufficient for the demand. French goods now comprise Asparagus, Kidney Beans, young Carrots, salading, and Cauliflowers. Flowers are plentiful and good, comprising Azaleas, Fairy Roses, Hyacinths, Cyclamens, Tulips, French and Scarlet Pelargoniums, Heaths, &c.

FRUIT.	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	3 0	5 0	Melons, each	—	—
Cobs, per lb.	0 9	1 0	Oranges, per 100	3 0	7 0
Filberts, per lb.	0 0	0 0	Pears, per doz.	4 0	10 0
Grapes, per lb.	10 0	20 0	Pine-apples, per lb.	8 0	10 0
Lemons, per 100	4 0	12 0	Strawberries, p. oz.	0 6	1 0

VEGETABLES.	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 0	15 0	Horse-Radish, p. bun.	3 0	5 0
Artichokes, p. doz.	2 0	3 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 0	2 0
Broccoli, per doz.	1 0	2 6	Mint, per bunch	1 0	1 6
Brussels Sprouts, p. ½ sieve	2 0	3 0	Mushrooms, p. pottle	2 0	3 0
Cabbages, p. doz.	1 0	1 6	Onions, per bunch	0 4	0 9
Capsicums, p. doz.	1 0	1 6	Parsley, per bunch	0 2	0 4
Carrots, p. bunch	0 4	0 8	Potatos, new, p. lb.	0 4	0 6
Cauliflowers, p. doz.	1 6	3 0	Salsafy, per bundle	1 0	1 3
Celery, p. bundle	1 0	1 6	Scorzonera, do.	1 0	1 3
Cucumbers, each	1 6	2 0	Seakale, p. punnet	2 0	2 6
Endive, per doz.	1 6	2 0	Shallots, per lb.	0 8	—
French Beans, p. 100	2 0	4 0	Spinach, p. bushel	2 0	3 0
Garlic, per lb.	0 8	—	Radishes, per doz.	1 0	1 6
Herbs, per bunch	0 2	0 4	Turnips, per bunch	0 4	0 6

Potatos, York Regents, per ton, 80s. to 110s.; Flukes, do., 80s. to 140s.

Delicious New Grape.

MR. WILLIAM BULL has a large stock of good, strong, well-ripened CANES of MADRESFIELD COURT BLACK MUSCAT, at 15s. and 21s. each.

☞ Thousands of LILIUM AURATUM, of all sizes, to offer.

Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonyms, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for 1 stamp

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

To Seed Importers, Nurserymen, &c.

PETHAM AND SON, Custom House, Shipping and General Transit Agents, beg to inform them that they receive and forward SEEDS, PLANTS, and GENERAL MERCHANDISE, from and to all parts of the world, at charges as low as possible

Office, 6, Lower Thames Street, London, E.C.

Chrysanthemums.

ADAM FORSYTH begs to inform the Trade and the Public, that he is now sending out his "NEW" and other CHRYSANTHEMUMS.

Descriptive list (containing a Treatise on their growth) now ready. Forwarded to all applicants for one stamp.

Brunswick Nursery, Stoke Newington, N.

EVERGREEN HEDGES.

AMERICAN ARBOR VITÆ, 4 to 5 feet, at 40s. per 100; 5 to 6 feet, at 60s. per 100

SIBERIAN ARBOR VITÆ, 2 to 3½ feet, 20s. per 100; 3½ to 4 feet, 30s. per 100; 4½ to 5 feet, 60s. per 100; 5½ to 6 feet, 80s. per 100.

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RICHARD SMITH'S LIST of EVERGREEN and DECIDUOUS SHRUBS, RHODODENDRONS, STANDARD ORNAMENTAL TREES, CLIMBING and TWINING PLANTS, with their generic, specific, and English names, native country, height, time of flowering, colour, &c., and general remarks, free by post.

RICHARD SMITH, Nurseryman and Seedsman, Worcester

HARDY HEATHS, in 50 varieties, free of package:—

24 plants, in 12 varieties, two of each for 7s.

48 plants, in 24 varieties, including choicer varieties, for 18s.

100 plants, in 50 varieties, for 35s.

100 plants, in 24 varieties, for 30s.

100 plants, in 50 varieties, for 50s.

Many Varieties can be supplied at the 100. See CATALOGUE

JAMES SMITH, Darley Dale Nurseries, near Matlock

TO THE TRADE.—

1½ SEEDLING HOLLY (very stout)

ARBOR VITÆ, 6 to 9 inches, 10 to 12½ foot.

SCOTCH FIRS, 4 to 6 inches, 10 foot.

PINUS LARICIO, 9 to 18 inches.

PINUS AUSTRIACA, 9 to 18 inches.

PINUS INSIGNIS RADIATA, 9 to 18 inches.

Apply to JOHN WATERER, Knaphill Nursery. A very fast growing Pine, and safe mover. Price on application to

J. THORNTON, Heatherside Estate, Bagshot, Surrey

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at greatly reduced prices, in order to clear the land for building purposes.

Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and ORNAMENTAL TREES generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.

To Gentlemen wishing to improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and shrubs is seldom to be met with.

Nursery and Seed Stores—Walton-on-the-Hill

Seed Warehouse, 15, Queen Square

Liverpool, April, 1870.

Golden Feather.

H. CANNELL begs to remind all who wish to have an edging of this elegant yellow, form like pilant, and so have it in perfect with other bedding plants, that now is the identical time to sow it (not earlier). 400 new seeds sent free for 13 stamps

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Wimbledon.

Beta chilensis.

BUTLER, McCULLOCH, AND CO. are enabled to offer SEED of the TRUE variety of this magnificent foliage plant; it is quite distinct from Beta brasiliensis, and is fully described in their SPRING CATALOGUE, sent post free for 1 stamp and 6*d.* per packet.

South Row, Covent Garden Market, W.C.

Established upwards of a Century.

RICHARD SMITH'S SEED CATALOGUE contains a Calendar of Time for Sowing, particulars of Collections, with Prices, Directions for Cropping small and economically, Soil, Manure, Depth, Distance, Season, Hardiness, Duration, Form, Height, Colour, Storing, Use, Flavour, and other qualities described. This List free by post for one Stamp. Seeds direct from the Growers, the surest way to success

RICHARD SMITH, Seed Merchant, Worcester

Verbenas, Verbenas.

PHILIP LADDS is now sending out purple, white, scarlet, and pink VERBENAS, including new varieties of 1868, at 2*s.* per dozen, 16 sorts; 24 New FUCHSIAS of 1869 at 3*s.* per dozen, in pots; 25 varieties of BRONZE GERANIUMS, 6*s.*; 12 new varieties of GRAY'S NUMS, 1869, 18*s.*; CRYSTAL PALACE GEM, 2*s.*; 12 varieties of ZONAL GERANIUMS, 1868, 2*s.* GERANIUM VESUVIUS, best bedding scarlet, 20*s.* per 100.

Nursery: Bexley Heath, Kent.

New Roses of 1870, from Paris.

LÉVÊQUE AND SON, 132, Boulevard de l'Hôpital, at Paris, have strong healthy plants of all the NEW SORTS (88 sorts—LIST on application). Price 19*s.* per dozen. They particularly recommend as good the 12 following:—T. R. Madame Ducher, Madame Lexet and P. Eugène Verdier, A. de Humboldt, Prince Bonbe, Charles Turner, Dominée, d'Oxford, General Mihradowitch, Louis Van Houtte, Susannah Wood, Madame Laurent. Moss P. Madame W. Paul

HENRY BAILEY begs to call the attention of the Trade and his extensive clientèle to his PHLOXOTYPES, FUCHSIAS, ROSES, HYDRANGEAS, &c., now coming into flower, grown for furnishing purposes, &c. H. B. has a few extra size PELARGONIUMS, suitable for Table or Vase Plants. Price on application. Cash or reference attended. Terms, cash. Nursery adjoining railway station on South-Western line.

Royal Nursery, Feltham, W.

TRICOLOR PELARGONIUMS.—In strong Plants, at the following low prices per dozen, for cash:—Mrs. Pollock, 2*s.* 6*d.*; Distinction, 3*s.*; Lady Cullum, 2*s.* 6*d.*; Dunnetianum, 3*s.*; Italia Unita, 3*s.*; Picturata, 3*s.* 6*d.*; Gold and Bronze Zonals.—Beauty of Calderdale, 3*s.* 6*d.*; F. G. Henderson, 6*s.*; Duke of Edinburgh, 9*s.*; Lucy, 12*s.*; Nestor, 2*s.* 6*d.*; Nemesis, 2*s.* 6*d.* Baskets and Packing, 1*s.* for a single dozen, and 6*d.* for every subsequent dozen. Remittances requested from unknown correspondents.

ALFRED FRYER, the Nurseries, Chatteris, Cambridgeshire

STRONG BEDDING GERANIUMS.—Tricolor and Bronze Cushion, Lady Cullum, 12 per dozen; Italia Unita, 4*s.*; Sophia Cusack, 6*d.*; Sophia Dumaresq, 3*s.*; Silver Flower of Spring, 2*s.* 6*d.* Bronze:—A. H. Wills, 3*s.*; Beauty of Calderdale, 3*s.*; Perilla, 2*s.* 6*d.*; Ravioli Hero, 4*s.*; Prince of Wales, 2*s.*; Little Golden Chained, 3*s.*; Zonals:—Leonidas, 3*s.*; Lord Derby, 3*s.* Good plants, in single 6inch pots, all package free.—Orders are now booked for April and May.

A PRICE LIST, with nearly 200 Varieties, can be had on application to

W. POTTEN, Florist, Sissinghurst, Staplehurst, Kent

Choice Bedding Geraniums.

THOMAS PESKETT, can now supply, in strong Plants, for cash, the following varieties:—

	Per doz.	Per 100
	s. d.	*s. d.*
LADY CULLUM	2 0	12 0
LOUISA SMITH	5 0	
LUCY GRIEVE	2 0	12 0
SOPHIA CUSACK	6 0	
CHARMING BRIDE	8 0	
GLENAVEE BEAUTY	6 0	
HOLLY	6 0	
PRINCESS ALEXANDRA	6 0	
EGYPTIAN QUEEN	8 0	
MOLLIE	6 0	
REFULGENS	4 0	
PERILLA	3 0	
AUDIENCE (Lemoine)	6 0	

Packed and Post Free. The above are well established in 60sized pots

A List of other choice varieties on application.

The Greenway Nursery, Uxbridge, Middlesex.

Choice Variegated Pelargoniums.

J. ELCOMBE AND SON beg to offer the following splendid varieties, at low prices, for cash:—

	Each	Per Dozen
	s. d.	*s. d.*
Countess of Craven	1 0	9 0
Defiance	1 0	12 0
Edward Milner	1 0	9 0
Edwina Fitzpatrick	0 6	4 0
Florence	2 0	20 0
Grandis	1 0	9 0
Humming Bird	1 0	12 0
Lady Cullum	0 9	6 0
Louisa Smith	0 9	6 0
Lucy Grieve	2 0	
Meteor	1 0	6 0
Mrs. Pollock	1 0	
Prince of Wales Smith	2 0	
Sophia Cusack	1 0	9 0
Sophia Dumaresque	0 9	4 0
Sir Roger Tichborne	1 0	

NEW ZONAL and NOSEGAY PELARGONIUMS of 1870, in each Nursery, and Seed Establishment, Romsey, Hants

WANTED, an ACTIVE PARTNER, in a small Nursery, Florist, and Jobbing Business in Islington. Long Lease. £400 cash required.—C. K., 3, Rotherfield Street, Islington, N.

WANTED, a GARDENER, to take charge of the Garden of a small Square in London. He must be married, without incumbrance, and give his whole time to his duties. His Wife will be required to take charge of a gate, to be constantly occupied in the Garden, and to open the Lodge attached to the gate for the occupation of the Gardener, free of rent and taxes. Salary £1 10*s.* per week.—Application to be made to J. HATHER, Esq., 17, Bedford Square, London, W.C.

WANTED, a YOUNG MAN who understands the Propagating of Soft and Hard-wooded Plants, Grafting and Budding Roses, and Growing Plants for Sale.—Apply, stating wages, &c., to JOHN BARRETT, Nurseryman, Bury St. Edmund's, Suffolk.

WANTED, a GARDENER (SINGLE-HANDED), who is thoroughly acquainted with the Management, Pruning and Training of Fruit Trees, the Management of a Kitchen Garden, and Bedding-out Plants. Wages 18*s.* per week, with a rise at the end of first year.—A. B., Mr. Edes, Huntingdon.

WANTED, a steady, active young Man as general PROPAGATOR and GROWER, but principally for soft-wooded Flowering and bedding Plants. One used to Market Work preferred.—Apply, stating wages, to W. MEADMORE, Romford, E.

WANTED, TWO or THREE handy YOUNG MEN, indoors; accustomed to Potting.—REEVES BROTHERS, Notting Hill, London, W.

WANTED, a MAN, to attend to a Small Shop and look after a House of Plants. J. P., *Gardeners' Chronicle* Office, W.C.

WANTED, a Young Man, as SECOND SHOPMAN, in a Wholesale House in London; he must be steady and industrious, and write well.—Apply, by letter only, post paid, to NUTTING AND SONS, 89, Bartholomew, London, E.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring a Gardener, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

To Wholesale Seed Merchants and Seed Growers.

AGENCY, for the Sale of Seeds and Oilcakes, Appointed, by an Englishman, resident in Dublin, who has a large connection, and visits all the principal towns throughout the country. First-class references, and security given if required.—Letters to 24, Lower Ormond Quay, Dublin.

To Nurserymen and Florists.

COMMISSION WANTED, for the Sale of Ericas and Soft-wooded Plants generally, by a Gentleman representing one of the largest Firms in other branches of the Trade.—B. J., Billingham's Central Hotel, Brigate, Leeds.

GARDENER (HEAD). Age 33; understands the profession in all its branches. Wife would undertake Poultry or Dairy if required.—A. B., Lee's, Greengrocer, 38, Henry Street, St. John's Wood, N.W.

GARDENER (HEAD).—Middle-aged, married, no incumbrance; thoroughly understands the profession in every department. Wife thorough good Cook, and can manage Dairy and Poultry. No objection to live in a lodge. Over four years excellent character from last 2 years in two previous places.—Y. Z., 75, Park Place, Park Road, Clapham, S.W.

GARDENER (HEAD).—Age 33; thoroughly experienced in Forcing Pines, Vines, Peaches, Melons, &c., a good Cultivator of Orchids, Stove and Greenhouse Plants, also the Kitchen and Flower Garden.—Gardening—Station and Alteration of same. Can be highly recommended.—C., 14, Devonshire Street, Hammersmith, W.

GARDENER (HEAD), age 38.—A Gentleman is anxious to recommend his Head Gardener (Scotch) to any Noblemanor Gentleman requiring the services of a practical industrious Man. Has been 8 years in charge. Accounts Mr. PARKS, Royal Horticultural Gardens, Chiswick, W.

GARDENER (HEAD). Married, one child; thoroughly experienced in the Culture of Stove and Greenhouse Plants, Pines, Vines, and all kinds of Forcing. First-class Flower and Kitchen Gardener. Good character.—R. L., Mottingham, Eltham, Kent, S.E.

GARDENER (Head). Age 30, married, no incumbrance; 17 years' experience in all branches of Horticulture, in thoroughly practical Gardens. Two and a half years as Head Gardener in last situation; highly recommended.—A. B., 23, Stafford Place, Pimlico, London, S.W.

GARDENER (Head), to any Nobleman or Gentleman requiring a first-class practical Gardener.—Age 30, married; fully competent in every branch of the profession, including Specimen Plant Growing, Early and Late Forcing; Spring, Summer, and Autumn Flowering, and Fine Kitchen Gardening. Can be highly recommended, with five years' unexceptionable character.—H. B., J. and C. Lee, Royal Vineyard Nursery, Hammersmith, W.

GARDENER (HEAD), where three or more are kept.—Age 29, single; understands Forcing Vines, Peaches, Cucumbers, Melons, and Ferns; also Bedding Varieties. Seven years in last situation.—B. B., Post Office, Ludlow.

GARDENER (Head, where two are kept), to any Nobleman or Gentlemen.—Age 30; respectable. Has lived in the families of Noblemen and Gentlemen. Satisfactory testimonials as to ability. Has obtained several Prizes at the Horticultural Meetings for Fruits, Flowers, and Vegetables. Leaving in consequence of his employer giving up his establishment.—H. W., 6, Lynch Cliff Cottages, Ventnor, Isle of Wight.

GARDENER (PRACTICAL, WORKING) where one or more are kept.—Age 30, married; two children, ages seven and five years. Good character and reference.—D. J., 9, Linton Grove, Lower Norwood, S.

GARDENER, where one or two are kept.—Age 32, single; thoroughly understands the Management of Greenhouse Plants, Vines, Cucumbers and Melons. Flower and Kitchen Gardening. Wall Fruit. One year and 10 months' good character.—J. W., Pine-apple Nursery, Edgware Road, W.

GARDENER (UNDER), in a Garden where he can improve himself.—Age 20; three years' good character.—Y. Z., J. Rogers, The Welch Harp, Finchley, Surrey.

GARDENER (UNDER).—Age 19; eight years in the Garden. Understands the Management of all kinds of Forcing Houses, &c. Four years' good character at present place. — R. BINLEY, The Hasells, Sandy, Beds.

FOREMAN, (GENERAL), or to take Charge of the Glass Department.—Age 27; first-class Nursery.—Energetic, and thoroughly practical. References unexceptionable.—J. H. S., Post Office, Lower Norwood, London

FOREMAN, or SECOND, in a Nobleman's or Gentleman's Establishment.—Age 24, single; understands Pines, Vines, Cucumbers, Melons, and the Propagation of Stove Plants. Three years' good character.—T. H., Post Office, Colnbrook, Bucks.

FARM BAILIFF.—Age 39, married, no incumbrance; a first-class Agriculturist; leaving present situation at the end of the month. Wife a good Dairywoman. Good character—E. B., Messrs. James Dickson & Sons, Chester.

BAILIFF.—Age 45, married, no family; good references.—M. G., 13, Jackson, 83, Westbourne Park Road, Paddington, London, N.W.

BAILIFF, to a Nobleman or Gentleman.—Middle-aged; has had great experience in the Counties of Lincoln, Nottingham, and Sussex, both on Light and Heavy Lands. He is competent to undertake the Cropping of Land and Hop Culture, the Management of Stock and Sheep, has been accustomed to Steam Cultivation, and is well acquainted with the Management of Woods and all matters connected with a large Estate. Being about to leave a situation of a similar kind after a period of 20 years, he is open to an engagement.—E., "Journal of Horticulture," 171, Fleet Street, E.C.

IMPROVER, under a Propagator in a Nursery.—Age 18, well educated, respectable. A Premium will be given. Address, with particulars, H. O., The Gardens, Oak Leigh, Sunning Hill, Staines.

ASSISTANT (INDOOR), in a Nursery, in the Glass department; also a good Packer.—Age 21; has been seven years in Nurseries, the last three entirely in the Glass. South preferred.—T. M., Messrs Stritzker's, Skerton Nursery, Lancaster.

SUTTONS' GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

SUTTON & SONS,

Having completed the cleaning of their extensive stock of NATURAL GRASSES, can execute Orders for their

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils.

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre.
or one pint or a bush Grass seeds and 12 lb Clovers supplied p. acre.
SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.**
per acre Carriage free

From J. J. Mechi, Esq., *Tiptree Hall, near Kelvedon.*
February 5.—"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

SUTTONS' HOME-GROWN FARM SEEDS.

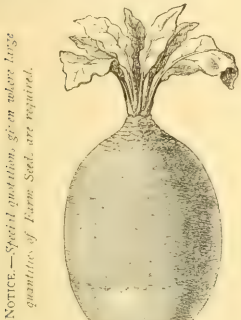

NOTICE.—*Special quotation, given where large quantities of Farm Seeds are required.*

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

Suttons' New Yellow Intermediate Mangel.

From the peculiar shape of this Mangel it can be allowed to stand closer in the rows than other kinds; hence it produces a greater weight per acre. It is of beautiful shape, small neck, and of superior quality. Having only one tap root, it can be pulled with a great saving of labour. This will be found one of the most profitable varieties that can be grown.

Price **1s.** per lb., cheaper by the cwt.

For prices and particulars of other varieties (**8d.** to **1s. 6d.** per lb.), see

SUTTONS' FARMERS' YEAR BOOK.

THE BEST SWEDE IN CULTIVATION IS

Suttons' Champion.

NOTICE.—*Special Quotations given where large quantities of Farm Seeds are required.*

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation; price **9d.** per lb., cheaper by the bushel.

The numerous Prizes which have been awarded to growing crops, and also to pulled specimens of our Champion Swede, during the past season, together with the unsolicited Testimonials we have received, fully justify our description

For prices of SUTTONS' GRASS SEEDS for all Soils, and all other FARM SEEDS, see "SUTTONS' NEW FARM SEED LIST," which may be had Gratis on application.

All Goods Carriage Free (except very small parcels). Five per cent allowed for prompt payment

SUTTON AND SONS, SEED GROWERS,
READING.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870.

IMPLEMENT ENTRIES CLOSE on MAY 1, and all Certificates received after that date will be returned to the Senders.

STOCK PRIZE SHEETS and CERTIFICATES are also ready, and will be forwarded on application to

H. M. JENKINS, Sec.
12, Hanover Square, London, W.

Fowls for Sale.

FINE BRAMAH POOTRA COCKS, of PRIZE STOCK, 10s. each. FINE SPECKLED HAMBURGH, 15s. per pair. FINE BLACK SPANISH, 10s. Cock and Two Hens. All Pure Breed, and in their prime.
COL. ROW, Brooklyn, Shirley Road, Southampton.

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (frontage), DWELLING HOUSE, STABLING, &c., situate at Maidenhead.
Apply to Mr. R. TANTON, The Nurseries, Epsom.

TO BE LET, by TENDER, from Michaelmas next, a CORN and STOCK FARM, in North Hants, of between 400 and 500 acres of Arable Land, well situated for Railway Transit. The Shooting over the Farm, together with that over an adjoining Covert, can also be rented. None need apply without ample capital. Particulars and Forms of Tender can be obtained from
Mr. HUGH E. RAYNBIRD, Estate Agent, Basingstoke; and by whom offers will be received till Wednesday, April 20 next.

SALES BY AUCTION.

Important Sale of Choice Orchids from Assam.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, April 20, at half-past 12 o'Clock precisely, CHOICE IMPORTED ORCHIDS from Assam, including Vanda cærulea; Dendrobium clavatum, Dendrobium, Falconeri, and Wardianum; also a small Collection of ESTABLISHED ORCHIDS, including Angræcum citratum, Cattleya Dowiana, Oncidium macranthum, serratum, sarcodes, and sessile; Odontoglossum Weltoni and nævium, Phalænopsis Parishu, Masdevallias, &c.

On view the morning of Sale, and Catalogues had.

Orchids from India, Mexico, and Demerara, just arrived, and a Collection of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, April 25, at ½ past 12 o'Clock precisely, IMPORTATIONS of ORCHIDS, in fair condition, just arrived, and containing probably many new sorts. Also a Collection of Choice ESTABLISHED ORCHIDS, consisting of CATTLEYAS, LÆLIAS, SACCOLABIUMS, AERIDES, VANDAS, CYPRIPEDIUMS, ODONTOGLOSSUMS, &c.

On view the morning of Sale, and Catalogues had.

Important Sale of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY and FRIDAY, April 28 and 29, at half-past 12 o'Clock precisely each day, FIRST-CLASS ESTABLISHED ORCHIDS, being duplicate plants from the Broomfield Collection, the property of Robert Warner, Esq., including many of the finest specimens ever offered for public sale, viz.—

Phalænopsis Schilleriana	Cymbidium eburneum
Trichopilia crispa	Lælia elegans Warneri
,, marginata	Phalænopsis Sanderiana
Cypripedium Lowii	Odontoglossum Alexandræ
,, Villosum	,, Warneri
,, Veitchii	Saccolabium Holfordii
Aerides Schræderi	Phalænopsis amabilis
Cattleya labiata	Aerides nobile
Oncidium Weltoni	,, Fieldingii
Lælia cinnabarina	Cattleya Warneri
Arpophyllum giganteum	&c. &c.

And many other rare species, all in good order and true to name

On view the morning of Sale, and Catalogues had

Sale of the Celebrated Osberton Herd.

MR. JOHN THORNTON will SELL by AUCTION, without any reserve (by order of the Executors), on WEDNESDAY, April 20, at 2 o'Clock, at the Osberton Farm, Osberton, Worksop, the celebrated and very Extensive HERD of SHORT-HORNS, bred by the late George Sitwell Foljambe, Esq. The Sale will comprise the entire Herd (with the exception of two Cows, three Heifer Calves, and one Bull), and consist of about 40 Head among which will be found the famous Prize Animals, "Gipsy Queen," "Rose of Windsor," and "Flora;" also "Knight of the Crescent," "Knight of the Thistle," "Knight of the Whistle," and "Robin." The Herd is entirely descended from the late Earl Spencer's noted Cow, Lady Sarah, and two animals, Flora and Alexina, bred by the late Mr. Booth. Mr. Carr's Imperial Windsor (18,086) and Knight of the Garter (22,662) have been used, but the young animals are mostly by Mr Peel's Lord Lyons (26,677). The Knights of the Bath, Thistle, and Whistle, winners at the Royal and Yorkshire Shows, as Bull Calves and Yearlings, have been and are still in service. The large number of Premiums awarded to the Osberton Animals at the Royal, the Yorkshire, and Lincolnshire Shows, as well as the magnificent Oxen exhibited at Birmingham and Smithfield, is the finest evidence of the capabilities and high standing of the Stock.

Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London; or of Mr. WOODS, at Osberton, Worksop.

Biddenham, near Bedford.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has received instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, May 3 next, at Biddenham, the entire and very superior HERD of PURE SHORTHORN CATTLE, belonging to Charles Howard, Esq., which have been long and carefully bred from some of the most fashionable blood, and consist of nearly 60 head of Cows, Heifers, and Bulls, about half of which are of the renowned Gwynne family, as well as several from Lady Spencer, with some very superior Fawsleys, Sweethearts, and other noted tribes. Bulls of the very first class have been used, such as 2d Duke of Thorndale (17,748), Grand Duke 5th (19,873), Lord Chertsey (24,376), and others of kindred blood. The Sire now in service is the Grand Duke of Lightburne (26,390).

Catalogues, with Pedigrees, may be had on application to Mr STRAFFORD, 12, Euston Square, London, N.W.; or of Mr HOWARD, Biddenham, near Bedford

Edenbridge, Kent.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without reserve, on THURSDAY, May 5 next, the entire and valuable HERD of HIGHLY-BRED SHORTHORNS, the property of G Burton Tracy, Esq., of Edenbridge, Kent, comprising members of the Cleopatra, Surmise, and Sylph tribes; the famous Cow, Sweetheart 3d, purchased at the Milcote Sale in 1869, with nearly 30 of her descendants, constitutes the distinguishing feature of the Sale. The principal Bulls used have been the Prize Bull, The Baron (13,833), himself a descendant of Sylph; Duke of Albemarle (21,560), Count Leinster (23,638), and latterly Fairbairn (24,276), of the renowned Princess blood, also purchased at the Milcote Sale of 1868, and whose dam was then sold for 345 guineas

Catalogues, with Pedigrees, may be had of Mr STRAFFORD, 12, Euston Square, London, N.W.; or of Mr TRACY, Edenbridge, Kent

Sale of First-class Carnations and Picotees, Standard and Dwarf Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, 38 and 39, Gracechurch Street, City, E.C., on SATURDAY, April 23, at half-past 12 o'Clock precisely, a first-class Collection of CARNATIONS and PICOTEES (the surplus stock of an eminent grower), a choice assortment of Standard and Dwarf ROSES, selected American PLANTS, clean grown FRUIT TREES, fine CAMELLIAS with buds, AZALEA INDICA, GLADIOLI, &c.

On view the morning of Sale. Catalogues had at the Rooms, and of the Auctioneers, Leytonstone, E.

Camberwell,

EXTENSIVE CLEARANCE SALE of CHOICE STOVE and GREENHOUSE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS have received instructions to SELL by AUCTION, on the Premises, Camden Nursery, Southampton Street, Camberwell, Surrey, on MONDAY, April 25, and two following days, at 12 o'Clock precisely each day, by order of the Executrix of the late Mr. William Barnes (without reserve), the whole of the valuable COLLECTION of FOLIAGE PLANTS, comprising 5000 fine Specimen Ferns, Adiantum Cuneum, Terminalis stricta, ferrea, and others; large quantities of Gardenias, Ixoras, Marantas, Medinillas, Caladiums, Stephanotis, Dracæna, Eucharis, Ardisys, and thousands of choice Greenhouse Plants, including 600 handsome specimen Pyramid Azalea indica, 2 to 6 feet, carefully trained for exhibition purposes, full of flower-buds; 3000 Standard and other small Azaleas; English-grown Camellias, many of which are fine examples, 5 to 6 feet; 350 Rhododendron Edgworthii, &c., Epacris, Ericas, and Erica hyemalis of sorts; Perisleca, Stocks, Mignonette, Tree Carnations; a fine crop of Specimen Ferns; Hardy Herbaceous Plants in pots, consisting of Carnations, Picotees, and Pinks; 1000 choice Phlox, by name; double Pyrethrums, Tea and other Roses in pots; together with the Vegetable and Flower Seeds, Garden Implements; also 50 two and three light Frames, &c.

May be viewed three days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

ALTERATION of DATE from APRIL 27 to APRIL 28.

Versailles Nursery, Hammersmith.

IMPORTANT CLEARANCE SALE.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. John Salter & Son to SELL by AUCTION, on the Premises, the Versailles Nursery, Hammersmith, W., on THURSDAY, April 28, at 12 for 12 o'clock precisely, without reserve (the Land being required immediately by the Metropolitan District Railway Company), the whole of the PLANTS in POTS, comprising large specimen Camellias, 6 to 9 feet; Orange Trees in Fruit, handsome Araucaria excelsa, and a quantity of other useful plants for furnishing; also 1000 Zonal and Double Geraniums, 100 Vallotas, the entire stock of Centaurea babylonica, awarded a First-class Certificate; likewise an unrivalled collection of show and rare SUCCULENTS, comprising 600 Echeverias of sorts, 200 Pachyphitons, Haworthias, Klenias, 500 Sempervivum Bolli, and others; 1000 Sedums, Rhipsalis, &c., large Agave, a quantity of Exotic and Hardy FERNS, including 50 Exhibition Specimens; also an extensive and interesting collection of hardy Variegated HERBACEOUS and ALPINE PLANTS, 60 Plants of the new Variegated Viola odorata, a very distinct and beautiful variety, not yet sent out; 600 new gold-striped Lily of the Valley, fine Double Pyrethrums, Penstemons, Agapanthus, Aubrietias, &c., together with 600 named Variegated Ivies, &c.

May be viewed two days previous to the Sale. Catalogues may be had on the Premises of Messrs SALTER, and of the Auctioneers and Valuers, Leytonstone, E.

Clapham, S.

CLEARANCE SALE of GREENHOUSE, STOVE and BEDDING PLANTS, GREENHOUSES, PITS, &c.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from Mr James Over, to SELL by AUCTION, without reserve, the whole of the choice STOVE and GREENHOUSE PLANTS, including 5000 Exotic Ferns, 100 thriving Gardenia intermedia; specimen Hoya Bella, 40 handsome specimen Stephanotis floribunda, double Primulas, a large quantity of specimen Ixoras and Azalea indica, Cyclamen, 30,000 Bedding Plants, 1000 White Giant Cloves (the same kind that Mr Over supplies the market with); Roses in pots, Deutzias, Myrtles, &c.; likewise the GREENHOUSES, consisting of a Span-roof House, 80 feet long, 8 Span-roof House, 60 feet long, and a Lean-to House, 44 feet long; 30 two and three light BOXES, with Sashes, about 1000 feet of 3 and 4 inch HOT-WATER PIPES, with requisite Valves, Stop-cocks, &c.; 4 capital BOILERS, thousands of Bricks, the erections of Shed and Stabling, a capital strong Market Van, and numerous other effects.

The VALUABLE LEASE of the Nursery Ground, comprising about 2½ Acres, and held on a lease for an unexpired term of about 50 years, at the moderate ground rent of £14 per annum, if not previously disposed of, will also be offered for SALE by AUCTION, on the Premises, as above, on MONDAY, May 2, at 11 o'Clock precisely, prior to the Sale of Plants.

May be viewed two days prior to the Sale. Catalogues and particulars of Lease may be had of Mr. OVER, Seedsman and Florist, High Street, Clapham; and of the Auctioneers and Valuers, American Nurseries, Leytonstone, Essex, E

To Gentlemen, Architects, Builders, Florists, and Others.

MR. BRIANT will SELL by AUCTION, at the Manufactory, 297, Camberwell Road, on MONDAY and TUESDAY, April 25 and 26, at 12 for 1 o'Clock, a large Stock of FOUNTAINS, FIGURES, VASES, STAGS, LIONS, BIRDS, DOGS, DOLPHINS, TRITONS, ROYAL ARMS of various sizes, BOX CHIMNEY PIECES, CENTRE FLOWERS, TRUSSES, &c., in Artificial Stone

May be viewed two days previous, and Catalogues had on the Premises, and at the Auctioneer's Office, 200, Kennington Park Road.

The Agricultural Gazette.

SATURDAY, APRIL 16, 1870.

THE Royal Agricultural Society of England has received proposals from only two agricultural students to submit to the competitive examinations by which it determines the excellence, proficiency, or competency of their professional education. The Highland and Agricultural Society, whose elaborate programme of examiners, with their syllabus of subjects, for the purpose of granting diplomas in agriculture, was noticed in these columns a few weeks ago, has this year no candidate for these honours at all!

What is the reason of the almost constant half-heartedness, varied by occasionally an utter failure, which seems to characterise the reception of these attempts to guide, promote, and guarantee the education of the agricultural body? It is not because people do not believe in the professional value of scientific instruction, nor is it altogether because, knowing that a practical and field knowledge of their business is essential to professional success, they comparatively disparage the importance of that insight which science gives. Neither of these can be alleged in explanation of the puzzle, for there are many agricultural students in chambers, schools, and colleges at both ends of

the island who are at work upon the theory and science, as well as on the actual practice and field labour by which a complete agricultural education is conferred. Professor WILSON'S class at Edinburgh furnishes, as our columns show, a considerable list of prizemen. The Royal Agricultural College at Cirencester is at work with a large body on its student roll, and with great success. There must be some difficulty in the way of these students, interposed by the conditions on which these official examinations are conducted, to which this failure to attract them must be attributed; and the attention of the Education Committees of both Societies should be directed to a careful consideration of the circumstances and conditions by which their operations have been hedged about, and without the observance of which they refuse to act.

Probably the thing will prove more difficult of alteration in the North than it is among ourselves. The diploma of the Highland Society means, we presume, a guarantee of the completed professional education of those who hold it. The prizes of the English Society are, we believe, offered expressly to students still in the midst of their course of study. In the former case a completeness and elaboration of scheme is probably necessary, which need not characterise the examinations in Hanover Square. Our examinations here might very well exhibit an elasticity and freedom from rigidity of rule which probably could not be allowed to candidates for a diploma. They might be less rigidly within strict rule than they are. No excluding limit as to age need, we think, be imposed until the success of these annual gatherings is assured, and probably the syllabus of subjects in which candidates must be prepared might be so drawn up as to be less likely to daunt than to attract. We are speaking without exact knowledge of the way in which the Educational Committee of the Royal Agricultural Society conducts its business; but it appears to us so certain, with the increasing knowledge and the growing general educational *status* of the agricultural body, that scientific education must come to be more and more appreciated, that the reasons for any comparative failure of these annual examinations should be sought for rather in the details of their management, than in any general indifference to their object.

As to what the public judgment, including that of agriculturists, may at present pronounce upon the subject, opinions probably may differ; but there can be no doubt as to what public opinion will ultimately pronounce. There is not an authority connected, whether directly or remotely, with any great branch of English industry, which is not already urgently calling for improved professional and technical training and instruction. The Presidents of our Engineer Associations, at their annual meetings invariably urge a higher style of scientific, and greater completeness and precision of practical, training. There is hardly one of the sections into which the British Association for the Advancement of Science arranges itself, connected however remotely with the practical art and industry of the country, whose chairman does not annually point out the great positive loss which our ignorance of science inflicts upon us, and the great comparative loss which we thus sustain in our competitive race with the neighbouring better educated countries. We cannot, therefore, suppose that the national agricultural societies will cease their efforts to promote this better education in the case of agriculture, because of any temporary disappointment as regards the response made to these efforts by agriculturists themselves. Let them rather try so to administer and direct their exertions as to remove those difficulties in the way of their success which are sure to meet any new scheme upon its outset—confident that ultimately this portion of their year's proceedings must bear good fruit as abundantly as the rest.

THE results of the new trials made in the application of sewage to the land near Paris, noticed in the *Agricultural Gazette* when first commenced, have been laid before the Society of Civil Engineers of that city by M. DURAND-CLAYE, the engineer charged with the conduct of the works and experiments, and they are too remarkable to be allowed to pass by unnoticed.

It will be remembered that a small experimental garden, together with purifying basins, were established at Clichy, close to the outfall of the great main drain of Paris, the results obtained having been duly noticed in our columns. The next step taken was to arrange for the distribution of 6000 tons a-day of sewage water over the poor lands on the opposite side of the river, in order to give the market gardeners and other cultivators of that poor soil an opportunity of testing the value of sewage water for themselves. A sum equal to £32,000 was voted for the purpose, and by means of two steam-engines, centrifugal pumps, and cast-iron pipes 2 feet in diameter and more than 2000 feet in length, 6000 tons of sewage are in ten hours pumped into a reservoir, the bottom of which is about 10 feet above the highest point of the plain of Gennevilliers, which consists of 5000 acres of poor, porous soil. In addition to this the municipal authorities purchased about 16 acres of land around the reservoir, and invited the gardeners in the neighbourhood to cultivate it; 40 of these accepted the invitation, receiving the sewage gratis, but finding their own labour, and in the course of two months the miserable soil was converted into a flourishing market garden, and yielded vegetables in a most luxuriant manner, and with most profitable result. The gardeners, seeing the effect produced, requested that they might be supplied with sewage on their own lands; for this purpose a conduit of Vauxhall pipes, 18 inches in diameter, has been established over a distance of 500 or 600 yards, and at the present time 100 acres, the furthest point more than a mile distant from the reservoir, are supplied with the sewage water. The results obtained have surpassed all expectation. In the winter the soil was saturated, the purified water draining off through the porous soil, and the fertilising elements remaining upon the land. Purification basins had been provided close to the banks of the river to receive the overplus of the sewage, and being treated with alum about 600 tons of deposit were employed by the gardeners around on about 50 acres; these basins, however, became useless in October last, by which time the whole 6000 tons of sewage, pumped over the river daily, were applied to the land. This must be regarded as a satisfactory result, though it must be borne in mind that the economical question remains yet unsolved.

The engineers engaged in the work are now attempting to find application for the whole. M. DURAND-CLAYE, who has brought the subject before the Paris Society of Civil Engineers, looks at the subject in a thoroughly practical manner. His plan is to convey the sewage to the nearest spots requiring it, and, while leaving the cultivators full liberty to use it or not, to teach them its real value; but he is quite aware that it will take a long time, and cost much money to complete the work, and that the only benefit that can be looked for by the authorities for some time is the purification of the city. It must, however, be admitted that the increased productiveness of the soil in the meantime is a boon to the public, as well as to the gardeners themselves. The total sewage water of Paris amounts to about 260,000 tons per day. It should be mentioned that the effect of emptying the sewage into the Seine is to raise the proportion of nitrogenous substances from 1½ gramme per ton above to 30 grammes below the embouchure of the great collector at Clichy; and further, that it has already cost the city £4000 for the removal of the banks of putrescent matter formed in the river. Surely we can find some hints worthy of note in the action of the Parisian authorities in this important matter.

—— No alteration in the prices of last week took place at Mark Lane on Monday. The supply was short of both home and foreign Wheat, but the demand was limited. ——In the Metropolitan Cattle Market on Monday trade was depressed, and the demand for all descriptions of stock inactive—a decline of 2*d.* per 8 lb. must be recorded.

—— From a discussion in the House of Commons last Friday, it appears that a site for the new Waterside Foreign Cattle Market has been found at Deadman's Dock, Deptford. The area obtainable there, if sufficient now, seems hardly enough for that growth of the trade which may be anticipated; the river frontage, too, seems barely enough. In these respects, as well as in nearness to the great body of consumers, any of the alternative sites upon the northern shore of the river would be preferable. On the score of safety to our own stock, however, we imagine the southern side is the better of the two.

—— Mr. LOWE'S Budget, announced on Monday evening, deals with an anticipated surplus of close upon 4½ millions sterling. The bulk of this enormous sum is disposed of by a proposed reduction of the Income-tax to 4*d.*, and by halving the sugar duties, thus taking sums which amount to near £3,600,000. In addition to this, £200,000 go in a scheme for extinguishing £7,000,000 of stock held by savings banks by converting them into annuities terminable in 1885; and there are remissions of various license duties, and reduction of stamps and abandonment of the newspaper stamp, with substitution of a half-penny postage up to 6 oz. weight, and equalisation of duty on railways, which together absorb about £380,000 more, leaving a surplus of about £300,000 untouched. The surplus is calculated upon a continued productiveness of the existing taxes, to which is added a sum of £150,000, derived from the imposition of a licence of £1 for carrying arms, the game certificates being abandoned—an alteration which, as Mr. READ pointed out, may fall hard upon farmers who put guns in the hands of boys for bird scaring. The Malt-tax remains untouched, but the Excise prohibition which has hitherto hindered agriculturists from using steeped Barley as cattle food is to be withdrawn. Precautions being taken in the interest of the revenue, it is proposed to permit the process of malting to be carried so far as the stage of steeping Barley is concerned without interference — the proviso being enforced that it shall not be kiln-dried. The moment at which the tax is imposed is in fact changed, so that farmers and stock-feeders shall be free from its incidence, which shall affect only those who are about to employ their Barley in brewing.

—— Mr. CHARLES NEATE, of Oxford, has published a letter on the attitude of Irish tenants towards their landowners, calling attention "to the remarkable similarity between the claims of the Irish tenant-righters and those set up some 20 years ago by a considerable portion of English landowners in their character of lessees, that is, lessees of the Church. It is not now," he says, "for the first time, that the comparison has occurred to me. In the year 1857, when I occupied for a few weeks, under notice to quit, a seat in the House of Commons, I denounced in that House the Church lessees as 'working their way to the eviction of their landlords by a series of steps, compared with which the most extravagant schemes of Irish tenant-right were reasonable and just.' When the Ecclesiastical Commission, created in 1836, refused to renew the leases of the Church property, which from time to time fell into their hands, there was a great alarm and outcry among the lessees all over the country, but more especially in the North; so great, indeed, that the Commission were obliged to stop in their progress of resumption, and negotiations began, and were carried on for some years between them and the Church lessees, as to the terms upon which the leases should be bought up by the Commissioners, or the reversions sold to the lessees, the latter process being called enfranchisement, a term which seemed to imply that a landlord is an incumbrance." Mr. NEATE adds—"I don't say now that this legislation was altogether unjust, though I thought so at the time, being perhaps too much biassed by my feelings as a collegiate landlord, and the fear that our turn might come next. Let those private landlords who are now judging the Irish Land Bill under the influence of similar feelings, let those at least of them who are or were lessees of the Church, remember what they then felt in that character—how little they thought of parchment rights, what stress they laid upon 'long-continued practice,' and how they did not hesitate to denounce as robbery the refusal to renew a Church lease, though it contained, as all such leases did, a covenant under their hand and seal to deliver up possession at the expiration of the specified term."

—— We have received from Edinburgh the following results of the winter session in the department of Agriculture, under the charge of Professor WILSON, in the University. The examinations were of a very satisfactory character:—

The College Medal was awarded to Mr. John M'Dowall, Kirkcudbrightshire, who obtained the highest number of marks in the class, 81 per cent.

First-class Certificates were awarded to Mr. John Mitchell, Kirkcudbrightshire, for 78 per cent.; Mr. Robt. M'Cracken, Wigtownshire, for 77 per cent.; Mr. J. J. Brown, Dumfriesshire, for 75 per cent. of marks.

Second-class Certificates were awarded to Mr. J. J. Turner, of Newcastle, for 73 per cent.; Mr. A. O. Torry, Perthshire, for 72 per cent.; Mr. James Murray, Limerick, for 72 per cent.; Mr. Andrew Graham, Berwickshire, for 70 per cent.; Mr. Forbes Burn, Roxburghshire, for 69 per cent.; Mr. Charles Stewart, Ayrshire, for 68 per cent.; Mr. William Morice, Banffshire, for 52 per cent.; Mr. William Simpson, Edinburgh, for 50 per cent.

The annual prizes given by the Highland Society, for which a separate examination was held, were awarded to —1st, Mr. John M'Dowall; 2d, Mr. Robert M'Cracken.

—— The Scottish Chamber of Agriculture are engaged in an inquiry into the possibility of supplying the papermaker with some home-grown vegetable fibre, which shall supplement the dwindling stock of Esparto Grass, whose price has lately become excessive. In a report read at the last meeting of the Chamber, it was stated that many semi-waste places of the country might, under treatment and management, be improved to grow Bent and other rough Grasses to yield a profit; and a conference with papermakers was arranged, at which it was to be proposed:—

(1). That any trial to be available should embrace a

growth of fibre, in quantity of at least a ton of each particular sort, so that its qualities might be fully and fairly tested.

(2). That the particular kinds of vegetable substances to be tested might be fixed upon at the proposed conference.

(3). That these being fixed upon, the papermakers might provide seed, while the farmers might select and give ground and culture, and the papermakers might test the fibre value of the produce.

(4). That careful reports of each sort, of the soils in which grown, the manure applied, &c., as well as of the expenses attending its growth and preparation for the papermakers, and also of the tests and value as a paper fibre, should be made by the parties engaged in the work, to this Chamber.

(5). That to give confidence to all concerned, a committee might be appointed by the papermakers to act with a committee of the directors or members of this Chamber, to procure seed, supervise growth and maturing, see the crops tested and prepare reports; and finally, as this experiment, on a scale sufficiently extensive to test each crop, must entail some expense, the papermakers might, for the product, pay all expenses, excepting rents and cultivation of ground, which the farmers might bear.

Mr. LANGLANDS, Balkemmet, Forfarshire, said he had grown Flax repeatedly, and found that the pure fibre of the Flax bore a very small proportion to the straw.—The Chairman, Mr. WILSON, of Edington Mains, said that the woody part of the Flax would, according to the opinion of experienced papermakers, be a favourable element in the formation of the pulp from which the paper was made.

OUR LIVE STOCK.

CATTLE.

THE fate of Mr. Torr's motion, "That judges of live stock at the Royal Agricultural Society's meetings should be supplied with a list of the animals entered for the prizes which they have to award, omitting the names of the exhibitors, but giving the pedigrees of the entries," must have been looked for with some interest by cattle breeders. The sense of the Council of the Society was against an innovation which would have confirmed a too strong tendency of the present day—namely, an over-estimation of "fashionable blood." In many cases no doubt "fashion" is the result of real worth, but if so, why should animals possessing it not be made to compete on equal terms with other well-bred but less fashionably descended stock? We confess to a difficulty with regard to cross-bred animals, which may after all exhibit superior points to true-bred ones, and yet be unfit for propagating their own good qualities. On this point we agree with Mr. Jacob Wilson, "that if the object of the motion was to guarantee the possession of hereditary qualities, Mr. Torr had placed the cart before the horse, for he should have moved "that the possession of a certain pedigree be made a condition of entry." Such a regulation would be sufficient protection for breeders of pedigree stock, and would not give undue influence to such weighty names as Kirklevington, Duchess, Charmer, and Bliss.

Mr. Hodgkinson's herd of Shorthorns owed their merits to careful breeding and selection rather than to the introduction of high priced, highly descended bulls. More than 30 gs. was never given for any animal, and yet the result of the sale was on the whole satisfactory. Morton Grange will be remembered by readers of the Royal Agricultural Society's Journal as having been described in the secretary's report upon Nottinghamshire farming. The animals were not brought out in tip-top order, and many of them were mere calves. This sale, under the direction of Mr. Thornton, took place on Thursday, 7th inst. An average of £25 10*s.* 8*d.* for 47 head of cattle was obtained, and a total of £1199 2*s.* Thirty-eight cows made £25 15*s.* each, and nine bulls brought £24 12*s.* 4*d.* each. The following animals made the highest prices:—*Carnation*, by KIRKHAM (16,345), 34 gs. (Mr. W. Gentle); *Fay*, by LUPUS (20,244), 39 gs. (Mr. John Foster); *Julia*, by LUPUS, 45 gs. (Mr. W. Cox); *Queen of the North*, by FREDERICKSBURG (19,784), 36 gs. (Mr. Longstaff); *Fairy Queen*, by LUPUS, 40 gs. (Mr. Greenwood); *Star of the Evening*, by VICTOR ROYAL (by ROYAL BUTTERFLY 10TH), 37 gs. (Mr. Blackwell); *Ada*, by PROUD MASTER BOOTH (27,217), 35 gs. (Mr. Dawson). The price of the day, 67 gs., was given by Mr. P. Brown for DUKE OF MORTON, by MAJESTIC (24,510) dam *Aconite* by VICTOR, and descended from *Dimity* by ZENITH (5702); BRIDEGROOM, a three months old calf, by THE BEAU, and also out of *Aconite* (lot 5) was purchased by Mr. Sampey for 20 gs.

—— We are favoured with a catalogue of Mr. Charles Howard's herd. The entire stock will be disposed of by Mr. Strafford without reserve on Tuesday, May 3, when an unusual gathering of admirers of Durham cattle may be expected. The catalogue contains the names and pedigrees of 56 animals, 26 of which are of the Gwynne or Princess tribe, and by the following famous bulls:—DUKE OF GLOSTER (11,382), MAY DUKE (13,320), 2D DUKE OF THORNDALE (17,748), 5TH GRAND DUKE, 12TH DUKE OF OXFORD (19,633), THORNDALE KNIGHTLEY (23,065), and GRAND DUKE OF LIGHTBURN (26,290), the sire at present in service. There are also 11 "Spencers" descended from *Lady Spencer 2d* by USURER, *Lady Spencer* by SHAMROCK (7488), and originally from Mason, of Chilton, stock. Three heifers and four bulls, all by first-rate sires, and of the *Charmer* by LITTLE JOHN tribe, will be offered, and five representatives of the *Fawsley 4th* by 4TH GRAND DUKE and *Coquelicot* by DUKE OF CAMBRIDGE sort. A few members of the *Sonsie* tribe complete this brief sketch of the contents of the catalogue.

—— A graphic account of the herd of Mr. Sheldon, Geneva, United States, by Mr. W. H. Sotham, appeared recently in the *Mark Lane Express*. The following extract deserves attention from admirers of Duchess blood and Bates cattle in general:—"My experience tells me that a thin-skinned animal is always tender; the lean meat is tender and the fat blubber y, the tripes and bowels are thin, all corresponding. They take cold easily, and it settles on their lungs, thereby breeding disease which becomes contagious. I have seen much of this in this country (America), more than I have in England. Many of the Duchesses inherited it, and breeders in America patronised this kind of handling because it was fashionable, and many of them suffered much loss from this folde. They were led away from sense and reason by a clique of leaders who had selected this soft touch, and who were determined to drive it into the brains of rich men with their tongues and pens, and many a novice with more money than wit was taken in by them. The scene seems to be changed here (America) now, and the thick, mellow skin, and long, thick hair of the Booth is taking the place of the thin-skinned Duchesses."

POULTRY.

Fleas in the Poultry-yard.—It would really be a great comfort if you would mention any way of getting rid of fleas. These creatures are a perfect torment, and no tidyings or lime-washings of the poultry-sheds, where they appear to hold their headquarters, are effective in doing more than diminishing them. Could you mention any better mode of attack? And if to this you could add any way of getting rid of the individual torments, which seem to evade the most continuous and scrupulous search, you would confer a favour on many of your correspondents, whose pleasure in superintending the poultry-yard is much lessened by such unwelcome additions. *Fleabane.* [Try Pyrethrum caucasicum powder, sold by all seedsmen.]

—— A contemporary contains the following valuable advice regarding the management of young chickens:—A very dreadful disease "pip" or "gapes" is to unfledged chickens; older ones it often attacks, but seldom kills them after they are six weeks old. Of proposed remedies for this disorder, there are dozens—some surgical, such as the extraction of the worms by a little feather; some medicinal, as the administration of turpentine; some utterly absurd, such as the removal of the little horny membrane which all chickens, sick and well, carry on the tip of their tongues; all alike useless. Warmth, fresh air, nourishing food, cleanliness, these are the only things I have ever known of the least service. For chickens with pip, for fowls that from any cause are out of order, there is no tonic to be compared to Wheat; and they should from the first be trained to eat it, for it is still more admirable as a preventive of indisposition than as a cure. Once they do this they prefer Wheat to any food; too much makes them quarrelsome. Chickens sometimes get pip in dry weather, but cold and rain are sure to bring it on; above all, they get worms in their throats because their mother "clucks" them out of their warm beds as soon as there is light. Her admirable instinct was intended to be used in a dry climate, and it cannot always be depended on in a damp one for the prudent management of her young. From rain she saves them well, calling them into shelter; but against dew, which is almost as hurtful, she is not on her guard. At nine of summer, at ten of spring and autumn mornings, is quite early enough for unfledged chickens to leave their dormitory; the hen will bring them back to it between 3 and 4 P.M., but in damp, cold weather they must not be left out so long.

SEWAGE FARMING.

RISING from the perusal of Mr. Bailey Denton's lecture on sewage farming, I feel like a hungry man whose appetite has been whetted by half a meal. Has the lecture been published? Mr. Hope read a paper the other day on the same subject, discussions followed, yet the whole is sealed to us in the country beyond the meagre reports in the papers.

Referring to your articles, I would say that I have had a little experience of sewage farming, and that I find it very difficult to reconcile my practice with the statements put forth. For example, Mr. Hope, who is justly regarded as a high authority, speaks of 70 tons of Italian Rye-grass per acre as an ordinary crop, and 100 tons as a possible crop. Mr. B. Denton takes 50 to 60 tons as an ordinary crop per acre, but quotes Mr. Hope's experience for the higher averages. I ask for information; will either of these gentlemen enlighten us outsiders how to secure these results? When such high authorities make these statements the public accept them as facts. Is Mr. Hope prepared to say that he will produce 70 tons of Italian Rye-grass per acre during the current year at Romford? Or will Mr. B. Denton undertake to produce from 50 to 60 tons per acre from a given area at Croydon?

Let us look into the most favourable examples cited by Mr. B. Denton. Barking, 53 acres, realised £1350; Norwood, 28 acres, £741. The average is nearly identical, both rate their sales at £1 per ton for Grass, on about 26 tons to the acre! But at Norwood there were 37 acres under Grass last year, what was the yield of the other 9 acres? Of Barking also, nothing is said of land in transition, which must affect general averages; nor of frosts, blights, and other ills to which vegetable life is heir. It would seem, but I do not say that it is so, as if the yield of selected pieces of land was taken as the basis for general averages!

The most perfect sewage farm in England is, I think, at Bedford; the soil is in every way suitable, the demand for Grass constant, price good: if anywhere, it is there we should expect to find maximum results (not a yard of the ground is wasted, and the plant is in luxuriant growth). A gross return of £20 per acre was received last year, at an average of 16*s.* per ton, equal to 25 tons per acre! I might undertake to prove that at the following sewage farms the general average of the year was less—viz., Rugby, Warwick, Banbury, Birmingham—and that their returns do not exceed £12 per acre: if I said £10 I think I should be as near the mark.

It is stated, or assumed by both writers, that the most profitable mode of cultivation of Italian Rye-grass is annually, and that ten crops can be taken. If the plant is to be established in time for spring cutting the seed must be in the ground by the middle of September, the first crop will be ready in April; if the land is again broken up in September, not more than six crops will be got, unless they are cut short: then the bulk will be less—if the plant remained till December two more light crops might be got. If 5 tons per acre be taken as the average of six crops, and 2½ tons each for the other two, I think this may be regarded as a very favourable return under the ordinary conditions of farming; and this is above the average obtained on the plains of Lombardy and Piedmont, the home of irrigation and of the Grass. I will give the actual return over different fields, taken by myself, every load of which was weighed in the scale, with the exception of the hay crops and those estimated:—

No. 1 Field, 7½ Acres.		No. 2 Field, 7½ Acres.		No. 3 Field, 7 Acres.		No. 4 Field, 4 Acres.		No. 5 Field, 3½ Acres.		No. 6 Field, 3½ Acres.	
Time of Cutting.	Tons per Acre.	Time of Cutting.	Tons per Acre	Time of Cutting	Tons per Acre	Time of Cutting.	Tons per Acre	Time of Cutting.	Tons per Acre	Time of Cutting	Tons per Acre.
Mar 9 to 17	2 16	Mar 21 to 27	2 14	Mar 2 to 9 ..	2 12	Mar 27 to 29	1 18	Mar 18 to 20	3 15	Feb 3 to 10 ..	1 0
May 19 to 31	12 0	June 2 to 23	11 4	April 24 to 30	3 8	June 13 to 16	6 18	April 30 to	4 0	May 4 to 7 ..	4 4
July 6 to 12 ..	6 0	July 19 to 23	4 17	June 2 to 29	10 10	June 28 to		May 4 ..	5 12	July 3 to 6 ..	4 5
Aug 4 to 5 ..	3 4	Aug 31 to		July 26 to 28	4 10	July 1 ..	6 7	June 18 to 22	8 8	Aug. 3 to 4 ..	3 5
Sept 25 to		Sept 4 ..	3 16	Sept 4 to 7 ..	3 0	July 30 to		July 20 to 25	4 0	Sept. 13 ..	1 12
Oct. 11 ..	4 18	December es-		December es-		Aug 2	4 16	Aug 26 to 27	2 18	Broken up ..	..
		timated .	4 0	timated .	3 10	Aug 30 to 31	2 16	December es-			
						Dec. 13 to 23	2 12	timated ..	2 10		
Total tons .	29 6	Total tons..	26 11	Total tons..	27 10	Total tons .	25 7	Total tons..	27 3	Total tons..	14 6

From this statement the following results may be noted,—That last year there was a cutting taken from all the fields before the end of March; that the first crop was light, the second or third heavy, the remainder light. The supply of sewage was abundant. The time occupied in haymaking may also be noted. As a comment on the above I may add, that not a sewage farm in England will take a crop till the middle of April this year, and in places the plant has been killed,—in truth it has suffered everywhere.

Other crops than Grass.—Extraordinary yields of Mangels have been secured, yet it is a fact that at Banbury, with the most careful cultivation, they did not obtain more than an ordinary crop, and it was sold from £10 to £12 an acre. The wonderful returns from Cabbages are often quoted, but if everybody grew Cabbages, as some gentleman shrewdly remarked, there would be no one to buy them. Against Mr. Hope's example we can cite another, where the cultivation proved a dead loss. Except in the neighbourhood of large towns, the demand for "green stuff" is very limited. In small towns most people have gardens of their own, any deficiency is readily met by the cottagers.

The value of sewage has been generally fixed at 1*d.* per ton; if 5500 tons are required, as stated, to dress an acre of land, the result would be £22 15*s.* 10*d.* for manure. Half of this would be a heavy sum, or even

* Made into hay. Nos. 1, 2, 3, 4 and 5, are the best fields on the farm, No. 6—of which class an equal number could be shown—on cold wet land.

a quarter. I would ask if 25 to 30 tons of farmyard manure, or 5 cwt. of Peruvian guano per acre, for general crops, would not be as productive as 5500 tons of sewage? Has any one demonstrated the equivalent in sewage of 25 tons of farmyard manure or a ton of guano?

Hay-making of Italian Rye-grass.—An uncertain process, "it takes a deal of making," occupying from seven to eight days in fine weather, to a fortnight or three weeks in wet weather. It requires to be kept constantly on the fork, holds latent moisture, dangerous to the rick if not carefully watched. Even when well made it does not find so ready a sale or so good a price as meadow hay. Made late in the season it is deficient in proof, and as far as my experience goes can hardly be sold to pay cost of making.

Clay-land, howsoever well suited for cereals and Beans, is the most unsatisfactory of all soils for Grass cultivation under sewage treatment. A good seed-bed is indispensable, with clay this is a most difficult thing to secure. When wet you cannot get on it, when dry it is baked, or, in common parlance, either all bricks or all mortar; the cost of working it is excessive. Norwood may be cited to the contrary, but the soil there is a clayey loam, readily worked with the spade. They are now breaking up 10 acres, at £4 per acre, and men earn at that rate £1 per week easier than they would 10*s.* on land I could show. Even after digging the land has to be top-dressed, I should say at 10*s.* per acre, and harrowed by manual labour, so that the cost of breaking up this land annually would prove rather a heavy expense.

Fallows.—Doubtless great advantage in dressing these in winter, when grass-land does not need the sewage. But this operation is not so simple as it appears to be regarded. On light soils the operation may be comparatively easy, but on heavy soils it is one of extreme difficulty. Irrigation means a prepared surface to secure it. Fallows, in clay, mean rough surfaces broken up by the plough, requiring the action of frosts, &c., to bring the soil down. I should like to see any one who thinks the job simple try their hands on two or three fallows I could show them, each of 5 or 6 acres in extent. Further, if the land has a good fall, or is of an undulating character, an immense quantity of silt is carried down, blocking drains and channels.

Cost of Laying-out the Land.—Mr. Hope, I think, puts it at £2 10*s.*; Barking, £4; others at £8 and £10 per acre. In reality it means any price between Mr. Hope's quotation and £50 per acre.

I have to apologise for the length of this letter. I am unused to public writing, but the subject is an interesting one. My purpose will be served if it elicits information, and if some one succeeds in striking fire out of my crudities. *H., March* 15.

P.S. I am, of course, aware that if Italian Rye-grass be cultivated in small beds, admitting of cutting and clearance in a day or two, a higher average can be obtained than that I have quoted, but in ordinary farming you have to deal with fields of varying extent (2 to 12 acres) and an uncertain market, and the times of clearing may range, as they do in fact, between two or three days and two or three weeks.

As food for horses, in season, Italian Rye-grass can hardly be surpassed; our horses are in first-rate condition; carriers and horsekeepers generally consume it largely, and bear willing testimony to its value.

FARM BUILDINGS.

V. COLESHILL, NEAR SWINDON, BERKS.

[The following engravings, illustrating a set of farm buildings in which many systems of cattle feeding, and especially the box system, are provided for, were published in this Journal some years ago. We reproduce them now as furnishing a characteristic example for the series now appearing in our columns. They are taken, with the accompanying description, from Morton's "Farmers' Calendar."]

THE buildings at Coleshill, Berkshire, the seat of the Earl of Radnor, are on the largest scale of farmeries, and confessedly in the style fitted for a nobleman's home farm. The execution, space, style, and quality of work, and, therefore, the expense, are probably higher than the mere economy of the farm would justify. But for the principles of its arrangement, the skilful connection of the different parts, the clever adaptation of the circumstances of the site, and the perfect adaptation of each part to its purpose, we know of few to equal it. Among its obvious merits are the admirable arrangement of threshing, grinding, and cutting machinery: the accessibility and roominess of the granaries, and the connection of a cartway beneath; the relation of steaming-house and food stores generally stored away close by; its grain, winnowed clean, is also stored away close by, and is easily deliverable into carts. The roots are brought easily to the cutters, close by the power which drives them, and near to the chaff and other food with which they are to be mixed. Cake and corn crushers, close to the power which drives them, and to the store of food which they have to prepare, deliver this prepared food at the very door of the food-house and the steaming house, whence, finally, food and litter are both sent out to the yards, byres, and stalls. These, accordingly, are arranged conveniently around the centre of distribution. A railway takes them down the central building, and, at its end, on either side, to boxes, stalls, and piggeries—7 being fatting stalls; 8, 8, pigsties opening into yards; 9, 9, fatting pigsties or boxes; 10 and 11, a shed and yard for young cattle; 12 and 13, stalls and boxes for cows; 14, a calves' house, and 15, hay-house; 16, are boxes for calves; 17, 17, fatting boxes for cattle; 18 and 19, yards and sheds for young cattle. At 20 there is a covered dung-pit, with tank underneath, where the soiled litter of all the cattle stalls may be easily concentrated; 21, still easily supplied from the food-house by the central gangway, is a house for fatting and other sheep on sparred flooring; 22 and 23 are sheds and yards available for sheep at the lambing season, or for young stock at any season; 24, 24 is the stable; 25 for corn, chaff, and hay store; 26 for harness; 25 and 26 have bedrooms over them; 27 is a loose box; 28, a cart-shed, and for implements; 29, kitchen for boys and bedroom over; 30, a house for implements; 31, excavated archway,

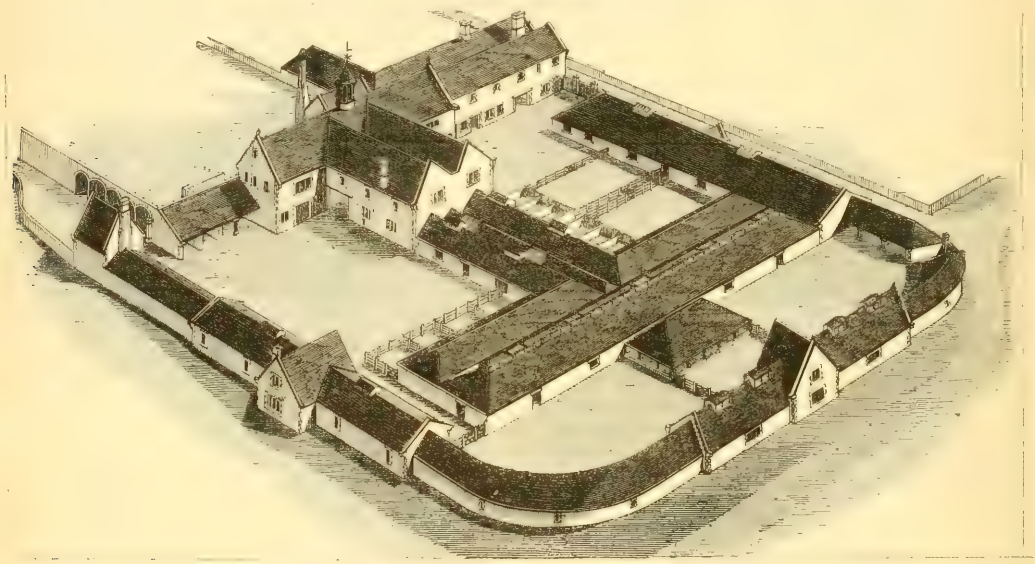

FIG. 101.—FARM BUILDINGS ON EARL RADNOR'S HOME FARM, COLESHILL, BERKS.

with cattle boxes and stalls; the proper mixture of boxes, stalls, and yards—the first for fattening cattle, the second especially for stables (box feeding answering only in the case of animals continually standing on the litter), and the third for younger stock; lastly, the sheep yards and the sheep feeding house over a sparred and open floor, which seems specially adapted, and we might say only adapted to the case of sheep, which carry their bed-clothes continually about them, and do not suffer from so hard a mattress.

The following references to the index figures on the plan (fig. 102) will, with the assistance of the perspective drawing (fig. 101), enable the reader fully to understand these buildings:—The barn is shown at 1, 1; 2 and 3 are the engine-house and coal-house: the power is communicated to shafting on the second floor of the barn, from which threshing machinery and machines for winnowing, grinding, bruising, and cake-crushing are driven. From this shafting, too, turnip-cutters on the lower floor of the barn are driven; they are supplied with roots from the stores in 33, close by, which are filled from the rickyard, which is on a higher level; and from which, therefore, the grain to be threshed is also easily delivered on to the second floor of the barn. 4 is the chaff-house, and 5, 6 a steaming-house. Over these, and connected with the threshing floor of the barn, is the granary. There is a roofed gangway between the barn and the chaff-house, in which carts may be loaded from the granary; and it should be here mentioned that the second floor over 34, 35, &c., on one side of the barn, is also available as storage for grain. It is plain that hitherto the arrangements are exceedingly convenient. The corn is brought to the machine, its straw, cut into chaff, is for waggons; 32, also for waggons and carts, which may here be loaded from the granaries above; 33 is a root-store, already referred to; 34, 35, 36, 37 are provisions for riding horses, harness, and carriage house; 38, shepherd's house and bedroom over; 39, carpenter's shop; 40, office; 41, warehouse; 42, wheelwright's shop; 43, open shed; 44, warehouse. The yard partly enclosed by these last numbers, and by an open shed facing them, is a timberyard and sawyer's shed for the purposes of the estate; 45 is the rickyard. An examination of the perspective drawing will show how the buildings lie on the successive steps of a sloping ground; the ricks being built on the higher ground, level almost with the upper floor of the barns, and the general fall of the land being made available both for drainage and for the easy delivery of the food and discharge of the manure.

A careful examination of the whole will discover the fitness of those different parts to each other which are placed near to one another on the plan, as well as the adaptation of the whole to the circumstances of the farm, which is of 800 acres—500 acres grass and 300 acres arable. These buildings were designed and erected by E. Moore, Esq., agent to the Earl of Radnor.

THE AGRICULTURAL LABOURER IN THE CAMBRIDGESHIRE FENS.

THERE is one great peculiarity in Fen farming which never fails to arrest the attention, and to elict the remarks of visitors. We refer to the smallness of the farms, their want of contiguity, and the residence of farmers in the towns and villages, and not upon the farms. There are larger farms in some localities where

the tenants reside upon them; but these form rather the exception than the rule. In many parishes the land is in the hands of a numerous body of small freeholders, and not held, as is the case in many districts of the country, by one or two large owners. Hence we not unfrequently find an occupier of 500 or 600 acres has not less than three or four farms, and these rather widely apart, and sometimes even these small farms consist of detached fields; the occupier consequently finds it more advantageous to live in the nearest town or village, rather than upon either of these small holdings. And the labourer, like the farmer, is generally to be found dwelling away from the land on which his labour is expended. There are many disadvantages in this, both to master and servant. To the one it is costly and inconvenient, and to the other laborious and fatiguing, and its tendency is not favourable to the training and maintaining of good and efficient labourers. It seems, nevertheless, an unavoidable necessity. In the larger parishes there is generally a sufficiency of labour, and at certain times quite an abundance. And all farms lying near these centres of population have a great advantage over those more distant. Where the distance is too great to be travelled twice daily, some difficulty is oftimes experienced in securing an adequate supply of labour in the busy seasons, and the supply is not uncommonly inferior in quality, as well as deficient in quantity.

The labourers as a class vary very much. Some are steady, honest, and industrious, whilst others are drunkards, untrustworthy, and idle. The more intelligent and worthy of the young men, as they rise up, are being constantly drafted away to other large centres of industry, where they readily find employment at a better rate of wages than can be obtained in the agricultural districts. If this state of things should continue it bodes ill to the Fen farmer. We need a better rather than an inferior class of labourers in the future. Improved machinery, which is being so largely forced upon us, requires increasingly intelligent and trustworthy men to manage it. But the difficulty of competing with other employers of labour, as to wages, appears rather to increase than decrease. In the Fens, through the smallness of farms and the increasing demand for land, rents have become so high that it is scarcely possible to remunerate the labourer to the extent that many would wish. And every day seems to augment the perplexity and increase the difficulty. At the present time 11*s.* per week is the wage paid to ordinary farm labourers; but every farmer selects his best men for his most important work, and supplements the current rate of wages by different sums, varying according to the nature of the duties required. For waiting upon horses, 1*s.* per week additional is given, and full time always allowed, whether adverse weather prevents outdoor work being done or not. We pay our engine-driver 9*d.* per day, our machine feeder 6*d.* per day, our hedger 4*d.* per day, our windlassman 6*d.* per day, our cultivating man 6*d.* per day, and our mowing or reaping machine manager 8*d.* per day additional when engaged in their respective employments; and probably some such scale as this is adopted by others as well as ourselves. This gives the more intelligent and trustworthy labourers an opportunity of earning increased wages, and these amount to something considerable during the year. None of these remarks apply to men living upon the farms, where special arrangements exist. In some instances these receive the current rate of wages, with certain privileges, such as house-rent, fuel, poultry fees, and the keeping of young men as lodgers, who go with the horses and pay a small sum weekly for lodging and attendance. In other instances a fixed rate of wages is given, with the privilege of keeping a cow, in addition to the other privileges just named. Most farmers keep a regular staff of well-selected labourers for the ordinary work of the farm, but for extra work, such as claying, harvest-work, and in some cases threshing, they have to obtain assistance from the general labour market, securing such hands as they can meet with; and I needly hardly say these are not always good ones, but frequently the very opposite. We have a class of men technically called "tool-men." These find employment in the autumn in cleansing drains and ditches, and in the winter in claying; in the spring many of them are engaged in digging turves, and in the summer in hoeing, and oftimes they are grass-mowers. These men always work by the piece, and for no settled master, but go where their class of work is to be found. They earn large wages, but are not generally provident, and are large consumers of beer. The consequence to their families may be easily inferred, and needs no description. They have no conscientious scruples against poaching, but many of them find that a source of pleasurable amusement so long as they escape detection and conviction; and were game more plentiful, perhaps this pastime would be more eagerly pursued. We rejoice to say game is not too plentiful, for the very obvious reason that the land, as has been already stated, is in the hands of so many owners that no one possesses a large estate lying in a ring fence, which is essential to game preservation.

In some counties—take North Lincolnshire as an example—the ordinary rate of wages is generally from 2*s.* to 3*s.* per week higher than obtains in the Fens; but for piecework, such as grass-mowing, corn-mowing, thatching, &c., the opposite is the case, and higher prices are paid in the Fens than there. This fact has been frequently brought under our notice. The Fen lands, being chiefly arable, occasion an excessive demand for labour at certain seasons, and it has to be dearly purchased. Hence the cost per acre for labour during the whole year is considerable, and probably higher than prevails in some other districts where the ordinary weekly rate of wages exceeds that paid in the Fen country.

Another feature peculiar to the Fens is their weed-producing tendencies. Perhaps no country grows more weeds than the Fens; and although high cultivation may, and undoubtedly does, check their growth, yet, under the most favourable circumstances, their removal is a heavy annual cost. And this accounts for the large employment of women and children during the Fen summer months, in what are popularly known as the "agricultural gangs." The farmer finds it needful to go through every one of his corn fields, from April to the end of June, to pull up the noxious weeds—which, despite all his hoeing and other efforts to eradicate them, will still be found mingling with the corn, to its certain injury, and consequently to his certain loss. This is an expensive process, but still the less of two evils. The larger farmers generally employ a gang of their own, selecting a certain number of children, and placing them under what they deem proper and judicious supervision. Others, with smaller occupations, employ the public gangs, which by recent legislation are licensed by the magistrates. Much has been written and much has been said of late, upon the subject of these gangs, a good deal of which has been wise and true, and a great deal exceedingly foolish and erroneous. There has been too much caricaturing, and too little fair and truthful representation. The very worst cases have been dragged to light, and held up to the public gaze as fair samples of the whole. The system has its evils, and no one is more sensible of these than the Fen farmer himself, and no one desires to see them remedied more sincerely than he does. But he likes to see a true picture presented, and not a fictitious one. Some of the evils attributed to this system might more properly, and to a much larger extent, be attributed to an altogether different cause, but to this subject we shall refer more fully by-and-by. In a growing, forcing season, when weeds grow luxuriantly, and vegetation generally is rank and strong, the Fen districts appear to require all the women and children of a proper age that the population affords to exterminate the weeds, for it is only during a very few weeks that this work can be done. The weeds do not grow much until the spring weather comes, and soon the corn is too high to be walked through without injury. If, therefore, corn and weeds are not to be allowed to grow up together, it appears necessary that no hindrance be placed in the way of the employment of children during these few important weeks of the year. I need hardly remark that the parents of these children view favourably their employment in the summer, as the wages they earn largely supplement their own narrow incomes.

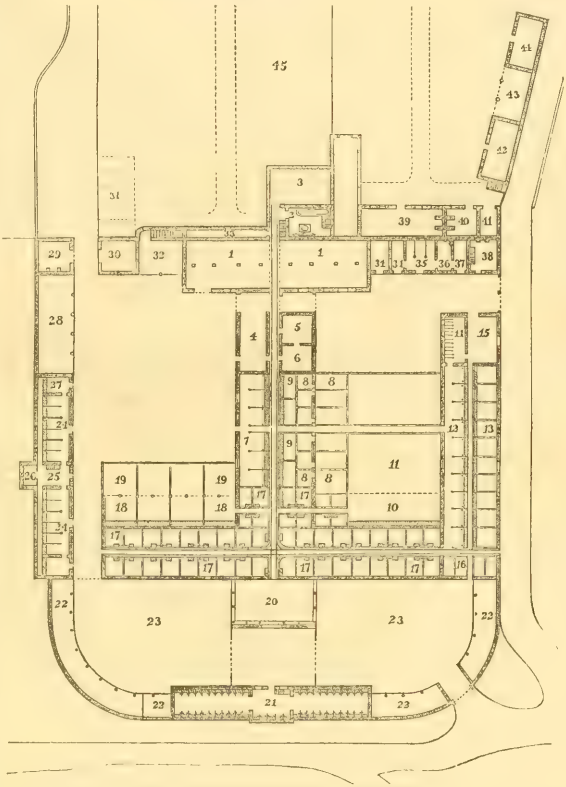

FIG. 102. PLAN OF COLESHILL BUILDINGS.

The question of education is one of vast importance, is at the present time engaging public attention largely, and promises very shortly to form the subject for legislative enactment. It is painfully true that amongst the labouring classes generally there is great indifference to this subject. They are far too prone to view their children as breadwinners, rather than to regard them as trusts, involving on their part certain duties and responsibilities. Some of the better and more worthy amongst them feel it a duty to avail themselves of the educational advantages which the neighbourhood affords; and esteem it a pleasure (and are willing even to make a sacrifice, if needs be) to send their children to school during the months when they are not required on the farm. It would be unjust to the labourer not to say this; but it would fail to be a true and faithful picture were we to refrain from saying also that there is a large class whose habits of intemperance are so inveterate that they feel very little concern for either wives or children, and care only to make them their slaves, ministerers to their own insatiable appetites, denying them every home comfort and every school benefit; not a farthing can be spared, but all must be expended upon the accursed drink!

Friendly societies and "clubs," as they are technically called, exist amongst the labouring classes, and are supported by the thrifty and well-to-do amongst them, and are sources of great comfort and help to them in times of sickness. Unhappily, most of these clubs meet monthly at public-houses, and at every meeting a certain sum has to be expended in beer. The consequence is, the publican grows fat at the expense of the poor hard-working labourer; but he, strange to say, appears to like it, and it is a most difficult thing to get a club removed from one of these beer-houses to any private room.

We come at last to the labourer's home. From what has been already stated, it will be at once perceptible that neither landowner nor farmer supplies the cottages, but that the labourer in the town, mixed up with the general population, seeks and provides his own house, where and on what terms he pleases. The smallness of farms and the diversity of owners precludes the possibility of any other system. We regard this as an unmixed evil. Were the land possessed mainly by one or two gentlemen of wealth and influence, we might expect to see, as indeed we do see in some localities, old dilapidated hovels being displaced by neat well-arranged cottages, constructed with a view to comfort and morality. But alas! the cottages which many of our labourers inhabit are far otherwise. They are mere hovels, and it would scarcely be a misnomer to call them pigstyes. Low, small, and in every respect uncomfortable, they foster no feelings of self-respect or

high-toned morality. These, far more than the "gangs" already alluded to, are the fruitful sources of vice and immorality. *A. S. N.*

Home Correspondence.

"Customary" Cultivation. — I have looked through Mr. Lawes' paper. The information contained therein is very valuable, but I cannot agree with his conclusions. Here is what he says:—"I would propose, therefore—1. That all land should be given up with a fixed proportion under fallows, root crops, seeds, and corn crops; the proportion to be settled according to the custom of the locality." Now, I want to know how we are to lay down a "custom" for any "locality," for on this little farm of mine I have three distinct classes of land, needing different modes of culture. My land on the hill is all of one character—heavy clay; my land on the flat, called light land, is a mixture of soils, viz., four of the fields are sand and gravel, and a considerable quantity of clay, and the two other fields are in character fen land, with some sand in them. Dr. Voelcker, who came in 1859 to Woolston, and took samples of soil and subsoil to make analyses of the soil for me, and to report on them, says:—"The locality abounds in a great variety of soils, ranging between light sandy land and heavy obstinate clays." Here is what he says about the heavy clay land on my farm after analysis:—"There is very little sand in either surface or subsoil, the preponderating constituent of each is clay. In the surface soil there is 60 per cent. of clay, in the stiffer subsoil no less than 76 per cent. of clay." Here is what he says of my four pieces of so-called light land:—"At the time of my visit the land ploughed into ridges was being subsoiled. The four horses employed in this operation to all appearance had no light work to perform, the small proportion of sand and the large quantity of obstinate clay in the subsoil fully accounts for this." The analysis showed clay 82.95 and sand 5.32. And here is what he says about my two fields that are fen land in character:—"This soil contains a considerable quantity of sharp, siliceous sand, which renders the land more friable and more easily cultivated." The analysis shows clay 54.98, and sand 37.27. This light fen land will grow good roots, a lot of thin Barley next, then some fair Clover; after that fair Wheat, both in quantity and quality; but Peas and Beans it will not grow. We may get plenty of Pea straw, but no corn, and with Beans both straw and corn are doubtful. My four fields of heavier land on the flat will grow good roots, Barley, Clover, Wheat, Beans and Wheat; that is my mode of cropping it. And my heavy clay land on the hill will grow good Wheat, Barley, Beans and Clover. It might grow roots, but would be so dirty to the sheep that it kills them to try to eat the roots on the land, and to draw the roots is ruination to the land, not only by robbery by taking the roots, but by murder in carting the roots away from the dirty soil. Yesterday a gentleman asked me by letter how best to farm such a soil under steam culture. My reply was—1st year, Wheat; 2d year, Barley; and the 3d year, Beans. Mr. Lawes supports this, when he says "that where fallow or liming, or subsoiling, or steam-smashing and allied processes are admissible and advantageous, or where root crops cannot be consumed on the land during wet weather without injury to the succeeding crops—that is to say, on the heavier and deeper soils—Barley may often be grown both in larger quantity and better in quality after Wheat than after roots." I am clearly of opinion that this three-crop system—Wheat, Barley, and Beans—would be a very profitable mode of cropping on very many of our heavy clays under steam culture. My mode of cropping on my four fields of good corn land on the flat is a very suitable one, but on one of the lighter fields that will not grow either Beans or Peas I am growing Barley every year. It is now planted with the fourth white crop in succession, viz., Wheat, giving a produce of 43 bushels; then Barley, produce 54 bushels; then Barley, produce 63 bushels; and now it is planted with Barley again, and bids fair to be the best crop of the lot, for it is sown in the best possible order, and I am growing Barley continually, because I find it to be the most paying crop that I can put upon this field. Then, what is the good of laying down cropping for any locality? for this farm of mine fairly represents vast tracts of land in this country. Here is what Dr. Voelcker says upon the point:—"The examination of the soil and subsoils from Woolston farm fairly represents the chemical constitution of a great many heavy and light soils in England." All that need be required of a tenant is that he pay his rent and keep his land clean. Mr. Lawes' evidence on the unexhausted manures in soil is first-rate, and is a good guide as to what an outgoing tenant should get paid for. *William Smith, Woolston, Bletchley Station, Bucks, April* 9.

Unfavourable Appearance of the Wheat Plant.—We do not quite agree with your correspondent's ("J. L. F.," p. 470) informant, when he lays the greatest share of the failure of his Wheat plant to the charge of the "champion" ploughs. No doubt these ploughs left their work at a greater angle than any others in the field, and therefore a deeper seed-bed than was actually required was made after harrowing. May not, therefore, the seed have gone in too deep upon this particular ploughing? When we sow Wheat upon one-earth lea in this locality (especially upon the light soils) we find it absolutely necessary to well press the furrows some time before sowing, in order that the land shall be made firm for the Wheat to root in, and that the seed shall not be too deeply buried. That the Wheat plant upon all kinds of soils has suffered considerable loss this year, there cannot be the slightest doubt (more especially upon one-earth lea). The cause of the loss will give rise to various opinions; I will as briefly as possible give mine. I believe it to be owing to the long continuance of the drought last summer; much of the Clover lea could not be ploughed up till very late in the season, and as seed-time quickly followed, with a favourable time for sowing, much of the Wheat was sown before the Clover sward had rotted sufficiently to allow the furrow slice to settle firmly upon the subsoil, as it otherwise would have done, could the land have been ploughed up in proper time, and well pressed, six weeks or two months before sowing. The young Wheat had therefore to root in a very hastily prepared seed-bed, whose furrows had not had time to get consolidated, so that the rootlets were suspended after passing through the furrow-slice, until they could reach the subsoil into which they could get a firmer hold. For some time no particular signs of failure were visible upon light soils, but upon some of the heavy clays in this neighbourhood the seed did not come up at all well; much of it germinated, and afterwards perished for want of sufficient moisture after sowing. When the rain set in, the already hollow land became saturated with water, and this was followed immediately with severe frost; and then it was that the plant was injured by the frost lifting up the soil, and breaking off the Wheat at the neck, as it did many acres of winter Beans throughout the country. As regards the "pickled" Wheat plant looking weak and thin, it may, perhaps, be traced to the pickle being applied too hot, and thus have partly destroyed the vitality of the seed. I know of an instance of the kind happening to a neighbour two or three years ago, and who sowed another field with the same kind of Wheat (but pickled under different circumstances), and who had a good plant. *John Watts, Whitfield, Berkely, April* 4.

A Walk over the Farm, April 9, 1870.—A backward season, but the work very much more forward than last year, owing to the dry March. Wheat, drilled at 9 inches apart, all horse-hoed; spring Beans up and horse-hoed, winter Beans (somewhat injured by frost) also horse-hoed. Quantity horse-hoed daily by one man and two horses, 14 acres: a spare horse to relieve one of the other two; Garrett's horse-hoe used, it covers 7 feet 2 inches, and I have used it for 24 years. Quantity of Wheat drilled, 4 pecks per acre. Barley (6 pecks per acre), coming up; Oats drilled, but not yet up—2 bushels per acre, following a double crop of winter Tares and Kohl Rabi. The Kohl Rabi were planted after Tares in July, and have been most valuable for ewes and lambs. Clover a good plant; Docks spudded out and weeds cut out. Cabbages planted out to come at harvest. Hand-hoers at work freely. (This time last year all work was late, as it was too wet to get on the land.) Kohl Rabi seed sown for plants. Mangel land scarified ready for seed, which we generally drill about April 20. Our Wheats look healthy on the heavy land; on the light land somewhat injured by frost. Lambs of last year sold fat at 52*s.* 6*d.*; 101 lambs this spring from 70 ewes,—cross Cotswold ram with Hampshire Down ewe, dark in the face. Mangel in demand; could sell them at 18*s.* per ton; have still a good stock, about 80 tons, to finish up the bullocks that will come out in June; sold our early bullocks before the recent fall. A great change in the farming all around me—plenty of draining, removal of fences and trees, use of steam-engines, iron sheep-hurdles, &c., for much of which, done 25 years ago, Mr. Mechi was then considerably snubbed: opinions get ripened and improved by time. As long fallow is going out of fashion, the only way to get rid of Twitch or Couch-grass is to fork it up, shake the earth from it, and carry it off the land. This we always do, and especially on the land autumn-manured and double ploughed for Mangel Wurzel. The cost of removing all the Couch-grass from this land has been 4*s.* per acre. This is done after two Wheat crops, which produced on one field 15½ qr. per acre, and on the other 13 qr. 2 bushels per acre in the two years. *J. J. Mechi.*

Alderney Cows.—I shall be obliged to any reader of the *Agricultural Gazette* if he will state the number of points in a first-rate Alderney, and also what those points are. I met a lady to-day who lived 14 years in Jersey, and she says the points are 10. I fancy they are more. By Alderney I mean the small breed. *W. F. Radclyffe, Okeford Fitzpaine.* [Mr. Radclyffe will find in vol. xx. of the English Agricultural Society's Journal an enumeration of 33 points in the case of the Jersey bull, and of 36 points in the case of the Jersey cow, the presence of which is held to constitute perfection.]

Fisken's Method of Steam Cultivation. — "G. A. H." has, after considerable fencing, in most instructively written papers, come to the conclusion that the double-engine system is not available, by reason of its great price, excepting on large occupations. After placing before us his calculations, based on Fisken's flying-rope system, he adds:—"There is no doubt that a good roundabout, worked by a traction-engine, would give pretty nearly the same results." Such being the case, why discard the roundabout, costing £520, for Fisken's, costing £650? With traction-engine for either set some £150 more will be required. "G. A. H." cannot have mastered the Fisken tackle, for he requires four men and two boys, traction-engine fetching water, thus saving one hand, otherwise it would be seven. Let me refer him to the *Farmer*, p. 810, 1869, where Mr. Fisken states:—"In the Fisken system only four attendants are required; two of them may be lads. Mr. Backhouse says that he has always wrought the Fisken tackle with four hands." I cannot agree with "G. A. H." that the engine-driver would require to be reckoned at quite 5*s.* per day; if a man of ordinary tact, his wages can be well earned on the farm. Let us now calculate, as Mr. Fisken states, for four hands only:—Engine-driver, 3*s.* 6*d.*; one man, 2*s.*; two lads, 2*s.*; coals, 6*s.*; oil, 1*s.*, = 14*s.* 6*d.* (coals and oil will be quoted the same in each case). Ten acres costing this sum will materially reduce his other calculations. I fear "G. A. H." resides in some favoured quarter, and is unconsciously led to believe we are all rowing up the same stream. I hope he will give me credit for being right when I say that a pair of good horses cannot always plough 1 acre of land, and even in hiring the charge varies from 10*s.* to 14*s.*, according to stiffness of soil, and not 6*s.* per acre. The roundabout, according to "G. A. H.," giving "pretty nearly the same results," we will not question the kind of tackle, but I doubt "G. A. H.'s" amount of work done: Mr. W. Fisken himself averages it at 9 acres; however, we will keep to his figures, and quoting the wages in each case at the rate in his neighbourhood, we find that to plough 10 acres will cost, as to estimate, under the several systems, as follows:—

Comparison of Rival Roundabout Tackle.

	"G. A. H." Roundabout Tackle	Mr. W. Fisken.
	s. d.	*s. d.*
Engine driver	3 6	3 6
Windlass	4 0	2 0
Ploughman	2 0	2 0
Potterlows, &c. ..	2 0	2 0
Anchormen	..	4 0
Coals	6 0	6 0
Oil	1 0	1 0
	18 6	20 6

This is at the rate of 1*s.* 10*d.*, 2*s.* 0½*d.*, and 1*s.* 5½*d.* per acre. Our engine (traction) is computed to cost £450 (see p. 287), of which £150 is to be charged to the ploughing department; this with £350 for Fisken's tackle, £500, on which interest must be charged for the whole year, at the rate of 15 per cent., viz., 5 per cent. interest, 5 per cent. replacement of capital, and 5 per cent. repairs = £75. Smith's roundabout tackle costing £225, engine as above £150, together £375, 15 per cent. interest = £56 5*s.* Let us glance at a small occupation of the same size as Mr. Smith's. We find that last autumn he required the use of his tackle for 15½ days (p. 1145, 1869): supposing we allow 20 days' use of tackle, the charge for interest in Fisken's case would be £3 15*s.*, in Smith's £2 16*s.* 3*d.* per day, "G. A. H.'s" quantity being taken as correct, viz., 10 acres, and the cost of ploughing, for wages, coals, &c., 1*s.* 10*d.* per acre of "Fisken's," as handled by "G. A. H.," or 1*s.* 5½*d.* as per maker's estimate, and the roundabout 2*s.* 0½*d.* per acre; 7*s.* 6*d.* must be added per acre to "G. A. H.," and Mr. Fisken—being one-tenth of interest on tackle, viz., £3 15*s.*; and 5*s.* 7½*d.* to Mr. Smith's, or roundabout, being one-tenth of interest on tackle, viz., £2 16*s.* 3*d.*; showing that, using the tackle only 20 days in the year, the interest, replacement of capital, and repairs, &c., estimated at 15 per cent., being charged, the ploughing would cost 7*s.* 8*d.* roundabout, 8*s.* 11*d.* Mr. Fisken, and 9*s.* 4*d.* "G. A. H." per acre. Again, using the tackle only 15 days—about the time Mr. S. requires on his 112 acres arable—and allowing, in this instance, 7½ acres as the ploughing done in one day, the cost for interest would be 13*s.* 4*d.*, and for labour, coals, &c., 1*s.* 10*d.* = 15*s.* 2*d.*, for Fisken's system as handled by "G. A. H.:" or by Mr. Fisken's own estimate, that is, with four hands, interest, 13*s.* 4*d.*, labour, coals, &c., 1*s.* 5½*d.* = 14*s.* 9½*d* per acre. Using Smith's, or the roundabout, the same time, viz., fifteen days, interest chargeable, 10*s.*, labour, coals, &c., 2*s.* 0½*d.* = 12*s.* 0½*d.* per acre. These figures would show that a small farmer, requiring the use of his ploughing tackle for only fifteen days in the year, can estimate the cost of ploughing his land at least as cheaply by steam as by horses, but the work will be done at the proper time; and mark its superiority. I will carry out these figures, showing what ploughing will cost on a holding requiring the use of the implement for thirty days, or two small farms of about 100 acres arable, requiring it say fifteen days each. Interest, labour, &c., in this case will stand thus:—Fisken's, as handled by "G. A. H.," 8*s.* 6*d.* per acre; Mr. Fisken, with only four hands, 8*s.* 0½*d* per acre; Mr. Smith, or the roundabout, 7*s.* 0½*d.* per acre. Let the small holders look at these figures, and consider well if it is to their advantage to continue in the old beaten track or not. *West Indian.*

Foreign Correspondence.

PARIS: *French Agricultural Inquiry, and the Anglo-French Treaty.*—Closely connected with the discussions throughout the country on these treaties is the General Agricultural Inquiry, which is to form the basis of certain measures to be introduced to the Chambers. The inquiry is closed, and the reports are being printed as rapidly as possible, nearly all the 36 volumes having appeared. The whole are divided into four series; the first, consisting of three volumes, contains the decrees, the series of questions, and the reports of the Commission and sub-committees, two of which have appeared; the second, forming 28 volumes, each of which contains the answers to the inquiries from one of the 28 districts into which the country was divided for the purposes of the inquiry: 24 of these volumes are published; the third portion consists of a single volume, which has been out some time, containing the evidence taken before the Commission itself; and the fourth consists of three volumes, also printed, containing the information collected respecting the condition of agriculture in other countries. As soon as the reports are completed a volume, containing an analytical index to the whole, will appear.

One volume contains a portion of the decisions of the Commission, and the rest will shortly appear, and be embodied in a draft law.

Apart from its direct object the reports of the Special Commission cannot fail to have an interest for agriculturists and statesmen all over the world; the inquiry has been conducted by men of undoubted capacity in the conduct of such inquiries, and our neighbours are great adepts in the composition of such reports as these. Moreover, the inquiry takes in almost every subject connected with agriculture and agrarian legislation; valuation of common and other land; gleaners' and other rights; charges on guano; rights of married women; customs regulations; management of watercourses; agricultural education, prizes, &c.; system of sales in markets; railway charges; silk culture; free import of agricultural machinery and implements; taxes on alcoholic liquors, culture of Tobacco, questions relative to agricultural loans, &c.

The blue-book, entitled "The Exposé of the Situation of the Empire," contains the following account of the Wheat crop of the past year:—Without attaining the abundance of 1868, the past year's results were satisfactory. From the information collected, the number of hectolitres (22 gallons) of Wheat harvested may be estimated at 100,000,000, or 1½ per cent. above the average yield of the empire. The price of Wheat, which, in consequence of the bad harvest, rose in October, 1867, to 27f. 72c., fell at the same period in 1868 to 22f. 27c., and in 1869 to 19f. 75c. This is a certain proof that the supply is sufficient, and that neither the interests of producers or consumers are suffering. From the month of August, 1867, to the same period in the following year, the importation of Wheat averaged nearly a million quintals per month, during the following twelve months it was less than 100,000, and at present it does not exceed 50,000 quintals.

This blue-book contains other information interesting to the agricultural interests of Great Britain; it gives tables of imports and exports between France, England, Belgium, Germany, Austria, Switzerland, and Italy. It is known that the British imports into France have fallen off to a certain extent, while those of France to England have increased, but the mere general fact does not tell much; the tables in question give these imports and exports for the first eight months of the past year, and the following are the results:—

The English imports into France, as compared with the same period of 1868, show a diminution of a little more than half a million; but that on cereals, silk, and cotton amounts to £880,000. The items of regular commerce connected with agriculture give the following results:—Horses, a small deficit; raw hides, increased nearly one-sixth; wool, nearly the same; oleaginous seeds, increased, nearly trebled; unenumerated articles, including, of course, many agricultural products, increased from £746,480 to £908,000.

The exports from France to England show a very large increase in live animals—from £200,000 to £581,560; a small diminution in meat, fresh and salted; an increase from 19,000,000 to 20,000,000 eggs of all kinds; an increase of about 25 per cent. in butter; of about 10 per cent. in raw hides; of 50 per cent. in wool; a small diminution in the case of Potatos; a falling off in fruit from 10,000 to 7000 tons, and in sowing seeds from 10 to 5 tons; an increase in Hemp and Flax from 375 to 744 tons.

NEUCHATEL.—*Swiss Agriculture.*—The following are the answers of M. Bovet, of this place, to the circular inquiry of Mr. J. Howard, M.P.:—Land is much divided. Farms in a ringed fence are very rare, except in the mountains, where it is the rule. In Western Switzerland farms of 12½ to 25 acres are considered small, 25 to 75 medium, and 75 to 250 large. Larger than 250 acres are very rare, except in the mountains. The greater proportion of farms is small.——Good land lets for 40*s.* an acre, medium 25*s.* 6*d.*, poor 16*s.* Pastures are let according to the number of cattle they will carry. The difference between the rent of large and small farms is unappreciable.——The land is generally farmed by the owners. We think it is better they should be owners; it is a great guarantee for the fixity of social order. For high farming it is a different matter, though for the last few years the example of the large proprietors and neighbouring farmers has exerted a salutary influence.——When let, it is generally on lease, the term three, six, and nine years, with a right of continuity, if there should not have been a twelvemonth's notice given. Leases are in writing throughout almost all Switzerland. In Western Switzerland a stipulation is made that no more than three white crops shall follow together, and no more than two of the same kind. Also, it is sometimes specified the extent of cereals, root-crops, and industrial crops that may be grown—generally a third of the total area.——The value of land to buy in large farms varies from £24 to £32 per acre, including the farm buildings; mountain and forest land, £3 5*s.* to £5. Small farms sell from £48 to £56 per acre; vineyards fetch from £200 to £320 per acre.——In nearly every canton there exists a game-law. The shooting season begins September 1 and ends December 31. There are, however, some exceptions, as there are open times between the latter date and the end of February.——As to methods of cultivation there are very few fixed rotations. In Western Switzerland, Wheat, Oats, Rye, Barley, roots, Rape or Colza, a little Tobacco, Sainfoin, Clover, Lucerne, &c. German Switzerland: Coarse Wheat, Wheat, Rye, Oats, Potatos, Clover, many fruit trees. Wheat, 30 to 34 bushels per acre, maximum 43 bushels ditto; Oats, 36 to 42 bushels per acre, maximum 54 bushels ditto. On the plateau of Western Switzerland in proportion to the seed, Wheat 6 to 10 to 1, and Oats 8 to 15 and even 20 to 1. Potatos give 144 bushels per acre, Carrots 240 ditto, Beetroot 480 ditto. Natural meadows 16 cwt. to 1 ton per acre; considerably more in Central Switzerland; artificial meadows 24 to 36 cwt. per acre; on the mountains 8 cwt. per acre; the most on the Jura.——Very little guano is used, a little pulverised bones, about 9 cwt. per acre generally. Several progressive farmers are now engaged in making comparative trials thereon, also the Alpine Societies for the mountain districts. In the Jura marl is used as manure.——Agricultural wages vary—with board and lodging, 8*s.* to 16*s.* a month; without board and lodging, 1*s.* 8*d.* to 2*s.* 6*d.* a day in summer, 10*d.* to 1*s.* 8*d.* in winter: in remote districts still less. Sometimes drink, particularly wine, in the vineyard districts.——Labourers are scarce in the manufacturing districts, abundant elsewhere. When manufacturing business was good, 10 or 15 years ago, the agricultural population migrated to the towns, but now it returns to the fields. Berne, Valais, the smaller cantons, have the greatest population and greatest pauperism, particularly the two first-named cantons. An increase of at least one-third.——It is rare for them to be housed gratis. They pay £4 a year for house and garden. In Western Switzerland the farm labourers live in the villages. In Western and Central Switzerland they have generally their own house, the population in those parts not being grouped in serried villages, as in the West. Nothing fixed, generally not, in any case not gratis.——Cattle have suffered excessively in one or two localities, where the sick beasts have been slaughtered immediately by order of the Government. In Eastern Switzerland there have been some cases of typhus imported from Austria, which has been stamped out in the same way. In Western Switzerland there have been some cases of foot-and-mouth disease in cattle, and foot-rot in sheep. It has never been dangerous, but seriously hinders the sale of beasts while it rages.——In some cantons there are no burdens, land paying a direct tax like any other capital. At Neuchatel the landlord pays for his land as his capital, and the farmer pays on his profits. In other cantons each pays on his revenue. The poor are generally dependent upon the parish and private charity.——Water is generally utilised for irrigation as well as drainage, with more or less skill in the application. Thus, in Western Switzerland, irrigation is in its infancy, whilst in Aargau particularly, and several of the central cantons, it is carried out with considerable skill.

Farmers' Clubs.

KINGSCOTE.

Farmyard Manure.—The management of farmyard manure was the subject considered at the last monthly meeting of this Club. Mr. H. S. HAYWARD, of Frocester Court, Vice-President of the Society, read the following paper:—

When I commenced my agricultural education—which, as my grey hairs indicate, must have been a good many years ago—Cirencester College was not thought of, and chemistry as applied to farming was in its infancy: consequently, I had not the advantage of receiving the instruction in that branch of the science of agriculture which is now so generally taught, with very good results when not, as is sometimes the case, carried too far—for at the same time that I admit a scientific education to be very important, I am bound to confess that I have not unfrequently observed considerable losses sustained by its taking precedence of practical knowledge; and my advice to young men learning farming is to acquire a thorough knowledge of the practical part first, and study the scientific as much as they like afterwards. The manure subject, as a whole, embraces so extensive a field, that I have thought it best to confine the few remarks I am going to make this evening to the value and management of real manure, and only to allude to other varieties when finding it necessary to do so for the purpose of comparison. So much is written and said by scientific men of the present day about artificial manures, that I feel disposed, as an old practical farmer, to stand to my colours, and say all I can to support our truly conservative friend, the dung-heap; for unless it found some such supporters in men of the old school, like myself—judging from what is too often seen—it would, I fear, be less thought of, and become more neglected than ever, thus necessitating its place being filled by its more fashionable artificial relations.

Farmyard manure, properly speaking, is the residual produce of all vegetable substances employed in the feeding and littering of the various kinds of live stock kept within the precincts of a farmyard. It therefore contains all the elements of the food and litter consumed by live stock, excepting those which are converted into flesh, bones, milk, &c., and it is scarcely necessary to say that the better the cattle are fed the better will be their manure; indeed, I consider nothing to be more profitable than giving store cattle a moderate quantity of linseed-cake with their rough fodder when a sufficient supply of roots is not obtainable, as not only benefiting the animals but greatly improving the dung-heap, and thereby economising the use of artificial manure. Of all the kinds of manure known and used, I believe it is the general opinion that that coming under the denomination of "farmyard manure" is the most efficient; and containing, as it does, all the food upon which plants thrive, it must necessarily be of the greatest importance to the farmer that it should be managed in the best possible way. Owing to neglect great waste of this valuable article is by far too general; one writer goes so far as to say "Good management will produce double the amount obtained under neglect"—and I am disposed to agree with him. Inconveniently-arranged yards and buildings are very frequently an obstacle. But this evil, which can only be rectified by the landlord, should not be made an excuse for mismanagement.

Faults in Management.—In alluding to bad practices I will mention that of allowing manure to accumulate in open yards, or in heaps thrown out of feeding stalls and stables, much too long before removing it to the dung-heap; thus exposed to the washing of the rain and to the water which runs off unshooted buildings, a valuable portion is carried away and consequently lost. There is, of course, a time when it is in the most advantageous state to be carted away and made up into a well-constructed heap, that time depending upon how thick the cattle have been kept in the yard, and the amount of litter supplied; but it should not remain long enough to get too rotten, or a loss will be sustained by the liquid manure running from it; just before that would take place I conceive to be the best time, instead of its remaining the whole winter, then to be turned up in the yards where it has been made. Independently of other losses, it is not easy in this way to make the heap of equal quality throughout, seeing that round the cribs and under the sheds it will be much better than over the other parts of the yard; and seeing that as turned up so it will go to the field, an uneven manuring will be the result, whereas if taken away at proper intervals to some other convenient place, and the carts drawn over the heap in forming, waste from over-heating and other causes will be prevented, and the dung will be equal in quality throughout.—Another bad practice which I will mention as being frequently seen in this neighbourhood, is the way in which heaps are formed by the roadside, or in waste places, for weeks, or perhaps months, together, by shooting up a few loads occasionally, and these not even thrown up into form, as if the object were to get rid of a nuisance, instead of husbanding a valuable commodity—one end perhaps being good rotten dung, the other inferior, or mould or road-earth, which is valuable no doubt as a mixture, but can only properly be made so by putting it under or carting it over the heap in regular layers. A dung-heap got up in this manner, and remaining for a long time without having been consolidated by pressure, will not only lose in quantity and quality, but will be uneven in value,—one end of the heap proving good, the other bad, so that when spread on the land the same uneven dressing will be the result as when heaped in the yards.—There is another method very general upon the Cotswold Hills, certainly superior to that I have just described, but still wasteful, and which may be greatly improved upon,—I mean the making heaps through the autumn and winter, at certain distances apart, in the fields where it is to be applied for roots in the spring. The plan, no doubt, is convenient, so far as that it provides the manure near at hand when required to be ploughed in at a busy time; but the loss from evaporation and the washing of a winter's rain must be very evident, and far outweighs the economising of labour: I believe if any person would count the loads carted out, and count them again when used, he would find the loss to be so great that he would be induced to alter his system. Still, I see no objection to later-made dung, required for almost immediate use, being made up by backing the carts against the heap instead of driving over: it then lies more loosely together, ferments more rapidly, and, if

frequently turned and separated, will soon acquire that rotten texture which enables it to be easily ploughed in. Horse-dung should from time to time be spread over the cattleyards, and not remain as thrown out of the stables until in a state of fermentation, being more valuable so mixed, at the same time doing the cattle good and preventing loss by evaporation. I doubt whether there is any operation upon a farm of greater importance than that of clearing out and relittering yards. It is therefore my opinion that no other work should be allowed to interfere with heaping your manure at the proper time. There are many who think nothing of expending money upon guano, superphosphate, and various concoctions of the present day, and begrudge the labour that might be so profitably expended upon the natural article. It is not easy to explain the exact time at which an open yard should be cleaned out and re-littered; but I think it should be as soon as possible after the liquid begins to drain from it in a discoloured state. Liquid-manure tanks, which promised to become very general some years ago, appear to have been more valued in theory than in practice, as we hear but little about them now, and those who adopted the plan seem in most cases to have relinquished it, proving that it did not pay. The best method therefore must be to prevent as far as possible the loss of this valuable part of the manure, which, I hope to show, may in a great measure be done by the proper construction of the dung-heap. Dung made by cattle fed in boxes is fit for immediate use, and cannot be more economically treated than by carting it direct to the field and ploughing in at once: not so with regard to long dung from open yards, for, although the practice is often followed by good farmers, I believe it to be wrong, especially upon the light soil of the Cotswold Hills. There is, however, a prevailing opinion that box-feeding is not so healthy as the ordinary fatting stalls; so it is to be feared that this excellent method of preparing natural manure cannot become so general as could be desired.

Proper Management.—Having spoken on wasteful management, I must endeavour to prove the best method of preparing and preserving farmyard manure. This greatly depends upon the proper construction of the dungheap, and the condition of the materials of which it is composed, which no doubt most practical men know as well as myself. In heaping manure (unless intended for immediate use), the carts should always be drawn over it, and be constructed upon an inclined plane on either side, so that horses could draw up on one side and down on the other, as the more it is trodden down by horses and wheels by its being drawn up load upon load the better; it will rot quite rapidly enough when so compressed, and there will be very little loss by the dissipation of gases from overheating, even if it should be required to remain for a long time; and once well turned about a fortnight before using will generally be sufficient to produce the proper consistency for ploughing in. Mr. Lawrence, of Cirencester, says of the plan which he has adopted, "Some three or more spots are selected, according to the size of the farm, in convenient positions for access to the land under tillage, and by the side of the farm-roads. The sites fixed upon are then excavated about 2 feet under the surrounding surface. In the bottom there is laid some 3 or 4 inches of earth to absorb any moisture, and on this the manure is emptied from the carts. This is evenly spread and well trodden as the heap is forming. As soon as this is about a foot above the ground level, to allow for sinking, the heap is gradually gathered in until it is completed in the form of an ordinary steep roof, slightly rounded at the top by the final treading. In the course of building this up about a bushel of salt to two cart-loads of dung is sprinkled amongst it. The base laid out at any one time should not exceed that required by the manure ready for the completion of the heap as far as it goes; and within a day or two after such portion is built up, and it has settled into shape, a thin coat of earth in a moist state is plastered entirely over the surface. Under these circumstances decomposition does not take place in consequence of the exclusion of the air, or at any rate it is to so limited an extent that the ammonia is absorbed by the earth; for there is not a trace of it perceptible about the heap, though when put together without such covering this is perceptible enough to leeward at 100 yards distance. The base may be 10 to 12 feet wide, and the roof about 9 feet from the base, which settles down to 7 feet." I think, instead of 3 or 4 inches of mould laid in the bottom, Mr. Lawrence's plan might be improved upon by having a foot to 15 inches; and a covering of 10 to 12 inches over a level surface when the heap is about 4 feet high would answer the purpose quite as well as gathering in the top to form a roof, if the mass be well consolidated by the pressure of horses and carts.

Green Manuring.—This is another kind of manuring that it may not be out of place shortly to allude to, which I have seen practised, with very good results, in some parts of the country, though not often adopted in this neighbourhood. I mean ploughing in green crops, such as Vetches, Mustard, &c.; of which "Morton's Cyclopædia" says—"Vegetable substances in their green and succulent state are powerful fertilisers when thoroughly incorporated with the soil. A great portion of the bulk of green crops is obtained from atmospheric sources; and after a green crop is ploughed in, the soil necessarily contains more of the organic elements essential to vegetable nutrition than it did before that crop was grown; it is richer, in fact, by the carbon, oxygen, hydrogen, and nitrogen, which the green crop has obtained from sources independent of the soil. In like manner, the crop grown after a green crop has been ploughed in has the advantage of a regular supply of mineral elements, which have been worked up by the roots of the fertilising crop from the soil and subsoil, and which in many instances, owing to their sparing solubility, are with difficulty obtained under ordinary circumstances." The value of green crops so applied is thus scientifically described, and I can bear practical testimony, upon ample experience, of its being most efficient.

Artificial Manures.—I should be very sorry for it to be inferred from my remarks that I wish to depreciate the importance of the use of artificial manures, especially guano, bones, blood, &c.; but I am of opinion that a vast amount of rubbish is manufactured nowadays. It may have the effect of exciting the soil to produce a crop of roots—though I have no faith in it with regard to white-straw crops—and it may be an advantage for the time being. But the important question is, how long will land answer the whip to this treatment? We know that land will get sick of certain crops if repeated too frequently, and it strikes me rather forcibly that the time will come, and in some instances may have already arrived, of land being artificially manure sick; and I hope this evening to hear from those who have been using light manures for some years whether they do not find that a more liberal dressing is required now to produce the same result than when first applied. If so it is to be feared that the soil must be deteriorating rather than improving. I have alluded to artificial manures for the purpose only of proving the importance of paying greater attention to the preparation and preservation of that manufactured in farmyards and stalls, of which there is no danger of land ever getting sick. I will conclude by quoting, as nearly as my recollection serves me, the words of some one speaking upon the subject which I have introduced for this evening's discussion at an agricultural meeting in Ireland, and which came under my notice two or three years ago:—"It is by the preparation and application of manure that good crops can and will be produced, and just in proportion as it is largely applied so will the farmer be enriched. If you want a large crop of Turnips, prepare manure and apply it; if you want abundant crops of Flax, prepare manure and apply it; if you want large Potatos, manure; if you want plenty of Oats, manure; in a word, if you want plenty of money, I would say prepare manure properly, and apply it."

Discussion.

Mr. Holbrow remarked that they had been going on contentedly with our system of managing manures, but that he did not doubt they had yet much to learn in this as in other branches of their business. His practice, he said, was to make as good dung as possible through the winter. Some of his animals were fed on hay and some on straw and cake. He often mixed the two manures together by putting them into one heap, which he hauled out on the ground, after his Wheat crop had been taken off, into heaps of 16 or 20 loads each, to be applied to the root crop in the following year. He did not consider he could get his green manure made into a suitable condition for the Swede crop the same year; neither did he think there was so much loss by keeping dung as some people imagined if the dung was only turned up into a good large heap. The plan Mr. Hayward had recommended of drawing the horses and carts over the dung-heap was practised on a farm he now held when he was a boy, and although that system had been discontinued, he was at a loss to know why, as he believed it a means of preventing too much decomposition. Having plenty of straw he kept his animals well littered, and therefore he did not think the loss from washing by rain was anything like so great as in many other instances.

Mr. T. Price said he was not one of those large farmers who could put aside old dung and have a store. He applied his manure to his roots for the same reason that he made it. His system was to have all his dung made from his horses and cattle in the same yard, and when a frost came, and he could do nothing else, he hauled it out and threw it up loose in a heap; and by having it once turned before using he never found any difficulty in getting it in a fit state to produce a good crop of roots. He felt sure there was a very great loss from the washing of the rain on the manure which lay in the yards a long time.

Mr. Garne said he could speak from experience in regard to green and rotten dung when applied to grass-land. Last season he manured one portion of a field with green dung out of the yards, and the other with rotten; and while by far the heaviest crop of hay was made from the former, the herbage of the latter was superior. This year he hoped the herbage of the portion manured with the green dung would be much improved.

It was unanimously resolved—"That it is of the greatest importance to pay more attention to the management of farmyard manure, and we fully agree with the system recommended by Mr. Hayward of managing it in such a way as to produce decomposition long before using."

Votes of thanks were passed to Mr. Hayward for one of the best lectures of the season, and to Mr. D. Holbrow, for presiding, and this concluded the proceedings.

Notices of Books.

Beetroot Sugar: *Remarks upon the Advantages Derivable from its Growth and Manufacture in the United Kingdom, &c.* By Arnold Baruchson. Effingham Wilson, Royal Exchange, London.

This is a capital shilling's worth upon a subject of immediate agricultural interest. The present position of the Beet industry—the cultivation of the Beetroot—the process of manufacture—and the argument for the extension of Beet growth in England—are the subjects of its four chapters. It is the second edition of Mr. Baruchson's work to which we are now directing attention. In the preface to this edition he thus speaks of the progress of the industry:—

"Since I first issued this pamphlet, in 1868, the questions discussed in its pages have attracted much attention throughout the United Kingdom. Enlarged inquiry has strengthened the opinions I advocated, and various improvements in the manufacture of beet-sugar having simplified the process, and realised the expectation that white crystals would be made direct from the Beet, it is now more than ever evident that, sooner or later, the Beet industry will be thoroughly established in this country. A beginning has been already made in England. The factory of Mr. Duncan, at Lavenham, continues in successful operation. Mr. Robert Campbell, of Buscott Park, Berkshire, who raised Silesian Beet last year from 335 acres, and erected a large distillery on his estate, is so satisfied with the result that he is now preparing 2000 acres for the same purpose. He expects, by the use of the steam-plough and liberal farming, to obtain from 30 to 40 tons per acre. In conjunction with his distillery, he is feeding his cattle with the nutritious pulp, and thus combines agricultural, pastoral, and industrial enterprises. He also intends to erect a sugar manufactory on his estate.

"I hoped to see much more done in these islands ere now; but the two establishments alluded to suffice to justify my confidence that, in a few years, Beet factories and distilleries will be found on all sides, and the roots be eagerly raised by our farmers."

Those who intend to grow Sugar-Beet this year are still in time; and we recommend them to procure Mr. Baruchson's pamphlet as their guide.

Farm Memoranda.

West Gloucestershire, *April* 1.—The cold, frosty nights still continue, almost as severe as though we were entering into the month of January instead of the month of April, and the country hereabouts looks as barren as possible, for there is scarcely any sign of life either upon the pasture or the arable land. It would be very difficult at present to form any accurate opinion about the Wheat plant, for we cannot see it any better now than we could two months ago. It will be remembered that the sowing upon some of the heavy clay soils was done when the land was too dry; and as the weather continued dry for some time after, much of the seed germinated and perished for want of sufficient moisture; consequently, the plant was not good enough to face such a trying winter as the one now passing away. Wheat has suffered to a great extent from root founder, and the frost having heaved much of it out of the ground, many farmers have in consequence sown again; fortunately, the very drying winds of late have so far dried the land as to enable us to get on with the heavy rollers, which will somewhat arrest further mischief. Winter Beans have lost plant considerably, and in many cases will, it is feared, be quite a failure. A more favourable time for spring work could not possibly be desired; and instead of work being very much behindhand, as was our fear some time ago, it will be well forward; indeed the bulk of the Lent corn hereabouts is already sown. There still remains a considerable acreage of Barley to be sown, which cannot be done till after the roots are fed off, which, by the way, will be rather too soon this year, unless a more genial temperature speedily sets in. What to do for sheep keep is becoming rather a grave question among large flockmasters, especially for ewes and lambs. Last year at this time we had an abundance of green food for them, in the shape of Turnip-greens, Rye, &c., but now we have nothing of the kind anything like fit for feed. We are using ox Cabbages, left over purposely for the ewes, and a most valuable article they prove to be. They have stood the frost and rain wonderfully well, and are perfectly sound. The ewes milk well with them, and the lambs thrive, which is a sufficient guarantee of their worth. We usually plant in May two varieties, Early Drumhead for autumn, and the Purple Flat Pole for winter and spring feeds, upon ridges 30 inches apart between the rows, and 36 from plant to plant, manured in the autumn at about the same rate as for Mangel, viz., 20 tons farmyard dung per acre, and in the spring with 5 cwt. salt and 3 cwt. of home-made artificial manure. With this system we have grown very successfully heavy crops of Cabbages.

Stock of every kind is selling well, especially milking cows and springing heifers. These, many of them, are realising over £20 per head. Graziers, too, have been bought in very dear, and many of them will be kept at a loss this summer, even if beef keeps up to its present price, 70*s.* per cwt. The demand for cow calves is very great this year, and as there is a small

proportion of them dropping to the number of bulls, the supply is nothing like equal to the demand, therefore they are very dear. Sheep have done well since the dry weather set in, and we are now getting rid of the tegs at 8¾*d.* to 9*d.* per lb. The lambing is pretty well over in this neighbourhood, and upon the whole has terminated satisfactorily, although the doubles are not so numerous as last year. Bacon pigs are selling at 10*s.* 9*d.* to 11*s.*; porkers at 11*s.* 6*d.* to 12*s.* per score. There has been, and is likely to be, a reaction in the price of store pigs: our markets are much better supplied, and the prices have a downward tendency. *J. W.*

Wheat Growing in Minnesota, U.S.—Mr. Dalrymple bought 2000 acres of the best Wheat land near the town of Hastings, at from 1*l.* 10*s.* to 3*l.* per acre. He fenced his farm in three divisions, one of 1000 acres, and two of 500 each. In 1866 he put in 15 breaking-up teams, each of six heavy horses. They turned furrows a mile in length, 16 inches wide, and 2½ deep. In 45 days he had 1700 acres under plough. As spring Wheat alone is grown on this and all other farms in Minnesota, Mr. Dalrymple commences ploughing about April 12, and despatches the whole in two weeks. He uses 12 broadcast seeders, which are followed by 24 drag teams, all moving together in battalion order under one supervision. He sowed last spring 3000 bushels of seed Wheat. This closes the first great operation, and is succeeded by an interim of two months, in which there is but little farm labour employed or required, as there is neither ploughing nor hoeing on the estate during this interval. A fortnight before the harvest, early in July, he advertises in the St. Paul journals for 125 men, at 2 dollars 50 cents. per day. He recruits this small army easily among the woodcutters and the river and raft men, who like the change and good cheer of harvest life. Fifteen 4-horse M'Cormick reapers move together through the 1000-acre field, followed by 90 binders working six in a section from one end to the other. These are followed by shockers, setting up sheaves in dozens. A mounted overseer directs the whole. In two weeks the battle of the reapers is over, and 60,000 Wheat shocks chequer the yellow scene of action. With not the interval of a day the whole force of men and horses is turned over to the threshing-machines and market waggons. Four 10-horse power and two steam-power machines are brought to bear upon these square miles of Wheat shocks. The Wheat is delivered into bags by the machines, is transported in waggons to the river, and is perhaps on the way to New York within a week of its reaping. In 12 or 15 days the operation of threshing and marketing is completed. Then the stubble land is turned over by 22 horse-ploughs, cutting 60 acres a-day, and the whole in about two months of ordinary weather. Then all the farm horses are stripped of their shoes and turned into the stubble-field to disport themselves until the middle of the next April. His hired men, with the exception of two or three, seek employment elsewhere, most of them probably returning to the farm with the birds in spring. Mr. Dalrymple's harvest in 1867 averaged 21 bushels to the acre, and netted him 10,000 dollars over and above the entire cost of his land, fencing, ploughing, seeding, and all the labour employed. His crop in 1868 netted him 40,000 dollars above the cost of production. Concentrating such an amount of labour within three months of the year, he says he is his own master in nine months. Indeed, between October 1 and April 1 he may make the tour of the Holy Land and of the Nile, if he pleases, and be at home and overlook every process of seed-time, harvesting, and marketing. *Daily News.*

An American Dairy Factory.—The following interesting letter is from Mr. M'Adam, late of Gorsty Hill, near Crewe, who first introduced the Cheddar mode of cheesemaking in Cheshire, now resident at Mattres Creek, St. Johnsville, New York State:—

"After ten months' residence in this country, I send you a few lines to acquaint you of our doings in, and impressions of, America. I have the pleasure of informing you that myself, wife, and family have all enjoyed excellent health, and that we find the Yankees a people who are ready to extend the hand of welcome to strangers, and who value people more for what they are than for what they possess or profess to be, and there exists a much more genial feeling of reciprocity amongst the different grades of rural life than is found in England. We have been engaged at our old trade of cheesemaking, myself and family having the management of eleven cheese factories, in which were made about 250 cheese, weighing between 7 and 8 tons, daily (during the best of the season). The cheese factories are all built of wood, two or three storeys high, the walls being double boarded, with deal floors, and are generally excellently adapted for the purpose of cheesemaking. Good spring water is abundant in this State, and the factories are all placed near a good spring. The cost and equipment of a good cheese factory runs from £800 to £1000, giving sufficient accommodation for making and storing cheese from the milk of a thousand cows. Factories are sometimes built by private individuals, but usually by a number of farmers taking shares and forming a company, which is usually incorporated. These stockholders either run the factory themselves by engaging a manager and staff of hands, or rent it out to some competent cheesemaker, who finds all the help he requires to make the cheese. This manager takes in the milk and weighs it, keeps the books, and actively engages in cheesemaking, everything depending on his skill, care, and efficiency. The position of a factory manager is a very responsible one, and it is not usual for any near relative of either stockholders or patrons to occupy that position. He is expected to do justice to all alike in weighing the milk, and to exert a rigid supervision to detect a want of cleanliness or dishonesty in every form. He is supplied with instruments for detecting water, skimmed milk, and impurities, and a sharp, honest manager can easily keep the rogues honest.

"The cost of making the cheese is one cent per lb., and another cent goes to furnish boxes, bandages, annatto, salt, &c., and to pay the stockholders from 7 to 10 per cent. on the capital invested in the building. A cent is a halfpenny when currency and gold are at par, but it is a fifth part less at present. Two cents on the pound of cheese is charged on all the cheese made when the factory is owned by one person for which the cheese is manufactured, and everything furnished and paid. The factories owned by one person generally give best satisfaction. The stockholders appoint a secretary, treasurer, and salesman. The latter attends the markets, and sells the cheese as they become ready, generally every week or fortnight. Cheese ripens more speedily here than in England, and are mostly sold at from three to six weeks old. The proceeds are divided amongst the patrons in proportion to the weight of milk furnished by each. The price of cheese here this season has averaged from 65*s.* to 70*s.* per Cheshire cwt. (in gold), and three-fourths of all the cheese in this State has realised a price between these figures. The quality of a great portion of the cheese made is fine, and if they are not so on their arrival in England they must deteriorate on the voyage over.

"The Cheddar method, with some immaterial alterations, is the mode followed out. The milk is brought both morning and night to the factories. The night's milk is distributed equally in the milk vats, and the temperature reduced by cold water being run through a chamber underneath the milk. These milk vats are made of tin, 18 feet long by 3½ feet wide, and 1½ foot deep. The milk and curd is heated by hot water or steam being turned into the chambers. The hands necessary to run a factory of 500 cows are three—one man and two active women. Some of them do with less, but to keep all things neat the above is needed. The cheese are only once turned in the press, when a thin calico cap (called a bandage) is put on and pressed in, and allowed to remain on. This calico cap serves the purpose of the Cheshire bandage, and protects the cheese better; being pressed in, it adheres to the cheese, and never comes nor is taken off. The cheese are never changed with dry cloths as in Cheshire, but the screws are often tightened, and although the cheese are taken out after 22 hours they never run whey.

"Notwithstanding some drawbacks incident to the factory system (which might be obviated or overcome), I believe it is not only beneficial to farmers in America, but might with even greater benefit be adopted in England and Scotland. This opinion is forced upon me contrary to my previous opinions on the subject. Circumstances are more favourable for making fine cheese in factories in Britain than in America. The extremes of heat and cold are not so great, and the roads are much better in England and Scotland, and fuel and labour cost less." *Chester Chronicle.*

Miscellaneous.

United States: Report of the Commissioner of Agriculture.—The effect of the past year's weather was more or less injurious, in proportion to the degree of negligence in culture and crudity in condition of heavy or moist lands. In some instances soils which are naturally of superior excellence, but in inferior mechanical condition, yielded unprofitable returns. The production of the country might be increased hundreds of millions of dollars by more thorough comminution of soils, by the proper modification and amelioration, and by the draining of the saturated or tenacious lands. The loss from want of these agricultural improvements, serious in any season, is exceptionally large the present year. Dissatisfied with present receipts and gloomy over future prospects, many farmers have sacrificed a portion of their flocks during the year. It is estimated that 4,000,000 of bulls were killed for pelts and tallow. American agriculture, in all its branches, is peculiarly subject to periods of elevation and depression, from the impulsive action which stimulates over-production at one time, followed by panic and abandonment of the temporarily unprofitable pursuit. The wool interest has often suffered, not merely from ordinary causes of fluctuation, but more disastrously still from tariff changes, frequent and extreme, as well as unexpected. The Commissioner reports as follows on the subject of southern agriculture:—"The continued high price of Cotton has made its culture more profitable than at any former period, and the crop of 1868 has yielded a larger amount of money than that of 1859. The yield of the past year exceeded very slightly the estimate of this department, which was 2,380,000 bales. The present season has witnessed great activity in this culture, an increase of area cultivated, and more general and generous fertilisation, and has also been characterised by drought in the seaboard States, and other causes of diminished production, which have modified the expectations of planters; yet the crop will exceed that of last year, and may reach 2,700,000 bales. It is to be regretted that the tendency is to neglect other crops and concentrate all available labour and capital upon a single product, however profitable. The inevitable result will be more Cotton and smaller nett returns in money after the purchase of needed supplies, and, as a further result, a slower improvement of neglected lands. The sugar interest is rapidly attaining its former proportions. A disposition is indicated to extend its culture beyond the cane plantations of the Mississippi river to Florida, Southern Georgia, and Texas. Fruit culture is gaining a prominence which it never before enjoyed; vineyards of hundreds of acres in extent have been established, and orchards of thousands of acres, with groves of Orange and other tropical fruits. There is evidence of progress also in the use of improved agricultural implements, the employment of fertilisers, and in the mental activity and spirit of inquiry which are moving the rural mind of this section." The Wheat culture forms another important topic of the report. The Commissioner says:—"The Wheat interest is at present suffering from one of the periodical seasons of depression which are the inevitable result of exclusive reliance upon a single crop. A good yield was obtained last year, and a still larger result the present season; this fact, in combination with financial causes, has depressed the price to a lower point than has been reached since 1860. The continuous planting of the new lands of the west with Wheat is removing westward, year by year, the centre of Wheat production, and increasing the distance of transportation; while the railroads, by their combination and advance of tolls to secure dividends upon watered stock, are increasing in equal ratio the cost of freights. Thus are Wheat growers reaping the fruits of their own improvident husbandry, and suffering extortion and loss from the accident of location. A diversification of industry, both agricultural and manufacturing, will render them masters of the situation, and release them from subservience to the railroads and European Wheat markets. The pioneer or 'skinning' system of culture must be abandoned, at least in the settled States, and capital be used in farm improvements. A judicious investment in draining often pays 10 per cent. the first year; a single horse-hoeing of growing Wheat, as reported to this department, has doubled the yield and paid 1000 per cent. upon its cost, and improvement in breeds of farm stock yields large dividends upon the investment." The report notices, lastly, the prevalence of numerous epidemics and zymotic diseases among the cattle of the United States.

Sewage upon Sand.—The power of sewage to produce a crop of succulent growth with a very minimum, if any, of assistance from the soil itself, has indeed been amply illustrated in an experiment of sufficient extent not far from Loop Farm, Barking. One of the features of the plan of dealing with North London sewage, for which Parliamentary powers were originally obtained, was the reclamation of a large portion of the many square miles of sand which the tide lays bare by Foulness, at the mouth of the Thames; and there fertilising some 8000 or 10,000 acres by sewage irrigation. Although similar work has been actually done with the best results near Leith, with the water of the Edinburgh "Foul Burn," it was thought desirable to test the fitness of the Maplin sand from Foulness for the use of sewage on it. About 3000 cubic yards of the sand were accordingly barged up to the sewage outfall below Barking, and there spread some 30 inches deep over an acre of abandoned contractor's yard, which was levelled for the purpose. This acre of sand was smoothed with a slope of about 1 in 120, and sown with Italian Rye-grass in March, 1866. Three or four cuttings of grass were taken from it during that year, one of them close on 20 tons per acre, and the others at intervals of four or five weeks varying from 8 to 12 tons per acre. The plant received frequent abundant floodings with the water from the sewer alongside of it. I am unable to say, however, how much exactly either of sewage it received or of Grass it produced. But it is certain that very heavy crops of Grass were produced by the use of sewage alone upon this sheer sea-sand, which could have contributed hardly anything to the growth of the crop. Smaller plots of the sand were planted with Mangel Wurzel, Celery, and Carrots, and yielded satisfactorily. *J. C. Morton, in a Report to the Metropolis Sewage Company.*

Veterinary Inspection at Ports of Debarkation.—The veterinary inspection, essential as it is that we may know where disease prevails, with a view to the adoption of preventive measures, is utterly unreliable as applied at ports; and it is absolutely injurious from its effects on importations and engendering a false sense of security at home. During the many years that we have suffered most from impure importations, infection has professedly taken place both at the ports of embarkation and debarkation. Whatever may be said of the work done abroad, that done at home has been fraught with untold mischief. My remarks are not directed to the body of inspectors, but to the system of inspection. We all know what it is to examine a horse for soundness, and there are many skilled veterinarians who, almost at a glance, will point out glaring defects. They would not rely, however, on any instantaneous powers for the inspection of a few hundred recruits for our cavalry stables. Were any respectable man asked to give his certificate for even so few as eight or ten horses walked leisurely past him he would scout the idea, and under the greatest pressure he would certainly give five or ten minutes to the inspection of each animal. All I can say is that the inspection of cattle at ports has

averaged, to my knowledge, from two to 20 per minute. Often a bullock has been "closely" inspected hanging in a sling on the ship's side; and always, to my knowledge, without facilities for a careful manipulation, taking the pulse, temperature, &c., which are absolute essentials in the diagnosis of contagious disease. I can claim some practical familiarity with the inspection of herds of cattle. I have stood on a hillock in Western America, with a body of men, catching with the lasso such animals as I indicated, and with a guide horse and trustworthy thermometers I could point out infected animals at the rate of one in ten minutes. That is inspection under great disadvantages; but I have often timed myself at a farm where cattle were tied up or enclosed in yards, and the quickest work I could ever do was one animal in three minutes. If any one attempts to report on a number of cattle without an examination conducted searchingly, by means requiring the time named, you may consider the reports not worth the paper on which they are written. *Professor Gamgee at Birmingham.*

On Weighing Oats.—Two modes of filling the measure are in use in the trade; both, however, give nearly similar results. 1st. The measure must be placed firm, so that it will not move or even shake, when the Oats are poured in. A large scoop holding a good half bushel must then be taken; and from it the Oats must be poured in quickly, and then, the scoop being immediately refilled, the remainder must be poured in quickly, and the "strike" applied at once. The success of the operation depends on the measure being placed on a firm basis and filled quickly. The Oats then have not time to run together and consolidate, the measure in consequence holds the least possible quantity. If the measure is shaky, or if through clumsiness or intentionally the scoop is allowed to knock against or even to lean on the measure, the result will be that it will hold considerably more grain than it ought. A similar result will follow if a small scoop is used. The time taken to fill the measure will allow the grains to settle and consolidate; and again each successive scoopful, as it is poured in, will cause the grain below to consolidate. Or 2d, the measure being placed on a firm basis, the Oats may be run rapidly into it from a sack. Care must be taken that the sack does not touch the measure. There is a good deal of knack in getting the Oats to run out freely. The mouth of the sack must be opened wide, and the sides should be well turned down, so that no interruption may occur in filling the measure. Either of these modes will give the fair weight of the Oats. The strike used in the trade is rounded. It takes out rather more Oats than a flat strike, and it should therefore always be used. The following are the results of some other modes of filling a bushel with Oats, the trade weight of which, as given by either of the above modes of filling, was 37 lb. Filled from a shovel held at the hip, the grains being allowed to flow or trickle in slowly, the measure held 40½ lb.; or in other words the sample was made to appear to weigh 40½ lb. instead of 37 lb., the true weight. Here both the height from which the grains fell and the slowness of the operation combined together in causing consolidation. Filled by placing the mouth of the sack on the rim of the measure and allowing the Oats to run in, the measure held 37½ lb., when the operation was neatly and quickly managed; but when it was clumsily performed and the measure was shaken and moved by the pressure of the sack, it held nearly 39 lb. Filled by pushing the measure into the heap and turning it up, and filling up the deficiency with the scoop, the measure held 38 lb. Filled quickly from a small scoop the measure held 38 lb. Filled slowly from the same scoop it held 38½ lb. Different samples no doubt will give somewhat varying results, according to the greater or less tendency which they may possess for consolidating; but from these details the intending purchaser will readily see, that in order to get the article he contracts and pays for it is necessary that he should know how to weigh a bushel. In addition, however, to knowing how to do it, there is a good deal of knack and practice required to fill the bushel properly; and the reader, if he tries the above experiments for himself, will probably at first fail to get the true weight. *Horses and Stables.*

The Week's Work.

April 16.—*Seed threshing* for the market commences at the close of harvest and continues on to the end of seed-time. Seed of every kind, properly harvested, keeps best in the straw, and those who grow their own seed thresh as they require to sow. Grass seeds are generally threshed out about the beginning of this month in early districts, and towards its close in late ones. The Rye-grasses, Timothy, and the other natural grasses, require to be carefully sifted, in order to remove the seeds of weeds, otherwise more weeds may braird than Grass. Most farmers have dressing machines for the different kinds of seed, but they should not be wholly trusted to, for the small seeds of weeds are not easily separated; and besides seeds are liable to be eaten into by insects, to be infested with the spores of Fungi and seed germs of parasitic plants, and to be imperfectly ripened; and all such should be removed, so as to get a uniform sample for sowing.

Change of seed will be more general this year than usual, more especially those kinds sown during the current and subsequent months. Intelligent farmers look about them in time where they can get a proper change, the delivery taking place shortly before the usual time of sowing, or when ordered. Many never grow their own Grass, Clover, and root seeds, and they must bear in mind that the "Adulteration of Seeds Act, 1869," comes into operation on the 1st of next month, and that there is some risk of much old seed being thrown upon the country before then, at tempting low prices. At all times the vitality of bought seeds cannot be too carefully tested in the flower-pot, and many farmers never sow an ounce of any kind, home-grown, exchanged, or purchased in the open market, without first having tried whether they will vegetate healthily or no; and upon the result depends whether they will sow or not, and if they sow how much will be required per acre.

Paring and Burning is not so popular as it was before the introduction of recent improvements. But although good meadow-land pays the farmer, there is a large breadth of grass-land that would pay better under the steam-plough, with artificial manures and improved thorough drainage when required. Lady-day entries give rise to much paring and burning in April. If the land is level and free from stones the work is best done by the horse-power plough; but if it is full of stones, unlevel, or covered with anthills, the paring must be done by the breast-plough or breast-spade. The depth to be pared depends upon the thickness of the effete vegetable matter composing the sod, and the quantity of ashes required. From 1 inch to 2 inches may be stated as examples, but in some peaty soils a shallow furrow-slice, from 3 to 6 inches, is turned up with a common plough. The latter practice, however, is generally termed "stifle burning." In dry weather the sods are soon ready for burning, but in wet weather, or when the atmosphere is loaded with vapour, they require to be set up, to prevent them growing and to catch the full benefit of the first drying weather. Sometimes a team with a heavy harrow keeps tossing about the sods. When ready they are collected and burned in small heaps with a smouldered charring fire, so as to produce black ashes. When done by contract it costs, with the horse-paring plough, about 15*s.* per acre, including the spreading of the ashes, and twice the money when done by the breast-plough. A small allowance of straw per acre is generally given for kindling the fires.

Draining and Trenching Grass-land.—Some pasture-lands are not suited for paring and burning, and these when broken up should either be close-trenched or bastard-trenched. When close-trenched with the plough, the one plough follows the other, sometimes two horses, three horses, and four horses in each team. In bastard-trenching a subsoil-plough follows the common one, loosening the bottom, but leaving it below the furrow-slice. When the subsoil is sound the former is preferred, but when unsound the latter. Both plans are best done with the spade. Sometimes the sods in bastard-trenching are difficult to rot in dry seasons. A ton of common salt, with a good dose of lime or artificial manure, well harrowed in, will promote the decomposition of effete vegetable matter. A good dressing of sewage manure is better, and when town or farm sewage cannot be had the land should be artificially watered, if practicable. The sods, whether below or on the surface, should not be disturbed until they are thoroughly rotted: a sufficient depth of mould for covering lime, artificial manure, and seed can be raised by the harrows and clod-crushers. The work is best done before winter, but we have trenched in April and grown heavy crops of Swedes and Turnips, both on heavy and light land. Trenching two spits deep with the spade costs from £4 to £6 per acre, according to the nature of the land, the workmen making 2*s.* 6*d.* per day.

Water Meadows are this year exceptional in many respects—not only as to the general lateness of vegetation, but also as to the greater diversity of yield. When cut for soiling throughout the season, the rule is simple, "Mow when ready, and rather earlier should stock so require;" but when intended for hay, it will not always be so easy settling what is best to be done—whether the Grass is used for soiling or folding. In many cases the lateness of the common pastures will compel farmers to make the most of their meadows—however objectionable, according to the old practice, a second and third folding may be. Many objections may be obviated, for the second and third crop may be mown and given to stock, both sheep and cattle, on dry ground, and by guano washed into the meadow you may make up for the droppings of live stock for a hay crop in July, August, or even September. *W. B.*

Notices to Correspondents.

Emigration: *Old Subscriber*, who wrote respecting the emigration of four young agricultural labourers, should address himself to Mr. W. Huntington, 6, Alexandra Cottages, Penge, Surrey.

Lentil: *C. P.* It has answered very well on poor sandy soils in Norfolk.

McDougal's Disinfectant: *A. Y.* It acts by its antiseptic power. Organic matter with which it comes in contact loses its tendency to putrefaction, and its organic nitrogen accordingly cannot form ammonia. As to ammonia already formed the disinfectant is, we believe, useless. We imagine its influence on manure matters must be mischievous.

Mangel Wurzel: *Cor.* The plan of cultivation adopted by Mr. Adkins, of Milcote, to which you refer, is described in Messrs. Suttons' "Farmers' Year Book:"—"Wheat is always the preceding crop. The farmyard manure, previously drawn, and slightly fermented in a heap, is spread, and the land ploughed before Christmas if possible; but at any rate soon enough to ensure a frost for the thorough disintegration of the surface deep enough to form a good bed of free mould. So soon in April as weather permits, the land is well harrowed as deep as it will work freely. By this plan the moisture is retained, and thereby the seed induced to vegetate. By deeper cultivation and evaporation, the soil is often rendered so dry that the germination of the seed is dependent on rain. Many a plant of Mangel has been lost in a dry spring by giving the land what is well described as 'the orthodox amount of spring tillage,' instead of permitting it to remain in the state which a Warwickshire farmer would call 'stale furrow.' The seed (about 7 lb. per acre) is drilled on the flat at 28 inches from row to row, and deeper than is usually recommended—fully an inch. As soon as the Thistles appear, dig them to the depth of the plough, and the after cultivation of the crop is the usual one of repeated hoeings by hand and horse labour."

Sheep Farming: *C. P., S. G.* Mr. Brown's little book, which we shall review, relates rather to the natural and agricultural history of the sheep and farm stock than to the practical details of sheep-farming.

Sundries: *C. P., S. G.* We presume that the Galega or Goat's-beard, which is said to increase the quantity and quality of cows' milk, is the Galega officinalis—Goats' Rue.

Tar as a Remedy: *A. Y.* says:—"When in India, and any of my horses had a cough, the veterinary used to say he would give them the blacking brush, and he used to take out their tongue and rub it over with some mixture of tar. Can you inform me what it was, and how to make it? as it generally had the desired effect, and cured them of their cough." [Tar is used in this country as a remedy for coughs in horses and cattle, but we never heard of the application being made in the way you mention. "Cow doctors" sometimes thrust a rope, previously dipped in tar, down the throat of a cow, but it is hardly probable that an educated man would use either that or the "blacking brush" in the treatment of disease.]

Markets.

SEED MARKET.

We have now a good steady demand for agricultural seeds, all descriptions of which are held with considerable firmness. The stocks of red Clover seed now on hand are light, and are being still further reduced by shipments to America; one lot of 1400 bags was sent last week to New York. In Rye-grasses the recent sudden advance has been well maintained; French Italian must be quoted 1*s.* per cwt. dearer. Our advices from France state that there is now very little seed left. Rapeseed has advanced 2*s.* per qr., while Mustard is very firm. Spring Tares meet with a ready sale, at recent currencies. Sainfoin and Lucerne seed is without change in value.

John Shaw & Sons, 16, Water Lane, London, E.C.

HOPS.

Borough Market, April 13.

Messrs. Pattenden & Smith report an improved demand for all descriptions, considerable quantities of new Americans and other foreign Hops having changed hands within the last week, at firm rates. Yearlings also command rather more attention.

ENGLISH WOOL.

There has been a somewhat better demand for English wool during the last week; the better sorts are in good demand, at full rates. Half-breds and Downs are hardly so much inquired for as lustres and demi-lustres, but altogether the tone is more cheerful, and it is generally believed we have positively seen the lowest point for the year.

Current Prices of English Wool.	Per lb.—	*s.*	*d.*	*s.*	*d.*
Fleeces—Southdown hoggets		1	1	to 1	2
Half bred ditto		1	2	1	2½
Kent Fleeces		1	3	— 1	4
Southdown ewes and wethers		0	0½	— 1	1
Leicester ditto		1	2	— 1	3
Sorts—Clothing		0	10	— 1	6
Combing		1	0	— 1	8

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, April 12.

Prime Meadow Hay	77*s.* to 84*s.*	Clover, old	115*s.* to 126*s.*
Inferior do.	60 70	Inferior do.	80 100
Rowen	— —	Prime 2d cut	100 110
Inferior do.	— —	Inferior do.	80 90
Straw	24 30	Charles James Easton.	

Cumberland Market, Thursday, April 12.

Sup. Meadow Hay	84*s.* to 90*s.*	Inferior Clover	90*s.* to 112*s.*
Inferior do.	68 78	New do.	— —
New do.	— —	Straw	30 35
Superior Clover	123 130	Joshua Baker.	

Whitechapel, Thursday, April 12.

Fine Meadow Hay	76*s.* to 82*s.*	Prime old Clover	120*s.* to 130*s.*
Inferior do.	60 70	Inferior do. do.	90 100
Prime New Hay	— —	Prime 2d cut do.	— —
Inferior do.	— —	New Clover	105 112
Straw	24 28	Inferior do.	80 90

METROPOLITAN MEAT MARKET.—April 13.

Best Fresh Butter 16*s.* per dozen lb.
Second do. do. 13*s.*
Small Pork, 5*s.* 4*d.* to 5*s.* 8*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 4*d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY April 11.

The number of Beasts is larger than on last Monday, and the quality very good; trade is exceedingly dull, and a clearance cannot be effected at our reduced quotations. There is a large increase in the supply of Sheep, and a further decrease in the demand, consequently a large number remain unsold; business transacted is at much lower rates, except for a few choicest descriptions. Trade for Calves is about the same as on Thursday. Our foreign supply consists of 1025 Beasts, 6860 Sheep, 130 Calves, and 5 Pigs; from Scotland there are 384 Beasts; from Ireland, 140; from Norfolk and Suffolk, 1320; and 594 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4 6	4 8	Best Long-wools..	.. to ..	
Best Shorthorns ..	4 4	4 6	Do. Short ..	4 4	4 6
2d quality Beasts	4 2	4 3	Ewes & 2d quality	.. ..	.. ..
Best Downs and Half-breds	.. ..	.. ..	Do. Short ..	4 3	4 4
Do. Short	4 4	4 8	Lambs ..	.. ..	.. ..
			Calves ..	4 0	5 6
			Pigs ..	3 6	5 6

Beasts, 3463; Sheep and Lambs, 28,880; Calves, 158; Pigs, 105.

MARK LANE.

MONDAY, April 11.

There supply of English Wheat to this morning's market, was very moderate, and was taken at the prices of this day se'nnight. There was a fair attendance; the demand for foreign was limited, and the business done in retail at last week's rates. Barley, Beans, and Peas were unchanged in value. Oats were firm, and in some instances rather dearer. There was no alteration in the value of Flour.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk. White	38—46	Red.....	35—45
— — fine selected runs..do.	42—50	Red.....	38—47
— — Talavera	53—55		
— — Norfolk		Red.....	—
— — Foreign	38—52		
BARLEY, grind. & dist. 26s to 30s. Chev.	39—42	Malting ..	34—38
— Foreign .. grinding and distilling	22—25	Malting ..	30—40
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire..Potato	24—26	Feed	—
— Irish	Potato 23—25	Feed	21—24
— Foreign .....Poland and Brew	21—24	Feed	19—21
RYE		32—38	Foreign ..	33—36
RYE-MEAL, Foreign			
BEANS, Maragan .. 30s. to 37s. Tick	31—40	Harrow ..	31—40
— Pigeon .. 50s. to 56s. Winds.	—	Longpod..	—
— Foreign ..... Small	41—43	Egyptian.	38—40
PEAS, White, Essex, and Kent.. Boilers	32—42	Suffolk ..	35—43
— Maple, 41s. to 45s. ..... Grey	32—42	Foreign ..	33—37
MAIZE			Foreign ..	29—34
FLOUR, best marks delivered..per sack	36—40		
— 2d ditto ..... ditto	25—37	Country ..	25—37
— Foreign ..... per barrel	22—25	Per sack..	29—55

WEDNESDAY, April 13.

Fresh up to Mark Lane this morning the receipts of Wheat from Essex and Kent have been only moderate; nevertheless, the demand for both red and white produce has ruled heavy at about the rates previously current. The show of foreign Wheat has been good; the transactions have been restricted, on former terms. The supply of Barley has been moderate; very little business has been doing, at previous quotations. Malt has been quiet, at late rates. Oats have been in fair supply and moderate request, at late currencies. Beans and Peas have been dull, but firm. Flour has changed hands quietly.

ARRIVALS OF GRAIN, &c, INTO LONDON LAST WEEK.

	Wheat.	Barley.	Oats.	Flour.
English [&	Qrs.	Qrs.	Qrs.	Sacks.
Scotch ..	4957	1952	230	14,862
Irish ..	—	—	—	—
Foreign ..	8557	2733	30,540	1708 / 7753 brls.
	13,514	4685	30,770	

LIVERPOOL, April 12.—At this day's market there was a good attendance of the town and country trade, and altogether a larger business was done than was expected. Wheat met with a fair consumptive demand at about Friday's prices, or a decline of 1d. per 100 lb. on white, and 2d. on red Wheat, since this day week. Flour was difficult to move, but without change in value. The same may be said of Oats and Oatmeal. Beans were neglected, and the turn lower at 31s. 6d. to 32s. 9d. per 480 lb. for prime Saidi Egyptian. Barley and Peas maintained their value, being scarce. Indian Corn was in fair request for feeding, at 29s. per 480 lb. for prime Trieste or Danubian, and 3d. to 6d. less for Italian, being an advance of 6d. per qr. on the week.

AVERAGES.

	Wheat.	Barley.	Oats.
March 5	41s 6d	33s 7d	20s 8d
— 12	40 9	33 10	20 10
— 19	41 9	34 4	21 1
— 26	42 5	34 5	21 2
April 2	42 5	35 0	21 5
— 9	42 8	34 11	20 9
Average ..	41 9	34 4	21 0

COALS.—April 13.

Hastings Hartley, 14s.; Holywell Main, 15s. 6d.; Eden Main, 16s. 3d., Tanfield Moor Butes, 15s. 3d.; Walls End Russell's Hetton, 16s. 6d., Walls End Haswell, 18s. 6d.; Walls End Hetton, 18s 6d., Walls End Hawthorn, 15s. 6d.; Walls End South Hartlepool, 16s. 6d.; Walls End Original Hartlepool, 18s. 6d.; Walls End Heugh Hall, 17s. 6d.; Walls End Kelloe, 16s. 6d.—Ships at market, 116; sold, 90; unsold, 26; at sea, 30.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex

MR. CHANDLER, HORTICULTURAL AGENT and VALUER, undertakes all kinds of VALUATIONS connected with HORTICULTURE.
N.B Mr. C., having for many years acted as Judge at various Metropolitan and Provincial Flower Shows, is open to engagements for the ensuing season.—10, Wynell Road, Forest Hill, S.E.

By Royal Appointment.

TO HER MAJESTY, 1s Special Warrant, dated December 27, 1865.

To the PRINCE OF WALES by Special Warrant, dated February 10, 1866.

DAY, SON, AND HEWITT, Original and Sole Proprietors of the STOCKBREEDERS' MEDICINE CHESTS, for DISORDERS in HORSES, CATTLE, CALVES, SHEEP, and LAMBS.

No. 1 MEDICINE CHEST,	No. 2 MEDICINE CHEST,
Contains sixteen different kinds of Compound, Admirably arranged, with Complete Guide to Farriery. Price £6 6s., carriage paid.	Contains the Extract Gaseous Fluid, Red Drench, and Red Paste, with Shilling Key to Farriery. Price £4 10s. 6d., carriage paid.

☞ Every Stockowner should have DAY, SON, AND HEWITT'S Work on Farriery Large Edition, 21s. 6d.; or free by post for 31 stamps. Small Edition, 11s., or free by post for 13 stamps.
DAY, SON, AND HEWITT, 22, Dorset Street, Baker Street, London

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER and CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on the Parks, Promenades, and Gardens of London, are kept in various sizes at the Nurseries of the Red and Calder Glass Company, 83, Upper Thames Street, where a Stock is kept; also at 25, Long Acre. J. GOODERIDGE, Agent

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—
GLASS for HORTICULTURAL SOCIETY,
As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each Box contains 100 feet. The prices only apply to the sizes stated

Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15	16 oz. to the foot	21 oz.
Fourth quality	15s. 6d.	19s. 6d.
Third quality	16s. 6d.	22s. 6d.
Seconds	18s. 6d.	29s. 6d.
English	20s. 6d.	37s. 6d.

The above prices include packing, which are not returnable.
HORTICULTURAL GLASS.
Stock sizes, 16 oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated

			4ths.	3rds.	2nds
11 by 9	12 by 9	13 by 9	14 by 9	s. d.	s. d.
12 by 10	13 by 10	14 by 10	15 by 10	13 6	15 6
13 by 11	14 by 11				
14 by 12	15 by 12	16 by 11			
18 by 12	16 by 12	17 by 12			
16 by 13	17 by 13	20 by 12	..	15 0	16 0
16 by 14	20 by 13	18 by 13	..	16 to 17 oz. to the foot	
	17 by 14	18 by 14	..		

3rds	2nds
s. d.	s. d.
15 6	17 0
18 6	

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	6½ by 4½	7 by 5	7½ by 5½	..	122 6d.
8 by 6	8½ by 6½	9 by 7	9½ by 7½	..	
		10 by 8	10½ by 8½	..	132 6d.

Boxes 2s. each, returnable at full price
London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use
SHEET and PLATE GLASS, PLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Horticultural Glass Warehouse.
THOMAS MILLINGTON AND CO., 87, Bishopsgate Street Without, London, E.C.
NEW LISTS for HORTICULTURAL GLASS, as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.
ORCHARD-HOUSE SIZES.

in.	in.		4ths.	3rds.	2nds.	Best.
20 by 12						
20 by 13		Per 100 feet	15 oz.	12s 6d	14s 6d	16s 6d
20 by 14			16 oz.	13s 6d	15s 6d	17s 6d
20 by 15			21 oz.	17s	19s	21s.
20 by 16						

SMALL SHEET SQUARES, 15 oz., per 100 feet.

From		To	4ths	3rds.	2nds	Best
6 in	by 4	9 in by 7 in	11s 6d	12s 6d	14s 6d	15s 6d
9½ in	by 7½ in	14 in. by 10 in.	11s 6d	12s 6d	15s 6d	16s 6d
14½ in	by 10½ in	18 in. by 12 in	13s 6d	14s 6d	15s 6d	17s 6d
20 in	by 12 in	22 in. by 16 in	15s 6d	16s 6d	18s 6d	20s 6d

SHEET GLASS
In Sheets for Cutting up, averaging from 6 to 9 feet super.

16 oz.	21 oz.
4ths quality, per 100 feet case, 34s	4ths quality, per 100 feet case, 34s.
36s " " 60s	36s " " 42s.
40s " " 60s	50s " " 60s
Best " " 75s	Best " " 75s

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.
HARTLEY'S PATENT ROLLED ROUGH PLATE in 18th in., 3/16th in., 14th in., and 38th in. substances
BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Stocking Glasses, &c., &c.
PAINTS, COLOURS, VARNISHES, &c
STUCCO PAINT, 24s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling Stone, Surface, and can be made any required shade. It is mixed with rain or pure river water
WHITE ZINC PAINT, 30s. per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a half of White Lead and 2½ gallons of Linseed Oil. Special Prices for this Paint
IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, on Brick, Stone, Compo, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared in white, 1 cwt. and 2½ gallons of Linseed Oil. Special Prices for this Paint

	Per cwt.		Per gallon.
GENUINE WHITE LEAD	30 0	LINSEED OIL	2 9
SECOND-WHITE LEAD	28 0	BOILED OIL	3 2
GROUND PATENT DRY-		TURPENTINE	2 9
ERS, 1 cwt. and per lb.		LINSEED OIL PUTTY,	
" OXFORD OCHRE, 3d.		28s. per cwt.	
to 4d. per lb.			
" RAW UMBER, 4½d. to		FINE OAK VARNISH, 10s to 12	0
6d. per lb.		" CARRIAGE do. 12s to 14	0
" BURNT do. 6d. per lb.		" JAPAN do. 10s to 12	0
GREEN PAINT, all shades,		" COPAL	16 0
28s. to 60s	0	KNOTTING	10 0
BLACK PAINT 24s. to 60s	0	Patent GOLD SIZE ..	10 0
RED PAINT .. 28s. to 56s	0	" BLACK JAPAN ..	12 0
GLAZIER'S DIAMONDS,		BRUNSWICK BLACK.	
14s. 6d., 15s., 18s., 21s. each		MILLED LEAD and PIPES.	
GROUND BRUSHES.		OLD LEAD Bought or taken in	
DUSTERS. SASH TOOLS.		Exchange	
DISTEMPER BRUSHES.			

The above are Nett, for Cash, and as such cannot be booked.
Lists of any of the above on application

To Gentlemen, Gardeners, and Others.—Write for HEADLY AND SON'S Illustrated List of Prices of the NEW PATENT HYDRAULIC APPARATUS for Watering Croquet Lawns and Gardens,
The NEW PATTERN FORCE PUMPS,
The NEW PATTERN GARDEN CHAIRS,
The NEW PATTERN GARDEN ARCHES, &c.
Post free on application to
E. HEADLY AND SON, Exchange Iron Works, Cambridge.

INDIA-RUBBER GARDEN HOSE, 60 feet ½ inch hose, with brass tap, rose, and jet complete, 10s. 6d.
60 feet ½ inch do. do. extra strong, 12s. 6d.
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India rubber forwarded on application.
E. G. CAPON, India rubber Manufacturer, Quadrant, Birmingham.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 27, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

Protection for Fruit and Flowers.
GARDEN MATS, 12s. per bundle of 10; TANNED NETTING, 2 yards wide, 1½d. per yard; 4 yards wide, 3d. per yard. SCRIM CANVAS, for Shading, in widths of 1 yard, 1½ yard, and 2 yards, at 4d. per square yard. TIFFANY, in pieces of 20 yards, 18 inches wide, 5s. per piece. Parcels of the value of £3 and upwards delivered carriage paid by
HENRY VAN AND CO., 17, Tooley Street, London Bridge, S.E.

Archangel and Petersburg Mats.
J. BLACKBURN AND SONS have received a large consignment, and are now offering them at very low prices. Price, &c., on application at 4 and 5, Wormwood Street, London, E.C.

HESSIANS and SCRIMS for SHADING, 44 Scrim, from 2d. to 6d. per yard, unbleached
54 inch Hessian and Scrim, at 3½d., 4d. 4½d. and 5½d.
72 " " " 4½d., 5½d. and 6½d. and upwards.
J. BLACKBURN AND SONS, Sack and Bag Makers, and Canvas Manufacturers, 4 and 5, Wormwood Street, London, E.C.

WIRE NETTING (Galvanised after made) for GAME and POULTRY.—CROGGON AND CO.,
Albion Wharf, 10, Upper Thames Street, London, E.C.
2, Goree Piazza, Liverpool
50, George Square, Glasgow.

GARDEN NETTING and SHADING.—New and Repaired TANNED NETTING, for the Protection of Fruit Trees, Seeds, Insects, &c. SCRIM and other Garden Shades; STRIPED CANVAS, for Blinds, &c.
For Price List, apply to BENJAMIN EDGINGTON, 2, Duke Street, London Bridge, E.C. Established 1820.

TANNED GARDEN NETTING for Seed Beds, and for the Protection of Fruit Trees from Frost, Blight, and Birds, or as a Fence for Fowls, &c.; 2, 4, and 6 yards wide, at one penny per square yard; 100 yards, 7s. 6d.; 500 yards, 15s.; 1000 yards, 25s. Remittance to accompany all orders. Sole Agent,
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough.

NETTING for FRUIT TREES, SEED BEDS, RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 1d. per yard, or 100 yards, 20s.; 4 yards wide, 1½d. per yard, or 100 yards, 30s. NEW LAWN NETTING, suited for any of the above purposes, or as a Fence for Fowls, 2 yards wide, 6d. per yard; 4 yards wide, 1s. per yard; 5 inch, 4 yards wide, 11d. per yard. Can be had in any quantity of
EATON AND DELLER, 6 & 7, Crooked Lane, London Bridge, E.C.

GARDEN NETTING (at Reduced Price), for the Protection of newly sown Seeds from Frost, Blight, and Birds; also as a Fence for Fowls, &c., 2 yards wide, 1d. per square yard, cartage free, in quantities of 250, 500, or 1000 yards.
SCRIM CANVAS, for Wall Fruit, Greenhouse Shades, Tulip Covers.
HAYTHORNS and WALLER'S NETTINGS, sample of material from application.
RICK COVERS, New and Second-hand, with Poles, complete.
Estimates for particular
FREDERICK EDGINGTON AND CO., Marquee, Tent, Flag, and Rick Cloth Manufacturers, 10 and 62, Old Kent Road, London, S.E.

No. 1, Peel Street, Manchester, 1870.
OUR HORTICULTURAL SHADINGS form a thorough Protection from Winds, Frost, and Hail, whilst at the same time they admit Light and Sun. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the kingdom, as well as on the Continent; in fact, are pronounced the only "proper shadings" ever offered to the public against Birds, Wasps, Blight, &c. Also a covering for strawberries, Tulips, Hyacinths, Seed-Beds, Greenhouses, &c., they have no rival. The price being very reasonable, brings them within the reached every one. With ordinary care they will last for many years. Samples forwarded on application DANIEL COLLINGE AND SON.

No 1—54 inches wide	at 8½d. per yard run.
No 2—54 inches wide	at 7d. per yard run.
No 3—54 inches wide	at 5½d. per yard run.
No 4—54 inches wide	at 4d. per yard run.
No 5—54 inches wide	at 3½d. per yard run.

In pieces of about 30 yards each, or any longer length as when specially ordered Nett cash in 30 days from date of Invoice

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.
The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, and a perfect temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS
"FRIGI DOMO" NETTING, 2 yards wide, 11 6d. per yard run.
"FRIGI DOMO" CANVAS

Two yards wide	11 9d. per yard run.
Four yards wide	3s. 6d. per yard.
An improved make, 3 yards wide ..	2s. 9d. per yard.
An improved make, 3 yards wide ..	2s. 6d. per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 5d., 6d., 7d., 7½d. and 8½d. per yard
Hessian Canvas, 54 and 72 inches wide, 6½d. and 8½d. per yard; 1d. extra for 100 yards length
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom

RALPH WALLER AND CO., 45, Dale Street, Manchester, Manufacturers of all kinds of GARDEN NETTING.—The serious injury done every spring to fruit crops by rust has proved to every Gardener the absolute necessity of providing some protection to the trees early in the year. If the blossom in its early development, has been slightly weakened by frost, the vitality of the fruit germ is destroyed, and the fruit lost. In this climate, on the average of a century, there is not more than one year in ten when the protection is unnecessary. Many famous have been tried for this purpose of protection, such metal or fine canvases, and so on; now say, without fear of contradiction, that no class of goods manufacturing the only fabric which is at once unobjectionable for this purpose. Without unduly nursing, it effectually protects the young germ, and does not impede the action of light and due circulation of air. Some other fabrics do this, and thus weaken the vitality of the tree altogether. Almost every large grower in the three kingdoms can testify to these facts.
The Nettings also make a beautiful shading for Hothouses in summer, and are cheaper than other fabrics on account of their great durability.
Netting (qualities): Nos. 1, 2, 3, in pieces of 30 yards long, 1½ yard wide. Tiffany: in pieces 20 yards long, 30 inches wide.
For prices, &c., apply to the above address—45, Dale Street, Manchester

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

	Each
6 ft. by 4 ft. Lights, 2 in thick, unglazed ..	£0 5 0
" " Primed and Glazed with 10 oz. sheet	0 11 0
" " with stout portable Box, not Painted	1 3 0
" " Painted four coats, and Handles on	1 8 0
" " Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do.	2 15 0

GREENHOUSES Per ft. super

Woodwork only Prepared and Painted 0 0 6
" Primed and Glazed with 16 oz. Sheet .. 0 0 9
" Delivered, and Fixed with Ironwork 0 1 0
" Painted four coats, two sides, ready for use 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

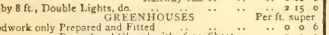

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.

Peill's Conical.

Tubular Boiler

WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED PEILLS, also Elliptic Boilers, from 24s. each.

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 52s. 6d. each.

CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, or use without brickwork, from 60s. each.

Portable Boiler

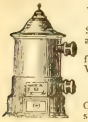

Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.

INDIA-RUBBER RINGS for Pipe Joints: Sockets require no other packing, and are perfectly water-tight.

Elliptic Boiler.

Goods, of the best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground street, London, S., Surrey side Blackfriars Bridge. Price List on application.

T. G. MESSENGER, MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH.

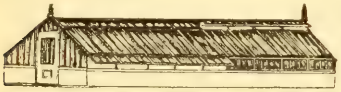

Honourable Mention awarded at the International Exhibition, 1862, and at the Dublin Exhibition, 1865; also a First-class Certificate by the Royal Horticultural Society.

T. G. Messenger, Inventor of many important improvements in Buildings and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed.

Any House Glazed, single or double, with or without putty. The mode adopted by T. G. Messenger for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented.

HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof and sides as though the glass were entirely removed, at once placing them in the external atmosphere.

T. G. Messenger's BOILER possesses all the advantages of the Tubular and Saddle combined, has hollow furnace bars, requires but a shallow stokehole, exposes as much surface to the direct action of the fire as can possibly be obtained, the whole of which can be easily cleaned; and it is an important fact, that out of upwards of 500 now at work made upon the improved principle not one has cracked.

T. G. Messenger's VALVE (single or double) is effective, simple, easy to work, and as durable as the pipe to which it is attached.

Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended. A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 13 stamps.

GREEN'S PATENT TUBULAR HOT-WATER BOILERS.

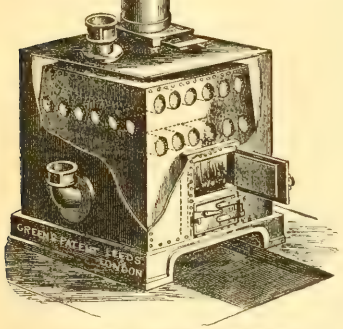

The following are the advantages of these Boilers:-

1st. They require no setting in brickwork.
2d. They are complete in themselves, having perfect means of regulation.
3d. They take up little room, and can be put in places inaccessible to other Boilers.
4th. They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th. Any number of Flows and Returns can be annexed to the Boilers by means of T pipes.
6th. By means of mud doors they can be readily cleaned out when required.
7th. The chimney is made of cast iron, which can either be taken through a roof or turned into a flue to meet the convenience of the situation that it may be fixed in.

They are warranted to be the most Economical Boilers extant.

Price Lists free on application.

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

West of England, Ireland, and Wales.

VINCENT SKINNER, Stokes Croft, Bristol, HOT-HOUSE BUILDER and HOT-WATER APPARATUS MANUFACTURER (formerly Partner with J. Weeks & Co.).

430 BOILERS at WORK.

Heating by Hot Water.

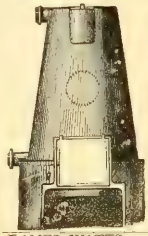

PUBLIC and PRIVATE BUILDINGS, MANUFACTORIES, CONSERVATORIES, &c., heated on the most improved system, combined with perfect ventilation.

These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require NO BRICKWORK.

POLLARD, JEPHSON, AND CO. (Successors to John R. Peill), Sole Manufacturers of the Improved CONICAL BOILERS,

Which are in general use, and which Boilers have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.

Bear Garden, New Park Street, Southwark, London, S.E.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.

Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each. GLASSES, all sizes.

References to the Nobility, Gentry, and Trade in most of the Counties in England.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS, Tree or Plant Labels, punched parchment, 4 in. by 1, long, 4s. per 1000, or 10,000 for 35s., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.

Plans and Estimates on application.

J. JONES AND SONS, 35, King Street, Cheapside, London, E.C. Manufactory, 6, Bankside, Southwark.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or equivalent.

HOT-WATER PIPES, Nos. 6 & 7 on illustrated sheet		2-inch. s. d. per yard	3-inch. s. d.	4-inch. s. d.
ELBOWS ..	.. No 12 on do. each	0 11	1 5	1 11
TEE PIPES ..	.. No 33 on do. "	1 4	2 1	2 9
SYPHONS ..	.. No 23 on do. "	2 0	3 0	4 0
VALVES ..	.. .. "	1 9	3 0	4 0
		10 0	11 0	12 0

GEORGE ROBINSON, Dial Iron Works, Stourbridge. London Warehouse, 16, Grand Junction Wharf, Paddington Basin.

Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c., WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

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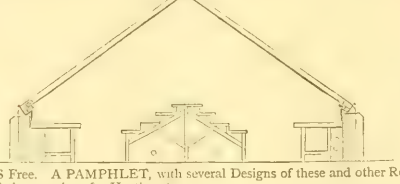

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OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

PATRONIZED BY

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ON FORTY-FIVE DIFFERENT OCCASIONS.

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THE KING OF THE BELGIANS.

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AND MOST OF THE NOBILITY, CLERGY, AND GENTRY IN THE UNITED KINGDOM.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last six years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—

1st. Simplicity of Construction, every part being free of access.

2nd. They are worked with far greater ease than any other Lawn Mower. **3rd. They are the least liable to get out of order.**

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THEY ARE THE ONLY MACHINES IN CONSTANT USE AT

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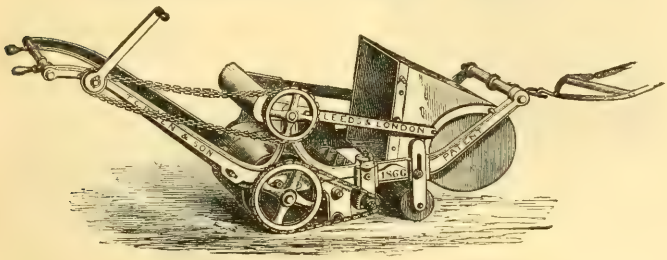

PRICES of HORSE, PONY, and DONKEY MACHINES, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness.

DONKEY AND PONY MACHINES.

To cut 26 inches	£13 0 0
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,, 30 inches	17 0 0
Leather Boots for Donkey	0 18 0
Ditto for Pony	1 2 0

HORSE MACHINES.

To cut 30 inches	£21 0 0
,, 36 inches	24 0 0
,, 42 inches	27 0 0
,, 48 inches	30 0 0
Leather Boots for Horse	1 6 0

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away, or in any way damaging the Machine.

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Every Machine is warranted to give entire satisfaction, and if not approved of can be returned unconditionally.

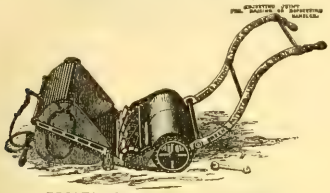

PRICES OF HAND MACHINES.

To cut 10 inches ..	£3 10 0	To cut 18 inches ..	£7 10 0
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Suitable for a Lady.		,, 22 inches ..	8 10 0
To cut 14 inches ..	£5 10 0	,, 24 inches ..	9 0 0
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Packing Cases are charged at the following low rates, viz.:—For the 10 and 12 inch Machine, 3s.; 14 and 16 inch, 4s.; 18 and 20 inch, 5s.; 22 and 24 inch, 6s. Parties providing themselves with Lawn Mowers are recommended to purchase the cases in which to stow them away when not in use, to prevent them from getting damaged; if returned, two-thirds will be allowed for them

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Ireland, and Scotland.

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First Prize Medal at the Namur Exhibition.
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GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

N.B. *All Orders are executed on the day they are received, either from our Leeds or London Establishment.*

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

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Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
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30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

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24 inches by	26 inches ..	..	..	..	..	£4	0	0
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Every Machine and Roller is warranted to give entire satisfaction, and, if not approved of, can be returned at once unconditionally.

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Having very extensive Premises in London, we are in a position to do all kinds of Repairs there, as well as at our Leeds Establishment.

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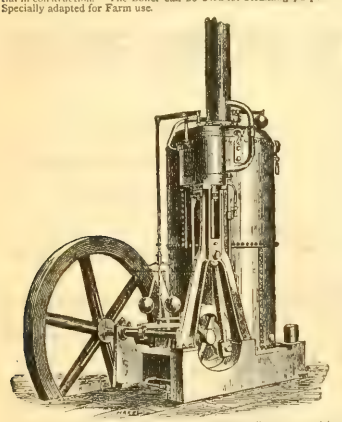

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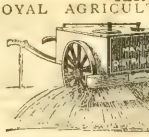

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American Lawns.

THE AMERICAN PATENT

"ARCHIMEDEAN" LAWN MOWER

is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

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The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

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The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement, but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 6 or 8 inches long. The 14 inch machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."

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WILLIAMS' PATENT "ARCHIMEDEAN" AMERICAN LAWN MOWER,

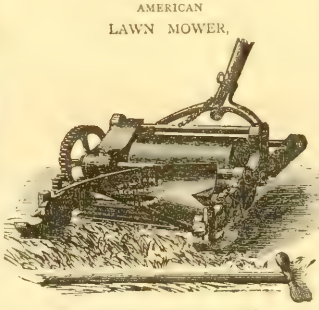

IS THE ONLY LAWN MOWER THAT CUTS WET or LONG GRASS WITHOUT CLOGGING, Thus enabling the man to work it in the morning or cool of the day, instead of waiting for the Grass to dry, and toiling under the heat of a mid-day sun. It is very easy to work, and will preserve its perfect cut whilst traversing over mounds or sloping banks.

"Far superior to any of ours."—Vide *The Field*.

"The quickest, most simple, and most efficient Mower ever used."—Vide *Gardeners' Chronicle*.

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COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

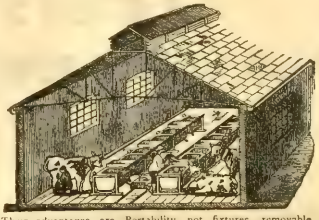

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

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N.B. Open Tanks of different sizes packed one in another to save carriage.

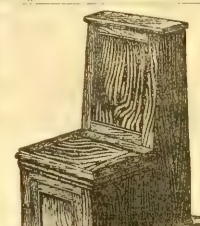

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"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

W. GILBERT.

"January, 1870."

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UNIVERSAL PORTABLE PLANT PRESERVER.

After looking at the Illustration it is unnecessary to give a long description of this new and invaluable article, suffice to say that it is Glazed without Putty and constructed of Wood and Iron. Watering is done expeditiously. The Ventilation is perfect, and the Lights are arranged to open on either side. It can be moved in lengths.

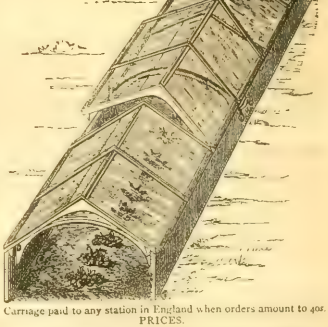

Carriage paid to any station in England when orders amount to 40s.

PRICES.

Width.	Height at Ridge	4 feet Length.	8 feet Length.	12 feet Length.
12 Inches	11 Inches	9s.	15s.	20s.
18 ,,	12 ,,	11s.	19s.	29s.
24 ,,	15 ,,	14s.	25s.	37s.
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Loose ends, 9d., 1s., 1s. 6d., 2s. 6d., and 3s. 6d. each.

A remittance or reference must accompany the orders.

Larger sizes can be had, suitable for Forcing Pits, 5 and 6 feet wide.

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The Perfect

WATERING CAN.

Registered according to the Act.

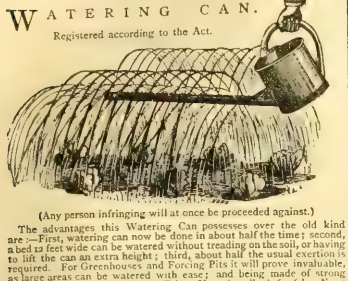

(Any person infringing will at once be proceeded against.)

The advantages this Watering Can possesses over the old kind are:—First, watering can now be done in about half the time; second, a bed 12 feet wide can be watered without treading on the soil, or having to lift the can an extra height; third, about half the usual exertion is required. For Greenhouses and Forcing Pits it will prove invaluable, as large areas can be watered with ease; and being made of strong zinc they will last a lifetime. Price, No. 1 (1 gallon), 6s 6d.; No. 2 (2 gallons), 8s 6d.; No. 3 (3 gallons), 10s 6d.; No. 4 (4 gallons), 12s 6d. Manufactured by JOSIAH LE BUTT, Haymaker Works, Bury St. Edmund's; to whom Post Office orders must be sent and made payable when ordering.

REUBEN HUNT, MANUFACTURER of IMPROVED HAND SEED DRILLS, Atlas Works, Earl's Colne, Essex.

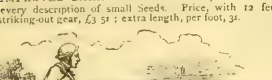

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For Sowing every description of small Seeds. Price, with 12 fee box and striking-out gear, £3 5r; extra length, per foot, 3r.

ONE ROW CUP DRILL, No 1.

For sowing Turnips or Mangel-wurzle or flat. Price	£2 10 0
Extra cup plate for altering quantity of seed	0 2 0
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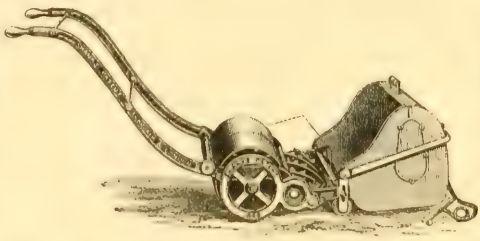

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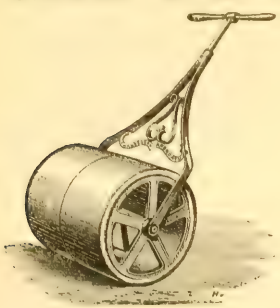

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NEW VERBENA (Lothair), unrivalled. CATALOGUES ready
JOHN KEYNES, Castle Street, Salisbury.

NEW DAHLIAS, unrivalled. CATALOGUES ready
JOHN KEYNES, Castle Street, Salisbury.

NEW GERANIUMS (Crimson Zonal, Lady Penzance Zonal, and Silver Tricolor). CATALOGUES ready
JOHN KEYNES, Castle Street, Salisbury.

Calceolaria aurea floribunda and Prince of Orange.

WILLIAM MEADMORE offers good strong Autumn-struck plants at 20s. per 100.
Nurseries, Stamford.

3-yr. Seedling Rhododendrons.

G. LAPWORTH has to offer a large quantity of the above, at 20s. per 100. Trade price sample on application at the Nurseries, Marlow.

WEEKS' PRIZE COCK PHEASANTS, and other FANCY COCK and HEN PHEASANTS. LISTS of terms free.
Mr. WEEKS, Keeper, Bagshot Park, Bagshot.

ORCHARD HOUSE TREES. Trained in Best Practical Shapes, for Walls, Espaliers, Pyramids, Bushes, Standards, and Pegs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

GOLD and SILVER FERNS.—Three hundred fine plants GYMNOGRAMMA PEKUVIANA ARGYROPHYLLA (true), from 6 CUT FRONDS, 12s. 6d. per dozen; a large quantity of GYMNOGRAMMA LAUCHEANA, from 6 CUT FRONDS, 12s. 6d. per dozen; and BIRKENHEAD, Nurseryman, &c., near Manchester.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. of his CATALOGUE of BRITISH FERNS, including pieces of many Exotic Ferns of the PRICED DESCRIPTIVE CATALOGUE of BRITISH EXOTIC FERNS, No. 7.
Fern Dell, Shooter's Hill, Kent.

British Ferns.

EDWARD SANG, Botanist, Nurseryman, and Seed Merchant, Kirkcaldy, N.B., are preparing their PRICED CATALOGUE of BRITISH FERNS for the present season. This Catalogue will embrace the entire Collection of Plants which belonged to Dr. Bell, Newburgh, Fife, and which they have recently acquired from him by purchase.

SPRING CATALOGUE of PLANT and CUTTINGS for 1870 now ready, containing the best new and select Varieties of Bedding Plants, including a New Hybrid, and other GERANIUMS, PHLOXES, &c. A general List of BEDDING PLANT free on application.
EDGE HILL Nurseries, Liverpool.

Just Arrived, from Belgium,

A CHOICE LOT of PLANTS, in fine condition, consisting of ADIANTUM FARLEYENSE, 21s. and 30s. per dozen; 2s. 6d. and 3s. 6d. each; CAMELLIAS and AZALEAS, well set with flower-buds.
R. GREEN, Belgian Conservatories, Covent Garden Market.

MR. B. S. WILLIAMS' Descriptive Catalogue of Japanese and Australian Plants, Bulbs, Seeds, &c. (including a splendid Collection of PRIMULA SINENSIS, ERICA JAPONICUM, ANGRÆCUM FALLATUM, DENDROBIUM JAPONICUM, &c., ALIANTUS GLANDULOSA, choice plants, &c.), free on application.

Green Hollies.

CHIVAS AND WEAVER offer a splendid stock of the above, from 2 to 3 feet. Prices and testimonials on application. Eaton Road Nurseries, Chester.

Irish Yews.

CHIVAS AND WEAVER offer a very fine grown stock of the above, from 2 to 3 feet. Prices very moderate on application. Eaton Road Nurseries, Chester.

English Yews.

CHIVAS AND WEAVER offer a very fine grown stock of the above, from 2 to 3 feet. Prices very moderate on application. Eaton Road Nurseries, Chester.

VANDA CŒRULEA.—Well established healthy plants for 12s. 6d. each.
WILLIAM MAULE AND SONS, The Nurseries, Bristol.

ACUBA BOLLEANA, the Green Berried, for 12 four dozen for 3s., sent post free on receipt of stamps by
JOHN TUCK, Royal Exeter Nurseries, Exeter.

To the Trade.

T. THORNTON, Bagshot, Surrey, has to offer a large stock of RHODODENDRON SEED of KALMIA LATIFOLIA and RHODODENDRON, saved from named varieties. Price on application.

FRESH SEED of CUPRESSUS LAWSONIANA and PINUS INSIGNIS at very moderate prices (see pages 74 and 75 of the TRADE CATALOGUE), or may be had post free.
HEAVEN HILL Nurseries, Ipswich.

WOODROW BROTHERS, Seed Merchants, Farnham, have to offer fresh seeds of INDIAN RAPE, trifolium, Cocksfoot, Cow Grass, Rye Grass, Burnet, Rape, Hybrid, and others. Terms on application.

Chrysanthemums.

ADAM FORSYTH begs to inform the Trade and the Public that he is now sending out his NEW and rarer choice CHRYSANTHEMUMS.
Free descriptive CATALOGUE on application, or may be had free with other CATALOGUES.
Brunswick Nursery, Stoke Newington, N.

Carter's Index, April 22.

CARTER'S PRIZE GLOBE MANGEL. See p. 556.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE LONG MANGEL. See p. 556.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE SWEDE TURNIP. See p. 556.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE GRASS SEEDS.
237 and 238, High Holborn, London, W.C.

Easter Decoration, Immortelles, &c.

FRESH IMMORTELLES in great variety. Lowest price to the Trade on application.
JAMES CARTER and CO., 237 and 238, High Holborn, London, W.C.

WEBB'S NEW GIANT POLYANTHUS (Crimson Flower), and GOLDEN QUEEN (Light Yellow Flower), unrivalled Cowslips, Prize Strain, Pinks of all the varieties, with double PRIMROSES of different colours; CINERARIAS, and all other Spring Flowers. LIST on application.—Mr. WEBB, Calcot, Reading.

LOUIS VAN HOUTTE'S SPRING CATALOGUES are in the Printer's hands. The last three Numbers of the FLORE DES SERRES ET DES JARDINS DE L'EUROPE are issued.
Royal Nursery, Ghent.—April 22.

NEW and CHOICE GARDEN, AGRICULTURAL, and FLOWER SEEDS. Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

SPRING PLANT CATALOGUE, 1870, containing a Select List of Stove and Greenhouse Plants, Ferns, Orchids, &c.
JOHN and CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

JAMES BIRKBECK AND CO., Seed Growers and Merchants, Bedale, Market Lavington, and Devizes, have pleasure in informing their Friends and Others that their DESCRIPTIVE PRICED LIST of DAHLIAS is now ready.

Spring Planting. To the Trade.

MAUPAY TOOLEY'S ABRIDGED CATALOGUE of Choice Flowering Plants, Ferns, Orchids, &c., is now ready, and can be had on application.
Midland Nurseries, near Godalming.

J. SCOTT, Merriott, Somerset, begs to call public attention to his NEW DESCRIPTIVE BEDDING CATALOGUE, which will be forwarded gratis to all applications. The plants are varied and fine this season, and as usual J. S. holds the largest stock of Calceolaria amplexicaulis in the country.

Genuine Seeds.

WM. CUTBUSH AND SONS' Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS is now ready, post free on application. The growth of the best kinds of Cabbage Seed may be recommended.
Highgate Nurseries, London, N.

To Seed Importers, Nurserymen, &c.

BENJAMIN AND CO., Custom House Quay, Shipping and General Transit Agents, beg to inform them that they receive and forward SEEDS, PLANTS and GENERAL MERCHANDISE, from and to all parts of the world, at charges as low as possible.
Custom House Quay, London, E.C.

SUTTON'S HOME GROWN FARM SEEDS.
For present prices see p. 571 of this week's Paper.

SUTTON'S GRASS SEEDS for ALL SOILS.
For present prices see p. 571 of this week's Paper.

SUTTON'S GRASS SEEDS for PASTURES.
For present prices see p. 571 of this week's Paper.

SUTTON'S GRASS SEEDS for PARK GROUNDS.
For present prices see p. 571 of this week's Paper.

SUTTON'S GRASS SEEDS for GARDEN LAWNS.
For present prices see p. 571 of this week's Paper.

EVERY GARDEN REQUISITE.
CARTER'S New Seed Warehouse, 237 and 238, High Holborn, London.

Farm Seeds.

CHARLES SHARPE AND CO., Seed Growers and Merchants, Sleaford, Lincolnshire, will be glad to send, free on application, their CATALOGUE of FARM SEEDS, grown from carefully selected stocks.

Agricultural Seeds.

ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E., has pleasure in forwarding his SPECIAL PRICED CATALOGUE of TURNIP, MANGEL, and other AGRICULTURAL SEEDS is now ready, and will be forwarded on application. Samples good, and prices very low.

BOWMAN AND SONS, 102, Eastgate Street, Chester.
For Farming, Field, and Garden Seeds, apply to the above address.

Turnip Seeds.

H. AND F. SHARPE have to offer to the Trade fine selected stocks of the above-named Seeds, all of 1869 growth, at moderate prices.
Market Harborough.

Agricultural and Garden Seeds.

SPECIAL OFFERS of TURNIP, MANGEL, and other AGRICULTURAL and GARDEN SEEDS are now issued by
H. LEIGHTON and SONS, Seed Growers, Reading, Berks.
Prices and Samples of the SEEDS of their own growth on application.

To the Trade.

SHARPE'S IMPROVED LARGE SWEDE, of their own growing, very large, uniform in shape, and of fine quality.
Send for Samples and Prices.
Market Harborough.

To the Trade.

ORANGE GLOBE, RED GLOBE, and GREEN GLOBE MANGEL, and other TURNIP SEEDS, of the finest quality, are offered by
JAMES CARTER and CO., 237 and 238, High Holborn, London, W.C.

MANGEL WURZEL, of extra choice stock, saved from selected roots, true to name, and of fine quality.
AGRICULTURAL SEEDS of every description, of the finest quality.
J. SCOTT, The Seed Stores, Yeovil, Somerset.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undermamed selections from their general stock. Every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ACER DASYCARPUM IMPERIALE, grand ... 21s. 0d. to 42s. 0d. each.
CHAMÆCYPARIS LAWSONIANA, fine ... per hundred.
„ LAWSONIANA ALUMII, a most ... 5s. 0d. per dozen.
„ MACROCARPA, ... per dozen.
THUJA DOMBEYI, ... per dozen.
„ GLOBOSA, ... per dozen.
„ ... of this fine Thuja they are quite worthless.
THUJOPSIS ... per dozen.
„ ...
„ VARIEGATA, ...
WELLINGTONIA ... per dozen.
ABIES NOBILIS, ...
„ ... MANNIANA, ...
„ ... ALBA, ...
„ ... GRANDIS, ...
„ ... PINSAPO, ...
„ ... LASIOCARPA, ... per dozen, to test.
„ MACNABIANA, ...
„ CEPHALONICA, ...
CEDRUS ...
YEWS, ...
„ ...
„ ...
„ ...
LIBOCEDRUS ...
„ ...
STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each.
„ ...
„ WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each.
„ PORTUGAL LAURELS, ... to 21s. each.

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

EHOLLANDICUM, ... per dozen.
„ CATAWBIENSE and HYBRIDS, ... 50s. to 75s. per 100.
„ ...
„ ...
„ ...
„ STANDARD ... 21s. each.
AZALEAS, ... per dozen.
„ ...
KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen.
„ ...
ANDROMEDA FLORIBUNDA, ... per dozen.

We have ... quantities of the leaves ... of

EVERGREENS OF ALL SIZES,

SUCH AS

ACCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR VITÆ, THUJOPSIS, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves; being an impossibility to accurately describe by advertisement.

We guarantee the plants sent out to be in a growing state, which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

NEW BEDDING PLANT, VERONICA BLUE GEM

AWARDED FIVE FIRST-CLASS CERTIFICATES LAST SUMMER.

THOS. CRIPPS & SON

Beg to announce that they intend distributing the above the first week in May. Unlike other shrubby Veronicas it is of a very neat dwarf habit, the axil of nearly every leaf producing spikes of beautiful mauve flowers, making the plants appear literally clothed with bloom. It commences flowering when only 2 inches high, and continues in bloom throughout the season.

In reviewing the New Plants of 1869, the *Gardeners' Chronicle* (see page 45, present volume) says—"Yet another blue bedder, viz., Veronica Blue Gem, of great promise, both as a decorative plant for the greenhouse and a serviceable plant in the flower garden, of remarkably close habit, and a singularly free bloomer. It cannot fail to answer all expectations formed of it."

Price 5s. each.

Usual Discount to the Trade on three Plants. (See p. 74 of our Trade CATALOGUE.)

THE NURSERIES, TUNBRIDGE WELLS.

NEW PLANTS FOR 1870.

B. S. WILLIAMS

Has much pleasure in offering the undermamed NEW PLANTS, which will be ready for distribution on May 1, next.

New Summer Bedding Plant.

PHLOX DRUMMONDII GRANDIFLORA ARGENTATA.—[illegible] which the ... [illegible] ... 10s. 6d.

Superb New Bedding Plant.

VIOLA CORNUTA VAR. PERFECTION.—B. S. W. ... which it has been tested both ... foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is ...

Azalea Grand Monarch.

A superb new and distinct variety, suitable for exhibition or early forcing purposes; the habit is compact and dense, of medium growth, ... [illegible] ... 21s. each.

Verbena Mauve Queen.

... very good variety, possessed of good constitution, and useful ... the ... [illegible] ... which so many of the ... [illegible] ... 10s. 6d. each.

New Fuchsias.

B. S. WILLIAMS has much pleasure in being able to offer ... [illegible] ... of this favourite plant; they are all of ... [illegible] ... distinct, and cannot fail to give general ...

FIRE OF BALAKLAVA.—... and sepals scarlet, well reflexed ... 10s. 6d. each.

FORMOSA.—Tube slender, and, as well as the sepals, bright scarlet; ... [illegible] ... 10s. 6d. each.

HOLLOWAY LEVAL.—... of the most distinct ... and sepals bright red, well reflexed ... substance, and rich deep violet in ... 10s. 6d. each.

STRIATA PERFECTA.—A charming and very effective variety; ... bright carmine, ... with ... [illegible] ... 10s. 6d. each.

TRIUMPHANS.—A superb double variety ... tube and sepals rich ... [illegible] ... large and very regular, petals intense violet, suffused at the base with crimson. 10s. 6d. ...

BENJAMIN S. WILLIAMS, VICTORIA AND PARADISE NURSERIES,
UPPER HOLLOWAY, LONDON, N.

NEW PLANTS.

JOHN LINDEN

HAS THE HONOUR TO INFORM THE PUBLIC THAT

THE FOLLOWING NEW AND DIRECT INTRODUCTIONS

Will be ready for distribution on and after the 1st of May next.

Allowance to the Trade: one plant over if three are ordered.

ACER PALMATUM MULTIFIDUM RETICULATUM, ... Net ... 12s.
ANTHURIUM ... 21s.
ARALIA ... 12s.
CHIRITA LILACINA, Ch. Lim. ("Illustration Horticole"), 12s. 6d.
COSMOS LINDENI, ... at the International ... 21s.
COSTUS AMAZONICUS, Lind., fine species, 12s. 6d.
DRACÆNA ... ("Illustration Horticole"), ... 21s.
MARANTA ... 21s.
MARANTA SMARAGDINA, ("Illustration Horticole"), ... 21s.
PASSIFLORA MARMOREA, ... 21s.
POSOQUERIA MULTIFLORA, fine flower ... 21s.
... 21s.
ARISTOLOCHIA DUCHARTREI, 10s. 6d.
... 21s.
... 21s.
... 12s. 6d.
... 21s.
... 5s. 6d.
... 21s.

Palms.

For Table Decoration and Stove and Greenhouse, by the dozen, hundred, or thousand, at very low prices. Amongst them all the ... [illegible] ... the Establishments of M. J. Linden, viz.:—

ACANTHORHIZA WARSCEWICZII.
ARECA VERSCHAFFELTII.
CALYPTROGYNE ELATA.
CARYOTA SPECIOSISSIMA LEEGANS.
CHAMÆDOREA NOBILIS NOBILIS.
CHAMÆROPS LITTORALIS.
COCOS MAYNENSIS.
„ WALLISII.
„ ... [illegible] ... (the largest number of the Gardeners' Chronicle.)
DECKENIA NOBILIS.
LEPIDOCARYUM GRACILE.
LICUALA GRANDIS, PUMILA, and ACUTA.
MAKTINEZIA LINDENIANA.
MORENIA CORALLINA.
OREODOXA REGIA.
PHŒNICOPHORIUM SECHELLARUM.
PHYTELEPHAS PŒPPIGIANA.
VERSCHAFFELTIA MELANOCHÆTES, ...
SPLENDIDA.
WELFIA REGIA.

Orchids.—... Houses of Staves. Many new and ... [illegible] ... to be ... with in England.

Morditona Pine-Apple. New and most delicious Pine-apple, ... [illegible] ... Fruit sweet, weighing 5 to 6 pounds. Fine plants, 21s.; extra strong, 42s.

Tropical Fruit Trees from India and South America.

Carriage paid to London.

CATALOGUES Free on application to Messrs. SILBERRAD & SON, 5, Harp Lane, Great Tower Street, London.

ESTABLISHMENT FOR THE INTRODUCTION OF NEW PLANTS,
J. LINDEN, BRUSSELS, and at GHENT (formerly Ambroise Verschaffelt), BELGIUM.

NEW PLANT CATALOGUE 1870,

POST FREE TO ALL APPLICANTS.

BENJAMIN S. WILLIAMS

HAS MUCH PLEASURE IN ANNOUNCING THAT HIS

GENERAL AND NEW PLANT CATALOGUE

For the current year is now ready. It contains select Lists of Orchids, Ferns, Palms, Flowering and Ornamental-leaved Stove and Greenhouse Plants, Azaleas, Camellias, Amaryllis, Florists' Flowers, &c., &c., and, in addition, full descriptions of many novel and excellent plants, which are now offered for the first time; also descriptions of many new or rare plants of recent introduction and sterling merit.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW FUCHSIAS.

GEORGE SMITH

Has much pleasure in offering Three SEEDLING FUCHSIAS, unequalled by any others in cultivation, viz.:—

AVALANCHE (G. S.)

This acquisition stands preeminent, being the finest I have ever offered, having very double, compact, and beautifully formed flowers; corolla pure white, of extra size, with large carmine filaments; tube and sepals brilliant carmine scarlet. This splendid variety is also shown to bloom 25 petals; has habit and free grower.

Plants 10s. 6d. each.

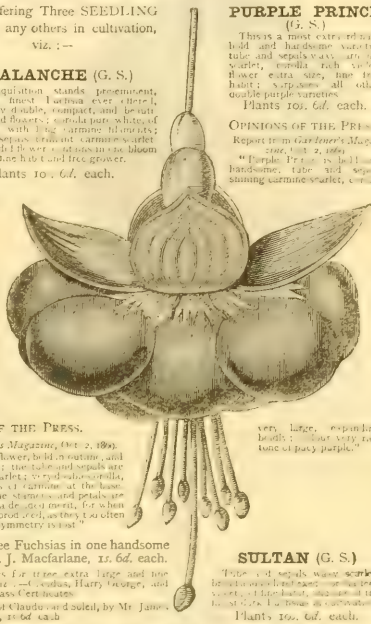

PURPLE PRINCE (G. S.)

This is a most extra robust habit and handsome variety; tube and sepals waxy and scarlet, corolla rich violet flower extra size, fine tree habit; surpasses all other double purple varieties.

Plants 10s. 6d. each.

OPINIONS OF THE PRESS.

Report from *Gardener's Magazine*, Oct. 2, 1869.

"Avalanche is a large flower, bold in outline, and massive though elegant; the tube and sepals are of a brilliant carmine scarlet; waxy and shows corolla, pure white, with streaks of carmine at the base. In the samples sent the stamens and petals were quite distinct, which is a decided merit, for when intermediate forms are produced, as they too often are, in double flowers, symmetry is lost."

OPINIONS OF THE PRESS.

Report from *Gardener's Magazine*, Oct. 2, 1869.

"Purple Prince is bold and handsome, tube and sepals stunning carmine scarlet, corolla very large, expanding boldly; colour very rich tone of deep purple."

NOTICE.—The above Three Fuchsias in one handsome coloured Plate, by Mr. J. Macfarlane, 1s. 6d. each.

G. S. is also booking Orders for true extra large and non SHRINKAGE GRANDIS, viz.—Lucifer, Harry George, and Soleil, which have taken First class Certificates.

Beautiful coloured Drawings of Claudia and Soleil, by Mr James Andrews, in two separate plates, 1s 6d each.

SULTAN (G. S.)

Tube and sepals waxy scarlet, bell-shaped, and large size, corolla deep velvety, of blue habit, and one of the best forms. Is true as cultivated.

Plants 10s. 6d. each.

For descriptions of above see CATALOGUE, forwarded on application.

Good Plants of the above first week in May. *Usual Discount to the Trade*

TOLLINGTON NURSERY, HORNSEY ROAD, ISLINGTON. LONDON, N.

PATENT URBAN HORTICULTURAL MANURE,

THE MOST GENUINE, PORTABLE, AND SUCCESSFUL MANURE FOR FLOWERS, ROSE TREES, SHRUBS, FRUIT TREES, ETC.

MESSRS. WAITE, BURNELL, HUGGINS, & Co.,

As Wholesale Agents for the PATENT URBAN MANURE COMPANY, have much pleasure in drawing the attention of Nurserymen, Florists, and others to the following report (issued with the sanction of the Council of the Royal Horticultural Society, London):—

ROYAL HORTICULTURAL SOCIETY'S GARDENS,
CHISWICK, LONDON, March, 1870.

Official Report on the Patent Urban Horticultural Manure.

The above Manure has been tried in the Gardens of the Royal Horticultural Society, Chiswick, during the past two seasons of 1868 and 1869, with very satisfactory results. It was applied to the following subjects—viz., Fruiting Vines, in pots; Cucumbers, in frames; Peaches and other orchard-house Trees, in pots; Fuchsias, Pelargoniums, and Strawberries, in pots and in the open ground. 1st, By mixing a little of the Manure with the soil in potting the plants; 2d, By sprinkling some of the Powder on the surface, and watering it afterwards; 3d, By diluting a portion with water, and then watering the plants therewith. In the case of the Vines and Fruiting Trees, in pots, which were watered twice a week with a weak solution of the Manure, the effect was especially decided; and this form of application throughout seemed to have the advantage, and, secondly, that of sprinkling on the surface of the soil. The foliage of the plants, where it was used, assumed a much darker hue, and became of more substance; and the plants, in general, increased much in strength, and the berries of the grapes greatly in size.

The proportions used were those recommended on the canister in which it is sold; and in its general influence it seems to possess greatly the character of Guano, and to be equally as powerful, without incurring so much risk in its application.

Judging by the results, I am justified in stating it to be the best "Patent" Manure we have ever used, and recommend it accordingly. (Signed) A. F. BARRON, Garden Superintendent.

This Manure is Manufactured solely by the PATENT URBAN MANURE COMPANY, LIMITED, and Sold in Canisters, 1s. each, by all Seedsmen, Chemists, &c. A liberal discount to the Trade.

Sole Agents—MESSRS. WAITE, BURNELL, HUGGINS, AND CO., SEED MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

SUTTONS' FRESH IMPORTED FLOWER SEEDS. Free by Post.

ASTERS, WALLFLOWERS, STOCKS, ZINNIAS, &c., imported from the most celebrated growers, direct.—See SUTTON'S DESCRIPTIVE LIST of FLOWER SEEDS, gratis and post free.

SUTTONS' COLLECTIONS OF FLOWER SEEDS

No. 1 Collection, as used by Lord ——, and containing 100 varieties, with ample directions for cultivation, fit for a Gentleman's Garden . . . £2 2 0
No. 2 Collection, as used by —— 1 11 6
No. 3 Collection, as used by —— 1 1 0
No. 4 Collection, as used by —— 0 15 0
No. 5 Collection, as used by —— 0 10 6

Single and Limited Collections, varying in price from 2s. 6d. to £1, free by post.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

FARM SEEDS of the best quality, extra clean.—Price List free on application.

James Dickson & Sons.

Seed Growers, 102, Eastgate Street, Chester.

The best Substitute for Grass.

PYRETHRUM TCHIHATCHEWI, a novelty from Asia Minor, [illegible] Cattle like the finest Grass. When cut it is produced in great abundance, and grows, having a compact bushy character, with very little stem, does not require mowing. Price [illegible] Post free for 24 stamps.

LEWIS WOOD, HOLLY HOUSE, Messrs. Nursery, Noble Hemingham, Essex.

Grass Seeds.

BOLTON AND CO. have to offer NEW GRASS SEED MIXTURES [illegible] the following places:—

GARDEN LAWNS
BOWLING GREENS
PLEASURE GROUNDS
CROQUET GROUNDS
PERMANENT PASTURE
MEADOW LANDS
ORCHARDS
CEMETERIES
SHADY PLACES
ROUGH ENCLOSURES
COVERS
RAILWAY BANKS
For ONE YEAR'S LAY
For TWO YEARS' LAY
For RENOVATING OLD PASTURES

At moderate prices, and can be [illegible] or [illegible], to be had on application.

BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

WHEELERS' SUPERIOR GRASS SEEDS, for Permanent Pasture, of the finest quality, are fully described and priced in WHEELERS' HAND-BOOK on GRASSES, which may be had gratis and post free.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS, are supplied in large or small quantities, at extremely moderate prices.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

WHEELERS' SUPERIOR GRASS and CLOVER SEEDS are forwarded carriage free to all railway stations in the Kingdom.

QUALITY—Unequalled, and unsolicitated.
PRICE—Wholesale from 25s. to 45s. per acre, according to soil and situation, extremely moderate.
TERMS—Cash only, discount for Cash.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

ON LAYING DOWN LAND to PERMANENT PASTURE.

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Permanent Pasture	.. ..	from 25s to 30s. 6d per acre.

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CARTER'S ILLUSTRATED FARMERS' CALENDAR for 1870 is now ready, post free (gratis to purchasers). All kinds of Farm Seeds at very low prices.
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H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL-TOP YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth. Prices very low
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They confidently recommend their superior stocks of TURNIP SEEDS, which have been carefully proved and found to grow about 90 per cent. This will ensure a much stronger braird than seed reduced to grow only from 60 to 70 per cent. Their stocks of MANGEL WURZEL, CABBAGES, &c., are also of excellent quality, and they have been equally careful in proving the quality and growth of their CLOVER and GRASS SEEDS, and their Mixtures for laying down Permanent Pasture. PRICED LISTS on application.
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Seeds direct from the Growers. The best means of preventing Disappointment
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TREATED LIBERALLY.

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"For the last three years I have grown Suttons' Intermediate Mangel, which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
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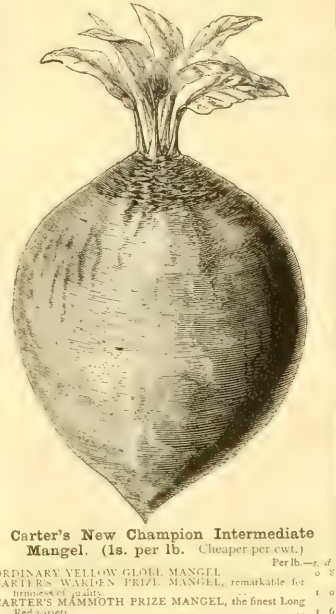

Carter's New Champion Intermediate Mangel. (1s. per lb. Cheaper per cwt.)

	Per lb.	s.	d.
ORDINARY YELLOW GLOBE MANGEL		0	8
CARTER'S WARDEN PRIZE MANGEL, remarkable for firmness of quality		1	0
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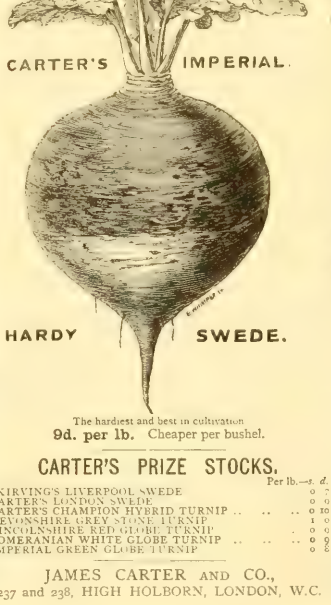

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SKIRVING'S LIVERPOOL SWEDE		0	6
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LAWES'S PATENT TURNIP MANURE.
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LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
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GARDEN MANURES are specially prepared for every crop grown in either Flower or Kitchen Garden, Lawns, Vine Borders, &c., by the undersigned. They are conveniently packed in 2 lb. Bags, at 6d. per Bag. These Manures will be found good, cleanly, and moderate in price. CATALOGUE, with ample directions, free on application to
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(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
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MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c. E. PURKER, Secretary.
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This Company was originally formed by, and is under the direction of, agriculturists of the substances that have justly earned for it another title of
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Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures of their own manufacture; consequently, the consumer has the best guarantee for the genuineness and efficacy of the Manures manufactured by this Company.
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PERUVIAN GOVERNMENT GUANO, £13 10s. per ton.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
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"SIR,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the per-centages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
"(Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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Post-office Orders payable at Fleet street, E.C.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. PAVIES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868
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GENUINE MEDICATED TOBACCO PAPER.—The most effective of all Fumigators. Terms, circulars and particulars on application
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

The Best and Cheapest Vermin Killer.

Vide "The Gardeners' Magazine," conducted by Shirley Hibberd Esq., F.R.H.S., of August 14, 1868.
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THE LONDON GROUND TOBACCO (free of duty), for the Destruction of Blight. Sold in Tins, 1s., 2s. 6d., & 4s. each, by Seedsmen and Druggists. POWDER DISTRIBUTORS, 2s. 6d. each.
Manufacturers COLE AND SOPER, at their Bonded Warehouse, Shad Thames, London, S.E. [AGENTS WANTED]

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Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 8 to 10 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
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Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
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By Royal Appointment.

TO HER MAJESTY, by Special Warrant, dated December 27, 1805

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SCRIM CANVAS, for Wall Fruit, Greenhouse Shades, Tulip Covers.
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Vases and Fountains, for the Garden and Conservatory.

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Horticultural Glass Warehouse.

THOMAS MILLINGTON AND CO., 87, Bishopsgate Without, London, E.C.
NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom.

ORCHARD-HOUSE SIZES.

in.	in.		4ths	3rds.	2nds.	Best.
20 by 12						
20 by 14		(15 oz	122 6d	142 6d	162 6d	182 6d
20 by 16	Per 100 feet.					
20 by 18		(21 oz	175	195	215	235
20 by 20						

SMALL SHEET SQUARES, 15 oz., per 100 feet

From	To	4ths	3ds	2nds	Best
6 in by 4 in	9 in. by 7 in.	115 6d	125 6d	145 6d	155 6d
9 in by 7 in	13 in. by 10 in	115 9d	135 6d	155 6d	165 6d
14 in by 10 in	18 in. by 12 in	125 3d	145 6d	155 6d	175 6d
20 in by 12 in	22 in by 18 in	1125 6d	145 6d	165 6d	185 6d

Lists on application

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In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz		
4ths quality, per 300 feet case, 34s		4ths quality, per 200 feet case, 34s.		
3ds " " 22s		3ds " " 28s.		
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SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., and 42 oz.

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 3-8th in. substances.

BRITISH PLATE GLASS for Windows and Silvered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

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STUCCO PAINT, 24s. per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. It is mixed with rain or pure river water.

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IMPROVED ANTI-CORROSION PAINT, 28s. to 34s. per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, such as Roofs, Sheds, Ships, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 3s. 6d. per gallon.

Per cwt.	£ s. d.		Per gallon.—s. d.
GENUINE WHITE LEAD	2 0	LINSEED OIL	2 0
SECONDS WHITE LEAD	26 0	BOILED OIL	2 3
GROUND PATENT DRY-		TURPENTINE	2 9
ERS, 22s. to 24s. per cwt.		LINSEED OIL PUTTY,	
" OXFORD or FIRE, 3d.		& pure cwt.	
to 4d. per lb.		Fine COACH VARNISH, 10s to 12s	0
" RAW UMBER, 4½d. to		" CARRIAGE do., 12s to 14s	0
6d. per lb. [per lb.		" PAPER do. 10s. to 12s	0
" BURNT do., 6d. to 9d.		" COPAL 16 to 18	0
GREEN PAINT, all shades,		" KNOTTING 10	0
28s. to 60s.	0	Patent GOLD SIZE	10 0
BLACK PAINT 24s to 30s	0	" BLACK JAPAN	12 0
RED PAINT 28s to 30s	0	BRUNSWICK BLACK	
GLAZIERS DIAMONDS,		LEAD and PIPES.	
12s. 6d., 15s., 18s., 21s. each		OLD LEAD Bought or taken in	
GROUND BRUSHES.		Exchange.	
DUSTERS. SASH TOOLS.			
DISTEMPER BRUSHES.			

The above are Nett, for Cash, as Lists such cannot be booked.
Lists of any of the above on application

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows :—

PROPAGATING GLASSES.

	Each.—s. d.		Each.—s. d.
2 inches in diameter	0 1½	12 inches in diameter	1 9
3 " "	0 2	14 " "	2 0
4 " "	0 2½	14 " "	2 6
5 " "	0 6d	15 " "	3 0
6 " "	0 8	16 " "	3 6
7 " "	0 10	17 " "	4 0
8 " "	1 0	18 " "	5 0
9 " "	1 2	19 " "	6 0
10 " "	1 3	20 " "	7 0
11 " "	1 6		

BEE GLASSES, with ventilating hole through knob

	Each.—s. d.		Each.—s. d.
4 inches in diameter	0s 6d	9 inches in diameter	1s 8d.
5 " "	0 8	10 " "	2 0
6 " "	0 10	11 " "	2 6
7 " "	1 1	12 " "	3 0
8 " "	1 4		

Either flat or conical tops.

CUCUMBER GLASSES.

	Each.—s. d.		Each.—s. d.
24 inches long	2s 0d	16 inches long	1s 4d.
22 " "	1 10	14 " "	1 2
20 " "	1 8	12 " "	1 0
18 " "	1 6		

	Each.—s. d.		Each.—s. d.
12 inches	0 6	20 inches	0 6
14 "	0 7	22 "	0 11
16 "	0 8	24 "	0 12
18 "	0 9		

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS.
PAINTS of various colours ground ready for use
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS PHILLIPS AND CO., 169, Bishopsgate Street Without, E.C.

GREENS PATENT LAWN MOWERS. No alterations for the present season, 1870. After the severe tests that the above Lawn Mowers have been subjected to during the last six years, they have been found to give entire satisfaction, and to meet all the requirements for which they are intended, viz., the keeping of Lawns in the highest state of perfection
They are the only machines in constant use at most of the principal places in England, being preferred above all others
Drawings and Price List on application
THOMAS GREEN AND SON,
Smithfield Iron Works, Leeds, and 54 and 55, Blackfriars Road, S

Caution to Gardeners.—When you ask for

SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years.

INDIA-RUBBER GARDEN HOSE, 60 feet ½ inch hose, with brass tap, rose, and jet complete, 19s. 6d.
60 feet ½ inch do do, extra strong, 31s. 6d.
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application.
F. G. CAPON, India-rubber Manufacturer, Quadrant, Birmingham.

To Gentlemen, Gardeners, and Others.—Write for

HEADLY AND SON'S Illustrated List of Prices of the NEW PATENT HYDRAULIC APPARATUS for Watering Lawns and Gardens, the NEW PATTERN GARDEN ROLLERS, PUMPS, the NEW PATTERN GARDEN CHAIRS, the NEW PATTERN GARDEN ARCHES, &c. Post free on application to
T. HEADLY AND SON, Ironmongers, Iron Works, Cambridge

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C. ; and Steam Plough Works, Leeds.

IRON HURDLES (Silver Medal of the Royal Agricultural Society) :
SHEEP, 3s. 6d. ; CATTLE, 4s. 2d. ; PONY, 5s. 11d.
List by post. GATES and FENCING of every description.
St. Pancras Iron Work Company, Old St. Pancras Road, London, N.W.

LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Price from £2 per foot.
Hooper & Co., Covent Garden ; Dixon & Co., 48A, Moorgate Street ; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road West, Chelsea.
BENJAMIN LOOKER, Inventor and Sole Manufacturer, Kingston-on-Thames.

LOOKER'S PATENT PROPAGATING BOXES.—The best mode of Raising all kinds of Spring Seeds and Cuttings. Price Tins, 1s. each.—Hooper & Co., Covent Garden ; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road, West Chelsea ; and Dixon & Co., 48A, Moorgate Street.
Inventor and Sole Manufacturer,
BENJAMIN LOOKER, Kingston-on-Thames

THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c. ; for all Decorative purposes ; and is the best Paint for Flatting over manufactured, as it dries in a few hours, at least five hours going down, has comparatively little smell, can be washed, and will cover all sunk parts.
Sold only by the GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.
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NO MORE DAMP WALLS.—The only Cure for Damp Walls, Preserving Stone, Brick, and Cement from Decay is the SILICATE ZOOPISSA COMPOSITION, Patented in the Houses of Parliament. Testimonial by the SILICATE ZOOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Devonshire for Chatsworth, the Secretary to the Crystal Palace ; Royal Gardens, Kew ; Professor Lindley on the Horticultural Society, &c.
The best Shading is "Frigi Domo" Netting.
White over Brown, made of prepared Hemp Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS "FRIGI DOMO" NETTING, 2 yards wide, 1¼d. per yard run.
"FRIGI DOMO" CANVAS.
Two yards wide " " 3d. per yard run.
Four yards wide " " 5d. per yard.
An improved make, 2 yards wide " " 1s. 9d. per yard.
An improved make, 3 yards wide " " 2s. 6d. per yard run.
Scrim Canvas, 72 inches wide, 70 yards long, 5¼d., 6¼d., 7¼d., 7¾d. and 8¼d. per yard.
Hessian Canvas, 54 and 72 inches wide, 6¼d. and 8¼d. per yard ; 1¼d. allowed for cut pieces returned.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom.

No. 1, Peel Street, Manchester, 1870.

OUR HORTICULTURAL SHADINGS form a thorough Protection from Winds, Frost, and Hail, whilst at the same time they admit Light and Sun. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the Kingdom, as well as on the Continent ; in fact, are pronounced the only "proper shadings" ever offered to the public against Birds, Wasps, Blight, &c. As a covering for Strawberries, Tulips, Hyacinths, Seed Beds, Fruit, &c., they have no rival. The price is very reasonable, brings them within the reach of every one. With ordinary care they will last for many years. Samples post free on application DANIEL COLLINSON AND SON

No. 1—54 inches wide	at 8½d. per yard run
No. 2—54 inches wide	at 7d. per yard run.
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No. 5—72 inches wide	at 8½d. per yard run.

In pieces of about 30 yards each, or any longer lengths when specially ordered. Nett cash in 30 days from date of Invoice

GARDEN WIRE WORK, consisting of ARCHES, BASKETS, FLOWER STANDS, &c.

GARDEN SYRINGES	4s. 6d. to 26s.
GARDEN ENGINES	20s. 6d. to 105s.
GARDEN WATER BARROWS	45s. 6d. to 90s.
GARDEN ROLLERS	35s. 0d. to 70s.
GARDEN CHAIRS	6s. 6d. to 30s.
GARDEN SEATS	16s. 6d. to 90s.
GARDEN TOOLS and WATERING POTS.	
PATENT LAWN MOWERS	70s. 0d. to 130s.
To cut 10 inches, £1 10s : 12 do., £1 15s	
suitable for a Lady	
To cut 14 inches, £2 2s ; 16 do., £2 10s	
Suitable for a Man	

WILLIAM S. BURTON, Furnishing Ironmonger, by appointment to H.R.H. the Prince of Wales, sends a CATALOGUE, containing upwards of 700 Illustrations of his unrivalled Stock, with Lists of Prices, and Plans of the 20 large Showrooms, post free. No. 39 to 42, Newman Street, 4, 5, and 6, Perry's Place, and 1, Newman Yard. With the present RAILWAY FACILITIES the cost of delivery of Goods to the most distant Parts of the United Kingdom is trifling. WILLIAM S. BURTON will of the United Kingdom is trifling. WILLIAM S. BURTON will also, when desired, undertake delivery at a small fixed rate

PAUL'S NOVELTIES of 1870.
See WM. PAUL'S SPRING CATALOGUE, just published

PAUL'S NEW ROSE PRINCESS CHRISTIAN.—
Three first-class Certificates. Plants ready in May, 10s. 6d. each
For description see WM. PAUL'S SPRING CATALOGUE

PAUL'S NEW ROSE VIRGIL
Plants ready in May, 5s. each
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For description see WM. PAUL'S SPRING CATALOGUE
Strong plants in April, price 3s. 6d. to 5s. each.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE.
First-class Certificate. Plants ready in May, 10s. 6d. each.
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PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE.
Plants ready in May, 10s. 6d. each
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM GOLD MEDAL.—The brightest and most effective of this section yet raised. Plants in May, 10s. 6d. each
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PAUL'S NEW BEDDING PELARGONIUMS (BRATON'S Race). BONFIRE, the finest of all the Stella race, and five others. Plants in May, 5s. each; or the six varieties for 25s.
For descriptions see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NOVELTIES of 1870.—
ROSE PRINCE LEOPOLD, GOLDEN VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c.
For descriptions see WM. PAUL'S SPRING CATALOGUE, just published

WM. PAUL, Paul's Nurseries and Seed Warehouse, Waltham Cross, London, N

SEEDS, of choicest quality.—ASTERS: French Perfection, Dwarf Chrysanthemum-fl. Emperor and Victoria; STOCKS—German Ten-week and Brompton; WALLFLOWER—Double ENGLISH, Mammoth PURPLE, PRIMULA FIMBRIATA, mixed; PETUNIA, single, in separate lots.
See previous Advertisements, or write a letter only, J. SCOTT'S PRICED DESCRIPTIVE LIST, which will be sent free on application.
J. SCOTT, The Seed Stores, Nevin's Street

TWENTY THOUSAND PLANTS of a beautiful but neglected GENERA, well adapted for Bedding and Rock work, description, well established, in 18-oz. pots, and secured for Potts, for immediate Disposal, at 6d. per 100. Selected from above and arranged like the subjoined, and packed and delivered free upon rail at MUSEMBRYANTHEMUMS (Iceplant).
Apply to Mr. THOMSON, forty years gardener to the late Royal Gardens, and Mr. MACKENZIE, Gardener to H.G. the Duke of Northumberland, at Sion House, and Lord Ashburton, The Grange, Hants. Lots may be viewed at 11 Exeter Exchange, Strand, Nurseries, Kensington Gravel Pits, and Paddington Station, Bridge

TO THE TRADE.—
per SEEDLING HOLLY (very short)
ARBOR VITÆ, 6 to 9 inches, 10s. 6d. per 1000
SCOTCH FIR, 9 to 18 inches
PINUS LARICIO, 12 to 18 inches
PINUS AUSTRIACA, 9 to 18 inches
PINUS RIGIDA, 2 to 3 feet. A very fine growing Pine, in great demand. Price on application
J. THORNTON, Heather-dale Estate, Bagshot, Surrey

HARDY HEATHS, in 60 varieties, free of package:—
24 plants, in 12 varieties, two of each for 12s.
48 plants, in 24 varieties, including choicest varieties, for 24s.
100 plants, in 12 varieties, for 25s.
100 plants, in 24 varieties, for 50s.
100 plants, in 50 varieties, for 50s.
Many varieties can be supplied by the 1000. See CATALOGUE
JAMES SMITH, Darley Dale Nurseries, near Matlock

Planting Season.
To PLANTERS of PUBLIC and FAMILY PARKS, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unusually large stock of choice EVERGREEN and DECIDUOUS SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at greatly reduced prices, in consequence of having more than he requires.
Among the Evergreens are many thousands of the finer sorts of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hollies; Common and Portugal LAURELS; COMMON and TREE geraniums, cultivated in Bedding masses of whatever size. Large sizes, well adapted for giving immediate effect.
To Gentlemen wishing to improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.
Nursery and Seed Stores, Walton-on-the-Hill
Seed Warehouse, 15, Church Square
Liverpool, April, 1870

MESSRS. J. STANDISH AND CO. are now prepared to execute orders for the following New and Choice Plants, to which they wish to call special attention. See larger Advertisement in last week's *Gardeners' Chronicle*.
INOREOPHIANUM, Phain., 7s. 6d. to 12s. 6d. each; with fine crimson spikes of bloom set, 25s. each.
ANTHURIUM SCHERZERIANUM.—Fine young plants, with two or three leaves, 10s. 6d. each; with three leaves and crowns, and stronger, 15s. to 20s. each.
TODEA PELLUCIDA COMOSA.—2s. 6d. to 5s. each.
STRUTHIOPTERIS SPICANT.—In April next, 10s. 6d. each.
BICUS MACROPHYLLA.—5s. each.
ABUTILON THOMPSONI.—15s. to 18s. per doz.; 12s. per 100.
COMMELINA PERENNIS VARIEGATA.—10s. 6d. to 12s. per doz.
FREESIA REFRACTA ALBA YELLOW.—Flowering plants, 10s. 6d. each; in April next, 5s. each and 7s. 6d. each.
ROYAL ASCOT VINE.—2s. 6d. to 5s. each and 21s. each.
PEARL EARLY SWEET CORN.—Plants, 1s. 6d. each.
MARQUIS of DOWNSHIRE.—Fine plants, 3s. 6d. to 15s. each.
ARECA OLERACEA.—2s. 6d. to 5s. each.
JUNIPERUS JAPONICA VARIEGATA.—2s. 6d. to 21s. each.
ACER RUBINERVE ALBO LIMBATUM.—2s. 6d. to 5s. each.
„ POLYMORPHUM DECHIANUM ELEGANS.—2s. 6d. to 21s. each.
AUCUBA, Males.—1s. 6d. to 5s. each. Other varieties. See our CATALOGUE.
Royal Nurseries, Ascot, Berks.

New and Select Farm Seeds.

1870. 1870.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 100, Last-gate Street, and the "Home" Nurseries, Chester.
TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.
CLOVERS, RYE GRASSES, and NATURAL GRASSES, very superior assemblies, thoroughly cleaned and free from weeds.
MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years' lay, from 10s. to 20s. per Pl.
MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 20s. to 28s. per acre. These mixtures are composed of the finest grasses, and are free from Seeds of the value of £2 and upwards (Grain, Vetches, and Potatoes excepted), carriage free to any railway station in the kingdom.
Special estimates for large quantities. Samples and prices on application.
PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis and post free on application.

Bedding Plants—Bedding Plants.

JAMES HOLDER'S unrivalled Collection of Scarlet and Variegated GERANIUMS, DAHLIAS, VERBENAS, CALCEOLARIAS, FUCHSIAS, LOBELIAS, PETUNIAS, GAZANIAS, KONIGAS, TROPÆOLUMS, CUPHEAS, COLEUS, IRESINES, AGERATUMS, PENTSTEMONS, &c., at his usual price (in spite of the long severe winter), namely, eight dozen for 20s., or four dozen for 10s. 6d.; hamper and package included.
Crown Nursery, Reading, Berks.

Silver Tricolor Pelargonium, Mrs. Col. Wilkinson.

J. JANES will send out the above beautiful PELARGONIUM on and after May 1. This is a great advance on any Silver yet distributed. It is of a free branching habit, the leaf very flat, margin white, with well-defined zone of crimson-lake and black. First-class Certificate Royal Horticultural Society, October, 1868. Price 32s. 6d. Price to the Trade on application.
North Road, Highgate, N.

Variegated Bedding Geraniums.

ALFRED FRYER offers the following choice kinds, in strong plants, at per dozen, for 24:—TRICOLORS: Sophia Dumfresque, 2s. 6d.; Lady Cullum, 6s.; Bella Donna, 3s.; Pulcinella, 3s. 6d. GOLD and BRONZE ZONALS: Beauty of Calderdale, 3s. 6d. Beauty of Biddenham, 3s.; Duke of Edinburgh, 2s.; E. G. Henderson, 4s.; Kentish Hero, 4s.; Mrs. John Todd, 4s.; Neatness, 2s. 6d.; Model, 2s. 6d.; Perilla, 1s. 6d. Most of the above are old-fashioned sorts. Baskets and packing, 1s. for a single dozen, and 6d. extra for every subsequent dozen. Remittances requested from unknown correspondents
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

Choice Bedding Geraniums.

THOMAS PESTRIDGE can now supply, in strong Plants, for cash, the following varieties:— Per doz.— £ s.
LADY CULLUM ... 4 0
LOUISA SMITH ... 5 0
LUCY GRIEVE ... 4 0
SOPHIA DUMAW ... 2 0
CHARMING BRIDE ... 2 0
GLEN FARG BEAUTY ... 2 0
ITALIA UNITA ... 3 0
PRINCESS ALEXANDRA ... 6 0
EGYPTIAN QUEEN ... 3 0
MOORE ... 4 0
KELTONIANS ... 4 0
PERILLA ... 2 0
ACHIEVEMENT (Turner's) ... each 1 0
Package included. The plants are well-established in 3-inch pots.
A List of other choice varieties on application.
The Greenway Nursery, Uxbridge, Middlesex

Choice Variegated Pelargoniums.

J. ELCOMBE AND SON beg to offer the following splendid varieties, at low prices, for cash:—

	Each Dozen.			Each Dozen.	
	s. d.	s. d.		s. d.	s. d.
Countess of Craven	1 0	9 0	Her Majesty	1 0	9 0
Defiance	1 0	9 0	Lucrezia Borgia	1 0	9 0
Lucy de Malpas	3 6	30 0	Princess	0 6	5 0
Mr. Lowe	1 0	9 0	Queen Victoria	0 6	5 0
Sophia Dumfresque	0 6	4 0	Tom Bell	0 6	5 0
Ulysses	0 6	5 0	Model	1 0	9 0
Grenadier	1 0	9 0	Countess of Kellie	1 0	9 0
Harriet Hall	1 0	9 0	Beauty of Calderdale	0 6	5 0
Lucy Grieve	1 0	9 0	Italia Unita	1 0	9 0
Louisa Smith	0 6	6 0	Perilla	0 6	5 0
Lucy Grieve	2 6	24 0	Harriet	2 6	24 0
Model	0 6	5 0	Duke of Edinburgh	0 6	5 0
Mrs. Dix	2 0	20 0	Lucrezia	2 6	24 0
Prince of Wales (Smith)	2 6	24 0	Lady Palmerston	2 6	24 0
Sophia Cusack	1 6	12 0	Queen Victoria	1 6	12 0
Sophia Dumfresque	0 6	4 0	Silver Star	0 6	5 0
Sir R. Napier	1 6	12 0	Star of India	1 6	12 0
Imperor	1 6	12 0	Johnson's Monarch	1 6	12 0
Jolly Tar	0 6	5 0	Crystal Prince	0 6	5 0
Mrs. Holland	2 6	24 0	Tom Thumb	2 6	24 0
Mrs. Pearson	2 6	24 0	Lucy	2 6	24 0
Countess	2 6	24 0	Model	2 6	24 0
Arthur H. Wills	1 6	12 0	Princess Alexandra	1 6	12 0

The above are strong autumn struck plants, they are now splendid colour. Spring-struck plants at 1s. each extra.
NEW VARIEGATED ZONALS, 1870, in course, at per dozen
VIOLA, Blue Perfection, in pots, in May, 12s. per 100
Nursery and Seed Establishment, Romsey, Hants

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS.
NURSERYMAN and SEED MERCHANT,
Victoria and Paradise Nurseries, Upper Holloway, London, N

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to stock gardens of various sizes, 10s. 6d., 21s., 42s., 63s. and 84s. each.

NEW and CHOICE VEGETABLES.

	Per packet	s.	d.
Backhouse's Winter White Protecting BROCCOLI		1	6
Dell's fine dark-leaved BEET		1	0
Williams' Matchless RED CELERY		1	0
Williams' Matchless WHITE CELERY, new		1	6
Telegraph CUCUMBER, Woolley's improved variety		1	6
Wheeler's Tom Thumb CABBAGE LETTUCE		0	6
Wellis's Emaus MELON, new		2	6
The finest fine-flavored green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Parks, June 30, 1869.			
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new		2	6

NEW and CHOICE FLOWER SEEDS.

		s.	d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and	5	6
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 5s. 6d., and		5	6
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &		5	6
BALSAM, Williams' superb strain	1s. 6d. and	2	0
CYCLAMEN, Wiggins' Prize strain	2s. 6d., 5s. 6d., and	7	6
VERBENA, Eckford's finest varieties, mixed		1	0
Williams' Improved Hybrid SOLANUMS	2s. 6d. and	3	6
CENTAUREA CANDIDISSIMA	1s. and	2	6
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The fruits are snowy white, and produced in great abundance	1s. 6d. and	2	6
Parsons' New Tree MIGNONETTE		1	0
PERILLA NANKINENSIS VARIEGATA, new		1	0
Williams' Improved French MARIGOLD, beautifully striped, and very large		1	0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and unequalled for continuous flowering and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for bloom borders. Per collection of three colours		2	6
VIOLA CORNUTA ALBA, new	1s. 6d. and	2	6
ZINNIA ELEGANS PUMILA flore-pleno, new		1	0
Named GLADIOLI	per doz. 4s., 6s., 7s., and	12	0
Fine English SEEDLINGS	per 100	20	0

Verbenas, Verbenas.

PHILIP LADDS is now sending out Purple, White, Scarlet, and Pink VERBENAS, including new varieties of 1869, strong plants, in pots, at 12s. 6d. per dozen; small plants of ditto at 6s. per dozen; CHOICE DOUBLE PINKS, 2s. per dozen; NEW CHINAS, 1869, at 3s. per dozen; 12 new varieties of CANTERBURYNUMS, 1869, at 2s. per dozen; 18 in 12 varieties, 1869, of PENSTEMONS, at 3s. per doz.; VESTIVUS, the best bedding Scarlet GERANIUM, at 20s. per 100
Nursery, Bexley Heath, Kent.

JOSEPH SMITH, Sen., having a large stock of the following, begs to offer them to the Trade at a low figure:—
RHODODENDRON PONTICUM, 12 to 15 inches, 18s. per 100; 15 to 20 inches, 20s. per 100; 18 to 24 inches, 25s. per 100—less by the 1000
Hybrids, 18 to 24 inches, 33s. per 100; 20 to 30 inches, 45s. per 100
RHODODENDRON HIRSUTUM, nice plants, 2 years planted, from layers, 15s. per 100
RHODODENDRON FERRUGINEUM, planted from layers, 25s. per 100
Double flowering WHIN, good plants, 12s. per 100
ROSE HOLLY, AMERICAN, 1½ to 2 feet, 2s. per 100; 2 to 3 feet, 7s. per 100 less by the 1000; 3 to 4 feet, 10s. per 100; 5 to 6 feet, 40s. per 100.
SPRUCE FIR, NORWAY, 12 to 15 inches, 15s. per 1000; 15 to 18 feet, 18s. per 1000.
MOUNTAIN ASH, 2 to 3 feet, 15s. per 1000; 3 to 4 feet, 25s. per 1000.
Tansley and Scotland Nurseries, near Matlock, Derbyshire.

RHODODENDRONS.

		Per doz	Per 100
PONTICUM, 1 to 2 transplanted, bushy, 12 to 18 in., 4s. 6d.			20s.
„	„	15 to 20 in., 4s. 6d.	22s.
„	„	18 to 24 in., 5s. 6d.	25s.
„	„	2 to 3 ft., 7s. 6d.	40s.
HYBRIDUM	„	1 to 18 in., 5s. 6d.	30s.
„	„	12 to 24 in., 6s. 6d.	40s.
„	„	2 to 3 ft., 7s. 6d.	60s.
MAXIMUM, white		15 to 20 in., 5s. 6d.	30s.
„	„	18 to 24 in., 6s. 6d.	40s.
HIBERNUM, dwarf in clusters			15s.

The above can be supplied by the 1000. For named sorts, see CATALOGUE.
JAMES SMITH, Darley Dale Nurseries, Matlock

New Roses of 1870, from Paris.

LÉVEQUE AND SON, 132, Boulevard de l'Hôpital, Paris, have strong and healthy plants of all the NEW SORTS (88 sorts), and the BEST OLD SORTS, for Autumn Planting. They particularly recommend as good the 12 following:—T. R.: Madame Ducher, Madame Levet. H. P.: Eugénie Verdier, A. de Humboldt, Eliza Boelle, Charles Turner, Comtesse d'Oxford, General Miloradovitsch, Louis Henri, Susannah Wood, Madame Laurent. Moss P.: Madame W. Paul.

A Glorious Show of Roses,
TEA, BOURBON, CHINA, and NOISETTE,
may be secured and enjoyed all the summer
BY PLANTING NOW.
Good plants of finest kinds, established in pots, mostly 48's, are ready for delivery. Selected from the best growers. Packages and delivery free. Price 18s. per 100. Packing extra at cost price. Wholesale. CHARLES NOBLE, Bagshot.

Forced Roses, and other Desirable Plants.

ROSES, the best kinds, now coming into bloom, 9s. per dozen; VIOLA ODORATA PENDULA, the new White Variety of New York, the largest Violet in cultivation, 12s. per dozen. CINERARIA DOUBLE BLUE, blue-red foliage, 12s. per dozen; the new Double Scarlet TYLECHIRUMS, 12s. per dozen; the New Giant Tree MIGNONETTE, 12s. per dozen; CYCLAMEN PERSICUM GIGANTEUM, the best Bronze, Golden, and Silver Edged GERANIUMS, the New VERBENAS and PHLOXES of this season, and all Plants adapted for bedding; CANNAS, in the best varieties; DAHLIAS, Show and Fancy, 12s. per 100; Cactus, 6s. per dozen. DESCRIPTIVE CATALOGUES free.
LEWIS WOODTHORPE, Munro Nursery, Side Hedingham, Essex.

Novelties.

DOWNIE, LAIRD, AND LAING are now offering the following Novelties, which have gained first honours wherever exhibited, and are the admiration of all who have the pleasure of seeing them.
New and unapproached Gold and Bronze PELARGONIUMS.
New and unsurpassed Hybrid Nosegay ditto.
New and unrivalled Double ditto.
New and unequalled PHLOXES and PENTSTEMONS.
New Hybrid Perpetual and Tea-scented ROSES for 1870.
New distinct and beautiful CALCEOLARIAS.
New Golden Blotched ABUTILON MEGAPOTAMICUM.
For prices see our NEW DESCRIPTIVE CATALOGUE for this season, which will be forwarded, post free, to all applicants.
Royal Nurseries, Leith Walk, Edinburgh, and Edinburgh.

CHATER'S AGERATUM, IMPERIAL DWARF.—
THE FINEST BEDDING PLANT of the SEASON.
This is admitted to be the greatest acquisition for modern Flower Gardening that has been offered for many years. Awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society on the 16th of August, 1867, and a Silver Medal at the Provincial Show, Norwich, September, 1867.
This beautiful New Bedding Plant will be sent out after May 1
1 plant ... 1s. 6d. | 12 plants ... 2s. 6d.
6 plants ... 1s. 9d. | 24 plants ... 4s. 0d.
WILLIAM CHATER, Nurseries, Saffron Walden.

SUPERB DOUBLE HOLLYHOCKS.—Now is the time for planting to ensure good spikes and blooms this season.
WILLIAM CHATER'S CATALOGUE of his unrivalled collection may be had upon forwarding one postage stamp. Choice bloomed cuttings, with colours attached, extra fine, 4s. per 100; unbloomed seedlings, 2s. per 100; finest varieties, 3s. per 100.
Seeds saved only from first-class flowers in packets and collections, from 1s. to 10s. 6d.
Special prices for quantities to the Trade on application
WILLIAM CHATER, The Nurseries, Saffron Walden

CHARLES TURNER recommends The BRIDE, a beautiful new CLOVE, pure white, smooth edge, large and full, 12s. 6d. each.
CARNATIONS and PICOTEES, named, and in fine variety, 21s. per dozen pairs.
PINKS, 6s. per dozen pairs
CLOVES, in colours, 6s. per dozen plants.
This is the best season for planting the above in borders or large pots for blooming. See descriptive and full LISTS, now ready.
The Royal Nurseries, Slough.

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of

Achimenes	Miscellaneous plants
Amaryllis	„ bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants	Verbenas

The Royal Nurseries, Slough.

CALCEOLARIAS, Herbaceous, nice plants, free by post, 2s. 6d. per doz.
ACHIMENES, 18 varieties, 3 tubers of each, 6s. per dozen.
DAHLIAS, 50 sorts, 50 varieties for 15s., 25 for 7s. 6d.; package free
CALCEOLARIAS, bedding, in 12 varieties, 2s. 6d. per dozen, 50 for 16s., 100 for 30s.; package free
GERANIUMS—Scarlet, Zonal, and Nosegay, in 20 named varieties (not including gems), for 20s., package free.
PRIMULA ALBA PLENA and HETEROPHYLLA, well set for blooming, 6s. per doze
DAHLIAS, Bedding CALCEOLARIAS and GERANIUMS we can offer to the Trade by the 1000, at reasonable prices, on application.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

TUNBRIDGE WELLS HORTICULTURAL SOCIETY.—The ANNUAL GRAND EXHIBITION of FLOWERS and FRUIT will take place on FRIDAY, July 1.

PRIZES OPEN to ALL ENGLAND.

Prizes for Hand Bouquets, and for Single Pieces or Groups for Table Decorations.

Also Prizes for best-kept Cottage Gardens, and for Cottage Garden Productions.

Schedules may be obtained on application to the Secretary,

Mr. E. F. LOOF, 26, Parade, Tunbridge Wells.

ROYAL HORTICULTURAL SOCIETY.

SHOW of AZALEAS, RHODODENDRONS, &c., April 20.

AWARDS of the JUDGES.

CLASS 1.—9 AZALEAS, distinct. (Open.)

1st Prize, Messrs. H. Lane & Sons, Nurserymen, Great Berkhampstead, £4.

2d, Mr. A. Wilkie, Oak Lodge, Kensington, W., £3.

CLASS 2.—6 AZALEAS, distinct. (Amateurs.)

1st, Mr. A. Wilkie, £3.

2d, Mr. G. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., M.P., St. John's Lodge, Regent's Park, N.W., £2.

CLASS 3.—6 AZALEAS, distinct. (Nurserymen.)

1st, Mr. C. Turner, Royal Nurseries, Slough, £3.

2d, Messrs. A. Henderson & Co., Pine-apple Place Nursery, Maida Vale, W., £2.

3d, Messrs. J. Dobson & Sons, Woodlands' Nursery, Isleworth, W., £1.

CLASS 4.—AZALEA, single specimen. (Open.)

1st, Mr. A. Wilkie, 15s.

2d, Mr. C. Turner, 10s.

CLASS 5.—6 RHODODENDRONS, forced, distinct. (Open.)

1st, Messrs. H. Lane & Son, £2.

2d, Messrs. J. Standish & Co., Royal Nurseries, Ascot, £1 10s.

3d, Mr. A. Wilkie, £1.

CLASS 6.—12 SHOW AURICULAS, distinct. (Open.)

1st, Mr. C. Turner, £1 10s.

2d, Mr. J. James, Gr. to W. F. Watson, Esq., Redlees, Isleworth, £1.

CLASS 7.—6 SHOW AURICULAS, distinct. (Amateurs.)

1st, Mr. J. James, £1.

CLASS 8.—12 ALPINE or FANCY AURICULAS, distinct. (Open.)

1st, Mr. C. Turner, £1.

2d, Mr. J. James, 10s.

CLASS 9.—9 SHOW PANSIES, in pots, distinct. (Open.)

1st, Mr. J. James, £1.

2d, Mr. H. Hooper, Vine Nursery, Widcomb Hill, Bath, 15s.

Class 10.—6 BEDDING PANSIES, distict, in boxes 12 inches square. (Open.)

1st, Mr. H. Hooper, £1.

Class 11.—Collection of Hardy SRRING FLOWERS, in a basket not exceeding 4 feet in diameter. (Open.)

1st, Mr. G. Wheeler, £1 10s.

Class 12.—12 Cut Trusses of RHODODENDRONS. (Open.)

1st, Messrs. H. Lane & Son, £1.

Class 13.—Collection of FORCED VEGETABLES. (Open.)

1st, Mr. R. Gilbert, Gr. to the Marquis of Exeter, Burghley Park, Stamford, £1 10s.

MISCELLANEOUS.

Messrs. H. Lane & Son, Miscellaneous Collection of Plants, Extra Prize, £2.

Messrs. J. Veitch & Sons, Nurserymen, Chelsea, Miscellaneous Collection of Plants, Extra Prize, £3.

Messrs. W. Rollisson & Sons, Nurserymen, Tooting, Collection of Orchids, Palms, &c., Extra Prize, £1 5s.

Mr. B. S. Williams, Nurseryman, Holloway, Collection of Plants, Extra Prize, £1 5s.

Mr. C. Edmonds, Hayes Nursery, Hayes, Middlesex, Collection of Cyclamens, Extra Prize, £1.

Mr. H. Bailey, Royal Nursery, Feltham, 12 Early Geraniums, Extra Prize, 10s.

The Gardeners' Chronicle

SATURDAY, APRIL 23, 1870.

MEETING FOR THE ENSUING WEEK.

WEDNESDAY, April 27.) Royal Botanic (Exhibition of
THURSDAY, " 28.) Spring Flowers) . . . . . 2 P.M.

THE publication of Mr. ROBINSON'S work on ALPINE PLANTS will, we trust, serve to draw renewed attention to these exquisite gems. Every traveller, be he gardener, botanist, or merely pleasure-seeker, goes into raptures over them in their native haunts. The Gentian, the Arabis, the Forget-me-not, the Silene, gathered on the "jardin" on the slopes of Mont Blanc, the Rhododendrons of the Rigi or of the Styrian highlands, who does not prize them? Does not the most unbotanical of travellers press them between the pages of "Murray" or "Bradshaw," as souvenirs? Are they not despatched in letters to loved ones at home, in the hope that even in that form they may enable the recipient in some measure to share in the pleasure of the sender, or perchance serve as mementos of former happy days of travel and enjoyment? To the professed gardener of all others we might look for some better attempt than we usually see practised to cultivate these flowers of delight at home. But, no: what do we see even in Botanic Gardens?—a few starved, slug-devoured plants, away in some back yard, growing in a cold frame, where little light can ever reach them, but where a chilling damp atmosphere environs them, more favourable to the growth of the Moss and Liverwort on the pots than to that of the unfortunate alpine. There are exceptions we know, and there are scattered here and there some really well-formed rock-gardens, where each plant has, as far as possible, the location best suited to its requirements; but how exceptional this is every one will admit who recals the frightful burr and clinker erections which so often go under the name of rockwork, and on which no plant *could* grow. Our object at present is not to dilate on such points as these, nor on the best means of combating the prejudices and assertions of those who account for their neglect of these plants by saying that it is not possible to grow them in this country, as if an equal amount of the intelligence and care that is brought to bear on the culture of Orchids or Ferns would not be rewarded with like success in the case of alpines. We shall take an early opportunity of adverting to these points and other matters of practical interest in a review of Mr. ROBINSON'S book. At present we would rather dwell on certain matters of great interest as regards the nature and history of these plants, and which, however familiar they may be to the geologist and naturalist, are not so likely to be well known to the gardener. But in the first place we would remark that, though we do know a good deal as to the conditions under which these plants live, either in the far north or on the mountain slope, we are still very ignorant as to the precise effect of these conditions on the plants in question. We are too apt to deceive ourselves in this matter, and to talk glibly about the long roots hidden away in deep chinks of the rocks—of foliage covered for months with snow,—of the melting of that snow and the consequent exposure of the plant to the pure light-illumined air, to the burning summer's sun, and the diminished atmospheric pressure, and so forth; and no doubt all these have their effect; but how—how does each one act? What effect is to be attributed to this, what to that cause? How much is due to their joint action? How is it that the Gentian (G. sedifolia) mentioned in our columns by Professor JAMESON, late of Quito (see p. 809, 1867), when growing at the base of the mountains, has comparatively small pale flowers, while at the higher elevations the flowers are not only thrice as large and azure-blue in colour, but also endowed with a sensitiveness to external impressions which causes them to contract their flowers when touched,—a phenomenon which is quite wanting in the same flowers at lower elevations? There is the fact, but the explanation is not forthcoming. There is another point in the history of these plants worth noting. A large proportion of what we term alpine plants are common to the mountains of Central Europe, including those of Britain, and to the Scandinavian and circum-polar regions. How come they in such widely-separated districts? Have they migrated from one locality to the other, and if so, how? To these questions, the answer furnished by the geologists is distinct. Just anterior to the incoming of the present order of things on the earth's surface an icy sea covered the whole of the northern part of Europe. The proofs of this are beyond dispute. Our Scottish hills at that time were as islets peering above the frost-bound waters. Direct communication with Scandinavia was thus afforded through the medium of icebergs; the vegetation of the whole area exposed above the waters must have been similar in character. Presently all this was changed, the land rose, the ice-bound sea disappeared, the islets became mountains, on whose summits still remain the traces of the vegetation which once spread over the whole of the land. Such is the history geologists give us of our alpine plants, and a wonderful history it is. The main facts are unquestioned, but some of the collateral ones have been challenged; thus, while all admit the former existence of glaciers in our islands and in Central Europe, and most assume that the temperature must have been colder and the climate more rigorous, there are some who doubt these conclusions, and with great ingenuity point out that the presence of glaciers implies a high, not a low temperature. This is how they argue—glaciers originate in snow, this snow is the result of a condensation of vapour; without heat there could be no vapour, therefore the presence of glaciers is an indication of heat. Certainly the birthplace of a glacier is not the warmest place in the world. But we must leave these nuts for the geologists to crack, enough for us now to show that the history of alpine plants is well worth studying.

—— THE Société Impériale et Centrale d'Horticulture de France has just issued a circular relating to the proposed trials of HOT-WATER APPARATUS to be carried out under the auspices of that body. The principal regulations are as follows:—Manufacturers of hot-water apparatus of all nations are invited to compete, with the object of ascertaining by as complete and fair a comparison as possible, what is the apparatus which will heat a fixed quantity of water, under the same conditions, the most economically, regularly, speedily, and persistently. The apparatus will be divided into two classes—those suitable for large, and those for small establishments. In either case the competitors will be provided at their own expense with a covered cistern, and of the same capacity in each set of experiments. These cisterns will communicate with the boilers by pipes of equal diameter and length. For the larger boilers the cisterns will have a capacity of 5000 litres, and the flow and return pipes will be each of the length of 20 mètres, and 10 centimètres in diameter. For the smaller class of apparatus the cisterns will have a capacity of 7000 litres, the flow and return pipes will be of the diameter of 8 centimètres, and of a length of 10 mètres. The cisterns and pipes will all be of the same construction and quality, and from the same foundry; and their arrangement will be regulated by the Commission in the same manner for all the apparatus. Every competitor will be permitted to set his furnace and its chimney as he pleases, to select the fuel he thinks most suitable—the fuel to be furnished by the Commission at the expense of the competitor. When the boilers are all filled with an equal quantity of water at the same temperature, the fires will be lighted at the same time, and the temperature of the water in each boiler will be noted every half-hour until the quantity of fuel allotted to each competitor is burnt out, and till the water is of the same temperature in all the boilers. The experiments will be continued for 24 hours on some day in June not yet fixed. Every exhibitor of the larger kind of apparatus will have to place in the hands of the treasurer, before May 1, the sum of 500 francs; and every exhibitor of the smaller apparatus 200 francs, or 700 francs in the case of those who compete in both classes. These sums represent the expenditure made on behalf of each exhibitor for the setting up of cisterns, pipes, &c. This competition was to have taken place in April, but it has been postponed till the second fortnight in June. The prizes offered in each class are gold medals of the value of 300, 200, and 100 francs. Those desirous of further particulars should apply to the Secretary of the Society, 84, Rue de Grenelle Saint Germain, Paris.

—— We have before us the "notes of lectures" of Prof. OLIVER'S LECTURES on BOTANY, as recently delivered to a class of ladies at the South Kensington Museum. These notes consist of a series of propositions explained and amplified by the lecturer in the class-room. If any excuse be needed for adverting to an ephemeral publication of this character relating to lectures which have been already delivered, it will be found in its excellence. Rarely have we seen so much information so well ordered and so clearly and concisely conveyed as in these modest lecture notes.

—— From the tenth annual report of the Brooklyn Park Commissioners, dated January 1, 1870, a copy of which is before us, we learn that between 500 and 600 trees, ranging from 4 inches to 17 inches in diameter, measured 3 feet from the ground, have been taken up and transplanted from one point to another more or less distant one in the Park or from the outside, with entire success. Not more than six have died that have been thus moved. The largest tree moved measured 17 inches in diameter at 3 feet from the ground, and weighed, with the ball of earth attached to the roots, 15 tons. It was carried a distance of half a mile, and, so far as its present appearance indicates, without material injury. For this purpose two large trucks, especially adapted to the moving of large trees, were constructed on the work in 1867, and which have been in successful and constant operation in the seasons proper for such work since that time. A description of Brooklyn Park will be found at page 1234, 1869.

—— An attempt is being made to secure the admission into the Infant Orphan Asylum, at Wanstead, of one of the infant children of the late J. E. SOWERBY, the well-known botanical artist and engraver. Mr. SOWERBY rendered such excellent services to science that we trust this attempt may be successful. Mr. SOWERBY died a short time since, after a short illness, leaving a widow and six children, with but scanty means of support beyond a small life insurance policy. Proxies may be sent to Mr. C. J. SOWERBY, 54, Lombard Street.

—— An English edition of M. BAILLON'S great work, L'HISTOIRE DES PLANTES, with the original beautiful illustrations, is in preparation by Messrs. L. REEVE & CO. The first volume will appear in the autumn, and the continuation will keep pace with the French edition.

—— At the last meeting of the Royal Irish Academy Dr. MOORE, of Glasnevin, read a paper on the MORPHOLOGY of the FLOWERS in some DICŒCIOUS PLANTS. A raceme of inflorescence of Nepenthes distillatoria was shown, on which the flowers produced on the lower half of the raceme were pseudo-hermaphrodite, having well developed ovaries which were surrounded at their bases with imperfect stamens. The flowers on the upper half of same raceme were all stameniferous or male. It was mentioned that the only difference observable between the ovaries of the pseudo-hermaphrodite flowers and those usually produced on female plants was, that the valves did not adhere firmly together, but stood slightly apart, somewhat as they do after dehiscence. Pollen from the well-developed male flowers was scattered over the stigmas of the female flowers, and some of them were touched with the stameniferous organs which surrounded their bases; but in neither case did perfected seeds result. A male plant of Carica Papaya was also shown, on which was a well-developed fruit, all the other flowers on it being males. In both of these instances the female

flowers were the first which had expanded on the inflorescences, where the greatest vigour might be supposed to be present; and, judging from them and some other analogous cases which were mentioned, Dr. MOORE was induced to believe that vigour and healthiness in plants is more conducive to the female line by vital force than to the male.

—— We are informed that the Science and Art Department of the South Kensington Museum has placed at the disposal of the SILK SUPPLY ASSOCIATION a room for the purpose of rearing silkworms during the ensuing months of May and June. The Association being possessed of some rare and valuable "grain" (imported by the hon. Secretary), expect thus to be enabled to demonstrate, for the information of sericiculturists in this country and in the colonies, the simple practibility of silk production. It being of much importance to obtain regular supplies of proper food for the worms, the Association would be obliged to gentlemen having Mulberry trees who will occasionally favour them with small quantities of leaves. It is desirable the first supplies should arrive as early in May as possible. The Secretary of the Association will gladly arrange, for periodical receipts of leaves, with gentlemen who may be willing to promote this national object, if they will kindly communicate with him at the offices of the Association, 65, Moorgate Street.

—— We have to announce the publication of Mr. MONGREDIEN'S TREES and SHRUBS for ENGLISH PLANTATIONS, and shall take an early opportunity of calling attention to the contents of the work.

—— A stupid attempt has been made for some years past to induce the belief that the EARTH is a FLAT SURFACE, and a Mr. HAMPDEN, who seems to have been persuaded that it is so, rashly risked £500 on the issue of an experiment on the Bedford Level in order to test the truth of the assertion. His offer was taken up by Mr. A. R. WALLACE, and arrangements satisfactory to Mr. HAMPDEN having been made, the experiment was tried by means of three discs, rising 12 feet above the level of the surface of a piece of water large enough to show the curvature, if there were any. Two referees and an umpire were appointed; the latter, the Editor of the *Field*, has decided against Mr. HAMPDEN—the central disc, as every one with a grain of sense supposed it would, rising considerably above the line formed by the two outer discs, as seen from one end through a selected and approved telescope. The curvature to and fro in six miles, to the extent of about 5 feet, was proved. Mr. HAMPDEN is very angry, and threatens legal proceedings.

—— By an unfortunate oversight we omitted to mention that the VANDA CŒRULESCENS, figured in our last issue (p. 529), was introduced to this country by Lieut-Colonel BENSON, to whose zeal we are indebted for so many fine additions to our garden flora.

—— According to M. POUCHET, the ARCHITECTURE OF BIRDS has changed with that of men. In former days, when the swallow's nest was built against Gothic edifices, it made a semi-globular nest with a very small rounded entrance, but in the new streets of Rouen its nests are now found to be of a semi-ovoid instead of semi-globular shape, and the entrance is a long transverse cleft.

—— From Mr. GLAISHER'S Weather Tables, printed in another column (p. 569), it will be seen that the MEAN TEMPERATURE for the week ending April 16 was considerably varied in different stations—thus, while Perth enjoyed a mean temperature of 51.2°, and Edinburgh and Blackheath (London) of upwards of 50°, Hull, which is nearly midway between the southern and northern stations, had a mean temperature 4° or 5° below either—viz., 46.5°. Generally speaking, the Scotch stations had the higher temperature.

—— M. CHATIN, who has been carrying out some researches on the cause of the DEHISCENCE OF ANTHERS, has arrived at the general conclusion, says *Les Mondes*, that while they are prepared for this change by the peculiarities of their organisation, the actual bursting is determined by external causes, such as the condition of the surrounding media, desiccation being one of the most active.

New Garden Plants.

ONCIDIUM WARSCEWICZII, *Rchb. fil.*

Tetrapetalum, macropetalum, racemo elongato pluriflore; bracteis spathaceis scariosis, ovaria pedicellata excedentibus.—*Oncidium Warscewiczii*, Rchb. fil. in Mohl and Schlechtendal, Bot. Zeit. 1852, p. 693; Lindl. Folia 1 Oncidium, n. 56. Rchb. fil. Beitrage zu einer Orch. Cent. Am. p. 19. Walpers' Ann. vi. 727.

Pseudobulbus ovoideo pyriformis anceps. Folia cuneato-ligulata acuta gemina. Pedunculus longe exsertus, basi vaginis paucis appressis. Racemus usque 17 florus. Bracteæ triangulæ acutæ concavæ, dorso carinatæ, glumaceæ, ovaria pedicellata æquantes seu superantes. Sepalum summum cuneato-oblongum acutum. Sepala lateralia subæqualia latiora apice bidentata. Petala latiora quam sepalum summum, obtusiora. Omnia labello breviora. Labellum a basi latissime cuneata auriculatum, auriculis obtusangulis, isthmo utrinque obtusangulo incrassato portione antica reniforme biloba. Carinæ in basi ternæ conniventes appositis lamellis supinis extrorsis. Columna sat longa tabula infrastigmatica v.x prominula. Alæ juxta foveam erosulo lobulatæ.

This is a very curious plant. Imagine a genuine Oncidium as to habit, but with an inflorescence of 17 golden-yellow flowers, with great spathaceous bracts, like those of many Cœlogynes. The callosity is five-toothed, white, with four little brown spots, and both borders of the narrow part of the lip are tinted brown. We think it will prove an ornamental plant, since it has something quite new in its appearance, and we do not know of any Oncid in cultivation with similar golden-yellow flowers and spathaceous bracts. It was originally discovered by Warscewicz in Costa Rica; and we heard no more of the plant till the other day we got it both alive and dried from the Messrs. Veitch, who have succeeded in introducing it. It must be submitted to cool treatment. *H. G. Rchb. fil.*

ODONTOGLOSSUM CARINIFERUM, *Rchb. fil.*

Leucoglossum vix Xanthoglossum, ut in Lindl. Folia, Odontoglossum, n. 25): sepalis petalisque lanceis acutis carinatis; labelli ungue bilamellato, lamellis serratis, dentibus geminis antepositis, lamina cordato triangula acuta.—*Odontoglossum cariniferum*, Rchb. fil., in Mohl and Schlechtendal, Botanische Zeitung, 1852, p. 638; Lindl. Folia 1 Odontoglossum, n. 15; Walpers' Ann. vi., p. 30; Rchb. fil. Beit. Cent. Am. Orch. 14.—*Odontoglossum hastilabium* var. *fuscatum*, Hook. Bot. Mag. 4919.

Pseudobulbi oblongi subancipites hinc costati diphylli. Folia cuneato-oblongo-ligulata acuta ampla. Panicula maxima diffusa. Sepala et petala oblongo-lanceolata acutiuscula basi subcuneata pergamenea extus sparse lineam medium carina crassa aucta. Labellum unguiculatum antice reniforme apiculatum hinc denticulatum. Lamellæ rhombeæ extrorsum tri-quadridentatæ supinæ utrinque in ungue antepositis dentibus geminis seu tertio unicuique elongata lucus baseos protrusis, alis denticulatis angustis nullisve pone foveam.

A very interesting Odontoglossum, bearing spreading panicles of flowers as large as those of Odontoglossum bictoniense. Both sepals and petals are greenish outside, and furnished on the middle line with keels; inside they are chestnut-brown, bordered with greenish yellow, or yellow. The lip has an unguis of violet colour, the cordate acute anterior part being white. It was originally described from dried flowers as yellowish white; hence, Dr. Lindley placed it among the Xanthoglossa, where it can scarcely belong, though it does assume at length a yellowish hue. It was originally discovered by Warscewicz in Chiriqui. By some oversight it has been regarded as a variety of the totally different Odontoglossum hastilabium. There is also scarcely a doubt that the information obtained from Mr. Jackson, of Kingston Nursery, was erroneous. It had been stated to have been sent by Mr. Birschel from Venezuela. The specimens came from that surprising sale of Mr. Bridges, April, 1856; and this plant, indeed, was living, and not a bad one. Now Messrs. Veitch have succeeded in importing it in a healthy state, as living and dried plants prove. *H. G. Rchb. fil.*

THE COMMERCIAL IMPORTANCE OF BOX.

EVERYBODY is familiar with the employment of Box as a permanent edging for flower-beds, and as an ornamental evergreen offering a considerable choice in respect both of colouring and habit. Besides the sorts with variegated and golden-tipped leaves, the Myrtle-leaved Box is small and pretty, while the Majorca Box (of which there are at least two cultivated sorts, one of them claiming to be a species, Buxus balearica) attains the dimensions of a respectable shrub, with branches feathering down to the ground, and when well-grown attracts certain admiration by its comparatively large, dark green, glittering leaves. Most people also are aware of the uses of Box-wood for engraving, for the fabrication of various instruments and toys, and for sundry branches of cabinet work.

Not everybody, however, is cognisant of the demand for green Box sprigs or branches, to take the place of Palm leaves in religious ceremonies of the Roman Catholic Church, in countries where Palm trees do not grow out-of-doors. In the Halles Centrales of Paris, a few days previous to Palm Sunday, the consignments of Box begin to arrive. The quantity required by the faithful is so great that, for Paris alone, the sale in four days amounts to 100,000f., or £4000. The principal supplies of Box are obtained from Brittany, in the north-west; from Auvergne, in the centre; and Saintonge, in the west coast of France.

But the habitats where Buxus sempervirens tells you, by its luxuriance, that it makes itself at home, are certain Pyrenæan valleys, especially in the department of the Basses Pyrénées. The instant you enter them you are struck with the fact that their national plant—their Rose, Shamrock, Thistle, and Leek combined—can be no other than the Box. There is no choice about the matter. The Box has no vegetable rival which need cause it the slightest uneasiness. Our acquaintance with it, in its native localities, only extends through summer and autumn, but during winter and early spring it must greatly add to the verdure and brightness of the scenery. In those valleys it grows in such abundance as to be used as firing by the peasants, besides serving for stakes and implements. On the plains at the foot of the Pyrenees, pretty but ineffectual hedges of Box are not unfrequent; they form, however, a better defence when backed by an inner line of Hawthorn. At the various *Eaux*, or watering-places, box walking-sticks, on sale, almost thrust their handles into your grasp. They are perfectly capable of breaking a viper's backbone, or of sending off a snarling dog with a limp and a howl. The iron-pointed *bâtons de montagne*, or mountain sticks, in use there for hill climbing, are staffs of box, tough and strong but heavy, more for use than for show. Their weight and solidity prevent their being carried about for display, like their smarter cousins the Swiss alpenstocks, with which young ladies and gentlemen enter, stumping loudly, the vestibules of hotels, the decks of steamers, and the refreshment rooms of railway stations.

The self-sown Box shrubs which stud the hillsides vary considerably in habit and character; and little seedling Boxes, 2 or 3 inches high, tempt you to transfer them to your garden. There are small-leaved, larger-leaved, stiff, compact, upright, pendent, and almost weeping varieties naturally produced.

Pyrenæan forests, unless within easy reach of the sea, are left unfelled and almost untouched—where the tree falls, there does it lie and rot—in consequence of the difficulty in conveying their produce to a market. On the other hand, where timber can be got down by and to water-carriage, as in certain parts of the oriental Pyrenees, the forests have been utterly destroyed, with most disastrous effects not easy to remedy. The rains have washed every particle of vegetable soil, leaving the naked rock as bare and clean as the dome of St. Paul's Cathedral. "The *Bon Dieu* ought not to have made such hills as those," was the irreverent remark of a complaining native. "The *Bon Dieu* did not make them so, but man," was our reply. "At your First Revolution the hills were stripped of their forests, the winds and storms did the rest, until there is scarcely earth enough on them to support a Box bush, or even a blade of Grass. Even now the *Bon Dieu* would make all right again, if man would only let Him. But you will not keep your sheep and goats at home; and if a stray plant contrives to sprout in the cranny of a rock, it is devoured before it has cast its seed leaves." The correctness of our statement was at once acknowledged. For the same reason with the inland forests, the Pyrenæan Box thickets are spared. Were they nearer at hand to railway stations they would be made to contribute largely to the celebration of Palm Sunday through a great part of France; and perhaps, as railways are now approaching and even penetrating some of their strongholds, that fate eventually may be theirs.

In French Catholic churches an immense quantity of Box is blessed during mass on Palm Sunday morning. On leaving, every member of the congregation who chooses, takes a few sprigs—and few neglect to do so. In Paris and many other places, the blessed branch is fastened to a crucifix stuck into a looking-glass frame, or attached to some piece of furniture, exactly as we decorate our rooms with Holly at Christmas; only that being attainable in much smaller quantities, in consequence of its quality of consecration, it is much more sparingly used, and also retains its place all the year round. The old Box is not burnt until it is replaced by the new. Blessed Box is used for sprinklings of holy water upon occasion, as on the dead and their coffins before interment.

It will be conceived that the use made of this Box is in proportion to the religious zeal of a district. In the cottages of Lower Brittany every bed is garnished with its sprig. On the arrival of a new-born babe, a few leaves from the sprig on the mother's bed are sprinkled on the infant's cradle. At the death of any member of the family, a sprig of blessed Box is laid on the body by the side of a plate of holy water. In Provence and other parts of the South of France, Box for these purposes is replaced by branches of Myrtle, Bay, and Olive. In the Jura they make use of Beech twigs. In Spain and Italy they employ the real thing—the branches of the Date Palm.

A considerable quantity of these branches are required for the ceremonies on Palm Sunday in the basilica of St. Peter's at Rome. These are supplied by a town, Bordighera, on the Corniche (the line of rocky coast lying between Genoa and Nice), not very far from Nice. How Bordighera acquired the privilege is a legend which has been told in several ways of several individuals. They were raising an obelisk in Rome. The operation was of so ticklish a nature, that the persons present were forbidden to speak on pain of death. The machinery was worked, the ropes were strained, but still the obelisk could not be set on its pedestal. Failure was imminent, when a sailor in the crowd, from Bordighera, at the risk of his neck, shouted, "Wet the ropes! I know I shall be hung; but wet the ropes!" The recommendation was followed, and succeeded. The reigning Pope, although usually inflexible, rewarded the culprit by assigning to his native town (some say to his family) the monopoly of Palm branches for the Vatican. It became sole purveyor of Palms to his Holiness the Pope.

Palm trees, consequently, are largely grown on the hill sides at Bordighera; but they are not, as might be supposed, pretty to look at. The Palm Sunday branches given away at St. Peter's are frizzled, and twisted, and tortured, and made up in a way which is curious, if not artistic. To prepare them for this operation they are blanched on the tree by tying them together, and excluding the light from the inner branches, which are the most in esteem. So that, during a part of the year, the Bordighera Palm trees resemble a plantation of monstrous Cardoons tied up with haybands for winter use. Blessed Box has at least the good fortune of not being submitted to this disfigurement. *E. S. D.*

PALMS.—No. IV.

Œnocarpus (Mart.) —This is a very natural group of oil-yielding Palms, abounding on the Amazon and Orinoco, and their tributaries, where the larger species are amongst the noblest objects of the vegetation. "The species differ at sight from Euterpe," says Dr. Spruce, "in the long sheathing base of the petioles being purplish or leaden coloured, fusiform, more than twice the diameter of the upper part of the stem, and split up in front, not whitish-green, cylndraceous and entire, like the leaf-sheaths of Euterpe. Another striking difference from Euterpe is in the broomlike spadix, with numerous long, simple, pendulous branches; crowded on an excessively contracted rachis. The sepals of the male flowers are velvety and united below, while in Euterpe they are free and imbricate. The female flowers have usually the same whitish hue and the same structure in both genera, and the plum-like primrose fruits are very similar." The genus consists of a dozen species, about half of which are inmates of our gardens, viz., Œ. altissimus, Bacaba, bolivianus, caracasanus (Diplotherium caudescens, Hort.), Chiragua, utilis, and dealbatus, Hort., the latter being one of the Silvery Palms, much to be recommended (though perhaps wrongly named as to genus). Dr. Spruce, who has added a new species (Œ. multicaulis), thinks that a closer study of Œnocarpus will reveal the existence of several others in the Amazon district. Most of the species are majestic trees, with smooth, unarmed, generally distinctly ringed trunk, pinnate leaves and strongly plicate leaflets; spadices appearing below the crown of leaves; monœcious flowers, and mostly globular fruit. The fruit of several kinds yield oil and a favourite drink, which the Brazilians term Yukissé. The leaves serve as thatch, and from the decayed petioles the Indians make arrows for their blow-pipes or gravatanas.

Jessenia (Karst., Fl. Columb. i. 98).—Two tall unarmed species, with pinnatisect leaves, simply branched spadix, one-seeded berry and ruminate albumen, compose this genus; the one, J. polycarpa, Karst., being native of New Granada; the other, J. oligocarpa, Griseb. et Wendl., a native of the island of Trinidad, where it is known by the name of "Palma de Jagua," but must not be confounded with the true Palma de Jagua, or more correctly "Yagua," mentioned by Humboldt in his "Aspects of Nature," and lately described by Dr. Spruce as Attalea Humboldtiana.

Oreodoxa (Willd). — Much has been written in admiration of the Oreodoxa regia, the Palma real de la Havana, one of the most common Palms of Cuba, and now introduced as an ornamental tree in various other countries. Ed. Otto has left us a graphic description of the famous avenue of this Palm, attached to the Angerona Coffee Estate of that island. It is 1900 feet long, and consists of four rows, each row numbering 100 trees, the whole forming a splendid natural colonnade protected by a roof of magnificent foliage. At the tomb of Columbus, in the Havana, there is also a fine specimen of O. regia. It was doubtless one of the first Palms he descried when discovering the New World, and it is now the last which shades his final resting place. The peculiarity of this species is that there rises upon the rough part of the trunk a grass-green, smooth, thinner shaft, like a column placed upon a column, and from this the leaf-stalks spring. This species has long, and deservedly, been an inmate of our gardens, and even in nurserymen's catalogues it is still able to compete with many more modern introductions. O. oleracea (the Cabbage Palm of the West Indies, so called from the heart of the leaves being used as a vegetable, now so scarce as to be often sent as valuable presents from one island to another), O. Sancona, and O. Ghiesbreghtii, Hort., are also under cultivation. All the species have a lofty, unarmed trunk, pinnated leaves, monœcious yellow flowers, and oval drupes. One of the species O. (?) frigida, the Palmito of the mountains of Quindiu, is remarkable on account of the great elevation above the sea at which it grows, and would be worth introducing as a greenhouse plant. Altogether we know six species.

Areca (Linn.)—Formerly a good many species were ranged under Areca, but it has now been restricted to those having ruminate albumen and unarmed habit; those with even albumen and unarmed habit have been separated under the name of Kentia, whilst the spiny ones are distributed under Acanthophœnix, Oncosperma, Deckenia, Verschaffeltia, and Phœnicophorium (Stevensonia in part). The Betel Nut tree (A. Catechu, Linn.), the present representative of the genus, has long been incorporated in our living collections, and is one of the few Palms extensively cultivated on account of its fruit in tropical Asia, especially towards the sea coast, near which alone it comes to perfection. The literature of the East is full of allusions to, and descriptions of, this Palm; and it has certainly an elegant growth, rising with an erect and slender trunk to a height of 40 to 60 feet, terminating in a tuft of dark green foliage, and bearing below the crown long bunches of orange-coloured fruit. The genus, as now restricted, is diffused over the East Indies and the tropical parts of New Holland, from which latter country we cultivate A. monostachya.

Kentia (Blum., Bull. Neerl. 1838, p. 66).—These may be described as unarmed Arecas, with even albumen, tall stem, pinnate leaves with reduplicate leaflets, spadix appearing below the leaf-crown, monœcious flowers, and ellipsoid fruit. The genus is remarkable, chiefly as furnishing the southernmost Palm of the Eastern Hemisphere (K. sapida, Seem.); and it is distributed over tropical Asia and the Polynesian Islands. We cultivate in our gardens K. sapida, Seem. (the Nikau of New Zealand), and K. Baueri, Seem. (Areca Baueri, Hook. fil.), from Norfolk Island, both of which were formerly regarded as one species until Dr. Hooker pointed out the difference between them. The Vitian Islands produce another species, K. exorrhiza, Wendl., which has aërial roots, in the manner of the Iriartea exorrhiza of South America, and which I found on the top of Taviuni Island when the Queen of Somosomo and her whole court, all dressed in cocoa-nut and fern leaves, fresh from the woods, accompanied me to the lake. New Caledonia has disclosed no fewer than six species (K. elegans, oliviformis, Vieillardii, Deplanchei, gracilis, and Pancheri), some of which, I believe, are in commerce, and it is probable that the New Hebrides and other islands contain several other undescribed species.

Clinostigma (Wendl., Bonplandia, 1860, p. 196).—This monotypic genus is confined to the Samoan or Navigator group, where it was discovered by the United States Exploring Expedition. C. samöense, Wendl., was gathered in Upolu, and I expect it is one of the Palms which the Rev. Th. Powell (Journ. of Bot. 1868, p. 360) remarks "grow very tall on the highest mountains of Upolu, especially near the mountain lake of Lanuto'o," and bear the collective name of "Niuvao." It is well worth introducing, as are all the other Samoan Palms, every one of which must be new to the gardens, if not to science. C. samöense is an unarmed tree, with pinnated leaves and monœcious flowers, berried fruit, and basilar embryo. Its nearest ally is Oncosperma, which differs from it by its spiny habit and technical characters.

Oncosperma (Blum., *Kepplera*, Meisn, not Endl.)—O. Van Houtteanum, Herm.-Wendl., a native of the Seychelles, is one of the latest and finest additions to this genus,—a genus consisting of armed trees, with pinnated leaves, confined to Eastern Africa and the East Indian Archipelago. The species just named shares with several other East African Palms the peculiarity of having highly coloured leaf-stalks, which impart a rare beauty to it, the reddish purple of the petiole forming a striking contrast with the green of the gracefully drooping leaflets. O. filamentosa, Bl. (Areca tigillaria, Jack.; and A. Nibung, Mart.), is also an inmate of our gardens, and has been introduced from the Malay Archipelago, where its leaves are used for food, and its trunk by the pile-builders of that region. O. horrida, Seem. (Areca, Griff.), has as yet not emerged from its native forests.

Acanthophœnix (Wendl., Flore des Ser., tab. 1706—1707), is founded on two spiny Arecas with even albumen, natives of the islands of Eastern Africa, and long inmates of our gardens, viz., A. rubra, Bory, and A. crinita, Bory. A. rubra has when young reddish green leaves, and A. crinita, in the same stage, leaves of a yellowish green colour, which gives them a very distinct appearance. They are Palms of middle size, with a trunk much swollen towards the base, pinnate leaves, simple spadix, with spirally arranged flowers, and placed in threes, the central being female, and a one-seeded, dark violet drupe. Both species are deservedly popular in collections.

Deckenia (Wendl.), is an undescribed genus, closely allied to Acanthophœnix, named in honour of the late Baron von der Decken, the African explorer. It should not be confounded with Deckeria, a synonym of the American genus Iriartea. At present only one species is known, viz., D. nobilis, an elegant spiny Palm, with pinnated leaves and linear pointed leaflets, which are gracefully drooping at the point. We give an illustration of a specimen in Mr. Bull's possession (fig. 103), which will give some idea of the beauty of the plant.

Phœnicophorium (Wendl., in Flore des Ser., t. 1595-1596). — The only species at present representing this genus is a magnificent spiny Palm, with entire leaves of large dimensions, most effective portraits of which are published in the periodical just quoted. It is a native of the Seychelles, whence it was brought to the Botanic Gardens at Mauritius, during the time that establishment was under the able management of Mr. Duncan. Three small specimens of it reached Kew, and the sender expressed a wish that the plant, if new to science, might be allowed to bear the generic name Stevensonia, in honour of the then governor of the island of Mauritius. How it came to pass that this wish was disregarded, and the name Phœnicophorium sechellarum imposed, is a long story, which has been told both in the "Journal of Botany" and the *Gardeners' Chronicle* for 1865. Objectionable as the latter name may be it cannot now be cancelled, for it appears that Mr. Duncan imposed the name Stevensonia not only on this plant, but also on another from the same region, resembling it in habit, but differing from it generically, viz., Verschaffeltia; and moreover, he never gave a definition of the genus. All I can find is the following note on p. 87 of his "Catalogue of Plants," in the Royal Botanic Gardens, Mauritius, published at Port Louis in 1863:—"Stevensonia grandiflora, Palmaceæ, dependencies of Mauritius, A." (*i. e.*, one of the plants introduced since Mr. Duncan took charge of the establishment). S. grandiflora is doubtless a misprint for S. grandifolia, under which latter name the plant is sometimes cultivated, as also under that of Areca sechellarum. Professor C. Koch, guessing at the genus from the foliage only—a most treacherous feature, unless very closely studied—described the plant as Astrocaryum aureo-pictum; but it is scarcely necessary to add, that Phœnicophorium has no relationship whatever with that genus of Cocoineæ, no member of

which has as yet been found beyond the confines of the New World. At present, Phœnicophorium sechellarum is still high in price, and is shown in Palm collections, and with justice, as one of the noblest species our gardens have of late years acquired. *Berth. Id Seemann.*

THE HARDY PENTSTEMONS.

Among the numerous plants that have been introduced from the New World, there are none I think possessing more attractions than the members of this family. They are one and all so full of interest, and so exceedingly beautiful when in bloom, that they will amply repay the little care that is required in their cultivation. They are admirably adapted for the adornment of our borders, and some even for rockwork. No group of hardy plants has a greater claim to our support than this charming family. They are free in growth, graceful in appearance, and exceedingly attractive when adorned with their long panicles of richly coloured flowers. They will grow in almost any soil, but seem to prefer—as most of the American plants do—a little peat. They are easily propagated by division of the roots, by seed, and some few by cuttings.

P. acuminatus is a very showy and distinct species, but it is not hardy in all situations. It will succeed, however, in any hot dry position; but continual moisture during its dormant state is very injurious to it. It grows about 1½ foot in height, and produces long, lanceolate foliage, with panicles of purple-coloured flowers.

P. barbatus is a very old favourite, which every one is acquainted with, either under this name, or the erroneous one of Chelone barbata. Its bold spikes of bright scarlet flowers are very attractive, and it certainly deserves unlimited cultivation, more especially as it is perfectly hardy, and alike indifferent to soil and situation.

P. barbatus Torreyi is a variety of the former, very interesting, and very effective as a bold border plant. Its bright scarlet flowers are produced upon spikes from 4 to 6 feet in height, and in this it differs from the type; it also differs by the greater profusion of bloom, and the entire absence of the beard upon the lower lip, which characterises the original species. It is perfectly hardy, and will succeed in any situation.

P. cordifolius is a Californian species of no mean merit, but unfortunately it will not stand our winters without protection. It is very free in growth, and distinct in character from the other species of this family; it grows from 6 to 9 inches in height, and produces in great abundance its lively red flowers.

P. digitalis is a bold free-growing species, with large copper-coloured foliage, and immense white flowers streaked with crimson. It throws up spikes, of flower from 2 to 3 feet in height, and succeeds in any situation; it is one of the hardiest of the race, and one of the most attractive.

P. glaber is another pretty species, of decumbent habit, generally growing from 9 to 12 inches in height; it is very pretty when in bloom, and must be considered one of the most desirable of this interesting group, for its bright blue flowers and deep green foliage render this plant exceedingly attractive; it is of very free growth, and flowers profusely in almost any situation, and the flowers last a considerable time, which is a great advantage in hardy border or rock plants.

P. grandiflorus is one of the largest of this beautiful race. It is a native of Mexico, where it attains the height of 4 or even 5 feet; the foliage is very large, ovate, and of a deep glossy green colour, very similar in appearance to P. Murrayanum. The flowers are very large, and are of a deep purplish blue colour. This species is also known under the name of P. Bradburii.

P. Hartwegii (gentianoides, Hort.) is a well known beautiful species, of which there are many varieties. It is sufficiently hardy to withstand our winters with a slight protection. It grows freely, and has a very pretty appearance when in bloom.

P. Jaffreyanus is the best of this family, and will surely become, when better known, one of the most familiar of our border plants. It produces in great profusion rich azure-blue flowers, upon spikes about 1½ foot in height, and continues in bloom from June to September. It is elegant in habit, exceedingly free in growth, and in dry situations is perfectly hardy. The foliage is of a dark green colour, which blends harmoniously with its beautiful flowers.

P. Murrayanus is another beautiful species, but requires partial protection during the winter. It is very vigorous in growth, and succeeds in any ordinary soil; the foliage is large, of great substance, and of a light green colour. The bright scarlet flowers are borne on stems from 2½ to 3 feet in height, and are very attractive.

P. Mackayanus is a hardy species of considerable merit, and deserves cultivation where flowers of this class are appreciated. The flowers are purple and white, and are produced very freely from July to September. It is quite hardy, and will succeed with ordinary treatment.

P. ovatus is a fine hardy species, flowering in July and August; the flowers are not large, but are of a pleasing bright blue colour. The foliage is large, and of a deep green colour, and in good soil this plant will grow 3 and even 4 feet in height.

P. pulchellus is a very pretty species, flowering in June and July. It is perfectly hardy, and will succeed in any situation. The flowers are produced very freely, and are of a pleasing rosy lilac colour.

P. procerus is a very dwarf species, admirably adapted for the rockwork. It forms a dense mass of dark green foliage, scarcely exceeding 6 inches in height, which is smothered in July with pretty purple-coloured flowers.

P. speciosus is a stately species, often attaining the height of 4 feet. Its brilliant bright blue flowers entitle it to a place in every collection. It grows very freely in any situation, but requires protection during the winter.

P. Wrightii is a comparatively new species, of great beauty, and deserves more than I shall say of it. It grows about 2 feet in height, and produces large, rosy carmine flowers. It is quite hardy, and succeeds with ordinary treatment.

The above-named species do not comprise one half of the known kinds, but sufficient is here given to make a good selection from; and any one procuring these will soon be anxious to make acquaintance with the other members of this much neglected family. *A. I. P., Tottenham.*

WINDOW GARDENING.

Concluded from p. 531.

9. *Window Plants for the Autumn.*—Fuchsias will now be in full beauty inside the window, and there is nothing to equal them. As the Pelargoniums fade, place them in a sunny spot out-of-doors, and give the Fuchsias room to show themselves off. Hydrangeas and Heliotropes may also succeed the Pelargoniums. The old Chimney Campanula (Campanula pyramidalis), and a few plants of Humea elegans would make a grand addition to the cottage window in autumn. Here and there a choice plant from the outside may also be brought in to furnish the inside.

The outside of the window in autumn will probably furnish the best part of the annual display. All the plants in the boxes will flower freely till the frost comes; but before it does come the whole of the Pelargoniums must be safely put inside, and the box filled with hardy plants for the winter. Those moved in while in full flower will bloom on nearly all the winter, until some of the winter plants begin to blossom, and thus the window will be lighted up with beauty all the year.

Not that any one cottager is likely to grow all the plants mentioned, but every one may readily pick out one or two from amongst those I have noted, as plants for the outside and in, throughout the season. The garden should help to fill the window, and the window the garden with beauty. Each may do a good deal for the other, to the improvement of both.

10. *The Procuring of Window Plants.*—Almost any neighbour will give cuttings, and most of the plants named can be bought for a few pence in any market town. See that the varieties are good, and the plants clean and healthy, rather than large.

11. *The Culture of Window Plants.*—Nothing can well be more simple. The chief rules are those affecting cleanliness and a supply of air, water, food, and light. In fact, the very things that would keep a man or woman healthy will keep plants so. Their leaves are their lungs and stomachs in one, therefore keep them clean. Put a curtain before the window when you sweep the house, to keep the choking dust from the plants, and frequently wash it off the leaves and stems; give them plenty of air, but do not stand them in a draught. Never leave plants where you would not like to stand yourself for half an hour; they will catch cold as readily as you. Give them plenty of water when thirsty, that is dry, and none till they are dry again; just exactly as you drink (that is, of water), so should they. Their food they derive from three sources—the earth, the water, and the air. As they grow, they need more earth to feed upon, as well as to make room for the roots. The best time for giving plants a larger pot is from June to August, when they are growing freely, and some time before they should flower. See that the pot is clean; put in a piece of broken potsherd over the hole, and an inch more of smaller pieces over this, then some of the lumpy fragments of soil, and finally the plant; next firmly fill up with the best soil that can be had all round the roots. A good watering, so as to wet and settle all, finishes the potting. The soil must be rather open, to admit air. It matters little how poor it is, as strength can be given to the plant by watering it with soapsuds or house refuse. But all manure-water must be applied in a weak state, much diluted, and quite clear. Light is also needed; keep the window clean, and the plants close to it, if you wish to excel in window gardening.

12. *The Training and Stopping of Window Plants.*—Many of the plants will need this, to keep them within bounds, and to support their weight or improve their appearance. Fuchsias and Pelargoniums of all kinds are generally stopped once or twice before they flower. When the shoots have grown about three leaves, their ends are pinched out. This gives three or four shoots instead of one, with a proportionate increase of blossoms, and keeps the plant dwarf. Training takes all forms. It is a matter of taste, and every cottager has his own way of doing it. The half circle or half globe is very common, and looks well. A Fuchsia supported by a single stake, and allowed to weep down all round, becomes a fountain of beauty; those of the globosa type are better without any training. Cactuses, again, are often trained into spheres, and sometimes round the window inside. Every pleasing form is equally good.

13. *The Propagation of Window Plants.*—Nearly all I have mentioned are increased by cuttings. The whole of the Pelargoniums may be rooted out-of-doors right in the sun during the summer or autumn. Cut off a branch with four leaves, cut it even at the bottom of the lower leaf, either removing the leaf or not; insert the cutting firmly in the ground, water it and treat it just as you would a rooted plant—that is, give it water when it needs it, and in three weeks it will be rooted. Fuchsias, Petunias, Lobelias, and others are best rooted by placing the cuttings round the edge of a potful of light soil, and inverting a tumbler or wineglass over them, only removing it to water them, till they are rooted. Cactuses will root if pieces are put into the soil anyhow or anywhere, and such plants as the Calla are increased by division of the roots.

14. *Storage of Window Plants in the Winter.*—The beauty of the window is often marred through the winter by overcrowding it with dormant or half-dormant plants. A remedy for this is within reach of most cottagers. Such plants as Fuchsias, Scarlet Pelargoniums, and all dormant bulbs, could be packed up into the garret or down into the cellar, beyond the reach of frost, for three or four months, to the great gain of the window in beauty and the saving of labour, while the plants would come forth from their hiding-places in the spring, all the better and the stronger for their quiet rest. It is only by adopting the pot system outside and in, and carefully storing the tender plants inside, and the hardy ones outside in sheltered nooks and corners, that these programmes of something in flower or in beauty either outside or inside, or upon the window, every day in the year, can be carried out. The plants that have thus been kept in the dark must be gradually inured to the light—brought out, if possible, in dull weather, and taught to bear the sun as children are to walk, a little at a time.

15. *Treatment of Window Plants when Out of the Window.*—Very much of success or failure depends upon this. If you want to have a dull window carry out the motto, "Out of sight, out of mind;" if a gay one, never lose sight of any portion of your stock. Two-thirds of it at times will be out of the window. Let it be taken care of, or others—younger, stronger plants—prepared to succeed it when the time arrives. Bulbs may be returned to the garden, Violets, Primroses, Polyanthus, Forget-me-nots, &c., divided, and young ones pushed on. Callas, Cactuses, Yuccas, and all hardy plants for baskets or sill outside, or inside too, carefully tended; and a fresh stock of strength and beauty got up for another year. Only by care and forethought can these results be realised, and the windows of the cottage lighted up with flowers more or less brilliantly every day in the year, and all the year round. *D. T. Fish, Bury St. Edmund's.*

THE GLOXINIA.

Last October I paid a visit to Grove Hall, near Retford, to see the display of bedding Pelargoniums, &c., which are so successfully managed there, and whilst there I had the good fortune to meet with the Rev. S. Reynolds Hole, whose name is so well known to all lovers of the Rose, inspecting a large batch of seedling Gloxinias. Such Gloxinias to form one batch of seedlings we agreed we had not met with before, and Mr. Park, the gardener, echoed our sentiments. Now, there is no class of plants that repays the cultivator better for his trouble than the genus Gloxinia. What can have a more showy or brilliant appearance than a quantity of Gloxinias grouped together in a mass? If they are raised from seed all the intermediate colours, from white to purple, carmine, &c., may be obtained at a very trifling expense, and for a general display equal to any named varieties if such seed can be procured as that which produced this fine batch at the Grove.

They were all grown in small pots, and were flowering freely in the front of a cool greenhouse so late in the season as October. Having been a successful cultivator of this beautiful flower, I shall offer a few brief remarks on its culture. Sow the seed in light sandy peat in February in well-drained pots or pans, filling them quite half full of crocks, over which place a layer of Moss and peat, after which sift a little peat and sand through a fine sieve, and press it firmly in the pot. The seed should then be evenly distributed over the surface. It requires no covering with soil, but should be very carefully watered with a fine rose, covered with a bell-glass, and plunged in heat. In about ten days or a fortnight the plants will appear; air must then be given by degrees, and the damp guarded against. When they have formed three or four leaves pick them off into small 60-sized pots, and if properly supplied with heat and moisture the plants will flower the same autumn.

The propagation of the Gloxinia is very simple; almost every part of the leaf will form plants, providing a portion of the midrib is retained in the cutting. Divide the leaves transversely; place them

in pots of sand covered with a bell-glass, and plunge in heat ; in a short time callosities will form at the base of the cuttings. As soon as they have sufficiently started into growth repot them into leaf-mould and good sandy peat, replunging and covering them with a bell-glass, giving air occasionally and guarding against damp. I have had plants propagated early in the season by this method form beautiful specimens, and flower freely the same season. Very choice varieties I usually place in a larger pot, and propagate them by making incisions in the midrib of the lower leaves, placing a small piece of crock on the leaves to keep them close to the soil. This is the more safe method to adopt with choice and expensive varieties ; they very readily root if a good heat is maintained, and may be potted at leisure.

In the autumn, when the plants begin to show signs of going to rest, gradually diminish the quantity of water, but not so as to let them become quite dormant ; some persons, I know, even with established roots, allow them to be quite dormant, but when dried off I often find them difficult to excite, and they never make such good plants : more bulbs are annually lost by the drying process than from any other cause. I have seen many a fine collection brought out at potting time that was dormant for ever. In February shake the earth from the roots, and trim the leaves ; plant them in pots according to the size of the bulb, in good soil, consisting of leaf-mould, sandy loam, peat, and well-rotted cow-dung ; plunge them in strong heat, and water sparingly until the plants appear to push, then water more freely. When the roots appear through the bottom of the pots shift them into their blooming pots, using the same compost as before. Plunge them into a bark bed, surrounding the plants and leaves with moss, on which the leaves will rest. They will now require a liberal supply of water overhead as well as at the roots.

About April the flowers will begin to appear, and by May they will be profusely in blossom. By following the above treatment the flowers will be both large and brilliant in colour. In the autumn, when the plants show signs of decay, gradually diminish the quantity of water, and treat the bulbs as before recommended. When they are at rest a dry shelf in a cool stove is the best place for them. *Edward Bennett, Enville, Stourbridge.*

TRADE MEMORANDUM.

THERE is a person in Belfast who lives by victimising nurserymen and seedsmen ; he orders seeds and plants everywhere, and sells them the moment they reach Belfast for any price he can get a buyer to offer. His orders meet with a response readily—a large parcel of named Rhododendrons, from the Midland Counties, worth probably £5 or £6, were sold to-day at the Quay for 10*s*. *Subscriber, April* 13.

Home Correspondence.

Iresine Herbstii v. Fungus.—At p. 496, a correspondent, "C. L.," asks for some information concerning the loss, somewhat serious to him, of Iresine Herbstii. Without assuming to give a positive answer as to the cause of his loss, I may suggest the probable cause. "C. L." is not alone in respect to this peculiar trait of damping off in the case of the Iresine, for I think there are few gardeners who have not been puzzled with the same thing at one time or another. The new and superior Iresine Lindeni, which I am propagating largely, I find subject to the same evil. The strange part of it is, that when a single plant damps off in any pot or pan, all the others are almost certain to follow. Now I believe there lies hidden beneath the surface something more important than appears at first sight, and which I shall attempt to point out. Why is damping, or, as it is sometimes called, "fogging off," so prevalent amongst cutting pots? What is it? It is not what I may term a natural shrivelling of parts from the want of necessary support. It comes suddenly, and takes off the hardest part of a cutting just at the ground line, or a little above it. The exterior bark is no protection, the sand at the surface—a hard, gritty, moisture-dispelling substance—does not deter it ; still the loss occurs, whilst the base of the cutting (with the recently-formed callus attached) remains intact. The upper part of the cutting is not even destroyed, but emits roots freely above the part where the injury exists. These facts relate, more or less, to all cuttings which "damp off," as we term it. I believe a peculiar form of Fungus to be the sole cause of the mischief — a minute, thread-like Fungus, which from its exterior appearance should be called the Cobweb Fungus, so manifold are its thread-like ramifications as it spreads over the surface of the soil and permeates a thin stratum of the same. I am not at all versed in the intricate study of mycology, but give the facts as they have appeared to me. Would Mr. Berkeley kindly lend his attention to this matter, and inform us whether or not I surmise aright? If so, any form of deterrent which can be suggested will be as acceptable to me as to "C. L.," and to gardeners generally, who propagate more or less. It seems certain that a somewhat close, moist atmosphere tends to the production of this form of injury, perhaps to the development of this form of Fungus—as I think generally the mischief occurs first in such a place. Once the mischief has gained a footing, however, it is of no avail to remove the cutting pots to other places or positions, for invariably this destructive opponent "will have its run." *William Earley, Dogswell.*

Fruit Prospects.—I am glad to state that there is an excellent prospect of a good crop of fruit. Apricots have set well, and are now almost as large as nuts. Peaches and Nectarines are just shedding their blossoms, and appear quite safe. Plums, and especially the Cherry Plum, are perfect sheets of blossom ; Greengage and other varieties are looking well. Pear blooms, which will be very plentiful, are just opening. I should have much pleasure in showing some of your correspondents, who advocate the extension system, some Pear trees here, many of which have been planted fifty years, and are now one sheet of bloom from base to point. Apples are completely studded with fruit buds, and there is also a capital show of blossoms on the small fruits, such as Gooseberries and Currants. *R. Gilbert, Burghley.*

Vine Growing.—I have a house of Vines under my charge, which has been planted 38 years, with highly satisfactory results. The Vines are pruned on the spur system, and when they were planted 40 deer were buried in the border, which is 60 feet long and 18 feet wide. This not only shows that Vines will live, but will flourish in what your correspondent "Thoth" calls "garbage." Permit me to add, in conclusion, that as far as practical matters are concerned, it is not all gospel which even the great Dr. Lindley has said. *R. G., Stamford.*

Garden Architecture.—The problem how to join the dwelling on to the garden is one which has never been properly studied. In my poor opinion it is a very simple one, and one which has been studied in another shape by Greeks and Egyptians successfully as regards town buildings, but most unsuccessfully as regards country edifices. Now what is it, after all? It is the reversing the difficulty of Greek and Egyptian. They had to blend the horizontal with the perpendicular lines of their temples, and did so successfully, notably in the case of the Parthenon, by metopes or panels of sculpture whose lines chiefly ran across the two ; thus it will be found that the outlines of the figures are all in violent or unperpendicular directions, being themselves as men perpendicular Apply this to houses : you have the upright house, the ground (as a rule) abruptly flat, your business is to apply between them curves to join both—double curves to meet both cases if you can. As a rule I think English gardeners are more successful than foreigners. These last trust to bringing down by gradation the house to the ground by terraces, or architecturally treating the garden. The English, on the contrary, do not succeed so well in this line, but by bringing the unarchitectural garden up to the house, join it in most cases more successfully to the ground. It must be allowed in favour of the Italian or French mode that the ground in foreign countries is less natural in colour or other adjuncts than in England, and that therefore their plan is so far more excusable ; but still there is no doubt that foreign artists and townsmen cannot bring the ground up to the house so well as our country-born men. *Somerset.*

Plant Nomenclature in Trade Lists.—I wish you would use your influence to correct the orthography of the plant lists, and even of the recognised authorities on botanical nomenclature. At this moment I have before me the name of that pretty plant, Disemma, so called, properly Distemma, double crowned. There are a host of others as erroneous, which it would be well if you with your authority and wide-spread influence, would correct. *B., Alton, Hants.* [This matter has received, at various times, much attention from us. There is, we are glad to see, a marked improvement in the catalogues of leading firms. EDS.]

Fungus.—As the Fungus question is being so freely discussed in your columns at the present time, the following facts may not be without interest to your readers. About 12 years ago, having a plant of Passiflora racemosa (princeps of gardens) which we wished to train along the roof of the stove, a sort of box was constructed for its reception in a corner underneath the stage by nailing together some Larch boards, which rested on the ground. The box was then filled with proper soil and the plant planted ; it grew most luxuriantly, soon running the length of the house (about 36 feet), and bloomed most freely, but in about four years it began to look sickly, the leaves became of a yellow tinge, and flagged under bright sunshine. Having always been taught that decaying wood would produce Fungus, and that Fungus was death to vegetable life, I suspected it to be the cause of ill-health in this case ; nor was I wrong, for on pulling away the boards I found them decayed, Fungus spreading through the whole of the soil, and every fibre of the root perished. Some very strong roots had struck down through the soil in the box, and into the ground beneath. These roots were covered with Fungus. I cut them all away but three, and these I had thoroughly cleaned with warm water and soft soap. Instead of using boards again, I built a wall of large turfs of peat, and filled up with soil as before. I soon had the gratification of seeing an improvement in my plant, which at length gained perfect health, in which state it remains, and for the last five years it has never been without bloom, more or less. At the present time it is literally laden with its lovely racemes of red blossoms. Surely Fungus was the cause of evil in this case. *Thomas Woodford, Eastwell Park, Ashford.*

Luculia gratissima.—Allow me a little space to reply to Mr. Culverwell on this subject. The facts are these :—At p. 181, writing in general terms, I said—"Luculias do not, as a rule, like very severe cutting in." Mr. Culverwell, at p. 385, gives us to understand that his success as a Canute amongst Luculia growers is due only "to spurring them in on the Vine system," and thereby giving all who are not thoroughly versed in their culture very erroneous data on which to base their operations, as I have taken the liberty to show at p. 460. Now, however (see p. 531), he would throw the odium of what I termed his "irresponsible criticism"—the statements in which he retracts with certain qualifications—on to the shoulders of "every writer to these pages," the writers having really but a neutral interest in his impromptu attacks and my replies. It is beside the subject to speak of growing a plant with spurs to cut off in a given time ; every gardener knows that plants required to be grown and pruned on the "spur system" must undergo some restrictive treatment from infancy. Summer pinching, or any form of careful pruning such as I suggested, Mr. Culverwell objected to. As a matter of course, we should cut the young plant down to three or four eyes upon the hardened wood yearly, as all spurred-in plants are treated. But Mr. Culverwell retracts. Now, the plants are only to be treated thus "if they are large enough ;" if not large enough, "only just break off the young shoots at the points with bloom-heads attached." This is an affirmation of what I have stated above, and quoted from p. 181 ; I therefore need add nothing further. *W. E.*

The Orchids at Chatsworth.—Without wishing to disparage Mr. Speed, or his treatment of the plants under his charge, I beg to deny that the plants were injured by shading otherwise than from the shade given by a dark and tumble-down roof, which let rain in at every point ; or that the Vanda teres was as yellow as an Aucuba. Your correspondent forgot to mention that the splendid specimens which Mr. Speed found in the old house crowded together have had two seasons in the best house in Europe, which was planned and erected under my superintendence. It might have opened your correspondent's eyes if he had seen the plants when I undertook them,—many lying on the pots from which all the soil had been washed by drip and careless watering. Many of those fine Vandas which Mr. Speed found furnished to the pot, and one of which, the season Mr. Speed went to Chatsworth, had 14 spikes of bloom, I found on bare stems, from 2 to 3 feet high ; and I had several cartloads of filth and rubbish taken out of the house. The only example I exhibited, Cœlogyne cristata, was stated, I believe by your reporter, to be the finest specimen ever brought before the Royal Horticultural Society, and was recommended by the committee as being worthy of the Lindley Medal, but I suppose the Society did not think it worth sending to me, for I heard nothing more of it, although I observe a Special Certificate was awarded to a plant with 15 spikes at a recent meeting : the one I exhibited had 94. In conclusion, I beg to remark that I should expect to find the Orchids at Chatsworth, and many other things also, in first-rate condition now if they had not been done anything with for two years, from the labour and care bestowed on them for the previous three years—a fact which is well known to plenty of good gardeners, including some of the best Orchid growers in England. *James Taplin, South Amboy, New Jersey, U. S. A.*

Mesembryanthemums for Bedding Purposes.—I have had an experience of not less than 20 years in the growth of these plants, and can confirm their value as decorative plants, as mentioned in the article on Dec. 4, 1869, by Mr. Bennett, of Enville Hall. I have at this time under my management about 70 species of the most free-flowering kinds, selected from a collection of 250 ; and out of the 70 so selected we again sorted out about 20 or 25 as being the proper sorts for the garden, the remaining 55 we used for furnishing the greenhouses, &c.—a list of which, used for outdoors and for culture under glass, I will furnish in a future communication, should you consider it would be interesting to your readers. [Pray do.] The Mesembryanthemum, in my opinion, possesses, in addition to its freedom of flowering and brilliancy of colour, the advantage of being much more perpetual in its habit of flowering, and not so liable to be injured by heavy storms of rain, nor disfigured, as is the case, with other bedding-plants, such as Calceolarias, on hot dry soils, or during very hot summers, even in more retentive garden soils ; they often look shabby, but, on the contrary, the hotter and dryer the situation the more interesting is the display where Mesembryanthemums are used for decorations. Moreover, as Mr. Bennett justly observes, in addition to their use and beauty they require little or no protection during the winter months, a common cold garden frame being all the protection they require. I allude to the woody varieties, not the tender succulent species, as many of

the garden kinds I use will bear at least from 8° to 10° of frost. Now it would be impossible to keep scarlet Pelargoniums and other soft wooded plants in a frame of this kind, for if not injured by frost the confined dampness of the place would destroy them. As further proof of their hardiness, I had several of the sorts I cultivate in full flower last November, weeks after the scarlet Pelargoniums and other bedding plants generally used for decoration were destroyed. As regards their value and use for winter decoration, for conservatories, &c., I consider them quite equal to the Chrysanthemum, Primrose, Genista, Salvia, Azalea, and innumerable other subjects used for that purpose, as many of my kinds flower during the dullest months of the winter, quite contrary to the universal and erroneously conceived idea that they will not expand their flowers unless exposed to the influence of a summer meridian sun, when in reality so peculiar have I proved them to be in their habits and characteristics, that some species, such as dolabriforme and others, only fully expand their flowers in the dead of the night, and close again on the approach of daylight; and this peculiar character in some of the family can only be familiar to those who, like myself, have had the responsibility of protecting and providing for the wants of a family consisting of 250 members. *J. Williamson.*

Orchid Culture.—Since reading at p. 311 in your Journal Colonel Benson's interesting letter, I have been hoping each week to see some one take the subject up, by asking him to give us some more information; as no one has done so, I venture to remind him that he in part offers to continue that letter in the sentence where he says, "I could give numbers of similar examples, but it appears to me to be unnecessary to do so at present." Should he consider that this sentence is not quite a promise, then I must fall back upon general grounds, and plead that I shall always believe that those who have helped to introduce new and rare exotics will watch over them with interest, and desire that our cultivation may be such as will enable us to realise their full beauty. In this view I think his letter confirms me, as I see that he notices "the deficiency in brilliancy of colour in the Burmese Orchids," shall I say regretfully? The first letter I wrote you upon Orchid culture was to throw doubts upon the advantage of the cool treatment of Dendrobiums, and of D. Falconeri in particular, and I should be very glad if he will give me his opinion, naming such as he thinks my system will suit. To enable you to see what that system is, I send you photographs of my large Vandas, and a Nepenthes, which have passed the winter in the same house, and under precisely the same circumstances as my young plants of D. Falconeri. [They are good well-furnished specimen plants. Eds.] To say that things that cannot speak cannot lie, is a sorry compliment to poor humanity, but you will excuse this when it enables you to judge, from their appearance, what their treatment has been. The Vandas look ugly from the quantity of their roots, and the progressive development of the leaves of the Nepenthes, including the still incomplete growth of the latter, are expressive enough as to its having got what it liked. I have rather jumped to the conclusion, that Colonel Benson will agree with me in my treatment, but will be glad to hear if I am correct. Should they be grown in winter, stimulating them as much as we can, and then ripened in summer, as we treat Vine canes? Can he give me any information upon seeding Dendrobiums, and have they been raised from seed, and how should the seed and seedlings be treated? I am also sending two other photographs, one of my large Phalænopsis Schilleriana and one of Odontoglossum Bluntii, with twelve flowers. The Phalænopsis has taken no harm by flowering, and has now completed its last leaf. I saw, at p. 386, Mr. John Garland asks "how it produces offsets." There is one young plant still on, and it is shown as it came, upon a sort of flower-spike; the previous one was produced in the same way. Is this usual, and can I count upon more? While upon Dendrobiums, I should have asked if it is of advantage to shrivel the bulbs during their season of rest? Many gardeners hold that it is the proper treatment; my idea is, that if they shrivel during that season it only proves that they are not properly matured bulbs, else a reasonable dryness would not produce that effect. And now a few words upon Odontoglossums and their natural climate. I have been again reading the communication from Dr. Spruce, at p. 1278, 1869, about the different climates at Quito and Ambato, one so dry and the other so wet; and I conclude that Bogota and Ocaña will have a similar climate to Quito, where he says it rains ten months out of the twelve. I conclude that the prevailing wind is west, and so the moisture falls on the east side of the Andes, having been condensed in crossing the mountain range by such a high elevation. I do not grow my Odontoglossums upon the cool treatment, neither do I think they should be so grown, for I never heard of any of them coming from a greater elevation than 9000 to 10,000 feet; and if I turn to Keith Johnston, I find that he says "Wheat grows luxuriantly" at this elevation, "and Oats near Lake Titicaca, at 12,795 feet." But what is cool treatment for Orchids? Having bought the other day some plants of O. Weltoni, and hearing that they were difficult to manage, my gardener thought from their semi-transparent appearance they would be much like O. Phalænopsis in habit, so we went to look at ours, and found that the new bulbs are in a great many instances as large as the imported ones. Now, when I bought these last year, Mr. Stuart Low pointed out this semi-transparency, and told me that his collector said they were dewed nearly every hour by passing clouds: is this the character of the rain at Quito? else in 10 months an enormous quantity must fall; and should not all the Odontoglossums be treated as if they came from this very humid climate? We think the O. Bluntii is capable of still greater development, how many flowers are usual? Then let me ask the only remaining question, and it must be one likely to rise in every one's mind, What is the great charm the name "cool treatment" possesses? My desire is to learn what are their requirements, and I am willing to leave to others all the honours that may flow from the establishment of an Orchid acclimatisation society. *G. H.* [We should be glad to have the opinions of our Orchid growers on the points raised in this letter. Eds.]

Trees in Kensington Gardens.—The public (I was about to say the London public, but the subject has a much wider interest than such a qualification would imply)—the general public is indebted to you for having drawn attention to the state of the trees in Kensington Gardens, and to the importance of some steps being taken, either to save or replace them. Residing in their immediate vicinity, I have watched for years their gradual progress towards extinction. After every gale it has been my practice to go and see the amount of damage done, and I observe a marked increase in the death rate, particularly within the last two or three years. Formerly my inquiry of the park keepers would be, "Any damage to the trees last night?" Now the "any" would be quite matter of supererogation: it is taken as a thing of course, and my question is, "How many trees down last night?" The replies have made an equally significant progression. Formerly two or three might have fallen—now from 10 to 20 is no unusual thing. Your correspondent, "An Arboriculturist," seems to think that something might be done for the remaining trees by the treatment recommended by him—the excellence of which I also can bear testimony to from personal experience; but I am afraid that the cases are few where any treatment will be of much avail. I have examined the roots of the grubbed-up trees, and these at least were in a state which nothing could restore—the fibrils rotting, and the roots more or less decayed. The experience of the neighbourhood of London seems to be, that when a tree begins to give way there, it is much more difficult to save than in districts under other conditions. At Kew, I believe, three years has been found to be the allotted space of life when the trees once begin to show symptoms of failing; still, I cordially endorse your correspondent's judicious recommendations. By all means let the surface earth around every tree worth saving be raked away, and its place supplied with fresh leaf-mould, and the soil beneath be treated with manurial waterings. As an illustration of the wonderful effects of this regimen, I may refer to the ancient Orange trees preserved in tubs at Charlottenburg and Potsdam. The whole secret of the beautiful and fresh condition of these centenarians is, that whenever the foliage is observed to lose its rich green hue, and to lean towards the pale and yellow leaf, then the mould is scraped out as deep as can be done without injuring the rootlets and replaced by leaf-mould, and the plant refreshed by manurial waterings; and as if by magic the sickly yellow leaves are replaced by fine rich, fresh, deep green ones, and the tree has a fresh lease of life, which generally lasts for three or four years, when the same process has to be repeated. Such treatment will undoubtedly be most beneficial to all trees that have not yet begun to give way, and probably may even save some which have begun to sicken. But what is to be done with the rest? Multitudes will still remain, which even the most sanguine must acknowledge to be past cure, past hope—the mere despair of sargery: what is to be done with them? Were this a mere question of forestry (that is, a question where nothing had to be considered but the best means of getting a healthy crop of trees on the ground without regard to their position or disposition), I should at once agree with the practical part of your correspondent's recommendation on this point. It has two recommendations—one in which he imagines you will agree with him, for it is pretty much your own, "Take advice;" the other practical, that in dealing with the trees, instead of attempting to replant the same ground the rotation should be shifted—that is, the grass should be turned into plantations, and the plantations into grass. The advice contains the germ of a good idea, which should be kept in view and be adopted wherever practicable. But it is obvious that it can be practicable only to a very limited extent. The question is complicated by considerations of amenity; of adaptation to the views from the Palace and of the Palace; of shutting out the surrounding streets, and of preservation of those parts of the plantations or individual trees where decay has not yet set in. The present laying out of the grounds is extremely good. It is understood to be the work of Wise, the celebrated gardener and landscape gardener; and anything that is done now in the way of breaking in upon or altering, much less reversing his plan, ought to be the subject of careful and skilled consideration. Merely to plant up the avenues or open spaces, and cut down the masses of wood between them, would be barbarous, and could never have been contemplated by such a judicious adviser as your correspondent obviously is. What is wanted is, 1st, a careful examination and report on the present state of the trees by competent persons; and 2d, a plan based on it (not necessarily by the same person), for restoring the plantations in some manner which will utilise the present sound wood as much as possible, and will harmonise with the present arrangement and laying out of the grounds. *C., Campden Hill.*

The Vines at Wrotham Park.—Permit me to thank Mr. Edlington for his courteous notice (p. 531), and to inform him that the information he promises concerning these Vines would be most interesting to me, and could hardly fail to prove very instructive to the readers of the *Gardeners' Chronicle*. I regret that at present I cannot accept Mr. Edlington's kind invitation to come and see for myself, though I hope to do so some day; meanwhile I trust he will speedily redeem his promise, and tell us all about these fine Vines, and thus further oblige *David Tell Fact.*

Horticultural Congress.—Mr. D. T. Fish, in referring to my observations on this subject, at p. 420 in the *Gardeners' Chronicle*, misrepresents my words and ideas. Mr. Fish says:—"He only knows three gardeners who would dare to question anything the Society endorsed with its cabalistic "R. H. S." What I wrote, and which is correctly printed at p. 420 of the *Gardeners' Chronicle* is:—"Yet I could not name three gardeners who would undertake to stand up at an Oxford Congress, and discuss off-hand the details of a prize essay stamped with 'R. H. S.'" I must beg to protest against such loose quotation. This is not the usage of intelligent writers who quote an opponent. I have said my say, and have done with the coming Oxford Congress, but remain, *Manchester Congress.*

Worms in Lawns.—A correspondent asked in your Journal, some time last year, what means should be adopted to get rid of worms on a lawn, but I missed the number in which his question was answered, and have hence been obliged to fall back on my own resources, for my lawn has almost been entirely destroyed by these, otherwise, useful creatures. At first I found that the worms could sometimes be persuaded to come to the surface by thumping the sod strongly with a mallet; but this system did not always succeed, and I gave it up as yielding too small an interest for so large an expenditure of labour. My next idea was to try what could be done by the simple process of stalking, and this proved a perfect success. I turned out this morning at peep of day, armed with a pair of nippers with bent nozzle, such as are used in chemical laboratories, and in the course of half-an-hour I had half filled a small flower-pot with large lob-worms, nipped in couples while intensely engaged in "voluptatibus amoris." This, then, is the season, and the above an easy mode of capturing the enemy; and I can strongly recommend it to your numerous readers. The nippers are indispensable, nothing can be done without them, and if the stalker attempts to substitute his finger and thumb, the worms will slip back into their holes, and laugh at him. Even against the nippers they will pull as hard as a salmon, but a good hold and patience will ere long force them to yield. The worms so caught should not be consigned to the tender mercies of fowls or fishes, but should be banished at once to the rubbish heap of the kitchen garden, where they will do good service in devouring decayed vegetable matter and converting it into rich mould. *A. M. M., Bedford.*

The Bishop Stortford Vines and Fungi.—Mr. Monro's letter demands an answer from me, for I have positively stated that these Vines were neither crippled nor destroyed by Fungus. To that statement I adhere. No Fungus was found in the border nor seen on the roots when the Vines were taken up. That it was found in plenty by both Mr. Monro and yourselves on the root sent I do not question; but the two statements are by no means irreconciliable. Wounded roots exposed to the air are peculiarly sensitive to the attacks of Fungi; they furnish a genial soil, as it were—a suitable root medium for the development of Fungus spores. According to the latest teachings of science (see Tyndall's Lecture upon Air at the Royal Institution, and his letter on Filtered Air in the *Times* of the 7th of this month), the air itself is a great granary for the storage of Fungus seeds. It is packed full of them; they tumble down into our lungs in millions, probably with every breath we draw. They penetrate every permeable substance, rest upon every exposed surface. Fortunately for us they don't all grow; probably not one spore in a thousand germinates, or grows up into the fulness of Fungihood. Like all other seeds, three conditions at least are more or less essential to their growth. The seed must be good, the temperature genial, and the soil adapted to their necessities. I fear adulteration has not yet reached down to the cooking of Fungus spores into lifelessness. The genuineness of the seed cannot be questioned, nor its germinating powers be doubted. Out of 100 Fungus spores probably 99 might grow. And then we can hardly draw much comfort from uncongeniality of temperature—that is sure to be suitable sooner or later; and the seed patiently waits for the spring time, and catches the opportunity of growth at the flood, and goes bravely forward to

perfection. But we have a chance left in regard to the soil. Life in a state of health is more or less invulnerable to the attacks of Fungi. Fungi are not like the Misletoe, that only grows on living trees; on the contrary, Fungus elects to grow and feed upon dead, debilitated, bruised, or abnormally exposed substances. The germ theory of germination seems to me to be identical with the germ theory of putrefaction. If either is accepted, the range of its operation cannot be limited to the animal kingdom. If the air is an inexhaustible seed warehouse full of Fungus spores, these must be scattered broadcast over everything upon the face of the whole earth. Hence, Professor Tyndal's remarks upon the wounds of men are also applicable, though perhaps not with the same force, to those of plants. See *Times*, April 7, p. 5. It is not needful for my present purpose to quote the able Professor's remarks in demonstration of the truth of the germ theory by a reference to the filtering functions of the lungs, and their power of sifting out spore seeds from the air that has fully passed through them. More apposite to my present purpose is the fact that the practice of sifting the air through cotton wool, before it comes into contact with a wounded surface, is now generally adopted as an antidote to putrefaction. Professor Lister and others avail themselves of the filtering power of cotton wool in treating a numerous class of wounds. They first destroy the germs inherent in the wool, and by a proper lotion kill those that may be scattered in the flesh. The cleansed wool placed upon the wound permits of a free diffusion of the air, but entirely intercepts the Fungus spores, and thus keeps the blood perfectly sweet. I have quoted this at length for two general reasons, entirely apart from its special reference to the Bishop Stortford Vines. The first is, because it is the best recipe for a cut or other wound to which the knights of the knife and spade are so liable; and the second, inasmuch as it embraces in a nutshell the whole theory and practice of careful packing. I have long been of opinion that fruit trees in particular, contract root Fungus on their transit from the nurseries to our gardens. The roots are always more or less wounded, and their tender surfaces and bruised parts are easily penetrated by air; and then how often they are wrapped round in the most abominable mixture of rottenness and semi-corruption, the longest of the strawy litter shaken out from stable dung—a complete hotbed of Fungus spores. After an exposure more or less long to the open air, fully seeded with Fungus spores, their wounded roots are ruthlessly bound round with Fungus-infected substances, neither water-tight nor air-proof. The physician shields our wounds with medicated cotton-wool, destroying first the spores of contagion on the lacerated flesh, and providing by the density of the sifting medium for the interception of all poison on its passage from the outside to the surface of the wound. Our plant packers reverse all this, and then wonder that Fungi prey upon the tender and susceptible parts of plants. Take this very Vine referred to by Mr. Monro. For a week or more its roots were exposed to the air at Bishop Stortford, the border was removed, and the roots left dangling in the air. It was then removed and cast upon a heap with the others. From that heap it was taken and packed on to a truck and sent to Potter's Bar; when it arrived it was eaten up with Fungus. Can any one wonder that it was so? Perhaps Mr. Monro will oblige your readers by saying how long this Vine had its roots fully exposed to the free air without any protection whatever, what it was packed in when he received it, how long it was upon the journey, and how many weeks elapsed between the time of its removal from the border at Bishop Stortford to that of its planting by Mr. Monro. Your readers will then be in a position to judge how, when, and where the roots came to be eaten up with, or, as you express it, full of, Fungus spawn. I enclose some roots from the same Vines, upon which I can see no Fungus. As to the Vines at Colney House, which I used to know long, long ago, doubtless Mr. Monro's failure arose from the want of water. He hung his borders up between heaven and earth, and then doubtless failed to water sufficiently his suspended Vine roots—hence drought engendered Fungus, and the two together killed his Vines. But the Bishop Stortford Vines rested upon *terra firma*, the roots were clean, plentiful, and healthy to the last; and we must look to other causes than Fungi for their failure. Whether or not these causes may yet have been indicated it is not for me to say, but looking at all the circumstances of the case that Mr. Monro adduces, the presence of Fungi on the old wreck at Potter's Bar is no proof whatever that the self-same roots were eaten up with Fungus in their normal state at Bishop Stortford. *David Tell Fact.*

Village Shows.—I send you a schedule of a local village show in Yorkshire, of which I am president; and although it can no longer be strictly called a cottagers' show, yet it may interest your readers to show how from small beginnings these societies may increase by judicious management, and may be the means of bringing all classes together in honourable competition. The society began in 1862 with only a cottagers' flower show, and a small class for amateurs, the total schedule amounting to only £20 worth of prizes. Each year, when we had a balance in hand, half the balance was put into the schedule for the next year; in 1867 we added some prizes for foals and sheep: this was so successful, that in 1868 further classes were added for horses and poultry. In 1869, having a balance of about £45, we added £22 or £23 more to the schedule by increasing the prizes in the cottagers' and amateurs' floral department; and with a good many special prizes (given by those in the neighbourhood who were interested in the growing prosperity of the Society, and who saw how much good it was doing), our schedule amounted to about £150. An increase of our schedule brought a corresponding increase in our subscriptions, which rose from £97 to £128, and also attracted the general public to our show ground; so that we found ourselves at the beginning of this year with a balance of £103 in hand, and a stock-in-trade of poultry coups, hurdles for sheep pens, and wood belonging to a grand stand, of the value of about £35 more. Following the plan which we have always hitherto adopted, we have added half our balance, or about £55, to the schedule for this year, our increase being chiefly in several additional classes for cattle and pigs and yearling horses, &c., and we have considerably increased the open class in plants. Our object in increasing the latter has been to induce more competition among the gardeners of gentlemen who are supporters of our Society. Although, as I before stated, our Society can no longer be called a village cottagers', yet it has proved an advantage to our village show, engrafting an exhibition of agricultural produce on to it, as it has enabled us to increase our prizes for the cottagers. The cottagers' produce is always shown in a separate tent, but many of the cottagers exhibit fruit and vegetables successfully in the open department as well. I attribute the success of the Society in a great measure to the interest which all classes in the neighbourhood take in it, both landlords, tenant-farmers, and cottagers, and also because we annually print the list of subscribers and a statement of accounts, so that every one knows how the money of the Society is being expended. I find it is a general holiday for all classes, and helps to bring them together. Almost every cottager in the neighbourhood is a subscriber, and a great many subscribe *2s. 6d.*, so as to enable them to compete in both classes; and they seem all to like the additional interest given to the show by the stock and poultry, and class of plants, &c., open to all. Our population is only 1000, much scattered; acreage, 6006; and Appleton-le-Street itself only a population of 150. *C. P. Peach, Appleton-le-Street, Malton, Yorkshire.* [We have to thank several correspondents for information of this nature, which we purpose to utilise on a future occasion. EDS.]

Cottage Garden Essays.—"One who Competed" is very kind to volunteer his advice, but really he must excuse me if I venture to form my own opinion of my own affairs. The limit imposed by Mr. Hubbard's "card" conditions necessarily imposed an absence of detail, and the omission of many important points altogether: but that is no reason that I, when unrestrained, should avoid them; in fact, as a literary speculation, I should be simple to do so. As, however, my friend appears anxious to "judge the judges," I will endeavour to gratify his itch for criticism by printing the essay in what is called "leaded" matter, while the additions will be set solid. With reference to the commendations, if it will minister at all to the happiness of "One who Competed," to believe and say my labours were not noticed at all, he is quite welcome to do so. I am quite content to leave my work to the arbitrament of the public. *W. P. Ayres.*

Road-making and Repairing.—I cannot tell your correspondent, "G. F. M.," where to lay his hand on any handy pamphlet on road-making. A good deal of information is given in "Loudon's Encyclopædia of Agriculture," and some useful instruction will be found in the first Number of the "Villa Gardener," issued this month. But as all the readers of the *Gardeners' Chronicle* walk or ride on roads, and many have to make or repair them, perhaps it may render others besides your correspondent a useful service if a few practical hints are given in your columns on road-making and repairing. It may be laid down as an axiom, that well-made roads need little or no repairing. Ill-made roads, on the contrary, are always under the hammer of the stone-breaker, and, what is more provoking still, ever out of order. Road-making is like laying the foundation of a house. If not well and truly laid, it cannot stand. The keystone of success in road-making is dryness; dry earth will bear any weight without sinking or bulging aside, but wet earth is like Chat Moss, it will swallow up anything rather than become firm. Those who have read the life of George Stephenson—and who has not?—will remember what material that swallowed up before a solid, or at least practicable and possible, line of rails could be laid across its yielding depths. George Stephenson's engineering difficulties were just the same in kind as thousands of your readers who have bad roads have been contending with all their lives. But all have not the wisdom of Stephenson: he resolved to have a solid foundation previous to laying down his rails, they lay their rails—that is, the surface material of the roads—on a sinking mass of wet earth, with neither compactness nor solidity enough to bear the burden. These qualities they expect to get out of the road materials. The head-stones are to make all dry, firm, and clean; but alas! they sink down—down into the depths, by their specific gravity, and are crushed into a lower depth still by every passing horse's hoof or carriage wheel. Such roads are ever calling out for more stones, more gravel, more labour; and the more you give them the more they seem to require. Their cry and their needs are like those of the horse-leech—give, give, give. And the very act of giving, like indiscriminate charity, makes matters worse, for there is nothing so trying to the constitution of a bad road as the dragging of heavy stones and gravel over it. It cuts through its very heart, breaks its back, and too often leaves it a deeply serrated mixture of stones and mud, lines of dry land variegated with holes and ruts of water—an insatiable sink for stones, gravel, and money. Now all these evils would be rendered impossible by simply laying the foundation of the road dry. The earth bears the weight of the road and of all that passes over it; therefore the first thing needed is to strengthen the earth. This is done by laying it dry; and in the capacity of a burden-bearer dry earth is strong, wet earth is weak. This must be obvious to every one. Walk across a ploughed field in wet weather, you sink deeply into it—up to the ankles; go across the same field in dry weather, and hardly a footprint is left behind you. In that walk, if you interpret its meaning aright, you have learnt the complete art of road-making. But it may be said that the importance of dryness is generally recognised. The mere fact of using such open porous materials shows the value that is attached to thorough drainage. But here lies a great danger of a complete misapprehension of the subject. Because porous materials are employed people wrongly imagine that a road can drain itself; this seems the popular view of the matter. Hence the more porous a road can be made—that is, the more freely water will pass through it—the better, is the opinion of very many. I hold just the opposite. The more impervious to water a road can be made the better it will be, and the longer it will last. I use hard material for surfacing a road for the same reason that iron is employed for rails and carriage wheels on the line, to lessen friction and endure the wear and tear of the traffic. But on the railway it is the sleepers that give solidity and firmness to the carriage-way. They upbear the weight of the traffic. Now just what the sleepers are to the rails, dry earth is to the road materials resting upon it. But it must never be forgotten that it is the earth, not the road materials, that needs drainage. The practice of forming a drain just on a level with the base of a stone line of roads, is as unwise as it would be to place the iron rail on the ground without any sleepers beneath it. The safety and comfort of railway travelling depends upon the massiveness and strength of the sleepers on which the rails rest; and the chief merits of the best roads, and especially their durability without repairs, depends upon the depth of their foundation of dry earth. Every road should have a drain down its centre, from 2 to 3 feet deep or more, on wet soils. The best form of drain is a tile in the bottom, and filled up to the stone line with large stones, brickbats, or other porous matters. The ground line of the road should also fall, say 2 inches at least, from the sides into the centre, so that should any matter pass through the substance of the road, it may run into the drain, and be carried off. In making roads of any length, one of the first things to be considered is the proper falls and outlets for these deep drains. With skill and forethought this need not, however, prove any practical difficulty. I may, however, add, for the comfort of your correspondent, "G. F. M.," and any others who may be labouring under the disagreeable infliction of bad roads, that the drainage difficulty is the chief one that he need have to encounter in making good new roads, or changing bad old roads into as good as the best new ones. Having drained the base of the road, it will be needful to make some provision for the removal of surface water. The bad road-maker sends all this water down through the surface of his road; this is a good recipe for forming our road materials into a hotch-potch of mud, stones, and water. The proper plan is to conduct the water to the side by the form of the road, and then, at intervals of from 20 to 30 yards, or closer if needful, to make small side drains in connection with the centre one, to carry the surface water off. These ought to be brought to the surface of the road in brickwork, and protected with iron gratings. These bricked spaces should also go down a few inches below the cross drains, to receive the sand and silt as removed from the road, and thus prevent the herring-bone or cross drains from being blocked up, as they too often are. If the sand or gravel is removed once or twice a year the whole of the drains will continue to act perfectly for a quarter or half a century, or indeed for any length of time. Having thus well and truly laid the foundation of the road upon a dry and therefore a strong and durable basis, I purpose instructing your correspondent how and with what to build his road thereon next week. *Macadamson.*

Foreign Correspondence.

CINCHONA PLANTATIONS: *Rungbee, February 16.*—We have had by far the finest cold season this year there has been since I came to the country, and the plantations are looking the irbest. The succirubras have fairly started into growth, but the Calisayas are still at rest. The tallest plant of Succirubra planted below the Bishop Hut in 1867 is 18 feet 4 inches in height,

and many of them are over 15 feet. In last year's planting we have exceedingly few vacancies, and now that the land is dry, the lines of plants stand out clearly from top to bottom. We have got bark enough of C. succirubra to make about 1300 lb. when dry, and are still barking. We are now cutting on the ridge above Kennedy's Hut, and from the stool of almost every plant cut down there are fine strong shoots from 4 to 10 feet high. The stools without young shoots are beginning to break nicely. M—— began barking before we did, and the stools of his plants first cut down are breaking as freely as Willows. I expect about 5000 lb. will be sent from Poomong this year, and the greater part of is very fair quality I imagine. I don't think that the plan of taking strips out of the standing plants will ever be adopted. It certainly injures the plants, and looks a most barbarous plan, to say the least. We are drying the bark in the first place under the open sheds (not exposed to the sun), and finishing off over charcoal. I hope it will be found that drying in the sun does not injure the bark, for it would make a vast difference in the amount of labour required.

The Calisaya plants are still in fine health, but we make slow work with the propagation of it. The stock plants will not stand severe cutting; if cut hard they bleed to death. We shall have a good few seeds from our own plants about April or May, and from about ½ oz. of Calisaya seed received from Java, we raised over 11,000 seedlings. A very small packet of C. lancifolia was obtained from the same place, and 700 seedlings are up, and a few more seeds germinating.

The Rajah of Sikkim has again applied for all the land between the Ryeng and the plains, and Major Morton took the trouble to go over the land to see if there were any Cinchona plantations on it. The conjectural reason why the Rajah wanted the land, was that the Nepaulese were fast driving the Lepchas out of British Sikkim, and if he got this land he would people it solely with Lepchas, and encourage them to settle in one place and cultivate the soil on improved principles, and have at least one part of British Sikkim where Lepchas could stay. Formerly, he made the application on the grounds that he wanted the land for the purpose of worship, but he was told that no hindrance whatever would be made to the performance of worship on any part of the land. He has now tried this other story about the Lepchas being driven out of their native country. It is quite true that the Lepchas are being driven out of British Sikkim, but it is entirely their own fault, for if they were as industrious as the Nepaulese they would stand the best chance of the two; but they will only work either when they are starving, or can get a job that will suit them, such as wandering about in the jungle for a few days. It strikes me that where real work is to be done, those who know least of the Lepchas like them best. Our Lepchas have dwindled down to one sirdar with six to eight men, and I do not know of any tea planter with even so many. *J. G.*

Societies.

Royal Horticultural. *April* 20.—W. W. Saunders, Esq., F.R.S., in the chair. The usual preliminary business having been concluded, the Rev. Joshua Dix read the awards of the Floral Committee, and the Rev. M. J. Berkeley, in the absence of Mr. Wilson, those of the Fruit Committee. Mr. Berkeley then stated, in reference to the Abyssinian Primula Contii (Hort.), shown by Messrs. Veitch at the last meeting, that Dr. Masters and himself had examined the plant independently, and had arrived at the conclusion that it was the P. verticillata var. simensis [and of which we hope shortly to publish a technical description]. Still alluding to plants exhibited on a former occasion, Mr. Berkeley directed attention to a specimen of Oncidium sarcodes, which agreed in most points with the coloured plate of O. amictum; the living specimen exhibited differed in the callus on the lip, than which nothing is so variable, especially in the case of the Odontoglossums. He considered that the O. sarcodes was merely a fine variety of O. amictum. An Epidendrum, exhibited as E. xantheum, Lindl., next came under notice as being certainly distinct from that species. Mr. Bateman had suggested that as it was almost the last plant received in this country from the late Mr. Bowmann, it should, as a mark of respect to that traveller, be called E. Bowmanni. The speaker then stated that as it was always advisable to correct the wrong nomenclature of plants, he begged to correct an error in regard to a specimen of Oncidium which had been called hæmatochilum (in allusion to the blood-stained lip), but which more correctly should be called O. phymatochilum. Alluding to a beautiful group of terrestrial Orchids exhibited by H.R.H. the Comte de Paris, Mr. Berkeley said that perhaps Ophrys speculum was the most beautiful of the whole, though most of the others were very curious and interesting. He said there were no plants that would pay better for the trouble of collecting and cultivating than these. The best of them were found in Spain, some in Italy and Switzerland; and he also earnestly recommended those who had friends in the south of Europe, to get them to send to this country, for cultivation in our gardens, bulbs of the many beautiful species of Narcissus, a genus which had lately been admirably reviewed in these columns by Mr. Baker, and of which there were in Italy a great number of beautiful species. A specimen of a new Brazilian species of Dorstenia named argentata, exhibited by the Chairman, was next referred to. On account of its botanical interest it was well worthy of a First-class Certificate, which, however, it had not received. He stated that the subject of a new form of award of distinction for such kinds of plants would shortly be brought under the consideration of a sub-committee.

The Chairman said it gave him great pleasure to refer to the exhibition then being held in the large conservatory, which was most satisfactory in many respects. To Lord Londesborough, he said, the Society was much indebted, for the splendid series of groups of Orchids which his lordship had sent to their meetings, at great trouble and expense, from Grimston Park; and he would therefore propose that a special vote of thanks should be given by the Fellows to Lord Londesborough, which, on being put to the meeting, was carried unanimously. After commenting upon the good qualities of several "small Orchids," Mr. Saunders, alluding to the group from the Comte de Paris, said that the terrestrial Orchids from the Cape, and also from Australia, were even more beautiful than those exhibited. They were really charming in colour, shape, and form, and many of them were very fragrant, thus adding an additional charm to their beauty. They were plants easily collected and easily sent home, but not easily cultivated. A knowledge of the climatal conditions under which they grow in their native countries is very essential to their well-doing in this country. In reference to the bulbs of Narcissus, Tulips, &c., obtained from Greece, he could not say whether they were species or not, but he could say that under cultivation they retained their essential characters.

Scientific Committee.—W. W. Saunders, Esq., F.R.S., in the chair. Rev. M. J. Berkeley alluded to the movement of the chlorophyll in Selaginella mutabilis, by which it becomes aggregated into ball-like masses, subsequently becoming diffused. The subject was alluded to as recent observers in France and Germany have recorded similar phenomena without apparently being aware of the fact above mentioned, which was first ascertained by Mr. Berkeley and Dr. Hooker, and is now well known to English physiologists as furnishing the reason for the peculiar change of colour in this plant when exposed to bright or to diffused light.

The Chairman exhibited a bulb of Lilium Thomsonianum with a number of adventitious bulbs proceeding from it; also a starchy matter produced from the tubers of Caladium bicolor.

Mr. A. Murray stated that the Coccus on the Plum shown at the last meeting was C. patelliformis, described in the *Gardeners' Chronicle* for 1843. Mr. Murray also showed some galls preserved by the electrotype process, and other specimens, which will be further alluded to on another occasion.

Mr. Glaisher exhibited a new ground thermometer, and a wet and dry bulb thermometer for garden purposes, and also exhibited diagrams showing the mean temperature of every day in the year for forty years, at Greenwich and Chiswick respectively. The latter diagram had been constructed from the Chiswick records after the necessary corrections had been applied. This diagram showed a remarkably close approximation to that derived from the Greenwich record, and is not only of the highest interest in a scientific point of view, but very valuable as giving in a readily accessible form a record of the temperature at Chiswick. The Chiswick records thus confirm and explain the Greenwich observations, and *vice versâ*. We hope shortly to publish a transcript of these diagrams, than which nothing more important in a horticultural point of view has ever been done in meteorology.

Dr. Masters showed a flower of Aristolochia grandiflora, var. Hookeri (the A. gigantea of the "Botanical Magazine"), grown in the gardens of A. Wattenbach, Esq., of Champion Hill; and drew attention to the peculiar provision for insuring fertilisation in this plant, on which subject further details will hereafter be given.

Floral Committee.—Rev. J. Dix in the chair. From Mr. Noble, Bagshot, came some beautiful blooming specimens of his new varieties of Clematis, Lady Londesborough and Miss Bateman, to which a Special Certificate was awarded. To Mr. B. S. Williams a First-class Certificate was given for Gloxinia Scarlet Gem, an upright-flowered variety, with brilliant scarlet flowers, deeper in colour than any other variety yet exhibited. To Mr. Needle, gr. to H.R.H. the Comte de Paris, a Special Certificate was awarded for a large and beautiful collection of terrestrial Orchids. From Mr. G. Smith, Wilton Road Nursery, Salisbury, came a basket of Viola cornuta var. Perfection, concerning which there has recently been a discussion in our columns. As there were no other specimens forthcoming it was impossible to arrive at a definite conclusion. A Special Certificate was awarded to Mr. Turner for a splendidly bloomed specimen of Azalea Grand Duchesse de Bade, a fine semi-double carmine-red flower, and also a First-class Certificate for Auricula Colonel Champneys, a grey-edged flower with blue ground and white paste, a variety which has very much improved since being awarded a Certificate of the 2d class about two years ago. To Mr. Atkins, Painswick, a Special Certificate was given for a beautiful specimen of Cyclamen vernum (repandum), Sibth. From Mr. H. Hooper came two boxes of cut blooms of Pansies, amongst which Sunshine, yellow ground, belted with orange-brown; and Mrs. Shirley Hibberd, faint white ground, with a streaked lilac belt, were awarded First-class Certificates. The same award was also made to a fine new yellow bedding variety named Golden Bedder, from Messrs. E. G. Henderson. To Mr. Morris, Deptford, a Special Certificate was given for a basket of seedling Pelargoniums, showing the various stages in the development of variegation. A special award was also made to Mr. R. Veitch, of Exeter, for a fine specimen of a new white-flowered Azalea, named Lady Poltimore. From I. Anderson-Henry, Esq., Hay Lodge, Trinity, Edinburgh, came a collection of Primulas with leafy calyces, a further development of those shown last year; and a white-flowered hybrid Rhododendron, between R. ciliatum and R. Boothii; and from Mr. J. Garland, gr. to Sir T. Dyke Acland, Bart., Killerton, Devon, a magnificent cut spike of Phalænopsis Schilleriana, on which were 80 fine flowers, to which a Special Certificate was awarded. Messrs. Veitch & Sons had samples of a fine hybrid Echeveria named intermedia, a cross between metallica and glauca, and which proved to be the same as the E. glauco-metallica exhibited last season; also a flowering specimen of Sempervivum (Grenovia) Bollii.

Fruit Committee.—D. Nash, Esq., in the chair. The objects brought before the Committee on this occasion were not very numerous, but of a very good description. Special Certificates were awarded to Mr. Westcott, gr., Raby Castle, for Lady Downe's Seedling Grapes, of excellent quality; to Mr. Gardiner, gr., Eatington Park, Stratford-on-Avon, for a good collection of Apples; to another fine collection of Apples from Mr. Mobbs, Tyringham Gardens, Newport Pagnell, Bucks; to Mr. Batley, gr., Wentworth Hall, Barnsley, for Black Alicante Grapes; and to Mr. Muir, gr., Oulton Park, Cheshire, for an excellent dish of Brown Turkey Figs. From Mr. G. Cooling, 18, Broad Street, Bath, came several specimens of a fine, new, close-hearting Broccoli, named Matchless, to which a First-class Certificate was awarded. Mr. Gilbert, gr. to the Marquis of Exeter, Burghley Park, sent a collection of forced salading, comprising a good brace of Telegraph Cucumbers, Lettuce, Beet, Radishes, &c. Messrs. Cutbush & Sons exhibited two dishes of Onions; and Mr. Denning, gr. to Lord Londesborough, specimens of a variety of early Cabbage. Mr. Craddock, The Gardens, Compton Verney, sent one dish of Neil's Perfection; and two dishes of Compton King Potatos, the latter a good-looking, large, smooth-skinned kidney.

Three prizes were offered for competition for a collection of forced vegetables, but only one collection, and that a very good one, from Mr. Gilbert, gr., Burghley, was exhibited. In this collection were a good dish of Fulmer's Early Forcing Beans, one dish of Tom Thumb Peas, with well filled pods, grown in 13-inch pots; a dish of excellent Mona's Pride Potatos, grown in boxes; a good dish of Mushrooms, and the same of Seakale, The 1st prize was awarded.

Azalea and Rhododendron Show.—This was another very satisfactory exhibition. Contributions were plentiful, and of excellent quality. The weather was glorious, and the company accordingly was very numerous. Of Azaleas there was a very good display, though, with one or two exceptions, the specimens were only second-rate. In the open class for 9 Messrs. H. Lane & Son were 1st with large, nicely bloomed pyramidal specimens of President Humann, Magnificent, Petuniæflora, Roi Léopold, Reine des Blanches, &c. The 2d prize was awarded to Mr. Wilkie, gr., Oak Lodge, Kensington, who showed well-bloomed examples of Queen Victoria, Duc de Nassau, Belle Gantoise, and Lord Raglan, &c. In the amateur class for 6 Mr. Wilkie came in 1st with smaller plants of Concinna, Prince Albert, President, and Alexander II.; the 2d prize being awarded to Mr. G. Wheeler, gr. to Sir F. H. Goldsmid, Bart., St. John's Lodge, Regent's Park, who showed amongst a lot of formally-trained plants, of which we had hoped we had seen the last, a dwarf, well-bloomed example of Duke of Devonshire. Mr. Turner took the 1st prize easily in the nurserymen's class for 6, with remarkably well-bloomed bushy heads, trained in the Belgian style, on clear stems, from 18 inches to 2 feet in height. The varieties were Hercules, Alba striata, Madame Jean Vervaene, Hooibrinkii, Antoinette, Marie Vervaene, and Auguste Van Geert; the 2d prize was taken by Messrs. A. Henderson & Co., Pine Apple Place, Edgware Road, with healthy specimens, not too freely-flowered, of Coronata, Striata, Distinction, Princess Royal, Iveryana, and Garland. Mr. Wilkie was 1st, and Mr. Turner 2d, for the best single specimen Azalea, the former having a tall plant of Sir Charles Napier, and the latter a short, compact, bushy specimen of Flower of the Day.

The Rhododendrons shown in competition were scarcely so good as those shown by Messrs. Lane at the last meeting, but a splendid group from the Berkhamstead Nursery was again staged in another part of the exhibition. Messrs. Lane came 1st in the open class for 6, with, amongst others, well-bloomed examples of Blandyanum, Lord John Russell, and Queen of the West. Messrs. Standish & Co. were 2d with a collection of unnamed seedlings. The other collections were very moderate.

Auriculas were not numerous, but of a good description. The best 12 show kinds came from Mr. Turner, who staged, of selfs, Crown Prince, Eliza, Bishop of Lichfield, Prince Alfred, and Master Hole; and of green and grey-edged varieties, Galatea, Earl of Shaftesbury, Exhibitor, Stapleford Hero, Buckstone, Admiral Napier, and Colonel Champneys. Mr. James, gr. to W. F. Watson, Esq., Isleworth, was 2d, with a similar group, in good condition. Mr. James was 1st in the amateur class for 6, with excellent specimens of Mrs. Smith and Meteor Flag, selfs; and Bright Phœbus, Conqueror of Europe, Lovely Ann, and Ne Plus Ultra, all grey or green-edged kinds. In the class for 12 alpine or dusty Auriculas Mr. Turner came in with some good flowers, amongst which the following were the best:—Mrs. Fordham, very fine deep velvet colour, with light grey paste; Defiance, a lighter shade of colour than the former, with lemon-coloured paste; Merrimac, deep purple, yellow paste; Prospero, purple, tipped with lilac, white paste; and Jessie, shaded purple, bright orange paste, a slightly convex-shaped flower, very showy.

The best 9 show Pansies came from Mr. James, who had Noo-gar-ood and Rev. H. Dombrain, both fine purple-velvet selfs; Sunset, yellow; Queen of England, white; J. B. Downie, purple belted, yellow ground; Chancellor, Isa Gray, purple belted, with white ground; Dr. Smith, and Princess Helena, purple-violet, with white ground. Mr. Hooper, Widcombe Hill, Bath, was 2d. Mr. Hooper was the only exhibitor, and took the 1st prize in the class for 6 bedding Pansies, distinct, in boxes 12 inches square. Boxes of cut blooms were exhibited by Mr. James, very good; Mr. W. Bragg, Slough; and Mr. Hooper.

Only one collection of hardy spring flowers, in a basket not exceeding 4 feet in diameter, was shown, and to this, which was filled with Dielytras, Tulips, Hyacinths,

Lily of the Valley, &c., from Mr. G. Wheeler, the 1st prize was awarded. Messrs. Lane & Son showed 12 fine trusses of Rhododendrons, and took the 1st prize.

In the miscellaneous class, which was a very large one, was another magnificent collection of Orchids, exhibited by Mr. Denning, gr. to Lord Londesborough, which were even better than those shown at the last show. A Special Certificate was voted to the collection, and also to a noble specimen of Cattleya Skinneri, purple, with ten grand spikes; to Dendrobium Jenkinsii, on a good-sized block, covered with its beautiful pale buff flowers tipped with yellow; and to Odontoglossum hystrix, with two very fine, gracefully curved spikes. Along with the above were a fine specimen of Dendrobium macrophyllum giganteum, with three spikes; D. pulchellum purpureum, very pretty; Cypripedium caudatum roseum, three splendid flowers; a freely-flowered specimen of the charming Chysis Limminghii, and a large pot of Cypripedium barbatum, with about two dozen expanded flowers. To Messrs. Veitch an extra prize was awarded for a fine collection of plants, comprising a very fine Anthurium Scherzerianum and Odontoglossum Phalænopsis, the pretty little Saccolabium ampullaceum and S. curvifolium; Oncidium sarcodes, one magnificent spike 6 feet long, to which a Special Certificate was given; Dendrobium infundibulum, white; D. lasioglossum, D. Dalhousianum, and D. densiflorum, several specimens of Echeveria intermedia, a hybrid between E. secunda glauca and E. metallica, not differing from E. glauco-metallica; a fine collection of Roses in pots, amongst which were beautiful blooms of Pierre Notting, Maréchal Vaillant, Charles Lawson, Duchesse de Caylus, Jean Cherpin, Madame Rivers, &c., and three excellent boxes of cut blooms. Mr. May, gr. to the Hon. Lady Ashburton, Melchet Court, Romsey, exhibited two specimens with Notting Hill, exhibited good specimens of Dielytra spectabilis and Deutzia gracilis, and two dozen pots of exceedingly well grown Mignonette. From Messrs. Standish & Co. came a charming box of cut blooms of Maréchal Niel Rose; and from Mrs. Forster, Watford, Herts, very perfect specimens of skeleton leaves.

Notices of Books.

Picturesque Designs for Mansions, Villas, Lodges, &c. By C. J. Richardson. Atchley & Co. Large 8vo. Pp. 398. 500 cuts.

It would be hard indeed to define the picturesque, though one might readily illustrate it in a stroll up the Canongate, at Edinburgh, "the High," at Oxford, and in many an English homestead. From the richly illustrated volume before us we might pick some picturesque designs, though the majority have little claim to that designation. Utility and picturesque appearance, unfortunately, do not always go together, and in the volume before us we are disposed to commend the beauty of fitness rather than the beauty of appearance. The designer has carried out the principle he lays down in his introduction. "His (the architect's) object ought to be to build a house to be lived in, and not to be looked at alone"—an excellent rule, and one not to be gainsaid; thrice happy he who can combine the *utile dulci*. Looking with unprofessional eyes at the designs as a whole, we are disposed to praise the author's careful study of the comfortable, and also the taste displayed in many of the details of the interior as well as of the exterior of the very varied buildings represented, while the general aspect of the majority is often anything but picturesque. Skilful and artistic landscape gardening, for which we are glad to say our author has a high regard, would, nevertheless, do much to redeem the deficiency in the buildings themselves.

In the course of some remarks on the South Kensington estate, purchased by the Commissioners of 1851, the author (who was largely concerned in designing the structures proposed to be thereon erected) makes the following observation on the future of the Royal Horticultural Society, which it is as well for those concerned for the fate of the Society to bear in mind:—"It cannot be supposed that a sum of £340,000 would have been expended by the nation for the purpose of giving the Horticultural Society a perpetual lease of the best portion of the estate purchased. It is already evident that the gardens are not well situated there. The smoke of the district will not permit the growth of delicate shrubs, and their exhibitions are [in part] supplied from the gardens at Chiswick. In much less than 50 years their grounds will probably be the centre of London, and consequently the noble conception of his Royal Highness (the late Prince Consort) has still a good chance of being carried into effect. The Society will be smoked out when the city bounds are extended." From the following passage there will be few dissentients:—"The Hall of Arts and Sciences as standing by itself, and without any of the buildings first proposed to be attached to it, and to which it would really have been only secondary, has been erected, and its appearance by the side of the Hyde Park Road astonishes the public. To render the Hall useful, and to prevent its being ridiculed, the complete collection of buildings, at first proposed by Prince Albert, must be added to it." How far the buildings now erecting for the International Exhibitions may harmonise with the new Coliseum, remains to be seen. No doubt they have been planned to do so, and whether or no the removal of the conservatory to some other spot in the Horticultural Society's grounds becomes imperative. Our illustration (fig. 104), for the use of which we have to thank the publishers of the present volume, shows the author's design for the National Gallery, and other buildings, as proposed by the late Prince Consort, to be erected at Queen's Gate, Hyde Park. The view shows the portion of the building facing the Prince Albert's Road. The Hall of Arts and Sciences was to have been placed in the centre of the mass of buildings,—a part of the dome is seen in the upper left-hand corner. In the small block plan, in the right-hand corner, *b* is the Prince Albert's Road, *a* the Exhibition Road, and *c* and *d* the roads north and south. Underneath the view are represented the gates and lodge as at present executed, and which if equally, or perhaps more serviceable, are not so effective as those designed by the author. The House of Commons, however, after granting such a large sum of money for the purchase of the land, expressed its disapproval of removing the National Gallery from its present position, considered by some to be the finest site in Europe!

To return to the work before us, we may say that, owing to the large number and great variety of the designs represented, applicable alike to the cottage or to the lodge, it is likely to prove very valuable, as supplying hints as to the arrangement of the house, and the details of its construction and ornamentation.

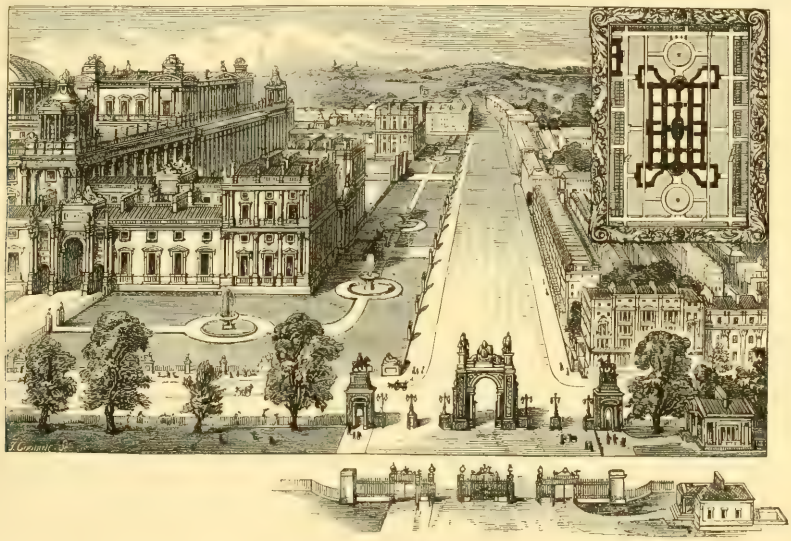

Fig 104.

magnificent spikes of bloom of Phalænopsis Schilleriana, to which a Special Certificate was awarded. To Mr. B. S. Williams an extra prize was awarded for a beautiful group of fine foliage and flowering plants, including nice blooming specimens of Lycaste Harrisonii, Epidendrum crassifolium, Phajus Wallichii, a small-flowered species of Oncidium, Cypripedium biflorum, &c. From Messrs. Rollisson & Sons, Tooting, came a choice group of Orchids, Ferns, Palms, &c., and several very fine Vandas, including V. tricolor formosa, V. tricolor var. insignis, and V. meleagris, with fine spikes. To the latter a Special Certificate was awarded, and also an extra prize to the collection. An award of the latter kind was also given to Messrs. Lane & Son for fine collections of Roses in pots, and Rhododendrons, &c. From Mr. J. W. Wimsett, Royal Ashburnham Nursery, came six large well bloomed plants of Wills' new hybrid Ivy-leaved Pelargonium Willsii; and from Mr. C. Edmonds, Hayes, a large and good collection of Cyclamens, to the latter of which an extra prize was awarded. To Messrs. Carter & Co. a Special Certificate was given for four fine baskets of new and other tricolor Pelargoniums. The same award was also made to Mr. T. S. Ware, for a large and choice assortment of hardy spring-flowering plants, beautifully arranged; to Messrs. E. G. Henderson, Wellington Road, for a similar collection, tastefully grouped in three-cornered boxes; to Mr. Wm. Paul, for several fine blooming specimens of Princess Christian Rose; to Messrs. Standish & Co., for a collection of new Japanese and other Maples; to Mr. James, for a good collection of Cinerarias; to Messrs. Dobson & Sons, Isleworth, for a fine group of herbaceous Calceolarias. From Mr. H. Bailey, Royal Nursery, Feltham, came a well grown and flowered collection of early flowering French Pelargoniums, to which an extra prize was awarded; and from Messrs. Lucking Brothers, nurserymen, Notting Hill, came a nice collection of dining and drawing-room decorative plants, bouquets, &c. Messrs. Reeves Brothers,

Florists' Flowers.

There is no lack of new Fuchsias for the coming season, and the lists of this popular flower are becoming so large that it is bewildering indeed to select sorts from the descriptions merely. The following eight varieties I saw in bloom during last summer, and have no hesitation in heartily recommending them:—Enchantress (Bull), a fine variety, with double white corolla and bright rose tube and sepals, which are broad and well reflexed; corolla large and full; habit good, free flowering, and exceedingly attractive. Killiecrankie, tube and sepals brilliant carmine-red, and of fine shape; corolla rich violet-black, very stout and glossy, and of perfect shape; an early blooming variety, and very free; a grand single flower for the exhibition table. Lady Sale, blush-white tube and sepals, the latter nicely reflexed; dark carmine corolla, shaded with purple; good habit, and an abundant bloomer; a very useful variety for all purposes. Mrs. Ballantine, a fine double variety, tube and sepals bright scarlet, of good substance, broad, and well-reflexed; corolla white, full, and well expanded; habit good, and free blooming; should be included in a collection for exhibition purposes. Puritani, without doubt one of the best of the single varieties with white corolla for exhibition and decorative purposes; scarlet tube and sepals, and finely formed corolla; close habit, and extremely free blooming. Tinted Venus (Bull), a very distinct and beautiful

Fuchsia; scarlet tube and sepals, the latter of fine shape and well reflexed; white corolla, tinted with violet-blue, the corolla somewhat imperfect, but the handsome markings seen on it are an excellent set-off against the imperfection; good habit, and free blooming. Tribune (Bull), a magnificent single Fuchsia; tube and sepals deep scarlet, the sepals long, broad, and handsomely reflexed; the corolla bright deep plum colour, large, and finely formed; very free blooming, and good branching yet compact habit.

To these I would add, of the section with scarlet tube and sepals, and dark corolla, Lizzie Hexham, with very fine dark corolla; and Try-me-Oh! an excellent variety for exhibition purposes, though the flowers are not over large; very free, and highly useful as a decorative plant. Of the section with white tube and sepals and coloured corolla, Brilliantissima, Guiding Star, though somewhat old, yet almost unsurpassed as an exhibition plant; and Starlight, which has a pure waxy white tube and sepals, and a rosy lake corolla, are varieties that can be highly commended. This makes a dozen kinds that, for exhibition purposes, can hardly be improved upon.

Some of the best young specimen plants of Fuchsias I ever saw were staged by Mr. C. J. Perry, of Birmingham, at one of the large provincial exhibitions during the last summer. They averaged about 4½ feet in height, were of an even pyramidal shape, and densely covered with flowers, that hung down to the very base of the pot. They were from autumn-struck cuttings, taken about October, and grown on with perfect freedom. Such plants, if well done, must always take precedence of plants of two and three years old, that are much more difficult to cultivate, and require careful housing and attention during the winter. Mr. Perry also combines admirably freedom of growth with an elegant habit, without falling into that common error of making the plants too formal in appearance. There were some plants at the great show of the Royal Horticultural Society, at Manchester, in July last, that were of a character to make a true florist's heart ache; had they been cast in moulds they could scarcely have presented a more severely formal trim. [Florists' hearts must be softening! Eds.] Fuchsias make a leading feature at our summer exhibitions, and they are generally as numerously produced as any other section of plants included in the schedule. There is no reason why fine young, free growing, free blooming, and yet elegant plants, should not be the rule rather than the exception; and a good means to secure this will be an abandonment of old plants in favour of yearling specimens of a more attractive cast. *Quo.*

Garden Memoranda.

Broomfield Lodge, Chelmsford.—Any person who was familiar with Broomfield Lodge a few years ago, would, on seeing it at the present time, find that a great change has taken place. All the old houses have either been removed or remodelled, and several new ones erected at great cost, on a style of magnificence, and a good collection of plants is being fast gathered together. The lawn and pleasure-garden has also undergone a great change; and indeed all the place, excepting the lake and the kitchen garden, has very decidedly put on a new hat, and it fits remarkably well.

It is, however, not my intention to enter into details concerning the place, but to speak more particularly of the Grape Vines growing here, of which the Black Hamburgh constitutes the greater part. The Vines occupying two of the houses are nearly 70 years old, and have stems at the base as thick as one's leg, but they have been so shamefully cut about in days gone by as to make it an exceedingly difficult task, as well as a work of time, to get them anything approaching to uniformity; and the question when the old roofs were doomed to come down, was, is it advisable to destroy the old Vines? A. says Yes! B. says No! C. looks with sympathy on the old veterans, and says nothing. A.'s theory is, that the old gentlemen, by reason of their age and other infirmities, such as diseased leaves, small bunches, and shanked berries, are altogether incapable of filling the place any longer with credit to themselves and satisfaction to their master, and therefore ought at once to be dismissed. B. intercedes for the old Vines, and argues that they have been very badly treated, which is the main cause of their infirmities, and feels sure that, under good treatment, they would prove themselves highly deserving their new hat, if allowed to stay.

C. falls in with B.'s sentiments, and suggests that if the Vines could speak for themselves, "like their grandchildren at Combe Abbey," they would most strongly protest against the barbarous treatment they had received at the hands of different gardeners in amputating limb after limb, as thick as one's arm, in such an unscientific and unsparing manner.

C. further suggests that their roots should be examined, and as much as possible of the old soil removed and fresh added; but here lies the difficulty, as many of the roots were found to have rambled out of all bounds, through a thick gravel path, and beneath a shrubbery, and probably half way to the lake, 70 yards distant. The shrubbery could not be sacrificed, and to cut off the roots at the edge of the border, 10 feet in width, would have been certain ruin, if not death. The only alternative, that of removing as much of the old border as possible and renewing it, was adopted, taking especial care to bring the smaller roots nearer the surface. Simultaneous with, or rather previous to this, the old lean-to roof had given place to the new one, a half-span, with a considerable internal alteration. Now, had it been possible to have extended the border 6 feet, and to have traced out those large roots which had rambled so far out of all bounds, and brought them back into the new border, I am satisfied that wonderfully fine Grapes might have been produced. As it is, I have not the slightest occasion to be dissatisfied with the result, for I am now able to supply my employer's table with Grapes 10 months in the year, equal in quantity and quality with any in the country.

These Vines are grown on the extension system, and produce bunches varying from 1 lb. to 3 lb. each, and I scarcely know what shanked berries are, and have very few aërial roots. Surely this speaks well for old Vines, as well as for the extension system, and convinces me that to restrict a Vine to a single rod is to lessen its capabilities and shorten its days. Vines grown on the restrictive or single-rod system are proverbial for producingl arge bunches in their youth, but are they lasting? Is a 6 lb. bunch on a 10-year-old Vine more creditable than a 3 lb. bunch on a 70-year-old Vine. I contend not. Was there ever a Vine restricted to a single rod that lived for 70 years? I have purposely made the above digression, in the hope that some of your "restrictive" correspondents may reply. In conclusion, let me give to your readers a motto these old Vines have taught me, viz., "Never despise the aged." *Thos. Simpson.*

Miscellaneous.

Mushroom Culture Out-of-Doors.—1. Preparation of the manure: It is of vital importance to let the rank steam out. When you get the manure from the stables throw it into a round heap, and give a good watering with manure-water. Let it lie till the third day, then turn over, and give another shake up. When well sweated, which will be in three days, another turn will be necessary; it will then be ready for use. 2. Making the bed is of secondary importance. Mark out the bed 3 feet wide at bottom, and of course of whatever length you have manure for. Put the dung on in layers of six inches the whole length of the bed, and spread out at the rate of four shovelfuls of dry soil to every barrowful of dung; tread down by stamping on it as the work proceeds, until you get the required height; then clap the bed all over with the back of a light spade, drawing the spade downwards at every stroke to, as it were, seal the bed. Cover up with a mat immediately, and on no account allow rain to enter. Place one stick in the middle, and one at each end. Feel the heat at least once a day; when found milk-warm, under rather than over, the bed is fit for spawning. 3. Break the spawn into pieces about the size of eggs, taking each piece in the right hand, and with the left lift the material upwards, inserting the spawn at 10 inches apart all over the bed; afterwards give it another beating, making the surface look smooth and smart. 4. This being done, set the line 9 inches from the edge of the bed, and cut the soil down inclining outwards, making a good foundation. To cover the surface of the bed any kind of soil will do. Mine is light and rich, but just the common garden stuff. Put 2½ inches on before beating, then sprinkle over with sand to make it work clean; begin at one end, and again beat it well, always drawing the spade downwards as the stroke is delivered, till you get the whole finished. Cover up if in winter—say October—with 5 inches of straw or very dry dung, placed so that the wet cannot get in. It will now have the appearance of the roof of a hayrick. Put a mat lengthways over all, and re-insert the sticks, looking at them sometimes to determine whether the bed is getting too hot, or over milk-warm; if so, uncover, but put the mat on this time crossways, to keep out the wet. In this way abundance of mushrooms are grown in the open air. *R. Gilbert, in the "Field."*

Diamonds.—Professor Tyndall has succeeded in igniting a diamond in oxygen by the concentrated rays of the electric light. The Professor has no doubt of his ability to ignite the diamond by the invisible rays from the same source.

The Almond Tree is a native of the Levant, and is extensively grown in Provence. There are two principal kinds of it: the one produces the bitter and the other the sweet fruit. Both the latter will yield the medicinal oil equally, but the former only will, by distillation, give laurel-water. There should not be more than 80 of these trees planted per hectare; each will produce six kilogrammes of what the French call *amandes princesses*, a hectolitre of which weighs about 56 kilogrammes. The Almonds are gathered about the beginning of September, when the outer drupaceous envelope opens of itself; this is good food for cattle. Of the above-mentioned quality Provence exports 20,000 bales of 120 kilogrammes each, value 160 to 170 francs per 100 kilogrammes; but in 1866 the crop was so small that the price rose to 340 francs. The kind called *amandes à la dame* are cheaper, and cost from 75 to 86 francs with the outer shell on, and about 130 francs without. The Bouches-du-Rhone exports 12,000 bales; the Hautes and Basses Alpes, 18,000; Vaucluse, 8000; and the Var not more than 1000. *The Press.*

Production of India-rubber. The *North American Review* states that there are now in America and Europe more than 150 manufactories of India-rubber articles, employing from 400 to 500 operatives each, and consuming more than 10,000,000 lb. of gum per annum. The business, too, is considered still to to be in its infancy. Certainly it is increasing. Nevertheless there is no possibility of the demand exceeding the supply. The belt of land around the globe, 500 miles north and 500 miles south of the equator, abounds in trees producing the gum; and they can be tapped it is said for 20 successive seasons. Forty-three thousand of these trees have been counted in a tract of country 30 miles long, and eight wide. Each tree yields an average of three tablespoonfuls of sap daily, but the trees are so close together that one man can gather the sap of 80 in a day.

The Discovery of America.—Mr. J. Hanlay, the Chinese interpreter at St. Francisco, says *The Press*, has published a pamphlet maintaining that the Chinese discovered America 1400 years ago. They described it as 20,000 miles from China. "About 500 years ago," says Mr. Hanlay, "Buddhist priests repaired there, and brought back the news that they had found Buddhist idols and religious writings in the country." Mr. Hanlay says that there is a resemblance between the Aztec religion and Buddhism. He further says that the Chinese called the new land Fosanay, after a tree like the Bamboo, from which the natives made cloth and paper, and the fruit of which they ate. Mr. Hanlay compares this with the statement of the Conquistadores, that the Aztecs from the pulp of a tree made paper, and used the roots and fermented spirit for food. He also relies upon a resemblance both in language and features between the Chinese and the tribes of Middle and Central America. It is probably certain, we may add, that the Chinese discovered Australia, and set it down in their maps as "Greater Java."

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Thriving plants of the noble *Lilium auratum* will now generally be forming their young growths preliminary to flowering. It is questionable whether we yet thoroughly understand the requirements of this plant; certain it is, that out of the large quantity annually imported into this country thousands are lost from some cause or another. And, in fact, instead of increasing the stock annually, in proportion to the increase which takes place with most other introductions, there is a too frequent decrease in the numbers of this plant. One or two points are observable in regard to their culture. They seem to have a decided aversion to being dried off and potted early in the winter, whilst they are dormant, so far as foliage is concerned. They certainly do not like a too plentiful supply of pot room, and appear to thrive far better in small-sized pots than when buried in large balls of soil. Perhaps there are few worse mistakes in the culture of new plants, than the desire to induce a luxuriant growth by potting them too often and affording too large shifts. Perfect drainage is of the utmost importance in the cultivation of the Lilium. Those which are making strong shoots, and growing in pots which are too small for their increasing wants, should therefore be attended to in this respect, the previous remarks being fully taken into consideration. They do not require artificial heat; any place or position where light is abundant, and where they will be free from frosts or cutting winds, will suit admirably. Give to all *Stove and Greenhouse Climbers* which are cultivated in pots all the benefit of the light by frequently turning the pots round, so that all sides may enjoy its beneficial influences alike. Train neatly and permanently all young growths as they are formed. *Bouvardia* should be induced to push its growth vigorously under favourable conditions, for it matters not how well the plants may have been prepared for blooming during the past autumn if natural laws are not obeyed at this particular season. I repeat, the fullest possible exposure to light is of the utmost advantage in regard to the successful treatment of this lovely species. Syringe *Orange* and *Citron Trees* freely now. Dash the water forcibly over their whole surface, as much to give them a thorough cleansing as to meet their natural wants at this period. In our sluggish climate we have little of the abundant outpourings of rain of more than tepid warmth that even Italy—where the Citrus is so thoroughly acclimatised—is subject to. In treating this genus we should not only bear this fact in mind, but also consider that the species are natives of India, China, and the tropical parts of Asia, and that a liberal treatment as regards heat and moisture would be desirable, and even prove beneficial to them. The lovely *Oleander*, or *Nerium Oleander*, should be pushed along now. It likes a compost composed of peat, loam, and cow-dung; and now that its season of activity has arrived, it should have abundance of root moisture. Inhabiting as it does the sides or natural embankments of the courses of streams in Palestine and Barbary, it will be seen how essential is the proper observance of the above suggestion. Give to pot *Rose-*

which are in bloom-bud alternate waterings with strong, clear manure-water. They do very well when guano-water alone is used, in strength about 2 oz. to the gallon of water.

FORCING HOUSES.

Where Grapes are ripening on *Vines* growing in outside borders, and which have been maintained at a proper warmth up to the present time, it will be well now to remove the heating materials, after which place a layer of short decomposed manure thereon, to allow the beneficial influence of the atmospheric warmth to enter and permeate the border thoroughly. If the heating material previous to its removal is agreeably warm, it will be advisable to place a sensible covering of some light, dry material on the borders nightly, removing it each morning when the sun shines brightly. Where Vines are at this time being kept back to produce a late crop, they will require watching, and should the buds break, the canes must be fixed into their proper place, and started properly forthwith. To try and retard them further after this stage is to do them certain injury, so far as the future crop is concerned. Bring them along gradually by keeping the atmosphere surrounding them down to as low a temperature as possible, by affording plenty of air ; and if it be wished to retard them to the utmost limit possible, shade them for a week or two just at mid-day, when the sun shines brightest and hottest. *Pines* which are now making a "frim" kindly growth will require shading when the sun shines brightly and not obscured by occasional clouds. If this is neglected the tender epidermis or leaf-surface will become prematurely bronzed or hardened over, a circumstance which exerts a dwarfing influence on the whole plant. Even fruiting plants will need such an amount of care when the sun is at its hottest—between 11 A.M. and 2 P.M. The shading, however, should be of the thinnest material possible, not any coarse cloth or canvas "stuff," but such a slight material as will admit the light in a subdued form, and obviate its more scorching influences. *Peaches, Nectarines, Cherries,* and all stone fruits should not have too warm an atmosphere during dull weather.

HARDY FLOWER GARDEN.

All *Hardy Annuals* may now be sown in the open borders with far less risk of injury than would have been the case a few weeks since. As soon as we are favoured with a good soaking of rain it will be necessary to fresh trim the sides of all walks which are enclosed within grass sward. When cut the portion to be removed should be chopped away with a strong hoe to a uniform depth with the existing sides of the walk and in keeping therewith. Make fresh plantations of the Czar, or any other desirable variety of *Violets*, by dibbling in singly single young shoots, with roots attached, into any freshly dug garden soil.

HARDY FRUIT GARDEN.

It will be advisable now to partially uncover all outdoor *Fig-trees.* In the majority of instances the best way will be to uncover them wholly ; to nail them into their places and then place some less permanent form of covering against the branches for a few weeks. By these means the sun will be able by its warmth to force them into some amount of activity, and yet the excessive cold of frosty nights will be warded off. Particularly attend to the hoeing and cleaning of all *Strawberry beds*, that no weeds or other injurious matter impede their growth at this season. Do not keep the coverings placed against *Wall Fruits* too constantly against them after this period, even by night. The beautiful soft humidity, which exists in the night air at this particular season, should not be deterred from full access to the trees. I have noticed already that the "blister" is likely to be prevalent upon the leaves of *Peach* and *Nectarine* trees; it consists of a deformed, puffy, bladder-like enlargement of the leaf surfaces, and should be removed. Whether it attacks only a part of the leaf or all, the whole of the part so attacked should be pinched off.

KITCHEN GARDEN.

Make now a more general sowing of all kinds of *Broccoli* which it is intended to grow. Sow also a succesions of *Spinach* upon a rich and cool soil. Transplant the last batch of autumn-sown *Lettuces* in a like soil and position. Those who have the last sown *Peas* and *Broad Beans*, now coming through the ground, should sow successional rows forthwith. Plantations of *Seakale*, which have been forced where they grow, should now have all litter or fermenting materials removed, so that no impediment to a good early summer's growth may remain. In instances where the crowns were not cut off below the ground line when the crop was taken, this should now be done, as to have them stalky at this season is to induce a long, ugly growth, which is objectionable not only in appearance but also bad for the purposes of forcing in the winter. *W. F.*

TOWN GARDENING.

THE *Pompon Chrysanthemum*, which is a most useful plant for town gardens, being always green, of compact habit, and flowering freely in great variety of colours, should now be propagated by dividing the roots, or by means of cuttings ; these latter should now be put in for filling the beds in the ensuing autumn. The varieties used for this purpose should be kept separate, and put in about 2 inches apart in any back border close together, and topped when about 3 inches high, and transplanted about a foot apart ; they can remain till the bedding plants begin to decline, when they can be removed into the beds, where, if well watered, they will not suffer by the moving. The *Crocus* leaves should be now neatly tied together, and a little mould thrown over the roots, and left till the tops are quite dead. *Hyacinths* will now require support by means of small sticks placed firmly in the ground close to the bulbs, to which the plants should be neatly tied. *J. D.*

ORCHARD HOUSE MANAGEMENT.

By this time most of the occupants of these houses will have finished flowering and set their fruit, at least Peaches, Nectarines, and Apricots will have done so, and perhaps some of the Plums and Cherries ; when, therefore, the setting of the fruit is fairly accomplished, the house should be kept closer, and a little warmer if possible, so that the young fruits, now that they have begun to swell and grow, may go on kindly and receive no check. The present clear, bright, sunshiny weather is very favourable for orchard-houses which have no artificial heat. *Temperature and Ventilation.*—In clear, warm mornings ventilate freely and early, and shut up by times in the afternoon, say about 3 o'clock. The temperature may range by day from 60° to 80°, or even higher just after being shut up. This shutting up early, so to enclose a body of sun-heated air, is a great point in orchard-house management. By so doing the night temperature, which is still frequently very cold and ungenial out-of-doors, is much increased within. Therefore husband as much sun-heat as possible, to ward off the cold of the succeeding night. In cold, dull, wet, windy days little ventilation will be required. *Atmosphere.*—Maintain a genial humid atmosphere at all times when the thermometer stands above 50°, by plentifully sprinkling the borders and pathways with water. When colder than 50° a drier atmosphere must be maintained, as moisture then tends to make the air still colder. If the day is likely to be warm and bright, syringe the trees freely early in the morning, or say between 7 and 8 o'clock, and again at 3 o'clock in the afternoon. If cold and dull it is better to syringe but little, excepting for the eradication of insects. *Insects.*—Look closely after all sorts of insects. Firstly, we have the red spider, which will be already beginning its ravages. Its effects may be first noticed by a silvery-like look on the upper side of the small leaves. To meet this enemy syringe freely with clear water, or with a little sulphur, taking care to wet the under side of the leaves, where the insects are. Secondly, there are two sorts of aphis—the green and the black fly, the latter being the worst and most difficult to destroy. The best mode of destroying these is undoubtedly the use of tobacco smoke, where it can be applied ; Pooley's tobacco-powder is also a very good thing. The way to apply this is first to slightly damp the leaves by syringing, and then to dust the powder all over the insects and over every part of the plant with a common penny pepper-box. The succeeding day slightly moisten the powder on the shoots with a fine syringe, &c., and the third day syringe them freely, when they should then be clean, but if not repeat the operation and persevere. Thirdly, we have caterpillars and grubs. These will be found chiefly destructive to Apricots, Plums, and Cherries, and there is no means of destroying them except by hunting for them and catching them one by one. They feed upon the expanding flowers and leaf-buds of these plants, and their presence may be detected thus :—The blossoms of the Plum or of the Cherry are found glued together ; these must be separated carefully, and a little reddish-brown grub will be seen, which must be destroyed with the point of a knife. And then the expanding leaves on the points of the young shoots, especially on those of the Apricot, Plum, and Cherry, will be found glued or fastened together like knots ; these must be unfolded carefully, and the little caterpillars and grubs which will thus be found destroyed. They must be looked for continuously ; whenever two leaves are found fastened together, there one or more may be detected. The unfolding of the leaves must be done carefully, as, when disturbed, the grubs slip out and let themselves down to the ground by a thread, which they spin, and by which they again rise to resume their ravages. Some of these grubs are not more than 1-8th of an inch in length, and no thicker than a needle, and, being nearly of the same colour as the leaves, they are not easily observed. Scores of them will frequently be found on a single small plant, whose leaves they speedily destroy. They must, therefore, be incessantly hunted for. There are some three or four distinct species of these grubs, which prey upon our orchard-house trees. In the open air the little titmouse and other birds feed upon and destroy them ; in the orchard-house, however, the labour is left to us, and must be performed by our own hands. *Disbudding and Stopping.*—It will be necessary to do just a little at this now. Where the young shoots or buds are crowded, thin out a few by rubbing them off entirely, and stop the others when they reach a few inches in length. Apricots, Plums, and Cherries should have the shoots pinched very closely—the closer the better, excepting where it is required to have the trees attain a larger size. *B.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, APRIL 20, 1870

1870. MONTH AND DAY. April	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition: Dew Point.	Degree of Humidity.	Amount of Vapour in a Cubic Foot of Air.	Direction of Wind.	Horizontal Movement.	Rain in Inches.
	Ins.	Deg.	Deg.	Deg.		Gr.			
14 Thurs.	30.08	55.3	53.6	45.9	77	3.6			
15 Friday	30.20	54.6	48.1	40.9	63	3.0			
16 Satur.	30.31	49.3	46.0	42.1	77	3.1			
17 Sunday	30.25	54.9	49.2	41.8	66	3.3			
18 Monday	30.10	46.0	44.0	41.8	89	3.1			
19 Tues.	29.88	57.5	51.2	45.5	64	3.4			
20 Wednes	29.87	71.3	58.0	42.4	43	3.7			

1870. MONTH AND DAY. April	TEMPERATURE OF THE AIR: Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	WIND: Direction.	Horizontal Movement.	RAIN: In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
14. Thurs.	65.2	47.1	18.1	51.0	+ 9.0	WSW. to NW.	255	0.00
15. Friday	64.6	42.5	22.1	52.2	+ 6.0	NW.	180	0.00
16 Satur.	65.2	37.9	27.3	50.4	+ 4.9	Calm; WSW.	105	0.00
17 Sunday	64.3	40.0	24.3	50.7	+ 5.0	WSW. to E.	225	0.00
18 Monday	57.3	39.3	18.0	45.8	+ 0.8	E.	270	0.00
19. Tues.	54.8	30.2	24.6	43.0	+ 0.6	E. S.E.	186	0.00
20 Wednes	58.7	45.5	13.2	60.5	+13.8	S.	100	0.03

April 14.—Variable amounts of cloud prevalent. Generally fine. Hazy. Solar and lunar halos and lunar corona.
" 15.—Small amounts of cloud prevalent. Hazy. Fine. Lunar corona.
" 16.—Generally cloudless. Very fine. Dense haze.
" 17.—Generally cloudless till 8 P.M ; the sky then became suddenly overcast. Great decrease of temperature between 7 and 8 P.M.
" 18.—Overcast till 10 A.M. ; cloudless after noon and very fine.
" 19.—Cloudless throughout. Heavy dew at night.
" 20.—Generally cloudless in the evening. Small amounts of cloud prevalent. A very fine and mild day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, APRIL 16, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR: Highest.	Lowest.	Range of Weekly Temperature.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	67.0	31.0	36.0	56.1	40.1	16.0	48.1	0.00
Blackheath ..	65.2	37.0	28.2	56.5	40.0	16.5	48.2	0.07
Bristol ..	65.7	37.7	28.0	58.0	40.6	17.4	49.3	0.08
Birmingham ..	68.1	36.2	31.9	58.8	41.7	17.1	50.2	0.48
Northampton ..	67.1	36.7	30.4	57.0	41.1	15.9	49.0	0.11
Leicester ..	66.5	42.5	24.0	56.7	39.0	17.7	47.8	0.17
Nottingham ..	67.5	43.5	24.0	57.1	40.8	16.3	49.0	0.14
Sheffield ..	70.8	36.0	34.8	56.1	41.8	14.3	48.5	0.01
Liverpool ..	59.8	38.0	21.8	54.1	41.2	12.9	46.3	0.23
Manchester ..	60.0	36.0	24.0	54.1	41.4	12.7	47.8	0.40
Salford	66.5	37.9	27.6	54.9	40.8	14.1	47.4	0.46
Bradford ..	63.6	37.2	22.6	54.7	42.1	12.6	47.0	0.22
Leeds	63.0	36.0	26.0	56.3	42.7	13.6	49.0	0.27
Hull	68.0	42.0	26.0	56.3	47.7	20.6	47.5	0.09
Newcastle ..	60.0	37.0	23.0	51.8	41.4	10.4	47.1	0.45
Edinburgh ..	62.7	42.0	20.7	..	..	..	50.5	0.00
Glasgow ..	57.9	35.5	22.1	..	..	..	47.5	0.31
Dundee ..	66.0	47.0	18.0	..	..	..	50.7	0.00
Aberdeen ..	66.0	34.1	31.9	..	..	..	48.0	0.00
Paisley	60.8	34.0	26.8	..	..	..	46.4	0.15
Greenock ..	54.5	38.0	16.5	..	..	..	47.8	0.63
Leith	65.5	40.4	25.1	..	..	..	49.5	0.05
Perth	68.0	31.0	34.0	..	..	..	51.2	0.00
Dublin	63.9	34.0	29.9	..	..	..	49.7	0.30

JAMES GLAISHER.

Notices to Correspondents.

ANTS IN HOUSES : *H. M.* Try boiling water. A hedge-hog or two would materially assist.

BOOKS : *Alex. Scott* "Hoopes' Book of Evergreens" (Trübner & Co.) will suit your purpose.

BOTANICAL DRAWING : *O. N.* We quite agree with you as to the desirability of republishing Mr. Fitch's articles and illustrations, which appeared in our pages last year.

HERBACEOUS PLANTS : *Herbert.* Mr. Robinson's recently published work on alpine plants will probably suit you.

HOLLY LEAVES, SPOTTED : *W. Hill.* The spots on your Holly leaves are caused by the larva of some insect which feeds upon their succulent tissue, leaving the cuticle untouched. There are many insects which have this habit. A familiar case is that of the grub which does so much injury to Celery leaves. *M. J. B.*

NAMES OF PLANTS : *D. T. F.* Myosotis sylvatica flore albo, not M. dissitiflora.—*W. T.* Scilla italica.—*A. Smythies.* Probably Holcus, or Sorghum saccharatum.—*L. R.* The Loquat, Eriobotrya japonica, hardy, against a south wall.—*A. Y. 1.* Juniperus excelsa, hardy ; 2, specimen insufficient to warrant naming. Our correspondents who send to be named pieces of Cypress, without flower, fruit, branch, or information as to native place, should endeavour always to send a piece of sufficient size to give an idea of the habit of growth, &c. ; or, if this cannot be done, to supply a sufficient description. *A. M.*—*H. E. B.* Luzula sylvatica, or L. pilosa ; impossible to tell which, without more developed flowers. *W. P. Shrewsbury.* Fezica viridaria, Bckl and Br.

RAISING SEEDLING PLANES : *A. R. H.* The following extract from Grigor's "Arboriculture" will perhaps assist you : —"In Britain, the tree is sometimes grown

from seeds, that are produced in round balls, which should be broken, and the seeds sifted, to separate them from the cottony substance with which they are mixed. They should be sown in March. They require scarcely any cover of soil, but should be pressed into the surface of the ground, and kept moist by being covered with leaves or spray of trees. The most speedy method of propagation is to grow the plants by layers, in a similar manner to that recommended for the Lime tree."

RATS: *J. R. J.* We cannot recommend any better plan than to persevere in trapping and poisoning.

SILVESTER'S FURNACE DOORS, &c.: *Reader.* No doubt your builder can get both bars and doors if he orders them. Those, however, who have such articles to dispose of should advertise them.

THE HYDROPULT. A correspondent would be glad of information of the address of the present proprietors or manufacturers of this implement, if there be any. The names on the instrument, which he purchased in Leadenhall Street some four or five years ago, are "Charles F. Button," London and Birmingham. The owner requiring some repair of the instrument finds no such firm in the London or Birmingham Directories.

ZOOPHYTE. Some Sertularia. As it is not of horticultural interest we cannot be more precise.

COMMUNICATIONS RECEIVED: A. M.—W. M.—H. J. O.—J. B.—W. B. S.—A. S.—F. W. B.—W. S.—G. H. B.—Kalmia.—W. H.—Conifer.—J. D. and S.—A. P.—W. W. A.—R. T. J. Adam.—J. F. E.—W. P. A.—A. F.—W. J. E.

Markets.

POTATOS.—Southwark, April 18.

During the past week the arrivals coastwise have been more plentiful; nevertheless trade was good, and the prices of the former week were well maintained. The following are this day's quotations:—Yorkshire Flukes, per ton, 110*s.* to 140*s.*; Ditto Regents, 110*s.* to 140*s.*; Lincolnshire Regents, 80*s.* to 100*s.*; Dunbar and East Lothian do., 100*s.* to 140*s.*; Perth, Forfar, and Fifeshire do., 90*s.* to 100*s.*; Do. Rocks, 85*s.* to 100*s.*; Do. Reds, 80*s.* to 90*s.*; French and Belgian Whites, 75*s.* to 85*s.*

COVENT GARDEN.—April 22.

There has been a decided falling off in business transactions during the past week, the provincial markets sharing the dulness of the trade generally. Large arrivals of Continental goods are again to hand this week. New Potatos from Lisbon, France, and Malta, which realise from 2*d.* to 4*d.* per lb. Flowers are plentiful and good, comprising Azaleas, Fairy Roses, Hyacinths, Cyclamens, Tulips, French and Scarlet Pelargoniums, Heaths, &c.

FRUIT.	*s. d.*	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve	3 0	5 0	Melons, each		
Cobs, per lb.	0 9	1 0	Oranges, per 100	3 0	7 0
Filberts, per lb.	0 6	0 9	Pears, per doz.	4 0	10 0
Grapes, per lb.	1 0	20 0	Pine-apples, per lb.	8 0	10 0
Lemons, per 100	4 0	8 0	Strawberries, p. lb.	6 0	12 0

VEGETABLES.	*s. d.*	*s. d.*		*s. d.*	*s. d.*
Asparagus, p. bund.	3 0	15 0	HorseRadish, p. bun.	3 0	5 0
Artichokes, p. doz.	3 0	6 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, per score	1 0	2 0
Broccoli, per doz.	1 0	2 6	Mint, per bunch	1 0	1 6
Brussels Sprouts, p. ½ sieve	2 0	3 0	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz.	1 0	3 0	Onions, per bunch	0 4	0 9
Carrots, p. bunch	0 4	0 8	Potatos, new, p. lb.	0 4	0 6
Cauliflowers, p. doz.	1 6	3 0	Salsafy, per bundle	1 0	1 3
Celery, p. bund.	1 0	1 6	Scorzonera, do.	1 0	1 3
Cucumbers, each	1 6	3 0	Seakale, p. punnet	2 0	2 6
Endive, per doz.	1 0	2 0	Shallots, per lb.	0 6	
Garlic, per lb.	0 8		Spinach, p. bushel	2 0	3 0
Herbs, per bunch	0 2	0 4	Radishes, per doz.	1 0	1 6
			Turnips, per bunch	0 4	0 6

Potatos, York Regents, per ton, 80*s.* to 110*s.*; Flukes, do., 80*s.* to 14 *s.*

Vegetable, Agricultural, and Flower Seeds.
MISCELLANEOUS HARDY BEDDING PLANTS, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. The stocks of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.
Exotic Nursery, Tooting, S.W.

GIANT ASPARAGUS PLANTS, the best that money can procure, 2*s.* 6*d.* per 100. This delicious Vegetable does not require half the expense usually incurred in planting it
See RICHARD SMITH'S SEED LIST for 1870
Extra strong SEAKALE, 2*s.* 6*d.* per 100
RICHARD SMITH, Nurseryman, Worcester

IVERY'S NONSUCH LETTUCE.—The best Summer variety in cultivation; will stand a month longer than any other kind without running to seed; 1*s.* per packet, sealed with initials, I. M. & I. Price to the Trade on application.
A GENERAL SEED CATALOGUE can be had post free on application. The Trade supplied with superior MUSHROOM SPAWN. Hanson Nurseries, Peckham, S.E.

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer for cash the AMERICAN RED POTATO, it has produced over 16 Tons to the acre this year. DOUBLE GERMAN WALLFLOWERS, 6*s.* per 100; SINGLE WALLFLOWERS, 2*s.* 6*d.* per 100; VARIEGATED KING DAISIES, CROWN DAISIES, WHITE DAISIES, all at 5*s.* per 100. Splendid mixed Laced PINKS, 4*s.* per 100. White SPANISH ONION SEED, 2*s.* per lb. All new and genuine.

Paterson's Bovinia, or Cattle-Feeder Potato.

MRS. WM. PATERSON, Widow of the late Wm. Paterson, Propagator of the Potato Plant, would particularly call attention to PATERSON'S BOVINIA, or CATTLE-FEEDER POTATO, the most valuable tuber out, and heaviest cropper in the known world; does to be planted so far asunder as on the head rigs of Turnip fields, and will grow 20 tons per acre on land where finger-and-toe destroys Turnips, also on land where Mangel cann the grow to profitably. With extra culture 40 tons per acre have been grown, and many of the tubers weigh from 4 lb. to 6 lb. each; it also keeps in good condition for twelve months, and is excellent for table use. Mrs. Paterson would also call attention to her valuable stock of SEED POTATOS, namely, Paterson's Victoria, or Queen Potato, Paterson's Blue, &c.
Mrs. WM PATERSON, 38, Union Street, Dundee

WANTED IMMEDIATELY, an experienced GENERAL FOREMAN and PROPAGATOR.—Address, stating age, former engagements, references, and salary required, R. THORNHILL, Nurseryman, Bowdon, Cheshire.

WANTED, where a good Collection of Plants are grown, a clever young Man as PROPAGATOR, and to assist in the Growing under the General Manager. State wages, and where employed.—J. & R. THYNE, Woodside Nurseries, Glasgow.

WANTED, as GARDENER, a trustworthy, steady, industrious young Man, who thoroughly understands and has been used to Early and Late Forcing of Vegetables for Market. None need apply who have not been employed in Growing expressly for Sale.—Mr. C. SHIPPAM, Chichester.

WANTED, a young Man, who has had experience in GRAFTING Camellias, Azaleas, &c.; also one to assist in the Houses, Potting and Tying.—Apply at the Royal Nurseries, Clapham, S.

WANTED, a YOUNG MAN, thoroughly acquainted with the Agricultural Seed Trade.—Apply, stating experience and terms expected, to GEO. RUTHERFORD, Manager for J. B. Lawes, Seed Warehouse, Market Street, Shrewsbury.

WANTED IMMEDIATELY, THREE or FOUR YOUNG MEN, accustomed to Vine Culture, Grape Thinning, and Plant Growing. Wages 12*s.* per week, with lodgings on the grounds.—JEFFERY MUNN, Gardener, Inveresk, Dalkeith, Scotland.

WANTED, a stout, active YOUNG MAN, to make himself generally useful in a Gentleman's Garden, where he will be able to learn his business in the houses and out.—Mr. G. SMITH, Wembley Park Gardens, near Harrow, Middlesex.

WANTED, an industrious middle-aged married MAN, without family, to take charge of a Farm House, and make himself useful. His Wife must be a decent person, as she would have to attend to the gate. Wages, 19*s.* per week, cottage, milk, and a part of his firing.—State age, &c., to A. B., Post Office, Epping, Essex.

CHARLES SHARPE AND CO., Sleaford, are WANTING a young, energetic Man as TRAVELLER; he must be of good business habits, and good address.—Apply as above, stating qualifications and references.

Seed Trade.

WANTED, a TRAVELLER and CLERK.—Must be experienced, and able to give first-class references as to character and qualifications.—Apply, in own handwriting, stating salary required, to Y. Z., *Gardeners' Chronicle* Office, W.C.

WANTED, in Mr. LOUIS VAN HOUTTE'S Office, a first-rate ENGLISH CLERK.—Royal Nursery, Ghent

WANTED, a good PLAIN COOK, in a Gentleman's Family, where assistance is given in the Kitchen; also a Single-handed PARLEY-MAID.—W. R., T. M. Smith's, Linthorpe Road, Middlesborough.

WANT PLACES,—Letters to be Post Paid.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those who WISH SITUATIONS will send their NAME and ADDRESS, and COPIES of TESTIMONIALS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen requiring them on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters they can bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

JOHN HARRISON begs to inform Noblemen and Gentlemen that he has on his BOOKS a number of Clever and Experienced MEN, with Characters from the Noblemen and Gentlemen of the highest order.—North of England Rose Nursery, Darlington.

To Wholesale Seed Merchants and Seed Growers.

A GENCY, for the Sale of Seeds and Oil-cakes, wanted, by an Englishman, resident in Dublin, who has a large connection, and visits all the principal towns throughout the country. First-class references, and security given if required.—Letters to 24A, Lower Ormond Quay, Dublin.

GARDENER (HEAD).—Single; has had 16 years' experience in all branches of the profession. No objection to a first-class Foreman's place. Highly recommended by a Lady, or Gardener where last employed.—A. W., Post Office, Leatherhead, Surrey.

GARDENER (HEAD).—Age 30, married, no incumbrance; 17 years' experience in all branches of Horticulture, in thoroughly practical Gardens. Two and a half years as Head Gardener in last situation; highly recommended.—A. B., 23, Stafford Place, Pimlico, London, S.W.

GARDENER (HEAD).—Age 30; 15 years' experience in Noblemen's and Gentlemen's establishments; thoroughly experienced in the Culture of Stove and Greenhouse Plants, Pines, Vines, and all kinds of Forcing, and Flower and Kitchen Gardening. Good character from last situation.—F. D., 2, York Street, Bedminster, Bristol.

GARDENER (HEAD) to any Nobleman or Gentleman requiring the services of a thorough practical Gardener in every branch of the profession.—Age 36, married; can be highly recommended by his last employer. Leaving in consequence of reduction of establishment.—W. BROWNBRIDGE, The Gardens, Worsbrough Hall, Barnsley, Yorkshire.

GARDENER (HEAD).—Age 27, married, no incumbrance; thorough practical knowledge of Gardening in all its branches, including Early and Late Forcing of Fruit and Vegetables, Vine, Stove, and Greenhouse Plants, Flower and Kitchen Gardening, also the Management of Land and Stock. Good character; can be highly recommended.—T. A., Post Office, Reigate, Surrey.

To Orchid Growers.

GARDENER (HEAD), age 27.—J. SHERRATT, Nurseryman, &c., Knypersley Nursery, near Congleton, can confidently recommend a practical industrious Man as above to any Lady or Gentleman requiring his services. Understands Gardening in its various branches, is a first-rate Grower of Orchids, and can have first-class testimonials

GARDENER (HEAD) to any Nobleman or Gentleman requiring a first-class practical Man.—Age 30, married; fully competent in every branch of the profession, including Specimen Plant Growing, Early and Late Forcing, Spring, Summer, and Picturesque Gardening. Can be highly recommended, with five years' unexceptionable character.—HENRY BURNHAM, 8, Crofton Terrace, Blythe Road, Hammersmith, W.

GARDENER (HEAD).—THOMAS WOODFORD, Gardener to his Grace the Duke of Abercorn, Eastwell Park, Ashford, Kent, can with great confidence recommend his Foreman (who has been with him upwards of four years) to the notice of any Nobleman or Gentleman requiring the services of a thoroughly steady and honest young Man, with a good general knowledge of his profession. T. W. will be happy to answer all inquiries.—Address as above

GARDENER (HEAD).—Age 37, married, no incumbrance; well skilled in all branches of the profession. Highest references.—W. B., 14, Adams' Square, Bromley, Kent.

GARDENER (HEAD).—Married, no incumbrance; well skilled in all branches of Gardening. Highest reference.—W. MOORE, 2, Linton Grove, Lower Norwood, S.

GARDENER (HEAD).—Middle-aged, married, no incumbrance. Over 9 years in last situation.—JAMES FOWLER, Plompton Hall, Knaresborough, Yorkshire.

GARDENER (HEAD).—Age 30, no incumbrance; thoroughly experienced in all branches of the profession. Good character.—R. G., Post Office, Knockholt, near Sevenoaks, Kent.

GARDENER (HEAD).—Age 37, married, no incumbrance; understands the profession in all its branches. Three and a-half years' good character.—C. P., Mr. Rycroft, Tooting, Surrey.

GARDENER (HEAD).—Married, no incumbrance; well skilled in all branches of the profession. Highest references.—L. X., 16, Pery Hill, Caltford, Kent.

GARDENER (HEAD).—Married; thoroughly experienced in the Culture of Stove and Greenhouse Plants, Pines, Vines, and all kinds of Forcing, first-class Flower and Kitchen Garden. Good character.—R. S., Mottingham, Eltham, Kent, S.E.

GARDENER (HEAD).—Married, no incumbrance; thoroughly practical and fully competent in every branch of the profession. Highest references.—C. D., Cheshire's, 14, Grove Road, Holloway, N.

GARDENER (HEAD), age 40.—A Gentleman, changing residence, is anxious to recommend his Head Gardener to any Nobleman or Gentleman requiring a thoroughly practical Man. Six years' character.—J. B., Stoke Park, Stoke Bishop, Bristol.

GARDENER (HEAD).—Age 31, married; has a thorough practical knowledge of the profession. Highly recommended by the Gentleman he is now leaving.—A. HILL, Gardener, Coopersall Hall, Epping, Essex

GARDENER (HEAD).—Age 30, married; understands the Cultivation of Fruits, Vines, Mushrooms, Cucumbers, &c.; Early and Late Forcing, and Flower and Kitchen Gardening. Good character.—W. M., 9, Windsor Street, Harrow Road, Paddington, W

GARDENER (HEAD).—Thoroughly understands Early and Late Forcing, as well as Flower and Kitchen Gardening. The best references can be given.—S. C., Post Office, Frome, Somerset

GARDENER (HEAD).—W. HALL, late Chief Gardener to the Princess Bachiocchi in France, is now open to an engagement with any Lady or Gentleman. Has had 14 years' experience in the English and Continental Gardens. Can be highly recommended.—W. HALL, The Exotic Nursery, Tooting, Surrey.

GARDENER (HEAD).—Age 45, married, no incumbrance; 30 years' practical experience in Gardening in all its branches. Leaves through death of his employer and breaking up of establishment, where he has lived six years.—W. HEWITT, The Park, Leytonstone, Essex, N.E.

GARDENER (HEAD).—Age 36, married, no incumbrance; thoroughly competent in all branches of the profession, and in the Management of Land. Good recommendations from present and previous employers.—GARDENER, Mr. Cranston, Nurseries, King's Acre, Hereford

GARDENER (HEAD, Working, or where two are kept).—Understands Forcing Fruits and Vegetables, also the Management of Flower and Kitchen Gardens. Can be highly recommended.—J. COOPER, Eppinghall, Epping, Essex.

GARDENER (HEAD), where two or more are kept.—Age 32; thorough knowledge of Plants and Flower and Kitchen Gardening; also Pleasure Grounds and Meadow Land. First-rate testimonials.—R. S., Mr. John Ley, Nurseryman, Croydon, S

GARDENER (HEAD), where one, or more than one, Under Gardener is kept.—Understands the Cultivation of Cucumbers, Melons, Vines, &c. Twelve months' character from last and previous situations.—B. B., Mrs. Fawcett, Grocer, Ollerton Road, Ollerton, Newark, Notts.

GARDENER (HEAD), where two or three are kept.—Age 26, single; has a good practical knowledge of Vines, Vines, Cucumbers and Melons, Stove and Greenhouse Plants, and Flower and Kitchen Gardening. Steady, active and industrious. Can be highly recommended by several Head Gardeners.—N. B., Post Office, Ilkley, Yorkshire

GARDENER (HEAD), where two or more are kept.—Age 35, married; thoroughly up in Forcing all kinds of Fruits and Flowers, also a thorough good Kitchen and Flower Gardener. Can give good reference. Three and a half years in last situation. Satisfactory reasons for leaving.—M. N., 151, Queen's Road, Bays water, London, W

GARDENER.—Age 30; understands Kitchen and Flower Gardens, Greenhouse, Growing of Cucumbers, Melons, &c. One year and nine months' character.—A. B., 155, Wirtembergh Street, Clapham, S.W.

GARDENER (SECOND), in a Gentleman's Garden.—Age 26; eight years' experience. Can be well recommended.—G. W., Kyston Hall, Downham, Norfolk.

GARDENER (UNDER), in a Nobleman's or Gentleman's Family.—Age 20; good reference.—E. D., 7, Alma Terrace, Wandsworth Common, Surrey.

GARDENER (UNDER), in Plant or Flower Garden Department.—A steady young Man, with two years' good character.—J. B., Post Office, Eynsham, Oxon.

GARDENER (UNDER), where he can obtain a good knowledge of House-work.—Age 20; has had some experience in the above. Good character. A Premium not objected to.—J. K., 3, Hunter's Place, Chelsea, S.W.

GARDENER and BAILIFF, or GARDENER only, in a Gentleman's Establishment.—Age 30. Good references.—A. Z., *Gardeners' Chronicle* Office, W.C.

PROPAGATOR, or PROPAGATOR and SALESMAN.—Well up in Azaleas, Camellias, Coniferæ, Roses, Rhododendrons, &c. Unexceptionable reference.—R. H., Paul's Nurseries, Waltham Cross, London, N

IMPROVER, in the Houses.—Age 19; will pay 2*l.* per week Premium. Good character.—C. D., H N Bransby, Alton, Hants

IMPROVER.—A Lady is desirous of procuring Employment for a Lad, between 15 and 16 years old, in a Gentleman's Garden, where he would be lodged in the premises. Respectable references can be given.—J. P., Post Office, Chapel Street, Belgrave Square, London, S.W.

BAILIFF.—Age 45, married, no incumbrance; good references.—M. P. G. Jackson, 83, Westbourne Park Road, Paddington, London, N.W.

BAILIFF, to a Nobleman or Gentleman.—Middle-aged; has had great experience in the Counties of Lincoln, Nottingham, and Sussex, both on Light and Heavy Lands. He is competent to undertake the Cropping of Land and Hop Culture, the Management of Stock and Sheep, has been accustomed to Steam Cultivation, and is well acquainted with the Management of Woods and all matters connected with a large Estate. Being about to leave a situation of a similar kind on a Farm of 700 acres, he is open to an engagement.—E., "Journal of Horticulture," 171, Fleet Street, E.C.

TRAVELLER or MANAGER.—Extensive experience in leading Metropolitan and Provincial Houses, and in both the Plant and Seed Trade. Excellent references from all past employers.—A. B., Milton Cottage, Kentish Town Road, London, N.W.

To the Seed Trade.

SHOPMAN.—Age 24; nine years' experience, with first-class references.—S. M. W., care of Messrs. Hurst & Son, 6, Leadenhall Street, London, E.C.

SUTTONS' GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

PERMANENT PASTURE MIXTURES, which are prepared for various descriptions of Soils.

PRICES:—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, carriage free 2 bush Grass Seeds and 12 lb. Clovers supplied p. acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. Mechi, Esq., *Tiptree Hall, near Kelvedon.*

February 5.—"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

SUTTONS' HOME-GROWN FARM SEEDS.

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

From Mr. W. McNicol, *Bailiff to the Right Hon. Lord Leigh, Stoneleigh Abbey Farm, Kenilworth.*

"*October 23, 1869.*—I have a splendid crop of Mangels, and in a general competition the other day I was successful in obtaining the 1st prize. If you wish any one to inspect the field, do so on Monday next, 25th inst."

SUTTONS'

Berkshire Prize Yellow Globe Mangel.

The heaviest Globe Mangel in cultivation, price **1s.** per lb., much cheaper by the cwt.

For prices and particulars of other varieties (**8d.** to **1s. 6d.** per lb.), see

SUTTONS' FARMERS' YEAR BOOK.

THE BEST SWEDE IN CULTIVATION IS

Suttons' Champion.

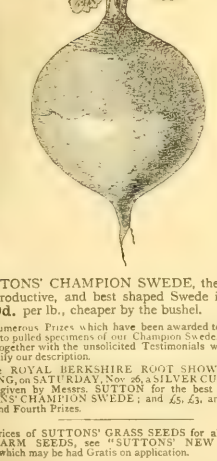

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

From J. Aspinall, Esq., *Manor House, Tingewick, near Buckingham.*

"*April 16, 1868.*—I took several Prizes last year with crops grown from your seed, and amongst them was a £10 Prize for the best general crop. I think there is no better Swede than the Champion grown."

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation; price **9d.** per lb., cheaper by the bushel.

The numerous Prizes which have been awarded to growing crops, and also to pulled specimens of our Champion Swede, during the past season, together with the unsolicited Testimonials we have received, fully justify our description.

At the ROYAL BERKSHIRE ROOT SHOW, to be held at READING, on SATURDAY, Nov 26, a SILVER CUP, value £10 10s., will be given by Messrs. SUTTON for the best 24 Specimens of SUTTONS' CHAMPION SWEDE; and £5, £3, and £2, as Second, Third, and Fourth Prizes.

For prices of SUTTONS' GRASS SEEDS for all Soils, and all other FARM SEEDS, see "SUTTONS' NEW FARM SEED LIST," which may be had Gratis on application.

All Goods Carriage Free (except very small parcels). Five per cent. allowed for prompt payment.

SUTTON AND SONS, SEED GROWERS, READING.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870.

IMPLEMENT ENTRIES CLOSE on MAY 1, and all Certificates received after that date will be returned to the Senders.

STOCK PRIZE SHEETS and CERTIFICATES are also ready, and will be forwarded on application to

H. M. JENKINS, Sec.

12, Hanover Square, London, W.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER and VALUER,

TO BE LET, the NURSERY, 16, Maida Vale, Edgware Road. Handsome Show-house and other Greenhouses in a commanding situation

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (frontage), DWELLING HOUSE, STABLING, &c., situate at Maidenhead.

Apply to Mr R. TANTON, The Nurseries, Epsom.

To Nurserymen, Seedsmen, and Others.

TO BE DISPOSED OF, a NURSERY and SEED BUSINESS, in full Trade, in a thriving Market Town, situate on the Great Western and London and North-Western Railways. Nursery Land, with Dwelling-house, with Greenhouse, Hot Water Apparatus and Pits. Good Shop in the best part of the Town. Full particulars on application, by letter only, to

X. Y. Z., Mr. Rowe, 9, Quality Court, Chancery Lane, London, W.C.

SALES BY AUCTION.

Camberwell,

EXTENSIVE CLEARANCE SALE of CHOICE STOVE and GREENHOUSE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS have received instructions to SELL by AUCTION, on the Premises, Camden Nursery, Southampton Street, Camberwell, Surrey, on MONDAY, April 25, and two following days, at 12 o'Clock precisely each day, by order of the Executrix of the late Mr. William Barnes (without reserve), the whole of the valuable COLLECTION of STOVE PLANTS, comprising 5000 thriving young plants of Dracæna Cooperi, Veitchii, striata, ferrea, and others; large quantities of Gardenias, Ixoras, Marantas, Medinillas, Caladiums, Stephanotis, Ficus, Eucharis, Aralias, and thousands of choice Greenhouse Plants, including Azaleas in variety, Pyramid Azalea indica, 2 to 6 feet, carefully trained for exhibition purposes, full of flower-buds; 3000 Standard and other small Azaleas; 350 English-grown Camellias, many of which are fine examples, 5 to 6 feet; 300 Rhododendron Edgworthii, &c.; Epacris, Erica, and Boronia of sorts; Petunias, Stocks, Myrtles, Tree Carnations; a choice collection of Exotic Ferns; Hardy Herbaceous Plants in pots, consisting of Carnations, Picotees, and Pinks; 1000 choice Phlox, by name; double Pyrethrums, Teas and other Roses in pots; together with the Vegetable and Flower Seeds, Garden Implements; also 50 two and three-light Boxes, &c.

May be viewed three days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

ALTERATION of DATE from APRIL 27 to APRIL 28.

Versailles Nursery, Hammersmith.

IMPORTANT CLEARANCE SALE.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. John Salter & Son to SELL by AUCTION, on the Premises, Versailles Nursery, Hammersmith, W., on THURSDAY, April 28, at 11 for 12 o'Clock precisely, without reserve (the land being required immediately by the Metropolitan District Railway Company), the whole of the STOCK-IN-TRADE, comprising large specimen Camellias, 6 to 10 feet; Orange trees in Fruit, handsome Araucaria excelsa, and a quantity of other useful plants for furnishing; 1000 Standard Zonal and double Geraniums, 100 Vallotas, the entire stock of Centaurea hybrida, awarded a First-class Certificate; likewise an unrivalled collection of choice and rare SUCCULENTS, comprising 600 Echeverias of sorts, 200 Pachyphytons, Bowiethias, Kleinias, Crassulas, Sedums, Aloës, and others; 1000 Sedums, Rhipsalis, &c.; large Agave, a quantity of Exotic and Hardy FERNS, including 50 Exhibition Specimens; also an extensive and interesting collection of hardy variegated HERBACEOUS and ALPINE PLANTS, 60 Plants of the new Variegated Viola odorata, a very distinct and beautiful variety, not yet sent out; 600 of the gold-striped Lily of the Valley, fine Double Pyrethrums, Pentstemons, Agapanthus, Aubrietias, &c., together with 600 named Variegated Ivies, &c.

May be viewed two days previous to the Sale. Catalogues may be had on the Premises, of Messrs SALTER, and of the Auctioneers and Valuers, Leytonstone, E.

Sale of First-class Carnations and Picotees, Standard and Dwarf Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, 38 and 39, Gracechurch Street, City, E.C., on SATURDAY, April 30, at half-past 12 o'Clock precisely, a first-class Collection of CARNATIONS and PICOTEES, the surplus stock of an eminent grower, a choice assortment of Standard and Dwarf ROSES, selected American PLANTS, clean grown FRUIT TREES, fine CAMELLIAS with buds, AZALEA INDICA, GLADIOLI, &c.

On view the morning of Sale. Catalogues had at the Rooms, and of the Auctioneers, Leytonstone, E.

Clapham, S.

CLEARANCE SALE of GREENHOUSE, STOVE and BEDDING PLANTS, GREENHOUSES, PITS, &c.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from Mr. James Over, to SELL by AUCTION, without reserve, the whole of the choice STOVE and GREENHOUSE PLANTS, including 5000 Exotic Ferns, 100 thriving Gardenia intermedia; specimen Hoya Bella, a handsome specimen Stephanotis floribunda, double Primulas, a large quantity of specimen Camellias and Azalea indica, Cyclamens, 10,000 Bedding Plants, 1000 White Giant Chrysos (the same kind that Mr. Over supplies the market with); Roses in pots, handsome Myrtles, &c.; likewise the GREENHOUSES, consisting of a Span-roof House, 80 feet long, a Span-roof House, 60 feet long, and a Lean-to House, 41 feet long; 10 two and three light BRICK PITS, Lights and Shutters, about 600 feet 3 and 4 inch HOT-WATER PIPING (put together with elastic rings), 4 capital BOILERS, thousands of Bricks, the erections of Shed and Stabling, a capital strong Market Van, and numerous other effects.

The VALUABLE LEASE of the Nursery Ground, comprising about 2½ Acres, and held on a lease for an unexpired term of about 50 years, at the moderate ground rent of £14 per annum, if not previously disposed of, will also be offered for SALE by AUCTION, on the Premises, as above, on MONDAY, May 2, at 11 o'Clock precisely, prior to the Sale of Plants

May be viewed three days prior to the Sale. Catalogues and particulars of Lease may be had of Mr. OVER, Seedsman and Florist, High street, Clapham; and of the Auctioneers and Valuers, American Nurseries, Leytonstone, Essex, E.

Edmonton.

THIRTY-ONE YEARS' LEASE of DWELLING-HOUSE, with an ACRE and a QUARTER of NURSERY GROUND, also the STOCK.

MR. A. RICHARDS will SELL by AUCTION, on the Premises, Church Street, Edmonton, on MONDAY, May 2, at 1 o'Clock, by order of the Executrix of the late Mr Thomas Barker, the LEASE of the HOUSE and GROUNDS, with Vinery 114 feet long, Span Greenhouse, Ranges of Pits, &c., held for 31 years, at the trifling rent of £20 per annum; also the STOCK, including 140 dozen double Stocks, 200 dozen scarlet Geraniums, Verbenas, Lobelias, Asters, 30 dozen Napier Strawberries, Boxes and Lights, Tools, Spring Cart, &c.

May be viewed and Catalogues obtained on the Premises, and of the Auctioneer, Tottenham.

To Gentlemen, Architects, Builders, Florists, and Others.

MR. BRIANT will SELL by AUCTION, at the Manufactory, 297, Camberwell Road, on MONDAY and TUESDAY, April 25 and 26, at 12 for 1 o'Clock, a large Stock of FOUNTAINS, FIGURES, VASES, STAGS, LIONS, BIRDS, DOGS, DOLPHINS, TRITONS, ROYAL ARMS of various sizes, BOX CHIMNEY PIECES, CENTRE FLOWERS, TRUSSES, &c. in Artificial Stone.

May be viewed two days previous, and Catalogues had on the Premises, and at the Auctioneer's Office, 200, Kennington Park Road.

Holly Bank, Burton-on-Trent.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, May 17 next, at Holly Bank, near Burton-on-Trent, the entire and very CHOICE HERD of SHORTHORNS belonging to Willoughby Wood, Esq., which are chiefly descended from the famed Kirklevington blood. Amongst them will be found the celebrated cow Oxford's Ada, the dam of the 1st prize Bull at the Birmingham Show, and other superior animals

Catalogues, with Pedigrees, will shortly be issued, and may be had on application to Mr STRAFFORD, 13, Euston Square, London; or of Mr WOOD, at Holly Bank, Burton-on-Trent.

Orchids from India, Mexico, and Demerara, just arrived, and a Collection of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, April 25, at ½ past 12 o'Clock precisely, IMPORTATIONS of ORCHIDS, in fair condition, just arrived, and containing probably many new sorts. Also a Collection of Choice ESTABLISHED ORCHIDS, consisting of CATTLEYAS, LÆLIAS, SACCOLABIUMS, ÆRIDES, VANDAS, CYPRIPEDIUMS, ODONTOGLOSSUMS, &c.

On view the morning of Sale, and Catalogues had.

Important Sale of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY and FRIDAY, April 28 and 29, at half-past 12 o'Clock precisely each day, FIRST-CLASS ESTABLISHED ORCHIDS, being duplicate plants from the Broomfield Collection, the property of Robert Warner, Esq., including many of the finest specimens ever offered for public sale, viz —

Phalænopsis Schilleriana	Cymbidium eburneum
Trichoglia crispa	Lælia elegans Warneri
,, marginata	Phalænopsis Portii
Cypripedium Lowii	Odontoglossum Alexandræ
,, villosum	,, Warneri
,, Veitchii	Saccolabium Helfordii
Aerides Schræderi	Phalænopsis amabilis
Cattleya lobata	Aerides nobile
Oncidium Weltoni	,, Fieldingii
Lælia gigantea	Cattleya Warneri
Arpophyllum giganteum	&c. &c.

And many other rare varieties, all in good order and true to name.

On view the morning of Sale, and Catalogues had.

Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, May 2, at half-past 12 o'Clock precisely, the first portion of ESTABLISHED ORCHIDS, belonging to C. H. Marshall, Esq., of Caversham, amongst which are fine specimens of

Phalænopsis Schilleriana	Cypripedium Stonii
,, amabilis	,, Lowii
,, grandiflora	,, Veitchii
Disa grandiflora	Trichoglia crispa
Odontoglossum triumphans	Oncidium marshallianum
,, Alexandræ	,, Kramerianum
Saccolabium præmorsum	,, Limminghii
,, giganteum	&c., &c.

On view the morning of Sale, and Catalogues had.

Important Sale of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, May 5, at half-past 12 o'Clock precisely, the well-known Collection of ESTABLISHED ORCHIDS of the late J. N. Clarke, Esq., of Trowbridge, including fine specimens of PHALÆNOPSIS, SACCOLABIUMS, VANDAS, ÆRIDES, CATTLEYAS, &c., all in good condition

On view the morning of Sale, and Catalogues had.

Exhibition Plants of Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY and WEDNESDAY, May 10 and 11, at half-past 12 o'Clock precisely each day, the splendid Exhibition Specimen Plants of ESTABLISHED ORCHIDS, the property of W. Marshall, Esq., of Enfield (who is giving up exhibiting and reducing his collection). These plants are well known as having taken numerous Prizes at all the principal Shows, and are in first-rate condition, including fine plants of the following:—

Odontoglossum luteo purpureum,	7 leads	Cypripedium villosum,	30 flowers
,, Phalænopsis,	20 leads	,, Schlimii,	9 spikes
Subraha macrantha,	Woolley's variety	,, caudatum roseum,	8 spikes
		Colegyne speciosa	
		Eriopsis rutidubbun	
Cattleya Schilleriana Regnellii		Lælia elegans Schilleriana,	30 bulbs
,, Trianæ Juno	1st class	,, lobosa	
,, ,, Atalanta	Certificate	,, Wolstenholmiæ,	6 leads
,, ,, Penelope	R. H. S.	Vanda gigantea,	15 pairs of leaves
Dendrobium chrysotoxum,	21 spikes	Cypripedium Parishii	
,, Schræderi,	5 leads	Phalænopsis Schilleriana	
		Lælia grandis, &c., &c.	

And many other rare and desirable varieties.

On view the morning of Sale, and Catalogues had.

(*For continuation of Sales, see page* 587.)

The Agricultural Gazette.

SATURDAY, APRIL 23, 1870.

THE several successful SALES of SHORTHORNS which have recently taken place justify the inference that when, a few weeks ago, we termed the Shorthorn "the dominant breed of cattle in the island," we were not far from the truth. Nevertheless the expression has been criticised, and the comparisons then made between the live weights of the prize animals of the leading breeds of cattle shown at the late meeting of the Smithfield Club, have been characterised as inconclusive and unjust towards another highly esteemed breed. Of course, as our conclusions tended to support the popular doctrine of the superiority of the Shorthorn, we expected that they would not be accepted without protest. Nor should they. The facts which we have investigated are good so far as they go, and bear out the results which we have arrived at; but they are only limited, and

are confined to one period and one sort of competition. Every known breed of cattle has, along with its distinctive characteristics of habit and form, its distinctive agricultural qualities, positive or negative, and is specially adapted to some circumstances of locality or need. The brick as well as the stone dressing has its place in the material structure, and the little Breton and Kerry are but links in the chain of which the Buffalo and the Shorthorn are the extremes.

To no breed, then, do we deny its special merits, when we contend that no other breed possesses *all* the qualifications essential to high merit in so great a degree as the Shorthorn. With beauty of form, style, quality, and early maturity, confessedly unequalled, the point of weight for age (the quantity of food not being taken into account) has certainly been occasionally a moot point between it and its competitors. Animals of many other breeds have at times appeared to excel it in this qualification. The modern regulations of the Smithfield Club, by giving us the live weights of all the cattle exhibited, have enabled us to test this point, for 1869, to our mind, satisfactorily ; and, therefore, so far as one experiment can speak, the result is decided and unequivocal.

The first objection, however, that has been taken to our conclusion is that, when comparing the live weights of certain breeds as exemplified in the prize animals shown at the last meeting of the Smithfield Club, we have confined our comparisons to the Devon, Hereford, and Shorthorn breeds, leaving unnoticed the Sussex, Norfolks, cross-breds, Scots, Irish, and Welsh ; so that we have done injustice, especially to the Sussex, and diminished thereby the value of our inference. To this we reply that the object was to compare only animals of such breeds as were shown under precisely similar conditions as to age, as it is only when circumstances are really identical that any truly correct deductions can be drawn from the results. And, in this instance, only Shorthorns, Herefords, and Devons were shown in classes where the ages were precisely alike. Thus in these breeds we had three classes of male animals, viz., steers not exceeding 2 years and 6 months, steers not exceeding 3 years and 3 months, and steers exceeding 3 years and 3 months, and "heifers not exceeding 4 years," and "cows above 4 years old." In Sussex and cross-bred stock, on the other hand, we had only two classes of male animals—"steers not exceeding 3 years old" and "steers above 3 years old," and "heifers not exceeding 4 years old" and "cows above 4 years old ;" and in Longhorns, Norfolks, Scotch Horns, Scotch Polled, Irish and Welsh, we had only "steers of any age" and "cows of any age." It is evident, therefore, that our comparison of classes must be between the Shorthorn, the Hereford and Devon, in the first instance—as breeds competing under exactly similar conditions—and, subsequently, between the other breeds.

Before making any remarks we supplement the information already given by the desiderated information as to the "other classes."

1. Comparative live weights of cattle of the Sussex and cross or mixed breed, to which prizes or commendations were awarded in like classes at Islington, 1869 :—

Oxen or Steers, not exceeding Three Years Old.

	Prize	Live Weight.	Average Weight.
Sussex.		cwt. qr. lb.	cwt. qr. lb.
Mr. Lee Steere	1st	17 1 10	
Mr Heasman	2d	16 2 13	
Mr G. C. Coote	3d	15 2 0	
Mr. Napper	C.	14 1 0	
Mr. Montefiore	C.	13 2 0	
			15 1 0
Cross or Mixed Breed.			
Mr. Martin	1st	19 1 20	
Mr. Lawson	2d	17 1 7	
Mr Walker	3d	16 1 14	
Mr. Senior	C.	15 2 17	
Mr Wordley	C.	15 0 10	
			16 2 22

Oxen or Steers above Three Years Old.

	Prize	Live Weight	Average Weight.
Sussex		cwt. qr. lb.	cwt. qr. lb.
Mr. Lee Steere	1st	22 2 7	
Mr F. Cane	2d	18 3 8	
Mr. Montefiore	3d	17 0 24	
Mr. Shoosmith	C	21 1 26	
Hon H. Brand	C	16 2 18	
			11 1 10
Cross or Mixed Breed.			
Mr. MacPherson	1st	20 1 24	
Mr. Martin	2d	24 2 24	
Mr. Harris	3d	23 2 16	
Mr. Bruce	C	13 2 20	
			22 0 0

Comparative Weights of other Breeds of Oxen exhibited at Smithfield, and not included in the previous Tables.

		Live Weight.	Age.
Norfolk or Suffolk.		cwt qr lb.	y. m.
Steers of any age :—	Prize.		
Mr. Symonds	1st	17 0 16	3 8
Mr. Harvey	2d	18 2 15	3 2
Longhorned.			
Steers of any age :—			
Sir J. Harper Crewe, Bart.	1st.	21 2 0	4 9
Mr. W. T. Cox	C.	17 2 18	3 7
Scotch Horned			
Mr Wishart	..	13 1 6	3 7
Mr. C. Morrison ..	..	18 1 19	4 3
Scotch Polled.			
James Stephen	1st	23 1 7	4 11
Andrew Longmore ..	2d	20 3 20	4 9
Irish.			
Mr. Robert Wortley ..	1st	15 2 15	4 0
Mr. William Slipper ..	2d	18 0 15	4 6
Welsh			
Mr. H. Williams	1st	13 3 22	4 8
Mr. H. Platt	2d	16 1 23	4 7

The reason why the classes of Sussex stock at the Smithfield Show were not the same as those of Shorthorns, Herefords, and Devons, is not for us to inquire into. Nor need we ask why cross-breds, Scots, Longhorns, Norfolks, &c., are in the same exceptional category ; but, being so, we take them as we find them, and apply the test of comparison to them accordingly. To the assertion that the Sussex cattle have been designedly eliminated from our comparative tests with the Shorthorn, Hereford and Devon, we have, therefore, simply to reply as above.

Our object has been to compare similar classes, and not individual animals at different ages ; and thus Sussex oxen could not be compared with the Shorthorns, &c. If, however, the test be a matter of importance, specially with the Shorthorn, we can now make it between the females in the class of heifers not exceeding four years old, for which prizes were offered in both the Shorthorn and the Sussex breeds. In these classes the competition was as follows :—

Heifers not exceeding Four Years Old.

	Live Weight	Average Live Weight.	Calculated Increase Weight
Sussex.	cwt qr lb.	cwt. qr. lb.	
Mr. E. Stanford .	12 3 18	11 0 26	7 stones
Mr. Lee Steere ..	10 2 6		
Shorthorn			
Colonel Townley	17 1 8	17 2 0	9 stones 11 lb.
Mr. Atherton ..	17 3 16		
Mr. Aylmer ..	16 2 2		

So far, then, Sussex gains little by comparison.

But the case for the Sussex is not closed. We are told that there is a more efficient test of comparative merit than the one we have adopted, and that by it the Sussex breed is proved to excel every other. This test is that of a comparison of exact weight for exact age.

For animals that have not reached full maturity, and for those that have been kept going as feeders, the method is correct. For old animals that have been used for breeding purposes for years it will not do. A cow may be ten years old, have had several calves, and weigh only 60 stone, while one of an inferior quality may weigh the same at four years old : but it cannot be said that the latter has made as much beef in four years as the other in ten years. We accept, however, the test in the case *Sussex* v. *Shorthorn*.

The case for the Sussex, as stated by Mr. Heasman, is as follows :—"The animals compared," says he, "are the eight first prize steers exhibited at Islington this year in the two classes for each breed, viz., under 3 years and 3 months, and above 3 years and 3 months." The result is as follows, sinking in each case the weight of the calf at birth :—

Steers under Three Years and Three Months Old.

	Age. Months.	cwt qr lb.		
Devon	32	14 0 6	or 40 lb.	Per month from birth.
Hereford	38	16 3 26	or 69 lb.	
Shorthorn	38	19 2 23	or 83 lb.	
Sussex	32	17 3 10	or 62 lb.	

Steers above Three Years and Three Months Old.

	Age Months.	cwt qr lb		
Devon	45	14 3 0	or 36 lb.	Per month from birth.
Hereford	49	19 0 6	or 43 lb.	
Shorthorn ..	47	20 1 6	or 48 lb.	
Sussex	45	22 2 2	or 56 lb.	

The observation we have to make here is that there was no class at Islington of Sussex steers "under 3 years and 3 months," but one for steers "not exceeding 3 years ;" and Mr. Heasman takes his prize animal out of this latter class to compete with the Shorthorn, Devon, and Hereford, in the former class. This gives an advantage to the Sussex animal in comparison with the Shorthorn, as being the younger : as it will be seen by the above Tables that the younger the animals the greater is the weight of carcase made per month.

But our defence does not consist in attacking the plaintiff's counsel. What we have to say for the Shorthorn as against the Sussex is simply to submit them to a full and thorough test of the kind which Mr. Heasman has employed partially ; not to take one animal of a class of varying ages, in each of the two breeds, for comparison, but to apply Mr. Heasman's guage of age and weight to the whole of the Shorthorn and Sussex oxen exhibited at Islington, and to ascertain the weight of carcase made by each animal during life, and the gross live weight produced from both by the whole of the animals of each breed ; from which we shall obtain the average age, average gross weight, and average weight gained by the two breeds per month.

This will certainly indicate the relative merits of the two breeds as meat-makers, better than picking out individual specimens that have attained the dignity of prizes in distinct and different classes. The following Tables illustrate our meaning :—

Live Weights of all the Shorthorn Oxen exhibited at Islington.

Owner.	Age.	Live Weight.
Oxen or Steers.	y. m.	cwt. qr lb.
Mr. Walter	2 5	13 1 0
Mr Barnett	2 2	13 3 13
The Queen	2 4	14 1 16
Mr. Bolton	2 0	15 1 0
Mr Stilgoe	2 3	14 3 10
Mr Bolt	1 11	11 1 2
Mr Dodd	2 2	14 2 0
Mr. Oliver	2 5	15 1 23
Lord Lovelace	3 2	20 0 14
Mr. Clayden	3 2	19 1 6
Mr. Outhwaite	2 7	17 0 19
Mr Purser	3 0	17 1 10
Mr. Pulver	2 7	17 2 14
Earl of Aylesford	3 2	17 3 25
Mr. Bult	3 10	19 0 16
Mr. Rowland Wood	2 11	17 3 24
Mr. R. Walker	3 9	23 2 17
Mr. J. Outhwaite	3 11	23 1 6
Mr. R. Harris	3 10	20 1 6
Mr. Brown	3 7	17 2 21
Marquis of Exeter	3 11	22 2 21
Mr. David Reynolds Davies ..	4 6	26 0 8
Mr. Freeman	4 2	19 2 23
Mr. Lloyd Lindsay	3 6	20 0 18
Mr. Colingwood	3 8	16 2 21
Mr. R. Wood	4 0	20 3 16
Mr Jos. Scales	4 3	21 3 14
Total	84 4	492 0 0
Average age (months) and weight..	37 4	18 0 24

Live Weights of all the Oxen of the Sussex Breed exhibited at Islington.

Owner.	No in Catalogue	Age.	Live Weight.
Sussex Oxen.		y. m	cwt. qr. lb.
Mr. J. A. Heasman ..	116	2 11	16 1 18
Mr. G. C. Coote	117	2 8	15 0 2
Mr. G. Napper	119	2 6	14 1 9
Mr. J. W. Montefiore	120	2 10	13 2 9
Mr. Lee Steere	121	2 8	17 1 10
Mr. G. C. Coote	122	3 11	18 1 13
Lord Leconfield	123	3 9	18 2 18
Mr. E. Cane	124	3 9	16 3 8
Mr. J. Shoosmith	125	4 10	21 1 26
Right Hon. H. Brand ..	127	3 7	16 2 18
Mr. Montefiore	128	3 10	17 0 24
Mr. Lee Steere	129	3 9	22 2 22
Total	41 0		211 0 9
Average age (months) and weight	41		17 2 10

It appears that the average age of the Shorthorn oxen at Islington was 37.48 months, and the average age of the Sussex was 41 months ; while the average weight of the same Shorthorn oxen was 18 cwt. 0 qr. 24 lb., while that of the same Sussex oxen was 17 cwt. 2 qr. 10 lb. ; from which we ascertain that the same animals have respectively gained weight as follows :—

The Shorthorns had made an average of quite 54.45 lb. each, per month, since birth.

The Sussex had made an average of quite 48.05 lb. each, per month, since birth.

From this it is clear that the merit of the Shorthorn is equally prominent, whether we test it by a comparison of the prize animals of the same age and class, or, as now, by the whole aggregate weight and aggregate age of all the animals of each breed exhibited. Who, then, shall dispute the claim of the Shorthorn to its position as "the dominant breed?"

—— Little business was done at Mark Lane on Monday, and prices were just the same as the previous

week.——At the Metropolitan Cattle Market the supply of Beasts was moderate, and although the demand was not excessive prices have advanced, and the tone of the market was firm and steady. In the sheep market, too, this was even more evident, and prices were in advance of last week's rates.

—— The subject of ENGLISH TENANT-RIGHT has been selected for consideration at the next meeting of the Farmers' Club, on Monday, May 2, when it will be introduced by Mr. HENRY CORBET, the Secretary of the Club, and the author of the Prize Essay on Tenant-Right.

—— A circular has been issued by Mr. W. LITTLE, of Heckington Hall, calling the attention of the Lincolnshire Farmers' Association to the power and advantage of combination amongst farmers as compared with their former isolation and weakness. A recent meeting of the Association is referred to as their first real battle in the interest of the members and in defence of the objects of the Association—a combined contract for artificial manure that should have the important elements of quality, condition, and punctual delivery. They had this year started with all the advantages of experience, and with contracts made under proper legal conditions and approved by all parties concerned—especially as to early order and prompt payment. They therefore reasonably expected to have their contract faithfully and honourably fulfilled. They were not a committee of Shylocks, determined to have the pound of flesh to the last grain, but they determined, as moderate business-men, to have a well considered bargain, legally made, fairly carried out. The report of the committee meeting showed that it was called to consider certain complaints made by some members of the condition of the manure lately delivered to them. The contractors attended the meeting, and several fair samples of manure were examined, and the chemist's analysis of each sample was laid before the committee. As regards quality, or percentage of soluble phosphate, no complaint in a single case could be made, as each sample analysed showed an excess over the guaranteed 26 per cent. ; but, as regarded the condition of the manure in the few cases complained of, there could not be two opinions, and this the contractors acknowledged like respectable men of business, and they did all they reasonably could do to satisfy the demands of the committee, by whom the interests of the members were thus secured far more effectually than they could individually have managed.

—— The Walton Eastertide Cattle and Horse Fair was held on the 20th. There was an active demand for stock for grazing purposes. The selling prices were as follows :—Milch cows and heifers in full profit, £12 to £18 ; large well-bred do., £20 to £23 ; cows, down calving, £8 to £15 ; steers and heifers, &c., to turn out to pasture, £9 to 12 ; and barreners and weight-making beasts, £13 to £16 ; cattle in full condition, £15 to £20 ; yearling heifers, £3 to £4. Horses for heavy draught work realised 18 to 32 gs. ; aged, 10 to 14 gs. ; riding horses and roadsters, 20 to 40 gs. ; cobs for saddle and harness, 12 to 18 gs. ; ponies, 6 to 9 gs., and colts, 15 to 25 gs. Fat hogs and store pigs were in great request at high prices.

OUR LIVE STOCK.

MR. THORNTON will sell the Osberton Hall herd on Wednesay next. The uniform good pedigree which runs through the entire herd, the excellent quality of the individual animals, and the high character of Mr. Foljambe as a breeder, will most probably result in a very successful sale. In briefly reviewing the Osberton catalogue, we may mention that it contains the names of 30 females and 8 bulls. The first matron on the list is *Lady's Slipper*, by MAY DUKE, 11 years old, but reported to be in blooming condition, likely to breed for some years to come, and altogether a "splendid cow." *Concertina*, by MAY DUKE, is "an excellent milker and breeder." She is the first of a long list of representatives of an excellent strain purchased from Earl Spencer, and originally descended from *No.* 54 *Chilton Sale* by MONARCH (2324). All these animals find a common ancestor in *Seraphina* by ZENITH (5702) and are the direct descendants of two cows, *Seraph* by LORD OF BRAWITH (10,465), and *Sympathy* by MASTER GRATEFUL (11,797). Thirty-three of the 38 cattle which will be offered are thus bred on the female side. The first sire used was MONARCH (13,347) a grandson of Earl Spencer's *Zeal*. Next followed MAY DUKE (16,553) ; IMPERIAL WINDSOR (18,086) hired from Mr. Carr, and KNIGHT OF THE GARTER (22,638), bought from the same breeder for 225 gs. in 1865. This last bull became the sire of the famous Osberton KNIGHTS, which have also been used. Mr. Peel's (of Knowlemere) LORD LYONS (26,677) was also in service for a single season, and has left some young stock. It is with regret we add that *Queen Bee*, by the last-mentioned sire, an exceedingly promising yearling, died on Wednesday, the 13th inst. On being opened, a hair-ball was found, about the size of a swan's egg.

—— It is long since we have been able to record so high an average as that realised on Wednesday, the 13th inst., at Captain Oliver's sale, when 56 animals brought £68 1s. 3d. a-head. The Sholebroke sale had long been looked for by Shorthorn breedersas an event of importance, and the result must have been satisfactory both to Captain Oliver and all admirers of Shorthorn cattle. Colonel Kingscote occupied the chair at lunch, and many noblemen and gentlemen, whose names are associated with the promotion of Shorthorns, assembled around the ring. Throughout the sale, the bidding was well-sustained and animated. Some lots were undoubtedly dear, while others were cheap. Thirteen out of the entire number of animals offered were from a week to six months old, a fact which should be remembered in connection with the general average obtained. *Viscountess*, by DUKE OF ARGYLL, lot 1, brought 43 gs., no mean price for an 11-year-old cow ; and the other old cows sold well. *Sonora*, eight years old, by Captain Oliver's favourite Towneley sire, ROMULUS BUTTERFLY, and a direct descendant of the famous *Charmer*, was purchased by Lord Skelmersdale for 61 gs. ; and *Bracelet 3d*, a 6-year-old cow, by TOUCHSTONE, and of the *Bracelet* and *Bijou* tribe, became the property of Lord Fitzhardinge at 47 gs. The highest price of the day was given by Mr. S. E. Bolden for *Lalage 4th*, by GRAND DUKE 7TH, a very good 5-year-old cow, with a wonderfully fine head, and of a good colour, although a little short in the hind-quarter. This animal was sold at the high price of 450 gs. She is from *Lalage* by PRINCE IMPERIAL, gr. d. *Lally* by EARL OF DERBY (10,177), and previously descended from *Olive Leaf*, by BELVIDERE and *Lady Barrington*, by SON OF HERDSMAN (304). Next followed *Filigree* by 7TH GRAND DUKE, and of the *Frill* family. *Filigree* was purchased for 115 gs. by the Hon. Mr. Fitzwilliam. Next followed *Lady Wild Eyes 2d*, a remarkably good Touchstone cow, and pronounced by a first-rate authority to be "the best Wild Eyes cow out ;" she attracted the attention of Lord Fitzhardinge, who became her owner at the price of 170 gs. *Vanity*, by GRAND DUKE 7TH, and out of lot 1, was purchased cheaply by Mr. J. Aubrey, Mumford, at 58 gs. ; as was also *Satanella*, by the same sire, and from *Sonora*, lot 6. This excellent young cow, descended from the best Milcote stock, was bought for 120 gs. by Lord Skelmersdale. Among other cheap purchases may be mentioned *Cowslip*, a GRAND DUKE 7TH cow, and descended on the female side from *Cowslip* by WATERLOO (2816), and who was knocked down to Lord Fitzhardinge at the comparatively low figure of 70 gs. *Bracelet 5th*, by KNIGHTLEY, a very good heifer, was bought by Sir C. M. Lampson for 100 gs., and *Vexation*, by GRAND DUKE 7TH, went cheap to Mr. S. S. Dickers at 51 gs. We have not space to further notice the various lots, but must content ourselves with referring our readers to the subjoined list of purchasers and prices.

Name of Animal.	When Calved.	Price.	Purchaser.
Cows and Heifers.		Gs.	
Viscountess ..	1859	43	Earl Fitzwilliam.
Darlington 9th ..	1859	40	Mr. A. J. Roberts.
Bracelet 2d ..	1860	50	Mr. J. Cole.
Wily Witch	1862	70	Sir Tatton Sykes.
Queen Bee	1862	31	Mr. W. Amos.
Sonora	1862	61	Lord Skelmersdale.
Duchess of Glo'ster ..	1863	40	Mr. J. W. Ellis.
Bracelet 3d	1864	47	Lord Fitzhardinge.
Adelina	1864	62	Earl Fitzwilliam.
Lalage 4th	1864	450	Mr. S. E. Boldrn.
Filigree	1865	115	Hon. C. Fitzwilham.
Lady Wild Eyes 2d ..	1865	170	Lord Fitzhardinge.
Vanity	1865	58	Mr. J. Aubrey.
Satanella	1865	120	Lord Skelmersdale.
Cowslip	1866	70	Lord Fitzhardinge.
Lady Seraphina 2d ..	1865	35	Mr. A. J. Robarts.
Orange Leaf	1866	40	Mr. T. T. Drake.
Bracelet 4th	1866	67	Mr. J. K. Fowler.
Blarney	1867	39	Mr. H. H. Hammond.
Crescent	1866	53	Mr. J. White.
Folly	1867	42	Mr. G. Savill.
Bracelet 5th	1867	100	Sir C. M. Lampson.
Bracelet	1867	66	Mr. T. Trotter.
Vexation	1867	51	Mr. S. S. Dickers.
Orangeade	1867	56	Mr. M. H. Williams.
Queen Caroline	1867	..	Not offered.
Athena	1867	56	Mr. J. White.
Lady Wild Eyes 3d ..	1867	140	Mr. J. Fitzhardinge.
Wily Witch 2d	1867	38	Mr. W. J. Sheldon.
Vision	1868	61	Mr. M. H. Williams.
Orange Pips	1868	71	Mr. Lark.
Freedom	1868	70	Lord Fitzhardinge.
Bracelet 7th	1868	70	Sir J. Reit.
Bracelet 8th	1868	130	Mr. S. E. Bolden.
Alicia	1868	56	Earl Fitzwilliam.
Duchess of Glo'ster 2d ..	1868	32	Mr. H. H. Hammond.
Wily Witch 3d	1868	50	Mr. P. Brown.
Queen Bee	July, 1869	27	Mr. H. H. Hammond.
Orange Peel	Aug., 1869	96	Mr. C. C. Donner.
Bashful	Sept., 1869	29	Mr. W. Wells, M.P.
Bracelet 9th	Sept., 1869	100	Mr. S. E. Bolden.
Bracelet 10th	Sept., 1869	120	Mr. S. E. Bolden.
Cascade	Oct., 1869	30	Mr. J. Beasley.
Bracelet 11th	Jan., 1870	45	Mr. J. Clayden.
Fretwork	Mar., 1870	36	Lord Fitzhardinge.
Orange Tree	April, 1870	13	Mr. F. Sartoris.
Bulls.			
LORD OF THE FOREST ..	1868	..	Not offered.
BEADSMAN	1865	61	Mr. J. W. Ellis.
CANDIDATE	1868	57	Mr. Clark.
CHORISTER	1868	51	Mr. J. Pretty.
DUKE OF LIVERPOOL ..	May, 1869	86	Mr. C. Barnard.
FORTUNIO	Aug., 1869	51	Mr. Lark.
ADONIS	Sept., 1869	23	Mr. C. Higgins.
VESPASIAN	Oct., 1869	28	Mr. G. Underwood.
TOKENHOUSE	Oct., 1869	20	Colonel Fitzroy.
SHOLEBROKE	Dec., 1869	15	Mr. W. Linnell.
DARLINGTON	Dec., 1869	27	Mr. S. Ayers.
SONGSTER	April, 1870	27	Lord Southampton.

45 cows and heifers averaged	£73	18 10	= £3327 9 0
11 bulls averaged	44	0 1	= 484 1 0
56 animals averaged .. .	68	1 3	= £3811 10 0

DAMAGES FOR EVICTION.

THE IRISH LAND BILL.

[The following opinions on this subject were quoted by the Prime Minister in his speech on clause 3, on Thursday of last week.]

WHAT are the proposals of those whom I may call the principal authorities upon this subject? In the first place, the hon. member for Banbury has not, what the Scotch term, condescended upon the precise figure he would indicate, but he looks upon disturbance as something which undoubtedly should be paid for at a high price. Another hon. member has suggested that five years' rent should be the basis of the damages, but he has not taken the figure as a *maximum* reducible to the lowest point, and therefore we do not regard the proposal with favour. A more important authority is Mr. Thompson, who lately sat for Whitby, and I apply the words "more important" to him, because he went to Ireland with the strong conviction that it was impossible to find a way to protect the tenant beyond giving him compensation for improvements, but further reflection has induced him to change his views upon that point. All tenants under 50*l*., even according to Mr. Thompson, who approached the question meaning to give compensation for nothing but improvements, ought to have the power of demanding five years' rent from the landlord absolutely ; and not only that, but also the value of the whole of the unexhausted improvements. Now, this is the opinion expressed by a gentleman of whose moderation in every sense of the word the committee is well aware. It is rather difficult to quote Mr. Fitzgibbon, because his mode of treating the subject is so distinct from ours that it is hard to draw a comparison between them. Still, the principle of his remarkable book is this—and, perhaps, it is all the better because it commences with 25 pages full of the most unmitigated abuse of the Government, though it is an excellent preface in many respects—the principle of his book is that by augmenting the rent voluntarily tendered in proportion to certain scales of augmentation, the actual tenants of the land should be able to demand leases for 60 years, leases for 70 years, and leases in perpetuity. That is the recommendation of the Conservative Master in Chancery, which is prefaced by 25 pages of as sound and rattling abuse of the Government as I ever read. Again, Judge Longfield, if I understand him rightly, recommends *simpliciter* a seven years' payment as equivalent to tenant-right. His writings on the subject are various, but I am now referring to his lately published "Essay," and I believe I have correctly stated the meaning of that "Essay." Lastly, I must quote a gentleman who does not belong to this House, and who has never had an opportunity of distinguishing himself here as he has had in the East. I mean Mr. Campbell, the author of as able a book on this subject as any I have read. Mr. Campbell recommends the Ulster custom, and something more. His proposal is the Ulster custom defined by a compulsory limitation of rents.

Those who have listened to the recital of what has been recommended by the principal authorities on the subject will see that Her Majesty's Government, in approaching this subject, have not been under the influence of a disposition to adopt extreme views, or to push to the farthest point even what they might have recommended under the cover of considerable and unquestionable authority. I may remark that I did not state Mr. Thompson's case in detail. According to him, I think, in cases above 50*l*. the landlord ought to have the option of five years' rent or five years' occupation. Of course, under such a scheme every sensible landlord would give the five years' rent, as he would be afraid to keep a tenant on a farm with a notice that he was to compensate himself as well as he could in the course of the five years. Thus even in the case of the higher class of holdings Mr. Thompson proposed to give five years' rent, together with a claim for unexhausted improvements of every sort.

Will the committee now allow me to explain the difficulty which we had to confront when we came originally to the construction of this scale, for I doubt whether it has been present to the minds of many members of this committee as much as it has to our minds? It is extremely difficult to construct a good and a sound scale, and the reason of thè difficulty is inherent in the nature of the case. It is because the case of the large holdings and the case of the small holdings do not stand in *pari materiâ* either as to loss or as to improvements. As far as regards loss, the difficulty is easily met by diminishing the scale ; but as regards improvements the case is quite different. The difficulty is that in the larger holdings you find improvements which I venture to call—though the application of the word is not quite correct—improvements of a merchantable character. If fences and roads are made, and if drainage is carried out on a holding of considerable size, the improvement is of a kind which, when it passes to the landlord, may be regarded as property delivered over into his hands, and he is accordingly called upon to pay for it. But when you come down to the smaller holdings, improvements and loss become mixed up and blended together so that you cannot effectually separate them. On a holding under £10 or £20, and even, perhaps, to some extent on a holding under £30, what are the improvements which

the Irish tenant makes or can be expected to make? I do not hesitate to say that in the construction of our scale we have been mainly governed by the belief that the only permanent improvement which is found to exist on a holding of that kind, of such a nature that it could be substantiated in court and charged on the landlord, is reclamation of land, together with permanent buildings in certain instances. But it would not very often happen that there would be permanent buildings which could be so charged. What do we know about the kind of building which the Irish tenant of the humbler class raises upon his holding? In Sir George Cornewall Lewis's book, "On Local Disturbances in Ireland," there will be found a particular reference to the cost of an Irish tenant's mud cabin or house, in which he and his family live, which answers his purposes, and which enables him to treat his holding as a farm. Well, he states that 22*s.* 6*d.* is the ordinary cost of such a habitation. That is the money cost, as stated by Sir George Lewis. Nay, I will go further and mention that he declares there is a cheaper kind of house, which you can erect for 7*s.* 6*d.* Now, it would of course be absurd to represent the mere money cost of such a house as the real value of it. Still, that is the cost of it, according to Sir George Lewis' meaning, as a marketable article. The mud, stone, and turf which suffice for the circumstances of the poor tenant are gathered together by him with immense labour. Consequently the cabin is to him of great value, and if deprived of it he would suffer a great loss. But how is he to establish that value against the landlord, and to make out in court that the money price of the mud cabin does not in the least degree correspond with the value it is to him? If this be true of a house, it is still more true of the gates, roads, and fences made or erected on these small holdings. As, however, the right hon. gentleman the member for Bucks says I know nothing about it, I would rather not rest the case on my own authority, and I will therefore read a passage from Mr. Campbell's book. Not in this passage only, but throughout the valuable discussion in his work, Mr. Campbell deals with a subject of the utmost practical consequence, and attempts to show that in the case of small holdings you must have regard to considerations different from those which apply to holdings at the top of the scale. Mr. Campbell says:—

"In truth, in this matter there are two sides to the shield, discrepant and irreconcilable beyond measure. Not only frequently in the North, but sometimes in the South also, the tenants have put up substantial buildings, which no one could deny to be improvements; but ordinarily the state of things is this—the tenants say that they have made all the improvements, and given the land its value, as much as the smith who forges the iron and puts a handle to it gives value to a spade; the landlords deny that the tenants have made any improvements whatever which in any proper sense can be called improvements. The tenant says that he or his predecessors have reclaimed and rendered culturable the land, built the homestead, set up the fences, done everything; and that the value he sets on these things is real, and not imaginary, he proves by showing that men of his class are ready to give large sums for his right of occupancy. The landlord says that, far from improving the land, he has utterly exhausted it by bad farming, and having done so wants to sell what is not his, and go off with the money to America; that so far from the wretched homestead and farm buildings and divisions of small fields by great wasteful fences being improvements, they are mere burdens upon the land, which can only be well utilised by going to the expense of levelling the fences, throwing down the houses, and consolidating the farms with adjoining farms. The improvements are of great value to the tenant; they are worse than valueless to the landlord. Between these two conflicting views no mortal man can decide the real value. It would be like trying to strike an average between incommensurate things, or deciding at an agricultural show between the relative merits of a horse and a cow."

Now, without saying that this is all gospel, yet I believe that in that passage there are indicated propositions of fundamental importance with regard to the just settlement of this question; and the result is, that whereas at the upper part of the scale, where the mere loss from eviction diminishes, it is separate and separable from the value of the improvements, yet as you go down to the bottom of the scale a great part of the loss from eviction is found to consist in the loss of the use of what he has erected on his holding, and which are real improvements for his purposes, though they are not of a kind which he would be able to go into a court of law to substantiate as improvements against the landlord.

TRIFOLIUM.

[The following engraving, with paragraph describing it, is taken from Mr. J. C. Morton's "Farmers' Calendar."]

THE following illustration (fig. 105) represents heads of the natural size of the different Clovers cultivated. We have heads and leaf of the natural size of—1, Trifolium hybridum—Alsike Clover; 2, Trifolium incarnatum—Crimson Clover; 3, Trifolium repens—White Clover; 4, Trifolium pratense perenne—Cow Grass; 5, Trifolium procumbens—Hop Trefoil; 6, Medicago lupulina—black Medick, or yellow Clover; 7, Trifolium pratense—common red Clover.

There are several methods of sowing Clover seed. 1. It may be sown broadcast and harrowed in at the time the Barley is drilled; a pair of light harrows at the same time following the drill-machine, to cover the Clover seed. 2. It may be sown before the roller, when the Barley is just above the ground. 3. It may be hand or horse-hoed in when the corn receives either of those operations, if the farmer is in the practice of giving them. Of these methods, the first is the surest for a crop, and the most to be recommended, notwithstanding the admitted evil which sometimes takes place in a wet season, of the Clover growing so luxuriantly as to damage the Barley. The second succeeds well, if rain follows in due time, and would, perhaps, generally succeed, if the farmer ventured to harrow it in, which he might safely do. In the third method it often succeeds, but it also often fails; nor is it necessary, in many cases, to hoe the Barley.

FIG. 105.

In any case it is best sown with a handbarrow covering 5 yards in width; and if this be set to sow one-half of the quantity per acre that is wanted and made to cover the ground twice, the work will be more perfectly done. If grass seeds be sown with the Clover then another sowing will be necessary with the same tool set for Grass seeds. It is covered in by a light harrowing with either the bush or web harrow, or light seed harrows of the common kind, and rolled. Of the seeds sown at this season we have—1. Trefoil, sown 14 to 16 lb. per acre alone in some districts, as one of the earliest foods for ewes and lambs in spring. It is ploughed up after a first folding, and a crop of Turnips may be taken. 2. Red Clover or Cow Grass, sown often by itself as affording a heavy first cut later in the summer for forage for stalls or stable—coming in after Trifolium incarnatum. 3. Various mixtures of Clovers, *e. g.*, 10 lb. of red Clover, 4 lb. of white, 4 lb. of Trefoil. The red Clover is a large seed, the white much smaller, so that 4 lb. of it contain as many seeds as 10 lb. of the other; the yellow blossomed Trefoil is the largest seed of the three. This will yield a first, second, and third cut during summer—the latter cuts containing more of the white and yellow Clovers. Alsike Clover is coming into use partly as a substitute for white; it is equally perennial, and has a larger habit of growth.

SEWAGE FARMING.

IN referring your correspondent "H.," of last week, to the pamphlets which were published by Mr. Morton and Mr. Henry Petre,* who successively managed this farm, I must remind him that it is an experimental farm upon which the plots of Grass have been sown, sewaged, and cut under different circumstances, and therefore exception ought not to be taken if the weight per acre from the most successful plot of Grass is quoted as that which under ordinary circumstances a farmer may look to attain; nor surprise be evinced if the grand total, which includes the yields of all the other experimental plots, materially affects the average weight per acre.

The great value of the pamphlets to which I refer consists in their being simple records of what has actually been achieved, and as 70 tons of Grass per acre were produced—and, although over a limited area, not from any "selected piece of land,"—Mr. Hope was, I think, justified in quoting this quantity as being possible over any number of ordinary acres.

I do not understand the meaning of the words "land in transition," as applied to the Grass crop. If "H." means that, upon the farms under Grass, there will be crops of all sorts—some old, some young, some dying out—I can only say that such a state of things may be permitted where experiment is being made, but would be altogether wrong once a decision has been arrived at as to the best time of sowing, when of course all Grass would be alike. As regards frost, we have lately had good experience, and if the Grass has attained vigour before it is attacked by the winter, its growth alone is checked, and the first spring cutting delayed.

It does not appear that either the most profitable mode of cultivating Italian Rye-grass has yet been determined, or that any number of cuttings for one season can be fixed, or the plough be set to work with any regularity of date. The weather varies too much to permit of any very arbitrary rule, at one time allowing the Grass almost to expend itself within a year from the date of sowing, and at another prolonging its life and its cuttings. Let me now give the particulars of two plots of grass-land, by the results of which I think we shall be guided, rather than by to those of plots which, being sown too late last autumn, have again been sown this spring, or of plots sown in March, 1869.

A piece of very poor land, of 3½ acres (having a gravelly subsoil), was sown down early in August last year, a good plant was obtained, and a cutting of 6½ tons an acre was taken between September 14 and 16 last. The Grass being full of vigour has stood the winter very well, and now presents a strong first-rate appearance.

We begin to cut it to-day, and although the first cut will be consumed on the farm, or sent away loose, the greater portion of it will I hope become long enough to bundle before the week is very far advanced. Supposing, then, this crop receives proper treatment, there seems nothing wanting to ensure a good result but sewage and time. If we are limited to a year, however, we cannot hope for more than six cuttings, as "H." very correctly observes; and I very much doubt that the Grass will, in August next, be in such a state of exhaustion as to warrant its being ploughed up, or that by that date we shall have run up a score of 70 tons per acre for 1870. If we continue our cuttings, as, indeed, we hope to do, as late in the year as we can, we shall learn what effect liberal dressings of sewage and frequent cuttings have

* May be obtained from Warne & Co., Bedford Street, Covent Garden, W.C.; Metchim & Son, Clement's Lane, E.C.; and Effingham Wilson, Royal Exchange, E.C.

on the life of this crop, and whether it will be more profitable to allow the Grass to live on to the spring of 1871, or plough it up at the end of this year for a following crop of Potatos. The other experiment to which I would refer is where some 6½ acres of land very similar to the last was sown down at the end of August or beginning of September, but from which we were not able to obtain a crop last autumn. It also has stood the winter very well, but was hurt by the frost more than the last crop I have referred to; and as the decayed Grass might have acted injuriously, we cut it over, beginning on March 23, and obtained 15 tons 2½ cwt. over all. It is now looking wonderfully strong and healthy, and will bear a heavy crop in about 10 days' time, if not sooner. I think we ran some risk in cutting this Grass when we did, as sharp unexpected frosts followed the scythe, and in some instances the sewage too, but at present there is a good strong crop over all.

Other Crops than Grass.—Your correspondent must pay us a visit during the summer and judge for himself whether the weights of the Mangel crops, or the amount of "green stuff" produced on the farm have been over-stated or over-estimated in the pamphlets to which I referred him—indeed, I hope to show increased quantities over those stated; and as the period as regards the growth of Cabbages and other market garden produce to which he points must be very distant, at all events in the vicinity of large towns, we shall have an opportunity of witnessing their growth. If, however, our market gardeners do not follow the example of those near Paris, and leave the sewage for the farmers, there will be no difficulty in satisfying them that any crop may be grown successfully either by sewage directly applied, or in land which has received it.

Value of Sewage.—It appears to me that the value of sewage will always depend upon circumstances, that no one sum can be fixed upon as its representative, and that its intrinsic value in any instance cannot be ascertained until the highest average crops which it is capable of producing have been obtained. It therefore is premature to contrast the value of farmyard manure, established through long practice, with that of sewage, but so far as trustworthy data serve, 25 to 30 tons per acre of farmyard manure would often fail to produce a heavy crop of Mangels or Savoys, whilst the half of the 5500 tons of sewage, named by "H.," would alway secure it.

Haymaking of Italian Rye-grass.— This is, of course, the wrong thing to attempt upon land from which heavy crops of Grass are expected, unless artificial means are used, when I believe no difficulty would be found in obtaining a good sale for it. Those who have grown this Grass for hay, speak well of it for horse fodder.

Clay Land.— We have no experience of it here under irrigation, but from what I learn from Mr. Clifford of Warwick, our rotation of crops would scarcely suit his land.

Fallows.—Would it not be possible to dress clay-lands when fallow by putting it up into ridges across the fall of the land where steep, so as to check the flow, and retain the sewage in the furrows? Leading furrows made with the plough would conduct it without trouble or waste. I should think that an even prepared surface of clay-land, without any crop in it to arrest or take up the dressing, would be about as difficult a mode of getting sewage into the land as could well be imagined. I, however, repeat, I have no experience in working clay-land, and merely offer these remarks as suggestions.

Laying-out Land.—There is scarcely sufficient experience at present to give the statement of an average cost per acre any value. The general formation of the land—the size of the farm which has to be prepared for the reception of sewage—the plan upon which the land is to be cultivated—whether the farmer has to consume a daily supply of sewage, or only take it just when he pleases—are amongst the questions which will influence the cost of laying out the land. We have expended as little as £2 10s. per acre on some of the land which we have farmed without much hand-labour, and we have spent a good deal more on other lands which required much hand-labour, and the removal of earth to avoid trouble and expense in its cultivation.

If the land is at first carefully laid out, although at an increased cost, the excess will soon be repaid by the saving in after labour, but when the difficulties attendant on the application of sewage demand an expenditure approaching anything like half the limit quoted by "H." the sewage would naturally be diverted on to more favourably farmed land. *Henry J. Morgan, Lodge Farm, Barking, April 18.*

AGRICULTURAL STATISTICS.

[We continue the publication of the official Tables.]

STATEMENT OF THE POPULATION AND AREA, AND OF THE ACREAGE UNDER CROPS AND GRASS FOR HAY, IN VARIOUS BRITISH COLONIES.

(The Area and Acreage are stated in English Statute Acres.)

Description of Crops, &c.	New South Wales.		Victoria.		South Australia.		Western Australia.		Queensland.		Tasmania.	New Zealand.		Natal.		Cape of Good Hope.
Population (according to latest returns)	447,620		696,161		172,860		22,733		107,427		98,455	218,668		250,808		566,158
Total area	206,999,680		55,571,840		245,329,920		640,000,000		433,920,000		16,777,600	68,005,760		10,332,800		128,390,400
Years (ended March 31 in some colonies)	1866-7	1867-8	1867-8	1868-9	1866-7	1867-8	1867	1868	1867	1868	1866	1867-8	1867-8	1868-9	1806	1867	1865
Total acreage under crops and Grass, &c.	452,850	413,164	631,207	710,024	739,714	810,734	45,519	50,014	31,559	39,321	167,866§	172,393§	770,872	783,435	110,372	121,723	460,754
Corn crops:—																	
Wheat	175,034	149,142	216,989	258,428	457,628	550,456	25,821	30,323	2,657	3,425	71,348	64,020	47,774	64,517	1,859	2,563	202,257
Barley and Bere	6,211	5,141	15,932	19,189	11,723	13,816	4,207	4,243	114	172	4,596	6,860	13,136	15,427	206	314	34,569
Oats	14,914	13,143	125,345	125,177	3,909	4,846	1,628	1,623	482	95	34,558	27,574	101,555	85,056	1,148	1,575	99,609
Rye	1,572	1,879	1,376*	2,407*	..	..	990	1,045	..	..	..	..	1,052*	..	..	..	24,330
Beans and Peas	..	..	3,658†	3,623†	1,853	3,499	..	7	..	..	4,163	5,067	4,387	..	245	511	8,784
Buckwheat	..	..	..	..	..	..	..	..	..	..	..	..	..	..	112	112	..
Maize	..	..	..	..	..	..	82	115	10,597	12,339	..	..	2,523†	..	63,260	82,618	50,126
Other kinds of grain	197	200	..	..	..	..	..	..	108	101	..	..	..	..	22,155	25,309	..
Total under corn crops	317,447	285,028	363,929	399,684	475,113	572,617	32,728	37,156	13,960	16,132	114,465	103,521	..	..	88,985	113,002	419,675
Potatos	18,810	15,440	35,831	36,407	2,526	2,701	422	439	1,913	2,027	10,520	10,766	14,345	11,557	2,564	2,081	12,845
Cotton	..	76	..	..	..	..	..	..	8,149	11,454	..	..	..	..	1,262	670	..
Sugar Cane	116	647	..	..	..	..	..	..	1,995	3,397	..	..	..	..	12,796	4,282	..
Tobacco	1,326	627	229	168	..	..	..	..	8	24	216	151	165	..	164	102	1,974
Vineyards	2,281	2,532	4,340	3,998	6,361	6,209	674	668	194	334	..	..	..	..	..	..	16,177
Bare Fallow	..	..	32,452	55,466	130,301	119,481	..	..	..	..	Notstated	18,805	94,394	96,429	..	..	..
Grass for hay	74,743	74,346	108,373	111,796	111,339	97,432	11,075‡	10,999	2,041	2,340	33,762	33,064	27,160	26,696	..	..	..

* Including Bere. † Including Millet and Sorghum. ‡ Including "green crops."

§ In Tasmania 119,064 acres in 1866, and 103,487 acres in 1867, were also occupied for gardens and other produce than "farm crops."

In the colonies upon the continent of Australia, according to the latest returns, there were under corn crops 1,310,000 acres, of which 991,000 acres were under Wheat. South Australia and Victoria, according to the returns, are the chief Wheat growing colonies, the acreage under that crop being 550,000 acres in the former, and 258,000 acres in the latter colony. The yield of Wheat is liable to very great variations in Australia. The crop in South Australia in 1868 is reported to have been diminished to the third of the ordinary production by the prevalence of the "Red Rust" blight. The highest average produce per acre of corn and Potatos is in New Zealand.

The number of cattle returned in 1868 is 3,515,000 for Australia, and about 400,000 for New Zealand and Tasmania. The number of sheep is returned at 37,441,000 for Australia; 8,418,000 for New Zealand, and 1,742,000 for Tasmania; making a total of 47,600,000 as the stock of sheep in the Australian colonies. This total, as compared with the number given in the colonial returns for 1867, shows the large increase of 4,000,000 sheep in one year. The latest return for the Cape of Good Hope—which, however, is not later than 1865—shows that at that date there were in that colony as many as 692,000 cattle, and 9,836,000 sheep.

Comparing the stock of sheep at the dates in these returns, and the quantities of wool exported from the colonies in 1867, there is a very near agreement between Australia and the Cape of Good Hope in the average weight of wool exported per head of the stock of sheep. The average is 3.75 lb. for Australia, and 3.65 lb. for the Cape of Good Hope.

THE WASTE LANDS OF ENGLAND.

[The following is an abridged report of a paper read lately before the Botley Farmers' Club, by Captain Maxse, R.N.]

THE total acreage of the United Kingdom amounts to 77,500,000, and of these we have, according to the Board of Trade returns, just issued, 46,000,000 under all kinds of crops, bare fallow, and Grass; and out of these 46,000,000 there are 23,000,000 acres of permanent pasture, meadow, or Grass, exclusive of heath or mountain land. This leaves 31,500,000 acres totally unaccounted for. The cultivated and uncultivated land is distributed in the following manner:—

Taking England first, we find that, out of an area of 32,590,397 acres, we have—13,274,408 under all kinds of crops, bare fallow, and Grass under rotation; 10,096,094 under permanent pasture, exclusive of heath and mountain land; 9,219,895 waste, or land unaccounted for.

In Wales, out of an area of 4,734,486, we have—1,003,105 under all kinds of crops, bare fallow, and Grass, under rotation; 1,527,534 under permanent pasture, exclusive, &c.; 2,203,847 waste or unaccounted for.

In Scotland, out of an area of 19,639,377, we have—3,325,868 under all kinds of crops, &c.; 1,112,269 under permanent pasture; 15,201,240 (three-quarters of whole) waste, or unaccounted for.

In Ireland, out of an area of 20,322,641, we have—5,596,824 under all kinds of crops, &c.; 10,046,877 under permanent pasture; 4,678,940 waste or unaccounted for.

In Isle of Man, out of an area of 180,000, we have—67,677 under all kinds of crops; 16,860 permanent pasture; 95,463 (more than half) waste, unaccouuted for.

1. *Cultivable Land.*—Two questions present themselves for consideration—1. How much of this land should be in cultivation? 2. What is the cause of fertile land lying waste? In England and Wales, where we have 11,423,742 waste acres, there is universal concurrence of opinion as to the extraordinary waste of our land wealth. Mr. Dyke Acland says that in Somersetshire alone "there are thousands of acres of moor and fen land capable of the highest order of arable cultivation." We have similar remarks on other counties in the Journal of the Agricultural Society. Mr. Bailey Denton stated before the Rivers' Commissioners, that whilst "only 2,000,000 acres of land in Great Britain have been drained, upwards of 20,000,000 remained undrained, and of this about 9,000,000 are clay soil." General Alexander, in a lecture, says:—"Some few years since, when visiting Cornwall, I saw large tracts of waste land in all directions, and some of it covered with luxuriant growth of Gorse and Ferns. How is it, I used to ask in my ignorance, that land which can grow such magnificent weeds is not turned to better account? 'Impossible,' was the answer I always received; 'the land is not worth cultivating; it would not pay.' Of course I had to be satisfied with this answer. Only last year, on revisiting Cornwall, I found that a large portion of the neglected land was in full cultivation, and bearing rich crops. 'I see a great change,' I observed to a friend. 'Yes,' he said in reply, 'there is a great improvement; the farmers have taken in a great deal of the waste land, and some of it now forms the most productive portions of their farms.'" General Alexander then refers to one of the causes that had tended to produce this result—"the landlords had granted their

tenants very long leases of their land, at exceeding low rents."

Then the Enclosure Commissioners report on the character of the waste land which is enclosed under authority. Since 1827 about 1,000,000 acres have been enclosed, and a large portion of it brought into cultivation. This is not much, seeing that population has about doubled since that date; but it proves, in spite of the disadvantage under which agriculture labours in this country, that it has paid to cultivate a large amount of waste land. It may, however, be said, that the land will not pay to cultivate, and that whatever has remained out of cultivation does so upon the sound commercial principle of its not paying. Now when we say this we must be very clear as to what we mean by "paying." I contend that no one is justified in wasting (to a clearly appreciable extent) the productive power of land; and it must be remembered, that although the land may not pay on the entire investment, including the purchase-money, it certainly will pay on the capital necessary to bring it into cultivation; there is, therefore, no ground for shirking the outlay—it is perfectly clear that the land pays no one while lying waste. Far more strongly does this argument tell in regard to common land that has been taken from the community, and allotted to proprietors with the express object of bringing it into cultivation for the general good.

I cannot wish for a better illustration of the unjustifiable waste of good land, and of the contrast between the interest of large and small landowners in the cultivation of the soil, than is afforded by a common in my own neighbourhood, called Titchfield Common. I shall content myself with a bare narrative of the facts of the case. This common was set out in allotments to large and small owners, in 1862, in the following proportion:

	Acres.
Land set out to 22 owners in parcels exceeding eight acres	680
Of this amount, up to September, 1869, eight owners had broken up and tilled	225
Leaving uncultivated	455
Land set out in 55 plots, in parcels under three acres	190
Of this, up to the same date, there has been broken up and tilled	182
Leaving uncultivated	8

These eight acres remaining, I believe, in the hands of speculators or lipholders. The capital necessary to bring this land into cultivation amounts to £10 or £12, and the average rent ranges from 30*s.* to £3, small tenants paying the highest rent, and, I need hardly say, purely for the sake of the produce of the soil.

I now come to the consideration of royal forests and woodlands. These extend to about 100,000 acres. As nearly three-fourths of this is situated in our own county, the woods and forests question may be considered essentially a Hampshire one. We are thus brought, therefore, to our own province. According to the Board of Trade Returns, just published, Hampshire contains 1,070,316 acres. Out of this area we have—531,112 under all kinds of crops, bare fallow, and Grass under rotation; 154,428 under permanent pasture; 384,676 acres, or more than one-fourth of it, waste or unaccounted for.

Deducting 30,000 acres for water in rivers and estuaries, we are still left with 334,676 acres of woodland and common. I feel that you can all judge far better than myself of the amount of this which might be under profitable cultivation. Mr. Blundell calculates that in Crown lands, heaths and commons, mudlands, and estuaries, there are in this county 130,000 acres which might be profitably converted into use as arable or pasture. If Mr. Blundell's 130,000 acres were absorbed into use, we should still have over 200,000 acres of wild land, which surely is as much as we can afford in a populous county. If, however, there is some misappropriation of woodland, how much more is there misappropriation of land in common and heath, and I should like to know where is the bit of common land that has once been got into cultivation, that it does not pay to continue in cultivation. Our greatest waste of land is in the New Forest. I have always understood myself (although Mr. Dickinson is probably as good an authority as any one) that there are in the New Forest about 30,000 acres of corn-growing land. If this be so, why should not the successful precedent of Wychwood Forest be followed with this amount, by reclaiming it, dividing into farms, and letting on leases of 31 years, reserving out of the rest complete common rights for the neighbourhood, and especially for the poor, who have suffered too much hitherto from enclosures? I would rather this were done than see it merely sold and absorbed into the unproductive "pleasure ground" of the rich.

Capt. Maxse proceeded to contend that a country could not be regarded as overpopulated before all its resources were developed. What we suffer from is, the congestion in the towns and depletion in the provinces. The method in which population is reckoned conveys a very fallacious idea. For instance, it is said that England and Wales have 347 persons to the square mile, but in some districts we have not more than one person to the square mile, and in the east end of London we have 130,000 persons to the square mile. The really important result to population is its distribution. While we have 11,000,000 in the towns, there are but 9,000,000 in the country; whilst Belgium with a poor soil is better off, although she has 430 persons to the square mile, for out of her population of 5,000,000, 1,500,000 live in towns, and 3,500,000 in rural parishes. In France, of the population of 38,000,000, 23,000,000 are rural, and 15,000,000 non-rural.

Notwithstanding apparent wealth there is some cause that prevents capital turning itself upon English land and employing English labour. We want to grow more food. In order to do this, three ingredients are necessary, capital, labour, and soil. We have them all in superabundance. But the capital flies abroad, the labour goes to the workhouse and the gaol, and the soil lies waste. Look at the amount of food we import from other countries. I believe myself we are too dependent upon other countries for food. Free trade is right, but home waste is wrong. Even granting that we can obtain corn cheaper from other countries than we can grow it ourselves, it is quite certain that we already grow some at home, and if we can, we should grow more. But putting entirely on one side our importation of Wheat, there yet remains an expenditure of £42,000,000 in foreign agricultural produce and stock. Since 1854, our importations of food have almost doubled. Now, how much of this food might we not grow at home? Look at the price of meat, a commodity which it is costly to import; compare the present price with its past. In the 16th century, beef and pork were sold at ½*d.* a lb., and veal at ¾*d.*; in the 18th century, it rose to 3*d.* a lb.; and now in the 19th century it has risen to a prohibitory price as far the poor are concerned.

Again, what a volume of comment is afforded in that single item about eggs—£1,000,000 for foreign eggs! Our dairy produce, not less than our meat growth, is—it must be confessed—miserably deficient. The reason of this is that dairy produce is the result of small farms, and these we have very nearly abolished in England.

2. *What is the cause of Fertile Land lying Waste?*—The cause is to be attributed to our land system, because it promotes the accumulation of land into few hands, artificially restricts its circulation in the market, and encourages an artificial value being placed upon land, which is detrimental to its true agricultural value. The first proposition that the land system promotes the accumulation of land in few hands, is proved by the fact that whereas in 1770 there were 250,000 rural landowners in England, we find ourselves at the last census (1861) with but 30,766, and is illustrated by the following passage from a very valuable work that has recently been published, entitled "Systems of Land Tenures in Various Countries." The article I quote from is by Mr. Cliffe Leslie, upon the land system in France. He says:—"The contrast between the land systems of France and England, two neighbouring countries at the head of civilisation, may, without exaggeration, be called the most extraordinary spectacle which European society offers for study to political and social philosophy. The English census of 1861 returned 30,766 landowners, and 249,461 farmers," and he goes on to tell us that, by the latest official statistics in France there are 5,000,000 rural proprietors, of whom nearly 4,000,000 are actually cultivators of the soil (the area of France being but one-third larger than Great Britain). He begged they would not think he advocated the French law of compulsory sub-division, which he proceeded to explain (although we may be quite sure that the effect of resisting moderate proposals will be that it will be ultimately demanded, and possibly conceded in a panic). The evil effect of our land system is, that cultivation is not the primary object of ownership of land, and therefore that agricultural produce is not the measure of its value. There are two forms of value attached to land—the one is what may be called the residential value, and the other the agricultural value; and in this country the residential value (which of course is a legitimate one within reasonable limits) supersedes the agricultural value. The attention of the community has never been aroused to the importance of the subject, and it is to be feared never will be, until the evil of the land system makes itself known in some disastrous manner.

An interesting discussion followed, in which Mr. Blundell, Mr. J. Withers, Mr. Spooner, and other gentlemen took part. Having briefly replied, Captain Maxse proposed a resolution to the effect that, whilst there are so many millions of acres lying waste, the Chamber was of opinion that attention should be directed to its cultivation as a means of employing our surplus population rather than to the question of emigration.

THE LABOURER IN CHESHIRE.

Few regular hands are kept, as a rule, on the dairy farms of Cheshire, owing to there being but a small proportion of arable land belonging to each. Women are not much employed in the fields, but many are kept in most farmhouses to attend to the cheese-making. The great influx of Irish into this county during the spring and summer months remedies the scarcity of labourers that would otherwise be felt, particularly in the harvest and other busy times; such as the harvesting of early Potatos (of which many are grown for the Manchester and other markets), and the hoeing and pulling of Turnips. On some farms, indeed, no Englishmen are employed, except those required to go with the teams.

Mr. Stanhope, one of the commissioners who have been inquiring into the employment of women and children in agriculture, in his report upon Cheshire, writes on this subject as follows:—

"Almost the whole of these parishes being laid down in permanent pasture, the amount of labour required for the cultivation of the land is small; but for this, the want of sufficient cottage accommodation near the farms would be a more serious evil than it now appears to be. Nevertheless, this fact, coupled with the great drain of the agricultural population into the manufacturing and mining districts, has led many of the dairy farmers to employ only such men as they can board and lodge in their houses, and has induced almost all to dispense with as much outdoor labour as possible. During the summer, when it is essential, it is supplied to a great extent by the Irish, who flock over from their own country for the two or three months of harvest, or who, crowded together into the towns of Northwich, Middlewich, or Knutsford, work on the farms a considerable distance from their homes. This has now become so recognised a system, that some landlords have added to their farmhouses a room specially for the Irish."

Wages differ considerably, according to the locality; in the neighbourhood of the manufacturing towns they are high, and as a rule they are on the increase; but, on the whole, they are still lower than in many other counties. This is perhaps owing, in some measure, to the advantages enjoyed in many parts, of low rents, &c. On many estates there is a portion of land set apart, in allotments, at a moderate rent, for the benefit of the agricultural labourers, which enables them to grow sufficient Potatos for their use during the year; and many grow a small patch of Barley or Oats, which provides them with food and bedding for a pig. There are very few labourers in this county who do not feed a pig for their own use, and some are able also to feed one to sell. Where they have not the benefit of these allotments, the farmer generally allows them sufficient land to grow their Potatos, for which they pay about 2*s.* 6*d.* per rood of 64 yards, the farmer finding the horse labour and manure, the labourer undertaking to keep the land clean. In some few parts of the county they have enough of land to enable them to keep a cow; this is a great boon, especially where there is a young family, but it is not at all a general thing. However, in all parts of the county there is a facility of obtaining buttermilk at a very trifling cost, and that is a very wholesome beverage.

One great advantage which the labourers of Cheshire have over many other counties is the cheapness of fuel. Cheshire is surrounded by great coal fields, and thus coal is to be obtained at 10*s.* per ton at Chester. Twelve shillings per week is about the average rate for ordinary day labourers during the winter, and 14*s.* in the summer. In harvest time it may reach 18*s.* per week. In some places, instead of the extra money in the harvest time, the men get their meals at the farm house, and in that case the wages are about 13*s.* per week through the year. Ploughmen get 14*s.* per week; or if they have their meals in the house, as is sometimes the case, from 7*s.* to 8*s.* per week.

A youth of from 18 to 20 years of age, to attend to the horses, under the head waggoner, gets from £9 to £10 per annum, with board; a cowman 11*s.* per week, with his breakfast. During the harvest time the men get three pints of ale per day, one in the morning, another at 3 P.M., and again at 5 P.M., at which time they also have some bread and cheese. When they receive this they are expected to work as long as may be required, but sometimes, when kept very late in carrying hay or corn, they get an extra pint. The wives of the labourers, under favourable circumstances, may also earn from 2*s.* to 2*s.* 6*d.* per week by milking. One farmer, who lives in the neighbourhood of Tarporley, which is pretty nearly in the centre of the county, writes:—"Wages are increasing; I should think the average is about 14*s.* or 15*s.* per week, including extras, such as Potato ground, food in harvest time, milk, &c. These things are often overlooked in estimating the wages of the agricultural labourer."

The state of the cottages has much to do with the condition of the agricultural labourer; and in Cheshire, as a rule, not only are the majority of them badly constructed and small, but in many parts there is a great scarcity of them, and, in consequence, the unfortunate labourer has to walk great distances to and from his work. A man who has to do this cannot possibly get through the same amount of work for his master as one living close at hand, and, moreover, has little or no time left to attend to the proper cultivation of his garden when he gets home. It is not the rule for farms to have cottages attached to them, although it is the case on some estates; and in these instances, not only is it a great thing for the labourer, but also for the farmer himself, who then has it in his power to keep only steady, useful men about him, and has them close upon the spot when any unforeseen occurrence requires their attendance at other than the regular hours, which is sometimes the case.

The internal arrangement of the generality of cottages in this county is anything but good; as a rule,

they have only one living-room, in which the cooking, washing, &c., have all to be done; and perhaps two bedrooms, and, in very many instances, only one, in which the parents and the whole of a large family of children, of both sexes, some grown up, or nearly so, have to sleep; and this is no doubt one great reason why morality is frequently but lax; besides which, this crowding together cannot conduce to good health. Very often, moreover, there is a hole full of stagnant water close to the front door, into which all sorts of dirty slops are thrown; while within a few feet of the back door are pigstye and privy and a heap of manure. Some of the landowners, foremost among whom may be mentioned the late Marquis of Westminster, have latterly been erecting good and commodious cottages for the use of labourers employed by the farmers upon their estates. The usual rent paid for cottages where there is a garden of from 10 to 15 roods of ground, is from £4 to £6; where there is land sufficient to keep a cow added, it is from about £8 to £10 per annum.

The labourers of Cheshire are not, generally speaking, very provident, but many of them are members of friendly societies, sick clubs, or some other institution of that class, which is a great thing for them in case of illness, as they have usually medical attendance free, and receive also 7*s.* or 8*s.* per week out of the funds while they are unable to work. In some cases, too, there is an allowance after a member attains a certain age, or is incapacitated from work; unfortunately, however, many of these clubs are based upon a bad system, and frequently have not sufficient funds in hand for the calls made upon them, and if at the end of the year there should be a balance in hand it is divided among the members, and they trust to the next monthly payments and what donations they may get being sufficient to meet all demands.

The want of education is very perceptible among the generality of farm labourers in Cheshire, many of them cannot read and very few indeed can write, and arithmetic is almost unknown. This is observable not only among the older people but also among the young, and is doubtless owing to the want of a proper grounding in these subjects. It is but a short time that the parents can afford to let their children attend school, and the schoolmaster has often too many upon his hands at once, so that those who are slow at learning are left to take their chance; and these children, when they go to service, very soon forget what little they have learned. In consequence of some of the parishes being so large the distance to the national school from the outskirts is too great for young children. The Irish who come to this country are far before the labourers of Cheshire in the matter of education.

Religion is a thing very little thought about by the agricultural labourer of Cheshire, very few, indeed, ever go to church at all, and the majority of those who profess any religion at all are dissenters; in most parishes there are chapels, but they are for the most part badly attended. Great numbers never go into a place of worship, and among those who do, you rarely find a seriously-minded person, and, as a natural consequence, there is hardly ever a thoroughly trustworthy man in this class to be met with. In some places, both parents and children are little better than heathens. The cause of this must be, in a great measure, the supineness of the clergy. The rector or vicar of the parish, in many instances, has other demands upon his time, and perhaps does not go the round of his parish once in 12 months; happily this is not always the case, and there are many good and true men to be found, who devote their time to their parish, and labour among the poor.

Drunkenness prevails greatly in some districts, but fortunately is generally less frequent among the labourers than in other classes; this is doubtless owing, in some measure, to the lack of temptation; many of the cottages being great distances from the villages, and therefore from the alehouses. The Cheshire Agricultural Society, as well as the smaller local ones, have done, and still are doing much good, by offering prizes for the neatest cottage and best cultivated garden; also for labourers who have worked the longest time on the same farm, or under the same master or mistress; also for the couple who have brought up the largest family without parochial assistance, and in the best manner. Prizes are also given to the male and female farm servants who have been in the same employ the greatest number of years, and have conducted themselves in a good and moral manner. And notwithstanding the picture I have drawn, the condition of the agricultural labourer in this county is improved, when it is compared with what it was some years back. *W. Dickenson Palin, Wilcot, Salop.*

Home Correspondence.

Straw and Roots consumed on the Land.—I must take exception to another of Mr. Lawes' conclusions—"2. That excepting under special agreement, and with the purchase of stable dung, no straw or root crops should be sold off the farm." Here is Mr. Lawes taking up the cry of the old hound—the land agent, who, in everything he does, tries to please the master who pays him; so in all agreements he puts in this stupid clause: and what does it do? Just nothing; for straw and roots cannot be sold off the farm; Mr. Lawes' few exceptional bits may, and that is all, for the farmer has not a customer to sell them to. England's towns do get a supply of hay, straw, and roots from Mr. Lawes' exceptional men. They always have had a supply of whatever they need, and they always will—let land agents put whatever special clause into their agreements they may. When the towns are supplied the farmers' shop for straw, &c., is shut; straw, &c., must mainly be consumed upon the land, therefore landlords may cast their special clause to the wind, and give over crying for protection that they never have had, nor ever will have. Now, let us see how Mr. Lawes would compensate a man for increasing the production of straw and consuming it upon the land. He tells you that an unmanured Wheat plot gave on an average 14 cwt. of straw per acre; "whilst plot 16 gave over the 13 years of heavy manuring 46½ cwt." Then, according to this evidence, the unmanuring farmer would have in 13 years 9 tons 2 cwt. of straw to go back to another part of his farm in the shape of manure, whilst in the same parish the manuring farmer would have 30 tons 4½ cwt. of straw to go back to his farm in the shape of manure—or an excess over the manuring man of 21 tons 2½ cwt. Now let us see how Mr. Lawes would compensate this man for his excess of 21 ton 2½ cwt. of straw, in the shape of a permanent improvement, which it certainly must be; for Mr. Lawes tells us himself that farmyard manures are those on which we must rely for durability. Take his plot of grass-land, for instance, that with a regular manuring for some years with farmyard dung kept up its productiveness "for six years afterwards without any further application of manure," and that at 43 cwt. per acre. Now, for this 21 tons 2½ cwt. of straw produce, and consumed upon a farm within a period of thirteen years, Mr. Lawes would give to the tenant at the end of that period "the consuming value of the straw which he leaves in excess of that which he entered upon;" that is, they are to have the eating value of a year's straw at leaving, if any remains unconsumed, and the landlord is to pocket the lion's share—the whole of the 21 tons 2½ cwt. of straw, or rather the whole of that quantity made into manure, and applied to his land in the shape of permanent improvement, without any acknowledgment whatever. If this is Mr. Lawes' justice to the farmers of England, I do not know what justice means. It appears to me something like giving a big man a pat on the back whilst picking a little man's pocket, and I will give an illustration of the matter. I highly manure with artificial manure 14 acres of land for Barley, and I take straw and all away every year, and send the straw when made into manure on to my heavy land, where it is very valuable—Mr. Lawes' evidence shown above to wit. This year I shall send 200 tons of manure from my bottom land to my heavy land, then I contend that under such treatment my farm will yearly be permanently improved, yet upon Mr. Lawes' plan all a tenant could claim would be the eating value of a year's straw. Why landlords should cry out, themselves and through their agents, for protection, I cannot understand,—binding a man from selling a thing (straw) that cannot be sold, there being no customer, and from cropping his land as he likes. For a landlord to insist upon the former is quite childish, and Mr. Lawes' evidence is dead against the latter. Mr. Lawes is sound in his three conclusions, "That tenants should be required to keep the land free from weeds," &c. That is all a landlord need trouble himself about. Look to past practice; tenants have improved their lands and landlords have shoved up their rents, thus taxing the tenant for his own improvement. I know of plenty of cases to bring to bear upon this. The landlords may have given a few tiles to a persevering tenant, and that is all, and now Mr. Lawes' would have them increase their yearly production of straw by the aid of artificial manure, and thus permanently improve their holdings; with nothing but the eating value of a year's straw that they can call their own, as a kind of acknowledgment from their landlords. Such one-sided agreements as Mr. Lawes' would not give justice to the farmers of England. If Mr. Lawes had "tortured Rothamsted with the huge contrivances of modern times"—that is, with steam cultivation—instead of trying to enrich the landlord at the tenant's cost, it would have been very much more creditable to him. His tables are well worth a pat on the back, but his principal conclusions, rotten at the bottom, are regularly rootfallen. With such evidence as this before us, we need not wonder why capital is shy at offering itself to the land, through a tenant, to be swallowed up by the landlord. *William Smith, Woolston, Bletchley Station, Bucks, April* 14.

Application of Steam-Power to Draining.—It has occurred to me that steam-power, now so commonly in use for ploughing and cultivating land, might be applied with much advantage to deep draining. A few days ago, in crossing a field where some drainers were at work, I was surprised to observe the hard work that was required to drive the heavy draining spade through the varying strata to the depth of 4 feet. At top was about 10 inches of mould, then 14 inches of stiff yellow clay, next 6 inches of "iron band" (a concrete of gravel and iron pyrites), followed by 12 inches of indurated whitish clay, under which in some parts of the field was a thin layer of white gritstone, which generally contained much water, and beneath which was a bluish clay. In other parts of the same field was a thin seam of "coal smut" and iron band, with a whitish clay between. The indurated clay was found throughout the whole of that and the neighbouring fields, making the work hard and not very remunerative, although paid at the rate of 3*s.* 8*d.* per chain. Now 3*s.* 8*d.* per chain, at a distance of 9 yards apart in the drains, makes a cost of about £5 18*s.* for labour per acre, and with the cost of tiles, at £2 3*s.* 6*d.* per acre, a total cost of £8 3*s.* 6*d.* per acre, without including the cartage of the tiles, which is undertaken by the tenant. As the money is borrowed of one of the Land Dainage Companies at £7 per cent., it will be seen that the charge upon the tenant in percentage for the capital expended on the drainage, and to be repaid in thirty years, must raise his rent per acre so high that few tenant-farmers can afford to pay it at the present price of corn. Hence, much improvable land remains undrained, and agricultural progress is at a standstill. The application of steam-power seems to me the only means of remedying this evil. A traction-engine could easily traverse the ground, and draw along a subsoil plough or other implement suited to the purpose of breaking up the soil, which a sufficient number of men might be employed to throw out, and cut the sides of the drain clean, and so prepare it for the next application of the plough. Thus, in about four journeys or traversings of the traction-engine, the drain would be completed to the depth required; or, if a stationary engine were more readily obtained, the wire-rope used in steam-ploughing could be easily set to work, and many of the engines used for threshing could be earning money at periods of the year when otherwise they would be idle. My object in writing this is merely to suggest the application of steam-power to drainage to some of the agricultural implement makers of the day, who would soon invent implements suited to the purpose. That there would be some difficulties to surmount in stony and very wet and soft ground, where the engine could not work or travel, is to be expected; but I am persuaded that its powers might be applied with great advantage in the majority of cases of drainage, to the great advantage of both tenant and landlord. *Clericus.*

Foreign Correspondence.

VALENCIENNES.—*French Agriculture.*—The following are the replies of M. Gustave Hamoir to Mr. James Howard, M.P.:—Landed estates here are very much divided. There are few large properties. All are let on lease, and, if large, are often distributed among several tenants. Twenty-five acres are considered a large extent. Ten acres may be considered as the average. A large number are only 1¼ acre. It is a rare exception for the landed proprietors to farm their own estates. A great number of farmers have a fourth or more of their land their own property, and hire the rest on lease. There are some farms of 450 to 650 acres; but the mean size of a farm must be considered 3¼ acres, and such farms may be considered to predominate.——The average rent of land is 72*s.* per acre. Large and small farmers compete for the land. The very small farmers pay a higher price, because they have to do with small plots, and do not offer so good a guarantee to the proprietor. The difference in the rent of the various classes of land does not bear any analogy to the natural quality of the soil, as high farming based upon root crops has brought all land almost to the same level.——Leases are generally and almost entirely for nine years. The leases are generally made out by deeds before a notary; each proprietor adds some particular clauses of little importance. The rotation of crops is no longer stipulated for, except indeed for the last two years. What is most generally required, is a thorough manuring three years before the expiration of the lease. The following is a common rotation:—Beetroot, Wheat, Clover, Wheat, Oats, Beetroot; or, Beetroot, Wheat, Oats, Clover, Beetroot. Large farmers have no rotation of crops. Many have one-third to one-fourth of their land in Beetroot; the largest farmers, one-half and more in roots.—The following are the average crops per acre:—

Beetroot	18 tons.		
Wheat	31 bushels grain	36 cwt straw	
Oats	60 „	32 „	
Clover	1st cut, 2 tons	2d cut, 1 ton.	

——Artificial manure is beginning to become popular. Some use guano at the rate of 3¼ cwt. per acre, besides 16 tons per acre of farmyard manure. Others apply 9¾ cwt. per acre of rape or colza cake, 1½ cwt. per acre of guano, besides the farmyard manure. Oilcake is the manure most used. Guano is becoming less esteemed, because it gives bad Sugar-Beetroot. I have established a manufactory of artificial manure suitable for different plants and soils, which has increased considerably, and excites competition.——In ploughing for roots 10 inches is the ordinary depth; the large farmers who have plenty of power turn up the soil 12 to 14 inches, and often 16 inches deep. The depth of ploughing for cereals is 7 to 8 inches.——The following particulars relate to cost of labour:—One or two are men hired by the year, and are paid a fixed wage of 24 to 27 bushels of corn for the summer months, and 2*s.* a week in money for the rest of the year, besides 8*s.* at the hiring and at festivals. In harvest time piecework is the rule, and a man may at this season earn from 3*s.* to 4*s.* a day, and a woman 1*s.* 8*d.* The general wages of women are 10*d.* per day in summer, and, like the men,

they often work by the piece. I send you the tariff for the various operations performed upon the farm :—

Cutting hay, Clover, Lucerne, &c.; first cut		3s. 6d.	per acre
Ditto, ditto,	second cut	2 11	,,
Bag-hooking corn, Oats, &c.		5 5	,,
Putting in sheaves not bound.. ..		1 4	,,
Ditto in shocks		2 3	,,
Making bands		0 8	per 100
Cocking Clover, Lucerne, &c. ..		1 4	per acre.
Hand-sowing cereals		0 5½	,,
Ditto artificial manure ..		0 7	,,
Spreading dung (16 tons per acre) ..		1 4	,,
Ditto lime, 400 kilos. per hect. ..		1 4	,,
Loading and unloading manure ..		0 2½	per ton.
Emptying the stables of manure ..		0 4½	,,
Hand-hoeing Beetroot four times ..		12 9	per acre.
The horse-hoeing is supplementary.			
Hoeing "Rutabagas" once Artichokes,		3 2	,,
Drawing Beetroot, cutting off leaves, and loading up		13 10	,,
Setting out "Rutabagas" (Artichokes).		10 10	,,
Feeders of the threshing machine ..		3 4	per sack.
Covering a stack		4 0	

——Land sells from £96 to £144 per acre. When there has been a succession of good crops for several years, and the farmer has saved money, the price of small lots is considerably augmented, because the ordinary farmer does not and will not appreciate any other investment than land, and buys, therefore, at any price when there is a possibility of doing so. I have known land sold at £192 per acre. ——We have sufficient manual labour. Our district is covered with sugar factories. The price of manual labour is high for a short time during winter, while it is low in other places. This allows workmen to tide over difficult times without suffering, and to wait for the spring season. Emigration is insignificant in this part. Wages have risen 20 per cent. during the last 20 years. ——The farmer has nothing to do with finding the labourer a dwelling. A labourer has mostly a cottage belonging to him, either bequeathed by his parents or built with his first savings. The poorest have to hire their house from some house proprietor. Each family occupies a separate house. The farmer has nothing to do with the wants of the labourer; in exceptional cases, however, he lets him a small portion of land to cultivate, for which a rent is charged.—— Foot-and-mouth disease and pleuro-pneumonia are two diseases which are frequently prevalent amongst us. The former presents itself as an epidemic, contagious to the last degree. It extends from neighbour to neighbour, and attacks all the stalls without sparing one. Pleuro-pneumonia is permanent in certain farms, but it presents itself rarely in its contagious character. In my opinion this malady arises, according to the hygiene or sanitary arrangements of the farm. If the animals being fattened are fed to an extreme degree, if the quantity of food absorbed exceeds the assimilative power of the organs, pleuro-pneumonia arises, and arises all the quicker if the substances given to the animals contain irritating and volatile matter, such as alcohol, acetic acid, or active essential oils. If the animals do not receive the quantity of food sufficient for their existence, or the quality which suits them—for instance, a cow poorly fed and having remarkable lactiferous qualities, draft oxen which are over-worked —in these cases pleuro-pneumonia will arise. In the first case the affection is easy to combat, because it suffices to modify the conditions of feeding, to weaken the animal, and diminish the inflammation of the blood, a result which is obtained with ease; but in the second case, when you have to feed up the animal in order to restore the equilibrium of its functions, a long time is necessary, during which the disease progresses and carries off the subject; therefore, pleuro-pneumonia created in these last conditions is much more terrible than the other. It is my opinion that a good farmer ought never to have this disease except in extreme cases of want of foresight, the causes of which depend upon himself, or upon circumstances over which he has no control. Sheep are rarely attacked with small-pox or other disease except foot-rot, which prevails almost continually. To cure it we cauterise the feet, having previously washed them with sulphate of copper.

Societies.

STAFFORDSHIRE.

Farm Capital.—At a recent meeting of this Chamber—the Earl of Harrowby presiding.—Mr. Carrington Smith introduced a discussion "On the causes now in operation which discourage the application of capital to agriculture." He attributed the discouragement alluded to, to three principal causes. The first was the unjust incidence of taxation on real property. Next to this he considered that a great deterrent was the infancy of the science of agriculture. By that he meant, not that agriculture was in its infancy, but that the application of true scientific principles to farming pursuits was very imperfectly understood. The third cause was the deficiency of a good Land Bill, and the total absence of power to compel compensation, either to the landlord for dilapidation caused to his land, or to the outgoing tenant for unexhausted improvements. On this point he must hold that as the tenant ought to be paid for the latter, it was but a correlative that the landlord should be paid when the tenant had suffered his farm to deteriorate. If agriculture was to make that progress which it ought to make, and which he felt it would make in its race with commerce, there must be a more general knowledge of the productive capability of the soil; there must be just laws for landlord and tenant; and all must press forward shoulder to shoulder in friendly emulation. These were the only means of securing success.

Mr. Robotham expressed disappointment that Mr. Smith had not brought forward more causes than he had done as a solution of the difficulty, and remarked that in his opinion there were other reasons why, in a country so densely populated as this, and where such a great production of food was required, men of capital and skill did not embark in agriculture. He referred to that clause in leases which gives to the landlord an exclusive right to the game; and concluded by moving—"That one chief cause which prevents the employment of capital in agriculture is the preservation of game by the landlords."

Mr. Stubbs, who seconded the resolution, said he would be the last man to prevent his landlord coming over his farm and having reasonable sport, but not to such a serious extent at now existed.

Mr. Brawn objected entirely to many of Mr. Carrington Smith's views, and did not altogether agree with Mr. Robotham's. Capitalists, he said, looked for both security and interest. Agriculture gave a smaller return for the capital employed than any other industry, and it could not be said that it afforded great security. It therefore became them to consider how a better return could be secured. The last vestige of protection on imported agricultural produce had been removed, and the farmer was put on an unequal footing with foreign producers. It was hence the duty of Government to remove every burden from agricultural industry, which suffered almost exclusively the load of increased pauperism caused by manufactures. Mr. Brawn, in conclusion, submitted the following proposition:—"That the application of capital to agriculture is discouraged by the absence of provisions which, whilst protecting the interests of the landlord, would give to the tenant security for money invested in improvements on the farm. That the destruction of crops by the ravages of ground game in many instances causes considerable loss to the tenant-farmer; and that the Malt-tax and existing law of levying local rates almost exclusively on land and buildings are a great discouragement to the application of capital to agriculture."

The Earl of Lichfield said, in his opinion, the main cause in operation which discouraged the application of capital to agriculture was, in the first place, the want of capital on the part of the tenant-farmers. The fact was that in this country where the farms were large the tenants were invariably men of capital. There were considerable tracts of land in that county which were not cultivated because of the want of sufficient capital, and other parts were badly cultivated through the tenant-farmers not having capital. He entirely agreed with Mr. Smith when he talked of the necessity for greater security for tenants' outlay; but he thought the application of capital upon a large scale to the land must be a work of time. He did not think landlords as a rule had been sufficiently business-like in their agreements with tenants, but had been content to let things go on, trusting to the good understanding which usually existed between them. With regard to the Earl of Warwick's published letter explaining his lordship's views on the Game-laws, he thought his noble friend was wrong in wishing to see discussion on agricultural matters stifled at meetings of that description. He (Lord Lichfield) could not see what harm there could be in discussing the question of the Game-laws. To avoid such topics would be to avoid the discussion of subjects the proper understanding of which would be likely to produce a good feeling between tenant-farmers and landlords, as it would show to the tenants that the landlords were willing to discuss matters that affected them both in a rational spirit. As to the advancement of agriculture, nothing operated so strongly in retarding it as a want on the part of farmers of a scientific knowledge, which could only be obtained by degrees. His lordship advocated the necessity for a law which would give ample compensation for permanent improvement by the tenant, and referred to the different customs existing in the counties of Lincoln and Stafford, expressing an opinion that there should be one uniform system. In some places landlords gave their tenants power to kill rabbits upon their farms, but that power was of little use when next to their farm there was a cover into which the tenant could not go. The tenant had no power to defend himself against the mischief done by game. He thought that landlords ought not only to give their tenants power to kill rabbits during a certain time of the year, but they should also assist the tenant to kill them. With regard to the Malt-tax, every argument was against it except one, and that was as to how the amount now raised would be raised if the tax were abolished.

Mr. Brawn's resolution was ultimately carried.

Farmers' Clubs.

Brecon: *April 2.—Popular Errors connected with Veterinary Medicine.*—Mr. Ferris, veterinary surgeon, read a paper on this subject, from which we make the following extracts :—

The progress of veterinary science has done much towards the amelioration and prevention of many diseases, which formerly devastated the property of the stockowners. How seldom do we now see glanders, farcy, pole evil, fistulous affections, &c. They now appear seldom, because our increased knowledge enables us to fathom not only the nature but the cause of disease. Still, errors are committed. Can any one think for a moment that the days of charms have passed? The man that has his animal charmed with a view to remove disease must be extremely ignorant, yet it is still common to find such men charming a horse for something in the shoulder, and keeping the animal in torture for days, and even months, when the foot has been the seat of injury, whereas if proper treatment had been resorted to at the beginning of the injury the animal might have been relieved almost immediately. From neglect of proper treatment the foot often becomes diseased to an immense degree, sinuses form in all directions, rendering the animal a cripple during his lifetime. Is it not a cruel operation to cut open the belly or abdomen of an animal supposed by the ignorant to have twist or gut-tie, when no such thing exists? Not long since I was called upon to go some four miles to operate on a bullock which had the gut-tie, and bring such instruments as were required for the operation. On my arrival I found that I was only second, as the owner had sent for an old practised hand, who was sure it existed, and declared that he had operated on scores in the manner mentioned above. I told him if he had operated on scores in that way he had tortured the poor dumb creatures enough, and that it would be wisdom on his part not to do so any more, and a very great saving to the owners, because the supposed disease rarely existed in cattle. In this case the bullock was suffering from mere constipation, and treated by me accordingly, and in a few days after the little animal quite recovered, without having his belly cut through, and his intestines roughly handled. Another error is cutting the tail of cattle supposed to be diseased, which supposed disease is known by various names, such as tail-slip, tail-ill, notch-in-tail, &c. It is thought to consist in a softening of the substance of the tail some few inches from the end downwards, which there can be easily doubled back upon itself; also, that at the place where it is capable of being doubled it has a soft relaxed or elastic kind of feel. Now, this imaginary diseased state is a natural condition in the tail of cattle; but when an animal is weak or suffering from almost any debilitating disease, this softening is more perceptible; hence it has led many to believe that it is the tail which is diseased, when in reality it is only a symptom of sickness. This injurious and cruel operation is performed by making a longtitudinal incision into the substance of this soft part of the tail, and then filling it up with some irritating nostrum. Many a poor cow, even while suffering from some real constitutional disease, has been subjected to this torturing operation, and thereby has got added to her other complaints a foul, sloughy, carious sore, frequently causing a portion of the tail to rot off. Another error is cutting or burning out the lampas and flaps, as they are called, in young horses, in which the front teeth, as a rule, are short, and, in consequence, the palate prominent. When they evince a loss of appetite in addition to this appearance, they are said to have the lampas, and if a sensible practitioner refuse to cut or burn them, the horse is taken to a farrier or blacksmith, who is ready with his hot iron to perform this useless and cruel operation. Flaps are supposed to be on horses, and more especially pigs that do not feed well. An absurd and cruel operation is performed by cutting out some of the loose tissue that connects the lips to the jaw. Whoever will thus treat animals ought to be severely punished. I may here observe the error of amputating animals—tail-snicking, fortunately, is almost forgotten, and it would be well if docking were so to. I think it might be stopped if agricultural societies would not award prizes to any animal that has been mutilated. It is said that the cropping of dogs' ears and tails is vivisection with a vengeance, and ought to be taken notice of by the Society for the Prevention of Cruelty to Animals; but think of the poor horse, how many a one has suffered torture for days with that formidable disease, lock-jaw or tetanus, caused chiefly by docking. Many have died from its effects, others have been less severely injured, and have a partial contraction of some of the muscles of the quarters, and have lost the beautiful bending action, and drag their legs throughout life as a consequence. When any portion of an animal is amputated the cold always affects that part sooner than any other. If, therefore, you cut off a sheep's tail, you not only deprive it of a natural protection, but you also make the unguarded part tender as well—so tender that when this operation has been performed in cold weather animals have often died in consequence. A very serious error is that of riding and driving a horse about hurriedly when suffering from an attack of colic, or gripes, and inflammation of the bowels. There is a fixed opinion that this is the best remedy for the disease, whereas, though occasionally it effects a cure, in nine times out of ten it causes the death of the animal. Lastly, I may observe the errors of periodical bleeding and physicing, which, however, are not so common as formerly. The continual giving of diuretic balls and powders is very erroneous, because such medicines weaken the animal, and, more than that, they not unfrequently bring on disease. A horse or other animal in

good health requires no medicine of any kind, and all balls, or powders, whether condition, alterative, cordial, or any other sort, are to be condemned, as they only tend to fill the pocket of the apothecary, and destroy the health of the animal that receives them. Although not an advocate for giving medicine when in health, when disease occurs the case is quite different, for it becomes our chief means in assisting Nature to bring about a restoration to health; and when it has been applied early and judiciously, it has been the salvation of many animals. Those who use medicine for the cure of disease must have a thorough knowledge of the action and use of such medicine before it can be applied judiciously, and also a knowledge of the complaint for which it is used, otherwise they are groping their way in utter darkness, and their medicine becomes reduced to a mere lottery and empiricism. From a want of this knowledge many an animal has been lost; hence to gain it is one great object of our science. Many of the modern discoveries made, and the doctrines promulgated, are worthy of admiration, in the setting aside as erroneous opinions once firmly maintained to be right, and the explanation of the phenomena of health and disease. Before concluding, I wish to say a few words on a subject which was introduced by Mr. D. Downes at the last meeting. I allude to the scab in sheep. It is really an extraordinary thing that some farmers will not look after their own interest, but from sheer laziness are content to suffer the value of these animals to be lessened to an almost inconceivable extent by so loathsome a disease. This affection is one of the most contagious to which the sheep is liable; so much so that one scabbed sheep is sufficient to affect the whole county. No punishment can therefore be too severe for a man who allows such an animal to stray; yet I constantly see sheep about the roads one mass of scab, helping to spread over the neighbourhood a disease which, by proper care, might be wholly exterminated.

The CHAIRMAN said, with all due deference to Mr. Ferris and to his skill as a veterinary surgeon, he thought there was yet much to be learnt with regard to the diseases of animals and the way of curing them. It was a humiliating thought that when such a disease as the cattle plague came into the land, with the knowledge before us that it had reappeared from time to time, yet the only remedy for the evil—if remedy it could be called -was what was termed "stamping it out," which was simply a euphemistic phrase for wholesale slaughter. So far back as the early times of the Roman empire the poet Virgil described this very cattle disease, and recorded that the only remedy was to slaughter all the herds that were infected with it. He had seen it stated that the diseases of pigs were manifold, and the remedy very uncertain; and we were told to make bacon of them at once or give them medicine. Now he thought that those who possessed animals were greatly to blame, for he did not consider that sufficient attention had been given to this important question. They had not, in his opinion, given the encouragement to science which they ought to.

Mr. FERRIS, in answer to a question with regard to cutting off sheep's tails, said he did not approve of the practice, which he considered to be cruel as well as unnecessary. The tails of animals were never intended to be cut off. As to the scab, if fat sheep took it they became poor; and poor sheep were more liable to it than fat ones; and the disease being highly contagious, a whole flock would soon become infected.

MAIDSTONE.

The Diseases Incidental to General Farm Stock.—At a recent meeting of the Maidstone Farmers' Club Professor Brown delivered a lecture on this subject.

Professor BROWN said, they had at the very outset a very inviting subject—he alluded to the mere fact of the existence of disease, for when they came to consider it was a most remarkable circumstance that a machine so perfectly adapted to its work as the animal body should ever get out of order. But from apparently trifling causes they found this was the case. They had the familiar example of a cold. A man one day in perfect health, on the next he had what was known as a very bad cold, and he ascribed it to some cause, such as getting his feet wet, or the wind having changed, or wearing a thicker or a thinner coat. That satisfied his mind, and the minds of his friends, but a little reflection would show how that he had done the same thing a hundred times before, and had not caught cold, or anything approaching to it. But among the lower infusorial orders nothing seemed to injure them. If they were turned inside out the stomach became skin and the skin the stomach, and performed its functions just as well as before. If they cut it to pieces, each piece, as if to satirise their efforts, became a perfect animal. As they ascended the scale animals had a more complex arrangement, and were more liable to be disturbed.

One of the facts or assumed facts, to which he would draw attention, was that disease depended upon domestication. That he held to be a complete fallacy. It was quite true that certain diseases, confined principally to human beings, depended on artificial modes of life, but they could not disguise from themselves the fact, that animals in what they called a state of nature, and man in a similar condition, was liable to disease. On the steppes of Eastern Europe, and Asia, where animals were in the most natural conditions possible, at liberty to make their selection of food, and with an unbounded quantity of air, the most malignant affections, such as the cattle plague, and the Russian steppe murrain, developed themselves. No doubt an artificial system which favoured early development rendered animals more liable to disease. The present system of treating cattle was what he might term the railroad system. The point was to breed animals of the most exuberant character, and to place them in positions where they would be able to obtain the earliest maturity. The object of the breeder was that his oxen might go to market at full growth, and if he could obtain this at two years he would not be content with a breed which would not do it under four. It was the same with sheep. Circumstances forced the farmer into the position, although no one would contend that the same nutriment and flavour would be found in a haunch of mutton off a teg that were to be found in a 4-year-old Southdown. The demand was such that all their resources were inadequate to supply it. Under these circumstances animals, it was true, became subject to certain diseases, mainly of the digestive organs—that part of the body whose duty it was to receive food, macerating it and preparing it for that chemical change which preceded its ultimate reception into the animal's body.

In treating his subject he would divide diseases into digestive, respiratory, and generative, and then speak to them of a class of diseases which was increasing very much in this country—those termed blood diseases—which were in a great measure connected with high farming. Taking first the diseases of the digestive organs, he referred to ordinary cases where cattle were "hoven," or blown. This occurred when cooked food, which had been standing a long time, was given to cattle, fermentation having commenced, or when they turned sheep into a clover field after a few days' wet, and the plant was just springing. The animals, which had, perhaps, been kept on dry food, gorged themselves, and the result was fermentation instead of digestion. The animal became blown to an enormous size, and the result was occasionally suffocation. This happened sometimes before aid could be rendered. Immediate relief should be given to all cases practicable. The shepherd might plunge a knife, if he had no more scientific implement, through the walls of the abdomen and the coats of the stomach, with perfect safety. Hyposulphite of soda, an antiseptic, might be given in large quantities—half an ounce to a sheep in a pint of water, and two ounces to an ox in a quart of water. This would very quickly relieve the distension. Another affection, which occurred in some districts very frequently was known as red-water, a disease which would naturally be supposed to proceed from some disturbance of the kidneys, but which really arose from a disturbance of the digestive organs. A certain amount of dead matter was left in the blood, which was got rid of by the excretion of urine. It was a very common thing to occur where animals were fed rapidly. In these cases the remedy was to keep the animal on a low diet, a course which the feeder naturally hesitated to adopt, as it would throw the animal back, perhaps, some two or three months. But without that lessening of the quantity of food and a modification of its quality, all remedies would be entirely thrown away. The next thing was to give some mild stimulant to the liver, such as a mixture of salts, taraxacum, and magnesia. Another affection was diarrhœa in cattle and sheep. In lambs it often arose from tape-worms, and the loss was sometimes excessive. The Professor gave an interesting explanation of how tape-worms were ordinarily developed. The remedy, which was most successful in the case of dogs, and in the human subject, was equal parts of areca-nut, common salt, and powdered gentian-root. The worm in the throat of lambs was also referred to. Various remedies were suggested, but he could advise none of them as a specific. Fumigation of tar or sulphur, and the application of turpentine was suggested, and also driving the animals backwards and forwards over some lime; but after all those methods of treatment did not succeed so well as a system of good feeding, which rendered the animals less susceptible to the influence of the parasite. Another subject to which he referred was one whose investigation, he said, would lead them to reflect on the whole system of high farming, and excessive manuring, as carried out in the present day. He alluded to what was called sour lands, or, as the shepherd termed it, "stenchy" ground—ground which was constantly fed and never mowed, and never, under any circumstances, ploughed up. Some of these were on chalk, the soil being only three or four inches deep, manured over and over again by the animals feeding on it, and by top-dressings, and the herbage got in an impure state. Many of these grounds were on blue lias, with water close to the surface. The animals feeding on it became affected with splenic apoplexy, and one moment they might be well, and the next dead. These symptoms arose from organic matter in the food. One universal remedy which was certain to succeed was to plough such land up, and well drain it. The animals ought to be at once removed from the ground, at least for a time, and hyphosulphite of soda in water was a very useful medicine. The cattle plague, the foot-and-mouth disease, the scab and small-pox in sheep were all briefly dealt with. He said they would gather from what he had suggested to them that they could do more in the way of prevention than in the way of treatment. The adoption of sanitary principles, the sheltering of unfairly exposed animals, especially sheep, the selection of the kind of food, and the moderating as far as possible, consistently, the stimulating method of feeding, and complete isolation in certain cases, were the most important matters in the preservation of the health of animals.

In answer to inquiries, Professor BROWN said, with regard to "stenchy" ground, the system of mowing for a few years and the employment of lime and salt would meet the case, but the difficulty was to convince the occupier of a large quantity of chalky ground that it was necessary to top-dress with lime, as he was generally under the impression that there was a sufficiency. The course indicated was, no doubt, the best to be pursued.—With regard to the question as to the time that elapses from the incubation of pleuro-pneumonia to the declaration of the disease, it might be taken to average from a fortnight to three weeks, but there were certainly many cases in which the animal appeared to go a much longer time. There had been cases where diseases had appeared on a farm and then stopped, and after three months re-appeared without any new infection being traceable. It was possible that it had been conveyed there some short period before the second outbreak. To meet so many cases of that kind, they therefore said the period of incubation was from three weeks to three months. But if a month elapsed they might consider themselves fairly safe without there was a new infection.—As to the time which should elapse after the disinfection of a building before the introduction of fresh stock, it depended upon the kind of disinfection adopted. His impression was, that what was called disinfection was no disinfection at all. Certain agents, as carbolic acid, chloride of zinc, and chloride of lime, which had the power of destroying infectious matter, were used; but before these were applied, persons were set to work to scrub the place thoroughly. He had seen over and over again such a washing and brooming of the place perfectly successful, without any application at all. Should he have pleuro-pneumonia on his own farm he should first of all cover the floors of his sheds with quicklime. He should then thoroughly sweep down the walls and wash them with hot water and soda, and then sweep the whole on to the manure heap, as he should be perfectly satisfied with the action of the quicklime, even with the cattle plague. Having done this he should dress the walls with a solution of carbolic acid or chloride of lime. He should then shut the place up and burn 2 lb. of sulphur, and then he should throw it open in a few days' time, and afterwards put stock in in perfect safety.—With regard to the question as to wet Clover, he quite agreed that the very time when Clover was likely to affect sheep was after very hot weather, as it was then stimulated to excessive growth.

Notices of Books.

British Sheep Farming. By William Brown, Factor and Estate Agent. Adam and Charles Black, Edinburgh.

The author of this little book speaks of it as in some respects necessarily a compilation, on account of which he has to acknowledge obligations to several sources. The apology thus made was altogether unnecessary. The book is a very clever description of its subject, from an original and extremely interesting point of view. Though not going into great detail on the practice of sheep management, there is in chapters 6 and 7 a great deal of useful information of practical serviceableness to the farmer.

The plan of the work has been to describe British sheep farming as a whole, taking the statistical returns of the cultivation and the live stock of the several counties as a basis of leading facts on which to build.

The following opening sentence illustrates the manner in which the author looks upon his subject:—

"To the world the map gives the British Isles as a small green spot, an equilateral triangle of some 500 miles on the side. To the British flockmaster two-thirds of these 77,000,000 acres—while nothing more than a few very extensive runs in South America—are fields of gold in wool or mutton; and to the man of science they possess a variety of interesting and instructive physical characteristics which probably do not exist within a similar extent in any other part of the world."

From this general view a descent is made upon the several particulars affecting the sheep farming of the country; and the leading facts regarding it and its distribution over the British islands are very fairly given. We do not suppose all the statements made can be defended. There are more than Leicester, Down, Cheviots, and blackfaced sheep in this country—Northumberland is not "confessedly the best farmed county in England"—the Wolds of Lincoln can hardly "now be marked as a Down-growing district"—in Essex the sheep are by no means universally "yard fed in winter"—and Mr. Brown is of doubtful authority when he speaks of the heath mutton of "the sunny side of London." He is, nevertheless, well deserving the confidence and attention of his readers throughout most of the pages he here fills; and is no doubt especially trustworthy in reference to sheep-farming in the Highlands.

By collecting a number of examples he arrives at the conclusion that sheep-farming pays only 10*d.* an acre rent for Highland properties, whereas deer forest and shooting pay 1*s.* 1*d.* per acre, and the following is the

conclusion which he presents as regards the interests of proprietors and the public respectively in these two styles of management :

"We have, then, 1,320,000 acres of deer forest at 1*s.* 1*d.*, giving an annual rent of.. ..	£71,500	0 0
And the same ground for sheep, at 10*d.*, would represent a rent of	55,000	0 0
	£16,500	0 0

"Here are £16,500 of annual revenue in favour of the proprietors, accruing from letting parts of their estates as deer-preserves. But now for the other, the national side of the question.

"According to our previously established averages, these forests produce 8800 stags and hinds. On the other hand, we find that 9,500,000 acres of these counties carry 3,366,000 head of sheep; and taking, as explained in chapter 4, three years as the average age of all sheep, there result 156,000 Cheviots and blackfaced that could be grown and killed annually, on the same area as that occupied by the deer-forests. Let us tabulate this :—

Sheep.		
156,000, 60 lb. each, at 8*d.*	£312,000	
300,000 fleeces wool (deducting lambs) at 2*s* ..	30,000	
156,000 skins, at 5*s.*	39,000	
	£381,000	
Deer.		
8800 stags and hinds, 140 lb. each, at 6*d.*	£30,800	
8800 skins, at 3*s* 6*d*	1,540	
8800 heads, averaging 12*s.*	5,280	
	37,620	
	£343,380	

"Deer *versus* sheep in this country, then, shows a gain of £16,500 annually in favour of the proprietors, and a yearly loss of £343,380 to the nation. These are the plain figures of the case, without any debiting or crediting. A lengthy argument as to extra money left in the districts by shooting tenants, reduction of parish and county rates per pound by the larger rental, or increase to national tax-revenue from the same source, on the one side; and nutritive value of flesh, improvement of land, and increase of population, &c., on the other, would not likely help to mend the question. Were argument desirable, where facts alone are presented, it could be shown how much flesh could be taken from deer-forests, not by sportsmen for sport alone, but by judicious stocking and thinning, as with sheep."

The book is well illustrated with maps, coloured and otherwise, and will, no doubt, obtain many readers, most of whom will be well satisfied with their purchase.

Continental Farming and Peasantry. By James Howard, M.P. Wm. Ridgway, 169, Piccadilly.

Mr. Howard's capital paper on this subject, read before the London Farmers' Club, has been republished in an octavo volume of 104 pages, supplemented by an appendix of answers to questions, put either by letter or *viva voce* to gentlemen of experience and position in various Continental countries. The author's strictures on *petite culture* and on Belgian farming are supported by copious extracts from the report on that subject just published by the Royal Agricultural Society of England. The whole is a very instructive picture of Continental agriculture—one in which an English farmer may well take an interest, and by which he cannot be said to be shamed.

The Quarterly Journal of Science. No. XXVI. Longmans, Green & Co., Paternoster Row.

The present number contains articles on Druidical Remains, Insanity, Metallurgy in Cleveland, the "Trophic Nerves," Underground Temperature, the Mines Regulation Bill, Practical Scientific Instruction, and Atmospheric Electricity. It also reviews Faraday's Memoirs, and Dr. Molloy's book on Geology and Revelation. There are besides these the usual chronicles of progress under 12 different departments of science and art—beginning with agriculture and ending with zoology. The agricultural chronicle speaks of sewage, manure adulteration, Belgian agriculture—the subjects discussed at meetings of farmers' clubs—and recent agricultural statistics. But it is not here alone that the pages of the volume will interest the agricultural reader. There are a number of passages we have marked for extract. The following are some of them :—

"*The Berberry Tree and Rust.*—It was noticed as long since as 1806 by Sir Joseph Banks, that the proximity of the Berberry tree appears to be a cause of the prevalence of the disease known as "rust" in the grain crops of the neighbourhood. It has now been ascertained that one of the Fungi which produce the rust in cereals, the Puccinia graminis, and the Fungus which causes the well-known orange spots on the leaves of the Berberry, the Œcidium Berberidis, are in reality different forms of the same plant; the spores of each form will not reproduce itself but the other form. In the commune of Genlis, department of Cote d'Or, in France, a railway company has recently planted its embankments with Berberry trees, and immediateyl afterwards the crops of Wheat, Rye, and Barley in the neighbourhood became infested with rust. A commission being appointed to investigate the subject, reported that wherever the Berberries are found the grain crops are more or less attacked by rust; where they do not occur the crops are free, and that the planting of a single bush of Berberry is sufficient to produce the disease where it has never appeared before."

"*The 'Yolk' in Wool.*—The fatty matter contained in sheep's wool, technically known as snint, is likely to become of considerable commercial importance. It contains some 40 per cent. of potassa; and when ignited this alkali becomes thereby intimately mixed with strongly nitrogenised animal charcoal. M. Havrez points out the profit to be derived from the use of snint for the manufacture of prussiates and cyanides, and M. Schattenmann, prussiate and cyanide manufacturer at Bouxwillir, near Strasburg, states that results of experiments made with snint by him on a large scale, are decidedly favourable to the use of that substance for the purpose alluded to. It should be observed that the quantity of snint contained in raw wool amounts to one-third of its weight; and that in 1867 there were imported into the United Kingdom 63,000,000 kilogrammes of raw wool from the Cape and Australia, the quantity of snint contained therein amounting to at least 20,000,000 kilogrammes."

"*Researches on the Relation of Heat to Work in the Human Body.*—Professor Pettenkoffer, of Munich, has undertaken an investigation into the amount of heat produced by the human body when at rest and when at work, which promises to give highly important results. The wonderful experimental chamber with King Max had constructed for Pettenkoffer's work is to be made use of. The chamber, which is about 10 feet square, is fitted with air iron tube through which the air is regularly drawn by means of an aspirator worked by a steam-engine, the air being accurately measured in a gas-meter. Smaller aspirators bring measured quantities of the air through analysis tubes in which the quantities of carbonic acid, water, hydrogen, and carburetted hydrogen (the last two by combustion with spongy platinum) are determined in the air both before and after it enters the chamber. The small aspirators, bringing a small but constant fraction of the whole air passed into the chamber through the analysis apparatus, the quantities of carbonic acid gas, water, and hydrogen, in the whole can be readily calculated. It is now intended to take the temperature of the air before and after it traverses the chamber, and in this manner to ascertain the actual amount of heat produced by the human body when at rest and when at work, and in relation to the amounts of the various excretions. For this purpose a smaller chamber has been constructed within the first made, and arrangements adapted, by means of non-conductors, &c., to prevent, as far as possible, the loss of heat. It is found that there is a constant loss of about 40 per cent. of the total heat with two candles burnt in the chamber; of about 50 per cent. with four. The heating effect upon the air passed through the apparatus is determined before each experiment with stearine candles of known weight, and thus when a man is placed in the chamber instead of the candles, you get his heating effect in terms of stearine candles, and this is, of course, at once convertible into units of heat. The preliminary experiments with candles promise very accurate and satisfactory results from this method. As an apparatus for chemical analysis the chamber is perfect; so perfect that the percentage composition of a candle can be determined as accurately by burning it in the chamber, and the fractional analysis, as by the most complete direct combustions. The determination of the heat produced is a matter of more difficulty, on account of the fluctuations of external temperature and the delicacy of the thermometers which must be used; but Professor Pettenkoffer has used every precaution, and succeeded in rendering the apparatus efficient. The experiments are now in progress; a man is to be kept in the chamber for six to eight hours, and the work done is in the form of crank-turning."

The book is capital reading for the country house, whether occupied by the landowner or the farmer. Certainly its circulation will extend as agricultural education improves.

Farm Memoranda.

HAMPSHIRE: *April* 13.—In the last report, written on February 15, it was anticipated that the extreme fluctuations of weather and temperature at that time prevailing must have a damaging effect on vegetation, and particularly of the Wheat plant. It is now known that large breadths of Wheat on all the light soils of the county have been seriously injured; a considerable portion has been ploughed up, and resown either with April Wheat or Lent corn, whilst a great deal remains thin of plant and patchy, particularly upon irregular soils, and will continue so until harvest, the result of which will be a diminished quantity of grain, and probably of inferior quality, for a very thin Wheat plant is usually subject to blight or premature ripening. Vetches are in many instances killed, and in others greatly injured. Trifolium, too, is very late, and also much damaged, which is to be regretted, seeing that this crop generally affords such valuable provender for stock. Swede Turnips have also suffered severely from the effect of alternate frost and snow, and where not gone rotten have lost a large amount of feeding value. This should teach the lesson of pulling the crop and covering with earth in the field during November and early part of December, if it is desired to preserve against game, or to retain the full properties of the root. The root crops have not held out so well as at one time expected. This is unfortunate, as the water meadows are unusually late this year; therefore, to be well provided against contingencies of this kind, large breadths of Mangel should be sown and carefully preserved until the spring months; and to have this very valuable root in perfection, it should be sown early (the middle of April being a good time), and a liberal dressing of good dung and guano applied. Late-sown roots have never the feeding value of the early sown. Stock farmers on the hill farms, as well as the vale farmers, are now beginning to be alive to the advantages of growing Cabbages, and a very extensive breadth will be planted this year: and as it is possible to grow excellent crops by planting as fast as Vetches and other soiling crops are cleared off the land, the advantage is seen in the safety and certainty of the crop, compared with seeding to Turnips, besides the alternation of crops, so beneficial in the future.

The fall of lambs now being completed, it may be considered a full average, but the loss of ewes has been greater than usual. There is, however, some compensation in the fact that the sheep throughout the county are more healthy than for many years past, there being scarcely any cases of epidemic lameness, from which, however, great losses have occurred in many previous years.

The splendid weather which has prevailed during the past three weeks has given a highly favourable seed-time, although rather later than sometimes happens; yet all kinds of spring crops, Beans, Peas, Oats, Barley, &c., have lately been deposited in the land with as little labour and in as fine and healthy a seed-bed as we can recollect, and the land being exceedingly fine on the surface is favourable for all kinds of small seeds, such as Clover and Grass, of the various sorts, there being also moisture sufficient in the land to vegetate all seeds in due season.

The price of fat stock has receded considerably within the past three weeks, although really good ripe sheep and bullocks still fetch a good price. This fall may be fairly attributed to the fact that the root crops have proved lighter than was expected, which, together with a backward spring, has made it very difficult for the hill farmers to maintain their flocks in good condition without resorting to a larger expenditure than usual in hay and artificial foods.

The price of grain seems remarkably stationary. Wheat certainly making a very unsatisfactory price to the grower, considering the great variations of the crop of the last year in this county.

Potatos are now being planted in field culture with the land in capital condition. The seed from Scotland and the northern counties is found to succeed best, by avoiding the disease, and when 4 cwt. per acre of Peruvian guano is applied an abundant crop is almost certain. This is now the latest period for sowing Cabbage seeds in beds, for pulling and planting in the fields. The best sorts are Champion Drumhead, Oxheart, and Drumhead Savoy. *Joseph Blundell, Southampton, April* 13.

THE NEW FOREST.—[The following reply by Mr. Dickinson, of New Park, Lymington, to a letter impugning his description of the Crown lands here, deserves a record] :—Mr. Esdaile states that the tone of my letter, on the whole, would lead people to believe that the ordinary agricultural value of the whole 63,000 acres may be estimated by the rent I pay for two farms—£2 per acre. My statement is directly contrary; I stated that the sum I paid was for rent, and money expended in improvements by the Crown at my request. I made no statement of 63,000 acres, but that the staple of many thousand acres round my two farms (four miles apart) is as good as is usually found in any county. I omitted to state there is plenty of clay, of sand, and of gravel, overlaid with decomposed vegetable matter, and below are beds of agricultural marl of very high manurial value, more so than I believed the first ten years, but can now attest by practical result.

His next charge is that I have not appointed the amount of rent paid for the naked land alone. I have no objection to do this. Twenty shillings per acre is the bare rent of the land at New Park, and 15*s.* at Burley Lodge, the greater part of which I had to clear of Furze and Fern. If I have erred by being an experimental farmer, the public has the benefit. Immediately I discover anything worth knowing I publish it. The Royal Agricultural Society's Journal bears witness. I will take this opportunity of stating that my experiments have been successful, profitable to me, and useful to the agricultural community. Every unsuccessful farmer demands a balance-sheet as his last weapon of defence and excuse against those who surpass him in the art he ought to understand, knowing that not one farmer in a thousand keeps one, and not one in a hundred can make one. I never saw a farmer's balance-sheet.

Mr. Esdaile then takes upon himself to answer for the opinions of some persons he calls practical farmers, and states that I have been, except in health and pleasure, year by year a most serious loser. I have been farming in the Forest 16 years, surely long enough to ruin any ordinary man. Although it is true I have no balance-sheet to show to the contrary, I have no objection to show the state of my finances for the 16 years I have been here in company with his for the same period.

His next remark is that my testimony is opposed to the opinions given before committees of both Houses of Parliament. It may be so; if it is, it is not the first time my facts have corrected the preconceived opinions of a committee of the House of Commons. I was examined by the Sewage Committee, who laughed at my evidence as ridiculous. I asked them to take a look at the farm and judge for themselves. The next morning they came to Willesden, bringing with them the celebrated agriculturist, the then Speaker of the House—Lord Eversley. They were more astonished at the facts than at the statements, and acknowledged it too. Here is now present a similar fact, which will outweigh a volume of opinions opposed to it, "That the finest white Chidham Wheat, Chevalier Barley, Oats, and all kinds of agricultural roots of the finest quality and great quantity were grown in the New

Forest during the two last years, the last known to be an unproductive one."

Mr. Esdaile next makes mention of the rights of commoners, notwithstanding he is well aware every commoner will be liberally paid for his right. He then places me in an enthusiastic vision farming the 63,000 acres myself, with flocks and herds. The vision is his; he is the visionary man, I the man of facts; I shall be removed, he may live to see his vision realised. Should he desire to know about how many sheep may some day be kept upon the 60,000 acres, it being half arable and half pasture, as New Park is, and farmed honestly as New Park is, I refer him to the returns to the Board of Trade in 1868 and 1869 of the stock kept upon the 264 acres at New Park in those two years. If he substitute four sheep for one horse, and four sheep for one bullock, add them to the sheep and pigs, multiplied from 264 acres to 60,000, he will find it amount to something like 200,000 sheep, besides the cereals from 30,000 acres.

Mr. Esdaile is a magistrate, and might have told us how many children were prosecuted for damaging trees in the Forest, and how many men for depredations of other kinds, but he is quite silent on this subject. The *Hants Advertiser* reports many cases, and on the 12th, Samuel Whittle (one of the contented, honest, well-to-do labourers of Burley) was committed for trial on a charge of killing and slaying his wife. His observation of the rates of Brockenhurst reminds me how much our opinions differed upon another subject. When the squire there wished to take in certain ways and roads belonging to the parish, and an order was issued from the bench at Winchester to do so, I asked him if he was not on the bench on that occasion, if he was not in the chair? It was reported he was in the chair. I hardly believed it, but was so shocked at the transaction that for the first time in my life I resolved to stand a lawsuit, took the case into the Queen's Bench, quashed the order, and the roads (then taken) were restored to the parish.

I do not know the gravelly hills Mr. Esdaile mentions, only fit to grow Fir trees, but I recollect the Crown selling by auction some such land, thought worthless, called Sandy Down, in the parish of Boldre, at £21 per acre, bought by Mr. Murden, who has since grown 5 quarters of Wheat per acre upon some part, and 11 quarters of Oats upon another part, and which is now a beautiful little spot, enclosed with Laurel hedges from 12 to 15 feet high.

Mr. Esdaile describes me as an experimental farmer, and he adopts the opinion of practical farmers. I wish to explain to him the difference; the practical farmer uses the means adopted by others without knowing why, and so goes on as it always was: the experimental farmer tests everything for the result in garden-pots first, which helps to give him health and pleasure, and illustrates what he may adopt with profit. I am one of these.

There is one very grand feature I have reserved for the last, because it is the most important of all. For what purpose did our Heavenly Father give us the land? Was it not to grow food for the people? *William Dickinson, New Park, Lymington, Hants, March 22.*

Miscellaneous.

Milk.—1. The best temperature for setting milk, to get the cream, is at about 60° to 62°. The range of temperature should run no higher than 65°. The butter makers of Orange County, N.Y., are of the opinion that the best quality of butter is made from cream that has been obtained at a temperature a little below 60°. Cream can be obtained in a short time and in large quantity by raising the milk to a temperature near boiling, and then setting aside to cool; but such cream has more of the casein or cheesy particles of the milk mingled with it than milk set without the application of artificial heat, and the butter will be injured in its keeping qualities. In butter making it is important to get good quality — butter that will come of good colour, that is hard and has a waxy consistency, and that will retain the peculiar aroma which imparts so much pleasure in eating it. To accomplish these ends successfully, the milk, as soon as drawn from the cow, should be cooled down to 60° or 62°; and this temperature maintained as far as possible while the cream is rising. And to do this properly, there should be a spring-house and tanks of water in which to set the milk. It is very difficult to arrange a dairy-house, so as to control the temperature of the milk while the cream is rising, without water. Orange County plan is to have tanks 6 feet wide by 10 or 12 long, and 20 inches deep, which are constantly supplied with running water. The milk as it is drawn from the cow is placed in long tin cans, which are at once plunged in the water and kept there until the cream rises. Generally the cream is all up in from twelve to twenty-four hours. The butter makers of Pennsylvania, who make the celebrated Philadelphia butter, have the water flowing over the bottom of the spring-house. Here the milk is set in pans. Narrow walks are arranged in the spring-house, so that the dairymaid may pass in and out and handle the milk conveniently. In both plans the principle of preserving an even temperature of the milk is the same, for it will be observed that the spring water that is constantly flowing in the vats or spring-house varies but little in its temperature while about the milk. When it is not convenient to have a spring-house, the best arrangement with which we are acquainted for setting the milk is the Jennings' pan. It is of tin, and set upon a shallow wooden vat, which is to be filled with water from the well or pen-stock, as the case may be, and thus the milk is rapidly divested of its animal heat, and a pretty even temperature maintained while the cream is rising. The cream that first rises is the best; and to make choice butter the cream should always be take from the milk before it has become old and sour. The greater the decomposition of the milk, the more will the cream be affected, and, as a consequence, the more difficult will it be to obtain from it a nice quality of butter. Now, there is great difference in opinion as to what constitutes a nice quality of butter. Some people who have always been accustomed to an ordinary article, judge from a low standard, and will pronounce a sample "good" that is really intolerable to those who are in the habit of eating and handling a "tip-top" thing. Again, butter may be very good if it is to be eaten when freshly made, but if kept it soon begins to deteriorate. When we speak of good quality we do not refer to that class of goods that is fit only for present use. The manufacture of this kind of butter is not to be recommended; the markets are full of this stuff, and great losses are sustained in consequence. Butter to be good must have some keeping qualities, for it cannot be consumed from day to day as it is made. We have seen butter that when freshly put up would pass as excellent to the taste, and yet in a few weeks it becomes rancid and intolerable. Well-made butter, if properly cared for, should retain its flavour and sweetness for months, but we cannot expect to obtain such butter from cream that has been badly managed. 2. Cream that has been raised in a temperature of 60° to 62° should be churned at about the same temperature. Butter makers do not like to have the cream churned at a temperature above 64°, as it injures the butter. If the temperature falls below 55° the labour of churning will be prolonged. We do not believe in great haste in churning, or "the shortest time" that cream can be turned into butter. We often hear of churns in which it is claimed the butter will come in three minutes. It is possible that good butter may be got from the cream in that time, but we have yet to be convinced that it can be done. That cream can be churned into butter in three minutes we are aware, and have often seen it accomplished in our own dairy, and, although the butter may be tolerable for present use, we have never been able, in our experiments, to get a good, keepable article when the churning was done in so short a space of time. The butter globules are enclosed or surrounded with thin pellicles of casein. In churning these are broken, and separated from the oily particles. If the churning is done rapidly the separation is imperfect, and hence we get an article of butter in which there is too large a proportion of the shells of casein. It is the casein or nitrogenised constituent of milk that decomposes and injures the flavour of butter. If all the shells of casein could be separated from the butter it could be preserved readily without salt. Pure fat or oil is very easily kept sweet. In some countries butter is melted, and the impurities taken out by "trying it" like lard. Of course butter treated in this way loses its texture and aroma, but we mention the fact for the purpose of showing the principle to be observed in obtaining butter of good keeping quality. In churning we do not care to have butter come sooner than from half to three quarters of an hour. The butter-makers of Orange County, who have had long experience, and who produce butter that sells in the market for the highest price, say that the churning process should occupy from forty to forty-five minutes to one hour. Their opinions are worthy of consideration, because they make an article that is unrivalled in the market, and from long and varied experience they ought to be able to settle this point definitely. It is a great saving of time and labour to have butter come in a very short time, but the experience of the world has shown that nothing really excellent can be produced without time and labour, and we do not know why butter-making should be an exception to the general rule. In conclusion, we may remark that no one should attempt to make butter without using a thermometer, especially in preparing the cream for churning. Old and experienced butter-makers may guess at temperature pretty accurately, but the temperature of the surrounding atmosphere varies so much from day to day that no one can be sure of being right without an accurate instrument for determining the degree of heat required in the cream to produce the best results.

Characteristics of Good Hay.—Hay should be moderately fine, somewhat hard, sweet smelling, well saved, of upland growth, and one year old. The colour should be green, and should convey an idea of newness. Very little heating or fermentation should have taken place in the stack. Some little heating is almost unavoidable, if the crop is cut, as it ought to be, early, whilst the juices are still in the grasses; or unless it is over-exposed to the sun, and over-dried before being carried. This slight heat will probably prevent the hay from being very green. A preference has been shown in London of late years for very green hay, arising from the idea that when of this colour it is most nearly in its natural state; but for the reasons given above, this idea, if carried too far, is a fallacy. The flowering heads of the grasses ought to be present in abundance. Every fibre should be firm and crisp, and should appear distinct. The fibres in good upland hay generally lie in one direction. In machine tossed hay, however, the direction of the fibres is not so well preserved as in that made by the hand rake. A tangled confusion of the constituents is a sign of badly saved or of lowland hay. The perfume of the best upland hay, though not so strong, is very like that of new mown Grass. If masticated, it has a mild pleasant flavour, whilst lowland and inferior growths have a strong pungent taste. A proportion of herbage, that is, of plants other than Grass, is desirable. The different varieties of Clover, especially white or Dutch, and Trefoil constitute the great mass of the best upland herbage. These plants are generally abundant, where the soil on which the crop is grown is good. Herbage does not contain much valuable nutriment, but it makes the hay sweet and palatable. Hay composed only of even the best grasses is not relished so well as when mixed with a proportion of herbage. An admixture of weeds is objectionable. Hay grown on good soils is also distinguished by the number and variety of its grasses. Horses prefer hay composed of a variety of good grasses to that consisting of only one sort of Grass, even though that sort may be the very best. The presence of flowers, which have not lost their colour, such as buttercups and the flowers of Trefoil and Clover, is always an item of value in hay, as it shows that the crop has been cut early in the season, before the grasses have lost their juice and nutriment. A similar favourable indication is given by certain early grasses being still in flower, *i.e.*, not run to seed. Hay made from artificial Grass, if good of the sort, is suitable for horses. Most samples of it, however, are deficient in aroma. Rye-grass is most commonly grown for this purpose. It should be cut whilst in flower; but for some reason, with which the author is not acquainted, the cutting is often delayed until the Grass is in seed. To recapitulate.—Cleanness, firmness, crispness, freshness, green colour, delicacy both in taste and aroma, and appearance, the presence of flowers in their natural colours, numerous varieties of grasses, and a proportion of good herbage, are the most marked characteristics of the best hay. Brightness of colour is an essential requisite as regards market value, but many samples of inferior colour possess no other actual inferiority.

The Adulteration of Butter.—A merchant of Birmingham recently paid a high price (108s.) for a parcel of butter imported from Ireland, and being desirous of testing its quality, he took 27 ounces from a firkin, and sent it for analysis to Mr. Stoddart, an analytical chemist, of Bristol. The following is a copy of the report made by Mr. Stoddart upon the butter sent him by our Birmingham correspondent:—"Analytical and Pharmaceutical Laboratory, 9, North Street, Bristol. Dear Sir,—I have examined the sample of butter left with me for analysis. You will find the report on the other side, and see that it is a compound of the most wretched description. The weight contained in the jar was 27 ounces. I have, therefore, given the result of my examination in ounces and also centesimally. A large quantity of wood and dirty rubbish was obtained by straining, many of the pieces being half an inch in length. On ignition a quantity of fine light brown mineral matter was left at the bottom of the crucible, which consisted principally of alumina, and which did not effervesce on the addition of an acid. By melting a portion and leaving it for some time a seventh part of water separated, with which was mixed a quantity of flour or meal, which appeared much coarser than Wheat flour, nor were the starch granules so perfect or abundant. Under the microscope the vegetable structure was well seen, but as the polariscope did not give the usual optical characters, the probability is that heat had been employed when this delectable compound was fabricated. Tincture of iodine gave the usual blue colour indicative of starch. The melting point differed from that of ordinary butter, and the microscope showed bundles of crystals of margarine, so that I have no doubt that a large admixture of lard was present. The bright yellow colour was most likely given by annatto.—I remain, dear sir, yours truly, *W. Walter Stoddart.*

	Ounces.		Per cent.
Water	.. 4.05	or	15.00
Wood, dirt, &c	.. .69	,,	2.52
Meal	.. 2.54	,,	9.40
Common salt ..	.. 1.60	,,	5.00
Mineral matter, clay, &c	.. .43	,,	1.60
Lard and butter	.. 17.70	,,	65.58
Colouring matter	.. —		—
	27.00		100.00

The Grocer.

Cheese Factories in England.—Attention has been very generally called to the introduction of the American system of cheese factories into this country. A committee was appointed by the Derbyshire Agricultural Society to inquire into the question, and the following are the advantages which the committee in their report consider will accrue from adopting the new method:—1st. Greater uniformity in the quality of English cheese than already exists. 2d. Enhancement of the quality and value of the product of milk in dairies, which, from poor plant and absence of good accommodation, are now producing an inferior quality of cheese. 3d. The removal of an arduous occupation, frequently deterring men of capital from entering

upon farms in which cheese-making forms a prominent feature. 4th. Improvement in the value of land. 5th. Generally the introduction of uniformity of system, best plant, best skill and supervision, into a manufacture hitherto subject to great uncertainty and vicissitude. The committee have further decided that one factory shall be established at Derby, and another in a dairying district in the county. The districts whose claims have been tested by the committee are Sudbury, Shardlow, Longford, Etwall, and Weston-under-Wood; but several other localities were named where the farmers were anxious to have the system at work. After careful consideration the committee unanimously selected Longford as the most desirable situation. There are absolute promises from the farmers of this district to supply the milk of more than 500 cows. The committee have also resolved to guarantee 6½*d.* per gallon for the milk, and to divide the profits derived from the disposal of the whey, &c., among those who supply the milk. The project seems in every way likely to be soon realised.

ATTEMPTED FRAUD.—The following case of attempted fraud is described and commented on in the *Pall Mall Gazette*:—

"Some weeks ago a clergyman in a western county advertised a Guernsey and Alderney cow and calf for sale. A day or two after he received the following communication:—

'(Memorandum.)

'From C. HARRIS, salesman, 4, Market Terrace, Metropolitan Cattle Market, Caledonian Road, London.

'Re A. & G. Cow and Calf.

'Rev. Sir—Kindly furnish me with full particulars as to age, condition, and lowest cash price, &c.; and oblige yours faithfully, 'Pro C. HARRIS,

J. H.'

To this the reverend owner of the cow and calf having replied in due course and in satisfactory detail, further correspondence ensued, resulting in the following order:—

'Sir,—I have pleasure in requesting you to forward the cow and calf to the gentleman named in the enclosed, to whom I have recommended and sold them. On receipt of counterpart of the enclosed consignment note I will remit you cheque for value, less the commission agreed upon. Trusting they will give every satisfaction, I remain, yours faithfully, Pro C. HARRIS,

J. H.

———Station.

Received from——
of ———one cow and calf, and forwarded same to the order of GORDON TEMPEST, Esq., at Crystal Palace Station.

Station-master.

4, Market Terrace, Metropolitan Cattle Market, March 17, 1870.

To the Station-master, G. W. R. Company ——

Sir,—Please receive from —— Esq. (*sic.*), of ———— one cow and calf, and forward same per next goods train to the order of GORDON TEMPEST, Esq., at Crystal Palace Station, and oblige

Yours faithfully,

'C. HARRIS and Co.'

Fortunately our clerical friend, remembering the strange disappearance of a fat pig, which had been sent by a neighbouring vicar to London in answer to a similar invitation, paused at this point in the transaction, and suggested that Mr. HARRIS should send his draft first. He has received no further communication from Mr. HARRIS, and congratulates himself on having retained possession of his cow and calf. Such a specimen of the way in which the simplicity of innocent countrymen is preyed upon by ingenious 'salesmen' is worth recording for the benefit and instruction of all whom it may concern. We should be glad to ascertain the authentic existence of Mr. 'C. HARRIS,' who looks up the local papers to so much purpose, and appreciates a possible customer who advertises from a 'parsonage.' We must do Mr. HARRIS the justice to own that 'GORDON TEMPEST' is really a sweet name to tickle the agricultural imagination withal."

RULES FOR DELIVERY OF MILK.—The following are the rules adopted by the Milk Condensing Factory at Elgin, Illinois:—"1. The milk shall be drawn from the cow in the most cleanly manner, and strained through wire cloth strainers. 2. The milk must be thoroughly cooled immediately after it is drawn from the cow, by placing the can in which it is contained in a tub or vat of cold water, deep enough to come to the height of milk in the can, containing at least three times as much water as the milk to be cooled; the milk to be occasionally stirred until the animal heat is expelled, as below. 3. In summer, or in the spring and fall, when the weather is warm, the bath shall be spring water, and over 52° temperature (a day or a night after a heavy rain excepted), constantly running or pouring in at the bottom, necessary to reduce the temperature of the milk within 45 minutes to below 58°; and if night's milk, to remain in such bath until the time of bringing it to the factory, and to below 55°. The morning's milk not to exceed 60°, when brought to the factory. 4. In the winter, or in freezing weather, the bath shall be kept at the coolest point (it need not be running spring water) by the addition of ice or snow sufficient to reduce the temperature of night's milk speedily below 50°. 5. In spring and fall weather a medium course will be pursued, so that night's milk shall be cooled within a hour below 50°, and morning's milk below 55°. 6. The bath and supply of water shall be so arranged as to let the water flow over the top to carry off the warm water. The can in which milk is cooled shall be placed in the water immediately after the milking, and shall remain therein until the process of cooling shall be finished. 7. The night's and morning's milk shall be separately cooled before mixing. 8. No milk shall be kept over to deliver at a subsequent time. 9. The milk shall be delivered on the platform at the factory at Elgin every day, except Sunday. 10. Suitable cans, of proper dimensions, to transport the milk from the dairy to the milk-works, shall be furnished by the seller, and the cans shall be brought full. 11. The company shall steam and clean the cans at the factory, free of charge, but customers shall keep the outside clean. The pails and strainers employed shall be by the seller thoroughly cleaned, scalded in boiling water, and dried morning and night. 12. Immediately before the milk is placed in the cans, they shall be thoroughly rinsed with clean water, and great care shall be taken to keep the cans and milk free from dirt or impurities of any kind. When the cans are not in use they should be turned down on a rack, with the tops off. 13. All the 'strippings,' as well as the first part of the milk, shall be brought. No milk will be received from a cow which has not calved at least 12 days, unless by consent of superintendent or agent, who may determine its fitness sooner by a sample of the milk. 14. The cows are not to be fed on Turnips, or other food which would impart a disagreeable flavour to the milk, or upon any food which will not produce milk of standard richness. 15. It is further understood and agreed by the parties hereto that if the superintendent or agent of the company shall have good reason to suspect, either from evidence furnished, or from the state of the milk itself, that water has been added, or that it has not been cooled as provided, or that it has been injured by carelessness, he shall have a right to refuse to receive such milk, or any further quantity of milk, from the person so violating these directions and stipulations."

The Week's Work.

APRIL 23.—*Wheat Hoeing* is later than usual, but it must not be forgot that the hoe greatly accelerates growth at this season, if it is properly handled in dry weather; a good season is imperative at all times, but doubly so in a late spring. There will be very little spring-proud Wheat this year to check with the scythe or sheepfold, the demand being all the other way—the use of a more than usual supply of artificial manures to stimulate growth so as to cover the ground before the dry weather sets in.

Horse Hoe, in dry weather, Beans, Peas, Parsnips, and the Carrots and Potatos as soon as they will stand it. To keep this implement going in fine weather is the surest and shortest way of overtaking the season; on the other hand, to horse-hoe in wet weather is to retard the growth of the crops being hoed, and to encourage the growth of weeds.

Vetches—the second April sowing—get in for summer soiling and folding, as previously directed.

Hemp, sow on rich fertile land. Poor soils are not adapted for it. If grown after a white corn crop the land should be fallowed and manured in autumn so that at this season it only requires smashing, harrowing, and clearing for the seed, as for Flax. From two to three bushels of seed are then sown broadcast and lightly covered by a stroke of the Grass seed-harrows. The young plants are hoed to 15 or 16 inches asunder, and the land kept clean until the crop covers the ground. The seed is also drilled in for horse-hoeing. The crop is a smothering one when once it covers the ground. It is even said to be obnoxious to most weeds. If not manured in the autumn the land should in spring, a month before sowing, get a liberal dose of rape-cake and superphosphate. On the Continent special liquid manures, consisting of rape-cake fermented in sewage, are applied at the time of sowing.

Lupine, sow. It grows on poor sandy, peaty, and fenny soils. Much of the success of its culture depends upon deep thorough tillage, as the plant only luxuriates in a deep friable soil. Chalky soils are unsuited for Lupine. Two bushels of seed per acre are drilled in on the flat, 16 inches or so apart, and the land rolled down immediately.

Teasel.—Sow from two to three pecks of seed per acre, either broadcast or in drills sufficiently far apart for horse-hoeing; or, what is better, sow in seed-beds for transplanting in autumn for harvesting the crop next year. Teasels require a clean, rather clayey soil, in a thorough state of cultivation. When sown broadcast the plants are hoed out 12 inches apart each way, in drills 6 to 8 inches asunder in the rows.

Chicory is sown on poor sandy soils, as a forage plant, in drills 8 or 10 inches apart, so as to permit of the crop being hand-hoed. The root is also grown on richer soils, for roasting as a part substitute for coffee,—the plants being horse-hoed and set out as Carrots. For either purpose, from 12 to 13 lb. of seed will sow an acre. Chicory is also sown broadcast in the place of Clover, the same way as Sainfoin, often half and half, 7 lb. each, in laying down light Clover-sick soils to permanent pasture with a light crop of Barley or Oats.

Lucerne is best adapted for the rich but dry calcareous soils of the southern counties. The land should be well fallowed and manured in the autumn, and smashed up and harrowed fine at this season, and then drilled with from 12 to 16 lb. of seed per acre, the drills no wider apart than will permit of hand-hoeing. It is sometimes sown with Oats or Barley, but as both plants, and all the grasses, are obnoxious to it, it is better to sow it alone on land expressly prepared for it, and afterwards to keep it perfectly clean and free from weeds of every kind.

Grass and Clover Seeds.—Sowing is now generally concluded for the season, with the exception of a few late districts in the North; and although the current season itself is late, the time of sowing Grass seeds should not be much behind its usual; more especially as the season continues favourable for the work. The mixtures are very diversified, both as to kinds and quantity of each. Much depends upon the quality. The quantity of Grass seeds sown varies from 30 to 60 lb. per acre, with from 12 to 20 lb. of Clover. Good perennial Rye-grass weighs from 28 to 32 lb. per bushel; Italian seldom more than 15 lb., the Meadow Poas and Fescues rather less—the number of seeds to a pound being inversely as the weight of the bushel. Thus, quoting Lawson's "Agrostographia," there are in an ounce of Lolium perenne, 13,700; Lolium italicum, 27,000; Festuca pratensis, 26,000; Poa pratensis, 243,000; Trifolium pratense, 16,000; and in T. repens, 32,000 seeds.

Mangel Wurzel and Sugar-Beet are extensively sown during the latter half of April, and will doubtless be so this year in favourable exposures; but a greater breadth than usual will be sown about the beginning of May, and therefore we shall resume the subject next week.

The Stocking of Pastures in late seasons is always a work of caution, and there is generally less danger when the bite is short than when a high temperature sets in, forcing up an over luxuriant growth, containing an excess of water with much crude matter, somewhat analogous to the second folding of a water meadow. To counteract the purging effects of such food on all sorts of stock, more especially sheep, hay chaff, with a sufficiency of meal to make animals eat it, should be given. Again, cold nights and sudden changes of temperature often continue up to the middle of May. If there is a dry run sheep should have it over night, and neat cattle may have to be housed nightly for a short time in the South, as is common in the North. *W. F.*

Markets.

HOPS.

BOROUGH MARKET, April 22.

Messrs. Pattenden & Smith report that the demand for both English and foreign is of a retail nature, quotations remaining unchanged.

HAY, per Load of 36 Trusses.

SMITHFIELD, Thursday, April 21.

Prime Meadow Hay	77*s.* to 82*s.*		Clover, old	..	100*s.* to 126*s.*
Inferior do.	60	70	Inferior do. ..	..	86 95
Rowen	50	68	Prime 2d cut	..	100 110
Inferior do.	..	—	Inferior do. ..	..	80 90
Straw	26	30	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, April 21.

Sup. Meadow Hay	84*s.* to 92*s.*		Inferior Clover	..	90*s.* to 114*s.*
Inferior do.	70	76	New do.		
New do.	—	—	Straw	30	35
Superior Clover ..	123	130	JOSHUA BAKER.		

WHITECHAPEL, Thursday, April 21.

Fine Meadow Hay	76*s.* to 80*s.*		Prime old Clover	..	120*s.* to 130*s.*
Inferior do.	60	70	Inferior do. do	..	90 100
Prime New Hay ..	—	—	Prime 2d cut do. ..		— —
Inferior	..	—	New Clover ..	..	105 112
Straw	24	28	Inferior do. ..	..	80 90

SEED MARKET.

We have a steady trade passing in agricultural seeds, and values for all descriptions continue exceedingly firm. The brisk consumptive demand for Clover seeds which has now prevailed for some time has reduced the stocks to very narrow limits. We have a good inquiry for sowing Rape seed, which is very scarce and dear. There is also a fair business passing in white Mustard seed. Tares are without change.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

ENGLISH WOOL.

During the last week the improved tone previously noticed has been fully maintained, and had it not been for the holidays a considerable business would have been done. Skin wools are ½*d.* per pound dearer than last month, and a very fair portion is taken up by the holders of fleece wool, who think it very possible to keep up rates at a trifle above those recently paid.

CURRENT PRICES OF ENGLISH WOOL	Per lb.	*s. d.*	*s. d.*
FLEECES—Southdown hoggets	.. .. ..	1 1	to 1 2½
Half-bred ditto	.. .. ..	1 2	— 1 2
Kent Fleeces	.. .. ..	1 3	— 1 4
Southdown ewes and wethers	.. ..	0 0½	— 1 1
Leicester ditto	.. .. ..	1 2	— 1 3
SORTS—Clothing	.. ..	0 11	— 1 0
Combing	.. ..	1 0	— 1 8

METROPOLITAN MEAT MARKET.—April 21.

Best Fresh Butter .. .. .. 16*s.* per dozen lb.
Second do. do. .. .. .. 13*s.*
Small Pork, 5*s. od.* to 5*s. 6d.*; Large Pork, 3*s. 8d.* to 4*s. 4d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY April 18.

The number of Beasts is small and trade is dull, prices are rather better, but it is difficult to effect a clearance. The supply of Sheep is shorter than last

Monday, but about an usual one for the day, this being a kind of holiday market. Choice Lambs and Calves are scarce and dear. Our foreign supply consists of 970 Beasts, 6200 Sheep, and 90 Calves; from Scotland there are 340 Beasts; from Ireland, 40; from Norfolk and Suffolk, 1180; and 286 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Hereford, &c.	4	8 to 5 0	Best Long-wools	..	to ..
Best Shorthorns	4	6 4 10	Do. Short	4	6 4 8
2d quality Beasts	3	0 3 8	Ewes & 2d quality	..	.. ..
Best Downs and Half-breds	..	.. — ..	Do. Short	..	3 8 4 4
Do. Short	..	4 8 5 0	Lambs	..	7 0 8 0
			Calves	..	4 0 5 8
			Pigs	..	3 8 5 8

Beasts, 2816; Sheep and Lambs, 20,560; Calves, 92; Pigs, 55.

THURSDAY, April 21.

There are a few more Beasts than on last Thursday, yet the supply is not large; trade is very dull, and they cannot all be sold; the choicest qualities make nearly as much as on Monday. We have a fair supply of Sheep; trade is slow, at Monday's quotations. Choice Lambs are scarce and dear. Calves are selling about the same as on Monday. Our foreign supply consists of 125 Beasts, 3390 Sheep, and 135 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Hereford, &c.	4	8 to 5 0	Best Long-wools	..	to ..
Best Shorthorns	4	6 4 8	Do. Short	4	6 4 8
2d quality Beasts	3	0 3 8	Ewes & 2d quality	..	.. ..
Best Downs and Half-breds	..	.. ..	Do. Short	..	3 8 4 4
			Lambs	..	7 0 8 0
Do. Short	..	4 8 5 0	Calves	..	4 0 5 8
			Pigs	..	.. ..

Beasts, 657; Sheep and Lambs, 10,210; Calves, 211; Pigs, —.

MARK LANE.

MONDAY, April 18.

The supply of English Wheat to this morning's market was very small, and brought prices rather exceeding those of this day se'nnight. There was a poor attendance, and the little business done in foreign was at that day's rates. Grinding Barley was 6*d.* per qr. dearer. Beans and Peas brought extreme prices. There was a fair demand for Oats, at an advance of 6*d.* per qr. Flour was steady, and unchanged in value.

PRICE PER IMPERIAL QUARTER.	s.	s.
WHEAT, Essex, Kent, Suffolk. White	38—46	Red	35—44
— — fine selected runs	46—50	Red	38—47
— — Talavera	53—55		—
— — Norfolk	—	Red	—
— — Foreign	38—52		—
BARLEY, grind. & dist., 26 to 30	Chev.	32—42	Malting	34—38
— Foreign grinding and distilling	22—25	Malting	30—40
OATS, Essex and Suffolk	22—24		—
Scotch and Lincolnshire	Potato	24—26	Feed	—
— Irish	Potato	23—25	Feed	21—24
— Foreign Poland and Brew		24	Feed	19—21
RYE		32—38	Foreign	33—36
RYE-MEAL, Foreign		—		—
BEANS, Mazagan 30s. to 37s.	Tick	31—49	Harrow	31—49
Pigeon 40s. to 56s.	Winds.	—	Longpod	—
— Foreign	Small	41 43	Egyptian	38—40
PEAS, White, Essex, and Kent	Boilers	32—42	Suffolk	35—43
— Maple, 41s. to 45s.	Grey	32—42	Foreign	33—37
MAIZE		—	Foreign	29—31
FLOUR, best marks delivered	per sack	36		—
— 2d ditto	ditto 25	37	Country	25—37
— Foreign	per barrel	22—25	Per sack	29—35

WEDNESDAY, April 20.

Fresh up to Mark Lane this morning the receipts of Wheat from Essex and Kent were limited, but the quality was good. Next to nothing was doing in either red or white produce, and prices were nominally unaltered. The show of foreign Wheat was moderate; the demand was inactive, at about late rates. Moderate supplies of Barley were on offer; all descriptions were firmly held, but the demand was not active. Malt was quiet, at previous quotations. Oats have been in fair request, at full prices. Beans have been steady in value, and Peas firm. Maize has been steady. Flour has sold quietly on former terms.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch	Qrs. 1010	Qrs. 240	Qrs. —	Sacks. —
Irish	—	—	—	—
Foreign	6450	6120	45,200	1090 brls.
	7460	6350	45,200	

LIVERPOOL, April 19. At this day's market there was a fair attendance, and a moderate business was concluded in the better qualities of red and white Wheat, at prices the turn in sellers' favour. Flour stood without change. Oats and Oatmeal sold steadily at a slight improvement. Beans 1*s.* 6*d.* per qr. dearer. Peas scarce, and quite as dear. Barley in fair request at previous rates. Indian Corn 1*s.* 6*d.* per qr. higher, but the advance checked the demand.

AVERAGES.

	Wheat.	Barley.	Oats.
Mar. 12	40*s* 9*d*	33*s* 10*d*	20*s* 10*d*
— 19	41 9	34 4	21 1
— 26	42 5	34 5	21 2
April 2	42 5	35 0	21 5
— 9	42 8	34 11	20 0
— 16	42 10	35 2	21 5
Average ..	42 1	34 7	21 1

COALS.—*April 20.*

Holywell Main, 15*s.* 6*d.*; Walls End Harton, 15*s.* 6*d.*; Walls End Hetton, 18*s.*; Walls End Hetton Lyons, 15*s.* 6*d*; Walls End Tunstall, 15*s.* 6*d.*; Walls End Hartlepool, 16*s.* 6*d.*; Walls End Deaf Hill, 16*s.* 6*d.*; Brancpeth Cannel, 18*s.* 3*d.*—Ships at market, 31; sold, 20; unsold, 11; at sea, 15.

Hot-water Pipes and Boilers.

J. JONES AND SONS deliver HOT-WATER PIPES and CONNEXIONS, with BOILERS, of every make, free to any station in England, for a cash with order; or they allow a liberal discount for cash at the wharf in London.
6, Bankside, Southwark, London, S.E.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
J. JONES AND SONS, 25, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark.

POLLARD, JEPHSON, AND CO'S CONICAL BOILERS for HEATING, by HOT-WATER, Pinetries, Greenhouses, Conservatories, Museums, Churches, Chapels, Halls, Warehouses, &c. Used at seats of Duke of Newcastle, Lord Belper, &c. At Viscount Sydney's replaced, after being 22 years in constant use. Apply at
Bear Garden, New Park Street, Southwark, London, S.E.

HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol, or equivalent

	2-inch	3 inch	4 inch
HOT-WATER PIPES, Nos 6 & 7 on illustrated sheet per yard	0 11	1 5	1 11
ELBOWS .. .. No. 12 on do. each	1 4	2 1	2 9
TEE PIPES .. .. No. 33 on do. "	2 0	3 0	4 0
SYPHONS .. .. No. 21 on do. "	1 0	3 0	4 0
VALVES .. .. .. "	10 0	11 0	12 0

GEORGE ROBINSON, Dial Iron Works, Stourbridge.
London Warehouse, 16, Grand Junction Wharf, Paddington Basin.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each

6 ft by 4 ft. lights, 2 in. thick, unglazed .. £0 5 0
" " Primed and Glazed with 10 oz. Sheet 0 11 0
" " with stout portable Box, not Painted 1 3 0
" " Painted four coats, and Handles on 1 8 0
" " Packed and Delivered in Railway van 1 10 0
6 ft. by 8 ft., Double Lights, do .. 2 15 0

GREENHOUSES Per ft. super
Woodwork only Prepared and Painted 0 0 6
" Primed in Colour, & Glass or Sheet 0 0 9
" Delivered, and Fixed with Ironwork 0 1 0
" Painted four coats, two sides, ready for use .. 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS,
353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5*s.* each GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England.

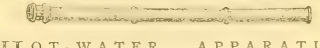

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Pell's Conical.

GREENHOUSES, HOTHOUSES, CONSERVATORIES, PUBLIC BUILDINGS, &c.
HOT-WATER PIPES in wholesale trade. Elbows, T-Pieces, Syphons, and every other connection kept in stock.
WEIGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED PETILLS, also Hipping Boilers, from 21*s.* each.

Tortoise Pells.

Improved and extra strong CAST IRON TUBULAR BOILERS, with or without Water Bars, from 15*s.* each.
CAST and WROUGHT IRON PORTABLE BOILERS, on Stand, or use without brickwork, from 60*s.* each.

Portable Boiler.

Patent THROTTLE and other VALVES, FIRE-GRATES, STOVES, and FURNACE WORK of every description and size.
INDIA-RUBBER RINGS for Pipe Joints: Sockets require no other packing.
Elliptic Boiler.

and are perfectly water-tight.
Goods, of the very best manufacture, delivered at Railway or Wharf in London.
LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground Street, London, S.; Surrey Side Blackfriars Bridge. Price List on application.

National Flower Show, June, 1867.

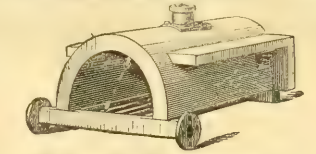

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"The judges consider this one of the most powerful and useful Boilers for general purposes."

GARDENERS' MAGAZINE.—"This Boiler possesses the rare merit of sucking all the heat from the fire, so that it reaches a maximum of power for a minimum outlay in respect of fuel."—*H. Thomson*

JOURNAL OF HORTICULTURE.—"I have no doubt that the Boiler that will burn any kind of fuel is the Terminal Saddle."—*Shirley Hibberd.*

GARDENERS' CHRONICLE.—"The Terminal Saddle contains the best old and modern inventions. If a substantial cheap article be wanted, get this improved Saddle. It will last a lifetime." March 24, 1868

J. IRELAND, Edward Street, Broughton Lane, Manchester

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price 1*l.* 12*s.* 6*d.* A Pamphlet, with Views of these and other Glass Houses, for 2*d.* stamps. BEHNAN AND MOULTON, 14, Dudley Street, Leicester Square, London, W.

GREEN'S PATENT TUBULAR HOT-WATER BOILER.

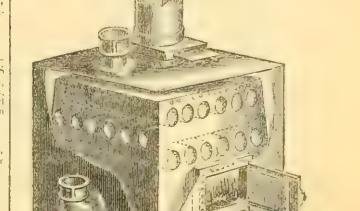

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1st. They require no setting, or brickwork.
2d. They are complete in themselves, having perfect means of regulation.
3d. They take up little room, and can be put in places inaccessible to other Boilers.
4th. They are economisers of fuel, owing to the great amount of heating surface upon which the products in a direct manner, and the consumption of smoke.
5th. Any number of Boilers and Returns can be annexed to the Boilers by means of Taps.
6th. By means of hand doors they can be readily cleaned out when required.
7th. The chimney is made of cast iron, which can either be taken through roof or through side of house to meet the convenience of the situation that may be best.
They are warranted to be the most Economical Boilers extant
Price Lists free by post on application.
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

Portable and Fixed Hot-water Apparatus

FOR
HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,
WITH
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LLAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS lately Designed and Erected by him in all parts of the Kingdom, and to the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY. The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to
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Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder,
Friar Street, Southwark Bridge Road, London, S.E.

Rosher's Garden Edging Tiles.

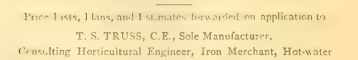

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GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
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ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Glazed and other Stable Paving Bricks of great durability. Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
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SILVER SAND (REIGATE), at the above addresses—
145 per Ton, 15*s.* per Bushel; 2*s.* per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 12*s.* per Ton less. A coarser grained Sand 4*s.* per Ton more. Samples of Sand by post on receipt of Stamp.
PLANTS and BRICK LUMPS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
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FOR THE

GENERAL ARRANGEMENT AND LAYING-OUT OF

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Horticultural Builder &
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TO SUIT ANY STYLE OF ARCHITECTURE.

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CARRIED OUT.

JOHN WARNER & SONS, HYDRAULIC ENGINEERS,

Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

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No. 547A.

GARDEN ENGINE.

28 Gallons	..	£5	13 0
24	..	5	1 0
16	..	3	16 0
10	..	3	0 0

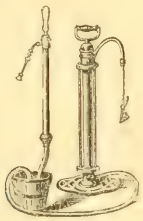

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AQUAJECT.

Useful for every variety of Garden work, including Watering Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, Boring Casks, &c.

Price, complete £1 8 0

Small size for the hand, as an ordinary Syringe .. 0 15 0

THE CRYSTAL PALACE

GARDEN or FIRE ENGINE.

No. 35.

CAST-IRON PUMPS.

2½ inches	..	£1	9 0
3	..	2	2 0
3½	..	2	7 0
4	..	2	15 6

No. 57½.

SWING WATER BARROW.

50 Gallons	..	£5	14 0
38	..	3	18 0
30	..	2	14 0
20	..	2	2 0

S. OWENS & Co.,

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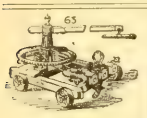

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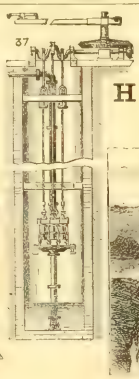

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50

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c

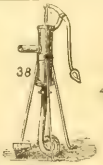

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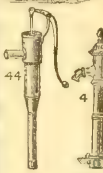

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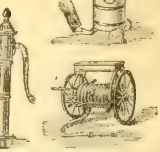

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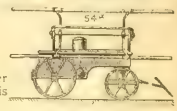

54a

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S. OWENS AND CO. Manufacture and Erect every description of Hydraulic and General Engineers' Work for Mansions, Farms, &c., comprising PUMPS, TURBINES, WATER WHEELS, WARMING APPARATUS, BATHS, DRYING CLOSETS, GAS WORKS, Apparatus for LIQUID MANURE distribution, FIRE MAINS, HYDRANTS, HOSE PIPES, &c., &c. *Particulars taken in any part of the Country. Plans and Estimates furnished.*

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PAXTON'S STRAWBERRY CRINOLINE.

The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, "Rock Hills," gave his approval of their usefulness. The right to Manufacture them was transferred to

R. HOLLIDAY, PRACTICAL WIRE WORKER, 2A, PORTOBELLO TERRACE, NOTTING HILL GATE, W.

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GARDEN ARCHES, ARCADES, VERANDAHS, ORNAMENTAL FENCING, TRELLIS WORK for CREEPERS, FLOWER STANDS, SUSPENDING BASKETS, AVIARIES, PHEASANTRIES, &c

Every description of Wire Work for Gardens, Conservatories, &c.

HENRY DOULTON & CO.,

HIGH STREET, LAMBETH, LONDON, S.E.,

MANUFACTURERS OF

VASES, PEDESTALS, FLOWER POTS, FERN CASES,

PENDANTS, GARDEN SEATS, EDGING TILES,

AND EVERY KIND OF

TERRA COTTA GARDEN ORNAMENT.

All the TERRA COTTA Manufactured by Messrs. H. D. & Co. is made of the best material, burnt extra hard, and

WARRANTED IMPERISHABLE.

PRICE LISTS ON APPLICATION AS ABOVE.

PORTABLE ENGINES, from 4 to 30-Horse Power.

THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

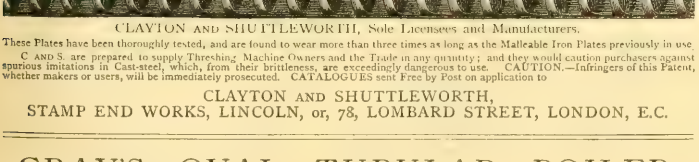

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.

These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

C AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

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GRAY'S OVAL TUBULAR BOILER.

INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

RICK-CLOTHS, NEW and SECOND-HAND, with POLES, PULLEYS, &c., complete.
An Illustrated Catalogue post free on application

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BENJAMIN EDGINGTON'S WAGGON CLOTHS, HAY CLOTHS, GARDEN NETTING, FLAGS

Address, BENJAMIN EDGINGTON (in full), 2, Duke Street, London Bridge, S.E. No other Establishment.

Cottam's Iron Hurdles, Fencing, and Gates.

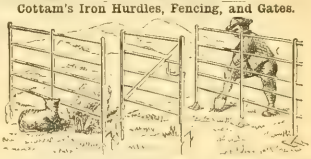

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

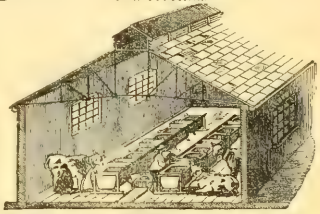

The advantages are—Portability, not BARNS, removable at pleasure, no Wooden Posts or Partitions to impede Ventilation or breed Vermin, Hay Racks dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 5£.

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MOULES'S PATENT EARTH SYSTEM.

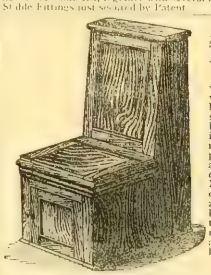

From Mr W. GILBERT,
Lamford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadefuls put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

To Agriculturists.

GREEN'S PATENT HIGH-PRESSURE BOILERS, with Inverted Cylinder Engine combined. Simple and substantial in construction. The Boiler can be used for Steaming purposes. Specially adapted for Farm use.

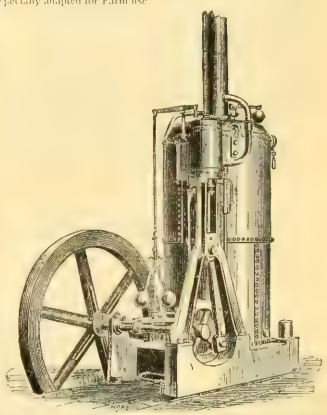

The above Engines and Boilers occupy a very small space, requiring no brickwork or foundation. They are sent out in complete working order, ready for immediate use. From 1 to 40-horse power always in stock or in process of manufacture. Drawings and prices free on application to

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax

B. HIRST AND SONS call special attention to their PATENT DUPLEX SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which combine the latest and best Improvements for the present season, lately noticed for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The necessity for B. HIRST AND SONS' Patent Lawn Mowing Machines has always been great. These Machines are acknowledged to be the best for a close, Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

WILLIAMS'S PATENT "ARCHIMEDEAN" AMERICAN LAWN MOWER,

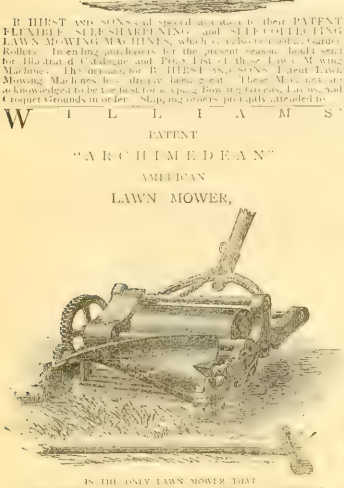

IS THE ONLY LAWN MOWER THAT CUTS WET or LONG GRASS WITHOUT CLOGGING. Thus enabling the Grass to be cut at the best time, instead of waiting for the Grass to dry, and toiling under the heat of a mid-day sun. It is very easy to work, and will preserve its perfect cut whilst traversing over mounds or sloping banks.

"Far superior to any others."—*Vide Field.*
"The quickest, most simple, and most efficient Mower ever used."—*Vide Gardener's Chronicle.*
"Remarkably easy to work."—*Vide Gardeners' Magazine.*

Illustrated Catalogues, Opinions of the Press, and Testimonials post free on application.

Manufactured and Sold by
WILLIAMS AND CO., 1, Gray Road, Finsbury Square, E.C.; and 1, Foubert's Place.

John G. Rollins, American Merchant, Old Swan Wharf, London Bridge, E.C., Wholesale Agent.

THE AMERICAN PATENT "ARCHIMEDEAN" LAWN MOWER is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and [illegible] works better and with less than half the power of other Lawn Mowers, also will do double the work in a day.

To any the Gardeners' Chronicle says:—"We are indebted to our American cousins for many ingenious devices and remarkable advances, adapted not only for [illegible] but the interest of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if long or short; the [illegible] is [illegible] easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."

Sole Wholesale Agent for the United Kingdom,
JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

W. S. BOULTON & CO.'S

NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

These Machines possess important advantages. By the introduction of a Rainbow Lath, the adjustment of the various parts is rendered exceedingly simple. Irregularities are entirely avoided, by making the handles and all other light parts of malleable iron. They adapt themselves to the inequalities of the ground, and seat persons of any height by means of the handles, working loose. Thus arranged, each [illegible] admits of their being used as a Roller, by folding back the front or cutting end. Every Machine is warranted to give entire satisfaction to the purchaser, and the [illegible] approach of can be returned. An Illustrated Catalogue, with prices, sent free by post on application.

Rose Lane Works, Norwich.

W. S. BOULTON & CO.'S DOUBLE CYLINDER and LAWN HANDLE CARDAN ROLLS

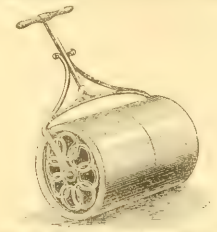

The [illegible] Walks, the ends [illegible]

SINGLE CYLINDER ROLLS Carriage paid.

[illegible]

PROTECT YOUR CROPS

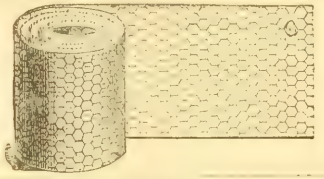

First-class Machine-made WIRE GAME NETTING, GALVANISED after [illegible] Price [illegible]

[illegible]

W. S. BOULTON AND CO.'S 30-gallon SWING WATER BARROW (the Top Carting pail [illegible] and Price £5 5s: [illegible] SWING WATER BARROW, with galvanised iron tank. To hold 18 gallons, £4 15s. [illegible]

Rose Lane Works, Norwich.

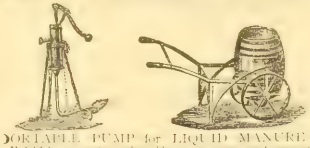

PORTABLE PUMP for LIQUID MANURE or WATER, [illegible]

W. S. BOULTON AND CO.'S NEW SWING WATER-MANURE CART, with galvanised iron tank

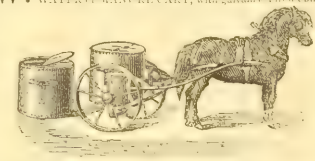

Carriage paid to all the principal Stations in England.

To hold 30 gallons, price £8; to hold 100 gallons, price £9; Valve and Spreader for ditto, price £1.

Rose Lane Works, Norwich.

W. S. BOULTON AND CO.'S IRON WATER or LIQUID MANURE CART.

Carriage paid to the principal Railway Stations in England. To hold 140 gallons, price £10; 200 ditto, £12; 250 ditto, £14

Galvanised Iron Pump and 30 feet india-rubber suction pipe, price £3 10s. Spreaders, 18s each.

ROSE LANE WORKS, NORWICH.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (Ida Wharf), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage.

REGISTERED HAND GARDEN SEED DRILL.—Four thousand sent out in 1868 and 1869. At the Great German International Agricultural Exhibition, Altona, Hamburgh (1869), the First-class silver Medal was awarded to JOSIAH LE BUTT for his Manufactures; also at the Great German International Horticultural Exhibition, Hamburgh, 1869, another First-class Silver Medal was awarded. By simply turning a screw, this Drill can at once be adapted for sowing Onions, Peas, Beans, Cauliflowers, Broccoli, Parsley, Wheat, Salsafy, Mangel Wurzel, Tares, Rape, Turnips, Leek, and Carrot Seeds. It is an invaluable implement for a Market Gardener, and to all who possess a Kitchen Garden, and for the Farm it will be found a useful aid for the purpose of Hoeing up the space where rape is needed has been [illegible] Worked by a boy.

Full directions sent with each Drill. On receipt of Stamp Post Office Order, made payable to JOSIAH LE BUTT, Patentee and Manufacturer of the [illegible] Hawthorn, Bury St. Edmunds, a Drill will be sent immediately. Price 14s. 6d. The name of the nearest Station should be given.

R. E. B. HUNT, MANUFACTURER of IMPROVED HAND SEED DRILLS, Atlas Works, Earl's Colne, Essex.

IMPROVED BARROW SEED DRILLS, For Sowing every description of small seeds. Price, with 15 tin boxes and stirring rod complete, £5 5s. Carriage paid to any part of England.

ONE ROW CUP DRILL, No. 1

For sowing Turnips or Mangels on ridge or flat. Price	..	£2 10 0
Extra [illegible] to attain quantity of seed	..	0 2 0
ONE ROW CUP DRILL, No. 2	..	1 15 0
TWO-ROW CUP DRILL	..	4 15 0
ONE-ROW TURNIP and MANURE DRILL	..	5 10 0
Extra coulters for flat work	..	0 3 6
ONE ROW BEAN and PEA DRILL	..	2 10 0
ONE-ROW BRUSH DRILL	..	1 5 0

Illustrated Catalogues post free on application

SHANKS'S PATENT LAWN MOWERS for 1870, The Patent Improvements recently introduced give SHANKS'S MACHINE

Several important advantages possessed by no other Lawn Mower.

PATENT DOUBLE-EDGED SOLE PLATE, WIND-GUARD, &c.

The annually increasing Sales forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

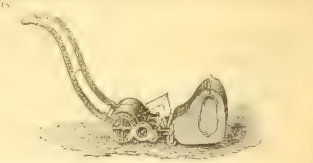

ALEXANDER SHANKS & SON have for some time past been making the Lawn Mowing Cutters of their Machines self-sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & Son now make the Sole-Plate or Bottom Blade of the Machine with Two Edges—one in front as usual, and one transverse at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the double-edged Sole-plate must be entirely renewed when the edge is worn down.

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

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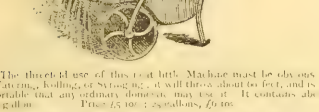

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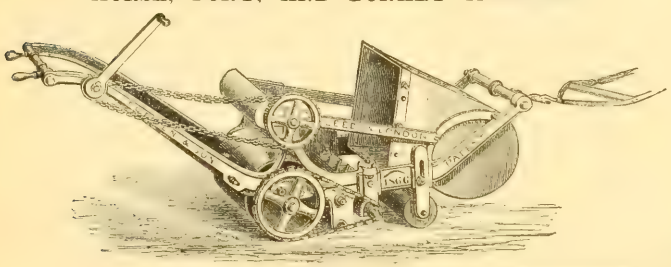

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Ditto for Pony	.. ..	.. 1	2 0

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To cut 30 inches	.. ..	.. £21	0 0
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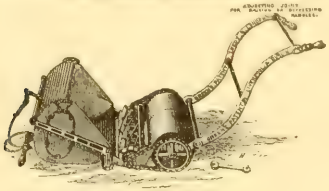

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Suitable for a Lady.			
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Diam.	Length	£	s	d
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

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ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length	£	s	d
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
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Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
FLOWER SHOW, FRUIT and FLORAL COMMITTEE MEETING, on WEDNESDAY NEXT, May 4, at 11 o'Clock. GENERAL MEETING at Three. Band of the Royal Horse Guards from 4. Admission, 2s 6d

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
SHOW of ROSES and AURICULAS, on WEDNESDAY, May 4. Band of the Royal Horse Guards from 4. Doors open at 2 Fellows' Friends Tickets bought before the 4th, 1s 6d Admission on the day, 2s 6d. Tickets for all the Fêtes are now ready, and can be had of the principal Music Sellers, or at the Gardens.

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870. PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, Forms of Entries, and Information to F. G. BUCKLE, Secretary, Peterborough

NEW ROSES of 1870.—Strong, vigorous plants now ready
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ROSES, New and Old, strong plants, in pots, now ready for delivery; also large stock of VERBENAS and FUCHSIAS, and general BEDDING PLANTS, which contains a selection of the best varieties only. CATALOGUES free.
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To the Trade only.
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ADAM FORSYTH'S CATALOGUE. Forwarded for one stamp
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SUTTONS' HOME GROWN FARM SEEDS. For present prices see p. 605 of this week's Paper.

SUTTONS' GRASS SEEDS for ALL SOILS. For present prices see p. 605 of this week's Paper

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Carter's Index, April 30.
CARTER'S PRIZE GLOBE MANGEL See p. 615. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE LONG MANGEL. See p. 615. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE SWEDE TURNIP. See p. 615. 237 and 238, High Holborn, London, W.C.

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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 13, 1870
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES and CO'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

NEW PLANTS.

J. LINDEN

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CHAMÆROPS LITTORALIS.
COCOS MAYNENSIS.
" WALLISII
" WEDDELIANA (Leopoldinia pulchra, figured in *Gardeners' Chronicle*, April 9, p. 404.
DECKENIA NOBILIS.
EUTERPE ANTIOQUENSIS and MONTANA.
GEONOMA ANTIOQUENSIS.
GLAZIOVA ELEGANTISSIMA.
INSIGNIS.
HYOSPATHE CHIRIQUENSIS.
LEPIDOCARYON GRACILE.
LEOPOLDINIA PULCHRA (Cocos Weddeliana)
MARTINEZIA LINDENIANA
MORENIA CORALLINA.
ORBIGNYA DUBIA
PHŒNICOPHORIUM SECHELLARUM.
PHYTELEPHAS PIEPPIGIANA.
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NEW PLANTS FOR 1870.

B. S. WILLIAMS

Has much pleasure in offering the undernamed NEW PLANTS, which will be ready for distribution on May 1, next.

New Summer Bedding Plant.

PERISTROPHE ANGUSTIFOLIA AURIO VARIEGATA.—This very elegant Acanthad is a native of the mountains of Java, and was awarded a First Class Certificate by the Floral Committee in spring. The leaves are ovate lance-date, bright orange in the centre, and margined with dark green; in habit it is dwarf and compact, and B. S. W. has a full confidence in its becoming a splendid edging plant in the Summer Flower Garden; as a pot plant it is very beautiful, and although the flowers are not remarkable for size, their bright mauve-purple colour forms a striking contrast with the orange colour of the leaves. Price 10s 6d.

Superb New Bedding Plant.

VIOLA CORNUTA VAR. PERFECTION.—B. S. W. has much pleasure in offering this superb plant to public notice, and from the manner in which it has been tested both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, and the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are full three times the size, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed it resembles a gigantic V. cornuta in habit, and whilst retaining its profuse blooming qualities, producing flowers which will equal our best Pansies for size and substance. This plant was awarded a First-Class Certificate by the Floral Committee, September 25, 1869. Price 2s. 6d. each, 24s. per dozen, 70s. per half hundred, 100s. per 100.

Azalea Grand Monarch.

A superb new and distinct variety, suitable for exhibition or early forcing purposes; the habit is compact and free, of medium growth, and a profuse bloomer: flowers 3 inches in diameter, of good substance and perfect outline, the lobes are perfectly round and smooth, and in colour deep pink, shaded with warm rose towards the margins; in addition, the upper lobes are densely spotted. Price 21s. each; a few extra-sized plants, 42s. to 63s. each.

Verbena Mauve Queen.

This very elegant variety possesses a good constitution, and is not subject to attacks of mildew and other diseases, which so many of the new forms of this plant are (and which has led to the almost total banishment of Verbenas from the parterre); in growth it is somewhat robust, and is a flowerer, most profuse; the trusses, which are of good size, are borne well above the young shoots, and the flowers are a beautiful mauve in colour, and yield a most delicate perfume. It can be highly recommended for bedding purposes. Price 2s. 6d. each.

New Fuchsias.

B. S. WILLIAMS has much pleasure in being able to offer the following five varieties of this favourite plant; they are all of good habit and thoroughly distinct, and cannot fail to give general satisfaction:—

BIRD OF PARADISE.—Tube and sepals scarlet, well reflexed corolla, very regular, and soft, delicate rose in colour. 10s. 6d. each.

FORMOSA.—Tube slender, and, as well as the sepals, bright scarlet; corolla double, very regular and compact, deep violet, the outer petals rosy red, elegantly flaked with light violet. 10s. 6d. each.

HOLLOWAY RIVAL.—This is probably one of the most distinct forms yet sent out: tube and sepals bright red, well reflexed corolla, very long petals of great substance, and rich deep violet in colour. 10s. 6d. each.

STRIATA PERFECTA.—A charming and very effective variety; tube and sepals waxy white; corolla bright carmine, striped with broad lines of pure white. This variety is not only exceedingly handsome, but totally different from any other variety in cultivation. 10s. 6d. each.

TRIUMPHANS.—A superb double variety; tube and sepals rich crimson, reflexed from the base; corolla large and very regular, petals intense violet, suffused at the base with crimson. 10s. 6d. each. The set, 42s.

The following Nurserymen and Seedsmen have already ordered the new Viola cornuta var. Perfection, and from whom the true Rotherfield Stock can be obtained:—

Messrs. Campbell & Sons		Glasnevin.	
" Carter & Co.		Forest Hill.	
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" Clibran		Warrington	
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" Fyvie		Ryde	
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" Kingborn		Richmond.	
" McPherson		Aberdeen.	
" Oakley		Southampton.	
" Parker		Tooting.	
" Parsons		Leamington.	
" Pilcher		Horsham.	
" Royle		High Leigh.	
" Scott		Bath.	
" Smith		Tollington Nursery, Holloway	
" Watkins		Bishop Stortford.	

BENJAMIN S. WILLIAMS, VICTORIA AND PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW PLANT CATALOGUE 1870,

POST FREE TO ALL APPLICANTS.

BENJAMIN S. WILLIAMS

HAS MUCH PLEASURE IN ANNOUNCING THAT HIS

GENERAL AND NEW PLANT CATALOGUE

For the current year is now ready. It contains select Lists of Orchids, Ferns, Palms, Flowering and Ornamental-leaved Stove and Greenhouse Plants, Azaleas, Camellias, Amaryllis, Florists' Flowers, &c., &c., and, in addition, full descriptions of many novel and excellent plants, which are now offered for the first time; also descriptions of many new or rare plants of recent introduction and sterling merit.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW ZONAL GERANIUM, PURITY (Eckford).

JAMES GARAWAY & CO.

Have much pleasure in offering the above, and can confidently recommend it as a DECIDED ACQUISITION. It is in the way of that well known variety Madame Werle, and is a great improvement on it. For correctness of shape and delicacy of colouring it cannot be surpassed, and its freeness of flowering especially adapts it both for Conservatory decoration and for effective bedding out.

Plants now ready, 5s. each. Four sent for three.

NEW SILVER-EDGED GERANIUM, MADAME VAUCHER VAR.

This is a sport from the green variety; is distinctly margined with clear white, with occasionally a bright pink zone. Plants ready the middle of May, **5s. each.**

☞ *Usual allowance to the Trade.*

JAMES GARAWAY AND CO.'S SPRING CATALOGUE is now ready, and is sent Post Free on application.

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GEORGE SMITH

Has much pleasure in offering Three SEEDLING FUCHSIAS, unequalled by any others in cultivation, viz.:—

AVALANCHE (G. S.)

This acquisition stands pre-eminent, being the finest Fuchsia ever offered, having very double, compact, and beautifully-formed flowers; corolla pure white, of extra size, with long carmine filaments; tube and sepals brilliant carmine-scarlet This splendid flower contains in one bloom 25 petals; fine habit and free grower

Plants 10*s.* 6*d.* each.

OPINIONS OF THE PRESS.

Report from *Gardener's Magazine*, Oct 2, 1869.

"Avalanche is a large flower, bold in outline, and massive though elegant; the tube and sepals are of a brilliant carmine-scarlet; very double corolla, pure white, with streaks of carmine at the base In the samples sent the stamens and petals are quite distinct, which is a decided merit, for when intermediate forms are produced, as they too often are, in double flowers, symmetry is lost."

PURPLE PRINCE (G. S.)

This is a most extraordinary bold and handsome variety; tube and sepals waxy carmine-scarlet, corolla rich violet-flower extra size, fine free habit; surpasses all other double purple varieties

Plants 10*s.* 6*d.* each.

OPINIONS OF THE PRESS.

Report from *Gardener's Magazine*, Oct 2, 1869

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NOTICE.—The above Three Fuchsias in one handsome coloured Plate, by Mr. J. Macfarlane, 1*s.* 6*d.* each.

G. S. is also booking Orders for three extra large and fine NOSEGAY GERANIUMS, viz:—Claudus, Harry George, and Soleil, which have taken First-class Certificates.

Beautiful Coloured Drawings of Claudus and Soleil, by Mr. James Andrews, in two separate plates, 1*s.* 6*d.* each.

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Tube and sepals waxy scarlet, broad and well reflexed, corolla deep violet; of fine habit, and one of the finest dark Fuchsias in cultivation.

Plants 10*s.* 6*d.* each.

For descriptions of above see CATALOGUE, forwarded on application.

Good Plants of the above are now being sent out. Usual Discount to the Trade

TOLLINGTON NURSERY, HORNSEY ROAD, ISLINGTON, LONDON, N.

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ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

ODAMS'S NITRO-PHOSPHATE for ROOTS.
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Its members are cultivators of upwards of 80,000 Acres of Land, who has been for years under management with Manures of their own manufacture; consequently the consumer has the best guarantee for the genuineness and efficacy of the Manures manufactured by this Company.

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LAWES'S PATENT TURNIP MANURE.
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These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom

PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures.
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GENUINE TOBACCO PAPER, of the finest quality, 10*d.* per lb., or 84*s.* per cwt.
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TOBACCO CLOTH, the cheapest and most effectual article for Smoking Greenhouses and Destroying the Fly, 1*s.* 4*d.* per lb.; over 10 lb., 1*s.* 1*d.* TOBACCO PAPER, 1*s.* per lb.
JOSEPH BAKER, 14, Nels on Square, Blackfriars Road, S.E.
Post-office Orders payable Fleet Street, E.C.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1*s.*, 2*s.* 6*d.*, and 5*s.*
Powder Distributors, 2*s.* 6*d.* and 3*s.* 6*d.* each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington May 1, 1868
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Sole Wholesale Agents, ADAMES AND GRANT, Chichester.

The Noted French Cold Grafting Wax
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For Grafting, Budding, Healing, &c., may be obtained of
HOOPER AND CO., Covent Garden, W.C. (Sole Wholesale Agents for the United Kingdom); also through any London or Provincial Seedsman and Nurseryman.

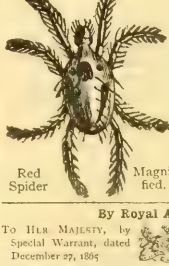

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Used by many of the leading Gardeners since 1869, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.

Sold Retail by Seedsmen, in boxes, 1*s.*, 3*s.*, and 10*s.* 6*d.*

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PRICE'S PATENT CANDLE COMPANY (Limited),
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By Royal Appointment.

TO HER MAJESTY, by Special Warrant, dated December 27, 1865

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The Best and Cheapest Vermin Killer.

Vide "The Gardeners' Magazine," conducted by Shirley Hibberd Esq., F.R.H.S., of August 15, 1868.

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THE LONDON GROUND TOBACCO (free of duty), for the Destruction of Blight 5s 6d in tins, 1l, 2l, 5l, & 9l each, by Seedsmen and Druggists. POWDER FUMIGATORS, 2s each. Manufacturers: CORRY AND SOPER, at their Bonded Warehouse, Shad Thames, London, S.E. [AGENTS WANTED.]

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Inventor and Sole Manufacturer,
BENJAMIN LOOKER, Kingston-on-Thames

LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES. Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Price from 1*s.* 6*d.* per foot.
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JAMES PHILLIPS AND CO. beg to submit their prices as follows:—
GLASS for ORCHARD HOUSES,
As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Gentry, and Gentlemen of the United Kingdom.
Each Box contains 100 feet. The prices only apply to the sizes stated

Squares	20 by 12, 20 by 14, 20 by 15, 20 by 16 cut to the foot.	21 oz
Fourth quality	.. .. 15*s.* 0*d.*	19*s.* 6*d.*
Third quality	.. .. 16*s.* 0*d.*	20*s.* 0*d.*
Seconds	.. .. 18*s.* 6*d.*	26*s.* 0*d.*
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HORTICULTURAL GLASS.
Stock sizes, 16-oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated.

					4ths	3rds	2nd
					s. d.	*s. d.*	*s. d.*
11 by 9	12 by 9	13 by 9	14 by 9	}	13 0	15 0	17 0
12 by 10	13 by 10	14 by 10	15 by 10				
11 by 11	14 by 11						
13 by 12	15 by 12	16 by 11	16 by 12				
18 by 12	19 by 12	20 by 12	17 by 12				
16 to 13	17 to 13	20 to 12			15 0	17 0	18 0
16 by 14	20 by 13	18 by 13					
	17 by 14	18 by 14			16 0	18 0	20 0
	20 by 14						

SHEET SQUARES (100 feet Boxes)

6 by 4	6 by 5	7 by 5	7½ by 5	125 6*d*
8 by 6	8½ by 6	9 by 6	10 by 6	
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Boxes 2*s.* each, returnable at full price.

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LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS; SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN SHEET, HORTICULTURAL, ORNAMENTAL, COLORED, and every description of GLASS, the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

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Horticultural Glass Warehouse.

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NEW LIST for ORCHARD-HOUSE GLASS as supplied to Her Majesty, the Nobility, Gentry, Mr. Rivers, and the leading Horticulturists of the United Kingdom

ORCHARD HOUSE SIZES.

in	in	4ths	3ds.	2nds	Best
20 by 12					
20 by 13					
20 by 14	Per 100 feet	15 oz.	125 6*d*	145 6*d*	165 6*d* 185 0*d*
20 by 15		21 oz	175	195	215 235
20 by 16					

SMALL SHEET SQUARES, 15 oz., per 100 feet

From	To	4ths	3ds	2nds	Best
6 in by 4 in	9 in. by 7 in.	..	115 6*d*	125 0*d*	135 6*d* 150 0*d*
9 in by 7 in	14 in by 10 in	..	115 0*d*	135 0*d*	155 0*d* 160 6*d*
14 in by 10 in	20 in by 12 in	..	125 0*d*	140 0*d*	165 0*d* 175 0*d*
20 in by 12 in	22 in. by 18 in	..	125 6*d*	145 6*d*	165 6*d* 185 0*d*

Lists on application

SHEET GLASS

In Sheets for Cutting up, averaging from 6 to 9 feet super.

15 oz.		21 oz.	
4ths quality, per 300 feet case, 34*l.*		4ths quality, per 200 feet case, 34*l.*	
3ds " " 40*l.*		3ds " " 47*l.*	
2ds " " 60*l.*		2ds " " 66*l.*	
Best " " 75*l.*		Best " " 75*l.*	

SHEET GLASS is made only in the following substances, 15 oz., 21 oz., 26 oz., 32 oz., 36 oz., and 42 oz.

HARTLEY'S IMPROVED ROLLED ROUGH PLATE in 1-8th in., 3-16th in., 1-4th in., and 3-8th in. substances.

BRITISH PLATE GLASS for Silvering and Covered for Looking Glasses, Coloured Glass, Glass Shades, Striking Glasses, &c., &c.

PAINTS, COLOURS, VARNISHES, &c.

STUCCO PAINT, 24*s.* per cwt. This Paint adheres firmly to the walls, resists the weather, and is free from the glossy appearance of Oil Paint, resembling a stone surface, and can be made any required shade. Sent out ready mixed with a pure clear water.

WHITE ZINC PAINT, 36*s.* per cwt. One hundredweight of pure Zinc Paint, with three gallons of Linseed Oil, will cover as much as one hundredweight and a-half of White Lead and six gallons of Linseed Oil. Special Dryers for this Paint.

IMPROVED ANTI-CORROSION PAINT, 28*s.* to 34*s.* per cwt. Anti-corrosion Paint is extensively used for all kinds of work in exposed situations, as Brick, Stone, Cement, Iron, Iron Bridges, Conservatories, Greenhouses, &c., and is easily laid on by any ordinary workman. Prepared Oil for ditto, 3*s.* 6*d.* per gallon.

Per cwt.—s. d.		Per gallon—s. d.
GENUINE WHITE LEAD 30 0	LINSEED OIL	2 9
SECONDS WHITE LEAD 28 0	BOILED OIL	3 2
GROUND PATENT DRY-	TURPENTINE	2 9
ERS, 3*d.* to 4*d.* per lb.	LINSEED OIL PUTTY,	
" OXFORD OCHRE, 3*d.* to 4*d.* per lb.	in pipe	
" RAW UMBER, 4*d.* to 6*d.* per lb. [per lb	Fine OAK VARNISH, 10*s.* to 12 0	
" BURNT DITTO, 6*d.* to 9*d.*	" CARRIAGE do., 12*s.* to 14 0	
GREEN PAINT, all shades,	" PALE do. .. .. 16*s.* to 18 0	
28*s.* to 60 0	" COPAL 16 0	
BLACK PAINT 24*s.* to 36 0	KNOTTING 10 0	
RED PAINT .. 28*s.* to 36 0	Patent GOLD SIZE .. 10 0	
GLAZIER'S DIAMONDS,	" BLACK JAPAN .. 12 0	
12*s.* 6*d.*; 15*s.*; 18*s.*; 21*s.* each.	BRUNSWICK BLACK	
GROUND BRUSHES.	MILLED LEAD and PIPES.	
DUSTERS.	SASH TOOLS.	OLD LEAD Bought or taken in
DISTEMPER BRUSHES.		Exchange.

The above are Net Prices for Cash, and as such cannot be booked.
Lists of any of the above on application.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4*s.* per 1000, or 10,000 for 35*s.*; cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND SON, Labels Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds

IRON HURDLES
(Silver Medal of the Royal Agricultural Society):
SHEEP, 3*s.* 6*d.*; CATTLE, 4*s.* 2*d.*; OX, 5*s.* 11*d.*
List by post. GATES and FENCING of every description.
St. Pancras Iron Work Company, Old St. Pancras Road, London, N.W.

CHEAP PAVING TILES.—A Manufacturing Firm have a considerable Stock of PLAIN and ENCAUSTIC TILES, more or less damaged in the processs of manufacturing, that they would be willing to DISPOSE OF, at prices below those of the commonest description of Paving materials. To landed proprietors these Tiles are invaluable for the floors of Cottages, Farmhouses, &c., and can be supplied at a very low rate.
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THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for Flatting over Distempered Walls, as it can be in working takes at least five hours in going down, has comparatively little smell, can be washed, and will cover all sunk parts.
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UNIVERSAL PORTABLE PLANT PRESERVER.
After looking at the Illustration it is unnecessary to give a long description of this new and invaluable article, suffice to say that it is Glazed without Putty and constructed of Wood and Iron. Watering is done expeditiously. The Ventilation is perfect, and the Lights are arranged to open on either side. It can be moved in lengths

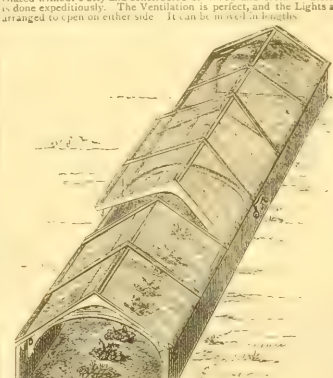

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PRICES

Width	Height at Ridge	4 feet Length	8 feet Length	12 feet Length
12 Inches	11 Inches	0*l*	15*l*	20*l*
18	12 ,,	0*l*	18*l*	30*l*
24	15 ,,	1*l*	25*l*	35*l*
30	21 ,,	2*l*	38*l*	50*l*
48	26 ,,	2*l*	50*l*	75*l*

Loose ends, 9*d.*, 13, 15, 21, 30*d.*, and 4*l.* each
A remittance or reference must accompany the orders.
Larger sizes can be had, suitable for Forcing Pits, 5 and 6 feet wide.

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IMPROVED BARROW SEED DRILLS,
For Sowing every description of small Seeds. Price, with 12 feet box and striking-out gear, £3 5*s.*, extra length, per foot, 3*s.*

ONE ROW CUP DRILL, No. 1
For sowing Turnips or Mangels on ridge or flat. Price .. £2 10 0
Extra cup plate for altering quantity of seed 0 2 0
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They are the only machines in constant use at most of the principal places in England, being preferred above all others.
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54-inch Hessian and Scrim, 3*d.*, 3½*d.*, 4*d.* 4½*d.* and 5½*d.*
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No. 1, Peel Street, Manchester, 1870.

OUR HORTICULTURAL SHADING affords a thorough Protection from Winds, Frost, and Hail, whilst at the same time they admit Light and Sun. They are used and strongly recommended by the most successful Exhibitors and Scientific Horticulturists in the kingdom, as well as on the Continent; in fact, are pronounced the only "proper shadings" ever offered to the public against Birds, Wasps, Blight, &c. As a covering for Strawberries, Tulips, Hyacinths, Seed-beds, Greenhouses, they have no rival. The price being very reasonable, brings them within the reach of every one. With ordinary care they will last for many years. Samples post free on application. DANIEL COLLINGE AND SON.

No 1 —54 inches wide	at 8½*d.* per yard run.
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In pieces of about 30 yards each, or any longer lengths when specially ordered. Nett cash, in 30 days from date of invoice.

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The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
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Two yards wide	1*l.* 6*d.* per yard run.
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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
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6 ft. by 4 ft. Lights, 2 in. thick, unglazed..	£0	5 0
" " Primed and Glazed with 10 oz. Sheet	0	11 0
" " with stout portable Box, not Painted	1	3 0
" " Painted four coats, and Handles on	1	8 0
" " Packed and Delivered in Railway van	1	10 0
6 ft by 8 ft., Double Lights, do	2	15 0

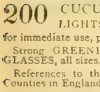

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Portable and Fixed Hot-water Apparatus

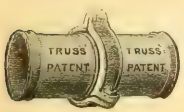

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T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY
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T. G. MESSENGER, MIDLAND STEAM POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH.

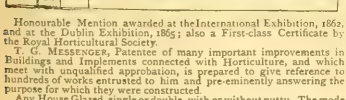

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T. G. MESSENGER, Patentee of many important improvements in Buildings and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and pre-eminently answering the purpose for which they were constructed.
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Coated sheet	per yard		0 11	1 5	1 11
ELBOWS	No. 12 on do	each	1 4	2 1	2 9
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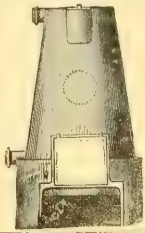

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These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require NO BRICKWORK.

POLLARD, JEPHSON, AND CO.
(Successors to John R. Peill),
Sole Manufacturers of the Improved CONICAL BOILERS,
Which are in general use, and which Boilers have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.

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HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c.

Improved Conical. *Tubular Boiler*

HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.
WROUGHT and CAST-IRON CONICAL SADDLE and IMPROVED CONICAL, also Elliptic, Boilers, from 24 each.
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CAST and WROUGHT IRON PORTABLE BOILERS, on Stand, for use without brickwork, from £10 each.

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PATENT THROTTLE and other VALVES, SLEEVES, DOORS, BARS, and FURNACE WORK of every description and size.
INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water tight.
Coals, of the very best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE,
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GREEN'S PATENT TUBULAR HOT-WATER BOILERS

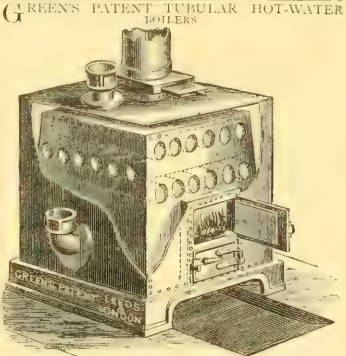

The following are the advantages of these Boilers:—
1st. They require no setting in brickwork.
2d. They are complete in themselves, having perfect means of regulation.
3d. They take up little room, and can be put in places inaccessible to other Boilers.
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5th. Any number of Flows and Returns can be annexed to the Boilers by means of T pipes.
6th. By means of mud doors they can be readily cleaned out when required.
7th. The chimney is made of cast iron, which can either be taken through a roof or turned into a flue to meet the convenience of the situation that it may be fixed in.
They are warranted to be the most Economical Boilers extant.
Price Lists free on application.
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

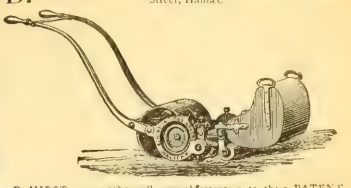

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

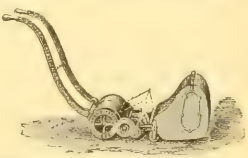

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reverse at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application.
A. SHANKS AND SONS, Deans Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.
N.B. A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

American Lawns.

THE AMERICAN PATENT "ARCHIMEDEAN" LAWN MOWER is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.
Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

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The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"
The *Field* says—"The Americans have been beforehand with us in many Machines, but we were not, however, until now aware they possessed a Lawn Mower which is far superior to any of ours."
The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 6 or 8 inches long. The machine is easily worked by a boy. It has been tried in the Gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."
Sole Wholesale Agent for the United Kingdom,
JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at greatly reduced prices, in order to clear the ground for building purposes.

Among the Evergreens are many thousands of fine specimens of variegated and broad leaved Green Hollies, and an immense Stock of all other Hardy Evergreen and Flowering and ORNAMENTAL TREES generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.

To Gentlemen wishing to Improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with

Nursery and Seed Grounds—Walton on the Hill.
Seed Warehouse, 15, Queen Square
Liverpool, April, 1870

New and Genuine seeds (Carriage Paid).

B. S. WILLIAMS,

NURSERYMAN and SEED MERCHANT,

Victoria and Paradise Nurseries, Upper Holloway, London, N.

COMPLETE COLLECTIONS of KITCHEN GARDEN SEEDS, to suit gardens of various sizes, 10s 6d, 21s, 42s, 63s and 84s. each.

NEW and CHOICE VEGETABLES.	Per packet
Backhouse's Winter White Protecting BROCCOLI	1 6
Dell's fine dark-leaved BEET	1 0
Williams' Matchless RED CELERY	1 0
Williams' Matchless WHITE CELERY, new	1 6
Telegraph CUCUMBER, Woolley's improved variety	1 6
Wheeler's Tom Thumb CABBAGE LETTUCE	0 6
Webb's Climax MELON, new (The finest flavoured Green-fleshed variety ever offered. Was awarded First Prize at the Royal Botanic Gardens, Regent's Park, June 23, 1869)	2 6
Williams' Paradise Gem MELON, Scarlet-fleshed, excellent flavour, and 12 days earlier than any other known kind, new	2 6

NEW and CHOICE FLOWER SEEDS.	
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s 6d, 3s 6d, and 5 6
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and	5 6
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
BALSAM, Williams' superb strain	1s. 6d. and 2 0
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d., and 3 0
VERBENA, Eckford's finest varieties, mixed	1 0
Williams' Improved Hybrid SOLANUMS	2s 6d and 3 6
CENTAUREA CANDIDISSIMA	1s. and 2 6
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The fruits are snowy white, and produced in great abundance	1s. 6d. and 2 6
Parsons' New Tree MIGNONETTE	1 0
PERILLA NANKINENSIS VARIEGATA, new	1 0
Williams' Improved French MARIGOLD, beautifully striped, and very large	1 0
EAST LOTHIAN STOCKS.—These are, without exception, the finest ever offered, the colours being scarlet, purple and white, and of remarkable brilliancy in the two former and purity in the latter; the flowers are very double, and produce immense spikes of bloom; they make a grand display in beds and for ribbon borders. Per collection of three colours	2 6
VIOLA CORNUTA ALBA, new	1s. 6d. and 2 6
ZINNIA ELEGANS PUMILA flore-pleno, new	1 0
Named GLADIOLI (per doz. 4s., 6s., 9s., and	12 0
Fine English Seedlines	per 100 20 0

MESSRS. J. STANDISH AND CO., The Royal Nurseries, Ascot, Berks, are now prepared to execute orders for the following NEW and CHOICE PLANTS, to which they wish to call special attention:—

IXORA DIXIANA.—This magnificent plant is of very free growth, carrying fine foliage; the trusses of flowers are large, and of a bright orange colour. Mr. Dixon found it, when in flower, itself of very strong constitution, and little affected by change of temperature, consequently is admirably adapted for exhibition purposes. Plants 6d to 21s each; with five or six spikes of bloom 25s each

ANTHURIUM SCHERZERIANUM.—Fine young plants, two to three crowns, 1s. 6d each; three to four crowns, and stronger, 15s to 63s each

TODEA FELTUCIDA COMPACTA.—A very dwarf and compact variety. As it does not grow seed fronds until the plant is very old, its beautiful transparency is preserved. 2s. 6d each; 24s per doz

STRUTHIOPTERIS JAPONICA.—A magnificent hardy Fern from Japan. It was exhibited at South Kensington on May 4 last, when it was awarded a First-class Certificate. For full description, see *Gardeners' Chronicle*, May 8, 1869. In April next, 10s 6d

FICUS MACROPHYLLA.—From New Zealand, where, such is its luxurious growth, it is said at times to cover an acre of land. It is undoubtedly the best Subtropical Plant of its kind, growing freely in a very low temperature, even withstanding 2 or 8 degrees of frost; hence it is not a doubtful plant for our variable climate, but if put out in the middle of May is sure to succeed. 5s. each.

ABUTILON THOMPSONI.—This has also proved itself a very fine Subtropical Plant, thriving well under adverse circumstances, the bright marbled colour of its leaves producing a very striking effect. It will do well up to the end of October, as a few degrees of frost do not appear to hurt it. Plants, 1s each; 9s per dozen; 60s per 100

COPROSMA BAUERIANA VARIEGATA.—This is a perfect gem for small beds, or for edging. Being a New Zealand plant it will thrive well in our climate, retaining its beauty until late in the autumn. 2s 6d each; 24s per dozen

TREE HOUSE AND CONSERVATORY.—This is of the most robust habit and a thorough perpetual. The colour an intense yellow, deeply edged with lake; flowers very large and finely shaped. A few strong plants, new, 5s. each; in April next, 2s 6d each

ROYAL OAK VINE.—This has now got well itself to be beyond doubt the most prolific of all the Vines yet set out, and ripens its fruit to perfection in a cold house. Plants, 1s 6d to 15s each, and a few extra strong three year old canes, that would carry a good crop this year, 21s each

NEW PEACHES.—The "Marquis of Downshire" and the "Early Ascot." These have been raised from Noblesse fertilised by the Noblesse Peach, partaking of both parents in equal degrees, their flavour surpasses anything we have previously tasted; of good size, very deep coloured, and ripening earlier than the Royal George. Very clean, strong growers. Fine plants, 7s. 6d. to 15s. each.

ABIES OBOVATA.—A beautiful new Conifer from Japan. We have proved it perfectly hardy, of very fast growth, with foliage of the most lovely glaucous green. 1s 6d to 21s each

JUNIPERUS JAPONICA ALBO-VARIEGATA.—By far the finest of the Juniper tribe. 2s 6d to 21s each

ACER RUFINERVE ALBO LIMBATUM.—Has large and beautiful variety of Maple is an introduction from Japan. It is quite distinct from other varieties, and in summer the leaves, which are nearly covered with white, have a crystallised or frosted appearance. 21s to 42s each

ACER POLYMORPHUM PECTINATUM RUBRUM.—We have a nice stock of this very charming Maple. The leaves are beautifully cut, and are coloured with green and red. 10s 6d to 21s each.

AUCUBAS, Males, 1s 6d to 5s each; and other varieties. See our CATALOGUE.

To the Trade.

KIRK ALLEN has to offer the following, strong plants in 3-inch pots, for cash only:—

NEW TRICOLORS.—Achievement (Turner), Sir Robert Napier, Mrs. Dunnett, Howorth Ashton, Victoria Reginæ, and Beauty of Dupuytren. The above six for 50s.

NEW GOLDEN BRONZE.—Crown Prince, Harrison Weir, Southern Belle, Red King, St. John's Wood Star, Prima Donna, Black Knight (Downie, Laird & Laing), Cleopatra (Smith), Mrs. Allan Lowndes, Criterion (Smith), Goldfinder (Smith), and Arab (Smith). The above 12 for 30s

MARIE LEMOINE, 12s per dozen

For prices of single plants and other varieties, see CATALOGUE, post free. The Nursery, Brampton, Huntingdon

Variegated Bedding Geraniums.

ALFRED FRYER offers the following choice kinds, in strong plants, at per dozen, for cash:—TRICOLORS: Sophia Dumaresque, 3s. 6d.; Lady Cullum, 6s.; Italia Unita, 3s.; Picturata, 2s. 6d.; GOLD and BRONZE ZONALS: Beauty of Calderdale, 3s. 6d.; Beauty of Ribblesdale, 4s.; Duke of Edinburgh, 9s.; E. G. Henderson, 4s.; Kentish Hero, 4s.; Mrs. John Todd, 4s.; Neatness, 2s. 6d.; Model, 3s. 6d.; Perilla, 3s. 6d. Most of the above are autumn struck. Baskets and packing, 1s. for a single dozen, and 6d extra for every subsequent dozen. Remittances requested from unknown correspondents.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

Choice Bedding Geraniums.

THOMAS PESTRIDGE can now supply, in strong Plants, for cash, the following varieties:—

	Per doz.	Per 100
	s. d.	s. d.
LADY CULLUM		4 0
LOUISA SMITH		5 0
LUCY GRIEVE		24 0
SOPHIA CUSACK		6 0
CHARMING BRIDE		8 0
GLEN EYRE BEAUTY		6 0
ITALIA UNITA		3 0
PRINCESS ALEXANDRA		6 0
EGYPTIAN QUEEN		8 0
MODEL		4 0
REFULGENS		4 0
PERILLA		3 0
ACHIEVEMENT (Turner's)	each 10 6	

Package included. The plants are well established in 3-inch pots. A List of other choice varieties on application to

The Greenway Nursery, Uxbridge, Middlesex.

Choice Variegated Pelargoniums.

J. ELCOMBE AND SON beg to offer the following splendid varieties, at low prices, for cash:—

	Each	Dozen		Each	Dozen
	s. d.	s. d.		s. d.	s. d.
Countess of Craven	1 0	9 0	Her Majesty	0 6	4 0
Dehunce	1 6	12 0	Egyptian Queen	0 9	6 0
Edward Milner	0 6	4 0	Model	0 9	6 0
Ludwina Fitzpatrick	0 6	4 0	Rev. Mr. Radcliffe	0 9	6 0
Florence	2 0	20 0	Painted Lady	1 0	9 0
Grandis	1 0	9 0	Model	0 6	4 0
Humming Bird	1 6	12 0	Countess of Kellie	1 6	12 0
Lady Cullum	0 9	6 0	Beauty of Calderdale	0 6	4 0
Louisa Smith	0 6	4 0	E. G. Henderson	0 6	4 0
Lucy Grieve	2 6	21 0	The Queen	2 0	
Meteor	1 0	9 0	Mountaineer	7 6	
Mrs. Lee	2 0	20 0	Emperor	0 6	
Prince of Wales' Smith	2 6		Lady Emmerson	0 6	6 0
Sophia Cusack	1 0	6 0	Crown Victoria	1 0	
Sophia Dumaresque	0 9	4 0	Silver Star	0 9	
Sir R. Napier	0 6	4 0	Star of India	1 0	
Impératrice Eugénie	1 0	9 0	St. John's Wood Star	5 0	
Italia Unita	0 6	4 0	Crown Prince	5 0	
Mrs. Lee (yellow)	0 6	4 0	Conspicuum	0 6	4 0
May Queen (Turner)	2 6	20 0	Perilla	0 6	4 0
Countess	0 6	4 0	Dawn	1 6	
Arthur Wills	0 9	6 0	Princess Alexandra	0 6	6 0

The above are strong autumn struck plants, they are now in splendid colour, and in three plants at a low price.

NEW GOLDEN QUEEN, 18s. per dozen, 3s. 6d. per variety, 3s per dozen

VIOLA, Blue Perfection, 12s per dozen, 2s Mrs. to per dozen

Nursery and Seed Establishment, Romsey, Hants

RHODODENDRONS.

		Per doz.	Per 100
PONTICUM, twice transplanted, bushy,	12 to 18 in.	4s 6d.	26s
"	15 to 20 in.	4 6d.	22s
"	18 to 24 in.	5s 6d	25s
"	24 to 30 in.	7s 6d	40s
HYBRIDUM	12 to 18 in.	5s 6d	45s
"	18 to 24 in.	6s 6d	40s
"	20 to 30 in.	7s 6d	60s
MAXIMUM, white	18 to 24 in.	5s 6d	30s
"	18 to 24 in.	6s 6d	40s
HIRSUTUM, dwarf nice plants		3s 6d	15s

The above can be supplied by the 1000. For named sorts, see CATALOGUE.

JAMES SMITH, Darley Dale Nurseries, Matlock.

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of

Achimenes	Miscellaneous plants
Auriculas	" bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants [Verbenas

The Royal Nurseries, Slough

Chrysanthemums.

ADAM FORSYTH begs to inform the Trade and the Public, that he is now sending out his "NEW" and other choice CHRYSANTHEMUMS.

For description see CATALOGUE (containing a Treatise on their growth) now ready. Forwarded to all applicants for one stamp.

Brunswick Nursery, Stoke Newington, N.

Bedding Plants—Bedding Plants.

JAMES HOLDER'S unrivalled Collection of Scarlet and Variegated GERANIUMS, DAHLIAS, VERBENAS, CALCEOLARIAS, FUCHSIAS, LOBELIAS, PETUNIAS, GAZANIAS, ROSES, PENTSTEMONS, CUPHEAS, COLEUS, IRESINES, AGERATUMS, PENTSTEMONS, &c., at his usual prices (in spite of the long severe winter), namely, eight dozen for 20s., or four dozen for 10s. 6d.; hamper and package included

Crown Nursery, Reading, Berks.

The West of England Bedding Plant Establishment.

THOMAS SAMPSON'S unrivalled Collection of BEDDING PLANTS will be ready to send out after May 1. This Collection contains all the leading kinds, at from 2s. per dozen, in 2½ and 3 inch pots; Collections (his selection) at £2 2s. for 25 dozen; ditto, £1 5s. for 15 dozen; ditto, 18s. for 10 dozen; ditto, 10s. for 4 dozen, including basket and packing.

CATALOGUES free on application.

THOMAS SAMPSON, The Freston Road and Houndstone Nurseries, Yeovil, Somerset. PETER DRUMMOND, Manager.

Verbenas, Verbenas.

PHILIP LADDS is now sending out Purple, White, Scarlet, and Pink VERBENAS, including new varieties of 1869, strong plants, in pots, at 1s. 6d. per dozen; small plants of ditto at 6s. per 100, or £2 10s. per 1000; 20 varieties of NEW FUCHSIAS, 1869, at 2s. per dozen; 12 new varieties of ANTIRRHINUMS, 1869, at 2s. per dozen; 18 new varieties of PENTSTEMONS, at 3s. per doz.; VESUVIUS, the best bedding Scarlet GERANIUM, at 20s. per 100

Nursery Bexley Heath, Kent

CHATER'S AGERATUM, IMPERIAL DWARF. The FINEST BEDDING PLANT of the SEASON

This is admitted to be the greatest acquisition for modern Flower Gardening that has been offered for many years. Awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society. See report of meeting, August 17, 1869; also opinions of the Press.

This beautiful New Bedding Plant will be sent out after May 1.

1 plant	3s 6d	25s 6d.
6 plants	18 0	12 plants 25s 6d.
		24 plants 49 0

WILLIAM CHATER, Nurseries, Saffron Walden.

SUPERB DOUBLE HOLLYHOCKS.—Now is the time for planting to ensure good spikes and blooms this season.

WILLIAM CHATER'S NEW CATALOGUE for this invaluable collection may be had upon forwarding one postage stamp. Choice bloomed Seedlings, with colours attached, extra fine, 40s. per 100; unbloomed Seedlings from finest sorts, 15s. per 100

Seeds saved only from first-class flowers in packets and collections, from 1s. to 10s. 6d

Special prices for quantities to the Trade on application

WILLIAM CHATER, The Nurseries, Saffron Walden.

CALCEOLARIAS, Herbaceous, established plants, in three sizes, price on application.

CALCEOLARIAS, bedding, in variety, our selection, 8s. to 10s per 100 out of pots.

GERANIUMS—Scarlet, Zonal, and Nosegay, in variety, out of pots, 8s. to 10s per 100

DAHLIAS, good named, pot roots, 25 for 7s. 6d., 50 for 15s

ROSES, in pots (fine), set with bloom-bud, 6s. and 9s. per dozen.

CYTISUS FRAGRANS, 6s. per dozen

ACACIA ARMATA, fine blooming plants, price to the Trade on application.

H. AND R. STIRZAKER, Skerton Nursery, Lancaster.

Notice.—True Fastolf Raspberry.

JAMES HUNT having a stock of fine Fruiting Canes (True), which can be removed with safety, same as sent out by Messrs. Youell & Co., of Great Yarmouth, beg to offer packages containing about 8 dozen canes, for 10s. per dozen.

GIANT ASPARAGUS, 2-yr., strong, 10s. per 1000; 3-yr., fine, £1 per 1000.

DAHLIAS of finest kinds, to name, per 100, 10s.

Finest Show PINKS, to name, 25 pairs for 10s.; 50 pairs for 15s; 75 pairs for 20s.; 100 pairs for 25s., packages included.

JAMES HUNT, Apollo Nurseries, Great Yarmouth.

TWENTY THOUSAND PLANTS of a beautiful but neglected GENERA, well adapted for Bedding and Rockwork decoration, established, in flower, in large-sized 60 Pots, for immediate Disposal, at £1 per 100. Selected from above 200 species of the most brilliant perpetual and free-flowering species of MESEMBRYANTHEMUMS.

Apply to Mr. THOMSON, for 10 years connected with the Kew and Windsor Gardens, and many years Head Gardener to the Duke of Northumberland, at Syon House, and Lord Ashburton, The Grange, Hants. Landscape Improvement and Hothouse Designer and Builder, now residing at Penge Nursery, adjoining the Chatham and Dover Railway Station.

Vegetable, Agricultural, and Flower Seeds.

MISCELLANEOUS HARDY BEDDING PLANTS, SWEET PEAS.

ROBERT PARKER begs to announce that his CATALOGUE, containing Descriptive Lists of the finest kinds in cultivation of the above-named, is now published, and will be forwarded to applicants. Large supplies of SEEDS have all been procured from the best possible sources; all are warranted genuine, and are offered at the lowest possible prices. Intending purchasers are requested to compare the prices with those of other houses.

Exotic Nursery, Tooting, Surrey, S.W.

SALTER'S NEW JAPANESE
CHRYSANTHEMUMS,
NOW READY.

SALTER'S NEW LARGE-FLOWERED
CHRYSANTHEMUMS,
NOW READY.

For CATALOGUE, with Descriptions and Prices, apply to

WILLIAM BULL, F.L.S., ESTABLISHMENT FOR NEW AND RARE PLANTS, KING'S ROAD, CHELSEA, LONDON, S.W.

NEW BEDDING PLANT, VERONICA BLUE GEM

AWARDED FIVE FIRST-CLASS CERTIFICATES LAST SUMMER.

THOS. CRIPPS & SON

Beg to announce that they intend distributing the above the first week in May. Unlike other shrubby Veronicas it is of a very neat dwarf habit, the axil of nearly every leaf producing spikes of beautiful mauve flowers, making the plants appear literally clothed with bloom. It commences flowering when only 2 inches high, and continues in bloom throughout the season.

In reviewing the New Plants of 1869, the *Gardeners' Chronicle* (see page 45, present volume) says:—"Yet another blue bedder, viz., Veronica Blue Gem, of great promise, both as a decorative plant for the greenhouse and a serviceable plant in the flower garden, of remarkably close habit, and a singularly free bloomer. It cannot fail to answer all expectations formed of it."

Price 5s. each.

Usual Discount to the Trade on three Plants. (See p. 74 of our Trade CATALOGUE.)

THE NURSERIES, TUNBRIDGE WELLS.

Important Notice.

H. CANNELL having received so many unexpected Orders for his NEW FUCHSIAS, has not yet sufficient stock, and must therefore defer sending them out until the middle of May. And H. C. finds, in consequence of FUCHSIA BANKS' PERFECTION being pronounced the most perfect flower of the present century, this cannot be sent out until July next. All the other new plants will be delivered next week.

H. CANNELL, New Florist Flower and Florist Flower Seed Merchant, Woolwich, S.E.

A Glorious Show of Roses,

TEA, BOURBON, CHINA, and NOISETTE, may be secured and enjoyed all the summer BY PLANTING NOW.

Good plants of finest kinds, established in pots, mostly 48's, are ready to be presented to all in exchange for cash at 40s per 100; purchasers may choose half the names at 50s per 100. Packing extra charge. Wholesale CHARLES NOBLE, Bagshot.

TUNBRIDGE WELLS HORTICULTURAL SOCIETY. — The ANNUAL GRAND EXHIBITION of FLOWERS and FRUIT will take place on FRIDAY, July 1.

PRIZES OPEN to ALL ENGLAND.

Prizes for Hand-Bouquets, and for Single Pieces or Groups for Table Decorations.

Also Prizes for best-kept Cottage Gardens, and for Cottage Garden Productions.

Schedules may be obtained on application to the Secretary, Mr. E. F. LOOF, 26, Parade, Tunbridge Wells.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870.—JUNE 3 TO 10

NOTICE TO EXHIBITORS.—Persons who intend to take part in this Exhibition must signify their intention to do so by letter, addressed to the undersigned, on or before May 20

ADMISSION.—First day, 10s 6d each; 2d day, 2s 6d each; Whit-monday and remaining days, 1s each. Gardeners will be admitted by Tickets as follows:—First day, 2s 6d each; 2d and remaining days, 1s each. Applications for these Tickets must be made on or before May 30.

The fine Bands of Her Majesty's 4th Dragoon Guards, and the 100th Infantry, in attendance each day.

Botanic Gardens, Manchester. BRUCE FINDLAY.

The Gardeners' Chronicle

SATURDAY, APRIL 30, 1870.

MEETINGS FOR THE ENSUING WEEK.

MONDAY,	May 2—	Entomological	7 P.M.
WEDNESDAY,	— 4	Royal Horticultural (Fruit and Floral Committee), at S. Kensington ..	11 A.M.
		Ditto (Scientific Committee) ..	1 P.M.
		Ditto (General Meeting)	3 P.M.
THURSDAY,	— 5—	Linnean	8 P.M.

IN the current Number of the "Popular Science Review," Dr. WILLIAM OGLE continues his interesting observations on the FERTILISATION of various FLOWERS by insects. The author admits his almost total want of acquaintance with the literature of the subject, and pleads that as an apology for passing over previous observations without notice. We hardly think the apology a satisfactory one, inasmuch as the author assumes that the mechanical contrivances described in his paper have never, "so far as I know," been described before. Unless we are mistaken, some of the contrivances aforesaid, or some very similar to them, have been described by Rev. G. HENSLOW in the very journal in which Dr. OGLE writes; and in so readily accessible a periodical as "Science Gossip" for February last may be found an excellent article from the pen of Mr. DUNCAN, the foreman in the herbaceous department at Kew, on the fertilisation of the Daisy, which goes over much of the ground traversed by Dr. OGLE. Indeed, so much has been written on these subjects of late, in the natural history journals and in our own columns, as at p. 687, 1867, where a rather full abstract of HILDEBRAND'S exhaustive essay on this subject is given, and especially since the stimulus that DARWIN has given to the investigation of this subject, that we think the author would have done better had he made himself to some extent acquainted with the literature of the subject before he recorded his own observations. In so saying we do not wish to detract in the least from the merits of the observations, which are highly curious, and, so far as we have tested them, accurate. We may possibly be living in a glass house ourselves when we note Dr. OGLE'S account of the fertilisation of one of our common Heaths (Erica Tetralix), as previously undescribed. At any rate it is interesting enough to bear quotation, and is the more valuable as enabling us to ascertain the office of the peculiar appendages to the anther.

"The above-named plant has a corolla which may be roughly described as bell-shaped, and which hangs when expanded, as a bell should, with its mouth more or less downwards. The style will stand for its clapper, but with this difference, that it reaches to the very mouth of the bell, or even projects slightly, when it terminates in a semiglobular stigma. The viscid surface of this faces downwards, that is, away from the cavity of the bell. The style rises from a superior ovary, under which is a disc that secretes a fluid highly attractive to all kinds of bees. From beneath this spring eight stamens, which soon converge and end in a circlet of anthers set closely round the style. Each anther consists of two cells, adherent in their lower and middle parts, slightly divergent at their apices. From the base of each cell a curious flat process is thrown out almost horizontally, towards the inner wall of the corolla, which it nearly touches. Thus when one looks into the mouth of the bell one sees 16 processes radiating from the centre like the spokes of a wheel, and forming an imperfect barrier between the upper and lower halves of the bell. The other ends of the two cells of each anther, as already said, diverge slightly, and near the apex of each, on the external lateral aspect, is an oval opening or pore, which gives issue to the pollen. As the whole corolla hangs upside down, the pollen grains would at once fall out from these pores as soon as dehiscence occurred, were there nothing to prevent it. But even then it is clear that the grains would not light on the viscid surface, for this faces in the wrong direction. The pollen, however, is prevented from so falling; for each anther cell adheres just in the part where its opening is situated to the corresponding part of the adjoining cell of the next placed anther in the circlet. Thus the pore of a cell, say the right cell of an anther, is, so to speak, closed by the pore of the left cell of the next adjoining anther; and so on all the way round. Thus the pollen is kept imprisoned in the cells by their mutual adherence. A very little force, however, is enough to dislocate this chain of anther cells. If a slight pressure be made down upon one of the radiating processes, which form the long arm of a lever of which the filament is the fulcrum, the upper ends of the corresponding anther cells, which form the other arm, are lifted up, and break from their union with their neighbours. The pores are then disclosed, and the pollen grains fall out in obedience to gravity. When a bee visits a flower it pushes its head against the mouth, which is too small to admit it, but which it obstructs completely. In so doing the head necessarily strikes against the viscid stigma, and will leave on this any pollen grains that it may have. The bee then extends its proboscis down to the disc to suck the nectar. The proboscis can scarcely get there without striking one or other of the processes, and as soon as it does this the jointed chain of anther cells, as before explained, is dislocated, and a shower of pollen falls from the exposed pores on the insect's head. This the bee carries off, and will, of course, give up to the stigma of the next flower it visits."

The whole paper from which the above quotation is made is one of great interest, so that it is the more vexing to find it marred by so many misprints; thus we have "Gesenria" for "Gesnera," "capital" repeatedly for "capitula," or flower-heads; this may, however, be an intentional neologism, but "Tynum" is, we suppose, "accidental" for Linum, and "Tythrum" for Lythrum. Unfortunately these are errors of a kind far too frequent even in journals professedly devoted to natural history and science generally. The names are, in many instances, uncouth enough when correctly spelt, how much more so when distorted by misprints.

THIS week we redeem an old promise, by publishing a woodcut illustration of the specimen of DAHLIA IMPERIALIS (see fig. 106, p. 596), which was to be seen last autumn in Messrs. SALTER'S nursery at Hammersmith. Few of our readers will need to be reminded what a magnificent plant this newly-introduced Dahlia is. All the gardening journals have sounded its praises, most of them have given illustrations of it. We ourselves were indebted to the "Florist" for the loan of a woodcut representing a single flower with a portion of a leaf (see p. 459). But, nevertheless, we may safely say that no illustration that has yet appeared, not even excepting the beautiful figure in the "Botanical Magazine," still less any description, has done justice to this noble plant. Its size alone would prevent any adequate representation being given. One objection there is, and that a formidable one, to this otherwise magnificent plant—its habit of producing a long, bare, unfurnished stem, at the top of which is the marvellous panicle of lily-bells, so unlike an ordinary Dahlia. Not only is this long stem ugly, but it offers an impediment to the proper growth and due enjoyment of the beauties of the plant. It is not every one who has a conservatory high enough to admit the giantess, and if the plant could be properly accommodated the bare stem would be an eyesore, and the crooked neck necessarily involvedin the process of looking up at it would still be objectionable. The method adopted in some places of laying the plant on its side was a make-shift more expedient than ornamental; all honour, therefore, to Mr. ALFRED SALTER, to whom occurred the "happy thought" of grafting a young shoot from the base of the plant on to the tuber of one of the liliputian Dahlias. What the success of this plan was, let the figure on our next page testify. It is, moreover, interesting as possibly adding another illustration of the effect of the stock on the scion. We say possible, because though at first sight it would seem as though the liliputian Dahlia stock exercised a dwarfing influence, strictly corresponding to that of the Paradise stock on the Apple, we are not quite sure that an ordinary Dahlia tuber would not have done equally well. We have an idea, which we should gladly see tested, that a "lateral" implanted on any Dahlia tuber would produce the same results. We may be wrong in our surmise, and for physiological reasons we hope we are, as, if so, the effect of stock on scion would be so conclusively proven. In any case we would strongly urge upon the possessors of this splendid plant the desirability of repeating the experiment in a variety of ways. That this is not a mere matter of science, interesting only to the physiologists, our illustration clearly shows, and so we hope next autumn to see many an example of these campanules of snowy lily-bells decorating our exhibition tables. For a full description of the plant we refer the reader to our previous articles.

— WE learn from "Nature" that the HERBARIUM of the late VON MARTIUS, which was offered to and refused by the Bavarian Government, has been purchased for 30,000f. by the Belgian Government, to form the basis of a national collection, to be located at Brussels. It consists, 1st, of the general herbarium, containing 60,000 species, represented by 300,000 specimens, nearly half of which are Brazilian; 2d, of the great collection of Palms; 3d, a collection of fruits and seeds; 4th, a series of woods; 5th, a collection of drugs and economic specimens, in great part formed by his brother THEODORE MARTIUS, Professor of Pharmacy at Erlangen. By the way, it is a pity that "Nature" does not learn to spell. The names of persons, plants, and things are too often grievously misspelt. In the above communication VON MARTIUS' patronymic was twice printed MARTINS. Such blunders are of course occasionally venial, but our contemporary is too notorious in this way.

— We understand that Messrs. VEITCH & SONS intend to exhibit at South Kensington, on Wednesday next (May 4), a specimen plant of ONCIDIUM MARSHALLIANUM, bearing from 50 to 60 flowers.

— The following directions for rearing the BOMBYX YAMA-MAI SILKWORM, compiled by Dr. WALLACE, may be of interest to some of our readers at this season:—

"The eggs should be kept during the winter in a cool, dry, and well-aërated place, where the temperature does not exceed 40°, at most 50° Fahr., till the Oak trees are breaking into leaf in the hedges. Eggs have been successfully wintered in a perforated zinc box with double walls, kept in a cool, shaded porch; also outside a North window: and suspended within a dry soda-water bottle, hermetically sealed, and buried in the ground in the shade of a North wall. A Norwegian kitchener (Sorensen's) is well adapted for wintering eggs. The temperature must be kept under 50° during the warm, sunny days of spring, lest the worms hatch out too soon. They will then keep perhaps better out-of-doors, in a shady spot, where the cool night air helps to retard the worms. The vicinity of mice, birds, beetles, &c., must be avoided. It is well to plant acorns, or force young Oaklings in pots, so as to obtain an earlier foliage, in case the worms hatch out prematurely. When the Oaks are breaking into leaf, bring the eggs into a temperature of 60°; expose them freely to light and fresh air; wash them well with water to cleanse away the mould and to moisten the shell, but do not remove the gum so that the young larvæ may escape more readily. It is a good plan to place the eggs on blotting paper in a plate covered with a glass funnel. The worms will hatch out from 6 to 8 A.M., and may readily be removed, by means of a stiff cat's hair brush moistened (avoid at all times touching the worms with the finger) on to a well-moistened plate, or slip of glass, whence they may drink up clean water, which is very beneficial to them: they may then be placed on their food, which must be fresh and moist. Admit fresh air freely, sunshine makes them wander: avoid the proximity of spiders, tomtits, robins, &c.; temperature if possible 60°; erratic at first, they cease to wander after the first moult. The worms fed on the living Oak tree should be protected by muslin bags; or on cut boughs, the longer the better, up to 6 feet in length, having the cut ends plunged into water, wet sand or loam; supply fresh boughs every 48 hours, and keep them in a well-ventilated room, or, better still, out-of-doors, so as to be exposed to the evening dew; the temperature should not exceed 75°, and range from 60° to 75°; during hot dry weather supply moisture freely in the evening by watering the foliage two or three times a-week. In changing the worms from stale to fresh food, avoid touching them, but cut off the stale spray or twig containing the worm, and pin it to the fresh food. If a bottle of water be used to plunge the Oak sprays in, take care to plug the neck so that the worms cannot crawl within and be drowned. If it be wished to cover over the worms to prevent their straying, a light wire frame covered with network, canvas, or open muslin should be placed over them, but so as to allow a free ventilation. Picked Oak leaves have been given to the worms with some success on a tray, as is done with Mulberry worms, but give plenty of pure fresh air, and do not shut them up in a box. Do not give Lettuce, but the worms will thrive on Apple, Beech, &c. Avoid disturbing the worms while changing their skins; when about to spin up they generally choose the end of the branch as the site of their cocoon. When spinning begins, remove bough and all from the neighbourhood of the other worms. The silk may be reeled the same as that of the Mulberry worms; the moth emerges about the end of August. It is found by experience that the Yama-Mai worms do best in a freely ventilated room, shaded from the sun, temperature about 70°, equable and rather moist; sunshine and a dry heat of 80° seem highly injurious. Great cleanliness is essential."

— We are informed that M. FAHNEHJELM, the Swedish Commissioner for the forthcoming series of Annual International Exhibitions, has applied for per-

mission to exhibit a full-sized model of a Swedish schoolroom, just as it exists in the country parishes in Sweden, with all the books, maps, apparatus, forms, desks, &c., in order to give a complete idea of the Swedish system of elementary instruction. It is to be hoped that encouragement will be given to other countries to follow this excellent example. An easy comparison of international appliances for educational purposes would be most useful to visitors to the Exhibition, and would be beneficial and stimulating to the countries exhibiting.

—— We have before us several Numbers of the AMERICAN ENTOMOLOGIST, a periodical which demands recognition at our hands as an admirable publication. It is of course mainly devoted to the insects of America and the injuries they inflict on plants and animals. The articles are accurate, and at the same time sufficiently devoid of technicalities to render them intelligible to the gardener and farmer. The illustrations are good and characteristic, and the "get up" superior to that of the generality of American publications. In the March Number is an excellent portrait of the late B. D. WALSH, whose death was noticed at p. 216.

—— The French market gardeners are famous for their Lettuces, Endive, Escarole or large-leaved Endive, and the means of BLANCHING the PLANTS in the spring and summer are well known. The grand difficulty is to get well bleached salads in the winter season, when the leaves are very liable to rot off on account of insufficient vitality. M. ROST, a market gardener of Fumel, has made known a plan which he has pursued for a long time for BLANCHING ENDIVE during the cold months. He prepares a bed of very active horse-dung, at least 16 inches deep; then taking up the roots of Endive with a ball of earth around them, he places them pretty closely together in the bed, but without overcrowding them, and covers them with a thin layer of straw. At the end of a week the Endive becomes thoroughly bleached, with scarcely a leaf decayed.

—— The Royal Horticultural Society has published, in the form of a small pamphlet, Mr. BADGER'S Prize Essay on COTTAGE GARDENING, and that of Mr. H. BUTTERY on WINDOW GARDENING. These essays may be obtained at a cheap rate for distribution among cottagers on application to JAMES RICHARDS, Esq., Assistant Secretary, Royal Horticultural Society, South Kensington, W. The prizes, it will be remembered, were offered by Mr. W. EGERTON HUBBARD, and were keenly contested for.

—— We learn from the *Otago Times* that the spread of CAPE WEED in the vicinity of Dunedin is becoming a serious evil. Dairymen complain that it is fast taking the place of Grass in their paddocks. Its proper name is Long-rooted Cat's-ear (Hypochæris radicatus.) Mr. BUCHANAN lately counted 60 seeds in a ripe head, and there were 60 flower-heads —making 3600 seeds from a single plant, of the kind carried long distances by the wind. We believe the name of Cape Weed was given to it in Australia. It is only of late years that it has become a great nuisance in Otago. It is a common weed in Britain, but not to such an extent as to be a nuisance here.

—— Under the title of "A Plant to be Fetched from the Antipodes," an extract is given in the "Bulletin d'Agriculture" of Paris from a narrative entitled "Shipwrecked on the Auckland Islands," published by M. RAYNAL last year. The author says that he found in the forest of these islands a small shrub, not much more than a yard in height, covered with a multitude of berries of a coral-red colour; the leaves were very thick, and somewhat resembled those of the Box, but were even smaller. As the fruit looked ripe he tasted it, and found it delicious; it was of about the size and shape of a Currant, and much like that fruit in flavour; it was not produced in bunches, but grew singly on a short stalk at the junction of the leaves with the branches. The fruit was so abundant, that at a distance the bush looked like a large red ball, speckled with dark green points. As the climate of the Auckland Islands is far from tropical, it is more than probable that the bush would grow in European countries, and, therefore, we trust some of our hardy explorers will bring home a few plants

FIG. 106.

the first time they pass the Aucklands, especially as the description of the bush presents some novel features. Perhaps it may turn out to be some species of Pernettya.

—— The chief METEOROLOGICAL FEATURES of the week ending April 23, were the high temperature and continued dry weather. In England (see Mr. GLAISHER'S Tables) the extreme high day temperature ranged from 71.6° at Portsmouth to 79° at Leicester; in Scotland, from 60° at Dundee to 72.7° at Glasgow. The lowest night temperature varied from 32.4° at Salford to 42° at Newcastle; in Scotland, from 34° at Paisley to 40° at Edinburgh and Greenock. The mean of the highest in England was 75.5°, and in Scotland was 67.7°. The mean of the lowest in England was 36.9°, and in Scotland was 38°. The mean of the extreme range in England was 38.6°, and in Scotland was 29.7°. The mean temperature of the air in England was 52.4°, and in Scotland it was 50.8°. The average RAINFALL during the week in England was 0.04 inch, and in Scotland was 0.39 inch. At Blackheath the highest temperature in the week was on the 20th, and was 78.7°; in April, 1869, it was 79.1°; in 1866 it was 79°; in 1865 it was 81.5°. The average rainfall at Blackheath for the month of April is 1.7 inch; and the fall this month, to the 23d, is 0.14 only; in April, 1817, 1840, and 1855, the fall for the whole month was 0.1 inch only.

—— In a letter to "Hardwicke's Science Gossip," Mr. W. W. SPICER states that the COLOUR of INSECTS is greatly influenced by the length of time during which they have remained in the chrysalis condition, well-marked varieties being produced by preserving the chrysalis in a state of abnormal torpidity through the autumn and winter, which can be done by keeping it in ice.

—— A compact and valuable little "Route-map and Index to the more interesting objects in the ROYAL GARDENS, KEW," says "Nature," is about to be issued under official sanction by Messrs. MACMILLAN & Co. It contains an excellent map of the gardens, and index to some of the more interesting plants: and as it is to be sold for the low price of 2*d*. it will doubtless have a very large circulation.

—— We have before us a pamphlet on POTATO CULTURE, by Mr. F. W. WILKINS, C.E., which is at least remarkable for brevity, and the chief recommendation in which is to plant on well manured ground large whole Potatos, the larger the better, scooping out all but one, two, or three eyes, and planting 4 or 5 feet apart in each direction. The Potatos produced will, it is said, be nearly all large ones, since the finest seed brings the finest crop. The produce is estimated to be, under favourable circumstances, 8½ bushels per rod, or at the rate of 1360 bushels per acre.

—— We have received from a correspondent a collection of EGGS of an INSECT which are disposed in a spiral arrangement round a thin twig of Whitethorn, in the same way as are those of the Lackey Moth, but they are covered and completely enveloped by a grey woolly substance, so as to look very like the fur of a mouse. This woolly substance seems to be the wool cut by the insect from the catkin of a Willow. The eggs do not appear ever to have been bred, so that we believe that the insect to which they belong is not known; at least we find it is new both to the entomologists of the British Museum, and those by whom it was seen at the last meeting of the Scientific Committee of the Royal Horticultural Society, but there are some reasons which lead to the supposition that it may be a Lyda. The Lydas are sawflies, the larvæ of some of which do a great deal of harm to forest trees. Lyda sylvatica feeds on the Whitethorn, and has been observed to cover its eggs with a gluey secretion, on which such a thatch as that seen in the specimen sent could easily be applied. We should be much obliged if our correspondent would send us a few more fresh specimens of these eggs, and we shall try to rear them, and report upon them hereafter. If he can find any with the larvæ come out and will also send the larvæ, we could determine at once whether it is a Lyda or not. *A. M.*

—— Our contemporary the *Builder*, in a recent Number, made some comments on the METROPOLITAN BUILDINGS and MANAGEMENT BILL, the object of which is to consolidate and amend the Building Acts

relating to the metropolis, the formation of streets and of sewers and drains in the metropolis [not very clearly expressed this, by the way], and for other purposes relating thereto, and which consists of 132 clauses and 17 schedules, printed on 69 pages. It was brought in by Sir W. Tite, Mr. Bentinck, and Mr. Bowring, and is to come into operation, if so accepted, on September 30 next. Amongst the exemptions we find :—

"Greenhouses, plant-houses, orchard-houses, summer-houses, poultry-houses, and aviaries, used exclusively for such purposes, standing detached, and not less than 10 feet from any other buildings, not being heated otherwise than with hot water, and the fireplaces, if any, being detached, with no flues of any kind within the houses or buildings."

"Water-closets and privies not exceeding in area 25 feet, and not exceeding in height 7 feet 6 inches, measured from the level of the ground to the under side of the eaves or roof-plate, and built on separate foundations, and external to the buildings to which they belong, and having no internal communication.

"Buildings not exceeding in area 50 feet, and not exceeding in height 7 feet 6 inches, measured from the level of the ground to the under-side of the eaves or roof-plate, and distant at least 10 feet from any other building and from any street, and not having therein any stove, flue, fireplace, hot-air or hot-water pipe, or other apparatus for warming or ventilating the same."

These exemptions, says the *Builder*, are very objectionable, and would fill the back-yards of suburban districts with dangerous wooden structures.

—— The fine collection of plants formed by the late M. Victor Van den Hecke de Lembeke, of Ghent, whose death we recently announced, is to be sold by auction on May 2 next and following days, under the direction of M. Jean Verschaffelt.

—— At a recent meeting of the Agri-Horticultural Society of Madras, the use of Carbolic Acid to destroy parasitical insects on plants was alluded to in these terms :—

"As carbolic acid has been recommended for the destruction of vegetable and animal parasites on cultivated plants, and as many seem afraid that its use might be attended with some risk of injury to the plants, it has been thought advisable to institute a series of experiments to ascertain with accuracy the effects of solutions of the acid of different strengths on vegetation. These are not yet completed, but it may be stated that the pure medicinal acid (Dakin's), painted on the stem of a young Morinda tinctoria (belonging to the same N. O. as the Coffee), merely produced a slight desquamation of the superficial layer of bark. A solution of the same sample, containing 1 part of acid and 30 of water, was tried on the Morinda and various strong herbaceous plants, and did not seem to injure the leaves or stems in the slightest degree. The pure acid painted on leaves and succulent shoots of woody plants caused them to turn brown and shrivel immediately, and in a few days the injured parts dropped off."

New Garden Plants.

Primula verticillata, *Forsk. var.* simensis.

Foliis rosulatis oblongo-lanceolatis farinosis (demum glabratis?); bracteis inferioribus oblongis trinerviis superioribus minoribus 1-nerviis; calycis late campanulati lobis deltoideo-lanceolatis integris; corollæ tubo calyce 3–4-plo longiore superne clavato farinaceo, limbi 5 partiti lobis obovatis integris emarginatis basi parum angustatis.—*Primula simensis*, Hochst in Schimp. Pl. Abyss. sect. n. n. 662; Field. et Gardn. Sert. Plant. i., t. 48; Jaub. et Spach, Ill. Pl. Orient. 5, tab. 440.—*P. Boveana*, A. Rich Tent Flor. Abyss. ii 15, non Desne.—*P. verticillata*, Duby in D. C. Prod viii. 667, non Forsk. (ex Jaub. et Spach, *l. c.*).—*P. Couttii*, Hort. Veitch.

Some time since Messrs. Veitch exhibited, at the Royal Horticultural Society, under the provisional name of Primula Couttii, or the "Abyssinian Primrose," a handsome Primrose some 18 inches in height, with tufted root leaves, each leaf about 8 to 10 inches long, oblong-lanceolate, feather-veined, covered with white mealy powder, especially on the lower surface, irregularly dentate at the margin. From the centre of the tuft of leaves rose a scape bearing two or three tiers or whorls of flowers one above another, these whorls consisting of a dozen or more flowers, the stalks of which measured some 2 inches in length. The whorls were provided with spreading leafy bracts, those in the lower whorls, being the largest, measuring 4 to 5 inches in length, 1¼ inch in breadth, and were oblong, acute, irregularly dentate, 3-nerved, and farinose on both surfaces. The upper bracts were smaller and narrower. The calyx was broadly cup-shaped, about half an inch long, divided half way down into five deltoid-lanceolate and entire segments; and the corolla yellow, salver-shaped, its tube nearly 2 inches long, dilated at the upper extremity, and its limb divided into five roundish notched lobes.

On comparison with native Abyssinian specimens and with the descriptions and figure above cited, we have no doubt whatever that this plant is identical with the P. simensis of Hochstetter, collected in Abyssinia by Schimper and others, and differing only in the greater degree of mealiness, the entire calyx lobes and other points in all probability dependent on the enhanced vigour imparted by cultivation.

But what is P. simensis? Richard says it is the same as P. Boveana; Jaubert and Spach think it distinct, and state that the P. verticillata of our gardens and of the Bot. Mag. is really P. Boveana, while the true P. verticillata is apparently not known in gardens. Finding that the authorities consulted expressed different opinions on the identity and limits of the plants just mentioned, we then turned to the herbarium, where native specimens exist, and which present such variations among themselves, and pass by such overlapping of characters the one into the other, that we think the preferable mode of dealing with them is to group them all as varieties under the head of Primula verticillata, an opinion in which we are glad to be supported by the Rev. M. J. Berkeley. The characters and synonymy will then stand as follows :—

P. verticillata, *Forsk. Flor. Ægypt. Arab., p.* 42; *Jaub. et Spach, Ill. Pl. Or.* v., *t.* 438.

Foliis lanceolatis vel oblongo-lanceolatis; bracteis 1-nerviis; calyce late campanulato profunde 5 partito segmentis linearibus integris; corollæ tubo quam calycye 5-plo longiore, limbi segmentis oblongis obtusis emarginatis basi haud contractis.—Hab. Yemen in Arabia Felici.

This is not in cultivation. The plant so-called in gardens belongs to the following variety :—

Var. α Boveana. Foliis late spathulatis; bracteis 3-nerviis; calyce cylindraceo-campanulato supra medium in segmentis 5 lineari-lanceolatis dentatis diviso; corollæ tubo calyce 2—3-plo breviore, limbi segmentis rotundatis crenulatis nec emarginatis basi contractis.—*P. Boveana*, Decaisne, MSS. ex Duby in D.C. Prod viii 35; Jaub et Spach, Ill Pl. Or v., t. 419.—*P. verticillata*, Bot. Mag t 2842; Link et Otto, Abbild. t. 51 (nec Forsk.).—Hab. in Monte Sinai, &c.

P. Boveana (the P. verticillata of gardens) is said to grow about the spot where Moses struck the rock and induced the water to flow.

Var. β simensis *(vide supra).*

Our present plant differs mainly in its shallower calyx and larger corolla, the lobes of which, though emarginate, are not crenulated, as in P. Boveana, which latter, moreover, has a more truly tubular or cylindrical calyx. Its leaves are like those of the true P. verticillata, and not so abruptly spathulate as in P. Boveana. Of this latter we have had the opportunity of examining fresh specimens, kindly forwarded to us by Mr. Green, gr. to W. W. Saunders, Esq.

Leaving on one side these technicalities, about which so much difference of opinion may legitimately exist, we may say that there can hardly be two opinions as to the merits of the plant exhibited by Messrs. Veitch. It has the mealiness of an Auricula, the stature and habit of P. imperialis, while each individual flower has the form and something of the colour of that of the common Primrose, though deeper in tint, and not quite so large. The dimensions, however, exceed those of its near allies, P. verticillata and P. verticillata var. Boveana. The Abyssinian Primrose is thus a very welcome addition to our garden flora. *M. T. M.*

STOKE-HOLE MANAGEMENT.

In the *Gardeners' Chronicle* of the 9th inst. the Editors (or one of them) seem to have put off their bland smile and to leave their high ground, perfumed with the Violet and the Rose, and with truly lenten severity descend to the depths of the earth to overhaul the coal-hole. Good housewives generally go through the house by way of visitation once a year, usually in the spring, either a little before Easter or just before Whitsuntide, according to the genius of the place; and that nothing may be neglected, the coal-hole, the ash-pit, and unnamable places get a coat of whitewash to have them in keeping with the lace curtains of the parlours, and the gold thread paper usually hung before the bars of the grate in the living-room, to look bright in the absence of burning fuel.

Now, when our talented Editor left his arm chair and that mahogany editorial table in his study, and descended the grimy steps, steep and awkward, that lead to the stokehole, it must have been in his anger that he preached to the inmates on the score of dust and ashes, of coal dust dropping through the bars, of cobbles carelessly cast into the flame, and of the raw material wasted that should have been made into a workman-like clinker. On opening the Paper it was evident that spades were trumps this time, and that the Editor had flung down the ace, the most elaborate card in the whole pack, and that in his hand he held prepared other trumps sufficient to turn the game and clear the board.

Instead of giving beginners a chapter on combustion, with all the gases weighed and measured to make a blaze, or, as the popular lecturers have it, to show how certain gases are "highly explosive" whilst others "burn with a silent and lambent flame," he rushes into the dark subject as if the ace of spades, with all its twists and dark surroundings, were his text, and declaims against gardeners for not consuming their own smoke and for using dampers in the chimney instead of damping the fire by means of the door of the ashpit. It was only the other night, when frost appeared to be setting in, that I went the round of the fires and hot-houses with the owner of a garden, and held the lantern whilst he shot down about two barrowfuls of coke through a hole in the floor, and said what an excellent boiler that was, and what a large extent of pipes it heated; but alas! its ways were not our Editor's ways, for it belonged to that breed of furnace which Mr. Mendel uses to heat some 10 or 12 miles of pipe, with one fire and one boiler.

The ordinary saddle boiler and comfortable slow-going furnace will do everything precisely as was stated, and the brick flue, with all its failings, will in like manner keep out frost, and force Grapes and Peaches or grow Pine Apples nicely with a little patience and a good deal of perseverance; but before we condemn the gardener for wasting fuel, &c., let us see some of the extenuating circumstances.

Coals in and near London are dear, and coke is freely used, and as there is no smoke in that kind of fuel, the stoking is rather peculiar, but there is no great merit in burning smoke where there is only a pinch of coal used to kindle the coke whose smoke has gone to light the city. Lads from the manufacturing towns never go to be gardeners; and it is only country youths that take to the "primæval art" who never see a furnace or handle a fire-shovel until they are ushered into the stoke-hole, and told to make a fire, which each one does after his own fashion, as it is always a dirty job, and is generally associated with degradation, being just about as respectable as cracking stones by the roadside. In some large places, as at Syon, the whole of the botanic department was heated by steam, and I had only to turn a brass cock to get a supply of heat, and the stoker had no pretensions to gardening—he was, to use a sailor's phrase, "told off for firing;" and this system is well worthy of imitation, for the "firing up," as it is called, is frequently such an oppression and so ill-paid for, that a man's health and spirits frequently break down under it. I have banked up at 10 P.M., and began firing again at 5 A.M., and that for months, for precisely the same wages that a labourer got in the same garden for 10½ hours daily, whereas I had 17 hours' labour for the same. This is a crying injustice, giving young men no time for learning plants, or making any other improvement. Not only should an elderly trustworthy labourer do the firing by day, but a watchman should do the night work in winter and early spring, in order that it might be done honestly both to master and man—being duly attended to, and as duly paid for. I quite agree with the Editor, that there is more art in firing than most people are aware of. A gentleman in the North of Ireland showed me his furnaces, and told me his system of firing. His fireman's wages depended upon the large amount of steam produced for the factory, and the small amount of the coal bill, and he found that a large furnace enabled him to use radiant heat instead of trusting to flame, and although he used two boilers and two furnaces where only one was used before, the extra one soon paid its cost, as it enabled the stoker to keep up steam whilst one furnace was cleaned out and got into working order. In firing with coke a very much larger furnace is needed than when coal only is used, and this kind of firing is little else but radiant heat, as there is seldom any flame from such a fire, and the slowness of the combustion is its greatest merit. A scientific gentleman in South Devon burnt cracked limestone in his hothouse furnaces along with coal, and it gave out a great deal of radiant heat, and the ash was valuable as manure for land. In ordinary practice not only will all the cinders and ashes be burnt into clinkers, but all the contents of the ash-pit from the mansion will be wanted to bank up the hot-house fires with. The great secret of burning dust coal, small cinders, and cinder-ashes, is simply to wet them all thoroughly. I should always have an opening of three-fourths of an inch between the fire-bars, and not a particle of wet fuel will fall through that, and if it did, it would only go like mortar in the next shovelful to make up the banking. There is never enough of water used about the stoke-holes, and seldom enough of wind, for steam assists greatly in "wilful fire raising," and helps to burn smoke. I have always had great trouble in getting large openings between the fire-bars to admit air on account of that terrible bug-bear—the small coals falling through. Stoking to perfection may be seen in Lancashire, not in a few instances, but by the hundred. Stoking under difficulties may be seen on board the Irish mail steamers, where the stokers are fanned by machinery to keep them from fainting between two fires.

I should no more think of dispensing with the damper in the chimney than I should of doing without a fire-door, but as for the ashpit-door I might lend that for a winter season and not feel its loss. The vexed question of fire-bars and their openings to admit air has been the subject of numerous patents. I have seen at least a dozen devices for this end, and should prefer the simple bar with a width of three-fourths of an inch and an opening of three-fourths of an inch. In practice it is far more important to keep the house at a regular heat by means of strong fires in changeable weather than to concern oneself with burning the smoke, for in a gentleman's kitchen garden half a mile from the mansion the smoke nuisance, especially at night, is *nil*. I think the late Mr. Anderson, of Chelsea, had a crotchet of his own on firing, namely to keep out frost by having his stoking done on the premises, under the greenhouse stage, in order to burn the cold air; and this may have suggested that hole-in-the-wall system with the wet blanket which drew its supply of air from the house it heated, and not from the stoke-hole, as all others had done. I merely mention these now to show in what various ways the simple firing up may have to be done; and before leaving the subject, let me, with all due respect, hint to our Editor that I am by no means certain that the carrying of a shovelful of live coals as he advises, from place to place, to kindle his fires, might not interfere with the rules of the fire insurance companies, who do not encourage that kind of display of fireworks on property which they insure. Moreover, when visit-

ing gardens for the future. I shall certainly look out for an ash heap, for I do not recollect seeing anything of the kind in any garden that I have visited, and, by a fortunate turn of affairs, I have been able to visit most of the best gardens in Scotland, England, and Ireland. Coals, coke, and ashes to be used as fuel, are all legitimate; but ashes "outward bound" might well excite the virtuous indignation of our Editor, for when he penned that sermon on unriddled cinders, chimney smoke, and wanton waste in the coal-hole—

"An angry man was he."

Alex. Forsyth.

NEAPOLITAN VIOLETS.

AMONGST the many objects that occupy the skill and attention of gardeners, few are more productive or better please the lady or ladies of the establishment than a plentiful supply, in their season, of Neapolitan Violets. Though requiring a certain amount of care and attention they are things that anyone can grow, who has at command a frame and a good supply of covering material. It is far better to grow them in cool frames in some out-of-the-way place, where the covering material does not present an untidy appearance, than in heated structures, as the plants are rather given to red spider, and the action of artificial heat only serves to increase that dreaded pest.

This being the time to lay in a supply of plants for next winter's work, a few remarks as to the proper culture may be acceptable, so that those who may desire to begin their cultivation may begin at the beginning. About this time the plants will have completed their season's work, and this is the time those not in the possession of them should secure a supply, as they are tolerably plentiful all over the country. They must be taken out of the frames where they have been flowering since last September, and have all the young branches and suckers separated from the centre or parent plant. They must then be transplanted in nicely prepared beds under a north or west wall, at 8 inches apart each way. The beds should be made 4 feet wide, finely dug over, and some three parts rotten leaf-mould carefully worked in 3 inches deep. When the runners or suckers are all planted as stated, they should receive a good watering, some sticks that will bend should then be arched over the beds, for the purpose of supporting mats, or some suitable covering material, to shade them from the bright sun until they are firmly established, that is, sufficiently rooted in the soil to avoid flagging, and also to protect them at night until all danger from frost is over, at which time the mats and hooped sticks may be taken away altogether.

They should receive copious waterings in the evenings during dry, hot weather, and of course must be kept perfectly free from weeds. By September these side shoots will have become nice plants with good plump hearts. A frame should then be got ready, where it can be protected by having any kind of dry litter placed around and above it in severe frosty weather, as no frost should be allowed to touch them. About 9 inches depth of soil should be placed over a thin layer of rotten manure, and the plants placed in rows as near as they can be to each other without actually crowding them. They should then have a good watering, and if the weather be at all bright, should be slightly shaded for a few days; but after that all the sun and air that they can have should be afforded them, taking proper care that when cold winds prevail the lights should be so tilted up as to afford the greatest break to the Violets inside the frame. As they require water they should have it with the chill taken off, and a nice dry bright morning should be chosen for the occasion; the lights may remain off until the foliage is dry, and should then be placed over them, and tilted up so as to allow a free circulation of air.

A light loamy soil is best to grow them in. Spent soil from a Cucumber frame is often used for the purpose, and it answers very well, but it is far better to use soil that has undergone the purifying influence of a winter's cold and frost. *Kalmia.*

WATER SUPPLY TO CITIES.

A SETTLING tank, to free the water of any mud which in time of heavy rains may be diffused in the water, is not necessary. Here the reader requires rightly to understand the difference between diffused mud and dissolved minerals. It is a general fact that river water is wholesome nearly in proportion to the amount of earth matter, especially clay, that is diffused in the stream. This arises from the deodorising effect of earth or clay in correcting any putrid organic matter in the water, or even in the fluids of the individual who may use it; that is when the earth is only diffused, not dissolved, such as lime or silex, when much of it becomes pernicious, though invisible, even giving the water a brighter, more crystalline appearance. Long-continued boiling of water increasing its power of solution of earthy minerals, and diminishing the quantity of water, is therefore to be guarded against. In the more unwholesome climates, where fever malaria abounds, it is found that the banks of muddy streams are much more wholesome than the banks of streams transparent as crystal. This is owing to the deodorising effect of the diffused mud, chiefly clay, which seems to prevent any malaria miasms from being given out by the water, the mud combining with putrid miasms and neutralising them. The horse, one of the most delicate of animals in the digestive organs, and which is strongly guided by instinct, raises the mud in the water where he drinks by pawing it before he drinks. This serves a double purpose, — it frightens away any injurious aquatic insect or animal he might drink up with the water, and also raises the mud.

In America, the St. Lawrence, which has the great American lakes as compensation ponds and clarifying tanks, and deriving its waters from a basin chiefly consisting of limestone strata, has so much lime in solution as to be unwholesome, though clear as crystal. So beautiful is the water, that emigrants from Europe going up in vessels to Quebec, Montreal, and other ports, after entering the St. Lawrence, having had impure, slightly putrid water on the voyage, and seeing the crystal water of the St. Lawrence so tempting, can scarcely be prevented from drinking largely of it, and becoming very unwell. The Mississippi also coming in part from the same limestone region before its junction with the Missouri, is also of pure crystal water, but its banks are subject to fever and ague, while the banks of the Missouri, an extremely muddy river, are comparatively free from fever. In Spain I have seen beautiful green hills and valleys, streams as clear as crystal, with clean beds and banks of gravel or sand, no marsh nor spot of mud—just such a dry country as you would suppose pre-eminently healthy, yet subject to remittent and intermittent fever. It is a well-known fact, though the means of extending infectious disease in towns is much greater than in hamlets and villages, yet scarlatina, measles, and even cholera, are generally more infectious and fatal, and easier communicated in the latter. This seems owing to the great disinfectant power of the coal smoke of cities, which acts unfavourably to the extension of the animalcule of the infectious disease—in fact, poisons it; while at the same time, like the clay in diffusion in water, smoke in diffusion in air deodorizes it—corrects the putrescency.

The balancings of Nature are admirable, though sometimes not understood by man, who, from ignorance, runs counter to them. When great rainfalls occur, and rivers are in flood, there is much organic matter carried down, as well as diffused minerals,—clay (alumina) being the most abundant, and which exerts a powerful deodorizing effect in neutralising the corrupting organic matter. Man, however, in the water he uses, is afraid of, and endeavours to get rid of, the diffused clay which he sees; but he is ignorant of the more injurious minerals which spring water—and, to some less extent, river water—often contain dissolved in the water, such as lime, silex, &c., which even renders the water clearer than when pure. Water containing these solutions is, however, unwholesome; while clay in diffusion is often advantageous, from its antiseptic quality. There is another common error in people not being aware that much boiling renders water less wholesome, by expelling the air it contains, and also by diminishing the quantity of water, while it does not diminish the mineral solutions. There are thus other ways of spoiling good water besides mixing it with mischievous ingredients, — alcohol poisons, Cocculus indicus, Nux vomica, sulphuric acid, lime, acetate of lead, &c., or even sugar, tea, coffee. Wise Nature has adapted pure water so as to be relished by man when he needs it; while, when he does not need it, it tastes insipid (Scotch, wersh). When water is mixed with other ingredients, whether injuriously stimulating or pleasing to the taste, man is often induced to drink more liquid than he requires, and, in consequence, he becomes of soft flabby consistency, defective in muscular strength, and disposed to disease.

The water of the Nile, in Egypt, is said to be the most salubrious water in the world, not only for drinking, but also in sailing upon, not giving out malaria, like most other rivers in hot climates. This appears to be caused by the mud it contains, and the complete deodorising the water sustains, in a course of 1500 miles, after it has received all its water—little or no rain and no springs being received during this long extended course, so that the deodorising power of the mud has had time to act completely to sweeten it. Although the Nile gets no accession of water in this great distance, yet from the abrasion of its banks it gets accession of suspended earth or clay. Rivers in becoming aërated in their course, along with common air seem to imbibe the malaria of the atmosphere where malaria exists. It is extremely dangerous to drink the water in the water-courses or ditches in Holland, or the Ditmarschen of Schleswig-Holstein, in time of dry warm summers, when the surface of the clay-silt fields is all cracked, giving out poisonous gases, miasms of fever, which the ditch-water seems to imbibe. But the organic matter in the water may of itself generate the malaria. In wet cool summers there is no malaria; such, in dry warm summers, has been the fatality of the malaria, that one-half of the harvest people that had come down from the higher country to assist at the harvest never returned. In the case of the St. Lawrence, and around its great lakes, and affluent rivers feeding the lakes, fever prevails while the water is generally clear, defective of deodorising mud. In limestone countries, where the rainfall disappears in large springs and underground streams, and the rivers are destitute of mud and only carry minerals in solution, fever is generally more prevalent than in sandstone countries, or of ancient siliceous rock.

In the case of a pond, to remove the mud as sediment, not only is what is highly useful abstracted, but in a day or two the mud subsides before it has had time to deodorise the water completely, while, along with the dissolved mineral matter, a considerable quantity of organic matter remains, which had been at first carried down with the diffused mineral, but which not being so heavy as the mineral does not subside, and is left to corrupt the water, generating animalcule life to increase the corruption. This goes to prove that a settling pond can well be spared, at least where the amount of water supply is of itself always abundant. In the case of the Isla water, coming from a cold alpine country, there is not much diffused organic matter except peat, a little of which may perhaps be useful, acting as a deodoriser to prevent corruption, though, when abundant, injurious to animal life. There is a strong presumption that mud in the water we use, being chiefly clay, has a salubrious effect upon the human organism in correcting any disposition to putrescence in the digestive organs or in the general system, which, especially in the corrupt atmosphere of cities, is not unfrequently the case. Clay may also remove dissolved lime or silex in water, as it does ingredients in sewage, by combining with them and subsiding.

It is a most valuable object, almost a necessity, alike advantageous to rich and poor, to procure good water. It must be remembered that water constitutes nearly three-fourths of the materials of organic life, and at the same time acts as the liquid element or floating power in the canals of life of the other materials to where they are required to build up the organism, to supply fuel to the fire of life, and to carry off the life-exhausted materials. It is thus above all necessary to procure it of the best and most wholesome quality and in abundant supply. *Patrick Matthews, Gourdiehill, Errol.*

HORTICULTURE FOR WOMEN.

[We extract the following from the pages of the *Boston Commonwealth*. Of course, as in all that a lady says, there is "something in it," but we do not endorse all the author's conclusions.]

So we are really to start a horticultural school for women! And why not? "Because," says the opposition, "women are physically unable to engage in gardening as a means of support;" and because "it will not pay." "Physically unable," do you say? Why, my dear sir, your daughter wastes more vitality during the balls of a season than would be needed to carry on a farm. Moreover, she is dying of *ennui*, and killing you at the same time with her restlessness and discontent. It will not pay, you tell me. Let her have some work for her hands; something besides what Fredrika Bremer calls the embroidering of interminable grey handkerchiefs; let her paint, mould clay, carve wood, saw, plane, build, if she has a knack at it; or put the money you now pay to her glover, her hair-dresser and perfumer, into a greenhouse, and let her be a florist, if she likes, and you will be paid ten times over in the cheerful spirit infused into your household in consequence.

But horticulture in the abstract, is it not lighter, more healthful, and more profitable work than the ordinary avocations of labouring women? Think of Camellias retailing at 25 cents each; Rose-buds, 1*s.*; Calla Lilies at Easter actually sold in Boston at 50 to 75 cents each; English Violets, 75 cents, a small nosegay; Smilax fabulously dear by the yard; and so on, *ad infinitum*. Think of the prices every housekeeper pays for Grapes, Melons, Currants, garden berries of all kinds, Tomatos, Asparagus, Lettuce, Radishes, Celery, Rhubarb, Spinach, and every other green thing; and then tell me if horticulture does not pay.

Sometimes a single fact is worth a page of theory. The writer of this knows a woman whose home is in a suburban city, and who all her life long has been a teacher in another seven miles distant. Rising long before light, travelling in damp cold horse-cars, in all sorts of wind and weather, seven miles to her school, and back again at night, the winter of 186— found her a confirmed invalid; for, though her indomitable will kept her still at her work, she was so deficient in muscular power that she could not step from crossing to curbstone without using her hands to lift up the limb. When not in her school-room she lay on a couch in a state of utter exhaustion, and so nervous, that the rattling of a newspaper caused her great suffering. As spring came on, instead of lying down on her return from school, she began to work in the garden, and though at first unable to raise her foot to push down the spade, or to stoop to pull up the weeds, she persevered in spite of the remonstrances of her friends, and not only recovered her health entirely, but, from the cultivation at odd hours of less than a quarter of an acre of land (no attention being given to horticulture), made money enough to pay the taxes on the family homestead? This, with similar facts that I might adduce from my own experience, convinces me that any woman in ordinary health may engage in this work without fear of injury; any woman who is strong enough to sweep, and cook, and wash and iron, and do the ordinary work of a household, is strong enough to take care of an acre of ground devoted to the raising of small fruits and vegetables. "What!" cries dear

Sensibility, "would you have women plough, and dig, and cart muck?"—an echo of that logic which has always opposed itself to the two great political questions of the day in the invariable "Do you want to marry a nigger?" "How would you like to shoulder a musket and go as a soldier?" and which I feel very much like meeting with Patrick's argument, "An' shure, if a man is born in a stable must he needs be a horse?" However, I answer mildly, "No;" and no more would I have women scrub floors, and spend their days at the wash-tub, or over a salamander stove baking pies and puddings to the ruination of your constitution and their own tempers. I would let brawn do the drudgery and brain the fine work in all trades. "Beware!" chimes in Selfishness, "here is another covert attempt to overturn our domestic altars and degrade our idols." (Selfishness, by-the-by, is a devout believer in the dogma, "Labour is worship," but he worships vicariously, as Mrs. Gargery always attended church. "It would kill him to wash dishes," you know, so he delegates the labour to the idols aforesaid.) Then he falls back upon sentiment, and asks if he has not a claim on the services of his wife and daughter, and if it is not their duty to do what they can to make the home he has so disinterestedly provided for them a comfortable one, and what is to become of him if they turn market-gardeners. To all of which I answer yes and no, with reservations, because I have my own ideas about his marital and parental duties, and am rather inclined to believe they include something more than providing a fine house and rich clothes and plenty to eat for his wife and daughter, not questioning for a moment that they owe him loving service for these, and will render it naturally and cheerfully, without thinking of it as a debt, provided he be not a tyrannical creditor who insists upon compound interest. About the wife I am not so positive, marriage being an entirely voluntary affair on her part; but about the daughter I do affirm that not a daughter of us but would have protested stoutly against being born, could we have foreseen that the process involved the absolute disposal by another of our time and talent; for there are daughters, must I confess it, to whom a needle in the hand is a dagger at their heart, who take up a broom-handle and find it heavier than a crowbar, with whom somehow or other the nap of the carpet always runs the wrong way, to whom the bread refuses to rise, and the cake is always dough; to whom the dish-tub is a burden and the wash-tub a slough of despond; who are as helpless with a flat-iron as if they were manacled, and who think the stocking-darning torture might be used with effect as a part of penitentiary discipline: and yet I have known such a daughter work out-doors the whole day with spade and hoe and rake, and declare at night she "wasn't a bit tired." It is for the sake of such as these that I rejoice in the prospect that horticulture is soon to become a recognised employment for the sex. Not for worlds would I disturb the relation between Selfishness and his daughter, if she be not of this nature; so let us forget that he has a daughter, and glance at some other women more likely than she to benefit by the new work.

Timorous Timid sees women in Switzerland reduced to the condition of mere beasts of burden, and accordingly enters in his note-book his profound conviction that "any attempt to take woman from her legitimate sphere of domestic service is unsound, and that nothing so degrades her as labour in the fields." Nearer home, I see widows with little children starving in city garrets and freezing in city cellars on the pittance they receive from the slop-shops; sempstresses, with narrow chests and hectic cheeks, bending over their work from eight to ten hours a day the year round, earning barely enough to keep soul and body together, and thinking it hardly worth while at that; shop-girls with sunken eyes and pale faces standing all day behind the counter, and huddled together three or four in an attic-room at night, half fed, poorly clothed, and yet thankful for the liberality that has opened the shop-doors to woman-clerks; teachers with no love for their work, and so unjust to themselves and it, driven to it because it is supposed to be the best paid and the highest grade of woman's work, receiving one-third the wages that men are paid for the same labour, and not daring to complain because there are enough others still needier ready to jump into their places;—and I own all this shocks me more than the sight I have often seen in a western city, of the German frau splitting wood, which her husband sawed, by my door all day. Very picturesque is the settlement made by these keen-sighted emigrants just outside that city's limits, with its neat little gardens planted and tended entirely by women; and many a soft spring morning, when, with aching head and languid step, I trudged to my daily labour, as with kindly "Guten morgen!" they passed me on their way to market, their broad backs laden with the produce of their little farms, I have envied them their outdoor life in the pure air and sunshine.

Near these simple folks, a man, hoping in time to be able to leave the desk over which he had stooped for 30 years, had invested all his savings in an acre or more of ground, stocked it fully with the best of Vines and fruits, built a snug little house and barn, bought a horse and cow, paid for them all, then—died. What were his family to do? There were three full-grown sons—clerks—foolishly fitted for nothing but office-work; two daughters, well placed at school, and three younger children. At that time all the fruit, and half the vegetables, eaten in that great city came from 40 to 100 miles by rail to market; and for a bouquet one must ride six miles to the greenhouse, there being no sale-places for flowers in town. So to the widow I said, "Don't sell the place; ten years hence, when the city shall have extended its limits, it will have trebled in value. Keep the horse and cow, hire a stout Teutoness to do the rough work of your garden, and raise fruit and vegetables for the market." I suggested that she could drive down every morning early with the produce of her garden to such friends of mine in the city as I would engage should become steady customers and pay the highest price for fresh fruits and vegetables throughout the season. My enthusiasm did not stop here. The garden being on one of the great highways for pleasure-driving out of the city, I thought how excellent it would be to whisper to my friends that in the little parlour they might stop and refresh themselves with real cream and Strawberries just from the vines at 2*s.* the saucer—and so I said. But from the city clerks and their sisters went up with such a howl of astonishment at my effrontery that I was glad to hide my diminished head. "What! we keep a restaurant!" "Our mother peddle vegetables like a Dutchman!" Let me tell you the sequel. The horse was soon sold, then the cow, then a building-lot for a paltry price, and finally the barn. One or two boarders were taken in, to help eat the widow out of house and home; the girls left school and went into shops; and 20 years hence, the clerks, still living on small salaries, will tell their children as they point to elegant marble-front houses on that same bit of ground, "We owned that once, but we had to sell out, while Hans Wisemann held on to his lot, and his son lives in the corner house."

In the suburbs of Boston, and of every other large city, there are dozens of such cases; widows left with small homesteads that might be cultivated by them with profit, but who, ill advised, sell out, and, flocking to the city for employment, soon sink under the unaccustomed burden and confinement in ill-ventilated tenements, and become inmates of our homes for the indigent or the consumptive. Will not those whose charity never faileth when they are called upon to succour such noble institutions as the above, come forward now, and aid us to establish one which we fondly believe is to be that "ounce of prevention" which is "worth a pound of cure?" The project is favoured by men of well-known judgment in our community. Two noble women have headed the subscription with 1000 dollars each. Others are following with smaller sums, according to their ability. The smallest will be welcome. All can give something. Let us not permit so benign an experiment to fail for want of funds. *C. Alice Baker.*

Home Correspondence.

The Destructive Influence of Fungus on Vines.—Like many of your readers, I have been interested in the discussion which has taken place in your columns regarding the fate of the long celebrated Vines at Bishop Stortford. To know the real cause of the failure of such a set of Vines cannot fail to be interesting and instructive to horticulturists, but in following "David Tell Fact" through his speculations as to the destructive cause, I cannot say that he presents any very satisfactory conclusions, nor adduces any circumstance from the effects of which, with good treatment, Vines with strong recuperative powers should not have satisfactorily recovered. In this, however, my impression may not be correct. But the cause which Mr. John Monro, of Potter's Bar, discovered in the roots of the Vine which he received from Bishop Stortford is to my mind quite sufficient to solve the mystery—if mystery it be. It quite accords with a little of my experience, that Fungus will most completely destroy Vines. I well remember the case at Colney House referred to by Mr. Monro; and I have had to do with a case of more recent date, where Beech nuts and small pieces of wood had found their way into a border supplied with bottom-heat, and in which the Vines did well enough for a few years, till such matter had time to breed Fungus; but no sooner had this taken place than the Fungus seized upon the roots, and followed up its work of destruction to the stems of the Vines, and proceeded up their stems like a travelling wedge, splitting them and causing rends as if produced by some mechanical means. The Vines, of course, languished, and would have died outright, only, when the cause of failure became so apparent, they were uprooted, a new border made, and a new set of Vines planted, which, in the absence of such an enemy, did splendidly. From what I have observed, I do not consider that in the absence of bottom-heat there is so much cause for apprehension of danger from Fungus as with it. I regret your correspondents have apparently allowed the subject to drop after Mr. Monro's statement of facts, especially as some who have taken part in the discussion regarding the power of Fungus seemed to discredit its destructive influence. In my own experience I never saw anything so powerfully destructive to Vines as Fungus in the case to which I refer, and, were it desirable, I could point to other cases that correspond with such experience. Where borders are supplied with bottom-heat, especially if inside borders, everything likely to produce Fungus should be rejected as dangerous to the well-being of Vines. If Mr. Monro be correct in stating that the Vine from Bishop Stortford was one mass of Fungus, I think the presence of such a destructive agency may safely be accepted as the real cause of the death of these famous Vines. *D. Thomson, Drumlanrig Gardens, April 23.*

Equisetum arvense.—In none of the books to which I have access is there any allusion to the strong, musk-like perfume which is emitted by the spike of the fruiting stem of this species. I put four into a little tin box and forgot them for two days, when on opening it the musky smell was noticed by all who were near. By the time the box reaches you, they will have been gathered five days. *W. T.* [We have noticed the same thing before. Eds.]

Luculia gratissima.—There is a noble specimen of the Luculia in the gardens of E. B. Hartopp, Esq., Little Dalby Hall, Leicestershire. When I saw it a few weeks ago it had been cut in and was breaking strongly. This plant is 10 or 12 feet high, and in the winter season bears a rich profusion of delicately scented flowers worth going miles to see. Those who possess plants of this beautiful winter bloomer, need not hesitate to prune them any more than they would to perform the same operation on the common Laurel. *F. W. B.*

—— If "W. E." will again read my article at p. 531, he will see that I stated my practice was to break off the young shoots that generally grow at the points, with the flower-heads, to strengthen the heads of bloom. This operation has nothing to do with forming the plant, but is adopted in order to prevent it growing while in flower. The plant has a tendency to grow at the extreme points before the flower opens, without making a shoot from the old wood. That is the reason why we see such long-legged miserable specimens generally. "W. E." speaks of summer pinching Luculias in Yorkshire. It takes a whole summer to grow shoots with flower-heads without any pinching. If you intend to grow it well, cut a pot plant after it has flowered and been partially dried just as you would a Rose; break it without much water, in a temperature of about 50°, away from any cutting winds; and encourage the growth with weak tepid manure-water. As the season advances the manure-water might be given of a reasonable strength, to increase the size of the blooms. *William Culverwell, Thorpe Perrow.*

The Vines at Heckfield.—Your correspondent "Robin Hood" is correct in numbering the above Vines amongst things of the past, notwithstanding the remarks of Mr. Wildsmith. Knowing something of the above Vines, a few remarks will prevent your readers from being misled. Mr. Wildsmith states that "these Vines have had nothing done to them beyond top-dressing;" this is not the case. The Vines in the late house became much diseased; his predecessor removed all the soil except so much as was sufficient to keep the Vines steady; new soil was added, the roots carefully spread, and the border finished with good sound loam. The roots were found to have penetrated beyond the border, and had got into a wet gravelly clay. Again, in the early house, which has been forced 25 years, the continual use of heating materials had raised the border 12 or 14 inches above the front glass; a considerable portion of this was removed, and a layer of loam applied, few or no roots being at the top. If they were never better than they are this season, they have never been much; but their improvement may be accounted for by their having taken to themselves a partial rest last season. The old greenhouse, which contains by far the best Vines, was renovated in a similar way, and wonderfully improved. The Vines in the Muscat-house had to be removed. I fear Mr. Wildsmith has forgotten the apostolic injunction, "I have laid the foundation, and another buildeth thereon; but let every man take heed how he buildeth thereon;" a precept which he and many other young men who succeed old practical hands are apt to forget. In conclusion, the Heckfield Vines may be certainly classed with the past, as it is some years since they produced a dish of Grapes fit for exhibition, though they may produce good ordinary fruit for some years. *Ebor, Acton, Middlesex.*

Narcissus.—Now that many, doubtless, besides myself, are thankfully availing themselves of Mr. Baker's elaborate analysis of these plants, published in your Paper during 1869 (pp. 416, 529, 686, 1015, 1136, and 1183), it may be the means of saving to others much of the trouble which I have experienced if you will allow me to correct an error which occurs at the bottom of the first column of p. 529. It is there wrongly stated that one of the distinguishing characters between N. Bulbocodium and N. Pseudo-Narcissus is that the filaments and style of the former are straight, and of the latter curved. Reference to the full descriptions of each species will show that these characters have been transposed,—the filaments and style of N. Bulbocodium are curved upwards, while those of N. Pseudo-Narcissus are straight. *W. T.*

Worms: Hepaticas: Apricots.—A Bedford gentleman has adopted a very long business to kill his worms. Let anyone troubled with worms on his lawn dissolve corrosive sublimate [poison], say half an ounce, in any sort of spirit; let him add this to a large watering-pot-

ful of water, and water the grass-plot. In about five minutes every worm will come up and die, when they may be collected and buried in the manure heap. "A. M. M., Bedford," not only does his work imperfectly, but by taking his worms alive to the manure-heap, allows them to spread the first opportunity. I see another of your correspondents says lime is injurious to the Hepatica. Can he show me any place where lime-haters like the Rhododendron, Heath, and Blechnum flourish, where Hepatica is not found in flourishing quantities, spreading itself, and the leaves in full vigour? Can anyone suggest a cure for the apoplexy of Apricots, and what is the best soil for Apricots? I use lime-clay mixed with good soil, and live in a county where they say Apricots will not grow. *Garden B.*

Saxifraga ciliaris.—Some time ago you recorded your own experience that this must not be regarded as a usefully hardy plant near London. I lately had an opportunity of confirming this by seeing a specimen out-of-doors at Messrs. Salters' nursery at Hammersmith, where a miserable bloom-spike was feebly forcing its way out from amongst a collection of blackened leaves. At the same place I had an opportunity of observing what a desirable plant this is for conservatory decoration, if merely protected from frost. Its apple-green leaves and cheerful pink flowers are both welcome amongst our early spring plants. Mr. Alfred Salter informed me that they have had it in bloom for four months, at the same time mentioning that it will not bear forcing. *W. T.*

Dendrobium Dalhousianum.—A plant of this grand species in the collection of W. Stead, Esq., Woodcliffe, near Leeds, has made pseudobulbs 5 feet 6 inches long during the last summer, and of a proportionate thickness; some of the old bulbs bear two spikes of flowers, 10 blooms on a spike, and each flower is about 3 inches across. A specimen of D. Paxtoni (Hort. = D. fimbriatum var. oculatum) has bulbs 4 feet long, two spikes on a bulb, and 26—29 flowers on a spike. It is not every day that we meet with such splendid examples of good cultivation, and I think it would interest many besides myself if others of your readers would kindly give measurements of the more remarkable Orchids they cultivate or may have seen. *F. W. B.*

Early Peas.—In reply to "R. G." I beg to say that instead of being three weeks behind one's neighbours in picking early Peas I have been that much ahead of some of them. Last year I picked Peas on May 24, and I could have done so a few days before that, but, where I was then living, a dinner party was fixed for that day, and the Peas were kept for that occasion. I sowed the latter part of January, some in the troughs, as already described, and others in the open ground at the same time. Those in the open ground were quite three weeks later than those sown in the troughs. Notwithstanding what "R. G." says about the November sowing in the open ground being the best way, I will guarantee that Peas sown in the troughs in January, and properly attended to in the way of hardening off, &c., will be fit for use before those that are sown in the November previous out-of-doors, besides saving three months' anxiety. I wish to say that I am not so vain as to suppose that no one else ever thought of the troughs until I described them. The idea struck me as an improvement on the horse shoe tile and turf principle, and as soon as I satisfactorily proved it I sent a description to you. I am sorry to say it will be out of my power to comply with "R. G.'s" request, to send Peas to your office, because I am at present out of a situation; but as a proof of the truth of my statements I enclose the name of the gentleman and of the place where I lived, as well as my own, and which you are quite at liberty to give to "R. G." if he has any doubts on anything I have stated. *W. S.*

Cottagers' Shows.—It is hardly possible to overestimate the importance of these upon the character and habits of the rural population. Fortunately, they are becoming common as blackberries in East Anglia; and, wherever they are established, cottage and window gardening start on a new and a higher level. Two things should never be lost sight of in connection with such matters—utility and ornament. All such shows should stimulate the cottager to get more produce of higher quality out of his garden, and offer inducements to him to make his cottage outside and in, at least so far as the windows are concerned, more beautiful. Perhaps it is not wise to go beyond the windows in the matter. They belong, as it were, to the garden, and the promoters of cottage gardening may legitimately claim them, or, at least, their floral occupants; in fact, no cottage society should be considered complete that does not offer prizes for window plants, hand bouquets tastefully arranged, and the best cropped, cleanest gardens — this latter being probably the most important point of all. The latter involves two inspections in the course of the year—say, a visit in May, and a second in September; but nothing is so productive of good cultivation and cleanliness as these visitations. Liberal prizes are offered in this district for the best kept gardens; 1st, £1; 2d, 15*s.*; 3d, 10*s.*; 4th, 7*s.* 6*d.*; and all who are commended by the judges, 5*s.* each. So close has the competition become, that equal firsts or seconds are not unknown; and the gardens competing for these prizes have become perfect models of profitable cropping, special excellence or quality of crops, cleanliness, and beauty. The flower-borders are extending year by year, till there are few cottage gardens that have not one or more flower-beds or borders prettily and tastefully furnished. The culture of Roses is likewise extending, and such splendid sorts as Gloire de Dijon beginning to adorn many gable ends of cottages. In a few more years Marechal Niel will be found in plenty in similar positions. The cottagers, in addition to many shows of their own throughout the county, receive liberal encouragement at all the shows of the Bury Horticultural Society. A special tent is set aside for the products, and liberal prizes are offered. There are a good many advantages in this plan: the cottagers are admitted free to see the show, and here they see the beauty and pick up the names of the best Roses, Fuchsias, Pelargoniums, &c., which in a few years will adorn their cottages or windows. They are likewise eagle-eyed over new or improved varieties of fruits and vegetables; but in the latter they have little more to learn. They grow only the finest varieties of Peas, Potatos, &c., and it is no uncommon thing for the great gardeners to buy seed of some favourite sort of the cottagers. The prizes are open to all comers, I believe, at our shows. In various societies there are restrictions as to character. I think all such restrictions ought to be abolished. It does a bad man good to grow good fruit, vegetables, or beautiful flowers; and it is a crying shame that a poacher or other doubtful character should not be encouraged to follow such humanising pursuits. The only point is to see that the men really grow the produce they exhibit, but it is very seldom that any frauds of this kind are attempted. Numbers of roots and quantities of fruits should be determined and strictly adhered to, else some of the cottagers would bring a sackful of Potatos instead of a peck, and a bushel of Onions instead of a dozen, thinking the mere quantity must carry all before it: and the same with window plants. Prizes should be offered for the best plant, the best pair, and the best four; also for the best pot of Mignonette, Musk, Fuchsia, Pelargonium, or any other plant. It is astonishing what the last will sometimes bring forth, but it is essential to limit the number. I attended a cottage show last year as sole judge. When I arrived I found the whole place literally blocked up with hundreds of pot plants, and saw the entire village in motion, pots in hands or arms. I found all bent upon bringing every plant they had, and piling them together upon the tables. My task was worse than the miscellaneous class at the first great International Horticultural Exhibition at Kensington, but after nearly two hours' sheer slavery among a Babel of voices and amid a perfect pot-maze of confusion, order was evolved. But I have doubts to this day about whether the right parties got the prizes. I give this case merely as illustrating the necessity of limiting the number of pot plants shown by each exhibitor. It is almost equally necessary in other departments. I shall be most happy to aid in the good work of establishing cottagers' flower shows by every means in my power, and to give to any of your readers at any time, through your columns, any information or experience I possess concerning their establishment and successful working. *D. T. Fish.*

Lilium auratum.—If it is not generally known that this plant can be bloomed so early in the year, permit me to record that during the last week in March there was a nice plant with three blooms fully expanded to be seen in the window of Mr. Reeves, the florist, at Notting Hill. *W. T.*

Ailantus glandulosa.—There is in the Park here (Bath) a tree of this species, which at 3 feet from the ground is 6 feet 2 inches in circumference, and is about 50 feet high. It was planted about 1832. This species is in every sense ornamental, and deserves to be much more frequently employed for planting in avenues, parks, &c., than is usual. *Bath.*

Moses' Rod Wanted at the Royal Horticultural Society's Garden.—The other day I determined to give my children a treat at the Royal Horticultural Gardens. The afternoon being very warm, the young ones became very thirsty, and wished to have something to quench their thirst. I hastened to the places where, on special days, there is never any want of refreshment, hoping to find there at least some water. But in this I was disappointed, and on asking several of the men employed there where a glass of water might be obtained, they informed me none was to be had. "But surely," I said, "there must be a drinking-fountain in some part of the gardens." "No, there was none," was the reply. As children will be children, and their thirst seemed to increase when they found they could get nothing to quench it, there was nothing left for me but to take a cab and drive home, as we could not possibly go to any of the low public-houses of the neighbourhood, and I did not see a single place near where one might have taken a young lady. Of course, I was very much annoyed that our pleasure was thus cut short, and I resolved there and then to write to my friends, the Editors of the *Gardeners' Chronicle*, to see whether they can't use their powerful influence, and induce the Council to provide a drinking-fountain for those who may feel thirsty after visiting the garden on a warm day. There were so many models of tasteful fountains at the entrance, that I feel quite sure the exhibitors would be very glad to allow them to be used as well as looked at. *F. R. H. S.* [What has become of the proposal to erect a drinking-fountain in the garden to the memory of the late Mr. G. Ure Skinner? Eds.]

Sparmannia africana.—This is a good old plant, not grown so generally as it ought to be considering its beauty and easy culture. Cuttings struck in the spring and grown in small pots—say 48's—during the summer, will bloom profusely the following winter and spring. Its delicate white flowers are invaluable for cutting, as also are the plants for conservatory decoration. *F. W. B.* [Certainly this is one of our old neglected plants. Eds.]

Foreign Correspondence.

Switzerland.—Having had my attention drawn to the subject of climatic advantages by the writings of Dr. Bennet, it has occurred to me that a few notes upon a recent trip to Switzerland might be interesting to some of your readers. The first place where we noticed any unusual advantage from situation was Seelisberg, on Lake Lucerne. Not liking to spend Sunday in the town of Lucerne, amid its heat and dust and crowd of tourists, we took the steamboat to Treib, from whence we ascended by a winding path through fertile fields to Seelisberg. The hotel, which is large, is much frequented by travellers, who, like ourselves, were attracted by the beauty of the situation. It is built so near the edge of the cliff, that as you look over the slight fence which runs along the narrow terrace in front of the house you see straight down into the depths of the green lake below. These cliffs, when seen from the lake, form the background of the Field of Grüth, access to which, we are told, can only be obtained from the lake, and wherefore historians say this field was chosen as the meeting-place of the three founders of Swiss liberty — Arnold von Melchthal, Werner Stauffacher, and Walther Fürst. They are mountain limestone, and the woods upon them round the hotel can furnish specimens of many sorts of trees. We were sorry to see in one place some most splendid Birch trees being made into firewood. Here we found the pretty little pink Cyclamen in flower, Asplenium viride and Hepatica growing in abundance, though of course not in flower: some plants we brought home have blossomed this spring, and are of a lovely blue colour. The excursions from this charming place are numerous, and we came away on the Monday morning, envying those we left behind, but promising ourselves another and longer visit, when we could take with us friends we loved who were now left in England.

Leaving our carriage at Andermatt, to walk on while the horses baited, we crossed the wooden bridge over the foaming Reuss, and began the ascent of the St. Gothard. The road here has been stolen from the rocks, which rise up like a wall; and in the clefts covered with dust, and so dry that the Fern fronds broke off in our hands, grew quantities of Asplenium septentrionale. In Switzerland, I may say once for all, no limestone, no Ferns. We followed the new carriage road over the Furca Pass, which rises to the height of more than 8000 feet, to gain the Rhone Valley; in ascending we found a great many flowers of the Sedum class, and an endless variety of others, all new to English eyes. Within a few feet of the Rhone glacier grew the pretty pink Dianthus, which grows so freely in Northern Italy. We ascended the Æggischorn, which is 9657 feet high, and were amply repaid for a somewhat toilsome ascent by the glorious panoramic view from the summit. The countless number of snow-clad mountains rising out of a bed of clouds far beneath us—the Marjelen lake, with its walls of ice, and the great Aletsch glacier, 19 miles in length, immediately below us—formed a scene it is difficult to picture and impossible to forget.

The Æggischorn abounds with curious plants. We first found here the little alpine Gentian; the flower-stalks were about an inch in height, and we marvelled that so tiny a plant could produce so large a flower; when we had raised with a knife a little group of three or four there seemed nothing but stalk and blossom. We went up the St. Nicholas Valley to Zermatt, and then returning as far as Stalden, ascended the Saas Valley to cross the Monte Moro Pass. In both these valleys we found Polypodium Dryopteris, Phegopteris, and calcareum, Asplenium septentrionale, and any quantity of Lycopodium helveticum: and at Saas, growing on the rocks, quantities of Auriculas, from which we gathered some seed; the number of flower-stalks told of the free manner in which they flower. The advantages of situation here were but small, the lower part of the valley having been entirely covered several feet deep by an avalanche of stones and *débris* from the mountains. Some of the wretched-looking inhabitants were busily engaged in trying to get down to the soil and remake their gardens, some had cleared a few square yards, and had succeeded in burying the stones and getting the soil uppermost. Our guide pointed out to us the ruins of a châlet where 26 people had perished during the recent flood. The elevation of the valley is considerable, and the guide told us

that the winters are so severe they are obliged to house the cows for five months, and the goats for three. We also found at Saas, Woodsia alpina, in a most picturesque situation near the Glacier du Fée; and on the Monte Moro, Anemone glacialis, which is rightly named, for it was growing in the cracks in the rocks amidst snow and ice, at an elevation of upwards of 9000 feet. The wind was piercingly cold, but we soon found a change in the temperature on beginning the descent, on the Italian side, to Macugnana. In the Val Anzasca Auriculas continued to abound, most luxuriant Parsley Fern, at least a foot high; the pretty, but not fragrant Chive, with its pink blossom, and something allied to it, at any rate in smell, with a small white flower, and a deeply cut leaf at the end of a long stalk, which we thought as pretty and graceful as a Fern. Our next point was Baveno, and here my heart begins to fail me, for to any one who has never enjoyed the rich treat of seeing the Italian lakes, it seems almost impossible to convey an idea of their extreme beauty, and the almost tropical luxuriance of the vegetation, particularly on Lago Maggiore. We were much struck with the beauty of the Aloes, which were growing in the cracks of the bare rocks on the Isola Madre; the whole island is a garden belonging to Count Borromeo,—he has a palace here, and another on the Isola Bella, which is very near. On both islands are rare trees of every description, from Camphor and Cork trees to the stiff and formal-looking Lignum and Arbor-vitæ of our English gardens, which are here really graceful looking trees.

On the south side of the Isola Madre we saw a collection of Orange, Lemon, and Citron trees laden with fruit; these we were informed were sheltered during winter. Against the palace grew Mandevilla suaveolens, Ipomœa Learii, Bignonia grandiflora, and other creepers, in the greatest profusion; Pomegranates, Hibiscus, a very free flowering shrub called Lagerstrœmia rosea; Magnolia grandiflora, as standards in size almost like forest trees; also a tree of Bambusa gracilis, looking like a Weeping Willow, 20 feet high at least; and groves of Oleanders, 14 or 15 feet high: on some of the single ones were seed-pods 8 or 9 inches long. The water was exquisitely clear, and as we watched the fishes swimming at the bottom of the lake we spied a Caper plant growing out of a crack in the wall. Among other curious plants we noticed Momordica Charantia, which looked very pretty running up a trellis: but in any reasonable time to describe all the curious and beautiful flowers and plants we saw would be impossible. After having laid in a stock of Pears, Grapes, Figs, &c., at Pallanza, we rowed to the nursery of Signor Rovelli, with whom one of our party wished to arrange for the purchase of some of his large Camellias, of which we found a large grove, many of them from 15 to 18 feet high. The show, when in bloom, must be worth the journey to see, and they were well set with buds at the time of our visit—the middle of September. We were also struck with the number of seed-pods on some of the more single ones, quite Apple-like in size. Hibiscus trees lined the sides of the road to shelter passengers from the sun, and the fine Acacia trees, with more flower-buds almost than leaves, looked silvery white in contrast to the Pinuses. I asked him to give me the heights of some of his rarer trees, which I give you in mètres as he furnished it to me,—a mètre is 40 inches; some of your correspondents will perhaps appreciate these even more than I can:—

Abies monocaulis	Mètres high	1½	
,, Pinsapo	,,	6	
,, Nordmanniana	,,	9	Bearing cones.
,, religiosa	,,	10	
,, Kæmpferi	,,	9	
,, jezoensis	,,	10	Bearing cones.
,, Lindleyana	,,	7	,,
,, orientalis	,,	8	,,
,, Menziesii	,,	8	,,
,, Webbiana	,,	6	,,
Araucaria brasiliensis	,,	12	Bearing numbers of very large cones.
Cupressus torulosa	,,	12	All these were perfect pyramids.
,, gracilis	,,	10	
,, chinensis	,,	10	
,, majestica	,,	10	
,, Lambertiana	,,	14	
,, glauca	,,	14	
,, Knightiana	,,	14	
,, californica	,,	10	
,, Macnabiana	,,	10	
Pinus insignis	,,	12	Bearing cones.
,, Sabiniana	,,	12	,,
,, canariensis	,,	10	,,
,, patula	,,	10	Bearing cones.
,, Wincesteriana	,,	10	,,
,, Russelliana	,,	10	,,
Libocedrus chilensis	,,	10	,,

We went next day to Canero, a small village on the lake, but rather out of the beaten track of tourists. Our object in going to this place was to visit the grave of a relative who had died there the preceding summer from sun-stroke. The high temperature is very favourable to the growth of Ferns. We found flourishing luxuriantly Adiantum Capillus-Veneris, and magnificent roots of a Fern-like Pteris cretica albo-lineata, but without the variegation. [Doubtless P. cretica itself. EDS.] We carried away as much as we could, to the astonishment of the natives, who doubtless looked upon them as weeds. At Lugano the heat was intense, but the luscious black Figs, Grapes, Peaches, &c., consoled us greatly for our discomforts. We ascended Monte San Salvadore, which rises from the lake. In the wood we passed through on the north-east side Cyclamens grew in the greatest profusion, and Christmas Roses were equally abundant. In sailing down the lake, which runs nearly east and west, we were struck with the difference between the barren cold-looking north side, which is nearly always in shade, and the sunny south, covered with Vines to a great height, and many Orange and Olive trees ornamenting the gardens; the peculiar grey tint and Willow-like growth of the latter made them striking objects. We left this lovely region with the hope of revisiting it, and many regrets that all lovers of gardening should not have, as well as ourselves, an opportunity of exploring and enjoying its varied beauties and practically realising its climatic advantages. *G. H.*

Societies.

ROYAL BOTANIC: *April 27 and* 28.—The second spring show of this Society was held on Wednesday and Thursday last. As a spring exhibition it was a very good one, but unfortunately the weather, which had been exceedingly fine for some time previous, turned very cold; and this circumstance, together with the occurrence of frequent showers of rain, was very much against the success of the show as regards the attendance of visitors. The large conservatory was remarkably gay with Azaleas and other spring-flowering plants, and we also noticed a young specimen of the Mexican Fourcroya longæva throwing up a fine flower-spike.

Stove and greenhouse plants were exhibited in very good condition. The best 12 greenhouse plants in flower were contributed by Mr. Wright, gr. to C. H. Crompton Roberts, Esq., Avenue Road, St. John's Wood, and consisted of good examples of Azalea coronata and A. alba, a fair specimen of Darwinia (Hedaroma) tulipifera, and very neat nicely-flowered plants of Erica Hartnelli superba, E. persoluta alba, E. elegans, and E. Cavendishii, Boronia serrulata, &c. Mr. Wheeler, gr. to Sir F. H. Goldsmid, Bart., came in 2d with a group of smaller plants, including nicely-bloomed specimens of Aphelexis purpurea, Tetratheca ericæfolia, Dracophyllum gracile, Erica Spencerii, Azaleas, &c. From Mr. Wright also came a miscellaneous collection, comprising a splendid specimen of Darwinia (Hedaroma) tulipifera, about 4 feet through, well furnished with foliage and flowers. a fine plant of the broad-leaved Phœnicophorium sechellarum, the same of Cupania filicifolia, a very graceful foliaged plant; Rhapis flabelliformis, showing for flower; with Ferns, Heaths, &c. Mr. Wheeler staged a similar group, in which were a grand specimen of Lomaria gibba, a large well bloomed Eriostemon linearifolium, Boronia tetrandra, in excellent condition, with Ferns, Palms, &c. Mr. B. S. Williams contributed a choice collection of Palms. Orchids, Dracænas, Ferns, Heaths, &c.; as also did Messrs. Rollisson, of Tooting; and from Mr. Wilkie, of Oak Lodge, Kensington, came a choice group, including a very good specimen of Epiphyllum Jenkinsoni, full of its beautiful vermilion-red flowers; a beautiful plant of Tremandra ericæfolia, Azaleas, &c. To each of the above extra prizes were awarded.

Messrs. Lane & Son sent the best 12 Rhododendrons, and took the 1st prize with dwarf, bushy specimens, with fine trusses of bloom, of Fastuosum flore-pleno, Impératrice, Ne Plus Ultra, Minnie, Sir Isaac Newton, Surprise, Madame Miolan Carvalho, Mrs. John Waterer, Lord John Russell, Leviathan, and Hendersoni. Mr. G. Wheeler and Mr. Wright also competed, with very creditable collections.

The Roses shown by Messrs. Paul & Son, in the nurserymen's class for 9, were a splendid lot, large, well bloomed, and in excellent health. Messrs. Paul also contributed a large and fine collection in pots, as also did Messrs. Lane & Son, to both of which extra prizes were awarded. Two groups of 6 were staged for competition in the amateurs' class, the best from Mr. Wright.

In the class for 6 Azaleas in 8-inch pots, three collections competed, the 1st prize being awarded to Mr. Wright, who showed some dwarf nicely furnished specimens; Messrs. Lane & Son being placed 2d, and Mr. G. Wheeler 3d. Messrs. Lane & Son also sent a very good miscellaneous collection, and the same must also be said of a group from Messrs. A. Henderson & Co., Pine-apple Place Nursery, Edgware Road, to both of which extra prizes were awarded.

The 6 Amaryllids exhibited by Mr. Baxter, gr. to C. Keiser, Esq., were all that could be desired. The kinds shown were Duke of Edinburgh, very deep red; Albertine, white ground, streaked with chocolate; Princess Teck, much like the former but fainter in colour; Prince Teck, deep crimson-scarlet; Charles Keiser, crimson-scarlet, with a white band up the middle of the segment; and Wilhelm von Nassau, a distinct type, somewhat resembling a Vallota, but with larger flowers of a scarlet suffused with orange colour. Mr. Baxter also sent a very fine collection of seedlings, amongst which Jane Balme, Olga, Mdlle. Tietjens, and Theophilus, were specially fine. The 1st prize to the former, and an extra to the latter, were given.

Messrs. Reeves Brothers, nurserymen, Notting Hill, had the best 6 Dielytras, rather overgrown specimens being shown by Mr. Ware, Hale Farm, Tottenham. The best 6 Deutzias were contributed by Messrs. Lane & Son; Messrs. Reeves, Mr. Wheeler, and Mr. Wilkie also competed, the prizes being taken by the three former in the order in which their names are given. Mr. Ware took the 1st prize for 12 hardy herbaceous plants, with a very choice collection, an extra prize being awarded to Mr. G. Wheeler for another group. Mr. Ware also contributed a large and rich collection, to which an extra prize was awarded.

Amongst the miscellaneous subjects exhibited were cut blooms of Beaumontia grandiflora, whose beautiful, large, white, trumpet-like flowers were slightly scented like Violets; these came from Mr. Chambers, gr. to J. Lawrence, Esq., Beddington, Croydon; cut blooms of La Reine and Céline Forestier Roses, from Mr. Osman, gr. to R. Holland, Esq., Stanmore Hill; a collection of very pretty hardy Primroses, from Mr. W. Paul; a beautiful group of tricolor Pelargoniums from Messrs. Carter & Co.; 24 splendid pots of Mignonette from Messrs. Reeves Brothers; a group of orchard-house trees, covered with bloom, from Messrs. Lane & Son; and a series of beautiful hand bouquets from Messrs. Lucking Brothers, Notting Hill, and Messrs. A. Henderson & Co. First-class Certificates were awarded to tricolor Pelargonium Ealing Rival, from Mr. Stevens, Ealing; to three new bedding Pansies, named Sunshine, Mrs. Shirley Hibberd, and Mrs. Felton, large white, from Mr. Hooper, Bath; to Macrozamia magnifica, from Mr. Kennedy, Covent Garden; to Mr. B. S. Williams, for Agave Verschaffeltii, and A. Verschaffeltii glauca; to Mr. Wm. Paul, for a new dwarf yellow Waliflower named Waltham Yellow, and for Waltham Bride, a dwarf silvery variegated white-flowered Pelargonium; to Messrs. Rollisson & Son, for Echeveria agavoides, Erica tubæformis, Rhododendron fragrantissimum, white, and Pteris straminea attenuata; to Mr. J. Jane, Highgate, for tricolor Pelargonium Mrs. Colonel Wilkinson; and to Messrs. Paul & Son for a fine new Tea Rose named Céline Noirey, of a pale blush colour, with the outer petals of a bright crimson shade.

EDINBURGH BOTANICAL: *Feb.* 10.—Sir Walter Elliot, K.S.I., President, in the chair. Donations to the library, herbarium, and museum were laid on the table. The following communications were read:—

I. *Remarks on the Flora of Shetland.* By Mr. Alex. Craig-Christie.

II. *Account of Botanical Excursions made in the Island of Arran during the months of August and September, 1869.* By Professor Balfour.

III. *Sketches of the Botany of Lord Howe's Island.* By Charles Moore, Esq., Director, Botanic Garden, Sydney. Communicated by Dr. Cleghorn. (See p. 968, 1869.)

IV. *Botanical Notes from Naples.* By Prof. Allman.

V. *Report on the Open-Air Vegetation in the Royal Botanic Garden.* By Mr. M'Nab. Mr. M'Nab remarked:—It has been my practice for the last 20 years to lay before the Botanical Society, at the February meeting, a notice of the spring plants then in flower. Frequently the list has been large. Last February meeting (1869), 24 species were noticed as being in bloom. This year, however, I can only record the flowering of the Tussilago fragrans on January 18, and the Snowdrop (Galanthus nivalis) partially on February 2. During the winter, the Hellebores have been flowering profusely, while the Primula vulgaris var., Gentiana acaulis, and Waliflowers have produced blooms more or less throughout the winter, and cannot therefore be recorded amongst the true spring-flowering plants. Up to this time we have experienced a good deal of frost. On 19 mornings since January 1 the thermometer has been below the freezing point, the six lowest being on January 11, 22, 24, 27, and 30; also on February 10, falling respectively to 25°, 25°, 26°, 17°, 20°, 21°; while the six highest morning temperatures during the same period were on January 7 and 8, also on February 1, 3, 5, and 7, indicating respectively 38°, 38°, 36°, 36°, 37°, and 39°. It was not till February 4 that the frost entirely disappeared out of the ground; since then the rush of spring vegetation has been considerable, and if it receives no material check, a number of the spring-flowering bulbs will be in flower immediately.

March 10.—Sir Walter Elliot, President, in the chair. Donations to the library, herbarium, and museum were announced. The following communications were read:—

I. *On the Formation of a Museum of Vegetable Materia Medica.* By William Craig, M.B. and C.M.

II. *On the Fructification of Griffithsia corallina, with a notice of the other Algæ found in Shetland, not mentioned in Edmonston's Flora.* By C. W. Peach, A.L.S.

III. *On two new British Hepaticæ.* By Dr. B. Carrington.

IV. *On the occurrence of Luzula arcuata and Buxbaumia indusiata, in Inverness-shire.* By Dr. Buchanan White.

V. *On some recent Additions made to the Flora of Canada.* By Mr. Sadler.

VI. *Report on the Open-Air Vegetation at the Royal Botanic Garden.* By Mr. M'Nab. At the last meeting of the Botanical Society, held February 10, I gave a brief report on the state of the open-air vegetation in the Botanic Garden. Since that period we have experienced a continuance of cold weather, the ground being more or less covered with snow, or hardened with frost. The six lowest morning readings since February 10 were on the mornings of February 13, 22, 25, 26, and 27, also on March 6, marking respectively 26°, 26°, 15°, 26°, 20°, and 27°; and the six highest morning temperatures during the same period were on February 16, 17, and 21, also on March 1, 2, and 3, indicating repectively 34°, 34°, 33°, 43°, 34°, and 34°. This low range of temperatures has retarded vegetation considerably. The Snowdrops are much in the same state as they were at the end of January last year. At this date I can only give the names of ten species of spring plants in bloom, independently of the two formerly noticed; while at the March meeting last year no less than forty-three species were recorded. This list included Ribes sanguineum, Erythroniums, Narcissus, Mandragora, Corydalis,

	Date of Flowering. 1870.	Date of Flowering. 1869
Corylus Avellana	February 18	January 14
Nordmannia cordifolia	February 19	January 21
Eranthis hiemalis	February 20	January 16
Tussilago nubiflorum	February 20	January 14
Garrya elliptica	February 14	January 14
Crocus susianus	March 1	January 22
Leucojum vernum	March 2	January 17
Crocus vernus and vars.	March 3	January 13
Galanthus plicatus	March 4	January 26
Hepatica triloba	March 5	January 23

Hyoscyamus, &c. The number this March is only twelve, including those noticed at the January and February meeting.

VII. *Miscellaneous Communications.*—Mr. M'Nab exhibited a head of female flowers of Pandanus, produced in the Palm-house at the Botanic Garden. He stated that the Pandanus had produced female heads of flowers for several years, but never more than two at a time. This year nine heads have been developed; they are all globular at first, and elongate as they advance towards maturity. Mr. M'Nab also exhibited a portion of the spadix of the Arenga saccharifera, now flowering in the Palm-house at Edinburgh. This Palm is now 68 feet in height, and has three large flower-spikes near the summit.—Mr. Sadler exhibited and presented a specimen of Guarana, which he had received from Dr. Lea Richardson. It is obtained from the seeds of Paullinia sorbilis, one of the Sapindaceæ, a tree which is found growing abundantly in some parts of the Great Amazon Valley. The fruit, when ripe, is roasted, and the seeds taken out and powdered. The powder is then mixed with water and made into a thick paste, which is moulded into cakes or round rolls and dried in the sun. It possesses a bitter principle, identical with theine, and is reported to be stomachic, and febrifuge. In Brazil it is regarded as a cure for dysentery and many diseases. According to Dr. Stenhouse, Guarana is the richest known source of theine. It also contains a colouring matter, analogous to the tannin in Cinchona bark, as well as fatty matter, which, like the fat of chocolate, does not appear to become rancid by keeping. According to the price paid by Dr. Richardson for the specimen presented, Guarana sells in the market of this country at 6*s.* an ounce.

Notices of Books.

Alpine Flowers for English Gardens. By W. Robinson, F.L.S. With numerous illustrations. London: Murray. Pp. 392.

There is no doubt whatever that the class of plants called alpines furnishes some of the choicest gems amongst living objects, and hence from a garden point of view they are quite worthy of having a special manual devoted to them. Almost every alpine traveller, botanical or otherwise, has given expression to regrets that we cannot enjoy in our gardens these most charming of flowers; and one chief object of the book, we are told, is to dispel this idea as being erroneous, and to show that there is no alpine flower that ever cheered the traveller's eye with its brilliancy, which cannot be successfully grown by an intelligent cultivator. In treating on this subject the author is quite in his element, and hence, as might have been expected, he has done it full justice.

It may at the outset be explained that what are meant by alpine plants are those dwarf herbaceous species which find their home on high mountain chains, often fringing the snow-fields with their many-hued beauty. "Enormous areas of ground inhabited by alpine plants are every year covered by a deep bed of snow. Where the tall tree or shrub cannot exist from the intense cold, a deep soft mass of downy snow settles upon these minute plants, like a great cloud-borne quilt, under which they rest untortured by the alternation of frost and biting wind, with moist, balmy, and spring-like days. But let it not for a moment be supposed that these conditions are indispensable for their growth! The reason that they predominate in these elevated regions, is that no taller vegetation can exist there. Were these places inhabited by trees and shrubs we should yet find alpine plants among them, but much fewer than in the rocky fields where they reign supreme. * * * In the fierce struggle for existence upon the plains and low tree-clad hills, the more minute species are often overrun by trees, trailers, bushes, and vigorous herbs; but when in northern and elevated regions these fail from the earth, we get the choice jewellery of vegetable life known as alpine plants."

This book of Alpine Flowers is divided into two parts—the first devoted to the cultivation, the second to the description of the plants. In the former, under various phases, will be found instructions for the construction of artificial rock-work, and the adapting it in different situations to the growth of alpine plants; and in this connection we find some excellent observations by Mr. James Backhouse, of York, than whom we have no more successful cultivator of alpine plants, no more tasteful constructor of a rock garden for their reception. This division of the book is profusely illustrated, and has afforded us, by the courtesy of the author, an opportunity of giving to our readers some pictorial hints on the arrangement of alpines. Here, for example, is a rocky waterfall (fig. 109), as it may be, fringed with Yuccas, and various climbing and trailing plants of the larger class; and here is a rock-garden, such as might be formed with excellent effect on the edge of a shrubbery (fig. 107), by means of a few cart-loads of stones and earth, the mossy pieces of rock cropping out from a carpet of Sandworts, Mountain Pinks, Rock-cresses, Aubrietias, Sedums, and Saxifragas, and backed up with Ferns and flowering shrubs.

Another arrangement—one which more strictly brings us within range of the culture of alpine plants—is such a rude stone wall as is shown in fig. 108, and which is surely within the reach of all. "By building a rough stone wall, and packing the intervals as firmly as possible with loam and sandy peat, and putting perhaps a little mortar on the outside of the largest interstices, a host of brilliant gems may be

Fig. 107.

grown with almost as little attention as we bestow on the common Ivy. Thoroughly consolidated, the materials of the wall would afford precisely the kind of nutriment required by the plants. The wall would prove a more congenial home to many species than any but the best constructed rock garden. In many parts of the country the rains would keep the wall in a sufficiently moist condition, the top being always left

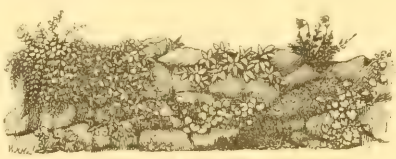

Fig. 108.

somewhat concave; in dry districts, a perforated copper pipe laid along the top would diffuse the requisite moisture. In very moist places, natives of wet rocks, and trailing plants, like the Linnæa, might be interspersed here and there among the other alpines; in dry ones it would be desirable to plant chiefly the Saxifragas, Sedums, small Campanulas, Linarias, and subjects that even in hotter countries than ours find a

Fig. 109.

home on the sunniest and barest crags." With one more hint of general utility we pass on: "Many alpine plants, when grown in borders, are much benefited by being surrounded by a few half-buried, rugged stones or pieces of rock. These are useful in preventing excessive evaporation, and in guarding the plants, when small and young, from being trampled upon, or overrun by coarse weeds or plants."

Having gone through the different phases of culture in general terms, the author turns, in the second part of his book, to describe the best alpine flowers, which is done in popular language, without any attempt at botanical precision, and in such a way as to notice the peculiarities of treatment which may be required by individual species. A large portion of the work—some 240 pages—is devoted to this branch of the subject. Then come selections of alpine and rock plants for various purposes, a series of lists which will be of much assistance to those about forming or adding to their collections.

It would have been desirable that some attempt should have been made to verify the nomenclature of the plants described, but on the whole we have no hesitation in recommending Mr. Robinson's book on Alpine Flowers, as yielding not only some pleasant reading, but as affording the best information to be had as to the cultivation of these "gems of earth."

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Some progress should now be made in the preparation of young plants of *Chrysanthemums*, either in the matter of propagating or potting on such as are already struck, where large specimens are an object; otherwise, for ordinary decorative purposes, cuttings struck any time between this and midsummer, at the latest, if grown on quickly, in a good rich compost, and kept in a cool, moderately moist atmosphere, with plenty of air, will do exceedingly well, and with a great saving of labour. Though these very useful autumn and early winter blooming plants were originally purchased of Chinese traders, in the market of Macao, and were introduced into Europe during the last century, we have only recently, through the efforts of that assiduous traveller, Mr. Fortune, become possessed of the remarkable feathery-flowered Japanese varieties, called "Fortune's Chrysanthemums," which bloom very much later on in the winter than the ordinary cultivated kinds. Indeed, I saw a bunch of these flowers in the hands of Mr. Fortune himself, about the last week in January of the present year, which is good proof of their late blooming capabilities. To attain fine large blooms of any of these for exhibition purposes, or otherwise, it will be necessary to let them grow on uninterruptedly with one or only a few shoots, never pinching them back during their whole period of growth and blooming, excepting where necessary to thin out the bloom-buds where too many form at the apex of the shoots. The lovely old "Two-coloured Incurved," I am afraid, is well nigh lost to us, for I do not remember having seen it for some years past. Pinch back the points of all soft-wooded stove or greenhouse plants, which are now growing rapidly, and thus induce stiff bushy growth. New Holland plants and others which are similar in their habits and requirements, such as *Aphelexis*, *Boronia*, *Cosmelia*, *Epacris*, *Dracophyllum*, *Leschenaultia*, *Rogiera*, *Pimelea*, and *Erica*, will require attention in regard to root-watering. If such plants as these are allowed to suffer through inattention in this respect certain injury will follow, as at the active growing or blooming season the resources of each plant are taxed to the utmost, and it has no surplus to fall back upon as a safeguard against a careless or thoughtless system of culture. Stimulants in the form of artificial manures, like Standen's, Peruvian guano, or good wholesome clear manure-water, may now be applied somewhat more freely, since we have experienced such bright sunny weather, which has imbued artificially-grown foliage with a more than ordinary vigorous capacity to turn such materials to useful account. Fumigate all plant-houses periodically as a preventive, if fortunate enough to be without aphis pests at this season. Should the fine bright weather continue take care to guard all young growths from the scorching influences of the sun, bearing in mind that the amount of foliage now forming is destined to play an important part in the decoration of our greenhouses for many months to come. Particularly attend to the removal of *Heaths* and *Epacrises*, as soon as they go out of flower, from any warm sultry show-houses, into cool pits or other similar places.

FORCING HOUSES.

What a glorious week for forcing operations was that ending on April 23! Such weather has done wonders towards bringing forced vegetation out of that state of supineness which it had fallen into during the very indifferent sunless period through which we had passed. Those who have *Grapes* colouring may carry them along kindly to a successful issue with the more than ordinarily vivid sunshine we have experienced. The requirements of the roots must not be overlooked, for according as the surface growth advances so will copious waterings be more and more required. Where properly drained borders exist within-doors, a lesson may be learnt from the frequency with which pot

Vines require to be supplied with root moisture, which should be supplied to larger and more permanent Vines in our everyday practice. Depend upon it, there is more injury done to forced fruits through insufficiency of root-moisture at the most active season of their growth than through excess when the roots are confined within-doors. As soon as the fruit is quite ripe in any *Early Vinerie*s, it will be advisable to reduce the temperature by degrees to about temperate at night. Abundance of air must be admitted by day, and indeed at all proper times, so as not to cause any undue fluctuations. In regard to *Pines* it must be remembered that, warm as the weather may be externally, the bottom-heat may at any time wane materially, hence the heating material should be frequently examined, if but for the sake of safety. Do not on any account let the bottom-heat fall below 83° or 84°, in connection with fruiting plants. A high top temperature with the roots too cold is a condition antagonistic to a progressive and favourable advance. This is perhaps one of the most trying times for Pines which are permanently grown in the same house with Grapes, and with no chance of changing them into a more favourable position. Under these conditions the Vines are not habitually started until late, hence this may be near to the time when many are starting them. To insure a strong start the temperature must be brought down below that which Pines are accustomed to — hence the hardship that is to be contended with. Be careful not to go below 56°, and by giving the Pines less root-water aid them as much as possible over the fall of temperature. Stop all "robber shoots" upon *Peach* and *Nectarine trees*, and endeavour to equalise the sap as much as possible. *Peaches* which are finally swelling off should not be unduly forced. Air should be given freely by day ; also upon warm nights.

HARDY FLOWER GARDEN.

I do not remember a worse season for *Pinks*, *Cloves*, *Carnations*, &c., fully exposed in open borders, than the past winter has been. The keen easterly winds found out every faulty plant or branch, and destroyed multitudes of promising plants. Those who have had the means of wintering young plants in frames should now plant them out into nice rich, open, porous soil; placing the soil well around them. Plant out into the open borders successional *Gladiolus* bulbs. Thin out hardy annuals immediately they become large enough, after the warm showers which we may expect at any time now. When pots or room is scarce let all late-struck cuttings of such things as *Verbenas*, *Pyrethrums*, *Lobelias*, *Calceolarias*, &c., be pricked out into vacant frames at once.

HARDY FRUIT GARDEN.

Proceed actively with disbudding *Peach* and *Nectarine trees*, removing all fore shoots, or such as emanate from the branches in any position not likely to fit well to the wall, or unlikely to be needed to furnish fruiting branches for the next season's fruit-bearing. Give copious applications of water — whether propelled against the walls from a hand syringe or a good form of garden engine—to the trees, over every part. Dash it freely against the wall, taking care not to injure the delicate young leaf formations ; and by aiding the growth, and by preventing any form of insect multiplication thus early, make a good move towards keeping the trees free from noxious pests.

KITCHEN GARDEN.

Earth-up and use any ready means to protect *Dwarf French Beans* immediately they show through the ground. By watchfulness in this wise a crop may be secured in time for the early venison, which is of importance in some establishments. Run the hoe freely between rows of all such crops as *Carrots*, *Beet*, *Onions*, *Parsnips*, &c., which now show freely, and will be very materially benefited thereby. Do not omit to prick out into nursery rows close together, immediately suitable weather arrives, all young spring sown and nursed vegetable seedlings, that they may attain strength for the final transplanting. Transplant any seedling *Turnips* if the plants are too thick, and the produce is likely to be of use when ready. *W. E.*

TOWN GARDENING.

Dahlias, and the *Marvel of Peru*, that have been started in heat, should now be divided ; each shoot should be taken off, with a portion of the tuber attached, and planted in the borders, shaded for a few days, and covered with a flower-pot at night if there is any appearance of frost. They will do well, particularly if the ground is previously prepared by digging a hole 2 feet deep and 18 inches square, and a good dressing of rotten dung worked in. *Hardy Annuals* that have come up too thickly should be at once thinned ; the following varieties will bear transplanting, if lifted with care, planted at once, and watered :—Larkspurs, Coreopsis, Stocks, Zinnias, &c. The *Ivy* has been very much cut during the past winter, and should now have attention, if it is desired to have it in perfection during the summer months. All the old leaves should be taken off, the dead wood cut out, and the remainder nailed close. *Window Plants* should have the surface mould stirred, and a little fresh soil added. As much air as possible should be given them during fine weather, and they should be watered when the surface is dry. In doing this, the pots should never be allowed to stand in water, but be raised above it. The *Ficus elastica*, or India-rubber, an excellent plant for town windows, should now have its leaves occasionally sponged with tepid water, which will tend much to the health of the plant ; and if the plants are pot-bound they should be shifted into larger pots in fresh peat, with plenty of drainage in the bottom of the pots. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, APRIL 27, 1870

1870. Month and Day.	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition			Temperature of the Air				Wind.	Rain
April.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air		Highest.	Lowest.	Range in Day.	Mean.	Direction.	In Inches
	Ins	Deg	Deg	Deg		Gr.		Deg	Deg	Deg	Deg		
21. Thurs.	29.99	62.0	50.2	51.0	68	4.2		74.0	49.1	25.3	60.8	S W	0.00
22. Friday	30.14	60.0	51.5	51.8	73	4.1		69.9	41.0	28.3	55.4	S W	0.00
23. Satur.	30.18	55.1	47.2	43.3	59	3.1		63.2	40.7	16.5	51.8	S W	0.00
24. Sunday.	30.24	53.1	49.1	45.1	74	3.4		61.6	40.5	21.1	51.0	W	0.00
25. Monday	30.22	57.4	51.9	46.9	73	3.6		67.0	47.1	19.9	55.4	W S W	0.00
26. Tues.	30.01	50.7	46.0	41.1	70	2.9		62.8	39.7	23.1	49.7	S W	0.05
27. Wednes	29.93	49.6	42.6	35.2	53	2.7		54.2	39.0	15.2	45.0	N	0.00

April	21.—Generally cloudless but hazy	A very fine day
"	22.—On all elements of cloud prevalent, generally cirrus and cirro-cumulus	S.S.W. halo. A fine day
"	23.—A very fine day	Hazy
"	24.—Generally cloudy till 8 P.M. ; variable after that time	
"	25.—Large amount of cloud prevalent throughout ; more fully cirro-cumulus and altho-stratus	
"	26.—Generally cloudy	Rain fell between 8 P.M. and mid-night
"	27. Generally cloudy and showery	Thunder about noon.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, APRIL 23, 1870

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Means of all Highest.	Means of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg	Deg	Deg	Deg	Deg	Deg	Deg	In
Portsmouth ..	71.0	38.0	32.7	61.4	40.8	21.6	51.0	0.00
Blackheath ..	70.7	40.2	42.5	68.7	42.7	26.0	55.6	0.00
Bristol	74.9	41.4	41.5	69.1	39.8	29.3	54.2	0.01
Birmingham ..	72.6	36.2	40.7	67.1	41.2	26.1	54.7	0.00
Wolverhampton	73.8	38.2	37.6	66.1	40.9	25.2	54.9	0.00
Leicester ..	72.0	37.7	41.1	65.8	40.4	25.4	53.9	0.00
Norwich	73.5	38.0	38.5	64.7	41.2	23.5	51.9	0.10
Nottingham ..	72.0	37.9	39.1	68.1	41.4	26.7	54.2	0.00
Sheffield	75.5	37.0	38.5	69.0	41.8	27.1	54.2	0.01
Liverpool	73.9	43.0	31.0	65.3	44.5	19.2	54.5	0.03
Manchester ..	77.3	34.7	41.6	68.5	42.0	22.5	54.7	0.11
Salford	76.1	32.4	44.7	67.6	41.2	26.4	54.4	0.14
Bradford	73.0	30.0	43.0	65.3	42.1	23.2	53.1	0.04
Leeds	78.0	38.0	40.0	68.0	42.6	26.0	54.4	0.01
Hull	70.0	40.0	30.0	61.0	37.1	24.5	47.8	0.01
Newcastle ..	74.0	42.0	32.0	62.3	45.3	17.0	52.7	0.13
Edinburgh ..	72.7	40.0	32.7	..	..	..	52.7	0.19
Glasgow	72.0	47.4	24.6	..	..	..	57.1	0.09
Dundee	69.0	38.0	32.0	..	..	..	48.4	0.15
Aberdeen	69.0	44.0	25.0	..	..	..	48.4	0.02
Paisley	70.0	41.0	29.0	..	..	..	51.4	0.26
Greenock	69.0	40.0	25.0	..	..	..	51.4	1.01
Leith	69.5	39.7	29.8	..	..	..	50.0	0.08
Perth	70.0	36.0	34.0	..	..	..	51.6	0.51
Dublin	68.4	33.2	35.2	..	..	..	51.6	0.09

JAMES GLAISHER.

Notices to Correspondents.

CRICKETS : *W. F.* The following methods for destroying these insects have been published in our early volumes :—Mix arsenic with roasted Apple or Potato, and leave it on a sheet of paper during the night ; the crickets will partake of it, and be destroyed. Or, place treacle in a saucer, to the thickness of about half-an-inch ; the insects will get fast stuck in the treacle, and must be picked out daily.

ERECTING A STOVE : *J. F. E.* The situation you propose will do very well. The branches of the trees must not come over the glass. Would it not be preferable to erect a half-span roofed house, and put the half-span on the 8 feet wall ?

FUCHSIA : *H. Cannell.* A choice and pretty novelty, the bright margin to the corolla being very conspicuous.

GUNNERA SCABRA : *Z. A. B.* Plant in a moist, boggy situation, and in winter cover up the crown securely with leaves or litter.

GRASS-SEED : *G. H.* Under the circumstances, roll during fine weather.

INSECTS : *R. M.* The Lady-bird sent is not a variety of the common seven-spotted species, but a distinct species named Coccinella ocellata, in allusion to the black spots being surrounded by a paler ring, like an eye. The species is considered rather rare by entomologists, but is occasionally met with in sufficient abundance. *A. M.*

INSECTS IN CUCUMBER-HOUSE : *W. W. A.* An Acarus named Gamasus marginatus. It feed upon dung and decaying vegetable and animal matter, and does not attack healthy living organisms. *A. M.*

LAWN MOWER : *J. S.* These instruments are most of them good. The newly introduced Archimedean lawn mower is remarkably easy to work, and does its work efficiently and rapidly.

NAMES OF PLANTS : *J. D. and S.* Hieracium laniferum of Polyanthus. The usually green calyx in these cases assumes the form and colour of the corolla.—*J. R.* Cupressus sempervirens. *A. M.*—*Amy.* Phillyrea latifolia. *Constant Reader.* Veratrum album or viride : we cannot tell which, from the leaf.—*J. W.* Helleborus viridis.—*G. B., Longleat.* 1. Pinus Pinaster, var. maritima ; 2. P. Pinaster ; 3. P. Pinaster ; 4. P. Benthamiana ; 5. P. tuberculata ; 6. P. insignis ; 7. P. Pinea ; 8. P. muricata, var. with doubt ; 9. P. Pinaster, var. Hamiltoni. If you get some one to call for the specimens they shall be returned to him, but you must not expect us to undertake such weighty matters in future.

PEA LOUSE : *An Old Sub.* The beetle is a well-known enemy to all the Pea crops, and in some years has been very destructive. Its name is Sitona lineata. The mischief is done by the insect when in its perfect state. Mr. Curtis recommended tarring or painting two strips of canvas, and placing one on each side of a row of Peas early in the morning, and two or three hours after, by shaking the plants, the beetles would fall down, and be held by the adhesive surface of the canvas, when they could be destroyed, and the surface could be retarred, and the experiment repeated until the ranks of the enemy should be thinned. It has also been proposed to dust the young Pea plants with soot or wood-ashes, so as to make them distasteful to the beetles. No sufficient remedy has, however, yet been discovered, and if "An Old Sub." succeeds in finding one we hope he will communicate it to us, *pro bono publico. A. M.*

PETUNIAS FOR EXHIBITION : *W.* asks, "What is the best shape to grow Petunias for exhibition?" To which we reply, the dwarf bush form, decidedly. The double-flowered varieties, especially, make beautiful specimens when grown in this form.

ROSE GRUB : *N. L.* As a reply to your inquiry, we have to thank Mr. W. Paul for the following extract from an article published in the "Florist" for May :—"A vigilant watch should be kept for the Rose Maggot, from the time the dormant eyes begin to swell. It is difficult to escape altogether from the ravages of this destructive insect, for the mischief is often done before you can detect the presence of the destroyer. Look over the plants frequently and closely, pointed penknife in hand, and wherever you see an eye or a young shoot struggling ineffectually to expand, open it carefully with the point of the knife, and the depredator will be there. In a somewhat more advanced state of vegetation the curl of the leaf is an unerring guide to the abode of the enemy. In addition to the Rose Maggot, there are many sorts of caterpillars, occasional visitors only, which require to be removed by hand-picking ; they are easily discovered, and are neither so numerous nor so constant as the former."

TESTIMONIAL : *A Scotch Gardener.* We know nothing of the merits of the particular case you mention, but we quite agree with you that the system is a vicious one, and is being carried to an absurd extent.

VEITCH MEMORIAL : *J. M.* The remaining names of the subscribers will, no doubt, be published as soon as all the lists are made up and examined. Your letter shall be forwarded to the committee.

VINES AT COLE ORTON. — Sir George H. Beaumont requests us to give publicity to the following statement :—"Seeing at p. 532 that Mr. Miller assumes that my gardener, Mr. Henderson, was afraid to exhibit at the Royal Horticultural Show at Leicester, I think it is only just to state that it was my wish that Mr. Henderson should not exhibit anything (though he was fully prepared to do so), as I did not think he had been well treated in a matter connected with the preliminaries of the exhibition."

WATER : *W. B. S.* Soft or rain water is decidedly the best for pot plants ; but where it cannot be had, spring water, exposed to the sun for eight or nine hours in an open tank, may generally be used without serious injury. The actual effect of spring water on particular kinds of plants is determined by the matters held in solution—hence water containing much lime would be injurious to Heaths and similar plants.

WINDOW GARDENING ESSAY : *Mrs. Barton.* Apply to James Richards, Esq., Royal Horticultural Society, South Kensington, W.

COMMUNICATIONS RECEIVED :—W. H.—E. W. D.—E. G. —H. D.—T. S.—R. S.—D. T. F.—J. Smulders.—J. M. —J. C. with thanks.—J. A. (with thanks).—W. A. M.—A. S. D.—R. B. F.—G. F.—E. W. B. (thanks, please do.)—Kalma, thanks : please do.—W. P. A. (next week.

Markets.

POTATOS.—Southwark, April 25.

During the past week the arrivals coastwise have been moderate, but owing to the weather being milder, with bright sunshine, coupled with the Easter holidays, the trade was heavy at the following quotations :—Yorkshire Flukes, per ton, 110s. to 140s. ; Ditto Regents, 110s. to 140s. ; Lincolnshire do., 100s. to 110s. ; Dunbar and East Lothian do., 100s. to 140s. ; Perth, Forfar, and Fifeshire do., 90s. to 100s. ; Do. Rocks, 85s. to 100s. ; Do. Reds, 85s. to 90s. ; French and Belgian Whites, 75s. to 90s.

COVENT GARDEN.—April 29.

We have very little to report either connected with this market or the provincial ones, business being generally dull and uncertain. A few Cherries have been received with other imports, but no regular supply ; and the supply of Strawberries and Grapes is now in excess of our

requirements. Flowers chiefly consist of Azaleas, Orchids, Roses, French and Scarlet Pelargoniums, Heaths, Fuchsias, Wallflowers, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p ½ sieve ..	3 0 to	5 0	Melons, each	— ..	—
Cherries, per lb. ..	0 0 —	1 0	Oranges, per 100 ..	3 0 —	7 0
Filberts, per lb. ..	0 0 —	0 9	Pears, per doz. ..	4 0 —	10 0
Grapes, per lb. ..	8 0 —	15 0	Pine-apples, per lb.	8 0 —	10 0
Lemons, per 100 ..	4 0 to	8 0	Strawberries, p. lb.	6 0 —	12 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6 to	15 0	Horse Radish, p. bun.	3 0 to	5 0
Artichokes, p. doz..	3 0 —	6 0	Leeks, per bunch ..	0 2 —	0 4
Beet, per doz. ..	2 0 —	3 0	Lettuces, p. score ..	1 0 —	2 0
Broccoli, per doz. ..	1 0 —	2 6	Mint, per bunch ..	0 6 —	0 9
Brussels Sprouts, p. ½ sieve	— ..	—	Mushrooms, p. pott.	1 0 —	1 6
Cabbages, p. doz..	1 0 —	1 6	Onions, per bunch ..	0 4 —	0 6
Carrots, p. bunch ..	0 4 —	0 8	Parsley, per bunch ..	0 2 —	0 4
Cauliflowers, p. doz	1 6 —	3 0	Potatoes, new, p. lb.	0 4 —	0 6
Celery, p. bund. ..	1 0 —	1 6	Salsafy, per bundle .	1 0 —	1 3
Cucumbers, each ..	1 0 —	1 6	Scorzonera, do. ..	1 0 —	1 3
Endive, per doz. ..	1 6 —	2 0	Scakale, p. punnet..	1 6 —	2 0
French Beans, p. 100	2 0 —	—	Shallots, per lb. ..	— ..	—
Garlic, per lb. ..	0 0 —	—	Spinach, p. bushel..	2 0 —	3 0
Herbs, per bunch ..	0 2 —	0 4	Radishes, per doz..	1 0 —	1 6
			Turnips, per bunch	0 2 —	0 3

Potatos, York Regents, per ton, 170s. to 190s.; Flukes, do., 110s. to 140s.

PAUL'S NOVELTIES of 1870. See WM. PAUL'S SPRING CATALOGUE, just published.

PAUL'S NEW ROSE PRINCESS CHRISTIAN.—One Special and Four First-class Certificates. Plants ready in May, 10s. 6d. each.
For description see WM. PAUL'S SPRING CATALOGUE

PAUL'S NEW ROSE VIRGIL. Plants ready in May, 5s. each
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S SELECTION of NEW FRENCH ROSES. For description see WM. PAUL'S SPRING CATALOGUE. Now ready, strong plants, price 3s. 6d. to 5s. each.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE. First-class Certificate. Plants ready in May, 10s. 6d. each.
"There are several very good new white-edged Pelargoniums in commerce. I think Waltham Bride may be considered amongst the very best."—P. GRIEVE, in *Journal of Horticulture*.
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE. Plants ready in May, 10s. 6d. each.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM BRONZE. The brightest and most effective of this section yet raised. Plants ready in May, 10s. 6d. each.
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PAUL'S NEW BEDDING PELARGONIUMS (BEATON'S Race). BONFIRE, the finest of all the Stella race, and five others. Plants in May, 5s. each; or the six varieties for 24s.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NOVELTIES for 1870.—ROSE PRINCE LEOPOLD; FOUR VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c.
For description see WM. PAUL'S SPRING CATALOGUE, just published.

WM. PAUL, Paul's Nurseries and Seed Warehouse, Waltham Cross, London, N

LAWSON'S GOLDEN CYPRESS, 24s. to 60s. p. doz.
CLOVE CARNATIONS, fine rooting, 25s. per 100
TURKEY SWEET WILLIAMS, fine rooting, 3s. per 100
ACER NEGUNDO VARIEGATUM, in pots, 5s. per doz.
ROSES, HUE and Dwarf, in pots, 12s. 25s. 35s. 42s.
GERANIUMS, Zonale, in pots, 12s. per doz.
" Gold and Silver Variegated, in pots, 12s. per doz.
" HOWARTH ASHTON, 12s. per doz.
" Gold and Silver Bedder, 20s. per doz.
" Golden Scarlet Bedder, 20s. per doz.
MARTIN and SON, 7, Market Place, Hull

IVERY'S NONSUCH LETTUCE.—The best Summer variety in cultivation, will stand a month longer than any other kind without running to Seed. 1s. per packet, sealed with instructions, by post free, on receipt of application.
A GENERAL SEED CATALOGUE can be had post free on application. The Trade supplied with superior MUSHROOM SPAWN Hanover Nursery, Peckham, S.E.

KENNEDY'S IMPROVED TURNIP SEEDS are to be had only of THOMAS KENNEDY AND CO., Nurserymen and Seedsmen, Dumfries.
These varieties require no commendation, as they are now well known and highly appreciated.
DESCRIPTIVE PRICED CATALOGUES sent post free on application.

To Improve Meadow Land.
RICHARD SMITH'S MIXTURE of the finest GRASSES and PERENNIAL CLOVERS (8 to 10 lb. per acre, at 8d. per lb.), if sown early, will cause a valuable improvement to the crop
RICHARD SMITH, Seed Merchant, Worcester.

Grass Seeds for Permanent Pasture.
RICHARD SMITH'S MIXTURES of the finest PERENNIAL GRASSES and CLOVERS are carefully made to suit all kinds of soil. Price 20s. to 30s. per acre.
PRICED LIST on application.
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NATURAL GRASSES: their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c. Free by post.
RICHARD SMITH, Seed Merchant, Worcester.

The best Substitute for Grass.
PYRETHRUM TCHIHATCHEWI, a novelty from Asia Minor, forms a carpet equal to the finest Grass. Will thrive upon the poorest and hottest soils where Grass will not grow, forming a carpet of the brightest green upon any bare place; does not require mowing or other attention. Price 6s. for 12 dozen, 25s. per 100.
LEWIS WOOD & HOPE, Munro Nursery, Sible Hedingham, Essex.

The North of England Nursery and Seed Establishment.
MESSRS. LITTLE and BALLANTYNE, Carlisle, have made SPECIAL OFFERS of FARM SEEDS, at liberal prices, when large quantities are required, and to deliver them free at nearest Railway Station.
They confidently recommend their superior stocks of TURNIP SEEDS, which have been all carefully proved and found to grow about 90 per cent. This will ensure a much stronger braird than seed reduced to grow only from 60 to 70 per cent. Their stocks of MANGEL WURZEL, CABBAGES, &c., are also of excellent quality, and they have been equally careful in proving the quality and growth of their CLOVER and GRASS SEEDS, and their Mixtures for laying down Permanent Pasture. PRICED LISTS on application.
44, English Street, Carlisle.

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SUTTON AND SONS are still supplying their GENUINE HOME-GROWN SEEDS, at the low prices quoted in their FARMERS' YEAR BOOK (published in February last).
Special terms given for extra large quantities.
For prices and full particulars apply to
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New and Select Farm Seeds.

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SEEDSMEN TO THE QUEEN.
FRANCIS & ARTHUR DICKSON & SONS, of the Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.
TURNIPS, MANGELS, and other FIELD ROOT SEEDS, saved from picked bulbs of the most select character.
CLOVERS, RYE-GRASSES, and NATURAL GRASSES, very superior samples, thoroughly cleaned, and free from weeds.
MIXED GRASSES and CLOVERS for ROTATION CROPS, for one, two, or three years' lay, from 12s. to 20s. per acre.
MIXED GRASSES and CLOVERS for PERMANENT PASTURE, to suit any soil or situation, from 21s. to 28s. per acre. These mixtures are composed of the finest Grasses, and cannot be surpassed.
Seeds of the value of £2 and upwards carriage free to any railway station in the kingdom.
Special estimates for large quantities. Samples and prices on application.
PRICED CATALOGUE of new and select Farm Seeds for 1870 will be sent gratis and post free on application.

Mangel Wurzel.
BOLTON AND CO., have to offer fine stocks of the following:—
YELLOW GLOBE MANGEL.
ORANGE GLOBE MANGEL.
FISHER HOBBS' GLOBE MANGEL.
LONG RED YELLOW MANGEL.
LONG RED MANGEL.
YELLOW OVAL-SHAPED MANGEL.
SUTTONS' INTERMEDIATE YELLOW MANGEL.
BOLTON AND CO., Seed Merchants, Station Road, Wood Green, London, N.

WANTED, a NURSERY FOREMAN.—One who thoroughly understands the Growth of Plants, and been accustomed to Market Work; a person of good Character, steady, sober, and trustworthy.—Apply, stating wages, &c., to A. B. C., Post Office, Tunbridge Wells.

WANTED, a GENERAL FOREMAN and SALESMAN, in a London Nursery. Must have a thorough knowledge of in and out-door Plants, and be a good Correspondent. Liberal salary to competent person.—Apply, in own handwriting, to ALPHA, *Gardeners' Chronicle* Office, W.C.

WANTED, as SALESMAN and FOREMAN in a London Nursery, a trustworthy intelligent Man, acquainted with the Cultivation of Plants and their Value. One used to making Bouquets preferred.—J. W. WIMSETT, Royal Ashburnham Park Nursery, King's Road, Chelsea, S.W.

WANTED, in a small Country Nursery, a middle-aged Man as SECOND FOREMAN, to take charge of the Fruit Trees and Glass Houses; thoroughly knowledge of the same, and be an expert Grafter, Budder, and Trainer; and willing to make himself generally useful. Wages 12s. per week, with constant work.—Apply, stating full particulars, to Mr. Robert Cooper, Seed Merchant, 152, Fleet Street, London, E.C.

WANTED, where a good Collection of Plants are grown, a clever young Man as PROPAGATOR, and to assist in the Growing under the General Manager. State wages, and where employed.—W. & R. WOODIS, Tunbridge Wells.

WANTED, in a Market Garden, a steady, active YOUNG MAN.—Must have been accustomed to Forcing, and capable of Potting, Watering, &c. Wages, 17s. per week.—Apply, stating age, to Mr. SMITH, Back Common, Turnham Green, Middlesex.

WANTED, ONE or TWO Young Men for the GLASS WORK, in a Wholesale Nursery. Must have a knowledge of Grafting, &c., and character that will bear strict investigation.—Apply by letter to H. LAPPIN, Cheshunt, Herts.

WANTED, an UNDER GARDENER and ATTENDANT. Wages to commence at £22, increasing to £30 per annum, with uniform, board, lodging, and washing. A Man with a knowledge of Music, and able to play in the Asylum Band, preferred.—Apply to the SUPERINTENDENT, County Asylum, Shrewsbury.

WANTED, in the Seed Trade, an IMPROVER.—A Youth, about 17, wishing for improvement, will find this a good opportunity. Must be steady and industrious.—Apply, stating reference and wages, to Mr. J. SCOTT, The Seed Stores, Yeovil, Somerset.

Seed Trade.
WANTED, a TRAVELLER and CLERK.—Must be experienced, and able to give first-class references as to character and qualifications.—Apply, in own handwriting, stating salary required, to Y. Z., *Gardeners' Chronicle* Office, W.C.

Seed Trade.
WANTED, a RETAIL SHOPMAN.—Must be experienced; will have entire control and management of that department. Must be a good salesman.—Apply, in own handwriting, stating where previously employed and salary required, to HY. CLARKE and SONS, 30, King Street, Covent Garden, W.C.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON and SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.
WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters they will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Gardener, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.

To Nurserymen.
MR. CHARLES J. CLARKE, late Nurseryman, Gravesend, being out of business, is desirous of Employment. He is 36 years of age, married, of good address, has some acquaintance with most departments of the business, is a good Correspondent, accustomed to Travelling, and willing to make himself useful in any way, or would invest a small amount where time and capital could be advantageously employed.—Mr C. J. CLARKE, 2, Zion Place, Gravesend.

GARDENER (HEAD).—Age 25, married; understands Orchids, Nepenthes, Stove and Greenhouse Plants, and the usual routine of a good Garden. Four years' good character. Leaving through death of employer and sale of Orchids.—W. H., Post Office, Trowbridge, Wilts.

GARDENER (HEAD), age 40.—A Gentleman, changing residence, is anxious to recommend his Head Gardener to any Nobleman or Gentleman requiring a thorough practical Man. Six years' character.—J. B., Stoke Park, Stoke Bishop, Bristol

GARDENER (HEAD).—Age 29, married; thorough practical knowledge of Gardening in all its branches. Good character from the Lady he is leaving and previous employers.—W. Bell, Kensington Park Road, Notting Hill, London, W.

GARDENER (HEAD).—Age 33, married, no incumbrance; understands the profession in all its branches. Scotch. Four years in last situation (a Nobleman's).—R. CAIRNS, Mr. F. J. Perry's Nurseries, Banbury, Oxon

GARDENER (HEAD).—Age 36, married; thoroughly understands Early and Late Forcing, a good Fruit Grower, and Kitchen and Flower Gardener. Three years in last situation. Good character. A. M., Mr. J. Christie, Leatherhead, Surrey.

GARDENER (HEAD).—Age 28, married, no incumbrance; thoroughly practical and fully competent in every branch of the profession. Best references.—W. B., Cheshire's, 14, Grove Road, Holloway, N.

GARDENER (HEAD).—Thoroughly understands the Management of Ferns, Vines, Stove and Greenhouse Plants, Early and Late Forcing; also Flower and Kitchen Gardening. Good character.—I. W. B., Post Office, Pool, near Camborne, Cornwall.

GARDENER (HEAD).—Age 34, Scotch; thoroughly understands all branches—Flower and Kitchen Gardening, Vines, Pines, Melons, Cucumbers, &c. Three years' character.—A. B., Lee's, 38, Henry Street, St. John's Wood, N.W.

GARDENER (HEAD).—Thoroughly understands Early and Late Forcing, as well as Flower and Kitchen Gardening. The best references can be given.—S. C., Post Office, Frome, Somerset.

GARDENER (HEAD).—Age 30, single; understands the Management of Vines, Pines, Melons, Peaches, &c., Early and Late Forcing of Fruit and Flowers, and the general routine of the Garden in all its branches. Can be well recommended.—W. J., Post Office, Banbury, Oxon.

GARDENER (HEAD), age 39.—A Gentleman, who has just sold his house and grounds, desires to recommend his Head Gardener, who has lived with him 13 years. He has had the care of Forcing and Greenhouses, Grapery, Conservatory, Pleasure Grounds, and Kitchen Garden, and is thoroughly sober, honest, and steady.—H. S., Mr. Bracket, Stationer, Red Hill, Surrey.

GARDENER (HEAD, or SINGLE-HANDED).—Age 41, married, no incumbrance; understands Flower and Kitchen Gardening, and Forcing. Wife as Laundress or otherwise. Good character. State wages and other particulars.—F. G., W. Cook, 6, Week Street, Maidstone, Kent.

GARDENER (Head, Working).—Age 30; 14 years' experience in very large establishments; competent in all branches. Highly recommended by present and previous employers.—E. WEST, 8 B Lennox Esq., Wallasea, near Birkenhead.

GARDENER (HEAD), where one, or more than one, Under Gardener is kept.—Understands the Cultivation of Cucumbers, Melons, Vines, &c. Twelve months' character from last and previous situations.—C. B., Mrs. Fawcett's, Grocer, Ollerton Road, Tuxford, Newark, Notts

GARDENER (HEAD), where three or four are kept.—Age 27, married, one child; thorough knowledge of Early and Late Forcing, Stove Plants, and all other branches of the profession. Unexceptionable character.—C. M., G. Dale, Fruiterer, 1, St. James Place, High Road, Lee, Kent, S.E.

GARDENER (FIRST-CLASS).—THOMAS COOLING, many years Head Gardener to the late Rev. G. H. Arkwright, Sutton Hall, Chesterfield, offers his services to any Nobleman or Gentleman requiring the above. He has kindly permitted to Sir Hew Dalrymple, Bart., Luchie House, North Berwick; Mrs Arkwright, Abbury House, Newbury, Berks; Mrs. Nolls, Ford Arkwright, Abbury House, Newbury, Berks; Mrs. Nolls, Ford Hall, Kidsmanton Lane, near Chesterfield; the Rev. M. M. Humble, Sutton Rectory, Chesterfield; and Mr. Edwin Cooling, Mile Ash Nurseries, Derby.—Please address, Sutton Cottage, Chesterfield.

GARDENER and ESTATE MANAGER.—Age 35, married; a thoroughly practical and trustworthy Man is open to engagement in either or both of the capacities. Has had 17 years' experience in first-class places. Can be highly recommended, with three and a-half years' good character from the Gentleman he has just left.—C. B., Post Office, Queen's Road, Bayswater, W.

GARDENER, in a small place, with one Man or a Boy, or FOREMAN in a Gentleman's Estate.—A. B., Post Office, Penn Street, Amersham, Bucks.

GARDENER, or GARDENER and BAILIFF.—Married, no incumbrance, steady; thorough practical knowledge of Early and Late Forcing all kinds of Fruit, Vegetables, &c., also the Management of Stove and Greenhouse Plants, Flower and Kitchen Garden. Character will bear the strictest inquiry.—A. G., Messrs. Lane & Sons, Great Berkhamstead, Herts.

GARDENER (SECOND), for further improvement.—Age 22; five years' experience in Fruit and Plant Culture. Good test monials.—L. M., Mr. Beer's, Caline Villa, Mitcham.

GARDENER (UNDER).—Age 24, single; good practical experience in the Cultivation of all kinds of Fruit, Flowers, and Vegetables. Can be highly recommended.—W., Kemerton, Tewkesbury

GARDENER (UNDER), in the Houses, in a Nobleman's or Gentleman's Establishment.—Age 22; seven years' experience. First-class character.—G. M., 4, New Cottages, Oval Road, Croydon, Surrey.

GARDENER (UNDER).—Age 20; has been used to the general work of the Kitchen and Flower Garden, Forcing Houses, &c. Active and strong, and well recommended by present employer. Three years' good character.—H. A., Camer, near Gravesend, Kent.

GARDENER (UNDER, or SINGLE-HANDED).—Age 20; five years' good character. Willing to make himself useful.—J. F., 5, Selhurst Terrace, New Barnet, North Road, Surrey.

GROUND FOREMAN and PROPAGATOR, or as GENERAL FOREMAN and ASSISTANT MANAGER and SALESMAN.—Thoroughly practical; is a successful Cultivator of Fruit Trees, Roses, Conifers, Ornamental Trees, Shrubs, &c., understands the routine of Nursery work, can conduct the Correspondence, and is conversant with the Value of the same. Unexceptionable character for ability and management.—G. B., 14, Lower North Street, Sloane Street, S.W.

FOREMAN, under Glass, where three or four are employed, or as GENERAL FOREMAN.—A steady, active, young Man.—Testimony as to character and ability on application to Mr. ANDERSON, Gardener, Newstead Abbey, Nottingham.

FOREMAN, SALESMAN, or with Propagating combined.—Age 31, married; considerable experience in all branches. Well recommended. London preferred.—PLANTSMAN, Barnet Post Office, London, N.

GENERAL FOREMAN, or CLERK of WORKS, to Superintend the Erection or Repairs of Buildings, &c., on a Nobleman's or Gentleman's Estate.—Age 36. Testimonials from eminent Architects and Builders.—W. C. T., 14, Denmark Road, Camberwell, S.E.

IMPROVER.—A Lady is desirous of procuring employment for a Lad, between 15 and 16, in a Gentleman's Garden, where he would be lodged on the premises. Respectable references can be given.—J. P., Post Office, Chapel Street, Belgrave Square, London, W.

CLERK, SALESMAN, or UNDER SEEDSMAN.—Age 24; 10 years' experience in a London Nursery. First-class references.—T. P., *Gardeners' Chronicle* Office, W.C.

To the Seed Trade.
SHOPMAN.—Age 24; nine years' experience, with first-class references.—S. M. W., care of Messrs. Hurst & Son, 6, Leadenhall Street, London, E.C.

SUTTONS' GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

PERMANENT PASTURE MIXTURES, which are prepared for various descriptions of Soils.

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, carriage free 2 bush Grass Seeds and 12 lb Clovers supplied p. acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. MECHI, Esq , *Tiptree Hall, near Kelvedon.*

February 5 —"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

SUTTONS' HOME-GROWN FARM SEEDS.

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

From EDWARD SQUIRE, Esq , *Cross Hall, St. Neots.*

July 20, 1869.—"For the last three years I have grown Suttons' Intermediate Mangel, and they come up as clear as an example with one very small root, and therefore be no doubt as to the purity of the seed. The quality also is superior."

SUTTONS' NEW YELLOW INTERMEDIATE MANGEL.—From the peculiar shape of this Mangel it can be allowed to stand closer in the rows than other kinds ; hence it produces a prodigious weight per acre It is of beautiful shape, small neck, and leaves of superior quality Having only one tap root, it can be pulled with a great saving of labour This will be found one of the most profitable varieties that can be grown. Price 1s per lb ; much cheaper by the cwt.

For prices and particulars of other varieties (**8d.** to **1s. 6d.** per lb.), see

SUTTONS' FARMERS' YEAR BOOK.

THE BEST SWEDE IN CULTIVATION IS

Suttons' Champion.

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

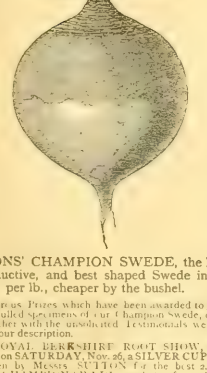

From I. ANSAFF, Esq , *Manor House, Tingewick, near Buckingham.*

April 16, 1869.—"I had 1 lb. of Champion Swede from your seed, and amongst them was a £10 Prize for the best general crop. I think there is no better Swede than the Champion grown."

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation ; price **9d.** per lb., cheaper by the bushel.

The numerous Prizes which have been awarded to growing crops, and also to pulled specimens of our Champion Swede, during the past season, together with the unsolicited Testimonials we have received, fully justify our description.

At the ROYAL BERKSHIRE ROOT SHOW, to be held at READING, on SATURDAY, Nov. 26, a SILVER CUP, value £10 10s., will be given by Messrs SUTTON for the best 24 Specimens of SUTTON'S CHAMPION SWEDE, and £5. £3, and £2, as Second, Third, and Fourth Prizes.

For prices of SUTTONS' GRASS SEEDS for all Soils, and all other FARM SEEDS, see "SUTTONS' NEW FARM SEED LIST," which may be had Gratis on application.

All Goods Carriage Free (except very small parcels). Five per cent. allowed for prompt payment.

SUTTON AND SONS, SEED GROWERS, READING.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870.

IMPLEMENT ENTRIES CLOSE on MAY 1, and all Certificates received after that date will be returned to the Senders.

STOCK PRIZE SHEETS and CERTIFICATES are also ready, and will be forwarded on application to

H. M. JENKINS, Sec.

12, Hanover Square, London, W.

WM. DILLISTONE, HORTICULTURAL AUCTIONEER AND VALUER, Sible Hedingham, Essex

MR. CHANDLER, HORTICULTURAL AGENT and VALUER, undertakes all kinds of VALUATIONS connected with HORTICULTURE.

N B Mr C, having for many years acted as Judge at various Metropolitan and Provincial Flower Shows, is open to engagements for the ensuing season —10, Wynell Road, Forest Hill, S.E.

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (large frontage), DWELLING HOUSE, STABLING, &c., situate at Maidenhead.

Apply to Mr R TANTON, The Nurseries, Epsom.

TO BE DISPOSED OF, a West-end FLORIST'S BUSINESS, offering an excellent opportunity to a persevering young Man ; old established, and doing an excellent trade. Capital required, about £200

A. B., Mr. Samuels, 26, Westbourne Grove, W.

To Nurserymen, Seedsmen, and Others.

TO BE DISPOSED OF, a NURSERY and SEED BUSINESS, in full Trade, in a thriving Market Town, situate on the Great Western and London and North-Western Railways. Nursery Ground about an acre, with Greenhouse (Hot Water), and Pits. Good Shop in the best part of the Town.

Applications, by letter, to X. Y. Z., Mr. Rowe, 9, Quality Court, Chancery Lane, London, W.C., will be treated in a few weeks, as the Business is about to be Sold under proceedings in Bankruptcy.

To Seed Growers, Market Gardeners, and Others.

A SMALL COMPACT FREEHOLD ESTATE, in Kent, for SALE, of about 63 acres of deep rich Loam, well suited for Garden purposes. Situate close to a first-class Railway Station, and charmingly seaside resort This desirable property would be sold whole or divided. The Farm Buildings and Cottages are of good elevation, and substantial Part of the purchase money could remain at 4 per cent. If not sold the Land will be to be Let from Michaelmas The Proprietor is open to Tenders either to Rent or Purchase. Address, W. F. G., Post Office, Crickhowell

SALES BY AUCTION.

Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, May 2, at half-past 12 o'Clock precisely, the first portion of ESTABLISHED ORCHIDS, Belonging to Mr Marshall, Esq , of Caversham, amongst which are fine specimens of

Phalænopsis Schilleriana	Cypripedium Stonii
,, amabilis	,, Lowii
,, grandiflora	,, Druryi
Dendrobium crassinode	Trichopilia crispa
Odontoglossum triumphans	Oncidium macranthum
,, Alexandræ	,, Kienastianum
Saccolabium præmorsum	,, Limminghii
,, giganteum	&c , &c

On view the morning of Sale, and Catalogues had

Important Sale of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, May 5, at half-past 12 o'Clock precisely, the well-known Collection of ESTABLISHED ORCHIDS of the late J. N. Clarke, Esq., of Trowbridge, including fine specimens of PHALÆNOPSIS, SACCOLABIUM, VANDAS, AERIDES, CATTLEYAS, &c., all in good condition.

On view the morning of Sale, and Catalogues had

Exhibition Plants of Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, May 10, at half-past 12 o'Clock precisely, and on half-past 2 o'Clock precisely each day, the splendid Exhibition Specimen Plants of ESTABLISHED ORCHIDS, the property of W. Marshall, Esq., of Penrallt Isaf who is giving up exhibiting (and selling his collection). These plants are well known as having taken numerous Prizes at all the principal Shows, and are in first-rate condition, including fine plants of the following :—

Odontoglossum luteo-purpureum,	7 leads	Cypripedium villosum, 30 flowers	
,, Phalænopsis, 20 leads		,, Schlimii, 9 spikes	
Sobralia macrantha, Woolley's variety		,, caudatum roseum, 8 spikes	
Cattleya Schilleriana Regnellii		Cologne speciosa	
,, Trianæ Juno) 1st class		Eriopsis rutibulbon	
,, Atalanta) Certificate		Lælia elegans Schilleriana, 30 bulbs	
,, ,, Penelope) R. H. S		,, ,, loboa	
Dendrobium chrysotoxum, 21 spikes		,, ,, Wolstenholmiæ, 6 leads	
,, Schraderi, 5 leads		Vanda gigantea, 15 pairs of leaves	
		Cypripedium Parishii	
		Phalænopsis Schilleriana	
		Lælia grandis, &c., &c.	

And many other rare and desirable varieties

On view the morning of Sale, and Catalogues had.

Edmonton.

THIRTY-ONE YEARS' LEASE of DWELLING-HOUSE, with an ACRE and a QUARTER of NURSERY GROUND, also the STOCK.

MR. A. RICHARDS will SELL by AUCTION, on the Premises, Church Street, Edmonton, on MONDAY, May 2, at 1 o'Clock, by order of the Executrix of the late Mr. Thomas Barker, the LEASE of the HOUSE and GROUNDS, with Vinery 114 feet long, Forcing Pits, &c., held for 31 years, at the trifling rent of £20 per annum ; also the STOCK, including 140 dozen double Stocks, 200 dozen scarlet Geraniums, Verbenas, Calceolarias, Stevias, 10 dozen Napier Strawberries, Boxes and Lights, Tools, Spring Cart, &c.

May be viewed and Catalogues obtained on the Premises, and of the Auctioneer, Edmonton.

Waltham, near Melton Mowbray.

SALE of the LATE Mr SHIPMAN'S ENTIRE HERD of SHORTHORNS.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, by order of the Executors, on WEDNESDAY, May 11, at 1 o'Clock, at Waltham, between Melton and Grantham, the late Mr. William Shipman's entire HERD of SHORTHORNS. Also will be SOLD, the entire HERD belonging to Mr Stodin, of Stonesby. These Herds number together between 50 and 60 Head of Cows, Heifers, and Bulls, and have been bred for several years from the well known stocks of the late Marquis of Exeter, Messrs. Eaton, Lawfield Southcott, Swingler, and Wood, and are full of the blood of the Cottesmore and Oakham Prize Animals, for which the district has so long been celebrated. The Bulls used of late have been from Mr Robarts' Herd at Lillingstone Dayrell, viz., Springthorn (25,209), and Royal Duke (25,018). Royalist (27,370), a son of 3d Grand Duke, from Diadem, of the Darlington tribe, is now in service. The animals are good milkers, in nice healthy condition, being mostly of a deep red colour, and show the good judgment of their late owner.

Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London.

Clapham, S.

CLEARANCE SALE of GREENHOUSE, STOVE and BEDDING PLANTS, GREENHOUSES, PITS, &c

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from Mr. James Over, to SELL by AUCTION, without reserve, on the Premises, The Nursery, opposite the Bowyer Hotel, Manor Street, Clapham, S., the whole of the choice STOVE and GREENHOUSE PLANTS, including 5000 Exotic Ferns, 200 thriving Gardenia intermedia ; specimen Hoya Bella, 40 handsome specimen Stephanotis floribunda, double Primulas, a large quantity of specimen Camellias and Azalea indica, Cyclamens, 10,000 Bedding Plants, 1000 White Grant Cloves, the same kind that Mr. Over supplies the market with; Roses in pots, Deutzias, Myrtles, &c ; likewise the GREENHOUSES, consisting of a Span-roof House, 80 feet long, a Span-roof House, 60 feet long, and a Lean-to House, 42 feet long ; 20 two-and three light BOXES, with Sashes ; about 1000 feet of 3 and 4-inch HOT-WATER PIPING (put together with elastic rings), 4 capital BOILERS, thousands of Bricks, the erections of Shed and Stabling, a capital strong Market Van, and numerous other effects.

The VALUABLE LEASE of the Nursery Ground, comprising about 2½ Acres, and held on a Lease for an unexpired term of about 50 years, at the moderate ground rent of £14 per annum, if not previously disposed of, will also be offered for SALE by AUCTION, on the Premises, as above, on MONDAY, May 2, at 11 o'Clock precisely, prior to the Sale of Plants.

May be viewed two days prior to the Sale. Catalogues and particulars of Lease may be had of Mr. ROE, Seedsman and Florist, High Street, Clapham ; and of the Auctioneers and Valuers, American Nurseries, Leytonstone, Essex, E.

Plashet Park, E.

IMPORTANT SALE of about 40,000 BEDDING PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, Plashet Park Nursery, Green Street, near Stratford, E., on MONDAY, May 9, at 11 for 12 o'Clock precisely, by order of Mr. John Frost, about 40,000 Choice BEDDING PLANTS, remarkably well grown, including 18,000 GERANIUMS of the leading varieties, 10,000 CALCEOLARIA AUREA, 1000 HELIOTROPES, 7000 GOLDEN FEATHER, 7000 FUCHSIAS, Double PETUNIAS, 5000 LOBELIA SPECIOSA from cuttings, 500 DAHLIAS, quantities of COLEUS, FELARGONIUMS, &c.

On view three days prior to the Sale. Catalogues had on the premises and of the Auctioneers, as above.

Hammersmith, W.

IMPORTANT SALE of about 25,000 BEDDING PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, The Nursery, Fulham Road, Hammersmith, W., on TUESDAY, May 10, at 11 for 12 o'Clock precisely, by order of Mr. F. Herridge, about 6000 GERANIUMS, Mrs. Pollock, Flower of Spring, Herald of Spring, Amy Hogg, Pink Stella, Copper Glaire de Nancy, and other leading kinds ; 2000 VERBENAS, White, Purple, and Scarlet ; 1000 HELIOTROPES, 1000 FUCHSIAS, 2000 LOBELIAS, CERASTIUM, Intermediate STOCKS, 4000 CALCEOLARIA AUREA, COLEUS, FEVERFEW, GOLDEN FEATHER, &c ; also Choice PELARGONIUMS, CALCEOLARIAS, FUCHSIAS, and other Plants in Bloom, &c.

On view two days prior to the Sale Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Surrey—Holmbury, near Gomshall and Ockley.

IMPORTANT UNRESERVED SALE of CHOICE STOVE and GREENHOUSE PLANTS, VALUABLE ORCHIDS, PALMS, EXOTIC FERNS, BEDDING PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions to SELL by AUCTION, without reserve, on the Premises, Holmbury, 4½ miles from Gomshall, Surrey, on TUESDAY and FRIDAY, May 17 and 13, at 11 for 12 o'Clock precisely (the Property being Sold and immediate possession required), the whole of the Valuable STOVE PLANTS (including many handsome and effective specimens), comprising Adiantum Cuneatum, Allamandas, Ficus, Marantas, Dracænas, Coleus, Crotons, Stephanotis, &c ; a choice collection of ORCHIDS, consisting of Cattleya Trianæ, Vandas, Aerides, Cypripedium, Dendrobiums, &c ; TREE and EXOTIC FERNS, SARAL ADANSONI and other PALMS ; 150 fruiting and Succession PINES, likewise all the GREENHOUSE PLANTS, including large specimen Indian Azaleas, many of which are fine examples, 3 to 5 feet ; a large assortment of Double Camellias, 3 to 7 feet ; thriving Ericas, by name, and Agaves, &c ; about 500 SLIDING LIGHTS, FRUIT TREES, and HARDY SHRUBS, in pots, together with several 2 and 3 light BOXES, MOWING MACHINE, GARDEN ROLLER, and numerous other effects.

May be viewed three days prior to the Sale Catalogues may be had of Mr BAYMAN, Head Gardner, on the premises, and of the Auctioneers and Valuers.

N B Arrangements will meet the Trains arriving at Gomshall at 11.4 and 11 17, and at Ockley at 10 52. Refreshments will be provided on the Premises

Edmonton.

IMPORTANT CLEARANCE SALE of 80,000 BEDDING and GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, Langhedge Nursery, Edmonton, South to 10 minutes' walk of Park Station, on the Great Eastern Railway, on MONDAY, May 16, at 12 o'Clock precisely, by order of Messrs. C. Woolven & Son, the land being immediately required by the Great Eastern Railway Company, about 80,000 BEDDING PLANTS, comprising 6000 GERANIUMS, including Mrs. Pollock, Sophia Dumaresque, and other Tricolor and Zonal Varieties ; Vesuvius, Tom Thumb, Christine, Madame Vaucher, and 600 Double Varieties and others ; also 1200 FUCHSIAS, coming into bloom ; 2000 VERBENAS, 1500 Intermediate STOCKS, and about 60,000 other BEDDING PLANTS.

May be viewed three days prior to the Sale Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E

Preliminary Notice.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. G. & W. Steell, to SELL by AUCTION, at an early date, on the Premises, The Nursery, Kew Road, Richmond, a large and varied assortment of CHOICE GREENHOUSE and BEDDING PLANTS.

Further particulars next week.

(*For continuation of* SALES, *see page* 619.)

The Agricultural Gazette.

SATURDAY, APRIL 30, 1870.

MEETINGS FOR THE ENSUING WEEK.

May 2 { London Farmers' Club (Mr. Corbet, on English Tenant-Right), at the Salisbury Hotel—6 P.M.

— 3—Central Chamber of Agriculture, at Salisbury Hotel—12 ½ P.M.

— 4—Agri Society of England, at Hanover Square—Noon.

ON Monday, at the meeting of the Farmers' Club, Mr. CORBET will once more discuss before a company of English farmers, land-agents, and landowners the merits of the system of tenant-right of which he has for so many years been so vigorous and so efficient an advocate. He could hardly do better for his subject than strike the same sort of key-note which Mr. SQUAREY adopted in a paper on Farming Covenants, lately read before the Institute of Surveyors, which we have given in another page. "The principle which ought to govern farming covenants would

seem to be that the tenant should have the freest and most unrestricted use of the lands and premises consistent with the maintenance and yielding up of the freehold at the end of the tenancy in an unimpaired and uninjured condition." That is a very frank and friendly view to take of the subject from the landlord's standpoint. How the same kind of truth, as it appears from the point of view which the tenant occupies, will be presented to us next Monday remains to be seen. For ourselves, looking on the whole question as it affects not only the material interests of the few who own the land, nor only the immediate interests of the many who consume its produce, but as it affects the whole character and standing alike of the landlord and the tenant, we greatly prefer the kind of independence which is given by a lease for a sufficient term of years coupled with conditions affecting the management during the last three or four years, to any system of valuations coupled with the liability at any time to a notice to quit.

If it be said that in Scotland "the lease" for a term of years has been found to involve a much more frequent change of tenancy than occurs in connection with mere tenancy at will in England, it must be remembered that the natural course of events is interfered with in the North by a law which artificially fosters competition for the occupation of land as much as heavy tenant-right valuation checks it among ourselves. All this, however, will no doubt be fully represented on Monday evening, when the subject announced upon the card of the meeting is not, we imagine, so strictly hedged but that it will permit, along with an "English Tenant Right" discussion, a consideration of the alternative methods by which the interests of landlord and tenant may be promoted.

THE land is the capital of agriculture, the crops are the returns, and the profit is the difference between the cost of growing them and what they will sell for. In drawing up the national balance-sheet must we take credit for an increase of capital (fertility), or are we reducing the fertility of our land, and so "paying dividends out of capital?" The question is important. We shall bring a few facts and illustrations to bear on it.

It is sometimes said that only corn crops are exhausting, and that green crops are the contrary. If so, our "capital" would increase fast, since only one-fourth of the land in this country is in corn, two-fourths are in pasture, and one-fourth in roots and other "green crops" and fallow. But the truth is, that all crops are exhaustive by their removal from the soil of the constituents of their growth. Whether crops be consumed by man or by the lower animals, they exhaust it in the first instance by the removal of certain constituents from the soil, and they leave it poorer in proportion to the amount thus removed. Whether they ultimately exhaust it depends on what becomes of the remains of the food. In the case of that consumed by the lower animals these remains are carefully preserved: in the case of man they are wasted. The strength and weakness of our national agriculture lie here. It is this part of the debtor and creditor account which is so complicated.

The weight of the dry material contained in a crop indicates pretty accurately the loss sustained by the soil. No doubt some constituents are more abundant in some soils than others, and some plants and some portions of plants draw more largely on the soil than others; but it is entirely erroneous to draw a line between cereals and succulent crops on the supposition that the former exhaust the soil and the latter do not. A heavy crop of Mangel (30 tons) contains 2½ tons of dry vegetable matter, and a heavy crop of Wheat (4½ quarters of grain and 1½ ton of straw) contains only 6 cwt. The amount of soil constituents contained in the former is greater than that in the latter, and the quantity of phosphoric acid is 30 lb. in the Mangel and 20 lb. in the Wheat and straw. The removal of a crop of Mangel exhausts a field much more than the removal of a crop of Wheat. But the roots are usually consumed in the field or on the farm, and the grain is carried off the farm, and this constitutes the difference in the comparative exhaustion of land by cereal and by forage crops. In the one case we restore and in the other we abstract from the soil the elements of its fertility. The comparison is heightened by the fact that our social habits prevent, in great measure, the ultimate return to the soil of the products of the food consumed by man. Animals, therefore, become a source of the increased fertility of the land, man is the means of its exhaustion. Not that root and green crops exhaust the land less than cereals in the first place, but the former are consumed on the farm with the purchased food which is used as an accessory in the feeding of stock. Not that cereals exhaust the land more than roots and green crops, but they are removed from the farm, and the manure arising from their consumption is wasted. It is a fallacious expression that "cereals exhaust the soil and green crops restore it."

The principle of all systems of farming is, and must be, to give and take from the land. Some farmers take with both hands, especially towards the end of a lease; others take corn crops with one hand, and give back the green crops along with cattle food and various purchased manures. The corn crops are handed over to the nation for consumption; unhappily, they never come back to the land, as they ought. The complete debtor and creditor account with the land may be a little more complicated than this, since there is a loss to the farm in the bodies of animals when they are sold. In the national balance-sheet, however, it must be noted that the bones are returned to the land, while the flesh is lost by going into human consumption. A well-known instance of exhaustion by "green crops" is the impoverishment of pastures, which has occurred in Cheshire, Staffordshire, and other cheese districts. In these instances it was Grass, not cereals, that exhausted the soil.

—— WHEAT sold for one shilling a quarter more money on Monday last at Mark Lane, and the tone of the market throughout was firm.——At the Metropolitan Cattle Market last Monday's prices were maintained, and sheep were even a little dearer.

—— The Gloucestershire Agricultural Society will hold its next annual show and meeting at Stroud. Applications had been received from Stroud and from Cheltenham—the former town is preferred, as it has never yet received a visit from the county Society.

—— Dijon, the old capital of Burgundy, and now the chief town of the department of the Côte d'Or, promises to be very busy next month when the agricultural exhibition of the region or district takes place. In addition to this, there will be held at the same time a congress of farmers interested in the production of wool, an exhibition of horses, and lastly, a special exhibition of wine, beer, spirits, and other liquors, malt, flour, bread, and all other preparations from grain, and hops, as well as of apparatus and implements used in the wine and beer trades. This special exhibition is international.

—— A correspondent of the *Farmer* describes his use of fish offal as a manure. He farms near a great fishing station in the North, where the average catch per week amounts in value to about £2000. When these fish are gutted he takes the offal, paying 1*s.* per cartload. A trench is dug, say 6 yards long, 2 wide, and 1 foot deep. The earth taken out is thrown up along the outer edge of the pit, forming a rampart, which not only keeps in the offal, but sucks up the great quantity of blood flowing from it. The carts are then backed in to the farther end and emptied, and when the offal rises about 4 feet, the entrance is closed in, and the whole covered with turf. After winter, large stores of peat ashes having been provided, the offal is taken out and spread on the ground about a foot thick, over which the ashes are thrown, making the mass another foot higher. Over this, again, the offal is spread, then ashes, and so on, until it reaches a height of perhaps 5 feet. A man then mounts to the top, the offal and blood being congealed by this time, and digs a pretty large hole, into which he pours a quantity of vitriol. The whole mass is then thoroughly mixed, great care being taken that lumps of clotted matter are broken up. When the topdressing season arrives, this mixture is pretty dry, so that in some cases it can be sown with the hand as guano. In a short time after it is sown its great value is seen.

OUR LIVE STOCK.

SOVEREIGN (27,538), the most distinguished animal in the Shorthorn classes at the recent Dublin spring show, may be described as a handsome bull of light roan colour, very deep and massive, with rather drooping quarters, and withal an excellent stock-getter. The honours he has won for his well-known owner and breeder, Mr. Chaloner, of King's Fort, have been exceptionally high. On Wednesday week he was awarded the Townley or *Irish Farmers' Gazette* Plate, valued at £155, and the Irish Railway Challenge Cup, value £150. The latter prize will be permanently retained at King's Fort, Mr. Chaloner having won it three times consecutively with the same bull, thus removing it from further competition. The Townley plate is still afloat, owing to BOLIVAR having won it in 1868, thus breaking the continuity of SOVEREIGN'S successes. That this bull's stock are true to their ancestry has been sufficiently proved at King's Fort, and, as an instance, we may mention that of SIR LEOPOLD, the winner of the prize for calves dropped in 1869, at the same show. Although his thighs are a trifle light at present, age will probably supply the deficiency. In general he may be described as a thick-fleshed bull, of rich colour, with much of his sire's style about him, and wonderfully altered since he appeared in the sale ring at King's Fort 12 months since, and was bought in by Mr. Chaloner at 12 gs. The pedigree of such a bull as SOVEREIGN is an interesting study to the breeder. He is now just four years old: he was by Mr. R. Booth's ROYAL SOVEREIGN, and from Mr. Torr's *Village Rose* by BLOOD ROYAL (14,169). The following diagram, which takes up his pedigree immediately after *three consecutive crosses of* WESTERN COMET (689), according to the fashion of the old breeders, will assist the reader in tracing his lineage:—

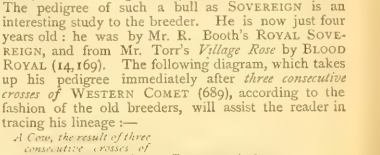

ROYAL SOVEREIGN was very full of BUCKINGHAM (3239) blood, and traced back directly to that noted sire through his 4th g.dam. BLOOD ROYAL, an Aylesby bull, was by DUKE OF BOLTON by GRAND DUKE (10,284), which at once connects SOVEREIGN, not very remotely, with the famous Bates' Duchesses, GRAND DUKE being out of *Duchess* 55; CROWN PRINCE and SIR LEONARD again take us back to the noted sire BUCKINGHAM, through *Charity* and *Cherry Blossom;* so we see in SOVEREIGN an animal whose pedigree contains the best strains of the two rival families of Shorthorns so long associated with the names of Bates and Booth.

—— Our readers will be in little danger of forgetting the Biddenham sale on Tuesday next. The long list of high-bred stock, in which the names of Gwynne, Charmer, Sylph, and Spencer occur in almost dazzling profusion, is sure to attract Shorthorn fanciers from all parts of the kingdom, and we may expect to see a keen competition between foreign buyers or their agents and our home breeders. On the eve of this important sale a few words on the breeding of the various lots may be acceptable. Twenty-six out of the 56 animals to be sold are "Gwynnes," and there are also eleven "Spencers," seven "Sweethearts," five "Fawsleys," two "Sousies," three descendants of *Moss Rose* by EMPEROR, and the sire now in service —GRAND DUKE OF LIGHTBURNE (26,290) who is descended from the celebrated *Beauty* by PURITAN. To begin with the Gwynnes or Princesses, their descent may be traced as far as 1739, on Stevenson's farm at Ketton (Dixon), and the STUDLEY BULL (626), bred by Mason of Chilton, lies at the foundation of their Herd Book pedigree. One of the most remarkable and instructive facts met with in the early history of this noted tribe is the bold policy of in-and-in breeding pursued. The following tabular view will show the reader how FAVOURITE (252), a bull which is associated more than any other in the bringing out of the Princess tribe, was produced. The cow *Favourite* and her daughter *Young Strawberry* were purchased from Mr. Maynard, of Eryholme, by Mr. Charles Colling, and became the joint grand-dams of this celebrated bull.

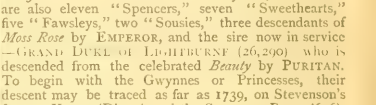

FAVOURITE was therefore himself a closely bred animal, and yet he was often used without ill results upon his own offspring for two generations. A cow by FAVOURITE was put to FAVOURITE, and the result was *Princess*. In *Princess*, then, we find the result of two FAVOURITE crosses, and she gives birth to *Nell Gwynne*, by PHENOMENON (491). But on consulting the Herd Book we find that PHENOMENON is by FAVOURITE; so that again the race is impregnated with the blood of this famous sire. *Nell Gwynne*, put to LAYTON (366), produces another *Nell Gwynne*, and on investigating LAYTON'S pedigree we learn that he was so thoroughly imbued with FAVOURITE blood that it is necessary again to have recourse to a diagram in order to be intelligible:—

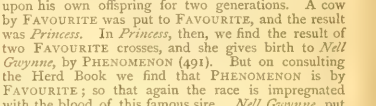

Thus four consecutive crosses, in which FAVOURITE blood is paramount, form the foundation of one of the best known and most esteemed families among Shorthorn cattle. That the superstructure has been kept up in quality with the foundation, has been abundantly proved by the continued popularity of present representatives. We therefore consider it unnecessary to follow out the pedigrees of such sires as MERLIN (430), MARMION (406), PRIME MINISTER (2456), and ST.

THOMAS, which were used in bringing out successive generations of Gwynnes. Among the more recently used sires we may mention (1) MAY DUKE (13,320), as combining in his lineage the best Booth (*Vivandière*, by BUCKINGHAM (3239)) and Bates blood; (2) GRAND DUKE 5TH (19,875), whose name proclaims his pedigree; (3) DUKE OF GLO'STER (11,382), whose merits need not be set forth to "Shorthorn" readers; and other Duchess sires of unquestionable extraction. Space compels us to be brief in speaking of the remaining families found at Biddenham. Where is the admirer of Shorthorns who has not heard of the Milcote "Charmers." We have spoken of their merits in reviewing Mr. Murton Tracey's catalogue, and here again we meet them further improved by alliances with first-rate Duchess sires. So also in the Spencer tribe we find animals splendidly bred, so far as the last crosses are concerned, and backed up by remoter descent from the best Chilton stock. The "Fawsleys," so long bred by Sir Charles Knightley, and the "Sousies," descended from *Sousie 5th*, by 2D DUKE OF NORTHUMBERLAND, and further back, from old TRUNNELL (659), will also command attention and create competition. We sincerely wish Mr. Howard a successful sale of so much valuable stock. Mr. Strafford will commence selling at 1 o'clock.

—— Mr. Murton Tracey's catalogue, recently issued by Mr. Strafford, announces an important sale next Thursday at Edenbridge, Kent. Rich as the contents of this catalogue undoubtedly are, the fact that 40 of the 47 animals are Sweethearts, directly descended from *Sweetheart* by ACCORDION (5708) and *Charmer* by LITTLEJOHN (4232), precludes much remark upon it. This fact is, however, sufficient guarantee that on the female side the cattle to be offered are thoroughly well bred. The bulls recently used are matter of interest, and, on applying to the catalogue, we first find the familiar Milcote and Fawsley names of DAYBREAK (11,338) and MAMELUKE (13,289), followed by that of the famous BARON (13,833), of Booth extraction, bred by Mr. Chaloner, of King's Fort. Next comes the DUKE OF ALBEMARLE, bred by Mr Tracey, by THE MARQUIS (20,961), in whose pedigree the Duke of Devonshire's *Cleopatras* and the Milcote *Charmers* are blended with the Booth element through his grandsire, THE BARON (13,833). BARON OF RATHCOOL (21,233), whose name next appears on the page, is also by THE BARON, and from *Sweetheart 3d* by DAYBREAK, lot 1; COUNT LEINSTER by DUKE OF LEINSTER, and from *Sweetheart 6th*. Lastly, to conclude the list of the sires of the Edenbridge Sweethearts, we may mention CORSAIR, (25,291), a son of BARON RATHCOOL and *Cleopatra 3d* by THE BARON; THE LAST OF THE BARONS by THE BARON, and out of *Cleopatra 3d* by THE BARON; and THE PATRICIAN, bred by Mr. Adkins, of Milcote. *Cleopatra 3d* by THE BARON, her daughter, *Cleopatra 5th* by DUKE OF LEINSTER, and grandson WRESTLER by PATRICIAN, will be offered. THE LAST OF THE BARONS and PATRICIAN, whose origin has already been traced, and several other well-bred bulls, will also be disposed of.

POULTRY.

THE following remarks on the poultry exhibited at the recent Dublin spring show are from the *Field*:—

"As might be naturally expected from the time of year, this show was not so large as it would have been had it been held prior to the commencement of the breeding season; and perhaps there might be a tendency for the same reason on the part of some amateurs to keep back some of their principal stock, lest it should interfere with poultry now in the very height of laying. Still with even this somewhat serious drawback the show was a creditable one, the pigeons being a very attractive feature of the exhibition. Dorkings were mostly shown in very bad feather. Many of the Spanish fowls were of great merit, and some few pens were shown in very creditable condition. The Brahmas were not so good as those exhibited at Dublin at the former spring show. There were some good buff, and also good white Cochins exhibited, but, as a matter of course, not in so good plumage as they were a few weeks back. Mr. Arthur Perrin's entry of game fowls was a good one, though the game classes generally were not equal to those at English shows. The Hamburgh classes were very inferior, but some first-rate Polands made ample amends. The classes for French fowls were well filled; the cocks of the Houdans, however, somewhat diverging from purity of feather,—a failing so general in the single cock class as to cause the 1st prize to be withheld. Some good Sultan fowls were present, and took the 1st prize in the 'any variety' class. The turkeys and geese were especially worthy of notice, being well grown and very large specimens. There was a general impression that the entry of pigeons was the most meritorious ever yet seen at the show of the Royal Dublin Society. The pens were large, and showed the poultry to great advantage. The judges were Mr. Edward Hewitt, Mr. Chas. Peacock, and Mr. Wm. Mulligan."

A list of the poultry prizes will be given next week.

GORSE AS FOOD FOR STOCK.

IN the *North British Agriculturist* of the 16th inst. I observe that in replying to a correspondent who asked your opinion of the value of Gorse or Whins as a crop to be cultivated on very poor land, with the view of producing food for live stock, you state that the advice to cultivate Gorse, frequently given by agricultural writers, though "advisable in theory, has never, so far as we are aware, been on any large scale reduced to practice, and when attempted, has invariably been discontinued." I hope, therefore, you will kindly permit me to give some particulars on this subject, which may be of use to your correspondent.

For several years Gorse has been cultivated to a considerable extent by many persons in Ireland, and its use as green food for horses and cattle, and as a substitute for hay during winter and spring—not "during the summer and autumn," as stated in your reply—is steadily extending in that part of the kingdom. It is just possible that some of your readers may not think the more highly of the practice because it is followed in Ireland—like the wise men of old, who thought that no good thing could come out of Galilee. But when Gorse is cultivated in Ireland, it is not by the ordinary class of farmers. It is chiefly found on farms where there is nothing to be ashamed of in the shape of management; and I know that some who grow it in Ireland, and prize it highly, are Scotchmen and Englishmen. I have also seen Gorse grown in England for the same purpose, with much satisfaction to those who cultivate it.

The description of stock which thrive best upon Gorse are horses, milch cows, and young stock. When given to horses no hay need be used, unless a little put in the rack the last thing at night. In fact, horses accustomed to Gorse, and getting it regularly during winter as the chief part of their food, do not care much for hay. It is well known that Carrots give horses a nice coat, but even Carrots do not surpass Gorse in this respect. I know that some do not give their horses as much Oats when feeding on Gorse as when fed on hay, but I consider it more advisable that farm horses should get their regular allowance of Oats when fed on Gorse.

When milch cows are fully fed on Furze or Gorse, which is the same thing, certain results follow: the cows give more milk, and it is richer in quality than that yielded by them on ordinary food. But this is not all. The winter colour, and too often the winter flavour of the butter is well known as something very different from the colour and flavour of butter made during summer and early autumn, when the cows are out on good pasture. Now, the butter obtained at this season from the milk of cows fed wholly on Gorse has as rich a colour and flavour as if the cows were grazing on the finest old pastures. This, I need scarcely say, is a very important point.

Store cattle getting plenty of Furze during winter keep good coats of hair, and are in fresh forward condition for the Grass. I know a gentleman who feeds cattle for the butcher regularly on Furze and what you may call half Turnips. His cattle are much liked by the butchers who kill them, and on one occasion he showed a heifer, fed as described, at a show of fat stock held in spring, and took a prize, although opposed by exhibitors who had used both roots and cake freely.

What I have stated is not done on a limited scale, for I know of many instances where 80 to 100 head of milch cows, young cattle, and horses are fed on one farm, I may say solely on Gorse—that is to say, with the exception of Oats for the horses. The Turnips are reserved for the fattening of cattle and sheep.

Gorse thrives on poor land. I have known it grown with success for years on land not worth 5*s.* an acre—but, of course, like everything else, it is most luxuriant on good soil. It is, however, a crop well suited for a poor soil, provided the land is dry, and made clean and fine before sowing the seed. The best manure to apply is bone-dust, and next to that, superphosphate; but the bone-dust is preferable. The proper time for sowing is March or April, or even May, and the quantity of seed is from 35 lb. to 40 lb. an imperial acre. Some sow less, but I invariably find the best crops where plenty of seed has been used. Oats are usually sown along with the Furze seed, but the Oats should be sown thin. The kind sold by seedsmen for sowing is called "French Furze," and it is believed to be finer than British Furze, although I confess I cannot perceive any marked difference.

The crop is ready to be cut for the first time eighteen months after the seed has been sown; that is, the crop grown from seed sown next April would be ready by November, 1871. After that it is a permanent crop, requiring only to be mown each year, and yielding every winter a large quantity of green food at a season when such food is not to be had, unless in the shape of roots. A friend of mine, now deceased, who had a large herd of valuable Shorthorns, well known in the showyards, grew Furze on land worth 40*s.* an imperial acre, with which he fed his cattle to a considerable extent, and his cattle had always a beautiful bloom on them in spring.

Old, self-sown Furze produces growths which may be cut off with a hook and given to stock; but cultivated Furze is much superior; that is, when regularly cut, so that each year's crop consists of fresh shoots.

In preparing Furze for the use of stock, many persons are in the habit of putting it once or twice through a straw-cutter. This answers well enough for horses, but cows prefer it when better prepared, and the best machine for the purpose is Walsh's bruiser, which was exhibited by Mr. J. Pringle, Victoria Street, Edinburgh, at the late show of the Highland and Agricultural Society. In fact, wherever Furze is largely used, and power required, it is advisable to get Walsh's machine.

In conclusion, allow me to say, that if Furze had been a difficult crop to grow, its value would perhaps have been better appreciated. It is best known in the form of old bushes, which often occasion considerable trouble in the improvement of land, and this, too, may have led to the plant being undervalued; but I trust I have said enough to induce those who, like your correspondent, have poor land which they find difficult to turn to profitable account, to give some consideration to the subject. *Ulex-Hibernicus, in the "North British Agriculturist."*

NOTES AND SUGGESTIONS AS TO COTTAGES FOR LABOURERS.

DEAR R——: You have asked me to give you my views as to cottage building in the agricultural districts, and also such suggestions as I can offer that may be useful as guides to any one about to engage in cottage buildings.

In the first place I must explain to you that I am convinced, from my own experience, and also from that of many practical persons both in the North and South of England, that the

Three-Bedroom Upstairs Plan (the principle which has of late years been generally adopted) has much retarded cottage building. Cottages built on this plan are decidedly unpractical, and are not suited to the wants of this class of occupiers. Consequently, they never give thorough satisfaction to any of those interested in their erection; and this prevents others from attempting cottage building.

In the second place, I believe so much stress having been laid on the question of cost and the paying of interest, has deterred many, and has also caused the requirements of the occupiers to be not sufficiently regarded.

I think the fair way for a landowner to consider this question would be to ask, in the case of an estate requiring 20 new cottages, each cottage costing £150, the cost amounting in all to £3000, whether he would improve his estate most by erecting these in the course of years from income, or by borrowing the money, under the Inclosure Commissioners, from the Land Improvement Companies. In case he borrowed this money, the yearly loss in interest would be £5 for each cottage for the 25 years (by which time the whole of the principal will be paid off), and this would amount to £100 a year. Would not this be by far the most satisfactory arrangement? What an advantage to an estate, and how satisfactory to the owner to know that he had comfortably housed twenty families at a cost of £100 a year, instead of being worried by the continued complaints arising from the badness or want of cottage accommodation.

I ought to remark on facts one often hears mentioned, namely, that the cottagers *will* take in lodgers, and that small owners of land *will* build indifferent cottages and charge exorbitant rents. If these evils arise they generally result from the cottage accommodation of the district being inadequate to the demand for labour. I should advise a landowner before he commences building cottages to consider whether it is his property that may be deficient in cottage accommodation or that of his neighbours.

My opinion being so strong against the principle of the three bed-rooms upstairs, I consider it to be barely necessary to give a plan, but I refer to the common form of such cottages as published by Mr. Birch in 1864, as it may meet the wishes of some persons, and may be adapted for some situations.

I now give you my notes which I made some years back, and to which I have added my experience up to the present time.

NOTES ON AGRICULTURAL LABOURERS' COTTAGES.

A direct profit cannot at present be expected from such dwellings. They must be viewed in the same light as servants' rooms in a house. In the South of England generally there are already enough cottages in the villages, therefore as a rule it is advisable for a landowner to build his cottages on his farms (these might be let with the farms), or he may be finding accommodation for the property of other landowners; and as such cottages do not pay in rent the interest for money expended, he may be adding to the value of the property of other people, to the detriment of his own income.

From much experience in altering old and building new cottages upon the plans most approved of during the last few years (such as the prize essay cottages in the Royal Agricultural Journal, vol. xvii., the Yorkshire prize cottages, and others on the principle of the three bed-rooms upstairs), it has been found that this arrangement is not well adapted to the comforts and requirements of the agricultural labourer, or to the fullest improvement of agricultural property; consequently, on an estate in Oxfordshire the principle of two bed-rooms upstairs, two rooms on the ground floor (one a bed-room), with, at the back of the living-room, a lean-to for scullery, pantry, fuel, &c., has been adopted as far as possible in new cottages, and in altering old ones.

The downstair bed-room with a fireplace has been substituted, as it is found that a farm labourer (though requiring the option of a third) does not for any length of time require the use of more than two bed-rooms, as his family is either very young, or as soon as able out in service.

The ground floor bed-room can thus either be used for a lodger, quite private from the family (which is not the case in the other plan), or as the heads of the family get old (it being in practice difficult to move them) they can retire to this room, and with their pantry under the stairs, live there, taking in either a married child or another couple to help pay the rent, and be mutually useful. The old woman, by looking after the children, enables the young wife to attend to work. An old man, if resident on a farm, is often most useful in crow-keeping, &c., thus allowing the children upon whom such occupation now usually devolves to be kept longer at school. (See figs. 110, 111, 112.) [The above figures are taken from a sheet of cottage plans published by Messrs. Bailey Denton, Son & North, of 22, Whitehall Place.]

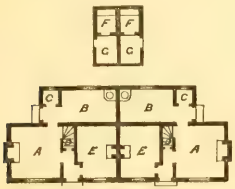

Fig. 111.—Ground Floor.

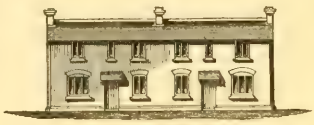

Fig. 110 (No. 1 —Front Elevation.

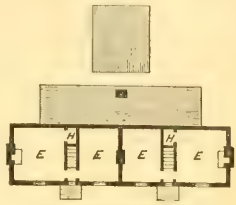

Fig. 112.—Bed-room Floor.

In the above cottages A is Living-room, B, Scullery, C, Pantry, D, Fuel, E, Bed-room; F, Privy, G, Tool-house, H, Closet.

The great advantages of this plan are—1. It will give nearly all the advantages of two cottages, through old people and young being able to reside under one roof. 2. Greater privacy, owing to the position of the rooms. 3. Greater warmth. 4. Absence of draught in the bed-rooms and their thorough ventilation into the stair-case. 5. If in or near a village, the down bed-room will come in very useful as a shop, or a small tradesman's work-room, or for a dress-maker, &c., or often for a crippled child. In case of illness it is much more convenient, it also causes better separation, therefore less risk of infection.

The principal objections to the plan of three bed-rooms upstairs—the usual one now in vogue—are:—

1. That to obtain space for three bed-rooms upstairs, of a proper size, more accommodation is given down-stairs than necessary, and the back kitchen is used as the living-room, and the front room is comparatively unused (without the possibility of being turned into a bed-room and living-room). 2. Less privacy upstairs, as the rooms are only divided with lath and plaster. 3. The bed-rooms are often badly shaped for the beds, and are small and draughty. 4. The aspect and ventilation not generally so good. 5. When the labourer gets old, and his family has grown up or left him, he cannot take in with any comfort to himself another family, and it has been found better that old people furnished with a pantry at the back in the place of the fuel store, which is placed in the block behind. This is rather a better place to keep food than under the stairs, but more expensive and not necessary, as so small an amount of food to keep for one person and two old people. One disadvantage is that it makes the room more draughty, and not so good a place for the bed.

There are three other ways of placing those two cottages so as to adapt it for any situation, still keeping to the same principle.

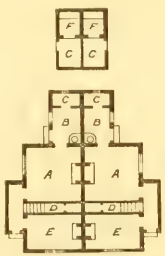

Fig. 114.—Ground Floor

Fig. 11 No. 4) —Elevation

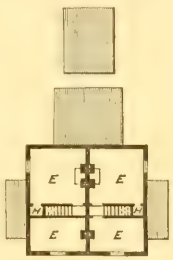

Fig. 115.—Bed-room Floor.

In the above plans A is Living-room, B, Scullery, C, Pantry, D, Fuel-house, E, Bed-room, F, Privy; G, Tool-house, H, Closet

Nos. 2 and 3. The pair at right angles. (Two ways of turning them.) This plan can be adopted where south aspect cannot be obtained, or for other reasons, such as an irregular elevation being required, or owing to the lay of site, or to the approaches of roads, but in this plan there is only room for a scullery and pantry to each in lean-to. (The fuel places must be put with block behind.)

No. 4 (figs. 113, 114, 115). The pair back to back, nearly the same as published for some years by the Cottage Improvement Society, (the oven and copper being put in a block behind the fuel places), can be adopted for the same reasons as Nos. 2 and 3, with the additional reason of economy.

No. 5. If a cheaper plan is required for cottages, on farms especially, make the rooms longer and narrower in this plan, so as to get the scullery, &c., which is to be less wide and with no fireplace, under one roof. This will save cost and make a very useful cottage.

Note.—Ovens and coppers are always better out of the cottages, and in a block separate, so as to keep away all smoke, steam, and risk of fire. There is also an economy of fuel if the oven or copper is used by both families at one heating.

In the North of England and Scotland it is customary for some of the beds to be in the living-room (mostly opposite the fireplace as a rule); these beds are somewhat like berths on board a ship, divided by boards or curtains, &c., so as to make them private. I must confess that I consider the plan to be a comfortable one, warm and healthy, as the fire causes such good ventilation. This plan necessitates the living-room being larger. See plan No. 6, by Mr. Bolam, of Wooller, Northumberland, which may be considered a good example of this description.

The principle is the same as in the other plans. I name the plan (No. 7) of the cheapest sort of cottage allowed by the Inclosure Commissioners for some of the wild parts of Scotland; and No. 7 A, a pair of cottages on the ground floor. These are the common North of England cottages, with the last improvements, and have every convenience. They are cheap, say £200 the pair.

No. 8. The plan of a cheap single ground-floor cottage, which has lately been published by the Cottage Improvement Society. Ground-floor cottages, in our damp climate, are not so suitable as those having also upstair rooms. The entire expense of walling cannot be so expensive as the extra roofing required by all rooms being on the ground floor. If Mr. Nicholls' concrete succeeds, it may develop the ground-floor plan of buildings, as his material is damp-proof, as also fire, temperature, and service-proof.

Nos. 9, 10. Plan of block of cottages, with one, two, and three bed-rooms. These may be found useful in certain localities, though I believe most places are supplied with small cottages.

The calculation is, that one family requires three bed-rooms; four require two, one requires one bed-room.

In the Cottage Improvement Society's plan of a block of three cottages, the three can have two bed-rooms each, or one with one, one with two, and one with three; and in two blocks, one with three bed-rooms, four with two, one with one. These two blocks will cost, say, £600.

I must draw attention to the Cottage Improvement Society, of 37, Arundel Street, Strand, W.C.,—where all these plans are to be seen,—a society

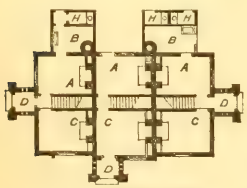

Fig. 118.—Ground Floor

Fig 117.—Side Elevation.

Fig. 116 (No. 9). Front Elevation.

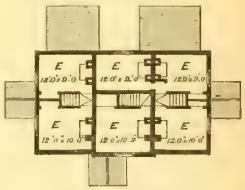

Fig 119.—Bed-room Floor

The above plan represents block of three cottages, with one, two, and three bed-rooms respectively—A, Living-room, B, Scullery C, Second-room, D, Porch, E, Bed-room; H, Privy

should, if possible, live with and be looked after by their own friends, instead of occupying cottages by themselves.

Question of Cost.—A good pair of cottages complete (supposing them to be erected under an architect and a builder with everything to buy) cannot be built for much less than £300 the pair, except under favourable circumstances. But on an estate with home materials, and erected by working tradesmen by contract or measure work, they will cost less.

The labourers much prefer cottages built on the plan recommended to that of the three bed-rooms upstairs.

*Explanation of Plans.**—Figs. 110, 111, 112—No. 1.—

* We give sketches of only three of the plans here referred to.

be 12 by 12—but the same plan of cottage carried out by placing the cottages in line instead of back to back, makes a most perfect cottage, and thoroughly adapted for the agricultural labourer; and, taking the run of years, it will often answer the purpose of two cottages.

Detail Explanation of Plan No. 1 (figs. 110, 111, 112).—Floors, 9 inches to 12 inches above ground level. Damp course at ground level. No floors in wood hovel, as they get broken up. Air-bricks to give air under the wood floor. These bricks to be kept well above the ground level, so as not to get stopped up in course of years when the soil rises.

Ventilation.—All the rooms are ventilated, with perforated zinc plates, into the staircase, which thus forms the ventilating shaft—a perforated zinc plate being placed in the ceiling over staircase; this allows of the bed-room chimney-flue being stopped up in the winter. The fireplace in the downstairs bed-room is placed near the window, so as to give more room for bed. The lean-to is not ceiled (the pantries are ceiled). The pantries and fuel places are boarded over, so as to form lofts (which are very necessary and most useful), for tools, &c. A rough movable small ladder is supplied, to get to these lofts.

The pantries are ventilated with two perforated zinc panes. In the fittings of the living-room give a cupboard (with lock and key), to keep the tea and sugar from the children.

Underground drains having been found expensive, and liable to get out of order, and unnecessary, no sinks are now put, as occupiers prefer to place the wash-tub on a stool (movable to exactly where they wish to work), in the old way, and to use slop buckets, which they empty in the garden.

I do not think it necessary to add any specification, for the simple reason that materials, &c., vary so much in different localities, and in every district firms are to be found quite competent to supply them.

The Inclosure Commissioners will supply their requirements, on application being made to them.

F. D., Westminster, May, 1869.

AGRICULTURAL STATISTICS.

[We continue the publication of the official Tables.]

STATEMENT OF THE POPULATION, AREA, AND ACREAGE UNDER CROPS AND GRASS IN THE UNITED KINGDOM AND IN VARIOUS FOREIGN COUNTRIES, ACCORDING TO RETURNS FURNISHED BY THE STATISTICAL DEPARTMENTS OF THE RESPECTIVE COUNTRIES.

(The Area and Acreage are stated in English Statute Acres.)

Description of Crops, &c.	United Kingdom (1869.) Great Britain.	Ireland.	Total, including Isle of Man and Channel Islands.	Sweden. (1867.)	Norway. (1865.)	Denmark. (1866.)	Holland (1867.)	France. (1868.)	Greece, including Ionian Islands. (1865.)	United States (estimated). (1868.)
Population, according to the latest returns	25,075,028	5,536,217	30,759,555	4,173,080	1,701,756	1,753,787	3,309,128	38,067,094	1,325,479	31,445,080
Total area	56,964,260	20,322,641	77,513,585	97,389,000 (exclusive of rivers and lakes.)	74,198,000 (exclusive of rivers and lakes.	8,563,000 (exclusive of lakes.)	8,111,000	108,651,000 (exclusive of forests.)	11,955,000 exclusive of lakes & rivers.	1,804,679,040
Total acreage under crops, Grass, &c.	30,339,278	15,641,791	46,100,153	19,576,000	700,000 (1,930,000	5,637,770	3,816,000	99,516,632 (exclusive of forests.)	..	..
Corn crops :—										
Wheat and Spelt	3,688,357	261,117	3,981,989	909,595*	11,008	119,845	195,644	17,485,831	376,552	18,459,779
Barley or Bere	2,251,480	223,338	2,483,277		120,220	683,245	115,677	2,764,594	117,717	937,498
Oats	2,782,720	1,684,788	4,480,125	1,882,397†	219,949	826,140	260,424	8,153,675	10,247	9,665,736
Rye	64,069	8,770	72,986		29,254	518,320	494,040	4,779,391	10,814	1,651,321
Beans and Peas	971,381	9,957	981,734	130,651	9,526	83,627	117,014	841,010	12,061	..
Buckwheat	..	..	..	..	..	44,964	168,338	1,723,756	22,953	1,113,993
Maize	..	..	..	..	..	..	..	1,618,450	181,509	34,881,109
Mixed Grain	..	..	..	Included with Barley and Oats.	46,035	104,355	..	1,307,163	127,808	..
Other kinds	..	..	..	..	..	..	6,390	510,277	318	..
Total under corn crops	9,758,047	2,207,070	12,000,111	..	..	2,380,496	1,357,527	39,184,147	859,979	..
Green and other crops :—										
Potatos	585,211	1,041,837	1,635,347	307,752	76,395	84,809	274,823	3,036,746	406	1,131,552
Carrots, Turnips, Mangel, Beetroot, Kohl Rabi, and Cabbage, &c.	2,623,863	388,848	3,023,431	18,474	..	42,245	32,693	1862. 1,390,441	..	..
Beetroot for sugar	..	..	..	Included with Carrots, &c.	..	..	14,131	337,135	..	..
Chicory	..	..	..	..	..	..	3,522	3,722	..	..
Rape and other oil seeds	..	..	..	11,459	..	Included with Carrots, &c.	59,705	597,446	..	..
Hops	61,792	..	61,792	..	..	Included with Flax & Hemp.	511	11,920	..	..
Tobacco	..	..	..	..	..	..	4,256	43,692	6,402	427,189
Madder	..	..	..	..	..	..	11,295	..	4,583	..
Flax	20,923	229,178	250,112	38,018	..	22,072	52,843	260,474	957	..
Hemp	..	..	..	..	..	..	3,520	247,202	92	..
Vineyards	..	..	..	..	..	..	..	5,732,398	193,735	..
Cotton	..	..	..	..	..	..	..	..	..	7,000,000
Sugar Cane	..	..	..	..	..	..	..	..	..	63,199
Bare Fallow	738,316	29,981	761,369	729,141‡	..	440,482	56,412	16,605,304	..	..
Grass, &c., under rotation	3,448,726	1,669,800	5,149,552	1,581,538	..	1,770,361	115,035	6,848,470	9,954	..
Meadows and permanent pasture	12,735,897	10,046,877	22,811,284	4,787,060	..	897,315	1,859,910	28,571,575§	4,595,571	21,541,573‖
Woods and forests	..	..	..	49,041,319	..	398,877	1,405,000	22,317,388	1,338,656	..

* Winter Wheat and Winter Rye. † Including Summer Wheat. ‡ No stated in original return. § Including mountain pastures. ‖ For hay only.

The returns for foreign countries relate only to those countries for which later information than that published in 1868 could be obtained. The chief officers of the statistical departments in the several countries have obligingly communicated information for publication in these comparative tables.

In Russia statistics of the agricultural resources of the country have not been officially collected, but carefully executed maps, illustrative of the agricultural condition of Russia in Europe, have lately been published by the Department of Agriculture attached to the Ministry of State domains at St. Petersburg. By these maps it appears that arable land, where it amounts to from 50 to 70 per cent. of the total area of districts, occupies abour one tenth of Russia in Europe, lying south of Moscow as far as Kharkow, and between Tambow on the East and Tchernigow on the west, with a south-west extension from Tchernigow to Podolsk and Kitchenow near Odessa. The proportion of land under pasture is large in other parts of the country. The best corn districts are: 1. On the Volga, South of Khazan and down below Saratow, extending chiefly on the left bank of the Volga to Ousa and the Oural river; 2. Between the Dniester and Dnieper, south of Podolsk and Poltova; 3. On the Baltic between Libau and Revel.

Flax, for the fibre, is grown in the north-west districts, largely about Pskow, and in the area situated between the towns of Pskow, Vitebsk, Grodno, and Libau. Hemp is cultivated further to the south, principally in the neighbourhood of the town of Orel or Orlow, and also in the district between the towns of Kalouga, Koursk, Tchernigow, and Vitebsk. Flax for oil seed is a crop of Southern Russia in the districts between the Dniester and the Don. Beetroot is also a crop of the southern districts situated between the towns of Kalouga and Karkow, but it is more especially cultivated upon the Dnieper near to Kiew. Tobacco is planted in detached districts in the south. Forests are most numerous in the country north of St. Petersburg, but they also occur, in less density, southward between St. Petersburg and Moscow. As regards the distribution of live stock in European Russia, horses are most numerous in the eastern half of the country, and cattle and sheep are most abundant in the southern and western districts.

For Prussia, the official returns at present only afford information respecting the percentage variations of the harvest from an average yield, but it is stated that statistics of the agricultural resources of the country will be obtained in 1870.

In Belgium agricultural returns have been collected for a recent year, but they are not ready for publication.

In France, information respecting the agricultural condition of the country is obtained with much completeness every 10 years, and every year inquiry is made as to the principal crops. The last general returns, relating to the year 1862, were published in 1868. M. Legoyt, chief of the department for the general statistics of France, has attached to the returns an interesting report upon the agriculture of France at different periods, and also an elaborate introduction explanatory of the information collected in 1862. There has been a marked change in the descriptions of bread corn grown in France: in 1862 as compared with 1840 the cultivation of Wheat shows an increase of 33 per cent., and that of Rye, and mixed Rye and Wheat, a decrease of 25 and 45 per cent. respectively. In the same period the average yield of Wheat increased from 13.9 to 16.3 bushels per English acre; and Potatos were more largely grown by 34 per cent. It appears that in the 50 years from 1815 to 1865 France imported more corn and flour of all kinds than she exported. The cultivation of Sugar-Beetroot in France increased from 57,000 hectares in 1840 to 136,000 in 1862, or 137 per cent. The quantity of land annually left fallow has decreased in France, but in 1862 it still amounted to 20 per cent. of the land under tillage.

The number of cattle (omitting calves under one year) was larger in 1862 than in 1842 by one million, the increase being almost entirely in cows. The number of sheep in the same period decreased. It is stated by M. Legoyt that in countries in which small holdings prevail, the number of cows generally increases and the number of sheep diminishes.

There are 3,800,000 proprietors of land in France. The number of agricultural holdings in 1866 was 3,226,000. Of this number, more than one half, or 56 per cent., had less than 12½ English acres of land. The average extent of all the holdings in France (exclusive of forests and woods) was 26¼ acres, which is as nearly as possible the same as the average of all the holdings in Ireland. The number of leased farms in France in 1862 was 568,000, of which 17 per cent. were leased for three years, 25 per cent. for six years, 51 per cent. for nine years, and seven per cent. for more than nine years; and it is stated that the best cultivation is found in districts in which farms are let upon the longest leases.

In the United States information respecting the agriculture of the country is obtained by a department of the government, and the interest of the United States in agricultural statistics has been extended to the larger subject of the relative supply of cereals in the American Union and in Europe. A report upon this subject, based upon data for European countries obtained by the American diplomatic agents, was presented to the Statistical Congress at the Hague, by Mr. S. B. Ruggles, of New York, the delegate to the

congress from America. The large product of corn in the United States is stated by Mr. Ruggles to be greatly facilitated by the numerous machines used for sowing, reaping, threshing, and preparing the grain for market. The number of reaping machines employed in the United States in 1866 was estimated by Mr. Gould, formerly President of the Agricultural Society of the State of New York, at 210,000, and the number now in use is believed to be much larger.

The product of cereals in the United States in 1868 is stated to have been 1,450 millions of bushels (Winchester measure), of which 906 million bushels, or 62 per cent., were Maize; 255 millions, or 18 per cent. were Oats; 224 millions, or 15 per cent., were Wheat; and 65 millions, or five per cent., were Barley, Rye, and Buckwheat. The consumption for human food, estimated at eight bushels per head of the population, is 312 million bushels; and from 500 to 600 million bushels are supposed to be consumed by animals. Large quantities of cereals are distilled into whisky and other spirituous liquors. Whilst exporting, in ordinary years, large quantities of Maize and Wheat, the United States requires an importation of Barley for the supply of the breweries. The yearly product of Barley, although it is said to have quadrupled between 1850 and 1868, has recently failed to meet the demand of the breweries, and more than four million of bushels of Barley were imported in 1868.

Upon the data furnished by official returns for the United States, and from the best information that could be obtained as to the production of cereals in Europe, Mr. Ruggles shows that of the corn produce of North America and Europe, nearly one half is raised in the United States and Russia; and he says that these two great producing countries will be abundantly able, for many years to come, to increase the supply of food in the more densely populated portions of Western Europe.

Too much importance cannot be attached to a knowledge of the relative production and consumption in various countries of the primary articles of food. The more the differences in these respects are ascertained, the better will the principle be recognised that the extent to which countries can be supplied not only with the necessaries but with the common comforts of life, must depend upon the interchange of their surplus productions.

Home Correspondence.

The Sheep Tick and "Louping-ill."—In the report of the veterinary official to the Royal Agricultural Society, as given in your issue of the 9th inst., there occurs the following sentence with reference to ticks found upon lambs in Kent:—"Until now they have not been found on animals in Great Britain to an extent injurious to health, much less as causing death." With reference to this statement, I beg to observe that many sheep-grazings in the south-eastern borders of Scotland are much infested by this parasitical insect; and that on farms where it abounds there is often a very serious loss of lambs and young sheep from a disease locally called louping-ill, but which I believe to be convulsion fits. I am well aware that these parasites are not generally regarded as the cause of louping-ill; indeed, when this disease formed the subject of discussion at a meeting, a few years ago, of the Kelso Farmers' Club, such of the speakers as made any allusion to ticks seemed to regard their presence as altogether inadequate to produce such a distressing and fatal malady. The quotation which I have just now made from an official report has prompted me to state the grounds upon which I have arrived at the conclusion that this disease is caused solely by ticks. 1st. It is well known that in the case of young children convulsion fits are often caused by the presence of worms in the intestines. 2d. Since my attention was drawn a few years ago to this subject, I have, as opportunity occurred, interrogated a good many stock farmers and shepherds who had experience of louping-ill, and they have, without exception, concurred in stating to me that they never saw a case of this disease in which ticks were not present. 3d. The tick in what I may call its normal condition is a very slim and nimble creature, but when it gets upon a sheep or other animal it at once burrows its head in the skin and there remains firmly fixed, distending itself with the blood of its victim and assuming the size with somewhat the appearance of a sloe. As they often fasten in great numbers on a single animal, it does not to me seem surprising that these bloodsuckers should, in the case of lambs or young sheep, cause such irritation of the nervous system as to issue in convulsions and death. 4th. It is known that the disease is mitigated when a portion of the natural pasture, on farms where it prevails, is broken up by the plough, and subjected to a course of cropping. The beneficial result thus obtained has usually been supposed to be due to the more succulent and nourishing food thereby supplied to the flocks in the shape of Turnips, and of the cultivated grasses and Clovers. My own belief is, that the breaking up of the natural pastures destroys the ticks; and hence, that on farms subject to louping-ill, the disease is either mitigated or entirely disappears according as the ploughing up of the lands infested by ticks is partial or complete. Let me give an illustrative case. On a farm in Roxburghshire, consisting partly of arable land and partly of natural hill pasture, the flock at one time suffered much from louping-ill. The tenant was very anxious to reclaim the hill pasture, and took opportunity when his landlord happened to be shooting on the farm, to ask him for permission so to do. The landlord replied that he would have been glad to grant this request, but that the ground in question had long been a favourite breeding place for grouse. His gamekeeper, who was present, here interposed the remark, that of late years the grouse on this ground had been ruined by ticks; whereupon the desired permission was given at once, the land was brought under cultivation, and louping-ill disappeared from the farm. *John Wilson, Edington Mains, April 22.*

Condition of the Wheat Plant.—Mr. John Watts, of Whitfield, Berkeley, gives us his opinion as to the loss of Wheat plant. Here is my opinion as to the cause. An insect pierces the stem of the plant just above the point where the top roots spring from, and deposits its egg. The egg becomes a grub, and the grub eats the life of the plant, and the result is the plant dies. I have examined thoroughly into the matter, and find all the middle of decayed plants eaten away, and can find numbers of the grubs carrying on their work of destruction in other plants that are become sickly. Why it is that this insect falls upon one field and not upon another I know nothing, but I do know that such is the fact, for at this moment my Bean stubble, which on my heavy land is looking well, is without any attack from the insect, whilst my neighbour's just over the hedge is looking bad, and the plants are either dead or full of grub, eating them up. *William Smith, Bletchley Station, Bucks, April 20.*

The Compulsory Clause in the Elementary Education Act.—Clause 66. Every school board exercising powers under this Act may from time to time, with the approval of the Educational Department, make bye-laws for all or any of the following purposes:—(1) Requiring the parents of children above the age of five and under the age of 12 years to cause such children (unless there is some reasonable excuse) to attend school; (2) determines the time of attendance; (3) provides for remission of fees; (4) imposing penalties; (5) provides for revocation of such rules. The reasonable excuses are, (1) that the child is under efficient instruction elsewhere; (2) sickness or disease; (3) that there is no elementary school within one mile of the child's residence; and then comes the strong compulsory part of the clause, which is as follows:—"Any proceeding to enforce any bye-law may be taken, and any penalty for the breach of any bye-law may be recovered, in a summary manner; but no penalty imposed for the breach of any bye-law shall exceed five shillings for each offence, and such bye-laws shall not come into operation until they have been laid before both Houses of Parliament for at least 40 days." Such is a summary of the compulsory clause. The principal objection to this clause is in reference to the age of 12 years. A fair elementary education can no doubt be attained by an intelligent child before exceeding the age of 10 years, so that after that time the attendance ought to be optional, but every encouragement should be held out to induce a continued attendance, and which in the majority of cases would be gratefully responded to, for the great bulk of the population, after all, are becoming fully alive to the advantages of education. Take our "navvies" for instance. Each ganger (leader of his gang or party) is generally selected for his knowledge of figures and admeasurement—his being "a scholar." Agricultural labourers, who are usually put upon the lowest scale of education, are also well up to such advantages, and anxious that their children should be taught. The great reluctance hitherto manifested by them has been mainly owing to the pecuniary benefit their families have derived from the earnings of their children. Herein they have been in the first instance decidedly in the wrong. Their children have been sent into the fields to labour at an age much too early. It has been no uncommon thing to find children at eight years and under engaged in field work. Not that the little fellows deemed it any hardship, but often quite the contrary, evidently thinking it quite manly to be permitted to labour, and so far as their healthy and robust constitution is concerned, much healthier than school children. The writer is continually importuned by little fellows of this order to be set to work. The parents hold out inducement to these little fellows to earn something towards a new cap, a new jacket, or new shoes, or otherwise. Their ignorance is to be deplored, but their health is not injured. The evil of this early commencement of labour has not been altogether lost sight of by the Legislature. No child under 10 years of age is allowed to drive any carriage on the public highway now—and if the compulsory clause was confined to 10 years instead of 12, there could be no valid objection of weight. No one deprecates compulsion more than myself, but I fear many parents would prefer their children's earnings in the field to their strict attendance at the school; hence the necessity for this slight innovation upon family order, freedom, and liberty: the great consolation being that the good derived will wonderfully compensate for the seeming restriction. There are, however, provisions in the Bill for enabling families to increase the family earnings in busy times without danger of fines, and thus the hardship in curtailing the family earnings is greatly mitigated. To compel the attendance of children at school up to 12 years of age is, notwithstanding, a serious injury to a poor man having a rather large family. It is, in fact, starving the body to feed the mind, and is both unnecessary and impolitic, and no doubt will ultimately retard the favourable working of a measure which, in its design for real usefulness, cannot be too highly praised. There is another defect in this clause which appears to be in favour of the poor man: his child is not to be compelled to attend the school if it is more than a mile distant from his residence. This, in innumerable cases, would be taken advantage of, and lead to endless difficulties. One mile is comparatively no objective distance; I question if two miles' extension would be far enough, taking into account "any reasonable excuse," *i. e.*, bad weather, the child's age, state of roads, &c. It must be borne in mind, that the comfort and welfare of the poor man's family must not be sacrificed, even to obtain the great benefit of elementary education for his children. *O. F.*

The Bacon Fly.—Will any of your correspondents inform me what is the best remedy against the ravages of the bacon fly in larders, either as to prevention or cure? *T. M. W.*

Thinner Sowing.—The more frequently I discuss this matter with practical farmers in various counties, the more convinced am I that their opinions of proper quantities are not based upon, or deduced from, comparative and experimental trials; but that they too often merely follow the practice of their fathers or grandfathers, and the general custom of the neighbourhood. In consequence of this want of comparative experiments on a small scale (say half an acre in each field), there is not only a great waste of seed, but a far greater loss by diminution of the crop. In my case, on heavy land, the difference was fully 30*s.* per acre in favour of 1 bushel of Wheat over 2 per acre. I should never have known this, had I not found it by comparative experimental quantities in each field. It does not answer to take old practices for granted under an altered set of circumstances. Under the old broadcast system, and the absence of dressing and blowing machines, it was necessary to allow much for uncertain planting, inferior seed, and waste by birds, &c. It is a great mistake to suppose that land can, in our climate, be too rich for cereals, for these are the crops that exhaust our soils, being all disposed of. It is the too thickly sowing that created this erroneous opinion. Farmers often say to me, "I dare not give my animals cake with the Turnip crop, for my Barley gets laid prematurely, and destroys the young Clover." In such a case I recommend a reduction from 3 or 4 bushels to 6 pecks, or on very rich soil to 1 bushel. This last year I grew 7 quarters per acre of Barley from 6 pecks of seed, after a white Wheat crop of 6 quarters per acre. A portion was sown with only 1 bushel per acre, and it appeared as good as, or even better than, the 6 pecks. For many years my Wheat crop has been grown from 1 bushel of seed per acre, and occasionally a small area has produced large crops from only 1 and 2 pecks. Many farmers who have adopted Mr. Hallett's advice and sown small quantities of seed, have reaped much heavier crops than usual. In fact, the practice of thinner seeding is at length making considerable, but by no means sufficient progress. Thick sowing, with high farming, produces a dense mass of vegetation, obstructing the passage of light and air and preventing that branching or tillering which is the natural habit of cereals. So eager are plants for light that being thus deprived of it horizontally they rush up vertically, become weak-legged, and tumble down prematurely. The robust wide-spreading Wheat plant, with its broad flag, and bold full ear, is crowded and cramped into a thin and weak stem, with puny ear, and few small kernels. The stem, where it issues from the crown, is soft and spongy instead of hard and glossy. The desire of plants for light is apparent under many circumstances. The window of a darkened room attracts alike the Potato shoot or the flower stem. Two trees in close proximity only make branches towards the light, turning their backs to each other. Unthinned plantations produce only branchless bare poles. To exclude light from a cereal plant is as unprofitable as to do so with an unthinned Turnip crop. In the latter case the necessity for thin plants is never doubted by any agriculturist. There is something absurdly convincing in the wretchedly small increase of our cereal crops. Ten kernels for one, or a quarter of an ear (which is estimated as the average of the United Kingdom) appears like an impossibility, but it proves, unmistakably, that a ruinous competition for air, light, and food takes place among the over-crowded plants, and must destroy many of them. Comparative experiments on a small scale would save the farmer's money in a variety of ways, and is, therefore, highly desirable. *J. J. Mechi, Tiptree Hall, April 20.*

Foreign Correspondence.

NEW ZEALAND.—I see by your impressions of September 25 and October 2, 1869 (just come to hand), that more information is wanted about the Wheat I sent you. I have little more to give, further than that the plant I sent you represents the whole stock of the variety, for we have had the rust so very bad

this year, it has destroyed the whole of our crop: we shall not have a grain. I thought the bearded Wheat would have escaped, as the White Wheat was quite dead with the rust before it showed on the bearded. The rust has been very bad all through the province this year. It has been a very warm forcing winter, and the Wheat grew away without any check from seed-time till it came into blossom, when it was fully 6 feet high, and gave promise of a splendid crop; but this plague of rust came, and it was all dead in a week.

I hope Mr. Hallett will succeed in growing it, for I should like to get the sort again; there is no chance of getting it here, for it has never been out of my hands, no one liking to grow it because it was bearded. Now I will tell you all I can remember of the growth of 75 bushels per acre.

To begin at the beginning, the land was covered with Fern, Coriaria, and a few Cabbage trees (Cordyline): the latter were burnt off, the stumps grubbed out, and the land ploughed up about 6 inches deep, and left to lie for summer; in the autumn it was harrowed and cross-ploughed, and as much of the Fern roots burnt as could be gathered easily; ploughed again, and the Wheat sown and harrowed in: it grew and produced 10 bushels per acre (from this crop I got first plant of bearded Wheat). After harvest the stubble was ploughed with a shallow furrow, and sown with White Clover, which was cut for seed the following summer, fed with sheep the next summer, and in the winter following ploughed 4 inches deep, and sown with Wheat—1 acre of it with the bearded Wheat, about a bushel and a half—which grew and produced the 75 bushels; the other part of the field was sown with White Wheat, which produced 40 bushels per acre.

This is all the information I can give—that it is not stronger than other Wheat to withstand rust you will see by the first part of my letter. I only wish it was, for I have never seen any other Wheat equal to it for productiveness.

Can you give me any information respecting the following case, or suggest a remedy:—We have a valuable Shorthorn cow (imported). About four years ago a small tumour was observed on her throat just between the jawbone and windpipe, and we thought that it was a bee-sting, or some kind of warble, and did not think anything of it, as it did not seem to hurt the cow; after a time it got much larger, and made her cough and wheeze very much, when it broke internally, and a great deal of mucus came from her nose, and we thought her better, but it has grown and broken several times since. It was proposed to cut it out, but none here were expert surgeons enough to do it; and now we think to do so would kill her outright, as the tumour is now about as big as a sheep's paunch, and much the same shape, and reaches from the jawbone on one side to the ear on the other. We have tried blisters, Steven's ointment, iodine, and setons; but all without effect. *Henry Nairn, Pourerere, Hawkes Bay, Jan.* 31. [The tumour is very likely to be due to constitutional disease (scrofula),—a malady which is much on the increase, in consequence of being readily transmitted from parent to offspring. Nothing can be done for the removal of so large a tumour in that situation.]

Societies.

Institution of Surveyors: *Farming Covenants.*—At a recent ordinary general meeting of this Institution, Mr. E. P. Squarey read a paper on this subject. He said:—The principle which ought to govern farming covenants would seem to be, that the tenant should have the freest and most unrestricted use of the lands and premises, consistent with the maintenance and yielding up of the freehold at the end of his tenancy in an unimpaired and uninjured condition.

The interest of landlord and tenant coincide in this abstract formula, but its application is interfered with in practice through various reservations by the landlord, and by the endeavour to define and limit the use of the land in such directions as may consort, not with the conditions of greatest production, but the prevention of deterioration of the soil. It would be an obvious waste of time to describe, however concisely, the various forms of agreement, with their almost illimitable number of covenants, which prevail, and control cultivation in various parts of England and Wales. Those whom I address need no description of present conditions of tenancy; but rather that, however incapably, I may indicate the relaxations and modifications, in whatever direction, which appear likely to conduce to increased production without injuriously affecting the interests of the landlord. I propose, therefore, to deal with the separate questions of rent, covenants as to cropping, repairs, and entries between outgoing and incoming tenants.

Rent.—The payment of rent is obviously all-important. Under all forms of tenancy at rack-rent it is prudent to reserve it quarterly; and in the last year or half-year of the tenancy, to reserve the last quarter's rent in advance. This is a protection against a dishonest tenant, and need not be enforced against a good one. The payment of the tithe rent-charge and the consequent letting of farms to the tenants free of tithes has some advantages, inasmuch as the landlord is protected from the contingency of loss by the failure of the tenant to pay the current tithes on his occupation. Where farms are let tithe-free, care must be taken to deduct the tithe rent-charge in arriving at the assessment of the farms for poor-rate and property-tax, so long as the rental of lands is adopted as a basis of rateable value. The payment of land-tax, fire insurance, quit rents, and other exceptional charges, are matters of agreement; but, as a rule, they are best payable by the landlord. How far the preferential position of the landlord over other creditors for rent due is really beneficial to the interests of either party, is open to grave doubt; less care in the selection of tenants doubtless arises under this system, and a thrifty, hard-working tenant is sometimes impeded in obtaining further capital by this special exception in favour of the landlord. One ill consequence is clear—a failing tenant is allowed by the landlord to remain longer on a farm, to its probable deterioration, than if all parties stood on an equal footing.

Covenants as to Management.—These vary so completely in almost every district of England and Wales, that my remarks must necessarily be confined to the broad principles which should influence their application. Where leases for terms beyond 12 years are granted to tenants of undoubted character and capital, I venture to think that no covenants as to cropping are necessary until the last four years of the term. It is a matter of experience that excessive continuous cropping, without the assistance of large quantities of artificial manure, or the fattening of cattle and sheep on extraneous food, is unprofitable to the occupier; hence, with a moderately long interest, a tenant may be reasonably trusted to pursue such a course of management as not to unduly impoverish his land for occupation in the last four years of his tenancy. During this period of free action, some limitations, dependent on the character of the soil and its locality, may be insisted on for the consuming proportions (to be governed by circumstances) of the hay, straw, fodder, root, and other green crops, on the demise. Assuming these conditions, the management of the last four years should be simple, yet stringent in the extreme. The cropping should be limited to two-fifths, half, or two-thirds of the arable land to corn, as the case may be, with moderate proportions of pulse to be harvested. The green and root crops should be consumed on the premises, except under special conditions; and an entry and quital, on convenient and equitable terms, should be clearly defined. The land should be given up clean and in good order; and herein lies the key to the position, if the liberal policy I have indicated is carried out:—The covenants of the last four years of the term should be stringently enforced, and compensation for breach of these, or the terms of quital or of proper and thoroughly cleanly management of the land (not according to custom of country, but according to the best rules of husbandry) should be distinctly insisted upon.

In some of the best-farmed districts of England these conditions are recognised by landlord and tenant, whilst in other localities it is the exception for a farm to be given up in proper condition; and in these latter cases, if the condition and management form the subject of arbitration, the whole matter is too frequently adjusted on terms which are lenient and highly favourable to the outgoing tenant.

At an institution of great importance and consideration, "The Farmers' Club," a paper has recently been read by Mr. Masfen on "Farm Agreements," which, highly valuable and suggestive in itself, has elicited more valuable conclusions in the resulting discussions. I earnestly commend a perusal of this paper and discussion to the members of the Institution of Surveyors. The lecturer refers to, and discusses with much acumen, the farm agreement of Mr. Cadle, for which the Royal Agricultural Society's prize was given in 1868, and the valuable opinions of my friend Mr. Randall, of Chadbury, on the same subject, elicited by a discussion at the Midland Farmers' Club. Mr. Randall has the courage to suggest a new principle for the adjustment of entries between outgoing and incoming tenants, which, like all suggestions from him, deserves the highest consideration. His view is, that no land should be given up to an incoming tenant in a condition of uncleanness, which would cost more than £2 10s. per acre to properly clean. If, in the opinions of the valuers, the cost would be less, the outgoing tenant would be entitled to receive the difference from the incomer; if more, the incoming tenant would be credited with such difference. I am hardly prepared to adopt a datum of £2 10s. per acre, or any larger or less sum, dependent on soil and locality, or to recognise that a tenant should be paid a premium for giving up lands in simply good condition, and thus fulfilling his covenants; but I fully concur in enforcing the severest penalties on the outgoing tenant, whose covenants, whether in the direction of clean farming, cropping, or general dilapidations, have been broken.

The application of this sterner discipline would greatly conduce to improved farming and increased production over an immense area of England and Wales. It is with some hesitation that I include in this paper an outline of the cropping which is adopted on the various soils of England and Wales, inasmuch as the variety of soils and climate produce important and infinitesimal modifications of each course, which are yet further affected by the proportions of arable, pasture, and meadow land on each farm.

On very light soils a five-field course prevails, viz., two-fifths corn, one-fifth roots or green crops, two-fifths Clover and Rye-grass; and where the old ley is broken up, a portion is sown to Rape or Turnips before Wheat. No pulse crop to be harvested in this course.

It is usually within the discretion of the farmer in what order the two-fifths corn crops shall follow.

On lands possessing more staple and of greater depth, the four-field course is almost universally adopted—viz., one-half corn, one-quarter roots, and one-quarter Clover and pulse; the proportion of pulse which may be permissible fluctuates according to the quality of the land from one-eighth to one-twelfth. In this case, also, the sequence of corn and green crops should be at the option of the tenant.

The three-field course, with its modifications converting it in some cases to the six-field shift, applies to the rich, deep, strong soils which, alas! are exceptional over the broad area of England.

Its ordinary formula would be two-thirds corn, one-ninth Clover, one-ninth roots or fallow, one-ninth pulse. It will be obvious that these forms of cropping are merely the skeletons of management, which permit endless modifications of catch crops between corn and roots. With the views previously propounded, it is clear I have only introduced the preceding paragraph to be some guide to the farming of the last four years of a reasonably long term. It is now to be considered how far this elasticity in cropping, which I have ventured to suggest, where long leases are to be granted, may be extended to tenancies determinable by 6, 12, or 24 months' notice. In discussing these conditions I must dismiss, with much regret, the actively operative but apparently sentimental consideration of "good feeling and good understanding" which, however commercially unreliable and unsound, has, over very many large estates in this country, co-existed with excellent farming and large and expensive improvements. It is obvious that, under a yearly or two-yearly tenancy, it would be a most unwise liberality which would concede perfect freedom of cropping or application of all produce to the tenant. In these cases any relaxation of the ordinary covenants as to cropping, or sale of produce ordinarily consumed on the farm, must be coupled with special stipulations as to return of manures or extraneous food to be consumed by the stock. A system of tenant-right, however valuable for the protection of the occupier under these contingently short tenancies, leaves the landlord's interest dangerously exposed, if any general concession as to cropping without limitation or stipulations is made; hence, the landlord or agent of an estate where short tenancies exist must exercise a continuous surveillance of the property, if the remotest departure from rule-of-thumb cropping and covenants is to be permitted. On the other hand, I do think that the cultivation and production of farms under these shorter tenancies may be greatly improved by the concession of a tenant-right for oilcake and artificial manures applied to green crops within a reasonable period of the termination of a tenancy; I do not suggest the details of such tenant-right, but the experience of Lincolnshire and other counties would be a valuable reliable foundation for the extension of the practice over our country.

But, as I conclude this portion of my subject, before me rises the recollection of various localities in England and Wales to which the most sanguine of improvers would scarcely apply the liberally elastic conditions I have suggested. The thin, poor, wet clays, often of considerable elevation, in the damp climates of a line of country extending from Cornwall, through Wales, to Lancashire, Westmoreland, and Cumberland; the weak, hot, burning gravels, and the occasional incompressible sands, where situated in an inhospitable and unattractive district, command, unfortunately, no class of tenants to whom these liberties may be safely granted.

New capital will not be drawn to these places. I say "new capital," because it happens often enough that, through long years of thrift, tenants are found on these farms who have money; but they progress not by producing, but by saving.

The average tenant of these districts lives from hand to mouth, and could not, if he would, supply the conditions which alone justify the relaxation of his ordinary management.

It has been suggested to me, that the further growth of wealth may and will beneficially affect these neglected districts, as it has others, heretofore, seemingly as desolate. I venture, if not to ignore, at least to depreciate this influence in these special cases. The competition will be keener for what is desirable, but will very remotely affect the areas which I have described in such gloomy colours. An advance of the cost of manual labour, and a permanently lower range of corn prices, may and ought to modify the character of produce of these farms. In these cases every aid should be given by the landlord and agent to develop such changes; in these directions it may be possible to concede greater freedom of management.

Covenants as to Keeping Stock.—The ordinary covenants for the keeping a defined number of sheep or cattle on a farm, should obviously be as elastic as the covenants for cropping, which I have indicated in the foregoing remarks. With equal stringency, the maintenance of a full proportion of live stock must be enforced during the last four years.

The management of dairy farms can scarcely be affected by any of the foregoing considerations, except

that a reasonable tenant-right should be given to the occupier of strictly Grass farms for oilcake or other artificial food which he may have consumed during the last two years of his tenancy. Further, the consumption of oilcake or other kindred food during any period of his tenancy should justify the sale of a certain quantity of hay.

Repairs.—Repairs are a large and important feature in farm agreements, and probably lead to more questions, troublesome of solution, between the landlord and tenant, than any other condition of tenure. The ordinary arrangements are—1. Where all repairs are borne by the landlord; 2. Where all are borne by the tenant; 3. Where the landlord provides the materials and the tenant pays the labour; 4. Where the landlord finds the materials and shares with the tenant the cost of labour.

It is obvious that these varied conditions proportionably affect the rent which is payable, and theoretically it would seem to be of little importance by whom the necessary reparation is made; practically, however, it is far otherwise. Left to themselves, and without any liability to make good the wear and tear which inevitably happens to farm buildings, the tenant is too frequently careless of the cost of these repairs, and permits waste and injury to his premises, which, had he an interest in their economical maintenance, would never arise. On the other hand, where the entire onus of repair is thrown on the tenant, he is too much disposed to evade, as far as possible, his liability; hence things go undone which, trifling in themselves at the outset, by the end of a long occupation assume very serious proportions. Arbitrations or legal proceedings are frequently necessary for their settlement, and it is exceptional if, in such cases, the tenant is not relieved of a portion of the liability which, directly or indirectly, should properly fall upon him.

For myself, I am inclined to the belief, that the fourth adjustment of the liability, *i. e.*, the division of the cost of labour by the landlord and tenant, most fairly meets the difficulties of the case.

The tenant's proportion of expenditure is limited to an amount which is more than balanced by the comfort and advantage of the maintenance, in proper condition, of his premises; and to avoid the large liability which is certain to result from neglect of prompt repairs, he will certainly be continually pressing on his landlord or agent the necessity for keeping things in good order.

Let me suggest, as exceptions to the materials to be provided by the landlord, straw for thatching, and glass and leadwork; further, the tenant should be bound to do the carriage of materials for repairs within reasonable distance. As with land, so with buildings, dilapidations at the termination of a tenancy should be more strictly enforced than is now the usual custom; but it is clear that the tenant should be only liable for a legitimate and necessary reparation, and not for restoration or reinstatement.

Entries.—The periods and conditions of entry on farms, and the power to hold over certain portions of the premises after the expiration of the term, by the outgoing tenant, and the right of pre-entry to prepare for Turnips and Wheat, by the incoming tenant, are singularly varied over England and Wales. It would be a waste of your time to describe them in detail; but I rejoice that the energy of some members of this Institution has led to the collection of information upon these points from the body generally, which, when collated and digested, will be as valuable as interesting. It is, however, within the province of this Institution to direct their efforts to a modification of some of the tedious, inconvenient, and expensive conditions by which many entries are now hampered. As an extreme instance of tediousness, I may mention, that in some of the west country Lady-day entries, it is fifteen months after the expiration of a tenancy before the incoming tenant has entire possession of the occupation. I need not again enlarge on the costly character of the Surrey, Sussex, and Kent entries, which really uselessly absorb no inconsiderable portion of a tenant's capital.

Where it is possible, there can be no doubt of the wise policy of the purchase, by the landlord, of a large proportion of the items of these expensive entries, and thus reducing the cost of entry and securing the application of the tenant's capital in more profitable directions. It is obvious that tenants will usually pay at least 5 per cent. in the shape of rent on the capital thus economised; from a variety of causes, it happens that few landlords are disposed to deal broadly with the purchase of these rights. It is, however, for our consideration whether, in granting long leases, it may not be desirable to make some effort to extinguish a portion if not the whole of these outrageous conditions. It is clear that the best entry is that which permits the incoming tenant to set himself down in his occupation at the least possible expenditure of capital without prejudice to the interests of the outgoing tenant.

The Wiltshire Michaelmas entries, for instance, appear to involve these conditions: the incoming tenant has a pre-entry given him for Turnips and Wheat of defined date and area, which he tills at his own discretion, without charge for rent, rates, or taxes. Even in these cases, however, a question of tenant-right crops up. Where the land on which a crop of Turnips has been consumed is given up to an incoming tenant, as an entry for his Wheat crop, custom has, during the last few years, established the payment of half the value of the tillages and artificial manure of such preceding crop to be paid by the incoming tenant. It is a matter of regret that the value of oilcake, or other artificial food, does not, without special agreement, come into the same category; but I am sanguine that custom, in this direction, is being quietly but certainly established.

Game.—It is with some hesitation that I introduce this topic; but the reservation is so usual and important a feature in the ordinary agricultural lease and agreement, that it may not properly be left unnoticed. The political and moral aspect of this question is scarcely within the province of our Institution. Apart from this, I regard the preservation of game and the rights of sporting as a simple matter of agreement between the landlord and tenant. It is, however, to be regretted, that the preservation of ground game and rabbits is occasionally carried to such an extent as to be utterly inconsistent with good cultivation, and too frequently productive of misunderstanding and quarrels between landlord and tenant.

I may now shortly summarise the results which I venture to anticipate from the adoption of more liberal covenants.

Chief amongst them, I am certain of great general increased production of all farm produce, from the conviction that, with perfect liberty of action, a farmer will only sow his land when it is in the fittest and ripest condition for perfecting a crop; the conditions incident to such fitness involving the growth of large proportions of green crop, and the consequent maintenance of a great stock of sheep or cattle.

2. The probability of more permanent occupations of farms by the same tenants. Once free to manage his lands in the fashion which he thinks most profitable, the tenant will be most unwilling to be reduced to the four corners of his cropping covenants in the last years of his term. He will make every effort to remain on his occupation by the payment of the extremest rent, consistent with his getting a living, before the strict covenants as to cropping in the last years of his term would come into operation. I believe that the adoption of these suggestions would necessitate great care in the selection of men of capital and experience as tenants; but I am sanguine enough to believe that it would tend, not only to the benefit of the state, but to the increased income of the landlord, and certainly to the comfort and prosperity of the occupier.

Farmers' Clubs.

CAERMARTHEN.—*Cropping.*—At the last quarterly meeting of this Farmers' Club, Mr. MORGAN, of Llwyn, read a paper on this subject. He said:—

I propose limiting my remarks to the growth and respective values of cereal and green crops, which are generally grown in this country. I shall also adopt as the basis of my remarks the four-course system, which is in my opinion (for at least a certain number of years) the most economical and efficient system of cropping. I say "for a certain number of years," for my own experience has satisfied me that after about 12 years' cultivation under that system, it will be necessary to give such land rest by laying it down in Grass. I will suppose myself entering upon a farm (which has already been treated on the four-course system) at Michaelmas, and will consider what I had best grow in the "Clover lea." I have no hesitation in saying, that if I purpose growing Wheat at all, I would plough it up and set the old red Lamas Wheat in it, taking care that it should be in the middle of October, as I am pretty sure that, taking the average of seasons for the last 15 years, moderately early sown crops have been by far the best. If the Clover crop had been a good average, and had been grazed on the land, perhaps the field would require no autumn dressing with manure; but if in the spring you find your crop does not look as thick and luxuriant as you could wish, I should strongly recommend a top-dressing of nitrate of soda. It has been tried with excellent results by some of the best farmers in our neighbourhood. I think the best time for the top-dressing is about the middle of March, which having been attended to, I think we must then let it take its chance, with the exception of a rolling or two and a run through it, to take care of the weeds. I must here remark that in nine cases out of ten the Wheat is permitted to become sadly over-ripe before it is reaped. The effect is seen not only in the shrivelled, crimped appearance of the grain, and in the scant yield of flour, but common sense and scientific testimony point to an enormous deterioration in the value of the straw. Now, gentlemen, I have intimated a doubt as to the wisdom of growing Wheat at all in this neighbourhood, but especially in the upper part of the county. Having fairly given the matter my best consideration, I have arrived at the conclusion that an Oat crop on Clover lea is the more remunerative of the two. Thus I take the average amount of Wheat grown per acre upon land of 20*s.* rental to be 25 bushels, which at 6*s.* 5¼*d.* per bushel—the average for the last seven years—will make £8 0*s.* 11¼*d.* per acre. Now let us see what Oats, set on the same land and under similar circumstances, will make. We can safely calculate upon a yield of 50 bushels per acre, which, taking the seven years' average at 2*s.* 11*d.*, will make £7 5*s.* 10*d.* per acre. But in favour of the Oat crop you have four whole months' grazing of the land, which cannot be put at less than 5*s.* per acre; then the difference in the cost of seed will amount to 7*s.* 3¾*d.*, leaving an apparent balance in favour of the Wheat crop of 2*s.* 5½*d.* per acre. If these figures are correct, I would ask you, which would you prefer, a field of Wheat or a field of Oats, when you take into consideration the extra risk which attends the harvesting of Wheat? We have not hitherto spoken of the relative value to the farmer of Wheat and Oat straw. And here I shall most likely run counter to the opinions of many, if not all the gentlemen present, for I am going to claim a decided superiority for the Oat straw. I was born and bred in the possession of quite a different idea; nor should I have been convinced now were it not for the observations and arguments of a very intelligent neighbour of mine, backed up as he was by an analysis made by Professor Voelcker. Oat straw heads the list for all flesh and fat-forming properties. Barley straw comes next, and Wheat straw, which is the highest priced in the market, is the least valuable of all. Such being the result, I think I am justified in submitting it to you for discussion. I should add that in my opinion the weight of straw per acre would be in favour of the Oats, while no one can doubt which is the more hardy and most to be relied on, taking the average of soils.

We must now proceed to treat the land preparatory to the next crop, and I shall practically confine myself to the Swedes and Mangels as being the most valuable roots grown for the maintenance of stock. As soon then as the pigs, poultry, &c., have picked up what ears and corn may have remained after hauling, I send in the scarifier with the broad spuds (or tines) on, and scarify it thoroughly 2 or 2½ inches deep, and, if necessary, to secure a thorough paring, I would recommend a cross-scarifying—then harrow it with a light harrow, say once a week till the middle of October—by that time the Grass, roots, weeds, and stubble, will have been reduced into a compost of considerable manurial value. I then spread over it what I consider to be a half-coating of farmyard manure, plough it in as soon as possible, not deeper than about 4 inches. I then shut up the field, leaving it to the mercy of wind, rain, frost, and snow, until the beginning of April, when you will find it reduced to a powder. This time plough as deep as you can—harrow it well—then send the cultivator through it—repeat the harrowing, and unless the land is very stubborn you will find it fit and ready to be cobbed into ridges. Previous, however, to the ridging process, we must remember that it has had only half the allowance of manure; I therefore, to act honestly by the land (for there is nothing that will carry tales sooner), purpose giving the other half now in the shape of articial manure. I have found 2 cwt. of superphosphate, and 1 cwt. of guano per acre, sufficient to produce an excellent crop of Mangels and Swedes. Mangels should always be set before the end of April. I only set as much as is necessary to keep my cattle on from the time that the Swedes are done, *i.e.*, about the latter end of March, until they are turned out to grass. I have found them of very great use for young calves, which I have sometimes housed during the summer months; but there can be no doubt that, in such cases, Vetches or cut Clover are as good as, and more economical than, Mangels and hay. I have frequently kept them in good order till July, and on one occasion I had some quite healthy in the early part of August. Still, I only grow them sparingly, as I have not grown anything like such a weight per acre of Mangels as of Swedes. I should like Swedes to be set during the first fortnight in May. I, last year, set a considerable portion in the last week in April, and a better crop I have never seen. In favour of early setting there is the obvious advantage that then the land is more moist, and better calculated to make the seed vegetate than under the broiling sun of June, when the land, after repeated ploughings and harrowings, is as dry as a bone, and so long as the drought lasts the seed might as well, or perhaps better, have been in the seedsman's warehouse. I am well aware that some object to such early sowing of Swedes, on the ground of their being the more liable to mildew. I can only say that I have not found that to be the case, and have sometimes suspected that the objection has been made merely to cover the farmer's remissness in not setting his crop in good time. I like the ridges raised about 27 inches apart, for then you will be able freely to send between them the horse-hoe, that most important implement in the successful cultivation of green crops. Whatever sins are pardonable in the farmer I can admit no excuse for the man who, having incurred very great labour and expense in setting a field of Turnips, permits the plants to be choked and the land overrun by foul and poisonous weeds. A light roller sent over the ridges prepares the way for the drill, which should have its coulter so as to form a groove for the seed to fall into. There should be no rolling after the seed is put in; for unless the land is perfectly dry it compresses the earth, which, when dried, becomes a hard crust, through which it is useless to expect the young plant to force its way. If we have a plentiful supply of plants I would, as soon as they have got into the rough leaf, send the hand-hoes through them, striking off the unnecessary plants, and only leaving small bunches of four or six at the distances at which you intend growing your permanent crop, and until the plant that is to remain can well dispense with the other's company, which will be when it is about 2 inches

above the ground. I like to see Swedes thinned about 10 inches apart, much preferring two moderate sized to one very large Turnip. They are generally firmer and keep better. I store my Swedes about the end of November, being satisfied that if sown at the time I suggested, they will have reached their full maturity. I have them topped and tailed in the field, charging the men not to cut the leaves too close, for by so doing a considerable quantity of winter food is lost, and the tubers have not so good a chance of standing the frost. I then tilt them about 3 or 4 feet high by as many feet wide, against the high bank of a hedge, running nearly north and south, which, with the assistance of a good covering of refuse of straw, the plasterings of hedges, and such stuff, effectually protects them from frost. I have adopted this simple plan for years, and have found them keep perfectly sound and healthy to the end of March. Mangels require much greater care. I store mine in a house built for the purpose, placing between the Mangels, at thicknesses of about 2 feet, layers of small branches, which act as ventilators, and prevent fermentation setting in. I should remark that Mangels require to be thinned at greater distances than Swedes; I should say about 14 inches, and when drawn the tops should on no account be cut close; for once the crown is cut, the keeping properties of the Mangels are materially injured.

Now, for our last white crop, I would, as a rule, recommend my favourite—Oats; because it is more hardy, and better adapted to the generality of soils than Wheat or Barley. Still, if you have a field suitable for the growth of Barley, it is a crop with which the farmer can hardily dispense. Its feeding properties and its superiority over even Oats in many respects are too well known to require enumerating. But it is only when that oppressive and unjust impost, the Malt-tax, shall have been repealed that the full value of Barley to the farmer will be realised. It only remains for me to advise you to sow, with the Barley or Oats, the very best Clover-grass seeds you can get, although, after the important disclosures as to the enormous adulteration of seeds at our last meeting, the warning may hardly be necessary.

Discussion.

Mr. Jones (Penycoed) said:—It would be just to say that the consideration of the system of cropping would be putting the cart before the horse, unless they considered how to put the land in proper order for sowing seed. Any farmer before he adopted a system of sowing or cropping would first ascertain the qualities of the land he was about to plough. Personally, he was not an advocate for ploughing old land before it had been manured. Farmyard manure, if it could be got, was very good. Lime and earth he often thought good. As to the four-course system he had tried it many years ago, and followed it for seven years. During the first round he found it answer very well, but when he came to the second he found the land too light to bear a heavy crop. That crop was generally Wheat. When the land had been one year in Grass he put in Wheat, which looked very well indeed until it came to the ear; when he found the stem withering at the root, the land being too light to hold it. It was then he discovered that the four-course system would not do. He would tell them what he had been doing since. He afterwards followed the six-course system. First, he had two years in Grass, then he put in Wheat, then he limed it well as he could after the Turnips, and then had a crop of Barley or Oats, according to the nature of the soil. Then he had Turnips, and then Barley or Oats again, according to the seed, then two years in Grass. He had found that system to answer well, and he was still pursuing it.

Mr. Brodie (Tyrdail) said it appeared to him that there was no general rule that could be laid down for cropping. The climate, the quality of the soil, and other things varied so much that a general rule was rendered impossible. For example, look at the rainfall in South Wales. There was one thing which appeared to him certain, viz., that no two crops of any sort should succeed each other. He did not think that was properly acted up to in Wales, and the day seemed to have gone by for having any stringent conditions in leases. He fancied now that if a farmer had got anything in his head, or anything in his pocket, he should never suffer himself to be bound too tightly by a lease. He should go with the times and his own inclination. Of the four-course system he did not approve. He never adopted it himself except upon one small farm, and that had a clay soil. It went on well for a time, but it told upon the land eventually. The land required after some of the crops a good deal of getting up again, as it was exhausted. Mr. Morgan had spoken very much in favour of nitrate of soda. He could not himself say that he had found it very satisfactory. It might do for a hay crop, but nothing else. It was like a man who wanted to get a good deal of work out of himself and so took a few glasses of beer; but on the next morning he would be found very seedy. If they would only notice the land after nitrate of soda had been used, they would find it was not a very profitable thing for the farmer. He might be wrong on the point, but anyhow such was his experience. He did not exactly comprehend what Mr. Morgan meant in his reference to the Malt-tax. He did not think that the Malt-tax had anything to do with cropping.

Mr. Morgan: It has to do with Barley.

Mr. Brodie agreed that if the duty were taken off a corresponding help would undoubtedly follow in favour of the foreigner. He did not see what the country could gain by beer being reduced in price.

Mr. Lewis (Llwynfedwen) said that he thought it would have been more practical if Mr. Morgan had attempted to show what system of cropping was best for Carmarthenshire. But on the contrary, Mr. Morgan had never alluded to any system of cropping; he had been talking only of the rotation of cropping. His own opinion was that when land was worth 25*s.* per acre, it would not answer for any rotation of cropping. It would be better then to keep it in permanent Grass. Besides there was very little land in Carmarthenshire that would produce Wheat to the extent Mr. Morgan had mentioned, viz., 25 bushels per acre. On the average he did not think the best land would produce that quantity. He could speak from experience, because he occupied some very good land himself. He had inferior land, of which it would be nearer the mark to say that it produced the half of 25 bushels per acre. And as to the comparative value of Oat straw and Wheat straw he ventured to say that Wheat straw was the more valuable. It afforded more nourishment to the cattle.

Mr. Harris (Abersannan) contended that in discussing the question of cropping they must ascertain what mode would best help them to pay their rates and taxes. As to the four-course system he believed it was quite practicable if they had a summer fallow. The first thing he would do after having a summer fallow would be to put in a crop of Oats. If after that he could put in a crop of Turnips he generally did so. He believed that was the old system, and they must adopt that until they could gain the opportunity to drain their farms; then they might regularly resort to the four-course system. It was easy enough for gentlemen to talk in theory about what was suitable for Towy-side and what was not suitable, but he wanted to hear something practical; he wanted to hear speakers relate what they had tried to do themselves, and how it answered.

Mr. Jones (Tygwyn) remarked that he could not speak on the subject of cropping, unless he spoke against it. He was quite tired of cropping. Ten years ago he used to cultivate on the average about 40 acres under different crops, but now he had reduced that quantity down to 16. And he saved a good deal by it: he saved a pair of horses and a man, and he repeated that he reckoned that a good deal. Upon the 24 acres formerly under crops he could keep about 20 head of cattle, in fact, he could keep three cows with the Grass formerly required for the two horses. Now, if the farmers present would pause for a moment to reckon up the difference between his former and present situation they would find he was making a better profit now than formerly by cropping. Besides, look at the anxiety when a man had 40 acres of land under corn, and when he saw the thunder clouds gathering and showering down day after day. The anxiety of that man was tremendous. On the other hand the cattle would thrive nicely during the stormy weather. A man's mind was rendered a good deal easier if only owing to that. Then last year the yield of corn had been very indifferent, and they now also found the price down very much. Therefore it was he could not speak at all in favour of cropping. The reason he kept 16 acres under crops was, that he wanted straw.

Notices of Books.

Transactions of the Highland and Agricultural Society of Scotland. February, 1870. W. Blackwood & Sons, 37, Paternoster Row.

The annual volume of Transactions of this Society, which has just appeared, contains an interesting report on North Country Farming, and a number of short practical essays on points in farm practice, with perhaps a preponderance of arboricultural subjects among them. A repetition of reports on the same subject, *e.g.*, on examining horses, and on sheep dipping and smearing, gives an air of sameness and consequent heaviness to the volume, which, however, disappears on a further examination of its contents. We quote from its pages the greater portion of the late Mr. Paterson's essay "On the Propagation of New Varieties of Potatos." Mr. Paterson informs us that after long observation and experience he came to the conclusion:—

"That the Potato plant was only designed to serve its generation, the same as in animal life, and that without a constant and successive renewal from the plum or apple of Potato, it was quite probable that this most valuable esculent might be lost altogether. Before arriving at this conviction," he says, "I planted year after year all the varieties I could obtain from the coldest and warmest countries, used all the manures I could think of, tried by different processes of planting and lifting, by preparing the ground and seed, to arrive at some satisfactory result."

"From 1853 I determined on carrying out my original idea of raising and improving seedling varieties from the plum or apple of vigorous and healthy tubers. The initial difficulty was very great, as Potatos in this country had almost ceased to flower. At considerable expense, I imported them from England, the Cape of Good Hope, Australia, America, and Calcutta, from which (as well as from our own standard kinds) I selected the healthiest tubers, raised them in a field of newly taken-in land, with reed manure, by the side of a stream where the atmosphere was damp. All produced flowers, and most of them apples. The experiment was successful, and from the seed or apple were produced those new and improved varieties which I have now given out to the public, and which are acknowledged to be (at home and abroad) of so much benefit to the community. I now beg leave to lay before the Society the method adopted by me in obtaining and preparing the seed from the plum or apple, which was as follows:—

"When the apple was ripe I gathered and stored them in boxes until the plums in a manner became decayed, then bruised them among water and filtered through a fine sieve, so as to allow the seed to be separated from the pulp. I again had the seed put through a finer sieve, so as to leave it as clean as possible. I next had it dried on a cloth in a dry atmosphere, and kept it safely over the winter.

"I then had it sown in March, 1854, among properly prepared mould, in small boxes placed in a greenhouse. After the seed brairded, so that I could distinguish the most healthy plants, I picked them out in the month of May, and replanted them in an early border, in a garden manured with vegetable mould. I paid every attention until lifting time, when I found most of the tubers not larger than Peas. I then placed them in small flower-pots, and clamped them up, keeping the produce of each plant separate, in a well sheltered garden, so as to secure them from frost.

"In March, 1855, I again replanted the tubers contained in each pot, in separate rows, in a garden a little more exposed than where I had them the former year, and at lifting time I found them of various sizes, the largest not bigger (except the Early Red Kidney) than good seed size. But I could now more easily distinguish the different varieties, and I placed the produce of each kind in separate boxes, and had them clamped up again in the ordinary way for the winter.

"In March, 1856, I planted the contents of each box (cutting the large tubers in two) in a well-sheltered field, on the farm of Dronly, near Dundee, still keeping each variety separate. At lifting time some of the varieties had almost attained marketable size. But still sound data cannot be ascertained until after years of continuous cultivation.

"My aim was to discover new varieties of plants possessing constitutions vigorous enough to enable them to combat successfully both atmospheric and insect adversaries.

"In regard to many of the varieties cultivated by me, and which were found to be magnificent croppers, and of surpassing quality, my hopes were frustrated, as, after years of time, and great expenditure, outlay, and trouble, they had to be discarded, on account of weakness of constitution, being unable to withstand the ravages of disease.

"In 1860, I had about 100 tons, from which I selected as many varieties out of the stock as I thought I could undertake to cultivate and give out true to name. I threw the remainder all together, and both sold and gifted them to English and Scotch growers, in hopes that some good varieties would be selected from them, as many of them were of handsome form, both oval and round shaped, containing an extraordinary amount of farinaceous matter, and flesh as white as milk. I am satisfied this has been the case, from the appearance in the country of a great many varieties of altogether new kinds besides my own named sorts.

"From 1860 to 1863 (the stock at this time having increased to about 1000 tons) I planted them on various farms in Forfarshire and Perthshire. In this year we gave out about 20 distinct named varieties, oval and round shaped, also 16 distinct varieties of kidneys, all of which I have found to be finely formed, rough skinned, heavy croppers, good quality, and all of strong constitution, yielding in many cases from 12 to 20 tons per acre (while from 8 to 12 tons per acre of the other standard kinds is considered a good yield), as also 21 per cent. farina, against 12 per cent. of the Regent kind, which was tested by Messrs. Schiebler & Son, Celle, seedsmen to the King of Hanover. My Victoria, which keeps in perfect order for the table for 12 months, was the richest in farina.

"I planted one field (strong clay soil) on the farm of Kinnaird, Carse of Gowrie. At lifting time, when my Victorias, Blues, and Reds were driven off the field, they looked like well-dressed London ware; weight per acre nearly double that of the other sorts, and no disease amongst them; while the Rocks and late and early Regents were quite black in the carts, and half gone with original disease. These varieties, along with many of the other sorts, have withstood the disease equally well up to the present year, which many growers have testified. I can refer to Mr. William Sturroch, farmer, Burnhead, Auchterhouse; Mr. Bell, farmer, Leoch, and many others, who grew the varieties referred to last year, and found some of them handsome, large tubers, heavy crop, and almost entirely free from second growth; while Rocks and Regents, under the same cultivation, were almost worthless, in many cases, for human food by reason of second growth.

"From reports I have had from almost every quarter, both at home and abroad, there can be no doubt of the superiority of the new varieties, and of the incalculable value they have proved to the community at large.

"When it is borne in mind that each variety has to be kept entirely separate, and this continued for years, it will give some idea of the vast amount of care, trouble, and expense to which the cultivator exposes himself ere he is enabled to judge of the success, or want of success, of his experiment, even in regard to any single variety; and when these varieties are very numerous, as was the case in my experiment, it may very well be conceived that the trouble and anxiety I entailed upon myself was, comparatively speaking, enormous.

"Still, regardless of cost, the benefit to society has been attained at very considerable pecuniary loss to myself—I might say, in fact, almost ruinous.

"Should my system of propagation be carried out hereafter, I would recommend that it be done by Government, or some public body, as it is an experiment far too costly for an individual in ordinary circumstances, even although Potato plums are now to be had in almost any district from my seedlings.

"The meaning of the word 'clamp' is to pit or store for keeping over the winter; it is a term generally used in England for this purpose; and the phrase 'good seed size,' I would place it in comparison with an ordinary sized hen's egg. Large and strong seed have always yielded the heaviest crops in my experience; and to get good seed, Potatos should be planted late in the season, or in cold soil, so that the tuber may not be well ripened. Potato crops grown from seed thus prepared invariably produce a heavier crop, with finer tubers, than seed produced on early soil and fully ripened. I am fully convinced (from past experience) that if strong seed from

the second growth of last year's crop be planted, it will yield a heavy produce. A farmer told me some time ago that he had planted 40 acres of Potatos produced from second growth, and that he never had such a fine crop of Potatos on his farm. It will be remembered that, some years back, the Potatos in many districts were cut down by frost on July 19, when they sprung up again in many cases, and produced a crop of second growth. It was from the seed thus produced that this farmer planted his 40 acres. To show the power of strong seed, I have seen large tubers of my Victoria and Napoleon (planted in a flower border, with a grapeful of seed manure under each plant) grow to the height of 6 feet, and forming a handsome plant, covered with purple flowers (which kept blooming for three months), and many handsome clusters of plums all round the plant, thus forming a very handsome plant for the border; and the crop, when dug in autumn, was most surprising. The Napoleon produces white flowers, which makes an excellent contrast for the border."

Farm Memoranda.

TATTENHALL FARM AND CHEESE FACTORY.—The following account of Mr. Jackson's cheese factory is abridged from the *Chester Chronicle*:—

Mr. Jackson's factory is, of course, only an experiment, but still one conducted on a sufficiently liberal footing to give the system a fair trial. The building which he has adapted for the purpose was used some years ago as a malt-kiln, but it required no very considerable alterations to suit it for cheese making. It is almost 100 feet long and 16 feet wide, except where the manager's apartments are built, where it is broader. As it adjoins the corn-mill on Mr. Jackson's farm, and has besides a good supply of spring water, it possesses all the advantages of site that could well be wished. One of the greatest essentials is to keep the factory entirely free from smells of all sorts, especially those arising from the refuse of cheese. That will be amply secured by the mill-stream running underneath the whole structure, and the current will also supply all the necessary power for turning and grinding purposes, without the use of steam. The place, too, is tolerably cool, and as it is situated near the junction of four roads, and is easily capable of extension, it might be made available for using the milk from as many as 1000 cows. At present the building is only large enough for the produce of 500; and during the first twelve months, Mr. Jackson thinks of confining it to his own, numbering from 100 to 150. The apparatus is not yet quite complete, a turbine wheel and connecting gear having yet to be added, but it is expected to be finished in the course of the present week, and several cheeses have already been made.

At the farther end of the building is a "vessel shed" with folding doors, reached from the outside by a few steps, where the milk in tins will be delivered by the cart which has collected the tins from the milkers. In this shed is also a boiler for preparing the hot water necessary for the various processes, while beneath the floor the turbine wheel referred to will be placed, which will pump spring water, grind the curd, and also hoist the cheeses into the upper storeys of the factory. Adjoining this apartment is the room for conducting the earlier processes of cheese manufacture, while next on the same level is the press-room, connected by a door with the lower apartments of the manager's house. From the boiler in the vessel shed a long pipe runs along by the farther wall the whole length of the building, for the supply of hot water, first for the milk tubs, and then to keep up the temperature of the press-room. And here, we may remark, that one of the most obvious advantages of a factory is, that by the apparatus used the various rooms may be kept at any degree of heat that may be required. In a small farm-house dairy you are very much at the mercy of the sun and the fire; but here, by hot and cold water pipes, you can either raise or lower the temperature in a few minutes, or keep a steady average for any length of time. The cold water is introduced by means of a side pipe receiving its supply from near the top of the mill wheel.

The milk, then, being received from the carts, say, in the evening, and duly tested by the lactometer, is poured into wooden tubs, containing from 90 to 160 gallons, ranged along the chief apartment we have referred to. Round the inside of each of the tubs a continuation of the hot and cold water paper winds, in the shape of a "worm;" and on the cold water being turned on, it circulates about this, effectually keeping the milk cool till morning. The water continually runs away by means of an open channel cut the length of the room, and delivering itself in the stream below. The Americans, it appears, run their water underneath the milk; but a worm, there is no doubt, will answer the purpose better. What cream rises by the morning will be taken off, but mixed again with the milk. Then the stream of cold water is stopped, and by turning another valve the hot water from the boiler is made to run through the same worm until the milk is brought up to the proper temperature for introducing the rennett and annatto. These are put in in definite proportions, according to the weight of milk in the tub, not left to depend upon the dairymaid's judgment. The milk having set, the curd-breaker is introduced. The one Mr. Jackson uses is an American invention, shaped on one side to correspond with the side of the tub, and having the look of a scale with uprights, the bottom of which consists of a great number of cross pieces of sharp-edged tin. When it is pressed down it at once cuts the curd into an infinite number of small cubes. The operation having been repeated sufficiently, a plug is taken out of the bottom of the tub, and a small sieve introduced, and then the whey immediately drains off by the open channel before mentioned, along other pipes, to some slate reservoirs outside the building. The curd is next taken as usual to one of Cornes's Patent Drainers, and there completely drained. Next it is lifted on to the curd-mill, the lower part of which is fitted with a weighing machine, so that the ground curd falling may be weighed, and the proper proportion of salt added. Mixing the salt, we need not say, is an important matter; and no more certain method can be devised than keeping to an exact proportion of each by weight. Then the curd is put into cheese vats and set under the presses. The press room, as we have said, is immediately adjacent, and at present contains about six or eight presses, some of the old sort, in which the weight is imparted by a large stone, regulated by a cog and screw, and some of Cornes's Patent. The former, Mr. Jackson says, give a steadier pressure, and can be raised and lowered through a greater space than the others, though the latter, no doubt, possess their own advantages. The hot-water pipe here is much thicker than in the adjoining room, terminating at the farther end in a sink, by means of which the water may be swilled over the floor when required for cleaning purposes. After the squeezing in the press the process is the same as usual, the cheeses being conveyed to the rooms above by the hoist previously mentioned.

The whey, as we have said, is taken to slate cisterns outside, which will hold 1000 gallons. These cisterns are roofed with slates, put on open so as to allow of a current of air circulating. The whey remains in them for 48 hours, at the end of which period the cream is taken off, and is then put into a pan or bath of hot-water heated to 200°. After that it is poured into cold spring water, which has the effect of removing all the impurities. This process is repeated, and then the cream is put into pots, and when churned produces what is known as whey butter, which, if skilfully manufactured, is little inferior to cream butter. The whey, when done with, will be carted away for the pigs, which, at Mr. Jackson's farm, are fed with it by means of open pipes running along the end of their styes.

The Week's Work.

APRIL 30: *Farmyards* in our southern counties are now cleared of stock and manure, or the manure is turned in the yards preparatory to its application to the land; further north, a week to a month later. Some farmers do not turn the manure, preferring to apply it fresh from the yards. We have practised both plans extensively, and prefer the mean between the two extremes of much rotting and no rotting; results proving that slightly fermented manure, so as to bring it to a uniform quality, if got in with its natural sap, is the best for root crops. Cabbages, &c. Farmyard manure intended for Mangel Wurzel should have nearly double the quantity of common salt, either in the turning or before, than that intended for Swedes and Turnips; or the extra quantity should be applied to the land at the time of sowing.

Cabbage Plants from the autumn sowing are planted from the beginning of April to the close of May, according to the season, &c. The land is either cultivated and manured in the autumn or in spring a month before planting, as directed for seed. If manured in the spring the artificial fertilisers may be sown over the farmyard manure. If the latter has been applied in autumn, give the ridges a stroke with a light harrow, sow the artificial manures broadcast, then set up with a double mouldboard plough, roll, and plant. "April showers" are favourable for the latter operation, and it is usual to calculate about 5000 Drumhead plants to the acre, but the quantity depends upon the distance between the plants each way.

Turnip Fallows are now worked chiefly with cultivators, so as to keep the winter-made mould upon the surface and retain the natural sap in the land. But old pastures that have been pared and burned, and peaty soils that have been stifle burned, require, as soon as the ashes are spread, to be ploughed and cross-ploughed from 3 to 4 inches deep, clod-crushed and harrowed, so as to incorporate the ashes and reduce the staple; an additional 3 inches of fresh soil are then brought up with the plough, broken down and mixed by means of the harrow, cultivator and clod-crusher. The land is then allowed to lie until the end of May or beginning of June. The last operation should be rolling, to keep in the sap. A heavy shower is favourable to the process of fallowing—a good dressing of sewage or liquid manure is better.

Mangel Wurzel Sowing.—When the land has been manured in the autumn the work at this season is light, as artificial manures and the seed are both drilled into the land, the former in a liquid or dry state as the weather requires. But when the land has to be manured at the time of sowing, it is otherwise, as the several operations require to be performed with expedition and regularity, so as to get the seed in with the sap, and thus ensure a sufficiency of plant. From 6 to 7 lb. of seed per acre should be drilled in and lightly covered with not more than half an inch of fine mould. The rollers of the seed-drill are seldom sufficiently heavy, with the greatest hand-pressure put upon them, to compress the soil properly; hence many roll a second time with a heavy roller. The plant is a greater consumer of common salt than any of the other cultivated crops—about twice that of the Swede. The latter consumes more potash and lime, so that the farmyard manure for the two crops requires to be doctored differently. About 2 cwt. of salt to 1 cwt. of superphosphate should therefore be sown over the farmyard manure, if the salt has not previously been applied to the manure in the yards. The better plan is to salt the manure in the yards as the other crops require, and to give the extra allowance, about weight for weight, along with the superphosphate, at the time of sowing, say 2½ to 3 cwt. of each.

Sugar-Beet is sown about the same time as Mangel Wurzel, and the cultivation of the two closely resemble each other, with the exception that Sugar-Beet is grown closer every way, the rows being 12 to 20 inches apart, and the plants in the row as close as they can be grown, to weigh not more than 4 lb. each; consequently from 10 to 14 lb. of seed is required per acre. Sow in a good season, and keep the horse and hand hoe going afterwards.

The Dairy.—Cheesemaking and butter-making both begin to grow in importance with the Grass. Milch cows should be gradually shifted from winter to summer food. For this purpose sewage or irrigated meadow Grass, Rye, or other early green forage should be cut up with their hay into chaff, mixing less and less hay as they take to their summer dietary. Practically speaking never allow the Grass to physic the cows, or it will affect the milk, butter, and cheese both in quantity and quality.

Swine.—The last litter of 1869 will be now well advanced. The first of the current season are coming forward, and the sows may have the boar for their second litter. Avoid the old rule of an excess of washy food if you wish healthy pigs and fine pork.

Sheep.—Fat lamb is now plentiful, or should be, all over the lowlands, South and North. About the middle of April blackfaced and Cheviot ewe flocks begin to leave the lowland pastures of the North of England and of Scotland, where they have been kept during the winter, and on their arrival in their native walks the lambing season commences. In early seasons the mountain grasses are ready for the ewes, two or three varieties of the Cotton-grass being in flower. In late seasons it is often otherwise. But shepherds contrive to leave a good deal of rough forage in the autumn, which in point of fact the sheep will not then eat; but in spring, when the early grasses grow up and mix with it, both breeds find enough to carry them through at this season. *W. B.*

Markets.

HOPS.

BOROUGH MARKET, April 29.

Messrs. Pattenden & Smith report an improved demand for all descriptions of both English and foreign, late rates being fully maintained.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, April 28.

Prime Meadow Hay	77s. to 82s.		Clover, old	110s. to 126s.	
Inferior do.	60	70	Inferior do.	80	95
Rowen	50	65	Prime 2d cut	100	110
Inferior do.			Inferior do.	80	90
Straw	26	30	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, April 28.

Sup. Meadow Hay	82s. to 90s.		Inferior Clover	95s. to 112s.	
Inferior do.	70	76	New do.	—	—
New do.	—	—	Straw	30	35
Superior Clover	123	130	JOSHUA BAKER.		

WHITECHAPEL, Thursday, April 28.

Fine Meadow Hay	76s. to 85s.		Prime old Clover	120s. to 130s	
Inferior do.	60	70	Inferior do. do.	90	100
Prime New Hay	—		Prime 2d cut do	—	—
Inferior do.	—		New Clover	105	112
Straw	24	28	Inferior do	80	90

ENGLISH WOOL.

CURRENT PRICES OF ENGLISH WOOL. Per lb	s. d.	s. d.
FLEECES—Southdown hoggets	1 1	to 1 2½
Half bred ditto	1 2	— 1 2
Kent Fleeces	1 3	— 1 4
Southdown ewes and wethers	0 9½	— 1 1
Leicester ditto	1 2	— 1 3
SORTS—Clothing	0 10	— 1 6
Combing	1 0	— 1 8

METROPOLITAN MEAT MARKET.—April 28.

Best Fresh Butter .. .. .. 16s. per dozen lb.
Second do. do. .. .. 13s. "
Small Pork, 5s. 0d. to 5s. 8d.; Large Pork, 4s. 0d. to 4s. 8d. per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY April 25.

The number of Beasts is larger than on Monday last; the demand has, however, increased, and prices are rather higher on the average. English Sheep are not plentiful, and choice qualities are rather dearer; foreign are a little lower. Choice Lambs are in request at fully late rates, but trade is very dull for middling qualities. Calves are rather lower. Our foreign supply consists of 755

Beasts, 7860 Sheep, 172 Calves, and 20 Pigs; from Scotland there are 213 Beasts; from Norfolk and Suffolk, 1760; and 438 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4 10	to 5 2	Best Long-wools	—	to —
Best Shorthorns	4 8	5 0	Do. Shorn	4 6	4 10
2d quality Beasts	3 4	4 0	Ewes & 2d quality	—	—
Best Downs and Half-breds	—	—	Do. Shorn	3 10	4 4
Do. Shorn	4 10	5 2	Lambs	7 0	8 0
			Calves	3 6	5 6
			Pigs	3 8	5 8

Beasts, 3166; Sheep and Lambs, 27,163; Calves, 196; Pigs, 130.

THURSDAY, April 28.

Our supply of Beef is rather larger than on Thursday last, but the demand is brisk, and best quality rather dearer. The Mutton trade is also better, with slight increase in values. Lamb is slow of sale, at reduced prices. Veal is also lower, the supply being in excess of the demand. Our foreign supply consists of 290 Beasts, 2980 Sheep, and 416 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4 10	to 5 4	Best Long-wools	—	to —
Best Shorthorns	4 8	5 2	Do. Shorn	4 6	5 0
2d quality Beasts	3 4	4 0	Ewes & 2d quality	—	—
Best Downs and Half-breds	—	—	Do. Shorn	3 10	4 4
Do. Shorn	4 10	5 4	Lambs	7 0	8 0
			Calves	3 6	5 6
			Pigs	3 8	5 8

Beasts, 815; Sheep and Lambs, 11,700; Calves, 570; Pigs, 10.

MARK LANE.

MONDAY, April 25.

There was a moderate supply of Wheat from Essex and Kent to this morning's market, and a brisk demand for the same, at an advance of 1*s.* per qr. upon the prices of this day se'nnight. The attendance was fair; foreign Wheat met a good consumptive inquiry, at a like improvement. Barley, Beans, and Peas were fully as dear, and Oats 6*d.* to 1*s.* per qr. higher since this day week. Flour brought the extreme rates lately current.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	39	46	Red	36	45
— — fine selected runs.. do.	43	50	Red	39	47
— — Talavera	53	55			
— — Norfolk	—		Red	—	
— — Foreign	48	52			
BARLEY, grind. & dist. 26 to 30	Chev.	39	42	Malting	34	38
— Foreign .. grinding and distilling	22	25	Malting	39	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire.. Potato	24	26	Feed	—	
— Irish Potato	23	25	Feed	21	24
— Foreign ..... Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan .... 30*s.* to 37*s.* Tick	31	49	Harrow	31	49
— Pigeon .... 50*s.* to 56*s.* Winds	—		Longpod	—	
— Foreign Small	41	43	Egyptian	38	40
PEAS, White, Essex, and Kent .. Boilers	32	42	Suffolk	35	43
— Maple, 41*s.* to 45*s.* Grey	32	42	Foreign	31	37
MAIZE	—		Foreign	29	31
FLOUR, best marks delivered.. per sack	36	40			
— 2d ditto	25	37	Country	25	37
— Foreign .. per barrel	22	25	Per sack	29	55

WEDNESDAY, April 27.

Fresh up to Mark Lane this morning the receipts of Wheat from Essex and Kent were only moderate; the trade was steady, and the quotations were well maintained for fine qualities. Fair supplies of foreign Wheat were on the stands; sales progressed slowly at about late rates. Moderate supplies of Barley were on offer; the trade was very quiet, but prices were firm. Malt was inactive, at late rates. Oats were in moderate supply and fair request, at previous quotations. Beans and Peas were steady on former terms. Flour was quiet, but at full rates.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch	Qrs. 750	Qrs. 300	Qrs. —	Sacks. —
Irish	—	—	—	—
Foreign	5220	239	11,350	200 2650 brls.
	5970	539	11,350	

LIVERPOOL, April 26.—There has been a good attendance, and millers have bought to a fair extent, at an advance of 1*d.* on both white and red Wheat. Flour in fair demand, and rather dearer. Beans 6*d.* per qr. higher. Oats and Oatmeal difficult to sell. Peas nominally unaltered. Indian Corn in very limited demand, and 9*d.* per qr. lower on the week.

AVERAGES.

	Wheat.	Barley.	Oats.
Mar 19	41*s.* 9*d.*	34*s.* 4*d.*	21*s.* 1*d.*
— 26	42 5	34 5	21 2
April 2	42 5	35 0	21 5
— 9	42 8	34 11	20 9
— 16	42 10	35 7	21 8
— 23	42 7	34 11	20 8
Average ..	42 5	34 9	21 1

SEED MARKET.

Although the season is now somewhat advanced, our markets during the past week have been well attended, and a fair amount of business has been transacted. Values of all descriptions are maintained with great firmness, and in no single article has there been any giving way in price. The stocks of new red seed which will be left over will, without doubt, be exceedingly light. We have a brisk inquiry for sowing Rape seed, which must be quoted fully 3*s.* per qr. dearer on the week. White Mustard seed is also very firm. Spring Tares are in good request, at unaltered currencies. In bird seeds we have no change to report.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

"Economy.—Seeds Direct from the Growers."

James Carter & Co.
Seed Growers
237 and 238, HIGH HOLBORN, LONDON, W.C.

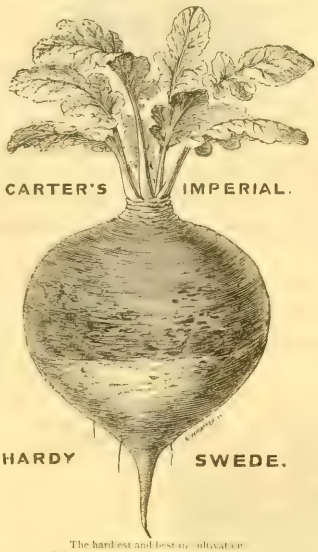

The hardiest and best mangel ever grown.

9d. per lb. Cheaper per cwt.

CARTER'S LONDON SWEDE, the largest variety	Per lb	0*s.* 9*d.*
SKIRVING'S LIVERPOOL SWEDE	,,	0 7
HALL'S WESTBURY SWEDE	,,	0 9
Cheaper per cwt. or bushel		

Carter's New Champion Intermediate Mangel. (1s. per lb.)

CARTER'S WARDEN PRIZE MANGEL, the finest globe variety	Per lb	1*s.* 6*d.*
ORDINARY YELLOW GLOBE MANGEL	,,	0 8
CARTER'S MAMMOTH LONG RED MANGEL	,,	1 6
IMPROVED RED GLOBE MANGEL	,,	1 0
Lowest price per cwt. on application		

EVIDENCE OF QUALITY.

From W. GOSLEE, Esq., *Paddockhurst, Sussex, Dec.* 1, 1869.

"You will be pleased to hear that I have again won the Cup for Red Mangels grown from your seed. This is the 14th year in succession that I have taken this prize."

From Mr. R. BELLETT, *Kilmalaska, Oct.* 25, 1869.

"Mr. Reynish took First Prize at our Show with Carter's Warden Mangel and Carter's Imperial Swede."

Carter's Devonshire Grey-stone Turnip,

Of quick growth, and very fine quality.

1s. per lb. Cheaper per cwt.

POMERANIAN WHITE GLOBE TURNIP	Per lb	0*s.* 9*d.*
LINCOLNSHIRE RED GLOBE TURNIP	,,	0 9
IMPERIAL GREEN GLOBE TURNIP	,,	0 8
CARTER'S EARLY NIMBLE, or Six-week TURNIP	,,	1 0

JAMES CARTER AND CO.,
237 and 238, HIGH HOLBORN, LONDON, W.C.

RICK-CLOTHS, NEW and SECOND-HAND, with POLES, PULLEYS, &c., complete.
An Illustrated Catalogue post free on application

Address, BENJAMIN EDGINGTON (a full), 2, Duke Street, London Bridge, S.E. No other Establishment

E. AND F. CROOK'S POULTRY APPLIANCES of every description, as supplied to Her Majesty, the Nobility, Gentry, Farmers, &c., at home and abroad.

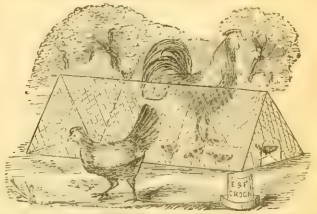

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Land and Premises Inspected. Designs and Estimates submitted for Erecting Poultry Houses and Yards, Aviaries, Pheasantries, &c., to any extent, in town or country.

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To Agriculturists.

GREEN'S PATENT HIGH-PRESSURE BOILERS, with Inverted Cylinder Engine combined. Simple and substantial in construction. The Boiler can be used for Steaming purposes. Specially adapted for Farm use

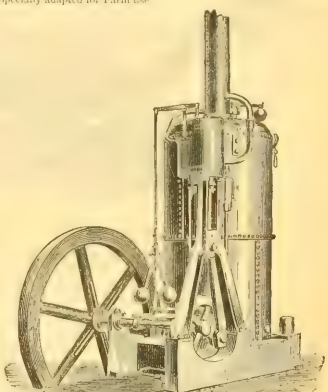

The above Engines and Boilers occupy a very small space, requiring no brickwork or foundation. They are sent out in complete working order, ready for immediate use. From 1 to 50 horse power always in stock or in process of manufacture. Drawings and prices free on application to

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

WILLIAMS' PATENT "ARCHIMEDEAN" AMERICAN LAWN MOWER

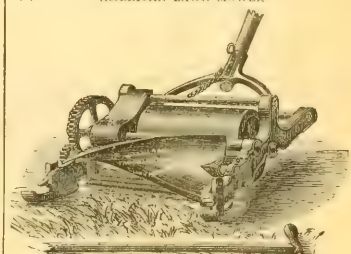

Is the only Lawn Mower that CUTS WET or LONG GRASS WITHOUT CLOGGING, it also enabling the machine to work it in the morning or cool of the day, instead of waiting for the grass to dry, and toiling under the heat of a mid-day sun, it is very easy to work, and will preserve its perfect cut without treading over mounds or slopping banks. NEVER INJURING THE ROOTS OF THE GRASS, which is the due cause of the brown, dead looking spots on lawns in midsummer; use our Machine but a few weeks, cutting the Grass once a week as the season demands, and you will perceive a great and decided improvement in your lawn.

"Far superior to any of ours."—*Vide The Field.*

"Remarkably easy to work."—*Vide Gardeners' Magazine.*

"The quickest, most simple, and most efficient Mower ever used."—*Vide Gardeners' Chronicle.*

Catalogues and Opinions of the Press, post free on application.

Manufactured and Sold by the Owners and Patentees,

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Wholesale Agent: JOHN G. ROLLES, Old Swan Wharf, London Bridge, E.C.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

PATRONIZED BY

HER MOST GRACIOUS MAJESTY THE QUEEN

ON FORTY-FIVE DIFFERENT OCCASIONS.

H.R.H. THE PRINCE OF WALES.

THE KING OF THE BELGIANS.

THE EMPEROR OF THE FRENCH.

THE EMPEROR OF RUSSIA.

AND MOST OF THE NOBILITY, CLERGY, AND GENTRY IN THE UNITED KINGDOM.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last six years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—

1st. Simplicity of Construction, every part being free of access.

2nd. They are worked with far greater ease than any other Lawn Mower. **3rd. They are the least liable to get out of order.**

From the fact that these Machines are so well known in Great Britain and Ireland, also on the Continent of Europe, upwards of 56,000 being now in use, T. GREEN AND SON do not deem it necessary to trouble the Public with a List of the numerous Testimonials they have received from time to time, but would add

THEY ARE THE ONLY MACHINES IN CONSTANT USE AT

THE ROYAL HORTICULTURAL SOCIETY'S GARDENS, SOUTH KENSINGTON.
THE ROYAL BOTANIC GARDENS, REGENT'S PARK.
THE CRYSTAL PALACE COMPANY'S GARDENS, SYDENHAM
BUCKINGHAM PALACE GARDENS.
MARLBOROUGH HOUSE.
THE HYDE PARK GARDENS.
THE WINTER PALACE GARDENS, DUBLIN
THE DUBLIN BOTANIC GARDENS.
THE LIVERPOOL BOTANIC GARDENS.
THE LEEDS ROYAL PARK.
THE HULL BOTANIC GARDENS.
THE BOTANIC GARDENS, BRUSSELS.
THE SUNDERLAND PARK.
THE PRESTON PARK.

AND IN MOST OF THE PRINCIPAL PARKS, SQUARES, ETC., IN THE UNITED KINGDOM.

HORSE, PONY, AND DONKEY MACHINE.

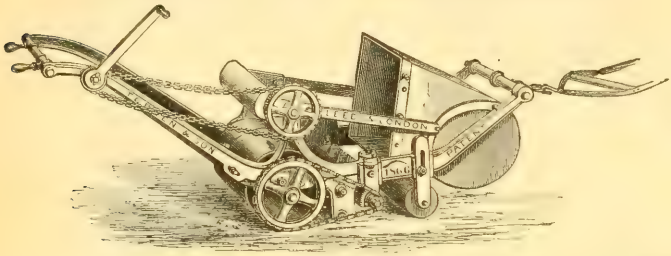

PRICES of HORSE, PONY, and DONKEY MACHINES, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness.

DONKEY AND PONY MACHINES.

To cut 26 inches	.. ..	.. £13	0 0
,, 28 inches	.. ..	.. 15	0 0
,, 30 inches	.. ..	.. 17	0 0
Leather Boots for Donkey	..	.. 0	18 0
Ditto for Pony	.. ..	.. 1	2 0

HORSE MACHINES.

To cut 30 inches	.. ..	.. £21	0 0
,, 36 inches	.. ..	.. 24	0 0
,, 42 inches	.. ..	.. 27	0 0
,, 48 inches	.. ..	.. 30	0 0
Leather Boots for Horse	..	.. 1	6 0

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away, or in any way damaging the Machine.

HAND MACHINE.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned unconditionally.

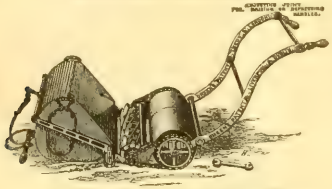

PRICES OF HAND MACHINES.

To cut 10 inches	.. £3	10	0
,, 12 inches	.. 4	10	0
Suitable for a Lady.			
To cut 14 inches	.. £5	10	0
,, 16 inches	.. 6	10	0
Suitable for one person.			
To cut 18 inches	.. £7	10	0
,, 20 inches	.. 8	0	0
,, 22 inches	.. 8	10	0
,, 24 inches	.. 9	0	0
Suitable for two persons.			

Packing Cases are charged at the following low rates, viz.:—For the 10 and 12 inch Machine, 2s.; 14 and 16 inch, 4s.; 18 and 20 inch, 5s.; 22 and 24 inch, 6s. Parties providing themselves with Lawn Mowers are recommended to purchase the cases in which to stow them away when not in use, to prevent them from getting damaged; if returned, two-thirds will be allowed for them

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Ireland, and Scotland.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.
T. GREEN AND SON did not exhibit at the Paris Exhibition, 1867.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again. Directly the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other

N.B. All Orders are executed on the day they are received, either from our Leeds or London Establishment.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	..	..	..	..	..	£4	0 0
20 ,, 22 ,,	..	..	..	..	..	3	2 6
16 ,, 17 ,,	..	..	..	..	..	2	10 0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

Every Machine and Roller is warranted to give entire satisfaction, and, if not approved of, can be returned at once unconditionally.

T. G. AND SON have a large quantity of LAWN MOWERS in stock (upwards of 2000) at their Leeds and London Establishments; also various other kinds of HORTICULTURAL and AGRICULTURAL IMPLEMENTS, GARDEN SEATS and CHAIRS, FOUNTAINS, VASES, PLAIN and GALVANIZED WIRE NETTING, &c.

Having very extensive Premises in London, we are in a position to do all kinds of Repairs there, as well as at our Leeds Establishment.

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PENDANTS, GARDEN SEATS, EDGING TILES,

AND EVERY KIND OF

TERRA COTTA GARDEN ORNAMENT.

All the TERRA COTTA Manufactured by Messrs. H. D. & Co. is made of the best material, burnt extra hard, and

WARRANTED IMPERISHABLE.

PRICE LISTS ON APPLICATION AS ABOVE.

Indestructible Terra-Cotta Plant Markers.

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Vases and Fountains, for the Garden and Conservatory.

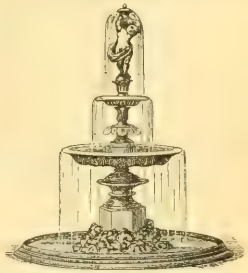

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The Britannia Iron Works have for the last 40 years been well known for the production of fine Iron Castings. The use of Cast-iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra cotta. Cast-iron Vases, if occasionally painted, are imperishable, and will not crack when exposed to wet or frosty weather.

Five large Sheets of Designs and Price Lists post free for 6 stamps. A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom

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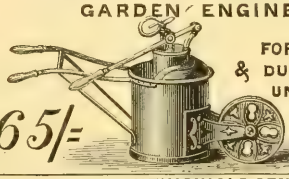

FOR STRENGTH & DURABILITY UNEQUALLED.

65/-

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Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

8, CRESCENT, CRIPPLEGATE, LONDON, E.C.

No. 547A.

GARDEN ENGINE.

10 Gallons	..	£3	0 0
16 ,,	..	3	16 0
24 ,,	..	5	1 0
28 ,,	..	5	13 0

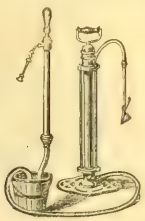

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Useful for every variety of purpose—in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.

Price, complete £1 8 0

Small size for the hand, as an ordinary Syringe .. 0 15 0

THE CRYSTAL PALACE

GARDEN or FIRE ENGINE.

No. 35.

CAST-IRON PUMPS.

2½ inches	..	£1	9 0
3 ,,	..	2	2 0
3½ ,,	..	2	7 0
4 ,,	..	2	15 6

No. 579½.

SWING

WATER BARROW.

20 Gallons	..	£2	2 0
30 ,,	..	2	14 0
38 ,,	..	3	18 0
50 ,,	..	5	14 0

SURVEYS MADE

IN ANY PART OF THE COUNTRY,

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PLANS PREPARED

FOR THE

GENERAL ARRANGEMENT AND LAYING-OUT OF

STRUCTURAL GARDENS.

APPLY FOR

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BOOK OF DESIGNS.

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Horticultural Builder &

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PREPARED FOR

FIRST-CLASS

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CARRIED OUT.

Bee-Hives.—Two Silver Medals Awarded to GEO NEIGHBOUR AND SONS, at the Paris Exhibition of 1867 The only English Exhibitors who obtained a Silver Medal for Bee-hives

NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE, as originally introduced by GEORGE NEIGHBOUR & SONS, working three bell glasses, is neatly and strongly made of straw; it has three windows in the lower Hive This Hive will be found to possess many practical advantages, and is more easy of management than any other Bee-hive that has been introduced.

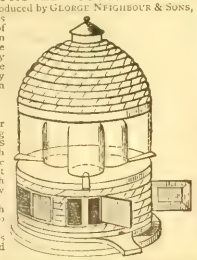

Price complete .. £1 15 0
Stand for ditto .. 0 10 0

The LIGURIAN or ITALIAN ALPINE Bees are much in repute, G. N. & SONS supply a swarm of Bees with genuine Italian Queen, in the Improved Cottage Hive, at £3 4s. Hive made of Deal will shortly have wholly yellow Italian Up Bees

An Italian Alp Queen, with full directions for uniting to Black Bees, 5s. each

ENGLISH BEES — Stocks and Swarms may be obtained as heretofore

A newly arranged Catalogue of other Improved Hives, with Drawing and prices, sent on receipt of two stamps

Address GEO NEIGHBOUR AND SONS, 127, High Holborn, W.C.; or 149, Regent Street, London, W.

AGENTS—Liverpool JAMES CHIPPERT, 12, Clayton Square Manchester I. WILSON, 69, Kennedy Street Dublin JOHNSTON BROTHERS, 10, Dame Street Glasgow AUSTIN & MCASLAN, 16, Buchanan Street

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The planter sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F & G. ROSHER, Manufacturers, Upperground street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.

WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.

To be obtained, F. & G. ROSHER, at their premises as above

SILVER SAND (KEIGATE), at the above addresses—1 ton per Ton, 1s. 2d.; 1 bushel, 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more Samples of Sand by post on receipt of stamp.

FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.

F. & G. ROSHER.—Addresses see above.

N.B. Orders promptly executed by Railway or Vessel. A liberal discount to the Trade

Cottam's Iron Hurdles, Fencing, and Gates.

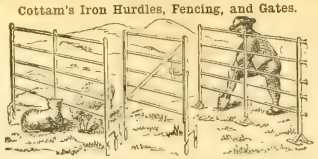

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

Their advantages are—Portability, neat features, removable at pleasure, no Woodwork or Paint on to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cheap, durable, and impervious to infection, being all of Iron. Prices of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street opposite the Pantheon, Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent

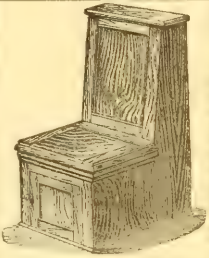

MOULE'S PATENT EARTH SYSTEM.

From Mr. W. GILBERT, *Lawford Street, Rugby*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle at all, by having by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Moule Closets, Rose Trees, a couple Cupressus, put into a bucketful of water), and this summer I ever had in my life. They have been admired by every one who has seen them

"W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

INDIA-RUBBER GARDEN HOSE, 60 feet ¾ inch hose, with brass tap, rose, and jet complete, 19s. 6d. 60 feet ½ inch do. do., extra strong, 21s. 6d Carriage paid to all Railway Stations in Great Britain Price Lists of every article made in India-rubber forwarded on application to E. G. CAPON, India-rubber Manufacturer, Quadrant, Birmingham.

THE HYDRONETTE (ROBIN'S PATENT),

FOR GARDENS, GREEN-HOUSES, CONSERVA-TORIES,

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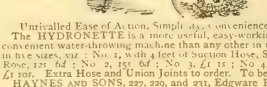

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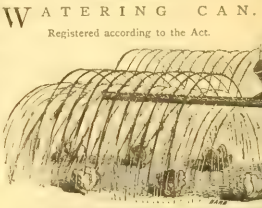

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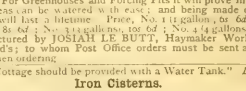

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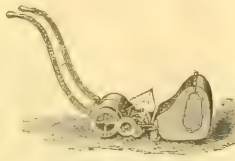

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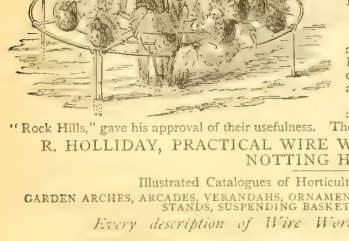

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Buckinghamshire—Vale of Aylesbury.
To Nurserymen, Market Gardeners, and others desiring investments in a first-class Market-Gardening Country, within the short distance of the Aylesbury Railway Station, improving Land and Market Town of Aylesbury, and having speedy communication with London by means of the London and North-Western and the Great Western Railways.
MESSRS. GARSIDE and SON are instructed to offer for SALE by public AUCTION, at the George Hotel, Aylesbury, on WEDNESDAY, May 18, at 4 o'Clock P.M., in 26 Lots, an important FREEHOLD and TITHE-FREE ESTATE, known as "Stone Park," situate in the Parish of Stone and Waddesdon, comprising the Stone Farmhouse, and large and commodious Yards, Farm Buildings, and Homestead, situate in the village of Stone, public House, the Market and Accommodation Lands, in and adjoining the village of Stone, and containing altogether about 338a. 2r. 22p., lately in the occupations of Mr. Walter Crook, Messrs. Kirby & Search, and partly in hand.

Lot 1.—Lands in the Eythrop Valley and adjoining	..	157	3 14
Lot 2.—The Stone Farm House, Farm Buildings, Homestead, Lands and Cottages	..	83	3 38
Lot 3.—Sink Close and Market Garden adjoining. This Lot has an aspect and soil scarcely to be excelled for Garden Cultivation	..	11	3 7
Lots 4 to 15 inclusive.—Butts Furlong, divided into Lots, varying in extent from 2a. 2r. 0p. to 2a. or 3p., suitable for Market Garden Cultivation	..	25	2 16
Lot 16.—Nursery Wood and Market Garden Cultivation	..	25	1 8
Lot 17.—The Downs and Unenclosed Land	..	21	0 11
Lots 18 to 26 inclusive.—Townsend Piece, now in cultivation as Market Garden Land, divided into Lots varying in extent from 0a. 2r. 13p., to 1a. 0r. 12p.	..	7	3 24
	Total ..	338	2 22

Detailed particulars, with Plans and Conditions of Sale, are in course of preparation, and may be had one month before the day of sale: of Messrs. BERKELEY AND CALCOTT, 87, Lincoln's Inn Fields, London, W.C.; or of J. J. BUSH, Esq., Land Agent, Hilperton Grange, near Trowbridge, Wiltshire; and of the Auctioneers, Aylesbury; or by post on application.

HORTICULTURAL BUILDINGS OF EVERY DESCRIPTION

DESIGNED, BUILT, AND EFFICIENTLY VENTILATED AND HEATED.

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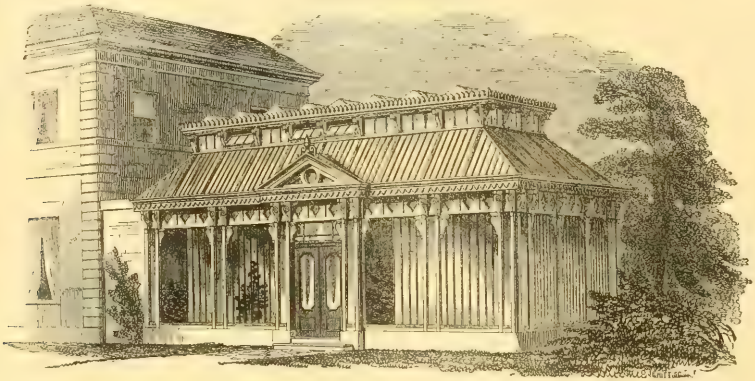

Ornamental Lantern and Ridge-and-furrow Roofed Conservatory.

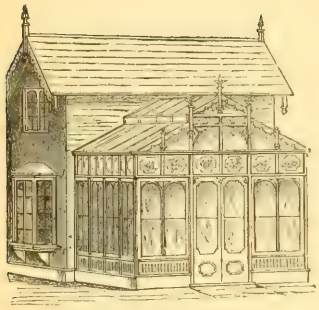

Elizabethan Conservatory.

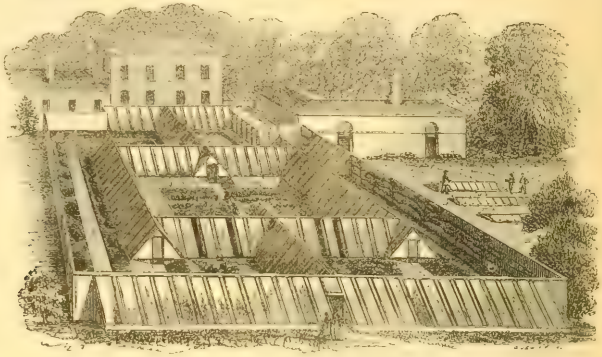

Winter Garden composed of Sir Joseph Paxton's Patent Roofs.

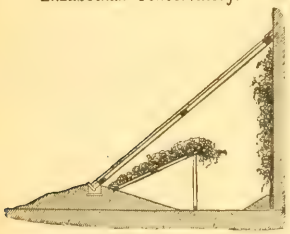

Peach Wall Cover.

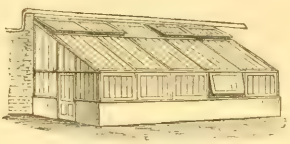

Lean-to Greenhouse.

Cheap Vinery or Orchard House.

PRICE LISTS OF

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For the Million, on application.

A Pamphlet, with several Illustrations, Testimonials, &c., for 2 stamps.

Estimates given for any Style of Building, on receipt of full particulars of sizes, with a rough sketch.

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Erected complete in any part of the kingdom.

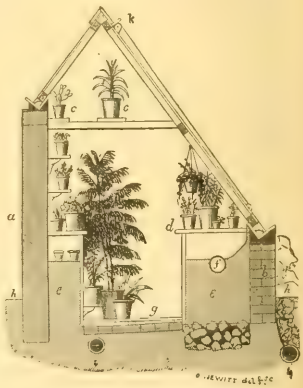

Cheap Semi-Span Greenhouse.

HEREMAN AND MORTON,

14, TICHBORNE STREET, REGENT'S QUADRANT, W. (formerly at PALL MALL EAST), LONDON.

HORTICULTURAL BUILDERS AND HOT-WATER ENGINEERS.

Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 19.—1870.] SATURDAY, MAY 7. { Price Fivepence. / Stamped Edition, 6d.

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ROYAL BOTANIC SOCIETY, Regent's Park.—EXHIBITIONS of PLANTS, FLOWERS, FRUIT, and WORKS of ART, WEDNESDAYS and THURSDAYS, May 25 and 26, June 22 and 23, July 6 and 7. Tickets on or before May 14, 4s.; after that day, 6s. each. AMERICAN PLANTS, June 1 to 14. NEXT MEETING for the ELECTION of NEW FELLOWS, May 14. Candidates, to be in time for the first great *Fête*, should send in their Nomination Papers before the 14th.

READING HORTICULTURAL SOCIETY.—The SPRING SHOW will be held on FRIDAY, May 27 (by permission of the Mayor), in the Abbey Ruins, Reading. A Band will attend as usual. The Show will be open to the holders of Subscriber's tickets at 11 o'clock, and to the Public at 4 o'clock, on payment of 1s. Schedules and tickets may be obtained of the Hon. Secretary,
CHARLES COLLINS, Esq., 34, Chain Street, Reading

SPALDING HORTICULTURAL FETE.—FLOWER, FRUIT, &c., SHOW.—The ANNUAL EXHIBITION will be held in the Gentlemen's Borough-Fee Hall, on THURSDAY, June 21. Band of the Royal House Guards attends. Schedules on application to GEO F BARRELL, Hon Sec.

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870. PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, with Forms of Entrance, on application to
F. G. BUCKLE, Secretary, Peterborough

BIRMINGHAM ROSE SHOW, July 7 and 8.—For PRIZE LISTS, apply to M. A. FORREST, Secretary, Cherry Street, Birmingham.

Fruiting Sized Vines.

E. G. HENDERSON AND SON have still the above on hand, of excellent quality, full of fruit-buds.
Wellington Nursery, St. John's Wood, London, N.W.

WEBB'S PRIZE COB FILBERTS, and other PRIZE COB NUTS and FILBERTS.—LISTS of these varieties from Mr. WEBB, Calcot, Reading.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, Vines, and Figs. RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

AUCUBA POLLEN.—One dozen flowers for 1s., four dozen for 3s., sent post free on receipt of stamps by JOHN STANDISH AND CO., Royal Nurseries, Ascot.

WOODROW BROTHERS, SEED MERCHANTS, Bombay, have to offer fresh seeds of INDIAN PALMS, including Cocos nucifera, Caryota urens, Borassus flabelliformis, and others Terms on application.

GARDENIA RADICANS and FLORIDA.—Large plants for sale, cheap; also about 40 large Clumps of PAMPAS GRASS. Apply to
J. POUNCE, Church Lane, Hendon, Middlesex, N.W.

Roses for Bedding, &c.

ROSES, New and Old, strong plants, in pots, now ready for delivery; also large stock of VERBENAS and FUCHSIAS, and general BEDDING PLANTS, which contains a selection of the best varieties only. CATALOGUES free.
WM. KNIGHT, Floral Nursery, Hailsham, Sussex.

Chrysanthemums.

A DAM FORSYTH begs to inform the Trade and the Public, that he is now sending out his "NEW" and other choice CHRYSANTHEMUMS.
For description see CATALOGUE (containing a Treatise on their growth) now ready. Forwarded to all applicants for one stamp.
Brunswick Nursery, Stoke Newington, N.

Viola cornuta Blue Perfection.

GEORGE SMITH has to offer a large quantity of this superb hardy bedding plant. This being the best time for planting it out, it will make a good show of bloom in a few weeks. 18s. per dozen; £4 per 100. A liberal discount to the Trade.
Wilton Road Nursery, Salisbury.

CHARLES TURNER is now sending out, in strong plants, Perry's set of 12 NEW VERBENAS, which are of very fine quality and good growers. Also a Collection of the best for pot culture or bedding, now ready, 4s. to 9s. per dozen.
The Royal Nurseries, Slough.

Verbenas, Verbenas.

PHILIP LADDS is now sending out Purple, White, Scarlet, and Pink VERBENAS, including new varieties of 1869, strong plants, in pots, at 1s. 6d. per dozen; small plants of ditto at 6s. per 100, or £2 10s. per 1000; 20 varieties of New FUCHSIAS, 1869, at 2s. per dozen; 12 new varieties of ANTIRRHINUMS, 1869, at 3s. per dozen; 18 new varieties, 1869, of PENTSTEMONS, at 3s. per doz.; VESUVIUS, the best bedding Scarlet GERANIUM, at 20s. per 100.
Nursery: Bexley Heath, Kent.

Hollyhocks.—To the Trade.

JAS. GARAWAY and CO. offer the above, Autumn-struck plants, best named varieties, 8s. per dozen, 50s. per 100
JAS. GARAWAY AND CO., Durdham Down Nurseries, Bristol

Cheap Bedding Plants for 2s. per dozen.

J. SCOTT, Merriott, Somerset, has, as usual, the largest and most varied collection in the West of England. The plants are now hardened off and ready
CATALOGUES on application

NEW VARIEGATED IVY-LEAVED GERANIUM, MRS. LAMBERT, of very dwarf habit, growing only 4 inches high; foliage of a vivid green colour with a clear white edge and of free growth; awarded First-class Certificate at Horticultural Society's Show, May 22, 1869. Plants 18s. per dozen Usual allowance to the Trade. H HARMAN, Denham Road, Uxbridge, W

WONDROUS CHEAP.—Thirty thousand choicest TRICOLOR, BICOLOR, and ZONAL GERANIUMS, strong plants, established singly in pots, from 2s. per dozen.
CATALOGUES sent free on application to
T. I. MAYOS, Seedsman, Lugwardine, Hereford

TRICOLOR, BRONZE, and ZONAL PELARGONIUMS.—Descriptive CATALOGUE of all the very best and newest varieties will be forwarded free on application.
J ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants

Specimen Tricolor Geraniums.

F. AND A. SMITH invite an inspection of their large collections of GOLDEN and SILVER TRICOLOR and BRONZE GERANIUMS, now in good colour.
List of sizes and prices on application.
The Nurseries, West Dulwich

Calceolarias and Cinerarias.

F. AND A. SMITH beg to announce that their splendid collections are now in full Bloom, and will well repay an inspection.
The Nurseries, West Dulwich

Specimen Azaleas.

F. AND A. SMITH have new in full Bloom a large collection of the above, presenting a very attractive display
The Nurseries, West Dulwich

NEW GERANIUMS.
Coleshill, Zonal; Lady Edith, Tricolor; unrivalled
JOHN KEYNES, Castle Street, Salisbury.

NEW VERBENAS, Eckford's, unrivalled.
CATALOGUES ready.
JOHN KEYNES, Castle Street, Salisbury.

NEW DAHLIAS, unrivalled.
CATALOGUES ready.
JOHN KEYNES, Castle Street, Salisbury.

Calceolaria aurea floribunda.

WILLIAM MEADMORE offers good strong Autumn-struck Plants, at 8s. per 100.—Nursery, Romford, E.

JAMES FAIRHEAD AND SON, Seed Growers and MERCHANTS, 7, Borough Market, London, S.E., announce to their Friends and Customers that their PRICED LIST of DAHLIAS is now ready, and can be had, post free, on application.

Verbenas, Verbenas.—6s. per 100; 50s. per 1000.

WILLIAM BADMAN offers PURPLE, WHITE, SCARLET, ROSE, CRIMSON, &c., well-rooted Plants, from store pots, 6s. per 100, or 50s. per 1000, cash.
Cemetery Nursery, Gravesend.

WEBB'S NEW GIANT POLYANTHUS, Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the varieties, with double PRIMROSES of different colours; AURICULAS, both single and double; with every sort of Early Spring Flowers LIST on application.—Mr. WEBB, Calcot, Reading.

DOUBLE POLYANTHUS, a very nice one. About 50 dozen good Roots for sale, 3s. per dozen.
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GARIBALDI POLYANTHUS.—A new double sweet scented variety of this pretty spring plant. It is of various colours, bright and showy, and produces its flowers well above the foliage. A desirable acquisition. Seed 1s. and 2s. 6d. per packet, post free. Plants 2s. 6d. each, 24s. per dozen.
BUTLER, MCCULLOCH AND CO., South Row, Covent Garden, W.C. Established upwards of a century.

Evergreen Oaks.

WOOD AND INGRAM offer fine stout 1-yr. Seedlings, at 10s. per 1000
The Nurseries, Huntingdon

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester

Ilex aquifolium var. Lawsoniana.

A golden blotched Hodgens' Holly, quite distinct and very effective.
PETER LAWSON AND SON are now sending out the above for the first time. Strong plants 21s., with the usual allowance to the Trade
Edinburgh and London —May, 1870

VARIEGATED HOLLIES.—For Sale, 12 remarkably fine specimen variegated Hollies, grown in slate tubs, 9 to 10 feet high, and 18 feet in circumference, neatly trained; safe to move. Lowest price upon application to Messrs. R. LOWE and CO., Nurserymen, Queen Square, Wolverhampton.

CAMELLIAS for SALE.—A Collection of healthy well-grown plants, varying from 3 to 16 feet in height, including tubs.—Apply for particulars to A. N., Post Office, Crouch End, N.

FOR IMMEDIATE SALE, in consequence of the sudden death of the owner, a small COLLECTION of ORCHIDS, many of them rare and valuable. The whole will be sold in one lot, and may be viewed on application to
Miss ORMEROD, 19, Portland Square, Bristol, of whom further particulars may be obtained.

MULBERRY LEAVES.—Gardeners and others who can Contract for regular supplies of Mulberry Leaves are invited to apply to B. F. COBB, Hon. Secretary of the Silk Supply Association, 65, Moorgate Street, E.C.

WANTED, JERUSALEM ARTICHOKES.
Apply, stating quantity and price, to
J. C. WHEELER AND SON, Gloucester.

Carter's Index, May 7.

CARTER'S PRIZE GLOBE MANGEL See p. 650.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE LONG MANGEL. See p. 650.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE SWEDE TURNIP. See p. 650.
237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE GRASS SEEDS.
237 and 238, High Holborn, London, W.C.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

To the Trade only.

VIOLA CORNUTA, var. BLUE PERFECTION.—Plants now ready, 15s. per dozen. A flower sent on receipt of one stamp.
THOMAS CRIPPS AND SON, Nurserymen, Tunbridge Wells.

The Chrysanthemum: How to Grow it.—See

ADAM FORSYTH'S CATALOGUE. Forwarded for one stamp.
Brunswick Nursery, Stoke Newington, N.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE OF BRITISH AND EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent

British Ferns.

EDWARD SANG AND SONS, NURSERYMEN and SEED MERCHANTS, Kirkcaldy, N.B., have now published their PRICED CATALOGUE of BRITISH FERNS for the present season. This Catalogue embraces the entire Collection of Plants which belonged to Dr. Lyell, Newburgh, Fife, and which they recently acquired to him by purchase.
Copies free on application, and orders carefully fulfilled.

Bedding Plants, &c.

EWING AND CHILDS'S SPRING CATALOGUE of BEDDING and other PLANTS is now ready, and will be sent gratis and post free on application.
The Royal Norfolk Nurseries, Norwich.

SPRING PLANT CATALOGUE, 1870, containing all the NOVELTIES, English and Continental, of 1870, post free
JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W

Spring Planting.—To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Aucubas, and other hardy Trees, Shrubs, and Evergreens, is just published, and can be had on application. Milford Nurseries, near Godalming.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

A. J. IRETON, FRUIT and FLOWER SALESMAN, Covent Garden, W.C., begs to remind his numerous Customers who have favoured him with their respective commissions, that he still endeavours to give that satisfaction which has hitherto met their various wants. Best prices and quick returns. For answers to inquiries stamped envelopes should be enclosed.

To Seed Importers, Nurserymen, &c.

BETHAM AND SON, Custom House, Shipping and General Transit Agents, beg to inform them that they receive and forward SEEDS, PLANTS and GENERAL MERCHANDISE, from and to all parts of the world, at charges as low as possible.
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CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and CAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, 1862, 1867. "Excellent seed Corn and Seeds."

SUTTONS' GRASS SEEDS for PASTURES, 20s. to 32s. per acre, carriage free
SUTTONS' GRASS SEEDS for PARK GROUNDS, 18s. per bushel, carriage free
SUTTONS' GRASS SEEDS for GARDEN LAWNS, 1s. per lb., or 20s. per bushel, carriage free
SUTTONS' CHAMPION SWEDE, the best in cultivation. 9d. per lb., cheaper by the bushel.
SUTTONS' TURNIP SEEDS for PRESENT SOWING. See p. 639 of this week's Paper
SUTTONS' FARMER'S YEAR BOOK. Gratis and post free.
Royal Berks Seed Establishment, Reading.

To the Trade.

ORANGE GLOBE, RED GLOBE, and OLIVE SHAPED MANGEL; selected stocks. Prices on application to
JAMES FAIRHEAD AND SON, 7, Borough Market, London, S.E.

Turnip Seeds.

HAND F. SHARPE have to offer to the Trade fine selected stocks of the above-named Seeds, all of 1869 growth, and raised from picked transplanted bulbs. Prices moderate.
Seed Growing Establishment, Wisbech

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer, for cash, AMERICAN RED POTATOS They produced over 16 Tons to the Acre this year.
Single WALLFLOWERS, 2s. 6d. per 100; SCARLET KING DAISIES, CROWN DAISIES, WHITE DAISIES, all at 5s. per 100. Splendid mixed laced PINKS, 5s. per 100.

Silver Tricolor Pelargonium, Mrs. Col. Wilkinson.

J. JAMES will send out the above beautiful PELARGONIUM on and after May 1. This is a great advance on any Silver yet distributed. It is of a free branching habit, the leaf very flat, margin white, with well defined zone; it crams like and blocks. First-class Certificate Royal Horticultural Society, October, 1868; First-class Certificate, Royal Botanic Society, April 27, 1870. Price 31s. 6d. Price to the Trade on application.

North Road, Highgate, N.

New Zonal Geranium, Purity (Eckford).

JAMES GARAWAY AND CO. have much pleasure in offering the above, and can confidently recommend it as a decided acquisition. It is in the way of that well known variety Madame Wolfe, and is a great improvement on it. For compactness of shape and delicacy of colouring it cannot be surpassed, and its freedom of flowering especially adapts it both for conservatory decoration and for effective bedding out. Plants now ready, 5s. each. Four sent for three.

NEW SILVER-EDGED GERANIUM, MADAME VAUCHER VAR.—This is a sport from the green variety; is distinctly margined with clear white, with occasionally a bright pink zone. Plants ready the middle of May, 5s. each.

☞ Usual allowance to the Trade.

JAMES GARAWAY & CO.'S SPRING CATALOGUE is now ready, and sent post free on application.

JAMES GARAWAY AND CO., Durdham Down Nurseries, Bristol.

Novelties of 1870.

JOHN MANN begs to offer the following new ZONAL PELARGONIUMS—

Amabilis | Countess of Derby | Hesperia | Valiant
Bella | Magnet | Sir Robert Napier | Fair Graham

GOLD and BRONZED PELARGONIUMS.

Basil | Helena

The flowers of the above are unsurpassed for size and form, Union Plates of which by Andrews may be had, 1s. each.

GOLDEN TRICOLOR PELARGONIUMS
SILVER TRICOLOR PELARGONIUMS
GOLD and BRONZED PELARGONIUMS
And best older kinds.

Descriptive Priced LIST will be forwarded free on application to JOHN MANN, The Nursery, Brentwood.

Variegated Bedding Geraniums.

ALFRED FRYER offers the following choice kinds, in strong plants, at per dozen, for cash:—TRICOLORS: Sophia Dumaresque, 7s. 6d.; Lady Cullum, 6s.; Hilton Unity, 5s.; Picturata, 5s. 6d. GOLD and BRONZE ZONALS: Beauty of Calverdale, 3s. 6d.; Beauty of Rabbleslade, 4s.; Duke of Edinburgh, 9s.; F. G. Henderson, 4s.; Kentish Hero, 4s.; Mrs. John Todd, 4s.; Neatness, 2s. 6d.; Model, 3s. 6d.; Perfection, 3s. Most of the above are autumn struck. Baskets and packing, 1s. for a single dozen, and 6d. extra for every subsequent dozen. Remittances requested from unknown correspondents.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

To the Trade.

KIRK ALLEN has to offer the following, strong plants in 3-inch pots, for cash only:—

NEW TRICOLORS—Yellow vein (Thomson), Sir Robert Napier, Mrs. Dunnett, Howorth Ashton, Victoria Reginæ, and Beauty of Bushmoor. The above six for 50s.

NEW GOLDEN BRONZES.—Crown Prince, Harrison Weir, Southern Belle, Red King, St. John's Wood Star, Prima Donna, Black Knight (Downie, Laird & Laing), Cleopatra (Smith), Mrs. Allan Lowrie, Criterion (Smith), Goldfinder (Smith), and Arab (Smith). The above 10s. per doz.

MARIE LEMOINE, 12s. per dozen.

Lists of sorts, separate, at their selection, see CATALOGUE, post free.

The Nursery, Brompton, Huntingdon.

Strong Bedding Geraniums.

W. POTTEN can now supply plants of Tricolor, Bicolor, Silver, Zonal, and Double GERANIUMS, by the dozen, 100, or 1000. Also strong Zonals in sorts for 20s.; all good plants, in single 3-inch pots, packed free. A LIST, with prices of most of the leading varieties, can be had on application to

W. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

PELARGONIUM, GEM OF THE SEASON

(HYBRID IVY LEAF).

MESSRS. JAMES VEITCH & SONS

Have much pleasure in offering the above

BEAUTIFUL AND DISTINCT PELARGONIUM,

Which is the result of a cross between Mrs. Pollock and an Ivy-leaf variety. The habit is compact, foliage good, flowers beautiful bright rose, in large trusses, and is well adapted for pot culture.

It has been exhibited both at the Royal Horticultural and Royal Botanic Society's Shows, and on each occasion received a First-class Certificate, and pronounced to be worthy of the name bestowed on it.

Good Plants, 10s. 6d. each.

ROYAL EXOTIC NURSERIES, CHELSEA, S.W.—May 6, 1870.

NEW PELARGONIUMS.

DOWNIE, LAIRD, & LAING

Have much pleasure in announcing that they are now prepared to send out the following

NEW BEAUTIFUL AND DISTINCT VARIETIES.

GOLD AND BRONZE.

	Each	s.	d.
IMPERATRICE EUGENIE.—Golden leaf ground, with pale zone of bright chocolate colour, robust growth, and compact habit; the brightest colour of any yet introduced for summer decoration; two First-class Certificates have been awarded	2	0	
MRS. LEWIS LOYD.—Large flowers, deeply lobed, of a golden yellow colour, variegated with a narrow zone of reddish chocolate, habit good, a distinct and very effective bedding variety; gained a First-class Certificate	1	5	0
PRINCESS OF WALES.—Yellow leaf ground, with medium zone of very dark chocolate, flowers large, semi-double, nearly circular, and of great substance; growth vigorous, and habit compact; a magnificent and very distinct variety	2	1	0
W. R. MORRIS.—Leaf ground bright golden, with a well defined bronze zone, foliage smooth and of great substance; shape perfect, a variety almost perfection, and unequalled for exhibition, was awarded the first prize at the Special Show of the Royal Horticultural Society at South Kensington, in May last; has gained several First-class Certificates, and is figured in the "Floral Magazine" for January	1	1	0

The set of four for 63s.

HYBRID NOSEGAY.

	Each	s.	d.
LADY HAWLEY.—Light orange scarlet, petals broad, truss large and compact, excellent habit, a magnificent variety; was awarded a First-class Certificate		7	6
LADY KIRKLAND.—Dark rosy purple, trusses of finely-formed flowers, carried high on a stiff flower-stalk, foliage very dark green; a really superb variety		7	6
STANSTEAD RIVAL.—Bright crimson, petals broad, of great substance, beautifully reflexed, with large truss of smooth well-shaped flowers, habit very good, colour quite new and distinct, a great acquisition; First-class Certificate; figured in "Floral Magazine"		7	6
SUNLIGHT.—Bright orange-scarlet, suffused with violet, trusses large, compact, and globular, petals broad, of immense substance, foliage fine, very dark green; a splendid variety		7	6
SUNSHINE.—Orange-carmine, suffused with purple, and shaded with light carmine, truss extra large, flowers magnificent, and habit compact; a beautiful variety		7	6

The set of five for 30s.

DOUBLE.

MADAME HOOK.—Very brilliant dark rose, flowers very large and double, vigorous and compact habit, very distinct; colour of Madame Barre. 7s. 6d. each.

VICTOIRE DE LYON.—Flowers reddish crimson, shaded with violet, colour quite new, and distinct from all other Doubles; blooms freely; habit dwarf and compact. 10s. 6d. each.

STANSTEAD PARK, FOREST HILL, LONDON, S.E., and EDINBURGH.

CARTER'S
LIST OF BEDDING AND OTHER PLANTS FOR 1870,

THE ROYAL SEEDSMEN

THE ROYAL SEEDSMEN

Is now ready, price 6d. Post Free (gratis to Purchasers).

The following NEW TRICOLOR and OTHER GERANIUMS are worthy of especial notice:—

PRINCE of WALES (CARTER).—Undoubtedly the finest tricolor ever offered, of most vigorous habit, and intensely brilliant colours. Price 63s. each.

A First-class Certificate was awarded to Carter's Tricolor Geranium "Prince of Wales," by the Royal Botanic Society of London, June 29, 1867.

A First-class Certificate was awarded to Carter's Tricolor Geranium "Prince of Wales," by the Royal Horticultural Society of London, July 7, 1868.

A First-class Certificate was awarded to Carter's Tricolor Geranium "Prince of Wales," by the Royal Botanic Society of London, May 25, 1869.

EDITH STUART (CARTER).—A free-growing variety, with flat salver-shaped leaves, zone bright vermilion, with a light yellow margin. Price 21s. each.

First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

PRINCESS of WALES (CARTER).—A variety similar to Prince of Wales, but more brilliant in colour and smaller leaves. Price 31s. 6d. each.

First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

SULTAN ABDUL AZIZ (CARTER).—A splendid dark tricolor, very distinct in character and free in habit, leaves of great substance and particularly round, zone a dark scarlet, light golden margin. Price 21s. each.

First Prize, May 22, Royal Horticultural Society. Special Certificate, April 20, 1870, Royal Horticultural Society.

The Set of the foregoing 4 varieties, £5 5s.

DR. WALLACE (CARTER).—A free-growing variety, leaves flat and of good form, deep coloured zone of carmine, intermixed with chocolate. Price 5s. each.

MARIAN MORRIS (CARTER).—A variety after the style of Goliah, and equally free in growth, but with brighter colours. A good bedder. Each 21s.

MRS. MULLER (CARTER).—A most compact-growing variety, zone light carmine, blotched with chocolate, margin creamy yellow. Each 5s.

BALLYMENA (CARTER).—A most desirable variety for bedding purposes, and very distinct in character; zone very dark chocolate and rosy purple. Each 5s.

Special Certificate, April 20, 1870, Royal Horticultural Society.

The Set of the foregoing 4 varieties for 30s.

CINDERELLA (CARTER).—Deep pink zone, silver margin, free bloomer. Each 5s.

CARRIE FOWLER (CARTER).—Seedling from Crystal Palace Gem, a beautiful bright golden colour, compact in habit; an excellent bedding variety. Each 5s.

Royal Horticultural Society, May 22, 1869.—Prize for best Golden-leaved Geranium, "Carrie Fowler."

ADA (CARTER).—Bright chestnut zone, narrow and very distinct, on a light straw ground; a fine bedding variety. Each 5s.

Prize, May 22, Royal Horticultural Society.

EDITH THOMPSON (CARTER).—A seedling in the way of Egyptian Queen, but with a much freer habit. Each 5s.

PERCY LEONARD (CARTER).—Bold vigorous habit, excellent for bedding, leaves of a bright golden colour, with a deep maroon zone. Each 5s.

THE GIANT (CARTER).—A very large and extra strong-growing variety, very desirable for conservatory decoration; the seedling plant measured 3 feet in height by 5 feet through; blooming continually from May till September, the trusses, of an immense size, being composed of 90 to 120 flowers. Each 21s. 6d.

VELOCIPEDE (CARTER).—A variety in the way of Lord Derby, flowers deep scarlet; a fine bedding variety. Each 21s. 6d.

NEW DOUBLE FLOWERED ZONAL GERANIUMS FOR 1870.

LE DUC DE SUEZ.—Flowers of excellent shape, almost imbricated, very double, scarlet-crimson, the darkest of all double varieties yet known; trusses of large size, habit of the plant dwarf and very free-flowering. Each 7s. 6d.

SAPEUR POMPIER.—Flowers of the largest size, very double, well shaped, colour orange-scarlet; trusses of an enormous size, 5½ to 6 inches diameter; foliage with well-defined zone. Flowers and trusses larger than those of all known varieties. Each 7s. 6d.

The Set, one plant of each of the above two splendid novelties, for 12s. 6d.

MADAME MICHEL BUCHNER.—Vigorous plant, free-flowering, both in and out-of-doors; flowers very double, well shaped, and borne in trusses of about 6 inches in diameter. The colour is of a delicate rosy salmon, and has been admired by all who have seen it in flower. Each 7s. 6d.

MADAME RUDOLF ABEL.—Plant of short-jointed habit, producing compact trusses of average size; flowers of a dark carmine-rose, with a brilliant gloss. The darkest and most brilliant of all the rose-coloured double varieties. Each 7s. 6d.

The Set, one plant of each of the above two splendid novelties, for 12s. 6d.

For full descriptions, see CARTER'S ILLUSTRATED PLANT CATALOGUE.

JAMES CARTER AND CO., SEED FARMERS and NURSERYMEN,
237 and 238, HIGH HOLBORN, LONDON, W.C.

NEW PLANT CATALOGUE 1870,

POST FREE TO ALL APPLICANTS.

BENJAMIN S. WILLIAMS

HAS MUCH PLEASURE IN ANNOUNCING THAT HIS

GENERAL AND NEW PLANT CATALOGUE

For the current year is now ready. It contains select Lists of Orchids, Ferns, Palms, Flowering and Ornamental-leaved Stove and Greenhouse Plants, Azaleas, Camellias, Amaryllis, Florists' Flowers, &c., &c., and, in addition, full descriptions of many novel and excellent plants, which are now offered for the first time; also descriptions of many new or rare plants of recent introduction and sterling merit.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

NEW PLANTS FOR 1870.

B. S. WILLIAMS

Has much pleasure in offering the undernamed NEW PLANTS, which will be ready for distribution on May 1, next.

New Summer Bedding Plant.

PERISTROPHE ANGUSTIFOLIA AUREO-VARIEGATA.—This very elegant Acanthad is a native of the mountains of Java, and was awarded a First-Class Certificate by the Floral Committee this spring. The leaves are ovate-lanceolate, bright orange in the centre, and margined with dark green; in habit it is dwarf and compact, and B. S. W. has all confidence in its becoming a splendid edging plant in the Summer Flower Garden; as a pot plant it is very beautiful, and although the flowers are not remarkable for size, their bright mauve-purple colour forms a striking contrast with the orange colour of the leaves. Price 10s 6d

Superb New Bedding Plant.

VIOLA CORNUTA VAR PERFECTION.—B. S. W has much pleasure in offering this superb plant to public notice, and from the manner in which it has been tested both in dry and exposed situations, as well as in moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are more larger than those of V cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size of the good variety; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed it resembles a gigantic V. cornuta in habit, and whilst retaining its profuse blooming qualities producing flowers which almost rival our Florist Pansies for size and substance. This plant was awarded a First-Class Certificate by the Floral Committee, September 25, 1869. Price 2s. 6d each, 24s. per dozen, 70s. per half hundred, 100s. per 100.

Azalea Grand Monarch.

A superb new and distinct variety, suitable for exhibition or early forcing purposes; the habit is compact and dense, of medium growth, and a profuse bloomer; flowers 3 inches in diameter, of good substance and perfect outline, the lobes are perfectly round and smooth, and in colour deep pink, shaded with warm rose towards the margins; in addition, the upper lobes are densely spotted. Price 21s. each; a few extra-sized plants, 42s to 63s each.

Verbena Mauve Queen.

This very elegant variety possesses a good constitution, and is not subject to attacks of mildew and other diseases, which so many of the new forms of this plant are (and which has led to the almost total banishment of Verbenas from the parterre). in growth it is somewhat robust, and as a flowerer, most profuse; the trusses, which are of good size, are borne well above the young shoots, and the flowers are a beautiful mauve in colour, and yield a most delicate perfume It can be highly recommended for bedding purposes. Price 2s 6d. each.

New Fuchsias.

B. S. WILLIAMS has much pleasure in being able to offer the following five varieties of this favourite plant; they are all of good habit and thoroughly distinct, and cannot fail to give general satisfaction:—

BIRD OF PARADISE.—Tube and sepals scarlet, well reflexed corolla very regular, and soft, delicate rose in colour 10s 6d each

FORMOSA.—Tube slender, and, as well as the sepals, bright scarlet; corolla double, very regular and compact, deep violet, the outer petals rosy red, elegantly flaked with light violet. 10s. 6d. each.

HOLLOWAY RIVAL.—This is probably one of the most distinct forms yet sent out; tube and sepals bright red, well reflexed corolla, very long petals of great substance, and rich deep violet in colour. 10s 6d each.

STRIATA PERFECTA.—A charming and very effective variety; tube and sepals waxy white; corolla bright carmine, striped with broad lines of pure white This variety is not only exceedingly handsome, but totally different from any other variety in cultivation. 10s. 6d. each.

TRIUMPHANS.—A superb double variety; tube and sepals rich crimson, reflexed from the base; corolla large and very regular, petals intense violet, suffused at the base with crimson 10s 6d each. The set, 42s.

The following Nurserymen and Seedsmen have already ordered the new Viola cornuta var. Perfection, and from whom the true Rotherfield Stock can be obtained:—

Messrs. Campbell & Sons	Glasnevin
,, Carter & Co.	Forest Hill
,, Cutbush & Son	Highgate
,, Dickson	Edinburgh
,, Gadd & Son	Salvington.
,, Harrison & Son	Dorchester
,, Haage & Schmidt	Erfurt.
,, Lawson & Son	Edinburgh.
,, Lee & Sons	Hammersmith.
,, Little & Ballantyne	Carlisle
,, Minier, Nash & Nash	Strand, W.C.
,, Roberts	Denbigh.
,, Rollyson & Son	Tooting
,, Stuart & Mein	Kelso.
,, Talbot & Prior	Hastings.
,, Tanner & Co.	Chippenham.
,, Veitch & Sons	Chelsea
Mr. Ashford	Muckingford.
,, Brittain	Fisherton.
,, Bull	Oxford
,, Benary	Erfurt
,, Cannell	Woolwich
Mr. Cattell	Westerham.
,, Clibran	Warrington
,, Cuce	Newport.
,, Cocker	Aberdeen.
,, Cooling	Derby.
,, Cunningham	Old Swan, Liverpool.
,, Cutbush	Barnet
,, Ekombe	Romsey
,, Frost	Maidstone.
,, Gray	Keyle
,, Harrison	Darlington
,, Kinghorn	Richmond
,, McPherson	Aberdeen
,, Oakley	Southampton.
,, Parker	Tooting
,, Parsons	Leamington
,, Pilcher	Horsham
,, Royle	High Leigh.
,, Scott	Bath
,, Smith	Tollington Nursery, Holloway
,, Watkins	Bishop Stortford.

BENJAMIN S. WILLIAMS, VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

YELLOW-LEAVED CALADIUMS,

RAISED AT THE GARDENS OF

THE ROYAL HORTICULTURAL SOCIETY.

MESSRS. JAMES VEITCH & SONS,

Having made arrangements with the Council of the Royal Horticultural Society to take all the available stock of the above striking and very distinct novelties, have much pleasure in OFFERING for SALE the Plants, which are now ready for distribution.

The following descriptions, published by the Society, may be relied on as being exact; and J. V. & S. feel they need add nothing to recommend to the Public these Novelties, which they are confident will be eagerly sought after by all lovers of this popular and useful class of Decorative Plant. They would only say, that the splendid golden tint of those now offered renders them perfectly distinct from any others previously in cultivation.

CALADIUM PRINCESS ROYAL.

Hybrid R.H.S.

Leaves large, of a pale green or yellow, with crimson centre, in the style of C. Brongniartii; very handsome.

CALADIUM PRINCE OF WALES.

Hybrid R.H.S.

Leaves large, similar to the preceding, with the addition of several deep spots and splashes of crimson; very handsome.

CALADIUM GOLDEN QUEEN.

Hybrid R.H.S.

Leaves large, pale green or yellow, uniform in colour; very handsome, and of a remarkably chaste appearance.

CALADIUM PRINCESS OF WALES.

Hybrid R.H.S.

Leaves large, similar to the preceding, with the addition of some bright spots of colour; very handsome.

The Set of Four Plants, £1 10s.

The usual Discount to the Trade; and special terms will be quoted where several Sets are taken.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, LONDON, S.W.

Cheap, Cheap, Cheap.

TRICOLOR and other PELARGONIUMS, in good plants, at the following low prices for each:—Mrs Pollock, 2s 6d per dozen; White Lady, 4s; Lady Cullum, 4s; Glen Eyre Beauty, 6s; Countess of Craven, 6s; Rosetta, 6s; Castle Milk, 6s; Italia Unita, 2s 6d.; Perilla, 3s; Crystal Palace Gem, 2s 6d; Luna, 2s 6d; Lord Derby, 3s; Leonidas, 3s. A large quantity of ZONALS, equally cheap. P.S. Sophia Dumbreseque, 3s

JOHN BARRETT, St. John's Nursery, Bury St. Edmund's, Suffolk.

PAUL'S NOVELTIES of 1870.
See WM. PAUL'S SPRING CATALOGUE, just published.

PAUL'S NEW ROSE PRINCESS CHRISTIAN.—One Special and Four First-class Certificates. Plants ready in May, 10s. 6d. each.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW ROSE VIRGIL.
Plants ready in May, 5s each
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S SELECTION of NEW FRENCH ROSES.
For description see WM. PAUL'S SPRING CATALOGUE.
Now ready, strong plants, price 3s 6d to 5s each

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE.
First-class Certificate Plants ready in May, 10s 6d each.
"There are several very good pure white-edged Pelargoniums in commerce. I think Waltham Bride may be considered amongst the very best."—P. GRIEVE, *in Journal of Horticulture*
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE.
Plants ready in May, 10s 6d. each.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM BRONZE. The brightest and most effective of this section yet raised. Plants ready in May, 10s. 6d. each.
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BEDDING PELARGONIUMS (BEATON'S Race). BONFIRE, the finest of all the Stella race, and five others. Plants in May, 5s. each; or the six varieties for 25s.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NOVELTIES for 1870.
ROSE PRINCE LEOPOLD. GOLDEN VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c.
For description see WM. PAUL'S SPRING CATALOGUE, just published.

WM. PAUL, Paul's Nurseries and Seed Warehouse, Waltham Cross, London, N

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of—

Achimenes	Miscellaneous plants
Auriculas	,, bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants | Verbenas

The Royal Nurseries, Slough.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at greatly reduced prices, in order to clear the land for building purposes.

Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and ORNAMENTAL TREES generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.

To Gentlemen wishing to improve their Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with

Nursery and Seed Stores—Walton-on-the-Hill.
Seed Warehouse, 15, Queen Square.

Liverpool, April, 1870

MESSRS. J. STANDISH AND CO. are now prepared to execute orders for the following New and Choice Plants, to which they wish to call special attention. See larger Advertisement in last week's *Gardeners' Chronicle*.

IXORA DIXIANA.—Plants, 7s 6d. to 21s. each; with five or six spikes of bloom set, 25s each

ANTHURIUM SCHERZERIANUM.—Fine young plants, with two to three crowns, 10s 6d each; with three to four crowns, and stronger, 15s to 63s each.

TOBEA PELUCIDA COMPACTA.—2s 6d. to 5s each.

STRUTHIOPTERIS JAPONICA.—In April next, 10s. 6d. each.

JUGUS MACROPHYLLA.—5s. each

ABUTILON THOMPSONI.—1s each; or per doz.; 6os per 100

CORYGONA MAJOR LUNA VARIEGATA.—2s 6d. ea.; 24s per doz.

TREE PICOTEE ASCOT YELLOW.—A few strong plants, now, 5s. each; in April next, 21 6d each

ROYAL ASCOT VINE.—7s 6d to 15s. and 21s each.

PEACH, EARLY ASCOT.—Fine plants, 7s 6d to 15s each

,, MARQUIS of DOWNSHIRE.—Fine plants, 7s. 6d. to 15s. ea.

ABIES OBOVATA.—10s 6d. to 21s. each.

JUNIPERUS JAPONICUS ALBO VARIEGATA.—2s 6d to 21s. ea.

ACER RUFINERVE ALBO LIMBATUM.—21s. to 42s. each.

,, POLYMORPHUM PECTINATUM RUBRUM.—10s 6d. to 21s each

AUCUBA, Males.—1s 6d to 5s. each Other varieties. See our CATALOGUE.

Royal Nurseries, Ascot, Berks

HOOPER AND CO. have just received small consignments of the undernoted SEEDS of INTERESTING and VALUABLE PLANTS from their native districts. The Seeds are in excellent condition, and will no doubt grow freely.

From British Guiana, the following:—

BIXA ORELLANA (the Annatto Plant).—Per packet, 1s. This, our correspondent says—"A very handsome shrub, the leaves are like the English Oak, but darker; and the fruit is like a cluster of English Filberts, of a large size and crimson colour. This I am sure will please. The Seeds are quite fresh and will grow at once, and flower in a year." Per packet, 2s 6d

CROTALARIA LITIGIUM.—Flowers like bunches of red coral Per packet, 1s 6d

OREODOXA OLERACEA (the Cabbage Palm).—Most handsome, from the largest-size Per packet, 5s 6d

THE PARIPI PALM.—"An interesting variety from the Upper Essequibo, where it forms an important article of diet among some tribes of Indians. I have seed now sent will be sure to grow, but will take perhaps 9 months to germinate" Two seeds, 5s 6d

THE MAHOGANY TREE. Per packet, 1s

STEPHANOTIS (probably Thouarsii) Per packet, 1s 6d

IPOMŒA SPECIES (the Moon Flower).—A noble white kind Per packet, 1s

From New Zealand, the following:—

CORDYLINE SPLENDENS.—Perfectly ripe and sound seed; charming ornamental plants. Per packet, 1s

PHORMIUM TENAX.—Sound seed. Per packet, 1s

Other SHRUBS, with native names, of an ornamental character. Four species; each, per packet, 6d.

From Algiers, the following:—

ABIES NUMIDICA (Baborensis).—Most rare and new Conifer, described last year in Van Houtte's "Flore." Seed has, we believe, never been offered before. Per packet, 5s

CEDRUS ATLANTICA.—Fine seed Per packet, 1s 6d.

A packet of each of the above for 21s

HOOPER AND CO., Covent Garden, London, W.C.

New Roses of 1870.

CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application.

ROSES for BEDDING.—Superb plants, in 5 inch pots, for planting out or for growing on for pot culture. Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.

JOHN CRANSTON, The Nurseries, King's Acre, Hereford.

A Glorious Show of Roses,

TEA, BOURBON, CHINA, and NOISETTE, may be secured and enjoyed all the summer BY PLANTING NOW.

Good plants of finest kinds, established in pots, mostly 48's, are ready to be presented to all in exchange for cash at 40s. per 100; purchasers may choose half the names at 50s. per 100. Packing extra charge. Wholesale. CHARLES NOBLE, Bagshot.

SEEDS, of choicest quality.—ASTERS: French Perfection, Dwarf Chrysanthemum-fl. Emperor and Victoria; STOCKS—German Ten-week and Brompton; WALLFLOWER—Double: CINERARIA, CALCEOLARIA, PRIMULA FIMBRIATA, mixed; PETUNIA, double, 2s. 6d. per packet.

See previous Advertisements, or what is better still, J. SCOTT'S PRICED DESCRIPTIVE SEED CATALOGUE, free on application.

J. SCOTT, The Seed Stores, Yeovil, Somerset.

TWENTY THOUSAND PLANTS of a beautiful but bright-red GENERAL, well adapted for Bedding and Rockwork decoration, well established, in Flower, in large-sized 60 Pots, for immediate Disposal, at £1 per 100. Selected from above 200 species of the most brilliant perpetual and free-flowering species of MESEMBRYANTHEMUMS known.

Apply to Mr THOMSON, for 10 years connected with the Kew and Windsor Gardens, and many years Head Gardener to the Duke of Northumberland, at Sion House, and Lord Ashburton, The Grange, Hants. Landscape Gardener and Hothouse Designer and Builder, now residing at Penge Nursery, adjoining the Chatham and Dover Railway Station.

Pandanus utilis, &c.

A. VAN GEERT, Nurseryman, Ghent, Belgium, has to offer a good stock of this fine plant for decorative purposes, in small pots, at 60s. per 100.

SABAL ADANSONI, 9s. per dozen.
CHAMAEROPS PALMETTO, 12s. per dozen.
HUMILIS, 12s. to 18s. per dozen
LATANIA BORBONICA, 42s. per 100
AGERATUM LISONI HOLLIS AUREA VARIEGATA, 5s. each. A very pretty novelty for bedding.

General CATALOGUE of Plants may be had, on application, of his Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Tower Street, London, E.C.

TO EXHIBITORS of FERNS.—Splendid specimens, fit for any show, of Platycerium grande, Alsophila australis, A. contaminans, Cyathea dealbata, C. Smithii, C. medullaris, Dicksonia fibrosa, D. antarctica, D. squarrosa, Lomaria cycadæfolia. The Tree Ferns are grown in a greenhouse temperature, and consequently are perfectly clean and fresh. They will be sold at a low price. Exact sizes on application.

JOHN MORSE, Nurseryman, Dursley.

NEW FERN, ADIANTUM CAPILLUS-VENERIS MAGNIFICUM, 1870 (J. & C. LEE).—We have much pleasure in introducing this really useful Greenhouse Fern to public notice, in the firm conviction that it will give satisfaction and become a universal favourite. The fronds are much larger than those of Capillus-Veneris, being from 12 to 15 inches long, by 4 inches broad, curving over the side of the pot. The stems are of a beautiful soft green, and are almost as large as those of A. Farleyense, and like that fine variety they overlap each other in graceful waves of maiden-hair, with finely incised and fringed edges. The chief value of A. magnificum is in its hardiness and adaptability to the temperature of a greenhouse, where A. Farleyense can only be cultivated by those who possess a stove. Price 3s. 6d. each.

JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

New and Choice

FLOWER SEEDS,

Post Free.

	Per packet—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
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NEW BEDDING PLANT, VERONICA BLUE GEM

AWARDED FIVE FIRST-CLASS CERTIFICATES LAST SUMMER.

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Beg to announce that they are now distributing the above welcome acquisition. Unlike other shrubby Veronica it is of a very neat dwarf habit, the axil of nearly every leaf producing spikes of beautiful mauve flowers, making the plants appear literally clothed with bloom. It commences flowering when only 2 inches high, and continues in bloom throughout the season.

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Price 5s. each.

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PICOTEE, PRINCE OF ORANGE.

(PERPETUAL FLOWERING.) Figured in the "Floral Magazine" for May.

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Has great pleasure in announcing that he is now distributing his beautiful

PERPETUAL FLOWERING PICOTEE, PRINCE OF ORANGE.

The colour is bright orange, edged with crimson; it is a very large, bold, good-shaped Flower, and a great acquisition for Exhibition purposes.

It was exhibited and received the following First-Class Certificates and Commendations during the year 1869:—

First-Class Certificate Royal Horticultural Society's Special Carnation Show at South Kensington, July 6	Banbury and Oxfordshire, August 31
Leeds Royal Park, August 27	Bath and West of England, September 9
	Coventry and Warwickshire, September 14
	Botanic Society of London, April 6, 1870.

Highly Commended at the following Exhibitions:—

Crystal Palace, Sydenham, May 15	Northampton, July 18
Leamington, June 23	Coombe Abbey, August 17.
Stafford, July 10	Royal Horticultural Society, Oct. 6, and Nov. 16.

Special Certificate, Royal Horticultural Society, March 16, 1870.

From the above it will be seen that it is a Continual Flowering Variety, and I shall have great pleasure in forwarding intending Purchasers a Flower (per return of Post), for inspection.

Price: Small Plants, **5s. each**; Strong Plants, with 10 to 15 buds, **10s. 6d. each.**

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THE MOST GENUINE, PORTABLE, AND SUCCESSFUL MANURE FOR FLOWERS, ROSE TREES, SHRUBS, FRUIT TREES, ETC.

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As Wholesale Agents for the PATENT URBAN MANURE COMPANY, have much pleasure in drawing the attention of Nurserymen, Florists, and others to the following report (issued with the sanction of the Council of the Royal Horticultural Society, London):—

ROYAL HORTICULTURAL SOCIETY'S GARDENS,
CHISWICK, LONDON, March, 1870.

Official Report on the Patent Urban Horticultural Manure.

The above Manure has been tried in the Gardens of the Royal Horticultural Society, Chiswick, during the past two seasons of 1868 and 1869, with very satisfactory results. It was applied to the following subjects—viz., Fruiting Vines, in pots; Cucumbers, in frames; Peaches and other orchard-house Trees, in pots; Fuchsias, Pelargoniums, and Strawberries, in pots and in the open ground. 1st, By mixing a little of the Manure with the soil in potting the plants; 2d, By sprinkling some of the Powder on the surface, and watering it afterwards; 3d, By diluting a portion with water, and then watering the plants therewith. In the case of the Vines and Fruiting Trees, in pots, which were watered twice a week with a weak solution of the Manure, the effect was especially decided; and this form of application throughout seemed to have the advantage, and, secondly, that of sprinkling on the surface of the soil. The foliage of the plants, where it was used, assumed a much darker hue, and became of more substance; and the plants, in general, increased much in strength, and the berries of the grapes greatly in size.

The proportions used were those recommended on the canister in which it is sold; and in its general influence it seems to possess greatly the character of Guano, and to be equally as powerful, without incurring so much risk in its application.

Judging by the results, I am justified in stating it to be the best "Patent" Manure we have ever used, and recommend it accordingly. (Signed) A. F. BARRON, Garden Superintendent.

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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

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"Sir,—Enclosed you will find the result of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of this high fertilising agent of this valuable artificial manure. The sample examined by me contained only to per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understood you undertook to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
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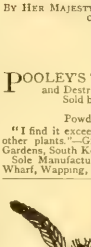

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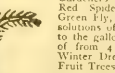

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Under Gardeners at Sawyeinhe	0	2	0
Mr. P. Daniell, Gr., Slindon Hall, Arundel	1	1	0
Two Under Gardeners at Slindon Hall	0	2	0
Mr C. Dardo, Foreman, Shirley Park Gardens, Croydon	0	5	0
Mr. Davidson, Foreman, Putney Heath	0	5	0
Mr T. H. Davis, Gr., Hazelwood, Norwood, S.E.	0	7	6
Mr Charles Deane, Gr., Combe Bank, Sundridge	0	5	0
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Under Gardeners at Stoke Place Gardens	0	7	6
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Mr. William Holah, Gr., Rufford Abbey, Ollerton	0	10	0
Mr. W. Holloway, Gr., Spye Park, Chippenham	1	1	0
Foreman at Spye Park Gardens	0	5	0
Under Gardeners and Labourers at Spye Park Gardens	0	10	0
Mr T. Hopgood, Gr., Somerhill Park, Tonbridge	0	10	6
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Under Gardeners at Ashwicken	0	1	6
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Under Gardener at Blendon Hall	0	7	6
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Mr. Jas. Murray, Gr., Tring Park	0	10	0
Under Gardeners at Tring Park	0	15	0
Mr A. Mussett, Foreman, Swyncombe Gardens, Henley-on-Thames	0	5	0
Mr. J. Musson, Stafford	0	5	0
Mr. G. Myers, Gr., Hevenigham Hall, Wangford	1	0	0
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Under Gardeners at Stoke Park Gardens	0	5	0
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Mr. W. S. Stevens, 10, Portobello Terrace, Portobello Road	0	5	0
Mr William Stocking, Gr., Didlington Hall, Brandon	1	0	0
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Mr R. Springer, Royal Exotic Nursery	0	5	0
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Under Gardeners at Tring Hall	0	5	0
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Mr. William Taylor, Gr., Buckland Tilleigh, Highampton	1	1	0
Mr. William Terry, Peterborough House, Fulham	1	1	0
Messrs. Thibaut & Ketcleer, Sceaux	4	0	0
Mr E. Thompson, Gr., Pitchford Hall, Shrewsbury	0	10	6
Mr. O. Thomas, Gr., Drayton Manor, Tamworth	1	0	0
Mr. Thomas Thomson, Campsall Hall Gardens	0	5	0
Mr. D. Thomson, Gr., Dromoland Castle, Thornhill	1	1	0
Mr. Joseph Thrower, Gr., High Canons, Barnet	1	1	0
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Mr H. Upton, Tortworth Park	0	2	6
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Mr F. Van Velsen, Jun., Overveen, Haarlem	2	2	0
Mr J. Wallis, Gr., Castle Park, Congleton	1	1	0
Two Under Gardeners at Castle Park	0	2	0
Mr John Wallis, Gr., Orwell Park, Ipswich	1	1	0
Mr H. Walton, Edge Lane Nursery, Marsden	0	10	6
Mr Joseph Warrender, Gr., Apley Castle, Wellington, Salop	0	10	0
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Mr. John R. White, Wotton-under-Edge	0	10	0
Mr J. Whitehurst, Gr., Oak Hill, East Barnet	0	10	0
Under Gardeners at Oak Hill	0	10	0
Mr. Jas. Whitelaw, Gr., Marino, Dublin	1	0	0
Mr. A. Wighton, Grimsthorpe Castle Gardens, Bourne	0	10	6
Mr. Wm. Wildsmith, Gr., Heckfield Place, Winchfield	1	0	0
Mr. A. Wilkie, Gr., Oak Lodge, Addison Road, W.	1	1	0
Mr. T. Williams, Gr., Gaywood Vale, King's Lynn	0	10	0
Mr. Joseph Williamson, Gr., Whitehaven Castle	0	5	0
Mr Edward Willmet	0	10	0
Mr Joseph Wilson, Gr., Elvetham Park, Hartley Row	1	1	0
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Mr R. Wright, Balderton Hall	1	1	0
Mr G. Zahn	1	0	0
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Under Gardeners at Blithfield Hall, Rugeley	0	5	0
Two Young Men at Castle Ashby	0	10	6
Under Gardeners at Sydney House, Cobham	0	7	6
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Foreman and Under Gardeners at Sprotborough Hall	0	12	6
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Under Gardeners at Meadow Bank	0	7	0

Corrections of preceding Lists.

	£	s.	d.
G. C. Adams, Esq., Coventry	1	0	0
Mr J. Birch, Foreman, Powerscourt Gardens	1	1	0
Mr F. Bottomer, Gr., Markree Castle, County Sligo	1	1	0
Mr J. Brady, Kilmore Cottage, Raheny	1	0	0
Mr J. Douglas, Gr., Kilkea	1	1	0
Mr M. Dunn, Gr., Powerscourt, County Wicklow	1	1	0
Three Under Gardeners at Powerscourt	0	10	6
Mr C. S. France, Powerscourt Gardens, County Wicklow	0	5	0
Mr Hull, Royal Exotic Nursery	0	12	6
Mr R. Love (not A. Love), Gr., Lyons, Hazlehatch, Kildare	0	5	0
Mr William Rayson, Gr., Doneraile, County Cork	1	1	0
Mr R. Towler (not Prowler), Nursery, Bedale	0	10	0

Botanic Gardens, Chelsea, May 4, 1870.

THOMAS MOORE, Hon. Secretary.

ROYAL HORTICULTURAL SOCIETY.
SHOW of ROSES, AURICULAS, &c., May 4, 1870.
AWARDS of the JUDGES.

CLASS 1.—9 ROSES, in pots, distinct (Open)
1st Prize, Messrs. Paul & Son, Old Nurseries, Cheshunt, Herts, £1
2d, Mr Charles Turner, Royal Nurseries, Slough, £3.

CLASS 2.—3 ROSES, in pots, distinct. (Amateurs.)
1st, Mr. Perry, Gr to F. G. Debenham, Esq., Cheshunt Park, Herts, £2.
2d, Mr J James, Gr. to W. F. Watson, Esq, Redlees, Isleworth, W., £1.

CLASS 3.—12 ROSES of 1867 68 69, in pots not exceeding 10 inches in diameter. (Open)
1st, Mr. C. Turner, £3.
2d, Messrs. J. Veitch & Sons, Royal Exotic Nursery, King's Road, Chelsea, S.W., £2

CLASS 4.—12 Show AURICULAS, distinct. (Open)
1st, Mr C Turner, £1 10s.
2d, Mr T James, £1

CLASS 6.—6 SHOW AURICULAS, distinct. (Amateurs.)
1st, Mr. J. James, £1.

CLASS 7.—12 ALPINE or FANCY AURICULAS, distinct (Open.)
1st, Mr. C. Turner, £1.
2d, Mr. J James, 10s.

CLASS 8.—6 HARDY PRIMROSES, distinct, in boxes 12 inches square. (Open.)
2d, Mr. T. S. Ware, Hale Farm Nursery, Tottenham, N., 15s.

CLASS 9.—6 HERBACEOUS CALCEOLARIAS, distinct. (Open.)
1st, Mr. J. James, £1 10s
Equal, Messrs. J. Dobson & Sons, Woodlands Nursery, Isleworth, W., £1 10s.

CLASS 10.—Collection of CUT ROSES. (Open)
1st, Messrs. J. Veitch & Son, £2 10s
2d, Mr W Earley, Gr to F. Pryor, Esq., Digswell Park, Welwyn, Herts, £1.
3d, Mr C. Newman, Gr to R. Holland, Esq., Stanmore Hall, Middlesex, 10s.

MISCELLANEOUS.
Messrs J. Veitch & Sons, Miscellaneous Collection of Plants, Extra Prize, £2.
Messrs W. Rollisson & Sons, Nurserymen, Tooting, S., Collection of Plants, Extra Prize, £1.
Mr. W. Denning, Gr. to Lord Londesborough, Grimstone Park, Tadcaster, York, Collection of Orchids, Extra Prize, £1.
Mr. B. S. Williams, Nurseryman, Holloway, Collection of Plants, Extra Prize, £1.
Mr. A. Wilkie, Oak Lodge, Kensington, Collection of Plants, Extra Prize, 10s
Messrs. Standish & Co., Nurserymen, Ascot, Collection of Plants, Extra Prize, 10s
Mr. T. S. Ware, Collection of Herbaceous Plants, Extra Prize, 10s
Mr. C. Turner, Collection of Auriculas, Extra Prize, 10s.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870.—JUNE 3 to 10

NOTICE TO EXHIBITORS.—Persons who intend to take part in this Exhibition must signify their intention to do so by letter, addressed to the undersigned, on or before May 20.

ADMISSION.—First day, 10s. 6d. each; 2d day, 2s. 6d. each; Whitmonday and remaining days, 1s. each. Gardeners will be admitted by Tickets as follows:—First day, 2s. 6d. each; 2d and remaining days, 1s. each. Applications for these Tickets must be made on or before May 30.

The fine Bands of Her Majesty's 4th Dragoon Guards, and the 100th Infantry, in attendance each day.

Botanic Gardens Manchester BRUCE FINDLAY.

LEICESTERSHIRE HORTICULTURAL SOCIETY. The GREAT SUMMER EXHIBITION of this Society will be held on the Race Course, Leicester, on TUESDAY and WEDNESDAY, July 5 and 6, when £40 will be offered in Prizes for Cut Roses, and upwards of £20 for Plants in pots.

A BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition

Schedules of Prizes and all particulars may now be had of

Market Place, Leicester WM. PENN COX, Secretary.

LOUGHBOROUGH HORTICULTURAL SOCIETY'S EXHIBITION, JULY 13.

SPECIAL PRIZES FOR ROSES (open to all England).

1st, For the best Collection of 72 Roses (72 varieties), single trusses, 1st Prize, a Cup, or £10 10s.; 2d, £5 5s.; 3d, £2 2s.

2d, For the best Collection of 48 Roses (48 varieties), single trusses, 1st Prize, a Cup, or £6 6s.; 2d, £3 3s.; 3d, £1 1s.

3d, For the best Collection of 36 Roses (36 varieties), single trusses, 1st Prize, a Cup, or £3 3s.; 2d, £1 1s.

SPECIAL PRIZES FOR PLANTS.

For the best 12 Stove or Greenhouse Plants (distinct varieties), 6 foliage and 6 in flower (Orchids excluded), 1st Prize, £10; 2d, £6; 3d, £4; 4th, £2

Full information may be had from WM. PALLETT, Secretary.

ROYAL CALEDONIAN HORTICULTURAL SOCIETY.—The SUMMER SHOW will be held in the Music Hall, George Street, on WEDNESDAY, July 13. ENTRIES CLOSE on the 7th. The following Prizes for Roses, open to all, will be awarded:—

NURSERYMEN.

6 Roses in bloom, in pots, 1st Prize, £2; 2d, £1
36 Cut Roses, of sorts, 1st, £5; 2d, £3; 3d, £1 10s
24 Cut Roses, of sorts, 1st, £3; 2d, £2; 3d, £1
12 Trusses, not more than three blooms in each truss, 1st, £2; 2d, £1; 3d, 10s.

GARDENERS AND AMATEURS.

4 Pots Roses, in bloom, 1st, £2; 2d, £1
36 Cut Roses, not less than 24 sorts, 1st, £5; 2d, £3; 3d, £1 10s
24 Cut Roses, of sorts, 1st, £3; 2d, £2; 3d, £1.
12 Trusses, not more than three blooms in each truss, 1st, £2; 2d, £1; 3d, 10s.
6 Cut Roses, 1st, 2s. 6d.; 2d, 5s

The competition in Roses to be open to all, whether they are Members of the Society or not. Prize Lists free.

Apply to WILLIAM YOUNG, 33, South Bridge, Edinburgh.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE:—

For the Two best COLLECTIONS of FRUIT and VEGETABLES, of such kinds of each as may be in season, a 1st prize of £5, and a 2d prize of £3.

☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.

The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868, and 1869 excluded from competition. The articles produced to be of the EXHIBITOR'S OWN GROWING

The Gardeners' Chronicle

SATURDAY, MAY 7, 1870.

A DAY in Paradise does not often cheer the lot of man in this sublunary sphere, but, comparatively speaking, such a treat we had the other day at Belvoir, where we went to spend a few hours among MR. INGRAM'S SPRING FLOWERS, which, in spite of a long, damp, and biting winter—frost on 17 days in March—a season a month to six weeks later than last year—were blooming as if we had had nothing but "sunshine and showers," and no lack of either. Last spring we apprehended the consequences of the preceding dry summer when these alpine gems were scorched almost out of existence—this year we feared a dripping winter, with prolonged, if not intense, frost, would be telling its tale. But no. Mr. INGRAM'S pets appear to rise superior to all climatic disadvantages, and bloom in spite of seasons. But Belvoir possesses an army of strong reserve; and if one plant fails, or is not so good as usual, there is another to fall back upon. Thus, last year Mr. FISH suggested that Myosotis dissitiflora or montana should be employed in preference to the ordinary kind, and a stock was provided. But it lacks vigour; hence large quantities had died off, though those remaining were quite equal to everything that had been said in praise of the variety. It certainly blooms much earlier, and when in full bloom the delicate azure-blue flowers are very charming, though in the earlier stages the prevalence of pink in the flowers is not so desirable.

For broad effect Mr. INGRAM depends upon large quantities of simple but beautiful materials, among which his own varieties of Aubrietia, Arabis, and dwarf yellow Wallflower, stand pre-eminent. Of the former, which is now being sent out by Messrs. BACKHOUSE, may be seen cushions 10 to 30 inches in diameter, so gay with bright lilac, almost purple flowers, as nearly to cover every leaf. Then many of the varieties have a clear white eye, almost like a small Auricula; and altogether the plant, though what is called a cold colour, is so striking as to form a groundwork of most effective decorative beauty. Again, Mr. INGRAM has a variegated variety, of much stronger constitution and broader foliage than the kind commonly cultivated, and that, too, has finely coloured flowers, which, sitting upon the white foliage, are very effective. This variety, like all variegated plants, is more delicate than its green brethren, and, in consequence, requires more care. It is, however, worthy of, and will well repay, every attention.

Of the Arabis, the fault is that the flower-stems grow too high, and hence in windy or rainy weather fall about and become unsightly. To remedy this Mr. INGRAM has been working to get a more compact variety, and has succeeded in raising a number of plants which do not rise more than 3 inches above the foliage, and thus form close and very compact patches, little taller than the Aubrietia. These will be admirable for front lines, while the original species will be suitable for the rear, where they may be supported between strong young plants.

The Wallflower is of bright orange-yellow, with a broad petaled, flat, and well-defined flower. It blooms at the height of 4 to 6 inches, rarely exceeding a foot, and in point of hardiness it may be stated that while the double and ordinary Wallflowers have all, or nearly all, succumbed to the season, this variety is not injured at all.

With such materials Mr. INGRAM almost defies the seasons, and this in some measure may be considered the secret of his success.

Then at Belvoir you meet with scores of varieties of Polyanthuses, Oxlips, or whatever you may please to call them, varying in colour from pale yellow to nearly crimson, some throwing their flower-stems boldly up above the foliage, others with the flowers nestling like the Primrose close upon the tips of the foliage, and forming compact little specimens. These Mr. INGRAM is encouraging as a special class, so that in a short time he will have a rich collection of these varieties. Alpine Auriculas also receiving careful attention, their rich colours being especially welcome. But they are not so readily cultivated as the Oxlips, and hence are not so abundant.

Of plants of more than usual interest we may notice again a Heuchera with bronzy purple leaves, which is very effective; and associated with it as a companion line was the broad-leaved, white-spotted Thistle. Other very telling beds were carpets of Cerastium tomentosum, thinly studded with bright purple Beet.

Carpet bedding is at Belvoir very fashionable, and for that purpose Saxifragas, Sedums, and other close-growing plants are used; while over them, standing thinly, may be seen Hyacinths, Tulips, dwarf Heaths, and other gay plants. Violets and common Primroses are used for the same purpose, and most charming beds they make. In fact, Mr. INGRAM'S object is to get rid of the naked soil, and to that end he uses any plant that has neat foliage or gay flowers. A singular fact may be mentioned: before Mr. I. went to Belvoir it was said and believed that Violets would not grow there, and the late Duke used to regard it as a favour for his neighbours to send him a bunch occasionally. Now Violets do so well, and the mass of bloom is so great, that they positively impart a glow of colour to the beds in which they are planted. It is, however, found that they do the best under the partial shade of deciduous trees, especially those which shed their leaves early in the autumn; and if, at the same time, the roots of the trees, by growing under the beds, insure the Violets a dry bottom, they are found to ripen more perfectly in the autumn, and in consequence to give more and earlier bloom.

In bulbs, Hyacinths, Tulips, Narcissi, Squills, &c., Mr. INGRAM is becoming a perfect Hollander, many of his home-grown bulbs blooming much stronger than those which are newly imported. It is now found that the bulbs flower much better through being left two years in the reserve ground without being transplanted, and upon such bulbs we saw many spikes of Hyacinths 9 inches to a foot high, strong in proportion, and profusely set with flowers. Upon the Belvoir strong soil, with the free use of cowdung, leaf-mould, and burnt earth, Mr. INGRAM is accumulating such a quantity of bulbs that he will soon be independent of the foreign grower,—a great point in the cost of the spring garden.

We must not omit to direct attention to Arabis rosea, a recent introduction by Messrs. BACKHOUSE, which, though it cannot be pronounced a decided rose colour, yet when planted *en masse* imparts a glow of pale rose colour to the bed. The plant is an acquisition, and may be the forerunner of still more decided colour. Then Anemone fulgens, as its name implies, is a most intense crimson-scarlet, while A. blanda is superior as a blue to that general favourite A. apennina. Some groups of Epimediums were effective, but the flowers are too fugitive for bedding purposes.

As to the general aspect of the spring gardens, the early Rhododendrons were very gay, and shrubs have scarcely suffered at all from the frost; but Pansies were drooping for the want of rain, the Cliveden Blue being little darker than lilac in colour—in fact, all the flowers were suffering through the dry season. The Duke's garden under the hill has been much increased in size, simple stone being used for the purpose, so placed, that when it becomes coloured by the weather, and partly covered with plants, the new parts of the garden may be mistaken for an abandoned stone quarry. This is the right place for naturalising alpine plants, and so gradually is Mr. INGRAM stealing his way, that in the course of a few years the whole walk, some two miles long, will become episodically, if not continuously, a garden of gay hardy flowers. If the persons who are making the London parks, through the winter and spring season, such a dreary waste of bare beds, would take a lesson out of Mr. INGRAM'S book, they might save the country much expense, and infinitely improve the aspect of the parks at all seasons.

Speaking of Mr. INGRAM'S work, we believe we shall not be out of place in stating that he has a book on spring flowers in preparation, which will probably be published early in the autumn, and we think will be welcomed by all lovers of gay spring gardens.

THE bed of the SERPENTINE, in Hyde Park, above the bridge, has been cleansed, the offensive mud removed and replaced by a thick layer of good clean Kensington gravel, and the space is now covered by a sheet of pure water, a dam having been thrown across at the bridge to allow of the upper part being put in order without hurrying or waiting for the completion of the lower part. In conjunction with these improvements some alterations have been made on the banks of the eastern side, as to which we feel disposed to make some remarks. We do so in no spirit of carping or fault-finding, nor even in the expectation that our remarks may catch the eye of those engaged in making the alterations, and so lead to the reconsideration of any points to which we object, but rather for the purpose of examining one or two of the principles of landscape gardening which are involved in the alterations.

In landscape gardening it generally happens that the view is more to be considered from one side than the other. Where, for example, the question is the disposition of views or scenery in front of a mansion, the views from the mansion are of more importance than those from any other quarter, and the latter are properly sacri-

ficed to the former. In the case of the Serpentine, such a preponderance of interest does not exist, for the public interest overrules the preference which, in ordinary cases, would be given to the Palace or mansion side. It is simply a sheet of water, on both sides of which the scenery has equal claims to consideration.

Hitherto we think the side next the Palace has had the best of it—more attention, or, at least, more effective attention, having been paid to obtain good views from it than from the other. We might notice various points on the eastern side where a judicious dealing with the trees would add greatly to the beauty of the scenery from that stand-point; but the views from the Palace and its immediate vicinity are, with the unhappy exception of SPEKE'S monument (which is a blunder of recent perpetration), exceedingly good. The main front view stretches down a glade to the Serpentine, and is carried across between two groves of trees, which continue the effect of the avenue on the west side, and the eye used to be refreshed by an open space of smooth short grass, which came down to the waterside, forming a lovely park-like slope, which was very pleasing. This smooth green slope was a not unimportant element in the scene of quiet beauty which has for many years, on the summer evenings, especially Sunday evenings, attracted crowds to the western slope, facing it, when all the chairs in the park seemed to be brought together to that one spot, and all were too few for the multitudes of well-dressed people who thronged to use them.

This attraction no longer exists. It is as if the gods were envious of the long-continued prosperity and favour enjoyed by the western side. To see it now the public must migrate to the eastern side, from which indeed they may still see a lovely green bank sloping down between trees to the water-edge, but the other circumstances are not the same. On the summer evenings, when alone the spot is sought after, the rays of the declining sun will flash right in the eyes of the people instead of behind their back—instead of a background of shady trees, they will have the dusty clouds of the carriage-road across the park, and they will be deprived of the natural amphitheatre of verdure in which they have hitherto been accustomed to arrange themselves. Change their place of rendezvous, therefore, we may be sure that they will not; and the question comes to be, does the new arrangement on the eastern side supply a sufficient equivalent for the sun of which they have been deprived. What is the new arrangement, and what does the spectator on the western side now see instead of the grassy slope whose beauty has been marred? A clump of Rhododendrons is clapped down on the one half of it, and across the other runs a bright yellow gravel path, fenced by an iron rail. According to our view, this is not an improvement.

We have always understood that obtrusive lines drawn right across the line of vision were objectionable; that a grassy slope stretching up from a sheet of water was to be prized; and that where, for the sake of contrast, it was thought advisable to break its uniformity by clumps of shrubs, these clumps should be the continuation or termination of groups of trees; and above all, that a clump obstructing wholly or in part a glade or avenue was against the rules of good art. We may be wrong in this, or, if right, our good reasons may perforce have to give way to better. There are always two sides to a question, and we therefore suspend our judgment until we see whether anything in favour of the alterations occurs to any of our correspondents.

—— TWO GRAND FLOWER SHOWS will be held at the Crystal Palace on Saturdays May 21 and June 11, to both of which will be added new features in the way of classes specially intended to encourage the skill of amateurs in the culture and arrangement of flowers. The annual Rose Show will be held on Saturday, June 25, and a magnificent display of some thousands of Roses in pots will be made by Mr. W. PAUL, of Waltham Cross, in one of the corridors overlooking the grounds, from May 28 to June 4. We learn also that it is proposed to establish a SOCIETY specially for the encouragement of the growth of FLORISTS' FLOWERS. The new Society is not intended to be in any way antagonistic to existing societies. Among the first things proposed is the restoration of the autumn show at the Crystal Palace. It is understood that the Directors of the Palace will give liberal assistance to the scheme. Those desirous of joining the Society, or taking part in its operation, should address themselves to the Rev. H. H. DOMBRAIN, Westwell Vicarage, Ashford, Kent. An exhibition of cage birds and pigeon shows will also be held later in the season. The programme, of which the above are merely a few items, fully warrants the Management in vaunting the season ticket—extending, as it does, over a clear twelve months—as the best guinea's worth in the world of entertainment. First-class railway season tickets are issued by each of the two railway companies running to the Palace for an entire year at two guineas.

—— The exhibition of CHRYSANTHEMUMS held under the auspices of the Horticultural Society of Liverpool—probably the best in the country—is fixed to take place on November 22 and 23 next. Entries close on November 16. A liberal schedule has been issued, and with it a copy of a letter written last December by the late Mr. S. BROOME, in which he writes:—"Will you be so good as to call the attention of the Chrysanthemum growers to an excess of training that I observed in some of their plants; they were too large and too flatly trained. The centre of the plant ought to be from 9 inches to a foot higher than the outside, and the blooms should not be tied down after the bud is of the size of a small Pea. By tying them so late, the stem of the flower is not strong enough to support the bloom erect, and the beauty of the flower is lost, as it is buried in the foliage. I have one more remark to make, viz., there are too many white and yellow varieties; try next year a few more dark colours."

—— We have been requested to announce that a meeting, in reference to the HORTICULTURAL DIVISION of the forthcoming ANNUAL INTERNATIONAL EXHIBITIONS, will take place on Friday, May 13, in the Council room of the Royal Horticultural Society, when the attendance of exhibitors is especially requested. The Right Rev. the Lord Bishop of WINCHESTER, Vice-President of the Society, will take the chair at 12 o'clock precisely.

—— The WEATHER during the WEEK ending April 30 was very varied in character. In England the maximum temperature varied from 57.4° at Bradford, to 67° at Blackheath; the mean of the highest for the 16 stations being 61.9°. In Scotland the extreme highest was 66.5° at Aberdeen, and the lowest maximum was 55° at Greenock; the mean for the seven stations being 60.3°. The minimum temperatures in England varied from 30.1° at Portsmouth, to 38.8° at Liverpool; the mean for all stations being 35.3°. In Scotland the lowest was at Aberdeen, viz., 33.8°, whilst at Greenock it was 40°; the mean for all stations being 37.4°. The RAINFALL was pretty equally distributed (with the exception of Manchester and Liverpool, the amount at the former station amounting to more than 1 inch), the mean for the two countries being 0.32 inches.

—— We are requested to state that a sum of about £990 has been raised for the VEITCH MEMORIAL, and that a general meeting of the subscribers will be held to receive the report of the Central Committee, and to determine finally on the application of the funds, as soon as the necessary arrangements can be completed. We would suggest that a day near the date of one of the principal exhibitions may be found convenient to subscribers who may wish to attend.

—— The display of INDIAN AZALEAS at the Royal Exotic Nursery, Chelsea—famous for the production of some of the most startling of the monster specimens which have appeared at our metropolitan shows, especially at the International of 1866—will be well worth seeing during the next week or two. The plants are in excellent health, and in splendid blooming condition. We may at the same time congratulate the Messrs. VEITCH on the position they have this season taken up amongst our foremost Rose-growers.

—— The following letter tells its own tale a melancholy one:—

"I herewith forward you specimens showing the EFFECTS of the FROST of the 4th inst., when the thermometer at Chiswick fell to 20° (12° of frost). On the previous morning it fell to 24 (8° of frost), which, however, did but little damage beyond destroying the Potato tops. On the morning of the 4th, however, the destruction amongst our fruit crops was immense. As you will observe, Cherries, Plums, Pears, &c., which had set their fruit, are nearly all destroyed, and even the unexpanded blossoms of the Apple, which is singularly, although the hardiest fruit, possessed of the most tender blossom."

—— Nearly 2000 acres of FURZE, besides a number of plantations of TREES in the New Forest, have been destroyed by FIRE during the last few months. Most of the fires have originated, it is believed, through mischief.

A HANDFUL OF FLOWERS FROM CHISWICK.

IT seems more than doubtful if we shall ever be able again to gather such a handful of flowers from Chiswick as we did some few days since, when many of the trees in that hallowed garden were in their loveliest garb. True it is that many, nay, most of the trees, may be seen elsewhere in as great or greater beauty than at Chiswick. Still Chiswick is Chiswick, and its memories will remain long after the Wilderness and the Arboretum are labelled as "eligible building land." True also was the remark that our bouquet "would not fetch much in Covent Garden Market;" perhaps not; but then we could not get such a one in Covent Garden if we wished.

Let us overhaul our bouquet. What have we got? Willows, Birches, Poplars "all a blowing and a growing," Plane buds just showing their pink styles, Primroses, Wallflowers, flowering Currants, Berberis, one sheet of golden bloom; Maples, some in all the graceful beauty of inflorescence, others with the golden hue of new-born foliage; the Canadian Amelanchier, a sight to make the heart bound, so beautiful in its snowy flowers. Let no florist talk of "windmill petals;" let him see the snowy Medlar in full bloom, and acknowledge that the windmill flowers are no disfigurement. The Grape-pear is another not inappropriate name for this plant, for its flowers are like those of a Pear (though, in truth, the latter are nearer to the florist's ideal), and arranged in Grape-like clusters. How came it with such a name—Amelanchier? Books tell us that is Savoyard for Medlar. Indeed; but we should be grateful for more information as to this word. Perhaps some philologist will kindly tell us more about it. Are Hooker, Koch, and other botanists right in separating this from the Pears? No one looking at the flowers would say so. But then the fruit is ten, not five-celled, and that is a difference. There are several varieties, but we confess our inability to distinguish them, and stick to the two species, the one European, with the blunter leaf; the other American, with the pointed leaf.

What have we here, with flowers like a large double Peach, and leaves like those of Kerria japonica? Surely it is a Peach or an Apricot? But how comes it with row after row of soft downy fruits in embryo, like eggs in a nest—Apricots luxuriating in six or eight carpels instead of one? No doubt it is a Prunus "gone mad," as a satirical friend has it, though even he recognises the rare beauty of the monster. No wonder the botanists were puzzled when they first saw it. Carrière called it Amygdalopsis Lindleii, not recognising its exceptional character. But truly it is like an Almond, while Lindley's name, Prunus triloba, though more correct generically, is far-fetched as to the specific name, for the leaves are not appreciably three-lobed. When we look into the flower and see one central carpel, and five subsidiary ones, each on a little stalk, we ask ourselves if it would be an advantage horticulturally to have six Peaches instead of one from a single flower; the answer is no, for reasons that any gardener will appreciate. When we ask ourselves, what if the additional carpels prove advantageous to the plant in some recondite manner, will they not be perpetuated through the agency of natural selection (see Darwin), and may we not have here the *fons et origo* of a new genus? If so, Carrière was only before the age when he established it as a new genus. On the other hand, what if pre-Adamite Apricots and Peaches had five or more carpels to each bloom, and this is a reversion to older conditions? Who can tell? The lake dwellers in Switzerland had Plums like our own to all appearance, but these prehistoric gentry are Mushrooms compared with other inhabitants of this world, more or less well known to the geologist. And now look at the flowers of this Acer macrophyllum: can anything be more exquisite than these full drooping flower-clusters, each flower a bell of perfect mould and with a filmy tuft of hairs around the stamens which Art could not imitate. But that is not all. Nature made these things for a purpose, and wonderfully, thrice wonderfully, is everything adapted to the fulfilment of that purpose. See here the principle of the division of labour carried out, see there the care taken to ensure the ripening of the seed, and the perpetuation of strong healthy seedlings. In this particular plant the majority of the blossoms—those at the free end of the cluster—have stamens only, and these stamens protruding beyond their envelopes bursting with ripe pollen, as the bees full well appreciate, and each one clothed with the delicate cobweb-like hairs before alluded to. Look now at the very bottom of these flowers, and see the thick fleshy green disc trickling out its dew-drops of honeyed liquor. Do you wonder that messieurs the bees are at work here? What a feast for them! How they battle with the hairs which cover over the treasure! How thickly they get dusted over with pollen as they are rifling the honeyed store! Now look at the flowers near the base of the cluster, and notice that they are in groups of three, the central one the most vigorous, and bearing the young seed-vessel (a fact for Mr. Meehan this, the female flower so placed as to receive the full flow of sap), the side attendant flowers similar to those at the end of the cluster. Examine now the central female flowers; there is the young seed-vessel, its stigmas all protruded, ready for messieurs the bees to alight on when weary of their labours in the pollen-bearing flowers. There are stamens here, too, around the young seed-vessel, but they are poor starvlings compared with the others; they are short, and do not protrude beyond the petals, their anthers are close, their pollen is not ripe, their stalks are less hairy than in the male flowers, and though there is a trace of disc at their base, the disc is dry as a chip: no honey there. It is clear that Nature does not intend these atomies to be the parents of the seedlings. The division of labour principle is acted on here, one flower is serviceable for pollen, the other for seed. What, then, is the meaning of the stamens in the female flower? Possibly they may be useful for other flowers,

or if pollen from other flowers fall short ; but more probably they are, as it were, relics of an earlier state of things, when the division of labour was not carried out as it is now, and when, instead of the influence of the pollen from one flower on the stigma of another being found requisite or preferable to ensure the continuance of the species, fertilisation was effected by the agency of the pollen on the stigma of the same flower. Physiologists tell us that this separation of the pollen element from the germ-producing structure is an advance, that a structurally perfect flower is in a physiological sense degenerate, and that a cross in some form or another is essential to the vigour and prolificacy of the species.

The other Maples, of which there is a fine collection in the garden, show the same facts as those we have alluded to in the Acer macrophyllum. Let us hope that no one will think their beauty detracted from by this exposure of their life-history. To us the knowledge that each flower has its history written for us, if we would but read it, adds immensely to their interest. They become then to us, as it were, humanised. We sympathise with them, and wonderingly and, we hope, reverentially, admire what before we merely looked at with more or less pleasure.

But our nosegay is not half exhausted. Here are Pavias, with leaves half expanded, and of the most delicate violet or mauve tints imaginable. Here is a double white Peach, a glorious sight indeed, with its large dead white blossoms. Here is the quaint Caragana, with its Laburnum-like flowers and queer stunted "spurs," quite normal, not monstrous, though ugly enough to be so were it not for the fact that the most beautiful of flowers in florists' eyes are monstrous ! And here is a Ribes, or rather what we took for one, and hunted in vain through books and plates for its name, till at length light gleamed in on us, and we found we had a Rosaceous plant (Nuttalia cerasiformis) to deal with—very like a Ribes, very unlike a Rose—not beautiful, certainly, but interesting ; and when the Wilderness is gone, where shall we go for a specimen of a Ribes-like Rose ? And here is another out-of-the-way Rosaceous plant—a Potentilla or a Geum, we think, as we look at its trailing habit and yellow flowers. Neither one nor the other says the magnifying-glass, but a Waldsteinia, as odd in its way as the Nuttalia, and much prettier ; odd, because, with the appearance of a Potentilla, it has the structure, so far as the flower tube and carpels go, of an Alchemilla. But then we remember that Roses and Saxifragas are very multiform, and, though all tied together, yet including some curiously eccentric forms. Our bouquet is not a third overhauled, but the patience of the reader !—oh, reader ! pray excuse *A Rambler.*

THE MANAGEMENT OF COTTAGE GARDENS.

[One of the Highly Commended Essays sent in for competition for Mr. W. Egerton Hubbard's Prize. Eds.]

FEW more cheerful sights are to be seen in the country than the home of the cottager—its walls clothed with the Grape Vine, from which the frugal housewife obtains her yearly supply of fruit wherewith she brews her famous home-made wine, or with sweet-scented clusters of Cabbage Roses, or the still sweeter blossoms of the Honeysuckle. On each side of the pathway leading from the wicket-gate to the cottage-door are trim flower-borders, where grow Giant Stocks, the pride and boast of their owner, together with a charming mixture of Wallflowers, Sweetwilliams, Pinks, Moss Roses, and a variety of other flowers. Near these, in some warm sheltered corner, perchance close by the Honeysuckle-covered arbour, are the bee-hives ; while at the far end of the vegetable plot stands the snug pigstye, all contributing to form a scene of frugal comfort, contentment, and prosperity, most pleasing to look upon.

No better time of the year in which to take possession of a garden could possibly be chosen than Michaelmas, when most changes occur among cottagers. The soil should then be trenched to a depth of 18 inches, manured, and laid up roughly, so that the frost and air may act upon it. That part of it which is intended for fruit trees should be closely examined, and if it is at all heavy, or of a clayey nature, a plentiful mixture of gritty matter, such as road-scrapings, would very much improve it ; but if it is a sound loam, no preparation other than the trenching will be necessary.

In the preparation of manure care should be taken that it is kept in a close heap and covered with earth, ashes, road-dust, or anything which prevents the escape of unpleasant smells. Never suffer manure to lie exposed about the garden, but dig it in at once for the sake of neatness, and that none of its richness may be lost. If the manure used in autumn is somewhat rough and only partly decayed, it will be all the better for the future crops, as it will decay slowly during the winter months, and also help to admit air into the soil. All quick-growing vegetables require abundance of manure, but fruit trees, growing in a good loamy soil, crop best without much manure. An occasional application of house-sewage during the growth of the fruit will assist the tree in bringing its fruit to a high state of perfection, and, generally speaking, will be all the manure a healthy vigorous tree requires.

Plant all fruit trees early in November. Dwarf trees are by far the best, standards suffer from the wind and shade the ground, and thereby affect the crops growing around them. Select stout, healthy young trees, one or two years from the graft : before planting shorten the shoots to three or four eyes, and cut off any bruised or broken roots. The trees should be planted close by the side of the garden walk, keeping the squares or open parts of the garden for vegetable crops. Apple, Pear, Plum, and Cherry trees to be 6 feet apart, and Currants and Gooseberries 4 feet apart. Raspberries produce most fruit planted in rows 4 feet apart, and 1 foot apart in the rows, the canes to be fastened to a couple of strained wires.

In planting keep the roots near the surface, 4 inches of soil over them is enough. Fasten each tree securely to a stake : this is very important, for if a fresh planted tree becomes loosened by the wind it will not only be slow in starting into growth, but its shoots will lack vigour and substance. Protect the roots of all fresh planted trees from frost by covering the surface of the soil around each with some rough litter ; this litter will also be useful the following summer in keeping the soil about the roots moist : an occasional watering will, however, be useful if the season is a dry one.

In pruning established fruit trees remember that all fruit thrives best when fully exposed to the sun. The aim of the pruner should, therefore, be so to regulate the branches that the sun may shine, and the air circulate, freely among them. As the pruning in a cottage garden is mostly done in winter, care should be taken to do it during the darkest period of the year, before the days lengthen ; for if it is left till the approach of spring, the trees and bushes will be weakened very much, and consequently the fruit will not be so fine as it otherwise would have been. It may be useful to give one or two simple reasons for this. The limbs of trees in winter are full of sap, and as the days lengthen, and the sun gains power, the buds swell, the sap also begins to move or circulate in the branches ; and if the pruning is left till this takes place, the motion of the sap must receive a severe check, and all the sap drawn up into the shoots which are cut off will be so much strength wasted, for the sap is the life of the tree.

If it is intended to grow Strawberries, there will be no occasion to plant them till July or August, so that a crop of early Potatos may first be secured. Give plenty of manure to the Strawberry ground ; plant strong healthy plants 1 foot apart, in rows 2 feet apart, water freely, and you will have a fair crop the following season. Plant a few young plants every year, and never suffer old plants to remain after the third year, but clear them off immediately after the fruit is gathered ; then manure and trench the ground, and it will be in readiness for a crop of winter Greens or autumn Cauliflowers.

Turning now to the vegetables, the Potato, as being the most important crop to the cottager, first claims attention. The Potatos intended for planting should be selected when the crop is lifted. Never suffer a Potato to waste its strength by making useless growth during winter. Select good seed, prepare it carefully for planting, plant in soil which has been thoroughly stirred and manured, earth-up lightly, and above all, plant kinds that ripen early, and you will have abundant crops of good quality and free from blight.

Preparation of the Seed.—Choose your seed early in autumn, spread it out in single layers, in a cool, airy room or shed, safe from frost. Cut out all eyes, except one or two of the strongest ; this may be done at any leisure time during winter.

Planting and Culture.—Do not plant till safe from frosts ; the stout, strong shoots which the Potatos will have when planted, will soon force their way upwards to the light. Draw drills 2 feet apart, lay the seed carefully in 1 foot apart, and draw the earth lightly over it with a prong-hoe. When the young shoots are up high enough to be seen clearly, stir the soil once or twice with a hoe ; and when they are 6 inches high, take a steel fork, and as you walk backwards between the rows, stir the soil well and earth-up, giving the whole a nice finish as you proceed, and so leave the soil as light and open to the air as possible. Do not form a high sharp ridge, but rather prefer a low, broad one, just high enough to cover the Potatos, as then they will profit by every passing shower and every hour of sunshine ; the dew trickling down their stems will also reach them, and the sun's rays so warm the shallow soil that a quick, strong growth, and early maturity will be the result.

Onions, Turnips, Carrots, and Parsnips are all profitable and nutritious vegetables, ranking next in importance to the Potato. Onions should be sown in deep rich soil early in March. Should the soil be wet, choose a clear, windy morning, and stir the soil 2 or 3 inches deep ; in a fine, clear day, with a brisk wind, it will be dry enough for drilling towards night. The drills for this and the other root crops should be 9 inches apart. Watch the seed-bed closely, and as the young growth is just appearing, settle the bed down with a light roller.

Of Turnips, make an early sowing of White Dutch in a cool shaded position, in March, for summer use ; and for autumn and winter, make two or three successive sowings of Snowball as the ground is cleared of Potatos in July and August.

Carrots and Parsnips are sown about the first week in March ; they should be watched closely, as the young plants are frequently eaten by snails. When the plants are large enough to handle, thin them out to 8 or 9 inches apart. Do not suffer Carrots to remain in the earth late in autumn, as they are liable to be eaten by slugs and wireworms. Carrots and Parsnips keep best stored in sand.

A little Celery seed sown in light soil in a warm corner, or, better still, under a hand-glass, early in March, will afford plenty of plants ; when large enough to handle they should be pricked out in rich soil in some open place, where they will become nice, stout, dwarf plants. A cottager should not aim at growing very large Celery, but should rather try to produce crisp firm hearts, a foot or 18 inches high. To do this no trench is required. Stir the soil deeply, mixing plenty of rich dung with it ; plant the plants in a row 9 inches apart, water freely (remember the Celery loves moisture); do not earth till the plants are about 9 inches high, previous to which tie each plant loosely, and keep them free from side shoots. In earthing, loosen the soil on each side of the plants, remove the string, then grasp the plant with the left hand, and bind the soil firmly around it with the right hand, then carefully throw up more soil with a spade, covering the stalks to the base of the leaves, taking care not to let the soil fall into the centre of the plants. Two more earthings as the plants make growth will be sufficient. In very severe winters some dry litter thrown over the plants will be useful, for if Celery suffers much from frost it is apt to decay.

Peas are a delicious vegetable, and where space can be afforded a nice succession may be had throughout the summer. Do not sow very early, but wait till the sun gains power, as then the seed will vegetate and grow quickly, so as to escape the ravages of snails and other insects. Make the first sowing the second or third week in February, and for a succession sow a row every three weeks till the middle of June ; this will give five sowings, the first of Ringleader, the second Climax, the third Laxton's Prolific, and the two last Veitch's Perfection. If the rows are separate from each other, in different parts of the garden where they can have plenty of air and light, the crops will be better than if the rows are placed side by side.

Two sowings of dwarf French Beans will suffice, one the last week in April, in a warm, sheltered spot, and the other the last week in June or early in July.

The main crop of Scarlet Runner Beans should be sown the first week in May, and if space can be had for two more sowings, one the end of May and the other the middle of June, they will serve to keep up a good succession throughout the season.

Two or three crops of Broad Beans may be useful if sown at the same time as the first few sowings of Peas.

Of Cabbages, sow Little Pixie early in March, in light rich soil on a warm border ; these will do well planted 1 foot apart, and will give a supply of sweet compact little hearts by the end of July. For an autumn bed to succeed these, sow seed of the same kind the first week in April ; this crop will come into use nicely after the late-sown French Beans. If a larger sort is wanted, Reliance is a good one, but it must be planted 18 inches to 2 feet apart. The seed for the spring bed should be sown about the second week in July. In planting this bed it is a good plan to have the plants twice as thick as is necessary, and after they have made a slight growth in spring to cut half the plants for Greens, leaving the remainder to grow into Cabbages.

Savoys, Brussels Sprouts, Cottagers' Kale for winter, and Walcheren Cauliflower for autumn use, should be sown early in March, and the main crop of Broccoli the beginning of April. Leeks are a useful vegetable for soups and stews ; they thrive best in rich soil. Sow seed thickly in March, and plant in rows 1 foot apart, and 9 inches from plant to plant in the rows.

For a succession of Lettuces sow Bath Cos and Stansted Cabbage the second week in August ; sow more Bath Cos early in March, and in order to keep up a constant summer supply, as every batch of plants is pricked out another pinch of seed must be sown. Ivery's Nonsuch and Paris Green Cos are good summer Lettuces.

Cucumbers and Vegetable Marrows must be sown by the middle of May. Prepare a bed by opening a trench a yard wide and a foot deep, laying up the soil in a high ridge on each side, fill the trench with rough manure, leaves, or any garden refuse ; cover with some rich soil, and sow the seed in patches a yard apart, five or six seeds in a patch. Protect the young plants from cold winds by laying thatched hurdles or the boughs of trees over them on the ridges. Waterings of sewage will assist them very much.

Sow early frame Radishes on a warm border in February, and make another sowing of the same kind in March, after which Turnip-rooted or French Breakfast Radishes are the best. Summer Radishes require abundance of water, without which they are hot and tough ; they should be sown in a cool shaded part of the garden. *Edward Luckhurst, Egerton House Garden, Kent.*

To be Continued.

THE FLOWER GARDEN AT DANESBURY.

THE flower garden at this place, which is the residence of W. J. Blake, Esq., though not extensive, is prettily arranged, and in the season it is very effective, part of the effect being derived from the relative proportions of the grass and flower-bed areas, proportions which would probably be good on a larger scale. It

also gains much from the trees and shrubs on the lawn surrounding it, and overlooking a well planted park with many picturesque views of this beautifully undulated part of the country. The general arrangement of the plan of this flower garden is due to Miss Blake, whose great taste is brought to bear with the best success in the arrangement of the planting for each year.

It will be perceived that the general outline of the garden (fig. 120) is of a horseshoe form, the forepart being flattened by the conservatory, which forms the boundary on that side. The ground by the conservatory is slightly elevated, and slopes away in all directions. The permanent features of the garden will first be noticed. Along the outer side of the walk is ornamental wirework, forming a series of arches on each side of the garden, having the best sorts of climbing Roses growing over them. The paths round the chain beds (1 to 12) are of fine gravel, Box-edged on both sides. The ring beds (13 and 14) have circular grass-plots within them, and a vase on a pedestal in the centre of each. Beds 15 and 16 are

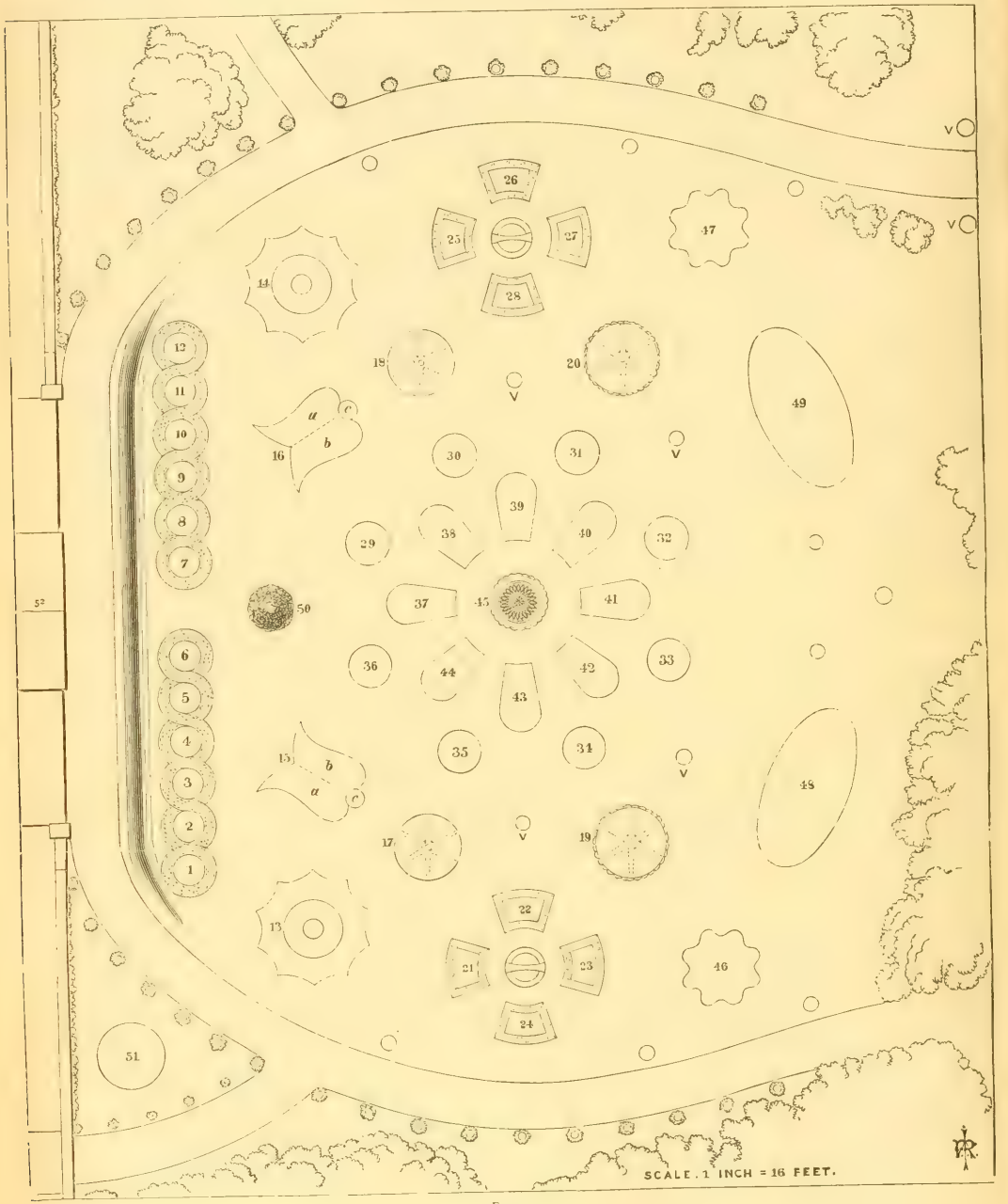

Fig. 120.

Box-edged all round; 17 to 20, and also 45, have shell pattern terra-cotta edgings. The segmental beds 21 to 28 are surrounded by ornamental pebble work, the beds being raised about 6 inches above the general level, and edged with Box; in the centres of these two clusters are ornamental baskets, containing various plants, on raised turf mounds. In the centre bed (45) is ornamental wirework, about 8 feet high, of columnar form, surmounted by a wirework basket, in which are planted Pelargoniums, &c., Jackman's and Fortune's new Clematises climbing up the column and falling over gracefully at the top. 48, 49, and 51 are planted with the best perpetual Roses, pegged down. A fine plant of Cassia corymbosa is usually planted out at 50, and a few standard Pelargoniums and Roses are dotted about the grass. The small circles on the plan, some of which are marked V, are vases, planted with Pelargoniums, &c.

The bedding arrangements for this year are as follows:—Beds: No. 1. Viola lutea grandiflora; 2. Pelargonium Beauty of Welwyn; 3. Lobelia speciosa; 4. Pelargonium Beauty; 5. Coleus Verschaffeltii; 6. Pelargonium Rose of Denmark; 7. Lobelia speciosa; 8. Pelargonium Waltham Nosegay; 9. P. Cloth of Gold; 10. Amaranthus melancholicus; 11. Viola cornuta; 12. Pelargonium Rose of Denmark; 13. P. Monsieur George Nachet, edged inside and out with

Cerastium tomentosum ; 14. P. Lady Constance Grosvenor, edged inside and out with Golden Feather Pyrethrum ; 15. P. Bijou, edged all round with Iresine Lindeni, with division down the centre of the same, and Golden Feather Pyrethrum in *c* ; 16. P. Beaton's Silver Nosegay, edged all round with Lobelia speciosa, with a central division of the same, Golden Feather Pyrethrum in *c* ; 17. Calceolaria floribunda, a star of Coleus Verschaffeltii, with a standard Coleus in the centre ; 18. Viola cornuta, a star of Pelargonium Stella, and a standard Pelargonium in the centre ; 19. Viola cornuta, with a star of Pelargonium Cybister ; 20. Calceolaria floribunda, and a star of Verbena Purple King ; 21. Viola cornuta ; 22. Pelargonium Rebecca ; 23. Viola lutea grandiflora ; 24. Pelargonium Indian Yellow ; 25. Verbena pulchella ; 26. Calceolaria Prince of Orange ; 27. Pelargonium Christine ; 28. Verbena Ariosto Improved ; 29. Pelargonium Indian Yellow ; 30. Coleus Verschaffeltii ; 31. Pelargonium Dr. Lindley ; 32. P. Christine ; 33. P. floribundum ; 34. P. Lord Palmerston ; 35. P. Blue Bell ; 36. P. Cybister ; 37. P. Amy Hogg ; 38. Calceolaria Kayi ; 39. Pelargonium Duchess ; 40. P. Alma ; 41. P. Rubens ; 42. Calceolaria Kayi ; 43. Pelargonium Lucius ; 44. P. Madame Vaucher ; 45. Centaurea ragusina edged with Campanula carpatica ; 46. Pelargonium Christine edged with Centaurea ragusina, with Ageratum in centre of bed ; 47. P. Boule de Feu, edged with Campanula carpatica, with Ageratum in the centre, *A. Parsons, Danesbury, Welwyn.*

ORCHID CULTURE.

In reply to your correspondent, I beg to say that I shall be glad to give such information as lies within the scope of two or three letters, concerning the locality, and the climatic and atmospheric influences, under which the Burmese Orchids, known by me, are found.

With this object, then, I will divide, as far as the varying distribution of these plants will permit, those growing on decided low levels (the plains) from those found on the hill ranges, naming only such plants as are generally worthy of cultivation in England.

The Orchids which come under notice here, taking Moulmein and Rangoon as two points of departure, will have a range of 300 to 400 miles, and as several names of towns and other places will be mentioned, those interested in this question would do well to consult a good map on a large scale, when the names will in most instances be detected, and the general character or features of the ground seen.

The rainfall at Moulmein not unfrequently exceeds 220 inches between April and November, and I have, within my experience, known 6 inches, or one-fifth of the yearly rainfall of England, to fall in 12 hours. At Rangoon the rainfall is somewhat less, not, however, of such a difference as to exclude the growth of the same plants, with few exceptions, as are found in the vicinity of Moulmein. The flora of these districts is nearly identical. Moulmein, from its proximity to the sea, is refreshed in the hot weather by cooling, moist sea breezes, and therefore is not subject to the same amount of dry heat in summer as Rangoon, which is more inland.

There are two plants found at Moulmein, never seen elsewhere by me in Burmah, and these two are Phalænopsis Lowii, and Cypripedium concolor. Phalænopsis Lowii is unquestionably a very rare plant, as difficult, I should think, to grow as it is to find. I had always been under the impression that the Rev. Mr. Parish was the first discoverer of this graceful little plant, but since I have been in England I have been informed that that indefatigable collector, Mr. Lobb, sent dried specimens to Messrs. Veitch ; however, be that as it may, the credit of introducing living plants is due to Mr. Parish, and well he deserves it, for it is a perfect little beauty of elegance and grace when seen growing in its own habitat. It is found on the limestone rock near Moulmein, approached from Moulmein either by the Saluen or Gyne rivers. These rocks, vast masses of carbonate of lime, rise out of the plain abruptly to the height of above 2000 feet ; consequently the rain clouds are attracted thereto, giving the mountains and their vicinity an extra degree of moisture as compared with more open plains.

On the same rock, but in a different position, and under peculiar conditions of growth, is found Cypripedium concolor. Phalænopsis Lowii is seated on the rock, receiving not only the direct downfall of rain, but also the drainage from the mountains above. Cypripedium concolor is found not only in shady places on the limestone rocks, but at this spot, and also up the Attaran River, growing on a stalactite formed by the filtration of the water through an arched cavity in the rock. I would mention that Adiantum Parishii may also be found here in abundance, as well as at or near the top of the Thakabui Mountains, its only supposed place of growth. *Vide* "Hooker's Species Filicum," vol. ii. p. 238.

These mountains at the latter end of the rains are objects of great attraction to botanists. They are at this season covered with a luxuriance of vegetation. Ferns, Mosses, Orchids, &c., crowd on the rocks and trees ; Platycerium Wallichii of gigantic size, with its pendent fertile fronds, and Drynaria quercifolia, of proportionate dimensions, may be seen. Again visit these parts after the rains have ceased, and the sun will have been playing his part, doing what is termed in England a little "scorching."

Between November and March vast changes have taken place. The pendent fronds of Platycerium Wallichii have shrivelled to nothing, the upper frond dried as a dead leaf. Phalænopsis Lowii, waving in all its splendour, in full flower and leaf in October, cannot be seen ; the roots only left and attached to the rock which, in exposed places, from the absorbed heat, would be hardly bearable to the hand. The stalactite has ceased dropping ; in fact all Nature seems drooping and fading from excessive heat.

Dendrobium fimbriatum, D. Farmeri, D. barbatulum, D. nodatum, D. formosum, D. Dalhousianum, D. albo-sanguineum, D. moschatum, D. chrysotoxum, D. aggregatum, Saccolabium curvifolium, S. Blumei, Aerides Lobbii, A. rosea, Vanda gigantea—each may be said to have a range of distribution from lat. 14° N., to 16°. Amongst these I will also include Dendrobium lasioglossum, and Saccolabium ampullaceum. Yet they are found in a somewhat drier locality, nearer Rangoon than some of the above. I will also mention that I have found D. albo-sanguineum and Dalhousianum, together with D. Parishii and chrysotoxum, extending at intervals from Moulmein to Prome and across the Arracan Mountains to Jougoup. It is difficult to understand why some Orchids should thrive under such varying climatic differences, whilst, on the other hand, others are circumscribed in their particular localities. However, as a general rule, I think we may come to the safe conclusion, that all Orchids require a decided season of rest.

The rains commence about the middle or end of April, increasing in intensity until June, from which month to the end of September they are at their maximum, gradually subsiding until the end of October or beginning of November. Of course the monsoon decreases as you recede from the coast line inland.

To those Orchids, therefore, which I have named, I should say the watering should be given as near and in the same proportion as they seasonably received it in their own climate. From November to the end or middle of March I should say these Orchids should not be forced into growing.

I have in England seen Dendrobium albo-sanguineum flowering and at the same time growing, and in this wise it is figured in the "Botanical Magazine." The specimen I noticed in London under this system of growth had a loose flabby appearance both in flower and pseudobulbs. In India albo-sanguineum flowers without a leaf. I have never seen it do otherwise. Saccolabium ampullaceum flowers during the hot season ; its leaves become dried, parched, and brown, yet its flowers are of great brilliancy in colour, and of good size, having the appearance of a dense stuck-up feather of more than a foot long. *R. Benson, Lieut.-Col.*

(To be Continued.)

Home Correspondence.

Viola lutea.—In the summer of 1868 I gathered some seed of a yellow Violet (Viola lutea ?) in Orkney, to all appearance the same plant that I had found in Norway. I sowed the seed immediately on my return home in August. The young plants flowered in April, 1869, bearing a flower too small to be of any use in the flower-garden, so they were transplanted into one of my children's gardens some three weeks ago, and are now in flower ; but the flowers are lilac, not yellow. Can you in any way account for the change of colour ?—the soil, a rather dry loam, and the situation, &c., are much the same as last year. There can be no mistake as to the identity of the plants. *E. W. Dowell.* [The plant is known to vary in this way, but the blue flowers have usually a yellow spot at the base. EDS.]

Orchids at Chatsworth. — Unless Mr. Taplin wishes me to ignore the evidence of my own senses he must not ask me to retract what I have stated respecting the Orchids referred to. If canvas, tacked upon the sides of the houses in the middle of April, and which had evidently been there all the winter, was not shading, what was it ? And certainly all the Cattleyas, many of which had once been fine specimens, had the majority of the leaves much eaten up with spot. The same remark applies to some Vandas, and most of the Phalænopsids, Oncidiums, and other plants. With the "tumble-down roof" of the house I have nothing to do, further than to say, that I believe that glass, putty, and paint have converted the same roof into a range of very serviceable forcing houses. As for the new Orchid-houses being the "best in Europe," I will only say they would be respectable places for a nurseryman ; but in our present knowledge of the requirements of Orchids, and for the surrounding associations, they, and the plant-houses with which they are connected, are certainly unworthy of the place in which they stand. Mr. Taplin very likely made some improvements at Chatsworth—I believe he did ; but as for the plant department, either in point of cleanliness or cultivation, the less that is said about it the better. Orchids, I know, will submit to a great deal of hard treatment, but for them to be in a good state now, through Mr. Taplin's three years good cultivation in "tumble-down houses," is an anachronism which "no fella can understand." I have no wish to disparage Mr. Taplin in any way ; he found difficulties and possibly made difficulties at Chatsworth, but to revive them now can do neither good nor harm to any one. *The Writer of the Article.*

Insect Eggs.—The eggs mentioned at p. 596, which were found on a twig of Whitethorn, are undoubtedly those of a very common moth, Eriogastra lanestris, the female of which is furnished with a mass of down at the apex of the abdomen, with which she covers the eggs as soon as they are deposited. *Henry Doubleday, Epping, May 2.*

Cedar of Lebanon.—In making the few remarks at p. 43 on the Ailantus, I alluded to a fine specimen of the Cedar of Lebanon, which I wish to state was planted by the late Duke of Wellington, when on a visit to Kingston Lacy, to lay the foundation-stone of a noble obelisk which stands on the lawn in front of the mansion. This obelisk was brought by the late W. J. Bankes, Esq., M.P., from the Island of Philea, where it had fallen, and from whence he caused it to be removed, under the direction of G. Belzoni, in 1819. The inscriptions on the obelisk and pedestal record its dedication to King Ptolemy Energetes II., and two Cleopatras, his queens, who authorised the priests of Isis in the isle of Philea to erect them about 150 years B.C., as a perpetual memorial of exemption from taxation. After the foundation-stone was laid, his Grace and a large company of visitors crossed the lawn to what was then a forest nursery, and planted the Cedar in question. The ceremony being over, the Duke's name, together with the date (August 17, 1827) was engraved on it by one of the workmen. The tree is now 50 feet 6 inches in height, and measures 9 feet 5 inches in circumference, at 1 foot from the ground, and 8 feet 8 inches at the height of 5 feet. I send you a cone from this tree, which produced a large quantity last year [a very fine one]. I sowed a great many seeds some months ago, and I find on looking over the seed-beds that they are coming up well. At the time of gathering the cones there were a great many which we could not get, and these, when they became ripe, were blown all over the grounds by the wind, and young plants are springing up through the grass by hundreds. We have some hundred or more fine specimens of this tree growing in the park and grounds here, some of which are supposed to be at least 200 years old. *J. Chapman, Kingston Lacy Gardens, Wimborne, Dorset.*

The Egg-plant.—Few subjects, grown almost exclusively for the decorative merits of their fruits, whether as seen upon growing plants in pots, or for the garniture of the most *recherché* dessert services, are more quaint or distinct than the several varieties of the Egg-plant, known technically by the name of Solanum Melongena. It is by no means a new plant, having been introduced so long ago as the year 1597—08, in some of its varieties, though the best edible variety did not reach England until the eventful year 1815. The seed-pods are generally egg-shaped, but vary in colour from an excellent imitation of a well-polished hen's egg to purple, &c. The form of the fruits of different varieties varies materially, some being more ovoid than others, while there is one or more varieties the fruit of which is round. These quaint plants have for years received a somewhat extended amount of attention, and are known by different names in those countries where they have been the most popular. The Spanish call them by the name of "Berengena," the Germans by that of "Cierpflanze ;" whilst the French, whose naming of them we often imitate, call them "Aubergines." In Africa, European settlers often grow them by name of "Guinea Squash." Nor is this latter name so ill applied as at first sight it seems, when we consider how much the Squash is grown as an article of food in some of the warmer parts of the intermediate zones, and that they are preserved very extensively for winter use, as well as eaten like the Vegetable Marrow is here in England. They are used extensively in some parts of America, and their culture is gaining ground yearly. Sometimes they use them there in soups and stews, but more frequently they are cut into thin slices and fried, the taste when thus cooked having some slight resemblance to that of oysters in a properly cooked state. The Egg-plant is seldom seen grown in Britain with a tithe of the vigour to which it grows in more favoured climes, and where, having sown it upon a slight hotbed, they can then harden the plants off, and by removing the lights give them the full benefit of an almost tropical summer. It is also very questionable whether we have ever possessed such good varieties as are to be met with growing in other countries. At Pekin, in China, for instance, some varieties are grown the fruits upon which average 6 and 7 lb. in weight. At New York, U. S., a large oval-shaped variety is being somewhat extensively grown, and has lately made its appearance in the markets around, under the name of "New York Improved." A variety resembling a hen's egg in size has made its appearance in America, having somewhat scarlet-coloured fruit, which are, to say the least, extremely ornamental. In regard to the general culture of these plants there is but little to say. Being originally natives of India, Africa, or truly tropical countries, they require a good warmth, such as that of a hotbed in which to sow the seeds, and to start them well into growth. Nor should a too temperate warmth be allowed until the flowers are set, and the fruits have nearly finished swelling, when an ordinary greenhouse will suit very well for the display of the fruits. They

should be kept near to the glass, and be grown in good rich soil of any ordinary character. A rich mulching is very advantageous when the fruits are swelling, and occasional waterings with good wholesome liquid manure should be also given. It is not too late to sow for an autumn crop, if the seeds are sown without further delay. *William Earley, Digswell.*

Primula veris duplex.—Under this name I have now in bloom a batch of very pretty and novel spring flowers, raised from seed last year. A few blooms sent with this will exhibit their character, and the marked advance they display upon the old white "hose-in-hose." As early border flowers I believe this variety of the Primula to be a valuable acquisition, as the plants are robust, hardy, and have with me flowered most profusely on a cold aspect all the month of April, and will continue to do so for some weeks. Some of the plants have not produced the duplex form, but these might well be termed fancy Polyanthuses, as they present a variety of markings that are both eccentric and pleasing, whilst others resemble giant Cowslips. *Alexander Dean, Old Shirley.* [All the forms of hardy Primroses and Polyanthuses are valuable spring flowers. Some of the flowers sent are very good dark-coloured "duplex" varieties, and afford a nice variety for the garden. The fancy Polyanthuses are similar to what Mr. Paul calls Auricula-flowered. EDS.]

Wistaria sinensis, &c.—I shall be obliged if you or any of your correspondents can give me information as to what soil, manure, and other treatment is most likely to induce the common Wistaria or Glycine sinensis to flower. Is root-pruning of any use? The soil will have to be made entirely in any case, as the ground at the side of the house where it is to be planted has been cut away to the depth of several feet; it is gravel. We tried a plant on a south fruit wall in the garden some way off, but it only grew moderately and did not flower. The same plant is now flowering well in what may be called a dwarf state, in a box 2 feet square, in the greenhouse. But the great size of the natural plant is a great merit. I may mention a plant of the common Celandine has come double this year, near but not on the garden rubbish heap: apparently it is double in every flower, and the other Celandines near are entirely single as usual. I may also mention, with regard to a kind of controversy about the Hepatica at present going on in the *Gardeners' Chronicle*, that the Hepatica does very well indeed here; I do not remember seeing such large spreading plants anywhere else, while the Rhododendron also answers particularly well, and Heather is the natural growth of the soil. *An Old Subscriber, Scotland.*

Phajus Wallichii.—What a noble plant this is for a moderately warm conservatory. We have a plant just now with eight flower-stems; they are 5 feet long, and have in all over 80 flowers expanded. The leaves are over 3 feet long and 9 inches wide. They also flower freely in a small state; some in 6-inch pots have two flower-stems. They continue to look well for a long time, and are easily managed. *Richard Carr, The Gardens, Taverham Hall.*

Primula cortusoides, var. amœna.—Allow me to call attention to this lovely plant. I know of nothing more beautiful at this time of the year to decorate a conservatory or greenhouse. Like other varieties of Primula it is a close compact-growing plant. The flower-stems rise well above the foliage, lifting their bloom about 6 inches clear of the leaves, and thus showing them off to the greatest advantage. The flowers are individually large, of a deep rose colour, from 12 to 20 radiating from the top of each flower-stem. As these stems are produced in great abundance, the result is a complete sheet of bloom, carried clear above the leaves of the plant. I have plants in 6-inch pots with from 18 to 20 flower-stems each, presenting a mass of colour which could not be obtained by any other plant in such small pots; and the best of all is that the plant is nearly, if not quite hardy. Mine had been kept in a cold frame with other hardy things all winter, without any covering whatever, until they were beginning to unfold their lovely flowers, and were then removed to a greenhouse, where they are the most conspicuous objects the house contains. Their culture is of the plainest and simplest character possible, and therefore need not be entered into at all; but I would strongly recommend everyone who is fond of beautiful flowers to get at once a supply of this lovely gem. *Thos. Jones, Gr. to J. E. Taylor, Esq., Didsbury.*

Medinilla magnifica.—I have a grand plant of this elegant stove shrub coming into bloom, with about 70 immense panicles of flowers. Six years ago it was a very small plant. *Richard Carr.* [We should be glad to know the treatment you have adopted with it. EDS.]

The Vines at Heckfield.—Please allow me to tell your correspondent "Ebor," p. 599, that his letter is no reply to the one I wrote respecting the Vines at this place, as I never said the Vines had not failed, but that failure was not caused by treatment on the restrictive principle. I still abide by all I have written. I have no doubt but that your readers will quite as readily accept for truth the remarks of one who is not ashamed to append his name thereto, as those of "Ebor." Had he given this, he would not have required to have written the words, "his predecessor," but would have told your readers (of course with becoming modesty) who it was that laid the foundation for the improvement of the Vines during a long stay at Heckfield, viz., 18 months. *W. Wildsmith.* [We have been favoured with communications from correspondents, confirming the remarks made by Mr. Wildsmith, but must decline inserting any further observations on this subject. EDS.]

The Fungus Theory.—To strengthen the defence of the Fungus question it has been considered necessary to hazard the statement that "Nature does not bury its sticks and leaves," for such is the dictum set up by Mr. Pearson, of Chilwell (see p. 460). To accept this new theory, for new it is, we must not only ignore all we ourselves know about Nature, but also endeavour to forget that ever there existed such geologists as Murchison, Agassiz, Lyell, De la Beche, Miller, &c.; we must close the Book of Nature, which, by such men, has been opened up and read to us page after page, from the primary formation up to the post-tertiary, and onwards through the alluvium to the floor on which man now stands. The whole testimony of the rocks must be totally disbelieved, the shells found in the lower silurian, the fossil fishes and lignites of the old red sandstone, the encrinites of the mountain limestone, the coal measures, which are said to consist almost, or entirely, of vegetable organisms, formed from the destruction of vast forests of timber. As to how those forests were transformed into basins or formations of coal our wisest philosophers can only hazard an opinion. One thing we may accept as certain, and open to no dispute, which is, that Nature buried these forests where they are now found. Nature formed them into beds of coal, which man, for purposes of fuel, digs out of the earth. Had Nature at such geologic periods neglected—but Nature knows no neglect—to bury and economise her devastated forests, from the most gigantic of Conifers down to the tenderest Fern, it would be difficult to say whether our modern means of steam locomotion either by land or sea would ever have had an existence. Is it not to the coal—the buried sticks and leaves of ages—we are indebted for enabling us, in our northern latitudes, to cultivate to such perfection so many delicious fruits and gorgeous flowering plants of tropical countries? The destruction of vast forests, and the burying of sticks and leaves is still going on. We can neither tell when the burying of vegetable or animal organisms began, nor can we say say when they shall cease to be buried—the burying process goes on continually. There is scarcely an artesian well dug but gives evidence of buried vegetation, and some of it of the most convincing form. At New Orleans, writes Sir Charles Lyell, "an artesian well was dug to the depth of 630 feet through strata containing shells of recent species, without any signs of the formation of the modern deposit having been reached; at a depth of 66 feet Cypress roots (Taxodium distichum) are mentioned; again at 130 feet bark of the Cypress, and at a depth of 153 feet, a Cedar log in a sound state." In borings made in other parts of the world, similar evidences of buried vegetation have been found. It is indeed difficult to say where did, or where did not, forests of timber exist, where they were buried or where they were burned—the forests beds of Cromer, for instance. Every ship which sinks in the sea and becomes imbedded in the mud or sand, and every tree brought down by a river and imbedded in its delta, is all proof of Nature burying its sticks, and these, like the fossil plants of our coal measures, will form in turn the fossils of future geological epochs. Descending to even a more humble agency by which Nature buries its refuse, it would be difficult to estimate either the quantity or bulk of decayed sticks and leaves drawn into the ground by the common earthworm. For further evidence in proof of buried sticks extending to even immense forests of heavy timber, see Lyell's "Principles of Geology," 10th edition, chap. xliv., p. 495. From this chapter and at p. 499 I may perhaps be allowed to make the following quotation:—"In Hatfield Moss, in Yorkshire, which appears clearly to have been a forest 1800 years ago, Fir trees have been found 90 feet long, and sold for masts and keels of ships; Oaks have also been discovered there above 100 feet long. The dimensions of an Oak from this Moss are given in the 'Philosophical Transactions,' No. 275, which must have been larger than any tree now existing in the British dominions." If we buckle on a dread of Fungus from having a knowledge that sticks and leaves are buried in the earth, our knowledge is very ample. The more we pry into the different strata forming the earth's crust, the more are we convinced of its being the great "charnel house" in which is entombed in such quantities as to form even the very rock itself, fossils of both the animal and vegetable kingdoms. In advancing such a theory that "Nature does not bury sticks and leaves," Mr. Pearson has many learned men to oppose. He may be found in a minority, but if he has, like Galileo, well studied his subject, his minority will do him no harm. If, on the other hand, he merely advances it as a statement to "prop up" a tumbling down argument, then, as has already been shown, his statement must fall to the ground, and instead of doing the party he professes to belong to a service, he does them positive harm, and impedes the progress of this otherwise very interesting controversy. *Wm. Miller, Combe Abbey Gardens.*

Diseased Cedar.—I should be very much obliged if you could give me any advice respecting the tree of which I enclose a small piece. It is a Cedar of about 70 years' growth, standing in a border near to a carriage drive, and has been (some years ago) deprived of all its lower branches, to enable a carriage to pass under. Just lately it has begun to shed its leaves to such an extent as to be now almost bare, and as this is what it has not done in previous years, I am afraid it is dying. Cracks, too, have appeared in the bark within about a yard from the ground, from which there has been a great escape of turpentine. Is there anything which you could advise to be done that might tend to prevent the death of the tree, which I should very greatly regret to lose. *J. B., Combe Hay Rectory, Bath, April* 30. [The symptoms are not encouraging. The presumption, we are afraid, is, that the tree will die, and very probably indirectly in consequence of the too severe lopping to which it has been subjected. If our diagnosis is right, nothing can be done to restore the tree. In fact, it is practically already dead, and the remaining verdure and vitality is little more than the unextinguished life which lingers in the dead frame for a time after decease, like the quivering of a man's muscles after his head has been cut off. We should like to know in another year whether our prognostic comes true. For the sake of our correspondent, and his Cedar, we hope we may be mistaken. EDS.]

Vines.—In October last we had our vineries repaired, the sashes being all taken off the roof of the houses. The leaves were quite green, and the wood far from ripe, and during the time they were thus exposed the frost destroyed the foliage. At the present time the Vines are showing very few bunches and growing to laterals where the bunches should be. The wood is strong, and in former years we had a fair crop. The roots are outside, and the border is in a bad state, owing to leakage from a drain that runs along the front of the houses. I have plenty of room inside for a border; would you advise me to have one made? Had the frost of last autumn anything to do with the present state of my Vines? *A. C., Surbiton.* [The unripe condition of the wood, aggravated by exposure and the destruction of the leaves by frost, have no doubt a good deal to do with the present want of crop. As the Vines are strong, they can scarcely require a new inside border, but the damage from the leaky drain should be made good. EDS.]

The Trees in the Parks about London.—I quite agree with "C.'s" judicious and cautious remarks upon this subject (see p. 564), excepting that I should much prefer fresh loam to leaf-mould as a top-dressing to the roots. His concluding suggestions of the importance of a thorough examination and systematic plan of the whole, preceding action, is of the highest importance. A careful report of the state of the trees could easily be made, and it could not be difficult to get a good plan of the whole of any of the parks, with the proposed changes and ultimate results of such alterations, submitted to our President of the Board of Works. It also appears to me that, with the exception of Rotten Row, which might tax the genius of the landscape gardener considerably to alter, and the resources of the cultivator to renew the trees on the same spot, there are no other portions of Hyde Park that might not be re-arranged with comparative ease. But I believe in the case of avenues much might be done to save them by top-dressing and watering; the latter is perhaps almost as important as the former, and I would water the tops as well as the roots. There is plenty of water-power at hand to send a stream right over the highest trees. During hard droughts the trees should frequently be drenched towards evening with a heavy shower from a pipe and hose; sufficient should be given to run through to the roots. In the case of old Elms, a different plan of watering would have to be adopted, the boles and stems only being watered. A heavy shower from a hose, on their leaves, would bring down the branches, but most young trees could be thus watered with impunity, and root-watering would do a great deal for the trees. The ground is trodden so firm in most of the parks, that the rain that ought to nourish the roots runs off; the trees consequently perish for want of water. If a report is made such as that suggested by your correspondent, one point of great importance to inquire into would be the most suitable trees for the different parks. All Elms except the Huntingdon variety ought to be condemned, from their disfiguring and dangerous frailty of dropping their branches without apparent cause or timely warning. I am glad your correspondent acknowledges the importance of an entire change of soil for the young trees. Where practicable, I advised a change of site for the plantations; but where artistic or other considerations render this impossible, the same result may be attained, though not so thoroughly, by bringing fresh earth to the old site. To plant young trees among the old, in the old soil, is a mere waste of time and money. [Hear, hear.] The base line of the new plantations should also be diversified with raised banks of earth. These might readily be so disposed as to shut out unsightly objects and biting winds at the same time, while they would afford depth of root-room for the trees and shrubs. In deep fresh earth, and with plenty of water at the top and bottom, there can be little difficulty in preserving the vegetable clothing of our public parks in health. *An Arboriculturist.*

Cantua dependens.—How is it that Cantua dependens is not more grown? I think for the want of being better known, and to recommend its more general cultivation is my object in writing, for a more beautiful plant is seldom seen than this when in flower. We have here a plant 10 or 12 feet high, which has been in bloom for some time, and will continue yet longer, many of the flower buds not yet showing colour. It is rather singular the plant commenced to flower at the highest part, and continues opening downwards. The plant has been greatly admired by all who have seen it. There is a common sort which must not be confounded with dependens, though many times it has been sent out for it. I may remark that the plant is planted out against a pillar; but it may be grown in a pot with little trouble; green-fly seems to be its chief enemy. I have sent a branch, with a few flowers, for your inspection; as you will observe, some of them have had 18 or 20 flowers upon them: fancy a plant covered with such lovely blossoms! There are, no doubt, much larger plants in the country (and I shall be glad to see many more); ours was planted about two years ago, the soil we used being composed of about two-thirds turfy loam, with one-third peat, leaf-soil, and sand. Let me strongly recommend Tacsonia Van Volxemi, which will thrive with similar soil and treatment; it has flowered here eight months of the year for the last three years. *A. S. Kemp, Haughton Gardens, Shiffnal, Salop.*

Sizes of Flower Pots.—I have some thoughts of being an exhibitor at a provincial flower show, in some classes where the schedule states that the size of pots must not exceed 10 and 14 inches respectively. I have lately had an opportunity of conversing with several regular exhibitors as to what was the proper way of measuring, but we could come to no definite conclusion on the subject, some asserting that the proper way was to measure from outside to inside at the top of the rim; others that the measure should be taken inside only, at the top of the rim. I am told by no less an authority than Mr. William Paul that the rule observed at the London shows is to measure the inside one inch from or below the top of the rim. Now this appears to me to be the most correct method, as it gives nearer than any other the dimensions of the soil the plant has to grow in. As this is a subject of very great importance both to exhibitors and judges, and as all, I am sure, are wishful to avoid contention in the matter, I and many others would thank the Editors to state for our guidance what is the rule in this matter. Of course none would be so narrow-minded as to dispute about a matter of half an inch, as it is impossible in any given cast (a dozen, as the potters in this neighbourhood call them) to get them of exactly one measurement. *Robert Featherstone, The Gardens, St. Ann's Villa, Burley, Leeds, April* 30. [The proper mode of measuring the diameter of a flower-pot is to take the length of a line extending from the inner surface on one side to the inner surface on the opposite side, just below the rim, at about the point to which the soil is filled up in using it—practically one inch or thereabouts below the upper edge, in pots of the sizes used for exhibition purposes. Eds.]

Electric Thermometer. — The following is a description of an electric thermometer which I invented some time ago. Its construction is so simple, and its object is so accurately and easily accomplished, that I think it will be interesting as well as useful to some of your readers. To simplify the description I have sent two sketches, which, although imperfectly done, embody the principle of the instrument, and will give a pretty accurate idea as to its practical application. Fig. 121 represents the thermometer, which is conveniently suspended from a rafter of the plant-house, in the usual way; from this instrument two wires are conveyed to the dwelling-house, and are connected to the instrument, fig. 122, and the battery, thus forming a complete circuit, except when contact is broken at fig. 121. In this figure, *a, a, a, a,* are four brass elbows which almost meet at *o*, but so far apart that actual contact does not take place. These elbows are inserted into sockets L, and can be conveniently raised or lowered by the screws S; in the centre at *o*, is a light wire placed perpendicular and made to float on the mercury in the glass tube A; on this wire is soldered a small piece of brass, D, which exactly fits the aperture at *o*, and as the mercury expands or contracts, the piece of brass, D, is pressed against either of the apertures *o*, a complete contact is formed, and a current of electricity established. By comparing the expansion and contraction of the mercury with an ordinary thermometer, a complete graduated scale can be made out, to which the elbows, *a, a, a, a, a*, can be set to the temperature necessary for the alarm bell to be rung. Fig. 122 represents the instrument by which the alarm is wrought; E in this instrument is a coil of insulated copper wire, coiled round a bundle of soft iron wires. When a current of electricity is passed through this coil, the iron wires become powerfully magnetic, which attracts the iron armature A, of the lever, *e, e*; the lever is drawn down from the point of the screw *s'*, thus breaking the current of electricity. When there is no current the elasticity of the spring S, brings the lever back to the point of the screw *s'*, thus establishing another current of electricity, which, so long as the brass D, in fig. 121, presses into the aperture at *o*, the lever *e e* in fig. 122 is kept moving on its axis *a*, which by its up and downward movements pulls the string B, which is attached to a light alarm bell. By the above brief description the circuit of the voltaic current will be easily perceived, but to illustrate

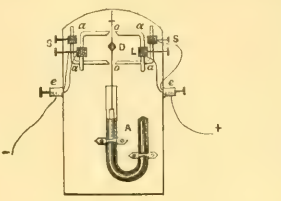

Fig. 121.

it further I will note its course, as it leaves the positive pole of the battery, travelling to the thermometer by the wire +, to the binding screw *e*, and by the elbows already described to the binding screw *e*, leaving by the wire, and enters the instrument fig. 122 by the wire +, to the coil E, and from thence to the brass standard N by the screw T, traversing the lever *e e*, and spring S; leaving the instrument by the binding screw *p*, and returning to the negative pole of the battery by the wire. For the permanent working of the electric thermometer it is necessary to connect it with a battery that requires little attention; this is found in a battery named Marie Davey, which is

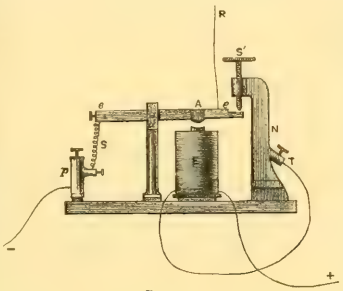

Fig. 122.

charged with a slightly soluble salt (persulphate of mercury) and water: when set up carefully, it will keep in action for nearly 12 months without further attention. There is no limit to the extension of the electric thermometer, a hundred houses may be connected as well as one, to the gardeners' dwelling, and all worked by one battery only; the instrument will cost but a trifle, and when it is once fitted up it will last for years. *W. Cochrane, Foreman, Balcarris Gardens, Colinsburgh, Fifeshire.*

The Bougainvilleas at Henley-on-Thames.—Since 1860, when Mr. J. Daniels, gardener to the Rev. C. E. Ruck-Keene, at Swyncombe Park, Henley-on-Thames, created such a sensation in the horticultural world by the manner in which he bloomed that most magnificent stove-plant, Bougainvillea speciosa—"one of the very foremost among the flowers we cultivate for their beauty"—and continuously down to the present time, the annual blooming of this splendid species has been a series of unbroken successes. Formerly it occupied one of two low span-roofed houses, 50 feet in length; then, getting beyond the bounds of it above, it was carried through the top of the partition into the other house; but now the partition has been altogether removed, the two houses thrown into one, and the Bougainvillea is gradually filling the whole length and breadth of the roof. Now, at the very height of its superb beauty, it forms an interior roofing of lustrous mauve. The branches are not rigidly trained to the roof, only the leading ones; and from these hang down a profusion of lateral shoots, of varying lengths, in the form of pendent wreaths. To describe it and its marvellous beauty would be worthy the attempt of the great word-painter, Ruskin; lesser mortals, untouched by the poetic fire, that imparts a nervous action to graphic pens, can only instinctively uncover in its presence, and yield it a silent homage the lips cannot express. The remainder of the roof of the Bougainvillea-house is occupied by a plant of B. glabra, a capital succession to B. speciosa, which fills all the roof space unoccupied by the latter. Since the Comte de Rouelle brought the Bougainvillea speciosa to Swyncombe from the Continent, where he had seen it blooming in the open air on the front of some Government buildings, and onwards to the present time, no one seems to be so deeply interested in its development as the French nobleman himself, who occasionally visits Swyncombe. The roots of the plant have now got away quite beyond the control of Mr. Daniels, and penetrate through not only to the border of a vinery at the farthermost end of the Bougainvillea-house, but also into a Potato frame at the south-west side of it, and in each case the fine rootlets come upwards seeking the rich soil near the surface. Also, there is no doubt that roots are in the chalk rubble forming the foundation of the path between the Bougainvillea-house and the vinery, and also in the rubble serving as drainage to the Vine border. It has been assumed that Mr. Daniels has hit upon some mode of treating this splendid plant, which he keeps a profound secret, and hesitates to impart it to others; instead, Mr. Daniels is only too desirous of furnishing every item of information likely to aid others in reaching the same results; and points to the fact that the plant, having penetrated beyond the house, cannot be curbed wholly at will; and so much sustenance does it derive from this enlargement of root-room, that Mr. Daniels no longer feels it to be necessary to give the plant supplies of liquid manure. Practically, it would appear that if Bougainvillea speciosa can be but planted in a house suited for it, and near the boiler for the sake of ripening it thoroughly in due season, it, when established, becomes a plant easy of culture, if the incidents of cutting in and other small details be observed. To Mr. Daniels it represents a plant comparatively easy of cultivation; and there seems no valid reason why it should not become so to others. Perhaps one of the chief difficulties besetting the cultivator (and it is not one difficult to surmount) has to be encountered in the earliest stage of the plant's career. Then it is that the fine and delicate roots of the plant are apt to be killed just as root action sets in, by over-watering and bad drainage. In laying the foundation of the future plant, a thorough drainage should be provided, so that the water can percolate readily through the soil about the roots, and pass away from any immediate contact with them when stagnant. In all probability, the natural subsoil of chalk at Swyncombe Park has materially aided Mr. Daniels now that the roots of his splendid specimen have got away beyond the boundaries of the house; still the conclusions just sought to be drawn are no doubt correct, and of vital importance to the cultivator. When the "delicate young rootlets," as Mr. Daniels terms them, have thickened, and become thereby strengthened, the chances of danger are lessened. The directions as to watering laid down by Mr. Daniels on p. 346 are worthy of being reproduced in this relation:—"Plant out in this bed" (*i. e.*, turning the young plant from a pit into a pit-bed prepared as its abiding place), "in good friable soil, consisting of leaf-mould, rotten dung, and sandy loam, with a little sand and peat, and charcoal if obtainable. Water sufficient to settle the soil, which keep a little moist through the growing season. Be careful to dry off and ripen the wood thoroughly before autumn, then keep the plants dry till January, when they will begin to show bloom, and when they may be gradually moistened by giving water in sufficient quantity to wet all the soil." There seems every reason to believe that it is a plant preferring comparative dryness at the roots to undue moisture. The cutting-back of the Bougainvillea is a matter of prime importance. B. speciosa may be said to throw two classes of shoots, 1st, a number of long thin wiry wreath-like laterals from the leading branches springing from the main shoots of the plant, the which bloom the second year; and, 2d, a quantity of thick, fleshy, very strong, vigorous shoots, coming away from the old wood—the former are thinned out pretty freely in the case of a vigorous plant like the one at Swyncombe, but not headed back. At the outset of his experience of the plant, Mr. Daniels used to head these back, but does not do so now. On the other hand, the thick fleshy shoots coming away from the old wood are remorselessly cut back, as hard and close as possible, so as to prevent their breaking again. In this way the balance of the production of wood with that of blossom is sustained, and from the point where the stem rises to the roof of the house from the pit in which it is planted, to its farthermost point, the rich gifts of its richly-coloured bracts are heaped up in happy plenteousness. This season, singular to state, B. speciosa is blooming from the young growth of the present year. This unusual effect Mr. Daniels traces to the simple cause that some alterations made during last summer in the Bougainvillea-house necessitated the removal of the roof, and the plant was much exposed during the hot dry weather that prevailed. B. glabra is just beginning to develop its pale rosy bracts in the same house as that containing B. speciosa. It is now beginning to make growth and produce bloom at the same time. It is the easiest of all the species to bloom; if it makes growth in a sufficiently warm atmosphere, it must bloom, and does so for eight or nine months, just as long as it makes young wood; and last season, when fully exposed to the outer air, owing to the removal of the roof of the house, it continued to bloom, notwithstanding the exposure. As soon as it has done blooming it is cut back closely as in the case of a Vine, generally about the beginning of the new year. Not less successful in blooming B. speciosa, has been Mr. W. H. Good, gr. to Miss Majoribanks, Greenlands, Henley-on-Thames. Just at the time that Mr. Daniels obtained so much notoriety for blooming the Bougainvillea some 10 years ago, Mr. Good got a plant from Mr. Daniels, and placed it in the second of a fine range of lean-to plant-houses and vineries. Here it did well for the space of six years, and four years ago the plant was lifted, and

planted at the furthest end of the first house occupying the east end of the range, a bed being prepared for it just where the flow pipes rise from the boiler. It sustained no check, and it is now a magnificent plant trained in the leading shoots along the roof, from which hang down in great profusion almost numberless wreaths of flowers. The higher elevation of this house, as compared with the Bougainvillea-house at Swyncombe, helps to show it off to better advantage; and the success attained by Mr. Good requires that his name should be bracketed with that of Mr. Daniels as a foremost cultivator of Bougainvillea speciosa in the present day. In each case collections of stove plants are grown in the houses occupied by the Bougainvillea. This is stated to show that no harm arises to the plant, nor does the glowing lustre of the bracts become dimmed from any evaporation that may arise from the presence of the plants beneath. *R. D.*

Foreign Correspondence.

Colonial Botanic Gardens—Brisbane.—From Mr. Walter Hill's report on this garden, we read that the chief feature in the way of improvement during the past year has been the addition of two artificial lagoons, in a line with the original two. One of these was to be devoted to the cultivation of the Victoria regia, which has flowered in the gardens, but which, for want of a proper supply of water, finally perished. As this for the future is no longer a hindrance, it is intended to reintroduce the plant, which, together with specimens of Nelumbium and Nymphæa, will present in the four lagoons a beautiful diversity of these interesting plants. Mr. Hill proceeds to say:—

In the matter of experiments, I have largely extended every department, and with the most gratifying results. The Urtica nivea, or China Grass plant, may no longer rank experimentally. That it will flourish fully as well in Queensland as in its native land there can be no doubt; and it is to be hoped and trusted that its cultivation and manufacture for commercial purposes will, ere long, engage the attention of capitalists. I may report with equal satisfaction of the other plants heretofore ranking under the experimental department, but which may now be regarded as thoroughly acclimatised and adapted to our soil and climate: the Indigo plant (Indigofera tinctoria), the Tea plant (Thea Bohea), the Coffee plant (Coffea arabica), &c., have all realised the most sanguine expectations; and thriving luxuriantly as they do in the gardens, there can be no doubt that many other parts of the colony would prove suited to their cultivation.

The seventeen varieties of Sugar-cane planted in the gardens are thriving admirably. There has been a great demand for them both at home and abroad, which has interfered, hitherto, with any practical test to determine the average saccharine yield of the several varieties. In answer to several applications from a gentleman appointed by the Mauritius Government, I have forwarded samples of thirteen different varieties to that colony, the remaining four having been imported from thence. The gentleman in question, lately connected with the botanical department of that island, expressed agreeable surprise at the luxuriant manner in which the canes flourished, and the number of varieties under cultivation.

There are now in the grounds several varieties of grasses under cultivation, the object being to determine which will prove most hardy under our climatic influences, and at the same time most nutritious for stock. The Guinea Grass (Panicum jumentorum), and a species of Paspalum, are both largely cultivated in Demerara and other parts of the West Indies for their nutritious properties. These grasses have been growing in the gardens for the last thirteen years, and both are capital grasses for dairy purposes, &c. The Buffalo Grass appears to thrive well, but can hardly be recommended for sheep, as it is coarse in quality, and they do not appear to thrive on it. The Prairie Grass (Bromus), however, has greater claims to favour; it is perennial, and much relished by horses, cattle, and sheep; and although they give the preference to other grasses, will fatten on it, and it possesses the great recommendation of being exceedingly hardy, and proof against the action of either drought or flood. For pastoral purposes, however, a mixture of certain tonic and carminative herbs will tend greatly to fatten, as also to conduce to the health of stock. The pasturage in the Darling Downs district is impregnated with the Wild Carrot (Daucus brachiatus), &c., and in no part of the colony do stock thrive and fatten better. The grasses adapted for cattle do not answer for sheep, as they prefer the short dry grasses, while cattle, on the other hand, prefer the rank, coarse grasses which are to be found in low lands.

Mr. Hill says he has recently made application to agriculturists both in India and South America for seeds of such grasses as prove best suited to those climates, as the importance of the best knowledge upon the subject cannot be overestimated in an agricultural country like Queensland. He goes on to say:—I am happy to report that the Grape Vines of this department have as yet escaped disease; and I am now in daily expectation of receiving a valuable consignment of 26 varieties from the United States of America. I purpose, after increasing them, to distribute them among some of the principal Vine growers of the Darling Downs district, as there cannot exist a doubt as to the advantage possessed by that locality for the cultivation of the Grape. These varieties will include the famous Catawba (from which large quantities of wine are manufactured annually), the Concord, Hubemont, Anna, &c., all of which are highly prized for their fruit or for the wine made therefrom.

The Mango fruit, of which there are several varieties in the gardens, flourishes in all its native perfection. The one imported from Bombay bears fruit annually, and a seedling obtained from the West Indies some eight years since has been reared most successfully, this being the fourth year of its bearing fruit. The flavour of the Mango is indescribable, being entirely *sui generis*, approximating to nothing which is commonly known. It is mellow and grateful to the palate, and elicits warm encomiums from all who have tasted it. The Mango plants imported from Java are likewise in a healthy condition. The Banana plants, of which there are six varieties from Java, are all bearing fruit of a superior winey flavour, and the different plants appear well suited to the climate of Queensland. Of the remainder of the fruits under cultivation the Chinese Date Plum (Diospyros Kaki), the Jack (Artocarpus integrifolia), the Cherimoya (Anona Cherimolia), are mentioned, all of which continue healthy and productive. The various species of the Cinchona plant, both indigenous and imported, are thriving most satisfactorily, and ere long it is to be hoped that this valuable bark will become an additional source of revenue to the colony. Among the plants introduced into the gardens during the past year are the Cochineal plant and insect, the Cocculus palmatus, which is prized for its medicinal virtues as an agreeable tonic, and others chiefly ornamental. Mr. Hill concludes his interesting report by saying that the visiting public appear to be taking an increasing interest in the gardens, judging from the increasing number of visitors, and the desire exhibited for information on various matters connected with the gardens.

Societies.

Royal Horticultural *May 4.*—W. W. Saunders, Esq., F.R.S., in the chair.—The usual preliminary business of the meeting being concluded, and the awards of the Fruit and Floral Committees having been announced, the Rev. M. J. Berkeley proceeded to address the meeting, first stating that he had been asked on what authority Triteleia uniflora was being sold about the country as T. alliacea? He wished to say that this was a mistake, as the plant in question was formerly shown as Leucocoryne alliacea, though that genus differed from Triteleia in the number of stamens, which were six in the former plant, and three in the latter. Having at a former meeting directed attention to the great beauty of the glass wall at Chiswick, he was pleased to mention that an immense crop of fruit had set, and that the trees were never in a better condition than at present. In the new orchard-house there was also every prospect of a very large crop, especially of Apricots, of which an enormous crop had set. Specimens of the fifth generation of wild Cabbage, from seed obtained from Abergele in North Wales, were then exhibited. The leaves differed from the original form in being more divided. One peculiar feature in the distinguishing characters of this plant was that, though hens are fond of pecking the Cabbage tribe generally they would not touch this plant. Some observations were then made upon the Auriculas exhibited in the Conservatory, and the speaker directed attention to the beauties of a small Californian Liliaceous plant (Calochortus splendens), a beautiful genus of plants, which had been said to be difficult of cultivation; but he believed that if they were grown in a mixture of sandy peat and a little loam, in a light position, under a north wall, they would be found to do well. A very handsome species of Iris, exhibited by Mr. Ware, of Tottenham, then came under notice, with a promise that further particulars concerning it should be furnished at a future meeting. Toxicophlœa splendens, a new apocynaceous plant from South Africa, exhibited by Mr. Cooper, of Reigate, next came under review; the bark of this shrub is exceedingly poisonous, and is used by the natives to poison their arrows. Another extremely poisonous plant, frequently found in stoves in this country, was the common Oleander (Nerium Oleander), which was so much so that it was very dangerous even to sleep under it. A case of poisoning in connection with it was mentioned, in which a party of 12 soldiers of the French army, camping near them, made skewers of the wood to roast their meat, the consequence being that 7 out of the 12 were killed by the poison imparted to the meat. Some comments upon the specimen of Cœlebogyne ilicifolia brought by Major Trevor Clarke, were then made.

The Chairman then directed attention to several handsome new species of Palms, which were exhibited by Messrs. Veitch; to a useful free-flowering species of Aloe, which he believed to be A. acuminata, and which belonged to a most beautiful class of succulent plants, which, not being fashionable, were sadly neglected. Alluding to the wild Cabbage shown by Mr. Berkeley, and to the fact that hens would not touch them, he remarked that in his own garden he was much plagued with skylarks, which came in droves early in the mornings, and ate the leaves of his Broccoli almost to the ribs. He also could not understand why blackbirds were so fond of picking off the pips of Polyanthuses and Primroses, as they did not seem to eat them,

Scientific Committee.—W. W. Saunders, Esq., F.R.S., in the chair. After the formal business had been concluded, the Rev. M. J. Berkeley stated that he had examined the floury matter from the interior of Caladium bicolor exhibited by the Chairman at the last meeting, and found it to consist of starch grains of extreme minuteness; a quantity of mites, such as are so commonly seen in flour, were also detected.

A brisk discussion ensued between Professor Westwood, Mr. Stainton, Mr. Murray, and the other entomologists present, as to the eggs of the insect exhibited at the last meeting (see p. 596). The debate turned on the question whether or no the peculiar furry investment of the eggs was the produce of the insect itself, or consisted of the hairs from the bracts of the Willow. The prevalent opinion seemed to be that the moth herself produced the hairy matter, and that the insect in question was no other than Eriogastra lanestris (see Mr. Doubleday's letter in another column). Ultimately it was decided to wait for further evidence before pronouncing a final decision. Mr. Horne exhibited some Vine leaves affected with hypertrophy of their tissues.

Mr. Berkeley showed some leaves of Peach trees presenting singular circular spots, from the centre of which exuded a sugary matter. It was supposed to be a result of insect puncture.

Mr. Munby exhibited flowering specimens of a species of Violet, collected by himself near the summits of the Atlas Mountains, and called Viola Munbyana. The plant is not unlike V. lutea, and was stated to be quite hardy.

Dr. Masters exhibited, on behalf of Mr. Parker, a shoot of Acer Negundo variegatum, which had partially reverted to the green form. The curious point was that the green shoots appeared uniformly on one side of the branch. In the case of the small lateral shoots the same arrangement pertained. Dr. Masters also exhibited a Carrot, the two main subdivisions of which had become spirally entwined, the one around the other. The following communication, from Mr. Simpson, Broomfield Lodge, Chelmsford, was then read, and the circumstances which had given rise to it explained:—

"*Potato and Artichoke Grafting.*—Notwithstanding the success which has attended Potato grafting, it undoubted still remains a *vexata questio*, and the successful grafting of the Artichoke into the Potato, and *vice versâ*, is for manifest reasons infinitely more so. However, Mr. Taylor, Mr. Fenn, and others, have solved the problem of the former, and I now claim to have solved the problem of the latter, and believe myself to have accomplished the feat of producing a cross between the Artichoke and Potato. After taking up my grafted Potatos and Artichokes last September, I was led to believe that a cross had been effected between the Artichoke and Potato, which aroused my interest not a little, and induced me to plant the produce in pots, which I did the first week in December, and placed them in a Peach-house which was just being started.

"After they had fairly started, and the heat became too much for them, I removed them to a cold vinery, where they remained till yesterday. Being ripe, I turned them out of the pots, and although the Potatos have now produced something better than "mongrels," they nevertheless exhibit no such cross as the Artichoke and Potato, they have produced some few decidedly handsome tubers. On referring to my letter in this Journal at p. 1065, 1869, it will be found that the Potatos grafted into the Artichokes were in each instance killed by frost, while the Artichokes grafted into the Potatos survived. It will also be seen that the Artichokes grafted on Fluke produced a round pinkish tuber; and in a leading article on this subject the Editors proclaim that tuber to be Artichoke, and not Potato. [Our statement was to the effect that, supposing the Artichoke scion to have grown, and to have produced tubers, those tubers would be Artichoke tubers. Eds.] Let us now look at it, however. That tuber was planted in a 12-inch pot, and has now produced seven tubers, three of which are about the size of a Bantam's egg, and the remainder quite small. I herewith beg to forward the whole crop for your inspection, and it is now for you to say whether they are Artichoke or Potato, or both.

"You will observe all the tubers are round, four of them red, the others white, and you will also observe that they are a good shaped tubers, very rough-skinned, resembling the Red Regent, and that the largest of the tubers partakes somewhat of the character of the Artichoke about the eyes.

"Now what has wrought this entire change of both character and colour but the grafting? Or is it due to other circumstances? If the former be the direct cause, then it is manifest that a cross is effected, and if the latter, Potato grafting is but a dream. Please give your opinion, and be so good as to return me the tubers in a few days, that I may lose no time in getting them planted out-of-doors; and I pledge myself to again send you the produce in the autumn of this year, if you think it worth while."

Great interest was manifested in the exhibition of these potatos? the more so as they are very different from the Fluke, and with only a distant resemblance to Artichokes. Of the seven tubers sent some were much larger than the others, and bluntly and regularly egg-shaped, with a rough red skin; the others were spherical, smooth, and white. It was hardly to be expected that the Committee would accede to Mr. Simpson's opinion, though giving that gentleman full credit for veracity. It was suggested that one of the tubers be sent to Chiswick, and the remainder returned to Mr. Simpson for further experiment. Whatever be the explanation, it is certain that Mr. Simpson has produced Potato tubers, which are not those of the Fluke, and certainly not of the Artichoke. Whether they are cross productions in the sense intended by Mr. Simpson, can only be decided after further trials; and Mr. Simpson has brought forward evidence, which, however opposed to all our notions, at least deserves to be submitted to further experiment.

The Chairman exhibited specimens of Wheat plant partly destroyed by wireworm and partly by the grub of an insect, determined by Prof. Westwood to be Musca Frit, and which devours the heart of the plant, but at the same time induces the formation of laterals which bear ears, and hence are not objected to by the farmers; a view from which the Chairman and others expressed dissent.

Major Clarke exhibited a cross between the Oxlip-form of Primrose and the garden Polyanthus. He stated that

he could never get a cross between the Cowslip and the Primrose, though this was stated to have been effected by the late Prof. Henslow.

An interesting conversation on Mr. I. Anderson-Henry's Primroses and other crossed forms then ensued. Lastly, Major Clarke showed a flowering spray of Ceclebogyne ilicifolia, the so-called Virginity plant.

Floral Committee.—Rev. Joshua Dix in the chair. From Messrs. Veitch & Sons came handsome young specimens of Cariudovica rotundifolia, a very handsome Cyclanth, and of the following graceful Palms:—Euterpe sylvestris, Areca monostachya, Deckenia nobilis, and Geonoma pumila, to which First-class Certificates were severally awarded; along with the above came a charming specie of Adiantum, named Veitchii, from Muna, to which the same award was made; and a new Azalea, named Acme, of a somewhat novel shade of rosy crimson colour. Mr. B. S. Williams exhibited, for the first time in this country, flowering specimens of Tillandsia Lindeniana, and Cochliostema Jacobianum. The former is a beautiful stove herb, bearing a distichous scape—about 6 inches above the leaves—of large, rich, blue flowers, with a whitish throat. It was obtained by M. Linden, from Brazil, with whom it has flowered. It is figured in Regel's "Gartenflora," t. 619, and has been exhibited on several occasions last summer, but not in bloom. The Cochliostema was a very fine specimen, with three large spikes of expanded blooms, and several others showing. It was first exhibited by M. Linden at the Paris Exhibition in May, 1867, where it created quite a "sensation." A full description of this extraordinary plant, together with an illustration, will be found in our own columns at p. 265, 1868. A First-class Certificate was deservedly awarded in each case. With the above came a fine specimen of Amaryllis carminata, with large, rich, bright vermilion flowers, and a scarlet and white flowering variety named President. Mr. Veitch, Exeter, sent a large form of Anthurium Scherzerianum grandiflorum, with very large spathes; and from Mr. S. Parsons, Brighton, came specimens of Reseda odorata eximia, a large-flowered very fragrant variety, to which a First-class Certificate was awarded. Mr. Green, gr. to W. W. Saunders, Esq., received a similar award for a flowering specimen of the singular Peloria Dicksonii. Mr. Green also exhibited Odontoglossum cariniferum, with one good spike, and the pretty little Calochortus splendens. From Mr. Cooper, Reigate, came a flowering specimen of Toxicophlœa spectabilis, a new white-flowered evergreen shrub, from South Africa. Messrs. Carter & Co. sent very nice balloon-trained plants of Ivy-leaved Pelargoniums, peltatum elegans, and Dr. Schomburgk. Messrs. Rollisson & Sons sent a variegated Azalea, named Bijou de Ledeberg, with pretty rose-coloured flowers; Epidendrum floribundum, and the dark red-flowered Kennedya Marryattæ superba. From Mr. C. Noble, Bagshot, came a beautiful group of his new Clematis, to one of which, called Lord Londesborough, a fine bronze-coloured flower, shaded with blue and red, a First-class Certificate was awarded. The same award of merit was also given to Viola lutea major, a fine new yellow bedding Pansy, from Mr. Parker, Tooting; to a new dwarf and free flowering white edged Pelargonium, named Avalanche, with white flowers, from Mr. W. Paul; to a handsome and highly curious species of Iris from Mr. Ware, Tottenham; and to a fine new Caladium, named Princess Alexandra, of a creamy yellow ground, with rose and green venation from Messrs. E. G. Henderson. Mr. Cox, gr. to W. Wells, Esq., M.P., Redleaf, sent some fine cut blooms of Rhododendron Aucklandii. Mr. Chapman, Llandudno, North Wales, again exhibited one of his new patent flower boxes, a very useful contrivance for conveying cut flowers, which was highly commended by the Committee.

Fruit Committee.—Geo. F. Wilson, Esq., F.R.S., in the chair. No prizes being offered for competition on this occasion, there were few subjects exhibited. Special Certificates were awarded to Mr. Carmichael, gr. to H.R.H. the Prince of Wales, Sandringham, for a very fine dish of President Strawberries; to Mr. Cadger, gr. to J. Shaw Leigh, Esq., Luton Hoo Park, Beds, for a brace of prodigious seedling Cucumbers, measuring 32 inches in length and 9 in circumference; to Mr. Hallet, Cossington, Bridgwater, for a very fine fruit of a Citron; and to Mr. J. Lee, Windlesham, Bagshot, for a good box of honeycomb. Mr. Hallet also sent fine specimens of Uvedale's St. Germain Pears, a nice brace of "Hallet's Perfection" Cucumbers, and two varieties of self-protecting Broccoli. From Messrs. Rollisson & Sons came a specimen of Rollisson's Telegraph; and from Mr. Collins, gr. to Major Trevor Clarke, came a thick smooth-skinned seedling Cucumber, the result of a cross between the Sion House and Telegraph varieties. Messrs. Carter & Co. exhibited growing examples of a variety of Kidney Beans named Ash Champion, a white-seeded variety, selected by Mr. T. Sutton, of Ash. The pods were of good size, but were not freely produced. Mr. Barron brought up from the Society's Garden, Chiswick, branches of currants and gooseberries and some Apple blossoms, which had been quite frozen the previous night, when 12° of frost was registered.

The Rose and Auricula Show.—This was in all respects another most successful exhibition. Roses were undoubtedly the great feature, and a finer lot we have never before seen at any spring show. To the Messrs. Veitch very great credit is due for the splendid group, comprising nearly three score plants, exhibited by them on this occasion, which were a perfect feast to the lovers and admirers of Flora's queen. The plants were remarkably uniform in growth and substance of the flowers, many of the latter, both in size and richness of colour, being remarkably fine, especially those of Dr. Andry, Fisher Holmes, Alfred Colomb, John Hopper, Centifolia rosea, Paul Perras, Beauty of Waltham, Maréchal Vaillant, Madame la Baronne de Rothschild, Marie Baumann, Horace Vernet, Général Jacqueminot, and Caroline de Sansal. In the open class for 9, distinct, in pots, Messrs. Paul & Son were 1st, and Mr. Turner 2d; the former showing fine specimens of Madame Villermoz, Maréchal Vaillant, Charles Lawson, President, Céline Forestier, Camille Bernardin, Vicomte Vigier, Madame Margottin, and Anna Alexieff, and the latter smaller plants, but as well-bloomed, of Madame de St. Joseph, Madame Eugène Appert, Souvenir d'un Ami, Maréchal Niel, John Keynes, Léopold Hausberg, Alba mutabilis, and Madame Margottin. Mr. Perry, gr. to F. G. Debenham, Esq., Cheshunt Park, Herts, contributed three very neat specimens in the amateur class for 3, and took the 1st prize; Mr. James, gr. to W. F. Watson, Esq., Isleworth, coming in 2d. The best collection of 12 of 1867, 1868, 1869, distinct, in 10-inch pots, came from Mr. Turner, and comprised, amongst others, very fine blooms of Duke of Edinburgh, Clothilde Rolande, Miss Ingram, Reine du Midi, Dupuy Jamin, Madame la Baronne de Rothschild, Madame Creyton, and Madame Alice Duncan. Messrs. Veitch were 2d, with a very good collection, in which Duke of Edinburgh, Madame la Baronne de Rothschild, Elie Morel, and Reine du Midi, were particularly fine in size and colour. Messrs. Paul & Son staged the best collection of cut blooms; Mr. Earley, Gr. to F. Pryor, Esq., Digswell, being 2d, and Mr. Osman, Gr. to R. Holland, Esq., Stanmore, 3d.

In point of interest the Auriculas stand next, and these, though not exhibited in quantity, were finer in quality than any shown before this season. Mr. Turner fully maintained his reputation as a grower of these fine old favourites, by taking first honours in both the open classes. In his collection of 12 show varieties, a new seedling, named Omega (Turner), a white-edged variety with black purple ground and white paste, finely proportioned, was awarded a First-class Certificate. Colonel Champneys (Turner), Sophia (Chapman), General Neill (Traill), Earl of Shaftesbury (Turner), and Bessie Bell (Spalding), were also very fine; Mr. J. James, who was 2d, had very good blooms of Meteor Flag (Lightbody), Lovely Ann, fine, Ne Plus Ultra (Faulkner), Superba (Headley), and John Bright (Smith). Mr. James was the only competitor in the amateurs' class for 6, and took the premier award. In Mr. Turner's group of 12 alpine or fancy varieties were admirable trusses of Bessie (Turner), deep purple, lemon paste; Brunette (Turner), almost black, with a white paste; Diana (Turner), purple violet; and Selina (Turner), purplish rose, with white paste. Mr. James contributed a very nice lot, and took the 2d prize. From Mr. Turner also came a large collection of alpine varieties, amongst which Monarch, Clipper, Selina, and Black Prince, were selected for First-class Certificates.

Of herbaceous Calceolarias, Messrs. Dobson & Sons contributed a very fine collection, consisting of medium-sized plants, with wonderful spikes of bloom, which also were large and rich in colour. In the class for 6, distinct, Messrs. Dobson were very justly placed equal 1st with Mr. James, who staged larger plants, very well grown, but not showing the same size of truss and flower as those of the former. Mr. Ware contributed 6 boxes of hardy Primroses, and was awarded the 2d prize. In the miscellaneous class,—always a large one here,—there was no lack of "good things." Lord Londesborough was again to the fore with an unrivalled collection of Orchids, &c., including three magnificent specimens of the charming Vanda teres, showing upwards of 20 fine spikes of bloom; and a handsome example of Oncidium sessile, on which were 12 spikes of flowers, to both of which Special Certificates were awarded. also Dendrobium infundibulum, with five grand white flowers; a beautifully-coloured Cattleya Mossiæ; Dendrobium Devonianum, a spike 3 feet long; together with Lycastes, Vandas, and five large handsome standard specimens of Maréchal Niel Rose. Messrs. Veitch also staged a fine group, comprising Odontoglossum Phalænopsis, with 12 splendid blooms, and Oncidium Marshallianum, a magnificent plant, to both of which Special Certificates were awarded. Along with them came Dendrobium Heyneanum, a fine white; Odontoglossum niveum, Saccolabium cordifolium, Masdevallia Veitchii, and a very fine Oncidium sarcodes, together with an assortment of Palms, Ferns, &c. Mr. B. S. Williams contributed a choice collection of Orchids and flowering plants, including Maxillaria lutea alba, Odontoglossum Bluntii, Cypripedium bifforum, Phalænopsis amabilis, with nine beautiful flowers; and the remarkable Aërpophyllum gigantæum. From Messrs. Rollisson & Son also came a similar assortment, included in which were four fine examples of the beautiful orange-flowered Dendrobium densiflorum, Cypripedium hirsutissimum, and Saccolabium ampullaceum moulmeinense, a pretty small rosy flowered species, to which a Special Certificate was awarded. Messrs. Standish & Co. sent a small group of well-bloomed Rhododendrons, Genistas, &c.; from Mr. Wilkie, Addison Road, Kensington, came a good collection of stove and greenhouse flowering plants; and from Messrs. E. G. Henderson, flowering examples of Blandfordia Cunninghamii, and B. nobilis grandiflora, and several large seedling forms of garden Mimuluses. Mr. Parker, of Tooting, sent 6 baskets of bedding Pansies, of which Cliveden Blue, Cliveden Yellow, and Cliveden Purple were the best. Mr. W. Paul staged a nice group of hardy Primroses, Rôses, and Pelargoniums, &c.; and from Mr. Woodward, gr. to Mrs. Torr, Garbrand Hall, Ewell, came four very fine standard specimens of Deutzia gracilis, grafted on clean stems about 4 feet high.

Garden Memoranda.

GARDEN REACH, CHAMPION HILL, CAMBERWELL, THE RESIDENCE OF A. WATTENBACH, ESQ.—This establishment may well serve as an illustration of what may be done in the way of suburban gardening in the neighbourhood of London. The garden is not large, but is so good in style and keeping as to be worthy of a few remarks in these columns. The house stands on rising ground, which slopes gradually to the north-west, and on this slope the garden is situated. Attached to the western side of the residence is a good-sized, elegantly built, span-roofed conservatory. Down the centre several handsome subjects are planted out, including a fine healthy specimen of Seaforthia elegans, about 14 feet in height; handsome specimens of the Silver Tree Fern, Cyathea dealbata and Alsophila Macarthurii, the latter a tall specimen, up the stem of which Lapageria rosea is climbing vigorously; whilst L. alba is growing close by in a similar manner, on a much shorter specimen. In the same border are two examples of the Norfolk Island Pine, Araucaria excelsa, as graceful a foliaged tree as could be obtained for such a position. One of them is planted out, both being of the same age and size at the time of planting. There is now scarcely any comparison between them, the one planted out having quite outstripped the other both in growth and beauty of form. At each end of the bed are specimens of Yucca aloifolia variegata, the one facing the entrance being a very handsomely furnished plant, about 5 feet high. Among the other inmates of this beautiful house there are large bushy Camellias, Oranges, &c., nice examples of Chamærops Fortunei and Latania borbonica, Aralia Sieboldii, Acacia armata, in full beauty; and a numerous collection of Azaleas, very good, healthy specimens, just coming into bloom. Associated with these, to give good effect, are a host of Cinerarias, Primulas, Epiphyllums, very good, and other spring-flowering plants, together with Ferns, Cactuses, &c. Climbing along the roof is a good mass of Habrothamnus elegans, which has been producing splendid racemes of its deep reddish purple flowers in profusion since November last; and along with it the free-growing and useful Cobœa scandens variegata, whilst on the back wall the beautiful Lapageria is attaining good dimensions.

The lawn is reached from the conservatory by a flight of stone steps, on each side of which are several small vases, now filled with spring-flowering bulbs, and in the summer with bedding plants. At the bottom of the steps a gravel path runs nearly the width of the garden and parallel with the conservatory, from which the grass slopes about 2 feet to the lawn, which gives it the appearance of a small terrace. On the other side of the path there is a bank of very healthy Rhododendrons (well set with bloom-buds), planted to hide the walls of the conservatory; Clematises, Wistarias, &c., being also planted against the walls for the same purpose. Under the conservatory are good commodious and convenient potting sheds and tool-house; and on the same level is a useful lean-to cool greenhouse filled with Pelargoniums, Fuchsias, &c., coming on for the show-house.

Returning to the lawn, which nearly resembles a triangle in outline, and which is planted all round with raised banks of trees and evergreen shrubs, we notice a large tree of the Silver Poplar literally loaded with inflorescence; good specimens of Wellingtonia gigantea, Araucaria imbricata, a perfectly formed tree of Thuja gigantea, about 16 feet high; a nicely furnished specimen of Picea orientalis; Cupressus macrocarpa, very fine, about 20 feet high; several handsome specimens of Cedrus Deodara, just pushing forth their pleasing green leaf-buds; together with several standard golden and silver variegated Hollies and Rhododendrons. At the bottom of the lawn is the kitchen garden and plant-houses, but before alluding to them we must mention the method adopted for watering the garden. Between the pleasure-ground and the kitchen-garden is a good-sized tank, made in a kind of scroll pattern, and filled with water, at one corner of which a good substantial though easily-worked force-pump has been fixed, and to which indiarubber hose, in lengths sufficient to reach all over the place, are easily fitted. The water is forced up in it, in sufficient force to enable the gardener to well wash most of the trees, as well as to water them and the grass. This process is essential to success in growing such trees near towns. Turning into the kitchen-garden, we pass through a miniature orchard, containing about a dozen beautiful pyramidal Pear trees, which at the time of our visit were a mass of bloom, as also are some small bushy Plum trees which had formerly been grown in pots. To make the most of the space at command, espalier Pears and Apples have been trained to neatly-fixed strained wires around the paths. These, together with some fan-trained Plums, in full bloom, gave the garden a very light and pleasing appearance. The houses form the boundary of the garden, the first one being the Cucumber-house, and here several plants of Rollisson's Telegraph were growing and fruiting freely up the roof, whilst the staging underneath was filled with young specimen plants of Ferns, Begonias, Marantas, and other fine-foliaged plants, including a good specimen of the curious Aristolochia grandiflora var. Hookeri, showing numerous fine blooms, and concerning which we shall have more to say on another occasion. The next is the Pine-stove, containing about three dozen fruiting plants, principally Queens, in excellent health and showing for fruit nicely. On a shelf running over the path were a good batch of Gloxinias in 48-sized pots, and other seedling plants. Leaving this house we enter an early vinery, where the Grapes, all Black Hamburghs, were swelling kindly; they will probably be fit to cut about the first week in June. The next is a span-roofed house containing a good collection of large Fuchsias, a lot of Lilium auratum and other varieties, and a miscellaneous collection of plants, &c. The Peach-house comes next. This is a large, light,

and airy house, with Peaches and Nectarines trained to trellis-work under the roof and up the back wall. The trees are planted out in the border, and have set a very heavy crop of fruit. This house is the one-half of a new range, the other being the late vinery. The Vines are planted in an inside border, and have made good canes to the top of the rafters. The varieties which are planted are the Black Lady Downe's Seedling, Trebbiano, Mill Hill Hamburgh, Frankenthal, &c. At the time of our visit they were just beginning to break, with every prospect of a nice crop. In front of this range of houses are two rows of pits, containing a few lights of healthy looking Melons, with other compartments filled with Balsams and such-like subjects, with a large assortment of bedding plants of unusually good quality.

Enough, we think, has been said to show that Mr. Wattenbach, with great skill, has made the most of the ground at his command, and we need scarcely add that the garden to him is a source of great pleasure; whilst to his gardener, Mr. Sullivan, great credit is due for the excellent condition in which he keeps it.

Miscellaneous.

PRESERVATION OF STONE.—Dr. Robert, in the Paris *Les Mondes*, maintains that the use of the black oxide of copper, and its salts, will effectually prevent change in stone. He shows that the decay of granite, marble, limestones, sandstones, and all natural building stones, is the combined effect of various causes, and that among these is a very minute Lichen, the Lepra antiquitatis, which is one of the worst enemies of stone, and its action is to such an extent that, for instance, the beautiful marble sculptures of the well-known Parc de Versailles will, unless proper measures be taken for staying the process of decay, be unsightly and ugly masses of dirt, and quite irretrievably lost, as works of art, within the next 50 years. The author, taking as instances such buildings at Paris as the Bourbon Palace, the Palais du Corps Législatif, the Mazarin Palace (l'Institut), the Mint, and others, points out that dust, spider's webs, and the action of rain combined with the minute Lichen above alluded to, hasten the decay of stone, especially of those parts where any sculpture or ornamental carving promotes the deposition of dirt and dust. Various places and instances are cited of the application of oxide of copper and its salts, which places are open to inspection, and the length of time which has elapsed since such application seems to warrant the conclusion that these compounds act as preservatives of stone. In reference to granite, the author states that this stone is also, according to the experience of Egyptian engineers, far more readily affected by a moist climate than one would be led to believe. The obelisk of Luxor, brought from Upper Egypt to Paris, has become blanched and full of small cracks during the 40 years it has stood on the Place de la Concorde; although 40 centuries had not perceptibly affected it as long as it was in Egypt. Granite, in a moist climate, becomes the seat of minute cryptogamic plants, which greatly aids its destruction, and it is moreover, a well-known fact that the disintegration of this stone, which is composed of three separate minerals (quartz, mica, and felspar), depends very greatly upon the thorough and intimate mixture, as well as the chemical composition of these three ingredients, each of which in a separate state more easily withstands the influence of the weather.

RISE OF SAP IN TREES AND PLANTS.—The nature of capillary, or hair-like attraction has long been known and satisfactorily studied. It is easily illustrated by placing a lump of loaf sugar in a plate containing a little water, when the liquid will almost instantaneously rise to the surface of the sugar, even 2 or 3 inches beyond its level. On this principle the rise of sap in plants and trees has been explained. But the celebrated philosopher, M. Becquerel, considers that electricity is an acting cause. A capillary tube that will not allow water to pass through it, does so at once on being electrified. And he conceives that electro-capillarity is the efficient cause of sap travelling in vegetable life. *The Electric Telegraph Review.*

EFFECT OF ELECTRICITY UPON WINE.—A curious phenomenon resulting from electricity is said to have been recently laid before the Academy of Sciences by Dr. Scontetten. The house of a wine-grower in the Basses-Alpes was struck by lightning a few months ago. Several casks were broken, and the wine from them escaped into a tank purposely placed to receive any wine spilled by accident. The proprietor having tasted it, and found it much improved, was induced by the advice of Dr. Scontetten to try the effect of artificial electrification upon some other wines of inferior quality, which gave similar results. Appended to this statement is a short direction for carrying out the operation indicated. The wires of the voltaic pile should be tipped with platinum, to which must be attached electrodes of the same metal, which both dip into the liquid. The process seems to take some time. *The Press.*

AUSTRALIAN TOBACCO.—In Gipps Land a Swiss gentleman is producing cigars of good quality at £5 per 1000 from tobacco grown by him in this locality. It is found that the soil of Western Australia is well adapted to the growth of the Castor-oil tree, and it is not improbable that its cultivation will be adopted. *Overland Telegraph.*

AMERICAN CAOUTCHOUC.—Of the early history of American caoutchouc we have very interesting facts. Among the earliest is that of Herrera, who, in his account of Columbus' second voyage, speaking of the natives of Hayti, says, "They had other amusements, such as the game of ball, for which they had a house set apart, and they played it so many on each side, without sticks or bats, for they struck the balls with any part of their bodies, and with great dexterity and nimbleness. And the balls were of the gum of a tree, and although large were lighter and bounced better than the windballs of Castile." Juan de Torquemada, however, seems to be the first who mentions the tree yielding this substance, viz., the Ulequahuitl, or Castilloa elastica, Cerv. In his "De la Monarquia Indiana," published at Madrid in 1615, when speaking of Mexico, he says, "There is a tree which the Indians call Ulequahuitl; it is held in great estimation, and grows in the hot country. It is not a very high tree; the leaves are round, and of an ashy colour. This tree yields a white milky substance, thick and gummy, and in great abundance. To obtain it the tree is wounded with an axe or cutlass, and from these wounds the liquid drops. The natives collect it in round vessels of different sizes, called, in their language. 'xicalli,' but by us calabashes. In these they allow it to settle in round balls, of the size most convenient for the purposes to which they are about to apply them. When quite set they boil them in water, in which state the gum is called 'ulli.' The Indians who have got no calabashes smear their bodies over with it (for Nature is never without a resource), and when it becomes dry they remove the whole incrustation, which comes off in the form of a very smooth membrane, its thickness depending on the will of the party collecting. They then make it into balls and boil them as before. Our people (*i.e.*, the Spaniards) used it in waxing their cloaks, which were made of coarse canvas, so as to make them resist water; and in truth it is of great effect in resisting the water, but not so the sun, for the rays thereof melt it."—*Electric Telegraph Review.*

OLD FASHIONED GARDENING.—Time was when kings and conquerors did not disdain the homely occupation of farming and gardening; when philosophy, in the persons of Plato and Epicurus, took up the gentle craft, and made their paradises—for so were gardens called in the olden days—real academies; when the rulers of Rome, with their proverbial magnificence, caused their gardens to rank among the wonders of the world; when, in our own land, princes and prelates loved gardens and gardening; and when Adam's craft,—"There are no ancient gentlemen," says the Clown in *Hamlet*, "but gardeners, ditchers, and gravemakers; they hold up Adam's profession"—was pursued with enthusiasm and delight by philosophers, statesmen, and courtiers. Gardening is a direct sign and warrant of civilisation. Without going back to the days of antiquity—when the Persians, the Greeks, and the Romans, borrowing the art from still more primitive people, filled their gardens with aromatic herbs, shady trees, and odorous flowers—we find abundant evidence of a knowledge of gardening among the highest and lowest in our land. *The Bookseller.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Aquatic plants in stoves or hothouses will now be making young leaves freely. Considering how short our summers are, I advocate that the *Victoria regia*, *Nymphæas*, and *Nelumbium speciosum*, &c., should be pushed along quickly at this part of the year. They grow quickest by keeping up an extreme temperature in the house wherein they are grown. Air need not be given constantly, even if the sun shines brightly, providing the thermometer does not rise higher than from 98° to 100° within the structure. Of course it will be necessary to allow such an amount of fresh air, once during every 24 hours, as will suffice to clear and freshen the atmosphere. Occasionally let the water in the tank be thoroughly disturbed, so to speak, by some artificial means, after which let it run out through the waste-pipe, so that fresh water can be admitted into the tank, for the purpose of keeping it pure and wholesome, and to dispel the sluggishness which exists more or less in standing water in hothouses. It is advisable as a rule to deprive *Nymphæas* of any suckers which form around the base of the old plants, for if they are allowed to remain they rob the parent plants of some of that vigour which is so essential to enable them to produce a succession of fine flowers at a later period. It is by potting these suckers as they are taken off that this lovely class of plants is generally propagated. The above remarks are equally applicable to those small aquariums, which prove so interesting, and afford such a fund of amusement in many homes, though many of them are of small dimensions. *Bouvardias*, with their lovely variously coloured flowers, should be kept up well to the glass, and so have a plentiful supply of light, if they are to be grown well and flower profusely at an early date. Those which are likely to come into bloom freely in a month or two hence should now have their final shift, if they have not yet received it; after which the treatment I have mentioned above should be adhered to. They delight in a compost formed of two parts each of peat and loam, to one of silver sand. B. Rosalinda, B. leiantha, B. delicata, B. Brilliant (a good autumnal bloomer), B. carnea (more fragrant than many), B. Hogarth, and B. longiflora (a lovely, large-flowered, pure white and fragrant species, which should be planted out into the open border in June, and taken up again early in September, preparatory to the production of its blooms), are very desirable varieties, though there are other varieties which possess great merit. Those who really value the plants grown in any form of plant-houses will not fail to shift at once those which need it, and have not yet received such attention; for it will not only be useless to pot them when the summer's growth is made, but it will be absolutely injurious, in more ways than one. Bring the full summer's treatment required by stove-plants generally into full play now gradually, for activity in growth will soon be at its highest pitch. For general stoves a maximum temperature of 76° will be ample under the most favourable external conditions at this present time, whilst 64° to 66° will be a good minimum at which to draw the lowest line. Shading must be maintained with care at such times as the sun shines brightly, and is likely to cause injury to the shoots. Copious syringings should be given at or about 9 A.M. and between 3 and 4 P.M. The finer the syringe can distribute spray-like tepid showers, so much the more will the plants be benefited. I do not say that less should be afforded; the quantity should be equally abundant, but its distribution should be prolonged. *Cape Pelargoniums*, the earliest of which will now be coming into flower, should have all tying operations performed quickly. The foliage must be kept particularly clean. A good fumigation should be given, and manure-water applied alternately with pure water, that the blooms may be fine and lasting for a proper time in flower. My thanks are due to Mr. Culverwell for his last reply concerning the culture of *Luculias*; we should have but one wish in common in writing in these pages, and that the elucidation and simplification of the practices necessary to grow all plants needing more than ordinary skill. I have personally tried the cutting down young plants of these with a view to forming good bushy specimens; invariably these have succumbed after being cut in, either at the second, or at latest the third time the operation was performed. Others may, however, be more successful, as I believe your correspondent is; and I hope our friendly controversy may conduce to the success of others on the same principle.

FORCING HOUSES.

Attend now very carefully to those *Grapes* in the second early or main house which are at this time engaged in what I may term stoning, for if all the requirements of the Vines are not met at this time, a want of success is likely to follow. Some growers advise greater attention in applying stimulants at the advent of the colouring period than now; this, however, I do not agree with. If manure-water is likely to benefit the plants, let those at such a stage have a supply forthwith. In stopping back the lateral or sub-lateral shoots two facts should always be kept in view as suggestive of a basis to work from:—1, on the principle of natural extension we should encourage as much wood as possible; and, 2, an extension as will cause the younger leaves to overtop the older leaves in too great a degree should never be permitted. The young leaves now being formed are as yet incapable of elaborating the crude sap which the roots are now actively pumping up for the perfecting of the fruit. The old maturer leaves divest it of its noxious parts, and the fruit in turn perfects it to its uses. The young leaves are capable only, on the contrary, of abstracting for their own uses from this rarified sap at the present; so that to let them stay over the tops of those which are actively engaged in the manipulatory process is to do them great injury. Be very careful that the temperature in houses which have Grapes colouring does not fluctuate too greatly. Sudden changes from hot to cold are often the cause of want of colour in Grapes, and this because a uniform flow of sap is checked thereby, —the injury increasing according to the largeness or otherwise of the crop. Those having the charge of *Vine borders* which are outside the house will be the best able to judge as to whether they require an artificial watering. We have hadsomewhat dry period for the time of year. It will be advisable to examine the borders well, and if necessary to give to any that need it a good watering. If artificial manure can be applied, so much the better. Again pot any thriving successional *Pines* which require it before the least check occurs, so that the plants may be kept freely growing. Continue sprinkling the paths and all cold internal surfaces, and use a thin shading, as before advised, when the sun is hottest. Do not water any fruit after the first symptoms of ripening occur. *Cherry-houses*, in which the fruit are ripening, should have abundance of air, so that the atmosphere will be maintained considerably dryer than was necessary before. Remove the thickest of the leaves from around fruits of *Peaches* and *Nectarines*, which show first symptoms of ripening, that the light and air which should be admitted freely should have access on all sides alike. Shut up the second houses in good time in the afternoon, and so not only

economise your heat, but secure the most natural conditions for the production of healthy vegetation.

HARDY FRUIT GARDEN.

Finish thinning the crop of young *Apricots* in all instances where necessary, for I can see that much work of this kind will be wanted at home. Those who have not attended to the disbudding of their *Peaches*, *Nectarines*, and *Apricots*, where young and thriving, will run some risk of injuring the branches, unless a keen-edged knife is used, instead of the quicker finger and thumb. All negligence demands an additional tax, however, on our energies, and the rule applies perhaps as much to behind-hand work in connection with gardening as to any known calling. If the shoots are not numerous enough at the apex of branches upon young trees, the points alone may be pinched back, which will conduce to the more uniform growth of the whole, and during favourable seasons form, on some kinds of fruit, two or three shoots for one.

HARDY FLOWER GARDEN.

Do not delay longer to transplant edgings of *Cerastium* in all instances where this plant is grown. Cut off the fading heads of bloom on all *Auriculas* which have done blooming. Place the plants in a cool, properly sheltered situation, and do not neglect their requirements now that their flowers are past for the year. Where older plants of *Carnations* and the hardier kinds of *Pinks* exist, they will require a preliminary support, as they grow apace now. Give the final shift to such as are intended to bloom in pots. Look carefully over all *Rose trees*, and remove any form of maggots which have built to themselves a secure retreat amongst the young growing buds, and are subsisting upon them; they bind the leaves so together that they are easily detected with a little close inspection.

KITCHEN GARDEN.

Take advantage of every shower to transplant all seedling plants which require it. Prepare the necessary beds or mounds for *Vegetable Marrows* or *Ridge Cucumbers*. The more stable litter you can pack together into a heap, damping it as it is made up if too dry, so much the better will the plants thrive. The first-crop *Peas*, which have six or eight flowers expanded, should have the tops pinched off, if time is to be gained. Plant out in favourable situations, under sunny walls, *Tomatos*, *Chilis*, &c., putting a branch in front of them, if the weather is ungenial. *W. E.*

ORCHARD HOUSE MANAGEMENT.

ATTEND generally to the instructions given at p. 569, as to *Temperature, Ventilation, Atmosphere*, and the suppression and eradication of *Insects*, &c.; the latter pests especially must be closely looked after, for if they are allowed to progress now, not only the crop will be lost, but the trees themselves will be materially injured. *Disbudding and Stopping.*—This is an operation which now requires increased and daily attention. Disbud Peaches in places where the shoots seem rather crowded, and pinch or stop all the others to three or four leaves. When the trees are young and small due consideration must of course be given towards the formation of the plant, &c.; the shoots of these may be allowed to extend a little further. It will answer to allow the shoots of Peaches to grow longer than this, it is not so desirable, however, for the maintenance of nice bushy, stocky trees, such as are required for the orchard-house. Apricots, Plums, and Cherries, however, must have their shoots pinched as closely as possible, for by so doing they will become one mass of flowering buds. If allowed to extend to whatsoever length, the flower-buds will just be found at the very extremity of the shoots where the pinching had taken place. The shoots being first pinched will break again, and these second growths must be again stopped at the first leaf beyond, and so on during the whole season. It is a simple operation, and very easily performed; all that is required is unlimited perseverance. If one part of the tree is growing more strongly than the other, that part must be most rigorously stopped and checked. *Thinning the Fruit.*—In most cases there is a superabundance of fruit this season. Blossom of all kinds was abundant, and every flower seems to have set, so that the operation of thinning must be seen to at once. With fruits, quantity and quality never go together, and especially is this the case with fruit trees in pots, especially Peaches and Apricots. Therefore, if fine fruit is wanted, they must be severely thinned; no very precise rules can be given as to the number, as much depends upon the strength of the plant, &c. For the present, they need therefore be only partially reduced—say the Peaches and Apricots—to one every 3 or 4 inches, or two upon every shoot, until the period of stoning is past, when they may be then finally thinned, as will be explained hereafter. Plums which have set freely should have the fruit reduced about one-half. Cherries will not require thinning. *Pruning Apricots.*—Now is the best time to do this. Plants which have not borne fruit, or plants which are straggling and unshapely, should now be headed back, when they will break again, and produce quite a mass of fine shrubby fruiting shoots for the next year. They may be cut back quite into the old wood of several years' formation, and they will break out quite freely. Apricots when at rest do not stand the knife well, but at this season, whilst the plants are in full leaf, nothing could be more satisfactory. I have practised this method of pruning the Apricot for years, and wish to recommend it. *Watering.*—Take care that neither the trees in pots, nor those planted out, suffer for want of water, for, if they happen to get dry, all the fruit will fall. *B.*

TOWN GARDENING.

Carnations and *Pinks* will now be putting up their flower-stems, and should, therefore, be neatly staked and tied as they progress in growth. For Carnations the sticks should be 18 inches above the mould, and 6 inches for Pinks; and if large blooms are desired, all the side buds should be removed as fast as they appear, leaving only the terminal one. *Pansies* are most serviceable for town gardens, and if now planted in beds in separate colours they will make a great show during most of the summer months. If the plants are purchased, never select or have those with the roots compressed; such only as have been nevely lifted out of the ground are likely to succeed. Another sowing of *Virginia Stocks*, *Cape Marigold*, *Nemophila insignis*, *Candytuft*, and the dwarf *Nasturtiums*, if sown now, and frequently sprinkled during their growth, will follow up the early sown plants, and make a good display in July and August. *Mignonette* and *Intermediate Stocks* should now be turned into the window boxes, and if a piece of board be fixed at each end it will be of great service as a protection from the wind. *Cobæa scandens* or *Convolvulus major*, if planted at the end of the box, will train nicely round the window on wire or string. Suspended baskets, if filled now with the drooping *Saxifrage*, commonly called Mother of Thousands, or *Tradescantia discolor*, and hung in the window, will make pretty objects during summer. When placing the pots in the baskets it is advisable to pack Moss round them, which will much assist in keeping them fresh and healthy. *F. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, MAY 4, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
April and May.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
28 Thurs.	29.95	52.7	46.3	34.3	88	2.1
29 Friday	29.84	48.1	42.0	35.1	69	2.4
30 Saturday	29.59	48.3	47.0	47.5	97	3.7
1 Sunday	29.43	51.1	47.0	40.7	66	2.9
2 Monday	29.67	45.1	40.0	36.9	77	2.5
3 Tues.	29.84	42.3	39.0	35.0	76	2.4
4 Wednes	29.91	40.5	40.0	41.1	92	3.1

1870 MONTH AND DAY	TEMPERATURE OF THE AIR.					WIND.		RAIN
April and May.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
28. Thurs.	51.0	37.6	13.4	49.7	−7.7	N.by W.	215	0.01
29. Friday	52.7	36.2	16.5	43.6	−5.2	N.W. to W.N.W.	260	0.03
30. Saturday	57.8	40.3	17.5	47.8	−1.5	W.	320	0.04
1. Sunday	59.8	43.2	16.6	49.9	+0.1	W.	305	0.02
2. Monday	54.7	39.0	15.7	45.1	−5.2	N.W.	275	0.02
3. Tues.	50.9	31.9	19.0	39.7	−11.1	N.W.	260	0.00
4. Wednes	56.2	31.5	24.7	42.2	−9.0	N	165	0.00

April 28.—Generally cloudy. Occasional rain in the morning. A little hail.
— 29.—Large amount of cloud prevalent till 3 P.M; overcast afterwards. Rain fell during the evening.
— 30.—Overcast throughout. Gloomy.
May 1.—The amount of cloud very variable throughout the day. Occasional showers. Thunder about 2 P.M. Very fine occasionally.
— 2.—Overcast till 2 P.M., variable afterwards. Occasional rain.
— 3.—Generally overcast till evening, then cloudless at times. Rain fell during the day.
— 4.—A fine day. Variable amounts of cloud prevalent, principally cirro-cumulus and cumulo-stratus.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, APRIL 30, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean	FALL OF RAIN
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	65.5	30.1	35.4	59.6	37.5	22.1	47.0	0.11
Blackheath ..	67.0	36.2	30.8	58.4	40.1	18.4	47.7	0.13
Bristol ..	68.0	34.2	34.7	54.8	40.1	13.8	46.1	0.26
Birmingham ..	63.8	36.3	27.5	55.6	42.0	13.6	47.2	0.41
Wolverhampton	64.4	35.0	29.4	55.5	41.3	14.2	46.8	0.49
Leicester ..	64.0	36.5	28.0	55.8	40.6	15.2	46.7	0.18
Norwich ..	64.5	34.0	27.0	54.8	40.1	14.7	45.8	0.35
Nottingham ..	65.6	36.2	29.4	56.8	40.7	16.1	47.1	0.11
Sheffield ..	60.7	35.0	25.7	54.4	41.3	13.1	46.2	0.28
Liverpool ..	60.7	38.8	21.4	53.3	43.0	10.3	46.6	0.61
Manchester ..	61.4	35.0	26.4	54.7	41.9	12.8	46.7	11.3
Salford	59.5	32.8	26.7	51.2	40.1	13.1	45.0	0.98
Bradford	57.4	37.0	20.4	54.3	41.3	13.0	46.2	0.22
Leeds	58.0	38.0	20.0	54.4	42.7	11.7	47.0	0.25
Hull	61.0	34.0	29.0	54.6	39.0	15.6	46.2	0.27
Newcastle	60.0	36.0	24.0	52.5	39.0	13.5	44.1	0.39
Edinburgh ..	59.7	38.0	21.7	..	..	..	47.1	0.10
Glasgow ..	55.8	37.2	18.6	..	..	..	45.3	0.22
Dundee ..	62.0	30.0	26.0	..	..	..	45.8	0.10
Aberdeen ..	66.5	33.8	32.7	..	..	..	49.4	0.12
Paisley ..	..	..	..	..	..	..	..	..
Greenock ..	55.0	40.0	15.0	..	..	..	46.3	0.44
Leith	61.5	38.0	22.6	..	..	..	47.2	0.10
Perth	62.0	38.0	24.0	..	..	..	49.1	0.05
Dublin	62.9	36.0	26.9	..	..	..	47.7	0.01

JAMES GLAISHER.

Notices to Correspondents.

ANTS IN CUCUMBER-HOUSES. A *Weekly Subscriber* is desirous of knowing the best remedy for destroying ants in Cucumber-houses.

BEES: *W. A. M.* Thank you. Your communication must stand over for a week or two.

BEDDING PANSIES: *A. Dean.* Of your four bedding Pansies, three are very promising, so far as we can judge from the blooms sent. The white is the best—pure, without any trace of dark eye, and with merely three or four short radiating lines, which are not seen at a distance; hence it will look, as it is, a solid white. The bronze is a distinct and useful warm brown tint. The violet one may be useful, as it seems darker than the Cliveden Blue and others of that strain.

BOOKS: *E. G.* Should specify what he wants more clearly. Does he refer to British plants only?—*Orient.* Perhaps "Porter's Tropical Agriculturist" is the book you require. We cannot tell you where it can be obtained, as we believe it is a very scarce work.—*R. C.* "Oliver's Lessons on Elementary Botany" will probably suit you.

CONIFER INSECT ON PICEAS. This is a coccus allied to the Silver Fir scale, Adelges Piceæ. We should be glad of more specimens for examination, comparison, and preservation, and should also like information as to whether the young plants have been raised from seed, and whether there are any Silvers in the neighbourhood infested by the common scale insect of that tree. The same remedies which are recommended for it, painting with quicklime and other unpalatable mixtures, should equally answer for this; but it is right to add that we have very little faith in them. *A. M.*

FUNGUS: *A Reader.* Agaricus integrellus. P.

GLAZING: *E. G. B.* asks what is the best mode of joining glass, which has been broken, without showing much appearance of the breakage? If it is firm, leave it alone; if loose have it replaced by sound glass.

INSECTS: *A. Y.* The common red spider,—an enemy, unfortunately, too well known to horticulturists. As for a remedy, our correspondent will find various more or less successful methods recommended in our pages from time to time, and in our advertising columns scarcely a week passes without the announcement of one.

LIQUID MANURE: *E. G. B.* Use guano in preference to bone manure for making up a liquid manure for plants.

MELONS: *Constant Reader.* You will not get a satisfactory crop of Melons in the open ground in this country "as in France;" the cases in which fruit is obtained in this way are exceptionally favourable.

NAMES OF PLANTS: *H. T. M.* 1, Aubrietia deltoidea; 2, Saxifraga hirta; 3, Lamium maculatum; 4, Platyloma falcatum; 5, Lastrea decomposita; 6, Selaginella uncinata; 7 and 8 are Sedums, not in flower.—*W. T.* Phytolacca (Pircunia) decandra; Hypocalymna angustifolium. The Orchid was smashed in transit; send another specimen, with further particulars as to native country, &c.—*H. D.* 1, Libonia floribunda; 2, Spiræa lævigata.—*E. W.* Arenaria serpyllifolia: not poisonous.—*F. D. S.* Erica Mackaiana.—*P. C.* The specimen named Anthericum Liliago is Ornithogalum nutans; the one named Paradisia Liliastrum is Anthericum Liliago, so probably you have got your labels transposed. *J. G. B.*—*A. Y. Z.* 1, Narcissus Pseudo-Narcissus, var. bicolor, 2, Narcissus bicolor, the typical variety, flore-pleno; 3, N. Tazetta var. patulus; 4, N. Jonquilla. *J. G. B.*—*B. D.* Euonymus radicans fol. var.—*D. E.* Kerria japonica.—*P.* Amelanchier canadensis—*R. B.* Omphalodes verna.

OXFORD SHOW: *T. B.* Should communicate with Mr. Richards, Royal Horticultural Society, South Kensington, who will gladly supply the information required.

PEAR LEAVES: *N. Country Gardener.* The affection is very common on Pear leaves, and sometimes extends to the fruit, when it does great mischief. Each pustule is perforated, and mites are sometimes seen on the leaves, but it is very uncertain whether they are the cause. Whatever that may be, no remedy is known. As long as it keeps to the leaves it does not seem to do much harm. *M. J. B.*

PEARS: *D. Buchanan.* The following are the names of the 13 Pears exhibited by Mr. Anderson, Oxenford, at the Royal Caledonian Horticultural Exhibition, on March 29:—Beurré Rance, Beurré Spring (Buchanan's), Beurré Easter, Beurré Bretoneau, Colmar, Passe Colmar, Colmar d'Aremberg, Crassane d'Hiver, Catillac, Glou Morceau, Rouse Lench, St. Germain (Uvedale's), Bellissime d'Hiver.

PELARGONIUMS: *W. B. Sellers.* No. 1, a good scarlet, but its merits can only be tested by bedding out. The others do not possess any special merit.

PICEA NOBILIS: *G. M.* Your nurseryman and you were at cross purposes when he said that the light-coloured plants of Picea nobilis which he sent you would turn darker as they got older. He must have referred to the greater depth of hue which an older, strong, healthy plant has naturally, as contrasted with a younger, weaker, and feebler one. You, again, wanted the constitutionally darker variety, which shows itself from the very first. There are many varieties of Picea nobilis—some very light, some very dark, some very robust and curly, others less so, but these are constitutional characteristics, inherent in the plant from its germination, and which again are subject to secondary modification according as they are young or old, strong and healthy, or young and feeble. *A. M.*

QUEEN EMMA MELON: *J. McMurdoe* asks if any of our readers can tell him who was the raiser of the Queen Emma Melon, sent out by Messrs. Veitch & Son, and stated to be a cross between Heckfield Hybrid and Cashmere.

SHADING: *E. G. B.* A very good mixture for smearing over glass to form a permanent summer shade, is thin flour paste containing alum, and in which whiting

or some coloured powder of any tint required has been stirred, to give it more opacity. A green tint looks as well as any. It should be kept clear of the putty in putting it on the glass.

THE HYDROPULT.—The manufacturers of this garden engine are Messrs. Griffiths & Browett, Bradford Street, Birmingham. Mr. Button's address is 142, Cheapside, London. *Y. Z.*

TREATMENT OF VINES: *A Subscriber.* Your Vine roots will require nothing done to them during the summer beyond well supplying them with water whilst the plants are growing. Whilst growing, if well drained, they can scarcely have an over-supply. Towards autumn, however, whilst the wood and fruit are ripening, water should be withheld. You may give the border a good coating of well rotted manure, which will impart to the Vines strength and vigour; or once a week or so give them a supply of liquid manure, which may be made from good stable or cow dung, &c., or a handful of guano may be mixed in a tub of water. Every gardener with any pretensions to the name knows how to do this.

VILLAGE SHOWS: *E. W. B.* Your suggestion shall be attended to.

CATALGOUES RECEIVED.—B. S. Williams: General Plant Catalogue.—J. Scott: Flower-Garden Annual Directory.—V. Lemoine: Catalogue et Prix-Courant.—Louis Roempler: Catalogue et Prix-Courant.—C. Turner: General Spring Catalogue.—Bell & Thorpe: General Catalogue of Plants.—Kirk Allen: Descriptive Catalogue of Pelargoniums, &c.—A. Stansfield & Son: General Fern List.—W. Bull: Retail List of New Plants.—Dick Radclyffe & Co.: Catalogue of Bedding, Alpine, and Decorative Plants.—Child & Lorimer: Spring Catalogue.

COMMUNICATIONS RECEIVED:—D. E.—A. Y.—W. F.—J. P.—A Young Gardener.—P.—R. B.—J. E.—Q.—W. B. S.—M. D.—H. D.—A. A. M.—J. P. & Son.—D.—B. D.—F. B.—W. P. A.

Markets.

POTATOS.—Southwark, May 2.

During the past week the arrivals coastwise and by rail have been heavy for the season, and much in excess of the demand, the consumption having fallen off a third since the rise in prices, which have declined 10*s.* per ton since this day week. Quotations as follow:—Yorkshire Flukes, per ton, 110*s.* to 140*s.*; Ditto Regents, 100*s.* to 130*s.*; Lincolnshire do., 90*s.* to 100*s.*; Dunbar and East Lothian do., 100*s.* to 130*s.*; Perth, Forfar, and Fifeshire do., 90*s.* to 100*s.*; Do. Rocks, 85*s.* to 90*s.*; Do. Reds, 80*s.* to 90*s.*; French and Belgian Whites, 70*s.* to 85*s.*

COVENT GARDEN.—May 6.

The weather is adverse to any improvement in home-grown produce, the frost having much injured Asparagus, Spinach, and such articles. Business is also much influenced by it, and there is not nearly the amount usually done at this period of the year. Continental supplies are heavy, comprising Asparagus, French Beans, young Turnips and Carrots, Peas, and Artichokes. Flowers chiefly consist of Azaleas, Orchids, Roses, French and Scarlet Pelargoniums, Heaths, Fuchsias, Wallflowers, &c.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve ..	3 0	to 5 0	Melons, each ..	..	..
Cobs, per lb. ..	0 9	— 1 0	Oranges, per 100 ..	3 0	— 7 0
Filberts, per lb. ..	1 0	— 1 6	Pears, per doz. ..	1 0	— 2 0
Grapes, per lb. ..	8 0	—12 0	Pine-apples, per lb.	8 0	— 10 0
Lemons, per 100 ..	4 0	to 8 0	Strawberries, p. lb.	6 0	— 12 0

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Asparagus, p. bund.	3 0	to 15 0	HorseRadish, p. bun.	3 0	to 5 0
Artichokes, p. doz. ..	3 0	— 6 0	Leeks, per bun'h ..	0 2	— 0 4
Beet, per doz. ..	2 0	— 3 0	Lettuces, p. score ..	1 0	— 2 0
Broccoli, per doz. ..	1 0	— 2 0	Mushrooms, per pott.	1 0	— 1 6
Brussels Sprouts, p. ½ sieve	..	— ..	Mushrooms, p. pott.	1 0	— 1 6
Cabbages, p. doz. ..	1 0	— 1 6	Onions, per bunch ..	0 4	— 0 9
Carrots, p. bunch ..	0 4	— 0 6	Parsley, per bunch ..	0 2	— 0 4
Cauliflowers, p. doz.	2 6	— 3 0	Potatos, new, p. lb.	0 4	— 0 6
Celery, p. bund. ..	1 0	— 1 6	Salsafy, per bundle ..	1 0	— 1 3
Cucumbers, each ..	1 0	— 1 6	Scorzonera, do. ..	1 0	— 1 3
Endive, per doz. ..	1 6	— 2 0	Seakale, p. punnet..	1 6	— 2 0
French Beans, p. doz.	2 0	— ..	Shallots, per lb. ..	0 8	— ..
Garlic, per lb. ..	0 8	— ..	Spinach, p. bushel ..	2 0	— 3 0
Herbs, per bunch ..	0 2	— 0 4	Radishes, per doz ..	1 0	— 1 6
			Turnips, per bunch ..	0 2	— 0 3

Potatos, York Regents, per ton, 120*s.* to 150*s.*; Flukes, do., 110*s.* to 150*s.*

The West of England Bedding Plant Establishment.

THOMAS SAMPSON'S unrivalled Collection of BEDDING PLANTS will be ready to send out after May 1. This Collection contains all the leading kinds, at from 2*s.* per dozen, in 2½ and 3 inch pots; also Collections, fit for 12 dozen, at 18*s.*; for 24 dozen, at 30*s.*; for 48 dozen, at 55*s.*; for 72 dozen, at 75*s.*; for 15 dozen, ditto, 18*s.*; for 30 dozen, ditto, 35*s.*; for 60 dozen, ditto, 70*s.*; for 120 dozen, ditto, 130*s.*; for 240 dozen, ditto, 250*s.*; for 480 dozen, ditto, 500*s.*; for 960 dozen, ditto, 1000*s.*; for 1920 dozen, ditto, 2000*s.*; for 3840 dozen, ditto, 4000*s.*; for 7680 dozen, ditto, 8000*s.*; for 15360 dozen, ditto, 16000*s.*; for 30720 dozen, ditto, 32000*s.*; for 61440 dozen, ditto, 64000*s.*; for 122880 dozen, ditto, 128000*s.*; for 245760 dozen, ditto, 256000*s.*; for 491520 dozen, ditto, 512000*s.*; for 983040 dozen, ditto, 1024000*s.*; for 1966080 dozen, ditto, 2048000*s.*; for 3932160 dozen, ditto, 4096000*s.*; for 7864320 dozen, ditto, 8192000*s.*; for 15728640 dozen, ditto, 16384000*s.*; for 31457280 dozen, ditto, 32768000*s.*; for 62914560 dozen, ditto, 65536000*s.*; for 125829120 dozen, ditto, 131072000*s.*; for 251658240 dozen, ditto, 262144000*s.*; for 503316480 dozen, ditto, 524288000*s.*; for 1006632960 dozen, ditto, 1048576000*s.*; for 2013265920 dozen, ditto, 2097152000*s.*; for 4026531840 dozen, ditto, 4194304000*s.*; for 8053063680 dozen, ditto, 8388608000*s.*; for 16106127360 dozen, ditto, 16777216000*s.*; for 32212254720 dozen, ditto, 33554432000*s.*; for 64424509440 dozen, ditto, 67108864000*s.*; for 128849018880 dozen, ditto, 134217728000*s.*; for 257698037760 dozen, ditto, 268435456000*s.*; for 515396075520 dozen, ditto, 536870912000*s.*; for 1030792151040 dozen, ditto, 1073741824000*s.*; for 2061584302080 dozen, ditto, 2147483648000*s.*; for 4123168604160 dozen, ditto, 4294967296000*s.*; for 8246337208320 dozen, ditto, 8589934592000*s.*; for 16492674416640 dozen, ditto, 17179869184000*s.*; for 32985348833280 dozen, ditto, 34359738368000*s.*; for 65970697666560 dozen, ditto, 68719476736000*s.*; for 131941395333120 dozen, ditto, 137438953472000*s.*; for 263882790666240 dozen, ditto, 274877906944000*s.*; for 527765581332480 dozen, ditto, 549755813888000*s.*; for 1055531162664960 dozen, ditto, 1099511627776000*s.*; for 2111062325329920 dozen, ditto, 2199023255552000*s.*; for 4222124650659840 dozen, ditto, 4398046511104000*s.*; for 8444249301319680 dozen, ditto, 8796093022208000*s.*; for 16888498602639360 dozen, ditto, 17592186044416000*s.*; for 33776997205278720 dozen, ditto, 35184372088832000*s.*; for 67553994410557440 dozen, ditto, 70368744177664000*s.*; for 135107988821114880 dozen, ditto, 140737488355328000*s.*; for 270215977642229760 dozen, ditto, 281474976710656000*s.*; for 540431955284459520 dozen, ditto, 562949953421312000*s.*; for 1080863910568919040 dozen, ditto, 1125899906842624000*s.*; for 2161727821137838080 dozen, ditto, 2251799813685248000*s.*; for 4323455642275676160 dozen, ditto, 4503599627370496000*s.*; for 8646911284551352320 dozen, ditto, 9007199254740992000*s.*; for 17293822569102704640 dozen, ditto, 18014398509481984000*s.*; for 34587645138205409280 dozen, ditto, 36028797018963968000*s.*; for 69175290276410818560 dozen, ditto, 72057594037927936000*s.*; for 138350580552821637120 dozen, ditto, 144115188075855872000*s.*; for 276701161105643274240 dozen, ditto, 288230376151711744000*s.*; for 553402322211286548480 dozen, ditto, 576460752303423488000*s.*; for 1106804644422573096960 dozen, ditto, 1152921504606846976000*s.*; for 2213609288845146193920 dozen, ditto, 2305843009213693952000*s.*; for 4427218577690292387840 dozen, ditto, 4611686018427387904000*s.*; for 8854437155380584775680 dozen, ditto, 9223372036854775808000*s.*; for 17708874310761169551360 dozen, ditto, 18446744073709551616000*s.*; for 35417748621522339102720 dozen, ditto, 36893488147419103232000*s.*; for 70835497243044678205440 dozen, ditto, 73786976294838206464000*s.*; for 141670994486089356410880 dozen, ditto, 147573952589676412928000*s.*; for 283341988972178712821760 dozen, ditto, 295147905179352825856000*s.*; for 566683977944357425643520 dozen, ditto, 590295810358705651712000*s.*; for 1133367955888714851287040 dozen, ditto, 1180591620717411303424000*s.*; for 2266735911777429702574080 dozen, ditto, 2361183241434822606848000*s.*; for 4533471823554859405148160 dozen, ditto, 4722366482869645213696000*s.*; for 9066943647109718810296320 dozen, ditto, 9444732965739290427392000*s.*; for 18133887294219437620592640 dozen, ditto, 18889465931478580854784000*s.*; for 36267774588438875241185280 dozen, ditto, 37778931862957161709568000*s.*; for 72535549176877750482370560 dozen, ditto, 75557863725914323419136000*s.*; for 145071098353755500964741120 dozen, ditto, 151115727451828646838272000*s.*; for 290142196707511001929482240 dozen, ditto, 302231454903657293676544000*s.*; for 580284393415022003858964480 dozen, ditto, 604462909807314587353088000*s.*; for 1160568786830044007717928960 dozen, ditto, 1208925819614629174706176000*s.*; for 2321137573660088015435857920 dozen, ditto, 2417851639229258349412352000*s.*; for 4642275147320176030871715840 dozen, ditto, 4835703278458516698824704000*s.*; for 9284550294640352061743431680 dozen, ditto, 9671406556917033397649408000*s.*; for 18569100589280704123486863360 dozen, ditto, 19342813113834066795298816000*s.*; for 37138201178561408246973726720 dozen, ditto, 38685626227668133590597632000*s.*; for 74276402357122816493947453440 dozen, ditto, 77371252455336267181195264000*s.*; for 148552804714245632987894906880 dozen, ditto, 154742504910672534362390528000*s.*; for 297105609428491265975789813760 dozen, ditto, 309485009821345068724781056000*s.*; for 594211218856982531951579627520 dozen, ditto, 618970019642690137449562112000*s.*; for 1188422437713965063903159255040 dozen, ditto, 1237940039285380274899124224000*s.*; for 2376844875427930127806318510080 dozen, ditto, 2475880078570760549798248448000*s.*; for 4753689750855860255612637020160 dozen, ditto, 4951760157141521099596496896000*s.*; for 9507379501711720511225274040320 dozen, ditto, 9903520314283042199192993792000*s.*; for 19014759003423441022450548080640 dozen, ditto, 19807040628566084398385987584000*s.*; for 38029518006846882044901096161280 dozen, ditto, 39614081257132168796771975168000*s.*; for 76059036013693764089802192322560 dozen, ditto, 79228162514264337593543950336000*s.*; for 152118072027387528179604384645120 dozen, ditto, 158456325028528675187087900672000*s.*; for 304236144054775056359208769290240 dozen, ditto, 316912650057057350374175801344000*s.*; for 608472288109550112718417538580480 dozen, ditto, 633825300114114700748351602688000*s.*; for 1216944576219100225436835077160960 dozen, ditto, 1267650600228229401496703205376000*s.*; for 2433889152438200450873670154321920 dozen, ditto, 2535301200456458802993406410752000*s.*; for 4867778304876400901747340308643840 dozen, ditto, 5070602400912917605986812821504000*s.*; for 9735556609752801803494680617287680 dozen, ditto, 10141204801825835211973625643008000*s.*; for 19471113219505603606989361234575360 dozen, ditto, 20282409603651670423947251286016000*s.*; for 38942226439011207213978722469150720 dozen, ditto, 40564819207303340847894502572032000*s.*; for 77884452878022414427957444938301440 dozen, ditto, 81129638414606681695789005144064000*s.*; for 155768905756044828855914889876602880 dozen, ditto, 162259276829213363391578010288128000*s.*; for 311537811512089657711829779753205760 dozen, ditto, 324518553658426726783156020576256000*s.*; for 623075623024179315423659559506411520 dozen, ditto, 649037107316853453566312041152512000*s.*; for 1246151246048358630847319119012823040 dozen, ditto, 1298074214633706907132624082305024000*s.*; for 2492302492096717261694638238025646080 dozen, ditto, 2596148429267413814265248164610048000*s.*; for 4984604984193434523389276476051292160 dozen, ditto, 5192296858534827628530496329220096000*s.*; for 9969209968386869046778552952102584320 dozen, ditto, 10384593717069655257060992658440192000*s.*; for 19938419936773738093557105904205168640 dozen, ditto, 20769187434139310514121985316880384000*s.*; for 39876839873547476187114211808410337280 dozen, ditto, 41538374868278621028243970633760768000*s.*; for 79753679747094952374228423616820674560 dozen, ditto, 83076749736557242056487941267521536000*s.*; for 159507359494189904748456847233641349120 dozen, ditto, 166153499473114484112975882535043072000*s.*; for 319014718988379809496913694467282698240 dozen, ditto, 332306998946228968225951765070086144000*s.*; for 638029437976759618993827388934565396480 dozen, ditto, 664613997892457936451903530140172288000*s.*; for 1276058875953519237987654777869130792960 dozen, ditto, 1329227995784915872903807060280344576000*s.*; for 2552117751907038475975309555738261585920 dozen, ditto, 2658455991569831745807614120560689152000*s.*; for 5104235503814076951950619111476523171840 dozen, ditto, 5316911983139663491615228241121378304000*s.*; for 10208471007628153903901238222953046343680 dozen, ditto, 10633823966279326983230456482242756608000*s.*; for 20416942015256307807802476445906092687360 dozen, ditto, 21267647932558653966460912964485513216000*s.*; for 40833884030512615615604952891812185374720 dozen, ditto, 42535295865117307932921825928971026432000*s.*; for 81667768061025231231209905783624370749440 dozen, ditto, 85070591730234615865843651857942052864000*s.*; for 163335536122050462462419811567248741498880 dozen, ditto, 170141183460469231731687303715884105728000*s.*; for 326671072244100924924839623134497482997760 dozen, ditto, 340282366920938463463374607431768211456000*s.*; for 653342144488201849849679246268994965995520 dozen, ditto, 680564733841876926926749214863536422912000*s.*; for 1306684288976403699699358492537989931991040 dozen, ditto, 1361129467683753853853498429727072845824000*s.*; for 2613368577952807399398716985075979863982080 dozen, ditto, 2722258935367507707706996859454145691648000*s.*; for 5226737155905614798797433970151959727964160 dozen, ditto, 5444517870735015415413993718908291383296000*s.*; for 10453474311811229597594867940303919455928320 dozen, ditto, 10889035741470030830827987437816582766592000*s.*; for 20906948623622459195189735880607838911856640 dozen, ditto, 21778071482940061661655974875633165533184000*s.*; for 41813897247244918390379471761215677823713280 dozen, ditto, 43556142965880123323311949751266331066368000*s.*; for 83627794494489836780758943522431355647426560 dozen, ditto, 87112285931760246646623899502532662132736000*s.*; for 167255588988979673561517887044862711294853120 dozen, ditto, 174224571863520493293247799005065324265472000*s.*; for 334511177977959347123035774089725422589706240 dozen, ditto, 348449143727040986586495598010130648530944000*s.*; for 669022355955918694246071548179450845179412480 dozen, ditto, 696898287454081973172991196020261297061888000*s.*; for 1338044711911837388492143096358901690358824960 dozen, ditto, 1393796574908163946345982392040522594123776000*s.*; for 2676089423823674776984286192717803380717649920 dozen, ditto, 2787593149816327892691964784081045188247552000*s.*; for 5352178847647349553968572385435606761435299840 dozen, ditto, 5575186299632655785383929568162090376495104000*s.*; for 10704357695294699107937144770871213522870599680 dozen, ditto, 11150372599265311570767859136324180752990208000*s.*; for 21408715390589398215874289541742427045741199360 dozen, ditto, 22300745198530623141535718272648361505980416000*s.*; for 42817430781178796431748579083484854091482398720 dozen, ditto, 44601490397061246283071436545296723011960832000*s.*; for 85634861562357592863497158166969708182964797440 dozen, ditto, 89202980794122492566142873090593446023921664000*s.*; for 171269723124715185726994316333939416365929594880 dozen, ditto, 178405961588244985132285746181186892047843328000*s.*; for 342539446249430371453988632667878832731859189760 dozen, ditto, 356811923176489970264571492362373784095686656000*s.*; for 685078892498860742907977265335757665463718379520 dozen, ditto, 713623846352979940529142984724747568191373312000*s.*; for 1370157784997721485815954530671515330927436759040 dozen, ditto, 1427247692705959881058285969449495136382746624000*s.*; for 2740315569995442971631909061343030661854873518080 dozen, ditto, 2854495385411919762116571938898990272765493248000*s.*; for 5480631139990885943263818122686061323709747036160 dozen, ditto, 5708990770823839524233143877797980545530986496000*s.*; for 10961262279981771886527636245372122647419494072320 dozen, ditto, 11417981541647679048466287755595961091061972992000*s.*; for 21922524559963543773055272490744245294838988144640 dozen, ditto, 22835963083295358096932575511191922182123945984000*s.*; for 43845049119927087546110544981488490589677976289280 dozen, ditto, 45671926166590716193865151022383844364247891968000*s.*; for 87690098239854175092221089962976981179355952578560 dozen, ditto, 91343852333181432387730302044767688728495783936000*s.*; for 175380196479708350184442179925953962358711905157120 dozen, ditto, 182687704666362864775460604089535377456991567872000*s.*; for 350760392959416700368884359851907924717423810314240 dozen, ditto, 365375409332725729550921208179070754913983135744000*s.*; for 701520785918833400737768719703815849434847620628480 dozen, ditto, 730750818665451459101842416358141509827966271488000*s.*; for 1403041571837666801475537439407631698869695241256960 dozen, ditto, 1461501637330902918203684832716283019655932542976000*s.*; for 2806083143675333602951074878815263397739390482513920 dozen, ditto, 2923003274661805836407369665432566039311865085952000*s.*; for 5612166287350667205902149757630526795478780965027840 dozen, ditto, 5846006549323611672814739330865132078623730171904000*s.*; for 11224332574701334411804299515261053590957561930055680 dozen, ditto, 11692013098647223345629478661730264157247460343808000*s.*; for 22448665149402668823608599030522107181915123860111360 dozen, ditto, 23384026197294446691258957323460528314494920687616000*s.*; for 44897330298805337647217198061044214363830247720222720 dozen, ditto, 46768052394588893382517914646921056628989841375232000*s.*; for 89794660597610675294434396122088428727660495440445440 dozen, ditto, 93536104789177786765035829293842113257979682750464000*s.*; for 179589321195221350588868792244176857455320990880890880 dozen, ditto, 187072209578355573530071658587684226515959365500928000*s.*; for 359178642390442701177737584488353714910641981761781760 dozen, ditto, 374144419156711147060143317175368453031918731001856000*s.*; for 718357284780885402355475168976707429821283963523563520 dozen, ditto, 748288838313422294120286634350736906063837462003712000*s.*; for 1436714569561770804710950337953414859642567927047127040 dozen, ditto, 1496577676626844588240573268701473812127674924007424000*s.*; for 2873429139123541609421900675906829719285135854094254080 dozen, ditto, 2993155353253689176481146537402947624255349848014848000*s.*; for 5746858278247083218843801351813659438570271708188508160 dozen, ditto, 5986310706507378352962293074805895248510699696029696000*s.*; for 11493716556494166437687602703627318877140543416377016320 dozen, ditto, 11972621413014756705924586149611790497021399392059392000*s.*; for 22987433112988332875375205407254637754281086832754032640 dozen, ditto, 23945242826029513411849172299223580994042798784118784000*s.*; for 45974866225976665750750410814509275508562173665508065280 dozen, ditto, 47890485652059026823698344598447161988085597568237568000*s.*; for 91949732451953331501500821629018551017124347331016130560 dozen, ditto, 95780971304118053647396689196894323976171195136475136000*s.*; for 183899464903906663003001643258037102034248694662032261120 dozen, ditto, 191561942608236107294793378393788647952342390272950272000*s.*; for 367798929807813326006003286516074204068497389324064522240 dozen, ditto, 383123885216472214589586756787577295904684780545900544000*s.*; for 735597859615626652012006573032148408136994778648129044480 dozen, ditto, 766247770432944429179173513575154591809369561091801088000*s.*; for 1471195719231253304024013146064296816273989557296258088960 dozen, ditto, 1532495540865888858358347027150309183618739122183602176000*s.*; for 2942391438462506608048026292128593632547979114592516177920 dozen, ditto, 3064991081731777716716694054300618367237478244367204352000*s.*; for 5884782876925013216096052584257187265095958229185032355840 dozen, ditto, 6129982163463555433433388108601236734474956488734408704000*s.*; for 11769565753850026432192105168514374530191916458370064711680 dozen, ditto, 12259964326927110866866776217202473468949912977468817408000*s.*; for 23539131507700052864384210337028749060383832916740129423360 dozen, ditto, 24519928653854221733733552434404946937899825954937634816000*s.*; for 47078263015400105728768420674057498120767665833480258846720 dozen, ditto, 49039857307708443467467104868809893875799651909875269632000*s.*; for 94156526030800211457536841348114996241535331666960517693440 dozen, ditto, 98079714615416886934934209737619787751599303819750539264000*s.*; for 188313052061600422915073682696229992483070663333921035386880 dozen, ditto, 196159429230833773869868419475239575503198607639501078528000*s.*; for 376626104123200845830147365392459984966141326667842070773760 dozen, ditto, 392318858461667547739736838950479151006397215279002157056000*s.*; for 753252208246401691660294730784919969932282653335684141547520 dozen, ditto, 784637716923335095479473677900958302012794430558004314112000*s.*; for 1506504416492803383320589461569839939864565306671368283095040 dozen, ditto, 1569275433846670190958947355801916604025588861116008628224000*s.*; for 3013008832985606766641178923139679879729130613342736566190080 dozen, ditto, 3138550867693340381917894711603833208051177722232017256448000*s.*; for 6026017665971213533282357846279359759458261226685473132380160 dozen, ditto, 6277101735386680763835789423207666416102355444464034512896000*s.*; for 12052035331942427066564715692558719518916522453370946264760320 dozen, ditto, 12554203470773361527671578846415332832204710888928069025792000*s.*; for 24104070663884854133129431385117439037833044906741892529520640 dozen, ditto, 25108406941546723055343157692830665664409421777856138051584000*s.*; for 48208141327769708266258862770234878075666089813483785059041280 dozen, ditto, 50216813883093446110686315385661331328818843555712276103168000*s.*; for 96416282655539416532517725540469756151332179626967570118082560 dozen, ditto, 100433627766186892221372630771322662657637687111424552206336000*s.*; for 192832565311078833065035451080939512302664359253935140236165120 dozen, ditto, 200867255532373784442745261542645325315275374222849104412672000*s.*; for 385665130622157666130070902161879024605328718507870280472330240 dozen, ditto, 401734511064747568885490523085290650630550748445698208825344000*s.*; for 771330261244315332260141804323758049210657437015740560944660480 dozen, ditto, 803469022129495137770981046170581301261101496891396417650688000*s.*; for 1542660522488630664520283608647516098421314874031481121889320960 dozen, ditto, 1606938044258990275541962092341162602522202993782792835301376000*s.*; for 3085321044977261329040567217295032196842629748062962243778641920 dozen, ditto, 3213876088517980551083924184682325205044405987565585670602752000*s.*; for 6170642089954522658081134434590064393685259496125924487557283840 dozen, ditto, 6427752177035961102167848369364650410088811975131171341205504000*s.*; for 12341284179909045316162268869180128787370518992251848975114567680 dozen, ditto, 12855504354071922204335696738729300820177623950262342682411008000*s.*; for 24682568359818090632324537738360257574741037984503697950229135360 dozen, ditto, 25711008708143844408671393477458601640355247900524685364822016000*s.*; for 49365136719636181264649075476720515149482075969007395900458270720 dozen, ditto, 51422017416287688817342786954917203280710495801049370729644032000*s.*; for 98730273439272362529298150953441030298964151938014791800916541440 dozen, ditto, 102844034832575377634685573909834406561420991602098741459288064000*s.*; for 197460546878544725058596301906882060597928303876029583601833082880 dozen, ditto, 205688069665150755269371147819668813122841983204197482918576128000*s.*; for 394921093757089450117192603813764121195856607752059167203666165760 dozen, ditto, 411376139330301510538742295639337626245683966408394965837152256000*s.*; for 789842187514178900234385207627528242391713215504118334407332331520 dozen, ditto, 822752278660603021077484591278675252491367932816789931674304512000*s.*; for 1579684375028357800468770415255056484783426431008236668814664663040 dozen, ditto, 1645504557321206042154969182557350504982735865633579863348609024000*s.*; for 3159368750056715600937540830510112969566852862016473337629329326080 dozen, ditto, 3291009114642412084309938365114701009965471731267159726697218048000*s.*; for 6318737500113431201875081661020225939133705724032946675258658652160 dozen, ditto, 6582018229284824168619876730229402019930943462534319453394436096000*s.*; for 12637475000226862403750163322040451878267411448065893350517317304320 dozen, ditto, 13164036458569648337239753460458804039861886925068638906788872192000*s.*; for 25274950000453724807500326644080903756534822896131786701034634608640 dozen, ditto, 26328072917139296674479506920917608079723773850137277813577744384000*s.*; for 50549900000907449615000653288161807513069645792263573402069269217280 dozen, ditto, 52656145834278593348959013841835216159447547700274555627155488768000*s.*; for 101099800001814899230001306576323615026139291584527146804138538434560 dozen, ditto, 105312291668557186697918027683670432318895095400549111254310977536000*s.*; for 202199600003629798460002613152647230052278583169054293608277076869120 dozen, ditto, 210624583337114373395836055367340864637790190801098222508621955072000*s.*; for 404399200007259596920005226305294460104557166338108587216554153738240 dozen, ditto, 421249166674228746791672110734681729275580381602196445017243910144000*s.*; for 808798400014519193840010452610588920209114332676217174433108307476480 dozen, ditto, 842498333348457493583344221469363458551160763204392890034487820288000*s.*; for 1617596800029038387680020905221177840418228665352434348866216614952960 dozen, ditto, 1684996666696914987166688442938726917102321526408785780068975640576000*s.*; for 3235193600058076775360041810442355680836457330704868697732433229905920 dozen, ditto, 3369993333393829974333376885877453834204643052817571560137951281152000*s.*; for 6470387200116153550720083620884711361672914661409737395464866459811840 dozen, ditto, 6739986666787659948666753771754907668409286105635143120275902562304000*s.*; for 12940774400232307101440167241769422723345829322819474790929732919623680 dozen, ditto, 13479973333575319897333507543509815336818572211270286240551805124608000*s.*; for 25881548800464614202880334483538845446691658645638949581859465839247360 dozen, ditto, 26959946667150639794667015087019630673637144422540572481103610249216000*s.*; for 51763097600929228405760668967077690893383317291277899163718931678494720 dozen, ditto, 53919893334301279589334030174039261347274288845081144962207220498432000*s.*; for 103526195201858456811521337934155381786766634582555798327437863356989440 dozen, ditto, 107839786668602559178668060348078522694548577690162289924414440996864000*s.*; for 207052390403716913623042675868310763573533269165111596654875726713978880 dozen, ditto, 215679573337205118357336120696157045389097155380324579848828881993728000*s.*; for 414104780807433827246085351736621527147066538330223193309751453427957760 dozen, ditto, 431359146674410236714672241392314090778194310760649159697657763987456000*s.*; for 828209561614867654492170703473243054294133076660446386619502906855915520 dozen, ditto, 862718293348820473429344482784628181556388621521298319395315527974912000*s.*; for 1656419123229735308984341406946486108588266153320892773239005813711831040 dozen, ditto, 1725436586697640946858688965569256363112777243042596638790631055949824000*s.*; for 3312838246459470617968682813892972217176532306641785546478011627423662080 dozen, ditto, 3450873173395281893717377931138512726225554486085193277581262111899648000*s.*; for 6625676492918941235937365627785944434353064613283571092956023254847324160 dozen, ditto, 6901746346790563787434755862277025452451108972170386555162524223799296000*s.*; for 13251352985837882471874731255571888868706129226567142185912046509694648320 dozen, ditto, 13803492693581127574869511724554050904902217944340773110325048447598592000*s.*; for 26502705971675764943749462511143777737412258453134284371824093019389296640 dozen, ditto, 27606985387162255149739023449108101809804435888681546220650096895197184000*s.*; for 53005411943351529887498925022287555474824516906268568743648186038778593280 dozen, ditto, 55213970774324510299478046898216203619608871777363092441300193790394368000*s.*; for 106010823886703059774997850044575110949649033812537137487296372077557186560 dozen, ditto, 110427941548649020598956093796432407239217743554726184882600387580788736000*s.*; for 212021647773406119549995700089150221899298067625074274974592744155114373120 dozen, ditto, 220855883097298041197912187592864814478435487109452369765200775161577472000*s.*; for 424043295546812239099991400178300443798596135250148549949185488310228746240 dozen, ditto, 441711766194596082395824375185729628956870974218904739530401550323154944000*s.*; for 848086591093624478199982800356600887597192270500297099898370976620457492480 dozen, ditto, 883423532389192164791648750371459257913741948437809479060803100646309888000*s.*; for 1696173182187248956399965600713201775194384541000594199796741953240914984960 dozen, ditto, 1766847064778384329583297500742918515827483896875618958121606201292619776000*s.*; for 3392346364374497912799931201426403550388769082001188399593483906481829969920 dozen, ditto, 3533694129556768659166595001485837031654967793751237916243212402585239552000*s.*; for 6784692728748995825599862402852807100777538164002376799186967812963659939840 dozen, ditto, 7067388259113537318333190002971674063309935587502475832486424805170479104000*s.*; for 13569385457497991651199724805705614201555076328004753598373935625927319879680 dozen, ditto, 14134776518227074636666380005943348126619871175004951664972849610340958208000*s.*; for 27138770914995983302399449611411228403110152656009507196747871251854639759360 dozen, ditto, 28269553036454149273332760011886696253239742350009903329945699220681916416000*s.*; for 54277541829991966604798899222822456806220305312019014393495742503709279518720 dozen, ditto, 56539106072908298546665520023773392506479484700019806659891398441363832832000*s.*; for 108555083659983933209597798445644913612440610624038028786991485007418559037440 dozen, ditto, 113078212145816597093331040047546785012958969400039613319782796882727665664000*s.*; for 217110167319967866419195596891289827224881221248076057573982970014837118074880 dozen, ditto, 226156424291633194186662080095093570025917938800079226639565593765455331328000*s.*; for 434220334639935732838391193782579654449762442496152115147965940029674236149760 dozen, ditto, 452312848583266388373324160190187140051835877600158453279131187530910662656000*s.*; for 868440669279871465676782387565159308899524884992304230295931880059348472299520 dozen, ditto, 904625697166532776746648320380374280103671755200316906558262375061821325312000*s.*; for 1736881338559742931353564775130318617799049769984608460591863760118696944599040 dozen, ditto, 1809251394333065553493296640760748560207343510400633813116524750123642650624000*s.*; for 3473762677119485862707129550260637235598099539969216921183727520237393889198080 dozen, ditto, 3618502788666131106986593281521497120414687020801267626233049500247285301248000*s.*; for 6947525354238971725414259100521274471196199079938433842367455040474787778396160 dozen, ditto, 7237005577332262213973186563042994240829374041602535252466099000494570602496000*s.*; for 13895050708477943450828518201042548942392398159876867684734910080949575556792320 dozen, ditto, 14474011154664524427946373126085988481658748083205070504932198000989141204992000*s.*; for 27790101416955886901657036402085097884784796319753735369469820161899151113584640 dozen, ditto, 28948022309329048855892746252171976963317496166410141009864396001978282409984000*s.*; for 55580202833911773803314072804170195769569592639507470738939640323798302227169280 dozen, ditto, 57896044618658097711785492504343953926634992332820282019728792003956564819968000*s.*; for 111160405667823547606628145608340391539139185279014941477879280647596604454338560 dozen, ditto, 115792089237316195423570985008687907853269984665640564039457584007913129639936000*s.*; for 222320811335647095213256291216680783078278370558029882955758561295193208908677120 dozen, ditto, 231584178474632390847141970017375815706539969331281128078915168015826259279872000*s.*; for 444641622671294190426512582433361566156556741116059765911517122590386417817354240 dozen, ditto, 463168356949264781694283940034751631413079938662562256157830336031652518559744000*s.*; for 889283245342588380853025164866723132313113482232119531823034245180772835634708480 dozen, ditto, 926336713898529563388567880069503262826159877325124512315660672063305037119488000*s.*; for 1778566490685176761706050329733446264626226964464239063646068490361545671269416960 dozen, ditto, 1852673427797059126777135760139006525652319754650249024631321344126610074238976000*s.*; for 3557132981370353523412100659466892529252453928928478127292136980723091342538833920 dozen, ditto, 3705346855594118253554271520278013051304639509300498049262642688253220148477952000*s.*; for 7114265962740707046824201318933785058504907857856956254584273961446182685077667840 dozen, ditto, 7410693711188236507108543040556026102609279018600996098525285376506440296955904000*s.*; for 14228531925481414093648402637867570117009815715713912509168547922892365370155335680 dozen, ditto, 14821387422376473014217086081112052205218558037201992197050570753012880593911808000*s.*; for 28457063850962828187296805275735140234019631431427825018337095845784730740310671360 dozen, ditto, 29642774844752946028434172162224104410437116074403984394101141506025761187823616000*s.*; for 56914127701925656374593610551470280468039262862855650036674191691569461480621342720 dozen, ditto, 59285549689505892056868344324448208820874232148807968788202283012051522375647232000*s.*; for 113828255403851312749187221102940560936078525725711300073348383383138922961242685440 dozen, ditto, 118571099379011784113736688648896417641748464297615937576404566024103044751294464000*s.*; for 227656510807702625498374442205881121872157051451422600146696766766277845922485370880 dozen, ditto, 237142198758023568227473377297792835283496928595231875152809132048206089502588928000*s.*; for 455313021615405250996748884411762243744314102902845200293393533532555691844970741760 dozen, ditto, 474284397516047136454946754595585670566993857190463750305618264096412179005177856000*s.*; for 910626043230810501993497768823524487488628205805690400586787067065111383689941483520 dozen, ditto, 948568795032094272909893509191171341133987714380927500611236528192824358010355712000*s.*; for 1821252086461621003986995537647048974977256411611380801173574134130222767379882967040 dozen, ditto, 1897137590064188545819787018382342682267975428761855001222473056385648716020711424000*s.*; for 3642504172923242007973991075294097949954512823222761602347148268260445534759765934080 dozen, ditto, 3794275180128377091639574036764685364535950857523710002444946112771297432041422848000*s.*; for 7285008345846484015947982150588195899909025646445523204694296536520891069519531868160 dozen, ditto, 7588550360256754183279148073529370729071901715047420004889892225542594864082845696000*s.*; for 14570016691692968031895964301176391799818051292891046409388593073041782139039063736320 dozen, ditto, 15177100720513508366558296147058741458143803430094840009779784451085189728165691392000*s.*; for 29140033383385936063791928602352783599636102585782092818777186146083564278078127472640 dozen, ditto, 30354201441027016733116592294117482916287606860189680019559568902170379456331382784000*s.*; for 58280066766771872127583857204705567199272205171564185637554372292167128556156254945280 dozen, ditto, 60708402882054033466233184588234965832575213720379360039119137804340758912662765568000*s.*; for 116560133533543744255167714409411134398544410343128371275108744584334257

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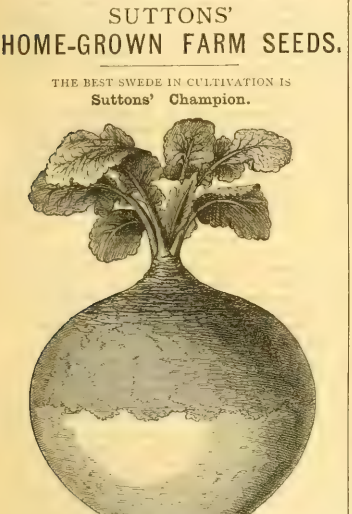

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IMPORTANT SALE of about 40,000 BEDDING PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, Plashet Park Nursery, Green Street, near Stratford, E., on MONDAY, May 9, at 11 for 12 o'Clock precisely, by order of Mr. John Frost, about 40,000 Choice BEDDING PLANTS, remarkably well grown, including 18,000 GERANIUMS of the leading varieties, 10,000 CALCEOLARIA AUREA, 1000 HELIOTROPES, 1000 GOLDEN FEATHER, 7000 FUCHSIAS, Double PETUNIAS, 5000 LOBELIA SPECIOSA from cuttings, 500 DAHLIAS, quantities of COLEUS, PELARGONIUMS, &c.
On view three days prior to the Sale. Catalogues had on the premises and of the Auctioneers, as above.

Hammersmith, W.

IMPORTANT SALE of about 25,000 BEDDING PLANTS, &c.

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On view two days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Surrey—Holmbury, near Gomshall and Ockley.

IMPORTANT UNRESERVED SALE of CHOICE STOVE and GREENHOUSE PLANTS, ORCHIDS, PALMS, EXOTIC FERNS, BEDDING PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions to SELL by AUCTION, without reserve, on the Premises, Holmbury, near Gomshall and Ockley, on THURSDAY and FRIDAY, May 12 and 13, at 11 for 12 o'Clock precisely (the Property being Sold and immediate possession required), the whole of the Valuable STOVE PLANTS, including many handsome and effective specimens, comprising Musa Cavendishii, Allamandas, Ficus, Marantas, Dracænas, Coleus, Crotons, Stephanotis, &c.; a choice collection of ORCHIDS, consisting of Cattleyas, Lælias, Vandas, Aerides, Cypripediums, Dendrobiums, &c.; TREE and EXOTIC FERNS, SABAL ADANSONI and other PALMS; Double Variegated Succinea PINES, Specimens of the GREENHOUSE PLANTS, comprising a large quantity of Indian Azaleas, many of which are fine examples, 3 to 5 feet; a large assortment of Double Camellias, 3 to 5 feet; Thriving Ferns by name, and Agaves; Also about 3000 BEDDING PLANTS, FRUIT TREES, and HARDY SHRUBS, in pots, together with several 2 and 3 light BOXES, MOWING MACHINE, GARDEN ROLLER, and numerous effects.
May be viewed three days prior to the Sale. Catalogues may be had of Mr. BAYMAN, Head Gardener, on the premises, and of the Auctioneers and Valuers.
N.B. Conveyances will meet the Trains arriving at Gomshall at 11.4 and 11.17, and at Ockley at 10.52. Refreshments will be provided on the Premises.

Edmonton.

IMPORTANT CLEARANCE SALE of 80,000 BEDDING and GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, Langhedge Nursery, Edmonton, within 10 minutes' walk of Park Station, on the Great Eastern Railway, on MONDAY, May 16, at 12 o'Clock precisely, by order of Messrs. C. Woolven & Son, the land being immediately required by the Great Eastern Railway Company, about 80,000 BEDDING PLANTS, comprising 6000 GERANIUMS, including Mrs. Pollock, Sophia Dumaresque, and other Tricolor and Zonal Varieties; Vesuvius, Tom Thumb, Tipper, Madame Vaucher, and 500 Double Varieties and others; also 1200 FUCHSIAS, coming into bloom; 2000 VERBENAS, 1500 Intermediate STOCKS, and about 60,000 other BEDDING PLANTS.
May be viewed three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Shepherd's Bush, W.

IMPORTANT UNRESERVED SALE of BEDDING PLANTS.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. T. Hawkins to SELL by AUCTION, without reserve, on the Premises, Oaklands Nursery, Shepherd's Bush, W., on THURSDAY, May 19, at 11 for 12 o'Clock precisely, about 13,000 TRICOLOR, BRONZE, and other choice GERANIUMS, thousands of thriving BEDDING PLANTS, comprising 2000 Calceolaria aurea, 1000 Heliotropes, 1000 Lobelias, Iresine Lindeni, Pelargoniums, Fuchsias, Coleus, Centaureas, &c.
May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers, as above.

Richmond, S.

IMPORTANT SALE of about 20,000 CHOICE BEDDING PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, The Nursery, Kew Road, Richmond, Surrey, on TUESDAY, May 17, at 11 for 12 o'Clock precisely, by order of Messrs. G. and W. Steel, who are leaving, about 20,000 well-grown BEDDING PLANTS, comprising about 2000 Verbenas, 500 Heliotropes, 600 Fuchsias, in 48 and 60 pots, 1000 Geraniums, of the leading kinds; also Seed Calceolarias, in 48 and 60 pots; Quantities of Cuttings, consisting of Verbenas, Heliotropes, Lobelias, Petunias, Perilla, Tropæolum, 2000 Golden Feather, 2000 Lobelias, &c. Also, some hundreds GREENHOUSE PLANTS in flower, viz., Pelargoniums, Fuchsias, Hydrangeas, Calceolarias, Scarlet Trees, Geraniums, &c.
May be viewed the days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers, Leytonstone, E.

Exhibition Plants of Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY and WEDNESDAY, May 10 and 11, at half-past 12 o'Clock precisely each day, the splendid Exhibition Specimen Plants of ESTABLISHED ORCHIDS, the property of W. Marshall, Esq., of Enfield (who is giving up exhibiting and reducing his collection). These plants are well known as having taken numerous Prizes at all the principal Shows, and are in first-rate condition, including fine plants of the following:—

Odontoglossum luteo-purpureum, 7 leads		Cypripedium villosum, 30 flowers	
„ Phalænopsis, 20 leads		„ Schlimii, 9 spikes	
Sobralia macrantha, Woolley's variety		„ caudatum roseum, 8 spikes	
Cattleya Schilleriana Regnelli		Cœlogyne cristata	
„ Trianæ Juno	1st class	Eriopsis rutibullon	
„ Atalanta	Certificate	Lælia elegans schilleriana, 30 bulbs	
„ Penelope	J. R. H. S.	„ „ Johnsa	
Dendrobium chrysotoxum, 21 spikes		„ „ Wolstenholmiæ, 6 leads	
„ Schroderi, 5 leads		Vanda gigantea, 15 pairs of leaves	
		Cypripedium Parishii	
		Phalænopsis Schilleriana	
		Lælia grandis, &c., &c.	

And many other rare and desirable varieties.
On view the morning of Sale, and Catalogues had

Buckinghamshire—Vale of Aylesbury.

To Nurserymen, Market Gardeners, and others desiring investments in a first-class Market Gardening Country, within the short distance of three miles of the large and important County and Market Town of Aylesbury, and having speedy communication with London by means of the London and North-Western and the Great Western Railways

MESSRS. GADSDEN AND SON are instructed to offer for SALE by public AUCTION, at the George Hotel, Aylesbury, on WEDNESDAY, May 18, at 4 o'Clock P.M., in 26 Lots, an important FREEHOLD and TITHE-FREE ESTATE, known as "Stone Farm," situate in the parishes of Stone and Waddesdon, comprising the Stone Farmhouse, and large and commodious Yards, Farm Buildings, and Homestead, situate in the village of Stone, 3 miles from the Market and County Town of Aylesbury, the well-known PLANTATION, called "Stone Hill Plantation," a valuable tract of GRAZING LANDS, in the Eythrop Valley; and sundry MARKET GARDEN and Accommodation Lands, in and adjoining the village of Stone, and containing altogether about 328a. 2r. 22p., lately in the occupations of Mr. Walter Crook, Messrs. Kirby & Search, and partly in hand.

	A.	R.	P.
Lot 1.—Lands in the Eythrop Valley and adjoining	157	3	14
Lot 2.—The Stone Farm House, Farm Buildings, Homestead, and Lands adjoining	88	3	38
Lot 3.—Sink Close and Market Garden adjoining. This Lot has an aspect and soil scarcely to be excelled for Garden Cultivation	11	3	7
Lots 4 to 15 inclusive.—Butts Furlong, divided into Lots, varying in extent from 2a. 2r. 0p. to 12a. 0r. 3p., suitable for Market Garden Cultivation	25	2	16
Lot 16.—Nursery Wood or Stone Hill Plantation	25	1	12
Lot 17.—The Downs and Unenclosed Land	21	0	11
Lots 18 to 20 inclusive.—Townsend Piece, now in cultivation as Market Garden Land, divided into Lots varying in extent from 0a. 2r. 13p., to 2a. 0r. 12p. ..	7	3	24
Total	328	2	22

Detailed particulars, with Plan may be had of Messrs. BERKELEY AND CALCOTT, 52, Lincoln's Inn Fields, London, W.C.; or of J. J. BUSH, Esq., Land Agent, Hilperton Grange, near Trowbridge, Wiltshire; and of the Auctioneers, Aylesbury; or by post on application.

Unreserved Sale of Mr. Bates' entire Herd of Shorthorns at Hitchin.

MR. JOHN THORNTON will SELL by AUCTION, at Hitchin, Great Northern Railway, on TUESDAY afternoon, May 10, at 3 o'Clock, the entire Herd, between THIRTY and FORTY HEAD, of PURE-BRED SHORTHORNS, belonging to Mr. Thos. Bates, of Eaton Green, Luton. This Stock has been bred for several years from the noted herds of Sir C. R. Philips, Mr. Lawfield, of Southcott, and Mr. Howard, and crossed with Sir Chas. Knightley's blood. Whitebait 121,094, bred at Fawsley, has of late been used, and John Barleycorn 124,256, is now in service. The animals are in nice healthy condition, and good milkers.
Catalogues with Pedigrees may be had of Mr. JOHN THORNTON, 15, Langham Place, London, W.

Important Sale of an Old-Established Flock of Pure-Bred Southdown Sheep.

MR. JOHN JONAS has been instructed by the Executors of the late Countess De la Warr, to SELL by UNRESERVED AUCTION, on FRIDAY, May 20, at the Hall Farm, Knole, the FLOCK of PURE-BRED SOUTHDOWNS, bred at Knole Park, Sevenoaks, Kent, and selected about 30 years ago from Ewes of the late Mr. Elliman, it has since been kept up with some of the best blood from the Sussex Downs, and Rams from Messrs. Journeay, Mills, Harrington, and Emery's flocks have been used, the object being to rear a good hardy useful sheep with a large frame and fine close wool.
The flock numbers about 900 head, full particulars of which are given in the Catalogues, to be had of JOHN THORNTON, 15, Langham Place, London, W.; or of Mr. JONES, Knole Hall, Sevenoaks, Kent.

Holly Bank, Burton-on-Trent.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, May 31, at Holly Bank, Burton-on-Trent, the entire and very CHOICE HERD of SHORTHORNS belonging to Willoughby Wood, Esq., which are chiefly descended from the famed Kirklevington blood. Amongst them will be found the celebrated cow Oxford's Aida, the dam of the 1st prize Bull at the Birmingham Show, and other very superior animals.
Catalogues, with Pedigrees, may be had on application to Mr. STRAFFORD, 13, Euston Square, London; or of Mr. WOOD, at Holly Bank, near Burton-on-Trent.

Biddenham Annual Sale.

MR. CHARLES HOWARD begs to announce that he has fixed FRIDAY, July 29 next, for his SALE of OXFORDSHIRE DOWN RAMS. Further particulars will appear in future Papers.

The Agricultural Gazette.

SATURDAY, MAY 7, 1870.

THERE is, we believe, absolute unanimity on the policy of spring hoeing. It is everywhere the practice of good farmers to kill weeds in their youth; and good farming everywhere includes the practice of hoeing corn crops in April and May. Travelling to and fro in England, Scotland, and Wales, we have during the past six weeks traversed by road or rail more

than 30 counties, and North and South, East and West, we have everywhere seen the hoers among Wheat and Peas and Beans. Tillage operations of all kinds are indeed the very test and touchstone of the difference between the energetic and slothful—the foolish and the wise in agriculture. The man who, by skilful and timely manipulation of the soil, makes Nature work for him, is the wise man; and he who thinks to cultivate and nourish crops by direct manuring only—disregarding natural supplies, and insisting upon results in spite of natural conditions, is the fool. He may enforce tilth by mere mechanism and brute force—he may enforce fertility by the direct addition of artificial fertilisers to the soil, but in neither case, and nothwithstanding his expenditure, is he so successful as his neighbour who, with hardly any cost, makes Nature provide him with both a mouldered seed-bed and a soil enriched and fertilised for the nourishment of his plants.

Notwithstanding, however, the undoubted superiority of the well-tilled soil, it is not certain that deep and thorough tillage during the growth of all kinds of crops on all kinds of soils is beneficial, and the Cirencester Chamber of Agriculture did well accordingly last year to direct a number of tillage experiments, for the purpose of determining the truth upon this subject on the shallow Cotswold soils of Gloucestershire.

Their experiments on the Wheat crop were intended to show, (1) how far a free admission of air and light would influence the growth of the plant; (2) how far interculture was beneficial or the reverse; (3) the effect of thin seeding.

In each set of experiments there were two plots, in which alternately two rows were removed and two rows were left—two plots, in which alternately two rows were obliterated and two rows left, the interspace being forked and sown with Carrots, Potatos, or some other crop—and two plots, in which two rows were alternately removed and left, the interspace being forked twice during the summer.

Lord BATHURST'S results were obtained upon a free working soil previously under Clover, the land being in good condition. The Wheat was sown in October and the surplus drills removed early in the season. The forking was done on April 9 and June 7, and the remaining plots were hoed so as to keep down weeds. The growing crop looked well through the summer, a marked difference being perceptible between the various plots. The wide drilled portions assumed a dark green colour and vigorous appearance, and the heads were larger than those of the surrounding Wheat. They were considered up till harvest time to be carrying a heavier and more bulky crop than the ordinary untouched Wheat. The straw, however, was not so clean and bright, being affected with mildew, and the result showed that, although more straw had been grown per acre, there was slightly less grain.

The Royal Agricultural College results were on land in poor condition. The surplus rows were removed as soon as the Wheat appeared, and the spaces were forked where required during March 10—13, and again in June. As might have been expected, the Wheat did not yield largely; the average of three unmanured and untouched plots being only 25 bushels per acre. The plots in which two rows had been alternately removed and left without any interculture except hoeing, gave respectively 60 and 80 lb. less corn per acre than the unmanured and untouched plots; while two plots similarly treated, but with the addition of forking between the rows, showed a diminished yield of 175 and 165 lb. compared with ordinary Wheat. The poverty of the land, owing to Barley having occupied it the previous year, may account for thin-seeding and wide drilling not being very successful.

Mr. SMITH'S (of Bibury) results were so satisfactory to himself that he has sown a larger area of Wheat upon the same principle this season. The land upon which these trials were conducted is of very good quality. It is a free, quick, Barley soil, of dark colour and in good condition. In one case, where alternately two rows were omitted and two left, the interspaces being firmly pressed, there was an increase of 8½ bushels of grain and 880 lb. of straw; in a second plot, where the interspaces were planted with Potatos, there was an increase of 440 lb. of corn (above 7 bushels) and 760 lb. of straw; in a third instance an increase of 320 lb. or upwards of 5 bushels of grain; and lastly, where the spaces were twice forked, there was an increase of 260 lb., or more than 4 bushels of corn. Such results teach us the importance of each farmer trying experiments for himself on his own land rather than pinning his faith to results elsewhere.

Mr. W. J. EDMONDS' results are not favourable to wide drilling and interculture between the rows, little more than half the yield being obtained in the case of the wide-spaced plots. These experiments were conducted upon good strong land in a sheltered situation. The untouched plots were also much better than the plots which were simply pressed with the foot, an operation which could not have done harm unless performed in improper weather.

Such are the results of wide drilling and interculture. In one case a remarkable increase of Wheat and straw was observed in connection with a saving of 1 bushel of seed per acre. A second case gave an increased amount of straw per acre, and was thought up to harvest to promise a greater yield of corn. Strict weighing, however, revealed a deficiency, probably owing to the presence of mildew. Another series gave a slightly diminished yield, accounted for by the poverty of the soil, this being the second white crop; and, fourthly, we have Mr. EDMONDS' experiments, giving a most unequivocal answer in favour of continuing in the "old paths."

On the whole it must be admitted that, as regards the Wheat crop, deep interculture was not beneficial on the Cotswold soils—a fact, however, which will not stop a single hoer among the growing Wheat either on the Cotswolds or elsewhere.

THE paper on "ENGLISH TENANT RIGHT," which is given in another page, was received by the Farmers' Club last Monday evening with much applause. Mr. CORBET is familiar with the subject in all its local variety of details, and did well to select the Lincolnshire system as a practical illustration of the question.

Mr. THOMAS commenced the discussion by declaring that the large amount of capital farmers now require to invest in successful farming demands more protection than it often receives. There are no doubt many good landlords, and on their estates tenants' capital is safe, but it cannot be denied that there are many exceptions, and for these such a protection of tenant-right as was advocated by Mr. CORBET is requisite.

Mr. SMYTHIES did not approve of Mr. CORBET'S criticisms on Mr. CAIRD—they were, in his opinion, more personal than practical. The paper did not define tenant-rights, it left them as vague as ever. He objected to the rules of the Lincolnshire system, as not being applicable to other counties, and he thought that if an Act of Parliament did not enforce definite repayments, landlords and tenants, who very generally understood each other in friendly terms, should be let alone.

Mr. WILLIAMS took an opposite view of the Lincolnshire system from the last speaker. It was, in his opinion, the best which Mr. CORBET could have taken as the basis of a fair settlement of the question. The details of the subject were intricate only because landlords were prejudiced against the principle, and would not entertain it. He thought two years' notice to quit would often, practically speaking, be a fair acknowledgment of tenant-right.

Mr. HAMILTON, as a landowner, approved of the Lincolnshire system of tenant-right. He had adopted it on his small estate, and found it answer fully as well as in Lincolnshire. He thought the principle generally applicable, whether the tenant held from year to year, or for a term of years.

Mr. LEEDS took exception to some of the remarks of the last speaker, and expressed himself in favour of a greater security to tenants' capital than the present Law of Landlord and Tenant provides. And tenants' capital is not all that requires statutory protection; for when a tenant received six months' notice to quit, without any grounds for removal, he had to look out for another farm, and before he got one his loss was often very considerable.

Mr. MECHI agreed with Mr. CORBET that the right of the outgoing tenant to unexhausted improvements should be legalised, quoting examples from his own county (Essex) of £5, and even £10, per acre invested, in proof of its necessity. He differed, however, from him on one point, for he thought a lease for a term of years must become the rule, as it enabled the tenant to invest capital more advantageously and safely than under yearly tenancy. In support of this he referred to the greater security under leases and improvements made in Scotland. He next referred to the Surrey and Sussex systems, and concluded by contrasting Lincolnshire with "the lamentable want of improvement in other counties."

Mr. HARPER approved of the Lincolnshire system, as it kept the land in a higher and more uniform state of fertility than the 19-year leases of Scotland. Tenant-right simply carried out the golden rule, "Do as you would be done by."

Mr. EDMUNDS drew attention to the increasing investment of tenants' capital in improved agriculture. He did not think sufficient security could be provided under yearly tenancy, which was anything but "business-like" as between landlord and tenant. Besides payment for unexhausted improvements, a lease of considerable duration was equally necessary, with at least two years' notice to quit, so as to enable outgoing tenants to enter upon other farms without sacrifice of time and capital.

Mr. MASFEN noticed the growing competition for farms, which was increased by wealthy townspeople farming often as much for amusement as profit. He thought tenant-right should be considered more in the light of a national question than it is. As the incoming tenant pays the outgoing tenant, landlords had not to put their hands in their pockets, and therefore had nothing to fear. On the contrary, tenant-right would secure for them a better and much more intelligent class of tenants.

The Chairman, Mr. J. HOWARD, M.P., complimented Mr. CORBET by saying his paper would meet with as favourable a reception from English farmers as did his Prize Essay on the subject. After pointing out the difference between the law of landlord and tenant in England and Ireland, he expressed the opinion that "an English Land Bill" would follow that of the sister country.

—— WHEAT is still rising in price, having gained one or two shillings last Monday at Mark Lane, on the advance of the previous week.——The Cattle Market on Monday was well supplied, but the previous Thursday's advance of prices was well maintained; on Thursday there was an over-supply, a dull trade, and considerable fall of price.

—— No business of great importance was transacted at last Tuesday's meeting of the Central Chamber of Agriculture. The report of the Local Taxation Committee was read by Sir MASSEY LOPES, and received by the meeting. Resolutions were passed by a majority of the Council, repeating its protest against the exemption of personal property from local rates, and challenging investigation into the truth of the assertion that real property is compensated by bearing a much smaller share of imperial burdens than personalty; asserting that the order in which the Government have indicated their intention of considering the subject of local taxation is irregular and inexpedient, and that readjustment must be preceded by a thorough inquiry into what objects are local and what national; and protesting that measures to widen the limits of the rateable area of local taxation by including woods, mines, and Government property, or to charge some portion of the rates on the owner, are not to be accepted as a settlement of the grievance to which both land and house property are now subjected. It was resolved that a copy of these resolutions should be submitted to the Government. A petition to the House of Commons, praying that the duty on game certificates may be retained, and that the contemplated exemption in favour of guns kept within a house be extended to those used upon the land and premises in the occupation of the owners of such firearms, was adopted. Another petition for the retention of hawkers' licences, as offering a safeguard against the indefinite multiplication of vagrants, was also agreed to.

—— At a recent meeting of the Scottish Chamber of Agriculture, very largely and influentially attended, the Government Bill on the subject of the Game Laws was unanimously condemned. The President, Mr. WILSON, of Edington Mains, unable to be present, wrote, saying:—

"I would not like to allow myself to think or say that this Bill of the LORD ADVOCATE'S has been drawn with the view of treating the complaints of the farmers of Scotland with mockery; but I do say that it seems to me to make it evident that he has utterly failed to appreciate the reality and greatness of the grievance which gives rise to these complaints. Bad as matters at present are with respect to game, I would very much rather see things remain as they are than see this Bill become law. It will do nothing towards reducing the number of hares and rabbits (the real cause of all the mischief), and the unhappy tenant who shall seek redress in the way which it proposes will simply add law pleas and open feud with his landlord to his game grievance. I trust that the Chamber will be unanimous in petitioning for its total rejection, and also that it will fall back on the ground which it first took up, by asking to have hares and rabbits removed from the game list. As long as we held to that our position was strong and hopeful, and the sooner we resume it the better."

Mr. THOMAS NICOLL, of Littleton, Kerriemuir, who was also unable to attend, wrote:—

"The Whigs at last election dangled the hare-and-

rabbit question before our eyes, and under promise of a fair, reasonable, and equitable settlement brought about the almost total extinction of the Tory party in Scotland. We have been lamentably and treacherously deceived; but the day of reckoning will come, and this sham measure of theirs, were an election now to take place, would, I believe, be the foundation, so far as the agricultural constituencies are concerned, of a decided Conservative reaction.

"Failing help from the Tories, might we not hope that the Scotch landlords—our natural allies after all—would step forward and aid us in this emergency, in this deadlock, and proclaim that their eyes are now open to the fact that the preservation of ground game is incompatible with modern agriculture, and that for the future they would place it at the command of the tenantry? Had I been able to be present at your meeting, I should have availed myself of the opportunity of pleading, as a member of the Chamber of Agriculture, with the landlords of Scotland to do so."

Mr. A. E. MACKNIGHT (Advocate) moved:—

"1. That the over-preservation of game is absolutely inconsistent with modern high farming.

"2. That were hares and rabbits struck out of the game list, and Parliament to enact that all contracts preserving these animals are illegal, great benefit would arise to the agriculture of the nation.

"3. That the law of England gives no practical benefit to English farming, and would give as little to Scotland; and hence the Bill of the Lord Advocate assimilating the Game Laws of England and Scotland does not ameliorate the existing grievances under which admittedly Scotch agriculture labours, but, on the contrary, would lead to litigation and disputes, and embitter the relations between landlord and tenant, and would result in a state of matters worse than the present, and therefore that the Chamber should petition against the Bill of the Lord Advocate.

"4. That the other game Bills, in so far as inconsistent with these resolutions, be also petitioned against."

Mr. SCOT SKIRVING proposed the resolution of the Aberdeen Chamber:—

"*First*, That any attempt to redress the grievance suffered by game based on compensation for damages to crops cannot be satisfactory either to the public or to farmers, (1) because compensation for the direct damage (even if it could be satisfactorily ascertained) would not indemnify the farmer for the indirect loss arising from injury to his system of cultivation; (2) because claims for compensation would form a common source of dispute, irritation, and discontent between landlord and tenant; and (3) because crops being still liable to damage by game, this insecurity would continue to deter farmers from investing in the soil the capital they otherwise would in the endeavour to increase the production of food. *Second*, That the Game Bill introduced by the LORD ADVOCATE, proposing redress by increasing the facilities for obtaining compensation, is, therefore, unsatisfactory. *Third*, That any measure promising a settlement of the game question must at least confer on the tenant the inalienable right, either by himself or others having his authority, to kill hares and rabbits on the land occupied by him."

Mr. MACKNIGHT's motion was carried by a majority of two. At a previous discussion before the Haddington Farmers' Club on the LORD ADVOCATE's Bill, which assimilates the Scottish to the English practice Mr. SCOT SKIRVING had said:—

"When he first saw that Bill, he became more and more convinced that he was reading a hoax. The public were hoaxed by one of the most ridiculous Bills that ever was framed—a Bill to assimilate the laws of Scotland to those of England, and place the tenant in as auspicious circumstances as he could be in making a bargain with his landlord. It appeared to him very much as if the LORD ADVOCATE said something like this: 'Here is a Bill for you, and if you do not like the Bill you may go to—he would not say the devil—but the law.' And what way were they to go to law?—not by arbitration to the sheriff; but it seemed as if the LORD ADVOCATE wished to show grace to the briefless barristers he had left behind him. If a large farmer suffered damages to the extent of £200 or £300, and chose to restrict it to £25, he might bring the matter before the sheriff; but if the sum was £50, he must go to the House of Parliament at Edinburgh, and then, he presumed, to the House of Lords. He believed he might say that, bad as present circumstances were, the LORD ADVOCATE'S Bill would make them worse should it come upon them, and he moved that the Club should petition against the Bill *in toto*."

NOTEWORTHY AGRICULTURISTS.

THE LATE JOHN GREY OF DILSTON.

[The following memoir is taken from Mr. H. H. Dixon's latest work, reviewed in another page. We prefer it to any words of our own. The portrait is not perfectly satisfactory to one who knew Mr. Grey in his prime. It has a melancholy tone, which once had no place in the ordinary expression of his face. Nevertheless we have the best authority for permitting it to appear as a likeness of him in his later days.]

FOR more than forty years John Grey of Dilston was a very prominent and a very honoured name in the North Country. He was born not far from Flodden Field, and both by his farming success on the Tweed and Tillside, as well as by his political energy on the hustings by the side of Mr. Lambton and Lord Howick, in "times enough to shake a man's soul," if he dared to be a Reformer, he soon took a place in the van. He was just in the prime of life at 47, when he was

MR. JOHN GREY, OF DILSTON.—Died Jan. 22, 1868, aged 82.]

made Commissioner of the Greenwich Hospital Estates, and he built his future home at Dilston, not far from the spot where the last Earl of Radcliffe lies buried with his head under his arm, and his heart embalmed at his side.

No man had enjoyed a finer training, and Earl Grey, Sir John Sinclair, and Clarkson were among those whom he could call friend. His own deep and abiding sense of religion and regard for his widowed mother moulded him early for the important part which he had to play in life. He honoured John Culley for always asking him to rise early from the Wooller market-table, and to be the companion of his homeward ride; and his first public speech was for the Bible Society in the church of that town. . . .

Whatever he did he did with all his might, and he invariably did it well. No man had a finer eye to hounds, or better hands and nerve, whether on Rose of Raby or "the flyer which stands in the stall at the top." In the heat of his Lambton canvass he worked on all day with two fractured ribs. Sir John Sinclair entrusted him to revise the proof-sheets of his Code of Agriculture; and even in his 82nd year he delivered a lecture of nearly two hours' length on poetry, at Haydon Bridge. Bone manure, draining, subsoil ploughing, and the application of animal and vegetable chemistry to agricultural objects were his theme in days when talk of such things was almost enough to stamp a man as a Jacobin and a visionary. He dared to denounce the corn laws as "the parent of scarcity, dearness, and uncertainty," when 99 out of 100 thought him a man of profane lips for saying so, and Bright and Cobden were mere boys. When he was "up" for a speech, the audience always knew that they would hear some sturdy truths; but no one was more uncompromising, and yet more full of tact. His opponents might dislike what he said, but they could not object to the language in which it was clothed. Only a week before his death he mediated in an excellent speech between landlord and tenant, when an offensively couched resolution about game had been passed at the Hexham Farmers' Club. "The Black Prince of the North," as he had been called in his hot political youth, was never in better tune for speaking than at the Newcastle Royal Dinner of '46, and an after-dinner remark of the second Duke of Cleveland's, to the effect that agricultural improvement had reached its utmost limit, drew from him an indignant denial, and a stout argument on tenancies-at-will as against leases. It was in '59 that he spoke what he called his "Peace and Plenty" speech, in which Prince Albert delighted, and his last at a public dinner was made at the Highland Society's meeting of 1867, where he attended as judge.

As an agent he practised what he preached. Strong as his political predilections were, he never interfered, directly or indirectly, with a voter. The Greenwich estates, when they came into his hand, produced £29,000 clear, and gradually rose, under the draining and other improvements which he planned and carried out, to £40,000. With the labourers he had peculiar sympathy, and "let the oppressed go free and break every yoke," was a saying that seemed ever present with him. He did not deem that even the poorest were "born just to be handled by those above them like £1 notes." It was the feeling that "John Grey is a just man" which was the secret of his power. The desire to help every one to the utmost was another great feature in him. During the cattle plague no magistrate was more active: and although he was past eighty, he would attend every sale, however small, within reach of his home, so that he might spare the buyers the trouble of coming to him to get the papers signed. His powers and his bodily strength seemed unimpaired to the last, although, as he would say, his children and grandchildren, by their affectionate thought for his comforts, whether at home or when he went to spend the Christmas at Millfield, would "try to make an old man" of him. That task would have been above their hands, with such a tough, square-jawed borderer to deal with. The lecture on poetry the year before he died, beginning as it did with Chaucer and the 107th Psalm, and dealing largely in Sir Walter Scott, the poet of "Teviot's bard and hero land," near which his lot had been cast, was given almost entirely from memory. His bodily force had abated as little as his mental, and when his son would insist, overnight, on sending his luggage down to the railway for him, the sturdy octogenarian rose an hour earlier, packed his big portmanteau, and carried it on his shoulder half a mile to the station.

In him there was hardly even that "gentle decay" which precedes death. He had a slight ailment, and to his daughter's tender eye there might be an unusual solemnity of manner when he read family prayers on his last night on earth, but still nothing to cause alarm. She exchanged a few words with him in the morning. "My wants are few, very few," were the last he spoke; and when she next saw him he was dead, seated on the stairs with "his forefinger raised, as if to enjoin silence, or as if he heard some one calling him." And so every scene in his life, from dawn to sunset, from sunset to the close, is touched, in his daughter's memoir

of him, with the same bold and yet tender hand. The last of all was on that wild Saturday before his funeral, when, as in Tennyson's Dead Earl, "the wind was howling through turret and tree," the very window-panes broken with a crash, the glass shivered about the floor, and the white sheet which had been thrown over the corpse blown rudely away. Sunday came in calm and clear, and hardly stirred a leaf of the bright, shining evergreen with which daughters' hands then wreathed his coffin. "He looked so grand when he was dead," with that union of tenderness and strength in the whole outline of his head and face which was the key to his successful manhood and his honoured old age. He has gone to his rest, but the impress of his practical knowledge and broad aims will be seen and remembered for many a long year in the "Sweet Glendale" of his earlier days, and the rich vale of the Tyne.

OUR LIVE STOCK.

MR. CHARLES HOWARD had a very successful sale of his entire herd of Shorthorns on Tuesday last. The great feature of it was the Gwynne tribe, which was probably the best branch of this family in the country. Some of them made extremely high prices. Mr. Howard had used 5TH GRAND DUKE (10,575), 2D DUKE OF THORNDALE (17,748), and GRAND DUKE OF LIGHTBURNE (26,290), all first-class Bates bulls, and the herd had been established about 12 years. A very large company assembled, and the following prices were obtained under Mr. Strafford's glass :—

Name of Animal.	When Calved.	Price	Purchaser.
		Gs.	
Cows and Heifers.			
Orphan Gwynne	1855	45	W. W. Slye.
Grace Howard	1859	31	W. Holland.
Golden Gwynne	1859	..	Withdrawn
Faustina Gwynne	1860	95	C. C. Dormer.
Fatima Gwynne	1862	85	J. P. Foster.
Lady Sophia Spencer ..	1863	52	C. Barnard.
Fanny Gwynne	1864	100	J. Hetherington.
Goody Gwynne	1864	65	C. Dormer.
The Star	1864	50	R. E. Oliver.
Day Lily	1865	31	K. Fenton.
Lady Susan Spencer ..	1864	61	C. C. Dormer.
Dunsinky 4th	1865	160	Earl of Dunmore.
Fanny Gwynne	1865	35	H. Sharpley.
Syrup	1865	61	G. C. Adkins.
Oleander Gwynne	1866	100	J. P. Foster.
Flossy Gwynne	1866	71	J. H. Blundell.
Fancy Gwynne	1867	54	H. Sharpley.
Dunsinky 5th	1866	..	Not offered.
Orange Gwynne	1867	200	R. Gibson.
Dunsinky McIntosh ..	1867	121	Earl of Dunmore.
Emma Gwynne	1867	61	Harvey.
Flora Gwynne	1867	50	G. Pain.
Lady Susan Spencer ..	1867	61	K. Fenton.
Lady Selina Spencer ..	1867	31	H. W. Martin.
Grace Darling	1867	32	Booth.
Lady Selina Spencer ..	1867	41	C. C. Dormer.
Daisy	1868	36	C. Barnard.
Florence Gwynne	1868	155	Holmersdale.
Frisky Gwynne	1868	50	G. Pain.
Lady Sousie Spencer ..	1868	61	C. Barnard.
Emma Gwynne	1868	55	K. Fenton.
Flora Gwynne	1869	50	G. Pain.
Fanny Gwynne	1869	43	J. P. Foster.
Ora Gwynne	1870	110	J. P. Foster.
Gipsy Gwynne	1870	85	Lynn
Spicy Lightburne	1870	40	J. K. Fowler.
Lavender Spencer	1869	155	D. McIntosh.
Lady Sybilla Spencer ..	1869	30	K. Fenton.
Fleecy Gwynne	1870	26	S. S. Dickers.
Flighty Gwynne	1870	45	J. P. Foster.
Bulls.			
GRAND DUKE OF LIGHTBURNE (26,290) ..	1867	90	Capt. Webb.
SPECTATOR (2,545)	1867	42	F. Wythes.
GRANVILLE GWYNNE	1868	120	G. Pain.
LORD KNIGHTLEY	1868	54	S. K. Webb.
DUKE OF SUSSEX	1868	71	W. Playne.
STANLEY SPENCER	1869	27	Booth.
SYDNEY	1870	70	S. K. Webb.
FANCY GWYNNE	1869	110	Mrs. Clark Irving.
FATHER GWYNNE	1870	47	Snowdon
SQUIRE SPENCER	1869	27	— Armstrong.
SAM SPENCER	1869	22	— Coleman
FOSTER GWYNNE	1869	32	J. H. Blundell.
GENERAL DARLING ..	1869	22	M. Brown.
OTHO GWYNNE	1869	30	Sir W. Broke.
SYDNEY	1870	..	Not offered.
SENATOR SPENCER ..	1870	21	Thorpe.

38 cows averaged ..	..	£77	13	6	= £2927 11 0
15 bulls averaged ..	..	54	13	0	= 824 5 0
53 animals averaged ..	..	£71	4	10	= £3775 16 0

—— Mr. Willoughby Wood's Shorthorns will be sold by Mr. Strafford on the 17th inst., at Holly Bank. The herd consists of 22 cows and heifers and six bulls, chiefly descended from the famed Kirklevington stock. A few remarks upon the present appearance of the Holly Bank herd, made upon the spot, will probably be acceptable to the large class of readers of Shorthorn news. No. 1, in the recently issued catalogue, is *Florence 6th*, of the Florence tribe long bred by Mr. J. Emmerson, of Eryholme, on the banks of the Tees. The original *Florence* was by CHILTON (10,054), bred by Mr. Hopper, late of Newnham Grange. Her daughter *Florence 2d* was by Mr. Maynard's RED DUKE (13,571), afterwards the property of Mr. Emmerson. This cow, put to LORD OF THE MANOR (16,437) by 5TH DUKE OF OXFORD, dam *Compe* by COTHERSTONE, produced *Florence 6th* in February, 1861. *Florence 6th* has had eight calves at single births, and must, therefore, have bred regularly since she was between two and three years old. Owing to her being a great milker, and seldom dry, she is not in high condition. *Bellona* (lot 2) is a useful cow of medium size, and a good milker ; she is by STANLEY (18,916), of Penrhyn origin, and of the highly respectable *Certainty* by SIR WALTER family. This is one of five lots contributed to the sale catalogue by Mr. Hardy, M.P., of Dunstall Hall. Lot 3 is the celebrated cow *Oxford's Ada*, a grand animal, particularly heavy in the forequarters, a peculiarity inherited by her offspring, and remarkable in a Bates bred beast according to some authorities. Her son DUKE OF LANCASTER won the 1st prize as a calf at the Staffordshire meeting, and the £50 prize as a yearling recently at Birmingham. Although suckling her calf, she is in good condition. *Oxford's Ada* is a pure Bates cow, as may be seen on inspecting her pedigree, where the name of her sire, LORD OXFORD 2D, is preceded by those of GENERAL CANROBERT (12,927), 3D DUKE OF YORK, 2D CLEVELAND LAD, &c. *Lady Adelaide*, by NORTHERN DUKE (22,431), daughter of the last-mentioned cow, possesses not only an unrivalled pedigree, but is herself a truly noble calf, much like her dam in character, and a good thriver. *Lady Walton*, by 3D EARL OF WALTON (19,673), is a grand-daughter of *Lily Bell*, by HORROX (11,591), and may be described as an elegant cow, with well-sprung ribs, noble hips, and first-rate quality. She is a regular breeder, and is in good condition. *Grenadine 2d*, by LORD WILD EYES 2D (22,234), inherits the milking powers of her grand-dam *Grenade* by TITAN, and has recently calved. No. 8, *Lady Hilda*, by LORD LIVERPOOL, is the daughter of *Lady Hudson* by 4TH DUKE OF OXFORD, now in the possession of Mr. Leney. She is undoubtedly an extraordinary heifer, uniting size, substance, and quality. She and No. 9, *Zeal 11th*, won the 2d prize as yearlings at the Staffordshire Show last year. Both of these heifers are worthy the attention of first-rate breeders. *Lady Walton 2d* by EARL OF GLO'STER (21,644) inherits a pure Bates pedigree, being out of *Lady Walton* (lot 5). She is a grand-daughter of 4TH DUKE OF THORNDALE, and promises to do credit to her pedigree. Next follows *Ginevra*, by GENEVA'S DUKE, sire of the Staffordshire and Birmingham prize heifers, a neat yearling of pleasing colour. *Fidelity 7th* is well bred on both sides, but low in condition, as it was also *Iris 3d* and some others, owing to the fact that the sale was not contemplated more than six weeks since. *Grenade 2d*, by EARL OF BARRINGTON, and from that excellent milker *Grenade* by TITAN, is good in front but rather low at the rumps. We conclude this brief notice of the Holly Bank heifers with *Countess of Clarence* by 3D DUKE OF CLARENCE, supposed by many to be the best Bates bull in the kingdom. On the female side this calf, now only three months old, is descended from *Lily Bell* by HORROX. EARL OF BARRINGTON (26,065), the first of the bulls, and the sire of several of the younger lots, is by DUKE OF DARLINGTON, a member of the family so long bred by Mr. Sainsbury, of Corsham. His pedigree on his mother's side is thoroughly Bates, commencing with *Countess of Ilsborough* by 6TH DUKE OF OXFORD. He is a useful bull, possessed of great substance, and is an excellent sire. Nothing can be more fashionably bred than lot 2, EARL OF THORNDALE by the 4TH DUKE OF THORNDALE, and out of *Fidget 6th*, mother of the somewhat notorious *Fidget 7th*, which, despite an acknowledged plainness of form, brought 210 gs. at Shobnall Grange last December. This is a good looking bull, and is in fair condition. The remaining young bulls are handsome and promising calves, and this is especially true of GRAMPIAN by DUKE OF SUTHERLAND A., who bids fair to make a splendid bull. DUKE OF SUTHERLAND A., the sire of four of the young lots, is by LORD LIVERPOOL, and from *Tryphena* by 4TH DUKE OF OXFORD (11,387).

—— At the recent show of the Royal Dublin Society, no fewer than 182 Shorthorns were exhibited, of which the yearling bulls numbered 122. The judges were—Mr. WOOD, of Stanwick Park House, Darlington ; Mr. JOHN CLAYDEN, Littlebury, Saffron Walden ; and Mr. DREWRY, of Holker. Some reference was made last week to the prize animals. It was virtually a Shorthorn show ; 122 yearling and 46 older bulls, with 17 cows and heifers, being shown of this breed, against 7 bulls and a few female Herefords, and 2 or 3 animals of the Scotch breeds. The Kerries were in great force, and there were 60 or 70 fat cattle and sheep. A capital show of Berkshire pigs and the poultry, referred to in another column, made up the collection.

—— The programme for the forthcoming meeting of the Bath, West of England, and Southern Counties Association has been completed. It has transpired that the entries of stock and implements are unusually numerous, ranking next in importance to those at Bristol and Southampton only, and exceeding those at any other meeting of the Society, notwithstanding the absence of the usual attraction of local prizes. The Taunton show will open on Monday morning, June 6, at 10 o'clock, when the open judging of cattle, sheep, horses, pigs, and poultry will commence and be continued till the awards are made in the several classes. The arts department will open at 10 o'clock, and the horticultural tent at 1 o'clock. A military band will be in attendance, and the yard will close at 6 P.M. On Tuesday the yard will open at 9 o'clock, on Wednesday at 9, and the competition of shoeing smiths at portable forges in the yard will commence at 10 o'clock. The annual meeting of members will take place in the Council tent at 12 o'clock (noon) on Wednesday. On Thursday and Friday, the shilling days, the yard will open at 9 A.M.

—— Mr. Thornton has issued two catalogues of sales for the ensuing week. On Tuesday he will sell 30 well-bred Shorthorns, at Eaton Green, near Luton, the property of Mr. Thomas Bates ; and on Wednesday, 45 head of excellent stock, the property of Mr. John Snodin, of Stonesby, and of the late Mr. William Shipman. Both these herds trace back to the stock of Mr. Lawford, of Southcott, and the pedigrees contain names familiar to students of pedigrees.

—— Want of sufficient space compels us to be very brief in noticing the result of the Osberton Sale. *Lady's Slipper* (lot 1), although 11 years old, made the extraordinary figure of 100 gs. *Mrs. Page* was bought by Captain Oliver for 165 gs., and several other animals were sold for 100 gs. and upwards. The very excellent average of £66 1*s.* 9*d.* over the 35 cattle disposed of was obtained, and the seven bulls, including the Osberton "Knights," brought a slightly higher average than the cows.

Name of Animal.	When Calved.	Price	Purchaser.
		Gs.	
Cows and Heifers.			
Lady's Slipper	1859	100	Mr H P Robinson
Concertina	1861	43	Mr E Paddison
Florence	1862	51	Mr. P. Brown.
Gipsy Queen	1862	62	Mr. R. Chaloner.
Lily of Windsor	1863	44	Mr. J. Greetham.
May Fly	1864	36	Mr. C. W. Brierley.
Rose of Windsor	1864	70	Mr. Kirkham.
Mrs. Page	1865	165	Captain Oliver.
Queen Oak	1866	45	Mr. Beard
Flageolet	1866	60	Captain Webb.
Prince's Dream	1866	140	Mr. Kirkham.
Archduchess 2d	1866	90	Mr. W. Knapton.
Cleo	1867	100	Lord Bolton.
Flora	1867	74	Lord Bolton
Queen of the Prairie ..	1868	62	Mr. White
Florentine	1868	38	Col. St. Leger.
Queen Bee	Dead.		
Castanet	1868	99	Mr. Locke.
Mistress Ford	1868	75	Mr. Gibson.
Goody Two Shoes	1869	110	Mr. Cochrane.
May Queen	1869	36	Earl Fitz-William.
Gratian	1869	52	Earl Fitz-William.
Madrigal	1870	35	Mr. Machin.
Pyramus	1869	..	Not offered.
Zoe	1869	40	Hon. H. N. Littleton.
Fayence	1869	28	Mr. Sneyd.
Red Ribbon	1869	72	Rev. P. Graham.
Spring Flower	Jan., 1870	21	Mr. Smith.
Ann Page	Feb., 1870	42	Mr. Hargrave.
Harmonium	Feb., 1870	38	Mr. Smith.
Bulls.			
ROBIN	1864	48	Mr. Stafford.
KNIGHT OF THE THISTLE ..	1867	43	Mr. W. Askew.
KNIGHT OF THE WHISTLE ..	1867	100	Mr. A. Cruickshank.
KNIGHT OF THE CRESCENT ..	1867	61	Earl Brownlow.
CHELTENHAM	1868	70	Heanly
RED CROSS KNIGHT	1869	..	Not offered.
BARDOLPH	1869	81	Rev. P. Graham.
HERN JOHN	1869	42	Colonel Ayres.

22 cows and heifers averaged		£65	18	6	= £1845 18 0
7 bulls averaged ..	..	66	15	0	= 467 5 0
35 animals averaged ..	..	£66	1	9	= £2313 3 0

—— We have received a copy of Mr. Thornton's Circular, No. 8. As in former numbers the inevitable monotony of a catalogue is enlivened by much valuable information upon the early history of the Shorthorned breed, and the principle kept in view by its founders. Some valuable extracts from Mr. George Cully's essay on live stock, very judiciously chosen, will be read with pleasure by cattle breeders. Preparatory notices, we had almost said rumours, of coming sales, are also given, among which we may mention that of Mr. Neasham's herd at Gainford, near Darlington, and Mr. J. G. Dixon's herd at Caistor. We must defer a longer notice of this interesting publication to a future occasion.

—— We are requested to correct an error in our report of the sale of Shorthorns at Sholebrook Lodge, which took place on the 13th ult. The purchaser of lot 49, CANDIDATE, is named Clark. It should be Geo. E. Frere, Esq., of Royton Hall, Diss, for whom Mr. Clark had bought it.

POULTRY.

THE following is the prize list referred to in a paragraph last week :—

Silver grey Dorkings, any age, cock and hen—Mrs. Warburton ; 2d, the Hon. Mrs. Greene ; 3d, the Hon. John Massy.
Dorking cock and hen—Mrs. Warburton ; 2d, ditto ; 3d, R. P. Williams.
Spanish cock and hen—J. C. Cooper ; 2d, Seymour Mowbray ; 3d, the Hon. Miss De Courcy Drevar.
Brahma Pootra cock and hen—J. C. Cooper ; 2d, the Hon. John Massy.
Brahma Pootra, light—Capt. Downman ; 2d, ditto.
Cochin China—J. C. Cooper ; 2d, F. W. Zurhorst.
Cochin China, buff—J. C. Cooper ; 2d, A. E. Ussher.
Cochin China—A. E. Ussher ; 2d, R. P. Williams.
Game—George Arthur Perrin ; 2d, C. E. M'Clintock.
Pencilled Hamburgh—Hon. J. Massy ; 2d, F. W. Zurhorst.
Spangled Hamburgh—Hon. J. Massy ; 2d, E. A. Seale.
White-crested Black Fowl, or black-crested White Fowl—R. P. Williams ; 2d, Miss De Courcy Drevar.
Gold or Silver Polands—R. P. Williams.
La Flèche—J. C. Cooper ; 2d, G. A. Stephens.
Houdan—J. C. Cooper ; 2d, Hon. J. Massy.
Crèvecœur—F. W. Zurhorst ; 2d, J. C. Cooper.

TURKEYS.

Cock and hen over a year old—J. C. Cooper ; 2d, Seymour Mowbray ; 3d, Miss King.
Single cock—J. C. Cooper ; 2d, Hon. J. Massy.

GEESE.

Gander and Goose of any age—J. C. Cooper; 2d, Hon. John Massy. 3d, Mrs. Warburton.

DUCKS.

Rouen Drake and Duck of any age—2d, R. W. Doyle. Aylesbury Drake and Duck—J. C. Cooper; 2d, Mrs. Robert Clay.

THE ROADS OF THE FARM.

A PAPER BY J. SCOTT, HERMONGERS FARM, RUDGWICK.

IT is to be deplored that good roads, or even what may be fairly termed roads at all, are so rarely met with on the farm. True, there are exceptional instances where the facilities afforded by a carefully-designed and well-constructed system of roads have been attained; but such cases mostly occur under the immediate occupancy of an energetic and wealthy resident proprietor, or on the home farms retained by the proprietors of the larger estates. They do not therefore present any appreciable limit to my first statement, and are only to be regarded as examples of, and inciting to, a better than the prevailing condition of things. I believe I may hazard the assertion that on the majority of farms in this country there is not a single furlong of made road—*i. e.*, of road solidly constructed and kept in repair—except the comparatively short lengths leading from the public highways to the homestead.

Some lands there are, undoubtedly, so situated, and of such a character that it would be superfluous to cut them up by internal roads; such, for example, where dry and flat grounds lie adjacent to, or are bounded by, public or occupation roads. It may then occur that easy access to a good road, and the contour of the field, together with the character and drainage condition of the soil, render the construction of roads inside the fences quite unnecessary. But that is not a very common occurrence, for even where a farm is well intersected by public and occupation roads, and the contour of the land flat, there will still be many fields which lie interior to those which abut upon the roads in question. Now, where, in order to reach one field another has to be crossed, it will always be advantageous to have a road. If there is much cart or waggon passage across a field it will actually become an economy to devote a portion of the land to the purposes of a permanent road. Of course where the ground is steep, or otherwise naturally unsuited to farm traffic, it often becomes a first necessity to open it up by a substantial road, even though a good road runs along the outside boundary.

But I am not to be held as advocating the indiscriminate construction of roads, far from it. I think that the fewer they require to be the better, for the first construction is very costly, and the labour and expense of maintenance is considerable, while they occupy a large amount of valuable soil. Yet it is not too much to say that at every place where a necessity exists for a road, at such a place the needed facility should be provided. There should, indeed, be a well-defined and complete system of roads upon every farm, providing easy and ready access in all directions and to every field. The cost of such a system would materially depend upon the skill with which it was designed and laid out. It is surprising to anyone who has never seen or attempted such a work, with what economy it is possible to lay even a hilly farm under road control. And who can estimate the value of such a boon? the pleasure, the facility, and the profit derived? or the annoyance, the delay, the ruts, and the waste, avoided thereby?

It is reasonable to suppose that, with the introduction of heavy machinery—such as agricultural locomotives, &c.—more general attention must be paid to farm roads, for a firm path is essential to the ready transport of these engines. But, apart altogether from the requirements due to the introduction of heavy modern implements and machinery, I do not consider the permanent improvements on any estate or farm as complete without a definite system of good roads. These roads, as being of the nature of permanent improvements, should be constructed at the expense of the proprietors, and maintained by the tenants or occupiers of the land.

The objects to be aimed at in road-making are, a dry foundation, a hard surface, and a small inclination. It would be quite foreign to my present purpose were I to enter into a detailed consideration of all the principles connected with the attainment of these objects; I shall therefore now only refer to the more prominent of the elementary principles involved in the construction of roads.

The resistance or draught on roads is an important matter, a proper knowledge of which is of advantage in considerations regarding the gradients to be admitted in a line of road. It has been found by experiment that the resistance of wheel-carriages on roads is proportional to the load, and inversely proportional to the radius of the wheels.

The average proportion of the resistance to the load on a level part of a good broken stone road has been variously stated at from 44 lb. to 75 lb. per ton. Telford estimated it at 1-30th of the gross load, or 74⅔ lb. per ton.

On an incline the resistance varies according to the sine of the angle of inclination, and we have this general rule for finding the amount of resistance to be overcome. To the known ratio of resistance to load on a level, add (if ascending), or subtract (if descending), the ratio of the rise to the horizontal length of the slope, and multiply by the gross load. The result gives the resistance very nearly. Thus, for example:—If we assume the resistance on a level to be 1-30th of the load, the force required to draw a waggon of 3 tons weight along a level part of a Macadamised road is $(\frac{1}{30} + \text{load}) = (\frac{1}{30} \times 6720 \text{ lb.}) = 224$ lb.; but the requisite force to draw the same load on an incline of 1 in 60 is $(\frac{1}{30} + \frac{1}{60}) \times 6720$, which gives 336 lb. as the force to be exerted in ascending, and 112 lb. in descending, the slope; while on a gradient of 1 in 30 the force required is $(\frac{1}{30} + \frac{1}{30}) \times 6720 = 448$ lb. in ascending, and $(\frac{1}{30} - \frac{1}{30}) \times 6720 = 0$ in descending.

From these and such like calculations we thus find that the comparative values of resistance to the same load on different slopes stand thus in ratio:—

Inclination.	Resistance.	
	Ascending.	Descending.
Level	1	1
1 in 60	1½	½
1 in 30	2	0
1 in 15	3	−1
1 in 10	4	−2

Consequently, if we estimate the tractive force which a horse is capable of exerting continuously at a steady walk at 112 lb., each horse will be able to draw along a level a gross load of $(112 \times 30) = 3360$ lb. $= 1\frac{1}{2}$ ton; while on an ascent of 1 in 60 a load of $(112 \times 30 \div 1\frac{1}{2}) = 2240$ lb. $= 1$ ton, will be sufficient; and on an ascent of 1 in 30, the load to be drawn with advantage must not exceed $(112 \times 30 \div 2) = 1680$ lb. $= 15$ cwt.

From these results we observe that since the resistance is doubled by an ascent of 1 in 30, it will be exactly neutralised in descending a slope of the same inclination. Hence, if the gradient at any part is steeper than 1 in 30, there is a waste of mechanical energy in descending, because a retarding force must then be exerted by means of breaks or otherwise, in order to prevent undue acceleration of speed. This is shown by the minus sign prefixed to the two last figures in the third column of the above Table.

These results exhibit the advantages arising from easy gradients, but of course the question of expense in excavating and embanking limits, in most cases, the flatness of the gradients, and farm roads, especially, are as much as possible constructed on the natural surface of the ground.

The principal points to be attended to in selecting the line of a road, are—that in crossing valleys or hollows a narrow part of the valley should be chosen, and the deepest part should be crossed at right angles; the summits of ridges also should be crossed as nearly as possible at right angles; and when roads pass through fields they should, as far as practicable, be formed alongside of the fences to avoid the subdivision of the fields, and consequent loss of time and inconvenience in working the land.

When a road has to be formed on the natural surface of the ground, the operation consists simply, when the ground is level across, in digging a drain or ditch at each side of the intended road, the earth from which is thrown upon the track so as to raise it a little above the adjoining ground, and any slight irregularites which occur in its course are then levelled. If the ground has a sidelong slope, a drain at the upper side of the road only requires to be cut. Macadam considered this to be all the preparation needed, even on swampy ground, before laying the broken stone covering on a road. Telford believed it necessary to have an artificial foundation of rough pavement below the stone covering, and this he formed of durable stones measuring from 4 to 7 inches, which were set by hand with the largest sides down, and packed with smaller pieces so as to form a compact layer about 7 inches deep at the centre and 4 inches deep at the sides of the road. Above the foundation thus prepared Telford spread a uniform coating of broken stones, about 6 inches in thickness. Macadam thought 10 inches of metal the greatest thickness required for any road made upon his system, and he often used from 5 to 9 inches as sufficient.

The road metal should consist of tough and hard stone, such as granite, or some of the varieties of greenstone; and, to ensure a firm and compact surface, they should be broken into angular pieces, about 1½ inch cube, and spread evenly over the road with a shovel and rake in two or three successive layers of 3 and 4 inches deep, each layer being allowed to get partially consolidated by traffic before another is laid on.

Opinions differ a good deal as to the best transverse form for a road. Some think it should be flat, and others that it should be higher in the middle than at the sides. There can be no doubt that it should have a certain amount of convexity, but evidently the road will be most suitable for traffic if the convexity is not more than sufficient to make the water run off from the middle towards the sides. The convexity may always be reduced to a minimum where there is a slight longitudinal inclination to the road, but a dead level should always be avoided on consideration of drainage.

It has also been debated whether the convexity should be given to the foundation, or to the surface material only; Telford's system, as we have seen, gives the convexity to the "bottoming," by which method a uniform depth of "metalling" is obtained over the whole breadth of the road. If the convexity is given only to the surface material it must be laid on thicker at the middle than at the sides of the road, and as the traffic usually preponderates near the centre, the more so if the cross-section has a considerable convexity, the action of horses and machines must throw the metal from the middle to the sides, and thus tend to reduce the road to a level, or to form grooves and ruts.

A depth of 2 or 3 feet is sufficient in general for the side drain or ditches already mentioned. The fence should be between the ditch and the road.

If open ditches along the sides are not sufficient, proper drains must be constructed, either by making a covered drain down the centre, with branch drains from the sides running into it, or by forming covered drains along the sides, with gratings at proper intervals to let in the surface water.

In repairing a broken stone road, the surface must be slightly loosened with a pick, and a layer of new metal spread uniformly over it. Blinding a newly metalled road with sand or gravel is a bad practice, and prevents the stone ever forming a really compact mass.

Home Correspondence.

Smith of Woolston as a Landlord.—What a liberal-minded landlord Mr. Smith would make! [See p. 577.] What a pity that his 112 acres had not been 112,000, so that he might carry out in practice the liberality which looks so grand upon paper. Why should a landlord prohibit his tenant from selling straw and roots off the farm? For straw and roots, quoth Mr. Smith, cannot be sold off the farm; there is nobody to buy them! Did Mr. Smith, of Woolston, ever hear of one Mr. Mechi, of Tiptree? If so, I fancy Mr. Smith could quite understand that if straw and roots were allowed to be sold there would be a great many Messrs. Mechi springing up who, farming their own land, would be very glad to buy straw and roots from their neighbours, knowing well that in a very few years their own acres would be fat, and those of the adjoining owners, who let out their lands to tenants, would be lean. But perhaps Mr. Smith knows all this well, and has an eye to the main chance in the "blind advice" he is propounding for the benefit of landlords and land agents. Perhaps he would like to try a little of his neighbours' roots and straw at feeding price! Did Mr. Smith ever hear of what is called in my part of the country "a bye-tack?"—that is to say, a second farm taken by the same farmer, but from a different landlord, and usually adjoining his own principal farm. And did he ever hear that landlords and land agents, as a rule, set their faces against letting farms as "bye-tacks" to any tenant who rents another and a larger farm under another landlord? And if so, does he know the reason why? Did he ever hear, too, that landlords and land agents do not like to let their land to yeomen, that is to say, to men who own a farm of their own, and occupy it themselves? And if so, why? I will tell him the reason. Because in a very few years the one farm would be fat and the other lean. If I draw all the hay, and all the straw, and all the roots off one farm which I rent, and consume them on my own land, and if I put all the dung which results from that feeding on to my own land, I venture very mildly to predict that in a few years my own land would be greatly increased in value and the farm which I rented would be vastly depreciated. Or, if I have a flock of sheep, and I take good care to fold them at night and during the heat of the day upon my own land, but feed them every morning and evening on the rented farm, I venture also to predict that in a very few years my sheep will have carried over bodily the fatness of my landlord's land, and laid it very neatly, "honestly, no doubt," on to my own paternal acres. It seems to me that Mr. Smith's idea of a model farmer is, to be a dog in the manger. He is not to expend a single penny in artificial manure (although by so doing he would greatly increase his own annual profits) for fear his landlord should benefit from the farm at the end of the lease being left in a much better state and more productive than it was when he entered. Fortunately for himself, Mr. Smith works his own land. If he rented under a landlord, and his mind was filled with these silly ideas, I think the chances are ten to one he would have been in the *Gazette* long ago. The man whose object is "to beggar his neighbour," seldom succeeds in making a plum for himself. The tenant whose whole object was not to improve his land for fear his landlord should reap some benefit by it, would soon find his farm of little benefit even to himself; and when he went to seek a new one out of which he might extract the marrow by bad farming, I think his character would go before him, and he would find both landlords and land agents would give him a very cool reception. If the farmers of England were a down-trodden race, growing yearly poorer, there might be some reason for such homilies as that which Mr. Smith has given utterance to. But when we know the contrary to be the fact—when we know that the farmers of England are growing annually richer, and advancing steadily in social position, influence, and consideration, the system of land tenure needs no apology from any one. A system of manage-

ment which renders the land of England more productive every year, and results not only in wealth to the tenantry, but also in increased wealth to their landlords, must be sound at bottom, and those men who, like Mr. Smith, strive to breed illwill between tenants and their landlords, are by no means the tenants' friend. The share of the capital invested in farming by the landlords is at least five times that advanced by the tenant. That is to say, a tenant occupying a farm worth £5000 will require perhaps £1000 to work it, and to suppose that the man who owns the £5000 will allow the man who owns the £1000 to reap all profit is pure and simple nonsense. The same rule holds in mercantile affairs, the sleeping partner who supplies the lion's share of the capital is not content to take simple interest, and leave all surplus profits to his managing partner. Nay, in mercantile affairs I think it will usually be found that the man who finds the lion's share of the capital also takes the lion's share of the profits, although he never exerts himself in the active management of the business. If Mr. Smith is so enamoured of the pleasant and liberal doctrines he propounds, suppose I was to give his own workmen a hint, and suggest that they should not work upon his land unless he gave them, not only their weekly wages, but also a share, or rather not a share, but the whole of the increased value which their labour produces! Whatever Mr. Smith may think, let me tell him and others, too, who seem inclined to follow a little in the same strain, that they are playing with edged tools. For my part, as a man possessing some property, I say distinctly that if I have to divide with any one, I should prefer to divide with the working classes rather than with the farmers. *G. A. H.*

Road-making on Farms.—As I appointed myself to be my road engineer—to form and make the farm roads needed here—the experience thus acquired may be of service to your inquiring correspondent, and I beg to offer it. In all cases I strongly recommend that the surface soil be removed, and if the solid base be not below 12 to 15 inches from the surface, it should be reached; and as a farm road is not likely to be made wider than from 7 to 10 feet, the hard bottom must be formed with a good inclination to one side, where there should be a shallow drain of 18 inches to 2 feet deep put in, to run all the length of the road. The primary requirement is to run off all water from the road as quickly as it falls, and so retain the earth foundation dry and hard. The sides of the cuttings should be perpendicular, as it is important these should act as buttresses to the road material, and prevent the wheels from crushing out the new road. Farm roads are, from the want of these side supports, soon worked into ruts, and the sloping foundation injured, giving a lodgment for water, and so spoiling the inclined foundation. The old dictum was to round the surface of the road, so that the water would run off to the sides, but in making a new road the material is loose and not consolidated, permitting the rain-water to percolate through to the foundation as it falls; thus proper means must be made to get rid of the water at the foundation. I have found that the surface earth dug out more than pays the expense, in the increase of productiveness of the land on which it is carried and spread. Having thus prepared a suitable portion of base, the largest sized material should, in the first place, be laid by hand; in fact, their biggest sized material must be placed as if paved, and thus, from the greater surface afford the most abundant support to the top material: it likewise will not be so liable to press into the earth foundation as if of smaller size; over this will be spread the smallest sized material to form the surface of the road. I prefer to keep the new made road thus in use for some time, being watchful—and this needs vigilance—that your men shall drive the carts not in only one tract, but evenly over the entire road, and in case of a rut or hole being made it should be immediately repaired. After the new road has thus become pressed and consolidated, any softer dressing, as ashes, small gravel, &c., may be applied. If these last are, as is too often the case, employed before the road is properly compressed, from the softer and smaller size of the material they are squeezed into dust and washed down, when the firmness of the road is deteriorated and loosened. As to materials, these are solely depending on the locality, but I may add that, as a rule, the want of farm roads is generally to be found in clay districts. The clay dug out in forming the foundation may be burnt, and will, if properly done, make no bad road, the chief care being to chop up enough of the clay to form the surface dressing, and thus save subsequent making; to have all the clods, &c., well dried prior to burning, and not to stint the amount of fire. I have no doubt any man who has experience as a brick burner will be able to perform this part of the operation. Not only will there be less fuel necessary if the lumps be dry, but they will be harder and more compact. I never got into the practice of letting this last labour by piece, but would recommend it being done for so much per cubic yard of hard burnt lumps and pieces, to be pretty exempt from cracks, which too rapid drying will produce. *W. A. Wooler.*

The Bacon Fly.—Perhaps it may be of use to "T. M. W." (p. 610) to state, that one year after we had lost an old servant, whose tidy ways had previously kept the bacon fly in check, we suffered much from it. Now, as before that year, we find very little of it. Lime-wash on the walls, and care in clearing out dust from holes and corners, seem to do much in checking it. We also rub wood-ashes all over and well into the hams and bacon when first hung up, and in addition put the small hams into calico bags (washed between each time of using) tied close round the leg-bone. *S. M. O.*

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, May* 4.—Present the Duke of Devonshire, K.G., President, in the chair; the Duke of Marlborough, K.G., the Earl of Lichfield, Viscount Hill, Lord Chesham, Lord Kesteven, Lord Tredegar, Lord Vernon, Lord Walsingham, the Hon. H. G. Liddell, M.P., Sir Watkin W. Wynn, Bart, M.P.; Mr. Amos, Mr. Baldwin, Mr. Barnett, Mr. Booth, Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Davies, Mr. Dent, M.P.; Mr. Druce, Mr. Edmonds, Mr. Brandreth Gibbs, Mr. Hassall, Mr. Holland, Mr. Hornsby, Mr. Wren Hoskyns, M.P.; Mr. Jonas, Colonel Kingscote, M.P., Mr. Lawes, Mr. Leeds, Mr. Milward, Mr. Pain, Mr. M. White Ridley, M.P.; Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Stone, Mr. Thompson, Mr. Torr, Mr. Turner, Mr. Webb, Mr. Wells, M.P.; Mr. Whitehead, Mr. Jacob Wilson, and Dr. Voelcker.

The following members were elected:—

Allcock, Thomas, Ratcliffe-on-Trent, Nottingham.
Armstrong, John Knight, Winsford, Chester.
Baskett, Nathaniel, Brames Hall, Wetheringsett.
Beeston, Thomas, Goldston Manor, Market Drayton.
Berridge, Samuel, Croughton, Brackley.
Berridge, Thomas Edward, Pimlico Farm, Tusmore, Bicester.
Bickerton, Samuel, Shotatton, Ruyton, Salop.
Birch, James, Pearse Hay, Penkridge.
Birchall, Edward, Willaston, Nantwich, Cheshire.
Chillingworth, John, Horsepath, Oxford.
Chillingworth, William, Cuddesdon, Wheatley.
Crawhall, George, 4, Queen's Parade, Cheltenham.
Crompton, John George, Derby.
Decanville, M., Petit Bourg, Corbeil.
Decanville, M. Paul, Petit Bourg, Corbeil.
De Kergolay, Count, Camisy (Manche).
De Monicault, Edouard, 127, Boulevard Hausman, Paris.
Derham, James, St. Thomas Road, Chorley.
Elwell, Charles James, Compton, Wolverhampton.
Fielden, John, Dobroyd Castle, Todmorden.
Fitton, Samuel, Willaston, Nantwich, Cheshire.
Foljambe, Francis J. S., Osberton, Worksop.
Gammon, H. M., Frewin Court, Oxford.
Garne, Thomas, Broadmoor, Northleach.
Gartside, Henry, Wharmton Tower, Greenfield, Saddleworth, Yorkshire.
Giles, F. Thresher, Marsh House, Bentley, Farnham.
Harcourt, Rev. W. Vernon, Nuneham Park, Abingdon.
Hargreaves, Edward Henry, Kirkham, Preston.
Hughes, James, Oxford.
Jones, William, Baschurch, Shrewsbury.
Lett, John, Stone Court, Kidderminster.
Lister, Edward, Cefn Ila, Usk.
Lloyd, John, Bod Lloyd, Ruabon.
Mansell, Andrew, Little Ness, Baschurch, Salop.
Mather, Daniel, Chipping Norton, Oxford.
Milner, John, Myerscough, Preston.
Nelson, John, Wyham House, Louth.
Page, Francis, Uttoxeter.
Pennel, Charles, Westwell, Burford.
Roberts, John, Wellhouse, Saltney, Chester.
Rowland, Samuel, Grimsditch Hall, Whitley, Northwich.
Russell, John, Sutton, Dartford, Kent.
Scott, Lawrence, Moor End, Ruddington.
Seymour, Richard Arthur, Kinivarton Rectory, Alcester.
Smith, R. C., Parkfield, Swinton, Manchester.
Sollom, Francis, Pennfields, Wolverhampton.
Stapley, Frederick Arthur, East Lavant, Chichester.
Symonds, Frederick, 35, Beaumont Street, Oxford.
Symonds, Horatio P., Oxford.
Taunton, George, Oxford.
Tomlinson, J. H., The Parkey Farm, Wrexham.
Vaughan, Edmund, Lapley, Penkridge.
Warner, Robert, 8, The Crescent, Cripplegate, London.
West, Richard Thornton, Streatham Hall, Exeter.
Wright, John, 30, Broad Street, Islington, Birmingham.

FINANCES.—Colonel Kingscote, M.P., presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by Messrs. Quilter & Ball, and were found correct. The balance in the hands of the bankers on April 30 was £3583 0s. 10*d.*, £3800 remaining on deposit at interest.

JOURNAL.—Mr. Thompson (chairman) reported that the committee recommended the offer of a prize of £20 for the best account of the preparation, preservation, and use of sprouted grain as food for horses, cattle, and sheep, competing essays to be sent in to the secretary not later than the 15th of July. The committee also recommended that the invitation of the "Société des Agriculteurs de France" to the Royal Agricultural Society to take part in an International Congress to be held in Paris next year, be accepted; that the request to furnish a report on British Agriculture be complied with, such report to be prepared under the auspices of the Journal Committee; that it be suggested to the "Société des Agriculteurs de France" that the time of holding the Congress which would be most likely to secure a good attendance of representatives of British Agriculture, would be Whitsun week; and that in compliance with the invitation in one of the letters on the question, the following list of subjects for papers or discussion be suggested, viz.: Drainage, Implements and Machinery, Manures, Rotation of Crops, Fattening of Cattle and Sheep, and the Labourer. The committee also gave notice that at the next monthly Council they will move for a grant of £100 towards defraying the cost of an autumnal tour of inspection similar to that of last year.—This report was adopted.

GENERAL, OXFORD.—Lord Kesteven reported that the committee recommended that the Finance Committee be given power to obtain the assistance of some members of Council, in place of any Stewards of Finance who may be unable to attend the Oxford meeting. The arrangements for the supply of refreshments to the showyard at Oxford, and the programme recommended for the Oxford meeting, were also reported.—This report was adopted.

JUDGES, SELECTION.—Mr. Milward (chairman) presented a list of gentlemen who had accepted the invitation of the Council to act as judges at the Oxford meeting, and reported the recommendation of the committee that they be now elected.—This report was adopted.

EDUCATION.—Mr. Holland (chairman) reported that neither of the candidates who had entered to compete for the Society's certificates and prizes had satisfied the examiners, and that the committee, therefore, could not recommend any award.—This report was adopted.

SELECTION.—Mr. Thompson (chairman) reported the recommendation of the committee that Lord Vernon be invited to accept the office of President of the Society for the ensuing year, and that the house list be printed in the usual manner.—This report having been adopted, it was moved by Mr. Thompson, seconded by Mr. Dent, M.P., and carried unanimously, "That Lord Vernon be recommended to the general meeting as President for the ensuing year."

HOUSE LIST.—In conformity with the bye-laws the Council then arranged by ballot the following election list, to be recommended by them for adoption at the ensuing general meeting on the 23rd inst:—

ATTENDANCES [FROM THE AUGUST MEETING, IN 1868, TO THE PRESENT TIME.]

Names.	Monthly Councils. Total 15	Special Councils. Total 2	Weekly Councils. Total 6	Committees. No. of Meetings.	Committees. Attendances.
Amos, Charles Edwards, 5, Cedar's Road, Clapham Common, Surrey.	1	..	..	24	12
Barthropp, Nathaniel George, Hachesston, Wickham Market, Suffolk.	7	2	..	4	1
Booth, Thomas Christopher, Warlaby, Northallerton, Yorkshire.	8	2	..	30	15
Bowly, Edward, Siddington House, Cirencester, Gloucestershire.	9	2	..	22	8
Clive, George, Perrystone, Ross, Herefordshire	6	..	..	..	..
Davies, David Reynolds, Mere Old Hall, Knutsford, Cheshire.	13	..	..	42	21
Druce, Joseph, Eynsham, Oxford.	13	3	..	22	11
Edmonds, William John, Southrop, Lechlade, Gloucestershire.	8	1	..	9	3
Gibbs, R. T. Brandreth, Halfmoon Street, Piccadilly, London, W.	14	3	..	54	52
Hassall, William, Bubney, Whitchurch, Salop.	6	1	..	3	1
Hesketh, Sir T. G., Bart., M.P. (elected February 3, 1869), Rufford Hall, Ormskirk, Lancashire.	2	..	..	..	..
Holland, Edward, Dumbleton Hall, Evesham, Worcestershire.	9	2	..	74	35
Hornsby, Richard, Spitilegate, Grantham	11	3	..	31	15
Hoskyns, Chandos Wren, M.P., Harewood, Ross, Herefordshire.	12	3	..	59	25
Kesteven, Lord, Caswick, Stamford, Lincolnshire.	9	2	..	17	11
Lawes, John Bennet, Rothamsted, St. Alban's, Herts.	5	..	..	8	1
Lichfield, Earl of (elected August 4, 1868, Shugborough, Staffordshire.	6	..	..	14	4
Macdonald, Sir Arch. Keppel, Bart., Woolmer Lodge, Liphook, Hants.	6	1	..	11	7
Randell, Charles, Chadbury, Evesham, Worcestershire.	8	1	..	64	22
Sanday, William, Radcliffe-on-Trent, Notts.	5	1	..	38	7
Shuttleworth, Joseph, Hartsholme Hall, Lincoln.	9	..	..	34	17
Statter, Thomas (elected Feb. 3, 1869), Stand Hall, Whitefield, Manchester, Lancashire.	7	1	..	11	8
Welby, William Earle, M.P., Newton House, Folkingham, Lincolnshire.	..	..	..	..	..
Wells, William, M.P., Holmewood, Peterborough, Northamptonshire.	11	1	..	56	35
Whitehead, Charles (elected Dec 8, 1869), Barming House, Maidstone, Kent.	3	..	..	..	..

COUNTY MEETING OF 1871.—The report of the committee appointed to inspect the sites offered to the Society by the local authorities of Shrewsbury, Stafford, and Wolverhampton, the Council were favoured by the attendance of the following gentlemen, as deputations from the competing towns:—

Shrewsbury.—Introduced by the Right Hon. Viscount

Hill: the Viscount Newport, M.P.; Gen. the Right Hon. Sir Percy Herbert, M.P.; J. R. Ormsby Gore, Esq., M.P.; the Mayor of Shrewsbury (Henry Fenton, Esq.); Edmund Wright, Esq.; Messrs. Thos. Groves, Thos. Southam, Thos. Mansel, Wm. Brewster, J. Bowen Jones, the Town Clerk of Shrewsbury, Hon. Sec.

Stafford.—Introduced by the Right Hon. the Earl of Harrowby: Lord Sandon, M.P.; Captain the Hon. Reginald Talbot, M.P.; Colonel Dyott, M.P.; the Mayor of Stafford; W. Blount, Esq.; W. Sylvester, Esq., Stafford, J.P.; J. Filling, Esq., Stafford, J.P.; W. H. Gibson, Esq., Stafford, J.P.; Captain Morgan; H. Woodhouse, Esq., C.E.; F. Greatrex, Esq.; R. Sylvester, Esq.; J. Darlington, Esq.; H. Gillard, Esq., Hon. Sec.

Wolverhampton. — Introduced by the Right Hon. C. P. Villiers, M.P.: the Mayor of Wolverhampton, the Town Clerk, T. M. Weguelin, Esq., M.P.; Sir John Morris, W. F. Fryer, Esq., J.P.; Alderman Ironmonger, Alderman G. L. Underhill, Jno. Moreton, Esq., J.P.; R. H. Masfen, Esq.; Councillor Jno. Lees, Councillor Sollom, Mr. Barnett.

These gentlemen having laid before the Council the facts and arguments in favour of their respective districts, and having answered the inquiries made of them by the Council, the President expressed to them the thanks of himself and the Council for their interest in the Society, their anxiety to promote its objects, and their kindness in attending the meeting that day.

The deputations having withdrawn, and his Grace the President having vacated the chair on account of an important engagement elsewhere, Lord Tredegar was nominated to preside during the remainder of the meeting.

It was then proposed by Mr. Milward and seconded by Mr. Jacob Wilson, "That the Council do first decide as between the counties of Salop and Stafford." An amendment was thereupon moved by Mr. Thompson and seconded by Mr. Wren Hoskyns, "That the voting should be taken for the three towns, and that the decision between the two having the majority of votes should be decided by a second vote." After some discussion, the amendment having the greater number of supporters, the original proposition was withdrawn, and a division taken in accordance with the terms of the amendment, as follows:—Shrewsbury (proposed by Lord Hill, and seconded by Sir W. W. Wynn), 17 votes; Stafford (proposed by Mr. Dent, and seconded by Lord Vernon), 1 vote; and Wolverhampton (proposed by Mr. Milward, and seconded by Mr. Baldwin), 22 votes. A second division having been then called for, it was decided, by 18 votes against 13, that the Society's country meeting for 1871 be held at Wolverhampton. It was then moved by Mr. Torr, seconded by Mr. Wren Hoskyns, M.P., and carried unanimously, after some discussion, that the Society's country meeting for the year 1872 be held in the district comprising South Wales and the counties of Gloucester, Worcester, and Hereford.

On the motion of Mr. Thompson, seconded by Mr. Turner, the question of the rotation of districts was referred to a committee, to consist of the Committee of Selection and Lord Tredegar, Mr. Wren Hoskyns, M.P., and Mr. Jacob Wilson.

The draft of the report to be presented to the general meeting was discussed, amended, and ordered to be printed.

Letters were received from Mr. A. Hansen on the cultivation of Potatos, and from the Rev. W. W. Jones, Rector of Summerstown (Oxford), in reference to Divine service in the showyard at Oxford, and the latter was referred to the honorary directors.

A communication from the Foreign Office, relating to the disease among cattle known as the "Mal de Rate," or splenic disease, which had been received from Her Majesty's Minister at Copenhagen, and of which the following is a translation, was referred to Professor Simonds:—

"The *mal de rate* is a disease which attacks man equally with other warm-blooded animals. It develops itself spontaneously in herbivores, and is communicated by contagion. The contagious principle is transmitted by the contact of either solid or liquid (blood) particles, or even by eating the flesh of infected animals; but it is not communicated by the agency of the atmosphere. This malady is especially dangerous in warm climates, and in Southern Europe. In Denmark it is somewhat rare, and only exhibits itself under a mild form (erysipelas), the *anthrax*, or burning scabs (*charbon*), being there nearly unknown. It is there observed only occasionally, in isolated cases, amongst cattle, but is not propagated even in the herd attacked, and it still more rarely acquires an epidemic character. Within the last few years it has shown itself in pigs, under the form of erysipelas, but without acquiring any great extension. The losses sustained by the country through the *mal de rate* are consequently very insignificant; but this result must be chiefly attributed to the excellence of the measures which have been taken to contend against it."

Farmers' Clubs.

LONDON.

May 2.—At this meeting the following paper was read by Mr. CORBET, the Secretary of the Club:—At our last annual dinner in December, I ventured to say that many of the members did not appear to know what the Club had really done in times past. I said so much when referring to the discussion of the previous evening, which had brought the relations of landlord and tenant once more under consideration. Indeed, during the last half year or so the duties of landlords and the rights of tenants have been continually cropping up again all over the country. It is probable that the introduction of the Irish Land Bill has tended to direct more general attention to the question; and, at any rate, this affords me an opportunity, in the outset, of drawing the strongest possible distinction between Irish and English tenant-right. I profess to speak with no especial authority on the Irish claim, but it seems to me to work very commonly something in this way: In the first place, the outgoing tenant is paid very liberally for every improvement he has made; in the next, he receives a very handsome sum as "goodwill" for giving up possession; and then—he thinks it a very great shame that he should have to leave his farm! English tenant-right does not go quite so far as this; and if I now attempt to define to you what this English right actually aims at, and in so doing necessarily travel over some well-worn ground, my reason for doing so must be the misapprehension which still continues to exist on the subject. At that very meeting in December one of our members stated that "this question suffered through being overshadowed by a cloud of vague generalities. They constantly heard such phrases as 'unexhausted improvement'—'custom of the country'—'duties of landlords,' and so on. What did they mean?" It will be my object to endeavour to answer that question, and to show what unexhausted improvements, customs, and duties do mean. In setting about this, I shall have to take you back to the earlier history of the Club, and to something of what it has done, as I have said, in past times.

History.—The first year, then, in which the Club held any regular series of discussion meetings was in 1845, and in the December of that same year the following subject stood in the name of my much valued friend the late Mr. William Shaw, of the Strand: "Tenants' Rights as between Landlord and Tenant."

In introducing this, Mr. Shaw said: "I should define tenant-right to be the right of the tenant to require compensation legally for outlay in the improvement of the soil or buildings when the period of his occupation has not been of sufficient duration to enable him to reimburse that outlay. I need scarcely remark that the portion of the outlay which should be reimbursed is that which remains after making due allowance for the benefit he has derived. I consider tenant-right as a question purely between landlord and tenant, and wholly distinct from the rights between incoming and outgoing tenants, commonly called 'tenants' rights,' or dues. The payments made by the incoming to the outgoing tenant vary according to custom, and although embracing certain other items, are little more than payments for labour, frequently used as a means of drawing heavily upon the purse of the incomer, absorbing his capital, crippling his means, and preventing him from managing his farm to advantage." This passage embodies not only a very good definition, but a very nice distinction between acts of improvement and acts of husbandry. The meeting, which may be said to have gone altogether with Mr. Shaw, concluded by adopting his opinion, that "A system of tenant-right would promote the interests of both landlord and tenant, and must materially conduce to the advancement of practical agriculture." In the succeeding month another or an adjourned discussion on the same subject followed, when a tenant-right committee of the Club was appointed. In the January of 1847 Mr. Shaw took up the subject from the landlord's point of view, when the Club went with him in declaring "That a well regulated system of tenant-right would be beneficial to the landlords of this country." Upon this Mr. Pusey brought in his Bill, on which he specially asked the opinion of the committee of the Club, which was given accordingly in the following report:—"The committee of the Farmers' Club on tenant-right have perused the draft of a Bill for the improvement of agricultural tenant-right in England and Wales, forwarded to them by the kindness of Mr. Pusey; and, after suggesting some alterations in the various clauses, do recommend that all items respecting buildings, roads, and fences, be left out of this Bill, and that a clause be added or a supplementary Bill be prepared to afford tenant-farmers those privileges in the removal of buildings erected by themselves which manufacturers and tradesman now enjoy, the landlord having, in the first place, the option of taking all or any by valuation." Then we prepared and presented petitions in favour of the Tenant-right Bill, and a deputation from the Club waited on Lord John Russell, the Prime Minister of the time, who, in answer, said that inquiry would be the best means of showing the justice of the cause, and of diffusing information on the subject. In the summer of the same year, 1847, a local Farmers' Club offered a prize for the best essay "On the necessity of some legislative enactment to secure the tenant-farmer the benefit of his improvements; and the great national advantages that would accrue therefrom." Being by that time tolerably familiar with the question I was, in the face of some competition, fortunate enough to write the prize paper. As I said in the preface to this, when I published it as a pamphlet, "When it is remembered that the tenant-right claim, if not entirely originating with, has been mainly supported by, the proceedings of the London Farmers' Club, the advantage of being associated with the business of that institution is at once apparent. The effect of this connection has been to induce the writer to give his arguments with more force and decision than he might, perhaps, have ventured to do on his own unsupported liability. As it is, there is not a case assumed nor an opinion broached but for which he could name the very highest authority and example." I feel that I am thus relieved of any charge of egotism when referring to this essay, which has been quoted or read again and again with and without acknowledgment; while I am happy to add, that in a review of its proceedings, as taken two or three years since, the Wenlock Farmers' Club considers this prize essay on tenant-right to be the "standard authority to this day."

In the spring of the following year, 1848, the Premier fulfilled his promise, and a committee of the House of Commons was appointed to take evidence on, and inquire into the agricultural customs of England and Wales in respect to tenant-right. And after some very careful study of the evidence thus collected, I have no hesitation in saying, that the Tenant-right Blue Book contains more valuable and more reliable information on the practice of agriculture than any work that ever was published in our time. Of course we had a hand in it. Mr. Philip Pusey, the chairman of the committee, came again to the Farmers' Club for witnesses, and we called for him some 50 or so of the picked men of all England—landowners and land-agents, tenant-farmers, members of the Club, and others, whose reputations had reached us. It was, however, by no means a one-sided inquiry; at least half of the members of the Commons' committee were dead against the principle, and everything that could be urged against it was brought up. Nevertheless, a blue book is at best but dry reading, while this was kept back in a somewhat suspicious manner, after having been partly circulated; and at the request of Mr. Pusey, Mr. Shaw and myself undertook to prepare a digest or proper arrangement of the evidence. I was in those days a very sanguine, energetic young man, and I may tell you, what was then no secret, that I had the lion's share of the labour, and hard work it was, too; although, as is generally the case with hard work, when you are in a condition to stand it, this did me a deal of good. Mr. Clement Cadle, I see, in his prize essay on Farming Customs and Covenants, states, handsomely enough, that he is something indebted in the compilation of his Customs to the "Law of the Farm," a work in which not merely the general arrangement, but actually some of my introductory remarks are taken, without any such acknowledgment, from the Tenant-right Digest. And it is from this digest, or like Hercules, by the aid of his own Club, that I propose to clear off the cloud of vague generalities, and to interpret those hitherto mystic phrases known as "unexhausted improvement," "custom of country," and "duties of landlords."

Description.—There is, then, in certain parts of Lincolnshire more especially, a certain custom which recognises payment for unexhausted improvement; or, in the words of the Report of the House of Commons' Committee:—

In some parts of the country a modern usage has sprung up, which confers a right on the outgoing tenant to be reimbursed certain expenses, incurred by him in cultivation, other than those of ordinary husbandry. That among such expenses are included the purchase of food for stock, the purchase of certain kinds of manure, and the draining, chalking, and marling of the soil; the result of all which outlay is, to effect an improvement of the soil, more or less lasting, and requiring more or less time to elapse before the increased productiveness, thereby obtained, reimburses the expenditure incurred. That this modern usage appears to have grown out of improved and spirited systems of farming, involving a large outlay of capital, and to have been promoted by forms of agreement between landlord and tenant, whereby the former covenanted to give compensation for such outlay; which forms have been from time to time altered and enlarged, and are still extending themselves with the continued advancement of agriculture. That these uses have gradually grown into general acceptance in certain districts until they have ultimately become recognised there as the custom of the country. That, in practice, the compensation agreed to be paid by the landlord to the outgoing tenant, is paid by the incoming one. That its amount is found by valuers, who ascertain the cost of the several improvements, spread that cost over a certain number of years, within which each kind of improvement respectively is supposed to repay itself, and then deduct from that number the time during which the tenant has enjoyed the benefit of the improvement. This usage is distinguished in the Commons' Report from the more ordinary practice of paying the outgoing tenant for "the preparation of the soil for crops by tillage, for the straw, hay, and dung left on the farm," and so forth. We then come to see which are properly the landlord's duties, and which the tenant's, in this good work of improvement. Briefly, then, the permanent, such as building and draining more particularly, should properly be the duty of the landlord, while the temporary, such as the due use of lime, bones, guano, oilcake, and ashes should be the business of the tenant. With regard to buildings, the House of Commons' Committee reported very much as the Farmers' Club Committee had done:—"The law, with respect to things affixed to the freehold is different and more beneficial as regards those annexations made for the purposes of trade than those made for the purposes of agriculture, an outgoing tenant being permitted in many cases to remove the former, when erected by himself, but not the latter. That this distinction does not appear to be supported by any sound reason, and your Committee are of opinion that the tenant's privilege of removal, with respect to fixtures set up for trading purposes, should be extended to those erected for agricultural objects." This recommendation has been carried into effect, and by an Act passed in July, 1851, a tenant has now the power to remove buildings which he has erected with the landlord's consent, if the latter decline to take them at a valuation. In fact his right so far is secured by law, but no further. The Report of the Commons' Committee admits "that the improvements (already mentioned) which are very generally required throughout the country, in order to develop the full powers of the soil, are greatly promoted by this system of compensation, and therefore it is highly important that all difficulties should be removed which stand in the way of its extension by the voluntary act of landlord and tenant." This is encouraging enough. The next clause, however, declares "That any attempt to make its general introduction compulsory would be met by great practical

difficulties, and your committee rely for the general and successful adoption of the system on mutual arrangements between landlords and tenants." Although this was only carried on a division, still the feeling against legislation has been very strong at times and places; and the landlords of Lincolnshire actually petitioned against the custom being enforced by law, on the very good but rather selfish showing that in their own case the custom had the force of law already. Then Mr. Caird went further still, and as the *Times* Commissioner could hardly say anything too bad about tenant-right, as towards the end of his book he thus sums up against it: "It must be plain that it is not the interest of the landlords, if the decision is left with them, to adopt this system. To legalise it by Act of Parliament, so as to render its operation general over the kingdom, it would be necessary to prove that it would promote the public welfare. We have seen in the counties where it exists that *its agriculture is on the whole inferior to that of other districts* (the italics are his own), and in no cases, even under the most favourable circumstances, superior to other well-conditioned counties which do not possess this tenant-right. In every county it has led to fraud in a greater or less degree. It perpetuates bad husbandry, by stereotyping costly practices which modern improvements have rendered obsolete. It absorbs the capital of the entering tenant, thus limiting his means for future improvement. It unfairly depresses the letting value of the land. Perhaps it may be urged that we dwell on the abuses rather than on the fair and legitimate uses of the system. But it is not easy to see where the line of demarcation is to be drawn."

It is easy enough here to see what it is the writer does not wish to see. Instead of attempting to draw any demarcation line, he is, on the contrary, very careful throughout the whole of this passage to confuse the payment for acts of husbandry with that of the payment for acts of improvement. Holding him to the latter—to the tenant-right we go in for, payment, that is, for unexhausted improvements—I am prepared to contradict on evidence every one of his statements. I say that it would be to the interests of the landlords generally to adopt this system. I say that where it already exists the agriculture is on the whole not inferior but superior to other districts and to other well-conditioned counties which do not possess this tenant-right. I say emphatically that its effect is to perpetuate—the word of all others—not bad but good husbandry, by stereotyping not obsolete but modern improvements; and I say that it raises not depresses the letting value of the land. I have promised that this contradiction should be made on evidence, and the first witness I will call shall be Mr. Caird himself. It is thus, writing in 1850, and still as a *Times* Commissioner, that he speaks of Lincolnshire:—"Till the reign of George III. the county remained in a neglected state, the fee simple of the now cultivated wolds and heaths worth little more than their present annual rent; the fen districts an unwholesome reedy waste, prolific of ague and aquatic birds. Till even a more recent period the improvement was slow. In the parish of Limber, 60 years ago, four tenants renting 4000 acres of land at £125 each, or 2*s.* 6*d.* an acre, became bankrupts. The same land is now yielding its owner upwards of £4000 a year, paid by prosperous tenants. Lincoln Heath, whose improvement had begun in Arthur Young's time, excited his astonishment that farmers in prosperous circumstances could afford to pay 20*s.* an acre for land which a few years before had yielded nothing, or next to nothing, to its owner. For the same land they now pay double, and at Blankney several thousand acres were let as rabbit-warrens in his time at 2*s.* to 3*s.* 6*d.* per acre, for which Mr. Chaplin now receives 20*s.*, the increasing rent being accompanied in both cases with the increasing wealth of the tenants. The transition has therefore been very rapid and striking, perhaps more so than in any other county in England. It was very fortunate that, when the time for this transition arrived, the leading landlords were liberal and enlightened men. Among these may be named the late Earl of Yarborough, and Mr. Chaplin, of Blankney. They saw the advantage of encouraging their tenants to embark their capital freely, and as leases were not the fashion of the county, they gave them that security for their invested capital which is termed tenant-right, and compensation for unexhausted improvements. Though this tenant-right may not be strictly a legal claim, it is universally admitted in Lincolnshire, the landlord paying it when the farm falls into his own hands, and refusing to accept a tenant who declines to comply with the custom. It varies, however, considerably in different parts of the county, and appears to have enlarged in its obligations with the greater development of agricultural improvement. In North Lincolnshire the usual allowances claimed by the outgoing from the incoming tenant include draining, marling, chalking, claying, lime, bone, guano, rape-dust, and oilcake. The following is the scale," &c.

Why, what, in the face of this, his own testimony, does the mean by saying that it is not, or has not been, to the interest of the landlords to adopt the system?—that where it exists the agriculture is inferior, and that it depresses the letting value of the land? Why every, line he writes, every figure he gives, proves that the system has raised the value of the land, and bettered the condition of owner and occupier. This extraordinary and unwarranted antipathy would be altogether inexplicable but for one significant fact—Mr. Caird is a Scotchman; and so surely as a Scotchman comes to teach us farming, so surely does he start with the infallible dogma that there can be no good farming without a lease. In concluding his labours as a Commissioner Mr. Caird says prophetically of the English farmer that "The wishes for leases will increase when the tenant-at-will discovers that security for his capital by tenant-right is neither possible nor desirable"—so far about the very worst prophecy that ever was made.

Mr. Caird, in his description of Lincolnshire, as just quoted, makes mention of the Chaplins of Blankney. Let me, then, call the present owner of those fertile lands as my next witness.

It was thus that Mr. Henry Chaplin spoke in the House of Commons but a few weeks since, not merely as one of the members for, but as one of the landlords of Mid-Lincolnshire: "In England, especially in those parts of the country where agriculture was carried to the highest perfection, there was something which was entirely wanting in Ireland—namely, a marked, distinct, and accurate system, capable of being enforced at law, assuring the tenant that he would be amply repaid for everything that he had laid out in the cultivation of the soil in the event of his being ejected from his farm. He would take as an instance the custom that prevailed in the county which he had the honour of representing—and he did not think he should be accused of undue partiality when he asserted that his county stood pre-eminent for the excellence of its cultivation. In no county was the science of farming carried to such perfection, or capital more liberally expended upon the soil, and nowhere was the identity of interest between landlord and tenant more fully recognised, or were more cordial and kindly feelings entertained between them. And yet this was a county where leases for a term of years were practically unknown, or, at all events, were very rare. It would merely weary the House were he to enter into details with respect to the various arrangements. They were many, and necessarily so, because in themselves the operations of farming were of a very multitudinous character. Under those arrangements compensation was amply provided for everything that could be laid out in fair farming, the amount of compensation to be paid being fixed by a valuer or valuers, and a third party being called in to act as umpire if necessary. So simple was that operation, and so well known its results, that an appeal to law or a dispute scarcely ever arose; and not the least advantage of the system was that it applied with equal effect to small or large farms. By this means security of tenure, and its attendant beneficial results, were attained; and, although no man could more heartily acknowledge than he did the cordial and kindly feelings mutually entertained with respect to each other by the landlords and the tenants, yet in his judgment those feelings were mainly due to the uniform operation of the just and effectual system of tenant-right to which he had referred." Mr. Chaplin is known to be a rising man in the House, but this speech alone might make him a reputation. It will be observed that he does not depend upon cordial and kindly feelings between landlord and tenant—very good things, no doubt, as far as they go and as long as they last—but he looks at the matter in a really business-like light, and speaks of a system, marked, distinct, and accurate, capable of being enforced by law, and assuring to the tenant ample repayment for everything he has laid out. And against this, and such results, how can Mr. Caird, I say, maintain his monstrous assertion that it is not to the interests of the landlords to adopt such a system? Only go to the heart of the landlord's interest in the question, and see how his rents would rise or fall by the establishment of tenant-right. According to the too prevalent custom, a tenant, if only duly and fairly forewarned of his going, does all in his power to leave the land as low and exhausted as, without directly infringing on any rule or covenant, he possibly can. Let tenant-right have the sanction of the Legislature; let the good farmer work under its protection, and it would be his interest to farm well up to the day of his departure, for this very simple reason—instead of, as in an unprotected state, gradually drawing in the value of his money, and staying the force of his ability, he would have confidence to make the most of every minute on every acre as long as he held it, knowing that just compensation would await him for what he left behind. Now, take the matter of rent here. Ask any agent or any tenant what difference is made in rent to a man entering on land in a good or in a bad state of cultivation? Hear how the incomer will, in the one case, plead the time he will have to wait, and the sums he will have to find before he can count on the least return. Attend to this, and only mark the effect it must of course have on the estimate. In the other case the talk is all the other way. Here is the land in a condition fit to repay as readily as that of the oldest inhabitant on the estate; and if one hesitates at the 40*s.* per annum, depend upon it there are plenty of others more than anxious to take it at almost any rate of rent a man of business could put upon it. Keep up the cultivation and you keep up the rent. Lower the one, and there will be a *sequitur* in the other as inevitable as unprofitable. The time spent by a tenant in enriching at his entry, and in impoverishing at his exit, is so much time lost to himself, so much income lost to his landlord, and so much food and wealth lost to the country.

I will call but one witness more to clear up any "vague generalities," and this shall be, as appropriately following a Lincolnshire landlord, a Lincolnshire tenant who has himself often been engaged in making these valuations according to custom.

I quote from a letter that I was the first to publish, but which has since gone the round of the papers. "Lincoln" says: "The great interest felt at the present time in farm agreements, leases, and tenant-right, and the frequent mention of the Lincolnshire tenant-right system induces me to give you the leading features of that system, which has made those parts of Lincolnshire where it is adopted one of the best, if not the very best farmed district in England. Let me first mention that tenancies, as a rule, commence and expire on April 6, six months' notice being required, and that leases are quite the exception. When a tenant quits his farm (and I now speak of the custom where no private agreement exists) he will be allowed for all underdraining done with tiles on the five years', and, in some cases, on the seven years' principle, including labour of leading tiles and putting in; on liming he will be allowed on the five years' principle, including carriage; half the last year's linseed and cotton cake bill will be allowed him, or one-sixth of the last three years; the whole of his last year's artificial manure bill will be allowed if used for roots; and all buildings made of wood and resting on brick or stone will be taken at their full value. The manure and the straw are the property of the landlord. These are the foundations of a system which, in Lincolnshire, has in one generation raised the rental of hundreds of acres of land from 5*s.* per acre to 30*s.*, and the fee simple from £10 per acre to £50 and £55." There is one sentence in this letter to which I would call your especial attention. This is where the writer speaks to a custom under which compensation can be claimed where no private agreement exists. There is no doubt but that the continued discussion of the tenant-right system and the gradual spread of information on the subject have done immense good, as more than anything else to root out the frowsy fusty old form of agreement that too long held something like sovereign sway in agents' and solicitors' offices. Landlords and land-stewards, as they come to be more enlightened, come more readily to introduce liberal or compensation clauses which encourage the tenant's exertions, and recognise his right to his own.

And here some would stop; but I would not. Like the Lincolnshire landlords, men who have the sense to see the advantage in, and avail themselves of, the custom, need, of course, no Act of Parliament to induce them to do so.

But any such argument as this is offered in defiance to the first principles of legislation. Laws are made not so much to bind over the good as to keep in order the bad, and to mete out equal justice to all; as it is clear enough that if tenants holding only under liberal landlords or enlightened agents can feel secure in this way, that equal justice is not meted out to all. In fact, we propose to stop just where and when the pressure is most required. Moreover, the elaborate agreement which minutely defines what improvements the tenant shall make and what rotation of crops he shall take, is fast going out of fashion. If a man be only to lime, bone, or chalk his land after a special contract to that effect with the owner or agent, he might just as well turn farm-bailiff forthwith, or hold under the last model Welsh agreement, which directs him how to burn his weeds and how to ask permission of his landlord if he should think of leaving home for a month or two. But then it is urged, further, that the law has no right to interfere in any private bargain made between man and man, or to put it more directly between owner and occupier. Why, the law is always interfering in the bargains made between man and man. The law ratifies the agreement between the citizen and his apprentice; the law looks jealously enough to the hiring between master and servant, and the law is ready enough to throw its protection over any unfortunate man who, in any private transaction with his fellow man, has made a bad bargain in buying a horse, a house, or a business. Why should it not afford its protection to the tenant-farmer?

Again, the relative positions here of the two contracting parties are, as Mr. Weller said of his grog, "unekal, and that's just the fault of it." Let the agreement run as it will, let there be agreement or no agreement, a landlord has always "a case" against an outgoing tenant for dilapidations, should the man have not acted fairly by the land. But, on the other hand, should the tenant have laid out capital on the land without full opportunity of reaping the benefit of it, he, as any lawyer will tell him, has "no case," unless this be in the bond. Thus, you see, there is a sense of equity for the one side and not for the other. But, it is said, it would be difficult or dangerous to attempt to legalise any particular custom. Why, half the statutes in the law books are little more than legalised customs, which, having been found to work well merely from force of custom, have been further emphasised by the force of law. And this is what I ask here; as against this the Tenant-right Committee of the House of Commons says, "any attempt to make these allowances compulsory would be met by great practical difficulties," and so would not recommend it. Now if it were proposed to pass a law of details by which compensation, say for the use of bones, should be made to extend over so many years in this district, and so many the less in another, then I say with the House of Commons' Committee there would be great practical difficulties in the way. One might as well attempt to draw up an agreement that should suit all the world over. But I would propose to do nothing of the kind. I would simply have the law recognise and support the justice of the principle, which would enable a man to claim his rights, even where, as "Lincoln" puts it, no private agreement exists.

Mr. Caird said 20 years back that the wishes for leases amongst English farmers would increase; since when, I believe, there has been scarcely any perceptible increase in such a direction. I will not say why it is, but so it is, neither landlords nor tenants in England would seem to care about leases, as some of the best farmed land in England is cultivated without any such security of tenure. But I care not which it may be; a lease, like a shorter agreement, cannot stand alone. In the evidence taken before the Parliamentary Committee the advocate for leases invariably stipulated for some provision towards the end of the term, as he was always ready to admit that without a proper system of compensation for unexhausted improvement even the most orthodox system of tenure could not be properly carried out.

One word more, and I have done. Often as this subject has been previously discussed by the Club, I cannot but think that it comes on very opportunely just now. If I tried to read the signs of the times, I should say it was by no means improbable that the present Government took up in turn the Land Question in England; and I feel very confident that much good might follow from further inquiry.

Mr. Philip Pusey, our stedfast champion, has long since departed from amongst us; but I look with even greater hope to a Parliament wherein I can find men like our present chairman, Mr. Howard, and our past chairman, Mr. Sewell Read. When that first inquiry into agricultural customs came on, one of the witnesses called was Mr. Chandos Wren Hoskyns, then described as a

barrister-at-law, but now more distinguished as one of the members for the bucolic city of Hereford. And we have a promise of further aid here, for it was thus that Mr. Wren Hoskyns, as a witness, answered one of the chief questions put to him as an agricultural lawyer—"Do you think that legislation could compulsorily direct compensation to be given by the landlord to the tenant for those improvements?—It would be very difficult to make it an act of direct legislation; but it appears to me that powers might be intrusted to those who should direct the arm of legislation in enforcing the claim of the tenant for improvements of that kind that had been made; not that legislation should dictate what the allowance or compensation should be, but merely that there should be a power given by the Legislature, in order to authorise their decision upon such a subject, whether it be the arbitration of a single referee or umpire, or the arbitration of a board or court." I am happy to be able to agree so much with so distinguished an authority as "Talpa," who, I trust, will have an early opportunity of saying again in the House that which he said so well in the committee-room. Customs vary very much—Yes. There are some customs that are very pernicious in their effects—Yes. Customs are often hazardous or uncertain in their action—Yes. But suppose from all this variety, uncertainty, and mediocrity, we are able to cull some custom that is particularly good, what shall we do with it? Why, make the most of it, of course; and this I contend we should best do by sanctioning its extension. In the claim we urge, as I hope I have in some degree succeeded in showing, there is nothing obnoxious, nothing impertinent, and nothing encroaching. It is an argument grounded and maintained on those wholesome ethics, Reason and Right.

HEXHAM.

Sterility in Soils.—At the last monthly meeting of this Club, Mr. H. R. GODDARD read a paper on this subject:—

A celebrated man has said that he who can make two blades of Grass grow where one grew before has conferred a benefit upon his country. I dare say we all know places, ay, and even whole districts, where this seems to be possible. Of course the terms fertility and infertility are only relative; at different times and in different places their signification may alter much, and therefore it may be necessary just to state the meaning we wish to place upon them. Simply, and without attempting a laboured definition, a soil may be said to be unfertile when its produce is below an average, even when ordinary care has been bestowed upon it in preparing it for and in getting in the seed. The causes of infertility may be divided into two classes, those that are natural and those that result from the course of management, or rather mismanagement pursued.

Among the natural causes of infertility we shall find some that at first sight we should say were beyond our power to remedy—situation as influencing the climate, for instance, but it is surprising how much climatic influences may be modified. We often hear complaints of the lateness of a district retarding the ripening of the corn, until autumn weather renders the harvest precarious and spoils the quality of the grain. High-lying land may be protected and materially sheltered by plantations judiciously placed, but the effect that high farming alone has is wonderful. I was over an estate some time since, and had frequent opportunity of observing two farms—one lay in a hollow slightly falling to the south, and sheltered on all sides; the other consisted of poorer land, over 100 feet higher, and with a much worse aspect. Any one would have classed the first as an early and the other as a late farm; the latter was taken in hand by the proprietor, well farmed, and the corn top-dressed; the other was badly farmed, and the consequence was they changed places, and the corn was safely stacked on the exposed land, while on the other it was still standing in the field.

Again, the temperature of a district will be affected by the rainfall and by the facilities existing for passing the water off the land; undrained land, where the water is retained by beds or bands of clay, and rendered stagnant, will be found colder than the same will be when properly drained. In both these particulars large woods or forests have an injurious effect; they both increase the rainfall of the district and prevent the water from evaporating from the surface, or being carried off by the wind. Cases have been recorded where springs, never known to have failed, have become dry when neighbouring plantations have been removed, and have remained so until a fresh growth has covered the land. The removal of large forests is calculated to make a country both warmer and drier, and for this reason in naturally humid climates much wood is not a thing to be desired.

Other natural causes of infertility may be found in the soil itself, and before passing to these it may be as well just to glance at its composition and functions.

We know that the soil is the source from which plants derive all their inorganic or mineral as well as a portion of their organic constituents, and therefore what we find in the plant we may rest assured of finding in the soil.

The ashes of all plants seem to contain variable quantities of the following substances:—Potash, soda, lime, magnesia, oxide of iron, silica, phosphoric acid, sulphuric acid, and chlorine, all being found in compounds more or less complex, none of them being uncombined.

Now, by careful experiment it has been found that plants cannot thrive if any one of these substances be wanting in the soil, and consequently that a soil cannot bear a productive crop unless all the constituents wanted by the plant are present in sufficient quantity and in such a form that the plant can absorb them. Potash, for instance, might exist in the soil in the form of felspar or mica, but not being present in a soluble form, the plant would not derive any benefit. Thus we see that it is not merely necessary that all the constituents of the plant should exist in the soil, but also that they should exist in an available form; and it is for this reason that analysis cannot give us always a correct idea of the comparative fertility or infertility of a soil, for though it will reveal the absence of any substance, it cannot always show whether they are present in such a form that the plant can make use of them.

We see, then, two causes which might render an otherwise fertile soil unfertile, viz., the absence, or the comparative absence, of some necessary constituent, or its presence in an unavailable form.

Again, infertility may be due, not to a deficiency of anything, but to the presence of something in the soil which has an injurious influence upon vegetation. If organic matter be present in an active state of decomposition it prevents the healthy growth of plants, and vegetable acids are produced, which often have a most injurious effect; these are often found inland, where an excess of water keeps the air from permeating it.

Decaying matter absorbs oxygen, and for this cause a large quantity of it is not a desirable thing. Iron, too, present in its lowest form of combination with oxygen, has a very deleterious effect, and it is often found in peaty soils, or in a subsoil of blue clay.

Things of this sort may often be noticed in soils which are being newly broken up. I saw a crop of Oats last year upon a marsh adjoining the Thames, the largest I ever saw; plenty of the straw was nearly the size of my little finger, whereas the year before, the field being fresh ploughed out, the Oats had completely failed. This might be due to the presence of some deleterious substance, which disappeared when the soil was laid open to the action of the air. In cases of this sort lime seems to be of great benefit; it neutralises any organic acids which may exist in the soil, and it assists the decomposition of vegetable matter, and with efficient tillage generally succeeds in removing these injurious substances.

But one thing which may be said more than any other to affect the fertility of a soil is the presence of stagnant water, no matter whether it comes from above or rises from below, and this for many reasons. The temperature of the soil is cooled, not only by the constant evaporation from its surface, and the growth of the plant retarded, but all the pores of the soil being filled, the atmosphere has not the power to penetrate to act upon the substances there, and prepare them for plant food. It not only acts directly as a poison on the plant but, by keeping out the air, tends to promote the increase of protoxide of iron and organic acids. The herbage found upon wet grass-land is sufficiently characteristic.

On tillage lands the furrows, often bare, or at best covered with spindly corn, shows the injury produced; but who can estimate the harm done by working such land in a wet state, as is often almost necessary, or the amount of manure wasted by its being washed off the land?

Land naturally fertile may be rendered unproductive by overcropping: all that is readily available for the use of the plant may thus be removed, but the soil itself aids and assists those who give it an opportunity to recover. The soil is not a dead inert mass, as we are apt to think; it is highly complex in its structure, and its insoluble parts are perpetually being acted upon by atmospheric and other causes, which prepare them for the plant. Tillage besides being necessary in suiting the mechanical condition of the soil for the reception of the crop we destine for it, is thus instrumental in preparing its nourishment, by enabling the air to gain access to all its pores, and to effect those chemical changes which are necessary. Too much importance cannot be placed upon all tillage operations being efficiently carried out. We sometimes find lands worn out by overcropping, possessing a good depth of soil which has never been turned over. Deep ploughing brings this to the surface, it becomes mixed with the impoverished soil, and materially assists in its improvement. Lime, too, may advantageously be applied to land in this state; it seems to act upon the constituents of the soil, and helps to render them available for the use of the plant. Thus we may say that it assists the soil to elaborate from itself what otherwise we should have to bestow. I have heard of land being overlimed, and can easily imagine where it has been continuously applied and then discontinued that the soil would feel the lack of the stimulus it gave, unless supported by an increased supply of manure. But this should be no argument against the application of lime, for by increasing the crops it gives the material for the manufacture of that manure which is necessary to sustain the land at its increased standard of fertility. Rain and dew have a great influence, and a considerable manurial value. In their fall they bring with them from the air ammonia and nitric acid, which are absorbed by the soil if of a clayey, loamy, or peaty character. The quantity, though not large in itself, yet becomes important when we consider the amount of rain and dew constantly falling, and the effect upon the crop of any nitrogenous manure we all know. They bring with them, too, carbonic acid absorbed from the air, and many things insoluble in pure water are thus to a certain extent made soluble.

Water charged with carbonic acid in contact with bone earth or insoluble phosphate of lime can even take a portion of this into solution. Drainage is, I think, the first improvement on poor and wet lands, and not merely for the reasons stated above, but because so much manure is wasted or washed away when applied to land undrained. Draining is necessarily an expensive process, and it is of the utmost importance to do it thoroughly, so as to avoid any risk of having to do it over.

I have seen a great deal of drainage rendered inefficient by attempting to keep in the old furrows, which are seldom at regular distances, often varying from 8 or 10 to 14 yards. Outfalls are often left in such an unprotected state that they become stopped, and a great portion of the labour and expense rendered useless. Every farmer should, for his own interest, see that they are gone through at least once a year. Rabbits frequently enter them when not grated. Last summer on one farm I had three main drains taken up stopped in this way.

There are great varieties of soils: we speak of clayey, sandy, and peaty soils, and there are endless modifications of these. Either of them pure would be absolutely unfertile, not merely from its chemical but from its mechanical condition. Nothing could thrive in an absolutely pure clay, even if it possessed all that the plant required; we therefore endeavour to modify soils which contain an overwhelming amount of either clay, sand, or peat, by the admixture of what will alter its texture and improve its composition.

There are soils so situated as to have the means for improving them in close proximity.

The poor sandy land of Norfolk has been wonderfully improved through the application of the marl, which lay almost close to the surface, and this has been used to an enormous extent through Kent, Berkshire, Lincolnshire and Cheshire, in fact wherever the marl was to be found, and the soil seemed to repay its application. Peat land in Lincolnshire has been thus improved, trenches being dug, sometimes to a considerable depth, and the subsoil laid upon the surface.

Perhaps the most wonderful instance of the improvement of a barren soil took place in the north of Scotland, on the estate of, I think, the Marquis of Tweeddale. The soil was a useless peat. The proprietor having discovered a good soil underneath, made canals thoroughly intersecting the land, into these the peat was thrown and floated away, and the productive soil was rendered available for cultivation.

No matter how fertile a soil may be, it cannot be continually cropped without adequate manuring, and it is of great importance that all lands should be provided with sufficient and suitable accommodation for the manufacture of manure. The position of the land with regard to obtaining manures from other sources has a great effect upon the degree of fertility to which it will be raised. Proximity to a large town, or direct and speedy communication with one, affords great opportunity for improvement. Perhaps there never was a time when greater facilities were available for making improvements general. The theory and practice of draining is better understood, we have more efficient implements of tillage, while steam is lending her mighty power to enable us to plough and to subsoil in a way which could not before be done. Supplies of manure are now being brought from the other side of the world to take the place of what is not returned to the soil. Never was there a greater amount of attention bestowed upon this subject, not merely in obtaining from abroad, but in manufacturing at home. We hear of refuse from our manufactories of all sorts being brought to the aid of agriculture, while even the primeval ocean seems to be rendering up its deposits. The potash which is largely obtained from the salt mines of Germany must have been deposited there from the sea, to which it had been carried down in the constant washings from the land. Thus we see that we derive benefit from what was robbed from the ancient lands, and we know not what changes may yet take place to render available for future generations the vast quantity of alluvium and sewage constantly being carried to the sea.

Geologists hold that the same causes which have resulted in the formation of the land we now inhabit are still at work. We have streams and rivers carrying to the ocean, to be deposited in its bed, the elements of future soils which only need the action of those volcanic agencies which are so actively at work in some parts of our globe, and to a less extent even here, to raise them above the sea, and thus render them available for cultivation.

Though this may be the case, and though the sewage now descending into the sea may not be ultimately lost, if one takes a broad view of the thing, still we personally should be benefited if the difficulties could be overcome of collecting, concentrating, and rendering it economically available.

DISCUSSION.

The CHAIRMAN said Mr. Goddard's paper exhibited a considerable amount of knowledge of the subject, and much care in its preparation. He told an agriculturist, the other day, that Mr. Goddard was to read a paper on

the want of fertility in soils, when he replied, "That's easily answered; they don't put muck enough on it." On most soils, as Mr. Goddard stated, the first thing was to drain the soil; a great deal of manure was wasted if put on wet lands. He believed almost any land could be made fertile by a sufficient amount of manuring, but then the question always came before them, "Will it pay?" It was the consideration of that question that was the most important,—in what way could they fertilise these very poor soils without throwing their money away? The causes of sterility should be carefully noted down, so that bearing these in mind they could go the right way about restoring the fertility of the soil. Steam cultivation, which was beginning to be appreciated in this neighbourhood, was of great advantage. The result, as it seemed to him, was to bring to the surface the poor subsoil by ploughing deeper than usual, and thus lessen the produce of the first crop. But the autumnal digging by steam cultivation broke the soil thoroughly up, and still left the surface soil on the top, to be exposed to the winter's frosts, winds, and rains, and in spring, instead of coming to work a hard and disagreeable soil, they would find it quite mellow, and would scarcely think it was the same field as before. The atmosphere was made to do the work for them during the winter, instead of waiting till spring and having to work the land over and over again; because, being exposed to the air, the atmosphere did the work for them, which they would otherwise have to do at great expense. In that way they got the full value of the ammoniacal qualities to be derived from the atmosphere, and from the rain which brought it from the atmosphere. As to liming, Mr. Goddard did not think they could over-lime land, but he had seen land thoroughly exhausted by a bad farmer by liming. That farmer merely used the lime as a sort of pick-pocket for robbing the land of the little that was left in it. In good farming, where a proper use was made of the produce, and justice was done to the farm, a judicious use of lime would naturally increase the value of the land.

Mr. EDWARD ROWELL said the question appeared to him to be, What was the condition of the soils they had to operate upon in this district or county? In many instances they were in a very exhausted state, but whether the fault was in the system of cultivation adopted by the agriculturists of Northumberland, or from the imperfect application of manure, it was not for him to say. The fact, however, was patent to them all as they passed through the country, that many soils were in such an exhausted condition that the question arose whether, considering the high wages they had to pay, and the taxes that were laid upon them, it was really worth cultivation or not. He held that land, though liberally supplied with dung, would become exhausted. On Tyneside, 30 years ago, they could get a good crop of Turnips without any application of artificial manures, but they could not now secure the crops of Turnips which once ornamented and beautified the fields on Tyneside. Yet there must be some cause for this; some of the most important constituents must have become exhausted. The question was, What was the best plan to be adopted to render that soil as fertile as it was formerly? There was no question but that the expense in the cultivation of land was much greater now than it was 30 years ago on Tyneside. In referring to this matter, he might state that the ever esteemed founder of their Club, the late Mr. John Grey, introduced in this neighbourhood, though among an unwilling and prejudiced tenantry, the five-course system of husbandry. In his humble opinion, it was a well matured thought, worthy of his far-seeing mind; and by adopting this system, and allowing the land to lie one year in Grass, it gave it an opportunity of resuscitating itself, as it were, —of regaining some of its exhausted properties. The soil, in his opinion, had been exhausted of some of its important constituents, and the five-course system should be improved upon, the land not only being allowed to lie in Grass a single year, but for five years. Artificial manures simply acted as stimulants; they themselves did not contain that amount of organic matter that would add materially to the fertility of the soil, but they stimulated the soil, and pushed it, so as to make it grow that which it was not naturally capable of growing. Artificial manures were exhaustive in their effect, and there was no principle which they could adopt which would invigorate the land and restore it to its original condition so thoroughly as to allow it to rest, and to depasture it with sheep and cattle.

Mr. JOSEPH LEE, referring to over-liming of land, said he had seen land in his own neighbourhood so impoverished by it that it could not be restored to its original fertility. But on soils not accustomed to lime he believed nothing paid so well as lime. Land limed from generation to generation, however, got exhausted of vegetable matter and the other things so necessary for the growth of good crops, but if used judiciously lime was of great advantage. From his own experience of thirty years upon his farm, he might say that a portion of it, which lay at a distance from the steading, had never had a particle of manure upon it, and yet it was in much better condition than the other. That land is always three years in Grass; and for the sake of keeping his farm in condition he generally let it lie two years in Grass, and some parts of it five, six, or seven years in Grass. He had had experience, as a farmer, of very unfertile soil. If they applied manure or dissolved bones to the amount of £4 per acre they would produce Turnips at a cheaper rate per ton than they could by only expending £3 per acre on manures.

The Secretary (Mr. TROTTER) said that Messrs. Lawes and Gilbert, of Rothamsted, grew Wheat and Barley each upon the same land, for a period of between twenty and thirty years, by simply using artificial manures, and the crops were increasing intead of going back. It was not absolutely necessary to let the soil lie in fallow in order that it might refresh itself. He thought the true theory of farming was to begin by taking the water and the large stones, if there were any, out of the land, for so long as there were large stones in it they would never get the land thoroughly ploughed, and until they got deep tillage, and the bottom of the soil manured as well as the top, they would never have good crops. With respect to allowing land to lie at rest, he believed they got better crops on the four-course than they did on the five-course system; invariably he got better crops of Oats after the land only lay one year than when it lay two years. A very good theory went to prove this: When Clover-grass was well up in height the roots went well down into the soil, and there were few better manurers of the soil than roots of Clover. When the land was allowed to lie two years in pasture, whickens grew upon the land, and they got a double crop; they ploughed it for Oats, but the whickens got among the Oats and robbed them of part of their nourishment and lessened the value of the crop.

Mr. GODDARD said there was some little misapprehension respecting what he stated about liming land. Land could be over-limed, but what he meant to say was, that after the land had been limed and increased crops of Oats and straw obtained, a larger amount of manure should be applied to the land, so that it would not have cause to suffer much. Providing manure was not returned it would afford the best opportunity of deteriorating and depreciating the value of the land.

Mr. DRYDON said that if poor land had been limed and drained, and its surface not broken up, it would have been worth double the value it was now. There was no difficulty in reclaiming land on the general principles laid down by Mr. Goddard, but would it pay? Many improvements might be carried out if the tenants had long leases or compensation for such improvements. On not only poor soil under cultivation, but grass-land in the higher districts, hundreds of acres might be rendered of greater value in many ways were it not for obstacles thrown in the way, for purposes he need not refer to on this occasion, but of which they were well aware. These lands could be improved at much less cost, and made better land than the poor exhausted soils to which reference had been made, and if the owners of this land felt the proper philanthropic spirit, they would see to the improvement of it for the good of the community at large.

The CHAIRMAN stated that he was not in favour of allowing land to rest, as he believed it was merely a matter of calculation, "Will it pay or not?" Poor land, once drained, might be forced to grow crops by the proper application of manures.

Mr. CHRISTOPHER GRAY said he had had some little experience in the management of poor lands, and he agreed with Mr. Rowell as to the advisability of allowing it to rest in Grass. It would naturally refresh itself, and when ploughed up again they would get better crops of anything with the application of lime and proper management. But he happened to have a different kind of soil as well on his farm, which would not refresh itself by lying in Grass. By letting this land lie in Grass two years he got, as Mr. Trotter said, a worse crop of Oats. Had not the late respected Receiver of the Greenwich Hospital Estates allowed him to adopt the four-course system, the best management he could have afforded would not have brought the crops up to the mark. He farmed other portions of his farm on the five, six, and seven course system, for he found by this means he got better crops on these light soils and better Grass afterwards. The four-course system was the best for poor soils that would not refresh themselves, but the five, six, and seven course system was better where the land, if allowed to lie in Grass, would refresh itself.

A vote of thanks was carried unanimously, and Mr. Goddard thanked the members for the compliment.

Notices of Books.

Saddle and Sirloin: *or, English Country Life*. By The Druid. Rogerson & Tuxford, 265, Strand.

We take from the columns of the *Times*, in which a full and appreciative review of this work was lately given, the following short memoir of the author:—

"Our agricultural and sporting readers will pardon us, we are sure, if before attempting to give a sketch of the contents of 'Saddle and Sirloin,' we say a few words concerning the author, who quitted this world on March 16 last, at the age of 47, after a most laborious and indefatigable literary career. Mr. Henry Hall Dixon, better known under his pseudonym of 'The Druid,' was a native of Cumberland, and was educated at Rugby and Trinity College, Cambridge, at both of which places his natural genius and his untiring industry would have probably gained him high honours, but for the persistent ill-health which pursued him from childhood to the hour of dissolution. Upon quitting the University he read for the law, and was subsequently called to the Bar, but after receiving a few briefs he ceased to pursue the profession, although his book on the 'Law of the Farm,' which is regarded, especially in the northern counties, as an invaluable compendium, sufficiently proves the solidity of his legal acquirements. From his earliest years he took an intense interest in all domestic animals, but his fondest worship was reserved for the noblest of all the creatures which are devoted to the service of man—namely, the horse. His enthusiasm in this direction is attested by the various scarlet-covered volumes which he published, such as the 'Post and the Paddock,' 'Silk and Scarlet,' 'Scott and Sebright,' in all of which the British horse appears as the grand central figure, surrounded by an attendant body of satellites, trainers and jockeys, huntsmen and masters of hounds. As a proof of the purity of Mr. Dixon's equine enthusiasm, we may observe that he never made a bet in his life. Beside the above works, he wrote an immense variety of articles on sporting subjects in numerous magazines and newspapers. To the readers whom we are now addressing, 'The Druid's' quaint, terse, original style is well known, and perhaps it was never better exemplified than in his biography of the Marquis of Hastings, transferred to these columns. Of late years Mr. Dixon's sporting enthusiasm somewhat cooled, and he devoted all his energies to subjects more exclusively agricultural. He wrote a series of articles on celebrated English herds in the *Mark Lane Express*, and then made a three years' tour in Scotland for a similar purpose. The greater part of this journey was performed on horseback, and often in the most inclement weather, and the hardships which he underwent induced the illness which terminated his laborious career. The volume now before us, 'Saddle and Sirloin,' treats of similar experiences in Northern England."

The book thus introduced is a most readable collection of anecdote and sketch of character and scene. It is written always in full sympathy with and knowledge of every phase of country life, and generally in the belief that the reader feels and knows almost as much as the writer. The unaccustomed reader thus finds himself in a company whose lively and entertaining conversation is only gradually acquiring the mastery of his attention. Very soon, however, he is to the full as interested as the principal narrator himself; and there are many who will rejoice that this volume has been added to a previous long series ere the pen of the writer was finally laid down. The present work on English farm and sporting worthies is confined to the northern end of the island. To quote the preface, "The second part (South) will (D. V.) see the light in the course of the present year." Mr. Dixon's intention, thus announced, will have to be carried out by another.

We only add, that since his death the friends of Mr. Dixon have united to collect a fund which shall be at once a testimony to the value of his life and a help (much needed) to the widow and family who survive him. Agriculturists may well be called upon to join in this good work. Mr. H. M. Jenkins, the Secretary of the Royal Agricultural Society of England, is secretary to the fund.

Farm Memoranda.

ORMSKIRK AND SCARISBRICK: *April* 26.—Since Friday last we have had nice refreshing rains and warmer weather, and the country has undergone a magical change. On Friday the fields had a brown sterile appearance, and now they are covered with verdure. We never remember such a sudden change. Up to Friday last we had sunny days, cold nights, and easterly winds. The spring has been a very late one, but the land was in first-rate order for seeding, and old farmers tell us they like a late spring, and never remember a better seed-time than the present. Of course all the spring corn has been sown, and Potato planting is nearly finished. In some few fields the Potatos are sprouting above the ground. This district is celebrated for the culture of early Potatos, which fetch a higher price than those from Cornwall. All the small farmers and cottagers prepare their seed Potatos with great care; they are spread on every available shelf and floor, even under their beds, and sprouted. They are planted in beds along a wall or thick hedge having a southern aspect early in February, or even in January, care being taken not to break off or injure the sprouts, and are covered with light straw hurdles. These hurdles are removed on warm sunny days, and carefully replaced at night, and kept on during the day in frosty weather. Large profits are made by this careful culture (one small farmer tells us he has often made £75 an acre by early Potatos), and a crop of transplanted Mangels is usually taken afterwards. The shoots in these beds are now upwards of 6 inches above the ground. This minute kind of market garden cultivation could not be carried out by our large farmers who devote themselves to steam-ploughing and smashing, and the breeding of Shorthorn cattle and Leicester sheep. Like poultry keeping, it is only practicable by cottagers and small farmers, but in this district it is the mainstay of our very industrious and careful peasantry, and the benefit is felt not only in a money sense, but in the careful and steady habits which invariably accompany the practice of cultivation of either flowers or vegetables by the labouring classes. All our crops are looking well. We shall soon be busy with our Swedes; the land is well cleaned. Even the Wheat, so much complained of elsewhere, is looking well; in fact, so much seed is usually sown here that this crop is all the better for having had more than half of it killed by the frost; we may, therefore, fairly expect that an old saying among us, that a late spring is followed by a good harvest, will this year be verified. *W. H. B.*

The Week's Work.

MAY 7.—*Barley* is sown in some late districts up to the middle of the month, but it is liable to suffer from the early autumn frosts of such places, much of it in consequence being unfit for malting purposes, or seed for the ensuing season. The change of weather in such localities is often very rapid, so that the main point of success is to get the seed into a favourable seed-bed with plenty of sap to force forward germination and the formation of the ear, whenever the weather begins to change; otherwise the land will be scorched and the braird burnt up. To effect the former and avoid the latter, the ploughing, sowing, and rolling should follow each other as fast as the land will permit, and it is better to reduce the land to a fine tilth with the harrow and roller, the latter only if necessary, and then drill in the seed, as that ensures a more uniform

depth of covering and brairding than when sown broadcast. Heavy soils smash up, so as to keep the winter-made mould on the top. When sown with Grass seeds, as is generally the case in such districts, this should be done immediately, and the land rolled if the weather permits. Where 2 to 3 bushels of seed were sown in March, 3 to 4 will be required in May, but much depends upon the vitality of the seed.

Bigg or Bere (a six-rowed Barley), ripens earlier and is better adapted for late districts and seasons and for northern latitudes than Chevalier and the other varieties of two-rowed Barley. It is sown in Scotland from the beginning to the end of the month, and in late seasons in June, and in favourable summer weather will be in the stackyard by the end of August. In Denmark, Sweden, and Norway, where it is more extensively grown than in this country, instances are on record where it has been only six weeks in the land. The cultivation of the land and sowing are the same as for common Barley, but the seed is less, and if sound germinates more freely, so that about a bushel less seed per acre is sown. Like the two-rowed Barley it is capable of improvement, but hitherto sufficient attention has not been paid to the different varieties of Bigg, and what is best adapted for this and the other district and so on.

Buckwheat sow from this to the end of the month. It is generally sown on poor sandy and gravelly soils, where it pays better than Barley; but in late seasons, where the latter (Barley) has not been got into good land in time, the former (Buckwheat) is often grown with more profit. Buckwheat is also grown in game preserves. The more common practice is to sow from 1 to 1½ bushel of seed per acre broadcast, but drilling from 10 to 12 inches between the drills is to be preferred, as the birds devour greedily every particle of seed not covered when sown broadcast.

Hemp may yet be sown, as directed in April, in a favourable seed-bed.

Lucerne is sown as directed last month, but if intended for forage cropping the sooner the seed is in the ground the better. It is a deep-rooted plant, and only luxuriates in a dry subsoil and warm climate.

Lupine is sown throughout the month as directed in April, in poor, sandy, peaty, and fenny soils, adapted for its growth as a forage crop. When grown for seed the end of April to the second week in May is the time of sowing.

Rape sow for folding and soiling on land prepared as for Turnips, from 4 to 5 lb. of seed per acre, drilled in on the flat, 12 to 20 inches between the drills; in dry weather use the water drill. The crop is well adapted for heavy soils, and is very commonly grown on such, after paring and burning, in preference to Turnips, more especially in our southern and midland counties. Farther north paring and burning is an exceptional practice.

Hoeing winter and spring corn should now be finished. Where the land has been cultivated too shallow Thistles now begin to make their appearance in drills, but more conspicuously when the corn is growing broadcast; they require to be spuded out, and the deeper the Thistle is cut the longer it will be in rising again, or it may not rise at all if the corn crop covers the ground. Sainfoin and Lucerne when grown as standing forage crops require careful hand-hoeing, both to let in fresh air to the roots and to keep them free from weeds. Couch-grass growing in the rows should be carefully pulled out by the hand. Horse-hoe and hand-hoe Peas, Beans, Parsnips, Carrots, Potatos, and Cabbage, and in hand-hoeing draw the earth well up to the plants. Where the crops are sufficiently far forward earth up finally with the double mouldboard-plough. Potatos grown in "lazy beds," as they very generally are in Ireland, are earthed up with fresh soil dug from the alleys.

Grass Seeds may be sown as soon as the hoeing of Wheat, Barley, and Oats is finished, and the seed covered by the roller.

Mangel Wurzel sowing should now be finished. In dry weather damping the seed and a liberal supply of liquid with the liquid-manure drill should be attended to, so as to forward germination and secure a sufficiency of plant; and if this is done, what is sown just now may not be far behind the April sowing.

Fallows for Cabbages, Swedes, and Turnips, are now got ready, as the time of planting or sowing the respective crops arrives. The modern improvements in tillage implements have greatly simplified the work of spring fallowing for root crops, the cultivator having superseded the plough. The use of artificial manures is also rendering the occasional liming of spring fallows less necessary, while in other respects it is removing the old objections to growing root crops too close in succession. In dry seasons the roller should follow the cultivator, so as to keep in the natural sap, more especially on light soils, and some think the heavy clays of our southern counties for Cabbages and Kohl Rabi are more liable to burn up in dry weather than light land.

Liming, whenever the land requires it, is a very important branch of fallowing for root crops. We have applied from 30 to 300 bushels and upwards per acre of newly calcined lime from the kiln. It is applied when the land is ready for the manure. When the doses are small the shells are emptied where water can be had, and when slacked the hydrate is spread either from the carts with shovels, or by broadcast distributing machines. The latter make the best work. In applying large doses in moist weather, the shells are emptied upon the land in small heaps and covered over with the moist earth, which soon slacks them; but in dry weather, or, rather, when the earth is too dry to slack the lime, it is slacked in cart-loads, and the slacked lime carted and emptied in heaps. When spread it should be immediately harrowed into the land, and to incorporate large doses properly the aid of the scarifier may be necessary. Very heavy doses are incorporated by two or three applications, the land being ploughed and harrowed between each; but this is generally done under a summer fallow, to change the character of sour, tenacious clay soils. From 30 to 100 bushels of shells per acre is a common application at this season.

Brood Mares are generally timed to foal about the first of the Grass. They are not very punctual to their time, but this is more than compensated by the little trouble they give at foaling. Gentle exercise before foaling is in favour of a mare that has been accustomed to hard work, but for ten days before it should be very gentle, and at night she should have a loose box for a month prior to foaling. Afterwards grazing in a paddock with her foal is the best exercise and the only exercise she should have. *W. B.*

Notices to Correspondents.

BUTTER: *H. O.* complains, "I have every week to churn a few pounds of butter, and it always comes so white." [This was a week or two ago. Surely it is not so now—"Dr. Green" has cured that, with other complaints from the dairy, by this time. The Grass has mended dairy produce, both as to quality and quantity. Is it not so?]

MR. MECHI'S CATECHISM: *Faversham.* Mr. Mechi's agricultural catechism is contained in Mr. Mechi's book, "How to Farm Profitably," sold by Routledge, Broadway, Ludgate Hill.

WOOL IN THE STOMACHS OF LAMBS: *J. F.* says: "During the last 10 days I have got several large lambs dead, and upon opening their stomachs I find large balls of wool, quite hard, in them. Can you, or any of your correspondents, tell me the cause of it, and what I should do in the case? I may say the ewes have all had more than two lambs." [It is not uncommon to find masses of felted wool in the stomachs of lambs, and when the balls pass into the small intestines they obstruct the passage and cause fatal constipation; if the masses were only in the stomachs there is reason to suspect the existence of some other cause of death. Lambs are constantly in the habit of swallowing small portions of wool, and if there is an insufficient supply of food for them a considerable proportion of the wool remains in the stomach long enough to cohere. Give any of the animals which show signs of constipation a little castor-oil; let the ewes have oilcake, and take particular care that the lambs do not get any cotton-cake or other food difficult of digestion. If there is an opportunity for them to nibble the young Grass, let them take moderate advantage of it.]

Markets.

ENGLISH WOOL.

There has been no new feature in the trade during the last week. Transactions have been only on a moderate scale, but prices are well maintained, and appear likely to keep so.

CURRENT PRICES OF ENGLISH WOOL. Per lb.	s. d.	s. d.
FLEECES—Southdown hoggets	1 1 to 1	2½
Half bred do.	1 2 — 1	2
Kent Fleeces	1 3 — 1	4
Southdown ewes and wethers	0 0½ — 1	1
Leicester ditto	1 2 — 1	3
SORTS—Clothing	0 10 — 1	6
Combing	1 0 — 1	8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, May 5.

Prime Meadow Hay	77s. to 82s.	Clover, old	110s. to 126s.
Inferior do.	60 70	Inferior do.	80 95
Rowen	50 65	Prime 2d cut	100 110
Inferior do.	— —	Inferior do.	80 90
Straw	26 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, May 5.

Sup. Meadow Hay	84s. to 90s.	Inferior Clover	96s. to 114s.
Inferior do.	70 77	New do.	— —
New do.	— —	Straw	30 35
Superior Clover	123 130	JOSHUA BAKER.	

COALS.—May 4.

Hastings Hartley, 15s.; Holywell Main, 14s. 9d.; West Hartley, 15s.; Walls End Gosforth, 15s.; Eden Main, 15s. 6d.; Walls End Braddyll's Hetton, 16s. 3d.; Walls End Haswell, 17s. 6d.; Walls End Hetton Lyons, 15s.; Walls End Russell's Hetton, 15s. 6d.; Walls End South Hetton, 17s.; Walls End Tunstall, 15s.; Walls End Heugh Hall, 16s. 6d.; Walls End Original Hartlepool, 17s. 6d.; Walls End South Kelloe, 16s. 6d.; Brancpeth Cannel, 18s. 3d.—Ships at market, 53; sold, 32; unsold, 21; at sea, 10.

METROPOLITAN CATTLE MARKET.

MONDAY May 2.

We have a considerable increase in the supply of foreign Beasts, that of English about same as last Monday; Thursday's advance in prices is well maintained, and a few choicest qualities have been sold rather dearer. There is very little alteration in the supply of Sheep, either English or foreign, but the demand has increased, and prices are higher; we have a large number of middling Lambs on offer; they cannot be all disposed of, and best qualities are lower. Calves are rather dearer. Our foreign supply consists of 1380 Beasts, 8160 Sheep, 187 Calves, and 20 Pigs; from Scotland there are 223 Beasts; from Norfolk and Suffolk, 2000; and 247 from the Midland and Northern Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5 0to5	4	Best Long-wools		to
Best Shorthorns	4 10—5	2	Do. Shorn	5 0—5	4
2d quality Beasts	3 6—4	2	Ewes & 2d quality	— —	
Best Downs and Half-breds	— —		Do. Shorn	4 0—4	6
Do. Shorn	5 4—5	8	Lambs	6 8—7	6
			Calves	3 8—5	8
			Pigs	3 8—5	8

Beasts, 3850; Sheep and Lambs, 29,800; Calves, 196; Pigs, 100.

THURSDAY, May 5.

We have a large supply of Beasts and a dull trade, consequently prices are much lower than on Monday, and several lots remain unsold. Sheep and Lambs are more plentiful; the former are nearly all disposed of, but at lower rates; several pens of middling Lambs remain unsold; best qualities find purchasers at about Monday's quotations. The supply of Calves is larger, and prices are lower. Our foreign supply consists of 408 Beasts, 3570 Sheep, and 445 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4 8to5	0	Best Long-wools		to
Best Shorthorns	4 6—4	10	Do. Shorn	4 8—5	0
2d quality Beasts	3 4—4	0	Ewes & 2d quality	— —	
Best Downs and Half-breds	— —		Do. Shorn	3 10—4	4
Do. Shorn	5 0—5	4	Lambs	6 8—7	6
			Calves	3 4—5	
			Pigs	— —	

Beasts, 1077; Sheep and Lambs, 12,350; Calves, 577; Pigs, —.

METROPOLITAN MEAT MARKET.—May 5.

Best Fresh Butter	16s. per dozen lb.
Second do. do.	13s. "
Small Pork, 5s. 4d. to 5s. 8d.; Large Pork, 4s. 0d. to 4s. 4d. per 8 lb.	

MARK LANE.

MONDAY, May 2.

The supply of English Wheat to this morning's market was small. There was a fair attendance. Factors commenced asking 2s. to 3s. per qr. more money, which millers resisted, and ultimately a moderate amount of business was transacted in both English and foreign, at an advance of 1s. to 2s. per qr. upon the prices of this day se'nnight. Barley, Beans, and Peas were unchanged in value. Oats were steady at last week's rates. The top price of town-made Flour was raised 3s. per sack, and American was 6d. per barrel dearer.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk. White	39—47	Red	36—46
— — fine selected runs..do.	43 51	Red	39—48
— — Talavera	53—56		
— — Norfolk	— —	Red	—
— — Foreign	38 —54		
BARLEY, grind. & dist. 26to30s. Chev.	39—42	Malting	34—38
— Foreign .. grinding and distilling	22—25	Malting	30—40
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire..Potato	24—26	Feed	—
— Irish Potato	23—25	Feed	21—24
— Foreign Poland and Brew	21—24	Feed	19—21
RYE	32—38	Foreign	33—36
RYE-MEAL, Foreign	— —		
BEANS, Mazagan....30s. to 37s. Tick	31—49	Harrow	31—49
— Pigeon ....50s. to 56s. Winds.	—	Longpod.	—
— Foreign Small	41—43	Egyptian	38—40
PEAS, White, Essex, and Kent...Boilers	32—42	Suffolk	35—43
— Maple, 41s. to 45s. Grey	32—42	Foreign	33—37
MAIZE	— —	Foreign	29—31
FLOUR, best marks delivered..per sack	39—43		
— 2d ditto Small	28—40	Country	28—40
— Foreign per barrel	25 Per sack		29—35

WEDNESDAY, May 4.

Coastwise as well as by rail the receipts of Wheat from Essex and Kent were very moderate; the trade was not so active as on Monday last, but steadiness was still its predominant feature, and prices were well maintained. There was a fair supply of foreign Wheat on the stands, for which the market was steady, at very full currencies. Moderate supplies of Barley were on offer. The trade was firm, at steady quotations. Malt was quiet, but at full prices. Oats were in request, and extreme rates were paid for all descriptions; the supply was moderate. Beans were firm, and quite as dear. Peas commanded a fair amount of attention. Flour was firm, at full prices.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch	430	300	—	—
Irish	—	—	—	—
Foreign	17,390	4750	23,140	270 6300 brls.
	17,820	5050	23,140	

LIVERPOOL, May 3.—The corn market opened quiet but steady for Wheat, but the prices now required for Flour are checking the demand.

AVERAGES.

	Wheat.	Barley.	Oats.
Mar 26	42s 5d	34s 5d	21s 2d
April 2	42 5	35 0	21 5
9	42 8	34 11	20 9
16	42 10	35 2	21 5
23	42 7	34 11	20 8
30	42 7	33 1	21 7
Average	42 7	34 7	21 2

SEED MARKET.

The consumptive demand for this season's sowing being nearly over, the seed trade is in consequence now very quiet. Although the stocks of Clover seed left on hand are unusually light, no speculative inquiry has as yet sprung up. Spring Tares are a little cheaper. Mustard and Rapeseed continue to advance in price. Hemp and Canary seed are without change in value.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

"Economy.—Seeds Direct from the Growers."

James Carter & Co. Seed Growers

237 and 238, HIGH HOLBORN, LONDON, W.C.

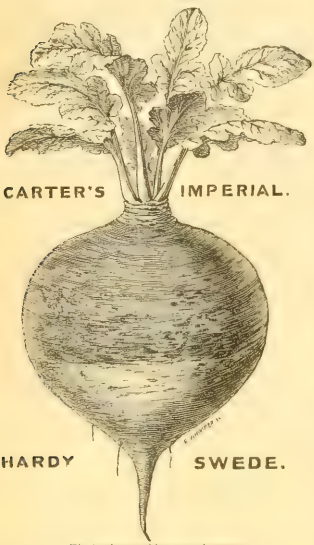

The hardiest and best in cultivation

9d. per lb. Cheaper per cwt.

CARTER'S LONDON SWEDE, the largest and best Per lb 0s 6d
SKIRVING'S LIVERPOOL SWEDE .. .. " 0 7
HALL'S WESTBURY SWEDE .. .. " 0 9
Cheaper per cwt. or bushel

Carter's New Champion Intermediate Mangel. (1s. per lb.)

CARTER'S WARDEN PRIZE MANGEL, the finest Globe variety Per lb 1s 0d
ORDINARY YELLOW GLOBE MANGEL .. .. .. " 0 8
CARTER'S MAMMOTH LONG RED MANGEL .. " 1 6
IMPROVED RED GLOBE MANGEL .. .. " 1 0
Lowest price per cwt. on application.

EVIDENCE OF QUALITY.

From W. GAZELEE, Esq., *Didlington, Nov. 1, 1869.*

"You will be pleased to hear that I have won a silver Cup for Red Mangels grown from your seed. This is the fifth year in succession that I have taken this prize."

From Mr. R. BEAMISH, *Kirtlington, Oxfordshire.*

"Mr. Beamish took First Prize at our Show with Carter's Warden Mangel and Carter's Imperial Swede."

Carter's Devonshire Grey-stone Turnip,

Of quick growth, and very fine quality.

1s. per lb. Cheaper per cwt.

POMERANIAN WHITE GLOBE TURNIP .. Per lb. 0s. 6d
LINCOLNSHIRE RED GLOBE TURNIP .. .. " 0 9
IMPERIAL GREEN GLOBE TURNIP " 0 8
CARTER'S EARLY NIMBLE, or Six-week TURNIP " 1 0

JAMES CARTER AND CO.,

237 and 238, HIGH HOLBORN, LONDON, W.C.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING AND BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S & C regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S & C's PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

ZIMMERMANN AND CO.,

MANUFACTURERS and IMPORTERS,

8 & 10, Vernon Place,
Bloomsbury Square,
London, W.C.

JARDINIERES in Bronzed Metal, with best China Pots, No. 12,508, 3 feet high, 26s.; gilt, 40s.

BRONZE FISH STANDS,

FIGURES, &c. &

FLOWER POT FRAMES.

REVOLVING BLINDS, made of Strips of Wood.

Price List on application.

12,500 Gilt.

WILLIAMS' PATENT "ARCHIMEDEAN" AMERICAN LAWN MOWER

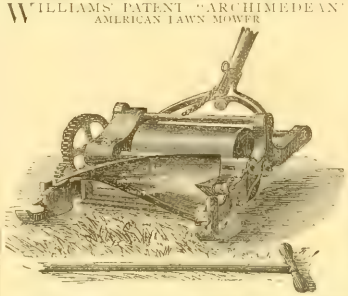

Is the only Lawn Mower that CUTS WET or LONG GRASS WITHOUT CLOGGING, thus enabling the man to work it in the morning, instead of waiting for the Grass to dry, and being under the heat of a mid-day sun, it is very easy to work, and will preserve its perfect cut whilst traversing over pebbles or sloping banks. NEVER INJURING THE ROOTS OF THE GRASS, with the direct cause of the Lawn, destroying the worm. Lawns in most instances, cost a Machine five or six weeks, after the Grass comes to work as the scissors in pinnacles, and you will perceive a great and decided improvement in your lawn.

"Far superior to any others."—*Vide Field.*

"Remarkably correct work."—*Vide Gardeners' Magazine.*

"The quickest, most simple, and most efficient Mower ever used." *Vide Gardeners' Chronicle.*

Catalogues and Opinions of the Press, post free on application at Manufactory and Sale by the Ironmongers and Patentees,

WILLIAMS and CO., 164, Fig. 1, The Broadway, E.C.

Woodyer Agent LIBS. O. Bourne, Old Swan Wharf, London Bridge, E.C.

SHANKS'S PATENT LAWN MOWERS for 1870.

The Patent Improvements recently introduced give

SHANKS'S MACHINE

Several important advantages possessed by no other Lawn Mower.

PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.

The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

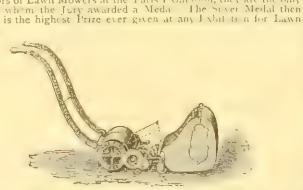

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines self-sharpening—that is, with Steel on both sides of each Blade, so that when they become blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be reversed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.

A Wind Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IDA WHARF), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage.

To Agriculturists.

GREEN'S PATENT HIGH-PRESSURE BOILERS, with Inverted Cylinder Engine combined. Simple and substantial in construction. The Boiler can be used for Steaming purposes. Specially adapted for Farm use.

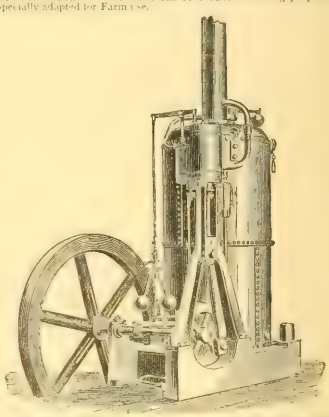

The above Engines and Boilers occupy very small space, requiring no brickwork or foundation. They are set to work at night working order, ready for immediate use. They are the best power always in stock at the prices of many others. Drawings and prices free on application to

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 63 and 65, Blackfriars Road, London, S.E.

American Lawns.

THE AMERICAN PATENT "ARCHIMEDEAN" LAWN MOWER

is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS.

The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

The *Field* says—"The Americans have been beforehand with us in many Machines, but we were not, however, until now aware they possessed a Lawn Mower which is far superior to any of ours."

The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 6 or 8 inches long. The 14-inch machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."

Sole Wholesale Agent for the United Kingdom,

JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

HENRY DOULTON & CO.,

HIGH STREET, LAMBETH, LONDON, S.E.,

MANUFACTURERS OF

VASES, PEDESTALS, FLOWER POTS, FERN CASES,

PENDANTS, GARDEN SEATS, EDGING TILES,

AND EVERY KIND OF

TERRA COTTA GARDEN ORNAMENT.

All the TERRA COTTA Manufactured by Messrs. H. D. & Co. is made of the best material, burnt extra hard, and

WARRANTED IMPERISHABLE.

PRICE LISTS ON APPLICATION AS ABOVE.

To Gentlemen, Gardeners, and Others.—Write for HEADLY AND SON'S Illustrated List of Prices of the NEW PATENT HYDRAULIC APPARATUS for Watering Croquet Lawns and Gardens, the NEW PATTERN FORCE PUMPS, the NEW PATTERN GARDEN CHAIRS, the NEW PATTERN GARDEN ARCHES, &c. Post free on application to E. HEADLY AND SON, Exchange Iron Works, Cambridge

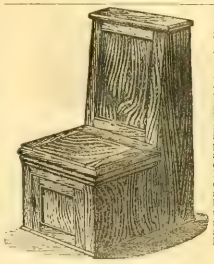

MOULE'S PATENT EARTH SYSTEM

From Mr. W. GILBERT, *Lawford Street, Rugby.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty, the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

MANLEY HALL, MANCHESTER

NEW HOT-WATER APPARATUS.

WHOSE IS THE BEST BOILER?

The most practical answer ever given to this all-absorbing question is, the New Apparatus in operation at the above.

It is considered the "largest" and "most perfect" ever erected, being a "wonder" in heating.

It works like a model, and is unequalled in Great Britain.

NOTE THE CONTENTS.

Reference No.	Name.	Quantity of Piping.	Reference No.	Name.	Quantity of Piping.
1	Hall	260 feet.	29	Orchid House	230 feet.
2	Corridor	90 "	30	Gymnogramma House	210 "
3	Closet	30 "	31	Plant Hospital	180 "
4	Picture Gallery	300 "	32	Gleichenia House	436 "
5	Sculpture Gallery	110 "	33	East India House	240 "
6	Conservatory (1st series of pipes)	720 "	34	West India House	240 "
7	Conservatory (2d " " ")	640 "	35	Span-roofed Plant House	260 "
8	Conservatory (3d " " ")	570 "	36	Heath House	260 "
9	Store Room	60 "	37	Late Vinery	280 "
10	Fernery (1st series of pipes)	380 "	38	Late Vinery	295 "
11	Fernery (2d " " ")	310 "	39	Peach House	310 "
12	Fernery (3d " " ")	380 "	40	Pit with Top Heat	150 "
13	Coach House	120 "	41	Croton House	360 "
14	Drying Room	60 "	42	Bottom Heat Tank in same	158 "
15	Harness Room	50 "	43	Forcing House	360 "
16	Coachmen's Rooms	30 "	44	Bottom Heat Tank in same	158 "
17	Living Rooms	75 "	45	Pit with Top Heat	160 "
18	Stables	380 "	46	Foliage Plant House	255 "
19	Passage	40 "	47	Bottom Heat Tank in same	110 "
20	Carriage Washing House	50 "	48	Ixora House	260 "
21	Entrance to Stable Department	60 "	49	Bottom Heat Tank in same	108 "
22	Fine Foliage Plant House	304 "	50	Flowering Stove	270 "
23	Bottom Heat Tank in same	80 "	51	Bottom Heat Tank in same	108 "
24	Palm Stove	304 "	52	Pit with Top Heat	160 "
25	Bottom Heat Tank in same	80 "	53	Rose House	360 "
26	Orchid House	345 "	54	Mushroom House	96 "
27	Orchid House	364 "	...	Mains, various	1800 "
28	Orchid House	225 "			

Total, 54 Compartments, containing 14,471 feet of Piping, equal to nearly 3 miles, all heated on

WEEKS'S ONE-BOILER SYSTEM.

No other but WEEKS'S UPRIGHT TUBULAR BOILER has ever approached such an extraordinary achievement.

A limited number of COLOURED LITHOGRAPH PLANS and SECTIONS, with Reference Notes and Explanations, giving full particulars of this masterpiece of heating, are in preparation. They will be mounted in the form of a Map, and forwarded post free on application to

JOHN WEEKS AND CO.,

HORTICULTURAL BUILDERS AND HOT-WATER APPARATUS MANUFACTURERS,

KING'S ROAD, CHELSEA, LONDON, S.W.

☞ J. WEEKS AND CO.'S "BOOK of DESIGNS" (12th Edition) free by post.

John Weeks & Comp.ʸ

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

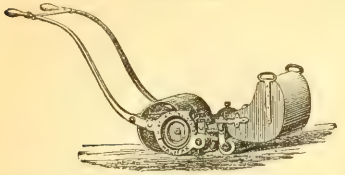

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

THE IMPROVED PATENT GARDEN WATER and ROLLING ENGINE may be had at J. DORE'S, the Sole Manufacturer, 17, Exmouth Street, Clerkenwell, London, W.C.

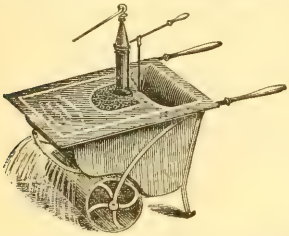

The threefold use of this neat little Machine must be obvious in Watering, Rolling, or Syringing; it will throw about 60 feet, and is so portable that any ordinary domestic may use it. It contains about 20 gallons. Price £5 10s.; 25 gallons, £6 10s.

RICK-CLOTHS, NEW and SECOND-HAND, with POLES, PULLEYS, &c., complete. An Illustrated Catalogue post free on application.

BENJAMIN EDGINGTON'S CRICKET TENTS, GARDEN TENTS, TENTS for FLOWER SHOWS.

BENJAMIN EDGINGTON'S WAGGON CLOTHS, HAY CLOTHS, GARDEN NETTING, FLAGS.

Address, BENJAMIN EDGINGTON (in full), 2, Duke Street, London Bridge, S.E. No other Establishment.

Bee-Hives.—Two Silver Medals Awarded to

GEO. NEIGHBOUR AND SONS, at the Paris Exhibition of 1867. The only English Exhibitors who obtained a Silver Medal for Bee-hives.

NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE, as originally introduced by GEORGE NEIGHBOUR & SONS, working under bell glasses, is neatly and strongly made of straw; it has three windows in the lower Hive. This Hive will be found to possess many practical advantages, and is more easy of management than any other Bee-hive that has been introduced.

Price complete .. £1 15 0
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The LIGURIAN or ITALIAN ALP BEE being much in repute, GEO. NEIGHBOUR & SONS supply a Swarm of Bees with genuine Italian Queen, in the Improved Cottage Hive, at £4 4s.; Hive included (each will shortly have wholly yellow Italian Alp Bees).

An Italian Alp Queen, with full directions for uniting to Black Stocks, £1 1s. each.

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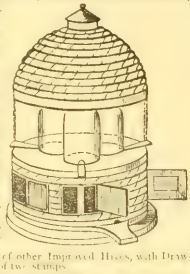

AGENTS.—Liverpool, JAMES CUMMINS, 12, Clayton Square; Manchester, J. WILSON, 50, King Street; Dublin, THOMPSON BROTHERS, 18, Dame Street; Glasgow, AUSTIN & M'ASLAN, 16, Buchanan Street.

INDIA-RUBBER GARDEN HOSE, 60 feet ¾-inch hose, with brass tap, rose, and jet complete, 19s. 6d.
60 feet ⅝ inch do. do. extra strong, 21s. 6d.
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application.
E. G. CAPON, India-rubber Manufacturer, Quadrant, Birmingham.

Cottam's Iron Hurdles, Fencing, and Gates.

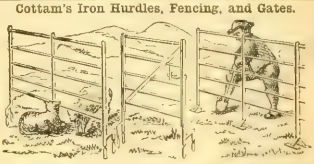

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

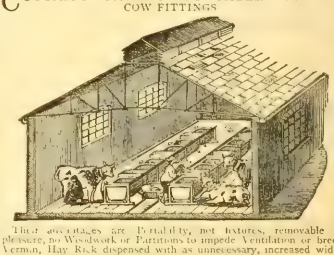

Their advantages are Portability, no fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

SURVEYS MADE

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PLANS PREPARED

FOR THE

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Horticultural Builder &
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TO SUIT ANY STYLE OF ARCHITECTURE.

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GARDEN ENGINE.

10 Gallons	.. ..	£3 0 0
16 ,,	.. ..	3 16 0
24 ,,	.. ..	5 1 0
28 ,,	.. ..	5 13 0

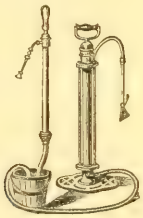

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Useful for every variety of purpose in watering or washing flowers or trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.

Price, complete £1 8 0
Small size for the hand, as an ordinary Syringe .. 0 15 0

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2½ inches	..	£1 9 0
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SWING **WATER BARROW.**

20 Gallons	.. ..	£2 2 0
30 ,,	.. ..	2 14 0
38 ,,	.. ..	3 18 0
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PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use

C. AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

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The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, "Rock Hills," gave his approval of their usefulness. The right to Manufacture them was transferred to

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Every description of Wire Work for Gardens, Conservatories, &c.

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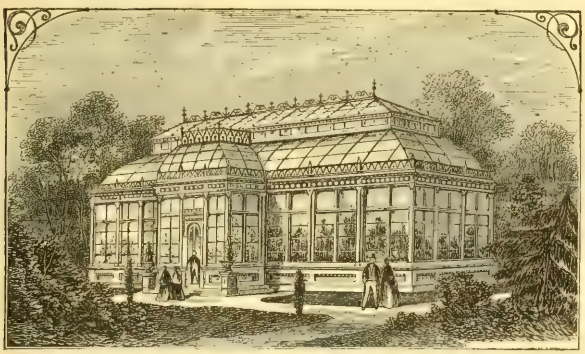

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GRAY'S OVAL TUBULAR BOILER.

INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

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"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

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W. S. BOULTON & CO.'S

NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

These Machines possess important advantages. By the introduction of a Radial Link, the adjustment of the various parts is rendered exceedingly simple. Breakages are entirely avoided, by making the handles and all other light parts of malleable iron. They adapt themselves to inequalities of the ground, and suit persons of any height by means of the handles working loose. This arrangement also admits of their being used as a Roller, by folding back the front or cutting end. Every Machine is warranted to give entire satisfaction to the purchaser, and if not approved of can be returned. An Illustrated Catalogue, with prices, sent free by post on application.

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W. S. BOULTON & CO.'S DOUBLE CYLINDER and BALANCE HANDLE GARDEN ROLLS.

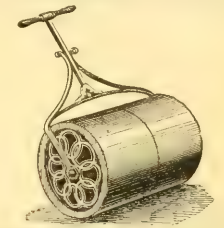

These articles are really first rate, both as regards workmanship and materials. They are divided in the centre, which admits of their being turned with ease, and without injury to the Grass or Walks, the ends being rounded off. The price is also very low.

Carriage paid to any Station in England.

20 in.	long by 18 in.	diam.	£2 17	24 in.	long by 22 in.	diam.	£1 17
22	,,	20	3 7	20	,,	24	4 7

SINGLE CYLINDER ROLLS. Carriage paid.

18 in.	long by 18 in.	diam.	£1 15	22 in.	long by 22 in.	diam.	£3 0
20	,,	20	2 8	24	,,	24	3 14

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PROTECT YOUR CROPS.

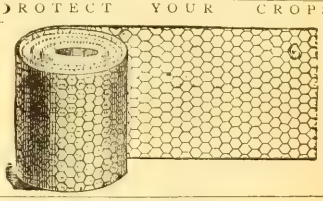

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WIRE GAME NETTING, GALVANISED after MADE, sent carriage paid to any station in the Kingdom at the following very low prices:—

2 feet high, 2-inch mesh, No. 19 guage, price 3¾d. per yard.
3 feet high, ditto, ditto, price 5¾d. per yard.
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All Netting failing to give entire satisfaction can be returned at once.

A full Descriptive Priced Catalogue sent gratis on application.

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W. S. BOULTON AND CO.'S 36-gallon SWING WATER BARROW—Oak Tub.

Carriage paid to any station in England.

Price, £2 5s.; Ditto, with two tubs, £3 3s.; Spreader and valve, 15s. extra.

SWING WATER BARROW, with galvanised iron tank. To hold 18 gallons, price £1 15s.; Ditto, 30 gallons, £2 5s.

Rose Lane Works, Norwich.

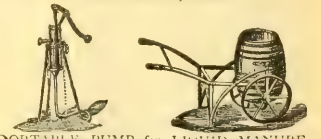

PORTABLE PUMP for LIQUID MANURE or WATER, 45s.; 10 feet india-rubber suction pipe, 20s. Carriage paid.

W. S. BOULTON AND CO.'S NEW SWING WATER or MANURE CART, with galvanised iron tank.

Carriage paid to all the principal Stations in England.

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Carriage paid to the principal Railway Stations in England. To hold 140 gallons, price £10; 200 ditto, £12; 250 ditto, £14

Galvanised Iron Pump and 10 feet India-rubber suction pipe, price £3 10s. Spreaders, 15s. each

ROSE LANE WORKS, NORWICH.

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J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at their wharf in London.
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6 ft. by 4 ft. Lights, 2 in. thick, unglazed.. £0 5 0
" " Primed and Glazed with 10 oz. Sheet 0 11 0
" " with stout portable Box, not Painted 1 3 0
" " Painted four coats, and Handles on 1 8 0
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6 ft. by 8 ft., Double Lights, do. 2 15 0
GREENHOUSES Per ft. super
Woodwork only Prepared and Fitted 0 0 6
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Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,

WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras

BATH and GAS WORK ERECTED in TOWN or COUNTRY
The Trade supplied.

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GREEN'S PATENT TUBULAR HOT-WATER BOILERS.

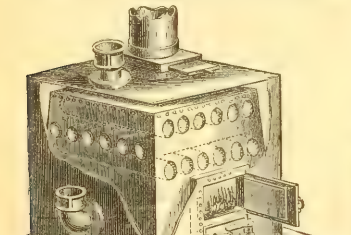

The following are the advantages of these Boilers:—
1st. They require no setting in brickwork.
2d. They are complete in themselves, having perfect means of regulation
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7th. The chimney is made of cast iron, which can either be taken through a roof or turned into a flue to meet the convenience of the situation that it may be fixed in
They are warranted to be the most Economical Boilers extant
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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each.
GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England

CRANSTON'S PATENT BUILDINGS for HORTICULTURE, Larkfield, Pershore Road, Birmingham
Descriptive Book, fully illustrated with Wood Engravings by the late Oscar Jewitt, from existing Houses in various parts of the Kingdom. Post free for 30 stamps

SPECIAL NOTICE—NEW PATENT.
The "GARDENERS' GREENHOUSE," including Conservatory and 12 Pits and Frames, with floor and stages in one structure, all complete, made to stand upon any level space, and not requiring walls These buildings of two sizes, viz., 24 by 18 feet, and 21 by 16 feet, are kept in stock ready to set off at three days' notice
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"Perfect ventilation without admitting rain or moving any of the glass.
"The readily sound and dry glazing without the use of putty."
"Glass in large panes and cut flaps."

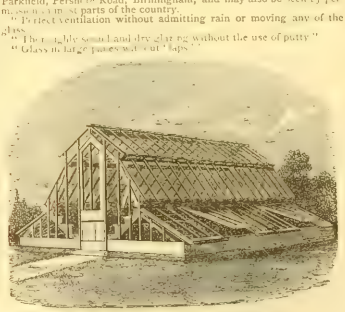

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HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at wholesale prices. Flows, T pieces, syphons, and every other connection kept in stock.
WROUGHT and CAST-IRON CONICAL SADDLE, and IMPROVED CONICAL, also Bridge, Boilers, from 25s. each

Improved Conical *Tubular Boiler*

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 52s. 6d. each
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INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water tight
Gongs, of the very best manufacture, delivered at Railway or Wharf in London.

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		2-inch.	3-inch.	4-inch.
HOT WATER PIPES, Nos 6 & 7 on illustrated sheet	per yard	*s. d.* 0 11	*s. d.* 1 5	*s. d.* 1 11
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SYPHONS	No 23 on do "	1 0	1 6	2 0
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HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
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H. BROOK AND CO., Sole Manufacturers of the CHELTENHAM GARDEN ENGINE, which weighs only 3 lb. 1 oz., throws water in a continuous stream over 35 feet. The large size, worked by the foot, throws over 60 feet, and is strongly recommended as a fire-engine. To be had of all Ironmongers, and Wholesale only at 10, Featherstone Buildings, Holborn, London, W.C.

COLEMAN AND MORTON'S HAND WATER-CART and GARDEN ENGINE.

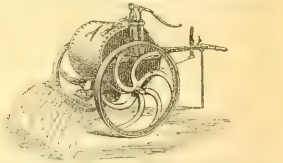

For use in Gentlemen's Gardens and Grounds. The delivery valve can be worked at the outlet when filling a watering-pot. It holds 25 gallons. The spreader for Watering Lawns, &c., can be removed at pleasure.
Price with Spreader £5 5 0
Force Pump for Watering Trees, &c. .. .. 2 2 0 extra.
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CHEAP PAVING TILES. A Manufacturing Firm have a considerable Stock of PLAIN and ENCAUSTIC TILES, more or less damaged in the process of manufacturing, that they would be willing to DISPOSE OF, at prices below those of the commonest description of Paving materials. To landed proprietors these Tiles are invaluable for the floors of Cottages, Farmhouses, &c., and can be supplied at a very low rate
Address E., Post Office, Broseley, Salop.

Vases and Fountains, for the Garden and Conservatory.

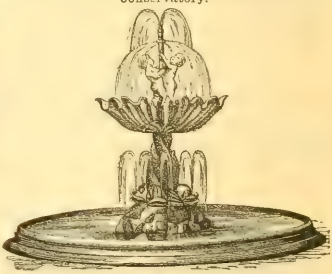

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The Britannia Iron Works have for the last 40 years been well known for the production of fine Iron Castings. The use of Cast-iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra-cotta. Cast-iron Vases, if occasionally painted, are imperishable, and will not crack when exposed to wet or frosty weather.

Five large Sheets of Designs and Price Lists post free for 6 stamps.
A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
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6 in by 7 in	14 in by 10 in	12s 0d	13s 0d	15s 0d	16s 6d
11 in by 10 in	18 in. by 12 in	15s 0d	15s 0d	15s 0d	17s 0d
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Lists on application.

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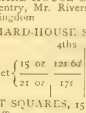

Each.—s. d		Each.—s. d
2 inches in diameter .. 0 4½	12 inches in diameter .. 1 9	
3 " " .. 0 4½	13 " " .. 2 0	
4 " " .. 0 6	14 " " .. 2 3	
5 " " .. 0 9½	15 " " .. 3 0	
6 " " .. 0 8	16 " " .. 3 6	
7 " " .. 0 10	17 " " .. 4 0	
8 " " .. 1 1	18 " " .. 5 0	
9 " " .. 1 2	19 " " .. 6 0	
10 " " .. 1 4	20 " " .. 7 0	
11 " "		

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6 " " .. 0 10	11 " " .. 2 6		
7 " " .. 1 1	12 " " .. 3 0		
8 " " .. 1 4			

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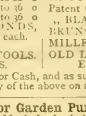

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16 " 8 6	24 " 12 6	
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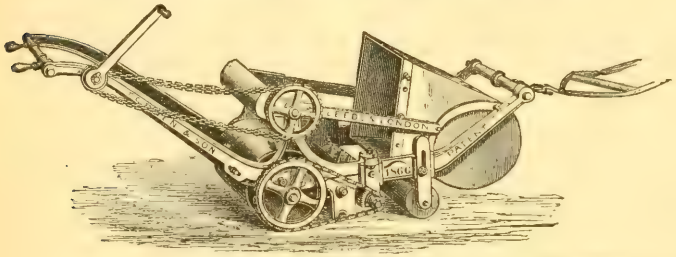

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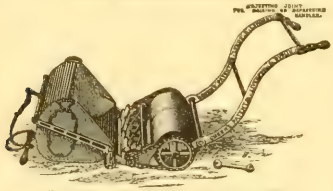

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Packing Cases are charged at the following low rates, viz.—For the 10 and 12 inch Machine, 3s; 14 and 16 inch, 4s; 18 and 20 inch, 5s; 22 and 24 inch, 6s. Parties providing themselves with Lawn Mowers are recommended to purchase the cases in which to stow them away when not in use, to prevent them from getting damaged; if returned, two thirds will be allowed for them

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First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
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First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
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T. GREEN AND SON did not exhibit at the Paris Exhibition, 1867.

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FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
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16 in.	17 in.	2	15	0

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ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
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30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
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30 in.	60 in.	15	10	0
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30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

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PRICES.

24 inches by 26 inches	.. ..	.. £4	0	0
20 ,, 22 ,,	.. ..	.. 3	2	6
16 ,, 17 ,,	.. ..	.. 2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

Every Machine and Roller is warranted to give entire satisfaction, and, if not approved of, can be returned at once unconditionally.

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Having very extensive Premises in London, we are in a position to do all kinds of Repairs there, as well as at our Leeds Establishment.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.

Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE

AND

AGRICULTURAL GAZETTE.

No. 20.—1870.] SATURDAY, MAY 14. { Price Fivepence. / Stamped Edition, 6d.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
SHOW of PELARGONIUMS, HEATHS, &c., on WEDNESDAY, May 18. Band of the Scots Fusilier Guards from 4 o'Clock. Doors open at 2. Fellows' friends' tickets bought before the 18th, 3s. 6d; admission on the day, 5s.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
FLOWER SHOW, FRUIT and FLORAL COMMITTEE MEETING, on WEDNESDAY NEXT, May 18, at 11 o'Clock GENERAL MEETING at Three. Band of the Scots Fusilier Guards from 4. Admission, 5s.

LINNEAN SOCIETY, Burlington House, Piccadilly.—The ANNIVERSARY MEETING of this Society will be held here on TUESDAY, the 24th of this Month, at 1 o'Clock precisely, for the ELECTION of a COUNCIL and OFFICERS, for the ensuing year.—May 12. FREDERICK CURREY, Secretary.

READING HORTICULTURAL SOCIETY.—The SPRING SHOW will be held on FRIDAY, May 27 (by permission of the Mayor), in the Abbey Ruins, Reading. A Band will attend as usual. The Show will be open to the holders of Subscriber's tickets at 1 o'clock, and to the Public at 4 o'clock, on payment of 1s. Schedules and tickets may be obtained of the Hon. Secretary,
CHARLES COLLIER, Esq., 34, Chain Street, Reading.

BRIGHTON and SUSSEX HORTICULTURAL SOCIETY.—GRAND ROSE and FRUIT SHOW, TUESDAY, June 28, at the Royal Pavilion and Eastern Lawn. Upwards of 50 Prizes are offered for Roses, and 43 for Fruits. Schedules on application to the Secretary, Mr. EDWARD RAPER, 41, Western Row, Superintendent of the Exhibitions, Queen's Graperies, Brighton.
N.B. GRAND AUTUMN SHOW, SEPTEMBER 14 and 15.

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870. PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, with Forms of Entrance, on application to F. G. HIKLE, Secretary, Peterborough.

A Glorious Show of Roses.

TEA, BOURBON, CHINA, and NOISETTE, May be secured and enjoyed all the Summer BY PLANTING NOW.
Good plants of finest kinds, from pots, mostly 48's, are ready to be presented to all, in exchange for Cash, at 40s per 100; if sent in pots, 50s. per 100. Packing charged extra
CHARLES NOBLE, Bagshot.

Roses for Bedding, &c.

ROSES, New and Old, strong plants, in pots, now ready for delivery. A large stock of VERBENAS and FUCHSIAS, and general BEDDING PLANTS, which contains a selection of the best varieties only. CATALOGUES free.
WM. KNIGHT, Floral Nursery, Hailsham, Sussex.

JAMES IVERY AND SON'S splendid Collection of AZALEA INDICA is NOW COMING INTO BLOOM, and will be found worth an inspection. The HARDY FERNS are also making a nice show.—Dorking, May 10.

To Seed Importers, Nurserymen, &c.

BETHAM AND SON, Custom House, Shipping and General Transit Agents, beg to inform them that they receive and forward SEEDS, PLANTS and GENERAL MERCHANDISE, from and to all parts of the world, at charges as low as possible.
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ADAM FORSYTH begs to inform the Trade and the Public, that he is now sending out his "NEW" and other choice CHRYSANTHEMUMS.
For description see CATALOGUE (containing a Treatise on their growth) now ready. Forwarded to all applicants for one stamp.
Brunswick Nursery, Stoke Newington, N.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part 1. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his FRESH DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

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EDWARD SANG AND SONS, NURSERYMEN and SEED MERCHANTS, Kirkcaldy, N.B., have now published their PRICED CATALOGUE of BRITISH FERNS for the present season. This Catalogue embraces the entire Collection of Plants which belonged to Dr. Lyell, Newburgh, Fife, and which they recently acquired from him by purchase.
☞ Copies free on application, and orders carefully fulfilled.

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JAMES FAIRHEAD AND SON, SEED GROWERS and MERCHANTS, 7, Borough Market, London, S.E., announce to their Friends and Others that their NEW and ATTRACTIVE PRICED LIST of DAHLIAS is now ready, and can be had, post free, on application

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ANEMONE HONORINE JOBERT, large white Japan Anemone, fine in autumn, 12s. per 100.
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JOHN KEYNES, Castle Street, Salisbury.

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Strong autumn struck Plants, with a good cutting, price 7s. 6d. each.

Carter's Index, May 14.

CARTER'S NEW COLEUS and GERANIUMS. See p. 659.—237and 659, High Holborn, London, W.C.

CARTER'S IMPERIAL HARDY SWEDE. See p. 659.—237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE TURNIP. See p. 659. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE GRASS SEEDS. 237 and 238, High Holborn, London, W.C.

The Chrysanthemum: How to Grow it.—See

ADAM FORSYTH'S CATALOGUE. Forwarded for one stamp.
Brunswick Nursery, Stoke Newington, N.

DOUBLE WHITE PRIMROSES. 2000 large plants, £6 per 1000
1000 CALCEOLARIA KAYII, £5 per 1000.
2000 GOLDEN FEATHER, £5 per 1000.
P. M. W., Messrs. Tait & Co., 45, Caple Street, Dublin.

SPRING PLANT CATALOGUE, 1870, containing all the NOVELTIES, English and Continental, of 1870, post free.
JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W

Spring Planting.—To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Aucubas, and other hardy Trees, Shrubs, and Evergreens, is just published, and can be had on application. Milford Nurseries, near Godalming

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WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
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CHARLES TURNER is now sending out, in strong plants, Perry's set of 12 NEW VERBENAS, which are of very fine quality and good growers. Also a Collection of the best for pot culture or bedding, now ready, 4s. to 9s. per dozen.
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SUTTONS' GRASS SEEDS for GARDEN LAWNS, 12 per lb, or 20s. per bushel, carriage free.

SUTTONS' CHAMPION SWEDE, the best in cultivation 9d. per lb., cheaper by the bushel

SUTTONS' TURNIP SEEDS for PRESENT SOWING. See p. 671 of this week's Paper

SUTTONS' FARMER'S YEAR BOOK. Gratis and post free.
Royal Berks Seed Establishment, Reading.

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RICHARD SMITH'S MIXTURE of the finest GRASSES and PERENNIAL CLOVERS 18 to 12lb per acre, at 8d. per lb., if sown evenly, will cause a valuable improvement to the crop. RICHARD SMITH, Seed Merchant, Worcester.

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Edinburgh and London.—May, 1870.

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PAMPAS GRASS	3 0
DELPHINIUMS (sorts)	3 0

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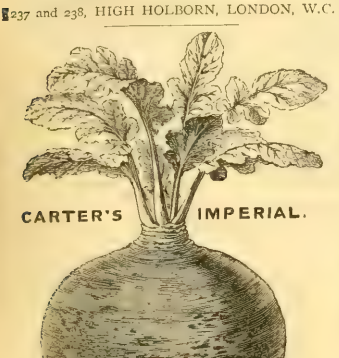

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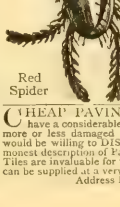

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The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS "FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
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Two yards wide	..	..	1s. 6d. per yard run.
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RALPH WALLER AND CO., 45, Dale Street, Manchester, Manufacturers of all kinds of GARDEN NETTING, &c.—The serious injury done every spring to fruit crops by frost has proved to every Gardener the absolute necessity of providing some protection to trees early in the season. If the blossom escapes its earliest development, be but slightly weakened by frost, the vitality of the fruit germ is destroyed, and the fruit lost. In this climate, on the average of a century, there is not more than one year in five in which the protection is unnecessary. Many fabrics have been tried for this purpose of protection, with more or less success; and we may now say, without fear of contradiction, that we have succeeded in manufacturing the only fabric which is altogether unobjectionable for this purpose. Without unduly nursing, it effectually protects the young germ, and does not impede the action of light and due circulation of air. Some other fabrics do this, and thus weaken the vitality of the tree altogether. Almost every large grower in the three kingdoms can testify to these facts.
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GARDEN SYRINGES	..	..	4s. 6d. to 20s.
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To cut 10 inches, 4 knives, 12 blades, £4 10s.
Suitable for a Lady.
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They are the only machines in constant use at most of the principal places in England, being preferred above all others.
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The following are the many uses of these Boilers:—
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6 ft. by 4 ft. Lights, 21 in thick, unglazed	..	5	0
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,, ,, with stout portable Box, not Painted	..	1	3
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GREENHOUSES Per ft. super.

Woodwork only Prepared and Fitted	..	0	0
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Which are in general use, and which Boilers have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.
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FOR
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WITH
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

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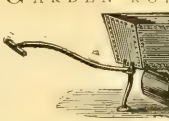
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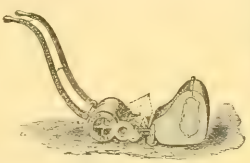
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Price per Gross, £4.
The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.
The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, "Rock Hills," gave his approval of their usefulness. The right to Manufacture them was transferred to
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Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each. GLASSES, all sizes.
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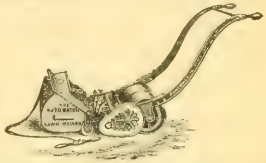
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UNIVERSAL PORTABLE PLANT PRESERVER.
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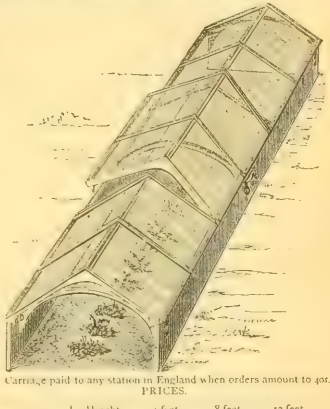
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12 Inches	11 Inches	9s	15s	20s.
18 „	12 „	11s.	19s.	26s.
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Loose ends, 6d., 1s., 1s. 6d., 2s. 6d., and 3s. 6d. each.
A remittance or reference must accompany the orders.
Larger sizes can be had, suitable for Potting Pits, 5 and 6 feet wide.

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NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE, as originally introduced by GEORGE NEIGHBOUR & SONS, wearing three bell glasses, is neatly and strongly made of straw; it has three windows in the lower Hive. This Hive will be found to possess many practical advantages, and is more easy of management than any other Straw Hive that has been introduced.
Price complete .. £1 15 0
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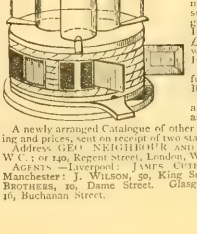
The LIGURIAN or ITALIAN ALP BEE being much in repute, G. N. & SONS supply a Swarm of Bees with genuine Italian Queen, in the Improved Cottage Hive, at £4 4s. Hive included. (Such will shortly have wholly yellow Italian Alp Bees.)
An Italian Alp Queen, with full directions for uniting to Black Stocks, £1 each.
ENGLISH BEES.—Stocks and Swarms may be obtained as heretofore.
A newly arranged Catalogue of other Improved Hives, with Drawing and prices, sent on receipt of two stamps.
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TRICOLOR and other PELARGONIUMS, in good plants, at the following low prices for cash:—Mrs. Pollock, 2s 6d per dozen; White Lady, 4s; Lady Cullum, 4s; Glen Fyfe Beauty, 5s; Countess of Craven, 6s; Kossuth, 5s; Castle Milk, 5s; Italia Unita, 2s 6d; Perilla, 3s; Crystal Palace Gem, 2s 6d; Luna, 2s 6d; Lord Derby, 3s; Leonidas, 4s. A large quantity of ZONALS, equally cheap. P.S. Sophia Dumbrepsie, 3s.
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Variegated Bedding Geraniums.

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B. WHITHAM has great pleasure in offering the above, and feels confident that it will ultimately prove itself to be a universal favourite, having been pronounced by competent judges to be one of the very best of its class.

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CHOICE DOUBLE GERANIUMS for BEDDING, in strong plants.
CAPITAINE L'HERMITE, bright rose, dwarf grower, 9s per dozen.
MADAME LEMOINE, carmine-rose, 9s per dozen.
MARIE LEMOINE, bright rose-pink, the best double yet sent out, large fl. wers, dwarf grower, and free bearing, 18s per dozen.
WILHELM PELTZER, bright carmine-scarlet, dwarf grower, and free flowering, 6s per doz.
MADAME MICHEL BUCHNER, flowers very double, borne in trusses 6 inches in diameter, delicate rosy salmon, dwarf grower, and will make a splendid bed, 6s each.
MADAME RUDOLPH ABEL, Dark carmine-rose, very brilliant and distinct, dwarf, and a great acquisition, 6s each.
PICCOLEE, PRINCE OF ORANGE.—Now in dry, set and 12s 6d each. See *Gardeners' Chronicle*, May 7, page 621.
The entire Trade Discount.
FREDERICK PERKINS, Nurseryman, and Wax Bloom, Regent Street, Leamington.

New Zonal Geranium, Purity (Eckford).

JAMES GARAWAY and CO. have much pleasure in offering the above, and can confidently recommend it as a decided acquisition. It is in the way of that well known variety Madame Werly, and is a great improvement on it.

For correctness of shape and delicacy of colouring it cannot be surpassed, and its freeness of flowering especially adapts it both for conservatory decoration and for effective bedding out.

Plants now ready, 5s. each. Four sent for three.

NEW SILVER-EDGED GERANIUM, MADAME VAUCHER VAR.—This is a sport from the green variety; is robust in habit, and with clear white, with occasionally a bright pink zone.

Plants ready the middle of May, 5s. each.

☞ Usual allowance to the Trade.

JAMES GARAWAY & Co.'s SPRING CATALOGUE is now ready, and sent post free on application.

JAMES GARAWAY AND CO.,
Durdham Down Nurseries, Bristol.

Sow now—Sow now.

PRIMULA FIMBRIATA, choicest possible strain, in growing seeds, 2s 6d; 100 plants, 4s. CALCEOLARIA, 2s 6d; CINERARIA, 2s 6d; CYCLAMEN, 2s 6d; POLYANTHUS, 1s 6d; with many other choice seeds for present sowing, all thoroughly reliable, and free per post.
PONSFORD AND SON, Nursery and Seedsmen, Bristol, Surrey, S.W.

Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted; each 1s., and 2s. 6d. per packet.
SCOTT'S WASP DESTROYER will quickly rid any place of Wasps, Crickets, Cockroaches, and other Garden pests. "It completely cleared the place."—*Vide* Testimonials, sent on application. Price 1s. 6d. and 2s. 6d. per bottle, in stamps.
J. SCOTT, The Seed Stores, Yeovil, Somerset.

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selection of—

Alstroemeres	Miscellaneous plants
Auriculas	" bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Primroses
Dahlias, in 5 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants | Verbenas

The Royal Nurseries, Slough.

NEW PLANTS.
ASPLENIUM HETEROCARPUM
ASPLENIUM RESECTUM
ADIANTUM DECORUM.
TRICHOMANES ARICULATUM.
TRICHOMANES MAXIMUM.
SELECTO PYRAMIDALIS.
For descriptions of the above see JAMES BACKHOUSE AND SON'S CATALOGUE of STOVE and GREENHOUSE PLANTS for the present season, which comprises Palms, Orchids, Ferns, &c., in the best varieties. Also a short list of select FLOWER SEEDS, including
AUBRIETIA PURPUREA GRANDIFLORA,
IMPROVED CALIFORNIAN POPPY,
DWARF EARLY YELLOW WALLFLOWER,
of Mr. Ingram's fine selected strain, described in the *Gardeners' Chronicle* last week.
JAMES BACKHOUSE AND SON, York

SPECIMEN VARIEGATED GERANIUMS,

AT MODERATE PRICES.

We hold a magnificent stock of VARIEGATED GERANIUMS in plants suitable for exhibition, varying in size from 1 to 3 feet across, and consisting of the best varieties in the three classes. They are in fine condition for the purpose named, and well worth a visit. Names, sizes, and prices on application.

F. AND A. SMITH, THE NURSERIES, WEST DULWICH, LONDON, S.E.

NEW PELARGONIUMS.

DOWNIE, LAIRD, & LAING

Have much pleasure in announcing that they are now prepared to send out the following

NEW BEAUTIFUL AND DISTINCT VARIETIES.

GOLD AND BRONZE.

	Each—s. d.
IMPERATRICE EUGENIE.—Golden leaf ground, with perfect zone of bright chocolate colour, robust growth, and compact habit; the brightest colour of any yet introduced for summer decoration; two First-class Certificates have been awarded.	21 0
MRS. LEWIS LOYD.—Large leaves, deeply lobed, of a golden-yellow colour, variegated with a narrow zone of reddish chocolate, habit good, a distinct and very effective bedding variety; gained a First-class Certificate	15 0
PRINCESS OF WALES. Yellow leaf ground, with medium zone of very dark chocolate, foliage large, smooth, nearly circular, and of great substance; growth vigorous, and habit compact; a magnificent and very distinct variety	21 0
W. K. MORRIS.—Leaf ground bright golden, with a well-defined bronze zone, foliage smooth and of great substance, shape perfect, a variety almost perfection, and unequalled for exhibition; was awarded the first prize at the Special Show of the Royal Horticultural Society at South Kensington, in May last; has gained several Certificates, and is figured in the "Floral Magazine" for January	31 6

The set of four for 63s.

HYBRID NOSEGAY.

	Each—s. d.
LADY HAWLEY.—Light orange scarlet, petals broad, truss large and compact, excellent habit, a magnificent variety; was awarded a First-class Certificate	7 6
LADY KIRKLAND.—Dark rosy purple, trusses of finely-formed flowers, carried high on a stiff flower-stalk, foliage very dark green; a really superb variety	7 6
STANSTEAD RIVAL.—Bright crimson, petals broad, of great substance, beautifully reflexed, with large truss of smooth well-shaped flowers, habit very good, colour quite new and distinct, a great acquisition; First-class Certificate; figured in "Floral Magazine"	7 6
SUNLIGHT.—Bright orange-scarlet, suffused with violet, trusses large, compact, and globular, petals broad, of immense substance, foliage fine, very dark green; a splendid variety	7 6
SUNSHINE.—Orange-carmine, suffused with purple, and shaded with light carmine, truss extra large, flowers magnificent, and habit compact; a beautiful variety	7 6

The set of five for 30s.

DOUBLE.

MADAME HOCK.—Very brilliant dark rose, flowers very large and double, vigorous and compact habit, very distinct; colour of Madame Barre 7s 6d each	VICTOIRE DE LYON.—Flowers reddish crimson, shaded with violet, colour quite new, and distinct from all other Doubles; blooms freely; habit dwarf and compact. 10s 6d each.

STANSTEAD PARK, FOREST HILL, LONDON, S.E., and EDINBURGH.

SOFT-WOODED AND BEDDING PLANTS.

JAMES VEITCH & SONS

HAVE THE PLEASURE TO ANNOUNCE THAT THEIR

CATALOGUE OF SOFT-WOODED AND BEDDING PLANTS

for the present season, comprising a LIST of the BEST NOVELTIES, as well as a selection of the most approved kinds in general cultivation, IS NOW READY, and will be sent Post Free on application.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, LONDON, S.W.

NEW DRACÆNAS.

MR. WILLIAM BULL

BEGS TO ANNOUNCE THAT HE CAN NOW SUPPLY

THE BEAUTIFUL TRICOLOURED DRACÆNA GUILFOYLEI,

In nice young plants, at 1½ guinea.

ALSO THE FOLLOWING NEW DRACÆNAS:—

ALBICANS, 1½ guinea.	EXCELSA, 2 guineas.	PULCHELLA, 1 guinea.
ANGUSTA, 1½ guinea.	LIERVALI, 1½ guinea.	REGINA, 1 guinea.
CONCINNA, 1 guinea.	NIGRO-RUBRA, 1 guinea.	SPECTABILIS, 1 guinea.

For descriptions, *vide* Mr. WILLIAM BULL'S CATALOGUE.

ESTABLISHMENT for NEW and RARE PLANTS, KING'S ROAD, CHELSEA, S.W.

BENJAMIN S. WILLIAMS'

GENERAL AND NEW PLANT CATALOGUE FOR 1870,

Contains LISTS of select ORCHIDS (many being now in flower), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS (both of which are extensively grown, and many fine specimens are now in full beauty), CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

B. S. WILLIAMS respectfully invites inspection of his numerous Collection of Plants, which at all times well repay a visit, but at this particular season are specially interesting.

CONSERVATORIES FURNISHED ON REASONABLE TERMS.

Choice Plants supplied for Balls or Dinner-table Decoration.

PRICED CATALOGUES Post Free on application.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870.—JUNE 9 TO 10.

NOTICE TO EXHIBITORS.—Persons who intend to take part in this Exhibition must signify their intention to do so by letter, addressed to the undersigned, on or before May 20.

ADMISSION.—First day, 10s. 6d. each; 2d day, 2s. 6d. each: Whit-monday and remaining days, 1s. each. Gardeners will be admitted by Tickets as follows.—First day, 2s. 6d. each; 2d and remaining days, 1s. each. Applications for these Tickets must be made on or before May 20.

The fine Bands of Her Majesty's 4th Dragoon Guards, and the 100th Infantry, in attendance each day.

Botanic Gardens, Manchester. BRUCE FINDLAY.

LEICESTERSHIRE HORTICULTURAL SOCIETY.—The GREAT SUMMER EXHIBITION of this Society will be held on the Race Course, Leicester, on TUESDAY and WEDNESDAY, July 5 and 6, when £40 will be offered in Prizes for Cut Roses, and upwards of £25 for Plants in pots.

A SHOW of BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition.

Schedules of Prizes and all particulars may now be had of Market Place, Leicester. WM. PENN COX, Secretary

LOUGHBOROUGH HORTICULTURAL SOCIETY'S EXHIBITION, JULY 13.

SPECIAL PRIZES FOR ROSES (open to all England).

1st, For the best Collection of 72 Roses (72 varieties), single trusses, 1st Prize, a Cup, or £6 10 : 2d, £5 5 : 3d, £3 3.

2d, For the best Collection of 48 Roses (48 varieties), single trusses, 1st Prize, a Cup, or £5 5 : 2d, £2 2 : 3d, £1 1.

3d, For the best Collection of 36 Roses (36 varieties), single trusses, 1st Prize, a Cup, or £3 3 : 2d, £1 1.

SPECIAL PRIZES FOR PLANTS.

For the best 12 Stove or Greenhouse Plants (distinct varieties), 6 foliage and 6 in flower (Orchids excluded), 1st Prize, £10; 2d, £6; 3d, £4; 4th, £2

Full information may be had from WM. PALLETT, Secretary.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE:—

For the Two best COLLECTIONS of FRUIT and VEGETABLES, 6 distinct kinds of each, a 1st prize of £7, and a 2d prize of £3.

☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.

The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868, and 1869 excluded from competition. The articles produced to be of the EXHIBITORS OWN GROWING.

STROUD HORTICULTURAL SOCIETY, 1870.—The ANNUAL FLOWER SHOW of the above Society will this year be held in conjunction with the Meetings of the Gloucestershire Agricultural Society, in Lord Bathurst's Park, Stroud, on WEDNESDAY, THURSDAY, and FRIDAY, August 10, 11, and 12. ONE HUNDRED and SEVENTY-FIVE POUNDS are offered in PRIZES. The Band of the Grenadier Guards has been engaged. Schedules and full particulars may be obtained on application to

EDW. W. WINTERBOTHAM, Hon. Secretary and Treasurer.

The Bank, Stroud, Gloucestershire, May 1, 1870.

VEITCH MEMORIAL.—The following are Corrections of previous Lists:—

Joshua Feilden, Esq., M.P., Witton Park, Blackburn	£2	2 0
Mr T. W. J. Fortey, Haven, Aymestry	1	1 0
Mr. Frederick Hocker, Gr., Warneford Place, Highworth	1	1 0
Mr. J. Johnston, Gr., West Lavant House, Chichester	0	10 6
Mr. John Kirk, Gr., Langleybury, Watford	1	1 0
Three Under Gardeners at Busbridge Hall	0	7 0
Mr William Lacey, Gr., Wiggonholt Park, Dorking	0	5 0
Rev. G. T. Marker, Grantlands, Collumpton	1	0 0
Mr. May, Kilnwood, Horsham, Sussex	1	1 0
Mr. Henry Memo, Clevelands, Lyme Regis	1	1 0
Mr. Thomas Newman, Gr., Torry Hill, Sittingbourne	0	10 6
O. Saville Onley, Esq., Sisted Hall, Braintree	1	0 0
Mr. William Smith, Gr., Marfield, Clonmel	0	10 0
Mr. F. Southam, Springfield Park Gardens, Knowle	0	5 0
Mr. R. Stringer, Royal Exotic Nursery	0	5 0
Mr. R. Tamplin, Gr., Fring Hall, Lynn Regis	0	5 0
Under Gardeners at Fring Hall	0	5 0
Mr. William Taylor, Gr., Buckland Filleigh, Highampton	1	1 0
Mr. T. Williams, Gr., Gaywood Hall, King's Lynn	0	2 6
Mr. M. Dunn, Gr., Powerscourt, County Wicklow	1	1 0

The Gardeners' Chronicle

SATURDAY, MAY 14, 1870.

MEETING FOR THE ENSUING WEEK.

WEDNESDAY, May 18 { Royal Horticultural (Fruit and Floral Committee), at S. Kensington .. 11 A.M. / Ditto (Scientific Committee) .. 1 P.M. / Ditto (General Meeting) .. 3 P.M.

In the last Number of the "Flore des Serres," we find an article by M. DUCHARTRE, based upon some researches of Prof. HOFFMANN, of Giessen, and which is so pertinent to the experiments in progress at Chiswick, and is of such general importance to cultivators, that we believe we shall be doing them a service by calling attention to it. By way of preface we may recall the interesting observations made at Rothamsted by Mr. LAWES and Dr. GILBERT, and from which it is made evident that the APPLICATION of certain MANURES to the MIXED HERBAGE of pasture land has the effect of diminishing to a greater or less extent, according to the nature of the manure employed, the number of species in any given plot, and consequently of favouring the growth of a few species at the expense of the rest. These results are so remarkable that one of the first series of experiments instituted by the Scientific Committee at Chiswick was undertaken with a view to throw light on this phenomenon. Twelve different species of plants, such as are commonly met with in pastures, were grown at Chiswick last year. For each species six boxes of sufficient dimensions were provided, 72 in all. In one box of each set of six the plants were placed in ordinary soil, to which nothing was added; to the other boxes different chemical manures were added, so that all 12 species were subjected to the same five manures. The growth of the plants was carefully watched and recorded, and a report will in all probability be laid before the Society at an early date.

Let us now turn to Professor HOFFMANN'S experiments, which were of a somewhat similar character. In a previous set of experiments the Giessen Professor had ascertained that the particular plants under observation grew equally well in all the varieties of soil in which they were placed, provided due care was taken to prevent the growth of intruding weeds. Having arrived at this result, Prof. HOFFMANN next left the several plants to themselves, with a view of ascertaining how they would comport themselves without assistance against the inroads of weeds. The result was that the weeds completely gained the upper hand, as might have been expected from their known habit. The species which held out longest was Asperula cynanchica. This plant, after having been grown in a bed for three years, and protected from weed-invasion by the use of the hoe, was then left to take care of itself. It held out for four years, but was ultimately elbowed out by the intruders. Bearing in mind the principle of "set a rogue to catch a rogue," Prof. HOFFMANN then set himself to observe the results of the internecine struggle between the weeds themselves, thinking that the ultimate survivors would perhaps prove to have special affinities for the soil in which they grew.

Thus left to themselves the beds became so densely covered, that in a square foot the Professor counted 460 living plants, and the remnants of many others, which had succumbed in the encounter. Every year in July the beds were examined, and every year the number of species was found to have diminished. Melilots, at first abundant, gradually disappeared; Artemisia vulgaris succumbed after two or three years; and so on, till at length only a few species were left, and these not only persisted but slowly gained ground from year to year, and ultimately remained in possession of the plot. The plots under observation were 2 mètres 30 cent. long, 1 mètre broad, all as nearly as possible under the same conditions, save that the soil was varied, in some cases consisting of the ordinary soil of the garden, in others of an admixture of lime, in others of sand, or of sand and lime, and so forth.

Of the 107 species under observation all, or nearly all, found the most essential requisites of their existence equally well in all the varieties of soil, so that, other conditions being equal, the nature of the soil was indifferent. The species which remained victors, all the others being ultimately dispossessed, were Triticum repens (Couch), Poa pratensis, Potentilla reptans, Acer Pseudo-Platanus (Sycamore), Cornus sanguinca, native plants; and Aster salignus, A. parviflorus, Euphorbia virgata, and Prunus Padus, derived from other portions of the garden.

It may, therefore, be inferred that the district in which these experiments were made would in process of time, if no obstacle were afforded, become covered with meadows and woods—meadows in the low ground and woods in elevated places. Again the experiments show that the survival of certain plants has not been influenced by the nature of the soil, thus the Couch-grass was ultimately spread over all the plots, whether of sand, or of loam, or of lime, whether drained or undrained. So also with Poa pratensis and Potentilla reptans. So that the chemical and physical nature of the soil, as has been so often shown in similar investigations, plays only a secondary part.

As to the action of shade, it was found by Professor HOFFMANN that low-growing plants, especially if annuals, disappeared rapidly, while taller-growing plants, such as Couch, Prunus Padus, &c., survived. The survival of certain plants then,—Couch, Aster, Potentilla, &c.,—is due much less to external conditions than to the "habit" of the plant itself, that is to say, to the facility the plant has of adapting itself to varying external conditions, and thus of triumphing over others less favourably endowed in this wise.

The immediate source of victory lies in the powerful root-growth of the survivors, including under the general term root, not only the root proper, but the offshoots and runners which are given off just below, or on the surface of the ground. Indeed, the latter habit of growth is more advantageous to plants in such a struggle than the development of the true root downwards would be. Among those plants where the roots were equally developed there were nevertheless inequalities of growth, dependent probably on the greater need for light in some species than in others, &c.

It is clear from Professor HOFFMANN'S experiments that, but for the continual use of the hoe, and the diligent extirpation of the weeds in our fields, the stronger growing ones would not only destroy our crops, but also other weeds less vigorous than themselves. The facts thus presented to our notice by Professor HOFFMANN are quite in accordance with other observations on this interesting subject, but they are not sufficient, as M. DUCHARTRE well remarks, to explain all the conditions of this complicated problem; thus, in the district adjoining the locality where Professor HOFFMANN'S experiments were carried on, the predominant plants are not the same as those which ultimately proved victors in the experimental beds.

Again, there is little in the organisation of such a plant as the American water weed (Elodea canadensis) to account for its predominance over the Potamogetons and other water weeds of our ditches, or in the nature of the common Watercress, which is becoming so great a nuisance in the watercourses of New Zealand,—phenomena the more curious, when it is remembered that in America the Elodea (Anacharis) is no more of a nuisance than is the Watercress here.

We shall probably revert to this matter when the results of the last year's experiments at Chiswick are published.

—— DAHLIA IMPERIALIS has no sooner come to the front than it has met with a rival. This at least is the conclusion we draw from the following statement, which we abstract from a circular issued by Messrs. HUBER et CIE., of Hyères, referring to a new Dahlia they have to offer. "The DAHLIA ARBOREA," they say, "is not a variety of D. imperialis, but a distinct and unpublished [?] species, having many points of advantage over its rival. One of these is its dwarfer habit of growth, some 6 or 7 feet being indicated as the limit of its height, while it forms a branched head, with large leaves, and produces an innumerable quantity of pretty mauve-coloured flowers. These flowers are produced very late, namely, after the end of December, and their development, we are told, is not arrested by a temperature below freezing point, this statement being made after the experience of two consecutive winters. To give flowers in profusion under so low a temperature," continues MM. HUBER, "is certainly a quality with which one seldom meets in plants, of which all the parts are soft and watery, and that would be sufficient praise. But this is not all, for the flowers in themselves are admirable both as regards colouring and form, the latter being quite new in the genus, and such as can only be compared with a gigantic Anemone. Plants are now being distributed." This plant is alluded to at p. 459.

—— The lovers of new and curious plants may be glad to learn that they will find just now blooming in the Victoria Nurseries, Highgate, a specimen of the beautiful blue-flowered TILLANDSIA LINDENIANA, as well as the noble COCHLIOSTEMA JACOBIANUM, of which a full account, with a woodcut, was given in our volume for 1868, at pp. 264, 323. Both these plants are, we believe, flowering for the first time in England. The choice collections of stove and greenhouse plants, and of succulent plants, afford further inducements for a visit to Mr. WILLIAMS' establishment, while at this season the specimen Azaleas and Orchids alone suffice to furnish a rich floral treat.

—— The beautiful IRIS sent to the last meeting of the Royal Horticultural Society by Mr. WARE, is Iris iberica, Hoffm., of some varieties of which figures were published by REGEL in 1863, from drawings forwarded to him. We doubt whether it has hitherto been in cultivation except at St. Petersburg. *M. J. B.*

—— It is important for all who are interested in the ROYAL NATIONAL TULIP SHOW to make note of the date which has been finally determined on. The event will take place on Wednesday the 25th inst. The date has been twice altered, once with a view to escape clashing with the Derby, and now to avoid what to many in Cambridge would be unseemly, the holding of a flower-show on Holy Thursday. We repeat that Wednesday, the 25th, is to be the date of the National Tulip Show.

—— Last week we recorded that the styles and ovaries (the young fruit) of APPLES in the neighbourhood of London were destroyed by the FROST on May 4, even in the unexpanded flower. We are now enabled to state that the flower-buds of the wild Crab, in the hedges, in low damp ground near Harrow, were similarly injured.

—— We are requested to state that a BAZAAR, under the special patronage of H.R.H. PRINCESS CHRISTIAN of SCHLESWIG HOLSTEIN, H.R.H. PRINCESS LOUISE, H.R.H. PRINCESS MARY of TECK, in aid of the funds of the North-Eastern Hospital for Children, will be held in the large hall of the City Terminus Hotel, Cannon Street, on Monday, May 16. PRINCESS LOUISE will open the Bazaar at 12 o'clock.

—— There still seems to be a doubt as to whether the PRIMROSE and the COWSLIP can be crossed; Professor HENSLOW succeeded in accomplishing the cross. Major TREVOR CLARKE has never been able

to effect it. We have before us some specimens from a correspondent, "W. T. C.," which he found growing in a garden, and which look intermediate between the two; the leaves are like those of the Cowslip, the flowers are like those of the Primrose and solitary on the stalks, but bent downwards as in the Cowslip. The anthers are destitute of pollen, and the calyx is leafy, as it so often is in Primroses. Mr. ANDERSON-HENRY has availed himself of this tendency to raise a race of large calyxed Primroses, some of which are very handsome, and are likely to be popular as garden flowers. There is a very old variety often brought to Covent Garden under the name of "Jack," in which the calyx is partly petaloid (hose-in-hose). The late Professor MORREN stated that the Belgian gardeners, in order to produce the fine colour of the calyx of Primula officinalis var. smaragdina, cut away the corolla in an early stage, so as to increase the coloration of the calyx. We have never seen the statement confirmed, but suggest that it should be tried in the case of the double Mimulus now in gardens.

—— The Council of the Royal Horticultural Society have elected Lord H. GORDON LENNOX, M.P., to serve on the Council in place of the late General Hon. C. GREY; and his Grace the President has nominated his lordship one of the Vice-Presidents of the Society for the current year.

—— A short time since we were favoured by Mr. SULLIVAN, gr. to A. WATTENBACH, Esq., with some flowers of ARISTOLOCHIA GRANDIFLORA var. HOOKERI, the A. gigantea of the "Botanical Magazine," but not of MARTIUS. The flower of this species is among the largest of the large-flowered kinds, and is very striking in appearance. The variety in question (not the species) is described as destitute of the disagreeable perfume which forms so objectionable a feature in many of these plants, but we are sorry we are unable to confirm this statement, the flowers sent to us being as odoriferous, or nearly so, as the others. Our present object, however, is to call attention to the singular funnel-like tube which hangs down in the lower part of the tube of the flower over the anthers. The lower part of the flower forms a distended sac, lined in the interior with cottony hairs, the general direction of which is downwards. At the upper end of the sac the flower is bent abruptly, and it is from the point of flexure that the curious tube just mentioned springs. It is about an inch in length, trumpet or funnel-shaped, perfectly detached from the side of the flower, except at its origin, and is directed downwards in such a way that an insect making its way down the tube must almost necessarily alight on the staminal column below. Escape of the insect would be difficult, the more so from the cottony hairs lining the flower tube. This "fly trap," then, would seem to favour self-fertilisation. We have looked in vain for any description of this tube in books and monographs; the omission is probably due to the circumstance that flowers of these plants are necessarily so scarce in herbaria that specimens for dissection are not to be had, hence the necessity of carefully examining flowers of living plants, in all cases where dried ones, from their size, are likely to be scarce, or from their tenuity, succulence, or other circumstances, are likely to lose their character in drying. In some other species, according to the figures, there is an indication of this tube, but very small as compared with that just described—thus in Aristolochia leuconeura, Bot. Mag. 5420, there is a slight fold in the situation of the tube. In A. macradenia, Bot. Mag. 4467, this fold is somewhat larger, and forms a trowel-shaped scale, evidently serving the same purpose of directing insects to the staminal column.

—— One of the most magnificent specimens of RHODODENDRON NUTTALLII that has bloomed in Europe since its introduction from the East, some 15 years ago, may now be seen in the shop of Mr. T. METHVEN, Princes Street, Edinburgh. The specimen under notice is about 8 feet high. The blossom-heads on the plant shown are 3 feet 4 inches in circumference, and the flowers —11 in number—measure 6 inches by 5. The most profusely-blossomed specimen of the Rhododendron Nuttallii, which had previously been grown in Europe, had only 10 flowers on the truss, and Mr. METHVEN'S plant far excels in grace of outline and beauty that figured by Sir WILLIAM HOOKER. Among other rare Rhododendrons to be seen in the Leith Walk Nurseries of Mr. METHVEN, who has for 20 years been the largest grower of this class of plants in Scotland, are R. Hookeri, a beautiful scarlet flower, now blooming, it is supposed, for the first time; and R. Thomsoni, also a scarlet-flowered variety.

—— From the "Revue Horticole" we glean the following particulars of a specimen of LIVISTONA AUSTRALIS, now or lately flowering in the Botanic Garden at Munich. The plant was originally sent from Kew by AITON to VON MARTIUS in 1826, when it was about 4 feet in height. It now measures about 50 feet in height, and above 7 feet in circumference at the base. The crown of foliage is nearly 20 feet across The plant flowered in 1860 for the first time, and has repeated the process five times.

—— A recent number of the "Indian Medical Gazette" contains the following extract from the Report of the Agri-Horticultural Society of the Punjab on SUNFLOWERS (Helianthus annuus):—Its seed has an edible kernel, and affords 15 per cent. of a mild oil, which is equally good for food or for burning. If the outer skin is removed, it would give a still larger proportion of oil. Although little cultivated as an oil-seed, it deserves to be better known, especially as its seed is very useful for nourishing and fattening poultry. It is said to increase the number of eggs. The roasted kernels are used instead of coffee. The foliage, which is abundant, and may be partially removed without injury to the seed, forms a good fodder for cows. The stems, which will do for sticks for Peas or Beans, may be burnt, and their ashes abound in potash. Sunflowers require good and fertile soil if they are to produce much seed, but they will succeed in very indifferent soil, or even in very moist ground. Their cultivation is very similar to that of Indian corn. They may be sown from April to May in lines or broadcast. It has often been said that large plantations of Sunflowers are useful in marshes or places where malarious fever is common, as this plant is a decided remover of malaria.

—— Among the objects of interest exhibited at the *soirée* of the Linnean Society on the 27th ult., was a collection of MIMETIC PLANTS shown by Mr. W. W. SAUNDERS, arranged in pairs. The plants forming each pair belonged to entirely different natural orders, but were so remarkably alike in their general form as only to be distinguished by a practised eye. One of the most strikingly "mimetic" pairs, says "Nature," were a Conifer and a Selaginella, belonging to the two subkingdoms of flowering and flowerless plants.

—— It is said that simplicity is the highest perfection, and this sometimes applies to the arts as well as to taste. Every one knows that the CULTIVATION of ASPARAGUS is regarded as rather a delicate matter, but M. ISIDORE BICKART assures us, in a communication to the Agricultural Journal of the Department of the Haut-Rhin, that it is all a mistake, and that Asparagus succeeds with very simple treatment. All the deep pits and heaps of manure, he says, are unnecessary; the plan which he has followed for a long time with the best results is described in the following terms:—The beds are dug to a depth of about 2 feet, and manured; if the soil is too close it is opened with old plaster broken up or ashes. The distances between the plants are given as follows:—For the early varieties of Holland and Ulm, 28 inches; and for the improved Dutch Rose variety, 48 inches. At the approach of winter trenches are dug across the beds and filled with manure, little more than 2 inches of mould being left over the roots. Manure rich in potash is best of all adapted for the development of Asparagus. M. BICKART'S plan gives large crops with a great reduction in the cost of cultivation. He declares that he has grown the improved Rose variety of Holland of unusual quality and size, three heads weighing a pound. We may add that in the South of France Asparagus is frequently grown between the Vines. We have eaten it at Montpellier and found it excellent, but of course the temperature and dryness of the climate and soil account for this.

—— Nothing adds so much to the effect of plants cultivated in rooms, whether in *jardinières* or otherwise, than the use of MOSS, which at once hides the mould and prevents rapid evaporation, but it has the very great disadvantage of containing innumerable eggs of insects, and thus of filling the apartments with disagreeable visitors. Prepared moss is well known, but it is generally of a dull bluish-green colour, that destroys all illusion. A French chemical journal gives the following recipe for preparing moss with slight alteration of appearance:—Dissolve one grain of nitric acid, and about 15 grains of indigo, in 2 quarts of water; tie the moss up in small parcels, throw them into the solution while boiling, and leave them in for a minute; after being dried in the open air the moss will afterwards last for an almost indefinite time without alteration.

—— The TEMPERATURE of the AIR in the week ending May 7, was as high as 67° at Wolverhampton, and did not reach more than 57° at Newcastle. The mean of highest readings in the week at the 16 places in England was 62.2°, and of the eight places in Scotland was 62.2° The lowest temperature during the week was, in England, 29°; and in Scotland was 31.1°. The mean of all the lowest in England was 33.3°, and in Scotland was 34.4°. The average range of temperature in the week was, in England, 28.9°, and in Scotland was 27.8°. The mean of all the highest daily temperatures in England was 56.1°, and of all the lowest was 38.0°; the average daily range of temperature was 18.1°. The mean temperature of the week in England was 45.3°, in Scotland was 47.3°. The RAINFALL in England varied from 0.02 inch to 0.32 inch; the average fall from the 16 places was 0.15 inch. In Scotland rain fell at Aberdeen to the depth of half an inch, and but little elsewhere. The nights in Scotland appear to have been warmer than in England.

—— M. CARRIÈRE, on the authority of M. C. VERDIER, adds another illustration of the EFFECT of a VARIEGATED SCION on the STOCK. In this case a graft of the variegated Pittosporum Tobira was worked on a green-leaved stock of the same species, and though the graft did not take, the contact was sufficient to cause the production of a variegated shoot from the stock below the graft. This confirms the statement made by M. MORREN, and already alluded to at p. 315.

—— We are requested to state that the BIRMINGHAM ROSE SHOW for the current year will be held in the Town Hall on Thursday and Friday, July 7 and 8. The Brighton Rose and Fruit Show will be held on June 28.

—— In a paper addressed to the Academy of Sciences, M. P. DUCHARTRE describes a curious phenomenon he has observed on certain MUSHROOMS. Vegetable physiologists have long been engaged in discussions relating to the phenomena of direction in certain organs, such as leaves, for instance, which invariably have the same face turned upwards, and consequently the other towards the soil. Whatever attempt be made to invert their relative positions, they constantly return to their natural one, with insurmountable energy, by a torsion which takes place on their basilary part. Various hypotheses have been put forward, especially by German philosophers, to explain this phenomenon, some assigning the cause to the laws of gravity, others to an inequality of growth, by which the tension in the various tissues differs, and so on. Our author's observations do not seem to confirm these suppositions. In a garden at Meudon there stood a cask containing about 225 litres (about 52 gallons), and the bottom of which, on the outside, was covered with a thick stratum of plaster of Paris, but rather curved inwards, so as to form a sort of cupola. The cask was sunk into the ground, in such a way as to leave an empty space below, nearly a foot in height, the ceiling of which was the above-mentioned plaster cupola. The receptacle was always full of water, and exposed to the noon-day sun. About the end of September last, M. DUCHARTRE, having occasion to examine the cask, had it turned upside down, and found one-fourth of the plaster surface, on the side exposed to the sun, peopled with a considerable number of Mushrooms of the Agaricus or Coprinus genus. They had, therefore, all been growing in an inverted position, that is, head downwards; and the consequences were twofold. First, the stalks had all deviated from their natural perpendicular, to incline by 30° towards the north; and secondly, their caps, the smooth part of which was turned downwards instead of the contrary, had quitted their usual thimble-like form, and spread out like open umbrellas, their inside portion, the lamellæ of which are generally attached to the stalk, having left the latter, which, in its turn, had bulged out, in order, as it were, to overtake them. The author does not venture to explain the primary cause of these phenomena.

—— The latest novelty in head-gear, says the *Press*, has made its appearance in Paris. During the ensuing summer it is thought the new form of hat will become exceedingly popular. In appearance it is snowy white: it is light and comfortable, and looks very like good straw. When an enterprising London hatter some years back produced a hat at 4*s.* 9*d.*, he met with extensive support from the lower strata of society; but the "upper ten" scouted the notion of appearing in a "four and nine." What will be said when the new hat makes its appearance in this country? and when it is discovered that its price is—inferior quality, 2½*d.*; better kind, 9½*d.*? This light, cheap imitation Panama is made from wood-shavings, but it is so well manufactured that, we are told, it "might be worn by a well-dressed heavy swell at a horticultural show." A hat so cheap must, of course, have certain defects. This one is admitted to be fragile, a heavy shower would reduce it to the consistency of blotting-paper. It must be carefully handled, and only brought out in fine, settled weather.

A BOUQUET OF NARCISSI.

THANKS to Messrs. Barr & Sugden, and other correspondents, we have had the opportunity of inspecting a large number of forms of this charming genus. Thanks to Mr. Baker, we have been enabled to refer them almost all to their respective places and names. The laborious and careful summary of these plants made by Mr. Baker was published in our columns at pp. 416, 529, 686, 1015, 1136, 1183, 1869, and has lately been republished in the "Journal of Botany." One can never tell how arrangements of plants will work till the actual test is applied, the groups and subdivisions, which are so neat and so easy on paper, are too often broken down when one comes to test them in practice. Let us at once say that after blundering over Herbert and Haworth's arrangements till our head ached, we took up Baker's, and found the solution for most of our difficulties—not all truly—for although botanists, with much care, and with as much precision as circumstances will allow, draw up analytical tables, it is quite likely that the very first specimen taken up by the student cannot be assigned a proper place in the system. So much the worse for the plant! And it really is the plant whose individual variations cause the difficulty. Nevertheless, as *clues*, such analytical tables as Mr. Baker has given us are invaluable; only, put not too much trust in them. In the instance before us, the cup won't always be "ob-conical," as it is expected to be, but will run away into the true cup form, and this again is apt to flatten out into a saucer. As for the filaments and style, which should be straight in some and curved in others—*vide* Haworth—it simply won't do. The straight

styles, at any rate, bend their necks sometimes, the crooked ones unbend at others. The relative length of these organs also varies at different times, in accordance with certain love-passages which have only partially as yet been recorded by prying botanists. In spite of Haworth, who made 16 genera out of Narcissus (the characters of which, for the life of us, we can't distinguish), and in spite of Herbert, who reduced them to six, most botanists agree with Mr. Baker, and adopt the one genus "Narcissus," which however is certainly not indivisible, inasmuch as some adopt Herbert's genera as sections. So far as our scanty experience entitles us to express an opinion, we agree entirely with Mr. Baker, and think his three main subdivisions by far the best and easiest that have yet been proposed. We refer the reader to Mr. Baker's papers for the details, and merely state here that the three main divisions in question are founded on the relative length of the cup or "corona" of the flower—long, short, or of middle length. If it were not unbecoming we should compare them to breakfast, tea, and coffee cups respectively, the latter form occasionally, as in the Poet's Narcissus, replaced by the saucer! Now let us look at the specimens before us, taking the breakfast-cup series first.

First we have the Hoop Petticoat (*N. Bulbocodium*), the Medusa's Trumpet of the French, so distinct and so generally grown that everyone knows it. The flower is bright yellow, perfectly funnel-shaped, the outer segments much narrower than the rest; the cup, if like a petticoat, is like one turned the wrong way upwards. Of this there is a charming variety, the white Hoop Petticoat Narcissus monophyllus, a native of Algiers. Its flowers are very like those of the common Hoop Petticoat, but pure white, and the bulbs throw up but a single linear leaf. The plant bloomed in January of the present year in the Royal Gardens, Kew, and has been figured in the "Botanical Magazine," and also in the "Florist," from which periodical the present illustration (fig. 124) is borrowed. Mr. Baker makes this a variety of the common N. Bulbocodium, but in the opinion of many it is deserving of specific honours, though truly the distinctive characters, such as the single leaf and broader perianth segments, &c., are too variable to be relied on. This is the plant the bulbs of which, gathered by Mr. Munby in Algiers, and placed in his herbarium, were found by him still retaining their vitality after a rest of 22 years, and in spite, no doubt, of the poisonous lotion which so careful a botanist would be sure to apply to his specimens to obviate the attacks of insects. The bulbs were taken out of the herbarium when seen to be alive (see 1869, p. 335), placed in a greenhouse, where, as we learn from Mr. Munby, they flowered in the spring of the present year.

N. bicolor comes next, and is, according to Mr. Baker, a variety of the common Daffodil, N. Pseudo-Narcissus. Its pale yellow segments and long tankard-like yellow cup, are unmistakeable. Mr. Barr sends us a double form of this under the uncouth name of "Tratus Cantus;" what that may mean we cannot divine. The flower is very double; very interesting to people like ourselves, who like to see what is inside the bellows, but to our thinking, ugly as a flower.

N. lorifolius belongs also to the variety bicolor, according to Mr. Baker. Our specimen is too far gone for us to pronounce an opinion.

Narcissus major is represented by two forms in Mr. Barr's collection; one he calls maximus, the other maximus flore-pleno. Clearly they are all the same species, only differing in size and doubleness. They are common in old-fashioned gardens, and those who have them not should get them for the sake of their large deep yellow flowers. They are Daffodils, a size or two larger, and hold their head more erect. We shan't quarrel with Mr. Baker for not keeping up Linnæus' species, but there are many who would think N. major as good a species as N. Pseudo-Narcissus. *Chacun à son goût.* We have no more of the large-cupped series before us, so we pass on to the mid-cupped series.

Narcissus incomparabilis is the first that comes to hand, and we think it deserves its name. Bold, yet graceful, its pale yellow flowers form above a spreading star, 4—5 inches across, and encircle an orange cup. It bears but one flower on each stalk. Among our bouquet we find a white variety with paler segments, but otherwise identical, and three "monster" double-flowered forms, which we should dismiss from the border and relegate to the dissecting-room, where their merits would be sure to be appreciated. But for the sake of old times, and the memories of gay cottage gardens in the country, we would keep "butter and eggs" (N. incomparabilis var. aurantius). Here belong Orange Phœnix, like the last-named a double-flowered variety, but paler; while Sulphur Phœnix is paler still, and is the N. incomparabilis var. albus fl.-pl.

N. odorus, the Campernel, is the next in our bouquet, with two or three flowers on each stalk—bright yellow spreading flowers, 2½ inches across. The cup is very elegant, six-lobed, and a little recurved at the edge. There are numerous varieties of this sent by Mr. Barr under the names of Campernelli, interjectus, calathinus, trilobus, and rugulosus, the differences between which are very slight. No doubt Mr. Baker is right in grouping them all under N. odorus. Everyone should grow some of them.

N. poculiformis.—This is a white flowered form, called generally N. montanus. It is an old friend of ours, because we have never seen a flower which was not "eccentric," in some way or other. Mr. Barr's specimens have the usual failings. It is so erratic that we do not venture to recommend it to cultivators in general, nevertheless *we* like it! The wild form is not known, and the cultivated one is supposed to be a mongrel. Its structure and inconsistent character bear out this notion.

N. Macleaii.—Mr. Barr sends us this under the name Diomedes minor. Mr. Baker says that this, like the preceding, is only known in cultivation, but it is strictly normal, and does not, so far as we have seen, indulge in the vagaries of the N. poculiformis, except that it has no pollen. The supposition is that it is intermediate between N. Tazetta and N. odorus in character. It is not one of the most attractive of the genus.

Turning now to the small-cupped series, we come to a group irreverently styled a botanical dust-bin, by which the profane mean that the group in question is a refuge for questionable characters, who can't or won't answer to their proper names, but hide under aliases innumerable. We mean the group of which N. Tazetta is the type.

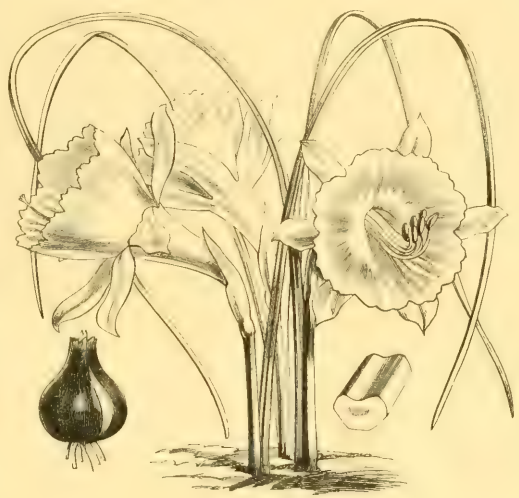

Fig. 124.

Every one knows N. Tazetta, or thinks he does. It is characterised by a flattish leaf, a group of flowers on a stalk, a medium-sized flower for the genus, and a proper bowl-shaped cup. We can hardly be more precise. Sometimes the flower is white or whitish, and the cup yellow, as in the Grand Monarque and Bazelman major of gardens. Mr. Barr sends us a smaller form, under the name of Hermione compressa. N. lacticolor is more creamy than white; sometimes the flower and the cup are both yellow, as in N. aureus (Soleil d'Or of gardens).

N. intermedius, which we have received from Mr. Barr under the name of N. bifrons, differs in its rounded, not flat leaves, else, so far as its flowers go, it might range under N. Tazetta. A third set of varieties of N. Tazetta have flowers and cup both white. Here are some exquisite varieties known generally as Paper Narcissus. We have three such before us—one labelled by Mr. Barr as N. dubius, but it is not the dubius of Gouan, or of "Moggridge's Mentone." We don't say what it is, further than it is one of the most exquisite of the lot, barring (we intend no pun) one thing, its perfume, which is not so agreeable as that of some others. It is a small-flowered form of Tazetta, with pure, dead white flowers, and a shallow lobed cup. It is very like N. Panizzianus, but we cannot refer it to that variety with certainty. Mr. Barr's Hermione luna is only a slight variety of the true papyracea, with larger, less pure white flowers than the preceding. N. dubius, of Gouan and Moggridge, Mr. Baker refers to his large-cupped series, but it evidently belongs, in our judgment, to the Tazetta set, and is only placed with the breakfast cups to fit into the analytical tables nicely, its natural affinities being with N. Tazetta.

N. italicus.—Mr. Barr sends us two forms of this, one under the name of præcox, the other under that of sub-albidus. They are both Tazetta-like, but have narrower segments and more "starry" flowers. For garden purposes we should retain N. italicus as distinct from N. Tazetta, but we dare say Mr. Baker is right in referring it to that polymorphous species, as he may have seen numerous intermediate forms. At any rate his analytical table, as all such contrivances have occasionally an awkward knack of doing, breaks down; for the italicus before us is dirty white, its crown pale creamy yellow, while according to the table cup and flower alike should be yellow. The starry flowers render N. italicus desirable for cultivation, but the perfume, to our appreciation, is not nice. Far otherwise is it with the Jonquil, N. Jonquilla. Everybody knows the Jonquil, so we need not tarry over it or its double variety. Mr. Barr sends us N. juncifolius, one of the Jonquil set in our estimation, but differing in the longer crown, on which account it goes into Mr. Baker's mid-crown set—another sacrifice to expediency, as it certainly does not differ more from the Jonquil than many of the forms ranged under Tazetta do from that species. Under the name N. tenuifolius, Mr Barr sends us a plant which is not Herbert's tenuifolius, and which, in the absence of leaves, we should be disposed to consider as a large-flowered, pale-coloured N. juncifolius; but we must speak with reserve, as we have only seen the flowers.

N. poeticus.—Too well known to need description. Every one knows it, every one admits it to be one of the very best of the genus. It varies considerably in the size and breadth of the segments of the flower, &c. Mr. Barr sends us a variety under the name of N. ornatus, a name we do not find in books, and another under the name of N. angustifolius, with very narrow flower segments. Last in our bouquet is—

N. biflorus.—A common plant in gardens, with horizontally bent white flowers with a yellow cup. Like N. poculiformis it is a friend of ours, for we seldom or ever have seen a perfect flower; indeed, it is said never to produce ovules; certainly we never saw any, and rarely any pollen, and yet it is not uncommon in a wild state in many parts of Europe.

In the course of these remarks we have incidentally alluded to the varying length and disposition of the stamens; indeed the species and varieties we have mentioned fall very naturally into two groups, those in which the six stamens are of equal length and really, or apparently, in one row and separate from the tube of the flower, unless at the very base, and those in which the six stamens are clearly in two rows, one above the other, the uppermost protruding from the tube of the flower. In these the stamens are usually adherent to the tube of the flower for nearly the whole length. The first, or free-stamened series, would include the Trumpet Narcissi, such as the Daffodil and its varieties, the Hoop Petticoat, also such forms as incomparabilis, Macleaii, the Campernel, &c. The adherent-stamened series would include the Tazetta series, the Jonquils, the Poet's Narcissus, &c.

It is worth while here to call attention to the accidental transposition of characters in Mr. Baker's first paper, where the stamens of the Hoop Petticoat series are said to be straight, and those of the Daffodil series upturned. The error occurs in the analytical table, and is corrected in the detailed description.

We are far from thinking that these varied arrangements of the stamens are simply for the convenience of "classifiers." What they do mean may in some degree be gleaned from the following facts:—Where the stamens are in one row and of equal length, the anthers open before the stigma is fully developed, and this latter when full grown protrudes far beyond and out of the way of the stamens: inference, it is not fertilised by the pollen formed by its associate stamens but by others in other flowers. Where the stamens are in two rows, and the upper row protrudes from the mouth of the flower-tube, there it will be seen that the upper anthers open at the time when the stigma is fully developed, and that the latter, which is on a level with them, is often dusted over with pollen from the immediately adjacent anthers: inference, stigma fertilised by the pollen from its associate stamens. But what of the three lower ones? These are still undeveloped when the upper ones are ripe. We can only guess that their use is to supply pollen for other flowers when that occasional cross which Darwin recognises as so essential takes place.

As to the "cup," it is neither fish, flesh, fowl, nor good red herring; that is to say, it is not calyx or corolla, or stamens, but an outgrowth from the perianth formed subsequently to the stamens, and is in all probability referrible to an abortive series of stamens. The use of the cup seems to be to guide the insects in their visits to the flower—visits so important to the well-being of the insect and of the flower itself, or at least of its descendants.

THE MANAGEMENT OF COTTAGE GARDENS.

(*Concluded from p.* 629.)

EVERY inch of space should be economised and made the most of; at no time during spring, summer, and autumn, should there be much unoccupied space in the cottage garden; one crop should succeed another as quickly as possible. Take, for instance, a border of early Potatos, such as Myatt's Prolific; these, if planted in February, would not be lifted till about the middle of June. Now, if the rows are 2 feet apart, a row of Leeks can be very well planted between every two rows of Potatos, and when the Potatos are lifted they can be replaced with plants of the March sown Little Pixie Cabbage. Early Ulm Savoy and Cauliflowers are both good crops to follow early Potatos. The larger growing Savoys and Winter Greens do nicely to follow the crops of early Peas. Broccoli will be in readiness to share with the late Turnips the space occupied by the second early Potatos. Thus in almost every instance two crops at least may be taken every year.

Order and neatness should prevail everywhere. Strive to have a system of cropping. Don't do things haphazard, but work with a purpose and plan. Never suffer weeds to rob the soil. Keep the soil well stirred among growing crops; remember that a loose soil lets in the sun's rays, and the warm air and showers of spring and summer admitted to the roots of plants, causes the sap to flow, and the plant to grow. Attend regularly to the watering, and if possible use water that has been fully exposed to the sun and air in a pond or tub. Save soapsuds and all kinds of house sewage; it is good for all crops, and is most suitable for all the Cabbage tribe. The weekly supply of soapsuds carefully given to Winter Greens or Broccoli in their young state tends to promote that quick, strong growth, which it is so important to secure in such vegetables; for, no matter how early they are sown, if they are not kept growing steadily on, but are permitted to suffer from drought, their growth is stunted and their produce falls far short of what it ought to be.

It has been said that "good morals and good flowers generally go together;" without inquiring how far this may be true, it may safely be concluded that the man who has a real love for flowers, and who takes a pride in the gay appearance of his own flower plot, will not care to exchange the quiet enjoyment and pure fresh air of his garden for the impure atmosphere and noisy mirth of the village tap-room. Flowers, therefore, are far too important to be left out of this essay.

In selecting flowers for a cottage garden, those kinds only should be chosen that are hardy and of easy culture. Roses in such gardens, as in all others, take the first place. They should be planted early in November, and will grow in most soils, but the richer the soil the stronger will be the growth and the finer the blossoms. Prune in February; cut all weak wood clean out, shorten the strong shoots to three or four eyes, and so thin out and regulate the branches that the air may circulate freely among them.

Amongst spring flowers Anemones are most beautiful, and when once established they need hardly any care for years. The best time to plant is October. They will grow freely enough in any good and rather light garden soil.

Hyacinths, Tulips, and Crocuses, may be planted at the same time and in the same soil.

The Gladiolus is a grand flower, of easy culture; the bulbs are hardy, and may be left in the ground during winter, but it is the safest plan to take them up after flowering and keep them on a dry shelf, planting them again in March or April.

Pinks, Picotees, and Carnations, all claim a place; cuttings of most of them, if made in August, will root readily in the open garden if kept moist and shaded from the sun.

Chrysanthemums are another useful class, blooming in autumn after most other flowers are faded and gone. A few clumps of single blue Russian Violet will give a supply of their sweet flowers from October to March, when they should be divided and transplanted year by year.

For the other flowers no particular culture is required. Plant them either in spring or autumn; tie all tall growing kinds neatly to stakes; remove all decayed leaves and flower-stalks; and should any plant become weakly in its growth, or fail to blossom as freely as it has hitherto done, a removal into fresh soil, or a little old rotten manure forked in around it, will in most instances be all that is necessary.

All the annuals and perennials may be raised from seed sown in the open ground; they should be sown in March—the annuals in the flower borders, the perennials on any spare border, from whence they are removed to the flower-borders in autumn, to flower the following summer. Sow thinly and cover lightly with fine soil.

The flowers given in the list will well repay the cottager for all his pains and care; and as with the flowers, so with the entire garden, to the man who really cares for it, it will prove an unfailing source of profit and pleasure. In unfavourable seasons failures may sometimes occur, but generally speaking, painstaking effort is certain in this as in all other undertakings to meet with its due reward.

The following Fruit, Vegetables, and Flowers, are suitable for a cottage garden:—

FRUITS.

Apples, kitchen.
1. Keswick Codlin.
2. Hawthornden.
3. Hanwell Souring.
4. Alfriston.

Apples, dessert.
5. King of the Pippins.
6. Court-Pendu Plat.

Pears.
1. Williams' Bon Chrétien.
2. Autumn Bergamot.
3. Louise Bonne of Jersey.
4. Seckle.
5. Beurré Diel.
6. Beurré, Easter.

Plums.
1. Gisborne's Early.
2. Orleans.
3. Goliath.
4. Denyer's Victoria.
5. Autumn Beauty.
6. Damson, common.

Cherries.
1. May Duke.
2. Kentish.

Currants.
1. Black Naples.
2. Knight's Large Red.
3. White Dutch.

Gooseberries.
1. Golden Drop.
2. Warrington.
3. Champagne Red.
4. Crown Bob.
5. Bonnie Lass.
6. Rough Red.

Raspberries.
Prince of Wales.

Strawberries.
Trollope's Victoria.

Nectarine.
Early Scarlet.

VEGETABLES.

Beans.
1. Early Mazagan.
2. Monarch Long-pod
3. Newington Wonder (dwarf French).
4. Scarlet Runner.

Peas.
1. Ringleader.
2. Climax.
3. Laxton's Prolific.
4. Veitch's Perfection.

Lettuce.
1. Paris Green Cos.
2. Ivery's Nonsuch.
3. Bath Cos.
4. Stansted Winter.

Potatos.
1. Myatt's Prolific.
2. Milky White.
3. Dalmahoy.
4. Paterson's Victoria.

Cabbage.
1. Little Pixie.
2. Cattell's Reliance.

Winter Greens.
1. Early Ulm Savoy.
2. Drumhead Savoy.
3. Roseberry Brussels Sprouts.
4. Cottagers' Kale.

Turnips.
1. Early Dutch.
2. Snowball.

Broccoli.
1. Walcheren.
2. Adams' Early White.
3. Frogmore Protecting.
4. Cattell's Eclipse.

Intermediate Carrot.
Cole's Celery, Red and White.
White Spanish Onion.
Wood's Early Frame Radish
French Breakfast Radish
Hollow Crown Parsnip.
Wood's Ridge Cucumber.
Custard Vegetable Marrow.
White Mustard.
Plain Cress.

FLOWERS.

Annuals.
1. Jules Margottin.
2. John Hopper.
3. Charles Lefebvre.
4. Eugène Appert.
5. General Washington.
6. General Jacqueminot.
7. Alphonse Karr.
8. Duc de Cazes.
9. Sénateur Vaisse.
10. La Ville de St. Denis.
11. Colonel de Rougemont.
12. Souvenir de la Malmaison.

Annuals.
1. Mignonette.
2. Candytuft, mixed.
3. Clarkia elegans.
4. Larkspur, Branching.
5. Larkspur, dwf. Rocket.
6. Stocks, Ten-week.
7. Poppy, double.
8. Sweet Pea.
9. Nasturtium.
10. Honesty.
11. Convolvulus, major and minor.
12. Calliopsis, mixed.

Perennials.
1. Antirrhinum.
2. Columbine.
3. Campanula pyramidalis.
4. Campanula carpatica.
5. Sweet William.
6. Canterbury Bells.
7. Scabious.
8. Wallflower.
9. Hollyhock.
10. Penstemon.
11. Polyanthus.
12. Pansies.
13. Viola cornuta.

A few other useful Flowers.
1. Chrysanthemums.
2. Gladioli.
3. Forget-me-nots.
4. Pinks, Picotees, and Carnations.
5. Lily of the Valley.
6. Dielytra spectabilis.
7. Parrot Tulips.
8. Crocus.
9. Snowdrop.

E. Packhurst, Egerton House Gardens, Egerton, Kent.

LACHENALIAS.

IT not unfrequently happens that in walking through a place where plants are done well as a general rule, we see that the representatives of this highly interesting genus of greenhouse bulbs do not present that vigorous growth and fine development of which we know they are capable. Perhaps they are too lightly valued in many instances, consequently they are neglected, the growth is feeble, and the flowers poor and comparatively unattractive; and they come to be regarded as scarcely worth the little attention and trouble really required to grow them well. Occasionally, however, they are seen remarkably good, answering well in the pleasant service they yield to the intelligent culture bestowed upon them, in which case they are classed as among the most useful of spring-flowering greenhouse plants, and the "prettily spotted lance-shaped leaves and curiously pendent blossoms" have a charming effect as a front row to other plants occupying a stage.

At Swyncombe Park, Henley-on-Thames, the home of the glorious Bougainvilleas, the culture of the Lachenalia is by no means neglected by Mr. Daniels. In one of the intermediate houses could be seen but recently some pots of Lachenalias having masses of bold well-developed foliage, and large showy spikes of yellow and red flowers. The system of treatment adopted by Mr. Daniels appears to be as simple as it is successful, and may be stated as follows:—As soon as the plants have done blooming, they are stowed away under the stage of the house to mature their growth, which is done by June. Then the pots are laid on their sides, to ripen the bulbs, till September, when they are shaken out of the soil, and the largest bulbs being selected for potting purposes, about eight or nine are placed in a pot 6 inches in diameter; the bulbs are just covered with a soil made up of fibry loam, leaf-mould, and silver sand, and the pots placed in a cold pit, out of the reach of frost. Here they remain till Christmas, when they are removed to a greenhouse, and come into bloom in February, and continue in flower for three months or more.

Some writers have recommended that the bulbs should be kept in the same pots for several years without fresh potting; perhaps this will account for the wretchedly attenuated appearance the plants sometimes present, at least it is suggestive of two things that should be avoided—undue crowding in the pot, and poverty at the roots. As in the case of many other plants similarly tormented and starved under the conditions of the traditional modes of cultivation adopted in past times, a generous course of treatment is abundantly rewarded.

As a window plant, the Lachenalia is very valuable. A few years ago, on the exterior of one of the windows in one of the law courts overlooking Broad Sanctuary, Westminster, could have been seen, in the month of May, some capital specimens in full bloom, and apparently none the worse for their exposure. In such a position an abundance of water, combined with free drainage, appears to be all that is required. As a matter of course, the plants should be screened from the sun when at its meridian, if the cultivator would prolong the season of bloom.

Unacknowledged by compilers of schedules, and rarely cultivated to that degree of perfection of which it is capable, the pretty, useful, unpretending Lachenalia claims that real attention it occasionally gets; and when so cultivated, amply asserts its right to be no longer relegated to that undeserved fate—a place among the neglected plants. *R. D.* [We endorse all our correspondent states in favour of Lachenalias. Where is the deep orange-coloured species or variety grown, many years since, in the Chiswick Gardens, introduced, if we mistake not, by Mr. Wicks? It was singularly beautiful. EDS.]

GARDEN LITERATURE.

EVEN in the seventh century, a pleasant fruit-bearing close existed at Ely, cultivated by the abbot of that city; and some among the thousands who daily pass over the Holborn Viaduct, in glancing down Hatton Garden, may readily recal that scene in Shakespeare, when Gloster, anger-heated, reminds the prelate, whose palace gave his name to Ely Place, that good Strawberries grew there,—"My Lord of Ely, when I was last in Holborn, I saw good Strawberries in your garden there." Fir trees, planted by Cardinal Pole, exist in the Bishop's garden at Lambeth, and Uvedale's Cedars still flourish at Enfield. In the time of Henry II. the citizens of London had large and beautiful gardens behind their houses. According to Hollinshed, the taste for gardens had so extended itself in Edward III.'s reign, that curious and delicate plants, brought from Holland and other distant places, were cultivated assiduously. But the wars of the houses of York and Lancaster diverted attention from the gardener's craft, and roses bloomed chiefly as the emblems of rival factions. From this period to the reign of Elizabeth there seems to have been no revival in England of the gardener's art, and parks, paddocks, and rude kitchen-gardens were the only evidences of a love of Nature, outside the walls of convents and monasteries. Though Raleigh is said to have introduced the Potato plant as a "fine fruit" from America, and the Lord-Keeper, the great Sir Francis Bacon, wrote an essay on gardens about this time, we find Dr. Turner, who dedicated his "Herbal" to the Queen, complaining that at the University of Cambridge he could not learn the name of a plant in Greek, Latin, or English—proof of the low state of botanical knowledge at that day. It was at Nonsuch, a royal appanage near the village of Cheam, in Surrey, that the first Lilac tree in England was planted; and in the catalogue made by Cromwell, secretary of Henry VIII., six of these beautiful and now common shrubs are named. With the extension of trade and commerce, new accessions were made to our horticultural and floral treasures; the growth of science naturally led to a love of flowers; and so, gardens grew into fashion, and the literature of gardens was pursued by able and enthusiastic writers.

Much might be said of the changes that have taken place in the style of our gardens since the time when Nonsuch was a Lord Chancellor's residence. Then, it was common to decorate gardens with pyramids, statues, pillars, and sun-dials, and to trim hedges and bushes into extravagant imitations of men and animals; and, though Bacon ridicules the shearing of trees into grotesque and fantastical forms, this absurd conceit did not disappear until the beginning of the present century, and has not, even now, thoroughly died out.

Enough, however, of gardens. Let us briefly refer to some of the books that have been written about them.

The earliest English work of importance is Fitzherbert's treatise on husbandry. Its title was "The Booke of Husbandrye, very profitable and necessary to al maner of persons. Imprinted at London, in Fleet Street, in the house of Thomas Berthelet, near the conduit, at the sign of Lucrece (cum privilegio). 1534." This is probably a wrong date. Judge Fitzherberd wrote a volume on land-surveying in 1534; a monogram bearing the latter date was used in the title-page of his second work, which is believed to have been published five years later, namely in 1539. The monogram was used on the title-page of both books, hence the discrepancy. The Book of Husbandry was several times reprinted with additions, but it is now very scarce.

In 1562 appeared Tusser's "Five Hundred Points of Husbandry," a work much oftener quoted than read, and of which many editions have since been published; we hear also of a new issue shortly about to appear under the careful editorship of Mr. Arber.

In 1571 was published (in black letter) the "Gardner Labyrinth," by Dydymus Mountain, a work chiefly compiled from Latin writers, with four plates of "herbes, knots, and mazes, cunningly handled for the beautifying of gardens." Next year Leonard Mascall produced his "Booke of the Arte and Manner how to Plant and Graffe all sorts of Trees," a treatise Englished from a MS. by a monk of the St. Vincent's Abbey in France. Another edition appeared in 1592.

Thomas Hyll, citizen of London, issued his "Profitable Arte of Gardening" in 1574; to which was added a chapter on the "Marvilous Government, Propertie, and Benefite of Bees, with the rare secrets of the honnie and waxe;" and others on the "Arte of Graffing and Planting of Trees." This also went through three editions; the last (1593) without the author's name, and said to be "set forth and printed by Robert Waldegrave."

This period seems to have been prolific in works on agriculture and gardening; for in 1578 we find Barnaby Googe's "Four Bookes of Husbandrie;" translated from the Latin of Conrad Heresbach, a German; reprinted in black letter, in 1614, by Gervase Markham, and intended, as he says, to adapt German husbandry to the English climate. In 1592, a translation from the French, entitled "A short Instruction, very profitable and necessarie, for all those that delight in Gardening," printed, also in black letter, by John Wolfe, and "sold at his shop over against the great South doore of Paules;" in 1593, Sir Hugh Platt, "of Lincolne's Inne, Gentleman," produced his "Dyvers Soyles for manuring Pasture and Arable Land;" in 1594, his "Jewel-house of Art and Nature, containing divers rare and profitable Instructions, together with sundry new Experiments in the Art of Husbandry, distillation, and moulding;" and "Divers Chimicall conclusions"—a book which by Martin is thought to have been really the work of several hands, and to have been edited merely by Platt, who in his preface extols his "Conceyted book of Gardening, wherein he has set downe sundrie observations, which neither M. Tusser, though he have written shapelily, nor Master Hill, though he have written painfully, nor Master Barnabe Googe, though he have written soundlye, applying himself in his whole discourse both to our Soyle and Clymate, hath as yet discovered to the world." The "Jewel-house of Art and Nature," was republished in 1653 by Dr. Beati, and several times subsequently by various booksellers. Dr. Beati, or Boat—for the name is spelt both ways by contemporaries—called his reproduction of 1653, and his second part of 1660, "The Garden of Eden;" though Platt himself seems to have embodied much of his first work in the "Paradise of Flora," published by Peter Short, "at the signe of the Starre on Bread-Street Hill," in the year 1600.

During the next twenty years or so, various unimportant works on gardening, &c., were published. "The Countrie Farmer" in 1600; "The Fruiterers Secrets," in 1604; a "Treatise on Drilling Corn," in 1606; "Flora's Paradise Beautified," in 1608; an "Old Thrift newly revived of Planting and Preserving Timber and Fewel," in 1612; and Gervase Markham's "Country Housewife's Garden," in 1623. Markham, says Mr. Harte, in his "Essays," "appears to be the first Englishman who deserves to be called a hackney writer. All subjects seem to have been alike easy to him. His thefts were innumerable, but he has now and then stolen some very good things, and preserved their memory from perishing;" from which it seems that theft is not always criminal. Now-a-days we call literary appropriation by the less offensive names of compilation and quotation.

Though gardening and farming had, as we have seen, no lack of expositors, few works of real importance, devoted to those arts, appeared till 1629, when the "Paradise," of Parkinson, was first published. This admirably-written and profusely-illustrated folio, contemporary with the first edition of "Mr. William Shakespeare's Comedies, Histories, and Tragedies," is a real treasure, and contains the best account extant of the then state of Horticulture and Floriculture in England. In the British Museum there are four copies, in excellent preservation, of this valuable work, the full title of which is as follows:—"*Paradisi in Sole Paradisus Terrestris*, or a Garden of all sort of Pleasant Flowers, which our English ayre will permit to be noursed up: with a Kitchen-Garden of all manner of herbes, rootes, and fruites, for meate or sauce used with us, and an Orchard of all sorte of fruit-bearing trees and shrubbes fit for our land, together with the right ordering, planting, and preserving of them, and their uses and vertues. Collected by John Parkinson, Apothecary of London, 1629, fol. Printed by Humfrey Lownes and Robert Younge, at the sign of the Starre, on Bread-Street Hill." The title-page, engraved on copper, by Switzer, represents the Garden of Eden, with many fanciful designs and representations of trees and flowers. The text consists of 612 pages, numerous woodcuts of trees, fruits, and flowers, and is prefaced by a portrait of the author. In this work we get a fair notion of the flowers and trees common to English gardens in the beginning of the seventeenth century. Among others, the author mentions 94 kinds of Narcissus, 50 Hyacinths, 31 Crocuses, 70 Irises, 66 Anemones, 20 varieties of Ranunculus, besides many kinds of Gilliflowers, Roses, Lilies, and those sweet-smelling plants which we now look for in what is called an old-fashioned garden. His catalogue of fruits comprises Raspberries, Cherries, Gooseberries, Currants, Barberries, Mulberries, Figs, Apples, Pears, Plums, Grapes, Peaches, Nectarines, Melons, Nuts, Almonds, and even Oranges—many sorts of which are described and pictured. His lists of vegetables and herbs for the table and the kitchen include many of those now in common use, and some that have gone out of fashion: while he speaks of such now ordinary trees as the Larch and the Sumach, as curiosities.

To this work many respectable writers and practical gardeners contributed, and from the names of growers and experimenters mentioned in the text, we may presume that this was regarded as the "authority" of the day on all matters connected with gardening operations. *The Bookseller.*

(To be Continued.)

TRADE MEMORANDUM.

THE trade will do well to be on their guard against a person in the neighbourhood of Warwick, who favours the trade with extensive orders. The person in question represents himself to be a grower of vegetable produce, and as very anxious to do business on reciprocal terms. He is not only a free-trader, but a protectionist, in so far that he claims to be the inventor of some new plant protector.

Home Correspondence.

The Muscat Vines at Wrotham Park.—It affords me much pleasure to reply to the queries regarding the present condition of these Vines, put forward by "David Tell Fact." Such a communication, I fancy, will prove more interesting, both to your general readers and to "D. T. F.," if given a few weeks later. I shall then, I hope, be in a position to give the amount of bunches, their size, and probably a few more details which at present would not be quite so satisfactory to myself, for were I to state accurately the number of bunches at present on the Vines it would probably be considered incredible. For the present I would refer your readers to Mr. Thomson's work on the Vine, from p. 68 to 71, in his sixth edition, where a detailed statement of these Vines is given as furnished by me, at Mr. Thomson's request. I have not observed any trace of Fungus in the borders; in fact, were such to exist, the roots have travelled far beyond its influence. This question is somewhat novel, and I am glad to see it is undergoing a thorough discussion by some of your correspondents, who I hope will in the end throw some light on the subterranean marauder—if it in reality has an existence—possessing such a blighting influence. *John Edlington.*

Diseased Calceolarias.—The last two years I have lost all my herbaceous Calceolarias, and this year I fear I shall again lose them. On reference to the "Cottage Gardeners' Dictionary," I find it stated that the herbaceous Calceolaria is subjected to a disease much like that of the Potato. A few of my plants are now showing blossom very stunted, the leave are one by one dropping, some of the plants are turning yellow, others shrivelling, and the best have a very altered appearance. The plants have been kept in a cool frame, under glass, standing in ashes. The frame was covered over at night and shaded during the late bright weather, and the plants were moderately and carefully watered. Till about three weeks ago they were as fine, strong, healthy plants as could be desired. The disease attacks the stem between the roots and foliage. I enclose a small portion as a specimen, and shall be glad to know the cause. Also, would some of the great herbaceous Calceolaria growers oblige me with the benefit of their experience, as to how to guard against this disease, their mode of treatment, and raising plants from seed, and particularly when near upon flowering. I may also add that several others in my neighbourhood have lost their plants much earlier. *Q.* [We have carefully examined your diseased Calceolaria. It is quite clear that the disease does not arise from the attack of a Fungus, like the Potato disease; but is one of those mysterious cases which, in the present state of our knowledge of vegetable pathology, is inexplicable. As far as we can judge from the dry condition of the specimens forwarded, the fault does not seem to be in the roots, but the disease commenced in what is popularly called between wind and water, and is either constitutional, or depends on some atmospheric action which is at present inappreciable. Your only chance is to alter your system. Whatever you do must in some measure be a leap in the dark. *M. J. B.*]

Sweet Peas.—I am a great lover of the Sweet Pea when in flower. On looking over several catalogues I found the following kinds mentioned, viz., Lord Anson's White, Do. Blue, Tangier, and Tangier striped, together with nine others of different colours. These I obtained from a well-known firm, from whom I have never had a bad article during the last 20 years. The roots above named have all come up like seedlings of the Everlasting Lathyrus. Are they really Sweet Peas, and will they flower this year with the others? *H. T.* [1. None of the above belong to the Sweet Pea, Lathyrus odoratus; 2. Yes. EDS.]

Pea Louse.—A flock of young chickens is a good remedy against the Pea louse. Forecast a flock of chickens about the middle of March. Procure a good-sized hen-coop, closed at one end, to keep the chickens warm at night, with the other end made so that the chickens can get in and out without being crushed. As soon as the insect begins to eat the Peas, place the hen and chickens in the coop about the centre of the Peas, and you will be delighted to see how well the chickens work. *D.*

The Weather in North Middlesex.—We had sharp frost here on May 3 and 4, which has blackened Potatos an inch above the ground. Those further advanced have so far escaped. French Beans and Runners have also suffered, as well as half-hardy annuals just making their appearance. The weather is extremely cold, with a cutting north-west wind, which is anything but genial to fruit trees in bloom. At present it would be premature to judge of the effects of the frost on the blossom: a more promising fruit season I never saw, but we are not safe yet. *John Edlington, Wrotham Park, May 5.*

Wistaria sinensis.—In reference to the questions asked by "An Old Subscriber" (p. 632), relating to the culture of this beautiful climbing plant, I wish to inform him that, although it often seems to be capricious in its rate and vigour of growth, it requires only a good, well drained loamy soil, free from chalk or gravel, and above all things a certain amount of patience. But with regard to its habits and mode of culture, I think it has never yet been fairly or properly treated in this country. It is usually nailed to a wall, which it soon occupies to its full extent, to the exclusion of everything else. Its own beauty is but of short duration, and I should be very glad if some of your correspondents would try to treat this noble foreigner in a manner more congenial to his natural tastes. In his own country he doubtless revels in native forests, climbing, not clinging, and flinging himself from tree to tree, forming canopies which, when loaded with the familiar blue and lilac floral racemes, must be grand indeed. I have attempted this with success, although hitherto to a limited extent, and chiefly on the Laburnum, a large tree of which it soon occupies; and as they both flower at about the same time, the effect of the contrast of the two colours is very pleasing. There is no reason why this should not be carried out to any extent in suitable situations, in shrubberies and pleasure-grounds, or even in many woods. I have adopted the same system with Ampelopsis hederacea, which finds itself quite at home among the trees, and would perhaps, in common with Wistaria sinensis, if uncontrolled, wander away to an undesirable extent. To ensure success in establishing and promoting the growth of either of the above plants, rather more than ordinary care should be taken in preparing the soil, owing to the probability of its having been already partially occupied and exhausted by other roots. I wish to make one more observation with regard to Wistaria sinensis, feeling desirous to know why such a free-flowering plant, and one apparently so perfectly adapted to our climate, has never, I believe, been known to perfect its seed in this country. Is there any botanical cause to hinder it? I have tried, but unsuccessfully, to hybridise it with the common Laburnum. *W. R. Baker, Bayfordbury, Herts.* [In a specimen before us the anthers are imperfect, and destitute of pollen; we do not know if this is so always. EDS.

Ants.—A speedy clearance of places infested by ants may be effected by simply pouring a small quantity of paraffin into the holes and places infested by them. They disappear almost by magic. *J. Loder, Woodbridge.*

—— I have found the following a most effectual remedy for destroying ants in Cucumber-houses. Place in a number of tea cups a mixture of brown sugar and warm water, sufficiently thick to prevent the ants from getting out when once in. The cups must be rather more than half filled and placed where the ants congregate. In this manner I have destroyed all the ants in my houses in one night. *Robert Smith, Silchester Nursery, Notting Hill, W.*

Protecting Wall-Fruit Trees.—Having found that the few remarks I communicated to your pages about this time last year on this important subject have to some extent drawn the attention of others to the better protection of their wall fruit, it has occurred to me that a similar notice may not altogether prove useless in promoting extended interest therein, and increased recognition of Frigi Domo canvas or similar

material for the protection of the fruit blossom, especially as instances are reported of considerable injury accruing to wall fruits this season, notably among Apricots, where efficient protection was not afforded. On the other hand, however, rumour proclaims an abundance of fruit generally, but whether or not it has been secured by means of artificial protection I am not informed. I expect, however, if the frosts prevailing last week have been as severe elsewhere as at Chiswick, to see adverse statements made in your forthcoming numbers. From here I am enabled to report favourably, as the frost was comparatively *nil*, as exemplified by the fact, that not even the stamen of a Strawberry or Apple blossom was injured. I learn, however, that in some localities in this neighbourhood vegetation suffered considerably. In reference to the general fruit crop here, I may report promise of abundance, including a most abundant crop of Apricots, partly secured by the aid of Frigi Domo protection, which proved of great service in the protection of the swelling and expanding blossoms in March, when the thermometer here registered 22° Fahr. on the morning of the 14th, and 16° on the 28th of the month. In illustration of the way in which our Apricots have set, I herewith transmit for your inspection fruit-laden shoots, selected from dozens similarly laden, the majority of which have been thinned for tarts, &c. [Densely laden with fine fruit.] I may add, parenthetically, as it may not be generally known, that green Apricots produce a *recherché* marmalade, highly esteemed by some epicures. It would prove interesting were correspondents to report remarks on the fruit crop of the current season, with information as to whether or not their crops have been secured by the aid of artificial protection. This information, I may be excused remarking, was conspicuous by its absence in the majority of the reports contained in the *Gardeners' Chronicle* at p. 872 and 895 of the fruit crop returns of 1869. In conclusion I would express a hope that the utility and advantages of efficient means of protection of our wall fruits may be more fully recognised than hitherto, as it is very distressing, to the gardeners especially, to lose a fine crop of fruit for lack of proper means, in our uncertain climate. *Wm. Gardiner, The Gardens, Faimgton Park, Stratford-on-Avon.*

Myosotis dissitiflora.—This has been a trying winter for this most delightful and exquisite of all our spring beauties. I write this sentence advisedly, and with the full knowledge that some have accused me of exaggeration in connection with this gem. I say the thing is impossible. No one can write down or up one half of its beauty, far less over-praise it. Do any of your readers doubt it?—then I invite them to come and see,—which, by the way, a good many have done, and they have gone away not only convinced but converted into enthusiastic admirers of M. dissitiflora's beauty. It carries all before it captive at its sweet will, and reigns supreme without a rival over all the Forget-me-nots. It comes first and endures to the last; and yet it is comparatively unknown. Nine-tenths of our visitors have never seen it before, and few or none of the others have it in possession. We are constantly met with the remark, "Why, your dissitiflora is different from ours; it cannot be the same variety." In many instances this may be true, for I find many good cultivators still confound dissitiflora with sylvatica. Among these I fear I must class your liberal correspondent, Mr. May. This gentleman was kind enough to send me a portion of his seed of Myosotis dissitiflora alba. All that have come white are sylvatica. I find others have made similar mistakes. I should be glad to hear if those who purchased the thousand seedlings offered so freely last autumn have really got the true dissitiflora. But apart from this mistake about the varieties, no plant pays so much for cultivation as Myosotis dissitiflora. We had a good many to look at our stock last autumn, and among others Miss Hope, of Wardie Lodge, who seemed astonished at the vigour and size of the plants. However, the experience of this winter has given me a cultural caution: moderate growth must be aimed at rather than an excess of vigour. The largest and finest plants have suffered the most from this trying winter; plants from 9 inches to a foot in diameter, that afforded space for the rain to rest upon, were mostly killed, or at least had their centres frosted out of them, leaving only a fringe of life around the outside. Compact, well grown plants, about from 4 to 6 inches across, stood the winter better. These points must be studied, for this wintering, with such winters as the last, is a serious matter. The winter found us with probably 4000 or more plants; it has left us with about 2000. I should be glad to learn, through the *Gardeners' Chronicle*, how it has fared, to use an East Anglianism, with my dissitiflora friends in the North. Next to compactness of culture, I recommend my last year's recipe, of elevation of ground lines for the safe wintering of this plant. It is wet rather than frost that kills it, and sudden alternations from frost to thaw. Frost, with the wet laying heavily upon the plant, leaves the black patch of death behind it. The great object of bank planting is to pitch off the wet. When dry the dissitiflora will endure from 10° to 15° of frost without injury; the wet, duration, and numerous changes of the past winter tried its constitution to the utmost limit of endurance. I have made another discovery this winter. A very slight protection suffices to carry this plant safely through such seasons. Our latest plantings were placed in a new shrubbery; they were divided late, and it was doubtful if they would do much. But every chance of increasing our favourite is eagerly adopted; and thus a large batch was put in for stock. The shrubbery is new and rather thin, but I don't think a single plant died there, and it is now a carpet of the loveliest azure. Next winter, if spared, I intend to stick a few boughs over our entire stock during the most severe weather. A very slight protection will suffice to carry it through, and it is astonishing how small a thing can ward off cold, or intercept the radiation of heat; it matters not to the preservation of the plant what function the overhanging branches perform, it certainly saves the plant. Those in very cold localities, or very far north, had better winter the Myosotis in small pots in cold houses, pots, or frames, and put out in April. This was the resolution determined on the spot by a nurseryman from Yorkshire the other day. As pot plants thousands might be sold in flower at this season, and dissitiflora is as well worth the shelter of glass as any bedding plant in the land. However, the new stock will not generally need any such shelter. Placed on raised ground, and very slightly protected, it will in ordinary seasons begin to flower in March. This year it has been much later; but side by side the Aubrictia and dissitiflora flowered together, almost to a day. One other point must be attended to, if this beautiful plant is to be had in perfect lines or masses without blanks. An immense stock must be grown. It is well to have a reserve of a half, or a third. Supposing 6000 are needed, propagate 9000; 4000, 6000; and so on. For the Myosotis dissitiflora, like many other beauties, has one most provoking and apparently incurable frailty—it will suddenly sulk, refuse to grow, become purple or red in the face, and linger and die. This weakness seems constitutional. I have tried to stamp it out by instantly destroying every affected plant, but cannot do it. As soon as the slightest symptoms of stuntedness appear, away with the plant, and replace it with another. Without a large reserve this is impossible, and patched beauty will be the penalty paid for a paucity of plants. Finally, the flowering stocks must all be renewed annually; no dependence should be placed upon old plants; they may live and they may flower, but young ones must increase by cuttings, or division, or by seed if you can get it. All my stock has been raised and preserved by the first method. *D. T. Fish.*

Alterations at the Serpentine.—With you, Mr. Editor, I consider the alterations on the east bank of the Serpentine above-bridge anything but improvements; I think it is not difficult to see how they have come about. Hitherto the grass came down to the water's edge, and although it was not observable from the other side, it was certainly in some places trodden a little bare and hard by people walking along the edge of the stream. It has no doubt been with the intention of preventing this that a regular walk a few feet back has been made and railed off, and most probably the clumps of Rhododendrons have been dotted down at equal distances between the water and the walk to hide the walk in part from the opposite side. Now, it seems to me that if the walk is to be substituted for the sward, the plan of partially concealing it by a clump of Rhododendrons is a very good one. I do not defend the position in which it has been put; that is as bad as could be; but by shifting it a very little nearer the bridge your objection would be obviated. Where I feel more disposed to be critical is with regard to the propriety of this walk being made at all. It wholly changes the character of the scene, destroys its rural effect, and as you say, spoils its beauty; but more than all that, it deprives a numerous though small population of a great enjoyment. It used to be something very pleasant to see the delight of the little urchins who were taking their first lessons in angling with a short stick or piece of thread and a crooked pin. Their occupation is gone, poor things! They must now keep, I presume, decorously between the railings of the gravel path. I should not wonder either but that this, too, has been done advisedly against them, for I have observed within the last year or two that the old occupation of fishing has somehow become attended with peril. No sooner did a policeman or keeper come in sight, than a general panic seemed to take possession of all the infantile votaries of the rod, who scuttled off with their apparatus as hard as they could pelt. I have always intended to inquire of these dreaded guardians of the treasures of the deep, what harm the poor little ragged urchins were doing, but they have invariably been so intent on the execution of their awe-inspiring mission, that I have never been able to catch them any more than they have been to catch the boys. Left to my own resources, I have worked out a solution for myself, but upon my word I have no idea whether it is the right one or not. I have supposed that the fish are wanted to maintain the balance of purity in the water, and that they have to be replenished by ova or fish brought from elsewhere, and that the efforts of the youthful Isaak Waltons to take out what has just been put in does not meet the approval of the guardians. If that be the case, I am sure there are plenty of benevolent people in London who would gladly subscribe enough to replenish all that the little fishermen take out ten times over, rather than that they should be deprived of their cherished sport, and it would not take many people to do it either; a £5 note would do it all. I know from personal observation what sort of baskets of fish they take home. They are not heavy, rarely exceeding one "whopper" of nearly an inch in length in a bottleful of water, but more generally the bottle goes home empty. *C., Campden Hill.*

Eriogaster lanestris.—I enclose some eggs of an insect, which seems to be precisely similar to those described at p. 596, which were on Whitethorn; these were found on Blackthorn, as may be seen by the leaves on the sprig sent. I have never seen the kind before. *Arthur Berrill.* [The eggs have come just in the nick of time. The young caterpillars are coming out of them in numbers, and busily spinning together the leaves of the Thorn on which they have been put, as is the manner of the young larvæ of Eriogaster lanestris, which these obviously are, as stated by Mr. Doubleday in our last week's Number. *A. M.*]

Bedding Pansies.—In the various articles appearing for some time past in the *Gardeners' Chronicle* on the above plants, I do not recollect to have seen the name of the best bedding Pansy grown (Vesuvius), which, in my opinion, as a hardy and early flowering variety, has not its equal. From its close and compact dwarf habit, throwing up stiff-petaled flowers above the foliage, it struck me as being far in advance of all other bedders. I saw it in early spring this year in full bloom, in spite of the cold biting winds, before any of our so-called early varieties had a flower open. I do not know the raiser's name, having only seen it in one locality and at two private establishments, at one of which it is used extensively. I am certain if known it would be highly appreciated by all who use bedding Pansies. *G. Wood.*

Medinilla magnifica.—The plant noticed last week is 6 feet high and 8 feet in diameter; it is in an 18-inch pot. The soil consists of equal parts loam and peat, with a little charcoal. It makes its growth after flowering, when it enjoys a temperature ranging from 60° to 90°, which is by the autumn reduced to 50° and 60°, and as I want it to flower at Easter I put it into a warm house in January, a fruiting Pine stove or Orchid-house, as circumstances permit, and for the last four years it has been magnificent. It flowers on the old wood as well as the new, in fact the panicles have to be tied up from the mould. It is one of the many plants grown in pots that want to be large to show their real beauty. *Richard Carr.*

Foreign Correspondence.

RUNGBU.—Dr. Hooker wrote to me some time ago for Rhododendron and Juniper seeds, Arum roots, &c., and particularly a tall Juniper, called by the Lepchas "Tchokpo." I had a great difficulty in finding a man who would go for it, as it is some 15 days' march from here, in a bitterly cold and bleak country. The man brought back what he declares is "Tckokpo," but I have my doubts about it, though several other rather decent sort of natives have since confirmed the man's statement. The seed was very green: the best of it I sent to Dr. Hooker, and placed the rest in the sun to ripen. Seeds of Rhododendron argenteum, the only species that grows near my house, I failed to get. I searched many trees, but could not see a single capsule. It is now flowering most abundantly, and I hope to have better luck this year. Dr. Hooker, I think, mentions that this species does not flower freely, but so far as I have seen, no plant could flower more abundantly than it does. At present there is a flower-spike at the end of at least 90 per cent. of the branches on some plants about 2¼ miles from my house.

Two of the most common plants growing beside R. argenteum, in the district I mention, are Daphne indica and Ardisia crenulata. It seems strange to see an old stove plant (Ardisia) growing in so temperate a climate. Both it and the Daphne flourish best about 6000 feet above the sea, where the glass in February occasionally falls as low as 28°, and showers of snow fall once or twice in the year. Both plants, however, flourish far best under the shelter of trees, where the temperature must be a few degrees higher than in the open. Neither keep very healthy for long when fully exposed, and are far finest in places where they are well sheltered, and never dry at the roots. I fancy both plants would do splendidly planted in the borders of the temperate house at Kew, under the large plants. I have never seen the Ardisia higher than about 4 feet, but the Daphne sometimes grows as high as 15 feet, but 8 or 10 feet is an ordinary height for a good plant. Were your gardeners to see some of the beautifully shaped natural plants of the Daphne, I am sure they would never afterwards let a knife or a stake near one of their specimens of it.

Two of the most showy plants (in the sub-tropical regions) at present are the white Buddlea and a Lobelia, I think excelsa. There were a few plants of the latter, which stood about the frames all the time I was at Kew, but which never grew at all, most likely for want of pot room; but if well managed it would be a splendid plant for decoration or for cut flowers at this season. It throws up a spike about 5 or 6 feet in

height, and flowers from the top to within a foot of the ground. The Buddlea is a plant which, though one of the most common here, would I am sure be very much thought of at home. I think more of it than of almost any other plant in the district. I have no doubt that you will succeed better in raising the temperate seeds of India in heat than entirely without fire. Even here we are more successful with a little bottom-heat than without. We always find that the faster we can get seeds to germinate the smaller the loss, and seedlings soon gather strength when placed in the cool.

We have just finished giving our Succirubra plantation of 1866 a very slight thinning, and have got about 2000 lb. of dry bark. With a very moderate thinning we could have doubled that quantity, but it was not considered advisable to have more cut just now, as success in manufacturing is not yet assured. The Darjeeling Cinchona Association have made a clean sweep of their 1866 plantation. The bark is not yet quite dry, but I calculate they will have 5000 to 6000 lb. of bark to send to market. It strikes me that after the end of 1872 or 1873 we shall be able to collect at least 100,000 lb. of bark yearly, and probably double that quantity if required. Mr. Clarke is now on his way to visit the Madras Cinchona plantations, and I am most anxious to hear the true state of affairs in that quarter, though I feel confident that the Darjeeling plantations are by far the best, for had we had as good and early a start as the Madras people had, we should have sent a very large quantity of bark to the market by this time, and so far as I know, the Madras people have scarcely sent any, neither have I heard of their quinologist manufacturing any quantity of alkaloids. These things look suspicious, to say the least; the Madras people are not guilty of "putting their light under a bushel."

I observed that C. Calisaya has been raised in St. Helena from seed sent by Dr. Hooker. I should be glad to have a supply of fresh Calisaya, and from South America, as it may turn out to be different from what we already have: we evidently have at least three varieties. Lately we have got a little Calisaya seed from Java, and more is on its way. We find it a most difficult species to propagate quickly from cuttings; the cuttings do not strike freely, and the stock plants will not stand the knife. I have just had a large number of eyes put in, in hopes that we may be more successful that way. *J. G.*

Fig. 125.

of blooming, soils, situation, &c., for the purpose of practical application." The very thing that was wanted! will doubtless be the exclamation of many a reader. Loudon, all honour to his memory, was a diligent compiler, and amassed an enormous amount of material, but employed little judgment in its use, wrote an encyclopædia where a compendium would have been more serviceable, and occupied a great deal of space with botanical details, which he was either not competent, or had not time to digest, and which therefore are all but valueless. Selby's "Forest Trees" is excellent so far as it goes, but it applies only to our commoner native kinds. Karl Koch's "Dendrologie" is admirable from a botanical point of view, but it is as yet incomplete, and is moreover not yet translated from the original German. There was room, then, for the present work, and a great boon would have been conferred had the excellence of its execution been commensurate with that of its plan. As it is we have a very unequal book, excellent in some respects, very disappointing and incomplete in others. Handsomely got up, the very first impression on opening the pages is an unlucky one,—we have a coloured frontispiece, apparently representing Araucaria excelsa, but which is labelled A. imbricata. The illustration is repeated on another page in an uncoloured state, and with the same legend. This may be a mere oversight, but it leaves an uncomfortable impression nevertheless. The other illustrations are, many of them, excellent as woodcuts, as may be seen from the specimens (figs. 125—127) we are, through the courtesy of the publisher, enabled to lay before our readers. Others, equally artistic, are not so characteristic, and the reader, save for the legend, would have some difficulty in ascertaining what plant was really meant.

The first part of the volume is devoted to an alphabetical list of 621 trees and shrubs selected as desirable for planting in the open air in this country. Of each of the selected plants, a short and often inadequate description is given. Here is an example of the author's method — he is speaking of the Naples Alder:—"Alnus cordifolia—Naples, 1820. Tree, 50 to 60 feet; leaves heart-shaped acuminate shining; male catkins long and ornamental. This handsome tree, which is of pretty rapid growth, is quite hardy, and presents an appearance very distinct from that of all other species of Alder: indeed, at a first glance, it would be taken for a Poplar." We quite sympathise with the author in his disregard of many varieties and garden forms, either trifling in themselves or of little merit from a gardening point of view, still we think he has sometimes carried his eclecticism too far, and has omitted many forms which should have found a place. Thus under the head of Cerasus we miss one of the best, if not the best, of the Bird Cherry section—we allude to Cerasus nepalensis—while not one of the varieties of the common Cherry Laurel is mentioned, though certainly some (as the C. caucasica) should have found a place, as superior in beauty and hardihood to the common Laurel. It would have been worth while to have mentioned Hartoghia capensis under the Laurels, if only for the sake of nailing bad coin to the counter, as the plant so called is only a variety of the Cherry Laurel. As selection, not collection, is the author's aim, he would have done well to have selected Chimonanthus fragrans var. grandiflorus, as preferable to the ordinary form.

Only three Cotoneasters are mentioned—C. Simonsii, one of the very best, being omitted. Again, surely it would have been desirable at least to note some of the now numerous varieties of Lawson's Cypress, but not one is even mentioned, though all are equal, and many superior, to the assumed typical form.

Every one who takes the least interest in his plantation is surprised and pleased at the Cytisus Adami. Surely we might have expected to find some notice of this remarkable form, but it is not even alluded to. Fremontia is perhaps too scarce to find a place in this

Fig. 126.

Fig. 127.

Notices of Books.

Trees and Shrubs for English Plantations. By Augustus Mongredien. With illustrations. 8vo, pp. 388. London: Murray.

It is quite worth while to quote the second title of this book, as it fairly indicates the nature of its contents. It runs thus:—"A selection and description of the most ornamental trees and shrubs, native and foreign, which will flourish in the open air in our climate; with classified lists of the several species, under the heads of size and habit, peculiarities of foliage and of flowers, season

volume, to which otherwise its splendid flowers amply entitle it. Under the head of Garrya elliptica, we are not even told that the catkins of the ordinary plant are male, and of course the existence of the female plant is wholly ignored. Again, if Iberis was worth introducing into a list of shrubs, surely I. Pruiti, and specially the true I. gibraltarica, should have been mentioned. The large-leaved variety of the Tulip Tree, so superior to the common form, is also not alluded to. The account of the Planes is limited to a meagre statement respecting P. occidentalis and P. orientalis, from which it is clear that our author has no definite knowledge of the two forms and the many fine varieties of orientalis,

while he evidently confounds our Park Plane with P. orientalis, in spite of the oft-repeated teachings of Rivers and others. We have taken these illustrations at random as we have turned over the pages, and were it necessary we could adduce a much larger number of instances wherein our author has exercised selection rather than discrimination. Indeed, so far as this portion of the work is concerned, a good nursery catalogue (and we can hardly do wrong in naming Osborn's catalogue as a model in this respect), contains, within smaller compass, not only more, but more trustworthy information than is contained in this volume.

It is a relief to turn from the first to the second part of this book, wherein the author has arranged his information under several heads, showing the height, habit, characters of foliage, flowers, &c. Thus we have lists of trees and shrubs with showy, abundant, or fragrant blossoms; others giving a catalogue of those that bloom in winter, and, indeed, in each month of the year; enumerations of timber trees and of others serviceable for some purpose or another; catalogues of trees arranged according to their mode of growth, rapidity of development; of those suitable for hedges or game cover; of others thriving in the shade or under the drip of trees, in towns, on the sea coast, &c. Other lists are given of shrubs and trees which require protection in the South of England in winter.

All these lists, though sharing in the defects of the previous part of the volume, are likely to be useful. The chapter containing a list of fine collections of trees and shrubs in various parts of the kingdom, partakes of the meagre incompleteness of the earlier portion of the volume. And so we take leave of this book, which, with all its shortcomings, is one which must find a place in the library of all who take interest in trees and shrubs, and which is likely to render good service by reviving interest in the noble and very interesting plants of which it treats; merely adding that fig. 125 represents Abies Pinsapo and Biota pendula, fig. 126 a scene in Burnham Beeches, and fig. 127 Gleditschia triacanthos.

Societies.

AGRI HORTICULTURAL SOCIETY OF MADRAS: *Nov. 5.*—Dr. J. D. Hooker communicated the following letter, dated Kew, November 12, 1869, accompanying a packet of seed of the best Havannah Tobacco:—"Tobacco is in great demand in the English market, and the brokers inform me that the India and colonial is very poor indeed, and that fair qualities would command good prices. It is greatly to be desired that this sample should be tried and bales sent home to a London broker, through some house of agency in Madras which would take an interest in this subject." The Secretary intimated that he had instructed the superintendent of the gardens to grow a considerable quantity of the plant, with the view of carrying out Dr. Hooker's suggestion. The meeting was also informed that a portion of the seed had been sent to the collector, Godavery district. It seems very desirable that more attention should be paid to the culture and curing of this important product, and there can be no doubt that if improvements were introduced, Indian Tobacco would be in demand and fetch a good price in the English market. The usual varieties of the plant now cultivated have greatly deteriorated, and the first step towards improvement must be the distribution amongst the growers of seeds of some of the best kinds likely to thrive in this country. The Society will be prepared in the course of the year to furnish supplies of seed of acclimatised plants, and it is proposed to seek the assistance of the Board of Revenue in distributing the seed, and to ask them to take such measures as they may deem advisable, for improving the crops and the preparation of the leaf in the Tobacco producing districts. Samples of the cured Tobacco from exotic seed might then be forwarded to the Society, who will undertake to have their value in the English market ascertained, in the manner recommended by Dr. Hooker.

If such steps were taken and the ryot made aware of the ready market and high price that a really good article would secure, it seems reasonable enough to suppose that he would devote more attention to his Tobacco crops. The following is a summary of the modes of cultivating and preparing Tobacco, as practised in Virginia.* The soil best suited for the plant, is a rich open alluvial, and before planting, it should be broken up into a fine mould. The mould is then drawn into little hillocks arranged in lines, usually 4 feet apart one way and 3 feet the other. (In this country 3 feet by 2 feet would be quite sufficient intervals between the lines, and the propriety of raising hillocks on which to plant the seedlings seems doubtful, as they would be apt to suffer from drought.) The seeds are sown in beds manured with the ashes of brushwood, straw or dried weeds, and each bed is surrounded with a strip of Mustard, which being more attractive to insects than the Tobacco prevents their attacking the young plants of the latter. In about a month the seedlings will be fit for transplanting, and they are known to be ready for lifting when the fourth leaf has sprouted and the fifth is just appearing. Rainy weather is best suited for the operation, and the seedlings must be carefully raised from the beds, so as not to injure the tender roots.

When lifted they are at once conveyed to the field in which they are to grow, and planted by making holes in the ground with a finger or dibble, inserting a plant in each hole and then pressing the earth round the root with the hands. Great care must be taken not to injure the leaves, as they are at this stage extremely tender, and if injured the plant is likely to die. After planting, Tobacco husbandry calls for continual labour in weeding, stirring up the soil and earthing up the plants, and these labours must be persisted in through the whole growth of the crop. When the plants show signs of coming into flower, the flower branches must be pinched off with the finger and thumb nail, as flowering reduces the size and impairs the quality of the leaves. In topping in this way some judgment requires to be exercised as to the height at which the stem is pinched off. In Virginia so much is removed as to leave only from five to nine leaves on the plant, according to the quality of the soil, as it has been found that, in general, the fewer the number of leaves left the greater will be the strength of the Tobacco. Another kind of pruning is also called for. In the axils of the leaves and about the roots shoots continually appear and must be pinched off, for if allowed to grow they injure the quality of the Tobacco. It is somewhat difficult to determine the time at which the plants should be cut down. When ripe the leaves change their colour to a yellowish green, putting on what may be called a mellow appearance, and the web of the leaf appears more prominent and somewhat thickened in its substance. As all the plants in a field do not arrive at maturity together, they are cut in succession as they become ready for curing. The proper time for cutting requires to be selected with great judgment, as if Tobacco be cut before it is ripe it never has a good colour, and is apt to rot when packed in hogsheads. The stems are cut across near the ground with a strong sharp knife, and if thick are divided down the centre nearly to the extremity. The splitting of the stems permits of the freer action of the air and the escape of moisture. When cut they are laid in regular order on the spots where they grew, with the end of the leaves all pointing in one direction. They are then collected and carried to the curing house or barn. This consists of a roof supported on pillars 12 feet high from the ground to the eaves, and partially open at the sides, so as to allow free circulation of the air. The interior of the barn is occupied by horizontal poles stretching across the building in a parallel direction, and 4 feet apart from each other. These poles are connected when the house is occupied by cross pieces called tobacco-sticks, on which the leaves are hung. The plant then must be conveyed to the curing house, as soon as the leaves are sufficiently pliant to hear handling. If taken in when newly cut, they get broken and damaged. The operation of hanging is then performed by suspending the plants upon sticks with the points of the leaves downwards, hanging them either on the stalk of the lowest leaf, or by the slit in the stem already mentioned. Each plant is placed so as to hang 4 or 5 inches apart from its neighbour. The agency of the atmosphere is principally relied on for curing the Tobacco, and in this country artificial heat could never be required. When the curing has proceeded to a sufficient extent the Tobacco is said to be in case, an effect generally produced in four or five weeks from the time of hanging. The method of ascertaining whether this point has been attained is to stretch the leaves gently over the ends of the fingers and the knuckles, and if in good case the leaves will be found elastic and tough and slightly covered with moisture. After this the first rainy day is chosen for taking down the leaves, and stripping them from the stalks. The lower or ground leaves being often soiled and torn are separated from the rest, while of those produced higher on the stalk some are inferior to others, and the whole are therefore distributed into three heaps. When the operation has been effected a number of leaves are tied together, each little bundle being a little thicker than a man's thumb at the end where it is tied. The bundles are then thrown together in heaps on a wooden platform, where they undergo the process of sweating. This amounts to a slight degree of fermentation, and care must be taken, by exposure to the air, to prevent this from going too far. On this point experience must be the only guide. The leaves when properly sweated will once more show an elastic quality, will be stretched, and are then in case for packing for shipment. The Tobacco is packed in Virginia in casks, 4 feet deep by 32 inches diameter at the heads, and each hogshead will, if properly packed, contain from 950 to 1000 lb. weight of Tobacco. In proceeding to pack, the little bundles are arranged one by one parallel to each other across the hogshead, their points all in the same direction. The next course is reversed, the points being in the opposite direction to that of the first layer. When the cask is about one-fourth full the layers are pressed down by a powerful lever, until compressed into the thickness of 3 inches, and the pressure is kept up until the Tobacco will retain its position when the weight is withdrawn. Fresh layers are then added and pressed in the same way, till the cask is full.

At the same meeting, a letter from Capt. Campbell, in the following terms, was read:—"I shall be very happy to furnish your Society from time to time with such information as they may want from my part of the country, *i.e.* the Pulney and Siramally Hills. As you are already aware, I am making a collection of the Dammars, gums, and other produce of those ranges, samples of which, together with specimens of the timbers, I will forward to you shortly. Some of these latter are I fancy valuable, as I think we have the Canarium strictum, Vatica Tumbagaia, Vateria indica, Shorea robusta, Pterocarpus Marsupium, and Pterocarpus santalinus.

"I have just brought out with me a large collection of English garden seeds, and a Wardian case with Olive, Vine, and Orange plants from the continent of Europe—about 300 fruit trees roughly packed in moss, and some very fine Rose trees. I will let your superintendent know exactly what I have, and should any specimens be wanting in your gardens I trust that you will allow me to supply that want.

"In the south of France I picked up some fine fresh seed of the Morus alba. I conceive that the probable cause of the sickness of the Mulberry in this country is caused by over propagation by cuttings; fresh seed will cure this.

"Conceiving that silk may be raised in the Wynaad and other planting districts of this Presidency I have carefully studied the cultivation of the Mulberry in France, and I can see no reason for its cultivation on our hill ranges being other than a success. I would however strongly urge planters to look on silk raising as an agricultural and not as an industrial undertaking. Many an enterprising man has been ruined by attempting to reel. Your School of Arts must teach the native how to do this. All the planters can do is to furnish you with packages of dried cocoons: I found the merchants in Lyons very eager to receive dried cocoons. The process of drying is a very simple one. An even temperature of 140° for three days will do all that is wanted. I fancy that with the aid of glass the sun will do in India what the clumsy apparatus (and costly) of the Italians often fail to do for them.

"I have now with me 10 lb. of white Mulberry seeds, and have some more following; some seed I am planting in hedges, some in beds like osiers at home, and the rest in the nursery for standards.

"As a fodder I have brought out some seed of the Locust or Carob Bean; it thrives well in dry arid countries, so ought to suit Madras districts.

"Tobacco seed—some from the Havannah, Virginia, and Turkey—I am planting myself, and distributing to ryots in the Dindigul Tobacco gardens, I trust to be able to improve the indigenous plant (or rather the plant now raised by the natives), to improve the curing of the crop, and if possible to revive languishing industry in the Dindigul talook.

"In Egypt I inspected some Cotton fields and received many valuable hints from the cultivators there. I brought 5 cwt. of fresh seed with me, and have already put down 20 acres as shade to young Coffee, and 6 acres of Cotton alone, in pits 18 inches wide, and 5 feet apart. Abandoned Coffee-land is, I believe, a virgin soil for Cotton, and I do not see why old estates should not be converted into Cotton fields. The only thing I fear is, that insects may destroy one's prospects in Cotton. I fear nothing else. Exotic Cotton thrives capitally on our hill ranges, and an experienced planter in Ceylon told me that he would grow it on his abandoned and grass lands if it were not for the unseasonableness of the rains there, which would injure the ripe pods. In India we have regular monsoons, so need not fear this danger. The gentleman I allude to above is putting down 200 acres of green Aloes for fibre. Is he not wrong, and should he not try the blue Aloe so common in this country, to be seen all along the Madras Railway? A line to the Ceylon papers might do good.

"The Egyptians get over the difficulty of insects by planting annually, and flooding their fields. Now, we on the hills want to plant Cotton as a perennial, and have no Nile at hand, so I fancy the only way for us to do is to adopt the South American plan of keeping great numbers of Turkeys, Guinea and other fowls, to destroy the insects whose nests should annually be buried by the ground in the plantation being dug over. I am told that the birds if put on the estate from the first will quite keep down the insects, but not so if the insects are once allowed to breed and get a fair start.

"Should you desire it I would spare you some of this fresh seed. It has arrived in capital order, so much so that the collector of customs was tempted to levy duty on it, a fact which I conceive will raise a storm in Manchester when it comes to the ears of the 'cotton lords' there.

"I have formed a connection with a firm in Japan, who import silkworm seed largely in Europe. I am going to write shortly for a little seed to try preliminary experiments with, and should be happy to get seed for your Society, should any be wanted."

* From "Porter's Tropical Agriculturist," a new somewhat scarce book.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Tuberous-rooted Tropæolums which flowered early will now want a season of rest, and must receive less water at the roots, so that the balls of soil may become gradually dried off by the time the leaves cease to perform their usual functions. Too frequently a superabundance of moisture at the root, even before the foliage begins to ripen, causes much unperceived injury to these now somewhat neglected plants. *Boronia serrulata* is now showing its pink or rose-coloured flowers, and should therefore be watered very carefully. It frequently happens that after these plants have exhausted their resources to the utmost during the flowering period, they immediately die off. It may therefore be readily surmised that by paying greater attention to their wants at such a period, this loss may be averted. Being a native of Port Jackson, it delights in pure rarified air, and consequently should not be grown in a close sluggish atmosphere. *Ixoras* will now be growing actively; some, indeed, which are intended for blooming next month will be already forming their young flower-buds. These plants thrive well if allowed a free supply of water at this period, together with a high degree of atmospheric moisture. Never let the temperature surrounding them fall below from 64° to 66° by night and 71° to 73° by day. Look well after insects which are likely to attack them at this season, such as thrip, red spider, and especially that detestable plague mealy-bug. Pot off young *Balsams* which are about 2 inches high into small pots, in a compost of rich fibrous loam, leaf-mould, and silver sand. Keep them as near to the glass as possible, and do not allow the temperature to get too high. Sow more seeds for a successional supply if required. Make a final sowing of *Cineraria* seed for winter blooming, to succeed those which are already up. *Cock's-comb* seedlings which have made three or more young leaves should now be potted off singly into 60-sized pots in moderately rich soil, after which they should be placed close up to the glass in a high moist temperature, to remain until they show flower, when

they should be immediately shifted into the pots in which they are to bloom. Varieties of *Schizanthus* which are coming into flower should be occasionally watered with good liquid manure; they should also be afforded plenty of light, as they assume a far brighter colour under such conditions than when they are placed in a shady position. Conservatories or show-houses should now have liberal internal treatment. It will not be possible, in the majority of instances, to syringe all the inmates over-head, because of the liability to injure the flowers of such as are in full bloom; it will, therefore, be better to damp over all such as are not likely to be injured with a fine-rosed water-pot. Keep the walks and borders constantly damped over, and so cause a nice amount of humidity to pervade the house.

FORCING HOUSES.

Carefully inspect those parts of inside or outside *Vine borders* wherein *young Vines* were planted last March, so as to ascertain whether water is required. It should be borne in mind that, as the young roots are near the surface, they are more likely to suffer from want of water than those of older plants which have buried themselves at a greater depth in the earth, and so obtain a more uniform supply of moisture. With perfect drainage, young thriving Vines require an abundant supply of water at the roots. Those who may have grown Vines on in pots, to forward them a little before turning them out, should not delay their final transplanting any longer; because in all instances of this kind they should be turned out in the heyday of their growth, and not when the current season's wood has become somewhat hardened and an unimpeded and quick growth becomes impossible. In regard to *Pines*, it has now become absolutely necessary that such an amount of atmospheric humidity should be constantly supplied, that the air may be kept densely surcharged with moisture, whether air be given or not. To keep up an abundant supply of humidity where air is on, will require a large amount of labour—so quickly will the warmth absorb all surface dampings or superficial sprinklings. Pans, or other appliances filled with water, and kept near to the heating mediums, will prove of great assistance towards attaining this end. It is thought less important by some growers to keep the pans filled with water during the summer months than during winter and early spring. This I think is a great mistake, for even if the moist vapour arising from them be not readily perceived, the influence it exerts is nevertheless very important, inasmuch as it softens the dry fresh air which is admitted, and so prepares it that, in its contact with the plants, no tax is imposed on their now hard wrought surfaces. As May advances 1° or 2° more heat must be allowed in all *Pine* stoves. To give the necessary amount weekly would be difficult, so far as the requirements of Pines at the various stages of their growth are concerned. The main principle to be followed is to make a steady advance, 1° at a time, until the full maximum of the growing season is attained. By the middle and end of July, and on through the month of August, we arrive at this point, when a mean temperature of from 80° to 82° of artificial heat should be maintained, during the coldest, dullest weather, apart from any influence which the sun may have at more favourable periods. At this time 75° will be ample, and should be maintained as the minimum by day on all occasions, the night temperature being 9° or 10° less than that of the day. It will be seen that between now and the first week in July, 5° or 6° are to be gradually added. *Forced Strawberries* will not now require to be elevated upon high shelves against hot, dry, insect-breeding back walls, &c.; a more rational mode must therefore be adopted. An ordinary cold frame or pit will forward them materially now, if it is closed early in the afternoon, so that a moderate amount of sun-heat is maintained away into the night. Give *Melon plants* which have set a full crop, liberal treatment; shut the frames up early, damping the plants over previously with a rosed water-pot. Weak liquid manure applied about every third root-watering will tend to increase the size of the fruit, but it should never be given until the fruit is obviously swelling freely.

HARDY FLOWER GARDEN.

Though many will begin bedding-out on Monday or Tuesday, the 16th or 17th inst., I advise due caution so as not to expose to risk any tender, scarce, or otherwise valued plants. Up to the time I write, the weather is unusually harsh and cold; hence, even more than ordinary caution should be used. I know there is much more lost than gained by planting out a few days too early. The 20th of May in a general way is quite soon enough, especially when we consider that a very severe frost once cut everything off on the 18th of May. Besides, where is the advantage, apart from the risk of losing one's stock, or getting the plants partly injured and thrown back for some weeks? It is better to keep them until the above date, and if they are pot-bound give them a little manure-water, and so assure to them an unchecked and uninterrupted growth when they are turned out. The requirements of each separate class of plants must be taken into consideration. All should be planted in beds having such an amount of good soil and artificial support added as will insure the necessary assistance should a very dry, hot, trying period ensue. The beds should not, however, be so rich as to cause the plants to run to leaf at the expense of flowers. Some subjects, such as *Pelargoniums* of the plain-leaved and zonal sections, require a somewhat poor soil to cause them to bloom freely, whilst other varieties, with variegated foliage, require a rich soil wherein to grow freely for the production of fine foliage, which is their main beauty. *Iresines* and *Violas*, of the cornuta and lutea types, like a deep rich cool soil. Those who succeed best with foliage plants, such as *Wigandias*, *Solanums*, *Ricinus*, when growing them in a bed, generally place such an amount of fermenting material in the bed before planting as will afford a fair supply of bottom-heat until they have made a good start into growth. These plants should not be planted out for another week or so.

KITCHEN GARDEN.

Cauliflower plants which have fairly started into a free growth should now have a good soaking of water at the roots. If the weather keeps cold, as at present, give them only a little weak manure water, and that either preceding or following the general watering with clear water, until some progress has been made. If frequent doses of strong liquid are given the delicate young spongioles will be injured. The soil, if at all rich—and these plants are seldom planted in poor soil—will contain moisture and support enough without the aid of such stimulants, but should a nice rain ensue, then by all means give a good watering with thick liquid manure, between the showers if possible, or immediately following them. If the weather continues dry all further sowings of *Broad Beans* and *Peas* should be watered in the drill rows after sowing and before the soil is drawn over them. Regular waterings must be afforded to all seed-beds, and in such a manner that they do not become dry after once the seeds have germinated until they are fairly established. Make a final sowing of *Broccoli* for late spring use, also *Cauliflower*, *Lettuces*, *Endive*, and *Dwarf French Beans*. *W. E.*

TOWN GARDENING.

AFTER the first shower of warm rain prepare the beds intended for *Bedding Plants*. Fork them over, and add a portion of rotten dung, leaf-mould, and sand. Afterwards level the ground, mark out the rows for Pelargoniums, Calceolarias, and Ageratums, 9 inches apart, and put in the plants in a diagonal fashion in the rows. Press the earth closely around the roots, and well water them. As the season advances, a mulching of rotten dung will be of great advantage to them, particularly to the Calceolarias. The varieties of *Pelargonium* which I have found to do well in town, are the following:—Cybister, Stella, Christine, and Madame Vaucher. Of *Calceolarias*, Aurea floribunda, Kayi, and Prince of Orange; and for *Edging Plants*, Cerastium tomentosum, Lobelia speciosa, and the Golden Feather, Pyrethrum aureum, which is a most useful plant in any position. The very pretty Echeveria secunda, E. secunda glauca, and E. pumila, make very neat edgings, and are well adapted for rock-work. The following *Foliage Plants* do well in town, and are very showy:—Varieties of Cannas, growing from 2 to 3 feet high; Indian Corn, 2 feet 6 inches; Centaurea gymnocarpa, 18 inches; and Cineraria maritima, 18 inches. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, MAY 11, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
May.	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air
	Ins.	Deg	Deg	Deg.		Gr.
5. Thurs.	30.08	48.7	44.0	40.1	72	2.9
6. Friday	30.15	51.8	48.0	44.2	75	3.3
7. Satur.	30.10	52.6	48.6	41.6	75	3.4
8. Sunday	30.17	50.9	46.1	41.7	71	3.0
9. Monday	30.08	48.3	41.7	38.7	70	2.7
10. Tues.	29.81	47.4	45.1	43.0	86	3.2
11. Wednes.	29.49	54.1	50.2	46.3	75	3.6

1870 MONTH AND DAY.	Temperature of the Air					Wind.		Rain.
May.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 39 Years.	Direction.	Horizontal Movement	In Inches
	Deg	Deg.	Deg.	Deg.	Deg.		Miles	
5. Thurs.	60.9	37.0	23.9	48.1	— 3.4	WSW N.E.	155	0.00
6. Friday	60.6	37.5	23.1	48.7	— 3.0	N.N.E.	120	0.00
7. Satur.	59.6	38.3	21.3	47.2	— 4.1	N.N.E.	196	0.00
8. Sunday	51.5	31.4	20.1	41.7	—10.0	N.E.	175	0.00
9. Monday	61.5	36.8	24.7	44.0	— 7.5	N.E.	170	0.00
10. Tues	59.0	38.3	21.6	47.1	— 3.9	E. S.E.	165	0.00
11. Wednes	60.8	35.2	25.6	46.3	— 4.9	S.E. S.W.	300	0.24

May 5.—Generally cloudless till noon; generally overcast after wards. Solar halo in morning.
— 6.—Large amounts of dense cloud prevalent till evening. Variable between 6 and 10 P.M., then cloudless.
— 7.—Cloudless till 8 A.M.; generally overcast till the evening, then again cloudless. Generally fine.
— 8.—Overcast till morning, then cloudless. Slight hoar frost at night.
— 9.—Variable amounts of cloud prevalent during the day; cloudless at night. A fine day.
— 10.—Small amounts of cloud prevalent. A fine day.
— 11.—Generally overcast after 9 A.M. Solar halo. Rain fell continuously from 1 P.M. till late in the evening. Gusty S.W. wind.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, MAY 7, 1870

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Temp. during Week.	Mean of the Highest.	Mean of the Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	61.1	32.9	31.2	50.7	38.1	21.2	45.0	0.14
Blackheath ..	60.9	31.5	29.4	57.5	30.3	21.2	45.0	0.02
Bristol	65.5	31.4	34.1	57.2	37.0	20.2	46.1	0.32
Birmingham ..	62.2	31.8	30.4	57.6	34.1	23.5	45.8	0.28
Wolverhampton	67.0	32.2	34.8	59.7	38.2	18.5	45.8	0.02
Leicester ..	62.7	31.0	29.7	59.7	36.0	19.8	45.1	0.18
Norwich	57.5	33.0	22.5	51.1	37.5	13.6	44.9	0.00
Nottingham ..	62.0	32.5	29.5	57.9	37.0	20.9	45.8	0.32
Sheffield ..	63.0	35.5	27.5	57.9	38.2	19.4	46.1	0.08
Liverpool ..	65.1	37.5	29.9	61.1	41.0	20.1	45.5	0.05
Manchester ..	66.9	30.8	36.1	58.4	38.8	19.6	46.1	0.03
Salford	63.4	30.5	32.9	59.4	37.3	19.1	45.1	0.09
Bradford	63.3	35.0	28.3	55.9	38.8	17.1	45.7	0.23
Leeds	63.0	31.0	28.0	55.4	30.1	16.0	43.7	0.26
Hull	60.0	29.0	31.0	51.4	31.7	19.7	41.0	0.32
Newcastle ..	57.0	34.0	23.0	50.5	40.0	11.5	41.1	0.13
Edinburgh ..	59.7	36.0	23.7	..	..	..	46.6	0.00
Glasgow	65.0	31.1	33.9	..	..	..	45.7	0.01
Dundee	60.0	31.0	29.0	..	..	..	41.1	0.05
Aberdeen	55.9	31.0	20.1	..	..	..	41.1	0.53
Paisley	63.5	30.0	33.5	..	..	..	41.1	0.00
Greenock	60.0	36.0	24.0	..	..	..	48.0	0.00
Leith	60.2	36.0	24.2	..	..	..	49.1	0.00
Perth	63.9	36.0	31.6	..	..	..	48.0	0.00

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *E. G.* We fear there is no book suitable for your purposes.—*H. W.* "Oliver's Lessons in Elementary Botany" would suit you, but the services of a teacher, however poorly qualified for the task, would be desirable.

HARDY FERNS: *W. E.* asks, "What chance should I stand if I showed Cyrtomium falcatum as one of twelve hardy Ferns, as per R. H. S. schedule? Are all British Ferns hardy, *e.g.*, Adiantum Capillus-Veneris, and Trichomanes radicans?" To the first inquiry we answer, Cyrtomium falcatum is a hardy Fern, for all practical purposes, and is so classed; its presence should, therefore, be no bar to the prize. To the second we say, No; the examples cited are not hardy, nor are they so considered.

INSECTS: *Right Hon. Mrs. K.* The beetles found in your vinery are the very destructive weevils named Otiorhynchus picipes, which feed at night on the young shoots, which they gnaw off. It is not impossible that they have been reared in the pots in which the Strawberries for forcing in the same house have been planted. The best plan for their destruction is to lay sheets on the ground under the Vines, and then visit the houses with a lanthorn sometime after dusk, when the insects which have already left their hiding-places during the day and crept up the Vines fall to the ground on the sheet, where they are easily seen, and must be collected and killed. *W.*—*J. P.* It is very difficult to determine minute Lepidopterous insects by their immature caterpillars, but we believe the small green larva which have attacked the blooms and embryo fruit of your bush Cherry trees is that of the Tinea Pruniella, Linn. (Ypsolophus ephippium, Fab.), which, although generally found on Plum blooms, will also attack those of the Cherry. We know no better remedy than hand-picking. *W.*—*R. F. J.* The weevils which have attacked the young shoots of Apricots, &c., are the common Nemoicus oblongus and Otiorhynchus notatus. There is no better plan to extirpate them than that which you have adopted, but it would be facilitated by laying down large sheets of white paper or linen beneath the trees, upon which the insects would drop on the approach of light after dark had set in. *W.*—*J. C. W. and Son.* The Potatos sent are infested, to a fearful extent, with the small snake millepede (often miscalled the wireworm), Julus pulchellus. In the absence of any particulars, we can only suggest that if this be a sample of a barrowful of Potatos, the best remedy will be to boil the entire lot, and thus destroy the creatures which would otherwise eat up the sets if planted. The earth should be pared off and burnt; strong lime-water mixed with soot is a remedy strongly advised, as well as the application of common salt, and also the sprinkling of nitrate of soda upon the ground. *W.*

FUNGUS: *H. D.* The Fungus on your Sweet Williams is Puccinia Lychnidearum. The species is not uncommon on plants of this natural order, therefore, it may be feared, you have no chance of stamping it out. *M. J. B.*

NAMES OF PLANTS: *R. H. H., Hodsweil*, 1. Narcissus Pseudo-Narcissus; 2 and 3, N. incomparabilis; 4, N. Jonquilla. *J. G. B.*—*P. H. Gosse.* True variety of Dendrobium transparens.—*P. P. W. M.* Oncidium carthaginense.—*M. D.* Mesembryanthemum geminiflorum.—*H. H. H.* Ornithogalum nutans. No: S. Bruno's Lily is Anthericum Liliastrum. —*M. A.* Exochorda grandiflora, Lindl. (Spiræa grandiflora, Bot. Mag. t. 4795).—*Cobea.* Arum Dracunculus.—*J. Park.* Anemone appennina.

PLANT CASE: *A. C.* Apply to Messrs. Barr & Sugden, 12, King Street, Covent Garden, W.C.

PUTTING CAMELLIAS IN THE OPEN AIR: *N.* asks if it would hurt Camellias to set them under Yew trees during the summer months, after they have made their growth? To which we reply, No.

SEEDS: *J. W. P.* We believe they are the seeds of Holcus saccharatus, which yields a sweet herbage of which cattle are very fond. We spoke advisedly as to the lawn mower.

VILLAGE SHOWS: *R. F.* We are inspecting the regulations of various associations of this kind, with the object

you mention. In a short time we will comply with your request.

VINE AND ROSE ROOTS EATEN BY WATER-RATS: A correspondent forwards us specimens showing the destruction of Vines, in a house, and Rose bushes, in the open ground, caused by water-rats, in his garden at Wallington.

WATERCRESS: *C.* We believe the culture is profitable where labour is cheap, and access to market easy.

COMMUNICATIONS RECEIVED:—J. B.—F. W. B.—A. O. S.—G. M.—A. C.—J. R. P.—G. T.—Lady F. H. M. M.—F. D.—F. W. D.—Veitch.—J. W. (yes).—P. G.—R. G.—W. S. France).—J. H. Kirkbride.

Markets.

POTATOS.—Southwark, May 9.

During the past week the arrivals have been quite equal to the demand, and prices very various, according to sorts and quality. The following are the quotations:—Yorkshire Flukes, per ton, 120s. to 150s.; Ditto Regents, 110s. to 140s.; Lincolnshire do., 100s. to 110s.; Dunbar and East Lothian do., 110s. to 140s.; Perth, Forfar, and Fifeshire do., 90s. to 105s.; Do. Rocks, 90s. to 100s.; Do. Reds, 85s. to 90s.; French and Belgian Whites, 75s. to 90s.

COVENT GARDEN.—May 13.

We have a large addition to the supply of forced fruit this week, and prices are receding. The sale of rough goods has improved, the stands being generally well cleared. Peaches may be added to the list, but the quantity is very limited at present. Flowers chiefly consist of Azaleas, Orchids, Roses, French and Scarlet Pelargoniums, Heaths, Fuchsias, Wallflowers, &c.

FRUIT.			
	s. d.		*s. d.*
Apples, p. ½ sieve ..	1 0 to 5 0	Melons, each ..	0 6 to 2 0
Cherries, per lb. ..	0 0 — 0 0	Oranges, per 100 ..	4 0 — 7 0
Filbert, per lb. ..	0 0 — 0 9	Pears, per doz. ..	4 0 — 10 0
Grapes, per lb ..	8 0 — 12 0	Pine-apples, per lb.	8 0 — 10 0
Lemons, per 100 ..	4 0 — 8 0	Strawberries, p. lb.	6 0 — 12 0

VEGETABLES.			
	s. d.		*s. d.*
Asparagus, p. bund.	3 6 to 15 0	Leeks, per bunch ..	0 2 to 0 4
Artichokes, p. doz. ..	3 0 — 6 0	Lettuces, p. score ..	1 0 — 2 0
Beet, per doz. ..	1 0 — 2 0	Mint, per bunch ..	0 6 — 0 0
Broccoli, per doz. ..	1 0 — 2 6	Mushrooms, p. pott.	1 0 — 1 6
Cabbages, p. doz. ..	1 0 — 1 6	Onions, per bunch ..	0 4 — 0 0
Carrot, p. bunch ..	0 4 — 0 5	Parsley, per bunch	0 2 — 0 4
— young, p. bun.	1 6 — 2 0	Potatoes, new, p. lb.	0 4 — 0 6
Cauliflower, p. doz.	1 6 — 3 0	Salsify, per bundle .	1 0 — 1 3
Celery, p. bund. ..	1 0 — 1 6	Scorzonera, do. ..	1 0 — 1 3
Cucumbers, each ..	1 0 — 1 6	Seakale, p. punnet .	1 6 — 2 0
Endive, per doz. ..	1 0 — 2 0	Shallots, per lb. ..	0 8 — ..
French Beans, p. 100	2 0 — 3 0	Spinach, p. bushel .	2 0 — 3 0
Garlic, per lb. ..	0 8 — ..	Radishes, per doz.	1 0 — 1 6
Herbs, per bunch ..	0 2 — 0 4	Turnips, per bunch .	0 2 — 0 3
Horse Radish, p. bun.	1 0 — 3 0	— young, p. bun.	1 6 — 2 0

Potatos, York Regents, per ton, 120s. to 150s.; Flukes, do., 110s. to 130s.

Economic and Effective Gardening—See

CARTER'S ILLUSTRATED PLANT CATALOGUE for 1870.
Now ready, post free, 6d.; gratis to purchasers.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

Upwards of 100,000 Bedding Plants for Sale,
At the UPPER MARSH, near Lewes, Sussex.
JOSEPH WESTLEY invites the special attention of the Trade and intending Purchasers to his very large and fine Stock of BEDDING and other Plants.
Calceolaria, Cuttings, 20s. per 100
Do. Pots, 2½ in., 30s. per 100
Do. Pots, 3 in., 40s. per 100
Heliotrope, 2½ in. pots, 30s. per 100
Heliotrope, 3 in. pots, 40s. per 100
Geranium, Flowering, Scarlet, Variegated, and Silver-leaved, 2½ in. pots, 30s. per 100
Geranium, Flowering, Scarlet, Variegated, and Silver-leaved, 3 in. pots, 40s. per 100
Fuchsias, Verbenas, Petunias, Lobelias, Ageratums, Alternantheras, Iresines, Coleus, Cuphea, Gnaphalium, and other Bedding Plants, 2½ in. pots, 30s. per 100
Fuchsias, Verbenas, Petunias, Lobelias, Ageratums, Alternantheras, Iresines, Coleus, Cuphea, Gnaphalium, and other Bedding Plants, 3 in. pots, 40s. per 100
Cash or reference on application.

Bedding Plants—Bedding Plants.

JAMES HOLDER'S unrivalled Collection of Scarlet and Variegated CALCEOLARIAS, VERBENAS, CALCEOLARIAS, FUCHSIAS, LOBELIAS, PETUNIAS, GAZANIAS, IONIDIUMS, TROPÆOLUMS, CUPHEAS, COLEUS, IRESINES, ALTERANTHUS, PINSHMONS, &c., at unusual prices for quantities. Descriptive Catalogues on application. Cash or satisfactory reference. Packages free on rail at Salisbury. Orders of 40s. value delivered free to the Railway Station at Salisbury. Boxes and packing at cost price.
JAMES HOLDER, Nurseryman, Salisbury.

Miscellaneous Plants suitable for Bedding and Decorative Purposes.

ROBERT PARKER begs to announce that his SELECT DESCRIPTIVE PRICED LIST, including the finest varieties of CALCEOLARIAS, PANSIES, SEMPERVIVUMS, TRITOMAS, PHLOXES, &c., &c., is now published, and will be forwarded to applicants.
Penn Nursery, Tooting Surrey, S.W.

The Market Gardens, Biggleswade, Beds.

RICHARD WALKER has to offer, for cash, AMERICAN RED POTATOS. They produce Lower 16 Tons to the Acre (see Gard. Chron.).
Single CHINA ROSES, 2s. 6d. per 100; SCARLET KING DAISIES, CROWN DAISIES, WHITE DAISIES, all at 5s. per 100. Splendid Double CLIMBING LINKS, 4s. per 100.

New Roses of 1870.

CRANSTON'S selection of the best and most distinct NEW ROSES of 1870. Extra strong plants now ready. Descriptive LIST on application.
ROSES for BEDDING.—Superb plants, in 5-inch pots, for planting out or for growing for pot culture. Large collection, 12 for 1 cental. Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.
JOHN CRANSTON, The Nurseries, King's Acre, Hereford.

New Roses.

JOHN HARRISON begs to offer to the Trade a splendid stock of fine healthy plants of the NEW ROSES of the present planting, 66s. per dozen, 15s. per dozen; purchaser's selection, 24s. They are just now in fine condition for planting out in the open air. Also fine plants of MARSHAL NIEL, 50s. to 75s. per 100. TEAS, 40s. to 60s. per 100.
HOLLYHOCKS and DAHLIAS of all the best varieties in cultivation, prices exceedingly low. SPECIAL QUOTE, now ready.
Seedling HOLLYHOCKS, from best named varieties, in separate colours, 25s. per 100; mixed, 20s. per 100.
MRS. PINCE VINES, fine strong plants, 1-yr. old, 24s. per dozen; strong fruiting, 36s. per dozen.
North of England Rose Nursery, Darlington.—May 9

PAUL'S NOVELTIES of 1870. See WM. PAUL'S SPRING CATALOGUE, just published.

PAUL'S NEW ROSE PRINCESS CHRISTIAN.—One Special and Four First-class Certificates. Plants ready in May, 10s. 6d. each.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW ROSE VIRGIL. Plants ready in May, 5s. each.
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S SELECTION of NEW FRENCH ROSES. For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM WALTHAM BRIDE. First-class Certificate. Plants ready in May, 10s. 6d. each. "There are several very good pure white edged Pelargoniums in commerce. I think Waltham Bride may be considered amongst the very best."—P. GRIEVE, *in Journal of Horticulture*
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW SILVER-EDGED WHITE-FLOWERED PELARGONIUM AVALANCHE. Plants ready in May, 10s. 6d. each.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BRONZE and GOLD PELARGONIUM WALTHAM BRONZE. The brightest and most effective of this class. Plants ready in May, 10s. 6d. each.
See WM. PAUL'S SPRING CATALOGUE.

PAUL'S NEW BEDDING PELARGONIUMS (BEATON'S Race). BONFIRE, the finest of all the Stella race, and five others. Plants in May, 5s. each; or the six varieties for 24s.
For description see WM. PAUL'S SPRING CATALOGUE.

PAUL'S NOVELTIES for 1870.—ROSE PRINCE LEOPOLD, GOLDEN VARIEGATED PELARGONIUMS, BEDDING PELARGONIUMS, &c.
For description see WM. PAUL'S SPRING CATALOGUE, just published.

WM. PAUL, Paul's Nurseries and Seed Warehouse, Waltham Cross, London, N.

WANTED, an active PARTNER, in a small Nursery, Florist, and Jobbing Business in Islington. Long lease—£300 required. G. R., 32, Rotherfield Street, Islington, N.

WANTED, a GENERAL FOREMAN and PROPAGATOR.—Address, stating age, reference, and salary required, ROBT. T. VEITCH, Nurseryman, Exeter.

WANTED, for a large Property in a North-Western County of England, a thoroughly qualified ESTATE BAILIFF. He must possess a practical knowledge of Agriculture, and be fully competent to Superintend and carry out under the direction of the Agent all Estate Works, including Draining, Brick and Tile Making, the Erection of Farm Buildings, the Formation and Maintenance of Roads, Fences, Water Courses, &c. A married Man, from 30 to 45 years of age, of steady sobriety, stating particulars, to Mr. JAMES FAIR, Estate Offices, Lytham.

WANTED, a GARDENER and his WIFE, without incumbrance, the Wife to undertake the Laundry. A good knowledge of the Orchard House is indispensable. A cow is kept on the Estate, and a Man, Cowhouse and Attendance if desired. A cottage will be found, with firing, &c.—Address, stating, length of last service and wages expected, Mr WM. THORNTON, Auctioneer, Old Bank, Reigate.

WANTED, as UNDER FOREMAN, an active Man, to take charge of the Fruit Tree Department of a Nursery.—Apply, stating age and wages required, and enclosing reference, to G. G. B., care of Messrs. Hurst & Son, Seed Merchants, 6, Leadenhall Street, E.C.

Propagator.

WANTED, a good GENERAL PROPAGATOR and SALESMAN.—For further particulars, address JONAS HOLDSWORTH, Nursery, Wilsden, near Bingley, Yorkshire.

WANTED, on a Farm, an experienced middle-aged MAN and his WIFE, without incumbrance.—Apply by letter to Mr. J. TAME, Lower Place Farm, Acton, W.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen. Further particulars on application to Messrs. R. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN (vast quantities) to whose character they will bear the strictest scrutiny. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Nursery Garden, Great Faversham, begs to remind Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.

Experienced Gardeners, also Under Gardeners.

JOHN HARRISON having a number of CLEEVER MEN on his books waiting for Engagements, any Gentleman requiring GARDENERS can be supplied at once with Men of first class character and ability.—North of England Rose Nursery, Darlington, May 9.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. have many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for LISTS to their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations to secure their interests.—237 & 238, High Holborn, London, W.C.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

GARDENER (HEAD).—Age 33, married; understands Vines, Vines, Stove and Greenhouse Plants, Ferns, and Flower and Kitchen Gardening.—H. H., The Shrubbery, Streatham, Surrey.

GARDENER (HEAD).—Age 40, married; has a thorough practical knowledge of the profession.—GARDENER, A. B. 37, Queen's Road, New Cross, Hatcham, S.E.

GARDENER (HEAD), to a Lady or Gentleman.—Married, no incumbrance; understands Forcing Flowers, Fruits, and Vegetables, and Flower and Kitchen Gardening. Seven years' testimonials.—14, Adam's Square, Bromley, Kent.

GARDENER (HEAD).—Age 30, single; understands Hothouse, Greenhouse, also Flower and Kitchen Gardening. Can have five years' personal character from last situation.—A. B., Langley Park, Beckenham, Kent, S.E.

GARDENER (HEAD).—Age 38, married, two children; practically acquainted with Pines, Vines, Melons, and Cucumbers, Stove and Greenhouse Plants. Also Flower and Kitchen Gardening.—H. N., 16, Smith's Terrace, King's Road, Chelsea, S.W.

GARDENER (HEAD).—Age 50, married, no incumbrance; has a thorough knowledge of the profession in all its branches. Can be highly recommended by his present employer.—T. R., Coworth Park, Staines, Middlesex.

GARDENER (HEAD).—Age 35, married, no incumbrance; thoroughly competent in all departments. Could undertake land if required. Good recommendations.—W. T. A., Mr. Cranston, Seed Warehouse, St. Peter Street, Hereford.

GARDENER (HEAD), age 40.—A Gentleman, changing residence, is anxious to recommend his Head Gardener to any Nobleman or Gentleman requiring a thorough practical Man. Six years' character.—J. B., Stoke Park, Stoke Bishop, Bristol.

GARDENER (HEAD).—Middle-aged, married, very active; thoroughly understands Forcing in every branch, Orchard-houses, Kitchen Garden, and Laying-out and Arranging Ornamental Flower Gardens. Highest reference.—HORTUS, 3, Linden Grove, Lower Norwood, Surrey, S.E.

GARDENER (HEAD).—Age 41, married, no incumbrance; thoroughly understands the profession in all its branches. First-class testimonials and eight years' character from last situation. No single handed place accepted.—F. C., Milford, Godalming, Surrey.

GARDENER (HEAD).—Age 30, single; understands the Management of Pines, Vines, Melons, Peaches, &c., the Early and Late Forcing of Fruit and Flowers, and the general routine of the Garden in all its branches. Can be well recommended.—W. J., Post Office, Blunham, Beds.

GARDENER (HEAD).—Age 32, married, one child (five years); thoroughly understands the Management of Pines, Vines, Peaches, Melons, and Cucumbers; and Flower and Kitchen Gardening. Has lived in many of the leading establishments in Scotland for the last few years; good reference.—M. A., Royal Horticultural Gardens, South Kensington, London, W.

To Noblemen and Gentlemen.

GARDENER (HEAD); age 28, married, one child.—T. HOGERY begs to offer his services to any Nobleman or Gentleman requiring a good, practical Gardener, fully competent in every branch of the profession. Leaving on account of the death of his late employer. Six years' good character.—T. HOGERY, Messrs. James Veitch & Sons, Royal Exotic Nurseries, Chelsea, S.W.

GARDENER (HEAD).—JAMES GRANT, Gardener to Algernon Perkins, Esq., of Ingress Park, Heunsloe, Middlesex, W., will be disengaged end of July next. Is open to an engagement with any Nobleman or Gentleman as Gardener or Gardener and Agent on an Estate; thoroughly understands Grass and Pasture, and Keep Breeding, Store Land, and Draw Plans. Good testimonials and reference to present employer; four years' character.—Apply as above.

GARDENER (HEAD), or GARDENER and BAILIFF.—Middle-aged, single; thoroughly understands the profession. Six years' good character as to character and abilities.—L. J., Post Office, Acton, Middlesex, W.

GARDENER (HEAD), or BAILIFF.—A Gentleman wishes to recommend a thoroughly respectable and trustworthy married Couple aged 45 and 40, the Man as above, and has had some years' experience in Woodland, Park, and Agricultural Planting, and Keep Rooks, Improve Land, and Draw Plans. Good testimonials and reference to present employer; four years' character.—Apply as above.

GARDENER (HEAD), or GARDENER and BAILIFF.—Middle-aged, single; thoroughly understands the profession. Six years' good character as to character and abilities.—L. J., Post Office, Acton, Middlesex, W.

GARDENER (HEAD), or BAILIFF.—A Gentleman wishes to recommend a thoroughly respectable and trustworthy married Couple aged 45 and 40, the Man as above, and has had some years' experience in Woodland, Park, and Agricultural Planting, and Keep Rooks, Improve Land, and Draw Plans. Good testimonials and reference to present employer; four years' character.—Apply as above.

GARDENER (HEAD), where not less than three are kept.—Age 30, single; nine years' good character as Under Gardener and Foreman in various large establishments. Can undertake the Management of Woods and Grass Land if required, and is thoroughly acquainted with the general Management of a large Garden.—A. B., Saltwood, Hythe, Kent.

GARDENER.—Age 40, married, no incumbrance; well understands the profession. Well recommended. Has been in Jersey seven years. Any situation in any part of England.—JAMES MEWSE, 44, Duke St. Heliers, Jersey.

To Noblemen and Gentlemen.

GARDENER.—Married; thoroughly understands every branch of the profession—the Management of Vines especially. Fruit and Greenhouse Plants, Turning, &c.—GARDENER, Lawn Cottage, Beacon Grounds, Leigh, Lancashire.—GARDENER, Mr. Germain, 10, Upper Maudlin Street, Bristol.

GARDENER, where two or three are kept.—Age 31; has a thorough knowledge of the profession. Four years' good character from present employer.—T. I., Mr. Ingram, Bellamy Street, Bathford, Bath, W.

GARDENER, in a small Establishment, where another is kept.—Age 24, single; understands the Cultivation of Pines, Vines, Peaches, Melons, and Cucumbers, and Flower and Kitchen Gardening. Six years' good character.—JAMES PUDBURY, Walton Grange, Warwick.

GARDENER (SECOND).—Age 22; four years' practical experience in Gentlemen's Gardens, and wishes for further improvement.—K. P., Post Office, Totteridge, Herts.

GARDENER (SECOND), in a Nursery.—A young Man, who has had 10 years' experience in the work; accustomed to Soft-wooded Plants; has also a knowledge of Rhododendrons and Conifers. Three years' good character.—E. A. L., Keymer, Sussex.

GARDENER (UNDER), in the Houses, in a Nobleman's or Gentleman's Establishment.—Age 22; 7 years' experience. Good character.—I. M., 4, New Cottages, Oval Road, Croydon, Surrey.

GARDENER, or GARDENER and BAILIFF.—Age 40, married, no incumbrance; thoroughly practical. Is well experienced in all branches of the profession, both the useful and ornamental; is a good practical Farmer, and has no objection to Manage Land and Stock. Highly recommended.—ADVERTISER, Paignton, Near Coventry.

FOREMAN, in a Gentleman's Garden.—Age 23; two years' good character.—A. B., Dyrnan Park, near Barnet, N.

To Gardeners.

FOREMAN, in a large Garden.—Seven years' experience; used to Forcing, &c. Can be highly recommended.—S. BEACH, The Gardens, Ash Grove, Sevenoaks, Kent.

ASSISTANT, under Hard-wood or general Propagator. Age 21. Bud and Graft well, and is willing to make himself useful at general Nursery Work.—F. S., 8, Apsley Place, Old Dover Road, Blackheath, Kent, S.E.

FARM BAILIFF.—Middle-aged, married, Englishman, without incumbrance, thoroughly understands the profession in all branches. Can be highly recommended. Reference to present employer.—G., Post Office, Parnane, Templemore, Ireland.

FARM BAILIFF.—Age 33; has had good experience in the Breeding, Rearing, Buying and Selling of Stock, &c., and thoroughly understands the Management of Land, being the Son of a Farmer in Marsh Lands. Can be highly recommended. Nothing but a good situation will be accepted.—C. ASHBURN, Bailiff to the Earls of Rosslyn, Easton Lodge, Dunmow, Essex.

To Noblemen and Gentlemen.

FARM and ESTATE BAILIFF, or GARDENER and ESTATE BAILIFF.—Age 38, a native of Scotland; has had the entire Management of a Home Farm of about 600 acres. Understands the Rearing, Buying and Selling of Shorthorn Pedigree Cattle, also Steam Cultivation of Land and Steam Machinery in general. Can be highly recommended.—Mains Valle, Warmouth, Forcing and Repairs of Farm Buildings, Collecting of Cottage and Allotment Rents, Draining, Fencing, Road Making, and the general Management of large Estates. Six years and three months' good character from last situation.—A. B., Joseph Meredith, The Vineyard, Garston, Liverpool.

FURNISHER or GENERAL MANAGER.—Twenty-two years' experience in London Trade. Can be highly recommended; the 15, Elgin Road, Maida Vale, Warmouth.

SHOPMAN.—Age 23; seven years' experience. Is open to an engagement.—J. T., Post Office, Perth, N.B.

SUTTONS' GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils.

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, carriage free 2 bush Grass Seeds and 12 lb. Clovers supplied p. acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. MECHI, Esq., *Tiptree Hall, near Kelvedon.*

February 5.—"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

SUTTONS' HOME-GROWN FARM SEEDS.

THE BEST SWEDE IN CULTIVATION IS

Suttons' Champion.

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation.

From JOSEPH VINCENT, Esq., *Simplemarsh, Addlestone, Weybridge*

"*January* 23, 1869.—I won the £5 Silver Cup, presented by the Members of the Western Division of the County of Surrey, with your Champion Swede."

From J. OSBORNE, Esq., *Coldashton, Marshfield*

May 27, 1869.—My neighbour, Mr. Cater, with your seed, won the £5 Cup which I annually give for the best four acres of Swedes."

From GEORGE BUSH, Esq., *Brooklands, Combemartin.*

"*July* 19, 1869.—The parcel of Swede seed I bought of you has come up splendidly. I tried yours against some seed recommended by my man, and have shown him the advantage of selected seed."

From Mr. FRANCIS SWAYNE, *Great Hill Farm, Langharne.*

"*December* 20, 1869.—" The roots I grew from your Swede seed won the Silver Cup given by Morgan Jones, Esq."

From Mr. JAMES PAGE, *Combe Farm, Kingston, Surrey*

"*February* 20, 1869.—The Swedes I grew from your Champion Swede seed supplied to me last June are the very finest quality Swedes I ever grew."

From T. C. MOORE STEVENS, Esq., *Winscott, Torrington, Devon*

"*April* 2, 1868.—I won a Ten-Guinea Silver Cup last year for Swedes wn from your Champion seed."

Sutton's Turnip Seeds for Present Sowing.

POMERANIAN WHITE GLOBE.
LINCOLNSHIRE RED PARAGON.
IMPERIAL GREEN GLOBE
IMPROVED GREEN TANKARD
GREY STONE.
GREEN-TOP YELLOW SCOTCH.
PURPLE-TOP YELLOW HYBRID.

Also all other Farm Seeds, as see

SUTTONS' FARMERS' YEAR BOOK

for 1870, Gratis and Post Free on application.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (frontage), DWELLING HOUSE, STABLING, &c., situate at Maidenhead.

Apply to Mr. B. TATTON, The Nurseries, Epsom.

TO BE LET, on Lease, a FLORIST'S, with handsome Shop, large Conservatory, Dwelling House, and every convenience; old established, and doing an excellent business, in best part of West End. An excellent opportunity. Price £100

B. B., 6, Addison Terrace, Notting Hill, W

To Florists and Others.—Grove Park, Chiswick.

TO BE LET, on LEASE, in this delightful locality, an eligible PLOT of LAND, in a commanding situation, adjoining the Station. A Dwelling House would be erected if required.

Address, Mr D. A. RAMSAY, Grove Park, Chiswick, W

To Nurserymen, Seedsmen, and Others.

TO BE DISPOSED OF, a NURSERY and SEED BUSINESS, in full Trade, in a thriving Market Town, situate on the Great Western and London and North-Western Railways. Nursery Ground about an acre, with Greenhouse (Hot Water), and Pits. Good Shop in the best part of the Town.

Applications, by letter, to X. Y. Z., Mr Rowe, 9, Quality Court, Chancery Lane, London, W.C., will be answered in a few weeks, as the Business is about to be Sold under proceedings in Bankruptcy

SALES BY AUCTION.

North End, Balham.

MR. J. A. SMITH is instructed by Mrs. Pollard to SELL by AUCTION, at King's Cottage Nursery, as above, on MONDAY NEXT, May 16, at 12 o'Clock, the EFFECTS of CONSERVATORIES, Potting Houses, Frames, three Span-roof GREENHOUSES, 300 feet run of IRON PIPING and HOT-WATER APPARATUS, Chestnut fast PONY, Spring Cart, Harness, Covered Van; and the remaining of about 5000 choice GREENHOUSE PLANTS

On view Saturday prior and morning of Sale. Catalogues on the Premises, and of the Auctioneer, Hammersmith, W.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, the 17th inst., consignments of imported ORCHIDS from India and South America, including several fine looking Odontoglossum grande; probably quite new; Cypripedium longifolium or Reichenbachii, Pescatorei, Warscewiczellis, Trichophilas, and other kinds, apparently new. Also Saccolabium Blumei majus, Saccolabium giganteum, &c.; the whole in good condition.

On view the morning of Sale, and Catalogues had.

Godalming, Surrey.

ANNUAL SALE of BEDDING PLANTS.

MR. W. ABRAHAM has received instructions from Mr. W. Kaile, of the Meadow Nursery, Godalming, Surrey, to SELL by AUCTION, on TUESDAY, May 17, a quantity of choice BEDDING, HOTHOUSE, and GREENHOUSE PLANTS (about 20,000).

Particulars by Catalogues, to be obtained at the Nursery, or of the Auctioneer, Goldsworth Nurseries, Woking, Surrey

Royal Nursery, Bagshot.

EXPIRATION of LEASE and CLEARANCE SALE.

MR. W. ABRAHAM is instructed by Mr. Hanafy, of the Royal Nursery, Bagshot, Surrey (near the Turnpike Gate), to SELL by AUCTION, on the Premises, without the least reserve, on WEDNESDAY, May 25, at 11 o'Clock, the whole of the remaining NURSERY STOCK, comprising 10,000 BEDDING PLANTS, of kinds usually grown for that purpose; also a quantity of JAPANESE PLANTS, choice CAMELLIAS, by name; TEA and H. P. ROSES, in Pots; 1000 FERN LARTERS, Standard RHODODENDRONS, CEPHALOTAXUS FORTUNEI, 6 feet; &c.

Full particulars will be given in Catalogues, to be obtained at the Nursery, and Post Free of the Auctioneer and Valuer, Goldsworth Nurseries, Woking, Surrey

Edmonton.

IMPORTANT CLEARANCE SALE of 80,000 BEDDING and GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, Langhedge Nursery, Edmonton, within 10 minutes' walk of Park Station, on the Great Eastern Railway, on MONDAY, May 16, at 12 o'Clock precisely, by order of Messrs. C. Wesdyen & Son, the land being immediately required by the Great Eastern Railway Company, about 80,000 BEDDING PLANTS, comprising 6000 VERBENAS, including Mrs. Pollock, Sophia Dumaresque, and other Tricolor and Zonal Varieties; Vesuvius, Tom Thumb, Christine, Madame Vaucher, and 600 Double Varieties and others; also 1000 FUCHSIAS, coming into bloom; 2000 VERBENAS, 1500 Intermediate STOCKS, and about 60,000 other BEDDING PLANTS.

May be viewed three days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Richmond, S.

IMPORTANT SALE of about 20,000 CHOICE BEDDING PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, The Nursery, Kew Road, Richmond, Surrey, on TUESDAY, May 17, at 12 for 12 o'Clock precisely, by order of Messrs. G. and W. Steell, without reserve, about 20,000 well-grown BEDDING PLANTS, comprising 2000 Verbenas, 500 Heliotropes, 600 Fuchsias, in 48 and 60 pots; 10,000 Geraniums, of the leading kinds; also 2500 Calceolarias, in 48 and 60 pots; 1000 Lobelias, Iresine, Kœnigia, Perilla, Tropæolum, 2000 Golden Feather, 2000 Lobelias, &c. Also, some choice GREENHOUSE PLANTS in flower, viz., Pelargoniums, Fuchsias, Calceolarias, Cinerarias, Achimenes, &c.

May be viewed four days prior to the Sale. Catalogues had on the Premises, and of the Auctioneers, Leytonstone, E.

Shepherd's Bush, W.

IMPORTANT UNRESERVED SALE of BEDDING PLANTS.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. T. Hawkins to SELL by AUCTION, without reserve, on the Premises, Oaklands Nursery, Shepherd's Bush, W., on THURSDAY, May 19, at 11 for 12 o'Clock precisely, about 13,000 TRICOLOR, BRONZE, and choice ZONAL GERANIUMS, thousands of thriving BEDDING PLANTS, comprising 2000 Calceolaria aurea, 1000 Heliotropes, 1000 Lobelias, Iresine Lindeni, Pelargoniums, Fuchsias, Golden Feather, &c.

May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers, as above

Leytonstone, E.

SALE of about 25,000 WELL-GROWN BEDDING and GREENHOUSE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, on the Premises, the American Nurseries, Leytonstone, Essex, adjoining the Railway Station, on MONDAY, May 23rd at for 12 o'Clock precisely, about 25,000 BEDDING and GREENHOUSE PLANTS, comprising 7000 fine GERANIUMS, including Lady Cullum, Sophia Dumaresque, Mrs. Pollock, Variegated, and others; thousands of choice named VERBENAS, CALCEOLARIA AUREA, COLEUS, HELIOTROPES, GOLDEN FEATHER, fine PELARGONIUMS, AZALEA INDICA, FUCHSIAS, PICOTEES, and other Plants, in Flower; likewise some Choice RHODODENDRONS, KALMIAS, and a quantity of CLEMATIS and other Climbers in Pots, CARNATIONS and PICOTEES, CUTTINGS, &c.

May be viewed the Saturday prior to the Sale. Catalogues may be had on the Premises, of the Auctioneers, as above

Hornsey, N.

SALE of about 25,000 FIRST-CLASS BEDDING PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. M. Cleall to SELL by AUCTION, without reserve, on the Premises, The Nursery, near the Church, Hornsey, Middlesex, on TUESDAY, May 24, at 11 for 12 o'Clock precisely, about 25,000 BEDDING PLANTS, comprising thousands of Fuchsias, Verbenas, Lobelias, Heliotropes, Petunias, Gazanias, Salvias; 10,000 GERANIUMS, including Lady Cullum, Sophia Dumaresque, Mrs. Pollock, Luna, Madame Lemoine, Dr. Lindley, and other leading varieties; also 3000 CALCEOLARIA AUREA, 1000 White and Scarlet Intermediate STOCKS, quantities of CERASTIUM, new COLEUS, &c., the PELARGONIUMS in flower, soft-wooded and hardy CLIMBERS, &c.

May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers.

Sale of First-class Cattle and Sheep.

MR. JOHN THORNTON will SELL by UNRESERVED AUCTION, the following first-class HERDS of SHORTHORN and DEVON CATTLE, and FLOCKS of SOUTHDOWN SHEEP. Full particulars and Catalogues to be had at 15, Langham Place, Regent Street, London.

MAY 18.—Mr J. Angell James' HERD of PURE-BRED SHORTHORNS, bred for several years from Knightly blood, at Bridgetown, Stratford-on-Avon.

MAY 20.—The late Countess de la Warr's FLOCKS of PURE-BRED SOUTHDOWNS, 900 Head, bred for 30 years at Knole Park, Sevenoaks, Kent, from Ellman Ewes, crossed with some of the best blood from the Sussex Down Flockmasters

MAY 24.—The late Mr. W. H. S. Adcock's well-known HERD of first-class SHORTHORNS, by Grand Duke 3rd, as well as her son "Royal Chester," and several other animals of the Kirklevington sort, whilst the Sires lately used have been principally of that renowned blood

After which, Messrs. LYTHALL AND CLARKE will SELL some prime RAMS, as well as choice EWES and LAMBS, from his famed Flock of Shropshire Sheep, which has been selected at great cost, and bred with care from the best blood in the country.

Also will be SOLD, some very superior PIGS of the White Breed

Catalogues, with Pedigrees, and other particulars, will shortly be issued, and announced in future Advertisements.

London : 13, Euston Square.—May 9.

Mere Old Hall, Knutsford.

IMPORTANT SALE of SHORTHORNS, SHROPSHIRE SHEEP, PIGS, &c.

MR. STRAFFORD has received instructions from Messrs. Hayes, Esq., to SELL by AUCTION, without reserve, on WEDNESDAY, July 13 next, at Mere Old Hall, his entire and very superior HERD of SHORTHORNS, consisting of about 60 head of Bulls, Cows, and Heifers, including the far-famed Cow "Moss Rose," with her daughter "Moss Queen," as well as her son "Royal Chester," and several other animals of the Kirklevington sort, whilst the Sires lately used have been principally of that renowned blood

After which, Messrs. LYTHALL AND CLARKE will SELL some prime RAMS, as well as choice EWES and LAMBS, from his famed Flock of Shropshire Sheep, which has been selected at great cost, and bred with care from the best blood in the country.

Also will be SOLD, some very superior PIGS of the White Breed

Catalogues, with Pedigrees, and other particulars, will shortly be issued, and announced in future Advertisements.

London : 13, Euston Square.—May 9.

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION for the RELIEF of DECAYED FARMERS, their WIDOWS and ORPHANS

Patron, HER MAJESTY THE QUEEN
President, HIS GRACE THE DUKE OF RICHMOND.

Allowances to Pensioners

Married	£40 per annum.
Male	£20 "
Widows and unmarried Orphan Daughters	£15 "

Every information to be had of the Secretary, by whom Subscriptions and Donations will be thankfully received.

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The ANNUAL ANNIVERSARY DINNER, in AID of the FUNDS of the INSTITUTION, will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 8, at 6 o'clock. The Right Hon. EARL CATHCART in the Chair

Dinner Tickets, £1 1s.; Ladies' Tickets, 5s.; to be had of the Stewards; the Secretary, at the Office of the Institution; and at Willis's Rooms

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The ANNUAL ELECTION of PENSIONERS and CHILDREN will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 22, at 11.30 A.M.

All Subscriptions shall be deemed payable on January 1 in each year; and no Contributor shall Vote while the same is in arrear.

No. 55, Charing Cross, London, S.W. C. BOUSFIELD SHAW, Secretary.

BATH and WEST of ENGLAND SOCIETY, and SOUTHERN COUNTIES ASSOCIATION.

POULTRY SHOW at TAUNTON, JUNE 6, 7, 8, 9, and 10.

ENTRIES CLOSE MAY 16 For Prize Sheets, Entry Papers, &c., apply to JOSIAH GOODWIN, Secretary.

4, Terrace Walk, Bath

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870.

STOCK ENTRIES CLOSE on JUNE 1, and all Certificates received after that date will be returned to the Senders.

PRIZE SHEETS and CERTIFICATES will be forwarded on application to

H. M. JENKINS, Sec.

12, Hanover Square, London, W.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.

A GENERAL MEETING of the Members will be held at the SOCIETY'S ROOMS, on MONDAY, May 23, at 12 o'Clock, when the Half-yearly Report of the Council will be read, the President, Trustees, and Vice-Presidents will be Elected, as well as 25 Members of Council, in place of those who retire by rotation, but are eligible for re-election.

H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

The Agricultural Gazette.

SATURDAY, MAY 14, 1870.

ALTHOUGH the subject is, at this moment, not of immediate urgency, some of our readers may be interested in the following discussion of a personal experience of the question of thin seeding.

Seven years on our present farm has brought round as many seasons of discussing the quantity of seed best calculated to insure the most successful results. We quite believe that it is wise on going to a new district to consult one's neighbours, and in many things to do as they do; yet having been brought up under the injunction, to "Prove all things, and hold fast that which is good," even our farming has in many important matters assumed the form of experimental proof,

and in no instance more signally than in the matter of seeding.

How far such a method of trial and observation may be of value the following report will show, and in how far we have ventured to differ from the practice of those around us may be gathered from the fact that we found the average quantity of seed sown to an acre of corn and pulse was quite a sack, and now we use little more than a bushel.

The following Table will show the facts of this case, as it has been, as it was, and as it is :—

Table of Seed Sowing.

	Highest of Thick Seeding.	Usual Seeding.	Last Year's Seeding.
	Bush.	Bush.	Pecks.
Barley	6	4	6
Wheat	3	2	6
Oats	4	4	8
Beans	4	4	3
Peas	3	2	8
Vetches	3	2	8
Average	13 2 pks.	12 pks.	7 2

Thus it will be seen that, taking six crops, the amount of seed used on our own farm is a little less than half of that which is not uncommonly employed in the same district, with a like soil, at the present moment.

This, it must be acknowledged, is a great reduction, but we should state that its propriety was not decided all at once, but in concurrence with various trials upon the subject which have led us to cultivate up to this mark.

1. A very dirty farm, from which corn had been taken year after year, and the roots grown had not been cultivated upon the best plan, had to be gradually got into better condition.

2. If we expect corn to tiller, and so produce several ears from a single root, it must have sufficient time for the process, so that procrastination and general backwardness in work is incompatible with even moderation in seeding ; and—

3. In thin-seeding care must be taken that good seed be employed. Thick-seeding, with 25 per cent. of the seed incapable of germination, becomes after all only moderate seeding ; and if to this be added the evils which may be expected to arise from the use of a thin feeble sample, it will at once be seen how much less seed may produce better results if it be but perfect in quality.

As an illustration, then, of seven years of work in this direction with a single crop—namely, Barley, we direct particular attention to the following list of seedings on an acre, from 1864, when one sack was used (being the general quantity for the district) :—1865, three bushels (this is now the usual seeding) ; 1866, ten pecks ; 1867, eight pecks ; 1868, eight pecks ; 1869, six pecks (with some small trials of four pecks) ; 1870, six pecks.

Now, upon these trials, we would note generally that as a rule our crops of Barley, from 1864 to 1869, have been remarkably even in both quantity and quality. Our average is about 40 bushels an acre, and it usually fetches the top malting price. We have been so fortunate as not to have had a sack of stained Barley during the whole time, a circumstance which we attribute to our fine 50-acre fields, open both to sun and air, so that we somehow dare to carry Barley when other people are afraid to touch it. Of course there will usually be a difference between the early and late sown, mostly to the disadvantage of the latter. Our best sample is grown after Wheat, as the stubbles are then ploughed up in the winter, and in spring we have merely to cultivate and put in the seed as early as convenient. To this some landlords make an objection ; but, as in this case we usually broadcast from 2 to 4 cwt. of Procter's Barley Manure to the acre, this plan, with good farming, may be occasionally adopted with advantage to the land, for an occasional instance of cross cropping under liberal treatment we take to be good as altering that uniformity of plan of which land tires as much as though it were a sentient being.

We hold, then, that a good farmer will ever strive to keep his land in good order to produce crops, and therefore he needs no restrictions ; if, however, the landlord cannot trust to this with ordinary leases, let him agree to pay for improvements, and take security for payment for injuries and dilapidations ; but for a landlord to insist upon a certain mode of cropping, and to stipulate that only a portion of farm crops shall be sold from the farm, in our opinion, is crippling instead of advancing agricultural progress.

But to our subject. Last year, in a 50-acre field of Barley, and not in the best part of the field, we set off an acre for 1 bushel of HALLETT'S Pedigree Barley, and by the side of this another acre to be sown with the like quantity of our own seed of CHEVALIER Barley. These two were drilled at a distance of 9 inches apart on March 27, and on the 31st of the same month the main crop was drilled by its side, at the rate of 2 bushels of seed to the acre, drilled in rows 7 inches apart. As these three plots advanced towards ripeness, it was soon seen that the thin-sown was stouter in the straw and longer in the ear than the ordinary crop. The crops were harvested on August 17, previous to which we hand-gathered a series of ears from each example, which, on examination, furnished the following particulars :

	Seed per Acre.	Average Length of Ears.
	Pecks.	Inches.
1. Ordinary crop	8	4½
2. Own selected	4	5
3. Hallett's Pedigree ..	4	5¼

Taking 100 ears of corn, and rubbing out the seed, we arrived at the following particulars :—

	Average Number of Grains in each Ear.	Weight of Grain in Ounces.
1. Ordinary crop .. .	27·5	2·5
2. Own selected .. .	31·0	3·5
3. Hallett's Pedigree ..	34·1	3·7

Before proceeding to comment upon these figures, it will be well to state that the crops of selected and Pedigree Barley were as nearly alike as possible, and both were a little *under* nine sacks per acre, whilst the average of the ordinary sowing of the farm was but a little *over* nine sacks ; but it must be remembered that 1869 was remarkable for the actual yield of both Barley and Wheat being so much below the farmer's estimate. The truth is, that all grain for last year was below the average in size, and tail corn was in excess of most seasons.

The smaller grains, and consequently less weight of our ordinary crop when compared with the others, is not to be wondered at, thin-seeding certainly tending in Barley to the production of a larger grain.

The nearness of the results of our own selected seed and HALLETT'S Pedigree Barley deserves a note, as it shows that, after all, if good seed be employed, room for growth is the prime element in producing a bold sample.

The results, then, of these trials lead us to conclude that as great a measure was produced by the use of half the seed as with double the quantity ; but they do not lead us to suppose that there was an increase of crop from small seeding, the truth being that the thin-seeding in the case before us encouraged the growth of weeds. If, however, on the contrary, the ground be thoroughly occupied with the crop, there will be less weeds and a better result. From these, and other circumstances, we infer that thin-seeding is not a matter to be entered upon abruptly, but one for which preparation must be made in the direction of (*a*) getting the soil into good heart, and (*b*) care in keeping under such hindrances to fair growth as weeds. Farms, then, as one usually finds them, are not fit for thin-seeding ; it is a matter to be worked up to, though it must be confessed that even on these half the seed is thrown away, as the use of seed beyond a certain quantity tends to make part of the grain itself grow up, and act in the same manner, as a weed to the rest. And we may truly say, where a sack of good Barley is used as seed the greatest weed in such a Barley crop is Barley. *B.*

HOME supplies at Mark Lane on Monday last were again short, and the prices of the previous week were fully maintained. —— There was an average supply of cattle and a full supply of sheep at the Metropolitan Cattle Market, and some difficulty was experienced in obtaining last week's prices.

—— On Friday evening last, in answer to a question by Mr. G. MILLER, whether, in the promised permission to sprout Barley, so that the operation be conducted within a quarter of a mile of a kiln, he will exclude the words "Hop oast" from the definition of "kiln," without which exclusion the permission will be practically nullified to a large number of farmers in Hop-growing counties, the CHANCELLOR of the EXCHEQUER replied : —"There is no doubt, I am afraid, that a 'Hop oast' is a kiln, and a kiln subject to all the dangers we anticipate ; and if we were to exclude it from the Act we should really be allowing kilns perfectly well adapted for drying malt. I fear, therefore, the farmers in Hop-growing counties will be precluded from the benefit we intended for them ; for I am afraid we cannot make an exception without seriously compromising the very principle on which we are able to make a concession, which is that there shall be no attempt to kiln-dry Barley after being steeped for the purpose of feeding cattle."

—— The non-appearance of competitors for the Highland Society's agricultural diploma at the late annual occasion, when a staff of distinguished examiners in the science and practice of agriculture assembled for the determination of competency, proficiency, or excellence of agricultural students, has been followed by more diastrous experience on the part of the Royal Agricultural Society of England, whose examiners, having assembled to deal with only two competitors, were constrained to disqualify them both. What is the reason of this failure? Are there no agricultural schools among us? Are there no agricultural students in the country? Are none of them fit for an examination of the kind proposed? Is there no advantage derivable from success before the examiners? Are the conditions of the examination such as practically to forbid success? These questions seem to us to exhaust the subject. It is only some of them to which we can confidently give answers. There *are* schools and students of agriculture at both ends of the island ; and we look for answers to our questions from them. Possibly some one, whether student or professor, North or South, may be able to explain the mystery to our satisfaction.

—— At a Conference last Friday, convened by the International Decimal Association at the Hall of the Society of Arts, the Central Chamber was represented by Captain CRAIGIE and Mr. JOHN ALGERNON CLARKE, the secretary. The first resolution called the attention of the Legislature to the necessity for inquiry with a view of introducing a convenient and uniform decimal system of weights and measures, and was carried unanimously. Captain CRAIGIE read the resolutions which the Central Council had passed in favour of selling agricultural produce by weight only, and in favour of the cental of 100 lb. as the standard ; and drew the attention of the meeting to the inconvenience felt by agriculturists from the numerous complicated and anomalous weights and measures now in use. Mr. JOHN ALGERNON CLARKE said that Captain CRAIGIE and himself wished to learn how the Chambers of Agriculture could aid in procuring a measure which they believed would be a great advantage to every class in the community. A great majority of the Chambers, he said, had sanctioned the sale of agricultural produce by weight only ; and he thought the Conference might assume that, after a little further discussion, the agricultural classes would agree to a decimal system. When the Central Council declared in favour of the "cental," he did not understand that they adopted that particular term ; they would probably prefer the plainer English "hundredweight," but the intention was to approve a decimal scale with reference to a weight of 100 lb. They would probably be very reluctant to adopt the nomenclature of the metric system. Earl FORTESCUE expressed his great satisfaction with the statements made by the deputation from the Central Chamber, and congratulated the Conference upon the assistance they were receiving from such an important body, representing the agriculturists of England.

—— The clause of the Irish Land Bill defining the scale of compensation for eviction from the tenancy of land stands thus :—

Value of £15 and under	..	Maximum of 5 years' rent if a separate claim be made for minor improvements.
.. .. ..	..	Maximum of 3 years' rent if no such claim be made.
£15 and under £30	..	Maximum of 4 years' rent, with separate claim.
.. ..	..	Maximum of 5 years' rent, if no such claim.
£30 and under £50	..	Maximum of 4 years } With
£50 and under £40	..	Maximum of 3 years } separate
£40 and under £50	..	Maximum of 2 years } claims.
Above £500	..	Maximum of 1 year

To this is added the proviso that in no case shall the compensation to be awarded for eviction exceed £250, and a limitation of the application of the clause to tenants of holdings below the annual value of £100.

—— The opinion of a very important body of agriculturists on the subject of the French treaty with this country has been recorded in a very decided manner ; the French Society of Agriculturists recently opened its general session, under the presidency of M. DROUYN DE LHUYS. M. POUYER QUERTIER, the determined Protectionist, made two speeches, one of two hours, and another of an hour and a half in length, in which he gave voice to the most vehement assertions respecting the effect of the commercial treaty. His eloquence was, however, thrown away, he could not persuade his hearers that they were ruined by a country which took all their surplus cattle, butter, eggs, fruit, &c., and a tolerable quantity of wine and spirits, and gave them in return cheap coal, cheap iron, and cheap woollen clothing ; and a second meeting terminated with a vote of 180 against 110, declaring that there was no present necessity for denouncing the treaty of commerce with England. We congratulate our friends over the water on these results, and we especially congratulate the OLLIVIER Ministry on its having shown how absurdly mistaken were the fears of

former Ministries when they hesitated to allow such secretions as that referred to above to meet, and state freely and fairly what were the views of their members on questions of political economy, which touch their interests so nearly. There was one feature which marked the whole of the speeches, Liberal and Protectionist, in the Corps Législatif, that we must not pass over, namely, the admirable tone which characterised every reference to our own country. Assuredly the understanding between the two countries is infinitely better than it was only a few years since, and much of this is certainly due to the effect of diminished import duties. Increased commercial dealings will ever beat diplomacy hollow.

—— The inquiry into the possibility of furnishing from our home growths vegetable fibre in sufficient quantity for the supply of the paper manufacturer, is being conducted closely and systematically by the Scottish Chamber of Agriculture. The form of questions issued specifies the following fibre vegetables as possibly sufficiently productive :—Flax, Thistles, Nettles, grasses, Peas and Beans, grain, trees, Hawthorns, Broom, Whin, Brambles, Heather, Sedges, Bulrushes, Potatos, Turnips, Mangels, Cabbages, Vines, Ferns, Mosses, sea-weeds. In all these instances members of the Chamber have been requested to state or estimate the climate and soil suitable for the plants ; the cost of seed and production, including artificial aids ; the time of sowing ; the time of reaping and winnowing ; the life of plant in favourable circumstances ; and the effect of its growth in exhausting soil. Papermakers are requested to estimate fibre product per ton, quality of fibre, price per ton to grower ; and the joint committee will fix plants to be tested, the selection and preparation of ground and artificial aids, and the quantity of seed per acre. The whole seems a very exhaustive plan of inquiry into the subject, and we shall soon hear the result. Meanwhile we direct attention to portions, in another column, of a correspondence on the subject which the Scottish Chamber have just published.——At a conference with papermakers held last week, Mr. Bruce stated Flax would much better pay the farmer to ripen it and send it for spinning purposes than to sell it to papermakers, but it might be cut while green, and Turnips or some other crop grown in the same season. Mr. Scot-Skirving said he thought straw was the cheapest commodity that could be produced for this manufacture. Mr. John Cowan stated that straw was better even than Esparto for papermaking. When lately on the Continent, he found large mills being erected in Germany and France, for no other purpose than to make paper from straw. In districts where there was a large command of straw 30*s.* a ton was paid, and the makers did not contemplate ever having to pay above 35*s.* or 36*s.* a ton of it. One great restriction in regard to the making of paper from straw was the difficulty of getting it, owing to the stipulations in leases that straw must be consumed on the farm. Mr. Chalmers had made experiments with straw, but did not find it so profitable as Esparto. Mr. John Miller said he had been importing straw from Sweden and Belgium to his works, and even from Ireland, as cheap as he could buy it in Scotland. What they therefore wanted was, that the farmers should give them straw as cheap as he got it abroad. The market price in this country was £1 per ton more than the price in Belgium or Sweden. The Chairman said he thought that since the introduction of light manures there were very few proprietors but would be willing to allow a tenant to sell straw if he introduced something of manure value for it. He did not think they could hold out great hopes from anything that had taken place in the discussion further than that they should grow us much straw as they could. He did not think the other substances mentioned could be cultivated in such abundance as to be the least likely to be useful to the papermakers. Flax was a very unpopular crop, and he did not think they would get any farmer to grow either Thistles or Nettles.

—— For some time water pipes made of Burgundy cement have been largely used in France, not only on account of their cheapness but their durability, for while iron suffers terribly in moist situations, those made of cement increase in hardness under such circumstances. Those pipes are moulded in place, and overlapping each other like ordinary metal or stoneware pipes, but with this difference, that the joints are absolutely solid, so that they form in fact one continuous pipe, the thickness of cement used depending on position and the chance of accident. These pipes have been used with great advantage in Burgundy, where the supply of water is frequently terribly deficient. One of the most extensive applications of cement pipes was made lately by an architect, M. Monniot, of Châtillon-sur-Seine, who has laid down a conduit for the supply of the town of Chaumont with water ; this conduit is more than nine miles long, and conveys 1440 tons of water in 24 hours. The whole of the work, including reservoirs, cost but £12,000, while the expense with cast-iron pipes would have been just double. The relative cost of cast-iron and cement pipes, 10 inches in diameter, in place, is, according to M. Monniot, as follows :—Cast-iron pipes, equivalent to 17*s.* 6*d.* per yard, and cement pipes to 5*s.* 3*d.* M. Belgrand, the director of the hydraulic service of Paris and the rest of the department of the Seine, has constructed a conduit at Avallon in cement pipes, and many more instances might be mentioned. The introduction has been a great boon for Burgundy and many other parts of France, and has been the means in many cases of converting sterility into fertility, and of supplying many villages with pure and cheap water. It is possible that cement pipes may not, in the case of small bores especially, present any advantage over our excellent English stoneware pipes, which have no representatives in France ; still, as England is well off for cement, the subject well deserves consideration and trial. Everything that increases and cheapens the supply of water demands attention.

OUR LIVE STOCK.

CATTLE.

Mr. Murton Tracey's sale, on the 5th inst., conducted by Mr. Strafford, was exceedingly successful. Forty-four animals realising an average of £86 2*s.* 6*d.*, and 31 cows bringing an average of £107 each, are facts which may well cause astonishment in the outer world. Such is, however, the homage paid to quality, beauty, and pedigree by those who desire to continue and improve a race of cattle now distributed over almost every civilised country. The highest price, 270 gs., was given by Sir C. M. Lampson for *Hebe 2d*, a yearling, and 260 gs. were given by Mr. F. Leney for the mother of the heifer just named. *Sweetheart 5th*, by Mameluke, brought 245 gs. from the Earl of Dunmore ; *Sweetheart 26th* was purchased by Mr. White, for Australia, at 200 gs. ; *Sweetheart 19th* goes to Killhow, at 220 gs. ; *Sweetheart 6th* was secured for the Beaumont Grange herd at 120 gs., and Captain Oliver and Mr. Foljambe both purchased individuals of the same celebrated family, at from 105 to 150 gs. each. The bulls made low prices in comparison. Major, own brother to *Sweetheart 28th* (bought by Mr. Foljambe at 150 gs.), only made 42 gs. ; and Belvedere, own brother to *Hebe 2d*, was bought (we are inclined to think very cheaply) by Mr. W. W. Slye, for 52 gs. On comparing Mr. Tracey's average with the results of former sales, we find that it is higher than any obtained either in 1869 or 1868. The first portion of Mr. Rich's herd in the autumn of 1868 averaged £69 3*s.* 10*d.* over 58 animals, and the second portion, sold in the succeeding spring, averaged £72 3*s.* Both these extraordinary sales were rivalled by Mr. E. Bowly, who, in April, 1869, sold 39 animals for £72 16*s.* each. This result has never been equalled until the sale of the Edenbridge cattle, which we now record. Reference to the accompanying list will show how far Mr. Murton Tracey has eclipsed the results of recent Shorthorn sales.

Name of Animal.	When Calved.	Price.	Purchaser.
Cows and Heifers.		Gs.	
Sweetheart 3d	1863	..	Withdrawn, by leave.
Constantia 3d	Dead	..	..
Sweetheart 4th	1869	145	Lord Dunmore.
Sweetheart 5th	1869	220	Mr. W. W. Slye.
Constantia 4th	1862	92	Mr. Thornton (for Mr. Torr).
Sweetheart 6th	1863	92	Mr. Thornton (for Mr. Chalmers).
Sweetheart 7th	1863	105	Mr. G. Payne.
Sweetheart 8th	1864	80	Mr. T. Conolly.
Sweetheart 11th	1864	105	Captain Oliver.
Sweetheart 12th	1864	81	Captain Oliver.
Sweetheart 13th	1866	120	Mr. G. Barton.
Sweetheart 14th	1866	72	Mr. G. Payne.
Sweetheart 15th	1866	..	Mr. R. Betts.
Hebe	1866	260	Mr. F. Leney.
Sweetheart 16th	1867	81	Mr. Thornton (for Mr. Chalmer).
Sweetheart 17th	1867	95	Mr. J. Fawcett.
Sweetheart 18th	1867	92	Mr. J. P. Lauder.
Sweetheart 21st	1867	120	Mr. G. Payne.
Sweetheart 22d	1867	61	Mr. Thornton (for Mr. Chalmer).
Sweetheart 23d	1868	55	Mr. J. H. Burnside.
Sweetheart 24th	1868	105	Mr. F. Bamford.
Sweetheart 25th	1868	175	Mr. F. Bamford.
Sweetheart 26th	1868	200	Mr. J. White (for Australia.)
Sweetheart 27th	1868	145	Sir C. M. Lampson.
Sweetheart 28th	1868	160	Mr. F. J. S. Foljambe.
Sweetheart 30th	Feb., 1869	72	Mr. J. K. Fowler.
Hebe 2d	April, 1869	270	Sir C. M. Lampson.
Sweetheart 31st	June, 1869	74	Mr. G. Moore.
Sweetheart 32d	Nov., 1869	62	Mr. C. C. Dormer.
Sweetheart 33d	Jan., 1870	82	Capt. J. J. Robinson.
Sweetheart 34th	Jan., 1870	91	Mr. J. K. Fowler.
Sweetheart 35th	Mar., 1870	91	Mr. W. W. Slye.
Sweetheart 36th	Mar., 1870	83	Mr. R. R. Sewell.
Bulls.			
Lord of the Harvest ..	1864	72	Mr. Mold.
Patrician	1865	42	Mr. G. Barton.
Major	1868	42	Mr. R. Betty.
Reginald	1868	65	Mr. F. Bamford.
Sweetheart	1869	..	Sold.
Red Gauntlet	Feb., 1869	52	Mr. J. Denchfield.
The Earl	April, 1869	54	Mr. J. B. White.
Rob Roy	May, 1869	26	Mr. Wise.
Patriarch the Younger	May, 1869	41	Mr. Tindall (for Australia).
The Kaiser	June, 1869	41	Mr. J. Denchfield.
Wrestler	Nov., 1869	28	Mr. H. Gerrings.
Champion	Dec., 1869	15	Mr. R. Betts.
Forester	Dec., 1869	15	Mr. Taylor.
Belvedere	Mar., 1870	52	Mr. W. W. Slye.
31 cows at	..	£107 0 0 =	£3316 0 0
13 bulls at	..	36 7 0 =	472 10 0
44 head at	..	£86 2 6 =	£3788 10 0

—— On the 29th ult. Mr. W. G. Preece, of Shrewsbury, sold 53 head of pure-bred Herefords. The highest price given was 50 gs. for a 2-year-old bull, Patters, by Paragon (3665, in Lydiat's Herd Book). Two yearling bulls made respectively 30 and 31 gs. ; *Stately*, a 5-year-old cow, by Titterstone (1775), was sold for 40 gs., but beyond these no prices of note were obtained.

SHEEP.

The Needham Hall Flocks.—A short account of the formation, progress, and present state of Captain Catling's flock may perhaps be interesting to such of your readers as admire the true Lincolnshire breed of sheep. It is fully 50 years since Captain Catling's uncle, the late Mr. Joseph Blackborn, established the nucleus from which this flock has been formed, but Mr. Blackborn confined himself simply to breeding rams, for use in his own flock and those of a few of his immediate friends and neighbours. The entire flock (exclusive of lambs) now consists of 570 sheep, about 300 of which are breeding ewes, which with their lambs (more than a third of which are twins) at their sides are now a beautiful sight. Both ewes and rams have been chosen from the very best to be obtained, irrespective of price, many of the former having cost 10 gs. each, and the tups have in several instances cost over 100 guineas, in one particular case 160 gs.

Some ewe hoggets intended for exhibition were being clipped last week, when I had the pleasure of seeing this flock, and I enclose two staples of the wool which I drew from two fleeces as they lay upon the winding-board ; by measuring you will find them 20½ inches in length, and you will remark how strong is each individual fibre, and how well the strength is maintained throughout. At my request three of the fleeces were weighed, which I took note of ; they are as follows :—No. 1, 20 lb. ; No. 2, 18½ lb. ; No. 3, 20½ lb. I do not of course wish you to suppose that I chose any but the best I could lay my hand upon, but I have no hesitation in saying that there were many sheep waiting in the pen to be shorn that would clip as much or more wool than those I have given you particulars of.

I may here note a peculiarity which, in these pushing days, seems somewhat behind the times—the rams are always let by private contract and not by public auction. One feature in the flock which struck me, in going over the farm, was the singular uniformity of the whole lot of sheep, not a trace of another class appearing in any individual. Captain Catling has of late years been very successful as an exhibitor of Lincoln sheep at the various Eastern Counties agricultural shows, one ram having taken £70 in prizes in a single season. *Nemesis*, *April* 21.

—— In the Number of the "Veterinarian" for May, we find the following respecting the rickets in lambs :—"In our last number we inserted an extract from the 'British Medical Journal' on rickets in the lower animals, and took occasion to remark that we should make some observations on the disease commonly known as rickets in lambs. The affection thus designated was, upwards of 25 years since, so far investigated as to prove to our satisfaction that its pathology was in no way allied to that diseased condition of the osseous tissue which constitutes the rickets of man. The bones of rickety lambs differ in no respect as to the relative amount of animal and earthy matter from those of the most healthy animals. The affection is in reality congenital defect of the soft tissues, involving especially the *ligamentum teres*, which is elongated, even at the time of birth in some instances, to allow of partial luxation of the hip-joint. As the young animal advances in life, however, this elongation increases, so that, almost exclusively by the power of the muscles surrounding the joint, the head of the femur is kept in the acetabulum. Hence lambs are said to become rickety when a few weeks old. It is difficult to account for this pathological condition of the hip-joint being so frequent in lambs, and especially so when it is borne in mind that on many sheep farms the cases are periodic in their occurrence. Under ordinary circumstances, in a flock of 300 or 400 ewes, a lamb or two may be affected, for a few years in succession, when a time arrives at which the cases will number even as many as 30 to 35 per cent. Heath-land farmers suffer most, and especially those on whose farms 'black sand' abounds. It is believed in Norfolk that if marl be spread on the surface of a black-sandy soil to improve its agricultural value, and the in-lamb ewes be fed on the Turnips which are sown in the ordinary course of cultivation, that causes are brought into operation which will suddenly augment the number of cases of rickets. It is not unfrequently observed that one lamb of a twin birth is rickety, the other being perfectly well. The affection, though congenital, is not hereditary. Rickety ewes, which had been bought as lambs from heath-land farmers and taken into valley farms, are often kept for breeding—the range of pasturage over which they travel being both limited and fruitful, thus enabling the ewes to keep up their condition—and it is not found that their lambs are affected with the disease. Even on heath-land farms the same fact has been often observed. No breed of sheep seems to be exempt from the disease, nor does it matter what may be the age of the ewes or of the rams, nor whether the ewes are kept exclusively on Turnips, or have a supply of manger food."

FARM BUILDINGS.

VI. The Prince Consort's Home Farm.

The old Dairy Homestead at Frogmore was built in the form of a square, with the piggeries and other buildings projecting from the north side. These buildings had been built at different periods, as the necessities of the farm required. They were not arranged on any regular plan, and consequently were very inconvenient. Sarah, the celebrated Duchess of Marlborough, former Ranger of Windsor Park, had had a garden at Frogmore, where the old homestead subsequently stood, and the principal cow-house had been its orangery. This part of the buildings served its purpose tolerably well, but all the remainder of the homestead presented a most ruinous appearance, and had been often compared to the homesteads of the worst parts of Ireland. The buildings were not only inconvenient and ruinous in themselves, they were also ruinous to the health of the cattle: and in 1845-46 a great many valuable animals were lost from pleuro-pneumonia and other diseases. This was not to be wondered at, because when the River Thames was flooded the water rose to the level of the floors, and some of the houses could not be used. In addition to these evils, the old houses required a great yearly expense to keep them in habitable repair. For these reasons His Royal Highness the Prince Consort, in 1851, resolved that an entirely new farm steading should be erected, suitable for the requirements of this important appendage to the Castle.

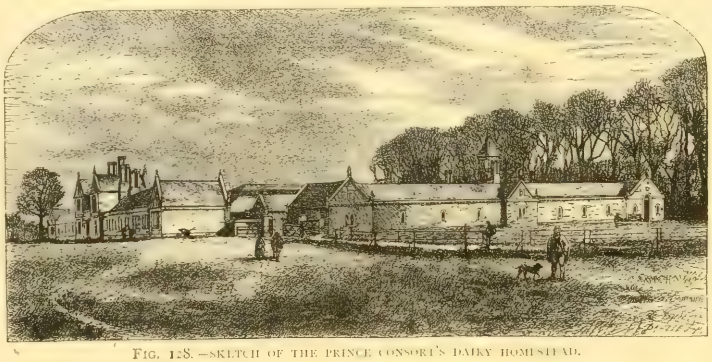

Fig. 128.—Sketch of the Prince Consort's Dairy Homestead.

General Wemyss had at that time the charge of all the Prince Consort's farms, and Mr. Turnbull received the Prince's commands to consult with the General on the subject; and after considerable discussion the site of the future homestead was resolved upon, and Mr. Turnbull's plans adopted. The works were at once commenced, but not completed until 1855.

These buildings, represented in the sketch (fig. 128) as seen from the north-eastern side of them, are also shown in plan (fig. 130), and in isometrical perspective (fig. 129).

The principal feature in the arrangement is the magnificent two-rowed cowhouse with its wide central gangway and lofty roof. The arrangements for watering and for draining, the latter being shown by dotted lines upon the plan, are most perfect throughout the building. The structure consists, it will be seen, of no fewer than five lines of building abutting upon a cross line which connects them, and which carries a clock-tower in its centre. A roadway runs across the other ends of these lines and gives access up the intervals between them, which are used partly as roadways and partly as open yards. On the other side of this cross road, occupying therefore the same relative position as the cross line of building on the other side, stands another line with a fine architectural elevation, of which a separate drawing is given (fig. 131): it faces this dividing road. The other elevation of this row is seen in the isometrical drawing, which very beautifully gives the general style of the structure. It includes cart-shed, cottages, loose boxes, and stables. From the southern end of it you walk up the space between the first two rows of which the main structure consists. On your right hand is a series of pigsties, fed from the roadway through Crosskill's hanging flaps. You may also look into them from the gangway separating them from the cow-shed, which is provided with an open yard upon its other side. On your left hand are other pigsties, stores for food and litter, boiling-house, slaughter-house, &c.; the whole of this department being a most complete establishment for the accommodation of the valuable herd of the Prince Albert Windsor pigs. Traversing the gangway in which the road terminates, you pass yards, *h'*, *d'*, and stores for straw and hay, *j f*, to the other side of the buiding, where is another open yard *d'* provided with sheds, a calves' house, *z*, and hemels *e e'*, for feeding cattle, cows, and bulls. Between this, the fifth ridge line, and the fourth, there is, as between the first and second, a roadway, and on the other side of this roadway, a shed like the cattle-shed of the second ridge line, furnished, as it is, with an open yard. The central line is the noble cow-byre to which reference has already been made. Its dimensions will be gathered from the section (fig. 132). The stalls are 9 feet wide, for two cows each, divided by slate partitions. The iron trough for each is divided into three compartments — the central division for water. The raised gangway, *a*, has a stone floor with slabs of slate on either side of it. The pipes, *d*, supplying water to the drinking troughs, lie below the passage floor. The stalls and passage floors are asphalte. The gutter, *b*, presents a sloping cross section, allowing of the easy escape of water, which falls at intervals into the drain shown in section below it. The plans and sections will enable the reader to follow the general design of the architect, and also to detect many clever points of detail by which Mr. Turnbull has obviated difficulties and avoided liabilities to nuisance.

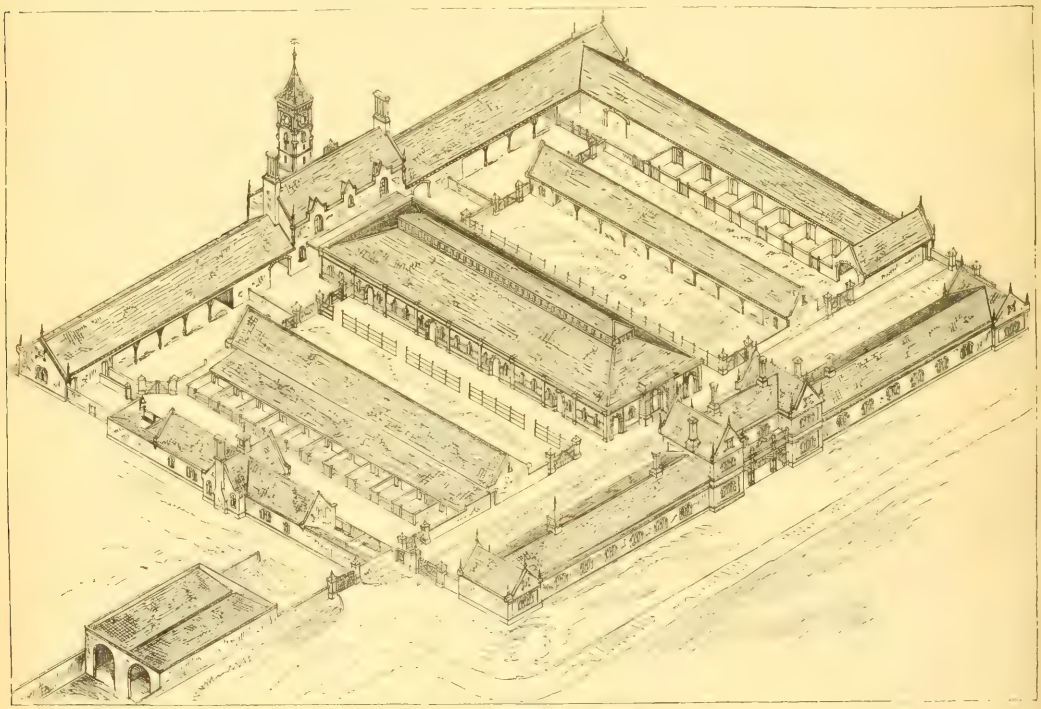

Fig. 129.—Isometrical Perspective.

It will be seen that ready access is given to all the yards and sheds for litter (chiefly fern-leaf mown from the park, and stored away for its winter purpose); and

that from the centres *j j*, and *n*, and *o*, where hay, pig food and meal are stored, easy access is given by the gangways, *a a*, to all the feeding-houses, stables, cribs, and boxes where the stock are kept. The whole of the floors are laid upon a strong bed of concrete, and this has completely prevented rats, mice, and other vermin from burrowing below them. The several yards for cattle have drinking troughs stationed in them, supplied on the self-feeding principle; and there are hydrants placed in various parts of the buildings, with a plentiful supply of water from the Castle waterworks in case of fire. The surface water from the roofs and roadways is carried away by a separate set of drains, which are not shown in the plan. The whole of the door and window jambs, the ornamental coping, corbels, terminal pieces, and panels in gable, are executed in terra cotta. This was done by the command of the Prince Consort, who took great interest in superintending the erection of the homestead, declaring when it was finished that he possessed the best cowhouse in the world. The reader will easily gather, by an inspection of the plan, how well and with how much economy of labour it is adapted to its purpose. In nothing is this saving of labour more considerate or more conomical, than in the provision of cottages for the herdsmen and young men employed in them. These occupy a position, *s* and *t*, on either side of the central archway.

It may be added that the whole of the soakage and drainage of the sheds and yards is conducted to a manure-house outside the plan.

The soiled litter is every morning wheeled from the road upon the level outside, along the gangway extending into this house, and tilted over into the space below upon the floor, from which it is removed by cart, which has access down a sloping road at the other end. The liquid drainage finds its way into the tanks, and is pumped out either to the water-cart, which takes it out to the pasture land, or on to the heap of manure itself, which being loosely piled in this receptacle is liable to ferment. The closed roof and walls hinder most of the loss, however, to which it is thus liable.

One of the chief features in these buildings evidently is the ample accommodation for pigs—*g g* on the plan. The comparatively smaller white Prince Albert's Windsor breed—from 16 to 20 breeding sows—are kept here. The pure Berkshire—10 to 12 sows—are kept at the other farmery. In both cases there is ample demand for the young stock for breeding purposes. Mr. Tait gives the preference to the former breed, both for fecundity and for precocity. As much as £700 worth of produce has been sold out of the piggeries at the Home Farm alone in a single year.

The dairy stock, for which ample accommodation is provided on these premises, is for the most part kept here. Nearly 200 head of stock are now kept—about 80 cows in general of the Shorthorn breed, besides 10 or 12 Alderneys. The Shorthorns of course are not yet all pure pedigree stock—the pure-bred herd has been growing into existence only during the last eight or 10 years. The Royal Dairy stands near the homestead just described. It is represented in the sketch, fig. 95, p. 506.

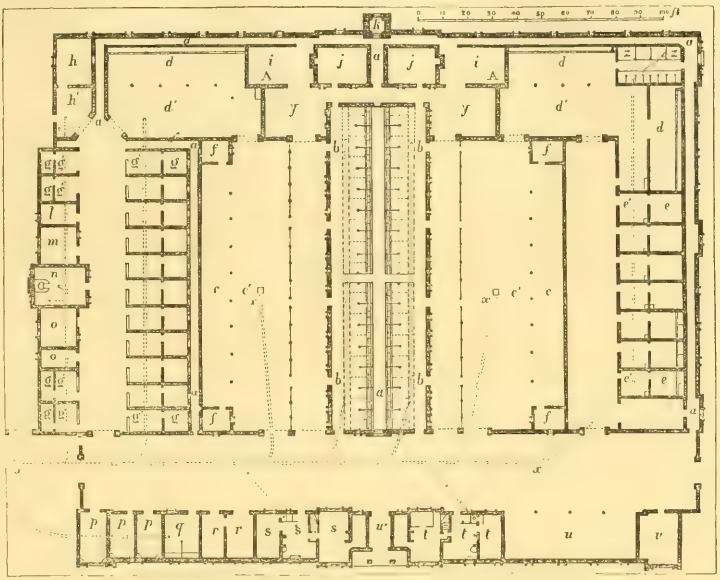

FIG. 130.—PLAN OF THE PRINCE CONSORT'S DAIRY HOMESTEAD.

REFERENCE TO THE INDEX LETTERS.

a, Gangways—*b*, Cow-house.—*c c'*, Cow-sheds and yards—*d d'*, Sheds and yards for young stock—*e e'*, Hemels for bulls and other stock—*f*, Calving-boxes—*g g'*, Pigsties—*h h'*, Yard and shed—*i y*, Sheds and yards.—*j j*, Hay house. *k*, Clock tower. *l*, Stores.—*m*, Slaughter-house—*n*, Boiling house.—*o*, Straw-store.—*p*, Horse-boxes.—*q*, Stables. *r*, Loose boxes.—*s t*, Cottages.—*u*, Cart-shed—*v*, Hospital. *w*, Entrance archway. *x*, Drainage of yards and Stables to the Manure house which is shown in the isometrical drawing—*y*, Yards.—*z*, Calves' house.

FIG. 131.—WESTERN ELEVATION OF CART-SHED, ENTRANCE, AND COTTAGES.

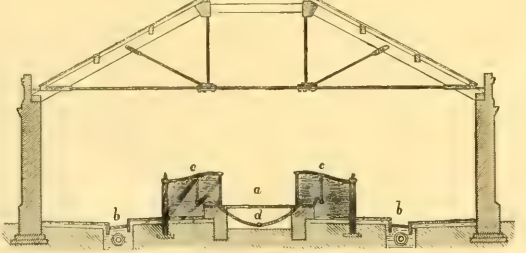

FIG. 132.—SECTION OF COW-HOUSE.

ROOTS AND STRAW.

SMITH OF WOOLSTON AS A LANDLORD.

"G. A. H." has stepped in again to question my remarks (upon the sale of straw and roots) upon Mr. Lawes' paper. Here is what he says:—"What a pity that his (Smith's) 112 acres had not been 112,000, so that he might carry out in practice the liberality which looks so grand upon paper."

I am not possessed of that grand total "112,000 acres" of land, but I am possessed of more land than I occupy, and for many years my tenants have occupied upon the terms "pay their rent and keep their land clean," and I have never had reason to regret those conditions; therefore, I practise according to the advice I give.

Again, "G. A. H." says:—"Did Mr. Smith, of Woolston, ever hear of one Mr. Mechi, of Tiptree? If so, I fancy Mr. Smith could quite understand that if straw and roots were allowed to be sold, there would be a great many Messrs. Mechi springing up who, farming their own land, would be very glad to buy straw and roots from their neighbours, knowing well that in a very few years their own acres would be fat."

Let us now look to Mr. Mechi's practice. His balance-sheet, published in your paper of Jan. 23, 1869, shows it. It reads thus:—"Purchased straw, 1865, £16; 1866, £6;" and that is all that we can find about either straw or hay having been purchased from "neighbours." We read this about "Hay sold (and straw in 1867):—1865, £72 17*s.*; 1866, £10 2*s.* 6*d.*; 1867, £130 1*s.* 6*d.*; 1868, £145 19*s.* 6*d.*" Now let us look to roots. There was not so much as a ton purchased, yet there were some sold, for I read thus:—"Mangel roots and seeds sold—1865, £39 17*s.* 6*d.*; 1866, £91 10*s.* 3*d.*; 1867, £1 3*s.*" Therefore the evidence is conclusive that Mr. Mechi did not make his farm "fat" by the purchase of straw and roots. Then let "G. A. H." tell us at once who these "Messrs. Mechi" are who have done so, for the sale of straw, roots, &c., aided Mr. Mechi in the purchase of feeding stuff, &c., to make his land fat. But then Mr. Mechi's evidence about making land fat is not worth having, for last year he did not get a penny as tenant, neither would he the year before had he not have shown his wheat as sold at 10*s.* per qr. more than the average of farmers of England sold theirs at. "G. A. H." must tell us, as I have said before, who the "Messrs. Mechi" are, for I do *not* know all this well, as "G. A. H." would have you believe that I do. Again, "G. A. H." says, "Perhaps he (Mr. Smith) would like to try a little of his neighbours' roots and straw at feeding price." I do not crave the purchase of neighbours' roots and straw at such a price, which I shall hereafter show.

Again "G. A. H." says, "Did Mr. Smith ever hear of what is called in my part of the country 'a bye-tack?' that is to say, a second farm taken by the same farmer, but from a different landlord, and usually adjoining his own principal farm; and did he ever hear that landlords and land-agents as a rule set their faces against letting farms as 'bye-tacks' to any tenant who rents another and a larger farm under another landlord?" I know of very many farmers who rent two, and, in some cases, three farms as "bye-tacks," under different landlords. In this parish there are three renting farmers occupying two farms each, held under different landlords; and when I look to the adjoining parishes to this—east, west, north, and south—I find men in every parish occupying land under two landlords and such men are to be found as thick as hail all over England; yet I never hear of landlords, or even land-agents, setting their faces against such practices. The evidence is conclusive against "G. A. H." upon this point, for the vast numbers of men who hold such holdings all witness against him.

Again "G. A. H." says:—"Did he ever hear, too, that landlords and land-agents do not like to let their land to yeomen—that is to say, to men who own a farm of their own and occupy it themselves? And if so, why? I will tell him the reason. Because in a very few years the one farm would be fat and the other lean."

I never heard of, nor do I know a landlord or a land-agent who would make such an objection, yet I do know where owners of land rent farms adjoining their own, and things have gone on smoothly and well between the tenants and landlords. Such men are to be found in this neighbourhood, and in almost every parish, for there are many "yeomen" about here. I will instance one, leaving names out:—A man 30 years back owned a farm, and then took the adjoining one: the two farms are very much alike in character, but the one just taken was very much out of condition, but was soon fetched into condition by this persevering tenant who owned the adjoining farm. This farmer died. The farm that he rented is now let at 10*s.* per acre over what he first rented it at, and his own farm is let at only 1*s.* an acre over the one he rented; thereby proving that men are not such rogues as "G. A. H." would have us believe that they are, for there are no end of like cases to be found. A man who can farm his own land well would be safe to farm rented land well, for a good farmer has not the heart to rob land.

So much for "G. A. H.'s" mountain in labour. Now I shall look this straw and root question fairly in the face upon its real merits, and I will take straw first.

A ton of straw makes four loads or tons of manure, worth 5*s.* per load or ton when fresh made; there is a less quantity and weight when rotted down. Mr. Lawes tells us that a ton of wheat-straw is worth for manure 12*s.* 6*d.* I say that a ton of straw and three tons of water are worth £1. I have just sold 40 tons of wheat-straw to a London straw dealer for the London market. He gives me nett 32*s.* 6*d.* per ton, doing the binding and delivering himself. According to this evidence I am robbing my heavy land of wheat-straw worth £40 for manure. Now I will show you how I am going to compensate it. I have bought of this London dealer 200 tons of London dung, to be delivered by him by canal to my heavy land, at 6*s.* 6*d.* per ton, so that the 40 tons of straw sold, at 32*s.* 6*d.* per ton, just pays for it. This dung is to be delivered to me just as it comes from the London stables, of the best quality. Good London dung consists of, say, 1 ton of wheat-straw—value for manure, £1; half a ton of hay—value for manure, 10*s.*; half a ton of corn—value for manure, £1 5*s.*; and say 3 tons of water, which would be the outside. These 5 tons of manure cost me 32*s.* 6*d.*, whilst I show that it is worth, as a manure to my land, 55*s.*, or 11*s.* per ton. Then the 200 tons are worth, at that price, £110. Now, if I pull from this the £40 for the value of the straw that I have robbed my land of, I gain in value £70 worth of manure over and above the £40 worth sold off to go back to my land.

This will show to "G. A. H." that the way to make land fat is to sell the straw and buy manure from town,—that Mr. Lawes' exceptional men get the best of it by doing so, and can afford and do pay to their landlords shillings per acre more for their land than the "protection" landlords get for theirs. "Protection" is their grand word, so they stick to it.

Now let us go into the question about roots for making a farm "fat." A ton of roots costs, carting and all, quite £1, very frequently more than that, and I think I may say never less; then we will fix their average at that price. Your Paper, at p. 606, tells us that the dry vegetable matter in a ton of Mangel is about 2 cwt., then the rest is water. The manure value of this 2 cwt. of dry stuff, with 18 cwt. of water, would be put high enough if fixed at 5*s.*, and the entire value of a ton would be put high enough if fixed at 6*s.*; the two items together make a total of 11*s.* Therefore the buyer would make himself poor by feeding his land with bought Mangel, and bought Swedes would be about the same.

Now let us try this straw and root question upon another point, viz.,—If a tenant under a noble Duke or Lord, or large landowner (who in all their agreements put in the protection clause about straw, &c.), were, supposing he had not got the clause in, to set-to and sell his straw and roots off without purchase of manure, &c., what would he do? Why, if he did not ruin himself quickly he would make a fool of himself; he would soon have to cut his occupation, and his brother farmers would look upon him as a great block-head. Therefore he might cut off to Van Dieman's Land, for his character would hunt him out of England.

The evidence is conclusive against the landlords' "protection" clause for straw, &c. If "G. A. H." has any more to say about it, let him give evidence instead of asking questions and making general statements, which show plainly that "Looker-on" had measured his head correctly for common sense. *William Smith, Weedon, Bucks, Stratton, Bucks, May 9.*

Home Correspondence.

Present Appearance of Crops.—*Devonshire:* The Wheat crop is looking as bad as I ever saw it at this season of the year; it is very rare for us to lose Wheat plants from severe weather. This year some persons have ploughed up a chance field. The weather still remains cold and dry; a favourable change would be in time to improve the spring crops, which now look indifferent. *Samuel Cornish, Stancombe, near Kingsbridge, May 9.*

—— *Lincolnshire:* Many fields of Wheat have lost plant very much from the severe winter, and look very unpromising; a few pieces which have not done so look fairly. The spring corn looked very well until the last week or two, which have been too cold, but I think with a return of warm weather it would recover. *Isaac Sharpley, Boswell, Louth, May 9.*

—— *North Lincolnshire:* I have pleasure to give you my opinion on the growing crops of the present season. As an old man, turned 80, I have not been far from home; I have been an invalid for several weeks. My neighbour, Dr. Mackintosh, whom I see almost daily, informs me the Wheat crop on our wolds, which he has known for more than 20 years, was never so bad as the present season: part of it is good for nothing, and many fields sown part over either with Oats or Barley. As to what I have seen the last few weeks, I quite agree with the doctor. It must be a failing crop. There are some fields of Wheat promising a crop, but the weather is cold and frosty, making it look yellow and not healthy. My son farms on strong lands, and his Wheats are very promising. The spring crops have come out well, but at present I cannot give an opinion on them. *T. G. Dixon, Caistor, May 9.*

—— *Wilts:* Wheat at this time is, in very many instances, thin on the ground, not more than half a plant; some instances a full crop or plant looking healthy and well; on the whole very backward, too much so to give anything like a correct opinion, although the spring corn was sown early. Should this weather continue much longer without rain, it will materially injure the prospects of having a full crop. Vetches very bad, from the extreme changes of the season. Winter Beans very bad. Thin sowing this season, I fear, will not be very favourable towards a full crop of any kind. Without rain very shortly food for sheep and cattle will be very scarce. *Geo. Brown, Avebury, Calne, May 9.*

Sheep Ticks.—Observing a paragraph in the *Agricultural Gazette* relative to sheep tick and louping-ill, it may be desirable to point out what was probably the real cause of death from convulsions in the lambs. That a visitation from sheep tick amongst a flock of sheep is a great and serious drawback upon their satisfactory progress, no one acquainted with sheep can doubt. It creates and upholds a continuous irritation, and is almost as bad as scab. The sheep tick is a very hardy and prolific insect; its bite is sharp, and it delights in sucking the blood from the puncture it makes. To old sheep its attack is almost unbearable, and the constant rubbing they practise injures their wool. To young lambs ticks are very detrimental; they are never at rest, but are continually "nabbing" at their wool, till they become almost like a pen-feathered fowl. It is this constantly pulling their wool that does them their great injury. They by degrees collect portions or pellets of wool in their stomachs, and as it is indigestible they cannot get rid of it; they cannot void these pellets of wool, and in the course of a short time they produce the convulsions of which the lamb dies. Seven cases have come within the writer's cognisance within the past few weeks. The pellets of wool become so closely compressed as to be difficult to unravel, and will not yeld to powerful purgatives. The chief thing is prevention. The ewes some months prior to lambing should either be dipped or "fag-watered, *i. e.*, the dipping mixture to be jerked from a corked bottle through a quill in the cork over the sheep, and be well rubbed in. It is highly dangerous to dip lambs in any of these poisonous mixtures at an early stage of growth; but if loss to any extent arises, a rather weak solution of tobacco-water might be applied, either as a dipping mixture, or to be jerked upon them from a bottle as above. Perhaps early shearing of the ewes, and then the immediate dipping of the lambs, is the safest practice. It would be certain death to many lambs to permit their dams to be dressed for tick with any poisonous mixture. They would suck the poison from the teat, and death would speedily ensue. There must be some error in your writer's idea of certain lands or certain districts being infected with sheep-tick. It is quite a new idea to the writer of these lines. The scab insect, we know, does live awhile in crevices of gates and fences, from whence sheep will take them when rubbing; but tick is a stirring, bonny fellow, only at ease when his nose is buried in a lock of wool, and sucking at the puncture he has made in the skin. Every precaution should be adopted by the flockmaster to keep clear of the pest. It merely requires attention and the administration of those simple remedies that are known to all flock-masters. The dipping mixtures are the most effective, and every country chemist can supply them. Mercurial ointment is by no means efficacious in killing ticks, many will escape; but effective dipping, or even "fag-water" dressings, as above, will not only destroy the tick, but will greatly injure, if it does not destroy the egg or pupæ of these ticks. It is customary for our best flockmasters to dip their sheep annually, and others to dress with mercurial ointment. In either case the growth and cleanliness of the wool is promoted, and the sheep graze more quietly. *O. F.*

Choice of Potatos for Seed.—In some recent Numbers of the *Agricultural Gazette* the following advice is given on the above subject:—"The sets should be cut from properly matured tubers;" and again, "Potatos that have not attained maturity are objectionable for seed." These statements are directly opposed to the experience of many persons who have given great attention to the cultivation of the Potato, and to whose evidence must now be added that of Mr. Paterson, a Potato grower of "long observation and experience" in Scotland, who writes thus (*Agricultural Gazette*, p. 613):—"To get good seed, Potatos should be planted late in the season or in cold soil, so that the tuber may *not* be well ripened. Potato crops grown from seed thus prepared invariably produce a heavier crop, with finer tubers, than seed produced on early soil and fully ripened." *P., May 2.*

Fly-blown Sheep.—The flies which breed maggots on the sheep are four species; the one with a shiny green colour (Musca Cæsar), and the M. cadaverina, with the thorax shining bluish and abdomen green, are, I believe, the two chief inflictors of this evil. There are, however, in addition, the two larger flies, the common blue-bottle or flesh fly (M. vomitoria), and the grey M. carnaria, which blow sheep. Now, as all these will quite readily, and, I believe, preferentially deposit their eggs on any carrion which has commenced to putrify, I have for the last two seasons offered them the choice. A dead mouse or bird, the cleansings from a ewe or cow, or a piece of meat, soon became alive with maggots, which no doubt would otherwise have been laid on the sheep. To avoid trusting to any servant to destroy the carrion along with the maggots, last year I had covered tin vessels made with a loose diaphragm with an aperture in the centre, filled below with water, and as soon as the maggots reached maturity they dropped into the water, and committed involuntary suicide. Treacle or other viscid substance, such as oil, &c., would be preferable, as I found in warm weather the water evaporated, and so needed attention, and as I had had the vessels made too small they called for more attention than is desirable. I had a cover attached to the cone by wire hooks, and on the underside of the cover was hung the carrion. A stone jar would answer the purpose admirably, or upon a larger scale, a larger piece of flesh hung over a pond, so that when the maggots dropped they would be drowned. As gardeners, we have been in the habit of hunting the queen wasps in April and May, with the full assurance that by each wasp killed a nest was prevented. How much easier would it be, with less industry, were we to supply these four flies with enticing nest-places in the early spring and summer months, both in town and country, and be rewarded with a freedom from sheep-blown and from legs of mutton "crawling with life." Such a desideratum is too obvious, as bearing upon the people's food supply and preservation, to need another word. *W. A. Wooler, Sadberge Hall, April 30.*

Steam Ploughing: Fisken v. Roundabout.—"West Indian" (p. 542) forgets that when Mr. Fisken and Mr. Smith were each describing their systems of steam ploughing, they had the natural bias of a parent for his offspring. Now when I was describing Fisken's system, and comparing it with others, I was acting, if I may use the expression, magisterially. I saw Fisken's plough at work at Manchester, and there were only four persons employed—namely, an engine-driver, a ploughman, and two windlass-men, one on each head-land; but then the field was a small one, and the length of ploughing-rope out was short and had no porters, consequently the porter-boys were dispensed with. I should be sorry, however, to work it in a large field, ploughing a long furrow without rope-porters, because the work would be greatly increased by the friction of the rope dragging upon the ground, and also the wear of the rope would be considerably greater. As to the amount of work done, I think I gave very good reasons for "the faith that was in me." I showed that the work done, if worked out on the data that your own reporter supplied, was 19¾ acres, whereas my estimate was 13 acres, or just two-thirds of what your report would have given. Why, then, should "West Indian" seek to cut down this quantity? We both saw the plough at actual work, and we both saw that there was no humbug about it. "West Indian's" common sense might tell him that an engine-driver, a ploughman, and two windlass lads, could not possibly work Fisken's tackle and supply it with water. There must be a lad at each windlass; who, then, is to drive the water-cart? I do not know what "West Indian's experience of "lads" is, but I know my own experience tells me that when a lad does man's work he very soon requires man's pay. To attend on a windlass may not require much strength, but it requires nerve, coolness, and steady attention,—three qualities not easy to find in a mere lad, and when they are found in one lad, I venture very mildly to suggest that the lad is worth more than a shilling a day. I do not see why "West Indian" should compare Smith's apparatus, costing £225, with Fisken's at £350. It would be about as reasonable to put a Crosskill cart made to carry 25 cwt. into the same category as a Crosskill cart made to carry 50 cwt. Fisken's set includes a first-rate Fowler's implement, which would tear up land that would most assuredly break Smith's implement all to pieces, just as to put 50 cwt. into a 25-cwt. cart would very quickly smash it. I stated pretty plainly why I thought Fisken's flying-rope system to be preferable to the roundabout. One great

reason was that Fisken uses in his windlasses friction clutches, which are screwed down each time the plough starts to the point just sufficient to overcome the resistance, and thereby obviating breakages, or the necessity for making your plough into a hunter, and teaching it to "jump over a stone." Another reason was that when the ropes and anchors are once laid out, you can go back over the ground without the trouble and delay of replacing the anchors and relaying out the ropes and pulleys. I do not know what sort of land "West Indian" has, but my experience is that a pair of good horses will plough more than an acre of light land in a day. I consider an acre and a quarter of light stubble land by no means severe work for a pair of horses (an acre of land contains nine miles of 11-inch furrow). If I hire in my neighbours to plough, I can get my light land ploughed at 7*s.* an acre; and in Sussex, where I have very heavy land, and where they usually put three horses to the plough, I can hire ploughing at 11*s.* an acre. I consider three-quarters of an acre of heavy land a moderate day's work for two horses. "West Indian" seems to have forgotten that when I named 1¼ acres as a day's ploughing for a pair of horses, I was speaking of the land which I saw ploughed at Manchester. "West Indian" finds fault with me for estimating the engine-driver's wages at 5*s.* per day, because he says he could easily do other work. What sort of work is there about a farm that an engine-driver could do? I really know of none that would keep him regularly employed, and most assuredly I know of no "farm work" that would be worth 3*s.* 6*d.* per day. *G. A. H.*

Foreign Correspondence.

PRUSSIAN AGRICULTURE.—[The following particulars are communicated to Mr. J. Howard, M.P., by Baron Elsner von Gronow, member of the Royal Prussian Board of Agriculture, Silesia]:—Land over the whole of Eastern Prussia is divided into great and small properties. There were in Prussia in 1858 farmed properties under 3 acres, 871,926; properties from 3 to 18 acres, 521,690; properties from 18 to 180 acres, 359,697; from 80 to 360 acres in the country, 14,082; from more than 360 acres, 14,082. The assessment of landed property in 1805 showed

5218 properties of	£2,000 annual value.	
2000 do.	£200 to £1500	do.
1171 do.	£44 to £200	do.
6674 do.	£7 to £44	do.
1000 do.	£1 to £7	do.

In 1865 there were 5214 properties in the townships
" 3434 " mountainous
" 2247 " hands of the gentry.

If you take the taxed revenue 30 times, it will represent the real value of the property. The morgen, or Prussian acre, pays in any neighbourhood on land of middle quality about three thalers a year (5*s.* 5*d.* per acre). The Prussian landowner farms mostly himself, and small landowners do not let farms; only the State and great landholders let land. The great landholders sometimes let small plots of arable land to the smaller landholders or farmers, or to the labourers. In my own case I let about 360 acres in pieces of 2½ to 7½ acres, at a rent of 25*s.* per acre for the best quality, and 7*s.* 6*d.* for the worst. Land is divided into six classes for taxation purposes.——Land in large lots fetches on sale from £15 to £20 per acre with the farm buildings, &c., and in small lots, £25 to £37 10*s.* per acre without buildings, &c.——I think you get a more steady population if everyone owns the land he farms. In Eastern Prussia there exists no class of persons who would farm a very small property, so I had never occasion to compare the results. For the State and the great landowners it is better to let the farms out to farmers with intelligence and capital, but a man of intelligence could not subsist on a smaller farm of middle quality than 130 to 200 acres.——Small farms are let out for periods of from one year to three years; but farms properly so called, with homesteads, are let upon a lease of 12 or 18 years. No one would take a farm with less than a 12 years' lease. The contracts are in writing. The farmer is precluded, by law, from selling straw or meadow hay; most contracts forbid him to sell such feeding stuff as Clover, Mangel, &c.——The law gives some security against damage by game, going so far as allowing the tenant to kill it, if the proprietor does not keep it in bounds. Nearly always the proprietor retains the right over the game.——The rotation of crops is very seldom mentioned. Rye, Wheat, Barley, Oats, pulse, Red Clover, White Clover, Lucerne, Esparsette (Hishfoin), Cow-grass, Swedish Clover (Trifolium hybridum), Rye-grass, Timothy-grass, and other grasses, Indian corn (for feeding geese), Rapeseed, Flax, Potatos, Mangels, Lupins, are among the crops we cultivate. The rotation is very various, but nearly a four years' course:—1. Potatos or Mangels; 2. Barley or Oats; 3, Clover; 4, Rye or Wheat. Rye, 27 bushels per acre; Wheat, 22½; Barley, 33½; Oats, 36; Potatos, 7½ tons; Mangels, 11½.——"Bones, superphosphate of bones, or "Baker's guano," nitrate of soda, sulphate of potassium, sulphate of magnesia, and gypsum, are much in use. The use of guano has decreased. The bones and most of the other artificial manures are used for Rye, Wheat, Potatos, and Mangel, gypsum for Clover, Sainfoin, and Lucerne; sulphate of potassium on very light or moory land (1½ to 3 cwt. per acre).——Wages are 4*d.* a day in winter, 5*d.* in spring and autumn, 7½*d.* to 10*d.* in harvest, without victuals. In harvest a little corn brandy is given. Unmarried women and widows are extensively employed; their wages are about 1*d.* less than the labourer. In harvest time they are paid 5*d.* to 6*d.* per day. As much work as possible is done by the piece.——Being situated in the neighbourhood of a large mining district, labourers are becoming a little scarcer; therefore wages are rising. Twenty years ago we did not pay more than 2½*d.* a day in the winter time, and now wages are 4*d.* a day. 9*d.* an acre was formerly the price for mowing and binding an acre of Wheat; now it is 2*s.* 3*d.*——Dwellings are found for the labourers, but they pay for the use of them a day's pay weekly. The houses consist mostly of two rooms, and a stall for a cow. Generally two or more families occupy one house. The practice, however, varies. The careful proprietors let some 1½ to 2½ acres of land to the labourer, or a garden about the house, on which to raise Potatos, and to keep a cow or some goats. The labourers on the larger estates are nearly always allowed to collect the dry wood in the forest on one fixed day.——My cattle have been free from murrain, foot-and-mouth disease, or affection of the lungs; but in my neighbourhood nearly every herd of cattle suffered from foot-and-mouth disease. Affection of the lungs is common, because cattle are nourished on many farms with the refuse wash of the Potato distilleries, very extensively combined with greater farms. The sheep are well all over the country. The animals never die of the foot-and-mouth disease, but lose much flesh and milk. Wood vinegar* and sulphate of copper are used as medicaments with success.——All over the land artificial water meadows exist, principally where small streams and a hilly or mountainous configuration of the soil make the arrangement of water meadows after the "Trèges" system easy. The result is good where water is not wanting, and the soil is not too flat. On 400 morgen of water meadows in my neighbourhood, where the land is too flat, the result is bad, only aquatic grasses springing up.

Farmers' Clubs.

LONDON.

May 2.—Discussion on Mr. Corbet's Paper on English Tenant-right.—Mr. THOMAS (Bletsoe) felt very much indebted to Mr. Corbet for so able a paper. As a tenant-farmer he entirely agreed with it. Land-agents might object to the opinions which had been expressed, but the paper contained nothing that should be objectionable to a tenant-farmer. You could not expect a tenant of capital and skill to embark in a farm, and make a considerable outlay upon it, unless he had a tenant-right agreement or a lease. A lease, no doubt, was preferable, notwithstanding what the reader of the paper had said; but some objected to a lease, and in that case tenant-right should be supplied. He could fully endorse Mr. Corbet's views as to the payment of the farmer for unexhausted improvements made upon the farm. The land would then be farmed at the end as at the beginning of the agreement, which would, of course, be a benefit to the incoming tenant, the owner, and the community at large.

The Rev. E. SMYTHIES said Mr. Corbet began his paper by some disparaging terms as to some remarks made at the Club last December, and reference was made to the question suffering from being overshadowed by a cloud of vague generalities. The original expression, he begged to say, was "vague and vapid generalities," and he did not at the present time see any necessity to withdraw that second epithet, because the generalities from which the question suffered were as vague and vapid as ever. The Club had been told that due allowance should be made to the outgoing tenant, and that an alteration should be made in the present system. He maintained these expressions were of no good whatever. What farming men wanted was to know exactly what the outgoing tenant was to receive—what proportion of the whole. The first departure from vague and vapid generalities which he had heard was the Lincolnshire tenant's letter, wherein was sketched out the money proportion and value of certain practical things to be allowed to the outgoing tenant. Let the Club be told whether the outgoing tenant was to have the whole of the last year's bill for artificial manure, half of the last year's bill for oilcake and other artificial foods, a third for the preceding year, and a certain proportion precisely defined for lime, &c. These statements would be valuable, and would guide landlord, tenant, and agent, in coming to a satisfactory conclusion; but when we were told time after time that "what is right between man and man must be done," and that "due allowances must be made," and so on, nothing whatever was said that would assist two men in coming to an agreement upon a matter where agreement was desirable. Let proportions and figures be placed before them, and all that remained would be a simple question of arithmetic, which the landlord and tenant could settle between themselves without any alteration or need to call in a third party. Supposing it were possible to make an agreement, it would be very difficult to frame it so that it would suit all parts of the kingdom, for even Acts of Parliament would be of no use if they merely embodied vague expressions.

Mr. WILLIAMS (Baydon, Hungerford) quite agreed with Mr. Corbet that, taking all circumstances into consideration, the Lincolnshire tenant-right was the best that could be adopted for the tenant-farmers of England. This opinion was founded upon practical observation of the working of the system. Tenant-right, admitting there were certain interests in the soil, should define what was occupation as distinct from ownership. No doubt this was an intricate subject, because, except in Lincolnshire, there were very few landlords who would take the subject in hand. In the county he had named there was no objection, but in the West of England the landords looked several times before they would have anything to do with tenant-right. In his neighbourhood they said that tenant-right would be landlord wrong. They could not yet be brought to see that they would suffer no injury by granting to the tenantry that which he believed every English farmer had the right of demanding. He, himself, held that a great good would be done if the law were simply altered on the matter of notice to quit. The law of the land at present was that six months' notice would send any tenant about his business, let him spend whatever he might in improvements. A strict tenant-right would alter this law so that no man should be turned out of his occupation without two years' notice to quit. Nothing short of that would do, and that was a very good idea of tenant-right. The tenant had to pay all the local burdens imposed upon the country, and it was an agreement between landlord and tenant that this should be so; and the consequence was the tenant never knew what he had to pay. Carrying his memory back 40 or 50 years, he could remember a continual accumulation of burdens upon their shoulders—county police, lunatic asylums, military stores, and a host of other things. Was that tenant-right? These local burdens were about to be increased again by an educational rate, and no man can see an end of what the tenant-farmer would be called upon to pay, and to which he never gave his consent. He suggested that the tenant-farmer should pay a proper amount of rent for the occupation of the soil, and then, in addition to that, in the same way as he paid the income and land-tax, he should be annually called upon to pay for his landlord all the other local taxes, the landlord reimbursing him as in the case of the income-tax. This was his definition of tenant-right.

Mr. HAMILTON (Acton), as a new member of the Club, attending his first meeting, wished to join in the thanks that had been expressed to Mr. Corbet for his paper. As a small owner of property in Hertfordshire, he had for 22 years adopted the Lincolnshire system of tenant-right. He had only had two tenants during the whole of that time, and the second paid the outgoing tenant what the custom required, so that as landlord he had no trouble whatever in the business; and he had every reason to believe that the tenants had been satisfied with the whole arrangements. The compensation clause he agreed to was that unexhausted improvement was paid for by the landlord or incoming tenant. The result was, that the land was kept in perfect condition always. The first tenant had a 21 years' lease; but he unfortunately did not carry on the farm as well as he ought to have done, and he (the landlord) gave him notice to quit at the end of 14 years, and the tenant then went on for seven years as a yearly tenant. The present tenancy was yearly, with six months' notice to quit. The tenant was perfectly satisfied, because if he laid out ever so much money upon the land it must come back to him in accordance with the Lincolnshire compensation clause. If this system, or a system modelled upon its principle, could be carried out throughout the entire country, it would be much better for the land, and there would not be that six years' loss which was now suffered by the outgoing tenant neglecting it for three years before he left, and the incomer having to wait three years before he got it back to its proper condition. The adoption of tenant-right in England would, therefore, not only improve the relations between landlord and tenant, but would increase our produce, and thereby tend to the welfare of the general community.

Mr. LEEDS (Castle Acre) differed from the last speaker, who thought six months' notice to quit was sufficient. Suppose a person had occupied his farm for 20 years, and had spent a good deal of money for improvements, which the landlord repaid him, no doubt during that time he had formed friendly connections; and to be called upon in six months to sever all the ties he had formed, would be a hardship which it would be difficult to satisfy by compensation.

Mr. MECHI thought the question before the Club was the very simple and distinct one—whether it was for the advantage of the landlord and tenant and the country at large that there should be a tenant-right for improvements. All were no doubt agreed that on the question of leases Government could not interfere; and that if tenant-right be for the national good our Legislature had the power, if it had the will, to enact that unexhausted improvements by the tenant should be paid for to him. It was equally plain that it would be impossible for the Legislature to define exactly all the circumstances of compensation according to the various soils and necessities of particular counties in England.

* I do not know the English expression for "Holzessig," perhaps "methylated vinegar." It is vinegar out of the distillation of wood

Once let the main principle be asserted, and there would be very little difficulty in ultimately arriving, through a proper Commission, at a clear notion of what agricultural improvements in this country meant. The necessity for legislation was important indeed, because, while much had been said about Lincolnshire, and the liberality of arrangements made there, and the custom which had now become a basis accepted as law, in the county of Essex, and many others, such a system was not in operation, and could not be with present discrepant views of the various valuers in different parts. A man might spend £5 or £6 an acre in draining his stiff clay, and another £5 in chalking it—two very essential elements of improvement, and if he went out or died to-morrow, not a shilling would be allowed by the custom of Essex for that ten pounds of valuable farm improvement. This state of things, to his knowledge, could be multiplied all over the country. Therefore he wanted the Government by Act of Parliament to define and lay down the general principle, and that, as Mr. Corbet had pointed out, should include remuneration to the tenant for unexhausted improvements. Much as he admired the intelligent paper Mr. Corbet had read, he (Mr. Mechi) agreed with Mr. Caird, that for the comfort and happiness of the farmer the lease must be the first consideration.

Mr. HARPER (Bury, Lancashire) also could testify from experience that the Lincolnshire custom was a good one, but it would not be good unless it were founded upon reason and truth. The great difficulty in dealing with the question of tenant-right was the correctly ascertaining the difference between the value of the farm when the tenant entered upon it, and the condition in which he left it when he gave up his tenancy. Whatever an outgoing tenant expended in the due course of his husbandry, of which the incomer received the benefit, was in his opinion tenant-right, unless on his original entering the tenant received a like benefit without paying for it. On some farms it was the custom for an outgoing tenant to leave all the manure without any payment; and in that case, when the incoming tenant came to an end of his occupation, he ought to leave his manure in the same manner. This was not a satisfactory arrangement perhaps, but it was based upon the sound principle that, as a tenant entered upon land, so he ought to leave it. The Lincolnshire tenant-right had simply arisen from a long course of practice and observance of the old rule of giving and taking—of doing unto others as you would that men do unto you. It was very desirable that this most excellent custom should be better known in various parts of the country where tenant-right was most required. He would like to ask Mr. Mechi, *apropos* of his remarks upon leases, whether he was really well acquainted with what was done in Scotland, and whether he was not aware that with all our difficulties of tenancy, and defective tenant-rights in England, and rabbits, and hares, and game, we had not on the whole longer tenancies and a greater number of generations living upon the same estates than in Scotland? In Scotland they had universally the 19 years' lease, and in the best parts of Scotland one rule which prevailed was, that about three years before the expiration of the tenancy, the tenant, unless he could make a satisfactory bargain with his landlord, began to take out of his farm all he could; which certainly was neither satisfactory nor beneficial. Possibly the law of hypothec, which gave the landlord a prior claim upon all the property of his tenant for payment of rent, might give an undue advantage and be an encouragement to the landlord to take an inferior set of, and not quite solvent, tenants. He did not like to hear leases compared with a satisfactory tenant-right like that existing in Lincolnshire and the south-east parts of Yorkshire. Let people once understand the difference between the two, and he was sure this satisfactory tenant-right custom would be carried out by agents and valuers, to the great benefit of agriculture and to improved relations between landlord and tenant. It would certainly be more beneficial to agriculture than when a lot of leases are put up to auction. In Scotland they were put up to auction. The landlord was protected by the law of hypothec, and he could tell them of some friends of his who had been lately dispossessed and turned out by strangers from a distance who offered a few more shillings rent per acre.

Mr. MANSELL said he thought a well-digested lease should contain covenants for the protection both of the landlord and tenant—covenants which would protect the landlord at the end of the tenancy and the tenant at the beginning of the tenancy.

Mr. S. SIDNEY said the farmers of England were a numerous and powerful body, and if they chose to make up their minds as to what they wanted there would not be the slightest difficulty in obtaining it; but the fact was—and here he expected to be received with a howl of indignation—the farms of England were under-let, and let exceedingly cheap, and there was an implied bargain between the landlord and tenant in those counties where there was no compensation for unexhausted improvements—where there were no leases at all—those leases which some people thought so much of. The real meaning was that the landlord said: "You take my farm. I can turn you out at six months' notice. You won't trouble me about my game. When there is a general election you will vote in my favour. If my wife's health is proposed at dinner, though you don't exactly like her, you will drink it with cheers. If you do that I will not disturb you—you shall not be troubled about the way in which you farm your land." That was the plain truth. The farmers might shuffle here and there, but that was the real thing. When he was young he attended a farmers' dinner, and he heard one toast with great indignation. It was proposed and received with great cheers. It was "Liberal landlords and grateful tenants." As long as there were grateful tenants they would not be able to make a bargain with their landlords. If they were now discussing whether or not farmers ought to have security of tenure, there could be no two opinions about it. It was perfectly absurd to suppose that a farmer should expend a large amount of capital unless he knew that, whether he lived or died, whether he remained on the farm or left it, he should have restored to him the money that he had put into it. It was no use disguising the fact; the farmer was no different from the shopkeepers and tradesmen of London: they must have confidence in laying out their money that it would come back to them; and if they were disappointed, they would only have themselves to blame, because they would have placed confidence without having sufficient security for so doing.

Mr. COUSSMAKER said, the question of tenant-right appears to be a very simple one. No doubt tenant-right properly defined would be most useful in this country, and might supersede, to a certain extent, what was generally called "the custom of the country." He did not think it could supersede the custom entirely, because custom differed so much in different localities that certain customs at one place would not be applicable at another place; but it would be a most useful thing if a good tenant-right could be established in combination with the custom of the country, so as to form a basis upon which all future leases should be granted. To upset existing leases would be unfair and unjust. All improvements made by the tenant might not be considered improvements by the landlord, and it would be very hard for the landlord to be pledged to a tenant-right in respect of them. The landlord should have fair play as well as the tenant. If any tenant wished to have any improvements carried out, the landlord should give his consent in writing; and when that had been done the improvements should be made, and the tenant paid: but the tenant ought not to be entitled to compensation on leaving the farm in respect of improvements to which the landlord had not consented. Before an agreement was made both parties were free—the landlord to let his land to the best tenant he could get, and the tenant was free to get the best farm he could obtain. Let them be careful in making an agreement, but after it was made no tenant-right in the world ought to upset it. What he asked for was, make a fair tenant-right, define properly what the tenant-right was, and then let the agreement take place between the two parties, the tenant-right being the basis of the agreement; then after that both parties should keep to their agreement.

Mr. W. J. EDMONDS (Lechlade) said it would be natural for landlords to ask why they were discussing a subject which 30 or 40 years ago would not have been considered of any consequence. He would remind them that 30 years ago the farm implements used were only ploughs, harrows, and rollers, but that now the farmer spends £100 where he formerly spent £1 upon implements. It was the same with manure: where the farmer formerly spent pounds he now spent hundreds of pounds; and with regard to oilcake also, years ago the farmer only spent £10 where now he would spend £100. It was for these reasons that they thought it necessary that the farmers should have tenant-right, but if they did not get tenant-right they must have instead of six months' notice a two years' notice. They might be laughed at for talking of two years' notice, but gentlemen who had leases had practically 12 or 15 years' notice. If instead of taking a lease for 12 or 15 years they took it for three years, with two years' notice, the farmer would go on his occupation probably his whole lifetime at the very same rent; but with a fifteen years' lease they might expect, at the end of that time, that the landlords would call upon them for increased rent, on the ground that the land had considerably increased in value to what it was fifteen years before; so that he considered the three years' lease with two years' notice preferable. He certainly was in favour of leases. With their present machinery, with the outlay farmers were called upon in the present day to make, there ought to be leases, because though a common year's tenancy with six months' notice to quit might be very convenient under a good landlord as long as he lived, there might be a death, or a change of circumstances; and he, therefore, did not think it business-like to have a yearly tenancy with six months' notice. He thought a tenant-right might be preferable to a two years' notice to quit, because there would then be no temptation to run out the farm at any time.

Mr. MASFEN did not look upon tenant-right as a tenant's question, but as a landlord's and a national question too. A tenant-right would increase the produce of the country, and give to the landlord a class of tenantry we did not see now where liberal covenants did not exist. He believed they were doing that which would be to the farmers a great security, and to the landlords an additional security, and to the community an advantage. It was one of those questions in which the whole community were directly interested. The tenant-farmers were not more interested than the community generally. It was ridiculous to suppose that a landlord was going to have his rights infringed upon when he was asked by the tenant for an agreement. If any idea of that sort was in existence, Mr. Corbet had dispelled the allusion by his reference to Mr. Chaplin's speech in the House of Commons on March 12 last, in which it was shown, in as plain language as was ever used, that the Lincolnshire custom had as greatly benefited the landlords as the tenants and the community at large. So well was that custom defined, that very seldom were the services of an umpire required; and the landlord had rarely very little to do with the arrangement, except that he secured to himself a better class of tenant; and, as regarded putting his hand in his pocket to pay for it, he did not do so.

The CHAIRMAN closed the discussion by saying that the rights of property in this country were never better understood or more fully recognised than they are at present. Time was when it was an accepted doctrine in this country that a man had a right to do as he liked with his own; but we have outgrown that, and the people of England now take a very much broader view of the rights of property. They believe that there are certain duties attaching to property, as well as rights to be exercised. If a man, or a class of men, so manage or control their property that the full benefits are not derived from it by the community—if, for instance, a landlord stocks his tenant's farm with game, or avails himself of improvements made by a tenant without recognising the right of the tenant to the advantages which he has created himself, or if for insufficient reasons he evicts the tenant from his holding,—then the State is perfectly justified in stepping in, and putting the law in such a form that the tenants and the public shall not be damaged by such arbitrary course of conduct on the part of any owners of property. That nothing would tend more to the advancement of agriculture in this country, and that nothing would tend more to the benefit of the landlords than a well-considered tenant-right; and the paper and discussion that has taken place will hasten that desirable end.

After a cordial vote of thanks to Mr. Corbet, the meeting separated.

NEWCASTLE.

Quarter-ill in Cattle.—At a meeting of this Club, Mr HENDERSON, of White Lea, read a paper on this subject, in which he stated that the great injury is done when, the stomach being full of dry food, the beast takes too much water upon it after fermentation has commenced. When you find your beast in the state already described—that, is, when it looks dull, sticks out its head, moves stiffly, is afraid to turn itself round, and is swollen—you may be sure, from these symptoms, that there is something wrong in the stomach. Suppose it is not swelled, the first thing for you to do is to give a plentiful supply of oil, not over large—a hornful at a time. You may give as much as a quart before it will dissolve the contents of the stomach, and then, immediately after the oil, give to a large beast ¾ lb. of salts, 2 oz. salts of tartar, and rub the chest and neck with mustard and turpentine, or the recipe No. 1 lotion. Mr. Henderson proceeded to describe various medicines and modes of treatment which he declared had proved successful.

Mr. JACOB WILSON, of Woodham, said he had gone there that afternoon rather by accident, and simply as a listener, and one who wished to gain some instruction, which necessarily would fall from a paper of that importance. He must say that the matter contained in that paper was of considerable value to the agriculturist generally, although he should be rather prepared to express his doubt as to proving a panacea for all the evils represented in it. It was a question which he had personally given some attention to, because in his young and aspiring days, rather imagining that one could go before the common times, he thought he could cure this disease, and he had a try at it. He took a young bullock, 18 months old, which was about the usual age at which the disease might be said to make its attack—from 12 to 18 months. There was no doubt he took the animal at a stage when the symptoms were the most marked, and, perhaps, in the most chronic stage, that was, when the quarter itself gave way. Like the gentleman who read the paper, he sat up all night also. He used remedies in the shape of hot fomentations, and he actually succeeded in driving the disease from that quarter; but it was simply to drive it to another. There was no doubt that, although the direct symptoms of the disease lay in a local part, and exhibited themselves to the eye in some quarter of the animal, yet the seat of the disease was the stomach. He perfectly agreed with Mr. Henderson on that point; but as to the cause, he thought they would generally notice that the disease occurred either in the autumn or the spring, most frequently, probably, in a Clover fog, slightly frosted, or perhaps in the case of young cattle grazing out on Turnip-tops. But he thought, with all due deference to the gentleman who had introduced the subject so ably, that the experience of this country would go to teach us that it was not a disease which was usually cured. He quite admitted that there was a possibility in everything. There was a possibility that the information contained in that paper, which possibly up to the present time had been withheld from

the public, might hereafter furnish recipes which might be of advantage to the farmers of this country, and might prove a panacea for the disease. He had his own doubts upon that point, but he believed that most practical men would tell them that they might take for dead any animal attacked with the disease. He thought that a very great deal of the importance of cattle management upon improved systems would also furnish them with the means of preventing this disease. He believed that no better general principle could be observed than the use of something which kept the stomach in a uniform way— he referred to a healthy good oilcake, or linseed, which kept the stomach uniform and not constipated. He made these remarks simply to encourage discussion, in which he was glad to lend a helping hand. He simply said that in this particular case prevention was better than cure. Mr. Wilson added that he took the precaution every autumn or spring to physic all his young animals, and to seton them all.

Notices of Books.

Practical Remarks on Agricultural Drainage. By W. W. Hozier, of Tannochside. Prize report, published under the auspices of the Highland and Agricultural Society of Scotland. W. Blackwood & Son, Edinburgh and London.

The large gold medal of the Highland Society was awarded to this report; and as it was rightly considered a valuable treatise on the subject, it was ordered by the directors of the Society to be printed separately from the Transactions, so as to render it more available to the public. The public are indebted to the Society for this resolution. The essay contains a sufficient reference to the theory of the subject, but it is mainly a discussion in full detail of the practical experience of the writer in outfalls, mains, small drains, depth, the laying-out and cutting of drains, tiles and tile-laying, filling in of drains, period for draining, and subsequent treatment of land. The whole is a good practical treatise, useful to Southern readers as well as to those for whom especially it was written. We make an extract on the treatment of land after drainage:—

"If the land is intended to remain in pasture, the sod should be taken neatly off along with the top spading, and replaced after the drains are filled, when a year or two's subsidence will erase almost every sign of its having been disturbed. Should the intention be to break up the land immediately, stripping the turf is unnecessary. All that is then requisite is to make each drain a feering when the ploughing commences, throwing a furrow slice from both sides on top of the drain. This avoids the necessity for horses trampling on the newly disturbed soil, and the furrows on each side of the filling have, in this mode of ploughing, a tendency to check the surface water, and to prevent its rushing too impetuously into the drains, which, before the filling is consolidated, is apt to burrow holes in the loose soil above the drain, and even to disturb the tile. By this mode of ploughing the crown of the ridge becomes the furrow, and the old furrow becomes the crown. The subsidence of the soil above the drains, when thus left in the crown of the ridge, sometimes causes the ridges to appear unsightly during the following summer, but appearance is of little moment when ultimate benefit is ensured. In the following autumn, the land should be cross-ploughed as deep as possible to stir up the subsoil, and break the 'pan' on the top of the old ridges, and in this state it should be left exposed to the influence of winter frost. Early in spring it should be thoroughly worked and cleaned, and, if not requiring to be fallowed, care should be taken to keep it clean during the fallow crop. In the following season it should be laid down, as it was originally, with the furrow exactly over each drain; and, in order to facilitate this, it is advisable to place marks in the fences opposite the drain ends at each boundary of the field.

"There is a prejudice against ridging amongst advanced agriculturists, and no doubt, in soils where percolation is perfect, ridging is wrong in principle. It tends to collect the surface water in the furrows instead of inducing it to filter downwards, thus washing away valuable matter, instead of contributing to the support of the plants. But in clayey soils filtration never can be as perfect as in those of looser texture. The ultimate element in clay causes its particles to run together when soaked with water, and, by closing many of the finer apertures, it materially impedes the process of absorption. Aëration and cultivation will overcome this tendency in some degree, but the addition of silica in the shape of sand is the only radical cure, and, until this mechanical change of texture is effected, a considerable portion of the rainfall in pluvious seasons must, before it gains admission to the drains, remain upon the surface longer than is expedient. Thus, the farmer has a choice of evils; he must submit either to the rotting of his plants and the chilling of evaporation, or to losing some of the fertilisers which he has it in his power to keep. But, as fertilisers are of little benefit to a saturated soil, the writer, even at the risk of being considered antiquated in his notions, has no hesitation in recommending every prudent man to choose the latter alternative, and in clayey soil, especially in humid climates, to make it an invariable rule to lay down his land in ridge and furrow. Experience has thoroughly convinced him that this practice is beneficial, at all events in such a climate as the West of Scotland. The rounding of the ridges need not exceed 6 inches, as it is not intended to supersede filtration. In well drained land water should seek the furrow only in unusually heavy downfalls, when the ducts have more to carry than their capacity permits. Not till this occurs does the clay expand to its full amount and close the ducts, which cannot then regain their former size till drought again sets in. The furrows should have connection with some channel at the bottom of the field, in order to get rid of this surface water."

The Sugar-beet and Beet-sugar. By J. H. Porter, Assoc. Inst. C.E. M. S. Rickerby, 4A, Walbrook, E.C. Pp. 47.

This pamphlet is a compilation from the reports of Mr. Baruchson, Dr. Voelcker, Mr. H. M. Jenkins, Sir R. Kane, and some French writers. Excepting a somewhat elaborate discussion of the *£. s. d.* aspect of the subject to both farmers and manufacturers, which is given towards the end of the pamphlet, the only point in which, as it appears to us, Mr. Porter himself contributes in these pages to the elucidation of a most interesting subject, is in reference to Mr. Duncan's works at Lavenham. The following is what he says:—

"About three years ago one of our largest Sugar refiners, Mr. James Duncan, of London, having by very liberal offers prevailed upon the farmers in the neighbourhood of Lavenham in Suffolk to grow the Sugar-beet from the seed he supplied, erected and fitted up there a factory for the extraction of the sugar.

"In the second season the factory was supplied with some 4000 or 5000 tons of roots, which it disposed of at the rate of from 50 to 60 tons per day. The farmers, well satisfied with the very liberal terms on which Mr. Duncan receives their roots and delivers to them feeding-pulp for their cattle, will no doubt very shortly enable him to conduct his operations on a larger scale. Those operations have already attracted much notice here, and not less on the Continent, whence, necessarily, Mr. Duncan has provided himself with his 'plant' and skilled workmen.

"Hitherto, he has stopped short of the production at Lavenham of the actual sugar in a crystallised state; for, as the refiner has to reduce the imported sugar to a fluid state by the addition of a proportion of water,—bringing it back, so to speak, to the state of syrup it was in at a previous stage of its manufacture,—Mr. Duncan, having purified the juice of his Sugar-beets, and evaporated from it so much water as to reduce it to the desired state of syrup, transports it in that stage to his refinery in London, where of Colonial and Continental sugars he operates upon 500 tons per week.

"The greater portion of the Beetroot sugar manufactured on the Continent passes through the hands of the refiners, but the author has not heard of this system having been adopted or tried there. Mr. Duncan argues that it not only obviates the provision of costly apparatus and machinery, and the larger buildings necessary for the reduction of the syrup to crystallised sugar, and saves the cost of so reducing it; but, at the same time, there is also disposed of in the syrup, that which remains otherwise on the hands of the manufacturer in molasses or uncrystallisable sugar."

Farm Memoranda.

North Riding of Yorkshire.—The month of April ended as it began, with weather of a character decidedly wintry. From the 7th to the 23d the temperature was mild, and on two or three days hot, but devoid of the mild refreshing showers which so frequently are characteristic of April. Since the 23d the temperature decreased, and on the 28th, with the wind N.N.W., we had slight showers of hail.

For field work the dry weather has been favourable. Barley sowing was finished in good time and in excellent order, and good progress has been made with Potato planting, and in preparing the fallows for the root crops, the land generally working very kindly and affording great facility for picking out the Couch, &c.

Spring-sown corn has come up an even braird, and generally is promising; although rain is now wanted. The dry season has been particularly favourable for Wheat, and though backward it has, where thin, tillered out; and on the whole in this district there is not room for legitimate complaint, as far as can be augured from present appearances.

Although our meadow and pasture land has assumed the russet green, yet the herbage remains short, and during the last few days vegetation has been almost dormant, and the prospect of early pasturage is by no means good. Up to the present time this state of things has not affected the value of good grazing cattle, *i.e.*, animals that a few months' Grass would qualify for the shambles, which are selling at very high prices. The demand for younger animals is not so animated, and they can be bought "bigger for money."

Store sheep, especially hoggets, meet with heavy markets, to a certain extent owing to the backward spring, and also to the low prices current for wool. About the beginning of the month our fat cattle markets were heavy, with drooping prices, but the supply being now in fewer hands, resulting in smaller markets, has arrested the downward tendency, and for really prime animals about 8*s.* 9*d.* per 14 lb. can be obtained. Sheep in the wool are making 9*d.*, and out of it 7½*d.* per lb. Pigs are scarce, and very dear.

The sales of stock, &c., consequent on a change of tenancy, are nearly at an end for the season, and have in number been fewer than is usual—a fact, let us hope, indicative of prosperity and contentment on the part of the occupants. Whether for the last few years the farmer's nett profit has been greater than during the previous years, is a matter of uncertainty, but no uncertainty rests on the subject of his great liberality in the manuring of the land. Ten years ago the application of purchased manure was confined to the roots, and supplied only by the larger and most intelligent of the tenantry. Now they are applied to the grain as well as root crops, and alike by the small and the large occupier. No doubt the general yield has been increased by this means, but has the purchaser always had his pennyworth for his penny? *W. J. M.*

Small Dairy Farm.—I have about 123 acres of good second-rate land, all either naturally dry or else well drained; also about 14 acres of land that used to be a wood, but now only a little timber in; this is on a slope, but nearly all dry.

My stock consists of 24 cows at present; I generally have from 17 to 27, the greater number in winter, and the less in summer; also six calves of about five weeks old, from my own cows, though I have only one heifer out of the lot; these are the first I ever attempted to rear. I have three horses, and three carts of 11 cwt. each.

I have 136 Northumberland ewes, tupped with two Lincoln-Leicester tups, bred near Wetherby, due to lamb about the 8th of March. The milk is all sold at 3*d.* per quart, and fetched from the house; some of it is fetched a mile; it is all ready money, excepting about a dozen customers that pay monthly; in fact, 30*s.* would cover all the bad debts I ever made with milk. I churn a little; being ready money, it varies at times; what we churn is whole milk, not cream: the buttermilk we sell at 1*d.* per quart; the butter averages here about 1*s.* 4*d.* per lb. Before tea and sugar became so cheap there used to be a great demand for buttermilk. Some time since I milked 35 cows; but churning a deal, my missus grumbled about it, having so much butter-making.

The last winter was my first beginning with sheep, partly through having so much Grass left on the land at the back end of the year, and then when we came to mow the meadows, the hay was full of the old dead Grass; and partly through the writer of the articles signed "J. S." in the *Mark Lane Express*, I bought 60 Cheviot in-lamb ewes, 20 Penistone ewes, and a few what they call Derbyshire Limestones, bred near Buxton. We lost one ewe in lambing, one lamb through sucking in wool; but being rather short of land for them, we gave them a deal of cake and corn, and sold both ewes and lambs to the butcher. I went to the sale at Shrewsbury, in September last—the 3000 sale, but I thought they sold very dear. I bid hard, but did not get a lot. I gave 48*s.* and 49*s.* for my north ewes at York, such would be bought at 40*s.* and 42*s.* the season before.

I will tell you how I keep my cows. I get from 12 to 15 loads of grains weekly, about two miles from here, at 2*s.* 6*d.* per load of 6 bushels; each cow also gets about 4 lb. daily of linseed-cake and rape-cake, together with 6 lb. of bean-meal, mixed up with the grains and Mangels, at present three times a-day; once a-day we fodder them with straw; what they leave we bed them with. We give them hay twice a-day in summer; they get the same weight of cake and meal with the grains. We turn them out to grass in April, but they don't go out in the night until June 1; they are tied up early in October for the winter. I have tried letting them stop out in the day until near December; but they always lost a deal of condition, and this is of some consequence, for I let them all go to the butcher. I have tried bulling a few, but they nearly all slipped their calves for several years; people here say it was through being too highly kept; but they never used to do it, and they have always had about 10 lb. each cow of meal or meal and cake per day. I did sell two that had been milked about 13 months, for £66, at Christmas; these made about £10 more than they cost me, but they were very well bred, and made a good price,—8*d.* per lb.; but as a general rule, of late they never make near the price they cost. At the present time they are very middling ones, at £24 or £25 each; we used to get better at £18, besides the risks attending getting in fresh stock from fairs and markets. My cows used to carry their calves before I got some land that was very poor—it had not had a shilling spent on it for 50 years; it lies near the rock, but fair amount of soil on it; it used to burn in summer if there were 10 days without rain, but now a long drought scarcely injures it. I have limed it three times—with 6 tons per acre once, and 4 tons per acre twice; it has not missed having a dressing of either manure or lime these nine years; it is in pasture, it is full of benty Grasses yet, and has a skin of about 2 inches thick of dead Grass, something like that from a heath. We put the heaver sheep and lambs on this field last summer, but they did not grow a bit; then we let it get fresh, and put the Cheviots and their lambs on it, but they stopped growing also, yet they all did well on the other land. How do you think it would answer to break it up, and sow it with Rape this season? This is a badly-farmed district; we live near what is called the backbone of England: they are almost all of them small farms, nothing but Grass, milking six or eight cows, skim their night's milk, and mix it with their morning's fore milk, and retail out at 2½*d.* per quart. My land consists of four or five such places. The steward, for part of my land, does whatever draining I have wanted done; he has done it all, both carted 3-inch pipes and put them in free; they also keep all walls on the roadside. Of such I have 1½ mile in good repair, free also. The rent averages about 50*s.* the statute acre. I live on the outskirts of the town; it runs near 1½ mile from

one end to the other; we can get on to two-thirds of the farm with 25 cwt. of manure with one horse, and for the remainder it takes two horses for that weight. There is horse and cow manure to be had at an average of 4*s.* 6*d.* per ton within 1½ mile of any of it, and they will put one-horse barrels of night soil on the land at 1*s.* 3*d.* per barrel: night soil and ashes mixed we can have free for fetching. We can get 35 cwt. or more hay to the acre. Swedes and Mangels are worth, on an average of years, 25*s.* per ton; they come some miles from here by rail, out of York.

All my land was in Grass until 1868, when a gentleman came out of Nottinghamshire, and said to me, "Why don't you grow some Cabbages and Mangels? This land will grow Cabbages and Mangels with any land. Try an acre of Cabbages, it will not be much loss if they fail." I did so, and put the manure on the flat surface, and only harrowed it, and got 5000 plants; we had lots above 30 lb. each; and green crops being a failure, people were quite astonished. Succeeding with these, and the cows doing so well on them, I put in about 5 acres last year, also 3 acres of Mangels, an acre of Kohl Rabi, and a few Swedes; my Mangels would weigh about 25 to 30 tons to the acre, Kohl Rabi 16 to 18 tons, but they were sown on some of the poorest land. People in this country said Cabbages and roots could not be grown, neither could sheep be kept; they could not tell their reason for it, only some one tried a few seeep about 20 years since, and he could not manage them.

I only came into possession of one part of this land at Christmas, the owner having let his mansion; it is all in Grass excepting about 12 acres that had been part Oats, part Beans, Potatos, Mangels, and Swedes; but it is Turnip-sick, for it has had Turnips on every other year, he being the only Turnip grower for miles. I was thinking of sowing this with Oats and seeds; the fault with corn of any sort here is, being late to get ripe. I have a field of about seven acres ploughed, and I think of sowing it with Oats.

The field in which I had the Cabbages, &c., was four fields made into one. There was a deal of labour to get it into form, so that it could be worked with horses. I have a midden in it of about 250 tons of horse and cow dung. I am thinking of planting Cabbages, Mangels, &c., again.

The way we used the Cabbages, part was cut with a large turnip-cutter for the cows, and mixed with grains, &c.; the ewes got a good many carted on the Grass fields, and a portion was given to some wethers feeding off 30 acres of good after-grass. I also sold a lot, about 10,000, to the hucksters about here. I can also get the winter eating of a lot of dry land near this, very cheap.

The cows are milked winter and summer in a shippon, about 200 yards from the house. I should like to get a class of cows that would milk well at less cost. I have given since Christmas £127 10*s.* for four, they were so dear: they are York and Skipton cows. I have bought five common ones, such as are bred about here, but they have not flesh about them; there is not a good bull kept in this district. I am rather fond of sheep, but know very little about them. I have given them a sack of bran (120 lb.) every morning for some weeks, but since the storm two sacks, and hay as well; and shall have some Mangels to spare for them. I have about 25 acres of Grass that nothing has been on since October. *A Small Farmer, in the "Mark Lane Express."*

Miscellaneous.

Horse Buying.—There is an old saying, "Do not look a gift horse in the mouth," highly applicable to our present chapter. If you go to market for a cheap horse, you must not be very particular about his age. We can give you some very correct "wrinkles" on this point. One of the great recommendations in a dealer's yard is "age." "See, sir," says the dealer, "he is just five off," as he puts his fingers into his mouth, and exhibits his teeth to a gentleman to whom, it is a hundred to one, he might as well have exhibited his tail. Now it would be far better to buy a horse of nine, if you could be tolerably certain that he was no more, and his legs were still hard and good. In the first case, it must be a toss-up whether he will stand work or not; in the second, it is an ascertained fact that he has done so. If you can be sure of your young horse, you will have so many more years of his services; but you will have to pay so much the more for him. When the tooth-mark is really gone, which is the case at eight years old, excepting to very good judges the horse is no longer a dealer's horse; he is said to be of any age, and may be bought well worth the money. We sold a mare fourteen years old, six years age, because we thought she must soon decline, though there were then no symptoms of it; we sold her to carry a lady of light weight to hounds. She is now twenty, and is just as good as at fourteen; we should like to buy her back, but we know her positive age, and she is not for sale. The most notable marks of too great age are length of tooth, change of colour, and interspersion of grey hairs in the coat, deep indentations over the eyes, a hanging of the nether lip, a sinking away of the muscles behind the shoulders, and leanness of head, which gets handsomer towards middle age. If the horse has been hardly used, we may add, roundness of legs, fulness of fetlock joints, and marks of work on his limbs. He may be perfectly sound for all that, but you had better not buy him. "*Cassell's Household Guide*" *for May.*

The Week's Work.

May 14.—*Cabbage Plants* (autumn sown) have in many places suffered much from the inclemency of the season, so that there will be an increased demand for spring sown plants, and these should be got in as soon as they are ready for transplanting. In dry weather, which has hitherto been general, some wait a shower, others use liberally the water-cart to start the young plants. We have tried both, but prefer the latter. Those who wait for rain in dry seasons are often disappointed.

Kohl Rabi sowing sometimes follows the Mangel seed time in our southern counties, in other cases it precedes. The plant is a slow grower and should be sown early. Some transplant, but sowing is now generally preferred. In the South many farmers find that they can grow heavier crops of this root than of Swede. It is otherwise in the North, the Swede being there better adapted for the climate. When sown in dry weather in May it should always be with the liquid-manure and seed drill, using from 500 to 1000 gallons per acre. Some only apply 200 gallons, but this quantity only wets the surface, while the liquid is too strong, assuming that 3 to 4 cwt. of superphosphate with an equal weight of common salt have been dissolved in it. When the liquid-manure drill is at work, it is a poor saving to stint the land of water in dry weather. For many soils in dry weather 1000 gallons are not enough, being less than 200 when the land contains more moisture naturally.

Rolling White Corn crops finish as soon as circumstances will permit. In dry seasons it not only makes a smooth surface for the reaping-machine, but keeps in the natural sap. Large stones brought to the surface of stony ground should be previously gathered off; also pieces of wood, as the points of stakes and hurdles where sheep have been folded, short pieces of hoop iron, and such like, as the roller in passing over them tilts up one end, so as to stand in the way of the knife of the reaper. Land infected with Coltsfoot should likewise be carefully gone over and picked clean, as the smallest bit left when rolled in is sure to take root and spread. Some soft land requires to be rolled so as to consolidate the soil about the roots of the plants, more so in seasons like this than commonly. An opposite quality, viz., hard crusty clays, require a heavy roller to break the crust, let in the air, and supply fine mould for tillering. Spring ploughed clay lands clod—and the clods must be broken fine with a heavy roller or clod-crusher—sometimes both, the roller following the clod-crusher. Meadows intended for hay should have been rolled before now, but many pastures may yet be rolled with a heavy roller so as to crush clods, wormcasts, and break the crust of unkindly clays so as to promote the tillering of the grasses and the covering of the ground with a close rich bite of Grass.

Wireworm and slug not unfrequently about this time play sad havoc, both in cornfields and grass-land. Some apply a top-dressing of lime, soot, and salt, with a broadcast distributor, and if done in time and either in moist weather or else washed in by means of the water-cart, or hose and jet when applied in dry weather, it will assist in checking their ravages if it does not kill. In the case of slugs the mixture is sown at night when they are abroad feeding. Some roll at night to kill the slugs and consolidate the earth about the plants. Wireworm is not so easily got rid of, as it feeds more below the surface, and is defended by a tough, leathery coat—very unlike that of slug. But lime, soot, and salt, and also the salts of ammonia, and potash are obnoxious to the insect, and if applied in a soluble form so as to reach it and the food on which it feeds, the solution will prove effective. Where town or farm sewage is at command it is the best remedy. Unfortunately all remedies are generally too long in being applied, so that afterwards blanks have to be filled up. In corn crops this may be done in moist weather by transplanting from thick places; one plant at 9 inches square, or even 12 inches square, will soon tiller and fill the ground; and with a shallow basket to hold the plants, it does not take long to make good what otherwise would be very bad. When old grass-lands are suspected, as they justly may be when daddy-long-legs, cockchafers, and click beetles abounded the previous season, they should frequently be examined during March, April, and beginning of May; and as soon as worms are observed active measures should be taken to soak the roots of the grasses in which they live with liquid manure such as the land requires, rolling the land as soon as it is sufficiently dry for the operation. But when such means have been neglected, and large patches appear brown when the dry weather of May sets in, from the insects having separated the sward sod from the soil below, rake off the loose sods, apply a top-dressing of the above salts with earth in the form of a rich compost to the bald spots, sow a renovating mixture of Grass seeds; and to the rest of the grass-land infected with the wireworm, but not yet beyond recovery, apply the top-dressing without earth, and well wash it in with the water-cart.

Stifle Burning, to obtain ashes for root crops, if not completed by the end of April, should be brought to a close as early in May as practicable, as the ashes should be applied a month before sowing. This, however, cannot always be complied with, the ashes having to be spread at the time of sowing. Stifle burning is also done to get rid of an excess of effete vegetable matter in peaty soils, the work being similar in character to paring and burning. A shallow furrow slice, from 3 to 6 inches deep, is turned up, dried and burned, at a cost of from 2*s.* to 2*s.* 6*d.* per cubic yard of the ashes. The ashes are then spread and ploughed in. Clay ashes cost about 6*d.* per cubic yard for burning, and from 2*d.* to 3*d.* for filling and spreading; the total expense—for fuel, burning, filling, carting and spreading—being from 9*d.* to 1*s.* 3*d.* per cubic yard. The quantity of ashes applied per acre is very different, but 100 cubic yards are commonly quoted as a fair average, so that the total cost per acre will at this rate run from 75*s.* to 125*s.* An old plan still in use in some places is to rib clay soils full of Twitch in the autumn, cross plough in spring, harrow, gather the clods full of Twitch, and burn them, at a cost of from 12*s.* to 40*s.* per acre—including the spreading of from 1000 to 4000 bushels of slightly burned ashes. But this old practice has been superseded by deep thorough drainage, steam-culture, with the liberal use of artificial manures,—a practice which gets rid of the weeds, aërating and enriching the land more effectually than the old one.

Water Meadows, late as the season hitherto has been, should now afford a daily supply of green food for folding and soiling, and if the weather continues favourable, the ordinary routine of practice may not in favourable situations be much deranged from its usual; but in others the most that is possible will have to be made of the meadows, both for sheep and neat cattle, as directed last month, by converting water and artificial manure into green forage for soiling.

Farm Horses continue to require extra corn and grooming, with green forage where it can be had, as it brings away the bots much better than drastic purgatives.

The "grass-parks" of the North now begin to be stocked in the more sheltered and favourable localities, and neat cattle generally to be turned out to Grass, being housed under night until the cold frosty nights are gone.

Milch Cows always require special management as compared with other stock, and in many places more so this season than usual. On southern pastures they generally are taken with the Grass, and do well by this time. In the North the bite is shorter and the nights are colder, while the cows are not yet taken with the Grass. But this season these adverse elements of practice will in many places perhaps be less divergent than usual, at all events where there is irrigated meadow Grass, town sewage, or farm sewage Grasses, Lucerne, Sainfoin, or Tares, farmers need be at no loss how to feed their milch cows. When soiled they do better in open yards with shedding than in confined stalls, and the green food should be cut into chaff along with a handful of hay and seasoned with bean-meal, and the mixing of the meadow Grass and Tares with Sainfoin or Lucerne or Carob bean-meal in the absence of such will be an improvement. *W. B.*

Markets.

ENGLISH WOOL.

A steady business has been doing during the week in English wool. Good deep grown lustres and half-breds still command the chief attention, but good skin wools are also inquired for, and prices are going against the buyer.

Current Prices of English Wool.	Per lb.—*s.* *d.* *s.* *d.*
Fleeces—Southdown hoggets	1 1 to 1 2½
Half-bred ditto	1 2 — 1 2
Kent Fleeces	1 3 — 1 4
Southdown ewes and wethers	0 6½ — 1 1
Leicester ditto	1 2 — 1 3
Sorts Clothing	0 10 — 1 6
Combing	1 0 — 1 8

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, May 12.

Prime Meadow Hay	82*s.* to 85*s.*		Clover, old ..	110*s.* to 125*s.*	
Inferior do.	60	70	Inferior do.	80	95
Rowen	50	65	Prime 2d cut ..	100	110
Inferior do.	—	—	Inferior do.	80	90
Straw	20	28	Charles James Easton.		

Cumberland Market, Thursday, May 12.

Sup. Meadow Hay	84*s.* to 90*s.*		Inferior Clover ..	98*s.* to 110*s.*	
Inferior do.	70	76	New do.	—	—
New do.	—	—	Straw	20	25
Superior Clover ..	123	130	Joshua Baker.		

Whitechapel, Thursday, May 12.

Fine Meadow Hay	76*s.* to 82*s.*		Prime old Clover ..	120*s.* to 130*s.*	
Inferior do.	60	70	Inferior do. do. ..	90	100
Prime New Hay ..	—	—	Prime 2d cut do ..	—	—
Inferior	—	—	New Clover	105	112
Straw	24	28	Inferior do.	80	90

METROPOLITAN CATTLE MARKET.

Monday, May 9.

We have a large supply of Beasts and a very dull trade, consequently prices are lower for all descriptions. There are a few more Sheep than on Monday last; the demand is very limited, and lower rates are submitted to. Lambs are not selling so well as of late; middling qualities are especially difficult to dispose of. Choicest Calves meet with a ready sale, but on the average trade is worse. Our foreign supply consists of 1305 Beasts, 9040

Sheep, and 108 Calves; from Scotland there are 383 Beasts; from Ireland, 30; from Norfolk and Suffolk, 1740; and 554 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4 8	4 10	Best Long-wools	to ..	
Best Shorthorns..	4 4	4 8	Do. Shorn ..	4 6	4 10
2d quality Beasts	3 0	3 10	Ewes & 2d quality	.. —	..
Best Downs and Half-breds	.. —	..	Do. Shorn ..	3 8	4 2
Do. Shorn ..	5 0	5 2	Lambs	6 8	7 4
			Calves	3 4	5 4
			Pigs	3 6	5 6

Beasts, 4012; Sheep and Lambs, 30,300; Calves, 205; Pigs, 120.

THURSDAY, May 12.

The number of Beasts on offer is considerably smaller than on last Thursday; trade is, however, very dull, and only in choicest qualities are Monday's quotations a little exceeded. There are nearly as many Sheep and Lambs; we have a fair demand for best qualities, at Monday's quotations, but it is difficult to dispose of middling descriptions. Trade is very dull for Calves. Our foreign supply consists of 170 Beasts, 2810 Sheep, and 450 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	4 8	5 0	Best Long-wools..	to ..	
Best Shorthorns ..	4 4	4 8	Do. Shorn ..	4 6	4 10
2d quality Beasts	3 0	3 10	Ewes & 2d quality	.. —	.. —
Best Downs and Half-breds	.. —	.. —	Do. Shorn ..	3 8	4 2
			Lambs	6 8	7 4
			Calves	3 4	5 4
Do. Shorn ..	5 0	5 2	Pigs	.. ..	.. ..

Beasts, 627; Sheep and Lambs, 11,630; Calves, 550; Pigs, —.

METROPOLITAN MEAT MARKET.—May 12.

Best Fresh Butter .. .. .. 16*s.* per dozen lb.
Second do. do. .. .. 13*s.* ,,
Small Pork, 5*s. od.* to 5*s. 4d.*; Large Pork, 3*s. 8d.* to 4*s. od.* per 8 lb.

MARK LANE.

MONDAY, May 9.

There was a very short supply of English Wheat to this morning's market, which was generally held for an advance of 1*s.* per qr.; this, however, millers were unwilling to concede, and the sales made were at the prices of this day se'nnight; very little business was transacted in foreign, and we do not alter our quotations. Barley, Beans, and Peas were unchanged in value, and Oats were a slow sale and rather cheaper. Flour brought last week's prices.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk White	39	47	Red.....	36	46
— — fine selected runs..do.	43	51	Red.....	39	48
— — Talavera	53	56			
— — Norfolk			Red.....		—
— — Foreign	38	54			
BARLEY, grind. & dist., 26*s.* to 30*s.*..Chev.	39	42	Malting ..	34	38
— Foreign .. grinding and distilling	22	25	Malting ..	30	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire..Potato	24	26	Feed		—
— Irish ..... Potato	22	25	Feed	21	24
— Foreign .....Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan.... 30*s.* to 37*s.*..Tick	31	49	Harrow ..	31	49
— Pigeon ....30*s.* to 56*s.*..Winds.		—	Longpod..		—
— Foreign ..... Small	41	43	Egyptian ..	38	40
PEAS, White, Essex, and Kent..Boilers	32	42	Suffolk ..	35	43
— Maple, 41*s.* to 45*s.* .....Grey	32	42	Foreign ..	33	37
MAIZE			Foreign ..	29	31
FLOUR, best marks delivered..per sack	39	43			
— 2d ditto ..... ditto	28	40	Country ..	28	40
— Foreign .....per barrel	22	25	Per sack..	29	55

WEDNESDAY, May 11.

At Mark Lane to-day the supply of Wheat from Essex and Kent was only moderate. There was a fair attendance of millers, but the demand ruled inactive for both red and white produce; prices, however, were well maintained. With foreign Wheat the market was fairly supplied; sales progressed slowly, but at full currencies. The supply of Barley was moderate; the trade was firm, on former terms. Malt was dull, at late rates. Oats were in moderate supply and healthy request, at full quotations. Beans were firm, and Peas were steady in value. Flour sold at full currencies, with a moderate inquiry.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English	Qrs.	Qrs.	Qrs.	Sacks.
Scotch..	850	—	—	—
Irish ..	—	—	—	—
Foreign ..	7190	6900	30,070	670
				— brls.
	8040	6900	30,070	

LIVERPOOL, May 10.—A fair extent of business done in Wheat, at 2*d.* to 3*d.* per cental advance on white, and 1*d.* on some sorts of American red; there was some speculative inquiry, and the market closed strong. Flour in fair request, at slight improvement. Beans sold readily at 1*s.* advance on the week. Barley 1*s.* per bushel dearer. Oats and Oatmeal sold at extreme prices. Indian Corn went off steadily, at 6*d.* per qr. over last Tuesday's rates.

AVERAGES.

	Wheat.	Barley.	Oats.
April 2	42*s.* 5*d*	35*s.* 0*d*	21*s.* 5*d*
— 9	42 8	34 11	20 9
— 16	42 10	35 2	21 5
— 23	42 7	34 11	20 8
— 30	42 7	33 1	21 7
May 7	43 3	34 2	23 1
Average ..	42 9	34 7	21 6

SEED MARKET.

The most noteworthy features in the past week's trading have been a further advance in the price of Rape seed, and a speculative inquiry for Trefoil seed. In Clover seeds there has been scarcely anything passing; a few retail orders continue to drop in. Spring Tares are in moderate request, at unchanged currencies. White Mustard seed is scarce and dearer. Canary seed is firm. Hemp seed is a little cheaper.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, May 12.

Messrs. Pattenden & Smith report an improved demand for all descriptions of both English and foreign, late rates being fully maintained.

COALS.—May 11.

Holywell Main, 14*s. 9d.*; Walls End Braddyll's Hetton, 16*s.*; Walls End Elliot, 16*s. 3d.*; Walls End Haswell, 17*s. 3d.*; Walls End Hetton, 17*s. 3d.*; Walls End Hetton Lyons, 14*s. 9d.*; Walls End Hawthorn, 14*s. 3d.*; Walls End Tunstall, 14*s. 9d.*; Walls End East Hartlepool, 16*s. 6d.*; Walls End Heugh Hall, 16*s. 3d.*; Walls End Original Hartlepool, 17*s. 3d.*; Walls End Tees, 16*s. 9d.*; Brancpeth Cannel, 18*s.* — Ships at market, 23; sold, 16; unsold, 7; at sea, 15.

Notices to Correspondents.

EGGS: *Chicken* will be very much obliged if any correspondent of the *Agricultural Gazette* can tell him the best way of preserving eggs for winter use. He has been told that putting them in a solution of lime takes away the nourishment. Is it so? [No; but some of our readers will no doubt state their experience on this subject.]

IMPORTS OF THREE MONTHS, 1869-1870: *K.*

Articles.	Quantities Imported. 1869.	1870.
Animals, living - Oxen, Bulls, and Cows .. .. No.	35,326	24,056
Calves	3,031	3,045
Sheep and Lambs	132,988	115,517
Swine and Hogs..	7,726	18,710
Ashes, Pearl and Pot .. .. cwt.	7,807	5,463
Corn—Wheat—From Russia ..	2,585,520	3,497,001
Denmark	115,720	52,262
Prussia	265,760	237,053
Schleswig, Holstein, and Lauenburg	10,160	..
Mecklenburg	8,600	94,447
Hanse Towns	274,055	67,447
France	64,000	10,482
Illyria, Croatia, and Dalmatia ..	21,200	33,385
Turkey and Wallachia and Moldavia	359,160	171,651
Egypt	200,135	88,527
United States	1,971,265	3,021,748
Chili	67,494	21,700
British North America	32,841	87,213
Other countries	11,560	41,881
Barley	3,658,597	1,853,260
Oats	1,074,891	1,111,429
Peas	207,007	191,727
Beans	677,380	280,370
Indian Corn, or Maize	3,882,780	3,860,040
Wheatmeal and Flour—Hanse Towns..	173,879	267,855
France	479,665	279,495
United States	1,678,601	559,639
British North America	4,000	4,050
Other countries	2,0[illegible]43	83,558
Corn—Indian Corn Meal	1,21[illegible]	1,602
Flax (dressed and undressed), and Tow	1,25[illegible]44	246,518
Guano .. .. tons	12,[illegible]89	43,951
Hemp (dressed and undressed) and Tow or Codilla of Hemp—From Russia .. .. cwt.	1,529	12,250
Venetia	61,253	80,170
Illyria, Croatia, and Dalmatia ..	17,[illegible]0	4,188
British India	5[illegible]	1,203
Philippine Islands	8,14[illegible]	17,581
Other countries	26,[illegible]83	13,[illegible]56
China Grass, Jute, and other vegetable substances of the nature of Hemp.	740,[illegible]62	527,811
Hides, tanned—Dry—From British India	36,818	48,171
Other countries	10,[illegible]92	12,023
Wet—From Argentine Confederation and Uruguay	15,[illegible]22	21,395
Brazil	5,709	5[illegible]
Australia	6,[illegible]29	3,523
Other countries	32,[illegible]79	24,078
Hides, tanned, tawed, curried, or dressed (except Russia Hides) lb.	1,603,597	1,375,306
Hops .. .. cwt.	77,287	45,194
Oil Seed Cakes .. .. tons	8[illegible]6[illegible]	25,347
Potatos .. .. cwt.	401,626	140,771
Provisions—Butter	262,935	217,039
Cheese	81,161	91,[illegible]60
Eggs .. .. No.	96,915,720	84,924,480
Fish, cured or salted .. .. cwt	134,264	246,813
Lard	51,294	66,724
Meat, fresh or slightly salted—Beef.	1,301	3,259
Pork	4[illegible]7	11,114
Meat, salted—Bacon and Hams ..	101,[illegible]05	116,[illegible]84
Beef	63,774	49,477
Pork	45,052	43,335
Meat, not otherwise described	17,[illegible]7	22,239
Saltpetre	21,[illegible]29	22,[illegible]4
Cubo Nitre	169,348	132,608
Seeds—Cotton .. .. .. tons	33,761	28,113
Clover .. .. cwt.	97,069	80,133
Flaxseed and Linseed—Russia		
Northern ports .. .. .. qr.	23,[illegible]16	19,900
Ports in the Black Sea	190,[illegible]23	71,922
British India	134,470	36,827
Other countries	25,713	26,083
Rape	38,[illegible]91	49,920
Tallow—From Russia .. .. .. cwt.	20,569	9,773
Australia	22,[illegible]89	35,357
South America	72,824	72,932
Other countries	35,291	62,269
Wool, sheep and lambs'—From Hanse Towns and other parts of Europe, lb.	5,073,607	2,374,288
British Possessions in South Africa ..	6,504,193	7,104,220
British India	1,967,082	1,284,639
Australia	34,[illegible]46,[illegible]16	49,779,593
Other countries	3,484,336	2,659,239
Wool, Alpaca and the Llama tribe	726,803	787,630
Woollen rags, torn up to be used as wool	3,984,736	3,706,640
Yeast, dried.. .. .. .. cwt.	25,048	25,992

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

IRON HURDLES
(Silver Medal of the Royal Agricultural Society):
SHEEP, 1*s.* 5*d.*; CATTLE, 1*s.* 9*d.*; OX, 5*s.* 11*d.*
List by post GATES and FENCING of every description.
St. Pancras Iron Work Company, Old St. Pancras Road, London, N.W.

To Gentlemen, Gardeners, and Others.—Write for HEADLY AND SON'S Illustrated List of Prices of the NEW PATENT HYDRAULIC APPARATUS for Watering Croquet Lawns and Gardens, the NEW FALLERN FORCE PUMPS, the NEW PATTERN GARDEN CHAIRS, the NEW PATTERN GARDEN ARCHES, &c. Post free on application to
E. HEADLEY AND SON, Exchange Iron Works, Cambridge.

INDIA-RUBBER GARDEN HOSE,
60 feet 1, inch hose, with brass tap, rose, and jet complete, 17*s. 6d.*
60 feet ¾ inch do. do. extra strong, 21*s. 6d.*
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application.
E. G. CAPON, India-rubber Manufacturer, Quadrant, Birmingham.

Hot-water Pipes and Boilers.
J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at their wharf in London.
6, Bankside, Southwark, London, S.E.

E. AND F. CROOK'S POULTRY APPLIANCES of every description, as supplied to Her Majesty, the Nobility, Gentry, Farmers, &c., at home and abroad.

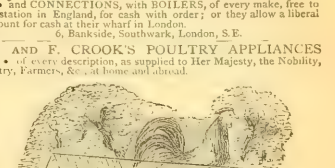

IMPROVED CHICKEN FEEDING FOLD, SEED and PLANT PROTECTOR. Full Illustrated List upon receipt of stamped and directed envelop.
Land and Premises Inspected. Designs and Estimates submitted for Erecting Poultry Houses and Yards, Aviaries, Pheasantries, &c., to any extent, in town or country.
E. AND F. CROOK, 2, Carnaby Street, Regent Street, London, W.

To Agriculturists.
GREEN'S PATENT HIGH-PRESSURE BOILERS, with Inverted Cylinder Engine combined. Simple and substantial in construction. The Boiler can be used for Steaming purposes. Specially adapted for Farm use.

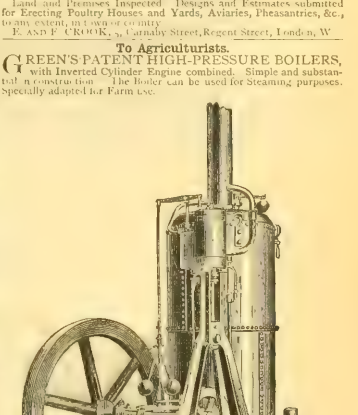

The above Engines and Boilers occupy a very small space, requiring no brickwork or foundation. They are sent out in complete working order, ready for immediate use. From 3 to 40 horse power always in stock or in process of manufacture. Drawings and prices free on application to
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

Important to every Man who Keeps

THORLEY'S HORSE and CATTLE SPICE. In Penny Packets only, of all Corn Chandlers in London, and of all Grocers, Druggists, and Corn Dealers in the Country.

By Royal Appointment.
To HER MAJESTY, by Special Warrant, dated December 27, 1865.
To the PRINCE OF WALES by Special Warrant, dated February 10, 1866.

DAY, SON, AND HEWITT, Original and Sole Proprietors of the STOCKBREEDERS' MEDICINE CHESTS, for DISORDERS in HORSES, CATTLE, CALVES, SHEEP, and LAMBS.

No. 1 MEDICINE CHEST, Contains Sixteen different kinds of Compounds, admirably arranged, with Complete Guide to Farriery. Price £6 6*s.*, carriage paid.

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Every Stockowner should send for DAY, SON, AND HEWITT'S Work on Farriery. Large Edition, 25 *6d.*, or free by post for 13 stamps. Small Edition, 2*s.*, or free by post for 13 stamps.
DAY, SON, AND HEWITT, 22, Dorset Street, Baker Street, London.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

PATRONIZED BY

HER MOST GRACIOUS MAJESTY THE QUEEN

ON FORTY-FIVE DIFFERENT OCCASIONS.

H.R.H. THE PRINCE OF WALES.

THE KING OF THE BELGIANS.

THE EMPEROR OF THE FRENCH.

THE EMPEROR OF RUSSIA.

AND MOST OF THE NOBILITY, CLERGY, AND GENTRY IN THE UNITED KINGDOM.

The extraordinary success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last six years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features :—

1st. Simplicity of Construction, every part being free of access.

2nd. They are worked with far greater ease than any other Lawn Mower. **3rd. They are the least liable to get out of order.**

From the fact that these Machines are so well known in Great Britain and Ireland, also on the Continent of Europe, upwards of 56,000 being now in use, T. GREEN AND SON do not deem it necessary to trouble the Public with a List of the numerous Testimonials they have received from time to time, but would add

THEY ARE THE ONLY MACHINES IN CONSTANT USE AT

THE ROYAL HORTICULTURAL SOCIETY'S GARDENS, SOUTH KENSINGTON.
THE ROYAL BOTANIC GARDENS, REGENT'S PARK.
THE CRYSTAL PALACE COMPANY'S GARDENS, SYDENHAM
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THE HYDE PARK GARDENS.
THE WINTER PALACE GARDENS, DUBLIN
THE DUBLIN BOTANIC GARDENS.
THE LIVERPOOL BOTANIC GARDENS.
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THE SUNDERLAND PARK.
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AND IN MOST OF THE PRINCIPAL PARKS, SQUARES, ETC., IN THE UNITED KINGDOM.

HORSE, PONY, AND DONKEY MACHINE.

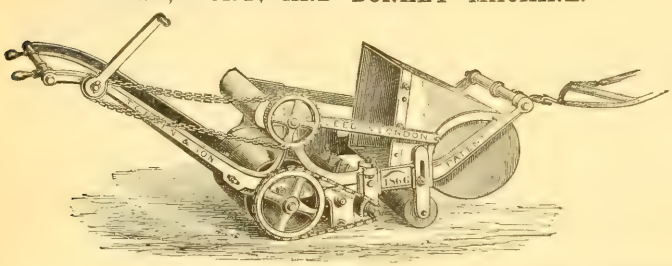

PRICES of HORSE, PONY, and DONKEY MACHINES, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness.

DONKEY AND PONY MACHINES.

To cut 26 inches	..	..	.. £13 0 0
,, 28 inches	..	..	.. 15 0 0
,, 30 inches	..	..	.. 17 0 0
Leather Boots for Donkey	..	..	0 18 0
Ditto for Pony	..	..	1 2 0

HORSE MACHINES.

To cut 30 inches	..	..	.. £21 0 0
,, 36 inches	..	..	.. 24 0 0
,, 42 inches	..	..	.. 27 0 0
,, 48 inches	..	..	.. 30 0 0
Leather Boots for Horse	..	..	1 6 0

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be emptied without fear of its running away, or in any way damaging the Machine.

HAND MACHINE.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned unconditionally.

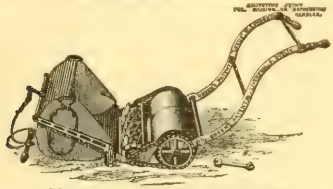

PRICES OF HAND MACHINES.

To cut 10 inches	.. £3 10 0	To cut 18 inches	.. £7 10 0
,, 12 inches	.. 4 10 0	,, 20 inches	.. 8 0 0
Suitable for a Lady.		,, 22 inches	.. 8 10 0
To cut 14 inches	.. £5 10 0	,, 24 inches	.. 9 0 0
,, 16 inches	.. 6 10 0	*Suitable for two persons.*	

Suitable for one person.

Packing Cases are charged at the following low rates, viz :—For the 10 and 12 inch Machine, 3s; 14 and 16 inch, 4s; 18 and 20 inch, 5s; 22 and 24 inch, 6s. Parties providing themselves with Lawn Mowers are recommended to purchase the cases in which to stow them away when not in use, to prevent them from getting damaged; if returned, two thirds will be allowed for them.

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Ireland, and Scotland.

PRIZE MEDALS AWARDED TO GREEN'S PATENT LAWN MOWERS.

First Prize Medal at the International Exhibition, London, 1862.
First Prize Medal at the International Exhibition, Dublin, 1865.
First Prize Medal at the Namur Exhibition.
First Prize Medal at the Gand Exhibition.
First Prize Medal at the Laeken Exhibition.
First Prize Medal at the Lineene Exhibition.
First Prize Medal at the Brussels Exhibition, on two occasions.
First Prize Medal at the Hamburg Exhibition.
T. GREEN AND SON did not exhibit at the Paris Exhibition, 1867.

GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given, in all cases of competition.

GREEN'S PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed in a moment, so as to give the sharp edge of the cutters against the bottom blade, which operation can be done by any ordinary person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

N.B. All Orders are executed on the day they are received, either from our Leeds or London Establishment.

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	..	..	..	..	..	..	£4 0 0
20 ,,	22 ,,	..	..	..	..	..	3 2 6
16 ,,	17 ,,	..	..	..	..	..	2 10 0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

Every Machine and Roller is warranted to give entire satisfaction, and, if not approved of, can be returned at once unconditionally.

T. G. AND SON have a large quantity of LAWN MOWERS in stock (upwards of 2000) at their Leeds and London Establishments; also various other kinds of HORTICULTURAL and AGRICULTURAL IMPLEMENTS, GARDEN SEATS and CHAIRS, FOUNTAINS, VASES, PLAIN and GALVANIZED WIRE NETTING, &c.

Having very extensive Premises in London, we are in a position to do all kinds of Repairs there, as well as at our Leeds Establishment.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.

JOHN WARNER & SONS, HYDRAULIC ENGINEERS,

Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

8, CRESCENT, CRIPPLEGATE, LONDON, E.C.

No. 547A.

GARDEN ENGINE.

10 Gallons	£3 0 0
16 ,, ...	3 16 0
24 ,, ...	5 1 0
28 ,, ...	5 13 0

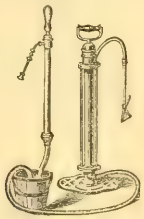

WARNERS'

AQUAJECT.

Useful for every variety of purpose—in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.

Price, complete £1 8 0

Small size for the hand, as an ordinary Syringe .. 0 15 0

THE CRYSTAL PALACE

GARDEN or FIRE ENGINE.

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CAST-IRON PUMPS.

2½ inches ..	£1 9 0
3 ,, ...	2 2 0
3½ ,, ...	2 7 0
4 ,, ...	2 15 6

No. 579½.

SWING WATER BARROW.

20 Gallons	£2 2 0
30 ,, ...	2 14 0
38 ,, ...	3 18 0
50 ,, ...	5 14 0

SURVEYS MADE

IN ANY PART OF THE COUNTRY,

AND

PLANS PREPARED

FOR THE

GENERAL ARRANGEMENT AND LAYING-OUT OF

STRUCTURAL GARDENS.

APPLY FOR

ORMSON'S

BOOK OF DESIGNS.

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Henry Ormson
Horticultural Builder &
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Stanley Bridge, Kings Road,
Chelsea, London. S.W.

DESIGNS

AND

ESTIMATES

PREPARED FOR

FIRST-CLASS

CONSERVATORIES,

TO SUIT ANY STYLE OF ARCHITECTURE.

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DESIGNS

CARRIED OUT.

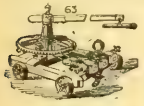

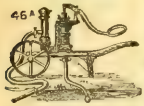

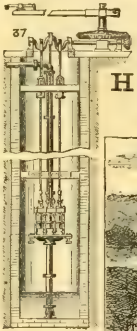

S. OWENS & CO.,

HYDRAULIC ENGINEERS,

WHITEFRIARS STREET, LONDON, E.C.

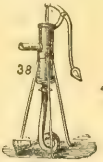

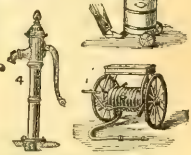

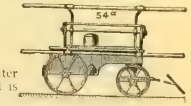

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

No. 37. DEEP WELL PUMPS for Horse, Hand, Steam, or other Power.

No. 63. PORTABLE IRRIGATORS with Double or Treble Barrels for Horse or Steam Power.

No. 46a. IMPROVED DOUBLE ACTION PUMPS on BARROW for Watering Gardens, &c.

No. 49a. GALVANIZED SWING WATER CARRIERS, for Garden use.

No. 50 and 54a. FARM and MANSION FIRE ENGINES of every description.

No. 38. PORTABLE LIQUID MANURE PUMPS, on Legs, with Flexible Suction.

No. 49. GARDEN ENGINES, of all sizes, in Oak or Galvanized Iron Tubs.

No. 54b. THE CASSIOBURY FIRE EXTINGUISHER, as designed for the Right Hon. the Earl of Essex.

No. 44. WROUGHT-IRON PORTABLE PUMPS of all sizes.

No. 4. CAST-IRON GARDEN, YARD, or STABLE PUMPS.

No. 39b. IMPROVED HOSE REELS for Coiling up Long Lengths of Hose for Garden use.

S. OWENS AND CO. Manufacture and Erect every description of Hydraulic and General Engineers' Work for Mansions, Farms, &c., comprising PUMPS, TURBINES, WATER WHEELS, WARMING APPARATUS, BATHS, DRYING CLOSETS, GAS WORKS, Apparatus for LIQUID MANURE distribution, FIRE MAINS, HYDRANTS, HOSE PIPES, &c., &c. *Particulars taken in any part of the Country. Plans and Estimates furnished.*

ILLUSTRATED CATALOGUES CAN BE HAD ON APPLICATION.

RICK-CLOTHS, NEW and SECOND-HAND, with POLES, PULLEYS, &c., complete.
An Illustrated Catalogue post free on application.

BENJAMIN EDGINGTON'S CRICKET TENTS, GARDEN TENTS, TENTS for FLOWER SHOWS.

BENJAMIN EDGINGTON'S WAGGON CLOTHS, HAY CLOTHS, GARDEN NETTING, FLAGS.

Address, BENJAMIN EDGINGTON (in full), 2, Duke Street, London Bridge, S.E. [illegible]

REUBEN HUNT, MANUFACTURER of IMPROVED HAND SEED DRILLS, Atlas Works, Earls Colne, Essex.

IMPROVED BARROW SEED DRILLS,
For Sowing every description of Small Seeds. [illegible] with 12 feet box and stand [illegible]

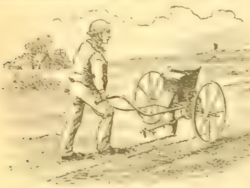

ONE-ROW CUP DRILL, No. 1

For sowing Turnips, Mangel [illegible]	[illegible]	[illegible]	[illegible]
Extra [illegible]	[illegible]	2	0
ONE-ROW CUP DRILL, No. 2	[illegible]	15	0
TWO-ROW CUP DRILL	3	15	0
ONE-ROW TURNIP and MANURE DRILL	5	10	0
Extra coulters [illegible]	0	3	6
ONE-ROW BEAN and PEA DRILL	2	10	0
ONE-ROW BRUSH DRILL	1	5	0

Illustrated Catalogues post free on application.

"Every Cottage should be provided with a Water Tank."—*Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive [illegible] (Ina Wire [illegible] WROUGHT-IRON TANKS, GALVANISED or PAINTED, [illegible] and at very short notice.

An Illustrated List of Galvanised Iron, and other of BRABY'S special [illegible]
F. BRABY AND CO., [illegible] Works, Euston Road, London [illegible]
N.B. Open Tanks [illegible]
carriage.

Cottam's Iron Hurdles, Fencing, and Gates.

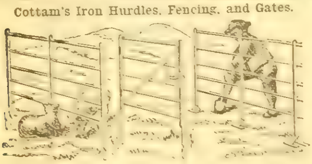

COTTAM'S HURDLES are made in the best [illegible] COTTAM AND CO., Iron Works, 2, Winsley Street [illegible]

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

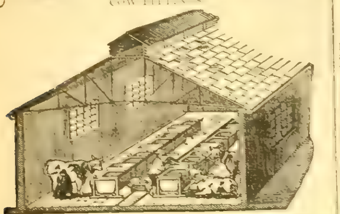

[illegible] pleasure, [illegible] Vermin, Hay [illegible] and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all Iron. Price of Fittings per Cow, 55s.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

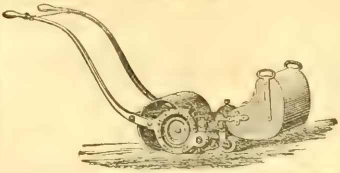

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of their Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

WILLIAMS' PATENT "ARCHIMEDEAN" AMERICAN LAWN MOWER.

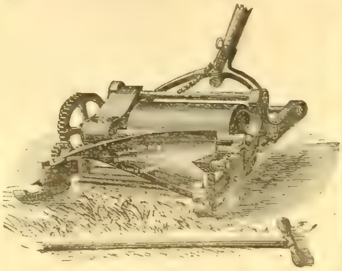

[illegible] NEVER [illegible] the [illegible] great and decided improvement in your lawn.
"[illegible]"—*The Field.*
"[illegible]"—[illegible] *Magazine.*
"[illegible] ever used."—[illegible]
Catalogues and Opinions of the Press, post free on application.
Manufactured and Sold by the Owners and Patentees,
WILLIAMS [illegible]
[illegible]

American Lawns.

THE AMERICAN PATENT
"ARCHIMEDEAN" LAWN MOWER

A[illegible] admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS.

The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

The *Field* says—"The Americans have been befriended with us in many Machines, but we were not, however, until now aware they possessed a Lawn Mower which is far superior to any of ours."

The *Gardeners' Chronicle* says—"We are indebted to our American cousins [illegible] remarkable contrivances, adapted not only [illegible] generally. We owe to them many thanks for improvements amongst [illegible] much lessened. The [illegible] wet as [illegible] the gardens of the Royal [illegible] reported as the [illegible] and most efficient Lawn Mower ever used; [illegible]"

Sole Wholesale Agent for the United Kingdom,
JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

THE HYDRONETTE (ROLLINS'S PATENT).

FOR GARDENS, GREEN-HOUSES, CONSERVATORIES,

HOTBEDS, WASHING WINDOWS, CARRIAGES, &c., &c.

Unrivalled Ease of Action, Simplicity, Convenience and Force.
The HYDRONETTE is a more useful, easy-working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz.: No. 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12s. 6d.; No. 2, 15s. 6d.; No. 3, £1 [illegible]; No. 4, £1 5s.; No. 5, £1 10s. Extra Hose and Union Joints to order. To be had of
HAYNES AND SONS, 227, 229, and 231, Edgware Road, W.
CAUTION.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

COLEMAN AND MORTON'S HAND WATER-CART and GARDEN ENGINE.

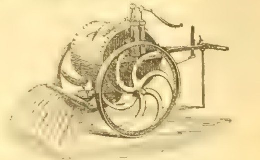

For use in Gentlemen's Gardens and Grounds. The delivery valve ca[illegible] It holds 35 gallons [illegible] at pleasure. [illegible] £5 5 0
[illegible] 2 2 0 extra
Force Pump for Watering Trees, &c.
COLEMAN AND MORTON, [illegible] Iron Works, Chelmsford.

First Prize,
ROYAL AGRICULTURAL SHOW, 1869,
Also 22 other PRIZES FOR LIQUID MANURE CART AND PUMP.

BONE OR STONE CRUSHER FOR HAND OR POWER.

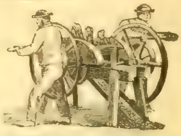

J. JAMES, [illegible]

MOULE'S PATENT EARTH SYSTEM.

From Mr. W. GILBERT, [illegible] Street, Rugby.
"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying in a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees a [illegible] spadeful put into a [illegible] kettle of water, and [illegible] had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT.
"January, 1870."
Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and [illegible] without no further labour and expense, as do "grown" Edgings, consequently [illegible] cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in great variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E.; Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. [illegible] and other Stable Paving Bricks of great durability, Dutch and Aluminaline Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—14s. per Ton, 1s. 2d. per bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

THE CLOCHES, or BELL GLASSES, named in Mr Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 81, Upper Thames Street, where a Stock is kept; also at 16, Long Acre. J. GOODERIDGE, Agent.

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—

GLASS for ORCHARD HOUSES,

As supplied by them to Mr Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.

Each Box contains 100 feet. The prices only apply to the sizes stated Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15.

	16 oz to the foot.	21 oz.
Fourth quality	15s 0d	19s 6d.
Third quality	16s 0d	22s 6d.
Seconds	18s 0d	26s 0d.
English	20s 0d	27s 0d.

The above prices include the boxes, which are not returnable.

HORTICULTURAL GLASS.

Stock sizes, 16oz., in 100 feet boxes, boxes included.

These prices only apply to the sizes stated.

	4ths.	3rds.	2nd
11 by 0 / 12 by 9 / 13 by 9 / 14 by 9	s. d.	s. d.	s. d.
12 by 10 / 13 by 10 / 14 by 10 / 15 by 10	13 6	15 6	17 0
13 by 11 / 14 by 11	..	..	..
14 by 12 / 15 by 12 / 16 by 11	..	..	..
15 by 12 / 16 by 12 / 17 by 12	..	..	..
16 by 13 / 17 by 13 / 18 by 13	..	..	..
16 by 14 / 17 by 14 / 18 by 14	15 0	16 0	18 6
20 by 14	20 by 13 / 18 by 13 / ..	..	16 to 17 0z to the foot
	17 by 14 / 18 by 14 / ..		
	20 by 14		

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	6s by 4d	7 by 5	7s by 5d
8 by 6	8d by 6d	9 by 7	9d by 7d .. 12s. 6d.
		10 by 8	10s by 8d .. 13s. 6d.

Boxes 2s. each, returnable at full price.

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and ENAMELLED GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

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The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.

No investigation of title is required.

For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.

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No investigation of title necessary, and no legal expenses incurred.

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THE LONDON ASSURANCE CORPORATION for MARINE, FIRE, and LIFE INSURANCES.

Incorporated by Royal Charter, A.D. 1720.

Offices: No. 7, Royal Exchange, and No. 71, Pall Mall.

JAMES HEATH, Esq., Governor.
THOMAS GRAY, Esq., Sub-Governor.
DAVID POWELL, Esq., Deputy-Governor.

Total Funds on 31st December, 1869 .. .. .. £2,515,629.

The Directors are ready to receive applications for Agencies for the Fire and Life Departments of the Corporation.

LIFE DEPARTMENT.

POLICIES in force for £1,865,823
(exclusive of Bonus Additions).

INCOME—Premiums £161,381
Interest 58,324
£219,705

Accumulated Premiums £1,342,472

Further information may be obtained on application.

SECURITY.—The Assurance Funds amount to no less than seven times the total annual income. The further guarantee of a fully subscribed Capital of £1,000,000.

WHOLE-WORLD POLICIES granted for a single extra payment of 10s. per £100, where no special Liability to foreign residence then exists. Policies on lives of full age when assured, after five years' existence without incurring extra charge for foreign license, allow unrestricted residence in any part of the world.

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LOANS are granted on Life Interests and Reversions.

E. A. NEWTON, Actuary and Manager.

LEGAL and GENERAL LIFE ASSURANCE SOCIETY, 10, Fleet Street, Temple Bar, London, E.C.

TRUSTEES.

The Right Hon. the Lord Chancellor.
The Right Hon. the Lord Chief Justice.
The Right Hon. Sir W. Bovill, Lord Chief Justice, C.P.
The Right Hon. Sir Edward Vaughan Williams.
The Hon. Sir George Grey.
Thomas Webb Greene, Esq., Q.C.
John Osborne, Esq., Q.C.
Edward Smith Bigg, Esq.
Robert Bayly Follett, Esq., Taxing Master in Chancery.

FINANCIAL POSITION on January 1, 1870.

Annual Income	£210,000
Invested Funds	1,581,000
Existing Assurances	4,200,000
Reversionary Bonus thereon	540,000
Assurance Claims and Bonus paid ..	1,760,000
Share Capital fully subscribed	1,000,000
Paid up	100,000

Annual Accounts have always been published in full detail.

SECURITY.—The Assurance Funds amount to no less than seven times the total annual income. The further guarantee of a fully subscribed Capital of £1,000,000.

WHOLE-WORLD POLICIES granted for a single extra payment of 10s. per £100, where no special Liability to foreign residence then exists. Policies on lives of full age when assured, after five years' existence without incurring extra charge for foreign license, allow unrestricted residence in any part of the world.

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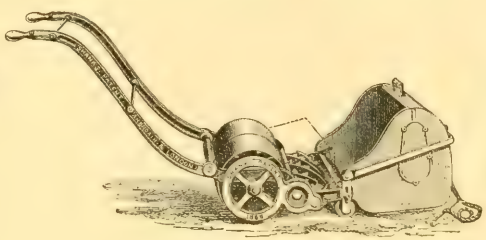

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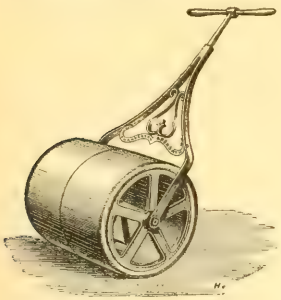

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NEW VERBENAS, Eckford's, unrivalled. CATALOGUES ready.
JOHN KEYNES, Castle Street, Salisbury.

NEW DAHLIAS, unrivalled. CATALOGUES ready.
JOHN KEYNES, Castle Street, Salisbury.

NEW GERANIUMS.
Coleshill, Zonal; Lady Edith, Ivyleaf; unrivalled
JOHN KEYNES, Castle Street, Salisbury.

NEW DOUBLE GERANIUMS. 12 fine varieties Double Zonal Geraniums, 6s.; 12 superb new Zonal Geraniums of 1869 for 12s.; 12 superb Single Zonal Geraniums, 6s.; 12 varieties Gold and Golden Bedders Geraniums, 6s. Package included, from
B. W. KNIGHT, Florist, Battle, Sussex.

TRICOLOR, BRONZE, and ZONAL PELARGONIUMS.—Descriptive CATALOGUE of all the very best and newest varieties will be forwarded free on application.
J. ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants

Bicolor Geranium, Prince of Orange.

J. SCOTT, Nurseryman, &c., Bathford, Bath, can with the greatest confidence recommend the above as a first-class Bedding variety, of very dwarf, but free habit, flat circular leaf, a very distinct crimson zone on yellow ground, retains its distinctness through the summer; bright scarlet flowers.
Strong cuttings struck from the young wood, ready, price 7s. 6d. each

CHARLES TURNER is now sending out, in strong plants, Ferry's set of 12 NEW VERBENAS, which are of very fine quality and good growers. Also a Collection of the best for pot culture or bedding, now ready, 4s. to 9s. per dozen.
The Royal Nurseries, Slough.

Verbenas, Verbenas.—6s. per 100; 50s. per 1000.

WILLIAM BADMAN offers PURPLE, WHITE, SCARLET, ROSE, CRIMSON, &c., well-rooted Plants, from store pots, 6s. per 100; 50s. per 1000. Terms, cash.
Cemetery Nursery, Bermondsey.

Verbenas, Verbenas.

PHILIP LADDS is now sending out White, Scarlet, Purple, and Pink VERBENAS, including new varieties of 1869, strong plants, in pots, at 12s. 6d. per dozen; small plants of ditto at 6s. per dozen; also a fine stock of SCARLET and PINK FUCHSIAS, 1869, at 2s. per dozen; VESUVIUS, the best bedding Scarlet GERANIUM, at 20s. per 100.—Nursery: Bexley Heath, Kent, S.E.

Bedding Plants, Florists' Flowers, &c.

MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, are prepared to send out very choice selections of the above, at very moderate prices, and will be glad to send their new priced CATALOGUE free on application.
North of England Nursery and Seed Establishment, 44, English Street, Carlisle.

GARIBALDI POLYANTHUS.—A new double sweet-scented variety of this pretty spring plant. It is of various colours, bright and showy, and produces its flowers well above the foliage. A selected stock, strong, 1s. and 2s. 6d. per packet, post free. Plants 2s. 6d. each, 24s. per dozen.
BUTLER, MCCULLOCH, AND CO., South Row, Covent Garden, W.C. Established upwards of a Century.

E. COLE AND SONS have much pleasure in announcing to their Friends and Patrons that they are now booking orders for their new and distinct LOMARIA GIBBA CRISPA, to be sent out the first week in May, at 10s. 6d. each, in strict rotation as the orders are received. Prices to the Trade on application.—The Nurseries, Withington, near Manchester.

WEBB'S NEW GIANT POLYANTHUS, Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the varieties, with double PRIMROSES of different colours; AURICULAS, both Single and Double; with every sort of Early Spring Flowers LIST on application.—Mr. WEBB, Calcot, Reading.

TO GARDENERS.—Required, TENDERS to supply on HIRE, to a large Hotel, about four dozen FLOWERING PLANTS, of an ordinary description, and a few EVERGREENS, and to change them for others as often as it is requisite.
SECRETARY, Westminster Palace Hotel, S.W.

Carter's Index, May 21.

CARTER'S NEW TRICOLOR GERANIUMS. See p. 690.—237 and 238, High Holborn, London, W.C.

CARTER'S IMPERIAL HARDY SWEDE. See p. 690.—237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE TURNIP. See p. 690. 237 and 238, High Holborn, London, W.C.

CARTER'S PRIZE GRASS SEEDS. 237 and 238, High Holborn, London, W.C.

NATURAL GRASSES: their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c. Free by post.
RICHARD SMITH, Seed Merchant, Worcester.

EVERY GARDEN REQUISITE KEPT in STOCK at CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

PENZANCE EARLY WHITE BROCCOLI.—Good plants from the seed-bed, sent to any address, at 2s. 6d. per 100.
JOHN MITCHINSON, Truro, Cornwall.

Turnip Seeds.

H. AND F. SHARPE have to offer to the Trade fine selected stocks of the above-named Seeds, all of 1869 growth, and raised from picked transplanted bulbs. Prices moderate.
Seed Growing Establishment, Wisbech

Mangel Wurzel Seed.

H. AND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S SELECTED SMALL-TOP YELLOW GLOBE, The Stocks are very fine, and of 1869 growth. Prices very low.
Seed-Growing Establishment, Wisbech.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

Farm Seeds.

CHARLES SHARPE AND CO., SEED GROWERS and MERCHANTS, Sleaford, Lincolnshire, will be glad to send, post free, on application, their new PRICED CATALOGUES of FARM SEEDS, grown from carefully selected stocks.

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

SPRING PLANT CATALOGUE, 1870, containing all the NOVELTIES, English and Continental, of 1870, post free
JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

Spring Planting.—To the Trade.

MAURICE YOUNG'S ABRIDGED CATALOGUE of New Japanese Plants, Aucubas, and other hardy Trees, Shrubs, and Evergreens, is just published, and can be had on application. Milford Nurseries, near Godalming.

Genuine Seeds.

WM. CUTBUSH AND SON'S Catalogue of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
Highgate Nurseries, London, N.

Fruiting Sized Vines.

E. G. HENDERSON AND SON have still the above on hand, of excellent quality, full of fruit-buds
Wellington Nursery, St. John's Wood, London, N.W.

FOR SALE, a good COLLECTION of PINES, Fruiting and Succession.
Apply, Mr. J. CORNELIUS, Tregullow Gardens, Scorrier, Cornwall.

WEBB'S PRIZE COB FILBERTS, and other PRIZE COB NUTS and FILBERTS. LISTS of these varieties from Mr. WEBB, Calcot, Reading.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

MULBERRY LEAVES.—Gardeners and others who can Contract for regular supplies of Mulberry Leaves are invited to apply to H. F. COBB, Hon. Secretary of the Silk Supply Association, 65, Moorgate Street, E.C.

AUCUBA POLLEN.—One dozen flowers for 1s., four dozen for 2s., sent post free on receipt of stamps by
JOHN STANDISH AND CO., Royal Nurseries, Ascot.

To the Trade only.

VIOLA CORNUTA var. BLUE PERFECTION.—Plants now ready, 15s. per dozen. A flower sent on receipt of one stamp.
THOMAS CRIPPS AND SON, Nurserymen, Tunbridge Wells.

WOODROW BROTHERS, SEED MERCHANTS, Bombay, have to offer fresh seeds of INDIAN PALMS, including Cocos nucifera, Caryota urens, Borassus flabelliformis, and others. Terms on application.

Ilex aquifolium var. Lawsoniana.

A golden blotched Hodgens' Holly, quite distinct and very effective.
PETER LAWSON AND SON are now sending out the above for the first time. Strong plants 21s., with the usual allowance to the Trade.
Edinburgh and London.—May, 1870.

LASTREA FILIX-MAS CRISPA GRACILIS (LYELL).—Nice plants of this new and unique Fern post free for 60 stamps. Priced CATALOGUES, enumerating upwards of 300 species and varieties of BRITISH FERNS, on application
EDWARD SANG AND SONS, Nurserymen and Seed Merchants, Kirkcaldy, N.B.

FERNS, BRITISH and EXOTIC, in more than 1000 beautiful species and varieties.—The Subscribers beg to intimate that their CATALOGUE of the above will be forwarded to any applicant on receipt of three postage stamps.
A. STANSFIELD & SON, Vale Nurseries, Todmorden, Lancashire.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

To Seed Importers, Nurserymen, &c.

JOHN BETHAM (Son of the late Senior Partner of the Firm of BETHAM & BLACKETER), begs to inform the above that he is Trading under the title of

BETHAM AND SON,

Receiving and Shipping Plants, Seeds, and general Merchandise from and to all parts of the world

Office, 0, Lower Thames Street, London, E.C.

Miscellaneous Plants suitable for Bedding and Decorative Purposes.

ROBERT PARKER begs to announce that his SELECT DESCRIPTIVE PRICED LIST, including the finest varieties of PELARGONIUMS, PANSIES, HEMERVIUMS, TRITOMAS, VIOLAS, &c., &c., is now published, and will be forwarded to applicants.

Exotic Nursery, Tooting, Surrey, S.W.

Sow now—Sow now.

PRIMULA FIMBRIATA, choicest possible strain, 50 growing seeds, 2s. 6d.; 170 ditto, 5s. CALCEOLARIA, 2s. 6d.; CINERARIA, 2s. 6d.; CALCEOLARIA, 2s. 6d.; POLYANTHUS, 1s. 6d.; with many other choice seeds for present sowing, all thoroughly reliable, and free per post.

PONSFORD AND SON, Nursery and Seedsmen, Beckton, Surrey, S.W.

Chrysanthemums.

ADAM FORSYTH begs to inform the Trade and the Public, that he is now sending out his "NEW" and other choice CHRYSANTHEMUMS

For description see CATALOGUE (containing a Treatise on their growth) now ready. Forwarded to all applicants for one stamp

Branswick Nursery, Stoke Newington, N

CHATER'S AGERATUM IMPERIAL DWARF. The finest bedding plant of the season. Strong robust growth, not exceeding 6 inches in height, and throws a mass of blossom all through the summer; for second rows in floral designs unsurpassed See Opinions of the Press. Id. per packet, 1s. 6d. per dozen. Trade, see advertisement; special prices for quantities will be forwarded upon request WILLIAM CHATER, Nurseries, Saffron Walden.

New Plants of 1869, &c.

FUCHSIAS, 24 distinct varieties of last year's best, strong plants, in pots, per dozen, 6s.

BEDDING GERANIUMS.—The best of last year are Fire Kind (Turner), Lizzy (Smith), Masterpiece (Smith), Little Pinkie (Lee), Morning Star (Bennett), Pride of Osberton (Bennett), Thomas Moore (Oubridge), and five other varieties. Price 9s. per dozen, or 1s. each.

DOUBLE GERANIUMS.—20 varieties, English and Continental, splendid plants (names free on application). Price 20s. the Collection, or 12 of do for 12s. 6d.

BRONZE and VARIEGATED GERANIUMS.—The following seven beautiful varieties, one of each, for 10s. 6d.:—Black Knight, Golden Emperor, Golden Queen, Star of India, May Queen, Red King, Kentish Fire.

	Per dozen.—s. d.
GERANIUM MADAME LEMOINE	4 0
CHRYSANTHEMUMS, 24 beautiful new kinds of large and showy flowering and handsome varieties	6 0
LOBELIA (Erinus), six splendid new kinds, two of each	4 0
HELIOTROPES, six finest sorts ever raised, two of each	4 0
PENTSTEMONS, nine magnificent sorts .. .. each	1 0
PHLOX, Beautiful and Conqueror (Bull's)	1 0
VERONICAS, six splendid varieties	1 0
IRESINE LINDENII and ACUMINATA	9 0
ALOPECURUS PRATENSIS aureo-variegatus (new Golden Grass) .. .. each	0 0
HOLCUS LANATUS albo-var (new Striped Grass)	0 0
YUCCA CORNUTA ALBA, from cuttings	4 0
" LUTEA GRANDIFLORA "	9 0
" DEVONIENSIS, best blue	4 0
" (Pansey), choice, to name .. .. .. 6s. and	9 0
" from seed	1 0
HEPATICAS sorts	4 0
PRIMROSES (double), to name, three varieties	1 0
HOLLYHOCKS " " six varieties	4 0
DAISIES " " six varieties	4 0
WALLFLOWER, double dark	1 0
BELLIS AUCUBÆFOLIA (spotted-leaved Daisy)	3 0
POLYANTHUS, from Prize Flowers	3 0
POLYANTHUS, finest spotted	3 0
PAMPAS GRASS	3 0
DELPHINIUMS (sorts)	3 0

LILIUM AURATUM, 1s. 6d., 2s. 6d., and 3s. 6d. each.

CALCEOLARIAS, six sorts, by 100 or 1000

Post Office Orders on Castle Hedingham

A CATALOGUE of Choice New Plants of 1869, Roses, Fruit Trees, &c., free on application.

WM. DILLISTONE, Nurseryman, &c., Sible Hedingham, Essex

Geraniums of all Classes.

WOOD AND INGRAM offer fine Plants of the following:—

GOLD and SILVER TRICOLORS

	Each—s. d.		Each—s. d.
Diamond	3 6	Silver Star	1 6
Lucy Grieve	3 6	Twilight	1 6
Mrs. Dix	3 6	Rosette	1 0
Star of India ..	1 6	Italia Unita ..	0 6
Mrs. Benyon ..	0 6	The Queen's Favourite ..	1 0
Sunset	0 6	Glowworm	0 6

Or the 12 varieties for 18s., package included.

EXTRA FINE NEW and CHOICE VARIETIES

	Each—s. d.		Each—s. d.
Mrs. Dunnett	15 0	Princess Beatrice ..	5 0
Sir Robt. Napier ..	15 0	Excellent	5 0
Huntingdonian ..	10 6	Charming Bride ..	5 0

Or the six varieties for 52s., package included.

NEW BRONZE and GOLD VARIETIES of 1869.

	Each—s. d.		Each—s. d.
Arab	3 6	Crown Prince	3 6
Beauty of Riverdale ..	2 6	Miss Beatrice	3 6
Black Knight	2 6	Miss Allen Lowndes ..	3 6
Cleopatra	3 0	Red King	2 6
Criterion	5 0	Southern Belle	2 6
Stanstead Beauty ..	2 6	St. John's Wood Star ..	2 6

Or the 12 varieties for 30s., package included.

DOUBLE-FLOWERING ZONAL

	Each—s. d.		Each—s. d.
Andrew Henderson	1 0	Madame Rose Charmeux ..	0 6
Gloire de Nancy	0 6	Marie Lemoine	2 0
Madame Lemoine	1 0	Wilhelm Pfitzer	2 0

Or the six varieties for 6s., package included.

NEW ZONAL of 1869.

	Each—s. d.		Each—s. d.
Acme (F. & A. Smith) ..	2 6	Kentish Fire	1 6
Bayard (Perkins)	1 6	Lord Stanley (F. & A. Smith)	1 6
Blue Bell (W. Paul) ..	1 0	Louis Veuillot	1 6
Charley Cashon	1 6	Reticular	1 6
Christine Surpasse	1 0	Robert Bowley	1 6
Dr. Muriel	1 0	Rossini	1 6
Forget-Me-Not	1 0	Jean Sisley	1 6
Fire King (Turner)	1 6		

Or 12 distinct varieties, W. & I.'s selection, for 12s., package included.

NEW SHOW PELARGONIUMS of 1869.

	Each—s. d.		Each—s. d.
Joan of Arc (Foster) ..	2 6	Emily (Hoyle)	3 6
Lady of the Lake (Foster) ..	3 6	Envoy (Hoyle)	3 6
Lord Napier (Foster) ..	3 6	Meteorite	3 6
Prince Imperial (Foster) ..	2 6	Mr. Rassam (Hoyle) ..	2 6
Queen of Scots (Foster) ..	3 6	Nathalie (Hoyle) ..	3 6
Troubadour (Foster) ..	3 6	Nonpareil (Hoyle) ..	2 6
Consul Cameron (Hoyle) ..	3 6	Prince Humbert (Hoyle) ..	2 6
Elvira (Hoyle)	3 6		

Or 12 distinct varieties, W. & I.'s selection, for 30s., package included.

NEW FANCY PELARGONIUMS of 1869,

Sent out by Mr. Turner.

Belle of the Season.	Lord of the Isles
Brightness	Mrs. Alfred Wigan.
Lady Dorothy Neville.	Mrs. Mendel

25s. 6d. each, or the six varieties for 12s., package included

The Nurseries, Huntingdon.

"Economy.—Seeds Direct from the Growers."

JAMES CARTER & CO.,

SEED GROWERS,

237 & 238, HIGH HOLBORN, LONDON, W.C.

In consequence of the great injury to the Growing Crops during the late winter, J. C. & Co. *regret being compelled to announce the following* ADVANCE *in* PRICES *for their* CHOICE PRIZE STOCKS *of* SWEDE, TURNIP, *&c., after this date.*

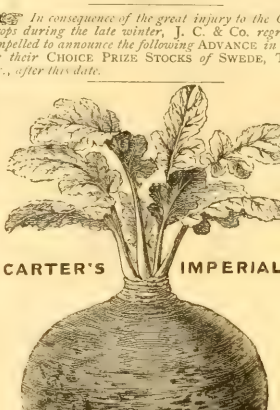

The hardiest and best in cultivation.

1s. per lb. Cheaper per cwt.

CARTER'S LONDON SWEDE (the largest variety) Per lb. 1s. 6d

SKIRVING'S LIVERPOOL SWEDE .. .. .. " 0 9

HALL'S WESTBURY SWEDE .. .. .. " 1 0

Cheaper per cwt. or bushel.

Carter's Devonshire Grey-stone Turnip,

Of quick growth, and very fine quality.

1s. per lb. Cheaper per cwt.

POMERANIAN WHITE GLOBE TURNIP .. Per lb. 0s. 10d.

LINCOLNSHIRE RED GLOBE TURNIP .. .. " 0 10

IMPERIAL GREEN GLOBE TURNIP .. .. " 0 10

CARTER'S EARLY NIMBLE, or Sixweek TURNIP " 1 0

PLANT DEPARTMENT.

CARTER'S LIST of BEDDING and other PLANTS for 1870 is now ready, price 6d.; Post Free (Gratis to purchasers).

New and Choice Plants for 1870.

GOLDEN TRICOLOR GERANIUMS.

PRINCE of WALES (CARTER).—Undoubtedly the finest tricolor ever offered, of most vigorous habit, and intensely brilliant colours. First-class certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, June 10, 1867. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Horticultural Society of London, July 7, 1868. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, May 27, 1868.

EDITH STUART (CARTER).—A free-growing variety, with flat silver shaped leaves, zone bright vermilion, with a light yellow margin. Price 21s. each. First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

PRINCESS of WALES (CARTER).—A variety similar to Prince of Wales, but more brilliant in colour, and smaller leaves. Price 21s. each. First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

SULTAN ABDUL AZIZ (CARTER).—A splendid dark tricolor, very distinct in character and free in habit, leaves of great substance and particularly round, zone a dark scarlet, light golden margin. Price 21s. each. First Prize, May 22, Royal Horticultural Society. Special Certificate, April 20, 1870, Royal Horticultural Society.

The set of the foregoing four varieties, £5 5s.

DR. WALLACE (CARTER).—A free-growing variety, leaves flat and of good form, deep coloured zone of carmine, intermixed with chocolate. Price 5s. each

MARIAN MORRIS (CARTER).—A variety after the style of Goliah, and equally free in growth, but with brighter colours. A good bedder. Each 21s.

MRS. MULLER (CARTER).—A neat compact-growing variety, zone light carmine, blotched with chocolate, margin creamy yellow. Each 5s.

BALLYMENA (CARTER).—A most desirable variety for bedding purposes, and very distinct in character; zone very dark chocolate and very large. Price 5s. Special Certificate, April 20, 1870, Royal Horticultural Society.

The set of the foregoing four varieties for 30s.

SILVER TRICOLOR GERANIUM.

CINDERELLA (CARTER).—Deep pink zone, silver margin, free bloomer. Each 5s.

GOLDEN SELF GERANIUM.

CARRIE FOWLER (CARTER).—Seedling from Crystal Palace Gem, a beautiful bright golden colour, compact in habit; an excellent bedding variety. Each 5s. Royal Horticultural Society, May 22, 1869.—Prize for best Golden-Leaved Geranium, Carrie Fowler.

For full descriptions and particulars of CARTER'S COLLECTIONS of BEDDING and other PLANTS, see

CARTER'S ILLUSTRATED

PLANT CATALOGUE for 1870.

JAMES CARTER AND CO.,

237 and 238, HIGH HOLBORN, LONDON, W.C.

Beautiful New Fuchsias and Nosegay Geraniums

GEORGE SMITH is now sending out, in good plants, his beautiful new FUCHSIAS, viz., Avalanche, Purple Prince and Sultan, at 10s. 6d. each; also his new GERANIUMS, Claudus, Soleil, and Harry George, 7s. 6d. each. Coloured drawings (by Mr James Andrews) of Claudus and Soleil, in two separate plates, 1s. 6d. each. The above are all first-class For description see CATALOGUE, on application

Tollington Nursery, Hornsey Road, Islington, London, N.

Cheap, Cheap, Cheap.

TRICOLOR and other PELARGONIUMS, in good plants, at the following low prices for cash:—Mrs. Pollock, 2s. 9d. per pair; White Lady, 4s.; Glen Eyre Beauty, 5s.; Rosetta, 5s.; Castle Milk, 5s.; Italia Unita, 2s. 9d.; Perilla, 3s.; Crystal Palace Gem, 2s. 9d.; Luna, 2s. 9d.; Lord Derby, 3s.; Leonidas, 3s.; Centaurea candidissima, extra-large plants, 2s. 6d. each. A large quantity of ZONALS, equally cheap P.S. Sophia Dumaresque, 3s

JOHN BARRETT, St John's Nursery, Bury St. Edmund's, Suffolk.

To the Trade.

CALCEOLARIAS, autumn-struck, of Yellow Prince of Orange, Aurea floribunda, Sparkler, Superb, and others, 6os per 1000, from cutting pots.

GERANIUMS of Scarlet, Zonal, and Nosegay, named, our selection, from pots, 8s. per 100: Purple Unique, 2s. 6d. per dozen.

DAHLIAS, named, our selection, from 16s. per 100.

H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of—

Achimenes	Miscellaneous plants
Auriculas	" bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants | Verbenas

The Royal Nurseries, Slough.

NEW FERN, ADIANTUM CAPILLUS-VENERIS MAGNIFICUM, 1870 (J. & C. LEE).—We have much pleasure in introducing this really useful Greenhouse Fern to public notice, in the firm conviction that it will give satisfaction and become a universal favourite. The fronds are much larger than those of Capillus-Veneris, being from 12 to 15 inches long, by 4 inches broad, curving over the side of the pot. The pinnæ are of a beautiful soft green, and are almost twice as those of A. Farleyense, and like that fine variety they overlap each other in graceful waves of maiden-hair, with finely incised and fringed edges. The chief value of A. magnificum is in its hardiness and adaptability to the temperature of a greenhouse, whereas A. Farleyense can only be cultivated by those who possess a stove. To be sent out in June. Price 21s. 6d. each

Both from CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

Superb New Bedding Plant.

VIOLA CORNUTA VAR PERFECTION

B. S. WILLIAMS has much pleasure in offering this superb plant to public notice, and from the manner in which it has been tested both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple. In habit it resembles a gigantic V. cornuta in both, and, whilst retaining its profuse blooming qualities, producing flowers which almost rival our Florist Pansies for size and substance. This plant was awarded a First-Class Certificate by the Floral Committee, September 15th, 1869. Price 21s. per dozen, 70s. per half hundred, 100s. per 100

Victoria and Paradise Nurseries, Upper Holloway, London, N.

B. S. WILLIAMS'

NEW and CHOICE FLOWER SEEDS,

Post Free.

	Per packet—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
BALSAM, Williams' superb strain	1s. 6d. and 2 6
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain ..	1s. 6d., 2s. 6d., and 3 6
CENTAUREA CANDIDISSIMA	1s. and 2 6
ECHEVERIA METALLICA, new bedding plant	2 6
HOLLYHOCK, from Chater's finest varieties ..	1s. and 2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 3 6
PYRETHRUM (Golden Feather)	1s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance	1s. 6d. and 2 6
Williams' Improved French MARIGOLD, beautifully striped, and very large	1 0
EAST LOTHIAN STOCKS, per collection of three colours ..	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
STOCK, white Ten-week Wallflower leved, the purest white Stock in cultivation	1 0
WALLFLOWER, New Golden Tom Thumb	1 0
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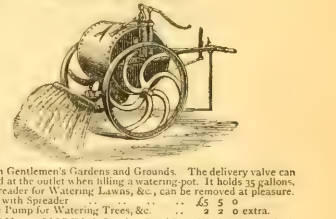

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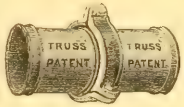

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	2-inch.	3-inch.	4-inch.
HOT-WATER PIPES, Nos 6 & 7 on illustrated sheet per yard	s. d. 0 11	s. d. 1 5	£ s. d. 1 11
ELBOWS .. .. No 12 on do. each	1 4	2 1	2 9
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GREENHOUSES Per ft. super
Woodwork only Prepared and Fitted 0 0 6
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GARDEN ROLLER BARROW.

This light, elegant, and useful combination of the necessary Garden Implements, the Roller and the Barrow, for Lawns and Walks, solely supplied by
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PROPAGATING GLASSES.

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2 inches in diameter .. 0 3½	12 inches in diameter	.. 1 9
3 ,, ,, .. 0 4½	13 ,, ,,	.. 2 0
4 ,, ,, .. 0 5½	14 ,, ,,	.. 2 6
5 ,, ,, .. 0 6½	15 ,, ,,	.. 3 0
6 ,, ,, .. 0 8	16 ,, ,,	.. 3 6
7 ,, ,, .. 0 10	17 ,, ,,	.. 4 0
8 ,, ,, .. 1 0	18 ,, ,,	.. 5 0
9 ,, ,, .. 1 2	19 ,, ,,	.. 6 0
10 ,, ,, .. 1 4	20 ,, ,,	.. 7 0
11 ,, ,, .. 1 7		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	or 6s. 6d.	9 inches in diameter	.. 1s. 8d.
5 ,, ,,	.. 0 8	10 ,, ,,	.. 2 0
6 ,, ,,	.. 0 10	11 ,, ,,	.. 2 6
7 ,, ,,	.. 1 1	12 ,, ,,	.. 3 0
8 ,, ,,	.. 1 4		

Either flat or conical tops.

CUCUMBER GLASSES.

24 inches long ..	2s. 6d.	16 inches long	.. 1s. 4d.
22 ,, ..	1 10	14 ,,	.. 1 2
20 ,, ..	1 8	12 ,,	.. 2 6
18 ,, ..	1 6		

HAND GLASSES, WITH OPEN TOPS.

Each.—s. d.		Each.—s. d.
12 inches	5 6	20 inches 10 6
14 ,, ...	7 6	22 ,, ... 11 6
16 ,, ...	8 6	24 ,, ... 12 6
18 ,, ...	9 6	

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LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
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MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

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BAMFORD'S "MODEL" GARDEN ENGINE,

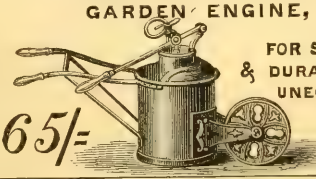

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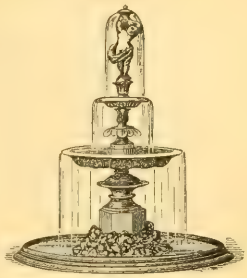

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No. 547A.

GARDEN ENGINE.

10 Gallons	..	£3	0 0
16 ,,	..	3	16 0
24 ,,	..	5	1 0
28 ,,	..	5	13 0

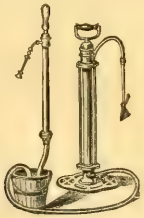

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Useful for every variety of purpose—in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.

Price, complete £1 8 0
Small size for the hand, as an ordinary Syringe .. 0 15 0

THE CRYSTAL PALACE
GARDEN or FIRE ENGINE.

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CAST-IRON PUMPS.

2½ inches	..	£1	9 0
3 ,,	..	2	2 0
3½ ,,	..	2	7 0
4 ,,	..	2	15 6

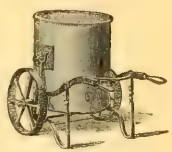

No. 579½.

SWING
WATER BARROW.

20 Gallons	..	£2	2 0
30 ,,	..	2	14 0
38 ,,	..	3	18 0
50 ,,	..	5	14 0

VIOLA CORNUTA PERFECTION.

THE SEASON FOR BEDDING OUT BEING SOMEWHAT ADVANCED,

GEORGE SMITH

Begs to announce that he has lowered the price of this splendid hardy SPRING and SUMMER BEDDING PLANT, and that he will now Sell the remainder of his large stock at **6s.** and **8s.** per dozen.

G. S. obtained a First-class Certificate at the Bath Floral Fête, Wednesday, May 18.

Plants may be seen beautifully in BLOOM at his Nursery, and at the Wilton House Gardens.

WILTON ROAD NURSERY, SALISBURY.

NEW GERANIUM, BRONZE QUEEN (Sheppard).

We have had several opportunities of seeing this GERANIUM in growth, and believe it to be one of the most effective of its class for out-door display. The zone is very distinctly marked on a bright bronzy yellow ground, and the habit all that could be desired.

Plants are now ready, 3s. 6d. each.

OSBORN AND SONS, FULHAM NURSERY, LONDON, S.W.

Our PLANT CATALOGUE for this season may now be had on application.

NEW BEDDING PLANT, VERONICA BLUE GEM

AWARDED FIVE FIRST-CLASS CERTIFICATES LAST SUMMER.

THOS. CRIPPS & SON

Beg to announce that they are now distributing the above welcome acquisition. Unlike other shrubby Veronica it is of a very neat dwarf habit, the axil of nearly every leaf producing spikes of beautiful mauve flowers, making the plants appear literally clothed with bloom. It commences flowering when only 2 inches high, and continues in bloom throughout the season.

In reviewing the New Plants of 1869, the *Gardeners' Chronicle* (see page 45, present volume) says :—"Yet another blue bedder, viz., Veronica Blue Gem, of great promise, both as a decorative plant for the greenhouse and a serviceable plant in the flower garden, of remarkably close habit, and a singularly free bloomer. It cannot fail to answer all expectations formed of it."

Price 5s. each.

Discount to the Trade on three Plants. (See p. 74 of our Trade CATALOGUE.)

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NEW ROSE, PRINCESS CHRISTIAN.

ONE SPECIAL, AND FOUR FIRST-CLASS CERTIFICATES.

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NEW PELARGONIUM, WALTHAM BRIDE.

A SILVER-EDGED WHITE FLOWERED BEDDING SORT.

TWO FIRST-CLASS CERTIFICATES.

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Contains LISTS of select ORCHIDS (many being now in flower), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS (both of which are extensively grown, and many fine specimens are now in full beauty), CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

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CONSERVATORIES FURNISHED ON REASONABLE TERMS.

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NEW COLEUS.—The new Golden and other select Coleuses, sent post free, 12 fine varieties, 2s. 6d.; 24 select varieties, 5s.

IRESINE LINDENI, ACUMINATA and HERBSTII, 1s. 6d. per dozen; VIOLA CORNUTA and CORNUTA ALBA, 1s. 6d. per dozen; 12 fine varieties TREE PINKS, 1s. 6d.; 12 fine varieties PHLOXES, 3s.; 12 superb varieties FUCHSIAS, 3s.; 12 ARTEMISIA STELLARIANA, 3s. Any of the above sent free by post, at the prices named, from

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Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted; each 1s., and 2s. 6d. per packet

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JOSEPH WESTLEY invites the special attention of the Trade and intending purchasers to his very large and fine stock of BEDDING and other Plants.

Centaurea, 2s. per 100	Flower of Spring, 20s. per 100
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Union Nursery, Reading, Berks.

The West of England Bedding Plant Establishment.

THOMAS SAMPSON'S unrivalled Collection of BEDDING PLANTS will be ready to send out after May 1. This Collection contains all the leading kinds, at from 2s. per dozen, in 2½ and 3-inch pots; also Collections (his selection) at £2 2s. for 25 dozen; ditto, £1 5s. for 15 dozen; ditto, 12s. for 10 dozen; ditto, 10s. for 4 dozen, including basket and packing.

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THOMAS SAMPSON, The Preston Road and Houndstone Nurseries, Yeovil, Somerset. PETER DRUMMOND, Manager.

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WOOD AND INGRAM beg to offer AGERATUM IMPERIAL DWARF (Chater), 2s. 6d. each, 18s. per dozen.

ARISTOLOCHIA ORNITHOCEPHALA, 3s. 6d. each.

DRACÆNA INDIVISA, 18 inches high, 18s. per dozen.

FUCHSIAS, in great variety, from store pots, 10s. per 100.

HELIOTROPES, in great variety, from store pots, 10s. per 100.

ISOLEPIS GRACILIS, 4-inch pots, fine, 1s. per dozen.

LIBONIA FLORIBUNDA, 1s. each

MESEMBRYANTHEMUM CORDIFOLIUM VARIEGATUM, 1s. 6d. each

VERBENAS, in great variety, from store pots, fine, 5s. per 100

VERBENAS, established in single pots, W. & I.'S selection, 2s. per dozen; 15s. per 100.

The Nurseries, Huntingdon.

ROYAL HORTICULTURAL SOCIETY.

SHOW of PELARGONIUMS, HEATHS, &c., May 18.

AWARDS of the JUDGES.

CLASS 1.—9 SHOW PELARGONIUMS, distinct. (Open.)

1st Prize, Mr. J. Ward, Gr. to F. G. Wilkins, Esq., Leyton, Essex, £7.
2d, Messrs. J. Dobson & Sons, Woodlands Nursery, Isleworth, W., £5.

CLASS 2.—6 SHOW PELARGONIUMS, distinct. (Amateurs.)

1st, Mr. J. Ward, £4.
2d, Mr. D. Windsor, Gr. to J. R. Ravenhill, Esq., Forest Rise, Leytonstone, Essex, £3.
3d, Mr. J. Weir, Gr. to Mrs. Hodgson, The Elms, Hampstead, N., £2.

CLASS 3.—6 FANCY PELARGONIUMS, distinct. (Nurserymen).

2d, Messrs. J. Dobson & Sons, £3.

CLASS 4.—6 FANCY PELARGONIUMS, distinct. (Amateurs.)

1st, Mr. D. Windsor, £4. | 2d, Mr. J. Weir, £3.
3d Mr. J. James, Gr. to W. F. Watson, Esq., Redlees, Isleworth, W., £2.

CLASS 5.—6 ZONAL PELARGONIUMS, distinct, not variegated. (Nurserymen.)

1st, Messrs. Downie, Laird & Laing, Stanstead Park Nursery, Forest Hill, S.E., £4.
2d, Messrs. Bell & Thorpe, Paddock Nurseries, Stratford-on-Avon, £3.

CLASS 6.—6 ZONAL PELARGONIUMS, distinct, not variegated. (Amateurs.)

1st, Mr. J. Catlin, Gr. to Mrs. Lermitte, sen., East End, Finchley, N., £4.
2d, Mr. J. Weston, Gr. to D. Martineau, Esq., Clapham Park, £3.
3d, Mr. H. Townsend, Gr. to J. C. Mappin, Esq., The Ferns, King's Road, Clapham Park, £2.

CLASS 7.—3 DOUBLE-FLOWERED PELARGONIUMS, distinct (Open.)

1st, Messrs. Bell & Thorpe, £2.
2d, Messrs. J. Standish & Co., Royal Nurseries, Ascot, £1 10s.
3d, Messrs. Downie, Laird & Laing, £1.

CLASS 9.—6 CAPE HEATHS, distinct. (Amateurs.)

1st, Mr. J. Carr, Gr. to F. L. Hinds, Esq., Byfleet Lodge, Weybridge, Surrey, £5.
2d, Mr. J. Ward, £3.
3d, Mr. Geo. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., M.P., St. John's Lodge, Regent's Park, N.W., £2.

CLASS 10.—8 CAPE HEATHS, distinct. (Open.)

1st, Mr. J. Ward, £7.
2d, Mr. J. Wheeler, Gr. to J. Phillpotts, Esq., Stamford Hill, N., £5.
3d, Mr. E. Morse, Original Nursery, Epsom, Surrey, £3.

CLASS 11.—12 CAPE HEATHS, distinct, in 12-inch pots. (Open.)

1st, Mr. J. Ward, £5. | 2d, Mr. J. Wheeler, £4.

CLASS 12.—6 STOVE FERNS, distinct. (Nurserymen.)

1st, Messrs. Bell & Thorpe, £4.

CLASS 13.—6 STOVE FERNS, distinct. (Amateurs.)

1st, Mr. A. Wright, Gr. to Mrs. C. Roberts, Esq., Sunnyside, Upper Avenue Road, Regent's Park, N.W., £4.
2d, Mr. J. Carr, £3.
3d, Mr. A. Wilkie, Oak Lodge, Kensington, W., £2.

CLASS 14.—FORCED FRUITS, 8 dishes, distinct. (Open.)

1st, Mr. G. S. Miles, Gr. to Lord Carrington, Wycombe Abbey, High Wycombe, Bucks, £5.

MISCELLANEOUS.

Messrs. J. & C. Lee, Nurserymen, Hammersmith, Miscellaneous Collection of Plants, Extra Prize, £3.
Mr. W. Denning, Gr. to Lord Londesborough, Grimston Park, Tadcaster, York, Collection of Orchids, Extra Prize, £2.
Mr. B. S. Williams, Nurseryman, Holloway, Group of Plants, Extra Prize, £1 10s.
Messrs. W. Rollisson & Sons, Nurserymen, Tooting, S., Collection of Orchids, Extra Prize, £1 10s.
Mr. C. Noble, Nurseryman, Bagshot, Collection of Clematises, Extra Prize, £1.
Mr. Wilkie, Group of Plants, Extra Prize, £1.
Mr. J. James, Collection of Calceolarias, Extra Prize, £1.
Messrs. Bell & Thorpe, Collection of Caladiums, Extra Prize, 10s.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870.—JUNE 3 to 10.

NOTICE TO EXHIBITORS.—Persons who intend to take part in this Exhibition must signify their intention to do so by letter, addressed to the undersigned, on or before May 20

ADMISSION.—First day, 10s. 6d. each; 2d day, 2s. 6d. each; Whitmonday and remaining days, 1s. each. Gardeners will be admitted by Tickets as follows:—First day, 2s. 6d. each; 2d and remaining days, 1s. each. Applications for these Tickets must be made on or before May 30.

The fine Bands of Her Majesty's 4th Dragoon Guards, and the 100th Infantry, in attendance each day.

Botanic Gardens, Manchester. BRUCE FINDLAY.

LEEDS HORTICULTURAL SOCIETY.—The SEVENTH ANNUAL SHOW will be held in the Cardigan Fields, Kirkstall Road, JUNE 3, 4, 6, and 7.

PRIZES NEARLY SEVEN HUNDRED POUNDS, including those offered for

Collections of Plants	£170
Pelargoniums	£170
Orchids, Azaleas, and Heaths	£120
Roses in Pots and Cut Blooms	£100
Fruit, &c.	£80
Bouquets and other Cut Flowers	£25

NOTE.—The North-Eastern, Great Northern, Midland, Lancashire and Yorkshire, and London and North-Western Railway Companies will convey Plants, Flowers, Fruits, &c., at ordinary rates to the Show, and return them free if they remain the property of the Exhibitor.

The Committee undertake to receive Boxes of Fruit, Cut Flowers, and Vegetables for Exhibition.

The Committee provide Assistants and Horses for Exhibition Vans coming by rail; also Covered Spring Vans to convey Plants, &c., between the Railway Station and the Exhibition Grounds, close at hand.

Schedules, with Forms of Entry, forwarded on application.

ENTRIES for PLANTS will CLOSE MAY 27; for FRUIT, CUT FLOWERS and VEGETABLES, May 31.

JAMES BIRBECK, Secretary, Crossgates, near Leeds.

LEICESTERSHIRE HORTICULTURAL SOCIETY.—The GREAT SUMMER EXHIBITION of this Society will be held on the Race Course, Leicester, on TUESDAY and WEDNESDAY, July 5 and 6, when £40 will be offered in Prizes for Cut Roses, and upwards of £25 for Plants in pots

A SHOW of BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition

Schedules of Prizes and all particulars may now be had of Market Place, Leicester. WM. PENN COX, Secretary.

ROYAL CALEDONIAN HORTICULTURAL SOCIETY.—The SUMMER SHOW will be held in the Music Hall, George Street, on WEDNESDAY, July 13. ENTRIES CLOSE on the 7th. The following Prizes for Roses, open to all, will be awarded:—

NURSERYMEN.

6 Roses in bloom, in pots, 1st Prize, £2; 2d, £1.
36 Cut Roses, of sorts, 1st, £3; 2d, £2 10s.
24 Cut Roses, of sorts, 1st, £3; 2d, £2; 3d, £1.
12 Trusses, not more than three blooms in each truss, 1st, £2; 2d, £1; 3d, 10s.

GARDENERS AND AMATEURS.

4 Pots Roses, in bloom, 1st, £2; 2d, £1
36 Cut Roses, not less than 24 sorts, 1st, £5; 2d, £3; 3d, £1 10s.
24 Cut Roses, of sorts, 1st, £1; 2d, £2; 3d, £1.
12 Trusses, not more than three blooms in each truss, 1st, £2; 2d, £1; 3d, 10s.
6 Cut Roses, 1st, 7s. 6d.; 2d, 5s.

The competition in Roses to be open to all, whether they are Members of the Society or not. Prize Lists free.

Apply to WILLIAM YOUNG, 33, South Bridge, Edinburgh.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE:—

For the Two best COLLECTIONS of FRUIT and VEGETABLES, 6 distinct kinds of each, a 1st prize of £7, and a 2d prize of £3.

☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.

The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868, and 1869 excluded from competition. The articles produced to be of the EXHIBITORS' OWN GROWING.

STROUD HORTICULTURAL SOCIETY, 1870.—The ANNUAL FLOWER SHOW of the above Society will this year be held in conjunction with the Meetings of the Gloucestershire Agricultural Society, in Stratford Park, Stroud, on WEDNESDAY, THURSDAY, and FRIDAY, August 10, 11, and 12. ONE HUNDRED and SEVENTY-FIVE POUNDS are offered in PRIZES. The Band of the Grenadier Guards has been engaged. Schedules and full particulars may be obtained on application to

EDW. W. WINTERBOTHAM, Hon. Secretary and Treasurer. The Bank, Stroud, Gloucestershire.

The Gardeners' Chronicle

SATURDAY, MAY 21, 1870.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY,	May 24—	Linnean (Anniversary)	3 P.M.
WEDNESDAY,	— 25	Royal Botanic (Exhibition of Plants and Flowers)	2 P.M.
THURSDAY,	— 26		

WE have on previous occasions intimated that it was the intention of those concerned in the management of the projected annual INTERNATIONAL EXHIBITIONS, which are next year to be inaugurated at South Kensington, that HORTICULTURE should form one of the main divisions of these periodically recurring shows. Such a prominent recognition of the claims of horticulture as an industrial science, while it must be gratifying to its votaries, ought at the same time to stimulate them to take up boldly and efficiently the vantage ground thus assigned to them, in order to prove—if, indeed, further proof be needed—that the importance to the State of the science they cultivate has not been overrated. We may surely claim that, irrespective of its special and direct produce, which is of no mean character, horticulture has a direct bearing on the well-being of the community, inasmuch as the successful and profitable cultivation of the soil is one of the necessities arising out of our high state of civilisation, and since experimental horticulture is the undoubted source and fountain head of all improved cultivation. Hence we may assume that the position assigned to horticulture in these International Shows is but a just recognition of its importance; and we also assume that the position is one which can, and will be, worthily occupied. While, therefore, to find for horticulture a permanent place in the International series, is to do it honour, we must maintain that the honour conferred has been fairly won, and, we doubt not, will be worthily worn.

It has been further intimated that the management of this horticultural division of the International Exhibition has been in great part delegated to the Royal Horticultural Society; and our readers will have seen from an announcement in our issue of the 7th inst., that a preliminary meeting, in furtherance of the arrangements to be made, took place yesterday week at South Kensington. There is not a shadow of a doubt in our own minds, whatever cavillers may say, that the Royal Horticultural Society, as the national representative of horticulture, is the right body to take charge of the arrangements for these meetings. We are, therefore, glad to find that the Council, on the occasion of this "International," has, without hesitation, accepted its proper position in relation thereto, of which the meeting in question, presided over by a staunch horticulturist, the Duke of BUCCLEUCH, is an earnest. It must have been gratifying to the Council to notice the cordial spirit in which they were met and supported on this occasion by representatives of the different sections of the horticultural world.

So far as we have had opportunities of learning, we believe it is the general intention that there shall be bi-monthly exhibitions, partaking very much in fact of the character of the shows—and really excellent and most highly varied shows they have been—of the present season. These exhibitions are to be supplemented by special prizes for various subjects, which prizes are to be offered at certain of the meetings for competition amongst foreign exhibitors only; while such arrangements will be made as will admit foreigners to compete at all the meetings for the Society's Certificates offered for new plants. Thus far, then, the International shows may be expected to represent augmentations of the present South Kensington meetings. Another feature, however, is to be added, and this most intimately concerns the trade. There is to be also a permanent exhibition, the exhibitor filling up to the best advantage for a given time—the whole period from May till October, or a part thereof—such 'a portion of the available space as he may find it convenient to undertake to occupy. For this a certain sum, to be allotted in medals, is to be set apart. Here, however, we think the Council may wisely reconsider its announcement; and since medals are comparatively little valued (amongst horticulturists, at least) in this country, we have no doubt it would be better to permit the exhibitor to take all beyond a single commemorative medal, in some more useful form—not necessarily in vulgar coin. Such a feature as this has formed part of our previous great industrial exhibitions, and may very well be repeated in the case of the lesser gatherings which are to commence in 1871. It was stated that our French neighbours had already intimated that they would take part in this permanent exhibition.

The meeting to which we have referred was held for the avowed purpose of consulting exhibitors on these and kindred matters, and the opinions expressed were decidedly in favour of holding bi-monthly meetings as now, and subject to similar regulations, as well as of supplementing these by continuous exhibitions supplied by individual cultivators. We are not quite sure that we should have consulted the exhibitors on another point—on which, however, the Council did consult them—that of the appointment of judges, namely, as to how and by whom they should be nominated; though in the result, perhaps, little harm was done, as the meeting clearly expressed its opinion that the nomination should rest with the Council. No doubt it should; the Council, as representing the Society, makes out the schedule of prizes, finds the prize money or the medals, and undertakes all the general arrangements of a show; and while doing this, it is certainly equally its duty to find out and appoint honest and competent judges to award its own prizes. That an exhibitor should choose his own judge is monstrous, and therefore we are glad to find that a mistake on this point has been avoided. The Council has, in the committees which carry on its most important horticultural work, the help of a strong body selected from amongst the most intelligent of our horticulturists, amateur and professional; these are quite sufficient for the purpose, and as a general principle we think it is due to the members of these committees, while perfectly safe for the Council, that the judges should be selected from amongst them. Anyhow the nomination should rest with the Council. If the members of this august body do not know enough of their committees to use them to the best advantage, in the interests of truth and justice, they are not the right men to occupy their position.

THE debate in the House of Commons on Mr. AYRTON'S DISMISSAL of Mr. BARRY, the architect to the Palace, from his employment, was rather a curious one, insomuch as the advocates on either side seemed to be labouring under the disadvantage of an incomplete case. While the leading principle on which the Government staked the issue of the contest, namely the right of putting the Palace on the same footing as other public buildings, and of claiming the drawings made for the building (for which the public have already paid) to aid them in this course, was in itself unassailable,—although we by no means wish to imply that the arrangements in force are good, or even that they ought to continue without very considerable amendment,—on the other hand, it was difficult to avoid the statements as to the alleged want of courtesy and the scant consideration that was extended to Mr. BARRY, in return for his long services. For this Mr. AYRTON has, in a great measure, to thank himself. The unseemly language in which he clothed his sentiments on the subject of art and literature in his speech at Southwark, coupled with the novel view he took of the duties he was about to undertake, naturally created a certain amount of distrust in those who, like ourselves, take a deeper interest in these proofs of civilisation, and have a higher conception and a wider view of the mission that is performed by art.

Although out of our usual path of criticism, we make no apologies for alluding to the debate, as Mr. AYRTON has many public parks—of which we are justly proud—as well as public buildings under his charge; and we were somewhat alarmed as to what practical results his views on these matters might lead, and feel confident that it was some such distrust as this that induced so large a minority in the House to pass a vote of censure upon his conduct, although a large majority decided, and we hold rightly, that the abstract principle called in question was correct.

But it is rather unfortunate for Mr. AYRTON, as well as for the country, that he should be called upon to preside over works for which he has so little sympathy. His peculiar views on subjects relating to Art scarcely compensate for his exceptional administrative ability. It is true his opinions seem to be undergoing some change, or perhaps, as a fact, that they were never so subversive as he painted them. But, while giving him full credit for the reforms he is undertaking, we think he might take a leaf from Mr. COWPER TEMPLE'S book, and by "a friendly bearing towards artists, secure the assistance of the best men," when public works are in contemplation.

THERE is a remarkable passage in the portion of MILNE EDWARDS' "Leçons sur la Physiologie" just published, which has such an obvious bearing on prevalent questions as to the ORIGIN of SPECIES, questions which apply to the vegetable as well as the animal kingdom, that our readers will be glad to have it before them. We have long believed that cellular Cryptogams belong to a totally different series from Phænogams, and perhaps the same may be said of those which are vascular, the similarity of the embryo in Lycopods being one rather of analogy than affinity, but at the same time we are very far from ignoring the immense service which has been done to science by DARWIN'S great work, and merely quote the passage for what it is worth, apart from any views which we may ourselves hold.

After stating the peculiarities which draw a definite line between the development of the embryo in vertebrate and invertebrate animals, the particulars of which would be out of place here, and indeed would, without many details, be unintelligible, our author makes the following general observations:—

"We see then that it is not only in the perfect state that the vertebrated animal differs intimately from every invertebrate, but that this difference manifests itself so soon as it begins to exist in the earliest stage of development. There is from the first an organic plan which is peculiar to it, and the order of primogeniture of the organs is in harmony with that of the importance of the zoological characters to which its structures will give rise. It is not yet characterised as a mammifer, or bird, or

reptile, or batrachian, or fish; it is merely a vertebrate, and yet differs already from all the inferior animals by the general plan of its organisation.

"The facts thus furnished by the study of embryology are in complete contradiction to the views of certain naturalists who have considered the *ensemble* of the animal kingdom as the result of the more or less complete development of one and the same organism, which, arrested as it arrives at different degrees of perfection, should constitute sometimes a monad, a zoophyte, a mollusk, sometimes a fish, a reptile, or a man. This hypothesis of the production of the long series of zoological species by a certain number of arrests of development, either in the whole of the animal economy or in one or more organs in particular, has been presented under different more or less seductive forms to those who are content with vague perceptions or gross resemblances; but the facts which I have just indicated show that it is not the expression of truth. The organisms of a vertebrate animal in the course of formation never passes by conditions similar to those which prevail in the formation of an annelide, mollusk, or radiate; and when we formulise these pretended laws as follows, 'The animal series considered in its organisms is but a long chain of embryos arrested from post to post, and ending in man,' so that 'the human organogeny is a transitory comparative anatomy, as in its turn comparative anatomy is the fixed and permanent state of human organogeny,' we merely present imaginary views, which are not in accordance with facts."

It is added in a note, of which we extract merely a portion:—

"These views were of ancient origin. In accordance with them, man commenced his existence as a worm, then was analogous to a mollusk, then to a fish, thus undergoing a series of transformations, whose different terms had permanent representatives in the different inferior types of the zoological world. As, however, comparative anatomy was better understood, it became evident that there are only very distant resemblances between the apodous larva of an insect and a worm, and that the embryo of the fowl is in no period of its existence fashioned after the manner of a worm or caterpillar."

We must refer to the work itself for further details. *M. T. B.*

—— In the *séance* of April 11, "Nature" says, M. Duchemin brought before the Academy of Sciences of Paris the following curious fact in Natural History:—In the park of the Château de Montigny (Eure), belonging to M. Deroche, there is a large piece of water, through which a gentle current of beautifully clear water flows. In this lake numerous Carp are reared, which thrive well, except during the first days of spring, when each year an extraordinary mortality occurs amongst them. In each animal one morbid symptom is always observable in the dead animals as they float on the surface of the water—in every case the animal is blind; a kind of film covers the eyes and even a part of the head. An examination of the body brings to light no internal disease, beyond a slight fatty degeneration of the tissues. The viscera appear healthy, and contain no intestinal worms. The cause of this strange malady has not hitherto received any notice; but from M. Duchemin's researches, in conjunction with M. Deroche, it seem that the toad (Bufo calamita) is an enemy, if not of all fishes, at least of the carp in spring. It attacks it, exhausts it, conquers it, and kills it. To determine the point, they examined all the carp in the pond, and found squatting on the head of each of those that were diseased an enormous toad, the fore-paws of which were placed on the two eyes of the unfortunate fish. Thus this ugly batrachian, which presents so stupid an aspect, has yet sufficient intelligence to assume the offensive, and to overcome a large fish. If it has not agility and energy, it has cunning and perseverance. It would appear to kill by exhaustion, but it remains to be ascertained whether the acrid secretion of its skin assists in the conquest.

—— Those of our readers who may be familiar with Swedish, and at the same time interested in the process of Fertilisation of Plants, should read a recently issued treatise by M. Severin Axell, the title of which runs as follows:—"Om Anordningarna för de Fanerogama Växternas Befruktning." It is illustrated with 58 woodcuts, and seems to go over much the same ground as that traversed in Hildebrand's work, already frequently noticed in our columns.

—— In a recent communication to the Swiss Alpine Club, M. Alphonse De Candolle suggests the desirability of searching for the remains of that Vegetation which existed on the Alps previous to the formation of the glaciers. The Alps, he points out, assumed their present contour and actual height at the end of the pliocene epoch. The great development of glaciers and snow took place in the subsequent geological epoch. As snow and ice are conservative agents, so he thinks it possible that remains of crustacea, diatoms, seeds, &c., may exist buried in the ice at great depths. In commenting on this suggestion, Professor Heer, a great authority on matters connected with fossil botany, says that the chances of finding any such remains as those indicated by Professor De Candolle are very slight, because, 1. Organised beings only pass into the fossil condition under rare and exceptional circumstances; 2. The so-called perpetual snow is not really perpetual, the upper layers exert a pressure on the lower and squeeze them down the slopes of the mountain, so that the rocky surface of the latter is necessarily denuded. The only chance of finding such remains as M. De Candolle alludes to, would be to search in the deep bowl-like cavities or fissures where the snow and ice are not subjected to this constant movement. Lastly, M. De Candolle suggests, what seems more practicable, and what certainly is desirable, the fixing on the summit of Mont Blanc, or other lofty mountain, of some guage by which the depth of the snow and ice could be ascertained from time to time. He describes an instrument adapted for the purpose. As to the seeds, &c., we think that if they by chance survived the crushing and grinding of the glaciers, they would be found at the lower end of the glaciers—in the moraines. We are not aware that any fossil remains of the kind indicated have been found in such situations.

—— The Strawberry Crinoline is an article of garden utility, which at this season of the year will soon be in demand. It was invented by the late Sir Joseph Paxton, was thoroughly tested by him in his garden at Rock Hills, Sydenham, and wherever it has been subsequently tried has, we believe, met with approval. The object of the "crinoline" is to keep the fruit of the Strawberry well up above the soil, and while thus preserving it against dirt, damp, and vermin, to facilitate the ripening process. It may be described as a wire table 16 inches in diameter, made of concentric rings; this is elevated on legs a few inches above the ground. It is made in two semicircular pieces, so as to fit neatly together, with the plant in the centre. The whole is galvanised after being put together, and in this way is made quite firm. The contrivance is simple but most efficacious, and one which may be recommended for general use. It especially recommends itself to amateurs, who grow a few choice sorts of Strawberries.

—— Planters will do well to inquire for Siebold's Malus floribunda, specimens of which, in all their beauty, were forwarded to us by Mr. Cripps, of Tonbridge Wells, and others were shown at the Royal Horticultural Society on Wednesday. It is impossible to imagine anything more lovely in the way of Apple blossom. Moreover, the tree is, we are assured, quite hardy. It was figured a few years since in Van Houtte's "Flore des Serres," t. 1585—9, but has not attracted the attention it merits. Professor Koch, in his "Dendrologie" considers it a variety of Pyrus spectabilis, from which, however, it seems to us abundantly different. Von Siebold, who introduced it, stated that it was a hybrid, which is so far confirmed by the statement of M. Van Houtte, that from seeds of this present plant he obtained seedlings of Pyrus Ringo. Grafted on the Paradise stock it would form a bush, which from the beauty and abundance of its flowers may fairly claim to be unrivalled among hardy flowering shrubs. It must find a place in Mr. Mongredien's next edition.

—— The chief Meteorological Feature of the week ending May 14 was the anxiously looked for *Rainfall*, which varied greatly in amount at the different stations, for whilst at Blackheath and Norwich the fall was less than four-tenths of an inch, at Portsmouth and Bristol it amounted to more than 1 inch: at several of the other stations in England the fall exceeded nine-tenths of an inch. In Scotland the fall ranged from a little more than two-tenths of an inch at Paisley and Leith to 1.8 inch at Greenock. The mean Rainfall for the 16 stations in England was 0.73 inch, and for the several stations in Scotland 0.92 inch. The rainfall at Dublin amounted to little more than half an inch. The Maximum Temperature in England ranged from 61° at Newcastle to 68.5° at Salford, and in Scotland from 59° at Dundee and Greenock to 66° at Paisley. The mean of all highest in England was 63.5°, and in Scotland 61.6°. The Minimum Temperatures in England ranged from 27° at Hull to 42° at Manchester, and in Scotland from 36° at Edinburgh to 43° at Paisley. The mean of all lowest in England was 36.1°, and for Scotland 40.1°. The *mean temperature* of the week in England ranged from 47.4° at Hull and Portsmouth to 51.7° at Manchester; and in Scotland from 47.5° at Dundee to 50.7° at Paisley; the mean for the several stations in England was 49.1°, and for Scotland 48.7°.

—— Much difficulty is often experienced by cultivators in obtaining Soil of good quality for the growth of choice Pot Plants. We are therefore glad to be able to report favourably on a sample of Peat Earth which has been sent us by Mr. W. J. Epps, of Lewisham, who some years ago was noted as one of our best cultivators of specimen Heaths, and who therefore must know exactly what is suitable for plants of such delicate organisation. This difficulty of getting a supply of good peat, properly selected and divested of all inert and superfluous matter, which has seriously hindered the successful cultivation of choice plants, more especially in the case of small growers, who do not require large quantities, has led Mr. Epps to make arrangements to supply peat selected from the best growths, and divested of all crude and sour matter, so as to render it fit for immediate use. This peat is sent out tightly packed in casks, and will therefore travel without damage to any distance. The sample sent to us was first-rate in quality, and, packed in this way, arrived in excellent condition. We have no doubt that many plant-growers, who are inconveniently situated in regard to obtaining good peat earth, will be glad to know of such a source of supply.

—— A Cricket Match between Married and Single (Benedicts and Celibates), both being *employés* in Messrs. Carter & Co.'s seed firm, was played on the Match Ground, at Battersea Park, May 7, resulting in an easy victory for the married.

PORTRAITS OF GARDEN PLANTS.

Acacia Riceana, *Bot. Mag.* t. 5835.

One of the most beautiful of the Acacias, with the habit of a Weeping Willow, and a profuse golden inflorescence. Its slender, whip-like, pendent branches are clothed with linear-subulate phyllodes, and from every axil droops a spike of golden flower-balls. Dr. Hooker calls it "by far the most beautiful Acacia of Tasmania." At Floors Castle "a single plant festoons the glazed corridor for full 50 feet of its length, flowering during many months of the year, from March or April onwards."

Antigonon leptopus, *Bot. Mag.* t. 5816.

This beautiful Polygonaceous climber is, in its native country, said to rival the Bougainvillea in the profusion and beautiful tints of its inflorescence. Here it seems to be a tall, slender climber, requiring the temperature of an intermediate house. The leaves are membranous, ovate or ovate-hastate, and acuminate, and the racemes of bright rosy-sepaled flowers are both axillary and terminal, the peduncles running out into branching hooked tendrils. It is a native of Mexico and other parts of South America, and was flowered at Kew last autumn from plants raised from seeds sent from the Sandwich Islands.

Arenaria purpurascens, *Bot. Mag.* t. 5836.

A tufted decumbent herbaceous plant, forming masses of several inches in diameter, clothed with ovate-lanceolate leaves, the short erect branches producing two or three pale pink starry flowers, with deep red stamens and pistils. The stems are also red. It comes from the lofty mountains of the Pyrenees.

Clavija macrophylla, *Bot. Mag.* t. 5829.

A noble stove shrub, with a simple stem, surmounted by a magnificent crown of 18—20 obovate oblong sinately-toothed leaves, 12—20 inches in length, intermixed with shorter ones, amongst which appear the numerous loose slender many-flowered racemes of orange-coloured flowers. The plant figured was imported by Mr. Wilson Saunders from Brazil, where it was collected by the unfortunate Bowmann, and is rather doubtfully referred to the C. macrophylla, on account of some discrepancy with the description of the flowers.

Curcuma petiolata, *Bot. Mag.* t. 5821.

A charming tuberous-rooted stove herb, of the Scitamineous order. The leaves are rather large, oblong-lanceolate acuminate, with a rounded or cordate base; and the flower-spike is 5 or 6 inches long, on a stout peduncle, and consists of from 20 to 30 reniform or shortly ovate rosy purple bracts, in the deep hollows of which are seated the pale yellow flowers. The species is a native of the forests of Pegu and Martaban; the specimen figured was sent to Kew from Moulmein by the Rev. C. Parish.

Cyclonema myricoides, *Bot. Mag.* t. 5838.

An interesting dwarf Verbenaceous stove shrub, "which has been long in cultivation in the Palm-house at Kew, flowering annually in spring, but how or from whom procured is not known." It has scattered angular branches, oblong-lanceolate or obovate toothed leaves, and fascicled axillary cymes of curious flowers, of which the four upper segments are almost white, elliptic, and set so as to form a cross, while the fifth is longer, obovate-spathulate, and coloured blue. Its range extends from Abyssinia to Natal, reaching to 7000 feet elevation in the former country.

Dahlia imperialis, *Bot. Mag.* t. 5813.

This magnificent plant has been so frequently alluded to in our columns, that description is unnecessary. Dr. Hooker's figure, derived from the Chiswick plant, does not at all exaggerate its beauty, though the original figure in the "Gartenflora" was "literally not one-third the size." The Lily-like aspect of the drooping capitulæ is remarkable.

Delphinium nudicaule, *Bot. Mag.* t. 5819.

An attractive-looking hardy perennial herb, nearly allied to D. cardinale, but smaller and said to be more manageable. The leaves are tripartite with numerous segments, and the scape, which grows from 12 to 18 inches high, is loosely racemose, bearing several flowers, of which the sepals and spurs are of a bright orange-red, and the petals bright yellow. It has been raised from Californian seeds by Mr. W. Thompson, of Ipswich.

Dendrobium lasioglossum, *Bot. Mag.* t. 5825.

One of the many choice Orchidaceous epiphytes discovered in Burmah by Col. Benson, and sent home by him. It is likely to prove a very useful plant for cutting. The stems are slender, erect, bearing lanceolate acuminate leaves, and when mature, numerous short racemes of white, fleshy-looking flowers, having a few red streaks on the lip, and a tuft of yellow hairs on the disc.

Enkyanthus japonicus, *Bot. Mag.* t. 5822.

An elegant Japanese shrub, probably hardy, introduced to cultivation by Messrs. Standish and Co. It forms a slender, deciduous shrub, with whorled branches, membranaceous elliptic-obovate leaves, which acquire a golden tint in autumn, and white globose nodding flowers, which have five saccate pouches at their base. It is more nearly allied to the Indian E. bimalaicus, than to the Chinese E. quinqueflorus.

Hernandia Mœrenhoutiana, *Bot. Mag.* t. 5839.

A native of the Pacific Islands, forming a shrub or small tree, furnished with coriaceous oval-oblong or ovate-cordate leaves, and axillary corymbs of flowers, of which involucral leaves, sepals, and petals are all of a pale buff-yellow. "It is closely allied to the well-known Hernandia sonora of the East and West Indian Islands, the juice of

which has the property of destroying the hair without pain when applied to the head; and the light wood of which is used for floats for fishing nets, and is said to take fire from a flint and steel, like German tinder."

PALMS.—No. V.

Verschaffeltia (Wendl. in Fl. des Ser., t. 1507—1598). -The adjectives lavished on the typical species of this genus—"splendid! magnificent! princely! majestic!" and, to complete the climax, those of "heavenly" and "divine" might be added—the adjectives, we say, show that we have here to deal with a genus of extraordinary beauty. Indeed, few plants of this order can be more striking than a well-grown V. splendida, such as may be seen in Messrs. Veitch's and some of our other Palm-growing establishments. Van Houtte has also given us, in his excellent "Flore des Serres," an illustration of this Palm in its native valleys of the Seychelles Islands, surrounded by Travellers' Trees (Uranias) and feathery Palms, where it throws up its erect but unarmed trunk, and displays its large simple leaves with their spiny petioles to advantage. Mr. Duncan, late of Mauritius, was the first who brought this noble species into notice, naming it Stevensonia viridifolia, because the leaves, in contradistinction of those of S. grandifolia (Phœnicophorium sechellarum), are green on both sides of the blade. Gardeners then named it Regelia princeps, majestica, and magnifica, but as there is already a well-established myrtaceous genus Regelia, that name had to be withdrawn in favour of that of the great Belgian nurseryman. A second species has since come to light in V. melanochætes, also a plant of rare beauty (fig. 133). The genus is one of the spiny Arecaceæ, but not yet well known technically. The fruit is a round drupe, with erect seed, ruminate albumen, and basilar embryo. The flowers have not yet been described.

Ptychosperma (Labill.; *Seaforthia*, R. Br.).—The focus of the geographical distribution of this extensive genus is in the Indian Archipelago, but four species are now known from New Holland, viz., P. elegans, Bl. (Seaforthia elegans, R. Brown, non Hook. Bot. Mag.; P. Seaforthia, Miq.); P. Cunninghamii, Wendl. (Seaforthia elegans, Hook. Bot. Mag., non R. Br.) P. Alexandræ, F. Müll., and P. Veitchii, Wendl. The Society Islands have disclosed one species (P. tahitiense, Wendl.), and six have been found by myself and others in the Viti Islands, of one of which (viz., P. vitiense, Wendl.) I have seen a young specimen in the collection of the Messrs. Veitch. One of the most common garden plants is P. Cunninghamii, of which there are fine large specimens cultivated in nearly every garden under the erroneous name of Seaforthia elegans. As already stated it is doubtful whether the genuine P. elegans (Seaforthia elegans of R. Brown) is in cultivation), or, indeed, whether even in Australia it has not disappeared through the process of clearing. P. Alexandræ, of which Dr. von Müller has given a portrait in his "Fragmenta," and which he named after her Royal Highness the Princess of Wales, is now to be found in many collections; but P. Veitchii I have only seen in the establishment of the enterprising nurserymen whose name it bears. A singular species is the P. filiferum, the lowermost leaf-segments of which, being narrow, and at least three or four times as long as the uppermost, hang down in fringes. When in the dusk of evening I first encountered this singular Palm in Viti, it was this peculiarity which attracted my attention, otherwise I should have taken it for Veitchia Johannis. It was pitch-dark before the tree was felled and dragged out of the forest towards the beach, but on passing my fingers over the leaves I felt a thick marginal vein, which assured me that I had added an undoubtedly new species to my collection. P. Seemanni, another Viti Palm, is only 8—10 feet high, and is used, on account of its straight trunk, for spears by the natives. Decidedly pretty is P. maculata (Pinanga maculata, Port.), a native of the Philippine Islands, the leaves of which (at least those of the young plants) are of light green, marked with dark green blotches. P. nobile (generic name doubtful) is also a fine species, with that bold habit imparted by the direction of the leaves approaching the perpendicular; moreover it has petioles of a delicate pink tinge, which greatly add to the beauty of the foliage. Garden catalogues offer, besides P. latisectum (Pinanga latisecta), gracile, polystachyum, rupicolum, and a few others, but the bulk of the species remains to be introduced. The Ptychospermas are erect Palms, with unarmed, smooth trunks, and pinnated leaves, the uppermost segments of which are generally like the fins of a fish; the flowers are monœcious, the males having numerous stamens, and the females a one-celled ovary and trifid stigma; the fruit is one-celled and of small size, the albumen ruminate. They are found in the depths of forests, and a few species overtop in height the surrounding trees, forming what St. Pierre has poetically described as "a forest above a forest."

Veitchia (Herm. Wendl. in Seem. Flora Vitiensis, p. 270, t. 81) is closely allied to Ptychosperma, which it resembles in habit, but from which it differs in the position of the male flowers (arranged in couples on the upper part of the spadix), in having only six stamens; in its hemianatropous, almost longitudinally affixed ovules; in its large fibrous mesocarp, and in its even albumen. The genus was named in honour of Mr. John Veitch, who, during his visit to the Viti Islands, added another species to those previously known, the first having been discovered by the United States Exploring Expedition in 1840, but not described until I brought home additional materials in 1861. As yet only one species (V. Johannis) has been introduced into our gardens. Young plants of it were safely brought by me to Sydney, and there placed in charge of Mr. C. Moore, of the Botanic Gardens; but those I sent to Kew died on the passage home, and it was reserved for Mr. Veitch finally to introduce the species to English gardens. In Viti this Palm is rather common, and known as "Niu sawa," sawa signifying "red," in allusion to the colour assumed by the ripe fruit. The kernel is eaten by children. Another noble species is V. Storckii, called after my assistant, Mr. J. Storck, who sent a complete spadix of it, several feet long, to the British Museum. This is known as "Vuleito" in Viti, and is an ornament of the banks of the Rewa river; a sketch of which will be found in the "Narrative of the United States Exploring Expedition." V. subglobosa is a third species, from the same island; and V. spiralis, a fourth, from Aneitium, where it was discovered by M'Gillivray. The Veitchias are unarmed Palms, with smooth trunks, about 40—60 feet kigh, pinnate leaves, monœcious flowers, appearing below the leaf-crown, six stamens, and ovoid drupes of a bright colour.

Fig. 133

Dypsis (Noronh.)—A genus of unarmed Cane Palms, with pinnated leaves, monœcious flowers, 1-seeded berries, and ruminate albumen, inhabiting Madagascar, and allied to Ptychosperma; it is composed of about four species, none of which, as far as I know, have as yet been introduced into our gardens.

Orania (Zipp. non Blum.; *Macrocladus*, Griff. Palms of the East Ind. t. 239).—This genus has the leaves and female flowers as in Arenga, the spathes as in Cocos, and the fruit as in Corypha, and was discovered in New Guinea by Zippelius, who gave it the family name of the King of Holland. There are only two species, the O. regalis, the type of the genus, and O. macrocladus (Macrocladus sylvicola, Griff.); the latter is a native of Malacca, where it grows in the forests, and is known by the name of "Ebool," or "Eboel;" specimens of which may be seen in the collections of Messrs. Bull, Veitch, and Williams. It is a stately Palm, with an unarmed ringed trunk, pinnate leaves, pendulous spadix, monœcious flowers, 1-seeded drupes, and even albumen.

Sclerosperma (Mann et Wendl. in Trans. Linn. Soc. xxiv. p. 427, t. 38, fig. C, and 40, fig. A).—This is a highly interesting genus, interesting because it approaches in its technical characters Phytelephas, Nipa, Manicaria, and Orania, and has extrorse anthers, and the position of the female flowers, to which must be added a distinct habit, well indicated in one of the plates above quoted. At present there is only one species known, viz., S. Manni, Wendl., which grows on the West Coast of Africa in swampy places near the Gaboon, from Point Clara upwards. It is a stemless cæspitose Palm, sending forth from the root-stock a mass of elegant pinnated leaves (10 13 feet long), with prærmorse leaflets, glaucescent above and whitish below. The flowers are monœcious, the fruit drupaceous, and the albumen large and hard like that of the Vegetable Ivory. Wendland justly regrets that the attempt to introduce this Palm has failed.

Socratea (Karst., Wendl. in Bonplandia, 1860, p. 103).—This genus has been separated from the allied Iriartea, from which it differs in several technical characters, but they may be distinguished at once by their respective taste. Whilst the "heart" of the leaves, indeed the whole plant, is very bitter, and therefore rejected by the natives as that of a "bitter Palm" unfit for "cabbage," that of the Iriarteas, as now restricted, is sweet, or at all events not bitter, so as to allow of their being eaten. Dr. Spruce objects to the genus, but in this place it would lead too far to discuss the merits of the case. The Socrateas have trunks supported on a cone of prickly roots, raised several feet above the ground, so as to appear as if they were placed on stilts. The trunk is unarmed, smooth, and distinctly ringed, crowned by a few paripinnate leaves, with pinnatisect leaflets; the spadices are placed in the axils of the leaves, and are either erect or horizontally patent, only bending down (unlike Iriartea) by the increasing weight of the berries. The flowers are monœcious in the same spadix, the male having 24, and even more stamens, the berry being 1 or 2-seeded, and the albumen even. We know only four species, viz., S. elegans, S. Orbignyana, S. exorrhiza, and S. (?) durissima. S. exorrhiza (Iriartea exorrhiza) is cultivated in our gardens.

Iriartella (Wendl., Bonplandia, 1860, p. 103).—I. setigera, the only representative of this genus, is a slender little Palm, of the stems of which the natives of the Amazon region make their blowing canes for shooting birds. "It is one of the very few Palms," says Dr. Spruce (somewhat invalidating by this a general remark he made on the habit of all Iriarteoous Palms), "that send out prostrate suckers from the root." The

Brazilians term it, "Paxiuba-i." River banks are its favourite haunts, where it attains 10 to 20 feet in height. The leaves are from 4½ to 5 feet long, and pinnate, the leaflets wedge-shaped, rhomboid, and præmorse at the point. The genus is closely allied to Socratea, with which it agrees in the apical embryo, but differs in the fruit, having the stigmatic scar a little above the base on the inner side, and not near the apex; the raphe is divided into ten filaments, which are slightly anastomosed. It seems still to be a desideratum in our living collections.

Catoblastus (Wendl., Bonplandia, 1860, p. 104). —Two species, C. præmorsus (Iriartea præmorsa), and C. pubescens (Iriartea pubescens), both natives of Venezuela, are the only known members of this genus, the former of which is under cultivation. They have the habit of Iriartea, but differ in technical characters. The leaves are imparipinnate, and the leaflets simple, whilst the spadices appear below the leaf-crown, bearing male and female flowers mixed, and a 1 or 2-seeded berry, with ruminate albumen.

Wettinia (Pœpp. et Endl.)—The first discoverers of this genus were the Spanish botanists, Ruiz and Pavon, of whose specimens certain fragments came into the hands of Martius, who figured them as belonging to a doubtful Arecacea from Peru (Hist. Palm. t. 166, fig. 7). The same species was afterwards found by Pœppig, but the specimens of it which he brought home, though showing that they belonged to an undescribed genus, were again so imperfect that the plant was held to be a Cyclanthacea rather than a Palm, and named W. augusta. Wendland has the merit of first pointing out the true systematic position of the genus near Iriartea. Dr. Spruce arrived at the same conclusion when travelling in Peru, and when he could not possibly have known what Wendland (Bot. Zeit. 1859, p. 73) had written on the subject. At present we are acquainted with three species, presuming that W. augusta and W. maynensis are really distinct, viz., W. augusta, from the Rio Tocache of Peru; W. maynensis, from the Maynenian valleys of the Andes; and W. panamensis, from the Isthmus of Panama. The latter was discovered by me in 1847, but mistaken for a species of the allied Iriartea, which at that time was not so well worked up as, thanks to the labours of Wendland, Spruce, and Karsten, it is at present. Only one species (W. maynensis) is as yet in cultivation. Wettinia has the habit of Iriartea, the prickly roots emerging above the ground, and supporting a tall, slender, unarmed trunk, with pinnatifid leaves, having long semi-lanceolate segments, equidistant, and all spreading out horizontally. The berry is invertedly pyramidal, hirsute, the albumen even, and the embryo basilar. The Peruvian species grow in company with several genuine Iriarteas, and it is stated that the natives sometimes cut them down for "cabbage," but soon become aware of their mistake on discovering the bitter quality of the leaves.

Dictyocaryum (Wendl., Bonplandia, 1860, p. 106, et Bot. Zeit. 1863, p. 128).—A small genus of the Iriartea group, and inhabiting tropical America. Wendland has only described one species of it (D. Lamarkianum), and a second I find in Mr. Bull's catalogue under the name of D. Wallisii, probably introduced from Brazil by that zealous botanical explorer, Mr. Wallis. It has the habit of Iriartea, from which genus it differs in several technical characters.

Iriartea (Ruiz et Pav., Wendl. in Bonplandia, 1860, p. 101; *Deckeria*, Karst. in Linnæa, xxviii., p. 258).—Owing to our imperfect knowledge of all the Iriartea-like Palms, a good many species were until recently referred to this genus, including even the Wax Palms of the Andes (Ceroxylon): and Dr. Spruce says, that "all these are so alike in habit that the Brazilian Indians unhesitatingly give them the same generic [*i. e.*, collective] name ('Paxiuba'); and a closer examination reveals so many essential resemblances that the botanist will probably indorse the opinion of the savage, and continue to unite these Palms under one title. Perhaps Ceroxylon and Wettinia are the only genera of this group, with the stem supported on an emersed cone of roots, which ought to be kept separate from Iriartea." Wendland is of different opinion, and characterises Iriartea proper by the embryo being lateral a little below the middle of the seed, and the filaments of the raphe distinctly anastomose. I. deltoidea, R. et Pav., is taken by him as the type of the genus, with which agree generically I. ventricosa, phœocarpa and Corneto. These Palms have a cylindrical or much swollen trunk, imparipinnate leaves, the leaflets of which are deeply pinnatifid, and præmorse at the point. The spadix appears below the leaf-crown, and when young has a certain resemblance to a horn, hence the Spanish name "corneto" given to one of the species, which Karsten adopted as a specific name; this Wendland altered into "cornuta," but "corneto" is quite in accordance with the genius of the Spanish language—corneta as name for the tree would be incorrect. The flowers are monœcious in the same spadix, and the berries more or less globular and of dark green colour. All the species are confined to the tropics of continental America.

Ceroxylon (H. B. K.; *Klopstockia*, Karst. in Linnæa, xxviii., p. 251). — Wendland has shown (Bonplandia, 1860, p. 69) that the genus Klopstockia is identical with Ceroxylon, the genus which embraces those South American Palms which exude a resin-like wax, which gives to their lofty stems a white and marble-like appearance, imparting a striking feature to those mountains where they abound, as in Quindiu, in New Grenada. To obtain the wax the tree must be felled, and in order to convert it into candles it must be mixed with tallow, to prevent its burning too fast. C. andicola was found in the Andes, as high as 9700 feet above the sea level, in company with Podocarpus and Oak trees, and may prove hardy even in the milder parts of England. It has long been an inmate of our Palm-houses, as has also C. Klopstockia (Klopstockia cerifera). Other species, worthy of a place in our collections are C. interruptum, utile, and quindiuense. Whether Morenia Chonta of Chili (one of the many Palms called Chonta in Spanish America) is also a member of the genus, is as yet doubtful, though Philippi vouches for it. All the Ceroxylons are trees with pinnated leaves, the underside of which is of a more or less intense white colour, rendering them desirable additions to collections. *Berthold Seemann.*

EPIMEDIUMS.

Epimedium alpinum (L.).—The leaves and flowers of this lovely little plant come up together in spring. The leaflets are heart-shaped, unequal-sided, fringed with hairs, supported by thin wiry stalks, and of great delicacy when young, but very hard when mature. The raceme is loose, and about 6 inches long. The sepals are red, and within or upon them rest the pale yellow or white spur-shaped, hollow petals. This species is easily increased by parting, and both this operation and that of transplanting should be performed in autumn. It delights in friable loam, with an occasional top-dressing of leaf-mould, and plenty of moisture during the growing season. It is adapted for the border, the rockwork, or the margins of shrubberies, and does not care much whether it is exposed to direct sunlight or not. If grown in a pot, the soil should be renewed every third year at least. It inhabits various parts of Southern Europe, and is sometimes declared to be a native of this country. There is a variety from Japan larger, and more handsome, though less hairy, than the typical form, and known by the very descriptive name of "roseum." I may here mention that I have never noticed seed on any member of the genus to which the present subject belongs.

E. diphyllum (Lodd.) is one of those neat and elegant plants which make some writers go into literary hysterics. It seldom rises above 6 inches in height, and one stalk serves both leaves and flowers for some distance. Shortly after the rich green foliage is fully grown, the pure white drooping blossoms expand. This may be known from all the other species of Epimedium by its corolla, which has no spur. Indeed, the absence of this has been taken as the character for a new genus, so that the plant is distributed under the name of Aceranthus diphyllus. Although quite hardy, its powers of endurance are not so great as to fit it for every ordinary border, but it is admirably adapted for any place which is both sheltered and shaded. In other respects it should be treated like E. alpinum. It is a native of Japan, and blooms early in summer.

E. macranthum (Lindl.).—Sometimes this species is grown under the name of E. grandiflorum, and so distinguished a designation is well deserved, for it is decidedly the most beautiful species of the genus. The lobes at the base of the leaflets are rounded, whilst along the margins occur occasional hair-like projections. The flowers are very large and drooping, and the spurs of the lilac petals are remarkable for being twice as long as the sepals. It blooms early in spring, and also occasionally in autumn. It is a native of Japan, and should be treated exactly like E. alpinum.

E. Musschianum (Morr. et Decaisne).—A cultivator seeing this when not in bloom would undoubtedly look upon it as the most distinct of the genus, because of its peculiarly erect and compact habit. Nevertheless, it is not easy to tell in what particular its leaflets differ from those of E. alpinum. The flowers come up with the leaves, and open early in spring. Moreover, they are pure white, and in this point agree only with those of E. diphyllum, but here there are spurs to the petals, whereas there spurs are altogether absent. It is a native of Japan, and should be grown in the same way as E. alpinum.

E. pinnatum (Fisch.).—Although this does not need shelter, yet when so treated it is evergreen. It is the only known species of the genus in which the leaf-stalk is distinct from the flower-stalk from the very beginning. The sepals are very much larger than the petals, and of a bright yellow colour, contrasting curiously though pleasantly with the neat little brown or red spurs of the petals. It requires the same kind of treatment as E. alpinum. It is a native of Japan, and blooms early in spring. There is a variety known as "elegans," which has uncommonly large racemes.

E. violaceum (Morr. et Decaisne).—The habit of this plant is similar to that of E. macranthum, but here the leaflets are regularly fringed with hairs, in the former they are not. Besides, in the present species the spurs of the violet-coloured petals are not half the length of those belonging to the other kind, being not longer than the sepals. It is a native of Japan, flowers in spring, is quite hardy, and ought to be treated in the same way as E. alpinum.

The preceding are all the Epimediums known to botanists, and yet in a nurseryman's catalogue, now before me, I find no less than 15 names disposed in a way which implies the possession of as many species. Surely no harm would accrue either to horticulture or the public from a reduction of that number. *John Duncan.*

A VILLAGE GARDEN SHOW.

"A garden is itself a comfort, and a badge of comfort. It is also an ornament, and the ornamental is sometimes no contemptible part of the useful. It makes home more pleasant, which, again, tends to improve the labourer's conduct to those who share it with him. Much more might be said of the beneficial influence of cottage gardens." *Edinburgh Review*, vol. 81.

In the county adjoining that where I reside there is a village which in most respects is the prettiest I ever saw. The cottages are nearly all old-fashioned ones, with thatched roofs; not a few of them are adorned with neatly trained climbers, Honeysuckle, Jasmine, Roses, or Ivy. On some of the cottage fronts, or on the gables, whichever chances to have the sunniest aspect, an Apricot or Pear tree is to be seen; and the Vine, too, is also to be found on some of them, contributing the adornment of its handsome leaves from early summer with the added charm of its lovely bunches of fruit later in the year. I do not think there is a single cottage in this village without its patch of garden ground, while, thanks to the considerateness of a good landlord (most of the village belongs to one proprietor), many of them have a *large* garden attached.

As example is invariably better than precept, a page from the history of this village may possibly be more useful than the most minutely didactic account of how a village garden show may be set on foot, and I therefore bespeak for it the thoughtful consideration of all who are interested in the welfare of our rural population.

A stranger's first impression on visiting this village is that it is an unusually tidy one. He soon finds that this impression is produced by the combined effect of clean cottages and well kept gardens. Fruit and vegetables; and flowers—"those stars so blue and golden that on earth's firmament do shine,"—are all in considerable abundance. Now the bulk of the cottagers are poor; most of them, indeed, are only farm labourers; and farm labourers' cottages are very often anything but models of cleanliness. But if the stranger pays a visit to the cottages of this village he will find them as decently kept as the gardens outside them, for the women, as a class, are housewifely and industrious.

It must be stated at once that a passion for gardening exists in this village. Husbands, wives, and children, seem to be all fond of the pursuit; and during the spring, summer, and autumn months it is a very pleasant sight to see these humble cottagers, in their leisure hours, vieing with each other who shall till their gardens best, while the outside world's greater excitements and pleasure-giving pursuits are miniatured here by the contests who shall have the earliest Peas and Potatos, or cut the first Cabbage; whose bush fruit shall be cleanest and heaviest, or whose main crop of Potatos shall yield the finest roots and the largest measure per rood.

Perhaps some of my readers will fancy that I am picturing a rural Arcadia which exists only in my imagination, but there will be others among the readers of the *Gardeners' Chronicle* who will know as well as I do that the village in question, model one as I conceive it to be, has both a "local habitation and a name."

What then, it may be asked, is the reason for the exceptional pre-eminence of this village compared with many others? My long acquaintance with it and the knowledge that it was once very different, warrants me in saying that all is due to the establishment in it some dozen years ago, by the excellent vicar of the parish of a cottager's garden show, and to the untiring care he has ever since bestowed on its management. Before the coming of this worthy clergyman the village was much as most other villages are. Some of the cottages were tidy and pleasant to look at, and there were a few decently kept gardens. But there were many other cottages devoid of attractiveness—too often dirty within and without; while the gardens—well, they were as thousands of cottage gardens usually are—in the winter empty of crops, undug, unpleasant, untidy spots, remnants of old crops rotting in heaps, or left standing attached to Pea sticks or Kidney Bean stakes; ground never dug till late in the spring, and then crops put in anyhow; and, as a consequence, generally unsatisfactory both as to the quantity and quality of their produce. The vicar soon became conscious of the state of things. His predecessor was a great scholar, who knew nothing about gardens or gardening, and to whom it had never occurred that a well-tilled cottage garden is invariably associated with a decently-kept cottage, and assists in the formation of habits of thriftiness and tidyness. The new vicar, as it fortunately chanced, was an excellent practical gardener, an enthusiastic florist, and one well read in social economics. He was not long in determining how to bring about a change. After a few month's residence he invited all the villagers to a tea party, and as there was no charge for admission the invitation was numerously accepted. It was a lovely afternoon early in autumn when the meeting took place, and it was held in the

school-room, which (as well as the church) is situated quite close to the vicarage. After tea the villagers were invited to accompany the vicar to his garden, where, as he told them, they were at liberty to inspect all it contained, the vicar and his wife doing their best to make them feel quite at home. Now the attention of a little group was drawn by him to one or other of the crops, and its cultivation was simply described; then he would go and hold a similar chat with another group. The charms of a well-kept garden were perceived by many for the first time. The visitors were told to help themselves to Currants, Gooseberries, and Raspberries, which hung in plenty and tempting ripeness; and then just before the descending sun showed the parting hour had come, the vicar assembled his humble but gratified friends on the lawn and spoke a few earnest words to them, pointing out how they might make their gardens both profitable and pleasant, and he added, "Next autumn, if we are spared, we will have another meeting;. but then instead of coming to see the crops my garden produces, it shall, with your kind help, be a meeting to look at the crops grown in yours. Now it is my intention," he went on to say, "to summon a meeting of the entire parish as soon as the harvest is completed, to consider how this may be brought about, and I shall then detail some plans which I think may be adopted with benefit to us all. I hope every one of you will try to be present, and will do all you can to assist in the establishment of an annual village festival." After a few more hearty words he bade them all good night, shaking hands with each of his guests as they passed through the wicket gate which led to the adjacent road.

In due time the meeting was held, the vicar meanwhile doing his best to interest some of his influential neighbours in the movement, though it must be confessed he had a good deal of difficulty in overcoming the prejudices of some of the more old-fashioned among them. The school-room was filled. The vicar opened the proceedings, and began by describing a village show in a distant part of the country, where he had lived as curate. He showed how it had increased the comforts and happiness of many homes. He then read a simple but well-considered code of rules and a list of prizes, which he said he hoped might be offered, and ended by proposing the establishment of an annual garden show open to all the cottagers in his parish. He invited the expression of opinion, and was followed by several speakers, some of whom had evidently been warmed by his enthusiasm. Before the meeting ended it was unanimously determined that a show should be held: the rules for its management were agreed upon, and other matters of detail were settled. Every cottager was invited to become a subscriber of not less than 1*s.* annually; the wealthy parishoners were asked to give of their abundance, and a committee of management was chosen.

This meeting marks an epoch in the history of the village, and from it dates the alteration in its appearance and its increased tidyness. The effects were, of course, produced gradually. Some of the more energetic among the villagers set to work at once; their example soon induced others to emulate them, and so the gardens were in time got into a better state of cultivation. During the winter months the vicar delivered several addresses in the school-room on matters concerning gardening practice. His addresses were short, plain, and instructive. He purchased from one of the leading firms of seedsmen a supply of good seeds and vegetable roots, carefully selecting such as were suited for the cottagers, and these were of course sold to them at cost price, which the seedsmen had liberally put as low as possible.

In due time the day for the first show arrived. It was a universal holiday in the village. The show was an excellent one for a first attempt; but every succeeding year it has grown in extent and usefulness, for the vicar, whose efforts have been seconded by a band of willing disciples and helpers, has never relaxed his efforts but has been unceasing in his endeavours to promote the welfare of his parishoners. This is not the place to record how his efforts to promote their social improvement have also advanced their spiritual welfare; but it cannot be improper to state that I know no village of the same size where there is less drunkenness or brawling, tidier cottages and happier homes, or more regular and attentive church-goers. Φιλαι θήs.

INSECT ENEMIES.

PHACECORYNES FUNERARIUS, *Murr.*

ON examining a number of different species of Encephalartos, lately imported from Natal by Mr. Bull, some of them were found in an unsatisfactory state—the stem being soft, with the scales loose and easily detached. On pulling them off it was seen that the whole was absolutely riddled by a white grub, about a third of an inch in length. By-and-by a number of black weevils appeared, each about half an inch in length, which Mr. Bull justly assumed to be the perfect insect of the grub. He communicated specimens of both to me, and I afterwards visited the plants, and obtained a further supply *in sitû*, which enabled me to examine them at my leisure, and I have now to report the result of my observation.

The perfect insect (fig. 135) is a new species of Phacecorynes, a genus dismembered from the old Linnæan genus Calandra (section Sphenophoridæ), chiefly distinguished by the concave form of its abdomen. Two species are already known, both from South Africa,—one, named Sphenophorus Zamiæ by Schönherr; the other, Calandra Sommeri, by Burmeister. The former is black, variegated with ferruginous and black velvet markings. The latter is also black, decorated with black velvet and blood-red markings. The one which I have now to describe is entirely black, with black velvet markings. There are other differences, which will be found noted in the specific description below.

The grub, both in this species and Burmeister's, and therefore probably in all species of the genus or subgenus Phacecorynes, is provided with a pair of recurved semi-fleshy hooks on the last segment of the abdomen; see fig. 138. In other respects it does not materially differ from the larvæ of other Rhynchophori. I have watched the grubs at their work in order to ascertain the purpose of these

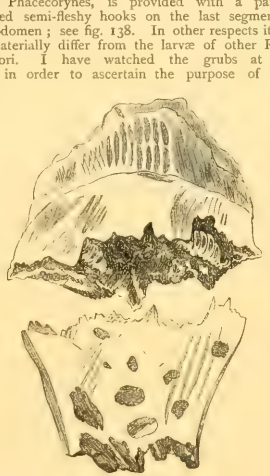

FIG. 134

hooks, and I think it is to push back the *débris* in the passages they make through the stem of the plants in which they live. As the reader knows, the stems of Zamia and Encephalartos are composed of a heart or core composed of reticulations of hard woody matter, with interstices filled up with cellular tissue, very much as the structure of the rhizome of a Fern, surrounded with a covering of large scales, more or less imbricated, like the cone of a Fir tree or the fruit of a Pine Apple. In the exterior lozenge-shaped apophysis of these scales, in the attacked plants, a small round hole is here and there to be observed—doubtless a door of exit made by the perfect insect in coming out. It is too large to have been a door of entrance made by the young larva, and the texture of that part of the scale is apparently too hard for its jaws. Inside I found grubs in all stages, in smaller numbers

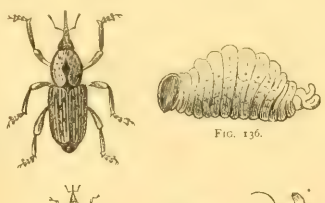

FIG. 135 FIG. 136. FIG. 137. FIG. 138.

in the core of the stem, but very abundant in and about the scales. In pulling the scales asunder the fat, well-fed, little pig-like larvæ dropped out in numbers from the holes or galleries they occupied. Their borings ran in every direction right through scale after scale, and at first I was quite contented with my harvest from thus tearing the scales asunder, but I afterwards found that the numbers I so picked up were as nothing compared to those I had left behind. After I had secured every visible grub, and nothing remained but a pile of apparently riddled empty scales, I found that almost every one of them contained either one or two grubs at work well up in its interior (fig. 134). It was anotheri nstance of what entomologists are familiar with in bark insects. I have seen one man go over a number of trees whose bark was full of insects, and after tearing off quantities of bark give it up in despair without finding one, while his companion coming after him took as many as he wished from the broken bark merely by breaking it down, and looking into instead of under it. The soft farinaceous-looking interior of the scales of Encephalartos crumbles into a reddish granular *débris*, through which these larvæ eat their way; and I see that they have a way of backing a little every now and then with the recurved hooks in a vertical position, which leads me to suppose that their use is to push back the *débris* behind them. They do not seem to be used in assisting progression, although no doubt they do give a leverage when applied against the walls of their borings; but the larvæ do not need any assistance of this kind. If laid on the table, notwithstanding the absence of feet, they walk off at a good pace, solely by the vermicular motion of the segments of the body.

The genus Phacecorynes is one of those subgenera which has always appeared to me to be established on insufficient grounds. In a large genus, in many species of which the abdomen and underside is flat, the fact of this flatness being turned in some into a more or less decided depression does not seem to me of generic value; but if it should prove that the larvæ of those having it are provided with these recurved terminal hooks, while all the rest are without it, it says a great deal in favour of the truth of the generic division as a natural section. Now, it so happens that of the large sub-family of Sphenophori, numbering upwards of 170 species, only four larvæ have been described, one of which, as already said, belongs to this sub-genus, viz., the Calandra Sommeri, of Burm., and it has these two recurved hooks. Westwood ("Modern Classification of Insects," i. 348) speaks of another specimen with this peculiarity in the collection of the College of Surgeons, but he says that in it "the points are more obtuse;" but I have been unable to identify the specimen he saw in the collection in question. I owe thanks to Mr. Flower for the trouble he took in giving me the opportunity of doing so.

The other two species whose larvæ have been described are Sph. liratus, Sch., and Sph. sacchari, Guild., both from the Antilles, and neither have this peculiarity—a simple, single, terminal tubercle being all that they possess. When we know which species are provided with hooks and which not, there is little doubt that we shall find that it corresponds with a good natural generic section, and very possibly a geographical one. As yet the two known to have these terminal hooks are South African, the two without them South American.

When the larva of this species is full grown, I believe that it passes into the chrysalis state in the scales or stem of the tree where it has passed the rest of its life. In the first place I believe this is the habit of all the other Calandras. It certainly is that of the common grain weevil, which undergoes its metamorphoses in the grain on which it has fed. In the next place, if it had gone out to pass its metamorphoses in the ground, Mr. Bull would not (as he has had) every morning a fresh supply of perfect insects lurking about the plants. He cleared them away regularly every day, but each new day brought a new crop; of course he had potted the plants in fresh earth, and if the mature larvæ had passed down to it they would have required a longer time than they had to complete their metamorphoses. And lastly, I succeeded in finding a dormant perfect insect in the heart of one of the scales, surrounded with *débris* on every side. It had no cocoon, nor appearance of chrysalid. The large Calandras (the Rhynchophori) do make a cocoon of the twisted fibres of the stem of the plants on which they feed, but the grain weevil has no cocoon, but comes out in the same way as this species.

The specific description is as follows, viz.:—

PHACECORYNES FUNERARIUS.

Larva (fig. 136-7).—Wrinkled, fleshy, yellowish-white. Head oblong, corneous, light brown, mouth directed downwards. The cephalic plate behind the labrum has six or eight depressions (in a double series) in the middle, and two irregular ones on each side near the anterior margin. No ocelli; no antennæ; clypeus short and transverse, labrum broadly trilobed, mandibles robust, rounded towards the point, the under side concave without basal tooth, but with one or two slight elevations not large enough to be called tubercles along their posterior edge; maxillæ far apart, each almost a fleshy column, most developed on the inner side, bearing on the external angle a short palpus, consisting of two articles, of which the lower joint is tumid, the terminal one minute and pointed; mentum triangular, with the base of the triangle in front, canaliculated in the middle; front with a slight projecting tooth on each side of the middle, and bearing on each side on the external angles a somewhat tumid palpus consisting of two small articles. Thoracic and abdominal segments all well separated from each other, and very wrinkled, the first thoracic segment with a corneous pale yellowish-brown plate along each side of the back, the last segment with two recurved fleshy hooks projecting upwards, yellow, and slightly corneous at the tip. Stigmata nine on each side, all distinct and easily seen, the first twice the size of the rest, placed close to the inferior angle behind the head. Feet, none.

Perfect Insect (fig. 135.)—Affinis Ph. Sommeri, et Ph. Zamiæ, colore toto nigro et segmentis abdominis haud villosis dignoscitur. Long. 5 lin., lat. 1½ lin.

Allied to Phacecorynes Sommeri and Ph. Zamiæ, which like it are both black with black velvety patches on the thorax and elytra, but Ph. Sommeri has also blood-red and Ph. Zamiæ ferruginous markings on the elytra, which this species has not. It has no villosity on the underside, while the depression of the abdomen is villous in both of the others Rostrum smooth shining. Thorax

and elytra opaque, the former coarsely punctate with smooth irregularities, and with a black velvety diamond-shaped patch in the middle, and three curtailed similar patches at the base (the lower third of each being absent), one in the middle and one on each side. The elytra deeply crenate-striate, the interstices punctate-striate with irregular velvety black patches on the interstices, forming a largish black velvet patch about the middle of the elytra, a smaller one behind the middle and points of velvet here and there. Underside without pubescence or villosity, and shining, except on the sides of the thorax and episternums of the body, which are thickly and opaquely punctate, the middle sparsely punctate, most closely so on the first segment of the abdomen; legs punctate, tibiæ crenate.

From the interior of South Africa, 300 miles from Natal. *Andrew Murray.*

Home Correspondence.

A Note on Palms.—The publication in the *Gardeners' Chronicle* of the interesting papers on Palms, by Dr. Seemann, and the growing taste for the cultivation of these elegant plants—which, along with Ferns and Mosses excel all others in beauty of form, if they have not much of the beauty of colour—will, it is to be hoped, lead to a call for a second edition of the "Popular History of Palms" of that able botanist. It does not say much for our English love of these matters for their own sake that, whilst one edition has sufficed for us, in Germany two large editions—perfect models of typography and illustration—should already have been exhausted. Now also that steamers navigate the Amazon to the very foot of the Andes, and the Negro and Orinoco up to the cataracts, and the traveller has no longer to creep up those vast rivers in canoes, as I had to do 20 years ago, the regions around their headwaters—more prolific in wonderful vegetable forms than perhaps any other in the world—will be brought sufficiently near to be safely transmissible to European conservatories. The most valuable collection of dried plants I ever made was nearly a whole year on its way to England, and at one place where it had to change hands before it could be sent on, the boxes were thrown aside for several weeks on the damp floor of a hut, the consequence being that many of the plants at the bottom of the boxes were glued together with mould and quite unrecognisable. Such long delay would have been fatal to living plants, and to the oily seeds of Palms; but I suppose it could never happen now. And when that canal is made, to avoid the cataracts of Atures and Maypures—which Humboldt showed would be so easy—the tourist may sail in his yacht, by way of the Orinoco, into the very heart of the most glorious forest in the world. Of all the Palms that flourish in the Orinoco-Negro region, the species of Lepidocaryum would most delight our cultivators. Smooth, reed-like stems, 4 to 12 ft. high, and not more than ¼ to 1 inch thick; fan-shaped leaves, deeply cut into from 4 to 20 segments, and lightly balanced on long petioles; fruit (which is copiously produced, and is borne on pinnate spadices), an oblong or obovate cuspidate berry, clad with shining reddish, rhombic scales: such is an outline picture of the Lepidocaryums, the slimmest and most fairy-like of all Fan Palms. They grow in the virgin forest, where the trees are not so thickly set as to exclude gleams of sunshine; in a climate where drought is unknown, and where the temperature ranges from 70° to 88°. On the shores of rivers in the same region grow the allied Mauritia aculeata of Humboldt and Bonpland (M. gracilis, Wallace), sending up its tufted spiny stems to the number of from 12 to 50 from a root, and to a height of 20 feet. It is a most graceful Palm, the outer stems of each tuft hanging far over the water, and the fan-shaped leaves (blue-green above, white beneath) having the laciniæ pendulous from the middle. Like the Lepidocaryums, it bears scaly fruits, but much larger and more numerous. The zoned, rainbow tints of the leaves, described by Humboldt, are those of decay, and are seen also in other Fan Palms. I must beg to disclaim the honour which Dr. Seemann would assign one, of being considered an authority on the classification of Palms. They were never a speciality of mine, and I have only studied with care a few of those of equatorial America. My paper on the Palms of the Amazon region was undertaken at the earnest solicitation of the lamented Dr. Von Martius. I hoped he might live to see it in print, and it was with great regret I heard of his death just after I had put the finishing hand to it. He had written to me only two months before in his usual firm distinct handwriting, and with all his accustomed warmheartedness, but not with the old vivacity. "I feel now," he said, "the pressure of years, I cannot do so much as I wish—

'Non sum qui fueram, periit pars maxima nostri;
Hoc quoque quod superest languor et horror habet!'"

It would seem as if he already felt some presage of approaching dissolution. I wish, indeed, that when I undertook to write on Palms, I had known of the arrangements proposed by Griesbach and Wendland, although I could hardly have adopted them as they stand, for their two primary divisions seem to me of very unequal value, and their "Arecineæ" surely comprise three or four groups of equal value with their "Cocoineæ." The arrangement adopted in my "Palmæ Amazonicæ" was struck out when I was living among Palms in their native forests, by comparing all the forms within my reach, and combining or contrasting them with the eastern Palms, as I found them described by Kunth and Endlicher. It seemed to me that the fruit had been too exclusively relied on in forming the primary divisions, and that in Palms, as in many other large orders, such as Leguminosæ, Compositæ, &c., the floral organs afforded better characters. I had drawn up a synopsis of all the genera known to me, disposed under seven tribes; but I did not include it in my memoir, being unwilling to burden it with extraneous matters. The tribes were distinguished as follows:—

SPATHIFLORÆ.—Spadices simple or branched (with polystichous branches), before flowering enclosed in fusiform spathes. Leaves simple or pinnate.
- Fruits exocarpic, usually asymmetrical.
  - Æstivation of ♀ fl. valvate. = Genomeæ (1).
  - Æstivation of ♀ fl. imbricated. = Arecineæ (2).
- Fruits symmetrical, endocarpic. =
  - Æstivation of ♀ fl. valvate. = Bætrideæ (3).
  - Æstivation of ♀ fl. imbricated. = Cocoineæ (4).

SPATHELLIFLORÆ.—Spadices pinnately branched (the branches distichous, the flowering ramuli mostly catkin-like), completely sheathed with numerous imbricated spathellæ. Leaves fan-shaped, except in a few genera of Lepidocaryineæ.
- Fruits scaly. = Lepidocaryineæ (5).
- Fruits naked.
  - Æstivation of ♀ fl. valvate. = Coryphineæ (6).
  - Æstivation of ♀ fl. imbricated. = Borassineæ (7).

These tribes are natural assemblages of genera, which I am persuaded will stand, although the technical bases may be varied, and the limits shifted hither and thither to suit the notions of individual systematists, and for the reception of new genera and species.* The distinction between a valvate and an imbricated æstivation in the female flower of Palms is certainly an important one; for the latter indicates a higher organisation, and probably a separate existence, dating from a remoter epoch. To justify this opinion, it will be necessary to enter into a few details. The male flowers of all Palms have valvate petals, often combined into a monopetalous corolla, and are of frail (though not always of thin) texture; while their butterfly-like existence in the perfect expanded state usually endures but a few hours after the shedding of the pollen. About half the number of all known Palms have the petals of the female flowers valvate, and in some genera scarcely at all different from those of the male flowers. In Genoma not only are the chaffy sepals and the lanceolate valvate petals so much alike in the flowers of both sexes that, before expansion, the female flowers are only to be distinguished by their central, and the males by their lateral position in the alveoles; but there is also a staminal tube in the female like that in the male flowers, only shorn of its anthers. It is in the Valvatipetalæ (as I proposed to call them) that hermaphrodite flowers are still normal to a few genera, and that an occasional reversion to hermaphroditism in monoicous and even in dioicous species is not infrequent. But in the other half of Palms, the Imbricatipetalæ, both sepals and petals of the female flowers are orbicular, widely imbricated, and often very thick and tough; and the petals increase in size after flowering so as to form a stout persistent cup, needed for the support of such enormous fruits as the common Cocoa-nut and the double Cocoa-nut of the Seychelles, and very rarely associated with fruits so diminutive as those of the Genomas. In this division, hermaphrodite flowers are unknown, or are only due to very rare instances of reversion. Now, as (on my theory) all flowers have been originally hermaphrodite, and uniform on the same plant, the vast difference between the male and female flowers of Œnocarpus, Cocos, Lodoicea, and other Imbricatipetalæ, implies either a more rapid or a far longer-continued process of specialisation than in such Valvatipetalous genera as Genoma, Lepidocaryum, &c., where the female flowers have undergone such very trivial modification. To give an example of the application of the same principle to another family of plants. I should consider Corylus a genus of higher organisation than Salix, seeing that there is a far greater difference between the male and female inflorescence of Hazels than between those of Willows. *R. Spruce.*

* In "Palmæ Amazonicæ," by a slip of the memory, I placed the Borassineæ among Valvatipetalæ instead of Imbricatipetalæ.

The Protection of Wall-fruit Trees.—Your correspondent, Mr. Gardiner, p. 667, in drawing attention to this subject asks for information respecting the present prospects of the fruit-crops, protected and unprotected. I am sorry to say that as to those fruit trees which were unprotected, the fruit is all killed; not so, however, with those under cover. Of Peaches, Plums, and Pears, there is abundance. I think as regards the advantage of protecting the trees there can hardly be two opinions, but concerning the material there may be a great many. Your correspondent uses Frigi Domo, which is no doubt an excellent covering material. Here, my father has used Hessian with great success for the last 11 years. Information respecting the article used, its price, and stability, and the degrees of frost which each will exclude, together with the amount of success attained with the crops, would be of the greatest service. I may add, that but a sprinkling of the Gooseberries have escaped. Currants are very much injured, as well as a great many of the Strawberries. *John J. Buchanan, Dyrham Park Gardens.*

Myosotis dissitiflora.—I cordially endorse all that Mr. Fish has written in praise of this beautiful spring flower, and can heartily wish with him that it was more universally known and grown, for in spite of the severe winter through which we have passed, and the cold, unfavourable character of the spring, I have had it in a blaze of bloom for several weeks past. For earliness, compactness, and general effect, it is far in advance of M. sylvatica, and the individual blooms are nearly twice as large. I say emphatically, that no arrangement of spring decorative gardening can be complete that excludes Myosotis dissitiflora. As to future modes of propagating it, I shall raise from seed only, as I found the result of a winter's experience to be that not a large, and scarcely a small propagated plant was left alive, whilst every seedling plant stood the winter with impunity, not one being injured. As the plant is such a continuous bloomer seed-saving is a matter of some difficulty; but if a little fine soil is used as a top-dressing, what seed falls before the flower-stems are finally gathered will germinate and grow all the more readily. And if the ripened seed that is gathered be sown in August it will be good time. It was surprising to note the growth of the little cushions of this Myosotis in the spring, as a plant that could be covered by a 4-inch pot in March would in a few weeks have required a large pan to hide it. My experience of its cultivation has been limited to a very dry gravelly soil, and in a southern locality, where it certainly has had a fair trial; and if it is found that old or propagated plants will not stand severe weather under such conditions, I fear we must assume it is really of too tender a constitution to be classed amongst hardy perennials. The stunted plants of which Mr. Fish writes are invariably those propagated by cuttings or side shoots; but I have never seen it developed in seedlings. To these latter I pin my faith, as from seed it comes perfectly true. Mr. Fish told us last year that he had got a white variety of this Myosotis, but he says nothing about it now. Was it Mr. May's M. sylvatica alba after all? As we have no lack of early white hardy flowers, a variety of that colour would be no great acquisition; but if it should prove possible to raise a pink variety—and that I think is not improbable—we should indeed have something over which to rejoice. The tendency of the Myosotis dissitiflora to produce here and there pink flowers appears to me to point in that direction. *Alex. Dean.*

Hose for Watering Streets.—A subscriber will be much obliged if any of the correspondents of the *Gardeners' Chronicle* can give any information about the hose used in Paris for watering the streets and parks. They appear to be made of leather, and run on several pairs of little wheels which keep the hose off the ground. Are they to be obtained in England? if so, from whom? And do they know if that mode of watering has superseded the use of the old fashioned watering-cart in any town in England? [A somewhat similar plan was followed in Oxford 14 or 15 years ago, but we are not aware that it has been tried elsewhere, nor do we know who supplies the apparatus in England. EDS.]

Fruit Prospects.—Fruit trees of all kinds are looking remarkably well in the gardens here. Peach trees have set a splendid crop, and the trees are very healthy. Apricots are also an abundant crop. No covering of any kind has been used for either Peach or Apricot trees this season. The only protection they have had is a board about 10 inches broad, fixed to the wall with iron brackets. I consider the abundant crops of these fruits partly owing to the treatment the trees have received—viz., early in the autumn I had all the young wood unnailed and left in that state till the middle of April; by so doing I managed to keep the trees at least a fortnight later in blooming. I think if gardeners generally were to pay more attention to keeping their trees back they would stand a much better chance of securing a good crop of wall fruit. Apple trees are laden with bloom. Pears are well set on the walls, and bush trees are well covered with bloom. Cherries on walls have set a splendid crop. Plums are looking well, and there is every appearance of a heavy crop. Figs are in a forward state, and look very promising. Filberts will be an average crop. The most conspicuous objects in the garden at present are the Siberian Crab trees, which are completely covered with fine large blossom, and are objects of great beauty. *J. Smith, Gr., Exton Park.*

Bedding Pansies.—G. Wood has been kind enough to tell us about the character and habit of Pansy Vesuvius (p. 668); will he please to give in addition the important information as to what is its colour. *A. D.*

Mimetic Plants.—Your allusion to the exhibition of mimetic pairs of plants, by Mr. W. W. Saunders, at the *soirée* of the Linnæan Society, excites my curiosity, and I have no doubt that many others besides

myself would be pleased to have a list of the plants shown, if it be possible. This mimicry in plants is an extremely interesting subject, as it naturally suggests a closer examination of plants, before attempting to refer them to their position in the vegetable kingdom, than would otherwise be accorded to them by many superficial observers. The plants belonging to this category are not so very numerous, it is true, but they prevail to an extent unknown to any except the practical botanist; and the gross mistake made by the "special correspondent" of a well-known daily paper, who accompanied our forces in the Abyssinian expedition, would have been avoided had he been aware of its existence when writing of the vegetation of that country. He said "that certain parts of the country abounded in huge Cacti," when, of course, they were nothing else than succulent Euphorbias. The most remarkable instances of mimicry among plants known to me—though only in a dried state—are to be found amongst the New Zealand species of Veronica. Indeed, V. tetragona was originally described and figured by Sir W. J. Hooker as a species of Podocarpus, though shortly afterwards he received flowering specimens and rectified the error the general appearance of the plant had led him into, for he discovered that his presumed Podocarpus was really a curious form of Veronica. V. lycopodioides, V. cupressoides, V. salicornioides, and several other New Zealand species, would puzzle the most accomplished botanist. I think, too, that geologists might profit by the study of these unusual alterations from ordinary types before naming their fragmentary fossil specimens. *H.*

A Plant from the Antipodes.—I should imagine the plant described by M. Raynal is a species of Coprosma, for his description agrees better with plants of that genus than of any other genus known from the Auckland Islands. The species are numerous in New Zealand and the neighbouring islands, some producing scarlet, and one, at least, blueish, edible berries. Besides the shrub mentioned by Raynal there are many other interesting things that might probably prove hardy in the south of England. Metrosideros florida and lucida form a greater part of the wood on the islands, it is stated, and would give us a little more variety, if hardy. Olearia Lyallii, Celmisia vernicosa, Gentiana cerina, Veronica Benthami, and Anthericum Rossii, are all very handsome plants from the same region. *H.*

Flower-basket.—I forward you a description of what must, I think, be a curiosity in its way. It purports to be a flower-basket, or rather, a Fern-basket, and to be fit only for a superior garden or conservatory, or to stand in a very large hall:—"The basket is suitable for either indoors or out, though the more it is exposed to the weather the better it looks. It is of hexagonal shape, larger at the top than the bottom, and stands upon three shell-covered curved legs, which form a claw foot. It is proof against all weathers—sun or frost, wet or dry. The shells are first used to form a panel on each side, and inside each panel is a basket of flowers made of various kinds of shells, the leaves being formed of the same kind of composition in which the shells are imbedded. The flowers and baskets are of a different kind in each panel: there are field flowers, Fuchsias, Dahlias, various-coloured Roses and Rose buds, double and single Tulips, Poppies, Apple blossoms, scarlet and white Geraniums, Laburnum, Snowdrops, and many others. Each flower is made with shells, and has its natural colour, as well as the leaves and stalks. The flowers are apparently set into the basket, some standing upright, others, such as Bluebells or Laburnum, drooping. The maker is Mr. Phillips, West Row, Soham." I have not seen this curiosity. *F.*

Burnt Peat.—In June, 1869, we had carted from a distant moss a large quantity of peat, which was put up in two large stacks of 100 cartloads each. We have made use of one stack, but on commencing the other we find it has been on fire in the middle, and has an unhealthy smell. Will any of your correspondents be kind enough to give us the benefit of their experience, as to whether it is safe to use such peat for Rhododendrons, &c. We may add the weather was very hot and dry when the soil was carted and put together. *John Palmer & Son, Annan, Dumfriesshire.* [We should not anticipate any injury to the Rhododendrons, as in some districts we have known it to be the practice to keep (and on a small scale to grow) American plants in beds of peat ashes—that is, the ashes from peat turves used as fuel. EDS.]

Sitona lineata.—This insect is very destructive to the young Pea plant this year in many parts of the country, and as I have been paying some attention to it, perhaps a note of what I have observed on one or two points, which seem to be in obscurity, may be acceptable to some of your readers. It appears from Curtis that there is no notion when they lay their eggs (one might almost think he considered the old ones lived on, *en permanence*); but I felt sure, from very quiet observation, eggs must be somewhere. If people go stumping along, of course the beetles vanish. Looking inside the largest beetles there are the eggs, about (say) eight in each. I think they are eggs because of their quite clear well-defined shape, and because on opening the beetle they at once stand out clear and clean among the *débris*, and also because I only find them in the largest; so that I do not think, though I am no insect anatomist, that I can be confusing them with other miscellanea of the insect cupboard; however, I send them to you for verification, with a store of the beetles their owners were taken from, and if you will examine them out of the spirit, I think their egg form will show much plainer than it does in the bottle. [They are unquestionably the eggs. EDS.] Now if these are eggs, might not one suppose (reasoning from the duration of life in the early stages in other small Curculios) that in about three weeks the larvæ from the Sitona eggs would be turning to pupæ, in three more the pupæ hatching? The duration of egg larvæ pupa life in Calandra, I think Curtis says, is 45 days. In the Turnip-seed weevil, one may gather, he considers it about the same; and—following up the fact of the Curculio causing different kinds of root-galls, and the idea that this sort causes them on Beans—I fancy that if some naturalists with good eyes would investigate the Pea roots, scraping and dusting the earth from them with their own hands as they grow, not as drawn out specimens, we might get this question solved. I shall try to do this myself, but I make the suggestion in the hope that others may be induced to try the experiment likewise. The more independent observers one can get, the better. *O.*

Strawberries.—On Thursday, May 5, I gathered five fine ripe Strawberries from plants of the old Black Prince growing in the open air without any protection. They were of a good size, richly coloured, and of excellent flavour. I shall be able to gather freely in about seven days from this date. The crop is abundant, and the fruit are changing colour beautifully. I have also in the same garden a plot of President and Dr. Hogg loaded with fruit, about the size of the hazle-nut. *Matthew Hague, Hagah Wentworth, Rotherham, Yorkshire, May 12.*

Aucuba.—The male Aucuba is destined to add a brilliancy to our shrubberies by causing our old female friend to glow with berries in such profusion as to vie with our own Holly or Hawbush. We were at first instructed to use a camel's-hair pencil to diffuse the pollen over the female blossom, but recent experience has taught us to trust to the means provided by the Creator for the production of berries. I was led to this conclusion by what has taken place in the garden of Captain James, of Littlebourne, where may be seen a bush 12 feet high, and almost as much through, literally loaded with oval, scarlet berries; so full is it that they are found from top to bottom, even touching the ground, and also adorning the smaller branches in the thickly set centre of the bush. Thus insects and wind have operated where the hand of man would never have reached. A plant of male in blossom was introduced on the sunny side of the large bush, and when the sun had faded away the male was removed to the greenhouse for the night, and if the morning was favourable the plant was brought back; this was repeated so long as the male plant was in flower. The result is a marvel of beauty. The effect, however, has not stopped here, for most of the other plants in the garden, and there are many, have become berry bearing from the same source. Amongst others a female A. himalaica, has produced numerous berries, some of which, through the Captain's kindness, I possess. All these are of a different form, for instead of being oval are precisely like a miniature Pear, indeed quite turbinate—in this respect differing from the beautiful coloured engraving in Cathcart's magnificent work published by Dr. Hooker. It is a nice point whether the A. himalaica is to be considered a species or not. I am curious to know if the berries of it are so formed. I have enclosed a berry, and wait your reply. *W. Masters.* [We should be glad to have the experience of our correspondents as to the fruit of the Himalayan Aucuba. Those we have seen have been bluntly ovoid. We believe the Himalayan and Japanese forms to be merely variations from a common type. EDS.]

Paint for Hothouses.—In your Journal for 1866, p. 392, you give your correspondents most excellent advice, and matter for consideration on this subject. I have, however, sought in vain in your columns for any information as to how often the paint of hothouses and frame-lights ought to be renewed, whether annually, biennially, triennially, or how? Is there any custom, or usual stipulation in leases of nursery grounds or market gardens, as to this? *Diss.* [Paint when required,—once in three years, or one coat a year. Some of our correspondents will perhaps answer the second question. EDS.]

Medinilla magnifica.—A magnificent specimen of this most gorgeous-flowering stove plant is now in full bloom here. The plant is about six or seven years old, and is growing in a rough oak box containing about 2 cubic feet of earth and drainage. The dimensions of the plant are as follows:—10 feet through, 30 feet in circumference, 6 feet high; it has 208 rosy panicles of inflorescence, varying in length from 12 to about 22 inches. The flowers are produced from the axils of the leaves on young wood, and also as freely down the branches of the old wood, where there are no leaves at all, to the very surface of the earth in the tub: one flower has pushed itself up through about 2 inches of a recent surface dressing. During the last 18 months the plant has been situate at the end of a fruiting Pine pit, during which period it has had to submit *nolens volens* to a continuous rather high temperature; but as the plant is in rude health it is evident there was nothing much wrong with its treatment. To view the plant as it now appears is certainly a treat seldom to be met with. In a tub, and situate close to the one containing the Medinilla, is a plant of Ipomœa Horsfalliæ. Its stem rises up through the Medinilla bush to the top of the house, where it covers an area of about 350 square feet. During winter and spring its magenta racemes of flowers hang from it in graceful profusion, than which I don't know anything more beautiful for the decorating of tall flower-glasses, where an opportunity is afforded of giving the raceme of flowers a swirl round the stem of the glass. This plant has rooted freely through its box into the sticks, leaves, and tan, which form the plunging material for the Pines; and so also has a very fine plant of Passiflora edulis, situate in the next house, occupying a space of about 400 feet, and now setting fruit freely. Passiflora macrocarpa and Musa Cavendishii also enjoy nooks in this house, and are remarkably productive. *William Miller, Combe Abbey Gardens.*

Otiorhynchus picipes.—In addition to your advice on the Vine beetle (p. 671), I would advise your correspondent to put a toad or two in the vinery; we have adopted this plan for the last twelve years with perfect success. Make with two or three bricks, or a horse-shoe tile, in a shady corner, a place for them to retreat during the day, and remove them at any time when smoking. *John Taylor, Rose Hill Lodge, Botcherby, Carlisle.*

Diseased Vines.—I herewith beg to send you some Vine roots, together with the soil they were grown in, for your inspection and opinion as to the probable cause of their present condition. They were planted in 1858 in a compost of turf, broken bones (boiled), and lime rubbish, and till lately the Vines grew to my satisfaction. This year they started of their own accord, broke strong and regular, and continued to do well till they commenced to show bunches, when I began to fancy they were not making such progress as I could wish for. I then examined the roots, and to my horror found them in the state of which I now send specimens to you. I have omitted to mention that when the Vines began to break, I gave them a thin top-dressing of turf and lime rubbish, and a thin sprinkling of the enclosed "bone flour" over all, and soon afterwards they began to show signs of having received a check. The enclosed soil is a small handful taken at random nearest to the dead roots. I am pleased to state that all the Vines in this vinery are not alike bad, but all have received a check from some cause or other. The Vines from which the enclosed roots are taken were grown on the back wall of a vinery. A flag footpath 3 feet wide, resting on arches, runs parallel with and about 1 foot from the wall; consequently they can have little soil to grow in, and under the arches can have no water, excepting what may reach them from the narrow border, but the roots nearest the surface of all the Vines back and front are injured. *A.B.* [We are afraid that your Vines are injured by the little coccus-like insect which has of late been so destructive. The insect is so minute that it is not easy of detection on roots which are transmitted without extreme care in packing, and some knowledge of its existence in the specimens sent, and the season is possibly not very favourable; still, after a minute inspection, we find two of the yellow eggs, which place the matter almost beyond doubt. Unhappily, no certain remedy has at present been ascertained. Plants badly affected should be burnt, and you should watch the leaves for the purse-like bodies which the insect causes on them, and destroy them as soon as they appear. *M. J. B.*]

The Destructive Influence of Fungus on Vines.—I am of opinion that Fungus is more frequently the cause of failure in Vines than is generally supposed. Every one that has had anything to do with renovating old Vine borders must have observed the large accumulation of old decaying bark round the large roots. Now, if the conditions are favourable to Fungus growth, as they would be in a quiet, well-drained, undisturbed border, it is quite clear that this mass of decomposing vegetable matter will breed Fungus, which will fasten itself on the living bark, poison the sap, and eventually kill the Vines. From what I have heard of the famous Vines at Bishop Stortford, and the exceeding porosity of the border, I think it most likely that they succumbed to the insidious attacks of Fungus, as I have seen light, dry, porous borders poisoned with it, and it is almost impossible to keep such borders in a sufficiently moist state to prevent its growth. It has been my practice for some time past to fill the holes where the Vines come through the wall with pieces of Gorse, to prevent the mice getting through to the Grapes. This I found was partly decomposed, and had generated Fungus round the stem of the Vines, which was spreading in an alarming manner—so much so as to seriously affect their health and vigour. I have just had the soil removed around the collar of the Vines, and find that it has travelled down the main roots deep into the border. I am having these stripped and carefully scrubbed, filling in with fresh soil, and shall give an abundant supply of tepid water during the summer, and I trust by these means to arrest the mischief. I

may add that these Vines were most vigorous before this attack, as last season they bore from 15 to 20 bunches each, some of which weighed over 3 lb., and won me three 1st class prizes. With this I send you specimens of the bark, and a small piece of root, that you may see the hold it has on them. *J. Sheppard, Gr. to J. Berners, Woolverstone Park.*

Fungus on Living Roots.—It is a general opinion that a good hearty laugh is conducive to health. Mr. Miller's paper at p. 632 may be considered quite sanitary. Did anyone before go further back for an argument or even for an illustration? If I have understood the subject in dispute, the question is as to the danger of living roots of trees being attacked by Fungus produced by sticks, pieces of timber, &c., decaying in the soil. Some one, I think it was Mr. Miller, referred to the accumulation of leaves and sticks in a forest, as Nature's mode of manuring trees. This appeared so little pertinent to the point in dispute, that I merely pointed out that in this case Nature did not bury her sticks and leaves, but left them on the surface to decay. Who would have thought it possible to make a lecture on geology out of this? Who besides Mr. Miller have thought it necessary to tell your readers and correspondents that coal was buried vegetable matter, or that large trees had been found in a bog or buried deeply in alluvial soil, or even that earthworms dragged leaves into their holes? I beg to congratulate him on the proof he has given that his own reading has been so extensive. When we have a deluge every five years, or causes are seen in operation tending to take recently fallen sticks and bury them beneath growing trees, his arguments will have great weight. Having seen the roots of trees covered and white with Fungus, which could be traced to bits of wood buried near their roots, I prefer to guard against such an accident in future. In this resolve I am strengthened by the observation of others. Not only have men of science, like Mr. Berkeley, pointed out the danger to be apprehended from this cause, but many of our best practical gardeners have recognised its effects. Mr. Speed, of Chatsworth, recently told me he had removed some Vines which had become unhealthy, and had found their roots white with Fungus, and he also stated there was no doubt on his mind that beech-nuts buried in the border had given rise to the Fungus. "But," he added, "I have thrown away scores of unhealthy plants with roots covered with Fungus in my time, which Fungus I have been satisfied has been due to old stakes broken off and left in the pots." Is not the experience of such men of more value than arguments drawn from sunken ships, or the formation of coal? One great discovery Mr. Miller certainly has made; he has discovered a doubt! It really is doubtful if men would ever have driven steam-engines if Nature had not buried her sticks. *J. R. Pearson, Chilwell.*

Foreign Correspondence.

TORONTO, CANADA.—I am very glad to see by late numbers of your interesting paper, and by other English publications, that Maize or Indian Corn is becoming a garden vegetable in Britain; and as doubtless a great portion of your readers are in a state of comparative ignorance respecting the plant and its productions, the following account from a practical person who grows it may be both useful and interesting.

Maize or Indian Corn has almost interminable varieties; it is one of the plants that hybridises of itself, and, therefore, the number of "sorts" need not be wondered at. The growth of Indian Corn is peculiar: the male flower is the plume at the top of the stem, which blossoms like Wheat, and evolves an immense quantity of pollen, which it casts adrift on the winds, and which, as wafted about, forms the fertiliser to the female portion of the plant,—this consists of the future ears, generally from two to three in number (but often only one), which spring forth from the junction of a leaf with the stalk; these ears are at first a mere cone-like cylinder of green integuments, wrapped round the future cob which is to form the ear. About the time the male blossoms, a tassel ripens, and there appears at the end of the ear (that is to be) a bundle of delicate threads called the silk: each of these threads extends down inside the bunch of green wrapper, and is fast to the cob at the place where the future grain of corn will come to perfection. There is one of these threads to each grain, generally about 500 to the ear; these threads are the female organs of reproduction, they receive the pollen of the tassel, and are at once fertilised. If any thread is injured or broken, or misses fertilisation, the grain belonging to it is lost, and its place in the ear is a blank. If all are fertilised, the ear is beautifully regular and complete from the stem to the tip of the ear; the threads which fertilise the lower grains extend the whole length of the ear, and all are regularly disposed over the surface of the future grain. The centre round which the grains are arranged is called the "cob."

If the pollen of one kind of Indian Corn falls on the thread or silk of another kind, the result is reproduction of the kind of corn to which the pollen or male element belongs. Thus, if one seed of red or yellow corn has been planted in a patch of white corn, the stray grains of pollen will cause scattered red or yellow grains of corn throughout the ears of the white corn. Unlike other plants, the hybridised seeds of which appear like the seed of the mother plant, but produce the following year a hybrid, Indian Corn reproduces the kind from the male fertiliser the first year, and that in a complete shape: the effects of this easy hybridisation are seen in the endless varieties of the plant.

It will thus be seen that where purity of kind is required, only one sort of Indian Corn must be sown. If two or more kinds are within reach of one another, an endless mixture is the result.

So far as the *Gardeners' Chronicle* is concerned, we need only treat of the best kinds of corn for kitchen use as a vegetable; the description of the different kinds of field corn would almost fill a volume. The only two kinds of Indian Corn which are grown by connoisseurs in gardening operations are the "Sugar" or "Sweet Corn," and the "Evergreen Corn. Both kinds are excellent, and they form a succession which lasts through the whole corn season. The first is the earliest, the second about a fortnight later.

In Canada we sow the corn on or about May 13, and between that and June 1, and the first of it is ready for the table late in August and through September. I do not mean to say that there are only two kinds used in gardens—there are a dozen sorts, from the small "six-rowed" to the great white "Tuscarora," but the two best sorts are the "Sugar" and the "Evergreen." When these are ready for the table they are fully formed, and as large as they will ever be; each grain is full and plump, and is just out of the milk and in the doughy state. When the corn of these sweet kinds gets ripe and dry, each grain shrivels up into half its original size, and becomes like a shrivelled piece of gum. Anyone not aware of its peculiarities would never believe that it could grow.

It is a great mistake in the British gardener to suppose that because Indian Corn does not ripen thoroughly in England, that it is not an esculent to cultivate for the garden there; the very fact that it does not ripen readily will made it continue all the longer in season, for, like Peas, when the corn is ripe it is no longer fit for cooking as a green vegetable, and its not ripening should form no objection to the gardener, as he will naturally get his seed from America, where it does ripen, just as we get our Cabbage and Cauliflower seed from England, because we cannot grow the seed here owing to the peculiarity of our seasons.

Our mode of cultivation is to plant the seed in the open ground as soon as the soil is warm; it is only a waste of time and seed to plant earlier. We make the ground as rich as possible. We plant in "hills" of five plants, and pull out to three. In exposed situations some people prefer to plant in rows, to stake the rows here and there, and run a line from stake to stake on each side of the row, at about 2 feet from the ground, to keep the corn from blowing down and about in high winds; and in a garden corn in any shape should always be staked. Where the corn is planted in "hills" or patches, a string round each three or four plants forms a sufficient support without stakes. Indian Corn requires rich ground, I never saw ground too good for it, and the better the ground the larger the ears. It has always an even number of rows, such as 10, 12, 14, &c.; different kinds have different numbers, but there is no absolute rule with all, for generally speaking the better the ground the greater the number of rows and the greater the length of ear. Goodness of ground does not delay the perfecting of the ears, the better the land the quicker the growth.

The rapidity with which corn comes to perfection is marvellous. One year we had a dreadful summer frost on June 10, 11, and 12, and cold weather for some days afterwards; all our corn was cut off and destroyed. We resowed after the frost, on the 13th or 14th, having steeped the seed in "chloride of lime water," to hasten the growth, and we never had better or finer table corn. We in Canada prefer getting seed corn fresh from the United States to saving our own seed, and if we can get seed enough, we never plant seed from the upper third of the ears. Corn transplants well; the course for the English garden would be to raise the plants in small pots in the greenhouse early, and then plant out as soon as the warm weather is established.

As soon as the ears begin to appear the plant throws out a number of large, strong roots from the crown of the root and the first and second joints of the stem; these are intended to nourish the seed: the first and fibrous roots seem to be for the growth of the stem; it is for the encouragement of these secondary roots that Indian Corn is always "earthed up," and although we speak of "hills," the corn ought always, on any land, to be planted in a hollow, so as to admit of easy and liberal earthing up. When these secondary roots once get hold of the ground there is but little fear of the corn blowing down, but if a gale happen before these roots have good hold the entire plant upsets with the wind easily, particularly if the plant is large and gross, hence the necessity in garden culture for the staking of the crop. If planted in rows they should be at least be 4 feet apart, and if ground can be spared, 6 feet is better; in hills or patches, they should be 4 feet apart each way. Though blown down the corn will still bear plentifully.

Every one knows how to plant Indian Corn, all it wants is heat and moisture; I have seen grains of it germinate on a wet board in a loft, where the wet was supplied by a leak in a vat. In such a situation it throws up its beautiful green aërospire, supported by the delicate roots spreading all round the grain like the claws of a bird. Of course corn in this situation would never come to perfection, nor grow to any extent; I merely mention the fact to show how easily it germinates where there is heat and moisture. As soon as the silk dies off, and the ear is swelled to its full size, the state of the grain may be ascertained by opening a slit in the upper part of the ear; when the upper part of the ear is fully formed, and the grains are out of the milk, it is fit to gather and use: the outer coating is then stripped off and the ears well boiled, and it is eaten either by biting the corn off the cob, or it is cut off and served up like green peas. Roasted ears of corn is a great American dish,—it requires plenty of good fresh butter, pepper, and salt, and is then a dish fit "to set before a king." People on this continent who once take to eating corn, will never be without it during the season, and it is now a regular article of merchandise when "canned" like preserved meats.

Where much corn is grown, the husks of the ears are saved and used for stuffing mattresses, bolsters, &c.; it is a material always clean, and sweet, and elastic. Paper is also made from it of good quality for wrapping. The stems of the corn in English gardens would be a highly useful acquisition to construct elastic hurdles with, or to use as shelter for hot-bed frames; for this purpose each stem is arranged, the head of one with the leaves all put straight and gathered up lengthways with it to the stem of the other. Rope-yarn or bass matting strings are then made use of in four or five places, to hold all together, like a piece of rough weaving; and the result is, when you have trimmed off the ends you have a good serviceable warm hurdle, which can be either set up straight, or curved, or used flat as a covering to bring up seeds under. It will last a considerable time; the stems and leaves, also, make the very best of fodder for cattle.

Taken altogether the Indian Corn plant is one of the most useful in the garden, and I cannot understand how you have in England done without it so long; but I believe it is from the fact that the plant does not ripen its seed with you, and parties have lost sight of the fact, that to be useful as a garden vegetable it must be used in an unripe state. The successful growth of Indian Corn is not altogether a matter of "latitude." It grows much better in Lower Canada than in Upper Canada, and in many parts of the former is a regular field crop, while about Toronto, Kingston, and Ottawa it is a garden crop only. In the western portion of the peninsula of Ontario, it again forms a field crop.

As a field crop, and properly planted, it is most useful as a clearing crop,—with the horse-hoes, corn-ploughs, and cultivators, in general use throughout America. A big boy and one horse will keep 20 acres of corn crop clear from weeds until the plants are so large as to smother all intruders.

As a crop for soiling cattle it is not surpassed, but it is then sown thin, and not cultivated, or expected to produce ears; it is cut and carried to cattle and cows, and is one of the great aids for dry American summers, where cheese factories abound. The stems when cut are as sweet as sugar. For the seed used, sown corn produces the largest yield of any known crop; from 600 to 1000 grains for one is a liberal return; but then one seed and plant takes up a good deal of ground. Many of our rich American corn lands have been sown without manure every year with Indian Corn for twenty years, with no apparent diminution of fertility.

I send you by this mail an ear of Evergreen Corn. You will observe that one grain has been fertilised by another kind. It is not a very fine ear; but having the infected grain in it, proves what I have advanced. It will of course be too late for this year, but it will grow next year, and you will get it and this letter just about the time you ought to be having corn in the garden coming out into tassel. *Vectis, April 26.*

Societies.

ROYAL HORTICULTURAL.—*May 18.*—George F. Wilson, Esq., F.R.S., in the chair. The usual preliminary business of the meeting being concluded, and the awards of the Fruit and Floral Committees having been announced, the Rev. M. J. Berkeley proceeded to address the meeting, first stating that the beautiful Iris sent to the last meeting by Mr. Ware, was *I. iberica*, as announced in our columns at p. 663. Mr. Ware was said to have obtained the plant from Greece, but, strictly speaking, its home was in Caucasus; and he was glad to state that Mr. Fitch had made a drawing of the plant, to be published in the "Botanical Magazine." A large white-flowered species of Cactus, exhibited by Mr. Martin, gr. to S. P. Kennard, Esq., then came under notice, as being probably a seedling from *C. triangularis*, and in all probability a hybrid between that and some other species. *Elisena longipetala*, a conspicuous white-flowered Amaryllidaceous plant from Peru, exhibited by Mr. W. W. Saunders, next came under notice. It is closely allied to the genus Ismene, and is very interesting, from the crown of the flower being curiously flattened and depressed. A figure of Ismene Macleaneana, a plant very nearly resembling the one under notice, was shown, and concerning which Mr. Berkeley read some interesting particulars respecting the use made of the flowers by the natives of Peru. Several of the Orchids, exhibited in the conservatory, were alluded to; and attention was then called to some flowers of the common red Lychnis, the anthers of which were attacked with

rust, and of which further particulars will be found in the report of the Scientific Committee. Some specimens of the Golden Alder were next commented upon as being, together with the Golden Sycamore, a fit subject for grouping with the Golden Oak, the beauties of a specimen of which in Flintshire he had alluded to at a former meeting. The Golden Sycamore was, said Mr. Berkeley, a most beautiful object, as would be acknowledged by all who had seen the fine specimen in the Wilderness at Chiswick. Some galls on Vine leaves next came under review, Mr. Berkeley remarking that the first time it was brought under his notice was four years ago. The galls, as would be seen on examination, were full of insects and eggs, which could not be mistaken. There was little doubt but that this is the same insect which has created such devastation in the French vineyards, and it was rapidly spreading through this country. Unfortunately no means of getting rid of the pest had as yet been discovered, with the exception of gas water, which was said to kill the insects, but at the same time it is doubtful whether it would not also kill the plants. He would recommend, as the only means of stamping it out, that all plants found to be infested with it should be immediately taken up and burnt. Mr. Berkeley then stated that on two former occasions he had had the pleasure of commenting favourably on the condition of the glass wall and new orchard-house at Chiswick, and he would now ask Dr. Hogg to make some further remarks respecting them.

Dr. Hogg said that as regards the orchard-house at Chiswick, there was, he believed, no better example to be found, and that the trees, both in pots and planted out, were managed in such a manner as to be highly appreciated by every one who saw them. The new house is 120 feet long and 30 feet wide, which dimensions offered a great advantage over structures of smaller size, as large houses do not become dry so soon as smaller ones, but always contain a greater body of moisture, which not only acts as a great preventive against insects but also is of material benefit to the trees. Another advantage—and that no mean one—which such a house possessed, was that a greater body of heat was at all times maintained in it, and this prevented the interior from being subjected to any sudden fluctuations arising from external cold. To Mr. Barron, he said, all the credit was due for the success attained, as also for devising a new plan for saving labour, in the shape of watering, an operation in connection with orchard-houses which required strict attention. The method which Mr. Barron has adopted is to leave the greater portion of the leaves packed round the pots in the autumn, as a kind of mulching, and this not only checks rapid evaporation, but keeps the roots uniformly cool. Dr. Hogg added that he had not seen any orchard-house in which a larger crop of fruit was set, and he thought that the Society had practically demonstrated the invaluable qualities of such houses when well managed.

Scientific Committee.—A. Grote, Esq., in the chair. Rev. M. J. Berkeley exhibited further specimens of Peach leaves on which a manna-like exudation was present (see p. 634). The microscopic examination showed the existence of numerous linear crystals, quite unlike those of true manna. 2. Specimens of Lychnis affected with Ustilago antherarum, which, however, did not confirm Miss Becker's observations (1869, p. 1012). 3. Specimens of Tragopogon, in which the receptacle was affected with a similar Fungus. 4. A portion of a branch of a Cucumber, in which the tissues were extraordinarily hypertrophied, as they sometimes are in certain species of Pelargonium. Mr. Berkeley also remarked that in the Chiswick garden Apple blossoms on the lower branches of trees were killed by the frost of May 4, as previously mentioned, while the flowers on the higher branches were unaffected. 5. Leaves of Vines infested with the new Vine disease, and showing an extraordinary development of the little wart-like excrescences in which the insects and their eggs may be detected.

Dr. Hogg exhibited a Polyanthus, in which the terminal flowers of the truss were abortive, showing only the rudiments of calyx, corolla, and stamens.

Dr. Masters presented a report on the experiments carried on last year at Chiswick, which will appear in the Society's Journal. Also the following letters from Mr. I. Anderson-Henry :—

"*Primulas.*—As allusion has been made to my seedling flower-foliate Primulas, so to call them, I beg leave to forward a spike of one of the most advanced of that particular form. [A further notice of this will be given hereafter.] It is odd enough that while some go on, like the specimen sent, to the extreme development of the leafy calyx, others pass into a pure 'hose-in-hose' form, of which I have quite just now coming into bloom, one which the lowest is as perfect a corolla as the uppermost, while both are of fine, dark, velvet-like texture. But I must defer till another opportunity to allude to the experiments I undertook to intermix, if I could, the other members of this interesting tribe. I may only observe generally that Nature refuses to be driven so far as I had expected; but in rare cases some rare things do result, *e. g.*, in the specimens on the cards inclosed, the lower part of a seedling 'hose-in-hose,' where, while the upper part, or corolla proper, is red, this lowest part is regularly flaked red and pale or ash-coloured white.

"*Self-sown Hybrid Seedling Rubus biflorus.*—It is well known to all who have tried their hand on the Rubus tribe how intractible they are to cross one with another. Mr. Darwin and others of note have remarked upon this, and I have often tried, but with doubtful success, to produce a hybrid between the Blackberry and Raspberry, though now I do think I have succeeded with the R. biflorus crossed on the Raspberry. But of this again, perhaps. At present I speak only of the seedlings sent, which I gather abundantly every year beneath a large plant of R. biflorus growing on a gable, away from all Raspberries. At first I got, perhaps, as many pure as hybrid seedlings, now not one pure among three mixed. I send with the hybrid plant (1) cuttings of an advanced self-sown hybrid, now opening into bloom; (2) cuttings of the pure R. biflorus; and (3) cuttings from the common garden Raspberry, for comparison. In such small specimens the difference, so marked in the growing bushes, is not nearly so discernible; yet to an educated eye it may easily be detected. A friend of mine, to whom I gave seeds, flowered the self bee-produced hybrid, and fruited it last year; and the fruit, instead of being amber-coloured, as in the R. biflorus, was red, as in the Raspberry. It is worthy of remark that at my place in Strathearn the self-sown seedlings are all of them pure R. biflorus, with the same milky stems as in the parent; whereas here they are all less or more tinted purple, and much more thickly set with spines, as in the young Raspberry, which I believe to be the male parent, the pollen being communicated by the bees. It is due to Mr. Rivers, when writing long ago on this tribe, to say that he most kindly sent me plants of a Raspberry, which he believed (and showed as good reasons as I can now for his belief) to be self-produced hybrids between a Raspberry and a Blackberry, and of which I have still plants now in my garden. All this I opine shows how much Nature, if left to her own means, works out those varieties, many of which, from their origin being unconsidered, we have been accustomed to regard as species; and thus, too, if all the lost links were recovered, might all vegetable forms be united in a bond of brotherhood.

"*Rhododendron Dalhousiæ.*—Permit me, ere I close, to direct the attention of the Committee to another singular instance of divergence, which Dr. Hooker some years ago, in putting a question, has fixed my attention to year by year since. He asked if the blooms of the Rhododendron Dalhousiæ, which, when first flowered in Britain, were, as in their Himalayan homes, pure white, had since become with us here, as they had also at Kew, of a primrose-yellow colour? That was the first year I believe he had observed the change, and it was the first year I observed it here; and it has so continued, and this season I think it is more yellow than before. But whereas formerly it was spotted, as if by decay, I have observed few or no spots this season."

Mr. Reeves showed Peach leaves affected with a peculiar spot of decaying tissue, which ultimately drops out, leaving a circular perforation. Some leaves on the branches of a Plum adjacent to the Peach were similarly affected. It was supposed to be produced by insect agency.

Mr. Glaisher exhibited leaves of a Horse Chestnut from Greenwich Park, which had recently been subjected to a cold wind of the force of 20—30 lb. on the square foot. The leaves were dried and shrivelled as if burnt. The flowers were not affected. Other members related similar instances. Mr. Glaisher then stated the results of his examination of the records of the rainfall at Chiswick for the last forty years, and compared it with similar records at Greenwich. This elaborate and most valuable report is a pendent to that on the temperature before alluded to, and, like it, will be printed in the Society's Journal.

Mr. A. Murray exhibited further specimens of Eriogaster lanestris, and also Larch twigs affected by the larvæ of Coleophora laricella, and other specimens.

Floral Committee.—Rev. J. Dix in the chair. From Messrs. Veitch & Sons came a large group of plants, to the following of which First-class Certificates were awarded:—Ficus elastica, a large, broad, deep green-leaved species, the under side of the leaves being of a beautiful silvery white; Oncospermum Van Houttei, a very graceful Palm; Pritchardia pacifica, a stiff-growing, broad-leaved species; Alnus glutinosa rubronerva, with deep copper-coloured leaves; Cyanophyllum spectandrum; and Rhaphis humilis, a distinct, upright, leafy-stemmed species. With the above also came a well-bloomed specimen of Azalea Antoinette Thelemann, a bright rosy carmine semi-double flowered variety. Mr. B. S. Williams sent a nice group of plants, including Aralia peltata, Clerodendron speciosum, Miltonia festiva, and Trichopilia crispa marginata, a very handsome Orchid, with a large deep claret-coloured lip, and with bronze white-edged undulated petals and sepals, to the latter of which a First-class Certificate was awarded. From Messrs. E. G. Henderson & Son came a collection of seedling garden Mimuluses, to which a Special Certificate was awarded. None of the varieties were singled out for certificates, as a packet of good seed—like the Calceolaria—would produce innumerable first-class varieties. Nevertheless those exhibited were thought very highly of, as being a great advance on previous varieties. To Messrs. Paul & Son a First-class Certificate was voted for Hydrangea stellata flore-pleno, a small-growing and double-flowered species, with pale green and rose-coloured flowers. Mr. Turner sent two new Azaleas, to one of which, named Roi d'Holland, a large deep crimson scarlet-flowered variety, a First-class Certificate was awarded. From Messrs. Bell & Thorpe came a collection of seedling zonal Pelargoniums, Petunias, &c. Mr. Laxton, Stamford, also sent a collection of seedling Pelargoniums. Mr. Mattan, gr. to S. P. Kennard, Esq., Woodlands, Harrowcald, sent a splendid basket of cut blooms of Hoya carnosa, richly scented, to which a Special Certificate was awarded. It seemed almost a pity that a plant should be robbed of such handsome plumage. From Mr. Green, gr. to W. W. Saunders, Esq., came six plants of a remarkably pretty Saxifraga named japonica tricolor; also Elisene longipetala, a large white-flowered species; and a large brilliant scarlet-flowered species of Gesnera, probably faucialis, from Jamaica. Messrs. Rollisson & Sons sent a good specimen of Vanda Rollissonii, a very fine variety of V. tricolor, which had however been frequently exhibited as V. tricolor superba.

Fruit Committee.—Daniel Nash, Esq., in the chair. There was a very small display of subjects brought before the Committee on this occasion. Special Certificates were awarded to Messrs. Standish & Co. for some very fine bunches of Royal Ascot Grapes; to Mr. Record, Lillesden Gardens, Hawkhurst, for two excellent dishes of President Strawberries, rather crushed in packing; to Mr. Merrett, Lavender Hill, Wandsworth Road, for a large and excellent dish of Keens' Seedling Strawberries; and to Mr. Gardiner, gr. to W. E. P. Shirley, Esq., Eatington Park, for a collection of exceedingly well kept Apples, consisting of Reinette du Canada, French Crab, Mère de Ménage, Sturmer Pippin, Royal Russet, Gravenstein, Dumelow's Seedling, Hanwell Souring, &c. Mr. Miller, gr., Worksop Manor, sent dishes of Cherries, Figs, and Strawberries, and also bearing branches of Figs bearing successional crops, cut from trees in a Fig-house, and on the open walls. Three prizes were offered for 8 dishes of forced fruits, but only one collection was shown, and to that sent by Mr. Miles, gr. to Lord Carrington, Wycombe Abbey, the 1st prize was given. The collection comprised small bunches of Black Hamburgh and Chaoush Grapes, very nice Enville and Queen Pines, a good dish of Brown Ischia Figs, Elton Cherries, Sir Charles Napier Strawberries, and Hybrid Cashmere and Bailey's Green-fleshed Melons.

Pelargonium and Heath Show.—When we say that this exhibition was a very fine one, the weather glorious, and the attendance large, we shall have said as much as is necessary, before giving the details. The show Pelargoniums made a splendid display in the western arcade. The best 9 in the open class came from Mr. Ward, gr. to F. G. Wilkins, Esq., Leyton, Essex, and comprised very large, finely bloomed specimens of Ariel, Conqueror, Exhibitor, Patroness, Empress Eugénie, Fairest of the Fair, Lucina, Regina Formosa, and Mdlle. Patti. Messrs. Dobson & Son, Isleworth, were 2d, with a good collection, including a very large example of Rose Celestial, Belle of the Ball, Constance, and Lilacina, &c. In the amateurs' class for 6 Mr. Ward was again placed 1st. His six were a capitally done lot. Pericles and Mdlle. Patti were very fine, whilst Desdemona, Maid of Honour, Fair Rosamond, and Empress Eugénie were very little inferior. Mr. D. Windsor, gr. to J. R. Ravenhill, Esq., Forest Rise, Leytonstone, came 2d with good examples of Caractacus, Patroness, Sir Colin Campbell, Desdemona, Rose Celestial, and Beacon. In the amateurs' class for 6 fancy varieties, distinct, the last named exhibitor took 1st honours, with six as well-grown and flowered plants as could possibly be wished for. The kinds shown were Mrs. Ford, Lady Craven, Madame Sainton-Dolby, Godfrey Turner, Roi des Fantaisies, and Ellen Beck. Mr. Weir, gr. to Mrs. Hodgson, The Elms, Hampstead, and Mr. James, gr. to W. F. Watson, Esq., Isleworth, were respectively 2d and 3d. Only one collection was exhibited in the nurserymen's class, and to this, from Messrs. Dobson & Sons, the 2d prize was given. In the above classes the pots were not allowed to exceed 8 inches in diameter.

The zonal Pelargoniums were represented very poorly in comparison to the displays made at former exhibitions. Messrs. Downie, Laird & Laing took the 1st prize in the nurserymen's class, with healthy, well-bloomed examples of Duchess of Sutherland, Sultan, Ladies' Pet, Comet, Countess of Strathmore, and Rose Stella; the 2d prize going to Messrs. Bell & Thorpe, Stratford-on-Avon, with Mrs. Hogg, Eleanor, Fairy Princess, Sparkler, very bright scarlet, Duchess of Sutherland, and Startler. In the amateurs' class for 6, Mr. J. Catlin, gr. to Mrs. Lermitte, East End, Finchley, was 1st with very large specimens, nearly 5 feet over, of Tintoret, Leader, Clipper, Commander, Oliver, and Mons. Rendatler. Mr. J. Weston, gr. to D. Martineau, Esq., Clapham Park, came in 2d with nicely bloomed plants of Amelina Griseau, Virgo Marie, Dr. Lindley, Herald of Spring, White Tom Thumb, and Sensation; and Mr. H. Townshend, gr. to J. C. Mappin, Esq., Clapham Park, was 3d. The best three double-flowering Pelargoniums came from Messrs. Bell & Thorpe, and included a very large specimen of Gloire de Nancy, Madame Lemoine, nicely bloomed, and Hector, very poor. Messrs. Standish & Co., Messrs. Downie, Laird & Laing, and Mr. C. Edmunds, Hayes, also exhibited smaller specimens.

The Cape Heaths were very attractive, and for the most part were well shown, the only objection, if any, being their unevenness in size. The best 6 in the amateurs' class were contributed by Mr. Carr, gr. to P. L. Hinds, Esq., Byfleet Lodge, Weybridge, and comprised very neatly flowered examples of E. Cavendishiana, very good; E. ventricosa grandiflora, E. mutabilis, E. Victoria, E. elegans, and E. ventricosa coccinea minor, remarkably good. Mr. J. Ward, gr. to F. G. Wilkins, Esq., came 2d, with a very uniform lot, though not over well bloomed; and Mr. G. Wheeler was 3d. Mr. A. Wright, gr. to C. H. C. Roberts, Esq., Regent's Park, also exhibited, and showed in his collection very good specimens of E. depressa multiflora, and E. ventricosa coccinea minor. Mr. J. Ward was placed 1st in the open class for 8 with E. Cavendishiana, very large; E. Candolleana, and E. ventricosa magnifica, very fine; E. aristata superba, very good; E. florida, splendidly bloomed, &c.; Mr. G. Wheeler 2d, with excellent specimens of E. coccinea minor, E. Spenceri, and E. Victoria Regina in his collection. Mr. C. Morse, Epsom, was 3d. Mr. J. Ward was also 1st for 12; Mr. J. Wheeler, gr. to J. Philpott, Esq., Stamford Hill, being 2d, both exhibitors showing very good groups of medium-sized, well flowered plants.

The stove Ferns, exhibited in competition for the prizes offered, contributed materially in affording variety. The best 6 in the nurseryman's class were furnished by Messrs. Bull & Thorpe, and consisted of Davallia pyxidata, Lomaria gibba, Pteris serrulata cristata, Dicksonia antarctica, and Thamnopteris australasica. The 1st prize lot in the amateurs' class, furnished by Mr. A. Wright, were excellent. The collection comprised Adiantum farleyense, Cibotium Schiedei, Gleichenia flabellata, Brainea insignis, Lomaria gibba, Gleichenia semivestita. Mr. J. Carr was 2d, and Mr. G. Wheeler 3d, both showing very effective groups.

In the miscellaneous class, which was again remarkably well represented, was a charming group of Orchids, exhibited by Mr. Denning, gr. to Lord Londesborough, and comprising some very fine Cattleyas, Saccolabium guttatum, with four handsome spikes, also S. præmorsum, very fine; Oncidium crispum, Burlingtonia fragrans, a very nice tuft; Cypripedium, &c., and a very nicely bloomed specimen of Trichopilia crispa. A Special Certificate was awarded to the latter, and an extra prize to

the collection. From Messrs. Veitch also came a very fine group of plants, including the following Orchids :—Trichopilia crispa, a larger specimen than the above, which also was honoured with special recognition; the handsome, lilac-like flower, Epidendrum syringothyrsus, Lælia purpurata, rich in colour, Oncidium bifolium majus, very bright yellow ; Aerides Fieldingii, and several varieties of Primula cortusoides, &c. Mr. B. S. Williams staged a very effective group of Heaths and other flowering plants, including several very nice Amaryllids, Ferns, &c., and of Orchids, Dendrobium Dalhousianum, the beautiful Aspasia lunata, Maxillaria Turneri, &c. Messrs. Rollisson & Sons also sent a group of Heaths, Palms, Orchids, &c. From Messrs. J. & C. Lee a fine collection of stove and greenhouse plants, including a good specimen of Medinilla magnifica, fine plants of Erica Cavendishiana, Clerodendron Balfourii, Gleichenia semivestita, very fine; and a very good specimen of Todea superba, &c. To Messrs. F. & A. Smith, Dulwich, Special Certificates were awarded for fine collections of Azaleas and herbaceous Calceolarias. Messrs. Standish & Co. exhibited a small collection of Rhododendrons and a very large specimen of Eucharis amazonica ; and from Mr. C. Noble came a splendid group of Clematis, some of them beautiful pyramidal plants in pots. Nothing could exceed the usefulness of these plants for conservatory decoration at this season. To Messrs. Carter & Co. a Special Certificate was awarded for a very neat group of tricolor Pelargoniums, Echeverias, &c. From Messrs. Bell & Thorpe came a collection of Caladiums and seedling Pelargoniums, and from Mr. James a splendid collection of herbaceous Calceolarias, fine in size and rich in colour. Mr. Parker, Tooting, again exhibited a collection of bedding Pansies. From Mr. Turner came a very showy collection of cut blooms of Tulips, and a neat group of Azaleas, to which Special Certificates were given ; and from Mr. William Paul came a very interesting collection of cut blooms of hardy trees and shrubs. Messrs. E. G. Henderson & Sons exhibited further flowering examples of Blandfordia nobilis, and also of the pretty dwarf Narcissus Bulbocodium, to which a Special Certificate was awarded ; and from Mr. Wilkie, Addison Road, Kensington, came a group of Caladiums, Heaths, &c.

Florists' Flowers.

Fringed Petunia.—We reproduce from the *American Agriculturist* a novelty amongst florists' flowers, in the shape of a fringed Petunia, which was raised by Mr. Vick, of Rochester, who writes :—"In my Petunia-house, devoted to saving Petunia seeds from pot plants this summer, I discovered a plant producing flowers that startled and delighted me; they had a pretty deeply cut fringe. My first impression was that this fringe resembled that of the fringed Gentian. I give a drawing of this remarkable flower, and hope to prove next season that the peculiarity will be reproduced from seed." The edge of the flower, it will be seen, is jagged, like the less deeply laciniated form of Dianthus Heddewigii. Something of the same kind was raised at Chiswick a year or two since, but was, we believe, subsequently lost. See fig. 139.

Fig. 139.

The Apiary.

The Handy Book of Bees. By A. Pettigrew.*—The author of this little work is not unknown to ourselves or to the apiarian readers of the *Gardeners' Chronicle*. Knowing Mr. Pettigrew to be a man of sterling honesty of purpose, as well as a good practical apiarian, we were prepared to find in his treatise much of really good and sound advice, adapted more especially to those bee-keepers to whom profit is of paramount consideration. After a careful perusal of its contents, we have found no reason to change our opinion as to the thoroughly honest and practical nature of the book and its author; but at the same time we are bound to confess that a few errors of fact, chiefly in that portion devoted to the natural history and physiology of the bee, have come under our notice. As it is important in the interests of science that truth should prevail, we have thought it advisable to point out some of these errors, and state what we believe to be the real facts, at the same time disclaiming the least shadow of an intention to depreciate the value of the book as a practical guide to the apiarian.

The first statement we notice to which we must take exception, is that nine months are given as the greatest duration of the life of the common worker bee. We would ask—has Mr. Pettigrew proved this by actual experiment? From experiments instituted by ourselves, partly with the object of determining this problem, we came to the conclusion that the workers do not live much, if anything, beyond seven months. The introduction of Ligurian queens afforded most favourable facilities for finding out the truth respecting this disputed question.

At p. 3 it is stated that "queens are fourteen days in being hatched ; that is, perfect queens are produced on the fourteenth day after eggs have been put in the royal cells." It has been proved by the experiments of many of our first apiarian authorities, and our observations are confirmatory of the fact, that at least sixteen days must elapse from the laying of the egg to the perfect development of the queen.

Here is another error :—"If they (queens) are not mated (with the drones) before they are ten or twelve days old, they are worthless for breeding purposes." It has been proved, over and over again, by actual experiment, that a queen may remain unmated with a drone for more than double the time that Mr. Pettigrew allows, and yet become a fruitful mother, capable of sustaining the best interests of a prosperous colony.

Mr. Pettigrew states at p. 7 that egg-laying commences from six to ten days after impregnation takes place. The majority of those who have minutely studied the habits and peculiarities of bees, unite in asserting that queens usually commence breeding in about 48 hours after impregnation. We have known in our own apiary queens to commence breeding in about and within this period of time.

But probably the strangest of all the incorrect theories held by Mr. Pettigrew, is that relating to the sexes of eggs. He believes that all the eggs laid by a queen, whether they may turn to be drones, queens, or workers, are precisely alike in sex, but that the common adult bees have the power of raising them into whichever class they may require, by their treatment of them in the cells. Mr. Pettigrew gives a portion of a correspondence on this subject, which he has lately had with Mr. Woodbury, of Exeter ; and although we think that the arguments of that distinguished apiarian in favour of the generally received opinion, that all eggs laid by a fertilised queen bee are of different sexes—that is, that they are of two kinds, fecundated or unfecundated—are unanswerable, Mr. Pettigrew, at the close of the chapter, declares himself "to be of the same opinion still" as that with which he started. It has been most satisfactorily proved that unfecundated eggs, if hatched out, invariably produce drones or males, and fecundated eggs are hatched out into females, whether perfect or imperfect—into perfect, that is, queens, if brought up under extraordinary treatment and nursing; into imperfect, that is, workers, if hatched out under ordinary treatment and nursing.

Mr. Pettigrew, in support of his view of the subject, quotes Mr. Quinby, an American author, as a powerful ally. He cannot have seen Mr. Quinby's last edition of his work, published in 1866. In this he most distinctly refutes all that he had previously asserted in support of the theory that all eggs are alike. For instance, Mr. Quinby says, at p. 37 of his book : "The fact that all eggs laid in drone cells will produce drones, and nothing else, is to be accounted for. There is no possibility of setting this aside. The attempt to rear queens from such has so utterly failed with myself and others, that we have no longer any hope of success. The reason undoubtedly is, that eggs laid in drone cells are not impregnated." We have not space to pursue this argument further, but we hope that Mr. Pettigrew will see reason to alter his opinions before he issues a second edition of his book. Again, Mr. Pettigrew startles us by asserting, or seeming to assert, that the working bees help to distribute and deposit the eggs in the cells. This statement seems to us to be so absurd, that we can hardly imagine Mr. Pettigrew to seriously believe in it.

At p. 41 Mr. Pettigrew states that the eggs intended to be raised into young queens are set about four days before swarming takes place. We can almost confidently assert that from a week to nine days is the more usual duration of time which elapses from the first deposit of the eggs in the royal cells to the issue of the swarm.

With respect to honey, our author asserts that bees reswallow honey before it is finally deposited in the cells. We do not believe they do, and would ask Mr. Pettigrew for his proofs for such a strange assertion.

We have extended our remarks on this portion of the book to such a length that we have left no room for any observations on the second, and by far the most valuable portion of it, viz., that relating to the practical management of bees. While we do not wholly agree with the author on every point, we can confidently recommend this portion of the book to the careful study of would-be practical bee-keepers. It is a great pity that so good a book should be disfigured with such errors as we have shown to exist in the first portion of it, devoted to the scientific consideration of the subject, in which it would appear as if Mr. Pettigrew had ventured rather beyond his depth. *X.*

* William Blackwood & Sons, Edinburgh and London.

Miscellaneous.

Californian Vineyards.—As a rule, the vineyards cannot be said as yet to have been very remunerative. While there are large quantities of excellent white, red, and sparkling wines made, and while the average quality is creditable, it will be understood that many wine manufacturers hardly as yet understand the full *modus operandi*. Further, it is difficult to introduce to a market a new wine anywhere, unless the quality is unmistakably high ; and yet the profits of the best vineyards near San Francisco are very enticing. I am acquainted with an amateur Vine-grower, who gets from about 10 acres an income of not less than 2500 dollars (£500) ; his Muscat of Alexandria Vines nett 370 dollars gold (about £75) to the acre. The same Grape (principally used for the table) netts 675 dollars (or £135) to the acre in one celebrated vineyard. In other localities I have known Grapes sold (for distillation) at from three-fourths of a cent to one and a half cents per pound. Even then they were more profitable than Wheat. Many Grape Vines in the State have grown to great size. There is one at Montecito, Santa Barbara county (Southern California), now 74 years old, which yields from three to four tons of Grapes per annum (the American ton is 2000 lb.) At Cotoma there is a Vine which produced 1000 lb. in 1867, when it was five years old. At Santa Cruz there is another, planted in 1851, which last year yielded about the same quantity. Southern California produces the largest amount of wine and brandy. One county alone, Los Angeles, has nearly 4,000,000 Vines, and yielded in 1868, 1,111,200 gallons of wine and 85,800 of brandy. The total produce for that year probably nearly doubled that of 1869, but the wine was inferior. The wines of California, especially of Southern California, are a little too alcoholic and heady. This springs from the freshness of the soil cultivated ; time will correct this drawback. The leading wine district for the present is undoubtedly Sonoma, 40 miles north of San Francisco ; but the foot hills of the Sierras (included in what are known as the "mountain counties") will probably yield the highest grades in the future. Already native champagnes are driving foreign importations from the market, both here and in the Atlantic States ; and this branch of the business will probably prove the most profitable of all. The wine yield of California was stated to be last season not less than 3,500,000 gallons, and it may be indefinitely increased. The area of good vineyard land in the State is probably larger than that of France. The latter country produces 600,000,000 gallons of wines and spirits annually, and with time California may become hardly second to her. Even now you cannot take up the wine card in any large New York or other Atlantic city hotel without finding the productions of California side by side with those of France, Germany, and Spain. I cannot find that the Vine is indigenous to California, but the priests early introduced the Spanish varieties from Mexico, and the "Mission" is still the stock Vine of the country, though nearly every other kind is largely grown. *F. Whymper, in "The Field."*

Garden Operations.

(for the ensuing week.)

PLANT HOUSES.

Fuchsias will now be making an advance towards flowering, in instances where they have been pushed on to afford an early display of bloom. When fairly started into growth, and with a sufficiency of pot room, these plants will stand and flourish in a high temperature ; but when so treated plenty of moisture in the atmosphere should be constantly afforded, together with a little shading when the sun shines

bright. Too much pot room should not be afforded at once, small and frequent shifts are far preferable. Some 15 or 20 years ago gardeners were wont to follow the single shift principle—potting such plants as these into their blooming pots at once—but these practices have been completely given up. Fuchsias delight in a rich compost, composed of good pasture turf (which should be laid in a heap for 12 months or so, that its fibry matter may become partly decomposed), good rotten dung, thoroughly pulverised by the action of the air, and plenty of silver sand. Old plants, when growing, must be frequently pinched back, except the strongest and best placed shoots, which should be reserved to form a symmetrical pyramidal growth. Yount plants which are being grown on from cuttings, and which have only grown invariably beat the older plants in point of compactness, &c., will also require pinching-back a little. These young plants should be so managed that they receive their final shift in time to allow of their being pinched back twice at the least. This will enable them to fill the pots well with roots before the flowers are permitted to expand, at which time good wholesome manure-water should be given alternately. Many soft-wooded stove plants, and others which grow freely at this time, will also be materially benefited if some kind of artificial manure is afforded them. There are many stove plants which may be used more freely than at present in the garniture of our conservatories or show-houses during summer, providing they are gradually inured to a more plentiful supply of air for a few weeks before removing them from the hotter houses to the cooler ones, and by keeping the latter kind of structures somewhat closer and entirely free from draughts for a few days subsequently. I may instance *Clerodendrons*, *Vinceas*, &c., and some exotic Ferns, such as the *Doodias*, *Adiantum formosum*, *A. pubescens*, *Blechnum*, and *Pteris*. Air should now be allowed nightly to all cool-houses, when the weather is at all favourable. Be careful not to over-crowd *Ericas* of the autumn or winter-blooming sections, which are now making their summer's growth, and look well into and throughout each plant to detect at the earliest moment anything in the form of mildew which may exist amongst them. This pest, which proves extremely fatal to this class of plants, is easily disposed of by applications of sulphur, dusted finely on all the affected parts.

FORCING HOUSES.

Attend as early as is necessary to all *Vineries* in which the Vines are now making active growth. Tie the young lateral shoots in their places before they become too stiff or old, and become likely to snap off at the base when being so tied. Syringe freely when the blooming period is over, and by affording air freely, at all times when the thermometer outside stands above temperate, imbue them with all the rude health and vigour possible. During fine weather but a very slight amount of heat will be required in the pipes, and that mainly to keep up a proper temperature during the night and early hours of morning. In earlier vineries, in which the Grapes are finally swelling, and especially if they are just approaching the colouring process, a good maximum temperature should be maintained. With bright weather, and a sufficiency of air allowed to keep the internal atmosphere continually moving, so as to neutralise the fixity of the sun's rays, from 95° to 100° may safely be permitted about mid-day, when the foliage is dry. Give to rooted suckers and other young *Pine plants*, which are actively growing in suitable pits, as much air as possible, so as to induce a thick sturdy growth. Make the necessary preparations for shifting any prominent successionals which may shortly require it, by the proper preparation of soils, &c., which if chopped up and placed under cover will be fit for use at any time when wanted. Do not omit to shade all fast-growing Pines with thin shading when the sun shines brightly, during about two hours of the hottest part of the day. Neglect in this wise, though it may not show itself at once, will nevertheless injure what otherwise would be a finely developed leaf-surface. Give an abundance of manure-water to *Fig trees*, which are swelling their fruit. There are few subjects which are more capable of imbibing and turning to good account a gross diet than these, more especially when it is afforded them under the other most favourable conditions of growth, viz., heat, humidity, and fresh air. Continue stopping all free-growing shoots, whether secondary or otherwise, as the young fruits are formed on these at the base of the young leaves, which latter become better developed when the shoot is so pinched back—a point of great importance to the well-being of the fruit. Be careful at this time not to permit old pots of forced Dwarf French Beans, or other similar subjects, to stand about, whether within or just without any of these structures, for that pest, the red spider, when not generated within the house, is liable to affect a lodgment in them through carelessness in this respect. Stop the grosser shoots upon *Melon plants* just before they reach the sides of the frames when at the earlier stage of their growth, and also all the lateral shoots upon those which are farther advanced, at two leaves beyond the female flowers. Set the flowers as soon as they expand. Keep the atmosphere surrounding them somewhat drier until successful fertilisation has taken place and a crop is secured, which will readily be seen by the fruits commencing to swell. Then a good root-watering must be given, and the most favourable conditions to a quick growth assured.

HARDY FRUIT GARDEN.

Apricot trees should now be looked over, and have all misplaced shoots which are unnecessary, taken off. If this be done forthwith, many of them might be snapped off with the finger and thumb, which is a better mode of manipulation than cutting them off with a knife. Of course such as are too strong (as many of them will be if left much longer) will have to be taken off with a keen-edged knife. Every encouragement should be given to all well-placed young shoots which are not too vigorous and will train well against the wall. In most of the sorts this is the wood required for fruiting next season. Not so in the case of the Moor Park, however, which fruits most freely upon "spurs;" hence every encouragement must be given to the formation of such when the summer pruning is being performed. Look over *Peach* and *Nectarine trees*, and in all instances where there is a good crop remove all the lesser fruits in places where they are too thickly placed. It will be seen that some branches which are shy to form wood-buds or grow have nevertheless a heavy crop of fruit forming on them. These in particular should be thinned out freely, so that every assistance may be given to such naked branches to form young growths as well as fruit. I have before suggested how important periodical syringings are to the well-being of the trees; even with the view of deterring the formation of insect pests alone, this simple operation should not be neglected.

HARDY FLOWER GARDEN.

Hardy Annuals which are sown in the open borders will, now that a nice rain has fallen, germinate and grow freely. No neglect should occur in properly thinning them out; too frequently from six to a dozen or more plants are made to occupy the space which one would need, could it grow freely and unimpeded by the others. It will be seen, therefore, how necessary it is to give each variety a proper amount of space, according to its requirements. In all varieties of plants there are certain characteristic proportions of the parts, as to the general outline, the foliage, and flowers, which excite our admiration; and without the proper development of each part, not a tithe of their beauty is discernible. How much we lose by overcrowding—which is so antagonistic to successful cultivation—I need not say. The *Annuals* and *Hardy Perennials*, now being raised from seeds, as well as *Half-hardy Annuals*—comprising such subjects as *Asters*, *Stocks*, *Marigolds*, *Zinnias*, &c.—will all pay for careful transplanting into good rich soil, advantage being always taken of a nice showery period for this purpose, as a matter of course. Necessary precautions should also be taken against slugs or similar nocturnal visitants. Do not delay longer to transplant, after properly dividing them, all kinds of Violets, and especially the Neapolitan, which requires a whole summer to grow and perfect its growth. Thin out the spindles upon choice *Pinks*, &c., and secure the stronger ones to neat sticks.

KITCHEN GARDEN.

Pinch off the tops of early *Broad Beans*, which have produced a sufficiency of flowers for a crop. This will enable the crop to swell-off freely and better than it otherwise would do. Transplant *Turnips*, in all instances where a limited sized bed only has been sown, or where they have come up patchy, for the fly, owing to the late cold winds, has been very troublesome. Transplant at the earliest possible moment, when fit, and when nice showery weather prevails, all spring-sown *Brussels Sprouts*, *Cauliflowers*, *Cabbages*, &c., into their permanent summer quarters. A dozen rows of the former, which I transplanted with the first warm showers on the 11th inst., are now growing away freely. The hoe must be kept constantly going now, whilst a weed remains. In addition to the destruction of the latter the moving of the soil between the crops is of very great importance. Transplant out the first row of *Celery* for early autumn use on the single trench principle. The trenches should be from 8 to 10 inches deep, according to the depth of the soil, for the first crop, and the wider they are made (in reason) so much the better, as more manure can be placed at the bottom for them to grow in, and superficial rains will have a more ready access to them. *W. E.*

TOWN GARDENING.

Lilium auratum and *L. lancifolium* will now receive much benefit from a watering with liquid manure twice a week; this should be done by putting a spadeful of horse droppings into a large water-can of soft water, and letting it stand 12 hours before using. Plant out *Tender Annuals*, such as African and French Marigolds, Hibiscus africanus, Portulaca Gilliesii, Phlox Drummondii, and if possible take the opportunity of a showery evening for the operation. They will do well if planted one in a 48-sized pot, and prove very useful for decoration in autumn. The *Pompon Chrysanthemums* that were put in last month, should now be topped, and if the tops are put into pots, six round each, and placed away in the shed for a few days, they will make nice plants for flowering in pots in front rows in the borders. *Grass plots* and *lawns* should be mown once a week, and the edges should be trimmed with the shears, which will add greatly to their neatness; and at this season take the advantage of rolling the walks after every shower with a heavy roller, which will render the surface close and smooth for the summer. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, MAY 18, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.			
May.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
12 Thurs.	29.32	54.4	50.9	47.4	77	3.7
13 Friday	29.55	57.0	54.2	51.7	82	4.3
14 Satur.	29.69	56.7	51.4	46.4	70	4.1
15 Sunday	29.85	56.7	51.9	47.0	71	3.7
16 Monday	29.69	53.2	52.4	51.6	94	4.3
17 Tues.	30.03	58.8	52.8	47.4	67	3.7
18 Wednes	30.11	64.4	57.0	51.1	61	4.1

1870. MONTH AND DAY.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	WIND. Direction.	Horizontal Movement.	RAIN. In Inches
May.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
12 Thurs	63.0	47.7	15.3	53.5	+ 2.3	S.W.	540	0.00
13 Friday	60.0	48.2	11.3	51.9	+ 0.5	S.W.	490	0.18
14 Saturday	65.8	48.2	17.6	55.2	+ 3.5	S.W.	590	0.00
15 Sunday	65.7	44.0	21.7	53.2	+ 1.2	S.W.	245	0.00
16 Monday	60.0	48.3	17.7	55.5	+ 3.2	WSW	215	0.04
17 Tues.	67.8	42.1	25.7	53.1	+ 0.7	S.W.	215	0.00
18 Wednes	70.2	42.3	33.9	57.0	+ 4.7	WSW	250	0.00

May 12.—Variable amounts of cloud prevalent. A heavy gale throughout the day.
— 13.—Generally overcast during the day, variable at night Rain fell during the morning. Brisk wind.
— 14.—Very variable amounts of cloud prevalent. Brisk wind.
— 15.—Generally cloudy but fine.
— 16.—Generally cloudy till night, then cloudless. Occasional rain.
— 17.—The amount of cloud varied much throughout the day. Very fine. A very fine solar halo.
— 18.—Generally cloudless. Very fine and hot.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, MAY 14, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	62.0	32.3	29.7	59.4	38.9	20.5	47.4	1.12
Blackheath ..	65.8	29.8	36.0	66.9	40.2	26.4	49.3	0.37
Brixton ..	62.7	34.0	28.7	58.2	40.2	18.7	48.2	0.30
Birmingham ..	62.4	37.0	25.4	59.1	42.0	16.2	49.3	0.90
Wolverhampton	61.4	40.1	21.3	59.4	43.0	15.7	49.9	0.93
Leicester ..	65.2	34.0	31.2	60.9	41.0	19.9	49.6	0.49
Norwich ..	65.0	33.5	31.5	58.3	40.3	18.0	47.5	0.35
Nottingham ..	63.3	34.4	28.9	60.4	42.1	18.3	49.5	0.34
Sheffield ..	61.0	35.0	28.0	60.0	41.0	18.0	48.5	0.28
Liverpool ..	61.2	41.0	20.2	58.7	44.9	13.8	50.1	0.65
Manchester ..	67.0	42.0	25.0	61.5	45.4	16.1	51.7	0.63
Salford	63.0	41.0	22.0	59.5	44.2	15.3	50.2	0.65
Bradford	61.1	38.5	22.6	58.2	44.0	14.2	49.4	0.98
Leeds	62.0	39.0	23.0	59.1	44.1	15.0	49.9	0.88
Hull	61.0	27.0	38.0	60.0	38.1	21.9	47.4	0.53
Newcastle ..	61.0	40.0	21.0	55.3	43.3	12.0	47.0	0.05
Edinburgh ..	61.7	36.0	25.7	..	..	..	48.7	0.60
Glasgow ..	61.8	38.5	23.3	..	..	..	48.2	1.41
Dundee ..	59.0	41.0	18.0	..	..	..	47.5	0.70
Aberdeen ..	61.8	40.4	21.4	..	..	..	48.0	0.43
Paisley	60.0	41.0	19.0	..	..	..	50.7	1.23
Greenock ..	59.0	41.0	18.0	..	..	..	48.6	1.80
Leith	62.0	40.8	21.2	..	..	..	48.8	0.27
Perth	..	..	..	..	..	..	..	..
Dublin	62.9	39.0	23.9	..	..	..	48.8	0.53

JAMES GLAISHER.

Notices to Correspondents.

A GOOD PLAIN GARDENER: *J. G.* We are of opinion that a gardener who can and does cultivate Vines, Melons, Cucumbers, Mushrooms, stove and greenhouse plants, and manage a kitchen garden and forcing-houses for fruit successfully, is a good plain gardener.

CAMELLIA: *H. M.* We intend giving a woodcut of the excrescence in question.

CUNNINGHAMIA SINENSIS: *Bath.* Yes, certainly. *A. M.*

CUT FLOWER PACKING CASE: *S. T. F.* Try Chapman's new box.

DISEASED CUCUMBER: *P. G.* Your specimen is very curious; we have seen nothing like it before. In the portion below the swelling the wedges of vascular tissue are quite regular, but in the tumour itself they are altogether deranged, and the medullary rays much thickened and blanched. On examination under the microscope we can find no trace of Vibrio, which we at first conceived might be the cause. You should send a perfect specimen, showing roots both above and below the tumour, to this office, with a view to having it figured. *M. J. B.*

FERNS: *B. B.* Adiantum Capillus-Veneris, being properly a greenhouse Fern, may be exhibited in a class for "Stove and Greenhouse Ferns." On the other hand, not being strictly hardy, it should not be shown in a class of "Hardy Ferns."

INSECTS: *Subscriber.* The insects found in your Pine stoves are one of the kinds of exotic species of snake millepedes, imported with the plants, closely allied to our common Polydesmus complanatus. We would recommend your burying slices of potato, stuck on sticks, in the ground, which should be examined from time to time, as the insects will quickly be decoyed to this kind of trap. *W.—J. B.* Otiorhynchus sulcatus. *A. M.*

NAMES OF PLANTS: *M. M.* Apparently Rhexia

viminea.—*A. O. S.* Wistaria sinensis, lilac ; Cianthus puniceus, scarlet.—*A. E. S.* Helleborus viridis. We have no knowledge of the other specimens referred to.

PRESERVING TIMBER : *G. M.* There is no doubt that creosote is the best preservation against Fungus. Corrosive sublimate answers for a time only. The bottom of your posts only would require being impregnated. We have no information at present as to the points on which you want instruction, but we will make inquiries. Inquire of the station-master at the nearest railway station. *M. J. B.*

ROSE TREES BARKED : *E. W. D.* Like yourself, we have never seen a similar attack on Rose trees. We will endeavour to obtain some information on the subject. Are you infested with cockroaches, which are omnivorous? Some Lime twigs similarly affected were brought to the Scientific Committee, May 4, 1869. It was supposed that squirrels were the enemies, but there is no trace of teeth on your Rose shoot, so that it is difficult to believe that any vertebrate animal is concerned. If an insect is the cause it must be one of considerable size. *M. J. B.*

TROPICAL AGRICULTURIST : *Oriens.* We know of no other work than that of Porter, a new edition of which is mentioned below.

VINE LEAVES CURLING : *F. D.* We should say that the cause of the leaves of your Vines curling in the way you mention is cold—a cold temperature in the house, or rather a chill, aided, it may be, by a cold border. The watering would not tend to improve matters. They will soon improve under good treatment.

VINES : *B. D.* Your Vines will grow quite well without the protection of glass. There is no necessity to take them up. Attend to their pruning and training the same as if the glass was over them, so as to get the wood properly ripened. It is this free exposure of the wood, and the consequent ripening of the same, that will enable your Vines to stand the winter uninjured.

Communications Received.—A. J. P.—Colonel Benson.—F. W. B.—W. B.—J. F. J.—J. H. O.—E. & M.—W. Swale.—W. H. G.

Markets.

POTATOS.—Southwark, May 10.

During the past week the arrivals coastwise have been limited ; trade for all best samples a little better, prices of former week fully maintained. Quotations as follow :—Yorkshire Flukes, per ton, 130s. to 150s. ; Ditto Regents, 110s. to 140s. ; Lincolnshire do., 100s. to 110s. ; Dunbar and East Lothian do., 110s. to 140s. ; Perth, Forfar, and Fifeshire do., 95s. to 110s. ; Do. Rocks, 95s. to 105s. ; Do. Reds, 90s. to 100s. ; French and Belgian Whites, 80s. to 100s.

COVENT GARDEN.—May 27.

We have no alteration to announce here. The supplies of home-grown produce have considerably increased since last week. Imports are heavy. Melons and Apricots are now offered in limited quantities. Flowers chiefly consist of Azaleas, Orchids, Roses, French and Scarlet Pelargoniums, Heaths, Fuchsias, Hydrangeas, Lobelias, Mignonette, and Heliotropes.

FRUIT.			
	s. d.	*s. d.*	
Apples, p. ½ sieve ..	3 0 to 5 0	Melons, each ..	3 0 to 12 0
Cobs, per lb. ..	0 6 — 0 9	Oranges, per 100 ..	2 0 — 7 0
Filberts, per lb. ..	0 6 — 0 9	Pears, per doz. ..	4 0 — 10 0
Grapes, per lb. ..	8 0 — 12 0	Pine apples, per lb.	8 0 — 10 0
Lemons, per 100 ..	4 0 — 8 0	Strawberries, p. lb.	6 0 — 12 0

VEGETABLES.			
	s. d.	*s. d.*	
Asparagus, p. bund.	3 6 to 15 0	Leeks, per bunch ..	0 2 to 0 4
Artichokes, p. doz. ..	3 0 — 6 0	Lettuces, p. score ..	1 0 — 2 0
Beet, per doz. ..	1 0 — 3 0	Mint, per bunch ..	0 6 — 0 9
Broccoli, per doz. ..	1 0 — 2 6	Mushrooms, p. pott.	1 0 — 1 6
Cabbages, p. doz. ..	1 0 — 1 6	Onions, per bunch ..	0 4 — 0 9
Carrots, p. bunch ..	0 4 — 0 8	Parsley, per bunch	0 2 — 0 4
— young, p. bun	0 4 — 0 6	Parsnips, p. bushel ..	2 0 — 3 0
Cauliflowers, p. doz.	1 6 — 3 0	Salsafy, per bundle .	1 0 — 1 3
Celery, p. bund. ..	1 0 — 1 6	Scorzonera, do. ..	1 0 — 1 3
Cucumbers, each ..	1 0 — 1 6	Seakale, p. punnet..	1 6 — 2 0
Endive, per doz. ..	1 6 — 2 0	Shallots, per lb. ..	0 8 — ..
French Beans, p. 100	2 0 — 4 0	Spinach, p. bushel ..	2 0 — 3 0
Garlic, per lb. ..	0 8 — ..	Radishes, per doz ..	1 0 — 1 6
Herbs, per bunch ..	0 2 — 0 4	Turnips, per bunch .	0 2 — 0 3
Horse Radish, p. bun.	3 0 — 5 0	— young, p. bun	1 6 — 2 0

Potatos, York Regents, per ton, 120s. to 150s. ; Flukes, do., 110s. to 150s.

Economic and Effective Gardening—See

CARTER'S ILLUSTRATED PLANT CATALOGUE for 1870

Now ready, post free 6d., gratis to purchasers.

JAMES CARTER AND CO., 237 and 238, High Holborn, London, W.C.

WPOTTEN now offers the following 20 choice GERANIUMS as under :—

GOLDEN TRICOLORS.—Edward Milner, Florence, Mrs. Turner Queen Victoria (Perkins), Star of India.

SILVER TRICOLORS.—Impératrice Eugénie, Mabel Morris, Mrs. John Clutton, Princess Beatrice, Queen Victoria (Smith's).

SILVER VARIEGATED.—May Queen (Turner's), Princess Alexandra

GOLD and BRONZE.—Crown Prince, Black Knight, Cleopatra, Black Prince

DOUBLES.—Marie Lemoine, Wilhelm Pfitzer, Madame de St Paul, Madame Lemoine

Good plants, in 3 inch pots, package free, for 25s

W. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

NEW FANCY GERANIUM (1870), CHARLES WHITHAM.—Bright rosy crimson, suffused with violet, margined with white, pure white throat, fine form and substance, free bloomer, and robust habit

B. WHITHAM has great pleasure in offering the above, and feels confident that it will ultimately prove itself to be a universal favourite, having been pronounced by competent judges to be one of the very best of its class

In order that the Public may have the opportunity of possessing the above, B. W. is now offering it at the very low price of 7s. 6d. and 10s. 6d. each,—strong flowering plants. Allowance to the Trade

Nurseries, Reddish, near Stockport.—May, 1870

Variegated Bedding Geraniums.

ALFRED FRYER offers the following choice kinds, in strong plants, at per dozen, for cash :—TRICOLORS : Sophia Dumaresque, 3s. 6d. ; Lady Cullum, 6s. ; Italia Unita, 3s. ; Picturata, 3s. 6d. ; Gold and Bronze, 3s. ; SILVERS : Beauty of Calverdale, 3s. 6d. ; Beauty of Ribbledsdale, 4s. ; Duke of Edinburgh, 9s. ; F. G. Henderson, 4s. ; Kentish Hero, 4s. ; Mrs. John Todd, 4s. ; Neatness, 2s. 6d. ; Model, 3s. 6d. ; Perfil, 3s. 6d. Most of the above are autumn struck. Baskets and packing, 1s. for a single dozen, and 6d. extra for every subsequent dozen. Remittances requested from unknown correspondents.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Choice and Distinct Geraniums.

THOMAS PESTRIDGE will forward the following 12 on receipt of Post Office order for £1 1s. :—

Achievement (Turner)	Prince Silverwings
Charming Bride	Prima Donna
Crown Prince	Hutsion Weir
Lucy Grieve	Red King
May Queen (Turner)	Italian Beauty
Princess Beatrice (Cutter)	Mrs. Wm. Noner

The Greenway Nursery, Uxbridge

Novelties of 1870.

JOHN MANN begs to offer the following new ZONAL PELARGONIUMS :—

Amabilis	Haward	Valiant
Bella	Sir Robert Napier	Wm. Graham

GOLD and BRONZED PELARGONIUMS.

Banff	Helena

The flowers of the above are unsurpassed for size and form.

GOLDEN TRICOLOR PELARGONIUMS

SILVER TRICOLOR PELARGONIUMS

GOLD and BRONZED PELARGONIUMS

Descriptive Priced LIST will be forwarded free on application to JOHN MANN, The Nursery, Brentwood

New Zonal Geranium, Purity (Eckford).

JAMES GARAWAY and CO. have much pleasure in offering the above, and can confidently recommend it as a decided acquisition. It is in the way of that well known variety Madame Werle, and is a great improvement on it.

For correctness of shape and delicacy of colouring it cannot be surpassed, and its freeness of flowering especially adapts it both for conservatory decoration and for effective bedding out.

Plants now ready, 5s. each. Four sent for three

NEW SILVER-EDGED GERANIUM, MADAME VAUCHER VAR.—This is a sport from the green variety ; is distinctly margined with clear white, with occasionally a bright rose zone.

Plants ready the middle of May, 5s. each.

☞ Usual allowance to the Trade.

JAMES GARAWAY & CO.'S SPRING CATALOGUE is now ready, and sent post free on application.

JAMES GARAWAY AND CO,
Durdham Down Nurseries, Bristol.

PARTNER WANTED, Active or Sleeping, to assist the Advertiser to carry out Silver Sand, Peat, Fullers' Earth Works, &c.—W. H. C., Post Office, Redhill, Surrey.

WANTED, a PARTNER, to join in extending a good paying Market Garden. Must be well acquainted with Jobbing Trade done. Situation one of the best in Midland Counties Capital required, £300.—G. W., Johnson's Brickyard, Worcester Wharf, Birmingham

Gardener and Industrial Trainer.

ABINGDON UNION.—The Guardians of this Union will, at their Meeting on Monday, June 13 next, proceed to the ELECTION of a Single Man as GARDENER and INDUSTRIAL TRAINER for the Workhouse of the above Union. The person appointed will be required to have a practical knowledge of Gardening, to Superintend the Male Adult Inmates, and to act as Industrial Trainer to the Boys when at work in the Garden. Salary, £40 per annum, with Rooms, Coals, and Rations in the Workhouse.

Applications, with testimonials as to age, character, previous occupations, &c., to be sent to my Office in the High Street, Abingdon, on or before Saturday, June 4 next.—By order of the Board,

Abingdon, May 5, 1870. BROMLEY CHALLENOR, Clerk.

WANTED, by a Gentleman in the country, an active MAN, for the care of a small private Farm, under a Gardener. A Man with a Wife and no family preferred. There is a cottage to live in. Apply (first by letter) to Messrs. Man and his Wife Nurserymen, Seedsmen, and Florists, Uckfield, Sussex

WANTED, a clever PROPAGATOR, for general work, chiefly outside ; 20s. a-week, with a comfortable room.—LITTLE and SON, Lakeland Gardens, Cork

WANTED, a steady, active Man, as PROPAGATOR, in the House Department of the Waverstree Nursery. He must understand the Propagation of Hard and Soft-wooded Plants.—THOS. DAVIES & CO., Waverstree Nursery, near Liverpool

WANTED, a good CORRESPONDENT CLERK, who can write and report promptly. Preference will be given to one well up in the Nursery and Seed Business. Wages to commence at 30s. per week, with an early advance.—B. S., 12, King Street, Covent Garden, W.C.

WANTED, as SALESMAN and FOREMAN in a London Nursery, a trustworthy intelligent Man, acquainted with the Estimation of Plants and their Value. One used to making Bouquets preferred.—J. W. WIMSETT, Royal Ashburnham Park Nursery, King's Road, Chelsea, S.W.

Improved Trade.

WANTED, as SHOPMAN, a young Man of experience. Must be steady, industrious, obliging, and able to keep Accounts correctly. First-class references required as to character. Apply, in own handwriting, stating age and salary expected, to HORTUS, Post Office, Richmond, Surrey

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application personally at any time will be happy to state the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen by their particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for above, beg to state that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon JAMES CARTER & CO adopting the most stringent regulations in relation to testimonials as to quality, honesty, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

GARDENER (HEAD).—Age 28 ; has a practical knowledge of the profession in all its branches. Good character. Wife as Laundress.—X. X., 37, Elgin Terrace, Maida Vale, Paddington, London.

GARDENER (HEAD).—Age 29, married, one child ; has a first-class practical knowledge of the profession in all its branches, including the management of Vines, Pines, Peaches, Cucumbers, Melons, Strawberries, Mushrooms, &c. Character will bear the strictest investigation.—J. W., Kingston, Tetsworth, Oxon.

GARDENER (HEAD).—Age 33, married, no incumbrance ; understands the profession in all its branches. Scotch. Four years in last situation (a Nobleman's).—R. CAIRNS, Mr. P. J. Perry's Nurseries, Banbury, Oxon.

GARDENER (HEAD), to a Lady or Gentleman.—Married, no incumbrance ; understands Forcing Flowers, Fruits, and Vegetables, and Flower and Kitchen Gardening. Seven years' reference.—G. B., 14, Adams Square, Bromley, Kent

To Noblemen and Gentlemen.

GARDENER (HEAD).—Age 35, single ; has a thorough practical knowledge of the profession in all its branches, including Specimen Plant Growing. Can be highly recommended.—A. L. X., Post Office, Sudbury, Suffolk.

GARDENER (HEAD).—Middle-aged, married, no incumbrance ; thoroughly experienced in the Culture of Vines, Pines, Stove and Greenhouse Plants, all kinds of Forcing, Kitchen and Flower Gardening, and can take the Management of Land.—S. Y., Warren's Library, 1, Edwarde's Terrace, Kensington, W.

GARDENER (HEAD), age 35, married.—J. ORSMAN, late Head Gardener to the Right Hon. Viscount Sydney, offers his services to any Nobleman, Lady, or Gentleman requiring a thoroughly practical Gardener. First-class references and testimonials, and five years' good character.—Victoria and Paradise Nurseries, Upper Holloway, N.

GARDENER (HEAD).—Age 33, married, no incumbrance ; thoroughly understands the profession in every branch, and would like to Manage a first-class Place. Unexceptionable character, and excellent reasons for leaving.—A. G., Post Office, Broadway, Deptford, S.E.

GARDENER (HEAD).—Age 26, single ; thoroughly practical in all branches of the profession ; understands Forcing Melons, Cucumbers, Mushrooms, Stove and Greenhouse Plants ; also a good Flower and Kitchen Gardener, &c. Good character.—A. B., 20, Neville Street, Upper Kennington Lane, S.

GARDENER (HEAD).—Age 30, single ; understands the Management of Vines, Pines, Melons, Peaches, &c. ; the Early and Late Forcing of Fruit and Flowers, and the general routine of the Garden in all its branches. Can be well recommended.—W. J., Post Office, Blunham, Beds.

GARDENER (HEAD).—Age 28, married, no incumbrance ; thoroughly practical, and fully competent in every branch of the profession, including Early and Late Forcing, Pinetreeing, Gardening, &c. Best references.—H. D., Mr. Cheshire's, 14, Grove Road, Holloway, N.

GARDENER (HEAD).—Aged 29, married ; practically acquainted with every branch of the profession ; over three years' excellent character from present employer. Gentleman he has just left also from Mr. Keay, Botanical Gardens, Sheffield, and present employers, Messrs. Fisher, Holmes, and Co., Handsworth Nurseries, Sheffield, to whose care please address for J. F.

GARDENER (HEAD), age 35, married.—A Gentleman, changing residence, can with confidence recommend his Head Gardener, who has lived with him nearly four years. He has had under his care a considerable range of Forcing, also large Pleasure and Kitchen Gardens, Plantations, &c., and he is a thoroughly honest and steady Man.—C. B., 4, Brunswick Place, Hammersmith Road, London, W.

To Noblemen and Gentlemen

GARDENER (HEAD).—Age 37, married, no incumbrance ; thoroughly practical, and quite competent to Manage a first-class Place. Has had great experience in the Early Forcing of Pines, and more especially Grapes, Peaches, Melons, and Strawberries, the Cucumbers all the year round, Mushrooms to any extent ; also the Cultivating and Hybridising of Auriculas, Roses, and Orchids (particularly Ferns, &c. ; has great taste in the Arranging of Flowers, and is a first-class Bouquet maker. Has been for the last 10 years Head Gardener to a Nobleman.—M. PIPER, Post Office, Stamford.

GARDENER (HEAD) and BAILIFF.—Age 41, married ; has had 21 years' experience as Nobleman's and Gentleman's Gardener, and thoroughly understands Farm Working of all kinds of Trades, Flowers, and Vegetables, also the Land, Sowing Various Seeds, Management of Land and Stock, Buying and Selling, Farm Accounts. Wife a good Dairywoman. Certificates, and nearly 12 years' good character can be produced.—A. B., 6, Eden Place, near Bromley, Kent.

GARDENER (HEAD, or good SINGLE-HANDED).—Married, no incumbrance ; thoroughly understands the profession in all its branches. Nineteen years' experience. Four years' good character.—W. BECKETT, Lodge, Chilmark, Salisbury

GARDENER (HEAD, or SINGLE-HANDED).—Middle-aged, married, no incumbrance ; has a good practical knowledge of the profession in all its branches ; also Stock and Meadow Land, if required. Six years' character.—J. S., 13, Addiscombe Road, Croydon, Surrey

GARDENER (HEAD), where one or more are kept.—Age 34, single ; has a good practical knowledge of Gardening in all its branches. No objection to Cows or Land. Can be highly recommended.—B. C., Barleythorpe, Oakham

GARDENER.—Age 40, married ; understands the general Management of a Garden in all its branches ; no objection to a Single-handed place. Can be well recommended.—A. Z., Mrs. Beach, Warder Street, Garratt Lane, Wandsworth, S.W.

GARDENER.—Thoroughly understands every branch of the profession ; the Management of Vines, especially Stove and Greenhouse Plants, Forcing, &c. Has grown extensively for the London Markets. Understands the Laying out of Pleasure Grounds and Flower-gardens.—GARDENER, Mr. German, 16, Upper Maudlin Street, Bristol.

GARDENER (UNDER, or SECOND).—Age 20 ; highly recommended by present employer, with whom he has been three years.—J. COOK, Ramsden Hall, Billericay, Essex.

GARDENER (UNDER), in a Gentleman's Garden.—Age 20 ; two years' good character.—A. B., Hassock's Gate, Hurstpierpoint.

GARDENER (UNDER), in the Houses.—Age 21 ; has some knowledge of Plants and Forcing. Can be highly recommended from the place he is now leaving, or from a Nursery.—L. H. E., Post Office, Acton, W.

GARDENER (UNDER), in a Gentleman's Garden.—Understands the Culture of Stove and Greenhouse Plants, and Vines and Orchard Houses. Four years in present situation. Good references as to character and capability.—Rev. CAPEL FORBES, Cranleigh, Guildford.

FOREMAN.—Age 24 ; seven years' experience. Highly recommended.—H. S. BEACH, Mrs. Ballard's, Sevenoaks, Kent.

NURSERY FOREMAN, or GENERAL MANAGER.—Knows the profession thoroughly in every department ; a good Salesman, and knows the value of Nursery Stock well ; a good Budder and Grafter, indoors and out ; is a successful Propagator generally. The Advertiser wishes for a situation of trust, and one that would be permanent. A Provincial Nursery preferred. First-class references.—ALPHA, Messrs. F. and A. Dickson & Sons, 106, Eastgate Street, Chester.

To Nurserymen.

FOREMAN and PROPAGATOR and SALESMAN.—An experienced Man of 25 to 30 years. First-class testimonials as to character and abilities.—A. B. C., Messrs. Low & Co., Clapton Nursery, Clapton, London, N.E.

STEWARD or BAILIFF.—Age 45, no incumbrance ; good recommendation.—Mr. STEVENSON, Sillwood Park, Sunninghill, near Staines.

FARM BAILIFF and ESTATE OVERSEER.—Age 33, married ; has had considerable experience in the above capacities, including the Buying and Selling of Stock, the Supervision of all Building and Repairs on a large Estate, the Laying out and Draining of Land, the Felling and selling of Timber, Management and Payment of all Men, and Repairs on the Estate, and is fully qualified to undertake a similar situation.—D. C. P., J. W. Barron, the R. H. S. Gardens, Chiswick, London, W

SUTTONS' GRASS SEEDS

FOR ALL SOILS, CARRIAGE FREE.

Producing abundant Crops of Hay and superior Pasturage.

PERMANENT PASTURE MIXTURES,

which are prepared for various descriptions of Soils.

PRICES :—

SUTTONS' BEST MIXTURES, **28s.** to **32s.** p. acre, carriage free 2 bush Grass Seeds and 12 lb Clovers supplied p. acre.

SUTTONS' CHEAPER MIXTURES, **20s.** to **26s.** per acre. Carriage free.

From J. J. MECHI, Esq , *Tiptree Hall, near Kelvedon.*

February 5 —"Your Grass Seeds are so pure and well selected that I have often spoken of them to those who required them."

SUTTONS' HOME-GROWN FARM SEEDS.

THE BEST SWEDE IN CULTIVATION IS

Suttons' Champion.

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation ; price **1s.** per lb., cheaper by the bushel.

Lowest price per bushel on application.

From JOSEPH VINCENT, Esq , *Simplemarsh, Addlestone, Weybridge.*

"*January* 23, 1869—I won the £5 Silver Cup, presented by the Members of the Western Division of the County of Surrey, with your Champion Swede."

From J. OSBORNE, Esq , *Coldashton, Marshfield*

May 27, 1869—My neighbour, Mr. Cater, with your seed, won the £5 Cup which I annually give for the best four acres of Swedes."

From GEORGE BUSH, Esq., *Brooklands, Combemartin.*

"*July* 10, 1869—The parcel of Swede seed I bought of you has come up splendidly. I tried yours against some seed recommended by my man, and have shown him the advantage of selected seed."

From Mr. FRANCIS SAWYER, *Great Hill Farm, Langharne.*

"*December* 20, 1869—" The roots I grew from your Swede seed won the Silver Cup given by Morgan Jones, Esq."

From Mr JAMES PAGE, *Combe Farm, Kingston, Surrey.*

"*February* 20, 1869—The Swedes I grew from your Champion Swede seed supplied to me last June are the very finest quality Swedes I ever grew."

From J. C. MOORE STEVENS, Esq , *Winscott, Torrington, Devon.*

"*April* 2, 1868—I won a Ten-Guinea Silver Cup last year for Swedes grown from your Champion seed."

Sutton's Turnip Seeds for Present Sowing.

POMERANIAN WHITE GLOBE, per lb., 1*od.*
LINCOLNSHIRE RED PARAGON, per lb., 1*od.*
IMPERIAL GREEN GLOBE, per lb., 1*od.*
IMPROVED GREEN TANKARD, per lb., 1*s.*
GREY STONE, per lb., 1*s.*
GREEN-TOP YELLOW SCOTCH, per lb., 1*s.*
PURPLE-TOP YELLOW HYBRID, per lb., 1*s.*

Also all other Farm Seeds, as see

SUTTONS' FARMERS' YEAR BOOK

for 1870, Gratis and Post Free on application.

SUTTONS' GRASS SEEDS for PASTURES, 20*s.* to 32*s.* per acre, carriage free.

SUTTONS' GRASS SEEDS for PARK GROUNDS, 18*s.* per bushel, carriage free.

SUTTONS' GRASS SEEDS for GARDEN LAWNS, 1*s.* per lb., or 20*s.* per bushel, carriage free.

SUTTONS' CHAMPION SWEDE, the best in cultivation.

SUTTONS' TURNIP SEEDS for PRESENT SOWING.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

SALES BY AUCTION.

Importation of Orchids from New Grenada.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, May 24, at half past 12 o'Clock precisely, an importation of ORCHIDS from New Grenada, in fine condition, comprising Odontoglossums Pescatorea, Bluntii, and Alexandræ; Oncidium Weltonii, O. Krameria, &c.

On view the morning of Sale, and Catalogues had.

Important Sale of Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, May 26, at half-past 12 o'Clock precisely, a collection of ESTABLISHED ORCHIDS, many of them fine specimens, and well deserving the attention of amateur Orchid growers Amongst them are good plants of—

Chysis lævis	Cattleya Warnerii
Phalænopsis amabilis	Aerides Fieldingii
,, Schilleriana	,, Schroederii
Cattleya Dowiana	Cymbidium eburnum
,, Mossiæ Marianæ	Oncidium macranthum
,, Rodrigueziana	Vanda suavis
Trichopilia crispa marginata	,, Batemanni
Cypripedium caudatum roseum	Lælia Warneri
,, villosum	,, gigantea
Odontoglossum nevium magus	,, prestans,—&c., &c.

On view the morning of Sale, and Catalogues had.

Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, May 31, at half-past 12 o'Clock precisely, the second portion of ESTABLISHED ORCHIDS, belonging to C. H. Marshall, Esq., of Cavendish, among which are fine specimens of—

Vanda Lowii	Trichopilia crispa
,, cærulea	,, coccinea
,, suavis	Odontoglossum citrosmum
Cypripedium Stonei	,, Alexandræ
,, caudatum	,, hastilabium
,, Schlimi	Cattleya amethystoglossa
,, villosum	,, bulbosa
Saccolabium Blumei	,, crispa
,, giganteum	Oncidium macranthum
Disa grandiflora	Phalænopsis amabilis
Calanthe Veitchii	,, grandiflora
Aerides Veitchii	,, Schilleriana
Cymbidium eburneum	&c.

On view the morning of Sale, and Catalogues had.

Leytonstone, E.

SALE of about 25,000 WELL-GROWN BEDDING and GREEN-HOUSE PLANTS, &c.

MESSRS. PROTHEROE and MORRIS will SELL by AUCTION, without reserve, on the Premises, the American Nurseries, Leytonstone, Essex, adjoining the Railway Station, on MONDAY, May 23, at 11 for 12 o'Clock precisely, about 25,000 HEALTHY and GREENHOUSE PLANTS, comprising 7000 fine GERANIUMS, including Lady Cullum, Sophia Dumaresque, Mrs. Pollock, United Italy, and others ; thousands of those named BEDDERS, CALCEOLARIA AUREA, COLEUS, HELIOTROPES, GOLDEN FEATHER, fine PELARGONIUMS, AZALEA INDICA, ERICAS, FUCHSIAS and other Plants, in Flower ; likewise some Choice RHODODENDRONS, KALMIAS, and a quantity of CLIMBERS and other Climbers in Pots ; CARNATIONS and PICOTEES, CLOVES, &c

May be viewed the Saturday prior to the Sale Catalogues may be had on the Premises, of the Auctioneers, as above.

Hornsey, N.

SALE of about 25,000 FIRST CLASS BEDDING PLANTS, &c

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. M. Cleall to SELL by AUCTION, without reserve, on the Premises, The Nursery, near the Church, Hornsey, Middlesex, on TUESDAY, May 24, at 11 for 12 o'Clock precisely, about 25,000 HEALTHY PLANTS, comprising thousands of Fuchsias, Verbenas, Lobelias, Heliotropes, Petunias, Gazanias, Salvias ; 10,000 GERANIUMS, including Lady Cullum, Sophia Dumaresque, Mrs. Pollock, Flower of Spring, Madame Lemoine, Italia, and other leading varieties ; also 3000 CALCEOLARIA AUREA, 1000 White and Scarlet Intermediate STOCKS, quantities of CERASTIUM, new COLEUS ; fine PELARGONIUMS in flower, soft-wooded and hardy CLIMBERS, &c.

May be viewed two days prior to the Sale Catalogues may be had on the Premises, and of the Auctioneers and Valuers

Shacklewell, N.E.

TO FLORISTS and OTHERS —A CAPITAL OPPORTUNITY for INVESTMENT.

MESSRS. PROTHEROE AND MORRIS are instructed to SELL by AUCTION, on the Premises, the Norfolk Nursery, Norfolk Road, Shacklewell, Middlesex, ten minutes' walk from Dalston Junction, on WEDNESDAY, May 25, at 11 for half-past 12 o'Clock precisely, a valuable and compact LEASEHOLD ESTATE, comprising four desirable Brick-built Residences, known as Nos. 3, 4, 5, and 6, Norfolk Terrace, Norfolk Place, Shacklewell, and estimated to produce together £104 per annum, or thereabouts ; also the valuable Lease, with possession, of the NORFOLK NURSERY, adjacent, consisting of about 1a 1r. 30p. of Nursery Ground, 10 capital Greenhouses, ranges of Pits, Stabling, and other appliances for carrying on a successful business.

May be viewed any day prior to the Sale. Particulars may be had on the Premises ; of Messrs. MILLS and LOCKYER, Solicitors, 2, Brunswick Place, City Road, London, E.C. ; and of the Auctioneers and Valuers, Leytonstone, Essex.

Shacklewell, N.E.

ABSOLUTE SALE of CHOICE GREENHOUSE and BEDDING PLANTS, VAN, &c

MESSRS. PROTHEROE AND MORRIS are instructed by the Proprietor to SELL by AUCTION, without Reserve, on the Premises, The Nursery, Norfolk Place, Shacklewell, Middlesex, on WEDNESDAY, May 25, at 12 o'Clock punctually, the whole of the choice BEDDING PLANTS, comprising 11,000 Geraniums, consisting of the leading varieties, the Scarlets, quantities of Verbenas, Lobelias, Golden Feather, Petunias, and others, fine Pelargoniums, Coleus, 1500 Dahlias, likewise some valuable GREENHOUSE PLANTS, including Azalea indica, Gardenias, Cytisus, &c.

May be viewed two days prior to the Sale ; Catalogues may be had on the Premises, and of the Auctioneers.

Royal Nursery, Bagshot.

EXPIRATION OF LEASE and CLEARANCE SALE.

MR. W. ABRAHAM is instructed by Mr. Hanafy, of the Royal Nursery, Bagshot, Surrey (near the Turnpike Gate), to SELL by AUCTION, on the Premises, without the least reserve, on WEDNESDAY, May 25, at 12 o'Clock, the whole of the remaining NURSERY STOCK, comprising 10,000 BEDDING PLANTS, of kinds usually grown for that purpose ; also a quantity of JAPANESE PLANTS, including CAMELLIAS, by name ; TEA and H.P. ROSES, in Pots ; 9000 COMMON LAURELS, Standard RHODODENDRONS, CEPHALOTAXUS FORTUNEI, 6 feet ; &c

Full particulars are given in Catalogues, to be obtained at the Nursery, and Post Free of the Auctioneer and Valuer, Goldsworth Nurseries, Woking, Surrey.

Shardeloes, Amersham, Bucks.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without Reserve, on FRIDAY, July 22, at Shardeloes, about FIFTY HEAD of very superior SHORTHORNS, the property of Thomas Tyrwhitt Drake, Esq , consisting mostly of Young Cows and Heifers that have been long and carefully bred from the famed Herds of the late Captain Dilke, Maxstoke Castle, Rev. F. Thursby, Abingdon, and of Mr. W. Torr, Aylesby. The sires principally used have been Final Hope (17,848), Lord Lieutenant (22,167), and Wizard (25,468) ; the latter Bull is now in service

Catalogues, with pedigrees and other particulars, will be issued in due time, and announced in future advertisements.

London : 13, Euston Square, N.W., May 19, 1870.

Important Sale of Shorthorns, at Farndish,

NEAR WELLINGBOROUGH, NORTHAMPTONSHIRE

MR. JOHN THORNTON will SELL by UNRESERVED AUCTION, by order of the Executors, on TUESDAY, May 24, at 2 o'Clock, at Farndish, near Wellingborough, the entire HERD of first-class SHORTHORNS, the property of the late W. H. S. Adcock, Esq. It comprises about 45 Head of Cows, Heifers, and Bulls, which have been selected and bred from some of the most fashionable Stocks of the day, and includes animals of the noted "Barrington," "Charmer," and "J" tribes ; as well as several remarkably fine specimens of the Twycross blood, with the admired cross of "Bates upon Knightley" also the Tribandum Bull 2nd Grand Adeline, and her son the R. A. S. E. Leicester Prize Bull Baron Geneva (25,568), who, with 2d Duke of Waterloo (23,800), has of late been in service

Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, or at the Farm

Extensive Sale of First-class Prize Devons.

MR. JOHN THORNTON will SELL by UNRESERVED AUCTION, on FRIDAY, May 27, at 1 o'Clock, at Upton Court Farm, Slough, near Windsor, the entire and very first-class HERD of pure bred DEVON CATTLE, belonging to the late W. G. Sayer, Esq. This Stock has been very carefully selected from the well-known Herds of Mr. George Turner, Mr. W. Smith of Exeter, Mr. Shapland of North Molton, and Mr. J. A. Smith of Bradford Peverell ; the Prize Bull, "Young Prince of Wales," bred by Mr. John Quartly, being in service The Sale comprises between 60 and 70 Head of Cows, Heifers, Bulls, and Steers. Among them will be found some well-known winners, and those famous Prize Animals that Mr. Sayer exhibited so successfully at the Royal and Bath and West of England Shows. There are also a number of Bullocks and Fat Cattle in a very forward state intended for Exhibition at the next Meetings of the Birmingham and Smithfield Clubs.

Catalogues, with Pedigrees, may be had of Mr. SHACKLADY, Upton Court Farm, Slough ; or of Mr JOHN THORNTON, 15, Langham Place, London

(*For continuation of* SALES, *see page* 723.)

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION for the RELIEF of DECAYED FARMERS, their WIDOWS and ORPHANS.

Patron—HER MAJESTY THE QUEEN
President—His GRACE THE DUKE OF RICHMOND.

Allowances to Pensioners.

Married	£10 per annum.
Male	£10 ,,
Widows and unmarried Orphan Daughters	£10 ,,

Every information to be had of the Secretary, by whom Subscriptions and Donations will be thankfully received

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The TENTH ANNIVERSARY FESTIVAL, in AID of the FUNDS of the INSTITUTION, will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 8, at 6 o'clock. The Right Hon. Lord LYTTON in the Chair.

Dinner Tickets, £1 ; Ladies' Tickets, 5*s.* ; to be had of the Stewards ; the Secretary, at the Office of the Institution ; and at Willis's Rooms

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The ANNUAL ELECTION of PENSIONERS and CHILDREN will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 22, at 11.30 A.M.

All Subscriptions shall be deemed payable on January 1 in each year ; and no Contributor shall Vote while the same is in arrear

No 55, Charing Cross, London, S.W.

C. BOUSFIELD SHAW, Secretary.

BATH and WEST of ENGLAND SOCIETY (Established 1777), and SOUTHERN COUNTIES ASSOCIATION.

President—The Right Hon Sir S. H. NORTHCOTE, Bart., C.B., M.P.

GREAT EXHIBITION of STOCK, POULTRY, IMPLEMENTS, WORKS of ART, and HORTICULTURAL SPECIMENS, at TAUNTON, on JUNE 6, 7, 8, 9, and 10.

JOSIAH GOODWIN, Secretary

LINCOLNSHIRE AGRICULTURAL SOCIETY. SLEAFORD EXHIBITION, JULY 27, 28, and 29.

The PRIZES offered amount to ONE THOUSAND FIVE HUNDRED and SIXTY POUNDS and upwards ENTRIES CLOSE JUNE 27. Prize Lists, Forms of Entry, &c., may be had on application to STEPHEN CUTTON, Secretary.

St. Benedict's Square, Lincoln —May 6

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD MEETING, 1870.

STOCK ENTRIES CLOSE on JUNE 1 and all Certificates received after that date will be returned to the Senders.

PRIZE SHEETS and CERTIFICATES will be forwarded on application.

H. M. JENKINS, Sec.

12, Hanover Square, London, W.

ROYAL AGRICULTURAL SOCIETY of ENGLAND ESSAY PRIZE.

A PRIZE of TWENTY POUNDS is offered for the best Account of the Preparation, Preservation, and Use of SPROUTED GRAIN as FOOD for HORSES, CATTLE, and SHEEP, based on practical experience.

Competing Essays and Motto Papers must be sent in not later than JULY 1, addressed to

H. M. JENKINS, Secretary.

12, Hanover Square, W

N.B.—A Copy of the usual Conditions will be forwarded to applicants

The Agricultural Gazette.

SATURDAY, MAY 21, 1870.

MEETING FOR THE ENSUING WEEK.

May 23 { Royal Agricultural Society of England (General Meeting), at Hanover square—Noon

OUR correspondents who have furnished the CROP REPORTS of some of the Southern and Eastern counties, including the chief Wheat-growing districts of England, which appear in another page, will no doubt see this paragraph. We should be much obliged to them if they would shortly state what now, after the lapse of a fort-

night of moist mild weather, their opinion of our prospects is. We have made "through" journeys on most of our English railways and many Scotch lines also during the past two months, and had not by any means such gloomy forebodings of the coming harvest as seem to possess the writers of the crop reports which we publish this week. We do not recall more than two instances in which we have seen the Wheat plant ploughed up and the land resown. But our experience only confirms the conclusion long since reached, that the opinion of a mere railway traveller, however industrious and attentive, is of little agricultural value. Though continually going to and fro at all seasons of the year, we rarely see a steam-plough or a mowing-machine at work from the railway carriage, though there are hundreds and thousands of them in use. And in like manner there may be thousands of acres of young Wheat ploughed up, though but little near the lines of railway.

But however ready to abandon an opinion formed in this way before the testimony of residents, we cannot doubt that even they must now be ready to report the improvement due to this very seasonable and delightful weather; and we shall be glad, therefore, in the interest of truth, to have a second report from them.

The warm rains of the past week have not only prepared a most valuable tilth for the Turnip seed-time, but they have set afloat again all the feeding materials within the soil, which had been lying helpless, useless, stranded as it were, for want of water by which to reach their destination within the roots of plants. The nitrates and other salts, whether sown directly or administered unwittingly in farmyard dung and other bulky fertilisers, which have been hitherto without effect upon the young Wheats (which sorely needed them), have been at length distributed throughout the soil, and the effect cannot but be almost directly visible. Let us then learn, from a second "edition" of our correspondence, what the difference produced has been between the present time and a fortnight since.

Messrs. W. Torr, Hall Keary, and T. Gibbons, have a very considerable agricultural responsibility placed upon them. They are to declare on behalf of the Royal Agricultural Society of England what Good Farming is. Some 20 or 30 farms within an area on the map whose points are Reading, Wantage, Lechlade, Stow, Banbury, Buckingham, Aylesbury, and Great Marlow, are in competition for two handsome prizes, and these gentlemen are the jury whose verdict is to constitute the award. They are well-selected judges. No one can deny their experience, intelligence, or trustworthiness. But, now—how will they set about their task?

They will, no doubt, walk or ride over every farm upon their list, once, if not twice, and they will probably require some information of what has been accomplished in the past, in addition to their inspection of what is actually before them. Will they, however, trust chiefly or exclusively to the general impression which they will thus acquire—letting each new farm stand in comparison with the victor among its predecessors in respect of the character and cleanness of its crops, the condition of its roads, gates, fences, buildings, the quality of its live stock, the apparent punctuality, smartness, and cordiality of its labourers, and the intelligence and businesslike ability of its tenant? Or will they go down to each competing farm with a definition of good farming already in their minds, and take up each point in succession of the many on which they have agreed as constituting, in the whole, perfection; and—noting whatever deficiency in any or many of these points it may exhibit—will they afterwards collate their notes, thus bringing the particulars of all the competing farms together, and determining by an addition of "points" which of them shall stand first and second on the rank?

We are inclined to expect that it is virtually the former of these plans which will be carried out; and an award made thus is not unlikely to be correct. We should, indeed, trust the opinion of an experienced man, like Mr. Torr, Mr. Keary, or Mr. Gibbons, formed after careful inspection of a farm, almost unreservedly. Nevertheless it will, we think, be considered a misfortune if the only result of this elaborate examination shall be the right award of a hundred-guinea cup. The effect even of the mere award will no doubt be to send many an agricultural student for a lesson in good farming to the decorated farm; and somewhat more than the award of a valuable prize will be even thus accomplished. But we shall lose all the advantage of that special lesson on the merits of the farm in question, which these three gentlemen ought to give us. The other plan, if carefully pursued, is much the more likely of the two to produce an instructive report. And, in the interest of the many who will never visit the successful farms, but who will desire to profit somewhat by Mr. Mason's patriotic offer, we trust that the selecting jury will do more than merely take such pains as are required to ensure that the best man wins.

The first step, then, on the alternative course of proceeding, is to define good farming. Will any of our readers help us here? Ought the natural fertility of the land, the severity of the rent at which it is hired, the natural or educated ability of the labouring population of the district, the fulness of the farmer's purse, to affect the judgment? Is it the greatest amount of produce profitably obtained beyond the natural yield of the soil—or is it the proved ability to pay the highest rent and overcome the greatest difficulties of other kinds with smallest means, which will determine merit? Is it the greatest profit derived from cultivation under average circumstances which ought to rule the award—or are straight lines, square fields, good crops, clean land, neat premises, irrespective of expenditure, necessary to justify success?

"A" has drained a swamp and laid it out in well fenced fields, to which good roads and well-made gates give access; but, even so, he has not the crops which "B," on naturally better land, laid out long before he entered on his occupation, has much more easily obtained. "B" looks best at harvest time, but has not "A" the greater merit? "C" may have accomplished a wonderful success by lavish outlay, "D" by good judgment much more economically. It appears to us that mere inspection is not sufficient to determine the relative agricultural status of the several candidates. The judges need a history as well as a mere inspection, and this history they must give us in the report which is to announce their judgment. Meanwhile, they would themselves perhaps benefit by a discussion of the duties of their office, and we shall gladly publish any suggestions which may occur to our readers on this subject.

—— On Monday last little business was done in Mark Lane; buyers refused to give last week's prices, and sellers refused to part with their Wheat on lower terms. On the whole, the tendency, owing to the favourable weather during the past week, has been downwards.——In the Metropolitan Cattle Market, a considerable reduction of prices had to be submitted to.

—— Those clauses of The Irish Land Bill which are intended to facilitate the purchase by tenants of the land they occupy, were adopted in committee last Monday with very little discussion. The clause (41) which regulates the advances to tenants for this purpose were amended with the assent of the Government; so that the amount to be advanced is not to exceed two-thirds of the price of the holding, and the repayment is to be by an annuity of £5 for every £100 advanced, lasting 35 years. The character of the discussion which preceded this resolution may be gathered from the following abridgment of speeches:—

Mr. Wren-Hoskyns observed that if hon. gentlemen would study the two Blue-books which had been issued about the conditions on which land is held in different parts of Europe, they would find that the ownership of land in small quantities is one of the most conservative, valuable, and pacifying elements which it is possible to introduce into a State. He looked with apprehension at the enormous aggregation of land in this country, and the prejudice which exists against small proprietors, and he should, therefore, heartily support the Government,

Colonel Barttelot would ask the hon. member for Hereford whether the system of small proprietors which he lauded so highly had proved successful in France? On the contrary, it was well known that the properties in that country are mortgaged to the chimney-tops; and in the belief that this provision would prove a curse instead of a blessing, he should support the amendment.

Mr. Tipping said that in those parts of France where the agricultural produce corresponded with that of this country the peasant proprietors are a poor class; it is only in the wine country that the cultivation by small occupiers is a great success. The general position of the agricultural population in France is decidedly inferior to that of our own agricultural population.

Mr. J. Howard grounded his objection to the clause on the plain and intelligible principle that it is not the duty of the State to interfere either in the aggregation of large estates or in their disintegration.

—— In the report on the Glasnevin Botanical Garden for 1869, Mr. Wood, the Director, speaks of the experiment of growing an extra crop of Kohl Rabi among a regular crop of Mangel Wurzel, and states that he has succeeded equally as in former years. The plants attained a fair average size before the leaves of the Mangel closed over between the drills, when the Kohl Rabi was gradually used as required, thus affording a considerable amount of nourishing food, much relished by cattle, at a time when it is wanted, and without seeming to injure the crop of Mangel.

—— The daily papers announce from France that the cattle plague has broken out among the cattle of the Department of Doubs, and that in consequence the Council of Neufchâtel has prohibited the importation of cattle from France.

—— On Tuesday last, at a meeting of the Council of the Royal Agricultural College, at the town residence of the Earl of Ducie, a prospectus of the Institution in its present prosperous condition was adopted, and we shall hereafter direct particular attention to it. Meanwhile we see it is announced that the income of the College now provides a surplus after paying the interest due on its £30,000 debt; and it is proposed to "appeal to the great landed proprietors of the kingdom, and to all persons interested in the extension of sound education in agriculture and its allied sciences, for their aid and co-operation in dealing with this £30,000 debt, which it is proposed to discharge by the issue, under the College seal, of bonds of the amount of £100 each, to be paid off at the end of 30 years (unless redeemed in the interval), with interest in the meantime at the rate of 4 per cent. per annum."

—— The North of England Chamber of Agriculture, at a recent meeting, resolved—

"That whilst highly appreciating the efforts made by the Central Chamber of Agriculture to establish Chambers of Agriculture throughout England, such Chambers are now established in sufficient numbers as, by each furnishing a delegate, to ensure an adequate attendance at meetings of an Association of Chambers, and that the mixed Council of the Central Chamber might now be beneficially transformed into an association constituted solely of delegated members from the provincial Chambers. By this means greater harmony would prevail among Chambers of Agriculture, more unity of action be promoted, a more powerful influence brought to bear on Parliament, and the present independent members of the Central Chamber would more efficiently aid in the common objects of Chambers by being formed into an independent local Chamber, either retaining the name of Central, or adopting some local designation."

—— With reference to Agricultural Instruction in France, it is said that the new Minister of Public Instruction has decided that the courses of instruction in the agricultural department lately established at the Jardin des Plantes shall be discontinued, and that each of the normal pupils shall receive an indemnity equal to £20, and return to his post in the primary schools of the provinces. This is a strange commentary on the opinions and writings of M. Dumas, at whose instigation the lectures were established, and of M. Chevreul, the eminent chemical professor, whose considerations on this subject were noticed the other day in our columns. We do not believe that the present Ministry have any intention of discouraging the scientific education of agricultural teachers, and if the above statement should turn out correct, we shall be curious to see what new plan is to be adopted. Possibly the bringing of young provincial pupil teachers to Paris has been regarded as an unwise step; and certainly the departmental colleges ought to be able to supply common school teachers with sufficient scientific knowledge nearer home. If this be the solution, we think the new Minister has acted wisely.

—— An Order in Council was published in last Friday's *London Gazette*, on the subject of the transit of stock. It extends to Great Britain only. The following are extracts:—

"*Transit of Animals by Sea.*—5. With respect to places used for animals on board vessels, the following regulations shall have effect from and after July 31, 1870:—(1.) Every such place shall be divided into pens by substantial divisions. (2.) Each pen shall not exceed 9 feet in breadth, or 15 feet in length. (3.) The floor of each pen shall have proper battens or other footholds thereon. (4.) Every such place, if inclosed, shall be ventilated by means of separate inlet and outlet openings, of such size and position as will secure a proper supply of air to the place in all states of weather. 6. Between each 1st day of November and the next following 30th day of April (both days inclusive), freshly shorn sheep shall not be carried on the deck of a vessel. 7. When sheep are carried on the deck of a vessel, proper gangways shall be provided either between or above the pens in which the sheep are carried. 8. From and after October 31, 1870, animals landed from a vessel shall, on a certificate of an inspector appointed by the Privy Council in that behalf, certifying to the effect that the foregoing regulations, or some or one of them, have not or has not been observed in the vessel, be detained, under the supervision of the Commissioners of Her Majesty's Customs, at the landing-place, or in lairs adjacent thereto, until the Privy Council otherwise direct."

"*Transit of Animals by Railway.*—12. From and after December 31, 1870, every truck used for carrying animals on a railway shall be provided with spring buffers, and the floor thereof shall have proper battens or other footholds thereon. 13. From and after June 30, 1870, a railway company shall not allow any truck used for carrying animals on their railway to be overcrowded so as to cause unnecessary suffering to the animals therein. 14. Between each 1st day of November and the next following 30th

day of April (both days inclusive), trucks used for carrying on a railway sheep freshly shorn and unclothed shall be covered and inclosed so as to protect the sheep from the weather, but shall be properly ventilated.

"*Cleansing and Disinfecting of Pens and Vehicles.*—15. Every pen, carriage, truck, horse-box, or vehicle used for carrying animals on land shall, on every occasion after any animal is taken out of the same, and before any other animal is placed therein, be cleansed and disinfected in manner following: (1.) By the sweeping out of the pen, carriage, truck, horse-box, or vehicle, and the effectual removal therefrom of all dung, sawdust, litter, and other matter. (2.) Then by the thorough washing of the pen, carriage, truck, horse-box, or vehicle with water. (3.) Then in the case of a pen, carriage, or truck, by the application to the floor and to all parts above the floor with which animals or their droppings have come in contact, of a coating of limewash made by mixing good freshly burnt lime with water, and containing in each gallon of limewash either one-fifth of a pint of commercial carbolic acid, or one-fifth of a pint of commercial cresylic acid, or four ounces of fresh dry chloride of lime, such limewash to be prepared immediately before use. The sweepings of the pen, carriage, truck, horse-box, or vehicle shall be well mixed with quicklime and effectually removed from contact with animals.

"*Penalties.*—16. If anything is done or omitted to be done in contravention of any of the regulations of this Order, the owner and the master or person having charge or command of the vessel in which,—and the owner and the occupier of the place where animals are put on board of or landed from vessels at which,—and the company carrying animals on or owning or working a railway on which,—and also in case of the overcrowding of a truck on a railway, or of the carrying on a railway of sheep freshly shorn and unclothed, the consignor of the animals in respect of which,—(as the case may be), such thing is done or omitted, shall severally be deemed guilty of an offence against this Order. 17. Provided, that no person shall be liable to a penalty under this Order in respect of sheep as freshly shorn, where it is proved that the sheep have not been shorn within 60 days before the time of the commission of the alleged offence."

A list of some 300 railway stations is appended to the Order, at which railways must provide water for animals carried on or about to be or having been carried on the railway of the company.

—— We have before us a copy of the *Thanet Advertiser* of April 30, in which appears the report of a gathering to do honour to our friend and correspondent throughout many past annual volumes of the *Agricultural Gazette*—Mr. W. MANSER, of St. Peter's. Mr. MANSER, who has been for 40 years resident in the Isle of Thanet, had been nearly all that time one of the Board of Guardians of that Union; and having lately resigned the position of their chairman, which he had held for many years, his friends and neighbours (upwards of 50 gentlemen from all parts of the Isle of Thanet) assembled to meet him as their guest. Among the company in the course of the evening was the now venerable Baronet, Sir MOSES MONTIFIORE, who declared that he could not retire to rest that evening without coming to express his regard for their guest, and his satisfaction that, though no longer chairman of the Board, he was still, as a guardian, to give them the advantage of his attendance and advice. We refer to the meeting not only as a gratifying compliment to our valued correspondent, but as an illustration of the kind, and quantity, and value of the unpaid labour by which public-spirited men in country places serve their generation. In returning thanks for the toast of the evening, Mr. MANSER said:—

"The Chairman and he had been born within a day of each other; they both came to the Isle of Thanet in the same year, in 1830, and it did not want much reckoning to show that that was 40 years ago. During the best part of that time he (Mr. Manser) had been devoted to the Board of Guardians, so that it was pretty nearly time he retired. He was in a very humble position when he came into this district, and in his most visionary moments he never aspired to such a position as that which he now held, nor thought he should ever be received by his friends in such a manner as he had been that evening. He became a guardian in 1841. When he took his seat he tried to get all the information he could, read everything that came out from the Poor-law Board before he gave an opinion, and listened to such men as Mr. JOHN ASHLEY WARRE. Nothing ever encouraged him more than to see any of the *ex-officio* guardians present. He had been told that he ought to have received it as a compliment that the *ex-officio* guardians were not at the Board meetings oftener; but he would tell them that it was much easier to go when than to get a thing right when it had been going wrong. He had attended at the board-room about 1000 times, and riden something like 10,000 or 12,000 miles. Now, what had he got for all that? The respect and esteem of his neighbours. The Chairman had spoken of the guardians being liberal and kind to the poor, and he hoped he had always been so; but he always thought it his duty to be just as well as liberal. They must take great care not to give a premium to make people beggars; they should take care of those who tried to take care of themselves. He was speaking to those who knew him well, and he thought they would give him credit for taking care of the old and infirm, and young children; and this was his reward. No man started lower than he did, and he had been taunted with it on many occasions, but he did not mind that. But he would say this: that there was at the present time a great disposition on the part of a certain class of persons to be what he called almost over liberal with regard to paupers, and a desire to feed the pauper in the house better than the hard-working poor were fed out of the house. He was not accustomed to public speaking, and they must take the will for the deed. He did not come there to make a religious speech or to preach a sermon, but this he would say, that He who had kept and prospered him in the past would support him to the end."

OUR LIVE STOCK.

CATTLE.

SOME excellent Shorthorns, comprising the herds of Mr. William Shipman and Mr. John Snodin, of Stonesby, were sold by Mr. Thornton, at Waltham, near Melton Mowbray, on the 11th inst. Although the average of £26 7*s.* 8*d.* over 48 head is low when compared with recent sales, yet some fair prices were made. *Perseverance* by PETULANCE (20,489) made 41 gs., and her daughter *Industry* by COLLEGIAN (23,591) became the property of the same purchaser, Mr. Gentle, at 70 gs. *Modesty* by WHITE VELVET (19,146), and from *Mohair* by OLD BUCK, brought only 29 gs., and her daughter by ROYAL DUKE (25,018) made 60 gs. *Julia* 10*th* by LORD CHANCELLOR (20,160) was purchased by the Hon. H. Littleton for 50 gs. The remaining heifers did not bring noticeable prices. ROYALIST (27,320), got by a GRAND DUKE (16,182), and from the Darlington tribe, was bought by Mr. Casswell for 70 gs.

—— Next Thursday, Mr. Thornton will sell Mr. Adcock's Shorthorns at Farndish. The herd contains four specimens of the "Barringtons," descended from *Lady Barrington* by BELVIDERE (1706), and since crossed with nothing but first-class bulls, such as CLEVELAND LAD, EARL OF LIVERPOOL, and DUKE of BOLTON. Lot 2, *Adeline* by SIR COLIN CAMPBELL (16,961), is the eldest of five representatives of the Knightley *Annette* by LITTLE JOHN tribe, in which a long list of excellent sires is consummated by 12TH DUKE OF OXFORD and DUKE OF GENEVA (19,614). Next follows *Fantja* 5*th* by YEOMAN, the ancestress of three females and two bulls. This cow was bred by Mr. Beasley of Overstone, and afterwards became the property of Mr. Lynn of Stroxton, and may be traced back to the famous STUDLEY BULL through three crosses of FAVOURITE (252). The *Fairies* and *Pearls* are both good old families, and said to be excellent as dairy cattle. Judging from the results of recent sales the three CHARMERS are likely to be in request, and among other representatives of Fawsley blood we may mention the *Lady Knightleys* 2*d*, 3*d*, and 4*th*, descended from *Roxy* by ROB ROY (557). 12TH DUKE OF OXFORD (19,633), and 2D DUKE OF WATERLOO head the list of bulls, which is completed by young animals from Farndish cows. In closing this brief notice of a most attractive catalogue, we may say that upon an excellent foundation great pains has been taken to raise first-class stock by the employment of thoroughly good bulls.

—— Lord Dunmore has sold *Siddingtons* 4*th* and 6*th* for 1000 gs. These two animals, it may be remembered, were purchased at Mr. Bowly's sale last spring for 400 and 370 gs. respectively; they have therefore left 230 gs. for one year's keep.

—— The following remarks by an old authority, George Culley, have been again placed before breeders in the last issue of Thornton's Circular, and are well worthy attention as bearing upon a frequently discussed point:—

"I apprehend one great mistake that breeders in general have run into, especially in breeding neat cattle, has been, endeavouring to unite great milkers with quick feeders. I am inclined to think this cannot be done; for, wherever we attempt both, we are sure to get neither in any perfection: in proportion as we gain the one, in the same proportion we lose the other—the more milk, the less beef; and the more we pursue beef, the less milk we get. In truth, they seem to be two different varieties of the same kind, for very different uses; and if so, they ought most certainly to be differently pursued by those that employ them. If the dairyman wants milk, let him pursue the milking tribe; let him have both bull and cows of the best and greatest milking family he can find; on the contrary, he that wants feeding or grazing cattle, let him procure a bull and a cow of that sort which feeds the quickest, wherever they are to be found. By pursuing too many objects at once, we are apt to lose sight of the principal; and, by aiming at too much, we often lose all. Let us only keep to distinct sorts, and we will obtain the prize in due time. I apprehend it has been much owing to the mixing of breeds and improper crossings that kept us so long from distinguishing the most valuable kinds.

"I do not suppose the doctrine to be so new, as it has been unattended to, and not properly considered; for I have heard many people say, 'How should that cow be a good milker; she runs too much to flesh?' And so it is, while all the great milkers are invariably thin. The former are generally high-sided, light-bellied, covered in all their fatting points, in proportion as they recede from the great milking tribe, though kept on middling fare; while the latter will be lean upon their backs, flat-sided, big-bellied, poor, and ill-looking, though much better kept than the others.

"I own there is a middling kind of cows which give a tolerable quantity of milk, and also keep in pretty good condition; but this, I apprehend, does not at all militate against the above reasoning, because, still those that incline the most to flesh invariably give the least milk, and *vice versâ*: and though many of the middling cows will make very fat when they are dried, or the milk taken from them, yet will not get so quickly fat, nor so ripe, as those which give less milk, and are inclined more to fatten while in a milking state."

—— It is the privilege of race-horses to prove the value of their breeding in the field. Shorthorns may be valued highly, simply because of pedigree. It is possible for a fashionably bred heifer to attract 500 gs. from the pocket of a noble lord, albeit fashionable blood is her only charm. It is possible for a second generation to again command a large sum, solely on account of parentage. With this we do not find fault. The high price is given because experience has shown the existence of a strong probability that well-bred cattle will propagate good stock. In a competition for prizes offered for special qualities the case is very different, and we maintain that after ordinary precautions have been taken to insure that an animal is pure-bred, the decision of the judges should be based solely upon personal merits. The turf offers a strict parallel, which we shall use to illustrate our meaning. Race-horses do not win stakes because they have pedigrees, but because they are first at the winning post. That they arrive there first may be due to descent, but what would be the value of a pedigree which conferred not the necessary strength, speed, and mettle? Stockwell is dead. His chief victories on the turf were the Two Thousand, Great Yorkshire, and St. Leger stakes. He was the sire of six St. Leger winners, namely, St. Alban's, Caller Ou, The Marquis, Blair Athol, Lord Lyon, and Achievement; two Derby winners, Blair Athol and Lord Lyon; and one Oaks winner, Regalia. In 1866 his stock won over £61,000—a gigantic sum, every penny of which must be considered as the reward of positive merit, thereby proving the goodness of their pedigree. During the seven years he was at the stud he became the sire of 184 colts and 226 fillies, who won upwards of £300,000, a success truly immense and never equalled. Nevertheless, we repeat that decisions were not given by judges in favour of these horses because they were got by Stockwell, but because they were first at the winning post. Such facts are significant at the present time, when some Shorthorn breeders are agitating for pedigree as a merit in a competition of beauty, symmetry, quality, and early maturity. The value of pedigree in selecting a bull or a cow for breeding purposes is incontestable, because of the probability of thoroughly good animals being thus produced. But the breeder's object is not to propagate a pedigree, so to speak, but first-class stock of unrivalled beauty and quality.

POULTRY.

WE are informed by Mr. J. C. Cooper, in the *Field*, that the Sultan, or Serai Taaouk fowl, was first introduced into Ireland by Mr. Zurhorst. These birds were first brought from Constantinople, where they are special favourites in the grand harems, and probably were called Sultans in compliment to the august ruler of those Oriental institutions. As ornamental birds it is difficult to imagine a prettier fowl, "lively without romping, with a cheerful, chatty voice, indicative of their character; of a plump and not very graceful contour, full breasted and well backed, and not long in the neck. The cock weighs 4½ and the hen 3¼ lb.," and the egg weighs as much as 2 and 2¼ oz. Mr. Cooper has not found them hatch, but they lay well, although not as early as some breeds. They have feathered legs, vulture hocks, and from four to five toes; cock's crest and comb like the Crèvecœur in form but less in size, and gills small; hen rounder crested, say 11 inches circumference, in full-aged and very good specimens, with an almost total absence of comb and gill; a thick short beard and whisker in both sexes, and a spotted white plumage completes the picture.

—— The Launceston poultry show will be held on the 25th and 26th inst. Taunton show, in connection with the Bath and West of England meeting, promises to be very successful. There are 35 poultry classes, including seven for single cocks. This show opens on June 6.

PRESENT APPEARANCE OF THE CROPS.

BEDFORDSHIRE—*North:* The prevailing dry weather of the last nine months, together with the winter's frost, has had a very beneficial effect upon our clay soil, which is now in fine condition. The Wheat, though backward, looks exceedingly well, with the exception of that after fallow, which has gone off very much, and in many instances cannot be a full crop. The Barley and Oats are very good where sown early; the late pieces after roots have come up very indifferently, for want of rain. Beans are backward and weak, especially the winter ones. Peas are looking well. The pastures stand greatly in need of rain and warmer weather. The barometer has fallen, and we have had some nice showers yesterday and to-day. *May* 13.

BERKS: I am sorry to say my opinion of the present growing crops is anything but favourable. Of Wheat we have a great deal very thin plant, and unusually backward. A great quantity has been ploughed up, also a large breadth resown with April Wheat. I never remember seeing so little really good Wheat, and so much inferior, at this time of year in this neighbourhood. The summer corn was generally planted in excellent season, and forward, but it is suffering from the long drought—the Barley particularly. I found, on Saturday last, in one of my fields of Barley, sown on March 21, lots of corn not the least vegetated.

Our forward Potatos are all cut down with the severe frosts during this month. There cannot be a good cut of upland Grass. I know several farmers who have not yet rolled an acre; I fear much (unless we have rain very shortly) must be fed off with sheep, and we will have to depend on the second crop. It has been one of the best seasons for preparation for the root crops I ever remember, but rain is much wanted to bring up the Mangel. *Thos. Owen, Clapton, Hungerford, May* 10.

—— The continued dry weather and cold nights are beginning to tell on the light-land farms, and neither the Wheat nor summer corn look so well as they did a fortnight ago; but on other lands, particularly where there is condition, no material damage has been done beyond that which a warm rain and a little forcing weather will put right again. The crops are more backward than usual at this time of year, but on the whole the weather has been favourable for Wheat, and I anticipate quite an average crop in this neighbourhood, with perhaps less straw than is grown some years. *John B. Spearing, Hamilton Road, Erlegh, Reading.*

—— The present appearance of the Wheat crop in this neighbourhood is not favourable. There is not a sufficient plant in much of it; in fact, several pieces have been ploughed up, and the whole is altered for the worse, during the last fortnight, from the cold winds and frosty nights. Some pieces of Barley and Oats look well, but the wireworm is doing much mischief, and the late sown is coming up very irregularly for want of rain. Peas and Beans are looking pretty well, and the Clover and Sainfoin promise to be a good crop. *James Hulbert, Streatley, near Reading, May* 12.

DEVON—*North:* Wheat, a partial failure. Many fields thin, some ploughed up, others fully planted and looking well. Oats regular but backward, much improved by the late rains, and will now advance; the same may be said of Barley. Mangel coming up. Potatos early, nipped by the recent frosts, but recovering; main crop over ground and looking fair. Pastures bare, owing to the dry, harsh, and ungenial weather of April and the early part of May; looking better now since the rain, but a full bite not expected very soon. Orchards a mass of bloom. *P. Cowan, Livestock Manor, Barnstaple, May* 16.

DORSETSHIRE: The Wheat crop about here in the chalky district is about half a plant; most fields are very thin, in patches that are scarcely worth standing, and some fields have been ploughed up and sown with spring corn; the plants now look very healthy, but do not braird out well for want of some warm weather and rain. The thin patches, when the rain comes, I expect, will throw out late shoots, which will cause green ears at harvest and an uneven sample. The Wheat in the strong clayey soils is mostly a thick good plant, and looks well; the plant on the light soils is very much improving in appearance. The Barley mostly looks yellow from the frosty nights. The early-sown Oats look promising. The winter Vetches about here are nearly all killed; I sowed about 50 acres, which are all gone. The Mangel seed is generally put in well, but requires rain to bring it up. I never remember sheep feed so short in general; many large sheep farms will be obliged to feed most of the young Grass, which ought to be cut for hay for next winter. The land is too dry to plant out our Drumhead Cabbage plants for autumn feeding. *T. H. Saunders, Watercombe Farm, Dorchester, May* 10.

ESSEX: I regret to state the plant of Wheat has suffered much, and a great deal has been ploughed up or drilled with Oats, &c., on the Wheat, and is generally looking yellow and no promise of a good crop. Oats and Barley, from the dryness of the weather and cold, frosty nights, are looking yellow, and do not generally look well. The frosty nights have greatly injured our young seeds. Potatos are looking black, having suffered much from the frots. Mangels are not up yet, wanting rain. Kohl Rabi the same, in fact our present prospects are not cheering. *Samuel Jonas, Crishall Grange, Saffron Walden, May* 10.

—— At the present time I cannot report very favourably of our harvest prospects. We have had a long and trying winter for vegetable life, and up to this period frequent frosty nights have occurred. The fall of rain since January 1 has been only 4.60 inches, and the soil is so dry that late spring seeding, whether of corn or Mangels, is not promising. Wheat is defective in plant on heavy clays. Many fields have been ploughed up and seeded with Barley or Oats. Upon deep light soils the prospect is good. Barley and Oats: The plant looks well when sown early, and may be a good crop with favourable weather following now, but it is very backward, which is adverse to full-bodied grain at harvest. Beans: Autumn-sown very defective, both in plant and growth. Spring seeding hardly ready for the hoe. Peas are in good plant, but it is too early to infer what the crop may be. They have an enemy to contend with in "French partridges," which abound here. They scrape out the seed in the drills, and feed upon the plant afterwards; and you will probably hear of their performance elsewhere. They do great damage to corn of all kinds in the spring. Mangels, put in early, have come up full and well; the later sown will not germinate till rain comes. All attempts to get Cabbage, Broccoli, or Kohl Rabi plants, is up to this time a failure. Land prepared, or preparing for Swedes or Turnips, is in excellent condition; the dry spring has been favourable for a fine tilth. Everything is backward at least a fortnight. There is but a scanty and short bite upon grasses and Clovers, &c. In this district much land is cultivated for Mangels, Swedes, common Turnip and Cabbage seeds, and the failure is a heavy one. *Henry Dixon, Dorwards Hall, Witham, May.*

—— On our light soils the Wheat is well planted, in some cases rather a want of that robust appearance which indicates health at this season. On the heavy lands, although late, the crops look healthy, and with more genial weather would make rapid progress. Barley has planted well, and in general has a satisfactory appearance. We have few Oats in this locality, those put in forward are promising. Rain is much wanted for grass-lands and all small seeds. Mangels sown the first week in April are rowed, but those sown afterwards have not vegetated. *P. Mitchell, East Hall, Rainham, May* 10.

HAMPSHIRE: Wheat sown after lea rather thin of plant, but rapidly improving; the prospect is very good on cold strong land, and all loamy soils in good condition. Barley is a good plant, put in at the right time to give a malting sample, scarcely any being sown late, the crop however requires rain. Oats a good plant, and all sown in good time; this crop also requires rain. Winter Beans damaged by the frost, except in a few cases; spring Beans late planted but taken well, and are now all hoed in excellent season. Peas of all sorts a good plant, rather late, but now making rapid progress owing to the favourable weather for hoeing. Trifolium and Vetches, very late, a very irregular plant, and promise altogether a poor produce, being so much damaged by frost. Clover for hay an excellent plant, rather late, but very promising, could we get a timely rain. Clover seeds for the next year are put in under the most favourable circumstances, the land being so very soft and fine: the plant is very thick and good. Potatos: Early sorts cut down by the night frosts, the main crop is planted with the best possible prospect. Mangel: A larger breadth than usual, planted with the land in the finest condition. Cabbages and Kohl Rabi for field culture are a failure up to this time, the fly having eaten everything as fast as the seed vegetated. *Joseph Blundell, Land Agent, Southampton, May* 10.

HEREFORDSHIRE: Had we written a report from this county three days prior to the present date it would have been full of gloomy forebodings for the future, not sufficient rain having fallen to moisten a clod from March 2 until the 11th inst.; on that day we were blessed with 12 hours continuous rain, and showery weather since, which has had a most beneficial effect upon all kinds of vegetation, and very materially changed the appearance of the country. The heavy falls of rain during the winter months, and the rapid changes of temperature from warm rain to cold north-east winds and biting frosts, told most severely upon the Wheat plant; hundreds of acres have been ploughed up and put to other corn, and, with few exceptions, that which remains is too thin and weak to attain more than half a crop. Winter Beans suffered in a similar manner, and where there are any left they are coming into blossom, scarcely 6 inches high upon some of the best land in the county. The spring-planted Wheat is generally very good; that pest, the wireworm, had commenced its ravages, but those genial showers it is hoped will drive the plant on out of further danger. The early planted Barley will now be set right, but much of the later planted has come up very irregular; where the ground received extra labour to render it a firm seed-bed it was too dry for the seed to vegetate, and where it was not rendered fine there it is in a similar state. The Peas, too, have suffered from drought. The early Potatos have been cut off with frost, and the pastures are most unusually bare. Never was so much artificial food given to sheep, and certainly never was it more required than during the past six weeks. The hay and Clover ricks are gone, and the cattle have in many cases have turned upon the pastures, not to graze, but to wait the growth of the food they so much needed. Thanks to our bountiful Creator, there is now every prospect of a rapid change. *D., May* 13.

KENT—*East:* I have had upwards of 40 years' experience of farming in this locality, and I say without hesitation that I never before saw Wheat in May looking generally so bad as at present. Some has been ploughed up, and the appearance of a great deal more is not such as to justify your expecting more than three-fourths of an average crop. The few hot days we had in April, followed by frosty nights, appeared to do the mischief. Wheat vegetated, and came up well in the autumn, and withstood our long winter with the severe callow frosts better than might have been expected on our thin soils up to the end of March, since which time it has gradually gone back. Barley at present is much more promising than Wheat, and Oats generally look well. Beans that were planted in the spring are good plants, and promising, but the winter Beans have suffered dreadfully from frost, and many have been completely destroyed, and not any look well. Peas are looking well at present. Rain is much wanted: the dry weather, with the continuance of frosty nights, retards vegetation so much that shortness of keep for cattle and sheep is the complaint of every farmer in this locality, and if we do not get rain and warmer weather very soon, the crops of Grass, Clover, Lucerne, Sainfoin, &c., must be very light. *Wm. Manser, St. Peter's, Margate, May* 10.

LINCOLNSHIRE: The Wheat plant on the better soils in this neighbourhood is looking well. On the peaty soils there has been a great loss of plant during the past two months, some fields were ploughed up, and many others it would have been better to have done so, for they cannot be more than half a crop. The inferior silty soils where not highly cultivated are also thin planted and very weak, especially the late sown after Rape and Mustard. The plant of Oats is generally good, and where sown with artificial manure, which is now very common, are looking well but backward for the time of year. Kohl Rabi and Mangel sown on the winter furrow are planting well. The young Grass is very bare, but with rain, of which we have an appearance to-day, there will be a very rapid growth; the soil is in a fine state, and the Grass well rooted. *Thomas Aitken, Decoy Farm, Spalding, May* 11.

—— The Wheat crops in this part are under an average. Barley not much grown. Oats good, but want rain. Beans under average. *H. Dudding, Panton House, Wragby, Lincoln.*

—— *North:* The Wheat crop is backward, and upon light land has thinned off a good deal, and does not look well. It must be a very favourable season to be an average crop. Early sown spring corn got a good seed-bed, and went in well, and looks well; later sown was wanting rain very much, but yesterday's fine rain will do an immense deal of good. *F. Sowerby, Aylesby, Great Grimsby, May* 12.

NORFOLK: Up to within the last few days the Wheat plant has looked remarkably well, but owing to the late severe frost some of it begins to look rather yellow. I have never seen the Barley plant look better. Peas and Beans up to the present look well, but I am afraid the frost will affect them. Oats, none grown. The feed is very short with us. *Samuel G. Sharp, Brandeston, May* 11.

—— *East:* I think we must be worse off (as regards Wheat) in this district than in any other part of England. During my 30 years' experience I never saw such a failure in plants. I generally grow from 5 to 6 quarters per acre, but see no chance of getting 4 quarters this season, and I am quite as well off as my neighbours. In this district I never saw the growing crop of Wheat more unpromising; thin on plant, and unusually backward. Many fields on the coast have been ploughed up, and sown with Lent corn, and others which were partially planted have been drilled over with various grain. Where the land is fairly planted the crops look neither strong nor healthy. Barley, Oats, Peas, and Beans are more promising, but wanting rain. No change of weather, however favourable, can now produce an average crop of Wheat in this immediate locality. Threshing is forward for the season, and we must draw heavily on foreign supplies before the harvest is secured. *Wm. Cubitt, Bacton Abbey, North Walsham, May* 11.

SALOP: Barley, Peas, and Oats, are looking well; winter Beans thin and blighted. Wheat varies much, a few fields looking very well (but they are the exception); a considerable breadth ploughed up and sown with spring grain; the generality very thin; the prospect for Wheat bad. We have not had rain sufficient to fetch Mangels up for five weeks, yet the Clovers and Grass are forward and good, and the Turnip fallows are nearly all ready for the seed. Mangels have all been sown some time, and many acres of Swedes are in. I am speaking of the crops in my own neighbourhood, for I do not go far from home. *Thos. Nock, Sutton House, Shipnall, May* 11.

SURREY: The appearance of the growing crops in this neighbourhood is very various. Wheat, Barley, and Oats on well-farmed land, and when not too thickly sown, are looking remarkably well generally; but on the chalk, gravel, poor land, either light or heavy, and badly farmed, with all the late sown crops are looking very badly indeed. Also the Wheat planted on the old Clover and Bent leys has lost plant very much from the attack of wireworm, and some in exposed situations from frost and cutting winds, so much so that many acres have been ploughed up and put to other crops. The cold, ungenial weather has kept back all spring feed very much, and the frosts have cut off all the Potato tops. Mangel is now almost invaluable, and has kept well, but is now being fast worked up and stock hurried to market. Early sown Mangel are coming on well to hoe, and do not appear to be hurt by frost, but the late sown do not come up well, the weather having been much too dry for them. The coming hay crop, I think, must be short, especially Clover, which is much affected by the continuous frost. Hay is advancing in price, and is fast disappearing. Sheep have done well, the fine dry weather suiting them. I finished shearing both fat and stores April 23, and have never had them do better out of the wool, though early, and the weather so cold. Fat pigs have receded considerably in price, but stores continue very dear. *Edward Hilder, Hoebridge, Woking, May* 17.

Sussex : The Wheat crop in this neighbourhood is very inferior thin on the ground, and plant very weak. Some Wheat has been ploughed up, and Barley sown. Oats and Barley have come up well, but are very late, owing to the late cold weather. *John Brotherton, Rose Hill Observatory, Robertsbridge, May* 13.

Wilts : I consider that the Wheat crop in this district looks very bad. Much of it is thin on the ground, and a considerable area has been ploughed up. Some of the low lands look well. The Barley crop, now that we are getting a good fall of rain, will probably be pretty good. The Bean crop is very bad. Green food of all descriptions for cattle and sheep is very scarce, and most of last year's hay has been consumed. Water meadows have been exceedingly valuable this spring. They have been fed off and are now laid up for hay. Early Potatos have been much injured by frost. *Cyrus Combes, Tisbury, Salisbury, May* 11.

Worcester : The present appearance of the corn crops in this neighbourhoods is not promising ; the severe and long winter has sadly tried the autumn-sown Wheat and Beans : some of the former has lost plant, and on the cold subsoils or undrained looks weak and yellow. Rolling, hoeing, and harrowing has been going on, and the colour of much of the Wheat has improved during the last week, the difference in effect, too, of good farming being evident. The winter Beans are very weak and short, presenting quite a contrast to those of last year. The dry spring has been favourable for cleaning the land and drilling the spring corn crops. Peas look fair, and spring Beans better than the winter. Spring Wheat is not much sown here. Barley and Oats, like all other crops, now suffer from want of rain, and the wireworm has done much mischief in some fields ; altogether the general appearance is backward, the nights having been cold and very little moisture. The young seeds, or Clover, present a bad prospect for the early hay crop, and Vetches are late for spring feed. Whilst writing this a fine rain is falling, which, if general, must prove a great blessing to all the growing crops. *Stiles Rich, The Cedars, Fearnall Heath, Worcester, May* 11.

— The Wheat in this neighbourhood is very much improving. The Barley is excellent, Oats good, autumn-planted Beans a failure, spring-planted promising. The Peas that were planted last autumn and very early in the spring have failed, but the later planted of all descriptions are very regular and good. Mangels deficient in plant, and a large breadth not yet come up. Pastures very fair. Clovers quite eaten down. The blossom of the Pear, Apple, and Plums magnificent, no blight whatever. Potatos coming up well. *H. Hudson, Vandyke Court, near Pershore, May* 12.

FARM AGREEMENTS.

Hay and Straw.

Mr. Smith evidently considers himself to be possessed of an uncommon amount of common sense, and others to be possessed of none. What a brilliant argument he gives us about Mr. Mechi and his straw ! If Mr. Smith possessed the great amount of common sense he thinks he has, he might have known that straw is not sold at "feeding price," and that Mr. Mechi, who is not devoid of common sense, therefore does not buy it, but prefers to take some cheaper feeding stuff. Mr. Smith gives us a homily upon selling straw and buying manure, and seems to think himself quite a genius for having discovered it ! I wonder he does not take out a patent for it, as he did for the Bath-chair handle to his smasher. It would be about as sensible. If every farmer could sell straw, does Mr. Smith suppose the price would be as high as at present ? And does Mr. Smith suppose that every farm is close to a railway station, or a line passing through London ? A great many farmers now sell straw by permission of their landlords on condition that they bring back 2, or 2½, or 3 tons of dung for every ton of straw sold. I myself know two farmers who have done that for a considerable time. When Mr. Smith asserts that 1 ton of straw makes 4 tons of manure, he is talking or writing on a subject he evidently does not understand. Straw will not absorb three times its own weight of water, consequently by no possibility could one ton of straw make four tons of manure. When straw, too, is passed through the stomach of an ox or a horse, Mr. Smith may rest assured it does not all come out again in the dung and the urine. I got some very accurate experiments made for me two years ago, with some very dry Wheat-straw grown in Hampshire ; and the conclusion I came to was that by no possibility could I convert one ton of straw into even three tons of dung, let alone four,—that in fact from 2 to 2½ tons of dung for each ton of straw might be taken to represent the usual proportion of dung to straw.

The feeding value of straw is a very disputed question, but no farmer in his senses would give 32*s.* 6*d.* per ton for it for feeding purposes. If therefore, Mr. Smith could every year sell all his straw at that price, and with the money lay down on his farm 5 tons of London dung for each ton of straw sold, he would do a good stroke of business ; for he may depend upon it his ton of straw is not worth more as manure than 2½ tons of dung such as comes from London. I myself sold a great deal of straw three years ago, which went to the camp at Aldershot. I got 40*s.* and 42*s.* per ton for it, and I believe the buyer resold it at the camp for 60*s.* I did not bring back London dung, for I could not afford the cartage, but I brought back superphosphate of lime to an equal value. I should not, however, like to repeat that experiment often, as I have more faith in straw fed on the farm than I have in superphosphate, even at those relative prices.

Mr. Smith never heard of a landlord who objected to let his land as a bye-tack. Well, I am a landlord, and have a very decided objection to letting my land as bye-tacks. All my wealthy neighbours, too, have the same objection, and every intelligent farmer in my neighbourhood knows that we object, and knows the reason why we object. Mr. Smith gives us an instance of a very honest yeoman-farmer. What of that ? Landlords do not require to make conditions and lay on restrictions against honest tenants, who are also good and intelligent farmers, but against dishonest tenants, or men who are ignorant and shortsighted, and who in a down-going farm would sell away the very marrow and fatness of the land to prolong for a short season their own miserable tenure of it. "If a tenant of a noble duke or lord or large landowner (who in all their agreements put in the protection clause about straw, &c.) were, supposing he had not got the clause in, to set to and sell his straw and roots off without purchase of manure, &c., what would he do ? Why, if he did not ruin himself quickly, he would make a fool of himself, he would soon have to cut his occupation, and his brother farmers would look upon him as a great blockhead. Therefore he might cut off to Van Dieman's Land, for his character would hunt him out of England." These are Mr. Smith's own words. Now I should like to know what satisfaction it would be to a noble duke, or lord, or great landowner, to hear that a tenant who had ruined a good farm, and left it worth not half the value it was a few years previously, was looked upon by his brother farmers as a great blockhead ! Would his brother farmers come forward and subscribe amongst themselves a sum sufficient to replace to his landlord the money of which he had robbed him by selling straw and hay without replacing them by bought manure ? I should think not. And if Mr. Smith was asked to subscribe to any such fund, his answer would most probably be, What a confounded fool his landlord was to let such a farm to such a man. And a very goon answer too.

Mr. Smith's valuations of farm produce are very amusing, and savour greatly of the uncommon amount of common sense he thinks he possesses. "A ton of roots (saith Mr. Smith) costs, carting and all, quite £1. Very frequently more than that, and I think we may never say less." What "uncommon" costly roots Mr. Smith grows. I get from 20 to 25 tons of Swedes from an acre. I should say my average crop of roots, taking yellow and white Turnips in also, will average at least 24 tons to the acre. Now, if they cost me £1 per ton, I am afraid I must make a desperate loss upon roots every year. I should be very glad, indeed, if I could get 10*s.* per ton, carted into my farmyard, for every ton of roots I grow. My roots cost me, according to Mr. Smith, £24 per acre, and yet I should think myself very well off, indeed, if I realised £12 per acre out of them. But perhaps Mr. Smith is confounding price with cost. Perhaps he means that he could not buy roots and lay them down on his own land under £1 per ton. Now this, I think, is very likely. In all probability the land around Mr. Smith belongs to some "noble duke, or lord, or great landowner," who lets his land on agreement, and not on lease, and who has a somewhat lynx-eyed agent ; and if the agent saw a tenant selling much Mangel, without bringing back manure to replace it, he would probably think, with Mr. Smith, he had much better "cut off to Van Dieman's Land, as he was a great blockhead," and so the price of Mangel sold off the farm becomes raised in consequence above a feeding price, and consequently would cost Mr. Smith £1 per ton to buy, instead of its feeding value of 8*s.* or thereabouts. If landlords and land-agents, however, were to adopt Mr. Smith's very liberal ideas, they would never trouble their heads about such matters, and so Mr. Smith might possibly at odd times be able to pick up a great deal of hay and straw and roots at prices far below their feeding value, provided he had ready money in his pocket, and could find a needy seller. And under such a system I have no doubt whatever a vast number of needy sellers would soon appear.

A celebrated physician was one day finding fault with St. John Long, the quack, and urging upon him that a man of his education and real knowledge ought to become a duly qualified physician, because, he said, "none but fools would ever go to a quack." "My friend," said Long, taking him to the window, "out of all the crowd you see passing by, how many do you think are wise men ?" "Well," said the other, "perhaps one in a hundred." "Then," said Long, "you may take all the wise men, and I will take the fools for my patients !" Mr. Smith may rest assured there are a vast number of fools in this world, and when a landlord puts a farm worth perhaps £5000 into the hands of a farmer whose capital is perhaps £1000, it becomes a very serious thing for the landlord if his tenant should turn out to be a fool. But if he should turn out to be a knave as well as a fool the matter is doubly serious. If the landlord should be a fool it would not hurt the tenant one bit, but if the tenant be a fool he might do the landlord a vast amount of injury. That is the reason why landlords and intelligent land-agents put restrictive clauses in their farm agrements ; and every good, honest, and intelligent tenant knows well that such restrictions are put in, not to tie him down, but to prevent a foolish or dishonest tenant from injuring the farm which has been committed into his hands. He knows right well what the reply would be if he goes to his landlord or the agent and says, "My farm is very well placed for selling hay, and straw, and roots ; I can sell them at very remunerative prices, but I know that I must replace them with at least an equal amount, if not a greater amount of manure, than they would produce if fed upon the farm. Well, then, let me sell these things, and I will bring back in place of them such and such manure." The landlord or the agent no doubt might stipulate for a large quantity of manure to be brought back, more perhaps than the articles sold would have really produced if consumed on the farm ; but although in the bargain made the landlord may reap some advantage in the gradual enrichment of his land, yet the tenant in all probability will reap the lion's share of profit out of a transaction which his own acuteness originated.

Mr. Smith's ridiculous use of the word "protection," puts me in mind of nothing but the fable of the ass who kicked the dead lion. His uncommon amount of uncommon sense must have elevated his intellect to that of a "Malaprop," for no one else could have seen any relation between restrictive clauses in farm agreements and protection to native industry. *G. A. H.*

EXAMPLES OF SEWAGE IRRIGATION.

1. *The Sewage Meadows near Edinburgh.*—These have long been quoted as an example of the largest produce known to agriculture, yielding Grass of a somewhat coarse and "washy" character, but perfectly well adapted for cow food. These meadows, cannot, however, be named as a good example of the agricultural remedy for the nuisance created by town sewage, for it is poured over them in such enormous quantity that the soil has not fair play given to it as a cleanser, and the water therefore leaves the grass-land still filthy and offensive.

The Edinburgh experience is rather one of agricultural profit from the use of sewage, than of that perfect abatement of its waste and nuisance, which, in the interest of rivers, we desire to see. This arises from the enormous quantity of the sewer water and the small area of land on which it is used. At Lochend and Craigentinny on the north and east of Edinburgh, about 230 acres receive the whole drainage of 80,000 people, being at the rate of 350 people per acre. At Grange on the south side of the city, 16 acres get the drainage of a comparatively small number. At Dalry, on the west, 60 acres or thereabouts receive a very large quantity of filthy sewage, which they are unable perfectly to clean ; and there are one or two other plots similarly treated on the road to Leith. Here, however, altogether are only 400 acres, whereas the population whose drainage they receive must largely exceed 100,000, and it is not therefore surprising that the drainage water leaves the land by no means perfectly cleansed.

The Foul Burn which waters the Craigentinny meadows passes first through Lochend farm, where about 20 acres of permanent Grass and 8 acres of Italian Rye-grass receive as much of it as the tenant chooses to apply. The quantity is, probably, often as much as 10,000 or 15,000 tons per acre during the growing season, besides an indefinite quantity during winter ; and of course a very small proportion of the filth which it brings down from Edinburgh is deposited here. The stream flows on in almost undiminished foulness to the meadows lower down. In addition to the 20 acres of permanent grass-land there are 12 acres arable at Lochend (of which 8 acres are every year in first and second year's Italian Rye-grass) commanded by a self-acting pumping apparatus. A water-wheel, driven by the stream, works a four-fold pump, delivering, when in perfect order, about 1000 cubic feet per hour, a quantity which, as it works night and day during eight months of the year, corresponds to nearly 20,000 tons, or, even assuming that only half duty is accomplished, to 10,000 tons per acre. In either case it is plain that an enormous quantity is applied—much beyond the needs of the largest possible crop of Grass.

The Grass of Lochend meadows has averaged, during nine of the spring sales at which it is disposed of by auction, £27 12*s.* 2*d.* per statute acre. During the past year the highest price attained was £41 17*s.* 6*d.* per acre ; and from that down to £19 an acre has been realised. The Italian Rye-grass on the same farm has varied in price from £32 an acre for the first year's cuttings to £25 an acre for the second year's cuttings.

Leaving Lochend the Foul Burn pursues its course to the sea on the Portobello side of Leith ; but it has for many years been diverted, right and left, to a considerable distance from the original watercourse, and a fan-shaped farm of more than 200 acres, widening out as it gets near the coast, has been thus laid out for irrigation at a cost of about £5000. This Craigentinny farm includes within its limits land of excellent natural

fertility, but it terminates at its lower end in a wide belt of sheer sea sand, which though not equal in its annual produce to any of the originally superior plots, old men still remember as a barren shore. There is here too a portion of higher land of excellent natural quality watered by a pump, in this instance driven by steam power. The area this year watered thus is 8 acres, and as the engine is driven only 300 hours during the six or eight dressings which this land annually receives, the pump, delivering from 60 to 80 tons an hour, does not distribute more than 3000 tons per acre annually, a quantity which at *1d.* per ton, if ordinary sewage be taken to be worth so much, many ordinary agricultural crops would easily repay. These 8 acres of Italian Rye-grass have been sold during the past year at from £25 to £36 an acre,—prices equal to those obtained at Lochend, where four times the quantity of sewage is applied. It would seem, therefore, that the enormous surplusage of foul water used at the latter place fails to be of any agricultural service.

In the lower Craigentinny meadows 190 acres receive probably nine-tenths of the Foul Burn, and, a night and day waterman being constantly employed in its distribution, it flows constantly over one plot after another; a single dressing of five or six hours being given between the several cuttings of Grass to each of the 250 plots, or thereabouts, into which the whole area is divided. The summer's Grass of these beds, varying from 2 to 5 roods each, is sold by auction to the Leith and Edinburgh cowkeepers every spring, and the maximum value reached last year was £36 15*s.* per statute acre. The quantity of Grass for which such prices are obtained is believed to vary from 50 to 70 tons per acre. And as the means are perfected of distributing the sewage more evenly, and as the subsoil drainage of the land improves, the quantity and price are both increasing year by year. No exhaustion is apparent anywhere. The sewage brings down more than the plants require of every necessary constituent of their food, so that even the poor sea-sand is as fertile as the rest, and the land is getting richer year by year, notwithstanding the enormous crops it yields. Taking the average price of the whole 240 acres to be £24 an acre, we have a total annual produce of £5760 a year, extracted by the land and Grass from the drainage of 80,000 people, or 1*s.* 5*d.* from each person annually—certainly not ½*d.* a ton over the enormous quantity of sewage which is here applied.

But the area is not sufficient to take up the whole of the filth brought down by the water. A much larger extent of crop could be obtained from the use of it if there were any land convenient on which it could be applied, or if there were a sufficient demand for the produce of it. The Edinburgh experience, therefore, must be quoted not as a successful example of sewage cleansed by irrigation, but rather as an instance of the largest produce raised by means of it from a limited area of land.

2. *Lodge Farm, near Barking.* We turn now to an example of another kind, where the supply of sewage is limited, and where the object has been, from this limited supply, by means of an ample extent of land, to obtain the largest annual produce. Neither at Edinburgh nor at the farm near Barking in the occupation of the Metropolis Sewage Company has the sanitary result or the purity of the water been the object aimed at. In the latter case, however, it has incidentally been secured. The object having been to obtain by agricultural use the largest return from the sewage used, it became necessary to make it as clean as possible before letting it go. At Lodge Farm, near Barking, the Metropolis Sewage Company in 1866 took about 200 acres, for the most part a light gravelly soil in comparatively poor condition, for the purpose of illustrating thereon the value of North London Sewage of which they hold the concession for a term of years. The land has been accordingly laid out in beds varying from 50 to 150 feet in width with a central carrier down the middle of each, and having a slope from this carrier on either side, down which the sewage trickles to a midway furrow. The carriers are, as nearly as the general slope of the land allows, horizontal; the slope on either side varying from 1 in 20 to 1 in 60. The sewage is pumped from the outfall on the Thames near Barking through a 15-inch pipe to a reservoir on the highest part of the farm, and from that it is conducted in open ditches to the ridge-line carriers of these lands. These carriers, being stopped at intervals by the spade of the waterman, overflow; and the sewage, passing over and through the soil to the furrows, is by them conveyed to the lower slopes of the farm, over which it is distributed until it either sinks altogether into the land or flows finally off the surface at the foot of the farm. The soil is too pervious and has too hollow and open a subsoil to permit the water to travel far upon the surface, so that after 50 yards at most of surface flow it sinks to reappear only at the mouth of the main drain of the farm; which, nearly dry in ordinary weather, pours a full flow within an hour or two of the sewage being properly applied to the fields.

Turning now to the produce of the sewage, here considered not as a nuisance but as a valuable manure, it appears that 300,430 tons were, in 1867, used over 56 acres of land, and 2480 tons of Italian Rye-grass were cut off that area. Of the sewage, however, no doubt a great deal was lost in the channels and on the land in first starting the process; and, as regards the Grass, we are informed that a large proportion was killed by the unusual frost of January 1867, only 13 acres, in fact, of the whole extent having been in full bearing; and these yielded 62 tons of Grass per acre. It appears, therefore, upon the whole experience, that for every 100 tons of sewage applied 1 ton of Grass per acre was obtained over and above the natural produce of the soil and climate. In 1868 and 1869 experiments over a considerable extent of land have been made with other crops than Grass, to which alone, or to equally succulent growths, so dilute a manure as sewage appears at first sight to be adapted. A field of 13 acres of poor gravel that was in Wheat in 1867, yielding then about 3¼ quarters per acre, was sown in 1868 in the following manner:—4¾ acres with Wheat early in November, 2¼ acres with winter Oats, 4 acres with Rye, and 2 acres were planted with Cabbages in October, which were taken off in March, and Mangel sown in their place. The Wheat was twice flooded with sewage, in March and in April, 450 to 500 tons to the acre being applied in the two dressings. The crop produced 5½ quarters, and three loads of straw to the acre. The winter Oats were three times flooded in March and in April, over the whole, and over a part in June, receiving in all about 500 tons to the acre. These Oats yielded 8 quarters of corn, with three loads of straw per acre. The Rye was flooded twice, in March and in April, in all with about 450 to 500 tons per acre; it was cut in July, and threshed in the field, yielding 6 quarters, with three loads of straw.

If it be urged that in such an unusually dry season as 1868, good results would necessarily follow irrigation with town sewage, it must be remembered that although these crops no doubt benefited in common with those of the whole country, by the lengthened fine weather, the soil is a dry burning gravel, and no sewage was applied to either Wheat or Rye after the month of April, up to which time there was the ordinary amount of wet weather, without any unusual heat. The same field has been again in Wheat and Oats and Barley, and the experience of 1869 with a cold May and June equally with that of the hot and dry season of the previous year, bears ample testimony to the power of sewage upon this soil as a manure for corn crops. The Wheat has yielded 4 quarters per acre, the winter Oats no less than 11 quarters per acre, the Barley ripening unkindly only 4½ quarters per acre; but it must be remembered in all these cases that the field, naturally a poor gravelly soil, was then yielding its third successive grain crop. Most satisfactory results also continue to be reported last year* from Lodge Farm in the cultivation of Potatos, Cabbages, Beet, Mangel Wurzel, and other green crops. The Lodge Farm experience, confining it to its growth of Grass, may be said to represent a return of 5*s.* annually from every individual contributing to the sewage used upon it. Supposing the water supply to be over 30 gallons a head, each person will make 50 tons of sewage annually, corresponding to the production of 10 cwt. of Grass, worth 10*s.* a ton.

The experience here, combined with the information derived from the analyses of the clear effluent water, pouring from the farm into the neighbouring brook, is sufficiently encouraging for those who are interested in the cleanliness of both town and river.

We turn now to a large number of instances of irrigation where the object has been not only to make a profit but to abate a nuisance. Such are the cases of Aldershot, Banbury, Bedford, Croydon, Norwood, Rugby, Warwick, and Worthing. *Report of H. M. Rivers Pollution Commission.*

(To be Continued.)

* Notes upon the Sewage Cultivation of Lodge Farm, Barking, by the Hon. H. W. Petre. Effingham Wilson, Royal Exchange.

PAPER FIBRE INQUIRY.

[The following are extracts from letters received by the Scottish Chamber of Agriculture on this subject.]

1. *From Mr. C. Lawson, of Borthwick Hall, Gorebridge, March* 11, 1870.—This subject is naturally of importance to paper manufacturers, and well deserving of their attention.

Fibre, of course, exists more or less in all grasses; but to ascertain which species will be found equally suitable for the manufacture of paper, and for cultivation on waste place, it will be necessary to conduct careful experiments, to which end I shall gladly offer my advice and services, so far as my health permits me, should the Chamber resolve to follow out the question seriously.

Esparto itself is not adapted to this climate, but there are several other grasses and plants with which advantageous experiments may be made.

Regarding waste lands, they may be divided into sea-coast and landward. On the sea-coast the common Bent or Marrum (Psamma arenaria), and the Elymus arenarius might be tried with probable success; and for such localities attention might also be given to the Tree Mallow (Lavatera arborea), which is indigenous to this country, and produces very strong fibre in considerable quantity. These plants occur to me at the moment, and I am sure that a certain amount of success would result from their cultivation. But in the course of experiments there is no doubt that other plants, suitable for the purpose, would also be found capable of cultivation on sea exposure.

The landward waste lands may be subdivided into three sections: 1. Very stony moorland on which the common Bent-grass (Agrostis vulgaris) suggested by Mr. Cowan, might certainly be tried; the Wavy Hair Grass (Aira flexuosa), and some of the Fescues, such as Festuca ovina and rubra, should also be experimented with, as well as the Gold of Pleasure (Camelina sativa), which yields a good strong fibre. 2. The damp peaty moorland where the Marsh Bent-grass (Agrostis alba), and the variety of it called Fiorin-grass (Agrostis stolonifera), may very likely succeed; and on drained and reclaimed parts the common Timothy (Phleum pratense) might be tried—this last with considerable prospect of success. 3. Waste lands in favourable situations, good exposure, and possessing some little fertility. On such, many grasses might be experimented with, and the Oat-grass (Arrhenatherum avenaceum) as well as Yellow Oat-grass (Trisetum flavescens) are chiefly deserving of notice. The common Nettle, or perhaps rather the Canadian species (Urtica canadensis), should also have attention; the Sunflower, the Jerusalem Artichoke, and any good hardy species of Althæa, and Mallow offer likewise good prospect of success.

Looking to the very high price which Mr. Cowan says Esparto has reached, I am still of opinion that in the good exposures of the South of England and Ireland, the New Zealand Flax (Phormium tenax) is worthy of further trial.

While on this subject, do you not think it possible that the refuse of the sugar-cane manufactories may form a good raw material for papermaking? I have frequently seen abroad mounds of the expressed cane lying about, apparently of no value; but surely this has been thought of and found unsuitable.

2. *From Professor Balfour, Royal Botanic Garden, Edinburgh, March* 21, 1870.—I have no doubt that there are many plants which can be cultivated in Britain for this purpose. Some years ago a gentleman presented to the museum of the Botanic Garden specimens of paper pulp manufactured by him from various plants, such as Broom, Whin, Heather, Blaeberry, Bramble, Thorn, &c. The specimens can be seen in the museum.

I agree with Mr. Lawson in most of his suggestions.

The following plants appear to me to be suited for furnishing materials for paper:—

Psamma arenaria, the common Bent, or Marrum of the shore, Elymus arenarius, Phragmites communis, and perhaps Carex arenaria. These are all native plants, which thrive well in a sandy soil. Elymus condensatus (the Bunch-grass of Western America), Arundo conspicua, and Tussac-grass, might also be cultivated with success.

The Mallow tribe might supply valuable species; such as Malva sylvestris, Lavatera arborea, L. triloba, Althæa officinalis, and A. rosea (the Hollyhock).

Among the Composite plants I may mention the Sunflower, the Jerusalem Artichoke, the Hemp Agrimony, Senecio sarracenicus, and the American species of Solidago, as being useful fibre plants.

The Nettle tribe also supplies fibres, and the common Nettle and the Hop can be easily grown in many kinds of soils.

Another plant which thrives in our climate, and which yields fibre, is Yucca gloriosa. Specimens of this plant thrive well in the open air in the Botanic Garden.

It is of importance to cultivate plants which can be cut down in summer without being destroyed. Some of the plants mentioned, such as Lavatera arborea, after being cut, would require to be renewed by seed.

These are some of the plants which occur to me as worthy of cultivation.

Mr. M'Nab has suggested the following additional plants as worthy of a trial:—Bark of Lime tree, Sanguisorba, especially S. canadensis; Spiræa aruncus, and perhaps S. Ulmaria; Campanula latifolia, species of Centaurea, Daphne Laureola, stems of species of Teazel (Dipsacus), Scirpus maritimus, some species of Rush, such as Juncus maritimus; leaves of Scotch Fir, Willows, species of Dock, stems of Chicory, Epilobium angustifolium, Privet, some Ferns, such as the common Bracken; Lythrum salicaria, species of Thalictrum, Typha latifolia, and T. angustifolia.

3. *From Mr. Charles Cowan, Mount Grange, Edinburgh, April* 2, 1870.—Regarding, as I do, a steady supply of suitable material for paper as an absolute necessity of our social and intellectual existence, I feel deeply interested in the success of the efforts that may be put forth for the growth and supply of such vegetable matters as may be found the best adapted for the various purposes for which paper is applied, at a moderate but remunerative price to the growers, and in such abundance as to render us independent of foreign nations.

The Esparto, or Spanish Grass, which was first introduced in small quantity in 1860, at a cost of £5 per ton, delivered at the port of importation, has been supplied at about the same price ever since, in large and yearly increasing quantities, till about six months ago, since which time, owing to an alleged very short crop, the price has nearly doubled.

The first question to be solved is, what are the vegetable substances the most likely for the purpose which could be supplied at about £5 or £6 per ton, free from extraneous matters.

The grower must bear in mind that the cost of growing, winning, gathering, and storing the crop, must, in a large measure, depend upon the density or sparseness of the yield, and besides, that it is of the utmost importance that the vegetable matter, when treated, should have comparatively but a small portion of the alkaline earths, such as silica, in its composition, it being essential to detach these earths by boiling the material in strong caustic alkali under very high pressure, the process, besides, being attended with great expense, and leaving but 50 per cent. or even less, of the original weight of material of fibre fit for paper.

I am of opinion that there are many of our grasses, such as the common Italian Rye-grass and Timothy-grass, which would cost much less than the Esparto in the boiling processes, and would be better adapted for paper. I may mention, among other substances which I am prepared to exhibit, specimens of pulp from Tussac-grass, and from Broom shoots, which have been tried, at the request of Sir James and Lady Matheson of the Lews, both of which yield a long fibre, which, when bleached, is of a fine white colour.

There is good hope besides of wood shavings being found very suitable ; but one disadvantage in their use arises from the enormous and dangerous pressure under which they are boiled in strong alkaline ley, and the heavy expense attending the process.

I by no means wished to discourage the production of Flax straw as a material for paper. My object was merely to state that, from the extreme strength of the fibre derived from it, and its consequent "harshness," it would not *per se* be well adapted for printing paper. But it would be valuable as a blend in papers used for printing, and certainly for packing paper for various purposes it would be admirably adapted.

Both printed paper and brown packing papers now used are adulterated by a large admixture of mineral matter introduced into very unsuitable materials ; and the supply of a tough and yet flexible packing paper, both white and brown, of various thicknesses, is a great desideratum.

AGRICULTURAL STATISTICS.

: [We continue the publication of the official Tables. The following are further Tables illustrative of Foreign Agriculture.]

STATEMENT OF THE ESTIMATED QUANTITIES OF THE PRINCIPAL KINDS OF CORN AND OF POTATOS AND OTHER CROPS PRODUCED IN FOREIGN COUNTRIES, ACCORDING TO THE LATEST RETURNS.

	Sweden, 1867.	Norway, 1865.	Holland, 1867.	France, 1868.	Greece, 1867.	United States, Estimates, 1868
	Imperial Bushels.	Imperial Bushels.	Imperial Bushels.	Imperial Bushels.	Imperial Bushels.	Imperial Bushels.
Corn Crops :—						
Wheat and Spelt	1,487,433	271,384	3,698,504	322,067,256	13,452,268	217,508,160
Barley	9,292,019	3,415,549	4,214,385	54,924,897	5,736,424	22,229,223
Oats	24,606,713	7,881,369	11,054,142	200,326,407	528,649	247,814,757
Rye	10,591,001	651,390	6,131,602	79,542,149	lb. 1,691,888	21,849,320
Peas	1,548,540	186,561	882,235	12,643,850	,, 22,008	..
Beans			1,538,055		,, 4,110,820	
Buckwheat	..	..	4,074,868	31,043,526	lush 469,560	19,285,146
Maize	..	..	..	30,144,370	,, 5,546,225	880,123,300
Mixed grain	3,393,034	1,741,213	..	26,362,244	,, 4,706,823	..
Other kinds	..	..	122,480	9,247,920	..	..
Green and other crops :—						
Potatos	25,314,267	18,035,350	41,704,096	321,343,978	cwt. 9,704	103,000,000
				1862		
Carrots						
Turnips						
Parsnips	2,592,543	..	..	tons 4,506,886	..	..
Mangels						
Beetroot and Cabbage						
Beetroot for sugar	*	..	..	cwt 87,236,932	..	..
Chicory	..	..	lb 56,579,600	lb 28,887,302	..	..
Colza and Rapeseed	94,322	..	bush. 680,175	bush. 9,902,546	..	..
Hops	..	..	lb. 638,647	lb. 14,668,434	..	..
Tobacco	..	..	lb. 187,420	,, 7,217,591	lb. 2,936,948	lb. 320,982,000
Madder	..	..	,, 14,614,493	,, 55,584,219	,, 59,662	..
Flax { Seed	..	..	cwt. 38,018	bush. 508,056	bush. 2,350,048	cwt. 1,702
Flax { Fibre	..	..	,, 90,666	cwt. 190,511	cwt. 1,029,406	..
Hemp { Seed	..	}	Included	bush. 40,258	bush. 2,536,572	..
Hemp { Fibre	..	}	with Flax.	cwt. 15,387	cwt. 1,130,217	,, 20
Cotton	..	..	..	..	..	bales 2,500,000
Sugar	..	..	..	..	..	lb. 95,051,225

* Included with Carrots, &c.

STATEMENT OF THE ESTIMATED AVERAGE YIELD PER STATUTE ACRE OF THE PRINCIPAL CORN CROPS, AND OF POTATOS IN IMPERIAL BUSHELS, IN VARIOUS COUNTRIES.

Countries.	Date of Return.	Wheat and Spelt.	Barley.	Oats.	Rye.	Beans and Peas.	Maize.	Potatos.
		Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.	Bushels.
Sweden	1867	..	..	..	..	11 9	..	82 2
Norway	1865	22 8	28 4	35 8	22 3	19 6	..	236 1*
Holland	1867	18 9	36 5	42 4	12 9	21 1	..	151 7
France	1868	18 4	19 9	24 5	16 6	15 0	18 5	129 0
Greece	1867	35 7	48 7	51 5	..	..	47 1	..
United States	1868	11 8	23 7	25 5	13 2	..	25 2	91 0

* This is the average yield, according to the returns furnished of the total acreage and produce of the crop.

STATEMENT OF THE NUMBER OF LIVE STOCK IN THE UNITED KINGDOM AND IN VARIOUS FOREIGN COUNTRIES, ACCORDING TO RETURNS FURNISHED BY THE STATISTICAL DEPARTMENTS OF THE RESPECTIVE COUNTRIES.

Countries.	Date of Returns.	Horses.	Cattle.			Sheep and Lambs.	Pigs.
			Cows.	Other Kinds.	Total.		
		No.	No.	No.	No.	No.	No.
Great Britain	1869	1,461,061	2,135,070	3,178,403	5,313,473	29,538,141	1,930,452
Ireland	1869	527,248	1,503,724	2,224,080	3,727,794	4,648,158	1,079,793
Total United Kingdom including Isle of Man and Channel Islands)	1869	1,998,147	3,666,304	5,421,978	9,078,282	34,250,272	3,028,394
Russia in Europe (exclusive of Poland and Finland)	Average of 1859 to 1863	..	..	..	22,816,000	39,315,000	9,517,000
Russia in Asia	1867	433,959	1,211,468	7,036[illegible]	2,648,000	5,815,000	580,000
Sweden	1865	149,167	690,777	262,259	1,042,137	1,621,931	362,371
Norway	..	352,603	811,831	382,030	953,036	1,705,394	96,166
Denmark	1866	2,313,817	4,865,898	3,130,920	1,193,861	1,875,052	381,512
Prussia	1866	..	463,943	445,070	7,996,818	22,262,087	4,875,124
Wurtemberg	1867	..	1,521,113	1,641,274	911,013	655,856	254,888
Bavaria	1864	..	107,222	413,755	3,162,387	2,039,983	921,456
Saxony	1867	..	255,130	..	625,260	304,087	325,564
Holland	1867	..	..	..	1,361,278	1,027,215	302,514
Belgium	18.67	277,311	..	..	1,257,649	583,485	458,418
France	1866	2,313,232	6,694,502	6,038,686	12,733,188	30,386,233	5,889,624
Spain	1865	..	..	..	2,504,598	22,054,967	4,264,817
Italy†	1867	..	..	..	3,708,635	11,040,339	3,886,731
Austria	1864	3,460,400	6,094,865	7,565,457	13,660,322	16,573,459	7,914,855
Switzerland	1866	..	627,116	365,779	992,895	445,400	304,191
Greece	1867	98,938	51,994	57,910	109,904	2,539,538	55,776
United States†	1867	..	..	..	12,674,968	32,795,797	13,616,876

* As returned by occupiers of land only. † Estimate returns. The total number of horses in Great Britain is estimated to be about 2,000,000. ‡ Results of returns for 1866 not yet published.

THE AGRICULTURAL LABOURER IN DORSETSHIRE.

THE earnings of a labourer in Dorsetshire are less, and present a greater variety,* than in any county visited by me ; and yet the amount is difficult to ascertain, because the wages are paid partly in money and partly in kind. This mode of payment is described as "a low weekly wage supplemented and eked out at various times by perquisites and allowances in coin or material, or opportunities of piece-work."

Omitting for the present all mention of carters, shepherds, or specially skilled men, the weekly wage for an ordinary labourer is generally 8*s.* with, or 9*s.* without, a cottage free of rent. Let us see what is added by perquisites and allowances, and opportunities of piece-work.

In the Vale of Blackmoor the only addition usually made to the money wage is a certain quantity of beer or cider, given more or less regularly. In other parts they sometimes include in addition "grist corn," that is, "tailing" or second Wheat, which some labourers are allowed to buy either below or at the market rate ; a certain number of perches of ground for a Potato crop, ploughed and manured by the farmer ; the cost of the carriage of fuel, and sometimes the fuel itself, whether wood, Furze, peat, or coal ; and a cottage rent-free.† It must in the first place be understood that these perquisites are given only to married men, that few (if any) farmers give all of them, and that in all cases they vary so much in amount, in quality, or in the time of year in which they are given, that it is impossible to lay down any general rule for estimating their value.

But the great objection to the system is its liability to abuse. That in many instances it is abused it is impossible to deny. No doubt good employers, who give the full value of these advantages, and who keep their agreement in the spirit as well as in the letter, may by this means add an average of 2*s.* or 3*s.* a week to their labourers' earnings. But, on the other hand, some farmers give none of these advantages, others give one or two only. Or again, the Wheat may be, as it sometimes is, of the most inferior character, the "fuel" may consist of the commonest Gorse, the cottage may be miserable and overcrowded, or extra labour (on Sundays or at harvest) may be required, either of the man or his family, in return for these advantages. In all of these cases it is clear that the addition to the money wages of the labourer may be very small ; and the inferior employer, sheltering himself under a system which in good hands works very much to the advantage of the labourer, can, by means of it, screw his men to the greatest possible extent.

The opportunities for piece-work are not so great as in many other counties. In the Vale of Blackmoor hardly any is done ; in other parts ordinary men get it, as a rule, only at haytime and harvest ; and many farmers, instead of giving it at all to regular men, substitute a fixed payment, varying from 10*s.* to £2.

* As an illustration of this variety, I append the wages of five large farmers, as stated by themselves :—

A. (Cerne Abbas) gives 8*s.*, a cottage and garden rent-free, some Potato ground, some Furze to burn, and "grist" corn when he has it. Beer at piece-work.

B. (Marnhull) gives 9*s.* and three pints of cider a-day during the summer. No other extras.

C. (St. Giles') gives 10*s.*, no cottage ; 12 "lug" [perch] of Potato ground to some men ; beer at piece-work.

D. (Winfrith) gives 7*s.*, cottage and garden rent-free ; 20 "lug" of Potato ground, pays the carriage of turf for fuel, and gives corn at market price. [In the parishes where C. and D. live work ceases at 5 P.M.]

E. (Whitchurch) gives 9*s.*, cottage and garden rent-free to three out of eight men ; 15 "lug" of Potato ground, and gristing at 5*s.* to all, some fuel to two. Beer at piece-work (average sum earned at piece-work, £22 12*s.*).

† The following observations may give some assistance in arriving at an approximate idea of the value of the various "perquisites."

"Grist" corn is sold to labourers either at a fixed price per bushel now generally 5*s.*—or at the market rate. Some few farmers allow them to buy as much as they like ; more generally it is offered to them only to a limited extent, or during a part of the year. It is clear that this may be a gain or a loss according as the price of corn is low or high, or the quality of the Wheat is good or bad. In many cases it is an undoubted gain ; in bad hands it may be, and is sometimes, a loss ; and in the neighbourhood of Dorchester the possible gain is often counterbalanced by the reduced pay given to the wife for her work, that is, she will get 8*d.* a-day and no "grist," or 6*d.* with it. One great hardship entailed by this system is that the corn has to pass through the miller's hands for grinding, and part of it is kept back as a toll. It is even complained in some cases that the Wheat from inferior corn is substituted for that sent to the mill.

Potato ground is a piece of land upon a farm, given (generally in Dorset) free from rent, and ploughed and manured by the farmer. If these conditions are complied with, it is fairly estimated at 1*s.* per year for every "lug" or perch. Each labourer has from 15 to 40 perches, or, in some cases, a quantity proportioned to the size of his family. Where allotments are common, as on Lord Shaftesbury's estate, Potato ground is very rarely given to ordinary labourers.

Fuel : Some few masters give a ton of coals at Christmas ; many more give Furze or peat, according to the locality, or send a waggon to fetch it. No two masters, however, observe the same rule in this respect.

Beer or cider is generally given, as in many other counties, at task-work. In my opinion it cannot be reckoned, any more than it is in those counties, as a part of wages, because it does not go to the benefit of the family. Some give it all the year. This practice, I am glad to say, is diminishing. It has been much discountenanced by many landowners, and especially by Lord Shaftesbury ; and money payments have been substituted for it. The value of this addition depends on the quality of the liquor, which is often very bad. In the case of cider it is generally grown upon the premises, and costs little or nothing to the employer.

This, it must be remembered, is earned at a cost of many extra hours of work, often amounting to an addition of two days to the week, and allowance must be made also for the greater amount of food and drink consumed, and for the wear and tear of tools. The difficulty of laying down any fixed estimate on this subject is shown by one of the Tables in the Appendix (Evid. 68), where the earnings of 12 ordinary labourers at piece-work varied from the fixed payment of £1 for harvest to £3, which was obtained by specially skilled men.

Difficult as these additions are to estimate, I think it may safely be said that the ordinary labourer in this county earns on the average (piece-work and everything included) from 10*s.* to 11*s.* a week. Carters and shepherds, who work longer hours, and to whom therefore some additional advantages are always given, would often receive from 2*s.* to 3*s.* a week more.

To the "perquisite" system, as above described, there is another very strong objection to be made. The general time of payment is once a fortnight, in many cases once a month, and in some at irregular intervals. The result of this is that very little money passes between the master and his man. Deductions are made for the "grist corn," and often for cheese and butter, for skimmed milk, for barley for the pig, or for the pig itself, so that the actual money earned never passes between the employer and the employed, but the balance only which remains (if any) is handed over to the labourer. The result is, that "48 hours after the labourer has taken his wages he has seldom a shilling left." (Evid. 72).

The rent of the cottages on some estates is very low. Lords Portman and Shaftesbury, for instance, let all theirs at 1*s.* a week, including a garden; so do many other landowners. Lord Westminster, who always adds an exceptional amount of land, charges £5 a year, and round Dorchester few cottages are to be obtained at a less rate. Indeed, many of the farmers in that district who include a cottage in their wages, estimate its value at 2*s.* a week. In Fordington and similar open villages 2*s.* 6*d.* is no uncommon price. On the whole, however, taking the ample gardens into consideration, the cottage rents are usually below the average of other counties.

The redeeming feature of rural life here is the amount of land held by the labouring class; indeed, but for this, the wages would sometimes hardly be sufficient to support life. The gardens are large, many regular labourers have a bit of Potato land ploughed and manured for them, and allotments are very common. A reference to the Tables appended to this Report (Evid. 65) will show that these are not always cheaply let, and that a good many are bringing in a profit of £4 an acre to their owners, and cannot, therefore, be described as any favour granted to the peasant. In the union of Bridport the average rent of land let in allotments is as high as 6 gs.* Some landowners, on the contrary, have been very careful to avoid this. On Lord Shaftesbury's estate alone there are 396 allotment gardens, of which the common rent amounts to a rate of 24*s.* per acre, and no less than 164 of them are half an acre in extent.

"For some years the cottages of Dorset were a byword and reproach. . . . It is pleasant to look back upon the serious charges then advanced against them, because it places in strong and gratifying contrast their present condition."† "There has been," says Lord S. G. Osborne, "in the 27 years I have known Dorset, the greatest improvement" (Evid. 4). Where many have improved, it is invidious to mention names. Following the lead of Mr. Sturt at Crichell, the great majority of landowners have effected great changes on their estates. The improvement in public opinion on this subject is no doubt in a great degree due to the exertion of Lord Sidney Godolphin Osborne, to whose most valuable paper in the Appendix (Evid. 4) it is unnecessary for me to call your particular attention.

In spite of these changes, the cottages of this county are more ruinous and contain worse accommodation than those in any other county I have visited except Shropshire; and it must be remembered that the system of hiring adopted here would especially seem to require a sufficiency of bed-room accommodation. The estate of Lord Rivers, having been long held by life tenants, is notorious for its bad cottages. And such villages as Bere Regis, Fordington, Winfrith, Cranbourne, or Charminster (in which there is an average of seven persons to a house), together with others described in the evidence, are a disgrace to the owners of the land, and contain many cottages unfit for human habitation. Nor can this condemnation be confined to large open villages. The parish of Batcombe, for instance (with an acreage of 1109), has within its limits 23 cottages occupied by agricultural labourers, of which 11 have one bedroom only, and in five of these families with three or more children are sleeping (Evid. 59). In the 42 parishes comprised within the unions of Cerne and Wimborne, no less than 314 (or 16 per cent.) of the cottages had one bedroom only, and 113 of these contained a family with three or more children (Evid. 59). What is called a second bedroom is often, too, a mere apology for it, and is sometimes described as "a closet not closed" from the bedroom. One special difficulty in the way of improvement in this county should, however, be mentioned. It is the number of cottages let on lease for lives, and until these fall in the landlord has no control, and no power of effecting such improvement. It is to be regretted that some are still being let on these terms.

There is one circumstance connected with these villages which renders them more especially open to reproach, that is, the neglect of the most obvious sanitary precautions. In village after village the answer was, "there is nothing like one privy to every cottage." I saw whole rows of cottages with none, and abounding with nuisances of all kinds. Remonstrance is generally disregarded, and the state of filth in which many parishes are left calls aloud for some active interference to relieve the present authorities of a responsibility they have grossly neglected.

In respect of education, this county appears to me to have made considerable exertion. The smallness of many parishes has rendered it difficult for them to procure a master, and therefore the school, which now exists in almost every parish, is generally taught by a mistress. From what I have already said it will be seen that these schools have great difficulties to contend with, owing to early labour, and to the scanty resources of the families. Education, therefore, is very insufficient, but I noticed with pleasure the great desire for instruction which prevailed among the labouring poor in this county, one proof of which may be found in the fact that the proportion of parishes with night-schools is very unusually large (Evid. 3). Farmers in this county are especially suspicious of education, because it is found in practice that the low wages drive away almost all the young men who are sufficiently well educated to go. A striking instance of this is given by Lord Sidney G. Osborne, in his memorandum relating to children educated at Durweston (in which parish the day-school is not of any pretension, but a night-school has been most energetically worked) during the last 24 years. Out of 187 children thus traced, 129 are accounted for as having left the parish, and 24, besides four whole families, have emigrated (Evid. 57).

The great need of education in this county is some check upon the continuous employment of children at an early age. In the case of girls, "gloving" is mainly responsible; in that of boys, as I have already said, it is field work. Many cease to obtain any effective instruction whatever after seven or eight years of age, and in some parishes it is the maximum age to which they can be kept at school. *Hon. E. Stanhope's Report to Commissioners on the Employment of Children, Young Persons, and Women in Agriculture.*

THE SMALL FARM IN IRELAND.

At a time when the ablest politicians have their thoughts anxiously directed to the state of the Irish peasant, and the wisest heads seem puzzled to find out the secret of his long-standing discontent and the readiest means of removing it, it may not be out of place to anticipate the issue of the Land Question, which is now the important move upon the political board after that of the Church; and, "come the conquest when it may," we shall assume that the crisis has been tided over with the usual amount of speeches, *pro* and *con*, and that the small tenant has at last secured the long-coveted prize, and has become the lucky farmer of one or two acres of his native soil, with all the advantages that law can give on the score of tenant-right, or any other right.

All this being settled, still the task lies before him of earning a livelihood; and if he is to live by the land, or upon it, he will require help from various quarters besides the Statute Book. When agriculture has been in a strait it has had to borrow from the kindred art of horticulture, until some farms have got to be more like immense market gardens than farms; but if we make every allowance for the Irish acre being large, still the farmer of a few acres will only be a small market gardener, that is to say, a person sparing neither labour nor capital to make the most of his holding. I recollect reading of a first-class gardener, who kept a full sized cow all the year round, and never had more than half an imperial acre of land to keep her on. He could not afford to grow corn of any kind, consequently he had to buy straw, but, as a set-off against that, he had many tons of manure to sell, which his employer was glad to purchase at a good price. The secret of his success lay in the well-known doctrine of having one crop half-grown, or well forwarded, before the other was got off; and, if we take the Cabbage tribe for example, many months of their growth would be in small compass in the seed-bed or nursery lines, whilst the crop of Vetches was waving on the future Cabbage ground — for the Cabbage plant will bear transplanting, either young, half grown, or full grown. Besides the Cabbage tribe he grew Carrots and Mangel Wurzel for his cow, and these being rich in nourishment, they would bear to be let down with a fair amount of finely cut oat-straw. In confirmation of this doctrine, I found that when my own cow got Carrots and Mangels *ad lib.* she would not eat hay, and the milk and butter were inferior in quality; but when I cut the hay, and rasped the roots, and mixed the mess, all went on right. My gardening friends will easily understand what a bulk of food a skilful gardener would get from half an acre of good land well situated, as there are crops, such as the Gourds, that yield a great weight of food, that will keep a long time with proper handling; but this style of farming is not calculated to meet the wants of the Irish peasant at the present time, although the climate of Ireland being favourable for green crops generally is indeniable.

No man is fit to be trusted with an acre of land who contemplates the cultivation of Potatos only; that day has gone by, and no friend of Ireland would wish to see it return. There has been for a long time past an excellent market for any amount of Irish butter or Irish pork, with hard-cash payments on the spot, thereby enabling the producer to exchange commodities with all the word. Agriculture and horticulture being carried on for the most part by ill paid and uneducated labourers, an idea has got into the minds of the inexperienced that any one can dig or plough: and we hear it from the pulpit, and read of it from the lighter portion of the press, that a country life in a thatched cottage must be happiness, or very nearly thereto. The homely art of digging or delving is by no means indigenous to Ireland, for in whole districts the ordinary spade, if known, is not used, for I noticed a body of men a few miles from Waterford with spades that were merely crooked sticks shod with a piece of iron not much wider than my hand; and in order to convince a person of the power of the spade, he might look in at some London market gardener's man digging by piecework, to see what good tools worked with a good will can do. Whoever, therefore, contemplates working in earth, whether with the spade or the plough, had better be well advised in the matter before he begins; for it is quite a serious affair now for a man to take his fortune into his own hands, when a crop of Potatos to supply all his wants can no more be depended upon.

Foreign aid—all that Government, however paternal, can do, is not taken into the smallest account; but the bleak and barren acres have to be made warm by drainage and shelter, and fruitful to the utmost that the soil and climate are capable of, and this principally by the untiring energy of one man and his family. Costly tools, steam, and machinery are out of the question here, however profitable elsewhere, and the happiness of the cottage life is seriously interfered with when we have to coerce an ungrateful soil or subdue a stormy climate. The former greatness of some chief bearing the family name, and the forlorn hope that the descendants of such a man might one day by some means get back the long-lost wealth and honours, has gulled thousands; and if I could only eradicate this weed (which years ago in Scotland, with all our pride, we have trodden under foot), I might then hope to plant something profitable in its place. A great deal of the land in Ulster is held by royal charter — actual grants from Government in "consideration," and this, no doubt, helps to keep alive the delusion that Court favour might some day make amends for the misery it had caused many years ago. I read only the other day the finest example I ever met with of a man blinded by his wealth and Court favour. When Naaman, the commander-in-chief of all the armies of the King of Syria, was afflicted with leprosy, he proceeded, with a splendid retinue befitting his high rank, from that Court with a letter from his royal master to the neighbouring king, in the hope that a prophet of that country would be able to cure him. He was, moreover, the bearer of rich presents of gold and other goods. Here was Court favour and Government aid with a high hand! The generalissimo himself was, moreover, valiant, honourable, and rich; and in addition to all this, the prophet kindly and freely offered him the gift of a miraculous cure; but all to no purpose, for the great general, like all true patriots, was proud of his native country, and jealous of its honour, and therefore thought lightly of the prophet's bidding him wash in the Jordan; and the whole embassy would have been a failure had not the practical wisdom of servants come to his aid, counselling obedience, of which as a warrior he no doubt felt the weight, and at last saw the necessity: so that after all the state patronage of two kings, and the kindness of the good prophet, it was the advice gently given, or rather hinted, by men of no mark that got over the difficulty. Now, since these things were written for our instruction, the case of the great general might save others from splitting upon the same rock.

Whether it be the echo of the Irish tiller of the soil and his tenant-right that has reverberated on the English shore, or whether it is a sign of better days coming, when the poor shall no more be forgotten unto the end, I know not; but certain it is that the importance of the agricultural labourer was never so openly acknowledged as it is now, and he too is spoken of as worthy of having half an acre or more of land attached to his cottage. I have stated above that even this small area of land may be made to go far towards keeping a cow, and the cow will go far towards keeping the family. Most people have more land than they have capital to manage; land must be got and kept in condition to grow anything that is found most profitable if it is to pay the occupier. A poor crop of anything is to be shunned, and the scientific rotation of crops, so important on a large scale, is of no service in small holdings. An eminent gardener remarked at the Congress of

* From 45 parishes where allotments are let I have a return also of the rent paid. The following shows that at least half are let at a very high rate:—Let under £2 per acre, 71 acres; £2 and under £3, 133 acres; £3 and under £4, 54 acres; £4 and under £5, 93 acres; £5 and over, 68 acres.

† "Journal of Royal Agricultural Society," xv., p. 441.

Horticulturists in Manchester last year, that those who did not agree with deep tillage should be disestablished and disendowed, for there is no profitable cultivation without it. If the diggings were tried on both sides of the Shannon in Ireland, and also on both sides of the Trent in England, it might save the long journey to the Antipodes or to California; for assuredly gold, or the value thereof, would be found in the underlying furrow or maiden loam, if we could only get it to work over the broad acres where it has so long reposed.

The earth being got, the next thing is manure. Now everything that your soil is short of, which good fertile land has, will be manure for your land. Sand may be of great service to your stiff clay soil; and peat, being vegetable matter, will be always a staple article, and should be used as an absorbent of liquid manure, to enable that article to reach the field of its labour; dry peat will pay for its carriage for this purpose, as it is of itself an excellent manure, and does double duty when charged with liquid manure. Clay, too, is useful when dried for the same purpose, and burnt clay becomes exceedingly valuable where it can be got. Sawdust being an exceedingly convenient form of vegetable matter, seems all at once to have attracted attention as an absorbent of liquid manure. Almost all forms of waste vegetable matter are useful to build up new tissues, and the manure-heap itself requires some management. No article should either be seen or smelt that is destined for manure; there should be a burial of the dead vegetable or animal remains; or, in other words, the manure-heap should be soiled over, that the properties of the manure should not be wasted before the time. Unless the English labourer intends to keep a cow, he will find that 40 poles of ground, or one-fourth of an imperial acre, will be quite as much as he can manage in the way of garden, and even this amount of garden may require him to hire labour to keep it in good working order, for if we take the digging at *4d.* a pole and the trenching (1 foot deep) at *8d.*, it will soon be seen that a moderate-sized plot of ground is best suited to the means of the tenant. The 65 miles of sea that divide Kingston from Holyhead separate also the ideas of the English labourer from those of the same class in Ireland, as I shall endeavour to show. The ordinary supply of vegetables to the English labourer's mid-day meal would average about 1 lb. of Potatos, whereas a working man in Ireland would require from 10 lb. to 14 lb. of Potatos daily for the three meals. The habits of the two classes are essentially different; whilst the one would be content to cultivate a moderate-sized garden for his immediate wants, the other would require quite a home farm to supply his family with the one article of Potatos. If we take the garden of the English agricultural labourer, and reckon it at 40 poles, and divide this into four quarters, we shall have to assign one quarter entirely to the Cabbage and Kale tribe, and another to the early and late Potatos, whilst a third will be taken up with fixtures or plants of perennial habits, such as Gooseberries, Raspberries, Currants, Plums, Apples, Rhubarb, as the raw material for tarts and dumplings. Strawberries also should have a small square if possible. The other quarters of the garden will be charged with that staple article the Broad Bean, and early and late Peas, with Carrots, Parsnips, Onions, Leeks, Lettuce, and Celery, with Parsley and other potherbs. I have not forgotten Turnips although I have not named them, as they can usually be grown after early Potatos or after early Peas, for spring sown Turnips seldom yield a profitable crop in a cottage garden, or indeed anywhere. Ground unoccupied by growing crops should be kept at work growing Kales or Cabbages, as they will bear to be transplanted several times, and are just as useful for table when half grown as when larger. Those who would allow the labouring man much less that 40 poles for a garden would be depriving him of a very great blessing, and those who would allot him a larger amount, unless for the keep of a cow, would not be his benefactor generally speaking; for I have counted the cost of seed, plant, labour, &c., and can testify from experience what the cropping, cleaning, manuring, and harvesting will cost, for I have just about 40 poles of garden ground in Aberdeenshire, and therefore I may be allowed to give a practical opinion, especially as it has been in the family for about 100 years.

I have travelled the length and breadth of Ireland at all seasons of the year, and have been grieved to see the mines of wealth unworked in landed property uncared for in a fertile climate, whilst the mud cabin in other places was pushed far too high up the hillside to be either comfortable or profitable to the tenant. Let us hope that the coming event of tenant-right may bring blessings in its train to every tiller of the soil. *Alex. Forsyth*, 9, *Islington Square, Salford.*

Home Correspondence.

Roots and Straw.—I must go into the latter part of "G. A. H.'s" letter. He tries to make it out that I am a kind of "dog in the manger," by making it appear that I am opposed to tenants using artificial manures. Now there was nothing in either of my letters upon Mr. Lawes' paper to justify him in this, for I took Mr. Lawes' own evidence, and showed that a man might take a farm in low condition, and by clean farming and the aid of manures, artificial or otherwise, its productiveness might be greatly increased; and my writings went to show that if a tenant left such a farm (no matter what the cause), all Mr. Lawes would give him for his improvements was the eating value of a year's straw. That is the sum and substance of Mr. Lawes' paper, and "G. A. H." has not shown that I put a wrong construction upon it, neither has Mr. Lawes. If I did, let either of them come out and show that I did. The fact is, I took Mr. Lawes' own words, and they stand dead against him. I said that such an acknowledgment would not do the tenant-farmer justice, and I say so now. The eating value of a year's straw never can be the just reward to a man who has increased the letting value of his farm some 8*s.* or 10*s.* per acre, which such an improvement must have effected. Let "G. A. H." read my letters again, and all that I have written, and he will find that I am not the "dog in the manger," trying to stop the use of artificial manures or any other permanent improvement on land, for all that I write or say goes for its improvement; all I ask is that the man who improves shall have justice done him. Mr. Lawes' eating value of a year's straw would not give him justice, for in this part of the country every farmer gets that, the eating value, &c., whether he be a good or a bad farmer, without Mr. Lawes' aid. *William Smith, Woolston, Bletchley Station, Bucks, May* 19.

Potato Planting.—We have had a most favourable time for planting. The land has been dry and in good condition, and if planted our way it will not have suffered from the sharp frosts of the last week. We are looking forward to an early and vigorous growth, although neither our first nor second sets have as yet made their appearance, mainly from our treatment of the seed through the winter and mode of planting. From past experience we find much depends on winter storing. Since digging time last autumn we have not sprouted them, neither have we put under earth, but housed them in an old cottage, and frequently removed from one side to the other by picking up and putting them into baskets. The slightest touch to the young spurts effectually prevents them from growing; in fact, we had no occasion to spurt once. My neighbours, as a rule, are very particular to get long spurts to their early seeds, and very carefully plant the spurt upwards to come through as soon as may be; in fact the sooner they come through the ground after planting the better they are pleased. If in good condition they certainly do come through soon, and grow away into large tops. This I consider is a great mistake; for if taken up some considerable time after coming through they will have clean blanched stems only, and simply growing at the expense of seed. If tops only were wanted for salad or any other use, by all means plant with a good long spurt, and with the eye upwards. We prefer them long in coming up, and for some years have planted with eye and sprout downwards; they are some time in finding daylight, and certainly form a stouter stem and more active root; and these are of primary importance, if we plant for a crop of tubers. At another time I will write you some further particulars about our most useful but consumptive patients, *pommes de terre*, with the view of finding some specific for their various diseases. *T. G., H. R. S.*

A Walk over the Farm, *May* 16.—Fifty-five acres of heavy-land Wheat looking all that could be desired, and amply thick, from one bushel of seed per acre. Equally promising are Oats from two bushels, and Barley from six pecks per acre. Spring Beans, red Clover, winter Tares, and Italian Rye-grass, all very satisfactory. Mangel coming up nicely. A good seed-bed of Kohl Rabi plants, for future planting. Two acres of Cabbages planted this spring, ready for harvest, growing nicely. Six acres of Peas for London markets, recovering from the attacks of frost and French partridges. Fourteen acres of pasture, late. The only failure is in six acres of Wheat on light land, thrown out by frost and partially injured by wire-worm; about two acres of this field are so much injured as to require drilling with Barley. Winter Beans, although somewhat injured by frost, are branching well, and the blanks supplied by spring Beans. Live stock, both sheep and bullocks, doing well. A sufficient supply of Mangel still on hand. Mowing Italian Rye-grass for our farm horses. Land clean, hoeing having been easy and uncostly, owing to the long drought. Thick sowers had better come and see my crops now, and draw their own conclusions from facts rather than from imagination. The 2 pecks per acre of Wheat drilled may surprise them, so may Wheat after Mangel and two previous Wheat crops; also Rivett Wheat after 6 quarters of White Wheat—the Rivett drilled at 1 bushel per acre. If thin sowing is ample in such a winter as we have had, there can be no doubt about it in ordinary winters under circumstances similar to mine. At all events let every farmer who desires to save his money, try half an acre in each field, or other small comparative experiments. With drainage, deep and clean cultivation, and plenty of unwashed cake manure, we may safely bid adieu to long fallows, thick sowing, and small crops, and choose such a rotation as we may find more profitable. So far as I have observed, Wheats are promising on well-farmed drained heavy lands—not so good on undrained heavy land—on light land very gappy from injury by frost and wireworm, a considerable breadth having been resown with Barley or Oats. As I anticipated, the non-paying prices received by foreign growers have led to a discontinuance of Wheat growing, so that we may reasonably expect a better price for the produce of our next Wheat crop. A gentleman just arrived by Pacific Railway from California tells me that they are changing from corn to cattle, owing to the unremunerative prices received for Wheat and dear labour. Barley and Oats appear to plant well wherever I have seen them. Much failed Wheat land has been resown with Barley, so that there is no present prospect of a high price for that grain. These fine showers are rapidly improving vegetation. As certain persons persist in pretending to doubt the truthfulness of my published balance-sheets, I will merely remark once for all that they represent the exact amounts received and paid in hard cash as entered in my cash-book, so that there can be no mistake as to the facts. *J. J. Mechi.*

Mr. Smith of Woolston as a Landlord.—What can be the matter with your irritable correspondent "G. A. H.?" Is there some disturbing influence in the atmosphere, or is he labouring under incipient gout? I have carefully looked over the article written by Mr. Smith, of Woolston, and can find nothing to justify the tone of "G. A. H.'s" recent communication. No one less deserves the accusation of striving to breed ill-will between tenants and their landlords than Mr. Smith, and such remarks as "dog in the manger" and "beggar my neighbour" might well have been spared. *W. H. B., May* 11.

Herefords v. Shorthorns and Devons.—After your tabulated statement of the live weights of the Devons, Herefords, and Shorthorns exhibited at the last meeting of the Smithfield Club, you say "That at 2 years 6 months old the Shorthorn exceeds the Devon in average weight by 17 st. 1 lb., and the Hereford by 3 st. 5 lb.;" whereas in your tabulated statement you have shown that the 1st prize Hereford weighed 14 cwt. 3 qr., and the 2d prize 14 cwt. 3 qr. 22 lb., and the 1st prize Shorthorn 14 cwt. 1 qr. 22 lb., and the 2d prize 14 cwt. 3 qr. 12 lb.; thus, instead of the Herefords being 3 st. 5 lb. lighter, they averaged 4 stones heavier, taking the 1st and 2d prize animals; and if taken as a class, the difference is greater, viz., 8 st. 4 lb., in favour of the Herefords. Having personally superintended the weight of every animals, I can vouch for the correctness of this. The subsequent portion of your remarks would lead your readers to forget the fact that at the previous show the average weight of the Hereford steers not exceeding 2 years 6 months old was 10 st. 3 lb. more, and of those exceeding 3 years 3 months old, 3 st. 4 lb. more than that of the Shorthorns, whilst in the class not exceeding 3 years 3 months old the Shorthorns exceeded the Herefords 5 stones. From these facts I think it right to question the soundness of your opinion of relying upon a single year's experience at the metropolitan show. *T. Duckham, Baysham Court, Ross, January* 12. [Mr. Duckham has sent us this copy of a letter posted on the date it bears, which had not reached us, or would have appeared at the time. See pp. 50 and 572.]

Agricultural Gleanings from Foreign Consuls' Reports.—*St. Croix, Denmark.*—An agricultural society has been re-established during the past two years, and appears to create much interest; but as the public are thus far without any reports as to its proceedings, no conclusion in the advance made through this means in so vital and important a subject can be arrived at. The great prevailing defect of exhaustive cultivation remains unaltered, whereby the finest lands of the island are becoming reduced in productiveness and value. The Labour Act of 1849 continues in full operation, by which a yearly contract is enforced, the labourers on the estates divided into three classes, and five days' labour of nine hours compulsory in each week, at a remuneration of 15 cents per diem for each first-class labourer, 10 cents per diem for each second-class labourer, and 5 cents per diem for each third-class labourer, in addition to houses, provision grounds, medicines, and agricultural implements; permission is also granted to keep hogs, poultry, and in many cases horses and carts. Immigrants are also supplied with medical attendance for the first two years after their arrival. Saturday is set apart for the use of the labourers, to cultivate their grounds and attend market; employment is, however, always open to them, at the rate of 20 cents per diem on this day. Any labour performed on the estates out of these hours is paid for extra. When desired, the labourers may receive 6 quarts of meal and 2 lb. of fish per week, at a reduction in their wages of 5 cents per diem. *Boulogne-sur-Mer.*—The indigence of labourers is being more and more felt in the country, where migration to the towns is constantly on the increase. Agricultural machinery would do much to supply this lack of hands, but it is as yet little known in this neighbourhood. Labour at harvest time is worth 2 francs 25 cents a-day with food, and 3 francs without; at other seasons, 1 franc 60 cents with food, and 2 francs 25 cents without food. The necessities of life and the exceeding dearness of provisions have made the position of the working man in a town extremely precarious; notwithstanding the great increase in the price of labour, he is now comparatively worse off than he was 40 years ago. Habits also of order and

economy have greatly disappeared, to give place to wants which only increase. Little is thought of the morrow, and the money thus gained is quickly spent. Publichouses and places of amusement have much increased, and swallow up each week what would, if usefully employed, bring in the end a certain ease and comfort to many families. *Kiel.*—The stock of Wheat in the hands of the farmers in the country is at present not large, but from the practice here of storing in barns it is impossible to give an approximate estimate as to its extent, and it is quite certain that even an advance in prices in England would not bring forward large quantities of Wheat for exportation. Oats are nearly in the same predicament, and, owing to the local demand, the exportation of Barley would likewise be limited; as to Rye, the quantity harvested, though considerable, will not be sufficient for the home consumption, and a supply will be required from abroad. *Lisbon.*—The exportation of cattle is an entirely new feature in the Lisbon trade. Nearly 2500 head were shipped hence in the course of last year for England. Unfortunately this promising branch of commerce threatens to be nipped in the bud by the proposal of the Finance Minister to impose an export duty of four milreas * per head of cattle, a duty which is said to be almost exactly equivalent to the profit of the breeder. *Smyrna.*—Steam cultivation has been introduced into many large farms in this district during the last five years, but the result has not been so satisfactory as was anticipated, the expense for coal, engines, and grubbing being very heavy items of expenditure. There are various descriptions of horses bred in this country, they are generally useful hardy animals. The horned cattle are very good for draught. *Philadelphia.*—An agricultural college is here established, and is supported partly by the National and partly by the State Government. The course of studies is adapted to the wants of the agricultural community. Three farms have been purchased at a large expense, and the board of directors have taken such steps as will ensure success for the practical application of knowledge and the lights of science in agricultural pursuits. *J. R. J.*

Foreign Correspondence.

PARIS.—The new society of French agriculturists, of which M. Drouyn de Lhuys is president, has announced that a competitive exhibition under its patronage is appointed to take place next year in Paris.

This exhibition is to be international as regards machinery, implements, and agricultural produce, but French only with respect to cattle and other live animals. The society has voted a sum equal to £2000 for the purpose, the Government, it is expected, will make a grant of £6000, and the municipality of Paris probably about the same; in addition a guarantee fund is to be raised to the amount of £12,000, in subscriptions of £40 each.

The same society offers a prize of £40 and a medal for the best agricultural application of a closed vessel, or other means of keeping grain for a long period without loss of weight or deterioration of quality. The papers, &c., are to be sent to the office of the society, 43, Rue du Bac, Paris, before the end of the present year. *G. W. Y.*

Societies.

SCOTTISH CHAMBER OF AGRICULTURE.

Entails in Scotland.—At a late meeting of this Society, Mr. A. E. MACKNIGHT, advocate, read a long paper on the law of entail, in the course of which he said it appeared that entails in Scotland took their rise from an attempt to protect property from the confiscation of a tyrannical Government, and this object was kept steadily in view, for after the Revolution in 1690 an Act was passed for the security of the creditors, vassals, and heirs of entail of persons forfeited. But the circumstances which caused the introduction of entails have ceased to exist in the country, and the principles and effects of them have been reprobated both by the ablest lawyers and political economists ever since their introduction. He then went on to say that the valued rent of Scotland is stated in 1814 at £3,804,221. The proportion of that held under entail is stated to be £1,213,150 17*s.* 9*d.* Scots, leaving unentailed the valued rent of £2,591,061 2*s.* 3*d.* Thus, at that period, nearly one-third of the landed property of the country was possessed under the fetters of entail. From 1811 to 1826 there had been no less than 342 deeds of entail put on record. The extent, therefore, of the entailed property had greatly increased between these two periods. By computing at a moderate rate the value of properties so entailed, and by taking into view the extent of property conveyed to trustees to be entailed as soon as debts are paid off, and the amount of funds conveyed to trustees for the purpose of purchasing and entailing, the conclusion may be truly drawn that about one-half of the territorial property of Scotland is held under entail, and the proprietors subjected to all the inconveniences attending their restricted rights of property, and the risk and expense of rendering effectual or defeating the settlements of their predecessors. In 1825 an examination of the record of entails was made, and the sum was divided, with the exception of the first period, into terms of twenty years; the whole number of entails was 1591, and there appears to have been recorded between 1685 and 1705, 79; 1705 and 1725, 125; 1725 and 1745, 158; 1745 and 1765, 138; 1765 and 1785, 272; 1785 and 1805, 360; 1805 and 1825, 459 —total, 1591.

It thus clearly appears that the system, instead of decreasing, has been largely on the increase, and that as the wealth of the country increased, so the number of persons who were desirous to found families and perpetuate their names and estates has been extended, to the injury and demoralisation of the country; and from the period of 1825 till the present time the evil has gone on magnifying, notwithstanding the passing of the Rutherfurd Act, which has effected some improvement in particular cases. But it clearly appears that the law of entail has operated as a very great impediment to the progress of agriculture, and the commerce and transmission of land is obstructed to a great extent, and over large districts of territory. In a commercial and trading country the disadvantages are obvious. The person who wishes to establish a family may, in the exercise of this power, find some motive for his industrious exertions. But the stimulus, even to this extent, terminates with himself. The incentive is by the same act taken away from his heirs, and a contrary influence, that of indolence or indifference, is substituted. Not only is improvement retarded, but a system of mismanagement may be perpetuated; for individuals making entails may do so under very imprudent and unwise conditions—not, indeed, for the purpose of wasting the estate, but through some narrow policy of an opposite kind, or under the influence of some wrong bias or partial view, or from mere caprice, which thus come to be upheld by the sanction of the law.

Further, one great principle of the law of Scotland and of every civilised country is violated by this system—namely, the right of every creditor at common law to obtain payment of his just debts from property of every description belonging to the debtor. He then went on to refer to the Rutherfurd Act. Undoubtedly, he said, some good has been effected under this statute; some entails have been brought to an end, and the country thus far relieved; but a greater number of estates, after having been disentailed, are just re-entailed again, which is the case with two of the largest entailed properties in Scotland. Then there is a serious defect in this Act, that it did not give the power to the creditors of the substitute heirs to sell their right of succession. This would have given rise to a great practical benefit to the country, by forcibly bringing to an end many entails which are still subsisting, owing to that defect. Although we should be grateful to Lord Rutherfurd for this Act, which, it has been said with truth, is the most valuable Act passed for Scotland since the abolition of the heritable jurisdictions in 1747, yet the circumstances of the country have greatly changed since 1848. A political revolution has taken place, and household suffrage now rules in the country. The question of waste land and waste labour is coming up prominently before the public. Since 1845 Scotland has been groaning under a compulsory poor law, which is demoralising the country by providing a subsistence from property for the idle, the drunken, and the depraved, for thieves and prostitutes. This is becoming a regular moral pestilence, and annually increasing, till it threatens to swallow up a large portion of the rental of the country. The large proprietors are pulling down houses and depopulating the country, in order to save themselves from the increasing assessments, and driving the people in herds into the large towns, there to be a permanent burden on the city proprietors, and to be maintained in idleness, as there is a scarcity of employment, owing to the present general stagnation of trade. But while this is the unfortunate position of many, will it be believed that there are 5,950,000 acres of waste in Scotland, capable of improvement, awaiting only the industry of the people to turn into fertile fields of waving corn? And what is the obstacle that stands in the way of this happy transformation? Why, it is this detestable Satanic law of entail, which seems to be an ingenious device of the Prince of Darkness to injure the owners, the heirs, the tenants, and any one at all connected with land.

The House of Commons' committee consider themselves justified in reporting the prevalence of a universal opinion that the law of entail in Scotland demands immediate alteration and amendment. Well, then, I trust that the Chamber of Agriculture will be of the very same opinion, having so many of them practically felt the evils of the system. And now, in reference to the remedy, I would say that the time for tinkering half-way measures is gone by, that we must demand and not rest satisfied with anything less than total abolition of all entails for the future; and in reference to existing entails, that a measure shall be passed to enable the heirs in possession to free themselves of their burdens by selling as much of the estate as will clear them, and should they refuse to do this, then their creditors should have the power, as in a bankrupt estate, to do it themselves. Further, we must demand the extension of the principle of the statute of 1848, so as to render compulsory the sale of their hope of succession by the substitute heirs, that so the entail may be wound up and destroyed. Nothing short of this will or ought to satisfy the people of Scotland, and the Chamber of Agriculture will not be in its right place if it does not take a leading part in this agitation. We want an Encumbered Estates Act as much or more than Ireland did, and it has done wonders there. We want a Land Bill in Scotland to protect the interests of tenants and occupiers, which has been so grievously injured by the law of entail. Finally, as a landed proprietor, I denounce this law as having been proved to diminish the respectability and degrade the character of the landlords of Scotland, and to reduce them to a state of bankruptcy and beggary—that it has been proved to defraud creditors and to create a system of legalised swindling upon the commerce of the country. As a patriot, I demand its abolition as having caused a train of innumerable evils to my country, and being proved to be a delusion, a mockery, and a snare to every one connected with the land, and as a Christian, I demand its abolition as contrary to the spirit of the Gospel. He begged to give notice of the following motion for discussion at next meeting of the Chamber:—"That this Chamber is of opinion that the law of entail has proved extremely injurious to agricultural improvement in Scotland—that it has inflicted serious injury to the general interests of the tenantry, as well as of the proprietors of land held under it, and therefore calls loudly for the interference of the Legislature. That the Acts of 1770, 1824, and 1848 have failed to remove the evils complained of, and therefore a measure must be obtained to abolish the Act of 1685, and also to provide for the winding up of existing entails, with due regard to the interests of proprietors, substitute heirs, and creditors."

DISCUSSION.

Mr. HOPE of Fentonbarns said he agreed very much with the principles which Mr. Macknight advocated, but at the same time he would wish to guard himself against some of Mr. Macknight's illustrations. He had long thought that entail was a grievance to this country, to the people who held estates under it, and to those who expected to succeed to these estates. Land is a property different from money, or anything that can by labour be obtained in quantities, and he thought if a man got the use of a property during his lifetime, it might be left to any one the proprietor pleased; but he (Mr. Hope) denied his right or title to tie it up in all future times. He would second the motion.

Mr. LANGLANDS, Balkenback, Forfarshire, in the course of some remarks, said they were all aware that the last great sum of money which was expended on the permanent improvement of the land of this country came neither from the proprietors nor the tenants, but was a sum of money borrowed from Government, and loaned out at a rate of interest that repaid both interest and capital in 24 years. That money, for which interest was paid at the rate of 6½ per cent., was principally taken up by the farmers, and expended in the improvement of another man's property. With the contingent expenses, he thought he was right in saying that the last great sum of money expended on the permanent improvement of the land of this country paid at the rate of 8½ per cent. This high rate he attributed to the interference of the laws of entail and primogeniture, and this affected every person in the community. In examination before a Committee of the House of Commons, Mr. Dickson, of Saughton Mains, said that, according to his experience, there was a fourth part of agricultural land which might be profitably employed awanting. Every farmer knew that for every 50*s.* of capital invested he must sell at least £1 worth of human food, or its equivalent. If this statement of Mr. Dickson's was right, and he (Mr. Langlands) thought he was, it followed that there was £1 of food awanting from every arable acre in Scotland. From Parliamentary statistics, he knew that at least there were 70,000,000 arable acres in the United Kingdom, and thus it would be seen that there was a lack of £70,000,000 of food to the inhabitants of this country. And this might be traced to the old-fashioned barbaric law of entail. Although he did not agree with everything which Mr. Mechi said, when that gentleman stated "with the proper cultivation of this island it was fit to maintain its present inhabitants," he cordially agreed with him.

Mr. MELVIN, Bonnington, considered that this question of entail must soon come up to be considered in Parliament. He thought they were indebted to Mr. Macknight for the comprehensive way in which he had noticed the subject, and he moved a vote of thanks to him.

It was then agreed to adjourn the discussion of the motion till next meeting of the Chamber.

CHESHIRE.

Uniformity in Weights.—At a recent meeting of the County Chamber of Agriculture Mr. RIGBY read a paper on the feasibility of selling farming produce invariably by weight, and the adoption of the cental as the standard:—

Thinking it might facilitate the discussion of the second question named on our agenda for to-day, I have ventured to write out a few thoughts thereon, more with this object simply than to exhaust or even to amplify remark upon the subject, and in this spirit I beg to bring them to your notice. The varieties of weights by which agricultural produce is sold in this country is very great, and is attended generally with much inconvenience and perplexity, and I think also with considerable loss to the seller. The market reports of our newspapers are reduced in value to all of us by the necessity of reduction to the standard we individually use, and which has been determined by the custom of our respective neighbourhoods, and they are oftentimes worse than useless to us when we are ignorant of the standard on which they quote.

* The value of one milreas is about 4*s.* 5½*d.*

As to variety. Wheat for instance is sold in all our markets by corn-dealers at a certain price per quarter, which represents 8 bushels of measured grain, and may weigh 480 or 496 lb., according to quality of sample. In some markets home-grown Wheat is sold 70 lb. to the bushel or measure, and in others 75 lb.

Oats are sold at 40 lb. to measure 42 lb., 45 lb., and 50 lb., and a quarter represents eight times these weights.

Barley is sold by 60 lb., 65 lb., and even 70 lb., and some maltsters will buy only by measure of 38 quarts, and this especially when the sample is good.

Beans are sold per 60 lb. and per 80 lb. Peas as a rule per 63 lb., and 60 lb. in some cases. Rye is generally sold 60 lb. to the bushel.

Potatos are sold by the load of 240 lb. or 252 lb., and by the bushel of 84 lb. and 90 lb. Hay, straw, Turnips, Carrots, Mangel Wurzel, and manures of all kinds, are sold by the ton of 20 cwt. of 112 lb. each; but cheese, the staple produce of the county, is sold per cwt. of 120 lb., to which long custom has added 1 lb. more. Butter is sold by the pound of 16 oz., and by the dish of 20 oz. and 24 oz. Fruit is sold generally by the measure, or by the hamper, both of which will represent different weights, according to mode of measuring, quality, and size of fruit.

The inconvenience and perplexity necessarily arising from this state of things to one who has any of these kinds of produce to dispose of only occasionally, and who may not be very quick at accounts, is apparent; but it becomes even worse in some markets than in others because of their situation on the boundary line between different districts, and has often led to expensive litigation. The weight per bushel of Wheat, for instance, not being named at the time the bargain is made, say in Northwich market, may lead the seller to infer he has sold 70 lb. per bushel, and the buyer may be just as confident that he bought 75 lb. The former being the rule at Warrington and on that side of the county, and the latter in Middlewich, Nantwich, and places more south, leads to perplexity and often to serious dispute.

The matter of loss by these varieties of weight is proved by the fact known to all close obervers that a higher proportionate value is obtained on sales by the lower standards than by the highest. It is seldom that 6*d*. per bushel more for Wheat of 75 lb. is obtained, now for instance, than for a bushel of 70 lb. Those of us who are sellers of Red Wheat in a market where 75 lb. is the rule, find more difficulty in making 6*s*. 9*d*. per measure than our neighbours 20 miles away find in making 6*s*. 3*d*. for 70 lb.; and at present prices the fractions on the 5 lb. are in our favour. When Wheat is 8*s*. per 70 lb. in one market, the same quality should make 8*s*. 7½*d*. per 75 lb. in the other, but it rarely makes more than 8*s*. 6*d*., and I give it as the result of some experience that as a rule the difference is even greater, and that the man who attends the market where Wheat sells at 70*s*. will make the most money in proportion. Similar remarks will apply to Oats and to Barley. On the Shropshire side of the county, maltsters almost invariably stipulate for 14 score lb. weight to the 4 bushel sack, and one of our members told me that having some fine Barley to dispose of last season, he offered it in Chester to sell at 56 lb. to the bushel, but was met with the reply, "We maltsters have entered into a combination with each other to buy only by measure of 38 quarts." A higher proportionate price per pound for butter will, I believe, be found to prevail where it is sold per 16 oz., than when sold by the dish of 20 or 24 oz. There being but one weight of cheese sold to the cwt. in the county by makers no discrepancy in value may arise; but why should the 1 lb. per cwt. be given over? We as farmers do not get a similar favour when buying Hops or Clover seed, or even in guano or bones. Nor does the cheesemonger give it to his customer; nor is our cousin Jonathan so liberal. I fancy "business is business" he will say, and

> "There's the bill, sir,
> How much your cheese is
> To the utmost carat,"

9 tons 19 cwt. 3 qr. 27 lb. nett weight of 112 lb. to the cwt. Why should I sell 120 or 121 lb. to the cwt. of cheese, when I neither sell nor buy aught else at other than 112 lb.? I make no reflection upon dealers in any of these commodities. They have a right to buy on the best terms they can, and to take advantage of any local customs that prevail in their district. But as a body of men interested chiefly in the sale of agricultural produce, we may, I think, fairly inquire whether uniformity of weight of some kind would not be to our advantage?

In discussing this question a little time ago, the Central Chamber of Agriculture came to the conclusion —"That in the opinion of this council all agricultural produce should be sold by weight only," and "that the cental of 100 lb. should be the standard," and certainly weight appears to be the fairest way of defining quantity, and there is little agricultural produce to which it might not be applied. Fruit certainly might be changed thus with advantage to the grower on his sales, and to the consumer in his purchases; as also might Peas, Beans, and similar garden produce, Eggs even might be more fairly valued by weight than by number, and in weighed instead of measured milk there would be one test of purity so far at least as admixture from the pump is concerned, milk being heavier than water. We shall have no difficulty then, I think, in agreeing with the Central Chamber on the first resolution, and the more we inquire into the second the more shall we be convinced that it is the best standard to adopt. It has been adopted in Liverpool corn market, and has worked well now for some years, and when the system on which it is based is understood it will be found to be the simplest and most complete. The reduction of sacks of scores and pounds into measures of 45, 50, 70, or 75 lb. would be entirely superseded, each sack being put down in pounds weight, the simple addition of the whole would show the number of centals by cutting off the two last units. Its adoption would be a change of the usual weights in all parts of the county, and would perhaps be troublesome at first, but a very little practice would make it simple, and it would be accompanied by the advantage of uniformity, and of knowing the exact market value of all commodities at a glance. A rise of 4*s*. per quarter in London is equal to an advance of 4*s*. 10*d*., or 7½*d*. per bushel, where Wheat is sold per 75 lb. and a fall of 4*s*., equal to a fall of the same amount; but to ascertain this, in order to apply it to our own cases, necessitates considerable calculation. If all market reports treated only of the cental of 100 lb. for all grain, the value of a rise or fall would be seen at once. And so in cheese, a rise of 5*s*. per cwt. in London is equal to nearly 5*s*. 6*d*. here, more if the old pound be considered; and if cheese were sold per 100 lb., it would redeem a sum of from £5000 to £10,000 to the cheesemakers of the county, which is now sacrificed by the custom of giving 1 lb. over per cwt. On this account, and on others named, and that might be further urged, I would say—Let us sell by weight instead of measure as much as possible. Let the weight chosen be applied as a standard for all heavy produce, and let it be that of the cental or 100 lb."

After some discussion it was resolved, on the motion of Mr. Jackson, seconded by Mr. Edwards, "That, in the opinion of the Chamber, all agricultural produce, except liquids, should be sold by weight, and that the cental should be standard.

ESSEX.

Corn Buyers' Deductions on Payment to Farmers.—At a recent meeting of the Essex Chamber of Agriculture, Mr. James YOUNGMAN introduced this question, and said the amount of these deductions differs on different markets. On Chelmsford market there is no uniform rule, and the practice varies from 1*d*. to 3½*d*. a quarter. The nearest approach to a rule appears to be 6*d*. a load of 5 quarters, as porterage, or for unloading, and 1*s*. more for the lot, large or small, as table money, or for the bowl. Of course there was at some time a reason for this. When payments were made at a public-house, no doubt some old-fashioned farmers used to think they took the value of the deductions away with them, except, of course, in cases when they took more than they could carry. But now science has taught the folly of alcoholic drinking, and payments are no longer made in public-houses, but in commodious corn exchanges; and delivery of corn is generally all that is desired, when it is taken to the door of the merchant's warehouse, or beneath the machinery at the mill, when the carter places the chain on the mouth of each sack. There is another objection to this practice besides its inconsistency with modern methods of transacting business. It enhances fictitiously the price which is returned to Government for the purpose of calculating tithe rent-charge and corn rents. This, considering the immense amount of money which has to be paid according to the rate of the corn return, is no trifling matter—how much in the shape of corn rents, we have no statistics to show, but in Essex alone the tithe rent-charge amounts to about £175,000 a year. The nett annual value of the livings, as given in the "Essex Almanac," is over £150,000. Now, 2*d*. a quarter added to the price at which corn is returned, increases the amount to be paid in this county alone about £1000. If no other reason could be given, I think this ought in itself to be sufficient to put an end to the practice of deductions, so that the price returned to Government should be that which the farmer actually receives. One would hope this needs only be represented to the corn buyers to secure their consent to the suggested reform. On many markets the payments are already made in full; at the principal markets in Kent it is so, and recently, I am informed, the plan has been adopted at Bedford and Peterborough, so we may hope it will speedily be in our own county. I therefore propose the following resolutions:—

"1. That the deductions made by corn buyers on payment to farmers for their corn are inconsistent with modern methods of transacting business; and the prices returned to Government, by which the tithe rent-charge and corn rents are regulated, being more than the farmer receives, the payments he has afterwards to make are inequitably increased, therefore such deductions ought no longer to be made.

"2. That this Chamber of Agriculture hereby requests the discontinuance of such deductions; and that the Council do endeavour to obtain the concurrence therein of the buyers in the Essex markets; also, if necessary, that farmers be invited to unite in refusing to sell their corn to any but those buyers who will agree to pay them in full."

Mr. HENRY PERTWEE (Danbury), in seconding the resolutions, said that it was far from his intention to insinuate that the corn merchants and millers, who were men of respectability and morality, were knowingly and ingeniously committing any fraudulent act upon the farmers, but the custom of which they as farmers so justly complained had been handed down to them by their forefathers, and they were apt to look upon its exercise as their undoubted right. It could easily be conceived that when those gentlemen came to look upon this question impartially they would see at once the propriety of discontinuing a practice which there was no just reason for continuing.

The resolutions were carried unanimously.

Farmers' Clubs.

DORCHESTER.

Irrigation.—At a late meeting of this Farmers' Club, Mr. Frederick GENGE, the vice-chairman, read a paper on irrigation, from which we make the following extract:—Gentlemen living on the banks of the Frome may be tempted with advantage to help themselves more freely to its waters; but then, perhaps, some unhappy miller would feel himself aggrieved; and this is a point which is well worthy of a passing notice. Water-mills on a stream are frequently a great nuisance, and I question whether the rent they pay is not often more than balanced by the injury they do the meadows both above and below them; in the one case by penning the water, and causing it to be stagnant on the land, and in the other by preventing its being used freely and advantageously for purposes of irrigation. I have been advised that £500 per annum would pay the rent of all the water-mills between Maiden Newton and Wareham. Could not the beneficial results of their removal be reckoned by thousands? And where, let me ask, can landed proprietors find a better or more paying investment for money than in the improvement of water meadows? I agree with Mr. Howard that hundreds of acres of extra water meadow could be made by a judicious outlay of capital, whilst much of what is now imperfectly irrigated or badly drained might be made doubly productive. Are the Fordington meadows, which we sometimes see so productive of docks, &c., rather than Grass, in a creditable state? And another fine tract of land, not many miles away, which unfortunately happens to be "common meadow," would well pay at least 7½ per cent. for capital invested were it enclosed, and the old, and probably doubtful, if not obsolete, rights to which it is subject bought up and annihilated.

I need not detain you by detailing the advantages arising from the possession of good water meadows. Water is now abundant, and the crop of grass will probably be good; and, should the severe frost we have lately experienced injure the Swedes and Turnips, it will be more than usually valuable for early feed. In making a water meadow, two things require the greatest consideration—first, how to get the water on; secondly, how to get it off your land. The size of your ridges or panes must depend upon the supply of water, which should be caused to flow gently and evenly over the surface when turned on, and when out the drainage should be sufficiently good to leave the land as dry as possible. With an adequate supply of water, and beds laid out in a uniform manner, there is little trouble in making the whole water well; but with small streams, and where the ridges are irregular in shape and size, considerable care and attention are required to give all the surface an equal share. In such cases the water should be kept together, and not more land irrigated at a time than can be done effectually. Drains and floats or flows should be well scoured or "taken up," as it is termed, every season where required, by which means the work of irrigation is greatly facilitated. The first flood in the autumn should be taken advantage of. The water may then be allowed to remain two or three weeks in one place, taking care not to shift it when there is a probability of frost. In severe weather all should be flooded that it is possible to get water for. In the spring of the year the water must be frequently shifted. If allowed to remain too long a scum settles on the Grass, which prevents its growth, and is very undesirable at any time. The appearance of scum on the Grass is a proof that it has had water enough for the time.

Notices of Books.

Report of the Commissioner of Agriculture and Arts for the Province of Ontario, *for the year* 1869. Hunter, Rose & Co., 86, King Street West, Toronto.

This large octavo volume contains a good deal of useful information for English readers. Besides the general report for the Province, given by Mr. Carling, the Commissioner, who issues the book, it contains a collection of reports by local societies, and statements of account by each, showing how by legislative grant, members' subscriptions, and the admission money to the local show, the funds at their disposal have been collected and used in the promotion of good agriculture. Among other efforts made are attempts, by crossing, to improve the Wheat plant. Thus North Brant says:

"Experiments in crossing the different varieties of Wheat have been attended with very promising results. Out of about 100 kernels carefully crossed between the red Midge-proof and white Soules, some 15 or 16 varieties are very promising, showing, in some instances, almost pure Soules, in colour and appearance of grain, with the earliness and midge-resisting qualities of the red Wheat. Some of these varieties have shown remarkable productiveness, as many as 4800 kernels having been produced from one in one season. The result of these experiments with Wheat cannot but be productive of much good to the agriculturist, as establishing the fact that different varieties of Wheat can be artificially crossed, and thus enable the operator to mould both the grain and the straw into the shape and colour that he may desire. It points also to the important fact, viz., that with plants as well as with animals, a cross between different varieties gives vigour to the offspring."

The following, again, is the good advice given to the members in the report of the South Brant Society:—

"We therefore say, educate your sons and daughters; never cease in season and out of season to impress upon their minds the nobility, the dignity, yes, the blessedness of labour, the godlike virtue of truth, the necessity of honesty and liberality in their dealings with all men. Purchase books, old and new, for the use of your families; spend less in adorning the person, more upon the mind; more usefulness, less worthless display. Place the minds of your sons and daughters, by means of books, in direct communication with the best minds that have lived during the last 3000 years, and thus endeavour to make the rising generation giants, mighty men of renown, who will go forth into the world to make their mark as artizans, mechanics, chemists, and farmers, men who will be eager to aid industrial progress of every kind, to help forward a new social organisation, having for its object the banishment of poverty and distress from the face of the land, together with other much needed reforms; then, after a lifetime spent in usefulness and self-abnegation in doing good and helping their weary, toilworn fellowmen, they will have fought the good fight, and will be prepared for the welcome summons which will call them hence to a new and more glorious life, in which they will enjoy eternal peace and rest, leaving behind them honourable names to be emblazoned on the pages of history along with those of other great and good benefactors of humanity."

Returning to matters of detail South Bruce points attention to the want of labourers:—

"There are plenty of farmers who would gladly pay good wages to ablebodied men, capable of performing farm work, yet cannot obtain them. Farmers would pay from 120 dollars to 160 dollars per annum and board, some have even paid as high as 20 dollars per month and board, and unless labourers and farm helps become more numerous, the farmers in this county cannot hope to succeed as well as they otherwise would. We, therefore, recommend that this matter be laid before those parties whose duty and interest it is to encourage a class of immigrants suitable to our wants."

A Medley of Rhymes for the Children. Written and illustrated by A. M. James Nisbet & Co., 21, Berners Street, W.

It is rarely in these columns that we can leave the homestead, fold, or field upon the farm, to enter the sitting-room or school-room, still less the nursery, of the farmer's house. There is, however, sufficient justification for our doing so just now. An invalid "Aunt Anne" has here written a little book for the children whom she has so often charmed with her stories as they stood around her couch. And whether they be children of the town, of the country-house, or cottage, who shall listen to the rhymes which she has written and translated in these pages, we are certain they, within the larger circle, will benefit by the same good and kindly influence which has been already exerted by these and similar tales and rhymes among the few at home. That is why we call attention to them here.

We may, perhaps, be asked to justify so confident an opinion. Here then, as an example of a lesson for the children, is a translation from the German:—

"A bee was sipping honey—the pretty blossom shook—
The bee, it toppled over into a tiny brook:
A dove upon her bower a leaf plucked from the tree,
She flew unto the brooklet, and dropped it to the bee:
The bee, with many struggles, got on the leaf afloat;
And safely to the margin came the little sylvan boat.
The dove was cooing softly within her bower one day
A sportsman came so gaily with dog and gun that way;
He raised the deadly weapon, he pointed to the dove—
The bee came flying swiftly upon the wings of love—
She lighted on his finger, she darted down her sting,
And puff! the shot was scattered—our dove was on the wing.
Then welcome every kindness, and pay it back with love:
Each one can help another, like the busy bee and dove."

Is it not a charming little parable, with all the sprightliness and grace and warmth which are certain to impress a listening child? We take as one other illustration the lines with which the book begins, giving perhaps still more truthfully the tone and keynote of the whole:—

"The blooming flower, with fragrant lip, whispered some words to me,
The happy bird, with gladsome voice, warbled them from the tree.
The river, as it onward went its pleasant winding way,
Sang with a smile of sweet content that message day by day.
On mountains high, in valleys low, the same small voice I heard,
And by the sea the waves to me spake out the wondrous word.
I looked upon the silent night,
And in the heavens above,
In golden letters, clear and bright,
The stars, in lines of shining light,
Repeated, 'God is love.'"

Farm Memoranda.

Merse of Berwickshire: *May* 9.—Now that the weather is of a more seasonable character, one may venture to speak of the bitterest spring that has been known for many years. Keen frost in March is not unprecedented, and with milder weather about the 19th came a good seed time. April opened with bright, hot days and cold nights, yet Grass and corn answered to the stimulus for a while, in spite of drought; but, latterly, vegetation has been cut up by cold, withering, north winds, especially young Grass early stocked with ewes.

It was curious to see snow lying on May 3, but things look a little better now, although showers are much wanted. Streams are remarkably small, for the ground has not been wet since seed-time, although the downfall exceeds an inch. In such weather, it need scarcely be said, fallows are working uncommonly well. Many fields were drilled up last week, and some sown according to the new fashion, which is certainly excusable in the case of clay lands at least. The regular Swede sowing time is now in, and all will soon be finished with ordinary fair weather; and then everybody will want a liberal rain.

Live stock is selling very high, especially small hoggs. Fat beasts have been very dull of late—at least 6*d.* a stone below last year, which sweeps off the profit. There are still a few feeding on early stored Swedes and other good things, from which we may draw a lesson. Swedes that "stood the winter" became almost worthless. *J. T.*

Anick Grange, Northumberland.—On nearing Hexham there lies on the north side of the Tyne, and in a semicircular curve of that picturesque river, the township and farm of Anick Grange; and on reaching the station a few minutes' ride across the curiously arched stone bridge and down by the river side brought us to the western field of the farm. The farm itself is principally a flat and open occupation in a "ring fence," as the auctioneer would say, but in reality about half bounded by the left bank of the river, while the remainder, about 100 acres, is on the hill side. The old fences have been grubbed by the present occupier, and new Whitethorn ones have been planted in straight lines, the trimming of which is in the narrowest wedge-like form.

Anick Grange consists of 420 acres, 120 of which are Grass. The character of its soil is very light at places, being composed for the most part of the alluvial sand which was deposited at some pre-historic period when a lake broke away, or the sea ebbed and flowed as it gradually subsided from this part of the country. The subsoil is apparently of a gravelly or stony conformation; and it certainly is what is commonly termed hollow-bottomed land, and, therefore, as Mr. Dods says, it will not hold and retain soluble manures for any length of time during the rainy seasons of autumn and winter. Thus, it will be perceived, here is an instance presented—which, too, is evidently not uncommon in the North—that proves the correctness of local practice in other parts of the country, and the wisdom of farmers, both there and here, in not being shaken in the confidence they have in their experience by agitating theorists, who would ignore the value of local observations and upset every principle of practical action. In these remarks we refer more especially to the application of both farmyard and more soluble fertilisers. If this be done in the autumn, three-fourths of it will have been washed away into the subsoil before the crop can begin to grow, and need nutrition in the spring.

In addition to the 300 acres of arable land, as a part of Anick Grange, Mr. Dods has 40 more acres of arable, a part of an adjoining farm of 54 acres. Thus Mr. Dods farms 340 acres of arable in all. This quantity he works with nine horses, which is a further indication of its light, hollow-bottom character. The men employed number eight as regular hands, while two extra men, with the aid of the groom-gardener, and the women on the farm, and six or eight from Hexham, suffice to get in the harvest. The cost for this in-gathering last year was 10*s.* 6*d.* per acre for cutting, tying, carrying, and thatching the corn. This economical accomplishment was largely due to the employment of three reaping machines, the work of which was done all one way.

The ordinary course of cropping pursued by Mr. Dods is Turnips, Wheat, "seeds," Oats. Portions of Potatos, about 15 acres in all, are taken after seeds on the more favourable spots. There is apparently an unaccountable fatality in regard to sowing Wheat after seeds in this part of the North. Two white straw crops are occasionally taken, but this plan is quite exceptional; and when we come to the food consumed, and the extraneous manures used, it will be seen that Mr. Dods is fairly entitled to pursue this practice when the season and the probable prices of grain are favourable. When Potatos are taken after seeds, Turnips follow, a practice which is in favour at Anick Grange, as the land becomes "sick" of both Turnips and seeds if grown twice in eight years; and as the Potatos make a fifth crop in the course, the Turnips and seeds are thrown further apart. Under the high farming practised, by using large quantities of stimulating manures, this is necessary, as it gives the soil time to recover itself.

In regard to green cropping, no catch crops, such as Rye and Tares preceding Turnips, or Rape and Mustard after pulse or grain, can be grown in this climate with advantage. Swedes and white Turnips are grown in alternate widths, the former to pull off and the latter to feed on the field. On the best fields, and when they are in high condition, 16 rows or drills of Swedes are grown to four of white; and on the poorer parts of the farm, eight rows of Swedes for drawing off and eight rows for feeding on the soil are grown.

The quantity of artificial manures used for the above crops, in addition to some of the highly charged farmyard manure, is above 30 tons annually; sulphate of potash, at £3 per ton; mineral phosphates, at £4 4*s.* per ton; and finely ground Egyptian bones, at £8 per ton. The latter are merely the shell of the bones of camels and other beasts of burden, which have been exposed to the dry and arid heat of the desert, and consequently the substance of them is devoid of all gelatinous matter, and the largest possible amount of phosphates is contained in this manure. This is, therefore, a highly valuable fertiliser, for restoring to the soil the phosphates which are annually walked off the farm in the bones of the young animals which Mr. Dods brings to early maturity. Besides these substances, salt is liberally used, and lime is occasionally supplied.

The stock of this farm includes six scores of lambing ewes. These are half-bred, which, in this northern country, means a border Leicester and Cheviot cross, the former being the male and the latter the dam. The breeding of these sheep, according to the soil and situation, is striking. Mr. Dods has a hill farm of 160 acres five miles away, and the ewes (eight scores) which are kept there have, as a rule, only one lamb; but on Anick Grange there are usually several trios, and the average yield is about two-thirds more lambs than ewes. This increase is a great triumph in good feeding. All the lambs are well kept from their birth, and they come out fit for market before and by this time of the year. Some we saw last week, which were on their way to market, were from 17 lb. to 20 lb. per quarter, while their wool was full and long. The number thus fed from the 14 score ewes is usually, as this year, about 17 scores, ewes and wethers together, all told. Of one lot, there were 94 couples out of 131 ewes that were tupped.

The stall-feeding and stall-fed cattle are equally interesting. Mr. Dods prefers to buy yearling steers and heifers that will "turn over" twice or more in the year, under his good feeding, to purchasing larger animals that will eat more food and only "turn over" once, and perhaps not that. Whether or not this plan would be successful if every one pursued it, we need not stop to inquire. But this we may say, if it was generally carried out we should have to do without a cut of large ox beef, and be satisfied with the small, young, pale, and somewhat tasteless joints, which are so general on butcher's stalls in the North. Mr. Dods practically testifies to the still greater value which Ireland might become to herself by generally buying yearlings from the sister island. In his transactions in procuring them, too, the advantage of treating the Irish cattle more considerately—that is, humanely—than Irish dealers generally do is amply proved. About 80 a year of these young animals are fed off, and last year only one was lost from sickness. A local dealer with an Irish name that we forget goes over occasionally from Whitehaven to Belfast, and takes as much care as possible of the animals he returns with. Consequently, chronic diseases, which ultimately end in death, are not contracted during this journey and voyage in the same way as almost invariably occurs when animals are embarked at Dublin; and from 30 to 40 that Mr. Dods had home last week, although thin on their arrival, ate freely of steamed straw, and looked fresh and healthy after a few days' rest. These ranged in price from £5 10*s.* to £6, according to age and condition.

These animals are kept in the yards eating steamed straw and a small quantity of cotton-cake till a bite has grown on the poor, rough pasturage by the river, and on the river bank, and among the sheep on the fields of seeds, when they will be turned out, first partially, and then entirely. In the autumn, when the Turnips or Swedes are fit to pull, they will be brought back to the stalls, and there be placed singly, the steers in a loose box under a shed, and the heifers tied up in a byre. Then they will have 3 lb. per day, or 1¼ stone per week of linseed, cotton, and rape cake, mixed with steamed straw, the cost of which (the cake) will be 2*s.* per week per head. Each animal will have with this 2 stones of Swedes. This is the feed for about 10 weeks before Christmas. About this time, however, the cake is increased to 5 lb. per head, and the cost 3*s.* 6*d.* per week, while the Swedes are also increased to 4 stones per day, and the steamed straw is given by itself *ad libitum*. For this purpose there are 59 stalls for heifers, and 24 boxes for steers; and, so far

as we saw, animals could not possibly have progressed better than those which were going away the day we were there, or about to go in a few days. The heifers weighed apparently from 35 to 40 stones of 14 lb. each, at the age of 21 to 24 months; and Mr. Dods informed us that last year they were of less value, and not so good in appearance as the little things which he had just bought of the Irish importer above-mentioned. In addition to the cattle grazed during summer, about 20 fresh heifers are purchased in October, and on being ready for market they are sent off, and the smaller ones brought into their place on full keep.

The quantity of extraneous food thus consumed by cattle and sheep is from 50 to 60 tons of cake, one-third being linseed, per annum. All the corn grown, too, is closely dressed, and the tail or light corn is, therefore, considerable, all of which is also used on the farm. As to pigs, Mr. Dods has no partiality for these animals, and only feeds enough for his men and household.

The terms under which Mr. Dods farms are a lease with liberal and fair covenants. On leaving, one-third of the prime cost of the cake used the previous year is allowed by the landlord or incoming tenant; also the value of the straw left and the manure made, the straw of the "away-going crop" belonging, as usual, to the incoming tenant. Half the prime cost of bone used the year before is also allowed, and one-fourth of that used the last year but one. The prime cost of lime used on fallow during the last year, and half that used the preceding year, is also paid by the landlord or the incoming tenant; while guano and rapecake used as manure on fallow during the last year are allowed for at the rate of one-third their prime cost. *North of England Farmer.*

THE NEW FOREST.—The forest is about 63,000 acres, and since 1851 its position has been neither more nor less than that of a manor, the lord of which is the Crown, and the usufruct of which is in the freeholders.

Previous to 1851 it was more than a manor—it was a forest, and the forest laws overrode the common law, and the exercise of the prerogative of the Sovereign in preserving deer (the one purpose of a forest) was paramount over the right of the freeholders wherever the two laws clashed. In that year the Deer Removal Act was passed, and, by the virtual disafforestation, the freeholders were supposed to be remitted to the full enjoyment of their property. At that time they were an uncertain and disjointed body, and unable to unite for the purpose of resisting the details of a legislation the unjust nature of which is now apparent; but fortunately for them they got clauses introduced into the Bill under which their rights over the forest could be definitely settled by a commission.

This legal decision has been and will be of the greatest moment to them in their struggles for the preservation of their property against either attacks from outside or from the clutch of the lord of their manor.

Those interested in the commons of Berkhampstead, Hampstead, Wimbledon, and other places in which common or public rights exist will know that this clutch is not peculiar to the officials of Whitehall Place.

The area of the forest being, then, 63,000 acres, the state of it may be taken to be something like this:—12,000 acres of new plantation enclosed; 20,000 acres more or less occupied by old timber and unenclosed plantations; 31,000 acres of clear land, of which the greater proportion is of a very poor description of soil.

This statement, given in round numbers, is founded not upon any rough guess, but upon the considered evidence given to Parliament by surveyors and others.

Assuming that they have formed a correct judgment, it may be taken that the available land over which the freeholders can exercise their rights of pasturage is less than 40,000 acres, some of them so poor as to be declared by the authorities referred to as "worthless."

It remains to state what rights there are and to what extent they exist. There are rights of fuel, of turf, of pasturage, and of pannage for pigs; but for the present I will only allude to the rights of pasturage. Under the parliamentary title given by the Commissioners appointed under the Deer Removal Act, no less than 67,000 acres are possessed of common of pasturage in the summer for as many cattle as can be kept on those acres in the winter. It needs nothing beyond this bare statement to demonstrate that on an enclosure the interest of the lord of such a manor would be confined to the trusteeship of the soil and the right of timber. This was not formerly denied by the representatives of the Crown, the Office of Woods; indeed, one of the chiefs expressly stated in 1848 (before the removal of the deer) that "timber and deer feed are the only produce in which the Crown is interested," and when the deer were removed an allotment of 16,000 acres (under special conditions) was made in consideration of the right to keep deer being given up.

Practically, therefore, the Act of 1851 is an Enclosure Act, by which the lord of the manor has an allotment of 16,000 acres, and retains his right to the timber. The plans which have been suggested for the sale or occupation of the lands which are now open have evidently been made by those who have not had the opportunity of considering the title by which the common is held by its owners. It may be possible that some disinterested politician may devote himself to the elaboration of a scheme by which this large track of open land may be rendered more profitable to those who own it, and so to the public; yet up to this time it has not been done, and the freeholders have to be more diligent in watching their lord of the manor, who, like some others holding that position, betrays from time to time a lurking desire to "approve the wastes" of the quondam forest in a way that may be to his own advantage, but is certainly detrimental to their common interests.

There may be a very proper question to be argued as to whether an enclosure should be forced upon the freeholders or not. It may be said that employment would thus be found for many poor persons; while, on the other side, it may be doubted whether the condition of agricultural labourers is so good that it is desirable largely to increase the class at the expense of a considerable number of persons, who, through the enjoyment of their forest rights attached to the lands they own or occupy, are able to maintain a comparatively comfortable and independent position in society.

On this I do not enter now. This letter is already too long for one which touches only cursorily upon the fringe of a subject which has so many branches requiring both time and care to consider properly. It is written, too, in haste; almost, as it were, by return of post; for it seems to me to be of no little importance that, if the New Forest is to continue to be a theme on which men are to employ their pens and tongues, they should at once understand that any scheme founded on the idea of 63,000 acres of available "Crown property" is founded upon a mistaken view of the beneficial ownership of that considerable tract of land in which they are good enough to interest themselves. *Correspondent of "Pall Mall Gazette," May 5.*

The Week's Work.

MAY 21.—*Scotch Terms* are Whitsunday and Martinmas. Unmarried farm servants are engaged a week or so before each term, a few by the year, but the vast majority for only six months. Married farm servants have generally houses on the farm, and are engaged by the year some time prior to Whitsunday, generally about Candlemas, so as to enable them to arrange about their gardens and potato ground.

Whitsunday Entries on Farms are, to the homestead, turnip and pasture lands on the term day, and to the land under corn and hay at the separation of the crop from the ground. The incoming tenant sows Grass seeds, has generally the option of working the fallow land for green crops, but more commonly pays the outgoing tenant for doing so. On many estates landlords have purchased the tillages so that the incoming tenant enters free. The manure on the farm he gets at a valuation, and sometimes the growing crops including the hay, generally Rye-grass and Clover, but the corn and hay crops are not unfrequently sold. Sometimes the incoming tenant has the straw of the awaygoing crop at a valuation or fixed price, on other estates for nothing; in which case the outgoing tenant retains the stackyard and barn until the threshing is over, he being bound to thresh out the straw as his successor requires it. Although there is thus a considerable diversity in the county customs of the North, they are upon the whole more uniform than in England.

Paring and Burning are more easily done now than in March and April in breaking up old grass-land. In late districts and seasons very little can be done before the beginning of the month, but when once the warm weather sets in, the sods dry rapidly, and the several operations of paring, burning, spreading the ashes, and breaking up the land, as directed last month, should be prosecuted with the greatest expedition, so as to get the land rolled down with as much natural sap as possible for the brairding of Rape or Turnips; and even when this is done the seed should be sown with the liquid-manure drill, applying plenty of water to moisten the dry ashes, which lick up the normal sap of land, otherwise it is difficult to get a sufficiency of plant in dry weather.

Stifle Burning and Clay Burning are old practices still in use, but thorough drainage, steam culture, and the application of artificial manures are fast rendering both practices unnecessary with very few exceptions, the available salts which the burnt ashes supply being obtained in the artificial manures now used.

Swede Sowing commences from the middle to the end of the month, and this year it should not be later than usual. The crop is a slow grower, and as a rule the water drill should be used to give it a fair start, success depending mainly upon a suitable supply of air and moisture below as a preventive of mildew. The land is generally manured at the time of sowing, as directed last month for Mangels—from 2½ to 3½ cwt. of superphosphate, with equal weights of the salts of potash and soda each, the mixture being sown over from 15 to 20 loads of farmyard manure per acre; or the artificial fertilisers may be applied in a liquid form by means of the liquid-manure drill. Where the former is the practice river or pond water should be applied along with the seed in dry weather. With less farmyard manure the difference should be made up with Peruvian guano. As a rule, farmyard manure should be covered, as it is sometimes termed, "down below the weather," and the drills or stetches rolled well down, almost as if sown on the flat, assuming that the land is thoroughly drained and deeply cultivated. In favourable weather 3 lb. of seed is sown per acre, but in dry seasons it is better to sow 4 lb. or more if the fly is dreaded, and then single out in time should no loss be sustained. Some sow soot, and other ingredients obnoxious to the fly, along with the seed; but to this we shall return next week under *Weevils, Ground Beetles*, &c., and how to prevent their depredations generally.

Live Stock are said to begin their new year with the Grass, and this year more than ordinary attention will require to be paid to the great change thus implied, and for a longer time after cattle are turned out to Grass. This will more especially be the case with milch cows, brood mares, and all cattle that have newly put off their winter coats in warm stalls. And in such cases it is not always the more robust constitution that stands the change the best. When individuals separate themselves from the herd, and otherwise exhibit unfavourable symptoms, a little exercise, with a free use of the currycomb, will sometimes start the stagnant circulation, and put matters right if applied in time.

Dorset Ewes are served from the beginning to the close of the month with Sussex Down or Hampshire Down rams for early lambs. In many cases the ewes are bought in for what is technically termed "lamb and dam fattening," the ewes and the lambs being sent to the shambles together. Sussex and Hampshire Down ewes also have early lambs, but the horned Dorset ewe is generally preferred for a single crop of lambs. A similar practice prevails in the North of buying in "crock" or draught ewes in autumn for the shambles in May along with their followers. *W. B.*

Notices to Correspondents.

BURGUNDY CEMENT: *Alix* writes as follows:—"In p. 20 of your periodical is a short notice of 'Burgundy cement.' Will any of your subscribers say what is Burgundy cement; what is its composition; whether made and sold in England, and whether it can be applied in making water-tanks, liquid-manure tanks, &c.? If all these can be answered in the affirmative there follows the question, will it stand alternate wetting and drying, sun and frost, in the open air? Very many persons must be interested in these questions. I am so myself in a small way, having several open tanks in my garden (brick and cement), which are my despair, and I am told by a builder that there is no cement that will stand in such situations."

CLIMATE OF IRELAND: *T.* Thanks.

FARMERS' SUPPLY ASSOCIATION: *C. P.* We have every reason to think well of it. The Board of Directors includes well-known and trustworthy names.

ERRATUM. At p. 644, in the paragraph on Road-making on Farms, line 33, "their" should be "the;" and line 58, "making" should be "breaking."

Markets.

HOPS.

BOROUGH MARKET, May 19.

Messrs. Pattenden & Smith report that the demand for both English and foreign is of a retail nature, rates being in favour of purchasers. Yearlings have been in rather better demand, but at low prices.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, May 19.

Prime Meadow Hay	80s.	to 84s.	Clover, old	..	110s. to 126s.
Inferior do.	 60	70	Inferior do.	 80	95
Rowen	 50	65	Prime 2d cut	.. 100	110
Inferior do.	.. .. —	—	Inferior do.	 80	90
Straw	 20	28	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, May 19.

Sup. Meadow Hay	84s.	to 90s.	Inferior Clover	..	95s. to 110s
Inferior do.	 70	76	New do.	.. ..	— —
New do.	.. .. —	—	Straw	.. .. ..	30 35
Superior Clover	.. 124	130	JOSHUA BAKER.		

WHITECHAPEL, Thursday, May 19.

Fine Meadow Hay	76s.	to 82s.	Prime old Clover	..	120s. to 130s
Inferior do.	 60	70	Inferior do. do.	.. 90	100
Prime New Hay	.. .. —	—	Prime 2d cut do.	.. —	—
Inferior ..	.. .. —	-	New Clover	.. ..	105 112
Straw	 24	28	Inferior do.	 80	90

METROPOLITAN CATTLE MARKET.

MONDAY, May 16.

We have nearly as many Beasts as on last Monday, and trade is exceedingly dull, prices are lower for all descriptions, and several lots remain unsold. The supply of Sheep is also large; trade was brisk at commencement, but declined towards the close; on the average prices are not much altered. Trade is dull for Lambs and Calves, at lower rates. Our foreign supply consists of 1650 Beasts, 9080 Sheep, and 183 Calves; from Scotland there are 385 Beasts; from Norfolk and Suffolk, 1500; and 365 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	.. 4	6to4 10	Best Long-wools	..	to ..
Best Shorthorns	.. 4	4—4 6	Do. Shorn	.. 4	6—4 10
2d quality Beasts	3	8—3 8	Ewes & 2d quality	..	— ..
Best Downs and Half-breds	..	.. — ..	Do. Shorn	.. 3	8 4 2
Do. Shorn	.. 4	10—5 2	Lambs	 5	8—7 0
			Calves	 3	0—5 0
			Pigs	.. ..	.. — ..

Beasts, 3900; Sheep and Lambs, 20,800; Calves, 190; Pigs, 50.

THURSDAY, May 19.

The number of Beasts is small, yet quite equal to the demand; on the average prices are not any better than

on Monday. The supply of Sheep is about the same as of late; trade is very dull, and it is difficult to effect a clearance at our quotations. Lambs and Calves with difficulty realise Monday's rates. Our foreign supply consists of 144 Beasts, 4880 Sheep, and 432 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4 6	to 4 10	Best Long-wools..	.. to ..	
Best Shorthorns ..	4 4	— 4 6	Do. Shorn ..	4 6	4 10
2d quality Beasts	2 8	— 3 8	Ewes & 2d quality	.. —	..
Best Downs and Half-breds ..	.. —	.. ..	Do. Shorn ..	3 8	— 4 2
Do. Shorn ..	4 10	— 5 2	Lambs	5 8	7 0
			Calves	3 0	5 0
			Pigs	.. —	.. ..

Beasts, 494; Sheep and Lambs, 12,380; Calves, 517; Pigs, —.

METROPOLITAN MEAT MARKET.—May 19.

Best Fresh Butter .. .. .. 16*s.* per dozen lb.
Second do. do. .. .. .. 13*s.* „
Small Pork, 5*s. 0d.* to 5*s. 8d.*; Large Pork, 3*s. 8d.* to 4*s. 0d.* per 8 lb.

MARK LANE.

MONDAY, May 16.

There was a short supply of English Wheat to this morning's market, which was held for the prices of this day se'nnight; millers, however, not being disposed to purchase except at a decline, the stands were not cleared at a late hour. The attendance was fair, and a small amount of business only transacted in foreign Wheat, at prices generally a trifle under those of last week. Barley was unchanged in value. Beans and Peas rather dearer. Oats slow, at a decline of 6*d.* per qr. There was no alteration in the price of Flour.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	39	47	Red.....	36	46
— — fine selected runs. do.	43	51	Red.....	37	48
— — Talavera	54	56			
— — Norfolk	..	..	Red.....	—	
— — Foreign	38	54			
BARLEY, grind. & dist ,26/6 to 30/..Chev.	30	42	Malting ..	34	38
— Foreign .. grinding and distilling	22	25	Malting ..	30	40
OATS, Essex and Suffolk	..	22			
— Scotch and Lincolnshire .. Potato	24	26	Feed	—	
— Irish .....Potato	23	25	Feed	21	24
— Foreign .....Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan .. 30/ to 37/.. Tick	31	49	Harrow ..	31	49
— Pigeon ....30/. to 56/...Winds. ..			Longpod..	—	
— Foreign .....Small	41	43	Egyptian ..	38	40
PEAS, White, Essex, and Kent..Boilers	32	42	Suffolk ..	35	43
— Maple, 41/. to 45/. .....Grey	32	42	Foreign ..	33	37
MAIZE	..	..	Foreign ..	29	31

FLOUR, best marks delivered..per sack 39 43
— 2d ditto .....ditto 28 40 Country .. 28 40
— Foreign.....per barrel 22 25 Per sack.. 29 55

WEDNESDAY, May 18.

Fresh up to Mark Lane this morning the receipts of Wheat from Essex and Kent were limited; for all qualities the demand was inactive, at about late rates. The show of foreign Wheat was good. Sales progressed slowly on former terms. Moderate supplies of Barley were on the stands; the demand was inactive at previous quotations. Malt was dull on former terms. Oats were in moderate supply and limited request, at the late decline. Beans were quiet, and the demand for Peas was inactive; prices were unaltered. Flour sold quietly, at previous quotations.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 290	Qrs. 100	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	11,920	—	12,860	{ 260 { 11,549 brls.
	12,210	100	12,810	

LIVERPOOL, May 17.—Millers have shown no disposition to purchase Wheat freely, and aggregate sales have been within a comparatively limited compass; prices are not so good as on Friday last. Flour unchanged. Beans 6*d.* dearer. Peas offering at 1*s.* reduction. Oatmeal scarce, at 1*s.* per load higher on the week. Oats steady. Indian Corn in retail demand, at 3*d.* decline.

AVERAGES.

	Wheat.	Barley.	Oats.
April 9	42*s.* 8*d*	34*s.* 11*d*	20*s.* 0*d*
— 16	42 10	35 2	21 5
— 23	42 7	34 11	20 8
— 30	42 7	33 1	21 7
May 7	43 3	34 2	23 1
— 14	44 5	33 9	23 1
Average ..	43 1	34 5	21 9

SEED MARKET.

We have but little to report this week concerning the agricultural seed trade. The sowing season is now over, so far as our markets are concerned, and in the absence of all speculation business is very limited. The three articles now in request are Mustard, Rape, and Trifolium seed, all of which, being exceedingly scarce, are rapidly advancing in price. Bird seeds meet with a moderate sale.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—May 18.

Hastings Hartley, 15*s.*; Holywell Main, 15*s.*; Walls End Gosforth, 15*s.* 3*d.*; Walls End Braddyll's Hetton, 16*s.* 6*d.*; Walls End Hetton, 17*s.* 6*d.*; Walls End Hetton Lyons, 15*s.* 3*d.*; Walls End Hawthorn, 14*s.* 9*d.*; Walls End South Hetton, 17*s.*; Walls End Hartlepool, 16*s.* 9*d.*; Walls End Heugh Hall, 16*s.* 6*d.*; Walls End South Kelloe, 16*s.* 6*d.*; Walls End Tees, 17*s.*—Ships at market, 17; sold, 16; at sea, 55.

W. S. BOULTON & CO.'S

NEW PATENT LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

These Machines possess important advantages. By the introduction of a Radial Link, the adjustment of the various parts is rendered exceedingly simple. Breakages are entirely avoided, by making the handles and all other light parts of malleable iron. They adapt themselves to inequalities of the ground, and suit persons of any height by means of the handles working loose. This arrangement also admits of their being used as a Roller, by folding back the front or cutting end. Every Machine is warranted to give entire satisfaction to the purchaser, and if not approved of can be returned. An Illustrated Catalogue, with prices, sent free by post on application.

Rose Lane Works, Norwich.

W. S. BOULTON & CO.'S DOUBLE CYLINDER and BALANCE-HANDLE GARDEN ROLLS.

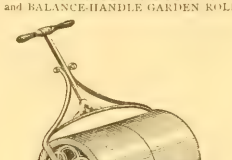

These are, be sure ready first rate, both as regards workmanship and materials. They are divided in the centre, which admits of their being turned with ease, and without injury to the Grass or Walks, the ends being round. The price is also very low.

Carriage paid to any Station in England.

20 in. long by 18 in. diam	£2	17	21 in. long by 22 in. diam	£3	17		
22	„	20	„	4	5	24	„	4	7

SINGLE CYLINDER ROLLS. Carriage paid.

18 in. long by 18 in. diam	£1	15	22 in. long by 22 in. diam	£3	0		
20 „	20	„	2 8	24	„	3	14

Rose Lane Works, Norwich

PROTECT YOUR CROPS.

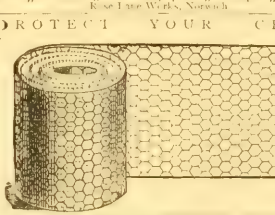

First-class Machine-made

WIRE GAME NETTING, GALVANISED after MAIDE, sent carriage paid to any station in the kingdom at the following very low prices:—

2 feet high, 2-inch mesh, No. 19 guage, price 3¼*d.* per yard.
3 feet high, ditto, ditto, price 5¼*d.* per yard.
2 feet high, 1½-inch mesh, No. 19 guage, price 5¼*d.* per yard.
3 feet high, ditto, ditto, price 7¾*d.* per yard.

All Netting being of the same satisfactory character can be returned at once if not approved. A full Price Current Catalogue sent gratis on application to W. S. BOULTON AND CO., Rose Lane Works, Norwich.

W. S. BOULTON AND CO.'S 36-gallon SWING WATER BARROW, with Tap.
Carriage paid to any station in England.

Price £2 5*s.*; Ditto, with 2 taps, £2 15*s.* Spreader and valve, 15*s.* extra.

SWING WATER BARROW, with galvanised iron tank. To hold 18 gallons, price £1 15*s.*; Ditto, 30 gallons, £2 5*s.*
Rose Lane Works, Norwich

PORTABLE PUMP for LIQUID MANURE or WATER, 45*s.*; 10 feet india rubber suction pipe, 10*s.* Carriage paid

W. S. BOULTON AND CO.'S NEW SWING WATER or MANURE CART, with galvanised iron tank

Carriage paid to all the principal Stations in England.
To hold 80 gallons, price £6; to hold 100 gallons, price £6 5*s.*; Valve and Spreader for ditto, £1 1*s.* extra.
Rose Lane Works, Norwich

W. S. BOULTON AND CO.'S IRON WATER or LIQUID MANURE CART.

Carriage paid to the principal Railway Stations in England. To hold 140 gallons, price £6 6*s.*; 200 ditto, £12; £250 ditto, £14.

Galvanised Iron Pump and 10 feet india rubber suction pipe, price £3 10*s.* Spreaders, 15*s.* each

ROSE LANE WORKS, NORWICH.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

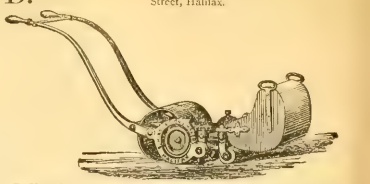

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.

The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

ALEXANDER SHANKS & SON have for some time past been making the Receding Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it will be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single edged Sole-plate must be entirely renewed when the edge is worn down.

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved can be at once returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

American Lawns.

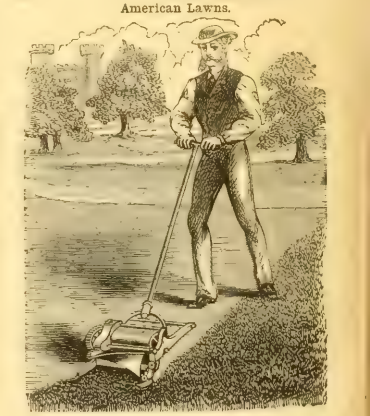

THE AMERICAN PATENT

"ARCHIMEDEAN" LAWN MOWER

is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS

The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

The *Field* says—"The Americans have been beforehand with us in many Machines, but we were not, however, until now aware they possessed a Lawn Mower which is far superior to any of ours."

The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 6 or 8 inches long. The 14-inch machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and is to our opinion."

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LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES. Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Price from 1s 6d. per foot

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S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield Established upwards of 125 years.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

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IMPORTERS AND MANUFACTURERS.

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PORTABLE ENGINES, from 4 to 30-Horse Power.

THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.

These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use

C. AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted CATALOGUES sent Free by Post on application to

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STAMP END WORKS, LINCOLN, or, 78, LOMBARD STREET, LONDON, E.C.

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WARRANTED IMPERISHABLE.

PRICE LISTS ON APPLICATION AS ABOVE.

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The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, "Rock Hills," gave his approval of their usefulness. The right to Manufacture them was transferred to

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Stand for ditto .. 0 10 0

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An Italian Alp Queen, with full directions for uniting to Black Stocks, £1 each

ENGLISH BEES.—Stocks and Swarms may be obtained as heretofore.

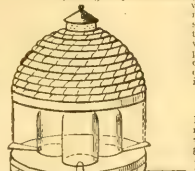

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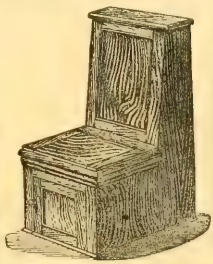

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"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty, the supply of fine Earth to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Freesia couple of spadesful put into a bucketful of water), and have had the finest Blooms this summer I ever had in my life. They have been admired by every one who has seen them.

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"January, 1870."

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COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.

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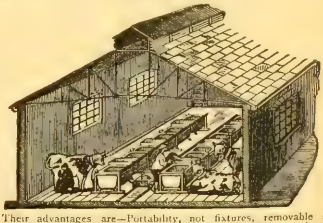

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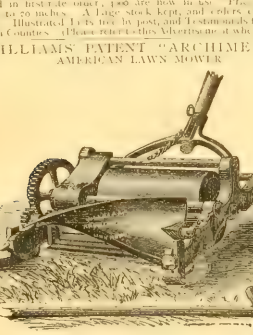

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W
GREAT FLOWER SHOW and EXHIBITION of RHODODENDRONS, by Mr. ANTHONY WATERER, on WEDNESDAY, June 8. Bands of the Scots Fusilier Guards and Honourable Artillery from 3 o'Clock. Tickets to Friends of Fellows (bought before the 8th), 5s. Admission on the day, 7s. 6d.

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Two yards wide	1s 9d per yard run.
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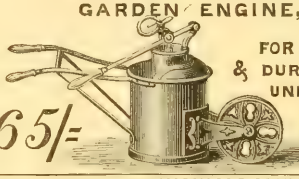

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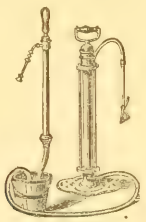

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20 Gallons	..	£2 2	0
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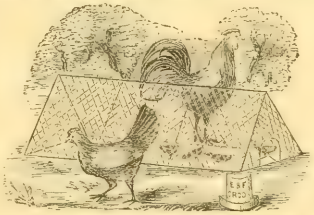

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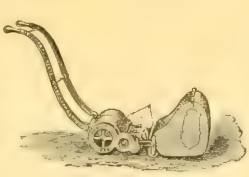

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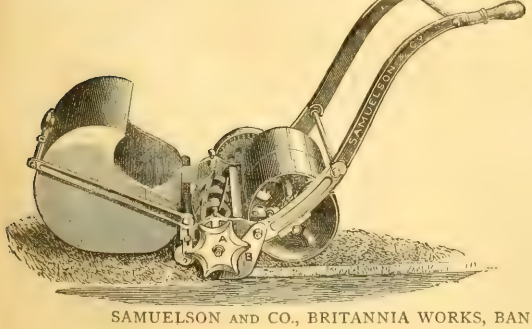

MESSRS. SAMUELSON & CO. Beg to draw special attention to their NEW

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which are fitted, when required, with a NEW PATENT EDGE-CLIPPING arrangement, entirely superseding the old and tedious operation of Edge-Clipping by hand.

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T. GREEN AND SON give the names of a few of the principal places where their Lawn Mowers are the only Machines in constant use, and have been for a number of years, giving entire satisfaction.

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GREEN'S PATENT LAWN MOWERS have proved to be the best, and have carried off every prize that has been given in all cases of competition; and in proof of their superiority upwards of 50,600 have been sold since the year 1856.

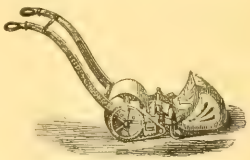

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To cut 10 inches ..	£1 10 0	To cut 18 inches .	£7 10 0
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Suitable for a Lady.			
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Suitable for One Person.		Suitable for Two Persons.	

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DONKEY AND PONY MACHINES.		HORSE MACHINES.	
To cut 26 inches	£11 0 0	To cut 30 inches	£21 0 0
" 28 "	15 0 0	" 36 "	24 0 0
" 30 "	17 10 0	" 42 "	27 0 0
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Stock to select from both at our London and Leeds Show Rooms, and all orders executed on the day they are received.

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Smithfield Iron Works, Leeds, and 54 and 55, Blackfriars Road, London, S.E.

N.B.—REPAIRS to LAWN MOWERS DONE at the London Establishment in the most expeditious manner, having every necessary appliance of steam power and machinery same as at Leeds.

Illustrated Price Lists of Green's Patent Garden Rollers, Patent Hot-Water Boilers, Garden Seats and Chairs, Fountains, Vases, and Galvanised Wire Netting, &c., free on application

NEW PLANTS FOR 1870.

JAMES VEITCH & SONS

BEG TO ANNOUNCE THAT THEY ARE NOW PREPARED TO SEND OUT

THEIR UNDERMENTIONED SPLENDID NOVELTIES.

ADIANTUM RUBELLUM.

A very pretty species of the Capillus-Veneris section, introduced by us from Peru.

It is of dwarf and very compact habit, rarely exceeding 8 inches in height, the young fronds, which are produced in great profusion, being always more or less decorated with the roseate tint which has suggested its name.

It has been frequently exhibited by us, and received Certificates.

Price 10s. 6d. each.

ALOCASIA SEDENI.

A very distinct and beautiful hybrid, raised at our own Nursery, and obtained by crossing the A. metallica with A. Lowii.

The form of the leaf is perfectly intermediate between the two parents, whilst the colouring is very striking and pleasing, a combination of the metallic hue of the one parent with the dark green and prominent white veins of the other.

As a fine foliage plant, we consider it decidedly superior to both parents, and in all respects worthy of a place in the most select collections. It received a First-class Certificate from the Royal Horticultural Society, [illegible], and a Gold Medal at the International Exhibition held at St. Petersburg in May, 1869.

Price 31s. 6d. each.

ARALIA OSYANA.

A very distinct introduction from [illegible] Islands, where it was [illegible] Mr. J. G. Veitch. It is a [illegible] plant, of graceful appearance, and will be especially useful for decorative purposes. We need only say that the colour of the foliage is a very pleasing green, which at the tips of the leaves, and also where the veins branch, changes to a striking chocolate-brown, the contrast being decided and pleasing. It requires an average temperature of 60 degs.

Nice young plants, 10s. 6d.; stronger ditto, 21s. each.

BEGONIA SEDENI.

Undoubtedly the finest hybrid flowering Begonia ever raised. It is a cross between [illegible], the [illegible] well known. It is equally as free in growth, and of the same upright habit, as B. boliviensis, but with [illegible] of which the veins are slightly rose coloured. The flowers [illegible], and of a large size. The plant continues a long time in bloom.

It was awarded the Silver Flora Medal, First Prize, at the New Plant Show of the Royal Horticultural Society, [illegible], as being the "best new plant shown for the first time in bloom," and we unhesitatingly offer it as one of the finest acquisitions of late years.

Price 21s. each.

BLANDFORDIA AUREA.

A very beautiful addition to the [illegible] group of Blandfordia, making a sixth [illegible] species in the tribe. It forms [illegible] cool greenhouse or conservatory plant, with narrow linear keeled or channelled leaves, from the base of which the flower-scape rises from 1 to 2 feet in height, bearing an umbellate cluster of three to five pale golden yellow drooping bell-shaped flowers, [illegible], and nearly equal [illegible] width. This [illegible] undoubtedly prove a valuable addition to the conservatory and greenhouse as a summer flowering plant, and we have every confidence in recommending it. It is of very easy cultivation.

Price 15s. each.

CROTON (CODIÆUM) UNDULATUM.

This plant having been exhibited so often, we think it unnecessary to give here any lengthened description.

Considered by many to be the most beautiful variety of the fine collection brought to this country by Mr. J. G. Veitch from the South Sea Islands, we offer it to the public as [illegible] other Croton yet in cultivation, both from the [illegible] and superb colouring.

It is of the usual free Croton growth, the edges of the leaves being beautifully undulated and wavy, and the [illegible] numerous streaks and blotches, which in mature leaves are of the brightest crimson, on a dark green ground. [illegible] the leaves at first yellow, gradually changing [illegible], the base of the petiole being a very light green.

As a plant for table decoration it will be [illegible], the colours by night having a magnificent effect, and, indeed, from whatever point of view we consider this plant, we cannot too highly recommend it.

It was thus described by the Editors of the *Gardeners' Chronicle*, 1868, at p. 943:—"One of the handsomest, if not the most so, of the set."

Price, 1st size, 63s.; 2d size, 42s. each.

CROTON (CODIÆUM) CORNUTUM.

A distinct and very compact growing variety, prettily blotched and spotted with yellow, having leaves frequently varying in form, and the greater number, from a peculiar extension of the mid-rib, having a horn at the apex, giving the plant a very distinct character.

In the *Gardeners' Chronicle* of August 8, 1868, p. 844, it is described as "a very curious variety, with irregular lobes, and a curious projecting horn-like process from the mid-rib, very ornamental in point of colour."

Price 21s. each.

CROTON (CODIÆUM) VEITCHII.

Another splendid introduction from the South Sea Islands, with foliage of great size, slightly undulated, and of perfectly new colouring. The leaves attain a length of 12 to 14 inches by 2½, the young leaves being traversed by broad bands of creamy yellow, which change with age to rose and carmine-purple, the intensity of these colours increasing as the leaves become older.

It is perfectly distinct, both in size of foliage and colouring, from any other known kind, and will be a magnificent variety either for exhibition or decorative purposes; and we have no hesitation in saying that this and the C. undulatum are two of the finest novelties introduced during late years.

The Editors of the *Gardeners' Chronicle*, who described the whole of our collection of Crotons in 1868, p. 844, thus speak of C. Veitchi-[illegible]:—"One of the most beautiful of the series, and one which attracted much attention in Paris, Ghent, and elsewhere."

It was first exhibited [illegible] plant, and received, amongst several other prizes, the Bronze Flora Medal at the Show of the Royal Horticultural Society, [illegible].

Nice young plants, 42s.; stronger ditto, 63s. each.

DAVALLIA MOOREANA.

This Fern, of which a very detailed woodcut is given in the *Gardeners' Chronicle* of September [illegible], 1869, page [illegible], to which we especially draw attention, as [illegible] giving some idea of its character,—is one of our best introductions of this year.

We [illegible], taken from the *Gardeners' Chronicle*, [illegible] the best method of describing this fine novelty:—

"[illegible] of the most beautiful stove Ferns which have yet been introduced to our gardens, and is remarkable in its family for its graceful habit, its large size, combined with its small [illegible] divisions, its pale green colour, its smooth surface, and its bullate sori.

"[illegible] of Borneo, whence it was introduced by Mr. [illegible] to the establishment of Messrs. Veitch & Sons, by whom it has been exhibited during the past season, and who have received for it the award of a First-class Certificate.

"The rhizome, which is as stout as one's little finger, is of a less rapidly elongating habit than in many other Davallias, and is clothed with narrow lanceolate dark brown scales.

"The stipes are about the thickness of a stout straw, from a foot to a foot and a half long, quite smooth, and pale coloured.

"The fronds are from 2 to 3 feet long, and from 1 to 2 feet wide at the base, triangular and pointed, of a graceful arching habit of growth, and most elegantly cut into a multitude of small blunt oblique soriferous segments; their colour is a pale green, and they are very remarkable for the dotted appearance presented by the upper surface from the prominence of the sori."

Dr. Masters adds:—"At the request of Messrs. Veitch we have named this Fern in honour of Mr. Thomas Moore, whose services in the cause of Fern knowledge are such that it is most fitting his name should be attached to so elegant a plant."

We need only say, that it is most difficult to describe adequately the grace and beauty of this plant, which was so much admired when exhibited by us last year at Hamburg, Edinburgh, and elsewhere; and it received the First Prize Silver Flora Medal at the Royal Horticultural Society's Exhibition, [illegible], 1869, as being "the best new plant not in flower" exhibited on that occasion.

Price 21s. each.

DRACÆNA CHELSONI.

We consider this to be one of the very finest of our new Dracænas, [illegible] at the same time [illegible].

Its growth is free [illegible] and striking, the ground [illegible] is the [illegible] crimson, a broad line of the same colour bordering the leaves on each side. We cannot too strongly recommend this fine plant, which we believe will supersede the well-known D. terminalis, latifolia variegata, and others of that class. It is another of our own introductions from the South Sea Islands. It has received the highest awards at various Exhibitions.

Price 42s. each.

DRACÆNA ALBICANS.

A distinct kind, of the upright habit of D. terminalis, and with foliage nearly as large as that variety.

The leaves are somewhat undulated, of a pleasing green colour, and as they attain age they become variegated with white, the fully developed plants having frequently entirely white leaves.

Price 15s. each.

DRACÆNA GUILFOYLEI.

A very distinct introduction; also a native of the South Sea Islands. It is of smaller growth than the other new kinds we now offer, the leaves being about 2 inches in width and 15 to 18 inches long, striped through their entire length with creamy white, which in age acquires a rosy tint, especially at the margin. It will be a useful decorative plant, and we know of no other kind at all resembling it.

Price 21s. each.

DRACÆNA MOOREANA.

This magnificent novelty, discovered by our Mr. J. G. Veitch, and imported by us direct from the South Sea Islands, resembles the D. Cooperi in habit, but is larger in size of leaf, and of perfectly distinct colouring. It is a noble plant, the leaves being fully 4 inches in width, 2 to 3 feet in length, and beautifully undulated. The habit is compact, and especially suitable for decorative purposes. The base of the leaf-stalk and the mid-rib are of a bright reddish crimson colour, which in the leaf itself changes to a glossy bronze. The plant for decoration is invaluable, as the colour of the foliage is most striking. We are confident it will find its way into every collection, and we particularly recommend it to all plant growers. It has received numerous prizes, and was much admired both at the St. Petersburg and Hamburg Exhibitions, as well as at our English shows. We have had very great pleasure in naming this fine plant in compliment to Mr. Moore, of the Sydney Botanic Gardens, an old and valued correspondent.

Price 42s. each.

ECHEVERIA GLAUCO METALLICA.

A very distinct hybrid, and one which will be a valuable addition to this popular class of summer bedding plants. The leaves are nearly as large as those of E. metallica, and in colour are intermediate between both parents, having the deep glaucous green of the one, but with the bronzy hue of the other. One of its great recommendations is that, unlike the E. metallica, it always remains stemless, and it is by far the most showy and largest leaved of all the dwarf kinds. It is a very free grower, and was awarded a First-class Certificate when exhibited August 22, 1868.

Nice young plants, 5s. each; larger ditto, 10s. 6d. each.

ORTHOSIPHON STAMINENS.

This is an easily cultivated flowering plant, and one which will be very generally grown for decorative purposes. The following description, taken from the *Gardeners' Chronicle* of September 4, 1869, p. 940, and published by Dr. Masters, will convey a very correct idea of its habit:—"At one of the recent meetings of the Floral Committee, Messrs. Veitch & Sons exhibited a flowering example of this very pretty labiate plant. The plant is herbaceous, with numerous much-branched purplish hairy stems; the leaves are ovate or deltoid, tapering at the base into a short petiole, coarsely and irregularly toothed, dark green above, with a purplish mid-rib, glaucous below, with whitish hairs along the veins. The flowers are very numerous, arranged in verticillasters, and these again in racemes at the ends of the branches. The calyx is leafy, tubular below, two lipped above, the upper lip roundish, the lower one divided into four linear lanceolate ciliate purplish teeth. The corolla is nearly an inch long, pale lilac blue in colour (sometimes white), with a straight tube projecting for some distance beyond the calyx, covered with long whitish hairs, and divided above into a two-lipped ringent limb. From the beauty of the flowers, and the profusion with which they are produced, there is little doubt that this plant will be a favourite with gardeners. It was introduced by Mr. J. G. Veitch, from the neighbourhood of Cape York." The plant is of very easy culture, and blooms when only a few inches high.

Price 7s. 6d. each.

RHODODENDRON LOBBII.

This is one of the most distinct and certainly the most brilliant coloured species we have yet imported. It is a free blooming variety, with a truss of from 8 to 12 flowers, which are 3 to 4 inches in length, curved, tubular, and of a brilliant glossy crimson colour, giving the plant a most striking character. It requires an intermediate stove, having been introduced by us from Borneo, through Mr. Thomas Lobb, after whom we have named it. We exhibited it at the Royal Horticultural Gardens, on October 6, 1869, when it was awarded a First-Class Certificate.

Price 31s. 6d. each.

NEW ORCHIDS.

CYPRIPEDIUM HARRISIANUM.

A beautiful hybrid, obtained by crossing C. villosum with C. barbatum. In foliage and flower the plant, whilst partaking largely of the character of both parents, is perfectly distinct from either.

The following, condensed from Professor Reichenbach's description, published in the *Gardeners' Chronicle* of January 30, 1869, page 108, will convey the most accurate description we can give of this distinct plant:—"The leaves are narrower than those of barbatum, but broader than those of villosum, spotted as in barbatum, and glossy like those in villosum. The peduncle is quite that of villosum. The bract is green and violet, but having less hairs than that of C. villosum. The upper sepal comes nearer C. barbatum, but is covered with a denser pubescence. The dark violet streaks in lieu of being distinct are confluent, so that the greater part of it appears of a blackish purple, whitish near the top. It is very glossy. The inferior sepal is whitish green, and not glossy. The petals are spread at a right angle, and are ligulate [illegible] the upper and under limb, as in C. barbatum, narrower than in C. villosum, very shining port wine coloured, with a very dark line on the middle nerves, which are green beneath and dark [illegible] tints of light green here and there; it has dark brown [illegible] sides of the limb, bristles around the mouth of the sac, and fine dark bristles internally. The colours are much brighter and darker than those of C. villosum, and the flowers are as large as those of the largest varieties of C. [illegible]." A plate of this [illegible] will be found in the "Floral Magazine" [illegible]. The plant has been awarded [illegible] First-class Certificates. We are again indebted to the energy and skill of Mr. Dominy for this beautiful acquisition, and at his request [illegible] Dr. Harris, [illegible] gentleman to whom Mr. Dominy is indebted for some of his earliest ideas on the hybridisation of Orchids.

Price £5 5s. each.

CYPRIPEDIUM (SELENIPEDIUM) LONGIFOLIUM.

A striking Orchid, discovered on the Cordilleras of Chiriqui at an elevation from 5000 to 8000 feet, and thus described by Professor Reichenbach in the *Gardeners' Chronicle*, 1869, page 1206:—

"The flowers remind one very much of Selenipedium davense. It is easily distinguished by the two angles at the inner base of the channelled claw or unguis of the lip. Selenipedium Hartwegii stands even nearer, yet it appears to be very distinct by its much larger and longer bracts, and by an open channel of the unguis of the lip, and by some discrepancies in the lip. Our plant appears to have the habit of the old Selenipedium caudatum. The inflorescence has bracts very much like those of Helicinias. The flowers are greenish, very shiny outside; the dorsal sepal is nearly oblong-triangular, with a brownish border. The inferior sepal is much broader and longer, or even quite as long, as the lip. The petals have a broad sub-cordate base, and taper into [illegible], with white borders, and two brown streaks at the base and [illegible] at the ends, these tails being much shorter than those [illegible] species. The lip is highly curious, for the [illegible] of the unguis overlapping one another, so that there is [illegible]."

Price 21s. to 63s. each.

EPIDENDRUM SYRINGOTHYRSUS.

A most beautiful and free-flowering Epidendrum, introduced by us from Peru. It is certainly one of the finest of its species. It flowers in panicles of 70 or 80 blooms, the flowering growths being from 2 to 3 feet in length. The throat is white, sepals and petals light purple, the labellum tipped with pink.

Price 105s. each.

ODONTOGLOSSUM CORONARIUM (true).

This beautiful species has been described by the late Dr. Lindley as one of the finest of the genus. The flowers are most striking, and of a deep brown, bordered with bright yellow, with a lip of the latter colour. The spikes are often 17 inches in length, quite erect, and have as many as 40 flowers expanded at one time.

This remarkable Orchid was discovered by Mr. Pearce, at an elevation of 8000 feet, on the Peruvian mountains, whence he sent us living plants. Coming from such a high elevation there can be no doubt of its thriving well under the cool treatment; indeed, it is already succeeding better with us in our coldest house than in any other.

Price 105s. to 210s.

SACCOLABIUM GIGANTEUM.

This distinct and beautiful Saccolabium was introduced by us from Rangoon, through Colonel Benson. The flowers, which are unusually large, are deliciously scented, and have cream colour sepals and petals, with dark purple lip, the former having a row of beautiful amethyst coloured dots. Being a winter blooming variety, and the flowers lasting a very long while after being cut, the plant is exceedingly valuable for all decorative purposes.

A full description by Professor Reichenbach will be found in the *Gardeners' Chronicle* for January 12, 1867.

Price 42s. to 63s. each.

VANDA BENSONI.

The flowers, which are of a yellowish green on the inside, and marked with numerous reddish brown spots, with a violet and white lip, are produced on spikes nearly 18 inches long. Sweet scented.

Price 63s. to 105s. each.

A NEW ILLUSTRATED DESCRIPTIVE CATALOGUE

Of the above and many novelties sent out by other houses will be forwarded free on application.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

GRAND NATIONAL HORTICULTURAL EXHIBITION, 1870.—JUNE 7 to 10.
Admission.—First day, 10s. 6d. each; 2d day, 2s. 6d. each; Whit Monday and remaining days, 1s. each. Gardeners will be admitted by Tickets as follows.—First day, 2s. 6d. each; 2d and remaining days, 1s. each. Applications for these Tickets must be made on or before May 30.
The fine Bands of Her Majesty's 4th Dragoon Guards, and the 100th Infantry, will attend on Friday.
Botanic Gardens, Manchester. BRUCE FINDLAY.

LEEDS HORTICULTURAL SOCIETY.—The SEVENTH ANNUAL SHOW will be held in the Cardigan Fields, Kirkstall Road, JUNE 3, 4, 6, and 7.
PRIZES NEARLY SEVEN HUNDRED POUNDS, including those offered for

Collections of Plants	£170
Pelargoniums	£150
Orchids, Azaleas, and Heaths	£120
Roses in Pots and Cut Blooms	£100
Fruit, &c.	£80
Bouquets and other Cut Flowers	£25

NOTE.—The North-Eastern, Great Northern, Midland, Lancashire and Yorkshire, and London and North-Western Railway Companies will convey Plants, Flowers, Fruits, &c., at ordinary rates to the Show, and return them free if they remain the property of the Exhibitor.
The Committee undertake to receive Boxes of Fruit, Cut Flowers, and Vegetables for Exhibition.
The Committee provide Assistants and Horses for Exhibition Vans coming by the Rail; also Covered Spring Vans to convey Plants, &c., between the Railway Station and the Exhibition Grounds, close at hand.
Schedules, with Form of Entry, forwarded on application.
ENTRIES OF PLANTS CLOSE MAY 27; for FRUIT, CUT FLOWERS and VEGETABLES, May 31.
A limited space will be set apart for Hort cultural Erections and Implements. Vases, Pots, and other Garden Requisites Not Exhibits will be provided. Applications for space must be made to the Secretary, by letter. All Implements, &c., must be on the ground on or before June 2.
JAMES BIRBECK, Secretary, Crossgates, near Leeds.

SAFFRON WALDEN HORTICULTURAL SOCIETY.—By kind permission of the Right Hon. Lord Braybrooke, the SUMMER EXHIBITION will be held in the Park, adjoining the Essex Agricultural Society's Show, on WEDNESDAY and THURSDAY, the 15th and 16th of June, when £112 10s., including Silver Cups, will be awarded in Prizes. Open to all England. ENTRIES CLOSE JUNE 7. Schedules forwarded on application to THOS. D. GREEN, Hon. Sec.

LEICESTERSHIRE HORTICULTURAL SOCIETY.—The GREAT SUMMER EXHIBITION of this Society will be held in the Horticultural Gardens on TUESDAY and WEDNESDAY, July 5 and 6, when £40 will be offered in Prizes for Cut Roses, and upwards of £25 for Plants in pots.
An SHOW of BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition.
Schedules of Prizes and all particulars may now be had of
Market Place, Leicester. WM. PENN COX, Secretary.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY, to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE, viz.:—
For the Two best COLLECTIONS of FRUIT and VEGETABLES, to consist of such of each, a first prize of £5, and a 2d prize of £3.
☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.
The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868, and 1869 excluded from competition. The articles produced to be of the EXHIBITOR'S OWN GROWING.

The Gardeners' Chronicle

SATURDAY, MAY 28, 1870.

MEETINGS FOR THE TWO FOLLOWING WEEKS.

THURSDAY,	June 2—Linnean	8 P.M.
SATURDAY,	— 4—Crystal Palace (Second Great Show)	
	Royal Horticultural Fruit and Floral	
WEDNESDAY,	— 8 { Committee), at S. Kensington ..	11 A.M.
	{ Ditto (Scientific Committee) ..	1 P.M.
	{ Ditto (General Meeting)	3 P.M.

IN the year 1825 the series of METEOROLOGICAL OBSERVATIONS at CHISWICK were begun. From these observations, in so far as they relate to temperature, Mr. GLAISHER has deduced the mean value at Chiswick for every day in the year for the 44 years ending with last year, as our readers will have seen by part of the meetings of the Scientific Committee of the Royal Horticultural Society, all which will appear in detail in the Transactions of the Society. It was still very important to ascertain the degree of confidence which could be placed in these results. Mr. GLAISHER had treated the observations made at the Royal Observatory, Greenwich, in the 50 years ending 1863, in a similar manner, the results of which are published in the Proceedings of the Meteorological Society in the year 1865. The results of both these long series of observations were laid down in diagrams and compared together, when it was found that the one series of observations completely confirmed the other, and that each series gave increased value to the other, as will be seen by the diagram printed at p. 735, showing the observed daily mean temperature of the air both at Chiswick and at Greenwich.

Notwithstanding that the means in the two series have been deduced, the one from 50 years' continuous observations at the Royal Observatory, Greenwich, the other from 44 years' continuous observations at the Gardens of the Royal Horticultural Society at Chiswick, there are still many instances of the difference between the mean temperatures of two consecutive days exceeding half a degree. In the table of Greenwich observations there are nine such cases in January, 11 in February, 15 in March, 17 in April, 14 both in May and June, 12 in July, 4 in August, 9 in September, 19 in October, 20 in November, and 16 in December; or no less than 160 in the year. Of those exceeding 1° between the mean temperature of adjacent days, they were three in January, in February two, in March one, in April three, in May five, in June three, in July two, in August none, in September three, in October five, in November seven, and in December four; or 38 in the year.

The largest of these differences in the several months were as follows:—In January, between the 21st and 22d days, was 1°.04; in February, between the 4th and 5th, was 1°.18; in March, between the 26th and 27th, was 1°.18; there were two instances in April, both amounting to 1°.30, viz., between the 13th and 14th and 19th and 20th; in May the difference of 1°.34 appears between the 14th and 15th; there is one of 1°.54 between the last day in June and the first day in July; and a difference of 1°.10 appears between the 15th and 16th of July; 0°.78 is the largest difference in August, between the 4th and 5th; 1°.40 between the 3d and 4th of September; 1°.74 in October, between the 28th and 29th; 1°.86 between the 14th and 15th of November; and 1°.74 between the 29th and 30th of December. The largest difference in the year between the mean temperature of consecutive days is 1°.86 between the 14th and 15th of November.

In the Table of Chiswick observations it will be seen that there are 130 cases in the year in which the difference between the mean temperature of two consecutive days has exceeded half a degree. In January there are 10 such cases recorded, there are 10 also both in May and June, in February there are 8, in March 9, in April 12, in July 13, in August 7, in September 8, in October 15, in November 13, and in December 15. Of days in which the difference in the mean temperature of two consecutive days has exceeded 1°, there was one in January, in February three, in March three, in April two, in May two, in June one, in July one, in August one, in September three, in October seven, in November five, in December three, or 32 in the year.

The largest of these differences in the several months are as follows:—In January 1°.3 between the 1st and 2d; in February 1°.2 between the 13th and 14th; in March, between the 26th and 27th, was 1°.5; in April 1°.5 between the 13th and 14th; in May the difference of 1°.4 appears between the 1st and 2d; in June 1°.2 between the 19th and 20th; in July, 1° between the 6th and 7th; in August, 1°.4 between the 28th and 29th; in September the largest difference is 1°.5 between the 15th and 16th; 1°.7 between the 23d and 24th October; 1°.2 between the 27th and 28th November; and 1°.7 on two occasions in December, viz., between the 24th and 25th, and between the 28th and 29th. The largest difference in the year between the mean temperature of consecutive days is 1°.7 between the 23d and 24th October, and between the 24th and 25th and 28th and 29th December.

With differences so large as these still remaining after 50 years' observation in the one case, and 44 in the other, it seems probable that 100 additional years of observations will be necessary to give results following each other progressively, and of their true values. It became therefore necessary to subject these numbers to some treatment, so as to deduce from them the most probable mean temperature of every day, and this has been done by making a curved line pass through or near every point, so that the area of the space between the line and the observed temperatures above the line should be equal to those below it; and in this way the two Tables, given at p. 735, were formed, showing the adopted mean temperature of every day for Chiswick and Greenwich.

At Chiswick, the days of lowest mean temperature, 36°.3, are January 7th, 8th, and 9th; it then increases to 39°.3 by February 4, remains stationary at that temperature till the 8th; and then gradually decreases to 39° on the 13th and three following days. From the 16th it increases and continues so to do—gradually for the first few days, but toward the end of March at a more rapid rate, the mean temperature of consecutive days differing as much as two or three tenths of a degree from each other; and continues increasing at this rate till June 8, when it slackens to a general rate of one-tenth, but still increases till we arrive at July 9, the mean temperature of this day differing from that of the 26th by one-tenth of a degree only. It then begins to decrease gradually till August 11, and at a more rapid rate from that day uninterruptedly to December 9, when the change is very small for three or four days together, and decreases till the end of the year.

At Greenwich the day of the lowest temperature, 35°.7, is January 8; it then slowly increases to 37° on the 20th, and then rather quickly to 38°.4 on the 27th; the temperature then declines to 37°.7 on February 2, increases to 38°.9 on the 8th and 9th, and declines to 38°.1 by the 15th and 16th; increases day by day to 40°.2 on March 1 and 2, and is nearly stationary for several days, differing only one-tenth of a degree from February 28 to March 7; then increases to 42° on March 17; differs but little from 42° for a week, or till March 24; increases then to 45°.4 by April 5, is stationary at this value till the 8th day, then declines to 44°.9 by the 13th day; a quick increase then sets in, and at the end of April the temperature increases 4°.4, being as much as the increase which took place between the beginning of March and the middle of April; the increase continues at the beginning of May, and is 51°.7 on the 6th, when it is checked, and remains stationary on the 7th and 8th; then declines half a degree by the 11th day, the temperature on May 11 and 12 being 51°.2; an increase then sets in, and on May 14 the temperature is the same as on the 7th and 8th, viz., 51°.7; a rapid increase now takes place, and on the last day of May the temperature is 56°.6. At the beginning of June the quick increase at the end of May is checked, and a slight decline takes place from 57°.4 on the 3d to 57° on the 6th and 7th, increases to 59° by the 14th, is stationary till the 17th, then increases slowly to 61°.9 by the 7th day; the increase is checked till the 10th day, and then increases to 62°.5 on July 14 and 15, the absolute hottest days in the year; the temperature then declines to 61°.4 by the 20th; but this increases to 62°.4 for five days, viz., from July 30 to August 3; and this is the hottest period in the year, the temperature continuing longer at these high values than about July 14 and 15, which are distinguished as the hottest days in the year. From August 4 a decline sets in, at first very slowly; several days together appear of nearly the same temperature; after the 28th day it sets in decidedly, and continues, with very slight checks, to 40°.9 on November 25 and 26; a very decided and remarkable increase then sets in to 42°.3 at the beginning of December, and till the 7th day there appears but little change, and from the 8th day the temperature declines to 37°.2 by the 27th day, when again the decline is arrested; the temperature on December 31 rises to 37°.5, and finally declines to 35°.7 on January 8.

There are some variations of temperature particularly during the early months of the year and the months of spring, during which the increasing temperatures are checked for some days, which are remarkable. Among these may be mentioned the declining temperature at the end of January and beginning of February, between February 8 and 16; the almost constant temperature at the beginning of March; and, again, from April 6, followed by a fall; again in May, from the 6th day, and cold days from the 10th to 14th; the check at the beginning of June; then quick increase and stationary at 59° for some days, about the middle of June, are periods in the ascending branch of the curve of daily temperature for which it is difficult at present to assign any physical cause. In the declining branch, there is but one great break in its continuancy, and that is at the end of November; it is very remarkable indeed, and perhaps is the most so of any in the year: its probable cause may be owing to the south-west currents of air setting in over our country about this time.

The number of days, from the lowest temperature to that of the mean, is 111 days; between the latter and the hottest day is 76 days, but to the hottest period of the year, viz., the beginning of August, is 91 days; from the hottest day to that when mean temperature is that of the year, viz., October 20, is 84 days, and from the latter to the lowest in the year, 78 days.

Assuming that on two days of the year the temperature is the same as the average of all, the 189 days are below the average, and 176 above. The number of days the temperature is rising from the coldest period of the year, January 7 to 10, to the hottest period of the year, viz., July 30 to August 3, is about 194 days; and the number of days from this period to the lowest again is about 171. The decline of temperature is, therefore, more rapid than the increase. Thus the two meteorological series of observations at

Chiswick and Greenwich confirm each other in a very admirable manner; and we may congratulate the Society, under whose auspices the observations were made, on the continuance of the Chiswick observations for so long a period as 44 years, and which has led to so satisfactory and valuable results. Horticulture also owes its acknowledgments to Mr. GLAISHER for the great pains and labour he has taken in verifying a series of observations which form the basis of most that has been written on this subject in horticultural works for the last forty years.

—— In a still more recent *séance* of the Academy of Sciences, M. DUCHEMIN, says "Nature," reverting to the communication in regard to the MORTALITY OF THE CARP (see p. 696) being in some instances due to the attacks of the toad, supplies observations which have been forwarded to him in support of his statements, and relates that from investigations undertaken at the Château de Montigny, the toad does not always remain permanently fixed on the head of the dead fish, but only so long as it gives signs of life. He observes, too, that all the carps from which the attacking toads had been removed were more or less blind. They were placed with care in another pond, but none of them recovered from the injuries received. No author has hitherto noted this animosity of the toad for the carp, who, perhaps, themselves consume the eggs of the toad. He has obtained additional evidence from M. MERMET, Directeur des Eaux at Contrexville (Vosges), who states that it has been found impossible to preserve carp in a sheet of water in that neighbourhood in consequence of the presence of numerous toads. M. l'Abbé CAILLET, Curé of Rosoy (Haute Marne), whilst confirming the above statements, writes to him: "The toad is a villainous beast. One day I observed one that had crawled beneath a hive; there, with his two forepaws advanced and his throat wide open, he attracted the innocent bees, with which his sides were distended."

—— From the report of Dr. SCHOMBURGK, the Director of the ADELAIDE BOTANIC GARDEN, it is evident that good work is being done in South Australia in the way of introducing serviceable plants, &c. The Sultana Vine has been introduced, and succeeds well, but, like the Zante Currant Grape, will not fruit if short spur-pruned. The system of long-rod pruning, says Dr. SCHOMBURGK, must, therefore, be adopted, and at least eight to ten eyes should be left on every rod. "The Guinea Grass, Panicum giganteum, also promises well; and if it only grows half as luxuriantly in South Australia as in South America, there would during the summer months be an end to all difficulties about green food for cattle." Cynodon Dactylon is spoken of as the only grass that will stand the scorching heat and drought of the summer on lawns.

—— Mr. ROBERT THOMSON sends us his report of the BOTANIC GARDEN, JAMAICA, for the past year, which is of a highly encouraging character. Grafted Mangos, Madder, China Grass, Nutmegs, Cinnamon, Ipecacuanha, Latakia Tobacco, various fibre plants, Assam tea, have all been introduced, and in most cases promise well. Cinchonas of various kinds are doing well, and making rapid growth, and manifesting their usual tendency to break into varieties, some of which are found much more valuable than others. Alluding to the obstacles afforded to Coffee and Cinchona plantations by the climate, Mr. THOMSON says:—"As the plantations (of Coffee) were gradually extended, and the primæval forests disappeared to make way for more profitable vegetation, the rain-producing agents were removed, and a comparatively dry hilly climate obtained for the new product. Coffee may thus be said to have created its own climate, and it is not presumptuous to predict for the Cinchona a somewhat similar history, abounding no doubt in episodes of disappointment, difficulty, and labour, but recording eventually a great and gratifying success."

—— We invite attention to an advertisement in another column, from which it will appear that the GARDENS at ENVILLE will be thrown open to the public, at certain stated times, through the liberality of the noble owner. This generosity on the part of Lord STAMFORD is worthy of imitation in other quarters, especially in the case of gardens which lie in contiguity to great centres of population. We understand that the bedding arrangements at Enville are in a very advanced stage.

—— The ASPARAGUS TRADE in FRANCE is an important one, and becomes more so every year. There are three regular kinds recognised in the Paris market—the early, or "Asperge en branche" as it is called, which is cut when it has reached two centimètres (four-fifths of an inch) above ground, the season for which generally commences about March 25, when the bundle never costs less than 10 francs, or 8*s.* wholesale; secondly, the intermediate, which requires no explanation; and, thirdly, the late kind, or "Asperge aux petits pois," which is usually cut up and dressed with sauce like green Peas, and eaten either as a separate vegetable, or as sauce to certain meats; it is also much used in soup. Another kind comes from the South, it is long and green from tip to stump, and the flavour is excellent; but it is not the fashion in Paris; it is too cheap!! Prize Asparagus is grown of great size in the neighbourhood of Paris, the maximum attained to the present time being *eight inches* in circumference, but a dish of such *grass* costs 40 or 50 francs. The consumption has grown enormous of late years. In 1820, Argenteuil, the chief place of its growth near the capital, only sent to market about 5000 bundles, now the produce probably exceeds a million. The price in Paris ranged the other day, at the wholesale market, from 15*s.* to 16*s.* per bundle. Except at the very commencement of the season, Asparagus is constantly given even at 2-franc dinners in Paris; it is served hot, with white sauce, as with us; but quite as frequently it is eaten cold, with a little oil, vinegar, salt, and pepper; and, although at first a little odd to an English palate, it is very good eating.

—— Mr. WILSON SAUNDERS has communicated to "Nature" a list of the collection of MIMETIC PLANTS exhibited by him at the recent Linnean *soirée*, and in reply to one of our correspondents we are enabled, through the courtesy of our contemporary, to subjoin a complete list of the mimetic pairs. Mr. SAUNDERS states that the plants were none of them grown for the purpose, but were simply selected from his greenhouse on the spur of the moment for the purposes of the *soirée*.

Olea europæa	.. ..	Oleaceæ
Swammerdamia antennaria	.. ..	Compositæ
Kleinia ficoides	.. ..	Compositæ
Cotyledon tricuspidata	.. .. ..	Crassulaceæ
Thujopsis læte virens	.. .. ..	Coniferæ
Selaginella circinata	.. .. ..	Lycopodiaceæ
Phyllanthus xylophylla	.. .. ..	Euphorbiaceæ
Polygonum platycladon	.. ..	Polygonaceæ
Peperomia sp. Brazil	.. .. ..	Piperaceæ
Nematanthus longipes	.. .. ..	Gesneraceæ
Haworthia planifolia	.. .. ..	Liliaceæ
Cotyledon (Echeveria) aloides	.. ..	Crassulaceæ
Gymnostachyum Verschaffeltii	..	Acanthaceæ
Echites rubro-venosa	.. .. ..	Apocyneæ
Sempervivum arenarium	.. ..	Crassulaceæ
Haworthia atrovirens	.. .. ..	Liliaceæ
Echinocereus Blankii	.. .. ..	Cactaceæ
Euphorbia echinata	.. .. ..	Euphorbiaceæ
Aralia sp. Bahia	.. .. ..	Araliaceæ
Philodendron sp. Trinidad	.. ..	Araceæ
Dorstenia sp. (near villosa) Brazil	..	Moraceæ
Eranthemum sp. n. Brazil	.. ..	Acanthaceæ
Grevillea sp.	.. ..	Proteaceæ
Acacia chordophylla	.. .. ..	Leguminosæ
Euonymus latifolius	.. .. ..	Celastraceæ
Hedera canariensis var.	.. ..	Araliaceæ
Ilex Aquifolium var.	.. .. ..	Aquifoliaceæ
Osmanthus Aquifolium var.	.. ..	Oleaceæ

—— During the next week the public will have an opportunity of inspecting Mr. WILLIAM PAUL'S ROSE SHOW at the Crystal Palace, which opens to-day, and will be continued for about a week. The fine specimen plants which have been preparing for this display will, no doubt, render it well worth examination by all who love Roses — and who does not own this soft impeachment?

—— The French Commission for THE INTERNATIONAL HORTICULTURAL EXHIBITION OF 1871 and following years, has appointed a series of committees for the selection of French productions, one for each class in the programme. The composition of these committees is of a nature to prove that the selection of specimens of French industry and art will be of a severe character. The horticultural committee is composed of the following members:—M. Drouyn de Lhuys, Senator, President of the new Society of Agriculturists of France (president); M. Decaisne, Member of the Institute; M. Hardy, head gardener of the Imperial kitchen gardens at Versailles; M. Pissot, keeper of the Bois de Boulogne; M. de Sainte-Marie, Director of Agriculture in the Ministry of Agriculture and Commerce; M. Tisserant, director of the horticultural establishments of the Government; M. Leroy, of Angers, horticulturist; M. Vilmorin, of Paris, horticulturist; M. Fouquier, Maître des Requêtes of the Council of State; M. Rivière, head gardener of the Luxembourg (secretary). We may therefore calculate on French horticulture not being unworthily represented at South Kensington next year.

—— We hear that the MANCHESTER EXHIBITION, which is to open next Friday, will be the finest ever held in the northern metropolis. There are a large number of new exhibitors, and the entries are considerably more than usual. We are also informed that the large exhibition-house has been put in good condition, and rendered perfectly sound and water-tight.

—— It can scarcely be said (we quote from "Nature") that any amount of WATER is too great for the SUPPLY of PUBLIC and PRIVATE WANTS; but, as the expense increases rapidly with the volume supplied, a limit is in practice soon reached, and cannot readily be exceeded. The average amount of water consumed per diem for each person is estimated at about three-and-a-half pints, below which proportion physical suffering commences. The quantity required for washing purposes is estimated at about one gallon. A considerable quantity is also required for the consumption of animals, for watering the streets, gardens, &c., the extinction of fires, and other purposes. The following table shows the quantity supplied in different cities to each inhabitant per diem, expressed in litres (= 1·7 pints).

Rome	944	litres derived from	springs.
New York	508	,, ,,	springs and rivers.
Marseilles	470	,, ,,	ditto
Besançon	240	,, ,,	ditto
Dijon	240	,, ,,	springs.
Bordeaux	170	,, ,,	springs and rivers.
Metz	125	,, ,,	ditto
London	95	,, ,,	rivers.
Lyons	85	,, ,,	springs and rivers.
Brussels	80	,, ,,	ditto.
Geneva	74	,, ,,	rivers.
Grenoble	65	,, ,,	springs.
Paris	60	,, ,,	springs and rivers.
Montpellier	60	,, ,,	springs.
Havre	42	,, ,,	ditto.
Liverpool	28	,, ,,	ditto.

—— A subscriber, who asks for information respecting HOSE FOR WATERING STREETS, &c., will find the system of watering the streets and roads of Paris explained and illustrated in every particular in "Les Promenades de Paris," by M. ALPHAND, the engineer entrusted with the entire transformation of the Bois de Boulogne, and of the construction of all the new parks and gardens. We understand that this work is about to appear in an English dress, and it will certainly be of great use to all connected with the keeping of roads and parks, or the embellishment of towns, as it contains the results of a long series of very costly experiences, carried on ever since 1852 in a thoroughly scientific manner. No portion of the work has been investigated more completely, or been brought to a more satisfactory issue than that of watering, and as the conclusions will occupy but little space we annex them, referring our readers to M. ALPHAND'S work for the details. The hose originally used was made first of leather, then of india-rubber, and lastly of canvas, which proved the most economical; but the friction on the macadam or gravel wore it so rapidly that the articulated system was tried and soon brought to perfection. The tubes of the apparatus now in use are made of thin sheet iron, the inner surface being covered with lead and bitumen, connected together by pieces of leather pipe 20 inches long. The whole apparatus consists of five tubes about 6 feet long each tube, to which the branch is attached, about a yard long, and seven leather connecting pieces. Close to one end of each tube is attached a small cross piece of wood, with two wheels about 3 inches in diameter. The apparatus is altogether 40 feet long, and the tubes have an interior diameter of rather less than an inch. The cost of the apparatus without the branch is under £3. The cheapest and lightest method of connecting the tubes and leather junctions is by means of copper wire. The cost of watering by means of this apparatus is about one quarter of that of the old system of water-carts, but in the former case the hydrants must not be more than about 100 feet apart. The grass plots and meadows are treated rather differently: similar apparatus are used, only much longer, the orifice being plugged instead of having a branch attached, and the iron tubes have rough holes, pierced at distances of about 3 feet apart, and at an angle of 45°. The water spurts through these in an irregular jet, and falls like fine rain over a considerable distance. The apparatus is shifted at intervals.

—— To provide space in the South Kensington Museum for the examination and EXHIBITION OF THE NATIONAL COMPETITION DRAWINGS of the Schools of Art in the United Kingdom, the gallery of Raphael's cartoons will be used, and must be closed for a short time.

—— We learn that the Parisians have had extraordinary WEATHER for some days, the thermometer standing at about 90° in absolute shade 30 feet above the ground. On the 22d the excessive heat finished, for the time, in a tolerably violent storm. The country has been visited in like manner, the rain, which has been long desired, falling in some parts in torrents. In and around Lyons the rainfall was large, and the Rhone is much swollen. The complaints from the South are serious; the Vines have suffered severely—first from the long frost, and since from the cold nights nipping the young shoots; it is said that more than half the fruit is lost. Now that the rain and warmth have appeared, it is remembered that in the famous year 1811, the year of the "comet" wine, as it is called, the Vines were completely frozen on the night of May 5, and the famous vintage was the result of the second shoots. However, we know that the Southern Vine growers never expect large results under such circumstances. The crop of stone fruit will not be great this year, which is unfortunate for English consumers; only on the lower and colder soils is there anything like a promise of abundance. The Apples are said to have suffered but little. The cereal crops generally do not look promising, at least they did not the other day, before the rain appeared.

—— In England the MAXIMUM TEMPERATURE has ranged from 85° at Blackheath, to 64° at Newcastle-on-Tyne; and in Scotland, from 67° at Leith, to 60° at Greenock. The mean of all the highest in England was 76°.5, and in Scotland, 63°. The MINIMUM TEMPERATURES in England ranged from 47° at Liverpool, to 37° at Hull; and in Scotland, from 50° at Greenock, to 42° at Aberdeen. The mean of all the lowest in England was 42°.2, and in Scotland, 44°.6. The mean temperature of the week in England ranged

from 59°.8 at Blackheath, to 52°.6 at Newcastle-on-Tyne; and in Scotland, from 55°.5 at Leith and Edinburgh, to 51°.4 at Greenock; the mean for the several stations in England was 56°.8, and for Scotland 53°.5. The higher temperatures were experienced near the eastern coast. The great differences, however, occurred during the day, the nocturnal temperature being more uniform throughout the country. Very little rain fell in England; the maximum fall was but 0.18 inch, this occurring at Portsmouth. The mean rainfall for England was but 0.05 inch. In Scotland the falls were very varied; they ranged from 2.44 inches at Greenock to 0.14 inch at Leith. The mean rainfall for Scotland was 0.79 inch. At Dublin the fall recorded was 0.38 inch.

New Garden Plants.

AMARYLLIS (HIPPEASTRUM) LEOPOLDII, *Hort. Veitch.*

This fine new Hippeastrum, which was named, by permission, in honour of the King of the Belgians, on the occasion of his visiting an impromptu show at the Royal Horticultural Gardens last year, is evidently related to the beautiful and recently introduced Amaryllis (Hippeastrum) pardina, of which several states, varying in form and colouring, have been flowered. The present is, however, much more robust and vigorous in its growth, and bears larger flowers, but it has the same expanded form and broad perianth segments as pardina, and this marks it out at once as distinct from the ordinary garden forms of Hippeastrum, and as one of the noblest of its race.

The bulbs of this novelty were imported by the Messrs. Veitch & Sons, of Chelsea, from Peru, the same country which yielded to the same successful explorer—the unfortunate Pearce—the leopard-spotted species already referred to. It was described by Pearce as the finest of all the Amaryllids he had met with in his journeyings, and has fully realised the description he gave of it. The leaves are broadly strap-shaped, and the scape stout, supporting two flowers, which issue from a broad tapered spathe. The individual flowers measure fully 7 inches in expansion, and consist of six broadly obovate perianth segments, the lower half of which is of a clouded crimson colour, while the tips are of a greenish or creamy white. The base of the shallow tube is also of a greenish white, and from this a bifid white bar passes upwards into each of the segments, forming a ten-pointed star. This disposition of the colour is very well indicated in our engraving (fig. 140), which was prepared by Mr. W. G. Smith from the stately specimen originally flowered by the Messrs. Veitch.

These two grand and distinct novelties — A. pardina and A. Leopoldii — have been very opportunely introduced at a time when the beautiful garden forms of the Hippeastrum group of Amaryllis are engaging the increased attention which they well deserve at the hands of cultivators. Few floral subjects are more gorgeous than the Amaryllis, while few plants produce a more magnificent display at an exhibition than such groups as those which often appear at the Belgian flower shows, or such as we have seen filling up and overflowing from the greenhouses of our worthy friend, Van Houtte. No name could therefore have been more appropriately chosen than that which has been given to this novelty, which must find its way into every choice collection of bulbs. It should be added that the plant has gained its First-class Certificate. *T. M.*

FIG. 140.

LILIES AND THEIR KIND.

A SMALL garden should be filled with floral gems, but it should also be a *multum in parvo*, a collection of specimens of varied beauty, representatives of all the great families, both of flowering and flowerless plants, which are cultivable in the open ground. In their selection, novelty has much to do, fashion more, and individual taste and researches something. I would here like to suggest the adoption, with flowers, of the system now pursued by ladies and their advisers with regard to dress, namely, a revival of the old in combination with the new: Louis XV. skirts and draperies, dyed with hues supplied by recent chemical discoveries, produce effects which most men pronounce to be charming. We thus convert Watteau's pictures into *tableaux vivans* with the improvement of new colours, fabrics, and faces. Our parterres admit of a similar kind of renovation.

Amongst old-fashioned flowers, let me speak up for the Lilies; the newly-arrived strangers of that noble family will speak up for themselves. No small garden should be without a collection of Lilies, even if restricted to one single bulb of each leading species or variety, as an economical beginning; for they obey the law of increase and multiplication. Two lancifolium rubrums, bought in pots last summer, are now nine, great and small. Lilies do not require, like the Gladioli, to be taken up and stored away from frost every autumn. Indeed they seem to prefer to be left quiet in their sites for two, three, and four years at a time, at the end of which period they require to be lifted and separated to prevent overcrowding by their own progeny of offsets. Although they do not like to be kept very long out of the ground, and will not bear tossing about like Tulips and Hyacinths, their period of rest is quite sufficient for the purposes of sale or interchange. While growing they require only ordinary care, and are not attacked by many enemies. He must be a slovenly gardener who would let them be ravaged by slugs and snails. Less obvious at first, and less suspected in their origin, are the injuries committed by a pretty small scarlet beetle, found crawling amongst Lily leaves, mostly in pairs, in April and May. These spoilers, conspicuous to the eye, are easily caught, and should be destroyed relentlessly, for their eggs give birth to an ill-favoured larva, which simply looks like a lump of dirt, being hidden beneath its own excrement. Knowing what they are, nothing is easier than to get rid of them as fast as they appear. Both the filthy grubs, and the smart perfect insects disfigure the plants by gnawing their stems and leaves.

Another recommendation is, that a parterre of Lilies is quite within the reach of a moderate purse. The only species which can be called at all expensive (I quote Louis Van Houtte's Catalogue of Bulbs, &c., No. 128—F., 1869; the prices charged by other nurserymen will not be widely different) are giganteum, 16*s.*; auratum, from 4*s.* to 8*s.*; and Brownii, from 3*s.* 3*d.* to 5*s.* But the first of these may be provisionally omitted, because its hardiness has not been ascertained, except in certain favoured localities, while the great beauty of the remaining two makes them well worth the money they cost, especially remembering that they are hardy perennials gaining strength and blooming more profusely with age, not to mention the probability of their giving offsets and seeds. The merits of auratum are already well known. Van Houtte's description of Brownii is, "Magnificent hardy species, with noble foliage; flowers three times as large as the White Lily, interior creamy white, exterior rusty purple. The stamens are of a rich chocolate, a distinctive characteristic with this species." But compare these reasonable figures with the prices asked for Orchids, and for almost every new introduction, as well as for almost every newly-raised variety of flower.

Other beautiful Lilies are so cheap, that it is not worth while depriving oneself of them. Lancifolium speciosum album is 5*s.* the dozen; lancifolium rubrum (still handsomer), 4*s.* the dozen; longiflorum (white, large, and long, tube-shaped flowers, with petals slightly turned back, and yellow stamens), 2*s.* per dozen: Thunbergianum aureum nigro-maculatum (of a beautiful nankeen spotted with black), 6*s.* 6*d.* per dozen; while that good old favourite, tigrinum, the Tiger Lily, now pushed out of most gardens by upstart intruders, is to be had for 1*s.* 3*d.* the dozen. Van Houtte does it the justice to call it "a well-known but ever beautiful variety, attaining 4 feet in height, reddish orange flowers spotted with black, petals much recurved;" but he patronises a new variety (8*s.* to 16*s.*), tigrinum splendens, "taller in habit, with flowers marked with larger spots, and altogether finer than the old sort." It is certainly a striking improvement, but does not, I think, whip its parent into nowhere. For half-a-crown a dozen you have Lilium umbellatum, in mixture, superb varieties, with very large cup-shaped flowers of divers shades, dazzling red, &c., suitable for the formation of masses on lawns, which are exceedingly effective when seen from a distance. These varieties, amongst the hardiest known, attain a height of from 2½ to 3 feet. The white Lily (a stately plant, if ever there was one, and which would be puffed up to the clouds if it was new or rare), is 1*s.* 8*d.* per dozen; the double-flowered white Lily, 6*d.* a-piece.

So much for inexpensiveness. To give an idea of their variety would require the enumeration of their qualities item by item; I cannot, however, help noting pyrenaicum, lemon-yellow, with scarlet anthers, besides others with petals of a similar hue; grandiflorum, magnificent deep blood-red, star-shaped flowers; and the well known (to our grandmothers) scarlet Turk's-cap.

Many Lilies do well in any ordinary garden ground; they all thrive in light soils with a liberal admixture of leaf-mould. This, being especially suited to the Japan Lilies, may be advantageously employed for all. It ensures good drainage, is less penetrable by frost than soils that retain moisture, and also admits of deep planting—another preservative against frost. Some gardeners take up their Japans every year, at the beginning of October, replanting them immediately after having removed the offsets and the old roots. Lilies grown in pots make showy ornaments, and will even rise to the dignity of specimen plants; but their most appropriate place is the open ground, whether border or bed; because many of them emit a perfume which, though sweet, is so powerful as to be unbearable in a closed apartment by any but the hardest heads and the robustest nerves. Outdoors they brightly fill up the considerable gap between the blaze of spring flowers, and the glowing hues of autumn.

I would not have my own Lily bed consist entirely of these plants alone, but would help it out with a succession of bloom obtained from near relations, and even from utter strangers. True, there is the pleasure of expectation as well as of actual enjoyment; but there is no reason why we should not, while watching the growth of the Lilies, be gratified by something more than hope. A Lily parterre may stand alone, or there may be two planted exactly alike; or correspondent pendents, with a reversed arrangement, in greater number, may answer to each other. Suppose there is but one, whether regular or irregular in shape, I would have its outer edge bordered, according to the size of the garden, either with Box or with Irish Ivy; inside which I would plant a fringe, either of Snowdrops or Crocuses—yellow, purple, or white. Within those, a ribbon of single Anemones (mixed), 18 inches or 2 feet broad. Sown (for economy) in May, they would begin flowering in the following October, and afterwards bloom at the regular season. The whole of the interior should then be assigned to liliaceous bulbs, planting a few Crown Imperials (in two varieties, orange and yellow) at symmetrical

stations, and making the outer rank to consist either of Dog's-tooth Violets or Fritillarias, or both. The centre is the place for the tallest Lilies (giganteum sends up a famous shaft), advancing the places of different sorts towards the outside, in proportion to their diminished stature; and when the Lilies are over, the bed need not be bloomless, so long as there are Colchicums and autumnal Crocuses to be had. *E. S. D.*

PORTRAITS OF GARDEN PLANTS.

ERYTHOCHITON HYPOPHYLLANTHUS, *Bot. Mag.* t. 5824.

A noble Rutaceous stove shrub, of erect, unbranched habit, with bold cuneate-oblong acuminate leaves, from a foot to a foot-and-a-half long, and remarkable for having the short cymes of from one to three flowers developed on the costa behind. The flowers are white, rather showy, with a tubular calyx and five oblong-ovate petals. "The position of the flowers upon the midrib varies, as they are sometimes produced not far above the petiole, and are often subtended by a second leaf, the upper surface of which faces the back of that from which they both spring." The introduction of the plant is due to M. Linden, whose collector, Schlim, found it in rocky ravines, at 2500 feet above the sea, in New Grenada.

GREVILLEA PREISSII, *Bot. Mag.* t. 5837.

A remarkably elegant greenhouse evergreen shrub, of spreading habit, with pale green slightly silky subbipinnate leaves, composed of numerous short narrow, almost filiform segments, and short dense terminal racemes of attractive flowers, the tube of which is of a deep rosy red, and the limb of a yellow-green. It is a native of Western Australia.

HOYA AUSTRALIS, *Bot. Mag.* t. 5820.

An evergreen glabrous warm greenhouse climber, of free growing habit, with obovate or suborbicular coriaceous deep green leaves, and deflexed umbels of white flowers tinged with pink, and diffusing a Honeysuckle-like scent. It is a native of Queensland and New South Wales, and was introduced to this country from the banks of the Brisbane River by the late Mr. James Backhouse.

JERDONIA INDICA, *Bot. Mag.* t. 5814.

A pretty little hothouse herb, belonging to the Didymocarpeæ, almost stemless, and producing a dense tuft of cordate obtuse petiolate dark green leaves, blotched with greyish green in the centre, and strongly suggestive in their form and marking of those of Cyclamen vernum. The flowers are small, rosy lilac, on slender scapes, which elevate them above the leaves, and have a singularly oblique ventricose tube, and curiously dilated filaments. It inhabits the western slopes of the Neilgherries, whence Major Beddome sent it last year to Kew.

LINARIA TRISTIS, *Bot. Mag.* t. 5827.

An old but seldom seen, and charming little hardy perennial, with numerous short ascending stems, bearing spreading linear glaucous leaves, and spikes of comparatively large yellowish flowers with a bronzy palate. It is a native of Spain and Gibraltar, a very free flowerer, and an excellent rock plant.

MONOLENA PRIMULIFLORA, *Bot. Mag.* t. 5816.

A remarkably beautiful and highly floriferous Melastomaceous stove herb, introduced, not from New Grenada, as stated in the "Botanical Magazine," but from Ecuador. It has been fully described, with a very characteristic illustration, at p. 309. The delicate tints of its rosy flowers, together with their abundance, render it a very attractive object.

NARCISSUS BULBOCODIUM MONOPHYLLUS, *Bot. Mag.* t. 5831.

A beautiful dwarf, hardy bulb, resembling the common Hoop-Petticoat Narcissus, except in the colour of the flowers, which is white. It has small globose bulbs, solitary (rarely two) semiterete leaves, and nearly white flowers, with a large hemispherical corona, crenulate at the edge. A native of Algiers, and figured at p. 665.

ŒNOTHERA MARGINATA, *Bot. Mag.* t. 5828.

A grand hardy herbaceous perennial, stemless, forming a tuft of spathulate lanceolate sinuately-toothed leaves, from amongst which rise the large white handsome flowers, fully 4 inches in diameter. The midrib and petiole are often of a blood red beneath. It is a native of the Rocky Mountains of North America, and has been for some years cultivated at Kew. One of the finest of all the dwarf perennial Evening Primroses.

ORTHOSIPHON STAMINEUS, *Bot. Mag.* t. 5833.

A showy-flowered Labiate, with the aspect of a Clerodendron, the resemblance arising from the long-stamened flowers. It is a branched herb, with ovate or rhomboid-ovate crenately-toothed leaves, and a terminal inflorescence of numerous whorls of blue-lilac flowers. It is a very widely-spread Eastern plant, and was introduced to the Royal Exotic Nursery, Chelsea, by Mr. John G. Veitch, See illustration at p. 941, 1869.

PARANEPHELIUS UNIFLORUS, *Bot. Mag.* t. 5826.

"A very beautiful hardy or half-hardy Composite, remarkable for the brilliant golden colour of the flowers, and the bright green reticulated foliage, which is snowy white underneath. It is a native of the Peruvian and Bolivian Andes, and was raised from seed by W. W. Saunders, Esq." "It appears to be thoroughly alpine, inhabiting rocky places at 14,000 to 18,000 feet elevation." It is a stout-growing dwarf perennial, with the obovate rugose leaves subpinnatifidly lobed, and the flower-heads are from 2 to 3½ inches across.

PHALÆNOPSIS PARISHII, *Bot. Mag.* t. 5815.

This lovely little Orchidaceous epiphyte was discovered in the Burmese forests and sent to England by the Rev. C. Parish, after whom it is named; it has also been found and sent home by Col. Benson. The plant is almost stemless, and bears a few distichous oblong-lanceolate acute leaves, and short racemes of numerous gay flowers, which are white, with the front portion of the lip of a rich amaranth. The disc of the lip bears some curious fringes.

THE CAMPHOR TREE OF SUMATRA.

AMONG the most luxuriant and valuable trees of the Island of Sumatra the first place belongs to the Dryobalanops Camphora. This is abundantly met with on the west coast, to the north of Ayer Bangie, chiefly in the extensive bush of the Batta lands, but seldom in places more than 1000 feet above the sea level, and although it is often found in dry (not marshy) places near the sea-coast, it attains its utmost growth at heights from 250 to 400 feet.

The tree is straight, extraordinarily tall, and has a gigantic crown, which often overtops the other woody giants by 100 feet or so. The stem is sometimes 20 feet thick. According to the natives there are three kinds of Camphor tree, which they name "mailanguan," "marbin tungan," and "marbin targan," from the outward colour of the bark, which is sometimes yellow, sometimes black, and often red. The bark is rough and grooved, and is overgrown with Moss. The leaves are of a dark green, oblong-oval in shape, and pointed; they smell of camphor, and are besides hard and tough. The outward form of the fruit is very like that of the acorn, but it has around it five petals; these are placed somewhat apart from each other, and the whole in form much resembles a Lily. The fruit is also impregnated with camphor, and is eaten by the natives when it is well ripened and fresh. The amazing height of the trees hinders the regular gathering, but when the tree yields its fruit, which takes place in March, April, and May, the population go out to collect it, which they speedily effect, as, if the fruit be allowed to remain four days on the ground, it sends forth a root of about the length of a finger, and becomes unfit to be eaten. Amongst other things, this fruit, prepared with sugar, furnishes a tasty comfit, or article of confectionery. It is said that it is very unhealthy to remain near the Camphor tree during the flowering season, because of the extraordinary hot exhalations from it during that period.

The camphor which the tree yields is generally known as Baros camphor, and outdoes by far in purity the Japanese and Chinese product. This was acknowledged as far back as the 16th century, and 100 guilders per catty was paid for it, while a like quantity of Japanese camphor was worth only 15 guilders. The gathering is made in Sumatra in the old fashion, and in a very unsatisfactory way. The natives have no means whatever of estimating the quantity of camphor in a given full-grown tree. Consequently everything is left to blind chance, although the greater the age of the tree the more camphor it contains, but it is just the age of the tree which the natives are uncertain about. Usually, the order of the rajah is given for a certain number of men, say 30, to gather camphor in the bush belonging to the territory which he claims as his. The men appointed then seek for a place where many trees grow together; there they construct rude huts, and sometimes remain there for months. When the encampment has been formed they forthwith set to work. The company is now divided into two parties, of which one occupies itself with felling the trees, and the other with gathering the camphor. The tree is cut down just above the roots, after which it is divided into small pieces, and these are afterwards split, upon which the camphor, which is found in hollows, or crevices in the body of the tree, and, above all, in the knots and swellings of branches from the trunk, becomes visible in the form of granules, or grains. The quantity of camphor yielded by a single tree seldom amounts to more than half a pound, and if we take into account the great and long-continued labour requisite in gathering it, we have the natural reply to the question why it fetches so high a price. The well-known camphor oil is of very little worth, and no tree is ever felled to obtain it. At the same time that the camphor is gathered—that is, during the cutting down of the tree—the oil, which then drips from the cuttings, is caught in considerable quantity. It is seldom brought to market, because probably the price and the trouble of carriage are not sufficiently remunerative. Whenever the oil is offered for sale at Baros, the usual price is one guilder for an ordinary quart wine-bottle full.

The production of Baros camphor lessens yearly; and the profitable operation of former times, say in the year 1753, when fully 1250 lb. were sent from Padang to Batavia, will never return. Since time out of mind the beautiful clumps and clusters of Camphor trees have been destroyed in a ruthless manner; young and old have been felled, and as no planting or means of renewal has taken place, but the growth of the trees has been left to Nature, it is not improbable that this noble species will ere long wholly disappear from Sumatra. Consequently, we have occasionally inquired whether the Government cannot do something on behalf of Camphor production and trade by causing plantations to be formed of this Camphor producing tree, such as is done in Java regarding the forests of jattie (Teak). The districts of Ayer Bangie and Rau, and also the Tapanolie Residence, offer perhaps the most favourable localities for the experiment, and the transport of fruits and plants four to six days old can be effected for a great distance, by potting them, or planting them in boxes half filled with wet sand. The contents need only to be carefully kept wet, and the box should be kept covered with linen. It is true neither the present nor perhaps the coming generation may derive profit from such measures, but people must not forget that we who, in other respects, have so much for which to thank our forefathers, are morally obliged to do something for our aftercomers. *Sumatra Courant.*

GARDEN LITERATURE.

Concluded from p. 667.

SEVEN years after, namely, in 1630, there was a work, however, published by Messrs. Adam Isslip, Joice Norton, and Richard Whitakers, which was in some respects an improvement upon, though it was not intended to supersede, the "Paradise." This was Gerarde's Herbal—"The Herball, or Generall Histories of Plantes. Gathered by John Gerarde, of London, Master in Chirurgerie, very much enlarged and amended by Thomas Johnson, citizen and apothecarye." Several editions of this folio exist in the British Museum library, though we have been unable to find a copy of the first edition by Gerarde alone. The title-page, a marvel of minute engraving, consists of vases and flowers, groups of fruits, and novel arrangements of trees, with figures of Ceres and Pomona on either side, and portraits of the Greek physicians, Theophrastus and Dioscorides, in medallions. The text is illustrated with hundreds of engravings on wood, which, considering the period of their production, are wonderfully well executed—many of them superior, indeed, to the majority of woodcuts employed in modern book-illustration, in that they are representations of natural forms faithfully and tastefully rendered.

Parkinson's second folio appeared in 1640. Its title ran thus:—"*Theatrum Botanicum*—the Theatre of Plants, or an Herbal of a large extent: containing, however, a more ample and exact Historie and Declaration of the Physicall Herbs and Plants that are in other authours, increased by the accesse of many hundreds of new, rare, and strange plants, from all the parts of the world, with sundry gummes and other physicall materials than hath been hitherto published by any before; and a most large demonstration of their natures and vertues. Showing withall the errors, differences, and oversights of sundry authours that have formerly written of them, and a certaine confidence or most probable conjecture of the fine and genuine herbes and plantes. Distributed into sundry classes or tribes for the more easie knowledge of the many herbes of one nature and property, with the chief notes of Dr. Lobell, Dr. Bonham, and others inserted therein. Collected by the many yeares travaile, industry, and experience in this subject, by John Parkinson, Apothecary of London and the King's Herbalist; and published by the King's Majestye's especiall privilege." In this work we have something like an attempt to forestall Linnæus in his classification, but in a more natural order.

In 1648, Gervase Markham's "Country Housewife's Garden" was re-edited and improved by William Lawson into a "Way to Get Wealth," in which husbandry, gardening, and kindred occupations are treated at considerable length: in 1649, Captain Walter Blith published his "English Improver Improved," a treatise on tillage, pasture, the planting and growth of trees, which enjoyed considerable reputation, and is still occasionally found in libraries and old book-shops: in 1653, Ralph Austen, "practiser in the art of planting," issued a "Treatise on Fruit Trees:" and in 1658 appeared Evelyn's first work on gardening—"The French Gardiner: instructing how to Cultivate all sorts of Fruit Trees and Herbs for the Garden"—mainly a translation, to which was usually added the "English Vindicated," by John Rose, gardener to King Charles II.; and a tract on the making and ordering of wines in France.

Evelyn's "Sylva," a discourse on forest trees, many times reprinted, and still an admired and much sought-for work, was first published in 1664; in which year also appeared a new edition of Markham's "Housewife;" and in the following year John Rea's "Flora," a guide to the planting and decorating of pleasure gardens. Evelyn's "Sylva" gave a great impetus to the planting, and, indeed, to the love of trees, now so important a feature in English scenery.

Worlidge's "Systema Agriculturæ, the Mystery of Agriculture Discovered," appeared in 1665, and is the text-book which formed the foundation of numerous treatises, and is even now worth consulting. In it the method of grafting and pruning still pursued was fully explained, the author adopting and enlarging upon the theories of Platt, Markham, and Gerarde.

For the next twenty years nothing of importance in the way of garden literature was published, though many compilations, reprints, and pamphlets were issued by the booksellers from time to time:—an "Epitome of Husbandry," by S. B., containing 181 pages taken from Fitzherberd without acknowledgment, and the rest of the text only colourably altered from Mascall, Blith, Gerarde, and others, being a sample of the rest. S. B. is said by some to have been Samuel Blagrave, and by others Samuel Billingsley, both booksellers' hacks, with ready pens and no great scruples.

In 1699, George London, chief gardener to their Majesties William and Mary, and Henry Wise, his assistant, brought out their joint work, the "Complete Gard'ner." This book, which is well known to collectors, contains directions for the planting of trees and the cultivation of flowers and vegetables, a calendar of

garden operations for every month in the year, on much the same plan as that adopted in recent works, and a recommendatory "Address to the Nobility and Gentry," by John Evelyn. . The same compilers produced, in 1707, a work, called the "Retired Gard'ner," now obsolete. From this period to 1714 no real work on gardening, as an art, made its appearance ; but in that year, the Rev. John Laurence (or Lawrence), Rector of Yelvertoft, Notts, and some time Fellow of Clare Hall, Cambridge, produced, in three parts, "The Clergyman's Recreation ; showing the Pleasure and Profit of the Art of Gardening ;" and a few years later, "A System of Agriculture and Gardening," in five books, folio. These works have been extensively used in the compilation of modern treatises. These were followed, in 1717, by Richard Bradley's "New Improvements in Planting and Gardening," a pamphlet of seventy pages, and in subsequent years by many treatises on husbandry and gardening, Mr. Bradley becoming, in 1727, Professor of Botany to the University of Cambridge. Thenceforward to 1732, few really original books on the art were published ; but in that year William Ellis issued the first monthly part of his "Complete Modern Husbandry," which was completed in 8 vols., 8vo, in 1774, abridgments of which were afterwards several time published. Again we have a long period of mediocrity. Essays, pamphlets, and small books on agricultural topics, "printed for the booksellers," appeared between 1727 and 1756, in which latter year Dr. John Hill produced, among other books on plants, his "Gardner's New Kalendar," and his "British Herbal," followed, in 1760, by his "Flora Britannica on Linnæus's Method," introducing the then newly-invented system of Linnæus ; about that time also appeared his "Outlines of a System of Vegetable Generation." To the same period we owe Stillingfleet's "Miscellaneous Tracts on Natural History, Husbandry, and Physic ;" and several small works, by various hands, such as the "Farmer's Guide," the "London Gardner," the "Botanist's Dictionary," the "Dutch Florist," the "British Gardners' Directory," &c. ; and in 1766, we find the publication of "Every Man his own Gardner," by Thomas Mawe.

A jump of nearly half a century, during which some scores of books on gardening, of greater or lesser authority and pretension, had been published, brings us to 1807, and the publication of Miller's "Gardners' and Botanists' Dictionary," edited by Thomas Martin, B.D., F.R.S., Regius Professor of Botany in the University of Cambridge ; a work of real value, in two volumes, large folio. Mr. Miller was curator of the physic garden belonging to the Worshipful Company of Apothecaries. Miller's book was first published about 1724, in four vols. ; but the edition most generally esteemed is that of Dr. Martin, in which all the knowledge of previous writers on gardening was thoroughly digested, systematised, and extended ; the plants being arranged in families and species, according to the natural system, with such additions as recent observation had enabled the editor to make ; the text being illustrated with all necessary figures in steel and wood. Miller's Dictionary, edited by Martin, was very successful, adapted to the wants of practical as well as scientific gardeners ; the descriptions and directions being written in a very unaffected and pleasing style ; and, being much sought for, produced a high price as the book got more scarce. After being suffered to remain out of print for some years, the proprietors determined to republish it, with such improvements as seemed desirable. For this purpose, they engaged the services of Mr. George Don, a gentleman bearing a high character for literary and scientific acquirements. Under his management, the first volume of the new edition appeared in 1831, but disappointed the expectations of both the proprietors and the public. It was too scientific for the "general reader," and too diffuse for the student. Three other volumes, however, appeared at intervals, and, in 1838, when the fourth was printed, Mr. Don, greatly to their surprise, coolly informed his employers that, so far from having completed his work, as he had engaged to do, he had materials, still unused, for more than two additional volumes ! Mr. Don, however, gained nothing by his move, for the proprietors determined to close their publication. They therefore dropped the name of "Miller's Gardners' Dictionary," and in the place of that, they called their work a "General History of the Dichlamydeous Plants," by George Don, F.L.S., and issued new title-pages. *The Bookseller.*

OBSERVED DAILY MEAN TEMPERATURE AT CHISWICK AND GREENWICH.

DIAGRAM SHOWING THE MEAN TEMPERATURE OF THE AIR FOR EVERY DAY IN THE YEAR, FROM OBSERVATIONS MADE, FROM JANUARY 1, 1826, TO DECEMBER 31, 1869, AT THE GARDENS OF THE ROYAL HORTICULTURAL SOCIETY AT CHISWICK.

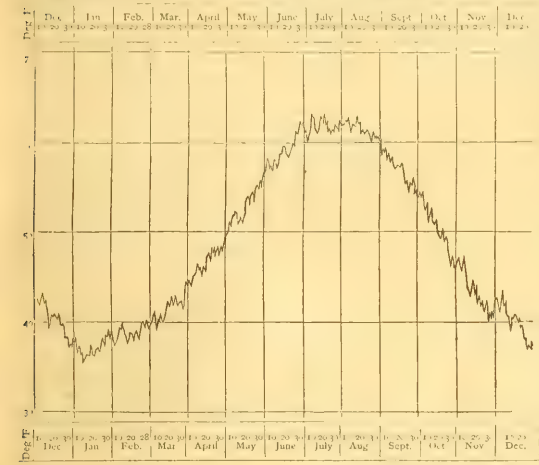

DIAGRAM SHOWING THE MEAN TEMPERATURE OF THE AIR FOR EVERY DAY IN THE YEAR, FROM OBSERVATIONS MADE, FROM JANUARY 1, 1814, TO DECEMBER 31, 1863, AT THE ROYAL OBSERVATORY.

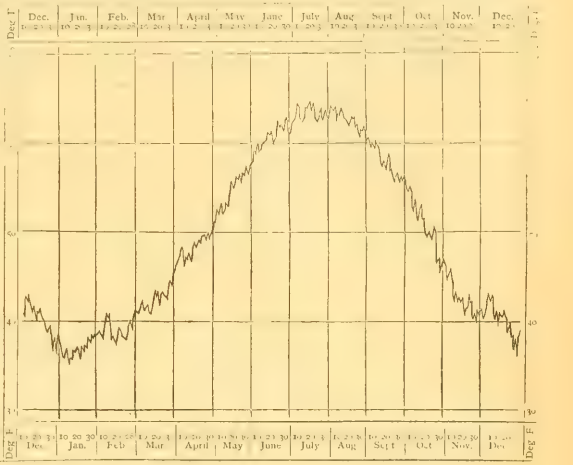

TABLE SHOWING THE ADOPTED MEAN TEMPERATURE OF EVERY DAY IN THE YEAR, AS DETERMINED FROM ALL THE THERMOMETRICAL OBSERVATIONS TAKEN AT THE GARDENS OF THE ROYAL HORTICULTURAL SOCIETY, CHISWICK.

Days of the Month.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	36.8	39.1	40.6	45.5	51.0	58.4	62.7	63.2	60.0	54.7	45.7	41.3
2	36.7	39.2	40.7	45.7	51.3	58.6	62.8	63.2	59.8	54.5	45.5	41.3
3	36.6	39.2	40.8	45.9	51.5	58.8	62.9	63.2	59.6	54.2	45.4	41.3
4	36.5	39.3	41.0	46.2	51.7	59.2	63.0	63.2	59.5	54.0	45.1	41.3
5	36.4	39.3	41.1	46.5	52.0	59.4	63.1	63.1	59.4	53.7	44.8	41.2
6	36.4	39.3	41.3	46.7	52.2	59.6	63.1	63.1	59.3	53.4	44.5	41.2
7	36.3	39.3	41.5	46.9	52.5	59.7	63.2	63.0	59.1	53.0	44.1	41.1
8	36.3	39.3	41.6	47.1	52.8	59.9	63.2	62.9	59.0	52.6	43.8	41.0
9	36.3	39.2	41.7	47.2	53.0	60.0	63.2	62.9	58.9	52.5	43.5	41.0
10	36.4	39.2	41.8	47.3	53.2	60.1	63.3	62.8	58.7	52.3	43.3	40.9
11	36.4	39.1	42.0	47.5	53.4	60.2	63.3	62.8	58.5	52.1	43.1	40.8
12	36.5	39.1	42.1	47.6	53.6	60.4	63.3	62.7	58.3	51.7	42.8	40.7
13	36.6	39.0	42.2	47.7	53.8	60.5	63.3	62.6	58.1	51.4	42.5	40.7
14	36.6	39.0	42.3	47.9	54.0	60.6	63.3	62.5	58.0	51.3	42.3	40.6
15	36.7	39.0	42.4	48.1	54.3	60.7	63.4	62.4	57.8	51.0	42.2	40.5
16	36.7	39.0	42.6	48.3	54.6	60.9	63.4	62.3	57.6	50.7	42.1	40.4
17	36.8	39.1	42.7	48.4	54.8	61.1	63.4	62.1	57.3	50.5	42.0	40.2
18	36.9	39.1	42.8	48.6	55.1	61.2	63.4	62.0	57.2	50.1	41.9	40.0
19	37.2	39.2	43.0	48.7	55.4	61.4	63.4	61.8	57.1	49.8	41.8	39.8
20	37.4	39.3	43.2	48.8	55.7	61.5	63.4	61.6	56.9	49.5	41.7	39.7
21	37.5	39.4	43.4	49.0	55.9	61.6	63.4	61.5	56.7	49.2	41.6	39.4
22	37.7	39.6	43.5	49.2	56.1	61.7	63.4	61.4	56.6	48.8	41.6	39.2
23	37.9	39.7	43.7	49.3	56.3	61.8	63.4	61.3	56.3	48.4	41.6	38.9
24	38.3	39.8	43.9	49.5	56.4	62.0	63.4	61.2	56.1	48.0	41.5	38.7
25	38.4	40.0	44.1	49.6	56.6	62.1	63.4	61.0	55.9	47.6	41.5	38.4
26	38.5	40.1	44.2	49.7	56.7	62.2	63.4	60.9	55.7	47.3	41.4	38.1
27	38.6	40.2	44.4	49.8	56.9	62.3	63.3	60.8	55.5	47.0	41.4	37.8
28	38.7	40.4	44.5	50.1	57.2	62.4	63.3	60.7	55.4	46.6	41.4	37.6
29	38.8	..	44.7	50.4	57.5	62.5	63.3	60.6	55.2	46.4	41.4	37.5
30	38.9	..	44.9	50.7	57.9	62.6	63.3	60.4	55.0	46.2	41.3	37.3
31	39.0	..	45.3	..	58.1	..	63.3	60.2	..	45.9	..	37.1
Means ..	37.2	39.4	42.7	48.1	54.6	60.8	63.3	62.0	57.6	50.5	42.8	39.8

The mean for the year = 49°.93

TABLE SHOWING THE ADOPTED MEAN TEMPERATURE OF EVERY DAY IN THE YEAR, AS DETERMINED FROM ALL THE THERMOMETRICAL OBSERVATIONS TAKEN AT THE ROYAL OBSERVATORY, GREENWICH, IN THE YEARS FROM 1814 TO 1863.

Days of the Month.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov	Dec.
	°	°	°	°	°	°	°	°	°	°	°	°
1	37.3	37.8	40.2	44.6	49.8	57.0	60.9	62.4	59.0	53.9	46.4	42.1
2	37.0	37.7	40.2	44.8	50.3	57.3	61.1	62.4	58.7	53.8	46.3	42.2
3	36.7	37.8	40.2	45.0	50.8	57.4	61.3	62.4	58.4	53.7	46.1	42.3
4	36.4	38.0	40.1	45.2	51.2	57.3	61.5	62.3	58.2	53.5	45.9	42.2
5	36.2	38.3	40.1	45.4	51.5	57.2	61.7	62.2	58.0	53.3	45.7	42.2
6	36.0	38.6	40.1	45.4	51.7	57.0	61.8	62.1	57.9	52.9	45.5	42.1
7	35.8	38.8	40.2	45.4	51.7	57.0	61.9	62.0	57.8	52.5	45.3	42.0
8	35.7	38.9	40.3	45.4	51.7	57.3	61.7	62.0	57.8	52.1	45.0	41.7
9	35.8	38.9	40.4	45.3	51.5	57.7	61.7	62.1	57.7	51.8	44.7	41.3
10	35.9	38.8	40.6	45.2	51.3	58.0	61.8	62.1	57.7	51.6	44.4	41.0
11	36.0	38.6	40.9	45.1	51.2	58.3	61.8	62.1	57.6	51.4	44.1	40.7
12	36.1	38.4	41.2	45.0	51.2	58.6	62.0	62.0	57.5	51.2	43.7	40.6
13	36.2	38.3	41.4	44.9	51.4	58.8	62.3	61.9	57.3	50.9	43.5	40.5
14	36.3	38.2	41.5	45.0	51.7	59.0	62.5	61.7	57.2	50.6	43.2	40.4
15	36.4	38.1	41.7	45.3	52.0	59.0	62.5	61.5	57.1	50.3	42.9	40.2
16	36.5	38.1	41.9	45.5	52.3	59.0	62.4	61.3	56.9	50.0	42.6	40.0
17	36.6	38.2	42.0	45.7	52.6	59.0	62.2	61.1	56.7	49.8	42.3	39.9
18	36.7	38.3	42.1	46.0	52.9	59.1	61.9	61.0	56.5	49.6	42.0	39.6
19	36.9	38.5	42.2	46.4	53.3	59.2	61.6	60.9	56.2	49.3	41.8	39.4
20	37.0	38.7	42.2	46.7	53.5	59.5	61.4	60.8	56.0	49.1	41.6	39.1
21	37.2	38.8	42.3	47.0	53.8	59.9	61.5	60.7	55.8	48.9	41.4	38.8
22	37.4	39.0	42.2	47.2	54.1	60.3	61.5	60.7	55.5	48.7	41.2	38.5
23	37.7	39.2	42.2	47.4	54.3	60.7	61.6	60.6	55.2	48.5	41.1	38.1
24	37.9	39.4	42.2	47.6	54.6	61.2	61.7	60.5	55.0	48.2	41.0	37.8
25	38.1	39.6	42.3	47.7	54.9	61.6	61.8	60.5	54.8	47.9	40.9	37.6
26	38.3	39.8	42.5	47.9	55.2	61.7	61.9	60.3	54.6	47.6	40.9	37.4
27	38.4	39.9	42.9	48.1	55.4	61.6	62.0	60.1	54.4	47.3	41.1	37.3
28	38.4	40.1	43.2	48.4	55.7	61.5	62.2	59.9	54.2	47.0	41.3	37.2
29	38.3	..	43.6	48.8	56.0	61.4	62.3	59.7	54.1	46.8	41.6	37.3
30	38.1	..	44.0	49.3	56.3	61.1	62.4	59.4	54.0	46.6	41.9	37.4
31	37.9	..	44.4	..	56.6	..	62.4	59.2	..	46.5	..	37.5
Means ..	36.9	38.7	41.7	46.2	52.9	59.1	61.8	61.2	56.6	50.2	43.2	39.8

The mean for the year = 49°.03.

Home Correspondence.

The Gem in the Head of the Toad.—The toad, the elephant, the swine, the rhinoceros, the hippopotamus, the tapir, the centipede, as well as numbers of the organisms of ocean, are entirely destitute of visible beauty, while some of them, instance the male Japanese hog, is a model of supreme ugliness. It is a remarkable fact that in the flora and fauna of former eras the principle of beauty and of grace appears not to have been so highly developed as it now is, nor, perhaps from the density of fogs and clouds, was the splendid magnificence of the day or the spangled infinite depths of the starry night opened up to be cognisable. Has this embellishment of the flora and fauna and splendour of the face of Nature only been introduced when beings came to be developed able to enjoy it? As proof of the absence of beauty in ancient eras, instance the want, as far as we can judge, of flowering plants (the term flora being improper), and the abundance of ugly saurian monsters and other uncouth types of animals. There is no means of judging whether the delightful aromas of the present flora have been wanting or present in the ancient, but as these aromas are chiefly restricted to the flower, the probability is that they were wanting. The larger animals, at least, the rude direction animal life seems then to have taken, would not have been delighted with the attar of roses. This remarkable beauty and fragrance of flowers, and in some cases fragrance as well as beauty of foliage, does not extend to most of the fauna, and seems to have been found incompatible with the devouring nature of their being, and the forces necessary to locomotion. There is often much gracefulness of motion, elegance of form and beauty, and harmony of colour, especially in the bird class, with a sweetness in their vocal harmony. But the fragrance of flowers does not extend to the fauna. The most that the fauna can attain is an absence of odour; yet the poet sings:—

"There's kaims o' hinny 'tween my love's lips."

Others say a pearl drops out every time the lips are opened. In the case of Homer and of syrens this may be true. The breath of the cow is said to be sweet and salutary, and I have known an instance of the fragrance of the Allspice flower or Strawberry in the human breath, not obtained from artificial means or from vegetable fragrance. A mal-odour, however, exists in all animals that harbour in holes, where the air is necessarily corrupt. This extends even to humanity where the air breathed is not sufficiently freshened. When a little boy running wild in the country, I could scent the mal-odour of a town at a mile distant, and pursue a fox by the scent. This mal-odour is especially strong and repulsive in those which subsist upon animal food, especially the mustela or weasel class. And inventive constructive Nature employs this odour as a formidable means of protection, almost as repulsive as the defence of the poison fang or sting. In some of the serpent class the mal-odour is accompanied by poison fangs. It would seem that foul air was necessary to the creation of animal poisons, and that hydrophobia was generated in the fetor of the fox-hole. The foul air of the bee and wasp hive go to corroborate this. The incense of the flora has been used as a religious aid or stimulant—a power of attraction, especially in Romish rites; and in ancient religions it has been employed as an offering to propitiate the gods. This has been resorted to in milder climates, and with meeker races; but in ruder climates, and with coarser races, the priesthood, such as our Druids, as well as those of the primitive Jews, and even those of more modern Christians, have found that human sacrifice, whether on the stone altar, or, as in later times, bound to the stake as heretics, forming *autos-da-fé*, or burnt on the witch hill as witches, had a much more exciting effect upon collected multitudes than incense or anything else in promoting superstition, terror, and priest power. But my wilful fancy has run away from my repulsive subject into a long preamble, which I hope my readers will forgive. My subject was the ugly, ungainly toad, but which we would love had we no other vital companion, such is the communicative, transmissive vital power of sympathy. Last summer I came upon a very fine spetimen of the toad in a locality rich in slugs, flies, and other insects. From its largeness I considered it a female, which in this class much exceeds the size of the male. Seeing me she stopped her march, in a rather awkward position, with a fore leg or arm up in the air, as if to take a step forward, and was seized with catalepsy. The sun had been for some time up, and I observed a fine, shining diamond upon the centre of her broad forehead, about the size of a pea. I had often heard of a beautiful gem existing in the head of the toad, but accounted for the poetic idea by supposing it had arisen from the brilliant eyes, more remarkable from their coarse uncouth surrounding. Here was the brilliant gem we had so often heard of. Upon examining the back of the creature I found a number of small shining specks or gems of the same nature as the large one on the forehead. Upon touching the large one on the brow I found it to consist of a gelatine, soft and shining, and I considered it and all the smaller gems on the back to be an exuded poison, given out by especial pores and glands, supplied by Nature as a means of defence, the poor creature being otherwise defenceless. I have, however, held a toad in my hand and patted one gently on the back with my fingers without any injurious effect. But my hand was a little hardened with work. I have seen a young dog seize a toad in his mouth and immediately throw it out, the dog's mouth foaming for near an hour afterwards, and he running about rubbing it on the grass and the ground. The dog's mouth having only a mucous membrane cover was different from my hardened hand. I have seen a toad exposed by boys to a treatment of stoning and pelting that would have been destructive to life in any other creature, yet when thrown into water it showed remaining life. The creature seemed almost as indestructible as a piece of india-rubber. Being closed up from the air, the chemical composition of this creature seems so well balanced and kept so well in hand by the vital attractions as to be permanently fixed, like those in a dried seed, and only requiring exposure to the air for the vital functions, after many centuries, to be resumed. *Patrick Matthew, Gourdiehill, Errol.*

Fruit Prospects.—Peaches and Nectarines have set their blooms most abundantly here and look well. The trees have been protected by putting small branches of evergreens over them. This year we used the blue-berried Cedar for the purpose, and found it answer admirably. We only removed the branches last week. Apricots are not so well covered with fruit. Plums and Pears are thickly set. Rain is much wanted to wash the trees, &c., none having fallen since the 13th, and only slight showers then, so that all growing crops are wanting moisture. *M. F., Ryton-on-Dunsmore.*

Alternation of Function in Palms.—The phenomenon which I have described under the name of "Alternation of Function" in Palms, is neither so new and strange, so entirely without parallel in other families of plants, nor so fraught with alarming consequences, as Dr. Seemann represents, p. 418. He facetiously compares it to a husband offering to relieve his wife, at odd times, of the burden of childbearing. It would be a truer simile to compare it to a wife saying to her husband, "What do you think of our wearing the breeches turn and turn about—you your three months, or six, or twelve months, and then me, for the same length of time?"—a state of things not quite unknown in some households, and which I am told some husbands would gladly compound for. But if we would personify all the phenomena of plant-life by human and other intelligent actors, we should see infinitely greater marvels; as, for instance, in the agency of insects in fertilising Orchids and other flowers. The question between myself and Dr. Wendland turns entirely on the existence of unisexual spadices, which I affirm and he denies. He says he has "seen hundreds of spadices of Geonoma, but never any essential deviation—never any unisexual spadices." I know not how many spadices of Geonoma I may have "seen," but I examined all those I described; and, not in Geonoma alone, but in every other genus of Palms, whenever I have been able to thoroughly examine the inflorescence, I have never failed to detect it in some polygamous practice, more or less glaring. Even in Nunnezharia, which he cites as a model of dioicity, I found, in examining a great many male spadices of N. fragrans, some flowers with the rudimentary pistil entire and merely trisulcate; others with it deeply tripartite, and in some very rare cases the three carpels were perfect and stigmatiferous, *i.e.*, the flowers were hermaphrodite—an instance (as I take it) of reversion to their primitive condition. Such an hermaphrodite flower is figured by Ruiz and Pavon. I have again looked through all my notes, made on living plants of Geonoma in the forest, and I see no reason to doubt that I described correctly what I saw, namely, that in certain species the abortion of all the male flowers on some spadices leaves the latter purely female, and the abortion of all the female flowers on other spadices renders them male. Exactly the same thing is affirmed by Martius of the genus Orania: "Flowers monoicous on different spadices; the male spadices with twin flowers, and the rudiment of a female flower between them." Elæis and Kunthia are described to have "Flores monoici in diversis spadicibus." I myself have seen both male and female spadices on the same plant in Wettinia, Geonoma and Leopoldinia. Are we to suppose that these spadices occur at random, along the whole length, and throughout the life, of a Palm-stem; or is it not more probable that their sequence is regulated by some law? I thought I had made out a law of alternation in certain species; and although it should be proved that what I attributed to the species belonged only to the individual, it could not at all affect the fact of the existence of a far more important law of progression, from hermaphroditism towards dioicity, which I find to pervade the entire family of Palms. *Richard Spruce.*

Hose for Watering Streets.—Our attention has been called to an inquiry at p. 700, regarding the apparatus in use in Paris for watering the streets and parks. The Local Board of Health here has used this apparatus for many years for watering the streets, and is quite satisfied with its working. Those in use here are larger than those in Paris, but are similar in other respects. We shall be pleased to give your correspondent every information if he will communicate with us. *C. Hart & Sons*, 13, *Gun Street, Reading.*

—In answer to your correspondent's inquiry as to hose for watering the streets as used in Paris, allow me to inform him that the simplest form is gas piping in 12-foot lengths, put upon small cast-iron wheels, and united by india-rubber hose. It is very cheap, and does well enough for lawns and for broad walks. I cannot make it answer for general garden purposes, it is difficult to move up and down the cross paths, and runs riot amongst the borders and edgings when drawn from place to place. *R. T. F.*

Roses.—These Roses have bloomed beautifully under glass in small pots:—Marquise de Montemart, silvery white with delicate blush centre; Edouard Morren, rich pure rose; and Souvenir de M. Poiteau, carmine-rose. I can so far highly recommend them. These are just come, and appear to be nice specimens, and I hope may be good:—Princess Christian, Prince Leopold, Paul Neron, Mdlle. Eugenie Verdier, Marquise de Castellane, Baron Chaurand, Louis Van Houtte, and Albion. *W. F. Radclyffe.*

Sitona lineata.—About a fortnight ago I selected some plants in a row of Peas apparently injured by Sitona lineata, and on examination of the roots could not find any difference in appearance from the others. Now, however, I am more fortunate. Yesterday I chose a spot near to where I had noticed the beetles the most closely earlier in the season, and where now the missing plants and the injured leaves point particularly to their former presence. Here I carefully loosened the earth with a large stick-knife, and carefully removed it, until I was able to lift the Pea-plants out with the roots attached, and found, with scarcely any exceptions, that the plants had galls fully formed on the large root in bunches—in rows or single. I only noticed one gall, I think, on the small side roots. Opening a good-sized gall, I found it hollow, and seemingly decayed; a bunch that I opened contained a number of transparent white tenants, various in kind it seemed to me, and from the galls on one side the bunch appearing each to have a little (a very little) puncture, I imagined that the active inhabitants were parasites, or at least extra lodgers. In this bunch of galls the divisions appeared to have crumbled or decayed between the cells (or possibly had been eaten away). In another gall, still in good order, the inhabitants looked to me, as far as I could make out, very like coleopterous larva. I have not examined further, as I was anxious you should have all the specimens for your own inspection, and I send them with some leaves on to identify them as Peas. You will also notice the stems appear gnawed. Might not this, if a case of beetle gnawing past, and beetle presence future, be another instance—to borrow a word from Dr. M'Cosh—of special ends in creation to keep the too great development of roots from stifling the young larvæ? *O.*

[The galls on the specimens sent by our correspondent prove to be all empty, the inhabitant having left them after they had served its purpose, and most of them already in an incipient stage of decay. They exactly correspond in size and appearance to the figure given by Curtis ("Farm Insects," pl. L., fig. 7) of the gall caused by Sitona lineata. *A. M.*]

An Early Gathering of Mushrooms.—I gathered in the park here (South Herts) an excellent dish of Mushrooms of all sizes on Thursday the 19th inst. They consisted of the lighter pink film variety, and were, when cooked, excellent. I have never gathered such Mushrooms so early in the year, and from open pasturage, before. *Opus.*

Societies.

CRYSTAL PALACE, *May* 21.—Seldom has there been at the Crystal Palace a better exhibition than that held on Saturday last. The stove and greenhouse collections brought together on this occasion were vastly in advance of anything shown in former years. Orchids, Heaths, and Azaleas, were rather under the average of excellence, though some very meritorious collections of these were shown. It was thought that the competition for the liberal prizes offered for bouquets would be an interesting feature in the day's arrangements, and that we might have the pleasure at least of seeing something good, if not new; but in this case we were much disappointed, for there was a lamentable deficiency of merit in nearly all the exhibitions. It would appear, to judge from the quantity of ungainly bouquets exhibited, that size was the first point to be considered, but to our mind a greater error of judgment could not well be committed. In the classes for three, to comprise one each for the wedding, the ball, and the table, we expected to see more originality in design. The severely formal flat style should be abandoned. We also want a change in the composition by introducing more green in the shape of foliage, and we should like to see the ordinary backing up of Ferns dispensed with, and a substitute found in some other direction. The bridal bouquets in particular should be made lighter, and the more they are unlike those shown on Saturday last the better.

Returning to the stove and greenhouse plants, which stand first in the schedule, we come to the 15 staged by Mr. Baines, gr. to H. Micholls, Esq., Southgate House, Southgate, which were brought out in wonderful perfection, and were undoubtedly the best grown group in the show. His specimen of Darwinia (Hedaroma) tulipifera, was magnificent; Erica ventricosa coccinea minor, was a very handsome plant; Aphelexis macrantha purpurea, and A. humilis rosea, both perfect globular masses of flowers; Boronia pinnata, a very pretty bush; Ixora coccinea, a large well grown plant with immense trusses of orange-scarlet flowers; a similar specimen of I. aurantiaca; a large beautifully flowered bush of Epacris

Eclipse, Clerodendron Balfourii, very good; Erica Cavendishiana, a splendid specimen; Eriostemon neriifolius, a beautiful specimen; Azalea Iveryana, 6 feet high and nearly 5 feet through, literally covered with snowy white flowers; A. coccinea, a dwarfer example but equally well flowered; a very fair specimen of Bougainvillea glabra, and Anthurium Scherzerianum with 13 finely expanded spathes. Mr. Chapman, gr. to J. Spode, Esq., Hawkesyard Park, Rugely, was second with, amongst others in a very good collection, excellent specimens of Erica ventricosa coccinea minor, Pimelea mirabilis, Darwinia macrostegia, Pimelea spectabilis rosea, Acrophyllum venosum, and Eriostemon pulchellus, &c. Mr. B. Peed, gr. to Mrs. Tredwell, St. John's Lodge, Lower Norwood, was 3d, and Mr. J. Wheeler, gr. to J. Philpott, Esq., Stamford Hill, 4th. In the amateurs' class for 10 the 1st prize was taken by Mr. Wright, gr. to E. H. C. Roberts, Esq., Sunnyside, Regent's Park, with a very handsome specimen of Bougainvillea glabra, very fair Medinilla magnifica, Darwinia (Hedaroma) tulipifera, very good; a very nice Aphelexis macrantha purpurea, a large bush of Erica Cavendishiana, well bloomed, and a smaller one of E. depressa multiflora; Dracophyllum gracile, good; and a fair specimen of Ixora coccinea superba. A more uniform, neater, and generally better grown lot, from Mr. J. Ward, gr. to F. G. Wilkins, Esq., Leyton, were placed 2d, on what account we did not learn. In this collection were Tremandra ericifolia, 4 feet through, and well covered with bloom; a very handsome Darwinia (Hedaroma) tulipifera, a much finer specimen of Stephanotis floribunda than is usually seen; Aphelexis macrantha purpurea, good; Epacris miniata splendens, a fine bush; the same of Erica Cavendishiana, and one of the best grown same of Erica Cavendishiana, and one of the best grown specimens of Dalechampia Roezliana rosea ever exhibited, quite 3 feet in height and diameter. The latter, however pretty it may be considered when in a small state, is evidently not striking enough for exhibition purposes. It looked dull and unattractive, and was probably the main cause of the otherwise unique collection being placed 2d. Other collections were also staged in this class by Mr. Carr, gr. to P. L. Hinds, Esq., and Mr. Wilkie, gr., Addison Road, Kensington. In the corresponding class for nurserymen, Mr. B. S. Williams exhibited an excellent group, and took the 2d prize, the 1st being awarded to Messrs. Jackson & Son, Kingston, Mr. Morse, Epsom, coming in 3d. Mr. Wright sent the best 6 stove and greenhouse plants, consisting of fine foliage and variegated plants, and others in bloom, comprising Phœnicophorium sumbellatum, very handsome; Cupania filifolia, a beautiful specimen; Gleichenia flabellata, very fine; Clerodendron Balfourii, Azalea Indiana, and Darwinia (Hedaroma) fuchsoides. Mr. J. Carr was 2d, and Mr. Wilkie 3d. In addition to the above, prizes were also offered for a group of stove and greenhouse plants arranged for effect, which brought forth an interesting display. The following exhibitors competed, and the prizes were awarded in the order named:—Messrs. Rollisson & Son, Mr. B. Peed, Mr. J. Woodward, gr. to Mrs. Torr, Garbrand Hall, Ewell; and Mr. W. Reid, gr. to Mrs. Hunt, Sydenham Hill.

As before mentioned, the Cape Heaths were not so numerous as heretofore, but as a whole they were in very good condition. The best 8 in the nurserymen's class came from Messrs. Jackson & Son, and consisted of exceedingly well grown and bloomed E. tricolor Wilsoni, E. tricolor dumosa, E. ventricosa coccinea minor, E. ventricosa, E. perspicua nana, E. depressa multiflora, and E. picturata; whilst a medium-sized uniform group from Mr. Morse came in 2d. In the corresponding class for amateurs, Mr. B. Peed stood 1st with a fine collection, including the pretty E. ventricosa coruscans, E. Lindleyana, good, E. Candolleana, and E. perspicua; Mr. J. Ward was 2d, and contributed in his group E. aristata major and E. tricolor Wilsoni, both very fine, and rich in colour, &c. Mr. J. Carr was placed 3d, and Mr. J. Wheeler 4th. Mr. J. Ward had the best 6 in the open class, which included very young specimens of E. florida, E. eximia superba, E. Cavendishiana, E. tricolor Wilsoni, E. Fairiana, and E. Candolleana. Mr. G. Wheeler and Mr. B. Peed, who both exhibited very commendable groups, were respectively 2d and 3d.

The best group of Azaleas in the show was contributed in the amateurs' class for 8, by Mr. S. M. Carson, gr. to W. G. Farmer, Esq., Cheam. They were quite 6 feet high, of a beautiful pyramidal form, and bloomed to perfection, contrasting favourably with the large, worn-out specimens from other quarters. The varieties were, Triumphans, Criterion, Symmetry, Model, Exquisite, Formosa, and Holfordi, &c. Mr. W. Neighbour, gr. to Sir W. Clayton, Bart., Harleyford, Great Marlow, and Mr. A. Wilkie were equal 2d; and Mr. G. Wheeler, 3d. The last-named was 1st for 6, and Mr. W. Chapman 2d. Mr. B. S. Williams took both 1st prizes in the corresponding classes for nurserymen, with first-rate collections; Messrs. J. & C. Lee being 2d for 8, and Mr. Turner for 6.

The display of Orchids was much below the average, Mr. B. S. Williams sent the best 10, and took 1st honours, having Cypripedium barbatum superbum, a fine specimen, with about three dozen handsome flowers; Odontoglossum luteo-purpureum, four beautiful spikes; Cattleya Mossiæ superba, good; Vanda suavis, with four magnificent spikes; and Dendrobium densiflorum, &c. Mr. G. Young, Casina Nursery, Dulwich, was 2d. Mr. J. Ward contributed the best 12, amongst which were Epidendrum macrochilum, Phalænopsis grandiflora, Oncidium serratum, Cattleya Mossiæ, Odontoglossum bictoniense, and Oncidium bifolium, in excellent condition. For 20, Mr. J. Burnett, gr. to W. Terry, Esq., Peterborough House, Fulham, was 1st with a very nice lot, including two nicely coloured specimens of Cattleya Mossiæ, the interesting Selenipedium caudatum, with a fine tail-like appendages, about 2 feet long; Dendrobium macrophyllum giganteum, with three pretty spikes; a very nice Cypripedium barbatum superbum, &c. Mr. Wright came 2d. In his collection were two finely-flowered examples of Dendrobium nobile, Oncidium leuchochilum, with four grand spikes; Odontoglossum citrosmum superbum, very fine white; and Oncidium Philipsianum, with good spikes, &c. Mr. B. Peed was 3d with a neat collection.

The Pelargoniums were very effective, the fancy varieties being remarkably well done. Messrs. Dobson & Sons, Mr. J. Ward, and Mr. D. Windsor all came in for 1st prizes. Mr. Turner was 1st for 10 Roses in pots, with an excellent lot, Messrs. Paul & Son being 2d; the smallness of the blooms in the latter collection was very noticeable; they were not at all like the glorious flowers we usually see from the Cheshunt nurseries.

Amongst the miscellaneous collections were several boxes of cut Roses from Messrs. Paul & Son, a fine group of plants from Messrs. Downie, Laird & Laing, a rich collection of hardy flowering plants from Mr. Ware, a choice collection of herbaceous Calceolarias from Messrs. Dobson & Son, a collection of Tulips from Mr. Turner, and from Messrs. Lane & Son a group of Rhododendrons. Mr. W. Chard, Salisbury, sent a collection of cut Roses, and the Rev. H. H. Dombrain a group of Auriculas. First-class Certificates were awarded to Mr. Turner for Azaleas Roi d'Holland and Reine Marie Henriette; to Mr. W. Paul for Pelargoniums Avalanche and Waltham Bride; to Mr. Parsons, Brighton, for Reseda odorata eximia; to Messrs. Carter & Co. for tricolor Pelargonium Lothario; to Mr. B. S. Williams for Oreodoxa plataniifolia, Thrinax grandis, Astrocaryum Niburgianum, Calamus ciliaris, and Caladium Meyerbeer; and to Messrs. A. Henderson for Licuala peltata [?]. Dæmonorops plumosus, Ficus Cooperi, Browna erecta, and Phœnix sylvestris. The system of awarding certificates here seems "slow but sure," if not quite satisfactory, seeing that the three latter plants have been in cultivation for some years, whilst the beautiful Trichopilia crispa marginata, Miltonia festiva, Livistonia rotundifolia, and other equally deserving plants were passed unnoticed.

ROYAL BOTANIC: *May 25 and 26.*—Fine weather and a newly-devised schedule brought together a very successful exhibition on this occasion. The large classes for stove and greenhouse plants, which used to be the great attraction of these late spring exhibitions, were somewhat missed; nevertheless, Mr. Don, the superintendent of the gardens, was enabled, with the abundance of excellent materials at his command, to arrange the whole in a very pleasing and satisfactory manner. The large classes of stove and greenhouse plants having been dispensed with, prizes were offered in their stead for groups of such plants arranged for effect. The conditions were that any number, size, and kinds of plants would be allowed. They were to be arranged as for the decoration of a small conservatory, with climbers, hanging baskets, vases, or other accessories. Three groups were arranged in this manner, shown by Messrs. J. & C. Lee, Hammersmith; Messrs. A. Henderson & Co., Pine-apple Place, Edgware Road; and Messrs. Rollisson & Son, Tooting; and the prizes were awarded in the order named. Recesses in the large tent were apportioned for these displays, and they were tastefully filled with Palms, Ferns, Orchids, and flowering plants, generally of various dimensions. No doubt such exhibitions would do much good in creating a taste for successful grouping, if they could only be got up so as to represent a furnished greenhouse as nearly as possible; but as shown in the positions assigned to them here and at the Crystal Palace, they are questionable, as it is doubtful whether the same plants would be suitable for a greenhouse proper. Prizes were also offered for a group of decorating plants arranged for effect by nurserymen; these were competed for by Messrs. E. G. Henderson, Mr. Ware, and Mr. J. Aldred, Kilburn. The collections from the two former were arranged on raised banks of a semi-oval form; and in the case of Messrs. Henderson's group, which took the 1st prize, were arranged in the following manner:—Six triangular-shaped shallow boxes, filled in the centre with different kinds of Coleuses and Iresines, with a band of Pyrethrum Golden Feather, and an outer edging of Selaginella Kraussiana, formed the front edging. Behind these were other little square boxes, filled with Coleuses, tricolor and other Pelargoniums, some very fine Stocks, several variegated forms of herbaceous plants and succulents, &c. Mr. Ware's group consisted of an outer margin of the Pyrethrum Golden Feather, then distinct rows of Echeveria metallica, E. secunda glauca, Funkia viridi-marmorata, and Centaurea, the space behind being filled in almost entirely with variegated foliaged herbaceous plants, without any flower or relief whatever. Messrs. Jackson & Son, of Kingston, were the only exhibitors in the nurserymen's class for 20 greenhouse plants in pots not exceeding 8 inches in diameter. In this collection were very neat specimens of Azalea Grand Crimson, very bright in colour; A. Extrani, also good; two specimens of Erica Cavendishiana, very healthy and well flowered; Pimelea Hendersonii, very rich in colour; and well flowered examples of Erica ventricosa coccinea minor, E. ventricosa albo-cincta, E. magnifica, &c. Messrs. Lane & Son sent the best 12 Rhododendrons, in pots not exceeding 8 inches in diameter, which were a nice, well bloomed lot. The best single specimen—a small but good one of Lord John Russell—also came from the Berkhampstead establishment.

Cape Heaths were divided into two open classes, for 8 and for 12 in 8-inch pots respectively. The kinds were nearly identical with those shown at the Crystal Palace, and therefore need not be repeated. Mr. J. Ward, gr. to F. G. Wilkins, Esq., had the best 8, fine groups being also staged by Messrs. Jackson & Son, Mr. J. Wheeler, and Mr. Carr. In the class for 12, which brought out some very promising young stuff, the two former exhibitors were placed equal 1st, and Mr. Wright 2d.

The best 6 Azaleas in the amateurs' class came from Mr. S. M. Carson, and in the corresponding class for nurserymen from Mr. B. S. Williams—Mr. Turner being placed 2d, and Mr. Tanton, Epsom, 3d; whilst for 12 in 16-inch pots, a very neat collection, which took the 1st prize, was contributed by Mr. J. Little, gr. to J. Goddard, Esq., Royden Lodge, Essex; Messrs. Lane & Son and Mr. G. Wheeler being respectively 2d and 3d.

The Orchids were grouped on a bank by themselves, the display being of about the average description. In the class for 8, Mr. Burnett, gr. to W. Terry, Esq., sent a selection from his Crystal Palace collection, and came in 1st; Mr. J. Ward being placed 2d with some nice plants, and Mr. Eckford, gr. to the Earl of Radnor, Coleshill, 3d. In the latter collection were a good Dendrobium nobile, Calanthe veratrifolia, with eight good spikes, and Saccolabium retusum, with four spikes, two of them being over 2 feet in length, and nicely expanded. Mr. B. S. Williams was 1st for 6, Mr. Parker, Tooting, being placed 2d, and Mr. Bull, Chelsea, 3d,—all exhibiting very good collections. The best single specimen was a fine Phalænopsis grandiflora, with two good spikes, on which were twenty nicely expanded flowers, from Mr. Fairbairn, gr. to the Duke of Northumberland, Syon House; Mr. Bull coming in 2d with Oncidium sarcodes, a good specimen, with two admirable spikes; Mr. Wright, who showed a tall specimen of Vanda suavis, and Mr. J. Douglas, gr. to Sir S. H. Waterlow, who had a very fine Cattleya Mossiæ, were placed equal 3d.

Stove and greenhouse plants, both in the amateur and nurserymen's classes for 3, were very well represented, some excellent examples being shown. Mr. Wright and Mr. B. Williams were 1st in their respective classes; Mr. T. Godfrey, gr. to J. Anderson, Esq., Ankerwycke, Mr. Carr, Mr. G. Wheeler, Mr. Wilkie, and Messrs. Jackson & Son, also competing. The best pair of Tree Ferns came from Mr. B. S. Williams, and the same of Palms from Mr. Fairbairn; whilst Mr. Hill sent the best three exotic Ferns, which consisted of Cibotium Schiedei, a fine specimen, but rather pale, Thamnopteris Nidus, very handsome, and a well-grown specimen of Drynaria morbillosa; Mr. Carr, who came 2d, had Lomaria gibba, Platycerium grande, and Dicksonia antarctica, in excellent condition; Mr. G. Wheeler, Mr. Wright, and Mr. Wilkie also competed.

Pelargoniums, notwithstanding the absence of prizes for fancy varieties in the schedule, made a very good display. The names of the varieties shown having nearly all been given before, we need only state that the 1st prize group, sent by Mr. Ward, gr. to F. G. Wilkins, Esq., comprised excellent examples of good cultivation, and that Mr. D. Windsor's 2d prize lot was very little inferior. Of Roses, Messrs. Paul & Son, and Mr. Turner, were the principal exhibitors, and the winners' honours were divided between them. The amateurs' class was well represented. Mr. James was 1st for Cinerarias, and the 3d prize was awarded to Mr. Fairbairn, both groups being very inferior, which cannot be wondered at considering the lateness of the season.

Amongst miscellaneous subjects were fine groups of Rhododendrons and Azaleas, from Messrs. Lane & Son; an excellent collection of herbaceous Calceolarias, from Mr. Fairbairn; ten boxes of cut Roses from Messrs. Paul & Son, including one of Maréchal Niel; and a smaller collection from Mr. Cranston, of Hereford; whilst from Mr. R. Wood, gr. to W. B. Kellock, Esq., Stamford Hill, came a nice collection of Agaves, including a very handsome specimen of A. filifera, quite two feet across.

A considerable number of subjects was shown in the class for new plants, the largest contributor being Mr. Bull of Chelsea. Amongst those furnished by him we noted in a flowering state the curious Dracontium elatum, of which an account was given at p. 344. There were also many Palms and Cycads. Among the latter, Encephalartus giganteus, dentatus, mirabilis, and expansus—all recent and promising though undeveloped acquisitions from South Africa—and Ceratozamia Kusteriana, were the most prominent for foliage, while E. nobilis bore a partially grown cone. Of the former, we specially noted Verschaffeltia melanochætes, a fine and rare species, represented at p. 697; Areea nobilis, a spiny species, with short pinnate fronds; Deckenia nobilis, somewhat similar in character; Welfia regia, with bifid leaves on slender stalks; Thrinax havanensis, a particularly elegant Fan Palm; Ptychosperma Alexandræ, a bold pinnate species; and P. regia, having the leaves unequally pinnate; Geonoma elegans, with slender pinnate leaves; G. lacerata, a dwarf bilobed species, with lacerate edges, and a tendency to become fenestrate at the base; G. speciosa, somewhat similar in character, but less distinctly bilobed; Chamædorea spectabilis, remarkable for its few broad pinnæ; Licuala peltata, with peltately palmate leaves, and truncated lobes; and Dæmonorops plumosus, a remarkably elegant free-growing pinnate species.

In the same group were some pretty plants of the dwarf, shrubby habited, silvery-leaved Dorstenia argentata; Piper futokadsura, which has more botanical than horticultural interest, being a hardy counterpart of the tropical black pepper of commerce; Macadamia ternifolia, formerly described by us, and interesting as a fruit-bearing plant; Cupressus Lawsoniana erecta viridis, one of the finest of evergreens; and Dracæna excelsa, a handsome South Sea Island plant, with broad recurved leaves of a deep bronzy tint variegated with rosy red. Finally, Mr. Bull had a good plant of the new Oncidium cryptocopis, with deep mahogany-coloured flowers having a narrow yellow border, and remarkable for its two elongated lateral sepals and its scandent flower-scape. Another considerable group was shown by Messrs. Veitch & Sons, of Chelsea. Here also were many Palms and Cycaloths, as Beccarinia nobilis, Euterpe sylvestris, Oncosperma Houtteanum, a charming little pinnate-leaved plant, with spiny leaf-stalks; Carludovica rotundifolia, a particularly striking Cycloth, remarkable for its erect petioles and roundish deeply-lobed lacerated leaf-blades; Rhapis humilis, of a most distinct habit, the stems being furnished with elegant little palmate fronds, so as to form leafy columns; Seaforthia Veitchii, a good addition to our pinnate-leaved Palms; Geonoma imperialis, with elegant drooping pinnæ; and G. pumila, a slender pinnate Palm, remarkable for its unequal pinnæ. In this collection was also a good plant of Phormium Colensoi variegatum, with white-edged leaves; a distinct-looking Araucaria, with stiff foliage, named A. elegans; Dracæna intermedia syringothyrsum, with its conspicuous raceme of long-stalked magenta-coloured flowers; Adiantum Veitchii, a very elegant bipinnate species of Maiden-hair; and last, but by no means least, Dieffenbachia Bowmanni, a species which appears likely to take up a high position amongst ornamental plants, having broad leaves, which are most elegantly marked

over nearly the whole surface with blotches of yellowish green. Mr. Williams, of Holloway, had a very interesting group—especially so as containing flowering specimens of the beautiful Tillandsia Lindeni, and of Cochliostema Jacobianum. Mr. Williams had also Nidularia Scherermetiffii, a spreading leaved bromeliad, with a red centre, and closely resembling Nidularia Carolinæ, as shown by Messrs. Veitch. With these were several good ornamental Palms, as Thrinax grandis, Dæmonorops plumosus, Welfia regia, Deckenia nobilis, and the little feather-fronded Calamus ciliaris, with Lomaria gibba crispa, a choice curly-leaved variety now being distributed by its fortunate raisers, Messrs. Cole & Sons. Messrs. Rollisson, of Tooting, further contributed to the display of Palms, by exhibiting Plectocoma elongata, with spiny petioled bilobed leaves; Korthalsia robusta, with Caryota-like pinnæ; Areca nobilis, Ptychosperma Alexandræ, Chamærops gracilis, a small-leaved species, apparently distinct. They had also a nice plant of the pretty narrow-leaved form of Pteris stramines, called attenuata, which is well worth growing amongst ornamental Ferns. From Messrs. E. G. Henderson & Son, of St. John's Wood, came a small plant of the double-flowered Hydrangea, called stellata prolifera, a plant which is likely to become useful in decorative gardening. There also came from the Wellington Road establishment a group of the charming Hoteia japonica variegata, with golden-veined leaves; and a pretty Saxifraga, marked "lancostana" (?leucostoma), with narrow ligulate leaves, and a dense dwarfish panicle of showy white flowers. From Mr. Atkins, of Painswick, came Erinus alpinus albus, a lovely pure white hardy rock plant; and Mr. R. Parker, of Tooting, showed a basketful of his brilliant golden blossomed Viola lutea major. Mr. H. Ley, of Croydon, had three very choice Ferns, the Lomaria gibba crispa already noted; Adiantum decorum, a South American species of much merit as a decorative plant; and A. excisum Leyii, a remarkably dense selected form of A. excisum multifidum, one of the most elegant of its race. Messrs. A. Henderson & Co. contributed, amongst other things, Zalacca edulis and Euterpe sylvestris, two elegant Palms, and a good plant of Dorstenia argentata. The distinct and hardy Struthiopteris japonica, a very remarkable Japanese Fern, came from Messrs. Standish & Co. of Ascot; and finally, in a group of Azaleas, Mr. Turner showed good examples of the varieties named Madame Van der Cruyssen, a bold flower with a fine rosy tint, and well spotted; and Roi d'Holland, a bright crimson scarlet, also nicely spotted. Most of the foregoing subjects received First-class Certificates.

CAMBRIDGE HORTICULTURAL SOCIETY: *May* 25.—A more fitting place than the charming gardens of King's College could scarcely have been selected for holding this exhibition, and in connection with it the Royal National Tulip Show. The show of the local Society was of a character in keeping with provincial shows in the Eastern Counties; the various plants were arranged under one large tent, the vegetables and fruit in a smaller one; while the productions of the Cambridge Florists' Society, all of which, excepting the Tulips, were very poor, were located in another small tent; a fourth tent was entirely occupied with Tulips, and here the general interest appeared to centre. Of the subjects staged in the large tent, stove and greenhouse plants, Azaleas, Pelargoniums, Ericas, and Caladiums, were the leading features, but none of these contained anything calling for special remark. Forced and other vegetables and salading, some Cherries in pots, and some capital Strawberries, especially a remarkably fine dish from Professor Adamson, were certainly above the average seen at this season of the year.

The first meeting of the National Tulip Show was held at Cambridge some 20 years ago, and the present year found the cultivators of this showy flower again meeting close by the sluggish waters of the Cam. The heat of the weather had materially affected the flowers of the Southern growers, while the Northern flowers were scarcely at their best; in the case of the former the flowers had become much "flushed,"—*i. e.*, the colours had run into the pure ground of the petals,—while some of the finest flowers were past their best. The blue riband of the meeting was a silver cup value five guineas, for 12 dissimilar Tulips, two feathered and two flamed of each class. This was won by Mr. S. Barlow, Manchester, with Royal Sovereign, beautifully marked and very fine; and Garibaldi, feathered; and Polyphemus and Sir J. Paxton, flamed bizarres; Martius 101, and Talisman, very fine, feathered; and Bacchus, finely flamed, and Duchess of Sutherland, flamed byblœmens; Mr. Lea, an exquisitely feathered flower, and Charmer, feathered; and Aglaia and Rose Celestial, flamed roses. This was a fine and even lot of flowers, very clean and pure, and finely marked. 2d, Mr. Richard Headly, Stapleford, with Richard Headly, finely marked, and Demosthenes, feathered; and Dr. Hardy and Prince of Wales, a highly coloured flower, flamed bizarres; W. E. Gladstone, a heavily feathered flower, and Mrs. Pickerell, finely marked, feathered; and John Kemble and John Thornley, flamed byblœmens; Sarah Headly, finely marked, and Queen of Beauty, feathered; and Semiramis and Circe flamed roses. 3d, Mr. D. Barber, Derby, in whose stand Mrs. Pickerell, Exile, a fine hardy feathered byblœmen; and Mary Barber, a fine flamed rose, was especially conspicuous. 4th, Mr. W. Lea, Leigh, who had, very good, Lord Byron and Sir J. Paxton, two feathered bizarres. A fifth stand was contributed by Mr. John Serjeant, Hastingfield. In another class for 12 varieties, the Rev. S. Cresswell, Radford, was 1st, with George Hayward and Storer's Seedling, the former finely marked, feathered; and Dr. Hardy and Sir J. Paxton, both very fine, flamed bizarres; Nepaulese Prince, feathered, and Duchess of Sutherland, Lord Denman (very fine), and Adela, feathered byblœmens; Vicar of Radford, beautifully marked, and Heroine, feathered; and Aglaia and Heroine, flamed roses, the last named variety being shown both as a feathered and flamed flower. 2d, Mr. W. Willison, Whitby, with J. Sanderson (very fine) and Sovereign, finely marked, feathered; and Sir J. Paxton (very fine) and Seedling 1283, flamed bizarres; Leache's Sarah and Mrs. Sharp, feathered; and Willison's Eliza and Nepaulese Prince, flamed byblœmens; Queen and Juliet, feathered; and Seedling 380 and Juliet, feathered roses. 3d, Mr. Thomas Haynes, Derby, who had Sir J. Paxton, feathered bizarre; Orion, feathered rose; and Lord Palmerston, flamed bizarre, of remarkably good quality. 4th, Mr. G. Pickerell, having a flower of Sir J. Paxton, bizarre, very finely flamed. In the class for 6 Tulips, one feathered and one flamed of each class, there were nine competitors, and the judges were some time in scrutinising the flowers. 1st, Mr. D. Barber, Derby, with Royal Sovereign, feathered; and General Lee, flamed bizarre; Mrs. Pickerell (very fine), feathered, and First-rate, flamed byblœmens; Heroine, finely marked, feathered; and Rose Celestial, flamed rose. 2d, Mr. G. Pickerell, Nottingham, with Storer's Model, feathered, and Sir J. Paxton, flamed bizarres: the first named a beautiful and finely finished flower; Mrs. Pickerell, feathered, and Duchess of Sutherland, flamed byblœmens; Heroine, feathered, and Aglaia, flamed rose. 3d, Mr. W. Willison, Whitby, with Henry Steward, feathered, and Sir J. Paxton, flamed bizarres; Leache's Sarah, feathered, and Queen, flamed byblœmens; Inimitable, feathered, and Captivation, flamed roses. 4th, Mr. J. P. Sharp, Birmingham. 5th, Mr. R. Headly. 6th, Mr. T. Haynes. Three feathered Tulips brought a very keen competition. 1st, Mr. Lea, with Sir J. Paxton, bizarre, Adonis, byblœmen, and Heroine, rose. 2d, Mr. J. P. Sharpe, with Sir J. Paxton, bizarre, Adonis, byblœmen, and Industry, rose. 3d, Mr. T. Haynes, with Masterpiece, bizarre, Mrs. Pickerell, byblœmen, and Heroine, rose. Equally brisk was the competition with three flamed flowers. 1st, Mr. T. Haynes, with Lord Denman, byblœmen, Triomphe Royale, rose, and Dr. Hardy, bizarre. 2d, Mr. W. Willison, with Willison's Queen, byblœmen, Inimitable, rose, and Sir J. Paxton, bizarre. 3d, Mr. J. R. Hextall, Ashby-de-la-Zouch, Prince of Wales, bizarre, Duchess of Sutherland, byblœmen, and Aglaia, rose. The best two Tulips, one feathered and one flamed, came from Mr. S. Barlow, who had Talisman, flamed byblœmen, very fine, and Heroine, feathered rose. 2d, Mr. Hextall, with Duke of Devonshire, feathered byblœmen, and Aglaia, flamed rose. 3d, Mr. J. P. Sharp, with Heroine, feathered rose, and Triomphe Royale, flamed rose. The prizes offered for the best eight flowers in each of the six classes brought together 39 feathered and 37 flamed bizarres; 27 feathered, 29 flamed roses; 26 feathered, and 28 flamed byblœmens. The best feathered bizarre was a seedling from Mr. Willison, a very fine flower; the next, Henry Steward, from the same; and Lord Sydney, the 3d and 4th. The best flamed bizarre was Ajax, then Pilot, Dr. Hardy, Sir J. Paxton, and Shakespeare. The best feathered rose, Heroine, which took the first five prizes. The best flamed rose, Aglaia; then Mrs. Lomax, and Aglaia, 3d and 4th. The best feathered byblœmen was Adonis, then Violet Amiable, Bugart, and Beatrice; the best flamed byblœmens, John Linton, Violet Sovereign, Duchess of Sutherland, and Adonis.

The stands of breeder Tulips were very attractive, notwithstanding their self-colours; the best six came from Mr. Headly, who had a stand of superb flowers, very perfect in form, all seedlings, of which Mr. Headly has a great lot in bloom at the present moment. 2d, Mr. T. Haynes, in whose stand was a bloom of Parker's Rose of England, which, in the breeder state, was very lovely.

The premier flamed flower in the whole exhibition was Sir J. Paxton, a flamed bizarre, in the stand of Mr. S. Barlow; and the premier feathered flower, Mrs. Pickerell, a beautiful feathered byblœmen, in the stand of Mr. D. Barber.

Very interesting was a collection of species of Tulips contributed by Mr. J. J. Chater, which included T. Gesneriana, T. viridiflora, T. carinata rubra, T. carminata violacea, T. Clusiana, T. persica, and T. cornuta.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Orchidaceous Plants, whether epiphytal or terrestrial, and either requiring cool treatment, or an assimilation to the heat and moisture of an exciting tropical climate, will generally have commenced active growth, and should therefore be duly attended to in all the essential details of practical treatment, if a fine robust growth is to be assured. In the houses inhabited by natives of tropical habitats, the minimum of from 86° to 88° of heat must be maintained in the daytime, during moderately bright sunny weather; whilst during dull days, and when the external temperature is cold, the temperature should never be allowed to fall below a mean of 70° by day, with a decrease of 5° or 6° at night. Orchids which are natives of Mexico, and, indeed, the cooler parts of very warm countries, will not require more than from 72° to 74° during the brightest weather, with a decrease of 4° or 5° when artificial heat is needed to maintain the above temperature, or when the weather is very dull. Amongst Orchids which are now in flower, many of the best, such as Saccolabiums, Burlingtonias, and such Dendrobiums as D. Devonianum and D. Dalhousianum, &c., should be removed to a cooler house, where less humidity is diffused, if they are to be kept as long as possible in bloom. These, if they have not very young growing leaves upon them, will all stand in any cool house where the temperature is not less than 56°, but the house must be kept free from anything in the form of draughts. The best way to provide them with a safe corner is to canvas the inside of the structure, so that the sun will not reach the plants. One inlet only should be allowed for air, and that at the point from whence the beauty of the plants is readily discernible. Moisture in any and every form should now be given them plentifully, and especially to those in the Indian house. With the exception that all the foliage should be allowed to become dry at least once during each day, they may bedeluged with tepid water, diffused over them in the form of natural rain with a fine syringe. Basket plants, and such as are grown on blocks of wood, should have continuous applications of water in this wise. Indeed, some few Orchids, even when grown in pots, may enjoy a continually damp surface; such for instance as the *Huntleyas*, which in their native country, British Guiana, grow amid perpetual spray scattered over the rocks from the cataracts.

FORCING HOUSES.

Some care must be taken in removing the fermenting materials from the borders of *Early Vineries*, for in many instances it will be seen that young roots have grown through the surface of the soil into the manure. To injure these is not desirable, so that it will be necessary to let an inch or two of the smaller broken material remain on them. Attend to the necessary thinning of the berries in *Late Vineries*, bearing in mind the fact, that all branches which are intended to hang late into the autumn or winter months should have a more decided thinning than such as are intended for more immediate use, because the more the bunches are thinned in reason, so much more freely will the air pass throughout them, and there will be less risk from injury through the damping or rotting of any of the berries. *Pines* which are showing fruit about this date will ripen about October, and in succession into the winter. Every encouragement should, therefore, be given them from this time forward, so that they may perfect their fruit to the utmost. Give to all the plants immediately they are found to be showing fruit, a good surface mulching with a rich fibrous loam, and occasional waterings with wholesome liquid manure, as previously advised. *Peach* and *Nectarines trees* now ripening their fruit, should have a temperature of not less than 66° maintained by night, with a good maximum of heat, and plenty of air, by day. The autumn of their artificial existence having arrived, they must, under such an artificial state of cultivation, receive treatment as nearly assimilated to that period as possible. Do not let the heat in linings attached to *Melon-frames*, or pits, decline too considerably yet, but maintain a nice brisk heat, without which no great amount of success can be anticipated. Those *Melons* which are now about ripening their fruits must have no root water given them, only an occasional sprinkling over the foliage with a fine-rosed water-pot.

HARDY FRUIT GARDEN.

That pest, the Gooseberry caterpillar, will now be making itself seen more or less numerously upon *Gooseberry* bushes, and must be removed immediately by handpicking, which is the most efficient of the many remedies recommended. In instances where they are not yet discernible to the casual observer, they may have already formed a lodgment amongst some of the branches, in which case they are readily detected by close scrutiny. When very young they are invariably collected together, one batch apart from another, upon the underside of the leaves, through which very small holes are being punctured, and by which means they are to be found out, and should be removed bodily by taking the leaf off. It will be seen that by so doing much labour will be saved compared with what would be needed were they permitted to grow and distribute themselves amongst the other leaves. Give the necessary support to the strongest and most prominently grown shoots upon *Peach* and *Nectarine trees*, by tacking them to the wall. This should be done before heavy rain showers, perhaps accompanied by wind, arrive, as these are very likely to cause them much injury, if, indeed, some of them may not be broken off altogether. Thin out the young sucker shoots which emanate from around the base of *Raspberry stools*. Leave about four or five to each stool, according to the quantity of shoots required to form new canes for next season's fruiting. Pinch back the young shoots upon *Out-door Vines* where fruit alone is wanted, at about two leaves beyond the flowers, which are now readily seen. When further growth is wanted to fill out any vacant spaces upon the walls, and to increase the exterior surface of the plants, those shoots which are strongest and are the best placed should be selected, and tacked firmly into their proper places.

HARDY FLOWER GARDEN.

Climbing Plants, and especially such as are grown against walls, which make their spring growth earlier than those which are more exposed, will need the necessary attention in regard to training, — this especially in connection with *Banksian* and *Boursault Roses* (which make a very good display when thus grown), *Loniceras* of the flexuosa type, *Clematises* (now so very greatly improved and worth growing everywhere), and many others. Break the capsules or seed-vessels off all *Tulips* which have shed their petals. Shade all finally transplanted seedling *Auriculas* from any sun which may reach them. A moderately shady place should be chosen for them. Attend well to *Hardy Cypripediums*, a most lovely class of plants, greatly neglected; support the growths which are hastening upward to display their beautifully marked blooms; keep the roots well watered, and if convenient plunge the pots into a cool moist material, such as cocoa-nut fibre, as they thrive better if such in-

ducements are accorded them. Give every attention to *Picotees* and choice *Carnations*, which "spindle" fast now, though it is somewhat late. There are very useful elastic or india-rubber rings procurable, which if slipped over the buds on to the spindles before the former get too large prevent the blooms from splitting at the base at a later date, if they are at the proper time pulled up around them. These are preferable to the old card-board bands, as, on account of their elasticity, they admit of the blooms swelling to their full extent unimpeded. Cuttings of *Pansies* may still be put in. The younger the shoots are, the more readily will they root. Plant out the whole batch of *Dahlias* remaining on hand at the earliest possible moment. As I have before stated, they require a deep rich soil to grow in.

KITCHEN GARDEN.

With the main crops in, and thriving apace, the principal duty in this department during fine weather will consist in the assiduous use of the hoe; for weeds will form and grow against our utmost efforts, and yet nothing looks so bad as such things seen in too great abundance within the limits of which the gardener has charge. There should be no excuse for them, if proper aid is afforded. In the use of the hoe much may be done to benefit the crops, besides simply uprooting the weeds. Hard baked surfaces should be stirred freely, so that the air may be admitted to the roots as readily as possible; besides, a loose irregular surface is not so attractive of the sun's rays as a smooth, hard one. The former is capable of maintaining a larger amount of moisture, as even the dews of night permeate its surface the more readily. Hence, too much cannot be enforced in favour of keeping a nicely loosened ground surface amongst all growing crops. Sow a successional batch of *Endive* and *Peas*, *Beans*, &c., as soon as those which were last sown appear through the ground. *W. E.*

ORCHARD HOUSE MANAGEMENT.

The general management of the orchard-house should continue much the same as already directed at pp. 637 and 569. *Temperature and Ventilation.*—On fine bright warm mornings air should be given tolerably early, say about 7.30, the trees having been previously freely syringed. Increase the ventilation until midday, and shut up early in the afternoon, say about 3 or 3.30, and afterwards again freely syringe the entire house. *Atmosphere.*—Maintain a genial humid atmosphere in the house at all times, excepting when very cold. On bright days evaporation takes place very rapidly, especially if air is freely admitted; then water should be plentifully sprinkled about in all parts, so as always to maintain the atmosphere in a humid state. This will tend very materially to the health of the foliage and trees, and will also prevent the attacks of red spider, which can only exist in a dry atmosphere. *Insects.*—Keep these in check as already directed. *Watering.*—Trees in pots should be examined twice a day or oftener, and be very liberally supplied with water. They should, in fact, never be allowed to become dry. Rain-water is the best where it can be had. A little liquid manure may now also be given once or twice a week. This should be diluted with water before using. A little guano may also be put into the water when watering the plants, say about half a handful for a large can. These stimulants will assist materially in swelling the fruit, and increasing the vigour of the tree. Trees planted out should also be plentifully supplied with water, but no stimulant should be applied, as they are frequently apt to grow too strong. *Top-dressing.*—This must be seen to now, for on this a great portion of the success depends—that is to say, if really fine fruit is wanted. Top-dressings should consist of some rich unctuous loam about one half, and the other horse-droppings, a little dried, as they might be gathered from the roads. Another very good thing is malt-dust, where it can be had. A little charcoal and burnt ashes may also be added, and the whole plentifully saturated with strong liquid manure from decayed night-soil. About 1 inch of this material should be placed on the surface of each pot, forming it into a sort of basin so as to hold the water. It should be put on very firmly with the hand, pressing it down as hard as possible, some of the top loose soil being taken away at the same time. As soon as the roots have penetrated through this, which they will very speedily, as they are now growing very rapidly, and require an immense amount of nourishment, another top-dressing should be applied. *Thinning the Fruit.*—With Apricots the stoning period is now passed, so that there is no danger of any more of the fruits falling. They should therefore be now properly thinned, leaving to each tree just a stated quantity. Peaches, as soon as it is found that they are fairly stoned, must also receive their final thinning. It is better, especially with pot trees, to err on the side of too few than too many. There is a very true saying that "no one ought to thin his own fruit, any more than be his own lawyer." The reasons are obvious, we have not sufficient courage to act in either case. In fruits we cannot have a great quantity with fine quality at the same time; we must sacrifice one or the other. For trees in 10-inch pots, from 20 to 25 fruits would be sufficient, and for trees in 12-inch from 24 to 36, and so on in proportion to the size, health, and vigour of the tree. Nectarines will bear a heavier crop of fruit than Peaches, therefore a third or fourth more may be left. *Stopping.*—Continue this determinedly as fast as the young growths are made. *B.*

TOWN GARDENING.

Complete the *Bedding-out* of Pelargoniums, Calceolarias, and all kinds of bedding plants as soon as possible. *Watering*, a most essential operation at this season, if the weather is dry, should not be neglected in the case of such trees and shrubs as were transplanted last spring. These should be well watered at their roots, and be syringed overhead frequently if success is to be attained with them. All fresh planted roots should also be particularly attended to in this respect. *Bulbs*, such as early Tulips, Hyacinths, and Crocuses that have done flowering, and have ripened their leaves, can now be removed and laid away to ripen the bulbs. If their place is not required, let them remain in the ground for another month. Large-flowered *Chrysanthemums* should now be shifted into their flowering pots, and should be plunged about half-way up the pot in the open borders. To keep out the worms stand them on a small pot turned bottom upwards. Secure them well to stakes as they progress in growth, and take off all laterals as they appear. Frequently syringe the foliage to keep it clean, and if they are at all troubled with thrip, dust them with a little Scotch snuff after syringing. *Window boxes* should now be filled with scarlet Pelargoniums and Calceolarias, planting them alternately; and, if the boxes are wide enough, the blue Lobelia or Viola cornuta may also be planted with them, and will make a nice front row. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,

For the Week ending Wednesday, May 25, 1870.

1870. Month and Day.	At 9 A.M. Readings of				Hygrometrical Deductions from Glaisher's Tables, 5th edition.		
May.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
19 Thurs.	30·08	68·9	60·3	51·6	54	4·2
20 Friday	30·01	71·2	59·5	50·1	48	4·0
21 Satur.	30·02	69·8	59·7	55·6	72	4·9
22 Sunday	29·83	70·0	61·7	57·1	68	4·7
23 Monday	30·12	56·1	50·9	46·2	69	3·5
24 Tues.	30·17	62·8	53·1	45·7	53	3·5
25 Wednes	30·21	66·0	55·7	41·2	57	3·2

1870. Month and Day.	Temperature of the Air					Wind.		Rain
May.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
19 Thurs.	81·2	47·2	34·0	63·9	+10·7	WSW: S.W.	240	0·00
20 Friday	80·7	49·1	31·6	65·2	+11·7	S.W.	195	0·00
21 Satur.	85·4	51·4	34·0	67·2	+13·4	W.S.W.	215	0·00
22 Sunday	82·1	49·5	32·6	64·1	+10·0	NNW	250	0·00
23 Monday	61·7	45·5	16·2	51·0	− 2·4	N.E.	165	0·00
24 Tues.	70·7	38·5	38·2	55·0	+ 1·3	SW. N.	175	0·00
25 Wednes	70·3	48·4	21·9	57·7	+ 2·8	N. N.N.E.	255	0·00

May 19.—Small amounts of cloud prevalent during the day. Very fine. Aurora at night.
— 20.—Thin cirrus and cirro-stratus predominated. Solar halo. Aurora at night, with large magnetic disturbance.
— 21.—Generally cloudless and very fine. Lightning at night.
— 22.—Light cirrus and cirro-stratus prevailed during the day. Very fine.
— 23.—Generally overcast.
— 24.—Cloudless during the morning. Cloudy in the afternoon and evening. Solar halo.
— 25.—Generally cloudless; a very fine day. Solar halo.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

During the Week ending Saturday, May 21, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg	Deg.	In.
Portsmouth ..	77·7	41·9	35·8	68·3	45·1	23·2	55·0	0·18
Blackheath ..	76·3	41·8	34·5	71·1	45·9	25·2	59·8	0·00
Bristol	70·4	42·8	27·6	65·1	46·6	18·5	54·2	0·01
Birmingham ..	77·2	43·1	34·1	68·3	48·5	19·8	58·7	0·10
Wolverhampton	76·3	42·2	34·1	67·9	47·9	20·0	56·2	0·01
Leicester ..	81·2	39·5	41·7	71·6	47·2	24·4	57·7	0·02
Norwich	80·0	41·7	38·3	71·7	49·0	22·7	58·6	0·05
Nottingham ..	77·6	39·9	37·7	69·5	48·2	19·3	56·2	0·03
Sheffield ..	78·0	42·5	35·5	68·7	50·3	18·4	57·8	0·01
Liverpool ..	75·4	46·7	28·7	65·4	51·7	13·7	58·8	0·08
Manchester ..	80·1	41·0	39·1	69·5	49·2	20·3	57·8	0·03
Salford	78·4	40·8	37·6	67·2	48·9	18·3	58·3	0·07
Bradford	74·4	44·9	29·5	67·4	51·5	15·9	57·8	0·00
Leeds	75·6	41·0	34·6	67·1	52·9	14·2	58·3	0·01
Hull	68·0	37·0	31·0	70·6	47·4	23·2	57·3	0·00
Newcastle ..	64·0	45·0	19·0	60·8	47·8	13·0	52·6	0·11
Edinburgh ..	65·7	45·0	20·7	..	..	..	55·5	0·20
Glasgow ..	61·5	45·5	16·0	..	..	..	52·0	1·05
Dundee	62·0	44·0	18·0	..	..	..	53·1	0·15
Aberdeen ..	63·3	42·2	21·1	..	..	..	52·3	0·07
Paisley	61·0	44·0	17·0	..	..	..	52·2	1·03
Greenock ..	60·0	50·0	10·0	..	..	..	51·1	2·41
Leith	66·5	43·7	22·8	..	..	..	55·5	0·11
Perth	64·0	44·0	20·0	..	..	..	54·9	0·48
Dublin	74·4	40·0	34·4	..	..	..	56·6	0·38

James Glaisher.

Notices to Correspondents.

Arum: *L. C. Smith.* Arums—we suppose you mean Richardia—are occasionally seen with a double spathe. Please send yours for inspection when withered.

Cucumbers: *An Amateur.* Yes. The information you have received from your professional friend is quite correct. By stopping the growing shoots of your Cucumbers at the joint just above the fruit, those fruits, having the forces as it were more concentrated at that point, develop themselves more rapidly than if the shoots are allowed to run away unstopped; you will also by adopting that system get a longer continuance of fruit in a small space.

Fern Seed: *A. B.* Your "Fern seed" is invisible. We find nothing but empty cases. Alsophila australis is so readily imported in the shape of fine tree-like specimens that the seed would be of little commercial value.

Heating Vine Borders: *R. S.* It would be interesting. Send us the particulars.

Libonia floribunda: *H. D.* This is a bushy-habited, warm greenhouse plant, which requires to be grown on into neat specimens, and during the summer and autumn rested in a warm greenhouse, and then pushed on to flower in rather more heat during winter and the early spring. It must have a rest and be well ripened before flowering. It comes from South Brazil, and is named after the collector, Libon.

Mushrooms: *R. S.* Presuming that the Mushrooms sent were grown in the open air, they were of a very fair description. When cooked, however, they were tough and much wanting in juiciness.

Names of Plants: *T. H. O.* Erysimum Perofskianum, —*A. B.* 1, Probably Cyathea excelsa, as supposed; 2, Hoteia japonica; 3, Goniophlebium grandidens.—*Anon.* Adiantum Capillus-Veneris; the Gymnogrammas, 1 and 2 are forms of G. Calomelanos.—*C. F.* 1, Aster capensis, Less. (Agathea cœlestis, Cass., and A. amelloides, Cass.), sometimes cultivated under the name of Kaulfussia amelloides; 2, we do not know which Acer is "Collinson's Maple," that sent is A. dasycarpum; 3, A Stenomesson, probably suspensum.—*T. S.* Acer oblongum var. This tree, we are informed, succeeds well under an old Spruce Fir tree, backed up by Laurels, and might be useful in other similar situations.—*B. M.* Prunus Padus var. parviflora, or a closely allied species. —*E. W. D.* Doronicum Pardalianches.—*W. Heale.* The specimen is not recognisable; be so good as to send further and better examples.

Plain Gardener: *J. G.* A gardener who knows nothing of hothouses, but is generally a good flower and kitchen gardener, is certainly a "good plain gardener," but then there are gardeners—and gardeners; and hence the man who knows all about the hothouses may also be a good plain gardener. Your other question is suggestive of discordances which would be better ended. Butlers have as much business in the garden "when they like," as gardeners have in the butler's pantry—and no more; that is, by courtesy, and when they have any legitimate business to transact there.

Peaches: *A Subscriber.* We are not prepared to say what is the cause of the spot you describe on your Peaches, without seeing it. It may be mildew; if so, sulphur will arrest it. It may be simply through weakness, and subsequent exposure of the fruit to alternate heat and cold, or may arise from other causes on which we need not speculate.

Pear Trees: *J. N. Gould.* Get rid of the Aphis on the leaves as soon as possible by syringing with tobacco water, or dusting with tobacco powder, and encourage the growth of shoots as much as you can. Your trees have not got over the check caused by removal. It is rather too much to expect fruit the first season. Guano water will kill them, especially if applied now, in their present weakened condition.

Rhododendron: *T. Hammond.* Your seedling between the Azalea and Rhododendron, and which you call A. Edenii, does not present at all the appearance of an Azalea; but its neat evergreen foliage and good-sized white flowers would no doubt make it a useful decorative plant, of moderate growth, if the general habit is good. The smooth leaves, glaucous beneath, give it an advantage over the varieties of R. ciliatum, with which its flowers may be compared.

Rose Trees Injured: *M. J.* Yours is not the only case of this kind which has come before us. Much larger shoots have been decortic ated in the same way. It is tolerably clear that it is the work of some insect or possibly mollusk, but we have at present no satisfactory information. See Notices to Correspondents in last week's *Gardeners' Chronicle. M. J. B.*

Thrips: *W. B.* Your plants are injured by the thrips, which you must endeavour to get rid of by the usual process. *M. J. B.*

Tortoises: *S. C. E.* asks for information as to "what insects, &c., a tortoise would destroy in a garden, and what injury, if any, it would do to vegetation. Also the mode of keeping and feeding, and whether one of those sold in the streets or shops would answer. Our kitchen is infested with blackbeetles, which traps of beer, and phosphorus paste, apparently have little or no effect upon. Could you suggest a remedy, and would the tortoise eat the beetles?" The tortoise will do no harm in the garden; and Chase's Beetle Poison will rid a house of beetles if its use is honestly persevered in; or a hedgehog turned down in the kitchen would soon diminish their numbers.

Village Shows: *R. M. Milford.* The whole subject of Rules will be discussed in due time; meanwhile we forward your letter to our correspondent.

Vine Leaves Diseased: *T. S.* The affection on your Vine leaves is very common, and is produced, we believe, by some peculiar condition of the roots. We have never seen any material injury arise from it. *M. J. B.*

Vine Roots: *A. L. O.* We have examined your Vine roots, and see nothing remarkable about them further

than that portions of them are dead—a not uncommon occurrence with newly planted Vines which have not been properly treated. The worms in your border will not do much harm; their presence there, however, so numerous, betokens a condition of soil not at all favourable for Vine roots, or Vines to grow in. It is here where the evil lies. To get your young Vines to grow freely you must plant them in new fresh soil, not in the old border, as you seem to have done. Young Vines will never do well planted amongst old ones.

COMMUNICATIONS RECEIVED.—W. P. R.—P. G.—S. L. M.—J. C.—Tilia.—Kalma.—W. S. W.—T. (next week).—R. G.—F. F.—B. S.—A. M.—W. P. A.

Markets.

POTATOS.—Southwark, May 26.

During the past week the arrivals coastwise have been moderate, but owing to the sudden change to warm summer weather, the consumption has fallen off more than one-half, and prices of the former week were barely maintained. The following are this day's quotations:—Yorkshire Flukes, per ton, 130s. to 150s.; Ditto Regents, 110s. to 140s.; Lincolnshire do., 100s. to 110s.; Dunbar and East Lothian do., 110s. to 140s.; Perth, Forfar, and Fifeshire do., 95s. to 110s.; Do. Rocks, 95s. to 105s.; Do. Reds, 90s. to 100s.; French and Belgian Whites, 80s. to 100s.

COVENT GARDEN.—May 27.

We have no alteration to announce. The supply is well kept up, and a fair amount of business is doing. Home-grown produce from underglass has much improved, and comprise all the usual varieties to be had at this season. Melons and Apricots are now offered in limited quantities. Flowers, which now very plentiful, chiefly consist of Azaleas, Orchids, Roses, French and Scarlet Pelargoniums, Heaths, Fuchsias, Hydrangeas, Lobelias, and Mignonette.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	3 0	to 5 0	Melons, each	5 0	to 12 0
Apricots, per doz	2 0	4 0	Nectarines, per doz.	12 0	28 0
Cherries, per lb.	1 0	2 0	Oranges, per 100	6 0	10 0
Cobs, per lb.	0 9	1 0	Peaches, per doz.	15 0	30 0
Filberts, per lb.	0 6	0 9	Pears, per doz.	—	—
Grapes, per lb.	8 0	12 0	Pine-apples, per lb.	8 0	10 0
Lemons, per 100	4 0	8 0	Strawberries, p. lb.	6 0	12 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	1 6	to 3 0	Leeks, per bunch	0 2	to 0 4
Artichokes, p. doz.	3 0	6 0	Lettuces, p. score	1 0	2 0
Beet, per doz.	1 0	2 0	Mint, per bunch	0 6	0 9
Broccoli, per doz.	1 0	2 6	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz.	1 0	1 6	Onions, per bunch	0 4	0 6
Carrots, p. bunch	0 4	0 8	Parsley, per bunch	0 2	0 4
— young, p. bun	1 0	2 0	Potatos, new, p. lb.	0 4	0 6
Cauliflowers, p. doz.	1 0	3 0	Salsafy, per bundle	1 0	1 3
Celery, p. bund.	1 0	1 6	Scorzonera, do.	1 0	1 3
Cucumbers, each	1 0	1 6	Seakale, p. punnet	1 6	2 0
Endive, per doz.	1 6	2 0	Shallots, per lb.	0 8	—
French Beans, p. 100	2 0	—	Spinach, p. bushel	2 0	3 0
Garlic, per lb.	0 6	0 8	Radishes, per doz.	1 0	1 6
Herbs, per bunch	0 2	0 4	Turnips, per bunch	1 0	1 6
Horse Radish, p. bun.	3 0	5 0	— young, p. bun	1 6	2 0

Potatos, York Regents, per ton, 120s. to 150s.; Flukes, do., 110s. to 140s.

Chrysanthemums.

ADAM FORSYTH begs to inform the Trade and the Public, that he is now selling out his "NEW" and other choice CHRYSANTHEMUMS.

For description see CATALOGUE (containing a Treatise on their growth now ready. Post-free on application for one stamp.

Brunswick Nursery, Stoke Newington, N.

GARIBALDI POLYANTHUS.—A new double sweet-scented variety of this pretty spring plant. It is of various colours, bright and showy, and piped as its flowers will always be foliage. Any quantity supplied at 12s. and 24s. per packet, post free. Plants 2s. 6d. and 5s. per dozen.

BUTLER, MOUTRAY, AND CO., South Row, Covent Garden, W.C. Established upwards of a century.

Echeveria glauco-metallica and secunda glauca major.

ROBERT PARKER begs to announce that he is now distributing these two distinct and fine varieties, both of which he has received First-class Certificates at the Horticultural and Royal Botanic Societies. The plants, which are stemless, are formed of rosulate tufts of leaves, similar to Echeveria secunda glauca, but are at least three times as large as that variety. Young plants, 5s. each; do., for 6d. and 12s. each.

Dedo Nursery, Tooting, Surrey, S.W.

Beautiful New Fuchsias and Nosegay Geraniums

GEORGE SMITH is now sending out, in good plants, his beautiful new FUCHSIAS, viz., Achilles, Purple Trio, and Sultan, at 2s. 6d. each; also his new GERANIUMS, Flash of Solell, and Harry Veitch, at 1s. 6d. each. Coloured drawings of Mr James Anderson of Chelsea and Soleil, in two separate plates, 1s. 6d. each. Both are all first-class. For description see CATALOGUE, on application.

Tollington Nursery, Hornsey Road, Islington, London, N.

Bedding Plants—Bedding Plants.

JAMES HOLDER'S unrivalled Collection of Scarlet and Variegated ZONAL PELARGONIUMS, CALCEOLARIAS, FUCHSIAS, LOBELIAS, PETUNIAS, GAZANIAS, KOCKIANS, TROPÆOLUMS, CUPHEAS, COLEUS, IRESINES, AGERATUMS, PENTSTEMONS, &c., at his usual price despite of the very severe weather, eight dozen for 20s., or four dozen for 10s. 6d.; hamper and package included.

Crown Nursery, Reading, Berks.

The West of England Bedding Plant Establishment.

THOMAS SAMPSON'S unrivalled Collection of PLANTS will be found fully described in his Catalogue for 1870. This Collection contains all the bedding kinds, at from 25 per dozen, in 25, and upwards, also Collections this selection at £2 2s. for 25 dozen; ditto, £1 5s. for 15 dozen; ditto, 15s. for 10 dozen; ditto, 10s. for 4 dozen, including basket and packing.

CATALOGUES free on application.

THOMAS SAMPSON, The Preston Road and Houndstone Nurseries, Yeovil, Somerset. PETER BRAMWELL, Manager

Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted, each 12, and 2s. 6d. per packet.

SCOTT'S WASP DESTROYER will quickly rid any place of Wasps, Crickets, Cockroaches, and other Garden pests. "It completely cleared the place." *Vide* Testimonials, sent on application. Price 1s. 6d., and 2s. 6d. per bottle, in stamps.

J. SCOTT, The Seed Stores, Yeovil, Somerset.

Ilex aquifolium var. Lawsoniana.

A golden blotched Hedgens' Holly, quite distinct and very effective.

PETER LAWSON AND SON are now sending out the above for the first time. Strong plants 21s., with the usual allowance to the Trade.

Edinburgh and London—May, 1870

Bedding Plants, Florists' Flowers, &c.

MESSRS. LITTLE AND BALLANTYNE, Nurserymen and Seedsmen, Carlisle, are prepared to send out very choice selections of the above, at very moderate prices, and will be glad to send them wrapped in MATS AND MATTING free on application.

North of England Nursery and Seed Establishment, 24, English Street, Carlisle.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),

Corn, Seed, Market, and Oilcake Merchants

Address, Seed Market, Mark Lane, E.C.; or Ravingstoke.

Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

Choice and Distinct Geraniums.

THOMAS PESTRIDGE will forward the following 12 on receipt of Post Office order for £1 1s. —

Achievement (Turner)	Prince Silverwings
Charmer (Turner)	Prince Teck
Crown Prince	Harrison Weir
Lucy Grieve	Red King
May Queen (Turner)	Rudolph Beauty
Princess Beatrice (Carter)	Mrs Turner

The Greenway Nursery, Uxbridge

W. POTTEN now offers the following 20 choice GERANIUMS as under —

GOLDEN TRICOLORS.—Edward Milner, Florence, Mrs. Turner

Queen of Denmark, Star of India, Eugénie, Mabel Morris, Mrs. John Cutton, Princess Beatrice, Queen Victoria (Smith's)

SILVER VARIEGATED.—May Queen (Turner's), Princess Alexandra

GOLD and BRONZE.—Crown Prince, Black Knight, Cleopatra, Black Prince.

DOUBLES.—Marie Lemoine, Wilhelm Pfitzer, Madame de St. Paul, Madame Lemoine

Good plants, in 3 inch pots, package free, for 25s.

W. POTTEN, Nursery, Sevenoaks, Stone, Kent

NEW FANCY GERANIUM (1870). CHARLES WHITHAM.—Bright rosy crimson, suffused with violet, rising well with white, pure white throat, fine form and substance, free bloomer, and robust habit

B. WHITHAM has great pleasure in offering the above, and feels confident that it will ultimately prove itself to be a universal favourite, having been pronounced by competent judges to be one of the very best of its class.

In order that the Public may have the opportunity of possessing the above, B. W. is now offering it at the very low price of 2s. 6d. and 10s. 6d. each,—strong flowering plants. Advance to the Trade.

Nurseries, Reddish, near Stockport.—May, 1870

Farm Pupil.

THE MANAGER of the celebrated Steam Cultivated Farms of MESSRS. HOWARD, of Bedford, has a VACANCY for a PUPIL.—WALTER J. HENMAN, Britannia Farm, Bedford.

WANTED, a HEAD GARDENER, where two Under Gardeners are kept. Personal reference to last situation indispensable. Apply by letter, stating experience and wages required, to J. H. T., Higham Lodge, Walthamstow, E.

WANTED, a HEAD WORKING GARDENER.—Must have a thorough practical knowledge of Vines, Fruit, Flowers, and Kitchen Garden Culture. Wages 23s. per week, without Cottage.—Full particulars to M. T., Chapel Place, Poultry, E.C.

Gardener and Industrial Trainer.

ABINGDON UNION.—The Guardians of this Union will, at their Meeting on Monday, the 13th inst., proceed to the ELECTION of a Single Man as GARDENER and INDUSTRIAL TRAINER for the Workhouse of the above Union. The person appointed will be required to have some knowledge of Gardening, to Superintend the Male Adult Inmates, and to act as Industrial Trainer to the Boys when at work in the Garden. Salary, £20 per annum, with rations, lodging, and washing in the Workhouse.

Applications, with testimonials as to character, previous employment, &c., to be sent to me Office in the High Street, Abingdon, on or before Saturday, June 4th next.—By order of the Board,

MICHAEL BAY. BROMLEY CHALLENOR, Clerk.

WANTED IMMEDIATELY, a steady, active, middle-aged MAN, age from 25 to 40. He must understand the Management of Peaches, Grapes, and Cucumbers, be quick at Potting, Tying, and Growing of Soft-wooded Plants for Covent Garden Market. To a regular and trustworthy person, with a character, wages £24 per week, with house, fire, and vegetables.—G. M., Post Office, Luton.

WANTED, an active Young Man, as UNDER GARDENER.—Apply, with testimonials, to Mr. MOORHOUSE, The Gardener, Moorville, Burley in Wharfedale, near Leeds.

WANTED, as SALESMAN and FOREMAN in a London Nursery, a trustworthy intelligent Man, acquainted with the Cultivation of Plants and their Value. One used to making Bouquets preferred.—T. S. & J. LAING, Royal Albert Park Nursery, King's Road, Chelsea, S.W.

WANT PLACES.—Letters to be Post Paid.

GARDENERS (Experienced).—Joseph Meredith, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Head Gardeners, Foremen and Journeymen.

JAMES DICKSON AND SONS can now recommend several EXCELLENT MEN, of whom they will be glad to send particulars on application.—"Newton" Nurseries, Chester.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books a LIST of various qualifications, whose character they have personally inspected, and can therefore in making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Hornsey Nurseries, Barnet.

To Noblemen and Gentlemen

GARDENER (Head).—Age 37, married, no incumbrance; thoroughly practical, and quite competent to Manage a first-class place. Has had great experience in the Early Forcing of Pines, and more especially of Grapes, Peaches, Melons, and Strawberries, to numbers of the highest Medal Standard. Possesses an extensive knowledge of the Cultivation and Bedding out of Camellias, Azaleas, Roses, and Orchids in particular. Ferns, &c., has great taste in the Arranging of Flowers, and is a first-rate Cucumber and Tomato Grower. For the last six years Head Gardener at A. N. Hanan.—ALPHA, Post Office, Stamford.

GARDENER (Head), age 38, married.—James Stewart, for the last six years Head Gardener at Nuneham Park, where he had the entire Management of the very extensive Flower and Kitchen Gardens, where Forcing of every description was carried out, including Pines, Vines, Peaches, in fact, every description of Fruit and Flowers, also Spring Bedding on a comprehensive scale, is now open for an engagement. Has been Foreman for the last six years to parties, the services of a first-class Man. Testimonials of the highest order.—Apply, in the first place, to Messrs. J. & C. Lee, Royal Vineyard Nursery, Hammersmith.

GARDENER (Head).—Age 33, married; thoroughly understands Pines, Vines, Stove and Greenhouse Plants, Ferns, and Flower and Kitchen Gardening. Two years' good character.—A. B., 9, Wells Lane, Streatham, S.W.

GARDENER (Head).—Age 33, married, no incumbrance; thoroughly understands the profession in every branch. Excellent character and first-class recommendations.—G. A., Mr. East, Grocer, Beckenham, Kent, S.E.

GARDENER (Head).—Age 30, single; understands Hot-houses, Greenhouses, and Flower and Kitchen Gardening. Five years' character from last situation.—A. B., Langley Park, Beckenham, Kent, S.E.

GARDENER (Head), age 29, married, one child.—Wright begs to offer his services to any Nobleman, Lady, or Gentleman requiring a first class practical Gardener, well up in every branch of the profession. Character will bear the strictest investigation.—J. Wright, Kingston, Tetsworth, Oxon.

GARDENER (Head).—Age 36, married, no incumbrance; has a thorough practical knowledge of the cultivation of Vines, Pines, Peaches, Stove and Greenhouse Plants, and the routine of Kitchen and Flower Gardening. Can be well recommended.—T. A., Post Office, East Sheen, Surrey.

GARDENER (Head).—Middle-aged, married, very active and energetic; thoroughly understands Forcing in every branch, Orchard-houses, Kitchen Garden, and Laying-out and Arranging Ornamental Flower Gardens. Highest reference — Hortus, 2, Linton Grove, Lower Norwood, Surrey.

To Noblemen and Gentlemen.

GARDENER (Head); age 28, married, one child.—E. Hewlett begs to offer his services to that Nobleman or Gentleman requiring a good, practical Gardener, fully competent in every branch of the profession. Leaving in consequence of the death of his late employer. Two years' good character.—E. Hewlett, Messrs. James Veitch & Sons, Royal Exotic Nurseries, Chelsea, S.W.

GARDENER (Head, or good SINGLE-HANDED).—Married; good practical knowledge of the profession. Excellent character.—A. B., Mr. Randall's, Upper Sunbury, Middlesex.

GARDENER (Head, or SINGLE-HANDED).—Married; thoroughly understands the profession in all its branches. Excellent references.—J. C., Post Office, Byfleet, Weybridge, Surrey.

GARDENER (Head, Working).—Age 40, married; thorough practical knowledge in all branches; understands Land and Stock. Good reference.—D. D., 2, Grove Place, Denmark Hill, London, S.E.

GARDENER.—A respectable young Man, married, one child; understands the profession. Well recommended. W., Mercury Gardens, Romford, Essex.

GARDENER, &c.—Age 38, married, steady; used to Growing Bedding Plants, &c., for Sale, Jobbing work, &c.—B. T., Post Office, Sutton, near Hull.

GARDENER.—Age 38; thoroughly understands the profession. Eight years' good character.—A. H., Mr. Surman's, Florist, High Street, Witney, Oxon.

GARDENER.—Age 27, married; has a thorough knowledge of the profession. Can be well recommended by his present employer, whose service he has been for the last three years.—Apply, in the first instance, to GEO. HAVELOCK, Nursery, Abbey Wood, S.E.

GARDENER (Second).—Age 22; six years' experience both in Gentlemen's Gardens and in Nurseries. Good character.—A. B., Messrs. Fraser's Nurseries, Lea Bridge Road, Leyton, Essex, E.

GARDENER (Under), in a Nobleman's or Gentleman's Establishment.—Age 21; two years in present situation. Good character.—W. F., The Gardens, Suberton, Worksop, Notts.

GARDENER (Under), age 19.—A Gentleman wishes to recommend a young Man, who has been with him two years.—R. Courtenay, Esq., Beechcroft, Sevenoaks, Kent.

GARDENER (Under).—Age 19; understands the Management of all kinds of Forcing Houses. House department preferred. Four years' good character.—R. Binley, The Lawn, Hitchurch, Hants.

GARDENER (Under), in the Houses, in a Nobleman's or Gentleman's establishment.—Age 22; seven years' experience. Good character.—F. M., 4, New Cottages, Oval Road, Croydon, Surrey, S.

FOREMAN, in a Gentleman's Garden.—Age 23; thoroughly knowledge of Fruit, Flowers, and Kitchen Garden. A. B., Dyrnan Park, Barnet.

To Nurserymen.

GROUND FOREMAN and SALESMAN.—Thoroughly experienced, with a good practical knowledge of the Value of Nursery Stock. Successful Budder and Grafter. First-class reference.—A. B., Mr. John Stevens, The Nurseries, Coventry.

To Landscape Gardeners and Nurserymen.

SUPERINTENDENT, in the Laying-out of New Grounds, the Keeping of Suburban Villa Gardens, &c.—Can draw and furnish Plans. Understands Drawing-room and Dinner-table Decorations. Would assist in Light Nursery business.—M. B., No. 5, Southgate Grove, Kingsland, London, N.

PROPAGATOR.—Age 24; understands Roses, Rhododendrons, Conifers, Soft-wooded Plants, &c. Good reference.—E. L., Mr. Parson's Nursery, Hassock's Gate, Hurstpierpoint.

PROPAGATOR (Under).—Age 20; has been accustomed to the work four years. Two years' good character from present situation.—A. B., Hassock's Gate, Hurstpierpoint.

To Noblemen and Gentlemen.

ESTATE AGENCY, or the Management of a large Farm.—A Gentleman, who is a good Accountant, and has had considerable experience in Agriculture in all its branches; thoroughly understands the Breeding and Management of Cattle and Sheep. Highest references, and good security.—G. S., Kirkby House, Penrith, Cumberland.

FARM BAILIFF.—Thoroughly practical; no objection to be under a Steward on a large Estate. Good references.—B. C. D., 1870, Post Office, Ross, Herefordshire.

FARM BAILIFF.—An Englishman, married, without incumbrance; thoroughly understands the profession in all its branches. Reference to present employer.—G., Post Office, Barnane, Templemore, Ireland.

To Gentlemen.

FARM BAILIFF, or Place of Trust.—Married; thoroughly understands every branch, also a good Accountant. Good character; very steady, and can be well recommended.—A. H., Wyke, near Pershore, Worcestershire.

TRAVELLER or MANAGER, in a good Country Seed Trade. Thoroughly understands the business.—J. H. J., Post Office, St. Alban's

SALESMAN or TRAVELLER.—Thoroughly understands Market Work, Furnishing, Table Bouquet Making, &c. Well known in the Trade. Highest testimonials.—W. S. H., 30a, Edwarde Street, Dorset Square, London, W.

IMPROVER.—Age 24; wishes to learn Gardening under a Gentleman's Head Gardener. A Premium will be given.—R. S., 4, Pelham Villas, South Kensington, London, S.W.

IMPROVER, in the Houses, in a Gentleman's Garden; where there are only two Improvers kept preferred.—Age 21; a Premium given. Good character.—A. B., Mr. Randall's, Sunbury, Middlesex

SHOPMAN.—Age 24; nine years' experience, with first-class references.—S. M. W., care of Messrs. Hurst & Sons, 6, Leadenhall Street, London, E.C.

SUTTONS' SELECTED TURNIP SEEDS.

Lowest price per bushel on application.

THE BEST SWEDE IN CULTIVATION IS
Suttons' Champion.

NOTICE.—*Purchasers of large quantities of Farm Seeds treated liberally.*

From J. ARNATT, Esq., *Manor House, Tingewick, near Buckingham.*

"*April* 16, 1868.—I took several Prizes last year with crops grown from your seed, and amongst them with a 40 to the Quarter bowl. The crop. I think there is no better swede than the Champion bowl."

SUTTONS' CHAMPION SWEDE, the hardiest, the most productive, and best shaped Swede in cultivation; price **1s.** per lb., cheaper by the bushel. Carriage Free.

The numerous Prizes which have been awarded to growing crops, and also to pulled specimens of our Champion Swede, during the past season, together with the unsolicited Testimonials we have received, fully justify our description.

At the ROYAL BERKSHIRE ROOT SHOW, to be held at READING, on SATURDAY, Nov. 26, a SILVER CUP, value £10 10s., will be given by Messrs. SUTTON for the best 24 Specimens of SUTTON'S CHAMPION SWEDE; and £5, £3, and £2, as Second, Third, and Fourth Prizes.

THE BEST TURNIP FOR THE MAIN CROP IS
Suttons' Imperial Green Globe.

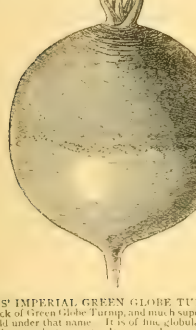

SUTTONS' IMPERIAL GREEN GLOBE TURNIP.—This is a splendid stock of Green Globe Turnip, and much superior to the variety generally sold under that name. It is of fine globular form, very clear skin, and only a single tap root. It is very heavy and nutritious, and will stand the winter of sown late. Price 10*d.* per lb., cheaper by the bushel. Carriage Free

Suttons' Lincolnshire Red Globe.

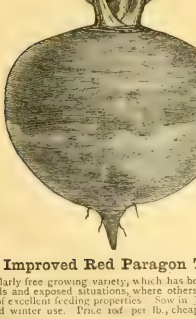

Or Improved Red Paragon Turnip.

A particularly free growing variety, which has been found to thrive on poor soils and exposed situations, where others had failed. Very large, and of excellent feeding properties. Sow in June and July, for autumn and winter use. Price 10*d.* per lb., cheaper by the bushel. Carriage Free.

For prices and particulars of other varieties of TURNIPS for present sowing, also MUSTARD, RAPE, GRASS SEEDS, &c., apply to

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about 1 acre (frontage), DWELLING HOUSE, STABLING, and other Buildings thereon.
Apply to Mr R. TANTON, The Nurseries, Epsom.

To Market Gardeners and Others.

TO BE LET, 213 ACRES of GOLD MARKET GARDEN GROUND, well stocked, Binding and other Sheds, Frames, Boxes, Horse, Carts, Van, &c., at Deptford, 4 miles from London.
Mr. GOOD, Gardener, Brockley Road, New Cross, Deptford, Kent.

To Nurserymen, Florists, Market Gardeners, and Others.

AN OPPORTUNITY WHICH SELDOM OCCURS
TO BE DISPOSED OF, with immediate possession, in consequence of the illness of the proprietor, Mr. George Tipping Fox, which incapacitates him for attention to the business, the whole of the OLD ESTABLISHED BUSINESS of NURSERYMAN, &c., situated at Wetley Rocks, near Leek, Staffordshire, with the GREENHOUSES, PROPAGATING-HOUSES and FRAMES, heated with hot-water, and comprising upwards of 5000 feet of glass, erected recently on the most modern and substantial principles, the whole now stocked with most rare and beautiful Plants, in splendid condition, for Sale. The stock of Bedding Plants and Dahlias is very extensive, comprising many thousands of the best varieties.
The Grounds comprise upwards of 20 Acres, and are stocked with choice hardy Evergreens, Fruit Trees, Ornamental Trees, Herbaceous and Alpine Plants, and Roses in great variety, also a splendid collection of Roses.
Most of the spare ground is planted with the choicest kinds of Potatoes, Rhubarb, Asparagus, or sown with suitable sorts of vegetable seeds for market purposes.
The whole of the Business, Stock in Trade, Horse, Carts, and Carriages, will either be sold in one Lot or in the market gardening department separately.
There is a population of about 250,000 residing within a radius of 10 miles of the premises, and for enterprising parties the whole of the business, might soon secure a valuable competency, as the extensive markets of the Pottery District are very good if regularly attended.
Early application is necessary as the busy season is now on, and the purchaser could be making money at once,—a very different matter to beginning a new business.
The incoming of the whole business would be about £2000, a portion of which might remain on security, or the proprietor would be willing to accept an enterprising Partner, who thoroughly understands the business, with a view to his ultimately taking the whole of the business in his own hands.
The above business has been established over 60 years, and has consequently a good connection.
To view, and for further particulars, apply to Mr G T FOX, The Nurseries, Wetley Rocks, near Leek

FOR SALE, a very handsome pure-bred ALDERNEY BULL, 14 months old, and remarkably good colour
Apply to Mr HULBERT, Farm Bailiff to the Most Noble the Marquis of Winchester, Amport St Mary's, near Andover

SALES BY AUCTION.

Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, May 26, at half-past 12 o'Clock precisely, the second portion of ESTABLISHED ORCHIDS, belonging to C. H. Marshall, Esq., of Caversham, among which are fine specimens of—

Vanda Lowii	Trichopilia crispa
" coerulea	" coccinea
" Suavis	Odontoglossum citrosmum
Cypripedium Stonei	" Alexandræ
" candidum	" hastilabium
" Schlimi	Cattleya amethystoglossa
" villosum	" bulbosa
Saccolabium Blumei	" crispa
" giganteum	Oncidium macranthum
Dusa grandiflora	Phalænopsis amabilis
Calanthe Veitchii	" grandiflora
Aerides Veitchii	" Schilleriana
Cymbidium eburneum	&c &c.

On view the morning of Sale, and Catalogues had.

Guildford, Surrey.

IMPORTANT SALE of BEDDING PLANTS
MR. W. ABRAHAM is instructed by Mr. Baxindine to SELL by AUCTION, at the Nursery, Stoke Road, Guildford, on TUESDAY, May 31, at 1 o'clock punctually, about 18,000 BEDDING PLANTS of kinds usually grown for that purpose, also a choice collection of PELARGONIUMS, FERNS, COLEUS, &c., for Conservatory and Window Decoration.
Full particulars in Catalogues, to be obtained of Mr. BAXINDINE, Florist, Guildford; or of the Auctioneer, Goldworth Nurseries, Woking, Surrey.

North Cray Place, Foot's Cray, Kent.

A SPLENDID ASSORTMENT of FOLIAGE, FRUITING, and FLOWERING TREES, SHRUBS, and PLANTS
FAREBROTHER, LYE, AND WHEELER are instructed to SELL by AUCTION, at North Cray Place, on SATURDAY, June 4, being the fifth day's sale of the effects of the late Mrs. Western Woodd, at 12 o'clock, a valuable and important collection of FOLIAGE, FRUITING, and FLOWERING TREES, SHRUBS, and PLANTS, including very beautiful and choice specimens of the Acacia longifolia, Aucuba japonica, Azaleas, Camellias, Cytisus, Coleus, Escharis, Epacris, Ferns, Fuchsias, Figs, Ficus elastica, Nectarines and Peaches, Grapes, Kalmia, Roses (of sorts), Rhododendrons, Thuja aurea, Tobacco, Salvias, Strawberries, Vines, &c.; several thousands of the choicest varieties of Geranium, Calceolaria, &c., being the entire stock of the celebrated gardens of North Cray Place.
May be viewed on application to the GARDENER, of whom Catalogues may be had; also of Messrs. FAREBROTHER, LYE, AND WHEELER, 8, Lancaster Place, Strand, London, W.C.

Syon Gardens, Isleworth, Middlesex.

Highly important SALE of Valuable and Rare TROPICAL FRUITING and FLOWERING TREES, SHRUBS, and PLANTS, of luxurious growth; for sale in consequence of a re-arrangement of the Gardens.
FAREBROTHER, LYE, AND WHEELER, beg to give notice that they are honoured with instructions from his Grace the Duke of Northumberland to SELL by AUCTION, at Syon, on WEDNESDAY, June 22, at 12 o'Clock, an assemblage of rare TROPICAL PLANTS and TREES, of remarkably fine growth; among which will be found some of the finest specimens in Europe of the

Alocasia macrorhiza	Ficus elastica, indica, &c
Anthurium acaule	Hibiscus sinensis bifloros
Areca concinna	Ilex paraguensis
Caladiums of sorts	Jambosa polypetala and vulgaris
Carolinea alba	Lagetta lintearia
Chrysophyllum Cainito	Palms in varieties
Cocos sp., and other Palms	Paper nigrum
Coffea Arabica	Psidium pyriferum and chinense
Croton pictum, elegans, &c	Saccharum officinarum
Cycas revoluta	Sterculia nobilis
Dioscorea sapota and Mabola	Theobroma cacao
Dracæna, sp.	Urania speciosa
Elæodendron australe	Vanilla planifolia
Eugenia Ugni	
Ferns of all sorts	

And a variety of other choice Trees, Shrubs, and Plants which are to be sold in consequence of alterations and a re-arrangement of the Gardens at Syon.
Catalogues are in course of preparation, and when ready, will be obtainable of Mr FAIRBAIRN, Gardener, at Syon; and on application to Messrs. FAREBROTHER, LYE, and WHEELER, 8, Lancaster Place, Strand, London, W.C.

Sale of an Entire Herd of Shorthorns, Sheep, &c.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on TUESDAY, June 7, at Roxwell, near Chelmsford, the entire HERD of pure-bred SHORTHORN CATTLE, belonging to Mr W Tupper. It numbers about 50 Head, and has been bred for several years from well known stocks, originally obtained from several of the best Herds in the South of England. Some of the animals have been successfully exhibited at the County Shows, and last year the Bull Duke (25,024), now in service, carried off the First Prize in his class. Also will be offered, 60 Ewes, pure-bred SOUTHDOWN RAMS, descended from the Babraham Flock, and some BERKSHIRE PIGS.
Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, or at the Farm

Important Sale of Prize Shorthorns in Ireland.

MR. JOHN THORNTON will SELL by AUCTION, on THURSDAY, June 30, at Thornville, near Wexford, the small but highly distinguished HERD of SHORTHORN CATTLE, belonging to Joseph Meadows, Esq. In the success that has attended the splendid animals exhibited by Mr Meadows at the Royal English and Yorkshire Shows, the Meetings of the Highland Society of Scotland, and of the Royal Irish and Dublin Societies, as well as the Tramore, Wexford Shows, has been remarkably brilliant; and among the animals for sale (which will comprise the entire Herd, except one Yearling Bull and the Calves of this year), will be found many Prize Winners closely related to the two celebrated Bulls Bellvar (25,699), and Charlie (25,745). The young Stock are chiefly by, and the Cows and Heifers mostly in calf to, Mr Carr's pure Booth Bull Prize of the Realm (24,527), who is also included in the Sale.
Catalogues, with Pedigrees and further particulars, will directly be issued.—London: 15, Langham Place.

To Shorthorn Breeders.

FOR SALE or HIRE, CYNTHIUS (25,804), half-brother to Lord Cobham (20,464); white, calved August 20, 1868; bred by, and the property of, the Earl of Zetland, Aske Hall, Yorkshire; got by Bolton, (23,440), dam Cynthia by Apollo (9869).—

g d Daisy, by Lottery (10,472).
R G d Delight, by Duke of Cornwall (5047).
R R G d Destiny, by Prince Ernest (4818).
R R R G d Dido, by Wallace (5580)
R R R R G d Dairymaid, by Wellington (2824)
R R R R R G d Dorothy Gwynne, by Mazimon (4067).
R R R R R R G d. Nell Gwynne, by Layton (3760.
R R R R R R R G d Princess, by Favourite (252).
R R R R R R R R G d. —, by Favourite (252).
R R R R R R R R R G d —, by Hubback (310)
R R R R R R R R R R G d. —, by Waistell's Bull (669)
R R R R R R R R R R R G d —, by Masterman (422)
R R R R R R R R R R R R G d —, by the Studley Bull (626)

The well-known bull, Lord Cobham, the sire of numerous prize and other valuable animals, was bred by Lord Zetland from Cynthia, the dam of the bull now offered.—Apply to
W. J. MOSCROP OLLIVER, Richmond, Yorkshire.

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION for the RELIEF of DECAYED FARMERS, their WIDOWS and CHILDREN.
Patron—HER MOST GRACIOUS MAJESTY THE QUEEN
President—HIS GRACE THE DUKE OF RICHMOND.
Allowances to Pensioners.

Married	£40 per annum.
Male	£26 "
Widows and unmarried Orphan Daughters	£20 "

Every donation to be laid at the Secretary, by whom Subscriptions and Donations will be thankfully received.

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The TENTH ANNIVERSARY FESTIVAL, in AID of the FUNDS of the INSTITUTION, will take place at Willis's Rooms, St James's, on WEDNESDAY, June 8, at 6 for half-past 6 o'clock. The Right Hon. Lord LYTTON in the Chair
Dinner Tickets, 21s; Ladies' Tickets, 5s; to be had of the Stewards; the Secretary, at the Office of the Institution; and at Willis's Rooms

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The ANNUAL ELECTION of PENSIONERS and CHILDREN will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 22, at 11 30 A M
All Subscriptions shall be deemed payable on January 1 in each year; and no Contributor shall Vote while the same is in arrear
No. 55, Charing Cross, London, S.W.
C. BOUSFIELD SHAW, Secretary.

BATH and WEST of ENGLAND SOCIETY (Established 1777), and SOUTHERN COUNTIES ASSOCIATION.
President—The Right Hon. Sir S. H. NORTHCOTE, Bart., C.B., M.P.
GREAT EXHIBITION of STOCK, POULTRY, IMPLEMENTS, WORKS of ART, and HORTICULTURAL SPECIMENS, at TAUNTON, on JUNE 6, 7, 8, 9, and 10
JOSIAH GOODWIN, Secretary

Dinner and Public Meeting at Taunton.

THE CENTRAL CHAMBER of AGRICULTURE will hold a DINNER and PUBLIC MEETING at TAUNTON, on TUESDAY, June 7, when the subject of LOCAL TAXATION will be discussed

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.
OXFORD MEETING, 1870.
STOCK ENTRIES CLOSE on JUNE 1, and all Certificates received after that date will be returned to the Senders.
PRIZE SHEETS and CERTIFICATES will be forwarded on application.
H. M. JENKINS, Sec.
12, Hanover Square, London, W.

The Agricultural Gazette.

SATURDAY, MAY 28, 1870.

SPANISH fever, or TEXAS FEVER, as different authorities have it, appears from all accounts to be a formidable disease, of which we have yet happily no practical knowledge, and from the ravages of which we have hitherto felt ourselves tolerably secure. The honorary corresponding secretary of the New York State Agricultural Society, however, has expressed his conviction that cattle on the Pampas are likely to be affected with Texas cattle fever, and as South American cattle have been landed in England recently, and more

may be on the way, stock owners in this country are not likely to receive the suggestion with indifference. With every desire to raise a warning note in time, we cannot help feeling that we are left very much in the dark as to the extent of the risk incurred. All that has been written or said about Texas fever confirms the belief that the disease is confined to certain districts on the shores of the Gulf of Mexico. Upon this point reporters who contradict each other flatly on every essential particular of the nature of the plague, are in accord, but Mr. HARRISON'S letter to Dr. CAMERON, as quoted by the "Chambers of Agriculture Journal," cuts at the root of this consolatory assurance, and sets us drifting in a sea of speculation.

The author of the suspicion which we are now trying to discuss says, he shall be very much surprised if cattle from the Pampas are not subject to the same diseases as the Texas cattle; but really it seems to be more a matter for surprise that they should be so affected and nothing be known of the matter. This difficulty, it is true, may be got rid of at once if we accept the statements of those who say that Texas cattle do not themselves suffer from the disease, which they communicate to other cattle with such effect that 90 per cent. of the affected beasts die; such a condition of things is indeed alarming and, worse still, mysterious. Once let the idea be accepted, that animals to all appearance in good health carry about the germs of a deadly disease, capable of ready communication, and of so malignant a kind that even the ground over which these animals tread becomes contaminated, and there is an end of all sense of security for the owners of home-bred stock, so long as cattle from distant regions are imported into this country. No amount of care in inspection, no length of quarantine will avail to protect our herds and flocks from animals which are the miserable but unconscious carriers of an infectious but permanently occult disease.

Medical authorities who have written upon the Texas fever do not hold the opinion that Texas cattle are exempt from the malady which they impart to others, although they admit that they are less virulently attacked, and also that they less readily succumb to the effects of the disease, which is almost invariably fatal to cattle that are brought within the sphere of the infection.

If it is true that Texas fever is, like other diseases, indicated by certain signs, and produces certain effects in the organs of those animals in which it is developed, it would be possible to obtain some information of its existence on the Pampas, and then the remedy would be obvious; but if the previous assumption be the correct one, and the affection cannot be known to exist, because it is not manifested at its origin by any appreciable signs, we are warring against a shadow. What can be done? Prohibit the importation of cattle from South America? On what ground? The mere suspicion of a disease, which may exist, but of the presence of which there is no evidence to be obtained without exposing home-bred stock to contact with the suspected beasts; or by the doubtful method of examining the interior of the body for traces of an affection, of the precise nature of which we know absolutely nothing definite.

Whichever view of the character of the Texas cattle fever be accepted, it seems we are only in the position to choose one horn of a dilemma. If cattle on the Pampas are subject to an infectious disease, the importation ought to be stopped; but if the disease in question is not indicated by any special symptoms, how is the proof of its existence to be obtained?

Perhaps after all there is not much reason for apprehension; the last lot of South American cattle, if we recollect rightly, realised a sum that would scarcely cover the original cost and expense of transit, and although we should be sorry to hint at a limit to the enterprize of cattle importers; it is tolerably safe to affirm that cattle will not be imported from the Pampas unless they can be sold here at a fair profit; and ships had better return empty than bring an unremunerative cargo. On the contrary, should the South American trade grow in extent, and Pampas cattle become as familiar to us as German, Dutch, French, and Spanish are now, we must be content to incur whatever may be the risk, until it assume a tangible form; and should it ultimately transpire that cattle from South America endure the hardship of a long voyage, and show no sign of disease on being landed in England, and, notwithstanding, subsequently communicate a malignant and contagious disease to home cattle, our veterinary authorities will all need to go to school again to learn the why and the wherefore.

AGRICULTURE thrives by the reproduction of vegetables; it is not a constructive art, and therein is essentially different from manufactures. However much it may depend on the aid of power and labour, it is chiefly on sun, soil, and shower, that it must rely, and on one or two other things which we will notice presently. These essential differences are overlooked by writers when they predict the future progress of agriculture by its "affiliation to steam-power," and also when they tell us that the time will come when "the ploughshare will pass through the soil, steam-urged, just as the shuttle passes through the fabric in the loom;" that "steam, which has imposed on the farmer a struggle for existence, brings him the means of issuing victorious from the encounter;" that "husbandry may now rise from the rank of a handicraft to that of a manufacture, farms be organised and worked like factories—food, like every other commodity, be at length produced by steam-power; tall factory (meaning farmyard!) chimneys rise among the trees, the steam-engine panting below." At the same time we are reminded of "the power of steam on the side of progress! the mighty power of steam!"

Power and labour, which are the prime agents in most industries, are comparatively insignificant in agriculture. It is true the soil must be prepared before the seed is sown, but this may be done by a spade, elbow-urged, even more effectually than by the "steam-urged" ploughshare. The crops, too, must be gathered in and prepared for market. No doubt something is saved by mechanical appliances, even on a farm; but fully admitting the farmer's alliance and connection with the workshop and the factory, it is not on the "affiliation" of his business to these, but on the fertility of the soil that he and the public must rely for the abundant production of food. This becomes manifest if we consider where food is now produced most cheaply and abundantly. Let us select three sites. First, Minnesota, where there are no "panting steam-engines," and where labour is twice as dear as in England, and good Wheat is now selling at 24*s.* a quarter. It may be said, "the land is rent-free." This, however, is not the case in our second example. The market gardens round London, cultivated by the spade, pay rents six times as high as common farm rents, but their proximity to the sources of fertility, the London stables, enable them to produce vegetables cheaply, and so abundantly that it is no exaggeration to say if our average agricultural production were in the same proportion, food would be so abundant, and the price so low, that none would be imported; our present population would be unable to consume one-half of our production. It may be objected, that this only applies to Cabbages and "vegetables," to which the reply is, that succulents and cereals are composed of the same constituents, and a fertile soil will produce equivalent proportions of either.

The third example is afforded by the agriculture of China and Japan, which is more productive, beyond all comparison, than that of England. Horses are but little employed in tillage, which is mainly effected by manual labour. Nowhere in the world is the farming better and more simple. No artificial manures are used. There are no farmyards and no cattle, so that no farmyard manure is made. The people avoid meat, and live almost entirely on vegetable food. According to popular agricultural theories, it would at first sight appear that the land could not be made productive without farmyards and dung. It is an axiom with us, "The more cattle the more manure; the more manure the more corn."

This, however, is not strictly correct; and the fact that one nation lives on a vegetable diet, and another eats flesh, has no actual relation to the state of fertility and of exhaustion in which the soil of the two countries may respectively be found. The lands of China and Japan gain nothing from the vegetable diet of their people, and our soil loses nothing from our eating flesh. It is true that a flesh diet is a little more costly, because the feeding of animals extends that circle which, by the law of Nature, the elements must traverse in their alternate passage from the inorganic to the organic kingdoms. But in this extension there need be no waste, any more than when a hamper of sherry is sent to the East Indies and back, instead of the shorter journey to the Cape. A crop of Potatos or Rice removes from the soil certain constituents, but the sum of fertility is not affected by the particular stage through which these earthy elements pass previous to their restoration to the soil. The Potato may be burnt or eaten by man, or passed through an intermediate stage in the body of a pig; the remains—the dead body or residuum—may be in the form of ashes, or in bones and excreta of pigs or man—it matters not, provided they are restored. The simple law of compensation which plays so large a part in the operations of Nature, requires that they should be restored to the soil in order that the Potato, or its equivalent Turnip or ear of corn, may be reproduced. It would not be profane to say that the remains of the food we eat should be laid with reverence in the earth as "ashes to ashes, and dust to dust."

The Chinese farmer, having no other resources, has obeyed this law, hence the fertility of his land. We, on the other hand, have depended on our own imported manures, and perhaps we have been somewhat misled by mistaken theories as to the nature and composition of the soil itself, and the kind of manure to apply to it, as well as by false notions about mechanics and steam, and what they could do for us; hence the increasing scarcity of all food which cannot be imported. If comparisons are to be made between agriculture and the "factory system," a true one is that the loom must be supplied with raw materials before it can weave them into fabrics, so the soil requires from the hand of the cultivator the materials removed from it in the previous crop. In this respect our agriculture has attempted to cheat Nature by various substitutes, such as deep tillage alone, and adding an inch of depth (equivalent to 100 tons per acre!) to the fee simple. This is futile. Let the raw material be supplied, and agriculture will speedily emulate our manufactures in her increased production. Steam and mechanics will then find an extended field, and probably one of their first tasks would be to cultivate the unproductive pastures, which, if well farmed as arable, would produce more meat than they do now, besides producing corn.

Practically the cost of manures rules the expense of cultivation and the price of food. Their high price prevents our poor pastures from being made rich arables. That manures continue to get scarcer is not surprising, for the *dead body* of 13,000,000 quarters of home-grown Wheat is lost every year. All the guano and superphosphate, and imported cattle food, are insufficient to prevent this fraud upon the land from causing its eventual bankruptcy. And until we restore to it what is now withheld, all the resources of our modern and improved agriculture will be unable to prevent the increasing cost of cultivation and the scarcity of all kinds of food that cannot be largely imported. *E.*

—— AT Monday's corn market in Mark Lane a decline of 1*s.* per quarter had to be submitted to in the price of Wheat; and Wednesday's quotations were, if anything, lower still. Oats, Beans, and Peas, were rather dearer.——In the Metropolitan Cattle Market prices, last Monday, were higher. There was a short supply and a fair demand; and on Thursday, with a much larger supply, the demand was sufficient to maintain Monday's prices.

—— The discussion on Wednesday last, during which Mr. TAYLOR'S GAME BILL was talked out of the House of Commons, by the arrival of the hour of adjournment before the conclusion of the debate, is shortly reported on page 751.

—— At the meeting on Monday last of the Council of the Smithfield Club, Lord WALSINGHAM, Vice-President, in the chair, a decision was made of the question relating to the disqualification of Mr. CHAMBERLAYNE'S pigs at the last show, and it was resolved, that—

"The Council, considering that both Mr. CHAMBERLAYNE'S steward and bailiff are highly culpable in respect of the false entry of the age of the pigs shown in class 59 at the last show, resolve that no entry be received in future signed by either of these individuals, and that Mr. CHAMBERLAYNE be allowed to exhibit in future on the sole condition that he shall himself certify the particulars required by the Club."

A letter from the Earl of POWIS, the President of the Club, was read, offering to place at the disposal of the Council a sum of money for prizes to be given for the best instrument for the slaughter of animals by the severance of the spinal vertebræ. — The hon. secretary notified the death of Mr. T. TWITCHELL, a member of the Council, and for many years one of the most successful exhibitors at the Club's show, and that the vacancy in the Council caused by his lamented decease will be filled up at the November Council meeting.

—— In his recent examination before the Local Taxation Committee of the House of Commons, Mr. C. S. READ, M.P., stated as regards the incidence of rates that increase and decrease of old rates, and all new rates fall upon the tenant during existing tenancies, and that landlords are usually able to eventually throw the whole increase upon the occupiers. To share the rates would be of no pecuniary benefit to the tenant; landlords would recoup themselves, and in order to be safe might in future agreements add rather more than half the existing rates to the new rents. It might, however, promote a more uniform, enlightened, and rational expenditure of local rates, but would certainly not lessen the amount. Revision of existing areas for local rating is required. County boards should manage great thoroughfare roads, large bridges, arterial drainage, and great sanitary works, and should be a court of appeal from smaller areas. Government should pay all county rates, such as militia, police, lunatics, prisoners, administration of justice, and might also contribute a certain fixed sum in aid of the poor-rate, without incurring the risk of extravagant local expenditure. Union chargeability has slightly increased poor rates, mainly by small farmers paying off labourers in winter, and guardians having less pecuniary interest in individual cases; halving rates might augment this, though this is not the case in Ireland and Scotland. One great drawback to the employment of capital in agriculture is the pressure of local taxation. Income from personal property, when it is applied to land, is at once taxed *2s. 6d.* in the pound, whereas it previously paid nothing. Good farming has often increased the rent of land £1 per acre; assessments are directly raised, and the money that finds increased employment for labour, and so reduces the poor-rates, has also to contribute to all other local taxation. Rates are 12½ per cent. on rental, and 25 per cent. on the profits of the farmer.

—— Professor THOROLD ROGERS read a paper on the incidence of local taxation last week, before the Statistical Society. Taking the amount of local taxation on the occupation of real property alone at £16,733,000, from the parliamentary paper moved for by Mr. WARD HUNT, he pointed out that half this amount is expended on the relief of the poor, and that the remainder is the cost of roads, sewers, police, water, light, and other purposes necessary for the enjoyment of property and safety of society. He contended that taxes levied on rents and paid by the landowner cannot be transferred to the occupier, but that taxes on occupiers (when not part of the cost incurred in carrying out any industry) remain a burden on the occupier. Hence he maintained that the local rates, which are now paid by the occupier, are really and ultimately borne by the occupier; and controverted the conclusion of Sir G. C. LEWIS and Mr. DUDLEY BAXTER, that the greater part of the rates fall on the owner. As regards houses, he argued that the rates are no burden on the landlord, but are a burden on industry, and that the owner is enabled by the increasing competition, and through his power of inflicting loss by determining the occupation, to enforce the payment of increased rates by the ocupier. As regards agricultural land, he desired the transference of the rates from the occupier to the owner. The heaviest item in the farmer's local taxation is the poor-rate. Economically considered the poor-rate is an insurance of the labourer's life and health. Cut away poor-law relief and one of two things must happen; either the labourer must be better paid, or many of those habitually maintained by the poor-rate must perish. A poor-rate, therefore, is a rate in aid of wages, which cheapens labour and so increases the rent. But the farmer pays only a portion of the insurance, through the fact that occupiers of houses have to contribute towards the support of his labourers. The poor-rate in country towns, is in fact, a house tax, levied to a large extent for the advantage of landlords, who obtain the boon in the shape of cheap labour in agriculture. Roads are still more markedly a beneficial outlay, and so far from highway rates being a burden to the land, they are a necessary part of the process of agriculture, some of the costs of which are thrust on occupiers of houses. County rates alone are a loss to the occupier. For these reasons Professor ROGERS contended that landowners have no right to those compensations which they have obtained under the idea that local taxation presses severely on real estate, such as a fixed land-tax, the exemption from probate duty, loans for improvement of land, exemption of farm-houses, and the custom of primogeniture, all of which he strongly condemned. He concluded by urging that the greater part of local taxation is beneficial outlay, and, therefore, not a tax at all; and that it is altogether paid by the occupier.—Mr. DUDLEY BAXTER replied that the paper was opposed to the teaching of all the great political economists, who were all agreed in the conclusion that the greater part of the local taxes fell upon the owner, and that only those on the outlay on improvements in farming land and on the building rent of houses fall upon the occupier. He pointed out that the rates on a farm are part of the cost of production, and in all valuations for the purpose of rent are deducted by the valuer before fixing the rent. He condemned Professor ROGERS' paper as founded upon a false theory of taxation, which will not be accepted by scientific men.—Canon GIRDLESTONE protested against its being supposed that a pauperising poor-law, supplementing wages by relief, is any benefit to farmers or landowners. They would get much more remuneration out of a smaller number of independent labourers at higher wages.

OUR LIVE STOCK.

CATTLE.

MR. WILLOUGHBY WOOD'S sale was on the whole satisfactory. Twenty-eight animals realised an average of £43 15*s.* 3*d.*, notwithstanding the drawback of eight calves within four months old, and 22 females made £46 6*s.* 4*d.* each. The *Flounces* were not in request; seven of them only realising an average of 21 gs. each. *Oxford's Ada*, a pure Bates' cow, particularly good at the forequarter, was purchased very cheaply by Colonel Kingscote for 140 gs., and her daughter, *Lady Adelaide*, by NORTHERN DUKE (22,431), became the property of Captain Oliver at 145 gs. *Lady Walton*, by 3D EARL OF WALTON (19,673), was bought by Mr. Baxter for 60 gs.; *Lady Walton 2d*, by EARL OF GLO'STER (21,644), goes to Beaumont Grange, at 71 gs., and *Countess of Clarence*, by 3D DUKE OF CLARENCE (a splendid bull), was knocked down to Mr. Fawcett, of Scaleby, at 61 gs. The EARL OF BARRINGTON combines the pedigrees of *Countess of Barrington 2d*, by 9TH DUKE OF OXFORD, with that of Mr. Sainsbury's *Darlington* family, and was bought by Mr. Wood for 68 gs. EARL OF THORNDALE, a good-looking bull, out of the same cow as Mr. Leney's *Fidget 7th*, became the property of Mr. Dugdale at 60 gs.; the remaining bulls did not realise noteworthy prices. Subjoined is a list of the prices and purchasers:—

Name of Animal.	When Calved.	Price	Purchaser.
Cows and Heifers.		Gs.	
Florence 6th	1861	21	Mr. Allen, Clifford.
Bellona	1862	25	Mr. Thompson.
Oxford's Ada	1864	140	Colonel Kingscote.
Frolic	1864	41	Mr. Webb.
Lady Walton	1865	60	Mr. Baxter.
Grenadine 2d	1866	40	Mr. Allen, Clifford.
Royal Florence	1867	37	Mr. Allen, Clifford.
Lady Hilda	1868	56	Mr. Allen.
Zeal 11th	1868	47	Mr. J. Hardy.
Forest Flounce	1866	28	——
Wild Flounce	1868	25	——
Lady Walton 2d	1868	71	Mr. Slye.
Ginevra	Jan., 1869	25	Mr. Hardy.
Grenadine 3d	Jan., 1869	23	——
Fidelity 9th	Feb., 1869	32	Mr. Allen, Clifford.
Grenade 2d	Feb., 1869	25	Mr. Tappenden.
Iris 3d	Mar., 1869	26	Mr. Martin.
Lady Adelaide	Nov., 1868	145	Captain Oliver.
Countess of Clarence ..	Feb., 1870	61	Mr. Fawcett.
Frolicsome	Feb., 1870	21	——
Tartan Flounce	Mar., 1870	21	——
Vernal Flounce	Mar., 1870	10	Mr. Fawcett.
Bulls.			
EARL OF BARRINGTON (26,051)	1867	68	Mr. Wood.
EARL OF THORNDALE ..	1868	60	Mr. Dugdale.
VISCOUNT	Jan., 1870	21	Mr. Martin.
GUARDSMAN	Mar., 1870	23	——
MARQUIS OF STAFFORD ..	April, 1870	5	Mr. Chapman.
GRAMPIAN	April, 1870	10	Mr. Mosley.

—— Messrs. Walcott & Campbell of New York have again been buying Booth heifers at Transatlantic prices. They have secured *Patricia*, a well-known prize-taker, by LORD BLITTER (22,126), and from *Alfrida* by PRINCE ALFRED (13,494), for 1000 gs.! and *Minaret*, a roan yearling by KING RICHARD, and from *Melissa* by GENERAL HOPEWELL, for 250 gs. The price of the latter heifer was to have been 500 gs., but Mr. Booth was persuaded to reduce it on account of the loss his customers had sustained on a former occasion through the death of *Bride of the Vale's* calf. *Bells' Messenger* of Monday last reports the further sale at Warlaby of a white November bull calf by KNIGHT OF THE SHIRE (26,552), from *Mabel* by GENERAL HOPEWELL (16,953), and a red and white July heifer calf by RAVENSPUR from *Marianne* by LORD OF THE VALLEY. Both these animals belong to the same family as *Patricia*—that of *Christon*, and are bought by Mr. B. St. John Ackers, of Brinknash Park, Gloucester. The price is high, but is not made public.

VII. THE PRINCE CONSORT'S FLEMISH FARM.

[We have again to express our acknowledgments to Messrs. Longmans for the use of the following engravings.]

THOUGH receiving for the future the name of his Royal Highness the Flemish Farm had been for many years in the occupation of a royal tenant. It received its name in the reign of George III., when it and the Norfolk Farm were set apart as illustrations—so they were intended—of the two systems of management known as the Norfolk and Flemish respectively. Since it passed into the occupation of the Prince it has been entirely remodelled; roads have been made; Gorse and Fern have been removed; the fields have been rearranged; the old buildings have been removed; a new homestead has been erected. And it has all been drained, under the superintendence of Mr. Parkes, 4 feet deep, at the cost of £3 per acre, exclusive of pipes and cartage. The whole neighbourhood, too, has partaken of the improvement. Your walk to it, from the farms previously described, is across the best grazed portion of Windsor Great Park, where great improvements in the grass-lands have been effected by drainage, chalking, and manuring.

Of this last agency a good illustration was afforded many years ago, by experiments made here under the direction of the Prince Consort, the very satisfactory results of which were described in the Journal for 1853 of the Royal Agricultural Society.

The following report of them is taken from that volume:—

EXPERIMENTS ON TOP-DRESSING GRASS-LAND IN WINDSOR GREAT PARK.

(Communicated by Order of H.R.H. the Prince Albert.)

"The land marked I. [in the annexed table] was enclosed from open pasture and cropped for hay, for the first time. The whole land so enclosed had received during the winter about 12 loads per acre of deer-pen manure, valued at *2s.* per load. This manure seemed never to have produced any effect, in consequence of the long drought succeeding its application; and though its value ought to be stated against the crop, when considered generally, it has not been taken into account in the above statement, which is intended to had this week the 16th annual show of our agricultural society, and within the last few weeks several other shows within eight miles round, and it is most curious to notice how judges differ in their awards, especially in Dorkings and in Golden and Silver Hamburghs, though in Spanish and game they are more uniform. What a good thing it would be if the Royal Agricultural Society, either alone, or in union with other societies, would have published a standard work, laying down laws and rules to be observed in clean birds: it would not only tend greatly to improve the different breeds, but would be a great assistance to exhibitors. Many amateurs demur to the trouble and expense of entering their stock through this diversity of opinion upon clean birds. *D. T. D.*"

[Mr. Tegetmeier, author of the "Poultry Book," illustrated with coloured plates by Mr. H. Weir, and contributor of the greater part of the information on poultry to be found in Mr. Darwin's last work, is one of our best authorities on poultry.]

—— Almost all naturalists, says Mr. Darwin, admit that the several breeds of ducks are descended from the common wild duck. Unless we can deny that domestication prolonged during centuries can affect even such unimportant characters as colour, size, and in a slight degree proportional dimensions and mental disposition, there is no reason whatever to doubt that the domestic duck is descended from the common wild species, for the one differs from the other in no important character. We have some historical evidence with respect to the period and progress of domestication of the duck. It was unknown to the ancient Egyptians, to the Jews of the Old Testament, and to the Greeks of the Homeric period. About 18 centuries ago Columella and Varro speak of the necessity of keeping ducks in netted enclosures like other wild fowl, so that at this period there was danger of them flying away. Moreover, the plan recommended by Columella to those who might wish to increase their stock of ducks—namely, to collect the eggs of the wild birds and to place them under a hen—shows, as Mr. Dixon remarks, that the duck had not at this time become a naturalised and prolific inmate of the Roman poultry yard. The origin of the domestic duck from the wild species is recognised in almost every language of Europe. The wild duck has a wide range, from the Himalayas to North America. It crosses readily with the domestic bird, and the crossed offspring are perfectly fertile.

FARM BUILDINGS.

STATEMENT SHOWING THE RESULT OF EXPERIMENTS ON GRASS IN WINDSOR GREAT PARK, WITH ARTIFICIAL MANURES, 1852.

Land Experimented upon.	Quantity of Top-dressing.	Cost per Acre	Date of Top-dressing.	Date of Cutting	Produce per Acre	Value at £3 per Load of 18 cwt.	Produce of surrounding Acres.	Value at £3 per Load.	Balance per Acre in favour of Top-dressed Land
		£ s. d.			ct. q. lb.	£ s. d.	ct. q. lb.	£ s. d.	£ s. d.
I. High Undrained Land.									
One acre with guano	2 cwt.	1 4 8	May 22	July 22	30 3 4	5 2 6	8 0 0	1 6 8	3 15 10
One acre with nitrate of soda	2 cwt.	1 17 10	,,	,,	29 2 0	4 18 4	8 0 0	1 8 8	3 11 8
II. Low-lying Meadow Land.									
One acre with guano	2 cwt.	1 4 8	,,	July 16	27 3 0	4 12 6	9 0 0	1 10 0	3 2 6
One acre with nitrate of soda	2 cwt.	1 17 10	,,	,,	25 0 0	4 3 4	9 0 0	1 10 0	2 13 4

POULTRY.

A CORRESPONDENT writes from Glasgow as follows:

"Will you kindly let me know the best authority upon poultry, their breed, points, and management? We have

show a comparison between land under two artificial manures, and land of the same description without them.

"The land marked H. was a portion of a meadow, which has long been cropped for hay every year. This land received no other treatment than the application of the artificial manures.

"From the above statement the benefit resulting from liberal top-dressing of Grass is apparent. The aftermath on all the top-dressed land was also superior to that on the rest of the field, but no difference could be seen betwixt the two sorts experimented with. On the application of guano there seems to be considerably the greatest profit; but as experiments have been tried in other localities in which the nitrate of soda has had the superiority, the explanation of the difference in the effects produced must be sought for in some peculiarity of the soil. In both cases stated above, the soil and subsoil consist of clay, not very tenacious.

"It is believed that the difference in the produce of the dressed and the undressed land is greater than may be expected in ordinary seasons, in consequence of the weather and other circumstances having been exceedingly favourable for the application of the manures. No rain had fallen, and there had been constant drying easterly winds from February till May 22, the day of application, and consequently the Grass had made no growth whatever. The manures, therefore, on being applied, came immediately into contact with the roots, and on May 26 genial rains commenced, which continued almost without interruption till the day of cutting. The surrounding Grass seemed never to make a start all the season, which the smallness of the crop will show, while the top-dressed land improved daily.

"F. H. Seymour,
Deputy Ranger.
"W. Menzies, Deputy Surveyor."

Since the date of this experiment a large experience in various quarters has been recorded, and especially by Mr. Lawes of Rothamsted, St. Alban's, in the same pages, upon the effect of manures on pasture land; and it has been shown that nitrogenous manures, such as ammonia and the nitrates of soda and potash, tend rather to encourage the growth of grasses, while the phosphates, alkalies and mineral manures tend rather to encourage that of the Clovers. The whole research to which the above report is a contribution, proves that our pastures, no less than our arable fields, are directly amenable to the influence of management. Though, however, the term "cultivation" thus applies to our Grass as well as to our ploughlands,—and pastures need manuring, drainage, weeding, and may even receive tillage with advantage, just as arable land,—yet it is to the latter more especially that the last-named of these cultivative processes is applicable.

The Prince Consort's Flemish Farm, with its clay soil, is a capital illustration of the benefits of the drainage and thorough tillage of arable land.

In the map of this farm (fig. 142) the numbered fields are arable, and the others are pasture. The stone roads are represented by shaded lines, the green rides by dotted lines. Thus every field is in either way easily accessible.

The buildings are centrally placed.

The rotation is a four-course, modified in both the ways which have been recommended; namely, by taking Beans instead of Clover over one half of the Clover break, and by taking Barley after a corn crop in place of after the roots or fallow. The whole arable land amounts to about 190 acres, and there are rather more than 200 acres of pasture-land and wood-land, the whole occupation including nearly 400 acres. It is for the most part a very stiff soil, and has been greatly improved by its regular division into fields, its tile drainage 4 feet deep and 7 yards apart, its admirable buildings and its thorough tillage. Fowler's steam plough, with a 12-horse engine, has been at work, with the effect of considerably cheapening the horse labour of the farm. Twelve or thirteen horses used to be employed on it, undertaking, however, of course, a good more than the mere labour of the farm. Since the employment of Fowler's 12-horse engine the work has been easily done by eight.

Fig. 141.—The Flemish Homestead.

One of the fields, No. 9 on the map, was set apart, by Her Majesty's desire, during the Battersea Show of the English Agricultural Society, for the exhibition of the steam-plough, in order that foreigners and others might have an opportunity of seeing it at work within easy reach of London.

The buildings on the Prince Consort's Flemish Farm, here represented (figs. 141, 143), were designed and erected by the late Mr. J. R. Turnbull, of Windsor Castle, in conformity with very comprehensive and detailed suggestions and directions from his Royal Highness, in 1858. They are one of the most complete homesteads in the kingdom. The principle is one of the best for uniting compactness with easy arrangement of parts. A central covered yard has a stable on one side of it, and an open yard on the other. At the end of these, and separated by a covered cartway, stand root-house and straw-house for the supply of the cattle and horses, with threshing-barn and granary; and close by, detached from the main block of the building, near the stables, are the cart-shed, implement-shed, and cottages for the ploughmen. The drainage of the whole buildings is conducted to a tank at some little distance from the buildings, and there by hose and jet it is spread over the grass fields on a lower level.

The plan (fig. 144), and the accompanying isometrical projection of these buildings (fig. 143), with the table of references, will enable the reader to understand their arrangement.

The connection of the various parts is most natural and obvious. The horses come out of the stable, and are at once close by the cart and implement shed. They are yoked in carts, and carry the corn from the stack through the gangway between *p* and *o*, where the sheaves are unloaded and threshed at *o*, the straw falls away into the straw-barn at *n*, and the grain goes upwards to the granary. From *n* the straw is carried the shortest possible distance to *a b c* and *g* and *h*. If the carriage of the litter should rule the position of the several feeding places, then this principle has been well observed in this instance. The soiled litter from the stable *g*, is thrust through openings near the floor into the covered yard *b*, and that from the cow-stalls *e*, into the open yard at *a'*. It thus gets trodden down into a solid material, which suffers no waste while waiting its application to the field.

The machinery in the barns and houses is well arranged and well selected. Messrs. Clayton and Shuttleworth put up the whole of the machinery, con-

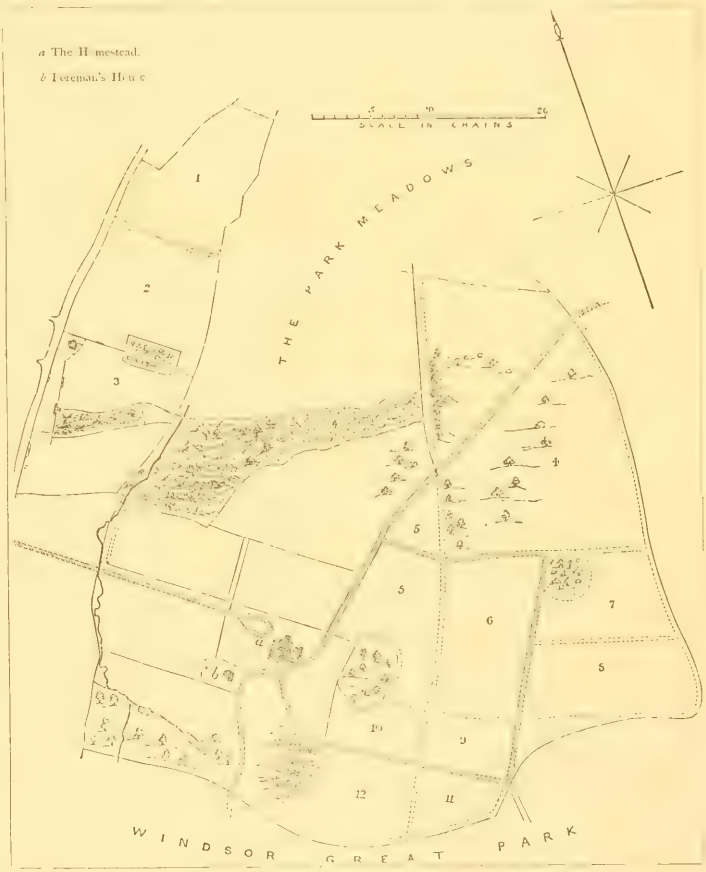

Fig. 142.—Map of the Prince Consort's Flemish Farm.

sisting of one of their 8-horse power fixed steam-engines, which works a threshing, winnowing machine, and corn-mill, manufactured by them; a chaff-cutter made by Messrs. Cornes, a litter-cutter by Messrs. Ashby, an oat and bean crusher by Messrs. Turner, a cake-breaker by Messrs. Garrett, a root-cutter by Messrs. Gardner, and a pulping-machine by Messrs. Bentall.

When the work of threshing is going on, three men remove and build the straw, two men and two boys unload the carts as they arrive and feed the mill. By the corn-stack stands a big tripod used when building the rick for suspending the cradle taken from the cart wheels which constitute the harvest cart. Pulleys are brought into use by which the inner cart frame on which the load is brought in from the fields is pulled by the horse up to a level with the rick and left there, while the one just unloaded is placed upon the empty wheels and taken back to the field for its load. In the shed outside are Fowler's steam-plough, Bentall's broad-share, Hancock's pulveriser plough, which met with more than its match on the stiff clay soil of the Flemish Farm, Phillips and Gardner's turnip-cutters, and Wood's mowing machine.

A cottage containing several bed-rooms, a kitchen, and a sitting-room for the unmarried ploughmen are part of the farmery. Very comfortable accommodation is thus provided, and the establishment is in fact a model "bothy."

A great deal of instructive detail exists in the history and construction of these buildings. The spot chosen for their erection was fixed upon because of its central position. There was, however, a great deal of earthwork and excavation needed to adapt it; and it was distant both from bricks and gravel. In Mr. Turnbull's hands, however, both of these difficulties were obviated, by the expedient of making bricks and burning ballast upon the spot with the excavated material. The nature of the excavation may be gathered from the section of the buildings, fig. 145. The yards are covered with ballast and road-metal about a foot deep. The ballast is valuable as a corrective of the damp, which might otherwise have been expected from the clayey site of the buildings. The walls are in every case built on a concreted foundation.

The flooring is everywhere concreted—having been dug out low enough to hold a large thickness of lair. That of the cow-houses, chaff-houses, and passages is asphalted in addition, and thus a complete security is provided against the lodging of rats and mice. The flooring of the stable is paved with stone above the concrete.

In the roofing of these buildings Colthurst's three-ribbed tiles are employed, the last row being Beadon's patent eaves tiles, which constitute a spouting for the roof water. Beadon's tiles are bedded in cement and screwed to the rafter, and make a perfectly strong and efficient spouting. The roof is of exceedingly neat construction, with iron tie and ring bolt, and wooden struts. The principal rafters are 9 inches by 3 inches in section, and 8 feet apart. All other dimensions may be obtained from the scale given with the drawing, fig. 145. The arrangement for providing ventilation to the covered yard is seen in the section given in fig. 145. It will be observed that the central roof is raised some 10 or 12 inches above those on either side—the iron sockets receiving the rafters on either side of them at the two different levels, while between the two the open space provides for the passage of fresh air.

In further reference to these buildings it may be mentioned that wherever the walls in the plan (fig. 144) are represented in shade lines, it will be understood that there is a second storey. Thus over the threshing-mill and boiler and engine-house there are granaries; and in the cottage the second floor is arranged in sleeping rooms for the ploughmen. The walls are whitened with a silica wash which does not rub off, and is thus clean as well as cleanlooking, which whitewash rarely is. The principal doors of the buildings are slung by friction wheels upon a horizontal iron rod resting on iron sockets built into the wall; and they slide to and fro without difficulty; thus easily shutting and opening gateways where collections of litter on the surface of the ground would interfere with the motion of a door upon hinges.

Water is laid on to the stables, and to troughs in the open and covered yards. The stable fittings, with rounded brick coigns, substantial oaken posts, elm stall divisions, and wooden mangers, everywhere carry out the instructions of the Prince, that the substantial and the useful, not the merely elegant and beautiful, should guide the construction. The buildings cost, we understand, upwards of £6000, of which not one-sixth was provided by the landlord, H.M. Commissioners of Woods and Forests. The Prince entirely approved of these buildings, which combined, as he declared, usefulness with elegance of outline of arrangement and of material, in just the right proportion; so much so indeed, that his Royal Highness repeatedly recommended them to his friends abroad, and the plans were accordingly sent more than once both to Germany and Hungary for execution on estates there. The plan has also been erected in more than one instance in England.

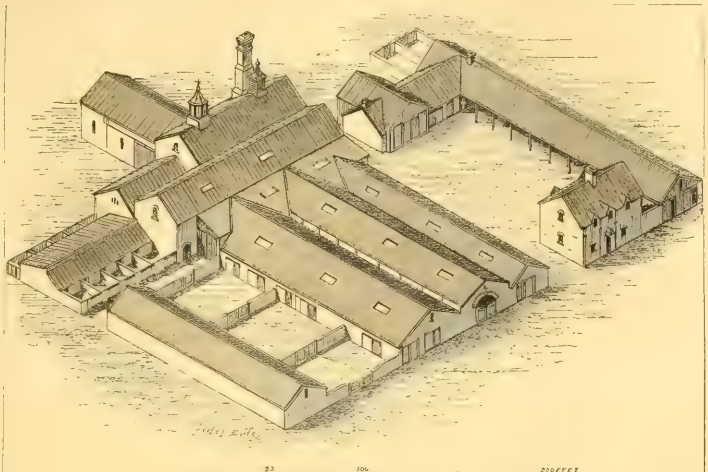

FIG. 143.—HOMESTEAD AT THE PRINCE CONSORT'S FLEMISH FARM.
(DESIGNED AND ERECTED BY J. R. TURNBULL)

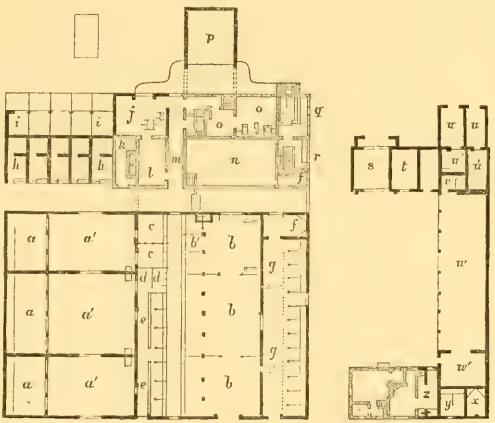

FIG. 144.—PLAN.

The following are the references to the index letters above:—*a a'*, Cow-yards open.—*b b*, Loose boxes.—*c c*, Covered yards for young stock.—*d d*, Feeding boxes.—*e e*, Calves' pens.—*f f*, Cow-stalls.—*g g*, Saddlery.—*h*, Farmhouse stable.—*i*, Piggeries.—*k*, Shed, with liquid manure tank near it.—*l*, Turnip-cutters.—*m*, Pig-food and cisterns.—*n*, Cut chaff.—*o*, Passage.—*p*, Straw-barn.—*q*, Threshing-barn, containing meal mill, oat and bean crusher, and cake mill.—*r*, Shed barn.—*s*, Boiler-house.—*t*, Engine.—*u*, Shed for portable engine.—*v*, Fowls.—*u u'*, Bulls' houses.—*w*, Forge.—*w*, Cart-shed.—*w'*, Implements.—*x*, Loose-box.—*y*, Nag-stable.—*z*, Cottage.

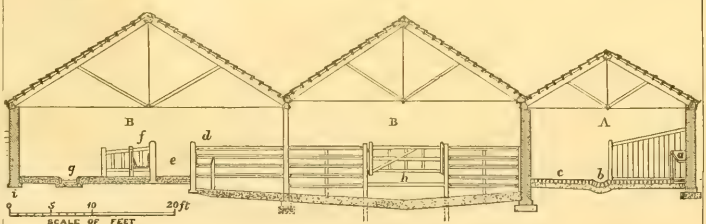

FIG. 145.—SECTION OF COVERED YARD.

The following are the references to the index letters:—A, Stable: *a*, manger; *b*, gutter; *c*, floor of heath-stone pitching over concrete.—B B, Covered yard divided by railing (*d* and *d*) gates; *e*, gangway between yard and cow-stalls; *f*, division of cow stalls; *g*, gutter behind cows; *h*, wall between covered and open yard.

THIN SEEDING.

I HAVE read your recent article on the thin seeding of Barley, and noted that you obtained in each year the average produce of 40 bushels per acre during six years. I also noted that you had made gradual reductions yearly in the quantity of grain sown, beginning with 4 bushels in 1864, and ending with 6 pecks in 1869, and that these reductions had no appreciable effect on your general results, the crops during that time being "remarkably even in both quantity and quality;" only you had a decided

saving in your later experiments in quantity of seed grain sown.

If I am right in supposing that the Barley during all these years was drilled in rows 7 inches apart, in accordance with your sowing of main crop in 1869 (in which, however, you state in one instance having employed 2 bushels instead of 6 pecks), then the results of these trials would be in accordance with your conclusion, that "as great a measure was produced by the use of half the seed as with double the quantity."

In giving us, therefore, the benefit of your experience in the direction of employing a lesser quantity of seed without loss to your annual returns, you unquestionably do the agricultural public good service; and if every one would experiment for himself by copying your example, and communicate results for tabulation, much wasted seed grain would otherwise be economised, but the matter to my mind is of yet greater public value than that, and should not end there.

I confidently assume that it is quite possible to secure from your land a larger return than your average of 40 bushels an acre, without either using more seed than you have been giving, or treating your land differently, as to cultivation or the application of manure, provided only you will deposit your grain in rows 4 inches distant, in place of rows either 7 or 9 inches distant from each other.

I will give you an instance of my experience. In the spring of 1869 I laid down 17 acres of Barley with the Aberdeen corn drill, sowing at the rate of 13 pecks an acre in rows 4 inches apart. Afterwards with a deep tined harrow, I crossed the lines of sowing to dislodge and disperse the grain from the line or bed of the rows, and the produce I realised in autumn was 120 quarters, sold grain, and 3½ quarters kept for horse feed; the produce being at the rate of upwards of 58 bushels an acre.

The land I grew this crop on had not been treated differently from other farming land in the neighbourhood. It is distant only a quarter of a mile from granite quarries, and rests on extensive beds of this primitive rock, whilst not much more than 30 years ago it was uncultivated moorland. If, therefore, your land will compare favourably as against mine, the important question would naturally arise, why your land should only yield 40 bushels and mine 58 bushels an acre.

I think the difference of 18 bushels an acre may be found due to my method of sowing, and I shall endeavour to show it. Of course it is to be supposed, in both cases, that the land is in good tilth and cleared of weeds, and that the Barley has had fair swing to braird and grow unmolested.

If I have made any mistake in using too much seed, I shall have "the struggle for life" existing, or, as you remark about thick seeding, I shall have to contend with "Barley as being the greatest weed in a Barley crop." However, when I placed my 13 pecks of Barley per acre in the ground in rows 4 inches apart, I find I had about one seed only in every six seeds more in the row than you had sowing 6 pecks an acre 7 inches apart; and yet I had nearly one-half more return than you. The fact is, you did not so deposit your Barley as to make the land yield all it could readily do. You had for one line of Barley 7 inches of interspace (less tillering or stocking of the plants), otherwise yielding nothing except weeds; whereas I had two lines of Barley for every 8 inches, and the 4-inch interspaces were nothing crowded, and but little room for weeds—quite in accordance with your own view, that "if the ground be thoroughly occupied with the crop there will be less weeds and a better result."

As, therefore, I had the growth of 13 pecks to 6 pecks per acre, or the produce of 13 plants to every 6 of your sowing, I could hardly fail (other conditions being by comparison about equal) to secure 58 bushels to your 40. In this respect the matter becomes one almost of arithmetical solution; but I would urge on every intelligent agriculturist to bring thin seeding and the 4-inch method of drill sowing to the crucial test of actual experiment.

My practice in the cultivation of cereal crops is based on what might be termed a primary or fundamental principle, in itself so evident as to admit of little dispute; namely, that with the view of obtaining the highest possible return from the soil every individual pickle of seed or plant should have all the necessary space of ground it requires for its perfect development, but nothing more. Now, in carrying out this primary idea, it will at once be seen that to place two seeds together is a departure from the principle, and therefore on error in culture. Some farmers endeavour to arrive at the most profitable results by broadcasting, and have deliberately thrown aside the wide-sowing drills to resume the broadcast machine. They certainly see in broadcasting the prospect of an unprepared and bad seed-bed, a great waste of seed grain, most irregular covering by the harrows, and irregular braird; but they are greatly reconciled to these drawbacks at harvest time by tolerably satisfactory results being obtained, returns exceeding those produced from the 7 or 9-inch drill-culture. The broadcasting of seed does blindly aim at such a scattering as will leave every individual seed its requisite space of ground to thrive upon, but as it fails to secure the correct and uniform deposition of the seed, any system of broadcasting must for that reason alone be pronounced a failure. The nearest approach therefore in a practical way to carrying out an illustration of the principle indicated, is the system of 4-inch drilling, and the employment of a "cross tine" of harrows to dislodge the seed in some degree from the rows, and separate the pickles or grains from each other. The laying down of grain crops happens to be surrounded with such a variety of circumstances concurrently affecting the ultimate results, that it is next to impossible to get any intelligent verdict recognised on a single point in dispute. If any farmer were to follow your example in the matter of thin seeding so as to arrive at a conclusion by which he would be afterwards generally guided in the quantity of seed he should use, you may depend on it he will have a dozen theoretical men about him, telling him the matter is all bosh, for in determining the quantity of seed grain to employ per acre he ought to have in his mind's eye also the quality of the seed, condition of his land, character of the climate, period or time of sowing, aspect or altitude of his land, &c.

No doubt all these points are very important, and have a distinct bearing on the single question at issue; but in your six years' experiments you probably were not so clouded by them in your views as to prevent you from coming to the settled conviction that 6 pecks an acre was the minimum quantity you could use profitably. If, therefore, every farmer were to do the same thing, the same conclusion might not be arrived at, because all the conditions might not be alike; still, one would be able to determine for himself the minimum number of pecks per acre he could most profitably use.

In the same manner as now indicated for determining the quantity of seed grain per acre, I should like a farmers' verdict given as to the proper manner of its distribution and deposition. That question is as capable of solution as the other, and should not be clouded by the collateral views of theorists.

In many parts of England I have seen different kinds of corn drilled at wide intervals, with the view of machine-hoeing the interspaces, in order to keep down weeds, pulverise and aërate the land. Where this practice is necessary, I am certain the highest possible returns are not obtained from the land; but where the land may be light and friable, and well cleaned, there are yet advocates for a wide distribution into rows (from 6 to 12 inches), who allege in effect that this practice will be found, both North and South, the correct and orthodox one, yielding the highest returns, and preferable to all others. To such an opinion my theory and practice are entirely antagonistic. Take, for instance, your 6 pecks Barley per acre. Let half of grain and land be sown in rows 8 inches apart, and the other half in rows 4 inches apart. Is it not at once apparent which series of rows will be most crowded? The 8-inch rows will certainly contain double the number of grains to the 4-inch rows. The comparative result that must inevitably follow from this circumstance should form an interesting problem for some of your numerous correspondents to reply to. My answer, however, is ready and distinct. "The best returns are only obtainable when there is an actual practical approach to the principle of giving to every individual grain of seed its requisite space of ground to thrive upon," and that can never be done either by thick seeding or wide row drilling.

Geo. Reid, Nurseries, Burnsbowzle, Aberdeen.

ADDRESS TO CHAMBERS OF AGRICULTURE.

[THE following whimsical letter has been published by the Chairman of the Central Chamber of Agriculture:—]

"And hunger's scowl was prophecy."—*E. Elliott.*

GENTLEMEN,—We shall have a free mint. No Government will again be able to refuse silver and gold coins to men whose business in life is to earn them.

One cause of pauperism will be removed. Others remain in excessive taxation and unequal rates. I venture to ask you to consider what our position is now, and what it might be.

One per cent. is a light tax.

The Probate and Legacy Duties average 4½ per cent.

The Malt-tax is 100 per cent.

Railway passengers contribute 5 per cent. to the Exchequer.

The duty on Tobacco in England and Ireland is—

Prohibition to grow it.

Local rates are 15 per cent. on one-third of the income of the nation.

One per cent., therefore, is a light tax.

Six per cent. is taken from the silver coinage, which, though it be the wage of all industry, is limited in amount.

The duty on an Inland Bill of Exchange for £10,000 is £5. The duty on £10,000 in shillings, which are the livelihood of poor men, is 600 sovereigns; and neither the sovereigns nor the shillings are permitted by the Chancellor of the Exchequer to be coined, though bills may be multiplied at the pleasure of rich men.

The duty on a Foreign Bill of Exchange for £10,000 is £1 13*s*. 4*d*.

The Bank of England deducts 1½*d*. from every ounce of gold bullion which it receives in exchange for bank notes. If the metal remain uncoined it does nothing for this charge. £2000 per million is only part of its profits if the gold be coined, though the expense be borne by the taxpayer.

The Bank has charged 10 per cent. for the loan of bank notes, with the consent and advice of Government, to break the law when in difficulties.

Mr. Lowe has justly proposed to take 1 per cent. from the sovereign to pay Mint expenses. In India there is a duty of 1 per cent. on gold; of 2 per cent. on silver, the poor man's metal. In Australia the duty on gold coin is 1 per cent.

One per cent., therefore, from the circulation is a common and light tax.

The assessed taxes stop employment and deny to Englishmen freedom of trade, which for many years seems to have been reserved for foreigners. These duties are now paid in advance, and a poor man has no practical appeal from the surveyor, but is at his mercy.

Therefore the assessed taxes are a grievance.

The Income-tax is a sad source of immorality. Fifty-seven millions in Schedule D escape the tax unfairly; and this immorality, become systematic, is ruining our commercial credit at home and abroad.

Therefore the Income-tax is a grievance.

The Malt-tax is a charge of 100 per cent. on the arable land of England and Ireland. It is borne chiefly by poor men, and injures the character of statesmen, who declaim in favour of free-trade, while they refuse it to their countrymen.

Therefore the Malt-tax is a grievance.

A tax of 1 per cent., shown to be comparatively light, on funds which pay no poor or other rates, would supply the means of redressing these three grievances.

The London Clearing-house statistics explain this:—£3,720,623,000 in cheques and bills were paid there last year.

One per cent. on £3,720,623,000, which now pay scarcely a tax and no rates, would give £37,206,230, collected weekly, by stamps, without the expense and annoyance of excisemen, Income-tax commissioners, or surveyors of taxes.

No poor man would feel this tax, and the wealthy might escape by using coins, which would become abundant instead of continuing scarce, as they are now.

One per cent. on unlimited paper money is a favour if contrasted with 6 per cent. on silver coin, which is limited, depreciated, and, when exported, not to be replaced.

If other nations had free mints and free trade they could be customers to each other, with power to purchase, of which now all are destitute. In the Banks of France and England, £73,000,000 are hoarded. Were these coins circulated, the French Treaty would be a success; now both nations complain of it.

I give a skeleton sketch of free trade, and ask you to examine it, bearing in mind that under our present system, one man in eighteen is a pauper, that other nations are as poor as we are, and that over-production and depression of trade mean that neither at home nor abroad can we sell what we produce to people who are willing to buy, but are not permitted by their Minister of Finance to have coins with which they can gratify their desires.

I have the honour to be, your obedient servant,

GEORGE TOMLINE,

Chairman of the Central Chamber of Agriculture.

Orwell Park, Ipswich, May, 1870.

FARM AGREEMENTS.

"G. A. H." AND W. SMITH.

"G. A. H." says, "What a brilliant argument he (Mr. Smith) gives us about Mr. Mechi and his straw. If Mr. Smith possessed the great amount of common sense he thinks he has, he might have known that straw is not sold at 'feeding price.'"

Straw is taken at "feeding price" by valuation from the outgoing to the incoming tenant, and that is all I know about straw being sold at "feeding price." I never said that Mr. Mechi sold straw at "feeding price," but "G. A. H." asked me if I should "like to try a little of my neighbour's at feeding price?" Let him see his own writing and my quotation of it, and then question himself a bit upon this point.

I do not know what he means about the "Bath-chair handle of my smasher." Let him explain.

"G. A. H." asks, "If every farmer could sell straw, does Mr. Smith suppose the price would be as high as at present?" I am clearly of opinion that that would not affect the price one atom, for there are plenty of exceptional men in England to keep the towns supplied; and I showed in my last letter that a farmer had better buy anything than straw to make his land fat with.

"G. A. H." then asks, "Does Mr. Smith suppose that every farm is close to a railway station?" I know they are not; therefore, those that are not have but a bad chance upon the sale of straw point. They had better by half keep it at what it is worth for manure, for it will not pay at the low figure "G. A. H." would put upon it to cart it about much.

"G. A. H." goes into the exceptional men's case, which I had already well explained, and then he questions my statement about a ton of straw making four tons of manure, and would have you believe that I do not understand what I am about, and then asserts thus:—"Straw will not absorb three times its own weight of water." Then I want to know how (as in the case of Mangel, shown at p. 606) a ton of dry vegetable matter could hold 9 tons of water? Let him reflect over that awhile before he tells us again that 1 ton of straw will not suck in 3 tons of water. It is quite clear to me that he does not understand what he is talking about, especially when he tells us about the lot straw loses in weight when passed through an "ox or a horse." You may depend on it that, if it goes in straw it will come out straw, without leaving behind (from a whole ton) enough fat to grease a shoe-string; there

fore the weight must be (exclusive of the morsel for the shoe-string) the same. His Hampshire straw was a bad sort, and his statement about it is as bad, for there is nothing authentic about it.

"G. A. H." then goes a little into the question as to the value of straw by telling me that a ton of straw is not worth more as manure than 2½ tons of London dung. I made it to be worth 3 tons, therefore it is only the half ton in dispute, and I take it that the way in which I put it is quite as plain as his. Then he runs away and tells us what he did in a dear year. That is of no use, we must take things as they are; but the strongest point of the matter is, that the sale of his high-price straw at Aldershot did not satisfy him, for he winds up thus—"I should not, however, like to repeat that experiment often, as I have more faith in straw feed on the farm than I have in superphosphate." What can we do with this man? Here he is putting a high value on straw as manure, whereas a few lines back he was making it almost worthless.

"G. A. H." then gives a bit about "bye-tacks," showing plainly the length of his liberality as a landlord, inasmuch as he looks at every man as a rogue, therefore takes care to "protect" himself by agreement lest they should "sell away the very marrow and fatness of the land to prolong for a short season their own miserable tenure of it;" and then he gives a quotation from my letter, "If he did not ruin himself quickly, he would make a fool of himself, he would soon have to cut his occupation." His statement and this quotation must mean the same thing, but then "G. A. H." goes on and makes a different thing of it by saying, "I should like to know what satisfaction it would be to a noble duke or lord or great landowner to hear that a tenant had ruined a good farm." A tenant may ruin himself, but he cannot ruin a good farm if he keeps it clean, and that is my point—that it shall be kept clean. He may crop and sell as he likes, growing less in quantity yearly, from which he must pay rent, &c., and his labour account cannot decrease, for his land is to be clean, therefore he must soon become poor; yet his land would not be ruined, for he gets nothing out of it. Let him feed it a bit, and it will feed him. He is robbing himself, not his landlord, for the landlord's matter would soon right itself, as soon as the "fool" got the sack; and, besides, the landlord would not lose a penny, for the fellow must pay his rent, and there would stand ready plenty of persevering men to take the blockhead's place; for, as the land would be clean, they would have nothing to do but to feed it a bit. These would not need a "subscription." The man would be the fool, not the landlord. But before I have done with this, I want "G. A. H." to tell us where we can find a ruined farm by letting it to an exceptional man to sell straw off as he likes. There are plenty of men in England who take their land to crop and sell as they like, yet I never heard of a good, or even bad farm having been ruined by such practice, and I now challenge "G. A. H." to show us one.

"G. A. H." questions my £1 a ton for roots, including carting, and then writes a great deal of nonsense about his own roots, and then asks whether I am not confounding price with cost. Roots are bought and sold, and the average price, including carting, may be put at £1 per ton. I showed plainly what I put their value at—5*s.* per ton as the value of manure, and 6*s.* as the eating value; total value, 11*s.* per ton. He fixes their value at 10*s.* per ton. Then why does he quarrel when his evidence proves that we are agreed, or nearly so. It seems to me that he does not know what he is talking about, but he talks on feeling nettled at me because he cannot substantiate a single scratch against me, so he bolts off to quackery for aid, which does not help him a bit; and he sums up by showing that the word "protection" nettles him as a landlord and fits his own case tightly.

"G. A. H." makes a great fuss about ruining land. I will look a little more fully into the case than I have done hitherto. I have looked about in all directions to find some that would fairly represent the case; at last I find an allotment of common land in a parish near here belonging to the poor of the parish, or rather the rents from it; it being under trustees' direction to thus apply it, according to the award of the parish. The parish has been inclosed about 80 years. From the inclosure down to about 20 years back this land was rented at about 10*s.* per acre by a farmer whose land adjoined it. For 60 years it was regularly folded from, and its "fat," as "G. A. H." would tell you, was driven away in the belly of the sheep to the farmer's land. For 60 years this practice went on, driving its fat away. Twenty years ago it was let to a man at £1 per acre to plough it up, to crop it as he liked, and to sell all away, just as he pleased. This man held it some years at that rent and on those terms. After his term was up (for he took it upon lease) another man took it, at the same rent and upon the same terms, for another term.

At the end of his term or lease it was let, seven years ago, to another man, upon the same terms, at a rent of 30*s.* per acre, and that man occupies it now at that rent; and it is quite as high a rent as any of the adjoining land is held at. This man's crops are quite as good, if not better, than they were when he began seven years back, and I have every reason to believe that he will continue the occupation at 30*s.* per acre. This is what has been done on poor clay land. It is all nonsense about ruining land by letting it upon liberal terms. "G. A. H." cannot point to an instance where land has been ruined, let upon those terms. If he can, let him do so.

"G. A. H." is "the dog in the manger" man, for he will not farm his land himself, neither will he let others, except in leading strings, drawn tightly almost to strangulation. The "sleeping partner" share of the matter is very plainly shown, for according to his notion the tenant must ransack his body and pocket to fill the "sleeping partner's" pocket. Let me tell him that trade and farming are two things, and very distinct ones too. A "sleeping partner's" name in trade is generally valuable. A man who has worked hard and has established a flourishing trade, has earned for himself a name, and that name is worth money, and the working bees are always glad to pay for it; but not so with "G. A. H." as a "sleeping partner" on his land, for the tenant must look entirely to the character of the land in his case. It is such men as "G. A. H." who make capital shy at offering itself to the land, for a capitalist will never lend it to a tenant when he sees that his landlord means to swallow him up. There is a lot of pride belonging to some of our landlords. They and their wives must cut a shine, so they spend their last farthing yearly, and in some cases outrun the constable, and are at their wits' end as to how they are to get on. In some cases they look to their character as a "sleeping partner" for aid. So they send John Land-agent (who always stands ready to do any dirty work) to assess their land some hundreds of pounds higher, disregarding tenants' improvements. I use the word assess advisedly, for they do not go to value now-a-day but to assess, spreading a fixed sum as the increased rent over the several farms, according to the direction of the "sleeping partner." This is going on in all directions. England never will be farmed until that "sleeping partnership" is honestly and fairly stoned to death, leaving a tenant to crop and sell as he likes upon condition that he keeps his land clean and pays his rent, receiving at the end of a term payment in cash for all the unexhausted improvements that he may have made upon the land during his term of occupation. If he is a good farmer the "eating value of a year's straw" would not be enough in 14 years' hence on many of our now out of "condition" farms. The word "condition" is Mr. Lawes'. *William Smith, Woolston, Bletchley Station, Bucks, May 23.*

EXAMPLES OF SEWAGE IRRIGATION.

(*Continued from p. 712.*)

3. *Aldershot Farm.*—The case of Aldershot may be placed first upon the list, because here land has been taken for irrigation, not by the authorities, but by a tenant who, bound no doubt to cleanse the sewage of the camp, yet has for his principal object the extraction of a profit from its use, so that he comes more nearly under the same class with the example last named. Mr. Blackburn here receives the drainage of the North and South Camps, *i. e.*, of a population which is fairly represented by a constant number of 7000 adults. During winter the drainage of this population, amounting to about 700 tons a day throughout the year, is poured in succession over the several fields of the farm, 80 acres in all, one half being in one and two years old Italian Rye-grass, and the other half growing crops of Potatos, Mangel Wurzel, Cabbages, &c. During the summer the crops upon the arable half take but little of the drainage of the camp, and it is then poured almost exclusively over the Italian Rye-grass land. The soil is the poor sand of the Aldershot waste (consisting of almost pure silica), prepared at considerable expense by levelling and deep grubbing, so as both to provide a uniform slope over which the water may flow evenly, and to remove the ferruginous "pan" which everywhere underlies the soil, and would hinder the even distribution of fertilising matter downwards. A few deep drains serve to draw off the water which sinks beneath the surface.

In this case the extreme natural poverty of the soil does not seem to have been a hindrance to the efficiency of the process of cleansing by irrigation. The farm, well managed, is covered with a capital plant of vigorous growth, to be fed by the filthy water, which accordingly is greatly purified by the process. Mr. Blackburn lets portions of his land to neighbouring cowkeepers, at £20 an acre; and here the Grass, cut in regular rotation, was in the heat of July, when everything was withered and burned up around it, a perfect oasis of luxuriant green, yielding annually its four or five crops of 8 to 10 tons apiece per acre. The Aldershot farm appears the more satisfactory as an example of the sewage nuisance abated, at the same time that its filthy contents are converted into valuable produce, from the circumstance that a previous attempt to deal with it by subsidence and filtration tanks had been a complete failure.

Supposing 40 acres here to yield £20 an acre, and other 40 acres to owe one-half of their crops, or £10 an acre, to the winter sewaging, we have here a return of £1200 from the waste of 7000 adults, or 3*s.* 4*d.* per head per annum.

4. *Carlisle.*—The sewage of Carlisle finds its way, for the most part, into the Eden through the main sewer beneath the alluvial pasture-land bordering the river. It is delivered in the middle of the river channel through a submerged iron pipe. On the town side of the meadow a pumping station has been erected by Mr. M'Dougal, to whom the land (about 100 acres) is let: and a quantity is thus lifted, deodorised by treatment with carbolic acid, and distributed over the land by means of light portable iron troughs. These are shifted from place to place by the man in charge, and in this way the sewage pours on at one place after another, distributing itself with more or less regularity according to the natural surface of the land, which has not been levelled,—flowing here, ponding there, soaking everywhere. There is an obvious increase in this way to the natural fertility of the land; and a larger quantity of stock is kept upon it than it would naturally maintain. There is no surface drainage from the land to the river.

As there is properly speaking no effluent water from this meadow, the whole of the sewage applied being absorbed by the sandy soil and there being no drain outlet, the result is not quite so trustworthy as in other cases; nevertheless, we may fairly conclude from it that the soakage from the irrigated land into the neighbouring river is effectually purified.

5. *Penrith.*—Here the drainage of a town of 8000 people, only partly provided with waterclosets, is received on 80 acres of good meadow land near the Eamont. A little more has been done here than at Carlisle to distribute the water by means of permanent carriers; but the treatment is otherwise the same, and the result is very similar. A very large stock of cattle and sheep is kept upon the land to graze down the abundant growth of Grass which is obtained.

Here, as at Carlisle, the whole of the sewage is absorbed into a porous sandy soil, but the drain passing beneath the irrigated land pours out a considerable and clear stream into the Eamont.

6. *Rugby.*—At Rugby, a town of more than 8000 inhabitants, the Board of Health have taken a lease of 65 acres of land for a term of 31 years, at a rental which, with rates and taxes, amounts to £4 10*s.* per acre; and, confident in the powers of their somewhat gravelly soil (lying upon a clay subsoil) to cleanse their town drainage, and to convert it into valuable produce, they have laid out nearly £5000 on the works required for the distribution of the sewage-water over it. An intercepting sewer takes the drainage of all the upper part of the town by natural gravitation to the top of the farm; and, by a deep and costly tunnel drain, the waste of all the lower part of the town is made to flow (along with the tail water of the upper fields) over about 16 acres of the lower part of the farm.

The quantity of sewage at command is about 900 tons a day, or nearly 4000 tons per annum for every acre of the farm. The land has been in hand for only one year, and much of it was sown with Italian Rye-grass for the first time in the spring of 1869, so that the best results can hardly have been yet realised. The third and fourth cuttings (both heavy crops) were, however, ready in the following month of July, and a sale was being obtained for the Grass at 8*s.* a ton upon the land. A considerable portion had been let at £10 an acre; and the 16 acres at the lower end of the farm had supported throughout the spring and summer 54 head of cattle, consuming at least 4 tons of its Grass produce daily; and a considerable extent of the crop on these 16 acres had been made into hay.

The following account of the experience of 1869 at this place has been communicated to us by Mr. T. M. Wratislaw, clerk of the Local Board of Health:—

"The gross produce of the sewage farm, for the year ending December 31, has been £544 16*s.* 8*d.* The total expenses, so far as the payments (including wages for the year) have been made, stand at £458 8*s.* 5*d.*, and I do not apprehend much addition.

"I am not aware of the actual number of persons contributing to the sewage utilised, but should estimate 7800."

7. *Banbury.*—A population of about 11,000 people here drain into tanks, from which, through a 12-inch pipe, the sewage is driven by steam-power a mile or more to the upper end of a farm of 136 acres, a lease of which has been taken for 21 years, at a rent of £4 10*s.* per acre. The quantity thus applied amounts to about 300,000 gallons a day, or about 4000 tons per acre per annum over that part of the farm which is under irrigation. The sewage settles to some extent in the tanks from which the pump lifts it, and both mud and scum are here taken from it, and mixed with the street sweepings and other scavenging refuse of the town; and 2000 tons of this compost were sold last year, for which a sum of about £100 was received at the depôt, the material being loaded by the purchaser into barges on the canal close by. The liquid part, delivered on the highest part of the farm, having about 17 feet of fall before it reaches the river Cherwell, flows twice or thrice over successive fields before it is finally dismissed, and the extreme filthiness of the river formerly complained of is now satisfactorily abated.

The farm is for the most part a very stiff soil, and the greater part of it is still in old grass-land, and neither circumstance is favourable to its efficiency; the former because the soil tends to crack in dry weather

thus giving the sewage direct access to underground drains, and thence to the river before it has been properly acted upon by the soil; and the latter because the surface of the land, not being specially and evenly laid out for irrigation, the water tends to collect in shallow ponds or puddles, to the injury of the produce, without being itself materially cleansed. The accounts given of the produce of the land are satisfactory, and it is believed that the farm will soon repay rent, and costs, and loan, so that the nuisance hitherto created by the town will be ultimately abated without any serious permanent charge upon the inhabitants.

The produce of Italian Rye-grass and of the meadow land is sold by auction as the successive cuttings are ready for the scythe; and prices varying from £3 to £5 an acre have been obtained per cutting.

The Banbury sewage, owing to a deficient water supply, is sometimes much above the average strength, and consequently its efficient cleansing is then a more difficult operation; nevertheless the above results are by no means unsatisfactory; and they are improving, both as regards the cleanness of the effluent water and the returns from the use of it.

The following account of receipts and expenses, in respect of the sewage farm here, for the year ending Lady Day, 1869, has been supplied to us by Mr. T. Pain, the town clerk:—

Receipts.

Amount realised from sale of Rye grass	..	£561 16 6
,, ,, mowing Grass	..	347 18 2
,, ,, Oats	..	198 0 0
,, ,, aftermath	..	166 11 8
Right of shooting over farm, and sundries	..	6 1 6
	£1280	7 10

Payments.

Mr. Tomline, a year's rent less property tax	..	£605 3 1
Rates and taxes for the year	..	57 4 7
Coals for engine	..	111 16 0
Labour expended in cultivation of farm	..	216 2 0
Seeds, implements, &c.	..	83 0 6
Manager's salary	..	45 0 0
Auctioneer's expenses of sale, including commission	..	73 6 11
		1190 13 1
Profit on farm	..	£89 14 9
Instalment of principal and interest in respect of £4000 borrowed to carry out the irrigation work	..	£250 0 0

The produce of the summer of 1869, when we were over the farm, bid fair to at least maintain the satisfactory character of the acove account.

8. *Warwick*, a town of 11,000 inhabitants, occupying 2400 houses, of which upwards of 2000 are connected with the sewers, has lately poured its sewage over a clay-land farm of 100 acres about a mile away. The quantity thus pumped, and which formerly fouled the Avon, amounts to about 600,000 gallons a day, double the water supply of the town, or nearly 1,000,000 tons a year, corresponding to 10,000 tons per acre annually. A large quantity of very dilute drainage water thus flows over a very stiff and therefore less appropriate soil.

The farm has been in hand for two years. Pumping commenced only in the autumn of 1868, and it was not continuously carried on until the following year. This, together with the difficulty which the low and flat part of the farm presents to the proper drainage from it of so large a quantity of water, has hitherto delayed the satisfactory financial result which is looked for. Nevertheless, the nuisance is sufficiently abated, and large crops of Italian Rye-grass have been obtained, for which a ready sale at 10*s.* and 12*s.* a ton upon the ground has latterly been obtained. The farm must, we understand, pay at least £1600 a year to replace the costs which the town has already incurred and still bears in respect of rent, pumping, and works.

9. *Worthing*, containing about 8000 inhabitants, has hitherto fouled a stream running into the sea two miles to the eastward of it. The town drainage now runs to a tank from which it may flow as heretofore, and still does run during the night, so that a good deal of very offensive filth even now lodges in the bed of the stream. During the day it is pumped and flows upon the land of the Worthing Land Improvement Company, who have about 100 acres on which to receive it. The soil is a good free loam perfectly well adapted for their purpose, and the natural slopes are quite sufficient for the easy distribution of the water. There are on the lower part of the farm upwards of 40 acres of an alluvial flat of natural Grass on which the effluent drainage of the higher arable land is received before it leaves the farm. Mr. W. Hugh Dennett, solicitor to the Worthing Land Improvement Company, has communicated to us the following account of the gross receipts and working expenses of the sewage farm for the year 1869:—

"Receipts	..	£1807 4 9
Expenses	..	1045 6 9
Balance	..	£761 18 0

"In the above expenditure is included a sum of £51 13*s.* 11*d.* for a "level" rate, made for the protection of various lands from the encroachments of the sea, which is a special and not an ordinary parochial rate. There is also included a sum of £50 for the rent of 8½ acres of the land referred to and comprised in the area stated below. A steam-engine on the farm was used for about three months, at a cost of about £25.

"The population of Worthing is about 7600.

"The engineer reports that the average volume of sewage pumped each day of 24 hours to the farm is about 480,000 gallons (of which about 130,000 gallons are spring or surface water). In addition to this, about 80,000 gallons of water per day flow into the Teville stream.

"The extent over which the sewage flows is about 83 acres.

"The whole farm consists of about 96 acres, a portion of which is not sewaged; 42 acres are pasture land.

"I cannot say that the pollution has altogether ceased, because although it is stated that the 80,000 gallons of sewage flowing into the stream per day is top water, yet it flows from the sewage well, and must be necessarily polluted with sewage. However, the actual pumping of the sewage into the stream ceased some months ago, and the communication has been removed. The Local Board of Health have also cleansed the stream, and there is reason to believe that all the sewage pumped goes upon the land, though materially diluted by spring and surface water."

The sewage, which was somewhat weak at the time of our visit, was sufficiently cleansed by passing over the first plot; indeed it was cleaner than another sample from the effluent stream which was probably carrying into the river the purified water from the stronger morning sewage. Close proximity to the sea affects the proportion of common salt in the Worthing sewage. The proportion of chlorine in all the samples is much higher than the strength of the sewage would lead us to anticipate. Some of the streets are watered with sea water.

To be Continued.

Home Correspondence.

Crops. — *Bedfordshire:* In this neighbourhood Wheat has much improved, but is not a good plant; Barley, good plant; Oats, good plant; Peas, poor and weak plant; Winter Beans I may say a failure; Clover and Rye-grass a general good crop. All permanent pasture late for the time of the year. *James Ross, Hoo Park Farm, Luton.*

—— *Gloucestershire:* I consider the Wheat varies a good deal in this neighbourhood. I think it is looking very well on the good land, but the weak land has lost plant, and looks bad. Barley and Oats generally looking well. Beans and Peas bad. *Giles Edmonds, Eastleach, Lechlade, May 21.*

—— *East Kent:* A great improvement has certainly taken place in our crops since my report on the 10th inst. On the day following we had a slight rain, and though it does not appear that we have had the quantity of rain here that has fallen in other parts of the kingdom, yet the change from cold bleak N.E. winds and frosty nights to a S.S.W. wind with warm nights has produced a marked improvement on the growing crops, nevertheless there is a great deal of Wheat about here that will not bear a close inspection even now. The rain we have had has been very beneficial to all small seeds, many that had been sown for weeks showed no signs of vegetating, but they are now coming up freely. The winter frosts and dry spring assisted materially in cultivating our fallows, and the rain has been just sufficient to cause our Mangels to germinate freely. There has been a beautiful time for the blooming of our fruit trees, and there is a prospect of a large growth of fruit of every sort. To use a commercial phrase, I think I may say the prospect of the farmer is 20 per cent. better than it was a fortnight since. *Wm. Manser, St. Peter's, Margate, May 21.*

—— *East Norfolk:* Since my last report we have had some very warm weather, but, with the exception of a few hours' gentle rain on the 11th inst., the drought has continued. The Wheat on good lands has certainly improved in colour, and to some extent has tillered; but when it is possible to ride in the roads and see blank spots in the middle of a 20-acre field, no weather, however genial, can make an average crop. Moreover, the continued drought is beginning to tell upon the light lands; and without a speedy downfall the results will be serious. The hay must now be very short. I took a long drive the other day in a light-land district, and saw many fields of Grass, which but a short time ago promised abundance, now scorching up. The Barleys are suffering for want of rain, and, however deep-rooted the Wheat plant, it cannot on sharp soils much longer withstand the searching drought. Many of our ponds and watering-places are drying up—quite unprecedented at such an early period. The sowing of Turnips has proceeded rapidly; Swedes are nearly all in, but the seed has only partially vegetated. The rain that fell on the 11th inst. was just sufficient to bring up the Mangel Wurzel, but some few fields have since disappeared from wireworm. *W. Cubitt, May 24.*

—— *Oxfordshire.*—I am glad to report that a great improvement has taken place in the Wheat plant during the last three weeks. On the kindly Wheat soils there is a prospect, although late, for an average crop, but the lighter soils are short of plant, and that remaining is in a sickly state; several fields have been ploughed up or resown, while others have been top-dressed, and every kind of pressure used, yet it has not tillered out as we have seen in former seasons, therefore a late thin crop, which is seldom a kindly one, must be expected. The early sown Barley and Oats are doing well, while several pieces of late planted Barley did not come up until the late beautiful rains, so much wanted for spring corn, as well as the seeds and grass land. Peas are doing well, but winter Beans and Vetches are all but a failure. We never had a finer season for cultivating the fallows, they are in a forward state, and planting is rapidly going on with various kinds of roots. The autumn steam-cultivated land has again the advantage, deep probing seems to beat deep ploughing on most soils. *Matthew Savidge, Sarsden Lodge Farm, Chipping Norton, May 19.*

—— *South Lincolnshire (Wisbech district):* An inspection of the crops throughout the district at the present time will not leave a favourable impression as to the prospect of a good harvest; although the Wheats on the higher and loamy soils have been looking well up to within the last few days, the continued cold winds and frosty nights have had a telling effect upon the plant, and many unsheltered fields have gone off, turning yellow and feeble to a most unpromising extent, but the crop on either side the railway from Ely to Wisbech, on the low-lying peat and moorlands, is in a truly shocking state, the plant having in many places disappeared altogether, and that which remains is very thin and patchy. On the Sutton or Lincolnshire side of the district, there have been many acres ploughed up and sown with Oats or other spring corn; in almost every instance, however, where the Wheat was put in with artificial manures, the crop is full and healthy. Oats are suffering much from want of rain, and also from the cold nights, and on the new lands from the wireworm; but a warm damp month will do great things for this crop. Barley we grow to no great extent, but where it has been sown it looks very well indeed. Potatos, of which there is a large acreage set again this year, like dogs, have their "day:" the now fashionable seed in this district being the Regent and Paterson's Victoria; the once favourite Fluke is left "out in the cold," and is not esteemed so highly even as the coarse and vulgar Rock. Growers seem to snub the Fluke because of the smallness of the yield, but it seems to me doubtful policy to grow Rocks, which, although they may produce 25 per cent. more Potatos per acre, are not so valuable by at least 4*s.* to 5*s.* per sack of 16 stone; besides the greater exhaustion which they cause to the soil, as may frequently be seen in the Wheat crop following, in a field where the two kinds have been grown side by side. The pastures are very backward, and where the stock have been upon them a little time they look bare and frost-bitten; but with some thoroughly soaking rains and warm growing days, we may yet hope that grazing will prove remunerative, although store stock are terribly dear. *Nemesis, May 4.*

Fisken v. Roundabout.—"G. A. H." having satisfied himself that the roundabout and the flying-rope systems "would give pretty nearly the same results" (p. 288), at p. 188, writing of the two systems, puts them about on a par as to the "arrangements of anchors and pulleys," claiming only that "the balance of convenience lies with the flying rope." Such being the case, he further informs us the field at Manchester was "light land." I do not think he has any reason to complain of my taking 10 acres as an average. He must be reminded that there is such a thing as stiff land in existence, and even Mr. Fisken's "natural bias of a parent" only claims 9 acres for his offspring; however, let us look at the relative cost for interest and labour of the two systems, taking "G. A. H.'s" figures for Fisken's, and Mr. Smith's for the roundabout, as to labour—granting that 13 acres can be done, Fisken's costing £500, interest £75; Smith's costing £375, interest £56 5*s.* (p. 542).

Fiskin's System.

Interest per day		Ploughing 13 acres per day.		
		Interest.	Labour.	Total.
	£ s. d.	s. d.	s. d.	s. d.
When working 10 days	7 10 0	11 6	1 5	12 11
,, 15 ,,	5 0 0	7 8	1 5	9 1
,, 20 ,,	3 15 0	5 9	1 5	7 2

Smith, or roundabout.

,, 10 ,,	5 12 6	8 8	1 7	10 3
,, 15 ,,	3 15 0	5 9	1 7	7 4
,, 20 ,,	2 16 3	4 4	1 7	5 11

With a full day's work of 13 acres the roundabout is the cheapest, and, as shown at p. 542, ploughing 7½ acres per day it is still the cheapest. In a roundabout the water-carrying might be lessened if tanks were supplied near the outlets of the drains, or at some spot convenient for working the engine. Very likely "G. A. H." has a workshop on the premises, and the engine-driver no doubt will find some odd jobs to do, and he can drive a mowing or reaping machine as well as an engine, build and thatch ricks; besides our engine is to be a traction one, and I hope he will be able to give a hand at harvesting, drawing out manure, and, may be, Mangels and Swedes home. In winter, grinding, chaff-cutting, if our farm is well stocked, will employ a considerable portion of his time; a coat of paint will prolong the usefulness of our implements, waggons, &c.; the ring of a mason's trowel will indicate that the brick and mortar portion of our holding has not been overlooked. "G. A. H." says, "I do not know what kind of land 'West Indian' has, but my experience is that a pair of good

horses will plough more than an acre of light land in a day." Very true, but as I said before, it cannot always be done; our horses, as well as our engine, feel the difference. He admits the difference in hiring in his neighbourhood to be from 7*s.* to 11*s.* per acre,—is the 10*s.* to 14*s.* in my neighbourhood a stumbling-block? He does not see "the necessity for making your plough into a hunter, and teaching it to 'jump over a stone.'" No, I would get the stone out of the way, rather than add £125 to the cost of my tackle. *West Indian.*

Foreign Correspondence.

PARIS.—*Complementary Manures.*—The chemists and agriculturists of the Continent are rendering good service by the analysis of manures, and the diffusion of scientific views respecting them. M. H. Villeroy, of the Agricultural Society of the Palatinate, Rhenish Bavaria, has lately addressed a letter to M. Grandeau, secretary-general of the late agricultural congress of Nancy, which was printed in the Paris "Journal of Agriculture" under the above title.

The farmers of Rhenish Bavaria make great use of commercial manures, convinced by the reasoning of Baron Liebig that ordinary manure does not return to the soil all the principles taken from it by the crops, and that therefore some supplementary substances are required to replace what is taken away in the grain, the meat, and the wool, which do not return to the soil. This doctrine has, however, found opponents, and although many experiments have been made, the exact value of chemical manures, and the best manner of employing them, are not yet clearly defined. The great differences in the composition of soils, the atmospheric influences and other causes, with which we are little acquainted, produce effects not easily explained.

Plaster (sulphate of lime) is largely used on the Continent, and its value is estimated more highly every; year yet although in some seasons it produces remarkable effects, in others it seems powerless, and it becomes impossible to distinguish fields that have been dressed with plaster from those which have not. It is, evident, therefore, that there is still something to be learnt respecting it.

The writer argues that high cultivation cannot be maintained without the aid of chemical or artificial manures, if only from the fact of the insufficiency of farm manure. In many parts the latter is aided by the refuse of agricultural industries, such as sugar-making, distilling, brewing, and oil-making, but this is at the cost of other lands, which furnish the materials of these manufactures. Moreover, these industries diminish the amount of land devoted to the production of cereals. Cattle are, it is true, fed with the refuse of these factories, and thus the quantity of manure is increased; but this kind of cultivation has an exhaustive effect on the soil, and renders chemical manure still more necessary. This is proved by the spent condition of the soil in the north of France, where the excessive cultivation of Beetroot has reduced the crops to a very low average.

Guano was the first commercial manure employed, and was in great favour, as it yielded very fine crops; but it was soon found that its effects, although very energetic, were of short duration, and that its continued application greatly exhausted the soil. Guano is still employed, but generally mixed with other substances, such as ground bones, acid superphosphate of lime, salts of potash and plaster. The proportions employed per hectare (2½ acres) are usually as follows:—

Bonedust, or superphosphate, often half and half ..	400
Guano	50
Potash	50
Plaster	200
Kilogrammes	700

—that is to say, about 600 lb. per acre, divided in the proportions of 8, 1, 1, and 4.

The superphosphate acts favourably on almost all soils and under all circumstances; if its effect is sometimes but small on sandy and clayey soils, it produces wonders on calcareous earth. Its effect is ascribed to the phosphoric acid which it holds in a soluble condition, and as calcareous soils are generally rich in alkali and lime, it is considered sufficient to add phosphates rendered soluble by sulphuric acid.

Ground bones have little effect in the latter kind of soil, because its compactness hinders the decomposition of the bone; but whatever may be the cause the fact is certain.

M. Villeroy gives an instance of the admirable effect of superphosphates on calcareous soil:—"At a short distance from where I reside," he says, "there is a tract of calcareous land which had been divided and sub-divided, ill-cultivated and badly manured, until the alternate crops of Wheat had dwindled down to about 11 bushels per acre; Rye was tried, and yielded a little better result. Superphosphate was tried, and the effect in the case of Rye was beyond all expectation—with 350 lb. per acre it is not at all uncommon to obtain crops of 44 bushels. This was a veritable revolution for the poor villagers, and every one was astonished to see magnificent crops of Rye produced on what was considered Wheat land, although it yielded so little. The question is, will the effect be permanent? The farmers think so; being richer in straw and forage, they produce more manure, and are able to give their fields two dressings of manure, alternating superphosphate with manure: thus they hope not only to maintain, but to increase the fertility of their soil. It would be difficult to find a more striking example of the good effects which may be derived from the employment of chemical manures." Another case is that of an old farmer and post-master, whose horses were rendered useless to him by the railways; he sold them, and found his manure reduced by one half, he had recourse to superphosphates and ground bones, which he mixed daily with his dung, and let them ferment together, and he found that one cartload of the manure thus produced gave him the same results as two cartloads of common dung had formerly. He has pursued this system for 10 years, and his crops are finer every season.

Other farmers improve the quantity and richness of their manure by the daily addition of ground bones or fossil phosphates and plaster. After fermentation they obtain an excellent manure, one-third, or even one-half superior in effect to common dung; by this simple plan they achieve great economy, are able to double the value of their manure, and thus arrive at very high culture.

M. Villeroy's conclusion is, that all who study the subject carefully must arrive at the conclusion that chemical manures are absolutely indispensable.

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

THE half-yearly general meeting of this Society was held on Monday afternoon at the Society's rooms, Hanover Square.

Lord Walsingham, in the absence of the President, the Duke of Devonshire, occupied the chair.

Mr. W. E. Welby, M.P., of Newton House, Folkingham, Lincolnshire, was elected a member of the Council.

On the motion of Earl Cathcart, Lord Vernon was elected president for the ensuing year.

The trustees and vice-presidents were re-elected, and the list of the members of the Council adopted.

Mr. Jenkins, the secretary, then read the following

REPORT OF THE COUNCIL.

Since the last general meeting in December, four governors and 69 members have died, and the names of 199 members have been removed from the list; on the other hand, one governor and 212 members have been elected, so that the Society now consists of 74 life governors, 74 annual governors, 1511 life members, 3704 annual members, and 15 honorary members; making a total of 5438.

The half-yearly statement of accounts to December 31, 1869, has been examined and certified by the auditors and accountants of the Society. This statement was published in the last number of the Journal together with the Manchester country meeting account, and a balance-sheet for the whole year 1869. The last-mentioned document shows that, independently of the financial results of the country meeting at Manchester, and after charging on income the cost of all additions to the permanent country meeting plant, the receipts of the year exceeded the expenditure by a sum of £675.

The funded capital of the Society remains the same as at the last half-yearly meeting, namely, the permanent fund of £20,000 New Three per Cents., and the Reserve Show Fund of £4,612 7*s.* 8*d.* New Three per Cents. In addition, the sum of £3800 lies on deposit with the Society's bankers, and the balance of the current account on the 1st inst. was £3583 0*s.* 10*d.*

The Council have granted a sum of £500 to the Manchester Local Committee, in aid of the extra and exceptional expense occasioned by the compensation awarded to the tenant of the trial ground.

Mr. Charles Whitehead, of Barming House, Maidstone, Kent, has been elected a member of Council to fill the vacancy caused by the election of his Grace the Duke of Devonshire, K.G., as a vice-president.

At the first anniversary meeting of the English Agricultural Society, held 31 years ago, it was stated that the prizes offered for stock to be shown at the then approaching Oxford meeting would amount altogether to £740, besides £50 for extra stock, implements, roots, and seeds, £50 for a draining plough, and two prizes of £50 each for the best specimens of white and of red seed Wheat. At the forthcoming Oxford meeting the prizes to be competed for amount to £3130 for live stock, and £395 in addition in 10 silver medals for implements. A contrast of these figures will enable the members to realise the growth of the Society's operations durng the interval; and to estimate the nature and extent of its influence on the progress of British agriculture.

The interest thus attaching to Oxford, where the first country meeting of the Society was held, promises to invest the forthcoming show with unusual attractions. The showyards for implements and live stock comprise nearly 60 acres. The entries for implements, machinery, &c., which closed on the 1st instant, prove that in this respect the display will be quite as extensive as the remarkable collection exhibited last year; while it is confidently anticipated that certain classes of live stock will be extremely well represented. Another element of instruction and interest will be found in the competition for the prizes offered last year by the then high sheriff of Oxfordshire, and the Society, for the two best managed farms in the district round Oxford. A list of the competitors (21 in number) and the names of the judges appointed by the Council have already been published; and it is hoped that the awards of the prizes may be made known at the general meeting of members held in the showyard.

The Council resolved last year, that the Society's country meeting for 1871 should be held in the division comprising North Wales, and the counties of Cheshire, Shropshire, and Staffordshire. Invitations having been received from the authorities of Shrewsbury, Stafford, and Wolverhampton, a committee was appointed to inspect and report upon the various sites and other accommodation offered by the competing localities. After duly considering the report of this committee, and after a conference with deputations from the three towns, the Council have decided that the country meeting for 1871 shall be held at Wolverhampton.

The Council have also to announce that the country meeting for 1872 will be held in the district comprising South Wales and the counties of Gloucester, Hereford, Monmouth, and Worcester.

The President and Council of the Société des Agriculteurs de France have invited the Royal Agricultural Society of England to take part in an International Agricultural Congress to be held next year in Paris, and to furnish a report on British Agriculture. They also request suggestions as to any of the subjects of interest which should be discussed at the Congress. The Council have determined to accept this invitation, and have suggested the following as subjects worthy of discussion, and affording opportunities of illustrating the present position of English Agriculture:—(1) Drainage, (2) Implements and Machinery, (3) Manures, (4) Rotation of Crops, (5) Fattening of Cattle and Sheep, and (6) the Labourer.

In accordance with the resolution mentioned in the last half-yearly report of the Council, the Society's consulting chemist has presented two quarterly reports on samples of guanos and bone manures forwarded to him for analysis by members of the Society. The immense increase in the manufacture of artificial manures and feeding stuffs, and the competition amongst dealers and manufacturers, have introduced into the market low priced and inferior articles, which often tempt purchasers by their apparent cheapness. It was hoped, therefore, that the publication of analyses of different manures and feeding stuffs submitted to the consulting chemist might render purchasers more cautious in their dealings, and prevent that disappointment which follows the purchase of inferior or adulterated articles, and the Council have reason to believe that the publication of these quarterly reports in the agricultural journals has already been productive of good results.

The Council have resolved, that in future the annual grant of £200 to the Royal Veterinary College shall be divided under two heads:—(1) That £150 shall be paid to the Royal Veterinary College, for the general advancement of veterinary science in reference to cattle, sheep, and pigs, as heretofore; and (2) That £50 shall be retained under the control of the Council for the purpose of being applied to experiments on the diseases of cattle, sheep, and pigs.

The Council have directed their attention to the desirability of improving the Society's Library, by the purchase of recent works bearing on the practice and science of agriculture together with such Parliamentary papers and reports as refer to agricultural subjects; and they confidently anticipate that a useful library of reference will shortly be at the command of the members.

Mr. BOTLEY, in moving the adoption of the report, said that he did so with much pleasure, because he saw in it evidence of the great progress of the Society. If he compared this report with the preceding ones he saw nothing in it but what was complimentary to the Society. Nothing could be more gratifying than to note the wonderful progress which they had made since they last met at Oxford, now 31 years since. The great increase in the members of the Society was a matter of congratulation. There was one paragraph in the report which was of special interest, namely, that which referred to the invitation to an agricultural congress at Paris, because it showed the great interest which the Emperor of France took in that subject. He was glad that the Society had accepted the invitation, for he was sure that every one who had travelled in France might be sure that in that congress England would hold its own.

Mr. ROBERTS seconded the motion, and he did so with great pleasure because he considered the report a very satisfactory one. At the same time there were one or two points on which he should like to make an observation. The progress they had made since their last meeting at Oxford had been very great, but he doubted the necessity of their continuing the system which had been adopted of giving rewards of a pecuniary character to those who were successful at their annual exhibitions. That might have been necessary in the infancy of the Society, but now that they were made aware of the very great advantages which the Society conferred upon those to whom it awarded prizes, he thought it scarcely necessary to continue to award money prizes. He found that at Oxford this year they proposed to give £395 to the exhibitors of implements, and £3130 to the exhibitors of live stock, and contended that there was no necessity for giving those money prizes, considering the profit made by the exhibitor of animals from the sale of his particular breed of stock which gained the prize; while as respected the manufacturer, the increased sale of his implements, in consequence of their being awarded a prize, was such that the pecuniary reward they offered was a matter of very little importance. Under these circumstances he suggested whether it would not be worth the consideration of the Council to discontinue the giving of pecuniary rewards and resort to bronze or silver medals, which would be equally efficacious, while it would enable the Society to devote a much larger sum to the advancement of agriculture generally. The motto of the Society was "Practice with Science," but he was afraid they did not altogether act up to it. They had much practice and much science, but not practice with science. He questioned whether one individual member of the Council, Mr. Lawes, had not done more by a strict

adherence to that rule than all the members of the Royal Agricultural Society put together. He did not by any means wish to detract from the important services which Dr. Voelcker, Mr. Coleman, and Mr. Ellis had rendered to agriculture through the Society, but he thought they would have been still more valuable if they had an experimental farm. He approved of the continuance of the grant to the Royal Veterinary College, but very much regretted the failure of the educational examination system, and hoped that it would be continued next year. He had taken great interest in the subject, and attended several of the examinations; and the conclusion at which he had arrived was, that with such a standard for examination as they had established, 21 years was a very unsuitable limit to the age of the candidate, because although at that age a young man might have a very good scientific knowledge of farming, or on the other a very good practical knowledge they could not expect them at that age to have both.

Mr. FREEBODY wished to offer a few remarks before the report was adopted. He regretted to say that out-of-doors among the public generally the feeling was growing that this Society was not fulfilling its duty or its mission; and certainly, considering the means at its command, he did not think that it had done what it ought to. In the first place he quarrelled with the large balance at their bankers. Mr. Raymond Barker at one time stated that when they had £5000 as a nucleus a different state of things would ensue, but that amount had long since been exceeded. He had been extensively engaged in the reclamation of land, and had seen thousands of sheep feeding where formerly ships sailed. He complained that the Society had been remiss in not encouraging by prizes the improvement of farms. Why should they restrict the competition at Oxford to farmers of 200 acres. They ought to have added another £100, and made the prizes £50, £30, and £20, and thus have made the high sheriff's prize a very valuable one. He complained very much of the inferior character of the Journal, both in regard to the matter, the manner, and the illustration and execution. Again, with respect to the manufacture of cheese he complained that the report of their commissioner on the subject had resulted in a most lame and impotent conclusion, merely leaving it an open question between the landlords and tenants as to whether it would be or not expedient to create cheese manufactories in this country. What he wished to suggest was, that committees consisting of three governors, three life members, three annual subscribers, and one hon. member, not in any way heretofore connected with the management, should be appointed to confer with the official staff, and to report to the next general meeting what measures the Society can adopt, in order that some of its accrued funded capital should be made available for the general advancement of agriculture.

The noble CHAIRMAN thanked the hon. member for his suggestion, and stated that the resolution to which he had referred should have the most serious attention of the committee.

Mr. DENT, in reply to the observations of the seconder of the report, contended that if the Society were to embark in experimental farms, they would very soon see the end of their reserve capital. At the same time the Society did, through its chemical experiments, combine practice with theory, and he pointed out that it was impossible to judge of the results in one year. In regard to feeding cattle, it had become a question whether they should not devote themselves to examining the effect of sprouted Barley on the feeding of cattle, since the statement of the Chancellor of the Exchequer, that it would be permitted to be used. He defended the Journal against the criticism to which it had been subjected, and stated that in his opinion there was nothing more readable or more instructive to farmers than the report which had been made on selected farms, and he anticipated very favourable results from the publication of the reports of the consulting chemist on artificial manures. If members of the Society would send up their manure examples to be analysed, and give the whole statement of the facts, he was sure that it would lead to the sale of genuine manures. He regretted as much as anybody could the failure of the education scheme, and attributed it to the extreme difficulty of applying an efficient test, stating his belief that a landlord would rather apply the test of practical experience to the tenant who sought a farm than refer to any diploma which they might receive from this or the Highland Society.

The CHAIRMAN said that he trusted that what had fallen from the two honourable members who had spoken did not represent any general feeling on the part of the members of the Society to establish either an experimental farm or a cheese manufactory, because while on the one hand such enterprises were far better carried on by private persons, on the other nothing could be more fatal or ruinous, in his belief, than that the Royal Agricultural Society should embark in such speculations. He called the particular attention of the meeting to the invitation which the Society had received from the French Society, and hoped that a large number of members would attend.

A short discussion ensued on the education question, in which it was admitted on all hands that it had entirely failed, and Mr. C. Barnett inquired whether they could not obtain candidates from middle-class schools.

The CHAIRMAN said that every facility was offered, but unfortunately they would not come.

Mr. WELLS, M.P., confessed, as one of the Council of Education, that he could not ask for a renewal of the vote for education, unless he could see some way of applying it more usefully. He considered that the examination system had altogether failed.

Sir M. LOPES suggested the institution of prizes and medals in the various schools throughout the country.

The report was then unanimously adopted, and the usual routine business having been transacted, a vote of thanks to the noble lord for presiding terminated the proceedings.

ESSEX CHAMBER OF AGRICULTURE.

The Game Laws.—At a recent meeting of this Society Mr. W. BROWN, of Braintree, read a paper on this subject, from which we make the following extract:—

I take it for granted that if landlords and tenants settle the question amicably the rest of the community will ratify their conclusions, as it seems impossible that the state of the Game Laws can be much worse than they are at present for all parties, whether landlords, tenants, or the community at large. I shall divide my remarks under two heads—1st, that the Game Laws as they are at present enforced are injurious to the tenant-farmer and the occupiers of the soil generally; 2d, that they are injurious to the ratepayers generally, and to the community at large.

I shall not attempt a disquisition on the Game Laws, of which we are told there are sixteen different Acts of Parliament now in force, and thirteen of them have been passed in the present reign—I expect all of them in favour of the game preserver, for on no question before the House of Commons, in my remembrance, has more zeal been shown than there has been in passing Acts of Parliament for the preservation of game—not even upon Reform, the Irish Church, or the Land question; and I cannot but think that in all these debates on the Game Laws very little regard has been manifested for the tenant-farmer. The Game Laws, fostering over-preservation of game, are injurious to the farmer, in that he has to maintain the game—not only hares and rabbits, but winged game as well. Some people think that it is hares and rabbits only that do mischief; with them I beg to differ. for though winged game may eat some slugs, if they (the birds) are too abundant they will eat your corn; and it is getting quite a common remark among farmers that "the old French partridges are eating all our winter Beans and Peas up." They are quite as bad, if not worse, than rooks; but rooks you may shoot, while it is more than many farmers' farms are worth to them to shoot the partridges, especially as the tendency upon many estates in the present day is not to give leases, so that the tenant-farmer's position—even in England—is fast becoming an increasingly unenviable one.

Another hurt to the tenant is the letting of the right of shooting over their farms by the landlord to a second party. The most striking illustration of this was the case of the Duke of Portland and his tenant, Mr. Dickons, which was tried at Leeds in 1869, when the tenant got a verdict in his favour, giving him £500 damages from a game association for libel. The decision has since been appealed against in the superior courts, but affirmed in favour of the tenant, who gets his £500, but loses his farms. The Duke ought now to reinstate him in those farms, seeing that he had been deceived by this so-called game association, consisting of merchants, bankers, and a solicitor. These parties hire of the Duke of Portland the right of preserving and shooting game on part of his extensive estates. Mr. Dickons hired two farms upon the estate, and, report says, was a thorough business man, and had improved both land and buildings since he had held them—one farm for 25 years, and the other for 16 years, a length of occupancy which ought not to have been severed very easily by any landlord without due inquiry. But the association wrote to the agent, complaining of Mr. Dickons for disturbing their game preserves (which, by the damages given against them, was proved to be false); the agent sends this letter of the association to Mr. Dickons, and with it a notice to quit his farms. The tenant writes to the Duke, denying that he had ever disturbed the game, and asks for an inquiry, which was refused; and ultimately the tenant gets evicted from his farms; so that game is made to stand first, and an enterprising tenant last.

Another illustration of the letting the right of preserving and shooting is seen in the upper part of this county, where a landlord dies and his estate goes into the hands of trustees on behalf of the heir, who is a minor. The landlord had, as usual, reserved the game in his leases, but had, while he was alive, allowed his tenants to shoot. After his death the trustees let the mansion, with the right of sporting over the estate, and the consequence is that game increases very fast, the tenants are forbidden to shoot or destroy it, and a sort of internecine war is begun between the tenants and the gamekeepers, which has already produced some very hard swearing before the magistrates, both in petty and quarter sessions; and very probably the final result will be that some of the tenants concerned may be brought to the edge of ruin, who, if their landlord had lived, would have been prosperous.

Surely the prosperity or ruin of a tenant ought not to depend upon the life of a landlord. Another source of injury to the tenant-farmers are the gamekeepers—a class of men who are generally uneducated, chosen more for their powers of physical strength and endurance than for their intelligence, who generally have the ear of the squire in preference to the tenant; and if the squire should happen to be a little deaf, you may be sure the keeper will know which ear the squire can hear best with. A fresh sort of annoyance to the tenant-farmer will be, I think, the proposal of a 20s. license to carry firearms, so that a farmer cannot shoot rats or rabbits without paying 20s. per annum, and yet dare not touch the game; while the landlord reserves the game, gets all the sport, and has only to pay the same.

Then as to the Game Laws being injurious to the ratepayers generally. This is seen in the large and increasing number of convictions under these laws; in 1845 they were 5000, in 1869 there were 10,345, 862 of which were under the Act of 1862, which Act virtually made policemen deputy gamekeepers. 310 convictions occurred in this county, but in the absence of county financial boards we are unable to tell what they cost the ratepayers. I think, however, if we put them each at £5 to the county rate, and £5 to the poor-rate in supporting the families of convicted poachers while they are in prison, we should not be very wide of the mark. This would make the cost of the Game Laws to this county alone over £3000 per annum. Then, how are many poachers made? Why, by the gamekeepers. It is well known that they purchase largely during the season pheasants' eggs poached from their neighbours' preserves, and very likely from their own preserves as well. The squire has to pay for them all. In Essex they say they get their game from Suffolk, and no doubt in Suffolk they say they get it from Norfolk. In fact the whole trade of procuring game is thoroughly contraband, and to lift the veil from it would be to reveal a hideous mass of cheating and lying.

Now as to remedies proposed to amend the Game Laws by the Home Secretary. So far as England is concerned there is only one clause in his Bill of any benefit—clause 7, which restrains a landlord from getting an injunction against his tenant for breach of contract under the Game Laws. It provides no compensation for damages done by winged game. And the latter part of clause 8 will provide plenty of work for valuers, arbitrators, and lawyers, but no benefit to the tenant, for should he be so simple as to sue his landlord once for damages he may soon look for an eviction. No doubt the most effectual remedy would be for the tenant to stand upon his legal right, and not to hire land where the landlord reserves the game; but as landlords have reserved the game so long I apprehend they will be loth to part with that power. So that I propose submitting three resolutions for your consideration as a remedy to the present state of the law:—

1. That the landlord and tenant should have the equal right of sporting over the lands that are let by one party and hired by the other. If this were done there would be plenty of game and sport for both parties.

2. That all game upon enclosed lands should be considered the property of the owners and occupiers of such lands. This provision would destroy one of the poacher's strongest arguments in favour of his poaching. Poachers generally maintain that the game is wild, and that it is as much his as yours if he can catch it, and when he sells the pheasants' eggs this idea is recognised by gentlemen's keepers. If game was considered property, it might also provide a remedy for damage done by game coming from neighbouring preserves.

3. That in lieu of the present Game Laws a stringent law of trespass should be enforced against all unauthorised persons. The difficulty of the present law of trespass is in fixing the damages, but I see no reason why a person should trespass upon my farm any more than a person should trespass upon a garden or orchard in a town or even into a house. It is those people who go crawling about your lands on a Sunday that do the mischief generally, and we need more protection against these intruders than we have at present.

In conclusion, I will give you a pen-and-ink sketch of what I should consider a model landlord upon the game question. At his next rent audit he will say to his tenants, "Gentlemen, I intend to dismiss my keepers and give you the right of sporting over the lands in your occupation, on this condition, that you will be able to find me some good sport whenever I may come over your lands in the season." If a system like this were tried, I am sure, with the inherent love of sport there is in most Englishmen, a better feeling would be produced, and more healthy sport would be enjoyed than there is under the present system.

After some discussion, the Chairman, Colonel BRISE, M.P., said: I stand here as a preserver of game, and I am not opposed to the preservation of game under certain restrictions. What I think is detrimental to the interests of the country is the over preservation of game. I agree with a great deal that Mr. Brown has said, but I think he has painted the blackest side of the picture. But, taking things altogether, I am not going to cavil with any observation—or with very few at any rate—that we have

heard. There are some I disapprove of, because opinions have been expressed by one or two gentlemen who have addressed this meeting, as well as by Mr. Brown, that we not only ought to get rid of hares and rabbits, but of wing game also. I do not believe there is any strong feeling in the county of Essex on this game question. A proof of this is that for three years our Chamber has been established and no gentleman has come forward till this time to introduce the subject, while Chambers in other counties have discussed it over and over again.

A great deal has been said about the convictions under the Game Laws, the expenses the country is put to thereby, and the evils that attend thereon. I hold in my hand statistics respecting convictions under the Game Laws in England. In some parts of Essex there have been a good many convictions, no doubt, and game is more preserved in one part of the county than another, but it is a hunting county — a county of sport, generally — and, compared with other counties, there is not much game preserved in it. The statistics which I have here show that although this is not a game preserving county, yet game convictions in Essex are pretty nearly as high as in other counties where game is preserved. In the county of Essex in 1869 we had 310 convictions under the Game Laws; in Norfolk, which is a game preserving county, there were only 266. Now, this, I think, proves that it is not strict game preserving only that tends to increase convictions; but there are many small owners of land in Essex which there are not in other counties, and, as Mr. Brown has observed, they don't like men trespassing on their lands, and a great many of those convictions that swell out the list in Essex are not the convictions of the large game preservers, but of yeomen and smaller occupiers and owners throughout the county generally.

As to the resolutions that Mr. Brown has proposed, I have no objection to any of them. In the first of them, it is proposed that the landlord and the tenant are to have an equal right, but I say the tenant has all the right — the tenant is the owner of the game at the present moment under the present law, and it is only by a stipulation, by the agreement of a certain payment from the landlord, or through some other inducement, that he hands it over to the landlord. Therefore, I do not see that that resolution is of any avail. I do not understand Mr. Brown means to interfere with agreement contracts, and I certainly have no objection to that rule. If one landlord says, "I will have the shooting and you pay me so much less rent," and another, "I do not want the shooting, you shall give me a little more rent than otherwise," that is an agreement with which I do not think it would be desirable to interfere. As to the second resolution, that all the game is to be the property of the occupier, that, I think, is a similar resolution to the first; the game is the property of the occupier already.

The third resolution asks for a stringent law of trespass. I quite agree with Mr. Brown that if you repealed the Game Laws a stringent law of trespass would be absolutely necessary; and I repeat, what I have said over and over again, that I have not the slightest objection to the repeal of the Game Laws, provided we have a stringent law of trespass. As to the Government Bill, I do not think it is a valuable Bill in any way. I do not think it will get rid of the evil that we all want to get rid of, and that is the evil of over preservation. I believe that the great remedy for that is public opinion—that the landlords who do damage their tenants will be won over by the force of public opinion being brought to bear upon them and showing them that want of consideration towards their tenants engenders an ill-feeling which is very dangerous and goes down to the very root of all society. These discussions are highly valuable in that respect; and although I have been told that in some counties there has been rather an ill-feeling engendered between landlord and tenant in the discussion of this question, I do think upon the whole it is for the benefit of the landlord rather than otherwise. It is therefore with great regret I hear that in some counties landlords have taken their names off the list of members of Chambers of Agriculture through observations that have been made on this subject.

Notices of Books.

Sanitary Arrangements for Stock. By W. Brown, Jun., Edderstone Farm, Peebles. W. Blackwood & Co.

This Prize Essay, which appeared in last year's volume of the Highland Society's Transactions, is well deserving of the separate publication here given to it. In it several existing sets of buildings for cattle are described, and thereafter the policy of the various methods of ventilation, arrangement, and construction which they illustrate, is discussed. We have in the following column made an extract descriptive of Mr. M'Combie's byres at Tillyfour. The following is a passage from the concluding part of the essay, in which the general subject is considered :—

"A byre constructed as follows should prove an excellent one so far as sanitary requirements are concerned. Walls of substantial rubble masonry, 1 foot 10 inches thick, 9 feet high, plastered inside, and washed with lime; roof formed of principal rafters and smaller intermediates, as at Dechmont, and slated; passages and cattle stances of close-jointed pavement, or of some hard and impervious composition, with a smooth and even surface; feeding-troughs of glazed earthenware, or of freestone; feeding passage before the cattle 4 feet wide. Cattle stances, from 7 feet to 9 feet 6 inches in length, over the feeding-troughs, according to the size of the cattle; passage behind, including gutter, 6 feet in width; gutters, 1 foot 3 inches wide, 3 inches deep, and smooth in the bottom; stalls 6 feet to 8 feet wide, according to size of cattle; travises of wood, with metal heel-posts; zinc or lead ventilators in the ridge, one for every four cattle, with orifices 5 inches square, and skylights 2 feet 6 inches long by 1 foot 6 inches broad, fitted to lift, as at Dechmont. Provide one skylight for every four cattle, and place them midway between the ventilators in the ridge. Space before the cattle between the travises sparred, 5 inches between centres, to the height of 2½ feet. This allows the expired air to get freely away; when close, and when an ox stands with its head directly against a wall, the air breathed out rebounds, and the animal again has to inspire in part the exhaled air.

"*Arrangement of Buildings.*—The straw-barn should be large and central, and the stables, byres, feeding-boxes, and cattle-courts, where straw is required, should be grouped around and as near to it as possible. The cattle accommodation should consist of airy byres for the cows; warm comfortable byres, feeding-boxes, or completely covered courts for feeding cattle; and roomy covered sheds, with open courts attached, for young rearing stock. In byres, small cattle, as Ayrshire, should have 700 cubic feet for each animal; and large cattle, as Shorthorns, should have 1000 cubic feet to each. When practicable, the cattle-courts should be open to the south, and the other buildings should be arranged to afford shelter from the north and east. It is desirable to have cattle-sheds on two sides of the open courts, because, if the wind blows directly into the sheds on the one side, those on the opposite side, of course, are sheltered. Each shed should have two entrances; if only one, an ill-natured ox can keep the others within or without at pleasure. These entrances should be wide enough to admit a cart, for the more readily removing of the dung within the shed, and should both be placed near the middle, so as to leave large sheltered recesses at the ends. Sufficient shelter should be provided. Each 2-year-old should have 90, and each stirk 75, superficial feet of covered area, with open courts about half these sizes.

"Overcrowding sheds should be avoided. If some of the cattle have to betake themselves to the open courts, where they are exposed to cold winds, rains, and snows, it entails pecuniary loss, as the animals so exposed sustain a great loss of heat, and loss of heat means loss of fat. Food is of two kinds—nitrogenous and carbonaceous; the former repairs and builds up the muscles and tissues; the latter, to a great extent, maintains the animal heat, and what is not required to keep up the temperature of the body is stored away as fat. If, therefore, an animal be exposed to cold and wet, greater oxidation of the carbonaceous part of the food is required to maintain the normal temperature of the body, and consequently less fat is produced from the same weight of food than would be the case if the animal were properly sheltered.

"In conclusion, however perfect the sanitary arrangements of byres, their good effects may be greatly nullified by allowing decaying litter to lie under the cattle, keeping the feeding-troughs filthy, the gutters unswept, and the passages littered with excrement. The importance and necessity of cleanliness of the steading, and especially in byres, cannot therefore be too strongly urged."

Farm Memoranda.

THE BYRE AT TILLYFOUR, ABERDEENSHIRE.—This steading, which consists of two squares, was designed by Mr. M'Combie, with the assistance of one of his cattlemen. The arrangement of the byres and cattle-courts is very convenient. The straw-barn is central, and the feeding-byre and large cattle-court have direct communication with it, whilst the other byres are as near as possible to the straw-barn, consistently with the arrangement in squares. The turnip-sheds are of easy access, and central for byres and courts.

There are two cattle-courts; the open court of each being surrounded on three sides by shelter sheds. The superficial area under cover in one set of sheds is 1650 square feet. The open court measures 25 feet 6 inches long, by 23 feet 6 inches broad. Twenty year-olds or sixteen 2-year-olds are wintered in it. In the other shed the area under cover is 1180 feet. The open court is 23 feet 6 inches square; fourteen stirks or eleven 2-year-olds are wintered here. The total covered area of the two courts is 2830 square feet, giving a space of 83½ square feet for each stirk, and 105 for each 2-year old; and the area of the open court is 1152 square feet, giving 34 feet for each stirk, and 43 for each 2-year-old. There are turnip-troughs along the back walls of the shelter sheds and under the "too-falls." There is no provision for ventilation by the roof, as enough of air is admitted by the doors, which are 9 feet 2 inches wide. The only provisions for drainage are, that the ground slopes on all sides towards the gratings in the centres of the open courts, and the water not absorbed by the litter is conducted away to a manure tank by covered drains formed of 4-inch glazed pipes.

The feeding-byre measures 80 feet in length by 17 feet 6 inches in breadth, and houses twenty cattle. The height of the walls is 8 feet. The cubical space to each ox is 840 feet. The passage before the cattle is 3 feet 6 inches in width, and that behind is 4 feet 6 inches. The length of the stances over feeding-troughs is 9 feet 6 inches. The floor is causewayed with pebbles. The feeding-troughs, travises, and system of drainage are the same as at Bridgend. The provisions for ventilation are three ventilators in the ridge, 1 foot 9 inches square, and about 2 feet high, fitted with louvre boards, which can be closed or opened more or less by drawing or relaxing a rope, and air-holes in the wall before the cattle, one to each double stall. These air-holes are about 1 foot from the top of the wall, and are 2 inches wide by 20 inches long. The doors are quartered, and part can be left open for the admission of air. The top panes of the windows are set in movable frames, and can also be opened or closed.

The cow-byre is stalled for twenty cattle. The cows stand in one row, and have no feeding passage in front. This byre is 85 feet in length by 14 feet 3 inches in breadth, and the walls are on an average 10 feet 3 inches in height, giving a cubical space of 893 feet to each cow. The provisions for drainage and ventilation are of the same description as in the feeding-byre, but here there are only eight ventilators in the wall in front of the cattle; these are 1 foot 9 inches long by 2 inches wide, and are placed 4 feet 2 inches from the ground.

Mr. M'Combie's cows suckle their calves, and whilst housed they occupy a byre 17 feet 6 inches wide, and 35 feet 3 inches long, which is divided into five stalls by wooden partitions, 9 feet 6 inches long and 5 feet high. There is a manger and straw-heck in front, and the space between them is filled up with spars 3 inches apart. Iron gates, 3 feet 9 inches wide, hanging on the wall, can be closed against the heel-posts of the travises, and thus each division is converted into a loose-box. The floor is laid with hard-burnt bricks, 1 foot long, 3 inches deep, and 5 inches broad, grooved out below, and when set together, a great number of channels are formed which conduct the urine to the gutter. The latter consists of an inverted tile 3 inches wide and 2 inches deep, covered with a wooden board 5 inches in breadth.

Miscellaneous.

MR. P. TAYLOR'S GAME BILL, which proposed simply to abolish the Game Laws, was talked out of the House of Commons on Wednesday evening.—In his introductory speech, Mr. Taylor cited the opinion of various authorities, legal and political,—quoted the *Field* to the effect that in Suffolk eleven gentlemen had in the space of five days killed 8345 head of game, being about 1 ton of game per head (in his opinion there was almost as much sport in such slaughter as in being apprenticed to a Leadenhall Market butcher)—and declared that the Game Laws were a curse to the landlords, bringing suspicion upon the administration of the law by the justices of the peace throughout the country (he was aware that justices of the peace never sat to determine their own cases, but they acted on the Christian maxim of doing to the poachers on other people's property as they wished should be done to the poachers upon their own property). The Game Laws were a curse to the farmers also, for the injury done to them by the game was impossible to estimate; and they were a curse to the agricultural population, to whom they offered a perpetual temptation to commit crime.—General Forrester and Mr. M'Lagan subsequently addressed the House, and at the hour of adjournment the debate was suspended.—The chief interest of the debate centered in the speeches of Mr. Sturt and Mr. M'Combie.—Mr. Sturt, "having been a game preserver more or less for upwards of 20 years, and having during all that period mixed in a friendly and familiar manner with many tenant-farmers, felt quite equal to the occasion, ready to grapple with the facts adduced by the member for Leicester, to deny his statements, to refute his arguments, to annihilate his doctrines, and, in fine, to shut him up altogether. The hon. member's statement about the ill-feeling existing between landlord and tenant showed that he either had no landed property, or, if he had, that he never went shooting on it; for, of all the 365 days in the year, the one to which the tenant-farmer looked forward with most pleasure was that on which his landlord came to take a day's recreation with him. He was referring to English landlords, and would say nothing of the landlords of Scotland, because he did not understand the language of that country. Then, was not the hon. member well aware that, whether in the town of Leicester or in an agricultural village, it happened in 99 cases out of every 100 that the poacher was the bad character of the place? Did any one suppose that the men who went out poaching, and who sometimes, without any provocation, committed murder, would hesitate to steal geese, chickens, turkeys, or even the watch which was now ticking close by the philanthropical heart of the hon. member for Leicester? Let the House consider the extraordinary argument of the hon. member, who demanded the repeal of the Game Laws because there were an enormous number of convictions under them. To repeal a statute because it was frequently infringed would be to pursue a policy fraught with danger. Then the hon. gentleman had spoken of the immense quantities of food which game destroyed, but he seemed to forget that hares, rabbits, and pheasants were food for the people as well as beef and mutton. Having said this much against the Bill, he desired to give some friendly advice to his brother preservers of game, for he believed they would take advice from him in a better spirit than they would from the member for Leicester. Now he confessed he did not think that everything in regard to the Game Laws was in a satisfactory state. The long list of convictions for poaching made him very uneasy, and was a sort of disgrace to the civilised age in which we lived. He wished, however, to effect a change by social and moral means, and not by Act of Parliament. If the owners of large estates wished to diminish the number of convictions for poaching they ought to see that every labourer on their property was comfortably housed, and had a nice garden and a good

allotment. He was not anxious to bring his own individual case before the public, but he might mention that he reared 4000 pheasants the year before last, and that during the last 23 years there had not been on the average more than one case of poaching per annum on his estate. This was because every labourer on the estate voluntarily constituted himself a keeper of game, as he was treated like a Christian, and, in fact, considered himself as one of the family. He wished every landlord would have all the rabbits on his estate killed, and see that his tenant-farmers were not eaten up with hares. If they took his advice they would do what was still more important, and refuse to let their places for shooting in order to put a few dirty sovereigns into their pockets. If the landlords built cottages for and made friends of their tenants, and if they declined to make the game the subject of a money transaction they would be able to withstand for many years the onslaughts of such men as the hon. member for Leicester, and to keep up a noble sport and amusement which brought about and cemented those feelings of friendship and cordiality which ought to exist between all classes, and more especially between the owners and cultivators of the soil.—Mr. M'Combie read extracts from letters sent to him by tenant-farmers in various parts of Scotland, some of whom said they regarded the Lord Advocate's Bill as an insult to the people of Scotland, and rather an aggravation of the evil. No one could deny that the question upon which some of the most important elections in Scotland turned was that of the Game Laws, and the gentlemen on the Treasury benches owed their large majority to the tenant-farmers and the feuars of Scotland. Now, he would say, that, after helping the Government to do justice to Ireland, the tenant-farmers wanted justice for themselves—justice in taxation, justice in not allowing their crops to be eaten up by the landlord's game, the modification of the Malt-tax, and the abolition of the law of hypothec. They wanted no more than justice, and they would be content with no less. It would not do for hon. members to say that they were friends of the tenant-farmers, and to come here and vote against them on this question. The tenant-farmers would judge, not by the words, but by the acts of their representatives, and would in this way see who were their friends and who were not. As to the Lord Advocate's Bill, he fully exonerated the right hon. and learned lord from any wish to hurt the tenant-farmers, but it would be a pity to waste the time of the House in the consideration of such a measure. He trusted that Bill would be withdrawn, but, if not, he would oppose it in all its stages by every constitutional means in his power, for he regarded it, and the tenant-farmers of Scotland regarded it, as a snare, a trap, and a mockery.

IRISH LAND BILL.—Mr. J. Howard, M.P., has written to the *Daily Telegraph* to explain his vote on the proposal to advance Government money to enable Irish tenant-farmers to purchase their occupation. He says that his speech was intended to show that "between the State lending money for improvements and lending it for the purchase of land a broad and important distinction was to be drawn. In the first case, money expended in the reclamation or improvement of land led to the employment of more labour, and the raising of more food for the people—the lending of State money for such purposes was therefore most justifiable, inasmuch as it was for the benefit of the public at large, or, as you have laid down the principle, 'if the object in view is really public in its importance, the State may advance the public funds.' The lending, however, of State money to a section of the public, in order to enable individuals to become owners, instead of occupiers, of their farms, is a totally different question. What does it matter to the general public whether particular farms are owned by A, B, or C? Nothing whatever, unless it can be shown that it will lead to the employment of more labour or the production of more food. The difficulty of maintaining such a position was well known; and the proposal was not, therefore, put forward on that ground, but simply on the plea that it is necessary for the pacification of the people of Ireland. Will this bear examination?" Mr. Howard adds,—"That the details of the Irish Land Bill can be introduced into an English Land Bill is out of the question; but that the main principle—the securing the tenant in his just rights—must, I hold, with an advancing style of farming, ere many years be adopted in England. Nothing less will secure the fullest development of the resources of the soil. With our limited extent of cultivated ground, the public have a right to demand that no individual rights, if indefensible, shall be allowed to stand in the way of the accomplishment of this important national object. I was therefore anxious that no important principle should be adopted in the Irish Land Bill which could not be applied equally in England; and, as I thought it to be an unsound principle, and neither necessary nor justifiable, although a loyal supporter of the Government, I deemed it to be my duty to stand up to oppose the clause in question. The policy of creating a peasant proprietory is so important a question that to discuss it in its various aspects would require many columns of your valuable space. That the raising of a portion of the peasants on the Continent from a condition of serfdom to actual proprietors of the soil has been attended with great advantages to the persons so raised is so palpable that no one can dispute it; but I believe no greater mistake can be committed than to assume that peasant proprietorship would be advantageous to other countries where the condition of things is so essentially different. For instance, can any country in the world compare with England in the amount of corn and meat raised on the same area? I believe, judging from extensive observation in other countries, were England parcelled out among small proprietors, that meat—dear enough now—would, with our teeming population, very soon be at famine prices. Again, it is admitted on all hands that even with a large proportion of small proprietors—such, for instance, as Prussia, which has 900,000 farms under 4 acres, there must always still remain a large class below them, mere labourers; and what, I ask, is their condition? I answer unhesitatingly—far more wretched than our own agricultural labourers. In my book, 'Continental Farming and Peasantry,' I have given the wages of each country in Europe. The lowest I met with were in a part of the very country you have singled out as a notable example of the benefit of peasant proprietorship. In Silesia the wages of farm labourers are 4*d.* per day in winter, 5*d.* in spring and autumn, and 7½*d.* to 10*d.* in harvest, without victuals."

The Week's Work.

MAY 28.—*Turnip Sowing* commences about the close of the month and beginning of June. Some of the hybrid yellows require to be sown as early as the Swede. The cultivation and manuring are the same as directed for Swedes last week. If the land was deeply ploughed in autumn, 12 to 14 inches, it should be smashed up in spring to the same depth, and the fine winter-made mould kept on the surface, which this year is unusually fine, and by this time the land should be ready for the manure. Much of the success of growing Turnips depends upon getting farmyard manure into the land without loss of moisture, and at the same time to keep the natural sap in the land, and to keep the sowing close up to the manuring. Where there is a sufficient force to keep a sowing machine going, this is easily done, and when otherwise sow at the close of every yoking close up to the ploughs in dry weather (and if needful use the liquid-manure drill), and never stint the land of water when it requires it, as success depends upon getting the braird rapidly into rough leaf.

Wheat Flagging is this year an exception, but the exceptions must be attended to with the timely use of the scythe; and it must also be borne in mind that in seasons like the present when once Wheat fairly starts growing it sometimes "grows too fast to straw," so that relieving the ear prevents etiolation and lodging, thereby forcing forward the harvest.

Liming root crop fallows continue up to the time of sowing. The lime should be well harrowed into the land before it is set up in stetches or drills for farmyard manure, and the thorough incorporation of the lime with the land is still more necessary when the manure is ploughed in for growing Swedes or Turnips on the flat. On many soils which previously required liming, every now and then the liberal use of superphosphate has rendered the practice unnecessary.

Fat Lambs (Leicester, Cheviot, and blackfaced crosses) should now be ripe for the shambles. 4-year-old Cheviot, draft, or crock ewes, and 5-year-old blackfaced are bought in autumn and served with Leicester rams so as to have the lambs ripe by this time for the market; the ewes follow, and in not a few instances the ewes and lambs are sold together. Some sheep farmers draft out the most forward ram lambs from breeding flocks for the shambles, and also ewe lambs when not suited for breeding. Generally speaking, lambs (whether ram or ewe) that run early to fat seldom turn out good breeders, so that when there is a good selling market for lambs the best plan is to turn them into money.

Castration of lambs should be done in mild but clear weather. Those intended to be sold fat need not undergo the operation. The whole lamb flock is generally docked at the same time, and those intended to be kept for breeding branded; the branding of those intended to be sold in the summer markets being left to the purchaser, who puts his own brand upon them as he thinks proper.

Sheep Washing and Shearing in our southern counties begin about the latter half of the month, sooner or later, according to the weather. Some flockmasters have washing places built of stone or brick expressly for the purpose, of a size capable of allowing one or more sheep to be washed at a time according to the size of the flock. Water is laid on from a pond or stream by means of a pipe or trough, the refuse water being drained off from below. A few stone steps lead down to where the shepherds stand, and as the sheep are washed they walk out clean, and as soon as the wool is dry shearing commences. Others dam a running stream, the shepherds each standing in a cask while washing. The older plan was to drive the sheep through and through a river, a practice still in force, as will be noted next month, in washing Highland flocks.

The Dairy.—When cows are newly turned out to the Grass, "small churnings and small cheeses" is the older rule. But by the latter end of May and beginning of June the milk should be in its prime both for butter and cheese making. When the fire is put out and the dryness and temperature of the milk room is wholly dependant upon solar heat, some extra attention is required to keep dairy utensils, shelves, and everything clean and sweet; and more depends upon the purity of the atmosphere outside than many imagine, for if the atmosphere outside is loaded with noxious matter, as it frequently is, that which is inside cannot be so very nice as it should be.

Dairy and Small Porkers, fed on the whey of cheese dairies, and on the butter milk and skimmed milk of butter dairies, should have a fair allowance of solid food; also an allowance of sour food daily. Sows that farrowed in February and beginning of March will be dry and coming forward to litter a second time; they should be kept in good condition, and so should those still nursing. Young pigs intended for bacon should never be allowed to lose their milk flesh; but fattening should be avoided, as it is opposed to growing flesh. *W. B.*

Notices to Correspondents.

TO PRESERVE EGGS: *G. A. H.* says, in answer to a question on this subject:—The best way to preserve eggs I ever saw or heard of, is to butter them. Take a piece of butter in the hand (it will soon soften), and rub the egg all over with it, rolling it well in the palm of the hands, and leaving it thoroughly greasy. A small bit of butter will do a great many eggs. Let the eggs be cold before they are buttered. I remember, when I was a boy of 13, one of my elder brothers, for a wager, marked a number of eggs, duly signed by both parties, buttered them and eat them on that day six months. They were beautifully fresh to all appearance, and quite milky."

Markets.

ENGLISH WOOL.

Market quiet but steady. Consumers are limiting their purchases to see the result of the opening fairs of wool of the new clip, which will now shortly take place. When once prices have been thereby established we may look for an improved demand.

CURRENT PRICES OF ENGLISH WOOL.		Per lb.-	*s. d.*	*s. d.*
FLEECES—Southdown hoggets	.. ..	..	1 1	to 1 2½
Half-bred ditto	.. ..	..	1 2	— 1 2
Kent Fleeces	.. ..	..	1 3	— 1 4
Southdown ewes and wethers	..	..	0 03	1 1
Leicester ditto	..	..	1 2	— 1 3
SORTS—Clothing	.. .. ..	..	0 10	— 1 6
Combing	.. .. ..	..	1 0	— 1 8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, May 26.

Prime Meadow Hay	80s. to 90s.	Clover, old ..	..120s. to 130s.
Inferior do.	65 75	Inferior do.	80 100
Rowen	— —	Prime 2d cut ..	105 115
Inferior do.	— —	Inferior do.	80 90
Straw	20 28	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, May 26.

Sup. Meadow Hay	84s. to 90s.	Inferior Clover ..	95s. to 110s
Inferior do.	70 76	New do.	— —
New do.	— —	Straw	30 35
Superior Clover ..	123 130	JOSHUA BAKER.	

WHITECHAPEL, Thursday, May 26.

Fine Meadow Hay	76s. to 82s.	Prime old Clover ..	120s. to 130s
Inferior do.	60 70	Inferior do.	90 100
Prime New Hay ..	— —	Prime 2d cut do. ..	— —
Inferior	— —	New Clover	105 112
Straw	24 28	Inferior do.	80 90

METROPOLITAN CATTLE MARKET.

MONDAY, May 23.

The number of Beasts is much smaller, and we have a fair demand, consequently prices are higher for all kinds. We have a very short supply of English Sheep; they are sold rather dearer, but trade was not brisk at the close. Choice Lambs are scarce and rather dearer; the average quality is only middling. Trade is brisk for choice Calves, at higher rates. Our foreign supply consists of 930 Beasts, 10,000 Sheep, and 137 Calves; from Scotland there are 286 Beasts; from Norfolk and Suffolk, 1260; and 314 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Here-fords, &c. ..	4 10to5	2	Best Long-wools ..	.. to ..	
Best Shorthorns ..	4 8—5	0	Do. Shorn ..	4 8—5	0
2d quality Beasts	3 0—4	0	Ewes & 2d quality ..	.. — ..	
Best Downs and Half-breds ..	.. — ..		Do. Shorn ..	4 0—4	6
Do. Shorn ..	5 0—5	4	Lambs	5 8—7	0
			Calves	3 6—5	6
			Pigs	3 4—5	4

Beasts, 2790; Sheep and Lambs, 26,280; Calves, 145; Pigs, 120.

THURSDAY, May 26.

We have a much larger supply of Beasts than on Thursday last; there is, however, a fair demand for best qualities, at fully Monday's quotations, and a pretty good clearance of all descriptions is effected. The number of Sheep and Lambs is larger, but the average quality is very middling; choicest qualities are readily disposed of, at a slight advance on Monday's prices. Calves are rather dearer. Our foreign supply consists of 260 Beasts, 3930 Sheep, and 315 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Here-fords, &c. ..	4 10to5	2	Best Long-wools ..	.. to ..	
Best Shorthorns ..	4 8—5	0	Do. Shorn ..	4 10—5	2
2d quality Beasts	3 0—4	0	Ewes & 2d quality ..	.. — ..	
Best Downs and Half breds ..	.. — ..		Do. Shorn ..	4 0—4	6
Do. Shorn ..	5 2—5	6	Lambs	5 8—7	
			Calves	3 8—5	
			Pigs	.. — ..	

Beasts, 918; Sheep and Lambs, 14,440; Calves, 375; Pigs, —.

METROPOLITAN MEAT MARKET.—*May 26.*

Best Fresh Butter .. .. .. 16*s.* per dozen lb.
Second do. do. .. .. .. 14*s.* ,,
Small Pork, 5*s.* 4*d.* to 5*s.* 6*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 8*d.* per 8 lb.

MARK LANE.

MONDAY, May 23.

There was a moderate supply of English Wheat to this morning's market, which was sold at a decline of about 1*s.* per qr. from last Monday's rates. The attendance was fair, and for foreign Wheat there was a good consumptive demand, at prices about 1*s.* per qr. below those current a fortnight since. Barley, Beans, and Peas were firm. Finest qualities of Oats brought an advance of 6*d.* per qr.; other descriptions were unchanged in value. Flour was quiet.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	39	47	Red.....	36	46
— — fine selected runs..do.	43	51	Red.....	39	48
— — Talavera	53	56			
— — Norfolk	—	—	Red.....	—	
— — Foreign	38	54			
BARLEY, grind. & dist., 26to 30*s*. Chev.	39	42	Malting ..	34	38
— Foreign ..grinding and distilling	22	25	Malting ...	30	40
OATS, Essex and Suffolk	22	24			
— Scotch and Lincolnshire..Potato	24	26	Feed	—	
— Irish .....Potato	23	25	Feed	21	24
— Foreign .....Poland and Brew	21	24	Feed	19	21
RYE	32	38	Foreign ..	33	36
RYE-MEAL, Foreign	—	—			
BEANS, Mazagan ...30*s*. to 37*s*.. Tick	31	49	Harrow ...	31	49
— Pigeon ....50*s*. to 56*s*...Winds.	—		Longpod..	—	
— Foreign ..... Small	41	43	Egyptian	38	40
PEAS, White, Essex, and Kent.. Boilers	32	42	Suffolk ..	35	43
— Maple, 41*s*. to 45*s*. Grey	32	42	Foreign ..	33	37
MAIZE	—	—	Foreign ..	29	31
FLOUR, best marks delivered..per sack	39	43			
— 2d ditto .....ditto	28	40	Country ..	28	40
— Foreign .....per barrel	22	25	Per sack..	29	55

WEDNESDAY, May 25.

The grain trade at Mark Lane this morning has been in a very quiet state. The supplies of English Wheat have been only moderate, but they have been sufficient to meet all inquiries; in all qualities sales have progressed slowly, at the late reductions. The show of foreign Wheat has been tolerably good; the trade has been heavy, at the quotations of Monday. The supply of Barley has been moderate; the inquiry has been restricted, but prices have ruled firm. Malt has been dull, at late rates. Oats, the show of which has been moderate, have been in healthy request, at full quotations. Beans have been quiet, but firm, and Peas have realised extreme currencies. Flour has been sold slowly, at Monday's quotations.

ARRIVALS LAST WEEK.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 4320	Qrs. 440	Qrs. 1104	Sacks. 21,794
Irish ..	—	—	—	—
Foreign ..	15,793	3127	37,488	580 (11,521 brls.
	20,113	3573	38,592	

LIVERPOOL, May 24.—The market opened very dull, but the attendance subsequently swelled, and a brisk demand set in, and, induced by the low prices, a large business has resulted in Wheat, at the decline of Friday last. Flour has been better, and the prices are the same as on Tuesday last. Barley rather dearer. Egyptian Beans 1*s.* 6*d.* higher. Oats and Oatmeal firm. Indian Corn slow, and 6*d.* per qr. cheaper.

AVERAGES.

	Wheat.	Barley.	Oats.
April 16	42*s*10*d*	35*s* 2*d*	21*s* 5*d*
— 23	42 7	34 11	20 8
— 30	42 7	33 1	21 7
May 7	43 3	34 2	23 1
— 14	44 5	33 9	23 1
— 21	45 3	32 5	22 0
Average ..	43 6	34 0	21 11

HOPS.

BOROUGH MARKET, May 26.

Messrs. Pattenden & Smith report the demand of a retail character, choice samples being extremely scarce, and these command full rates, but middling and low descriptions are to be had upon easier terms.

SEED MARKET.

Our seed markets are now very quiet, as must be expected at this season of the year. The two articles which have principally engaged the attention of the trade during the past week have been Rape and Mustard seed, both of which, being very scarce, have advanced in price. A good rain would, without doubt, considerably increase the demand for these seeds. We have an improved inquiry for large blue Peas. Reports to hand from France speak very badly of the growing crop of Trefoil. Clover seeds of all descriptions meet just now with no attention whatever. Trifolium incarnatum is in fair request.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—*May 25.*

West Hartley, 15*s.*; Walls End Gosforth, 15*s.*; Eden Main, 15*s.* 3*d.*; Walls End Haswell, 17*s.* 6*d.*; Walls End Russell's Hetton, 15*s.* 9*d.*; Walls End South Hetton, 17*s.*; Walls End Stewart's, 16*s.* 6*d.*; Walls End Hartlepool, 16*s.* 3*d.*; Walls End Kelloe, 15*s.* 9*d.*; Walls End East Hartlepool, 16*s.* 6*d.*; Walls End Original Hartlepool, 17*s.* 6*d.*; Brancpeth Cannel, 18*s.*—Ships at market, 47; sold, 39; unsold, 8; at sea, 25.

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps. HEREMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each.

6 ft. by 4 ft. Lights, 2 in. thick, unglazed.. £0 5 0
" " Primed and Glazed with 10 oz. Sheet 0 11 0
" " " with stout portable Box, not Painted 1 3 0
" " Painted four coats, and Painted 1 8 0
" " Packed and Delivered in Railway van 1 10 0
6 ft. by 8 ft., Double Lights, do 2 15 0
GREENHOUSES .. .. .. Per ft. super
Woodwork only Prepared and Fitted 0 0 6
" Primed and Glazed with 16 oz. Sheet 0 0 9
" Delivered, and Fixed with Ironwork 0 0 0
" Painted four coats, two sides, ready for use .. 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5*s.* each GLASSES, all sizes
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Sole Manufacturers of the Improved CONICAL BOILERS,
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Improved and extra strong CAST IRON TUBULAR BOILERS, with or without Water Bars, from 65*s.* 6*d.* each

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Patent THROTTLE and other VALVES; FURNACE DOORS, BARS, and FURNACE WORK of every description and size
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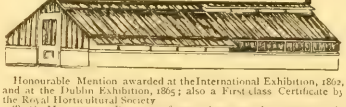

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HOT-WATER, GAS, RAIN-WATER PIPES, BOILERS, &c., delivered in London, Liverpool, Bristol or equivalent

	2-inch.	3-inch.	4 inch.
	s. d.	*s. d.*	*s. d.*
HOT-WATER PIPES, Nos. 6 & 7 on illus.	1 4	2 0	2 8
trated sheet .. .. .. per yard	0 11	1 5	1 11
ELBOWS .. .. No. 12 on do. each	1 4	2 1	2 9
TEE PIPES .. .. No. 33 on do. ,,	2 1	3 0	4 0
SYPHONS .. .. No. 23 on do. ,,	1 9	2 6	3 6
VALVES .. .. .. ,,	10 0	11 0	12 0

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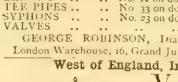

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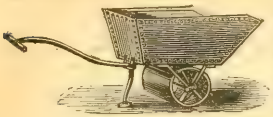

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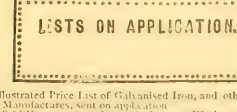

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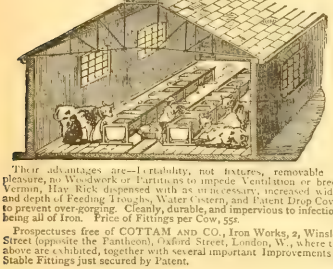

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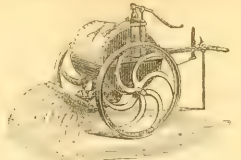

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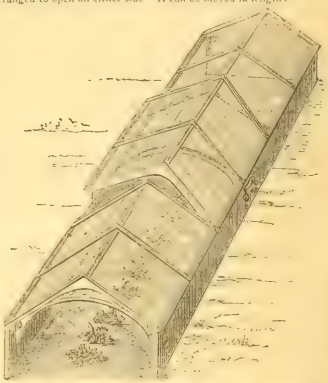

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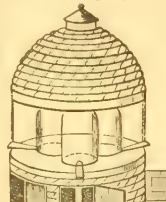

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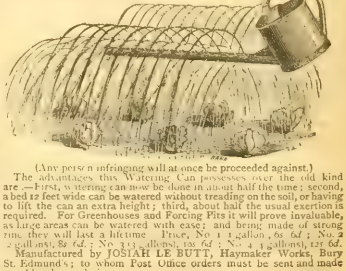

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13 by 11	14 by 11	..	..			
13 by 12	15 by 12	15 by 11	16 by 11			
18 by 12	19 by 12	20 by 12	17 by 12			
16 by 13	17 by 13	20 by 12	..	15 0	16 0	18 6
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The Patent Improvements recently introduced give Shanks's Machine several important advantages possessed by no other Lawn Mower.

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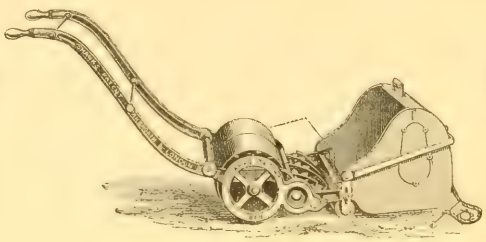

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8-inch Machine	£3 0 0	*By a Lady.*
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The Hand Machines are all with Silent Movement.

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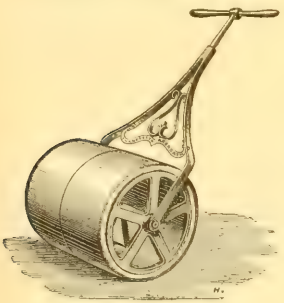

These Rollers are made in halves, and are much easier to work than when cast in one piece. The edges are rounded off to prevent any marks being left on the Walks or Grass; a counterbalance handle is fitted to each Roller.

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Roller,	18	Inches	Diameter,	×	20	Inches	Long	..	..	..	..	£3	0 0
,,	20	,,	,,	×	22	,,	,,	..	..	..	..	3	10 0
,,	24	,,	,,	×	26	,,	,,	..	..	..	..	4	10 0
,,	26	,,	,,	×	28	,,	,,	..	..	..	..	6	0 0
,,	30	,,	,,	×	32	,,	,,	..	..	..	..	7	10 0

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,,	30	,,	,,	×	36	,,	,,	..	..	..	..	10	15 0
,,	30	,,	,,	×	42	,,	,,	..	..	..	..	11	15 0
,,	30	,,	,,	×	48	,,	,,	..	..	..	..	13	10 0
,,	30	,,	,,	×	60	,,	,,	..	..	..	..	15	10 0
,,	30	,,	,,	×	72	,,	,,	..	..	..	..	17	10 0

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Editorial Communications should be addressed to "The Editor:" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 23.—1870.] SATURDAY, JUNE 4. { Price Fivepence. / Stamped Edition, 6d.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

GREAT FLOWER SHOW and EXHIBITION of RHODODENDRONS by Mr. WATERER, on WEDNESDAY, June 8. Bands of the Scots Fusilier Guards and Honourable Artillery from 3 o'Clock. Tickets to Friends of Fellows (bought before the 8th), 5*s*. Admission on the day, 7*s*. 6*d*.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

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ROYAL HORTICULTURAL SOCIETY'S GREAT PROVINCIAL SHOW of FRUIT and FLOWERS, will be held at OXFORD, from JULY 19 to 22 inclusive. Applications for Schedules of Prizes, as yet unissued, for Supplement, Exhibition, should be made at once to JAMES RICHARDS, Assistant Secretary, South Kensington.

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7 " "	.. 0 10	17 " "	.. 4 0
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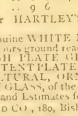

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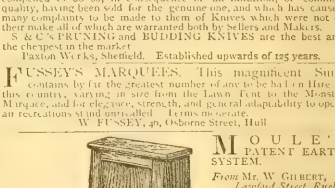

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Full directions sent with each Drill. On receipt of stamps or Post-office Order, made payable to JOSIAH LE BUTT, Patentee and Manufacturer of the Champion Haymaker, Bury St. Edmunds, a Drill will be sent immediately. Price 12s 6*d*. The name of the nearest station should be given.

Why pay More than Thirteen Guineas
FOR A HAYMAKER?

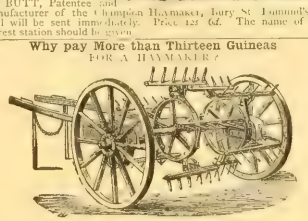

THE CHAMPION HAYMAKER, for strength, lightness of draught, simplicity, and efficiency, is unequalled More than ordinary care has been bestowed upon the construction and arrangements of all the vital parts, rendering an accident when at work in the field almost a matter of impossibility; while all complicated parts, such as "levers and eccentrics," are entirely dispensed with, and the cog-wheels are so arranged that it is impossible for them to be worked wrong, and altogether the commonest agricultural labourer is enabled at once to understand the working of the machine. The parts made of cast-iron are numbered, and if by any chance they get broken, a duplicate can be supplied at an hour's notice. It is guaranteed equal to work in the heaviest crop, and is equal in every respect to the high-priced machines of other makers.

"NOTES IN THE IMPLEMENT DEPARTMENT."—At the great Meeting of the Royal Agricultural Society of England, at Bury St. Edmunds, the *Mark Lane Express* of July 29, 1867, under the above heading, says:—"One of the simplest, strongest, and most efficient Haymaking Machines we have seen is that made by JOSIAH LE BUTT, of Bury St. Edmunds, and which he has christened, not vaingloriously, 'The Champion'

Price, including delivery to principal stations, £13 13s., and will well screened wood travelling wheels. Width of machine, 8 feet; weight, 8½ cwt.

MOWER or REAPER KNIFE REST, for firmly holding knife of Reaper or Mower during the process of sharpening, and obviates the Tenant Right disputes so frequent in use.

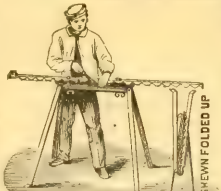

It is very portable, and is adapted for all reaper or mower knives, whether knives are above or below the bar, an advantage not to be found in others; and a spanner is sent out with every Rest for loosening nuts when required Price 12s 6*d*. Full Descriptive and Illustrated Catalogues on application to the Manufacturer,

JOSIAH LE BUTT,
Bury St. Edmunds,
Suffolk.

Lawn Mowers, Iron Vases, Seats, &c.

J. JONES AND SONS are now selling surplus Stock of the above at a discount of 15 per cent for cash
6, Bankside, London, S.E.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order Shipping orders promptly attended to

ARCHIMEDEAN LAWN MOWER to be SEEN at BUTLER, M'CULLOCH AND CO'S, 3, South Row, Covent Garden Market, London, W.C. (opposite Southampton Street). Established upwards of a Century.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages, possessed by no other Lawn Mower.
PATENT DOUBLE EDGED SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

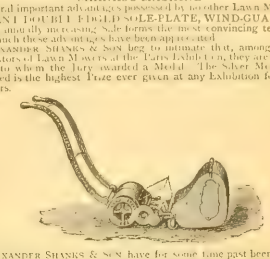

ALEXANDER SHANKS & SON have for some time past been making the Keen Edge Cutter of their Machines Self-Sharpening; that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole Plate In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single edged Sole-plate must be entirely renewed when the edge is worn down

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no jibbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Dens Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

Automaton Lawn Mowers, Manufactured by

RANSOMES, SIMS, AND HEAD, Ipswich. The best, simplest, and most durable Machines They leave no ridges in the grass, and are unsurpassed for keeping a Lawn or Croquet Ground in first-rate order; 4000 are now in use. Prices from 55s. Sizes 8 to 30 inches. A large stock kept, and orders executed on receipt. Illustrated Lists free by post, and Testimonials from Thirty English Counties. (Please refer to this Advertisement when ordering.)

American Lawns.

THE AMERICAN PATENT
"ARCHIMEDEAN" LAWN MOWER is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never leaving untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS.

The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

The *Field* says—"The Americans have been beforehand with us in many Machines, but we were not, however, until now aware they possessed a Lawn Mower which is far superior to any of ours."

The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances adapted not only for our amusement but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 6 or 8 inches long. The 14-inch machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."

Sole Wholesale Agent for the United Kingdom,
JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & Co.,

IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

87, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted; each 1s., and 2s. 6d. per packet.

SCOTT'S WASP DESTROYER will quickly rid any place of Wasps, Crickets, Cockroaches, and other Garden pests. "It completely cleared the place." *Vide* Testimonials, sent on application. Price 1s. 6d., and 2s. 6d. per bottle, in stamps.

J. SCOTT, The Seed Stores, Yeovil, Somerset.

Bedding Plants, &c.

WOOD AND INGRAM beg to offer AGERATUM IMPERIAL DWARF (Chater), 2s. 6d. each, 18s. per dozen.
ARTELOCHIA ORNITHOCEPHALA, 3s. 6d. each.
DRACÆNA INDIVISA, 18 inches high, 18s. per dozen
FUCHSIAS, in great variety, from store pots, 10s. per 100.
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ISOLEPIS GRACILIS, 3 inch pots, fine, 4s. per dozen.
LIBONIA FLORIBUNDA, 1s. each.
MESEMBRYANTHEMUM CORDIFOLIUM VARIEGATUM, 1s. 6d. each.
VERBENAS, in great variety, from store pots, fine, 5s. per 100.
VERBENAS, established in single pots, W. & I.'s selection, 2s. per dozen; 15s. per 100.
The Nurseries, Huntingdon.

Superb New Bedding Plant.
VIOLA CORNUTA VAR. PERFECTION.

B. S. WILLIAMS has much pleasure in offering this superb plant to public notice, and from the manner in which it has been tested both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is shaded blue, the eye orange yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed it resembles a gigantic V. cornuta in habit, and, whilst retaining its profuse blooming qualities, producing flowers which almost rival our Florist Pansies for size and substance. This plant was awarded a First-Class Certificate by the Floral Committee, September 25, 1869. Price 2s. 6d. each, 24s. per dozen, 70s. per half hundred, 100s. per 100.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

TRY HILLIER'S COLLECTIONS of FOLIAGE BEDDING PLANTS:—

1 dozen Centaurea candidissima	1 dozen Golden or Verschaffelti Coleus.
1 dozen Centaurea gymnos tpa	
1 dozen Artemisia Stelleriana	2 dozen Golden Feather
1 dozen Iresine Lindeni	1 dozen Lady Cullum Geranium.

The above are strong plants, and will be sent, package free, for 21s.; or half the quantity, 11s.

Choice GERANIUMS, the following for 15s.:—Lucy Greeve, Mrs. Pox, Florence, Sophia Cruickshank, Sophia Dumuresque, Queen Victoria, Louisa Smith, Excellent, Imperatrice Eugénie, and May Queen (Turner). Strong plants. Package included.

The following good kinds for 5s.:—Lemoine, Madame Lemoine, Victor Lemoine, Victor, Triomphe, A. Henderson, Masterpiece and Lizzie.

Centaurea gymnocarpa, 2s. 6d. per dozen, 16s. per 100; Coleus, choice kinds, 2s. per dozen, 12s. per 100; Geranium, Rev. W. F. Radclyffe, the best bicolor for bedding, 6s. per dozen; Lady Cullum, good strong plants, in 48's, per dozen, 9s. Terms Cash.

EDWIN HILLIER, Nurseryman, Winchester.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.

CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received the special 1st Prize last season at the Royal Botanic, Royal Horticultural, and other places. Per packet, 2s. 6d.

CALCEOLARIA, finest hybrid. Per packet, 2s. 6d. CALCEOLARIA, finest spotted. Per packets, 2s. 6d., saved with the greatest care, and from one of the largest collections in the kingdom.

CINERARIA, choicest, mixed—saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2s. 6d.

PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.

PRIMULA.—Choicest mixed, fringed. Per packet, 2s. 6d.

PRIMULA.—Dark carmine, fringed. Per packet, 2s. 6d.

PRIMULA.—New scarlet. Per packet, 2s. 6d.

PRIMULA.—Rose fringed. Per packet, 2s. 6d.

PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.

PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2s. 6d.

PRIMULA.—Choicest Fern-leaved white, 2s. 6d.

PRIMULA FIMBRIATA.—Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.

Forwarded immediately on receipt of Post-office Order.

JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

The Bath and West of England and Southern Counties Societies' Meeting at Taunton,
JUNE 6, 7, 8, 9, and 10

MESSRS. SUTTONS' STAND of AGRICULTURAL and HORTICULTURAL PRODUCE will be found in close proximity to the Horse Ring and Poultry Department.
Royal Berks Seed Establishment

The Exhibition of the Bath and West of England Agricultural Society, Taunton.

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JAMES CARTER AND CO., SEED FARMERS, 237 and 238, High Holborn, London, W.C., invite inspection of their extensive and varied collection of Samples of CARTER'S PRIZE MEDAL MANGEL, SWEDE, TURNIP, and other FARM SEEDS, harvested on their own SEED FARMS. On View and Sale during the Show at [STAND No. 396.
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These varieties require no commendation, as they are now well known and highly appreciated.
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Achimenes	Miscellaneous plants
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Azaleas	Ornamental foliage plants
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Chrysanthemums	Petunias
Cinerarias	Phlox
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B. S. WILLIAMS'
NEW and CHOICE FLOWER SEEDS,
Post Free.

	Per packet	s.	d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and	5	0
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and		5	0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &		5	0
BALSAM, Williams' superb strain	1s. 6d. and	2	6
CARNATION, from Prize flowers		1	0
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d., and	3	6
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PANSY, finest Belgian varieties	1s. and	2	6
PANSY, Cliveden Blue, Purple and Yellow	each	1	0
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ZINNIA ELEGANS TAGETIFLORA, flore-pleno		1	0

Victoria and Paradise Nurseries, Upper Holloway, London, N.

NEW GERANIUM, BRONZE QUEEN (Sheppard).

We have had several opportunities of seeing this GERANIUM in growth, and believe it to be one of the most effective of its class for out-door display. The zone is very distinctly marked on a bright bronzy yellow ground, and the habit all that could be desired.

Plants are now ready, 3s. 6d. each.

OSBORN AND SONS, FULHAM NURSERY, LONDON, S.W.

Our PLANT CATALOGUE for this season may now be had on application.

BENJAMIN S. WILLIAMS'
GENERAL AND NEW PLANT CATALOGUE FOR 1870,

Contains LISTS of select ORCHIDS (many being now in flower), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS (both of which are extensively grown, and many fine specimens are now in full beauty), CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

B. S. WILLIAMS respectfully invites inspection of his numerous Collection of Plants, which at all times well repay a visit, but at this particular season are specially interesting.

CONSERVATORIES FURNISHED ON REASONABLE TERMS.

Choice Plants supplied for Balls or Dinner-table Decoration.

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Economic and Effective Gardening.

CARTER'S COLLECTIONS
OF
BEDDING and other PLANTS,
FOR THE
SUMMER DECORATION OF THE FLOWER GARDEN,

Are now ready for delivery.

These Collections are made up in the most liberal manner, and will produce a permanent and effective display.

Carter's "Battersea Park" Collections of Bedding Plants.

50 Plants, 15s. | 120 Plants, 30s. | No charge for packing.

Carter's "Crystal Palace" Collections of Bedding Plants.

60 Plants, 17s. 6d. | 120 Plants, 30s.
No charge for packing.

CARTER'S
"Own" Collections of Bedding Plants.

80 Plants, 15s. | 158 Plants, 30s. | 296 Plants, 60s.
No charge for packing.

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"Surplus" Collections of Bedding Plants.

72 Plants, 15s. | 96 Plants, 17s. 6d. | 144 Plants, 25s.
No charge for packing.

CARTER'S
NEW and CHOICE PLANTS for 1870.

GOLDEN TRICOLOR GERANIUMS.

PRINCE of WALES (CARTER).—Undoubtedly the finest tricolor ever offered, of most vigorous habit, and intensely brilliant colours. Price 63s. each. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, June 19, 1867. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Horticultural Society of London, July 7, 1868. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, May 27, 1868.

EDITH STUART (CARTER).—A free-growing variety, with flat salver-shaped leaves, zone bright vermilion, with a light yellow margin. Price 21s. each. First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

PRINCESS of WALES (CARTER).—A variety similar to Prince of Wales, but more brilliant in colour, and smaller leaves. Price 21s. 6d. each. First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

SULTAN ABDUL AZIZ (CARTER).—A splendid dark tricolor, very distinct in character and free in habit, leaves of great substance and particularly round, zone a dark scarlet, light golden margin. Price 21s. each. First Prize, May 22, Royal Horticultural Society. Special Certificate, April 20, 1870, Royal Horticultural Society.
The set of the foregoing four varieties, £5 5s.

DR. WALLACE (CARTER).—A free-growing variety, leaves flat and of good form, deep coloured zone of carmine, intermixed with chocolate. Price 5s. each.

MARIAN MORRIS (CARTER).—A variety after the style of Goliah, and equally free in growth, but with brighter colours. A good bedder. Each 21s.

MRS. MULLER (CARTER).—A neat compact-growing variety, zone light carmine, blotched with chocolate, margin creamy yellow. Each 5s.

BALLYMENA (CARTER).—A most desirable variety for bedding purposes, and very distinct in character; zone very dark chocolate and rosy purple. Each 5s. Special Certificate, April 20, 1870, Royal Horticultural Society.
The set of the foregoing four varieties for 30s.

SILVER TRICOLOR GERANIUM.

CINDERELLA (CARTER).—Deep pink zone, silver margin, free bloomer. Each 5s.

GOLDEN SELF GERANIUM.

CARRIE FOWLER (CARTER).—Seedling from Crystal Palace Gem, a beautiful bright golden colour, compact in habit; an excellent bedding variety. Each 5s. Royal Horticultural Society, May 22, 1869.—Prize for best Golden-Leaved Geranium, Carrie Fowler.

For full descriptions and particulars of
CARTER'S COLLECTIONS
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BEDDING and OTHER PLANTS,
SEE
CARTER'S ILLUSTRATED
PLANT CATALOGUE for 1870.

JAMES CARTER AND CO.,
237 and 238, HIGH HOLBORN, LONDON, W.C.

NOW SENDING OUT,

NEW ROSE, PRINCESS CHRISTIAN.

ONE SPECIAL, AND FOUR FIRST-CLASS CERTIFICATES.

"One of the grandest Roses in cultivation."—*Journal of Horticulture.*
"A good Rose for exhibition, and a grand Rose for the garden."—*The Field.*

Price 10s. 6d. each.

NEW PELARGONIUM, WALTHAM BRIDE.

A SILVER-EDGED WHITE FLOWERED BEDDING SORT.

TWO FIRST-CLASS CERTIFICATES.

"Waltham Bride may be considered amongst the very best."—P. GRIEVE, *in Journal of Horticulture.*

Price 10s. 6d. each.

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ROYAL BOTANIC SOCIETY.

FIRST SUMMER EXHIBITION, MAY 25 and 26.

AWARDS OF PRIZES.

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Messrs. J. & C. Lee, Hammersmith, for Group of Stove and Greenhouse Plants, arranged for effect.

MEDIUM GOLD MEDAL.

Messrs. A. Henderson & Co., Pine Apple Nursery, for a Group of Stove and Greenhouse Plants, arranged for effect.
Mr. S. M. Carson, Gr. to W. G. Farmer, Esq., Nonsuch Park, for 6 Azaleas.
Mr. Charles Turner, Royal Nurseries, Slough, for 10 Roses in pots.
Messrs. Paul & Son, Cheshunt, for 10 Roses in pots.
Mr. B. S. Williams, Holloway, for 6 Azaleas.

GOLD MEDAL.

Mr. T. Burnett, Gr. to A. Terry, Esq., Fulham, for 8 Exotic Orchids.
Mr. G. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., for 6 Azaleas.
Mr. Charles Turner, Royal Nurseries, Slough, for 6 Azaleas.
Mr. J. Ward, Gr. to F. G. Wilkins, Esq., Leyton, Essex, for 9 Pelargoniums.
Messrs. Dobson & Son, Isleworth, for 9 Pelargoniums.
Messrs. Rollisson & Son, Tooting, for Group of Stove and Greenhouse Plants.
Messrs. E. G. Henderson & Son, for Group of Bedding Plants, arranged for effect.

LARGE SILVER-GILT MEDAL.

Messrs. Jackson & Son, Kingston, for 20 Greenhouse Plants.
Mr. J. Ward, Gr., Leyton, Essex, for 8 Cape Heaths.
Mr. J. Ward, Gr., Leyton, Essex, for 8 Exotic Orchids.
Mr. B. S. Williams, Holloway, for 6 Exotic Orchids.
Messrs. Lane & Son, Great Berkhampstead, for 12 Rhododendrons.
Mr. Wilkie, Gr., Oak Lodge, Kensington, for 6 Azaleas.
Mr. John Little, Gr. to J. Goddard, Esq., Roydon Lodge, Essex, for 12 Azaleas.
Mr. Thomas Terry, Gr. to A. G. Puller, Esq., Youngsbury, Herts, for 6 Roses in pots.
Mr. Charles Turner, for 20 Roses in pots.
Mr. D. Windsor, Gr. to J. R. Ravenshill, Esq., Leytonstone, for 9 Pelargoniums.
Mr. Charles Turner, for 9 Pelargoniums.
Mr. T. S. Ware, Tottenham, for Group of Bedding Plants, arranged for effect.
Mr. G. Wheeler, for a Collection of Foliage and Flowering Plants.

LARGE SILVER MEDAL.

Messrs. Jackson & Son, Kingston, for 8 Cape Heaths.
Mr. Wright, Gr. to C. H. Crompton Roberts, Esq., Avenue Road, Regent's Park, for 3 Stove and Greenhouse Plants.
Mr. Wilkie, for 12 Rhododendrons.
Mr. Ransley Tanton, Epsom, for 6 Azaleas.
Messrs. Lane & Son, for 12 Azaleas.
Mr. Thomas Godfrey, Gr. to J. Anderson, Esq., Ankerwycke, Wraysbury, for 6 Roses in pots.
Mr. C. Turner, for 3 Azaleas.
Mr. Robert Parker, Exotic Nursery, Tooting, for Collection of Hardy Herbaceous Plants in pots.
Mr. James Weir, Gr. to Mrs. Hodgson, Hampstead, for 9 Pelargoniums.

SILVER-GILT MEDAL.

Mr. J. Wheeler, Gr. to J. Philpott, Esq., Stamford Hill, for 8 Cape Heaths.
Mr. J. Ward, Gr., Leyton, Essex, for 12 Cape Heaths.
Messrs. Jackson & Son, for 12 Cape Heaths.
Mr. Isaac Hill, Gr., Poles, Ware, Herts, for 8 Exotic Orchids.
Mr. H. Eckford, Gr. to Earl Radnor, Coleshill, for 8 Exotic Orchids.
Mr. Robert Parker, Tooting, for 6 Exotic Orchids.
Mr. J. Carr, Gr. to P. Hinds, Esq., Byfleet Lodge, Weybridge, for 3 Stove and Greenhouse Plants.
Mr. B. S. Williams, Holloway, for 3 Stove and Greenhouse Plants.
Mr. G. Fairbairn, Gr. to the Duke of Northumberland, Syon House, for Specimen Orchid.
Mr. Isaac Hill, Poles, Ware, Herts, for 3 Exotic Ferns.
Mr. B. S. Williams, Holloway, for Pair of Tree Ferns.
Mr. G. Fairbairn, Gr. to the Duke of Northumberland, for Pair of Palms.
Messrs. H. Lane & Son, for 2 Specimen Rhododendron.
Mr. G. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., for 12 Azaleas
Mr. Wilkie, Gr., Oak Lodge, Kensington, for 3 Azaleas.
Mr. T. S. Ware, Tottenham, for 24 Hardy Herbaceous Plants.
Mr. T. S. Ware, Tottenham, for 12 Liliaceous Plants in bloom
Mr. J. James, Gr. to W. F. Watson, Esq., Isleworth, for 12 Cinerarias.
Mr. Charles Turner, for 20 Pelargoniums.
Mr. D. Windsor, Gr. to J. R. Ravenshill, Esq., for Specimen Pelargoniums.
Messrs. Paul & Son, for Collection of Roses in pots.

SILVER MEDAL.

Mr. Wright, Gr. to C. H. Crompton Roberts, Esq., for 12 Cape Heaths.
Mr. William Bull, Chelsea, for 20 Exotic Orchids.
Mr. J. Wheeler, Gr. to J. Philpott, Esq., for 3 Stove and Greenhouse Plants.
Messrs. Jackson & Son, Kingston, for 3 Stove and Greenhouse Plants.
Mr. William Bull, Chelsea, for Specimen Orchid.
Mr. J. Carr, Gr. to P. Hinds, Esq., Byfleet Lodge, for 3 Exotic Ferns.
Messrs. Rollisson & Son, Tooting, for a Pair of Tree Ferns.
Mr. Wright, Gr. to C. H. Crompton Roberts, Esq., for Pair of Palms.
Mr. Wilkie, Gr., Oak Lodge, Kensington, for Specimen Rhododendron.
Mr. J. James, Gr. to W. F. Watson, Esq., for 6 Roses in pots.

SILVER MEDAL.

Mr. Wright, for 20 Pelargoniums.
Mr. J. Ward, for Specimen Pelargonium.
Messrs. Paul & Son, for Collection of Cut Roses.

SMALL SILVER MEDAL.

Mr. Douglas, Gr. to Sir S. H. Waterlow, for Specimen Orchid.
Mr. Wright, for Specimen Orchid.
Mr. G. Wheeler, for 3 Exotic Ferns.
Mr. G. Fairbairn, for 12 Cinerarias.
Mr. G. Fairbairn, for Collection of Calceolarias.
Messrs. Dobson & Son, for Specimen Pelargonium.
Messrs. Lane & Son, for Collection of Rhododendrons.
Mr. Wilkie, for a Collection of Caladiums.

CERTIFICATE.

Mr. T. S. Ware, Tottenham, for Collection of Hardy Cut Flowers.

BOTANICAL CERTIFICATES OF MERIT.

FIRST CLASS.

Mr. William Bull, Chelsea, for Dracontium elatum.
Mr. William Bull, Chelsea, for Ceratozamia Kusteriana.
Mr. William Bull, Chelsea, for Verschaffeltia princhatus.
Mr. William Bull, Chelsea, for Dracæna pulchella.
Mr. William Bull, Chelsea, for Encephalartos nobilis.
Mr. William Bull, Chelsea, for Encephalartos saguarinus.
Mr. William Bull, Chelsea, for Encephalartos dentatus.
Mr. William Bull, Chelsea, for Dioonium rzipsoppos.
Mr. William Bull, Chelsea, for Areca nobilis.
Mr. William Bull, Chelsea, for Cupressus Lawsoniana erecta viridis.
Mr. William Bull, Chelsea, for Deckenia nobilis.
Mr. William Bull, Chelsea, for Welfia regia.
Mr. William Bull, Chelsea, for Thrinax havanensis.
Mr. William Bull, Chelsea, for Encephalartos mirabilis.
Mr. William Bull, Chelsea, for Ptychosperma Alexandræ.
Mr. William Bull, Chelsea, for Genoma elegans.
Mr. William Bull, Chelsea, for Chamædorea spectabilis.
Mr. William Bull, Chelsea, for Macadamia ternifolia.
Mr. William Bull, Chelsea, for Piper futokadsura.
Mr. William Bull, Chelsea, for Dorstenia argentata.
Mr. William Bull, Chelsea, for Geonoma gracilis.
Mr. William Bull, Chelsea, for Licuala peltata.
Mr. William Bull, Chelsea, for Geonoma lacerata.
Mr. William Bull, Chelsea, for Daemonorops plumosus.
Mr. William Bull, Chelsea, for Encephalartos expansus.
Mr. William Bull, Chelsea, for Ptychosperma Regina.
Mr. William Bull, Chelsea, for Pandanus dubius fimbata.
Mr. B. S. Williams, Holloway, for Agave Verschaffeltii glauca.
Mr. B. S. Williams, Holloway, for Calamus ciliaris.
Mr. B. S. Williams, Holloway, for Thrinax grandis.
Mr. B. S. Williams, Holloway, for Nidularium Scheremetieffii.
Mr. B. S. Williams, Holloway, for Daemonorops plumosus.
Mr. B. S. Williams, Holloway, for Thrinax grandis.
Mr. B. S. Williams, Holloway, for Lomaria gibba crispa.
Mr. B. S. Williams, Holloway, for Cochliostema Jacobianum.
Mr. B. S. Williams, Holloway, for Welfia regia
Mr. B. S. Williams, Holloway, for Tillandsia Lindeni.
Messrs. Veitch & Sons, Chelsea, for Dieffenbachia Bowmanni
Messrs. Veitch & Sons, Chelsea, for Adiantum Veitchii.
Messrs. Veitch & Sons, Chelsea, for Carludovica rotundifolia.
Messrs. Veitch & Sons, Chelsea, for Deckenia nobilis.
Messrs. Veitch & Sons, Chelsea, for Euterpe sylvestris.
Messrs. Veitch & Sons, Chelsea, for Picea araucana.
Messrs. Veitch & Sons, Chelsea, for Geonoma pumila.
Messrs. Veitch & Sons, Chelsea, for Oncospermum Van Houtteanum.
Messrs. Veitch & Sons, Chelsea, for Rhapis humilis.
Messrs. Veitch & Sons, Chelsea, for Epidendrum syringothyrsus.
Messrs. Veitch & Sons, Chelsea, for Nidularium Carolinæ.
Messrs. Veitch & Sons, Chelsea, for Phormium Colensoi.
Messrs. Veitch & Sons, Chelsea, for Araucaria Bidwillii.
Messrs. Veitch & Sons, Chelsea, for Seaforthia Veitchii
Messrs. Veitch & Sons, Chelsea, for Geonoma imperialis
Mr. John H. Ley, Croydon, for Adiantum excisum Leyi.
Mr. John H. Ley, Croydon, for Adiantum decorum.
Mr. John H. Ley, Croydon, for Lomaria gibba crispa
Messrs. A. Henderson & Co., for Zalacca edulis
Messrs. A. Henderson & Co., for Euterpe sylvestris.
Messrs. A. Henderson & Co., for Dorstenia argentata.
Messrs. E. G. Henderson & Son, for Araucaria bidwillii variegata.
Messrs. E. G. Henderson & Son, for Saxifraga lancostana.
Messrs. Rollisson & Son, Tooting, for Plectocoma elongata.
Messrs. Rollisson & Son, Tooting, for Northalsia obusta.
Messrs. Rollisson & Son, Tooting, for Areca nobilis
Messrs. Rollisson & Son, Tooting, for Chamærops gracile.
Mr. Charles Turner, for Azalea Roi d'Hollande
Messrs. Downie, Laird & Laing, for Pelargonium straminea attenuata
Messrs. Rollisson & Son, Tooting, for Ptychosperma Alexandræ
Messrs. John Standish & Co., for Struthiopteris japonica.
Mr. R. Parker, Tooting, for Viola lutea major.

FLORICULTURAL CERTIFICATES OF MERIT.

Messrs. E. G. Henderson & Son, for Hydrangea stellata fl.-pl.
Mr. Charles Turner, for Azalea Madame Van der Cruyssen.
Mr. Charles Turner, for Azalea Roi d'Hollande
Messrs. Downie, Laird & Laing, for Pelargonium Reine Victoria
Messrs. Downie, Laird & Laing, for Pelargonium Earl Rosslyn
Messrs. Downie, Laird & Laing, for Pansy Miss Hope Johnstone
Messrs. Downie, Laird & Laing, for Pansy Pandora.
Mr. Hooper, Vine Nursery, Bath, for Pansy Sunshine
Mr. Hooper, Vine Nursery, Bath, for Pansy Mrs. Felton.
Mr. John Aldred, Kilburn, for Bronze Pelargonium Little Gem.

CHATER'S AGERATUM IMPERIAL DWARF.—The finest bedding plant of the season. Strong, robust growth, not exceeding 6 inches in height, and throws a mass of bloom all through the summer; for second rows in floral designs unsurpassed. See Opinions of the Press, to be had on application.
Price—1 plant, 3s. 6d.; 6, 18s.; 12, 25s.; 24, 40s. Special prices for quantities will be forwarded upon request.
WILLIAM CHATER, Nurseries, Saffron Walden.

NEW FERN, ADIANTUM CAPILLUS-VENERIS MAGNIFICUM, 1870!! & C. 1187.—We have much pleasure in introducing this really useful Greenhouse Fern to public notice, in the firm conviction that it will give satisfaction and become a universal favourite. The fronds are much larger than those of Capillus-Veneris, being from 12 to 15 inches long, by 4 inches broad, curving over the side of the pot. The pinnæ are of a beautiful soft green, and are almost as large as those of A. Farleyense, and like that fine variety they overlap each other in graceful waves of maiden hair, with finely incised and fringed edges. The chief value of A. magnificum is in its hardiness and adaptability to the temperature of a greenhouse, whereas A. Farleyense can only be cultivated by those who possess a stove. To be sent out in June. Price 31s. 6d. each.
JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE:—
For the Two best COLLECTIONS of FRUIT and VEGETABLES, 6 distinct kinds of each, a 1st prize of £7, and a 2d prize of £3.
☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.
The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868, and 1869 excluded from competition. The articles produced to be of the EXHIBITORS' OWN GROWING.

LEICESTERSHIRE HORTICULTURAL SOCIETY.—The GREAT SUMMER EXHIBITION of this Society will be held on the Race Course, Leicester, on TUESDAY and WEDNESDAY, July 5 and 6, when £40 will be offered in Prizes for Cut Roses, and upwards of £50 for Plants in pots.
A SHOW of BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition.
Schedules of Prizes and all particulars may now be had of Market Place, Leicester. WM. PENN COX, Secretary.

LOUGHBOROUGH HORTICULTURAL SOCIETY'S EXHIBITION, JULY 13.
SPECIAL PRIZES FOR ROSES (open to all England).
1st, For the best Collection of 72 Roses (72 varieties), single trusses, 1st Prize, a Cup, or £10 10s.; 2d, £5 5s.; 3d, £2 2s.
2d, For the best Collection of 48 Roses (48 varieties), single trusses, 1st Prize, a Cup, or £5 5s.; 2d, £2 2s.; 3d, £1 1s.
3d, For the best Collection of 36 Roses (36 varieties), single trusses, 1st Prize, a Cup, or £3 3s.; 2d, £1 1s.
SPECIAL PRIZES FOR PLANTS.
For the best 12 Stove or Greenhouse Plants (6 distinct varieties), 6 foliage and 6 in flower (Orchids excluded), 1st Prize, £10; 2d, £6; 3d, £4; 4th, £2.
Full information may be had from WM. PALLETT, Secretary.

Grand Exhibition of Hardy Scarlet Rhododendrons.
ROYAL BOTANIC GARDENS, REGENT'S PARK.
JOHN WATERER AND SONS have great pleasure in announcing that their ANNUAL DISPLAY of the above is NOW ON VIEW at the above Gardens. Cards of Admission are granted by all Fellows of the Society, and by application at the Exhibitors' Gate.
The Rhododendrons at the Nursery are now finely in Bloom.
The American Nursery, Bagshot, Surrey, near Sunningdale Station, South-Western Railway.

The Gardeners' Chronicle

SATURDAY, JUNE 4, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, June 8	Royal Horticultural (Fruit and Floral Committee) Gardens	11 A.M.
	Ditto (Scientific Committee)	1 P.M.
	Ditto (General Meeting)	3 P.M.
SATURDAY, " 11	Crystal Palace (Second Great Show)	

THE show which has just been held in Paris, under the auspices of the Société Centrale et Impériale d'Horticulture, presented some noteworthy features. In the first place it was the GREAT FLOWER SHOW of the year in PARIS—nay, the only one. What would Londoners say to one flower show only during the summer? Of course this is partly to be accounted for by the circumstance that the Paris season ends when the London season is at its height, but more than that, it is one indication amongst many others that our Parisian friends are not so energetic in these matters as their neighbours the Belgians, or as ourselves.

The exhibition was held in the nave of the Palais de l'Industrie, a building, as many of our readers will remember, erected in the Champs Elysées for the Exhibition of 1855. The galleries of this edifice constitute the "salon" wherein are exhibited the pictures of French artists, after the fashion followed in our own Royal Academy. The idea of combining a flower show with the statuary of the "Exposition des Beaux Arts" is a good one—the one should lend grace to the other, but in fact but little benefit resulted from the combination. It is only fair to say that no attempt was made to harmonise the two, unless it be in one instance in the centre of the building, where a fine Fan Palm was borne off (metaphorically) by a group of sea-horses and dolphins' assisted by a tortoise.

The building itself is a very trying one for an exhibition of plants. Its proportions are so vast that the groups of plants would necessarily be dwarfed, much more so when, as was the case, no attempt was made to raise the plants into effective masses. The general plan may be described as a series of narrow raised borders of picturesque outline, and in which the plants were

plunged, so that the pots were not visible a great improvement, so far, over our exhibitions, where sometimes the pots are as obtrusive as the flowers themselves. These borders surround a central sunk grass plot, in which—rare thing in Paris—the grass really is well kept and in good colour.

We may possibly advert to sundry details on another occasion, and will allude now only to certain features of the exhibition in which the contrast with our own shows was the most marked. It will not occasion much surprise to hear that in the matter of Palms a finer display was made in point of numbers and variety than we are accustomed to. Cycads and Tree Ferns were fairly represented, and such a group of Pandanads as we should have a difficulty in matching, so far as number and variety of specimens are concerned. As might have been expected Caladiums were well done, one collection especially; but we are not sure whether to our English eyes the large and brilliant collections of annual and herbaceous plants sent by MM. VILMORIN-ANDRIEUX ET CIE. were not the most extraordinary feature of the exhibition. It was not only the number and immense variety of the plants exhibited, to enumerate which would require a longer catalogue than that of HOMER'S ships, but the admirable way in which they were grouped. The plan of sinking the pots—to which we have already alluded—was of special advantage in this case, and whoever arranged them was a true artist, and made out of a somewhat weedy class of plants as brilliant and effective a bit of colouring as an Indian shawl weaver could produce.

Florists' flowers were very numerous, but with few exceptions of such a nature that our florists would not look at them—Pelargoniums far inferior to our own; Zonal Pelargoniums very indifferent; Tricolors poor in colour and represented by about a dozen plants, or very few more; the Gold and Bronze section scarcely better represented; Calceolarias which would not pass muster in England. The Azaleas, grown as low standards, were very effective, but, as flowers, very indifferent; indeed, the display of these plants at La Muette, and to which we may hereafter allude, was far superior to that in the exhibition. Fancy Pansies were very effective and good, but cannot be judged by our standards; although, singularly enough, they call them English Pansies, they belong to a strain but little known in England, and credited with a foreign origin.

A border of Vinca rosea, grown as dwarf standards, deserves special mention, as we do not often see the plants so grown, and they are remarkably effective. Dwarf Oleanders also are admirable for table decoration. Double Zinnias, of which one collection was shown, were very good indeed, rich in colour, and good in form. Standard Roses in pots are useful to mix in with Palms for the decoration of apartments, &c., but the flowers were indifferent, while as to pot Roses in our sense of the term they were conspicuous by their absence—an indifferently cultivated and badly trained Céline Forestier proving the rule! Of Orchids there were a few, including fine samples of Cypripedium Veitchii and Selenipedium caudatum; but after our own grand fortnightly displays they are not worth mentioning. Double Stocks, such as were here exhibited, would be shown the door in London, or at least sternly frowned at by the judges. On the other hand, a collection of succulent plants was richer and better than anything we are in the habit of seeing in London now-a-days. Fruit and vegetables scarcely merit a notice. Forced fruit was scarcely to be seen, and what there was, save some passable Pines, was not worth much attention. Some of the gigantic Asparagus was exhibited growing almost as thick as the end of an elephant's trunk, and about as well worth eating, in fact it is probable the latter would be preferable. The class of new plants was poorly represented, the best collection coming from M. LINDEN, who sent a small lot, consisting of Dioscorea Eldorado (Hort.), with cordate leaves of a brown velvet-like appearance, prettily marbled with white; Cissus Lindeni (Hort.), also another marbled-leaved climber, not to be named in the same breath with the now universally diffused C. discolor; Ficus Wendlandi (Hort.), a good bold-leaved foliage plant, but of a type not much wanted in our collections.

We forbear now from entering into further details, as we may hereafter again allude to the subject; in the meantime we should be sorry to convey the impression that the exhibition on which we have been commenting was a fair representative of French Horticulture. In other fields, as we shall perhaps have an opportunity of showing, French cultural skill is more remarkable than it would appear to be, to the casual visitor accustomed to the triumphs of British horticulturists.

THE PRUNING KNIFE is a very necessary implement of garden use, but, like other edged tools, it may be used or abused, and work well or not in proportion to its proper direction. The practice of pruning a tree is known to many, the art and mystery of doing so properly only to a few—those who think before they cut, and can say why they cut at all. To cut here, or to cut there, to thin out this branch or shorten that, is easy enough, and may be very necessary processes. But why do we do so? What object do we propose to gain? It may be more or larger flowers or fruit, or it may be more timber, and it is then that the abuse of the knife steps in, and generally does more harm than good. So far as forestry is concerned, the systematic pruning of a quarter of a century or more ago has been abandoned by the most successful timber growers, as has also the system of sowing or planting thick, so that in the struggle for life the strong plants may stamp out the weak ones, and thus gain the desired position. If the rule of planting thick is in some situations indulged in, the counterbalancing practice of thinning early is no less necessary.

Plants, like animals, must have breathing space; they must also have light, as without it it is impossible that those functions of the leaf, the elaboration and fusing of the crude materials of the food, be it collected from the earth by the roots, or the atmosphere by the air, can be so carried out and consolidated as to add to the fabric and stature of the plant. If you want a forest of whip-sticks plant thick, thin not at all, and in a few years you will have trees so thin and attenuated that they depend upon each other for support, and if thinned out are unable to stand alone. This, to borrow a phrase from recent discussions, may be called the restrictive system, and may be carried out just as certainly by continuous pruning and pinching as by thick planting. The effect is in both cases the same, viz., a restriction of the working, wood-forming principles of plant life, first by the natural condition, the supply of light, being insufficient; and secondly, by the unnatural crippling of the plant by the removal of foliage, which, if left to itself, must add materially to the plant bulk. Hence, pruning may be abused, and is abused, as by a systematic method of weekly pinching we reduce a plant to that state of enfeebled existence which might not inappropriately be called half-life.

In stating this much, we do not say that a plant under the artificial conditions of cultivation must be allowed to develop into a branch every bud upon its surface; but we do say if vigorous root action is desiderated, why then every branch and leaf that can be fully exposed to the action of light must be retained and well cared for. Is it a few vigorous and well-placed branches that are required? why, then, to reduce and thin out those that are not required may be good and permissible practice. But there must be method in an operation of that kind. Reckless defoliating will just as certainly paralyse a plant's growth as will the destruction of the roots—one cannot live without the other; and it matters not which may be injured or destroyed, the other suffers in proportion to the amount of injury received.

These remarks may be necessary at this season, especially to those who seek to ascertain the area of foliage necessary to produce a given quantity of fruit; we doubt, however, if it will ever be possible to lay down a rule of that kind, at least not until such time as we can guage the constitutional vigour and vital force of each plant we have to operate upon. Hence the rule of retaining and encouraging every inch of foliage that light, the life of plants, can act upon, is the right one; and if we wish to regularly increase the vigour of our plants, that can only be accomplished by a yearly increase of the respiratory and elaborating organs of the plant, viz., its leaves. Thus it will be seen restriction and perfect development in plant life are antagonistic terms. The exigencies of cultivation may and do enforce restriction, but it is only under such conditions that it is either necessary or commendable.

Apposite to the foregoing conclusions we may mention a fact communicated to us a short time back. One of the first gardeners in England wrote: "I have long been wavering between restriction and extension in plant management, and it was not until to-day that I was convinced that the doctrine of restriction is untenable, and will not hold water. In the flower garden here is a long avenue of Roses, one row of which has had the shoots trained at nearly full length in the pendent manner, while the other has been pruned upon the strictly orthodox manner of close spurring. The trees had been planted at the same time and in the same soil, and about 12 years ago; but in taking them up to make way for more modern kinds, I found those of extended growth had extended roots, and stems as thick as my arm, while the restrictive pruned plants had restricted roots, and stems scarcely large enough for a broom handle. Hence, I say, farewell to restriction, except where necessity enforces it."

Another writer startled us with the abrupt ejaculation, "Did you ever see a Maréchal Niel Rose with a thousand flowers upon it? If you have not, make a pilgrimage to Wollaton Hall." This plant, which is a standard upon the Brier, was planted a dormant bud three years ago last October. It is growing up an iron column about 12 feet high, it then divides, and is trained along a wire 18 feet on each side the column, and nearly 10 feet another way, the blooming branches depending in most graceful festoons, forming a floral gem such as perhaps no other conservatory in England can boast of. Gloire de Dijon, and Climbing Devoniensis, are not less vigorous and beautiful. Now these Roses scarcely know the pruning knife. The most they get of it is to cut away rude growth in the summer, and remove the immature points of the shoots at the winter pruning." We commend the attention of the restrictive advocates to these facts.

—— THE garden corridor at the Crystal Palace, which overlooks the beautiful grounds, and commands a picturesque view of a great portion of the richly wooded county of Surrey, has seldom been utilised for a better purpose than for the display of the magnificent collection of PERPETUAL ROSES which Mr. WILLIAM PAUL, of Waltham Cross, has exhibited there during the past week, to the delight and gratification of thousands. Mr. PAUL has long been known as one of the foremost of the great champion growers, and has well maintained his honour and reputation as a most successful exhibitor. This season, however, he has, so far, declined to compete at our horticultural exhibitions, and instead, has husbanded and concentrated his great resources for the purpose of holding an exhibition of his own with what success will be hereafter gleaned. Entering the "Rose Garden" *pro tem.*, the path on either side was lined with freely blooming zonal and other Pelargoniums, including the new dwarf, and free white-flowered varieties, Waltham Bride and Avalanche, which must prove great acquisitions for bedding purposes. The Roses were principally arranged in one long bank, broken up at intervals, and so arranged that a most pleasing effect was presented. To relieve the excessive amount of colour, Mr. PAUL had judiciously disposed amongst the Roses a number of nicely trained plants of garden Ivies in pots, together with pretty standard specimens of the Acer Negundo variegatum, the Golden Oak, and other pictorial trees. The bank was divided into three divisions, the centre one being edged with a belt of Pyrethrum Golden Feather, whilst those on either side were set off with a margin of Euonymus radicans variegata, alternating with neat specimens of tricolor and zonal Pelargoniums, &c. Amongst the Roses, which comprised most of Mr. PAUL'S best specimens, the following were all that could be desired for size and colour:—Hybrid Perpetuals: Marie Baumann, large and rich in colour; Madame Alfred de Rougemont, fine white; Beauty of Waltham, very fine, large and full; Princess Christian, one of the best peach-coloured Roses in cultivation; Madame Clémence Joigneaux, splendid blooms; John Hopper, good; Comte de Nanteuil, bright rose, very fine; Pierre Notting, a grand Rose, deep and rich in colour; Souvenir de Mons. Boll, very large and good; Sénateur Vaisse, and Général Jacqueminot, old favourites in excellent condition; and Comtesse de Chabrillant, pink, large and beautifully cupped. Of Hybrid Chinas, Charles Lawson, Coup d'Hébé, and Paul Perras, were very fine; whilst amongst Teas, Madame Falcot, Devoniensis, Madame Villermoz, and Madame Pauline Labonte, appeared to be the best. Besides the above were necessarily a great number of well known kinds that cannot be particularised here, as well as many new flowers, which will probably be seen again during the season. Several admirable boxes of cut Roses were also used with good effect, as a margin, and amongst these were two lots of the grand yellow Maréchal Niel, which, to borrow a quotation from "Lothair," were in well "sustained splendour."

—— The BEGONIA BOLIVIENSIS, which is, no doubt, one of the finest of its genus at present known under cultivation, was introduced by the Messrs. VEITCH, of

Chelsea, and attracted much attention at the International Horticultural Exhibition at Paris in 1867 as a new plant. It has been figured and described as being two-flowered, but our attention has been called by Mr. CHARLES GREEN to the fact that it has not hitherto been seen bearing on the entire plant three-flowered panicles. Is this because it has not previously attained sufficient age and vigour to develop its proper character? It is now flowering in the collection of Mr. WILSON SAUNDERS at Hillfield, Reigate, and is, we learn, bearing from the axils of the leaves some 80 flowers or more, the whole in three-flowered panicles. The centre flower of each panicle is the male, and is about 3 inches in length, while the lateral female flowers are about 2 inches long. The plant has a thick fleshy stem, 3 feet 9 inches high, producing several branches. This ornamental plant should be in every collection of warm greenhouse plants.

—— We recently received from our correspondent "T." a couple of fine specimens of the MOLE CRICKET, which we have forwarded to the Horticultural Society for the collection of economic entomology at South Kensington. "T." describes them as burrowing in the ground and eating the roots of Lettuces, and other plants growing in the gardens of Rome, and asks for a notice of the best mode of destroying them. Although occasionally met with in the south of England they are not so common in this country as to do much damage. In France and Italy, however, they are often very destructive, especially to the horticulturist. The growers of bulbs and tubers are always at war with them. Mr. ROBINSON, in his "Parks, Promenades, and Gardens of Paris," gives an interesting account of them; and we cannot better answer "T.'s" inquiries as to the best mode of destroying them, than by quoting Mr. ROBINSON'S description of the plan adopted by M. SOUCHET, the great Gladiolus grower at Fontainebleau (and generally followed by gardeners in France) to get rid of them :—

"When this strong and well-armed little fellow gets into a bed of choice Gladioli, you cannot well dig him out as you could if he happened to be in an open spot. The way he is then killed is as follows :—When the mole cricket goes about he leaves a little loose ridge, like the animal after which he is named; and when his presence is detected in a closely planted bed of Gladiolus, they generally press the ground quite smooth with the foot, so that his track and halting place may be more distinctly seen the next time he moves about. This had been done in the present instance in the case of a young bed of seedlings. We saw his track, and a workman, who brought with him a jar of water and one of common oil, opened a little hole with his finger above the spot where the enemy lay; then he filled it with water twice, and on the top of the water poured a little oil. The water gradually descended, and with it the oil, which, closing up the breathing pores of the mischievous little brute, caused it to begin to suffer from asphyxia, and in about twenty seconds we had the pleasure of seeing it put forth its horns from the water, go back a little when it saw us, but again come forth to die on the surface, hindered for ever from destroying valuable bulbs. Being very strong and well armed, a single mole cricket can do a deal of damage in a bed of Gladiolus; and therefore the moment the workmen of M. SOUCHET see a trace of the pest, they take means to catch it as described, jars of water and oil being always kept at hand."

—— We learn from "Nature" that Mr. SHERWOOD has invented an ingenious method for the SEPARATION of animal FIBRE from vegetable. The process does not alter the colour or structure of the animal fibre, and permits the use of cotton or linen separated from it for numerous purposes. It is sufficient to suspend the goods in an atmosphere of nitrogen or carbonic acid, and to cause the vapour of perfectly dry sulphuric, phosphoric, or hydrochloric acid to enter the room. These fumes disentangle the vegetable fibre, and leave intact the animal—the two fibres can thus be separated and appropriated to their respective uses.

—— Our neighbours the French give great attention to the GRAFTING of TREES, and their fruit attests the fact. One of the difficulties in practice is the keeping of grafts cut some time previously to being used; generally they are placed in the ground in a sheltered situation with a northern aspect, but without considerable care being taken disappointment will often occur. Professional grafters make tours amongst the farmers, and often find the prepared grafts dried up or otherwise injured. To avoid such accidents the following plan has been adopted with excellent results :—The cuttings are first wrapped in rags, in order to prevent the soil from mixing with the scions and attaching itself to their bark, and then the packets are buried in a cold spot, to the north of a wall, at a depth of 8 or 9 inches; and, in order to prevent the scions from being injured when unearthed, a few branches are laid upon them. Scions thus treated, whether cut in autumn or in February, will keep perfectly till the end of April, if not still later, and they have the great advantage over those simply inserted in the ground that the sap does not begin to flow so early. A case may be quoted in which last year's scions, treated as named above, were applied to 50 Apple and Pear stocks which had been drawn before the winter and re-planted from February to March 19; the scions were inserted in simple slits, from April 1 to 13, and not one of them failed to take. The growth of the year ranged from 24 to more than 40 inches. The rule laid down is, that at the time of grafting the sap should be rising in the stock, and about to do so in the scion; if the latter is cut at the moment of grafting it may be more forward than the stock, in which case the graft will fail. By cutting the scions previously the movement of the sap is stopped, and if they are then laid under ground the retardation may be carried to such an extent that they may be applied to stocks already in leaf, which is a great advantage where many graftings are to be made, whereas if the buds of the scions are much developed success is very doubtful.

—— It will be seen from an announcement by Messrs. FAREBROTHER, LYE & WHEELER, in another column (p. 773), that the collection of TROPICAL FRUITS and other rare plants for which the gardens at SYON HOUSE have so long been famous, is to be disposed of by auction on the 22d of the present month. So little attention is paid generally to this interesting class of plants that we can ill afford to lose the Syon collection, and we trust therefore that the present opportunity may be taken advantage of by some one having the necessary convenience to secure and keep up the cultivation of some of the choicer and more remarkable specimens.

—— The SMUT which attacks the ANTHERS of LYCHNIS DIURNA has been extremely prevalent this year, and in consequence we have been enabled to study it more effectually than has been possible to us hitherto. Amongst myriads of plants, we have found a single plant only of the male and female form respectively, in which, while some blossoms were attacked, a few escaped. In most cases every flower was equally affected. In the male plant, and this only in the white-flowered variety, which is quite distinct from Lychnis vespertina, the unaffected flowers were in their normal condition, with scarcely a trace of pistil. In the female plant, though the pistil was partially developed, but in no case, as far as we could find, fertile, the stamens were uniformly developed in the affected flowers, and the anthers filled with the spores of the Ustilago; in the unaffected flowers there were just the same rudiment of stamens as are always visible in unaffected plants, and no further development. It seems perfectly clear, therefore, that when the female plant is traversed by the mycelium of the Fungus there is a tendency to cause the development of the stamens, which takes place at the expense of the pistil, which is much reduced in size. There is not the slightest ground for considering it a reversion, and the true explanation is undoubtedly that which is given in this Journal, 1869, p. 1110:—"The Ustilago penetrates the plant, but as it can only fructify in the stamens, it would appear to be the determining cause of the production of those organs in the normally female flower." We have planted affected female plants, and we shall be very surprised if any of them prove truly hermaphrodite, should they not be attacked by the Fungus. Amongst thousands of unaffected plants we have not found a single one, after a long search, which combines both sexes. *M. J. B.*

—— THISTLES are making their way at the antipodes. A correspondent of the *Otago Daily Times*, who, during one day's journey, met with a few Thistles growing here and there by the wayside, on the next day entered a district in which, for over 40 miles, this acclimatised weed seemed to have fairly taken possession of the land. Now, æsthetically considered, this correspondent observes, a Thistle is a tolerably handsome object, and has an air of independence about it possessed perhaps in an equal degree by no other plant; but there is a place for everything, and no doubt the farmers in this part of the country have every reason to complain of the apathy which allowed the Thistle to become such a nuisance. Spreading from a small point to the north of Hampden, where it is said to have been introduced by a flock of sheep, the Thistle is now to be found all over the valleys of the Shag, Otepopo, and Kakanui, comprising some of the finest agricultural land in the colony; and not only in the valleys, but up to the tops of the hills, not a spur or a gully being without its hundreds. This nuisance has now reached a point at which all the Thistle Prevention Ordinances in the world will fail to prevent its spread. Slowly but surely it will work its way to the southward and westward, until it has overrun the province.

—— The METEOROLOGY of the WEEK ending May 28 was remarkable for the entire absence of RAIN throughout England, whilst in Scotland the falls amounted to nearly four-tenths of an inch at one or two stations. The MAXIMUM TEMPERATURES were 82°.1 at Blackheath, in England, and 75° at Perth, in Scotland; the mean for all stations in the former country was 73°.6, and in the latter 68°.8. The MINIMUM TEMPERATURES were 33° at Hull, in England, and 39° at Perth, in Scotland: the mean for all stations in the former country was 40°.8 and in the latter 41°.6. The MEAN TEMPERATURE of all stations in England was 54°.3, and in Scotland was 52°.1.

ORCHID CULTURE.

BEFORE proceeding further, I wish it to be understood that I do not profess to express an opinion on the best system of the cultivation of Orchids in England. I have had no practical experience, and consequently am incompetent to do so. My intention in these remarks is to give an account of the natural or instinctive habits of these plants in their own country, leaving the amount of "scorching" or "shrivelling" they can be beneficially subjected to artificially in England to be settled by the judgment and intelligence of experienced cultivators.

There is an error in the printing in my former letter, Jougoup being given for "Toungoup," or "Tongoup," a village at the foot of the Arracan mountains, direct west of Prome, on the Irawaddy River. This I wish to correct, as in this locality several, in fact the greater number, of the Orchids sent by me (which proved to be new species) were found.

In my last letter I concluded with drawing attention to Saccolabium ampullaceum as being a plant capable of bearing a considerable amount of dry heat. In the same category, then, I will also place Vanda teretifolia, for these two plants are found in great profusion together. The latter, having a scandent habit, climbs to the top of large trees; from this I am inclined to infer that its shyness in flowering in England arises from immaturity, or, in other words, from not having regained sufficient age and strength after transportation to England. Although this plant bears the same amount of dry heat as Saccolabium ampullaceum, yet it is found on the Andaman Islands, where the climate is analagous to that of the Straits.

Before dismissing the Orchids found on the plains I must mention Dendrobium formosum, for I have never observed it growing at any elevation worthy of notice above the plains, or at any great distance from the sea. On ascending the mountains, more inland, we come across its co-species D. infundibulum, D. eburneum, and D. Jamesianum, which, in my opinion, barely deserve a separate specific name. The favourite habitat for D. formosum is on trees growing on a laterite soil, as Dipterocarpus lævis, and a species of Dillenia. This plant does not seek shady places for growth, in fact, as far as my knowledge goes, few Orchids do, beyond what is given by the trees when in leaf. During the months of February, March, and April, they must be exposed to an atmosphere of 110° Fahr. in the shade. That the fresh-grown pseudobulbs are by this heat reduced in size, or "shrivelled," there can be no question, and in some of the mountain Orchids this reduction takes place to such an extent as to render it doubtful whether they are the same plants when first seen at the end of the rains. Cymbidium tigrinum is a good example of this, for when specimens were brought to me at the end of February I could scarcely identify them as the same plants I had seen growing at the end of November. The pseudobulbs had decreased to at least half their dimensions in this short space of time. Saccolabium giganteum and S. guttatum, Vanda Bensoni, Dendrobium Parishii, D. albo-sanguineum, D. Dalhousianum, D. chrysotoxum, Saccolabium ampullaceum, &c., may, as plants found on the plains, be said to bear a difference of temperature, from 46° F. to 110° or 112° F. in the shade during the cold and hot seasons; and this difference during the month of February would frequently take place in one day.

Enough has, I think been said about the Orchids found on the plains: I will therefore address myself to those inhabiting the mountain ranges to an altitude of from 6000 to 7000 feet above the sea, and to the best of my recollection they may be taken in the following consecutive order of growth, commencing from the plains at an elevation of about 1000 feet :—Dendrobium Bullerianum, Thunia Bensoniæ, Dendrobium infundibulum, Cypripedium villosum, Cymbidium tigrinum, Pleione Reichenbachiana, &c. At the same elevation as Pleione Reichenbachiana, 6500 feet, Dendrobium infundibulum is found, but its character of growth is somewhat modified, the pseudobulbs being compressed or thickened into shorter bulbs, having an almost globose form. At this elevation, then, the thermometer averages in the shade somewhere about 75° in the mid-day, descending to 40°, or even lower, in the mornings at sunrise.

The mountain on which these Orchids are found is about 150 miles from Moulmein, and reached by ascending the Houndrow River, which runs in a southerly direction from the Siam territory. This range of mountains will be observed, by the map, to run nearly north and south on the east side of the Sittang and Salween rivers, forming a vast chain of mountains separating the Shan and other independent States from the British territory on the Moulmein side of British Burmah, forming a vast field for botanical research, the greater part being unknown ground.

The mountain here referred to not being a great distance from the sea becomes subject to a heavy rainfall and moisture from the constant mists from the clouds which frequently envelop it: here then we come to the conclusion that the plants Cymbidium tigrinum, and Pleione Reichenbachiana, will stand a great deal of moisture the greater portion of the year. P. Reichenbachiana was plucked by me in the beginning of December, embedded in moss, from which a goodly supply of water could be squeezed, and the broken or fallen rotten branches of trees were so damp as to render it somewhat difficult for us to kindle our camp fires. On this mountain the dry, or season of rest for the Orchids above named, then, may be taken from December to the middle of March.

I will now close this letter, leaving the Orchids found on and near the Arracan hills to another letter, in which I will conclude the subject, by adding a table

showing the several Orchids named in this communication, with their respective localities, the probable amount of rainfall, the elevation and temperature at which they are found. *R. Benson.*

PALMS.—No. VI.

THE encouraging remarks of Dr. Spruce, at p. 700, about my writings on Palms, shall not be lost upon me. I have long wished to bring out a second English edition of my "Popular History of the Palms" which should be equal to the two German ones in typography and illustration, and superior in completeness; but until recently there was in this country so little taste for foliage plants, that I do not wonder no publisher could be found bold enough to lead rather than follow in the wake of public taste by engaging in such a publication. Now, however, Phyllomania is decidedly in the ascendant; the claims of Palms can no longer be overlooked by us botanists, and I will therefore once more light my lanthorn and look for a publisher; but as I shall probably not be very successful in that attempt, the present papers, sketchy as they must necessarily be, will probably be for a long time the only *résumé* I shall be able to give of the subject.

Wallichia (Roxb.; Harina, Ham.).—Like Caryota, to which it is allied, Wallichia has the peculiarity of flowering only once during the term of its existence, and having leaves the segments of which resemble the fins and tail of a fish. But whilst Caryotas have bipinnatisect leaves, the Wallichias have them merely simply pinnate. The genus was named in honour of N. Wallich, the well-known botanist, and is composed of about a dozen species, all of which form part of the underwood of Indian forests, notably those of Chittagong, Assam, and Darjeeling. They are low spreading Palms, with reed-like, unarmed trunks, sometimes creeping (soboliferous), with pinnatisect leaves furnished with net-like fibres, and wedge-shaped segments, variously erosed, on the upper surface dark green, and on the lower whitish with black dots. The flowers are monœcio-dicœcious, and the berry is somewhat dry, 1—2-seeded, oblong or oblique, of a red or white colour, and containing a caustic juice. One of the most remarkable species as yet brought to light is W. disticha, which Dr. T. Anderson found, with many other fine Palms, in Sikkim, and fully described in the Journ. of Linn. Soc. 1869, p. 6. This Palm, which was cultivated in the Botanic Gardens of Calcutta under the name of Caryota mitis, and which seems to be Griffith's "Wallichsoidea, trunco 3—10-pedali," resembles the well-known Traveller's Tree of Madagascar (Ravenala) in appearance, from the manner in which the leaves are ranged along two opposite sides of the stem. It grows gregariously, but very locally on the steep sandstone declivities of Eastern Sikkim valleys. The Lepchas call it "Katong," and dread touching even its leaves, from the reputed irritability of the plant,—confirmed by Dr. T. Anderson, who suffered from slight urticaria on the hands and face after examining the seeds. W. densiflora, a species with the normal habit of the genus, was introduced, with many other East Indian plants, by Dr. Hooker. W. porphyrocarpa, caryotoides, and myriostigma, are also inmates of our gardens, forming by their peculiar foliage a very distinct feature in Palm collections.

Arenga (Labill.).—Though composed of half-a-dozen species, this genus is rendered famous principally by one, the sugar-yielding A. saccharifera, known in the East Indies by the names of Anao, Sagwire, Gomuti, &c., and long an inmate of our hothouses, where it attracts attention by its robust growth and gigantic foliage. It is largely cultivated in its native country, and is one of the monocarpous Palms which flower only once during the whole term of their existence. The flowers (male and female being generally on distinct spadices) appear first on the top of the tree, and gradually from parts lower down, until the base of the trunk sends forth the last spadix, and announces the death of the plant. The trunk is unarmed, and, like that of the true Sago Palm, yields an edible, farinaceous substance, which, however, disappears after the ripening of the fruit, leaving when the tree dies a tube, which is used for water pipes in irrigation works. The petioles are clad at the base with copious black, rigid fibres, which, having a great power of resisting wet, are used in India and elsewhere for cordage, both domestic and naval, and by some tribes for writing pens and arrows. The gossamer-like substance underneath these fibres is used for caulking ships, and also instead of tinder. The leaves are pinnate, and thee laflets, often 5 feet long, are linear-ensiform, bilobed, or eroso-dentate at the apex; dark green above, and whitish underneath. When young they are eaten, and when fully expanded they serve as thatch. The flower spadices, by a well-known process of tapping, yield "toddy," convertible into an intoxicating drink, sugar, vinegar, or yeast. All the species delight in shady forests and the neighbourhood of rivulets; and one of them, which I have named A. Griffithii, may possibly prove hardy in the milder parts of England, as it grows on the mountains of the Irawaddy, in the company of Campanulas and Horse Chestnuts. A. obtusifolia is enumerated in several nurserymen's catalogues.

Caryota (Linn.).—Caryota is among Palms as singular for the form of its leaves, as is Salisburia among Conifers. Not only are the leaves bipinnate, but their ultimate divisions have the shape of the fins and tail of a fish—features so peculiar, that by means of it Caryota may be distinguished from all the other genera of the order. C. urens is the best known species, it being one of the most productive of sugar and starch-yielding Palms. It is cultivated in many parts of the East Indies and the Archipelago. According to Dr. T. Anderson it is found in Sikkim at a height of 4400 feet above the sea level, where the temperature of the air is often as low as 40° Fahr. I noticed several trees in the factory gardens of Canton, where occasional night frosts, and even a thin layer of ice on the pools, is no uncommon occurrence. But though the tree may and does thrive under these conditions, it grows best in the warmer parts of Asia, where it is much cultivated for its sugar, which can be produced at one-fourth or even one-sixth of the price of the cheapest made from Sugar-cane. All Caryotas, as all Arengas, flower but once during the term of their existence; and the spadices are developed in exactly the same manner, first at the top, and last at the very foot of the trunk. The spadices are large, and their spikes often hang down in bundles, somewhat like the tail of a horse, bearing monœcious flowers, the males having an indefinite number of stamens. The berries are red, 1-seeded, and sour. The Royal Gardens at Kew and other establishments can boast of some noble specimens of Caryotas, and most of the species described, viz., C. Cumingii, purpuracea, sobolifera, propinqua, maxima, urens, and others.

FIG. 146.

Bentinckia (Berry; Keplera, Endl. non Meisn.).—The type of this genus is the Condapanna of the Telinga language, B. Condapanna, which has of late years been introduced to Europe, and is a Cane Palm, about 20 feet high, with pinnated leaves, scarlet male and lilac or violet female flowers, and egg-shaped berries of purple colour. The second species of the genus, B. Renda, Mart., of Sumatra, is apparently not yet in our collections.

Geonoma (Willd.).—We are indebted to Dr. Spruce for a recent revision (Linn. Soc. Journ. xi., p. 98) of these humble but graceful American Palms, which often grow beneath the shade of the Mauritias, Attaleas and other lofty Palms, bearing about the same relation to them as the Hazels of our European woods do to the Oaks and other cupuliferous trees. The stems usually reach a height of from 6—10 feet, rarely 15 feet, their thickness being that of an ordinary walking-cane, or sometimes no greater than that of a swan's quill; and their smooth polished straw-coloured cuticle is marked with closely set rings. A few species are stemless. The stems vary in leafiness even in the same species, and the older the plants get the fewer leaves they have. The leaves are, in some species, scarcely a foot long, in others they reach 6 feet or more; and their blades are either entire or more or less pinnately divided, of a pleasant pale green colour, and (in some species) of a pinkish or bronzy hue when unfolding. The flowers are monœcious, one female being seated between two males, the latter bearing six stamens. The fruit is a small dry berry, of globose or oval shape, rarely exceeding half an inch and sometimes not more than 1 line in length. The stems of some species are converted into walking-canes, the fruit of others is edible, and those with entire leaves are used as thatch. Dr. Spruce praises in the latter respect the "swallow-tailed" kinds, that is, the species with entire bifid leaves, but my own experience is just the reverse. In the Chontales Mountains, where we could not get the fine thick leaves of the Coryphas and Sabals, of which in other parts of America such fine roofs are made, we were obliged to resort for thatching to a variety of Genoma Martiana, which is grown in gardens under the name of G. Seemanni, because introduced by me. But though such a thatch looked remarkably neat when first put up, it turned quite white on exposure, shrivelled up during the dry season, was apt to work out by the action of the wind, proved very leaky when the rains set in, and lasted scarcely longer than two seasons. Such a temporary roof was found to be about three times as expensive as the best galvanised iron roofing imported from England. Nothing is more suitable for roofs in the tropics than Palms, if the proper ones can be obtained; their coolness is something delightful; but Geonomas are, in my opinion, not the proper Palms for the purpose. Considering that about 80 species of this genus are now known, and that all of them are by their manageable size and fine foliage specially to be recommended to cultivators, it is strange that as yet only about a dozen species are found in our gardens.

Calyptronoma (Griseb. Fl. West Ind., p. 518).—This genus is founded upon the old Elaëis occidentalis of Swartz, a West Indian unarmed Palm, 50 or 60 feet high, with pinnated leaves, and linear bifid leaflets. Resembling Euterpe in habit, but approaching Calyptrogyne in its technical characters, it differs from the latter in habit, in the infundibular, exserted, staminal tube, the sagittate anthers, the structure of the female flowers, the divided spadix, and the basilar two-valved spathe. We only know as yet one species, C. Swartzii, Griesb. (Geonoma, Kth.), which grows on low hills of Jamaica and Cuba, and seems to have been also a native of Barbados, before that island was turned into a vast Sugar-cane field.

Welfia (Wendl. in Regel Gartenflora, 1870).—Two elegant unarmed Palms, distinguished by their simple bilobed leaves, of fine bronze colour on unfolding, compose this genus. It bears the family name of the last King of Hanover (Welf or Guelph), and is closely allied to Geonoma, from which it differs by its large number of stamens (36—42) and staminodia (18), as well as its branched raphe. One of the species, W. Georgii, grows in Costa Rica, the other, W. regia, in New Grenada. The latter, which Mr. Bull has allowed us to figure (fig. 146), is more frequently to be found in gardens than the former, and is perhaps the finest of the two. If I mistake not, it was distributed some years ago from Kew, under the name of Œnocarpus bolivianus, the seeds having been sent home by Purdie; but it is only quite recently that the plant has become more generally cultivated in our gardens.

Calyptrogyne (Wendl. Bot. Zeitung, 1859, p. 72).—Two species, C. spicigera, Wendl. (Geonoma spicigera, C. Koch, Wochenschrift, 1858, p. 244), from Guatemala, and C. Ghiesbreghtiana, Wendl. (Geonoma Ghiesbreghtiana) from Chiapas, and a doubtful garden species, which is sold under the name of C. elata, are the members of this genus. They occur in forests as underwood, and have the habit of Geonoma, from which they differ in several technical characters; but may be distinguished off-hand by their two spathes, one of which drops off the moment the flowers begin to open. The flowers are monœcious, the males having six stamens, and the females a three-celled ovary, of which two become abortive.

Iguanura (Blum. ; Slakia, Griff. Palms of British India).—The typical species of this genus, I. geonomæformis (Slakia geonomæformis, Griffith), of Malacca, was one of the Palms introduced to our gardens by the Prussian expedition to Eastern Asia, whilst I. remotiflora, of Borneo, and I. leucocarpa, of Sumatra, seem still to be desiderata in our collections. All the species are Cane Palms, with pinnatisect leaves and cuneate leaf-segments ; the spadix, which is simple, emerges from the axils of the leaves, and bears polygamo-monœcious flowers. There are 6—9 stamens, a 3-celled ovary, and a fleshy 1-seeded drupe.

Calyptrocalyx (Blum.).—Amboina and other islands of the Moluccas are the native country of C. spicatus, a stately Palm, which attains 20 to 40 feet in height, and has pinnated leaves with reduplicate leaflets, polygamo-monœcious flowers, arranged in long spike-like spadices, and orange-coloured 1-seeded drupes. The wood is used for timber, and the seeds serve as a substitute for Betel-nuts. I have not found it in any of our garden catalogues.

Manicaria (Gærtn.).—Until Grisebach and Wendland pointed out (Fl. West. Ind. Islands) that the West Indian representative of this genus was a distinct species, which they named M. Plukenetii (because the fruit was first figured in Plukenet's "Phytographia," tab. 323, fig. 3), botanists believed that there was only one species of the genus, viz., M. saccifera, of Gærtner, so named because the spathe taken off the tree entire forms bags and caps used by the South American natives. The principal difference between the two species is that the leaves of M. Plukenetii are obovate bilobed (with an angle of 40° at the point), inciso-dentate towards the apex and pinnatisect towards the base, whilst in M. saccifera they are oblong, entire, almost truncate at the apex, and their teeth are equal to those of the upper part of the leaf. These Palms have been not inaptly compared to Plantains, on account of their leaves, which make excellent thatch. They have unarmed and arboreous trunks, with axillary spadices, numerous stamens, a 3-celled ovary, a dry echinate verrucose fruit, and even albumen. They abound in rivers, and the seeds are frequently carried about by the tides. M. saccifera, perhaps also M. Plukenetii, is an inmate of our gardens. *Berthold Seemann.*

HERBACEOUS PLANTS.

Waldsteinia fragarioides (Tratt.).—This is one of the gayest of spring flowers, and a favourite with all who know it, but unfortunately it mostly bears the name of a weedy simple-leaved relative, W. geoides (Willd.). The leaf in the present, and only horticulturally-valuable species of the genus, is compound, consisting of three roughly toothed, or sometimes lobed leaflets. Each scape bears several blossoms, which are of a bright yellow colour, and half an inch across. A drawing of this as Dalibarda fragarioides is given in the "Botanical Magazine," but the petals have hardly received justice, being rendered much too narrow. The stems are creeping, and root readily from the under side as they advance, so that propagation is an easy matter. The soil should be a rich loam, and the situation any part of a rock-work, or front of a border. It ought to be mentioned that this flourishes under trees quite as well as anywhere else, and is, therefore, all the more valuable on that account. It is a native of North America.

Erinus alpinus (L.).—A delightful little herbaceous alpine, which is a native of many parts of Europe. It is not rare in our gardens, but should be excessively common, for anything more delicately beautiful than a mass of it in full flower is seldom realised. When the small hairy stems are about 4 inches high the flowers begin to appear, one in the axil of each leaf, and a display is kept up for a month or more. The corolla is composed of five petals, the spreading but unequal limbs of which are of a rose or purple colour. Care is taken to ensure complete self-fertilisation. There are two races of this plant. One has hairy leaves and a robust habit, whilst the other is slender, and has glabrous leaves. Though almost regardless of exposure and position, yet this is rather particular about the kind and state of the earth in which it is to grow. Loam never permitted to become absolutely dry meets every immediate want, but where permanence is aimed at, an occasional top-dressing of some vegetable mould ought to be given. Readily multiplied by seed sown when ripe, or by parting early in autumn. The flowers begin to expand about the beginning of summer.

Coptis trifolia (Salisb.).—A short time ago the Rev. H. Harpur-Crewe wondered where this, amongst other good old things, had gone to, but that gentleman will now have the pleasure of knowing that this little gem still lives in our gardens. Indeed, it grows larger in this country than it does in its native North American bogs. The leaves are shining evergreen, and each one consists of three leaflets. The scape is one-flowered, and about 6 inches long. The flowers are large for the size of the plant, white, produced plentifully, and expand in spring. I have known this to thrive both in loam and peat. In the former it is stouter, and much more disposed to blossom than in the latter. It cannot bear extreme drought, and, like the Dodecatheons, is fitted for the margin of a Rhododendron bed, or, indeed, any position having the appropriate conditions. It is increased by parting in autumn, and by seed sown when ripe. *John Duncan.*

FIG GROSSE MONSTRUEUSE DE LIPARI.

[We borrow this paper and illustration fig 147 from our monthly contemporary, the "Florist and Pomologist." Eds.]

As an early, free-fruiting, useful variety, this Fig merits attention, and is well worthy of cultivation. In its general appearance it resembles, in many respects, the good old Brown Turkey, differing, however, in the more turbinate, flattened shape of the fruit, and in its habit of growth, which is more stubby ; it is, moreover, a better producer of the first crop. In this last respect it is of sterling merit, and one of the most satisfactory varieties in existence. It is essentially a "first-bearing" variety, and but rarely produces a second crop. It is well known that some varieties of Figs are apt to cast their fruit much more readily than others, through some defect in the setting. This the Grosse Monstrueuse de Lipari very rarely does, so that almost every fruit which is formed—and they are formed in abundance—comes to perfection ; and this, too, under very adverse treatment, as I have frequently proved. The fruits ripen about the same time as those of the Brown Turkey, and the plants require much about the same treatment.

Fig. 147.

Fruit, medium-sized, roundish-turbinate, much flattened at the apex. Skin, light brown or chestnut-coloured, shading off to dark, and with dark-coloured ribs, and occasionally dark spots throughout, the whole being covered with a thick bloom. Neck very short. Eye large, almost closed. Flesh dull red, thick and juicy, very pleasantly, although not richly flavoured. Habit of plant robust, and very prolific. Early, suitable for cultivation on the open wall.

This variety comes from France, and is yet comparatively unknown in this country. The accompanying figure is taken from a fruit in the collection of the Royal Horticultural Society. *A. F. Barron, Chiswick.*

EARLY SPRING BEDDING FLOWERS.

THAT somewhat modern feature of gardening, "spring bedding," has met with a rather severe check during the past inclement winter. Even so far south at this, the mischief and damage done to hardy plants has been very great, and the autumn growths of many of the earliest and most useful bedders have either been entirely destroyed, or so much injured as to greatly impair their usefulness for the present spring ; whilst the later blooming section of flowering plants, such as the Silenes, Limnanthus, Myosotis sylvatica, Iberis sempervirens, Saxifraga granulata, Cheiranthus Marshallii, and a few others, were so behindhand, that they scarcely reached the full development of their beauty ere it was time to rout them out to make way for their more gorgeous, but certainly not more pleasing, successors. But it will be little to our credit if we are not able to cull from the record of disasters that have befell the spring flower garden, some few useful lessons, and such an addition to our experience as shall make us better able to surmount these difficulties should they again present themselves.

If we do but ascertain what varieties of flowering plants are at once the earliest, hardiest, and most effective, a winter's severity and a spring's partial failure will not have come upon us in vain. It is scarcely correct to designate a blaze of bloom during the month of May "spring flower gardening," neither is it the highest or most enjoyable development of it. The humblest cottager, with the aid of a few packets of seed, may get that with much ease ; but to begin early in March, with a gradual expansion of flower, that increases in extent and variety with the progress of the month, and makes all April a veritable month of bloom and beauty, calls forth something more than mere labour—it requires much searching for the right plants, much forethought in their preparation, and such capacity for arrangement as shall result in having the successional flowers so dispersed as to have some in all directions, until the whole of the decorative material shall arrive at its best.

To secure this it is not desirable to mass together the very earliest of the flowering plants ; patches of these placed in sheltered nooks, or on warm borders, where they may flower and pass away, will not be missed if there are other patches to succeed them : but beds of them, leaving after blooming a long interval before the summer filling up, would be a mistake, and create a void that would sadly mar the whole arrangement. As a rule it is best to fill the beds with plants that will flower altogether, and that will have performed their blooming functions by the beginning of May. There is one drawback, however, to an effective display of bedding in the earlier months of spring that is not existent later on, and that is, the small choice of colours at the disposal of the gardener, as these are then chiefly limited to three—namely, white, blue, and yellow. Early blooming reds are scarce ; the prettiest of these is the rosy pink double Hepatica, but that is too early for beds and far too difficult of cultivation to be generally used. The later bedding system finds in the Silenes and Saponaria great aid in producing shades of red ; but I fear the use of red annuals or biennials in the earlier months will not avail unless we can secure that very great desideratum, a bright red dwarf Wallflower that will bloom early and come true from seed. Perhaps one of the most useful early reds that we have now is the mottled double Daisy ; although even these are exceptionally late this year, owing no doubt to the severe wintry weather. Where the pocket will admit of it, however, bulbs will supply an abundance of this bright colour, especially in the Hyacinth and Tulip ; and the bright scarlet Anemone will yield a richness of colour that the gaudy Pelargonium cannot excel.

If bulbs are used for bedding a much greater effect and a far more pleasing variety can be produced where the beds are carpeted with plants the flowers of which produce a striking contrast to those of the Tulips, Hyacinths, or whatever bulbs may be used. Tulips afford the brightest contrast in this respect, but Hyacinths also will be greatly improved. If, for instance, a bed of scarlet Van Thol, Vermillon Brillant, or General Garibaldi Tulips, had a good carpet of the beautiful golden-tipped Sedum acre, or a bed of either Duchess of Parma or Thomas Moore Tulip over the pretty purple Aubrietia græca, the beauty of the Tulips would be greatly added to, whilst the bed itself would become a perfect picture. But bulbs are, after all, a luxury in external gardening that all cannot afford, and are not essential to the production of a really pleasing floral effect where there is an abundance of other material to be obtained. One of the most recent introductions into our flower gardens is the very early and very beautiful Myosotis dissitiflora, celestial blue. This plant is a great acquisition, as it begins blooming at the end of March, and will continue to do so for months. I have found, however, with regard to this plant, that seedlings will flower earlier and stand the

winter better than those raised from cuttings or offshoots: it is a perfect gem for the early spring. Another first-rate plant, with flowers of a blue shade, is the old Cliveden Blue Pansy. This is the earliest to flower of all the Pansies, and although during its earlier blooming period it was, owing to the great amount of sunlight that has prevailed, somewhat deficient in colour, it seems at present to be in no danger of being displaced. The Blue Perfection Viola has not so much "blue" in its colouring, and certainly is not nearly so early to flower. It will prove no doubt to be most valuable as a summer bedder. I think that the Myosotis and the Pansy are the two best early blue bedders that we have. The best and most useful white bedder to match is the old Arabis albida, with its variegated congener; either of these make a fine mass of white, and will match the blues admirably. For taller uses the white Honesty is both early and effective, and for dwarfer purposes the double white Daisy and Primrose. Another capital bedder is the old white Hose-in-Hose—that has a wonderful faculty to flower; and the pretty Phlox Nelsoni looks like patches of snow. Amongst purple or lilac plants, the purple Honesty, Aubrietias purpurea and græca, old plants of Viola cornuta, and Phlox frondosa, will furnish a pleasing variety; and to these I trust soon to see added some early blooming Pansies: but of these more anon.

In yellow flowers there are few so useful or effective as the varieties of Viola lutea grandiflora. I say varieties, because there are a large number of shades of it under this name (some of which show considerable merit, whilst others are worthless), but strong old plants are necessary for early flowering. Another capital yellow which I have met with this year is a dwarf compact Wallflower, that comes very true from seed and has a brightness that closely resembles the Cheiranthus Marshallii, and looks like the result of a cross between that and a common yellow Wallflower: it has been in bloom all through April. A splendid plant for yellow colouring is the Pyrethrum Golden Feather. I have never seen it in better foliage than it has been with me this past month, and I have proved also how exceedingly hardy is its constitution, as some hundreds of it have had to pass the winter in the open field; these were sown in the open ground in May last, but owing to the drought they made but little growth until the autumn, when they were planted out: small plants with only a few leaves were killed, but those that were from 3 to 4 inches in diameter came out of the severe trial unscathed.

Amongst other early blooming plants that should be found in every garden, a beautiful gem is the single crimson Primrose; this is truly a winter bloomer, as in sheltered places strong plants of it will commence flowering in November, and continue to do so in open weather up to the end of April. The form of this flower is excellent, and it has a bright lemon eye; the plants flower profusely, and are quite hardy. Like all the Primula race, however, it has more to fear from heat than cold. A good strain of the golden-edged Polyanthus affords some pretty and exceedingly pleasing bunches of flowers; indeed, the different varieties of "spring flowers," as the country people about here call all the Polyanthus tribe, must always rank amongst the best of early border flowers. Another favourite that is by no means common is the old Magpie Pansy. This variety always blooms early and abundantly, and its somewhat grotesque flowers make it, either in beds or patches, a very distinctive object. I saw this spring in flower for the first time some patches of the Saxifraga oppositifolia major, with flowers of rosy red. It opens very early, and is a capital companion plant to the variegated Sedum.

Of variegated foliaged plants for the spring there is no lack, but they cannot be treated of here. Suffice it to say that, with a careful selection, and with a season not too severe, it is possible to have in the spring flower garden foliage as well as flower in great variety. None, however, are more useful or effective than the two already mentioned in this paper. Judging by the improvement that has been effected in the first few years in the bedding Violas, it seems not unlikely that to them ultimately we shall have to look forward for supplying the place now occupied by the bedding Pansies. The best of these latter for early blooming I have already mentioned, and the Cliveden Yellow has not been surpassed for summer work, except by the Violas. But the bulk of the so-called bedding Pansies have blooms too large in size, and few of them are sufficiently distinctive in colour. The blue is not true to its name, and the yellow has a dark blotch; and as for a good white, that has not yet been sent out. Plenty of creamy whites have seen the day, but not good pure colours; and, excepting the old Magpie, to these three colours we have in bedding Pansies hitherto been restricted. I perhaps should have mentioned that Imperial Blue has a rich colour, but its habit, I fear, is scarcely what is desired for a good bedder.

I have recently seen some promising kinds growing that have a good variety of self-colour in them, and the flowers of which are not more than half the size of ordinary Pansy blooms; they are not yet sufficiently advanced to speak to their blooming qualities, but a pure white and a rich purple, if they flower freely, will be sure to prove acquisitions, and it is not improbable that the rich clarets and maroon, found amongst the Belgian Pansies, may also add in time to the beauty of our spring flower gardens. I have in this sketch but skimmed the surface of the subject, but I pass its practical application upon all possessing gardens, as affording an abundance of rich delight. *A. D., South-[illegible]*.

Home Correspondence.

The Fungus Question.—Mr. Gardiner has not very dexterously changed his front in the battle on this question. But I suppose I must not complain, as it has almost brought him round to my side, although he either does not, or will not, see it. Our argument commenced with the wonderful adventures of his Picea Pinsapo. In his description of its ailments he attributed all the blame to an attack of Fungus, caused by the tree having been planted over the roots of pre-existing trees, and in a soil containing bits of stick. We all remember how the old philosophers used to reason. Instead of observing facts, and then deducing theories, Mr. Gardiner appears to have acted upon their plan. Having got his pleasant theory into shape, he proceeded to try to find the facts to bear it out. But alas! his search was vain; no roots or bits of stick would turn up. So he rather shabbily deserted his old friend the Picea, and pays his addresses to some Peach trees. These have not had half such wonderful adventures as the other; but they are said to be "incontrovertible instances" of Fungus as a source of decay. Mr. Gardiner's history of these "instances" may be fairly summed up as follows:—1st, The trees were planted in a layer of decayed leaves; 2d, drought set in, which, 3d, so much debilitated the trees as to predispose them to disease, and also, 4th, developed Fungus in the decayed leaves; and 5th, the Fungus attacked the predisposed tree roots. I may in support of my fourth clause call attention to what Mr. Gardiner says (p. 349) about a certain state of dryness being one of the "chief elements necessary to the development of Fungus." But what a change is here. In the case of the Picea he wrote as if Fungus was not merely the leading symptom of the final stage of the disease, but the primary cause of the disease also (the *fons et origo*). Now the Fungus is treated almost as shabbily as the poor Picea, and is actually deposed from the front rank to the fifth and last. Is he going to desert it also? But where did Mr. Gardiner get his opinion about a certain state of dryness being necessary for the creation and development of Fungus? This theory, Mr. Gardiner ingeniously says, is analagous to mine. It is perfectly so; and had Mr. Gardiner beheld his own face in a glass and compared the reflection, he could have found no better analogy. (See my letter on Fungus, p. 247). Another correspondent, writing from Wales, agrees with me that no danger from Fungus arises from decaying roots, when left in the ground, or from fallen branches. The gist of his argument is, that we need only fear bits of stick when left in earth mechanically made up for certain purposes. Differing from Mr. Gardiner and myself, this philosophic correspondent appears to overlook the fact that drought has anything to do with it. Mr. Berkeley, again, argues quite the contrary to the teachings of his Welsh disciple; for, at a meeting of the Royal Horticultural Society (see p. 387), we find the eminent mycologist speaking in the following manner:—"As an instance to prove that the dead roots of trees are injurious, Mr. Berkeley mentioned that some years ago two Deodars were planted near the residence of the late Sir W. Hooker, at Kew, one of which was placed where a Cherry tree had formerly stood. This one became unhealthy, and it was not until the soil had been thoroughly cleared of the bits of dead wood that the tree grew," &c. Who would think of planting a tree in a hole dug in a root-bound surface? This, together with the late Marquis of Huntley's observations, "that there was no use in making a new plantation on ground which had been cleared of timber until that ground had been covered over with Heath [Furze]," &c., is loose argument. Do culturists of any pretensions ever think of either sowing or planting a piece of ground until every vestige of the previous crop has been removed and the ground again prepared? Really common sense is here altogether lost sight of, and I am compelled to ask this most ludicrous, but not the less appropriate question, Would any old woman think of planting her Greens before she had rid the ground of the old "runts" and "delved the yaird?" The Marquis could afford to wait until the roots on his ground had decayed, but could the old woman? or could the settlers in Canada or any other country afford to wait? The answer is short but expressive, "No." Now I have already stated my opinion that Fungus is contracted in most cases by drought. Drought kills the smaller roots, they mortify, in fact, and the mortification spreads through the dying into the contiguous living tissue. Dead fungoid tissue, to be injurious, must be placed in contact with the living tissue in what I may call an abnormal manner, and in an abnormal place, that is, within the structure of the tissue itself. But placed in contact with it in a normal manner and in the proper place, dead tissue is assimilated and does good. But to argue that dead wood is altogether to be avoided as a manure—that is, as food for plants—is utterly foolish. This fungophobia is the rabid teetotalism of certain gardeners. Because a man with a diseased stomach cannot receive beef and mutton, are we to deny beef and mutton to all? Because, as it is alleged, that trees with diseased roots cannot stand decayed leaves, are we to deny decayed leaves to all?—and decayed leaves, bark, and wood are the beef and mutton of trees. As animal stomachs most easily assimilate animal food, so vegetable roots most easily assimilate vegetable food. Leaves, bark, and bits of stick are the only natural manure. In natural woods what else is there to recuperate the soil. These alone are sufficient, for with these they have been enabled, for thousands upon thousands of years,

"Gaily to bourgeon and broadly to grow."

Don't, therefore, let us be frightened out of the use of Nature's chief restorer by a senseless panic. Rather let us try how best we can keep our tree roots in that healthy state in which they are able to assimilate vegetable manure; and in the word "healthy" is the whole gist of my argument. My favourite vinery had its inside border made up almost entirely of leaves; the leaves were placed there for a certain purpose, and having served their end we set about their removal, when we found the bed—not a "sea of Fungus," but a complete mass of fibrous Vine roots. The removal of the leaves was stayed and—like the buried faggots in the vineyard of M. Cornu, at Champerion—they are now entirely eaten up by the roots of the Vines. Having a terrible dread of drought I water freely—not so many potfuls to a light, but from a 3-inch hose, until the borders almost float like a quagmire, and until we see the water freely running away by the waste drain. Tey late severe seasons of drought—I mean those of 1864, and 1868—taught many a lesson. During those seasons or I should rather say the seasons following, it was easy to observe the ravages drought had made amongst our park and other ornamental timber. Great Britain, notwithstanding its insular position, is subject to occasional severe droughts, sufficiently severe at these times to materially affect its vegetation. In our overdrained and often overgrazed parks, and I may also add our over-dressed shrubberies, what is there to protect trees from the killing effects of these droughts, or even to recuperate them when there is no drought at all? Now it is useless to argue that it is impossible for drought to overtake many plants which are directly under a gardener's care, even when water is at command. I have seen it with myself, and also with others who considered themselves much my superiors in practice. Once let earth become thoroughly indurated, whether in a pot, tub, Vine, or other border, and note the consequences. It is sufficient, however, to abide by such consequences under what I may be allowed to call ordinary circumstances, but under such abnormal circumstances as that described by Mr. Monro, at Colney House (see p. 497), where the Vine border was suspended between heaven and earth, and an unnatural heat applied in the chamber underneath, could any one be sanguine enough to hope for other results than that described by Mr. Monro? To supply the waste by evaporation from both the upper and under surface of such a constructed border, the quantity of water to be poured on must have been something enormous. I remember when at Trentham that Mr. Fleming experimented with a hot-water pipe underneath a narrow Vine border, and the effect of this pipe was so terribly drying that its use was speedily abandoned. "David Tell Fact," with whose letters I am very much pleased, is also evidently under serious suspicion that water is too scrupulously administered to plants which are dependent on gardeners alone for their supply. At an agricultural dinner, I remember hearing Mr. Newdegate tell in a very humorous speech how a farmer during a very dry year got a splendid field of Mangel Wurzel. In answer to Mr. Newdegate's inquiry the farmer simply stated that he turned the river over them! We may not all, like the farmer, have a river so convenient; but my opinion is that Fungus often gets the credit for what really is due simply to the lack of water. It is possible, too, to over-water, but Vines with their roots well at work soon absorb an excess of moisture. Reverse the circumstances, and of which the "splitting of Vines," of which we have heard so much of late, is a proof, and all is disaster and disappointment. *Wm. Miller, Combe Abbey Gardens.*

Fern.—In that highly interesting novel, "Lothair," by the Right. Hon. B. Disraeli, there occurs in the description of an English nobleman's seat the following passage:—"Vauxe stood in a large park, studded with stately trees; here and there an avenue of Spanish Chestnuts, or a grove of Oaks; sometimes a gorsy dell, and sometimes a great spread of antlered Fern, taller than the tallest man." Can you tell me what Fern thereby can be meant? *A. W.* [Pteris aquilina, we suppose. EDS.]

Stokehole Management.—This is a subject of so much importance to the horticultural world, that I am surprised that your editorial article, at p. 491, has not called forth the opinions of others versed in the subject besides Mr. Forsyth. The first hothouses I had to do with were heated by old flues, some of which were rather dilapidated and leaky, requiring some care to get the fires to burn bright, so as to prevent the smoke from passing through into the house. This was best done with a shovelful of fire, and a little dry wood to make a blaze, so as to drive the damp out of the flue, and by feeding the fire behind the flame a good clear fire was secured. This same plan of making a fire holds good to the present time, where the fire is supplied with fuel at the furnace door, and not, as Mr.

Forsyth happily puts it, from a "hole in the floor." In that case the fire is made very much the same as I have described, only on a far better plan, viz., put a little straw and wood in the centre of the furnace, light it, and shut the furnace door, and add coke or coal at the opening above; in doing so the fuel will naturally fall down all round the kindling material, allowing the flame to rise from the centre of the heap, which will consume its own smoke, on the same principle as the fire in the old flue. Waste in the stokehole is so identified with the kind of boiler in use, that it is impossible to discuss the matter further without their assistance. I have had the management of a variety of boilers, viz., saddle, conical, retort, cannon, Burbidge & Healy's, and Cottam & Allen's, all of them good in their way, and like the flue efficient in keeping out frost. In addition to patience and perseverance they also require a considerable amount of care. In attending to the firing of such boilers as I have just mentioned, the wonder is that the waste is not more than it is. They require to be often looked at, the clinkers often drawn out and fresh fuel added, and all the time the stoker has to be in front of a strong fire, surrounded by hot clinkers. This is stoking under difficulties, and can it be wondered at if some of the fuel should get mixed with the ashes and clinkers? I have had no experience with the thin plate firebars, but all the other solid firebars I have ever seen in use soon get deformed, warping and twisting about like so many snakes in the furnace, requiring often to be replaced by others if much fire is wanted. We do not pretend to anything like the extent of piping as that heated for Mr. Mendel by Messrs. Weeks & Co.'s upright tubular boiler, but what we have (the same description of boiler) works well, with ease and comfort to the stoker, and at a profit to the owner compared to what it was when a dozen boilers were in use. We have had the above-mentioned boilers in constant use for three years, and there has been no trouble either in making a good fire, or fear of being scorched or suffocated; and the firebars being hollow tubes, with the return water almost cold, there is no danger of their warping, neither do the clinkers adhere to them as they do when the firebars are solid. We never clinker the fires but once in the 24 hours, and that is arranged so that it is done when the fire is about to be started afresh, and, as a matter of course, there is little fire in the furnace to inconvenience anyone, and the clinkers are no sooner drawn out, and the fire gathered together, than the stoker ascends to the floor above to put in the fuel. I like the damper in the chimney, and consider it of great use when the fire is at a red heat, to prevent the heat escaping up the chimney; closing the furnace only will not prevent it. I quite agree with you as to the excellent qualities of the Silvester sliding doors; those supplied by Messrs. Weeks are very similar, entirely shutting off the draught, and when they are open they are not in the way like doors on hinges. It sounds very nice to talk about a day fireman and a watchman to attend to them at night, but it is but a very few places where such an arrangement can be carried out. And indeed where the one-boiler system is in operation it is unnecessary; all that is required is some one to clean up the stokehole in the morning and attend to the supply of fuel. It is much better that the man who will be responsible for the safety of the hothouses at night should attend to the starting of the fires in the afternoon, for I have found that the houses are often either rather hot or a little too cold just between the day and the night management: and this is much more likely to occur when two people have to do with the fires instead of one. *George Thomson, Stansted Park, Sussex.*

Larch and Spruce Scale Insects.—I have been lately watching the process of egg-laying by the chermes of the Larch and Spruce. It strikes me as curious, and as I am not aware that the points I am about to mention have been hitherto recorded, I venture to bring them under the notice of your readers, although they are few and trifling. Unlike most other insects the process in them is slow. They seem to get on at the rate of five eggs in a day, and there may be observed in the insect an almost constant kind of pumping motion, producing from the inside of the creature a succession of drops of something like turpentine, which remain hardening successively and continuously among the young family. I have not seen an egg actually laid, but from the sudden movement occasionally of one close to the chermes' mother, I think it must then just have happened. The difference in colour shows clearly the difference in age. On the Spruce I was struck also with the singularity of an ordinary chermes sitting amongst ordinary eggs, and another much smaller sitting amongst much smaller eggs, these last (mother and family) all being green, while the ordinary chermes and eggs are purple or purplish brown. Surely, unless it is a different sort, it would be a curious thing to find the creature and the eggs gradually enlarging. *O.* [What do our entomological friends say to this? Eds.]

Purple Laburnum.—The accompanying specimens were cut from a Laburnum tree growing among a group of common Laburnums in this neighbourhood. The yellow and dull-red flowers break out all over the tree, one colour generally predominating on one branch, and the other colour on another branch, while here and there break out tufts of the purple Cytisus, as in one of the twigs sent. Please inform me if this three-flowered Laburnum is common? how it originated, and where it is to be got? The tree in question has no particular history, has not apparently been grafted or "worked" in any way, and was discovered accidentally among the others growing in a wild state. *J. Simpson, Wortley.* [It is the Purple Laburnum, known as Cytisus Adami, which is supposed to have originated in a bud-graft of C. Laburnum and C. purpureus, and in such specimens as these, which are occasionally met with, appears to be reverting to the forms from whence it sprang. Eds.]

—— In Buckingham I recently came across a common yellow Laburnum tree, on which were numerous branches of another description, like the enclosed. I could only trace one graft, and am puzzled to know from what cause this arises. Can you give me any information? *J. W. Heatley.* [The specimen is Cytisus purpureus, tufts of which sometimes break out on the Purple Laburnum. The tree in question was, perhaps, a yellow-flowered seedling with infected blood. Eds.]

Spring Bedding.—It would be desirable, in the interest of spring bedding, if practical gardeners would communicate to you their experience as regards the state of their spring flower gardens, at the close of this somewhat exceptional season. It seems to me that as it is a safe rule to be always prepared for the worst, it should be the constant aim of those who have to make their spring gardens as gay and effective as possible, that they should regard such a season as always to be expected, and so select varieties that have proved themselves well able to withstand the vicissitudes of the past somewhat extra severe and variable winter. Nothing looks worse than patchy and ragged beds, with here and there a plant, and great bare intervals of naked soil; and unfortunately it is very few who can, consistently with other claims, provide the immense stock of Myosotis dissitiflora which Mr. Fish recommends. My experience this last winter tells me that we have more to fear from cold biting winds from whatever quarter, more especially, of course, from the north or east, than from any ordinary amount of frost; and I, like Mr. Fish, am fully determined, if spared, to protect my spring flowers next winter with Spruce boughs thrust in the beds in an oblique direction, so as to offer the most effectual break to wind and frost, but most especially the former. With me—and I am situated in probably one of the bleakest places in the south-eastern part of Ireland—nothing could have done better than the various sorts of bulbs, especially Tulips. They have really been brilliant, but, of course, they were warm and snug beneath the ground during our most severe weather. During the recent stormy weather I have to lament the breaking off of a vast number of the double varieties, especially Rex Rubrorum and Tournesol, whilst the single ones are all but unhurt. I tried tying, but I really believe that it only made matters worse, as they broke off at the ties worse than if they were allowed to bend to the storm; still I cannot see such treasures destroyed without another trial or two, and I have an idea that something in the way of support would be far preferable, such as strongish branches placed amongst them, which, whilst not actually holding them fast, would still materially support them. Silene pendula is splendid, not a leaf is injured; whilst Nemophila insignis, which was round it as an edging, has all but entirely perished. On the other hand, Saponaria calabrica has proved very tender, and is a partial failure, whilst the various Aubrietias which border it are most effective. All the varieties of the Myosotis have done indifferently; but Daisies, which are an edging to them, have stood moderately well. Stocks are all killed; the double Wallflower is perfection, Viola cornuta and Viola lutea are but middling. The golden Saxifrage is good. Nothing in its way could beat the Cliveden Blue Pansy, but the yellow has suffered severely. Both Arabis albida and albida variegata are untouched, so is the golden variegated Periwinkle. Auriculas have been very good, also Hepaticas; the Czar Violet has escaped well and was grand, whilst the common Russian ones have lost all their foliage, though they are growing freely now. Polyanthuses were very good, and Stachys lanata is perfectly hardy; Cheiranthus Marshallii is good, and Alyssum saxatile, though it suffered a little, soon regained its vigour, and is now one mass of bloom. I shall look anxiously for more information on this subject, as I doubt not that many of us have bare places in our beds which we would rather not see, and grievous failures which we shall remember and try to avoid in years to come. *Kalmia.*

Hardy Penstemons.—Allow me to offer a few comments on the article headed as above in p. 562. P. digitalis, "with large copper-coloured foliage and immense white flowers, streaked with crimson," must be something out of the common way of the species. In the United States, to which it is indigenous, and in cultivation here, the foliage is light green, and the flowers attractive indeed, but by no means "immense," being little over an inch in length, and either pure white or slightly pink-coloured. P. grandiflorus is not "a native of Mexico," but of the plains on the Missouri River, &c., as far north as lat. 40°; rarely exceeds 2 or 3 feet in height; and its foliage, "very similar in appearance to P. Murrayanum," indeed far from being "of a deep glossy green colour," is exceedingly pale and glaucous. The large flowers are showy, but with us by no means "deep purplish blue." P. Mackayanus is only the old P. pubescens. *A. G.*

The Royal Horticultural Society.—A Fellow of this Society recently complained of the need of "Moses' Rod" at South Kensington, because a drinking fountain in course of construction was not finished in time for his visit with the juvenile members of his family. Now, as holes are so readily picked in the shortcomings—supposed or otherwise—of the officials of public bodies is it not just that equal publicity of their shrewdness should also be given to non-*habitués*? Hence I ask space to say how much I was pleased to see a "case of living plants" fixed in a conspicuous part of the South Kensington station of the Metropolitan District Railway, attached to which is a suitable advertisement respecting the Society's gardens in that neighbourhood. Surely this is a move in the right direction, and will be duly appreciated by all who take an interest in the well-being of these gardens. *W. E.* [A most appropriate and unexceptionable form of advertising, which we have ourselves noticed with much satisfaction. Eds.]

Cherry trees not bearing Fruit.—On taking charge of these gardens, two years ago, I found a large Cherry tree (the name of which I do not know), which, for the last 25 years (so says my informant, who has been on the place nearly 40) never bore more than from one to two dozen fruit at the most in a year. Last year it was one mass of bloom, and, being against a wall, I had no difficulty in protecting it with glass, which I did, leaving both ends open. With the assistance of the camel-hair brush I carefully distributed the pollen, but still only the usual quantity set. Now, being in favour of the extension system of pruning Vines, I was induced to try it with Cherries, and therefore left the whole of the breast wood to grow as it liked; strange to say, this season it has set a fine crop of fruit, to the great delight of my noble employer. *R. Gilbert, Burghley.*

Encephalartos villosus, &c.—When looking round the new and rare plants exhibited at the Royal Botanic Gardens, Regent's Park, on the 26th inst., I was surprised to find in the collection of Mr. W. Bull, Encephalartos villosus (Lehm.), with five different names (viz., giganteus, mirabilis, expansus, dentatus, and nobilis, the latter without fronds), yet any botanist must have seen on examination that the whole were one and the same species. The villose stem is so very marked a character, that any one pretending to a knowledge of these plants cannot fail to notice it. On looking at the cards appended, I was astonished to see that a First-class Certificate had been awarded to each—five certificates for one species! and that named incorrectly! What are certificates for? I thought they were awarded for distinct, or new plants; but here we have five plants of the same species, in different stages of development, each receiving one. Purchasers have a right to expect a plant which is certified as distinct, to be so, but if this is a specimen of the value of First-class Certificates, we shall soon begin to say it is *nil*. As for the merit of the plant in question, there can be but one opinion—that it deserves a First-class Certificate, but why give it five? It can't be to make it sell, as it is too rare ever to hang on the hands of any one, and so very elegant that one has only to see it to raise a wish to possess it as an ornament to any conservatory. If the judges had a superabundance of certificates to dispose of, why not have given them to the other deserving objects that were passed over, although of equal merit? I may add that I have seen several plants of the above Encephalartos imported, and not one could be said to be exactly equal in its growth to another; but the same general character can be seen on examination, and we have a right to expect the judges to examine before they give their awards. Any importer of plants knows that in five or six years these plants will take up their characters, to the astonishment of the innocent possessors, and will proclaim that they are brethren all. *J. Croucher, Royal Gardens, Kew, May* 28. [There is some room for difference of opinion on this question, as we may be able to show hereafter. Our correspondent alludes to other deserving plants which were passed over. Is he certain these were not subjects already certificated, and therefore ineligible? Eds.]

Mimetic Plants.—I observe a letter at p. 700, on the subject of mimetic plants, made so interesting by Mr. W. W. Saunders' recent exhibition of this class of curiosities. Your correspondent does not seem to be aware of the existence of a little work upon the subject, recently published by me, namely "Echoes in Plant and Flower Life," by Mr. Leo Grindon. This work contains a vast number of instances of the general proposition; and, though not professing to be a scientific treatise, nor, indeed, anything more than an enumeration of facts, dealt with in a popular manner, is worth the attention of all who value the inquiry. *Frederick Pitman, 20, Paternoster Row, May* 25. [Mr. Grindon's book was noticed by us at p. 843, 1869. Eds.]

Myosotis dissitiflora.—I cannot agree with your correspondents who think this plant less hardy than M. sylvatica. If the old plants are divided for transplanting, many of them will damp off in the winter and spring months, but if a small patch is planted every autumn, far away from any other variety, and the seed

carefully saved, the seedlings will not only prove true but will also withstand the wet and frost quite as well as the different varieties of sylvatica, and they will likewise blossom more profusely than divided plants. I have adopted this plan for four years, and have not lost more than a score of plants out of several thousands, even during the last winter, which has been particularly destructive to spring plants generally. *Thomas Challis, Wilton.*

—— I beg to endorse all that Mr. Fish has to say about Myosotis dissitiflora. I was induced to buy a packet of seed, and I am happy to say that it quite agrees with Mr. Fish's description. I have M. dissitiflora edged with Limnanthes Douglasii, and I must confess that I never saw anything to equal it, both for compactness of growth and profuseness of bloom. I beg to thank Mr. Fish for bringing its merits before the gardening world. *S. Wraight, The Gardens, Newland, Sittingbourne.*

Amaryllis Johnsoni.—I have only one bulb of this plant large enough to bloom. Last year I sent you an account of the number of times which it bloomed, which, together with your remarks, will be found at p. 1233, 1869. The plant has at present three blooms on it, each 8 inches in diameter. The height of the flower-stalk is 2 feet 3 inches. *Robert Stokoe, Gr. to H. C. Marshall, Esq., Westwood Hall, Leeds.*

Early Strawberries.—The letter of Mr. Hague at p. 701 has taken us in this part (Kent) by surprise. In the North, not many years ago, and not many miles from Rotherham, the beginning of July was the usual time to gather Strawberries. I have a memorandum of the first lot of Keens' Seedling being gathered on the 22d of that month. On the very day (May 5) that your correspondent was enjoying the pleasure of picking ripe Strawberries, we in Kent and in other parts of the South were bewailing the loss of every flower that was expanded, by the destructive energy of frost. Such an instance as that given by your correspondent is worthy of record; but I should like to know what was his motive in thus giving it publicity? Was it to show us that the occurrence was unusual in his garden or in the neighbourhood? or does he desire to impress on our minds that the above variety is a month or two earlier than any other sort? Or perhaps he has some peculiar treatment tending to this precocity. I have looked over many acres of Strawberries in this district, and from what I have mentioned as having occurred on May 5 you will not be surprised when I state that the fruit is only just showing itself. The earliest date of which I have any memorandum of the Black Prince variety being ripe in this garden is May 29. Last year, which was not a late season, it was first gathered on June 13. *W. P. R., Holwood, Kent.*

Saxifraga granulata fl.-pl. is exceedingly attractive at this season of the year, and should be grown by every one who appreciates spring flowers. It requires a damp, shady situation, where it rapidly increases, and soon forms a very attractive object. The flowers are large, very double, and of a pure white colour, and are produced upon stalks from 4 to 6 inches in height. The typical species, although common in some parts of this country, is well worth growing, the flowers are very large and numerous. Both this and the double variety die down soon after flowering, and thus make room for other plants near. *A. I. P., Tottenham.*

Black Beetles and Peaches.—Can any of your readers tell me of a certain cure for black beetles. Following the advice given me in the *Gardeners' Chronicle*, I glazed in a wall 80 feet long, covered with six Peaches and five Nectarines. The result, as far as fruit goes, is most satisfactory, but I find the beetles are attacking the fruit at night time, and more especially the Nectarines. This is very annoying. There is no doubt they come from the furnace of the Stephanotis-house, which adjoins the Peach-house. *R. C. T., Brixton.* [Do you mean cockroaches? If so, Chase's Beetle Poison, perseveringly used, will clear them. Or do you mean weevils? EDS.]

The Purple or Brown Beech.—I have just been reminded, by the transplanting of some seedlings from under a grafted tree, *i. e.*, the purple-leaved grafted on the green-leaved variety, of a question asked by one of your readers some few years ago, which, if my memory serves me correctly, amounted to this:—Are seedlings from trees, grafted in the above manner, constant in colour? I beg leave to say, in answer to that question, and for the information of those who still have doubts on the matter, that some seedlings found here under the same trees about six or seven years ago, are still quite equal in colour to the grafted trees from which they were raised. From the size to which they have grown—about 8 feet high, with branches from 4 to 6 feet long—I think sufficient evidence has been obtained to prove that the colouring is really permanent. This is a fact worthy of notice, and one, perhaps, of as much interest to the nurseryman and the planter, as it must be to the physiologist. *Henry Mills, Enys, Penryn.*

Phlox stolonifera is now a dense mass of flower, and is certainly one of the best alpine Phloxes. It requires no care in its cultivation, for it creeps steadily over the ground, rooting as it goes, and soon forms a complete carpet of soft green foliage, which is smothered with purplish rose-coloured flowers from the middle of April to the end of May. These are produced upon stems about 4 inches in height, and generally number from five to eight flowers upon each. It frequently flowers again in the autumn, but not so freely as in the spring, and I have seen flowers at intervals during the whole of the summer. P. subulata var. frondosa is very distinct in character from the one just mentioned. It forms large cushions of moss-like foliage, of a bright green colour, which is now completely hidden by its flowers. It grows very rapidly, and good plants planted now will form tufts at least a foot across, and from 6 to 8 inches in height. The flowers are of a bright rose colour, with a conspicuous dark eye; these are produced close to the foliage, and in innumerable quantities. P. Nelsoni is another beautiful variety, and a charming companion for either of those mentioned. It is supposed by some to be a variety of subulata, but I am inclined to think it is a near relation of P. nivalis. It grows very freely in light sandy soil, but is subject to injury from drought. I find large stones placed close to the plant of great service, for they help the soil to retain the moisture, which is very essential to many plants of this character, and there are many more of these alpine plants which will not grow without this assistance. The flowers of this variety are of a pure white colour, and I think, if possible, are produced in greater profusion than in any other of this class. *A. I. P., Tottenham.*

Queen Emma Melon.—The late Mr. Dwerrihouse claimed the honour of being the raiser of this variety, during the period of his head-gardenership for Lord Eversley, at Heckfield. *Jos. Forsyth Johnson, Curator, Royal Botanic Gardens, Belfast.*

French Nurserymen's Catalogues.—A custom is beginning among the French nurserymen, and I think the seedsmen also, of issuing their catalogues in English, and charging the prices of the articles in English money. For example, trees that are charged 1 franc in the French editions of their catalogues, are charged 1*s.* in the English editions, and everything in the same proportion, so that their English customers are charged exactly 20 per cent. more than the French. Why this should be I am at a loss to understand. Is it because they have a doubt as to our knowing what the value of a franc is, and that we should not be able to compute an account made out in francs? If it is, they are mistaken, for we know that 100 francs are equal to £4, and that 100 shillings are equal to £5. Why then are we to be charged £5 for what a Frenchman is charged £4? This sort of trading may be honest, but it is not just, and rather suggests a covert form of extortion insidiously presented to the English purchaser. I have been caught once this way, but I shall take care I shall not be caught again. I could mention the names of the nurserymen, but I shall forbear for the present. *A Greenhorn.*

The Aucuba.—I am induced, by the remarks of Mr. Masters, at p. 701, to state the method which I have adopted to obtain berries on large plants of the female variety. It is that of grafting bits of the male kind all over the female bush. This practice ensures the distribution of the pollen, in a manner which can hardly be expected from planting dwarf plants of the male kind alongside. *H. Mills, Enys, Penryn.*

Foreign Correspondence.

CORSICA.—I have recently returned from a very pleasant and successful expedition to this island, and I am glad to say that the plants I collected are, on the whole, in very fair order. I was much struck with several points of contrast between the flora of the island and the continent, especially in the extreme abundance of individuals of species which do not occur at all, or are found but very sparingly, on the mainland. Pancratium illyricum was most abundant, and is a grand plant, just coming into flower. It is not a shore plant, as alleged by Woods. I found it nowhere on the coast, but in mountain pastures up to 3000 feet above the sea. Helleborus lividus is another most conspicuous plant, forming quite a feature in the landscape. It is in the style of H. fœtidus, which it seems to replace: H. fœtidus is abundant about Nice and Mentone, but I did not see it in the island.

Of Euphorbias, eight or nine species were in great abundance. Some of them were new to me, but E. dendroides, which is so conspicuous about Nice, is, I think, absent. Statice pubescens, the species so common on the neighbouring continental coast, I could not find, it seems to be replaced by another species (duriuscula, or one closely allied). Crocus versicolor I found in extraordinary profusion, commencing at about 2300 feet, and extending up to the snow line. Cyclamen europæum was to be seen everywhere. Lilium candidum I found above Bastea, but I am not satisfied that it is indigenous; also another species (probably pomponium), which is truly wild in the higher woods. There were also Sedum corsicum, S. dasyphyllum, and an allied species with hairy leaves; also a great flat-leaved annual species allied to S. Cepæa, and another species allied to S. acre. Orchids are very abundant, and I think I collected about ten species, some of them rare. Arum corsicum (? A. pictum), a remarkable looking plant, with heavy thick dark green leaves, and very distinct, was abundant about Ajaccio, but I did not see it on the east side of the central range. The only other species I saw were A. italicum and A. Arisarum.

Bulbous plants were in great abundance as regards the number of individuals of each species. I found two species of Romulea, one with dark purple flowers; Allium neapolitanum, A. triquetrum, and A. subhirsutum (I think), besides the common species; also Colchicum montanum, and two species of Scilla new to me; an Ornithogalum allied to umbellatum, but larger and more diffuse; also several species of Muscari. Of Ferns I found Nothochlæna Marantæ in the greatest profusion, also N. lanuginosa near Ajaccio, but of the latter only a few specimens. Cheilanthes odora is very common; Asplenium acutum, common and very large; also A. lanceolatum, and a few small specimens of A. septentrionale. A. Adiantum-nigrum was nowhere to be seen. The valley of the Restonica, near Corte, is truly magnificent; we ascended it as far as the mules would take us, and I then ascended, *à pied*, one of the ridges subordinate to Monte Rotundo, to the snow line (6000 feet). I was, however, too soon for the alpine districts, as the snow cut me off just as the flora begins to change. I, however, got several good things, including Berberis ætnensis, a most singular-looking, small thorny shrub, with golden-yellow branches; a silvery-leaved Potentilla, an Arenaria, and just at the highest point I reached acres of a stony-growing Androsace, not distinguishable in its present state.

I got up to the watershed between Monte Rotundo and Monte Cinto, and obtained a magnificent view over the greater part of the island, with the sea visible at several points; but the beauty of the scene scarcely made up for the disappointment of having to leave "under the snow" nearly the whole of the alpine region of from 6000 to 9000 feet. I must try and revisit it some day six weeks later, as in June the mountain is nearly clear of snow. I found one or two species of Dianthus not in flower, also several alpine Silenes, and one very pretty annual species, on the coast, which I have never seen before; and near Ajaccio I found for the first time Arenaria balearica.

The altered rocks on the east side of the island are exceedingly interesting,—alternations of gneiss marble, serpentine, and conglomerate, with a tolerably uniform strike north and south, suddenly terminating against the great mass of granite on the west side of the island, just to the west of Corte.

I think the neighbourhood of Bastea is the best botanical district, as you get a considerable range of altitude in its immediate neighbourhood. The town is not attractive, and the Hôtel de l'Europe is to be avoided. The Hôtel de France, to which we removed, was very comfortable. At Corte, which is a singular little town, the accommodation (Hôtel de l'Europe) is all that can be wished for. Ajaccio is a bright pleasant place, with excellent hotels, but the scenery is not so striking as in the interior. The road across the island, crossing the watershed at nearly 4000 feet, is a wonderful work, equal to anything of the kind in the Alps; and the drive through the Pine forest is unlike anything of the sort I have before seen. The whole thing is on such a scale that it is scarcely possible to realise the size of the trees till you see them fallen and squared into timber. Pinus Laricio and P. halepensis (the latter sparingly) were the only two species I noticed, and I do not remember seeing the Stone Pine, which is so abundant between Nice and Marseilles. The "insular" donkeys are remarkably small, certainly not half the size of the English kind, and I think not a fourth the size of the fine animals you see on the Riviera. They must be a distinct race, of great antiquity. We saw none of the large breed in the island. *Geo. Maw, Benthall Hall, near Broseley, in a letter to Dr. Hooker, C.B., F.R.S.*

Societies.

EDINBURGH BOTANICAL: *April* 14.—Sir Walter Elliot, President, in the chair. The following communications were read:—

1. *On the Flowering and Fruiting of Aucuba japonica.* By Mr. P. S. Robertson. The author had observed that recently-introduced female plants from Japan (grown in a cool pit) came into flower in January and February, while the male plants, grown in the same circumstances, never came into flower till the middle of March. Yet he had every year obtained a crop of young seedlings from the berries, although the female flowers were quite shrivelled before the male ones expanded. He found that the common spotted variety, long grown in this country, does not flower till May or June, although grown in the pit or house with the others, and begins to expand its flowers when the males are getting past; yet it also never fails to produce a crop of fruit with perfect seeds. He thought that the pollen must lodge for some time in the scales of the unopened flower-buds, or must reach the pistils before the flowers are expanded; but how to account for the fertilising of the early flowering varieties he was at a loss. This year he has forced on the flowering of the male plants by placing them in strong heat, and has all the varieties of the male and female plants in full flower at very nearly the same time, and accordingly he anticipates a much larger produce of berries than in former years, when they were left to the ordinary course. He exhibited a branch bearing berries with perfect seed; yet when that plant came into flower, there had not been a male plant in the house where it grew for fully a month previously. Mr. Sadler stated that he had been informed by the

Messrs. Lawson that when there was a great lapse of time between the flowering of male and female Aucuba plants, they frequently collected the pollen and kept it wrapped in paper until such time as the female flowers were ready for fertilisation, when it was applied to the stigmas, and thus secured invariably a crop of fruit with perfect seeds. By grafting the male plant on the female, the two kinds of flowers might expand nearly at the same time.

II. *Remarks on Grimmia pruinosa* (*Wilson's MSS.*). By Mr. William Bell.

III. *Remarks on Boehmeria nivea* (*Urtica nivea of Linnæus*). By Mr. Sadler. Mr. Sadler exhibited raw and prepared fibres of the Boehmeria, as well as articles of dress manufactured from it, and drawings and specimens of the plant. He stated that it was a plant which was attracting a good deal of attention at the present moment, both in this country and abroad, from the fact that the Government had lately offered an award of £5,000 for the invention of a machine capable of separating the fibre from the bark and stem in an inexpensive manner; the working expenses of the prepared fibre not to exceed £15 per ton, and to be of such quality as to realize not less than £50 per ton in the English market. The offer of this premium was issued from the India Office in February last, and one year given to competitors; but he regretted to see it stated in the newspapers about three weeks ago that a gentleman in Bombay had invented a machine such as was required. He thought that the Government ought to contradict such a statement, as he believed that it had had the effect of stopping many intending competitors in their inventions. Mr. Sadler exhibited a scarf manufactured from the fibre of the common Nettle (Urtica dioica), which he described as a fine and soft, but not lasting fibre. The Boehmeria is known as "Rheea," "Ramie," "Ma," or "Chu-ma," "Chinese Grass," and "Chinese Nettle."

IV. *Memorandum on Ipecacuanha*. By Clements R. Markham, Esq.; communicated by Dr. Cleghorn.

V. *Report on the Open-air Vegetation at the Royal Botanic Garden*. By Mr. M'Nab. Since the last meeting of the Botanical Society (March 10), the temperature has been somewhat variable. On nineteen mornings the thermometer has been below the freezing point, the lowest being on the 12th, 13th, 14th, 23d, 27th, and 28th of March, falling respectively to 24°, 25°, 23°, 27, 24°, and 27°, while the six highest temperatures were on the mornings of 16th and 31st March, also 1st, 8th, 12th, and 14th of April, standing respectively at 40°, 40°, 41°, 40°, 47°, and 49°. Having more sunshine during the past month than during the previous markings of this year, vegetation, in consequence, has made considerable progress, although still behind last year, as exemplified by the following register. In the forest and ornamental tree departments the foliage is still very backward, even more so than has been at this date for many years.

	Date of Flowering.	Date of Flowering.
	1870.	1869
Tussilago nivea	March 14	Feb. 26
Symplocarpus fœtidus	,, 18	,, 7
Populus tremula	,, 18	Jan. 21
Nuttallia cerasiformis	,, 20	Feb. 7
Sisyrinchium grandiflorum	,, 23	,, 1
Andromeda floribunda	,, 23	Jan. 17
Narcissus pumilus	,, 24	Feb. 28
Sisyrinchium grandiflorum album	,, 25	,, 20
Scilla bifolia, blue	,, 25	,, 3
Scilla bifolia major	,, 25	,, 21
Narcissus minimus	,, 26	,, 20
Daphne Mezereum	,, 27	Jan. 29
Scilla bifolia alba	,, 27	Feb. 21
Scilla sibirica	,, 28	March 2
Scilla bifolia rubra	,, 28	,, 8
Corydalis cava	,, 28	,, 4
Muscari botryoides	,, 30	Feb. 28
Puschkinia scilloides	April 1	,, 20
Gagea lutea	,, 2	March 5
Erythronium Dens-canis	,, 2	,, 6
Rhododendron Nobleanum	,, 2	Jan. 16
Aubrietia grandiflora	,, 2	Feb. 11
Orobus vernus	,, 3	Jan. 25
Mandragora vernalis	,, 3	March 2
Draba aizoides	,, 4	,, 11
Cydonia japonica	,, 4	Jan. 30
Petteria ramiflora	,, 5	March 28
Ribes sanguineum – first flower seen open on standard plant	,, 6	,, 1
Adonis vernalis	,, 8	,, 18
Muscari botryoides alba	,, 8	,, 5
Mahonia Aquifolium	,, 8	Jan. 30
Hyoscyamus scopolia	,, 9	,, 19
Omphalodes verna	,, 9	,, 19
Symphytum caucasicum	,, 10	,, 10
Hyoscyamus orientalis	,, 11	March 10
Pulsatilla vernalis	,, 11	April 6
Muscari racemosum	,, 12	March 25
Anemone nemorosa	,, 12	April 3
Pulmonaria virginica	,, 12	,, 1
Narcissus moschatus	,, 13	March 16
Carex montana	,, 14	April 1
Primula nivalis	,, 14	,, ,,

VI. *Remarks on the Embryos of the White Water Lily* (*Nymphæa alba*), *and the Date Palm* (*Phœnix dactylifera*). By Professor Dickson.

Miscellaneous Communications. — Professor Balfour communicated a letter which he had received from Dr. Gambleton Daunt, dated San Paulo, Brazil, November 19th, 1869. Mr. Daunt says:—"I enclose you some seeds of the Herva de Lagarto, or Lizard plant, whose leaves the lizard (a large variety) masticates and eats during or after its combats with venomous snakes. The people of the country say that it is an antidote to all serpent poison, and a Saxon apothecary here avers, that when engaged in a natural history commission in the Island of Santa Catharina, by order of the Dresden Government, he was bitten by a serpent, and saved his life by swallowing the juice of the leaves of this plant, and applying the pulp of the leaves to the wound. The seeds should be planted in the greenhouse, not in the hothouse. Senhor Correa de Mello of this place succeeded in rearing a specimen of the (Physostigma) Calabar Ordeal Bean plant, which flowered and then died." A letter was read from Mr. Frere, Roydon Hall, Diss, transmitting specimens of eight different Dogwoods from the Government powder works at Waltham Abbey, for examination. Mr. Sadler stated that he had examined these woods, and found them all to be Rhamnus Frangula. A nurseryman in Edinburgh had lately received a large quantity of the plants of Cornus mascula as the gunpowder Dogwood. He was not aware, however, that the wood of this species was ever used for powder charcoal, and thought that the plants must have been sent by mistake. The wood of Rhamnus was easily distinguished from that of Cornus, from its becoming yellow when moistened, and having coloured medullary rays, and alternate branches.

GLASGOW AND WEST OF SCOTLAND HORTICULTURAL: *May* 25.—The second show of the season took place in the City Hall. The day was excellent, the attendance more numerous than usual, and to the initiated eye, the quality of the objects exhibited was such as not only to command attention, but to elicit admiration. At the shows in the West of Scotland competition frequently occupies but a subordinate part. It is different in London, and even throughout the provinces, and it can only be so in Glasgow, we presume, because of the greater number of gentlemen who prefer keeping their beautiful or interesting plants at home. On this occasion, the collections most worthy of notice were those of the President, Mr. Thomas Coats, of Ferguslie, Paisley, and of Provost Russel of Falkirk. The plants from the latter occupied the post of honour, and beautiful as they were in themselves, as individuals, the setting up of them, for effect, by Mr. Sorley, could not fail to please the artistic eye. In the background was the silver-fronded Fern, Cyathea dealbata, supported on either side by Seaforthia elegans, and flanked with that beautiful Fan Palm, Chamærops Fortunei; these again were relieved by the majestic Australian Dracænas, the pale-green glaucous-fronded Cibotium regale; and, to add life from a colour point of view, two plants of Coprosma Baueri, so handsome, with its green and gold variegation, for cool conservatory decoration. In the centre was the blood-leaved Maple (Acer polymorphum atropurpureum), forming a suitable companion to the handsome Reed Palm, Calamus Getah; and then a multitude of rare Orchids, some of which were worth their weight in gold. Talk of the Tulipomania of days past! It never by odds reached the Orchidomania of the present. Among these varieties we noted the New Grenada Odontoglossum nævium majus, the rare spotted Anguloa Turneri, Cattleya lobata, with its fine veined purple flowers, and the yet more gorgeous C. labiata, with a labellum of so rich a crimson as to defy all art to imitate. Then there were Ladies' Slippers (Cypripedium); Odontoglossum Alexandræ, a plant of modern introduction, winning no end of admirers from the delicacy of its colour and the elegance of its outline; and many other choice things. These were set off by the addition of Maidenhair Ferns in variety, and such a quantity of Sempervivums, Echeverias, and other succulents, in species and variety, as would require more than a passing glance to record. The plants put up by Mr. Dickson (Mr. Coats' gardener) were very meritorious indeed. In number they were less than those already referred to, but there was a great amount of skill apparent in bringing out their respective qualities of foliage and inflorescence. In addition to excellently-grown Palms were some magnificent Orchids, especially Saccolabium guttatum, a noble Cattleya Mossiæ, a brilliant air plant (Aerides affine), the beautiful Primrose-flowered Anguloa, and the charming Dendrobium formosum, whose pure white flowers are prized so much for bridal bouquets. With these were interspersed Heaths, Azaleas, and rare plants of beautiful foliage. Messrs. J. & R. Thyne had rare Palms, choice Ferns, the beautiful white Dracophyllum gracile, and that ornamental Araucaria excelsa that is so suitable for the cold conservatories of country seats. Mr. Bullen sent a very good lot from the Botanic Garden, comprising West Indian plants in variety, for which these gardens are in some degree famous; some curious Orchids, and one or two choice hardy plants.

The principal competing collections were from Mrs. Crum, The Rouken (Mr. Murray, gardener), Mr. A. G. Kidston of Newton House (A. Henderson, gardener), and Mr T. D. Findlay, of Easterhill (W. Boyd, gardener). The first-named collection comprised one of the best bloomed Heaths we ever saw; it took position as the best cultivated plant in the hall, and its name is Victoria—quite a royal flower. Along with it were other Heaths, Everlastings, and a solitary Orchid, all neat, clean, and well set up. The plants from Newton were larger, but some of them lacked that freshness which is a paramount necessity for all exhibition plants. Erica ferruginea major was the best flowered plant we have seen, but a little past its best.

Among novelties were several varieties of Gloxinias from Colonel Buchanan, of Drumpeller (Mr. Lewin, gardener), one fine large shaded violet variety being fortunate enough to obtain a First-class Certificate. Various forms of silver-leaved Pelargoniums came from Mr. P. M'Kenzie, Gordon Street, some of which were Highly Commended, and recommended to be shown again in a more advanced stage. A finely-flowered specimen of Clianthus Dampieri, a beautiful scarlet and black leguminous plant, shown by Mr. Thomas Hill, of Merrylee (Alex. Walker, gardener), obtained special distinction.

Notices of Books.

Les Fleurs de Pleine Terre. (*Hardy Flowers, Annuals, Perennials, and Bulbs.*) 1300 cuts. Paris: Vilmorin-Andrieux et Cie. Pp. 1562.

The two former editions of this work are well known to all flower lovers as constituting a veritable encyclopædia on the subject on which they treat. The present issue is much improved by the addition of more than 1200 woodcuts, which, though small, are in most instances very characteristic. After an introductory chapter, giving the mode of raising, cultivating, and propagating hardy perennials and annuals in general, an alphabetical list of the several genera and species is given, with a detailed description of each species, and the method of cultivation appropriate to it. In many instances a figure is given. The descriptions are clear and accurate, and the selection of species judicious. The second portion of the work is devoted to the various means in which the plants described in the preceding portion may be utilised; thus we have instructions when, where, and how to sow the seeds; select lists of plants suitable for particular situations, borders, beds, shrubberies, ferneries, aquaria, rockeries, subtropical gardens, &c., an enumeration of sweet smelling flowers, of others suitable for bouquets, &c. Garden plans and devices for flower-beds are given, together with indications of the plants to be placed in them. To those who read French we recommend this unpretending volume in all confidence, as the best book of its kind in garden literature. We would, however, suggest to the authors the propriety of issuing future editions in two volumes. The present volume is inconveniently bulky.

—— We have before us the first two parts of the **Villa Gardener**, which, from the variety and general excellence of their contents, may safely be recommended, not only to villa gardeners, but to gardeners of all degrees.——Messrs. W. and A. K. Johnston have recently published the first of a series of **Illustrations of Botany**, and devoted to the conformation and structure of plants. The sheet in question is intended for school use in the same way as an ordinary map. Accompanying it is an explanatory handbook. The figures have been selected by Professor Balfour, who also supplies the descriptive matter. It is almost a work of supererogation to say, that the illustrations and accompanying handbook are well adapted for the purpose they are intended to serve.

—— The **Report of the Fruit Growers' Association of Ontario** for the past year is before us, from which we are glad to observe the great and increasing interest taken in fruit culture in the New World. There are several good practical papers on the cultivation of the Apple, Pear, Plum, Cherry, Currant, &c., being the essays for which prizes have been awarded during the past season. Amongst the prizes offered for 1870, we observe a sum of 20 dollars to any person who will send to Wm. Saunders, Esq., of London, 2000 of the Plum Curculio (Conotrachelus venuphar), as these are the insects which commit such dreadful havoc in the Plum orchards in America, rendering their cultivation extremely difficult. They are such a dreadful scourge of Plums, that we have no wish to meet them on more intimate terms. We would fain hope that Mr. Saunders, when he gets them in his custody, will grant them no "tickets of leave" to visit our Plum trees.

Florists' Flowers.

I MUST confess to having experienced much disappointment at the recent exhibition of BEDDING PANSIES at South Kensington. I think it was a mistake to specify so large a size box, as it necessitated the crowding together of a number of plants to ensure anything like an effective display. This prevented the individual habit of the variety being seen to the best advantage. If the experiment is tried again (and I hope it will be), and the same sized box is retained, there should be a restriction as to the number of plants to be exhibited in each box. I think three or four plants should be named, so that ample space be given to display the true habit of the variety grown. A dozen lanky plants crowded together in a mass, each one producing at most a brace of flowers, gives, to my mind, a very poor and deceptive idea of a bedding Pansy. It was also a mistake fixing the exhibition at so early a date. Even in ordinary seasons it was too early, by a fortnight at least, for Pansies to be in full bloom in the open ground; but in such exceptional seasons as the one we are passing through, it was a month or six weeks too early. The framers of the schedule are not keepers of the weather, but such a contingency is worth being kept in view. The only chance of getting the Pansies in bloom this spring was by pushing them on under glass. Even by this means some intending exhibitors were not early enough—Messrs. Downie, Laird & Laing to wit, who had a nice collection in boxes, but were unable to get them into bloom early enough to exhibit them. Those having no glass under which to push their Pansies into bloom, had no chance whatever. The bedding Pansy is to all intents and purposes a plant to be cultivated in the open air; and plants exhibited as bedding Pansies should be grown in the open air. Any variety which has not strength of consitution or hardihood enough to stand exposure during the winter, fails to fulfil one necessary service essential to a bedding Pansy. What a Pansy does under glass cannot be taken as representing what it is capable of doing in the open air. I hope that if a class is provided for bedding Pansies another year, the exhibition will be held at a later date, so as to admit of a better representation of this class of plants.

To my mind, a dwarf, compact, branching habit, and a certain hardihood of constitution, are qualities of the first importance in a bedding Pansy; hence, after some three or four years' trial I have well-nigh come to altogether abandon the fancy Pansy as valueless for bedding purposes, owing to the vigorous growth that generally characterises it. I think it was a mistake of the Floral Committee to give a First-class Certificate to Messrs. E. G. Henderson & Son's Golden Bedder Pansy, for the simple reason that not a single plant of it as shown exhibited the slightest approach to a branching habit. Next in point of importance I would place size—the flowers to be somewhat undersized rather than oversized, like Golden Bedder; such for want of stoutness of texture get bedaubed by a shower of rain, and hang down their heads, and rarely raise them again. Next there must be profusion of bloom, added to a disposition to continuity of flowering, which can only be obtained in plants of a branching habit. The desired prolificacy of bloom is far more likely to come with plants producing small rather than oversized flowers. The flowers should also be produced on stiff, erect footstalks: this is a most important consideration.

Bedding Pansies should be self-coloured, and, as far as possible, destitute of a central blotch. What we most require is a floral mass of one colour, not a confused mass of white and black, yellow and black, and so on. Mr. John Fleming, of Cliveden (than whom no one knows better the value of the bedding Pansy), always made a great point of self-coloured Pansy flowers for bedding purposes. I have now planted out in my garden at Ealing a good variety of bedding Pansies, varying from pure white flowers, with only a few faint lines radiating from the eye, to the rich black-purple self of the darkest type. I have endeavoured, for the sake of comparison, to get all the so-called bedding varieties I could lay my hands on, and, with some three or four exceptions, I have come to the conclusion that it is essential to discard most of the kinds now in cultivation as bedders, and to commence again by crossing, making habit and self colours the basis on which to work. I have now in bloom a seedling Pansy, raised by my brother, Mr. W. Dean, when at Shipley, of singularly dwarf and compact growth, and most floriferous; on plants barely 4 inches in diameter I can count 20 expanded flowers, each of which is about the size of a large flower of Viola lutea grandiflora; the upper petals are of a rich reddish plum colour, the lower petals having the striking hue of the Imperial Blue bedding Pansy. There is no blotch, and with the combination of colours the effect is very striking indeed. For edging purposes this variety will prove invaluable; but I hope to make it still more serviceable as a starting point from which to set out in order to obtain other flowers even better than this. *R. D.*

Obituary.

We have to record with regret the decease of Mr. John Burgess, of Penkhull, a partner in the firm of Burgess and Kent, Penkhull Nurseries, Stoke-on-Trent. He died on Tuesday, the 24th ult., at the good old age of 85. Mr. Burgess was widely known and respected amongst the old-established members of the nursery and seed trade.

Garden Memoranda.

Ferniehurst, the Seat of E. Salt, Esq.—The Orchids cultivated here belong for the most part to the "cool section,"—rather an indefinite term by-the-by, but it may generally be understood as meaning either plants from temperate countries, as the Australian Dendrobes, or, if from the tropics, those that are found at an elevation of say 2500 or more feet; thus many Odontoglots come from high altitudes in New Grenada, very near the equator itself.

The Odontoglossa form a distinctive feature at Ferniehurst, there being upwards of 150 plants of O. Alexandræ alone, and many were showing their spikes at the time of my visit. A fine batch of O. Uro-Skinneri was growing vigorously, making some of the strongest growths I ever saw, and some were throwing up stout spikes that promised well for future bloom. A fine plant of O. pendulum (O. citrosmum of gardens) bore 11 fine spikes, but the flowers were not yet expanded. Several plants of O. luteo-purpureum were in full flower, the spikes 2 feet or more in length, and bearing 10 to 12 blooms on each. This varies much in the colouring of its flowers, some being very pale, others blotched profusely with rich brown.

A nice piece of O. nebulosum var. candidulum, was producing a spike of flowers that differs from the common form in having the flowers pure white except the bilobed crest, which is suffused with lemon-yellow, and streaked with orange. A plant of O. Phalænopsis had one of its Miltonia-looking flowers expanded; also a bit of O. cordatum (Lindl. Bot. Reg. N.S. p. 50). This plant, by the way, is figured in the Bot. Mag. t. 4878, as O. maculatum, and a figure of O. maculatum (La Llave Descr. Nov. Veg. ii. 25—1, is substituted for it in Paxt. Mag. of Bot. xiii. p. 147. The two plants agree pretty closely in the pseudobulbs, leaves, and ancipitate scapes; but O. maculatum is easily distinguished by its much broader subhastate petals, and the bilobed crest on the unguis of the labellum is essentially distinct. Cultivators easily recognise O. cordatum by its equal lanceolate attenuated sepals, the petals being yellow, blotched for their whole length with rich brown, and by the ground colour of the labellum being white; whereas in O. maculatum it is yellow, and the petals, besides being much broader than the sepals, are only blotched at the base. O. cordatum is figured correctly in the Flor. Cab. Knwl. & W. t. 100 (with the exception of the lip being represented with a yellow ground). There is a figure in Regel's Gartenfl. t. 356 (1862), evidently taken from the true plant. O. maculatum is figured correctly in Bot. Reg. t. 30, 1840, and also in Bateman's Mon. Odont.

A near relative of the Odontoglossa—Mesospinidium sanguineum, Rchb. fil. in Bot. Mag. t. 5627—was also in flower, although past its best. I was most agreeably surprised to meet with a nice blooming plant of Odontoglossum roseum, (Lindl. in Benth. Pl. Hartweg. 151; Folio i., Odont., No. 65). This is an old plant, bearing a short spike of 10 to 12 rosy flowers, and the lip being parallel to, and closely addressed to the column, it looks something like an Epidendrum. The three-lobed lip is of a paler colour than the sepals and petals. This is just the plant for the "Refugium Botanicum," not but that it is worth a place in any collection of rarities.

Among the Oncids were several fine plants of O. macranthum, with a vigorous flexuose spike several feet in length, the flowers of which were not as yet expanded. A strong plant of O. serratum (O. diadema, Linden), with a panicle 9 or 10 feet long, had one or two of its fine blossoms just expanded. The petals of this species are connivent, and their apices being joined together, or coherent, they form a sort of arch over the column, and give a peculiar characteristic appearance to the great brown flower. Several plants of the beautiful Oncidium sarcodes (O. amictum var. sarcodes?) were blooming. This is a very variable plant, some varieties having pale yellow flowers merely speckled with pale brown, while others have sepals and petals of a rich golden yellow heavily blotched with crimson-brown, the panicle varying in length from 1 to 6 or 7 feet. Two fine varieties of O. bifolium were just opening their flowers, one had a lip nearly an inch and a half across, with an undulated margin, the other had a smaller lip, but it was much deeper coloured than the large variety. A small plant of Oncidium pubes had a panicle of dusky flowers, nearly 2 feet long, the two lateral sepals being coherent; their whole length gives to the flowers a characteristic cruciate appearance. The habit of the plant much resembles that of O. sarcodes, so much indeed that inexperienced buyers of imported plants should be cautious, for they will not be likely to meet with the same pleasant surprise that attended those who luckily purchased Cypripedium niveum in mistake for C. concolor, or Phalænopsis Luddemanniana for P. rosea (P. equestris, Rchb. f.). There was a small plant of Oncidium cucullatum, with dusky purple sepals and petals, and a spotted lip; this interesting plant is found in New Grenada at an altitude of 3000 feet. A plant of Oncidium altissimum had several large panicles of yellow and brown flowers, and a fine variety of O. Papilio must not be forgotten, its petals standing up like the antennæ of some gigantic moth. A fine plant of Trichopilia coccinea (Warsc.) bore several of its large solitary reddish carmine flowers, bordered with white. This is an old species from Central America, and is, both in habit and colour of the flowers, something in the way of T. crispa, Lindl., but cultivators may easily recognise it by its flowers being each larger than in the last-named species, and borne on one-flowered scapes: both flower about the same time.

First amongst Dendrobes comes the brilliant D. Falconeri, a fine plant of which was blooming on a block. The flowers were both large and richly coloured. A nice piece of the older but perhaps equally rare D. Cambridgeanum had three or four flowers on one of its fresh young growths. The flowers are of the richest golden yellow colour, with a blotch of dark velvety crimson on the lip, and look more beautiful by being seen in juxtaposition with the bright green foliage. Some fine plants of the elegant Dendrobium Devonianum were flowering freely, the lip is beautifully fimbriate, with two large blotches of yellow, and the flowers have a delicate musk-like perfume.

Lælia flava, with a pair of golden yellow flowers, and Lælia præstans, with a flower of the richest crimson-purple, together with some good varieties of Cattleya labiata and Mossiæ, one of which had an extra large and richly coloured flower, were also to be seen. Sobralia macrantha was blooming at the extremity of its slender reed-like stems, and the pretty little rose-flowered Compartettia falcata was just going out of flower. There is, moreover, in this collection one of the finest plants of Masdevallia Veitchii in the country, and probably worth upwards of 100 gs. Several large pans of Disa grandiflora with healthy foliage, not a speck upon them, might be taken as models of skilful cultivation. How seldom it is that we see this plant in perfection, or, indeed, any of the other terrestrial Orchids from the Cape.

The plants in the span-roofed house devoted to the Odontoglots are placed upon a layer of hard coal, broken into pieces about the size of hazel nuts, and with which the benches on either side are covered. The thick, fleshy aërial roots seemed very eager to reach and creep among the black nodules. I should say, judging from what I saw, that it is one of the best things that can be used—much better than either gravel or shell; it is always clean and sweet, and its powers of absorption are well known, and may play a more important part in the economy of the plants than at first sight might be supposed. There is also, near one of the Orchid-houses, a very pretty exotic fernery, constructed *à la mode rustique*, with a beautiful waterfall, and a natural-looking basin below, which is well stocked with fish. *F. W. B.*

Miscellaneous.

The Flower Sermon.—The Flower Sermon will, this year, be preached at St. Katharine Cree, Leadenhall Street, as St. James's Church is closed for the present. This quaintly interesting service will commence at 7 o'clock, on Whit-Tuesday evening, and the sermon will, as usual, be preached by the Rev. Dr. Whittemore, rector of St. James's. The young persons attending this special service carry bouquets, and the sermon is on some floral text. There is something both touching and encouraging in the sight of an old City church crowded to overflowing with these young people, whose eager and blooming countenances are a flower-sermon in themselves. *The City Press.*

Handy Rules.—The following is a rough-and-ready way to find the contents of circular tanks, wells, and pipes:—Square the diameter in inches, and cut off the right-hand figure as a decimal, and the result will be gallons in each 3 feet (yard) of depth; or length, if a pipe; as—

Pipes.

Diameter in Inches	Inches	Square.	Gallons in 3 feet
2	2 × 2 =	4	0·4
4	4 × 4 =	16	1·6
6	6 × 6 =	36	3·6
12	12 × 12 =	144	14·4

Wells, &c.

36	36 × 36 =	1296	129·6
72	72 × 72 =	5184	518·4
100	100 × 100 =	10000	1000·0

To turn francs into pounds sterling English:—Multiply by 4, and cut off two right-hand figures; as—

125 francs	£1
1000	40
10000	400

And so on—

25 francs	£1
50	2
250	10
1000	40

By using this rule, French money may be turned into English; that is, its value in English money may be seen at a glance. To turn English pounds sterling into francs, reverse the process: divide by four and add two cyphers; as—

£1	100 francs
2	200
10	1000
40	4000

This rule assumes that 25 francs are the value of £1 sterling, and is near enough for the rough-and-ready purpose indicated. *Builder.*

Gardenias.—In order to grow Gardenias thoroughly well, there are three essential requisites, namely, great heat, abundant atmospheric moisture, and very rich soil. With these advantages, and the aid of judicious management, they may be had in bloom all the year round, the most difficult season to secure a supply being the month of January. If planted out in a well-prepared bed of rich soil, Gardenias will continue to blossom in succession, from March until December; but in order to secure this result, both heat and moisture must be kept up to a high standard. The temperature of the house should never be less than 70° at night, and the house may be shut up in the afternoon with abundant moisture, at a heat of from 90° to 110°; but it must be always borne in mind that with this excessive amount of heat, there must be a very moist atmosphere. Plants in pots will produce three crops of flowers, but it is better for the plants that they should bear but two crops, so that they may be rested. The resting period should immediately succeed the flowering season. When the plants are once started into growth, they should be kept moving onwards until the blossoms are developed, for if, during this growing period, they are at all checked or starved, they will only produce small semi-double flowers. To obtain a supply of flowers in the month of January, the plants must be started into growth about the middle of June. When the flower-buds begin to show, which will be about August, they must be put into a cold frame, and kept as cool as the weather at the time will permit. In this position they must be kept until the beginning or middle of September, according as the season may be warm or cold. The resting state must be maintained until November, but the plant should not be subjected to a lower night temperature than 50°, or the flowers will be small. In November the heat should be increased, and if the plants have been and are well attended to, they will furnish a good crop of flowers through December and January. No plant delights more than the Gardenia in the heat from a dung-bed, and during the summer they will grow better in a dung-bed than in any other way. They should be potted in turfy peat and loam, with plenty of

sand to keep the compost in a free open condition. During their growing season they require to be kept well fed with liquid manure, or with some other of the well fed with liquid manure, or with some other of the fertilisers now in use, such as Standen's manure, which suits them remarkably well. It seems to be almost an impossibility to keep the mealy-bug off these plants, and therefore constant attention is necessary so as to keep down the intruders. Clarke's compound is the best application we have made use of for killing them, but there are many others which we have not tried. Gardenia Fortunei brings the largest blossoms, but for general purposes I find G. florida intermedia the best variety, taking quantity and size of blossom both into account. *John Standish, Royal Nursery, Ascot, in "Florist and Pomologist."*

THE GAMEKEEPER'S ENEMIES.—Everybody knows with what persistent zeal the gamekeeper will follow up, and destroy every bird of the falcon tribe which may be domiciled on his "preserves;" but, although it may not be generally known, they occasionally serve the keepers a good turn by destroying that notorious egg-poaching reptile—the common adder. Quite recently a remarkable instance of this occurred in the neighbourhood of Camborne. A harrier hawk, too cunning ever to come within range of the keeper's gun, was invited to precipitate himself on a gin, or trap, over which was put tempting bait in the shape of a young rabbit, and then a bird, and again a weasel. But all to no purpose; for, hovering over the place, his keen eye detected something wrong in the "make up." At last the gamekeeper, having killed an adder, put it over the trap coiled up as if asleep, and awaited the result. He had not long to wait, for the hawk, quietly sailing along with outstretched wing, espied the reptile, and without a moment's hesitation, pounced on it and—we are sorry to add—was caught in the trap. *Cornish Telegraph.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE elegant *Howea Celsi*, which is now producing its vivid deep blue flowers, reminds us that there is another very useful variety, *H. pungens major*, which, if grown-on well at this time, will afford us flowers of the rich deep blue colour during a portion of the dull winter months. If the antipodes had furnished to horticulturists no other gems than these from amongst its floral riches, it would still have done a great service in contributing for our use a colour which is rare indeed in any class of plants. The plants of this genus, and especially those mentioned, grow best in peat, having a slight quantity of fibrous loam and silver sand, with a few pieces of charcoal in admixture. They should be shaded from the more scorching rays of the sun. Another floral gem, *Euphorbia jacquiniflora*, although a stove plant, is a most fitting associate for the Hoveas. Its bright orange-scarlet flowers are produced in great abundance upon long, somewhat tapering, flexile branches, and last a very fair length of time in full beauty. These also thrive best in a mixture of peat, having a moderate quantity of fibrous loam and silver sand. Plants which have finished blooming should now be gradually dried off, or be allowed to rest for a week or two, preliminary to their being cut back and started into fresh growth. When pruned, they should be afforded a little bottom-heat, so as to induce them to make as many young growths as possible, after which they will require fresh potting into good fibrous compost, such as that recommended for Euphorbias, but with a little more sand. Such plants grow quickly in a high moist temperature, averaging about 70°, with plenty of air upon all suitable occasions. *Poinsettias* which have been stored away to rest may now be brought forward, and started into growth, so that cuttings may be produced for propagating purposes at an early date. *Lachenalias* which have done blooming should be gradually ripened off, by supplying them with less root moisture, and by exposing them fully to both the sun and air. Give to *Indian Azaleas* which are now making their young growths a high moist temperature. If proper attention is observed in the matter of shading them occasionally, just at the hottest time of day, and of affording a wholesome quantity of water to the roots, without in any way causing the soil to become sour, it will not injure them to close the house early after noon, and allow the temperature to run up to 100°. Of course, in such a case the mean temperature should not be less than from 73° to 75° by night. Pinch back the points of all strong growing shoots, so that not only may a greater multiplicity of shoots be formed, but a more equable distribution of the sap take place.

FORCING HOUSES.

Forcing, in the general acceptation of the term, is at this most felicitous period reduced to very simple limits, if only a little forethought and judgment be brought to bear on all such active operations. All that requires to be done now is to watch our houses carefully, so as to guard them against the bad effects of extreme fluctuations in the external temperature. A steady and regular temperature must constantly be maintained, whether by affording a little artificial warmth when the outside thermometer falls below temperate, or giving air abundantly when the sun shines with much force. It is scarcely necessary to say that moisture must be afforded, both in the atmosphere and to the roots, in a measure equivalent to the dryness of the external air or the brightness of the sun, &c. Keep a sharp look-out for *Red Spider*, which is very liable at this particular season to attack *Vines*, and especially those with somewhat ripened foliage, and much taxed by a heavy crop of fruit. Brimstone is the red spider's greatest enemy, and it may be safely used as a preventive by sprinkling it around upon warm places within the structure, which are not likely to be heated beyond 110° or thereabouts. Many experienced cultivators make a thick wash of it, and then paint over their flues or hotwater-pipes; but great experience must be acquired before such a step is taken, because too frequently the fumes from the sulphur injure the under surface of the leaves very much, as well as cause "rust" to form upon the Grapes, which ends in their inevitable destruction, so far as finely finished fruit is concerned. In regard to *Pine-pits*, it will now be necessary, no matter how warm the external temperature may be, to renovate the heat of the tan-beds, with the assistance of a fresh supply of new tan or leaves as the case may be. Go through the whole stock of *Pines* at once, and repot all that require it. It is a common practice in most establishments to have such operations carried out at certain fixed times; this is very convenient, so far as the aggregate amount of work to be done is concerned, though it may not be so advantageous in the matter of keeping up a good successional supply of fruit. After the fermenting materials have been renewed (which must at this season be done with great moderation in regard to the quantity of fresh matter added) the bottom-heat must be closely watched to see that it does not exceed a wholesome mean of from 85° to 90°. Keep the atmosphere moist, and do not let the sun shine too brightly on to any newly-potted plants. The second crop on the earliest *Fig trees*, which are now growing vigorously, should have even more attention than before in the matter of watering, &c., for it must be understood that every effort which the roots are capable of making will be quickly turned to the most useful account. Turn out-of-doors all those *Cherry trees* in pots from which the fruit has been gathered. A sheltered position will be the most suitable place for them. Give to all *Cucumber plants* which are grown in houses a thorough good soaking occasionally with weak manure water. Sprinkle a little fresh soot over the whole surface of the beds before watering.

HARDY FLOWER GARDEN.

Seldom has the maggot been so numerous, and so injurious to Rose trees, as it is this season. It has given us much trouble to keep the bloom-buds clear of it. It will be advisable to give all plants of this universal favourite a good syringing with soap-suds as frequently as possible. The latter part of the day—towards the evening—when the rays of the sun have lost their power to injure, will be the best time at which to syringe them. Not only will this cleanse them of such pests as the green aphis, but they will thrive with more vigour in consequence. Look sharply after all robber shoots and "suckers." The former emanate from around the base of the bud upon the Brier stocks, and are a part of the latter. The suckers sometimes push up through the soil after having traced a circuitous route under ground, and must be followed from the points right home; thus they may be severed in twain from the parent stock, with less risk of their growing again than would be the case were they broken off carelessly.

HARDY FRUIT GARDEN.

The shoots which have formed too numerously during the present spring upon bush fruits, Black Currants excepted, should now be thinned out in all instances where they grow too densely. The young shoots upon White and Red Currants may be somewhat shortened, so that the strength of the trees may be thrown into the fruit, and also that bloom-buds may be formed more freely for next season. During dry periods, and especially if the sun shines warmly during the day, too much cannot be said in favour of syringing wall-fruit trees in the evening, more particularly such as are carrying heavy crops.

KITCHEN GARDEN.

Take the handlights off *Ridge Cucumbers* and *Vegetable Marrows* as soon as they begin to grow freely, and see that neither suffer from want of moisture at the root. The weather may be dry when this is read, heartily as I wish that such a prediction may be incorrect. If no rain falls in the interval, artificial waterings will be absolutely needed by most crops, especially *Peas*, and such things as *Lettuces*, *Endive*, *Radishes*, small seedling plants, &c. I do not advise watering until some slight check is observable in the growth; then give water freely, and in abundance. *W. E.*

TOWN GARDENING.

CONTINUE to put in the cuttings pinched off *Pompon Chrysanthemums*, which will make nice stuff to follow the bedding plants when taken up in the autumn. They should be placed round the rim of the pots, and be put away in a shady position until they are rooted. They may also be dibbled in the open border if care is taken to shade them, and from thence they can be transplanted in the autumn. Finish planting out *Dahlias*; stake them at once, and give them a mulching of rotten dung just over their roots, which will do them much good. Common *Alpine Auriculas* do well in towns when once established; now is the proper time to propagate them. This should be done by taking off the shoots with a portion of the roots if possible, the divisions to be planted close to the edge of a pot in rich sandy soil. Place them in the shade until they are well rooted, at which time they should be planted out and not again disturbed, for I find that the longer they remain in one position the better they flourish. A little good rotten dung placed round the older plants at this season is of great service to them. French and African *Marigolds*, *Love-lies-bleeding*, *Prince's Feather*, *Stocks*, and all kinds of tender annuals, may still be transplanted if carefully taken up with as much earth as will hang to their roots; as soon as they are planted give them a good watering. Plants that are required to be kept low should be pegged down as they progress in growth. I save all my old birch brooms, which come in very useful for cutting pegs from for this purpose. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WHITSUN-DAY, JUNE 1, 1870.

1870 Month and Day	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, Selection.		
May and June	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
26. Thurs.	30·25	60·1	59·5	41·9	52	3·0
27. Friday	30·21	64·8	55·0	48·8	56	3·8
28. Satur.	30·03	57·7	52·7	46·7	73	3·8
29. Sunday	29·71	59·8	52·7	51·6	85	4·3
30. Monday	29·70	64·1	59·6	55·3	73	4·9
31. Tues.	29·61	59·1	52·1	45·0	64	3·5
1. Wednes.	29·64	60·1	54·0	49·2	69	3·9

1870 Month and Day	Temperature of the Air.					Wind.		Rain.
	Highest	Lowest	Range in Day	Mean.	Departure of Mean from Average of 30 Years	Direction	Horizontal Movement	In Inches
May and June	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
26. Thurs.	72·0	47·9	24·1	55·5	+ 0·3	N.E.	125	0·00
27. Friday	69·8	42·9	24·0	51·3	− 1·8	E.	148	0·00
28. Satur.	70·1	45·0	25·1	53·5	− 0·8	E.	165	0·00
29. Sunday	68·7	45·3	23·4	60·1	+ 4·1	S.W.	115	0·00
30. Monday	72·2	50·0	22·2	62·2	+ 5·0	S.W.	318	0·00
31. Tues.	72·5	51·3	21·2	57·3	+ 0·0	W.S.W.	190	0·17
1. Wednes.	61·8	48·7	13·1	54·0	− 2·4	W.S.W.	300	0·12

May 29.—Generally dull. A very windy day.
" 27.—Wet. Temperature of dew-point prevailed throughout the day.
" 28.—Wet. Temperature of dew-point prevailed at night.
" 29.—[illegible] Showers in the afternoon.
" 30.—Fine. Temperature of dew-point remained high. Heavy rain in the evening.
" 31.—Generally cloudy. Occasional showers. Brisk winds.
June 1.—Generally cloudy. Heavy showers of rain in the evening.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, MAY 28, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	70·0	41·0	31·0	65·1	45·1	20·0	55·1	0·00
Blackheath ..	72·1	37·3	34·8	71·0	42·8	28·8	56·9	0·00
Bristol	70·8	40·3	30·5	67·1	43·0	24·1	55·3	0·00
Birmingham ..	70·0	44·0	27·0	65·0	48·0	17·0	56·9	0·00
Wellington ..	74·1	41·1	33·0	67·8	42·6	25·2	55·7	0·00
Leicester	..	..	..	..	..	..	..	..
Norwich	70·8	39·2	31·6	66·9	46·7	20·2	55·1	0·00
Nottingham ..	72·0	38·5	33·5	66·8	41·0	25·9	53·2	0·00
Sheffield	72·5	41·0	31·5	65·7	41·5	24·2	53·6	0·00
Liverpool	73·2	44·5	29·2	64·3	48·0	16·7	56·2	0·00
Manchester ..	71·3	42·0	29·3	67·8	45·1	22·1	56·9	0·00
Salford	71·0	37·9	33·1	65·3	41·3	24·0	53·1	0·00
Bradford	75·2	41·0	34·2	67·7	40·1	27·3	53·4	0·00
Leeds	77·0	42·0	35·0	66·0	39·7	26·3	52·8	0·00
Hull	69·0	43·0	26·0	65·3	44·6	20·7	55·0	0·00
Newcastle	69·0	41·0	28·0	66·3	45·2	21·1	55·8	0·00
Edinburgh	..	..	..	..	..	..	..	..
Glasgow	72·2	40·0	32·2	..	..	..	55·1	0·05
Dundee	65·0	42·0	23·0	..	..	..	53·4	0·00
Aberdeen	63·8	41·5	22·3	..	..	..	52·3	0·35
Paisley	72·0	41·5	30·5	..	..	..	56·2	0·30
Greenock	67·2	44·0	23·2	..	..	..	55·3	0·47
Leith	66·0	41·0	25·0	..	..	..	54·9	0·02
Perth	75·0	40·0	35·0	..	..	..	54·3	0·00
Dublin	71·4	36·0	35·4	..	..	..	52·7	0·00

JAMES GLAISHER.

Notices to Correspondents.

DRAINAGE. *G. H.* For all successful drainage there must be an outfall. The plan you propose, of digging large holes to be filled up with loose stones and the crumbled marl, would not benefit you unless there were drains leading from the bottom of such excavations to proper outlets.

FLOWERS FOR A NORTH BORDER: *S. J. M.* The situation described is not at all favourable for any summer flowering plants. We recommend you to try scarlet Pelargoniums, assisting them with liquid manure.

GALLS ON LIME LEAVES. *Tilia.* The galls on your Lime leaves are produced by a little mite, of which a figure is given in the "Annales des Sciences Naturelles," 2 série, vol. 2, tab. xi., fig. 1. *M. T. B.*

HARDY WALL PLANT. *H. H. P.* For a plant which

will grow against a wall without trellis, and would cover a large exposed surface, having a W.N.W. aspect, where Ivy has been tried and failed, take Ampelopsis tricuspidata, or Veitchii, or even the common Virginian Creeper, only these are not evergreen. Cissus antarcticum is a fine evergreen for the purpose.

INSECTS: *J. D. S.* The grubs are those of Otiorhynchus sulcatus. Before answering positively our correspondent's inquiry as to their complicity in causing the death of his Kalmias and Rhododendrons, we should like to have known whether there was any, and if any, what relations between the grub and the roots of the Kalmia and Rhododendron. Were they found in their vicinity, or apparently eating them? Our impression, from the information given and the specimens sent, is that the two have had nothing to do with each other. The roots have, to our eye, more the appearance of death from some ailment affecting the general health of the plant than from the attacks of insect enemies. The best mode of dealing with the Otiorhynchus is to destroy as many of the perfect insects as possible. *A. M.*

ISOMETRICAL DRAWING: *T. W. S.* The principles of isometrical perspective as used in some of our illustrations are extremely simple, and we are not aware of any work devoted specially to this subject; indeed handbooks of perspective generally omit all reference to it, as it comes under the head of geometrical projection. To project any subject in isometrical perspective, a wooden "angle of 60°" (to be purchased of any artist's colorman for 3*d.*) must be used in connection with a T-square; this will give an angle of 30° to both sides of the structure, which sides, though apparently in perspective, are really in oblique elevation. There are only three sets of lines in isometrical perspective (and they are all parallel), viz., the vertical, and the two oblique sets, pointing right and left, which the wooden angle gives. All measurements can be taken off as in ordinary elevations; this gives it a certain value for some subjects. We intend to give an illustrated article on the subject in a early number.

LASIANDRA MACRANTHA: *Old Sub.* Do not keep it too warm; treat it about the same as Pleroma elegans.

NAMES OF PLANTS: *J. E. Lees.* A seedling plant of Polystichum angulare.—*J. Shaw.* Clematis montana.—*F. W. B.* One of the many forms of Gymnogramma chrysophylla.—*J. C., Shadwell.* 1, Lithospermum purpureocæruleum; 2, Halesia tetraptera; 3, Geum rivale.—*P. B.* Euphorbia Esula.—*P. H. G.* 1, a Gaultheria, near (or a variety of) G. repens; 2, a Polypodium bophyllum, but we cannot identify the species with any described.—*J. C. & Co.* Lithospermum purpureo cæruleum.—*P. C.* 1, Camassia esculenta; 2, Acer rubrum.

PANSIES: *Dickson & Co.* Your set of bedding Pansies and Violas contain several highly promising sorts. The V. lutea suaveolens Improved is very sweet scented, and a good clean yellow flower; V. lutea pallida, a large sulphur-yellow, with a few radiating lines at the eye, is a beautiful thing; V. lutea Grievii is somewhat deeper tinted and smaller, but good; and there are two large unnamed varieties, deep golden-yellow and straw-coloured respectively, which are very promising, being as round, and full, and large as Pansies. The crosses with the sterile and V. arvensa are also very interesting, and are likely to yield good results if followed up. We are of course noting the characteristics of the cut blooms submitted to us, and have no evidence as to habit, or continuity of bloom. A rich dark blue seedling Pansy, not named, described as very dwarf, and a fine bedder, is remarkably rich in colour, with round, stout flower, which looks as if it would last a long time.

PEAR LEAVES: *W. S. W.* The affection on your Pear leaves is very common. It does not seem to be caused by an insect, but is an over-development of the cellular tissue. It does no harm, except when it attacks the fruit, which is sometimes the case. The affection on Rose leaves is quite different. It consists rather in an under-development of parenchyma. We do not recollect having observed precisely the same condition before. *M. J. B.*

PRESERVING WOOD: *G. M.* Charring the lower ends of wooden posts is a common country method of preserving the wooden against decay. Can any of our readers inform this correspondent where he can get his posts steeped in creosote?

ROGIERA GRATISSIMA: *Old Sub.* This requires an intermediate house, turfy peat soil, well drained and gritty, and must not be over-potted. It must be treated like a hard-wooded plant.

TO DESTROY ANTS: *Sub.* Various plans have been suggested: one is to soak a sponge in some sweet fluid, and place it in the place frequented by ants. They will crowd to it, and the sponge may then be plunged in boiling water. Your plant is a Celsia, probably C. heterophylla.

VINE LEAVES: *R. S. N.* The little growths on the under side of your Vine leaves are very common, and are not injurious. The exact cause is not known *M. J. B.*

WATERING GARDENS: *R. F.* Warner's Aquaject will probably suit you. In ordering, if you cannot select personally, describe the work you require it to do.

COMMUNICATIONS RECEIVED:—I. S.—H. K. I. D.—The Marquis.—A Sub.—C. T.—A. B. C.—H. J. C. (thanks).—W. F.—R. F.—O.—C. J. E.—D. L.—J. C.—I. R. J.—R. O. B. (has not received).—R. I. J.—A Sub.—D. B.

Markets.

POTATOES.—Southwark, June 2.

During the past week the arrivals coastwise have been more plentiful; this, coupled with the hot weather and large importations of foreign new Potatoes, has caused dull trade, and a fall in prices. Quotations nominal:—Yorkshire Flukes, per ton, 110*s.* to 130*s.*; Ditto Regents, 90*s.* to 110*s.*; Lincolnshire do., 90*s.* to 100*s.*; Dunbar and East Lothian do., 100*s.* to 130*s.*; Perth, Forfar, and Fifeshire do., 90*s.* to 100*s.*; Do. Rocks, 60*s.* to 100*s.*; Do. Reds, 85*s.* to 95*s.*; French and Belgian Whites, 70*s.* to 90*s.*

COVENT GARDEN.—June 3.

A large increase in our supplies has taken place, and prices have receded accordingly. Heavy importations of foreign goods are also to hand, and among them 20,000 West Indian Pines. Flowers comprise Azaleas, Orchids, Roses, Pelargoniums, Heaths, Fuchsias, Hydrangeas, Lobelias, Mignonette, and bedding plants in large quantities.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve	3 0	to 5 0	Melons, each	5 0	to 12 0
Apricots, per doz	2 0	— 4 0	Nectarines, per doz	12 0	— 24 0
Cherries, per lb.	1 0	— 2 0	Oranges, per 100	6 0	— 10 0
Cobs, per lb.	0 9	— 1 0	Peaches, per doz	15 0	— 30 0
Filberts, per lb.	0 6	— 0 8	Pears, per doz.	2 0	— 4 0
Grapes, per lb.	6 0	—10 0	Pine apples, per lb.	6 0	— 10 0
Lemons, per 100	4 0	— 8 0	Strawberries, p. lb.	3 0	— 8 0

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Asparagus, p bund.	3 6	to 15 0	Leeks, per bunch	0 2	to 0 4
Artichokes, p. doz.	3 0	— 6 0	Lettuces, p. score	1 0	— 2 0
Beet, per doz.	2 0	— 3 0	Mint, per bunch	0 0	— 0 0
Broccoli, per doz.	1 0	— 2 6	Mushrooms, p. pott.	1 0	— 1 6
Cabbages, p. doz.	1 0	— 1 6	Onions, per bunch	0 4	— 0 9
Carrots, p. bunch	0 4	— 0 8	Parsley, per bunch	0 2	— 0 4
— young, p. bun.	1 6	— 2 0	Potatos, new, p. lb.	0 4	— 0 6
Cauliflowers, p. doz.	1 6	— 3 0	Salsafy, per bundle	1 0	— 1 3
Celery, p. bundle	1 0	— 1 6	Scorzonera, do.	1 0	— 1 3
Cucumbers, each	1 0	— 1 6	Shallots, per lb.	0 8	— ..
Endive, per doz.	1 6	— 2 0	Spinach, p. bushel	2 0	— 3 0
French Beans, p. 100	2 0	— ..	Radishes, per doz.	1 0	— 1 6
Garlic, per lb.	0 8	— ..	Turnips, per bunch	1 0	— 1 6
Herbs, per bunch	0 2	— 0 4	— young, p. bun	1 6	— 2 0
Horse-Radish, p. bun.	3 0	— 5 0			

Potatos, York Regents, per ton, 120*s.* to 150*s.*; Flukes, do., 110*s.* to 140*s.*; new round, 14*s.* to 18*s.* per cwt.; new kidneys, 16*s.* to 28*s.* do.

A PRACTICAL FARMER wishes to undertake the charge of a young Gentleman, as PUPIL, desirous of instruction in really practical Farming. He is on the most desirable home terms as application.—Mr. LOVEJOY, The Library, Reading; or Mr. JEMMETT, Murrell Hill Farm, Binfield, Berks

WANTED, a Young Man, as MANAGER of a retail Nursery and Seed Business, in the Midland Counties.—CHARLES SHARPE AND CO., Sleaford.

WANTED, a GARDENER, for a small place; must understand Forcing Flowers, and have a thorough interest in his work.—Apply between 10 and 4 o'clock to Mr. J. H. BRYANT, Fairfield Works, Bow.

WANTED, a steady, active Man as PROPAGATOR, in the House Department of the Waterloo Nursery. He must understand the Propagation of Hard and Soft wooded Plants, Stove and Greenhouse Climbers required.—THOS. DAVIS AND CO., Waterloo Nursery, near Liverpool.

WANTED, a thoroughly proficient TRAVELLER for a large Nursery and Seed Establishment near London.—Address, stating full particulars as to terms, references, &c., to E. V., Messrs. Hooper and Co., Centre Avenue, Covent Garden, W.C.

WANTED, TWO or THREE sober, honest, and steady GARDEN LABOURERS, in a large Amateur Garden at Twickenham.—Apply to the Gardener, or to HENRY G. BOHN, Esq., 18, Henrietta Street, Covent Garden, W.C.

GEORGE CLARKE is in WANT of a Young Man as UNDER SHOPMAN. He will require to have a good knowledge of Plants, and be a good Salesman.—Streatham Place Nursery, Brixton Hill, S.W.

WANTED, a DAIRYMAID, for a Gentleman's Family, 30 miles from London. Must be well qualified, and an experienced Person.—Apply, stating wages required, to A. Z., Post Office, Tring. Last place must not be less than 20 years' stage.—A. Z., Post Office, Tring, Herts.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, W.

Head Gardeners, Foremen and Journeymen.

JAMES GRAY AND SONS can now recommend several EXCELLENT MEN. Seldom they will be called to send particulars on application.—"Seaton," Nurseries, Chester.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

£5 will be given to any Gardener knowing of a HEAD GARDENER.—MITCHELL AND MATTHEWS, at the Advertiser's obtaining it, the sum to be paid in the first six months. Wages not under £70 a year.—A. Z., Roberts Library, 110, Brompton Road, S.W.

To Noblemen and Gentlemen.

GARDENER (HEAD); age 28, married, one child. C. F. HOARE begs to offer his services to any Nobleman or Gentleman requiring a thoroughly practical, fully competent Man in every branch of the profession. Leaving no stone unturned for the death of his late employer. Six years' good character.—F. HOARE, Messrs. James Veitch & Sons, Royal Exotic Nurseries, Chelsea, S.W.

GARDENER (HEAD).—Age 29, married, one child; has a first-class practical knowledge of his profession in all its branches, including the Management of Vines, Pines, Peaches, Cucumbers, Melons, Strawberries, Mushrooms, &c.; Greenhouse and Stove Plants, also Kitchen and Flower Gardening. Character will bear the strictest investigation.—J. W., Kingston, Teiworth, Oxon

GARDENER (HEAD), age 30.—FRANK NICHOL, late Gardener to Miss Brodie, The Gore, Eastbourne, is now open to an engagement with any Lady or Gentleman requiring a first class Gardener. Thoroughly understands the Forcing and Growing of Fruits, particularly Grapes, and has a thorough practical knowledge of the Culture of Stove and Greenhouse Plants, Orchids, Ferns, &c. First-class references.—F. NICHOL, Mr. Stevenson's, The Vineyard, Sunbury Common, Middlesex.

GARDENER (HEAD), age 38, married.—JAMES STEWART, for the last six years Head Gardener at Nuneham Park, where he had the entire Management of the very extensive Flower and Kitchen Gardens, where Forcing of every description was carried out, including Pines, Vines, Peaches, in fact, every description of Fruit and Flowers, also Spring Bedding on a comprehensive scale, is now open for an engagement with any Nobleman or Gentleman requiring the services of a first-class Man. Testimonials of the highest order.—Apply, in the first place, to Messrs. J. & C. LEE, Royal Vineyard Nursery, Hammersmith.

GARDENER (HEAD).—Age 37, married, no incumbrance; well skilled in all branches of the profession. Highest references.—G. B., 14, Adam Square, Bromley, Kent

GARDENER (HEAD).—Age 33, married, no incumbrance; thoroughly understands the profession in all its branches. First-rate character and good recommendations.—T. A., Mr. East's, Beckenham, Kent

GARDENER (HEAD).—Age 26, single; thoroughly understands Early and Late Forcing, Fruit, Flower, and Kitchen Gardening.—J. EDMOND, Gardens, Norton Hall, Daventry, Northamptonshire.

GARDENER (HEAD), age 40, married, no incumbrance.—GEORGE GADD, Gardener to Sir Benjamin Brodie, Bt., Brockham Warren, Reigate, Surrey, is at liberty to engage with any Noblemen or Gentleman requiring the services of a practical Man.—Address as above

GARDENER (HEAD).—Age 37, married, no incumbrance; has had 20 years' experience in Early and Late Forcing, Fruit, Flowers and Vegetables; also the Management of Flower and Kitchen Gardens. Good testimonials from last employers.—F. W., 7, Portland Place, Hammersmith, W

GARDENER (HEAD).—Middle-aged, no incumbrance; thoroughly understands the profession in all its branches, the Laying-out of New Gardens, the Erection and Heating of Horticultural Buildings; also the Management of Farm Land. First-class testimonials.—J. B., Mrs. Bradford, Market Place, Selby, Yorkshire.

GARDENER (HEAD) or FOREMAN, where good gardening is appreciated.—Age 29; thorough practical, and accustomed to Private Nursery and Growing for Market; thoroughly understands the profession, of which he has a true heart,—the whole of his energy would be devoted thereto. Ten or 15 miles from London preferred. Liberal wages expected. Can be well recommended by present and previous employers.—R. Mr. Macintosh, Nurseryman and Florist, King Street East, Hammersmith, London, W.

GARDENER (HEAD, WORKING).—Age 38, married; understands the profession, also the care of Stock and Land, if required. Eight years' character.—A. H., Mr. Surman, Florist, Witney, Oxon

GARDENER (HEAD, or SINGLE-HANDED).—Age 40; understands Forcing Vines, Cucumbers, Melons, &c., Flower and Kitchen Gardening. Wife can act as Laundress, or otherwise, as required. Good character.—F. G., D. N. Enoch's Library, Clifton Road, Maida Vale, W

GARDENER (FIRST-CLASS, WORKING), where two or three Under Gardeners are employed.—Experienced in all branches. Highly recommended.—D. M. T., Mr. Sprigings' Nurseries, St. Albans

To Nurserymen.

GARDENER, &c.—Age 22; well up in Nursery work, Hard and Soft-wooded Propagation, Stove and Greenhouse Plants, Vines, &c. Three and a half years' good character.—W. WILLIAM, 9, Russell Street, Stapleton Road, Bristol.

GARDENER (SINGLE-HANDED, or otherwise).—Age 23, married; thoroughly practical. Well recommended.—W., Mercury Gardens, Romford, Essex

GARDENER (UNDER), where he will have an opportunity of improving himself.—Age 18; six years' good character from present situation. State wages, &c.—C. G., 5, Trinity Terrace, Trinity Square, Stockwell, London, S.W

FOREMAN.—Age 25; understands Vines, Pines, Cucumbers, and Melons; also Stove and Greenhouse. Two years' first-rate character.—J. SMITH, Crystal Palace Nursery, Male, S.

FOREMAN, under Glass, in a Nobleman's or Gentleman's Garden.—Age 22; has the best of testimonials from several Noblemen's gardens.—W. L., Cambridge Town, Blackwater, Surrey

FOREMAN, in a Nobleman's or Gentleman's Garden.—Has had good practice in the Culture of Exotic Orchids and Ferns, Stove and Greenhouse Plants, Vines, Melons, Cucumbers, and other fruits, Forcing and General Gardening. Good character from present employer (Mr. Hill, Gardener to R. Haubart, Esq., Pides Cross), also from previous employer.—T. PARKER, Pides Cross, Ware, Herts

NURSERY FOREMAN, or GENERAL MANAGER.—Knows the profession thoroughly in every department; a good Salesman, and knows the value of Nursery Stock and Crops. Has handled and valued Nurseries without Check; a successful Propagator generally. The Advertiser wishes for a situation of trust, and one that would be permanent. A Provincial Nursery preferred. First-class references.—A. HA., Messrs. F. & A. Dickson & Sons, 106, Eastgate Street, Chester.

FOREMAN and PROPAGATOR.—Age 37; no objection to travel. Considerable experience. Good references.—B. C., Mr. Tooley, North End, Hampstead, N.W.

To Nurserymen.

GENERAL FOREMAN and PROPAGATOR and SALESMAN.—An experienced Man, of 30 years' practice in some of the first Nurseries in England. First-class testimonials as to character and abilities.—A. B. C., Messrs. Low & Co., Clapton Nursery, Clapton, London, N.E.

FOREMAN or UNDER GARDENER.—Age 28, single; has served as above in first-class establishments. Can be highly recommended by present and previous employers.—A. HERBERTS, Post Office, Norwich

FOREMAN (or UNDER) in large place.—Seven years' practical experience; can be well recommended; four years in last situation.—G. F., Messrs. Carter's Nurseries, Forest Hill, S.E.

To Nurserymen.

GROUND FOREMAN and SALESMAN.—Thoroughly experienced, a good practical knowledge of the Value of Nursery Stock. Successful Budder and Grafter. First-class reference.—A. B., Mr. John Stevens, The Nurseries, Coventry.

MANAGER or TRAVELLER.—Age 33; has a thorough knowledge of the Business, both Plants and Seeds, having brought up in the trade and had considerable experience, both in Management and Travelling.—B. S., 25, Kingslake Street, Edge Hill, Liverpool.

AGENT or FARM STEWARD (at Michaelmas next), where a Herd of Cattle is kept.—An experienced Person, who has had the entire Management of a large Farm and first-class Herd of Cattle.—For further particulars apply to JOHN THORNTON, 15, Langham Place, London.

AGENT or LAND STEWARD.—Scotch; has been brought up a practical Agriculturist, has studied Agriculture and the management of Landed Property at the University of Edinburgh, and has had the Management of large Estates in England for 18 Years. Can give most satisfactory references.—F. J. A., Messrs. Thwaites, Brock & Co., Seedsmen to the Royal Agricultural Society of England, Half-Moon Street, Piccadilly, S.W.

BAILIFF.—A single Man, of really good practical experience.—For particulars, address R. W., James Dickson & Sons, Chester.

To Nurserymen, Gardeners, Florists, &c.

PUPIL, or otherwise.—Age 24, used to the Farming business, wishes to have two years' experience in the above branches.—Address, with terms, to H. L., Post Office, Ditcheat, Evercreech, Bath, Somerset.

SALESMAN and FOREMAN.—Thoroughly understands Market Work, General Nursery Business, Furnishing, &c. Moderate salary; well known in the Trade. Highest testimonials.—A. B., 67, Boston Place, Marylebone Road, London, W.

To the Seed Trade.

SHOPMAN.—A young Man, has had 10 years' experience in Country and London Houses. A slight knowledge of the Nursery business. Country preferred.—C. W., Post Office, Reading

MESSRS. SUTTONS' SEED STAND,

AT THE

BATH and WEST of ENGLAND

AND

SOUTHERN COUNTIES AGRICULTURAL SOCIETIES' MEETING,

TAUNTON, JUNE 6, 7, 8, 9, and 10.

SUTTON & SONS,

SEEDSMEN to the QUEEN, READING,

Invite the attention of all Visitors to the above Show to their interesting

MUSEUM OF AGRICULTURAL AND HORTICULTURAL PRODUCE,

In the Show Yard, in close proximity to the Horse Ring and Poultry department.

The Collection will include upwards of

ONE HUNDRED and FIFTY SPECIMENS of GRASSES, in their dried and growing state.

SAMPLES of PURE HOME-GROWN SEEDS.

SPECIMENS of AGRICULTURAL ROOTS, and MISCELLANEOUS FORAGE PLANTS.

Orders will be received at the Stand for

SUTTONS'

HOME-GROWN TURNIP SEEDS

FOR PRESENT SOWING,

Suttons' Lincolnshire

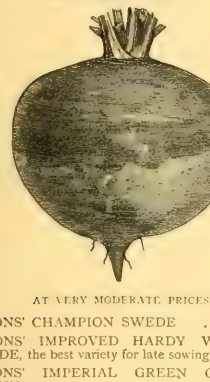

Red Paragon Turnip.

AT VERY MODERATE PRICES.

	Per lb.	s.	d.
SUTTONS' CHAMPION SWEDE		1	0
SUTTONS' IMPROVED HARDY WHITE SWEDE, the best variety for late sowing ..		1	0
SUTTONS' IMPERIAL GREEN GLOBE TURNIP		0	10
SUTTONS' LINCOLNSHIRE RED GLOBE TURNIP		0	10
SUTTONS' POMERANIAN WHITE GLOBE TURNIP		0	10
HARDY GREEN ROUND TURNIP		0	10
GREY-STONE, or MOTTLED GLOBE TURNIP		0	10
SUTTONS' PURPLE-TOP YELLOW HYBRID TURNIP		1	0
IMPROVED GREEN-TOP YELLOW SCOTCH TURNIP		1	0

Much cheaper by the bushel. Also

MUSTARD, RAPE and GRASS SEEDS

For present Sowing, full particulars of which may be had on application.

IMPROVEMENT of GRASS LANDS.

SUTTONS' RENOVATING MIXTURE should be sown after the Hay is carried, and will greatly improve the quantity and quality of succeeding crops on all Meadows or Pastures which have suffered from the late continued drought.

Price **9d.** per lb., **80s.** per cwt. Carriage Free.

☞ *All Goods Carriage Free, except very small parcels.*

Five per cent. allowed for cash payments.

SUTTON and SONS,

SEEDSMEN to the QUEEN,

READING, BERKS.

To the Trade.

WANTED to RENT, on Lease, a SMALL NURSERY, with or without a Seed Trade, in or near a thriving Provincial Town. Address, with particulars, to W. B., 25, Kingslake Street, Edge Hill, Liverpool

To Florists.

TO BE LET, on long Lease, or SOLD, a FREEHOLD PLOT of about ¼ Acre (frontage), DWELLING HOUSE, STABLING, &c., situate at Mandeville Cottage, Epsom

Apply to Mr R TANTON, The Nurseries, Epsom

TO BE DISPOSED OF, with immediate possession, a FLORIST'S BUSINESS, situate in best part of West End, old established, and doing an excellent trade.

For further particulars apply to B. B., Mr. Samuels, 26, Westbourne Grove, W

To Nurserymen, Seedsmen, and Others.

TO BE LET, on long Lease, an old established NURSERY, consisting of about Two Acres of Ground, with Dwelling House, Seed Shop, and Three Greenhouses, &c. Stock, young, in good saleable condition. Pleasantly situated about three miles south of London.

For full particulars apply to Mr. CHANDLER, Horticultural Agent and Valuer, 10, Wynell Road, Forest Hill, S.E.

To Market Gardeners, Nurserymen, and Others.

SURREY, about 25 miles from London, and within one mile from a station on the South Eastern Railway.

TO BE LET, on Lease, from September 29 next, a capital KITCHEN GARDEN, productive ORCHARD, and good DWELLING HOUSE, eligibly situated in a highly respectable and improving neighbourhood, and within 3 miles from two important Market Towns rapidly increasing in population.

The Garden is well walled in, and stocked with Fruit Trees of the most approved sorts in full bearing, and contains Vineries, Brick Melon Pits and Potting Shed, with plentiful supply of Water The House is surrounded by Lawn, Shrubbery, and Paddock, portion of which will readily Let. The whole presenting a favourable opening seldom met with. For terms and cards to view apply to

MESSRS. NASH, Land Agents, Valuers, and Auctioneers, Reigate.

Eastdean and Pevensey, Sussex.

TO BE LET, by the Year, by Tender, from SEPTEMBER 29, 1870, the desirable FARMS, known as BIRLING, HOTCOMBE, and MICHELDEAN Farms, lying together, situate in the Parish of Eastdean, and now in the occupation of Mr. John Horrage. Comprising Good Farm-house, with Gardens, all necessary Outbuildings, 14 Cottages for Labourers, and about 960 acres of Arable, Pasture, Meadow, and Down Land, together with 56 acres, or thereabouts, of Upper Marsh Land in Pevensey

Particulars of the Farms, with terms of letting, may be seen at Mr NORTON STEVENSON'S, Old Town, Eastbourne, who will show the Farms; or Mr JAMES BANKS, Looker, Pevensey, will show the Marsh Land.

Tenders to be sent in on or before JUNE 24 next, to MESSRS. GELL AND MOLLEY, Solicitors, Lewes, from whom further information may be obtained. The Lessor will not be bound to accept the highest or any tender.—Lewes, May 6, 1870.

SALES BY AUCTION.

Syon Gardens, Isleworth, Middlesex.

Highly important SALE of Valuable and Rare TROPICAL FRUITING and FLOWERING TREES, SHRUBS, and PLANTS, of luxurious growth; for sale in consequence of a re arrangement of the Gardens.

FAREBROTHER, LYE, AND WHEELER, beg to give notice that they are honoured with instructions from his Grace the Duke of Northumberland to SELL by AUCTION, at Syon, on WEDNESDAY, June 22, at 12 o'Clock, an assemblage of rare TROPICAL PLANTS and TREES, of remarkably fine growth; among which will be found some of the finest specimens in Europe of the

Abotasia macrophza	Ficus elastica, indica, &c
Anthurium scaule	Hibiscus sinensis filiflorus
Areca concinna	Ilex paraguensis
Caladiums of sorts	Jambosa polypetala and vulgaris
Carolinea alba	Kigelia linteaeria
Chrysophyllum Cainito	Palms in varieties
Cocos sp., and other Palms	Piper nigrum
Coffea arabica	Psidium pyriferum and chinense
Croton picturn, elegans, &c.	Saccharum officinarum
Cycas revoluta	Sterculia nobilis
Diospyros sapota and Mabola	Theobroma cacao
Dracæna, sp	Urania speciosa
Elæodendron australe	Vella pluteifolia
Eugenia pimenta	
Ferns of all sorts	

And a variety of other choice Trees, Shrubs, and Plants which are to be sold in consequence of alterations and a re arrangement of the Gardens at Syon

May be viewed two days prior, by Catalogues only, obtainable of Mr FAIRBAIRN, Gardener, at Syon; of Mr JUDSON, Syon House; and of Messrs. FAREBROTHER, LYE, AND WHEELER, 8, Lancaster Place, Strand, London, W C

To Noblemen, Gentlemen, Horticulturists, and Others.

SOUTHFIELDWORTH HOUSE, HANTS, nine miles from Andover, 11 from Salisbury, and five from Grately Station, S.W.R.

PRELIMINARY NOTICE OF SALE of the COLOSSAL CONSERVATORY, upwards of 300 feet in length, 40 feet in width, and of proportionate height, fitted with appropriate Boiler, and several hundred feet of IRON PIPES, all of which was erected some years since at the most expensive and substantial manner by the late Thomas Assheton smith, Esq., at cost of upwards of £10,000; also a small PINERY, well stocked, together with several hundred CREPED FERNS and other PLANTS, amongst which will be found some fine specimens

MR. FREDERICK ELLEN has been honoured with instructions from Francis Sloane Stanley, Esq., to SELL by AUCTION, in the Autumn, on some date in the month of JULY the above unusually valuable PROPERTY, which will be first offered in one Lot, and if not Sold, then in such other Lots as may be arranged at the time of sale.

Full particulars and date of this important Sale will appear in future Papers, and in Catalogues now preparing; and in the meantime any person wishing to treat for the purchase of the entirety may do so. Contract can apply to Mr J P FOWLER, Kimpton, or Mr F ELLEN, Auctioneer and Estate Agent, Andover

Sale of an Entire Herd of Shorthorns, Sheep, &c.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on TUESDAY, June 7, at Roswell, near Chelmsford, the entire HERD of pure bred SHORTHORN CATTLE, belonging to Mr W Tippler It numbers about 50 Head, and has been bred for several years from well known stocks, originally obtained from several of the best Herds in the North of England. Some of the animals have been successfully exhibited at the County Shows, and last year the Bull Duke (25,924), now in service, carried off the First Prize at Chelmsford. They will be offered, a few pure bred SOUTHDOWN RAMS, descended from the Babraham Flock, and some BERKSHIRE PIGS

Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, or at the Farm

Mere Old Hall, Knutsford.

IMPORTANT SALE of First-class SHORTHORNS, SHROPSHIRE SHEEP, PIGS, &c.

MR. STRAFFORD has received instructions from D. R. Davies, Esq., to SELL by AUCTION, without reserve, on WEDNESDAY, July 13 next, at Mere Old Hall, his entire HERD of First-class SHORTHORNS, consisting of about 50 head of Bulls, Cows, and Heifers, including the far-famed Cow "Moss Rose," with her daughter "Moss Rose 2d," as well as her son "Royal Chester," and several other Bulls of the Warlaby and Levington sort, whilst the Sires lately used have been principally of that renowned blood.

After which, Messrs. LYTHALL AND CLARKE will SELL some prime RAMS and EWES, from Mr. Davies' famed Flock of Shropshire Sheep, which has been selected at great cost, and bred with care from the best blood in the country.

Also will be SOLD, some very superior PIGS of the White Breed, reared from the best sources.

Catalogues, with Pedigrees, and other particulars, may be had on application to Mr. STRAFFORD, 13, Euston Square, London; or of Mr. CHORLTON, the Bailiff, at the Bucklow Hill Farm, Knutsford, Cheshire.

Shardeloes, Amersham, Bucks.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without reserve, on FRIDAY, July 15 next, at Shardeloes, about FIFTY HEAD of very superior SHORTHORNS, the property of Thomas Tyrwhitt Drake, Esq., consisting mostly of Young Cows and Heifers that have been long and carefully bred from the famed Herds of the late Captain Duke, Maxsalse Cholly, Rev. P Thursby, Abingdon Rectory, and of Mr W Torr, Aylesby. The sires first used were of the famed Knightley sort, such as St. Patrick (12,948), and Seapullary (15,241), followed by Jonal Hope (17,848), from Aylesby; Lord Lieutenant (17,467), from Bushey Grove; and Wizard (15,498), from Shobrooke Lodge: the latter is now in service, and included in the Sale

Catalogues, with Pedigrees, may be had of Mr. STRAFFORD, 13, Euston Square, London; or of Mr. WINFIELD, the Bailiff, a Shardeloes, Amersham, Bucks

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION for the RELIEF of DECAYED FARMERS, their WIDOWS and ORPHANS.

Patron—HER MAJESTY THE QUEEN

President—HIS GRACE THE DUKE OF RICHMOND.

Allowances to Pensioners.

Married	£40 per annum.
Male	£26 "
Widows and unmarried Orphan Daughters	£20 "

Every information to be had of the Secretary, by whom Subscriptions and Donations will be thankfully rece ved

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The TENTH ANNIVERSARY FESTIVAL, in AID of the FUNDS of the INSTITUTION, will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 8, at 6 o'clock. The Right Hon. Lord LYTTON in the Chair.

Dinner Tickets, 21s.; Ladies' Tickets, 5s.; to be had of the Stewards of the Secretary, at the Office of the Institution; and at Willis's Rooms.

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The ANNUAL ELECTION of PENSIONERS and CHILDREN will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 22, at 11 30 A.M.

All Subscriptions shall be deemed payable on January 1 in each year; and no Contributor shall Vote while the same is in arrear.

No. 55, Charing Cross, London, S.W. C. BOUSFIELD SHAW, Secretary.

HIGHLAND and AGRICULTURAL SOCIETY. DUMFRIES SHOW, JULY 26, 27, 28, and 29

ENTRIES CLOSE on JUNE 15.

Premium Lists and Certificates may be obtained on application to FLETCHER JOHNSTON MENZIES, Esq., Secretary. 3, George IV. Bridge, Edinburgh.

LINCOLNSHIRE AGRICULTURAL SOCIETY. SLEAFORD EXHIBITION, JULY 27, 28, and 29.

The PRIZES offered amount to ONE THOUSAND FIVE HUNDRED and SIXTY POUNDS and upwards. ENTRIES CLOSE JUNE 27. Prize Lists, Forms of Entry, &c., may be had on application to STEPHEN UPTON, Secretary. St. Benedict's Square, Lincoln.—May 6

BATH and WEST of ENGLAND SOCIETY (Established 1777), and SOUTHERN COUNTIES ASSOCIATION

President—The Right Hon Sir S. H. NORTHCOTE, Bart, C B, M P.

GREAT EXHIBITION of STOCK, POULTRY, IMPLEMENTS, WORKS of ART, and HORTICULTURAL SPECIMENS, at TAUNTON, on JUNE 6, 7, 8, 9, and 10.

JOSIAH GOODWIN, Secretary

Bath and West of England Society and Southern Counties Association.

THE GARDENERS' CHRONICLE AND AGRICULTURAL GAZETTE, for JUNE 11, will contain a FULL REPORT of the above MEETING.

A Single Copy sent free by post on receipt of 6 stamps.

Office, 41, Wellington Street, Strand, London, W.C.

The Agricultural Gazette.

SATURDAY, JUNE 4, 1870.

MEETINGS FOR THE ENSUING WEEK.

June 6 to 10 { Annual Meeting of the Southern Counties and Bath and West of England Agricultural Society, at Taunton

June 6 to 10—Horse Show at Agricultural Hall, Islington.

THE great annual meeting of the SOUTHERN COUNTIES' AND BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY will open on Monday at Taunton, which it revisits after an interval of 18 years: and with this meeting may be said to begin the great displays of English agriculture, of which the summer months are full.

The authorities of the Society may well be satisfied if we shall next week be able to congratulate them upon a spirit and energy only equal to that displayed by their predecessors in 1852; but they and we, and every other person, would be wofully disappointed if we should not be able to chronicle a wonderful advance in the result of whatever effort they may make. Even so early as 1852 no fewer than 50 implement makers contributed their manufactures to the show. The cattle were arranged in two main classes, namely, Devons and "other pure breeds;" but these, as it happened, were all confined to Shorthorns, of which 26 were shown. Nearly 100 lots of sheep were exhibited, and 58 lots of pigs and a few horses.

It is, however, to the 60 Devons and the 26 of "other pure breeds" at Taunton in 1852 that we especially direct attention. What will be the relative number of these two classes at the show in 1870? It is a very crucial test by which to measure the progress of a breed, to see how it stands at intervals of time in the very home of any of its rivals. No doubt "other pure breeds' will next week mean something more than those words did 18 years ago. Then it included Short-

horns only. The Society belongs, however, now to the Southern Counties as well as to the West of England; and Herefords and Sussex cattle will no doubt be exhibited at Taunton. But we shall probably not err very materially if we should rest our opinion of the Shorthorns as now, more than ever, the dominant breed of cattle in this country, upon the exhibition which is made of it in 1870, as compared with that in 1852 in the very home of the Devon.

We do not, however, need to let our opinion on this subject rest on this alone. The wonderful list of sales which we have had to report this spring gives extraordinary testimony to the increasing estimation in which pure Shorthorn blood is held. Higher averages than have ever before been quoted are obtained by almost every breeder of any note; and when any herd, long known for the purity of its descent, comes under the hammer of the auctioneer, the prices realised, considering the numbers of such sales which are being advertised, are wonderful.

Here, too, an illustration may be drawn from the fortunes of an exhibition of another kind after an interval of time. Ten years ago *Sweetheart 3d*, a cow calved in 1853, and therefore seven years old in 1860, was bought by Mr. MURTON TRACEY, at Mr. ADKINS' sale at Milcote, near Stratford-on-Avon, where 31 of her relatives averaged £69 a-piece. She had already had four calves, and till lately she, now 17 years old, and no fewer than 37 descendants in Mr. TRACEY's hands, have been bred in the Edenbridge herd.

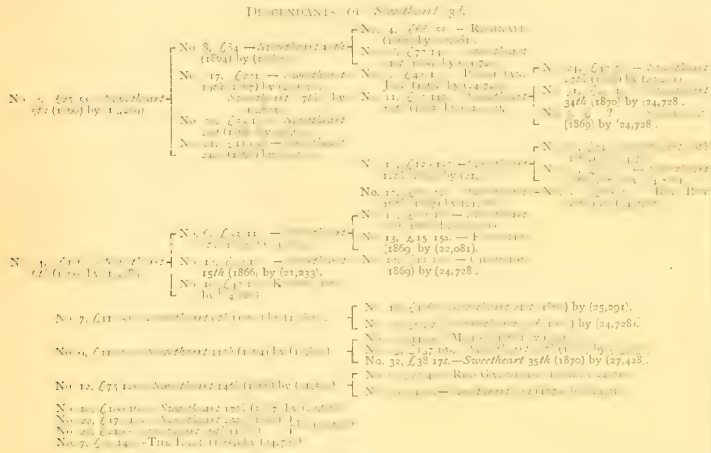

Her 37 descendants were sold the other day—28 females, averaging £96 11*s.* 8*d.* each, and nine males, averaging £35 4*s.* 8*d.* In the above Table we give in four successive columns the descendants of which she was dam, grand-dam, g.g. dam, and g.g.g. dam respectively. The names of cows are printed in italics, and of bulls in small capitals; the dates of birth, and the prices realised are also given; and we challenge the champion of any other breed—say Mr. DUCKHAM, the champion of the Herefords (to whom we owe an apology for having so long mislaid a former letter with which he favoured us, criticising conclusions regarding the Shorthorn breed at which we had arrived)—to bring forward any example of value, quality, fecundity of live stock, which shall tell with anything like the force of this in favour of any other breed than Shorthorns.

THE tendency of our civilisation has been to enlarge the towns at the expense of the country, and to produce food with less labour, so that a smaller number may feed on our fields and a larger number be fed by them. Coal and steam on large farms are to some extent a substitute for men, and have promoted economy and facilitated the change which has occurred in the distribution of the population, but we believe that the popular expectation of continued agricultural improvement in the same direction is exaggerated. Our own opinion is that a more productive system of agriculture, when realised, will necessarily be accompanied by an increase in the agricultural population. The necessity for saving labour appears to have introduced a cheap rather than a productive system of agriculture. Half the country lies still in pasture, and although the growth of corn has considerably diminished in the last 20 years, the production of meat is still far below the capabilities of the soil, and inadequate to the wants of the people. Notwithstanding the settled high price of meat, farmers find that it does not pay to manufacture it rapidly, if we may use the expression, by artificial means; they are compelled to leave a large portion of the process to Nature, relying on pasturage and on the grasses under rotation—on crops, in short, which yield little, but at the same time cost little. Expense is saved at the cost of time, and in the ordinary rotation on arable land, the land is economically manured by those crops which are subordinate to corn—rotations are devised, in fact, to distribute the labour and manure of a farm with economy. Success in farming depends very much on the adoption of a skilful rotation, but the necessity for a nice adjustment of a succession of crops, for the mere purpose of manuring, is a great defect arising from the lamentable waste of the manure resources of the country and the dearness of artificial substitutes. If the nation were economical in the direction indicated in the recent report of the Rivers Pollution Commission, the rotations throughout the country would be greatly modified, and agriculture would become far more productive both of corn and meat. Farming would then, to some extent, approximate to market gardening. At all events, when the land is better fed it will yield more, and not before. Agriculture is a vegetative not a mechanical art! And even by-and-by, in the good time coming, though we expect much from steam, we expect more from men; and the population of farms will necessarily be increased when the crops are augmented.

An ox, or five or six sheep, will gnaw off all that grows on an acre of Grass between April and October, and no labour is expended in the process. But the same acre, well manured, would produce 30 tons of roots, which would feed at least five oxen for six months better than the Grass had fed one ox for five months. Whatever aid we may obtain from mechanical appliances, the acre of arable, and the five oxen, and next year's crop of Wheat will employ a considerable amount of labour. Generally speaking, it appears the country has found the cheap system more profitable than the other, in spite of the improvement of mechanics. But when the land is fertilised by means of the waste of towns, the cost of growing a ton of roots or a quarter of Wheat will be reduced, and there will be a reaction in favour of arable cultivation, with great advantage to the country.

We have endeavoured to place the question of agricultural production on a broader basis than that of the relative size of farms. We have no apprehension of the *morcellement* of the land of this country; nor, on the other hand, do we share the excessive admiration which some have felt for exclusively large holdings. These questions will find their natural level with the gradual development of agriculture. Large farms will no doubt hold their ground to a great extent, but probably there are certain details in practical cultivation—certain small strokes of economy, which little farmers manage best.

The steam-engine is the giant ally of capital; its tall chimney is reared near the abode of the wealthy agriculturist, and is the landmark of large farms; but let us hope that the honest industry and patient toil, and the thrift and independence of the little farmer may always exist among the varieties of rural life, and may find their sphere on a fair number of homesteads, and that a certain proportion of small occupations may still survive and flourish, just as the village forge remains in spite of the great workshops. We have not a word to say against the principle of division of labour, but, after all, on land there is no labour so cheap as manual labour well bestowed—no cultivation so profitable and productive as that by the spade, and no spade half so industrious as that of the little farmer and his sons.

Steam has been the friend and teacher of the poor when it has lightened their toils and caused a demand for skilled labour; but there are limits to the success and extension of steam as an economical power, and we rejoice to believe, therefore, that the operation of the laws of commercial economy may not continue to diminish the number of the rural population, already relatively smaller in this country than in any other. Putting aside the question of economy for a moment, we prefer to see the exercise of the force that dwells in the human breast and swells the muscles of men rather than that of mere mechanical power, bound within the iron ribs of a steam-engine. We hope to witness the progress in number and character of the rural population, which is the healthiest, and we believe we may add the happiest, of all classes of the community, and which, in all countries, has been an anchor in stormy times.

There is reason to hope that these desires will be realised, if, as we have endeavoured to show, the future progress of agriculture is dependent less on the further economy of manual labour and better husbanding of the means now at the farmer's disposal, than on an increase of those means, securing the increased fertility of the soil by feeding it with what is now wasted.

—— A short supply of English Wheat at Mark Lane on Monday brought an advance of 1*s.* to 2*s.* per qr. on the prices of the previous week, and trade was firm again on Wednesday.—— In the Metropolitan Cattle Market on Monday, notwithstanding a large supply of both cattle and sheep, prices had an upward tendency. On Thursday an excessive supply induced a duller market; much stock remained unsold, and prices were lower.

—— The seventh annual Metropolitan Horse Show is this day opened at the Agricultural Hall, Islington. The entries include contributions from many fine studs, including those of Baron ROTHSCHILD and Mr. BLENKIRON. There is a good show of pony stallions, and a large show of hunters and harness horses. The show will continue open during next week, until Friday evening, June 10.

—— The Irish Land Bill was read a third time and passed through the House of Commons on Monday evening last, after a speech from Mr. GLADSTONE, in which he declared the principle of the Bill, as a rule, to be to leave freedom of contract, it being only with respect to particular matters in the third clause that it is interfered with. "By any contract made by any tenant from the day the Bill receives the Royal assent to pay any rent whatsoever, reasonable or unreasonable, he will be absolutely bound," said Mr. GLADSTONE, "and he will not be able to escape from the obligation." The following is an abridged report of the Premier's speech:—

"It has been charged that this is a one-sided Bill—against the landlord and in favour of the tenant, but I will just point out this fact, that for generations and centuries legislation has been almost entirely in favour of the landlord. What has been the result? What is the position of the landlord in regard to security of life, security of property, and in regard to the price which his estate will fetch in the market? And when we find the result has been what it is of the adoption of the too one-sided policy pursued by Parliament in former generations, can you not bring yourselves to admit that legislation in favour of the tenant for the purpose of securing to him the fruits of his industry may turn out to be one of the surest methods of legislating in favour of the landlord? In framing this measure we deliberately and advisedly declined to meet the popular demands in Ireland. There was a demand widely spread that the Ulster custom should be recognised as the universal land law of Ireland. To that demand we declined to accede. Another demand which went through the whole of Ireland was one for the valuation of rents and for fixity of tenure, and there are those who say that valuation of rents is involved in the Bill as it stands. Now, that is true up to a certain point, where the Ulster custom prevails, but that question does not stand on the ground of conventional legislation, but on recognised rights already in existence. I contend that the principle of the third clause, establishing damages

for eviction, is entirely different from the principle of the valuation of rents. It places a burden, I admit, on the landlord who evicts without a cause, but that burden is limited and cannot go beyond a certain point. A valuation of rents would fix the absolute amount of rent that should be paid : the amount under the Bill is left wholly free, and the fine or burden that may be levied on the landlord is confined within the limit of a certain maximum. We advisedly declined to accede to those popular demands, and having brought in a Bill founded upon a distinct and much more limited basis, we have presented it to the House after an amount of labour on our part such as in the course of a long political life I have never known bestowed on the preparation of a Bill ; and I must add, entirely agreeing in the main upon this point with the right hon. gentleman, that the House of Commons, which has spent 22 or 23 nights in the discussion of the Bill, has bestowed on it an amount of care, attention, and time for which there are but few precedents. Referring to the objections still entertained to the provisions of the Bill, I put this question—and I found myself on the conduct of the Irish landlords in this House for the opinion I entertain :—Suppose we could gather the Irish landlords in a mass and obtain from them honestly their judgment whether they would prefer the Bill, on the one hand, as it stands, or, on the other, the state and prospects of Ireland were the Bill to be rejected or to be mutilated in a manner to insure its rejection, and we were to put to these Irish landlords this categorical question, 'Will you take it as it is, or will you have it lost?' I may be wrong, but my firm conviction is that the cry of these landlords would be, 'Let the Bill pass into law.'"

—— On Friday last Lord E. CECIL moved a resolution calling on the Government to deal as early as possible with the defective state of the law for punishing the use of false weights and measures and the adulteration of food and drink. He suggested that inspectors should be appointed by the local authorities, with an appeal to a central analyst, and, above all, though he would not revert to the strict letter of the sharp and severe punishments of our ancestors, of which he read some striking examples from the *Liber Albus*, he was for giving the fullest effect to the spirit of them—publicity.—Mr. T. HUGHES agreed with Lord E. CECIL as to the deterrent effects of publicity, and suggested that the names of the offenders should be placarded on what he called "Rogues' Boards."—Mr. BRUCE admitted that the law, both as to adulteration and short weights, was full of defects capable of removal by legislation. But he was not very sanguine about the power of even the strongest Government to deal with them, for "independent memberdom" would assert itself at once if a proposal were made to cover the country with an army of inspectors and analysts.—Mr. MUNTZ narrated some startling instances of the extent to which adulteration is carried, and included both practices in the sweeping condemnation that "we are all plundered, and two-thirds of us poisoned" by dishonest tradesmen.—Mr. BASS was obstinately incredulous on the practice of adulterating beer, and treated as a good joke the notion of "cocculus indicus" or the "New River" entering to any extent into its composition ; and Lord E. CECIL withdrew his motion.—In reference to the speech of Mr. BASS, Mr. SMEE has since written to the *Times*, stating that an examination of 12 different samples, obtained from London beerhouses, led him to believe that beer is very generally salted and watered, but not adulterated with any deleterious or poisonous ingredients.

—— The question of game licences and gun licences has been reconsidered. At present and up to this time no tax was payable on carrying a gun, unless the gun were carried in pursuit of game. In that case the sportsman paid to the Revenue a duty of £3 a year for the enjoyment of the privilege. The CHANCELLOR of the EXCHEQUER proposed in the original scheme to abolish this special impost and to substitute for it a general tax of £1, payable on carrying a gun or other firearm for any purpose whatsoever. On Monday evening, however, he announced that the proposal in that shape would not be pressed. The game licence is not to be abolished, but continued, only with this indulgence, that it will include the gun licence, so that whoever is licensed to kill game will be licensed also by the same warrant to carry firearms. Supposing the licence taken out for not killing game, but only for carrying a gun, the tax of £1 is still proposed.

—— At a recent meeting of the Cirencester Chamber of Agriculture, Professor MCBRIDE read a valuable paper on the Prevention of Cattle Disease, to which we hope hereafter to give publicity. The following is an instructive passage in the conversation which ensued upon the lecture :—Mr. BOWLY said : We know what restrictive measures have done—we saw their efficacy during the time of the cattle plague, for whilst there were restrictive measures the foot-and-mouth disease and pleuro-pneumonia almost disappeared. I am sure I should be glad to do anything I can to strengthen our Members' hands, and to obtain restrictive measures. Mr. MCBRIDE : We have about 12 agriculturists present representing the Cirencester Agricultural Chamber on such an important subject as cattle disease—how can they expect Government to take an interest in it, when they do not take an interest in their own affairs !

—— We have received from the publishers, Messrs. J. SMULDERS & Co., of the Hague, a copy of a wall map of the Netherlands, by Dr. W. C. H. STARING, in which, along with complete geographical and topographical detail, there is given what is virtually a picture of the soils and agriculture of that country. We should be glad to see a map of England on a similar scale, drawn up upon a scheme equally elaborate and detailed, giving the character of the soil and cultivation, and enabling anyone at a glance to learn the agricultural character and circumstances of any locality on which information might be desired. We have not sufficient acquaintance with the Netherlands to give any opinion of the accuracy of the agricultural picture of that country which the map presents. We are, however, certain that a scheme so complete and well-devised has been worked out here with all the care which its elaborate character required.

OUR LIVE STOCK.

THE late Mr. Adcock's herd of Shorthorns was sold by Mr. Thornton on the 24th ult. A large company, among whom were many well known Shorthorn breeders, assembled to witness the dispersion of the herd. The average realised over the 47 animals disposed of was £49 3*s.* ; that of the 35 females was £50 6*s.* 10*d.*, while the 12 bulls made £45 13*s.* 6*d.* each. The total proceeds of the sale amounted to £2310. The highest price, 145 gs., was given by Mr. C. C. Dormer for 12TH DUKE OF OXFORD (19,633), now nearly eight years old, and bred by the Duke of Devonshire at Holker. He was purchased in 1864 for the sum of 210 gs. *Charmer 2d* was bought by the same gentleman for 100 gs. ; *Catalani*, of the Charmer tribe, was purchased by Mr. Purkis for 55 gs., and her daughter, by the 12TH DUKE OF OXFORD, became the property of Mr. H. J. Sheldon for 100 gs. *Lady Knightley 2d*, by GRAND DUKE 4TH, was knocked down at 140 gs. to Mr. Sartoris ; while other two *Lady Knightleys*, both by 12TH DUKE OF OXFORD but with a previous cross of 6TH DUKE OF AIRDRIE, made respectively 30 and 46 gs. 2D DUKE OF WATERLOO, by LORD LALLY and out of *Waterloo 28th*, who was sold at the first Didmarton sale for 270 gs., was purchased by Mr. Tippler at the modest figure of 36 gs. We subjoin a complete list of the prices realized.

Name of Animal	When Calved.	Price.	Purchaser.
Cows and Heifers		Gs.	
Miss Bates	1862	57	Mr. Sartoris.
Adeline	1859	61	Mr. R. Blackwell.
Twilight 4th	1866	28	Mr. T. Pashler.
Pattern	1864	31	Mr. W. Strickland.
Fairy Queen	1866	41	Mr. J. H. Blundell.
Heartsease	1861	80	Mr. C. C. Dormer.
Pearly	1864	45	Mr. J. W. Larking.
Fancy 15th	1864	50	Mr. O. Wallis.
Charmer 2d	1865	100	Mr. C. C. Dormer.
Catalani	1868	55	Mr. T. Purkis.
Lady Knightley	1866	68	Mr. J. W. Larking.
Bonny Orphal	1865	41	Mr. G. Curtler.
Velvet	1869	51	Mr. J. Gross.
Fancy Orphal	1867	50	Mr. W. Strickland.
Duchess of Oxford ..	1866	54	Mr. B. Baxter.
Lady Knightley	1867	140	Mr. F. Sartoris.
Lady Essex 2d	1867	128	Mr. S. Burchnall.
Miss Barrington	1866	99	Mr. J. P. Porter.
Victoria	1868	43	Capt. F. M. Eden, for Duke of Bedford.
Clara	1862	100	Mr. H. J. Sheldon
Fairy Oxford 2d	1868	47	Capt. F. M. Eden.
Heiress	1868	50	Mr. G. Graham.
Adeline 2d	1867	72	Mr. H. J. Sheldon.
Lady Knightley 3d ..	1868	44	Capt. F. M. Eden.
Empress	1868	32	Mr. B. Baxter.
Countess Spencer	Mar., 1869	35	Capt. F. M. Eden.
Lucilla	May, 1869	18	Mr. W. Cox.
Lucetta	May, 1869	17	Mr. H. Robinson.
Jessica	July, 1869	17	Mr. J. Hawley.
Lady Knightley 4th ..	May, 1870	46	Mr. A. W. Winnell.
Bonny Waterloo	Oct., 1869	41	Mr. F. Wythes.
Fancy	Oct., 1869	22	Mr. B. Baxter.
Graceful	Mar., 1870	27	Mr. Bence Tomlinson.
Lucinda Lass	March, 1870	17	Mr. R. Wood.
Pet Maid	April, 1870	20	Mr. W. Woodhouse.
White Lily	1865	28	Captain Welton.
Paddington Lass	1867	34	Mr. D. N. Brown.
Tiny	1868	21	Captain Welton.
Bulls.			
12TH DUKE OF OXFORD (19,633)	1862	145	Mr. C. C. Dormer.
2D DUKE OF WATERLOO (13,800)	1865	36	Mr. W. Tippler
BARON GENEVA (25,568) ..	1866	79	Mr. A. S. Blacklaw.
OXFORD BARRINGTON ..	Jan., 1869	41	Mr. J. Johnson.
DUKE OF NORTHUMBERLAND ..	Mar., 1869	36	Mr. W. H. Jervis.
FAWSLEY OXFORD 2D ..	Mar., 1869	50	Captain Welton.
BARON RUSSELL	Sept., 1869	32	Mr. J. Gadsby.
EARL OF OXFORD	Oct., 1869	30	Mr. H. Woods.
EARL OF WATERLOO	Feb., 1870	29	Mr. W. George.
DUKE OF THORNDALE ..	Mar., 1869	29	Mr. W. H. Walker.
BARON WELLINGTON	Mar., 1870	25	Mr. J. Woodward.
BARON FARNDISH	Mar., 1870	17	Lord St. John.
BULL CALF	Mar., 1870	7	Captain Welton.

—— We have received a copy of the Mere Old Hall catalogue, just issued by Mr. Strafford. The entire herd, so long associated with the name of Mr. D. R. Davies, will be disposed of on the 13th of next month. The catalogue contains the names of 31 cows and heifers and 14 bulls. As we cannot to-day give the necessary space for an account of this herd, we shall defer our further remarks.

—— Next Tuesday Mr. Thornton will sell 42 Shorthorns, the property of Mr. Wm. Tippler, at Roxwell, near Chelmsford. Reference to the catalogue shows us that many of the animals trace back to the herds of Messrs. Chrisp and Angus, of Northumberland ; Messrs. Harrison, of Lindrick and Greta Bridge, Yorkshire ; and Messrs. Rose and Burgess, of Nottinghamshire. These tribes, brought into the county of Essex many years ago, have since been crossed with good bulls descended from fashionable strains of blood, and when in the possession of Messrs. Bramston & Christy were most successfully exhibited at the county shows. The sires lately used have been PILOT (22,519), a son of Mr. Adkins' COMEDIAN, from a cow of Earl Spencer's blood ; GAY LAD (24,012), by a son of the celebrated bull 3D DUKE OF THORNDALE, and DUKE, winner of the 1st prize at the Essex County Show last year, a son of Mr. Oliver's SINECURE, who was by the famous GRAND DUKE 3D. The young stock are chiefly by this bull and LORD GREY, whose sire, THE PRESIDENT, won the 1st prize at the County Show in 1867, and was out of the prize cow *Princess Mary of Cambridge*.

—— The well known herd of Devon cattle belonging to the late Mr. W. G. Nixey, of Upton Court, Slough, was disposed of by Mr. Thornton last week. Four bulls, 29 cows and heifers, and 29 fat steers and heifers were sold, and realised £1330. The highest price given was 81 gs. for a six months old heifer.

—— Last week LORD BLITHE (22,126), the sire of *Patricia*, recently sold by Mr. Booth to Messrs. Walcott & Campbell, of New York, was erroneously named LORD BLITTER.

POULTRY.

THE following is the list of prizes awarded at the Launceston Poultry Show on the 25th and 26th ult. :—

Dorkings, coloured—S. Trivethick ; 2d, Mrs. Wollocombe ; 3d, E. A. Smith.
Dorking, white—F. Packard ; 2d, E. Archer ; 3d, G. Climo.
Spanish—J. H. Nicholls ; 2d, W. Leach ; 3d, S. R. Harris.
Cochins—F. Brewer ; 2d, J. H. Nicholls ; 3d, W. L. Trewin.
Game, black, and other reds—J. H. Reynolds ; 2d, E. C. Pope ; 3d, S. R. Higham.
Game, any other variety—F. Angel ; 2d, J. Palmer ; 3d, G. Raddall.
Brahmas, light—P. D. Maddox ; 2d, Mrs. Wollocombe ; 3d, Mrs. Bradshaw.
Brahmas, dark—P. D. Maddox ; 2d, R. W. Beachey ; 3d, W. Curtain
Hamburghs, gold pencilled—H. Pickles, jun. ; 2d, N. Barter.
Hamburghs, silver pencilled—H. Pickles, jun. ; 2d, ditto.
Hamburghs, gold spangled—H. Pickles, jun. ; 2d, W. P. Bastard
Hamburghs, silver spangled—J. R. Harris ; 2d, H. Pickles, jun.
Polands—J. Beard ; 2d, H. Pickles, jun. ; 3d, T. Jacobs.
Barn-door or Cross Breed—Barrable ; 2d, J. B. Lyle ; 3d, ditto.
Bantams, game—J. Collacott ; 2d, S. R. Harris ; 3d, E. Burton.
Bantams, any other variety—N. Barter ; 2d, T. D. Wills.
French, any variety—E. A. Smith ; 2d, P. D. Maddox ; 3d, ditto.
Guinea Fowls—G. and W. E. Lobb ; 2d, J. Perry ; 3d, J. N. Jasper.

DUCKS.

Aylesbury—S. R. Harris ; 2d, T. E. Hawken ; 3d, E. A. Smith.
Any other variety—S. Vinnecombe ; 2d, D. Brent, 3d, E. Burton.

GEESE.

1st, S. Longman ; 2d, H. Harris.

TURKEYS.

1st, Mrs. A. Thynne ; 2d, J. Nicholls ; 3d, T. S. Golding.

PIGEONS.

Carriers—J. P. Bolt ; 2d, H. Yardley.
Pouters—H. Yardley ; 2d, J. P. Bolt.
Tumblers—T. Pryor, jun. ; 2d, T. Chudley, jun.
Fantails—H. Yardley ; 2d, F. A. Pearce.
Any other variety—H. Yardley ; 2d, G. Hicks.

RABBITS.

Lop-eared—C. Leat ; 2d, W. H. Hoskin.
Any other variety—J. B. Parsons ; 2d, J. Williams.

MR. LAWES ON UNEXHAUSTED IMPROVEMENTS.

YOUR correspondent, Mr. Smith, of Woolston, does not represent the proposals put forward in my paper correctly when he says that if a tenant had taken a farm in low condition, and by clean farming and the aid of manures, artificial or otherwise, had greatly increased its productiveness, "all Mr. Lawes would give him for his improvements was the eating value of a year's straw." If Mr. Smith will read my paper, he will see that I proposed the valuation of two other items, as well as a year's straw. I said :—"The three items upon which I would rely as the basis of a valuation in favour of the outgoing tenant are,—the farmyard manure made during the last year of the occupancy ; the manure from purchased food which has not grown a crop ; and the straw of the corn-crops of the last harvest." I will endeavour to show, as briefly as possible, by way of example, how the rules supposed would operate in a particular case. Let us suppose a farm of 400 acres, cultivated on the four-course system ; that the tenant enters upon it in a low condition ; that after years of clean farming, and the liberal use of purchased food and manures, he leaves it in a high condition ; and that, accordingly, it yielded at the time of entry, and the time of giving up, respectively, the following average amounts of produce :—

	Average produce per acre.	
	On entry.	On leaving.
100 acres roots	6 tons.	12 tons.
100 acres Barley	28 bushels.	42 bushels.
100 acres hay	1 ton	2 tons.
100 acres Wheat	24 bushels.	36 bushels.

It will be unnecessary to complicate the subject by taking into account the Oats consumed by the horses, as the amount of manure produced from them would be not be materially different in the two cases ; and for the

sake of simplicity also, the same proportion of straw to corn may be assumed on entry and on leaving, though it would probably be higher under the improved condition. Let it be assumed, then, that in each case half the roots are consumed in the yards; that previous to entry no purchased food had been employed; that during the last year of the occupancy 20 tons of decorticated cotton-seed cake were used; that for every bushel of Wheat (of 60 lb.) there was an average of 100 lb. of straw, and for every bushel of Barley (of 52 lb.) an average of 62½ lb. of straw. Adopting these data, the following are the amounts of straw, and the estimated amounts of dung, entered upon and left, respectively; and the value of the difference between the two, together with a proportion of the manure-value of the purchased cake, will represent the compensation to be received by the outgoing tenant for his improvements. First, as to the straw, we have—

	Wheat-straw.	Barley-straw.	Total straw	Value at 15s. per ton
	Tons.	Tons.	Tons.	£ s. d.
On entry	107	78	185	138 15 0
On leaving	160½	117	277½	208 2 6
Difference ..	53½	39	92½	69 7 6

Reckoning the same amounts of straw as above assumed on entry to have been converted into manure during the season previous to entry, and again, the same amounts as assumed on leaving to have been converted into manure during the season previous to leaving, with, in each case, the consumption of roots and hay as above supposed, the amounts of manure, calculated according to carefully considered data, would be about as follows :—

	Fresh Dung.	Value at 5s. per ton.
	Tons.	£ s. d.
On entry	649	162 5 0
On leaving	1069	267 5 0
Difference ..	420	105 0 0

Lastly, the estimated money value of the manure obtained by the consumption of 1 ton of decorticated cotton-seed cake is £6 10s. 0d.; and allowing the outgoing tenant two-thirds of this (£4 6s. 8d.), we have, on 20 tons cotton-cake (at £4 6s. 8d.), £86 13s. 4d.

The outgoing tenant would, therefore, according to the above estimates, receive as compensation for his unexhausted improvements the following amounts, beyond what he paid for on entry :—

On straw	£69 7 6
On dung	105 0 0
On purchased food consumed ..	86 13 4
Total	£261 0 10

Whether the above amount would, or would not, be adequate compensation, may be a question fairly open to discussion; but it is very different from that which would result from simply allowing "the eating value of a year's straw," which Mr. Smith says "is the sum and substance of Mr. Lawes' paper." In conclusion, I wish it to be clearly understood that I do not at all insist upon the general applicability of the exact amounts of 15s. per ton for the consuming value of straw, and 5s. per ton for fresh dung, which I have adopted for the purpose of illustration in the above estimates. All I contend for is, the principle of valuation which I have proposed; being convinced that valuations so made would rest upon a basis of much more easily ascertainable, and much more trustworthy, facts, than would any estimates of the value of the unexhausted residue of manures which have been applied to the land and have already yielded a crop. *John Bennet Lawes, Rothamsted, Herts, May 25.*

ON THE BREEDING OF SHORT-HORNS.

[Mr. Willoughby Wood has addressed the following letter to *Bell's Weekly Messenger* :—]

IT is nearly twenty years since I began to advocate in your columns the claims of pedigree to the attention of practical farmers. At that time pure breeds of domestic animals were in the hands of comparatively few men. With some of these the cultivation of blood was a profitable monopoly, while with others it was a speculation, in which only the wealthy could indulge with impunity. The ordinary farmer, whose cattle were reared for feeding or for dairy purposes, regarded animals with pedigrees as "fancy stock," with which he had as little concern as with a prize Tulip or Carnation. In the exceptional case of one who gave a liberal price for a well-bred bull, the neighbours shook their heads, and hoped such extravagance might not be his ruin. But the rapid advance which about that time took place in the price of stock caused attention to be turned to rearing animals of an improved character. The demand for the better qualities raised their prices so greatly in proportion to that of inferior kinds, as to render the breeding of the former an object well worthy of the study of agriculturists. I pointed out that the best means of effecting the improvement of stock at a reasonable cost was by the purchase of pure-bred Shorthorn bulls, to be used with the ordinary cows of the district. The effect on the offspring is so decisive that the steers or heifers of such a cross may be taken as worth some 5*l.* a-head more than if they had been by a mongrel bull. Some of the finest animals ever exhibited have been the result of a cross between a Shorthorn bull with a cow either of another pure breed, or of an ordinary dairy cow. Thus any farmer, owning a herd of cows, possesses the means of improving his stock almost indefinitely, by the purchase of Shorthorn bulls. Gradually men have become convinced that this small outlay yields a return of profit which is not exceeded by any other agricultural investment. Thus a demand for pure-bred bulls has been steadily growing on the part of men who breed for practical purposes, and who, not expecting to sell their stock for fancy prices, looked for their profits to the butcher or the dairyman. Such purchasers have no preference for one strain of blood over another. All that they require of a bull is that he should be the sire of heavy thriving steers, and of large good-looking heifers. They are careless of showyard honours, except those of Islington, Birmingham, or wherever else quantity and quality of beef is held to be the sole criterion of merit. There can be no doubt that such a demand as this, is the only solid foundation on which a pure breed can rest. Is it a fact that the offspring of pure Shorthorn bulls attain heavier weights at an earlier age than the offspring of ordinary bulls? Then the demand for the former must continue and extend. If, on the other hand it should ever be found that the introduction of pure blood, so far from insuring size and early maturity, was the means of introducing light flesh, weak constitutions, and dwindling frames, then the days of the Shorthorns would be numbered. They would pass away and be forgotten, as has been the case with breeds once as fashionable, but which ultimately failed to satisfy the practical requirements of the time.

No one who has read what I have written during the last 20 years on the subject of breeding will accuse me of depreciating the importance of pedigree. That my views are unchanged is evinced by the two articles which appeared in the *Agricultural Gazette*, in which I advocated the expediency of placing the pedigrees of animals exhibited at the Royal and other shows of store stock before the breeders, as one element necessary to arrive at a sound decision. I think that where there are two animals, for example, of equal merit in other respects, the judges ought to give the preference to the one whose pedigree contains the more valuable materials. And I am sure that no risk ought to be incurred of awarding a prize when the pedigree is below a certain standard. These views have met with support from several breeders of experience and reputation. But a friend of mine, who is one of the first living authorities in such matters, takes the opposite view. I am not at liberty to give his name. I will, instead of quoting his words, endeavour to convey the substance of his ideas on this question. "Let the judges award the prize to the best animal in the class regardless of pedigree. If pedigree is worth anything, it ought to produce good animals; but if animals are bad, does the length of their pedigrees make them better? Breeders are too much the slaves of pedigree already; they give long prices for animals, not on account of their merits, but because they are Bates, Booth, or Knightley, according to their respective partialities. Hence a degree of close breeding, which must sooner or later injure our most fashionable lines of blood. Hence narrow chines, flat loins, and washy constitutions. The only rational plan is to follow the example of Charles Colling, and to breed from the best animals, whatever may be their pedigree. Unless breeders look more to merit, and less to names, the value of the Shorthorns will, it is to be feared, collapse, and their existence prove as short-lived as that of other breeds once equally celebrated, but which have perished out of sight, and almost out of memory." What will enthusiastic breeders say to this jeremiad? Which view is right and which wrong, or is it possible to reconcile them?

I will endeavour to answer the question impartially, holding the scales evenly between merit and pedigree. If we inquire who are the breeders who have attained the highest fame, and whose stock has been most eagerly sought after, and has realised the largest prices, we shall find that they have been those who adhered, as a rule, the most closely to their own blood. Charles Colling, for example, constantly bred from very near affinities, although at that early time he was frequently obliged to make his original selection from animals of whose pedigree he had less knowledge than would satisfy a breeder of the present day. In other words, he required a good animal to begin with, but being satisfied with his stock, he adhered to the same line of blood. Mr. Bates, in like manner, being convinced of the superior excellence of the Duchess family, adhered to the same plan, and continued to pile up the blood of HUBBACK, FAVOURITE, and *Comet*, as assiduously as his predecessor had done. It may be literally true, as stated by Baron Nathusius, that there is no example of any eminent breeder having adhered throughout his whole career to one strain of blood. And some writers have spoken of BELVEDERE as having been employed by Mr. Bates "to bring out" or to "make" the Duchesses. All, however, who knew that tribe previous to its alliance with BELVEDERE, must be aware that it repeatedly won premiums against competitors of the highest class; and although nominally belonging to another family, BELVEDERE inherits the blood of FAVOURITE to a greater extent if possible than the Duchesses. Space will not allow me to examine this subject in detail; but if any one will compare the pedigrees of the *Princess* and *Duchess* lines, he cannot fail to be struck with the similarity of their blood. In this important instance, therefore, Mr. Bates can scarcely be held to have deviated from his own strain.

The celebrated prize bull DUKE OF NORTHUMBERLAND (1940), which Mr. Bates refused to sell at any price, was by BELVEDERE (1706), dam *Duchess 34th* by BELVEDERE. Mr. Bates still continued in the same track by using him with the Duchess and other allied families. Here we arrive at that part of the career of this great breeder which will always prove more or less of an enigma, whatever view we take of it. It is difficult to imagine his motive, not for breeding from the *Matchem* cow, with her two recorded strains of pure blood, but for mingling her blood with that of the Duchess family, and in fact with his entire herd. However it may be accounted for, the fact remains that from this time he used her son, CLEVELAND LAD (3407), so generally, that a few years later no descendant of any of the families comprising his herd was to be found free from this alliance. We have evidence thus early of the intrinsic merits of these in the position which CLEVELAND LAD and the *Oxford Premier* cow held at the first show of the Royal Agricultural Society. And to prove that this was no exceptional merit, we have the fact of the distinguished favour with which the descendents of this tribe have ever since been regarded by the public. So far from the Duchess and the other families composing Mr. Bates' herd being injured by the alliance, they have fetched higher prices subsequently to its introduction than they did previously. Some years ago I ventured to express the opinion that Mr. Bates knew more respecting the breeding of the *Matchem* cow than he chose to make public; and that he would not have acted as he did, unless he had felt confidence in the purity of her blood. But, however this may be, all we have now to guide us in our judgment on the course pursued by this eminent breeder is the recorded pedigree of CLEVELAND LAD (3407). The son of a Duchess bull, his dam's sire, presuming it to have been by ST. ALBANS (1412), having no small share of the blood of Favourite, while his grand-dam being by a Princess bull, we have here evidence that even when Mr. Bates introduces fresh blood how carefully he sets to work. If, then, we do not greatly err in estimating the proportion of Duchess and Princess blood in CLEVELAND LAD to be about two-thirds, it appears that Mr. Bates deemed that one-third-of fresh blood afforded a sufficient change after generations of close breeding. Whether this course was the result of deliberate calculation, or of instinctive impulse, the result remains the same, that the Bates blood, in all its ramifications, not only maintains its ground in public favour, but year by year advances in popularity. The outlay made by American breeders at the sales of Lord Ducie, Mr. Bolden, and others, has been repaid with most liberal interest, and Englishmen are now buying back this blood at prices much in advance of what they were willing to give a dozen years ago.

Here, then, we have an example of a stock which, during some 50 or 60 years, has been practically bred from the closest affinities, without other change of blood than that involved in the introduction of the so-called Oxford family, in other words, of the bull CLEVELAND LAD, and of the offspring of his half-sister, the *Oxford Premium* cow. It may be taken, therefore, as established, that close breeding carried on with judgment, is not only not injurious to a herd, but is calculated to maintain those good qualities for which it was originally celebrated. On the other hand, it is a law of Nature that in no race can breeding from near affinities be continued for an indefinite period without sooner or later producing a tendency to sterility, or to degeneracy in size, or to some form or another of defective constitution. This law may probably be more tardy in its operation in some species than in others, as appears to be the case with cattle; but none can altogether escape its effects. The problem with breeders has always been this,—given a stock superior to all others, how to maintain its vigour and its fertility without impairing its characteristic merits? Fortunately, it is a problem which it is not impossible to solve. Mr. Darwin, in his great work,* which ought to be in the hands of every breeder, has accumulated an immense number of facts, not only from among domestic animals, but also among cultivated plants, tending to show that if a cross is wonderfully efficacious in restoring vigour to an exhausted stock, how small a change frequently suffices to confer this benefit. In this manner it is possible to guard against the ill effects of close breeding without sacrificing the benefits which our stock has derived from it. Referring my readers to chap. xxvi., vol. 2, of Mr. Darwin's book for facts of extreme interest on this subject, I must here confine myself to such instances of the foregoing principles as come within the ordinary experience of breeders.

There is a striking uniformity of practice common to nearly all whose herds have obtained the highest celebrity, such as Colling, Bates, the Booths, Lord Spencer, and Sir Charles Knightley. Adhering to the blood from which they started as closely as possible,

* "The Variations of Animals and Plants under Domestication."

rarely introducing a change, and even then admitting the minimum of foreign blood, they would then return to their original line. Such, I have shown, was the practice of Mr. Bates. Although I am less familiar with the pedigrees of Mr. Booth's herd, Mr. Carr informs us in his interesting history, that a similar course was pursued by that eminent breeder. Mr. Carr also remarks that on the rare occasions when a foreign alliance was admitted by Mr. Booth, the effect was seldom beneficial if the new blood was admitted "raw." For example, supposing a Bates bull were mated with a Booth cow, the offspring would probably be inferior to either; whereas good results would come out in another generation or two, after reverting to the original blood.

No breeder adhered more closely to the fine blood of his own herd than Sir Charles Knightley, and year by year its descendants advance in public favour, until they bid fair to rank not far behind those of the Kirklevington herd. So too the kindred blood cultivated by Mr. Adkins, surpassed in purity by none, admitted the alliance of *Accordion* (5708) with, I believe, the unanimous approbation of competent judges.

My space will only allow me, in conclusion, to contrast a few examples of the consequences of recklessly mixing blood, with the success which, as we have seen, attends perseverance in a line of proved excellence. At Mr. Packe's sale in 1868, several cows descended from Mr. Bates' Waterloo family, which had been crossed by Booth bulls, were disposed of at low prices, *War Cloud*, a 6-year-old cow with three Booth crosses, only reaching 32 gs. In the autumn of the same year, *Waterloo 28th*, a white cow, eight years old, of the same family, but with none but Bates bulls in her pedigree, realised 270 gs. at the Didmarton sale. The rapid increase in value, where the same strain of first-rate blood is judiciously persevered with, is also strikingly shown in the Kirklevington family. At Didmarton *Kirklevington 12th* made 380 gs., and at Siddington, Mr. Bolden obtained a larger sum for some of that tribe. In like manner the Barringtons have risen in public estimation, a two months old calf of that strain being sold at Mr. Slye's for 300 gs., and Capt. Oliver's *Lalage 4th* realising 450 gs. These are only a few among numberless instances in which several families of Bates blood have, during the last 20 years, advanced some hundred per cent. in value. On the other hand, that this value is not depreciated by a small admixture of other first-class strains, is proved by the continued favour with which those Bates lines are regarded with which Mr. Bolden mingled a certain proportion of Booth and Cherry blood. In like manner DUKE OF LANCASTER, with which I won the 1st prize at Birmingham, inherited through his sire a minute proportion of Booth blood. As he is no longer my property, I may say that both on this ground, and from his intrinsic qualities, I consider him a valuable mate for pure Bates cows.

What herds can boast of results like the foregoing in which blood has been made a secondary consideration, and in which showyard triumphs have been the main objects of their owners? We have seen herds whose winnings have accumulated in successive years to several thousand pounds, and yet, when brought to the hammer, they have realised but little over the market value of the animals of which they were composed. We have seen near relations of Christmas prize-winners which scarcely any one appeared inclined to buy. Perhaps the public in these matters sometimes runs too much into extremes. Perhaps fashion is allowed too much influence, while intrinsic merit has not sufficient weight: perhaps certain lines of sterling worth are unduly neglected. Still the superiority of the Shorthorn race over every other remains a proved fact, as has been strikingly brought out in the interesting articles which have lately appeared in the *Agricultural Gazette*, in which the weights of the several classes of steers exhibited at Smithfield during a series of years are carefully analysed. Referring my readers to the article of April 23, I cannot better conclude than by quoting its closing sentences:—"From this it is clear that the merit of the Shorthorn is equally prominent, whether we test it by a comparison of the prize animals of the same age and class, or as now, by the whole weight and aggregate age of all the animals of each breed exhibited. Who, then, shall dispute the claim of the Shorthorn to its position as 'the dominant breed?'" *Willoughby Wood, Holly Bank, May 5.*

FARM AGREEMENTS.

Artificial Manure and Tenant-Right.

MR. SMITH is not pleased with my criticism of his critique on Mr. Lawes' paper. He says I try to make it appear he is a kind of "dog in the manger," and that he is opposed to tenants using artificial manures. The letter which I criticised appeared in p. 577, and, to my judgment, the whole burthen of it was to point out to farmers that they ought not to use artificial manures unless they got paid by their landlords at the end of their take for the increased value of the farm over and above its value at their entry. Let us take some of Mr. Smith's own words.

"Here is Mr. Lawes taking up the cry of the old hound, the land agent, who, in every thing he does, tries to please his master who pays him."

"Now let us see how Mr. Lawes would compensate a man for increasing the production of straw and consuming it upon the land. For this 21 tons 2¼ cwt. produced (by artificial manuring) and consumed upon the land (in 13 years) Mr. Lawes would give the tenant the consuming value of the straw he leaves in excess of that he entered upon,—that is, they are to have the eating value of a year's straw at leaving, if any is left unconsumed, and the landlord is to pocket the lion's share—the whole of the 21 tons 2¼ cwt., made into manure and applied to his (the landlord's) land in permanent improvement—without any acknowledgment whatever. If this be Mr. Lawes' justice to the farmers of England, I do not know what justice is! It appears to me like giving a big man a pat on the back while picking a little man's pocket?"

Well, then, will Mr. Smith tell your readers what all this means if it is not to be interpreted in the way I take it. To my mind it is simply saying to the farmers of England, "Do not use artificial manure, even though it pays year by year to use it; do not use it, because each year you get more and more straw which you are are not allowed to sell—although you may feed with it, and more and more dung, which dung you must put upon the land, thereby yearly improving it, and leading ultimately to an increase of rent! Do not, then, use this artificial manure, notwithstanding that it pays you, unless your landlord will consent to pay you a second time for it, in the shape of remuneration for the increased fertility of the farm at the end of your take."

Here, again, are Mr. Smith's own words, "Look to past practice; tenants have improved their lands and landlords have shoved up their rents, *thus taxing the tenant for his own improvement.*" The italics are mine.

Mr. Smith's nose has fallen out with his face, and there is a nasty scratch upon it, to heal which would add greatly to his nose's comfort; but then it would improve the beauty of his face, and so the scratch shall be left to fester, unless the face will consent to pay handsomely for the improvement of its beauty.

Now Mr. Smith tells us he is a landlord (p. 677), and that for many years his tenants have occupied upon the terms "pay your rent and keep your land clean,"—very liberal terms, no doubt, provided the rent is low, as low as it would be under "a noble duke, or lord, or great landowner," but if otherwise, then the terms may be by no means liberal. I will assume, however, that Mr. Smith is a very liberal landlord, and lets at low rents. Well then, if he is ready to carry out in practice the doctrines which he preaches, I ask him for an answer to these two questions:—

1. Are you willing that your present tenants should sell the whole of the hay, straw, and roots off their farms, without any obligation to bring back purchased manure in their place?

2. Are you willing that your present tenants and their descendants should continue for ever to occupy their farms at their present rents, without any rise, until the land should become "building land" and so cease to be agricultural?

If Mr. Smith does not answer these questions in the affirmative, then I tell him he is not prepared to practise the doctrine which he preaches, and his vaunted liberality is a sham.

But now let us go a little bit deeper into this question of compensation for increased fertility of the farm, produced by artificial manures and good farming.

At p. 715 Mr. Smith says, "I took Mr. Lawes' own evidence, and showed that a man might take a farm in low condition, and by clean farming and the aid of manures—artificial or otherwise—its productiveness might be greatly increased; and my writings went to show that all Mr. Lawes would give him for his improvements was the eating value of a year's straw, which never can be the just reward to a man who has increased the letting value of his farm 8*s.* or 10*s.* per acre."

Now I beg to join issue with Mr. Smith on this point, and say distinctly that Mr. Lawes, in giving the feeding value of the unconsumed straw, awarded the correct amount, and my reasons are as follows:—

1. No tenant-farmer will use artificial manures or any purchased manures upon his farm simply to increase the future letting value of it; a landlord may do so, but certainly not a tenant. If a tenant uses such things, he uses them because their present use leaves him a present profit, realisable within the term for which he holds his land, and he knows at the very time he uses them that any increased future value they may confer upon the land will belong, not to him, but to his landlord, who owns the land.

2. Every tenant-farmer when he uses artificial manure, knows that the probable effect of that manure will be not only to increase the produce of grain which is saleable, but also of straw, which is forbidden to be sold. But he also knows that if he increases the straw he increases his future quantity of feeding stuff, and his future quantity of dung, which he is bound to put upon the land, and which will react year by year in upholding and increasing the produce, and therefore increasing the letting value of the land. And, as he knew that the increased letting value would belong to his landlord, it is plain that it formed no part of the inducement which made him buy artificial manure and apply it to his farm.

3. If a tenant-farmer applies artificial manure in such a way that he does not expect it within the year to repay its cost and a profit in addition, the chances are he has a lease, or else he holds under a landlord who does not frequently or arbitrarily raise his rents, and upon whose reasonable consideration he can confidently reckon. But if he does not so hold, and if, being a yearly tenant to an arbitrary landlord, he is foolish enough to spend his money on artificial manure without a reasonable prospect of getting back his money with a profit within the year, then he is (to use Mr. Smith's own words) "a blockhead, and the sooner he cuts off to New Zealand the better."

Now, I am one of those who have a thorough contempt for humbug, and I always call a spade a spade. We have had a great deal of discussion lately about the relations between landlord and tenant, and I have no hesitation in saying that the great bulk of what is said and written about it is pure "bosh." The tenants are right well able to take care of themselves, a deal better in many instances than the landlord is; and in reading the *Agricultural Gazette* for May 14, I saw at p. 680 a speech made by Mr. S. Sidney, which seems to me one of the most sensible I have read for many a day. He said:—"The farmers of England were a numerous and powerful body; and if they chose to make up their minds as to what they wanted, there would not be the slightest difficulty. But the fact was, that the farms of England generally were underlet, and there was an implied agreement between landlord and tenant something like this. The landlord said, 'You take my farm. I can turn you out at six months' notice. You won't trouble me about my game. When there is an election, you will vote in my favour. If my wife's health is proposed at dinner, though you don't exactly like her, you will drink it with cheers. If you do that I will not disturb you, and you shall not be troubled about how you farm your land.' That was the plain truth. The farmers might shuffle here and there, but that was the real thing, and they knew it. When he was a young man he was at a farmers' dinner, and he heard one toast with great indignation, but it was proposed, and received with great cheers. It was 'Liberal landlords and grateful tenants.' As long as there were grateful tenants they never would be able to make a bargain with their landlords."

There is good sound common sense in this. If the farmers of England desire to be thoroughly independent and to have full security for every penny they expend, let them do what their brethren in Scotland did two generations ago, let them take leases. A lease is the best security a tenant can have, and it is in the end far better for the landlord's pocket, and for peace and good will. At present many a landlord is restrained from raising his rent, although he knows his land is fairly worth more than he gets, because to raise rent is an unpopular act. But why it should be more unpopular to raise rent than to raise the price of corn or of beer, or of iron, or of coal, I really cannot see. With leases this rise of rent would come periodically, and this (I like to call a spade a spade) the tenant-farmers of England know right well. Heretofore leases in England have been the exception, but when taken the usual farm lease is for 21 years, with breaks at seven and 14 years, if six months notice is given before each period arrives. Six months' notice seems to me too short, 18 months would be a more reasonable notice. It would give a man longer time to look round him, and make the hardship of a change less if he and his landlord did not agree as to the new rent. With such leases the rent would very likely rise a little every seven years, and if a tenant was a good farmer, who increased the fertility of the land so as to enable it to bear an increase of rent and still leave a comfortable income for him who worked it, he would in all probability remain upon it all his life. But the man who followed out Mr. Smith's tactics, and kept his farm poor for fear the landlord should "tax the tenants for his own improvements," in all probability would get his dismissal at the first septennial period. Good tenants would be at a premium, while the "dog in the manger" type would be at a discount. When a good farmer wished to move from a small into a large farm, if his own landlord could not accommodate him, there would be a dozen at his disposal, for every landlord in his neighbourhood would know that not only would he be able to make a good living for himself, but also he would be able every seven years to pay an increased rent in consequence of the increased fertility of the soil. A dozen landlords would be bidding for him, and a dozen more saying to him, "Thou hast been faithful in a few things, I will make thee ruler over many things."

No doubt in such leases the landlords, or rather their advisers the land agents, would introduce rather stringent clauses as to the general course of husbandry, and a prohibition against using in the two years preceding each septennial period any artificial manures except certain specified ones, so as to prevent the land being impoverished by an outgoing spiteful tenant,—for there are such things, although Mr. Smith tells us a farmer "has not the heart to rob land."

There has been a deal of discussion lately about what it is now the fashion to call "tenant-right," but which old Lord Palmerston so humorously described as only another word for "landlord wrong," and Mr. Smith is plainly one of those who cry it up. I do not suppose that it signifies three straws to Mr. Smith whether tenant-right ever becomes law or not, for he

farms his own land; but I would simply suggest to the tenants, who are just now inclined to talk a deal of nonsense about it, that the moment tenant-right becomes a serious question in England, leases will become the rule and not the exception. And if what Mr. Sidney tells us be true, that the land of England is let far below its value, and if what more than one speaker at the various farmers' clubs tells us be also true, that the lease system in Scotland has forced up the price of land there far beyond its value to an English tenant than the lease system in England, is not likely to result in a money profit to English tenant-farmers.

Let it not be forgotten that the Scottish system of 19 years' leases, and letting the farms after extensive advertisement by public tender (all the tenders to be opened the same day), is practically putting up the farm to public auction. For although a landlord does not bind himself to accept the highest, or any offer, yet in practice the highest offer is almost always taken.

The territorial influence of the landlords is fast passing away. Before a single grouse falls on the 12th August next, the Ballot in all probability will have become the law of the land, and one great item in the tacit agreement, which Mr. Sidney so humorously described, will have disappeared. Whether the honour of having their wives' health drunk with cheers will be a sufficient inducement to the great landowners to continue to let their farms below their value, remains to be seen, but for my part I doubt the potency of it. Women are beginning to assert their rights, and husbands consequently are inclined to shrug their shoulders, and leave the women to take care of themselves. Not long ago a noble duchess and two of her daughters did all the honours of a farmers' public dinner, and proposed most of the principal toasts of the evening. The farmers then would do well to brace themselves up for the change. "The lease" is looming upon them, and while they are dreaming of "tenant-right," and, under Mr. Smith's would-be leadership, groaning over the hardship of not being paid twice over for their artificial manure, they may wake up to the sad reality that a great rise of rent is upon them. They may find out, when too late, that after all a great many landlords agree with old Lord Palmerston in thinking that tenant-right is landlord wrong. *G. A. H.*

EXAMPLES OF SEWAGE IRRIGATION.

(*Concluded from p. 71.*)

10. *Bedford.*—At Bedford, which contains about 15,000 inhabitants, large sums have been recently laid out, under the direction of Mr. John Lawson, C.E., on both its water supply and its drainage system. The sewers here receive not only the fouled water supply of the town, together with a certain proportion of the rainfall on its houses and yards, but an immense quantity of land water from the gravel site on which the town is built. Thus, though the water supply does not much exceed 150,000 gallons daily, the quantity of drainage which reaches the pumping station, about a mile below the town, is as much as 500,000 or 600,000 gallons daily. Each of the two 12-horse power engines here stationed is, however, capable of lifting 2000 gallons a minute to a height of 20 feet, so that either of them can master the ordinary dry weather sewage of the place.

During the night the comparatively pure water which then drains away is stored in the outfall sewer and tank at the pumping station. In the daytime it is delivered by an 18-inch iron pipe to the irrigated land 400 or 500 yards off, flowing thence into a small circular tank, and afterwards, by two 15-inch pipes, along either side of the nearly flat land which has been laid out in transverse beds for its reception. These beds are about 70 feet wide on the side, with a fall of 8 or 10 inches from the central carrier to the midway furrow. The carriers are either 5-inch pipe tiles with open longitudinal slit, or 8-inch half-round tiles; and a fall of about 1 in from about 300 to 800 is given to them.

The beds were sown in 1868 with Italian Rye-grass, and have yielded heavy crops. Up to the middle of July three crops had been cut off 20 acres, besides one crop off 15 acres sown in 1869, and the sales amounted to nearly £330. A much larger area of land is about to be taken in hand for irrigation purposes by the Corporation. The extent at present rented is about 50 acres, but a farm of about 200 acres will ultimately be under their management. The cost of pumping, which amounts to £4 per acre of the land now irrigated, will then be reduced to a rentcharge of about 20*s.* an acre, which will be more easily repaid. And as the houses become more generally connected with the sewers, both the need of the greater area, and the produce derived from so large a supply of fertilising matter, will increase. At present, as analysis shows, the sewage is very weak, but the cleansing process is satisfactory.

The undertaking here is sufficient as a sanitary agency, and its ultimate profitableness appears probable from the character of the crops we saw growing on the land. The Italian Rye-grass must have weighed 12 to 14 tons per acre. The Mangel Wurzel and Kohl Rabi were tolerably promising. The prices obtained by auction for the former crop were improving at the successive sales, as the prejudice against sewage-grown cattle food was dying out. The difficulties connected with the even distribution of the liquid will also diminish every year as the settlement of the moved land enables the necessary corrections of the surface to be made, so as to ensure a more uniform flow of water over it. The following report for 1869 has been furnished by Mr. John Lawson, C.E.:—

"The land leased by the Corporation from the Duke of Bedford contains 54*a.* 3*r.* 7*p.* Of this area 47 acres have been irrigated by sewage.

"Two fields, containing about 22 acres, were sown with Italian Rye-grass in 1868, and the produce sold from this land in the year 1869 was about £420.

"Of the remaining portion of the land irrigated 15*a.* 2*r.* were sown with Italian Rye-grass in the spring of 1869, and the remainder with Mangel Wurzel and other root crops. The sales from this portion amount to about £227 10*s.* 4*d.*, making a total of £647 10*s.* 4*d.*

Produce on the year 1868 as sold by auction				£417 12 4
Rent, 55 acres at £4 per	..	..	£247 10 0	
Auctioneer's commission	..	..	33 8 0	
Printing	..	..	22 9 0	
Seeds and plants	..	..	33 13 0	
Labour, including salary of manager			213 4 0	
Taxes	..	..	17 11 8	
Sundry expenses	..	..	11 1 0	
				583 4 8
				£6 7 8

11. *Norwood.*—The history of the facts connected with sewage irrigation at Norwood and at Croydon has been sufficiently prolonged to make it now thoroughly trustworthy and instructive. At the former place about 30 acres of low-lying clay land, with sufficient slope for natural surface drainage, have been well laid out for irrigation by Mr. Baldwin Latham, C.E. The drainage of about 4000 people is received into a subsidence tank at the upper end, and thence flows along surface carriers, arranged both nearly in contour and down the slope. The fall in these carriers varies from 1 in 100 to 1 in 1000, and the water stopped at intervals in their course flows over their edges, and so finds its way over the surface of the land. Plots varying in size from 1 to 3 acres are irrigated at once, according to the abundance of the supply, which, especially in summer time, when it is most wanted, is barely sufficient for the proper irrigation of the land. Nevertheless, very good crops of Italian Rye-grass are cut five or six times a year; and a ready sale is obtained for the produce, at prices varying from 9*d.* to 1*s.* 3*d.* per rod, or £6 to £10 per acre, and the Croydon Board of Health have in this way obtained a revenue of £22 per acre during nine months of 1868, and £25 per acre in 1869, which, spread over the population to whose drainage it is due, amounts to about 3*s.* 9*d.* per head per annum. Mr. Baldwin Latham has furnished the following satisfactory report of the past year's experience:—

"The total amount received for the produce in the year [illegible] .. £941 6 0

The expenses have been as follow:—

Rent after deducting income-tax .. £292 16 3				
Wages for cutting produce, attending to the distribution of the sewage, re-digging, and otherwise preparing the land for crop ..			194 1	
Seed	..	..	17 2 6	
Horse-hire, and tallet ..		..	63 17 3	
Printing	..	..	2 7	
Sundry bills ..	..	..	20 11 6	
				611 11 9
Balance ..	..	..	..	£329 14 3

"The area under irrigation is 30 acres. Previous to the Local Board becoming the tenants of the land, the rent paid was 18*s.* per acre. The adjoining agricultural land is let at less than £1 per acre rent. The average population draining to this area during the last year has been about 4000. During the last month or two we have made provision to bring in a much larger area to this outfall, and in order to make provision for the increased population the Board has taken a sufficient area of land adjoining the present irrigation works at a rent of £10 per acre. This will nearly double the existing area under sewage. It may also be interesting to the Commissioners to know that when the existing works at South Norwood were completed they were let to a tenant for three years, at a rent of £200 per annum. The Board at this time paid the cost of distributing the sewage, so that as long as the works were let, there was a clear loss to the Board of £180 per annum, but since they have taken them into their own hands a profit has accrued, as has been seen from the foregoing figures."

Report of H.M. Rivers Pollution Commission.

INOCULATION AND PLEURO-PNEUMONIA.

WITH a very faint hope of averting some of the confusion which we forsee, we intend to state the present position of the argument as concisely as possible, dealing only with facts which have come under our own observation, and which bear with some degree of force upon the question which is again before the agricultural public. To make the matter as clear as may be we shall place all speculative points first, and then, leaving these, proceed to the consideration of others which are capable of demonstration.

Speculation the first relates to the origin of the disease in this kingdom. Did it arise spontaneously, or was it introduced from the Continent in 1840? The answer to this question is based on a legend of the importation of Dutch cattle into Cork by a certain consul for his own private use. As this event is said to have occurred less than 30 years ago, some one ought to remember the name of the consul, the number of the cows, and the fact of the disease first appearing among them, but none of these details have been satisfactorily made out. We have, however, no objection to admit the truth of the speculation without this evidence, as the admission does not in the least affect the present investigation.

The mode of propagation of the disease involves speculation number two—Is it contagious? Is the virus contained in the breath or the excretions? Can the malady be artificially induced? All the evidence on these points is conflicting. There is no doubt that the admission of a diseased animal into a cow-shed or field is followed in many instances by an extension of the malady to the sound animals; but then it has to be remembered that pleuro-pneumonia often occurs where no fresh stock has been introduced for many months, and also that the disease often ceases with the first or second case, even though no means are taken to arrest its spread. Further, the direct transference by inoculation of the fluid from a diseased lung does not cause pleuro-pneumonia or any disease like it; in fact, beyond the production of local irritation it has no effect at all. Many stockowners deny the contagiousness of the disease altogether, while others who have observed its course in localities where the circumstances are favourable to its progress, are equally positive in the opposite opinion. The balance of evidence is decidedly in favour of the contagion theory, and we therefore accept that view of the nature of the malady as the correct one.

Passing from the debatable points to facts which admit of only one interpretation, we have first to notice some of the peculiarities which are manifested during the progress of the disease. Everyone knows what is the rule that obtains in reference to contagious disease in general; an outbreak occurs, two or three animals are attacked, and day by day fresh cases are added, until the majority succumb, perhaps none escape. No one who has carefully watched the course of pleuro-pneumonia of cattle can assert that this account is explicitly true of it; on the contrary, it is impossible to predicate of an outbreak when the malady will cease, or how many victims it will seize, what time will elapse between the attacks, or after what period the remainder of the herd may be considered safe. Sometimes one animal after another is taken ill at an interval of a fortnight, and then several may be smitten almost on the same day. This kind of thing often goes on pretty regularly in some parts of the country; but in others, where the circumstances are totally different, the disease will assume a much more irregular character. Perhaps one animal is attacked and dies, and the disease is at an end: or in another instance, cases occur at various periods for a long time, and then disappear entirely. Change in the system of feeding and general management has, in our experience, been frequently followed by the sudden cessation of the disease after a considerable period of its continuance in a malignant form.

In the light of these facts, relating to the progress of the disease, we may proceed to consider some of those referring to the results of inoculation. That the introduction of a few drops of serum from the lungs of a diseased ox causes pleuro-pneumonia, or any disease bearing the slightest resemblance to it, no one believes or asserts. Therefore, whatever influence the operation may have cannot be due to the induction of the condition which usually attends inoculation with the matter of other contagious disease. The local effects of swelling and suppuration may be produced over and over again in the same animal, and in this particular the introduction of the serous exudation differs entirely from inoculation with the matter of other contagious diseases.

Inoculated animals are in many instances subsequently attacked with pleuro-pneumonia. As a matter of fact cows have died of the disease after having lost their tails from the effects of the inoculation. This again is contrary to the experience of inoculation with the matter of other contagious diseases. The only question which remains in reality is one of degree. Does inoculation confer any amount of protection; and if so, to what extent?

Again we appeal to facts within our own knowledge. Inoculated cattle, we repeat, have taken the disease naturally in many instances. A considerable number of inoculated animals resist the infection, so do a large percentage, in many cases, of animals which are not inoculated. In the same shed we have seen inoculated cows attacked, while others left uninoculated have remained free of the disease. After the performance of inoculation, pleuro-pneumonia sometimes ceases; so it does very often when the diet is altered or medical treatment is had recourse to, or disinfectants are employed.

Mr. Priestman has been very successful in arresting the course of the disease by the use of carbolic acid, and, we believe, prefers it to inoculation, which he at one time extensively practised. Under all the circumstances of the case, considering the very irregular course which the disease takes at different times, and in various places, what can be expected of a number of experiments undertaken by persons imperfectly acquainted with the subject, unaccustomed to the critical examination of evidence, and incapable of drawing correct conclusions from facts which they can only dimly observe? At best an addition to the mass of crude unsatisfactory evidence which already exists is alone to be expected.

We understand that it is proposed in Cheshire to

inoculate certain animals on a farm and leave the rest; an experiment which has been performed repeatedly with results which have been adduced in proof of the total failure of the operation by its opponents and of its success by its advocates. Again, it is contemplated, we believe, to test the matter in Norfolk by inoculating some 30 or more animals on a farm where two or three cattle have died of pleuro-pneumonia. The experiment, however, is to be made contingent upon the occurrence of another attack. To the pathologist there would be something infinitely amusing in these arrangements if there were not something tragic in the idea of well-meaning people deliberately entangling themselves in confusion of the most hopeless character. Take the last suggested experiments as a type of the practical idea. The mere act of holding back until another attack occurs, faithfully expresses a conviction of the probability, or at least of the possibility of no more attacks in the herd, and yet, if one other animal be attacked and inoculation be then had recourse to, what is likely to happen? If none of the inoculated animals are attacked, what a testimony to the efficacy of inoculation! And yet in numerous instances the same result has followed the adoption of sanitary measures, the use of disinfectants, and it must also be confessed the "let-alone system."

In 1850 we were called upon to advise respecting the treatment of a number of cattle—Irish, Scotch, and Hereford—among which pleuro-pneumonia had made rather serious ravages; 24 animals having died out of 200. Various means of a sanitary character were employed, and judging from the result, they were completely successful, as no more cases occurred in the herd. Recently an outbreak of pleuro-pneumonia occurred in a small herd of 10 or 12 cattle; disinfection was resorted to, and the sick animals were removed from the apparently healthy. The disease, after attacking three animals, which died, ceased altogether, and has not since reappeared. These instances are only quoted in exemplification of the difficulty to which we have alluded, of distinguishing between *post hoc* and *propter hoc*; and it is to be feared that the difficulty will not be lessened by the prosecution of the inquiry according to the method which is being adopted. If inoculation had been employed in the few instances referred to, and in numerous other cases which we can call to mind, a very strong argument would have been established in its favour; but while it is admitted that inoculated animals are at least sometimes attacked while others escape, and that the progress of the disease is arrested by other means, we cannot avoid the conclusion, that a repetition of former experiments is likely to lead to more contradictions.

If the farmers of England have made up their minds to give inoculation for pleuro-pneumonia a fair trial, we venture to propose a few questions for their consideration. What constitutes successful inoculation, and who is to be the judge? Upon this point much confusion appears to prevail. How much swelling of the tail is necessary? or must the caudal appendage be entirely sacrificed before security is gained? If any protection be afforded by inoculation, how long is it likely to last? Are calves to be operated on, or not? or is it necessary to wait until they are a year old, or more? If so, what is to save them from the disease meanwhile? If calves are to be inoculated, when is the operation to be repeated. Points of this kind are of the first importance, if the system is to be generally adopted in this country. We say if, because the antecedents are not quite so satisfactory as they might be. Then if we take the Continental view of the subject, the prospect is not all sunshine. In Germany, Belgium, and Holland the operation is extensively practised, and the faith in its efficacy is unbounded: but we have not yet heard that pleuro-pneumonia has been exterminated in any of those countries. Perhaps we may be more fortunate here; but it seems rather odd for us to get into a state of excitement in favour of a practice which originated, and is most supported, in those parts of the world whence, as we persistently assert, animals are constantly sent to us infected with the disease, which, if the theory of inoculation is worth anything, should have been long ago eradicated. *The Veterinarian.*

Home Correspondence.

Crops.—*Dorsetshire:* I find it most difficult to report on the present appearance of the crops in this locality. Wheat varies so very much; in some places I hear of its being fed or cut, owing to its luxuriance; in others it presents a very poor appearance. I can only state my opinion that the crop will not be an average one. Barley is very thick and promising. Beans and Peas also look very well. Oats are likely to prove a fair crop. Flax is almost a failure, and a great deal has been ploughed up. Mangel is just making its appearance, but will require rain, otherwise a considerable portion of the seed sown will lie dormant in the ground. The pastures are unusually bare for the season. The orchards, perhaps, are the most pleasing objects which meet the eye in this unusually trying year. *John Pope, Symondsbury, Bridport, May* 25.

—— *Hampshire:* The Wheat crop, although somewhat backward, promises well on all cold, strong, and loamy soils; but on light soils, and particularly on the chalk hill farms where the Wheat was sown after lea, it has lost plant, and will be very thin and light; some considerable portion of the thinnest having been ploughed up, and resown to Lent corn, will reduce the breadth of the Wheat crop. The Barley crop has been sown under the most favourable circumstances, and is generally a good plant, having also been sown in good time. There is a chance of a good sample of malting Barley, for although the season was a little delayed at first, yet there is hardly any late sown this year; and having vegetated with great regularity, there will be few edge-grown crops this year. Oats are also a good plant, and look well generally; and, having been sown in good time, will no doubt produce grain of good quality. The Clover and Grass seeds sown in the Lent corn have taken remarkably well; the land worked so fine that these small seeds vegetated very evenly. Winter Beans have failed in plant in numerous instances, owing to the winter frosts. These require a firm bottom, and the greatest failures are where the land was ploughed; those crops put in after the scarifier have suffered but little. Spring Beans have planted well, and the hoeing season has been unusually favourable. The same may be said of Peas of different kinds, and as the hoeing time always operates favourably on the produce, we may expect a good crop of both Beans and Peas should the summer prove favourable. The Clover and Grass crops are a good plant, and although late are strong and promising, and with genial showers a good crop of field hay may be expected. Trifolium and winter Vetches are very late, and also much injured by frost, large breadths being entirely destroyed. Grass, both for hay and pasturage, in the meadows, is very late and unpromising, and cannot give an average produce. All kinds of Cabbage seeds and the like have been destroyed by the fly in nearly every instance, and in some cases the second sowing also; and up to the present time the fly is very strong, which, it is to be feared, bodes no good to the Swede and early Turnip crops, if sown early. Mangel has been largely sown this year, with the land in capital condition, and the late fine rains have vegetated the seed very quickly. In the last year and the present season, up to this time, the weather has been exceedingly favourable for cleaning the land, and as an agricultural operation it is full of promise for the future, indeed, it is scarcely within recollection when the land has been so forward in condition for root crops, particularly upon strong cold soils. The price of store sheep and cattle continues very stationary, as keep is very short even on the best pastures; and on many of the hill farms the loss on the Vetch crop is very serious, and will cause large breadths of Grass intended for hay to be sacrificed. There is, however, one thing in favour of chalk soils—the Sainfoin may be said to be the crop of the season, and in most instances is truly magnificent, which may be attributed to the high temperature of the subsoil. Steam culture is still progressing in public estimation, and particularly when used for breaking up strong soils and also shallow gravelly land. When these soils have been deeply stirred it will be a long time before the subsoil will become consolidated as before, and it is now well understood that an impervious subsoil is always a cause of sterility. Potatos have been planted extensively this season, the land being in such fine condition. Some of the early sorts have been cut down by frost, but the main crop in field culture is coming on well, the most approved sort being the Scotch Rock. The seed direct from Scotland answers best, and guano is considered the best manure, as it saves much time in its application compared with bulky manures. *Joseph Blundell, Southampton, May* 25.

—— *Lincolnshire (North):* Ever since I wrote you last (May 12) the weather has been very dry the whole time, which is telling unfavourably upon grass-land and late-sown spring corn, both of which want rain very much. Wheat, where a full plant, has done well; indeed, thin Wheat has improved, and may get to be much better than at one time expected. Should this dry weather continue, we may have harvest at the average time. *H. A. Sowerby, Aylesby, May* 25.

—— *Northamptonshire:* Wheat: On good Wheat soil the plant is looking remarkably well, but on the weaker land it has anything but a favourable appearance. Barley and Oats look well, but begin to show the effects of the present excessive drought. Winter Beans a failure. Peas: Many fields in bloom prematurely, and the crop must be very light. Mangels and Turnips: In many places the seed has not germinated, in consequence of the continued dry weather. Pastures bare and parched up, and, unless there is a good fall of rain immediately, the hay crop will be very short. Altogether present appearances are not at all encouraging, though a copious fall of rain with a high temperature would soon improve matters. *J. Borlase Tibbats, Barton Seagrave, Kettering.*

—— *Wilts:* I have delayed to answer your inquiry, to see what effect the late rain had on the crops in this neighbourhood, and although the Wheat looks a better colour, I am sorry to say it won't bear inspection. The Wheat crop may be divided into three parts, one third looking very well, and promising for a good crop; another third anything but good, looking well at a distance, but on going over it is much too thin, and cannot be a large crop. The remainder is miserably thin, and no weather can make more than half a crop; much of it ought to have been ploughed up and sown with spring corn. The Lent corn is looking well, considering the cold weather we have had, and the want of rain. The Grass must be a very light crop unless it rains very soon, and we shall be very badly off for water. The land is in a very fine condition for the root crops, and should we get some rain soon, we may probably get some heavy crops of Mangel, Swedes, and Turnips, if not it will be a poor look out-again for another winter. *J. A. Williams, Baydon, North Wilts, May* 27.

Paper Fibre.—Noticing in your last impression statements by three gentlemen well qualified to give an opinion to the Edinburgh Chamber of Commerce on the probable substitutes for the present high priced material used in paper-making, I beg to ask the favour of your inserting this letter to direct attention to the paper which forms a large proportion of the solid matter of our sewage. Where irrigation is the order of the day, provision for paper and such solid matters is generally made at the pumping station, but by some means or other quantities get passed through the screen and find their way to the land in an unchanged state, or if changed by the disturbing action of the pumping into frothy matter, on deposition are found to be in large amount the elements of paper. Let those interested in the matter take a measure of sewage from a settling tank or pit, say one-tenth of a gallon, evaporate in a steam bath to the consistency of a dry portable manure; on committing it to the mortar it will be found so soft and unworkable a mass for the pestle as almost to defy its use. From practical experience it may safely be said to lose a quarter of its weight in water, leaving a good quarter more as pure paper, sand and other solid matters making up the remaining half. Founding on the maxim that "like produces like," the fact presents scope for inquiry; and, if practicable in the opinion of paper-makers, it might be matter for consideration for those local authorities or boards of our large towns connected with irrigation, whether they could not reduce their item of yearly pumping, at the same time that they grew fibrous grasses, which in time might come to be cultivated on the farm for paper-making. *A Scot, May* 24.

—— Seeing that there is an inquiry afloat as to the plants and grasses suitable for the production of fibre for the manufacture of paper, &c., may I, therefore, beg to call your attention to the Pampas-grass, as no other plant in this part of Her Majesty's dominions produces one-tenth the amount per acre of gross herbage. The annual growth of the leaf and stem in this place ranges from 17 to 25 feet, and so dense is each tussac that they present the appearance of a great sheaf tied at bottom. Should the fibre prove suitable for the above purpose, an unlimited supply could be produced in this part of Ireland; it is easy of propagation, and will succeed in almost any geological formation in Tipperary, and like the Whin, after being once established nothing further is necessary but cut and work away. Perhaps some of your readers are not aware that the people in Ireland claim this plant as their own, for, for the first time in Europe, the vitality of vegetation was infused into a few dry hopeless-looking seeds with Irish soil at Glasnevin; and I think many Irishmen should pray, more power to Dr. Moore. *William Jones, Kilboy, May* 23.

Tiptree Hall.—Hoed all the spring and winter Beans, and going over the Wheat again; Cabbage, Barley, Peas, Mangel, and Grass want rain very badly. I think there will be a good crop of Wheat on our heavy land. Twelve men on our heath out of work, and a great many more at other places. Plenty of work wants doing, but not much money to do it with. Low prices of corn, and only a moderate crop are acting unfavourably on the labourer in arable districts. Don't think hay will be late, but a very bad crop. Hope we may have a dripping June, which is said to "bring all things in tune." *J. J. Mechi, May* 27.

Sugar-Beet and Beet Sugar.—In your last Number you give under the heads of "Foreign Correspondence" and "Complementary Manures," a digest of a letter by M. Villeroy of the Agricultural Society of the Palatinate of Bavaria. The inference conveyed in the fourth paragraph is, that in the North of France the soil is "spent" by the excessive cultivation of the Beetroot for sugar, &c., and that thereby the crops have become reduced to a very low average. The contrary is the fact. The cultivation of the Beetroot for the sugar and spirit industries has been for years increasing, and still extends with great strides; and the results are an increasing area under cereals, and a larger yield of corn per per acre than obtains where the Beetroot is not cultivated. What is true is, that many people (and landowners, who in France are very numerous, and of small means) have improvidently grown Beetroot season after season without intermission of other crops and without any "high cultivation." In such cases of course the land becomes impoverished, but that is not the rule in the North of France. No; I am told by those who understand farming as it is practised in England, that even English farmers may learn something to their advantage by a visit to the North of France. Permit me to say that the little pamphlet you did me the honour to notice in your issue of May 14 is not published for sale, and that I shall be pleased to send a copy of it to any one of your readers who may take an interest in the

subject of "Sugar-Beet and Beet sugar." *John Henderson Porter, 9, Mincing Lane, London.*

Fisken v. Roundabout.—"West Indian" makes one mistake, which vitiates the whole of his calculations. He supposes now that because Fisken's plan will do 13 acres a day, therefore Smith's roundabout will do 13 acres. A Smith's roundabout, costing £375 as estimated, is made up of half the price of the engine, say £150, and the cost of a Smith's tackle at £225. But no Smith's tackle, costing £225, will go over 13 acres of deep ploughing per day. It would be knocked all to pieces. You must either get Fowler's heavy implements, which cost more money, or you must come down to 8 acres per day for a Smith's roundabout, costing only £375. Therein lies the error of "West Indian's" calculations. Now, let us go back to p. 542. "West Indian" there gives a Table of the cost per day of labour and materials, and he puts down the roundabout at 20*s.* 6*d.* and Fisken's at 18*s.* 6*d.* This will give the rate per acre for 8 acres and 13 acres respectively, as follows:—Roundabout, 20*s.* 6*d.* ÷ 8 = 2*s.* 6¾*d.* per acre; Fisken, 18*s.* 6*d.* ÷ 13 = 1*s.* 5*d.* per acre. As to interest, &c., "West Indian" shows the annual charge on the roundabout to be £56 5*s.*, and upon Fisken £75, and assuming them to work 10 days a-year (as he suggests), the charge per day for interest, &c., would be—

Roundabout ..	£56 5*s.* ÷ 10 =	£5 12*s.* 6*d.*
Fisken	75 0*s.* ÷ 10 =	£7 10*s.* 0*d.*

and dividing these sums again by the acres done in a day we get—

Roundabout ..	£5 12*s.* 6*d.* ÷ 8 =	14*s.* 0¾*d.*
Fisken	7 10*s.* 0*d.* ÷ 13 =	11*s.* 6¼*d.*

Putting these together, then, we get the respective costs as follows, when the two implements are working ten days in a year:—

Smith's Roundabout.

Interest, &c. 8 acres a day		14*s.* 0¾*d.*
Wages, &c. (8 acres a day)		2*s.* 6¾*d.*
Cost per acre		16*s.* 7½*d.*

Fisken's Heavy Rope.

Interest, &c. (13 acres a day) .. .		11*s.* 6¼*d.*
Wages, &c. (13 acres a day		1*s.* 5*d.*
Cost per acre		12*s.* 11¼*d.*

showing that Fisken's method, working 10 days a year, costs 12*s.* 11¼*d.*, while Smith's roundabout costs 16*s.* 7½*d.* per acre, working the same number of days. I have in this calculation taken "West Indian's" own figures. *G. A. H.*

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, June* 1.—Present, the Duke of Devonshire, K.G., in the Chair, Earl Cathcart, the Earl of Powis, Viscount Bridport, Lord Chesham, Lord Kesteven, Lord Tredegar, Lord Vernon, Lord Walsingham, Sir Watkyn W. Wynn, Bart., M.P., Mr. Cantrell, Col. Challoner, Mr. Clayden, Mr. Davies, Mr. Dent, M.P., Mr. Druce, Mr. Jonas, Colonel Kingscote, M.P., Mr. Ridley, M.P., Mr. Shuttleworth, Mr. Thompson, Mr. Webb, Mr. Wells, M.P., Lieut.-Colonel Wilson, and Dr. Voelcker.

The following members were elected:—

Baker, William, Combe Farm, Woodstock, Oxford.
Beaumont, Joseph, Ducklington, Witney, Oxford.
Butler, Edward, Ewell Hall, Kelvedon, Essex.
Caffin, Peter, Hazelwick, Crawley, Sussex.
Cleminson, Robert, Endon, Stoke-on-Trent.
Colman, J. J., Carrow House, Norwich.
Combe, Thomas, Oxford.
Davis, Stephen, Woolashill, Pershore.
Dawson, George, Thornecliffe, Sheffield.
Freer, Jesse, Rothley, Loughborough.
Gorst, William, Garston, Liverpool.
Hall, Richard, Great Barford, Deddington.
Hansell, Rev. Henry, Magdalen College, Oxford.
Hawkes, William, Thenford, Banbury.
Hitchcock, Rev. John, Chitterne, All Saints, Heytesbury.
Hopkins, Rev. T. H. T., Magdalen College, Oxford.
Hornby, Captain Montague, Hanley House, Shrewsbury.
Hudson, John, Subberscroft, Lea Cross, Salop.
Inge, Rev. George, Thorpe Constantine, Tamworth.
Jones, Edward, Park Farm, Caersws.
Jones, George, Osney Wharf, Oxford.
Jones, Stephen, Lea Cross, Salop.
Kirbell, Edward, Latimor, Chesham.
Lake, John, Edgeworthy, Morchard, Tiverton.
Macdona, Rev. J. Cunning, Hilbre House, West Kirby, Birkenhead.
Mainwaring, Charles S., Galltfaenan, Rhyl.
Mansell, Edward, 27, Great George Street, London, S.W.
Marsh, Richard, Little Offley House, Hitchin.
Masters, Joseph, Bengeworth, Evesham.
Mount, William George, Wasing Place, Reading.
Nalder, James Hall, Haseley Iron Works, Tetsworth.
Paxton, Edmund, Willaston House, Bicester.
Pritchard, William T., Angel Down Farm, Wantage.
Roberts, George, Overbury, Tewkesbury.
Robinson, George John, Maunby, Thirsk.
Rush, Thomas, Babraham, Cambridge.
Savage, Gilbert Cole, Pony Knoll, Shifnal.
Sawyer, Henry G., Richmond Park, Richmond, S.W.
Smith, William, Sandon House, Clifton Down, Bristol.
Townsend, William, Westcote, Chipping Norton.
Troutbeck, George, Barton-under-Needwood.
Vernon Benjamin, Aychley, Prees, Salop.
Waller, Hugh Sydney, Farmington, Northleach.
Warrington, William, Bretby, Burton-on-Trent.
Wearing, J. W., Oxford.
Whitfield, Thomas, Oswestry.
Williams, E. A., Gilli, Mold, Flintshire.
Williams, John Fisher, 10, Queen's Square, Bloomsbury, London, W.C.

The motion for the adjournment of the Council was withdrawn.

FINANCES.—Mr. Davies presented the report, from which it appeared that the secretary's receipts during the past month had been examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on May 31 was £3659 3*s.* 7*d.* The committee reported that a new valuation of the household furniture, fixtures, and books in the library had been made, and they recommended that the amount of this valuation, £1451 7*s.* 6*d.*, be substituted for the previous estimate of £2000. The attention of the committee having been called to the suggestion made by Mr. Freebody at the last general meeting, viz., "That a committee, to consist of three governors, three life members, three annual subscribers, and one honorary member—not heretofore in any way employed by this Society—be appointed to inquire, and confer with its present honorary and official staff, in order to report at the next general meeting what measures this Society can best adopt, in order that some of its accrued funded capital should become of greater practical service towards the general advancement of English agriculture than of being invested in the New Three per Cents.;" they therefore recommended that a communication be addressed to Mr. Freebody, referring him to clause 9 of the Charter, in which it is enacted "that the president and council shall have the sole management of the income and funds" of the Society. This report having been adopted, the committee gave notice, in accordance with bye-law No. 76, that at the next December Council meeting they will propose a bye-law embodying a suggestion, contained in a letter from Mr. G. Drury, that members of 20 years' standing and upwards should be permitted to compound for future annual subscriptions by a single payment of £5.

JOURNAL.—Mr. Thompson (chairman) reported that the committee recommended the preparation and publication in the Journal of a map of the prize-farm district round Oxford, showing the surface-geology, at a cost not exceeding £40. In accordance with the notice given at the last monthly Council, the committee moved for a grant of £100 towards defraying the cost of an autumnal visit to representative farms, in order to obtain a report for the Journal on the following departments of Scotch agriculture:—(1). Arable farming in the Lothians; (2). Arable farming in the western counties; (3). A large dairy-farm; (4). Hill sheep-farming (black-faced); (5). West Highland cattle-farming; and (6). Aberdeenshire cattle-farming, including descriptions of any special arrangements for supplying the London market. The committee also recommended that a competent writer be engaged to report on the trial of implements at Oxford, and that he shall embody in his report the awards and opinions of the judges, which shall be given before leaving Oxford.—This report was adopted.

CHEMICAL.—Mr. Wells, M.P., reported that the committee recommended the publication of the following quarterly report, containing analyses and information furnished by the consulting chemist:—

DR. VOELCKER'S REPORT.

There is at the present time need of very great caution in the purchase of Peruvian guano. Samples have been forwarded to Professor Voelcker from all parts of England; for instance, from Devonshire, Staffordshire, Nottinghamshire, and Surrey, in each of which the guano, although in some cases coming direct from the importers, and being genuine Peruvian guano, was damaged by sea-water, contained a considerable proportion of sand and rock, and was inferior in value to the best samples by 50*s.* to 60*s.* per ton. The great number of these guanos that have been forwarded for analysis prove the truth of the warning given earlier in the year, that the qualities of guano now arriving are so variable and uncertain that great caution is necessary in making purchases of this manure. The following are examples of such inferior guanos:—

Moisture	10 10
*Organic matter and ammoniacal salts ..	43 33
Phosphate of lime	20 73
Alkaline salts	10 01
Sand	9 18
	100 00
*Containing nitrogen	10 65
Equal to ammonia	12 21

This guano was sold as "best Peruvian guano," at £14 2*s.* 6*d.* per ton. It is, however, not best Peruvian guano, for it is damaged by sea-water, contains too much sand (rock), and yields only 12 per cent. of ammonia, and is worth about £2 less per ton than Peruvian of average quality.

Moisture	17 79
*Organic matter and ammoniacal salts ..	36 24
Phosphates	20 21
Alkaline salts	10 75
Sand	5 01
	100.00
*Containing nitrogen	11.49
Equal to ammonia	13.95

This guano was bought at the full market price of £14 5*s.* cash. It is genuine, but damaged by water, and worth about 25*s.* to 30*s.* less per ton than good Peruvian guano.

Moisture	16.04
*Organic matter and salts of ammonia ..	41.38
Phosphate of lime	20.81
Alkaline salts	9.32
Insoluble siliceous matter	12.45
	100.00
*Containing nitrogen	9.65
Equal to ammonia	11 71

The bulk of this guano was delivered in a very damp state, and with a quantity of stone. The quality was guaranteed first-class Peruvian guano, and the price charged £14 per ton. It is genuine Peruvian guano damaged by water, and, apart from the larger stones, contains 12½ of fine silicious matter (rock), and yields only 11⅜ per cent. of ammonia, instead of 14½ to 15 per cent., which Peruvian guano of good quality at present contains, on an average.

The committee next directed attention to the following analysis, showing the composition of a sample of British guano, sent to Dr. Voelcker by Mr. H. Robbins, Northfield Farm, Witney:—

Moisture	26.80
*Organic matter	11.09
Phosphate of lime	.65
Oxide of iron and alumina	2.94
Carbonate and sulphate of lime	47 20
Alkaline salts and magnesia	1 72
Insoluble siliceous matter	9.54
	100 00
*Containing nitrogen	.53
Equal to ammonia	.64

This so-called guano is sold as Pound's British Guano, at High Street, Bromley, Bow, E., at £3 10*s.* per ton, and is described by the maker as "an extraordinary scientific combination of night-soil, sulphate of lime, and bones, possessing immense body, which gives it great durability and feeding power, whilst no known manure can compare with it in quantity of fixed ammonia." The preceding analysis, however, shows that the sample sent to Mr. Robbins contains merely a fraction of one per cent. of ammonia and phosphate of lime, and is all but worthless as an artificial manure. Its strong smell is chiefly due to animal or bone-oil.

As an instance of the caution that is requisite on the part of agents for the sale of manures, the committee wish to call attention to the following case, in which the son of a farmer was about to become agent for a manure known as the British Economical Manure. Before undertaking this agency he was requested by a friend who had formerly purchased the manure to have an analysis made of the article, and accordingly Mr. Stephen H. Allen, of Eastover, Andover, forwarded a sample to Dr. Voelcker, which was analysed, with the following result:—

Composition of a sample of British Economical Manure, sent by Mr. Stephen H. Allen, Eastover, near Andover, sold at £12 per ton by B. Coveney, 17, Devonshire Square, Bishopsgate Street, E.C.:—

Moisture	9.86
Crystallised sulphate of iron green vitriol ..	28 81
Sulphate of lime	2.05
Chloride of sodium common salt	13 49
Bisulphate of soda	30.69
Insoluble siliceous matter sand)	15 20
	100.00
Nitrogen	.06
Equal to ammonia	.07

The proprietor of the British Economical Manure states in his prospectus that 1½ to 1½ cwt. per acre has been found in result equal to 3 cwt. of the best Peruvian guano, and cautions farmers not to apply more than 1½ to 1½ cwt. to the acre. This caution is very appropriate, for a compound like the Economical Manure, which contains no intrinsically valuable fertilising matter, and which is a mixture of cheap saline matter with green vitriol—a constituent inimical to vegetation—is certain to do injury if it be used in quantities in which Peruvian guano and other concentrated artificial manures are usually employed.

In corroboration of the above, the following analysis of another sample of the same manure, which was sent by Mr. W. Hicks, Hillgrove, Wells, Somerset, may be quoted:—

Moisture	11.84
Crystallised sulphate of iron	20.92
Sulphate of lime	2.81
Chloride of sodium	13.77
Sulphate of soda	37 39
Sand	13 36
	100 00
Nitrogen	traces

Both samples are worthless as manure.

Many samples of superphosphate, which contain either no bone whatever or but very little, are sold this season professing to be made from bone. The following case is an illustration of this fact:—

Composition of a sample of superphosphate advertised as made from bone, sent by Mr. S. Browne, Brockton, near Shifnal, Salop, bought from Mr. George Dawler, Plume Works, Aston, Birmingham, at £7 per ton.

Moisture	11.76
Water of combination and }	25.33
*Organic matter }	
Biphosphate of lime (monobasic phosphate of lime)	1.69
Equal to bone phosphate (tribasic phosphate of lime), rendered soluble by acid, 2.56	
Insoluble phosphates (coprolite powder)	17.91
Sulphate of lime	28.27
Alkaline salts and magnesia (common salt) ..	5.18
Insoluble siliceous matter	9.86
	100.00
*Containing nitrogen	.56
Equal to ammonia	.68

Practically this bone-superphosphate contained no bone, but was a badly made coprolite superphosphate, containing only 2½ per cent. of soluble phosphate. It would be dear at £3 3s. a ton.

Cake is often sold as genuine linseed-cake, which is either made from inferior and undressed seed, or is mixed with other articles. The following is a good example of one of these cases. Mr. Dudfield, of Catsley, Bewdley, fowarded a sample of cake branded (B) genuine, bought from Mr. Firmston, Stourbridge, price £10 15s. per ton, and manufactured by Walker & Smith, of Hull. The analysis is as follows :—

Moisture	12 30
Oil	9.69
*Albuminous compounds (flesh-forming matters)	32 50
Mucilage, sugar, starch, and digestible fibre	26.16
Woody fibre	12.03
Mineral matter (ash)	7 32
	100 00
*Containing nitrogen	5.20

This cake was found to be made of dirty Linseed, and to be mixed with earth-nut cake. A correspondence on the subject with Mr. Dudfield ensued, and the committee think it right to that gentleman and the manufacturers to publish the last letter received from him :—

"Catsley, Bewdley, April 15, 1870.

"Dr. Voelcker.—Dear Sir : I have to thank you for yours of the 13th inst., as also for other communications, but I have *not* to thank you for any information tending to lead me as to the relative value of the cake you analysed for me ; and I beg to say that it is not my wish that any publicity should be given in this matter, or if it is, it must be on your own, or the Council of the Royal Agricultural Society's account—the parties I bought the cake of having amicably settled the matter with me, and the makers, Messrs. Walker & Smith, having accounted for the error, and shown every courtesy in the matter.—I am, dear sir, yours truly, "BENJ. DUDFIELD."

Another sample was forwarded by Mr. Hudson, of Castleacre, bought of Messrs. Marsten, of King's Lynn, as genuine linseed-cake, at £10 15s., of which the analysis is as follows :—

Moisture	13 78
Oil	10 31
*Albuminous compounds (flesh-forming matters)	30.93
Mucilage, sugar, starch, and digestible fibre	22.44
Woody fibre	15 53
Mineral matter (ash)	7 01
	100.00
*Containing nitrogen	4.95

This cake was found to be mixed with earth-nut cake, and although it was by no means a bad feeding-cake, it should not have been sold as genuine linseed-cake.

Other cases of adulteration have occurred, in some of which the Professor has been able to prevent loss to the purchasers ; but the committee regret to find that many farmers are unwilling to give up the names of the dealers, resting satisfied with the settlement made in their individual cases.

It was also reported that the committee had had under their consideration some observations made at the general meeting, with reference to the possibility of experiments being carried out to a greater extent than is the case at present, and that they had requested Dr. Voelcker to prepare for the next meeting of the committee a statement of what he has done in this direction during the last few years, with the view of considering with him whether any change in the present system can be advantageously adopted.—This report was adopted.

GENERAL, OXFORD.—Lord Kesteven reported that the committee recommended that the secretary be empowered to make arrangements for advertising the Oxford meeting at a cost not exceeding £400, and that the secretary be instructed to communicate with the Home Office, requesting the assistance of the usual number of the A. division of the London police.—This report was adopted.

COUNTRY MEETING DISTRICTS.—Mr. Thompson (chairman) reported that the committee had agreed to an order of rotation to be recommended to the Council, and that they suggested that a copy of this scheme should be seat to each member of the Council, to ensure its being duly considered by the next meeting, when the committee will move its adoption.—This report was adopted.

In the absence of Mr. Booth, it was moved by Mr. Shuttleworth, that the railway expenses of the Committee of Inspection at Shrewsbury, Stafford, and Wolverhampton be paid by the Society ; and it was explained that this motion was brought forward in consequence of the refusal of the railway companies to grant free passes, as on former occasions. Mr. Cantrell having seconded the motion, Lord Kesteven and Mr. D. R. Davis, who were members of the committee, expressed their unwillingness to be reimbursed in an exceptional case. It was, therefore, suggested by Mr. Dent, M.P., that the resolution should be amended as follows :—"That the railway expenses of the Committee of Inspection for the present and future years be paid by the Society." This suggestion having been adopted by the mover and seconder, the resolution was carried unanimously.

The Earl of Powis, in moving "that in future lists of stock prizes a class be established for mules," urged the desirability of improving the character and increasing the value of these useful animals. He quoted facts showing that a large number of them are employed on small holdings, especially in Ireland, and particularly mentioned the school at Oldcastle, to which is attached a farm of 13 acres, worked entirely by a jennet. He also mentioned the greater longevity of the mule as compared with the horse, and the probability that owners might treat their mules better if the value of the animals were more generally appreciated, as reasons why the Society should establish a class for them in future prize lists. That mules were really valuable for draught purposes and as beasts of burthen was proved, he maintained, by their extensive use in Spain and other countries, and particularly by the use made of them by our own Government in the Abyssinian Expedition. Mr. Dent, M.P., while agreeing with what had been stated by Lord Powis, urged that the reasons which proved that the Society ought to give prizes for mules were at least as strong in favour of their giving prizes for asses. Lord Powis, having concurred in this view, moved "That in future lists of stock prizes classes be established for asses and mules." This resolution was then seconded by Mr. Dent, M.P., and carried unanimously.

The Secretary laid before the Council the following letter, which he had received from the chief of the Veterinary Department of the Privy Council at Dublin in the course of correspondence with reference to the conveyance of cattle, sheep, and pigs to and fro between Ireland and the Society's showyard at Oxford.

"Veterinary Department of the Privy Council Office, Dublin Castle, May 20, 1870.

"Sir,—In reply to your communication of the 17th inst., addressed to the secretary of this department, I have the honour to inform you that there is no legal obstacle to animals going from Ireland to the Oxford show, and returning therefrom, if the cattle or sheep, as the case may be, are accompanied on their return with a declaration and a certificate of health. There is, however, an obstacle with which the Government has, unfortunately, no power to interfere. It is caused by the steam-packet companies, principally the Dublin one, refusing to bring agricultural live stock in their vessels from Great Britain to Ireland. For any stock going to, or returning from, the Oxford Show of the Royal Agricultural Society, the greatest facilities in the power of the Government will be afforded ; and on application to this department by the owners or exhibitors of stock at your approaching show, wishing the same to come on return to Ireland, and be landed at the port of Dublin, instruction will be immediately given to their owners, or agents, and to the steam-packet companies, that the Government have no objection to such animals being landed at Dublin, provided that they are accompanied with a certificate of health.

"Assuring you that I have received directions from the Government to afford the utmost facilities for the movement of cattle into Ireland, compatible with safety and the provisions of the law,

"I have the honour to be, sir,
"Your obedient servant,
(Signed) "HUGH FERGUSON.
"H.M.V.S."

"To H. M. Jenkins, Esq., Secretary, &c."

The Secretary also stated that he had applied for, and obtained from the authorities at Dublin Castle, copies of the forms of declarations and certificate of health for the use of Irish exhibitors at the Oxford show, and that he had ascertained, by direct communication with the companies, that although the City of Dublin Steam-Packet Company refused to convey cattle to Ireland under any circumstances, the Chester and Holyhead Company, in connection with the London and North-Western Railway Company, were prepared to convey them if accompanied by the necessary documents, mentioned in the foregoing communication from the veterinary department, properly filled up and signed by the authority appointed by the Government.

Mr. J. D. Dent, M.P., gave notice that at the next monthly Council he would move—"That it is undesirable to persevere with the agricultural examinations hitherto carried out by the Society ; but that in lieu thereof the Society should give medals or other premiums for agricultural knowledge in such public county schools as may apply for them, and be approved of by the Council."

Farmers' Clubs.

MORAYSHIRE.

Haymaking.—At the late quarterly meeting of this Farmers' Club, the question for discussion was "Hay : what is the opinion of members as to the best method of managing the hay crop in this country?"

Mr. ROSE could not prescribe anything better than the usual mode of cutting it, letting it lie a day or two, putting it up in small coles, then into larger ones, and allowing it to remain in stack for the winter. It would scarcely do in this country to adopt the English plan of turning it over and over for two or three days. He fancied the plan the farmers adopted in this country was the general rule of this part of the country.

Mr. HARRIS was in the same position with Mr. Rose in regard to the growing of hay, for he had scarcely grown 100 acres during his lifetime. He thought they should cut it pretty green, beginning with it when the bloom was on it, certainly before it had left it. He would leave it in the swathe for two or three days, then turn it gently over with the handle of a fork, and get it into cole as speedily as possible. They were apt to forget that the hay grown in this country differed from the natural grasses and seeds of England. It had therefore to be sorted in quite a different manner from the hay in this country, which was a mixture of Clover and grasses. Some years ago he had an English gentleman with him, a very successful farmer, from the midland counties. That gentleman laughed at the manner in which the hay was being managed, and it was left to him to try his own way with it. He knocked it about in the English fashion, and appeared to leave about about one-half of it on the field. It was put into the stack, and, though it heated, he insisted it was all right, until the cattle came to get it, when they would not eat it. He thought the plan presently pursued in this country, though very much run down, was the proper way of making hay.

Mr. WALKER (Leuchars) said the way they made hay in the county of Fife, so far back as 40 or 50 years ago, was to cut it and let it lie for two or three days, the time depending upon the strength of the hay. When hay was left in the swathe as cut, it would stand a great deal of rain, but if they turned it over and over, it was easily spoiled. After lying for two or three days in the swathe, he would turn it over with the handle of a fork, then put it into cole, and it would stand two or three good showers : then put three or four of the small coles into one, and allow it to stand till it could be put into stack. He might mention, with regard to his experience of the English mode of making hay, that they turned it up at once immediately after it was cut, and put it into little handcocks at night. After turning it up, however, it began to rain ; but, being fair the next afternoon, they turned it out of the small cocks and began to put it into larger ones. It rained again, and they wrought away in that manner with it till they got it put into large coles, and by the time that operation was completed the hay was almost on fire. They had to turn it out again, and the crop was lost nearly altogether. They could not in this country depend upon weather for making the hay, as in England.

Mr. PATERSON (Mulben) said he generally made a little hay. If it was hay for use, he cut it when the bloom was upon the Clover. If the weather was very good, perhaps a day or two was sufficient time for it to lie, and if there was sunshine at the time it was cut, he coled it at night. He did not make the coles large, but increased them in size as he thought it expedient. With regard to hay for seed, he let it ripen pretty well before cutting, and if the weather was good he left it out a day or two and then shook it over a paling bar. He never threshed hay. If the weather did not look well, he put it into stook ; and of the weather improved he shook it over a bar out of the stook ; if the weather was not favourable, he carried it home and stored it till satisfactory weather came for shaking it out.

The CHAIRMAN (Mr. Yool) said, before summing up, he would express his own opinion. In the first place, in their country, as almost no natural Grass was cut for hay, the system pursued must be considerably different from that pursued in England. The whole of the grasses cut for hay in this country consisted of mixed Clovers and grasses grown under a regular system of rotation. There was one point that had not been alluded to by any of the speakers, the modes of cutting the crop, whether it was best done by scythe or machine. The machine, he was aware, was in great favour, and was generally admitted to do its work in as good a style as the scythe. His own experience corroborated that. By the help of the mowing machine he could cut a great deal more than with the scythe, and they had the crop left lying thin upon the ground behind the machine, so that in good weather they could carry it off very much sooner than they could if left lying in swathes by the scythe. That was no inconsiderable advantage. In cutting by the scythe, the crop being left in swathes took longer to dry. During wet weather, cutting by the scythe was the best course, because in swathes the hay was not so much liable to be damaged ; lying in a large body the rain was easier thrown off it. If the weather was dry, they would cut better with the reaper. The machine considerably reduced the expense of the operations, while it was clear that where the surface of the ground was moderately even and free from stones, the mower could do the work as well as the scythe, and could be set to cut quite as close as was desirable, and made more level work than the majority of scythemen. The difference of expense in mowing a heavy crop of Grass by machine and scythe was considerable, amounting, according to his calculation, to from 2s. 6d. to 3s. an acre in favour of the machine. A comparative statement of the cost might be put thus. The manual labour for cutting with the scythe a heavy full crop of Grass might be put down at 4s., or say 4s. 6d., an acre. Against that, cutting by the machine, he would put down the manual labour at 3⅛d., an acre, allowing that the machine would cut 10 acres a day, which it would do in a fair crop ; the horse labour at 6d. an acre, which would give 5s. a day for horses ; the percentage upon the mowing machine he estimated at 9d., making a total of 1s. 6¼d. an acre, and giving a difference in favour of the machine at 2s. 11d. per acre. At least 2s., and as he thought 3s., could be saved by the use of the mower in place of the scythe. They had also to add the lessened cost of the after operations, for that they did not require to turn the hay made the case still stronger in favour of the machine. If the crop consisted principally of Italian

Rye-grass it should be cut on the appearance of the flowers, as this Grass is such a fast grower that if cut at this stage a second cutting can be obtained, nearly, if not quite, equal to the first, and on good land a third, and perhaps even a fourth cutting. With regard to ordinary Rye-grass, it might be allowed to produce the flower, and Clover was best cut when the greatest number of heads were in full bloom; if left longer the leaves began to fall off, the stems got more woody, the weight of crop was diminished, and the quality deteriorated. Fields of mixed grasses and Clovers, if for ordinary hay, should be mown when the greatest number of the plants are in full flower. When the crop was cut by the mower it required very little handling during the drying operation, the principal thing necessary being to spread out somewhat more thinly that part of it which was drawn together by the dividing shoe of the machine, in order to clear a space for the horses' feet: then the less turning they gave it the better, until it was put into small coles. When cut by the scythe it should be turned as quickly as possible, without knocking it about, on the second or third day, in order to let the drying process get though the swathe. It should then be put into small cocks, and carried as soon after as there was a chance of it keeping. All this should be done with as little rough shaking as possible, so as to retain the leaves of the Clover unbroken. He thought the tedders would be of no use to them, but rather disadvantageous, and for this reason that their Clovers would not bear to be knocked about with the tedder as the natural grasses of England would. If they knocked the Clover about they knocked off all the fine leaves, which were very nutritious to the cattle. The practice of letting hay stand long in the field in small cocks he had frequently observed in this and in other parts of Scotland was very wasteful. When allowed to stand long on the fields in these small cocks it would be found that the parts of the cocks next the ground were very much deteriorated, in fact, were worth little or nothing, except for manure. As soon as it was fit to be carried to the ricks it should be carried; in fact, the whole process of cutting, drying, and carrying the hay crop, should be done as fast as possible with safety. If just sufficient time is allowed to let it dry thoroughly, so as not to heat in the stack, the more quickly it was carried the less would be the loss incurred through wasting and fermentation. These were his experiences, and from what had been said it seemed to him that the finding of the meeting would be that a party making hay could make, on the whole, very little improvement upon the prevalent system. As Mr. Harris said, Scotch farmers had been often taunted for the inefficient way in which they made hay, as compared with the English farmers; but really there was not an element of comparison between the two. By machines they might cheapen the cost of making hay, but, on the whole, their mode of managing the hay crop could not be very much improved upon.

Notices of Books.

Agricultural Economy in China. (*Industries Anciennes et Modernes de l'Empire Chinois, &c.* By M. Stanislas Julien and M. Paul Champion. 8vo, pp. 254, with plates. Paris: Eugène Lacroix.)

The Chinese have always been considered to rank amongst the first agricultural people in the world. Few facts are more remarkable in that remarkable country than the excellent condition of the fields, the admirable methods of irrigation, and the ingenious expedients of all kinds for increasing the fertility of the soil. As a proof of the success which has been achieved, it may be mentioned that, cheap as rice is, ordinary vegetables are still cheaper in China—a fact that speaks volumes for the condition of market gardening.

We are learning very gradually to know what China and the Chinese are really like, and a French chemist, M. Champion, who lately visited the East expressly for scientific observation, has recently published some highly interesting facts respecting Chinese agriculture, and on the way in which waste matter of all kinds is used up in that old country.

The Chinese farmer, says M. Champion, no matter how distant may be the sources of water, always contrives to supply his land with the necessary quantity of that fertilising agent. Can we say as much?

The extent of China gives it a great variety of soil. Some of the land is too rich, causing plants to produce an excess of fibrous growth and leaf to the detriment of grain and fruit; some, on the other hand, is very poor. When circumstances permit, the Chinese farmer remedies this state of things in a strikingly practical manner—he mixes the soils together.

The value of manure has become proverbial with the Chinese. "Manure," say they, "should be treated like gold!" and "It is cheaper to manure the field you have than to buy another."

The Chinese know little of the science of chemistry, but they practised manuring elaborately ages before we in Europe had the slightest notion of the effects of fertilising substances; they found out that different lands and different crops required special treatment; they employed all the waste of the cities on the land, and, in some cases, they produced what we should call artificial manure. To show to what an extent the system has been carried in China, it may be stated that they have at least five well recognised kinds of manure in constant use, to which they give the names of trodden stable manure, enclosed manure, stifled manure, burnt manure, and boiled manure.

Trodden stable manure consists of the refuse from the threshing floors, placed in stalls and cow sheds, where it is trodden by the animals and absorbs all the urine; after a few days it is reduced to a pasty mass, spread on the land, and turned in with the plough. Enclosed manure consists of all kinds of animal and vegetable refuse, thrown into pits carefully lined with brickwork and covered in, where it is left to ferment, or, as the Chinese say, to "cook." Stifled manure is produced in enclosures called manure-houses, in which all kinds of excrement and waste matter is thrown; the house is carefully roofed over, to shut out the wind and rain, and it is always built on a slope, so that the rain-water shall not diminish the value of the manure. Burnt manure consists of manure of all kinds partially dried and then covered over with leaves and set on fire; the ashes thus produced are mixed with certain seeds at the time of sowing. Boiled manure consists of the trodden manure first mentioned, mixed with bones and other matters, and boiled in water. The Chinese find this highly efficacious in certain kinds of culture. The insoluble matter left at the bottom of the cauldrons is sometimes used with the liquid manure, and sometimes separately.

The Chinese use every kind of waste for manure—Hemp and Lucerne stalks, oilcake, and especially that left from the extraction of castor oil, waste Rice, fœcal matter of all kinds. In the case of Hemp stalks they take the trouble to cut them up and mix them with ordinary manure in large pits kept well closed until the top layer is fermented, when they remove this and close the pit again, repeating the process till the whole is thoroughly "cooked."

One kind of manure is rarely used alone, the Chinese finding that certain mixtures suit best certain crops, and they are perfectly aware that the proportions must be varied according to circumstances of soil, climate, and crop. Printed works, centuries old, prove how long the Chinese acquired this kind of knowledge before we in Europe had a notion of it. Lime, oyster shells, and certain other mineral substances, are largely used, the system being to plough them into the soil with the weeds and roots.

The most remarkable fact, in connection with Chinese agriculture, is that all the fœcal matter produced is turned to account. In the neighbourhood of towns it is mixed with earth, or artificial manures, on the spot; in those districts well supplied with water-carriage it is carried, frequently to a great distance, in large barges, managed by two or three men, and when the farmer lives near streams that are not navigable he uses up all the water plants he can procure, fermenting them and mixing them with mud. Sometimes the night-soil is collected in great pits, into which the water used for cleaning rice and all other kitchen refuse is thrown, and sometimes it is stored in huge earthen jars, placed near the fields and along the sides of roads. No village in China seems to be without one or other of these contrivances.

The Rice fields in the east and south of the empire furnish the most striking evidence of the careful cultivation of the Chinese. They are often situated on the hill sides, where the soil is arranged in terraces, each of which is bordered with a low wall, formed of stones and clay, to stop the water coming down from the hills. When the first field is sufficiently moistened, a hole is made in the wall, and the water is allowed to descend to the next terrace.

When the source is on a low level the water is raised up by rude bamboo wheels, worked by two men, and near streams the water is simply baled out in pails slung at the end of a bamboo; the water is received in a trench cut for the purpose in a convenient position, and is conveyed in all directions by a series of carefully arranged trenches. The Rice is soaked in water before being sown, the soil being previously irrigated, and the grain is transplanted in little tufts of six or seven heads, set 5 or 6 inches apart—an immense labour when the extent of the Rice fields is considered. Several crops are obtained annually, the fields being sown in succession; so that when one crop is cut and carried, the soil is immediately ploughed, and set with the surplus plants from another.

Such being the condition of Chinese agriculture we are not surprised to find that the farmer is held in great esteem, and that many monuments and *fêtes* exist in honour of his calling. It is recorded in ancient Chinese works, that in old times the Emperor used to plough a furrow at a certain period of the year with his own hand, and M. Champion was assured, when at Peking, that the antique custom was still perpetuated.

Farm Memoranda.

Warwick Sewage Farm: *May* 25. A few notes on our farm may be of sufficient general interest to find space in your Journal. Last year we began our season's cutting of Italian Rye-grass on March 2, this year on May 2. The field, of 7 acres, yielded 50 tons 2 cwt., or 7 tons to the acre. The second crop now averages all over 18 inches in height, and will be fit to cut in another week.

The experiences of Barking, Aldershot, and places of kindred soils, are, that it is not profitable to grow Rye-grass beyond a year. Mr. Hope finds one year sufficient; Mr. B. Denton gives, I think, two. The field referred to above is entering its fourth year. What, therefore, is true of Barking and Aldershot is not true of Warwick. The Editor of the *Agricultural Gazette* has himself seen this field under cut, and can correct me if I am wrong.

We have one field of 12 acres, an old ridge-and-furrow pasture; over it the sewage has been scrambled during the winter. There has been a good crop for cutting the past fortnight. Failing to sell the Grass, I began cutting for hay on the 28th, and hope to have the whole down by to-morrow night. The crop is very heavy; half an acre carted off gave 5 tons 11 cwt. I estimate the yield in hay at 2½ tons per acre. The field next to it, precisely similar in every respect, is dried up, and the Grass over it does not average above 6 or 7 inches high. As only two or three of the grasses have developed seed, I look to make a good second crop of hay.

What more striking example of the value of sewage as a food-producing element can be shown? Applied to old pasture, the keep is enormous. I send specimens of Cock's-foot, Fox-tail, and common Clover.

With regard to the value of Italian Rye-grass as food for cattle, I note that it is often spoken of in a hesitating way, as if the question was doubtful, or at least open. I will give our experience:—In 1868 the prejudice was so great against sewage-grown Grass that we could only sell part of our crops at nominal prices; indeed, at times we could hardly give them away. To prove the value of the Grass, the Mayor, Mr. G. H. Nelson, bought stock especially for the purpose. The late Mayor, Mr. Robins, put all his cattle upon it, and I bought a cow myself, and kept her wholly on the Grass. The result was very satisfactory. In the spring of 1869 the cowkeepers began to come in, gradually the horsekeepers; these were followed by the carriers, and lastly, by the brewers. At the close of the season, all without exception expressed their satisfaction with the Grass, and all are coming in again this year.

Further, I was very desirous of selling the crop off the 12-acre field of natural Grass above referred to, and offered it at 10*s.* to 12*s.* per ton. Many tried it once, but no more; preferred giving 15*s.* to 16*s.* for the Italian Rye-grass.

We had three fields cut during last December. All suffered much from frost. They looked in the spring as if burnt up. I harrowed the bare places, and rolled some seed in. The fields are now coming round well.

A field sown in October, the plant well started, was wholly killed by frost. Seed sown at the same time the previous year came on well. No seed ought to be sown later than first week in September to be safe.

I should be glad of the experience of others as to spring sowing of Italian Rye-grass. I sowed a considerable breadth in March, some in April, and some in May. The first started very well, but the bitter east winds and frosts appear to have cut it down. The April sowings are backward, and much of the seed has either missed, or the young plant has been destroyed by the grub. Our May sowings are nearly as forward as those of March.

Look at the fibre in the specimen of Cock's-foot I send you, under sewage treatment. Would it not make a good paper Grass?

Can you tell me anything of the plant of which I send you a specimen? The seed of it was sent me from France as an Algerian forage plant. It grows with great luxuriance in my garden, a dry sandy soil; stands several cuttings in the year; but as far as I have tried, neither cattle nor horses will eat it. The name I know it by is "Galuga." It has beautiful green foliage. It appears to grow well almost anywhere. Transplanted some plants to fill bare places on a border under trees; the result is satisfactory. It belongs, I think, to the Lentil family; bears a pretty lilac-coloured flower. *W. Clifford.* [It is a Galega, probably Galega officinalis—more a Lupine than a Lentil.]

Roxburghshire: *Tweedside, May* 28.—The warm weather we have had for the last two or three days is telling favourably on the grain crops, but we require moisture to bring on the pastures, that have been unusually bare all this season. Of Wheat there is little sown, the peculiar and trying winter preventing the seed being got in. Barley was sown under most favourable conditions, and brairded most beautifully, and now looks well. Oats had also a fine seed-bed, and are generally promising well. Hay has been too long pastured, and, even though it gets rain, can scarcely be a full crop. The Turnip break is working uncommonly well; and never before, perhaps, has such a large breadth been sown, as early and in such good order,—on many farms they are all sown, and on others they only delay for a few days to lessen the risk of running to seed; the Turnip fly, however, has made its appearance, and the fine brairded stands in considerable danger of disappearing unless we get rain with heat immediately, to force the young plants forward.

At the numerous farm sales that have taken place lately stock has sold well, ewes and single lambs bringing from 50*s.* to 70*s.*, and twins from 60*s.* up to 120*s.*, on one farm where there was a good stock of pure Leicesters. Ewe and lean wether hoggs have also brought long prices, and grazing cattle are very dear.

Horses have not been bringing as much money as they would have done at the March fairs, which may be owing to farm work being far advanced; whereas in March the opposite was the case. The severe black frosts have certainly saved a great deal of labour, and will thus in part make up for the damage caused to unstored Turnips last winter. *H.*

The Week's Work.

June 4.—Buckwheat may yet be sown on dry soils adapted for it where other crops have failed. Although hardy when up, and widely cultivated in most of the Northern States of Europe, from whence large quantities are annually imported, it is very susceptible of frost at the time of brairding, so that what was early sown last month should be examined in time, and resown if killed by frosty nights. It is a rapid-growing plant, and the late-sown is often the best crop. Buckwheat meal is relished by all kinds of stock. Drill in a bushel of seed per acre as directed last month.

Turnip Seed-time.—"This is the great season for sowing Turnips," wrote Arthur Young; and so it is at the present day. The weather has been favourable for spring fallowing and getting the land ready for manuring and seeding. The free use of the liquid-manure drill will be very general, with more than the common allowance of water. If 25,000 plants are grown per acre, 1000 gallons will not be much to each when divided amongst them, granting that it is applied on the drop principle; and if dribbled continuously along the drill, the question is—How much will each Turnip get? The whole art of growing Turnips lies in getting the seed with plenty of sap in properly cultivated land. It is a good plan to well soak farmyard manure with liquid manure from the tank some days prior to its being carted to the land, as it both supplies sap and makes the manure spread better in the drills. In this way upwards of 1000 gallons of water per acre may be applied much more available to the Turnip crop than when sprinkled along the surface of the drills in dry weather. In short, such is the importance of sap, that the quantity each plant requires should become a question of exact calculation, just as the quantity of guano, the solid portion of plant food, is calculated. In the northern counties Swedes are generally sown during the latter part of May; but in the southern counties the beginning of June is more common. But, as stated last month, Kohl Rabi is now preferred to Swedes in the South. In the North the sowing of the white and yellow-fleshed Turnips follows the sowing of Swedes—the white-fleshed Globe and Tankard first—in order to get them consumed before the winter frosts set in. In the South white and yellow Turnips are now mostly stolen stubble crops. About 3lb. of seed is the common calculation per acre, but in dry seasons we prefer 4lb., singling in time should growing weather set in.

Lupine.—Continue to sow on poor dry soils adapted for it up to the middle of next month. Keep the early-sown crops clean. Weeds are apt to grow in soils suited for Lupine, proving very inimical to its growth; and in hoeing draw the earth up to the roots, as in hoeing Peas, Beans, and Potatos; and it is an old saying, that "where Lupine prospers it is a paying crop."

Weeds now begin to ripen their seeds, which should be prevented everywhere on the farm. Bear in mind the old proverb, "One year's seeding is seven years' weeding." All the corn and grass fields, roads, and fences, should be gone over, and the weeds collected and reduced to manure either by lime-burning or fermentation with liquid manure; Grass and every green thing along the ditch and fence sides round fallow and Turnip fields (as under hedges) beyond the reach of the plough, pare deep with the spade, throw into heaps and cart off. This and the cleaning of the ditches should be done before the Turnips are sown. When the green sod parings and cleanings of ditches are stifle-burned they yield excellent ashes for the seed and manure drill. The seeds and roots of some weeds are very tenacious of vitality, therefore whatever may be the mode of destruction, very great care should be taken that it is effectual.

Sewage Farming is now at its maximum, yielding large and rapid returns of Italian Rye-grass—10 tons per acre and upwards at a cutting for soiling. The inestimable value of such a supply of the best green food for live stock will this year be appreciated by many; and it should be borne in mind that such a supply is not limited to the use of town sewage, for wherever there is a command of water 10 tons per acre during this and the following two months can be had by washing in a few hundredweights of guano or artificial Grass manure. Water is a most powerful stimulant at this season to all farm crops, provided there is anything in the land for it to work upon. In point of fact, heavier crops can be grown with doctored water than with town sewage, for the latter is not a specific manure even for Italian Rye-grass, and it is still more defective for Mangel Wurzel. In other words, town sewage should be doctored with superphosphate, &c., to make the most of it.

Soiling.—Although the season has not only been late but remarkably backward in other respects, Vetches, Clover, Lucerne, and other forage plants should now be ready for the scythe, and should daily be given to live stock to save the pastures. Milch cows, fattening cattle, and horses, that can be more profitably soiled in the yards, should be kept at home, and only the younger beasts and sheep left in the field. To overstock the pastures at this season is ruinous, and the removal of a few "big mouths and feet" is a great relief.

The Pastures now begin to feel the influence of a vertical sun, more especially when cropped too bare. The shelter which a close full bite affords from the rays of the sun, obviating at the same time the exhausting evaporation from a bare surface during mid-day, together with the opposite moistening and fertilising effects of the night dews caught and utilised by the long Grass, are facts with which graziers have long been familiar; and this is not all, for the old proverb that "grazing cattle eat with two mouths," reminds us that at this season cattle, when the pastures are bare, consume more with their feet than with their mouths. Hence the practice of shifting grazing stock from one close when it begins to get short to another where there is a full bite, and in doing so advantage is always taken of a summer shower to start the Grass.

Irrigation of Pastures.—The rapid growth that follows a summer shower proves that with our present steam-pumping appliances much grass-land might be watered on the same principle. We have seen it successfully done on outfield land that was irrigated on the old plan when lying in pasture. When the cattle were shifted the gutters were cleaned out, the water turned on for a day or so to well soak the land, and in ten days "the cattle were up to their knees in Grass again," and so on. At one time also, much grass-land was irrigated by means of underground culverts, with hydrants rising here and there in the surface, and from these the water was distributed by means of troughing and leather hosing. We have now got beyond these old appliances, and by means of a short length of movable troughing grass-lands can be irrigated in the same way it is now done on Lodge Farm, Barking, with fixed troughing, either on the ridge or catch-water system, according to the inclination of the land.

Hop Gardens attend to, in hoeing, digging, and tying up bines, and in liquid manuring should the plants require it, to force them forward and obviate insects, blight, &c. When the land is sufficiently moist, and yet requires manure, guano and fish manure may be sown on the hills, and the hoeing will help to work it in to the roots. *W. B.*

Markets.

ENGLISH WOOL.

No fresh feature in the market, buyers still holding off in the hopes of being able to come in for the new clip on moderate terms. We are strongly of opinion, however, that no decline will take place, or if it does that it will be only temporary.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	s. d.	s. d.
FLEECES—South-down hoggets	.. .. ..	1 1	to 1 2½
Half-bred ditto ..	.. .. ..	1 2	— 1 2
Kent Fleeces	.. .. ..	1 3	— 1 4
Southdown ewes and wethers	.. .. ..	1 0	— 1 3
Leicester ditto	.. .. ..	1 2	— 1 3
SORTS—Clothing ..	.. .. ..	0 10	— 1 6
Combing ..	.. .. ..	1 0	— 1 8

HAY. per Load of 36 Trusses.

SMITHFIELD, Thursday, June 2.

Prime Meadow Hay	85s. to 95s.	Clover, old ..	..120s. to 130s.
Inferior do.	70 80	Inferior do.	100 110
Rowen	— —	Prime 2d cut ..	100 126
Inferior do.	— —	Inferior do. ..	80 90
Straw	29 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, June 2.

Sup. Meadow Hay	84s. to 99s.	Inferior Clover	95s. to 110s.
Inferior do.	72 76	New do.	— —
New do.	— —	Straw	30 35
Superior Clover ..	120 130	JOSHUA BAKER.	

WHITECHAPEL, Thursday, June 2.

Fine Meadow Hay	76s. to 82s.	Prime old Clover	..120s. to 130s.
Inferior do.	60 70	Inferior do. do. ..	90 100
Prime New Hay ..	— —	Prime 2d cut do. ..	— —
Inferior	— —	New Clover	105 112
Straw	24 28	Inferior do.	80 90

METROPOLITAN CATTLE MARKET.

MONDAY, May 30.

We have a larger supply of Beasts, but there is a good demand, and prices are better on the average. Sheep are also more plentiful; prices, however, have an upward tendency, although trade is not very brisk; the average quality of the Lambs is very inferior, consequently the few choice ones on offer realise higher prices, but middling ones are difficult to sell. Choice Calves are dear. Our foreign supply consists of 1023 Beasts, 9350 Sheep, 253 Calves, and 10 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5 2	to 5 4	Best Long-wools ..	..	to ..
Best Shorthorns ..	4 10	— 5 2	Do. Shorn ..	5 0	— 5 4
2d quality Beasts ..	3 4	— 4 4	Lambs, 2d quality ..	..	..
Best Downs and Half-breds ..	..	— —	Do. Shorn ..	4 4	— 4 10
Do. Shorn ..	5 4	— 5 6	Lambs	5 8	7 4
			Calves	5	5 6
			Pigs	3 8	— 5 6

Beasts, 3190; Sheep and Lambs, 19,840; Calves, 306; Pigs, 190.

THURSDAY, June 2.

We have a much larger supply of Beasts than for a long time past on Thursday; prices are consequently lower for all kinds, and a considerable number remain unsold. The number of Sheep and Lambs is nearly the same as last Thursday; trade is not so active as on that day, and prices generally are lower. The supply of Calves is larger, but the average quality is only middling; some of the choicest are making nearly as much as on Monday. Our foreign supply consists of 450 Beasts, 3100 Sheep, and 550 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4 10	to 5 2	Best Long-wools ..	..	to ..
Best Shorthorns ..	4 8	— 5 0	Do. Shorn ..	4 10	— 5 0
2d quality Beasts ..	4 0	— 4 6	Ewes & 2d quality ..	..	..
Best Downs and Half-breds ..	..	— ..	Do. Shorn ..	4 2	— 4 8
Do. Shorn ..	5 2	— 5 4	Lambs	5 6	— 5 8
			Calves	3 6	— 5 6
			Pigs	..	— ..

Beasts, 1500; Sheep and Lambs, 14,250; Calves, 67; Pigs, —.

METROPOLITAN MEAT MARKET. June 2.

Best Fresh Butter	14s. per dozen lb.		
Second do. do.	12s. "		
Small Pork, 5s. 4d. to 5s. 8d.;	Large Pork,	3s. 8d. to 4s. 4d. per 8 lb.	

MARK LANE.

MONDAY, May 30.

The supply of English Wheat to this morning's market was very short, and brought an advance of 1s. 2s. per qr. upon the prices of this day se'nnight. A like improvement was demanded for foreign, and paid by needy buyers, but the business done was not extensive. Grinding Barley was rather dearer. Beans and Peas brought 1s. per qr. more money. The Oat trade was firm, at an advance of 1s. per qr. upon the week. Flour was 6d. per barrel and 1s. per sack dearer.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk. White	41—49	Red.....	43 48
— — fine selected runs..do.	45 53	Red.....	44 50
— — Talavera	55—57		
— — Norfolk		Red.....	
— — Foreign	40 55		
BARLEY, grind. & dist., 26s to 30s. Chev.	39—42	Malting ..	44 48
— Foreign ... grinding and distilling	22—25	Malting ..	39—43
OATS, Essex and Suffolk	22—24		
— Scotch and Lincolnshire Potato	24—26	Feed	— —
— Irish ..... Potato	23—25	Feed	21 24
— Foreign .....Poland and Brew	21—24	Feed	19 21
RYE	32—38	Foreign ..	33 36
RYE-MEAL—Foreign			
BEANS, Mazagan....30s. to 37s. Tick	31—49	Harrow ..	31—49
— Pigeon ....50s. to 56s. Winds.		Longpod ..	— —
— Foreign ..... Small	41 43	Egyptian ..	38 43
PEAS, White, Essex, and Kent.. Boilers	32 42	Suffolk ..	35—43
— Maple, 41s. to 45s. ..... Grey	32—42	Foreign ..	33—37
MAIZE	— —	Foreign ..	29—31
FLOUR, best marks delivered..per sack	39 43		
— 2d ditto ..... ditto	28—40	Country ..	28—40
— Foreign ..... per barrel	22—25	Per sack ..	20—55

WEDNESDAY, June 1.

At Mark Lane this morning the receipts of Wheat from Essex and Kent were very moderate. The demand was not active, but the trade ruled firm, and prices were well maintained. The show of foreign Wheat was moderate; the inquiry was limited, but at full currencies. Moderate supplies of Barley were on the stands. The trade was firm, at full quotations. Malt was quiet, on former terms. Oats were in request, at the recent improvement. Beans and Peas were quite as dear, with a moderate inquiry. Flour was steady.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 150	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	4700	2130	31,030	850
	4850	2130	31,030	21,000 bdls.

LIVERPOOL, May 31.—We had a fair attendance at to-day's market, and Wheat was in limited request, at prices ranging higher than those of Friday last. Flour was in fair request, at previous rates. Indian Corn dull, and to transact business lower prices had to be accepted. Peas dull, and a shade easier.

AVERAGES.

	Wheat.	Barley.	Oats.
April 23	42s 7d	34s 11d	20s 6d
30	42 7	33 1	21 7
May 7	41 3	34 2	23 1
— 14	44 5	33 9	23 1
— 21	45 1	32 5	22 0
— 28	45 4	32 11	23 10
Average ..	43 11	33 7	22 4

SEED MARKET.

The past week has been quite of a holiday character, and there having been scarcely any demand for agricultural seeds, the business transacted has been very limited. Values of all descriptions remain very firm; the excessive and long-continued drought exercises a hardening effect upon prices, as it is believed that a considerable breadth will require re-sowing, and this would of course cause a good trade during the autumn. Tares are a little dearer. Rape and Mustard seed are in fair request, at the recent advance, but a good rain is needed to give impetus to the demand. The Linseed trade is steady. The reports of the growing crops of Trefoil, both in this country and on the Continent, are very unfavourable. Hemp seed is without alteration. Canary seed is 1s. to 2s. per qr. dearer.

JOHN SHAW & SONS, 16, Water Lane, London E.C.

COALS. June 1.

Walls End Gosforth, 15s.; West Hartley, 15s.; Eden Main, 15s. 3d.; Walls End Haswell, 17s. 3d.; Walls End East Hartlepool, 16s. 6d.; Walls End Original Hartlepool, 16s. 3d.; Walls End Kelloe, 15s. 6d.; Walls End Russell's Hetton, 15s. 9d.; Walls End South Hetton, 17s.; Walls End Stewart's, 16s. 6d.

Notices to Correspondents.

GAME PRESERVING: *M. A.* writes as follows:—A friend of mine took a house and the grounds, and the shooting over 300 acres, from year to year: the land is in the occupation of tenants. In the agreement drawn up and signed by my friend and his landlord, my friend agreed to pay for the shooting. My friend entered on his occupation, and is now living at the place. Talking one day to one of the tenants over whose land he imagined he had the right to shoot, this individual informed him, quite respectfully, that he should be happy to allow him to shoot over his farm, being no sportsman himself. My friend mildly hinted his belief, subject to correction, that he had the right to this. "No, sir," he replied, "Mr. ——" (naming their landlord) "could not have done this, for he had not the power, the shooting was not reserved by the landlord." Now this farmer merely holds his farm from year to year, and there is no lease, and, my friend thinks, no written agreement. I wish to know your opinion for my friend. Has a farmer who holds from year to year the same right of sport, unless reserved by landlord, as a farmer who holds by lease? [We are not learned in the law, but we imagine that this farmer has the right in question.]

IMPORTS OF FOUR MONTHS, 1869-1870: *R.*

Articles.	Quantities Imported	1869.	1870.
Animals, living—Oxen, Bulls, and Cows	No.	53,339	33,588
Calves		4,098	5,687
Sheep		221,648	283,825
Lambs		1,417	1,400
Swine and Hogs		11,595	23,452
Bones, burnt or not, or as Animal Charcoal	tons	19,568	21,253
Corn—Wheat—From Russia	cwt.	2,796,828	3,921,127
Denmark		133,854	92,091
Prussia		1,431,618	478,780
Schleswig, Holstein, and Lauenburg		21,600	7,152
Mecklenburg		214,275	171,548
Hanse Towns		284,858	115,569
France		106,204	125,681
Illyria, Croatia, and Dalmatia		112,414	42,085
Turkey and Wallachia and Moldavia		461,987	174,362
Egypt		279,292	95,327
United States		2,674,190	3,[illegible]
Chili		1,[illegible]	57,376
British North America		37,791	87,761
Other countries		156,563	117,345
Barley		4,179,931	2,719,069
Oats		1,[illegible]7,417	2,005,935
Peas		[illegible]4,32	278,756
Beans		[illegible]80,81	51,[illegible]35
Indian Corn, or Maize		4,[illegible]4,[illegible]75	4,[illegible]75,[illegible]31
Wheatmeal and Flour—Hanse Towns		214,767	327,366
France		605,958	491,980
United States		273,646	71,[illegible]47
British North America		6,148	4,687
Other countries		177,661	171,714
Corn—Indian Corn Meal		2,[illegible]	2,[illegible]
Flax and Tow or Codilla of Flax—Russia		36,[illegible]47	94,[illegible]24
Holland		69,847	72,[illegible]
Belgium		81,[illegible]3	8[illegible],[illegible]41
Other countries		74,161	81,[illegible]42
Guano—West Coast of Africa	tons	597	[illegible]45
United States		1,[illegible]	[illegible]
Peru		14,[illegible]	594,[illegible]
Bolivia		7[illegible]	[illegible]37
British West India Islands		454	[illegible]
Other countries		1,018	10,256
Hemp and Tow or Codilla of Hemp—From Russia	cwt.	2,341	15,280
Venetia		8,[illegible]21	7,[illegible]15
Illyria, Croatia, and Dalmatia		26,[illegible]48	4,911
British India		14,[illegible]20	3,[illegible]
Philippine Islands		24,[illegible]28	21,[illegible]37
Other countries		33,[illegible]64	18,744
China Grass		14	787
Jute and substances of the nature of Hemp		1,[illegible]5,[illegible]43	1,[illegible]9,[illegible]60
Hides, untanned—Dry—From British India		1,[illegible]5,[illegible]61	[illegible]4,[illegible]81
Other countries		14,[illegible]49	2,[illegible]56
Wet—From Argentine Confederation and Uruguay		19,775	24,[illegible]84
Brazil		[illegible]8,[illegible]28	3,[illegible]94
Australia		9,[illegible]83	5,809
Other countries		43,040	42,179
Hides, tanned, tawed, curried, or dressed (except Russia Hides)	lb.	2,[illegible]81,[illegible]30	3,[illegible]14,[illegible]27
Hops	cwt.	97,[illegible]40	57,171
Oil Seed Cakes	tons	52,177	38,405
Potatos	cwt.	540,091	197,835
Provisions—Butter		1[illegible],[illegible]59	323,724
Cheese		1[illegible],[illegible]47	[illegible]36,[illegible]43
Eggs	No.	147,[illegible]91,[illegible]20	144,[illegible],[illegible]06
Fish, cured or salted	cwt.	177,[illegible]86	272,937
Lard		66,222	85,072
Meat, fresh or slightly salted—Beef		2,[illegible]24	4,[illegible]15
Pork		[illegible],[illegible]48	15,[illegible]43
Meat, salted—Bacon and Hams		251,[illegible]20	235,968
Beef, salted		[illegible]4,[illegible]74	[illegible],[illegible]43
Pork		[illegible],[illegible]05	[illegible],[illegible]80
Meat, not otherwise described		24,076	33,640
Saltpetre		[illegible],[illegible]11	[illegible],[illegible]79
Cubic Nitre		[illegible],[illegible]00	263,520
Seeds—Cotton	tons	45,[illegible]33	[illegible]6,[illegible]01
Clover	cwt.	[illegible]32	108,495
Flaxseed and Linseed	qr.	328,103	228,852
Rape		50,656	75,[illegible]41
Tallow—From Russia	cwt.	[illegible]6,[illegible]67	9,773
Australia		34,049	[illegible],[illegible]86
South America		[illegible],[illegible]70	[illegible],[illegible]03
Other countries		41,[illegible]55	[illegible],[illegible]73
Wool, Sheep and Lambs'—From Europe		[illegible]	[illegible],[illegible]47
British Possessions in South Africa		[illegible]	[illegible],[illegible]11
British India		4,[illegible]05,824	1,879,383
Australia		[illegible],[illegible]11	72,457,533
Other countries		4,618,487	4,184,447
Yeast, dried	cwt.	37,502	[illegible]8,[illegible]04

TO PRESERVE EGGS: *F. W.* asks our correspondent "G. A. H." to be good enough to say which is the best way of packing or storing eggs after they have been buttered, as he recommends, to preserve them.

ST. PANCRAS IRON-WORK COMPANY.

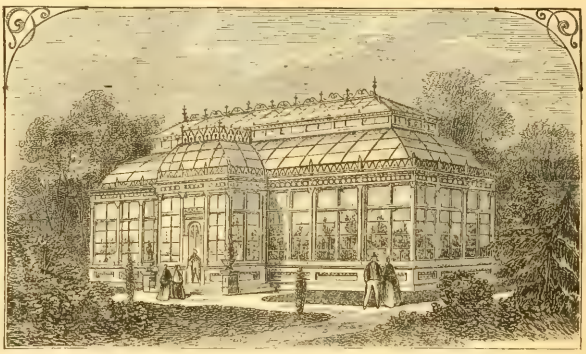

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Horticultural Builder &
Hot Water Apparatus Manufact.
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SURVEYS MADE
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FOR THE
GENERAL ARRANGEMENT AND LAYING-OUT
OF
STRUCTURAL GARDENS.

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PREPARED FOR FIRST-CLASS
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ALSO
ARCHITECTS' DESIGNS.

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INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

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NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of boiler is usually made on a square in plan, rather than a square, it seems feasible that the Boilers on the oval but the oval form [illegible] Mr. Gray's [illegible] to be preferred in short [illegible] the tubes most completely within range of the [illegible] as evaporation [illegible] to bring [illegible] the tubes [illegible] to heat, and this being so, the change, though [illegible] with the [illegible] [illegible] a further [illegible] parallel [illegible] improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

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PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

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PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

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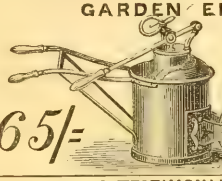

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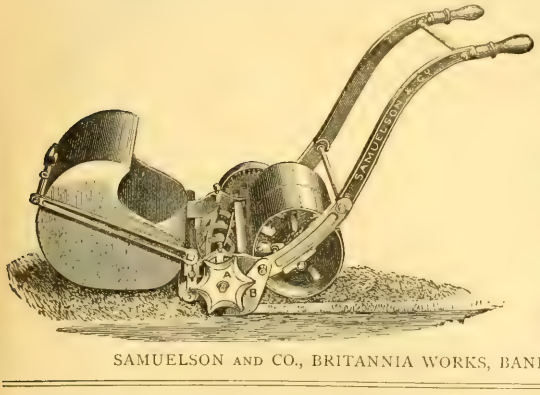

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Beg to draw special attention to their

NEW

Lawn Mowers for 1870,

which are fitted, when required, with a NEW PATENT EDGE-CLIPPING arrangement, entirely superseding the old and tedious operation of Edge-Clipping by hand.

All Machines fitted with new Silent Gearing, insuring perfect freedom from noise when at work.

Catalogues, with full descriptions and prices of the New Patent Edge-Clipping Silent Lawn Mower, on application to

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"Rock Hills," gave his approval of their usefulness.

The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, The right to Manufacture them was transferred to

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6 ft. by 4 ft. Lights, 2 in. thick, unglazed . . £6 5 0
" " Primed and Glazed with 10 oz. Sheet 0 11 0
" " with stout portable Box, not Painted 1 3 0
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0 ft. by 8 ft., Double Lights, do. 2 15 0
GREENHOUSES Per ft. super.
Woodwork only Prepared and Fitted 0 0 6
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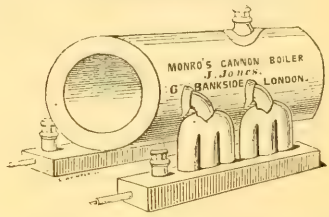

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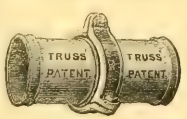

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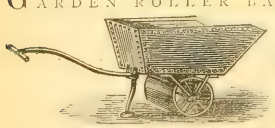

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10 Gallons	.. £3	0	0
16 ,,	.. 3	16	0
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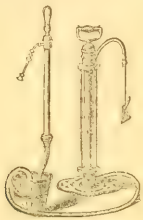

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Useful for every variety of purpose in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, Laying Dust, &c.
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Small size for the hand, as an ordinary Syringe .. 0 15 0

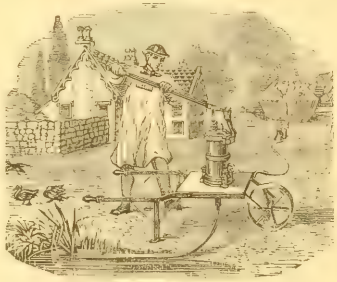

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2½ inches	.. £1	0	0
3 ,, ..	.. 2	2	0
3½ ,, ..	.. 2	7	0
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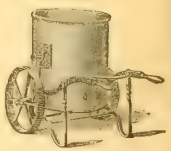

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20 Gallons	.. £2	2	0
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"Perfect ventilation without admitting rain or moving any of the glass."
"Thoroughly sound and dry glazing without the use of putty."
"Glass in large panes without laps."

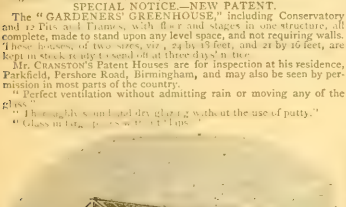

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Without making any further comments at present on the various articles that have appeared in favour of the Archimedean, we will merely add that we are prepared to come into PUBLIC COMPETITION with it to prove the truth of our remarks. We make no selection of places, but leave the matter in the hands of the parties (who appear to take an interest in the Archimedean) to offer a suggestion; and the sooner the better.

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ROYAL BOTANIC SOCIETY, Regent's Park.—The NEXT EXHIBITION of PLANTS, FLOWERS, and FRUIT will take place on WEDNESDAY and THURSDAY, June 22 and 23. The attention of Nurserymen and Florists is particularly directed to the New Schedule of Prizes.

ROYAL BOTANIC SOCIETY'S LIST of AWARDS.—OMISSION. Botanical Certificate of Merit to Mr. Atkins, Fainswick, Gloucestershire, for Erinus alpinus albus.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—The TWENTY-SEVENTH ANNIVERSARY FESTIVAL will take place at the LONDON TAVERN, Bishopsgate Street, LONDON, on WEDNESDAY, June 29,
The Right Hon. the EARL of DERBY in the Chair.
Dinner upon Table at 6 o'Clock precisely. Tickets, 21*s.* each.
EDWARD K. CUTLER, Secretary.
14, Tavistock Row, Covent Garden, W.C.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—A SPECIAL GENERAL MEETING of the MEMBERS of this SOCIETY will be held at the Bedford Hotel, Covent Garden, W.C., on TUESDAY, July 5 next, for the purpose of ELECTING SIX PENSIONERS. The Chair will be taken at 6 o'Clock. The Ballot will close at 8 o'Clock precisely. By order,
June 10. EDW. K. CUTLER, Secretary.
The Voting Papers have all been delivered. Any Subscriber not having received one is respectfully requested to make immediate application.

SPALDING HORTICULTURAL FETE—FLOWER, FRUIT, &c., SHOW.—The ANNUAL EXHIBITION will be held in the Grounds of Spring Gough School on THURSDAY, June 23. Band of the Royal Horse Guards attends
Schedules on application to GEO. F. BARRELL, Hon. Sec.

LEICESTERSHIRE HORTICULTURAL SOCIETY.—The GREAT SUMMER EXHIBITION of this Society will be held on the Race Course, Leicester, on TUESDAY and WEDNESDAY, July 5 and 6, when Prizes will be offered in Prizes for Cut Roses, and upwards of £25 for Plants in pots
A SHOW of BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition
Schedules of Prizes and all particulars may now be had of
Market Place, Leicester. WM. PENN COX, Secretary.

PETERBOROUGH HORTICULTURAL SOCIETY'S SHOWS will be held JULY 7, and NOVEMBER 16, 1870. PRIZES, ONE HUNDRED GUINEAS, and FIVE SILVER CUPS, £5 each. Schedules, with Forms of Entrance, on application to
F. G. BUCKLE, Secretary, Peterborough.

BIRMINGHAM ROSE SHOW, JULY 7 and 8.—For PRIZE LISTS, apply to Mr A. FORREST, Secretary, Cherry Street, Birmingham ENTRIES CLOSE JULY 2

Verbenas, Verbenas.—6s. per 100; 50s. per 1000.
WILLIAM BADMAN offers PURPLE, WHITE, SCARLET, ROSE, CRIMSON, &c., well-rooted Plants, from store pots, 6*s* per 100; 50*s* per 1000 Terms, cash.
Cemetery Nursery, Gravesend.

Miscellaneous Plants suitable for Bedding and Decorative Purposes.
ROBERT PARKER begs to announce that his SELECT DESCRIPTIVE PRICED LIST, including the finest varieties of ECHEVERIAS, PANSIES, SEMPERVIVUMS, TRITOMAS, VIOLAS, &c., &c., is now published, and will be forwarded to applicants.
Exotic Nursery, Tooting, Surrey, S.W.

WOOD AND INGRAM beg to offer fine plants of the following, in 2½-inch pots:—
AGERATUM IMPERIAL DWARF (CHATER), 12*s.* per dozen.
MESEMBRYANTHEMUM CORDIFOLIUM VARIEGATUM, 12*s.* per dozen.
The Nurseries, Huntingdon.

Isolepis gracilis.
WOOD AND INGRAM offer fine plants of this, in 2½-inch pots, at 2*s.* 6*d.* per dozen; 4-inch pots, at 3*s.* per doz.
The Nurseries, Huntingdon.

MULBERRY LEAVES.—Gardeners and others who can Contract for regular supplies of Mulberry Leaves are invited to apply to F. FOBBS, Hon. Secretary of the Silk Supply Association, 65, Moorgate Street, E.C.

Pteris serrulata.
ANDW. G. DALY, NURSERYMAN, Newry, begs to offer the above, strong plants, 12*s.* per 100. His Stock is not to be surpassed in the Kingdom
ANDREW G. DALY, Nurseryman and Seedsman, Newry

BEDDING PLANTS, BEDDING PLANTS.—An Immense Stock of the above at exceedingly Low Prices. Catalogues, Wholesale and Retail, Post Free on application to
THOMAS PERKINS, *42*, Drapery, Northampton

Bedding Plants, Florists' Flowers, &c.
MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, are prepared to send out very choice selections of the above, at very moderate prices, and will be glad to have their new priced CATALOGUE free on application
North of England Nursery and Seed Establishment, 44, English Street, Carlisle.

Bedding Plants—Bedding Plants.
JAMES HOLDER'S unrivalled Collection of Scarlet and Variegated GERANIUMS, DAHLIAS, VERBENAS, CALCEOLARIAS, FUCHSIAS, LOBELIAS, PETUNIAS, GAZANIAS, KONIGAS, TROPÆOLUMS, CUPHEAS, COLEUS, IRESINES, ALTERNANTHERAS, &c., at his usual price despite of the long severe winter), namely, eight dozen for 20*s.*, or four dozen for 10*s.* 6*d.*; hamper and package included
Crown Nursery, Reading, Berks.

NEW DOUBLE GERANIUMS.—Twelve fine varieties Double Zonal Geraniums, 7*s.*; 12 superb new Double Zonal Geraniums of 1869 for 12*s.*; 12 superb Single Zonal Geraniums, 6*s.*; 12 varieties Gold and Golden Bicolor Geraniums, 6*s.*, package included, from
B. W. KNIGHT, Florist, Battle, Sussex.

CHARLES TURNER recommends MRS. HEADLY as the finest Golden Tricolor GERANIUM yet offered, 21*s.*
NEW AZALEA, MRS. TURNER, 21*s.*
" REINE MARIE HENRIETTE, 21*s.*
For descriptions, see CATALOGUE.
The Royal Nurseries, Slough.

NEW HYBRID IVY LEAF GERANIUMS, WILLSII and WILLSII ROSEA, sent free for 2*s.* 6*d.*
H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich.

NEW COLEUS, 1870.

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Sixpence each, or the six sent free for 2*s.* 3*d.* The six best and older varieties free for 2*s.*
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NEW COLEUS.—The new Golden and other select varieties, sent post free, 12 fine varieties, 2*s.* 6*d.*; 24 select varieties, 4*s.*
IRESINE LINDENI, ACUMINATA and HERBSTII, 1*s.* 6*d.* per dozen, 12 fine varieties ALTERNANTHERA ALBA, 1*s.* 6*d.* per dozen; 12 fine varieties CHRYSANTHEMUMS, 2*s.* 6*d.*; 12 fine varieties PHLOXES, 3*s.*; 12 superb varieties FUCHSIAS, 3*s.*; 12 ARTEMISIA STELLERIANA, 3*s.* Any of the above sent free by post, at the price named, from
B. W. KNIGHT, Florist, Battle, Sussex.

AGERATUM IMPERIAL DWARF.—Well-rooted plants, out of stores, 2*s.* per dozen; strong, in pots, 6*s.* per dozen.
S. BADMAN, Eltham Road Nursery, Lee, S.E.

AGERATUM IMPERIAL DWARF (CHATER'S).—Good plants in pots at 12*s.* per dozen.
RICHARD SMITH, Nurseryman, Worcester.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

PEACHES and NECTARINES.—Fine healthy Pyramids, in Pots, each bearing from 12 to 18 good Fruits Price 7*s.* 6*d.* to 10*s.* 6*d.* each.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

NATURAL GRASSES: their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c. Free by post.
RICHARD SMITH, Seed Merchant, Worcester.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots DESCRIPTIVE PRICE LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

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ROSES, New and Old, strong plants, in pots, now ready for delivery; also large stock of VERBENAS and FUCHSIAS, for PERMANENT BEDDING PLANTS, which contains a selection of the best varieties only. CATALOGUES free.
WM. KNIGHT, Floral Nursery, Hailsham, Sussex.

New Roses of 1870.
CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application.
ROSES for BEDDING.—Superb plants, in 5-inch pots, for planting out or for growing on for pot culture. Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.
JOHN CRANSTON, The Nurseries, King's Acre, Hereford.

CUT FLOWERS.—Wanted, by a London Florist, a BOX of CUT ORCHIDS and other rare Flowers and Foliage, once or twice a week.—Apply by letter, immediately, to
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WANTED, a magnificent Specimen of CROTON VARIEGATUM: must be a superbly handsome plant. Quote size and price, either in exchange or for cash.
WILLIAM BULL, Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

SUTTONS' SELECTED TURNIP SEEDS, Carriage free.

SUTTONS' CHAMPION SWEDE. The best variety in cultivation

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The Best Turnip for the Main Crop is
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WM. CUTBUSH AND SON'S CATALOGUE of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with prices at which they can be recommended
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JOHN BETHAM (Son of the late Senior Partner of the Firm of BETHAM & BLACKITH), begs to inform the above that he is Trading under the title of
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CORN, SEED, MANURE, and OILCAKE MERCHANTS.
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Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

SUTTONS' IMPROVED HARDY WHITE SWEDE.—This is the best variety for late sowing, and is a very superior sto k. Price 1*s.* per lb.; cheaper by the bushel.
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HAND F. SHARPE have to offer to the Trade fine selected stocks of the above-named Seeds, all of 1869 growth, and raised from picked transplanted bulbs. Prices moderate
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HAND F. SHARPE are prepared to make Special Offers of the above Seed, comprising all the best varieties, and including SHARPE'S KING, SHARPE'S MAMMOTH, and PYNE'S YELLOW GLOBE. The Stocks are very fine, and all of 1869 growth Prices very low.
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CHOICE SEEDLING FRENCH and SHOW PANSIES (post free), 2*s.* per dozen A quantity of LOBELIAS, VERBENAS, PHLOXES, GERANIUMS, GOLDEN FEATHER, VARIEGATED ALYSSUM, and HELIOTROPES (post free), 1*s.* 4*d.* per dozen.
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Sow now—Sow now.
PRIMULA FIMBRIATA, choicest possible strain, for sowing seeds 2*s.* 6*d.*; mixed, 1*s.*; double, 2*s.* 6*d.*; CALCEOLARIA, 2*s.* 6*d.*; CINERARIA, 2*s.* 6*d.*; CYCLAMEN, 2*s.* 6*d.*; POLYANTHUS, 1*s.* 6*d.*; with many other choice seeds for present sowing, all thoroughly reliable, and free per post.
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CHATER'S AGERATUM IMPERIAL DWARF.—The finest bedding plant of the season. Strong robust growth, not exceeding 6 inches in height, and throws a mass of blossom all through the summer; for second row in floral designs unsurpassed. See Opinions of the Press, to be had on application.
Price—1 plant, 3*s.* 6*d.*; 6, 18*s.*; 12, 25*s.*; 24, 40*s.* Special prices for quantities will be forwarded upon request.
WILLIAM CHATER, Nurseries, Saffron Walden.

GARIBALDI POLYANTHUS.—A new double sweet-scented variety of this pretty spring plant. It is of various colours, bright and showy, and produces its flowers well above the foliage. An invaluable acquisition. Post paid 1*s.* and 2*s.* 6*d.* per packet, post free Plants 2*s.* 6*d.* each, 24*s.* per dozen
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NEW FERN, ADIANTUM CAPILLUS-VENERIS MAGNIFICUM, 1870 (J. & C. LEE).—We have much pleasure in introducing this really useful Greenhouse Fern to public notice, in the firm conviction that it will soon find favour and become a universal favourite. The fronds are much larger than those of Capillus-Veneriy, being from 12 to 15 inches long, by 4 inches broad, curving over the side of the pot. The pinnæ are of a beautiful soft green, and are almost as large as those of A. Farleyense, and like that fine variety they overlap each other in graceful waves of maiden-hair, with finely incised and fringed edges. The chief value of A. magnificum is in its hardiness and adaptability to the temperature of a greenhouse, whereas A. Farleyense can only be cultivated by those who possess a stove. To be sent out in June. Price 31*s.* 6*d.* each
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GENERAL AND NEW PLANT CATALOGUE FOR 1870,

Contains LISTS of select ORCHIDS (many being now in flower), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS (both of which are extensively grown, and many fine specimens are now in full beauty), CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

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No. 1. LARGE FLAT BLOOD-RED.
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The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

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Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CANDYTUFT (carefully hedged), from plants 9 to 18 inches high. Flowers perfect in shape, and in every variety, including the beautiful mottled and spotted; each 1*s.*, and 2*s. 6d.* per packet.

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MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, 20 lbs. bag, 5*s.*; 1 bags of 1 cwt., 10*s. 6d.*; ¼ cwt., 21*s.*; and 1 cwt., 42*s.*; with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.

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LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

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"London, January 15, 1870.

"SIR,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,

"To JAMES REES and CO." "A. VOELCKER."

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The Best and Cheapest Vermin Killer.

Vide "The Gardeners' Magazine," conducted by Shirley Hibberd, Esq., F.R.H.S., of August 15, 1868

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Manufacturers, CURRY AND SMITH, at their Bonded Warehouse, Shad Thames, London, S.E. [AGENTS WANTED.]

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1*s.*, 2*s. 6d.*, and 5*s.*
Powder Distributors, 2*s. 6d.* and 3*s. 6d.* each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868

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Red Spider — Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1869, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.

Sold Retail by Seedsmen, in boxes, 1*s.*, 2*s.*, and 10*s. 6d.*

Wholesale by
PRICE'S PATENT
CANDLE COMPANY
(Limited),
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COLIN PULLINGER'S newly-invented SULPHUR DISTRIBUTOR, for VINES, PLANTS, &c., is acknowledged by every Gardener who has seen it to be the most simple and effectual machine invented for the purpose. Price, complete with bellows, 4*s.* Retail of all Ironmongers and Nurserymen.
Sole Wholesale Agents, ADAMES AND GRANT, Chichester.

The Noted French Cold Grafting Wax
(MASTIC LHOMME LEFORT),
For Grafting, Budding, Healing, &c., may be obtained of
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CROQUET.—BARCLAY'S WALKING-STICK LAWN WEEDER (Registered) removes Daisies and other weeds from Lawns and Croquet Grounds without the trouble of stooping, down the lines. Wholesale and Retail
Messrs. EATON and DELLER, Crooked Lane, London.

THE HYDRONETTE
(ROBINS' PATENT),

FOR GARDENS, GREENHOUSES, CONSERVATORIES, HOTBEDS, WASHING WINDOWS, CARRIAGES &c., &c.

Unrivalled Ease of Action, Simplicity, Convenience and Force.

The HYDRONETTE is a more useful, easy-working, reliable, and convenient water throwing machine than any other in use. It is made in five sizes, viz.: No. 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12*s. 6d.*; No. 2, 15*s.*; No. 3, 17*s.*; No. 4, 25*s.*; No. 5, £1 10*s.* Extra Hose and Union Joints to order. To be had of
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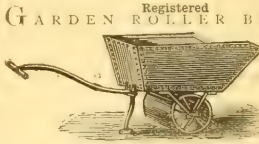

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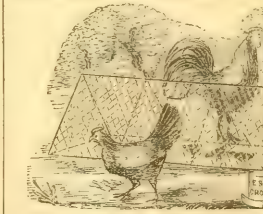

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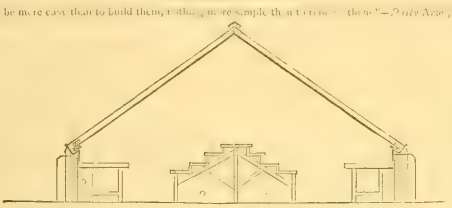

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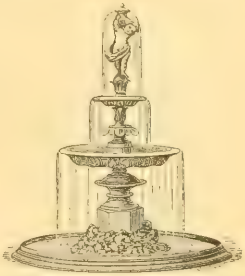

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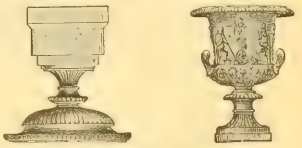

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CLASS 33.—PEACHES, Single Dish. (Open.)
1st, Mr. G. T. Miles, £2
2d, Mr. W. Carmichael, Gr. to H.R.H. the Prince of Wales, Sandringham, Norfolk, £1 10s.
3d, Mr. W. Gardiner, Gr. to E. P. Shirley, Esq., Eatington Park, Stratford-on-Avon, £1

CLASS 34.—NECTARINES, Single Dish. (Open.)
1st, Mr. W. Lynn, £2. | 2d, Mr. G. T. Miles, £1 10s.
3d, Mr. W. Hill, Gr. to R. Sneyd, Esq., Keele Hall, Newcastle, Stafford, £1

CLASS 36.—FIGS, Single Dish. (Open.)
1st, Mr G. T. Miles, £1.
2d, Mr. G. Fairbairn, 15s. | 3d, Mr. J. Douglas, 10s.

CLASS 37.—CHERRIES, Single Dish. (Open.)
1st, Mr G. T. Miles, £1.

CLASS 38.—STRAWBERRIES, Single Dish. (Open.)
1st, Mr. J. Douglas, £2. | 2d, Messrs. J. Standish & Co., 15s.
3d, Mr. E. C. Clarke, Gr. to J. C. Brown, Esq., Holmbush House, Horsham, Sussex, 10s.

CLASS 39.—MELON, Green-fleshed. (Open.)
1st, Mr. J. Douglas, £1.
2d, Mr. W. Lynn, 15s. | 3d, Mr. E. Clarke, 10s.

CLASS 40.—MELON, Scarlet-fleshed. Open.
1st, Mr. J. Douglas, £1.
2d, Mr. H. Barnard, Gr. to Miss Ffarington, Worden Hall, Preston, Lancashire, 15s.
3d, Mr. G. T. Miles, 10s.

CLASS 41.—MISCELLANEOUS, for Fruit not mentioned in Schedule. (Open.)
2d, Mr. C. Ross, Gr. to C. Eyre, Esq., Welford Park, Newbury, for Dessert Pears, 15s.
3d, Mr. C. Ross, for Dessert Apples, 10s.
Extra 3d, Mr. W. Davis, Basket of Black Grapes, 10s.
Extra 3d, Mr. C. Gardiner, Collection of Peaches and Nectarines, 10s.

MISCELLANEOUS. (Plants.)
Messrs. J. Veitch & Sons, Nurserymen, Chelsea, Miscellaneous Collection of Plants, Extra Prize, £2.
Messrs. W. Rollisson & Sons, Nurserymen, Tooting, Collection of Palms, Extra Prize, £3.
Mr. W. Bull, Collection of Plants, Extra Prize, £2.
Mr. R. Parker, Collection of Herbaceous Plants, £1.
Mr. C. Turner, Collection of Pelargoniums, £1.
Messrs. Hooper & Co., Seedsmen, Covent Garden, Collection of Ixias, Extra Prize, 10s.
Mr. T. S. Ware, Hardy Herbaceous Plants, 10s.
Mr. J. Tibbles, 6 Selaginellas, 10s.
Mr. C. Noble, 2 Spiræas palmata, 10s.
Mr. H. Hooper, Collection of Pansies, &c., 10s.

Economic and Effective Gardening.

CARTER'S COLLECTIONS

OF

BEDDING and other PLANTS,

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SUMMER DECORATION OF THE FLOWER GARDEN,

Are now ready for delivery.

These Collections are made up in the most liberal manner, and will produce a permanent and effective display.

Carter's "Battersea Park" Collections of Bedding Plants.

50 Plants, 15s. | 120 Plants, 30s. | No charge for packing.

Carter's "Crystal Palace" Collections of Bedding Plants.

60 Plants, 17s. 6d. | 120 Plants, 30s.
No charge for packing.

CARTER'S

"Own" Collections of Bedding Plants.

80 Plants, 15s. | 158 Plants, 30s. | 296 Plants, 60s.
No charge for packing.

CARTER'S

"Surplus" Collections of Bedding Plants.

72 Plants, 15s. | 96 Plants, 17s. 6d. | 144 Plants, 25s.
No charge for packing.

CARTER'S

NEW and CHOICE PLANTS for 1870.

GOLDEN TRICOLOR GERANIUMS.

PRINCE of WALES (Carter).—Undoubtedly the finest tricolor ever offered, of most vigorous habit, and intensely brilliant colours. Price 6s. each. A First class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, June 19, 1867. A First class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Horticultural Society of London, July 7, 1868. A First class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, May 27, 1868.

EDITH STUART (Carter).—A free-growing variety, with flat salver-shaped leaves, zone bright vermilion, with a light yellow margin. Price 21s. each. First Prize, May, 27, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

PRINCESS of WALES (Carter).—A variety similar to Prince of Wales, but more brilliant in colour, and smaller leaves. Price 21s. 6d. each. First Prize, May 27, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

SULTAN ABDUL AZIZ (Carter).—A splendid dark tricolor, very distinct in character and free in habit, leaves of great substance and particularly round, zone a dark scarlet, light golden margin. Price 21s. each. First Prize, May 27, Royal Horticultural Society. Special Certificate, April 20, 1870, Royal Horticultural Society.

The set of the foregoing four varieties, £5 5s.

DR. WALLACE (Carter).—A free-growing variety, leaves flat and of good form, deep coloured zone of carmine, intermixed with chocolate. Price 5s. each.

MARIAN MORRIS (Carter).—A variety after the style of Goliah, and equally free in growth, but with brighter colours. A good bedder. Each 21s

MRS MULLER (Carter).—A neat compact growing variety, zone light carmine, blotched with chocolate, margin creamy yellow Each 5s.

BALLYMENA (Carter).—A most desirable variety for bedding purposes, and very distinct in character; zone very dark chocolate and rosy purple. Each 5s. Special Certificate, April 20, 1870, Royal Horticultural Society.

The set of the foregoing four varieties for 30s.

SILVER TRICOLOR GERANIUM.

CINDERELLA (Carter).—Deep pink zone, silver margin, free bloomer. Each 5s.

GOLDEN SELF GERANIUM.

CARRIE FOWLER (Carter).—Seedling from Crystal Palace Gem, a beautiful bright golden colour, compact in habit; an excellent bedding variety. Each 5s. Royal Horticultural Society, May 22, 1869.—Prize for best Golden-Leaved Geranium, Carrie Fowler.

For full descriptions and particulars of

CARTER'S COLLECTIONS

OF

BEDDING and OTHER PLANTS,

SEE

CARTER'S ILLUSTRATED

PLANT CATALOGUE for 1870.

JAMES CARTER and CO.,
237 and 238, HIGH HOLBORN, LONDON, W.C.

Echeveria glauco-metallica and secunda glauca major.

ROBERT PARKER begs to announce that he is now distributing these two distinct and fine varieties, for both of which he has received First-class Certificates at the Horticultural and Royal Botanic Societies. The plants, which are stemless, are formed of rosulate tufts of leaves, similar to Echeveria secunda glauca, but are at least three times as large as that variety. Young plants, 5s; large do., 10s. 6d. and 21s. each.

Exotic Nursery, Tooting, Surrey, S.W.

CHARLES TURNER'S SPRING CATALOGUE of POPULAR PLANTS is now ready, and may be had on application. It contains the best selections of—

Achimenes	Miscellaneous plants
Auriculas	" bedding plants
Azaleas	Ornamental foliage plants
Carnations	Pelargoniums, in 11 classes
Chrysanthemums	Petunias
Cinerarias	Phlox
Coleus	Picotees
Dahlias, in 4 classes	Pinks
Fuchsias	Roses
Gloxinias	Stove plants | Verbenas

The Royal Nurseries, Slough.

LOUGHBOROUGH HORTICULTURAL SOCIETY'S EXHIBITION, JULY 13.

SPECIAL PRIZES FOR ROSES (open to all England)

1st, For the best Collection of 72 Roses (72 varieties), single trusses, 1st Prize, a Cup, or £10 10s.; 2d, £5 5s.; 3d, £2 2s.

2d, For the best Collection of 48 Roses (48 varieties), single trusses, 1st Prize, a Cup, or £5 5s.; 2d, £2 2s.; 3d, £1 1s.

3d, For the best Collection of 36 Roses (36 varieties), single trusses, 1st Prize, a Cup, or £3 3s.; 2d, £1 1s.

SPECIAL PRIZES FOR PLANTS.

For the best 12 Stove or Greenhouse Plants (distinct varieties), 6 foliage and 6 in flower (Orchids excluded), 1st Prize, £10; 2d, £6; 3d, £4; 4th, £2

Full information may be had from WM. FALLETT, Secretary.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE:

For the Two best COLLECTIONS of FRUIT and VEGETABLES, 6 distinct kinds of each, a 1st prize of £7, and a 2d prize of £3

☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.

The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868, and 1869 excluded from competing. The articles produced to be of the EXHIBITOR'S OWN GROWING.

The Gardeners' Chronicle

SATURDAY, JUNE 11, 1870.

MEETING FOR THE ENSUING WEEK.

THURSDAY, June 16—Linnean .. .. 8 P.M.

MR. AYRTON'S Bill for the ALTERATION of KENSINGTON ROAD put the House of Commons to some trouble. Three times the great car of State had to pull up, thrice the progress of national legislation and administration was delayed, to allow a question about the diversion of a road for a few feet and the laying-out of a corner of Hyde Park to be discussed in solemn conclave. It is not our part to deprecate this. We laud it, we rejoice at it. It is great honour for the like of us to have the little accessory details of our profession exercising the thoughts and agitating the minds of our great statesmen. But does the wreath really belong to us? We fear to take it up, and we would rather not assume it if we may not wear it, rejoice in it, and make much of it. We suspect that we may say with Romeo

"Here's much to do with love, and more with hate;"

but neither the hate nor the love concern us or the subject of debate. Personal likes and dislikes have made our harmless objects a bone of contention among rival politicians. Mr. AYRTON, with the perverse ingenuity of an insane diplomatist, has brought all the weaknesses and leverages of human nature, by which he might have easily guided his projects into a safe and secure bed, into action to obstruct and upset them. One has very little sympathy with a man who, for want of a little politeness and consideration, miscarries in his aims. When one is defeated, the absence of means is readily acknowledged as a sufficient apology; but when the defeat is due to the non-employment of means of which an abundance was at hand, it is difficult to find either sympathy or apology for the anquished. Still Mr. AYRTON has our support, and the ground on which we give it is that we believe that he desires to do what is right, and—what very few, we suspect, have taken into consideration in the whole dispute—that what he proposes is in point of fact for the public advantage, and will contribute to the public enjoyment.

By far the most important feature in his scheme as regards both pedestrians and equestrians—for the whole public as regards this matter resolves itself into two great bodies, those who go on foot, and "them wot rides in chaises"—is the stoppage of Rotten Row when it reaches the cross road from the Serpentine Bridge to Exhibition Road, and carrying it round by that road and back by the Knightsbridge Barracks, and the absorption of the space thus acquired into Kensington Gardens. No one can doubt that from the pedestrian's point of view this is an immense improvement. What Mr. AYRTON most justly characterised as an unsightly corner will in future come within the limits, and share and contribute to the beauties of Kensington Gardens; and as to the equestrians, they, in the first place, get a very good *quid pro quo*, against which we have heard some of the pedestrians already grumbling as depriving them of the view of the carriages and their occupants from the grassy side of the drive; in the next place, they did not value the portion of Rotten Row of which they are now deprived, for not one in 50 went further than they do now; and lastly, in balancing the account, we must remember that, although many of the pedestrians are never equestrians, all the equestrians are from time to time pedestrians, and have a share in the interests and enjoyments of that section of the body politic.

It may, indeed, be said with truth, that there was no need of an Act of Parliament to carry out this improvement. The Chief Commissioner could have done it of his own authority. It is within the limits of the park under his charge, and quite within the limits of his power. So are the trees, about the sacrifice of which much moan has been made. We read that the alteration will occasion the loss of 48 fine old trees. We speak with knowledge; we pass the spot daily. There may be 48 young ones, but fine old trees there are none. But if there were, they are as much beyond the question as the other part of the improvement of which we have spoken. We think neither are beyond the question, only if one is to be shunted out of sight, the other, which is on the same footing, should go with it. Neither are beyond the question, because it is fair, in looking at what a man wants to do beyond his powers, to see what use he makes of the power he already has; and if it be found to be well used, to carry the prestige thereof to his credit when he demands additional power. The additional power sought applies merely to the deviation of Kensington Road for a short space, a few paces from its present course. Practically it affects the general public in no way whatever. If the little strip taken from the park were to be built upon, the thing would be wholly different, but it does not affect the amount of open space for breathing in, either one way or other. That which is the great end-all and be-all of the park is not touched. More injury was done to the park by the erection of the Serpentine waterworks, SPEKE'S monument, or the Maharajah's drinking fountain (all which would have been within the Chief Commissioner's power, and which were erected without other authority), than by any such deviation as that proposed. It is wanted for the more advantageous display of the PRINCE CONSORT'S Memorial, and for a better access to the Royal Albert Hall of Science—both erections of public interest and importance. Shall we never learn to accept facts as they are, and make the best of them? Must we always be harping on the string of "should have" done this, or "should have" done that? To our mind the reasons are sufficient, and were the question still open we should say at once, '*fiat ut petitur.*"

—— LEOPOLDINIA PULCHRA, *alias* Cocos Weddelliana, is now flowering, for the first time we believe in this country, in the superb collection of exotic plants at Manley Hall, near Manchester.

—— The gardens at Chatsworth have long been noted for their Aquatic Plants, and we conclude that Mr. SPEED, who is now gardener there, is not overlooking their merits, for he informs us that he has succeeded in raising a few plants, the result of a cross between the Victoria regia and Nymphæa Devoniensis, the latter a magnificent crimson Water Lily, raised some years ago in the same establishment. He has, however, more plants of this HYBRID WATER LILY than he has space to accommodate, and in order that they may not be lost, he requests us to state that, on direct application being made to him, he will be happy to distribute the surplus among those who may have the means and the inclination to cultivate them.

—— We learn from the *Builder* that the joint committee of the town council and the inhabitants, for the establishment of a PUBLIC PARK and PLAYGROUND at CONGLETON, have made an appeal for subscriptions in aid of the object. Mr. KEMP, the manager of the Birkenhead Park, proposes to lay out the town wood in walks, and to form the whole of the land between it and the river Dane into recreation and ornamental ground. The chief part of the land is already the property of the borough; and Sir CHARLES WATKIN SHAKERLEY, Bart., has kindly offered to place the remaining piece, which is his property, at the disposal

of the town council for the purpose of the park, on very favourable terms, on condition that the whole cost of the scheme be defrayed by voluntary subscriptions. To place upwards of 20 acres of land, commanding fine views of the surrounding scenery, at the service of the inhabitants of the borough, for the purposes of health, recreation, and improvement, will require the outlay of £3000.

—— At the meeting of the ROYAL SOCIETY on June 2, the following 15 candidates, whom the Council recommended for election out of the total number of 53, were elected Fellows of the Society, viz.:—William Froude, C.E.; E. H. Greenhow, M.D.; J. Jago, M.D.; N. Story-Maskelyne, M.A.; Maxwell T. Masters, M.D.; Professor A. Newton, M.A.; Andrew Noble, Captain Sherard Osborne, R.N.; Rev. S. Parkinson, B.D.; Captain R. M. Parsons, R.E.; W. H. Ransome, M.D.; Robert H. Scott, G. F. Verdon, C.B.; A. Voelcker, Ph.D.; S. Wilks, M.D.

—— M. VAN VOLXEM of Brussels, in the "Belgique Horticole," states that there is a considerable difference in the habit of the male and female plants of Ginkgo biloba. The male forms a tapering tree, with wide-spreading verticils of branches; the female, much smaller, forms a compact and bushy tree.

—— In an interesting notice in a recent number of "Nature," Mr. A. W. BENNETT discusses the claims of the great painter LEONARDO DA VINCI to be ranked among the BOTANISTS. It appears that the method in which leaves are arranged on the stem (phyllotaxis) was known to and described by DA VINCI long before Sir THOMAS BROWNE, in his Garden of Cyrus, called attention to it, and before GREW and MALPIGHI noticed it. The fact that in exogenous trees the age may be determined by the number of rings, and the aspect in which the tree has grown by the greater thickness of the tree on the south side, was also first noticed by the great painter. Many other illustrations of his botanical knowledge are cited, and which have hitherto been overlooked. The student will find in Mr. RUSKIN'S "Modern Painters" many remarkable observations on plant conformation, which appear to be as much neglected by the botanists as those of LEONARDO DA VINCI—a consolation for Mr. RUSKIN.

—— Among the NEW BOOKS on our table are *The Student's Flora of the British Islands*, by J. D. HOOKER, C.B., F.R.S., Director of the Royal Gardens, Kew (MACMILLAN). Every student will find it necessary to procure this handy little volume, of whose contents we shall have to speak more fully at an early date.—*The Mineral and other Resources of the Argentine Republic* (La Plata), by Major F. IGNACIO RICKARD (LONGMANS).—*Cryptogames Vasculaires (Fougères) du Brésil, par* A. L. FÉE (WILLIAMS & NORGATE).—*The Poetical Magazine* (SIMPKIN & MARSHALL), the gist of which may be divined by the motto on the title-page—

> "They best can judge a poet's worth
> Who oft themselves have known
> The pangs of a poetic birth,
> By labours of their own."

—*Notes of a Course of Nine Lectures on Light*, by JOHN TYNDALL, LL.D., F.R.S. (LONGMANS).—*The Universal Nurseryman*, containing full descriptions and critical accounts and illustrations of all the latest improvements and inventions for flower and kitchen gardens, orchards, nursery, and pleasure-grounds, groves, hothouses, woods, parks, implements, &c., edited by the Directors of the Pomological Institute at Ringelheim (Germany). The size is quarto, the period of publication bi-monthly. Woodcuts and coloured illustrations are supplied. The text is in German, but it is proposed to publish an English edition as soon as 300 English copies are subscribed for. Messrs. SILBERRAD & SON, Harp Lane, Great Tower Street, are the agents.—*Mushroom Culture*: its Extension and Improvement, by W. ROBINSON, F.L.S., illustrated (WARNE & Co.).—*The Story of Aristæus and his Bees*; a translation of VIRGIL'S Fourth Georgic, by E. R. MILLINGTON, M.A. (LONGMANS).—*Selections for Latin Prose*, by E. R. MILLINGTON, M.A. (LONGMANS).—*Annales Industrielles*, construction et matériaux de construction mécanique, mines, métallurgie, chimie, télégraphie, agriculture, economie et jurisprudence industrielles. Edited by A. CASSAGNES (Paris: 30, Rue Lepelletier).—The *American Entomologist*, of which we had occasion to speak in favourable terms lately (p. 596), has increased in usefulness by the addition of a botanical department, conducted by Dr. GEORGE VASEY.—The *Horticultural Directory* for 1870 (171, Fleet Street).—*On Food*: the substance of four Cantor Lectures delivered at the Society of Arts, by H. LETHEBY, M.B. (LONGMANS).—The second part of the *Kryptogamen Flora von Sachsen, &c.*, by DR. RABENHORST, with capital illustrations of the Lichens (Leipsig, KUMMER; London, WILLIAMS & NORGATE).—*Narrative of a Spring Tour in Portugal*, by Rev. A. C. SMITH, M.A. (LONGMANS).—Among "new editions" we are glad to see both Mr. REYNOLDS HOLE'S *Book about Roses* (BLACKWOODS), and Mr. FISHER'S modest pamphlet "On the art of *Growing Roses Out-of-doors*" (BRADBURY & EVANS), both of which are excellent, but which bear the same relation one to the other as Mr. DISRAELI'S "Lothair" does to Mr. GLADSTONE'S "Juventus Mundi" (see *Punch*).—A fifth edition of *The Principal Baths of Rhenish Germany*, by EDWIN LEE, M.D. (CHURCHILL).

—— How satisfactory it is to find our friends across the Channel have as characteristic a CIRCUMLOCUTION OFFICE as ourselves! Here is what the French papers say on the matter:—A provincial druggist, desirous of gathering Fox-glove (Digitalis) in one of the State forests, applied for permission to the local authority (*garde général local*), offering at the same time to pay an annual sum of 6 francs for the privilege. The local magnate transmitted the request to his inspector, who forwarded it to the conservator of the department, who despatched it to Paris to the director-general of forests, who caused it to be sent to the Minister of Finance. The Minister referred it *for study* to the director-general of domains, who sent it to the departmental director of domains to be examined by the registrar. The latter, after examination, pronounced a favourable opinion on the request, and sent it back to the departmental director, who forwarded it to the general director, who, in his turn, despatched it to the Minister through the agency of the general secretary of finance, who availed himself of the opportunity to make his comments on the matter. Then the unhappy druggist's request was returned to the director-general of forests, who sent it to the conservator, he to the inspector, and the inspector to the *garde général* who was the original recipient of the request. The authority "to cull simples," at length reached the successor of the original postulant, and at age when he was too old to herborise. We hope this style of management will not be engrafted on to our Indian forest department, already well provided in this way.

—— With true scientific candour M. E. MORREN publishes in the current number of the "Belgique Horticole" a coloured plate of a DOUBLE-FLOWERED STOCK with VARIEGATED LEAVES. A similar plant was figured in the "Revue Horticole" last autumn, and adds another exception to M. MORREN'S law that double flowers and variegated leaves do not co-exist in the same plant.

—— How fond the French are of what they call Anthémis (CHRYSANTHEMUM FRUTESCENS). You see it everywhere just now in windows, in halls, in flower-beds, on restaurant tables, and its similitude in almost every young lady's bonnet. If it were not effective, one might be sure it would not grace the latter situation. At the recent exhibition in Paris were three or four gigantic plants, 4—5 feet across, and trained dome fashion. They were very handsome and novel, a trifle too regular, perhaps, but that would be thought no defect by some.

—— During the week ending June 4, the HIGHEST TEMPERATURE OF THE AIR (see Mr. GLAISHER'S Tables in our present issue) was as in the previous week at Blackheath, in England, and Perth, in Scotland; the mean of all the maximum temperatures for the several stations in England was 73°, and in Scotland was 68°.3—the mean of the readings in the former country being nearly 5° higher than the mean of the readings in the latter. The LOWEST TEMPERATURE in England was, at Hull, 39°, and in Scotland, at Aberdeen, 42°.9, the mean of all minimum in the former country was 44°.5, and in the latter 45°.6. The MEAN TEMPERATURE of England was nearly 3½° above that of Scotland, the values being 56°.4 and 53° respectively. The RAINFALL in Scotland, however, greatly exceeded that in England, for whilst the maximum fall at any station in the latter country was less than two-tenths of an inch, at several stations in the former the falls amounted to considerably over 1 inch. The mean rainfall for England was 0°.11 in., and for Scotland 0°.86 in.

—— The BOTANIC GARDEN at ROTTERDAM, directed by Dr. RAUWENHOFF, and in which M. WITTE acted as head gardener, is to be given up. We do not know the reasons for this step.

—— It is worth while chronicling the names of the PANDANADS exhibited at the recent show in Paris, as we so seldom see more than one or two species exhibited here. We give the names as we found them, without guaranteeing their accuracy. We presume they came from that wonderful repository, La Muette. Here is the list:—*P.* reflexus, Vandermeerschii, inermis, elegantissimus, Porteanus, ornatus, Lais, utilis, pygmæus, amaryllidifolius, and an unnamed species from Madagascar. The plants were not large, but they were interesting.

—— Collectors and possessors of FRESH WATER SHELLS may be interested (says "Scientific Opinion") in knowing that such conchological specimens are wanted, either in exchange or for purchase, from all parts of the world, by Mr. CHARLES M. WHEATLEY, of Phœnixville, Pennsylvania, U.S.

—— Notwithstanding the extreme drought of the present spring, and the damaging late frosts of May, 1869, which killed so much of the young growth, the EXHIBITION OF AMERICAN PLANTS by Mr. ANTHONY WATERER, at the Royal Horticultural Society, South Kensington, which is now open, and will be continued as long as the weather permits, is as usual of a very striking character. The happy arrangement of the ground, and the tasteful distribution of the masses of colour, always produce a most gorgeous picture, the general effect of which is but little touched by the drawbacks to which we have alluded, though on a closer inspection it may be seen that both causes—frost and drought—have left their mark upon the inflorescence of some of the varieties. Those who can do so should take the earliest opportunity of visiting the exhibition, as the present dry, sultry weather will necessarily limit the duration of the flowers—and the Knaphill Rhododendrons are a sight not to be missed. The exhibition of the Messrs. J. WATERER & SONS, of Bagshot, at the Royal Botanic Gardens, Regent's Park, is also now open; and, being of a similar character to that just alluded to, a visit to it will afford an additional treat to lovers of flowers.

—— On Thursday, June 2, the men employed by Messrs. FRANCIS & ARTHUR DICKSON & SONS, of Chester, to the number of 125, were treated to a good substantial dinner in the grounds at Upton, the occasion being the marriage of Mr. THOMAS DICKSON, a member of the firm. The bride and bridegroom were of course "toasted," as also "The Mayor of Chester" (Mr. FRANCIS ARTHUR DICKSON).

COCHINEAL.

THE natural order Cactaceæ is not great in economic value, cochineal being about the only really valuable product of the family, the demand for which in this country, judging from the quantities imported during the last 20 years, is steadily increasing. Very little is generally known about cochineal, from whence it comes, how it is produced, and, in short, what it is, and many even of those who know something of these matters have little idea of the extent of the trade in this article. Brazil and Mexico have always supplied us with large quantities, but in later years the plants have been largely cultivated in Madeira and the Canary Islands, and during the past year many new cochineal plantations have been established in Teneriffe and the neighbouring islands, in all of which the cultivation is proving most remunerative, a large amount of capital being thus employed. So great, indeed, is the demand in Europe for this valuable dye, and so large are the profits derived from it, that every available piece of land is being laid under Cactus cultivation for the production of cochineal.

To such an extent is this cultivation carried that every other branch of field produce is suffering accordingly; even the cultivation of food plants both for human consumption as well as for cattle is being much neglected. The temptation of realising such large returns from the cochineal crops is causing the landholders to neglect the proper care of their soil as suitable for other plants, it being necessary for the successful growth of the Cacti to use large and constant supplies of guano. Not only is every owner of every small patch of land tempted to embark in the cultivation of Cacti in preference to any other crop, but they are also guilty of appropriating the water supply—which to a certain extent is limited in the towns, and which should be carefully husbanded on sanitary principles,—for the irrigation of their plantations.

Mr. Consul Grattan says, writing from Teneriffe, "The water supply in the towns of this island, which is limited during six months of the year, has been abstracted in order to irrigate cochineal plantations, causing much inconvenience and distress, not to say suffering, to many of the inhabitants. The public health cannot but be injuriously affected by the scarcity of this most necessary article, especially during the hot months of summer when it is experienced. I have been informed by the best authority that, of 40 pipes of water per hour, that should at present reach the town of Laguna for public use, 33 pipes are lost on the way, the greater part being abstracted from the open aqueducts before it reaches the public tanks and fountains. The individuals interested allow their love of gain to stifle even feelings of humanity, and the municipal authorities permit these proceedings, or take no efficient steps to prevent them, which, practically, amounts to the same thing."

A cochineal plantation must present a singularly weird aspect, with its rows of green, fleshy, and spiny plants. It is said that in some of the older and larger plantations as many as 50,000 or 60,000 plants may be seen arranged in parallel rows, the plants being kept down as nearly as possible to a height of 4 feet. The impregnated female insects are first placed on the plants about the month of August, and so quickly do they breed, that about November or December the first crop is ready for gathering, and other crops again mature at periods of about four months. After being gathered they are thrown into boiling water for the purpose of killing them, after which they are dried in the sun. It is estimated that 1 lb. weight of cochineal contains 70,000 of these insects, and when we consider that the quantity annually imported into this country ranges between 30,000 and 40,000 cwt., we can form some little notion of the countless myriads of insects to be found in one plantation. The average value of cochineal is somewhere about £400 per ton.

Several species of Opuntia serve as food for the cochineal insect; O. cochinillifera and O. Tuna are perhaps the most common. Several varieties or qualities of cochineal are known in commerce under dif-

ferent names, as "silver grain," "black grain," "granilla," &c. The first is of a purplish-grey colour, with silvery white lines. The black variety has no bloom, and is of a dark reddish colour, while granilla is composed of the smaller insects, sometimes of broken insects, and the inferior qualities are occasionally mixed with dust and fragments of foreign substances. The chief use of cochineal is in the manufacture of carmine, and as a colouring agent in cookery, confectionery, and medicine. *J. R. Jackson, Kew.*

New Garden Plants.

TODEA WILKESIANA, *Brackenridge, United States Exploring Expedition*, xvi. 309, t. 43; T. FRASERI β, *Hooker and Baker, Synopsis Filicum*, 427.

T. caudice erecto; stipitibus lævibus semiteretibus antice sulcatis; frondibus membranaceis glabris bipinnatis; pinnis sessilibus oblongo-lanceolatis inferioribus deflexis; rachibus pilosis alatis; pinnulis oblongis obtusis dentatis basi obliquè cuneatis pellucid-punctatis. *Brackenr. l. c.*

This beautiful and very rare miniature Tree Fern was first discovered by the botanist attached to the United States Exploring Expedition in Ovolau, one of the Fiji Islands, where it was found growing in humid mountain forests. It is closely allied to T. Fraseri, but is of larger growth, with an arborescent habit, and has the lower pinnæ distinct and deflexed, and the rachis hairy. Mr. Baker, indeed, makes it a variety of T. Fraseri, but the two plants are distinct enough for all garden purposes. We are indebted to the Messrs. Veitch & Son, by whom it has been imported, for the opportunity of figuring and describing it (See fig. 148).

Fig. 148

Mr. Brackenridge describes the trunk as being from 18 to 20 inches high and an inch and a-half in diameter, scaly towards the top, and producing from near the base black wiry roots, about the thickness of a crow-quill, the surface roughened by the raised scars of fronds that have fallen off, the summit crowned by from 10 to 12 spreading fronds, of a broadly-lanceolate outline, and 2 feet or upwards in length. The pinnæ are sessile, oblong-lanceolate, spreading, the two or three lower pairs distant and deflexed. The pinnules are oblong obtuse, obliquely cuneate at the base, dentate, pellucido-punctate, with numerous small brownish spots. The rachis of the pinnæ is winged and clothed with articulated hairs. Messrs. Veitch's parent plant has already a stem of a foot or more in height, and about an inch in diameter, which slender tree-like habit gives it quite a distinct aspect amongst its allies—which include some of the most lovely of cultivated Ferns.

The present species belongs to the Leptopteris group, which, however, does not present any sufficient differential characters to separate it from Todea, the thin texture and pellucid character of the fronds affording the only marks of distinction. *T. M.*

SERVICE TREE.

THE Service tree (Sorbus domestica) attains the largest dimensions among fruit trees in height and in diameter. Its regular pyramidal form is very marked, rendering it a very desirable tree for avenues or as isolated specimens. Its wood is hard and very slightly grained; it is very much esteemed for turning and cabinet-making. These qualities ought to induce planters to avail themselves of it. This tree, indeed, is many years before it fruits, but its other advantages afford ample compensation for these unfruitful years; many varieties of trees are planted which produce no fruits, and yet have not the same advantage as the Service tree has in its beauty and in the profit arising from the sale of its wood.

Like many other trees, the Service tree is unhappily too much neglected after its plantation; it is scarcely ever supported or protected from the cattle, and the surrounding ground is often ploughed or dug. These facts attest the ignorance or carelessness of the cultivator.

When a plantation of Service trees is made, the first care is to secure them upright with strong stakes, to which the trees are attached by thick hay-bands, so as not to injure the bark of the tree, which is very liable to become deeply cankerous, and thus to lose its value. Around the stakes Thorn branches should be placed, in order to prevent the inroads of cattle.

The stem of this tree has naturally a good habit, but it is as well every year to inspect the trees, so as to remedy any, that for some reason or another may not have assumed the vertical direction. When the tree, after many years of plantation, has got a reasonable strength, it is useful to cut away very carefully its lowest branches, to make its trunk every year grow taller, and so much the more valuable. It is afterwards sufficient to prune the off-shoots, so as to preserve the regular form of the tree, and the equilibrium of all its parts.

The fruits, being light, do not weigh down the branches, as in the case of the Apple or Pear tree.

The fruit, named Sorb or Corme, is produced in corymbs, and has the form of a small yellowish Pear; it is commonly more or less red in colour, according to the variety. At first very austere, the Sorbs become eatable when over-ripe; they have then the taste of Medlars, and are, when taken in this condition, very astringent. This fruit is generally used to make three sorts of drinks:—

1. When green it is soaked in water for a fortnight, in the proportion of 15 décalitres to the tun of 230 litres. It thus forms a refreshing drink, which remains good a long time, and forms a very economical beverage for workmen.

2. When still green, but nearly ripe, at the end of September, the Sorbs are pounded and pressed in the same way as Apples or Grapes, in order to extract the juice, which is put in barrels and allowed to ferment. Many months afterwards it forms the true *cormé* ("Vin de Cormes"), a beverage commonly strong and alcoholic, and which is put into bottles as wine.

3. The fruit is submitted to broiling [? boiled], and from it a very sweet and agreeable drink, to be used in winter, is obtained, which is ready for use sooner than that prepared from the green fruits; 70 or 80 litres only are necessary for a tun of 230 litres.

In making the *cormé* the kernels are extracted, these are wanted by nurserymen for seedlings. As soon as the fruits are pressed, the skins, which will not ferment, are picked out, to extract the kernels, which will be laid out to dry or *ressuyer*. These kernels are laid out to stratify in January, to be sown in the following March; they habitually shoot from the ground very readily, but strange to say, the seedlings damp off (*s'échauffent*) and die some days afterwards; *ils fondent*, accordingly the term used by French nurserymen. For this reason the kernels of Sorbs are always sown with Pears or Apples, or mixed with other seeds; kernels of by separating the seedlings from each other the plant succeeds pretty well, and may be planted in the nursery during its first or second year. Up to this time the separation has been considered necessary by all nurserymen. For this reason, this tree is always sown mixed in conjunction with Apple, Pear, Plum trees, &c., in the nurseries of Anjou. I doubt the advantage of the plan in the plantations in the nursery, and think this mode of planting is a mere matter of routine.

It is certain, indeed, that in a plantation of Sorb trees in the nursery, all the stocks will not attain the same degree of vigour; a few of them will be beautiful standards after three years, the majority will want five, six, or even ten years; others of them will produce no shoots, and will decline every year. I have compared a bed of Sorb trees planted by themselves with the same number of these trees mixed with other trees; I have, nevertheless, found the same results. I think it is an error to say that Sorb trees do not prosper when isolated in nurseries.

This tree, the roots of which are tap-shaped, requires a warm, deep, and calcareous loamy soil; it lives with difficulty in poor, sandy, or swampy ground. As has been before said, it is liable to canker, and especially when planted in unsuitable soil. When the tree is large and cannot be removed, the best remedy consists in surrounding the canker, as soon as perceived, with a composition of cowdung and chopped hay, after having cleaned the wound up to the live wood. In the course of years the wound will heal completely. In the nursery the only remedy is to cut down the tree near the ground, and make it form a new stem. It produces shoots of 3 or 6 feet in length a-year.

At first there were only two varieties of Sorbs, the grey and red sorts. Their seedlings have already furnished several other varieties, such as those with rose fruit, large grey fruit, and large rose fruit. The most esteemed varieties are the two sorts with grey fruits. The three common sorts would undoubtedly reproduce themselves by seed, if the kernels were taken from stocks isolated from those of another variety, and not liable to become hybridised. Generally, however, the stocks grown in nurseries are mixed with grey and red sorts.

To have all the varieties true, it is necessary to graft or bud them on young plants from seedlings. Many experiments have been made by grafting it on Sorbus Aucuparia; the Sorb tree succeeds on it, grows for a time, but lives only a very few years.

As a fruit tree, the Service tree is more or less fruitful each season. An old proverb says, "When it rains on St. George's Day, there is neither Cherry nor Sorb." Undoubtedly this saint had not much to do with the matter; and it is better to say, that the flowering of this tree, being about May 23, suffers the vicissitudes as it reaps the advantages of favourable weather at this season.

Very often one side of the tree is loaded with fruit, whilst the other is entirely destitute of them, and *vice versâ* another year. We attribute this anomaly to the direction of the wind, which is favourable on the

one side and detrimental on the other, so far as regards the fecundation of the ovary. *Delépine aîné, Nurseryman, Angers.*

ORCHID CULTURE.

As I have before mentioned, Vanda Bensoni and Saccolabium giganteum are found in the plains in the drier climate of Prome and its vicinity; but when you commence ascending the Arracan mountains, to which I have already referred, all trace of S. giganteum is lost. The ascent of these mountains begins at a place called Neeounkidouk, about 30 thirty miles from Prome due west; and the highest point reached in crossing through this mountain pass, leading to Toungoup, is about 2500 to 3000 feet. At the height of about 2500 feet the following Orchids are found:—Dendrobium crystallinum, D. chrysotoxum, Thunia Bensonæ, Pleione Wallichii, Vanda Denisoniana, D. binoculare, and D. crassinode; and at a lower elevation, say 1500 feet, Dendrobium Bensoniæ and Vanda cœrulescens.

These mountains form, as it were, a barrier to the south-west monsoon, arresting its force to the eastward; consequently, the country around Prome and Thayetmyo (the chief civil and military stations) has a considerably drier climate than that about Rangoon and Moulmein. Thus the rainfall on the Prome, or the east side, is very much less than on the west, which is exposed to the full violence of the south-west monsoon, coming direct from the ocean. Although the rainfall on the east side is greatly diminished in intensity, yet the rain-clouds hang about the tops of these hills, giving them a moist, watery vapour, an atmosphere these plants delight in, but without a great deluge of rain. Observing this, I was led to search these mountains, conceiving I should be well rewarded for my labour, and this turned out to be a correct conclusion.

It is, indeed, strange to see how in ascending a few feet the flora changes, and how some plants are strictly confined to chosen spots, whilst others again are distributed far and wide. How is this to be accounted for? Is it the instinctive sensitiveness of the plants, which causes them to emigrate to suitable habitations, or is the original germ there developed, from the congeniality of certain climatological influences? We hear and read now much about the fertilisation of plants by bees. It has occurred to me, that other insects besides bees are made the vehicle through which fertilisation and hybridisation are carried on. Thus this cross impregnation or sympathetic assimilation between different plants, together with physical and climatic variations, must naturally tend to modify types. Thus the action of the sun, for instance, must necessarily play a prominent part in these modifications, for its rays, penetrating through different media, as the more rarified air of the mountains and denser atmosphere of the plains, must, it is to be presumed, produce some corresponding chemical effect upon the plants.

However, be this as it may, it is foreign to my present subject; I will, therefore, again refer to the several Orchids found in these parts. The first time I visited these hills was in the beginning of February. The trees had dropped their leaves, the jungle grass was burnt up, even to the elevation of 1500 feet. The hills were bare. The stems of the leafless trees were charred and scorched, giving the whole country thereabouts a burnt, black, desolate appearance. Here the heat was almost insupportable, and I do think I shall not be exaggerating in stating that the thermometer could not have been less than 120° in the shade at this season; yet this is the spot selected by Vanda cœrulescens and Dendrobium Bensoniæ, and other Orchids. It is not until we get to a higher elevation that we come across Dendrobium crassinode, D. crystallinum, Vanda Denisoniana, D. binoculare, D. Farmeri (yellow variety), &c. The three last named plants prefer more shady places to D. crystallinum and D. crassinode. For more detailed particulars the following table may be referred to:—

Names.	Approximate elevation in feet.	Average temperature.	Probable rainfall in inches.	Locality and Remarks.
Dendrobiæ.		Degs. F.		
D. barbatulum	..	80 to 83	120 to 200	Plains of Moulmein and Rangoon; on trees generally of small size.
,, Bensoniæ	.. 1500 to 2000	80	90	Arracan hills, about half way up, on exposed ridges; in addition to rain, great moisture; trees.
,, binoculare	.. 2000 to 2500	75	90	Ditto; shady places.
,, Bullenianum	.. 1000 to 1500	75 to 80	120 to 200	Mountains near Moulmein, &c.; trees.
,, crassinode	.. 2000 to 2500	75	90	Arracan and Siam mountains; on large trees; scarce; moisture considerable; thermometer falling to 46 in cold seasons.
,, cretaceum	.. ..	80 to 83	200 to 250	Wide distribution on plains of Burmah.
,, chrysotoxum	.. 2000	75 to 83	90 to 200	Plains and mountains; wide distribution. This plant is hardy, thriving in dry and moist climates, when found on mountains, pseudobulbs compressed globose.
,, crystallinum	.. 2500	75	90	Arracan mountains; small trees; exposed ridges.
,, Dalhousianum	.. ..	80 to 83	90 to 200	Plains; wide distribution.
,, Farmeri, white	.. ..	80 to 83	200 to 250	Plains and low hills near Moulmein.
,, ,, yellow	.. 2500	75	90	Arracan mountains; large trees and shady places.
,, fimbriatum	.. ..	80 to 83	90 to 250	Plains and mountains in Burmah.
,, formosum	.. ..	80 to 83	150 to 250	Plains, Rangoon, Moulmein; near the coast in abundance.
,, infundibulum	.. 1000 to 1500	75 to 80	200 to 250	Mountains near Moulmein.
,, Jamesianum	.. 1500	75 to 80	90 to 100	Arracan range, near Prome.
,, moschatum	.. ..	80 to 83	150 to 200	Plains in Burmah; plentiful.
,, nodatum	.. ..	70 to 80	100 to 250	Plains and mountains; hardy.
,, Pierardi	.. ..	80 to 83	150 to 250	Common; plains and hills.
Bletiæ.				
Phaius albus	.. ..	80 to 83	150 to 250	Widely distributed on Burmah plains.
Thunia Bensoniæ	.. 1000 to 2000	80	150 to 200	Arracan and Moulmein mountains; there is a yellow and red variety.
Vandeæ.				
Aerides Lobbii	..	80 to 83	150 to 250	Plains, Moulmein; plentiful.
,, roseum	..	80 to 83	150 to 250	Plains, Rangoon and Moulmein; local.
,, odoratum	..	80 to 83	150 to 250	Ditto; very common.
Saccolabium ampullaceum	..	80 to 83	150 to 250	About 70 miles north of Rangoon.
,, Blumei	..	80 to 83	150 to 250	Very common, plains, Burmah.
,, giganteum	..	80 to 83	90 to 150	Plains near Prome, Thayetmyo, and Tonghoo.
,, guttatum	..	80 to 83	90 to 150	Ditto.
Vanda Benson	..	80 to 83	90 to 100	Ditto.
,, cœrulescens	.. 1000 to 1500	80 to 83	90 to 100	Arracan mountains; deciduous trees.
,, Denisoniana	.. 2500	70	90	Ditto; shady places; trees.
,, gigantea	.. ..	80 to 83	150 to 250	Jungles, Moulmein and Rangoon; plentiful.
Cypripedieæ.				
C. concolor	.. ..	80 to 83	200 to 250	Moulmein, on rocks limestone).
,, villosum	.. 3000	70 to 75	200 to 250	Moulmein and Tonghoo mountains.
Calogyneæ.				
Pleione Reichenbachiana	.. 6500 to 7000	65 to 70	200 to 250	Alpine; near Moulmein.
,, Wallichii	.. 6000 to 7000	70 to 75	150	Arracan mountains.
Phalænopsideæ.				
P. Lowii	.. ..	80 to 83	200 to 250	Plains near Moulmein; rocks.
,, Parishii	.. ..	80 to 83	200 to 250	Plains, jungle trees; Moulmein and Rangoon; trees.
Brassideæ.				
Cymbidium tigrinum	4500 to 7000	65 to 70	200 to 250	Moulmein mountains; trees.

Besides the above there are various others, which I have not considered worthy of notice. I have given the localities in which I have myself found the Orchids. The rainfall and temperature is, of course, only taken approximately. *F. Boxall.*

THE DODECATHEONS.

Dodecatheon Meadia (L.).—In North America this is called "Shooting Star," and few of the many lovely plants we get from that continent surpass it in beauty. The blossoms begin to open about the dawn of summer, and continue to do so for over a month. The leaves are of a deep green, produced in large tufts. They grow nearly erect, are from 3 to 7 inches long by about 3 inches across the broadest part; they are wavy or irregularly indented along the margins, and are quite glabrous. The scape rises boldly twice the height of the leaves, and is crowned by a noble umbel of drooping flowers. One of these, viewed as a whole, presents to the eye a conical outline as well as a most extraordinary alternation of coloured bands. The broadest part of this so-called cone is formed by the red, white, or pink, and reflexed petals. Close to the base of these is a belt of yellow, succeeded by another of a rich chocolate tint, and so on, shade after shade, until the purple end of the style, protruding beyond the points of the long anthers, is reached. Although easily increased by parting in autumn or by seed sown when ripe, this is by no means a plant for an ordinary border, requiring as it does shade and moisture though not stagnation. It is a subject qualified in a superior degree for the margin of a Rhododendron bed, where the soil is peat or friable loam, and really it is a pity one does not oftener see it in the position it is so peculiarly well fitted for. Besides it varies considerably, as well as forms an excellent plant for growing in a pot. The general treatment of the three following species should resemble that which has been recommended for the present.

D. Jeffreyi (Hort.).—This has been called the giant of the genus, but the great oblong entire leaves furnish the sole claim to such a distinction. The scape lifts a head of handsome and curious flowers, only a few inches above the foliage. The petals are reflexed, of a delicate pink or rose colour, and yellow towards the base, whilst the stamens, along with the protruding portion of the style, are purplish. In the "Flore des Serres" there is an admirable drawing of this species, and the flowers are represented as they ought to be, each with four sepals, four petals, and four stamens, but the letterpress errs by applying to the case in hand the ordinary generic description, which makes every one of the floral whorls consist of five parts. It is an inhabitant of the Rocky Mountains. The blossoms expand shortly after those of D. Meadia.

D. integrifolium (Michx.).—The maximum length of the oblong-lanceolate, glabrous, entire leaves of this may be taken at 7 inches; the breadth at 2 inches. The scape is a little longer than the leaves, and bears at its apex from five to twelve flowers; these resemble those of D. Meadia in colour, but are smaller, neater if possible, and attended by peculiar spathulate or else oblong bracts. This is a well-marked species, and amongst practical men is in no danger of being confounded with any of its relations. It is a native of N. America, flowers early in summer, and is worthy of one of the best positions on the rockwork.

D. frigidum (Cham.).—In every sense, except in its capacity for exciting interest, this is the undoubted dwarf of the genus. Its more perfect leaves are ovate, irregularly notched along the margins, about 3 inches long, and spreading. The scape never bears more than six flowers, and mostly fewer. The blossoms do not droop as do those of all the other species, and the pedicels are almost as long as the scapes; only apologies for bracts occur. This is rather a stubborn little mountaineer to cultivate, and I understand that it is to be met with in places both north and south of the equator on the American continent. It occurs in nurseries under various names, all of which are wrong. It should have stones about its roots, to preserve an equable temperature. Its flowers open towards the end of spring. *John Duncan.*

Home Correspondence.

Variegated Zonal Pelargoniums. — Should tricolor Pelargoniums be exhibited in or out of bloom? Supposing two collections to be competing, the one consisting of plants with highly coloured foliage, but with no flowers, and the other of plants with but moderately coloured leaves, but with a head of bloom, to which should the premier prize be awarded? As there seems a considerable amount of doubt relative to the above question amongst growers and exhibitors, in this part of the country at least, owing to its being left an open question in the schedules, I should be glad if you or some of your readers who are growers of this class of plants, would express an opinion on the matter, and thus help to settle this vexed question. *F. J. H.* [Pelargoniums of this class are shown on account of the beauty of their leaves, and hence it is the condition and colouring of the foliage, combined with a good general habit, which should decide the award of the premiums. Flowers are seldom an advantage to such plants, often a great disadvantage. Hence they are usually, and should always be, shown without flowers. EDS.]

Encephalartos villosus, &c.—Under this heading you have published a letter (p. 767), signed "J. Croucher, Royal Gardens, Kew," in which, after telling us that certain specimens of Encephalartos, exhibited at Regent's Park by Mr. W. Bull under five different names, were "one and the same species," viz., "E. villosus, Lehm.," which "any one pretending to a knowledge of these plants" could not fail to recognise by "the villose stem," the writer records his surprise that five certificates had been awarded to one species, and "that incorrectly named." As I do not happen to be one of the judges criticised, and as these gentlemen are well able to take care of themselves, I will confine myself to stating my impression on examining these singular Cycads. I first saw some of them at Burlington House, on the occasion of Mr. Bentham's *conversazione*, where they were as carefully looked at as time and place would permit, not only by myself, but amongst others by Mr. Carruthers, who, as your readers know, has just enriched our Transactions with a monograph of fossil Cycads. Without anticipating what Mr. Carruthers or any other botanist may have to say about them, I may state that the question of absolute identity of the exhibited plants never entered our mind. I have since looked more closely at these Encephalartos, and cannot but think that Mr. Croucher has been too hasty in publishing his opinion, and would be put to some trouble if called upon to define the species to which he thinks the five condemned ones belong. E. villosus of Lemaire (not of Lehmann, as he puts it) is not described by Miquel in

his last revision of the order in De Candolle's Prodromus (June, 1868), nor has Lemaire himself seen flowers or fruit. But apart from this difficulty, Mr. Croucher is incorrect in assuming that "the villose stem is so very marked a character" of the species with which he identifies the offending ones. Villosity is a character certainly, but one common to several well-known species, notably E. lanuginosus, horridus, cycadifolius, &c. Moreover, a villose stem (does he mean trunk or rhachis?) is by no means found in all the exhibited species. More competent hands than mine will doubtless deal with the systematic aspect of these interesting plants; but I may remark that the Encephalartos exhibited at Regent's Park differ so much in their habit, shape of trunk, their glabrous and lanate nature, the length of the leaves (ranging from 18 inches to 7 feet), the setting of the leaflets (closely approximated in some, 1½ inch distant in others), their shape (pointed in some, 3-fid at apex in others), and other peculiarities, that it is quite impossible for any one examining them with a critical eye to arrive at any other conclusion but that they do belong not to one but to several distinct species. The opinion of Mr. Croucher, mistaken though it may be in this instance, derives importance from the position he occupies at Kew. Of course those behind the scenes know that his writing from the Royal Botanic Gardens does not necessarily imply, nor does imply, that he has sought or obtained for his article the sanction of the eminent botanist who directs the affairs of that celebrated establishment; but outsiders and people abroad may not be able to dissociate the private from the public opinions emanating from Kew. Mr. Croucher may be assured that the respect which one is apt to entertain for what he may have to say, will rise in proportion to the discretion he displays in writing to the papers from the place with which he is connected. *F. L. S.*

—— In reference to Mr. Croucher's remarks on the specimens of Encephalartos recently exhibited at Regent's Park, I will only trespass on your space so far as to say, that if in his opinion the specimens commented on are all of one species, that opinion is totally at variance with mine, and that of others better qualified to decide. *One of the Judges.* [From our own repeated examination of these plants we have been led to a different conclusion from that expressed by Mr. Croucher. Drawings and descriptions of some of these plants have been submitted by us to Professor Miquel, of Utrecht, and Mr. Carruthers has, at our request, kindly undertaken to furnish us with a description of the specimens. It will be better, therefore, to wait till the publication of the decision of these eminent botanists—*facile principes*—as regards a knowledge of the plants of this order before expressing an opinion. In a short time the description and illustrations will be in the reader's hands, and he will then be able to judge for himself between the contending parties. We do not think that Mr. Croucher is fairly open to the rebuke of "F. L. S." Right or wrong he was expressing his own opinions, as he has very good right to do. In so doing, he did not in any way compromise the officials of the establishment in which he so worthily fills an important position. In any case, Mr. Croucher will have done excellent service by calling attention to the mischievous tendency to give different names to trifling variations of the same plant; and if Mr. Croucher's protest leads nurserymen to pause ere they tack a Latin name of their own construction to their plants—thus assuming the privilege of the botanist without pretending to partake of his laborious inquiries, or share his responsibility—we think most of those who write F.L.S. after their names will applaud Mr. Croucher. Eds.]

Potatos and Salsafy. — Out of a considerable variety of early Potatos planted with the same manure, viz., burnt vegetable, and earthy and cesspool matters, I find none with even indications of tubers excepting those known here as Gloucestershire Kidneys, of which I have gathered to-day (June 4) of the first three roots tried about a dozen at a root, averaging the size of pigeons' eggs. These were grown on ground which has been planted almost annually for many years with Potatos, whereas some Early Handsworth, Early Shaws, Early Goodrich, &c., on quite new and excellent soil, have as yet no tubers. My garden is in an elevated and cold situation; I do not, therefore, instance this case as one of positive earliness, but to show that the Gloucestershire Kidney is a comparatively early kind amongst those reputed early. Will you now allow me to say a few words about the culinary preparation of a vegetable which I feel assured would be very generally grown if it were properly cooked, I mean Salsafy, which is known by some as the "Oyster Plant," a name it richly merits, for when cooked in precisely the same way as scalloped oysters it is very similar in flavour, and, to my thinking, quite as good, and many people think the same. I suppose it is not too late to sow the seed now. The green top, just before the flower-stalk appears, is as greatly admired by many when cooked as Asparagus: it has an agreeable cocoa-nut flavour. With regard to the cooking—the roots must be boiled quite tender, when the skins will easily be removed by wiping with a cloth. They must then be sliced obliquely and thinly, not cut into lumps. Then melted butter, seasoned with anchovy sauce, must be poured over them in the scallop tins, and the whole covered with bread crumbs. Bake in an oven, and brown before the fire. *J. H. M.*

Lawn Mowers.—In the *Gardeners' Chronicle*, at p. 311, there is an article eulogising the Archimedean lawn mower, and endorsing a report from the authorities at Chiswick as to its being the quickest, the most simple, and most efficient mower ever used. Partly through reading that article I was led to give the machine alluded to a fair trial, and am much astonished that such authorities should commit such a mistake in so vastly overrating both its qualities and capabilities. As to the first recommendation, of its being the "quickest," my experience leads me in some cases to the opposite conclusion. Twenty years ago, when I first worked one of Budding's machines, we used to think what a saving of labour it was to us to have a machine that would not only cut the grass but collect it at the same time, thereby relieving us of the necessity of getting up by 4 o'clock in the morning to haggle away with the scythe. However, the times are changed, and our "astute" friend the "Yankee" steps forward and tells us that there is no necessity to sweep and clean so much. In some cases I agree with our friend, but like many other over-astute people, I think he has missed one or two main points or requirements of a mowing machine for our English lawns. There are times and places when to leave the cut grass on the lawn would be very objectionable; therefore, would it not have been better if our "astute" friend had made provision in his mower to collect the grass when necessary, thereby saving the labour of the sweeping process in such cases? The statement as to its being the quickest can only apply to cases in which is not objectionable to leave the cut grass on the lawn, and then it only gains that advantage by obviating the necessity of stopping to empty the grass-box and barrow. Next as to its being "the most simple," I suppose that applies to its construction, which I think is an entire misnomer, as it has all the clumsy cross bar, cog-wheels, jingle and noise, of the old Budding. The only simple point I see about it is its cast iron cutting-blade or screw as it is called. If any one is "simple" enough to believe that a "cast iron" cutting-blade is an advantage, then our friend the Yankee deserves the appellation of being "astute." As to its being "the most efficient," the machine I got would not touch our lawn till I had about a quarter of an inch filed off the skid, so as to be able to set it nearer the ground; it then made a lasting impression in the form of what some might call beautiful waves, but which I call ugly ribs; in that matter then I found it a long way inferior to our best English lawn mowers, therefore it does not merit the title of being the most efficient. It no doubt gains one point, "in long grass especially," in not having rollers in front; but where lawns are cut once a week, as they ought to be, rollers are found not objectionable, and they are very necessary for mowing narrow verges, &c. I have no pecuniary interest to induce me to recommend any lawn mower, or to disparage any, still I would say to all intending purchasers, "Do not place implicit reliance on the authorities quoted; but see and judge for yourselves, or wait till the Archimedean has been fairly and publicly tried against some of our best English machines." *Robert Featherstone, St. Ann's Villa, Burley, Leeds.* [Longer experience does not induce us to alter our favourable opinion of the American lawn mower; for small gardens and amateur's purposes it is the most efficient machine we know, and the easiest to work. It will not do everything, for instance it does not answer for steep slopes or verges; and if the grass be so long as to be in flower, it does not cut the "bents" well, and those that are cut in drying make a litter like straw. But a lawn should never be allowed to get into such a condition. Eds.]

Early Strawberries.—I know Mr. Hague by repute to be an enthusiastic amateur and a good gardener, and I have no hesitation in believing him when he tells us he gathered ripe Strawberries on May 5, but allow me to caution your readers against taking the fact as an indication of the forwardness of crops in his neighbourhood. I am pretty familiar with the Wentworth estates and Mr. Hague's locality, where I know that no such feats can be accomplished, as a general rule, even under hand-lights; but I am informed, on good authority, that one of the coal-pits in that locality has been on fire for years in a certain part, and its influence on the surface of the ground is so felt in some parts as to be destructive to vegetation altogether, while in other places it imparts only a mild bottom-heat that has enabled others to perform feats quite equal to Mr. Hague's that have never been chronicled. I do not know whether Mr. Hague's garden is situated on this favoured strip, and I should not like to assert that it is, but if I am not greatly mistaken, the gardens of his neighbour, just across the road, are; and the presumption is strong that Mr. Hague's Strawberries were also benefited from the same source. I may be wrong in this, but I am nevertheless confident that the ripe Strawberries which he pulled on May 5 must have been produced under equally exceptional conditions, though they may have been grown in the "open air." *P. Q.*

Fruit Prospects in North Cheshire.—Fruit of every description in Cheshire promises well. Peaches are good; Apricots a great crop—the trees on the houses of cottagers, generally carelessly managed, being as heavily loaded as the well-managed trees of the hall or castle. Apples, Pears, Plums, and Cherries, are well set, and promise a full crop. In the Frodsham and Helsby district, celebrated for the large quantities of Damsons produced, more than an average crop is anticipated, and Currants and Gooseberries, of which large quantities are grown, are very full; in fact, I am informed by old growers that it is some years since fruit of every description promised such an abundance. The above district is also celebrated for its production of Potatos, which are very extensively grown for the Manchester market, particularly the early varieties. The system of cultivation appears to be peculiar to the district. The ground is ploughed or dug in the autumn: and in the end of February, or the first week in March, it is laid in ridges 3 or 4 feet wide, being previously manured, so that the manure is only covered 3 or 4 inches deep. The Potatos are then dibbled in rows, 3 or 4 feet apart, according to the width of the ridge, and 1 foot apart in the rows. As soon as the Potatos show themselves above ground, the soil is taken out of the alleys (which are left 12 inches wide between the ridge), and spread over them, which completes the operation. Few of the ash-leaved varieties are grown, as it is found that if they are cut down by frost they seldom recover so as to produce a remunerative crop. The favourite sorts are known as Radicals and Falaries — early pink-eyed round varieties. The preparation of the sets is carefully attended to. The farmers and cottagers have all a number of boxes or trays 4 inches deep, and from 30 to 34 inches square, with a piece of wood at each corner projecting above the box about 4 inches, so that they can be placed one above the other without injuring the sets. The first or second week in March is the favourite time for planting for the early crop, the sprouts being then 1 or 2 inches long. After the crop is gathered the ground is frequently planted with late Potatos for a second crop, or with Mangel Wurzel transplanted from a seed-bed, the alleys being planted with cattle Cabbage. The soil is a light sand, and requires much manure. A large quantity of guano is used. The land is not so clean as it should be, Couch being very prevalent. Rain is much wanted; the earlier Potatos are now in want of moisture, and the samples now going to market prove deficient in quality and quanity. This has been one of the most ungenial Mays on record, cold, without rain, with high winds, and very changeable. The Oak was in full leaf before the Ash showed signs of growth—a pretty sure indication of a dry summer. *T. Shortt.*

Grape Showing.—I feel certain that it would be very interesting to Grape growers if exhibitors at our coming great shows would state the age of their Vines, and whether grown on the extension or spur system. It is a well-known fact that it requires less skill to produce first-class Grapes from young canes than from old ones. Judges at horticultural shows would do well to bear this in mind. *J. Smith, Exton Park.* [A good suggestion. Eds.]

Chapman's Patent Flower Cases.—These have been already formally noticed in your columns, but will you allow me to add my mite of praise from personal experience? I was from home the day before the Crystal Palace show on the 21st, but I requested my daughter (an ardent little florist), to cut a dozen blooms of Auricula and send them up. The box was entrusted to the tender mercies of the railway, and when I opened it at the Crystal Palace the blooms were all perfect, and not a drop of water had been spilt. After the show was over they were again put into the case, and arrived at home in perfect condition. This was to me conclusive proof that this invention of Mr. Chapman is one of the most valuable for amateur florists that has been brought out for a long time. Mr. C. has also recently added to it a very ingenious zinc tally for the address; you pass the padlock which fastens the box through it, and it remains perfectly secure, so that no mishap can happen to the box from the address coming off. *D., Deal.*

Cherry Trees not Fruiting.—I have read with much interest Mr. Gilbert's remarks on this subject, at p. 767. I have a similar instance in the case of a White-heart Cherry tree. Every year it is white with blossom. It is growing on a south-east wall, and is well protected with Frigi Domo netting. All the blossoms seem to set, but only a dozen or less swell, the remainder falling off. The tree makes a deal of breast wood, which has always been summer and winter pruned. One year I root-pruned it. It is 13 years old, and I was thinking of casting it away, but I shall now try Mr. Gilbert's plan. I should; however, like to know if he winter-prunes his tree, or leaves all the breast wood on. In a year or two it would, I fear, become a mass of wood. *H. A.*

The Vines at Broomfield Lodge.—In your columns, at p. 568, there is an article on Grape growing at this place, on which I beg to make a few remarks in reply. I happened to be well acquainted with Broomfield Lodge nearly 40 years ago, when one Robert Harris was gardener there, and he was allowed to be one of the best Grape growers of his day. He was a descendant from Harris, the celebrated fruit-grower to King Henry VIII. In all probability it was he who planted the old Vines. If such was the case they are now about 60 years old. The events to which I wish

more particularly to refer, took place at a more recent date. Mr. Payne, who was gardener there to the late Mr. Beadle, exhibited Grapes, cut from the old Vines, at the Chelmsford Show every year, from 1857 to 1861, both years inclusive, and took away the cream of the prizes every time. In the year 1860 Mr. Payne exhibited a bunch of Grapes, at the opening of the gardens at South Kensington, which weighed 8 lb. 14 oz., and was the admiration of thousands; the judges had it placed in a position apart from the rest of the show, that the spectators might obtain a better view of such a splendid bunch. In the same year he also took four prizes in London, and one at Romford. Mr. Payne's knowledge of Grape growing did not forsake him when he left Broomfield, for in the autumn of last year he carried off two 1st prizes at the Brighton exhibition in classes open to all England. Surely Mr. Payne is not such a veritable "duffer" as your correspondent insinuates, or how is his success as a Grape grower to be reconciled with a system of "barbarous treatment," "unscientific amputations," and the like other harsh epithets? I question whether his critic will acquit himself with equal credit as his predecessor, not even now the houses have been remodelled on a "style of magnificence," and the Vines have the benefit of a little "scientific" handling. Is your correspondent really in earnest when he says he can supply his employer's table with Grapes ten months in the year, and that, too, equal in "quantity" as well as "quality" to any in the country? I believe there are plenty of places to be found where Grapes are grown in greater "quantity" than they are at Broomfield Lodge, and I cannot avoid the conclusion that the "ten months' supply" is considerably overdrawn. *One who "honours" old age.*

Orchids at Chatsworth.—If your correspondent had taken the trouble to inquire, he would have found that the canvas on the sides of the houses was tacked on for a temporary purpose a few days before I left there in April; and if he is a practical man, he will know that if spot once gets on a Cattleya it remains until the leaf is cut off, and also that the most fatal cause of spot is the cold drip from a bad roof. I know there was some spot on some old plants of Cattleya, which originated before my time from the cause I mentioned in my last, viz., bad watering and drip. No doubt glass, putty, and paint, to which your correspondent should have added doors, would make a very good structure of the old Orchid-house. I may say there was no spot on the Phalænopsids when I was there, and only on a few old plants of Oncidium and Vanda Roxburghii, which I had kept to see how nearly it was possible for plants to be dead and then recover. I should like to know where there are finer plants of Oncidium ampliatum majus than the two I left there? As regards the new houses, I may say that I always imagined that nurserymen were tolerably good judges of the kind of houses required for plants, so that it is satisfactory to know that they are considered respectable by that body of growers. I beg to inform your correspondent that the Duke and his friends were satisfied with my plans, a fact vouched for by their being carried out, but this "any fellah can understand." Your correspondent has made such a flourish about the wonderful improvements in the Orchids in general and Cattleyas in particular, that I will challenge him to produce as good growth or as many flowers on any of the improved specimens at Chatsworth, with his superior skill and all the evidences of his senses, as I can produce for the same two years here. I am sorry to see that anonymous writers still flourish at Chatsworth, and I may mention, for the benefit of your correspondent, that the only difficulty I ever had at Chatsworth was with one of those pests to society, and that I should never have troubled you on the subject if it had not been for the personal and uncalled-for article to which my first reply was sent, for if there was ever any interest in such an article it is lost before I can reply to it from here. I shall now take leave of this subject, merely remarking, in conclusion, that I have done with a country in which a gardener, if he wishes to hold his place, must not only please his employer, but fall down and worship his employer's man-servant and maid-servant, his ox and his ass. [1] *James Taplin, South Amboy, N. J., United States of America.* [We can insert no more on this subject. Eds.]

May in the Eastern Counties.—There is a sound of potentiality in the name of the month through which we have just passed which probably conveys to some ears a promise of success in the vast amount of work to be done and progress to be made during its 31 days. But my own experience, invariable, though limited, I confess, for a few years, leads me to think that outdoor gardeners in the chalky and lighter soils of West Suffolk and Norfolk, and Cambridgeshire, would find "Mustn't" a more appropriate name for it than "May." Blazing suns and keen drying winds, of whose biting character one is aware even when the sun is fiercest, are so unfavourable for the growth of seeds and young vegetables, especially where the means of watering are limited, that the "merry" month tries one's patience here to the utmost. It would be interesting to learn, from some of the gardeners in the North, particularly in the Western Highlands, what has been the character of the month with them—the range of the barometer, the amount of rain and of moisture in the air, and the prevailing winds. Perhaps the tale which they have to tell would explain better than anything else the "pull" which the North has upon the South in respect to the kitchen garden. A good start at this time of the year is of incalculable advantage—can never, in fact, be overtaken. As for annuals for the flower garden, it is in nine years out of ten such a mockery to sow them in this district, that I wonder that our nursery gardeners ever find any customers here for their numerous packets and assortments of seeds. Even the bedding plants might as well be still in their frames, since, although the nights are not cold enough to hurt them much, only constant watering will keep them from utter starvation. *East Anglian.*

Raising Early Peas.—In reply to "R. G.'s" note a few weeks ago, stating that he did not approve of sowing Peas in boxes of any kind, and that he could gather Peas earlier from those sown in autumn than from those sown in boxes and planted out, in which, moreover, he demanded that a sample of transplanted Peas should be sent to the office, and engaging to send a sample of autumn-sown Peas when fit to gather, I have this day sent a sample of Suttons' Ringleader Pea, sown in boxes of the ordinary kind February 21, planted out on south border April 2, and gathered May 28. I have practised sowing Peas in boxes or pots for many years, and have had an autumn sowing as well, but have found the transplanted Peas to be from six to eight days earlier than the autumn sowing, and frequently the autumn sowings were much destroyed by rats, mice, sparrows, &c. *D. L. B.* [A very good sample indeed. Eds.]

Cinchonas at St. Helena.—Table showing the growth of 14 Cinchona plants from the date of planting up to April 14, 1870 (elevation 2700 feet):—

Name of species.	Date of planting.	Height at time of planting.	Height on 14th of April.	Girth of stem.	Remarks.
		in.	ft. in.	in.	in.
Cinchona Aug., 1869		6	3 8½	½	Long leaf. 17 × 10
,,	,,	7	3 7	½	,, 14 × 4½
,,	,,	7	3 11½	½	
,,	May ,,	7	4 2	½	
,,	,,	7	3 11	½	
,,	,,	7	4 1	½	,, 14 × 9½
,,	,,	7	4	½	,, 17 × 11
,,	Aug. ,,	6	3 2	½	,, 14 × 11½
,,	May ,,	8	3 4	½	,, 14 × 11½
,,	,,	7	4	½	,, 14½ × 10
,,	,,	7	4	½	,, 17 × 14½
,,	,,	6	3 6	½	,, 17 × 12
Cinchona Oct., 1869		5	3 7½	½	Old plant, much injured
,,	,,	6	3 7	½	May [illegible]

J. H. Chalmers.

The Fungus Pest.—This discussion is assuming proportions far too serious to be any longer poohpoohed. I unfortunately am practically acquainted with the Vine Fungus, and though I have no complaint to lodge against the stick theory, I have the strongest proof that Fungus may be generated by burying some kinds of animal matter. My experience arose in this manner: Four years ago I had occasion to make borders to a new vinery, and the gentleman for whom I was acting had collected from the shoeing forge a quantity of the parings and filings of horses' hoofs. This was used in about the same proportion as I should have used bone-dust, and from it a similar result was anticipated. The border was made, and some extra strong pot Vines were procured, and planted in duplicate, the object being to fruit the strongest of the two the following season, and to cut the other down to make wood for the succeeding year's crop. The Vines were not planted until the end of July, but the progress they made was satisfactory, the wood was well ripened, and at pruning time we looked forward to a satisfactory result. Starting naturally the following spring the roots were assisted with a soaking of weak warm manure water, and the borders being inside ones, sufficient was given to soak them thoroughly. The Vines broke strongly and went on in a promising manner until the fruit began to show, and then they came to a dead stand, only a shoot here and there making an effort at growth. Finally, the leaves began to flag with every ray of passing sunshine, until at last it took them all night to replenish the loss of the day. All this time atmospheric moisture had been duly supplied; indeed had the Vines been in the hands of an expert in Grape management they could not have been attended to with more care. But it was useless: grow they would not, so that day by day they got worse. In this emergency Mr. Speed, now of Chatsworth, was called in, and no sooner was the first turned out than the whole secret of the failure stood revealed, the ball of earth and the whole of the roots being a complete network of Fungus. All this could be traced to the parings, but most notably to those pieces taken from the frog or soft inner part of the hoof, which in fact was the chief cause of the mischief, for wherever it presented itself there the Fungus was spreading in all directions. As it was useless to attempt a remedy, the borders were cleared away to the bottom of the drainage, the walls washed with scalding water and with hot lime-wash strongly impregnated with sulphur. New borders were made, avoiding the parings, and though loam from the same field was used, no more Fungus presented itself. But my troubles did not end here, for having some faith in the nutritive qualities of the parings, I had some mixed with loam, to top-dress the borders of a Muscat Hamburgh house. In 1868 the Fungus showed but little, and from lime and sulphur dressing I hoped it had disappeared; but last year it spread over a portion of the border like so much fermenting yeast, and though it was removed as fast as it appeared, its effect upon the crop was quite manifest. In the winter I had the soil removed, and then I found that so far as the Fungus had spread, principally upon the surface, the roots were quite black and dead, and, therefore, we followed the Fungus so far as a trace could be found, and removed it from the garden. Dressing the border liberally with lime and sulphur I hope the enemy has been eradicated, but of that I am not at present quite certain. Again, some of the parings were used in preparing a narrow border for the growth of Roses. The situation being a hot but very draughty one I was not surprised to see the plants grow slowly, but as several sets of plants have perished I had the last lot examined, and found the roots completely coated with Fungus. Here the same enemy has been at work, and, therefore, in future I have determined to reduce the parings to a state of superphosphate by digesting them with sulphuric acid, and then I think they may be used with safety. I quite agree with Mr. Sheppard that the failure of the Bishop Stortford Vines appears more attributable to Fungus than anything else, and if we consider the heterogenous accumulation of London street garbage out of which that fine porous border was mainly formed, there is nothing unreasonable in the assumption. Residing in Bishop Stortford at the time, I saw the materials accumulating, and the border in process of formation, and therefore I can speak with confidence upon the subject. Finally, as to Fungus in the soil, whether it may arise from the burying of vegetable or animal matter, it is a plant scourge much to be dreaded, and which ought to be combated by every possible means; and therefore I feel it a duty to add my mite of evidence against the dictum of those who would lead the uninitiated to believe that those who write about fungoid injuries are mere alarmists, who must not be listened to. I have paid for my experience so far, and am not sure that the scourge may not demand another dividend. *W. P. Ayres, Nottingham, May 25.*

Cottage Gardening.—Your correspondent, at p. 608, does not estimate too highly the good that can be done by a village horticultural society. It has been my fortune to watch the progress, and note the results, of several. The first I remember ceased to exist some 15 years ago, but the good seed it sowed is still producing good fruit, not only in the parish and its immediate vicinity, but the example has been followed in many places. With all village horticultural societies the object should be to promote the good and profitable cultivation of cottage gardens, rather than to get up a successful exhibition. The latter may be a means to promote the former, but I have known cases where the exhibition has been the prime object, and the direct encouragement of cottage gardening made of secondary importance. The most successful village horticultural society (judging by results) that I know, never made its exhibition of primary importance. The society offered prizes for the neatest, best arranged, and best cultivated gardens; and on the day when the prizes were to be distributed an exhibition of produce took place, but nothing grown out of the parish was, under any pretext, admitted. It was the practice of the president, or some member of the committee, to give to the assembled competitors the substance of the judge's praises or strictures. For temporary reasons there has not been an exhibition in connection with this society for the year, but the garden competition has gone on the same, with the same good results; the crops last year in some of the gardens were, both for quality and quantity, such as any gardener in the land might have been proud of. I am glad that the subject of cottage gardening is being taken up, and in such a manner that its importance will be made known to all. My experience tells me that in no way can a man of influence in a parish better promote the temporal and moral welfare of his poorer neighbours than by showing what benefits can be obtained from a well cultivated garden, and by teaching how to secure them. A provincial paper, of which I send you a copy, contains the first of some periodical articles on cottage gardening; this is an example that may well be followed, but let not the writers be too ambitious—let them leave the higher branches of horticulture to their proper channels. *W. F.*

Sitona lineata.—May I ask to add a few words more about Sitona lineata? The economy of this insect is mentioned by Curtis in his "Farm Insects," p. 475, as so entirely unknown, both as to where the female lays her eggs, and the larva feeds, and also as to where the pupa changes, that it would be very interesting if any light could be thrown on the subject. I have now forwarded some more roots of Peas, some with a few galls, some with many—these last having grown where a quantity of lime was mixed with the soil, and on opening some of these galls before they decayed, I found a white, coleopterous larva, slightly tinged with chestnut, and with chestnut-coloured mandibles. On digging up some young Vetch plants

amongst which I found specimens of Sitona, which I enclose, I found similar galls on the root containing larvæ, which, as far as I could ascertain by microscopic examination, were precisely similar to those in the Pea-root galls. With regard to the exit of these grubs, I noticed in one of the Vetch-root galls, still tenanted by a larva, a round dark spot; in another a larva was holding firmly by its head to a similar spot, and in a third, the larva was gone, but the black, circular mark was there, with an opening through it. From this, and from the absence of the larvæ in the perforated galls, I infer that they gnaw at one particular spot, till, aided by the natural process of decay, it is thin enough to admit of their exit. I have endeavoured to find the pupa by digging carefully beneath the infested Peas, and examining the earth, by carefully spreading it on a large, white handkerchief, but at present without success. A few weeks, however, may possibly supply the pupa so much developed as to give a complete history of the economy of Sitona lineata. *O.* [The so-called galls are the normal tubercles found on the roots of most Leguminous plants. Eds.]

Ranunculus aconitifolius fl.-pl.—This is a beautiful double-flowered variety of the ordinary white Crowfoot, commonly called "The Fair Maids of France." It grows from 18 inches to 2 feet in height, and is a charming plant for the select border or rock-work; it thrives best in a deep, light soil, partially shaded, where it soon forms a beautiful object. The flowers are produced very freely, on comparatively small plants, for I have one planted last season which has borne 24 pure white flowers; these are not large, but very regular and double. There are several more of this family, which bloom at the same time, and deserve notice, viz.:—R. amplexicaulis, R. gramineus, R. speciosus, R. alpestris, R. montanus, and R. rutæfolius. *A. I. P., Tottenham.*

Malus floribunda (Sieb.).—This is without doubt one of the most ornamental trees of recent introduction. Beautiful as it is in flower, it is, if possible, more so when covered with ripe fruit. The fruit is rather less than that of the Siberian Crab, of a fine bright amber colour, the skin being peculiarly rough. The contrast of the fruit with the dark foliage is very striking. The fruit does not suffer from the attacks of birds or insects. *T. Shortt.*

Luculia gratissima.—Your columns have recently been occupied with remarks respecting the treatment of this plant, and I have no doubt a few additional notes will be read with interest. I believe many persons are under the impression that it is difficult to manage. I certainly must admit that it is not so easily propagated as many other plants; yet this drawback should not deter people from attempting its culture, for plants can be procured for a mere trifle from the nurseries. In order to cultivate the Luculia to any size, it should be planted in a bed or border of a conservatory, where it will be sufficiently shaded to prevent the sun beating fiercely upon its leaves, and yet not altogether deprived of a large amount of indirect light. It should also be planted where a current of cold air can never play round it, and then, provided it is planted in good soil well drained, and yet capable of being kept moist enough to maintain a rather damp atmosphere around the plant, it will flourish with a luxuriance seldom witnessed, and will bloom magnificently. After two or three years blooming in the same soil, a mulching of well pulverised manure will be of the greatest assistance to the plant, and this should be liberally continued in every subsequent season. Naturally this species is of luxuriant growth, making a few strong shoots, which grow to a great length, and consequently it is not by any means a bushy plant. After it has flowered, or, indeed, before the blossoms are well fallen, these branches produce several shoots near the apex, all the lower buds remaining dormant, and hence the plant is left bare of leaves and shoots for perhaps half its height; and if this is continued for two or three years the growing powers of the plant are impaired, owing to the large quantity of useless wood that consumes the sap necessary to support new growths. The great error in its management is the fear of using the knife freely; it is only by pruning (and severe pruning too) that the naturally straggling character of the old plants can be overcome, and made bushy. Instead of allowing the uppermost buds on the preceding summer's growth to furnish the shoots for the succeeding season, the old branches should be cut away to within an inch or two of their base; thus from two to four branches will be obtained from each near the point from which only one or two pushed the preceding year, consequently the number of shoots will be yearly increasing, and instead of becoming naked at the base, and of a loose growth, the plant will become more compact and bushy. This character, however, may be carried to excess, even with the Luculia, for if too many shoots are permitted to form they will prevent one another from acquiring that degree of vigour which is necessary to produce a good Hydrangea-like head of bloom. Besides the large leaves demand a proportionate space for their exposure to light, and if they are crowded the loss of the interior and lower ones will be the inevitable result. Another error, which necessarily ensues from permitting the uppermost buds to remain is, that as they have mostly begun to grow before the flowers are withered, the plants are deprived of their season of repose and kept in a continual state of excitement, but when pruned back to the lower buds and kept cool, and partially dry for a time, they get, as it were, a season of rest. The plants should be gradually started into growth, and the strongest shoots stopped, up to the middle of July, but not later if expected to flower the following season. The foliage must be kept free from insects, for like all delicate plants, it is very liable to their attacks—indeed it is an especial favourite with the black thrips, &c. The Luculia will not thrive in a lower temperature than 40° to 45°, for when the temperature does not average this the flowers are very liable to damp off. *Edward Bennett, Enville Gardens, Stourbridge.*

Aquilegia cœrulea.—I am afraid my powers of description will fail to give an adequate idea of this charming plant. It is the most beautiful of this race, and as easily grown as the common Wallflower. This plant grows about 18 inches in height, and flowers during the whole of May, and frequently again in the autumn. The flowers are large and erect, very numerous, and of a pleasing violet-blue colour, shaded towards the mouth with white; this gives it a very pleasing and striking appearance. The spurs are at least 2 inches in length, very slender, and tipped with green; it has the advantage also of flowering much earlier than most of the other species, but in succession to it, A. alpina, A. glandulosa, A. Skinneri, A. spectabile, and a host of others will expand their blooms. *A. I. P., Tottenham.*

Foreign Correspondence.

The Palms of Herrenhausen.—Business having called me a few weeks back to the old town of Hanover, I availed myself of the opportunity to carefully examine the valuable and extensive collection of plants in the Royal Garden of Herrenhausen. Few Englishmen are aware of the extent of the plant collection at this place, and those who dole out the supplies for their maintenance are either equally ignorant, or else indifferent to the value of them, or better accommodation would be provided. Rich as are the gardens of Herrenhausen in plants generally, it is in Palms particularly that they excel. This will be better understood and appreciated when I state that the collection comprises nearly 500 species, many of them large specimens of great beauty, but in most instances housed in structures totally unfit for their cultivation. Most of the houses are heated with smoke flues, which, for such moisture-loving plants, are the worst possible source of heat, and consequently all sorts of odd contrivances have to be introduced in order to preserve the life of many species. It is to be hoped the authorities will speedily look into this state of things, and while providing this unique collection with proper house room, at the same time remove a national disgrace.

Palms are not well understood or much cultivated by the majority of horticulturists. The Hanover Garden excels all other European ones in its collection, and is specially fortunate in having for its director a man who is thoroughly acquainted with this order, both scientifically and practically. The horticultural world will hail with delight the publication of his research and views as to the classification of these plants, which I understand may be shortly expected.

One of the great features in this, as in most other German gardens is, the very small tubs and pots in which large specimens are grown. For instance, at Herrenhausen a plant of Livistonia australis, with a stout clear stem upwards of 30 feet high, and bearing a crown of more than 100 leaves, and which is about 40 feet in diameter, is growing in a tub 5 feet in diameter and not quite so much in height. Several other examples quite as marvellous might be named. It is almost wonderful how they exist; indeed, under the usual treatment of Palms in English gardens, it would be impossible. The liberal and copious supplies of water they receive is the secret of the success which has crowned Mr. Wendland's labours as a cultivator of Palms. One visit to Herrenhausen, I am sure, would be sufficient to convince all reasonable men of the truth of this assertion, for not only do these plants receive large supplies from watering-can and syringe, but a great many kinds are standing in tanks of water up to the rim of the pots in which they are planted; and I again had proof of what I had frequently maintained, that if a Palm through drought or other causes gets into a sickly state, the removal to a tank of water is a safe and certain restorer of vigour and beauty. Without doubt the reason we have failed to establish many rare and beautiful Palms which have been introduced to this country is the absurd practice of keeping them too dry, for wherever they can obtain an abundant supply of water they grow very rapidly. As examples of this I may cite the large plants which have become such splendid ornaments in the Royal Botanic Gardens at Kew. Since these were planted out their growth has been wonderful, and I am firmly convinced their roots have got down below the water level. Similar evidence exists in the Botanic Garden of St. Petersburg, where there are two fine examples of Palms which are very slow to make stems,—one is Attalea princeps, the other Maximiliana regia, the latter with a clear stout stem 20 ft. high, and a grand crown of plume-like leaves. These, without doubt, have their roots down in the water of the Neva, as the surface of the ground is only 2 or 3 feet above the water level. At Manchester, again, until quite recently, there existed in the Botanic Gardens a large plant of the moisture-loving Rhaphia, but which has been cut down on account of being too large for the house. This plant could never have attained such dimensions had its roots not been well supplied with water, and in the position it occupied they would have but a very few feet to travel to get into it. I have been led into this digression through having so often noticed with how mean and niggardly a hand many gardeners in this country supply water to these grand and beautiful plants, and afterwards express surprise at their want of success; and as the Palms are becoming favourites in English gardens, I would impress upon the minds of gardeners generally that, unless well supplied with water, they will not make handsome specimens.

To return, however, to Herrenhausen. The following are amongst the most rare or handsome specimens, conspicuous even amongst grand plants:—Thrinax radiata, with stem 20 feet high, and splendid head of leaves; as a small plant, this is most beautiful for the decoration of apartments, and it will also stand in the open air during summer. Cocos botryophora, with a magnificent head of plume-like leaves, and stem 24 feet high. Chamærops Martiana and C. excelsa, handsome fan-leaved Palms, with stems 20 feet high; both species are admirably adapted for decoration of halls, corridors, or the subtropical garden during summer. Ceroxylon andicola and C. niveum, beautiful specimens, with their long pinnate leaves, which are rich deep green on the upper side, and white as a Gymnogramma beneath. Livistonia chinensis, which is better known in English gardens by the erroneous name of Latania borbonica, is here represented by a glorious specimen, having a stout columnar stem upwards of 20 feet high, and a crown of leaves measuring about 35 feet diameter. Fine specimens also exist of the rare Acanthorrhiza Warscewiczii, and A. stauracantha; also handsome plants of the spiny Acanthophœnix crinita, and A. ruber, both of which luxuriate in water, and beautiful plants of the following:—Pinanga javana, nenga, cæsia, maculata, and latisecta; also of Arenga obtusifolia, and Copernicia macroglossa. This latter plant has a very curious appearance; it has large fan-shaped leaves, but they are almost destitute of petiole. There are fine examples of Calyptrocalyx spicatus, Catoblastus præmorsus and robustus; also of Œnocarpus utilis, and Œ. caracasana.

The genus Bactris is largely represented, and many very handsome small specimens exist in the collection. Some of the rare West African Calami are also doing well in pans of water, the finest plants being C. Hookeri and C. secundiflorus. The Indian representatives of this genus are also growing well, and many species might be enumerated; amongst the handsomest C. Nicolai, ciliaris, tenuis, anceps, javensis, Impératrice Marie, plumosus, crinitus, flagellum, and fasciculatus. All these are very useful for purposes of decoration in a young state.

Of the genus Chamædorea, which is so eminently adapted for the decoration of apartments or the dinner-table, numerous fine specimens exist, and the number of species is very extensive; as also are those of the elegant genus Geonoma, amongst which may be mentioned the true G. Porteana, which is extremely rare. G. Willdenovii is also a beautiful species, and has been distributed from some Continental gardens as Porteana, but it is not so handsome as the true plant. Other species which I specially remarked for their extreme beauty are G. ferruginea, cæspitosa, congesta, undata, Martiana, Schottiana, and the true elegans. Here also are fine specimens of the massive and graceful Hyophorbe amaricaulis, Verschaffeltii, and the true indica.

Of the genus Iriartea, which is so difficult to cultivate, I saw beautiful specimens of I. gigantea, deltoidea and ventricosa, which, rising above the soil upon their cone of stem-like roots, present a singular and very tropical appearance. The beautiful fan-leaved Licuala horrida, paludosa, celebica and peltata are all doing splendidly. Beautiful plants are also here of Pritchardia pacifica and P. Martii, very handsome and distinct species, although in many English gardens they are considered synonymous. Nice plants of the rare Plectocomia Mülleri and hystrix, Ptychosperma Alexandræ, and the true Ptychosperma, or Seaforthia elegans of R. Br.—not Seaforthia elegans of "Botanical Magazine," which has been wrongly named, and must in future be known as Seaforthia, or Ptychosperma Cunninghamii. Other rare species of this genus are promising to be highly ornamental plants, such as P. Veitchii, rupicola, Rumphii and Smithii. The Seaforthia elegans (Ptychosperma Cunninghamii) of English gardens is represented by a fine specimen, with a trunk 25 feet high, bearing a superb crown of leaves, and is growing in a tub scarcely 4 feet in diameter.

The genus Areca is largely represented by fine specimens, and many of the species are well adapted for dinner-table and drawing-room decoration. Kentia Baueri and sapida are represented by specimens with stems some 12 feet high, and large heads of their beautiful pinnate leaves, and are growing in extremely small tubs; these two plants are fine greenhouse Palms, and fine objects in the subtropical garden. Livistonia Jenkinsii is also a fine cool-house plant; L. Hoogendorpii, olivæformis, and spectabilis are grand plants; the last named is a superb species. The two plants

existing here are supposed by Mr. Wendland to be all that are in Europe; it somewhat resembles L. chinensis, but carries a much larger crown of leaves in proportion to its size than that species; the leaves are also larger, and the segments are more pendent, the petioles shorter and more spiny. These appeared to me to be its chief points of distinction at present: it will with age doubtless become still more distinct. Other rare kinds are Pholidocarpus Ihur, and Veitchia Johannis—good specimens of this latter kind, which is deservedly named in honour of that ardent collector, Mr. John Veitch. Various species of Caryota, the only genus of Palms with bipinnate leaves, are also found here in handsome specimens; also the difficult Manicaria Plucknetia, Korthalsia robusta, and K. debilis. The large fan-leaved Sabals, serrulata, Blackburniana, and umbraculifera are also doing well. This genus should be generally grown, the coriaceous leaves rendering them good plants for outdoor decoration in summer.

Amongst many other fine specimens and rare kinds a few only can be named here, such as Corypha Gebanga, Calyptrogyne spicigera, Brahea dulcis, Chamærops hystrix, C. humilis bilaminata, Synechanthus fibrosus, fibrosus gracilis and Warscewiczii; Oncosperma fasciculata, filamentosa, and Van Houttеana; many beautiful species of Thrinax; the rare Welfia Georgii and regia, the latter with its young leaves a deep crimson, bids fair to become one of the most elegant of stove Palms; fine examples of Verschaffeltia splendida and melanochætes,—this latter becomes with age a fine pinnate-leaved plant, and will probably have to be removed to another genus: they were luxuriating in an abundant supply of water in company with grand plants of Phœnicophorum sechellarum. Cocos Weddelliana, perhaps the most elegant and graceful Palm yet introduced to cultivation, also enjoys a copious supply. Bentinckia coddapana, Zalacca Blumeana, Wagneri, and edulis are also very ornamental plants. Mauritias, with Rhaphia Hookeri and longifolia—the two last very rare West African Palms—are growing splendidly, and are all standing in a tank of water. More species it is not necessary to enumerate. Sufficient has been said to show that by keeping these plants well supplied with water, success is almost certain; but if this element is supplied with a niggardly, sparing hand they will not develop their true character, and we shall fail to enjoy the beauties of the most ornamental and glorious tribe of plants in the whole vegetable kingdom. *W. H. G.*

Societies.

Royal Horticultural: *June* 8. — Sigismund Rücker, Esq., F.L.S., in the chair. The usual preliminary business being concluded, the Rev. J. Dix announced the awards of the Floral Committee, which were very numerous. Those of the Fruit Committee were read by the Rev. M. J. Berkeley, in the absence of Mr. G. F. Wilson. Mr. Berkeley then directed attention to some remarkably fine specimens of Early White Naples Onions, from Messrs. Carter & Co.; and also to two monster examples of a water Cucumber from Java, bearing the Chinese name of "Sooly Qua," exhibited by Mr. Temple, gr. to the Earl of Aylesford, Packington Hall, Coventry. He (Mr. Berkeley) thought they were the fruits of some species of Luffa, a Cucurbitaceous genus, native of tropical Asia and Africa. One character of the genus was that the fibres within were very hard and tough. This part of the fruit, it was said, was used by the natives as a sponge, and was also made into hats, of which there were specimens in the Museum at Kew. Some species of the genus, as L. acutangula, were edible, and highly esteemed by the natives of India as potherbs, whilst others were extremely poisonous. The subject of mildew on the fruits of Peaches, which is very prevalent this season, was next alluded to, as completely changing the colour of the hairs to a buff colour. Further remarks on this subject are given under the head of the Scientific Committee. Several of the more remarkable of the Orchids exhibited in the conservatory then came under notice, including a beautiful new species of Gongora, named portentosa (*Gardeners' Chronicle*, 1869, p. 892), shown by Mr. Green, gr. to W. W. Saunders, Esq., who received it under that name from the Continent. Mr. Berkeley then stated that Mr. Bateman had requested him to deprecate the plan of mixing Orchids with other plants on exhibition tables, as it was impossible that the full beauty of such subjects as Masdevallias could be observed under such arrangements. Several curious abnormal forms of vegetation which had been exhibited at the Scientific Committee were then allued to, and a specimen of the fly-trap figured in our columns at p. 461 (fig. 84) was shown, the speaker remarking that Mr. Barron had tried one at Chiswick for some time, and had found it to be very efficient.

Scientific Committee.—A. Murray, Esq., in the chair.—Rev. M. J. Berkeley reported that on further examination he found that the eggs of the Vine aphis, Phylloxera vastatrix, varied very much in size even on the leaf, though, as a general rule, those on the leaf were larger than those on the root. He also stated that an examination of numerous specimens of Lychnis diurna affected with the parasitical fungus, Ustilago antherarum, had led him to form an opinion exactly contrary to that of Miss Becker, who thought that the ovary was developed in the male flowers in consequence of the attacks of the Fungus. Mr. Berkeley, on the other hand, stated that it was the anthers which were developed and not the ovary, and generally endorsed the opinion given in these pages (1869, p. 1012) at the time. Mr. Berkeley also brought before the notice of the meeting the decorticated Rose twigs, already noticed, p. 706, but no opinion was pronounced as to who or what the marauder might be. Specimens of a variety of the common Wallflower (Cheiranthus cheiri, var. gynantherus) were exhibited, in which the stamens were metamorphosed and formed an adventitious circle of carpels around the normal pistil. A sport of Mrs. Pollock was also shown, in which the plant had almost entirely reverted to one of the zonal forms from which it originated. Two specimens of Geaya (?) were shown, one perfectly glabrous, the other downy, both gathered from the same plant. A specimen of Coleus Verschaffeltii was shown, in which one shoot bore small contracted spoon-shaped leaves perfectly cup-shaped, and in colour more like that of the Iresine than of the Coleus.—Dr. Masters stated that some of the white variegated Ivies almost constantly produced leaves of this form.—The gigantic Cucumber-like Gourd was also exhibited, and was considered to belong to a species of Luffa. Specimens of an Azalea, from Mr. Parsons, were shown, in which the flower was singularly everted. A similar instance is figured in Dr. Master's "Vegetable Teratology."

Professor Westwood exhibited specimens of Mint affected by Œcidium Menthæ, which produces changes similar to those of the copper-web Fungus, often met with on Asparagus and Lucerne. Two roots of the garden Pea, with its peculiar tuberculer growths, which it was conjectured might at times be the resting place of some larvæ, or serve as food to it. The larva of Sitona was stated not to be a gall feeder.

Mr. Berkeley exhibited fruits of Peaches covered with mildew, which had the effect of causing buff-coloured spots on the fruit.

Dr. Hogg alluded to the curious circumstance that those Peaches destitute of glands were found to be free from the attacks of mildew, while those varieties with glands on the leaves were peculiarly liable to the attacks of this Fungus. It had been remarked that the Noblesse Peach, which has no glands, is often attacked by mildew, but that a seedling from this variety, and which is provided with glands, is not subject to the attacks of this parasite.

Dr. Hogg reported on the condition of the plants in the experimental boxes at Chiswick, and stated that the plants this year were under much more favourable conditions for observation and experiment than they were last year.

Mr. Glaisher made some further remarks on the meteorological observations carried on at Chiswick for the last 40 years, and presented a Table showing the deviations above and below the average mean temperature for every day throughout the period.

Floral Committee.—Rev. J. Dix in the chair. A large number of awards were made on this occasion, consisting of First-class Certificates, to a fine early white forcing Fink, from Mr. Shenton, Biggleswade, Beds; to Gongora portentosa, a new pink and yellow flowered species, from the gardens of W. W. Saunders, Esq.; to the following distinct and beautiful Palms, &c., from Mr. Bull:—Geonoma elegans, G. speciosa, Welfia regia, Cycas Armstrongii, Pandanus decorus, and Anœctochilus pardina; to Messrs. Rollisson & Son for Korthalsia robusta, Bactris marissa, and a beautiful purple-flowered Gloxinia, named Alice; to Messrs. Veitch & Sons for Adiantum sessilifolium, Pandanus Veitchii, Dieffenbachia Bowmanni, Aralia Veitchii, Cypripedium Dominianum—one of Mr. Dominy's most successful hybrids, between C. caudatum and C. Pearcei, and Aerides maculatum; to Messrs. Cripps & Son, Tonbridge, for a beautiful white Clematis named Sylph; to Mr. Thompson, Ipswich, for Brodiæa coccinea (?), a beautiful hardy bulbous plant, Delphinium nudicaule, a fine scarlet, and Leptosiphon roseum, dwarf, and very pretty; to Mr. Cannell, Woolwich, for a new dwarf bedding, pink-flowered zonal Pelargonium, named Master Christine; and to Mr. Turner for the following fine new show Pelargoniums:—Admiration, Charlemagne, Duke of Edinburgh, Syren, May Day, and Iron Duke. Special Certificates were voted to Messrs. Cripps & Son for a rich collection of cut blooms of Clematis; to Mr. Fairbairn, Syon House Gardens, for a large collection of herbaceous Calceolarias, well bloomed, but past their best; to Mr. Stevens, Ealing, for a group of tricolor Pelargoniums; and to Messrs. J. Waterer & Sons, for a collection of Rhododendrons.

Fruit Committee.—G. E. Blenkins, Esq., in the chair. Partly in consequence of prizes being offered in connection with the large exhibitions, there was a paucity of productions for adjudication by this body. From Messrs. Carter & Co. came splendid examples of White Naples Onions, to which a Special Certificate was awarded; they also sent some capital specimens of improved Musselburgh Leeks. To Mr. Hill, gr. to Ralph Sneyd, Esq., Keele Hall, Staffordshire, a Special Certificate was awarded for fine examples of Lady Downe's Seedling of this season and last season's growth; and to Mr. Miller, Worksop Manor Gardens, for a collection of fruit. New seedling Melons were exhibited by Mr. Jack, gr. to the Duke of Cleveland, Battle Abbey, Sussex; Mr. E. C. Clarke; and Mr. G. R. Rennie, gr. to C. W. Finzel, Esq., Frankfort Hall, Somerset; but the flavour in each case being inferior, no awards were made. Mr. Turner sent a fine dish of Frogmore Early Black Cherries, grown in the open air.

Show of Stove and Greenhouse Plants, &c.—This was without question the best show of the season, which is saying a great deal considering the very successful character of its forerunners. The stove and greenhouse plants were exceedingly fine. The fine foliage plants were first-rate, and the Orchids charming. The weather was all that could be desired for the occasion (but not for vegetation), and the attendance was much larger than we have seen it for some time. The class for 20 distinct stove and greenhouse plants, in 12-inch pots, brought forward three very good groups of well grown plants. This is a step in the right direction, as affording more opportunities for exhibiting to the smaller growers, while the beauty of the young and vigorous plants is greatly enhanced by their being seen easily, without stretching one's neck, as is the case with larger specimens, and many new and good old plants, now almost totally neglected for exhibition purposes, are thus brought out. Messrs. Jackson & Son, Kingston, had the best lot, and they were uncommonly good, comprising nice bushy, well grown and flowered examples of Erica Cavendishiana, E. ventricosa grandiflora, a perfect picture of health and beauty; E. ventricosa coccinea minor, almost as good; Clerodendron Balfouri, very good; C. Kæmpferi, very attractive on account of its bold foliage and bright deep scarlet flowers; beautifully coloured examples of Aphelexis, Dracophyllums, and Azaleas, &c. Mr. J. Ward came 2d, and contributed admirable specimens in all respects of Kalosanthes Frederick Desbois, and K. Phœnix; a very well grown plant of Bougainvillea glabra, and Vinca ocellata, fine white; the same of Franciscea eximia, and nice plants of Adenanda fragrans, Ericas, &c., Mr. Wilkie, Addison Road, Kensington, was 3d. In the amateurs' class for 9, in pots of the same dimensions, the best came from Mr. Carr, gr. to P. L. Hinds, Esq., Byfleet Lodge, Mr. J. Wheeler being placed 2d; and Mr. J. Little, gr. to J. Goddard, Esq., Royden Lodge, Essex, 3d. In Mr. Carr's collection the most noticeable plants were one of Begonia parviflora, very neat and well flowered; Aphelexis macrantha purpurea, good; Erica eximia superba, and E. ventricosa grandiflora, &c., in excellent condition. In the nurserymen's class for 6, three collections were shown, the best being staged by Mr. Morse, of Epsom; Mr. B. S. Williams coming in 2d, and Messrs. Jackson & Son 3d. The first-named exhibitor had Allamanda nobilis, very healthy; Dipladenia amabilis, good, but thinly flowered; Erica ventricosa grandiflora, very fine; Dracophyllum gracile, excellent; and Leschenaultia biloba major, always attractive, on account of its rich colour. The corresponding class for amateurs was the great attraction of the show, and these almost made an exhibition of themselves in the western arcade. Six collections, containing some magnificent specimens, were shown in competition, the 1st prize being cleverly won by Mr. Baines, gr. to H. Micholls, Esq.; Mr. J. Ward being placed 2d, and Mr. J. Carr 3d. The productions of Mr. Baines were grand, and included immense bushy plants of Aphelexis humilis rosea, Dracophyllum gracile, Darwinia (Hedaroma) tulipifera, Erica Cavendishiana, Ixora coccinnea, with remarkably fine trusses; and Azalea Chelsoni, all well bloomed and very fresh. Mr. Ward also had a good Darwinia and Erica, with an admirable specimen of Stephanotis floribunda, Bougainvillea glabra, and a very good plant of Statice profusa. Mr. Carr's lot was very good, the most remarkable being a grand bush of Phœnocoma prolifica var. Barnesii. Mr. A. Wright, Mr. Wilkie, and Mr. J. Wheeler also exhibited. In the open class for 9 distinct fine foliage plants, Mr. Baines again carried off the premier award with as fine a group as ever graced a metropolitan exhibition; his specimen of Nepenthes Rafflesiana was wonderfully fine, and had over two dozen handsome pitchers, many of them measuring 9 inches by 5, along with it were Alocasia metallica, a splendid specimen, about 5 feet through, with finely developed foliage; an exceedingly handsome Gleichenia Speluncæ, of about the same size; Croton augustifolium and C. variegatum; Verschaffeltia splendida, the finest ever shown, and Stevensonia grandifolia, both noble Palms, Theophrastum imperialis and Dasylirion acrotrichum. Mr. Fairbairn, gr. to the Duke of Northumberland, Syon House, was 2d, with large and handsome examples of the Cocoa-nut Palm, Phœnix farinifera, and Latania borbonica; a very good Alocasia zebrina, the same of Anthurium acaule; Thamnopteris Nidus, an extremely handsome specimen, nearly 6 feet across, &c. Mr. J. Burley, Albert Nursery, Bayswater, was 3d, and Mr. J. Wheeler, 4th, both collections being very commendable. Mr. A. Wright came 1st in the amateurs' class for 6 with a similar collection to that shown on a former occasion; Mr. J. Tibbles, gr. to A. Haines, Esq., Kensal House, Harrow Road, and Mr. J. Carr, being respectively 2d and 3d. Mr. Bull took 1st honours in the open class for 20 in 12-inch pots; his collection consisting of excellent specimens of Palms, Ferns, Cycads, Dracænas, &c. Mr. Fairbairn was 2d; and the 3d prize was awarded to Messrs. Bell & Thorpe, Stratford-on-Avon. Mr. J. Burley, Mr. G. Wheeler, and Mr. A. Wright, also exhibited.

Of Orchids, as before mentioned, there was a charming display, much finer than on any former occasion this year. Mr. Denning, gr. to Lord Londesborough, sent the best 9 in the open class, comprising Aerides odoratum var., a fine specimen with 16 beautiful spikes; Aerides affine, very good; Epidendrum vitellinum majus, with its richly coloured spikes; Cattleya Warneri, very fine; Lælia purpurata, beautifully coloured; Dendrobium crystallinum; D. M'Carthiæ, a four spiked specimen of the prettily spotted Odontoglossum niveum, and the curious Pescatorea cerina. The 2d best lot came from Mr. Burnett, gr. to W. Terry, Esq., Fulham; and the 3d from Mr. W. Bull, Chelsea. From the former came a very fine specimen of Cypripedium barbatum superbum; a good example of the pretty rosy crimson Saccolabium ampullaceum, and an excellent Cattleya Mossiæ, &c. Mr. Bull sent Odontoglossum citrosmum and O. citrosmum roseum, Lælia Brysiana, and L. purpurata splendens, &c., in very nice condition. The best 6 in the nurserymen's class were contributed by Mr. B. S. Williams, and consisted of a splendid specimen of Cypripedium barbatum superbum, nearly 3 feet over, grand examples of Cattleya Mossiæ and C. Warneri; Lælia purpurata, two fine spikes of richly-coloured flowers; Aerides odoratum, a very healthy specimen; and Anguloa Clowesii. Mr. W. Bull, who had amongst others a fine specimen of Trichopilia tortilis, was 2d; and Mr. R. Parker, Tooting, 3d. In the amateurs' class for the same number, Mr. Denning was again to the fore with Dendrobium Parishii, very beautiful; Lælia purpurata, with four admirable spikes, two very nice Aerides, &c.: Mr. J. Ward, gr. to F. G. Wilkins, Esq., Leyton, who had two good Cattleyas, Oncidium bifolium, Anguloa Clowesii, with eight grand flowers, and a very fine Phalænopsis grandiflora, being 2d. Mr. J. Woodward, gr. to Mrs. Torr, Garbrand Hall, Ewell, Mr. A. Wright, and Mr. Wheeler, also competed. The best single specimen was Dendrobium Devonianum, with four mag-

nificent spikes, about 30 inches long; from Mr. T. Baines, gr. to H. Micholls, Esq., the second being a remarkably handsome Lælia purpurata from Mr. R. Laing, gr. to P. W. Flower, Esq., Furze Down, Tooting, Common.

The best 6 Azaleas in the amateurs' class were contributed by Mr. S. M. Carson, gr. to W. R. G. Farmer, Esq., Cheam. Messrs. Ivery & Son, Dorking, furnished the 1st prize group in the corresponding class for nurserymen, and also a very good collection of 15 in 12-inch pots, which came in 2d, the premier award being won by Mr. J. Woodward, with a well grown uniform lot. Messrs. Paul & Son and Mr. Turner contributed effective groups of Roses, each taking 1st prizes. Six hardy rhododendrons came from Messrs. J. Waterer & Son and from Mr. C. Noble in very good condition, and the prizes were awarded in the order named. Hardy Ferns were shown well, and produced a very good effect. Messrs. Ivery & Son were 1st in the nurserymen's class with a capital lot, consisting of well grown examples of Osmunda regalis, Trichomanes radicans, and several varieties of Athyrium Filix-fœmina and Polystichum angulare; Messrs. Jackson & Son being 2d. In the corresponding class for amateurs the competition was more numerous, collections being staged by Mr. Smith, gr. to C. Walton, Esq., Manor House, East Acton; Mr. J. Carr, Mr. Fairbairn, and Mr. Earley, and the prizes were given in the order named. In Mr. Smith's group—a very good one—were a capital plant of Adiantum Capillus-Veneris, and good examples of Onoclea sensibilis, Cyrtomium falcatum, and varieties of the Lady Fern. The best 6 variegated Zonal Pelargoniums were staged by Messrs. J. Carter & Co., consisting of Fairyland, Aurora, Sophia Cusack, Lady Cullum, Prince of Wales, and Mrs. Dunnett, all good and bright in colour; Mr. Turner was 2d with, amongst others, Echo, Princess of Wales, Italia Unita, and Mrs. Turner, &c.

Amongst miscellaneous collections were very excellent groups of Palms, Ferns, Orchids, &c., from Messrs. Veitch & Sons, Mr. Bull, and Messrs. Rollisson & Sons; a splendid group of hardy herbaceous plants from Mr. R. Parker, Tooting; and a large nicely-grown collection of Caladiums from Mr. Wilkie.

The display of fruit was first-rate. The best Pine Apple was a noble Queen, weighing 6 lb., from Mr. Ward, gr. to T. N. Miller, Esq., Bishop Stortford; the 2d best being a fine smooth-leaved Cayenne, the same weight, from Mr. J. McLean, gr. to W. P. Herrick, Esq., Beaumanor Park, Leicester. Mr. Douglas, gr. to F. Whitbourn, Esq., Loxford Hall, sent the best dish of black Grapes, fine in berry, bunch, and colour; Mr. Davis, New Lodge, Whetstone, being 2d; and equal with him was Mr. G. Thomas, gr. to H. W. Wright, Esq., Turner Road, Lee,—Mr. Bannerman, gr. to Lord Bagot, Blithefield, coming in 3d. The best dish of white Grapes, very fine Buckland Sweetwater, also came from Mr. Douglas; Messrs. Standish & Co. taking 2d honours with Muscat of Alexandria, and Mr. Miles, gr. to Lord Carrington 3d, with excellent bunches of Foster's White Seedling. Messrs. Standish & Co. sent nice examples of the new Royal Ascot, and Mr. Davis sent a good basket of Black Hamburghs, which received an extra prize. Of Peaches, the best was a dish of first-rate Royal George, from Mr. Miles; Mr. Carmichael, gr., Sandringham, being 2d with Stirling Castle, of good colour; and Mr. Gardiner, gr. to W. P. Shirley, Esq., Eatington Park, coming in 3d with an unnamed dish. Other examples of Royal George were contributed by Mr. Lynn, gr. to Lord Boston, Hedsor; and from Mr. Tegg, Clumber Gardens, Notts, came some nice Bellegarde. Of Nectarines, capital specimens of Violette Hâtive were sent by Mr. Lynn, and Mr. Hill, gr., Keele Hall; Mr. Miles sent Elruge, as also did Mr. Gardiner; and from Mr. Tegg came Brugnon. Mr. Lynn came 1st, Mr. Miles 2d, and Mr. Hill 3d. Mr. Miles exhibited the best dish of Figs, and the same of Cherries. The 1st prize for a single dish of Strawberries was taken by Mr. Douglas with exceedingly fine British Queen; Messrs. Standish & Co. securing the 2d with very fine La Constante; and Mr. E. C. Clarke, gr. to J. C. Brown, Esq., Holmbush House, Horsham, the 3d with Sir Charles Napier. Some very good fruit of Dr. Hogg were also shown by Mr. C. Ross, gr. to C. Eyre, Esq., Welford Park, Newbury; and also by Mr. Miles. The competition in the classes for Melons was very good, Mr. Douglas eventually winning both 1st prizes. His green-fleshed variety, a hybrid between Scarlet Gem and Hybrid Cashmere, named Loxford Hall Hybrid, was particularly fine. The fruit is of medium size, with very thick flesh, and very rich in flavour. His scarlet-fleshed Melon was rather larger, with very firm flesh, and a hybrid from the same varieties as the former, but scarcely so rich in flavour. Mr. Lynn came 2d in the green-fleshed class with a good fruit of Hybrid Cashmere; and Mr. E. C. Clarke, 3d, with Queen Emma. The 2d and 3d prizes in the scarlet-fleshed class were taken by Mr. H. Barnard, gr. to Miss Ffarington, Worden Hall, Preston, and Mr. Miles. Royal Ascot came from Mr. Lynn and Mr. Miller, Worksop Manor, and Scarlet Gem from Mr. Douglas and Mr. Earley, gr. to F. Fryor, Esq., Digswell. From Mr. W. Gardiner came excellent dishes of Royal George Peaches and Elruge Nectarines, to which an extra prize was awarded.

MANCHESTER BOTANICAL AND HORTICULTURAL: *June 3 to 10.*—This Society has again been fortunate in bringing together an exhibition of a first-rate character, equal perhaps on the whole to any of the great exhibitions of ordinary years, metropolitan or provincial, and probably never surpassed, certainly very rarely equalled, except indeed at the International of 1866, in the element of Orchids—which made a thoroughly magnificent display, so numerous were they, and of such generally excellent quality. These, the aristocrats of flower shows, and the groups of alpine and herbaceous plants, which we have seldom seen shown in better style, were the two most successful points of the exhibition. Ferns, especially hardy ones, were particularly good, Roses and Pelargoniums somewhat below the average; while Azaleas, miscellaneous collections, and foliage plants, if thinned as they probably were by the occurrence of another show at Leeds, and by the loss of Mr. Micholls' famousi pants, now located near London, were, nevertheless, sufficiently and well represented.

A remarkably fine group of 15 Orchids was put up by Mr. Archer, gr. to A. Turner, Esq., of Leicester, and to this the 1st prize was given. It included a magnificent plant of the Bornean Phalænopsis grandiflora, one spike of which bore 16 such flowers as are seldom seen; a Trichopilia suavis, literally a mass of blossom; a Cattleya Mossiæ, with upwards of 30 flowers; Dendrobium Parishii, a fine mass, brilliantly coloured; Oncidium ampliatum, with three stronger and two smaller flower-spikes; and a good Cypripedium Stonei. Mr. Mitchell, gr. to Dr. Ainsworth, who was 2d, had a nice plant of Oncidium sarcodes. The 3d prize went to Mr. Allen, gr. to J. H. Fernley, Esq., who showed Oncidium Lanceanum superbum, richly coloured; Cypripedium Lowii, with a dozen flowers; a large Dendrobium nobile intermedium, quite a mass of blossoms; and other good plants. In collections of 6 plants Mr. J. Stevenson was 1st. He had a good Vanda tricolor, and Lælia purpurata with 16 flowers. The 1st prize for 3 plants went to Mr. Higson, gr. to G. Smith, Esq., who had good plants of Cattleya Mossiæ, and of C. lobata, and perhaps the finest Lælia purpurea ever seen,—a well-grown, compact mass, not less than 4 feet across, with upwards of 60 perfect flowers, and certainly the gem of the exhibition. The 2d prize was given to Mr. Orme, gr. to W. C. Bird, Esq., who had a neatly bloomed Dendrobium Devonianum. Mr. Stevenson came 3d, and had a fine variety of Cattleya lobata, bearing some score or more of flowers, and remarkable for its richly coloured purple-veined lip. The single specimens included Saccolabium Holfordianum superbum, from Mr. Allen, and Odontoglossum Alexandræ from S. P. Callender, Esq. Mr. Williams of Holloway won the 1st prize in both nurserymen's classes of 24 and 6 plants, his most effective specimens being Cattleya Warneri, with six spikes; a richly coloured Lælia purpurata; a large Oncidium sphacelatum—we are glad to see these lively yellow-flowered plants again more plentifully shown than they have been lately; and Cypripedium caudatum, with six very highly coloured flowers. Messrs. Brooks & Co., and Mr. J. Shaw were also exhibitors in these classes.

The most noticeable plant in the collections of Palms was a handsome specimen, some 4 or 5 feet high, one of the finest in the country, of Leopoldinia pulchra, shown by Mr. Stevenson, who had also Calamus Jenkinsii, a prickly-stemmed species, not often seen at exhibitions.

Foliage plants were well represented, in the amateurs' class, by Mr. Stevenson, who was 1st for 6 plants, and in whose group was Alocasia Jenningsii, 4 feet through; A. Lowii, fully as large, and A. metallica, 3 or 6 feet through, all grand specimens. Mr. Elkin, gr. to T. H. Birley, Esq., had in his 2d prize group a remarkably well-grown Maranta fasciata. Messrs. Felton & Sons, who were 1st in the nurserymen's class, had a very fine Phormium tenax variegatum, and a large, densely leafy Cycas revoluta, which was very effective. In Mr. Williams' lot was a fine narrow-leaved Croton; an extremely well-developed Cordyline indivisa; and Lomaria cycadifolia, with a thick stem 2 feet high, and a good head of fronds, including several fertile ones.

The leading prizes for collections of Ferns, 12 and 8 plants respectively, were won by Mr. Varty, gr. to T. M. Shuttleworth, Esq., the plants including an Adiantum cuneatum, a yard through, and a model of gracefulness and high cultivation. Mr. Cardwell's (gr. to T. Hobson, Esq.) 2d prize lot had a fine standard plant of Cyathea Smithii, but it and some other fine Ferns were disfigured by having the fronds unnaturally bent down. Mr. Goodall, gr. to Mrs. Leach, who was 3d, had a fine Asplenium macrophyllum, a bold, pinnate, drooping-habited species, very effective, and one we do not remember to have previously seen used for exhibition purposes. The hardy Ferns included many choice varieties, especially that which obtained the 1st prize in the class for 24, shown by Messrs. Stansfield & Son, the well-known nurserymen of Todmorden.

Miscellaneous groups of stove and greenhouse plants comprised some highly meritorious specimens. Messrs. Cole & Sons were 1st for 16, and had some grand Azaleas, some good Heaths and Pimeleas, Dipladenia crassinoda, scarcely 3 feet high, but covered with highly coloured flowers; Ixora amboinensis, dwarf and finely bloomed; and Ixora Colei, a new white-flowered variety, quite an acquisition in its class, and remarkable for its free blooming quality. Mr. Brierley, gr. to T. Kendal, Esq., who was 2d, had as perfect a specimen of Erica Cavendishiana, about 5 feet high, and as much through, as was ever seen; Dipladenia amabilis, fine; Pimelea Hendersoni, Allamanda grandiflora, and Gompholobium polymorphum splendens, all well handled; and Epacris miniata grandiflora, spoiled by being tied down to a globular form. Mr. Cardwell, gr. to T. Hobson, Esq., had in another class a fine Darwinia (Hedaroma) tulipifera, 5 feet through; and a well-coloured Dipladenia amabilis. Mr. Stevenson also had a good Darwinia tulipifera, Bougainvillea glabra, and Ixora princeps, in the style of javanica, a little specimen, 2 feet high, and about as much across, but a perfect model as to growth and bloom.

Passing to new plants, the Messrs. Veitch & Sons came 1st with a valuable group, containing Crotons Hookeri, Wisemannianum, Veitchii, undulatum, and Johannis, the latter being one we have not often seen in public, having long stiff narrow leaves with a yellow rib; Alocasia Chelsoni, which proves to be very fine; Dieffenbachia Bowmanni, Draccæna Chelsoni, and Adiantum concinnum latum, all fine plants, frequently alluded to in our pages. Mr. Williams came 2d, and had in his group Tillandsia Lindeniana; the Commelynaceous Cochliostema Jacobianum, which one of the local journals tells us "is so unlike the generality of Orchids in respect of foliage, that the blossoms alone declare its relationship!" Glazioua elegantissima, a remarkably elegant Palm of the Leopoldinia style; Welfia regia, and several others. Messrs. Cole & Son had a nice group of their distinct and beautiful Lomaria gibba crispa; and Messrs. Stansfield & Son had a charming British variety, Athyrium Filix-fœmina crispissimum, with remarkably dense crispy fronds, in the way of Edwardsii.

The size of the Azaleas quite reminded one of the days when Messrs. Veitch and Turner used to contend against each other. They were of the huge crinoline shape, exceedingly well flowered, and occupying, as they did, two of the central mounds in the large tent, they were a charming feature in the vista opened up to those standing on the elevated ground at the west end of this tent. A fine group of Conifers at the far end, with Palms and Tree Ferns at the sides, admirably relieved the glare of flower in the Azaleas, and toned down the deep hues of some of the scarlet-flowered kinds. In the amateurs classes for 10 and 12 kinds, Mr. G. Fletcher had it all his own way, there being no foe worthy of his steel. The kinds staged were Brilliant, Iveryana, Juliana, Mrs. Fry, Empress Eugénie, Gem, Extrani, Admiration, Perryana, Variegata, Illustris nova, and Vesta. The groups of 8 Azaleas in 14-inch pots, contributed by amateurs, were not good enough to admit of a 1st prize being awarded. The competition among nurserymen brought a much smaller class of plants, but equally valuable as decorative agents. Messrs. E. Cole & Sons had the best 8, and were the only exhibitors, as well as of the best 12 in pots 14 inches in diameter. The group of 8 formed a very good lot, and consisted of Conqueror, Distinction, Sir C. Napier, Marginata, Forget-me-not, Criterion, Perfecta elegans, and Duc de Nassau. The 12 comprised Stella, Adelaide de Nassau, Extrani, President Claëys, Etoile de Gand, Baronne de Vrere, Mrs. Fry, Perfecta—the quality of this very fine, Variegata superba, President, Cedo Nulli, and Eulalie Van Geert, Messrs. H. Lane & Son had Advance, Comte de Hainault, Juliana, Rubens, and Crispiflora rosea, as their best kinds.

Fuchsias were represented by old bushes and old sorts, the branches were thin, and the eye could easily follow the outlines of the framework of each tree. There may be a little difficulty in getting plants sufficiently forward for exhibition at this early season of the year; but it is quite as likely to be done with young plants as with old ones. The class for Gloxinias brought a capital lot of plants arranged as a kind of fringe to the large collections of stove and greenhouse plants in the conservatory. The plants were large and finely bloomed. Several nice pots of Lilium auratum were staged, forming a background to some of the Roses in pots, amongst which they dispensed an exquisite fragrance. A group of Amaryllis in flower was furnished by Mr. John Shaw, but it contained nothing calling for special remark. Pansies in pots brought no competition, though a special prize of 3 guineas was offered for the best 18.

Show Pelargoniums were well grown, but somewhat sparingly bloomed. Among amateurs, Mr. G. Oliver had the best 6, the best were Beadsman, Magnificent, Spotted Gem, and Rose Celestial. The 12 best were also well grown, but had little flower. In the nurserymen's class for 8 kinds Mr. C. Rylance was 1st with well-grown plants, among which were Majestic, Charles Turner, Victoria, a light-spotted flower; Madame Hiliare, Desdemona, Beadsman, Betrothed, finely bloomed; and Rose Celestial. Mr. Rylance also had the best 8 fancy kinds, viz., Miss Ford, Undine, Illuminator, Madame Sontag, Roi des Fantaisies, Delicatum, Godfrey Turner, and Advancer. No plants were staged in the amateurs' class for 6 kinds.

Zonal Pelargoniums were very well done, and made a nice display. In point of quality and growth they were much superior to those shown at South Kensington on May 18. The best 8 came from Messrs. Felton & Son, who had Mrs. William Paul, Prince of Wales, Dr. Karl Koch, having a very fine glow of scarlet; Louis Veuillot, a fine hybrid nosegay; Rose Rendatler, Virgo Marie, Mrs. Menzies, and J. P. Aldebert. Mr. Charles Rylance came next, the best varieties being Rev. H. Dombrain, very bright orange-scarlet; Pre-eminent, Comet, and Magnum Bonum. Messrs. G. & W. Yates were 1st with 8 variegated zonal and 8 variegated Pelargoniums, being the only exhibitors. The first consisted of well-grown plants of Lucy Greive, Sir Robert Napier, conspicuous for its marked individuality of character; Florence, Sophia Cusack, Italia Unita, Sophia Dumaresque, Beauty of Ashburnham, and Mrs. John Clutton, a fine and free grower. The 8 variegated kinds consisted of Princess Alexandra, a very robust grower; May Queen, also vigorous in growth; Prince Silverwings, Lucy Greive, Lady Cullum, Italia Unita, Victoria Regina, and a good plant of L'Elégante. In the amateurs' classes, Mr. G. Macbeth had the best 8 variegated Zonals; and Mr. Myers the best 8 variegated Pelargoniums. They were the ordinary kinds, and pretty well grown. Herbaceous Calceolarias were represented by nice and somewhat small plants, very well bloomed, and of good quality. The class for shrubby Calceolarias did not fill.

Messrs. Lane & Son were the only exhibitors of 10 and 25 Roses in flower, the last restricted to pots 8 inches across. These 10 consisted of good examples of Maréchal Vaillant, Paul Perras, Marcella, Madame A. de Rougemont, Baronne A. de Rothschild, Coupe d'Hébé, Professor Koch, Charles Lawson, Anna de Diesbach, and Pierre Notting. The best kinds in the large class were Felix Gonero, Mons. Bonnaire, Monsieur Furtado, Madame de Rothschild, Charles Verdier, Victor Verdier, Maréchal Niel, and Madame Bravy. The Roses in pots, contributed by amateurs, were of indifferent quality. In the way of cut Roses Mr. John Cranston contributed a fine stand, in which there were some splendid blooms of the leading Tea Roses; also 24 blooms each of Maréchal Niel and Gloire de Dijon, the former extremely fine.

Mr. Thomas Ware contributed a capital group of 12 succulents, including some of the newer forms of Echeverias; and Mr. B. S. Williams also contributed a miscellaneous collection, intermixed with Double Pyrethrums.

The alpines (widely interpreted), in groups of 50, made up, as already noted, a really interesting and effective display. Messrs. Backhouse & Son were 1st, and we noticed amongst the gems of their collection Lychnis Lagascæ, Linaria origanifolia, Lithospermum prostratum, Dianthus neglectus, Iberis coriacea, Anthyllis

erinacea, with greyish flowers and singularly inflated calyces; and several species of Orchis, as militaris, latifolia, odoratissima, nigra, &c. In Messrs. Yates' 2d prize lot was the beautiful Spiræa palmata, while in that of the Messrs. Stansfield & Son, which came 3d, was the lovely Gentiana verna, and a remarkable tuft of Pinguicula grandiflora, with its large Mimulus-like, lilac flowers. Mr. Ware had also the remnants of a good collection, part of which had been lost in transit.

Some good fruit was shown—notably some Pine Apples from Mr. Ward, gr. to T. N. Miller, Esq., of Bishop Stortford—who had a Black Prince weighing 6lb., and two splendid Queens, weighing respectively 6lb. and 5lb.—and some Grapes from Mr. Potts, gr. to J. Knowles, Esq. The latter exhibitor carried off the 1st prize in both classes (three bunches and two bunches) of black Grapes, with some splendidly finished Hamburghs, as perfect as Grapes could be, not of extra size in either bunch or berry, the bunches being about 8 inches deep, by 6 inches across the shoulders, but compact and plump, lying well upon the dish, perfectly black, evenly covered with bloom, and altogether exhibiting that refinement and finish which carries with it so much weight—and properly so—in all matters of competition. Mr. J. Wilson, gr. to J. E. Reynolds, had also some good Hamburghs. Mr. J. Smith, gr. to W. Blinkhorn, Esq., who stood 1st in the class for two bunches of white Grapes, showed some very fair Muscat of Alexandria; and Mr. W. Wright, gr. to T. C. Clarke, Esq., who was 1st for three bunches, took the prize with fair samples of Buckland Sweetwater. There was quite a display of Cucumbers, some 18 brace being shown, but we venture to question the awards, since the best was, in our opinion, altogether passed over.

LEEDS HORTICULTURAL, *June 3 to 7.*—Considering that a large national horticultural exhibition was held so near at hand as Manchester, it was not surprising that visitors to this show noticed some slight falling off from the high standard to which they have been accustomed during the last few years. But if the display in one or two departments was scarcely equal to that of former years, the committee must be congratulated on one feature, which cannot fail to mark this year's show as the most remarkable in the Society's history, which is that, formerly as a rule, the prizes were borne off by amateur or professional gardeners from a distance, whilst the inhabitants of Leeds were content to find the money, and enjoy a spectacle in every way so charming. But recently, the very result aimed at by the establishment of the Society has come to pass. The exhibitors from a distance were not reduced in numbers, whilst those in the locality mustered more strongly, and showed well in front. A most worthy ambition has been stirred up in the minds of cultivators in and about Leeds; and, judging from the aspect of this year's prize list, even those whose names stand highest amongst horticulturists must look well to their laurels at future exhibitions held in Leeds.

In the class for 12 stove and greenhouse plants Mr. Dixon, Norwood Nursery, Beverley, had it all his own way, and took the 1st prize. Around a beautiful Ixora, which formed the centre of the group, were staged some magnificent specimens, those most conspicuous being two fine species of Darwinia (Hedaroma) tulipifera and fuchsioides—both well grown and covered with bloom; a fine example of Aeschynllum venosum, one fine Azalea, and a capital specimen of Erica ventricosa coccinea minor. For 6 stove and greenhouse plants there was a good competition, Mr. L. Temple, gr. to the Mayor of Leeds, being 1st. Some of the plants shown in his Worship's collection, such as a beautiful Stephanotis, and a fine example of Clerodendron Balfouri, were remarkably good. For the best single specimen, Messrs. E. Cole & Sons, of Manchester, took 1st honours with a comparatively new kind of Ixora—Ixora amboinensis; Mr. James Garth Marshall came next with a wonderful specimen of Clerodendron Balfouri; and Mr. J. C. Padman, of Boston Spa, 3d with a very nice example of Bougainvillea glabra. In another tent filled with similar plants, Messrs. Cole & Son assumed the most prominent position—their collection of nine plants embracing some kinds not yet sent out—which include Ixora Colei and I. Alexandræ. The 2d prize in this class was taken by Mr. James Garth Marshall, amongst whose plants a fine specimen of Cattleya Mossiæ was conspicuous. Next in order came the Rose trees and Tree Ferns. In the first-named department, Mr. F. W. Tetly, of Weetwood, carried off by far the largest number of prizes. Mr. Charles J. Perry, of Castle Bromwich; Mr. Butler, of Burley; Messrs. Lane & Son, of Great Berkhampstead, Herts; and Mr. George Edwards, York, pressed Mr. Tetley somewhat hardly in several of the classes.

The most attractive features of the show were the collections of fruit and cut flowers. The 1st prize for 6 varieties of fruit was taken by Mr. W. Wallis, gr. to H. S. Thompson, Esq., of Kirby Hall. In this collection the Grapes, both black and white, were particularly good, as also were the Peaches and Figs. The finest Pine-apple was exhibited by Mr. John Clark, Studley Royal, who took the 2d prize. The heaviest bunch of Grapes came from Mr. H. S. Thompson, and the 2d from Mr. F. W. Tetley; whilst for Strawberries Mr. Chas. J. Perry carried off the principal honours, with enormous specimens of Dr. Hogg. In all the classes for cut Roses, with one exception, Mr. Perry was 1st—the exception being for 48 blooms, in which Messrs. Paul & Sons, of Cheshunt, were 1st. Although not set out with so much display as last year, the groups of flowers for the centre of dining tables and the bouquets were as attractive as before, and gave evidence of great taste and judgment in their construction. The vegetables did not make a large show, but, considering the season, few varieties in a better condition could be found than those shown by the 1st prize-taker, Mr. J. Clark, Studley Royal.

MANCHESTER LITERARY AND PHILOSOPHICAL: *Feb.* 8.—The following paper "On the Natural Ropes used in packing Cotton Bales in the Brazils," was read by Charles Bailey, Esq.:—

Most of the Cotton bales which reach this country from the Brazils are corded with the long stems of climbing plants, which grow in the greatest profusion in the forests bordering on the Cotton districts. In their fresh state these stems are exceedingly pliant and of remarkable strength, so that they serve admirably for cordage purposes; but by the time that the Cotton reaches the mills of Lancashire they become dry and rigid, and as no further use can be made of them, they are burned for firewood. Being very long, they are very troublesome to put on the boiler fires, and most millowners are glad to get rid of them.

These objects are invested with singular interest when examined in regard to their structure; for although the external form of many of them is extremely curious, their chief interest centres in their remarkable internal organization. Although they reach this country in immense quantities, they are not often to be met with in our museums or colleges; it may be questioned whether any one of our public institutions possesses a complete collection of these stems; certainly the names of the plants which produce them are for the most part unknown.

Bignoniaceæ.—Travellers in the Brazils tell us that by far the larger number of climbing plants in the South American tropics belong to the natural order Malpighiaceæ, and we should therefore expect that this would be the family which furnishes the majority of natural ropes. But this does not appear to be the case; the Bignoniacea stands pre-eminent as the natural order most largely used for supplying lianas for packing purposes, both as regards the quantity of ropes and the number of species.

Most of them are readily identified by the remarkable and symmetrical outlines presented by the cortical and woody systems of their stems when seen in a horizontal section, the bark being projected into the woody tissue, towards the centre, in the form of rays. These cortical rays are wholly formed of liberian fibres, and they vary in colour according to the species. In the majority of stems such prolongations of the bark are four in number, disposed after the manner of a Maltese cross. In a few species each of the four cortical portions is very thick and perfectly square in contour, but in the large number they are long and slender, frequently reaching the pith itself.

The yearly additions to these rays do not proceed after a uniform method, and I shall notice two or three of the principal arrangements. The more common is that where the four primitive rays are deeply projected into the woody portion, the additions taking place each season in the form of plates deposited on each side of the primitive cortical ray. It is difficult without the aid of a diagram to convey a clear idea of the sequence in which the various portions of bark and wood are formed; suffice it to say that each successive addition of bark is projected into the wood a shorter distance than its predecessor, and as the innermost extremity of every plate is truncate or rectangular, it follows that the outline presented by each cortical mass is that of a pyramid, whose sides are formed of a series of rectangular steps, like an ordinary stone staircase. It is difficult to account for this singular appearance; but the more probable explanation seems to be that a layer of wood is deposited for every layer of bark, so that by the time a new deposition of the bark is about to take place, the wood has already surrounded the extremity of the previous plate, in consequence of which the progress of the new plate inward is barred by the previous season's layer of wood. If this explanation be sound, the number of cortical plates on one side of, and including the primitive cortical ray, indicates the age of the stem under examination. Each annular layer of wood is thus broken up into four distinct portions by the projecting bark, each portion filling up one of the spaces enclosed by two of the arms of the cross. The number of plates formed on each side of the four primitive cortical rays rarely exceeds six. The peculiarity of arrangement, to which I here draw attention, is so striking, that it is a matter of surprise to see this feature so badly represented in Gaudichaud's plates; it is fairly drawn by Schleiden, in his "Principles of Botany" (pp. 251-252 of the English translation), but a better figure is given by Duchartre, in his "Eléments de Botanique," p. 167.

Another arrangement of the cortical portion is also common. It commences, as in the last method, with the projection of four slender rays into the midst of the woody fibres, reaching about half way to the pith; but the next additions which take place are not found by the side of the four primitive rays, as in the first-noticed arrangement, but occur as four new projections placed exactly midway between the first four, so that the stem now exhibits eight of these rays arranged like the spokes of a cart-wheel. At first, the four secondary rays are very much shorter in length than the four primitive rays, but as the stem increases in age, all the eight rays become of equal length. Even in this type some species exhibit an approach to the first type, by some of the primitive rays in the older stems having one or two lateral plates lying alongside them.

Perhaps the most striking form of all the Bignoniaceæ which I have hitherto examined is one which unites the peculiarities of both the preceding arrangements, but carried to such an excess that the cortical portion at last forms one-half the bulk of the stem. Originally the woody portion is arranged in the form of a cross, the bark filling up the whole space enclosed by the four arms of the cross. According as the stem increases in diameter, new cortical rays are projected into the four extremities of the woody mass, so that the arms appear to be bifid; these bifurcations also in their turn become bifid, and so the woody mass has its primary, secondary, tertiary, and quaternary divisions, according to its age. Further, as the innermost cortical deposit—that surrounding the woody tissue—is very dark in colour, it throws into high relief the stellate outline of the woody portion. I have met with only one or two species of Bignonia which furnish this elaborate arrangement, and the specimens exhibited will show its striking character.

The woody system of the stems belonging to this natural order is by no means uniform, but it requires careful study before a detailed description can be given. Nearly all the species, however, have numerous vessels of large diameter imbedded in the woody tissue, so that the stems are for the most part very light and porous. Such an arrangement might have been expected in plants whose stems are only as thick as a finger, and whose sap has to travel a long distance before it can reach the leaves, which are for the most part met with only in the uppermost portions of the stems. In most of the species, this woody tissue is traversed by a large number of fine medullary rays, which give a beautiful figure to many of the sections. Their internal arrangement does not manifest itself in any marked way on their exterior; their form is generally cylindrical, but some of them exhibit four slight projections in the form of narrow raised bands arranged lengthwise, which correspond with the outermost portions of the four cortical rays. Some species have a square stem during their early growth, and even the older stems do not altogether lose their four-sided character.

The constancy of the figure four as the radical number is very noticeable in the structure of the different parts of these stems, and there can be little doubt that it originates in the decussate arrangement of the leaves. The stems of the Mints, Sages, and many other British plants furnish us with ready examples of a quadruple arrangement of parts.

To be Continued.

Florists' Flowers.

TEN years ago it was stated that the great improvements which had been made in the VERBENA within the past few years were so truly remarkable that, "whoever has seen in our botanical works the first introductions, would be led to believe that there had been a magic hand in order to lead to such results." And, in like manner, comparing the new flowers of the last year with those of ten years ago, the improvement manifested is not less remarkable, nor less brilliant in results.

All our finest new Verbenas are mainly derived from these well-known raisers, Mr. C. J. Perry, Castle Bromwich; and Mr. W. Eckford, Coleshill Gardens. Occasionally other growers bring out a good flower, and the Continent will sometimes send over a good flower, as our lists of choice Verbenas testify. It is, however, the two first named raisers to whom we look for the annual lists of new kinds, and their unceasing enterprise and proverbial success never fail us. It was generally admitted that the new flowers of 1868 were of more than average merit: it is equally certain that as great, if not a greater degree of praise can be laid to the credit of the new flowers of 1869. Out of a batch of 13 new flowers of Mr. Perry's raising, the following eight received First-class Certificates from the Floral Committee:—Ada King, white, with a faint zone of pink round the eye; flowers large, circular and stout, and habit good, suggestive of making an acceptable bedding kind. Butterfly, glowing flesh colour, with a striking and distinct crimson ring round a pale eye; a fine and showy flower, that will tell on the exhibition table. Joseph Sanders, bright deep red, with a conspicuous lemon eye, a fine and striking show flower. Rev. Joshua Dix, blush, with a centre of deep rose extending some way along the segments of the pip; a very promising flower, pip large and bold, and fine truss. Richard H. Vertegans, a true purple self Verbena, colour shaded plum-purple; very novel and striking, and a splendid exhibition flower. Rising Sun, probably the very finest and most distinct of this fine floral octave; colour glowing salmon-red, with small white eye, surrounded by a rich deep maroon ring; extra fine quality, and will be most effective for exhibition purposes. Thomas Hyatt, clear glowing red, shaded heavily with dark round a pale eye; pip large and of fine form: and Thomas Lawdon, clear rosy pink, with a large blotch of crimson in the centre; pip of fine form, and truss bold. The remainder of Mr. Perry's flowers are: Edwin Day, cerise-scarlet, with a small pale eye, pip of fine form, and large truss. Kate Lawdon, a very pretty white flower, with a pale ring round a small primrose eye. Mrs. Day, something like the preceding in character but quite distinct from its ground colour, pure white, with a band of deep pink round a small lemon eye—a little undersized, but delicate and pretty. The Rev. P. M. Smythe, a fine self flower of a crimson-violet hue, pip and truss large and bold, a fine exhibition variety; and The Rev. S. R. Hole, pale mauve, shaded slightly with purple, a fine and novel flower, pip large, circular and smooth, and bold truss.

Mr. Eckford sends out, through Mr. Keynes, a batch of eight new flowers, to the following of which, forming one half of the batch, First-class Certificates have been awarded:—Countess of Radnor, lilac suffused with blue, with deep violet ring round a lemon eye; distinct and novel, pip and truss of fine quality. Eclipse, rich crimson-scarlet, fine and distinct; pip smooth, and of fine form, and bold truss. Harry Eckford, deep crimson, with large white eye; pip large and smooth, and fine truss: and Lady Ann Spiers, rosy pink, margined with white, properly a white ground flower, with so much of the centre covered with rosy pink as to merit being termed an edged flower; very novel, and of fine quality. The remainder of Mr. Eckford's batch comprise Martha, shaded rose, a very pleasing type of flower; pip finely formed, truss large and bold. Miss Cole, lilac, with distinct rosy purple ring round a yellow eye; novel and distinct. Pearl, pure white, with small, greenish lemon eye, pip smooth and well formed; and

Sensation, dark rose, with deep scarlet ring round a conspicuous yellow eye, good pip and bold truss.

That there is no lack of production of new Verbenas notwithstanding their banishment from the flower garden, is shown in the fact that Messrs. E. G. Henderson & Son announce 12 new varieties, chiefly remarkable for their brilliant colours, large trusses, and profusion of bloom. There are in addition Marquis of Bute, Lady Cowley, and Lord Charles Percy, specially adapted by habit and otherwise for bedding purposes; the former of a rich bright scarlet, the second rosy pink, the last crimson flushed with scarlet. Mr. B. S. Williams also announces Mauve Queen, a bedding variety, of strong constitution, robust growth, and great freedom of bloom.

At most of the leading provincial exhibitions the Verbena is seen generally pretty well done, in some cases excellently so; and it must be admitted that when the blooms are cut from the plants, and shown as other florists' flowers are, in neat green stands, with the colours well arranged, they have a charming effect, and always (when well done) become a leading feature. Mr. George Smith, of Islington, whose name was for many years most honourably associated with the Verbena, once made some capital suggestions to Verbena exhibitors worthy of being reproduced here:—"When the flowers are cut for exhibition, be very careful not to place them in too damp or too warm a situation, or in a newly painted box, as any sudden check will cause them to shoot their pips. Many think that the Verbena, when cut from the plant, cannot be carried any distance. My experience leads me to an altogether different conclusion, as I have known flowers drop three times as many pips as those which had travelled a much greater distance, the age being the same. This was caused by their being grown in close and warm greenhouses or frames. The aim of the exhibitor should be to bloom his flowers in a similar atmosphere to that in which they are generally exhibited." *R. D.*

Miscellaneous.

GLOIRE DE DIJON ROSE AS A STOCK FOR MARÉCHAL NIEL.—The time for budding Roses will shortly arrive, and many will be looking around them for suitable stocks upon which to bud, and thus to increase the number of some especial favourites. I need, therefore, make no excuse for offering a few remarks upon the merits of Gloire de Dijon as a stock upon which to bud that most lovely of all Roses, Maréchal Niel. Two years ago, as well as last year, I placed some buds of the Maréchal into about the middle and more natural part of some grossly grown shoots of Gloire de Dijon. The buds having taken, I reduced the young shoots upon the stock in each following spring down to the buds which had formed prominently, as a preliminary in making a strong "start;" and the result, as to progress afterwards made, both in regard to the growth and the profusion of bloom, has surpassed anything I could have wished for. The buds grew so as literally to exceed the stock in size, and the base of each bud has so enlarged as to overlap the wood upon which it was inserted. The young shoots made thereon last season in some instances exceeded 10 or 12 feet in length. One thing I have particularly noticed in connection with the Gloire de Dijon as a stock, which is, that if an old branch, or branchlet, be budded upon, and afterwards cut in to the bud as is customary, the bud of the Maréchal so placed seems to lose its capability of growing large, and produces wonderfully shortened growth in regard to its branches, as well as yielding blooms more profusely. I therefore advise all who have a large plant of the Gloire, to try its effects either way upon Maréchal Niel. I have not yet tried the former as a stock, treated in the ordinary way, but hope to do so in the ensuing autumn, as I have a small stock of cuttings well rooted in preparation, upon which I intend to experiment. *William Earley, in "Florist and Pomologist."*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

SPECIMENS of that very interesting genus *Anæctochilus* may now be favoured with a somewhat more liberal treatment than they have heretofore received. Up to this time they have been strictly confined under bell-glasses—a system which is necessary to their well-being when only a limited amount of humidity is admissible in the atmosphere of the structures in which they are grown. It will now be practicable to admit air to them with tolerable freedom at certain times in every 24 hours; the time chosen should be when the excessive heat and humidity maintained in all houses containing true exotics has become somewhat proportioned to their wants. Giving air in such a case is best done by simply tilting the bell-glasses more or less on one side, with a wedge of some kind. The same remarks apply with equal force to such as are grown in small frames made especially for them. With this liberal treatment they will require damping over the whole surface of the leaves more frequently than was before advisable. This is best done by means of a small water-pot, having a very fine spray rose. Always use tepid water, and if soft water so much the better. *Chrysanthemums* should also be more liberally treated from this time onwards throughout the summer. They should be removed from such confined spaces as pits or frames into the open borders, or any other position where a moderate amount of shading may be afforded them from the full rays of the mid-day sun. When plunging them into the soil, always place a piece of slate beneath each pot, for the double purpose of keeping out worms and of keeping the roots from running rampant into the soil in which they are plunged. When placed in this position they should be firmly tied to suitable stakes or trellis-work, so that they may not be injured by the wind, and then they should be pinched back as often as may be necessary to form bushy plants. Frequent moistenings over their whole surface should be given by the best means at hand. Every one engaged in the culture of these plants should know that they are gross feeders, and that liquid manure of moderate strength is an absolute necessity to their successful culture. Like all other plants, however, this stimulant suits them best when given alternately with clear water, as then one acts as a zest to the other. *Camellias*, *Indian Azaleas*, and many similar subjects which have by this time nearly or quite finished their growth, such as flowered and were grown on in the early winter months, should now be exposed more fully, a little at a time, to the sun and air. This will cause flower-buds to form, and the wood to become more thoroughly ripened. At such a time, it is advisable to syringe these and similar subjects constantly, once or twice daily, whilst a sufficiency of root moisture must always be afforded. A somewhat more limited supply than heretofore may not be without its advantages. The early flowered *Pelargoniums* should be somewhat dried off as soon as they cease flowering. Such cuttings should now be taken off as are likely to strike freely and subsequently to form good plants. Place the old plants in a position where they can be kept moderately dry until they are cut back.

FORCING HOUSES.

The later *Vineries* in which the crops are set must now have an increased amount of the humidity of which they have been in a measure deprived, to insure more successful fertilisation. Keep the lateral shoots or sub-laterals where they have formed, especially such as emanate from those spurs showing fruit, well stopped back. For the purpose of inducing abundant formation of young roots, or rootlets, let some few shoots—one or so upon each Vine, ramble along the back wall beneath the foliage of the Vine already formed, or along the front, in a similar situation, and for a like purpose. Queen *Pines*, which, as the forwardest successionals, are following the more immediate fruiters, should have every possible attention at this time. Any which have the pots nearly filled with roots should receive a nice shift into moderate sized pots, only large enough to allow the plants to fill them well with roots by the third week in September. They will require very liberal treatment during the next few months. Stop the young growths upon *Fig trees* at about the fourth leaf. *Melon plants*, however grown, will need attention in some stage or other of their growth almost constantly. When a good crop of fruit is secured, and these have swelled to about three parts their full size, it will be seen that the parent plants lose much of their vigour in so far as crude growth is concerned. Indeed, in some instances, so great will be the tax upon the plants, caused by the growing requirements of the fruits, that the plants will often flag during bright weather, and will need some amount of nursing, such as attentive shading at such times, &c. During such a trying period full encouragement should be given to every shoot which may form and grow. These at such a time will keep up a more healthy communication between roots and branches, and, it may be, cause a better root action. A species of canker often attacks Melon plants at the base or shoulder. This, if not guarded against, will often cause the plant to rot off: attend to them, if symptoms of this disease occur, by placing a little fresh slacked lime on the place affected, and by removing those leaves which shade these parts; see also that no drip falls thereon, and that the parts do not become too wet.

HARDY FRUIT GARDEN.

With the exception of finally thinning the fruit upon all *Peach* and *Nectarine trees*, bearing in mind during such an operation that an excessive crop is extremely injurious to the well-being and longevity of the trees, little can be added at this time to directions given in former Calendars. Continue, therefore, to fasten in all shoots which require such support, and to destroy insects by washing the shoots with tobacco-water in which soft-soap, sulphur, &c., has been freely mixed. It is always best to apply it when slightly warmed, as the soap causes it to act more freely, and more work is in consequence got over.

HARDY FLOWER GARDEN.

From the beginning of June onward *the budding of Roses* may be performed. Generally speaking, in budding thus early, the buds are expected to form into heads of moderate size during the current summer, the operation being of advantage when time has to be studied. The oldest buds at the base of shoots upon the current spring growths must be chosen. In all instances where buds are procurable upon forced Rose plants, these should be used in preference to any others, as they are more matured, and, in consequence, more fitting for the operation. Thin out the bloom-buds upon *Carnations* in all instances when fine blooms are wanted; the centre bud, it is needless to say, will be the finest; only from three to five should be left. Put in pipings of *Pinks* and *Picotees*, if attainable, and never afterwards let them become too dry through want of watering. Place a good thick mulching of rotten dung around the base of all *Dahlias*, and soak this afterwards thoroughly with liquid manure or water. It always pays well to place a similar mulching and to water *Phloxes* of the decussata type, than which few other plants are grosser feeders at this particular season. Give the necessary support in the form of stakes to *Hollyhocks*, having previously thinned the shoots out as lately advised. If the weather keeps dry do not mow grass-lawns too frequently, but use the daisy-knife or rake instead, and so insure a green surface, even if it be not so smooth as you could wish, as mowing at such times produces a brown unsightly surface.

KITCHEN GARDEN.

With the weather still too dry for anything in the way of useful work to be done in this department, excepting indeed it be hoeing and constantly watering the suffering vegetation,—a most thankless, wearying performance,—little can be added. With the first shower of rain get out all kinds of autumn and winter Broccolis, Kales, &c., which are large enough to be transplanted. Afford to each plant as much space as possible, so that the full sun and air may act, and allow the plants to harden their fibres fully in process of growth, thereby enabling them the better to withstand the frosts of the coming winter. Never plant these upon ground which has been but just dug over, especially if the soil is light and stony in its nature; rather choose a piece which has laid in "fallow" from a month to eight or ten weeks,—the lighter the texture of the soil the longer, and *vice versâ*. Just loosen the surface of the ground amongst stools of *Seakale*. Make the last sowing this year of tall Marrowfat *Peas*, and sow a succession of all things needed. *W. E.*

TOWN GARDENING.

THE *Virginian Creeper*, *Ivy*, and all other plants used for covering walls, will now require attention. The leading shoots should all be nailed in closely, and, except where there is space to be filled, all the superfluous shoots should be removed. Look over the shrubs in the borders. Where any have made rank, straggling growths, they should be reduced to order, either by taking them out altogether, or by shortening them, so as to preserve something like regular growth. Continue to support with sticks all tall-growing plants, for there is nothing more necessary in a flower garden than to have all plants standing firmly in their places. Hoe the borders between the plants frequently, and water freely. Let the lawn alone, with the exception of watering during hot weather. Take off all the lateral buds of *Carnations*, and also those of *Chrysanthemums*, if specimen flowers are required. The blue *Siberian Larkspur* will grow in the most confined positions, and if planted in front of the bed, and pegged down, it will make an excellent edging plant where the Lobelia will not thrive. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON
FOR THE WEEK ENDING WEDNESDAY, JUNE 8, 1870.

1870 MONTH AND DAY. June.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
2. Thurs.	29.82	60.9	57.0	53.5	77	4.6
3. Friday	29.95	61.3	59.2	57.3	87	5.2
4. Satur.	30.21	60.3	57.2	51.4	82	4.8
5. Sunday	30.32	61.3	59.5	58.2	73	4.4
6. Monday	30.37	62.8	55.8	40.5	63	4.0
7. Tues.	30.31	57.6	53.8	50.4	77	4.1
8. Wednes	30.05	61.3	55.4	48.3	66	3.7

1870 MONTH AND DAY. June.	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 59 Years	Wind. Direction.	Horizontal Movement.	Rain. In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
2. Thurs.	73.0	47.3	26.3	59.2	+4.9	WSW to NW	145	0.00
3. Friday	79.6	52.0	18.6	57.4	0.0	WSW to E.S.E.	169	0.00
4. Satur.	69.0	50.1	18.6	58.0	+0.7	S.E. to W.S.W.	85	0.00
5. Sunday	72.2	52.0	20.2	60.3	+3.1	N.N.E.	205	0.00
6. Monday	70.3	41.4	28.9	51.1	−2.9	N.N.E.	240	0.00
7. Tues.	74.9	42.8	32.1	59.9	−0.1	N.N.E.	285	0.00
8. Wednes	70.7	51.3	19.4	62.2	+4.9	N.N.E.	230	0.00

June 2.—Variable amounts of cloud prevalent. Hazy.
— 3.—Generally overcast till the evening. Fine afterwards.
— 4.—Generally cloudy. A few drops of rain fell on east side.
— 5.—Overcast during the day. Cloudless after 4 P.M.
— 6.—Generally cloudless. Very fine.
— 7.—Variable amounts of cloud prevalent during the day, generally overcast at night. A few large drops of rain fell at 8.30 P.M.
— 8.—Generally cloudless. A very fine day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, JUNE 4, 1870

NAMES OF STATIONS.	TEMPERATURE OF THE AIR							FALL OF RAIN.
	Highest.	Lowest.	Range of Mean.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	71.0	45.0	26.0	62.2	48.4	21.0	55.5	0.12
Blackheath ..	73.2	45.5	27.7	63.6	43.1	20.1	53.6	0.10
Boxted ..	69.7	35.7	34.0	64.0	40.8	23.2	52.4	0.19
Barnes, Ibam ..	74.0	45.0	29.0	65.5	40.9	24.6	53.2	0.00
Wick, Shampton ..	71.0	41.7	29.3	69.4	45.2	24.2	57.8	0.06
Leicester ..	..	..	..	..	..	..	..	..
Nonsuch ..	71.0	45.8	25.2	67.4	48.6	18.8	58.2	0.00
Swinton, Ibam ..	72.0	41.3	30.7	70.5	48.8	21.7	57.9	0.00
Skelton ..	72.0	40.2	31.8	68.2	44.7	18.5	56.2	0.00
Lincoln ..	70.0	43.1	26.9	69.0	44.8	24.2	56.9	0.00
Dunham ..	72.0	43.0	29.0	69.1	50.0	18.2	58.2	0.10
Manchester ..	72.0	43.0	31.0	69.1	50.0	18.2	58.2	0.10
Southport ..	73.4	40.9	32.5	67.1	40.5	17.6	53.5	0.17
Rossall ..	71.3	46.0	25.3	65.9	46.3	19.6	56.1	0.11
Bridlington ..	71.3	46.0	28.0	65.0	49.0	16.0	55.5	0.10
Hull	70.0	39.0	31.0	66.0	41.7	21.3	53.8	0.04
Newcastle ..	66.0	40.0	20.0	60.0	47.7	12.3	54.0	0.32
Edinburgh ..	68.7	47.0	21.7	..	..	..	54.5	0.50
Greenock ..	68.7	41.7	25.0	..	..	..	53.3	0.50
Dunbar ..	69.8	45.9	23.9	..	..	..	54.8	0.40
Aberdeen ..	68.0	42.0	25.1	..	..	..	51.8	0.07
Tarsby	66.5	45.0	21.5	..	..	..	52.8	1.15
Greenock ..	69.0	48.0	17.0	..	..	..	51.2	1.44
Leith	69.2	47.6	22.6	..	..	..	52.9	0.72
Perth	71.0	47.0	24.0	..	..	..	51.6	1.09
Dublin	77.0	41.5	35.5	..	..	..	56.2	0.17

* This reading appears to be erroneous

JAMES GLAISHER.

Notices to Correspondents.

FERNS: *C. Adams.* The Fern is Todea superba, and the cause of its turning brown is either drought or exposure to sunshine. It will grow freely in a greenhouse temperature, under a bell-glass, but requires to be kept constantly sprinkled with water; this, however, necessitates planting it in a thoroughly drained pan of soil.

GALVANIZED WIRE: *M. I.* No. We have used it for some years, and it has answered exceedingly well. We should use it in preference to anything else.

GRAPES, SCALDED: *Tyro.* The berry was much crushed in the post, but the appearance is that of injury by sun-burn, known under the name of "scald." As far as we can judge, it does not appear to be that form of spot which arises from the condition of the roots. *M. J. B.*

INSECTS: *D.* The small white grubs which have attacked the roots of your Cauliflowers, Brussels Sprouts and Broccoli are the larvæ of a two-winged fly, Anthomyia Brassicæ, assisted by members of one of the smaller species of Millepedes (Julus sp.), whose attacks have been greatly favoured by the long-continued dry weather. Salt water mixed with lime has been recommended as a remedy, but we would rather recommend burying some decaying plants or slices of Potatos, as a decoy, and which should be examined from time to time. *W.—H. K.* The young Pears are infested by the minute yellow larvæ of Cecidomyia nigra, a little black midge, which lays its eggs in the embryo fruit during flowering time. We strongly recommend the affected fruit to be picked out and burnt before the larvæ have made their exit, and buried themselves into the earth to become pupæ. *W.*

MILDEWED ROSES: *F. S.* Here is excellent advice from Mr. Reynolds Hole's sparkling book about Roses: "Remove the leaves most affected, and cover the rest with flowers of sulphur when the tree is wet from shower or syringe, giving them another good washing next day. Mr. Rivers recommends tea as a remedy." The soot is applied to the sulphur, allowed to remain a day or two, and then washed off. We have no experience with the soot, but the value of sulphur is now beyond dispute.

NAMES OF PLANTS: *C. P.* Vinca minor, Lonicera Standishii. The Snowberry, Symphoria racemosa or Symphoricarpus racemosus. — *B. & S.* A very old thing, first called Angræcum, and afterwards (by Lindley) Œceoclades falcatum. It will succeed under cool treatment. — *A. B. C.* Centaurea montana. — *A Subscriber.* Pyrus scandica (P. hybrida). *The Marquis.* Your Kalmia is a Barberry, probably Berberis asiatica. — *C. W. Strickland.* Your plant arrived in such a bad condition that we cannot pronounce positively upon it. It is probably Crinum asiaticum, see Bot. Mag., t. 1073. Crinum capense=Amaryllis longifolia; but Nerine undulata and Amaryllis crispa are different plants. — *A Lady.* 1, Pernettya angustifolia; 2, Aubrietia deltoidea; 3, Nierembergia filicaulis. — *W. Phillips.* Coronilla Emerus.

PEACH LEAVES DISEASED: *C. R. S.* It is the common Peach mildew, caused by a species of Oidium. The sulphur should be applied as soon as the Fungus makes its appearance, and care should be taken that it is sublimed sulphur, not ground sulphur, which is applied. *M. J. B.*

VINES: *Duncan Brown.* We have examined the sample of roots and berries sent, as well as the soil. The latter is very sour, and totally unfit for the growth of Grapes. We do not think you can do anything better than remake your border completely and plant some fresh Vines Although Vines delight in abundant moisture at times, a constantly wet border is extremely injurious. One of the great requirements of Vine borders is good drainage.

VINES INFESTED WITH RED SPIDER: *A Subscriber.* Give your pipes a coating of sulphur, and when the house is shut up close at night apply sufficient heat to cause a slightly sulphureous smell therein. The pipes must not be made too hot. Repeat this for two nights in succession, then maintain a moist humid atmosphere in your house until the Grapes begin to colour. Another method is to get a few lumps of unslaked lime, and place in the house when shut up; while this is being slaked in the usual manner, throw on the top of the lumps a handful or so of the flowers of sulphur. The fumes arising from this have the same effect in destroying the red spider.

VINE LEAVES: *S. R.* The roughness on the under side of your Vine leaves is a very common affection, which has lately been repeatedly noticed in answer to correspondents. It does not appear to be injurious, being merely an exuberant condition of the lower leaf-cells. Your explanation is very likely to be the right one. *M. J. B.*

WEEDS ON LAWNS: *C. P.* It depends on circumstances. If the acid had been freshly applied, and the quantity eaten great (which is not probable), no doubt serious injury would follow. It is a dangerous weapon at best, and can only be used on the small scale.

WURMKRAUT: *Wurzelgraber.* The name of "Wurmkraut" is used in Germany for three distinct plants, viz., Spigelia Anthelmia, Sisyrinchium Sophia and Spiræa Ulmaria; but unless our correspondent mentions further particulars it is impossible to say which of these is meant. Spigelia not being an indigenous plant is only called "Wurmkraut" in pharmaceutical language; but the other two, being indigenous, are called Wurmkraut by the people.

COMMUNICATIONS RECEIVED:—W. C.—W. P. R.—W. W. S —A Reader.—J. P. C.—F. H.—J. A.—A. McL.—N. G. N.—C. A.—G. M.—A. R. H.—F. W.—C. P.—P. M.—S. K.—H. F.—J. C. S.—D. D.—W. M.

Markets.

POTATOS.—Southwark, June 9.

During the past week the arrivals coastwise have been small, but quite equal to the demand. which is now very limited for old Potatos. The quotations as follow:—Yorkshire Flukes, per ton, 110s. to 130s.; Ditto Regents, 90s. to 110s.; Lincolnshire do., 90s. to 100s.; Dunbar and East Lothian do., 100s. to 130s.; Perth, Forfar, and Fifeshire do., 90s. to 100s.; Do. Rocks, 90s. to 100s.; Do. Reds, 90s. to 100s.; French and Belgian Whites, 70s. to 90s.

COVENT GARDEN.—June 10.

We have again to report the arrivals of very heavy supplies, both home-grown and Continental, with a somewhat improved trade, Oranges being the only article that has advanced in price. A few outdoor Strawberries have been offered from the West of England. West Indian Pines are plentiful and good. Flowers comprise Azaleas, Orchids, Roses, Pelargoniums, Heaths, Fuchsias, Hydrangeas, Lobelias, Mignonette, and bedding plants in large quantities.

FRUIT.

	s. d.	s. d.
Apples, p. ½ sieve ..	3 6 to	5 0
Apricots, per doz. ..	2 0 —	4 0
Cherries, per lb. ..	1 0 —	2 0
Cobs, per lb. ..	0 9 —	1 0
Filberts, per lb. ..	0 6 —	0 9
Grapes, per lb. ..	1 6 —	2 0
Lemons, per 100 ..	4 0 —	8 0
Melons, each ..	0 6 to	1 5 0
Nectarines, per doz. ..	1 6 —	2 0
Oranges, per 100 ..	6 0 —	10 0
Peaches, per doz. ..	1 8 —	2 4 0
Pears, per doz. ..	— —	0 9
Pine-apples, per lb.	6 0 —	10 0
Strawberries, p. lb. ..	3 0 —	5 0

VEGETABLES.

	s. d.	s. d.
Asparagus, p. bund.	3 6 to	5 0
Artichokes, p. doz. ..	3 0 —	6 0
Beet, per doz. ..	2 0 —	3 0
Broccoli, per doz. ..	1 0 —	2 0
Cabbages, p. doz. ..	1 0 —	1 6
Carrots, p. bunch ..	0 4 —	0 8
— young, p. bun	1 6 —	2 0
Cauliflowers, p. doz	1 6 —	3 0
Celery, p. bund. ..	1 0 —	1 6
Cucumbers, each ..	0 9 —	1 6
Endive, per doz. ..	1 6 —	2 0
French Beans, p. 100	2 0 —	..
Garlic, per lb. ..	0 8 —	..
Herbs, per bunch ..	0 2 —	0 4
Horse Radish, p. bun.	3 0 —	4 0
Leeks, per bunch ..	0 2 to	0 4
Lettuces, p. score ..	1 0 —	2 0
Mint, per bunch ..	0 2 —	0 3
Mushrooms, p. pott.	1 0 —	1 6
Onions, per bunch ..	0 4 —	0 9
Parsley, per bunch ..	0 2 —	0 4
Potatos, new, p. lb.	0 4 —	0 6
Salsafy, per bundle .	1 0 —	1 3
Scorzonera, do. ..	1 0 —	1 3
Shallots, per lb. ..	0 8 —	..
Spinach, p. bushel ..	2 0 —	3 0
Radishes, per doz..	1 0 —	1 6
Turnips, per bunch ..	1 0 —	1 6
— young, p. bun	1 6 —	2 0

WANTED IMMEDIATELY, as good WORKING FOREMAN, for a Small Nursery, a Man accustomed to get up Plants for Market. Liberal wages given to a Man of good abilities. —Apply to SMITH, Nurseryman, &c., Silchester Road, Notting Hill, London, W.

MESSRS. JAMES VEITCH AND SONS are in WANT of a SECOND FOREMAN for their Fruit Tree Nursery. He must be a first-rate Budder and Grafter, and good Kaleneuse. Apply, by letter, giving full particulars and references, Royal Exotic Nursery, King's Road, Chelsea, S.W.

WANTED, a successful BUDDER and GRAFTER. —State the wages required and references. — HENRY CARRINGTON, Mile End Nurseries, near Stockport.

To Budders and Grafters.

WANTED, in a Surrey Nursery, a thoroughly efficient BUDDER and GRAFTER, capable of carrying on the out-of-door Propagation of a large Establishment. Good wages given to a successful Man.—Apply by letter, stating wages required and giving full references to A B C, *Gardeners' Chronicle* Office, W.C.

WANTED, a SECOND GARDENER, to work in Pleasure Grounds, Flower Borders, and General Shrubs. None need apply unless they have had some experience, and a good character.—Mr. SEARLE, Head Gardener, Himley Hall, Dudley.

WANTED, a Young Man, about 18 years of age, as IMPROVER, in a Nobleman's Gardens, where a general system of gardening is carried on. A Premium will be required. 12s. per week, with lodgings. Enclose testimonials, &c.—W. PHIPPS, Ingestre Gardens, Stafford.

WANTED, an active Young Man, as ASSISTANT in a small Nursery. Must be handy at Tying and Potting Plants, have some knowledge of Packing, and willing to make himself useful.—Apply by letter, stating wages required and where previously employed, to SMITH AND SIMONS, Seed Merchants, Glasgow.

WANT PLACES.—Letters to be Post Paid.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

EXPERIENCED GARDENERS, also UNDER GARDENERS.—J. HARRISON having a number of Clever Men on his books, waiting for engagements, any Gentleman requiring Gardeners can be supplied at once with Men of first class character and abilities.—North of England Rose Nursery, Darlington.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, Finchley, N.

GARDENER (Head).—Married, no incumbrance; well skilled in all branches of the profession. Highest references. —A. B., Post Office, South End, Catford, Lewisham, Kent.

GARDENER (Head).—Age 33, married, no incumbrance; understands the profession in all its branches. Scotch. Four years in last situation (a Nobleman's).—R. CAIRNS, Mr. J. Peter's Nurseries, Banbury, Oxon.

GARDENER (Head).—Age 35, married; first-class experience in Fine, Grape, and Plant Growing, also in every branch of Gardening. Highly recommended. Please state wages.—X. Y., Dudbridge, Stroud, Gloucestershire.

GARDENER (Head), to any Nobleman or Gentleman going abroad; Sydney (Australia) preferred.—Single; understands Gardening in all its branches. Testimonial, with reference.—F. W. B., 21, Silver Street, Golden Square, W.

GARDENER (Head).—Married; many years' experience in all branches of the profession. Has a thorough knowledge of the Management of Vines, Melons, Peaches, Kitchen and Flower Gardens, also Pasture Land and Stock.—T. S., Post Office, Nuneham, Oxon.

GARDENER (Head), age 40, married, no incumbrance.—GEORGE GADD, Gardener to Sir Benjamin Brodie, Bt., Brockham Warren, Reigate, Surrey, is at liberty to engage with any Nobleman or Gentleman requiring the services of a practical Man.—Address as above.

GARDENER (Head), in a Nobleman's or Gentleman's Garden.—Married, no incumbrance; thoroughly practical in all branches of the profession. Eleven years' character.—T. B., Mr. Wm. Bull, Establisment for New and Rare Plants, King's Road, Chelsea, S.W.

GARDENER (Head).—Age 30, single; understands the Management of Vines, Pines, Melons, Peaches, &c., Early and Late Forcing of Fruit and Flowers, and the general routine of the Garden in all its branches. Can be well recommended.—W. J., Blunham, Beds.

GARDENER (Head).—Age 34, married; has a thorough practical knowledge of the profession in all its branches. Well educated. Was apprenticed three and a-half years in one of the first gardens in the Midland Counties. Good references.—M. W., Post Office, Bromley, Kent, S.E.

To Noblemen and Gentlemen.

GARDENER (Head), age 39, married, one child.—E. WELSH, for the past ten years Head Gardener to the Lord Primate of Ireland, is thoroughly competent to Manage a first-class Establishment. Testimonials of the highest order. Satisfactory reasons given for leaving.—E. W., Duke of Cumbridge's Stables, Park Lane, London.

GARDENER (Head), age 38, married.—JAMES STEWART, for the last six years Head Gardener at Nuneham Park, where he had the entire Management of the very extensive Kitchen Gardens, where Forcing of every description was carried out, including Pines, Vines, Peaches, in fact, every description of Fruit and Flowers, also Spring Bedding on a comprehensive scale, of Fruit and Flowers, also Spring Bedding on a comprehensive scale, would like an engagement with any Nobleman or Gentleman requiring the services of a first-class Man. Testimonials of the highest order. Apply, in the first place, to Messrs J. & C. LEE, Road Lane and Nursery, Hampstead, London.

GARDENER (Head, or SINGLE-HANDED).—Age 29; understands the profession in all its branches.—G. G., 1, Grice, Grocer, Cambridge Street, W.

GARDENER (Head), or GARDENER and AGENT. —Age 28, has had 13 years' practical experience in first-class establishments; thoroughly understands the Cultivation of Vines, Pines, Peaches, Cucumbers, Melons, Stove and Greenhouse Plants, Orchids and Nepenthes; also Orchard Houses, Flower and Kitchen Gardening, and the Management of Land and Stock. Is a good Accountant. Highest references.—A. B., Post Office, Uxbridge.

GARDENER (Head), where two or more are kept.—Understands Early and Forcing of Fruit and Vegetables, and Flower and Kitchen Gardening. Good reference as to character and ability.—E. M., Post Office, Basingstoke, Hants.

GARDENER (FIRST-CLASS, WORKING), where two or three Under Gardeners are employed.—Experienced in all branches. Highly recommended.—D. M. T., Mr. Springings' Nurseries, St. Albans.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man whom he has known for several years, and can testify to his abilities; he held the position of Bailiff and Gardener in last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

GARDENER, where two or three are kept.—Age 23, single. Good character.—A. P., 9, Russell Terrace, Oakley Square, N.W.

GARDENER (SINGLE-HANDED), or to take charge of Gentleman's Country Seat.—Age 34, married, no incumbrance, respectable; understands the profession. Highly recommended, with four years' good character.—S. L., Post Office, Broad Street, Bloomsbury, W.C.

GARDENER (SECOND, or SINGLE-HANDED).—Age 22, respectable; can be well recommended.—Y. Z., Post Office, Chelmsford, Essex.

GARDENER (UNDER).—A respectable young Man; Nursery not objected to. Good character.—E. S., Mr Green, Stationer, Wimbledon.

GARDENER (UNDER), where he will have an opportunity of improving his knowledge; age 18; six years' good character from present situation. State wages, &c.—C. G., 5, Trinity Terrace, Trinity Square, Stockwell, London, S.W.

GARDENER (UNDER, or IMPROVER).—Age 20, respectable; no objection to pay a Premium of 25 per week. Three and a half years' good character.—J. B., Mr. Lodge, Pinner, Middlesex.

PROPAGATOR, or PROPAGATOR and FOREMAN (First-class).—Married; of considerable experience. Near London preferred.—A. B., Catford Hill, Catford, Kent, S.E.

FOREMAN (SECOND), in a Nobleman's or Gentleman's Garden.—Age 20; four years' good character. State wages given.—C. T. B., 3, Brompton Grove, E. E., Finchley.

IMPROVER, in a Nobleman's or Gentleman's Garden. —Would pay a small Premium. Active, industrious, and can have first-class recommendation.—Apply to Mr. MAURICE YOUNG, Milford Nursery, near Godalming.

BAILIFF.—A single Man, of really good practical experience.—For particulars, address R. W., James Dickson & Sons, Chester.

BAILIFF and GARDENER.—Has had great experience in the Cultivation of Arable and Grass Land, the Management of Woods, the Buying and Selling of Stock, &c., and has held first-class situations as Gardener.—A. B., 9, Clifton Road, Maida Hill, London, W.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
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GRASS-SEED CLEANING MACHINE for SALE. A Second-hand Machine, of most approved description; been little used, and will be sold cheap.
Box 15, Post Office, Leith.

To Horticultural and Agricultural Societies.

TO BE SOLD, a Bargain, TWO NORTON'S TURNSTILE REGISTERS, strongly fitted, in a portable wood frame; also TWO Wrought-iron EXIT TURNSTILES, complete, suitable for Exhibitions. May be seen at 251, High Holborn.

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Eastdean and Pevensey, Sussex.

TO BE LET, by the Year, by Tender, from SEPTEMBER 29, 1870, the desirable FARMS, known as BIRLING, HOTCOMBE, and MICHELDEAN Farms, lying together, situate in the Parish of Eastdean, and now in the occupation of Mr. John Gorringe. Comprising a good Farmhouse, with Gardens, all necessary Outbuildings, 14 Cottages for Labourers, and about 600 acres of Arable, Pasture, Meadow, and Down Land, together with 56 acres, or thereabouts, of superior Marsh Land, in Pevensey.
Particulars of the Farms, with terms of letting, may be seen at Mr. WILTON STEVENSON'S, Old Town, Eastbourne, who will show the Farms. Mr. JAMES BANKS, Looker, Pevensey, will show the Marsh Land
Tenders to be sent in on or before JUNE 24 next, to MESSRS. GELL AND WOOLLEY, Solicitors, Lewes, from whom further information may be obtained. The Lessor will not be bound to accept the highest or any tender.—Lewes, May 6, 1870.

To Market Gardeners, Nurserymen, and Others.

SURREY, about 25 miles from London, and within one mile from a station on the South Eastern Railway.

TO BE LET, on Lease, from September 29 next, a capital KITCHEN GARDEN, productive ORCHARD, and good DWELLING HOUSE, eligibly situated in a highly respectable and improving neighbourhood, and within 3 miles from two important Market Towns rapidly increasing in population
The Garden is well walled in, and stocked with Fruit Trees of the most approved sorts in full bearing, and contains Pineries, Brick Melon Pits and Potting Shed, with plentiful supply of Water. The House is convenient, having 2 entrances, the Garden portion of which will readily let. The whole presenting a most desirable opening seldom met with. For terms and cards to view apply to
MESSRS. NASH, Land Agents, Valuers, and Auctioneers, Reigate.

SALES BY AUCTION.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, June 13, at half past 12 o'Clock precisely, Importations of ORCHIDS, just arrived from New Granada, Mexico, and Japan, comprising many choice sorts, in good condition
On view the morning of Sale, and Catalogues had

Syon Gardens, Isleworth, Middlesex.

Highly important SALE of Valuable and Rare TROPICAL FRUITING and FLOWERING TREES, SHRUBS, and PLANTS, of luxuriant growth; for sale in consequence of a re-arrangement of the Gardens.

FAREBROTHER, LYE, AND WHEELER, beg to give notice that they are honoured with instructions from his Grace the Duke of Northumberland to SELL by AUCTION, at Syon, on WEDNESDAY, June 22, at 12 o'Clock, a valuable collection of rare TROPICAL PLANTS and TREES, of remarkably fine growth; among which will be found some of the finest specimens in Europe of the

Alocasia macrorhiza	Ficus elastica, indica, &c
Anthurium acaule	Hibiscus sinensis bifolorus
Areca concinna	Ilex paraguensis
Caladiums of sorts	Jambosa pulchella and vulgaris
Carolinea alba	Lagetta lintearia
Chrysophylum Cainito	Palms in varieties
Cocos sp. and other Palms	Piper nigrum
Coffea arabica	Psidium pyriferum and chinense
Croton pictum, elegans, &c.	Saccharum officinarum
Cycas revoluta	Sterculia nobilis
Diospyros sapota and Mabola	Theobroma cacao
Dracæna, sp.	Urania speciosa
Elæodendron australe	Vanilla planifolia
Eugenia jamenta	
Ferns of all sorts	

And a variety of other choice Trees, Shrubs, and Plants which are to be sold in consequence of alterations and a re-arrangement of the Gardens at Syon.
May be viewed two days prior, by Catalogues only, obtainable of Mr. FABAIRN, Gardener, at Syon; of Mr. JUDSON, Syon House; and of MESSRS. FAREBROTHER, LYE, AND WHEELER, 8, Lancaster Place, Strand, London, W.C.

Important Sale of Prize Shorthorns in Ireland.

MR. JOHN THORNTON will SELL by AUCTION, on THURSDAY, June 30, at Thornville, near Wexford, the small but highly distinguished HERD of SHORTHORN CATTLE, belonging to Joseph Meadows, Esq., the whole of which has attended the splendid animals exhibited by Mr. Meadows at the Royal English and Yorkshire Shows, the Meetings of the Highland Society of Scotland, and of the Royal Irish and Dublin Societies, as well as the Enniscorthy and Wexford Shows; has been remarkably brilliant; and among the animals for sale (which will comprise the entire Herd, except one Yearling Bull and the Calves of this year), will be found many Prize Winners closely related to the two celebrated Bulls Bolivar (25,649), and Charlie (25,745). The young Stock are chiefly by, and the Cows and Heifers mostly in-calf to, Mr. Carr's pure Booth Bull Prince of the Realm (22,629), who is also included in the Sale.
Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London; or of Mr. MEADOWS, Wexford

Preliminary Announcement.

SALE of MESSRS. MITCHELL'S HERD at ALLOA

MR. JOHN THORNTON will SELL by UNRESERVED AUCTION, on THURSDAY, August 25, at Alloa, by Stirling, N.B., the entire HERD of first-class SHORTHORNS belonging to Messrs Mitchell. It has been bred for many years from some of the best sources; several first class Bulls having been hired from Mr Booth, of Warlaby. In the Showyard the stock has been most successfully exhibited; Middleton and Blue Bell having been well known Prize Cows, the latter won Premiums at the last Birmingham and Smithfield Club Shows.
Further particulars will be given in future Advertisements, and Catalogues duly announced.—London, 15, Langham Place, June 4.

THE LANDS IMPROVEMENT COMPANY.—(Incorporated by Special Acts of Parliament.)
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Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
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The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.
The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.
No investigation of title is required.
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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.
Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.
The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term.
No investigation of title necessary, and no legal expenses incurred.
Application to be made to ARTHUR MILMAN, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

The Agricultural Gazette.
SATURDAY, JUNE 11, 1870.

THE QUESTION is put, in another column. What are the objects of the Royal Agricultural Society of England? It is not difficult to supply the answer. Five thousand of the leading farmers of this country—many of them owners as well as tenants of the land—have for many years banded themselves together for the improvement of the Science, Art, and Business of the Farm. Their purpose is "the perfecting of the system of English Agriculture by the union of Practice and Science, and by the collection and dissemination of facts having reference to the capabilities and cultivation of the soil, the theory of crops, and the improvement of live stock." Their purpose also includes "the gradual perfection of the various operations and implements of husbandry, and the amelioration of the condition of the English labourer." But we need not look about for words or phrases by which to represent the uses of the Agricultural Society of England. They are carefully and explicitly defined in the Charter by which its members are incorporated; which directs them to embody in their Journal agricultural information from all sources, whether already published in books or acquired by correspondence with societies, or by the labours of its members and of men of science. These it directs them to "encourage" in their researches conducted for the improvement whether of farm processes or of implements, or of plants and animals.

It is on this last direction that our correspondent founds his protest. The Council of the Society have refused to "encourage" the men of science to whom the British Association has committed the investigation of the sewage question, which has undoubtedly important agricultural relations. They have refused to copy the example of the Sister Societies in Scotland and Ireland, who have contibuted to the funds which the British Association Committee are accumulating for this research.

For ourselves we think that the English Society ought to be very careful how they refuse counsel from outsiders. They have to thank outsiders for some of the most useful parts of their career. Mr. SIDNEY had insisted on the need of local farm reports long before the Council were induced to issue their commissions of investigation into steam-ploughing, cheese-dairying, and Belgian agriculture, which have filled the most readable pages of recent Journals. And now it is Mr. MASON of Oxfordshire, and not the Royal Agricultural Society of England, whom we have to thank for what promises to be one of the most interesting competitions connected with the ensuing Oxford Show. Let us hope that the award of the prizes thus offered may be early enough announced and definitely enough explained to guide the visitor of the Oxford showyards to what will be the best agricultural lesson of that meeting. No doubt, that definition of the duty of the judges, which declares that the award ought to be made to the farm on which (being conducted in a business-like way) the agricultural visitor shall learn the most for the future improvement of his own occupation, is the correct one. Let the report put this clearly, and point out with precision the lessons which are to be learned upon the prize farms, and then, thanks to the High Sheriff of Oxfordshire, the English Agricultural Society will have a satisfactory answer to our correspondent's question. Its "use" will have been, this year, at any rate, to point out to its members, and to English farmers generally, what good farming is, and where it is to be seen.

It must not be forgotten, however (to return to the letter of our correspondent), that this, like others of the Society's performances, has been virtually the work of outsiders. We think with him that it is a pity they have declined to assist the useful inquiry in which an important body of outsiders—men of science and others—are now engaged, upon a subject of great agricultural importance.

A CORRESPONDENT very naïvely asks how large cattle can be soiled at home in yards? He has no Tares and but little hay, and the cows are in the mowing Grass. He is, in fact, waiting for rain before shutting up the fields hitherto grazed, so that at present he has nothing to feed with. We fear it is not easy to help him. It is not possible to keep cattle, whether large or small, whether in stalls or fields, without food! But, indeed, the experience thus described is too general, and is becoming too serious, for a joke; and anything which will anyhow economise the little cattle food there is ought to be carefully considered. Already, in the first week of June, we see pastures withering and brown and bare. The arable lands are standing the drought better than the meadows. Wheat has not yet suffered materially, though all spring-sown crops are very short. Beans and Peas in full bloom are indeed to be measured by inches. Clover mowing yields everywhere a sorry swathe: and where in the Southern Counties any haymaking has begun, the promise of a crop is miserable in the extreme.

As to economy of food, we doubt whether, when cattle are driven to bite off every blade, any saving is effected by keeping them indoors, and using the scythe to provide them with forage. A very scanty bite of dry grass, with plenty of water, will keep store stock in fair condition. There is, however, considerable help given, both to the live stock and to the fields in which they are being pastured, by bringing them in at mid-day, and giving them a meal of chaff in the feeding yard. We saw the other day a considerable herd of young Shorthorn cattle looking in capital condition notwithstanding the bareness of their pastures. They had been brought into the yard, and were eating with relish the clean Wheat chaff fresh from the threshing machine. This, with access to water, and with such food as they could get in the fields, already bare and burning, had sufficed to keep them.

Now is the time to get seed-beds forward, for transplanting as soon as the weather changes—Cabbages, Kohl Rabi, even Mangel Wurzel, may be thus got ready. A good-sized plant dibbled into suitable land a few weeks hence will bring cattle food to hand sooner than it can be had from seed, sown then. And not only now but long before this, contingencies of this kind ought to be foreseen. The advantages of autumn-sown Vetches and Trifolium become apparent in a spring like this; and the lesson of one year in four or five ought so far to affect the management of every year as that a larger extent ought always to be provided of spring forage crops of these kinds than is expected to be needed. A watered meadow proves in dry seasons, like 1868 and 1870, an invaluable adjunct of the farm; and it is weather like that of the past two months which quickens our anticipations of the good to be realised from sewage irrigation.

—— THE continued drought and its obvious effects on the young corn crops are at length affecting the supplies to the corn market. Holders will not send in their corn; and a short supply on Monday at Mark Lane resulted in a rise of fully 2s. a quarter on the prices of last week. ——It was a dull market on Monday in the Metropolitan Cattle Market, and only the choicest qualities could maintain the prices of last week; all ordinary and inferior stock, both sheep and cattle, was fully 2d. per 8 lb. lower than on the previous Monday.

—— On Wednesday evening the 10th anniversary of the Royal Agricultural Benevolent Institution was held at Willis's Rooms, St. James's, when 150 gentlemen, including the Honduras Minister, Lord SONDES,

Col. LOYD LINDSAY, and other distinguished guests dined together, under the presidency of Lord LYTTON. The object of the Institution is, as our readers well know, to provide pensions for those in distress who have been farmers, their widows, and their unmarried orphan daughters, and to maintain and educate the orphan children of farmers.—Described more particularly the persons eligible for the relief which the Institution affords are farmers of the age of 60 and upwards, being British born subjects, who during 20 consecutive years have cultivated as an exclusive means of support holdings of at least 50 acres, or at rentals of at least £100 per annum, and who by circumstances beyond their own control have become so reduced in circumstances as not to possess an income from all sources exceeding £20 a year. In cases of bodily infirmity resulting from accident, and of such a nature as to disable the candidate from following any occupation as a means of livelihood, the limit of age is reduced to 45 years. The widows and orphans of farmers are eligible for relief under prescribed rules, and subject to the provision that they are the widows and orphans of farmers who have fulfilled the above-mentioned conditions. The CHAIRMAN, in proposing "Prosperity to the Royal Agricultural Institution," expressed his opinion that no charity was entitled to more general support. He dwelt on the great vicissitudes, entirely beyond their own control, to which farmers are exposed, and on the fact that their success is at the root of all commercial prosperity. He regretted that from Ireland, Scotland, and the wealthy district of Lancashire there should be so few subscribers to the funds of the Society, and concluded by advocating strongly its claims to the assistance of the public.—Among the other speeches of the evening was an excellent address by Mr. J. B. BRANDRAM, one of the local secretaries, who contended that more might be done with the income of the Society, and that it was impolitic to fund so large a proportion of their means.—Mr. C. SHAW, jun., in responding for "the Secretary," was able to state that the Institution had prospered since his appointment; and with the entire acquiescence of the meeting he could claim for himself that the anticipations of those who had protested against the appointment of so young a man had entirely failed.—Donations and subscriptions were announced to the amount of over £4000.

—— The Horse Show at the Agricultural Hall, Islington, has been a great attraction during the past week. Our columns are so occupied with more strictly professional agricultural matters that we have room for but a short report of it and the prize list, which will be found in another page. But we cannot resist extracting from the columns of the *Mark Lane Express* the following description of the prize horses in the weight-carrying hunter class, evidently written by a clever and enthusiastic lover of horseflesh :—

"But we are diverging from the 39 articles in horseflesh, who, with Iris and Expectation, are far in advance of last year's lot, headed as they were by the soft, carty-looking St. Clare, and the flashy Harkaway. The latter is much improved, and again tried for honours, together with such prize horses as Tyrconnel, Brian Boru, and Monarch. Then there was that tough old Chicken of Captain Heath's, a hunter of a couple of hundred years ago in form and breed, and who, in his seventeenth year, may be had at 500 gs. Iris, the prize horse at Wetherby, and of the year 1868, and whose wall eye and form now attract as much attention on the walls of the Royal Academy as they do at Islington, came straight away from Fife by rail in a box, and landed at the Hall the over-night—out of the frying-pan into the fire this; for anyone who has tried the rail and the Hall knows that one is hot and the other hotter; so we were not surprised to see so high-couraged a horse fretted away and shrunk. But the Hall is too confined for Iris to show himself to advantage. In fact he is not a circus horse, and was fairly beaten on the tan or sawdust by the grand, square, symmetrical chestnut of Sir Watkin's, a model of a weight-carrying hunter, and a show-horse from head to heel. If his joints are a little gummy what of it? as hunters are not made to look at, and most of them, especially if they are good for anything, bear a memento of some good run. Then that noble sensible-looking head and perfect tail, how vaminitly are they set on, and with what a jaunty way he carries them as he steps away so firm and free, as if the whole place belonged to him and he was on good terms with every one: or should he catch the eye of some crabbing dealer or coper who has not fingered something out of him, he has that honest independent composure that tells the fellow his abuse is useless. But we hope to see Iris and Expectation meet again in the open, either at Oxford or the great Yorkshire meeting, where they will have room on the turf to fight it out, as at Islington the prize has generally gone to the best form or "standstill" horse. The 3d prize, Ironmaster, is a neat horse and does not look sixteen hands and an inch, which is the greatest compliment we can pay him."

—— We learn from the South of Scotland that on the 27th ult. there broke out simultaneously all over Berwickshire and Roxburghshire, a perfect plague of the Turnip flea. In three days they swept off whole fields, which had a beautiful braird all over. In this brief space of time the bright green lines of young Swedes, so pleasing to the eye, totally disappeared, and already an immense breadth has been resown. A fortnight ago there never before was seen so good a braird over so great an acreage at the same date, and already this fair prospect has gone.

—— The *Farmer* calls attention to the relations between country consignors and London consignees at the metropolitan meat markets :—Mr. DEAR, "a well-known cattle food manufacturer at Southampton, had some beasts to sell, and sent them to a salesman who had previously assured him that the beef was 4*s.* 8*d.* per stone. Mr. DEAR sent his animals, and the returns were 6*d.* less per stone than was promised, with a deduction of 19*s.* 3*d.*, on the allegation that the weight invoiced was above the actual quantity. It was proved, however, that the meat had been put in the scales, or on the steelyard, both by Mr. DEAR and the railway company; and both agreed that the correct number of pounds were sent to the seller. Judgment was allowed to go by default; and the Registrar, Mr. THORNDIKE, remarked, on the question of expenses, that 'he would grant the fullest amount possible.' This, it is declared, is not a solitary instance of transactions of the same nature between country consignors and the consignees in the metropolis. The sooner it is put an end to the better, and this action may help towards the desired result. A case of a similar nature took place last week at Crewkerne, with the same result."

—— Lord KINNAIRD has addressed a letter to the Secretary of the Highland and Agricultural Society, asking for the appointment of a small committee of gentlemen who have acted as judges "to consider whether it would not be possible to frame a set of rules for the guidance of judges at their shows, according to points, after the manner in which prizes are accorded in rifle matches." "It might be tried first with the Shorthorn class. Certain points being specified, the judges would have to report their opinion on each individual point, rather than their impression of the merits of the animal generally, and by this means the exhibitors would be satisfied on what grounds their animal was rejected or approved of." Lord KINNAIRD illustrates the need of some such alterations of practice by his own experience of the inaccuracy of judgments as at present conducted. It appears that at the Edinburgh show "the gentlemen had evidently no experience in judging. There was scarcely a decision which was in accordance with the opinion of the many good judges in the yard. I should prefer not bringing my own case forward, but it was so singular and so much to the point, and being naturally better acquainted with my own case than any other, that I must mention it. Mr. YOUNG, the manager for Sir W. STIRLING MAXWELL—and there is not a better judge of Shorthorns in Scotland—volunteered to tell me before the judges went round, that his heifer was fairly beaten by mine; and I will venture to say, though the surprise of those looking on was great, no one could have been more surprised than Mr. YOUNG himself at finding his heifer placed before mine. I may say *ex uno disce omnes*."—We fear his lordship will not get many men to agree with him as to the policy of judging Shorthorn or any other breeding stock by points. Certainly we shall not do so until the following question can be answered :—If the quality of hair be counted as 5, and, say, the colour of the nose as 2, within what limits shall the number vary which is fairly to represent variations in such a thing as health, vitality, energy, or force of character? The differences here vary from 1 to 1000, and will swamp all other considerations whatsoever.

—— We are informed that an exhibition of horses and agricultural implements will be held at Lille (France) from June 22 to June 26. We beg to call the attention of our readers to this fact, and to inform those of them who intend exhibiting that any information they may be in need of as regards the transport of horses and machinery will be readily obtained from Messrs. LEBEAU & Co., Continental agents to the London and North-Western Railway, Great Northern and Midland Railways, 6, Billiter Street, E.C.

OUR LIVE STOCK.

THE OLD MERE HALL catalogue (Knutsford) contains an interesting list of animals for sale on the 13th of next month. The oldest matron of the herd is *Moss Rose*, by MARMADUKE, and out of *Cambridge Rose 6th*, by 3D DUKE OF YORK, and therefore admirably bred. Her character and appearance are well known, and attracted comment at the last Killhow sale, when she was purchased by her present owner, Mr. D. R. Davies, for 400 gs. She is due to calve on the 10th of this month to GRAND DUKE 10TH, the Duke of Devonshire's purchase at Willis's Rooms when the Grand Duchesses were sold. *Moss Rose 2d*, by 4TH DUKE OF THORNDALE, and ROYAL CHESTER, by GRAND DUKE 10TH, are both from this excellent cow, and will no doubt attract a lively competition. *Moss Rose 2d* has grown into the fine healthy animal she promised to become when a calf at Preston Hall. She has just returned from a visit to Wetherby. *Cleopatra 5th* is a rich roan fine massive cow, a good breeder and heavy milker, as are most of her tribe. She is by 9TH DUKE OF OXFORD, and of the *Cleopatra* by EARL OF DUBLIN family. Several other members of the same tribe, as for instance *Cleopatra 9th*, by LORD OXFORD (20,214), and *Cleopatras 12th* to 15*th*, one of which is by 3D DUKE OF CLARO, will also be offered. *Harmony*, by CHERRY DUKE 3D (15,673), has much of the Grand Duchess character in her appearance, and was greatly admired at the Milcote sale, where her dam and her daughter were purchased for Her Majesty's herd. Lot 4, *Wellingtonia*, by 3D DUKE OF THORNDALE, is a Bates' Waterloo cow, with an abundant coat of hair, and possessed of a pleasing appearance. She calved a fine roan bull on the 19th ult., by 12TH DUKE OF THORNDALE. *Charlotte 4th*, by DUKE OF KNOWLEMERE (19,623), is a thick-made cow of the *Crummy* by COTHERSTONE sort, and was the winner of the 1st prize at the Plymouth meeting of the Royal Agricultural Society, 1865. She has a fine head and good forehead, with well sprung ribs, and is the mother of two heifers and a bull, all well got. The next lot is *Candidate's Duchess*, by Captain Gunter's Duchess bull DUKE OF WHARFDALE (19,648), and otherwise very well bred. She is a good cow, and the mother of a heifer, of thriving appearance, by GRAND DUKE OF ESSEX, and a young bull by GARIBALDI (17,919). *Rose of Thorndale 2d*, by 2D DUKE OF THORNDALE (17,748), comes of the *Garland* and *Moss Rose* by EMPEROR family, and is a very good looking cow, and the mother of four nice cows and heifers and a yearling bull. Among the bulls there are some good and useful animals, but the son of *Moss Rose*, ROYAL CHESTER, will be probably more sought after. GRAND DUKE OF ESSEX 4TH is by GRAND DUKE 4TH, and of the Lady Bates family. He was purchased at the Havering Park sale, when exactly one year old, for 180 gs.

—— In our advertising columns will be seen a notice of a Shorthorn bull offered for sale or hire by the Earl of Zetland. This bull, CYNTHIUS (25,864), is half-brother to LORD COBHAM (20,164), well known as the sire of much valuable stock. He was bred at Aske by the Earl of Zetland, and is by BOLTON (23,440), and from *Cynthia* by APOLLO (9899), and previously descended from *Dido* by WALLACE, WELLINGTON, MARMION, LAYTON, and FAVOURITE (252). His pedigree is, therefore, excellent, and if he proves as good a stock-getter as his half-brother he will be a truly useful animal. CYNTHIUS is white, and is two years old in August.

—— Five hundred calves are at present being weaned at Buscot Park by Mr. Campbell. Far too many together, some of our readers may rejoin; but whether the criticism be just or not can only be proved by the result. Certainly Buscot presents facilities for a work of this kind, possessed by few farmers. It is an estate of well nigh 4000 acres, all in the hands of the spirited owner. Mr. Campbell's agricultural operations would, if described at length, fill many columns of this journal. At present we wish to say a few words about his calves. First, they receive very little milk but are fed first upon milk, and gradually changed when about a fortnight old on to a diet of gruel. At present, Indian meal and a little linseed-cake ground fine are the feeding materials used, and the general method adopted is based upon the same principle as was enumerated by Mr. Henry Ruck before the Cirencester Chamber of Agriculture three years ago. The leading idea, both at Buscot and on Mr. H. Ruck's farm, was to wean calves with the smallest possible amount of milk, and Mr. Ruck has not hesitated to state, that any number of calves may be reared on his principle, say after the first fortnight, with little or no milk at all. Indian-corn meal is the staple of the gruel used at Buscot, and this is diluted with the requisite amount of water, and given in buckets to the calves at the temperature of new milk. Mr. Ruck's method is rather more complicated, but it must be remembered that young animals will repay extra trouble and attention, and that a method of feeding may be so simple as to become monotonous to the animal and scarcely fitted to the special requirements of individuals. Mr. Ruck's plan may be thus described :—7 lb. of finely ground linseed-cake is dissolved in two gallons of hot water, and to this is added two gallons of hay tea; 7 lb. of mixed meal, consisting of equal parts of wheat, barley, oat, and bean-meal, is also added with two gallons of water. This mixture, which may be described as 7 lb. of linseed-cake ground fine, 7 lb. of mixed meal, 2 gallons of hay tea, 4 gallons of hot water, is given to the calves as follows :—Two quarts in the morning, further diluted with 2 quarts of water, and 2 quarts mixed with 2 quarts of water at night. Upon this gruel the calves thrive well, and are weaned at 12 weeks old, having cost not more than from 1*s.* 3*d.* to 1*s.* 6*d.* per head per week. Mr. Ruck is fully convinced of the practical character of the method of weaning calves just described, but insists upon the importance of strict personal supervision and attention to the wants and peculiarities of appetite of each calf.

POULTRY.

IT is neither necessary nor desirable, says Mrs. F. Somerville, to go into the market for expensive feeding stuffs for poultry; still, there are several kinds of food not grown upon the farm which yet are cheap and useful in the rearing of young poultry, or putting in condition birds intended for exhibition. One of the cheapest of these, if properly prepared, is rice, if it can be bought at 1½*d.* per lb., or even less. Preference should be given to small grain, or fine rice, which should be prepared in the following manner. To 6 quarts of boiling water add 2 lb. of rice, and let boil for 10 or 15 minutes, according to size of grain; when sufficiently boiled, pour it into a hair-sieve, and when cold, mix it with as much oat or barley

meal as will, when stirred lightly round with hand, give it the appearance of small well-dusted pills; each grain being then separate it will be very convenient for, and is greedily devoured by, young birds, and being very digestible, is an invaluable food for them. Another kind of food for young birds is prepared by boiling two or three eggs until quite hard; afterwards chop fine, adding two or three handfuls of stale bread-crumbs: mix well together, so that the one cannot be eaten without the other. This may be thought expensive food; but as the consumption of young birds is at first very small, a little extra keep is not thrown away upon them; the young birds will under this forcing system grow rapidly, and repay you at no distant date. Another description of food is Indian and barley meal, in equal quantities, slaked with boiling water or milk, and served cold. It cannot be surpassed as food for young chickens, and answers admirably given alternately with the rice and egg prepared as aforesaid. The youngest chickens should be fed sparingly every two hours throughout the day.

PRESENT APPEARANCE OF THE CROPS.

AYRSHIRE: Wheat, early-sown (of which there is little in this neighbourhood), strong and healthy; spring-sown nearly all resown, and in many places second sowing of Wheat or Oats not looking well. Oats generally looking very promising and forward; have not been so regularly good for some years. Barley also looks very healthy and promising. Hay must now be generally a heavy crop. Potatos look well and healthy everywhere. With the exception of spring-sown Wheat, the crops generally in this neighbourhood have seldom looked so well at beginning of June. *And. W. Ralston, Loggs, by Ayr.*

BUCKS—*Vale of Aylesbury:* Wheat healthy-looking and strong, but very thin on the ground. Oats thin and poor, want rain badly. Barley good plant, but getting yellow and spindling. Beans (winter) very short and bad; ditto spring, average. Peas below average. Clovers very short and poor, not half a crop. Mangels fair plant, drying up. Swedes, as soon as up fly destroys them. Grass, the worst crop known for many years, hundreds of acres intended for mowing broken into for grazing; great want of rain everywhere. *J. K. Fowler, Prebendal Farms, Aylesbury.*

DEVONSHIRE: As to the corn crops of this immediate neighbourhood, I beg to say the prospects are not good, from the extreme dry weather, having had only one day's rain (on May 11) and a shower (on Wednesday last) since February. The plant of Wheat is very thin indeed, a large quantity of the plant killed by the frost, and late sown very plain. Early-sown Barley very good, late sown-plain. Oat crop similar to the Barley: a slight crop of straw in all cases. The crop of Clover-grass is the lightest I have known for many years. The meadows are suffering from want of rain, but there is plenty of time for a good crop if we have rain shortly. Mangel Wurzel very good. Not many Turnips sown yet. *R. W. Pollard, Blaydon, Paignton, Devon.*

GLOUCESTERSHIRE: Wheat has very much improved in colour since the beautiful rain which fell on May 11, but there will nevertheless be a deficiency of fully one-third upon an average in this neighbourhood; some of the early-sown is now coming into ear, but much of it will come out very irregular, and a fortnight later than usual. Early-sown Barley is very promising, and coming into ear; late-sown much in want of rain. Oats are not extensively grown hereabouts; what few acres there are look pretty well. Winter Beans are very thin in plant, and also very short in the haulm, being about as many inches high this year as they were feet last; some farmers have filled up with spring Beans, some with Peas, &c. Spring Beans are looking very well, and at present free from blight. Peas are generally good, and with a genial rain soon would be a full average crop. Winter Vetches are very thin and late; spring-sown require rain, otherwise a good plant. Potatos are looking very promising at present; there is a full average breadth planted. Mangels have come up very regularly; owing to the extraordinary fine tilth, nearly every seed grew, and grows slowly in spite of the drought. Early sown Swedes are up, but there is great difficulty in keeping off the fly, which is unusually troublesome, but by frequent dustings with a mixture of road dust and gas-lime when the dew is upon the leaf we have hitherto saved them. The Clover crop is very various in this neighbourhood; we are now busy cutting, in hopes that there may be a chance of cutting a second time, or our prospects of hay next winter are very doubtful, for the English hay threatens to be almost a failure in this district; there is not enough Grass at present (except upon some of the very best meadow land) to cover the points of the mowing-machine. *John Watts, Whitfield Farm, Berkeley, June 6.*

NORTHAMPTON: Can any of your more experienced readers inform me through your valuable columns, 1st, Why does the Wheat look so bad after Clover this season more than after any other crop, as it generally does best after Clover? 2d, What makes the Barley grow in bunches about the field? the bunches look a good colour and are much higher than the rest of the crop, which begins to look sickly; it is not where the sheep troughs have stood or where the Swede heaps have been. I have inquired of several practical farmers, and none can give me a satisfactory answer. *A Young Farmer B. B.*

NORTHUMBERLAND: Wheat on my own farm is looking well—a full plant and good colour. This, however, is not general, and especially on the strong Wheat soils, where the plant is thin; in many cases not half a crop, and in many more ploughed down and sown with Barley. Barley is generally looking well, short but healthy, and Oats also; all needing rain. Beans and Peas, few grown. Seeds thin and short, and too far forward for rain to make much impression on the first cutting. Old land hay short, but a good soaking rain would make a crop of it still. Potatos looking well, and growing fast. Turnips, a very poor prospect for a crop unless we have rain in a day or two; where a plant has been got it is much damaged by the flea. *Thomas P. Dods, Anick Grainge, Hexham, May 6.*

WORCESTERSHIRE: Everything in this neighbourhood, even Wheat, is suffering from lack of rain. Straw of all kinds must be very short, and, from present appearances, I should say that the crop of corn of all sorts must be far below an average. Hay not half a crop. Mangels alone are looking as well as usual. *C. Randell.*

YORKSHIRE: I beg to say that autumn-sown Wheat upon good land is looking well, and promises to be a good crop, but all spring-sown Wheat and Oats and Barley, which had been looking well up to a short time ago, are so much affected by the continued drought that they will be very light indeed; each day they continue to get less, so that I expect we shall have the lightest crop of each description of grain we have had for some years, according to the present appearance. Turnips in general, in this district, with few exceptions, have been taken off by the fly, and will have to be sown over. With regard to seeds and pastures, they are nearly all burnt off, and the hay crop will be very light, and unless rain should come in a few days, cutting will have to commence next week to save the little Grass there is from burning away. *John Outhwaite, Bainesse, Catterick.*

WOOLSTON FARM AGREEMENTS.

PAY YOUR RENT, AND KEEP YOUR LAND CLEAN.

MR. SMITH, at p. 747, says, "Roots are bought and sold, and the average price, including carting away, may be put at £1 per ton. I showed plainly what I put their value at—5*s.* per ton as the value of the manure, and 6*s.* as the eating value; total value, 11*s.* per ton. He ('G. A. H.') fixes their value at 10*s.* per ton." Now I beg very distinctly to say, that "G. A. H." did not fix their value at 10*s.* per ton. I simply said I should be very glad indeed if I could get 10*s.* per ton for every ton of roots I grew. Mr. Smith does not seem to know the difference between buying and selling. I should be very glad to sell at 10*s.* per ton, but I should be very sorry indeed to buy at any such price. Will Mr. Smith buy some roots here at 10*s.* per ton? I will be very glad to give him 2000 tons of Swedes and yellow Turnips next November and December, put into carts on a good hard road, at the price of 10*s.* per ton.

I would like to know how Mr. Smith fixes upon this value of 5*s.* per ton for manure. Is it drawn from his own experience, or is it that he had been reading the Table Mr. Lawes drew up of the value of manure obtained by the consumption of 1 ton each of various substances? I find in that Table Mangel put down at 5*s.* 3*d.*, and Swedes at 4*s.* 3*d.* No doubt Woolston is a grand farm for roots, and Mr. Smith has had a deal of experience in them; and as he is such a very warm admirer of the Tiptree system of stall-feeding, and keeps such very accurate accounts, he is able to tell to a penny the value of roots for manure.

When Mr. Smith sets himself up to lecture the landowners of England, and to tell them that their farm agreements are a mistake from beginning to end, that they are drawn up in ignorance and founded on prejudice, an injury to themselves, and a robbery of their tenants, it behoves him to show his diploma. Let Mr. Smith show that he is a man fitted to pass judgment on such things. He presumes to fix 5*s.* as the value of the manure to be obtained by the consumption of 1 ton of roots, that is to say, Turnips, Swedes, or Mangel. Now, is he fitted by experience or by a scientific education to fix authoritatively the manure value of any article? There are only two conceivable ways for doing this: the one is by actual experiment, carried on through a long period of years, and most accurately performed, the other is by chemical analysis. Has Mr. Smith ever done either? Has he carried out an actual experiment with Turnips, or Swedes, or Mangel? and has he accurately noted the results? And if he has not, as we have every reason to suppose he has not, then is he fitted by education and practice to carry out a chemical analysis? If he be not possessed of this superior knowledge, what right, then, has he to lecture in the way he does the landowners of England about their way of managing their land? and, above all, what right has he to talk of a respectable body of men—the land agents—in such terms as the following?—"Here is Mr. Lawes taking up the cry of the old hound, the land agent, who, in everything he does, tries to please the master who pays him, and so in all agreements he puts in this stupid clause" (p. 577); and again at p. 747, "so they send John Land-agent (who always stands ready to do any dirty work) to assess their lands some hundreds of pounds higher." These are pretty terms for Mr. Smith to use about such men. I have a very strong idea that the land agents of England know more about farming, both practically and scientifically, than Mr. Smith does; and I have a still stronger idea that they are much better fitted by education and by experience to fix the value of land, and to point out safe rules for its management, than Mr. Smith is.

When Mr. Smith begins to talk about trade, and says "a sleeping partner's name in trade is generally valuable," it is plain he knows nothing about it. The sleeping partner's name never appears, and the very term "sleeping partner" might have shown him that. As to a man "who has worked hard, established a flourishing trade, and whose name is worth money," such a man seldom becomes a sleeping partner. If he leaves his name behind, and ceases to be a partner, he is certainly not a sleeping partner; and he leaves his name either for a money consideration, or out of goodwill towards his successors; but if he remains a partner Mr. Smith may feel assured he does not sleep. When Mr. Smith tells me that "trade and farming are two things, and very distinct ones too," he does not know what he is writing about. Farming is as distinctly a "trade" as any trade Mr. Smith can name, and it is a trade which takes much longer to learn than most trades.

Farming carried on as Mr. Smith carries it on, and recommends it to be carried on, is "huxtering;" but farming carried on in the way in which the well-educated scientific practical farmers of the present day carry it on is a trade of the highest class, and which requires great skill, great tact, great judgment, much experience, and great knowledge, for it is the two businesses of a manufacturer and a merchant combined. Mr. Smith recommends the farmers of England to buy no artificial manure, for fear that their landlords might reap some benefit out of it from its enriching the land they farm. Even though it leaves an excellent profit to themselves over and above this enrichment of the land, they are not to buy it, unless their landlords will agree to pay them for the supposed value left in the land. Now this is the true spirit of a "huxter," who expects the article he sells to be always sold at the highest possible price, and to be forthwith consumed, and who would be cut to the heart if he thought any one else made a single penny of profit out of any article he had ever parted with.

But although Mr. Smith puts this forward as his reason for advising the farmers of England not to buy artificial manure, I do not think it is the true reason. I believe that at least he "funks" it; he is afraid it will not really pay to use it. If it were really the fear of a landlord grasping at his tenant's improvements, Mr. Smith himself can have had no such fear. He has been a yeoman, farming his own land for 20 years or so, and therefore has not had hanging over his head the terror of a grasping landlord sending in a land agent to revalue the farm, in order to appropriate to himself his tenant's improvements. Well, then, will Mr. Smith tell how much he has spent in artificial manure and bought food during the last 20 years? He has had 112 acres of land in hand, and I suppose we may safely presume it to be worth at least £2 an acre to rent, or £224 per annum. Has he, then, spent an amount equal to two or three or four rents each year in artificial manure and bought food? If he has not, then I tell him he is behind many a tenant-farmer, for in East Lothian (if I am rightly informed by a gentleman, a tenant-farmer there, whom I happen to know) it is by no means an uncommon thing for a tenant to spend in manure and bought food two or three or four times as much as his rent comes to, and yet rents in East Lothian are a great deal more than £2 per acre.

But now let me refer to another bit of Mr. Smith's rhodomontade. "Pay your rent and keep your land clean," saith Mr. Smith, is all the agreement that any landlord needs to have with any tenant. How very clever,—what a genius Mr. Smith must be! If brevity be the soul of wit, surely Mr. Smith would make the very wittiest of estate managers. Pay your rent and keep your land clean. "A tenant may ruin himself but he cannot ruin a good farm if he keeps it clean—that is my point (saith Mr. Smith), that it shall be kept clean. He may crop and sell as he likes, growing less in quantity yearly, from which he must pay rent, &c., and his labour account cannot decrease, for his land is to be kept clean, therefore he would soon become poor, but his land would not be ruined, for he gets nothing out of it." Is the man who writes all this in his sober senses? The land is to be brought down to the point at which it will grow nothing, and yet Mr. Smith tells us the farm is not ruined! But Mr. Smith goes on thus—"Let him feed it a bit and it will feed him." Ay, Mr. Smith, there is the rub—let him feed it a bit; but who is to feed it—the landlord or the new tenant? If the new tenant is to feed it, do you suppose the new tenant will be fool enough to pay the old rent for it?—and if he gets less than the old rent has the landlord been robbed, or has he not? The land has been kept clean, but it is no

longer worth the old rent, for it will produce nothing, and the farm has literally been ruined. Either the landlord or a new tenant must make a heavy outlay to restore it to fertility. So much for Mr. Smith's silly maxim, "Pay your rent and keep your land clean."

The cleanest bit of land I ever saw was a long strip of sand close to the seashore at Portobello, near Edinburgh. About 30 years ago there was not a plant of any sort or description upon it except here and there a few scattered roots of short benty Grass, the common Grass which is found along the sandy links of the east coast of Scotland. This land was clean, because, being pure sand, it had nothing in it fit to sustain vegetable life. The sewage of Edinburgh, however, was turned on to it, or rather what remained of the sewage after it had passed over a long series of irrigated meadows that lie between Edinburgh and Portobello, and in a very few years this piece of worthless land became a rich green carpet. Suppose, now, a tenant were, under Mr. Smith's silly form of agreement, to get possession of that land, and, after turning off the sewage, were to mow it as long as there was anything to mow, and then in the dry weather chose, out of spite, to plough down the Grass roots 12 inches deep, bringing up the pure sand again: the land would still be clean, the tenant would have kept to his agreement, but what would be its value? At this moment it is worth £20 an acre of annual rent, but the moment it was ploughed up it would not be worth 20 pence. Yet this great loss might be laid upon the landlord if Mr. Smith's cuckoo cry, "Pay your rent and keep your land clean," were the sole agreement between landlord and tenant.

I know another instance of a gentleman who has an estate near Malahide, in the county of Dublin. A very large portion of it is in his own hands, and is, to all appearance, pure sea sand, but by dint of heavy manuring, bringing out dung from Dublin, it has been brought into a high state of fertility, and grows excellent crops of Potatos, Carrots, Turnips, Barley, Oats, and Rye-grass. If, however, the manuring be discontinued it runs rapidly down in condition, for a very large portion of the produce (Potatos, Carrots, and Barley) is sent into the Dublin markets. Now, suppose this gentleman were to let this land on Mr. Smith's plan, "Pay your rent and keep your land clean," three or four years would utterly exhaust it if no dung were brought back. The tenant would not ruin himself, on the contrary he would make a great profit, for there is a good supply of manure now in it which would bring two or three very fair crops, and it most certainly would not grow a weed all the time. As soon as it ceased to pay for cultivation, he could give it back to his landlord not worth one-fourth part of the rent it is worth at present, and yet he would have stuck manfully to his agreement, "Pay your rent and keep your land clean."

Pay your rent, and keep your land clean! Why the man must be a born idiot who could seriously propose such a maxim as sufficient for a farm agreement. Rich land badly farmed produces the greatest amount of weeds, the poorest land in the kingdom is the cleanest. Let Mr. Smith go to a dry grouse moor in Scotland, and he will see miles upon miles of land upon which there is only one plant—Heather. But Heather is no weed, and land which grows only one plant is most undoubtedly clean. In places here and there you will find a shepherd's "clearing," a spot which has been rendered fertile by hard labour and manure, and upon which fair crops grow. Now suppose a landlord had cleared a thousand acres of such land, and by a heavy outlay upon it had created a good and useful farm. That farm can only be kept in fertility by restoring to it every atom of manure that it naturally produces; and if any grain is sold away from it, the land will fall rapidly out of condition unless some manure is brought in to replace what you take away. Suppose the owner of that farm were silly enough to adopt Mr. Smith's silly rule, "Pay your rent and keep your land clean," and were to let it on those conditions for a few years to the owner of an adjoining piece of moorland; and suppose that tenant were to carry away every year every atom of grain and straw and hay and roots, and were to consume them with sheep and cattle upon his own adjoining moorland and not upon the rented land. He would not have broken his agreement in any way, and yet in four or five years he would have converted his own barren moor into a fertile farm, and could then restore the rented land like a sucked orange to its owner, clean, no doubt, but so poor that it would hardly even grow the natural plant of the country, Heather.

Pay your rent and keep your land clean! Ah! Mr. Smith, you made one little mistake: you ought to have written, "Pay your rent and keep your land fertile;" but that word "fertile" involves a great deal, and necessitates those "stupid" clauses which intelligent land agents take good care to insert in any leases or agreements they have to draw.

Pay your rent and keep your land clean! Was there ever a more silly sentence penned by any one? And who is he who penned it? Why the man who sets himself up to be the Mentor of the landowners of England, and who presumes, not only to read them a lecture on their management of their estates, but also has the hardihood to talk of their land agents as men "who always stand ready to do any dirty work!"

Pay your rent and keep your land clean! Let the words be stereotyped, but, printer, take care to put a "full heading" at top, in the very largest of letters, and let that heading be "Smith's Folly." *G. A. H.*

FARM BUILDINGS.

VIII. THE BARTON HOMESTEAD.

[We have again to thank Messrs. Longmans for the loan of the wood engravings used in their work on the Prince Consort's Farm.]

THE Barton Homestead (fig. 149) is hidden from Osborne House by its sunken site, and by plantations along the top of it. The roadway to the homestead lying thus along the foot of an abrupt bank is at the top of the surface more gradually sloping from it, on which is a series of east and west rows of buildings, and of yards connected by a higher cross line of barns and threshing house, and at their western end the rickyard stands. Coming to it from the farmhouse, you pass between a double row of shedding, set apart on one side as a cottage, coach-house, &c., and on the other as implement-shed, nag-stable, &c. A little study of the plan and of the index upon it will show how easy is the communication in these buildings between those parts which are connected in use; and this, as saving labour in the management of stock and produce, for whose shelter they are designed, is the true key to the merit of farm buildings. The rickyard and root stores lie on the further (western) side of the threshing-barn and turnip-house, so that corn is easily brought to the threshing-machine and roots to the turnip-cutter. These roots are cut by an oscillating turnip-cutter, and filled into a truck upon a tramroad, by which all kinds of food are easily conveyed to their destination in the feeding stable, and boxes on either side of it. The straw-barn, which is of course close to the threshing-machine, is also close to the yard where straw is needed—to this central roadway down the feeding house where it is also needed—and to the roadway between it and the stables. The labour of carriage is here also, therefore, reduced to a minimum. It is also close to the chaff-house, passing thither through a chaff-cutter, by which it is reduced either to small chaff for mixture with food, or to coarser chaff for litter in the cattle boxes. The machinery is well arranged. From the fixed engine, erected by Messrs. Easton & Amos, shafting, fixed wherever necessary, conveys power and motion to Clayton's threshing-machine and corn-elevator, Garrett's chaff-cutter, Burgess and Key's turnip-cutter, Biddell's cake-crusher, Ransome's corn-crusher, and Hughes' millstone—on one side, and on the other the Parson's saw bench or the carpenter's bench close by. In the implement shed are collected, when not in use, the best farm implements of the day.

The accommodation for stock in the buildings is exceedingly good. A 13-stall stable, with two loose boxes at one end, and harness-room at the other, provides accommodation for the horses of the farm. The stalls, 6½ feet wide, are provided with a rack on one side on the level of the manger, for chaff, hay, or green food, a manger for corn, and a small tank for water in enamelled iron. The whole of the stabling and cattle-sheds are well supplied with water by natural gravitation from a spring and pond outside, and all are drained to a tank as shown in the map, to which the open yards also have their surplus water directed, and whence it is taken at intervals by water-carts to the pasture land.

The central line of buildings contain a row of accommodation for cows and cattle—boxes or stalls or calf-pens—on either side of a gangway furnished, as already said, with a tramway. Parallel with this, on the other side of intervening yards, is other shedding for the yard-fed cattle not yet put up to fatten; and on the southern and eastern sides of the eastern yard, facing respectively south and west, are the well-arranged pig-sties. In the eastern yard, too, are bulls' houses, near the cow-byre, and boiling-house close by the piggeries; and below the eastern yard, on the southern side of it, is a sheep-yard, and shedding used as a lambing-house. There is thus ample accommodation for the machinery and the horse-power of the farm, for the cows and fatting and store cattle, and for the pigs and sheep. As a last illustration of the fitness of the arrangements for the economy of labour, we may point out the granary, built on arched and fire-proof floor, over the cart-sheds, thus enabling the easy loading of the carts for market.

The live stock of the farm included, when we visited it some years ago, 13 working horses, chiefly Clydesdales, three or four mares, and a pure Clydesdale stallion, brother to the prize filly shown by the Prince Consort at the Leeds show, and son of the prize stallion shown at the first Chelmsford meeting of the Royal Agricultural Society. Three or four mares are bred from every year, so that of all ages there are generally 24 to 30 horses. Twelve to 16 Alderney cows, and a bull of the same breed, are kept. The dairy is within the farmhouse; a good example of simplicity and cleanliness of arrangement and management. Eight breeding sows of the black Sussex breed are kept, and their produce are for the most part fattened as large porkers, being killed when from four to eight scores a-piece. The stock at any one time thus generally comprises 100 pigs, or thereabouts, of various ages. Besides the cows, and their produce reared for breeding purposes, some 30 or 40 Galloways are purchased every year at the Barnet fair, fed in the yards on straw and Turnips during the first winter, turned out to the pastures during summer, and taken into the boxes and feeding stalls during the following winter, and fattened off as fast as possible on Turnips, Swedes, Mangels, hay, cake, and meal. In feeding, excepting in the case of the pigs, no cooking of food is practised. Hay and straw and roots are cut into chaff and slices, and corn and cake are crushed and ground; but the food is given in an uncooked state. A flock of 40 to 100 Dorset ewes, in lamb by a black-faced ram, is purchased every autumn. Lambing commences before Christmas. Both ewes and lambs, fed first on Turnips brought to them in the shed and pastures, are at length folded in the Turnip field, receiving there, the ewes about half a pound of oilcake apiece, and a few Peas daily, the lambs having liberty beyond the fold, and receiving, in addition to the Turnips, as many Peas as they choose to eat; both thus fattening together. The Dorset lambs, thus fed, have been this spring worth 38*s.* to 40*s.* apiece in the months of April and May.

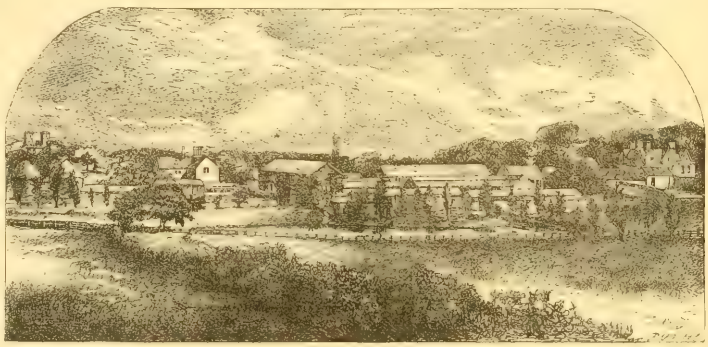

FIG. 149. SKETCH OF THE BARTON HOMESTEAD.

A flock of 300 Southdown ewes is also kept, and their produce kept on, and fattened and sold, at 20 or 24 months old. The stock of all kinds which has a place in the Michaelmas inventory, when it is as low as at any time during the year, thus varies from 800 to 1000 head.

Let us now take a walk across the farm. It includes 820 acres, of which 412 are permanent pasture, and 13 waste and wood. The cropping of the remainder at the time of our visit was as follows:—Wheat, 86 acres; Barley, 44; Oats, 64; Beans and Peas, 26; Vetches and Rape, 24; Potatos, 2; Turnips, 88; Carrots and Cabbages, 3; Mangel Wurzel, 8; Clover, 50—the corn crops thus amounting to 220 acres, and the green crops to 175. The cropping next year was as follows:—Wheat, 97 acres; Barley, 61; Oats, 46; Clover and Grass, 54; Trifolium, 3; Mangel Wurzel, 16; Turnips, 78; Cabbages and Potatos, 3; Vetches, 25; Peas, 10; fallow, 6.

The arable fields of the Barton Farm are most at the further end of the farm: the rest of that portion of the estate, with the exception of the two outlying fields in the extreme north of it, which are also plough-land, being

pasture. Notwithstanding discrepancies of acreage, the rotation adopted is essentially a four-course series. When, however, one corn crop follows another, as Oats or Barley after Wheat, a dressing of guano is given. Since the purchase of the estate an immense improvement has been effected in the land, not only by

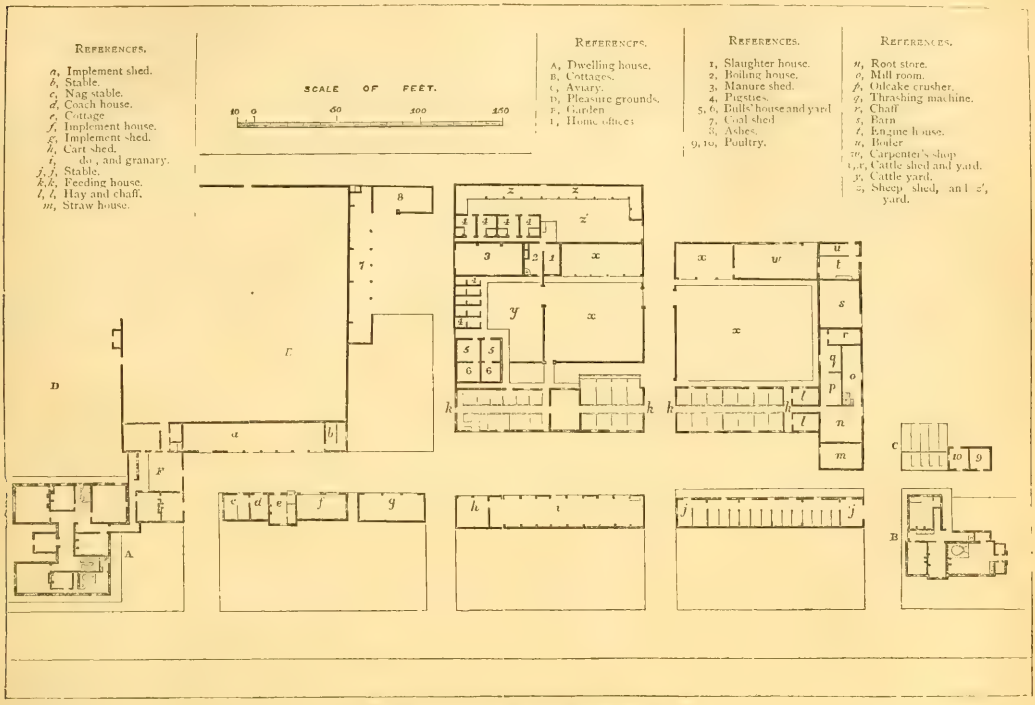

FIG. 150.—PLAN OF BARTON HOMESTEAD.

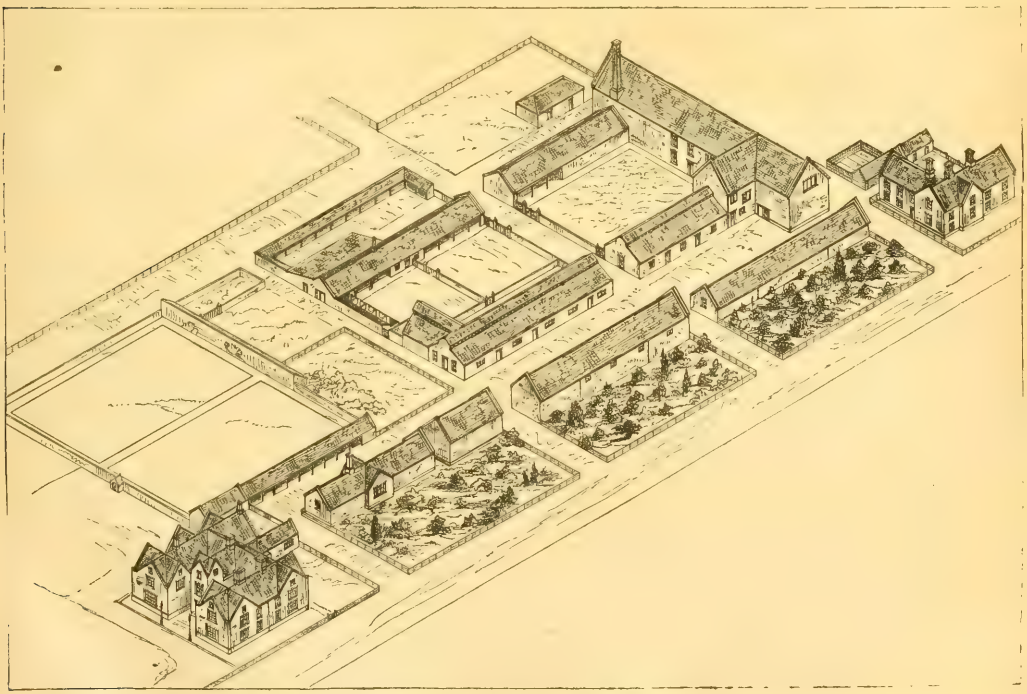

FIG. 151. ISOMETRICAL PERSPECTIVE: BARTON HOMESTEAD.

tillage and drainage, but of course also by the purchase of artificial and other manures, and of cattle food. Less is done in this way now than in former years, when it was more needed. The produce of the crops has thus been raised to from 4 to 5 quarters per acre of Wheat, 4½ to 6 quarters of Barley, and from 5 to 7 or 8 of Oats. A few acres of Belgian Carrots, for dairy cows, and of Cabbages, which yield most useful autumn produce, are generally grown. And 5 or 6 acres of

corn stubble are sown each autumn with the Trifolium incarnatum, yielding most useful early spring feed for the stalls.

White Mustard is also occasionally grown as a stolen or catch crop. The Swedish Turnips, of which there was, on the occasion of our last visit, an unusual extent, are grown either in rows sown by the Suffolk drill upon the flat, or by the special sowing machine, on the raised drill system adopted in Scotland; and on this plan of cultivation, as the crop then followed a failing Mangel plant, there were several fields. The crop was remarkably full and even, not a blank being visible in the planting, and a good average size prevailing through the fields. In general, superphosphate and ashes are depended on for a crop of Swedes. The dung of the boxes and yards is applied upon the Clover for the Wheat crop, and for Mangels, Cabbage, and Carrots. A large quantity of manure is thus provided, and, with the artificial aids already named, the farm is growing in fertility. The manure from the royal mews is also purchased for the farm—a clear addition to the land, as all the hay and straw of the farm is consumed in the courts and buildings of the farm itself.

On walking over the fields you are struck with the excellence of the roads and fences. These last are almost entirely new, *i. e.*, made since the purchase of the estate; they were planted a single row of Thorns in lines prepared carefully for them by deep digging and manuring, and they have since been kept perfectly clean and well trimmed—one man having the sole duty all round the year of looking after them. They are now a good sheep fence, occupying not more than 2 feet width, and being about 3 feet or 3½ feet high. The land is cultivated close up to them, and the fields are clean. A mixture of Holly with Thorn is added, with great success, wherever the fence runs under trees, in which case Thorn alone will not prosper.

PAPER MAKING MATERIALS.

Can a Farmer afford to Grow them?

Mr. Charles Cowan, who is an experienced paper-maker, says that Esparto-grass, which now sells at £10, was originally introduced at £5 per ton, delivered at the port of import, and that at that price for many years a very large quantity of it was used, and that if a similar material could be supplied by the farmers of this country, at from £5 to £6 per ton, large quantities of it would be consumed by paper-makers. He says that the common Italian Rye-grass and Timothy-grass would both be "better adapted" for paper-making, and would cost less in the boiling process; consequently it seems fair to assume that they would both be worth more than Esparto, that is to say, worth more than £5 to £6 per ton. We may, then, safely assume that Rye-grass hay would be worth to a paper-maker £6 per ton, put on railway, or a little more if delivered at the manufactory. Now, it seems to me that if a farmer could be assured of £6 per ton for Rye-grass hay it would pay him to grow it, and it would pay the landlord to allow it to be sold if the farmer brought back 40*s.* worth of artificial manure for each ton of hay sent off the farm. Mr. Lawes values the manure from a ton of hay at 30*s.* 6*d.*; so that 40*s.* worth returned would leave the land better than if it only had the hay manure returned to it. And £4 per ton, which would be the farmer's nett price, certainly seems to me more than any farmer could make by feeding Rye-grass hay. Supposing the Rye-grass to be cut just as it came into full flower, the exhaustion to the land would be very little if the theory be true that it is the perfecting of the seed which exhausts; and as Rye-grass is a very early plant, the quantity of after-grass would be very great. Thirty cwt. of hay from the acre would leave (deducting manure) £6, minus the cost of cutting, saving, and delivering at the nearest station; or, allowing those items to cost £1, he would get a nett profit of £5 per acre from his hay, and have all the after-grass and the wintering.

Mr. Lawes has shown that land can be kept "in condition" quite as well with artificial manure as with farmyard dung. He experimented for 14 years on two plots of permanent meadow land, mowing it regularly each year, and the average produce, where farmyard manure was applied, was 43 cwt.; while the average produce of the other plot, to which artificial manure was applied, was 45 cwt. of hay yearly.

Now, if we reckon an acre of Italian Rye-grass mown early to produce 30 cwt. of hay the first year, and the same quantity the second year, that makes 3 tons in two years; and the quantity of manure to be brought back (at the rate of 40*s.* worth of artificial manure for each ton of hay) would be £6 worth, or £3 each year for each acre. Of course the exact species of manure to be brought would be varied, according to the soil and situation, but over a great extent of soils a dressing of lime, salt, superphosphate, nitrate of soda, and kainite (native potash), would answer very well, at all events for several rotations. But the following are fair average prices for these articles laid down at the farmyard. Of course at some farms they might be a little cheaper, at others a little dearer:—

	Per cwt.—*s.*	*d.*
Lime	1	0
Salt, clean	1	0
Superphosphate, 26 per cent. soluble	5	6
Nitrate of soda, to per cent. refraction	7½	0
Kainite (potash salt)	4	0

and £3 expended in them would give to each acre the following dressing:—

	Cwt.	*s.*	*d.*
Lime	20½	20	6
Salt	2	2	0
Superphosphate	4	22	0
Nitrate of soda	6½	7	6
Kainite	2	8	0
Per acre per year		60	0

and if mown twice it would get this dressing twice over, and most farmers and landowners will agree in thinking that the above named dressing would fully make up for the loss of the manure arising from 30 cwt. of hay consumed upon the farm.

A question might arise as to when the manure ought to be applied. If I were the farmer, I should like to put on the salt, superphosphate, nitrate, and kainite in March, before the Grass began to grow (which I was going to cut for hay), and the lime as soon as the hay was off. But if I were the landlord, possibly I would like them brought in after the hay was gone, so as truly to replace the manure which it would have produced; and that unquestionably would be the fairest towards the land. With such a dressing as I have named above I think there is very little doubt that the second year's cutting of Italian Rye-grass would be quite 30 cwt., so that I do not over-estimate in saying that an acre in two years would give 3 tons of hay, which, if sold at £6 per ton to the paper-maker, would produce £18, and deducting £6 for two years' manure, the farmer would get £12 nett, and all the after-grass, and all the wintering for two years from each acre of Rye-grass. And this certainly ought to leave him a good profit, after paying rent and taxes and expenses.

If, then, I were a farmer within easy reach of a paper-manufacturer, either by road or railway, I think I would be inclined to write and ask him would he give me £6 per ton for Rye-grass hay, and would he make a contract with me to buy it, provided I could arrange with my landlord to let me sell it? and if he was willing, I would then go to my landlord and offer to bring back £2 worth of artificial manure for each ton of Rye-grass hay sold off the farm.

Mr. Cowan also mentions Timothy-grass or Cat's-tail as suitable for paper-making, and as this Grass produces a very large crop and is perennial, it very probably would pay better even than Italian Rye-grass, as it might be left down for several years if a few renewing seeds were sown upon it in early spring before shutting up for hay. At all events, if the paper-makers can afford £6 per ton for hay, whether Rye-grass or Timothy-grass, it seems to me that it will pay farmers to grow it, returning £2 of the price in artificial manure; and I also think it will pay the landlord to let it be sold on these terms. If any of your readers are paper-makers, will they let us hear their ideas? or if any of your farmer readers live near a paper manufactory it would be well if they talked to their neighbour about it, and got him to write you a line. *G. A. H.*

Home Correspondence.

A Walk over the Farm: *June 6.*—Since I wrote on May 15 there has been scarcely a shower, consequently there is no bottom to the pastures, and on the uplands the few heads of early ripened grasses are being brushed down with the hope that the after-crop may be a good one. On some lands the spring crops are showing unmistakeable signs of suffering from want of moisture. I fear our Eastern Counties have been less fortunate in regard to rainfall than others in the West and Midland. My Wheat, Oats, Barley, Beans, Peas, Clover, and Tares, are all at present satisfactory, with the exception of 6 acres of light-land Wheat, which are much improved. We are mowing Tares and also Italian Rye-grass, passing them through the chaff-cutter. I could not find the half acre of Wheat drilled with only 2 pecks per acre, for it looked as thick as where the bushel was sown. Thick sowers should really come and see my 60 acres of Wheat. I call 1 bushel per acre thick sowing. Barley, with 6 pecks, and Black Oats with 2 bushels, seem thick enough. I have a full plant of Mangel and first-rate Red Clover. Depend upon it drainage, deep and clean cultivation and unwashed cake manure show their good results in a dry season as well as in a wet one. Market gardening and seed growing are extending in this neighbourhood. There are some very clean examples of it near me; they want to be nearer to the great metropolitan sewers or London dung. These gardens employ much labour, which is lucky, for our population here is rapidly increasing since my first settling down here. My own men average five children each, including those who have no children. Day wages are 10*s.* a week, the farmer finding small beer, estimated at 1*s.* per week. Ploughmen get an extra shilling. The conclusion I arrived at, after a 44 miles' ride in Essex, is, that upland hay is a failure, so far as regards the first crop; Clover crops thin and patchy; that Wheat on well-favoured and well-drained heavy lands is healthy and promising for corn, but must be short in the straw, and perhaps rather late at harvest; that on light, hot, and weak lands Wheat will be a poor crop, and, unless we get rain, prematurely ripened, and a very short crop of straw; that there is a great misplant of roots where the land has not been manured and deeply cultivated before winter; that there are great complaints of the destruction of the young plants by insects; that this is likely to be a bad farmer's year, and that there will be a good many farms to let at reduced rents next Michaelmas. I hear of farmers drawing on their reserves at their banker's. Fortunately on my farm I have little to complain of, except that corn has been too cheap, and that on my 14 acres of pasture we shall have scarcely one-fourth as much hay as we had last year. When we consider that one half of the United Kingdom (22,500,000 acres) are in permanent pasture, the drought must cause much loss to the farmers and to the nation. I am decidedly opposed to permanent pasture, except under peculiar circumstances of climate and locality. I have only 14 acres of pasture on 170 acres of land. A great many labourers are out of employ, and I fear will remain so, seeing how small will be the bulk of hay and straw as compared with last year. 'Tis true that bread is cheap, but wages are lower than last year. Meat, butter, and cheese are, however, much too dear for the agricultural labourer. His position as compared with last year is not favourable. At present there is no sign of rain. If we should have a dripping June, which is said to "bring all things in tune," it would very much improve our agricultural prospects. Late ploughed and late sown spring crops are in a critical condition, owing to the dry weather. *J. J. Mechi.*

Woolston Dung.—Mr. Smith still sticks to it that a ton of straw will absorb 3 tons of water, and that the mixture will be 4 tons of manure. That is Mr. Smith's idea, founded upon no known data, and in all probability picked up hap-hazard from some chance conversation with a neighbour; but Mr. Smith hath said, and so it must be right! As to my Hampshire experiment he says:—"His ('G. A. H.') Hampshire straw was a bad sort, and his statement about it is as bad, for there is nothing authentic about it." Of course Mr. Smith saw the Hampshire straw, and is a great judge of the goodness of the statement, and of the authenticity of it! "Then I want to know," says Mr. Smith, "how, as in the case of Mangel, a ton of dry vegetable matter could hold 9 tons of water." What a clever argument! I wonder if our Woolston friend ever drank a glass of cider. What! he has? Well, then, suppose we take 10 tons of Apples, and put them through the cider press, we shall get about 8½ tons of liquid out of them, and what is left behind will be, not dry, but nearly dry, vegetable matter. Suppose, then, Mr. Smith, you try your hand and see if you can make this dry vegetable matter absorb the 8½ tons of juice again! Try hard, Mr. Smith! It takes a long time to do—at least for a mortal! You profess to be omniscient, but I fear you must also become omnipotent before you succeed. When you do succeed depend upon it you will be a more celebrated character than Prometheus was in days of old. Suppose, however, Mr. Smith tries a simpler experiment. Hampshire straw is bad, but Woolston straw must be first-rate, for are not all the Woolston geese swans? Suppose, then, he weighs out 10lb. of Woolston straw, and puts it to soak in water in a tin vessel for a week or two. Then let him take it out and let it drip until no more water will drop from it, so as to make it as dry as London stable dung, and having so done let him try if it weighs 40 lb. Then let him tell your readers honestly the result. Tell the truth, Mr. Smith, and if you cannot shame the devil at all events refute *G. A. H.*

G. A. H. and West Indian.—Will "G. A. H." turn over to p. 288, and look at the following words penned by him?—"Although in the foregoing calculation I have taken Fisken's flying-rope system as my basis, there is no doubt that a good roundabout, worked by a traction engine, would give pretty nearly the same results." Does he consider 8 acres as "pretty nearly the same results" as 13 acres? But perhaps Smith's name is a bugbear, and, substituting the name of Howard or Fowler as makers of the roundabout, he may admit that his estimate of "pretty nearly the same results" is quite correct. Pray what does he consider deep ploughing—7½ inches, as he states at p. 188? Is it at such a depth that these said stones that are apt to convert the plough into a hunter or smash it to bits, are to be found? When "G. A. H." closed his letter with "I have in this calculation taken 'West Indian's' own figures," he should have added, "being a quotation from a correspondent in the *Agricultural Gazette*, p. 287, signed 'G. A. H.'" Will he inform me where tackle on Fisken's system, costing £525—portable engine same power as Mr. Smith uses, is to be found averaging 13 acres a day? Please let us have more instances than one. *West Indian.*

What are the Objects for which the Royal Agricultural Society of England was formed?—It has been stated in scientific circles that the Council of the Royal Agricultural Society of England has declined to contribute towards the fund for payment of the expenses attending "the inquiry into the treatment and utilisation of sewage," by the committee of the British Association, although the subject is of greater consequence to the agricultural interest than perhaps any other. It is remarkable that this decision was come to at a meeting of the Council when there were present as many as nine peers and

five members of the House of Commons, who, being legislators, it may be presumed must know the value of an inquiry conducted by gentlemen of various opinions, independently of the Government, with the sole intention of arriving at facts by local investigation and critical research, and requiring, on their part, only to be relieved of loss when giving their time gratuitously to the public. On what ground could such an application be refused? According to the charter, the fourth object of the Society is "to encourage men of science in their attention to the application of chemistry to the general purposes of agriculture," and surely when the food of millions may be cheapened by the proper application of sewage it could not have been deemed a departure from the charter to have given a few pounds towards the expenses of the inquiry undertaken by the committee. But there may be some other reason for the refusal which the public would like to know, particularly as both the Scotch and Irish agricultural societies have contributed liberally. There is something sublime in the satisfactory tone of the reports of the Chemical Committee on the adulteration of oilcake. It is quite evident that the Council has been led to believe that if by publishing the names of a few rogues it can be shown that the Society is of some use as detectives, the funded property may be suffered to remain intact, in spite of anything Mr. Freebody may say. *A Member of R. A. S. E.*

Societies.

BATH AND WEST OF ENGLAND.

TAUNTON, *June 6 to 10.* — The show-ground and trial-fields opened at 10 o'clock on Monday, amid weather of the most cheering description — bright and yet breezy. Last year the show week at Southampton was ushered in with rain, which happily, however, cleared away on the evening previous to the show, leaving a brightened vegetation and lovely scenery all the lovelier for its refreshing influence. The present season has been, up to Wednesday, a complete contrast to the last; and although nothing could be pleasanter for sight-seeing, the practical effect of so long-continued a drought is, that the mowing-machines in the trial-fields had little to encounter but "bents," with a very scant undergrowth, and farmers were expressing grave fears as to the success both of Grass and root crops.

At the time we write we can only express an opinion as to the quality of the show as an exhibition; its pecuniary success can only be known at the end of the week. As an assemblage of implements and animals it deserves the highest praise, and the arrangement of the show-yard could not be improved.

This has been the second combined meeting of the Bath and West of England and Southern Counties Societies, a combination which has been an undoubted advantage to both, principally because it ensures a good implement show. The implement makers, who probably would not have sent their machinery to two comparatively small meetings, here at the combined gathering assemble in full force. An important feature is the absence of prizes for implements, the exhibitors being willing to send their goods without further advantage than this opportunity for advertising them.

At the Taunton meeting one of the most striking points was the improvement in horse-ploughs, a class of implements which we had learnt to think had arrived at maturity or perfection. The last few months have shown us that this is not the case, and that there is still room for striking modifications in the structure of even the common plough. The show of both live and dead stock has been excellent, but instead of dealing in generalities we pass on to details.

CATTLE.

Shorthorns are fairly represented, especially in the yearling heifer and bull classes. Mr. George Garne takes the 1st prize with ROYAL BUTTERFLY 20TH (45,007), bred by Colonel Towneley, from whom he was purchased by his present owner for 300 gs. This is a remarkably well made bull, especially in his forequarters. He has a beautiful head; and his whole appearance is grand. Lord Sudeley is in the 2d place, with MANDARIN, an excellent, level, white bull, and prize-winner last season.

In the class for the best bull under 2 years old on June 1, Lady Pigot takes the 1st place, with a level bull, good across the shoulders, and showing signs of constitutional strength. Mr. Stratton, of Burderop, comes 2d, with a very good animal, rather coarse at the shoulder point, and perhaps a shade cow-like about the head. In class 8, Mr. Garne carries off the prize with a very excellent roan cow, and Mr. Stratton's *Coriander* was placed 2d.

In the class for heifers in calf, Mr. Stratton takes the 1st prize with *Peeress* by BUDE LIGHT (21,342), a wide, level, and good beast, but exceedingly fat, and Lady Pigot obtains the 2d place with *La Belle Hélène* by PRINCE OF THE EMPIRE, a thick, level, and well-grown heifer of the true Branches Park character. The yearling heifers are well represented, and allowed by all to be a very perfect class. We refer our readers to the subjoined Prize List.

Herefords. — This is an excellent section. In the bull class for animals over 2 and under 4 years of age, Mr. Thomas, St. Hilary, carries off the 1st prize with an animal bred by Mr. Rawlings, of Shropshire, which afterwards was sold into Glamorganshire, where he signalised himself as a prize-taker. He is a good, straight, large-sized bull, of excellent quality, got by SIR JOHN, and is a grandson of old SIR BENJAMIN. The merits of this animal are indicated by the fact that the Manchester prize bull is exhibited against him, and is fairly beaten. LORD ASHFORD, the 2d prize bull, in the same class, and the property of Mr. Baldwin, of Luddington, is a son of *Lady Ashford*, a remarkable cow, which was a 1st prize-taker at a Royal meeting, afterwards winner of a 1st prize at Smithfield as a fat cow, and subsequently she again became a breeding animal in Mr. Baldwin's herd. The great feature in the exhibition of Herefords is the class for yearling heifers, which has rarely ever been equalled. Many good judges preferred the 2d to the 1st prize heifer in this class.

The Devons.—These occupied the first place in the catalogue, and formed, as might have been expected, a large and good section of the live stock exhibited. Lord Falmouth gains fresh laurels by his excellent bull NARCISSUS, and Mr. Davy, of Flitton Barton, and Mr. Smith, of High Hoopern, well nigh divides the remaining prizes between them. Mr. J. H. Buller show a good 3-year-old bull, which was placed 2d.

The following are the awards in the cattle classes :—

DEVONS.

CLASS 1. For the best Bull, exceeding 2 and not exceeding 4 years old on June 1, 1870.—1st, £20, the Right Hon. Viscount Falmouth, Tregothnan, Probus, Cornwall, NARCISSUS, aged 2 years and 8 months; 2d, £10, Mr. J. H. Buller, Downes, Crediton.

CLASS 2. For the best Bull, not exceeding 2 years old on June 1, 1870.—1st, £20, Mr. James Davy, Flitton Barton, North Molton, DUKE OF FLITTON 5TH, aged 1 year, 8 months, 3 weeks and 3 days; 2d, £10, Mr. W. Smith, Hoopern, Exeter, PENNSYLVANIAN.

CLASS 3. For the best Cow in calf or if in milk, having had a calf within six months next preceding June 1, 1870.—1st, £15, Mr. James Davy, Flitton Barton, North Molton, *Actress* (7740), best 10 years, 1 week and 1 day; 2d, £10, Mr. W. Smith, Hoopern, Exeter, *Mush* (2883), aged 5 years.

CLASS 4. For the best Heifer in calf or if in milk, having had a calf within six months next preceding the first day of the exhibition, not exceeding 3 years old on June 1, 1870.—1st, £15, Mr. Walter Farthing, Stowey Court, Bridgwater, *Pretty Maid*, aged 2 years, 6 months, 1 week and 6 days; 2d, £10, Mr. J. A. Smith, Bradford Peverill, Dorchester, *Picture* (2922).

CLASS 5. For the best Heifer, not exceeding 2 years old on June 1, 1870.—1st, £10, Mr. James Davy, Flitton Barton, North Molton, *Jumpseed* (1070), aged 1 year and 10 months; 2d, £5, Mr. W. Smith, Exeter, *Duchess*, aged 1 year, 5 months, 2 weeks and 3 days.

SHORTHORNS.

CLASS 6. For the best Bull, exceeding 2 and not exceeding 4 years old on June 1, 1870.—1st, £20, Mr. George Garne, Churchill Heath, Chipping Norton, Oxfordshire, ROYAL BUTTERFLY 20TH (25,007); 2d, £10, the Right Hon. Lord Sudeley, Toddington, Winchcombe, Gloucester, MANDARIN, aged 2 years, 11 months, 4 weeks and 2 days.

CLASS 7. For the best Bull, not exceeding 2 years old on June 1, 1870.—1st, £20, the Lady Emily Pigot, Branches Park, Newmarket, Suffolk, BUTE, aged 1 year, 9 months and 1 day; 2d, £10, Mr. Richard Stratton, Burderop, Swindon, Wilts, MAJESTY.

CLASS 8. For the best Cow in calf (or if in milk, having had a calf within six months next preceding June 1, 1870).—1st, £15, Mr. George Garne, Churchill Heath, Chipping Norton, *Pride of the Heath*, aged 6 years, 9 months; 2d, £10, Mr. Richard Stratton, Burderop, Swindon, Wilts, *Coriander*.

CLASS 9. For the best Heifer in calf (or if in milk, having had a calf within six months next preceding the first day of the exhibition), not exceeding 3 years old on June 1, 1870.—1st, £15, Mr. Richard Stratton, Burderop, a roan Shorthorn heifer, in calf, *Peeress*, aged 2 years, 10 months and 2 weeks; 2d, £10, the Lady Emily Pigot, Branches Park, Newmarket, a red and white Shorthorn heifer, in calf, *La Belle Hélène*.

CLASS 10. For the best Heifer, not exceeding 2 years old on June 1, 1870.—1st, £10, Mr. Richard Stratton, *Gertrude*, aged 1 year and 10 months; 2d, £5, Mr. Richard Stratton, *Flower Girl*.

HEREFORDS.

CLASS 11. For the best Bull, exceeding 2 and not exceeding 4 years old on June 1, 1870.—1st, £20, Mr. T. Thomas, St. Hilary, Cowbridge, Glamorganshire, SIR JOHN THE THIRD, aged 3 years, 9 months and 1 week; 2d, £10, Mr. John Baldwin, Luddington, Stratford-on-Avon.

CLASS 12. For the best Bull, not exceeding 2 years old on June 1, 1870.—1st, £20, Mr. T. Edwards, Wintercott, Leominster, Herefordshire, *Wye*, aged 1 year, 1 month, 3 weeks and 3 days; 2d, £10, Mr. Henry Nicholas Edwards, Broadward, Leominster, SIR JOHN (3451).

CLASS 13. For the best Cow in calf (or if in milk, having had a calf within six months next preceding June 1, 1870).—1st, £15, Mr. John Hungerford Arkwright, Hampton Court, Leominster, *Hampton Beauty*, aged 5 years and 11 months; 2d, £10, Mr. T. Thomas, St. Hilary, *Lizzie*.

CLASS 14. For the best Heifer in calf (or if in milk, having had a calf within six months), not exceeding 3 years old on June 1, 1870).—1st, £15, Mr. William Tudge, Ardcorn, Leintwardine, Herefordshire, *Silver Star*, aged 2 years, 9 months, 2 weeks and 5 days; 2d, £10, Mr. Philip Turner, The Leen, Pembridge, Leominster, *Livia*.

CLASS 15.—For the best Heifer, not exceeding 2 years old on June 1, 1870.—1st, £10, Mr. Thomas Thomas, St. Hilary, SUNBEAM, aged 1 year and 9 months; 2d, £5, Mr. James D. Allen, Tisbury, Salisbury, Wilts, *Lovely*, aged 1 year, 11 months and 4 days. Highly Commended: Mr. John Harding, Bicton, Shrewsbury, Salop, *Dahlia*.

SUSSEX.

CLASS 16.—For the best Bull, not exceeding 2 years old on June 1, 1870.—1st, £20, Mr. John Turvill, Alton; 2d, £10, Mr. Jenner, Rye, Sussex.

CLASS 17.—For the best Cow in calf (or if in milk, having had a calf within six months next preceding June 1, 1870).—1st, £15, Mr. Smith, Ashford, Sussex; 2d, £10, Mr. Turvill, Alton.

CLASS 18.—For the best Heifer in calf (or if in milk, having had a calf within 6 months next preceding the first day of the exhibition), not exceeding 3 years old on June 1, 1870.—1st, £15, Messrs. John & Alfred Heasman, Angmering, Arundel, *Southampton*, aged 2 years, 5 months, 3 weeks and 3 days; 2d, £10, Messrs. John & Alfred Heasman, *Beauty*.

CHANNEL ISLANDS.

CLASS 19. For the best Bull, not exceeding 4 years old on June 1, 1870.—1st, £10, Mr. George Digby Wingfield Digby, Sherborne Castle, Sherborne, SIR JEFFRY, aged 2 years and 6 months; 2d, £5, Mr. Henry Compton, Manor House, Minesteed, Lyndhurst, PRINCE.

CLASS 20. For the best Cow in calf (or if in milk, having had a calf within six months next preceding June 1, 1870.—1st, £10, Mr. William Gibbs, Tyntesfield, near Bristol, aged about 3 years; 2d, £5, Mr. Henry Compton, Manor House, Minesteed, Lyndhurst, *Ada*.

SHEEP.

There is a good show of sheep. The Leicesters are all from West of England flocks. The Cotswolds appeared in moderate force, although many of the principal breeders of this race still hold back from exhibiting. The Devon Longwools, a cross between the Leicester and the Devon Knot, forms a large class of useful sheep, larger and lengthier in their carcases than pure Leicesters. The short-woolled sheep embrace all the usual breeds in considerable numbers; and Southdowns are sent by Mr. Rigden all the way from Brighton, to compete successfully with west country bred sheep. Among Hampshires, Mr. Rawlence is 1st in two and 2d in the remaining class, but we were sorry to observe that the Messrs. Russell's (of Kent) pens were all empty, otherwise the competition might have been keener. To a visitor in the south-west of England probably the most interesting part of the sheep show would be the Exmoors and other mountain breeds, which were well represented.

The following is the list of awards :—

LEICESTER.

CLASS 21. For the best yearling Ram.—1st, £10, Messrs. John & Albert E. Gould, Poltimore, Exeter; 2d, £5, Mr. James Tremain, Polsue, Grampound, Cornwall.

CLASS 22. For the best Ram of any other age.—1st, £10, Messrs. John & Albert E. Gould; 2d, £5, Mr. George Turner, Beamford Speke, Exeter, Devon.

CLASS 23. For the best pen of 5 yearling Ewes.—1st, £10, Messrs. John & Albert E. Gould; 2d, £5, Mr. James Burston Corner, Longforth, Wellington, Somerset.

COTSWOLD.

CLASS 24. For the best yearling Ram.—1st, £10, the executors of the late Thomas Killett, Kilkenny, Farringdon, Oxfordshire; 2nd, £5, the executors of the late T. Gillett.

CLASS 25. For the best Ram of any other age — 1st, £10, the executors of the late Mr. Gillett; 2d, £5, Mr. T. Beale Browne, Salperton Park, Andoversford, Gloucestershire.

CLASS 26. For the best pen of 5 yearling Ewes — 1st, £10, the executors of the late T. Gillett; 2d, £5, Mr. John Williams, Caercady, Cowbridge, Glamorganshire.

DEVON LONG-WOOLS.

(Not eligible to compete in Classes 21 to 26 inclusive.)

CLASS 27. For the best yearling Ram.—1st, £10, Mr. Richard Corner, Torweston, Williton, Somersetshire; 2d, £5, ditto.

CLASS 28. For the best Ram of any other age.—1st, £10, Mrs. Elizabeth Gibbings, Higher Brenton, Kennford, near Exeter; 2d, £5, Mr. Richard Corner.

CLASS 29. For the best pen of 5 yearling Ewes.—1st, £10, Mr. James B. Corner, Longforth, Wellington, Somerset; 2nd, £5, ditto.

SOUTHDOWN.

CLASS 30. For the best yearling Ram.—1st, £10, Sir William Throckmorton, Bart., Buckland, Faringdon, Berkshire; 2d, £5, Messrs. J. & A. Heasman, Angmering, Arundel.

CLASS 31. For the best Ram of any other age — 1st, £10, Mr. William Rigden, Hove, Brighton; 2d, £2, the Right Hon. the Earl of Portsmouth, Hurstbourne Park, Whitchurch, Hants.

CLASS 32. For the best pen of 5 yearling Ewes.—1st, £10, Mr. Ralph Neville-Grenville, Butleigh Court, Glastonbury, Somerset; 2d, £5, Sir William Throckmorton, Bart., Buckland.

HAMPSHIRE DOWNS.

CLASS 33. For the best yearling Ram.—1st, £10, Mr. Alfred Morrison, Fonthill House, Tisbury, Wilts; 2d, £5, Mr. James Rawlence, Bulbridge, Wilton, Salisbury.

CLASS 34. For the best Ram of any other age.—1st, £10, Mr. James Rawlence; 2d, £5, ditto.

CLASS 35. For the best pen of 5 yearling Ewes.—1st, £10, Mr. James Rawlence; 2d, £5, ditto.

SHROPSHIRE.

CLASS 36. For the best yearling Ram.—1st, £10, Mr. Henry Wood, Pucknall Farm, Romsey, Hants; 2d, £5, the Right Hon. Lord Chesham, Chesham, Latimer, Bucks.

CLASS 37. Ram of any other age, disqualified.

CLASS 38. For the best pen of 5 yearling Ewes.—1st, £10, the Right Hon. Lord Chesham, Chesham, Latimer, Bucks; 2d, £5, Mr. Henry Wood, Pucknall Farm.

OXFORDSHIRE DOWN.

CLASS 39. For the best yearling Ram.—1st, £10, Mr. Charles Gillett, Cote House, Bampton, Oxfordshire; 2d, £5, ditto.

CLASS 40. For the best Ram of any other age.—1st, £10, Mr. George Wallis, Old Shifford, Bampton; 2d, £5, Mr. Charles Gillett, Cote House.

CLASS 41. For the best pen of 5 yearling Ewes.—1st, £10, Mr. Charles Gillett; 2d, £5, Mr. Gillett, Burford.

SOMERSET AND DORSET HORN.

CLASS 42. For the best yearling Ram.—1st, £20, Mr. Henry Mayo, Coker's, Frome, Dorchester; 2d, £5, Mr. Herbert Farthing, Nether Stowey, Bridgwater.

CLASS 43. For the best Ram of any other age.—1st, £10, Mr. Herbert Farthing, Nether Stowey; 2d, £5, Mr. Abraham Bond, Hunstile.

CLASS 44. For the best pen of 5 yearling Ewes.—1st, £10, Mr. Farthing, Bridgwater; 2d, £5, Mr. Culverwell, Bridgwater.

EXMOOR AND OTHER MOUNTAINS.

CLASS 45. For the best Ram of any age.—1st, £10, Mr. Quartly, South Molton; 2d, £5, Mr. Davy, North Molton.

CLASS 46. For the best pen of 5 Ewes of any age.—1st, £5, Sir Thomas Dyke Acland, Bart., Minehead; 2d, £3, Mr. Smith, Exeter.

HORSES.

Considerable classes of agricultural horses, a small show of hunters and hacks, and a pretty fair exhibition of ponies, make up a whole which has never been a great feature in the annual meetings of this Society; but which is this year as considerable as it has elsewhere been. There are 23 entries of agricultural horses, 39 in four classes of hunters and hacks, and 20 ponies.

The following are the awards of the judges :—

FOR AGRICULTURAL PURPOSES.

CLASS 47. For the best Stallion, foaled before 1868.—1st, £25, Mr. Hitchcock, Heytesbury; 2d, £15, Mr. Joyce, South Molton.

CLASS 48. For the best Stallion, foaled in 1868.—1st, £20, Mr. Tice, Bridgwater; 2d, £10, Mr. Hitchcock, Heytesbury.

CLASS 49. For the best Mare and Foal.—1st, £15, Mr. Hutson, East Brent; 2d, £5, Mrs. Burbidge, South Wraxhall.

HUNTERS.

CLASS 50. For the best Mare or Gelding, foaled before Jan. 1, 1866.—1st, £25, Mr. Clement Champeney, Theale, Wells, "Hunting Horn," aged 5 years; 2d, £10, Mr George Bland Battams, Kilworthy, Tavistock, Devon, "Seneschal," aged 5 years.

CLASS 51. For the best Mare or Gelding, foaled in 1866.—1st, £25, Mr George Bland Battams, Kilworthy, Tavistock, "Epicure," aged 4 years and 1 month; 2d, £10, Mr. George Bland Battams, "Grimaldi," aged 4 years.

CLASS 52. For the best Filly or Gelding, foaled in 1867.—1st, £10, Mr. John Thomas Robson, Leckby Palace, Asenby, Thirsk, "Splashwater," aged 3 years and 1 month; 2d, £5, Mr. George Bland Battams, Kilworthy, Tavistock, Devon, "Topthorn."

CLASS 53. For the best Colt or Filly, foaled in 1869.—1st, £10, Mr. Joyce, South Molton; 2d, £5, Mr. Robinson, Thirsk.

CLASS 54. For the best Mare or Gelding.—1st, £15, Mr. Battams, Tavistock; 2d, £5, Mr. Peren, South Petherton.

PONIES.

CLASS 55. For the best Mare or Gelding, not exceeding 14 hands high.—1st, £10, Capt. Ballard, Cowbridge; 2d, £5, Mr. Gibbs, Pitminster.

PIGS.

There has been a large entry of pigs, and a good show both of black and white breeds. The Messrs. Howard, of Biddenham; Messrs. Duckering, of Lincolnshire; and Mr. Taylor, of Taunton, carry off most of the prizes for large and small white breeds, and we would especially mention Mr. Duckering's "Lily," a 2-year-old sow of extraordinary merit. In the Berkshire class Mr. Russell Swanwick, of the Royal Agricultural College, showed an exceedingly perfectly formed boar, which took precedence of a remarkably good pig, exhibited by Mr. H. Humphrey, Shrivenham. Mr. Swanwick is again 1st in the class for the best two breeding sows, with two admirable hilts.

The following are the awards of the judges:—

LARGE BREED.

CLASS 57. For the best Boar, above 1 year and not exceeding 2 years old on June 1, 1870.—1st, £5, Messrs. J. & F. Howard, Britannia Farms, Bedford, "Victor the Second," aged 1 year, 11 months, 4 weeks and 1 day; 2d, £3, Messrs. R. E. Duckering & Son, Northorpe, Kirton Lindsey, Lincolnshire, "Cultivator the Sixth," aged 1 year, 8 months, 1 week and 4 days.

CLASS 58. For the best Boar, not exceeding 1 year old on June 1, 1870.—1st, £5, Messrs. Duckering & Son, "Victor, aged 9 months and 3 weeks; 2d, £3, ditto, "Cornet," aged 7 months and 1 week.

CLASS 59. For the best Breeding Sow in farrow, or exhibited with her litter.—1st, £5, Messrs. J. & F. Howard, "Longville the Second," aged 1 year, 11 months, 1 week and 1 day; 2d, £3, Messrs. Duckering & Son.

CLASS 60. For the best pen of 2 Breeding Sows, not exceeding 9 months old on June 1, 1870.—1st, £5, Mr. Jacob Dove, Hambrook House, Hambrook, Gloucestershire, a pen of 2 white breeding sows in farrow, aged 8 months, 3 weeks and 4 days; 2d, £3, Messrs. Howard, two white breeding sows.

SMALL BREED.

CLASS 61.—For the best Boar, above 1 year old and not exceeding 2 years old on June 1, 1870.—1st, £5, Mr. William Mortimer, Ware, Newham House, near Helstone, Cornwall, "Gem," aged 1 year, 2 months, 3 weeks and 1 day; 2d, £3, ditto, "Jet," aged 1 year, 2 months, 2 weeks and 1 day.

CLASS 62.—For the best Boar, not exceeding 1 year old on June 1, 1870.—1st, £5, Mr. Thomas R. Cornish, Wolfsgrove, Bishop's Teignton, Teignmouth, Devon, "Comet," aged 8 months, 4 weeks; 2d, £3, Messrs. Duckering & Son, "Peter," aged 9 months and 2 weeks.

CLASS 63. For the best Breeding Sow in farrow, or exhibited with her litter.—1st, £5, Messrs. Duckering, "Lily," aged 2 years, 10 months and 1 week; 2d, £3, Mr. William Osborne, Ponty's Pool, Hillfarrance, Taunton, Somerset, "Gipsy Queen," aged 1 year, 9 months, 2 weeks and 5 days.

CLASS 64. For the best pen of 2 Breeding Sows, not exceeding 9 months of age on June 1, 1870.—1st, £5, Messrs. Duckering, "Lily" and "Daisy," aged 7 months and 1 day; 2d, £3, Mr. Thomas Taylor, Pool Farm, Taunton, Somerset, "Love" and "Unity," aged 6 months and 2 weeks.

BERKSHIRES.

(Not allowed to compete in any other class.)

CLASS 65. For the best Boar, above 1 year and not exceeding 2 years on June 1, 1870.—1st, £5, Mr. Russell Swanwick, Royal Agricultural College farm, Cirencester, Gloucestershire, "Sambo the Second," aged 1 year and 1 day; 2d, £3, Mr. Heber Humfrey, Kingsview Farm, Shrivenham, Berks, "Royal Oak," aged 1 year, 6 months, 3 weeks and 3 days.

CLASS 66.—For the best Boar, not exceeding 1 year old on June 1, 1870.—1st, £5, Mr. Stewart, Gloucester; 2d, £3, ditto.

CLASS 67. For the best Breeding Sow, in farrow, or exhibited with her litter.—1st, £5, Duckering and Son, Northorpe; 2d, £3, Mr. Stewart.

CLASS 68. For the best pen of 2 Breeding Sows, not exceeding 9 months of age on June 1, 1870.—1st, £5, Mr. Swanwick, Cirencester; 2d, £3, Mr. Humfrey, Shrivenham.

The following gentlemen acted as judges of the several classes:—

Devon, Sussex, and Channel Islands Cattle.—Mr. Josiah Pitcher, Hailsharn, Hurst Green; Mr. R. Warren, Childokeford, Blandford.

Shorthorns and Herefords.—Mr. M. Savidge, Sarsden, Chipping Norton; Mr. William Yeomans, Stretton Court, Hereford.

Long-wool Sheep.—Mr. William Bartholomew, Waddington Heath, Lincoln; Mr. T. Brown, Marham, Downham Market.

Short-wool Sheep.—Mr. Henry Woods, Merton, Thetford; Mr. F. Budd, Hatchwarren Farm, Basingstoke; Mr. Canning, Wiltshire.

Pigs.—Mr. J. Coate, Hammoon, Blandford; Mr. J. Smith, Henley-in-Arden.

Horses.—Mr. Howard, Temple Brewer, Sleaford; Mr. H. Thurnall, Royston.

Inspector of Shearing.—Mr. Henry Bone, Avon, Ringwood.

Poultry.—Mr. Hewitt, Birmingham; Mr. Tegetmeier, London.

IMPLEMENTS.

This report would extend beyond due limits if all that was interesting was even slightly described. We must, therefore, confine our remarks to novelties, or at least to improvements in agricultural mechanism that have not been long before the agricultural public. The various implements were to be seen either in the sheds or trial-fields contiguous to the yard.

Messrs. Howard, of Bedford, have shown a self-acting horse-rake, furnished with sheaves inside the travelling wheels, around which pass friction-straps or brake-bands. By means of a lever handle the friction-strap is tightened, and immediately, in revolving with the travelling wheels, raises the teeth and delivers the load. The same firm show an iron Anglo-Saxon plough, made at Bedford, with catch-and-swing head, rendering it unnecessary to hold the stilts on turning at the headlands; a digging breast, suitable for a horse-plough, and a double-furrow plough furnished with anti-friction wheel, which follows in the furrow, taking the place of the plough sole, as in the case of the Pirie plough. Messrs. Howard also exhibit a large assortment of ploughs, harrows, horse-rakes, and reaping-machines.

Messrs. Dening & Co., Chard, exhibit a large number of implements, among which we may specially notice a patent brush-drill, invented by Mr. Shiner, of Crimchard, adapted for sowing all kinds of agricultural seeds, from a Clover to a Bean. It requires no change wheels, and hilly land or change of the horses' pace is said not to influence the regular deposition of seed. The same firm exhibit a Spencer's chain-drill with a removable slide, furnished with a brush specially used for regulating the sowing of Beans.

Messrs. Picksley & Sims exhibit a large variety of implements, including chaff-cutters, mills, horse-rakes, mowing machines, &c.

The Bristol Waggon Company show a large collection of carts and waggons, among which we noticed Captain Stevens' adaptation of endless rails or shoes to enable carts to travel over boggy ground. Each shoe or section of rail is fixed on the tire by means of hooks, attached by spiral springs to the nave. The shoes are removable at pleasure, and may be fixed upon any cart. Carr's disintegrator, by means of beaters revolving rapidly in opposite directions, pulverises minerals, ores, artificial manures, &c., and is exhibited by the same firm.

The next novelty we have to notice is exhibited by Mr. Henry Beare, Newton Abbott, Devonshire. It is a manure distributor of ingenious design, in which the manure is conveyed from the box in the zigzag grooves of a revolving roller or barrel passing along the bottom of the manure box. The manure is kept running by means of horizontally oscillating agitators, worked by a revolving cam at the end of the grooved barrel. Any unbroken fragments of manure are pulverised by being brought in contact with a number of fixed iron teeth in close proximity to the zigzag grooves just mentioned, so that nothing but finely divided manure can pass out. This implement is therefore at once a manure distributor and pulveriser.

Fellows & Bate, of Manchester, exhibit a pyrometer, for testing the temperature in the centre of stacks. This instrument consists of a hollow tube terminated by a screw or worm, by means of which it is introduced into the stack; at the end next the stack centre is an expansive material (quicksilver), which expands with the increased temperature, pushes up a piston rod, and registers the temperature by an indicator and graduated table. The same firm also again exhibit their exceedingly neat and effective lawn-mower, first exhibited at the Smithfield Show last winter, and which at that time challenged admiration.

The Bristol Implement Co. exhibit a three or four-horse cultivator with rotary tines and diggers, adapted for varying conditions of soil. A large travelling wheel, 5 feet in diameter, is furnished with internal gearing and a pinion. The pinion engages with this gearing, and by an intermediate action causes a shafting, on which are fixed the teeth or diggers, to revolve rapidly.

Mr. Heap's earth closets act simply, and are well adapted for cottages as well as for more pretentious residences. We were specially struck with one suitable for the first-named class of dwelling, in which the ashes from the house are thrown through an aperture, as in the case of an ordinary ash-pit; these fall upon a sieve or screen, through which the finer portion, by a simple contrivance, must find its way to act as a deodoriser upon the night-soil, while the coarser cinders are returned to a vessel, where they accumulate for reburning.

Messrs. Nell, Harrison & Co., London, exhibit their excellent smut separator, described under the head of "mechanical novelties" in the "Chamber of Agriculture" of January 3. It has been largely sold in Canada and North as well as South America, where it is announced to be "the best Wheat cleaning machine in the world." The whole work of separating and cleansing is done by fan-blast. The Wheat is "cleansed in a whirlwind," at the rate of 10 up to 200 bushels per hour, depending upon the size and capacity of the machine. The same firm also exhibit a bran duster of considerable merit.

Moule's earth closets appear in usual force, with many improvements, and adapted for all kinds of dwellings.

A new winnower and corn dresser, patented by Mr. G. R. Turner, of Charmouth, is exhibited by Brown Brothers, Lyme Regis. In this implement the riddle frame and screen require only one motion to work both, the action being parallel and horizontal. The corn passes through six riddles, if required, exposing it to the blast sufficiently long to ensure a perfect sample.

This Spring several ingenious lamb hurdles have been brought out. The latest improvement exhibited by Messrs. Carson & Toone, of Warminster, Wilts, amidst a large and excellent assortment of implements. It is entitled the "automatic lamb creep," and makes provision for the return of the lamb without injury, when, from its increased size after eating the nutritive food outside the fold, he can only return with comfort through a larger opening than that which sufficed to give him egress. This is effected by the roller frames opening freely from the outside but not from the inside, and again closing immediately the lamb has passed through, by means of springs.

THE TRIAL FIELDS.

Several acres of Rye, conveniently situated for the show ground, and two fields of Grass were placed at the disposal of the exhibitors of mowing and reaping machines. The Rye was a good upstanding crop, offering little opportunity to any implement to show special capabilities for grappling with difficult work. The Bath and West of England Society do not give prizes to implements, and both these facts combined to render the trial of reapers somewhat "mild." Many well-known reapers were to be seen upon the ground, among which we may notice three forms of the implements sent out by Messrs. Burgess & Key, including the Automaton, a small back-delivery reaper, and the older form of the McCormick, greatly improved by the old straps having given way to chain-gearing, &c. Messrs. Howard showed their British Reaper; the Beverley Iron and Waggon Company exhibited a reaper propelled by horses, which did excellent work. Wood's reaper was also present, and accomplished its work in its usual excellent style. It was difficult after the trials, in passing over the stubble and examining the swathes or sheaves, as the case might be, to speak distinctly in favour of any one of these implements.

Mr. Robert Hellard, Taunton, has patented a reaping-machine furnished with a revolving divider and two knifebars, the top one working on the under one, thereby requiring little sharpening. However good the idea, this implement found it difficult to compete with the older established machines, which, to a thorough development of the principles upon which they are constructed, add the advantage of highly finished workmanship.

Mowing Machines.—These have only a light crop to encounter and little to test their merits. Burgess & Key exhibited a mower in which the crank is low placed, to give a horizontal push to the knife, thereby economising power. Samuelson showed an excellent implement with the draught placed low so as to take it from, as near as possible, the point of greatest draught. The horses draw by means of a draught chain, instead of from the pole or shaft. The Messrs. Howard showed an improved mower of a very perfect kind, which we cannot further describe at present. Picksley & Sims' combined reaper and mower exhibits a very pretty contrivance for sliding the entire bottom frame or bed with the knife, so as alternately to cause the driving pinion to gear to the right or to the left travelling wheel as Grass or corn is being cut. Brenton's mower boasts the introduction of india-rubber washers for preventing vibration from the oscillating action of the knives. Hornsbys exhibited their "Paragon" mower which won the first place at Manchester, and both Bamlett and Woods were also represented.

By far the most interesting portion of the trial-fields was that devoted to ploughs. Even last year at Manchester the horse-plough trial-field would have been about the last place that an inquirer after novelties would have entered. All is now changed, and the old-fashioned single and simple horse wheel-plough seems doomed to be a thing of the past. Mr. Pirie deserves a high place among the improvers of this useful class of implements, and we may mention, among ploughs, which in general construction appear to be made upon the same principle, a very good one, made by John Gray & Co., of Glasgow. Two excellent turnwrist ploughs, one by Ransome, in which two mouldboards are used, one of which is held above the work while the other is turning its furrow; and one by Mr. Davy, which cannot be spoken of too highly. By a simple contrivance all the moving parts of this last plough are turned at once—one breast being placed in proper position while the other is raised clear of the beam. The mould-plates are of pure cast steel. Mr. Woofe's now celebrated general purpose plough showed to great advantage even on the hard and dry land upon which the trial was conducted. A revolving disc protrudes through the mouldboard and cuts the furrow, thereby effectively pulverising it, and closely following the mouldboard is a conical wheel-presser, which consolidates the furrows as fast as laid. Both objects appeared to be attained, and the implement evidently did its work more effectively as the depth of the furrow was increased. Mr. Woofe also exhibited a good and new double plough, which we cannot do more than mention. Messrs. Ransomes also exhibited a two-furrow plough with stilts, as in the older forms of ploughs, thereby differing from all the other double ploughs in the field. This plough has a very short sole, and no anti-friction wheel, and yet goes perfectly steady, and did its work

admirably. A very good contrivance for facilitating turning on the headland, by means of what Mr. Ransome calls a lifting wheel, is also worthy of notice. Not only does the wheel keep the plough upright in turning, but by means of the lever, which presses it down into position, the plough may be instantaneously lifted out of work above the surface of the ground. This saves the too frequently ragged work at the ridge ends, as ploughs are gradually run out on to the headland.

Messrs. Sutton & Sons, Seedsmen to the Queen, Reading, exhibit an extensive and varied collection of agricultural and horticultural produce, including many specimens of dried natural grasses, an extensive collection of grasses in their growing state from Messrs. Suttons' experimental farm, Reading; samples of fine cleaned grasses and Clovers, several hundred samples of seeds of various kinds in glass cases, all distinctly labelled; very large specimens of Messrs. Suttons' improved varieties of agricultural roots, and a miscellaneous assortment of agricultural forage plants, including the Bromus Schræderi and the Bromus odoratus.

Messrs. Carter, of High Holborn, also show a large and varied collection of agricultural seeds, and some exceedingly fine samples of Mangels, fresh and firm, and apparently capable of retaining their good qualities for many months longer.

FLOWER SHOW AND ARTS EXHIBITION.

To the thorough-going agriculturist these appear in the light of a relief from hard work rather than as the theatre of study. It was indeed refreshing to pass from the hum of machinery in motion, and the almost endless lines of sheds, into the quiet of the horticultural tent. Some magnificent Azaleas full of flower, exhibited by Mr. Proctor Baker; a very fine Tree Fern (Dicksonia antarctica), a large assortment of Ferns, Pelargoniums, Begonias, &c., were among the principal and most attractive objects.

The *Arts* department was divided into two sections—the first devoted to fine and the other to useful arts. Glancing at the first-named section we found it further divided into paintings and articles of *vertu*. The pictures appeared under the heads of water colours and oil paintings, many of them being of the very highest merit, as is rendered evident when we mention that Whitaker, Ansdell, Calcott, Carter, and many other well-known artists were represented by their works. Designs for, and some beautiful specimens of, Honiton lace were the more striking as products of an industry peculiar to the district. Something less attractive, but nevertheless interesting, was the sister exhibition of useful arts, in which were arranged a variety of useful appliances, such as sewing machines, articles of domestic interest, surgical instruments, carving in stone, and beautifully-worked furniture. Wednesday was the day fixed for a youth, *sans* legs, *sans* arms, to appear, decked in wooden representatives of these useful members, so skilfully executed as to render detection of their unnatural character impossible.

At the annual meeting of the Council, on Wednesday, Sir Stafford Northcote, M.P., President for the year, who arrived in England from Quebec only on Tuesday, took the chair, and in opening the proceedings congratulated the Council on the appearance of the present exhibition. Great evidence had been afforded of the success of the Society in the number of the agricultural implement makers who thought it worth their while to send their implements for exhibition; and no one could have made himself acquainted with the progress of agriculture in the south-west of England without noticing the improvement that had been made. Mr. Goodwin (secretary) read the report, which stated that the steady progress and financial prosperity of the Society afforded legitimate ground for congratulation on this the occasion of its 93d anniversary meeting. The Council hoped the contemplated meeting at Guildford next year would firmly cement the union recently contracted between the Western and Southern Counties.

THE HORSE SHOW.

AGRICULTURAL HALL, *Islington*.—We have elsewhere referred to this show as if it hardly came within the subject-matter of a strictly professional agricultural journal. That is not our meaning. There are certainly no specially agricultural horse classes exhibited on this occasion, and the whole display acquires a sort of holiday and unbusiness-like aspect from the prominence given to efforts specially for the mere amusement of spectators. But it is far from our wish to imply that there is not a considerable section of the agricultural body who are professionally interested in the breeding of horses of the classes which have drawn such crowds of spectators to the Agricultural Hall this week. The constant announcement "for sale" one sees on many of the stalls, shows that it was with an eye to business, and for meeting with customers, even more than for the winning of a prize or the achievement of mere reputation, that many of the horses here exhibited have been sent to Islington. We are not aware if the meeting has been a good one for business; but certainly there have been crowds of lovers of the horse in the Hall this week, and very handsomely filled classes from which to choose. We have to be satisfied with the following short account of them. There is a larger number of entries on the whole than were exhibited last year. Very noble classes of hunters—the 39 weight-carrying hunters were especially a noteworthy class. The 1st prize went to Sir W. W. Wynn, Bart., for his chestnut "Expectation," which also carried off the Gold Medal. It is described by another pen elsewhere. In the second class of hunters without restriction as to weight, another 39 contended for the honours. The award of prizes is given below. Other two classes, under 15¼ hands and four years old, included 47 entries. The show of hunters, combining strength and activity probably more perfectly than any other class of horse, was not only thus remarkably large, but of excellent quality. Of riding horses and roadsters there have been smaller classes—cover hacks and roadsters (weight carriers) being especially a small class of capital horses. A fine and showy class of ladies' horses, and a good display of carriage and harness horses, have contended for a liberal prize list. The ponies were a capital class, or series of classes—sprightly, clever, compact, hardy looking, and very attractive.

The leaping was, as usual, great fun; and, no doubt, added immensely to the enjoyment and the number of spectators. The stallion classes were fairly filled. The following is the list of awards:—

LIST OF JUDGES.—The Earl of Coventry, the Earl of Portsmouth, Henry Chaplin, Esq., M.P., Colonel George A. Maude, C.B., and James Baillie, Esq.

PRIZE LIST.

CLASS 1. Hunters, weight carriers, equal to not less than 15 stones.—1st (£80, Sir Watkin W. Wynn, Bart, M.P., Wynnstay Ruabon, for his chestnut, aged, named "Expectation;" 2d (£40), J. W. Thompson, Esq., Charlton, Colinsburgh, Fife, "Iris," bay; 3d £20), Mr. H. Sanders, Brampton Hill, Northampton, for "Ironmaster," grey, 6 years.

CLASS 2. Hunters, without condition as to weight.—1st (£50), Henry Spencer Lucy, Esq., Charlcote Park, Warwick, for "Heroine," bay; 2d (£25), H. S. Lucy, Esq., for "Queen of Hue," chestnut; 3d £15, S. J. Welfitt, Esq., for "Loiterer," bay.

CLASS 3. Hunters, without condition as to weight, and not exceeding 15 hands 2 inches high.—1st (£40), Major Quentin, Woodleigh, Dartmouth, for "Bird on the Wing," bay gelding; 2d (£20, Mr. Francis Barker, for "Bird on the Wing," black.

CLASS 4. Hunters, 4 years old.—1st (£50, Mr. Thomas Sutton, Middleton One Row, Darlington, for "Comrade," dark chestnut; 2d (£25), John B. Booth, Esq., for "Borderer," chestnut; 3d (£15), T. J. Dorset, Esq., County Club, Albemarle Street, for "Villager," chestnut.

CLASS 5. Riding horses, of any height exceeding 15 hands.—1st (£20), Captain George Cook, Prince's Gate, for "Sobraon," grey; 2d (£10), Earl of Rosslyn, Dunmow, Essex, for "Angela," black; 3d (£5), Joseph Topham, Esq., Great Staughton, near St. Neots.

CLASS 6. Cover hacks and roadsters (weight carriers) not exceeding 15 hands 2 inches high.—1st (£15), Henry Frisby, Esq., for "Daisy," grey; 2d (£10), Mr. G. H. Sanday, Holme Pierrepont, Nottingham, for "Brunette," brown; 3d (£5), Mr. Frank Barker, for "Bird on the Wing," black.

CLASS 7. Park hacks and ladies' horses, not exceeding 15 hands high.—1st (£20), Major Quentin, for "Coxcomb," bay gelding; 2d (£10), Mr. Robt. G. Heart, for "Master Stygins," black horse; 3d (£5), Mr. T. J. Cook, for "Beauty," dark brown.

CLASS 8.—Harness horses, not exceeding 15 hands 2 inches high: for the horses of the best shape, with park action, exhibited in single harness, with suitable carriages.—1st (£15), Henry Frisby, Esq., 20A, St. James's Place, London, for "Daisy," grey mare; 2d (£10), Harvie Farquhar, Esq., 60, Lowndes Square, for "Blacksmith," black.

CLASS 9. Park hacks and ladies' horses, not exceeding 15 hands 1 inch high.—1st (£20), Major Quentin, for "Burnt Sienna," bay gelding; 2d (£15), Mr. George Gurnell, Broughton, near Brigg, Lincolnshire, for "Quicksetp," bay mare; 3d (£10, Henry Frisby, Esq., for "Dunstan," bay.

CLASS 10. Park pobs—high steppers, not exceeding 14 hands 2 inches high.—1st (£20), F. J. Cooper, Esq., 131, Piccadilly, for "Primrose," brown; 2d (£10), the Duke of Wellington, Apsley House, Piccadilly, for "Skewbald;" 3d (£5), Mr. Charles Gakes, Illington Hall, Thetford, Norfolk, for "Princess," bay.

CLASS 11. Harness horses, not exceeding 14 hands 2 inches, in single harness.—1st (£15), Henry Frisby, Esq., for "Dunstan," bay; 2d (£10), Mr. J. Grout, for "The Colonel," dark chestnut; 3d (£5), William Henry Gaunt, Esq., for "Rocket," brown mare.

CLASS 12. Ponies, not exceeding 13 hands 3 inches high, in single harness.—1st (£15), Mr. William King, Leighton Buzzard, for "Tommy;" 2d (£10), Frank G. Haines, Esq., 18, Oxford Road, Ealing, for "Multum in Parvo;" 3d (£5), Lord Cardross' dun mare.

CLASS 13. Thoroughbred stallions.—Agricultural Hall Medal and £50, B. J. Angel, Esq., Lubbenham, Leicestershire, for "Alcibiades," chestnut.

CLASS 14. Stallions, half bred, not less than 15 hands high, for getting roadster trotters.—1st (Agricultural Hall Medal and £30), B. Mitchell, Esq., Crowe Hall, Downham Market, Norfolk, for "Fireaway," dark chestnut; 2d (Medal and £15), to Mr. Wm. Flanders, Fen House, Mildenhall, for "Quicksilver," roan.

CLASS 15. Stallions of any breed, under 15 hands, for getting hacks or cobs.—1st (Medal and £15), to Mr. Henry Roundell, Queen's Head Hotel, Otley, for "Sir George," brown; 2d (Medal) to Richard Munson, Esq., Whalpole, St. Peter's Lodge, Norfolk, for "Young Rattler," black.

CLASS 16. Stallions, not exceeding 13 hands 3 inches high.—Agricultural Hall Medal and £10, J. A. Ransome, Esq., Carr Street, Ipswich, for "Perfection," brown.

EXTRA CLASS "E." For any animal of extraordinary merit not qualified to compete in any of the 16 classes.—£10, Henry William Peek, Esq., M.P., Wimbledon House, Wimbledon, for "Selim," grey Arab stallion.

HIGH COMMENDATIONS.

IN CLASS 4.—Mr. E. Paddison's chestnut gelding; P. Wollerstan, Esq., for "Tommy," bay.

IN CLASS 5.—H. S. Lucy, Esq., for "Twilight," brown mare.

IN CLASS 6.—Mr. J. Robson, for "Miss Patty," chestnut.

IN CLASS 14.—Mr. Robert Turnham, 234, Euston Road, for "Young Resolute," red roan.

COMMENDATIONS.

IN CLASS 1.—Mr. F. Barker, of Westlands, Ingatestone, Essex, for "Sampson;" John R. Booth, Esq., of Kellerly Hall, Catterick, Yorkshire, for "Brian Boru," chestnut.

IN CLASS 2.—Mr. W. J. Wheeler, Oxford, for "Master of Arts," bay.

IN CLASS 3.—R. Brown, Esq., Carlisle, for "Tiny Tim," chestnut; William Wright, Esq., Woolaton, Nottingham, "The Pilot," brown.

IN CLASS 5.—Mr. E. Paddison's roan gelding.

IN CLASS 7.—Sir Arundle Neave, Bart., of Dagenham Park, Essex, for "King Charming," dark chestnut.

IN CLASS 14.—Major H. Stapylton, for "Shepherd F. Knapp," chestnut.

IN CLASS 15.—Mr. Richard Taylor, Park House, Nichells, near Birmingham, for "Hercules II.," chestnut.

IN CLASS 16.—Charles Groucock, Esq., Standfield Hall, Wymondham, Norfolk, for "King Arthur," chestnut; G. Burnard, Esq., Jewin Water, Welwyn, Herts, for "Frolic," bay.

CENTRAL CHAMBER OF AGRICULTURE.

AT last week's meeting of the Council of this Society a number of resolutions were adopted:—

(1). *On Occupation Roads.*—"That the subject of legal provision for the repair of occupation roads is of sufficient importance to be worthy of consideration by the Government, in connection with any general road Bill that they may hereafter introduce.

(2). *On the Turnpike Acts Continuance Bill.*—"That this Chamber regrets to find in the Government Turnpikes Act Continuance Bill, now before Parliament, that trusts with toll incomes amounting to nearly £200,000 (£11,183 of which is in the county of Warwick), are placed in the abolishing schedules of the Bill. The Chamber had hoped, from Mr. Knatchbull-Hugessen's speech at the Central Chamber, on February 8, that the Government were preparing to deal with the whole subject of roads at the first convenient opportunity, and therefore trusted that the Annual Continuance Act would not be made the vehicle for shifting the burden of the repairs of the turnpike roads from the users thereof to the adjacent payers of rates levied upon real property alone, until a revision of the incidence of local taxation has been inquired into and readjusted. It is also resolved that the Secretary send a copy of the above resolution to Sir Massey Lopes (chairman to the Local Taxation Committee to the Central Chamber), and to the M.P.'s for the county, cities, and boroughs, and request them to give their strenuous opposition to the Bill, unless the abolishing schedules are abandoned."

(3). *On Weights and Measures.*—The following six gentlemen were requested to act as members of a joint committee for the discussion of this subject, along with a committee of the International Decimal Association, namely, Colonel Tomline, M.P. (Chairman of the Central Chamber), Mr. C. S. Read, M.P., Mr. Albert Pell, M.P., Mr. R. Jasper More, Mr. R. Varden, and Mr. John Algernon Clarke (Secretary of the Central Chamber).

(4). *On the Game Laws.*—"This Council, while declaring that an excessive preservation of ground game is incompatible with good farming, disapproves of any legislation on the subject that would interfere with freedom of contract between owners and occupiers." On this subject a prolonged discussion took place, and various amendments were proposed—(*a*) (by Mr. D. Long, Gloucestershire): "That in the opinion of this Central Chamber the special laws which surround the preservation of game are prejudicial to the interests of agriculture and the public generally, inasmuch as they diminish home production and the supply of food for the people, greatly increase crime, and frequently cause animosity between landlord and tenant; and they therefore require the early attention of the Legislature, with a view to their abolition, and the substitution of a sufficient and effectual law of trespass;"—(*b*) "That this Council repeats its protest against the over-preservation of ground game, and considers that in all future agreements the owner and occupier of the soil should have a joint right of killing hares and rabbits"—by Mr. C. S. READ, M.P. (Norfolk), who said it was impossible to know anything of the increase of game. One gentleman had spoken of the long leases and the increase of game; but he would say that in one year a gamekeeper might increase the game indefinitely if a landlord were an absentee. It was said that the landlord had a right to his own property. So he had so long as he remained in occupation; but when he gave it up that was changed. Though he was against an appeal to legislation between owners and occupiers, he thought it should be sometimes asked to interfere on account of what he would call the rascality of some owners of land, who went on increasing their ground game.—The Council further adopted on this subject two resolutions, that "This Council considers that, in justice to ratepayers, all land should be rated at its full value, irrespective of any reservation of the rights of sporting on the part of the owner;" and (after a prolonged discussion) that "This Council is of opinion that hares and rabbits should be excluded from the operation of the Game Laws; but considers that such exclusion would render imperatively necessary a change in the law of trespass, by giving a summary remedy without the necessity of proving pecuniary damage."

HIGHLAND AND AGRICULTURAL.

AT last week's monthly meeting of the directors of this Society the Secretary reported that in terms of the instructions of the last Board meeting he had proceeded to Dumfries, and arranged with Mr. Mathew Richardson, Annan, for the erection of the showyard.

The Board approved of the President's dinner being held in the Mechanic's Hall on the evening of Wednesday, July 27; and the Secretary was instructed to arrange with a contractor.

Closing of the Entries.—The Secretary stated that, as the last day for lodging certificates was Wednesday the 15th inst., he would attend at the King's Arms Hotel, Dumfries, on that day, to receive entries, and to close the list.

British Association—Treatment and Utilisation of Sewage Committee.—The following letter, addressed to the Secretary, was read :—

"22, Whitehall Place, London, S.W., May 10, 1870.

"Sir,—I have been requested by the committee to beg you will do it the favour of placing before the Council of the Highland and Agricultural Society of Scotland the enclosed circular letter, addressed to the sewer authorities of the towns of the United Kingdom, explaining the objects for which the committee exists, and suggesting for consideration whether they are not such as the Council may fairly encourage by a subscription to the Inquiry Fund. This committee has thought it probable that, as the utilisation of sewage in agriculture is one of the great ends, if not the principal end, to which the labours of the committee are directed, the Highland Society may be disposed to add a subscription to the fund now raising to defray its expenses. I need hardly add that the members of the committee give their own services gratuitously for the public benefit.—I have the honour to be, &c.,

(Signed) "RICHARD B. GRANTHAM, Chairman."

On the motion of Mr. Walker, of Bowland, the Board unanimously resolved to subscribe £10 in aid of the fund.

Farmers' Clubs.

LAVENHAM.

Horse Breeding.—At a recent meeting of this Club, Mr. G. D. BADHAM, of Bulmer, read a paper on this subject :—

I shall state my views with regard to breeding and rearing horses. 1. As regards horses for riding. We constantly hear the remark, "Breeding nags does not pay." Why does it not pay? Simply because we breed amiss. Do we not put mares without any known pedigree, and too often with some hereditary defect, to any stallion which happens to come near us? If we wish to improve our cattle, sheep, or swine, the services of a good male animal are secured, and sometimes we go even further, and purchase some good females, but we take no trouble with our horses, and frequently the one we use is hardly looked at. Certainties in horse breeding are fallacious, yet we must be guided by general rules, and the breeder who carefully studies the selection of both sire and dam will far outstep the reckless breeders. Our great object should be to produce an animal as near perfection as possible ; for this end the sire chosen should be possessed of those points in which the dam may be deficient. There is, in my opinion, but one true shape for a horse, whether it be a cart horse or a hunter, and depend upon it the sloping shoulder is as necessary for the one as the other, for if he has a straight shoulder he cannot walk, and the old story about being able to draw with a sloping one is sheer nonsense. You must, if you wish to succeed, give up using the half-bred horses, except upon thoroughbred mares ; if you have the alloy in the dam you do not want it in the sire. The modern hunter or hack must be thoroughbred on one side, and I should like to see the same rule in our Agricultural Society in Suffolk as they have in the North, where no animal is allowed to compete unless the pedigree show at least two crosses of blood. The great improver of his species is the thoroughbred horse, and if we wish to succeed in breeding a modern hunter or hack we must select a mare free from hereditary ailments, and put her to a horse with plenty of stout blood in his veins. In the best hunting counties, such as Leicestershire, Northamptonshire, and many others, the cocktail stallion is unknown, and more will be found in the Eastern Counties than in any part of England. The selection of a good mare is of the greatest importance. I have scarcely ever seen a bad horse of any class from a really good mare, and there is scarcely an instance of extraordinary merit but the prevailing points of excellence could be traced in some way to the dam. At the same time we must not overlook the importance of good sires, for without these we shall assuredly fail in our attempts to breed a good animal.

How does the chance breeder proceed in the choice of his sire? Does he look for one which has all the points good in which his mare is defective? If he did, half the evils might be avoided ; but chance is again trusted to, and all the anxiety he evinces in the matter is the cost of the horse's services ; while in other cases it is the one which passes the gate, or is close at hand, which is chosen. He may have every defect to which horseflesh is liable, but this is no matter to the chance breeder ; a foal is all he wants, and I once heard a breeder say, "A foal was a foal, and it could not be a calf." He never pictures to himself the cost of rearing a colt up to three, four, or five years old, and then finding the animal has a spavin, a curb, or a ringbone.

The systematic breeder never allows any chance-work to creep into his concerns. Whether he breeds racers, hunters, carriage, saddle, or cart horses, he selects with deep anxiety the animals he intends to breed from, of both sexes, and those which he can trace back to blood of unquestionable family in their class. Breeders of this description are not numerous in these counties, but there is nothing to prevent their becoming so, and they will generally succeed best by confining themselves to breeding only one class of horse, though of course there are exceptions to this as every other rule. One, I remember, some years ago in the eastern parts of this county ; I remarked that all his colt foals were sent away as sires, and his fillies became first-class mares, and were always winners at the Suffolk agricultural shows, and before he let his home farm he offered to show his five mares with any five in the county ; the challenge was accepted by the late Mr. Cattlin, who was beaten by him. The same gentleman bred also a few hunters and hacks, and in these he was just as successful ; his carriage horses were bred by himself, and they had not their equal in the county, and one of his hacks I shall always remember.

I mention these facts to show it is not so difficult as people fancy to breed good animals if you only set about it in the right way, for "like breeds like." Temper, power, endurance, spirit, generally follow the dam ; form, action, &c., the sire. Without losing sight of the power, the more breeding a hunter can have the better, for they are often called on to perform extraordinary acts of gameness, and from the thoroughbred comes all the pluck and courage to stay a distance, and by their blood-like action to give their riders a comfortable seat in their saddles. It is not necessary for a mare to have been a fine performer herself, but there are a few points indispensable, viz., a sloping shoulder, deeper girth, short cannon bones, a good back, big quarters and thighs and hocks, with her hind legs in the proper position under her. As I have before said, temper, spirit and endurance are all very essential in the dam. Mares to breed carriage-horses need not be so well bred as those for breeding hunters, but they must have plenty of knee action, with good heads, necks, and shoulders, and should be put to a thoroughbred sire if you wish to breed first-class animals. The same thing applies to hacks, and it is utterly impossible to breed a modern hack except in this way.

As regards horses for agricultural purposes, there is nothing will interest you more as a body of advanced practical farmers than what we want to constitute a good draught brood mare, and there is nothing connected with agriculture of greater importance to the farmer than his horse-power, with the exception of manual labour. It is true that steam is largely employed where formerly horse-power was used, both in cultivation and threshing ; but horse-power still is, and must always be, the principal means by which a farmer gets through his work, and steam becomes more of an auxiliary than a real power. Such being the case, is it not our interest to have this great power of the most approved class? And in order to effect this, the same attention must be paid both sire and dam as in breeding horses for the field or road. A pedigree of undoubted authority is absolutely necessary ; if you see two horses with all that you want in a sire, but no pedigree, or only an imperfect one, and another with some faults, but with a pedigree, select the latter, as you are more certain to get an average foal, but with the other it is all chance, you may get what you want, or you may not. The all-important point of soundness is now to be considered. It is the essential one in the brood mare for all purposes. It is a notorious fact, that there are certain diseases to which parents are the subjects, and which will descend in the progeny. Ringbones and sidebones are hereditary in almost any form, indeed ringbones will come out after many generations ; blindness, a special disease of horses, is certain to follow breeds, and on no account would I recommend breeding from either sex affected with it. A mare may lose an eye or become blind from accident ; but though this would not be hereditary, it unfits her for that office for which Nature has destined her—to protect and shield her offspring from injury, besides, it makes her clumsy, and she is liable to tread on the foal. Diseases of the respiratory organs, as roaring, whistling, broken wind and thick wind, are all, I consider, hereditary diseases. Diseases in the feet should be carefully avoided. Sand-crack I have seen follow in families, and seedy toe also.

In conclusion, I may add that it is most important to have both sire and dam in a healthy condition, as the progeny of sickly framed animals are sure to inherit some of their failings. Perfect conformation and soundness in both sire and dam are of the greatest importance. Before I conclude I will make a few remarks upon the treatment of foals and yearlings, &c. Having bred a good animal, the next thing we have to attend to is his being well cared for. I will suppose you are breeding animals of the right sort, and such as will bear a little increased expenditure to be bestowed upon them. I will begin with the foal : get them as early as possible, and give the dam bran, corn, and hay. Corn should be continued a good part of the summer, if you intend having a good yearling, and three feeds should be given to the foal daily, when it is weaned ; during the following summer, and, indeed, till the animal is rising three years old, no corn will be necessary, but at that age it should be brought into the stable and commence its education ; this course requires good management, but I would on no account allow it to be taken off the farm to be what is termed broken ; if you must employ a person for the purpose of getting the animal in a fit state to be ridden, by all means have it done at home. And I strongly advise all breeders to have their foals haltered and tied now and then when they are sucking upon the mares. The greatest care is necessary with stock of this description. It is quite possible to avoid accidents in a great measure—at all events, we should try to avoid them ; allow only a very careful man, who uses your animals gently, to have anything to do with them, and I feel sure you will find accidents much less common than heretofore.

Notices of Books.

Report to the Metropolitan Board of Works on the Economy of Road Maintenance and Horse-draught through Steam Rolling. By F. A. Paget, Esq., C.E. Judd & Glass, Phœnix Printing Works, Doctors' Commons, E.C.

MR. PAGET, who has proved his powers of exhaustive investigation in connection with other subjects, has here collected and discussed a great quantity of information on the maintenance of London roads, and on the economy of using the steam roller. It is intended hereafter to republish this report with an introduction expressly written by Field-Marshal Sir John F. Burgoyne, Bart., G.C.B., F.R.S., R.E., &c., formerly Chairman of the Board of Works in Ireland, who has studied the subject of road-rolling for more than thirty years ; and, together with this, several other articles. Amongst these will be a paper by the Paris Steam Road-rolling Company, on the results of the last seven years' steam road-rolling in that city ; and another on road-rolling in Germany, by an eminent German engineer : both to be translated by the author of the Report. Articles will also be contributed by John Colam, Esq., Secretary of the Royal Society for the Prevention of Cruelty to Animals, on the law bearing on the subject ; by an eminent veterinary authority on the injury caused to horses by unrolled roads—and others.

The following is an extract illustrating the mode in which Mr. Paget treats his subject, section by section, in detail :—

Advantages of Steam Road-rolling.—The steam-roller produces no interuption of the traffic from time taken up in turning the machine, nor from slow progress of the rolling on account of light weight. The steam road-roller can completely consolidate from 2000 to 2400 square yards in a day of ten hours. The steam-roller can be rapidly turned, and be made of almost any weight endurable by a road ; while its smoothing action, from this extra weight and its possession of a motive power not requiring the metalling for such fulcra as the horses' hoofs, is much superior. Aveling & Porter's, the French, and other steam road-rollers can go up inclines of one in twelve with ease. It is considered by Mr. Mann, the superintendent of the department of Her Majesty's Commissioners of Works—and his opinion is endorsed by Mr. E. A. Cowper, the consulting engineer of Her Majesty Post-office—that the steam-roller has 'the effect of turning down the sharp edges of the stones and leaving their flat sides uppermost, bedding the stones together in the road so as to make a solid level surface.'

"A fully loaded ordinary cart presses with at least 5 cwt. to the inch run ; and 10 cwt. to the inch wide is rather below the load of a great proportion of the metropolitan traffic. The railway vans of Messrs. Pickford and of Chaplin & Horne weigh 1¼ ton, and carry loads of about 3½ tons ; and on tires about 3 inches wide. This gives more than 16½ cwt. per inch run ; even if we suppose that the felloes form perfect cylinders, though, as a rule, they are soon rounded off by the wear for more than an inch from each edge. The tires then really bear on only one inch of their widths on a level road, or 1½ ton per inch run. The present London omnibuses, which have remained unchanged for many years, weigh from a to 22 cwt. when empty, and, when loaded with twenty-six persons, exclusive of driver and conductor, about 3 tons. The 1¾ inch wheel felloes become so convex that the load often rests on a zone only an inch, or half-inch, or even sometimes only a quarter of an inch. This last minimum width would give as much as 3 tons per inch run. Of course, as soon as the rounded wheel sinks into the ground and cuts into the stones, its full width would come into play, but it has to sink before this takes place. Omnibuses are, no doubt, the most destructive vehicles on a road. They are mostly filled in wet weather, or just at the very time when the roads are in the worst state for bearing a load. When starting, the efforts of the horses to overcome the inertia of the vehicle necessarily break the road being much cut up. To take the most favourable case, that of a Pickford van with new felloes, and only loaded with 1½ ton, on less than half its usual load. If the Aveling & Porter roller at Liverpool, with its width of roller of 9 feet 6 inches, were required to exert a pressure of only 10 cwt. per inch run it would have to be weighted to 57 tons, though its present weight of 30 tons has been found sufficient in practice. It makes up for want of weight by an additional number of passages over the metalling, just as the paviour's rammer, though comparatively light, sets the paving-stones by a series of repeated falls. To roll down for the omnibus wheels when on a level road flooring, the same roller should weigh 114 tons ; a weight quite out of the question when it is remembered that the roller has to pass over bridges, subways, water and gas mains, and more especially old cellars. In fact the 30-ton roller has been found to do injury in this way, and even the 25-ton roller at Sheffield, though perfectly successful as a roller, has been found to break down badly laid shallow drains. Messrs. Aveling & Porter, as the result of this experience, now recommend a 15-ton engine. Messrs. Gellerat & Co., of Paris, inform us that '15 tons is the weight most suitable for new roads where the ground is not very good ;' but they 'preferably employ on old roads (for *ratissements*) rollers weighing from 24 to 30 tons, which work much

more rapidly and economically.' The 15-ton Gellerat & Co. roller presses with nearly 5½ cwt. per inch run; the 30-ton Paris roller with more than 8 cwt. per inch run; the Aveling & Porter 30-ton roller with more than 5¾ cwt.; and their 15-ton roller with a little more than 4 tons to the inch of width. The roller in Hyde Park, hired by the Government from Messrs. Moreland & Son, carries nearly 6 cwt. per inch run. Messrs. Batho & Clark's new roller, now at Birmingham, is loaded with nearly 5 tons per inch. Comparing these figures with the heaviest and best sample of horse-roller, we find that the 10-ton 5 feet 6 inch wide water-ballasted roller of Messrs. Amies & Barford presses with only about 3 cwt. per inch run."

Farm Memoranda.

STREAT ROAD STATION, CHESTER COUNTY, PHILADELPHIA.—Mr. Samuel J. Sharples has here a dairy of thorough-bred Jerseys. The milking-house is a light wooden structure, with so many open doors and windows that it is hardly more than a shed. In the winter it is closed up, and used as a stable for young stock. In size it is about 22 feet by 36, with a row of stanchions on each side, and with mangers in which a little bran is put at milking time. Each cow has her own place, with her name, age, and pedigree on her own manger, and she always goes to it as though she could read. Their names have been put up in the order in which they come from the pasture, the "master" cow entering first, and the least plucky last. The milking is done by women, the same one always milking the same cows, and it is done rapidly and quietly, no unnecessary talking and no skylarking being allowed. We measured "Niobe's" yield, and found it to be 11 quarts (she gave 9 the next morning, making it 20 quarts for the two milkings)—not bad for a butter-making Jersey. The others gave less (the smallest not more than 8 quarts at two milkings); but the whole herd of 18 cows could not have given less than 200 quarts a-day, and this of milk that yields over 20 per cent. of cream. Near by the milking-house is the "spring-house," about 24 feet long by 18 feet wide, built of stone, with its foundations set deeply in the hill-side, and its floor about 4 feet below the level of the ground at the down-hill side. The sight is that of a plentiful spring, which is allowed to spread over the whole of the enclosed area to the depth of about 3 inches above the floor of oak laid on sand or gravel. At this height there is an overflow by which the water passes to a tank in an open shed at the down-hill end of the house. On the floor of the spring-house there are raised platforms or walks to be used in moving about the room, but probably three-quarters of the space is occupied by the steady-flowing spring water. The walls are about 10 feet high, and at the top, on each side, are long, low windows, closed only with a wire cloth, which give circulation of air at the upper part of the room. The milk is strained into deep pans of small diameter, that are kept well painted on the out-side, and are provided with bails, by which they are handled. The depth of the milk in the pans is about 3 inches, and they are set directly upon the oak floor, the water, which maintains a temperature of about 58° Fahrenheit, surrounding them to about the height of the milk. The cream is taken off after 24 hours, and is kept in deep vessels having a capacity of about 12 gallons. These vessels are not covered; and as the room is scarcely warmer than the water, the cream is kept at about 58° or 59° until it is put into the churn.

Churning. The churn is a large barrel (bulging only enough to make the hoops drive well), with a journal or bearing in the centre of each head, so that it may be revolved by horse-power. This barrel has stationary short arms attached to the inside of the staves, so arranged as to cause the greatest disturbance of the milk as it passes through them in the turning of the churn. At one side is a large opening, secured by a cover that is screwed firmly into its place—this is the cover or lid of the churn. Near it is a hole, less than an inch in diameter, for testing the state of the churning, and for drawing off butter-milk; this is closed with a wooden plug. The churning lasted about an hour, at the end of which it was necessary to add a little cold milk to cause the butter to gather. This being secured, and the butter-milk drawn off, cold water was twice added, a few turns being given each time to the churn, and when the last water was drawn off it came nearly free of milkiness. A crank was then put on to an arm of the churn, the horse-power thrown out of gear, and a gentle rocking motion caused the butter to be collected on the lower side, and directly over the small hole, through which the remaining water escaped. It was left in this condition about two hours. After breakfast we returned to see the working of the butter.

The Butter Worker.—In one corner of the spring-house stands the butter-worker, a revolving table about 3 feet in diameter. The centre of this, for a diameter of 12 inches, is an iron wheel with a row of cogs on the upper side of its rim. From this rim to the raised outer edge the table (made of wood) slopes downward, so that the butter-milk as worked out is passed into a shallow groove, and is carried away through a pipe which discharges into a pail standing below. Over the sloping part of the table there works a corrugated wooden roller, revolving on a shaft that is supported over the centre of the table, and has a small cog-wheel that works in the cogged rim of the centre wheel, and causes the table to revolve under the roller, as this is turned by a crank at its outer end. Of course, the roller is larger at one end than the other, so as to conform to the slope of the table, and its corrugations are very deep, not less than 2 inches at the larger end. Supported on each end of the roller, and on both sides, are bevelled blocks which, as the table revolves, force the butter from each end towards the centre of the slope. About 20 lb. of butter is now put on the table, and the roller is turned, each corrugation carrying through a long narrow roll, which is immediately followed by another and another, until the whole table is covered. The roller does not quite touch the table, and there is no actual crushing of the particles. The bevelled blocks slightly bend these rolls, and crowd them towards the centre of the sloping part, so that when they reach the roller they are broken in fresh places, and by a few revolutions are thoroughly worked in every part.

Final Processes.—Then follows a process that was new to all of us—the "wiping" of the butter. The dairyman turning one roller backward with the left hand, so that the butter came through at the right hand side, presses upon every part of it a cloth which has been wrung dry in the cold spring water, and which he frequently washes and wrings out. This is continued until not a particle of water is to be seen in the butter as it comes from the roller, to which it now begins to adhere. If there is any secret in the making of Philadelphia butter this is it; and it has much to do with the uniform waxiness of texture, whether hard or soft. After this the butter is salted (an ounce of salt to 3 lb. of butter), still by the aid of this machine, and any lurking atom of moisture is in this way prevented from becoming a cause of rancidity. When the salt is thoroughly worked through the whole mass the butter is removed to a large table, where it is weighed out and put up in pound prints. The working, wiping, and salting of over 100 lb. of butter occupied about an hour; and before 10 A.M. the entire churning, beautifully printed, as fragrant as the newest hay, and as yellow as pure gold, such butter as only Jersey cream will make, was deposited in large tin trays and set in water to harden. The next morning it was wrapped in damp cloths, each pound by itself, put in a tin case, each layer having its own wooden shelf, with two compartments of pounded ice to keep it cool, and, surrounded by a well coopered and securely locked cedar tub, was sent to the Continental Hotel, where we found it on our return as delicious as when it left the farm. It is very difficult to describe any process in which so much depends on the judgment of the operator; and the writer hardly hopes for more than that his example will stimulate others who are interested in the subject to examine for themselves the daily operations of this interesting and beautiful region for butter-making.
G. E. Warring, Jun., in the "Boston Cultivator."

The Week's Work.

June 11.—*Manuring and Watering Cabbages, Mangels, Carrots*, &c., is practised in some parts of the United States of America, where root crops can with difficulty be otherwise grown, owing to the warm, dry summers. As soon as the Cabbages are planted, or the young Mangels begin to break the surface, the "water drill" (a common water-barrel cart with a biforked hose) is yoked, applying the liquid from the manure tank to two rows at a time, a man behind guiding the flow to where it should fall. If the field is not more than a mile from the homestead, a man with an active horse will do two acres a day, and if only half a mile, four acres, and so on. The application not only secures an abundance of plant in the rows, but also prevents the ravages of turnip-fly. All drill crops may be watered in the same way, either with or without manure dissolved in it. A water drill made on the same plan, but with four discharge pipes for four drills, was patronised by the Highland Society of Scotland in the early part of the present century. A water-cart made on the same plan was exhibited at the Leicester meeting of the Royal Agricultural Society. The practice is sound in principle, but as yet defectively carried out, or it would have met with more support than it has hitherto received. Success depends upon timing the velocity of the discharge pipes in the opposite direction of the pace of the horse, so that the water shall fall upon the ground with no more force than that due to gravitation from the mouth of the pipes, which should be allowed to trail as it were over the surface. The mechanical proposition is doubtless a nice one, but not beyond the hope of a practical solution, and just now, on the eve of the Oxford meeting, when root crops are suffering for the want of rain and from fly, it comes home with inviting claims on attention.

Hoeing and Weeding corn crops, if not finished, should be so without delay. In peculiar seasons and circumstances the fields have to be gone over again to remove Docks, Coltsfoot, Turnips, &c., which may have sprung up or escaped previous observation. All such should be carefully pulled by hand and carried off, and the ground and plants of corn loosened in pulling should be put to rights with the foot. Sometimes "the wild Oat," where it prevails in the land, can be distinguished by this time, and when such is the case it also should be put into the basket.

Beans, Peas, and Potatos go over. If too far advanced for the hoe, weeds should be pulled by the hand. Earthing-up is the last operation, and if preceded by the horse-hoe, the double-mouldboard plough will work all the better.

Mangel Wurzel horse and hand hoe. In early seasons the crop will be ready for a second hoeing by this time, but in late ones, like the present, it is otherwise. Opinion is yet very much divided as to the proper distance between the plants; the practice of singling ranging from 8 to 18 inches apart. Roots averaging 8 lb. can be grown at 8 inches apart, and we have found this distance and the above medium of weight of root yield a heavier crop of better quality than here and there large roots grown at twice the distance asunder; and we believe the practice of growing this root closer in the rows is becoming more general, strong as the prejudice once was against it.

Sugar-Beet horse and hand hoe as Carrots, singling out the plants 5 to 6 inches apart. To keep the earth loose and in a porous state with the horse-hoe is in favour of the growth of this root, and the practice applies with nearly equal force to all root crops.

HOEING TABLE FOR MANGELS, KOHL RABI, SWEDES, AND TURNIPS.

Distance between Rows.	Distance between Plants.	Number of Plants per Acre.	Weight of each Root.	Weight per Acre.
Inches.	Inches.		Lb.	Tons. cwt.
27	6	38,720	8	137 8
27	8	29,040	8	103 14
27	9	25,813	8	92 14
27	10	23,230	8	82 10
27	11	21,120	8	75 8
27	12	19,360	8	69 1
27	16	14,520	8	51 17

HOEING TABLE FOR SUGAR-BEET, PARSNIPS, AND CARROTS.

Distance between Rows.	Distance between Plants.	Number of Plants per Acre.	Weight of each Root.	Weight per Acre.
Inches.	Inches.		Lb.	Tons cwt.
30	5	62,726	4	111 0
30	6	52,272	4	93 6
24	5	52,272	4	93 6
24	6	43,560	4	77 10
27	5	46,460	4	82 10
27	6	38,720	4	69 4

Hemp grown in drills hoe as soon as the plants will bear it. The crop is a smothering one, and when once it covers the ground it will keep itself clean.

Sheep Folding on Vetches, Clover, &c., answers well for the land during this and the following summer months, and could some plan be devised for sheltering the sheep from the mid-day rays of the sun, a discovery which might have been made long before now, the practice would answer the sheep equally well. The burning sun of summer is very intolerant to sheep, melting the fat, as it were, as fast as it is made; and it certainly would not take much to set up two stuffed hurdles in the form of a half-roof and side wall, or, what would be better, two of Gooday's patent straw webs, which can be made by the patentee's "Multiple Needle Sewing-machine" at the rate of "1500 feet per hour." Having got this length in the solution of the problem, why stop? The practice of folding answers the heavy class of soils adapted for Vetches as well as the light land, which is benefited by the trampling. Some farmers allow the sheep to eat the Vetches or Clover off the ground taking in small plots at a time; others mow, and either feed in racks or cribs in the field, or else soil in open yards at the homestead. On Vetches fatting sheep will require about a pound of corn each daily, and on Clover about half the allowance. On irrigated meadow rot has now to be guarded against. For this purpose apply 10 cwt. of salt before the water is let on to the meadow. Mow and soil, seasoning the Grass with a sprinkling of salt and beanmeal, and if there is Clover, Sainfoin, Lucerne, Lupine, or Chicory, these are all preventives, and therefore should be used along with the meadow-grass. Much in this way may be done to obviate sheep-rot.

Flax hand weed carefully as soon as it is fairly above the ground. The old rule of "an inch above ground" is not attended to in our Flax growing districts, for much more depends upon the nature of the land than the height of the plant above it. Weeds are easier seen when the crop is short, and pulled before their roots entwine around those of the Flax. As gardeners weed their beds without doing any harm with their feet, so trained hands weed Flax, doing comparatively no harm to the crop. In weeding go straight forward, taking on no more breadth at a time than you can weed without any twisting and turning on the tread, and as you advance lift the foot heel and toe together, setting it down evenly in the same way on the Flax, and your footprints will shortly disappear.

The Weevil and Ground Beetle Tribes soon begin to enter upon active life, depositing their ova in the roots of Parsnips, Carrots, Cabbages, Beans and Turnips. The former two, Parsnips and Carrots, become "forked," the Cabbage and Beans "club-rooted," and Turnips have "anbury." Some of the insects devour the young leaves, as the turnip-fly, others live on the roots, and so on; and the havoc they play above and

below ground is even greater than is generally imagined. They are more numerous in dry seasons than in wet ones, and in ground that is tired of growing any of the above crops, than in rich productive land, which indicates the best means of getting rid of them. Thus the curculionidæ or club beetles are vegetable feeders, but they live chiefly on the decaying remains of plants, *i.e.*, club-roots soon rot when the insect is in an active feeding state. Others subsist on animal matter in the soil, and hence are seldom found on land in a healthy state, where such animal matters undergo immediate decomposition, and so on. The mode of prevention therefore is deep tillage, plenty of farmyard manure below, with the proper use of the liquid-manure drill; the salts of ammonia, lime, soda, and potash in solution being destructive to both the insects and their food. The subject requires more attention than it has yet received. *W. E.*

Notices to Correspondents.

EGGS AND BUTTER: *Q.* says:—If "Chicken" will rub his eggs over evenly with mutton or beef fat, they will keep perfectly fresh for many months. It should be done as soon as taken from the nest, when quite "fresh laid." Fresh butter will also keep good for months, by adding half a drachm powdered nitrate of potass to each pound, if for long keeping one drachm; it should be thoroughly beat up together, with a little extra salt; if kept many months, it may be well washed and made into shape. This I have frequently tried in India most successfully.

POULTRY: *G. E. O.* We submit the following letter to poultry correspondents:—I have a Dorking hen, supplied to me last autumn from an excellent establishment, that lays eggs almost without any white. She lays a great number of eggs, and now they are sometimes very thin in the shell, and sometimes wrongly shaped, but always small in size. She has not yet sat. I should be much obliged if you would mention to "G. E. O." in your Notices to Correspondents, whether it is at all likely that the hen will lay properly when she is older. (I am told that when she has sat the eggs will be different, but see no reason for believing the statement.) Another hen that came at the same time, and has been treated exactly in the same way, lays, sits, and hatches perfectly.

RICKETS IN LAMBS: *A Cotswold Farmer* says:—In your number of the 14th inst. is an extract from the "Veterinarian," regarding the disease in lambs known by the term of "rickets." I have been a sufferer to a great extent this year, losing more than 70 out of the produce of 200 ewes. The sheep and lambs have had about the same treatment they have had for this last 14 years. Can yourself or any of your readers favour me with any remedial suggestion as to the remaining lambs, some of them still showing symptoms of the malady? [No remedy appears to be of any use in the treatment of this disease, indeed, as the affection consists in a physical defect (elongation) of ligaments, it is scarcely possible that a cure could be obtained by the use of medicines.]

Markets.

HOPS.

BOROUGH MARKET, June 9.

Messrs. Pattenden & Smith report the market quiet, the demand being of an entirely retail character, at last week's quotations.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, June 9.

Prime Meadow Hay	60s to 100s.	Clover, old	110s. to 140s.
Inferior do.	75 84	Inferior do.	110 120
Rowen	— —	Prime 2d cut ..	110 120
Inferior do.	— —	Inferior do.	85 95
Straw	24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, June 9.

Sup. Meadow Hay	100s. to 112s.	Inferior Clover ..	105s. to 117s
Inferior do.	88 95	New do.	— —
New do.	— —	Straw	30 35
Superior Clover ..	128 136	JOSHUA BAKER.	

WHITECHAPEL, Thursday, June 9.

Fine Meadow Hay	76s. to 82s.	Prime old Clover ..	120s. to 130s.
Inferior do.	60 70	Inferior do. do. ..	90 100
Prime New Hay ..	— —	Prime 2d cut do. ..	— —
Inferior	— —	New Clover	105 112
Straw	24 28	Inferior do.	80 90

ENGLISH WOOL.

No fresh feature in the market, buyers still holding off in the hopes of being able to come in for the new clip on moderate terms. We are strongly of opinion, however, that no decline will take place, or if it does that it will be only temporary.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	s. d	s. d
FLEECES—Southdown hoggets	..	1 1	to 1 2½
Half-bred ditto ..	..	1 2	— 1 2
Kent Fleece ..	..	1 3	— 1 4
Southdown ewes and wethers ..	..	0 0½	1 1
Leicester ditto ..	..	1 2	1 3
SORTS. Clothing	..	0 10	— 1 6
Combing	..	1 0	— 1 6

METROPOLITAN CATTLE MARKET.

MONDAY, June 6.

The supply of Beasts is about the same as on Monday last, but the demand has greatly decreased, and prices are lower. The number of Sheep is about the same as last week; trade is exceedingly dull for them at lower rates, and several lots remain unsold. There are more Lambs and Calves than can be disposed of; some of the choicest make about as much as on Thursday, for other kinds prices are lower. Our foreign supply consists of 840 Beasts, 9530 Sheep, and 204 Calves; from Scotland there are 174 Beasts; from Norfolk and Suffolk, 1670; and 536 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-fords, &c. ..	4 10	to 5 0	Best Long-wools ..	.. to ..	
Best Shorthorns ..	4 8	— 4 10	Do. Shorn ..	4 8	— 5 0
2d quality Beasts	3 0	— 3 10	Ewes & 2d quality ..	..	..
Best Downs and Half-breds ..	..	— ..	Do. Shorn ..	4 0	— 4 6
Do. Shorn ..	5 0	— 5 2	Lambs	5 0	— 6 8
			Calves	3 6	— 5 6
			Pigs	3 6	— 5 6

Beasts, 3220; Sheep and Lambs, 30,800; Calves, 216; Pigs, 120.

THURSDAY, June 9.

The supply of Beasts is much shorter than on last Thursday; demand very limited, and prices have not advanced except for a few choicest descriptions. The number of Sheep and Lambs is the largest we have had on Thursday this year; the average quality of the latter is very inferior. The trade generally may be stated as on Monday. Choice Calves are scarce, and rather dearer. Our foreign supply consists of 190 Beasts, 4200 Sheep, 343 Calves, and 60 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-fords, &c. ..	4 10	to 5 2	Best Long-wools ..	.. to ..	
Best Shorthorns ..	4 8	5 0	Do. Shorn ..	4 8	5 0
2d quality Beasts	3 0	— 4 0	Ewes & 2d quality ..	..	— ..
Best Downs and Half-breds ..	..	— ..	Do. Shorn ..	4 0	— 4 6
Do. Shorn ..	5 0	5 2	Lambs	5 0	— 6 4
			Calves	3 6	— 5 8
			Pigs	3 6	5 6

Beasts, 930; Sheep and Lambs, 16,900; Calves, 450; Pigs, 70.

METROPOLITAN MEAT MARKET. June 9.

Best Fresh Butter	14s. per dozen lb.
Second do. do.	13s.
Small Pork, 5s. 0d. to 5s. 4d.; Large Pork, 3s. 6d. to 4s. 0d. per 8 lb.	

MARK LANE.

MONDAY, June 6.

There was a moderate supply of English Wheat to this morning's market, which was generally held for considerably more money, but a portion only was sold at an advance of fully 2s. per qr. on the week; for foreign there was a good demand, at a similar improvement. Barley was 6d., Beans 1s. per qr. dearer. Peas steady. The Oat trade was firm, at an advance of 6d. to 1s. per qr. Flour was 1s. to 2s. per sack and 6d. to 1s. per barrel dearer.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk. White	46—52	Red.....	44—52
— — fine selected runs..do.	44—48	Red.....	47 4
— — Talavera	50—50		
— — Norfolk		Red.....	—
— — Foreign	42 58		
BARLEY, grind. & dist., 26s to 30s...Chev.	33—42	Malting .	44 48
— Foreign .. grinding and distilling	32—33	Malting ..	39 40
OATS, Essex and Suffolk	22s 24		
— Scotch and Lincolnshire	Potato 24—26	Feed	—
— Irish	Potato 23—25	Feed	21 23
— Foreign .....Poland and Brew	24 26	Feed	23 24
RYE	32—36	Foreign .	33 36
RYE-MEAL, Foreign	22s 24		
BEANS, Mazagan ....34s. to 43s.	Tick 34—46	Harrow ..	34—41
— Pigeon ....40s. to 55s..	Winds — —	Longpod..	—
— Foreign	Small 41 43	Egyptian .	38—40
PEAS, White, Essex, and Kent..	Boilers 34—38	Suffolk ..	37—40
— Maple, 34s. to 40s.	Grey 32—35	Foreign ..	31—37
MAIZE	— —	Foreign ..	29—31
FLOUR, best marks delivered.. per sack	32 43		
— 2d ditto	ditto 23 41	Country ..	20—41
— Foreign	per barrel 23—26	Per sack .	30—36

WEEKLY AVERAGE, June 8.

Coastwise as well as by rail the receipts of Wheat from Essex and Kent were very moderate. The trade was very firm, and prices were well maintained. The show of foreign Wheat was moderate; the demand was steady, and extreme rates were obtained. The market was moderately supplied with Barley, for which the trade was firm, at fully late quotations. Malt was quiet, on former terms. Oats, the show of which was moderate, were in request, at improving prices. Beans and Peas were firm, and fully as dear. Flour was steady.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE DURING THE WEEK.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 480	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	4430	5160	44,090	360 7110 brls.
	5230	5160	44,090	

LIVERPOOL, June 7.—To-day's market was well attended by local and distant buyers. In Wheat there was a large speculative and consumptive business at an advance of 4d. to 5d. per 100 lb. on the week. Flour also was in good request, and 1s. to 2s. dearer than on Tuesday last; the business being restricted only by reason of the present limited stocks. Oats and meal both neglected, but otherwise unchanged. Beans met a fair sale, at full quotations. Canadian Peas were unaltered. Wheat and Barley, now in smaller compass, exhibited an upward tendency. Indian Corn experienced to-day a very fair inquiry from consumers, the rates ranging 6d. per qr. above those of last Tuesday.

AVERAGES.

	Wheat.	Barley.	Oats.
April 30 ..	42s 7d	35s 1d	21s 6d
May 7 ..	43 3	34 2	23 1
" 14 ..	44 5	33 9	23 1
" 21 ..	45 3	32 8	22 0
" 28 ..	45 4	32 11	23 10
June 4 ..	45 1	32 0	23 0
Average ..	44 4	33 1	22 9

First Prize,

ROYAL AGRICULTURAL SHOW, 1869,

Also 22 other PRIZES FOR LIQUID MANURE CART AND PUMP

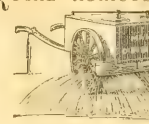

BONE OR STONE CRUSHER FOR HAND OR POWER

J. JAMES, Tivoli, Cheltenham

Automaton Lawn Mowers, Manufactured by

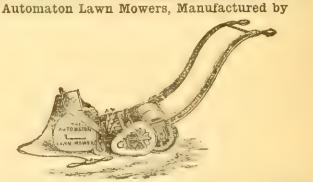

RANSOMES, SIMS, AND HEAD, Ipswich. The best, simplest, and most durable Machines. They leave no ridges in the grass, and are unsurpassed for keeping a Lawn or Croquet Ground in first-rate order; 4000 are now in use. Prices from 55s. Sizes 8 to 20 inches. A large stock kept, and orders executed on receipt. Illustrated Lists free by post, and Testimonials from Thirty English Counties. (Please refer to this Advertisement when ordering)

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

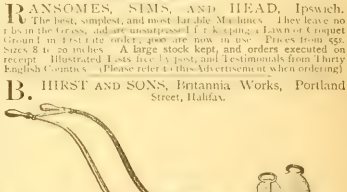

B. HIRST AND SONS call special attention to their PATENT INVISIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which combine Improved Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

American Lawns.

THE AMERICAN PATENT "ARCHIMEDEAN" LAWN MOWER is admitted the best Machine ever brought out for the purpose; is easiest as to draught, simple, and performs its work better and with less than half the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS.

The *Gardeners' Magazine* says:—"The New Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable in many.'"

The *Field* says—"The Americans have been beforehand with us in many Machines, but we were left behind, until now, except they possessed a Lawn Mower which is far superior to any of ours."

The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement, but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in any state, or at from 8 inches long. The Finish machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."

Sole Wholesale Agent for the United Kingdom,

JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

THE Extraordinary Success of GREEN'S PATENT LAWN MOWERS is an established fact. During the last Six Years the demand has been unprecedented, which alone is a proof of their superiority over all others. The following are their characteristic features:—

1st, Simplicity of Construction, every part being free of access. 2d, They are worked with far greater ease than any other Lawn Mower. 3d, They are the least liable to get out of order.

LEEDS HORTICULTURAL AND FLORAL SHOW, JUNE 3, 1870.

TRIAL OF MOWING MACHINES.

EXTRACT FROM *Yorkshire Post.*

"During the Show, a very interesting trial of Lawn Mowers took place on the ground. The competitors were the well-known manufacturers of these Machines, Messrs. THOMAS GREEN & SON, Smithfield Ironworks, Leeds, and the maker of a Machine called the Archimedean. The judges were the gentlemen who had made the awards at the flower show. The merits of the competing Machines were decided by setting them to work to cut long coarse grass, the style and time in which they accomplished their task, and the draught of each, being elements in guiding the judges in giving their award. The following was their unanimous conclusion:—

"We, the judges of the Leeds Horticultural and Floral Society, having tested Lawn Mowing Machines manufactured by Messrs. Thos. Green & Son against the one called the 'Archimedean,' in an open field where the bents were from 5 to 8 inches long, have come to the unanimous conclusion that the 'Archimedean' is perfectly useless, either for long or short Grass, the superiority of Green's Machines having proved on this, as on many other occasions, pre-eminent. We find the 'Archimedean' is only suitable for banks and steep rising grounds."

EXTRACT FROM *Leeds Mercury.*

"Amongst the other interesting features of the Show to which attention has not yet been called was a public trial on the opening day of Lawn Mowing Machines, manufactured by Messrs. GREEN & SON, of Leeds, and the American Machines known as the Archimedean. The test took place before all the judges in an open field where the bents were from 5 to 8 inches long, and at the close the decision was unanimously in favour of the Machines made by Messrs. GREEN & SON. That firm had an excellent stand on the ground occupied by horticultural machines of various descriptions."

Judges.—Wm. Carmichael, John Wells, F.R.H.S., M. Saul, W. Culverwell, J. McIndoe, James Fowler, Wm. Stewart, T. S. Holloway, late Chairman of the Society.

JAMES BIRBECK, Secretary.

GREEN'S PATENT LAWN MOWERS HAVE PROVED TO BE THE BEST, AND HAVE CARRIED OFF EVERY PRIZE THAT HAS BEEN GIVEN IN ALL CASES OF COMPETITION.

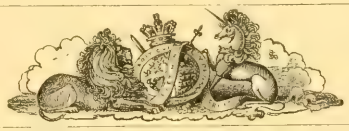

EVERY MACHINE IS WARRANTED TO GIVE ENTIRE SATISFACTION, AND IF NOT APPROVED CAN BE RETURNED WITHOUT ANY COST WHATEVER TO THE PURCHASER.

The following are a few of the distinguished Patrons of Green's Lawn Mowers, who can fully guarantee their superiority and efficiency:—

Her Most Gracious Majesty the Queen.
His Royal Highness the Prince of Wales.
H.M. the Queen of Prussia.
H.M. the King of the Belgians.
H.I.M. the Emperor of the French.
H.I.M. the Emperor of Russia.
H.R.H. the Pasha of Egypt.
H.R.H. the Duchess of Cambridge.
H.S.H. the Prince Liechtenstein
H.H. the Rajah of Sarawak
His Grace the Archbishop of Canterbury.
His Grace the Duke of Buccleuch.
His Grace the Duke of Leinster.
His Grace the Duke of Devonshire.
His Grace the Duke of Leeds.
His Grace the Duke of Northumberland.
His Grace the Duke of Richmond.
His Grace the Duke of St. Albans.
His Grace the Duke of Wellington.
His Grace the Duke of Argyle.
His Grace the Duke of Marlborough.
His Grace the Duke of Rutland.
His Grace the Duke of Buckingham.
His Grace the Duke of Newcastle
Her Grace the Duchess of Sutherland.
The Most Noble the Marquis of Westminster.
The Most Noble the Marquis of Anglesey
The Most Noble the Marquis of Bath
The Most Noble the Marquis of Exeter
The Most Noble the Marquis of Aylesbury.
The Most Noble the Marquis of Hastings.
The Right Honourable the Earl of Ducie.
The Right Honourable the Earl de Grey and Ripon.
The Right Honourable the Earl of Darnley.
The Right Honourable the Earl of Derby.
The Right Honourable the Earl of Chichester.
The Right Honourable the Earl of Carlisle.
The Right Honourable the Earl of Cathcart.
The Right Honourable the Earl of Stamford and Warrington.
The Right Honourable the Earl of Effingham.
The Right Honourable the Earl of Harewood.
The Right Honourable the Earl of Scarborough.
The Right Honourable the Earl of Leicester.
The Right Honourable the Earl of Stair
The Right Honourable the Earl of Stradbrooke.
The Right Honourable the Earl of Brownlow.
The Right Honourable the Earl Spencer
The Right Honourable the Earl of Abergavenny.
The Right Honourable the Earl Fitzwilliam.
The Right Honourable the Earl of Ellesmere.
The Right Honourable the Earl of Howarth.
The Right Honourable the Earl of Airlie.

The Right Honourable Count Kennisdal.
The Right Honourable Count Donnemarsh.
The Right Honourable Count Bernstoff.
The Right Honorable the Lady Palmerston.
The Right Honourable the Countess of Harewood.
The Right Honourable the Countess Dellarmorella.
The Right Honourable the Countess Dowager of Jersey.
The Right Honourable Viscountess Downe.
The Right Honourable Viscount Falmouth
The Right Honourable Viscount Campden
The Right Honourable Viscount Eversley
The Right Honourable Viscount sydney
The Right Honourable Viscount Lomerton
The Right Reverend the Lord Bishop of Rochester.
The Right Reverend the Lord Bishop of Kilmore.
The Right Honourable Lord Charles Fitzroy.
The Right Honourable Lord Stourton
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The Right Honourable Lord Bolton.
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The Right Honourable Lord Broughton.
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Sir Joshua Walmesley.
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Baron de Biel.
Baron de Mattsake.
General Blumhard.
General Reeve.
Lieutenant-General Higginson
Colonel Jackson.
Colonel Brise
Colonel Loyd Lindsay.
Colonel Passy.
Colonel Browne.
Colonel Cartwright
Colonel Carmichael, C.B.
Colonel Clayton.
Colonel Greenwood.
Colonel Vandeleur, M.P.
Colonel Seymour.
Colonel McMurdo.
Colonel J. R. Smith.
Colonel P. Grant.
Colonel Hill.
Colonel Duncombe.
Colonel Thornton.
Colonel Linton.
Colonel North.
Colonel Vyse.
Colonel Gossell.
Colonel Gould
Lieut.-Col. Montresor
Lieut.-Col. Bower.
Lieut.-Col. Sale.
Major the Hon. C. Keith Falconer.
Admiral Evans.
Admiral Warren.
Vice-Admiral Hughes D'Aeth.
Vice-Admiral Eden.
Rear-Admiral Brasier.
Rear-Admiral Poppam.

The following are a few of the principal places where Green's Patent Lawn Mowers are the only Machines in use, and have been for a number of years giving entire satisfaction:—

THE ROYAL GARDENS, WINDSOR.
BUCKINGHAM PALACE GARDENS.
MARLBOROUGH HOUSE GARDENS.
SANDRINGHAM HALL GARDENS.
CHISWICK HOUSE GARDENS.
ROYAL HORTICULTURAL SOCIETY'S GARDENS, SOUTH KENSINGTON.
ST. JAMES'S PARK.
GREEN PARK.
KENNINGTON and BATTERSEA PARKS.

ROYAL BOTANICAL GARDENS
ROYAL HORTICULTURAL GARDENS.
KENSINGTON PALACE GARDENS.
TEMPLE GARDENS.
ZOOLOGICAL GARDENS.
CRYSTAL PALACE GARDENS.
SOUTH KENSINGTON MUSEUM.
BERKELEY SQUARE GARDENS.
RUSSELL SQUARE GARDENS.
GORDON SQUARE GARDENS
PARLIAMENT SQUARE GARDENS.

BRUNSWICK SQUARE GARDENS.
ROYAL HOSPITAL, CHELSEA.
ROYAL NAVAL SCHOOLS
HYDE PARK GARDENS.
LIVERPOOL PARK.
BIRKENHEAD PARK.
PRESTON PARK.
SUNDERLAND PARK.
HALIFAX PARK.
BRADFORD PARK
LEEDS ROYAL PARK.

Testimonial from the Council of the Royal Horticultural Society, South Kensington, May 28, 1870.

"GENTLEMEN,—I am directed by the Council to inform you that your Lawn Mowing Machines have been in constant use in their Gardens at South Kensington during the last 10 years, and that they have always given the greatest satisfaction, doing their work excellently and with so much ease as to be generally preferred by our workmen.

"I remain, gentlemen, your obedient servant,

"THOS. GREEN & SON. JAMES RICHARDS, Assistant Secretary."

Illustrated Price Lists of Green's Patent Lawn Mowers, Garden Rollers, and Patent Boilers, free on application.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
J. JONES AND SONS, 15, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark

West of England, Ireland, and Wales.

VINCENT SKINNER, Sole Proprietor of the HOUSE BUILDER and HOT-WATER APPARATUS MANUFACTURER (formerly Partner with J. Weeks & Co.)
430 BOILERS at WORK

Portable and Fixed Hot-water Apparatus

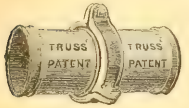

FOR
HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,
WITH
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved system cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras

BATH and GAS WORK ERECTED in TOWN or COUNTRY
The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to
T. S. TRUSS, C.E., Sole Manufacturer,
Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder,
Truss Street, Southwark Bridge Road, London, S.E.

T. G. MESSENGER, MIDLAND STEAM-POWER HORTICULTURAL WORKS, HOT-WATER APPARATUS, VALVE MANUFACTURER, LOUGHBOROUGH

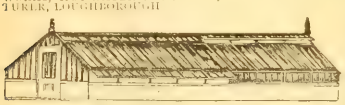

Honourable Mention awarded at the International Exhibition, 1862, and at the Dublin Exhibition, 1865; also a Prize-Medal Certificate by the Royal Horticultural Society.
T. G. MESSENGER, Patentee of many important improvements in Buildings and Implements connected with Horticulture, and which meet with unqualified approbation, is prepared to give reference to hundreds of works entrusted to him and is eminently answering the purpose for which they were constructed.
Any House Glazed, single or double, with or without putty. The mode adopted by T. G. MESSENGER for Heating and Ventilating Forcing Houses is particularly successful, drip being entirely prevented.
HOUSES can be constructed on his Patent Ventilating principle to open the whole of the roof and Sides, so as though the glass be entirely removed, it may be placed in the centre of the sphere.
T. G. MESSENGER'S BOILER possesses all the excellences of the Tubular and Saddle combined, has no brass or copper tubes, and the shallow stoke-hole exposes as much surface to the direct action of the fire as can possibly be obtained, the whole of which can be easily cleaned; and it is an important fact, that out of upwards of 500 now at work made on the improved principle not one has cracked.
T. G. MESSENGER'S VALVE (single or double), effective, simple, easy to work, and as durable as the pipe to which it is attached.
Designs and estimates supplied for all kinds of Horticultural Work, and guaranteed to answer the purpose for which they may be intended. A richly ILLUSTRATED CATALOGUE, with descriptions, forwarded post free on receipt of 33 stamps.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

		Each.
6 ft. by 4 ft.	Lights, 2 in thick, unglazed	£0 5 0
" "	Primed and Glazed with 10 oz. Sheet	0 11 0
" "	with stout portable Eaves, not Painted	1 3 0
" "	Painted four coats, and Handles on	1 8 0
" "	Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do.		2 15 0

GREENHOUSES Per ft. super
Woodwork only Prepared and Fitted 0 0 6
" Primed and Glazed with 16 oz. Sheet 0 0 9
" Delivered, and Fixed with Ironwork 0 1 0
" Painted four coats, two sides, ready for use .. 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

Monro's Cannon Boiler.

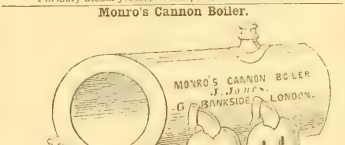

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, from which they can be delivered direct at the wharf in London. Estimates given.
J. JONES AND SONS, Iron Merchants, 6, Bankside, Southwark, London, S.E.

Heating by Hot Water.

PUBLIC and PRIVATE BUILDINGS, MANUFACTORIES, CONSERVATORIES, &c., heated on the most improved system, combined with perfect ventilation.

These BOILERS are adapted for setting in Brickwork, or as shown in sketch. Estimates on application.

POLLARD JEPHSON, AND CO.
(successors to Hinds, Pell),
Sole Manufacturers of the Improved CONICAL BOILERS,
Which are in general use, and which [illegible] for 1870 [illegible] economy attained a celebrity far surpassing any other Boilers ever invented.
Iron Garden, Near York Street, Southwark, London, S.E.

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c.

Improved Conical. *Tubular Boiler.*

HOT WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.
WROUGHT and CAST IRON CONSERVATORY SADDLE, and IMPROVED CONICAL, also Hedge Boilers in stock.
Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Jackets, in case or cash.
CAST and WROUGHT IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60s.
Portable Boiler. Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.
INHALER for Nos. 1 and 2 Pipe Joints: Sockets to pass over the pipe ring, and are perfectly water tight.
Elastic Joint.
Goods of the very best manufacture delivered at Railway or Wharf in London.

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground Street, Bankside, Near Stone Bridge, Blackfriars Bridge.
Price List on application.

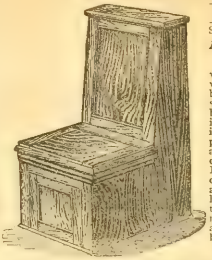

MOULE'S PATENT EARTH SYSTEM.

From Mr. W. GILBERT,
Larches Street, Rugby.
"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadefuls put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT.
"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (Dia Works), are prepared to supply WROUGHT IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

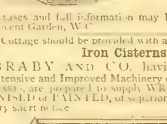

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.
F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.
N.B. Open Tanks of different sizes packed one in another to save carriage.

Cottam's Iron Hurdles, Fencing, and Gates.

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
Illustrated Price Lists sent upon application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

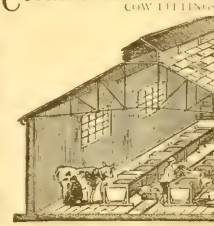

The Fittings are:—Portability, not fixtures, removable at pleasure, by Workmen or Partitions to any Stall or Standing. Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent overfeeding. Cheap, durable, and unpervious to infection, being all of Iron. Price of Fittings per Cow, 55s.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—
GLASS for ORCHARD HOUSES,
As supplied by them to Mr. Rivers, Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each box contains 100 feet. The prices only apply to the sizes stated

	Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15	
	16 oz. to the foot.	21 oz.
Fourth quality	16s 6d	19s 6d.
Third quality	19s 6d	22s 6d.
Seconds	18s 6d	20s 6d.
English	21s 6d	25s 6d.

The above prices include the boxes, which are not returnable.
HORTICULTURAL GLASS.
Stock sizes, 16oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated.

				4ths.	3rds	2nd.
11 by 9	12 by 9	13 by 9	14 by 9	s. d.	s. d.	s. d.
12 by 10	13 by 10	14 by 10	15 by 10	13 6	15 0	17 0
13 by 11	14 by 11	..	..			
14 by 11	15 by 11	15 by 11	16 by 11			
18 by 12	19 by 12	16 by 12	17 by 12			
19 by 13	17 by 13	20 by 12	..			
16 by 14	20 by 13	18 by 13	..	15 0	16 0	18 6
	17 by 14	18 by 14	..	16 to 17 oz. to the foot		
	20 by 14					

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	7 by 5	8 by 6	9 by 7	10 oz.
8 by 6	8½ by 6½	9 by 7	10 by 8½	.. 12s 6d.
		10 by 8	10½ by 8½	.. 13s 6d.

Boxes 2s. each, returnable at full price.
London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS.
PAINTS of various colours ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWNS, SHEET, HORTICULTURAL, COMMERCIAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

SAMUELSON & CO.'S
Newly Patented EDGE-CLIPPING SILENT LAWN MOWERS.
THE MOST IMPORTANT IMPROVEMENT EVER INTRODUCED.

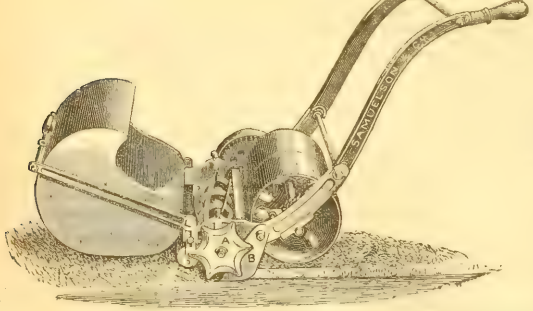

MESSRS. SAMUELSON & CO. Beg to draw special attention to their
NEW
Lawn Mowers for 1870,
which are fitted, when required, with a NEW PATENT EDGE-CLIPPING arrangement, entirely superseding the old and tedious operation of Edge-Clipping by hand.
All Machines fitted with new Silent Gearing, insuring perfect freedom from noise when at work.
Catalogues, with full descriptions and prices of the New Patent Edge-Clipping Silent Lawn Mower, on application to

SAMUELSON AND CO., BRITANNIA WORKS, BANBURY.

Lawn Mowers, Iron Vases, Seats, &c.

J. JONES AND SONS are now selling surplus Stock of the above at a discount of 15 per cent. for cash.
6, Bridewell, London, S.P.

ARCHIMEDEAN LAWN MOWER to be SEEN at BUTLER, M'CULLOCH AND CO'S, South Row, Covent Garden Market, London, W.C. (opposite Southampton Street).
Established upwards of a Century.

Indestructible Terra-cotta Plant Markers.

MAW AND CO'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s.; cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Workers, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal seedsmen. Prices on application

LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES. Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Price from 4*d.* per ft.
Hooper & Co., Covent Garden; Dixon & Co., 48a, Moorgate Street; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road, Chelsea.
BENJAMIN LOOKER, Inventor and Sole Manufacturer, Kingston-on-Thames.

LOOKER'S PATENT PROPAGATING BOXES.—The best mode of Raising all kinds of Spring Seeds and Cuttings. Price from 2s. each. Hooper & Co., Covent Garden; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road, West Chelsea; and Dixon & Co., 48a, Moorgate Street.
Inventor and Sole Manufacturer,
BENJAMIN LOOKER, Kingston-on-Thames.

INDIA-RUBBER GARDEN HOSE, 60 feet ½ inch hose, with brass tap, rose, and jet complete, 10s. 6d.
60 feet ¾ inch do. do. extra strong, 12s. 6d.
Carriaged to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application to
E. G. CAPON, India-rubber Manufacturer, Oundle, Birmingham

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 29, Oxford Street, Manchester.

BROWN'S FLORAL SHADING, a protection from Frost and Sun. Samples and prices on application to
CHARLES BROWN, Cornmarket Street, Oxford.

RUSSIA MATS, for Covering Garden Frames.—VANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application
JAS. T. VANDERSON, 5, Commercial Street, Shoreditch, London.

Archangel and Petersburg Mats.

J. BLACKBURN AND SONS have received a large consignment, and are now offering them on very low prices. Price, &c., on application as at 4 and 5, Wormwood Street, London, E.C.

HESSIANS and SCRIMS for SHADING, 1 yd. wide, from 2½ to 6½ per yard, advancing ½d. per yard; 54 inch Hessian and Scrim, 3½, 3½d., 4d., 4½d. and 5½d. per yd. 72 in. do. do. 4½d., 5½d., 6d., 6½d. and upwards.
J. BLACKBURN AND SONS, Seed Bag, Oil Cloth, and Canvas Manufacturers, 4 and 5, Wormwood Street, London, E.C.

TANNED GARDEN NETTING for Seed Beds, and for the Protection of Fruit Trees from Frost, Blight, and Birds, or as a Fence for Fowls, &c.: 2, 4, and 6 yards wide, at one penny per square yard; 50 yards long, 6s.; 100 yards, 10s.; 1000 yards, 65s. Remittances to accompany all orders.
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough.

NETTING for FRUIT TREES, SEED BEDS, and STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3d. per yard, or 100 yards, 20s.; 4 yards wide, 6d. per yard, or 50 yards, 20s. NEW TANNED NETTING, suited for any of the above purposes, as an Fences at Poultry Runs, 1 yard wide, 1d.; 2 yards wide, 1½d.; 4 yards wide, 3d.; 6 yards wide, 1s. per yard. Can be had in any quantity of
EATON AND DELLER, 6 & 7, Crooked Lane, London Bridge, E.C.

GARDEN NETTING (at Reduced Price), for the Protection of newly-sown Seeds from Frost, Blight, and Birds; also as a Fence for Poultry, Rabbits, and Sheep, 1d. per square yard, carriage free, in quantities of 250, 500, or 1000 yards.
SCRIM CANVAS, for Walls, Greenhouse Shades, Tulip Covers.
HAYTHORN'S and WALTER'S NETTING. Sample of material free on application. RICK COVERS, New and Second-hand, with Poles, complete. Re-parts 1d.
FREDERICK EDGINGTON AND CO., Marquee, Tent, Flag, and Rick Cloth Manufacturers, 60 and 62, Old Kent Road, London, S.E.

E. T. ARCHER'S "FRIGI DOMO."—By Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Domo" Netting.

White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, and will last for years; moisture, where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS
"FRIGI DOMO" NETTING, 2 yards wide, 12*d.* per yard run.
"FRIGI DOMO" CANVAS.

Two yards wide	.. .. ..	18 *d.* per yard run.
Four yards wide	.. .. ..	32*d.* per yard.
An improved make, 2 yards wide	.. ..	22*d.* per yard.
An improved make, 3 yards wide	.. ..	30*d.* per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 54*d.*, 64*d.*, 74*d.*, 74*d.* and 84*d.* per yard.
Hessian Canvas, 54 and 72 inches wide, 63*d.* and 84*d.* per yard; 4*d.* extra for cut lengths.
ELTHAM: THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom

GARDEN WIRE WORK, consisting of ARCHES, BASKETS, FLOWER STANDS, &c.

GARDEN SYRINGES	.. .. ..	1*d.* to 26*s.*
GARDEN ENGINES	.. .. ..	20*s.* to 105*s.*
GARDEN WATER BARROWS	.. ..	45*s.* to 90*s.*
GARDEN ROLLERS	.. .. ..	35*s.* to 70*s.*
GARDEN CHAIRS	.. .. ..	16*s.* to 50*s.*
GARDEN SEATS	.. .. ..	16*s.* to 90*s.*
GARDEN TOOLS and WATERING POTS.		

PATENT LAWN MOWERS

To cut 10 inches, £3 10*s.*; 12 do., £4 10*s.*;	15 do., £5 10*s.*; 21 do., £8.

WILLIAM S. BURTON, Furnishing Ironmonger, by appointment, to H.R.H. the Prince of Wales, sends a CATALOGUE, containing upwards of 700 Illustrations of his unrivalled Stock, with Lists of Prices, and Plans of the 20 large Showrooms, post free.—39, Oxford Street, W.; 1, 1 A, 2, 3, and 4, Newman Street; 4, 5, and 6, Perry's Place; and 1, Newman Yard. The cost of delivering Goods to the most distant Parts of the United Kingdom by Railway is trifling. WILLIAM S. BURTON will always undertake delivery at a small fixed rate.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 83, Upper Thames Street, where a Stock is kept; also at 36, Long Acre. J. GODERIDGE, Agent.

FUSSEY'S MARQUEES.—This magnificent Suite contains by far the greatest number of any to be had on Hire in this country, varying in size from the Lawn Tent to the Monstre Marquee, and, for elegance, unsurpassed, and total adaptability to open air recreations stand unrivalled. Terms moderate.
W. FUSSEY, 46, Osborne Street, Hull.

Caution to Gardeners.—When you ask for

SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, late Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of the enormous quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make, all of which have warranted both Sellers and Makers.
S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market
Paxton Works, Sheffield. Established upwards of 125 years.

Bee-Hives.—Two Silver Medals Awarded to

GEO. NEIGHBOUR AND SONS, at the Paris Exhibition of 1867. The only English Bee-hives obtained the Medal for Bee-hives.

NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE, as originally introduced by GEORGE NEIGHBOUR & SONS, working three bell glasses, is neatly and strongly made of straw: it will receive WARM or the lower Hive. This Hive will be found to possess many practical advantages, besides more easy of management than any other Bee-hive that has been introduced.

Price complete .. £1 15 0
Stand for ditto .. 0 10 0
The LIGURIAN or ITALIAN ALP BEE being much in repute, G. N. & SONS supply a few Stocks of Bees with genuine Italian Queen, in the Improved Cottage Hive, at £4 4s., included. [Such will shortly have wholly yellow Italian Alp Bees.]
An Italian Alp Queen, with full directions for uniting to Black Stocks, £1 each.
ENGLISH BEES.—Stocks and Swarms may be obtained as heretofore.

A newly arranged Catalogue of other Improved Hives, with Drawing and prices, sent on receipt of two stamps.
Address G. N. NEIGHBOUR & SONS, 127, High Holborn, W.C.; or 140, Regent Street, London, W.
AGENTS:—Liverpool: JAMES CUTHBERT, 12, Clayton Square. Manchester: R. WILSON, 50, King Street. Dublin: EDMONSTON BROTHERS, 10, Dame Street. Glasgow: AUSTIN & M'ANSAN, 16, Buchanan Street.

THE OMBRA, the OMBRA.—The new Sunshades, applicable to all Hats for Ladies, Gentlemen, and Children, in Straw Plait, &c. Extremely light, becoming, portable, and moderate in price. A real *boon now* to travelling, the seaside, and all country pursuits, whilst for India invaluable
Wholesale: The Patent Ombra Company, No. 29, Red Cross Street; Retail: ANDREWS, Alexandra Road, and all respectable Hatters, &c., in Town and Country. Agents, where not appointed, apply

By Royal Appointment.

TO HER MAJESTY, by Special Warrant, dated December 27, 1865

TO THE PRINCE OF WALES by Special Warrant, dated February 10, 1866.

DAYSON AND HEWITT, Original and Sole Proprietors of the SYCOPHANTOCRADEERS' MEDICINE CHESTS, for DISORDERS in HORSES, CATTLE, CALVES, SHEEP, and LAMBS.

No. 1 MEDICINE CHEST,	No. 2 MEDICINE CHEST,
Contains Sixteen different kinds of Compounds, admirably arranged, with Complete Guide to Farriery. Price £5 0*s.*; carriage paid	Contains No. 1 Extract Gaseous Fluid, Red Drench, and Red Paste, with Shilling Key to Farriery. Price £2 10*s.* 6*d.*; carriage paid

☞ Every Stockowner should send for DAY, SON, AND HEWITT'S Work on Farriery. Large Edition, 2*s.* 6*d.*; or free by post for 33 stamps. Small Edition, 1*s.*; or free by 18 or 19 stamps.
DAY, SON, AND HEWITT, 22, Dorset Street, Baker Street, London.

THE LONDON ASSURANCE CORPORATION for MARINE, FIRE, and LIFE ASSURANCES.
Incorporated by Royal Charter, A.D. 1720.
Offices: No. 7, Royal Exchange, and No. 7, Pall Mall.
JAMES BUNN, Esq., Governor.
EDWIN GOWER, Esq., Sub Governor.
DAVID POWELL, Esq., Deputy-Governor.
Total Funds on 31st December, 1869 .. £2,515,629.
The Directors are ready to receive applications for Agencies for the Fire and Life Departments of the Corporation.

LIFE DEPARTMENT.

POLICIES in force for .. .. (exclusive of Bonus Additions.)	£4,865,823
INCOME—Premiums	£161,581.
Interest	58,324
	£219,705
Accumulated Premiums	£1,342,477

Further information may be obtained on application.
JOHN P. LAURENCE, Secretary.

LEGAL and GENERAL LIFE ASSURANCE SOCIETY, 10, Fleet Street, Temple Bar, London, E.C.
TRUSTEES.
The Right Hon. the Lord Chancellor.
The Right Hon. the Lord Cairns.
The Right Hon. Sir W. Bovill, Lord Chief Justice, C.P.
The Right Hon. Sir Edward Vaughan Williams.
The Hon. Sir George Rose.
Thomas Webb Greene, Esq., Q.C.
John Osborne, Esq., Q.C.
Edward Smith Bigg, Esq.
Robert Bayly Follett, Esq., Taxing Master in Chancery.

FINANCIAL POSITION on January 1, 1870.

Annual Income	£210,000
Invested Funds	1,581,000
Existing Assurances	4,000,000
Reversionary Bonuses thereon	540,000
Assurance Claims and Bonus paid ..	1,780,000
Share Capital fully subscribed	1,000,000
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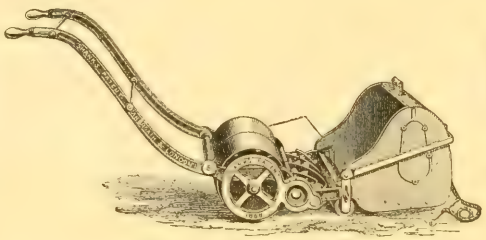

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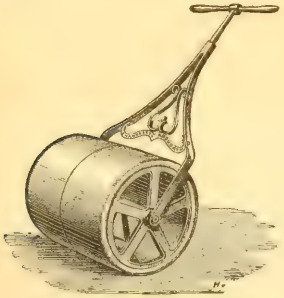

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CRYSTAL PALACE.—The GREAT ROSE SHOW, SATURDAY, June 25.—Forms of Entry and Schedules on application to I. WILKINSON, Superintendent, Crystal Palace.

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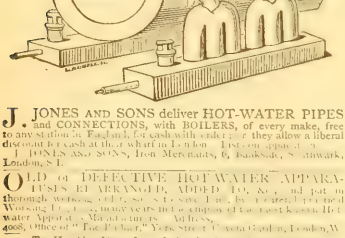

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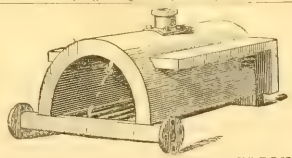

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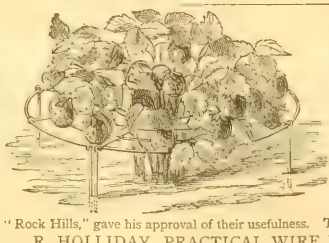

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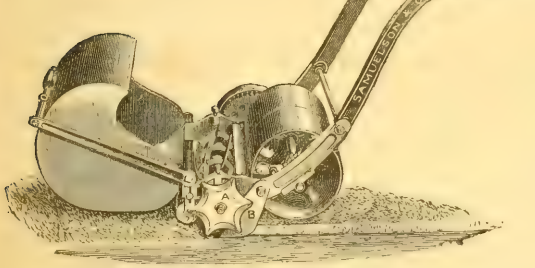

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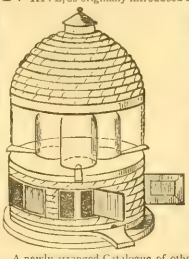

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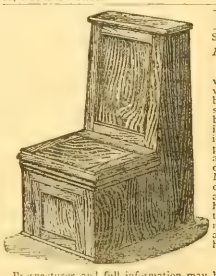

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"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.

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(Signed) "AUGUSTUS VOELCKER.
The Secretary, REES AND CO.'S Biphosphated Peruvian
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GOLDEN TRICOLOR GERANIUMS.

PRINCE of WALES (CARTER).—Undoubtedly the finest tricolor ever offered, of most vigorous habit, and intensely brilliant colours. Price 63s. each. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, June 19, 1867. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Horticultural Society of London, July 7, 1868. A First-class Certificate was awarded to Carter's Tricolor Geranium, Prince of Wales, by the Royal Botanic Society of London, May 27, 1868.

EDITH STUART (CARTER).—A free-growing variety, with flat salver-shaped leaves, zone bright vermilion, with a light yellow margin. Price 21s. each. First Prize, May 22, Royal Horticultural Society. Silver Medal, June 30, Royal Botanic Society.

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The set of the foregoing four varieties, £5 5s.

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PELARGONIUMS of Show, French and Fancy, choice named, coming in bloom, young in 4½ inch pots, strong in 4½ and 5 inch, and extra in 6-inch These can be supplied by the dozen or 100

PETUNIAS, choice named: Blue SALVIAS; VERBENAS, mixed, named; GAZANIAS, CALCEOLARIAS, DAHLIAS, cheap by the 100.

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CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application.
ROSES for BEDDING.—Superb plants, in 5-inch pots, for planting out or for growing on for pot culture. Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.
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MESSRS. DOBSON AND SONS, Seed Growers, &c., Woodlands Nursery, Isleworth, from their unequalled collections.
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SCARLET INTERMEDIATE STOCK.—Very rich in colour 6d. and 1s. All the above post free

Myosotis dissitiflora.

MESSRS. VEITCH AND SONS can now supply new seed of this splendid early flowering BEDDING PLANT, price 2s. 6d. per packet; also
CALCEOLARIA, James' choice strain
from the Dalkeith collection.
CINERARIA, saved from the finest named sorts.
PRIMULA SINENSIS FIMBRIATA RUBRA, From the finest
" " " ALBA, strains in cultivation.
" " " Mixed,
Each 2s. 6d. per packet
Royal Exotic Nurseries, King's Road, Chelsea, S.W.

The Gardeners' Chronicle

SATURDAY, JUNE 18, 1870.

MEETING FOR THE ENSUING WEEK.

WEDNESDAY, June 22 } Royal Botanic (Exhibition of
THURSDAY, — 23 } Plants and Flowers) .. .. 2 P.M.

EVERY one admits that "comparisons are odious," yet every one makes them. It is like that little *soupçon* of venial naughtiness which gives flavour to an otherwise tame story, or "goody goody" book. Moreover, it is often difficult, sometimes impracticable, to convey one's ideas without recourse to some such device. And so, although the two establishments are not fairly comparable one with the other, the comparison of the JARDIN DES PLANTES at PARIS with our own Kew Gardens will rise to the mind; and when our dear, dingy, ugly London is weighed and found sadly wanting in some particulars, as compared with gay, brilliant, gladsome Paris, it is natural to feel a sort of retaliatory triumph when the scale is turned in the opposite direction. What does it matter that pounds are probably spent at Kew where shillings are expended at the Jardin des Plantes? In the retaliatory frame of mind just alluded to, such trifles as that are overlooked, or set down to our own credit.

The French themselves say, that in their establishments everything is done for science, while in England everything is done for the public. Now this is a miserable sophism, that will not impose upon the merest tyro. Are we to suppose that that elderly female in the round white cap, with the basket on her arm, who, attended by the squire in the blue blouse and the black round cap, is staring at the plants in the parterre devoted to *plantes potagères*, is a *femme savante*, intent on studying the scientific peculiarities of Fœniculum vulgare or Apium graveolens? Surely we have no more reason to think so than we have to infer that the arrangement of the plants in the succulent house at Kew, or the disposition of the specimens in the museum, is devised simply for the innocent recreation of excursionists from Bow and Poplar! How many of the latter have the faintest idea of the amount of scientific work that is done in the garden; how many realise the immense services Kew has done and is doing in accumulating and dispersing plants and products upon which the health and daily necessities of millions of our Indian and colonial fellow subjects depend. But remembering the odiousness of comparisons, we will pursue this subject no longer. Let us rather indicate certain points of interest about the French garden.

Badly situate, it presents no special features in a landscape garden point of view, though the vistas of fine Limes, and the avenues of Virgilia lutea and of Robinia, are noticeable features of interest. The botanic garden proper consists of a series of narrow beds arranged gridiron fashion. We have our doubts as to whether this eminently simple plan of arrangement is really the best, or whether the plan of grouping the plants in more picturesquely-shaped beds is not preferable. In the one case, all the disadvantages of the "linear" system which botanists deprecate so much in their schemes of classification are intensified. On paper such arrangements are unavoidable, but in the garden it is not so. There it is possible, by skilful management, to arrange beds of greater or smaller size in such a manner that the pupil may see at a glance both the relative populousness of the different orders, and many, if not all, of their multiple and reciprocal relations. Moreover, the "habit" of individual plants, their tendency to grow by themselves or in masses, can be better illustrated by the more picturesque method than by the rigidly formal style, wherein the plants look so supremely uncomfortable and out of place. As these remarks suggest themselves from an inspection of the Paris garden, it is only just to add, that in the parterres devoted expressly to ornamental plants, herbaceous or perennial, an arrangement more in consonance with the nature of the plants themselves is—and very successfully—followed. We must not omit either to comment upon the richness of the collections of herbaceous plants and fruit trees, and on the evident signs of intelligent care bestowed on these departments. Labelling is carefully attended to, the plan adopted being to affix to the top of a tall stick, some 3 feet in height, a sloping metal tablet, on which is painted the name of the plant. If the plant be of use in medicine, the label is red, like a doctor's lamp; if of service for food, it is green; if used in the arts, blue; if interesting for ornament alone the label is yellow, and if the plant be poisonous a black label—a kind of Death's head and cross bones—serves to indicate the fact. The houses—closed to the general public, another tribute to science!—are quite unworthy a garden with such a history, quite below the requirements of so noble a nation, and bear no relation to the acknowledged genius and skill of those who have the management of the establishment. That the plants should be drawn is only what would be expected from a glance at the structures in which they are growing, good cultivation being next to impossible under such circumstances, and scientific or geographical arrangement out of the question. So much indeed are some of the poor things drawn that when turned out for the summer their poor skinny naked stems, surmounted with a wisp of leaves at the top, have to be tied together in rows, with a friendly stake here and there to prevent them from being blown over. That so fine and interesting a collection should be gathered together under such disadvantageous circumstances reflects no little credit on the management, and affords an idea of what might be done under happier auspices.

To attempt to enumerate what may be found in these stoves would be tedious, we content ourselves with mentioning one or two curiosities whose rarity and value give them special interest, such are Cyclanthus bipartitus, which held the post of honour in the aquarium; Zamioculcas Loddigesii, an Aroid which might well figure among Mr. SAUNDERS' mimetic plants, so close is the resemblance of its thick compound leaves to those of a Zamia; while Hoya imbricata, with its fleshy green leaves, recalling the shells of turtles, mimics, or is mimicked by, the leaves of some Marcgraavias.

Of the arrangements for rendering these gardens available for public instruction, we may possibly speak at another time.

WE subjoin a statement of the results of the EXAMINATIONS in FLORICULTURE and in FRUIT and VEGETABLE CULTURE, held in April last by the Society of Arts, the particulars of which have just been made public in the Journal of that Society. We take the opportunity thus afforded to remark with satisfaction that a steady interest is evidently taken by the rising generation of gardeners in this means of self-improvement, and that, notwithstanding the animadversions to which these examinations have from time to time given rise. This public effort, on the part of young gardeners, under such auspices, affording as it does evidence of the use by them of one worthy means towards attaining a noble end, cannot but be gratifying to all who desire to see the professors of the art and science of gardening admitted to the social status to which, if they be true gardeners, their manifold acquirements justly entitle them. That these and other kindred examinations are calculated to assist in raising the standard of the gardener's acquirements, and of obtaining for them a more general appreciation, thereby tending to elevate the whole profession, there can be no doubt, and hence they are entitled to receive our hearty support.

We are, nevertheless, free to admit that the personal advantages to be derived from these examinations are rather of an indirect than a direct character, although we by no means underestimate the value of the latter. We believe that on this point mistaken notions have been entertained, and that in consequence the value of the certificates awarded have been unduly exalted or depreciated. It should be distinctly understood, that the award of a first-class certificate does not necessarily prove the certified candidate to be a first-class gardener any more than the attainment of a similar place in a military examination marks out the young cadet as already an accomplished general. But in both cases the certificate indicates the possession of valuable qualities on the part of the candidate. It shows that he has a good share of intelligence, and that he has turned this to account in the acquirement of the technical knowledge which, applied and followed up, can hardly fail rightly to gain for him a position in the coveted front rank of his profession. True he might possess an inborn spirit of perseverance, by the aid of which, without any such stimulus as that afforded by an examination he might have been led to win his position, but it is more likely that in the majority of cases he might have suffered his light to be hid under a bushel but for some such inducement to let it shine forth. We have been supposing the case of an inborn genius, but take another a grade lower—that of a man with ordinary moderate ability—and say if such an one would not be specially benefited by the stimulus of preparing himself for an examination. To a young man in this position the very sight of others striving is of itself an inducement to enter on the struggle, and but for this no small amount of latent talent may have been suffered to die out unutilised.

It is not, then, because we think certificates make good gardeners that we uphold gardeners' examinations; but it is because the habits of study acquired in the preparation for such examinations, and the extra knowledge thus directly acquired, cannot fail to raise those who try to win certificates above the level they would otherwise be likely to have attained to, and hence we urge upon young gardeners the desirability of continuing to avail themselves of this means of self-advancement. No professional information, whether acquired in this or any other way, can be other than useful. It is when it comes to be brought to bear on everyday practice by the observant student that real progress is made towards the honourable position of a first-class gardener.

It may indeed be said, in disparagement of these examinations, that the answers to some dozen or score of set questions cannot possibly afford much insight into the gardening knowledge of the candidate examined. Having, however, had some experience in the matter, we altogether dissent from this opinion. A series of varied questions on matters which may fall at any point within the whole range of the subject, and to meet which no other than a general preparation is possible, does afford a good test of the technical knowledge of the candidate, while it also renders evident his aptitude and general

intelligence. It does this for gardeners as for other classes of students, without in the least degree depreciating the value and importance of practical acquirements.

The result of the examination of the Society of Arts in April last, above referred to, is as follows:—

Name.	Age.	Floriculture.	Fruit and Vegetable Culture.
E. Beaparke, Hull	26	..	2
W. Davis, Richmond	22	1	2
G. Downton, Richmond	22	1	1
C. Ford, Bury St. Edmund's ..	25	2	..
J. C. Higgs, Southampton	29	2	..
T. Hogg, Glasgow	26	2	..
W. Jones, Liverpool	22	1	2
T. Kemp, Bury St. Edmund's ..	23	3	3
J. McArdle, Stamford	23	1	2
W. Read, Richmond	21	1	3

The prizes offered by the Society of Arts and the Royal Horticultural Society, respectively, in connection with these examinations, have been awarded as follows: -

G. Downton: S. A. and R. H. S. 1st prizes for Floriculture; S. A. and R. H. S. 1st prizes for Fruit and Vegetable Culture—£20.

W. Jones: S. A. and R. H. S. 2d prizes for Floriculture; R. H. S. 2d prize for Fruit and Vegetable Culture—£9.

The prizes offered by the Proprietors of this Journal for proficiency in Book-keeping and Mensuration, to candidates in Floriculture and Fruit and Vegetable Culture, have not been awarded, none of the candidates having fulfilled the conditions required.

—— We gladly give insertion to the following communication from Dr. R. Spruce on the Sexuality of Plants. We shall have some comments to make on it at another time, at present we think it right to let Dr. Spruce speak for himself:—"In an unpublished essay I undertake to prove that—1. The ancestral type of every plant had hermaphrodite flowers; 2. In plants with inconspicuous flowers, the sexes have either already become separated or are continually tending to become so. The multiplication of individuals, causing a perpetual struggle for place, and a consequent division of labour and economising of individual force, may be regarded the chief origin of this phenomenon. Another powerful motive must be the benefit which experience proves to accrue from a cross between vigorous individuals of the same species, and then, out of so many competitors, the survival only of the fittest. 3. In plants with showy flowers, the intervention of insects in the process of fertilisation has checked (but not entirely stopped) the tendency to the obliteration of the male organs in some flowers and the female in others; the requisite cross-breeding being as effectually secured by this means as if the sexes were relegated to distinct flowers, or even to distinct plants. One of the numerous corollaries that this proposition suggests is that showy flowers and winged insects began to exist about the same time. The truth of the first proposition is tacitly (perhaps unwittingly) conceded by botanists whenever they describe flowers as unisexual "by abortion," thereby implying that the missing sex might or should be present; but they never describe such male or female flowers as incomplete by reason of their not having yet acquired the full complement of sexual organs. And if it be the fact that some unisexual flowers have become so by the abortion of one sex, why not all such flowers? I cannot here go at length into the reasons on which I ground my firm belief that all flowers were originally bisexual, and that they still retain organs of both sexes in potentiality if not in actuality. This law being established, it is easy to explain the reversions to hermaphroditism in monœcious and dicœcious flowers. Let us consider a few cases, by way of example. The flowers of the common Papaw (Carica Papaya) are dicœcious. Yet, more than 200 years ago, Piso, in his great work on the useful and medicinal plants of Brazil, gave an account of male plants which sometimes produced a few fruits. Twenty years since Dr. Wight described the same thing as occasionally occurring in India, and in the Journal of the Linnean Society for the year 1867, Senhor Correa de Mello and myself—unaware that the fact had been previously recorded—gave a full description and figures of it. The flowers that yield fruit on the male plants are those that terminate the primary and secondary axes of the peduncles, and they are hermaphrodite, all the other flowers on the same peduncles being males—plainly a case of partial reversion to the primitive type, wherein I suppose all the flowers to have been hermaphrodite. Of another species of Carica from the cool region of the Andes, seeds were sown by Mr. D. Hanbury at Clapham Common. One of the seedlings, transplanted to his brother's country seat on the shores of the Mediterranean, produced first a few panicles of male flowers, and then panicles wherein were a few hermaphrodite flowers, mixed with the males. Yet the person who furnished the seeds, from his own orchard at Ambato, had never seen any fertile flowers or fruits on his male plants — a question particularly asked of him. In the case of this plant, it is probable that changed conditions of growth had induced the reversion. Miss Becker's hermaphrodite Lychnis dioica is a similar case of reversion, however brought about. In Cœlebogyne we have an instance of the substitution of actual for potential male organs in the female flower, but to so very slight an extent as almost to elude the minutest observation, and yet sufficiently to ensure impregnation. Dr. S. O. Lindberg, the learned Professor of Botany at Helsingfors, Finland, writing to me on December 28, 1869, says:—'I have several times seen an alternation of function in Maples (Acer platanoides) both here and at Stockholm. One year many individuals bore hermaphrodite flowers, owing to the long and warm summer before; but for several years afterwards they produced only male blossoms, showing that the year when they bore copious fruit had exhausted their strength for several coming years. I have also many times seen the same thing in Ashes. This last summer many Ash trees in our garden have flowered and fruited, having been sterile the foregoing four years.' As regards the Ash, it seems to be practically dicœcious in this neighbourhood (Castle Howard), for during the past three summers it is always the same trees that bear fruit, while others bear flowers alone. The former are more robust, with sturdier branches; the latter more gracile, more frondose, and keep their leaves longer in the autumn. But I am told that, at intervals of a few years, the trees I call 'males' will bear keys like the rest. Nature, when free from man's interference, carries on her incessant modification of forms by such very slow and insensible steps, that it is only by her occasional slips or reversions that we can actually see in what direction she has been moving. I hope, however, to be able to show that there are cases where we may trace all the phases of polygamy through which a plant must have passed on its onward progress from hermaphroditism to perfect dioicity. For the present I will merely add that nearly 25 years ago I worked out to my own satisfaction the problem of the continual tendency to heteroicity, or separation of the sexes, so far as Mosses were concerned; but whenever I tried to apply the same doctrine to Phanerogams, I always stuck at the plants with showy flowers; and it was not until I read Mr. Darwin's admirable thirteenth chapter—especially that part of it which treats of classification by descent—and his description of the fertilisation of Orchids by insects, that I clearly perceived the cause of the partial suspension of what I now believe to be a universal law."

—— We have received from Mr. Benjamin Looker, Norbiton Pottery, Kingston-on-Thames, specimens of a new form of Plant Cover, or protector, of which, thanks to the patentee, we are enabled to subjoin

Fig. 152.

illustrations (figs. 152 and 153). Of their usefulness to amateurs and others—not possessing regular glass erections—for the purposes for which they are intended we have no doubt. The originator says:—"These new plant covers are introduced as a cheap but most effective substitute for bell-glasses, *cloches*, and hand-glasses. They consist of red earthenware boxes or cases without bottoms, the upper surface being sloped,

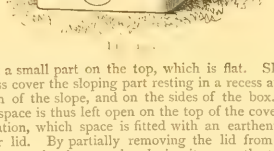

Fig. 153.

except a small part on the top, which is flat. Sheets of glass cover the sloping part resting in a recess at the bottom of the slope, and on the sides of the box. A small space is thus left open on the top of the cover for ventilation, which space is fitted with an earthenware cap or lid. By partially removing the lid from one end—by turning it over—by placing it across the top—or by removing it altogether, perfect ventilation is obtained, and regulated with the greatest nicety." Mr. Looker also sends us a first-rate sample of Strawberries, grown in the new "capped garden frames." They were grown in 32-sized pots from last year's runners, and had no protection whatever before they were placed in the frames in March, and from the first have had no other covering than the glass, and no bottom-heat whatever.

—— We may remind our readers that the 27th anniversary dinner in aid of the funds of the Gardeners' Royal Benevolent Institution will take place at the London Tavern, Bishopsgate Street, on the 29th of this present month. The Right Hon. the Earl of Derby has kindly consented to take the chair. This institution has now upon its pension list no less than 58 pensioners of the class for whom the funds are especially collected. Upwards of £15,000 have already been expended in alleviating the distress of a class of men who are specially liable, from the nature of their calling, to numerous diseases, from which others are comparatively exempt. Relief is also afforded to the widows of gardeners who, from any cause, have been rendered incapable of providing a sufficiency for them. The fund is specially intended to benefit those who have, by an annual subscription of £1 1s., or a life donation of £10 10s., tried to help themselves and their less fortunate brethren. The subscribers, then, have less hesitation in confidently appealing for the support of all charitable patrons of horticulture than they would have if they had not themselves put their shoulders to the wheel. The distance which separates gardeners one from the other acts most antagonistically to their interests as a class, and often begets in individuals a heedlessness of the wants of the other members of the craft. This should not be. Members of the fraternity should show their sympathy with their fellows, specially those in distress, by subscribing, if possible, to this valuable institution. Let us hope that employers and gardeners will afford their customary aid at the forthcoming festival toward making up such a dessert as shall be worthy of the occasion and of the cause. Independently of the saving to the funds of the Society, a much fresher display will be afforded, and the noble Chairman will be the better able, from demonstrative evidence, to descant upon the beauties, the usefulness, and the importance of the gardener's art. Mr. Cutler, the secretary, 14, Tavistock Row, Covent Garden, will be happy to hear from any who may be desirous of helping the cause in any way.

—— Two novel forms of Columbine have recently come under our notice; and as the taste for hardy flowers seems to be reviving, we are glad to have an opportunity of mentioning them. The one is a single red, with the petals margined with white, forming a red centre; the other a deep chocolate-colour, margined in a similar manner. They are distinct from any varieties which have previously come under our notice, and will be found useful in imparting variety to beds of perennial flowers. The specimens were sent to us by the Messrs. Carter & Co.

—— We learn that a Garden Fête and Flower Show, under the patronage of their Royal Highnesses the Princess of Wales and the Princess Mary of Teck, and of other distinguished personages, will be held, by permission of Sir John Maryon Wilson, in the grounds and park of Charlton House, Old Charlton, Kent, in aid of the House of Relief for Children Afflicted with Hip Disease, 19, Queen Square, Bloomsbury. The show is to take place on Tuesday next, June 21. Four military bands will be in attendance, and, towards the close of the entertainment, the four bands, comprising more than 200 performers, will be massed together, and perform a special programme, under the leadership of Mr. Smythe, bandmaster of the Royal Artillery. The schedule of prizes is of the usual mixed character, including collections of various kinds of plants, and flowers, and fruits, together with table decorations and bouquets. With all these attractions, and so good an object to boot, we trust the exhibition may be a thoroughly successful one.

—— We are informed that the Metropolitan Society for the encouragement of Florists' Flowers will hold its first exhibition at the Crystal Palace on September 6 and following days, when prizes to the amount of £150 (towards which the directors of the Crystal Palace Company give £100) will be offered for Dahlias, Hollyhocks, Gladioli, Verbenas, and Asters. Schedules will shortly be issued. All communications should be addressed to the Rev. H. H. Dombrain, Westwell, Ashford, Kent.

—— The Brussels *bouquetistes* have an excellent substitute for Spirœa (Hoteia) japonica in the shape of Smilacina bifolia, which, judging from the quantities in the markets, must be as plentiful wild near Brussels as it is rare in England. We strongly commend the plant to our gardeners as one to be grown for market. Its near neighbour, Solomon's Seal, Polygonatum multiflorum, is very abundant in the Bois de Boulogne, Paris, and also finds a place in the markets of that city.

—— We are glad to hear that the receipts on the occasion of the recent show of the Manchester Botanical and Horticultural Society amounted to the very satisfactory sum of £1650, of which amount £1100 was taken in shillings.

—— The Temperature of the Air during the week ending June 11 has been very high (see Mr. Glaisher's Tables in our present issue). The Maximum temperature in England was at Manchester, viz., 80°.2, and in Scotland at Perth, viz., 80°; the mean of the several stations in England was 76°.1, and in Scotland 74°.4. The Minimum temperature in England descended to 32°.6 at Hull, whilst in Scotland the lowest was 41°.2 at Aberdeen. The mean of the minima in England was 42°.4, and in Scotland 43°.5. The Mean Temperature in England varied from 59°.8 at Portsmouth, to 52°.2 at Hull; and in Scotland, from 58°.4 at Perth to 52°.4 at Aberdeen: the mean of all stations in the former was 57°.3, and in the latter, 55°.4. Rain is still greatly needed:

during the past week the amount collected at the several stations south of Nottingham amounted to little more than the one-tenth of an inch, but north of that station the mean at each station amounted to nearly two-tenths, whilst in Scotland the mean for all stations amounted to .13 inch.

—— We have received from Messrs. CARTER & Co., samples of two new ANNUAL WHITE-FLOWERED BEDDING PLANTS, which seem to be acquisitions for general decorative purposes. One is a Dwarf White Virginian Stock, a single tuft of which forms a close erect mass (much like Lobelia Erinus in habit) of some 6 inches high and 9 inches broad, clothed with a profusion of pure white flowers. It will form a capital white edging plant. Another is Nemophila cramboides alba, which is dwarfer in habit and a closer grower than N. insignis grandiflora alba, and with white flowers equally pure as in that useful variety.

New Garden Plants.

ONCIDIUM CRYPTOCOPIS, *sp. n.*

(Cyrtochila auriculata, labello apice dilatato : Sepalo summo ovato transverse undulato serrulato hastato supra unguem bene aureolatum, sepalis lateralibus deflexis longe unguiculatis in laminas oblongas acutas paulo undulatas cuneatis, auriculis in basi nullis : petalis unguibus latis brevibus oblongis acutis, undulatis serrulatis ; labello trifido, lacinis lateralibus triangulis postice serrulatis antice abruptis, lacinia antica unguiculata, antice dilatata semiovata, biloba crispula, tumore baseos incrassato medio carinato, utrinque papuloso, papula altera antice utrinque apposita ; strus sulcisque utrinque postice : columna curva, alis ligulatis antice retusis carnosis juxta foveæ basin, laminis lanceis acutis geminis sub fovea.

This is a very unexpected novelty. The large flowers are chestnut brown, with yellow streaks, and a yellow margin around the crisped and toothletted sepals and petals. The superior sepal has a long claw, with two auricles at its base. Its lamina is transverse oate acute. The lateral sepals are stalked, and lengthened into cuneate ovate acute laminæ. The petals have very short and broad claws, while the laminæ of the same are oblong acute. The lip is highly curious, having triangular laciniæ of a purplish brown colour, with a proclive anterior part, and many toothlets on the posterior side. There are furrows on both sides of the whitish flesh-colour callus, whose posterior part is a little velvety. The claw of the lip is of the same whitish flesh-colour, and its border is sulphur-yellow. The yellowish column has brown spots. Its wings are purplish brown, and under the stigmatic hollow there are two swordblade-like laminæ—hence the name.

We had hitherto only the Oncidium diceratum, Lindl., with such a lip, so that the plant is interesting. Its flowers are fully as large as those of the now well-known Oncidium serratum. Mr. W. Bull has obtained it, under the name of Oncidium serratum, and has sent us flowers of both species. *H. G. Rchb. fil.*

PALMS.—No. VII.

Phytelephas (Ruiz et Pav. ; Elephantusia, Willd.).—When about 1844 Sir W. J. Hooker began to interest himself about obtaining information and specimens of the ivory-yielding Palms, nothing was known about them except that two species had been found in Peru (P. macrocarpa, vernacularly termed "Palu-puntu," and P. microcarpa, vernacularly termed "Yarina"), and that one of the species, or perhaps a congener, existed on the banks of the Magdalena in New Grenada. Purdie, the collector for Kew Gardens, found the Magdalena species, called "Tagua" by the natives, and sent it home. A few years later (1847) I discovered extensive groves of vegetable ivory in Southern Darien, where it was known to the Indians by the name of "Antá ;" but owing to the imperfect knowledge we then had of the Peruvian species, both Purdie's "Tagua" and my "Antá" were held to be P. macrocarpa. Wendland always entertained a doubt about the correctness of this identification, and moreover insisted upon the specific difference between the Magdalena and Darien plants. However, it is only since Dr. Spruce has enabled us to know what the Peruvian species really are that the genus can be put in anything like order. Besides P. macrocarpa and P. microcarpa, Dr. Spruce found, about Guayaquil in Ecuador, a third species, which the natives term "Cadi," and which he named P. æquinoctialis. It approaches closely to, but appears to be different from, the Darien species, of which my description, drawn up on the spot (Kew Misc. 1851, p. 303), rather than the account subsequently given by me (Botany of Herald, p. 205), should be consulted. I have received ivory nuts from Esmeraldas, Ecuador, but do not know to what species they may belong, possibly to P. æquinoctialis. About Portobello, in the State of Panama, large tracts of country are covered with Phytelephas, and an estate of that kind was recently offered for sale in the newspapers. Whether this Portobello species be identical with the Magdalena one (both bearing the same popular name of "Tagua") has not yet been ascertained. Portobello is the most northern station of the genus, as yet recorded. How many species there may be, even in gardens, it is impossible to say. Gaudichaud gave names to ten, but he published no descriptions, only figures of the seeds. The seeds doubtless afford some good characters, for instance, the Darien species has a cavity in the centre of the albumen, which renders it of less value commercially than its congeners. All the species (now fully admitted to be genuine Palms) have a short creeping or ascending trunk, terminated by a magnificent crown of pinnated leaves. Male and female flowers are borne on different plants, and emit a delicious perfume. The male flowers densely surround a fleshy cylindrical spike, each having a large number of stamens—P. macrocarpa, from 150 to 280, and P. æquinoctialis 1000 and more. The female flowers are in almost sessile heads, and develop into several muricate drupes, containing as many as nine seeds (the vegetable ivory of commerce, used by turners). Ivory Palms have flowered at Kew, Schœnbrunn, and other gardens, but I believe as yet only the female plants.

Borassus (Linn.).—The typical species of this genus (B. flabelliformis, Linn.) is one of the most widely distributed Palms of the Old World, being found in most parts of tropical Asia, and if B. æthiopum should prove identical with it, also in tropical Africa. No doubt the infinite number of uses to which it is applied,—a Tamil poem enumerates no fewer than 801, without exhausting the catalogue,—has materially tended to its geographical spread. No part of the plant is useless, but the Palm is principally cultivated for its great sugar-yielding qualities, its edible fruit, and its valuable timber. The fate of millions of human beings is intimately linked to this Palm, it being, in fact, one of the most important plants on the whole earth. The Palm of Timbuctoo, which travellers had conjectured to be the Cocoa-nut, I have shown (Journal of the Linnean Society, i., p. 152) to be B. æthiopum, which has generally a curiously swollen trunk, and is supposed to have suggested to the early Egyptians the ventricose shape of their columns. Attempts have lately been made to identify B. æthiopum with B. flabelliformis, but the proofs adduced do not appear conclusive. B. dichotoma of India is doubtless identical with B. flabelliformis, which sometimes divides into two or even more branches, and is then regarded with peculiar, often religious, veneration by the natives. The genus has long been represented in our gardens, and is composed of trees with unarmed trunks, often 70 feet high, fan-shaped leaves, with spiny petioles, diœcious flowers appearing in the axils of the leaf-stalks, and large brown drupes, containing three seeds, and being the largest Palm fruit next to the Cocoa-nut.

Pholidocarpus (Blum. ; Teysmannia, Zoll. et Rchb. in Bonplandia, 1858, p. 322).—This is an imperfectly known genus, of great beauty, which seems to range from Sumatra to New Caledonia. The fruits are in look much like those of Manicaria, but, closely examined, of different structure. At present only one species is known, Teysmannia altifrons being held to be identical with Pholidocarpus Ihur (Lontarus silvestris altera "Ihur" dicta, Rumph. ; Borassus Ihur, Gieseke ; Livistona (?) Diepenhorsti, Hassk.) This species was grown years ago, perhaps is still, in the garden of Mr. Blass, of Elberfeld, who described it as having the appearance of a Plaintain, the leaves being large and entire. It is certainly one of the rarest, as it must be one of the most beautiful, of Palms. I have not seen anything of it myself, except the tesselate fruits collected by M'Gillivray in New Caledonia and preserved at the British Museum.

Lodoicea (Labill.).—The double Cocoa-nut has often been introduced into our living collections, but after putting forth a few leaves it has generally died, and it is, therefore, still one of the rarest of Palms. The largest specimen I ever saw under cultivation was in the Botanic Gardens of Mauritius, in 1860, planted by Mr. Duncan, and I should like to know the fate of it. Until, in 1743, the only spot on the globe where this noble Palm grows was discovered, the nuts occasionally picked up at sea were thought to be the produce of trees at the bottom of the ocean, fetching a high price, and being esteemed amongst the most precious of royal gifts. A single nut, which now would realise at our public auction rooms about £10 (and that only if germinating), was then paid for at the rate of 60 to 150 crowns. The Emperor Rudolph II. of Germany is stated by Malte Brun to have offered 4000 florins for one, which, taking into calculation the difference in the value of money in that time and ours, is perhaps the highest price ever paid for any single fruit. There is only one species of the genus, L. sechellarum, an unarmed tree, 80 to 90 feet high, bearing fan-shaped leaves, often 20 feet long and 10 to 12 feet broad, diœcious flowers, and fruits sometimes 3 feet in circumference, and from 40 to 50 lb. in weight. The rapid destruction of the tree in the Seychelles Islands, where it is cut down for timber, thatch, and "cabbage," was nearly leading to the total extinction of this singular Palm, and induced the Linnean Society to send a memorial to the Governor of Mauritius, praying for the protection of the few remaining specimens—a step which has happily led to the desired result.

Latania (Comm.).—A genus of Fan Palms, inhabiting the islands of Eastern Africa, composed of a few species, all of them middle-sized trees, with palmate flabelliform leaves, diœcious flowers and yellow 3-seeded drupes, eaten by the negros. Our gardens boast of L. borbonica, Verschaffeltii, glaucophylla, &c.

Hyphæne (Gærtn. ; Douma, Poir.). — The representative species of this group is the well-known ginger-bread tree of Egypt (H. thebaica), the fruit of which has somewhat the look and taste of gingerbread, whilst the trunk, unlike that of other Palms, is normally branched. This species shares the peculiarity of branching with H. coriacea, but not with H. crinita (H. natalensis, H. Petersiana) and H. ventricosa. Hyphænes have an unarmed trunk, fan-shaped leaves, diœcious yellowish orreddish flowers, and large bunches of fruit with mealy rind, yellowish or purplish in look. The species are not well defined ; this even Dr. Kirk (Linn. Journ. ix., 234) has to own, though we have to thank him for a valuable contribution towards a better state of things. H. thebaica, crinita, and several undetermined species, are now in our gardens.

Pritchardia (Seem. et Wendl. in Bonplandia, ix., p. 260, et x., p. 311, tab. 15).—This is the only genus of Fan Palms as yet met with in the Polynesian Islands, where it was discovered by George Forster, who mistook it for the Corypha umbraculifera of Ceylon ; however, he saw only one leaf of it in the Marquesas Islands, where it was afterwards met by F. D. Bennett and Langsdorf, and where, as in Viti, it is devoted entirely to the use of the chiefs, no common man being allowed to convert the leaves either into fans, mats, hats, or thatch. There are at present four species known, three from the Hawaiian or Sandwich Islands—P. Martii (Livistona Martii), P. Gaudichaudii (Livistona Gaudichaudii), and an undescribed species enumerated by Horace Mann ; whilst the fourth is from Viti (Fiji), viz., P. pacifica. The latter seems to range from the Fiji to the Samoan, Tongan, and Marquesas Islands. In 1860 I brought numerous germinating seeds of this plant to Europe, so that it is now to be found in most gardens, a fine specimen being lately exhibited by Messrs. Veitch at the *conversazione* of the President of the Linnean Society. P. pacifica attains a height of above 30 feet, is unarmed, and bears a fine crown of palmate leaves, axillary spadices, with hermaphrodite flowers, having six stamens, and 3-celled ovary. The drupes are dark purple, and about the size of a sloe. In Viti I have never seen it truly wild, but always planted as isolated specimens near houses of chiefs of rank. The other species are not yet introduced.

Corypha (Linn.).—Formerly this genus included several species now distributed under Copernicia, Licuala, Livistona, &c., and at present only six are retained under the old generic name. All these are trees of tropical Asia, having ringed or channelled unarmed trunks, generally remarkably straight, but not much higher than 30 feet, and terminated by a crown of fan-shaped leaves, with prickly petioles. The flowers are hermaphrodite, emitting a powerful though not always agreeable odour, and the fruit is a roundish 1-seeded berry. Under the native government of Ceylon no person was allowed to have more leaves of C. umbraculifera carried before him than his social station allowed, reminding one of the absurd restrictions existing in the good old times in Europe, when people who dared "to dress above their station" infringed the laws of the land. A single leaf will afford shelter for seven or eight persons, as may be seen from the fine specimens exhibited at the British Museum, and hence these leaves are extensively turned into umbrellas and parasols. In common with other fan-shaped Palms they have been used from the earliest times for writing upon, hence it comes to pass that we still employ the term "leaf," in connection with books as well as plants, just as we borrow our term "book" from the ancient name of the Beech (Fagus sylvatica), still preserved in the word "Buckinghamshire," because from the wood of that tree the writing tablets were made. C. umbraculifera is an old favourite in our gardens ; more recent introductions are C. Gebang and Cumingii.

Livistona (R. Brown).—To the accidental introduction of the seeds of L. australis (Corypha australis), which happened to have been used as crocks by the attendants of Allan Cunningham, and had germinated during their passage home, we are indebted for the useful discovery that Palm seeds are best sent home in mould if they are to retain their germinating power unimpaired. Three of the plants which first came over in that way are amongst the gems of our present Palm collections ; one is at Kew, one at Sydenham (formerly in the possession of Messrs. Loddiges), and one, perhaps the finest of all, at Hanover. The latter has long been too tall for the house, and every few years the tub in which it is planted has to be lowered into the ground, solid walls of masonry surrounding the well. Excellent portraits of this species are published in Van Houtte's Flore des Serres, tab. 1789-90. It is the Cabbage Palm of Australia, which country also supplied us with two other species, L. humilis (now in our gardens) and L. inermis. The bulk of the species are natives of the Indian Archipelago. They are unarmed Fan Palms, most of them with arboreous trunk, having generally spiny petioles, the base of which is enveloped in fibre. Their flowers are hermaphrodite and arranged in axillary spadices, and their fruit a drupe, often inæquilateral, and always of a shining, glossy blue colour, by which latter character Livistonas may be distinguished from their allies, the Licualas. The leaves are used for thatch, hats, fans, &c. Nurserymen's catalogues offer us several species, among them L. chinensis, Jenkinsii ("the indispensable accompaniment of every native gentleman's house in Assam"), olivæformis, rotundifolia, humilis, &c.

Trithrinax (Mart.).—There is only one species of this genus known, viz., T. brasiliensis, which grows in the campos between the rivers Uruguay and Paraguay. It has an erect, unarmed trunk, fan-shaped leaves, her-

maphrodite or (by abortion) polygamous flowers, and 1-seeded berries. T. aculeata (Lieb.), of Mexico, has been shown to be an Acanthorrhiza, and T. mauritiæformis, a Sabal. Both are in our gardens. *Berthold Seemann.*

THE KNOWN FORMS OF YUCCA.—I.

THERE is now probably no genus of plants that is familiarly cultivated about which less information can be obtained from books than Yucca. No enumeration of the known species has been attempted since 1843 in any botanical work, and a considerable proportion of the forms known in horticulture seem never to have been described and named. With one or two exceptions, the only figures of the species in existence, except small woodcuts, are more than a generation old, and usually both these and the descriptions are so vague that they will apply indifferently to many forms individualised by cultivators. The fullest and most satisfactory account of the cultivated forms which we possess is contained in a series of papers by M. Carrière, commenced in the eighth volume of the "Revue Horticole," and continued at intervals through succeeding volumes; but these only profess to include the forms known in the French gardens, and have only been completed for a portion of the genus. Mr. Wilson Saunders has taken a special interest in the genus, and has gathered together at Reigate as many forms as he could, and is quite prepared to devote a number of the "Refugium Botanicum" to the genus as soon as I can undertake to describe the known forms with any satisfactory measure of completeness, and to give figures and dissections of as many of them as possible. In the present state of chaos, as regards names, in which the genus stands, it is very difficult to get to know what forms exist in different parts of the country. So far as I can judge it would seem that a considerable proportion of the forms which have been named and described in the books are not in the collections of the English cultivators; but this point is one which it would be very desirable to have settled if possible. I propose, therefore, in the present papers, without touching upon the characters furnished by the general inflorescence or parts of the individual flower, points relative to which our notes are still very incomplete, to attempt briefly to characterise by means of the general habit and leaves all the forms with which we are acquainted, either from living specimens, or of which we have more or less definite knowledge from published descriptions. This will give any one interested in the matter a key to the information which we possess about each of the groups, and show which are the forms on which further information is wanted; and such further information, I need not say, we shall be very glad to receive either through the pages of the *Gardeners' Chronicle*, or privately in the shape of a description, and if possible a drawing from the living plant of any clearly marked form to which we have not already access.

Dividing the genus into groups as follows:—

1. *Serrato-marginatæ*, species in which the edge of the mature leaves is distinctly serrulate;

2. *Filamentoso-marginatæ*, species in which the edge of the leaf habitually splits up into filamentous threads;

3. *Integro-marginatæ*, species in which the edge of the leaf is entire, and consequently neither toothed nor filamentous;

I will enumerate in this paper all the forms of the first group about which I have any information, with the hope of following it up soon with a similar account of the forms of the other two groups.

I. Forms known to us from specimens in cultivation in England at the present time:—

1. *Y. aloifolia.*—Stem, when fully developed as thick as a man's arm, always, so far as I have seen, unbranched, rising to a height of 6—10, or even, it is said, in the "Botanical Magazine," to 18 feet; leaves 100 or more, spread over a space of a foot or more, all rigidly ascending whilst in a living state, dark green, with a slight glaucous bloom, when fully developed 18—21 inches long by 1—1¼ inch broad half way up, narrowed to ⅜—½ inch broad above the dilated base, and gradually upwards, to a decidedly pungent reddish brown point; the texture the thickest of any form of the group known to us in the living state, the upper part not at all plicate, but the edge enrolled for 2—3 inches below the point, the edge narrowly transparently horny, with copious minute teeth of the same substance. This form may clearly be fairly regarded as Y. aloifolia, Linn. Sp. Plant., p. 457. As a native plant it is said to begin on the coast of North Carolina, and to extend southward, by way of Florida, to Mexico and Jamaica. The western (Californian) plant, which has been called by the same name, is no doubt a distinct form. The fine figure of Dillenius in Hortus Elthamensis (t. 323, fig. 416) differs only from the plant just described by having the leaves slightly shorter and broader (15—16 inches long by 1⅓ inch broad). The Y. aloifolia of Haworth's Suppl. Pl. Succ., p. 32, is characterised from the Dillenian figure; and the ordinary form, as in our description, is his Y. serrulata (Haworth, Suppl. Succ., p. 32, Rœm. et Schult, Syst. vii. 716; Kunth, Enum. iv. 270).

2. Stem not nearly so tall as in the last, and not more than from 1—1½ inch thick. Leaves paler, not nearly so numerous, a little thinner in substance and slightly inclined to droop when fully developed, 15—16 inches long, by 9 — 10 lines broad half way up, narrowed to half an inch broad just above the base, the central half flat, the upper third concave on the face, the point and toothing as in the last. The alliance of this is entirely with the last, but all its parts are upon a smaller scale. I know of no published name that belongs to it. There is a form with the leaves tinged with purple, which is known in the gardens as the "Algiers variety of aloifolia."

3. Stem as robust as in No. 1, and reaching several feet

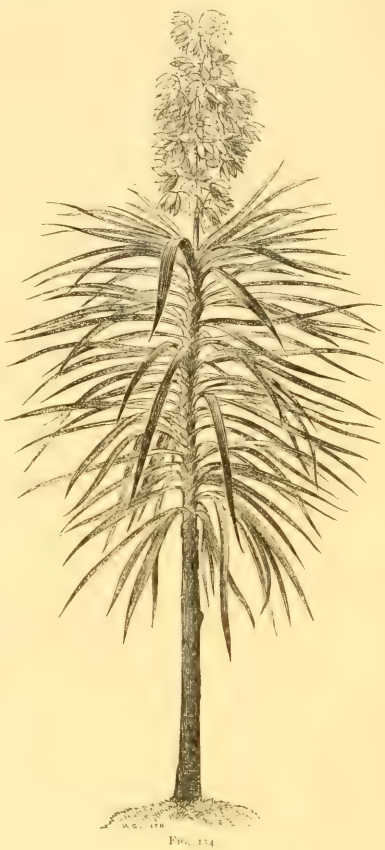

FIG. 154

in height. Leaves 25—30 spread over a space of a foot or more, and consequently very much laxer than in No 1, bright apple-green, not at all glaucous, much thinner in texture than in No. 1, and the lower ones decidedly

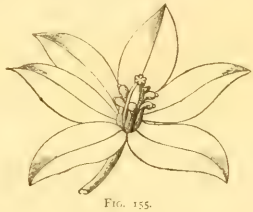

FIG. 155.

recurved whilst living, when fully developed 28 to 30 inches in length by two inches broad half way up, narrowed to an inch broad just above the dilated base, the point not pungent, and the edge of the leaf near it very little enrolled, and the upper part of the leaf very slightly plicate, the face and back of the leaf both flat except the lowest quarter and very apex; the edge very narrowly transparent, the teeth closer but still more minute than those of No. 1 This, we believe, is the plant now growing in England under the name of Y. Draconis, but it is quite different to the true plant of that name, which we shall notice shortly, and for which another figure in the Hortus Elthamensis of Dillenius is the original authority. We know of no other name for the present plant, but two forms, called in the gardens Ghiesbreghtii and guatemalensis, appear to be essentially the same, differing only by their extremely glossy green leaves.

4. Stem about an inch in thickness, only a foot long below the leaves in the specimen examined, tuberous at the base; leaves 20—25, resembling those of the last in texture, but very much smaller, the fully-developed ones being not more than 16 inches long by an inch broad half way up, bright apple-green, only slightly glaucous when young, the lowest rather drooping, the point not pungent, the face slightly concave throughout, the transparent edge a little broader, but the teeth as close and fine as in the last. Of this form Y. mexicana is the garden name, but it quite agrees with the description, so far as that goes, of Y. conspicua, Haworth, Suppl. Succ., p. 32, Kunth, Enum. iv. 270, a plant received by Anderson, of Chelsea, from Paris, in the year 1816, under the name of Draconis.

II. Forms not known to us from living specimens, about which further information is wanted.

5. *Y. crenulata*, Haworth, Suppl. Pl. Succ., p. 33, Kunth, Enum. iv. 271. — "Rough-edged oblique Yucca. Central leaves a little recurved, subobliquely bent, glaucescent, lorately linear-lanceolate, the edge and obtuse keel asperous." Thus characterised by Haworth from a young plant at Loddiges before 1818.

6. *Y. arcuata*, Haworth, Suppl. Pl. Succ., p. 33; Kunth, Enum. iv. 271.—"Leaves lorately linear-lanceolate, arcuately recurved, almost in a semicircle, flaccid, deep green, smooth, 7 — 8 lines broad." Described from the Chelsea garden previous to 1817, but only seen in a young state.

7. *Y. tenuifolia*, Haworth, Suppl. Pl. Succ., p. 33; Kunth, Enum. iv. 271.—"Leaves sharply arcuate, recurved almost in a semicircle, lorately linear-acuminate, very narrow (4—5 lines broad), the face distinctly concave." Received by Loddiges from Malta in 1817. Known only in a young state.

8. *Y. Draconis*, Linn. Species Plant., p. 457 (founded upon tab. 324 of the Hortus Elthamensis of Dillenius, of which our woodcut (fig. 154) is a reduced copy), and of numerous authors, including Haworth, Suppl. Succ., p. 33. The whole plant, as figured by Dillenius, is 8 feet high, the leaves spread over half that space, upwards of 100 in number, 2 feet or more long, an inch broad half-way up, thinner in texture than in aloifolia, recurved, bright, shining green, with a longer and thinner point.

9. *Y. spinosa*, H. B. K., Nova Gen. i. 289, Kunth, Enum. iv. 271.—Arborescent, with the habit of gloriosa; leaves 1½ foot long, 4 lines broad, green, glabrous, shining, flat, coriaceous, striate, the edge beset with ascending yellow spines. Temperate regions of New Spain.

10. *Y. rupicola*, Scheele, Linnæa, xxiii. 143.—Stem 4—7 feet high. Fully developed leaves in the wild plant 18—20 inches long, by 1 inch broad at the middle, thicker in texture than those of No. 1, with a point equally pungent, often twisted, the horny edge broader, and the teeth more distinct. A native of Texas. The above notes were taken from herbarium examples. Y. lutescens (Carrière), Revue Horticole vii., p. 579, is apparently the same plant. He says it was introduced by M. Trecul, and has been called tortilis, and contorta in French gardens. He describes as acaulescent, the leaves very pale green or even yellowish, 20—24 inches long in the cultivated plant by 1¼ inch broad, and nearly erect at the flowering time.

11. *Y. Treculeana*, Carrière, Revue Horticole, vii., p. 580.—At first described as acaulescent, but afterwards found not to be so. The finest form of the group, introduced, like the last, by M. Trecul from Texas, and flowered at Paris in 1863. Fully-developed leaves 40—50 inches long, 2—2½ inches broad, slightly twisted, dark green on both sides, the apex furnished with a firm mucro, the edge reddish brown, the serratures fine and very regular. When strong, the nearly flat leaves are suberect, except the lowest, which droop a little. See also Revue Hort., 1861, p. 304, and 1865, p. 55.

12. *Y. Whipplei*, Torrey, Bot. Mex. Bound., p. 222.—A Californian form, near aloifolia, not yet described fully. Caudex 1—2 feet high, leaves, in the imperfect examples I have seen, thicker in texture than in any of the preceding, and more rounded in the back, said to reach a length of 18 inches or more, narrowed gradually upwards from above the dilated base, where it is ⅝—¾ inch broad, to a rigid pungent point, the face flat below, channelled upwards, the serrations fine, but distinct.

Do any of the forms of this group with toothed leaves grow up to the flowering stage in England, in the open air? *J. G. Baker, Royal Gardens, Kew.*

THE MULBERRY TREE.

AN effort is being made to introduce once more into England the cultivation of the Mulberry tree, and as the leaves of either the white or black variety (but especially those of the former) afford food for the silkworm, and both kinds will flourish in a tolerably mild and moist climate, there seems to be no reason why we should be altogether dependent upon foreign sources for a supply of raw material for the looms of Coventry and Macclesfield. Certainly the present is a favourable opportunity for making the experiment, as the price of silk has been largely enhanced by disease amongst the worms in the south of Europe, and by the destruction of the Mulberry trees in China during the rebellion. At Yately, in Hampshire, Captain Mason has for the last three or four years been successfully engaged in rearing silkworms, and he calculates that if his Mulberry plantations had been made upon a sufficiently extensive scale, a profit of £10 an acre might

have been easily realised. King James I. preceded him in this speculation, and imported shiploads of Mulberry trees from France with the view of encouraging the production of silk in England. In 1629 Walter Lord Aston was appointed "to the custody of the garden, Mulberry trees, and silkworms near St. James's, in the county of Middlesex." But the scheme, like many others framed by the same monarch, proved abortive, and within a few years the Mulberry garden became, in the words of Evelyn, "the only place of refreshment about the town for persons of the best quality to be exceedingly cheated at." Pursuing its history a little further, we find the gardens converted into the site of Buckingham House, and in our own time Dr. King's allusion, written a century and a half ago, is a good deal more true than when he penned it :—

> "The fate of things lies always in the dark ;
> What cavalier would know St. James's Park?
> A princely palace on that space does rise,
> Where Sedley's noble muse found Mulberries."

Within our own memory a similar experiment was tried in the neighbourhood of Slough, but it failed, not from any deficiency in the supply of food, but from the difficulty and expense incurred in tending the worms and carding the silk. Mechanical processes have now, in a great measure, removed these drawbacks, and the whole process of cultivation is one which would afford suitable employment for women and children.

The vicissitudes of fortune experienced by the Mulberry tree in England belong to a curious chapter in the yet unwritten history of Botany. In common with the Vine and several other trees, the Mulberry has been alternately fostered and neglected : but in spite of royal favour and many intrinsic merits (for its fruit is wholesome and its timber valuable), it has now become a rare tree in Britain. The specimens at Syon House enjoy the reputation of being the first planted in England ; but the probability is that the Mulberry was introduced by the Romans, for the Saxon name for the tree, "mor-beam," is little more than an echo of the Latin *morus*, which again can be traced to a still more Eastern source. The Syon House trees were, perhaps, some of those imported by James I., but their interest is far inferior to that which attaches to the celebrated tree planted at Stratford by Shakespeare's own hand, and ruthlessly destroyed by a Goth of modern times. *C. J. Robinson, in "Nature."*

HARDY PALMS FOR THE SUB-TROPICAL GARDEN.

THE interesting letter from your correspondent, "W. H. G.," at p. 799, respecting the cultivation of Palms at the Royal Garden of Hanover, leads me to think that the additional experience gained since I wrote from Algiers last spring on this subject may be useful to some of your readers.

The statement that a bountiful supply of water is essential to the healthy and rapid growth of Palms, is fully borne out by my travelling experience in Spain and in North Africa. At Elche, on the south-east coast of Spain, where a forest of large fruit-producing Date Palms is seen, the like of which is seldom met with even in the tropics, a river is actually turned through the forest, and its waters are diverted into large saucers, or depressions, round the trees, a couple of feet deep. At Murcia the Date Palms which I found in the gardens of Lord Howden, 15 feet high, although only 12 years old, were planted at the bottom of a wide ditch, 3 feet deep, into which a running stream was frequently turned in summer. In Algeria the Date Palm only thrives where there is plenty of water, and the Arabs have a proverb, "that for the Palm to flourish its feet should be in the water and its head in the fire." In the oases of the Desert of Sahara, where Date Palms grow in such luxuriance, ripening the fruit we eat, they are principally found at the foot of the southern slopes of the last ranges of Mount Atlas. In these regions the watershed of the Atlas forms streams or springs which enable the Arabs to abundantly irrigate their Palms. Where there are no streams at the surface, the water is arrested below the superficial sands by impermeable rocks, and the roots of the Palms no doubt strike it, as in the cases quoted by "W. H. G."

There is one very important circumstance, however, connected with water-supply in the cultivation of Date Palms, which your correspondent does not mention. An abundance of water should only be given when the Palms are growing in a state of nutritive activity, that is, in warm summer weather. This I was told in Spain, at the Garden of Acclimatisation of Algiers, and by M. Narbonnard, a nurseryman at Golf Juan, near Cannes, who is devoting much attention to the cultivation of hardy Palms for outdoor purposes. To water Palms freely when at rest is to kill them. The regions where Palms live and flourish, I may remark, those I have mentioned—the east coast of Spain, the Genoese Riviera, the Desert of Sahara—are all regions where the winter weather is peculiarly dry and sunny, although the thermometer goes down to the freezing point, or to only a few degrees within it, every winter.

When at Algiers last April twelvemonth I purchased some three score small Palms at the Garden of Acclimatisation, and had half sent to my garden at Mentone, half to my country residence at Weybridge. They were Cocos nucifera, Latania borbonica, Raphis flabelliformis, Corypha australis, Oreodoxa regia, Phœnix tomentosa. Those sent to Mentone have done well as a matter of course, so I shall say no more about them. Those that came to England were a fortnight on the way, but were so admirably packed in a deal box, like books on a book-shelf, that they did not suffer in the least. They came by quick train, and the carriage from Algiers amounted to about 1*s.* a-piece. They were at once repotted, and I only lost two Oreodoxas. The rest grew vigorously during the summer, in the sun, on the top shelf of an orchard-house, and when shifted a few months later there was not an unhealthy root. They have passed the winter in a house where the temperature has been repeatedly down to within a very few degrees of freezing, without being in any respect damaged. They are now again in the orchard-house, and have started into growth. Were it not for the ungenial weather they would be in the garden, in my "small" subtropical department. During the winter they were not watered more than three times.

That Palms require the full blaze of sunshine when growing, as well as water, was proved to me by a little experiment unwittingly made. For the last few winters I have used small Palms at Mentone for the decoration of the drawing-room. These Palms, sparingly watered about once in three weeks, have remained perfectly vigorous and healthy, although constantly in the shade, and on repotting in the spring I have each year found every root sound and healthy. Last spring I thought I might do the same at Weybridge, and placed six of the best Palms received from Algiers on a staircase in bright light, under a skylight, but shaded by a white blind. In the autumn we found every root rotten. The treatment that suited them in a dormant state in winter killed them in an active state in summer ; they ought to have had their heads "in the fire of the sun." I have this year a convincing proof that the position was not one suited for such constitutions, for six vases of Selaginella robusta, by which I have replaced them, are in perfect health and beauty.

I can endorse what your correspondent says of the crowded state of Continental Palm-houses by my recollection of many that I have seen in the South of Europe—Madrid, Valencia, Murcia, Montpelier. I have repeatedly wondered that the Palms could live piled one against and one over the other, in shady places, any how, and planted in very small tubs and pots for their size. But in reality Palms are very hardy vigorous plants, if treated according to their constitution. If these tubs are examined, the thick, white, wiry roots would be found curled round and round at the bottom, like those of a potted Hyacinth. In the South some nurserymen conform their pots to this tendency of the roots to descend and curl at the bottom, and plant Palms in deep conical pots, twice as deep as ordinary ones. I once purchased at Marseilles some Chamærops humilis, grown in pots of this kind. Half the pot was full of a tangle of white curled roots. My Mentone gardener foolishly cut them off instead of patiently unravelling them, and the result was that the Palms lived planted in the ground, but never started into growth for two years.

Thus it would appear that what the more hardy Palms require in winter is shelter from frost and little or no water, in all but any kind of house, and in summer, whilst growing, a blaze of sunshine with plenty of water. I would add that, wherever I have found them flourishing out-of-doors, the soil has been more or less siliceous.

With these Palms from Algeria I received three Musa Ensete, for which I paid 10 francs, or 8*s.* each. Two died, rotting off, probably from over-watering. The third has lived and flourished. When I left last October it was only 10 inches high. It was put in a house where the temperature was never much above 50°, but has grown all winter prodigiously. It is now a large plant, 4 feet high, and occupies a No. 2 pot. I look upon it with pleasure, but with some alarm, for he is a regular Brobingnag child, and will, I am afraid, soon get too big for me. In the garden of M. Gastaux, at Nice, there are two, only five years old, as large as moderate-sized Oaks. One alone would fill the largest house I have, and come out majestically at the top. *Henry Bennet, M.D., Grosvenor Street, June* 11.

Home Correspondence.

Encephalartos villosus, &c.—In answer to the letter of "F. L. S.," at p. 796, I must beg to say that he is in error in supposing my remarks on the above were made in haste ; on the contrary, they are the result of close examination and previous knowledge. As for the Burlington House examination, I should say an evening *conversazione* of the Linnean Society is not a likely place for a critical examination of any such plants. "F. L. S." seems to think I ought to have suppressed my name and address, as he has done, though I never write anonymously, but should have given it, had it been Seven Dials or Whitechapel. As to the trouble of defining the species, it is one of the most distinct, especially in the acuteness of the spines on the pinnæ, which vary from two to eight on the same frond, and the villosity on the trunk, which may be pulled off the same as one might pull the cotton from the ripe capsule of Gossypium. As to "F. L. S.'s" reference to E. lanuginosus, horridus, and cycadifolius, he cannot have examined these species very minutely, or he would have given me credit for knowing them from villosus, even in the dark. Had he taken E. Altensteinii as an example, I might have allowed that one who saw them seldom might be mistaken ; but even here an experienced eye detects the circumstance at once. As for the shape of trunk, length of frond, or distance of pinnæ, there are seven or eight plants of E. villosus in these gardens, and not two stems or trunks are shaped alike. The length of the frond is owing to the strength of roots, age of the plant, or the vigour of the whole, and of course according to vigour of growth, so will the length or distance of pinnæ be. I have seen some plants of the above with weak roots form depressed fronds about 20 inches long, and others that were vigorous and started in bottom-heat grow 7 feet, and almost erect. "F. L. S." hints about cones : now I have seen species of Encephalartos, one year with a cone 2 feet high, and the next with one only 1 foot. If that is to influence botanists in naming them, we shall have one called E. Caffra one year, and the next something else. I can show "F. L. S." a plant of E. villosus, with perfectly cylindrical and angular rachis on the same plant. When he writes about pointed and 3-fid pinnæ, I can show him 2, 3, and 4-fid or pointed pinnæ on the same frond. I must say, if our botanists were of the same opinion as "F. L. S." we should not stand still for number of species of Encephalartos. *J. Croucher, Kew.*

Cherry Trees not Bearing Fruit.—There are in this garden two Cherry trees which have been planted 15 years ; I do not know the name of the variety, but it is the best we have. During that time only once have they borne a crop of fruit, generally producing one fruit where there ought to be a hundred. During the past two years I have covered one with tiffany at nights and the other in the morning until the sun ceased to shine on it, but I had not the slightest recompense. Last year I went over a part of each tree with the camel-hair brush, but no good result accrued from the operation. This year I am happy to say they are, like all the other trees, loaded with fruit, and that without any assistance from me. I may say that they have flowered annually most abundantly, and sometimes the fruit has set, but finally turned yellow and dropped. Mr. Gilbert may therefore have made a rash conclusion ; it is to be hoped that he has not, and that we shall live to see a similar record made by him in future years. *W. P. R. Holwood.*

—— In reply to your correspondent "H. A." permit me to say that I have this day (June 13) slightly shortened the breast-wood, but I do not intend to winter-prune at all. I am happy to add that the Cherries are now swelling fast, some of them colouring. *R. Gilbert, Burghley.*

Pine-apple Fibre.—I beg to submit for inspection a small sample of the fibre of one leaf of the Pine-apple plant—a distinct portion of the membranes of the upper and under surface of the leaf, and a little of the fibre from a short section of the stem. The fibre enclosed may be reckoned as a sixtieth part of what an ordinary sized plant would produce with probably 50 lineal yards of the membrane, &c. It is not supposed that this article can be produced in this country in such abundance as to be useful in trade, but if it has not been already tried, should it be found to possess any of the qualities requisite for paper making, &c., no doubt the article could be found in considerable quantity where the Pine is extensively cultivated—the plant, as I understand, being of no use after its fruit is cut. My knowledge of the fibres in use being limited, may I ask your opinion of the enclosed? *John Reid, Haigh Hall Gardens.* [We submitted this letter and its enclosure to Mr. Jackson, of the Kew Museum, who kindly replies as follows : —The fibre of the Pine-apple (Ananassa sativa), when properly cleaned and bleached, is very fine and silk-like. The natives of the Philippine Islands prepare a very delicate muslin-like fabric from it, which is frequently embroidered by the nuns in the convents of Manilla, and is then much prized. It is said that the fibre loses its strength, and becomes brittle if it is not prepared from the leaves while they are green ; this would stand considerably in the way of exporting the article to this country, as it would be necessary to clean the fibre before sending it, instead of sending the leaves in bulk. So long ago as 1836 samples of the fibre, of native production, were sent to the Society of Arts, and specimens of the fibre and fabrics made from it are in the museum at Kew ; therefore its merits are not unknown in Europe. If it could be had in any quantity, and could be sold at a reasonable price, there is no doubt that it would meet with a demand, and would be used for similar purposes as China Grass. The fibre obtained from the stem is brittle, and would be valueless as a textile material. The cuticle of the leaf could not be put to any economic use. With regard to the application of the whole leaf to paper-making, I reckon the cost would be far too great, especially when other materials around us are still unused and considered waste.]

Lawn-mowers.—The present time is by no means an improper one at which to raise a discussion upon the respective merits of lawn-mowing machines, as with the great Oxford meeting looming at a not very remote distance it may not be altogether unwise to

anticipate that so great a horticultural gathering will not be allowed to pass without some opportunity being afforded to makers of these machines to submit their best specimens of manufacture to a public trial, just as the agricultural machinists submit their machinery to the approval or otherwise of competent judges. The Messrs. Green have, according to announcement in your advertising columns, taken the initiative in this matter by putting their machine into competition with the "Archimedean" at Leeds; and as it is impossible to discredit the judgment of the eminent practical men to whose approval the two machines were submitted, there seems no doubt but that the "Archimedean" is not, after all, so successful a "notion" as some would have us believe. But, of course, a trial upon so limited a scale as this cannot be accepted as conclusive by any of those who are interested either in the sale or use of lawn-mowers. A competition that should include the machines of every good maker, would be a trial of great interest, provided it were conducted under the special supervision of a great public body like the Royal Horticultural Society, and the judges were men perfectly and practically conversant with the fullest requirements of a good mowing-machine. It is possible that such a suggestion as this would not have been made, had it not been for the authoritative manner in which the claims of the "Archimedean" machine to high favour has been put before the public, but when it has been declared by the authority of the Royal Horticultural Society to be the "most efficient lawn-mower ever used" it certainly becomes our own makers to bestir themselves lest their well-earned reputation of many years should suffer, possibly unjustly. There are, however, many important considerations that enter into the question of practical usefulness with regard to mowing-machines, all of which should have due attention paid to them at any trial of their respective merits. It is not enough that a machine should do its work neatly and well; it is not enough that it should gather or scatter the grass at the pleasure of the user of it. If there are several tests to which in ordinary working it is put, it should pass through, not simply one or two of them, but the whole successfully; and any machine that will do that deserves to receive the highest approval that can be publicly bestowed. I had the pleasure for a number of years of enjoying many a wet shirt whilst working mowing-machines; and I say it in the interests of those gardeners and garden labourers of whose work mowing forms no inconsiderable portion, that the question of draught should have an important consideration. There is no machine in existence that is at all adapted for mowing lawns the working of which does not involve considerable labour, and certainly nothing can be more absurd or ridiculous than those "cuts" with which advertisements make us so familiar, in which a highly-dressed "girl of the period" is represented as being hard at work mowing the lawn, upon which doubtless she is supposed a little later to be engaged in the exquisitely feminine game of croquet and in doing a bit of effeminate flirting. I am not at all sure that our "lords of the creation" would at all desire to see their wives and daughters engaged in the masculine labour of lawn mowing, even though it were with an "Archimedean." In any public trial of lawn-mowers there could be no difficulty in testing the draught of any machine by using a spring dial similar to those wherewith on certain public occasions we are so earnestly invited to pull our arms out of joint for the small charge of one penny. Stiffness of going too often depends upon complexity of construction. The greater the number of spindles and bearings required the greater will be the friction, liability to get out of gear, and consequent larger expenditure of labour needed; and any machine that is so liable to these defects is pretty certain after one or two seasons' working to entail upon those who have to operate with it an amount of labour that is truly severe and often excessive. To discuss with gravity the question as to whether this or that machine can best cut grass that is from 6 inches to 8 inches in length is a severe test for the risible faculties. Who but the most complete sloven would ever allow a lawn to become so untidy? Mowing-machines are intended to keep grass short, not long, and to raise such an issue is absurd. A very much more proper point to raise is the effectual clipping off during the spring months the blooms of those irrepressible Daisies, that will continue to burst up in spite of all efforts to keep them down. I have usually found the leading rollers to be a considerable hindrance against doing this well. The pressure to which the flowers are subjected frequently prevents their rising to the knives, and as a consequence they are left behind, to the great annoyance of the operator. Here, no doubt the introduction of the side skids is advantageous, but machines so constructed cannot be worked upon verges or along the edges of walks and beds, and thus their benefits are practically nullified. I have often thought that the only way for makers to effectually surmount this difficulty would be to put the guide-rollers behind the large roller instead of in front; and if they can further so improve their machines as to make the driving projections at the side to occupy less space than at present, they will make their respective mowers all the more useful to gardeners. As to the argument in favour of the "Achimedean," that it "equally distributes the grass over the surface of the lawn," I think the Messrs. Green have fairly met it when they say that the operator has only to leave off the box from their machines and the like results are attained. But how many gardeners are there who consider the leaving of the cut grass ungathered to be an advantage? Very few, indeed; and supposing there is any gain attached to it, the litter occasioned by the casting of the grass over the walks, borders, and beds, more than outweighs the supposed advantages. This is certainly a new idea in lawn gardening; but I see no reason to believe that it will take root amongst us. To sum up what I conceive to be the requirements of a good lawn-mower, it should be light of draught, easy and convenient to handle; it should perform its work perfectly neat and smooth, and should leave behind no notches or scores to mark its path; it should be as noiseless as possible in its working, its driving power simple in construction and not easily put out of gear, the bearings should be properly protected from dust and convenient to oil; and lastly, it should be cheap. I think any machine that fully answered all these requirements would afford to the public complete satisfaction. *A. D.*

Early Peas.—Experience leads me to confirm the truth of "R. G.'s" statement on this subject, which appeared in your pages a few weeks ago, as the following will show. On February 28 I sowed in the open ground Dillistone's Prolific, Sutton's Ringleader, Taber's Perfection, Beck's Gem, and Daniel O'Rourke. I gathered from Dillistone's, June 4, being exactly the same time to a day, from sowing to gathering, as "D. L. B.'s" was from his, which were raised in boxes; and I not only gathered, but I gathered both in quantity and quality. Sutton's Ringleader was about three days later, the others in the order I have given them. Will some of your correspondents kindly give their opinion as to whether Peas sown in boxes and planted out ever produce such a crop as those sown in the open ground, even if they do gather a few days earlier? "D. L. B.'s" sample was good, but what sort of a crop had he? *E. Morgan, The Butts, Harrow-on-the-Hill.*

—— My first gathering was on May 29—Ringleaders, and on June 7 I had Laxton's Supreme in fine condition, both sown at the same time, November 16. *R. Gilbert.*

Marechal Niel Rose grafted on Gloire de Dijon.—In February, 1869, I grafted a few Maréchal Niel as an experiment on Gloire de Dijon, in the manner followed in the case of potted Manetti stocks. The result exceeded my expectations; as, from a small plant which bloomed in March last in a 6-inch pot, I had fourteen large and finely-developed blooms of a much richer colour than I have ever seen Maréchal Niel have before. The growth is much more compact, and I believe the plant will bloom much more freely, and of a deeper golden-yellow than on any other stock. In fact, many gentlemen and gardeners that saw it in bloom at our establishment stated that they never saw it so fine. *William Lock, The Nurseries, Sutton, Surrey.*

Gold and Bronze Zonal Pelargoniums.—It would be interesting to all growers of the above modern introductions to know what, in your opinion, constitutes a first-class variety. The Leeds Horticultural Society offered, at its recent exhibition, handsome prizes for six gold and bronze zonals, and, as may be expected, there was strong competition. Among others, Mr. Butler, of Burley, Leeds, and Messrs. Downie, Laird & Laing, sent collections, and to these were awarded the 1st and 2d prizes—Mr. Butler taking the 1st with plants of Model (Wills), Beauty of Calderdale (Wills), Beauty of Ribblesdale (Wills), Beauty of Oulton (Wills), Admiration (Wills), and I think either Fascination or Conspicua (I am quoting from memory); while Messrs. Downie & Co.'s lot comprised the following, of their own sending out:—Impératrice Eugénie, Crown Prince, Prima Donna, Princess of Wales, W. R. Morris, and Mrs. Lewis Lloyd. Both lots of plants were equally clean and well grown, Mr. Butler's being much the larger and more grossly grown lot—they were indeed bronze and green with a very slight tinge of yellow; the Messrs. Downie & Co.'s, on the other hand, were of the most vivid bronze and yellow, with hardly a shade of green on the leaves. One of the judges was the eminent raiser, Mr. John Wills, F.R.H.S., and the other a Yorkshire farmer. *Looker-on.* [Similar cases often arise at all exhibitions, in which the judges have to decide between higher culture on the one hand, and better quality of material on the other. It would be well if societies would always indicate in their regulations which they elect to encourage; such a course would save many disputes. As it is, a chance word in the schedule may sometimes give a reason for preferring the one to the other, but generally the question is left quite open; and, consequently, the decisions are liable to vary according to the bent of the judges. EDS.]

French Nursery Catalogues—I observe in the *Gardeners' Chronicle* (p. 768), a complaint of Mr. "Greenhorn," which seems to me ill-founded. If the French nurserymen print English editions of their catalogues, and affix higher prices than in their French editions, this is simply and purely a piece of French flattery [*galanterie*] on their part towards their celebrated, eminent, and learned [*sic*] brethren on your side of the water. The French know well enough that the English thoroughly appreciate all that is most perfect and exquisite. Hence, then, it is a favour that the French grant to the English in offering them the first choice of their goods. If Mr. "Greenhorn" is disposed to inquire of the French horticulturists for goods of second or third quality, they will tell him, "Sir, these are not good enough for an Englishman; they are not worth the cost of packing and transport; nevertheless, if you wish them, we will send them." *Joseph Napoléon Baumann fils, Gand, Belgium.*

How to Gather Two Crops of Strawberries before the end of May.—Begin forcing the plants in January. Push them forward pretty rapidly; this will enable you to gather the first crop in April. If strong plants, they will push up second flowers. Remove them about the middle or end of April into a piece of rich ground, in a warm aspect. Water them well, and place Rendle's protectors, or Looker's patent capped frames, over them. They will flower, set, and swell off their fruit at once. I served a hundred plants of Keens' Seedling so this year, placing them close together, and covering the whole with 60 feet of the protectors, and we have been picking from them since the middle of May, and will do so till we gather outside, which will be at least a fortnight yet. We also find these protectors most useful for winter Lettuces. As soon as we could dispense with them for Lettuce growing we whipped them on to French Beans, and these are already showing flowers. This was a great saving of time during the cold season. *Pro bono publico.*

Queen Emma Melon.—Observing a paragraph at p. 768 respecting the parentage of this Melon, I feel constrained to bear testimony to its high excellence. No Melon is so much liked here, and it is likewise handsome, full-sized, and a good grower. The Merton Hall and Queen Emma are our favourites. Turner's Gem is good in quality but under-sized, which is a misfortune, for small Melons are not effective for large desserts, and look poor. Three on a dish together are flat, and four look too much of a good thing. The two I have named are fine representatives of useful dessert Melons in size, form, and general appearance, and the quality, when well grown, will disappoint no one. *D. T. Fish.*

Unfruitful Cherry Trees in Pots under Glass.—Notwithstanding that almost everybody says it is so easy to grow Cherries under glass, or to force them, it is but seldom we meet with a good crop. They flower in sheets of spotless large blossoms, and then between the flowering and the setting, or swelling, down they fall. I can warrant Mr. Gilbert's remedy of allowing the breastwood to grow out from the wall, and renew them, as good practice for the open air; but how to manage pot Cherries, so as to have full crops, has beat me and many others besides. Will some of your Cherry growers under glass kindly give their experience, and oblige *A Great Lover of Early White Hearts.*

The Fungus Question.—Before gardeners can be made to believe or realise the evils said to be created by Fungus, they must be taught how the mycelium really acts on the vegetable tissue. But at present a correspondent describes the amount of Fungus in the soil, as well as the deplorable appearance of the things growing in it, and forwards them to a mycologist. The reply is—"Evidently the effects of Fungus." Now even Mr. Miller will not deny that Fungus may not in some cases injure the roots of plants in a similar manner to that in which mildew affects the leaves. It may even poison the soil, or in some other way interfere with the progress of the roots; though I am happy to say I am not a witness to its effects. It is singular that, whilst water with an unbearable amount of low temperature is conducive to mildew, a plentiful supply of water will keep away Fungus, and even destroy it. After hearing of all the evils attributed to Fungus a gardener must be stricken with horror when he finds traces of it in the soil. But on the other hand, if obstinate persons will persist in planting trees where others have been, or give them faggots to grow in instead of peat,—or peat, sand, or clay, instead of a compound of the three,—they can only expect to reap their reward. They may as well make Fungus the scapegoat as inculpate themselves. It is an axiom with gardeners not to plant the same piece of ground with two crops of the same kind successively, the interval being generally two years. During that time it might be said that the ground is disturbed three or four times for other crops, and Mr. Miller might be easily forgiven for being sarcastic where he is refuted with an argument of the effects of Fungus, by a healthy tree being planted over the wreck of another. Four years ago the indoor Peach trees here were fruitless, and evidently had been so to a great extent from the time they were planted, eight or nine years previously. They had made shoots annually several feet in length, but very little of what might be termed bearing wood. For this I saw no remedy but to root-prune, and in disturbing the border I found a quantity of Fungus in the soil as well as on the roots. I was recommended by a gentleman visiting here at the time to send some of the roots to the office of the *Gardeners' Chronicle*, and some editorial remarks will be found in your columns at p. 1017, 1866, which were anything but encouraging to me, and they had such an effect on my nervous temperament that I dreamt of that mycelium

in the soil. Night after night could I see its progress, until at last things came to a crisis—it developed itself in the shape of Fungus of various shapes and colours, and some of the most demoniac appearance. At the dawn of spring I was delighted to see the various hues of the flowers, and more so still to gaze at the rosy checks of a goodly sprinkling of Peaches and Nectarines. The trees are still alive, and on two may be seen from 500 to 600 Peaches. The border is all inside, and well drained, and at the time of disturbing it, though it had recently been watered, it was very dry a little distance below the surface. I have concluded that dryness was the actual cause of the fruit falling and of other disasters, such as buds dropping, &c. Twelve months ago I saw a house of Cucumbers, the beds on each side were a mass of spawn. This was in the month of January, and all that the grower wished for was some sunny weather, so that he might apply a few soakings of water, which he considered an unfailing remedy. I mention this because I consider it a mite contributed to prove the soundness of Mr. Miller's logic in his last letter. *W. P. R. Holwood.*

Picea magnifica.—I have a Picea magnifica which last year grew with a somewhat crooked leader, and this year seems to be making a still crookeder one, to my great annoyance. Can anything be done to it? It is too stiff to stake. A Douglas Fir is also growing in the same manner. Neither of them have been injured that I know of, certainly not the magnifica. *G. M., Derby.*

Purple Laburnum.—I enclose samples of three varieties growing here on one tree. It appears to have been grafted about 4 feet from the ground—the purplish flowered kind on the common yellow variety. The scion portion of the trunk is about one-third greater in diameter than the stock. The blood of the stock seems to be struggling hard with that of the scion, for on one branch of the tree the yellow appears at the point, the purple all round for 3 feet lower down, then a whorl of the lilac-coloured, then the purple all the way to the main stem, interspersed with bushy twigs of the lilac form. Doubtless the lilac sports are occasioned by the commingling of the purple and yellow blood, while the purple is affected by the struggle of the yellow to appear by the influence of its stock. *P. M., Wynnstay.*

Variegated Zonal Pelargoniums.—I sincerely trust that the "dictum" laid down at p. 796 respecting the conditions under which these beautiful plants should be staged at flower shows will generally be brought before the notice of the managers of all provincial societies, so that in future it may be distinctly defined in their respective schedules of prizes, "that in all cases Variegated Pelargoniums of any class or description exhibited for competition shall be without flowers." Nothing has tended so much at exhibitions to mar the beauty and rich colouring that can be developed in the foliage of these plants as the very common practice on the part of judges of awarding the prizes where the greatest amount of flower existed, thus literally judging them by the same standard as they would the zonal or nosegay varieties. I have long held that with respect to Variegated Pelargoniums highly coloured foliage and expanded flowers are incompatible; indeed, it may be a question whether or no the colouring matter absorbed in the flowers is not so much abstracted from the leaves of the material that produces their richness and beauty. I have almost always found that those plants which carried the greatest quantity of flower have displayed the least amount of leaf-colouring, whilst the foliage has usually been the most meagre. Should the suggestion you have made be generally accepted, it will be emphatically a step in the right direction. *A. D.*

Preservation of Rose Blooms.—Some years ago a friend of mine was told by her physician that cut Rose blooms might be preserved in water for a much longer time than usual if some drug or drugs were added to the water. The physician in question died before my friend could ascertain for me what it was that should be added. Can you or any of your correspondents kindly tell me this? *A Regular Subscriber.* [Query, was charcoal intended? EDS.]

Laburnum Pods.—The Laburnum has this year flowered exceedingly abundantly, but, with me at least, has scarcely set any fruit. I have two trees in my garden which were a perfect mass of bloom, but which have now scarcely a dozen pods between them, while the shed flowers have been swept up by the bushel almost. Has this been the case elsewhere? or can any of your correspondents suggest a reason why the fertilisation has taken place so very sparingly? We are told that most leguminous plants require the agency of insects for their fecundation, but that can hardly have been wanting in this case. *Alfred W. Bennett*, 3, *Park Village East, Regent's Park.*

Roses.—Marquise de Castellane and Albion, planted out from a pot 13 days ago, have bloomed, and are promising infants. The most beautiful Rose, thoroughly proven here on Manetti, without a fault, is Felix Genero. It is first-rate as to form, colour, outline, growth, and free blooming. I advise all nurserymen to propagate it largely, and Rosarians to buy it extensively. I have 11 plants of it in bloom now, and I see no difference. It is as good in form as Chabrillant, larger, of a better colour, and of better growth, foliage, and health. I thank M. Lacharme. *W. F. Radclyffe, Okeford Fitzpaine.*

Iberis, or Candytuft.—As there are several of these worth notice, I hardly know which to select, as they are all deserving more attention than they have hitherto received. They are dwarf evergreen shrubs, producing in the spring innumerable corymbs of white flowers, so dense on most of the species as to entirely eclipse the whole plant. I. gibraltarica is a robust-growing species lately reintroduced into this country. It is the largest flowered of the race, but is not so hardy as some, therefore cannot be recommended for general purposes; it is, however, a beautiful plant, and one which will soon become familiar to us all. I. corifolia must be called the gem of this family; it is an invaluable hardy plant, and indispensable where good flowers are appreciated. It is distinct from all the others, having large thick foliage and compact heads of pure white flowers, which stand up boldly above the plant; the individual flowers, as well as the corymbs, are much larger than any other species of this character, and it continues in flower long after all the others have done. I. sempervirens superba is a variety of the common Candytuft, much larger in flower and foliage, and is a decided improvement upon the old plant. *A. I. P., Tottenham.*

Myosotis dissitiflora.—I have been much interested in all that your correspondents have written about this beautiful plant, and have been rather struck with their concurrent testimony in favour of seedlings over cuttings or divisions as a mode of increase. Several have said that such plants are not affected with dissitiflora weakness. Well, I hope not, but am still doubtful about it. It is very important in this matter that we should be sure of our variety, or know for a certainty that we have the veritable article. Within the past month I have had from a dozen to a score samples of Myosotis sent to me, not one of which was dissitiflora, and therefore it is just possible that some of your correspondents may also be mistaken. As far as sylvatica goes, seedlings are the best mode of increase without doubt, and it seeds remarkably freely. But I never found any weakness engendered by increasing it by cuttings, which I had occasion to do with the white variety on a large scale some 20 years ago. Besides, it is not with me alone, nor with my stock only, that dissitiflora exhibits this tendency. I have heard of similar exhibitions of sudden weakness from Scotland, Ireland, and many parts of England. Doubtless many of such plants were seedlings. However, I will carefully test the matter for myself now, as I have ripened some this season, and have sown a stock for next year. The cuttings and seedlings shall be flowered, and the difference, if any, duly chronicled. One word about the mode of propagation I have described. It is not division, in the usual sense of that word; I only keep a portion of the old stem until the young branch establishes itself. Every branch roots into the ground, and it matters not after a few weeks whether the stem lives or dies. The divided branch is soon as independent of it as a rooted cutting of the plant whence it was taken. Nothing, again, can exceed the healthiness and strength of our cuttings. They bear great broad leaves wider than those of any seedlings I have ever seen, so that they cannot go back for want of growing force. But I am also afraid that your readers have over-estimated the risk of loss from growing this variety, and that my last letter helped them to do so. The plants we lost last winter were lost through the exceptional character of the season, and not through dissitiflora's usual malady. In ordinary seasons our loss does not exceed 10 per cent.; last winter it was nearly cent. per cent. Lastly, I do not agree with Mr. Challis that dissitiflora is as hardy as sylvatica. Perhaps, if they were both in the same condition, the difference would not be so great. But as sylvatica side by side is fast asleep while dissitiflora is in full glory, there is a great difference in the power of endurance of the two plants. One word in the ears of my correspondents, and to some whose questions I may not have answered. May I beg of them to send their specimens to be named to the *Gardeners' Chronicle*, not to me? I think I can read off dissitiflora pretty plainly now, but when asked, "If not dissitiflora, what then?" I pause over the withered fragment, and fear to answer wrong. Further, permit me to say, that in future I must decline to answer privately questions arising out of my public correspondence unless a stamped address is enclosed. Some of my correspondents have been thoughtful on this matter, but others do not seem to know that postage stamps are a heavy tax on the slender resources of gardeners. *D. T. Fish.* [It is most inconsiderate to intrude on the privacy of our correspondents without previously asking permission. EDS.]

The Mole Cricket.—At p. 763 your correspondent "T." gave an account of the habits of the mole cricket. We can fully bear out his statements from our own experience in the past, and shall avail ourselves of M. Souchet's method of extirpation. With us it is equally as mischievous as the cockchafer grub. It appears to be fond of moist, shady ground, where in a few nights it inflicts incalculable mischief in uprooting everything not of sufficient strength to resist its attacks. From a shady portion of our nursery, devoted to the training of seedling Rhododendrons, it has quite driven us away, entirely from our inability to check its ravages. It appears to work entirely by night, and, moreover, it is very shy; if discovered by day, it makes a hasty retreat. We have detected it on high, open, or sunny grounds. I am pleased to think, with your correspondent, that it is rather uncommon, or the consequences would be serious indeed. *F. Waterer, Nursery, Bagshot.*

Dodecatheon Jeffreyanum.—Among the many hardy plants which have recently been in flower, there is none more interesting than this charming perennial. It was introduced into this country from the Rocky Mountains, but, like many more such good things, is but rarely to be seen. It is a very vigorous growing species, often attaining the height of 18 inches; the foliage is very long, lanceolate, and of a dark green colour. It produces many stalks, which support large umbels of bright rose-coloured flowers, often as many as 10 or 15 upon each. The flowers have a yellow ring at the orifice of the corolla, which gives it a pleasing and striking appearance. It is quite hardy, but succeeds best in a slightly sheltered position. *A. I. P., Tottenham.*

Garden Literature.—In perusing the *Gardeners' Chronicle*, I read an extract at p. 734 from "The Bookseller" respecting old "Gerarde's Herbal," &c., which induced me to look to the date of the edition I have in my possession. On the title-page is—"Imprinted at London by John Norton, 1597," but with considerable variation in its adornment. Vases and flowers there are, of inimitable beauty, but not a vestige of fruit that I can discern. There are two goddesses, one at the top and another a little way from the bottom of the page, and four men, two on each side. Under all is a well laid out geometrical garden, with the house or castle on the right, a summer house, gardeners digging, and the master and mistress parading. After the addresses to the author and the author's to his reader, is placed an excellent plate of the likeness of the herbalist, with "Effigies Joannis Gerardi, Cestreshyrii civis et chirurgi Londinensis, anno ætatis 53, 1598." May this be a copy of the first edition by Gerard alone? It appears to be 272 years old. If this would be of service to the inquirer in the "Bookseller" through you, I trust I shall not have called your attention to it gratuitously. *Charles Tucker, Vicarage, Charminster, Dorchester.*

Early Peas.—I had ready for gathering on June 8 an excellent sample of that very early dwarf marrow Pea, Multum in Parvo. These were sown in the open field in the middle of February, about three months later than the usual period at which the earliest garden sowings are made, viz., the middle of November, whilst the difference of time in readiness for table was not more than a fortnight. I think it is not unfair to infer from this, that were Multum in Parvo to be sown early in January upon one of those warm south borders usually allotted to early Peas, it would be ready for gathering quite as soon as any of the other early kinds, with this difference in its favour, that it is a marrow Pea of capital flavour. As this Pea does not grow higher than from 15 to 18 inches, crops well, and needs no sticks, it is one of the least troublesome Peas in cultivation; it is in fact an improved Little Gem. It is quite remarkable to observe how tenaciously gardeners still cling to the tall varieties, the growth of which entails upon them so much labour and expense in sticking, whilst they also require so much of the valuable space of the garden. Our best dwarf kinds offer to growers almost all that can be desired in the shape of good crops, well filled pods, and rich flavour. And I believe that, of those for successional culture, Multum in Parvo, Advancer, Wonderful, Premier, and the Prince, have as yet in the market no other five kinds to beat them. *A. D.*

Black Beetles and Peaches.—I suspect the damage done to the Nectarines of your Brixton correspondent was caused by snails or the large slug. We had a Peach and Nectarine wall attacked in a similar way, and gave a good dusting with quicklime and soot in equal proportions. The cure was instantaneous. The soot was added to take away the too conspicuous appearance of the lime. This year they have attacked us outside, and the same remedy was applied with instant effect. *P. M., Wynnstay.*

Foreign Correspondence.

ROUEN.—Being neither a cotton-spinner nor a manufacturer of "Rouenneries," I can hardly form an opinion as to what either of these individuals would say to the phrase one hears so often, to the effect that "Rouen is the Manchester of France." All I know is that in an æsthetic sense the phrase is an abominable libel on the French town. True, there is an "r" in Manchester and an "R" in Rouen, but the position of the letters is reversed in the two cases. The inversion is characteristic of the contrast between the two towns. In the one case the environs are flat and simply detestable, in the other they are bold and hilly, I might say lovely; the river is a broad limpid stream in the one, a foul black ditch in the other town. The streets present a similar contrast. If you take old Rouen, that is, such of it as there is left, every turn reveals some picturesque "bit," every corner some

striking feature, which one might look for in vain in the murky monotony of Manchester. Contrast, also, the new streets, broad handsome boulevards, emulating those of Paris, but having nothing in common with any street in Manchester, save that there are houses and shops in both cases. And if one turns to the cathedrals and churches, still more must the Lancashire town hide its diminished head. The western front of St. Maclou, for instance, is beautiful almost beyond belief. St. Ouen and the cathedral present portions almost equally lovely; and lose nothing by repeated inspection. Every fresh visit reveals new beauties, or enables one to see them from a different point of view; but as all this is told in the pages of "Murray," I will not occupy more time in descanting on such subjects, but pass at once to matters in which your readers may be supposed to take special interest. Let me then give the first place to the Botanic Garden: it doesn't deserve it, nevertheless I will remember the question, "Dost thou not respect mine office?" and speak of it first. A mile or two out of the town, under an avenue of Elms (U. glabra), in full fruit at the time of my visit, is the entrance to the garden, a tall gateway in a long stone wall. Enter it, and a large ill-kept grass-plot is before you, with four huge oval beds, filled—one with Wallflowers, another with Nemophila (blue), another with Collinsia, and so on. In front is a large tumble-down structure, that looks as if it were meant for the director's residence, and for class-rooms, &c.; but the director lives in the town, and no lectures are given in the garden. Turn to the left, between a row of tubs filled with Phormium tenax (cheap and effective plants for the purpose, as requiring little attention in the way of protection in winter), and the Botanic Garden proper is before you, but does not offer a very tempting prospect—a square enclosure within a wire fence, parcelled off into narrow oblong beds, with plenty of tallies but few leaves or flowers. I am quite willing to believe the plants were "all there," as Albert Smith used to say of the photograph of Strasburg Cathedral taken at midnight on a dark night; but it was intensely hot at the time of my visit, and a superficial glance did not enable me to see many oases in the apparent desert. Placed on a terrace overlooking the garden is the Palm-stove, a square glass box with a small wing on either side the walls, straight up and down, and the plants therein also straight up and down, the stems drawn with a tuft of leaves at the top, just as one might expect in such a structure; nevertheless, there were a few interesting plants, some of which it may be worth while to note. Petræa volubilis, with its long racemes of pale violet flowers, is beautiful enough to be mentioned in the same breath with the Bougainvillea; if it received as much attention at the hands of the gardener it might repay his care in an ornamental point of view. Some fine Palms; Cocos flexuosa was pushing its head to the top of the stove; Ceroxylon niveum, &c.; two good plants of Cycas circinalis, a Bamboo, a Dracæna (D. arborea), showing by the swellings on its stem the dates of its periodical "shifts." Now, by the way, all the larger plants are planted out in a bed two mètres deep. There is no bottom-heat, but a flue runs round the circuit of the house. Under the circumstances, it is remarkable that the plants looks so well as they do. In other houses, destined soon to fall down if not prevented from so doing by being taken down forthwith, are a good collection of succulents, and a few Orchids and Ferns. As to the Orchids, it is worth while recording what my cicerone, the most obliging and intelligent *chef de serres*, or whatever his official designation may be, said. We were looking at a plant of Epidendrum tigrinum, the flowers of which are pretty, but not very conspicuous, as I happened to remark, when drawing himself up, and speaking in a tone of implied rebuke:—"But, monsieur, to a botanist every flower is beautiful." The man was right, and deserved to have had the Cross of the Legion of Honour conferred on him on the spot.

At the back of the houses is a rockery, which would excite Mr. Robinson's just scorn; it is simply a conical mound of stones, with a bigger pebble at the top, like a cap on a flagstaff. There are by far more stones than plants, still the plants were interesting, and after the rebuke I got, I must not fail to do justice to a local celebrity, to wit, Viola rothamagensis, a plant of limited range; an Iberis, also local, Ceterach officinarum, and Cotyledon Umbilicus—that is I believe! "all told."

Trees of Populus virginiana are numerous in the garden, as, indeed, throughout this part of France, and, moreover, they are greatly infested with Mistleto, great bushes of which hang from nearly every tree. Few things root more freely from cuttings than this Poplar, but a cutting infested with a trace of Mistleto spawn will not root. My informant told me he had tried repeatedly to get a cutting to grow under these circumstances, but had never succeeded. It will be gleaned from what has been said, that the condition of the Botanic Garden is not creditable to such a flourishing town as Rouen—a town of merchants and manufacturers, to whom the practical value of a botanic garden might be brought home. That the municipality can do better things in the gardening way is evidenced by the Ecole d'Arboriculture adjoining the Botanic Garden, and in which are palmettes and éventails, cordons oblique, cordons unilateral, cordons bilateral, in fact, illustrations of most of the ingenious methods of training for which our French friends are so renowned, and many of the pyramids and other trees were capital examples of well-balanced, well-managed trees. Every Sunday the Professeur d'Arboriculture holds forth to whomsoever will, on the principles and practice of fruit-culture. A small park, dignified with the name of Trianon, adjoins the Botanic Garden on one side, but calls for no special remark beyond one of surprise that the smoke of the numerous factories and chemical works at no great distance apparently does no harm to the trees. If Rouen presents an illustration of a neglected garden, she also gives a specimen of what a town square should be, and if the garden conveys an impression of neglect and the square indicates care and attention, it is also abundantly clear that it is money which is wanting in the one case, while brains are not wanting in either. The square, "Jardin Solferino" as it is grandiloquently designated, may be of about the same size as the enlosure of Finsbury Square, or perhaps a little larger, but here the comparison ceases. Within a boundary of trees and shrubs, among which the scarlet Pavia was particularly beautiful at the time of my visit, are undulating mounds, planted with shrubs and bordered with bedding plants. A small lake—it is a mere pond as to size, but it is too artistically managed to be called a pond,—affords an opportunity for the landscape gardener to make believe that the square is much larger than it really is by jutting out promontories into the lake, and partially hiding it from view in places and allowing it to expand freely at others, so that you might, with a little stretch of imagination, think you had to deal with a large piece of water. At any rate, Water Lilies and well disposed clumps of Iris come in well amid the shrubs, and the whole may be put down as a successful bit of gardening, except the grass, which is not to be envied by an Englishman.

Science, literature, and art, are well represented in Rouen. There is a large gallery of pictures, an extensive public library, and a museum of natural history, the latter under the direction of M. Pouchet, the well-known opponent of M. Pasteur, in the matter of spontaneous generation. M. Pouchet, I was told, lectures occasionally on botany, as also does M. Blanche, the director of the Botanic Garden. Let us hope that the fame of these gentlemen will lead the powers that be to avail themselves of the capital opportunities that such a city as Rouen offers of putting the Botanic Garden on a proper footing, and of making it serviceable, not only to science but to the mercantile community of the city; with which wish I subscribe myself

A Rambler.

Societies.

CRYSTAL PALACE: *June* 11.—This exhibition, in comparison to the extent and excellence of the one held on May 21, was of little importance. Many of the specimen stove and greenhouse plants had already done their owners good service on the stages at South Kensington a few days before, and in consequence did not look any the better for it, and some of the classes were but poorly represented. These drawbacks were, however, atoned for by the excellent display of floral devices for the decoration of the dinner table, which constituted by far the most interesting and certainly the most attractive feature in the day's arrangements. The first table to attract attention in the department set aside for this portion of the exhibition, was arranged by Messrs. Bertram & Robarts, as if for a wedding breakfast. This, the first in position, was also undoubtedly first in point of merit, as was fully testified by the hearty encomiums bestowed upon it by the fair sex, though to be sure their testimony might be interested. Messrs. Phillips & Pearce, of New Bond Street, also had a very fine display, which comprised some tasteful copies in glass of the water temples in the Palace grounds, but which, as a whole, were a little too heavy and elaborate, nevertheless it was deemed worthy of an extra prize. The 1st prize in the open class was taken by Mrs. W. L. Buster, St. Mary Cray, Kent; Mrs. Green, 28, Crauford Street, Bryanstone Square; Mr. G. Weeks, Bromley, Kent, and Mr. W. Dedman, Sundridge Park, also securing prizes. In the class for amateurs only, Mr. W. D. Soder, gr. to O. Hanbury, Esq., took the premier award. To Mr. E. Jackson, Mayfield Place, Orpington, the 1st prize for a bouquet vase, epergne, or basket, was awarded; and Messrs. Dick Radcliffe & Co., High Holborn, exhibited a series of baskets, &c., of a curious combination of woodwork and shells, filled with dried flowers, which were considered worthy of an extra prize.

Mr. Baines, gr. to H. Micholls, Esq. had the best 10 stove and greenhouse plants, in the amateurs' class, and which were of unusual excellence; Mr. B. Peed coming in 2d with a good Allamanda grandiflora, fully 4 feet through, and well bloomed, in his collection; and Mr. A. Wright 3d. In the corresponding class for nurserymen, Mr. B. S. Williams and Messrs. Jackson & Son staged excellent collections, and the prizes were adjudged in the order named. As most of the plants shown in the classes for 6 have already been noticed, it will be sufficient here to mention that Mr. J. Ward and Mr. J. Carr were placed respectively 1st and 2d amongst amateurs, Mr. Baines and Mr. Carr occupying similar positions in the open class. For 10 Orchids, Mr. B. S. Williams came 1st, with richly coloured examples of Cattleya Warneri and Mossiæ; a very good Dendrobium densiflorum, Lælia purpurata, with two grand spikes, Aerides, Cypripediums, &c.; Messrs. W. Maule & Son, Bristol, coming in 2d, with amongst others Cypripedium Hookeræ, with 12 good blooms, 3 good Saccolabiums, and Vanda suavis, with two very nice spikes, &c. The best 8 came from Mr. Page, gr. to W. Leaf, Esq., Streatham Hill, Mr. T. Burnet sending the next best in this class as well as for 6, in which latter class Mr. J. Ward was placed 1st.

The Heaths were very good, but have nearly all been noticed before. Mr. Morse, Epsom, sent the best 8 amongst nurserymen, and Mr. J. Ward the best in the corresponding class for amateurs; also the best 6 in the open class for that number. Mr. J. Carr, Mr. B. Peed, Mr. J. Wheeler, and Messrs. Jackson & Son also competed. Mr. S. S. Carson contributed 8 remarkably good Azaleas, and took the 1st prize. Mr. B. S. Williams and Mr. J. Woodward also occupied similar positions in the open classes for 6. Several other collections were also shown, nearly all being past their best.

Several prizes were offered for Tricolor and Bicolor Pelargoniums, and had they been better competed for a good display would have been produced; as it was, the staging allotted to them presented a very thin appearance. The 1st prize for 12 Gold or Silver Tricolor varieties was awarded to Mr. Stevens, Ealing, who had well grown plants—not over well coloured—of Sophia Cusack, Sophia Dumaresque, Lucy Grieve, Lady Cullum, Mrs. Turner, &c.; Mr. Cannell, Woolwich, came 2d with, amongst others, Victoria Regina, Sir R. Napier, Mrs. Dunnett, Sunray, &c., large plants, but not well finished; Mr. Turner being 3d. Messrs. Carter & Co., and Messrs. Downie, Laird & Laing also competed, the former with a very neatly grown and beautifully coloured lot, but rather small. In the amateurs' class for 6, Mr. C. Welsh, gr. to D. Rutter, Esq., Parkfield House, Hillingdon, sent a capitally grown lot, averaging about 18 inches over, comprising the following varieties:—Sophia Cusack, Lady Cullum, Italia Unita, Sophia Dumaresque, Mrs. Turner, and Lucy Grieve. Mr. W. H. Townshend, gr. to J. C. Mappin, Esq., Clapham, came 2d; and the Rev. H. H. Dombrain, Westwell Vicarage, Ashford, 3d. The Gold and Bronze Pelargoniums were by far the most effective, their bold, well-defined markings rendering them at once distinct and attractive. Messrs. Downie, Laird & Laing were 1st amongst nurserymen, with very well grown specimens of Black Douglas, Mrs. Allan Lowndes, Prima Donna, Impératrice Eugénie, Red Gauntlet, and Crown Prince; Mr. Cannell was 2d. Mr. W. Townshend was 1st in the corresponding class for amateurs, with fair examples; the Rev. H. H. Dombrain being 2d. The best Silver Tricolor was Miss Bond, from Mr. Turner. This is a very pretty variety, with a bluish green centre, irregularly defined zone, next to which is a band of reddish crimson, and an outer margin of bright silvery white. The same exhibitor was also placed 2d with Mrs. Rousby, apparently a free-growing variety, with convex leaves of a duller or more greenish colour than the former. The best Golden Tricolors were adjudged to be Prince of Wales (Carter), 1st, Ealing Rival (Stevens), 2d, and Achievement (Turner), 3d. Roses were very well shown, especially cut blooms, which were both plentiful and good. Mr. Turner was 1st for 10 and 20, in pots, with excellent specimens, Messrs. Paul & Son being placed 2d in the former class. Amongst the collections of cut blooms, which will be more fully noticed at another time, were several very fine boxes from Mr. Mitchell of Pitlochry.

Amongst the miscellaneous collections were a group of new plants from Mr. B. S. Williams, amongst which Viola cornuta var. Berfection, Agave Verschaffeltii, and the new golden bedding plant, Peristrophe angustifolia aureo-variegata, were selected for First-class Certificates. Mr. Wilkie sent 10 very good Caladiums; Mr. William Paul, 3 dozen very fine Lilium auratum; Mr. Hooper, Bath, a collection of Pansies, Pinks, &c.; Messrs. Hooper & Co., Covent Garden, a beautiful collection of Ixias, &c.; Mr. Mann, Brentwood, several new seedling Zonal Pelargoniums; Mr. Turner, a fine group of Roses; and Messrs. Downie, Laird & Laing, a miscellaneous collection of Pelargoniums, Coleus, &c.

EXHIBITIONS OF AMERICAN PLANTS.—In our last we called the attention of our readers to the exhibitions of American plants in the Royal Horticultural Society's Gardens at South Kensington, and at the Royal Botanic Gardens, Regent's Park, respectively. Owing to the effects of frost which we experienced last winter, and of the drought during the spring and early summer months, neither exhibition comes up to the high standard of excellence attained during the past few years. As every one knows, who has visited the Society's gardens at South Kensington, the ground under the great tent is most happily laid out for the production of a good effect; and if—as in the present instance—the masses of colour are judiciously grouped, the whole forms a very pleasing and attractive floral display. Here Mr. Anthony Waterer, of the Knap Hill Nursery, has brought together an immense collection of all the leading varieties, comprising most of the older and better known favourites, as well as those of more recent introduction. Amongst the latter were fine trusses of that general favourite, Stella, flowers pale rose, with an intense chocolate blotch on the upper petal, a free bloomer, and one of the best of its class; Purity, white, with a faint yellow eye, very fine; Lady Armstrong, a pale rose, much spotted, pretty; Othello, crimson, with a beautiful mauve tinge, showy; Rosabel, pale rose, distinct and good; Francis Dickson, very bright scarlet, with immense trusses, one of the best late-blooming varieties; H. W. Sargent, fine crimson, grand trusses, of a good habit and hardy; Sir Thomas Sebright, deep purple, distinctly blotched with bronze; Lady Frances Crossley, beautiful rosy pink, very distinct; Mrs. John Clutton, flowers white and exquisitely shaped, remaining longer in perfection than any other variety; and Lady Clermont, rosy scarlet, intensely blotched with black, beautiful in shape, and of good habit. Of older sorts, the following were in very good order:—Duc de Brabant, showy; Concessum, clear pink, one of the best; Lady Eleanor Cathcart, Delicatissimum, Scipio, Alarm—good, and always brilliant; Caractacus, Brayanum, Archimedes, and Fleur de Marie. Cut flowers of several very promising unnamed seedlings were also exhibited. One great feature of the Knap Hill Rhododendrons, is their fine and striking foliage, added to a vigorous constitution.

The transition from South Kensington to the Regent's Park is now easy, thanks to the Metropolitan Railway. Here Messrs. John Waterer & Sons, of Bagshot, have brought together a similar collection to that at Kensington, and the ground being arranged somewhat after the same style, the display is quite as effective. Several new varieties are exhibited in flower for the first time, and of these the following are in every way worthy accessions to the already numerous list of good sorts which have emanated from the Bagshot nursery :—Mrs. William Agnew, delicate pink, with a deeper, or faint rosy tinged margin, trusses magnificent in size, fine in form, and of a good habit ; Duchess of Mecklenburg, bright rose, cinnamon spotted on the upper petal, large and fine ; Frederick Waterer, bright deep crimson, very compact neat truss, and showy ; Mrs. Thomas Agnew, white, very large and fine ; Loquendum, rich rosy pink, beautifully marked, and distinct : Lady Southampton, clear rose, large and very pleasing ; Mrs. Williams, pale lilac, with beautful rosy margin ; and Waterer's Comte Gomer, deep crimson, strongly marked, fine in shape, good. Amongst the older kinds we noticed excellent blooms of Mrs. John Penn, salmon-pink ; Pantherinum, rose, darkly spotted ; Henry Bohn, a grand flower, bright rosy crimson with a pale centre ; Joseph Whitworth, dark purple with deeper spots, one of the very best ; Michael Waterer, very rich scarlet-crimson, excellent ; Lady Falmouth, clear rose with intense black blotch, very distinct ; Alexander Adie, bright rosy scarlet, handsome truss ; and Countess of Clancarty, pale rosy crimson, well marked, and with large trusses. As a rule the blooms are not so large or so freely produced this season, but the colour is first rate.

MANCHESTER LITERARY AND PHILOSOPHICAL (*concluded from p.* 802).—*Malpighiaceæ*.—If the lianas which belong to the Bignoniaceæ are remarkable for the symmetry of their parts, the lianas of this family may be said to be characterised by an absence of symmetry. In general, their stems are singularly rugged in outline, a section presenting deep sinuosities or irregular projections, while at other times they appear to be made up of a number of separate branches which have become consolidated in the progress of growth, so as to form a rough looking rope of many strands.

Jussieu gives a full and interesting account of the structure of one of these stems, the Stigmaphyllon emarginatum ("Memoire," &c., pp. 103, &c.), and Gaudichaud ("Recherches," &c., pl. xviii., fig. 11, p. 129) figures an allied species, but I have not, as yet, identified either amongst those coming with Cotton. I exhibit however a stem which appears to be the Tetrapterys Guilleminiana, referred to by Jussieu, and figured by him in his monograph, plate iii., fig. 5, p. 106 ; but this species does not exhibit the sinuosities so characteristic of most of the lianas of this family.

As a general rule, the woody matter is developed unequally round the central pith in the form of irregular lobes, the bark closely following all the sinuosities of the stem. If the lobes increase on one side of the stem only, the pith soon becomes eccentric ; but, on the other hand, in many species, while the pith retains its central position, the irregular growth of the woody lobes—each of which is closely invested by the bark—causes some to grow beyond their neighbours, and these latter, in the progress of growth, become imbedded, with their bark, in the midst of the woody matter produced by the more vigorous lobes. A stem in this adult state therefore presents the greatest irregularity of form, particularly in the genera Banisteria and Heteropterys.

Sapindaceæ.—In this natural order we meet with some wonderful aberrant forms of dicotyledonous stems, but I shall here notice only two which are met with on Cotton bales.

One of these is most probably the Serjania cuspidata figured by Duchartre ("Elements," &c., fig. 82, p. 170) and Schleiden ("Principles," fig. 168, p. 253), and easily recognised by its triangular form and compound character. It consists of a primitive stem not specially noticeable for any divergence from the usual type of a dicotyledonous stem ; but round this stem are arranged three other lateral stems, each of which has its own bark separate from the rest, but united to the bark of the primitive central stem. These lateral portions are circular in outline, save that they are flat on the side by which they are attached to the central stem, which latter is in consequence hexagonal. The attachment of the lateral portions to the central mass is not very firm, as most of the ropes of this species reach this country with their strands separated, but this is due to the rough usage to which they have been subjected in packing ; but Gaudichaud points out that in certain parts of the stem—most likely at the nodes, for he is not very clear upon the point—the lateral strands have an organic attachment to each other, since some of the woody fibres of the central mass are continued in one of the lateral strands, and *vice versâ*. ("Recherches," pl. xiii., figs. 2 and 3, p. 110.)

A still more remarkable example supplied by this family in the form of a natural rope, is one which might have served our telegraph engineers as the model of a submarine cable. Like the Serjania, there is a central woody mass possessing a medullary sheath and pith, several layers, and a cortical system ; but surrounding this central core and arranged parallel with it is a series of eight lateral strands, each surrounded by its own bark, the whole being consolidated so as to form a rigid cylindrical axis, which presents no external manifestation of its peculiar internal organisation. It is represented in the last figure of Gaudichaud's "Recherches" (pl. xviii., fig. 21, p. 130), and has been copied into most of our text-books, in some cases incorrectly described as a Malpighiaceous plant, as by Professor Balfour in his "Class Book," figs. 186 and 1429.

On examining such stems of this order as I have been able, the pith and medullary sheath with its characteristic tracheal vessels appear to be met with in the central mass only, and some botanists, contrary to the opinion expressed by Jussieu ("Memoire," pp. 116—117), doubt the existence of these organs in the lateral strands. Nevertheless, one of the most recent observers of these stems, Herr Nageli, has recently demonstrated their presence in each of the surrounding woody masses (Dickenwachsthum des Stengels . . . bei den Sapindaceen. Munich, 1864).

A short summary of their mode of growth, communicated to the French Academy by Monsieur Netto, will be found in "Comptes Rendus," t. 57, pp. 554—557, Sept. 21, 1863, from which it would appear that a young stem, two to three weeks old, exhibits a number of fibro-vascular bundles in the midst of an outer zone of cellular tissue, one bundle being formed opposite the innermost portion of each of the external grooves of the stem ; so that from its very earliest stage the stem exhibits all the rudiments of the lateral strands which surround the core. Around each of the fibro-vascular bundles a mass of liber is formed, at first crescent-shaped, but afterwards annular ; and by the growth and union of these several parts the stem soon assumes its peculiar composite character.

Leguminosæ.—Another group of lianas, presenting some external resemblance to the sinuous Malpighiads, is met with in plants which belong to this natural order of the genera Bauhinia and Schnella. In the Brazils they bear the name of Cipo d'Escada from their resemblance to a ladder, but Jussieu restricts this name to the Schnella macrostachys ("Memoire," p. 118).

They are chiefly remarkable for depositing their woody fibres on two sides only of the central pith, so that their stems have a singular flat, tape-like appearance, presenting in section the outline of an elongate ∞, the position of the pith being at the intersection of the two loops. The pith, however, by no means maintains its central position, for according to the researches of M. Netto the growth of branches brings about a lateral deposit of woody matter, sometimes on one side and sometimes on the other, so that the pith soon becomes eccentric. The pith is generally in the form of a small Maltese cross, formed of two unequal arms, the longest of which lies in the direction of the largest diameter of the stem.

There are many other forms of Bauhinia, many of which will be found figured in the standard works of Lindley, Schleiden, Richard, Duchartre, &c.

Aristolochiaceæ.—It is very likely that this natural order has representatives amongst these ropes ; at least to it I refer for the present two species, remarkable for their very striking medullary rays.

In both species these rays proceed from the pith to the bark, increasing in breadth and volume as they recede from the pith, so that by the time they reach the bark they become of considerable thickness.

In one species, whose wood has a reddish tinge, there are about 19 or 20 of these magnificent rays in a stem exceeding half an inch in diameter ; the intermediate spaces are filled up with woody fibres, in which occur large vessels. In this species secondary medullary rays rarely make their appearance. But in the other species, which has a beautiful cream-coloured wood, of the shade of our common Holly, secondary and tertiary medullary rays make their appearance, so that in a stem three quarters of an inch in diameter there will be as many as 30 primary rays, and as many more secondary rays. In this, the commoner species of the two, the cortical system is much thicker than in the first-mentioned species. Both bear much resemblance to a wood-section in my cabinet which is called "New Zealand Pepper," a plant of which I am quite ignorant.

Ampelideæ.—Gaudichaud in his memoir ("Recherches," plate xiii., fig. 5, p. 109) gives a figure of the Cissus hydrophora as one of the common lianas of the Brazil, but I am not sure whether it occurs amongst the ropes which reach this country. It is described by M. Netto ("Annales des Sciences," 5th ser. Bot. t. vi., p. 320 ; "Comptes Rendus," tom. 62, p. 1076), and a short summary is worth transcribing, as he had the advantage of studying the living plant.

In the section of a young stem, beginning with the bark, we have first a suberous layer, then a thick cellular layer containing very little chlorophyll ; and having at the side nearest the bark a mass of dotted cells whose walls become very thick. On the inner edge of this cellular layer we meet with a number of liberian bundles in front of some woody bundles ; the latter are strikingly subdivided by the adjacent parenchyma into separate groups so as to cause it to look more like the arrangement generally seen in a monocotyledonous plant.

M. Netto mentions that the structure of the woody mass is even more remarkable, since in the place of the ordinary medullary rays cellular bands are projected from the bark towards the pith, which form cortical rays. Another peculiarity of the woody part is that, notwithstanding it may be two years old, the woody fibres are so loosely held together that they readily detach themselves from the cellular tissue in which they are imbedded. The stem must be at least three years old before it attains anything like consistency ; this weakness, as contrasted with other lianas, probably leads to its not being so frequently used for packing purposes.

There is one histological character, however, presented by this liana which will lead to its identification, and that is the abundant quantity of raphidian crystals contained in all parts of the stem. M. Netto describes the form of these crystals as needle-shaped, but bifurcate at one extremity—which is peculiar.

However abnormal many of the stems belonging to these various orders may become, and however difficult it may be to trace their divergency from the normal structure, there can be no doubt that the characteristic elements of the dicotyledonous stem are all present during some portion of their lives. Their unequal development may be brought about either by the vital energy of the growing tissue of the bark being in excess of that of the wood, or *vice versâ*, from which circumstance will arise the curious outlines presented by the relative distribution of each ; or else it may be produced by a much more copious deposition of woody tissue at some points of the circumference than at others, from which will result the curious forms presented by the Bauhinias and many of the Malpighiaceæ.

The monocotyledonous division of the vegetable kingdom has also its representatives amongst these ropes. There are two species, perhaps belonging to the grasses, which I have met with ; but in neither case is the entire stem used. One species is much larger than the other, their diameters being about 2 inches and 4 inches respectively ; both are hollow and are divided into strips for use.

There are many other species found amongst these ropes which belong to other natural orders, such as the Menispermaceæ, Gnetaceæ, Asclepiadaceæ, &c., but our knowledge of them is too limited to assign them to their respective orders. Most of my specimens have come from bâles of Santos Cotton, and it would be as well to keep a record of the localities from whence they are derived. I am very anxious to get some from the Pacific coast, where many species differing from Brazilian species must be found. Gaudichaud mentions the neighbourhood of Guayaquil, in Ecuador, as being particularly prolific in these lianas.

I will conclude with a notice of another species which was sent me from the Liverpool Docks by Mr. Griffiths, whose structure is so puzzling that I know not whether to call it dicotyledonous or monocotyledonous. It consists of a central spongy mass of woody tissue apparently without medullary sheath, pith, or medullary rays, and arranged in the form of a pentagon formed of semicircular lobes, the whole being surrounded with what appears to be liber, which has shrunk away from the very thick and hard external bark, so as to leave the woody core isolated within it. The core consists of woody fibres, but half its area is taken up with wide-mouthed vessels.

I may add that the whole of these lianas furnish beautiful objects for the microscope.

Notices of Books.

The Student's Flora of the British Islands. By J. D. Hooker, C.B., M.D., F.R.S., &c., Director of the Royal Gardens, Kew. Fcap. 8vo, pp. 504. London : Macmillan.

Botanists will, we imagine, take up this volume with a mixed feeling. Students will hail its advent, and appreciate its value, without any such admixture. The professed naturalist will rejoice that so excellent a summary of the views of the modern school of botanists has been published, but he will lament that its execution should have delayed, as we fear it must have done, the prosecution of that other work, the "Genera Plantarum," for the completion of which so great a desire is felt. The student—the beginner—whose wants the present volume is intended to supply, is hardly in a position to share in this lament. For him all is gain. He has placed in his hands in convenient form an admirable account of the plants found wild in Britain. The descriptions, which are clear, concise, and well contrasted, have been drawn up from actual specimens, and then, as we are assured, have been compared with those in the usual British and Continental Floras, and collated throughout with the account given of each species in Dr. Syme's edition of the "English Botany." Indeed, Dr. Hooker seems to a large extent to have adopted the views of Dr. Syme, and, contrary to his usual practice of late years, to have followed an analytical plan of action rather than a synthetical one. It is curious to conjecture how far Dr. Hooker's adhesion to the Darwinian hypotheses may account for this change. Variations and modifications apparently trifling in themselves, assume a high degree of importance under the theory of evolution. The "character" we used to think lightly of may, for aught we know, be the indication of a possible future change, or it may be the sole remaining trace of an older and different condition, in any case it is a sign which we must not overlook. At the time when these variations were set down merely to an "innate tendency to vary," for which neither rhyme nor reason were alleged, we were justified in passing over these deviations as of little import. We were taught that plants varied because it was "their nature to." If a reason were sought, the answer given was analogous to that of the medical student, who when asked why opium acted as a sedative, answered "*Quia est in eo virtus dormitiva*." It is far different now : not the least of the services rendered by Mr. Darwin has been the demonstration of the significance of these variations, no matter how trifling they may apparently be. Students and collectors used (and we fear the practice has not altogether died out yet) to look on plants merely as things to be collected, named, ticketed, sorted, and put away. Their past history, their living present, their possible future, were, by all but a very few, ignored. The process followed by many and many a so-called British botanist was to get his specimens together just as the post-office *employés* get letters together. The officials in question collect the letters, ascertain to what town or district they are addressed, distribute them accordingly, and finally deliver them to the individual for whom they are intended, without troubling themselves as to where the letters come from, by whom they were sent, or what their contents may be. Now this process, unexceptionable in the case of a post-office clerk, is not one which should be held up to the student of Nature as sufficient. It is his business to pry into Nature's secrets, and the more deeply, the more minutely he does so, provided he proceed with due intelligence, the more likely he is to be successful. On this account we are glad to see in the present volume a full account (so far as the necessary limitations enforced by the plan of the work will allow) of the more important

"varieties" of British plants. The term variety, we ought to say, is here subordinated to that of sub-species. On this plan, what we used to call a marked variety becomes a "sub-species," and the modifications of this latter are classed as "varieties." The following extract will suffice to show the plan followed by the author :—

"Sagina, L.—Pearl Wort.

"Very small tufted annual or perennial herbs. *Leaves* subulate, connate at the base. *Flowers* small, pedicelled. *Sepals* 4—5. *Petals* 4—5, entire, sometimes minute or o. *Stamens* 4, 5, 8, or 10. Ovary 1-celled; styles 4—5, oposite the sepals, ovules many. *Capsule* 4—5, valved to the base.—Distrib. Temp. and cold N. and S. hemispheres; species 8. Etym. doubtful.

"1. S. apetala, L.; annual primary and lateral branches all flowering, the latter ascending, radical leaves sub-rosulate, petals minute or o."

Dry banks, wall tops, &c; fl. May—August.—A slender, almost filiform wiry herb, 4—10 inches, leaves 1-10th—1 inch, spreading. Flowers 1 12th inch in diam., green, pedicels capillary.—Distrib. Europe, N. Africa, W. Asia, doubtfully indigenous in the U. States."

Then follow the descriptions of three sub-species, apetala proper, ciliata and maritima, of which latter four varieties—maritima proper, debilis, Jord. (sp.), densa, Jord. (sp.), and alpina, Syme, are admitted.

In this manner it will be seen that a very complete account of the forms met with in Britain is given in comparatively small compass. In determining what should be admitted into, and what rejected from the Flora, Dr. Hooker has followed the "London Catalogue of British Plants;" this being so it would have been a great convenience if the numbers used to indicate the plants in the catalogue had been employed also in this book. References to good figures, especially to those in the new edition of "British Botany," might also advantageously be inserted in those future editions which are sure to be called for.

Pleased as we are to call attention to so excellent a book, and one so well adapted for students' use, we are even more gratified at the promise held out in the last paragraph of the preface. "When I commenced this Flora," writes Dr. Hooker, "it was my intention to have made it a record of those physiological and morphological observations on British plants which have of late given so great an impulse and zest to botanical pursuits, and toward which I was offered much assistance from my friends Mr. Darwin, Prof. Oliver, and Prof. Dickson, of Glasgow, and this intention was my chief inducement to undertake the work. I had, however, made but little progress before I discovered that the number of such observations was so great, and that the value, accuracy, and interpretation of many were so much disputed, that to make even a small selection from them would be a very difficult task, and would have filled a volume far exceeding the dimensions required for students. I do not abandon the hope of being able at some future time to undertake such a task in the form of a companion to the "Student's Flora."

British Floras we have, but no such digest as Dr. Hooker has here alluded to. We do but echo the general wish of botanists when we hope earnestly that no long delay may elapse before the fulfilment of the promise above expressed.

The Apiary.

Bee Management.—We once more propose to enter into the subject of keeping bees in our gardens, whether for amusement or for profit. This latter point has been so often written about, and such delusive hopes have been held out of securing harvests of honey to all who will follow a system, or adopt a certain construction of some patent, or non-patent hive, that we shall at once decline the aid of any bee books, and refer our readers to the practical experience of some 30 years, leaving the naturalist, or even the common observer of the instincts of bees, to follow our short instructions, and judge for himself in the management of the bees and hives, taking warning in time from expending money in useless hives and books, where disappointment and vexation are marked on the prices of the one and the pages of the other.

We have, however, first to turn our attention to the leading object in the bee-master's views on the subject. If it be the idea of securing the largest quantity of honey with the greatest sacrifice of bee-life, this may be carried out in any locality where the bee pasturage is abundant, and where meadows abound, with the Willows and Alders to supply pollen or propolis, with the Limes or Linden tree, with their honeydews and pollen, or the later-flowering Heaths, for a full autumn supply for the last fortnight's honey harvest, as it is after their great summer breeding is over and the drones have been destroyed that the largest stores are treasured up, and a pound of honey a day is no uncommon gathering for a strong stock of bees, be they placed in any kind of hive, or box, or common straw skep, so long as they are well protected from heat and wet. For these, then, we do not write; they may follow the old destructive method of suffocating the bees, to obtain their honey. This old cottager's method has, however, been exploded, and the Rev. C. W. Cotton's writings, in letters to cottagers and others, has changed this foolish old custom of "killing the goose for its egg," which experience has proved to us for these many years that when the bees have been saved from the autumn condemned hives and joined into one family for the winter, and care has been taken to secure the youngest and most prolific queen bee for this united colony, these stocks, with very little care and feeding, prove the most prosperous, and form the best swarms for the following year. The reason is this—we write from experience: the life of the worker bee is now known to us almost as a certainty, both by those who have acted as "registrars of bee life," and those who have calculated the averages—that the lives of bees extend to six months or a little over. We have found that a colony of bees, left in October, will not have a single individual alive in the May following; so all hatched and raised before May will have died out by October of the same year—the casualties of summer, from the birds, wind, and rain being greater than those of winter, when the bees are quiescent in their hives. We proved this fact by introducing a Ligurian queen in the autumn, when the drones had been destroyed, to a large stock of the brown bees, when the whole of the bees have been found to be of the yellow or Ligurian bee, in the period mentioned; and again, reversing the experiment, we have found, by introducing a brown queen amongst the Ligurians (first, of course, removing in each instance the queens regnant), that the whole colony has become brown bees. Whilst this settles the question of the duration of life in the worker, we have equally proved the ages of the drones and queens, which will be proved at another occasion, but we must protest stated upon another occasion, but we must protest against any experiments being conclusive where the bees have been diverted from their normal condition, and have been cooped up in glass or experimental hives. We know that the queen bee's life is only extended so far as the seasons permit her to deposit the eggs from the two ovaries, and when these are exhausted, which they naturally are in the second season, the queen dies; but we must leave the question to be discussed on another occasion. What, then, is the use of saving the bees when they must die within six months, the drones within four months—as we have never been able to keep them alive after January or February when raised in September or October previously? This question will be answered in a future paper. *M. D.*

Florists' Flowers.

I have read with much pleasure "R. D.'s" brief but interesting comments on Violas and bedding Pansies at p. 769. I have been a lover as well as a cultivator of these gems for the last 20 years; therefore these comments cannot fail to whet one's appetite for a glimpse at what is fresh and new in this type, and a desire to compare them with the old but good sorts of other days. My attention was directed a week or two ago to an article in a leading daily paper, giving a formal description of the Violas to be seen in bloom in the nurseries of Messrs. Dicksons & Co., Leith Walk, Edinburgh. It reminded me of Mr. D. Thomson's (then of Archerfield) predictions for them some three years ago, which induced me to see them, and form their better acquaintance. The product of those then described, and subjected to a trial, would, I am certain, now surprise and delight him. The crosses with montana, lutea, and amœna, are marvellous, and extraordinarily fertile in selfs of all hues and shades—repeating "R. D.'s" statement that all bedding Pansies should be of self colour, which holds good in every kind of bedding plant if they are to be effective.

With permission I noted down a few of the most telling for my own guidance—keeping habit of plant, size of flower, and colours in view. Violea lutea pallida is a clear primrose, flowers large, habit compact, most profuse bloomer, quite a distinct shade of colour among bedding Violas, and is sure to be in demand for that purpose. V. lutea Grievei, rich yellow, large flower, branching habit, yet dwarf, and free growing; most profuse bloomer. This one, I understand, had a First-class Certificate at the International Show. The next lutea is a little gem, called The Fairy, with under petals clear rich yellow, slightly pencilled, upper petals puce, deeply edged with yellow; very neat, an extraordinary free bloomer, and which will be charming for small beds, the flowers standing well above the foliage.

One named New Colour is quite a novelty, also a self and a colour much wanted; ground colour peach, streaked with plum; flowers round, with more of the Pansy substance and form about it than any already named; habit dwarf, very free grower, and profuse bloomer. Purple King is another wonderful variety, a large dark purple flower, with a small golden eye; plant of dwarf branching habit, flowers of great substance, retaining their colour pure to the last; it had a First-class Certificate at the International. Of the mountain race is Viola suaveolens major, a fine deep clear yellow flower, very large, well formed, and of great substance; very sweet scented, of a dwarf branching habit, an immense flowerer, and will be a great acquisition. Then comes Viola montana aurea, clear yellow flower, much larger than montana, but blooms more profusely; very close compact habit. My own idea of bedding Violas leads me to fancy that those two can scarcely be improved, certainly not in the colour, and any addition to the size would not be an advantage for standing the weather.

Viola amœna Excelsior is a fine light clear purple plant, of much freer growth, but still retaining the creeping dwarf habit of that species; the flowers, which are much larger than the parent, stand well above the foliage; it is a most profuse bloomer. Viola amœna oculata has upper petals of a light purple, under petals light mauve, with a distinct small eye; habit same as the last. Viola amœna Polly is similar in size and habit to the above, but with a clearer white centre, strongly pencilled, and a most effective variety as a bedder. Viola coriacea is a clear white, very large, and exceedingly dwarf, equal in size to a good show Pansy, with a much stouter petal than Cliveden White; habit very dwarf, blooms very freely, and is one that cannot be dispensed with. There was a seedling from Viola stricta, of much dwarfer habit than the parent, colour of a pure white, which is likely to take the place of any other white at present out; but the plant was too small for me to form a distinct opinion respecting it.

At the same time I noted their bedding Pansy Celestial, a rich dark blue, of a charming shade of colour, with fine round flowers of great substance, quite fit for a competition stand; the colour is new among Pansies, it blooms as freely as Imperial Blue; but as a bedder I like it better, it does not show the dark blotch, detracting nothing from its grand effect.

Summing up the list of their new and much needed hardy bedding plants with Viola amœna magnifica, montana Dicksoni, and cornuta Vanguard—which are not only first in their sections, but conspicuous among many of the highest merit,—they are, in fact, the real type of what bedding Violas ought to be, keeping their colour and texture for the whole season.

Messrs. Dicksons & Co. have the newest strains planted side by side with the original and other known sorts, as well as in pots, thus making the labour of drawing comparisons of little trouble and ensuring correctness in decision. The plants were put out in beds in the second week of February with older varieties; they have been in full bloom since the middle of April, and are still improving, notwithstanding the severe drought and cold winds of the past spring months. On some of the seedling plants I counted 25 good and fresh flowers and 13 buds ready to open, and some of last October's cuttings had no less than 17 fresh blooms expanded; this is not a criterion, for in ordinary cases they would have a great many more, as the numerous visitors to this attractive spot are constantly carrying away with them handfuls of blooms to admire and be admired.

This firm has been well known for the last 30 years as successful raisers and cultivators of our best show Pansies, and must be accorded every credit for their perseverance in following up a subject which, though full of interest in itself, yet must appear at first very distant from pecuniary interest. To the lovers of this charming race it would be a treat worthy of a long day's journey to see the hybridising grounds of the new Violas in the Leith Walk Nursery. *A. McLeod, Newbattle Abbey, Dalkeith.*

Miscellaneous.

Improvements in Roadmaking.—Experiments are to be tried in one of the suburban parishes of London with a steam road-rammer, which, if the promises held out by the patentees, Messrs. Gore & Green, be fulfilled, is calculated to effect a revolution in road-making, and entirely supersede the steam-roller, as yet but slightly in use. The advantages claimed for the invention are, that it combines a traction-engine and rammer: hence it can be readily and easily moved from place to place. The machine is said to be equally applicable to roads paved with granite cubes and macadam. The blow from the hammer can be regulated. The machine is said to be so simple that any one of ordinary intelligence can work it. *Builder.*

Rose Growing.—In England there are two classes of Rose-growers, those who grow for plants and those who grow for flowers. The two points are not usually combined in the same individual with the highest degree of success. As the results sought are different, so are the means used in their attainment. Those who grow for show let the dormant buds of the last year's budded plants flower from the first growth, and by means of high manuring, copious watering, and disbudding, induce a fat growth and fat flowers, which, by the use of hand-glasses, flower-pots, mats, canvas, and other warming, bleaching, shading, or disbudding processes, as the case may require, obtain flowers of a size and complexion which are not often met with except on the exhibition tables. True, the garden during this process is in a state of infinite disorder, but what does that matter to your exhibitor? He grows for a purpose, and attains it. The grower for plants, on the contrary, stops the shoots of the last year's budded plants when only a few inches long, whereby he destroys the first bloom; but he gets a later bloom, and, what he chiefly aims at, instead of a few stout and often ill-ripened shoots, many well-placed shoots of moderate growth and well ripened. In France, although some growers show and some do not, there is not this broad difference in their practice of cultivation. All grow for plants. I discussed at length with several of them the different ideas of showing prevalent in England and in France, and agreed with them that the extra size of

the flowers obtained in England by the disbudding process was dearly bought by the absence of flower buds. I discussed this with M. Margottin, especially at the flower show at Sceaux, where the Roses were in some cases very good. There was one fully expanded flower of each sort exhibited, surrounded with leaves and two, three or four beautiful buds in various stages of development. There was far more beauty to my eye in these Roses than in the larger flowers seen afterwards at the Crystal Palace and Kensington, leafless and budless, bald and unnatural, though very tidily set up like so many rows of balls or teacups in a toy or china shop. But *chacun à son goût. W. Paul, in "Florist and Pomologist."*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

All the hardier kinds of *Stove Plants* which have been properly inured to the full action of the air may be safely removed at this time into conservatories, greenhouses, &c., provided these are kept rather close and free from actual draughts. In many instances such a change will be much approved of by those who are necessarily limited to one or two houses only, because the house which contains greenhouse plants, and especially such things as *Camellias, Indian Azaleas,* &c., will be all the better for being kept closer, for the purpose of ripening the new wood and perfecting the bloom-buds. Then, again, at this season we are wont to introduce into such houses *Fuchsias, Balsams, Cockscombs, Gloxinias,* and all similar plants, the better to maintain them in full bloom as long as possible. It is unnecessary for me to observe that when so introduced a close, moderately shady place is the most suitable for them. All *Begonias*, even those coming from the hotter regions, will be better prepared for winter by being placed in such a position for a month or six weeks. *B. weltoniensis*, which is now showing flower freely, will attain more colour and do far better in a moderate temperature than when pampered up in a close moist atmosphere. I cannot without some misgivings recommend the placing of any hardier kinds of greenhouse plants out-of-doors yet, so exceedingly cold are the nights, with but few exceptions. If any of them could be placed out, it would be such as *Oleanders, Oranges, Agaves* and other subjects of the *Genista* and *Coronilla* type, which are not likely to receive any very great amount of injury. Attend to the choicer kinds of *Primulas*. Propagate by division all double flowered or other favourite varieties, of which a larger stock is required. Such plants as these do much better if turned out of their pots into a nicely sheltered shady place, in a good rich sandy compost in which plenty of leaf-mould is intermixed. Pot off all young seedling Primulas into 60-sized pots, as soon as they are large enough to handle; and place them in a close, cool frame for a week or two, keeping the air moist around them. Flood the floors of all kinds of structures at this date, and endeavour to afford to the inmates as great an amount of atmospheric humidity as possible. Attend at this particular time to the necessary painting, cleansing, or repairing of all stoves which require such renovation, for no better opportunity is likely to occur.

FORCING HOUSES.

Do not fail at this very trying season to give all outdoor *Vine borders* such occasional soakings of water as will not fail to afford a full supply of moisture to all the roots. Too frequently during dry seasons, such as the present, a short supply of water lays up an evil for an ensuing season, in the form of slow growth, with plenty of dormant buds. In the case of all such borders as have not been plentifully supplied with water, even if a little rain should fall, it will be advisable to give them a liberal allowance forthwith. Some consideration should, of course, be had to the stage in which the crops are. Finish thinning all late Grapes, such as Lady Downe's, &c., which are intended for use through the winter. Be careful not to permit too densely packed bunches to remain, but by using the pruning scissors freely, though with judgment, endeavour to ensure the air free access throughout every part, at a subsequent date when each berry has grown to its full size. Stop the laterals upon these, until the first stage of swelling is completed, when a little growth may be advantageously allowed. Do not omit, at this early stage in the swelling of the berries, to give air early in the morning, say by 7.30, when the weather is favourable. Attend carefully to all forward successional *Pines*, in the matter of root watering, as many of them will now have well nigh filled their pots with roots, and will therefore need a supply, commensurate with their increased requirements. Both *Pines* and *Grapes*, which are now ripening fast, will be materially benefited by having a very small amount of air left on nightly; this not only has a beneficial influence upon the fruit, but by neutralising the condensation it ensures a far more buoyant atmosphere, and, in consequence, is better in keeping with the requirements of the plants.

HARDY FRUIT GARDEN.

Runners upon *Strawberry plants* should be cut away close to the base, immediately they show, in all instances where they are not required for the purposes of propagation. These should always be selected and made use of at the earliest possible moment, if fine strong plants are in request for forcing during the ensuing winter. For such purposes always layer them into small pots, and if possible plunge the pots into the soil, so that they become dry less frequently than would otherwise be the case. Procure the necessary protective materials for *Cherry trees*, the fruit upon which is now ripening. Place a nice layer of straw around Strawberries to keep them free from dirt and gritty matter, should heavy showers of rain fall. During the first really moist period the clay from around all grafts should be carefully removed, and at the same time the ligatures should be loosened so that the graft and scion may swell and grow away freely together.

HARDY FLOWER GARDEN.

Tulips should be taken up in all instances when the tops are tolerably ripe, and be placed in an open shed where they will have plenty of light and air, and be protected from superficial rains. In the outdoor flower garden, order, neatness, and a scrupulous regard to cleanliness should be the order of the day. To neglect these essential points is to deprive the garden of half the beauty it would otherwise possess. Edgings of *Cerastium* should have the flowers constantly picked or clipped off. And it will be necessary thus early to clip it neatly around the edges that it be not permitted to run beyond its legitimate limits. To permit this plant at this early season to grow away too freely, necessitating its being cut back somewhat severely at a later date, is to spoil its capacity for display afterwards, because, as the shoots elongate, the foliage, which becomes buried away beneath, "yellows" and dies, so that when it is cut back to these old useless leaves it takes a long time in forming young shoots, and, in fact, never again during that season attains its proper colour. Brush and clean up well beneath evergreen shrubs, for few things look more unsightly or are more to be deprecated in a neat and enjoyable garden, than symptoms of decay. Common and Portugal *Laurels* may now have the young shoots pruned or clipped in. The operation is best performed with the knife, and is quickly got over by a handy person. When clipped back to an even surface with shears there is the great drawback of cutting in twain all leaves which come in the way, the edges of which subsequently decay and do not fail to give evidence of this somewhat barbarous practice. Give thorough soakings of water to the roots of all shrubs planted during the past winter. These remarks apply also with equal force to all *Hardy Perennial Plants*, the flowers upon which are valued, and which have only been planted out during the present spring. *Ranunculuses* are producing a somewhat small and premature bloom this season; shading should be had resort to in all instances where, by proper sprinklings, &c., the growth has been somewhat finer, and hence more prolonged in bringing the flowers "out." Outdoor planted *Chrysanthemums* should have frequent copious waterings.

KITCHEN GARDEN.

Constantly looking forward for a fall of rain, I can only suggest that immediately such a felicitous period arrives we must set "all hands" to work sowing, planting, transplanting, and thinning out the various successional crops in this department. Not a weed should be permitted to remain to enjoy such a treat of rain, or it will soon assert its native supremacy over the nursed and cultivated neighbouring crops. *Tomatos, Chilis, Capsicums, Ridge Cucumbers*, and *Vegetable Marrows, Celery*, &c., will need frequent waterings if the present weather continues. In the majority of instances the wholesome contents of a manure tank will be most beneficial to them. Sow early *Peas* for a late crop, such as Sangster's No. 1. Veitch's Perfection is a good late podder, and so also is Ne Plus Ultra. The seed should be watered in the drill rows immediately it is sown and before the soil is drawn over them. *W. E.*

TOWN GARDENING.

If not already done shift the large-flowered *Chrysanthemums* into their blooming pots, which should not be less in size than those known as 24-inch, though I prefer 16. They should then be plunged, halfway up the pot, in an open border, on a small flower-pot placed upside down, to keep out the worms. If you have not a convenient spot to plunge them in, in the border, they may be stood on the walks, if boards are placed in front of them to protect the roots from the heat of the sun during hot weather. Put in pipings of *Pinks* as soon as possible, for the sooner they are struck now the better plants they will make to stand the winter. Take off the young shoots of this season's growth, and cut them off at the third or fourth joint with a sharp knife; at the same time remove the lower leaves, being careful not to tear the stem, and shorten them at the apex of the shoots. The pipings will then be ready for putting in the ground, which should be prepared for them by sifting some fine soil, about 3 inches deep, and covering it with a layer of silver-sand, afterwards well watering it, and allowing it to become somewhat solid before putting in the pipings. These points being attended to, the cuttings should be thrust into the ground up to the leaves, and about 2 inches apart. A gentle watering should then be given to settle the earth around them, and when they are dry cover them with a hand-glass or paper cover, and shade them from the mid-day sun. They will then require nothing more until they have made roots, which will be in about five weeks, at which time the cover should be lifted off for a few days, prior to their being planted out. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON

FOR THE WEEK ENDING WEDNESDAY, JUNE 15, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
June	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point.	Degree Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins	Deg	Deg	Deg		Gr.
9. Thurs.	29.71	59.5	55.9	52.7	79	4.5
10 Friday	29.57	58.8	53.2	48.2	68	3.8
11. Satur.	29.66	61.2	51.5	43.7	52	3.2
12. Sunday	29.69	61.3	57.2	52.3	67	4.3
13. Monday	30.04	67.9	59.4	52.6	58	4.3
14 Tues.	29.95	67.2	60.9	55.9	67	4.9
15 Wednes	30.01	69.0	60.5	53.0	55	4.5

1870. MONTH AND DAY.	TEMPERATURE OF THE AIR.					WIND.		RAIN.
June	Highest.	Lowest.	Range in Day	Mean.	Departure of Mean from Average of 30 Years	Direction.	Horizontal Movement	In Inches.
	Deg.	Deg.	Deg	Deg	Deg		Miles	
9 Thurs	72.7	52.0	20.1	62.4	+0.7	WSW	1/250	0.00
10 Friday	66.9	41.8	25.1	55.1	−2.9	NW	200	0.00
11 Satur	69.0	51.0	19.0	63.5	+0.2	WSW	500	0.00
12 Sunday	74.0	50.0	18.0	62.2	+4.6	WSW	170	0.00
13 Monday	82.0	54.3	28.7	66.9	+8.1	SW	250	0.00
14 Tues	81.2	51.2	30.0	65.4	+6.4	WSW	105	0.00
15 Wednes	83.7	51.2	32.5	65.7	+6.7	WSW	175	0.00

June 9—Variable amounts of cloud prevalent. A fine day. Solar halo. Lunar halo and corona.
— 10—Overcast throughout the day.
— 11—Generally cloudy. Brisk wind
— 12—Generally cloudy. A fine day.
— 13—Cloudless. Very fine and hot.
— 14—Small amounts of cloud prevalent. Hazy. Fine.
— 15—The amount of cloud was generally small. Very fine day

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, JUNE 11, 1870.

NAMES OF STATIONS	TEMPERATURE OF THE AIR.							FALL OF RAIN.
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	77.4	45.6	31.8	73.8	43.4	24.1	59.8	0.00
Blackheath ..	70.8	41.4	29.4	67.5	42.8	24.7	58.0	0.00
Brighton ..	71.1	46.0	25.1	68.0	48.0	20.7	57.0	0.02
Birmingham ..	78.0	43.5	34.5	70.4	50.2	20.2	58.5	0.00
Wolverhampton	78.0	42.7	35.3	70.4	49.4	21.0	58.1	0.11
Leicester ..	..	..	..	..	..	..	..	..
Norwich ..	70.5	42.0	28.5	66.1	46.9	19.2	54.7	0.00
Nottingham ..	78.6	42.2	36.4	72.4	48.6	23.8	58.7	0.03
Sheffield ..	77.0	40.0	37.0	69.3	45.0	24.3	57.3	0.13
Liverpool ..	77.2	45.8	31.4	66.7	50.8	15.9	58.9	0.21
Manchester ..	80.2	44.0	36.2	71.5	48.6	21.9	58.7	0.31
Salford	79.5	44.0	35.5	70.1	48.9	21.3	57.6	0.32
Bradford	77.4	46.5	29.9	70.5	50.7	19.8	58.8	0.06
Leeds	79.0	42.0	37.0	72.4	49.4	23.0	59.1	0.08
Hull	71.0	42.0	29.0	66.7	47.3	19.4	57.2	0.13
Newcastle ..	71.0	45.0	26.0	64.7	48.3	16.4	54.7	0.12
Edinburgh ..	71.7	45.0	29.7	..	..	..	56.0	0.20
Glasgow ..	77.8	43.0	34.8	..	..	..	55.2	0.22
Dundee	71.0	42.0	29.0	..	..	..	54.0	0.30
Aberdeen ..	70.6	41.2	29.4	..	..	..	54.7	0.09
Paisley	70.0	42.5	27.5	..	..	..	56.5	0.00
Greenock ..	73.5	47.0	26.5	..	..	..	56.0	0.11
Leith	72.0	44.6	27.4	..	..	..	54.6	0.09
Perth	80.0	43.0	37.0	..	..	..	58.4	0.05
Dublin	80.4	41.5	38.9	..	..	..	56.5	0.00

JAMES GLAISHER.

Notices to Correspondents.

Alpine Plants: *Mrs. K.* Robinson's "Alpine Plants," or if you wish to ascertain the names of the plants for yourself, Wood's "Tourist's Flora."

Diseased Vine Leaves: *W. S.* The production on Vine leaves is Erineum Vitis, formerly considered a Fungus, but now regarded as an hypertrophy of the hairs. *M. J. B.*

Drainage: *G. M.* We can only repeat that for all successful drainage there must necessarily be an outlet for it—in some direction. If the stratum of "Skerry," to which you allude, provides that, we should be content to try the plan proposed, with reasonable confidence of its success.

Erratum: *Mildew on Peaches.* An error crept into our report of the Scientific Committee, at p. 800. It is those Peaches whose leaves are provided with glands (not destitute of them) that are not so much subject to mildew. Articles on this subject, from the pens of Mr. Rivers and M. J. B., will be found at p. 921, 1866.

Gooseberry Caterpillar: *Belfast.* Hand-picking is the best remedy; you may also dust the bushes with lime.

Grapes: *A. B., Cumberland.* Your Grapes are shanked, and covered with mildew, and, apparently, also with rust. They are, altogether, in as bad condition as you could possibly have them.—*A Subscriber.* The specimens sent are covered with rust, which is attributable to various causes.

Holly: *Reader.* Cuttings of Hollies and other evergreens, such as Laurels, should be put in in August, Choose the firm young wood.

Insects: *A. R. H.* Camellia (?) leaves infested with the

white woolly coccus, described recently in the *Gardeners' Chronicle*, p. 308. Please be a little more communicative in future queries. *J. O. W.*

INSECTS ON GERANIUMS: *A. J. C., Bedford.* We found in the box of fragments of stems of Geraniums sent, several specimens of a small snake millepede, a young specimen of Lithobius (another species of Myriapod), and a young wood-louse (Oniscus sp.), all feeders upon decaying vegetable matter, and by no means likely to have been the original cause of the injury to the plants. The millepedes may be trapped by sinking slices of Potatos near the plants, and if they are very numerous, the soil should be carefully removed and burnt. *J. O. W.*

ISOMETRICAL DRAWING. A correspondent informs us that "'The Illustrated Drawing Book, for the use of Schools, Students, and Artizans,' by Robert Scott Burn, contains much useful information, and many examples of isometrical and other systems of drawing." His copy is the third edition, revised—London: Ward & Lock, 1856—and he considers it wonderfully cheap at 2*s.*

NAMES OF PLANTS: *W. H.* Tragopogon porrifolius (Salsafy.) *J. P. C.* Ceanothus collinus—*J. H.* 1, 3, 4, 7. Athyrium Filix-femina 2. Lastrea montana 5. Cystopteris fragilis 6. Polypodium hexagonopterum.—*Geo. Sturge.* Some Casuarina—we cannot tell which from the specimen. In Australia they are called "Oaks," or sometimes Beef Wood. In the Fiji Islands Dr. Seemann says the canibals used to eat human flesh with forks made from the wood of a species of Casuarina, while all other food was eaten with the fingers.—*N. G. N.* Your Oncid is one of a herd of yellow-flowered species that abound on the wastes of South America, from Honduras to Rio Janeiro, but it would be impossible, without devoting half a day to the enumeration, to pretend to say which it is. They are all worthless.—*W. M.* 1, Potamogeton pusillus, probably, but it is not well developed; 2, one of the many forms of Ranunculus aquatilis.—*J. H. Hawkins.* The Feather Hyacinth (Muscari comosum), a very old friend.

NURSERY GARDENS: *Tino.* Ask Messrs. Osborn, Fulham, or Mr. W. Paul, Waltham Cross.

PEAR LEAVES AND FRUIT: *R. O. B.* This is an aggravated case of the affection which is so common on Pear leaves, which seems to consist in a mere hypertrophy of some of the cells. As long as it is confined to the leaves it does not seem to be injurious, but when it attacks the Pears themselves it is fatal. Your Pears, however, have evidently other enemies. They have been attacked by some caterpillar, and have apparently suffered also from cold winds. *M. J. B.*

PELARGONIUM: *G. J. W.* In the way of Madame Werle, and apparently not so good as that variety.

PROPAGATING HOUSE: *A Two Years' Subscriber.* The house you propose to erect should answer sufficiently well in the situation indicated, or better if, as we understand you, it can be turned so as to face the west. The utility of the house will depend more on the completeness of the internal arrangements, as to affording a regular supply of heat and moisture at the busy season, than upon its aspect or position.

ROSES: *R. F.* asks how many varieties of Roses he must show to meet the requirements of the following class in the schedule for the Salisbury Rose Show:—"48 blooms, 3 trusses of each, distinct varieties." We suppose 48 varieties are intended, but this "R. F." should be able to judge from the position of his class in respect to others, and from the amount of the prizes. If so, it ought certainly to have been more clearly expressed.

RUST ON GRAPES: *H. F.* The berries sent are affected with rust, mainly attributable to the cause you surmise. There is no cure for it.

SPOT ON PEACHES: *J. C. S.* This is a clear case of mildew on the fruit. It is in a too advanced stage now to be cured, as the injury is done. It ought to be carefully attended to at its commencement. As your trees seem somewhat subject to it, we would recommend you next year to sulphur them as soon as the fruit is fairly set, and repeat the process frequently. The cause of its appearance it is difficult to determine. Some varieties—indeed, the two you mention—are more subject to mildew than others.

VARIOUS: *Subscriber.* 1. The simplest, and perhaps the most useful, of all boilers, especially for small houses, is the old saddle, of which there are various forms. Tiles are about as economical as anything you can use, when you take durability into consideration, and decidedly cleaner; you may, however, have good pathways made of slips of wood, 3 inches by 1½, nailed on quartering, with half inch meshes, which is tolerably cheap, and lasts a good time. 3. Yes. Plant your Vines at 3½ feet apart, afterwards you may adopt the extension system if you think proper, by cutting out any plant which does not grow well or proves worthless. 4. Vines planted outside will, we consider, suit your purpose best. 5. The sooner the Vines are planted the better; now, or a month hence, will do, or in winter any time. 6. For Geraniums (Pelargoniums properly) you had better apply to your nearest nursery. The varieties are so numerous that you might find it difficult to procure just what we might name for you.

COMMUNICATIONS RECEIVED: T. S. (too late).—A. C.—P. G.—W. P. A.—G. J. W.—R. S.—G. S.—E. W. R. M'C.—A. B. C.—W. W. G.—Subscriber—J. E. D.

Markets.

POTATOS.—Southwark, June 15.

During the past week the arrivals coastwise have been very small, only a few lots in sacks by steamers. As all the old Potatos at this market will be finished in two or three days, this will be the last report for the season. The following are this day's quotations:—Yorkshire Flukes, per ton, 120*s.* to 130*s.*; Dunbar and East Lothian Regents, 100*s.* to 130*s.*; Perth, Forfar, and Fifeshire do., 100*s.* to 110*s.*; Do. Rocks, 100*s.* to 110*s.*; Do. Reds, 95*s.* to 100*s.*; French and Belgian Whites, 90*s.* to 100*s.*

COVENT GARDEN.—June 17.

We have little to record this week, as markets and prices remain much the same. Flowers comprise Orchids, Roses, Pelargoniums, Heaths, Fuchsias, Lobelias, Mignonette, Pinks, and the usual description of bedding plants.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve	3 6	to 6 0	Melons, each	6 0	to 15 0
Apricots, per doz.	2 0	— 4 0	Nectarines, per doz.	16 0	— 20 0
Cherries, per lb.	1 0	— 2 0	Oranges, per 100	6 0	— 10 0
Cobs, per lb.	0 6	— 0 9	Peaches, per doz.	2 0	— 4 0
Filberts, per lb.	0 6	— 0 9	Pears, per doz.	..	— ..
Grapes, per lb.	1 6	— 10 0	Pine apples, per lb.	6 0	— 10 0
Lemons, per 100	4 0	— 8 0	Strawberries, p. lb.	3 0	— 8 0

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Asparagus, p. bund.	3 6	to 12 0	Leeks, per bunch	0 2	to 0 4
Artichokes, p. doz.	3 0	— 6 0	Lettuces, p. score	1 0	— 2 0
Beet, per doz.	2 0	— 3 0	Mint, per bunch	0 3	— 0 6
Broccoli, per doz.	1 0	— 2 6	Mushrooms, p. pott.	1 0	— 1 6
Cabbages, p. doz.	1 0	— 1 6	Onions, per bunch	0 4	— 0 9
Carrots, p. bunch	0 4	— 0 6	Parsley, per bunch	0 2	— 0 4
— young, p. bun.	1 0	— 1 6	Potatos, new, p. lb.	0 2	— 0 6
Cauliflowers, p. doz.	1 6	— 3 0	Salsafy, per bundle	..	— ..
Celery, p. bund.	1 0	— 1 6	Scorzonera, do.	..	— ..
Cucumbers, each	1 0	— 1 6	Shallots, per lb.	0 8	— ..
Endive, per doz.	1 6	— 2 0	Spinach, p. bushel	2 0	— 3 0
French Beans, p. 100	1 0	— ..	Radishes, per doz.	1 0	— 1 6
Garlic, per lb.	0 8	— ..	Turnips, p. bun.	0 9	— 1 0
Herbs, per bunch	0 2	— 0 4			
Horse Radish, p. bun.	3 0	— 5 0			

Potatos, York Regents, per ton, 120*s.* to 150*s.*; Flukes, do., 110*s.* to 140*s.*; new round, 14*s.* to 15*s.* per cwt.; new kidney, 14*s.* to 24*s.* do.

WANTED, an ACTIVE PARTNER, in a Small Nursery, Florist, and Jobbing Business in Islington. Long Lease. £50 cash required.
Apply to G. R., 32, Rotherfield Street, Islington.

A PRACTICAL FARMER wishes to undertake the charge of a young Gentleman, as PUPIL, desirous of instruction in really practical Farming. He can offer a comfortable home terms, one application. Mr. HAYDON, The Library, Reading; or Mr. EMMETT, Murrell Hill Farm, Binfield, Berks.

WANTED, a NURSERY FOREMAN.—A smart, active, intelligent Man, with a good general knowledge of the Nursery and Seed Business, to act as SALESMAN and BOOK-KEEPER, and generally superintend a pushing business in the Midlands. One capable of forwarding Plants and superintending the carrying out of the same, would be preferred. A suitable Man would receive every encouragement.—E. W., 41, Wellington Street, Covent Garden, W.C.

WANTED, a First-class SOFT-WOODED PROPAGATOR.—Must thoroughly understand the Cultivation and Management of Soft-wooded Plants in general, and be able to produce good references as to sobriety, integrity, and industry.—F. & A. SMITH, The Nurseries, West Dulwich.

WANTED, a first-class SOFT-WOODED PROPAGATOR.—Must be a steady, unreduce Man of a first-class Propagator of Soft-wooded Plants (only). He must be quick, active, and intelligent, also thoroughly understand the Florist Flowers' business. A thorough knowledge of honesty and sobriety is indispensable. Liberal and progressive wages and every encouragement will be given to a good Man. Applications, in first instance, in own handwriting, with full particulars, as to the will be seen personally first, H. C. being determined to engage the best Man that offers himself.—H. CANNELL, F.R.H.S., Woolwich.

WANTED, an experienced GARDENER, who understands Greenhouse Plants, and is a good Horticulturist, and who also can thoroughly Kitchen Garden, and the treatment of Fruit Trees. Must be industrious, sober, honest, and respected in his demeanour, and have an unexceptionable character.—H., South Lodge, Southall, S.W.

WANTED, by a Widow Lady, a Man and Wife,—Man as GARDENER, and to take care of Pony and Chaise, and make himself useful; the Woman as HOUSEKEEPER, of kind disposition, cleanly in person and work.—Apply, by letter, stating full particulars and wages, to A. B., Post Office, Egham, Surrey.

WANTED, a thoroughly proficient TRAVELLER for a large Nursery and Seed Establishment near London.—Address, stating full particulars as to terms, references, &c., to S. & T. A., Messrs. Hooper and Co., Centre Avenue, Covent Garden, W.C.

MESSRS. DOWNIE, LAIRD AND LAING are in WANT of a SHOPMAN for their Edinburgh Establishment. He must have had good experience, and be well recommended.—Apply by letter, giving full particulars, references, and salary expected, to 17, South Frederick Street, Edinburgh.

WANTED, a Young Man of good experience, as ASSISTANT SHOPMAN in a Provincial House.—Apply in own handwriting, stating age, references, salary expected, &c., to G. M., *Gardeners' Chronicle* Office, W.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen, on further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (HEAD).—Middle-aged, married, without incumbrance; thorough practical Man. Over five years in last situation.—JAMES FOWLER, Plompton Hall, Knaresborough.

GARDENER (HEAD).—Age 29, married, no incumbrance; thoroughly understands Kitchen and Flower Gardening, and the Management of Greenhouse Plants; also has a good knowledge of Forcing. Three years' good character.—G. K., Post Office, 18, Albion Street, Hulton, Hastings.

GARDENER (HEAD).—Age 46, no incumbrance; has a thorough practical knowledge of Vine Cultivation, Orchard-houses, Stove and Greenhouse Plants, and the routine of Kitchen and Flower Gardening. Seven years' good character from last situation, and two-and-half from the one now leaving.—J. PERKINS, Walditch, Bridport.

GARDENER (HEAD), age 29, married, one child.—J. WRIGHT begs to offer his services to any Nobleman, Lady, or Gentleman requiring a first-class practical Gardener, well up in every branch of the profession, including the Management of Vines, Pines, Peaches, Cucumbers, Melons, Strawberries, Mushrooms, Greenhouse and Stove Plants, and Flower and Kitchen Gardening. Character will bear the strictest investigation.—J. WRIGHT, Kington, Tetsworth, Oxon.

GARDENER (HEAD).—Married, no incumbrance; well skilled in all branches of the profession. Highest references.—A. B., Post Office, South End, Catford, Lewisham, Kent.

GARDENER (HEAD), to any Nobleman or Gentleman going abroad; Sydney (Australia) preferred.—Single; understands Gardening in all its branches. Testimonial, with reference.—F. W. B., 23, Silver Street, Golden Square, W.

GARDENER (HEAD).—Age 35, married; first-class experience in Vine, Grape, and Plant Growing, also in every branch of Gardening. Six years' character.—R. F., 2, Bertram Cottages, Hartheld Road, Wimbledon.

GARDENER (HEAD).—Age 30, married; thoroughly practical in all branches of the profession. Six years' excellent character from present employer.—H. CLARKE, Gardener to Sir W. H. Humphery, Bart., Penton Lodge, Andover.

GARDENER (HEAD), to live off the place, and within 12 miles of London.—Age 38; a successful Cultivator of Stove and Greenhouse Plants, Ferns; Early and Late Forcing of Fruits and Vegetables; also Flower and Kitchen Gardening. State wages. Good character.—O. Z., Post Office, Bromley, Kent.

GARDENER (HEAD).—Age 37, married; thoroughly understands the profession, including Early and Late Forcing, Kitchen and Flower Gardening, also a good Plant Grower. Three years in last place. Good character.—C. D., Post Office, Leatherhead, Surrey.

GARDENER (HEAD), or GARDENER and AGENT.—Age 28; has had 13 years' practical experience in first-class establishments; thoroughly understands the Cultivation of Vines, Pines, Mushrooms, Cucumbers, Melons, Stove and Greenhouse Plants, Orchids and Nepenthes; Orchard-houses, Flower and Kitchen Gardening, and the Management of Land and Stock. Good Accountant. Highest references.—A. B., Post Office, Uttoxeter.

GARDENER (HEAD), or GARDENER and BAILIFF.—Age 41, married; is thoroughly experienced in Early and Late Forcing of the choicest Fruits; Flowering and Vegetables; also Kitchen and Flower Gardening, the Management of Land and Stock, Keeping Accounts, &c. Wife a good Dairywoman, if required. Eleven and a half years' good character can be produced.—A. B., 6, Eden Place, New Bromley, Kent.

GARDENER (FOREMAN), in a Nobleman's or Gentleman's Establishment.—Age 24, single; has had experience both in Gentlemen's Establishments and Plant departments in London Nurseries. Good references.—A. B., Messrs. Rollisson's, The Nurseries, Lower Tooting, Surrey.

GARDENER (FIRST-CLASS, WORKING), where two or three Under Gardeners are employed.—Experienced in all branches. Highly recommended.—D. M. T., Mr. Sprigings' Nurseries, St. Albans.

GARDENER.—Age 30, married; thoroughly understands the profession, can take charge of Meadow Land, if required. Has good references.—HAMBURG, Post Office, Houndsdown, Southampton.

GARDENER.—Mr. WILKIE, Oak Lodge, Kensington, W., is anxious to procure a situation as above, for a middle-aged Man, who has had great and varied experience in all branches of the profession. Well acquainted with Horticultural Buildings and Ground work. Every particular given on application as above.

GARDENER.—H. LANE & SON have on their List a first-class Gardener, age 38, open to an engagement; thoroughly competent in the branches of Early and Late Forcing of Fruits, Orchids, Stove and Greenhouse Plants, Ferns, &c.; has been a successful Exhibitor at the Metropolitan and Provincial Shows.—The Nurseries, Great Berkhamstead, Herts.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man in whom he has known for several years, not only as to his abilities; he held the position of Bailiff and Gardener in last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, N.

GARDENER (SINGLE-HANDED).—Age 26, married; can undertake the Management of a Greenhouse, &c., and Flower and Kitchen Garden. Four years' good character from present employer.—J. F. W., Post Office, Earley, Reading.

GARDENER (UNDER).—A respectable, steady, young Man. Good recommendation from last place.—H. B., Post Office, Pensford, near Bristol.

GARDENER and BAILIFF, or BAILIFF.—Middle-age, married, no incumbrance; thoroughly understands both professions; has a thorough knowledge of Farming both Heavy and Light Land; has had the Management of large Grass Farms, Buying and Selling of Stock, &c.—M. N., Fairfield Cottage, Hounslow, Middlesex.

FOREMAN, in a Nobleman's or Gentleman's Establishment.—Has a practical knowledge of Gardening in all branches. Good reference.—E. BRADLEY, Newton Nurseries, Chester.

FOREMAN, in a Nobleman's or Gentleman's Garden.—Has had good practice in the Culture of Exotic Orchids and Ferns, Stove and Greenhouse Plants, Vines, Melons, Cucumbers, and other fruits, Forcing and General Gardening. Good character from present employer (Mr. Hill, Gardener to R. Hanbury, Esq., Poles Park), also from previous one.—J. PARKER, Poles Gardens, Ware, Herts.

FOREMAN and PROPAGATOR.—Age 37, married; no objection to Travel. Considerable experience. Good references.—B. C., Mr. Tooley's, North Hampstead, N.W.

To Nurserymen.

FOREMAN, or FOREMAN and PROPAGATOR, in the House Department.—Age 38; has been used to growing a general Collection of Plants for Market and other purposes.—A. B., Hart's, Fruiterer, 5, Market Place, Leytonstone Road, Stratford, Essex.

PROPAGATOR (or PROPAGATOR and FOREMAN) of Roses, Rhododendrons, Conifers, &c.—Has been for the last six years in the largest Rose Nursery in the North. Satisfactory reference.—ALPHA, R. T. Blackwell, Darlington.

BUDDER and GRAFTER, under a Foreman.—Reference if required.—ALPHA, Post Office, Worcester.

AGENT or FARM STEWARD (at Michaelmas next), where a good Herd of Cattle is kept.—An experienced Person, who has had the entire Management of a large Farm and first-class Herd.—For further particulars apply to A., John Thornton, 15, Langham Place, London.

STEWARD or BAILIFF.—Age 45, married, no incumbrance; has had the Management of an Estate of 500 acres. Two good references.—Mr. STEVENSON, Sillwood Park, Sunninghill, Staines.

To Noblemen or Landed Proprietors.

AGENT or LAND STEWARD.—A Gentleman, who has had many years' experience in the Management of a large Estate, and who is also a practical Agriculturist, wishes to obtain a situation as above. Can give the most satisfactory references as to ability and character.—F. J. A., Messrs. Thomas Gibbs & Co., Half-Moon Street, Piccadilly, W.

FARM BAILIFF or STEWARD.—Respectable, middle-aged, married; thoroughly understands the business. Can be highly recommended by present employer.—O. H. LATIMER, Chesham, Bucks.

IMPROVER, in a first-class Provincial Nursery.—Age 19, respectable, intelligent; good knowledge of Seed Trade. Can Paint and Draw from Nature. Medal awarded. Four years' excellent character.—State salary, &c., to W. G., Post Office, Lavenham, Suffolk.

To the Seed Trade.

SHOPMAN.—Ten years' experience in the best Retail Houses. A slight Knowledge of the Nursery Business. Country preferred.—C. W., Post Office, Reading.

To Nurserymen.

TO BE LET, on Lease, nearly THIRTY ACRES of LAND, highly suitable for Nursery purposes, near Bagshot, with excellent frontage to the main road, 1¼ mile from Sunningdale Station, S.W.R. Mr. RICHARDSON, Laversbot, Bagshot

Southdown Farm.

TO BE LET, at Michaelmas next, a FARM, consisting of about 550 Acres of Arable, Pasture, and Sheep Down, with a good Residence, and Seven Labourers' Cottages.
For particulars, apply to Mr. T. COLGATE, Glynde, Lewes, Sussex.

To Florists and Nurserymen.

TO BE LET, in the best position in St. John's Wood, a SHOP COMFORTABLY, well adapted for the Sale of Plants, Seeds, Birds, and Gold Fish.
Apply to No. 1, Queen's Terrace, St. John's Wood, N.W.

Highly Important to Florists,

Desirous of carrying on a successful Market Trade, in conjunction with a good Local Jobbing Business.

TO BE LET, or the LEASE to be SOLD, with possession, of the NORFOLK NURSERY, Shacklewell, Middlesex, ten minutes' walk from Dalston Junction, comprising about 1 a. 1 r. 39 p., with the Erections thereon, viz.—10 Greenhouses, mostly of modern construction, ranges of Pits, Stabling, and other Outbuildings, and every requisite for carrying on a successful business. The whole is held on a Lease from Lady day, 1865, for a term of 21 years, at the exceedingly low rental of £34 per annum. The LEASE, also, of FOUR DWELLING-HOUSES, adjoining, held for the same term, three of which are let to respectable tenants; the other, which is in hand, may be occupied by any one renting or purchasing the Nursery. For further particulars apply to
PROTHEROE AND MORRIS, Auctioneers, Leytonstone, Essex

Radnorshire, South Wales.

PEN CWM FARM, about 040 Acres, 800 of which are suitable for Ploughing, will be LET on LEASE, for 21 years, from March 25, 1871. This Farm is in Radnorshire (where the people all speak English), and has been in the owner's hands for several years preparatory for a first-class Tenant. It has been Fenced, Drained, Limed, and Reclaimed, a vast quantity of Lime, Salt, and Superphosphate having been put into it during the last three years. A New Twelve-roomed House, and a most complete set of New Farm Buildings have been erected and arranged, so that it can be used either for a Dairy or as a Feeding and Fattening Farm, being in the centre of a great breeding country, and only 70 miles by an excellent road from Newtown, in Montgomeryshire, and 90 miles by railway from Shrewsbury, 65 hours from London, and 3¼ from Liverpool, Manchester, and Birmingham, thus affording easy access to those great Meat Markets. Pen Cwm is a fine Hill Farm, which, for soundness, has a right to be called the same as a Lowland Farm in the south of Scotland. The land is of good quality, very easily worked, and produces excellent Crops of Oats, Roots, Barley, and Seeds. Wheat and Clover do not like it (but can be got anywhere), and moderately good Crops of Barley, Beans, Peas, Mangel, and Carrots. Wheat is also grown to a small extent, but the straw is too high for that grain. About 90 Acres are occupied in Plantations and Fences, 50 acres are Steep Hill Sides and Rough Pasture; 50 acres more are Bottom Land, suitable for Cow Pastures and Meadows, and 800 acres are good Ploughable Land, easily worked, and suitable for a 5 or 6 or 7 course rotation, 3 years in crop, and 2 or 3 or 4 years in Grass.
For full printed particulars apply to G. HAIG, Esq., Pen Ithon, Newtown, Montgomeryshire.

SALES BY AUCTION.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on FRIDAY, June 24, at half-past 12 o'Clock precisely, choice ORCHIDS, just arrived from New Grenada, consisting of Odontoglossums, Oncidiums, &c., comprising many rare varieties; also an importation of Cattleya superba
On view the morning of Sale, and Catalogues had.

Syon Gardens, Isleworth, Middlesex.

Highly important SALE of Valuable and Rare TROPICAL FRUITING and FLOWERING TREES, SHRUBS, and PLANTS, of luxurious growth; for sale in consequence of a re-arrangement of the Gardens.

FAREBROTHER, LYE, AND WHEELER, beg to give notice that they are honoured with instructions from his Grace the Duke of Northumberland to SELL by AUCTION, at Syon, on WEDNESDAY, June 22, at 12 o'Clock, an assemblage of rare TROPICAL PLANTS and TREES, of remarkably fine growth; among which will be found some of the finest specimens in Europe of the

Alocasia macrorhiza	Ficus elastica, indica, &c
Anthurium aculle	Hibiscus sinensis illiflorus
Areca catechuma	Ilex platyphylla
Caladiums of sorts	Jambosa polypetala and vulgaris
Carolinea alba	Lagetta lintearia
Chrysophyllum Cainito	Palms in varieties
Cocos sp., and other Palms	Piper nigrum
Coffea arabica	Psidium pyriferum and chinense
Dracontium, elegans, &c	Saccharum officinarum
Cycas revoluta	Sterculia nobilis
Diospyros sapota and Mabola	Theobroma cacao
Dracæna sp.	Urania speciosa
Elæodendron australe	Vanilla planifolia
Eugenia pimenta	
Ferns of all sorts	

And a variety of other choice Trees, Shrubs, and Plants which are to be sold in consequence of alterations and a re-arrangement of the Gardens at Syon.
May be viewed two days prior, by Catalogues only, obtainable of Mr FAIRBAIRN, Gardener, at Syon; of Mr JUDSON, Syon House; and of Messrs. FAREBROTHER, LYE, AND WHEELER, 8, Lancaster Place, Strand, London, W.C.

Important Sale of Choice Greenhouse and Orchard-House Plants and Trees.

MESSRS. POTTS AND NEALE are favoured with instructions from the Executors of the late Mrs. J. Hadden, to SELL by AUCTION, on the Premises at Bramcote, near Nottingham, on TUESDAY, June 28, the whole of the beautiful COLLECTION of about 100 CAMELLIAS and AZALEAS, of the finest sorts, many of them 6 to 7 feet high; ROSES, GLOXINIAS, fancy GERANIUMS, and other GREENHOUSE PLANTS, in great variety. The ORCHARD HOUSE TREES are in fine condition, full of fruit, and number 34 Nectarines and Peaches of the best sorts.
The Auctioneers beg respectfully to announce that this collection of Camellias and Azaleas has never come under their hammer, both as regards size, beauty of training, condition, and selection of sorts
Catalogues may be had on application, by post, to the Auctioneers, and at the Office of this Paper

SHORTHORN SALES, 1870.

THURSDAY, June 30.—The CELEBRATED HERD belonging to Joseph Meadows, Esq., at Thornville, Wexford, Ireland, including many Prize winners and noted descendants of the noted prize bulls, "Bolivar" (25,649), and "Charlie" (25,745).
THURSDAY, August 25.—Messrs. Mitchell's ENTIRE HERD at Alloa, Stirling, N.B., crossed with bulls hired from Mr. Booth for several generations.
WEDNESDAY, September 21.—A valuable selection of COWS, HEIFERS, and BULLS, of Duties and Princess blood, from the first class herd belonging to James Fawcett, Esq., at Scaleby Castle, near Carlisle.
FRIDAY, September 23.—The ENTIRE HERD belonging to Chas. R. Saunders, Esq., at Nunwick Hall, near Penrith, comprising between 60 and 70 head, and many remarkably fine specimens of the "Waterloo," "Rieda," "Gwynne," "Emma," "Wild Eyes," and other fashionable tribes; also the prize bull "Edgar" (19,086).
THURSDAY, October 6.—The late Mr. William Hewer's HERD, about 80 Head, and stock of first-class BERKSHIRE PIGS, considered some of the finest in the kingdom, at Sevenhampton, Highworth, Wilts.
Catalogues, with Pedigrees of these Sales, will be issued in due time. Further particulars can, however, be had on application to JOHN THORNTON, 15, Langham Place, London.

Mere Old Hall, Knutsford.

IMPORTANT SALE of First-class SHORTHORNS, SHROPSHIRE SHEEP, PIGS, &c

MR. STRAFFORD has received instructions from D. R. Davies, Esq., to SELL by AUCTION, without reserve, on WEDNESDAY, July 13 next, at Mere Old Hall, his entire HERD of First-class SHORTHORNS, consisting of about TWENTY of Bulls, Cows, and Heifers, including the far-famed Cow "Moss Rose," with her daughter "Moss Rose 2d," as well as her son "Royal Chester," and several other animals of the Kirklevington sort. Whilst the Sires lately used have been principally of that renowned blood.
After which, Messrs. LYTHALL AND CLARKE will SELL some prime RAMS, selected from Mr. Davies' famed Flock of Shropshire Sheep, which has been selected at great cost, and bred with care from the best blood in the country.
Also will be SOLD, some very superior PIGS of the White Breed, reared from the best sources.
Catalogues, with Pedigrees, and other particulars, may be had on application to Mr. STRAFFORD, 13, Euston Square, London; or of Mr. CHORLTON, the Bailiff, at the Bucklow Hill Farm, Knutsford, Cheshire.

Shardeloes, Amersham, Bucks.

IMPORTANT SALE of SHORTHORNS

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without reserve, on FRIDAY, July 15 next, at Shardeloes, about FIFTY HEAD of very superior SHORTHORNS, the property of Thomas Tyrwhitt Drake, Esq., consisting mostly of Young Cows and Heifers that have principally been bred from the famed Herds of the late Captain Dilke, Maxstoke Castle, Rev. F. Thursby, Abingdon Rectory, and of Mr. W. Torr, Aylesby. The Sires first used were of the famed Knightley blood, namely, Baron (12,038), and subsequently (15,244), followed by Final Hope (17,848), from Aylesby; Lord Lieutenant (22,167), from Bushey Grove; and Wizard (25,408), from Shulcbroke Lodge; the last is now in service, and included in the Sale.
Catalogues, with Pedigrees, may be had of Mr. STRAFFORD, 13, Euston Square, London; or of Mr. WINFIELD, the Bailiff, at Shardeloes, Amersham, Bucks.

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ROYAL AGRICULTURAL BENEVOLENT INSTITUTION for the RELIEF of DECAYED FARMERS, their WIDOWS and ORPHANS.
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Every information to be had of the Secretary, by whom Subscriptions and Donations will be thankfully received

ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.—The ANNUAL ELECTION of PENSIONERS and CHILDREN will take place at Willis's Rooms, St. James's, on WEDNESDAY, June 22, at 11 30 A.M.
All Subscribers who have paid previous to January 1 in each year; and no Contributor shall Vote while the same is in arrear
C. BOUSFIELD SHAW, Secretary.
No. 55, Charing Cross, London, S.W.

LINCOLNSHIRE AGRICULTURAL SOCIETY.
SLEAFORD EXHIBITION, JULY 27, 28, and 29.
The PRIZES offered amount to ONE THOUSAND FIVE HUNDRED and SIXTY POUNDS and upwards. ENTRIES CLOSE JUNE 27. Prize Lists, Forms of Entry, &c., may be had on application to STEPHEN UPTON, Secretary.
St. Benedict's Square, Lincoln.—May 6.

The Agricultural Gazette.

SATURDAY, JUNE 18, 1870.

WE give the utmost prominence to a letter from Mr. HALL KEARY, one of the judges appointed by the Royal Agricultural Society of England to determine the award of Mr. MASON's prizes for the best cultivated farms in the Oxford district. It is to Mr. KEARY that the work of drawing up the report on these farms has been allotted; and it is plain, from the tone of his letter, that he is aware of the importance as well as difficulty of his task. No discussion has followed upon our former reference to this subject, and we hope that Mr. KEARY's expressed anxiety for suggestions may be more successful in eliciting from our readers remarks upon the desired character of the report, and even upon the points by which award of the prizes should be guided. The following is his letter:—

"Bridgnorth, Salop, June 13, 1870.

"Dear Sir,—I have read with interest the article, in your Paper of May 21, touching the 'Oxford Show Farm Prizes.' In the first place, I am glad that you think the selection of the judges is a good one, and hope that you will not be disappointed by the results of our work. As it falls to my lot to write the report, I shall be most anxious to read any suggestions which may occur to your readers on that subject. I think that my task is a very difficult one, for unquestionably one great object is to have an instructive report published in the Journal of the Royal Agricultural Society. We have, as you observe, to declare, on behalf of the Royal Agricultural Society, what good farming is. That is not a very difficult thing to do, if the climate, soil, and all other circumstances are alike, but in this case there are 21 competing farms, many of which it is almost impossible to compare one with the other. There are large light land arable farms upon the stone brash, and small cold clay farms, and several fine mixed arable and pasture farms where Nature has done almost everything. Then, again, there are dairy and breeding farms, where stock is very well managed, and where it forms the principal feature. If the 21 farms had been divided into three classes our task would have been less difficult, and our report might have been made, I think, more instructive. I shall hope to see some further remarks in your columns. I remain, dear Sir, yours faithfully,

"H. W. KEARY."

As the inspections are not yet completed, perhaps it may be well, as a first suggestion, to remark that the work of the reporter, and even the accuracy of the award, will depend very much upon the patience and thoroughness with which the circumstances and condition of every farm are examined. It is possible that the leading characteristics of any example of farm management may strike the professional eye at once, and a very cursory inspection may suffice to satisfy a practised judge as to the order of merit in which a dozen farms should be arranged. But there are certainly a great many points of primary importance for the preparation of a satisfactory report which cannot be appreciated—cannot even be observed—by gentlemen who despatch their work at the rate of three farms a day, getting over their inspections pretty much as if they were riding to hounds. It might have been unreasonable of the Society if it had required the work of inspection to be done on foot, but unquestionably the judgment so obtained would have been less liable to error; and Mr. KEARY's special part of the duty to be done would have been made much easier. The judges would all have realised more perfectly those conditions, particulars, and details by which, combined, the impression is produced on which the accuracy of their award depends; and the reporter would have had a fuller note-book to assist the memory, on which he has to rely for the production of his report.

We are glad to know that a second inspection is to be made, and that the hasty impressions of a first hurried visit have thus to be submitted to review. The probability, no doubt, is, considering the competency of the jury, that their first verdict, if they have already arrived at one, will stand—that it is, in fact, accurate, and ought to stand. But it cannot be too strongly urged that to give a verdict is only part of the duty which devolves upon Messrs. GIBBONS, TORR and KEARY. There are a multitude who ought to read the English Agricultural Society's Journal who will never see these farms, and to whom the award will be nothing unless the grounds of it are carefully and explicitly stated in a report. On Mr. HALL KEARY, too, it depends not only whether the influence of this award shall tell upon the many farmers who will hear of it, and who would like to know the reasons of it, but also whether this great opportunity of getting agricultural readers for the Society's Journal shall be well used. And we defy him, or any other man, to learn everything about a farm which the readers of his report will expect to find in it, unless ample time for conversation as well as mere inspection be taken for his visit.

Take a single point—to which we refer, both because it may not be considered as of the first consideration in an estimate of good agriculture, and also because success in it is attainable only as an incidental result of management, and is not to be achieved by expressly directed effort:—How are a man's relations to the labourers whom he employs to be ascertained during a gallop over his farm? It certainly is a capital testimony to the business-like ability of a tenant-farmer when you find that all his achievements have been won for him by a body of well-conditioned cordially disposed labourers. We can refer to this without hesitation, because no one is more ready to doubt and even to condemn the policy of petting labourers, or making agriculture any other than a business, whose object is simply a livelihood and a profitable investment for capital; leaving it of course to farmers and labourers

alike to do that duty which devolves equally on both as "neighbours." Nevertheless, it is a fault and failure, in spite of good crops, clean cultivation, well kept stock, and other evidence of good farming, if masters and men are at variance, so that results are gained only by constant drive, and notwithstanding pretty constant ill-will. Unquestionably, however, the relations of masters and men cannot be ascertained by anyone at a hand gallop. And if another "suggestion," therefore, be permitted us, we venture to express the hope that Mr. HALL KEARY, if he should find it desirable after the second inspection which has yet to be made, will not hesitate to pay a third personal visit to those few farms out of the 21 upon the list of which he proposes to give a more detailed account.

—— THERE was again a short supply of Wheat at Mark Lane on Monday, and a consequent rise of 3s. per quarter in the price. All spring corn was dearer too. ——A great show of fat stock at the Metropolitan Market lowered prices of both beef and mutton on Monday; and though the supply was not so great on Thursday, it exceeded the demand.——Prices for old hay have risen considerably, in anticipation of the poor crop which is everywhere a certainty.

—— In the discussion last Thursday on the Customs and Inland Revenue Bill a proposal by Colonel BRISE to dispense with the notice to the exciseman on the steeping of grain, allowed by the Bill, being objected to by the Government, was pressed to a division, and rejected by 47 to 31.—Mr. G. GREGORY moved a clause providing that horses kept for husbandry shall not be liable to duty on account of being employed occasionally in the repair of highways. He was supported by the SPEAKER and by Mr. DISRAELI, and the CHANCELLOR of the EXCHEQUER offered to exempt horses for whose services no money payment was received. This compromise was refused by Mr. G. GREGORY, and on a division the clause was carried against the Government by a majority of four—49 to 45.

—— On Friday evening last in the House of Commons Mr. LOCH drew attention to the attempts that had been made in the last and present Sessions of Parliament by private members and by the Government to amend the laws relating to game, and observed that, in spite of the number of measures introduced, no progress had been made towards the satisfactory solution of this question. He analysed the several Bills which had been introduced this session, pointing out their shortcomings, and condemning the perfunctory manner in which the Home Secretary had redeemed the promise of the Government. He stated, in proof of the necessity for investigation, that no fewer than five Bills had been introduced on the subject this session, that it was 25 or 26 years since there had been any inquiry into the operation of the Game Laws in England, whereas there never had been any inquiry into their operation in Scotland, and that there was no adequate knowledge possessed by the generality of members of the feeling of the people of Scotland on this question.—Mr. PARKER said that in giving their support to the present Government the agriculturists of Scotland had looked for action in respect of the Game Laws. If the Government did not take action in the matter the result of the next election would be different from that of the last.—Sir L. PALK observed that the best mode of settling this question would be to abolish the Game Laws altogether, and to substitute for them a stringent trespass law.—Mr. BRUCE said the Government appreciated the difficulty in which the House was placed by the proposals respecting this question, but stated that the House was already in full possession of all the facts of the case, and promised on behalf of the Government to deal with the question on a very early day in the light of those facts. The measure of the Government would tend to reduce the quantity of ground game materially, and be generally as strong as it could be without infringing the rights of property.

—— Turnip-fly is so destructive this year that we are glad to publish the following letter on the subject from a correspondent. Mr. BAINBRIDGE, of Oulston Hall, Easingwold, Yorkshire, writes thus :—

"For the last 15 years, on sowing Turnips, I provide, ready slaked, one ton of lime per acre. As soon as the plants appear the lime is spread from a cart over the young plants in the rows. In hot seasons the plants have had rough usage from their tormentors, but sufficient plants escape. I never missed a crop, nor have I had to sow a second time. Another important effect of the lime in the present drought is to reflect back the rays of the sun, and thus moisture is preserved in the soil to meet the roots of the infant plants. If evenly spread over the rows, the young plants will push through the coat of lime and present a beautiful green line on the white surface. Many of my neighbours have to sow a second time. Mine are ready for the hoe. Several of my neighbours have by this means saved their crop. The lime must be put on dry, and on a warm or hot and dry day; for if any dew or moisture be on the plants, they will be destroyed. The lime must be ready to be put on the moment the mischief begins, for in the 24 hours of a hot season the fly can ruin any crop; it is of no use then going for the lime."

—— The following Table, showing the Greenwich rainfalls in each month of a series of years, is extracted from the *Pall Mall Gazette*:—

	Average Rainfall in 54 Years.	In Four Years of Rainfall in excess of Average.				In Three Years of Deficient Rainfall.			
		1867	1866	1865	1860	1861	1863	1864	1870
January	1·8	2·8	3·5	3·3	1·8	0·6	2·6	0·9	1·5
February	1·6	1·2	3·9	1·9	1·1	1·8	0·6	0·8	0·5
March	1·6	2·3	1·6	0·9	1·9	2·2	0·7	2·7	2·1
April.. ..	1·7	2·2	2·4	0·4	1·0	0·8	0·4	0·7	0·3
May	2·2	2·3	2·0	4·4	3·9	1·8	1·3	1·9	0·5
June	2·0	1·8	3·6	2·4	5·8	1·9	3·9	0·9	..
July	2·6	5·8	1·6	2·3	2·8	2·2	0·1	0·3	..
August	2·4	2·6	2·4	4·0	3·7	0·6	1·8	1·4	..
September	2·4	2·9	3·9	0·2	3·1	1·5	3·2	2·8	..
October	2·8	2·1	2·1	5·9	1·6	0·9	1·7	1·1	..
November	2·4	1·04	1·5	2·4	2·5	5·2	1·8	2·6	..
December	1·9	2·0	1·8	0·9	2·8	1·3	1·1	0·6	..

The REGISTRAR-GENERAL, referring to the continued drought, states that since March 17 the total rainfall at Greenwich has only been 1¼ inch in 16 out of 86 days; no rain has fallen on 70 out of the 86 days. It is a satisfaction, though oftentimes a melancholy one, to have a standard of comparison by which we can estimate our present position. As regards drought that standard is supplied by the year 1864, the driest of which we have any certain evidence on record. In 1864 there was a deficiency of rainfall on the entire year of 7¼ inches; but the fall during the first five months of 1864 was 7 inches, whereas only 4·9 inches have been measured this year at Greenwich. Thus far, then, the present year compares unfavourably with the exceptionally dry year 1864. The "April showers" have this year been conspicuous by their absence, and those of May equally so. Less than an inch of rain has fallen in those last two months, their average fall being at least 4 inches. May especially has been dry beyond precedent, its fall of half an inch being an inch and a half less than the fall in the corresponding month of 1864.

OUR LIVE STOCK.

THE sale of Mr. Tippler's (Roxwell Castle) herd was conducted by Mr. Thornton on Thursday, the 7th inst. Local events and the great scarcity of keep combined to depress prices, few of which ranged higher than 40 gs.

—— Mr. Strafford has published a catalogue of some Shorthorn cattle, the property of Mr. T. T. Drake, of Shardeloes, Amersham, which are to be brought to the hammer on the 15th of next month. The catalogue contains the names of 49 females and 5 bulls, all of which may be arranged under seven families. First on the list we notice the name of *Vestris 5th*, by LUCIFER (18,288), a Shardeloes bull, by Mr. Cartwright's METEOR (13,334), and of the Aylesby "Meadow Flower" tribe. *Vestris 5th* is descended on the female side from Captain Dilke's *Vestris*, by PRINCE ARTHUR (11,938), and traces back to *Smoker*, bred by Mr. Cattle. Next follow two more members of the same tribe, both by Mr. J. H. Langston's HONEYCOMB (16,279), and subsequently *Vestris 7th* and *Vestris 10th*, both by Mr. Torr's FINAL HOPE (17,848). Three bulls, VAUBAN, VULCAN, VALOROUS, all by WIZARD, whose breeding we shall presently consider, completes the list of the Shardeloes "V." tribe. The next family commences with *Climax 7th* (lot 4), and includes five cows and heifers of the same name, up to *Climax 14th*. The original *Climax* was bred by Mr. Torr, and was by Mr. Booth's VANGUARD (10,994); afterwards METEOR (13,334), bred by Mr. Cartwright, was used; and lastly, Mr. Langston's HONEYCOMB became the sire of *Climax 7th*. Lot 5, *Madrigal 6th*, together with lots 10, 13 and 15, represent the older members of a numerous family, the youngest of which, *Madrigal 25th*, is a 4-months-old calf. The first *Madrigal* was bred at Aylesby, and was a daughter of Mr. Booth's VANGUARD, and *Mellow Tone*, by Earl Spencer's splendid bull EXQUISITE, whose portrait appears in the seventh volume of the Herd Book. Previous to this the family had been in good hands, and their pedigree goes back to YOUNG FAVOURITE (255). The next leading strain commences with *Meadow Flower 7th*, by FINAL HOPE (17,848), a cow that traces back, as in the case of the "Climax" and "Madrigal" tribes, to Aylesby, and also finds a common ancestor with them in Vanguard, who was purchased by Mr. Torr from Mr. Booth. There are 10 members of this family, the youngest being *Meadow Flower 18th*, a 3-months-old calf. Several members of the "Lælia" family, descended from the Rev. Mr. Thursley's stock, of Abington, *Sunflower 4th*, by FINAL HOPE, and her daughter, and three *Camellias*, representing a "Maxstoke" family, conclude the account of the Shardeloes herd. The sires formerly used were of the famed Knightley sort, such as ST. PATRICK (12,038), and SCAPULARY (15,244), followed by FINAL HOPE, from Aylesby (17,848), LORD LIEUTENANT (22,167), from Bushey Grove, and WIZARD (25,468), from Sholebroke Lodge, the sire now in service, and No. 1 in the bull section of the catalogue. WIZARD is five years old, red in colour, by 7TH GRAND DUKE, and out of *Wily Witch*, by ROYAL BUTTERFLY 5TH.

HEREFORDS.

According to my promise, made to the Editor of the *Agricultural Gazette* a long time back, I send a review of the Hereford herd of my esteemed friend Mr. James William James, of Mappowder Court, Dorset. I must premise and say that the fine parish of Mappowder, about 1800 acres, originally belonged to Lord Spencer. When I was curate thereof, about the year 1835 (Dr. Gray, Bishop of Bristol, gave me the valuable curacy, worth £200 a-year—he never had anything to give his three sons, or anyone else, during the time of his episcopate), the parish belonged to Lord Beauchamp, of Madresfield Court. The father of the present earl sold the estate and living to Mr. Wingfield Digby, of Sherborne Castle, the prince of esquires. My kind friend, the late Mr. James, came to Mappowder in 1819. He tried Devons and Shorthorns, but found them too tender to stand the cold exposed situation of Mappowder; he therefore went to Hereford in the year 1836, and bought a son of old SOVEREIGN of Mr. John Turner, of Noke: the dam's name was *Spot*. That bull arrived when I was at Mappowder, and was the foundation of the Hereford herd. The next bull I also remember well—a thicker bull than the former, with fuller hindquarters. This bull he bought of Mr. P. Turner: his name was GOLDFINDER. The next was in 1839—a son of COTMORE, bought of Mr. Jeffreys, of The Grove. He then bought three bulls following of Mr. J. Turner, of Noke; namely, YOUNG SOVEREIGN, dam Mr. Turner's celebrated cow *Countess*; WALLACE, calved January, 1846; and BERTRAM, calved in January, 1847. The next bull he bought of Mr. Stephens, of Sheephouse, Herefordshire: his name was CHANCE. In 1854 he bought a bull in Shropshire of Mr. Steadman, of Bedstone Hall: his name was VALENTINE, as he arrived on Valentine's day. The last bull he bought was STATESMAN, bred by Mr. Price, of Pembridge: his sire was GOLDFINDER 2D (959). This closes the account, so far as my lamented friend had anything to do with the herd. I now come to speak of the worthy son of such worthy parents; and glad was I to find, on my visit, May 27, that his kind mother, who lives with him, was well. The present Mr. J. W. James succeeded his father. His first purchase was HAPPY LAND, of Mr. Price, of Pembridge; the sire was GOLDFINDER 2D (959). He also bought nine heifers of Mr. Price at the same time, thus showing that zeal descends from sire to son! After this he bought of Mr. Rea, of Weston Bury, SAMPSON (2208), a son of the celebrated SIR BENJAMIN. His bulls now are, DUNDEE (3080), a bull of 80 score weight, and of a high order of excellence. He was bought of Mr. Tudge, of Adforton, and is an aged bull. DUNDEE is by CHIEFTAIN 4TH (2458), dam *Duchess 3d*. DUNDEE won the 1st prize at Stalbridge, the 2d prize at Sherborne, and the 1st prize at Yeovil in 1869, the only times he has been exhibited. The young bull WONDER (3602) was bred by Mr. Rogers, of Coxall, Brampton Brian; the sire was BATTENHALL (2406), the dam *Beau Ideal*. WONDER won the 2d prize as a yearling at Sturminster in 1869, the only time he has been exhibited; his grandsire was the celebrated SIR THOMAS. Besides these two bulls, Mr. James has a splendid yearling by WONDER, wanting only, in my judgment, a little more length.

I now come to cows. *Estella* is a splendid cow, bred by Mr. James; sire SAMPSON, dam *Nelly*—sire of dam, GOLDFINDER. *Estella* won the 1st prize, as a yearling heifer, at the Bath and West of England show held at Hereford in 1865, beating 32 competitors, bearding the "lionesses" in their own dens,—1st at Sturminster, as cow and offspring, in 1867; 1st at Falmouth, as dairy cow, at the Bath and West of England in 1868; 1st at Dorchester, as dairy cow, in 1868. I saw also *Dolly Varden*, with a most splendid heifer calf running by her side in the field. I could not help making a note :—Sire, SAMPSON (2208); sire of the dam, GOLDFINDER 2D (959). *Dolly Varden* won four 1st prizes. In the same field, besides noble graziers, I saw another noble cow and calf. I now come to heifers. There are three noble yearlings, which will hereafter speak for themselves. I pass to *Lisette*, sire VALENTINE; she took the 1st prize and silver medals at Birmingham and Smithfield Club Show. The same year she took the 1st prize at the Bath and West of England Show at Dorchester, beating LORD BATEMAN and others. The next is *Beryl*, two years old, sire SAMPSON (2208), dam *Pretty Grand*, sire SIR BENJAMIN. *Beryl* won the 2d prize at Southampton, at the Bath and West of England Show, in 1869; 1st in pair of yearlings at Stalbridge, in 1869; 2d at Sturminster, as ditto, 1869; 1st at Sherborne, and 2d at Yeovil in 1869. I now come to two most remarkable fat heifers, one of which will be selected to go to Islington this year. They are three years old. The largest, with fine quality, is *Helen*, sire ENOCH ARDEN, dam *Maud*, sire SAMPSON. *Helen* won three 1st prizes. The next is not so large, but a perfect beauty—*Miss Wren*, sire SAMPSON, dam *Laura*, sire of dam, GOLDFINDER 2D. *Miss Wren* won nine 1st prizes, including 1st in her class at Plymouth as best Hereford cow or heifer, special prize as being bred and fed by the exhibitor, and extra special prize as being the best female in the yard, either Shorthorns, or Devons, or

Herefords; this was at Christmas, 1869. Mr. James lets two or three dairies. I had not time to review them. His father let three, but I do not know whether he retains the third.

I now come to calves. Mr. James has saved two bull calves—one of them of great length. He has saved this year 31 heifer calves, of which I bought two of the five best to come here. I saw 28 2-year-old heifers and 26 yearlings, some of each of great merit. The half has not been told. It is a land of wonders. You must go and see for yourself. It is well worth a long and expensive journey. You will be charmed with the family no less than with the Herefords. Under any circumstances Mr. James would receive you graciously and with sincerity and truth—peculiarly his attributes; but if you used my name it would act as a talisman, and you will get a reception such as no one but SIR BENJAMIN (1387) should expect to receive! In fine, long may my friend (I have carried him in my arms) live and prosper, and continue, as he has hitherto done, to adorn the noble and valuable class to which he belongs—the English yeoman. Mr. James has won 40 prizes in the last two years, and 95 prizes since he commenced the Hereford warfare! *W. F. Radclyffe, Okeford Fitzpaine, Dorset.*

POULTRY.

A CORRESPONDENT sends us the following method of preserving eggs:—Several years ago we preserved a quantity of eggs by dipping them in melted mutton fat, and as soon as this was cool dipping them a second time, that the places where they were held by the finger and thumb might also be covered and made air-tight by the melted fat. They were then stored in a large earthen pan, and if the experiment had stopped here it would have been quite successful, as the eggs were perfectly good some months afterwards, but the recipe said that the space between should be filled also with mutton fat, and this became so hard that the cook in trying to separate the eggs overheated them, so that they were of no use, though as fresh as when put away. *G. E. O.*

—— The hen mentioned by "G. E. O." (p. 816) has probably diseased ovaries, and is very unlikely to recover, and should certainly not be used to breed from. *H. S. W.*

THE GREAT SEWAGE QUESTION.

LIQUID *versus* DRY.

FOR a long period I have been a regular reader of your paper, and no subject of the many that have been under discussion in its columns has excited my attention more than the great sewage question. The recent articles reporting results at various places where the liquid distribution of sewage is adopted have induced me to write this letter as a contribution on this very important subject, which is at present only in an early stage of development.

Your review of a work in a recent number on Chinese Agriculture was to my mind excessively instructive, bringing, as it does, the practical experience of such a vast empire as China to bear upon a matter which, until within a comparatively recently date, was thought beneath the notice of ourselves.

The proper utilisation of town sewage has become a question between two parties, one advocating the liquid form of its distribution, the other dry deodorisation and subsequent application to the soil. Before going further, I may state that after three years' practical test of the dry system, both in private houses and in yards public to many cottages, I am strongly an advocate for its adoption in preference to the liquid, but should prefer to see both systems in use at the same time, each system doing the work for which it is best adapted.

The advantages claimed for sewage irrigation are manifold, but the great cost of sewage works in towns, and the comparatively small return in value for the sewage supplied to the land, should make the authorities in places where sewage works have not yet been established, pause and weigh well the relative good which may be obtained from this plan as compared with the other.

Taking, as an example, the town of Cirencester with 7000 inhabitants, let us see what is its condition as regards the subject before us. The drainage of the town is only by shallow drains, discharging themselves at short distances into the nearest points of the small river that runs through the town, and is called the Chur. It is obvious that these drains are applicable only for storm water and the overflow from cesspools, into which at the present time everything of an offensive kind is placed, until by accumulation a necessity for its removal occurs.

The soil on which the modern town of Cirencester is built is, to a very great extent, what is called a made soil, or rather the accumulation of centuries of the *débris* of former cities on this same site. The natural foundation, however, is gravel interspersed with clay-beds and stone strata.

The water supply of the town is never failing, and is derived from shallow wells, dug in the gravel, it consequently happens too frequently that a cesspool, containing every sort of abomination, is in close contiguity to the well from which the daily supply of water is obtained, and sometimes it has been discovered that open communication has existed between the two wells—in the summer time the cesspool contributing to the drinking well, in the winter the gravel-water rising in the cesspool.

For many years we have had the subject of dry closets brought under our notice by one of the Improvement Commissioners, who is enthusiastic as to their efficiency, and believes in the possibility of their ultimate universal adoption.

Encouragement has been given to the inhabitants by the Commissioners for the use or these dry closets, the authorities having undertaken to remove, without charge, twice a week, the accumulation of refuse, and to supply in summer, when ashes are scarce, such other deodorising material as may be necessary.

Many of these appurtenances have, in consequence of this regulation, been erected, and Earl Bathurst, who is a large owner of cottage as well as other property, has caused several of his premises to be fitted accordingly, but having a steward who knows something of Chinese farming, his lordship gets the refuse removed to his own estate, instead of leaving it for the public scavenger.

I am strongly of opinion that in towns situate similarly to Cirencester as respects sewage, it would be a great advantage were the dry system made compulsory so far as the mere human excreta are concerned, and this being accomplished the existing shallow drains and cesspools would be harmlessly and beneficially employed in carrying out of sight the impure water from the washing-tubs, &c.

The cost of converting existing closets into such as have been put up in the town during the last six or seven years is very trifling, in many instances not equal to the cost of once cleansing a large and offensive cesspool.

I may add that on my own premises, and for the use of a large family, I have two of these closets, which have been in use more than three years without a single penny of expense for repairs or anything else. Being a public officer, I have made them known to the public, and have received more visitors to see them than would probably be believed; I am, however, glad to know that seldom are they inspected that the number of them is not increased in consequence. *George Jones, Town Surveyor and Sanitary Inspector, Cirencester, June 7.*

P.S. The great advantage of the dry over the liquid system is its economy, both as regards the first object, namely, the removal of offensive matter from our habitations, and also the enhanced value of the sewage itself.

PRESENT APPEARANCE OF THE CROPS.

BERKSHIRE: The Wheat on the strong land is looking pretty well, but a good deal has lost stock, and does not look promising for a good crop. Barley and Oats, where put in forward, look fair, but the later sown have come up uneven, and are suffering from the drought, especially on the chalky land. Winter Beans are very short, and Peas look bad. The grass is a very bad crop, with the exception of a few pieces of Sainfoin. *Wm. Dewe, Southbridge, Streatley, June 8.*

DEVON: I never remember the plant of Wheat varying so much as it does at the present season in this neighbourhood. Many acres have been ploughed up; certain fields are patchy, with a very thin plant; other fields, again, are extremely good, and promising for an abundant crop, though, on taking the matter as a whole, I think I may venture to say, if we get favourable weather we may reasonably expect an average crop of Wheat. Barley and Oats, in all well cultivated lands, are very promising. Hay crop very light. Mangels and Swedes, although suffering from the fly in some instances, are progressing very favourably. Potatos promising to be good. Grass very scarce indeed, and where the stockmaster has neglected to provide Trifolium and Vetches, or other green food, the stock is suffering greatly, and men are driven to the grass sales, and giving 100 per cent. more for grass than it is really worth. I have not seen a Wheat-ear yet, but think I may in the course of a few days. *John Wills, Southfetherwyn, Launceston, June 7.*

DORSETSHIRE: With the warmer days and nights of the last few days the Wheats are tillering favourably, and many a spot with but a thin plant is warning the farmer that too great haste to plough up a thin plant is not wise. Still, with all the improvements making in this crop, it seems unlikely that it will be at all favourable this year. Barley, where sown early, especially on winter-ploughed land, is looking well, and we should say, judging from our own experience, that the thinner seeding, say from 6 to 8 pecks, looks the most promising when sown after Swedes. In soil not of a fine "tilth" the seed has behaved like that that fell among stones, it has matted and succumbed to the continued dry weather. Oats look very promising, as they got ahead before any injury from drought could accrue. Beans, both winter and spring, seem to look up better than was at one time expected, but the crop has been sadly mauled by the Sitona lineata, the Pea weevil, which we shall anon notice at greater length. They are now recovering this, and though they will be short in burden they seem to blossom well. Peas were literally eaten down to the bone with the Sitona, and more especially the white sorts. Being at our wit's and with our own crop we determined to pass a medium light wooden roller over them, which seemed to act by magic; doubtless many of our enemies were crushed to death, while the smoother soil spoilt their hiding places; however, these migrating creatures were so disturbed that they went off to our near neighbour, whose crop was a little later, and we hope that he sent them on by the same means, as it is comparatively easy to roll, and, if the roller be followed with the hoe as soon as may be, we find it freshens up the old shoots, and makes new ones spring from the bases of these, and the injury is quickly repaired. In our own crop we are happy to say that the means employed, followed by the rain, have happily left us with a promise of a fair crop. Seeds have come up but badly, and we fear the young plants have greatly suffered from the drought. With us they are much as they were in the dry summer of 1864. They are not late this year, as they have prematurely run up to stalk, but the bottom is so poorly filled up that at best the crop will be small, and this may be said, even more emphatically, as regards meadow hay. Under the circumstances, then, we should advise haymaking to be set about as soon as may be, for then when rain comes we shall have something worth feeding off for the autumn; and good autumn meadow feed gets on stock so fast, that little hay or artificial food is required for their winter finishing. At present Mangel Wurzels are up well, and the dry weather will assist in weeding and cultivating them. Potatos have recovered the frost of May 4, and crops are now looking healthy and well. *J. S., Sherborne.*

EAST LOTHIAN: The breadth of Wheat is rather under average, part having been ploughed up in spring and re-sown with Barley. A number of fields remain thin in plant, but there are a number of unusually fine fields, and all have an excellent colour, so the crop may still be an average. Barley in general looks promising. Oats rather inferior, all suffering from drought, and a portion very poor. Beans are very promising, and Potatos have seldom looked better. Turnips are in great jeopardy from the extreme dryness of the soil and the attacks of fly, a good braird is hardly to be seen. The hay crop must be a very poor one. *F. B., June 8.*

ESSEX: I regret to say my account of the crops in this immediate neighbourhood cannot be at all good, as we are suffering dreadfully from the drought, and much of the spring corn will now be very bad,—if the weather lasts another week it must be wretched. There is some fair Wheat on the clay land, but even the best of it is better in colour than in reality, and does not bear inspection, it will be short in the straw; but from the dry weather will probably shoot out a good head, and, if it has a fine blooming, will yield well according to the straw. Grass and Clover very, very bad, and not one-third of a crop. Peas and Beans, whether winter or spring, do not promise well, and this continued dry weather is against them. Just now I think it is impossible to give a fair report of what the crop may be should we soon get genial rains, if we do not the young Clovers in the corn must be ruined. This is a very serious loss for another year. Mangel Wurzel varies in plant, and does not grow. Very few Turnips, or Kohl Rabi plant. *John Clayden, Littlebury, Saffron Walden, June 8.*

—— The general impression is that Wheat will be a full crop on well farmed stiff and deep lands; that straw will be short and stiff; that a great deal of Wheat has been ploughed up and resown with Barley or Oats; that it is a bad light land season for Wheat, and that on such lands much harm will be done by continued drought. The hay crop so far is a failure, where we had 27 cartloads last year on 8 acres, there are not now seven; fortunately we have only 14 acres of permanent pasture, but seeing that we have in the United Kingdon nearly 23,000,000 of acres in pasture, the deficiency must be important. I hear that Clovers are patchy, and in some cases giving in to the drought. I hear of rain elsewhere, but Essex has not been favoured, nor, I believe, Suffolk and Norfolk. *J. J. Mechi, Tiptree Hall, near Kelvedon, June 7.*

KENT: I again forward to you an opinion on the crops in this neighbourhood. On our heavy and well-farmed clay soil Wheat will be a tolerably good crop, as on this class of land the wireworm has done but little mischief; a close observer would find the plant somewhat deficient for a heavy crop—the fields of Wheat look best at a distance, owing to the deep green colour, whereas upon close inspection the deficiency is at once seen. I think this deficiency is somewhat owing to a protracted and late winter's frost, accompanied with a very severe north-east wind; this class of land will produce the best Wheat in this neighbourhood. The frost and wind did sad havoc on the winter Vetches, this crop being nearly a failure—in many fields completely so. On our light soils the Wheat has much lost plant, through the depredations of the wintower, even in some fields to the extent of one-third of a crop. I am afraid the yield of Wheat will come under our expectations when the crop is threshed, as under the circumstances above-named one cannot well judge the produce now. Oats up to this time have looked well in most fields; some pieces are more or less eaten by wireworm, but this crop is now in want of rain, which must soon come or otherwise Oats will go off in colour, and the produce will be light

and indifferent seed. Peas and Beans are an indifferent crop, the latter being in many instances but a few inches out of ground and coming into bloom. Our prospects for roots at present are cheerless; this, in conjunction with the prospect of an exceedingly meagre hay crop, makes us look forward to next winter's supply of fodder with doleful faces. Our prospects at the present are anything but cheerful; "and what of the agricultural labourer next winter, should our harvest prove according to present appearances?" Pastures have now a parched and burned appearance, require a good soaking rain and warm nights to revive them; but I think the frosty nights, followed by sunshiny days, have produced the greatest mischief upon the pastures. April and May have been much deficient in amount of rainfall. I have registered but 1.84 inch for the two months, being about 1.20 inch below the average. *John Avery Buckland, Frogs Hole Farm, Biddenden, Staplehurst, June* 13.

LEICESTERSHIRE: The Wheat in this immediate neighbourhood is looking very well, and promises a full crop. Oats and Barley a fortnight since were equally so, but the last week or two they have gone off very much from want of moisture, and are looking yellow and bad; if we don't have rain soon, they cannot be anything like a crop. Winter Beans are thin and bad, but spring Beans and Peas are very promising. Mangels (unless where sown very early) have come up badly, and are thin. Swedes likewise, in some fields, are badly gone through the fly. If we don't have rain soon, the consequences to the graziers will be very serious, as we have not had a drop of rain for weeks, and the pastures are quite dry and burnt up; a great many cattle being still fed with hay, of which there is a good lot left, but the prospects for this season's hay crop are wretched. *George Turner, Jun., Alexton Hall, Uppingham, June* 8.

LINCOLNSHIRE, SOUTH (*Wisbech District*): Since my last report, dated May 4, there has been one long-continued drought up to last Saturday afternoon, when the rain began to fall, and continued falling gently until Sunday morning, 5 o'clock, and was followed by a cold dull day, which gave the rain an excellent chance of thoroughly getting into the land. To-day (Monday) has been very hot and sunny, and I fear that we shall have no more rain at present, although we should be much benefited by it. The Wheats, which have lately been going off and looking unhealthy, already show signs of improvement in colour, although so short a time has elapsed since the rainfall; however, taking the whole district through, the crop cannot be heavy, for there is nowhere a thick plant, and in many places it is miserably thin. The Oats have had a very trying time of it lately, for in many instances the wireworm attacked them in their young days, and the long dry season has rendered their growth very slow, and although the rain has come at last still they must be very short in the straw, and I fear the yield will not be much better. Barley is not much grown, but where it has been sown early it looks well, and there is a chance of lowland Barley being again fit for the maltster, as it was in 1868, but of course this will depend upon the condition in which it is harvested. Mustard, which is largely grown in this locality, is now in full flower, but the season has been much too dry for a large crop of this seed, and the average produce I think will not exceed 16 to 18 bushels per acre this year. It is to be hoped that the mustard-crushers will fix the price for good brown seed sufficiently high to leave a margin of profit to the grower, even with this small yield. Potatos are looking well generally, but I hear of one or two instances, in which the Scotch seed have been used, where the tubers have rotted in the ground, from which I infer that the Potatos must have heated in the vessel during the transit from the Scottish port to Wisbech—the rain of Saturday might well do this crop a great deal of good. Mangels: Early-sown are very well, and are being singled out; but wherever they have been drilled since the first week in May, there they have remained until now, but this glorious rain will doubtless start them. But our chief cause of trouble is the scarcity of grass; for a long time the bullock pastures have been quite bare, and the stock have either been put upon rations of artificials, or have remained *in statu quo:* and sheep have had to work hard for a living, instead of getting fat. Of hay there will be scarcely any, and many of the meadows laid in to be mown have been stocked from dire lack of pasturage for the cattle. *Nemesis, June* 13.

MID-LOTHIAN: It is yet too early to give anything like a decided opinion as to what the crops in this district will be when they come to maturity; as to what they now are I may say Wheat suffered severely from maggot, and a larger breadth has been ploughed down and sown with Barley than in any year for the last 30, and much that has been left might also have been similarly treated, as many fields are very thin of plant. Spring-sown corn is well planted, but now suffering from want of moisture, and will be very short of straw unless we have rain soon. Potatos never looked better at the season of the year. The Turnip crop does not promise well, nearly all the early-sown Swedes, having been cut off by the flea or beetle, have been ploughed down and sown with yellow and common Turnips. Hay must be much below an average crop, from want of moisture, and pastures are suffering from the same cause. Few Beans are sown in the district, but they promise well. These remarks may apply not only to this district but to the whole district extending along the coast from Edinburgh to beyond Dunbar. *Dalkeith, June* 8.

NORTHUMBERLAND: I find it necessary already to supplement my report (see p. 807) as to the appearance of the crops. The last three days have made a very great change for the worse, both on corn, grass, and Turnips, and in many places they are all three past recovery, even if rain should fall, of which there is no more appearance than for weeks back. If we have not rain immediately, crops of all kinds will be in a much worse case than either of the last two years. *Thos. P. Dods, Anick Grainge, Hexham.*

—— *North:* Wheat—little more than half the usual breadth sown—a good colour, but very thin in the ground. Barley came away well, but is now suffering from the dry weather. Oats suffering very much from want of rain. Beans short in the straw, and not likely to be a good crop. Hay will be a light crop. Turnips: the land has worked well, and most of it is now sown, in good condition, for the first time. The Turnips came away well, but the fly and a frosty night, together with the dry weather, have taken nearly all the early ones off. Everybody in the neighbourhood is busily engaged re-sowing with yellows, whites, &c., and in consequence there will be a very small breadth of Swedes; in fact, if we have not rain soon, we shall have very few Turnips of any sort. Potatos look pretty well as yet, but want rain. *George Laing, Wark, Coldstream, June* 9.

OXFORDSHIRE: Wheat a fair crop, not heavy. Barley looking well, but wants rain. Oats and Peas fair crops, but want rain. Spring Beans, good plant, but short in the straw. Mangels, good, mostly hoed out. Swedes, good plant, just coming to hoe. Winter Vetches, a bad crop; Spring ditto, a good plant, but wanting rain. Clovers, very short; seeds, ditto. Sainfoin, a good plant, but short. Meadow for hay, very bad. Rain much wanted. *F. J. D., Kirtlington, June* 6.

SHROPSHIRE — *North:* All crops here vary very much in appearance. Generally speaking Wheats are thin, and the plant in many places weak and of an unhealthy appearance; many acres have been ploughed up and sown with spring corn, a really full healthy crop is quite the exception. Barley has much improved of late, and now looks very promising, but would be all the better for some rain. Oats look well. Peas and Beans have a very wretched appearance generally. Potatos look healthy, but the continued dry weather will be against there being a full crop. Mangels have not germinated evenly, what have come up are at a standstill for want of rain. There seems a poor prospect of a Turnip crop if the present dry weather continues, what has already come up is either taken by fly or has withered, and will have to be sown again; a great breadth yet remains unsown. Grass is very much burnt up; hay and Clover will be a very short crop. *W. Dickenson, Palin, Wilcott, Baschurch, June* 6.

SUFFOLK: For nearly two months we have had no rain. The Wheats on good soils bear the drought well, and on most soils the Wheat crop will get through the drought with but little injury. Late-sown Barleys are very short, and Barleys generally are suffering much from the dry weather; on sandy soils they must be more or less a failure: on all these will be a lack of straw. Winter Beans are good on heavy lands; spring-sown short. I have seen a few good pieces of Peas; the layers are thick but short. A good many are busy cutting, making, and carting Clover. Hay will hardly be worth cutting on upland meadows; on the low meadows it is a short crop. The pastures are getting brown and bare, and the prospects for flocks and stock feeding, now that the Mangels are consumed, are becoming serious. Green crops:—Potatos look well, but few are grown, mostly for home consumption. Mangel and Sugar-Beet: a few early pieces are up, and suffering terribly from the drought. A great many have sown, but not got a plant; all are waiting for rain to sow afresh, or if it does not come directly, to put in Swedes. The fields are also ready for white Turnips, but none can be got in till after the rain. I noticed several farmers sowing Mangel and Swedes last week, ploughing, ridging, and drilling simultaneously. Every grain of moisture is thus turned to account over good soils. Perhaps enough might be obtained to make the seeds sprout. Others, again, had sown seeds of Mangel on the flat, also a good plant in dry seasons. It is not wise to be in too much of a hurry to plough up Mangel or Beet; the seed lies long dormant when dry, and it will, if good, spring forth into rapid growth the moment the rain falls. The short grass in the meadows is rushing into flower, and hay-making will be generally attempted within a week or a fortnight. Alas! much of it will not pay for the cutting. It is said that "Rain in June puts all things in tune;" but unless it comes very soon, I fear many farmers will be very much out of tune at rent-day this season. Prospects at present are indeed gloomy. With the exception of Wheat, the whole of the crops are in much danger of failure more or less complete. *D. T. F., June* 8.

YORKSHIRE: As regards the present appearance of the crops in this district I may say that a deficiency of Wheat plant is complained of; this I do not believe to be general, but confined to some of the poor cold clays and worse descriptions of the lighter soils. On all good and well farmed land, the plant maintains a healthy colour, and with a timely rain would promise well for a full crop; but on some of the thin soils colour has succumbed to the drought, and the crop on them is likely to be very deficient unless we have rain very soon. Spring-sown grain, Oats, and Barley brairded as strong and evenly as could be desired, and up to the present time have progressed very favourably, but, as in the case of the Wheat, or even more so, the prospect for a crop now very much depends on an immediate fall of rain. The Swedes sown early came up well, but have suffered much by the ravages of the fly. We hear of some fields being entirely destroyed and resown, the second prospect at present being no better than the first. Many fields sown lately will not braird until we have rain, and altogether the feeling as to the future of the crop is not assuring. The hay crops, good or otherwise, hinge on an immediate fall of rain, but in any case we think they cannot now attain to an average, and if we have not rain they must be very light. *W. J. Moscrop, Olliver, Richmond, June* 7.

—— *Leeds:* Wheat is in general looking well; on wet lands it has perished in places; summer fallow Wheat looks very well; Wheat after Beans does not look so healthy, but may make a crop. Oats and Barley are at a standstill for want of rain. Beans, not much grown about here,—my crop (winter-sown) suffered from the cold winds, and I filled in with Peas, hoeing the Peas in: they are doing well, began to flower on May 25, are in full flower now. Tares, early-sown, good, late-sown want rain. Lucerne seldom grown about here; that which I have wants rain. Meadows will not bear a heavy crop this year unless rain comes soon; and pastures, where heavily stocked, will soon be bare. Rye-grass and seeds are doing better than meadows in most cases where they have been well manured for the winter. Haymaking will be general in about two weeks. Swedes want rain, the first sown Swedes will hardly make a crop, unless rain comes soon; the later sown Swedes are better, but want rain. People are waiting till rain does come to sow white Turnips. Potatos look healthy, and are coming up well. *E. H. Marshall, June* 8.

THE VALUE OF MANURE.

MR. LAWES.

AT p. 511 you reprint a Table of the estimated value of manure obtained from the consumption of various articles of food. These estimates are those given by Mr. Lawes, in his paper read before the London Farmers' Club on April 4. And in this Table I find that Mr. Lawes values the manure from the following articles at the following sums:—

1 ton of hay (meadow)	..	..	£1 10 6
,, bay Clover	..	..	2 5 6
,, wheat-straw	..	..	0 12 6
,, barley-straw	..	..	0 10 9
,, Mangel	..	..	0 5 3
,, Swedes	..	..	0 4 3
,, Turnips	..	..	0 4 0

Again, at pp. 775 and 776, you publish an article by Mr. Lawes, in which he gives us some figures about a farm of 400 acres, and he estimates the crop and the dung thereon.

Now I am not going to question these figures in any way; I am going to test his valuation of manure by his own figures. Mr. Lawes states that a farm of 400 acres in a poor condition, and producing 100 acres of Wheat, 100 acres of Barley, 100 acres of hay, and 100 acres of roots, might be estimated to yield as follows:—

Roots	..	..	600 tons.
Hay	..	..	100 ,,
Barley-straw	..	..	78 ,,
Wheat-straw	..	..	107 ,,

and that such a farm would produce 649 tons of dung.

Let us then calculate, according to Mr. Lawes' Tables of values, what this dung ought to be worth. He does not say what the roots consist of, but I shall assume that half were common Turnips, one-fourth were Swedes, and one-fourth Mangel. As to hay, I shall assume half to be Clover hay, and half to be meadow hay, which I suppose will represent fairly Rye-grass and Clover hay grown on a four-course farm. And then, taking the valuation as given in his Table, the value of these 649 tons of dung ought to be as follows:—

300 tons Turnips, at 4*s.*	..	..	£60 0 0
150 tons Swedes, at 4*s.* 3*d.*	..	..	31 17 6
150 tons Mangel, at 5*s.* 3*d.*	..	..	39 7 0
50 tons Clover hay, at 45*s.* 6*d.*	..	..	112 15 0
50 tons meadow hay, at 30*s.* 6*d.*	..	..	76 5 0
78 tons barley-straw, at 10*s.* 9*d.*	..	..	41 18 6
107 tons wheat-straw, at 12*s.* 6*d.*	..	..	66 17 6
885 tons producing 649 tons of dung, worth			£430 1 0

But as there are just 649 tons of dung, that would make the value of each ton, according to Mr. Lawes' Table of values, rather more than 13*s.* 3*d.* Now, would any practical farmer in England give 13*s.* 3*d.* per ton for common farmyard dung, made

from the consumption of the articles named above, namely, roots, hay and straw grown upon the farm, and without the addition of any bought food?

Looking at the long list of articles, the value of which Mr. Lawes gives in his Table, I suppose we may assume that those values are ascertained by chemical analysis and not by actual experiment. Mr. Lawes, no doubt, is a very great experimentalist. He has made some of the most useful experiments that have ever been made for farmers, but he could scarcely have experimented in so many substances to determine, by actual experiment, in observing its effects, the value of the dung from each article.

If, then, these values are simply the values ascertained by analysis, I think it is open to us as practical men to doubt the standard by which he fixes those values. I have no pretensions to be a chemist either in practice or in theory; indeed, my knowledge of chemistry is very small; so that, in judging of these matters, I can only test them by the principle of common sense and by analogy.

As I take it, a chemist fixes upon certain articles as being useful manures, and having ascertained what is the cost of those things artificially produced in the most economical manner, he assumes these to be their value in whatever manure they may be found. It seems to me, however, that there are several elements of error in this. In the first place, a chemist may fix on certain things as being the most valuable portions of a manure which may really not be so valuable at all; and in the second place, he may altogether overlook other substances which occur possibly in very minute porportions, but which, nevertheless, may be extremely valuable. Another source of error consists in the basis by which he fixes the price or value of each article. For instance, salt exists in minute quantities in the blood of animals; but if we were to say that the price or value of salt was represented by the expense of extracting it from blood, we should get a very exaggerated idea of its cost or value.

Now, I do not know on what basis Mr. Lawes fixes the price or value of the various elements he finds in farm produce, but it seems to me that the most sensible way of fixing that value would be to assume that a ton of ordinary farmyard dung was worth a certain amount as manure, and then to work back from it and fix the relative values of the various species of farm produce as manures. I have shown above that Mr. Lawes' present Table of values brings out ordinary farmyard dung, made from the consumption of roots, straw, and hay, grown on land in poor condition, to be 13*s.* 3*d.* per ton. But I think most farmers would agree with me in saying, that such an amount is a very excessive value to put upon it. A dressing of 20 tons of dung to the acre is considered a full dressing for land, but 20 tons of dung at 13*s.* 3*d.* would cost £13 5*s.* If, however, we fix the value of dung made from the articles named above at half the value Mr. Lawes would by his Table put upon it—or, say, 6*s.* 7½*d.* per ton—then the Table of values which Mr. Lawes has drawn up would be a useful document for a practical farmer. I would not like to buy dung made from hay, straw and roots at 13*s.* 3*d.* per ton, but I should not object to buy it at half the money; and if this rule holds, then we have simply to halve the values which Mr. Lawes has affixed to the various articles in order to make his Table a very useful one to a practical farmer. Mr. Lawes, in his letter to you at pp. 775 and 776, incidentally alludes to another matter, which is one of considerable interest to many farmers, and that is the weight of dung we may expect to find upon a farm according to the produce grown upon it. Mr. Lawes estimated that 885 tons of hay, straw and roots would produce 649 tons of dung, and from observations which I have myself made this is pretty nearly the quantity I should have estimated. I have no doubt whatever that Mr. Lawes' data for calculating these quantities are more valuable and more to be relied upon than anything that I can offer, and if he would favour us with them I am sure your readers would put a high value upon them, as he is unquestionably a very accurate experimentalist. My own rough way of estimating the probable weight of dung is as follows:—

1. Each ton of roots may be estimated as giving a quarter of a ton of dung.

2. Each ton of hay or straw consumed by an ox, that is to say eaten by him, may be estimated as giving 1 ton of dung, a large proportion of which of course is simply water.

3. Each ton of straw, used for bedding and trampled into dung, may be estimated as producing 2½ tons of dung.

Now, with these rough rules, I will calculate what dung I should have expected from the 885 tons of farm produce in question. I reckon that all the roots and all the hay are actually eaten, and that half the wheat-straw, or say, 53 tons, are eaten, whilst the remainder of it, 54 tons, and all the barley-straw, 78 tons, was used for bedding, and, therefore, was trampled into manure.

The following, then, would be the quantity of dung which I should expect to find:—

Roots, all eaten—600 tons should give	..	150 tons.
Hay, all eaten 100 tons should give	..	100 ,,
Wheat-straw, eaten—53 tons should give	..	53 ,,
Wheat-straw, trampled—54 tons should give		135 ,,
Barley-straw, trampled—78 tons should give		195 ,,
Making		633 ,,

which I should expect to find as manure.

Of course, each of your readers will take my estimate *quantum valeat*—for what it is worth. I do not pretend to say that in the two first there is any great accuracy, but as regards the third, which refers to trampled straw, it is founded upon the experiment of weighing out a certain quantity of dry chaff, then soaking it well in water for several days, and, after it has been well drained, weighing it again.

In looking at these figures, too, there is another matter brought prominently out by them which has many a time occurred to my mind, and that is, what is a fair dressing of farmyard dung? It is customary amongst farmers to talk of 20 tons of dung as a full dressing, and 10 tons as a half dressing. Now, a little contemplation of the figures which Mr. Lawes gives us at p. 776, will show how very seldom land could get what we call a full dressing. Here is a farm of 400 acres worked upon the four-course system, and when in low condition the whole manure produced is only 649 tons, and if we suppose this all applied to one division, it would only be 6½ tons to each acre of that division, so that each acre of the farm would get dressed once every four years with 6½ tons of dung. If thus we are to give 20 tons of dung as a dressing, it is plain we could only dress 1-12th of the land each year, and consequently it would only get a full dressing once every 12 years!

Look, again, at the same farm when brought into high condition by means of artificial manures and bought food. The quantity of manure has increased to 1069 tons, but if we laid all this in to the 100 acres of roots, which come round every four years, it would only be about 10⅝ tons of dung to the acre once in four years, so that the land would only get a full dressing of 20 tons about once every eight years. Looking at these figures, it seems to me that we make a great mistake when we speak of 20 tons of dung as a full dressing. It would be more consonant with reason to call 10 tons of dung a full dressing and 5 tons a half dressing. *G. A. H.*

Home Correspondence.

Landlord and Tenant: Mr. Lawes' Explanation.—Mr. Lawes' explanation is very acceptable, inasmuch as he states a case, and places it clearly before us. He would give to the tenant £69 7*s.* 6*d.* as the eating value of his extra straw. That is just nothing, for the custom of the country gives that. He would give £84 13*s.* 4*d.* on purchased food consumed. But that, too, is nothing, for in 99 cases out of every 100 a farmer would keep his money in his pocket, instead of spending it to make permanent improvements for the benefit of a tenant to follow him; and he would give £105, at 5*s.* per ton, for the extra dung made upon the farm the last year. That is something, for it clearly proves that the farm must have been vastly improved; yet he will pay this tenant for only the extra manure that he has made the farm produce for the last year, leaving the substantial improvement unacknowledged. Such justice as that will never tempt capital to improve land. This tenant is to be swallowed by the landlord, all he is to get is what he has made the farm produce for the last year in the shape of extra manure. This landlord may put up the rent to a new tenant £105 a year, and start him on improving for another rise as quickly as possible. Mr. Lawes is doubtful as to whether he has shown the tenant justice, for, after stating the case, he writes thus:—"Whether the above amount would or would not be adequate compensation may be a question fairly open to discussion." By this it is clear that Mr. Lawes means justice, although in this case his conclusions are short of it to the tenant. The case is now clearly shown to the public, and I have done. *William Smith, Woolston, Bletchley Station, Bucks.*

Woolston Chemistry.—What a profound knowledge Mr. Smith possesses of animal economy! He says:—"It is quite clear 'G. A. H.' does not understand what he is talking about, especially when he tells us about the lot straw loses when passed through an ox or a horse. You may depend upon it (saith Mr. Smith), if it goes in straw it will come out straw, without leaving behind (from a whole ton) enough fat to grease a shoe-string; therefore, the weight must be (exclusive of the morsel for the shoe-string) the same!" Unanswerable logic! An ox shall eat a ton of straw, and (deducing as much fat as would grease a shoe-string) every ounce of that straw shall be found in the dung and the urine in the shape of straw! Prodigious! The ox is a great chaff-cutting machine; and its urine and dung, which we poor mortals fancy to be in a liquid and semi-liquid state, are positively nothing but dry chaff. "G. A. H." had said (p. 711), "When straw is passed through the stomach of an ox or a horse Mr. Smith may rest assured it does not all come out again in the dung and the urine." But Mr. Smith knows much better: the Woolston oracle hath spoken, and "G. A. H." stands rebuked. Two oxen, each one year old, shall be put into two separate stalls side by side, but separated by a thin partition. Both shall be kept warm and both shall have plenty of good fresh air to breathe, and good sweet water to drink, but one shall have nothing whatever to eat, while the other shall have plenty of good oat-straw (carefully separated from the corn), and nothing else. In a few days, or at most two or three weeks, the one which had nothing but air and water given to it will be dead, and if weighed the carcase will be found to be many pounds lighter than it was when put up,—it will, in fact, have been living on the tissues of its body. The other, which had straw but no other food, will be alive and merry, and will continue so for six months, and if then taken out and weighed, it will be found to have increased many pounds in weight, several inches in height, in length, and in girth, and considerably in strength. Marvellous result! The one ox had air and water, and died several pounds lighter than it went in, the other had air and water and straw, and it is still alive and merry, and many pounds heavier than when it went in. Yet it has had nothing more than the other except some 3 or 4 tons of straw, and the whole of that straw, Mr. Smith tells us, will still be found in the dung and the urine, every ounce of it, except perhaps the hundredth part of an ounce which might be necessary to grease three or four shoe-strings! How wonderful! The straw has been eaten, but the straw is still there, and yet the ox is many pounds heavier! *Ex nihilo nihil fit*—out of nothing nothing comes—said the old Roman, but we now know better! Let us rub our eyes and wonder! There are two lines of Pope with which most school-boys are familiar, from having had them so often for a copy from the writing master:—

> "A little learning is a dangerous thing;
> Drink deep, or taste not the Pierian spring;"

and when Mr. Smith sets himself up to teach his brother farmers, if he would bear them in mind, possibly they might prevent him laying down the law quite so dictatorially. *G. A. H.*

The Wheat Plant.—In answer to the question of "A Young Farmer," Why does the Wheat plant look worst this year after Clover-lea? I may state that we have a field of Wheat here after Clover; about a quarter of it was ploughed up directly after harvest, and the rest was left for about a month. Now, that that was ploughed first has looked well all along, and is a good plant, but the last is a poor plant, and not so good a colour, so much so that it shows now where a ridge was drawn out at the first ploughing, and the casting left till the second; therefore I think, with one of your correspondents some time since, that the failure is in consequence of the soil not having had time to settle before the seed was drilled. I may state that the worst is greatly improving now. *Pitstone, Tring, Herts.*

Farmers Politically Left to Themselves.—What are they to do, or what can they do. The Chancellor of the Exchequer gives them a somewhat easier or less restrictive way to vegetate their Barleys for farm stock to be used as food. A precious few will avail themselves of this supposed privilege, which in real fact is of very little service, as the old practice of grinding it is more efficacious and more valuable as food for the average of farm stock, most assuredly for pigs, upon which they are principally fattened. He also gives them the advantage of carrying a gun upon more moderate terms than a game license; but upon the average of farms this will prove a certain grievance, as no farmer can keep a gun for bird-tending purposes, unless he pays the license of 20*s.* As there is nothing said about revolvers or pistols of any kind, possibly our "crow boys" may use a pistol instead of their "clappers," or their glib tongues. Be that as it may, every one who has observed the habits of crows and pigeons, and some small birds, know full well that they pay very little regard to either. The boy may clap, or rattle, or shout himself hoarse, the birds will merely fly out of his way to another part of the field, to continue their depredations, but the report of the gun and flash of fire does truly alarm them and drive them away. The gun or pistol, then, is a necessity to the "crow boy." There are, in fact, more difficulties put in the farmer's way, and payments to make, from which he was exempt. He can't keep a shepherd dog now, unless he pays a 5*s.* tax; he cannot use his farm-horses for profit even for a day, except upon his farm, without paying the tax (duty so called). "Booning," or road-repairing, is now obsolete with him. But are there no ways open whereby the farmer may recoup himself in some measure? Well, if he pays his 20*s.* and carries a gun, he may shoot a hare, rabbit, or other game, or why do away with game licences? The landlord may interfere, but the number of guns that will be "carried"—yes, at 20*s.* each—will certainly be used more or less in a way the landlord won't approve. Farmers must be watchful. There are many ways in which they are wronged, and they must use their best endeavours to have them redressed and rectified. Take the corn averages. Farmers pay little attention to see that they are correct. It is the duty of the inspector of corn returns to receive the account of the purchases made by each merchant or buyer in his market, to look them over, and to regulate and adjust the quantities and prices, and so calculate the differences as to make a fair and just return, taking, as in many markets, both price and weight into account. It is his duty to ascertain yearly the average weight of each kind of grain in imperial bushels in his immediate district, and upon that ascertained weight he has, and ought, to regulate the imperial

average price of corn by which tithe averages and corn rents are taken. Now, does he do this? Farmers should see to this. Take a market having some 50 or 60 or more buyers. Does he receive their returns? Does he carefully investigate, analyse, and properly regulate them so as to abstract from each and every one a correct average, are all thrown into one general careless account, and a hasty, indefinite, and unreliable average given? These things require to be watched. Some inspectors, according to Government returns, have placed the average weights of corn grown in their districts much too high; some to the extent of more than 5 stones for a bushel of Wheat, 4½ stones for Barley, 4 stones for Oats, &c. Then come in the various heavy payments farmers have to meet under the head of local taxation. Why are they to bear so many and such exclusive burthens? These must be closely watched and scrutinised. Some say local taxes are landlord's taxes, and only another form of rent: queer logic, I think. Be it so, he has no right to bear all the burthen for ever, as he now does. Suppose these burthens to be shared alike by the whole community, the landlord would be thus relieved to the extent of two-thirds of the present payments. Is that all to go into his own pocket exclusively in the form of rent? Certainly not. Whatever tends to the advantage of the landed interest is shared by all connected with that interest. Land will always find its value: undoubtedly it does so at all times. A depressed agriculture always lowers rent and the value of land, and is equally bad for both landlord and tenant; a relieved agriculture is *vice versâ*—it matters not how—and would be a benefit to both landlord and tenant. Their interests are more or less identical. Some farmers take alarm upon the local taxation question, supposing that their crops and farm stock are to be valued and rated above what they now sustain. This is ridiculous. It is these crops and this stock that in any way make the farm profitable for rating now; and it is upon and from these they have to make their payments. Surely the less the landlord has to pay the less he will require of his tenant in some degree; and all farmers are not tenants. The burthen of local taxation is exclusively upon real property—land or buildings thereon—to the extent of two-thirds above what is fair and right; and to relieve this property of this extra burthen cannot fail to be of advantage to it, and must be diffused over all connected with it. *O. F.*

Relations of Straw and Dung.—"G. A. H." writes a great deal, but he does not always write correctly. At p. 810, speaking of me, he writes thus:—"Suppose, then, he weighs out 10 lb. of Woolston straw and puts it to soak in water in a tin vessel for a week or two. Then let him take it out and let it drip until no more water will drop from it, so as to make it as dry as London stable dung, and having so done, let him try if it weighs 40 lb. Then let him tell your readers honestly the result. Tell the truth, Mr. Smith, and if you cannot shame the devil, at all events refute 'G. A. H.'" This professes to represent my estimate of straw and water in a wet state, just as it is taken from a farmyard. Now, let us see what I say about London dung. At p. 678, I write thus:—"Good London dung consists of, say, 1 ton of wheat-straw, value for manure, £1; half a ton of hay, value for manure, 10*s.*; half a ton of corn, value for manure, £1 5*s.*; and say 3 tons of water, which would be the outside." By this it may be seen that my estimate of London dung and straw and water, just as it comes out of a farmyard, are two things. The former I estimate to consist of two-fifths dry and three-fifths wet, for I know that the Londoner does not want to cart more water about than he is obliged, and the latter I estimate at one-fourth dry and three-fourths wet, and I am of opinion that I am not much out in my estimate; but whether I am quite exact or not, it does not matter, for I fix the value of £1 upon the straw and nothing upon the water. Let me give another quotation from p. 678:—"A ton of straw makes four loads or tons of manure, worth 5*s.* per load or ton when fresh made, there is less quantity and weight when rotted down." This is conclusive evidence that I did not tie myself to an exact weight, but to value, and I stand by that now. Let "G. A. H.," or any other man, send to me 100 tons of wheat-straw and I will give £100 for it; but then "G. A. H." will tell me that I shall have the eating value into the bargain. Then I will give him a bit of fat for his shoe-string, and that will make that right.—This is all "truth," "G. A. H.," whether it "shames the devil" or not. *William Smith, Woolston, Bletchley Station, Bucks, June* 13.

"The Blind Leading the Blind."—With regard to the letters and article on the subject of the self-appointed Committee of the British Association on the treatment and utilisation of sewage, the question arises, and should be satisfactorily answered before the acts of the Royal Agricultural Society are impugned:—What prospect of good is likely to be derived from inspections by a number of gentlemen, necessarily as unpractical and ignorant of the subject as those whom they propose to instruct, of the places where sewage is being utilised or wasted, or where experiments for the conversion of it into a portable manure are being conducted? In the first place, there are not many modes of dealing with the refuse of towns; and so far as one can learn from the public journals, and from reports published upon the subject, the number of such is decreasing rapidly, and so the question is practically becoming solved without the assistance of the "jury" who propose to "sit" upon each separate town, and offer the local Board advice in proportion to the subscription made to the committee. Now, sir, what can this committee say of its experience to justify the local authorities in paying it any special attention? If they have any experience at all, their minds are possibly made up as to the course to be pursued, and visiting about the country becomes unnecessary. If they have none, there is no reason why both they and their patients should not both "fall into the ditch." Take the A. B. C. plan: it is either—we will say for the sake of argument—in its infancy, or it is a failure. What can the committee say of that system more than has already been said of it by the Royal Commissioners on the Pollution of Rivers in their lately published report: and so on of all the other systems and places to which the Commissioners—gentlemen appointed by Government from their peculiar fitness for the task—have, and still are, giving their best attention? *A Non-subscriber, London, June* 13.

"West Indian" and "G. A. H."—A good Fowler's implement could be pulled through 13 acres of ploughing daily, or much more, without any risk of breakage. No Fisken's system, that I know of, can be set to work for £525, neither can a good roundabout of Fowler's make be set to work for any such sum. The fault of Smith's tackle is making it too light, and not having the iron properly proportioned. A bar of iron 1 inch square and 2 feet long between the supports, will bear 425 lb. without injury, but if we take a bar 2 inches deep, and half an inch thick, it will just weigh the same, and yet will bear 850 lb., or just double the weight. I do not consider 7½ inches "deep" ploughing, but the ploughing I saw done at Manchester was just 7½ inches, and that is why that depth was mentioned, if I remember rightly. I call 12 or 13 inches deep ploughing, and I have frequently ploughed that depth (with four horses and a Howard's B. B. B. plough) land that had never been ploughed in the memory of any one about here. As to stones to be found at 7½ inches, I have no doubt whatever about finding them if they are in the land; but old wood is quite as bad as stones. I am at this moment draining land which has old trees lying embedded in it, and coming within an inch or two of the surface after it has been pared and burnt. How would "West Indian" deal with them? would he like to put a Smith's smasher into that ground without a friction clutch? *G. A. H.*

Foreign Correspondence.

PARIS.—The French Minister of Commerce, in the name of the Superior Agricultural Commission, recently presented to the Emperor the report embodying the conclusions arrived at by the Commission, after examination and discussion of the immense mass of evidence collected in all parts of France. The greater portion of the document deals with questions which have little or no interest out of France, but some few touch Great Britain nearly; and as in France a Ministerial report may be looked upon as a law all but passed, the recommendations of the Superior Commission acquire double importance. The following are the points of general interest:—*Customs Duties.*—From a general point of view the Commission recognises the principle of freedom of commerce, wisely applied, as favourable to the development of agricultural riches; that agriculture, mother of all other industries, has a right to be treated on a footing of perfect equality with the other branches of national production, and that in any future commercial treaties the attention of the Legislature ought to be directed to the produce of the soil as well as that of our manufactures; in short, that the modifications to be introduced into the general tariff of duties ought to be conceived in a liberal sense, rather with a view to the increase of the national revenue than with that of favouring the tendencies of a protective *régime*. Proceeding to details, and taking up in the first place the question of wool, the Commission did not hesitate to pronounce against the re-establishment of import duties on the raw material. The freedom accorded to the importation of foreign wool appears to the Commission to be in harmony with the general system which at present prevails in our customs legislation. On the same principle the Commission demands the suppression of the surcharge on guano coming from *entrepôts*, and the diminution by one-half of the duties on foreign horses, colts, &c. The Commission pronounces against the free admission of agricultural implements proposed in the inquiry, its opinion being chiefly founded on the view that such a measure could not be reconciled with the system of tariffs, at once liberal and fiscal, of which it demands the adoption, and according to which all merchandise should in the interest of the public treasury pay a duty on entering France. The Commission, at the outset of its labours, at once set aside the question of the legislation upon cereals as completely settled by experience in the sense of the liberal solution given to it by the law of 1861; but it reserved to itself at the same time the examination of the complaints made respecting the temporary admissions of foreign grain duty free for re-exportation in the form of flour. The principal complaint is that under the present system, by a traffic in the bonds, flour may be exported from a point far distant from the port of entry of the corn. Independently of the loss sustained by the treasury, the facilities accorded to the miller have lost their importance since the abolition of the extra dues has allowed foreign corn to be brought into port in foreign bottoms at the rate of 50 centimes the metrical quintal. After a long and animated discussion, the Commission recommends the Government to examine this system with the view to its modification. *Application of Sewage, &c.*—The Commissions dwells with great emphasis on the importance of the application of the waste substances and liquids of towns, and declares that to allow sewage or *detritus* of any kind to be cast into rivers is an injury to agriculture and the country generally. It pronounces in the most decided manner its conviction that the most advantageous mode of applying sewage is without concentration, disinfection, or preparation of any kind, conveying away in the liquid form all the refuse of the houses and streets. "This is the system adopted in the city of London; and the best application that can be made of liquid manure thus obtained is the irrigation of natural or artificial grass lands."

—— The *fièvre aphtheuse* continues to rage amongst the cattle in the Vosges, and more or less throughout the Eastern districts of France. The cattle markets are in consequence ill supplied and poorly attended, for every one fears purchasing diseased animals. The farmers see no hope of the visitation being stopped, as healthy animals arriving in railway trucks in which diseased beasts have been conveyed contract the germs of the malady, and until means of completely purifying the trucks have been adopted the evil must continue, unless all importation ceases. The disease is found in France to be extremely contagious; it is asserted that if a person enters a shed where there are diseased beasts, and then visits another without changing his clothes, he may carry the infection to healthy cattle in the latter. The fact, it is said, has been proved in many instances. It is therefore impossible that a locality into which diseased beasts have been introduced should get free of it while the same railway trucks are used—especially as cattle, when fatigued, fasting, and crowded together, are ready to take any disease. It is urged, and with reason, that special precautions should be taken, now that the warm weather is advancing, when all epidemics assume increased intensity. [The alleged reappearance of the cattle plague in the Department of Doubs, referred to in our columns, at p. 708, proves to have been a rumour without foundation.]

—— The French Government has lately suppressed the duties on salt for agricultural purposes, and this has naturally caused an increase in the use of that condiment, and, as some people believe, to an excessive extent. A member of the agricultural *comice* of Epinal says that, although all animals are very fond of salt, it should be given to them in moderation, otherwise it may prove injurious instead of useful, it is therefore important to fix the proper quantities. The average derived from practice in France is 20 grammes (⅔ oz.) per 100 kilogrammes (2 cwt.) of the weight of the animal, per day, and rather more for sheep and pigs. In such proportions salt is serviceable for fatting animals. The Germans have a proverb that 1 lb. of salt makes 10 lb. of meat; and it certainly contributes greatly to its development and keeping qualities. *G. W. Y.*

Societies.

THE ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.

THE following is the address of the Chairman, Lord LYTTON, in proposing prosperity to this association, on the occasion of its annual banquet last week:—

Among the attributes for which England is distinguished, I know not if there be one which is more remarkable—and certainly there is not one which presents the character of our countrymen in a more amiable light—than that readiness to combine for purposes of charity and benevolence which springs from active sympathy with human suffering. The main distinction between the civilisation of Christianity and the civilisation of the old heathen world is, that all Christian communities recognise to an extent unknown to the most enlightened commonwealths of antiquity the simple doctrine, "Help one another." The ancients had among their goddesses three Graces, to whom they gave in their language the endearing name of "The Charities." Goddesses very charming and attractive were they: elegant companions in feasting, in merriment, and in gallantry. But those charities did not take their stand by the sick bed and the desolate hearthstone. They had no fellowship with old age and decrepitude; no broken-hearted widows knelt at their altars; no fatherless orphans cried to them for bread. Instead of those three heathen charities we have adopted one simple image of Christian charity; we place her, not amidst the hearths of joy, but in the abodes of sorrow; and the only festivals to which we invite her are such as we hold to-day, in order the better to fit her to-morrow for her sacred mission as the benefactress of poverty and the consoler of distress. Now, gentlemen, when I look around me I see many with whom I am familiar—many with whom I hope on some other occasions to become more familiar—who are engaged in the active pursuits

of life; and I think most of us may say that we are that.

It is commonly said that those who are engaged in such pursuits, and in keen competition for gain and power, are apt to forget others in their desire to advance themselves. And yet there are no communities in which that competition for gain or power is so active as it is amongst us of the Anglo-Saxon race; and in no communities are there so many institutions that attest the sympathy of the prosperous for the unfortunate, or in which the desire to aid and serve those who have to struggle against the ills of life, more systematically pervades our public legislation, or more enters into our private habits of thought. So that, perhaps, the truth is in reality, that the more active and busy our lives are, the more our sympathies for large varieties of mankind are aroused and diffused; and our exertions for gain and power bring us naturally so much into familiar contact with the poor and the feeble, that we become more sensible and compassionate simply because objects of compassion are brought more frequently before our eyes. The Samaritans were much more engaged in the active pursuits of life than the priests and the Levites; but when the wounded traveller lay half dead in the public thoroughfare, the priests and Levites passed by on the other side, and it was the Samaritan who bound up his wounds and took care of him.

Amongst all our charitable institutions, speaking honestly and fairly, I know not one which is more entitled to general support than those in aid of which we are met this evening—a support which should not be confined to that class the suffering members of which it is the object of this charity to relieve. For the wealth of our nation has its groundwork in the culture of the soil. It is in proportion as land becomes productive that capital arises for the purposes of trade, commerce, and manufactures. So that all classes may well say, "Speed the plough," because it is the plough which puts in motion the ships of the merchant and the mills of the manufacturer. And yet, gentlemen, while every other class and vocation long since established its special guild or benevolent institution for its unfortunate members, it is only within the last ten years that there has been added to the charities of this country this institution for the benefit of those cultivators of the soil who, while adding to the wealth of the nation, have themselves been overtaken by poverty. There are many who think that the life of the farmer is the most enviable of all, and in many respects it is. Still the life of the farmer is exposed to vicissitudes over which he has no control. This has been the case at all times; but I think I could show that in the times in which we live there is a more special call for the resources of this institution. In all times the English farmer is exposed to the risk of bad seasons in a climate proverbially fickle and uncertain; in all times his flocks and herds are exposed to disease, and his crops to blight and mildew, storm and tempest; in all times he is subject, by the conditions of other countries as well as his own, to great fluctuations in prices, and to the consequent difficulty of calculating profits and guarding against losses; in all times, too, he must be subject to that anxiety and fear of the morrow which preys upon the heart and undermines the health. And if he belong not to one of the higher order of farmers, such as I see to-day, but is one of the working class of farmers, his frame must be always exposed to the inclemencies of the weather, and, stout though that frame may be, he is thus more liable than weaker men who carry on their work under shelter within doors to be suddenly stricken down by disease. And yet, perhaps, there is no vocation in which the eye of the master is more imperatively demanded than in that of the laborious agriculturist.

While, then, at all times the life of the farmer is exposed to unforeseen reverses, this institution, in aid of which we are now met, is the only one existing in which in case of misfortune he can find comfort and relief, a provision for his old age, a pension for his wife, and a school for his orphans. The times in which we now live are marked by circumstances which may perhaps render the resources of this institution still more called for and important. We cannot conceal from ourselves that for several years past a transition state of agriculture has been in operation, and that it must continue in increased activity and force. There is a growing persuasion that a much larger amount of capital than was formerly needed is now required for the due cultivation of the soil. Small farms are being somewhat rapidly melted into large ones, and that old class of farmers whom we may fairly call working farmers, who had little other capital than their own bodily labour and the scanty savings of their own careful thrift—that class is either rapidly disappearing, or, where it exists to any great extent, is engaged in a life and death struggle against the competition of neighbouring tenants, with all the costly advantages of machinery and science at their command, perhaps with some resources at their backs, which enable them to resist the pressure of adverse seasons and fluctuating markets. That change began long before the repeal of the Corn Laws, but that repeal gave to the change an irresistible impulse. The change is inevitable, and if it is for the good of the community, I cannot say that it is not desirable. Whatever brings to any description of business a higher degree of education and a larger amount of capital is not a change which any sound reasoner can deprecate or lament. But in the course of that change there must be a corresponding amount of innocent sufferers, and this institution comes opportunely to their aid. But even when the change shall be completed, even when large farms have become universal, and when the opulent tradesman and the scientific agriculturist shall more and more become eager competitors, at high rents, for the hire of acres in which to invest their capital and hazard their improvements, still we cannot hope that all will succeed. On the contrary, the hope of large profits necessitates the risk of great losses; and thus, perhaps, the uses of this institution may become more demanded when the change is complete than they are now that the change is in course of operation.

Why, I learn from the last report, which I have looked over rather carefully, that among the recipients of your bounty are the former occupiers of large farms at high speculative rents, farms of 500 or 600 acres (Mr. Mechi: "A thousand"). The occupier of one farm paid, I find, not less than £3500 a-year rent. We must not forget that in the course of this transition, in which the old class of farmers is disappearing, with it must also disappear the old affectionate spirit of clanship between landlord and tenant. Formerly there was a kindly, affectionate relationship between the squire and the farmer. The former was naturally—he could not help being so—indulgent towards the man whom he had known in his childhood, whose ancestors had lived there almost as long as his own ancestors; and I don't see how he could be persuaded to set adrift in his old age a tenant who, whether from straitened circumstances, from infirmity, or from obsolete notions of agriculture, was not doing full justice to the land. But when the hire of acres is to become that mere matter of business which political economists tell us, and perhaps rightly, it ought to be; when the sole consideration between landlord and tenant is to be that of rent and contract, you cannot expect that the landlord will have the same affectionate indulgence that he has had heretofore for a failing tenant; and then the uses of this institution may become more urgently required.

Now, in presenting the subject thus earnestly before you, I have not attempted to disguise the fact that it is dry and tedious; but I have dwelt thus minute upon it, in order that I might bring the uses of this institution now and hereafter more visibly, not before the public, but before those distant counties which at present subscribe to your funds in a proportion so light compared to the wealth of the districts and to the agricultural interest there, that I am induced to suppose that in those districts the uses of your society must be unknown. With a few brilliant exceptions, which I shall presently notice, I have observed that, while the Society has been liberally supported in the Home Counties, where its benefits are, I suppose, best known, as a general rule the amount of support diminishes in proportion to the distance of a district from the metropolis. Well, ought that to be the case? This Society offers its bounty impartially to the three kingdoms; yet Ireland, with regard to which we hear a little more about the distress of small tenants than we hear in the case of either of the other parts of the United Kingdom, sends us only one subscriber, and he is a physician at Dublin—long life to him as well as to his patients—while Scotland, which justly prides itself upon its agriculture, and which sets in many respects so notable an example of prudence and of foresight, sends, I think, only five subscribers, one of whom is a duke, and another a bishop. Long life to the duke's order, and long life to the bishop's church! We may be reminded of the old sarcasm, that farthings were first coined in order to enable the Scotch to subscribe to our public charities (great laughter). Yes; but, then, I find that the Welsh seem to think the farthings just as useful to them as they are to the Scotch, or more so, for North Wales and South Wales together only send us eight donors and subscribers. The county of Cornwall exceeds them all in care for the farmers. With the single exception of Earl St. Germans, not one single farthing has that great county contributed to our funds. Derbyshire sends us, I think, nine subscribers. Cumberland and Westmoreland combined send us four; and the wealthy district of Lancashire, which would never have had its manufactures or its wealth but for the agriculturists, in spite of the munificent example of the late Earl of Derby, and of the interest evinced in the Society so sincerely and so warmly by the present earl, who was my predecessor in this chair, that county only sends us 15 subscribers, nine of whom (honour to the town and discredit to the country!) as appears from their place of residence, are not squires, or farmers, or persons belonging to rural districts, but persons residing in the towns of Liverpool and Manchester. Well, then, gentlemen, surely our object ought to be to diffuse as far as we possibly can a knowledge of the uses of this institution among those wealthy but benighted districts. How much can be done by the efforts of a single individual we may learn from the brilliant example of the founder of this institution. I have no doubt that it is owing much, and mainly, to his exertions that we are so greatly supported by the Home Counties in general, and by the county of Middlesex in particular. Perhaps the generosity with which certain Southern districts contrast the parsimony of the Northern counties is also to be ascribed partly to the superior exertions of individuals, and especially of the honorary local secretaries; I mean the districts or counties of Hampshire and Leicestershire.

Being myself the son and the brother of a Norfolk squire, perhaps I may be allowed to say with pride that the county of Norfolk sends us 85 donors and 250 annual subscribers. Well now, I would suggest one very cheap and simple mode of extending a knowledge of the society in those districts which do not at present contribute to our exchequer, and confirming our hold upon those which do: it is, that we should endeavour that at the various agricultural dinners, which take place every year, "Prosperity to the Royal Agricultural Benevolent Institution" should form one of the toasts, and be entrusted to some person of local weight and influence. If he be a farmer of local weight and influence, it will be better than if he were a squire; but at all events let him possess those qualifications. I should like to see such a toast proposed by my friend Mr. Brandram at the next agricultural dinner in Hertfordshire. No one could propose that toast better; and though Hertfordshire—thanks much to him—has done its work worthily, and we subscribe largely, still if the example be once set of bringing the institution fairly and clearly before the farmers of the county, it might be followed at other county festivals and the practice become general. Further, I think that the editors of the great county newspapers should really make a fair mention of the Society; and if, besides this, we could secure in the more distant, and at present niggardly districts, honorary local secretaries who would actively exert themselves to get farmers to take an interest in the work, then, I think, year by year we should be enabled to extend the benefits of this institution. There is one object to which I wish to allude that is only partially carried out, and which, to my mind, is of the highest importance to the community—I mean a provision for the orphan children of poverty-stricken farmers. To soothe and cheer the last days of the old in their passage to the grave is a noble and a lovely charity. But for the community at large it is perhaps of still more importance that the rising generation, which is to influence the days to come, should be saved from the adverse influences of ignorance and destitution, and trained to become useful members of the body politic. I have here to appeal to the ladies who have honoured our festival with their presence. This is an object to which they can contribute, and I cannot believe that the cry of the orphan will fall in vain on the heart of woman. Now, ladies and gentlemen, why have I thus argued? To increase your funds. And, while I have complained of the comparatively small proportion of subscribers, let it not for a moment be supposed that I am dissatisfied with the progress you have already made. On the contrary, when I consider within how short a time the Society has been founded, and how large is the country it has to permeate, I see ample reason for congratulation. Within the past year you have distributed amongst the pensioners nearly £3500, and, besides your annual subscriptions, you have within 10 years accumulated £22,000, which is now invested in the Funds; and while your resources have thus increased, your expenditure has been almost annually diminished; so that the Society presents every ground for encouragement, combining, as it does, a most rare and admirable economy of management, with a benevolence which comprehends in its range affliction and old age, pensions for widows and schools for orphans. Knowing, then, that I appeal to your reason as well as to your hearts, I give you "Prosperity to the Royal Agricultural Benevolent Institution."

DERBYSHIRE

The Agricultural and Commercial Value of Artificial Manures.—Professor Voelcker lately delivered a lecture to the members of the Derbyshire Agricultural Society on this subject.

Dr. HITCHMAN introduced the lecturer, saying: Like almost all men possessing great knowledge, Dr. Voelcker is most cautious in induction and modest in statement, and is ever ready to receive with courtesy and thankfulness any facts which may be communicated to him by practical and observant men. Facts from such a source are always most acceptable, provided they are facts, for it is a sad fact that there are many things alleged to be facts, and given in all good faith by the communicant as facts, which are nothing less than illusions, mistakes, part-truths, or entire blunders, and which, taking the place of facts, act as barriers to progress, prevent or retard discoveries, act, indeed, like sand-shoals in the ocean of truth, until their true nature has been revealed, and the alleged fact is found to be a phantom—what Lord Bacon would have named an idol, called into existence by false perception or erroneous induction. To observe accurately is a valuable quality, and one by the acquisition of which the most humble of us may contribute something to that great storehouse of knowledge from which things new and old are being daily called forth by scientific minds for the benefit and instruction of mankind. I have watched with interest and admiration the career of Dr. Voelcker for more than 20 years; and I confess that his industry, honesty, caution, practical sagacity, and inductive skill have excited my reverence and esteem. He has never been fond of indulging in "sensational" theories, has not emulated the brilliancy, the scientific romance, of some other great chemists,

has never longed to "o'erstep the modesty of nature;" but with child-like docility he has sat at her feet, and with inexhaustible patience awaited her teachings, and then placed them in calm, clear language before his own auditors and readers; and if he has not dazzled us with the splendour of his genius, neither has he led us into quagmires by its delusive coruscations. I am, unfortunately, old enough to remember the hopes which were excited in the minds of ardent agriculturists by the earlier writings of Liebig and his imitators. Enthusiasts began to think that agricultural chemistry was an Aladdin's lamp, to conjure up corn crops from a deal board; and even soberer men expected that any number of crops might be successively raised from any plot of ground by substituting a few pounds of potash for the crops removed. Persons talked in such a manner of manuring a large field with a mere hatful of salts as to call forth the satirical remark that, when that took place, they might bring back the produce in the waistcoat pocket. Those days have passed; and practical chemists like Dr. Voelcker know that there is a wide difference between chemical compounds subjected to the influence of soils, of wind, of light, of moisture, cold, and warmth, in variable and varying quantities, in the external air, and to the added influence of the special vital qualities of the growing plant, and the same compound obediently complying with the wishes of the chemist in the scales and retorts of his laboratory. Dr. Voelcker has conferred great benefits on the cultivators of arable soil, by his valuable analyses, by his description of fertilising earths, by his exposure of the frauds of dishonest manufacturers of cattle food and manures, and by the information he has imparted on the manures best adapted for special soils and seeds; and he has now, under the auspices of that wise friend of the farmer—the right hon. Lord Vernon—come among us, to tell us something of artificial manures and the agencies best adapted for the fertilisation and sustentation of our grass lands.

Dr. VOELCKER said: The subject of artificial manures was of annually increasing importance, for where five or ten years ago men spent their tens of pounds in the purchase of artificial manures they now spend their hundreds, and those who spent their hundreds now spend their thousands. To see how important the question was becoming they need only look at the many manufactories of artificial manures which were springing up everywhere, and at the keen competition which existed between rival dealers; indeed, the dealer in artificial manure had become one of the greatest bores in the market. They could not go into a market without being pestered by some agent for an artificial manure manufacturer, who praised his wares often to the detriment of those of his rivals. There were now makers who produced from 30,000 to 40,000 tons per annum; others 20,000 and 10,000, and some 1000 or 500. Very large sums were invested in the manufacture, and it was unnecessary to say that large sums were paid annually for these manures by agriculturists who must, in the present day, if they would successfully cultivate their land, spend a good deal of money for the purchase of these manures: for the present state of agriculture necessitated the application to the soil of more fertilising agents than could be conveniently obtained from farmyard manure. Seeing that so large an amount was spent on these manures, it was of the greatest importance to the farmer that he should lay out his money to the greatest advantage, and how could he do that unless he possessed some knowledge of the fertilising constituents which enter into the composition of the manures offered for sale? The time was long past when the fertilising powers of certain materials were ascribed to a certain unknown force, and they now knew pretty well on what substance the value—both economical or money value, and the fertilising or practical value—of the manures depended. It was not by any process of cooking or of turning over that they could obtain good manures; they could only secure them by incorporating the right materials. There was a time when a mistaken notion prevailed that farmyard manure should be turned three times, and that it got better every time. Now there was, as was generally the case, a little truth mixed up with the error involved in that idea. To turn manure helped to make it rotten, and rotten manure was better than fresh, bulk for bulk; but by its standing exposed it was apt to lose a great deal of its fertilising properties, and the more economical plan was to cart the dung to the field as soon as possible, and then they avoided the risk of losing a portion of its valuable properties by evaporation or by drainage. They knew well that the value of animal manure depended very much upon what they put into the animal's belly, and that it would be very different if they used plenty of oilcake, or other rich food, than if they gave their stock an insufficient amount of poor food. So with artificial manures. Their value depended on the materials put into them. They might concoct a manure of the sewage matter of London, or Birmingham, or Derby, by sifting out its solid parts, but its fertilising value would be very little, and it would largely consist of soil, clay, or sand, with some organic matter of no great value. They must not expect to get much fertilising matter from town sewage, unless they incorporated with it a good deal of Peruvian guano, or good bone dust, or nitrate of soda. The fertilising value of manures depended mainly on the nitrogenous matters, phosphates, and salts of potash they contained. Nitrogenous matter was derived from animals, and existed largely in blood, flesh, skin, hair, and other refuse animal matters. As a rule ammoniacal salts produced bulk, and phosphates produced quality, and his aim would be to get both.

Artificial Manure.—He would now direct their attention to a few of the common artificial manures. The fertilising value of guano depended essentially on the amount of nitrogenous matter, which was measured by the amount of ammonia it yielded. The fertilising value of guano was declining. Formerly it would often contain 19 per cent. of ammonia, but that was a great rarity at present. A few years ago they might fairly have expected 16 per cent., and often 17 or 18 per cent., with very little insoluble siliceous matter, which was only a long name for their old friend sand. The following table showed the composition of four samples of guano:—

	I.	II.	III.	IV.
Phosphates of lime	25.07 ..	19.31 ..	30.98 ..	42.93
Organic matter:—				
Ammoniacal salts	52.98 ..	59.11 ..	33.94 ..	19.79
Insoluble siliceous matter ..	1.50 ..	1.45 ..	14.50 ..	9.36
Yield of ammonia	17.21 ..	19.30 ..	11.80 ..	4.35

This showed that whilst two specimens of Peruvian guano contained about 1½ per cent. of sand, another, which was evidently adulterated, contained 14½ per cent., and another nearly 9½. The last had once been Peruvian guano, but it had suffered from the action of the weather and the sea water, and its valuable constituents had been washed out. Whilst the first yielded upwards of 17 and the second upwards of 19 per cent. of ammonia, this yielded only 4½ per cent. The ammonia was easily removed by the exposure and washing of the sea, but this specimen contained a good deal of the phosphatic materials, which were not so valuable, and were not so easily affected by the water. It was really guano no longer. Peruvian guano was getting less and less valuable, and if they could this year get it from the Government directors' stores to yield 15 per cent. of ammonia, they would have no reason to grumble, and they would have a good chance of getting only 13 per cent. The manufacturers knew well the difference in the value according to the yield of ammonia. Each percentage of ammonia in a ton was worth 12*s.* to 15*s.*, so that the difference between 13 per cent. and 16 per cent. would be at least 36*s.* in value. If they paid £14 per ton for guano yielding 16 per cent. of ammonia, which they might fairly expect to do, they ought to pay 36*s.* less if the yield was only 13 per cent., all the other circumstances being equal; and he had no hesitation in saying that many a farmer had paid too dearly for Peruvian guano. The importers could always sell the good guano to the manufacturers, and he was not sure whether farmers could not now often buy prepared artificial manures more cheaply than Peruvian guano. At any rate it was manifestly unjust to charge the same for Peruvian guano yielding 13 per cent of ammonia, as for that which yielded 16 per cent.

An inferior guano was perhaps the dearest thing the farmer could buy. Genuine guano was light in colour; it had not a pungent but an aromatic smell, and a cheesy flavour when tasted, which was derived from the undigested fish on which the birds fed, and which disappeared when it had been washed by the sea. The inferior guano was discoloured, and was generally of a darkish brown, somewhat like the colour of varnished oak when neither very new nor very old, and invariably lost the peculiar taste to which he had referred. Inferior guano always weighed more in proportion to the bulk than the best. It should not exceed 68 or 70 lb. per bushel. By applying those tests every farmer could tell whether the article was genuine or not, or whether it was of inferior quality or not. He had had many samples of guano direct from the importers, and from respectable dealers, which contained 12 or 14 per cent. of sand. It had not been mixed with it purposely, but the guano had been scraped too near the rock, and some of the rock had found its way into it. The sand should not exceed two or three, or at most four per cent., as it was dear at £14 a ton. He would strongly urge them, as practical men, to agitate the question of the purchase of guano being so regulated that they might buy it to pay only for what valuable properties they actually received

Nitrate of soda was often used with great advantage, especially for cereals, and it was useful as a spring dressing for Wheat, but like many other manures of high value it was often adulterated, and often a large quantity of common salt was mixed with it. Not long ago a Worcestershire dealer in manure came to him, and asked "What are we to do this season? The price of nitrate is going up so frightfully that we cannot sell it unless it is mixed with salt. If I don't do that my customers won't buy at all." He mentioned that as an example, and all the cases to which he referred had come under his own experience, or were vouched by correspondence: they were not the creations of fancy. Now as the retail price of nitrate of soda was £17 per ton, and that of common salt 16*s.* to £1, it was plain that a mixture of 10 per cent. of common salt would pay very well.

Whilst all manures were very much adulterated, none were so much adulterated as bone dust. It was extremely difficult to get genuine bone dust, as bones were getting scarcer and scarcer. People had learnt to appreciate their value as manures, and they had also learnt to appreciate the comparative value of bone phosphate, in comparison with mineral phosphate.

The superior value of bone phosphate arose from its containing a large proportion of nitrogen, and genuine bone dust yielded from 4½ to 5 per cent. of ammonia. For pasture land he preferred steamed bones to boiled bones, because in steamed bones the fat, which was naturally contained in a large proportion in bones, was removed. Fat, as an element in bones, had no fertilising qualities whatever. It consisted of carbon and hydrogen, and they need not trouble themselves to supply those elements to the plants. Fat was decidedly injurious in its effects, for it prevented the decomposition of the bone dust, and fresh bone would be in the land for many years before it came into active play, the fat preventing the rain from affecting it. Bone dust put into a heap, especially when it was a little wet, heated; and the effect was to cause the ammonia to combine with the fat, and to make what was called ammonia soap, which would not prevent the rain obtaining access to the bone phosphate which was then rapidly brought into operation. Superphosphate was another kind of manure on which he would offer a few remarks. He was often asked to give the composition of a good superphosphate, and also what was a fair price for it. The general answer to the second question was "As much as it is worth." The determination of the value of a superphosphate was not easy. It could not be ascertained by merely looking at it, or handling it, or smelling it. It might be necessary to handle it to see its condition, whether it was dry, and so on; but they could not test its value by smelling at it. Pointing to a table showing analysis of eight specimens of superphosphates. Dr. Voelcker said the value of a superphosphate of lime depended on the amount of the soluble phosphate it contained, and the amount in comparison of insoluble phosphate. The former would be greatest in the case of bone dust, the latter in the case of mineral phosphate, and that made all the difference. Coprolite, which was a mineral phosphate, had hardly any practical value. In the next place the value of a superphosphate depended upon the amount of organic matter it contained, and a very good test of that was the amount of ammonia it yielded. Speaking generally, the value was regulated by the amount of soluble phosphate of lime. The quantity varied from 10 per cent. to as much as 40 per cent. It was entirely a question of what they would pay. They might say, "I pay, say, £6 per ton; what sort of manure should I get for it?" or they might say, "Here is a manure, what ought I to pay for it?" His advice was that it should be bought at a rate fixed according to the quantity of soluble phosphate it contained—so much for each percentage of soluble phosphate—say 3*s.* 4*d.* to 4*s.* per cent.

There was a class of manures termed phospho guanos: some of them were very good. They were a mixture of phosphates with ammoniacal salts. They were sold under various names. Their value depended on the amount of soluble or insoluble phosphates, and the amount of ammoniacal salts which were present. Another class was that of nitro-phosphates, which was only another name for a description of superphosphates. These often did not contain nearly so much nitrogenous matter as ordinary bone superphosphates. Fraudulent mixtures, he was sorry to say, were very frequently sold in England. There was one which had almost gone the round of every county, for after being exposed in one place it was sold with vigour in another district. It was not improving. One sample he had analysed yielded sixth-tenths per cent. of ammonia, a later one a third per cent., and the last not a trace. It consisted of gypsum, salt, and vitriol, and was of no value whatever. It was true that the proprietor got many testimonials, and no doubt most of them were genuine, but it was not difficult to see how they were obtained. Small specimen bags were sent gratis to a number of persons with a request for a statement of the results, and the maker wisely advised that only a small quantity should be used, not exceeding 1 cwt. or 1½ cwt. per acre, and for the simple reason that if used in any quantity it would seriously injure the land.

Everyone knew that the result of the best manures was peculiarly affected by the season, and that a crop which had been treated with the best manure would sometimes look worse than one badly manured. Hence a certain number of crops to which this stuff was applied would turn out pretty well, and as all the bad results went into the waste-paper basket, in the course of a few years (with a liberal distribution of samples) a good many testimonials were obtained. It was impossible to form a decided opinion of the value of manures without repeated trials and different circumstances, there was so much variety in the seasons; and he would advise them not now to spend any money in top-dressing, the season was far too much advanced for it, and it would do more harm than good. Nitrogen existed in organic matters, in the shape of ammoniacal salts, in the shape of nitrates, which consisted of nitrogen and hydrogen, and as nitric acid, which consisted of nitrogen in combination with

oxygen. The next in value to nitrogenous compounds as fertilising elements were phosphates, which were compounds of phosphoric acid, and were very important elements in many artificial manures.

The third class of fertilising substances was salts of potash, and the value of an artificial manure, speaking generally, depended on the quantities it contained of nitrogenous matters, phosphate of lime, or potash salts. Of course there were other matters essential to the growth of plants, but they were of minor importance because they either existed naturally in abundance in the soil, or if not they could be readily supplied in a cheap form. Gypsum, for instance, was a useful fertiliser on many soils; but it would be better to apply it directly to the land requiring it than to buy it in the shape of artificial manure. Lime was very valuable on some land, and especially pasture land, and also on some arable land; but he need not say that it answered infinitely better to lime the land than to buy lime in the shape of artificial manure. So common salt was another useful fertiliser, and mixed with lime was the means of renovating many poor pastures; but they could use those materials in their ordinary form.

He would name a few constituents that should not be present at all in artificial manures. They did not want vegetable matter in the shape of peat, or sawdust, or rotten straw, or such cheap substances, which, he was sorry to say, sometimes entered very largely into the composition of artificial manures. Peat had been called one of the best friends which artificial manufacturers had; and he knew that sawdust, impregnated with sulphuric acid, often did duty for superphosphate. Superphosphate was an acid substance, and was often cleverly simulated by acid sawdust. There was a manure called bone phosphate, which did not contain bone or phosphate in any shape or form. Sand was a substance which should exist in artificial manures in as small a proportion as it was possible to obtain it. It was impossible for any commercial product to be chemically pure, and substances could not be dealt with for the purpose of manufacture without a little sand being introduced into them, and it was found in small quantities in the best artificial manures, but the quantity should be as small as possible. So far as the value of manures depended on the matters employed in compounding them, it could be ascertained by analysis, but their value depended also on the form in which the elements of fertility existed in them. In certain combinations nitrogen acted much more rapidly on vegetation than in others. Nitrate of soda when properly washed into the soil showed its effects in the course of three or four days, by imparting a darker colour and a healthier appearance to the Grass. But this would not be witnessed in dry weather, and it was only fit to be applied in showery weather, or it would be lost. It was the most powerful form in which they could apply nitrogen to the soil, was most easily taken up by the plant, and the quickest in its effects; but it readily disappeared from the soil, and those substances which were quickest in their operation most readily passed away in drainage and otherwise. Ammonia in the shape of ammoniacal salts was not quite so active as nitrate of soda, so that it could be applied with less risk of being lost. They might top-dress the land with manure containing ammoniacal salts in the autumn, but it would be a bad plan to top-dress with nitrate of soda. It was a remarkable fact that the soil possessed a special power of laying hold of ammonia in the form of ammoniacal salts. That constituted, he considered, the second stage in which nitrogenous matters were presented to the plant, an intermediate stage between the crude fertilising material, such as they found in fresh manure, or in dried blood or flesh, which entered into fermentation readily, and was changed into ammoniacal salts. The soil readily laid hold of these ammoniacal salts, and during the winter months converted them into nitric acid, which was, he believed, the form in which nitrogen was taken up by the crops. That was a lesson from Nature that time should not be lost, but that the farmer should make good use of his spare time, and cart his manure to the land as soon as his leisure would admit of it. It would never do to apply fresh manure, as they well knew, in the spring. It would have very little effect comparatively on the root crops. Rotten dung answered a great deal better, for the reason that it had undergone the necessary change, and the nitrogenous matter existed in it in the appropriate form.

In considering the value of artificial manures they must consider, not only the value of the materials which entered into them, but also the form in which they existed in the manure. They might have nitrogenous matter, for instance, in the shape of nitrate of soda, Peruvian guano, or dried blood, in which case it readily became effective; or again in the shape of shoddy or wool refuse, which required a long time before it came into action, unless specially prepared. Ammonia existed in shoddy or wool refuse, but it was impregnated with greasy or fatty matter, which prevented its decomposition; and this greatly detracted from its value. Again, nitrogen occurred in leather; but do what they would with leather, let them reduce it to the finest powder, the nitrogen would remain inactive. Some manufacturers knew well how to compound a manure, which on analysis would show a large percentage of nitrogen; but it made all the difference whether it was in such a form as leather powder, or as Peruvian guano, in which latter shape it was readily taken up by the soil. He would rather have 1 per cent. of nitrogen, in the shape of sulphate of ammonia, than 6 per cent. in the shape of powdered leather. They must not, therefore, too implicitly trust to analyses, which were sometimes made for sale as much as the manures themselves. A mere number of figures of percentages would not put them into a proper position to judge of the true value of manures, but they would show in what force the various constituents figured in the analysis were present in the manure.

Another point was the mechanical condition of the manure, which had a material influence on its value. Dryness and fineness of division could not be obtained without expense, but the farmer was well repaid for paying something like 7*s*. 6*d*. or even 10*s*. per ton extra for a manure in a dry and finely powdered condition. Again, the fertilising value of manure depended very much on the use the farmer made of it. Certain manures answered best for cereal crops, and others for root crops; some were adapted for one kind of soil and some for another; and their value also depended on their being applied at the right time of the year, and in right manner.

Some years ago he made a series of experiments with a variety of artificial manures as applied to grass land, and the result of those experiments, carried out on a tolerably large scale in several counties in England, was to lead him to the conclusion that the most economical and most efficient manure which could be applied to grass lands was good farmyard manure. No manure produced so good a result, if they could get plenty of it, as good stable dung on grass land; but as they could not always get enough they must get the next best, or the land, instead of becoming richer, would become poorer and poorer. In determining what was the best substitute, they had to consider what was the character of the land. If, as was the case with most of the Derby pastures, the land required lime, they should lime it well, and having done so, leave it for a couple of years without putting any manure at all upon it. His experience showed that in most counties of England it was desirable to apply bones to grass land, but bones never did well on newly limed land, and in many cases where it had been so applied he had not been able to see even where the bones went to. It was very important to settle the point whether the land needed lime. If the herbage looked unhealthy or deathlike, as people said, they might take a little of the soil, and pour upon it weak spirits of salt, and if there was an effervescence that would be an indication that there was enough lime. If they tested the land in that locality, they would find that by far the larger part of the pasture land required lime. The effects of liming might be regarded as permanent, and after its application they should adopt other means. Supposing the lime to be thoroughly incorporated with the land, the next thing to decide was whether bones would answer as a manure. There were no general rules which would hold good under all circumstances. Speaking generally, on heavy soils fresh bone dust, at any rate, did not show so well as on light and more porous soils; and as bone manure was rather expensive at the present time it was well to make an experiment on a small scale before applying it extensively. The result of his inquiries went to show that all good artificial manures for grass lands should contain a certain proportion of phosphatic materials, if possible in the shape of bone dust; and light land should also be supplied with salt of potash.

Pasture lands, to yield a good crop, must be also supplied with a considerable proportion of nitrogenous matter, in the shape of ammoniacal salts, and he would recommend for light pasture lands mixtures of manures, which should include potash—a good deal of which was now got from Germany, where it had been discovered in a state called kainit. They ought to pay for that something like £3 to £3 10*s*. per ton retail. It was imported into England for something like £2 10*s*. It was retailed at £4, which was rather too much profit, and the farmers should insist upon getting it for less, and the dealers could well afford to reduce the price. He would recommend for light marly grassland 1 cwt. of supherphosphate, which would cost 6*s*.; 2 cwt. of bone dust, which at 7*s*. 6*d*. would be 15*s*.; 2 cwt. of potash salt at 4*s*., which would be 8*s*.; and 1½ cwt. of Peruvian guano, which would be £1 or 21*s*., making a total of £2 10*s*. per acre. He would not advise them to lay out less than that, if they wished to apply artificial manure to grass-lands at all, as he thought it would be like wasting away powder by dribbling it into the breech lock of a gun, where it would produce no effect. Two cwt. of bone dust, and the same quantity of Peruvian guano, and ¾ cwt. of nitrate of soda, made a very good dressing for light grass-land. On heavy soils they might leave off the potash salts, more especially if they contained a fair proportion of the better description of the more unctuous kind of red clay.

In buying artificial manure they should first ascertain what would suit the land, and they could ascertain that for themselves, if they were not ashamed of being called experimenting farmers; and every farmer should be that, if observation and experiment were essential to progress. He would advise them to deal with respectable men, who had a reputation to lose, for in buying cheap manure from some one who went on for a short time and then failed, they would, in the long run, not gain any advantage. He would advise them not to be led astray by statements of analytical results, for, as he had stated, nitrogen might be present in the form of leather or phosphate in an insoluble mineral, like coprolite, which would have very little effect. He would not, on the whole, advise them to deal with their brother farmers, who made a little manure, and dealt in horses, and so on; as, generally speaking, they would get an inferior article. He would not recommend them to buy cheap manures, and he showed by reference to analysis that many of the cheap manures were by far the dearest. Some of these manures consisted mainly of dried nightsoil, which was perhaps worth about 5*s*. for a good cartload, and which were sold at £3 or £4 per ton. If they bought superphosphate they should buy by analysis, and when they were certain that they had got what they wanted, they must give the price for it. In buying nitrate of soda they should have a guarantee stating the amount of impurities it contained—5, 6, 7, or 8 per cent. This was called "refraction," and deducting it would show the amount of nitrate it contained. He should have liked to have spoken on the question of Supply Associations, for the purpose of ensuring genuine manures, but could only recommend the question to them for discussion. Such associations were springing up in various counties in England, and some were carried on in a very profitable manner.

In reply to Mr. Robinson, of Melbourne, Dr. VOELCKER said there was no better easy test of guano than weighing, filling the bushel lightly, and sweeping it off level; and the weight as above stated should not exceed 68 or 70 lb. Any material mixed with guano weighed heavier, and they would find some weighing 72, 73, and even 74 lb. The test of the application of quicklime with a view to determine the amount of ammonia could not be relied upon, as a small quantity of ammonia would produce a good deal of effervescence, and cause a strong smell. Hence dealers in inferior manures were fond of putting that test forward.

CIRENCESTER.

Prevention of Cattle Disease.—At a recent meeting of this Chamber, Professor M'BRIDE, of the Royal Agricultural College, read a paper on "The Prevention of Cattle Disease." After quoting statistics as to the loss sustained by this country from disease amongst stock, he proceeded to consider the means of preventing disease.

(1). *The Inspection of Foreign Stock at British Ports*:—After some experience of this mode of preventing disease, I am compelled to say that at the best it is of doubtful utility. Every one knows that the results obtained from the examination of animals which have been at sea are very unsatisfactory, as the excitement produced by bad ventilation between decks, overcrowding, and the cruel manner in which they are treated in landing, are sufficient to obscure the signs of disease. Inspectors cannot possibly recognise disease during its incubative stages. These vary, extending to 40 days in pleuro-pneumonia, in cattle plague six days, epizootic aphtha ranging from 24 hours to five days. Now it is quite possible that a cargo may be passing through this stage and yet be reported healthy by the inspector. They are then permitted to be exposed in our markets, to propagate disease. The inspector may limit the number of animals suffering from the acute form, and in this particular may be of some little service. But it must be evident that it can be no protection to our home stock.

(2). *Quarantine* has been recommended for all foreign cattle. I believe that it is impracticable in this country, because it would never be so efficiently conducted as to secure us against the spread of such maladies; in fact, it would resemble our sanatoriums during the cattle plague, and would merely be a centre for the spread of such disorders. The advantages to be gained by this procedure would be so few that it would never compensate for the expense. It would meet with very much opposition from its impracticable character. Imagine an old Dutch cow retained in quarantine for six weeks—it is simply absurd. No doubt this measure would have this advantage, that it would soon put a stop to foreign supplies altogether.

(3). What I would suggest for your safety would be, that all foreign cattle and sheep should be slaughtered when they arrive at our ports, and sent as dead meat to our central markets. Sheep, if allowed to be exposed in our markets alive, would be capable of propagating all the epizootics to our home cattle. There should be no half measures. Government should be compelled to restrict this traffic, and encourage our home trade. If the British farmer offered animals for sale, knowing that they came from a diseased stock, and that they were suffering from the disease in a latent form, he would be punished. Why, then, should Government allow salesmen to dispose of foreign cattle when they are known to come from infected districts? Indeed, this fact often leads to an increased supply of such animals to our markets. Foreign cattle dealers know we will give good prices even for stock capable of propagating disease in the

shortest possible time. This shows the inequality of our English laws, foreigners being allowed to go scot-free for the same offence that you would in all probability be imprisoned for. Why should you suffer from any defect in the laws of free trade in cattle? I can assure you if the same thing was even attempted to be done to any other section of the community, the statute would be at once repealed. In fact, the more seldom that either sheep or cattle are permitted to leave our ports alive, the less likely are we to have a repetition of the calamity of 1865, which proved so fatal to your interests. It is one of the most characteristic features of epizootics that they always tend to become extinguished in places remote from those wherein they seem to have a spontaneous origin. The influences which affect this extinction are difficult to determine; perhaps one reason is, that the contagious matter requires other conditions besides the mere presence of animals before it can establish itself permanently in a country. As these conditions, however, exist nowhere excepting in those countries wherein such diseases spontaneously arise, their absence in our own land may be one cause of those disorders undergoing a gradual extermination. Again, these diseases, from being transmitted through several generations, lose much of their virulence, and animals become much less susceptible to the influence of their contagious principles. It is well known, for example, that neither pleuro-pneumonia nor epizootic aphtha is so deadly now as when it appeared first amongst us, and it is just as certain that each of these diseases would ultimately disappear if it were not for the continued introduction of virus from abroad.

(4). *How to Treat Home Stock.*—I should advise you to place newly-purchased animals from public markets in isolation houses for at least six weeks. You will never regret doing so, as it will prevent the spread of such diseases as pleuro-pneumonia. Should this disorder break out among your stock, what should be done?—Kill at once all those suffering from the malady, separate the rest of your stock into small lots, and be certain that each herd is isolated from the other. Then put them all under tonic treatment, sulphate of iron being the best. By this procedure you will invigorate them to such an extent that they will probably withstand the action of the specific poison. Be careful that those attending diseased animals do not come in contact with your healthy stock. Such measures will tend to confine disease to the districts in which it has first broken out, and at the same time stay its progress. It is at all times wise to use antiseptics. This treatment in its entirety would not apply to epizootic aphtha, as its period of incubation is so short that it would be difficult to prevent its spread. It is not deadly, but it leads to great waste of meat and milk. Fat stock may sink £3 per head in value, while with the dairy stock it is simply ruinous. This disease has, during the past 30 years, robbed our people of not less than between two and three million tons of animal food. A practical farmer has stated the money lost at £250,000,000. He recommended that farmers should show their annual losses from disease, with a view to claiming compensation from Government. They might appoint registrars in different parts of the country, whose duty it would be to ascertain the diseases in particular districts. Their reports should contain, (1) name of disorder; (2) its causes; (3) its nature, whether contagious, infectious, or otherwise; (4) its duration; (5) the number of deaths. Finally, he proposed that they should inaugurate the system of record which he had suggested, and to get reliable statistics as to the annual loss of cattle in Gloucestershire.

BANBURY.

The Rotation of Crops.—At a recent meeting of the Banbury Chamber of Agriculture a paper was read by Mr. W. COTHER on this subject. He said:

I will, in the first place, give you my own experience and information on the subject of a light sandy soil; secondly, consider the better mode relative to the cultivation of retentive stone-brash; and thirdly, to make a few remarks on the kind of soil which prevails generally in this district.

In the first place, I propose that the first-named soil, being sandy, shall be farmed on a five-course system; the second, or retentive stone-brash, on a three-course system; and the third on a five-course system, the details of which I propose to enumerate thus:—The sandy soil to be cultivated on the following rotation—1st, fallow; 2d, Barley; 3d, Peas; 4th, Rye, seeds, Mangels, and Swedes, with a liberal dressing of manure previously supplied; 5th, Barley. This is a course by which the land may be kept from tendril Couch, by the occasional application of the fork, which can be best applied during the crop of Mangels and Swedes, both before and after they are raised or consumed. The second, or stone-brash soil, to be farmed on a three-course system, viz., 1st, Wheat; 2d, Barley or Oats; 3d, every kind of green crop known, or to be known, as a preparation for Wheat. What I mean by the green crops already known as a preparation for Wheat are these: Rye, Beans, Peas, Trifolium, Italian Rye-grass, or a mixture of Italian and Trefoil, and the various kinds of Clover, or any others that may be introduced. The third kind of soil already named, or that which generally abounds in this district, I propose should be farmed on a five-course system, viz., 1st, Turnips; 2d, Oats; 3d, Barley; 4th, Beans and seeds in equal proportions; and 5th, Wheat. The reason for naming the Oat crop after Turnips is this: On the highest-farmed lands in Norfolk this is preferred, because the succeeding Barley crop is not thrown or lodged, the Barley is of superior quality, the seeds are not injured by lodging of the Barley, and the seed crop is superior either for mowing or grazing.

I shall now consider the summary of these courses on a farm of 250 acres. 1st, there will be 150 acres of corn, 50 acres of Rye, and 50 acres of Mangels and Swedes on the sandy soil. 2d, there will be 166 acres of corn, and 83 acres of green crop; but by the addition of an indefinite number of acres of Beans the 166 acres may be increased. The 3d course will comprise 175 acres of corn, and 75 acres of Swedes and Beans. This will give an idea, from the various courses I have named, at what rent the different soils should be taken; but the further consideration of this question may be better left for a future paper in detail, by some person more competent than myself to decide on such a question.

There are still two other kinds of soil to be alluded to, but they do not abound in this immediate neighbourhood, and are of a directly opposite character to each other, viz.: A very thin brash soil, such as is found on the Cotswold Hills; the other being a very heavy clay. The first of these, as I gather from the best authorities I have met with, should be farmed upon a six-course system, viz.: 1st, Turnips; 2d, Barley; 3d, seeds; 4th, seeds again; 5th, Wheat; and 6th, Oats. And here I should observe that preceding the Oat crop there should be a liberal application of cart manure, and that the Turnip crop succeeding should be thoroughly well manured with superphosphate of lime. This is a system, as will be observed, by which each crop of corn will be kept at a considerable distance from the others of a like description.

With regard to the clay, having lived in a clay district, the old system would perhaps be best adhered to, thorough draining done much to improve such soils; and here from the most experienced farmers I gather that the better rotation as a preparation for Wheat is Vetches or Clover consumed by sheep early in the summer, a fallow made, Wheat succeeding the same year, to be followed in the next by Beans, and in the following year by Barley. I would here, as a rider, if I may be permitted the term, say that I recommend Mangels and Swedes mixed, because I believe and feel almost certain that Mangels have the nature of taking that from the soil which is prejudicial to the successful growth of Swedes, and inducing a healthy state, the Swede crop being almost free from the direful disease known as "finger-and-toe." I would here remark that in using the drill for planting Mangels and Swedes the seed should be in proportion of 36 oz. of Mangel to 16 oz. of Swedes, the seed to be thoroughly mixed in the box of the drill, in the proportion of 9 oz. of Mangels to 4 oz. of Swedes, and that the hoe should be applied immediately on the appearance of the plants, as sandy land produces so many annual weeds.

There now arises a very grave question, and one which requires very careful handling. It is, what is the most satisfactory arrangement that can be come to between landlord and tenant? My own opinion is that there is a very simple basis on which that conclusion may be come to, viz., to graft on the present agreements the customs of Lincolnshire, admitted to be not only the most improved, but one of the best cultivated counties in the kingdom, quite equal to Norfolk, where leases are prevalent. In the former county the tenants are protected by equitable tenants' compensation. The tenants' compensation in Lincolnshire is 25 per cent. upon the last two years' outlay for oilcake, to be paid by the incoming to the outgoing tenant, wholly irrespective of the landlord. This compensation from the incoming to the outgoing tenant is based upon the production of just bills; but in the event of erroneous or unjustly made-up accounts being introduced the outgoing tenant forfeits his claim to compensation under this head.

With these observations it is better for me to conclude that the improvement of agriculture may be unlimited, under wise and careful provisions; and this is no less an agricultural than a consumer's question, the well-being of every individual consumer of agricultural produce being concerned therein, and therefore the improvement and perfection of agricultural science and practice is a subject which concerns the interest of all.

In consideration of these Lincolnshire customs, I would suggest that a committee be formed to take this subject into consideration, such committee to consist of the chairman, the vice-chairman, and secretary, three landed proprietors, and three tenant-farmers, as you will then have a preponderance of the landlord element in the committee; that they shall well consider the question, and report to a future meeting of the Chamber.

DISCUSSION.

Mr. S. BERRIDGE would have much preferred it if Mr. Cother had gone a little further into the subject of the application of capital to agriculture. Certainly he should like to have heard from him what treatment he thought would be best in the management of the different soils he had a knowledge of. It was certain that the application of artificial manures had a great deal to do with the treatment of the soil and the rotation of cropping, and he thought it preposterous to think that they would have good crops if their land was not fit for them. It would be a great benefit to them if Mr. Cother would inform them as to the application of lime and the different kinds of artificial manures to be used, so that they might grow better crops by their application and secure the rotation of crops most to be desired.

Mr. DUNN thought that in a large portion of this country agriculture had languished owing to miserable interference on the part of landlords, who, although singularly incompetent to give advice, had yet attempted to impart it to their tenants, who were very often bound down by the most absurd arrangements. They would have a much better system of farming, they would have a much greater amount of enterprise, industry, and energy, and they would have more capital applied to the cultivation of the soil, if a system of leases or tenant agreement, such as Mr. Cother had referred to, was more general amongst them. The land would be found much better cultivated if they had a tenant agreement such as was the practice in Lincolnshire and Norfolk.

The CHAIRMAN thought that landlords should have a remedy against the neglect of tenants. If the landlord gave a lease for 21 years, as suggested by Mr. Dunn, the man might be active and energetic enough the first half of the lease, and the other half he might let the land go down so as to be quite worthless, and he thought the landlord should be protected against such neglect.

Mr. WALTON said if they compared the system of tenure adopted in Scotland with that of his locality, the comparison was greatly in favour of the former. In Lincolnshire they had the system of compensation for unexhausted improvements, and if a tenant increased the value of his holding during his occupation he was compensated for it. He agreed with the chairman that there should be protection for the landlords. The application of capital to agriculture was also much discouraged by the present system of rating; if a landlord erected commodious farm buildings the rateable value of the land was raised, and both tenant and landlord had more to pay.

The following resolution was ultimately agreed to—"That in order to encourage the application of capital to agriculture, tenants be allowed greater security and permanency of tenure, with compensation for unexhausted improvements."

Notices of Books.

The Farmers' Harvest Companion and Country Gentleman's Assistant. By Thomas Jarvis. A new edition, considerably enlarged. By William Burness, Author and Editor of various works on Practical Agriculture, Land Surveying, &c. G. Routledge & Sons, The Broadway, London.

There are here 19 Tables relating to areas of land—value per rod—cost per acre and per bushel—value of bulk at given prices per unit—measurement of haystacks, thatcher's work, drill work—land drainage—weights, measures, wages, &c. There is a great quantity of useful help here offered in the shape of a ready reckoner for almost every possible calculation which the farmer has to make, whether to satisfy his landlord, his customer, his labourer, or himself. Mr. Burness has added very materially to the original edition, and has done his work well. We make the following extract from his preface:—

"The amount of capital now invested in British agriculture, including the joint investment of the landlord and tenant, far exceeds that invested in any other branch of British industry, and with an area of upwards of 40,000,000 acres, and say £40 invested per acre—£30 for the landowner and £10 for the tenant—the yearly outgoings and incomings involve an extent of business that requires every means in the power of science to expedite—calculation in the daily transactions of the landed interest. To effect this, and at the same time secure accuracy of calculation, is the grand object of Jarvis's Tables, and of all agricultural Tables of a similar kind. 'Time is money,' said Franklin, and the saving of time effected by the use of such Tables is incalculable.

"The thorough revisal, extension, and enlargement of 'The Farmers' Harvest Companion and Country Gentleman's Assistant' Tables, so as to bring the work up to the requirements of the present time, cannot fail to continue for it the very favourable patronage it has hitherto received. The sale of seven large editions, and the demand for the present, is very satisfactory evidence to the authors and publishers of its practical usefulness and standard character in the daily experience of the agricultural public."

Farm Memoranda.

WEST SUSSEX: *June* 13.—We cannot give a very favourable report of the farm prospects. The hay crop is the lightest in the memory of man. We meet a great many meadows that ought to have been cut, but have been fed, and much of what will be cut is hardly worth the labour. For dairy farmers, perhaps, it hardly ever was worse. Some are now cutting, and the crop is hardly equal to the rakings of ordinary years, and it seems nearly all weeds, very little grass. As a consequence cattle food is also short, but not so bad as it may soon be, as much of what was to be cut has been turned into, and they are eating both their winter and summer food at once.

The Wheat crop is not nearly up to the mark, but it improves steadily. As a rule it was thinned very much

during the winter, and has up to this time kept a good dark colour; it is now coming out in ear, and though the straw is likely to be short, the ears promise fairly. Barley has done well up to this time, but now begins to wither at the roots, and, unless we have rain soon, will to a certain extent fail. Oats can hardly, in any case, be a fair crop, especially where late-sown. Peas are said to be very bad in some places, but what I have seen are pretty good, as I suppose they are on the deep heavy lands. Mangel comes on very well, and some are fit to hoe; but as the land as a rule is pretty free of weeds, we shall let them get well-rooted before disturbing them while it is so dry. Swede sowing is over, and some are up, but we fear the fly will find them out, as they are not likely to go a-head very fast.

Works of every kind are well advanced, and hands are not likely to be very busy until harvest, which we may expect about the beginning of August. The Potato crop is healthy, but is showing signs of coming to maturity too soon. As a matter of course, lean stock of all kinds are lower, and a very dull sale, and fat stock are also lower, and lambs nearly unsaleable. *G. S.*

Wark, near Coldstream.—The Wark farm, now in the occupation of Mr. George Laing, consists of 917 acres, about 120 of which are pasture. This is the farm which was occupied by the Messrs. Culley during the latter part of the last century, when they wrote their "Agricultural Survey of Northumberland, Westmoreland, and Cumberland," introduced the Leicester breed of sheep, practised irrigation, and did other matters of which the farm and neighbourhood bear evidence to this day. It was the model, too, of the homestead of this farm which attracted so much attention in the Great Exhibition of 1851. In this steading, however, there is nothing extraordinary beyond its substantial character, for in many instances much more convenience might have been devised. It is in the form of a square, and everything goes in and comes out of one gateway close by the bailiff's dwelling-house. On one side is the cart-stable of 24 stalls and two loose boxes; on another side is a row of boxes for feeding cattle; on the third side are byres or boxes and shedding and small yards; and on the fourth side are mill-house, granary, threshing-floor, cart-sheds, implement and manure houses, and so on, while in the centre are capital yards for fatting cattle in. The premises are certainly compact and good, without any false pretentiousness, and they far surpass the average of farm homesteads about the country.

The formation of this farm gives it two characters, one of which is flat and alluvial, from deposits made by the shifting and overflowing of the Tweed, and the other is higher and more hilly, and in many places of a stratified clayey character that was deposited in its present position before the *débris* of the lower ground was left as a subsidence by retreating waters.

On these 797 acres of arable and 120 of pasture of variable soil, there are kept 400 breeding Border Leicester ewes. Mr. Laing's name is well known in connection with this breed. At Manchaster last year he took 1st and 2d Royal prizes for shearling tups. A few of the best tups are sent to the great ram show and sale at Kelso in the autumn, where they make good prices. The hoggs and surplus females are fed off in the winter and spring, and so disposed are these animals to mature early that in a good Turnip season like the last they require nothing more than the roots they have given them. In exceptional cases a little meal made from light corn is given them during the last month or six weeks. These sheep are sold or sent to market a truck or two at a time as they are clipped, beginning in April and ending in May. This year 900 fat sheep have been sold, some of which were brought in to consume the extra yield of Turnips last year. As an instance of the weight these sheep come to, 33 tup hoggs, which did not come up to the mark in appearance for sires, were sold by weight in April, and they averaged 28 lb. per quarter. As Mr. Laing was the off-going tenant of a neighbouring farm at Cornhill, the fat sheep off this farm were sold at the auction on May 5, when the 250 shearlings averaged out of their coats 59*s.* per head. The smaller hoggs, which were sold privately, averaged 46*s.* per head. And the ewes, draughted from the flock last year, were privately sold at an average of 62*s.* per head. These prices, considering the sheep were fed almost entirely on Turnips, will, no doubt, add to the importance of Mr. Laing's breed, notwithstanding that in past years his sheep have taken prizes in Scotland, Ireland, and America, as well as in England.

The cattle kept are properly looked upon as mere instruments to tread straw down into manure. Mr. Laing as properly concludes that boxes for cattle, excepting it be for a month or six weeks at the finish, are a great mistake. He prefers small yards, where two, three, or four bullocks can walk about; for by the exercise they can take there, the muscles are not only kept in a healthy state, but they are much more fully developed. This must be obvious to every one who does not want to appear to be a modern wiseacre, capable of teaching every experienced farmer in the country that he has learned nothing all his life. The muscles of a blacksmith's arm and the branch of a tree trained *en espalier*, both show how exercise developes organic substances, both animal and vegetable. The tied branch of a tree is so thin and weak that it drops down on being loosed, because it had not been gently bent backwards and forwards, or exercised by ordinary currents of wind. Last year 118 cattle were fattened, besides which 50 young cattle ran on the pastures in the day and ate straw and half a feed of Turnips at night. These 50 steers are now in fine order on the grass, preparing for Turnips (should there be any) in the autumn and winter, when they will be sold according to the food there may be for them and the market price of meat. Mr. Laing judges correctly when he thinks it better to keep 50 cattle and make a direct profit on them, than it is to keep 75 eating expensive food, and, consequently, have to pay for the pleasure of keeping three beasts at a loss, where two would have been profitable. It is the greatest mistake in the world to think that English farmers ought to depart from the rules of every other man of business, and use their judgment and their capital for benevolent purposes. If the public will have free trade in live stock, and if they will—led by the Chancellor of the Exchequer—over-tax and unduly tax the raw materials of the agriculture of their own country, it is their own look-out if they have dearer and dearer meat. It certainly is not the producer's duty to grow more than he can make profitable to himself. This is true political economy, as well as sound agricultural economy. For if British farmers were to expend their capital at a loss, in a few years' time agricultural produce would necessarily decrease.

The system of cropping pursued is generally the four-course, viz., Turnips, Wheat or Barley, seeds, Oats. The exception consists in about 50 acres per annum being planted with Potatos and Beans, which throw the Clover crop on this area over for eight years, when the sowing and cutting of Clover for hay is made on this Clover-rested portion of the farm. Indeed, here, as well as almost everywhere else, the soil is Clover-sick, and Rye-grass and Welsh Clover or Cow-grass, Trefoil and Dutch Clover have to be resorted to. Great complaints of Clover-sickness have been made, of late years, to Messrs. Hogg & Wood, the celebrated agricultural seedsmen, of Coldstream, and they have devised a mixture which has been attended with great success. This is especially the case at Wark, for we never saw better bottoms of "seeds." This mixture is:—Alsike Clover, 5lb.; Cow-grass, 3lb.; Welsh red, 3lb.; Trefoil, 3lb.; Perennial Rye-grass, 2 pecks. The Welsh red—from which we have always understood the Cow-grass is descended—is obtained direct by Messrs. Hogg & Wood of a Welsh saddler who collects a few pounds of it from small farmers and cotters, who gather it off the mountain side, or in their small inclosures, when a few heads escape their goat, pig, or cow. The sheep these seeds carry per acre through the summer number from five to six ewes, with their lambs, to every two acres. This these seeds appear to be well capable of doing, for there is yet an abundance of feed, although rain has been so much wanted; and the Border Leicester ewes and their lambs are now looking as well as we have ever seen any unpampered and really practical tenant-farmer's breeding flock.

Potatos are grown at Wark in a way that is well worthy of consideration elsewhere. Orkney Reds are preferred as a main crop both by Mr. Laing and his husbandmen. The seed of this kind is had direct from the Orkney Islands. They are not so prolific when thus first obtained, so a given quantity is planted every season to supply the seed for the main crop the next year. The first yield of the native growth is the most prolific, and also the most trustworthy as regards blights and diseases. The third year they degenerate a bit, and by the fourth year they would be very much altered in character for the worse. This eventuality is, therefore, avoided in the manner described. These Potatos are obtained through Berwick merchants, who ship them direct, and retail them to the Border farmers. Twelve acres are generally grown for home use among Mr. Laing's household and men; and if there be a surplus, as there was last year, they are not sold, but consumed by the cattle in the yards. The flavour and quality of these Potatos are excellent, and those we tasted this week were sound and firm as well as white, mealy, and of an agreeable flavour.

The Turnips at Wark this year are anything but promising. The first sowing of Swedes will, it is feared, all have to be re-sown. This was already begun when we were there on Wednesday. The plan Mr. Laing adopts answers admirably: he harrows down the "drills" or ridges, whereby all the annual weeds are killed, when the fine surface moulds thus disturbed are reformed into a drill at the same place where they were worked from. Thus, no disturbance of the farmyard manure occurs, and no coarse moulds or clods are brought uppermost, which is a very important point on the clayey parts of such hilly and irregular fields as we saw being worked. Although 3 lb. per acre of seed were sown, and in most places an ordinary proportion of it "brairded" or vegetated, the whole of the plants, as a rule, have been cleared off by the fly. This year there are 184 acres of land for Turnips, as against 200 acres last year.

The manures used are mainly applied for the Turnip crops. Farmyard manure is applied in a half-rotted form at the rate of 15 1-horse cart loads per acre. In addition to these, 4 cwt. per acre of mixture are used: this compost is, 1 cwt. dissolved bone-ash, 1 cwt. sulphate of ammonia (containing 25 per cent. of ammonia), and 2 cwt. of sulphate of potash. This dressing costs about 35*s.* per acre.

The crops on the Wark Farm are, as a whole, looking well; but the Wheat is very weak, as it is almost everywhere else, and where there is a full plant it is spindly, and there is comparatively nothing of it. Oats are standing the dry weather in a surprising manner; so is the Barley. The Beans are very short; but the Potatos are strong; and there is one of the best fields of Clover and Rye-grass for mowing that we have seen. The quantity of Wheat sown per acre is 2 bushels. Mr. Laing as well as every one else will have plenty of experience in their seeding this year—if not to their sorrow, it will certainly be to their loss; 2 bushels, or 2½ bushels of Barley are sown and 4 bushels of Oats. The greater part of all these crops are broadcasted either by hand or with one of Messrs. Brigham and Bickerton's excellent and cheap broadcasting machines.

The horses kept to do all this work number 11 pairs, two jobbing animals, and a pony. For these, indeed for none of his animals, Mr. Laing neither pulps nor steams any of his roots or fodder. Mr. Laing calculates the cost of a system before he begins, and acts accordingly. This is Mr. Laing's third year at Wark, and if he pursues the same course he is doing here, and has done for some years at Cornhill, Wark will soon be a farm that will be worth going many miles to inspect. *North of England Farmer.*

Miscellaneous.

The Climate of Ireland.—In the science of Nature there is no chapter more interesting than that which treats of physical geography, which, properly understood, means the account of physical phenomena as they are modified by geographical position; and at the present moment the physical geography of Green Erin, or its peculiarities of soil and climate, presents a theme of no slight importance. It has been stated in the House of Commons, as a proof of the retrograde condition of Ireland, that its production of cereals has of late years diminished, while its pasture lands have increased. To this it ought to have been answered that the decreased cultivation of cereals, and of Wheat in particular, was a proof of improved knowledge. Years ago, at the meeting of the British Association in Cork, a communication was read, pointing out that agriculturists in general are governed wholly by example, their scanty science not allowing them to quit the beaten path. Hence Irish farmers, when they aim at improvement, endeavour to imitate the farming of Norfolk or the Lothians, and in so doing fail miserably, owing to the wide difference between the climates of the western isle and of the eastern side of Great Britain. It is commonly stated that Ireland has a very wet climate. It has undoubtedly a humid atmosphere, owing, perhaps, in some measure, to a great extent of undrained surface. But the total quantity of rain that falls in Ireland, little, if at all, exceeds the rainfall of England. In its distribution through the year, however, it differs much from the latter. The vicinity of the Atlantic gives Ireland in the highest degree an oceanic and, to some extent, an equatorial climate. Winter in the Green Isle is extremely mild. The southern and western coasts, though seldom free from wind and drizzling rain, never experience severe cold. Vegetation remains in mid-winter brilliantly green and undepressed. As spring advances, everything seems to flourish; crops of all kinds promise abundance, and already, in May, harvest seems to be close at hand. But now the scene changes. There is little or no dry summer. When the sun is highest in the meridian, there is a constantly clouded sky and no sunshine. Rain begins to fall in June. The rainfall of July is the heaviest in the year. In August the rain begins to abate; but clear skies and bright sunshine cannot be reckoned on till September, when the shortened days and the sun's declination have much reduced the solar heat. The crops in the meantime, arrested in their progress, are not the better for two months' slumbering under the clouds. They have summer rain in excess, and too little sunshine. From this it will be seen that the character of the Irish climate is, that under it everything grows well, but that the process of ripening is painfully slow and uncertain. Now, to cultivators of the cereals the success of this process is of the utmost importance. The corn harvest in Ireland falls late in the year, in September and October, when the days are short and nocturnal frosts not unfrequent. The plains of Southern Russia, or of the Red River in Canada, with a comparatively rigorous climate, far excel Ireland as Wheat-producing countries, because their short summer is one of uninterrupted fierce sunshine; their vegetation suffers no check; the grain is ripened all at once, and the harvest gathered without delay or difficulty. The deficiency of ripening power in the Irish climate produces a secondary defect, which meets with less attention than it deserves. The grain which lingers on the stem two or three months before it hardens is sure to be unequally ripened; some of it is immature, while more is tending to decay. Consequently, it is bad seed, and the Irish farmer habitually sows perhaps six or eight times

as much as Mr. Mechi would deem requisite. Under these circumstances, it is evident that the Irish farmer ought to cultivate cereals no further than is requisite for the economy of his farm, and to look to other productions for his profit. Fortunately, there is a husbandry for the pursuit of which he enjoys peculiar advantages. In green crops no country can compete with Ireland, where, nevertheless, they are still little known or esteemed by the multitude. From this it may be inferred that sheep and cattle ought to be the chief objects of Irish husbandry. In truth, the Green Isle, under proper management, could easily supply England with beef, mutton, poultry, milk, and butter, and grow rich by giving abundance at a cheap rate to her neighbours. But then this could be effected only under a system of large farms. The grazier and cattle dealer, to make their business profitable, must do it on a large scale. Butter of the best quality cannot come from a small dairy. The improvement of Ireland, therefore, as dictated by climate and natural capability, can be effected only under a system of large farms. The popular wish, however, is for small holdings. It is thought that the country, when divided into Potato gardens and all covered with cottages, will be a paradise. But this poor man's paradise, beginning with a few years of felicity, will assuredly lead to the pauperism of ages. The Legislature cannot countenance schemes opposed to the wholesome development of society, and which would make poverty an institution; neither can it prevent their diffusion; but it may counteract them by spreading enlightenment and by presenting plain truths to the common sense of the community. This might be done by the publication of some statistics, showing the relative amount of cost and production of wheat and of green crops in England and Ireland, with some illustrations of the gain derivable from large farms and the use of machinery. *W. D. C., in "Nature."*

THE PRODUCTION OF CHEESE.—The production of cheese is becoming an important branch of our agricultural industry, and the demand both for home consumption and for export is every year increasing. Factory-made cheese will compare favourably with the best of English and Dutch manufacture. The business of making cheese in the United States has long been profitable to the farmer and dairyman; and that it will continue to be so for years to come seems highly probable, in view of the limited crop and the growing taste of our people for food of this description. It is estimated that there are in the United States and Canada 1000 factories, whose average weekly production is equal to 117,250 boxes. The cheese made in the United States and Canada in 1867 reached 215,000,000, and in Great Britain 179,000,000 lb. The consumption in America during the same period amounted to 160,000,000 lb., and in Great Britain to 400,000,000 lb., leaving a deficiency over the joint production of the two countries of 75,000,000 lb. This deficiency was supplied by Holland and Belgium. The principal States engaged in the manufacture of cheese in this country are New York, Vermont, Massachusetts, Pennsylvania, Illinois, Ohio, Michigan, and Wisconsin. Western New York, the Western Reserve, and some sections of Illinois and Michigan, enjoy a deservedly high reputation for the excellent qualities of the products of their dairies. England has long been justly celebrated for the abundance and superior quality of its cheese. Cheshire, Stilton, Derbyshire, Suffolk, and Cheddar, are the best known varieties. Gouda cheese, the best made in Holland, is very pungent, which preserves it from mites, and this pungency is attributed to the fact, that muriatic acid is used in curdling the milk instead of rennet. Parmesan cheese, made at Parma, in Italy, owes its rich flavour to the fine sweet herbage of the meadow along the Po, where the cows are pastured. The best Parmesan cheese is kept several years, and none is sold until it is at least six months old. Swiss cheese is made, in part, of skim-milk, and is flavoured with fragrant herbs. They usually weigh from 40 to 60 lb. each, and are exported in casks, each of which contains ten cheese. Westphalia cheese derives its flavour from the curd being allowed to become soured before it is compressed. Dutch and Swiss cheese contains, according to chemical investigation, from 26 to 40 per cent. of nitrogenised matter, considered the most nutritive constituents of food. The best cheese is from 25 to 100 per cent. more nutritious than bread and meat, which contains only about 22 per cent. of nitrogen. The superior qualities of cheese has been repeatedly proved by the experience of labourers in those countries where it forms one of the principal articles of food. To delicate stomachs, cheese is objectionable, on account of its slow and difficult digestion; but to individuals of great physical strength, it is a healthful and agreeable article of consumption. In combustible or heating qualities, cheese is only exceeded by oil, butter, and like unctuous substances. *New York Mercantile Journal.*

The Week's Work.

June 18.—*Rape* sow as directed last month. The first sown, if in rows, horse and hand hoe, giving the plants "a rough singling." If sown broadcast and too thick on heavy land, yoke the harrow; if not too thick, hand-hoe. Some prefer the hand-hoe to the harrow for thinning on soft land.

Lucerne. — Spring sowings, when grown alone, require to be hand-hoed as soon as the plants will stand the hoe. Old crops also require hoeing after every cutting, and all weeds or grass which cannot be removed with the hoe pull with the hand. Some prefer forking in spring, and also after the summer cuttings, to keep down weeds, but this old practice has been superseded by forking deep between the rows after the last mowing in autumn, and then hoeing in spring and summer, so as to keep the fine winter-made mould on the surface, which is better for aëration, for the absorption of night dews and the retention of the natural sap in the land, than the raw soil brought up by forking.

Sundry works now claim attention. Old roads may be repaired and new ones made; hedges will require cutting, and if infested with "goss" (caterpillar) should be switched close in time, as the removal of the young shoots deprives the insects of food; new stone fences may be built; as rivers and their tributaries fall low, their channels should be cleaned, straightened, and deepened, if necessary; straightening and deepening watercourses increases their fall and capacity for the conveyance of water,—as narrow places tail back the water, so widening them lowers the surface level; on steep inclinations the lower landsend is apt to increase in depth, so that a spit may be taken off without doing harm. This, and the cleaning of ditches, &c., will afford work for the teams after the Turnips are sown. Marl and chalk may also be carted into hills for application after harvest, or they may be applied directly to land that has been pared or burned, or to Vetch stubbles, for Cabbages, Rye-grass, and Clover stubbles intended for Wheat. "Lay clay on sand and you buy land," which may be done either by carting or warping. Applied rough from the pit to poor, sandy, gravelly, chalky, and peaty pastures, clay is easily broken down at this season with the clod-crusher and roller, and bush or chain harrowed in. Clay warp may be applied to a large area of soft bog land more readily just now than in winter. Farm buildings should be repaired, or new ones built, and stackyards and thatch got ready for hay and corn harvest.

Hay Harvest generally commences with Rye-grass and Clover, but this year there will be exceptions, meadow hay being made first, to prevent its being burnt off the ground. In bright, sunny weather both plants are liable to "roast," more especially the Clover, so that turning is the rule, which should be carefully done, so as to avoid breaking the grass. When mown by the scythe, the swathe is easily turned with the fork handle or rake handle. The great bulk of the crop, however, is now cut with the mowing-machine, which leaves the grass behind the knife in a broad flat swathe, more contracted and compressed at the one side than at the other by the "track clearer," so that the hay does not make equally. When the crop is not very heavy, and the weather forcing, the outspread grass, from its great exposure, may be ready for cocking without turning. But if the crop is heavy, the thick half of the swathe should be turned over upon the thin half with a common hand-rake, which operation will generally fit it for hand-cocking. But if the weather is precarious it may have to go into grasscocks, which will next day, weather permitting, have to be spread out, avoiding breaking of the grass, and when ready put up into handcocks. There is no use in shaking out grasscocks in a moist atmosphere greatly loaded with vapour; in which case the grasscocks may have to be turned upside down, to prevent heating, or the making of "hay vinegar," should the grass be much broken. The hay remains in the handcock until fit for the "trampcock" or "cole," and in the latter until fit for stacking, the length of time in each case depending upon the weather.

Clover, Sainfoin, and Lucerne, when made into hay separately, require careful turning in scorching weather to prevent the leaves being burnt to "tinder" or "snuff." In other repects the *modus operandi* of hay-making is similar to that above described under Rye-grass and Clover hay. Sainfoin is sometimes carried when half made or so, and stacked in layers alternately with straw, to which it imparts much of its odorous and sapid properties—the two when cut into chaff being wholesome and much relished by cattle.

Parsnips and Carrots (Belgian) horse and hand hoe. In singling look before you, so as that the best plants shall fall in their place, 6 inches apart. When grown in raised drills, draw the earth well up to the plants in hand-hoeing, as it is liable to go the other way with the horse-hoe. Hoe deep and close, but do not touch the roots; skimming the surface does no good.

Chicory horse and hand hoe as Carrots, leaving the plants somewhat closer in the rows, when grown as a substitute for coffee.

The Dairy.—"A cow is made by that which goes in at the mouth," says the old proverb, and as green food is now in its prime this is one of the best months for the dairy farmer, provided his milch cows receive a plentiful supply of pure filtered water, and are sheltered from the scorching rays of the sun, and otherwise properly attended to. Whether soiled at the homestead or grazed in the pastures, on no account should a milch cow be roasted in the sun or tormented with flies, as her milk is thereby reduced in quantity and depreciated in quality. Some natural grazings yield rich milk, but generally speaking richer butter and cheese can be produced by soiling than by grazing under ordinary good management; but when Vetches, irrigated meadow grass, sewage grass, &c., are forced forward at this season, such forage requires to be mixed with others, as Clover, Sainfoin, and Lucerne, or properly seasoned with pea and bean meal, to supply the requisite proportion of cheesy element requisite to produce rich milk either for butter or cheese. As the natural grasses of rich grazings consist of a mixture of several varieties, so must the artificial supply of green food for milch cows, to produce similar results.

Grazing Stock in pastures devoid of shade from the sun now begin to suffer at mid-day, and to avoid the scorching effects of the sun's rays and the torment of flies some farmers take home their cattle between 10 and 11 A.M., and turn them out again about 4 P.M.; and where cattle and sheep have trees to go under, they will be found ruminating in the shade which they afford during the above hours of mid-day.

Swine attend to as directed last month. For a single litter June is considered a favourable month for farrowing, and therefore it is not unfrequently chosen for young sows to bring forth their first litters; but it is too late to be followed by a second litter under ordinary management. *W. B.*

Notices to Correspondents.

CALVES: *A Correspondent* says—My calves are at present affected with some sort of disease in the skin; it generally appears first about the head, cheek, and neck in small spots, the hair dropping off, and seems a little itchy; they get rather dry in the hair, and do not seem to improve, but feed much as usual; my neighbours do not seem to know anything of it. Your advice will greatly oblige. [It is very probable that the calves are affected with ringworm, a disease to which these animals are liable. Feed liberally, and apply to the bare places an ointment composed of pure carbolic acid, half an ounce, and lard 8 ounces.]

Markets.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, June 16.

Prime Meadow Hay	110s.	to 120s.	Clover, old ..	115s.	to 145s.
Inferior do.	90	100	Inferior do. ..	115	125
New Clover	95	110	Prime 2d cut ..	115	140
Inferior do.	80	90	Inferior do. ..	100	110
Straw	24	30	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, June 16.

Sup Meadow Hay	118s.	to 126s.	Inferior Clover .	115s.	to 126s.
Inferior do. ..	100	110	New do.	—	—
New do.	—	—	Straw	33	36
Superior Clover .	138	147	JOSHUA BAKER.		

WHITECHAPEL, Thursday, June 16.

Fine Meadow Hay	76s.	to 82s.	Prime old Clover	125s.	to 130s
Inferior do. ..	60	70	Inferior do. do. ..	90	100
Prime New Hay ..	—	—	Prime 2d cut do. ..	—	—
Inferior	—	—	New Clover ..	105	112
Straw	24	30	Inferior do. ..	80	90

ENGLISH WOOL.

The market remains unaltered, and, we think, will continue to do so until the bulk of the new clip has been brought forward at the various county fairs shortly to take place.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.–	s. d.	s. d.
FLEECES—Southdown hoggets		1 10	1 2½
Half-bred ditto		1 2	— 1 2
Kent Fleeces		1 3	— 1 4
Southdown ewes and wethers		0 04	— 1 1
Leicester ditto		1 2	— 1 3
SORTS—Clothing		0 10	— 1 6
Combing		1 0	— 1 8

METROPOLITAN CATTLE MARKET.

MONDAY, June 13.

We have a large increase in the supply of Beasts, and a very dull trade; prices are lower for all descriptions, and a clearance cannot be effected. The supply of foreign is shorter, but of English quite as good or better than of late. Trade is dull, at our quotations. Choice Lambs and Calves are in demand, there being very few of that quality on offer. Our foreign supply consists of 1040 Beasts, 7250 Sheep, and 350 Calves; from Scotland there are 174 Beasts; from Norfolk and Suffolk, 1680; and 1096 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4 10	05 0	Best Long-wools ..	.. 10	.. ..
Best Shorthorns ..	4 6	— 4 10	Do. Shorn	4 8	— 5 0
2d quality Beasts ..	2 8	— 3 8	Ewes & 2d quality ..	.. —	.. ..
Best Downs and Half-breds ..	.. —	.. ..	Do. Shorn	4 2	— 4 8
Do. Shorn	5 0	— 5 4	Lambs	5 0	— 6 8
			Calves	3 6	— 5 8
			Pigs	3 4	— 5 4

Beasts, 3990; Sheep and Lambs, 27,300; Calves, 390; Pigs, 80.

THURSDAY, June 16.

The number of Beasts is not quite so large as on last Thursday; it, however, exceeds the demand; prices are lower, and several remain unsold. The supply of Sheep is large, and the demand for them is small, consequently lower prices are taken, and a clearance cannot be effected. There is scarcely any sale for middling Lambs; a few choicest qualities are disposed of at nearly late rates. Calf trade is very dull. Our foreign supply consists of 270 Beasts, 3120 Sheep, 655 Calves, and 5 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	4 8	05 0	Best Long-wools ..	.. to ..	
Best Shorthorns ..	4 6	— 4 8	Do. Shorn ..	4 8	— 4 10
2d quality Beasts ..	2 8	— 3 8	Ewes & 2d quality ..	.. —	.. ..
Best Downs and Half-breds ..	..	—	Do. Shorn	4 0	— 4 6
Do. Shorn	4 10	— 5 2	Lambs	5 0	— 6 4
			Calves	3 4	— 5 0
			Pigs	3 4	— 5 4

Beasts, 880; Sheep and Lambs, 15,850; Calves, 840; Pigs, 25.

METROPOLITAN MEAT MARKET.—June 16.

Best Fresh Butter .. .. .. 15s. per dozen lb.
Second do. do. .. .. 13s. „
Small Pork, 4s. 8d. to 5s. 0d.; Large Pork, 3s. 6d. to 3s. 8d. per 8 lb.

COALS.—June 15.

Walls End Haswell, 17s.; Walls End Hetton, 17s.; Walls End Hetton Lyons, 14s. 6d.; Walls End Hawthorn, 14s. 3d.; Wall's End Ryhope, 15s. 0d.; Walls End Russell's Hetton, 15s. 3d.; Walls End Heugh Hall, 16s.; Walls End Original Hartlepool, 17s.; Walls End South Kelloe, 16s.; Walls End Tees, 16s. 9d.; Brancpeth Cannel, 18s.—Ships at market, 53; sold, 39; unsold, 14; at sea, 20.

MARK LANE.

MONDAY, June 13.

There was a very short supply of English Wheat to this morning's market, which was sold at an advance of 2s. to 3s. per qr. The attendance was good at this morning's market, including several country millers, and also some purchasers of foreign Wheat for the Continent, who took a considerable quantity at an improvement of 3s. per qr. upon American, and 2s. per qr. upon other qualities. Barley, Beans, and Peas were 1s., and Oats 1s. 6d. to 2s. per qr. dearer. The top price of town-made Flour was raised 4s. per sack, and foreign was 2s. per sack and 1s. per barrel dearer.

		s.	s.
WHEAT, Essex, Kent, Suffolk.	White	49—55	Red..... 47—55
— —	fine selected runs..do.	52—60	Red..... 50—57
— —	Talavera	53—62	
— —	Norfolk	—	Red..... —
— —	Foreign	42—60	
BARLEY, grind. & dist., 26s to 30s.		Chev. 39—42	Malting .. 34—38
— Foreign ..	grinding and distilling	32—30	Malting .. 30—40
OATS, Essex and Suffolk		22—24	
— Scotch and Lincolnshire..		Potato 24—26	Feed .... —
— Irish		Potato 23—25	Feed .... 21—24
— Foreign		Poland and Brew 25—27	Feed .... 20—25
RYE		32—36	Foreign .. 33—36
RYE-MEAL, Foreign			33—36
BEANS, Mazagan....	34s. to 43s...	Tick 34—46	Harrow .. 34—46
— Pigeon	40s. to 55s...	Winds —	Longpod.. —
— Foreign		Small 41—43	Egyptian . 38—40
PEAS, White, Essex, and Kent..		Boilers 34—38	Suffolk .. 37—40
— Maple, 33s. to 40s.		Grey 32—35	Foreign .. 33—37
MAIZE		—	Foreign .. 30—32
FLOUR, best marks delivered..		per sack 39—47	
— 2d ditto		ditto 29—41	Country .. 29—41
— Foreign		per barrel 24—27	Per sack.. 32—58

WEDNESDAY, June 15.

The receipts of English Wheat at Mark Lane this morning were very moderate. For all qualities the trade was firm, at fully the late advance. The show of foreign Wheat was moderate; the demand was steady, and extreme quotations were obtained. With moderate supplies, the Barley trade was firm at the recent improvement. Malt was steady at late rates. Oats were in short supply and healthy request, at improving prices. Beans and Peas were firm, and quite as dear. Flour was steady, on former terms.

ARRIVALS OF GRAIN, &C., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 760	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	9180	1510	10,420	{ 360 { 14,470 brls.
	9940	1510	10,420	

LIVERPOOL, June 14.—Good average business in Wheat, at an amendment of 3d. to 4d. in white and 2d. to 3d. per cental in red, on the week, the sales being chiefly to British millers. Flour 1s. per barrel and nearly 2s. per sack dearer. Oats, Oatmeal, and Barley neglected. Beans and Peas 1s. per qr. higher. Indian Corn in moderate demand, at an advance of 6d. per qr. on last Thursday's quotations.

AVERAGES.

	Wheat.	Barley.	Oats.
May 7	43s 3d	34s 2d	23s 1d
— 14	44 5	33 9	23 1
— 21	45 3	32 5	22 0
— 28	45 4	32 11	23 10
June 4	45 3	32 0	23 0
— 11	46 1	33 1	22 0
Average ..	44 11	33 1	22 10

HOPS.

BOROUGH MARKET, June 16.

Messrs. Pattenden & Smith report the market quiet, the demand being of an entirely retail character, at last week's quotations.

SEED MARKET.

Quietness in demand but firmness of tone continue to characterise the agricultural seed trade. The prolonged drought, which is now becoming quite serious, causes all descriptions of seeds to be held very firmly. Accounts from the provinces speak very badly of the growing crops, whilst our French advices describe Italian as almost a total failure. Mustard and Rape seed are held for full prices; a few days' rain would create a large demand for these seeds. We have an inquiry for old Trifolium seed. In Tares there has been a rapid advance of several shillings per qr., large quantities having been bought for export to France. Canary seed must be quoted 3s. to 4s. per qr. higher. French Italian is 2s. to 3s. per cwt. dearer. Linseed is steady.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,

WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extent sions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to T. S. TRUSS, C.E., Sole Manufacturer, Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder, Friar Street, Southwark Bridge Road, London, S.E.

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED CONICAL, also Elliptic Boilers, from 21s. each

Improved Conical. *Tubular Boiler.*

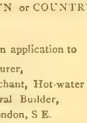

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 52s. 6d. each

CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60s. each.

Portable Boiler. Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.

INDIA-RUBBER RINGS for Sockets require no other packing, and are perfectly water-tight. Pipe Joints: *Elliptic Boiler.*

Goods, of the very best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE, Old Barge Iron Wharf, Upper Ground-street, London, S. (Surrey side Blackfriars Bridge). Price List on application.

THE CLOCHES, or BELL GLASSES, named in Mr Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 83, Upper Thames Street, where a Stock is kept; also at 36, Long Acre. J. GOODERIDGE, Agent.

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

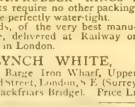

	Each.—s.	d.		Each.—s.	d.
2 inches in diameter	.. 0	3½	12 inches in diameter	.. 1	9
3 „ „	.. 0	4½	13 „ „	.. 2	0
4 „ „	.. 0	5½	14 „ „	.. 2	6
5 „ „	.. 0	6½	15 „ „	.. 3	0
6 „ „	.. 0	8	16 „ „	.. 3	6
7 „ „	.. 0	9	17 „ „	.. 4	0
8 „ „	.. 1	0	18 „ „	.. 5	0
9 „ „	.. 1	2	19 „ „	.. 6	0
10 „ „	.. 1	4	20 „ „	.. 7	0
11 „ „	.. 1	7			

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	.. 0s.	6d.	9 inches in diameter	.. 1s.	8d.
5 „ „	.. 0	8	10 „ „	.. 2	0
6 „ „	.. 0	10	11 „ „	.. 2	6
7 „ „	.. 1	1	12 „ „	.. 3	0
8 „ „	.. 1	4			

Either flat or conical tops.

CUCUMBER GLASSES.

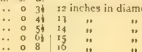

24 inches long	.. ..	2s. 0d.	16 inches long	.. ..	1s. 4d.
22 „	.. ..	1 10	14 „	.. ..	1 2
20 „	.. ..	1 8	12 „	.. ..	2 6
18 „	.. ..	1 6			

HAND GLASSES, WITH OPEN TOPS.

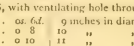

Each.—s. d.			Each.—s. d.		
12 inches	.. ..	6 6	20 inches	.. ..	10 6
14 „	.. ..	7 6	22 „	.. ..	11 6
16 „	.. ..	8 6	24 „	.. ..	12 6
18 „	.. ..	9 6			

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

HORTICULTURAL EXHIBITIONS. NOTICE TO COMMITTEES.

Upon application to the Undersigned, Plans and Prices for the HIRE of elegant and commodious TENTS are forwarded free of charge. All letters should be addressed to 2, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.

BENJAMIN EDGINGTON.

GARDEN CANOPIES, of various sizes, suitable for Croquet Lawns, Children's Playing Grounds, and general Garden use, may be seen erected at

BENJAMIN EDGINGTON'S Establishment, 2, Duke Street, foot of London Bridge,

CROQUET, CRICKET, and GARDEN TENTS of all sizes and shapes. An Illustrated Catalogue free on application. Address, BENJAMIN EDGINGTON (in full), 2, Duke Street, London Bridge, S.E. No other Establishment

Illustrated Catalogues post free.

GARDEN and LAWN TENTS, of the most elegant form, easily erected and removed, at BENJAMIN EDGINGTON'S, 2, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.

ARCHIMEDEAN LAWN MOWER to be SEEN at BUTLER, M'CULLOCH AND CO'S, South Row, Covent Garden Market, London, W.C. (opposite Southampton Street). Established upwards of a Century.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Bow, Lincolnshire.

LOOKER'S PATENT CAPPED GARDEN FRAMES, GROUND VINERIES, and FERN CASES. Equal to every other arrangement as regards usefulness, and by far more ornamental in appearance. See *Gardeners' Chronicle*, March 12. Price from 11. 6d. per foot.

Hooper & Co., Covent Garden; Dixon & Co., 48A, Moorgate Street; Rosher & Co., Upper Ground Street, Blackfriars, Kingsland Road, and Queen's Road West, Chelsea.

BENJAMIN LOOKER, Inventor and Sole Manufacturer, Kingston-on-Thames.

LOOKER'S PATENT PROPAGATING BOXES.—The best mode of Raising all kinds of Spring Seeds and Cuttings. Price from 1s. each.—Hooper & Co., Covent Garden; Rosher & Co., Upper Ground Street, Blackfriars Road, and Queen's Road, West Chelsea; and Dixon & Co., 48A, Moorgate Street.

Inventor and Sole Manufacturer,

BENJAMIN LOOKER, Kingston-on-Thames.

THE GRANITIC PAINT, as used in the Crystal Palace, Sydenham, is the Cheapest, most Brilliant, and Enduring for all Outside and Inside Work, on Iron and Wood, &c.; for all Decorative purposes; and is the best Paint for lasting qualities manufactured, as it does not change, takes at least five hours in going down, has comparatively little smell, can be washed, and will cover all sunk parts

Sold only by the GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.

Prospectuses and Testimonials free on application.

NO MORE DAMP WALLS.—The only Cure for Damp Walls, Preserving Stone, Brick, and Cement from Decay is the SILICATE ZOPISSA COMPOSITION, used in the Houses of Parliament, and manufactured by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 39A, King William Street, London, E.C.

THE BEST and CHEAPEST PAINT for Farm Buildings, Stables, Conservatories, Garden and Park Railings, and all Inside and Out-door work, whether Iron, Stone, Stucco, or Wood, is JAY'S PATENT METALLIC PAINT. It covers well, dries quickly, presenting a hard glossy surface, and never blisters or cracks. The price is half that of ordinary paints, and a little goes as far, one coat being equal to two. Price, ready mixed for use in all colours, 5s. 6d. per gallon, or 27s. per cwt.; Red, Chocolate, and Black, 4s. 6d. per gallon, or 22s. per cwt. Orders for 1 cwt. or upwards sent carriage free to any Railway Station in England upon receipt of remittance addressed to

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BROWN'S FLORAL SHADING, a protection from Frost and Sun. Samples and prices on application to CHARLES BROWN, Greenheys, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.

JAS T ANDERSON, 7, Commercial Street, Shoreditch, London.

TANNED GARDEN NETTING, for Preserving Seed Beds, Fruit, Strawberries, from Frost, Blight, Birds, &c., and as a Fence for Fowls, &c. Our Garden Netting, 2 yards wide, 2½d. per yard, 3d.; and four yards, 4d. per yard in any quantity. May be had of CHAS. WRIGHT AND CO., William Street, Newark-on-Trent, or their Agents, Messrs. HOOPER AND CO., Covent Garden Market, London, W.C.

TANNED GARDEN NETTING for Seed Beds, and for the Protection of Fruit Trees from Frost, Blight, and Birds, or as a Fence for Fowls, &c.; 2, 4, and 6 yards wide, at one penny per square yard; 100 yards, 7s. 6d.; 500 yards, 35s.; 1000 yards, 65s. Remittances to accompany all orders.

CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough.

NETTING for FRUIT TREES, SEED BEDS, &c. RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3d. per yard, or 100 yards, 20s.; 4 yards wide, 6d. per yard, or 50 yards, 20s. NEW TANNED NETTING, suited for any of the above purposes, or as a Fence for Fowls, 2 yards wide, 2d. per yard; 4 yards wide, 1s. per yard; ¾-inch mesh, 4 yards wide, 1s. 6d. per yard. Can be had in any quantity of

EATON AND DELLER, 6 & 7, Crooked Lane, London Bridge, E.C.

GARDEN NETTING (at Reduced Price), for the Protection of newly-sown Seeds from Frost, Blight, and Birds; also as a Fence for Poultry, Rabbits, and Sheep, 1d. per square yard, carriage free, in quantities of 250, 500, or 1000 yards.

SCRIM CANVAS, for Wall Fruit, Conservatory Shades, Tulip Covers.

HAYTHORN'S and WALLER'S NETTINGS, sample of material free on application. RICK COVERS, New and Second-hand, with Poles, complete. Be particular—

FREDERICK EDGINGTON AND CO., Marquee, Tent, Flag, and Rick Cloth Manufacturers, 60 and 62, Old Kent Road, London, S.E.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens; the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Domo" Netting.

White or Brown, made of Hemp or Hair and Wool. A perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes.

PROTECTION from the COLD WINDS and MORNING FROSTS "FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.

"FRIGI DOMO" CANVAS.

Two yards wide	1s. 9d. per yard run.
Four yards wide	3s. 6d. per yard.
An improved make, 2 yards wide ..	2s. 0d. per yard.
An improved make, 3 yards wide ..	2s. 8d. per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 54d., 64d., 72d., 78d. and 84d. per yard.

Hessian Canvas, 54 and 72 inches wide, 64d. and 84d. per yard; 1d. extra for cut lengths.

ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nursery-men and Seedsmen throughout the Kingdom.

Registered

GARDEN ROLLER BARROW.

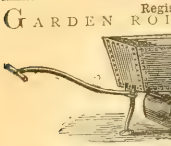

This light, elegant, and useful combination of the necessary Garden Implements, the Rake and the Barrow, for which Messrs. Hall and Wilkes, Sydney, are supplied by

HALL AND WILKES, 456 CO., Bear Garden, New Park Street, Southwark, London, S.E.

Price Lists free on application.

H. BROOK AND CO., Sole Manufacturers of the CHELTENHAM GARDEN ENGINE, which weighs only 3 lb. 14 oz., throws water in a continuous stream over 35 feet. The large size, worked by the foot, throws over 60 feet, and is strongly recommended as a Fire-engine. It can be had of Ironmongers, and Wholesale only at 100, Feathers' ne Buildings, Holborn, London, W.C.

Vases and Fountains, for the Garden and Conservatory.

ANDREW HANDYSIDE AND CO., Britannia Foundry, Derby; 32, Wallbrook, London

The Britannia Iron Works have for the last 40 years been well-known for the production of fine Iron Castings. The use of Cast-Iron permits a delicacy of outline, and smoothness of surface, impossible in cheap Stone or Terra-cotta. Cast-Iron Vases, if neatly finished, painted, are imperishable, and will not crack when exposed to the severest frosty weather.

Five large Sheets of Designs and Price Lists post free for 6 stamps. A. H. & Co. make the better kind of IRON and GLASS CONSERVATORIES, and have constructed some of the largest and finest in the kingdom.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, stone-ware, and Red-ware, and of great durability. The former of these are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, never "turning." Things, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.

WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slabs, Cements, &c.

To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.

FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.

F. & G. ROSHER.—Addresses see above.

N.B. Orders promptly executed by Railway or Vessel.

A liberal discount to the Trade.

Automaton Lawn Mowers, Manufactured by

RANSOMES, SIMS, AND HEAD, Ipswich. The best, simplest, and most durable Machines. They leave no ribs in the Grass, and are unsurpassed for keeping a Lawn or Croquet Ground in first-rate order; 500 are now in use. Price from 5s. Sizes 8 to 20 inches. A large stock kept, and orders executed on receipt. Illustrated Lists free by post, and Testimonials from Thirty English Counties. (Please refer to this Advertisement when ordering).

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Increasing purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. To be obtained of B. HIRST AND SONS' Patent Lawn Mowing Machines, too already been tried. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

SHANKS'S PATENT LAWN MOWERS for 1870.

The Patent Improvements recently introduced give SHANKS'S MACHINE

Several important advantages over all other Lawn Mower

PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.

The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated

ALEXANDER SHANKS & SON have been informed that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Price ever given at any Exhibition for Lawn Mowers

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the Plate has only to be unscrewed and the second edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to be used twice as long as in other machines, where the single-edged Sole-plate must be entirely removed when the edge is worn down.

A Wind-Guard has also been added, to prevent the Mown Grass being blown past the Box during the process of cutting.

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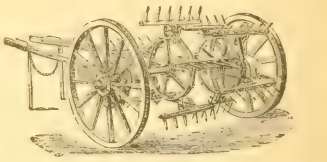

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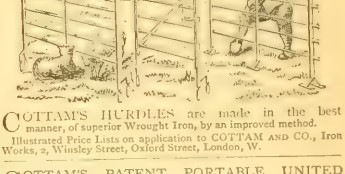

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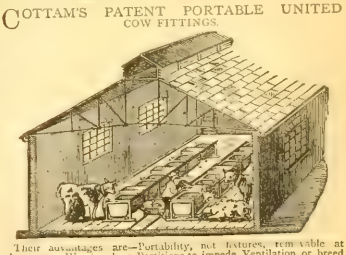

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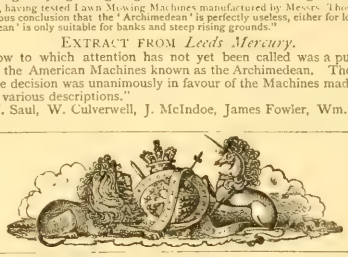

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LEEDS ROYAL PARK.

Testimonial from the Council of the Royal Horticultural Society, South Kensington, May 28, 1870.

"GENTLEMEN,—I am directed by the Council to inform you that your Lawn Mowing Machines have been in constant use in their Gardens at South Kensington during the last 10 years, and that they have always given the greatest satisfaction, doing their work excellently and with so much ease as to be generally preferred by our workmen.

"THOS. GREEN & SON. "I remain, gentlemen, your obedient servant, JAMES RICHARDS, Assistant Secretary."

GREEN'S IMPROVED PATENT ROLLER,

FOR LAWNS, DRIVES, BOWLING GREENS, CRICKET FIELDS, AND GRAVEL PATHS.

Suitable for Hand or Horse Power.

PRICES OF

HAND ROLLERS.

Diam.	Length.	£	s.	d.
30 in.	32 in.	7	10	0
24 in.	26 in.	4	10	0
20 in.	22 in.	3	10	0
16 in.	17 in.	2	15	0

PRICES OF

ROLLERS

Fitted with Shafts, suitable for Pony or Horse Power.

Diam.	Length.	£	s.	d.
30 in.	32 in.	10	0	0
30 in.	36 in.	10	15	0
30 in.	42 in.	11	15	0
30 in.	48 in.	13	10	0
30 in.	60 in.	15	10	0
30 in.	72 in.	17	10	0
30 in.	84 in.	19	10	0

These ROLLERS possess many advantages over all others; they are made in two parts, and are free to revolve on the axis, affording greater facility for turning, and the outer edges are rounded off, or turned inwards, thus avoiding the unsightly marks left by other Rollers. They are manufactured of the best materials, and are got up in a manner surpassing any ever yet brought out.

The ROLLERS, 24 by 26 inches, 20 by 22 inches, and 16 by 17 inches, are also made in one part, at a reduced price; and, for Rollers of that size, will be found to answer many requirements, as the handle can be reversed to either side of the Roller at pleasure.

PRICES.

24 inches by 26 inches	£4	0	0
20 ,, 22 ,, ...	3	2	6
16 ,, 17 ,, ...	2	10	0

Delivered Carriage Free to all the principal Railway Stations and Shipping Ports in England.

GREEN'S PATENT TUBULAR HOT-WATER BOILERS.

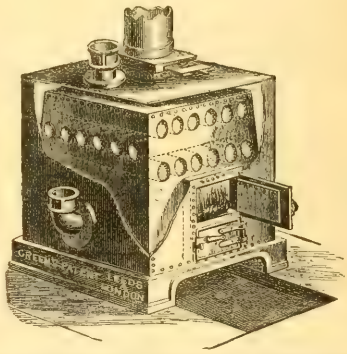

The following are the advantages of these Boilers :—

1st. They require no setting in brickwork.
2d. They are complete in themselves, having perfect means of regulation.
3d. They take up little room, and can be put in places inaccessible to other Boilers.
4th. They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th. Any number of Flows and Returns can be annexed to the Boilers by means of T pipes.
6th. By means of mud doors, they can be readily cleaned out when required.
7th. The Chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

They are warranted to be the most Economical Boilers extant. Price Lists free on application.

Illustrated Price Lists of Green's Patent Lawn Mowers and Patent Boilers, free on application.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 26.—1870.] SATURDAY, JUNE 25. {Price Fivepence. {Stamped Edition, 6d.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
GREAT ROSE SHOW, WEDNESDAY, June 29. Band of Scots Fusilier Guards from Four. Tickets of principal Musicsellers, or at the Gardens (if bought before the 29th). Fellows' Friends, 3s. 6d.; Public, 5s.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
FLOWER SHOW, FRUIT and FLORAL COMMITTEE MEETING, on WEDNESDAY, June 29, at 11 o'Clock. GENERAL MEETING, at Three. Band of the Scots Fusilier Guards from Four. Admission, 5s.

ROYAL HORTICULTURAL SOCIETY'S (in conjunction with the ROYAL OXFORDSHIRE HORTICULTURAL SOCIETY) GREAT PROVINCIAL SHOW of FRUIT and FLOWERS, will be held at OXFORD, from JULY 19 to 22 inclusive. Band of the Royal Horse Guards, July 20. Admission—First day, 5s. (Tickets bought before the 19th, 3s. 6d.); Second day, 2s. 6d.; Third and Fourth days, 1s.

GARDENERS' CHRONICLE PRIZES.—At the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY, to be held at OXFORD, in JULY, 1870, in connection with the Show of the Royal Agricultural Society, the following PRIZES will be offered by the PROPRIETORS of the GARDENERS' CHRONICLE:
For the Two best COLLECTIONS of FRUIT and VEGETABLES, 6 distinct kinds of each, a 1st prize of £7, and a 2d prize of £3
☞ The Vegetables to be neatly set up in flat baskets; the Fruit to be displayed on stands or in dishes.
The competition is open only to AMATEURS and to GARDENERS of Private Families. The Winners of the *Gardeners' Chronicle* Prize in 1867, 1868 and 1869 excluded from competing. The articles produced to be of the EXHIBITOR'S OWN GROWING.

THE GREAT WEST of ENGLAND ROSE and ORNAMENTAL PLANT SHOW will be held in the beautiful Grounds of WILTON PARK, SALISBURY, WILTS, on TUESDAY, June 28. For Prize Lists apply to Mr. S. GRIFFIN, Secretary and Treasurer, Wilton Road, Salisbury.

BRIGHTON and SUSSEX HORTICULTURAL SOCIETY.—GRAND ROSE and FRUIT SHOW, TUESDAY, June 28, at the Royal Pavilion and Eastern Lawn. Upwards of 50 Prizes are offered for Roses, and 43 for Fruits. Schedules on application to the Secretary, 36, St. James's Street, or E. SPARY, Superintendent of the Exhibitions, Queen's Grapenes, Brighton
N.B. GRAND AUTUMN SHOW, SEPTEMBER 14 and 15.
EDWARD CARPENTER, Secretary.

Exhibition of Roses.

THE SUMMER SHOW of the REIGATE ROSE ASSOCIATION will be held at the NEW PUBLIC HALL, REIGATE, on SATURDAY, July 2. Admission by Members' Tickets at 1 o'Clock; and after 2 o'Clock to the Public on payment of 1s. Close at 6 o'Clock.

LEICESTERSHIRE HORTICULTURAL SOCIETY.—The GREAT SUMMER EXHIBITION of this Society will be held on the Race Course, Leicester, on TUESDAY and WEDNESDAY, July 5 and 6, when £40 will be offered in Prizes for Cut Roses, and upwards of £25 for Plants in pots.
A SHOW of BRITISH and FOREIGN BIRDS will be held in connection with the Exhibition.
Schedules of Prizes and all particulars may now be had of
Market Place, Leicester. WM. PEPPER COX, Secretary.

THE ROMFORD and ESSEX FLORAL and HORTICULTURAL SOCIETY.—The FIRST SHOW, Open to All England, will be held on THURSDAY, July 7, when PRIZES to the amount of ONE HUNDRED and TEN POUNDS will be awarded. ENTRIES to CLOSE JUNE 30. Schedules and full particulars on application to E. S. PALMER, } Secs
R. HULSE,
Committee Room, White Hart Hotel, Romford.

SLEAFORD HORTICULTURAL SOCIETY.—The ANNUAL EXHIBITION of the above Society will take place on THURSDAY, July 14, when the following Prizes, open to all England, will be awarded:—
12 Stove and Greenhouse Plants—1st Prize, £5; 2d, £3; 3d, £1 10s.
24 Roses, distinct varieties—1st Prize, £3; 2d, £2; 3d, £1.
Collection of Fruits—1st Prize, 10s.; 2d, 7s. 6d.
Schedules on application to Mr. J. C. BROWN, Hon. Sec.
Sleaford, June 21.

Exhibition of Fuchsias.

H. CANNELL will OPEN an EXHIBITION of the above plants simultaneously with the Flower Show of South Kensington, and will continue open until further notice.
H. CANNELL, F.R.H.S., Woolwich.

BIRMINGHAM ROSE SHOW, JULY 7 and 8.—For PRIZE LISTS, apply to Mr. A. FORREST, Secretary, Cherry Street, Birmingham. ENTRIES CLOSE JULY 2.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—THE TWENTY-SEVENTH ANNIVERSARY FESTIVAL will take place at the LONDON TAVERN, Bishopsgate Street, London, on WEDNESDAY, July 6 next, for the purpose of
The Right Hon. the EARL of DERBY in the Chair
Dinner upon Table at 6 o'Clock precisely. Tickets, 21s. each
EDWARD R. CUTLER, Secretary.
14, Tavistock Row, Covent Garden, W.C.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—A SPECIAL GENERAL MEETING of the MEMBERS of this SOCIETY will be held at the Bedford Hotel, Covent Garden, W.C., on TUESDAY, July 5 next, for the purpose of ELECTING SIX PENSIONERS. The Chair will be taken at 6 o'Clock. The Ballot will close at 8 o'Clock precisely. By order,
June 16 EDWARD R. CUTLER, Secretary.
The Voting Papers have all been delivered. Any Subscriber not having received one is respectfully requested to make immediate application.

TO the SUBSCRIBERS of the GARDENERS' ROYAL BENEVOLENT INSTITUTION.—The Friends of DONALD SINCLAIR, one of the Candidates at the ensuing Election, beg leave to remind those Subscribers who have kindly promised their support, that the ELECTION takes place on July 5.

Golden Chain Geranium.—To the Trade.

WILLIAM BRYANT begs to offer extra strong Plants of the above, at 20s. and 30s. per 100.
The Nursery, Rugby

NEW DOUBLE GERANIUMS.—Twelve fine varieties Double Zonal Geraniums, 6s.; 12 superb new Double Zonal Geraniums of 1869 for 12s.; 12 superb Single Zonal Geraniums, 6s.; 12 varieties Gold and Golden Bicolor Geraniums, 6s., package included, from
B. W. KNIGHT, Florist, Battle, Sussex

Stangeria paradoxa.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, begs to offer fine healthy plants of the above-named very rare Cycad, at 42s. to 63s. each. There is but a few of them for Sale.

ORNAMENTAL PLANTS, PALMS, FERNS, &c., in large and small specimens, can be had of
Mr. ALFRED SERDOBBEL, Faubourg d'Anvers, Ghent, Belgium.

A GERATUM IMPERIAL DWARF.—Well-rooted plants, out of stores, 4s. per dozen; strong, in pots, 6s. per dozen.
S. BADMAN, Eltham Road Nursery, Lee, S.E.

A GERATUM IMPERIAL DWARF (CHATER'S).—Good plants in pots at 12s. per dozen
RICHARD SMITH, Nurseryman, Worcester.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

PEACHES and NECTARINES.—Fine healthy Pyramids, in Pots, each bearing from 12 to 18 good Fruits. Price 7s. 6d. to 10s. 6d. each.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

NATURAL GRASSES; their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c.
Free by post
RICHARD SMITH, Seed Merchant, Worcester.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots. DESCRIPTIVE PRICED LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Roses.

THE COLLECTION of ROSES at Woodlands Nursery, Maresfield, near Uckfield, Sussex, occupying an area of many acres, are NOW COMING INTO SPLENDID BLOOM.
WM. WOOD AND SON.—June 25.

CHOICEST ROSES, in pots. TEA-SCENTED, CHINA, NOISETTE, &c. The largest stock in the kingdom, consisting of many thousands of strong healthy plants.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Roses for Bedding, &c.

ROSES, New and Old, strong plants, in pots, now ready for delivery; also large stock of VERBENAS and FUCHSIAS, and general BEDDING PLANTS, which contains a selection of the best varieties only. CATALOGUES free.
WM. KNIGHT, Floral Nursery, Hailsham, Sussex.

Roses, Roses, Roses.

H. LANE AND SON'S magnificent COLLECTION of over 100,000 PLANTS is NOW IN FULL BLOOM. An early inspection is respectfully solicited
One hour's ride by rail from Euston Station, London. Convenient trains to and fro.
The Nurseries, Great Berkhamsted, Herts

A Glorious Show of Roses,

TEA, BOURBON, CHINA, and NOISETTE, May be secured and enjoyed all the summer
BY PLANTING NOW.
Good plants of finest kinds, from pots, mostly 48's, are ready to be presented to all, in exchange for cash, at 40s. per 100 if sent in pots 50s. per 100. Packing charges extra.
CHARLES NOBLE, Bagsho

Miscellaneous Plants suitable for Bedding and Decorative Purposes.

ROBERT PARKER begs to announce that his SELECT DESCRIPTIVE PRICED LIST, including the finest varieties of ECHEVERIAS, PANSIES, SEMPERVIVUMS, TRITOMAS, VIOLAS, &c., &c., is now published, and will be forwarded to applicants.
Exotic Nursery, Tooting, Surrey, S.W.

TWO HUNDRED PINE PLANTS for SALE, all sizes, chiefly QUEENS
The GARDENER, Isleworth House, Isleworth, Middlesex.

WANTED, ADIANTUM CUNEATUM. State quantity and price, cash.
WM. ARMITAGE AND SON, Seed Merchants, Huddersfield.

WANTED, strong Cuttings TRICOLOR GERANIUMS, POLLOCKS, &c. State quantity and price, cash.—WM. ARMITAGE AND SON, Seed Merchants, Huddersfield.

The Best Turnip for the Main Crop is

SUTTONS' IMPERIAL GREEN GLOBE.
Price 10d. per lb.; much cheaper by the bushel.
SUTTON AND SONS, Seed Growers, Reading.

The best Substitute for Swedes is

SUTTONS' PURPLE-TOP YELLOW HYBRID TURNIP.—For sowing the latter end of June and in July and August, this variety is invaluable, and will produce a very heavy crop. Price 1s. per lb., cheaper by the bushel
SUTTON AND SONS, Seedsmen to the Queen, Reading.

Turnip Seeds.

H. AND F. SHARPE have to offer to the Trade fine selected stocks of the above-named Seeds, all of 1869 growth, and raised from picked transplanted bulbs. Prices moderate.
Seed Growing Establishment, Wisbech.

RICHARD WALKER has the following to offer for cash.—DRUMHEAD PLANTS, 3s. selected stock; NONPAREIL PLANTS, all at 3s. per 1000; Red and White CELERY PLANTS, 1s. per 100. Market Gardens, Biggleswade, Beds.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

CARTER'S PRIZE SWEDE and TURNIP.
See page 854 of this day's *Gardeners' Chronicle*.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or, Basing, stoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

Transit Agency for Plants, Seeds, &c.

C. J. BLACKITH AND CO., Cox's and Hammond's Quays, Lower Thames Street, London.
Forwarders to all parts of the World.
N.B.—Mr. BLACKITH is sole Survivor of the late Firm of BETHAM AND BLACKITH

NEW and GENUINE GARDEN, AGRICULTURAL and FLOWER SEEDS. Special Prices and advantageous offers of above, on application to
ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

Genuine Seeds.

WM. CUTBUSH AND SON'S CATALOGUE of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
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To Seed Importers, Nurserymen, &c.

JOHN BETHAM (Son of the late Senior Partner of the Firm of BETHAM & BLACKITH), begs to inform the above that he is Trading under the title of
BETHAM AND SON,
Receiving and Shipping Plants, Seeds, and general Merchandise from and to all parts of the world.
Office, 9, Lower Thames Street, London, E.C.

Verbenas, Verbenas.—6s. per 100; 50s. per 1000.

WILLIAM BADMAN offers PURPLE, WHITE, SCARLET, ROSE, CRIMSON, &c., well-rooted Plants, from store pots, 6s. per 100; per 1000, 50s. cash.
Cemetery Nursery, Gravesend.

Beautiful Columbine.

JOHN GRIGOR AND CO., Nurseries, Forres, N.B., offer fresh seeds of their AQUILEGIA GLANDULOSA, with specimen blossom, post free, for 18 postage stamps, per packet.
"This is perhaps the handsomest hardy perennial in cultivation."—LINDLEY

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Bedding Plants, Florists' Flowers, &c.

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FERNS, BRITISH and EXOTIC, in more than 1000 beautiful species and varieties.—The Subscribers beg to intimate that their CATALOGUE of the above will be forwarded to any applicant on receipt of three postage stamps.
A. STANSFIELD & SON, Vale Nurseries, Todmorden, Lancashire.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

NEW FERN, ADIANTUM CAPILLUS-VENERIS MAGNIFICUM, 1870 (J. & C. LEE).—We have much pleasure in introducing this really useful Greenhouse Fern to public notice, in the firm conviction that it will give satisfaction and become a universal favourite. The fronds are much larger than those of Capillus-Veneriy, being from 12 to 15 inches long, by 4 inches broad, curving over the side of the pot. The pinnæ are of a beautiful soft green, and are almost as large as those of A. Farleyense, and like that fine variety they overlap each other in graceful waves of maiden-hair, with finely incised and fringed edges. The chief value of A. magnificum is in its hardiness and adaptability to the temperature of a greenhouse, whereas A. Farleyense can only be cultivated by those who possess a stove. To be sent out in June. Price 5s. each.
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TAN, Gratis, in the immediate neighbourhood of Covent Garden. Apply to
ESSEX AND SONS, 28, Stanhope Street, Clare Market, W.C.

A Boon for Grape Growers.

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JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

BENJAMIN S. WILLIAMS'
GENERAL AND NEW PLANT CATALOGUE FOR 1870,

Contains LISTS of select ORCHIDS (many being now in flower), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS (both of which are extensively grown, and many fine specimens are now in full beauty), CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

B. S. WILLIAMS respectfully invites inspection of his numerous Collection of Plants, which at all times well repay a visit, but at this particular season are specially interesting.

CONSERVATORIES FURNISHED ON REASONABLE TERMS.

Choice Plants supplied for Balls or Dinner-table Decoration.

PRICED CATALOGUES Post Free on application.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

ROSES IN BLOOM.

MESSRS. JAMES VEITCH & SONS

BEG TO INFORM THE PUBLIC THAT THE

COLLECTION OF ROSES,

At their COOMBE WOOD NURSERY, KINGSTON HILL,

Is now in great perfection, and they respectfully solicit an inspection.

The Coombe Wood Nursery is within one hour's drive of Hyde Park Corner, and a short distance from the Norbiton, Malden, or Kingston Stations, South-Western Railway.

ROYAL EXOTIC NURSERIES, CHELSEA, S.W.—June 25.

NEW PLANTS FOR 1870.

ILLUSTRATED DESCRIPTIVE CATALOGUE FORWARDED FREE on APPLICATION.

MESSRS. JAMES VEITCH & SONS

Beg to announce that they are now sending out their undermentioned splendid NOVELTIES, full descriptions of which were given in the *Gardeners' Chronicle* of May 28, 1870.

ADIANTUM RUBELLUM, 10*s.* 6*d.* each.
ALOCASIA SEDENI, 31*s.* 6*d.* each.
ARALIA OSYANA, 10*s.* 6*d.* to 21*s.* each.
BEGONIA SEDENI, 21*s.* each.
BLANDFORDIA AUREA, 15*s.* each.
CROTON (CODIÆUM) UNDULATUM, 42*s.* to 63*s.* each.
CROTON (CODIÆUM) CORNUTUM, 21*s.* each.
CROTON (CODIÆUM) VEITCHII, 42*s.* to 63*s.* each.
DAVALLIA MOOREANA, 21*s.* each.
DRACÆNA CHELSONI, 42*s.* each.
DRACÆNA ALBICANS, 15*s.* each.
DRACÆNA GUILFOYLEI, 21*s.* each.
DRACÆNA MOOREANA, 42*s.* each.
ECHEVERIA GLAUCO-METALLICA, 5*s.* to 10*s.* 6*d.* each.
ORTHOSIPHON STAMMINEUS, 7*s.* 6*d.* each.
RHODODENDRON LOBBII, 31*s.* 6*d.* each.

NEW ORCHIDS FOR 1870.

CYPRIPEDIUM HARRISIANUM, £5 5*s.* each.
CYPRIPEDIUM (SELENIPEDIUM) LONGIFOLIUM, 21*s.* to 63*s.* each.
EPIDENDRUM SYRINGOTHYRSUS, £5 5*s.* each.
VANDA CŒRULESCENS. Prices on application.
VANDA DENISONIANA, 105*s.* to 210*s.*

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

The Royal Seedsmen.

Economy.—Seeds Direct from the Growers.

The Royal Seedsmen.

CARTER'S
PRIZE SWEDE AND TURNIP,

FOR IMMEDIATE SOWING.

	Per lb.—*s.* *d.*		Per lb.—*s.* *d.*
CARTER'S IMPERIAL HARDY SWEDE, the hardiest and best in cultivation	1 0	CARTER'S IMPERIAL GREEN GLOBE TURNIP	0 10
CARTER'S LONDON SWEDE, the largest variety	1 0	POMERANIAN WHITE GLOBE TURNIP	0 10
SKIRVING'S LIVERPOOL SWEDE	0 9	LINCOLNSHIRE RED GLOBE TURNIP	0 10
HALL'S WESTBURY SWEDE	1 0	DEVONSHIRE GREY-STONE TURNIP	1 0
		CARTER'S EARLY NIMBLE TURNIP	1 0

Cheaper per cwt.

For full descriptions of the above, and instructions for Laying Down Land to Grass, see

CARTER'S ILLUSTRATED CALENDAR FOR 1870.

Post Free, Sixpence. Gratis to purchasers.

JAMES CARTER AND CO., SEED FARMERS, 237 & 238, HIGH HOLBORN, LONDON.

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEREMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

West of England, Ireland, and Wales.

VINCENT SKINNER, Stokes Croft, Bristol, HOT-HOUSE BUILDER and HOT-WATER APPARATUS MANUFACTURER (formerly Partner with J. Weeks & Co.)
430 BOILERS at WORK

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock. WROUGHT and CAST-IRON CONICAL SADDLE, and IMPROVED CONICAL, also Elliptic, Boilers, from 24*s.* each. Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 12*s.* 6*d.* each. CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60*s.* each. Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size. INDIA-RUBBER RINGS for Pipe Joints: Sockets require no other packing, and are perfectly water-tight. Goods, of the very best manufacture, delivered at Railway or Wharf in London.

Improved Conical. *Tubular Boiler.*

Portable Boiler. *Elliptic Boiler.*

LYNCH WHITE, Old Barge Iron Wharf, Upper Ground Street, London, S.E. (Surrey side Blackfriars Bridge). Price List on application.

Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.

Victoria Works, Bury St. Edmund's.

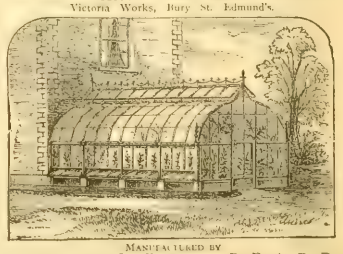

MANUFACTURED BY CHARLES BEARD, Senior Partner in the late Firm of Sanders, Frewer & Co., which Firm was dissolved by mutual consent.

The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866;

The First-class Certificate at the Grand Manchester Horticultural Show, 1867;

The Three First-class Certificates at the Royal Horticultural Show, at Bury St. Edmund's, 1867, viz.:—One Prize for Patent Glazing without Putty; One Prize for Best System of Patent Ventilation; One Prize for S., F. & Co.'s Improved Span-Roof Plant Houses.

These much-approved Patent Systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c.

Full particulars and Prices of the Patent Houses, glazed with 26 oz. Sheet Glass from 1*s.* 2*d.* per foot super and upwards; as also Illustrated Catalogues for 1s postage stamps; may be obtained on application to CHARLES BEARD, Victoria Horticultural Works, Bury St. Edmund's.

PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelope.

Portable and Fixed Hot-water Apparatus

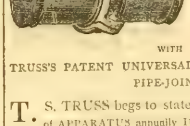

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,

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T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY The Trade supplied.

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LABELS, LABELS.—PARCHMENT or CLOTH LABELS —Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s ; cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

American Lawns.

THE AMERICAN PATENT
"ARCHIMEDEAN" LAWN MOWER
is admitted the best Machine ever brought out for the purpose ; because it is durable, simple, and performs its work better and with LESS THAN HALF the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS.

The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

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The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances adapted not only for our amusement but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 6 or 8 inches long The 14-inch machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used ; and such is our opinion"

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Automaton Lawn Mowers, Manufactured by

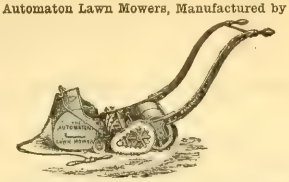

RANSOMES, SIMS, AND HEAD, Ipswich. The best, simplest, and most durable Machines. They leave no ribs in the Grass, and are unsurpassed for keeping a Lawn or Croquet Ground in first rate order ; 4000 are now in use. Prices from 55s. Sizes 8 to 20 inches. A large stock kept, and orders executed on receipt. Illustrated Lists free by post, and Testimonials from Thirty English Counties. (Please refer to this Advertisement when ordering).

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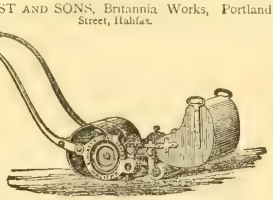

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to

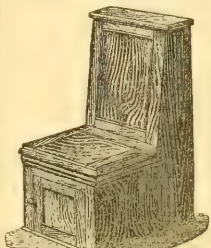

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From MR W. GILBERT,
Lawford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle ; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees a couple of spadesful put into a bucketful of water, and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

(Signed) W. GILBERT.

"January, 1870."

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W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

		Each.
6 ft. by 4 ft. Lights, 2 in thick, unglazed	..	£0 5 0
" " Primed and Glazed with 10 oz. Sheet	..	0 11 0
" " with Stout portable Box, not Painted	..	1 3 0
" " Painted four coats, and Handles on	..	1 8 0
" " Packed and Delivered in Railway van	..	1 10 0
6 ft. by 8 ft., Double Lights, do	..	2 15 0

GREENHOUSES Per ft. super.

Woodwork only Prepared and Fitted	..	0 0 6
" Primed and Glazed with 16 oz. Sheet	..	0 0 9
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" Painted four coats, two sides, ready for use	..	0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

Heating by Hot Water.

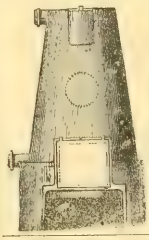

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These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require NO BRICKWORK.

POLLARD JEPHSON, AND CO
(Successors to John K. Peill),
Sole Manufacturers of the Improved CONICAL BOILERS,

Which are in general use, and which Boilers have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.

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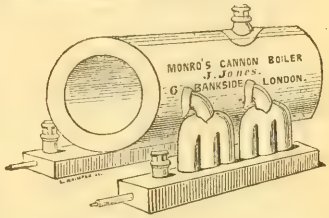

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order ; or they allow a liberal discount for cash at their wharf in London Lists on application.

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Registered

GARDEN ROLLER BARROW.

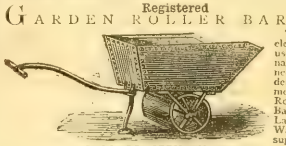

This light, elegant, and useful combination of the necessary Garden Implements, the Roller and the Barrow, for Lawns and Walks, solely supplied by

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Bear Garden, New Park Street, Southwark, London, S.E.
Price Lists free on application.

THE HYDRONETTE
(ROBIN'S PATENT),

FOR GARDENS, GREENHOUSES, CONSERVATORIES,

HOTBEDS, WASHING WINDOWS, CARRIAGES &c., &c.

Unrivalled Ease of Action, Simplicity, Convenience and Force.

The HYDRONETTE is a more useful, easy-working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz : No. 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12s. 6d. ; No. 2, 15s. 6d ; No. 3, £1 1s. ; No. 4, £1 5s. ; No. 5, £1 10s. Extra Hose and Union Joints to order To be had of HAYNES AND SONS, 227, 229, and 231, Edgware Road, W.

CAUTION.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

The Perfect

WATERING CAN.

Registered according to the Act.

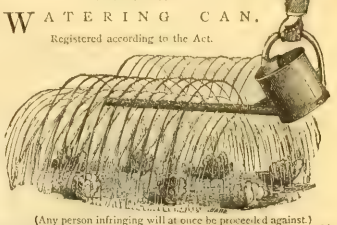

(Any person infringing will at once be proceeded against.)

The advantages this Watering Can possesses over the old kind are :—First, watering can now be done in about half the time ; second, a bed 12 feet wide can be watered without treading on the soil, or having to lift the can an extra height ; third, about half the usual exertion is required. For Greenhouses and Forcing Pits it will prove invaluable, as large areas can be watered with ease ; and being made of strong zinc they will last a lifetime Price, No. 1 (5 gallon), 6s. 6d ; No. 2 (7 gallons), 8s. 6d. ; No. 3 (9 gallons), 10s. 6d ; No. 4 (14 gallons), 12s. 6d.

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WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & CO.,

IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

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SAMUELSON & CO.'S

Newly Patented EDGE-CLIPPING SILENT LAWN MOWERS.

THE MOST IMPORTANT IMPROVEMENT EVER INTRODUCED.

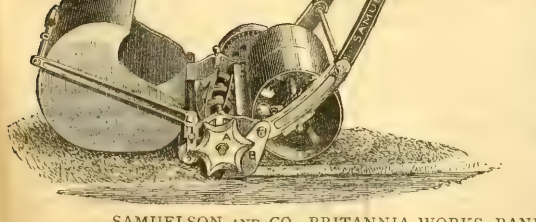

MESSRS. SAMUELSON & CO.

Beg to draw special attention to their

NEW

Lawn Mowers for 1870,

which are fitted, when required, with a NEW PATENT EDGE-CLIPPING arrangement, entirely superseding the old and tedious operation of Edge-Clipping by hand.

All Machines fitted with new Silent Gearing, insuring perfect freedom from noise when at work.

Catalogues, with full descriptions and prices of the New Patent Edge-Clipping Silent Lawn Mower, on application to

SAMUELSON AND CO., BRITANNIA WORKS, BANBURY.

LAWES'S MANURE for GRASS LAND should be applied during the months of February and March. SUPERBLE of SODA supplied ex Ship, or from stocks at Docks at London, Liverpool, and other ports, at lowest market prices

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LAWES'S WHEAT, BARLEY, GRASS, and MANGEL
LAWES'S CONCENTRATED CORN and GRASS MANURE.
These Manures can be obtained at any of the above addresses, or through any of the appointed Agents throughout the United Kingdom.
PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and other Chemical Manures
AMERICAN and other CAKES at market prices.

THE LONDON MANURE COMPANY,
(ESTABLISHED 1830)
Have now ready for delivery, in fine condition,
COEN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PEARL ED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
E. PURSER, Secretary.
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REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Guano of good quality, containing 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
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"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the just centages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this valuable manure is known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(signed) "A. VOELCKER.
The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

COLIN PULLINGER'S newly-invented SULPHUR DISTRIBUTOR, for VINES, PLANTS, &c., is acknowledged by every Gardener who has seen it to be the best simple and effectual machine invented for the purpose. Price, complete with bellows, 4s. Retail of all Ironmongers and Nurserymen.
Sole Wholesale Agents, ADAMES and GRANT, Chichester

The Noted French Cold Grafting Wax
(MASTIC LHOMME LEFORT),
For Grafting, Budding, Healing, &c., may be obtained of
HOOPER and CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsman and Nurseryman.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s, 2s 6d, and 5s.
Powder Distributors, 2s 6d and 3s 6d each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
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Magnified.

GISHURST COMPOUND.
Used by many of the leading Gardeners ever since 1865, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s, 3s, and 10s 6d
Wholesale by
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NO MORE DAMP WALLS.
The only Cure for Damp Walls. Preserving Stone, Brick, and Cement from Decay is the SILICATE ZOPISSA COMPOSITION, used in the Houses of Parliament, and manufactured by the SILICATE ZOPISSA COMPOSITION and GRANITIC PAINT COMPANY, 30A, King William Street, London, E.C.

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SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Taxton Works, Sheffield. Established upwards of 125 years.

ROYAL BOTANIC SOCIETY.

SECOND SUMMER EXHIBITION, June 22 and 23.

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Messrs J. & C. Lee, Hammersmith, for a Group of Stove and Greenhouse Plants.

MEDIUM GOLD MEDAL.

Messrs A. Henderson & Co., Pine-apple Nursery, for a Group of Stove and Greenhouse Plants

GOLD MEDAL.

Messrs E. G. Henderson & Sons, Wellington Road, for a Group of Bedding Plants
Mr. J. Ward, Gr. to F. G. Wilkins, Leyton, for 8 Exotic Orchids.

LARGE SILVER GILT MEDAL.

Messrs Jackson & Son, Kingston, for 20 Greenhouse Plants.
Mr. J. Ward, Gr. to F. G. Wilkins, Esq., Leyton, for 6 Pelargoniums.
Messrs. Dobson & Son, for 6 Pelargoniums.
Messrs. G. Paul & Son, Cheshunt, for 20 Roses in Pots.
Mr. E. S. Williams, Hollow Way, for 6 Orchids.
Mr. Isaac Hill, Gr., Poles, Ware, Herts, for 8 Orchids.
Mr. C. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., for a Group of Stove and Greenhouse Plants.
Messrs. Jackson & Son, for 8 Cape Heaths.
Mr. Bannerman, Gr. to Lord Bagot, Blithefield Hall, Rugely, Stafford, for a Collection of Fruit.

LARGE SILVER MEDAL.

Mr. John Ward, for 8 Cape Heaths
Mr. J. Carr, Gr. to P. L. Hinds, Esq., Byfleet, for 6 Foliage Plants
Mr. D. Windsor, Gr. to R. Ravenshill, Esq., Leytonstone, for 6 Pelargoniums
Mr. R. Parker, Tooting, for 24 Herbaceous Plants in pots.
Mr. J. Catlin, Gr. to Mrs. Lermitte, Finchley, for 6 Scarlet Pelargoniums
Mr. J. Stevens, Ealing, for 6 Tricolor Pelargoniums.
Messrs. James Carter & Co., for 6 double-flowered Pelargoniums.
Mr. Henry Clark, Gr. to Earl Cowper, Brocket Hall, Herts, for a collection of Fruit.

SILVER GILT MEDAL.

Mr. J. Carr, Byfleet, for 3 Stove and Greenhouse Plants.
Mr. B. S. Williams, Holloway, for 3 Stove and Greenhouse Plants.
Mr. J. Wheeler, Gr. to J. Philpott, Esq., Stamford Hill, for 8 Cape Heaths.
Mr. J. Ward, Leyton, for 12 Cape Heaths
Mr. Wellband Hall, F.L.S., Chelsea, for 6 Orchids.
Mr. E. S. Williams, for specimen Orchid
Mr. Cole, for to W. Bungett, Esq., Ealing Park, for 6 Foliage Plants
Mr. Wilkins, Gr., Oak Lodge, Kensington, for 6 Caladiums
Messrs. G. Paul & Son, for Cut Roses, 50 varieties.
Mr. S. Dobree, The Priory, Wellington, Somerset, for Cut Roses, 25 varieties.
Messrs. Dobson & Son, for 20 Pelargoniums, distinct.
Mr. Thomas Ware, Tottenham, for 24 Herbaceous Plants in pots
Mr. Thomas Ware, Tottenham, for 12 Herbaceous plants
Mr. Tyler, Gr. to J. Hutter, Esq., Oak Lodge, Clapham Park, for 6 Foxgloves
Mr. H. Cannell, Woolwich, for 6 Fuchsias
Mr. Jas. Hassee, Gr. to J. Noble, Esq., Forest Green, Finchley, for 6 Scarlet Pelargoniums
Mr. Thos. Welch, Gr. to D. Butler, Esq., Hillingdon, for 6 Tricolor Pelargoniums
Mr. Bragg, Star Nursery, Slough, for 6 double-flowered Pelargoniums.

SILVER MEDAL.

Mr. Wilkins, Oak Lodge, Kensington, for 3 Stove and Greenhouse Plants
Mr. Ransley Tanton, Epsom, for 3 Stove and Greenhouse Plants.
Mr. J. Carr, Gr. to Capt. Hall, for 12 Cape Heaths
Messrs. Jackson & Sons, for 12 Cape Heaths
Mr. R. Parker, Tooting, for 6 Exotic Orchids
Mr. J. Stevens, Gr., Trentham Hall, for specimen Orchid
Mr. Isaac Hill, Poles, Ware, for 6 Foliage Plants
Mr. G. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., for 6 Caladiums.
Messrs. Rollinson & Son, for Cut for 6 Gloxinias.
Mr. James Mitchell, Piltdown Nurseries, Sussex, for Cut Roses, 50 varieties.
Mr. Hollingsworth, for Cut Roses, 25 varieties
Messrs. Paul & Son, for 1 basket of Cut Roses.
Messrs. James Carter & Co., for 6 Tricolor Pelargoniums.
Messrs. E. G. Henderson & Co., for 6 Tricolor Pelargoniums.
Mr. George Ward, Gr. to F. N. Miller, Esq., Bishop Stortford, for 1 Pine-apple.
Mr. George Ward, for 1 basket of Grapes.
Mr. M. Henderson, Gr., Cole Orton Hall, for 1 dish of Black Grapes
Mr. Alex. Forbes, Gr. to Hall, Esq., Fassingworth, Sussex, for 1 dish White Grapes.
Mr. Miles, Gr. to Lord Carrington, Wycombe Abbey, for 1 dish Figs.
Mr. M. Henderson, Cole Orton, for 1 dish Grisly Frontignan Grapes.
Mr. Thomas Jack, Gr. to the Duke of Cleveland, Battle Abbey, for 2 dishes Peaches.
Mr. T. Miley, Gr. to Lord Carrington, for 2 dishes Nectarines.
Mr. Charles Noble, Bagshot, for 4 Spiræa palmata.
Mr. C. Allen, Gr. to J. B. Clegg, Esq., Withington Hall, Cheshire, for 2 dishes Nectarines

SMALL SILVER MEDAL.

Mr. J. Wheeler, for 3 Stove and Greenhouse Plants
Messrs. Jackson & Son, for 3 Stove and Greenhouse Plants.
Mr. J. Wheeler, for 1 specimen Orchid.
Mr. Davies, New Lodge, Whitestone, for 6 Gloxinias.
Mr. John Harris, Eridge Nurseries, for Cut Roses, 50 varieties.
Mr. G. Marlow, Gr. to J. Wigan, Esq., Mortlake, for Cut Roses, 25 varieties.
Mr. J. Cranston, King's Acre, Hereford, for Cut Roses, 24 single blooms
Mr. S. Dobree, for basket of Roses.
Mr. C. Ross, Gr. to C. Eyre, Esq., Welford Park, Newbury, for Dianthus, 24 spikes
Mr. Thomas Ware, for Hardy Herbaceous Cut Flowers, 24 varieties.
Mr. G. Weaver, Gr. to Dobson
Mr. Tyler, for 1 specimen Dracæna
Mr. C. Penford, for 1 Pine-apple
Mr. A. Cowell, Gr. to G. Plucknett, Esq., Finchley, for 1 Pine-apple.
Mr. H. Battram, Gr. to S. T. Crawshay, Esq., Cyfarthfa Castle, for 1 Pine
Mr. Lamb, Gr., Colston Bassett, Bingham, Notts, for Green-fleshed Melon
Mr. James Weir, Gr. to Mrs. Hodgson, Hampstead, for 1 Scarlet-fleshed Melon
Mr. M. Henderson, Cole Orton Hall, for basket of Grapes.
Mr. Miller, Coombe Abbey, for 1 dish Black Grapes.
Mr. James Douglas, Gr., Loxford Hall, Ilford, for 1 dish White Grapes
Mr. C. Ross, for 1 dish Figs
Mr. William Davies, for 2 dishes Peaches
Mr. Carmichael, Gr. to H.R.H. the Prince of Wales, for 2 dishes Nectarines
Mr. Hooper, Nurseryman, Bath, for collection of Pink
Mr. Hooper, for collection of Carnations.
Mr. Daniel Pizzie Fulmer, Slough, for stand of Pinks.
Messrs. Lucking Brothers, for 3 Bouquets.

BRONZE MEDAL.

Mr. Thos. Ware, for 24 spikes Digitalis.
Mr. Bird Porter, Gr. to E. Benham, Esq., Isleworth, for Hardy Herbaceous Cut Flowers.
Mr. William Davies, Gr. to W. Booker, Esq., for 1 Pine-apple.
Mr. J. Cross, Gr. to Sir F. H. Goldsmid, for 1 Green-fleshed Melon.
Mr. James Douglas, for 1 Scarlet-fleshed Melon.
Mr. G. T. Miles, Gr. to Lord Carrington, for 1 dish Black Cherries.
Mr. G. T. Miles, Gr. to ditto, for 1 dish White Cherries.
Mr. G. T. Miles, Gr. to ditto, for 4 dishes Strawberries.
Mr. James Douglas, for 2 dishes Strawberries.

CERTIFICATE.

Mr. J. Wheeler, for 6 Gloxinias.
Mr. J. Skinner, Gr. to Captain Christy, Westerham, for 25 Roses.
Messrs. Paul & Son, for Roses, 24 Single Blooms.
Mr. R. Webb, Reading, for basket of Roses.
Mr. D. Turner, Portland Road, Notting Hill, for Herbaceous Cut Flowers.
Mr. James Budd, Oaklands Park, Hants, for 1 Pine-apple.
Mr. James Douglas, for 1 Green-fleshed Melon.
Mr. Bird Porter, Gr. to E. Benham, Esq., for 1 Scarlet-fleshed Melon.
Mr. Bannerman, Gr. to Lord Bagot, for basket of Grapes.
Mr. George Ward, for 1 dish Black Grapes.
Mr. Bannerman, for 1 dish Black Grapes.
Mr. P. Feist, Gr. to J. Ashton, Esq., Staines, for 1 dish White Grapes
Mr. C. Ross, for 2 dishes Peaches.
Mr. Hill, Keele Hall, for 2 dishes Nectarines.
Mr. Isaac Hill, for 1 dish Black Cherries.
Mr. John Willis, Gr. to W. Philips, Esq., Ealing, for 1 dish White Cherries.
Mr. A. Johnson, Gr. to the Marquis of Aylesbury, for 4 dishes Strawberries
Messrs John Standish & Co., for 2 dishes Strawberries
Mr. C. Koss, for a dish of Tomatos.
Mr. George Masters, Gr. to the Earl of Macclesfield, for 1 Hybrid Melon
Mr. Chitty, Stamford Hill, for 1 Equisetum sylvaticum.

BOTANICAL CERTIFICATE OF MERIT.

Mr. W. Thompson, Ipswich, for Delphinium nudicaule.
Mr. W. Thompson, Ipswich, for Leptosiphon roseus.
Messrs. A. Henderson & Co., Pine-apple Nursery, for Pteris serrulata var. gleichenizfolia.
Messrs. Veitch & Sons, Chelsea, for Ficus Pearcei.
Messrs. Veitch & Sons, Chelsea, for Adiantum sessilifolium.
Messrs. Veitch & Sons, Chelsea, for Ficus sarapigienis.
Messrs. Veitch & Sons, Chelsea, for Croton Hookerianum
Messrs. Veitch & Sons, Chelsea, for Caladium Princess of Teck.
Messrs. Veitch & Sons, Chelsea, for Aralia Veitchii.
Messrs. Veitch & Sons, Chelsea, for Dracæna Denisoni.
Messrs. Veitch & Sons, Chelsea, for Pandanus Veitchii.
Messrs. Veitch & Sons, Chelsea, for Cypripedium Dominianum.
Messrs. Veitch & Sons, Chelsea, for Vanda Denisoniana.
Messrs. Veitch & Sons, Chelsea, for Begonia Chelsoni.
Messrs. Veitch & Sons, Chelsea, for Cattleya Reineckiana.
Messrs. Veitch & Sons, Chelsea, for Cattleya quinicolor.
Messrs. Veitch & Sons, Chelsea, for Miltonia Warscewiczii.
Messrs. Veitch & Sons, Chelsea, for Nepenthes rubra.
Messrs. Veitch & Sons, Chelsea, for Pritchardia pacifica.
Messrs. Veitch & Sons, Chelsea, for Veitchia Johannis.
Messrs. Veitch & Sons, Chelsea, for Chamædorea Ernesto-Augusti.
Messrs. Veitch & Sons, Chelsea, for Chamædorea glaucifolia.
Messrs. Veitch & Sons, Chelsea, for Dæmonorops melanochætes.
Messrs. Veitch & Sons, Chelsea, for Acanthorhiza Warscewiczii.
Messrs. Veitch & Sons, Chelsea, for Calamus cinnamomea.
Messrs. Veitch & Sons, Chelsea, for Geonoma Schottiana
Messrs. Veitch & Sons, Chelsea, for Pandanus angustifolius.
Messrs. Veitch & Sons, Chelsea, for Chamædorea graminifolia
Mr. William Bull, Chelsea, for Lilium Thunbergianum bicolor.
Mr. William Bull, Chelsea, for Corylus Avellana pendula.
Mr. William Bull, Chelsea, for Viola cornuta Perfection
Mr. William Bull, Chelsea, for Caladium Golden Queen.
Mr. William Bull, Chelsea, for Cissus Antiqui.
Mr. William Bull, Chelsea, for Pandanus decorus.
Mr. William Bull, Chelsea, for Anæctochilus pardinus.
Mr. William Bull, Chelsea, for Euryale australis.
Mr. William Bull, Chelsea, for Fraxinus longicuspis.
Mr. William Bull, Chelsea, for Godwinia gigas.
Mr. William Bull, Chelsea, for Orbignya dubia.
Mr. William Bull, Chelsea, for Acanthorhiza Warscewiczii.
Mr. William Bull, Chelsea, for Geonoma princeps.
Mr. William Bull, Chelsea, for Stangeria paradoxa obtusa.
Mr. William Bull, Chelsea, for Verschaffeltia melanochætes.
Mr. William Bull, Chelsea, for Marcgraavia grandis.
Mr. William Bull, Chelsea, for Thormium tenax gracilis.
Mr. William Bull, Chelsea, for Curculigo recurvata stricta.
Mr. William Bull, Chelsea, for Latania rubra vera.
Mr. William Bull, Chelsea, for Mesembryanthemum cordifolium var
Mr. B. S. Williams, Holloway, for Viola cornuta var. Perfection.
Mr. B. S. Williams, Holloway, for Chamædorea glaucifolia.
Mr. B. S. Williams, Holloway, for Peristrophe angustifolia aureo-variegata.
Mr. B. S. Williams, Holloway, for Pogonia sp. Java.
Mr. B. S. Williams, Holloway, for Verschaffeltia melanochætes.
Mr. J. Mapplebeck, Broseley, Athyrium Filix-fœmina caudigerum.
Mr. J. Mapplebeck, Broseley, Scolopendrium vulgare supra ferax.
Mr. J. Mapplebeck, Broseley, Scolopendrium vulgare perifera cornutum
Mr. J. Mapplebeck, Broseley, Athyrium Filix-fœmina furcillans.
Mr. J. Mapplebeck, Broseley, Arhyrium Filix-fœmina Craigii.
Mr. J. Mapplebeck, Broseley, Athyrium Filix-fœmina Mapplebeckii.

FLORICULTURAL CERTIFICATE OF MERIT.

Mr. Hooper, Vine Nursery, Widcombe Hill, Bath, for Double Rocket Compactness.
Messrs. J. Veitch & Son, Exotic Nursery, Chelsea, for Gloxinia Magnet Improved.
Messrs. J. Veitch & Son, Chelsea, for Gloxinia Kingcraft.
Messrs. J. Veitch & Son, for Gloxinia Sunshine.
Messrs. J. Veitch & Son, for Gloxinia Aurora.
Mr. H. Cannell, Woolwich, for Fuchsia Champion of the World.
Messrs. E. G. Henderson & Co., for Tricolor Pelargonium Lass o' Gowrie.
Messrs. E. G. Henderson & Co., for Tricolor Pelargonium Edward Benyon.
Messrs. E. G. Henderson & Co., for Tricolor Pelargonium Mysterious Knight.

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ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

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ROSES for BEDDING.—Superb plants, in 5-inch pots, for planting out or for growing on for pot culture. Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.

JOHN CRANSTON, The Nurseries, King's Acre, Hereford.

NEW COLEUS.—The new Golden and other select Coleuses, sent post free, 12 fine varieties, 2s. 6d.; 24 select varieties, 4s.

IRESINE LINDENI, ACUMINATA and HERBSTII, 1s. 6d. per dozen; VIOLA CORNUTA and CORNUTA ALBA, 1s. 6d. per dozen; 12 fine varieties CHRYSANTHEMUMS, 2s. 6d.; 12 fine varieties PHLOXES, 3s.; 12 superb varieties FUCHSIAS, 3s.; 12 ARTEMISIA STELLARIANA, 3s. Any of the above sent free by post, at the prices named, from

B. W. KNIGHT, Florist, Battle, Sussex.

To the Trade.

MRS. POLLOCK, ITALIA UNITA, and some 40 other varieties of Gold, Silver, and Bronze-leaved GERANIUMS, about 3000 of young and strong plants on offer.

PELARGONIUMS of Show, French and Fancy, choice named, coming in bloom, young in 3½-inch pots, strong in 4½ and 5-inch, and extra in 6-inch. These can be supplied by the dozen or 100.

PETUNIAS, choice named; Blue SALVIAS; VERBENAS, mixed, named; GAZANIAS, CALCEOLARIAS, DAHLIAS, cheap by the 100

H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

VARIEGATED GERANIUMS.—
LADY CULLUM, 4s. per dozen, 20s. per 100.
SOPHIA CUSACK, 6s. per dozen.
SOPHIA DUMAResQUE, 4s. per dozen.
ITALIA UNITA, 3s. per dozen, 20s. per 100.
IMPERATRICE EUGENIE, 3s. per dozen, 20s. per 100.
ELEGANTE (Ivy-leaf), 3s. per dozen, 20s. per 100.
DUKE of EDINBURGH (Ivy-leaf), 3s. per dozen, 20s. per 100.
REFULGENS (Bronze), 3s. per dozen.
METEOR (Golden Tricolor), 4s. per dozen.
ZONAL GERANIUMS.—Peach Nosegay, Countess of Rosslyn, Black Dwarf, Eclat, Grand Duke, C. Hardy, Dr. Hogg, at 3s. per dozen; 20s. per 100.—VERONICA BLUE GEM, 1s. 6d. each. Terms Cash

J. ELCOMBE AND SON, Nurserymen and Florists, Romsey, Hants.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.
CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes last season at the Royal Botanic, Royal Horticultural, and other places. Per packet, 2s. 6d
CALCEOLARIA, finest hybrid. Per packet, 2s. 6d. CALCEOLARIA, finest spotted Per packet, 2s. 6d. Saved with the greatest care, and from one of the largest collections in the kingdom.
CINERARIA, choicest, mixed.—Saved from a splendid collection of the best varieties, and may be supposed Per packet, 2s. 6d.
PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The improved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.
PRIMULA.—Choicest, mixed, fringed. Per packet, 2s. 6d.
PRIMULA.—Dark carmine, fringed. Per packet, 2s. 6d.
PRIMULA.—New scarlet. Per packet, 2s. 6d.
PRIMULA.—Rose fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest white-edged. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved white, 2s. 6d.
PRIMULA FIMBRIATA, Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.
Forwarded immediately on receipt of Post-office Order.
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B. S. WILLIAMS'
NEW and CHOICE FLOWER SEEDS,
Post Free.

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Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
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CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d., and 3 6
CENTAUREA CANDIDISSIMA	1s. and 2 6
ECHEVERIA METALLICA, new bedding plant	2 6
HOLLYHOCK, from Chater's finest varieties	1s. and 2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 3 6
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EAST LOTHIAN STOCKS, per collection of three colours	2 6
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WALLFLOWER, New Golden Tom Thumb	1 0
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Hunt's Auricula-eyed SWEET WILLIAM	0 6
MYOSOTIS AZORICA, var. CŒLESTINA	1 6
TACSONIA VAN VOLXEMII, splendid greenhouse climber	2 6

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Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted; each 1s., and 2s. 6d per packet

SCOTT'S WASP DESTROYER will quickly rid any place of Wasps, Crickets, Cockroaches, and other Garden pests. "It completely cleared the place." *Vide* Testimonials, sent on application. Price 1s. 6d., and 2s. 6d. per box, free by stamps.

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Bedding Plants—Bedding Plants.

JAMES HOLDER'S unrivalled Collection of Scarlet and Variegated GERANIUMS, DAHLIAS, VERBENAS, CALCEOLARIAS, FUCHSIAS, LOBELIAS, PETUNIAS, GAZANIAS, KONIGAS, TROPÆOLUMS, CUPHEAS, COLEUS, IRESINES, AGERATUMS, PENTSTEMONS, &c., at his usual price despite of the long severe winter), namely, eight dozen for 20s., or four dozen for 10s. 6d.; hamper and package included.

Crown Nursery, Reading, Berks.

The Gardeners' Chronicle

SATURDAY, JUNE 18, 1870.

MEETING FOR THE ENSUING WEEK.

WEDNESDAY, June 29 { Royal Horticultural (Fruit and Floral Committee), at 3 Kensington .. 11 A.M. / Ditto (General Meeting) .. .. 3 P.M. / Ditto (National Rose Show).

IF any one desire to see variety in the matter of TOWN GARDENING, let him repair to Paris. He should take with him Mr. ROBINSON'S work on the subject as a faithful guide, and one which precludes the necessity of going into detail here. It makes little difference in which direction he turns. In the course of a short walk, he is sure to meet with many and diverse bits of garden effect. The simplest of all is that produced by the use of Ivy, pegged down around the grass plots, and filling up the angles of buildings, architectural terraces, and the like. Years ago, before town gardening became so prominent a feature in Paris as it is now, this use of Ivy was pretty general. It was effective then, and loses nothing now in comparison with more ambitious attempts. Another and rather odd use of Ivy may be seen in certain confined spaces in the midst of the city. Here the Ivy is trained so as to form little pyramids dotted about like ninepins, or with greater regularity disposed in pyramidal groups, the tallest in the centre.

Where space is not so much an object, another style is adopted, still in association with buildings, which is neither a shrubbery, nor a mixed border, nor a flower-bed, but a combination of all three, and, as might be expected, it is not satisfactory. This also is a plan that has been adopted for years, but it does not improve on further acquaintance, though it is not a little astonishing to a Londoner to see standard Roses in full bloom under the very walls of the Louvre. Fancy what they would be round St. Paul's! This tells a tale of brighter, purer air, and also of the constant use of the hose. By the way, even the bedding plants are sunk in basin-like hollows of the soil, so that not a drop of water may be uselessly expended.

A better form of this style of town gardening may be seen in the Place du Trône at Brussels. Here the garden is strictly architectural, with narrow geometric beds, edged with a low iron rail of formal pattern. Rhododendrons and evergreen plants occupy the centre, grass plots intervene, and here and there are scattered such plants as Agaves, Aloes, Phormium tenax, &c. In the case of very narrow borders, Ivy is trained along the ground trellis-wise, the spaces filled with common Ling—Calluna.

Reverting to Paris gardens, we must allude to the very simple and very satisfactory arrangements, which consist of a mere belt of shrubs and trees, evergreen and deciduous, intermixed, with a grass plot in the centre. "We have this in London." True, but with a difference, attributable mainly to our smoky atmosphere, the less diligent use of the hose, and the foolish plan of raising the beds and borders into hillocks. On the other hand, the trees in many of our West End squares are far superior to those in Paris, and hence, with a little more attention, our town squares might easily vie with most of those in the gayer capital.

If we banish from our minds for a moment the recollection of the depressing sooty atmosphere which blackens our London parks, and renders its denizens dirtier in a day than their Paris brethren become in a week, and then compare the highest flight of town gardening in Paris, say the Parc Monceau, with our own St. James's Park, the contrast is by no means unfavourable to our own park. True, we have not the beds of Negundo or of deciduous Magnolias, nor the specimens of Ensete; we cannot boast so grand a specimen of Weeping Juniper; we have not great beds of Judas trees or of Tamarix; our flat surface is not diversified by such constant undulation. Still, in the disposition of its masses, and as a piece of landscape gardening generally, our own park may carry the palm. It should be remembered, however, that the Parc Monceau is comparatively small. Small as it is, it contains a lake of very dirty water, surrounded by some cockney ruins, and overtopped by some rockwork, excellent in all respects but one, and that one fatal—it has no business there. One is surprised to see it; nothing leads one to expect its presence. It has not the aspect of a natural feature of the locality, but conveys the impression as if the landscape gardener thought a rockwork was desirable, and accordingly constructed one—a very good one.

At the Buttes Chaumont, in a not very choice quarter of Paris, another type of town gardening may be seen. The opportunity was such that the artist must have been unworthy the name if he had not made a fine work. An old disused quarry, with bluffs and cliffs of say 100 to 150 feet in height, and irregularly disposed, commanding a splendid view of clear-skied Paris on the one side, and its smoky manufacturing suburb on the other—such is the material the gardener had to work on. The result is really grand, save in one or two particulars, which time may mend. As if the natural features of the place were not bold enough, a fictitious mass of plaster-rock, recalling those in the confectioner's shops, has been raised, which, though respectable in proportions, is hideous in its bareness—no plant would grow on so cockney-like a structure. Another eyesore in this otherwise noble town garden is the painful prominence given to the temple which caps one of the hills, and the ugly and anomalous paths leading to it. If it be a Temple of Fame, a road fit for a coach-and-six is hardly the most appropriate means of access, according to the fitness of things.

For town gardens, supported by the contributions of ratepayers, an expensive style of gardening should be deprecated; better by far, in our populous towns, a series of neatly kept open spaces for the benefit of the masses, diffused here and there, than a few highly ornate squares for the pleasure of the few.

Our London squares in many instances possess all the necessary elements to make healthy, pleasant recreation grounds, and in the matter of trees leave nothing to be envied in Paris. Too much praise can hardly be given to such men as Mr. GODWIN, who have for years advocated the necessity of well kept open spaces in the denser quarters of London and other towns, and to Mr. ROBINSON, who, in the work before mentioned, has told us how these benefits may be secured without incurring the lavish expenditure necessarily bestowed on some of the gardens we have been commenting on.

IT may be opportune, now that we are in the midst of the season of FLOWER SHOWS, to invite attention to the following note, which we find appended to one of the regulations for the Grand Yorkshire Gala Exhibition. It reads thus:—

"In consequence of great difficulty and inconvenience having been experienced in former years from parties entering plants and not exhibiting them, the committee desire it to be distinctly understood, that where this rule is violated, such person so offending shall forfeit, in the open classes, a sum not exceeding 10s., and in the amateur classes, 5s."

The rule to which this is very properly made a pendent, is as follows:—

"Intending exhibitors must give notice [by a specified date] of the class or classes in which they intend to compete and of the average diameter of the plants to be exhibited; after which time no entries can be received. This is to be done by filling up and returning to the secretary the accompanying form. A compliance with

this rule is indispensable, in order that proper accommodation may be provided."

The reason for such a rule is made quite evident by the last sentence. It is "in order that proper accommodation may be provided." Now, as this is a matter which concerns the exhibitor himself equally as much as the managers of an exhibition, one would think there would be no attempt at evasion, and consequently no ground for inflicting a fine such as that which the above-quoted note imposes. It is to be regretted, however, that this is not the experience of show managers. We are told that it is by no means so rare a case as it ought to be, to find an exhibitor entering in more classes than he intends to fill, so that he may shift into the one or the other as a quick glance over the forces opposed to him may lead him to determine on the spur of the moment, and this is sometimes called "generalship," sometimes "jockeyism," as the moral perceptions of the commentators may or may not be slumbering.

Leaving, however, the question whether this is good, honest, hearty downright competition, worthy of manly Britons, or whether it is condescending to win by trickery — leaving also the application to the individual consciences of those whom it may concern, we pass on to notice the effect of such defections upon the arrangement of an exhibition—that very point on which every one is so anxious to see some improvement made, but which none seem to have the courage to grapple with boldly and effectually. The manager of a show of course provides space according to the returns sent in, and he allots this space in the first instance to suit the various returns. It is the only course open to him. But if he could count on all the collections entered being honestly forthcoming, he might study something like an arrangement for effect, and be able to carry out any plan determined on without flaw or flurry; but it is quite evident that if any groups are not forthcoming, all his plans are upset, and he is thrown back on an amount of labour and bustle in rearrangement, which it is quite unreasonable to impose on him at the last moment, or otherwise he must be content with a patchy, made-up and necessary faulty picture. What we desire most especially to point out is, that such defections do not give the managers a fair chance to make the best of the material in hand; and the too frequent recurrence of such defections must act as a check upon any serious attempts at improved arrangement. We have seldom, indeed, heard of so flagrant a case as one which occurred at the last Manchester show, and which might have done irreparable injury to that exhibition but for the able manner in which it was met. We have official information that one grower, who had entered in 23 classes, and had even a few days before the show written to make some alterations or corrections in his entries, not only failed to show in any of them, but actually suffered the arrangements to proceed without giving the slightest intimation of his intention not to contribute to the show. A case of this kind is indeed hardly met by the small fine imposed by the York committee. It is worthy of consideration, whether an entrance fee, returnable in some shape to those who keep their engagements, should not be paid in all cases.

—— A couple of reports on the New Vine Disease in France, lately published by the Société des Agriculteurs, contain some interesting, but confessedly incomplete particulars of this new disease, respecting which it is important our own cultivators should be informed as far as possible. Certain premonitory instances of the malady, it is said, were noted in 1866 and 1866, but it was not until the summer of 1869 (a season, it will be remembered, of remarkable heat, following upon a severe winter) that the evil assumed proportions, the magnitude of which has been steadily increasing ever since. At present it is confined to two districts—viz., the valley of the Rhone and the department of the Gironde. In the latter, the damage is of limited extent. The Medoc country has escaped altogether; but in the former the results have been truly deplorable. The crops have been reduced to one-tenth of the average of former years. On the right bank certain districts have hitherto escaped; but on the left, which possesses a different geographical conformation, wide plains and valleys watered by numerous streams, the disease has been almost universal. Out of 60,000 acres in Vaucluse, 20,000 have been utterly ruined. Many proprietors (including some of the most skilful, the prize growers of these districts) have been compelled to abandon the culture within the last 12 months. Around Bouquemard and in Le Gard entire vineyards have been grubbed up, and the sticks sold as fuel at 4*d.* per cwt. (82c. per 100 kilos.). It is a curious fact, that the greater the distance from the banks of the streams, the less severe the ravages appear to be. Everywhere the symptoms are identically the same—healthy plants die off suddenly without any apparent cause, the stems turn black, the leaves fade and drop off, and close examination shows that the roots are rotten throughout. The whole of a vineyard is not attacked at once; the disease appears to establish itself in a number of independent centres, from whence it radiates rapidly in all directions, until the entire area is infected. For the investigations made by Professor Westwood and Mr. Berkeley, and other information, we refer to our own columns, 1869, pp. 109, 687, 762.

—— We are glad to learn that the Earl of Derby will not only confer the honour of his presence on the festival of the Gardeners' Royal Benevolent Institution on Wednesday next, but has also promised a supply of fruit for the occasion. This is an example which might well be followed by others. His Highness the Nawab Nazim of Bengal and his two sons have also intimated their intention to be present at the dinner, which promises to be very successful.

—— The inauguration of the pleasure-grounds of the Summer Garden Society, situated within about a quarter of a mile of the Willesden Junction Station on the North London Railway, was celebrated recently. These gardens have been established by a body of working men under the title of the Summer Garden Society, and will be conducted on a principle popular on the Continent, under the management of Mr. Henry Bolleter. The admission is by season ticket only, at the price of 1*s.*, and admitting until September next, the children of members under 12 years of age being admitted free with their parents, it being the object of the Society that the gardens should become a summer resort for families. On week-days, among the other amusements provided are cricket, bowls, quoits, athletic sports, and dancing on a large platform, with special amusements for children. On Sundays the gardens will be opened in the afternoon for promenade, with instrumental band, which will play from four until eight in the evening. No persons but those holding season tickets will be admitted into the grounds.

—— The quantity of Vegetables and Salad produced annually in Paris is estimated at 134,000 tons. The ground cultivated by market gardeners in and around the city amounts in all to more than 3000 acres, and the business gives employment to 9000 persons and 1700 horses, these being used for pumping water as well as for transport. It is said that 360,000 glazed frames, and more than 2,000,000 of bell-glasses are employed in the production of vegetables alone. The annual amount expended for manure is said to be £72,400, and the total receipts from the sale of vegetables and other productions of the market gardens to exceed half a million sterling—which, after all, does not seem a very large sum, as the consumption of Paris includes a very considerable proportion of expensive early vegetables. This sum does not, however, represent the entire consumption of Paris, as large quantities of Potatos, Asparagus, and other vegetables are sent to the capital from all parts of the country. A month ago excellent Alpine Strawberries were to be had in all the restaurants at a very low rate, brought from Bordeaux.

—— In recording the result of the recent Gardeners' Examinations at p. 826, we omitted to mention that Mr. G. Downton, who occupies so honourable a position in the prize list, was at the time one of the Chiswick students.

—— After many years' observation of the curious Pustules which have been so very prevalent this year on Pear Leaves, and have sometimes extended to the Pears themselves, we have at last done something towards solving the mystery. The pustules have almost always a little aperture, through which it might be conjectured that some insect had passed; but, on the other hand, the stomates are so large, that it might be only a stomate extended beyond its usual dimensions. However, on a recent examination some of the pustules which were without any aperture, we found in each three or four minute acari, so minute, that it is not wonderful that they had hitherto escaped observation, especially as they occur only in small numbers, their dimensions being only one-hundredth of an inch in length, with a breadth of one by 500. The whole body has dense transverse striæ, consisting of granules. The anal extremity is slightly contracted, with two bristles, and there are 4 feet in front, each consisting of four joints, of which the basal one is swollen, the second oblong, the two terminal ones being about half its length, the latter furnished with a hooked appendage. They appear to be very inactive, and possibly are the larva state only of some more perfect acarus, though scarcely of one which occurs sparingly on Pear leaves, and which resembles closely the common "red spider." We trust that some competent entomologist will take up the subject. It will be seen at once that we have here an insect closely allied to the Currant-bud acarus, figured in this Journal, p. 841, 1869, but it is twice as long, at least when extended, for when contracted it is not about half the length. The point which is to be determined by entomologists is, whether the four-footed acari are merely a condition of the eight-legged Tetranychi, though Dugès says expressly, "larvæ hexapodæ, adulto simillimæ;" or whether, as is more probable, they constitute with some other parasitic species, a distinct tribe in these curious, though minute insects. *M. J. B.*

—— A correspondent, who asks whether Clematis Jackmanni is not admissible as a greenhouse plant, writes us a long letter to explain why he puts such a question. It appears that at the recent exhibitions at Leeds and at York there were classes for collections of "6 stove and greenhouse plants in bloom." At Leeds we are told that "two out of the three prize winners had each a plant of Clematis Jackmanni;" while at York a few days later, a similar, if not the very same collection, was marked with the "very objectionable word, Disqualified," the ground of disqualification being the presence therein of a specimen of this very Clematis, which the judges regarded as "not being in accordance with the schedule." We entirely agree with them. If all disputed points in the reading of prize schedules were as clear as this, there need be little hesitation about them. If Clematis Jackmanni is anything, it is a hardy plant; bred of hardy plants, and itself having grown out unprotected from its youth (we speak of the parent plant), having been multiplied and bedded out by thousands, as a permanent bedding plant, occupying its position winter and summer, what further evidence of the fact is needed? But then if hardy, as it undoubtedly is, it is not a "greenhouse" plant according to the proper interpretation of schedules, and if so, it follows that it was not eligible for competition in the cases quoted. That the Leeds judges were lax in their interpretation of the class affords no proof whatever in favour of admitting the disputed plant. Its admission or rejection must depend upon the evidence of facts, and the facts are dead against admitting it as a "stove or greenhouse" plant, though very much in favour of introducing it to an independent position in any schedule as a late summer exhibition plant of great merit. We must add that our correspondent, in shaping his inquiries, has, to our minds, altogether shot beside the mark. After explaining the circumstances as above, he continues:—

"The questions I therefore beg to ask are, first, is the fact that a plant having stood out unprotected and unharmed half-a-dozen of our ordinary winters sufficient to establish it as a hardy plant? Secondly, if the plant, as in this case, can be improved both in colour and size of flower, is the former fact sufficient to outweigh the latter, so as to exclude it from ever being admissible to be exhibited in a collection of stove and greenhouse plants, to the true and liberal interpretation both of the spirit and letter of the schedule? I have seen the plant alluded to exhibited in the same class of plants more than half-a-dozen times before, and never heard of any objection being made to it. It is a matter of such importance to all of us that it would be well if we could be satisfied as to the correctness of our views of what constitutes a greenhouse plant within the meaning of the term stove and greenhouse. As for myself I should adopt the same rule in judging a plant as I would in the case of a lady or gentleman,—not merely by their money worth, or the still more questionable standard sometimes alluded to of gentle or tender blood, but by the broader and more universal test of their deserts and merits."

To all which, we need only reply that a hardy plant is not properly admissible in a class defined as being for "stove and greenhouse plants," whatever its merits may be; and that the meaning of the words "stove" and "greenhouse" when used in a prize schedule is simply "stove" and "greenhouse" respectively.

—— It is stated that the manufacture of Alcohol from Reindeer Moss, which was set on foot in 1867 by M. Sternberg, Professor of Chemistry at Stockholm, has been carried on to some extent in Sweden, and is about to be introduced into Norway. At present, large quantities of grain and Potatos are consumed in the manufacture of spirits. It is to be hoped, continues our informant, that the production of alcohol from less valuable material than hitherto, will tend to ameliorate the condition of Scandinavia, by setting at liberty the large amount of foodstuffs at present destroyed by distillation.

—— It is worthy of mention that the idea of the Halfpenny Card Postage, which is shortly to come into operation, originated, as far as this country is concerned, with Mr. Beale, of the firm of James Carter & Co., the eminent seedsmen of Holborn, and that Mr. Beale has received an acknowledgment from the authorities to that effect. It has been in use in Germany for some time past.

—— The Meteorology of the week ending June 18 differed from that of the preceding week in the copious rainfall (see Mr. Glaisher's Tables in our present issue) which took place at all parts of the country on the 16th or 17th, and at the more northern stations of England on the 18th; at Leeds the rainfall on the 18th amounted to 1.15 inch, the heaviest for the week was at Hull, where it amounted to 2 inches. For the stations in England south of Nottingham the mean rainfall was 0.39 inch, and for those to the north it was 0.93 inch. In Scotland the mean rainfall for all stations was 0.45 inch. The Maximum Temperature of the air in the week was at Blackheath, viz., 86°.2, and the mean maximum for the stations south of Nottingham was 80°.3, whilst for those to the north it was only 74°.5. In Scotland the mean amounted to only 67°.3. The Minimum Temperature in England

was 44°, and the mean for all stations was 47°.9. In Scotland the lowest was 43°, and the mean 44°.6. The MEAN TEMPERATURE for the stations in England south of Nottingham was 61°.2, and for those to the north 58°.7. In Scotland the mean for all stations was 55°.3.

New Garden Plants.

TILLANDSIA LINDENIANA.

(*Sect.* WALLISIA) *Regel.*

Sect. WALLISIA. Stigma trilobum, lobis apice connatis. Placentæ multiseriaiter ovulatæ.

Regel Gartenflora, 1869, p. 193.

† WALLISIA LINDENIANA.

Folia dense rosulatis, patente-recurvis, subulato-ensiformibus, supra glabris, subtus minutissime laxeque punctato-lepidotis rubroque nervosis; spica di-tricha, subquinquefiora; ß tribus maximis sessilibus, fauce albidis; genitalibus inclusis; staminibus omnibus petalorum unguibus per paria adnatis; stigmate trilobo, lobis apice connexis; placentis multiseriatim ovulatis.

Brasilia. Collegit G. Wallis. *Regel Gartenflora*, 1869, p. 193, tab. 619.

Our illustration (fig. 156) shows on a much reduced scale a plant which, when first shown at one of the meetings of the Floral Committee by Mr. Williams this spring, excited great attention. It is a native of Brazil, whence it was introduced through M. Linden by Mr. Wallis. Unluckily, there is another plant figured by M. Morren in the "Belgique Horticole," a little after the publication of M. Regel's description, under the name Tillandsia Lindeni. There is considerable difference between the two plants, so that M. Morren is disposed to retain the two names, Lindeni and Lindeniana, in spite of the similarity between them. M. Regel, on the other hand, proposes to form a new genus under the name of Wallisia, to receive his plant. These matters of botanical etiquette we may well leave Professor Morren to settle. That gentlemen is at present engaged on a monograph of this order, and in which he will no doubt marshal the species under their appropriate designations.

The flowers of our present plant are each about the size of a half-crown piece, of a beautiful glistening pale bluish violet colour. The bracts have a faint rosy tinge, but not so pronounced as in M. Morren's plant. Moreover, the flower-stalk in our specimen is longer, so that the flowers are further removed from the leaves than they are represented in the plate in the Belgian journal. The differences between the two plants are greater than those dependent on cultivation merely. In any case, the present plant is a charming addition to the list of a family already rich in showy plants.

FIG. 156.

HARDY ORCHIDS.

Cypripedium pubescens (Willd.) is a native of North America, grows from 1 to 2 feet high, and flowers early in summer. Every healthy stem bears five perfect leaves, and each one of these passes away from its support in a graceful curve. They are oval acute in form, pale green in colour, clothed all over with minute hairs, deeply grooved along the surface in the direction of the venation, and wavy along the margins. The two outermost perianth segments are mottled, and one extends in an upward and the other in a downward direction, whilst the two lateral ones are each 2 or 3 inches long, pendulous, and very beautifully curled. The column stoops forward, and is of the same colour as the large yellow slipper, the entrance to which it partly closes. In the present instance not much shading is needed, but rather than let the rays of a mid-day sun do harm, perhaps it would be as well to select a site where extremes do not occur. The soil may be either leaf-mould or loam with a top-dressing of peat. The former being almost wholly composed of organic elements, when it is used, much less watering should be given than when the latter is employed. A neglect of this precaution will lead to damping off. They are increased by division, and autumn is the best time for the operation.

C. candidum (Muhl.) grows from 6 to 12 inches high. It is slender, and shows a gradual passage from scales below to perfect leaves above. The flowers are small but very neat, and are produced singly. Both the outer and inner segments of the perianth are either undulated or curled, whilst the slipper is about the size and shape of a sparrow's egg, white on the outside, spotted or otherwise marked around the entrance and within. The column is yellow, with a few spots of another hue near the apex. A native of North America. For cultivation, see the preceding species. Blossoms early in summer.

C. acaule (Ait.) is perhaps the most remarkable species of the genus, and it is not a mere botanical oddity, for it is marked so as to attract even the dullest eye. It may be distinguished at once by its pair of nearly opposite radical leaves, from between which springs the scape, bearing but a solitary terminal flower and a foliaceous bract. The slipper is rather larger than a blackbird's egg, slit right up the face, and with the column bent tightly down, so as to do away with the usual opening. The movements which take place under these circumstances, with a view to fertilisation, are very remarkable. This goes sometimes by the name of *C. humile*. A native of North America. For cultivation see under *C. pubescens*. Blossoms early in summer.

C. spectabile (Swartz.) is a noble species, which every ecstatic person should see. It is the gem of the genus, and few are so prosaic and sober-minded as to feel no little thrill of pleasure from the contemplation of so much rare beauty. The stem grows from 1 to 3 feet high, bears plenty of handsome foliage all the way up, and ends in three or fewer flowers. The leaves are hairy, sessile, alternate, ovate, and tapering to a point. The perianth segments are white and spreading, and the slipper or labellum is larger than that of *C. acaule*, and of a most pleasing rose-purple or pink tint towards the front. Sometimes the whole flower is on a par with snow in colour. The remarks on the cultivation of this species in the "Botanical Register" are eminently misleading, and the coloured figure in Sweet's "Flower Garden" is a miserable representation. On account of the manner in which the roots spread horizontally, so as to demand much surface but little depth, this, like many of its relations, is not well adapted for pot culture, and if subjected to such usage, a few years can hardly fail to span its life. The treatment should resemble that given to *C. pubescens*. A native of North America. The blossoms expand during summer. [The late Mr. W. Barnes used to grow this species with much success in a pot, and has shown beautiful examples of it in that condition. EDS.]

C. parviflorum (Salis.) is very dangerously near *C. pubescens*. Both inhabit North America, blossom in the spring, require the same care, and have flowers of a like colour supported in the same way. In this, however, the lip or slipper is much broader than it is deep, whereas in *C. pubescens* the very reverse is the rule. The species under notice is said to be fragrant, but several trials have not enabled me to find any odour whatever.

C. Calceolus (L.) used to be found in Durham and other parts of England, but some Vandals have probably torn it nearly all up and taken it away for sale. It is a species which is distributed over many parts of the adjoining Continent, so that quantities are often and easily imported to enrich our gardens. It resembles *C. parviflorum*, but it is less handsome, and has not the ringlet-like perianth leaves which are so conspicuous an ornament of that species. The blossoms open early in summer. The same kind of treatment as *C. pubescens*.

In addition to the above *C. arietinum* is sometimes cultivated with us, and although the least of the genus, it is pretty and very interesting. It is entitled to the last-named distinction chiefly because of its perianth leaves remaining separate, so as to be clearly five in number, whereas in the other species the two lower leaves cohere, and form one whole, or almost whole, piece. Then *C. macranthum*, *C. guttatum*, and *C. ventricosum*, from Siberia, are all first-rate kinds; and let us hope some energetic nurseryman may ere long reintroduce them, for I fear they are not now in this country, although they were a little time ago.

The terrestrial Orchids of the larger part of North America, and of all Europe, excepting the more southern portions, being capable of standing the severities of our winter with hardly any extra protection, and being often very gay, have not received anything like the notice which they deserve. Further, even the humblest of the order is raised in importance when we think over the discoveries of Mr. Darwin about the part insects take in the general economy, and, indeed, life of these plants, and try to repeat for ourselves some of the experiments which helped to confirm that great student of Nature in his original notion of so wide and wonderful a law as that which he has shown to exist. And that the objects in question are not harder to manage than many other far less instructive things is quite true, and can no longer be doubted by any one who has had the advantage during the spring months of a visit to the garden at Twickenham of H.R.H. the Comte de Paris. Although the roots are brought home in the very best state by the distinguished owner of the place just named, yet the skill and care which follow their arrival are admitted to do high honour to Mr. Needle, the gardener; and the method by which he attains his end is as follows:—The soil is chiefly loam, renewed every year in the case of pot culture, and little if any water is given after the leaves decay, but plenty should be used so long as these continue green. Full exposure to the rays of the sun is the rule until the flowers expand, but let it be remembered that this does not apply to any one kind at every stage of its career. For instance, to leave a weakly plant unprotected is usually succeeded by consequences the very reverse of those which follow the like treatment to a strong one. Indeed, the latter may rise equal to the occasion, and actually gain strength by a process almost certain to shower ruin on the former; and it is in such critical cases that the saving power of practical wisdom is wanted. *John Duncan.*

HORTICULTURISTS AT OXFORD.

As we are now within a month of this great event, it seems time that something definite was told us of the expected sayings and doings of horticulturists at Oxford. One of the chief conditions of the success of a Congress, for instance, in which weighty deliberations and earnest discussion may form an important feature, is the timely announcement of subjects, and of the gentlemen who are to introduce them. Time is as needful to prepare for the intellectual work that may be expected of us, as

it is to enable us to grow fruits, plants, or flowers for the show. And yet while the schedule of prizes has been in our hands for months, the programme of the Congress is not yet before us. I do not say that the same amount of time is needed for both these objects; but sufficient ought to be allowed for each; and it might even be possible after a time, if such meetings became permanent, to arrange and publish the plan of the Congress proceedings with the usual schedule of prizes. I know the novelty of the project has hitherto made these arrangements difficult and slow of execution, and I write, not to blame for the past, but suggest for the future, and urge the present importance of at once announcing the programme of the Congress to be held at Oxford. The time now is all too little for horticulturists to be able to refresh their memories, and familiarise themselves with the subjects to be discussed. There is no recipe for promoting freedom of good speech equal to a complete mastery of the subject to be spoken upon.

Another great want at these annual gatherings is a general rendezvous or place of meeting for mutual friends, or strangers who wish to become friends. Already I have had many letters, many of them from gardeners I have never seen, saying they hoped to meet me at Oxford. The same thing happened at Manchester and Leicester, and in the majority of instances the shows passed over without the meetings or recognitions taking place. I hardly know how this is to be remedied. Of course where one stranger meets another they pass on, although the said stranger may be the very man who has written so affectionately, hoping to shake you by the hand, &c. Some may say, what does it matter? Well, I think it matters much; I value these annual meetings highly for their social influence. Meeting with our neighbours or friends from year to year we know them better and love them more, and the more we know of each other the better. I have a brotherly feeling for every true knight of the knife and spade and pen throughout the kingdom, and I long to grasp the hand of every one of them and tell them so. This being impossible, one of the next best things seems to be to make acquaintance with all who desire to know me at the Royal show. Doubtless other gardeners have similar desires. How are they to be gratified? I hope you or your readers will point out a plan. Meanwhile I offer the following suggestions for promoting fraternity:—A general place of meeting for all gardeners or others who wished to be introduced to anyone else at Oxford. Certain houses might be specified for this purpose. Every one who entered to have his name taken down in a book, and to be announced by the door-keeper both on his entrance and departure. This would afford the chances for recognition to all who were within.

The horticultural dinners have not perhaps been so successful as they deserved. The idea of inviting gardeners to lunch with the Council and jurors was good, but it was marred by an inadvertence, in placing the tent close to the military band. "The feast of reason and the flow of soul" were stopped by a fuller measure of the sweetest music. Could it not also be managed for horticulturists to drink tea on a large scale? This could be done for little money, and it is said by the fair sex that tea loosens all tongues, and opens all hearts. Why should we not try it at Oxford? It might prove less exciting than the dinner at St. Martin's Hall, but of this I am quite certain, there would be fewer hats smashed and coats lost, and more friendships formed at the end thereof.

But Oxford suggests something even more ambitious. I have the most pleasing memories of the *conversazione* at Kensington in connection with the great International Exhibition. That was a delightful reunion, tending to refine, elevate, and instruct in many ways and directions where we need it most. Is it not possible to have something on a smaller but similar scale at Oxford? The very place is suggestive of intellect married to social pleasure, and it would do us all good to partake of such a feast of these good things as Oxford might readily provide for us. Our isolation is not only our weakness, but it often begets something akin to roughness. The atmosphere of a well conducted *conversazione* would refine as well as enoble. It could hardly fail to sweeten our manners, enlighten our intellects, and enlarge our hearts. *D. T. Fish, F.R.H.S.*

[We hope to be able to announce the programme of the Congress in a few days. In the meantime we may state, that we believe it will be found in every way satisfactory. Eds.]

ELECTRICITY IN PLANT LIFE.

No one seems to have questioned the usefulness of steam or vapour in the culture of all indoor plants, still no one seems to have fixed its boundary line and stated clearly the times when it is most beneficial, and the actual heat at which the steam or vapour should be applied; neither has it ever been very clearly made out what end this steam or vapour served beyond that of moistening the surfaces of the plants on which it settled. I had charge of four bark stoves at Syon, heated by steam, or in other words heated by iron pipes always at the boiling point. To pour water upon such pipes to raise vapour would have been madness, and this will give your readers a clear idea of what I mean by having a boundary line by which to regulate the temperature of the vapour supplied to hothouses.

In propagating plants from cuttings, or, in other words, in growing plants that have no roots, it would be idle to say that such plants are not fed by their leaves, or at least partially so. Of the functions of the leaf we have in botanical works elaborate accounts, we can propagate the perfect plant in many cases from the single tiny leaf, and no one needs to be told that leaves unfolding themselves to the action of the air act as lungs. If any one will take the trouble to examine the opening foliage of the Beech tree he will find along the margin of each leaf a fringe of hairs like an elegant eyelash. I have selected the Beech because it is the most likely to be within the reach of every student. Now this air which we breathe, and in which plants live, has had its history told over and over again in scientific works, but besides the ordinary ingredients of our atmosphere, there is occasionally announced to us, literally with a "voice of thunder," that it is there and then especially seasoned or charged with a power that can fuse metals and rend Oak trees; in short, the forked lightning tells us that, whatever the bulk of our air may be made up of, it is occasionally "salted with fire."

If I had time and space given I might bring a good deal of evidence together to show that every hair and sharp point in the vegetable kingdom cannot help being a lightning conductor in its own little way any more than the pointed rod on the tall chimney or the church steeple can. In some of the beautiful machines made for illustrating lectures on electricity, the conductor is charged by induction, and receives from the cylinder the electric fluid on sharp-pointed wires not actually in contact with the revolving cylinder, the conductor really catches the fluid on its horns. Whoever has looked closely into the economy of plant life must have been struck with the great ends constantly attained there by small means, for it is not the large spread of the gaudy corolla that propagates the species, but the tiny thread-like stamens and pistils which they enclose; and when the petals of the flower are altogether wanting, the mere dots of the anther and stigma do the important work.

Now although, logically speaking, this may look like begging the question, I hope I shall be able to give some reason why I look for the hairs of the leaf to do what they are so well calculated for, namely, to conduct an agent capable of rendering such signal service as electricity has proved itself to be. There can be no question that wherever water rises in the form of vapour electricity is present, and although its action may be weak for scientific tests, it may not be the less useful for plants.

A professor in the College at Aberdeen got a hollow ball of metal, and enclosed a small quantity of water in it, and when this was converted by flame into superheated steam, the electric current kindled gunpowder at the end of a long wire, thereby proving beyond doubt the relation between the giant powers of steam and electricity. In "Silliman's Journal" there is given on good authority the case of an electrical lady who became at one time so charged with electricity that her fingers flashed fire, and the state of the atmosphere most congenial to the display of sparks was a good Pine-stove heat of about 80° Fahrenheit. Again, the electrical eel of the Amazon river is endowed permanently with a dangerous share of electricity, so much so, that when anyone touched the water of the tank in which one was confined he received a shock. There have been innumerable experiments with conducting wires on poles and Leyden jars to try to harness the electric spark, and get it to draw the car of horticulture, but all in vain, and there is little doubt that electricity thus applied was never diffused enough to meet the case; the dose would always be excessive, for who would imagine it needful to have 30 or 40 conductors for one leaf of the Beech tree, with an area of about 1 square inch; and yet this is no doubt the way that tree gets its share of electricity.

However useful the sun's rays may be when diffused, if you collect them in a focus on a lens the size of your thumb nail they will set plants on fire. The position of the hairs on plants favours the idea of their being conductors of electricity, for they are never developed on the roots or stems underground [??], and in many plants we find them on the ribs of the leaves as if they were placed on the flow and return currents, whereas in the case of the Beech they are beautifully arranged on the margin of the leaf; and unless all this array has been made in vain, every hair must have a duty to perform. Our thunderstorms usually occur after a time of drought, and in all experiments with electricity dryness is considered essential to success; and this falls in so well with the wants of vegetation, that we really need the aid of such a vivifying power after the heat, for it is then that every hair will have its work to do. And if the case of the electrical lady is to be relied upon, we have a key to the temperature of hothouse vapour at 80°, when every hair upon the Vine leaves may fill its horn with what it seems to long for. An artificial climate has, therefore, immense advantages on account of the way that vapour, and with it other things, may be imprisoned in a glass case for the service of exotics; and we can have no doubt when we see the wonderful effects of vapour, when it has been regulated by reason and experience in the growth of plants, that through it small doses of electricity have been administered to every hair and point within the house. Never was a bar of magnetised steel more truly positive and negative than the parts of a tree above and below the collar; they are as opposite in their requirements as light and darkness, and although united, yet each must have its own way or die in the attempt.

In the case of the electrical eel, above mentioned, it is clear that water is a good conductor of electricity, indeed, water seems the halfway house for electricity between the earth, its grand reservoir, and the region above, where it displays its grandeur and its force; and there seems no rational way of accounting for the invisible particles of water in a damp atmosphere being collected on the points of leaves in the form of dew drops, unless we give the point the credit of attraction, not of dew, but of electricity, and when that fluid travelled through the moist medium there is no mystery about its carrying the particles that eventually form the dewdrop, neither is there any other rational explanation of a soft spongiole making its way through a substance harder than itself unless we credit the strong hand of electricity with the deed. When the lecturer shows you that it decomposes water and melts minerals, and you know that this is just what plants require, and that this agent is undoubtedly present when these difficult works are doing, there is at least circumstantial evidence that electricity has done it.

When ozone was first talked about it was thought by many that we had got the clue to electricity, and the explanation given led us by the nose, for it was said ozone was "smell of electricity;" still when ozone is present vegetation seems to be more active than when it is not, and when we see the fresh sown fields smoking like the cooler at a brewery, the old farmer will tell you that you may almost see things grow: this is just the time when the ozone paper will give you its evidence—that "smell of electricity" has toned the paper in its own peculiar way, just to mark the action as its "act and deed." There is scarcely a plant that grows in water, a true aquatic, that produces highly flavoured food for man, and they are almost always without hairs. Again the gaudy flowers of the epiphytal Orchids, glorious to behold, are the most worthless as food for man or beast of anything that ever grew upon a tree, and most of them are destitute of hairs. The North of Scotland may be regarded as the headquarters of the Gooseberry, and the highest flavoured kinds there are beset with hairs; the Lancashire Gooseberry grower gives you heavy weight without flavour; the Warrington is a sort with moderate flavour, and it has a good deal of hair, but after about half a hundred years of extensive eating of this fruit, north, south, east, and west, I can say that I have never seen anything to equal the small Scottish jamberry (Champagne) in flavour, and its berries are as bristly as a hedgehog. This is not properly a table fruit, but the hairy green Gooseberry and the hairy yellow Gooseberry, grown in Aberdeenshire, are the only Gooseberries worth eating, and they are beset with hairs all over. The richly-flavoured Pine-apple has every leaf edged with hundreds of sharp pointed prickles. The Prickly Pear, as its name implies, has its thorns bound in bundles; a single fruit may have thousands, all set on edge. The goodly Cedar and the vast forests of the Fir tribe have every leaf needle-pointed; the grasses that clothe the earth with verdure and feed "all flesh" are all pointed, as if they hoped for good to come from on high and had lifted up their horns accordingly.

My attention was once called to an electrical experiment on a large scale at a paper mill. As a roll of writing paper was passing from the steam-heated cylinder, where it was dried, to the reel on which it was wound ready for cutting, the rosin size, with which it was starched, had been rapidly changed from the form of thin gruel to that of dry paper; and when a boy was asked to sit under the roll for a minute or two the hair of his head stood on end like a bottle brush, as if every hair presented arms to some unseen agent passing. And in this case we know electricity was the attracting power, visible only by its effects. The vague meaning of this word "attraction" is apt to mislead us. When we see two corks in a tub of water come together, it is considered conclusive that they attract each other, and the water and the electricity are left out of the question. But a few of the well-known experiments with the pith of the Elder tree will settle the cork theory; and if we take the passage "Deep calleth unto deep" in its literal meaning, we shall soon see that when water called unto water, that water which had the power obeyed the call and came; and hence we find that Westmoreland with its lakes gets nearly double the rainfall that Warwickshire gets. You can often see with the naked eye the vapour moving on the face of the still water, and this charged more or less with the electric fluid will attract clouds of vapour similarly charged, and the rain-gauge tells that some unseen agent has conducted about 54 inches of rain into its receiver.

The difficulties, nay, the impossibilities, of getting evidence of the working of electricity in vegetable life arises from the fact that vegetables have life but have not the faculty of speech, and hence we may draw wrong conclusions; whereas if "Pulvermacher" cures rheumatism by electricity the patient gives evidence of the fact. Highly poetic things have been said of the Holly tree being beset with prickles when low and

young, and when old and high leaving off this habit and bearing smooth leaves, but what if the prickles had been wanted for a time just as much as the roots. The Ivy plays the same freaks, not only with the shape of its leaves but also of its branches, bearing no roots when it begins to flower. Another agent has come upon the stage to act, and that with different tools, just as we see the tadpole drop his tail and take to his legs because circumstances compel him to be a fish no longer. You can see salt crystallising in the mother liquor, but no botanist has been able to see the formation of the bladders of cellular tissue, and, as yet, no man knows how they bring forth their young [?]. One author thinks they bud (pullulate), another thinks they embrace (anastomose). Here, then, we have the true sap by way of the mother liquor, and some silent, unseen, accurate, and powerful agent binding up the tissues, cellular, vascular, and fibrous; and no power seems so well able to do this as electricity, with its conductors bearding the leaves, as in the Beech, &c., above mentioned.

When plants put forth their hairs they are evidently asking for help; for, in the case of the electrical lady, when she was under the influence of fear she gave out no sparks. When we see the dog preparing for an onslaught his mane rises on end, and the heat of his anger is, no doubt, helped by his bristles attracting electricity; and it is when the cat is enraged that her tail assumes great dimensions and her back rises, but when she runs away, and the case is hopeless, her tail drops, and bodily fear smooths her back. Electricity is, therefore, intimately connected with the working gear of vegetables in fighting their battles, and one cannot help borrowing the boy's hair and the bristles of the cat and dog to help to explain a very difficult question.

If I could only succeed in showing that all the best fruits are pre-eminently endowed with points to conduct electricity, and that all our valuable timber trees, such as the resin-bearing Coniferæ, owe their resin and their other virtues to the spearheads with which every one of their leaves is armed, we could arrange our culture accordingly. I might adduce the example of the Chestnut among trees as yielding both food and timber of the first order, and its leaves are terribly sawed and pointed, and we might see in this way how woods and forests may be benefited by the exhaled vapour from lake and river, where other water could not come; and there are secrets still in the way that alpine plants of the tenderest forms live on hillsides, which the cultivator would be glad to know; and the cloud-cap of mist on the mountain top could, no doubt, explain the mystery. In our dealings with vapour we may safely reckon upon another ingredient being present although invisible. *Alexander Forsyth.*

GLASS WALLS FOR FRUIT AND FLOWER GROWING, SCREENS, FENCES, &c.

We have long been familiar with the name of glass walls; but these were only ordinary walls with glass facings. Whether the name begot the idea of veritable glass walls I know not; but I now have the pleasure of introducing and describing real glass walls to your readers. They were invented by the patentee, Mr. Charles Beard, of the Victoria Works, Bury St. Edmunds, Suffolk, and are of the simplest and most serviceable character. They can be had of any height, and of course of any length, straight or zigzag, high or low, thick or thin, to suit all positions and all circumstances. All of them, down to the very lowest, are made sufficiently strong to resist the stress of ordinary weather in the open air.

Fig. 157.

The elements of all forms and sizes are alike, the structural constituents the same. The glass is supported and held in position by iron. The two main constituents of the wall are consequently distinguished by cleanliness and indestructibility. They are dirt and decay proof.

The foundation of the edifice, which we trust soon to see crowned with fruit trees and flowers, in most gardens consists of T-shaped double iron bars, placed at intervals of say 5 feet apart; these rest upon soles, or are bolted on to blocks of wood, or built firmly into a foundation of brick or stone, or set in a base of cement or concrete. They must be made quite firm, so as to keep the wall from swerving with the highest winds. These bars are formed of 1¼-inch angle-iron, and are joined into an I-formed top. At 2, 2, fig. 157, are grooves for the insertion of the glass. Sufficient space is left for a layer of felt to support the glass on each side, and keep the two sides of the bar (3) from touching the glass. A small bolt or screw is used (near fig. 4) to screw the two sides of the bar firmly together, and keep the glass in position. In fig. 158 we have a front view of a 5-feet length of a very high wall. The base is of slate; (fig. 158, 1,) The position of the outside principals is shown at 2. The common glazing bars (3) are formed of two ¾-inch semicircular bars, placed face to face, gripping the ends of the squares between two layers of felt. At (4) the glass sides abut against each other at the dotted lines. The coping projects 3 or more inches on each side. This is (5) bolted on to the iron principals, and is consequently movable. Portable copings are best, for though useful in cold weather to pitch the frost and the hail and snow or cold rain over the face of the wall, they are injurious in summer and autumn, by intercepting the nourishing dews, and hindering the cleansing rains from reaching the tops of the trees. The glass used is strong rough plate, ranging from 40 oz. to the foot and upwards, according to the height and strength of the wall required. Other advantages are likewise gained by the use of stout glass. The greater its substance or mass, the more heat it will absorb and retain for future use.

The walls are covered with wires for training, or sheets of galvanised wire netting, of 3 or 4 inch mesh, can be suspended from projecting struts screwed into the principal supports—the length of these struts and their distance apart being determined by the wants and character of the plants to be trained against the wall. If more are used, the distance apart may range from 4 to 12 inches. But there is nothing so convenient in practice as the wide-meshed netting, as a tie can always be made upon it wherever a branch is found. This rearing of the surface completes the glass wall, and what has surprised me most is, not their light, elegant, and beautiful appearance, although these are all that could be desired, but their strong, practical, business-like character. They do not seem the fragile, fairy things that a storm could smash, or a hurricane level, but substantial walls, so firmly grounded as to defy the fury of both for any length of time. This stability of the whole wall is combined with the utmost portability of its different parts. No walls can compete with these in facility of erection or removal. They involve no cartage of bulky materials, and but little excavation of stubborn foundations. They are as easily erected as a sheep or bullock wire-fence. Arriving in crates or bundles complete they may be erected ready for use within a few hours. This facility of erection implies equal or greater despatch in the taking down or removal. The latter is of equal practical importance to the former. For a very large number of those interested in the erection of walls for horticultural purposes, the chief hindrance to their building is that, although they are perfectly free to put walls up, they are by no means free to take them down again. The property was the tenant's to-day, it becomes the landlord's to-morrow, by being simply fixed upon his property. But these glass walls need not be converted into fixtures. They will thus continue the property of the tenant, and may be removed and transported from place to place at a small cost.

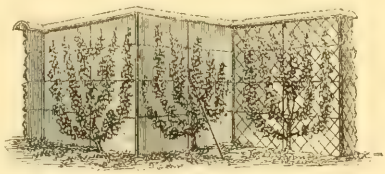
Fig. 158

They are neither bulky in transit nor do they occupy more than an inch of space when erected. Their thinness is of great importance where ground is scarce and gardens are small. In villa and suburban gardens 10 per cent. of the ground is often covered with brick walls. By the use of glass the proportion will be reduced to from 1 to 5 per cent. The abolition of deep, ponderous, impenetrable foundations, will deliver the roots from a perpetual warfare with unbroken lines of brick, stone, or concrete, and give them greater freedom of root room, and a choice of site. This is of great cultural importance. Not only will the feeding grounds for the roots be enlarged, but improved, and the roots will have the power of electing to live in the best places. The whole of the holdings previously occupied by bricks and stone, will, by the use of glass, be given up to the roots; and the sharp dividing lines, marked off by dead walls between genial and ungenial borders—north and south for instance—will be destroyed. When this is done, is it too much to expect that the instincts of plants will find out and abide in the best quarters? But the greatest merit of the distinguishing characteristic of glass walls remains to be noticed. They are transparent—they may be seen through, and if we can see through them the plants will also see or feel the light and the heat through them, just the same, or nearly so, as if no wall interposed between them and the sun. Glass walls will deliver one half of our plants from the reign of semi-darkness. It is impossible to overrate the cultural importance of these simple announcements. The great problem of shelter without shadow, seems to be solved by the use of glass for walls. The backs of trees will enjoy the light, and bask in the sun's beams, as well as the front. North walls will be converted into south ones, by the passage of the warmth and the light through the glass. Transparent walls will not improve the climatic position of every tree, but double the extent of the genial area provided by ordinary walls. They will even do more and better than this. Their thinness and transparency will enable them to be placed much closer together. Whole blocks of ground may be covered with these walls, at distances of from 4 to 6 feet apart, of equal or graduated heights, and the climate of the South of France be thus commanded throughout the greater part of the three kingdoms. Not only will this compacting of walls together save ground, but afford rare facilities for protecting their occupants from frosts and vermin by horizontal protectors thrown over entire blocks at special seasons. The frost and the birds may thus easily be vanquished by bunting or netting in early spring or mellow-fruited autumn. By protecting the cold or northern side of glass walls, the plants on both faces will enjoy the light, all the while the protecting material keeps in the heat and out the cold.

Another mode of economising space as well as providing every kind of aspect, consists in the erection of glass walls in zigzag lines, at any angle, in convenient lengths (figs. 157, 158). By the adoption of this plan plants may be made to look to every or any point of the compass. The force of the wind would be broken as the angles form such snug nooks and corners for early spring flowers or tender early produce of any kind.

When glass walls are used for dividing lines in suburban gardens, considerations of privacy may render their complete transparency objectionable. In such positions ground glass may be used, or a thin coat of paint will obstruct the sight either way without seriously impeding the passage of light or heat to or from our neighbours.

Fig. 159.

This permeability of glass walls to light and heat may be objected to by some upon other grounds. Of course they will be somewhat colder than opaque walls, but possibly this may prove one of their chief merits. The alternations of temperature on ordinary brick walls is something terrific, the trees are at one time half roasted, at another frozen through; the changes will be much more moderate and limited on glass walls. They may be as cold, slightly colder, but never so hot as brick walls, and the great thing we have to fear in the spring is heat, not cold. Dormant trees are safe. It is when the heat rouses them into life and growth that the danger arises. For this reason it is probable that glass walls will prove the best for our climate. In appearance nothing can equal them in neatness and beauty, and as to price I have heard that they can be erected complete for about two-thirds of the price of ordinary walls. They will be exhibited at Oxford, and for further particulars I must refer your readers to the manufacturer and patentee, Mr. Charles Beard, of the Victoria Works, Bury St. Edmund's. My duty in relation to this useful horticultural invention begins and ends with this introduction of them to your readers. For cheapness, strength, cleanliness, elegance, and general utility, as well as the many other merits alluded to, I consider glass walls one of the most useful inventions of the day. *D. T. Fish, F.R.H.S.*

Home Correspondence.

Antigonon leptopus.—Your readers will be glad to learn that, instead of having only one species of Antigonon in our gardens, we have already two, perfectly distinct; but at this stage of the inquiry I am not prepared to say which is which, or in other words, to decide whether the plant lately figured by Dr. Hooker in the Botanical Magazine, tab. 5816, or the plant which I introduced from Central America, is the true A. leptopus of Hooker and Arnott. For the present purpose it suffices to say, that in colour and growth my plant is much superior to that figured by Dr. Hooker. In fact, the Botanical Magazine plant, beautiful though it is, is not one that I should go into ecstacies about. Mr. Bull has both of them growing side by side, and they may be readily distinguished, even by the touch, the Botanical Magazine plant being soft and weedy, my plant hard and more substantial in texture. The Botanical Magazine plant has the petioles and young shoots reddish, leaves ovate or ovate-oblong cordate, at least three times larger than those of my plant. My plant displays no reddish tinge on the young shoots, petioles or blades of the leaves, and has more hastate leaves. The Botanical Magazine plant grows fast, and produces seeds readily (bushelfuls having

been sent to this country since I first drew attention to Antigonon in these columns), whilst my plant grows much more slowly, and produces seeds so rarely that I never could find more than six, though I looked out for them for years. The leaves which Van Houtte figures with his plate of Antigonon (tab. 1886—1887) have evidently been taken from the plant I introduced, but the flowers which are tacked on to them are very unlike in colour the beautiful ones displayed by my plant. As the plants now in gardens begin to develope, their synonomy can be easily set to rights; at present my impression is that my plant is the true A. leptopus of Hook. et Arn., and that the Botanical Magazine plant is inferior in beauty, though still most acceptable, to other species of the genus. *Berthold Seemann.*

A Potato Show.—If I remember rightly, there was some talk last season of holding a sweepstake exhibition of the "noble tuber," and I pictured in my mind's eye how the "crack" growers would exult when they saw their more humble rivals placed *hors de combat* in the race; but I have heard no more about it. Allow me, thus early, to suggest that a sweepstakes be started, for the purpose of holding "a little go" at one of the meetings of the Fruit Committee during August next. This ungenial season is a very trying one, even to the best of culturists, for the production of first-class Potatos, hence the prospects are the same for all. I will gladly undertake to accept suggestions or receive subscriptions for the purpose; and if I may be permitted to make another suggestion, it is that the Fruit Committee should be selected to adjudge the awards. *William Earley, Dogsell, Welwyn.*

Cranberries.—I shall be obliged to any of your readers for information how best to grow Cranberries. I have spots admirably suited to them, in which the bog Mosses in which they delight grow luxuriantly. What would be the best method of inoculating these Mosses with the Cranberry? If by seed, where is it to be obtained? *H. S. H.*

Cacti.—My acquaintance with collections of Cacti is so very limited, that I fear perhaps I may be announcing no novelty in saying that I have in my possession two examples of Echinopsis oxygona of the purest and most dazzling whiteness, and which I consider as some of the gems of my little collection. Excepting for the column and the pistil being considerably larger than in the typical form, and perhaps they flower a little more freely, they are identical. One plant is most proliferous in offsets. They were selected from a batch of seedlings raised by Mr. Cooper, of Reigate. *J. E. Daniel, Epsom.*

Blight Compositions.—The question is often asked by many of your correspondents as to which is the best blight composition, and as the season is now approaching when we may expect a return of those pests, a few words on the subject may not be inapplicable. Many of the compositions now in use have obvious disadvantages, some from their odours and others from the unsightly stain left on the foliage of the subject to which they are applied, and which is often with difficulty removed, while some are very expensive, and not within reach of the many. Last season Mr. Wilkie, the gardener at Oak Lodge, Kensington, seeing the frightful state my Roses were in, being nearly eaten up with fly, sent me a jar of a composition, which he tells me he has used for years, and always with the most satisfactory results; and much to my astonishment it had the desired effect. I gave the trees a thorough syringing, and within one hour after the application not a living insect was to be seen. I am induced particularly to make this statement, as I believe Mr. Fairbairn, at Syon House, has been using this composition for several years upon various kinds of insects, and always with the same results; and perhaps this may induce him to give your readers the benefit of his experience, as Mr. Wilkie may also do. I may further remark, that the composition imparts no disagreeable odour, leaves no stain on the foliage, and I am given to understand that it is far from being an expensive article. *Amygdalus.*

Cherry Trees not Bearing Fruit.—Will Mr. Gilbert of Burghley kindly aid me with a scrap of his knowledge in the above matter, and particularly in the case of two Cherry trees I have? About two years ago I chanced to visit the Royal Gardens at Frogmore, and while there particularly admired a pyramidal or bush form of a Morello Cherry tree, standing, if I remember rightly, alone and near the edge or intersection of two paths. On inquiry I was told it was the "Frogmore" Morello, that it succeeded well, and always bore fruit in profusion, and of fine quality. I thought it a most desirable tree, and on my return home searched for it in the trade catalogues of the nurserymen, and found it described in that of Mr. Rivers of Sawbridgeworth. In due course I obtained from him two very prettily formed trees of this Frogmore Morello, and hoped some day to have as handsome and useful trees of that variety as I had seen there. They were planted in an open and airy place in deep land, where you may dig 3 feet down without coming on sand or gravel. For the first four or five years I pinched in their summer growth and moderately root-pruned them, as Mr. Rivers, in his books, directs should be done. Since then they have been treated much the same as I prune Black Currants, by thinning out the old wood and leaving the young wood its entire length; they have thriven well in their growth, are now about 9 to 10 feet high, and nearly the same through, year by year they are densely covered with bloom from the ground upwards, but have never produced a ripe Cherry. Before the stoning time comes every fruit turns yellow and drops off. I was induced to feel that this year might prove an exception, as the trees blossomed later, and atmospheric influence all through the blooming period was especially favourable to success, but the trees are barren now, as before. For some years past I have been in the habit of leaving standing out from the wall the "last year's" wood of all my Morello Cherry trees trained to the wall, and have every reason to be satisfied with the result. That difference exists in Morello Cherries I feel quite assured, for some trees I purchased of Mr. Scott, of Yeovil, have grown stronger and produced much finer fruit than any trees I had previously had from any other nurseryman, but here, vigour of tree and size of fruit are the characteristics; for quantity of fruit, they are neither better nor worse than any I have obtained elsewhere. *James Eustone, Exeter.*

Rose Growing.—In Mr. William Paul's paper from the "Florist and Pomologist," quoted in your colums at p. 834, he states, "that in England there are two classes of Rose growers, viz., those who grow for plants and those who grow for flowers," by which we presume he intends to convey to the public (to put the sentence into plainer words) that those growers who exhibit are not the persons from whom to purchase, as the disbudding system practised by exhibitors does not produce plants equal in ripeness and well-formed heads to those produced by non-exhibitors, who all practise, we are led to infer, the removal of the first blooms. Now, in this we entirely differ from him, and record our opinion only after the most careful practical trial of both methods. We assert, with the examples of plants treated either way standing side by side on our quarters, that properly disbudded plants are equal in every respect to those from which the first blooms have been entirely removed, while to lovers of Roses the first blooms of disbudded plants are not things to be willingly thrown away. These trial plants may be examined here by anyone whom the subject interests, and if such persons come during the exhibition season, we trust they will not find our Rose grounds in the state of disorder described in the paper to which we allude. *Paul & Son, "Old" Nurseries, Cheshunt, Herts.*

French Nursery Catalogues.—I do not know whether M. Baumann intends his communication (p. 830) to be satirical or apologetic. If satirical, it bears its character on the face of it; but if apologetic it requires a few words in reply from me, as I opened the subject in your Paper. Allow me to assure M. Baumann, that we, in England, do not appreciate that kind of French *galanterie* which prompts French nurserymen to print their catalogues in English and then ask us to pay for it. Their *galanterie* would be better exhibited by charging us the same as they charge their home customers, in francs insteads of in shillings. I have from time to time, during the last 25 years (long before Frenchmen printed English catalogues with English prices), had trees and plants from the Continent, and my experience, which has not been small, teaches me that what I now pay a shilling for is no better, but just the same as what I formerly paid a franc for; and my experience further teaches me that Frenchmen are as anxious for the best that can be had as Englishmen are. I have yet to learn that a Frenchman will be satisfied with what an Englishman rejects. No, no! Mr. Baumann, you must find a more satisfactory apology. Respectable houses, like M. Louis Van Houtte, M. Linden, Simon-Louis, Charles Baltet, Jamin-Durand, and Dauvesse, are satisfied to issue their catalogues in French and with French prices in England, and we are satisfied we can appreciate such *galanterie*, but the *galanterie* of charging shillings for francs we call by another name. *A Greenhorn.*

The Fungus Question.—With the thermometer standing at nearly 90° in the shade, and work looking one in the face in almost every direction, I have but little time or inclination to enter on the Fungus controversy, but seeing at p. 830 your correspondent "W. P. R." recommending water for the destruction of the Fungus, which certainly seems to me a most extraordinary recipe, I beg to state how I have succeeded in its destruction here. During the past four years a Peach tree in one of the late houses has always suffered more or less from Fungus; last year my predecessor lifted the tree, removed the soil, washed the roots, and replanted the tree. This any one would have considered a most satisfactory way of getting rid of the pest, but I am sorry to say the tree was attacked during the early part of the season worse than ever. The tree being too far advanced in growth to remove the soil from it, I determined to try my sovereign remedy—diluted gas water, which has not only destroyed the Fungus but restored the tree to its former vigour; and I much question if in the space of a few more weeks it will not be the most healthy tree on the place. Now facts are stubborn things, and all the logic that some of your correspondents are gifted with will not remove the Fungus, or even enlighten us much on the subject, although it is, I admit, interesting, and a question that requires well ventilating, and one which I believe is but very little understood. I once heard an old friend of my father's, a Dr. Richards, make a very sensible remark to one of his patients who was bothering him about the origin and other particulars respecting some very peculiar disease he was suffering with, and which, I believe, was not well understood. The doctor replied, "Bother the disease and its origin; let us make up our minds to kill it." And this is the advice I would recommend to the writers on Fungus. *Edward Bennett, Enville Gardens, Stourbridge.*

Cultivating Cherries under Glass (see p. 830).—We received from the nurseries, in the year 1861, several varieties of Cherry, four or five years old—Bigarreaus, Hearts, Dukes, and Morellos. They were planted in the fruit garden, where they remained for two or three years, growing very vigorously and blossoming very freely; but no fruit could be ripened upon the Bigarreau and Heart varieties. My employer then erected an orchard-house, 135 feet by 26 feet. Having plenty of spare room in the house for my fruitless Cherries, I had them all lifted and placed in boxes. The boxes were 22 inches deep, 22 inches square at the top, and 15 inches square at the bottom, inside measurement. The roots had to be cut back very much to get them into the box. After that the boxes were filled with good turf well rammed in. The trees were then removed to the orchard-house, where they produced fruit very sparingly. For two or three years I could not get more than half a crop from them, but I found as the trees got older and the roots filled the boxes, they produced more fruit. I am now gathering fruit every day as fine as any person could wish. The trees are producing from 500 to 1000 fruits each. The treatment they have received has been to place them in a line along the back of the house in the early part of the month of March; as the trees came into blossom the back lights of the house were left open 5 or 6 inches day and night, to allow a continual circulation of air, unless the thermometer indicated a frost in the early part of the evening, when the lights were partially or wholly closed. The most critical period in the cultivation of Cherries is when the fruits are stoning; the temperature in the house at that time ought to be kept as fixed as possible. We endeavour to keep the house between 55° and 65°. We have got one flow and return pipe in the house, heated by a small saddle boiler. Should the weather prove very hot, with bright sun, the trees will require shading. Then, as to watering, we give each tree 2 or 4 gallons of water daily. After the soil in the boxes or pots has become full of roots there is no fear whatever of the soil becoming sour by watering. The roots so thoroughly drain the soil that if watering is not well attended to they will very soon become dry, and should that prove the case a failure in the crop may be looked for. I think it very bad practice to allow Cherry trees to grow fast, especially Bigarreau and Heart varieties. It is better to pinch off the ends of the young shoots after they have made two or three leaves, and so on through the summer. Should the trees be full of new growth it should not be taken off during the time the fruits are stoning, though it may safely be taken off as the fruits begin to swell after stoning. The Duke Cherry fruits too freely here to grow very much; it is a very hardy and useful Cherry, but not at all to be compared to the Bigarreau. Governor Wood is, in my opinion, the sweetest and best Cherry in cultivation. I remember once hearing a very practical man amongst fruit describe a Cherry-house that he had seen several times. It was a lean-to house, in which the trees were all planted out. In winter the trees looked very ugly, showing nothing but stunted and crooked growth, but in summer, on the other hand, they afforded a beautiful spectacle, being one mass of fruit. *Henry Mansley.*

The Vines at Broomfield Lodge.—I am not such a "curmudgeon" as to grumble at a little criticism, and will, therefore, with your permission, say a few words in reply to the letter of "One who honours old age." Your correspondent singles out one Robert Harris, as he is pleased to style him, and Mr. Payne, as the objects of attack in my letter at p. 568; but if he will re-read my article at the above page, he will find that no names are mentioned. Mr. Robert Harris planted these Vines in 1802, they are consequently about 68 years old; but for your correspondent to state that he was one of the best Grape growers of his day, is, I am informed on good authority, mere assumption, and indeed the reverse of fact. From what I can gather, Harris appears to have left here about 26 years before Mr. Payne came, and notwithstanding your correspondent's 40 years' knowledge of Broomfield Lodge, he omits to give any particulars of this 26 years' interval; for such information I should be much obliged. I have not the slightest hesitation in stating, that the greater part of this "barbarous treatment," and "unscientific amputations," which seem to have tickled your correspondent's fancy, were performed before Mr. Payne's time. Mr. Payne, I hesitate not to say, is a very good Grape grower, and I am quite sure he will agree with me that these Vines have been handled in a very unscientific manner; but I never insinuated that he was the person who thus handled them. The large bunch which Mr. Payne exhibited in London was not cut from these old Vines, as your correspondent would have your readers to infer, but from a young Vine about four years old; and it is worthy of notice that even Mr. Payne never produced anything like it afterwards, which circum-

stance tends to confirm my statement at p. 568, "that Vines grown on the restrictive or single rod system (as these were) are proverbial for producing large bunches in their youth, but are they lasting?" These monstrosities are no uncommon things on young Vines; but once overcrop the Vines, and they will cease for ever, that is, if they are confined to a single rod. Mr. Payne's success, too, at Brighton, was not the produce of old Vines, but from what I will call "fancy Vines" of not more than six years old. Your correspondent questions whether I shall acquit myself with equal credit as my predecessor. Does he overlook the fact that my predecessor left for the very reason that he failed to produce anything worth calling Grapes? Such is the fact; and

"He that says the things he shouldna,
Is sure to hear the things he wouldna."

I forbear to mention names, but there are plenty of horticulturists who can testify as to the state in which I found these Vines when I took charge of them in April, 1867. I repeat for your correspondent's information, that my ten months' supply is no overdrawn statement, as I will show, and that, too, under adverse circumstances; but let me first state that I never allow the Vines to carry a fourth of a crop for the sake of producing "exhibition Grapes," but I always give them a heavy crop, and notwithstanding which I generally secure an average number of prizes. The adverse circumstances above alluded to are these, viz., my late vinery is converted into a second conservatory through the summer, being filled with large foliage plants, Orange trees, &c., while all through the winter it is crammed full of greenhouse stuff, the greenhouse itself being only large enough to hold the Cape Pelargoniums, and not a single month in the year is the vinery empty. Notwithstanding this drawback, I manage to keep Grapes hanging till the end of January, this year till February 5, when I cut the last in good condition. My early house I can ripen by the middle of March if I wish, but I prefer the first week in April. In conclusion, let me add that my object in my former letter was to prove the value of the extension system, and not to call in question Mr. Payne's abilities as a Grape grower. *Thomas Simpson.*

Large Apricot Tree.—Your readers may feel an interest in the particulars of an Apricot tree, which is growing in one of the numerous gardens in the plain between Hyères and the Mediterranean, and from which Paris is so largely supplied with early fruit and vegetables. This tree I should judge to be between 25 and 30 feet high. The stem, as measured by me, is a little more than 6 feet in circumference immediately below the spring of the branches. The branches from end to end in one direction extend 56 feet, in the other 52. The proprietor informed me that the average yield of the tree is 2000 fruits. He describes the fruit as so large that six and sometimes only five go to the kilogramme of 2 lb. 2 oz., and in this he is confirmed by his neighbours. They all agree in saying that the flavour is far finer than that of any other Apricot known to them: the quantity this year seems wonderful. The history of the tree is curious. It grew from a kernel, but whence derived no one knows. It is said to be about 30 years old. I observed some large blocks of stone placed in the forks of the principal boughs. I was told that it had attained a very large size before it bore any fruit, and the owner was thinking of cutting it down, when he was advised to try the effect of the stones, and it has since borne so abundantly. I have seen this system adopted with a Pomegranate tree, but I have failed to discover any principle or theory on which it is founded, nevertheless I am assured that it has the unanswerable argument of success in its favour. Some of your readers may be able to explain it. *H. M.*

Gold and Bronze Pelargoniums at the Leeds Exhibition.—Your correspondent "Looker-on" labours under the same impression as the reporters and public alike did, after the decision of the judges on the Gold and Bronze Pelargoniums at the Leeds exhibition. We were awarded equal 1st prize, but the 2d prize card was put to our plants without the words "2d prize" being erased, and underneath was written, in very small and indistinct pencil markings, "equal to 1st prize." As soon as our Mr. Laing called Mr. Birbeck's attention to the improper state of the card, he had it rectified at once, but evidently too late for the press reporters and your correspondent "Looker-on." It would be superfluous to offer any remarks on the decision of the judges, as it was sufficiently criticised during the exhibition by growers and others. *Downie, Laird & Laing.*

—— It would have been better had "Looker-on" armed himself with particulars respecting the award of the judges at the Leeds show before rushing into print, and if he had given his name more reliance would perhaps have been placed on his statement. The schedule states that the prize was to be awarded for 6 Bronze and Gold Pelargoniums in class 39, type Beauty of Calderdale and Beauty of Ribbledale. The matter was well considered, and three points were considered to be in favour of Mrs. Butler's exhibition, namely, size and uniformity of the plants, and good constitution, whilst only one point could be given to the other lot, namely, colour; and it was well known that some of the varieties named in the first lot would be cultivated long after the others were forgotten, but in order to please every one it was suggested by another of the judges that the 1st and 2d prizes should be put together and the amount made equal, giving the two exhibitions an equal 1st prize. I was not aware but that this had been done. It would be a good rule if the Editors would refuse to insert all communications from correspondents not sending their name and address; this would be the means of keeping their valuable Journal more sacred to its legitimate purposes. No man should ever write that which he is ashamed to sign his name to; if my friend Mr. Stewart has added to his horticultural knowledge a store of the sister art, he is very likely as capable of judging the qualities of a good Pelargonium as "Looker-on" without indulging in personalities. *J. Wills, Ashburnham Park Nursery, Chelsea.*

Preserving Peaches.—As the Peach crop in our neighbourhood this year is likely to be an abundant one, I should be glad if any of your correspondents could inform me the American mode of preserving them in tins, as they are sold in London at this season of the year. *T. T. Huntingdon.*

Early Peas.—The best way of testing the earliness of Peas, either of those sown in turves or boxes, and brought on under cover, and finally transplanted to the open ground, or of those sown in the usual way, is to have both methods under one's own observation. The influence of localities—nay, the turn of a garden wall—will give one a week's advantage over his neighbour. How, then, can the relative value of each method be correctly judged when the evidence comes from places miles apart? I myself decidedly give the preference, and have for the last four years gathered the first Peas from those that have been sown in boxes. This spring I determined to test the value of each method. On February 2, two boxes of Sangster's No. 1 were sown, and placed in the early vinery, and two rows of the same kind at the same time were sown out-of-doors. Those in the boxes were up in a few days, and shifted into a cold frame, and finally planted side by side with those in the open ground, in the month of March. They experienced very cold weather, sometimes 6° of frost, and very often 2° and 3°; while those which had been sown in the open ground, and had escaped the ravages of mice, &c., slowly made an appearance, and never at any time looked so promising as those that had been planted out, and they were ten days later into the bargain. *Andrew Meikle, Read Hall, Whalley.*

—— I am glad to find a little discussion on Peas, and I trust the result will prove useful in the way of reducing the number of varieties, all of which have good recommendations. I have no doubt that seedsmen would hail the reduction with satisfaction. I often think they must be compelled at times to make several kinds out of the same bag. I have been trying for some years different varieties, and this year I am trying all the varieties I can get at this time; I have 44 varieties from one of the most extensive seedsmen in London. I am noting all particulars with care, such as time of sowing, when in flower, date of flowering, height, and other remarks. The description that "A. D." gives at p. 831 of Multum in Parvo is worthy of the name, and I quite agree with his remarks about gardeners clinging to tall varieties. If the experience of growing tall varieties was shown in figures I think the peck of tall Peas would cost double that of the small varieties. At p. 830, Mr. Morgan states that Sutton's Ringleader was three days later than the other sorts; now I find this variety one of the earliest. I sowed all my kinds on February 23, and have daily observed the race which should prove the winner as to flowering. Since the startall have done well, notwithstanding the dry season about the middle of May. The kinds that took the lead are as follows:—Maclean's Little Gem in flower May 21, Sutton's Ringleader in flower May 21, Dickson's First and Best in flower May 23, Sutton's Early Champion in flower May 25, Taber's Perfection in flower May 30. The earliest Peas ready to gather were—Little Gem, June 16; Ringleader, June 18; Dickson's First and Best, June 18; Sutton's Champion, June 18; Taber's Perfection, June 20. The second, third, and fourth named now look to me as if they had been taken all out of the same bag, for I cannot see any difference between them, but I intend to invite three or four gardeners to assist me in deciding as to the merits of all the kinds, and will communicate the same to the *Gardeners' Chronicle*. *R. Draper, Seaham Hall, Sunderland.*

—— The result of sowing early varieties of Peas in boxes for transplanting out has always proved most satisfactory here. My plan is to sow in rows, across boxes, 4 feet by 2 feet, on Feb. 1. The boxes are then placed in a temperature ranging from 40° to 50°, and well watered. When they have made about 2 inches of growth they are removed into cold frames, where plenty of light and air can be given; this point is carefully attended to, that they may not become drawn up too much. By the first week in March they will be ready for planting out, when they are protected with Fir boughs, as we are very much exposed to north-east winds. In 1868 I gathered Dillistone's Prolific on May 22; the same variety the first week in June in 1869; this year on May 30. These dates show no fault in the Pea, as the same variety was grown each year, but indicate the variation of the seasons. As regards the productiveness of Peas grown in this way, there can be no doubt about their bearing quite as good crops as those sown in the open ground: to my mind it is conclusive. *J. M. Burleigh, Herts.*

Valeriana pyrenaica.—The enclosed Valerian grows very commonly in a dean here—have you ever heard of its growing in any other locality? It spreads yearly, and seems likely to overgrow the other wild flowers in its vicinity. *R. Draper, Seaham.* ["Naturalised in plantations," is the comment in Hooker's "Student's Flora." EDS.]

Anemone sylvestris is one of the most showy of our May flowers, and one which has almost been lost sight of. This plant is widely distributed throughout Europe, but I think it has not been found wild in this country. It grows very vigorously in almost any soil, but prefers a damp shady situation. It is something similar in habit to A. japonica, but differs very much in height, as this plant rarely exceeds 18 inches, while the Japan species will grow 3 feet. When in full flower it forms a very striking object; the flowers are very large, many of them measuring from 1 to 1½ inch in diameter, and are produced so freely as almost to eclipse the whole plant. The flowers are of a pure white colour, and last a considerable time in bloom. A. Pulsatilla is a British plant of no mean merits; it is found growing in many localities, especially upon the chalk. I have seen the downs near Newmarket covered with its large, shaggy, purple blossoms. It grows, however, much larger under cultivation, and soon forms very strong tufts. I have seen plants more than 2 feet in diameter, with from 50 to 100 fully expanded blooms, and twice this number waiting to expand. It grows very freely in any ordinary border, and forms a charming companion to A. sylvestris. *A. J. P., Tottenham.*

Fungophobia is far too common, and it is full time that a check was applied to it. I agree with Mr. Miller that there is little danger from Fungus if the earth is kept wet enough, and with another eminent Grape grower, that Fungus may be washed out of any border, or restrained from mischief by the free use of the hose or watering-pot. Amid such a parching drought I would, if I could, put the whole garden under water for three or six hours at a stretch. I quite envy the old farmer who sent the river over his Mangel. The greatest drawback to the perfect prosecution of horticulture throughout a large portion of England is the want of water. We have carried off or intercepted the subterranean supplies with our under-drains, and failed to compensate our plants by doubling or trebling the natural rainfall. Under-drainage dries both earth and air. By one and the same process we deprive the roots of their deep cool drinking fountains, and quicken the evaporating force of the leaves. Drainage is right and proper, but it seems to be forgotten that artificial watering must be its necessary complement, if the highest excellency is to be reached in the cultivation of succulent vegetables and luscious fruits. This fact seems only dawning upon gardeners. A few here and there see its importance, and apply water, clean and foul, with a freedom and a frequency that astonishes others. Last year I called at a garden famous for Vine growing. Along the side shelves of a Pine-stove stood a row of pot Vines, with fine outspreading leaves and roots, round, thick, and brown. The surface of the pots was as black as ink. "You are a believer in soot for Vines?" I exclaimed. "Not at all," was the reply. "Why, then, what black stuff have you given them?" "Nothing," was the answer. "They are soaked through and through" (if I remember aright, three times a day) "with water, and that black slime you see on the surface comes of the copiousness and frequency of the deluge. I consider it impossible," added the grower, "to over-water growing Vines in a Pine-stove." The houses had just been shut up at 90°, and, as the Vine leaves quivered under the hazy lashings of the syringe, and the pots were again filled up for the night with water, one would fancy that he saw the plants growing. The same cultivator said he believed the watering of Vine borders would generally prevent shanking. I strongly urged him to *Chronicle* his experience. "Not for the world," was the answer—"to be subjected to such a badgering as my friend Mr. Miller, of Combe Abbey, is just now subjected to." I write this down, hoping that some of your correspondents may take the hint and write a little less incisively, and with a shorter measure of gall in their ink. [Hear, hear.] But not only is water an antidote to Fungus, but likewise Fungus mostly, if not always, succeeds and does not precede disease. In this also Mr. Miller and myself are at one. The weak roots succumb to the attacks of Fungus, the strong resist it or eat it up. Take a simple illustration, that of "fairy rings." Your observant readers will have noticed the rankness and strength of the grass the succeeding year, on the line occupied by this Fungus the season before. Whence comes this strength and succulence? From the old spawn? It seems so. The grass seems to consume it so thoroughly along the whole line that only the outside edges of the spawn, which have struck into fresh earth, is let to grow; hence Fungus is not seen, or but seldom seen, within the charmed circle. I know the explanations that have been offered to account for this singular phenomena, and I venture to hope that this is not only an original but a better solution of the difficulty than any of them. The old spawn becomes good food for

the grass, and the grass grows rank and strong upon it, showing that it enjoys the diet. If grass roots consume spawn, why not other roots, as I believe they do? and if not, why not? But the point is not so much whether roots can eat Fungus, as whether Fungus can injure or destroy healthy roots. I very much doubt it. I have moved thousands of trees and shrubs in my practice. Many of them have been growing in perfect nests of Fungus, and the majority of the roots have been perfectly healthy. Let any one try the experiment of digging down through the roots in Spruce, Scotch, or Larch Fir plantations, and in most cases they are full of Fungus spawn of various kinds. The roots are often enclosed with it, like a network of lace, and yet it does not seem to injure them in the least, and it is probable that they make many a good meal out of it. The fact is, that because Fungus and disease are often found together, the conclusion has been hurriedly drawn that they sustain the relation of cause and effect. But coincidence is not correlation. Things often exist, side by side, without the one being in any way responsible for the production or presence of the other. It is so, I verily believe, in the matter of Fungus and roots. Plants are weakened by drought, overcropping, insects, an excess of cold or heat, a scarcity or excess of food, or a biting north-easter. They are checked, the growing force is arrested; partial paralysis ensues—internal disorganisation, perhaps; putrefaction supervenes, and then the Fungi, watching their opportunity, cling to the weakened tree. The signs of sickness, distress, disease, become manifest, the cause is searched for, found—so it is thought—in Fungus; and another case, a fresh proof, sure and certain, of destruction is laid up in the memory of the Fungophobist for future warning and use. But was it Fungus that wrought the destruction? Most certainly not. It only assisted to complete it, or came in at the death. But not only have such mistakes been frequent but they work most mischievously in other ways. Such cases are treasured up for use in or out of season. No matter what the particulars or condition of failure in any particular case, nor how plainly these are pointed out, the Fungophobist straightway mounts his Fungus hobby-horse, and trots it up and down—an appearance—and forthwith it is credited with all the mischief. We have had some notable instances of such misapplication of facts in your columns. Permit me briefly to advert to one of them. In endeavouring to indicate the cause or causes of failure, I took especial care to guard against a fresh display of Fungophobia. Having studied the whole case for myself, and secured the hearty and skilful help of other and perhaps better authorities in its investigation, I endeavoured to lay all the facts before your readers. These facts fully warranted me in asserting, in the most positive manner, that the Vines did not succumb to Fungus. None was seen on root or branch, or within the borders, when the Vines were uprooted. The roots were in fact exceptionally clean, strong, and numerous. They were likewise in full and active growth. In truth, I doubt whether old Vines were ever before found in equally good condition. The monster rods were likewise healthy. All this was carefully pointed out. Notwithstanding this, however, hardly had my diagnosis of the case been completed, when two distinguished gardeners burst in our pages with the old cry of "Fungus! Fungus!" How do they go about to prove it. They duly set out two cases from the book of their experience, both as unlike as anything could well be that has relation to the same plant, to the case I described; and infer, or seemed to infer—for apart from such an inference, their letters were meaningless—that because their Vines were destroyed by Fungus, so also must have been the Vines at Bishop Stortford. True, we are told that circumstances alter cases, and that like produces its like; but your correspondents made short work of such aphorisms. According to their logic, the unlike produces like. The generation of Fungus, under one or two sets of circumstances eminently favourable to its generation—spontaneous or otherwise—means that it will spring forth everywhere else. Because a pabulum of beechmast or leaves in a Vine border in Scotland, and the suspension of Vine roots in a hanging border in Hertfordshire had their roots destroyed, and their stems rent asunder by Fungus, therefore the Bishop Stortford Vines were also destroyed by it, though their roots were so numerous and healthy, and their stems so fine, strong, and wholly unriven. Can Fungophobia go further, and is it not high time for something to be said or done to stop the spread of this mania among horticulturists? If such things have been done among—said by the green trees—what may we not expect to hear among the dry. The fact is, we do hear, and that constantly, the most preposterous statements made about Fungus. If the officers of the army of horticulturists are possessed with Fungophobia is it any marvel that the rank and file become bewildered amid a network of mycelium, or are blinded alike to the reception of facts and the force of logic by the thick dust of Fungus spores? Since writing the foregoing, I have seen Mr. Ayres' letter, p. 798, and am surprised that a writer of his ability and shrewdness should have added another case of the unlike producing the like. He believes that the Bishop Stortford Vines succumbed to Fungus, and here is his proof:—He planted some young Vines out of pots, without breaking their balls, seemingly into a well made border, enriched, however, with the parings of horses' hoofs. The Vines broke strongly, went on promisingly till the fruit showed—came to a dead stand—the leaves drooped, and they lingered thus, between a sort of dreamy life at night and semi-death by day, until they were destroyed as hopelessly weak and diseased. What was the cause?—Fungus; and the cause of Fungus?—horse-feet parings. Well, it may or may not have been so. I have used these parings to most pot plants, and found them excellent. But what logical relation has this case to the Vines at Bishop Stortford? None whatever; they had not a single symptom in common. The inference is irresistible, if such are the manifestations of Fungus-infested Vines, and Mr. Ayres' Vines perished of Fungus, then the Bishop Stortford Vines did not. They made splendid wood and clean healthy roots to the last. They never flagged in the sunshine, nor had to recover themselves at night. The air they grew in needed no extra care, nor charging with moisture by an expert in Grape growing. The shows of fruit were fine, and the progress satisfactory up to the last, or shanking stage. The Vines only shanked, nothing else; and finally they had no parings of horse feet, and no Fungus was found in the soil. And yet, well—will some of the professors be asked to read a paper on the laws of inferential reasoning at the Oxford Congress? I must also beg that Mr. Ayres will explain what he means by the borders for the Vines at Bishop Stortford having been made by a heterogenous accumulation of London street garbage. I have been in London a good many times, and never saw an atom of such matter in the streets. I have, indeed, heard the refuse of Covent Garden Market called garbage. Does Mr. Ayres mean that the Cabbage and Lettuce leaves were swept up and sent to Bishop Stortford? The materials of these Vine borders have already been carefully described in your columns by data provided by the maker of them, and I feel bound to protest against any writer asserting "that these fine borders were mainly formed out of London street garbage." The thing is impossible and controverts itself, as must appear to the youngest reader when formulated thus—Wanted, fine porous Vine borders: accumulate London street garbage. *David Tell Fact.*

Corbularia Bulbocodium, commonly called the Hoop Petticoat, is nearly allied to the Narcissus, and is frequently called N. Bulbocodium. It is a dwarf bulbous plant, scarcely exceeding 4 inches in height, producing narrow Rush-like foliage from 4 to 8 inches in length, from which issue solitary funnel-shaped flowers of a deep yellow colour. It is perfectly hardy and increases very rapidly, and is an indispensable adjunct to the spring garden. It is very useful for pot cultivation, and will stand forcing very well, but by keeping it in a cold frame you may have it in flower in March, without doing the bulbs any injury. There is a very pretty white variety, but it has not yet found its way into commerce. *A. I. P., Tottenham.*

Thunder Storm.—On Thursday, the 16th, the early part of the day was very hot and sultry, much more so than during any part of the drought up to the above date. The continued dry weather lasted nearly five weeks, scorching and drying up all light land pastures, which looked so promising at the beginning of the drought. As usual, poorly cultivated land suffered first and most severely when the severe drought set in. About 1 o'clock on Thursday the sky became overcast, and continued getting darker and darker, while the braying of the ass and the call of the pea-fowl betokened a sudden change. Overhead the fleecy clouds changed places rapidly; the barometer sinking fast to "change." A vivid flash or two of lightning, followed with the distant roll of thunder; the sky became very black in the south-east, and indicated that the tempest was coming from that direction. Flash after flash followed each other in rapid succession. I cannot say that the thunder was extraordinarily loud. About 3 o'clock the rain fell in torrents, and for a few minutes, amongst the downpouring of the rain, we had one of the heaviest hail-storms that I ever witnessed. Many of the stones were an inch in diameter; the noise of the hail in coming down the manor hills and across the valley was terrific in the extreme. In driving through the woods after the storm, the ground was seen to be literally covered with the young shoots of the Oak. Amongst the hothouses the grand smash took place. Some of the lights were completely riddled and broken in all directions. Some were cut out as if with a diamond, in rounds and ovals. The old small squares suffered most. The Peach-houses, where the squares are 20 by 14 in., 16 oz. glass, did not suffer so much, although they looked as if they had got a charge from a Rifle brigade. The Pine stove (span-roofed), standing south and north, had only a few broken squares in it. Cucumber and Melon frames were completely riddled. One house of 22 oz. glass had not a cracked square in it. When the storm was over, the walks looked very much as if they had been gravelled with Derbyshire spar. The storm raged more or less for three hours. About midnight another storm occurred, with no hail, but with heavier rain, which gave our bedding stuff a grand soaking. *J. Miller, Worksop Manor.*

The Palms at Kew and the Botanic Gardens.—Since I wrote last week I have been over the Palm-houses at Kew, and at the Botanic Gardens, Regent's Park, and have much admired their contents. These houses, however, and especially the great Palm-house at Kew, are decidedly overcrowded. Many of the smaller Palms are quite in the shade, instead of being in the full blaze of the sunshine, and are suffering accordingly. I recognised many hardy Palms thus situated, such as the Corypha australis, Latania borbonica, Phœnix, Chamærops, &c. I would suggest, in all humility, whether such Palms would not be better out of the houses during two or three months of even our summer, say from June 15 to September 1 or 15. Full exposure to English sunshine in the open air, it seems to me, is more suited to their constitution than the sickly shade of their noble relatives in a Palm-house. On the other hand their presence along the walks, and around the houses, would add much to the beauty of the gardens, whilst those left in the Palm-houses would thrive all the better for the absence of their brethren. The same remark would apply to the large Aloes, and to many of the large Cactaceæ and Crassulaceæ. Lastly, a strong impulse would thus be given to subtropical gardening. The success of the plan followed at Battersea Park proves it to be applicable to Palm-houses in general. *Henry Bennet, Grosvenor Street, June.*

Caltha palustris fl.-pl.—"The Double Marsh Marigold," is a bold, striking plant, and one which should be found in every garden, where a damp spot can be found. It has large, dark green, glossy foliage, heart-shaped at the base, and produces in the wildest profusion large, bright yellow flowers, about the size of a florin, and very double. It continues to flower from May to August; but that depends on the situation, as abundance of moisture is essential to its full development. *A. I. P., Tottenham.*

Societies.

Royal Botanic: *June 22 and 23.*—The alterations in the schedule, which the authorities thought proper to make, had no doubt a great influence in determining the character of the exhibition held on Wednesday and Thursday last. The show was unfortunately a poor one, considering the prestige of the place, and the season. Nevertheless we entirely agree with the Society, that for the benefit of horticulture a change from the usual stereotyped schedule was highly necessary, yet it would have been more satisfactory had the alterations been made in a more gradual or easy manner. The large classes of stove and greenhouse plants, which have hitherto contributed so much to the success of these exhibitions, were altogether absent, classes for three being substituted—a number which an exhibitor could scarcely set up with credit to himself, to say nothing of the uneven effect which such small groups tend to produce. Again, the hot and sultry nature of the weather had a great deal to do with the paucity of Pelargoniums, &c., a class of plants largely patronised in the schedule, but not shown in sufficient numbers to fill the space allotted to them, as growers no doubt found it very difficult to retard them during this exceptionally trying season.

Four prizes were again offered for groups of stove and greenhouse plants arranged for effect, any number, size, and kinds of plants being allowed. This is an innovation which has also been tried at the Crystal Palace, but beyond bringing together a bulk of most ordinary greenhouse plants we cannot perceive that it has done any good: the large prizes offered might certainly be employed for a better purpose. On this occasion only two groups were shown in competition, Messrs. J. & C. Lee, of Hammersmith, securing the 1st prize, and Messrs. Arthur Henderson & Co. the 2d. In neither case was the exhibition at all striking, yet the large sum of £25 was taken between the two. Messrs. E. G. Henderson & Son sent a collection of bedding plants, similar to that shown at the last exhibition, and secured a 1st prize, a 2d award being made to Mr. John Aldred, Kilburn, for a modest but pleasing display, including a faithful representation of an anchor—presumably of Hope—worked out with Pyrethrum Golden Feather and blue Lobelias. Mr. R. Parker, Tooting, had the best collection of 24 hardy herbaceous plants, including excellent specimens of Betonica grandiflora, Œnothera venusta, fine yellow; Pæonia albiflora Lucrece, large, white, and rose; Potentilla hybrida William Rollisson, with large semi-double orange-scarlet flowers; Tradescantia virginica alba, and Pyrethrum, &c. A neat collection of 20 moderate-sized greenhouse plants, in 8-inch pots, came from Messrs. Jackson & Son, and a 1st prize was awarded. Some very good Heaths were contributed by Mr. J. Carr, Mr. J. Wheeler, Mr. J. Ward, Messrs. Jackson & Son, and Mr. Loxley Panton, and Rent Smith towards enlivening the exhibition tent. Mr. R. S. Williams sent the best 6 Orchids, including a magnificent Cypripedium; and Mr. Ward the best 8 in the amateurs' class, Mr. Bull being 2d in the former, Mr. I. Hill taking a similar position in the latter class.

Amongst florists' flowers two classes were made for Fuchsias in 13-inch pots, but only one collection of any merit was shown in each class; these being contributed by Mr. Filce, gr. to J. Hutten, Esq., Clapham Park, and Mr. Cannell, Woolwich, who both took premier awards. The latter exhibitor's collection comprised well grown and flowered bushy specimens of Alba coccinea, Lizzie Hexam, Puritani, Lustre, Starlight, and Try-me-oh. Mr. J. Ward, Mr. D. Windsor, and Messrs. Dobson, each contributed show Pelargoniums, and took awards. The best 6 scarlet or zonal varieties came from Mr. J. Catlin, gr. to Mrs. Lermitte, Finchley, comprising plants of Clipper, Tintoret, Leader, Commander, Oliver, and Monsieur Rendatler, over 4 feet across, and remarkably well bloomed. Mr. J. Haines, gr. to J. A. Noble, Esq.,

Finchley, being 2d, with a collection very little inferior. Of Roses, a nice group of 20 in 8-inch pots came from Messrs. Paul & Son, who also contributed some fine cut blooms. A large quantity of the latter were also contributed by Mr. Cranston, Hereford; Mr. Fraser, Lea Bridge; Messrs. Veitch & Sons, Mr. J. Mitchell, Piltdown, &c.; whilst from Mr. Webb, Calcot House, Reading, came some grand blooms of Maréchal Niel. From Mr. Ware came a choice assortment of beautiful hardy plants; from Mr. W. Paul a large collection of Zonal Pelargoniums, in very fine order; from Messrs. Rollisson & Son a choice group of Gloxinias; and from Mr. Stevens, of Ealing, and Messrs. Carter & Co., specimens of Tricolor Pelargoniums.

One of the most interesting new plants exhibited on this occasion was the bright pink Leptosiphon roseus, a charming annual from California, exhibited by Mr. W. Thompson, of Ipswich, as was also the Delphinium nudicaule, a scarlet-flowered tuberous-rooted perennial, both of which received First-class Certificates. Leptosyne maritima, from the same exhibitor, a large yellow half-hardy annual composite, received a Second-class award. Messrs. Carter & Co. showed a good plant of Lomaria gibba major, which had previously received an award. In Messrs. A. Henderson & Co.'s group was a narrow-leaved form of Pteris serrulata named gleichenièfolia, which received a First-class, and Broussonetia laciniata, which received a Second-class award. Messrs. Veitch & Sons had a fine group, in which the following received First-class Certificates:—Ficus Pearcei with large thin but firm elliptic leaves; Ficus sarapigiensis, with cordate ovate leaves, whitish beneath, in the way of nymphæifolia; the charming Adiantum Hensloviannm (sessilifolium); Croton Hookeri, with fine yellow-centred leaves; Caladium Princess Teck, one of the golden-leaved sorts, with a bright red centre; Aralia Veitchii' with palmate leaves composed of narrow undulated leaflets; Dracæna Denisoni, a stiff erect broad-leaved dark bronzy variety; Pandanus Veitchii, a bold habited species, with white striped leaves; × Cypripedium Dominianum, a very interesting hybrid, with recurved lorate leaves, and flowers in the way of those of C. Pearcei; the white-flowered Vanda Denisoniana; × Begonia Chelsoni, a hybrid in the way of B. boliviensis with orange-red flowers; Cattleya Reineckiana, a pretty pale-flowered kind, with delicate flesh-coloured sepals, and a yellowish fringed lip; Cattleya quincolor, with olive-shaded sepals, and a gay yellow-centred lip with rosy veined front lobes; the pretty Miltonia Warscewiczii; Nepenthes rubra; Pandanus angustifolius, narrow-leaved, with a white base; and the following ornamental Palms—Pritchardia pacifica, Veitchia Johannis, Chamædorea Ernesto-Augusti, Chamædorea glaucifolia, Dæmonorops melanochætes, Acanthorhiza Warscewiczii, Calamus cinnamomea, Geonoma Schottiana, and Chamædorea graminifolia. Brassia Gireoudiana, in the way of B. caudata, and Tillandsia filiformis, with slender thread-like leaves, received Second-class Certificates. Mr. W. Bull also sent a large group, among which the following received First-class awards:—Corylus Avellana pendula, a distinct weeping Hazel; Lilium Thunbergianum bicolor, with broad, bright flame-coloured flowers; Viola cornuta Perfection, a very useful bedding plant; Caladium Golden Queen, an effective self-coloured golden-green variety; Cissus Lindeni, with cordate silvery variegated leaves; Pandanus decorus, a neat and pretty species in the way of P. ornatus; Anœctochilus pardinus, from the South Sea Islands, a handsome species, with elegant green reticulated leaves, having a chamois-rose margin; Eurvale australis, with white pancratium-like flowers; Fraxinus longicuspis, the hardy Japanese Ash, which nourishes the wax insect; Godwinia gigas, the Gog-Magog Arad introduced by Dr. Seemann from Panama; Stangeria paradoxa obtusa a distinct-looking form of this anomalous plant, with remarkably obtuse leaflets serrated at the apex; Marcgraavia grandis, a fine evergreen, of Ivy-like habit, adapted for covering the walls of stoves; Phormium tenax gracilis, an elegant variety with narrow drooping dark-edged leaves; Curculigo recurvata striata; Mesembryanthemum cordifolium variegatum, a charming decumbent plant, with a chastely-tinted creamy variegation in the foliage, and forming a close-growing mass studded over with rosy purple flowers—a charming plant both for bedding-out and for baskets. Mr. Bull also exhibited the following First-class Certificated Palms:—Latania rubra vera, Verschaffeltia melanochætes, Geonoma princeps, Acanthorhiza Warscewiczii, and Orbignya dubia. Mr. Williams contributed an interesting group, in which the most remarkable subjects, and which obtained First-class awards, were:—Viola cornuta Perfection, beautifully flowered; Chamærops glaucifolia, an elegant narrow-leaved pinnate Palm; Peristrophe angustifolia aureo-variegata, a golden variegated plant, recommended for bedding purposes; the curious and rarely seen Pogonia discolor; and Verschaffeltia melanochætes. A specimen of the large-flowered variety of Epidendrum vitellinum was shown by the Messrs. Rollisson. Finally, in a group of interesting varieties of British Ferns, from Mr. Mapplebeck, of Birmingham, and which our space precludes us from more closely noting, were the following interesting forms, to which First-class Certificates were given, namely, Athyrium Filix-fœmina caudigerum, A. F.-f. Jonesii, A. F.-f. furcillans, A. F.-f. Craigii, A. F.-f. Mapplebeckii, and Scolopendrium vulgare supraferax.

The exhibition of fruit was excellent, and quite up to the average. The best collection of fruit, arranged as a dessert for the dinner-table, came from Mr. T. Bannerman, gr. to Lord Bagot, and consisted of good dishes of Black Hamburgh and Foster's White Seedling Grapes (?), two nice Pines, two good dishes of Peaches, and one of Nectarines, the latter being fine in size but pale in colour; a handsome-looking Melon, and dishes of Cherries and Strawberries. Mr. Clark, gr. to Earl Cowper, Brocket Hall, was 2d with a similar collection. The 1st prize for one Pine Apple, any variety, was adjudged to a handsome Queen, weighing 5 lb. 11 oz., from Mr. Ward, gr. to T. N. Miller, Esq., Bishop Stortford; equal 2d prizes being taken by Mr. Battram, gr. to R. S. Crawshay, Esq., Cyfarthia Castle, with a Providence, weighing 10 lb.; and Mr. Penford, gr. to Earl Radnor, Longford Castle; while Mr. Grant, gr. to G. Plucknett, Esq., Finchley, came in 3d with a Queen, weighing 4 lb. 7 oz. Twenty Melons were shown in competition in the class for green-fleshed varieties, and, as a rule, were much better flavoured than the scarlet-fleshed kinds. The best of the former was a finely flavoured fruit, named Colston Basset Seedling, shown by Mr. Lamb, Colston Basset, Bingham, the next best being a large unnamed variety from Mr. Cross, gr. to Sir F. Goldsmith, Rendcombe Park, Gloucestershire; Mr. J. Douglas, gr. to F. Whitbourn, Esq., Loxford Hall, taking 3d honours with a good specimen of Meredith's Hybrid Cashmere. Weir's Eclipse, a medium-sized, moderately thick-fleshed, and good flavoured Melon, from Mr. J. Weir, gr. to Mrs. Hodgson, The Elms, Hampstead, was 1st in the scarlet-fleshed class, Mr. J. Douglas being 2d, and Mr. E. Forster, gr. to E. Benham, Esq., Isleworth, 3d. The best basket of Grapes, of not less than 12 lb., came from Mr. G. Ward, being Black Hamburghs, with good berries, well coloured, and having plenty of bloom. Mr. M. Henderson came in 2d with a smaller berried lot, but with plenty of colour, and Mr. T. Bannerman 3d, Mr. W. Davies, Whetstone, being 4th with very fair examples of Muscat of Alexandria; Mr. Miller, gr., Combe Abbey, also sent very good Black Hamburghs. Mr. M. Henderson was 1st for the best dish of Black Grapes, with medium sized bunches, very large berries, and well finished; Mr. Miller, Combe Abbey, taking 2d honours with fine bunches, smaller in berry than the former, but fine in colour and bloom. Mr. Bannerman was placed 3d, and Mr. G. Ward 4th, with very creditable specimens. A very good dish of Buckland Sweetwater, contributed by Mr. A. Reid, gr. to L. Huth, Esq., Passingworth, Essex, was placed 1st in the class for White Grapes, Mr. G. Douglas being 2d with large, well grown bunches of the same variety. Very fair examples of Royal Muscadine and Muscat of Alexandria were also shown, but in an unripe condition. Of Peachès, 2 dishes, 13 lots were staged, the best being very fine examples of Bellegarde and Royal George, from Mr. Jack, gr. to the Duke of Cleveland, Battle Abbey. Mr. W. Davies was 2d with the same varieties, and Mr. C. Ross, gr. to C. Eyre, Esq., 3d, with Violette Hâtive and Royal George, large, but pale in colour. In addition to the above varieties, shown in other collections, were some fine Grosse Mignonne. Mr. Miles, gr. to Lord Carrington, showed the best Nectarines, very fine Elruge, of a beautiful colour; Mr. Carmichael, gr. to H.R.H. the Prince of Wales, being 2d with good examples of Elruge and Violette Hâtive; Mr. W. Hill, gr. to R. Sneyd, Esq., coming 3d. Mr. Miles was also 1st for Black and White Cherries, with admirable fruit of Black Circassian and Bigarreau Napoléon. Mr. J. Douglas took 1st honours for 4 and 2 dishes of Strawberries, with well grown specimens of Frogmore Late Pine, La Constante, Mr. Radclyffe, Sir Harry, and British Queen. Messrs. Standish & Co. were 2d in the latter class. Amongst miscellaneous fruit came a fine dish of Brown Turkey Figs, from Mr. Miles, to which a 1st prize was awarded.

YORKSHIRE GALA: *June* 15 to 17.—The York Gala, which has always maintained a high reputation for its magnificent display of plants and fruit, was held in York last week, and on this occasion it did not lose any of its fair fame, but, on the contrary was a grand success, and added another leaf to its well-won wreath. In the central pavilion were staged some of the finest and largest plants in the exhibition, and whether as regarded shape and size, richness and brightness of bloom, and healthy and redundant foliage, they could not be excelled. The greenhouse plants in bloom, and the ornamental, fine foliage, or variegated plants were here exhibited, and they formed a magnificent array, the collection in this tent being of a very imposing character. In another marquee stood the Pelargoniums, whose beauty and brightness of bloom, enhanced by the sunlight penetrating through the canvas roof, was the theme of general commendation. Mr. George Edward, of York, nurseryman, carried off the 1st prize of £12 for the best dozen show Pelargoniums, beating Mr. Aid. Steward, who took the second place, and Mr. Tetley, of Westwood, the third. For 12 stove and greenhouse plants in bloom, distinct varieties, Mrs. Cole & Sons, of Wimbledon, were 1st; Mr. W. P. Stevenson, of Timperley, the 2d, and Mr. W. E. Dixon, of Beverley, the 3d, after a very sharp competition. In the next class, 12 ornamental, fine foliage, or variegated plants, Mr. Dixon and Mr. Stevenson ran a dead heat for first place, and Mrs. Cole & Sons took the 2d prize. This was indeed a splendid class. For Zonal Pelargoniums, a capital lot of plants, the successful exhibitors were J. Wilson, Esq., of Nunthorpe Hall, Great Ayton, Sir G. O. Wombwell, and the Hon. Admiral Duncombe. The two latter named were also prize-takers in the class for 16 distinct bedding plants, Mr. G. Edward again taking first honours, as well as in the class for 6 Fuchsias. Running the whole length of the centre of one tent, and placed at a height of several feet from the ground, stood in a row a numerous array of gigantic Fuchsias, one mass of bloom. The Verbenas were superb, the Calceolarias were generally good, the Orchids were as curious and as beautiful as ever, the Azaleas of various colours were very large, of fine shape, and dazzling bloom, the Ferns were excellent and very interesting, and the Cape Heaths, Achimenes, and Palms were equal to any specimens that we have witnessed at similar shows. Mr. B. S. Williams, of Holloway, sent a very unique collection of new and rare plants, which was greatly admired.

Whatever beauties the plants presented, and they were indeed a splendid collection, the cut flowers held their sway and were the powerful, and to some extent the successful rivals of the plants, being so numerously exhibited as to constitute a host in themselves. Cut flowers of Roses and Verbenas were the principal subjects, and of the Roses it is said that "a more magnificent display was certainly never seen in York before." In the class for 16 distinct varieties of Roses in pots (the prizes for which were offered by the Lord Mayor and the City Sheriff along with other inhabitants of York), three out of the four marks of distinction were won by citizens of York, Mr. J. Douglas being first and gaining the prize of £15; Mr. G. Edward third with a £7 prize, and Mr. J. Buckle fourth with a £5 prize. Mr. Douglas was also very successful in the other classes. Other successful exhibitors of Roses were Messrs. Paul & Son, Mr. J. Cranston, Mr. C. J. Perry, Mr. T. Laxton, and Mrs. Grimston. In the class for 24 cut Verbenas, a first-rate lot, the successful exhibitors were Mr. Perry and Mr. Dove. In the floral section were several bouquets suitable for marriages or balls, and also groups of flowers in vases and ornamental stands. They were arranged in good taste, both as to shape and harmony and combination of colour, so that they failed not to please the most fastidious eye. The department for fruits is always attractive at the Yorkshire Gala, and never on any previous occasion was it more so than this year. The Grapes, especially, were in prime condition, and the bunches exceedingly large. The Melons, too, were quite up to the mark. Peaches and Nectarines were very fine. There were some very good Strawberries exhibited, and the Figs and Cherries were in prime condition.

Garden Memoranda.

M. LINDEN'S ESTABLISHMENT AT BRUSSELS. A glance into the interior of a great manufactory often enables us to gain in the course of an hour or two more information on some particular product than could be obtained from a daily visit to any number of retail stores. In this manner, although the name of Linden has become a household word among horticulturists and botanists, although we have all heard of his triumphs in the arena of competition, and many of us have seen and admired the Armstrong guns and Whitworth rifles with which his victories have been gained, none but those who have been privileged to inspect his armoury can have any, save a very faint, notion of the extent and variety of his resources. As may be known to many of our readers, M. Linden not long since became the possessor of the already famous establishment of M. Ambroise Verschaffelt at Ghent. Of this and other establishments in the capital of Flora, as it has not inappropriately been termed, we may speak more at length on another occasion; our business now lies with the unassuming establishment of M. Linden, at Brussels. We say unassuming, because nothing external leads the visitor to surmise what may be found within, and if the visitor were not duly advised beforehand, he might make the circuit of the establishment, like the agonised husband, pourtrayed by Dickens, and who, on a dark night, walked round and round the little lighthouse on Folkstone pier in the vain endeavour to find the night bell!

That the interior should present more the aspect of a scientific than of a commercial establishment is what we might expect, when we remember M. Linden's personal botanical researches, during a period of 12 years in Mexico, the West Indies, Venezuela, New Grenada, Peru, and Brazil. Horticulturists know well enough the general results of these travels as regards the introduction of living plants to our stoves and greenhouses, and they have had ample opportunities of judging what has been accomplished in this way by the phalanx of celebrated collectors employed by M. Linden, after his own return to Europe. That the phalanx deserves the epithet celebrated is shown by the names of Funck, Schlim, Porte, Libon, Ghiesbreght, Triana, Galeotti, and last, not least, Wallis. Most of these collectors have followed M. Linden's own example, and enriched our herbaria with dried specimens for which they have earned the lasting gratitude of botanists. Those specimens will remain, and retain their scientific value, when many of the living plants have disappeared from cultivation, from the caprices of fashion or other causes. Moreover, a much larger number of dried specimens, illustrating a greater variety of plants, can be sent home than is possible in the case of living plants; and so we hold a collector who fails to send home carefully dried specimens, leaves more than half his work undone.

By the means just alluded to M. Linden was enabled to found, first at Luxembourg and afterwards at Brussels, an establishment expressly for the purpose of receiving his introductions of new and rare plants. The stoves and greenhouses therefore, though well adapted for the purpose for which they are intended, have no pretensions to ornament, their adornment naturally consists in their contents. They are filled to overflowing with collections of plants, a large proportion of them not yet in commerce, but cultivated until they show their flowers, or acquire what "characters" for identification. The ordinary stock of a horticulturist is not to be found here, that must be sought in the Ghent establishment.

On entering the first house at the extremity of a little lane going up from the Rue Wiertz, behind the zoological garden of which M. Linden was for some twelve years the director, we enter a veritable Palm grove; most of these plants are large, and were brought by M. Linden himself. Here, it is said, the finest specimen of Chamærops stauracantha known in Europe, 14 feet in height, with its stem covered with adventitious roots,—if productions that grow upwards, and are covered with spines, are really to be called roots. Specimens of Latania, and Pandanus, Areca alba, Seaforthia robusta, Carludovica, &c., are mixed together in the most picturesque order; Tree Ferns, such as Cibotium princeps, from Mexico; Cyathea Beyrichiana, Lophosoria magnifica, Cyathea microlepis, and enor-

mous masses of Angiopteris Brongniartii, and gigantea, adorn this house with their noble foliage.

Opposite this building commences the principal range of houses of the establishment. A small stove, along the wall of the zoological garden, contains a rich collection of various foliaged plants and new introductions. There grow freely the following new plants, some of them not yet known in the trade :—an Aristolochia, with large leopard-spotted leaves, a new Pitcairnea (?), Peperomia odoratissima, a new Carludovica (?), Xanthosoma Wallisii, leaves hastate, with pure white zones along the nerves ; Isoloma digitaliflora (Hort. Lind.), a charming Gesnerad with pink flowers spotted with green. This has flowers about the size and very similar in form to those of the Foxglove, but the lobes of the corolla are bent backwards ; it is a beautiful novelty, as many will have the opportunity of judging, as we learn it is shortly to be figured in the "Illustration Horticole." The following species are also new, but as they are comprised in this year's catalogue of M. Linden, many of them are already known to amateurs :—Cissus Lindeni, Centrosolenia bullata, Alloplectus vittatus, Calathea illustris and roseo-picta, Anthurium hybridum and trilobum, Cochliostema Jacobianum, Maranta Lindeni, Cyanophyllum spectandrum, the valuable Dracæna Guilfoylei, &c. Some strong specimens, very often the original importations, enable the visitor to gain an adequate idea of the beauty attained by the plants in their native countries.

The succeeding house is devoted partly to herbaceous and Tree Ferns, among which we found the Cibotium regale, covered with its hairy golden ornament on the rachides ; a fine Cibotium spectabile, the stipes of which are covered with white silvery hair ; the noble Cyathea dealbata, Balantium Culcita, and others. The remainder of the house is filled by an extensive collection of Araliaceæ, especially of the genus Oreopanax, and well adapted for ornamental purposes in the conservatory. We noticed the Oreopanax palmatum, Osyanum (quite distinct from the Aralia Osyana, Veitch, and named before this last plant), O. platanifolium, dealbatum, umbraculiferum, dactylifolium, besides many other species not yet in the trade, as O. laciniatum, auriculatum, denticulatum, furfuraceum, &c. In another house devoted mainly to Palms and Tree Ferns, are fine specimens of Angiopteris pruinosa, A. australis, Cyathea funebris, Alsophila contaminans, Didymochlæna sinuosa, Dicksonia chrysotricha, a new species from the high mountains of Java ; a Cyathea (C. lugubris, Hort. Lind.) from New Caledonia ; Alsophila paleolata. Among the noticable Palms we noticed a fine Phœnix from the Niger, Oreodoxa ventricosa, Brahea nitida, B. calcarea, with palmate glaucous leaves, and which is found in Mexico amid the Pines, and may therefore prove hardy in the South of Europe ; Livistona Hoogendorpii, Cocos schizophylla, Martinezia Lindeniana, densely clothed with spines ; Areca speciosa and Verschaffeltii, Martinezia erosa, and a very elegant Geonoma undata, 10 feet high, with a straight, yellow, annulated stem, and a tuft of leaves like a Seaforthia ; Cocos Bonnetii, C. elegantissima, a charming species ; and a very fine plant of Leopoldinia pulchra (Cocos Weddelliana), showing a spathe of flowers ; Glaziova elegantissima is likewise a most elegant feathery pinnate-leaved Palm.

On entering the next house, devoted to the tropical fruit trees and useful exotic plants, a powerful smell of Tuberose is perceived, the product of a new species of Posoqueria, now covered with splendid creamy-white tubular flowers. The plant will shortly be named, and figured in the "Illustration Horticole." In the same house is a numerous and important collection of trees of economic or botanical interest, such as Machærium firmum, Garcinia Mangostana, Crescentia nigripes, bearing from the stem a long green fruit ; Persea jitotolensis, Jambosa vulgaris, : the rare Erythrochiton hypophyllanthus, lately figured in the "Botanical Magazine ;" Galipea odoratissima, quantities of Erythroxylon coca, many in flower, and well known through all the equatorial parts of South America as a stimulant, and which serves to stave off hunger ; the new Citrosma Lindeni, the lemon-scented leaves of which are used as tea ; Calophyllum Limoncillo ; Cupania undulata, the fruits of which are used as pepper ; the beautiful Rudgea macrophylla ; the broad foliage of Coccoloba regalis and Gustavia Leopoldi. The new Ficus Wendlandi, with noble elliptic glaucous leaves ; Icica nucifera, the young leaves of which are of a beautiful pink colour, like the unexpanded foliage of Brownea ; a species of Gomphia, with the habit of a Weeping Willow, and young leaves of a colour similar to that of the last-mentioned plant ; a species of Brunsfelsia, with opposite trifid leaves, producing a stellate or radiating arrangement of the foliage ; Myrtus melastomoides, well named as being a true Myrtle, with the foliage of a Melastomad ; Coccoloba pubescens, with fine broad leaves ; two species of Cinnamomum from Japan, C. pedunculatum variegatum, and C. sericeum, both supposed to be hardy ; species of Persea and Monodora ; the Pimento, or Allspice, Macropiper excelsa, the berries of which furnish a substitute for pepper, with the advantage that the plant may be cultivated in cold countries ; a small-fruited Pine-apple, Ananas microcarpa ; Triplaris Lindeni, with fine foliage ; Flacourtia Ramoutchi, Meliosma coccinea, Crescentia regalis, a new white-leaved Cataleuca, Ficus Leopoldi, as well as many noble Theophrastas, T. attenuata macrophylla, imperialis, &c., but, indeed, the house is full of objects of importance and interest.

Still another house devoted to Palms, in this case mostly young plants, among which we noticed elegant fronds of Dictyocaryon Wallisii, Acanthophœnix nobilis, Glaziova elegantissima, Calamus ciliaris, or Dæmonorops ciliaris, Areca Verschaffeltii, in quantity ; Calamus asperrimus, Malortiea elegans, simplex, and gracilis, Corypha Gebanga, Pinanga, and cæsia ; Geonoma Seemanni, Astrocaryum robustum, Ceroxylon niveum, Chamærops stauracantha, Livistona oliviæformis, a new Cocos from Yurimaguas, Euterpe Zamuro, Iriartea Zamuro, Hyospathe chiriquensis, Phytelephas Yurimaguas, Corypha Martiana, Hyospathe antioquiensis, the charming Welfia regia by thousands, Phytelephas Pœppigiana, Calyptrogyne elata, Martinezia Lindeni, Lepidocaryon gracile, Verschaffeltia splendida and melanochætes, both noble plants. This list may serve to give some idea of the number of species in cultivation here, though the numbers are few compared with those in the Ghent nursery. A few Pandanads, noticeably P. reflexus, a splendid specimen ; P. ornatus, of beautiful habit, leaves light green with thorns at the margin ; P. Vandermerschii, a very elegant species, are placed here together with numerous rare Bromeliads, such as Vriesia Glaziouana, Distiacanthus scarlatinus, provided with scarlet central leaves ; Encholirion Liboniana, a noble species, belonging to the same family.

The greenhouse next to the large Palm stove is now nearly empty, most of its inhabitants being placed in the open air for the fine season. Here we noticed numerous species of Vaccinium, from the higher parts of the Cordilleras of Columbia, and among them the lovely Ceratostema speciosum, lately described and figured in the "Illustration Horticole ;" several Psammisia, Thibaudia, among them T. acuminata, introduced by M. Linden fifteen years ago. The Gunnera manicata which wanted more space to extend its enormous orbicular leaves ; the collection of new Acers from Japan, purchased from Siebold, Lomatia Bidwilli ; a new Sterculia, a laciniate-leaved Carica from Chiriqui, are all good plants.

Torreya bogotensis, a glaucous-leaved conifer, is a valuable addition to our collection of greenhouse conifers. Orchids one expects to find in quantities here, and the expectation is not disappointed. It is computed that not less than 800 selected forms are here cultivated, some in very large quantities. At the time of our visit a lovely new Masdevallia, M. Lindeni, was in bloom, with puce or crimson flowers ; the brown-yellow Odontoglossum cristatum Dayanum ; the brown flowered Oncidium serratum majus, the white-flowered Maxillaria grandiflora ; Oncidium macranthum hastiferum, a magnificent plant when in full bloom ; many varieties of Oncidium nubigenum, and cucullatum ; the magnificent Epidendrum Friederici-Gulielmi, with a panicle of purple flowers, the only specimen now existing in Europe ; Oncidium miniatum, Epidendrum Xylosteum, E. purum, with white flowers ; E. Sophronitis ; Oncidium sarcodes, Mesospinidium roseum, Helcia sanguinolenta, Oncidium leucochilum, Trichocentrum tigrinum, Stenia pallida, Zygopetalum Gautieri, whose chosen home is the stock of a Tree Fern, &c.

A special feature of this collection is its richness in species of Odontoglossum, a valuable genus as consisting of temperate house plants. They, almost all of them, come from the high parts of the Cordilleras, not far from the snow line, and they do not require more than a cool pit treatment during the winter months. They have become, during the last few years, great favourites with British Orchid growers. Such plants as Odontoglossum Pescatorei, nævium, coronarium, Hallii, odoratum, leucopterum, Alexandræ, triumphans, ramosissimum, hastilabium, and a score of others, are worthy of the best place in our houses, owing this favour to their beauty and their easy cultivation. Among them are about a dozen of supposed new species, introduced by M. Linden.

The collection of Cattleyas is a splendid one, comprising fifty species and varieties, not including the new plants from Choco, lately received. The Houlletias, Angulos and Acineta, were just coming into bloom ; Warscewiczella discolor, Burlingtonia granatensis, Polycycnis muscifera, Miltonia flavescens, the strange and beautiful Gongora portentosa, magnificent varieties of Lælia purpurata, the gorgeous racemes of Aerides Fieldingii, Larpentæ, virens, crispum, purpureum, odoratum, assamicum, affine roseum, and their neighbours Saccolabium guttatum splendens, Holfordii, retusum, form a fine display. Vanda cœrulescens, Cathcarti, Denisoniana, Cypripedium Stonei, Polycycnis bifida and barbata, Huntleya albido-fulva, Selenipedium caudatum splendens, several Phalænopsids, among them P. Lüddemanniana, Oncidiums (from Chirigua), Oncidium amplidatum, with its large panicles of yellow-lipped flowers, quite white outside, comprise a few among the flowering plants of these houses at the time of our visit ; while the health of the specimens, the root growth, and the deep colour of the foliage leave nothing to be desired.

What M. Linden calls his private houses is a small range, wherein are deposited the most important plants of his new introductions, until a sufficient number are propagated and fit to be sent out. Among these species, many of them still unnamed, we found a beautiful Aristolochia, some ten or a dozen Passifloras, a Centropogon (from Chiapas), Pilogyne (from Queensland), a new Cycad (Macrozamia cylindrica, from the same country), Zephyranthes —— (?), some Dioscoreas, perfect gems, having cordate velvety leaves, variegated with the brightest colours, and destined, M. Linden thinks, to rival the species of Anæctochilus, and certainly much easier to cultivate ; Rapatea pandanoides, an extraordinary plant, which made its first and only appearance in public at the International of 1866, and which has a broad leafy petiole flattened at right angles to the direction of the blade ; Colocasias, numerous Gesneraceæ, a new Gunnera with red petioles and peltate leaves ; and a very interesting set of new Melastomaceæ, highly remarkable for the varied forms and colour of their foliage. The majority of these plants come from the high regions of the Cordillera, and hence may be safely grown out-of-doors in the summer time. These plants have a great future before them as decorative plants for conservatories, or for bedding out in the summer.

Space forbids us detailing the contents of the remainder of the houses forming M. Linden's establishment, and we can only add, that there is also a small garden devoted to hardy plants, where are some valuable new trees and shrubs. A Philadelphus Satzouma, from Japan ; new species of Weigela, Rosa rugosa, Betula, Clethra, Actinidia, Xanthoxylon, Distiocaryum, Cratægus, Rhus, and Hamamelis, the specific names of which are not yet determined, are there growing and flowering, and several of these species will be worthy of a place in our arboreta and shrubberies.

The above notes may serve to give some idea of this collection, extraordinary for the vast number and variety of plants which the energy, skill, and enterprise of M. Linden and his collectors have amassed. The "Illustration Horticole" is a publication devoted to the illustration and description of some of the novelties in this collection, and has been since the beginning of the year under the direction of M. André. Its plates do not come up to those in the "Flore des Serres" of M. Van Houtte, but that is no disparagement, when the excellence of the latter is considered. M. André will have no sinecure office in determining the correct names to be applied to M. Linden's introductions, and in describing those that are new ; but let us hope, for the sake of science, that he may be enabled to fulfil this duty conscientiously, and so relieve us from the incubus of those often misleading and always objectionable provisional names.

Miscellaneous.

A GARDENER'S WOES.

I CRAVE permission, gentlemen,
My sorrows to relate,
That may be known to garden men
What are my troubles great.

My garden is a bed of stone,
It's colour a pale buff ;
In summer 'tis as dry as bone,
In winter cold enough.

My houses they have heat by flues,
My pits have none at all :
Indeed it doth give me the "blues,'
For how the plants do crawl !

Of live stock, too, I've not a few,
Rats, mice, and sparrows too,
Hares, cats, and rabbits for a stew,—
The rest I leave to you.

Keen winds scorch'd up the evergreens,
The sun burnt up my lawn ;
The frost kill'd all my early greens,—
But "man was made to mourn."

Melons were attack'd by canker,
Geraniums by the spot ;
My Vines quite o'errun by spider,
My Primulas by rot.

Cucumbers, indeed, were beauties,
But pride receiv'd a fall
When nasty crawling aphides
Came and destroy'd them all.

They laughed at Pooley's Powder,—
Which ended all in smoke,
At which they laugh'd the louder :
Oh, what annoying folk !

My beds of greens in turn engag'd
My very grave attention :
What matchless prowess was display'd
By hares I need not mention.

Desponding, I return'd from thence,
But on the road I saw
The nimble mice ; to stay suspense,
My Peas were gone before.

O bitter trial ! lumbago
Three weeks my back now tore :
Three full weeks I wish'd it may go,
It tried my temper sore.

And now I for myself do fear
Lest I may be ejected ;
My master he may think me dear,
And feel himself neglected.

J. C.

SODA AS MANURE.—Ordinary washing soda—the hydrated carbonate—has been rather extensively and successfully employed as a manure by Mr. Toms, a market gardener, of St. Ives, Cornwall. All manure,

strictly speaking, should supply the plant directly with the elements and compounds necessary for its growth and development, and supply to the soil all the substances removed from it by the cropping. But certain other substances are used as manures which exert a fertilising influence on certain soils, or for certain crops, by effecting a chemical change with substances already in the soil, and to this class of fertilisers soda undoubtedly belongs, as a substance used as a manure cannot supply to a growing crop that which it does not itself possess, unless it can develope it from the soil to which it is applied. The substances may be in the soil, but in such a state of chemical combination or mechanical condition as to be of no comparative use to the plant, and the action of soda is likely to change the chemical compounds, and so render soluble that which was before insoluble, or by double decomposition from new chemical compounds, such as the plant requires, or in such a state of aggregation that the plant can assimilate them into its complex structure. *Scientific Review.*

Road Repairing. — When roads are much cut about by heavy cartage, the cheapest repair in the end consists in breaking up the entire surface, so that the whole body of the road may present one uniform body of equal hardness, and the same degree of smoothness. The worst of piecemeal repairs is, that the repaired portion continues weaker than any other part of the road, and being mostly on the wheel line it has to bear the heaviest burden. Compulsory means, such as heavy timbers and blocks of wood, are often used to compel a more equal use of the whole roadway, but these are inconsistent with the beauty and safety which ought to distinguish private roads. Dry weather is almost as trying to many roads as rain or frost — they break up into dust, and their substance or surface is carried away by the wind. Nothing pays better than water for roads in dry weather; it is cheaper than gravel and equally useful; it adds immensely to the comfort of travelling, and acts as a preservative of the road. If followed by the roller, the effect upon the hardness, solidity, and smoothness of roads is astonishing. As to the cleaning of roads there is nothing so cheap and effective as putting their surface in pickle once or twice a year. This may either be done with a surface sprinkling of dry salt during hot weather, or by a shower of hot brine from Heming's salting machine. Either way the salt will kill every living thing, and make the gravel sparkle like a bright shingly beach. Well made roads, however, need little cleaning. We have seen roads so hard and smooth and dry, that scarcely a blade of grass could lay hold of or find food for life on their surface. Finally, all roads should be slightly curved, at the rate of from ½ to 1 inch fall per foot, from the centre to the sides. The edges, if of grass, should not be more than 1 or 1½ inch in depth, and these should be cut, and all sediment removed from against the sides at least once a year. The bottoms of the side drains should be renewed at the same time. On very wet land, and in out-of-the-way positions, roads are sometimes formed wholly above the natural surface; thus the expense of drainage is avoided, and considerable saving of material effected. Greater convexity may be given, and the entire drainage of the road is pitched on to the ground on either side of it. This, however, at best is but a slovenly mode of road-making. Public roads, again, are, as everybody knows, mostly drained by open ditches of more or less depth on each side of them. Many of these, however, might be kept in repair at half the expense, were a deep drain run along underneath them.

Detection of Logwood in Wine by Neutral Acetate of Copper.—Lapeyrère has discovered that the hematine contained in logwood yields a sky-blue colour with salts of copper. Thus, if strips of good filtering paper (Swedish being preferred) are placed in an aqueous solution of neutral acetate of copper, and then dried, they can be used for testing wine. When a strip has been dipped into the wine and removed again, the adhering drop must be made to run backwards and forwards over the paper, which is then quickly but carefully dried. If the wine be free from logwood, the colour exhibited after the strip is dried will be grey, or rose-red greyish; but if logwood is present, the tinge will be distinctly sky-blue. *European Mail.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Greenhouse or stove climbing-plants, which are planted out into borders, and have been permitted to occupy a position in such structures, must, now that they are entering on the full-flowering season, have every attention in the matter of training, so that all the space allotted to them may be filled in such a manner that the best possible effect may be produced. Many kinds which produce pendulous flowers, such as *Passifloras*, *Tacsonias*, and the like, will simply need catching up and tying in their proper places. It is with such upright blooming plants as *Dipladenias*, *Allamandas* of the grandiflora type, *Combretums*, *Tecomas*, &c., that the greater amount of work and taste is necessary to bring the more upright spikes of bloom prominently into sight, without the appearance of any unnatural restraint. Cut away all the grosser young shoots which may be forming, as well as those which are not likely to produce flowers. Syringe them freely, and give copious waterings to the roots of all those which are thriving well. *Achimenes* which are now producing their flowers, after having well filled their pots with roots, will be much benefited if a little clear manure water is applied to them. Both these and *Gloxinias* will do well if placed in any cool greenhouse or conservatory free from draughts, when their growth is perfected and the flowers opened. Under some circumstances the accelerating or retarding of the growth and flowering period of certain stove plants may be necessary, and where this is the case it may be advisable to give some of them a slight shift. This should not be delayed one single day beyond what is absolutely necessary, for the season is already advancing apace. Give but small shifts, and be careful that the compost used is as open and fibrous as possible, according to the requirements of individual species, and that perfect drainage also exists.

FORCING HOUSES.

Admit air to *Pine plants* more freely during mild, warm days, after rainy weather, as the salubrity of the atmosphere at such times is very invigorating to them. Besides, now that the longest day has passed, it is necessary to begin to prepare for the comparatively more ungenial period we have to anticipate. In a word, we must endeavour, by greater exposure, to imbue the plants with hardiness, the better to enable them to withstand such weather without in any degree causing a check in their onward growth. Still afford a slight amount of shading when the sun shines brightest about mid-day, and especially to those which have been but recently potted. In fact all Pines which have been just potted should be well shaded for a fortnight or three weeks, and be kept in a closer atmosphere, well charged with humidity. Attend well to *Peach* and *Nectarine trees*, in the matter of keeping a good supply of moisture at the roots whilst the fruit is swelling, and syringe all internal surfaces in these structures most copiously twice a day. Do not afford water too freely when the fruit commences to ripen; the drier the air is at such a period, and the less actual moisture is afforded to the roots within reasonable limits, so much the better will be the flavour of the fruit. Every precaution should be taken against *red spider* at this season, for they multiply rapidly. When *Melons* are actively swelling off their fruit they should, before being pinched back, receive a pot or two of wholesome manure water, and afterwards a good soaking with clear tepid water, to wash the former well down to their roots; this will prove far more beneficial than periodical moistenings of the surface, which keeps the soil constantly in a stagnant unwholesome state, without proving so beneficial as it should do. Of course the foliage will require the usual damping over at shutting-up time for some days yet. A little night air should now be given regularly to these, and also to *Cucumbers*, whether grown in frames or proper houses. The proper *modus operandi* is to sprinkle them all over early in the afternoon, and to close up the house or frame until about 6 or 7 P.M., when a little air should be afforded at the top of each light as regards frames or pits, and at the tops of the Cucumber-house proper.

HARDY FRUIT GARDEN.

Finish the early summer pruning and fastening in to the wall of all *Peaches*, *Nectarines*, *Apricots*, *Cherries*, &c., at the earliest possible moment in instances where any remains to be done. To save labour in nailing, &c., it is customary to fix many of the young shoots of the current season's growth by the aid of small thin sticks about a foot in length. Those procured from Privet hedges, or other similar places, are the best, as they are not too thick and do not look unsightly in use. In fastening the younger shoots to the wall with them, one end is pushed crossways between the old wood and the wall, so that when the young shoot is brought into its place the other end is drawn and pushed behind another older branch, and so the young shoot is firmly secured. Many of the strongest young shoots upon Peach and Nectarine trees should be cut right away, leaving only those which are composed of small hard wood, and are likely to be useful for fruiting in the ensuing season. Upon Apricots summer growths will have again pushed forth, and if these are not required for the purpose of increasing the size of the tree, or to fill out any vacancies amongst the main branches, they should be carefully taken off. To let these grow now will be to rob the tree of some portion of that support which the tree will want for the proper development of its fruit. It should be unnecessary to suggest that the final thinning out of all fruits of this kind should have been performed before this. In instances where these are very late, however, no further delay should take place.

HARDY FLOWER GARDEN.

Carefully fasten all *Dahlias* to neat strong stakes now that they begin to grow fast. The mulching which, a few weeks since, I suggested should be placed around their base, will have been very beneficial to them during the past very trying weather. It will be necessary to repeat the root waterings at well regulated intervals, as neglect in this wise is sure to tell against them, unless a wet period ensue. Weak little shoots, which emanate from the base of old *Pansies*, if taken off at this season, and dibbled into rich soil in a shady corner, will root readily, if kept moist for a time, and form nice plants for early autumn transplanting. The thunderstorm which visited here (South Herts) on the 16th, has proved very beneficial to *Carnations*, *Pinks*, &c., which did not show well this season. In all instances where single dwindling plants alone exist, it will be well to remove the flower-stalks which have formed at the earliest possible moment, that the young shoots forming may attain to greater robustness. Many kinds of perennials, &c., which, though grown early in the season, have not succeeded in their growth, owing to the harsh and arid weather, should again be sown. These comprise, amongst others, such things as *Sweet Williams*, *Wallflowers*, *Aquilegias*, *Hollyhocks*, *Antirrhinums*—of which some exceedingly dwarf large-flowered varieties are now obtainable, and *Pentstemons*, &c.

KITCHEN GARDEN.

With the late shower some progress will have been made in transplanting all kinds of "winter stuff." In the more northern portions of the island I fear little if any rain has fallen, and there cultivators must wait till such favours visit them. It is quite useless to transplant until a damp period arrives. The check will be so great upon the plants, even with artificial root-waterings, that it is better to wait awhile. As fast as the first crop or two of Peas are cleared off the ground let trenches be prepared to plant *Celery* in with all possible despatch. Choose good stiff and moist manure, to be dug in in good quantities, and walk along the top of this when done, so as to make the whole moderately firm before the plants are put in. Of course they will need a thorough soaking of water immediately they are planted if the weather is dry. Further sowings of *Spinach*, *Endive*, *Lettuce*, *Turnips*, *Radishes*, &c., should be made now; also a little *Cauliflower* seed, which, with an open autumn, may prove useful in November. *W. E.*

TOWN GARDENING.

Pelargoniums that have done flowering indoors should have the old flowering shoots cut down to the new shoots that are appearing. The top soil should be stirred, and a little fresh added, and placed out in the garden, and kept well watered, when they will again flower towards the end of the summer. The *Mignonette* in boxes should have the seed-pods picked off as fast as they appear, which will be the means of prolonging its existence. The beds and borders should be occasionally stirred with the Dutch hoe, and levelled with the rake—this will keep down weeds, ensure neatness, and likewise let the water into the soil instead of running off. Cut off all flower-stems that have done blooming, and remove damaged leaves. Fern cases should be occasionally watered round the shades, and shaded from the mid-day sun. *Liliums*, and all other plants coming into flower will now be much benefited by a good watering twice a week with liquid manure, and there is not a more useful thing for this purpose at this season than a tub sunk in the ground, into which you can throw a few spades of cowdung, and fill it with water, and use it about twice a week on any growing plant. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
For the Week ending Wednesday, June 22, 1870.

1870. Month and Day.	At 9 A.M. Readings of Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.
June.	Ins.	Deg.	Deg.	Deg.		Gr.
16. Thurs.	29.89	75.9	64.0	52.2	57	5.1
17. Friday	29.72	61.7	58.5	55.6	82	4.0
18. Satur.	29.99	60.2	57.8	55.0	89	3.9
19. Sunday	30.07	74.1	61.3	50.8	50	5.1
20. Monday	30.08	68.3	63.0	58.8	71	5.4
21. Tues.	30.19	73.2	64.0	54.8	53	4.8
22. Wednes.	30.11	75.6	60.0	50.3	50	5.4

1870. Month and Day.	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years	Wind. Direction.	Horizontal Movement.	Rain. In Inches
June	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
16. Thurs.	86.2	53.3	32.9	69.5	+ 10.5	S.S.E. : N.E.	155	0.04
17. Friday	77.1	53.0	24.1	61.5	+ 2.5	S.E. : W.S.W.	340	0.11
18. Satur.	75.9	50.5	25.4	60.9	+ 1.8	S.W. : WSW	275	0.00
19. Sunday.	81.2	53.1	30.1	66.3	+ 7.1	WSW	230	0.00
20. Monday	81.8	54.7	27.1	66.4	+ 6.9	WSW : W.	205	0.00
21. Tues.	84.1	53.7	30.4	67.1	+ 7.2	N.E.	95	0.00
22. Wednes	90.2	57.8	32.4	72.2	+ 11.9	WSW	150	0.00

June 16.—Generally cloudy but fine. Solar halo. Thunder storm at night
— 17.—Generally cloudy. A heavy shower of rain fell about 3.30 P.M.
— 18.—Generally cloudy. Rain fell about 5.30
— 19.—Light clouds were prevalent during the day. Very fine.
— 20.—Generally cloudy till evening, then cloudless. Fine
— 21.—Cloudless in the morning, variable afterwards. Fine
— 22.—Generally cloudy. A few drops of rain fell about 7 P.M.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, JUNE 18, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	78 8	49 5	29 3	74 0	52 2	21 8	61 5	0.23
Blackheath ..	87 2	50 5	36 7	80 5	52 7	27 8	64 6	0.25
Bristol	77 1	52 3	25 0	67 9	54 1	13 8	59 2	0.51
Birmingham ..	79 0	51 0	28 0	71 2	54 1	16 8	61 0	0.51
Wolverhampton	77 0	49 6	27 4	70 7	52 8	17 9	59 9	0.33
Leicester ..	..	..	..	..	..	..	..	..
Norwich	81 8	49 5	32 3	73 8	53 2	20 6	61 7	0.31
Nottingham ..	81 7	47 4	34 3	72 0	52 2	19 7	60 7	0.03
Sheffield ..	75 0	47 0	29 0	70 4	52 4	18 0	60 6	0.75
Liverpool ..	71 0	49 0	22 0	66 8	53 3	13 5	58 3	0.00
Manchester ..	75 0	46 0	29 0	71 0	52 3	18 7	59 1	0.44
Salford	73 9	44 1	29 8	68 4	52 8	15 6	57 6	0.67
Bradford	76 0	48 0	27 0	68 4	53 4	15 0	59 1	1.21
Leeds	75 0	44 0	31 0	68 6	52 7	15 9	58 8	1.37
Hull	80 0	41 0	36 0	72 0	49 1	22 9	58 8	2.05
Newcastle ..	72 0	47 0	24 0	68 3	51 7	16 6	58 2	0.35
Edinburgh ..	68 7	46 0	22 7	..	..	..	55 8	0.30
Glasgow	66 0	44 4	21 6	..	..	..	54 1	0.82
Dundee	68 0	43 0	25 0	..	..	..	54 9	0.25
Aberdeen ..	..	..	..	..	..	..	..	..
Paisley	65 0	45 0	20 0	..	..	..	55 0	0.45
Greenock	64 0	46 0	18 0	..	..	..	54 3	0.68
Leith	68 2	44 1	24 1	..	..	..	56 0	0.53
Perth	71 0	44 0	27 0	..	..	..	56 7	0.14
Dublin	72 9	47 0	25 9	..	..	..	57 0	0.99

JAMES GLAISHER.

Notices to Correspondents.

*** The Editors cannot undertake to reply to communications made to them, or to name plants, otherwise than through the columns of the Journal. Contributors should also please, in all cases, to pay the carriage of the parcels they send, else no notice can be taken of their communications.

BOOKS: *Alpha*. Oliver's "Lessons in Elementary Botany" (Macmillan), will probably suit you. The cost is a few shillings.

COVERING FOR VINE BORDERS: *A Constant Subscriber*. There is nothing better, or, indeed, so good, as wooden shutters. We have used coverings made of asphalte (such as is used for roofing), nailed on a frame, and found it answer well. It is cheap also, and we would prefer it either to zinc or canvas, which we think would prove rather expensive.

DISEASED CURRANT BUDS: *D. D.* The buds of your Black Currants are deformed by a little mite, of which an account was given in last year's *Gardeners' Chronicle*, pp. 921, 1016. *M. J. B.*

FUMIGATING HOTHOUSES: *A Subscriber*. Procure any one of the fumigators which have lately been noticed in our columns, or a common 8-inch flower-pot and some Tobacco, or tobacco-paper. Then, on a still, quiet evening, first placing a few live embers in the bottom of the pan or pot, and laying the tobacco material, torn up pretty fine, on these coals, carry it into the house. All that is required is to raise smoke, but care must be taken to prevent it from getting into a flame, which would entirely destroy the plants. The smoke may be allowed to become as close as possible, and it is well to repeat it frequently. To syringe with a decoction of Quassia chips, or Fowler's Insecticide, is also good for keeping plants clean.

GARDENERS' EXAMINATIONS: *Frank Spivey*. Apply to the Secretary, Royal Horticultural Society, South Kensington, W.

HASWELL'S PATENT GARDEN SYRINGE: *B. R. D.* would be glad of the name and address of the maker of this article.

INSECTS: *M.* We have not before met with the Acarus on the Lilac bark. It is closely allied to the Apple-bark louse, described in *Gardeners' Chronicle*, 1843, p. 356. *W. J. G.* The branch of your Beurré Diel has been attacked by the half-grown larva of the wood leopard-moth, *Z. Æsculi*, which is not very particular in the choice of the tree on which the female deposits its eggs. *W.*—*Mrs. S.* The pretty green beetles found on some young Larch trees were there accidentally. They are a species of weevil (Polydrusus mali), and are found on nettles and various other plants and trees. *W.*—*W. R.* Your box containing leaves of some plant was crushed in the post, and, as you gave no particulars of the manner in which your "Cabbage, Cauliflower, and such crops," are attacked, we can only guess that the mischief may have been caused by the larvæ of a two-winged fly, Anthomyia Brassicæ, very like the common house fly. *W.*

LIGURIAN BEES: *J. N.* wishes to know where he can obtain half-bred Ligurian queen bees. Messrs. Neighbor, Holborn, could probably supply them.

NAMES OF PLANTS: *Messrs B. & S.* 1, Allium magnum L.=A. magicum, Bot. Mag., t. 1148. 2, A. multibulbosum, Jacq. *J. G. B.*—*J. E. D.* Apparently a Stenopressus, but the flower was rotten when received. *J. G. B.*—*W. P.* We cannot tell from the flowers alone to which species your plant belongs, but as you say it is hardy, is probably Chamærops Fortunei. The flowers are undoubtedly male flowers.—*J. A. P.* We submitted your Saxifrage to Mr. J. G. Baker, who kindly replies as follows:—"There can be no question that this is the true Saxifraga longifolia of Lapeyrouse, which is confined to the Pyrenees. I have laid it side by side with a specimen gathered and labelled by Lapeyrouse himself, and am quite satisfied that such is the case. Probably what you mean by "longifolia" is S. elatior, a Swiss species, or S. crustata, of the Tyrol, which are so near to this that they are all three put as varieties of a single species in Sternberg's great monograph.—*Montana*. 1. Pinguicula vulgaris; 2. Menyanthes trifoliata; 3. Ranunculus hederaceus; 4. Pedicularis sylvatica; 5. Polygala vulgaris.—*G. S.* Calycanthus floridus.—*W. A. D.* Spergularia marina.—*A. C.* Eleagnus angustifolia.—*C. W. S.* Momodes aromaticum. We cannot determine the Gesneria from the specimen sent.—*M.* Coprosma petiolata.

ORANGES: *W. D.* We regret that we are not able to give the name of the particular variety. The fruit is handsome and curiously depressed at the top. If you can furnish us with further particulars as to whence received and how grown, we may be able to assist you. In Southern Europe there are as many varieties of Oranges grown as there are Pears with us, and each has its name, but they are not known in this country.

PEAR LEAVES DISEASED: *W. W. G.* There are two things on your Pear trees—the warts on your leaves, of which you will find some account at p. 858; and the common muscle-bug, or coccus, which has, we believe, no connection with the warts, as they occur abundantly where there is no coccus. *M. J. B.*

ERRATUM.—The Rev. W. F. Radclyffe requests us to correct an error at p. 831, where M. Lacharme is credited with the production of the beautiful new Rose, Felix Genero. The credit should have been given to M. Damaizin.

COMMUNICATIONS RECEIVED: C. D. S.—W. H. B.—J. S. F. B. K.—Norfolk Dumpling. Bath.—G. A. H.—A. E.—A. F.—W. P. A.

Markets.

COVENT GARDEN.—June 24.

Some improvement has taken place in the general tone of the market, and the best qualities of goods have maintained their prices. A fresh arrival of West Indian Pines is to hand, in good condition. Flowers comprise Orchids, Roses, Pelargoniums, Heaths, Fuchsias, Lobelias, Mignonette, Pinks, and the usual description of bedding plants.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	3 6	to 1 0	Melons, each	1 6	to 3 0
Apricots, per doz	2 0	— 4 0	Nectarines, per doz	16 0	— 25 0
Cherries, per lb.	1 0	— 2 0	Oranges, per 100	6 0	— 10 0
Cobs, per lb.	0 9	— 1 0	Peaches, per doz	18 0	— 24 0
Filberts, per lb.	0 6	— 0 9	Pears, per doz.	..	— ..
Grapes, per lb.	6 0	— 10 0	Pine-apples, per lb.	6 0	— 10 0
Lemons, per 100	4 0	— 8 0	Strawberries, p. lb.	3 0	— 8 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 6	to 5 0	Horse Radish, p. bun.	3 0	to 5 0
Artichokes, p. doz.	3 0	— 6 0	Leeks, per bunch	0 2	— 0 4
Beet, per doz.	2 0	— 3 0	Lettuces, p. score	1 0	— 2 0
Broccoli, per doz.	1 0	— 2 6	Mint, per bunch	0 1	— 0 2
Cabbages, p. doz.	1 0	— 2 0	Mushrooms, p. pottle	1 0	— 1 6
Carrots, p. bunch	0 4	— 0 8	Onions, per bunch	0 4	— 0 9
— young, p. bun.	1 6	— 2 0	Parsley, per bun. h.	0 2	— 0 4
Cauliflowers, p. doz.	1 6	— 3 0	Potatos, new, p. lb.	0 2	— 0 6
Celery, p. bund.	1 0	— 1 6	Shallots, per lb.	.. 0	8 — ..
Cucumbers, each	1 0	— 1 6	Spinach, p. bushel	2 0	— 3 0
Endive, per doz.	1 6	— 2 0	Radishes, per doz.	1 0	— 1 6
French Beans, p. 100	2 0	— ..	Turnips, new, p. bun	0 9	— 1 0
Garlic, per lb.	0 8	— ..			
Herbs, per bunch	0 2	— 0 4			

Potatos, York Regents, per ton, 12 s. to 150 s.; Flukes, do., 100 s. to 160 s., new Round, 150 s. to 180 s. per cwt., new Kidneys, 140 s. to 240 s. do.

HORTICULTURAL EXHIBITIONS.
NOTICE TO COMMITTEES.
Upon application to the Undersigned, Plans and Prices for the Hire of Elegant and commodious TENTS are forwarded free of charge. All Tents are Waterproof.—Nos. 2, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.
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MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

Vases and Fountains, for the Garden and Conservatory.
ANDREW HANDYSIDE AND CO., Britannia Iron Works, Derby; 200 32, Walbrook, London. Illustrated Sheets of Designs and Prices sent on receipt of Two Stamps

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
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Manufactory, 6, Banksole, Southwark

SHAWS TIFFANY.
For Samples and Prices apply to
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BROWN'S FLORAL SHADING, a protection from Frost and Sun. Samples and prices on application to
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RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 5, Commercial Street, Shoreditch, London.

TANNED GARDEN NETTING for Seed Beds, and for the Protection of Fruit Trees from Frost, Blight, and Birds, or as a Fence for Fowls, &c.; 2, 4, and 6 yards wide, at one penny per square yard; 100 yards, 4s. 6d.; 50 yards, 15s.; 1000 yards, £12. Lengths cut to order, carriage paid.
CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough

NETTING for FRUIT TREES, SEED BEDS, &c. STRAWBERRY, &c. TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3d. per yard, or 100 yards, 20s.; 4 yards wide, 6d. per yard, or 50 yards, 20s. NEW TANNED NETTING, suited for any of the above purposes, or as a Fence for Poultry, 2 yards wide, 6d. per yard; 4 yards wide, 1s. per yard; 3¼-inch mesh, 4 yards wide, 1s. 6d. per yard. Can be had in any quantity of
EATON AND ADELER, 6 & 7, Crooked Lane, London Bridge, E.C.

GARDEN NETTING (at Reduced Price), for the Protection of newly-sown Seeds from Frost, Blight, and Birds; also as a Fence for Poultry, Rabbits, and Sheep, 1½ per square yard, carriage free, in quantities of 500, 500, or 1000 yards.
SCRIM CANVAS, for Wall Fruit, Greenhouse Shades, 6d. per yard; 4 yards wide, 1s. per yard; ¾-inch mesh, 4 yards wide, 1s. 6d. per yard. Can be had in any quantity of
HAYTHORN'S and WALLER'S NETTINGS, Sample of material free on application. RICK COVERS, New and Second hand, with Poles, complete, for hire.
FREDERICK EDGINGTON AND CO., Marquee, Tent, Flag, and Rick Cloth Manufactures, 60 and 62, Old Kent Road, London, S.E.

To Orchid Growers.

WANTED, a first-rate MAN, to take Charge of an extensive and valuable Collection of Orchids. A liberal salary will be given to a thoroughly competent person.—Apply by letter, stating full particulars as to references, &c., to C. D., *Gardeners' Chronicle* Office, W.C.

MESSRS. VEITCH AND SONS REQUIRE a YOUNG MAN for the House Department of their Coombe Wood Nursery. He would have propagating to attend to, and lodgings on the Grounds, with a first-rate opportunity of becoming an efficient Propagator.—Apply, by letter, or personally, to the Royal Exotic Nursery, Chelsea, S.W.

DOWNIE, LAIRD, AND LAING are in WANT of a YOUNG MAN, quick and successful at Rose Budding. Satisfactory references required.—Dunstan Park, Forest Hill, S.E.

WANTED, MEN accustomed to Potting, Watering, and Tying for Market. None need apply without good references.—REEVES BROTHERS, Notting Hill, W.

WANTED IMMEDIATELY, as PORTER and PACKER, a steady respectable young Man. One accustomed to the Trade preferred.—Messrs. DICK RADCLYFFE AND CO., Seed Merchants, 129, High Holborn, W.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENERS (EXPERIENCED).—JOSEPH MEREDITH, The Vineyard, Garston, near Liverpool, begs to intimate to Ladies and Gentlemen requiring the above, that he has on his REGISTER some excellent MEN for every class of situation, whom he can strongly recommend from his personal knowledge of them.

GARDENER (HEAD).—Married, no incumbrance; well skilled in all branches of the profession. Highest references.—A. B., Post Office, Southend, Catford, Lewisham, Kent, S.E.

GARDENER (HEAD).—Married, no incumbrance; has a thorough knowledge of the profession in all its branches, and can take the Management of Land. Satisfactory references and character.—B. C., Mr. Hurrell's Post Office, Fulham, S.W.

GARDENER (HEAD).—Married; understands the profession. Also an ESTATE AGENT, age 32. Would not object to a Cow, &c. Highly recommended.—B. W., Mr. Randall, Sunbury, Middlesex.

GARDENER (HEAD).—Age 39, married, one child; thoroughly conversant with all branches of the profession. Ten years' last situation with a family. Character will bear the strictest investigation.—E. W., Duke of Cambridge's Stables, Park Lane, W.

GARDENER (HEAD), age 40, married.—The Advertiser is now leaving his situation, and begs to offer his services to any Nobleman, Lady, or Gentleman in want of a thoroughly practical and painstaking married man. He is specially qualified for forcing, and producing first-class Grapes, Pines, Peaches, Melons, &c. Having lived upwards of 20 years in first-class situations, is fully competent to carry out the modern style of Gardening in all its branches. For abilities and character, reference can be made to present employer, with whom he has lived 12 years as Head Gardener.—ALEXANDER, Gen. Studd's, Kensington Palace Gardens, W.

GARDENER (HEAD), or GARDENER and BAILIFF.—Married; thoroughly experienced in Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, also Pleasure Grounds, and Flower and Kitchen Gardening. Has had the Management of large Glass Houses, Buying and Selling Stock, &c. Highest references.—B. B., Messrs. George Gibbs & Co., Seedsmen, 24, 25, and 26, Down Street, Piccadilly, W.

GARDENER (FOREMAN), in a Nobleman's or Gentleman's establishment.—Age 24, single; has had experience both in Gentlemen's establishments and Plant departments in Kendon Nurseries. Good reference.—A. B., Messrs. Rollisson's, The Nurseries, Lower Tooting, Surrey.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man who has lived for several years, and can testify as to his abilities, he held the position of Bailiff and Gardener in last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

GARDENER.—H. LANE & SON have on their List a first-class Gardener, age 38, open to an engagement; thoroughly competent in the branches of Early and Late Forcing of Fruits, Orchids, Stove and Greenhouse Plants, Ferns, &c.; has been a successful Exhibitor at the Metropolitan and Provincial Shows.—The Nurseries, Great Berkhamstead, Herts.

GARDENER, and to look after Grass Land and Cows.—A Gentleman wishes to recommend a married Man, age 34, without children; disengaged in consequence of family leaving the neighbourhood. Excellent character.—D. B., Wraysbury House, Staines.

GARDENER (WORKING).—Age 31, married, one child; understands Forcing Fruit, Flowers, and Vegetables; also Flower and Kitchen Gardening. Good character. Can milk. Satisfactory reason for leaving.—L. B., 3, John Street, College Place, Chelsea, S.W.

GARDENER (UNDER).—G. S., Mr. Bingham, 84, Mount Street, Park Lane, London, W.

GARDENER (UNDER).—Age 22; good reference.—W. W., 1, Teign Street, Teignmouth

To Nurserymen.

GROUND FOREMAN and PROPAGATOR, to any Nurseryman requiring a thorough energetic Man.—A proficient Workman, thoroughly experienced in Roses, Fruits, Ornamental Trees, Shrubs, and Conifers. Character will bear strict investigation.—A. B., 14, Lower North Street, Sloane Street, S.W.

PROPAGATOR (Soft-Wooded) and PLANT GROWER for Market. Understands the Forcing of Grapes and Cucumbers, and is also a good Rose Budder.—G. L., Mr. Little, Surrey Road, King's Road, Chelsea, S.W.

FARM BAILIFF or STEWARD.—Middle-aged, married, respectable; thoroughly understands the business. Can be highly recommended by present employer.—O. H., Latimer, Chesham Bucks.

Seed Trade.

IMPROVER.—Age 18; has a knowledge of Plants and Herbs.—A. B., *Gardeners' Chronicle* Office, W.C.

IMPROVER, in a Nobleman's or Gentleman's Garden.—Age 19; has had six years' experience in Housework, and can produce an excellent character. No objection to a small Premium.—C. SHEPPARD, Kingsworthy, Winchester, Hants.

WAREHOUSEMAN, SHOPMAN, or CLERK.—Age 32, married; of active business habits. Fifteen years' experience in the Wholesale and Retail Nursery and Seed Trade, and has a knowledge of Plants. Will be disengaged shortly.—E. J., *Gardeners' Chronicle* Office, W.C.

KITCHEN-MAID (FIRST or SECOND), in a Nobleman's or Gentleman's Family.—Age 23; thoroughly understands Plain Cooking, Fish, Game, Sauces, Household Baking, &c. Two years' good character.—CATHERINE C., The Archers, Ingbrook, Stroud, Gloucestershire.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER and CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

INDIA-RUBBER GARDEN HOSE,
60 feet ½ inch hose, with brass tap, rose, and jet complete, 10s. 6d.
60 feet ¾ inch do. do., extra strong, 31s. 6d.
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in Indiarubber forwarded on application.
E. C. CAPON, India-rubber Manufacturer, Oxyddart, Birmingham

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER and VALUER,
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Notice to Florists.

TO BE LET, on Lease, or SOLD, a FREEHOLD BLOCK of GROUND, situated at Tottenham, suitable for Garden or Building purposes. Apply for terms, &c.,
J. T. Gardener, Haye du Puits, Guernsey.

Whitton Nursery, Hounslow.

D. FERGUSON offers the LEASE of the above (or half as a partner), about 80 years of which is unexpired. It consists of about 3 acres of Land and 13,000 feet of Glass. Erections: The residence and situation is first-rate, in Whitton Park on the north side; Richmond Hill, with the Star and Garter, on the East; and Epsom Downs in the distance on the south. This is an excellent opportunity for two young men with a little capital, or for anyone wishing to establish their sons, as hundreds of thousands of plants can be grown here on the system practised by D. F. at Stowe, or grown for Covent Garden, or, as D. F. does, Sell at Home. For further particulars, apply as above.

To Nurserymen, Florists, and Others.

FOR SALE, with immediate possession, a first-class NURSERY and FLORIST'S BUSINESS, 15 miles S.W. of London, about 10 Acres in extent, with good connection; long Lease, rich loamy soil, surrounded by good roads, plenty of water, and adjoining a Railway Station. The Stock consists of a good collection of Hardy Trees and Shrubs, some Soft-wooded Plants, a Show House, two Span-roofed ditto, Pits, Frames, and other appliances for carrying on a very lucrative trade. A portion of the Purchase-money may remain at interest on approved security if required.
Further information, and Cards to view, may be obtained on application to Mr. W. ABRAHAM, Horticultural Auctioneer, Valuer, &c., Goldworth Nurseries, Woking, Surrey.

Highly Important to Florists,

Desirous of carrying on a successful Market Trade, in conjunction with a good Local Jobbing Business

TO BE LET, or the LEASE to be SOLD, with possession, of the NORFOLK NURSERY, Shacklewell, Middlesex, ten minutes' walk from Dalston Junction, comprising about 2a. 1r. 30p., with the Erections thereon, viz.:—10 Greenhouses, mostly of modern construction, ranges of Pits, Stabling, and other Outbuildings, and every appliance to ensure a successful business. The whole is held on a Lease from Lady-day, 1865, for a term of 21 years, at the exceedingly low rental of £34 per annum. The LEASE, also, of FOUR DWELLING HOUSES, adjoining, held for the same term, three of which are let to respectable tenants; the other, which is in hand, may be occupied by any one renting or purchasing the Nursery. For further particulars apply to
PROTHEROE and MORRIS, Auctioneers, Leytonstone, Essex.

HOUSE TO BE LET, on the North Kent Line, 20 minutes' ride from London Bridge, on the high road from Lee to Chislehurst,—a SUBSTANTIAL FAMILY RESIDENCE, erected under the careful superintendence of a London Architect. It stands in the centre of its Grounds, and contains Drawing, Bed rooms, Dressing do., Linen Closet, and lofty Dining and Drawing Rooms, 26 feet by 14. Bay Window Plate Glass, fitted up with Venetian Blinds, and carried in the Entrance hall, making a Morning-room. Two Kitchens, and the requisite Offices. Approach Carriage-drive, Ornamental Portico, Terrace Stone Steps, planted with the choicest Shrubs, Conifers, &c. Rear Lawn, Flower Ground and Kitchen Garden walled in, laid out the same as front. The whole the premises well drained, and good supply of Water from Chislehurst Waterworks. Rail and Omnibus cross the fields to the Eltham Station, by road one mile; one mile from Church. A Stable for two horses, and Coach house on the premises, if required, to be let on lease, at a progressive rent.
Apply to Messrs. HERRING and CO., Moorgate Street, E.C., and Bracon Hill, S.W.; or to Mr. G. DEARK, Propagator, Streatham Place Nursery, S.W.; or on the Premises, Mottingham Nursery, Kent.

SALES BY AUCTION.

Horndon-on-the-Hill.

Valuable BUILDING and MARKET GARDEN GROUND, adjoining the Stanford-le-Hope Railway Station.—The desirable FREEHOLD RESIDENCE known as HIGH HOUSE, and several ENCLOSURES of very valuable ACCOMMODATION LAND, with possession.

MESSRS. BEADEL will SELL by AUCTION, at the Mart, Tokenhouse Yard, London, on THURSDAY, July 21 next, at 1 o'Clock precisely, the above valuable PROPERTY, in Four Lots, which will comprise two very eligible Closes of Freehold Land, eminently suitable for Building Purposes, and very desirably situate adjoining the Stanford-le-Hope Railway Station, with considerable frontage to the high road, and containing an area of 30a. 2r. 37p. Lot 2. The very desirable Freehold Residence, known as High House, in the village of Horndon-on-the-Hill, with Garden, Paddock, Stabling, and Outbuildings, in the occupation of Mr. J. G. Vincent, as yearly tenant. Lot 3. Three Closes of Freehold Building and Accommodation Land, fronting the High Street, also in the occupation of Mr. Vincent, with Cottage and Garden adjoining, containing together an area of 11a. 1r. 24p. Lot 4. The valuable Plot of Freehold Orchard and Garden Ground, with frontage to the High Street, particularly adapted for building purposes, in the occupation of Mr. John Wright, as yearly tenant.
May be viewed by permission of the Tenants, and particulars, with Plan, obtained of Messrs. HICKS and SON, Solicitors, Gray's Inn, W.C.; at the Mart, E.C.; and of Messrs. BEADEL, 25, Gresham Street, London, E.C.

Important Sale of Prize Shorthorns in Ireland.

MR. JOHN THORNTON will SELL by AUCTION, on THURSDAY, June 30, at Thornville, near Wexford, the small but highly distinguished HERD of SHORTHORN CATTLE, belonging to Joseph Meadows, Esq. The success that has attended the splendid animals exhibited by Mr. Meadows, known as High House, and Yorkshire Shows, the Meetings of the Highland Society of Scotland, and of the Royal Irish and Dublin Societies, as well as the Enniscorthy and Wexford Shows, has been remarkably brilliant; and among the animals for sale (which will comprise the entire Herd, except one Yearling Bull and the Calves of this year), will be found many Prize Winners of recent shows, has been purchased in the Bolivar (25,649), and Charlie (25,745). The young Stock are chiefly by, and the Cows and Heifers mostly in-calf to, Mr. Carr's pure Booth Bull Prince of the Realm (20,627), who is also included in the Sale.
Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London; or of Mr. MEADOWS, Wexford.

PRELIMINARY ANNOUNCEMENT OF TWO VERY IMPORTANT SALES OF SHORTHORNS.

Scaleby Castle, near Carlisle.

MR. JOHN THORNTON will SELL by AUCTION, on WEDNESDAY, September 21, at Scaleby Castle, near Carlisle, a valuable selection of pure-bred SHORTHORN CATTLE, from the first-class herd belonging to James Fawcett, Esq.
Further particulars will shortly be given.

Nunwick Hall, near Penrith.

MR. JOHN THORNTON will SELL by AUCTION, on FRIDAY, September 23 (the day after the Penrith Show), at Nunwick Hall, Penrith, the entire herd of first class SHORTHORNS, belonging to Charles R. Saunders, Esq.
Further particulars will be given in future Advertisements, and Catalogues duly announced.
London: 15, Langham Place.—June 9, 1870.

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LINCOLNSHIRE AGRICULTURAL SOCIETY.
SLEAFORD EXHIBITION, JULY 27, 28, and 29.
The PRIZES offered amount to ONE THOUSAND FIVE HUNDRED and FIFTY POUNDS and upwards. ENTRIES CLOSE JUNE 27. Prize Lists, Forms of Entry, &c., may be had on application to STEPHEN UPTON, Secretary.
St Benedict's Square, Lincoln.—May 6.

The Agricultural Gazette.

SATURDAY, JUNE 25, 1870.

MESSRS. VILMORIN-ANDRIEUX & CO., of Paris, have published a circular, in which they call the attention of French agriculturists to the remaining possibilities of this dry season as to its yield of cattle food. They enumerate several crops which, sown now, may still be able in the course of the year, if not of themselves to give a full return, at any rate to assist a most useful economy of the small produce, which is undoubtedly all that natural and artificial grass will this year yield. Some of the plants they name may be serviceable to English farmers; and among them are various species of Maize, Millet, Sorghum, Canary-grass, and Buckwheat, in addition to Vetches, various Cabbages, Rape, white Mustard, &c. They also suggest various mixtures of seeds of these crops, calculated, when cut green, to furnish very useful autumn fodder. Among them are mixtures (somewhat whimsical to English ideas) of Peas, Vetches, white Mustard, Millet, and Spurry—or Buckwheat, Maize, Peas, and Canary-grass. We have very little experience here of Maize, but the occasional occurrence of excessively hot summers like the present suggests the advantage of having seed-beds ready of these and other crops to which our climate is only rarely adapted, so that use may be made of an exceptional season; or at any rate, so that means may be at hand to meet the difficulties which such seasons bring with them.

The collection of evidence as to how to meet a drought which appeared last year in the Journal of the English Agricultural Society—descriptive of what was actually done during the drought of 1868—may probably be referred to now with as much chance of serviceableness to English farmers as can be expected from any account of French agricultural necessities and possibilites. Among the witnesses whose experience was then collated, were Mr. CHARLES HOWARD, of Biddenham, Mr. RANDELL, of Evesham, and Mr. HENRY HUDSON, of Pershore, all well-known and trustworthy men. Much of what they did in the autumn of 1868 may well be done two months earlier in prospect of the hot, dry summer of 1870, which has already spoiled our hay crop, and may yet spoil our Turnip fields.

Mr. HOWARD says that immediately after early harvest he sowed 20 acres with Essex dwarf Rape; also 13 or 14 with Italian Rye-grass and Rape mixed. Both the Rape and the stubble Turnips proved most servicable. Excellent crops of Mustard after Peas proved useful for sheep. Cabbages were planted out, and would be fit for use in the following May. Eight acres of Cabbages, which he had that summer, were most serviceable—sheep, pigs, and Shorthorns, were all glad of them. "As a rule," Mr. HOWARD says, "farmers do not cultivate this plant so much as they should; it can be managed to come in all the year round, at any time the farmer requires the most keep: in my case I have to provide for the summer months. Nothing grows more keep; it is beautiful food; and above all, I know of no plant that can be cultivated more cheaply according to its weight, if only set about in the right way."

The Cabbage crop is specially a great resource on the stiffer class of soils; witness both Mr. HENRY HUDSON'S experience and that of Mr. RANDELL, which are recorded at length in the article referred to.

So much for ordinary English agricultural experience. Probably the best thing that can be done by any farmer now, to obtain an early help in autumn, when, in all probability his cattle and sheep will be hard up, is to prepare a field as well as possible by thorough tillage and liberal manuring, against the first soaking rain; and meanwhile get a large seed-bed ready of the quickest growing Cabbage known to London market gardeners. If these are picked out a foot apart, on land well fitted for them, an immense growth of cattle food will come as quickly as anything we can name after the first heavy rains.

In case, however, any of our readers should desire to try the Maize crop for green growth, notwithstanding the late seed-time—hoping that this hot weather may characterise the whole of the ensuing three months—we publish the following notes on Maize growing by Mr. FORSYTH, of Salford, who sends them to us as the result of personal experience. Although it is already a month past the seed-time proper for an attempt to ripen this crop in this country, it may still be possible to obtain a great bulk of useful green stuff for autumn forage by means of it.

"About four plants to the square yard will give a fair crop, and as the plant grows rapidly and feeds voraciously, deep culture and heavy dressings of manure are of the greatest importance. Thick sowing is ruinous, producing unnatural stalk, long and lean, whereas the signs of health are short chubby stems with great breadth of blade, and that of a deep green hue. The seed should be dibbled singly by hand, rather less than 1 inch deep, in rows 27 inches from row to row, and 12 inches from plant to plant in the row. Even if forwarding Maize plants in pots were practicable for farmers, it would not be desirable, as the plant does not bear transplanting with profit. I believe that, properly cultivated, it will in hot seasons be a useful agricultural crop, even in England."

"The milk from Turnips, Mangel, and Sainfoin, where these are given *ad lib.* to cows, is far from sweet, but the Indian Corn has never had a blot on its fair fame, and it will yet be grown in garden and on farm for both man and beast."

Mr. FORSYTH'S remarks, added to the recommendation of Messrs. VILMORIN-ANDRIEUX & CO., may perhaps induce some of our readers to make an attempt at growing Maize for autumn forage this autumn. For ourselves we should rather trust the Cabbage tribe.

IN an estimate of this year's crops, which Mr. MECHI contributed to last Thursday's *Times*, he says:—"This is a more unfavourable season for light land farmers than even 1868, and must cause serious losses unless we should be favoured with heavy rain shortly." He is probably right; nevertheless we were on Tuesday over a light land farm, which is giving promise of a capital harvest, in Wheat, Barley, Oats, and even winter Beans. All the early-sown Swedes are showing a capital plant. Mangel Wurzel is very promising, and even the Clover swathe is fair. The excellence of the corn crops is owing to the spring dressing which they receive of nitrate of soda. That is not mere opinion. Across every field a blank ridge has been left, which, having received no dressing, has depended only on the ordinary condition of the land, and of the season. The contrast thus presented in each field is most obvious and instructive. Even in this dry season all the Wheat and Barley and Oat fields show a difference between the nitrated and undressed parts of the field of probably many bushels per acre. It is impossible to doubt that a lesson of this kind must tell upon the whole neighbourhood. No one can escape the proof which is thus afforded of the profitableness of liberal management even in a drought like that of 1870.

And it may interest our correspondents, "G. A. H." and Mr. SMITH, of Woolston, to know that this lesson is being given in the midst of a large estate which is wholly let on lease—whose landlord, indeed, would not let his land in any other way. The whole of this estate, moreover, is left to the tenants to farm it how they choose, up to within four years of the end of the term. The only security for the fertility of the property is, in fact, the self-interest of the tenant. And its present condition is sufficient proof that the security in question is great enough for its purpose. Leases for 21 years, with liberal covenants, and provision made towards its close for a retaking on mutually favourable terms,—these, combined with care in choice of tenants, are all the security which the landlord needs for ensuring the maintenance of his own influence, the prosperity of his tenantry, the fertility of his land, and the welfare of the labouring population. It seems to us, in the light of such an example as this, that Mr. SMITH, of Woolston, is not far wrong when he declares that the only conditions landlords need impose upon their tenantry are, "Pay your rent, and keep your land clean." With Rothamsted experience to sanction such a maxim, and imperturbable good humour to help him in the contest, we do not think he need be daunted even by the slashing onset of such a fighting man as "G. A. H."

—— In Monday's Corn Market the prices of the previous week were not exceeded, and on Wednesday no change took place.——In the Metropolitan Cattle Market trade was dull both on Monday and Thursday, the supply exceeding the demand.

—— The programme of the great annual meeting of the Royal Agricultural Society at Oxford is already issued. The class of implements entered for competition this year include steam-engines and various farm implements. The trial of these machines will take place before the Society's judges in the week July 11—16. On Monday, the 18th, the entire showyard will be open from 8 in the morning, at which hour the judges will commence inspecting the live stock, and making their awards. On Tuesday, the 19th, general meeting of the members in the showyard will take place at 2 o'clock. The yard will remain open until Friday evening. Members of the Society are admitted free. The public are admitted daily up till Monday evening, July 18, on payment of 5*s.* each. On Tuesday and Wednesday the charge will be 2*s.* 6*d.*, and on Thursday and Friday 1*s.* each. The exhibition of cattle in the rings will take place at 10, and of the horses at 12 noon, each day after Monday. The following are this year the principal officers of the Society:—*President:* His Grace the Duke of Devonshire, K.G. *Stewards of Departments*—Live stock: Mr. Davies, Mr. Jacob Wilson, Sir Watkin W. Wynn, Bart. Implements: Sir A. K. Macdonald, Bart.; Major Wilson, Mr. C. Wren Hoskyns, M.P.; Mr. W. J. Edmonds (Steward elect). Finance and Showyard Receipts: Major-General Viscount Bridport, Colonel Kingscote, M.P.; Mr. Davies, Mr. Randell, Mr. Torr. Forage: Mr. J. Druce. General Arrangement of Show: Mr. Brandreth Gibbs.

—— The reaping-machine trials organised by the Société des Agriculteurs de France, under the presidency of his Excellency M. DROUYN DE LHUYS, will be carried out as follows:—First series of competitive trials, July 5 and 6, at the farm of M. DECANVILLE, Petit Bourg (Seine-et-Oise), near Paris. Second series competitive trials, July 25, at Chamant, near Senlis (Oise). A 1st prize of 1000*f.* is offered by the Société des Agriculteurs de France, and two prizes of 500*f.* offered respectively by the Agricultural Societies of Seine-et-Oise and Senlis are also at the disposal of the jury. The jury will consist of eight members, of whom seven will be chosen from a list of 15 names by the exhibitors themselves, and one English member, whom the Royal Agricultural Society of England will be respectfully requested to nominate. Intending exhibitors will receive a certificate of admission upon sending a written entry to the Société des Agriculteurs de France, 43, Rue du Bac, Paris, before July 1, 1870.

—— The Norfolk Agricultural Society is holding its annual meeting and show at Harleston as we are going to press. In the cattle classes Shorthorns and Devons are in strong force. In sheep, Southdowns are well represented. The PRINCE OF WALES is among the exhibitors. There is also a large show of cart-horses, hunters, and hackneys.

—— Mr. J. J. MECHI, writing to the *Times* on harvest prospects, calls attention to the fact that the drought is affecting injuriously much the greater portion of the occupied land of the country. "In the United Kingdom, with an area of 45,000,000 available acres, we grow only 3,700,000 acres of Wheat. My experience teaches me that we might grow much more Wheat with advantage, and abolish much poor and unprofitable pasture."

OUR LIVE STOCK.

CATTLE.

THE herd from whence sprung BOLIVAR, the famous Leicester prize bull of 1868, may fairly be called "celebrated," and an inspection of the interesting catalogue, just issued by Mr. Thornton, shows clearly that its reputation does not depend upon the fame of any one animal. Our readers will hardly need reminding that the herd thus alluded to is the one which for the last 12 years has been carefully bred by Mr. Meadows, of Thornville, County Wexford. Mr. Meadows has resolved to make a sale, and we have pleasure in drawing attention to what he has to offer to the Shorthorn-loving public. The interest of this catalogue is enhanced by the introduction of notes upon the past history of each animal. Thirty lots, 27 of which are females, will be sold. First on the list stands *Chemisette*, by FAMOUS, the grandmother of *Chaumontel*, winner of the 1st prize at Dublin in the heifer class this spring. This grand old cow, now above 12 years old, is the mother of *Camisole*, *Canezou*, and *Chansonette*, all celebrated prizetakers. *Fanny 7th*, by SATAN (16,910), is the oldest representative of several excellent cows and heifers of the same name, among which we may name *Fanny 9th*, by FUGLEMAN (a King's Fort bred bull), which as a calf distinguished herself as the best animal in the yard at the Wexford meeting, 1862. Lots 4 to 8 include five cows, all first-class prizetakers, by FUGLEMAN. Lot 9, *Chansonette*, by FIRST FIDDLE, is a daughter of lot 1 and mother of *Chaumontel*, above referred to. Next upon the list is *Bloom*, by FIRST FIDDLE (19,749), and from *Blossom 5th*, by DUKE OF BEDFORD, and therefore full sister to BOLIVAR. The remainder of the catalogue fully bears Mr. Thornton out in speaking of "the small but distinguished herd" at Thornville. In conclusion we may say that this stock comprises the representatives of six noted tribes, as follows:—Four heifers and a bull, descended from *Chemisette*, by FAMOUS (12,857); ten members of the *Fanny* tribe; three *Primroses*, descendants of *Primrose* by ABRAHAM PARKER (9856); *Chintz*, by FUGLEMAN, and her two daughters; *Amelia* (of Chilton origin), by FUGLEMAN, and her daughter *Adelaide*, by VICTOR (25,371); and three of the Blossom tribe, from whence sprung BOLIVAR. Such good foundations have been improved by carefully selected bulls, such as PRINCE OF THE REALM, a sire worthy of his grandmother *Bonnet*, by BUCKINGHAM (3239), and his g.grand-dam *Bliss*, by LEONARD. Other sires recently employed have already been incidentally mentioned. The Thornville sale is advertised for the 30th inst.

—— There was a capital show of Shorthorns at the meeting of the Essex Agricultural Society last week at Chelmsford, of which the following statement is abridged from the *Chelmsford Chronicle*:—

"The quality of the pure-bred Shorthorns was very high throughout, and the class included four or five animals of extraordinary merit. The premium offered by the Society for the best bull was awarded to MONK, a red and white bull of fine shape and quality, belonging to Mr. James Upson, of Rivenhall; the 2d prize was given to WHIPPERIN, and owned by Lieut.-Colonel Brise, M.P. For the prize of £20 for the best bull of any age, open to all England, there was a strong competition, no fewer than 17 animals being submitted for the judges' approval. The competition was not merely strong in number, but in point of merit, as well—so much so that seven cards of high commendation were awarded, in addition to the prize. In this class, as in the last, Mr. Upson's bull MONK carried off the honours. The yearling bulls contesting for premium 43 were not over good altogether, but there was among them one remarkably fine animal—viz., Lord Braybrooke's HAYDON DUKE, qn whom the 1st prize was bestowed. This bull is of a rich roan colour, has splendid flesh, beautiful hair, and all the qualifications of a first-rate stock-getter. The judges spoke of him as *the* animal of the show, and there is no doubt that if he had been entered for the open prize he would have beaten Mr. Upson's bull MONK, which is saying a good deal for him. The Society's 2d prize in the yearling bull class was bestowed on a useful animal named OLD SAM, belonging to Mr. R. H. Crabb, of Baddow Place. The prize of £15 offered by Lord Braybrooke for the best yearling bull, competition open to all England, was won by his lordship's own bull, HAYDON DUKE, against an array of opponents whom it was a mark of distinction to beat. A fair class of bull calves were exhibited, premier honours going to Mr. James Christy, jun., of Boynton Hall. In the next class—an assembly of 10 excellent cows—the same gentleman was again the successful exhibitor, second honours being bestowed upon Mr. John Clayden, of Littlebury, and three others being highly commended. The 2-year-old heifers were a lot of useful animals. Among the yearling heifers brought together to do battle for premium 48 we encountered another remarkably fine specimen of the Shorthorn breed in *Knightly 2d*, a roan heifer by 3D DUKE OF GENEVA, the same sire as Lord Braybrooke's excellent yearling bull (HAYDON DUKE), dam *Dewdrop*; and the property of Mr. D. McIntosh, of Havering Park, Romford. To this animal the blue rosette was deservedly awarded, the 2d prize going to *French Aster*, belonging to Mr. James Christy, jun. In the next class of heifers, not over twelve and not under six months old, another representative of the 3D DUKE OF GENEVA, the property of Mr. McIntosh, was the winner of the 1st prize; the 2d was given to Mr. C. Barnard, of Harlow Bury, for *Thorndale's Sugar Plum*. The open prize of £20 for the best bull, cow, and calf, only brought two exhibitors into the field—Mr. G. Kersey Cooper, of Bowbeck House, near Ixworth, and Mr. John Clayden. The prize fell to the first-named gentlemen for a trio, headed by the celebrated bull HOGARTH 2D—Mr. Clayden, who showed a very creditable lot, receiving high commendation. Premium 51 was taken by a very good red and white bull, and a couple of equally nice yearling heifers, belonging to Lady Pigot, of Branches Park. These were closely run by a similar lot, exhibited by Messrs. Thomas Garne & Son, of Broadmoor. The half-bred cattle were a very miscellaneous collection, including one or two useful animals. The Alderney, Jersey, or Guernsey cattle formed a pretty feature of the show, and the shed under which they stood was a good deal visited by the people on both days.

—— The following interesting reminiscences of a bygone time were communicated by Mr. James Fawcett to the late Mr. Dixon, and appear as a note in the last work of that untiring chronicler of rural affairs:—"I have endeavoured to recall from the depths of memory some of the bygone days spent with my old friend and tutor Mr. Bates, of Kirklevington. Having studied at the Edinburgh University, he was well up in the chemical and scientific part of his business, and far beyond his neighbours in that respect. The chief enjoyment, however, of his life was in his cow pastures, which were generally visited once or twice a day, and the history and points of each animal made known to any visitor as it came up to have its head rubbed. I well remember the interest and pains he took to initiate me into the mysteries of 'handling.' What he termed quality he considered the most essential point in cattle, and under this designation he included aptitude to fatten, early maturity, symmetry, firmness of bone, and, above all, the covering of the frame evenly with flesh of a delicate fibre, and well intermixed with fat. In those days he had very few pure Duchesses and Kettons, but a number of beautiful cows by KETTON and KETTON 2D, from choice Argyleshire heifers, which he had selected with the view of rearing an original herd like Charles Colling, whose success he attributed to the judicious blending of that blood, obtained through GRANDSON OF BOLINGBROKE, with the best Shorthorns of the day. From some cause or other, he lost the Argyleshire tribes after leaving Northumberland, and steadily cultivated the Duchesses, and one or two other tribes, among the best of which were *Red Rose* and *Fairy*, two splendid cows, from Mr. Hustler. From the former he bred 2D HUBBACK, by the EARL, which he considered the best bull he ever had, and destined to become quite a regenerator of Shorthorns. He was a light red bull, with a lemon muzzle, and as perfect in his points as could be desired, at the same time evenly covered with flesh of the best possible quality. Mr. Bates considered Mr. Charles Colling to have been the most thorough judge of cattle of his day, and, in fact, the originator of the improved Shorthorn, having imbibed this knowledge from Mr. Bakewell, of Dishley, with whom he lived some time *in statu pupillari*. He thought that his brother Robert's fame as a breeder was entirely due to the superior judgment of Charles, whose bull FAVOURITE was the undoubted fountain-head of pedigrees, and the source of their distinction, being the sire of COMET, KETTON, &c., as well as of the famous old cows *Princess* and *Duchess*. Mr. Bates used to describe FAVOURITE as a very rich roan, robust and massive animal, with a very fine, long, and downy coat, and superb handling, but by no means so 'pointy' a bull as his son COMET, although a much better sire. He thought him so much better than the other, that he did not scruple to breed in-and-in with him several times, and with success. He was an advocate for that mode of breeding, and at last preferred it to having recourse to impure blood, as there was apparently (in that day at least) no bad result from it in his cattle, which were distinguished by their vigour and healthy appearance. To dairy properties, too often overlooked, he paid great attention, and very few of his cows were deficient in this respect."

—— Mr. Torr has sold to Mr. Brassy, M.P., Preston Hall, Kent, by the advice of an experienced and practical breeder, the following 15 animals from the Aylesby herd. They are remarkably good heifers, and are from one of the best large herds in the country. We are not at liberty to name the prices, which are high:—

Waterloo Plume, red and white, calved July 30, 1866; got by PRINCE OF WARLABY (15,107), dam *Waterloo Princess* by BRITISH PRINCE (14,197).

War Parade, roan, calved May 26, 1869; got by CHERRY PRINCE (23,555), dam *War Dance* by FITZ-CLARENCE (14,552).

Welcome Lass, roan, calved May 17, 1865; got by BREASTPLATE (19,337), dam *Welcome Princess* by BRITISH PRINCE (14,197).

A roan heifer, calved October 30, 1869; got by BLINKHOOLIE (23,428), dam *Welcome Lass* by BREASTPLATE (19,337).

A red and white heifer, calved January 18, 1869; got by BREASTPLATE (19,337), dam *Weal Blossom* by FITZ-CLARENCE (14,552).

A roan heifer, calved October 12, 1869; got by BREASTPLATE (19,337), dam *Waterloo Plume* by PRINCE OF WARLABY (15,107).

Welcome Dawn, roan, calved July 2, 1868; got by CHERRY PRINCE (23,555), dam *Welcome Dane* by BREASTPLATE (19,337).

Wave Ripple, roan, calved March 16, 1866; got by

KILLERBY MONK (20,053), dam *Wave Princess* by BRITISH PRINCE (14,197).

Wave Rise, red and white, calved May 31, 1869; got by BLINKHOOLIE (23,428), dam *Wave Ripple* by KILLERBY MONK (20,053).

Warrior's Crest, red and white, calved April 24, 1869; got by BLINKHOOLIE (23,428), dam *Warrior's Plume* by BREASTPLATE (19,337).

Wave Elf, roan, calved October 28, 1868, got by CHERRY PRINCE (23,555), dam *Wave Naiad* by BREASTPLATE (19,377).

Bright Halo, roan, calved July 10, 1868, got by BREASTPLATE (19,337); dam *Bright Dew* by BRITISH PRINCE (14,197).

Bright Diadem, red, calved August 25, 1868; got by MOUNTAIN CHIEF (20,383), dam *Bright Queen* by FITZ-CLARENCE (14,552).

Bright Rinqlet, red, calved July 14, 1869, got by RINGLEADER (15,164), dam *Bright Queen* by FITZ-CLARENCE (14,552).

Bright Cherry, roan, calved December 19, 1868, got by CHERRY PRINCE (23,555), dam *Bright Spangle* by PRINCE OF WARLABY (15,107).

POULTRY.

MR. TEGETMEIER draws attention to a new plan of classifying fowls according to their various qualities and characters, published in the "American Agriculturist" of June, 1870. As the proposed classification is not thoroughly adapted to English requirements, Mr. Tegetmeier has presented an arrangement of his own more in accordance with the experience of this country.

A. PROLIFICACY.—*Non-sitters*: Hamburghs, Leghorns, Spanish, Houdans, Crèvecœurs, and Polish. *Sitters*: Brahmas, Cochins, Dorkings (for winter layers, Brahma and Cochin pullets superior to all others).

B. VALUE FOR TABLE.—*First-rate table fowls for market*: Dorkings, La Flèche, Houdan, Crèvecœurs. *For home use*: Cross-bred Dorkings and Brahmas, cross-bred Crèvecœurs and Brahmas, Brahmas, Cochins.

C. HARDIHOOD.—*Hardy*: Brahmas, Cochins, Houdans, Leghorns. *Hardy, if with unlimited range*: Spangled Hamburghs, game Crèvecœurs. *Delicate*: La Flèche, Dorkings, Polish, Sultans.

D. SIZE OF EGG.—*Layers of large-sized eggs*: Crèvecœurs, Spanish, Houdans, La Flèche. *Layers of medium-sized eggs*: Leghorns, Cochins, Brahmas, Dorkings, Polish, game. *Layers of small eggs*: Hamburghs, Bantams.

E. SIZE OF BIRDS.—*Large*: Brahmas, Cochins, Dorkings, La Flèche, Malays, Crèvecœurs. *Medium*: Spanish, Leghorns, Polish, game. *Small*: Hamburghs, Sultans, silkies. *Diminutive*: Bantams.

F. ACTIVITY.—*Active fowls*: Hamburghs, game, game Bantams. *Less vivacious*: Spanish, Leghorns, Dorkings, &c. *Very domestic and quiet*: Brahmas, Cochins.

G. INCUBATION.—*Good Sitters*: Brahmas, Cochins, Dorkings, game, farmyard fowls, Bantams, silk fowls. *Non-sitters*: Hamburghs, Spanish, Leghorns, Polish, French breeds.

A SUBURBAN FARM.

[We give the following extract on this subject for the benefit of our correspondents, from the Prize Essay by Mr. J. Bligh Monck, which appeared some years ago in the Journal of the English Agricultural Society.]

MANY persons who are led by the social and other advantages of town life to give it the preference, nevertheless acknowledge the superior beauty, healthiness, and other attractions of the country. The bright corn fields, the orderly array of luxuriant "bracts," the cheery faces of the rural population, the readiness with which a bountiful Nature perfects the work of the husbandman, hold out to them a very tempting prospect. But what if the enjoyments of either way of life can be combined by the occupation of a farm close to a town! What position can be so desirable, presenting such ready opportunities for selling on the spot the more bulky and perishable articles of your production, and again of procuring close at hand the refuse which your customers are anxious to be rid of?

As I find many practical farmers hold this opinion, and the generous offer of a prize for the best description of suburban farming almost implies that some special management is essential to success near towns, I venture to offer the result of twenty-five years' experience on a gravelly soil liable to burn, in the immediate vicinity of a borough of upwards of 20,000 inhabitants. I shall have to consider the advantages attendant on such a situation with its accompanying drawbacks, that I may assist owners and occupiers of land under the like circumstances, in turning the one to the best account, and in making light of the other.

Nearly thirty years ago I was forcibly impressed with the fact, that land let to a farmer on one side of a boundary hedge fetched about 30*s.* per annum, and the adjoining land, in precisely the same circumstances, was taken by a market gardener at £5; while the latter was making money, the farmer could barely get a living. I therefore determined to try for myself whether, without losing my position and independence as a farmer, I could not realise some advantage from having a large body of consumers in my immediate neighbourhood, and, luckily, began with a few acres at first to learn my lesson and put my ideas to the test of practice. My first efforts were, as is usual with young beginners, unsuccessful. I endeavoured to grow vegetables for sale, supplied straw to butchers and horse-keepers, receiving dung in return; but I soon discovered, what I now find to be a general rule in all trades, that the retail dealer—*i.e.*, the middle-man, between the producer and the consumer—reaps all the profit. I grew some excellent crops of vegetables, but could not sell them unless I went about myself with a hand-barrow. For Cabbages—sold in the shops at 2*d.* a head, or Turnips realising 2*d.* a bunch, which at this rate would have realised £20 per acre—I was offered 3*d.* or 4*d.* per dozen by the greengrocer. This, with the trouble of weeding out all the inferior ones, and the drawback of cleaning and delivering in small lots, and waiting for the money, at last produced a worse return than I could obtain by feeding cows. Early Peas gave the same result. A fine crop, which at the greengrocer's price of 1*s.* per dish would have made £40 or £50 per acre, only brought me many shillings less than I made eventually by selling the produce as seed. This was my first disappointment. I now find that I can sell a fair quantity of Potatos during the winter, and now and then a few tons of Mangel Wurzels or Carrots in the spring, at very remunerating prices; but as soon as there is any general demand for these, the farmers at a distance glut the market, and reduce the price to little over the feeding value.

My next disappointment was my dungheap. Though I got from the straw some hard cash besides the manure, this barely covered the expense of getting it out of the pit (always up a narrow courtyard) and loading. And after all it was not spit-dung; some was only dirty straw, and had to be used again under my own cattle; some was so heated and fire-fanged that it was not fit for the heap—all had to be turned over once or twice before it was fit to plough in; so that it cost me full 5*s.* a cartload by the time I had spread it; and I found I could make my own straw into dung at that price. I now sell all the straw I can spare at from 50*s.* to 60*s.* the ton, and buy good spit-dung, fit for use, as I want it—that is to say, when I have leisure to fetch it, and land ready to receive it. Having bought thus much of experience, I took in hand the rest of the farm, consisting of 100 acres of arable, and rather more of meadow land, from which I have succeeded in reaping a considerable increase, if not the full amount of my hopes, in rent and profit. Two objects have been kept constantly in view—to increase the quantity and quality of the dung; and, as a consequence, to grow the utmost amount of saleable produce. I now keep a herd of above thirty cows, or about twenty-five in full milk all the year round. These are soiled in the house, except from Midsummer to Michaelmas, when they go out into the meadows. They are fed in winter on chopped hay, straw, and roots, with bought grains, malt-dust, and a little meal. The milk is sold to milkmen, who fetch it from the cowhouse door, and pay 2*d.* a quart, ready money. Each cow produces £20 per annum, which, I reckon, pays for her keep, leaving me the dung for the litter. This latter I economise as far as possible by running all the liquid into a tank, to be drawn over the grass land; a very small quantity of straw is then required to absorb the remainder. This is further improved by the manure of 100 pigs fatted every winter. With this, and the help of four cart-horses, I am enabled to thoroughly dress one-third of my arable land every year. I plough it in 14 inches deep, with a second plough following in the furrow of the first, and thereby secure very large crops of roots: these are nearly all drawn for the cows or for sale, the tops and refuse being left to be penned over by sheep; the second year, Wheat; the third, Barley, partly after stubble Turnips fed off. After twenty years' repetition of this three-course rotation, I now get an average of 40 bushels of Wheat, and the same of Barley, the latter of prime malting quality, unless where the sheep, remaining too long on the Turnips, have made it rank. By thus keeping two-thirds of my land in corn, I get a large quantity of wheat-straw for sale, of barley-straw for fodder for the cows, besides a few acres of Potatos and roots for sale. The horses and cows eat about three-fourths of the meadow hay, and leave the rest for sale. The meadows, mown every year, are kept in condition by refuse ashes, road dirt, and inferior dung bought in the town, of which large quantities can be procured for less than 2*s.* the one-horse load, or about £2 per acre, every third or fourth year.

In assessing the profits of my farm, I shall compare it with 200 acres of similar land at a distance, the arable being supposed to be farmed highly on the four-course system, and cows kept for the sale of butter or calves, or beasts fatted in yards with the same amount of purchased food:—

Nett produce of 30 cows, at £20 per cow ..		£600
Deduct usual produce of do. at £14		400
Leaving a profit on selling milk		£200
Arable produce of 33 acres of Wheat × 5 qr. 165 qr.		
Instead of 25 acres do. × 4 qrs.	100 ,,	
Increase	65 ,,	
Profit on 65 qr. at 55*s.* average price (nearly) ..	£180	
Add 8 tons of wheat-straw	20	
		200
Produce of 8 acres of Barley additional = 40 qr., 37*s.*		75
Potatos or roots sold, say 5 acres nett		50
Hay sold, say 10 tons only		50
		£575
Deductions.—Extra rates	£50	
Do. cost of labour	100	
Manure purchased	50	
		200
Leaving as clear profit of suburban farm over the same under the usual management ..		£375

In order not to burden the above account with any unnecessary figures, I have omitted all mention of profit from sheep or pigs, which in my case is pretty much the same as in that of other people. I fat off about 100 pigs and wethers, and lamb down 100 ewes, which are sold with their lambs in the spring. The 28 acres of roots which enable me to keep this stock, besides supplying some 500 tons of Mangels, Turnips, &c., to my 30 cows, manifestly give as good a return as 50 acres of fallow crops under ordinary management.

I come now to the deductions, with which I have debited the account. I find the general rateable value of a farm situate as mine is to be about £1 per acre more than if it were away from the town, and the rates, including a borough rate instead of county rate, to be somewhat higher; I have, therefore, deducted £50 on that head. I find, too, the labour bill is large. House rent near towns is very high. Common labourers, through the summer, can get their half-crown or more per day, and consequently will not work at farmers' prices, even for constant employment. There is also a little more expense incurred in mending fences, bird-keeping, &c. The £50 worth of ashes, &c., is as much as we have time to cart home in the course of the winter. After making these necessary allowances, the handsome balance of £375, or nearly £2 per acre, remains to be divided between the landlord and the tenant. I have obtained this result now for a series of years with great regularity; indeed there is very little difference in the amount of the corn crop between good years and bad years.

FRENCH PURCHASES OF WHEAT.

A FACT on which we have often dwelt is once more attracting some notice. France, which is usually a Wheat-exporting country,—a country from which we occasionally take a considerable portion of our total imports of Wheat,—becomes sometimes an importer of that article, and a competitor with ourselves in the food-markets of the world. And the present is one of the occasions when she is a buyer. The season, which has not been favourable for most crops in England, has been bad for almost all French produce. The long drought has excited no little apprehensions about the coming harvest—a fact which tells more, of course, as last year's harvest was somewhat deficient. Consequently, it is understood, large purchases of Wheat have lately been made on French account, and this is the principal cause in the sudden rise in price which has lately taken place. It is obvious that a fact of this sort must be of no small economic importance. Anything which causes fluctuations in Wheat is important, but such great fluctuations in the condition of France, as her changes from selling to purchasing Wheat imply, must deserve investigation for themselves.

But first as to the fact of the fluctuations in the attitude of France. This is sufficiently indicated by the extreme variations in our own imports from that country. Sometimes she sends a great deal, but often so little as not to count—showing, in fact, that what is imported is for some special purpose, an isolated transaction of some kind, not a real contribution to our food supply. When she sends us little we may be sure that she is very probably competing with us in the grain markets of the world. The following are the figures of our imports of Wheat and Wheat-flour from France for a series of years:—

	Cwts.
1859	8,124,978
1860	4,583,412
1861	1,359,882
1862	1,961,835
1863	1,857,403
1864	2,854,424
1865	6,058,902
1866	8,023,530
1867	2,140,832
1868	846,863
1869	2,153,350

The fact of great fluctuation is thus established. It would be difficult to imagine more irregular action than that of France in this department of dealing.

What, then, are the causes and effects of this very important fact? To begin with the latter, perhaps the chief result is to aggravate excessively the fluctuations in the supply and price of our Wheat. France is a not unimportant source of supply. Mr. Caird has calculated for the twelve years ending with 1866 that she sends us 12 per cent. of the Wheat we get. Her average contribution is large enough to count for a good deal, and as the average is the result of enormous fluctuations she may frequently be among the principal countries from which we import. In 1866, the year of highest import from France since 1860, her contribution was in fact 27 per cent. of the total. In 1859 her contribution was 38 per cent. The imports of Wheat and flour for these two years are:—

		From France only.	Proportion of Import from France to Total Importation.
	Total cwt.	Cwt.	Per cent.
Imports in 1859 ..	21,497,734	8,124,978	38
Imports in 1866 ..	29,371,679	8,023,530	27

And the peculiarity is that this country, whose dealings are so important to us, is likely to sell in years

when our own home supply is good, and to buy in years when it is bad. Her soil and climate and situation are so nearly alike to ours that a bad harvest in the one country is likely to occur when there is a bad harvest in the other; and so with good harvests also. Consequently the action of France is almost always of the worst possible kind for the interests of our consumers and agriculturists. In bad years she makes Wheat much dearer, for even a little difference in demand makes a great difference in price with articles of prime necessity. In good years, when prices would naturally be low, she aggravates the fall in a way that diminishes the profit of the farmer without any corresponding benefit to the consumer. To a large extent, too, the irregular action of France is a cause of violent fluctuations. Naturally in such a business, with so many and various sources of supply, prices will be likely to rise and fall in cycles, as in fact they mostly do; but the interference of a country like France introduces a highly speculative element. A few weeks' bad weather, instead of varying her surplus, as with other food-supplying countries, or the extent of her purchases as with ourselves, suffices to convert her from a large seller into a large buyer. So sudden and incalculable a change naturally upsets markets, and is no slight misfortune. In these two ways, then, the unfortunate effects of the irregularities of France in exporting and importing Wheat may be traced. She is the cause, first, of greater extremes in price, and then of more violent fluctuations, than would otherwise occur.

But second—as respects the causes of these irregularities, which are found to be so mischievous—they may all be summed up in one, though it may appear at first sight far-fetched. The real reason why France acts so mischievously is her system of peasant proprietorship. The point may require a little elucidation, but it is not in any way difficult. The French system has one effect to which the cause of the great fluctuations in the yield of her Wheat harvests is distinctly traceable. It means bad cultivation. How bad the actual cultivation of France notoriously is we need hardly say. While the average yield of Wheat per acre in England is 28 bushels, in France it is only 15, a difference of nearly 100 per cent. in favour of our agricultural methods. And as the wheat land of France is of vast extent, peasant proprietorship means bad cultivation over an enormous area. These conditions involve great fluctuation in the yield. There is no doubt first that the crops under poor cultivation are more subject to bad weather influences than crops on well cultivated land. Good agriculture will all but ensure crops in spite of weather, but the needy farmer is at the mercy of the elements. Both kinds of crops fluctuate with the weather, but the poor crops fluctuate most. Again, the mere fact that the effect is spread over a large area in proportion to the total yield makes a good or bad season more telling than when cultivation is concentrated. As Mr. Caird explains—"The effect of good or bad seasons is more intensely felt in all the chief corn countries than in our own. This arises from our higher average rate of produce, and the consequent smaller extent of surface at the mercy of the seasons. A bushel an acre, above or below the average, makes a difference of less than half a million quarters in the total yield. In the United States each bushel indicates a million-and-a-half quarters, and in France upwards of two millions of quarters of variation."

It is thus clear that a result of French peasant proprietorship is the fluctuation in its harvest, which has so mischievous an economic effect. With a better system of agriculture there would either be less land laid out for Wheat to yield the present average crop—consequently a less surface exposed to the mercy of the seasons, and a steadier crop; or the same land would always produce a much larger crop, and the fluctuations in proportion to the average supply would be less. The former alternative would be the more likely, as the economic circumstances of France are too like those of England to make a large cultivation of Wheat for export profitable; but whichever should be the actual practice, the peculiarly irregular action of France in the Wheat market would cease. And the peasant proprietors would gain as much by the change as the consumers of their produce. *Economist.*

A SMALL FARM IN BELGIUM.

THE cow-keeping of *la petite culture* may be truly described as arable land dairying, for the quantity of grass is generally not much more than sufficient for an exercise-ground, certainly not enough to have much influence on the system of feeding, or the method of farming. There are two systems of feeding milch cows—the warm-food system, and the cold-food system. The former is practised chiefly in the Campine, and to some extent in the Pays de Waes; but the latter is the more general in the remainder of Flanders, except with the smallest farmers.

Warm-food System.—Before the farmer and his family go to bed, they hang a large cauldron over the wood fire in the capacious fireplace. In this vessel they put Turnip-tops, a few Turnips, any weeds that may have been gathered, some cut grass, a little (very little) rye meal, a small modicum of rape cake and a quantity of water, enough to give the cattle (large and small) a good drink each. This broth is given lukewarm at 5 o'clock in the morning, after which the cows are milked. In summer, at 6 o'clock, the cows are led about the pasture until 8 or 9 o'clock, when they return to the stables, and get some cut grass between that hour and noon. Another allowance of soup is then given, and the cows are milked a second time. At 4 o'clock they go into the pasture, having had a little more cut grass in the interim, and at 7 o'clock they are brought in, get some more broth, are milked for the third time, and finish their day with more cut grass. On a farm of 60 acres, which was a good representative Campine farm, and where we saw nine milch cows, two heifers, and four calves (one beast to 4 acres), the cauldron in which this soup was made held 55 gallons. In summer it was half-filled each time, and in winter it was quite filled, to make up for the deficiency in green food, so that each animal got about 2 gallons of soup three times a day in summer, and 4 gallons each time in winter.* The allowance of cake and meal to these 15 animals was 1½ gallon of rye meal per day in summer, and double the quantity in winter, and a little more than 2 lb. of rape cake per day (not each, but for the whole of them). In winter the other ingredients of the soup are chiefly hay and Turnips. About the middle of September the cows, when out, go on Spergula, instead of grass, and live as much as possible on that food and the soup until the appearance of frost, which destroys Spurry immediately. Spergula is sown for this purpose as a catch-crop after Rye, instead of Turnips.

The arrangements for cooking the soup and conveying it *en masse*, while warm, into the cow-house, demand a brief description, not for their economic value, but because they form a characteristic feature of a large portion of the small-farm system. They also furnish another illustration of a peculiarity which struck us very forcibly—that primitive contrivances entailing continuous labour are often resorted to for the purpose of saving the first cost of more perfect machinery.

There are two plans in vogue in the Campine and some parts of Flanders, one known as the Old Campine system, and the other as the New. The former is illustrated in figs. 160 and 161, and the latter in fig. 163, which also gives an idea of the arrangement of the farmhouse.* The cooking apparatus consists of a ponderous wooden crane, the shaft of which works in a socket in the floor, and in an eye projecting from the back wall of the living-room; the position of the shaft is nearly equidistant between the fireplace and the door leading to the cow-house, but nearer the latter. The arm of the crane is made as long as possible, with a view of its carrying the cauldron into the cow-house, even at the expense of the necessity of "fending" it off from the projecting corner of the entrance lobby near the fireplace. From the end of this arm the cauldron is suspended by a chain at the upper portion, attached to an iron screw-rod which works into a female screw in the centre of the cauldron handle. By this arrangement the cauldron can be raised or lowered, as required, by turning it round a few times. In this system it will be seen that the fireplace is situated at the end of the living room opposite to the door leading into the cow-house.

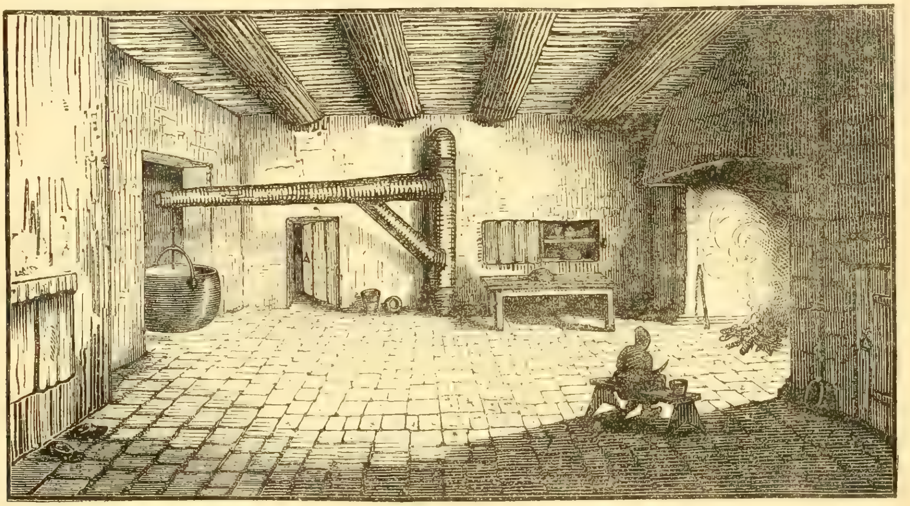

FIG. 160.—INTERIOR OF LIVING-ROOM IN A CAMPINE FARM-STEADING, ILLUSTRATING OLD METHOD OF COOKING FOOD FOR COWS (*See Plan, fig.* 161).

In the modern Campine system the fireplace is at the other end of the living room, and the entrance to the cow-house is through a small iron door at the back of it. Therefore, instead of the enormous crane just noticed, only a small but strong iron bracket is required; this is attached close to where the door opens, and is sufficient to swing the cauldron from the fire to the cow-house, or *vice versâ*. The only relative disadvantage possessed by this system is a real danger, viz., of fire; for with the least draught the incandescent wood ashes, being very light, are liable to be blown on to the straw and other easily inflammable materials in the cow-house. The small farmers are convinced that the cooking consumes little or no fuel, because it is done immediately after the preparation of their own meals!

On what are termed "model" farms, where the account of "profit and loss" is omitted from the ledger, one frequently sees steaming and boiling apparatus of the most extensive and ingenious description; but in *la petite culture* cooking for cows is generally done in one of the two ways which we have described; while the labourer-farmers are, of course, reduced to the use of the simple saucepan.

The Cold-food System is practised by some of the most intelligent of the small farmers, by many proprietors, and on most large farms. In illustration of it we shall describe the treatment of both cows and

* It is necessary to remember the [illegible] of the food in [illegible], the quantity and quality of the [illegible].

* The buildings in the Campine consist of but two buildings, generally placed at a right angle to each other; one is shown in figs. 160 and 163, and the other is simply a large barn and [illegible]. There is no separate [illegible] or manure-house, the [illegible] [illegible]

younger beasts, as well as feeding steers, as practised on one of the best farms in the Pays de Waes. This farm of 20 acres is the one to which we have referred as maintaining four cows, three heifers and calves, and five feeding beasts, assisted by hay bought off the water-meadows, and by the common-right to the aftermath during September and October. The cows are milked about 5 o'clock in the morning, and go out between 5 and 6 on to the little bit of pasture belonging to the farm; when the heat begins to be oppressive they are brought into the cow-house, and given Clover and hay; about the middle of the day they are milked, and afterwards get more Clover or cut grass. Towards sundown they are turned out again until dark, when they are brought in, milked the third time, and get some more Clover the last thing. In the winter their food consists of cut Turnips and Carrots, Turnip-tops, oat-straw, hay, and a little Rye, or, when there is no corn, some linseed cake or cake meal. In the autumn they live to a great extent on the aftermath of the water-meadows, but it is the prevailing practice when a farmer has grass of his own, to cut it and give it green in the cow-house, in preference to allowing the cows to tramp about the pasture. Under this system no food is cooked, nor is any warm drink given; and those who practise it believe that the animals keep in better health than on the Campine plan. The 2-year-old steers are given cake in September, beginning with about 3 lb. each per diem, and gradually increasing to 9 lb. or 10 lb.; * and they are generally sold in November, weighing from 6 to 7 cwt.

As a further illustration of the principles of the "cold-food system," and especially to show the importance attached to "drinks," we shall give the practice pursued by another of the best farmers in the light-land region (in East Flanders) on a farm of 60 acres. In summer the cows get Clover in the stables between 5 o'clock and half-past, and are led about the grass from 6 to 10. At noon they get a drink of cold water, mixed with an allowance of half a pint per head of rye meal, oatmeal or crushed linseed. From 5 to 8 o'clock in the evening in summer, and in the autumn from 3 o'clock until 6, they are again tethered on the pastures, and during the day are fed chiefly on Clover. When they come in at night, they get another drink and some more Clover. The great point is to keep the cows indoors during the heat of the day and at night, and to give them plenty of liquid food at milking times. In the autumn the evening allowance of Clover is accompanied with plenty of straw, which is regarded as a preventive of the illness which would otherwise ensue from eating Clover wet with autumn dew. The straw is given long, and the cows pick out the best of it. Another hygienic point is that Linseed for food is always crushed, but as a medicine it is always given whole. In the winter, on this farm, the cows got about half a hundredweight of Turnips each three times daily, namely, between 6 and 7 o'clock in the morning, at noon, and about 6 in the evening; they also get the drink with the two latter meals, and straw the last thing at night.

Calves are fattened in some districts, the food consisting entirely of milk at first, then bread and milk, in large and gradually increasing quantities; but it is necessary to be careful not to give too much, otherwise they get diarrhœa. Should this occur the milk is withheld, and the diet altered to lukewarm soaked bread which has been boiled in water. The food is given at stated times with great regularity, generally in three meals per day.

In all well-regulated farms it is considered essential to have the power of preventing beasts from obtaining access to the vessel in which their food is ordinarily given, whenever that may be deemed desirable. This is effected in two ways; either the food is given in a trough, separated from the animals by a screen furnished with trap-doors (see fig. 162), or the prepared food is given in tubs (fig. 163), which are placed in the troughs or on a bench, and can be taken away at pleasure. The object is to ensure the regular feeding of the animals; to ascertain, by a cow's appetite, the state of its health; and to enable the tubs and troughs to be kept thoroughly clean. The same principle is carried out in feeding calves by putting baskets over their noses; and also in the construction of pig-troughs by a swinging shutter which may be bolted to the front or back of the trough. The cattle are usually nearly pure Dutch; but a cross of Durham is very much prized.

In large towns the small farmer can sell his milk at the remunerative price of 2½*d.* per quart; but where such a market does not exist, the milk is made into butter, which at 1*s.* per lb. gives something less than half that return. *Mr. Jenkins' Report on the Agriculture of Belgium, in the Journal of the R. A. S.*

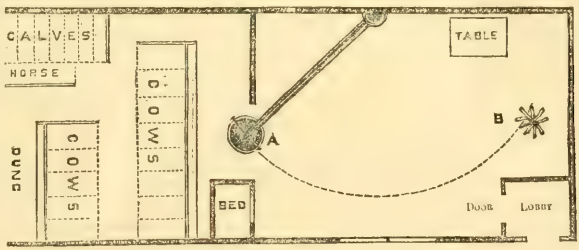

FIG. 161.—PLAN OF PART OF FARM-STEADING.

A, Cauldron suspended from arm of a crane; B, Fire.

DAIRYING IN AMERICA.

WE believe in improved stock, but it is more judicious for dairymen to improve herds gradually than to expend a large amount of money in getting together at once a dairy of thorough-bred animals. We are speaking now in reference to farmers who seek to make a profit by the production of milk, in distinction from the breeder, whose profits in part may come from the sale of blooded stocks. To purchase thorough-bred stock at from 300 to 500 dollars or more per head, for the purpose of butter or cheese-making alone, would be, in our opinion, a very unwise investment, and one that would not pay for the dairy. If good milkers be selected from the common stock of the country, it may be profitable to purchase a thorough-bred bull, breeding from the best cows, and thus by raising a certain number of grades each year a superior herd will, in a few years, be established at a moderate expense.

It is no easy matter to get together a herd of "first-class milkers." Even among thorough-breds of any breed there is great difference in the milk-producing capacity of different animals. There are thorough-breds of every breed that are unprofitable for the dairy—animals that will not give sufficient milk to pay for their keep. A dairyman looking only to the yield of milk and its quality, would hardly care, and, indeed, could not afford, to retain in his herd an inferior milker, even though she may be faultless in form. Then there are accidents constantly occurring among dairy stock that render it advisable to turn off certain animals every year, replacing them with sound stock. The annual loss from this change, if improved stock at high prices was employed, would be so large as to make a serious inroad on the profits of the dairy. The practical dairyman, therefore, looking to all these considerations, finds it to his advantage to work into improved stock gradually—to purchase thorough-bred bulls of good milking families from time to time, and perhaps a good thorough-bred cow, improving his stock by this means rather than paying fancy prices on a large scale to breeders.

What breed is considered best for a butter dairy, is a question upon which there is great difference of opinion. In selecting breeds a very important point to be considered is a breed that is well adapted for the soil or farm where it is to be kept. The Shorthorn, for instance, would not be a good breed for rough, mountainous pastures where feed is scanty or not easily obtained, but on rich, level, or slightly undulating land, affording an abundance of sweet, nutritious herbage, it might give the very best results. On rough, hilly pastures, perhaps there is no breed more profitable than the Ayrshires. They are hardy, and yield a large quantity of milk of good quality. The Devons yield milk rich in quality, but as a breed they are not remarkable for quantity. They are esteemed by many as a good breed for butter, especially grades, or a cross on the common stock of the country.

Of all the breeds there is none which surpasses the Alderney in the richness of milk. They yield only a moderate quantity of milk, but it is of a deep yellow colour, and wonderfully rich in cream and butter. They are small, and more delicate in constitution than most other breeds, and require good shelter and feed. They are not a "beef-making" breed, and hence in turning stock failing in the dairy on account of accident or other causes they would not realise near so much money for the shambles as the Shorthorn and Devon.

The price of butter in the market depends more upon its manufacture, packing, and condition when it arrives there, than on any particular breed of cows from which it is produced. With high skill in manufacturing, and a strict observance of all the requisites for producing good butter, high prices may be realised without regard to breeds. Still, for the production of an extreme fancy article, all things being equal, we should say that the Alderney breed would give that which would command the highest price.

As to the average amount of butter to be obtained from the different breeds, we could give no definite reply without, perhaps, misleading our correspondent. In selecting cows it will not answer to rely upon any pedigree or race implicitly. Actual trial of every cow's milk, especially where butter is to be made, is the only reliable means of information in regard to its quality. We could give innumerable statements showing large yields of butter from cows of different breeds. Sometimes cows of different breeds have been put on the same pasture, and the amount of butter made from each in a given time compared the one with the other. Such experiments may be interesting, but are often a fruitful source of mischief, as a poor cow of one breed may be pitted against a good cow of another breed, or some of the breeds may not be adapted to the soil.

Some years ago experiments were made at Bradley Hall, in Derbyshire, England, with four breeds of cows. During the height of the season and when fed upon the same pasture, the cows of the different breeds gave per day as follows:—

Holderness, 29 quarts of milk made	..	..	38½ oz. butter.
Alderney, 19 quarts of milk made	..	..	25 ,,
Devon, 17 ,, ,,	..	..	28 ,,
Ayrshires, 20 ,, ,,	..	..	34 ,,

Here the Ayrshires are made to yield richer milk than the Alderneys. Youatt gives an account, on the other hand, of an Alderney cow which made 19 lb. of butter each week for three successive weeks.

In 1844 George Vail, of Troy, N. Y., received a premium from the New York State Agricultural Society for producing from six cows in 30 days 262 lb. and 9 oz. of butter. This is an average of 1 and 1¼ lb. a day for each cow during the trial. The cows were of the Shorthorn breed, and fed on pasture only.

In 1848 the first premium for butter made from five

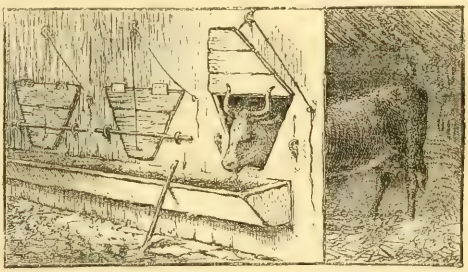

FIG. 162.—THE CATTLE-FEEDING OF LA PETITE CULTURE.

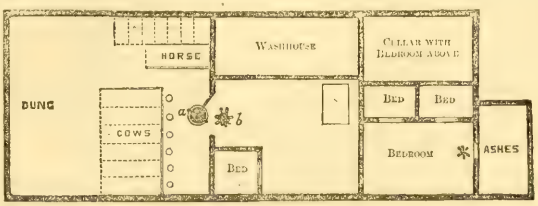

FIG. 163.—PLAN OF FARM-STEADING, ILLUSTRATING MODERN METHOD OF COOKING FOOD FOR COWS.

a, Cauldron; *b*, Fire; *o*, Tubs for cows' food.

* This farmer fed more liberally than his neighbours, and kept his farm in that admirable condition which we read is general in *la petite culture*, but which we have found exceptional.

cows in 30 days was awarded to E. R. Evans, Marcy, Oneida Co. His cows were of "native breed," fed on pasture only, and produced 249 lb. of butter—an average of more than 1¼ lb. per day.

In 1850 S. P. Chapman, Madison Co., N. Y., received first premium on Shorthorn cow, five years old, which made 40 lb. 2 oz. butter in 20 days.

It is stated on the authority of the Massachusetts Agricultural Society that the Oaks cow produced in one year, from April 5 to September 25, 480 lb. of butter, besides suckling her calf for five weeks. She was of the so-called "native breed," and had been purchased out of a common drove for a mere trifle. Besides pasture, she was fed on a bushel of corn meal per week, and all her own milk skimmed.

These statements, if they prove anything, go to show that good cows for butter may be selected from any breed; and in the case of the Oaks cow it is evident that the extra feed had much to do in producing the remarkable yield for which she is credited.

The butter dairymen of New York seem to be well satisfied with any breed of cows that will make an annual average yield of from 200 to 225 lb. of butter per cow.

In conclusion, we should say to one about commencing the business of butter dairying, and whose object is to make a profit from the business—select good milkers of any breed that can be purchased at fair rates. Do not invest largely in thorough-bred stock at fancy prices merely for the purpose of making butter. Find out first what breed is best adapted to your soil and climate, working gradually into the breed that appears to give the best results. And this should be done by breeding the animals on the farm—buying a good thorough-bred bull, one that comes of a good milking family, to be used with the herd, and raising calves only from deep milkers. This course will incur but little extra expense, and be in the end far more satisfactory than to attempt to reach the highest improvement in a herd by making a large investment. But if the object is to raise thorough-bred stock for sale in connection with carrying on the business of butter-dairying, why, that is another question. *Moore's Rural New Yorker.*

UTILISATION OF SEWAGE.

It is almost impossible not to mark the frequent hints given in your valuable Paper, commending to the notice of your agricultural readers the subject of the utilisation of sewage. Let those that know what it is to get two blades of grass to grow where only one grew before, go in the lull of their work and feast their eyes on the specimens of growth that sewage presents to them, and see how under it there can be grown not only two, four, six, but even eight or nine raisings of that commodity, grass, under which, in most cases this season, the land has lain almost idle. Agriculture is generally reckoned a slow but sure investment, procure for it sewage power and it is bound to be the liveliest business abroad. But with farmers even sewaging will have prejudices to overcome. Under sewage land exhibits an earliness and productiveness of growth not to be equalled by our present modes of raising crops, Hitherto sewaging has been considered not of the nature of things for agricultural talent, but only fit to be dabbled in by the engineer and chemist; and in the application of such skilled labour there thus arise in great measure the high figures frequently given currency to for its adoption.

The subject as regards towns divides itself into two distinct appointments—they that be engineers to the engines, pumps, pipes, and their belongings: and they that be agriculturists to the laying-out and farming of the land. The first to deliver the sewage along the various points, the second to take charge of it there and see to its distribution over land and crops until it be parted with, the standard purity.

Depend upon it, it is the man that knows the chemical and physical conditions of soil, and when to dig in dung and crop it—qualifications (acquired only by close observation and long experience on a farm) not to be expected in an engineer—that is to be trusted for sewage farming.

What man of the soil now-a-days would desire to be told how to drain his farm? And is the practice of sewaging, which is putting water on land, more difficult to comprehend than the more costly operation of draining, which is drawing water from it?—or, in preparing for drainage, is he, as is the fashion with sewaging, to indulge in hair-breadth engineerings and levellings all over his fields?—or are our ordinary farmers to call in the aid of professionals to be taught how to dress down each face of their ordinary 25 to 30 feet ridges, so as to get water to pass readily and uniformly down them?—or is any common ploughman ignorant how to plough a ridge so as to raise it in the centre and finish it with a uniform slope from crown to furrow?—or our more practised ploughmen, would they feel diffident at being tasked to lay off a feering for the formation of a ridge, or to finish at seed-time with a water-furrow, as it is called, with the plough and guiding poles in the direction of any parts that might be considered to lodge water—regulating its course in places either to accelerate or slacken the flow, inclining it at its connection with the part to be tapped upwards so as to get a pressure for a quicker run in the more flat parts of the furrow? As to the shape in which land should be laid out for sewage, for the farmer there can be no form better than the ridge, and to it he is most accustomed, raised slightly in the centre, and where too steep down the field to be drawn angle or cross-ways to the greatest fall, preserving an easy run from end to end, of the usual breadth, 30 feet or less, according to the strength of the particular sewage, remembering that it is not water as a moistening agent only that is being dealt with, but the dissolved matter in it as a fertiliser,—and the more directly it is applied to the soil the better; so that he should be careful with it as if he were dealing with so much guanoed water of his own mixing.

After its manure ingredients have been deposited in the water its means of conveyance should not be retained one instant longer than can be helped, but should escape down to the drains through the soil prepared as a filtering medium by deep cultivation, or be let off down the furrow, but on no account allowed to stagnate. There is little land (if any, in England) in occupation for arable purposes too steep to be ridged in one direction or another. If really too steep for being conveniently ridged across the greatest incline, it may be laid out in halves of ridges (not necessarily straight) of not more than 15 feet in breadth, the slope of the ground serving the purpose of the inclination given to each face of the whole ridge, and having its sewage supply in many respects the same as if it had formed one of the faces of an entire ridge. As to the sewage or other fertilising element applied to, or incorporated in, the land, getting down through the soil into the drains, it may be an old idea or not, still it is common sense, that this be seen to at the outfall; and if it be not fit to be passed away, it should be directed over fields situated below, to exhaust it of every pretension to being anything but water pure and simple.

Assuredly sewaging is to be regarded as a purely agricultural operation, and the more it is considered the business of the farmer, the more hope is there of its speedy and general adoption as a positive remedy by towns and other large populations beset with pestiferous rivers, bad enough now, and daily getting worse. *A Scot.*

FARM AGREEMENTS AND TENANT-RIGHT.

The cause of so much difference of opinion in regard to these matters appears to arise chiefly from one man taking the tenant's and another the landlord's view of them. As I have for many years endeavoured to do what is right between these two parties, both in England and Scotand, I hope I shall not be considered guilty of presumption in asking you to insert the following remarks in your Journal:—

1st. Farm agreements or leases. The term of entry will be regulated by the prevailing customs in different districts for a long time to come, as the time of the year of the expiry of existing agreements is fixed, and unless some very decided advantage can be shown it is not likely to be altered in new agreements, as the new tenant must enter when the old one leaves; but the tendency may be towards uniformity, if people could come to see what is the best term in general. Now, that arrangement which allows the outgoing tenant to be clear of all things connected with the farm as near to one date, and the oncoming tenant to enter to them, without any serious disadvantage to either party, must be the best. The outgoing tenant ought to have an awaygoing crop of Wheat off the land, which he has fallowed, but it is certainly the best way for the crop to be given over to the oncoming tenant by valuation. I therefore consider the best term for land to be the 2d of February or Candlemas, except that the oncoming tenant should have liberty to scarify, cultivate, and plough the stubbles after October 15 preceding; and also have stable-room for the horses employed in such work. But to give the outgoing tenant time and opportunity to thresh out the grain crops and to consume the hay, straw, and root crops, he must have the buildings till May Day.

The duration is the next point requiring notice. Much has been said in favour of leases for a term of years, and no doubt theoretically it appears to be the best system, and perhaps if one could weigh all the good and bad results of leases in Scotland and England against those of an equal number of yearly tenancies, the former might be found to be the best, but it has not been so in my experience. Both systems will in all probability hold their ground for many years, but the yearly tenancy system might be improved by an 18 months' notice to quit, except in cases where the tenant had died, or had failed to pay his rent at the usual rent-day, or within say 21 days thereafter,—then a six months' notice from either party in the case of death, and a similar notice from the landlord only in case of nonpayment of rent to be sufficient without any proceedings at law.

As to management it is impossible to fix any rule which would be generally applicable. The hay, straw, and root crops should be consumed on the farm, or an equivalent returned to the land of good dung or genuine bone manure. Tenants may apply what Peruvian guano, nitrate of soda, or sulphate of ammonia to their farms they please, but it is not the landlord's interest to bind them to apply these manures, or compounds similar to them, nor should they be considered as compensatory for hay, straw, or root crops sold off, as their effects are most assuredly exhaustive. The rotation should be expressed in a negative rather than a positive form—such as, in regard to light soils, not to take two corn crops in succession, and in regard to heavy soils not to take more than two corn crops in succession, nor more than three corn crops off the same land in five years. Something should be said in regard to game, but in the present conflicting state of opinion I shall pass it over as beyond my power to propose a scheme which would give general satisfaction, but I may remark that if landlords had been more careful in seeing that the rabbits were kept down, and not taken their gamekeeper's report, there would not have been such a general outcry about the game, and the question might have been more easily settled. Because if rabbits had been generally kept down, as they ought to have been, tenants would have had more confidence that, if they had occasion to complain about injury to their crops by hares or winged game, their complaints would meet with due consideration. But I will pass on to my second subject, viz.—

Tenant-right.—Now I cannot see why it should be necessary for the Legislature to interfere farther than probably to make it more easy, if they can, to have any dispute settled as to what is the rule or custom of the district. For it is impossible that the Legislature can enact what would be an equitable rule for tenant-right in all the various districts of England. A rule ought to be fixed by the Chambers of Agriculture in the different counties or districts, which should come into operation in all cases where the tenant-right is not fixed by the agreement or lease. In this view it seems almost superfluous for anyone to attempt to specify the different items of what would be a fair tenant-right. I will, however, mention a few which would be generally applicable.

1. Draining.—If the landlord has supplied the tiles gratis, the tenant's outlay to be paid for according to an exhaust rate of five years. But if the tenant has borne all the expense, his outlay to be paid for according to an exhaust rate of 10 years—the drains to be shown to be in proper order, and all mouths clear and open.

2. Bones applied to pasture land to be paid for according to a five years' rate, also lime in the same manner. Dung might also be included, although the dung has been produced on the farm, as the tenant must have supplied its place in the cropping rotation by some other manure, otherwise he will have suffered loss by diminished crops.

3. Bones, lime, or dung applied to meadow land, to be paid for according to a three years' rate.

4. Manure applied to arable land. The tenant-right may, without injustice, be restricted to land which has not produced a grain crop since these manures were applied. Here the custom of paying for half tillages seems a fair one, but no artificial manures should be taken into the valuation, except genuine bone manure.

5. The dung on the farm should be paid for to the outgoing tenant, and in fixing its value special notice should be taken of the quantity of cake, grain, or other feeding stuffs, which may have been consumed in its production.

6. What may be termed tenant-wrong—dilapidations to buildings, fences and lands; the last, in regard to their being in a foul state, should be particularly noticed, and deducted from the valuation.

But as Chambers of Agriculture are now pretty general over the country, the fixing of a rule of tenant-right for the district of each would be very appropriate work for them; and to do it so as to be fairly and generally adopted, both landlords and tenants should attend, or be represented at the meeting of the chamber for the purpose. If this were done for every county or district Parliament might pass an Act making the observance of these rules obligatory in all cases where they were not superseded by a legal written agreement. *J. McK.*

Home Correspondence.

Present Appearance of the Crops.—*Berwickshire:* The grain crops in this district are looking very well indeed, with the exception of a portion of the Wheat, which was much injured in spring by a maggot, which eat out the heart of the young plants and killed them. It seems that it is 24 years since we had a visitation of the same pest. Everything looks well on our farm at present, with one very serious exception: since May 25 the whole county, and, I believe, several adjoining ones, has suffered from a perfect plague of the Turnip fly. I never saw the crop make a better start. The land worked more kindly than usual, and everywhere there was a quick and regular braird; but within three or four days after the date above-named whole fields that seemed past all danger were swept clean off. Ever since re-sowing has been going on on every farm, and still the plague continues. You may guess the extent of the mischief when I mention that I have re-sown 70 acres to my own share, and I am no worse than my neighbours. In several cases a third sowing has already been resorted to. The present position of this important crop is causing much uneasiness. *John Wilson, Edington Mains, Chirnside, June* 15.

——*Devon:* Wheat has suffered very much by the late frosts, there will, however, be probably an average crop. Oats and Barley want rain very much, will be short in the

straw. The Mangel Wurzel crop is looking well, and promises a good yield. Turnips, unless we get rain soon, are likely to be below an average. Hay crops are mostly bad, owing to the dry weather. The pastures are mostly very short of grass, stock generally are lookings well. *Tavistock, June* 15.

—— *Devon (North):* Wheat, with the exception of a good field here and there, the general crop is thin and spiry, portending a scanty yield. Barley good on deep soils, inferior on bare low quality lands. Oats short and unpromising. Mangel sown on the flat has prospered, on the ridge it is irregular and backward. Swedes devastated by the fly. Meadows a very short growth, foreshadowing light hay crops. Pastures very bare on the deep lands, and brown and barren on the hillsides and on lands of an inferior description. Potatos looking well. The lament of all persons connected with land just now is the continued dry weather, and, of course, the great desideratum is a copious rainfall, but of this there is not the slightest indication at present. *P. Cowan, Tavistock Manor, Barnstaple, June* 13.

—— *Dorsetshire:* I am sorry not to be able to report more favourably of the growing crops. Wheat in this part of the county is thin, and very short in straw, ears just bursting forth which appear to be very short. Barley and Oats suffering much from want of moisture, especially the late sown; and if rain came at once I fear it would be too late to imptove it materially. A short quantity of hay will be made owing to the dryness of the season, many farmers having been obliged to feed nearly all their Clover that was intended for hay, with sheep, keep having been scarce for months past. Root crops, from want of rain, progress slowly; the Turnip fly has made sad havoc with the early sown. *John Ford, Rushton Blandford, June* 13.

—— *Essex:* Since my last report on May 10 a great change has taken place in our harvest prospects. On our light soils all the spring corn crops are past recovery, and much of the Wheat will not mature itself. The heavy lands present a different aspect: Wheat has all the appearance of a fine crop—short stiff straw, a bold ear; with every chance of a favourable blooming time we may anticipate a good yield, of fine quality. Beans also promise well; full of bloom from near the root, and still progressing, with not a rapid but satisfactory growth. Mangels that were got in early, and sown on the winter cultivation, are doing well; those seeded on spring-worked land, even where a plant was obtained, are making slow progress. Hay all but a failure. If there be one lesson more than another that this season will teach, it will be the advantage of deep-drained land and next to that thin-seeded Wheat. Here we have about 80 acres sown with a bushel an acre, all of which is thick enough to satisfy the tastes of a very thick-seeder; indeed, I think with Mr. Mechi, that 2 pecks is near the mark. In a field here, about a quarter of an acre was all but taken off with the wireworm; I filled up by transplanting the portion early in spring at 1 foot apart, and at this time, although later, it has the best appearance of any Wheat on the farm. We have been singularly unfortunate in not getting much of the rain which has visited some districts since March 26. We have not had sufficient to reach Mangel seed sown on April 9. *P. Mitchell, East Hall, Rainham, June* 20.

—— *Wilts:* Wheat, thinned by frost—most pieces have vacant spots; late, and to all appearance below an average crop. Barley and Oats, good. Winter Beans generally inferior; half ploughed up. Spring Beans, good. Peas, very promising. Clover and Sainfoin, excellent. Pastures late, and must be a poor crop unless we get rain in abundance very soon. *R. Stratton, Burdeorop, Swindon.*

—— *Worcestershire:* I have delayed writing with the hope of getting rain, and thereby enabled to send you a better report. Wheat on light land a very bad crop, partly owing to a thin plant, and partly to the dry season. On strong land, where there is a good plant and condition, the straw will be short, but I think the crop will be a good one. Most of the Wheats—after Vetches and fallow—are deficient in plant. I am quite of opinion that our general crop of Wheat will be below an average. Barley suffers very much from the dry weather, and will be below average. Oats: scarcely any grown. Beans: Winters were very much damaged by frost, but have wonderfully recovered, and will be two-thirds of a crop. Beans: Spring Beans very much depend upon the weather; if no rain comes for eight or ten days they will be very bad, and in any case will not be an average. Peas: All the early sorts on the hot soils are grown prematurely ripe; the others depend upon the weather in the next ten days; rain would save them. Mangels: More planted this year than usual, and are looking very well considering the dry season. Potatos: The early ones are a bad crop, and there will be no late ones unless a quantity of rain comes at once. *Benj. Bomford, Pitchill, Evesham.*

"G. A. H." and Mr. Smith of Woolston.—I find the following, over the signature of "G. A. H.," in the *Agricultural Gazette* of Feb. 8, 1868, p. 134:—"I venture to assert that good farming consists, not in feeding cattle on purchased food, but solely on food grown on the farm. Increase the produce of your farm by all means by the purchase of artificial manures, and feed so much of that produce as is necessary to maintain and even to increase the fertility of your soil. But when a man steps out of his way to buy cattle and to buy food for those cattle, and by a fortunate turn in the market makes a profit upon the transaction, he must not suppose that his profit is made by farming, or that it comes out of his land." These words were penned more immediately referring to Mr. Mechi's system at Tiptree Hall, and in your last impression "G. A. H." asks Mr. Smith how much he spends on purchased food; adding, "If he has not, then I tell him he is behind many a tenant-farmer, for in East Lothian (if I am rightly informed by a gentleman, a tenant-farmer there, whom I happen to know) it is by no means an uncommon thing for a tenant to spend in manure and bought food, two or three, or four times as much as his rent comes to, and yet rents in East Lothian are a great deal more than £2 per acre." Wherein does good farming consist? *West Indian.*

Straw v. Manure.—I am surprised, after all that has been said and written on the subject of manuring, to find re-asserted in your columns that the quantity of decomposed straw left by an outgoing tenant can be the least criterion of the value of the dung contained in it. It must be evident to anyone who will think on the subject that the manure elements left by feeding cattle are the same in value and in effect, whether contained in a heap of 50 or 100 tons of rotten straw, ashes or sawdust, or any other article; in fact, where the carriage to the field is expensive, the larger the heap the less may be its actual value. Mr. Lawes, in his valuation of the residual value of feeding stuffs, has very wisely put down the extreme value derivable from cattle properly housed and fed, and the manure carefully protected from water. Where these circumstances are not fully attended to, a very large percentage will have to be deducted from their theoretical value, but in any case the trodden straw can only be reckoned as the vehicle for preserving the manurial value, not as manure in itself. Where the artificial manure dealer has mixed 50 per cent. of London clay with his guano, or the publican mixed only half a glass of brandy with the tumbler of water, they are very properly prosecuted as cheats; so should the seller of the farmyard mixen, if it only contains a portion of the pretended valuable contents. I am induced to trouble your readers with these truisms because straw is becoming every year more valuable and scarce, while the value of the manure made throughout the country is gradually increasing. Farmers are becoming more alive to the use of their straw as food, and have less to throw away as thatch or litter; indeed, such will be the scarcity of hay next winter, that a great portion of our straw crop will of necessity have to be chopped up and consumed as chaff, with roots and such other helps and condiments as may be attainable. In this probable emergency I would call the attention of my brother farmers to the necessity of preserving all dry and well made Pea haulm and straw during the present season for winter consumption, and to the expediency of collecting ashes and sawdust, and other refuse, for bedding, to enable them to keep their stock dry through the winter. Any surplus straw will probably be saleable at 50*s.* or 60*s.* the ton, which will go some way in making up the deficiency in other receipts, without trenching on the amount of stock kept and actual manure made during the coming winter. *J. B. M.*

Personal Invective v. "G. A. H."—Only a gardener, I nevertheless read the *Agricultural Gazette* weekly. I have, in common I doubt not with others not interested in farming matters, read "G. A. H.'s" communications with much pleasure. Hence I am extremely sorry now to see that he has thrown aside much of that gentlemanly courtesy which was his wont when fighting a literary antagonist, choosing now to deal so greatly in personal invective, a weapon unbecoming a person of his literary calibre. I need not quote samples, every column which bears the mark of his pen bears witness of it. And his arguments are, I submit, no longer so trustworthy as they were. Look at p. 807, "G. A. H." says—"Farmers are manufacturers and merchants." Does he think before he writes? Where is manufactured hay this season? Is corn grown wholly by hand or art? manufactured or fabricated alone by the hand of man? Does he—the farmer—pour down the showers which manufacture corn, wine, and milk upon the arid steppe? No, verily man is no manufacturer of these vegetable blessings. In the sight of the Omnipotent he is but a small part of the machinery which, as work, he has deemed a necessary tax upon him ere he can become a recipient of those blessings. With his usual tone "G. A. H." offers to sell 2000 tons of Swedes and yellow Turnips? But where and when? Why, from the womb of the future! next November! We have faith that in due time Providence will pour down a blessing in the form of showers. But how would this great manufacturer of Heaven's choicest blessings keep pace with his promises, did rain not fall within another three weeks—another fortnight! Then, again, he is not satisfied with this; he makes the farmer not short of being "a merchant," placing in Mr. Smith's mouth, as a target for his own witticisms, the term "huxter." Is one who of necessity sells calves, cows, &c., singly—bidding for the higher price—a merchant? One, in fact, who sells all his produce (not manufactures) in lots and littles, can he be termed a merchant, or, technically speaking, a wholesale "dealer?" There is again the term "silly" applied to his antagonist's remarks, a most meaningless word as a refuter of words, especially offensive when used thus by one writer of ability against another. This more especially in refutation of a fact particularly apposite to all good farming, *e. g.*, "Pay your rent, and keep your land clean." But this is not all: "G. A. H.'s" antagonist becomes "a born idiot," as, proceeding onward in unmeasured words, "G. A. H." waxeth the more wroth. I know not Mr. Smith, but I would advise him to pass such attacks by without reply. *Opus, Dogwell.*

Smith's Tackle.—"G. A. H." works hard, and is for ever at it, running Smith and "Smith's tackle" down (see p. 842). He says:—"The fault of Smith's tackle is making it too light, and not having the iron properly proportioned." Then, I ask, how is it that I can show my old implements, with which I have worked my farm for 15 years, that have never been broken? I have seen them pull the engine up dead against roots, and I have seen them smash landfast flints and stones, yet I have never seen them broken, or at fault, even without a "friction clutch." Let "G. A. H." get his Fisken tackle at work, for us to see how he can get on, and let him beat me as to the cost of operation and results if he can. I started on some poor clay land that I bought last year (last autumn) that had been farmed upon the dead fallow system down to last year, and here is the produce of last year's crop:—

		Bushels.
32 acres of Wheat	.. ..	768
10 ,, Beans	.. ..	200
6¾ ,, Peas	.. ..	30
7¾ ,, dead fallow	.. ..	..
6 ,, Vetch fallow	.. ..	..
62		997

Or an average of 16 bushels per acre.

All excepting the fallows has been smashed once only, at a cost of from 4*s.* 8*d.* to 7*s.* 1*d.* per acre, extras and all included, to complete the seed-bed. It is all in crop, and dead fallows will be banished from it as long as I live. From the look of the crop upon it I have every reason to believe that I shall double its last year's produce the first year, and if I live a few years I shall hope to do more than that with never going more than once by steam-power for a crop, and I shall soon have the land as clean as my old land. "G. A. H." may write and talk against me and my implements as long as he likes, but he must *do* something before he can make a mark against me. I am talking of things that I have done, and can be seen; not like "G. A. H.," who fancies that he shall do something, yet talks about it before he does it. Here, after my farming on my heavy land, are Beans, Wheat, and Barley, and nothing else. Let "G. A. H." watch me, and so may all the world. I mean if possible to multiply last year's produce of 16 bushels per acre, on my new land, by three—taking Beans, Wheat, and Barley together. Let "G. A. H." set himself a similar task, and then give me his address, and I will come and look, if he gets anything worth looking at. He may have Fowler, Fiskin, or whoever else he likes to help him.—"G. A. H." appeared to be very knowing about feeding cattle upon oat-straw. Let him put his "1-year-old ox" in, and provide for it "3 or 4 tons of straw," and thus find out how much fat he can get from the 3 or 4 tons. Before it has eat half 3 or 4 tons it will become lousy, and these lice will eat it alive before it gets through the other half, and Martin's Act must be brought to bear upon "G. A. H." Let him give his ox a bit of cake daily, leaving it to eat just what it likes of the best of the straw, and then rest upon the remainder. Let "G. A. H." keep away from the strong arm of the law, he may then make sure of a bit of fat for his shoe-string. "G. A. H." at times tells you that I am cross. He is vastly mistaken even in that, for I generally laugh when writing a bit for him, for I can stand all his nonsense. He may run me and my tackle down as much as he likes, but it will take a better man than him to write me down. The facts that I keep by me and am working out can outweigh a hundred "G. A. H.'s." He may get a pen with a hundred points to it, and it will be of no use against me and my facts. "G. A. H." is very fond of running up Fowler's tackle, I can give him a bit of news from that quarter. I was told by a gentleman who was at Buscott the other day, that the tip-top two engine 30-horse power Fowler tackle there is getting a bad name, and even the men do not like it. *William Smith, Woolston, Bletchley Station, Bucks, June* 21.

Farmers' Clubs.

FRAMLINGHAM.

Mowing and Reaping Machines.—At the last meeting of the members of this Club for the season, Mr. FREDERICK LONG, the representative of Messrs. Woods, Cocksedge & Co., read a paper on this subject, from which we make the following extracts:—

History.—Having by a collection of passages given the early history of attempts to hasten and cheapen harvest work, Mr. Long said:—Thus you will see that reaping machines were in use at the commencement of the Christian era, and that they continued to be used for several centuries after. In the psalters and

manuscripts of the Middle Ages, reaping is represented as performed by labourers with sickles, as described in Biblical history, and as is the case at the present day. The earliest proposal for a mechanical reaping machine in Britain appears to be that described in the "Annals of Agriculture," published in the year 1785. In the fourth volume of that work appears a letter on a machine for reaping corn, by Capel Lofft, Esq., of Troston, near Bury St. Edmund's, from which the following is an extract:—"The Society for the Encouragement of Arts, Manufactures, and Commerce, having, in the year 1780, proposed the gold medal or £30 as a premium for a machine to answer the purpose of mowing or reaping Wheat, Rye, Barley, Oats, or Beans, by which it may be done more expeditiously and cheaper than by any method now practised, provided that it does not shed the corn or pulse more than the method in common practice, and that it lays the straw in such a manner as may be easily gathered up for binding." Mr. Lofft then refers to the machine mentioned by Pliny and Palladius, and suggests whether these would not sufficiently correspond with what the Society offered. In 1787 Mr. William Pitt, of Pendeford, contributed a short account, with drawings, to the "Annals of Agriculture," of what he thought was a machine answering to Mr. Lofft's translation of Pliny and Palladius. This machine was a carriage in which the horse's head went towards the body; at the back was a roller with teeth, thickly placed in rows, the bases of the teeth meeting; this roller was kept revolving by means of cogwheels at the side, worked by a band from the nave of the travelling wheel. There is no record as to whether this suggestion was ever carried out; and the next mention of reaping machines is in "Walker's Philosophy," published in 1799, where the machine is described with two travelling wheels working a large horizontal circular wheel, on which were placed, at regular distances, seven large cutters. This idea seems to have suggested itself again many years afterwards, for in 1852 Mr. F. Mason, of Ipswich, registered a reaping-machine with precisely the same method of cutting. The first patent obtained in England for a reaping-machine was on July 4, 1799, by Joseph Boyce, of Pine-apple Place, Marylebone, London; and in the following year another was granted to Robert Meares, of Frome, Somersetshire. This machine, in appearance, was a large pair of shears running upon wheels. Having thus brought the reaping-machine down to the present century, I will not trouble you with details of the various attempts, the numerous patents, the numerous failures; but I have made a sketch of some 50 or more of the different motions for cutting, most of which proved anything but successes. The great rock on which they all foundered was the cutting apparatus, which, do what they would, would always choke. Few attended to the delivery, and the history of reaping-machines, may be divided into two portions, namely, that of their cutting apparatus, and that of their delivery apparatus. I may mention in passing that the first reaping-machine invented in America was in 1803, by one Richard French, but it was never used after its first trial.

Bell's Reaper.—Now, first as regards cutting apparatus, the first practical machine was that of the Rev. Patrick Bell, of Carmyllie, Forfarshire, and will be found fully described in "Loudon's Encyclopædia of Agriculture." It was made 6 feet in width, was pushed forward by two horses; the travelling wheels set in motion a cogwheel which worked an eccentric rod. The cutters were in all 21 inches long, 13½ inches projecting beyond the bars to which they were attached. There were 25 of these cutters 13 fixed and 12 movable; the movable ones were attached to a bar that received its motion by friction from the eccentric rod: the cutters thus passed over one another, cutting the corn that came between them. The corn fell on to a sheet or apron of canvas tied on to two revolving chains; it was thus carried off in a swathe at the side. This machine worked so well at a trial at Powrie, Forfarshire, in September, 1828, that 50 landed proprietors and practical agriculturists signed a declaration that the machine cut down a breadth of 5 feet at once, was moved by a single horse, and attended by from six to eight persons to tie up the corn, and that the field was reaped by this force at the rate of an imperial acre per hour. This machine was the only noticeable one that came before the public until the International Exhibition of 1851. Indeed, it appears to have been almost lost sight of by the public, and to have been abandoned by the inventor, thus affording an instance, if such were wanted, of the utter inutility to the general public of the most valuable suggestion, unless thrust upon their notice by some party who is peculiarly interested in introducing them in a practical form. As another instance that there is "nothing new under the sun," the original motion of Bell's knife was introduced into a machine, and exhibited at the show of an adjoining county last year, when the judges awarded it a prize for being new and improved. Why, during the 25 years that followed the introduction of Bell's machine no progress was made, may be owing to the fact that nothing was done by independent parties to bring them into use, and that neither the requirements of the farmer, nor the prospect of reward to the agricultural implement makers, were sufficient to awaken public attention to the national importance of reaping by mechanical means. The credit of effecting this step is undoubtedly due to our Transatlantic brethren.

American Reapers.—The Great Exhibition of 1851 brought into notice several reaping machines; the two best, and those that attracted attention, were in the American department. The first was M'Cormick's; the main feature of this was the cutter, that was composed of a series of thin cutting plates placed side by side, the front parts were arranged so as to form a zigzag line when fixed, the edges of the blades were serrated so as to cut (when moved by a reciprocal motion) right and left against the fingers or guards, which were of a spear-head shape; acting as a saw, the knife pressed the grain forward into the base of the projection of the guard, and severed it off in the hollow. The other machine was that of Obed Hussey, which had been invented in 1826, and after many years' use was looked upon in America as the standard machine, and at the Exhibition was the great competitor of M'Cormick. It is only due to Mr. Hussey to give him the credit of having introduced the "open finger," or "open guard," as he termed it—the piece through which the knife worked backwards and forwards was left open part of the way on the top, thus enabling the knife to clear itself.

The Cutting Apparatus.—This was the commencement of the only system of cutting apparatus that has proved of practical value; the knife worked backward and forward, cutting off the grain against the guard with what may be termed a paper-knife action, doubling the straw into the slot in the finger and there cutting it. After 1851, in consequence of the great demand for reaping-machines that followed the International Exhibition, numerous attempts were made to supersede the paper-knife action, combined with the open guard, by continuous and other motions, but the old drawback, "choking," again was apparent; and, notwithstanding the very many attempts to supersede it, to this day it keeps its ground against all others. Until the perfecting of the cutting apparatus the mowing-machine was an impossibility, because although many imperfect forms of cutting apparatus were competent to deal with grain—especially in hot, dry climates, where there was a little undergrowth—they were failures on account of the knife requiring to work with absolute freedom from choking in green crops. The latest development of this is in the inclined knife of Samuelson's, which is so arranged that both the underside and the top side of the reciprocating bar is free for the discharge of cut stuff, no matter how close to the ground. The great importance of this must be apparent, for 1 inch of the grass near the ground adds more to the weight of the hay than several inches above it.

The Delivery.—Having thus spoken of the cutting-apparatus, I will now proceed to that of the delivery, and here the subject divides itself into three heads—manual, swathing, and self-acting sheafing. First, the manual. The Hussey machine of 1851 did not achieve that great success which was expected of it, mainly on account of its delivery. It was the heavy work for the man (described by the judges of the Royal Agricultural Society as being as hard as the tread-mill) sitting on the seat and pitching the cut corn off the platform, that caused it to be almost thrown on one side. To remedy this, Mr. Dray made a great step towards improving it by introducing a tipping or tilting platform, and Mr. Wood still further perfected this by bringing out the sparred or spine platform, allowing the stubble mainly to perform the operation of clearing the platform when dropped by the raker's foot. These manual machines are making immense progress, many preferring them to larger machines, not only on account of their cheapness, but because they are so handy to move about in a field. They are suitable for all kinds of cultivation, and being only half the price of the self-raking machines, two can be had, and, if necessary, used on different parts of the farm. The Scotch farmers use two in one field, cutting up the same side of the piece, one returning empty whilst the other is going up. The quantity these machines will cut in a day varies from 8 to 14 acres, but on an average 1 acre per hour is not hard work.

Next, as to swathing machines. These will work beautifully when the land is dry and the crop stands up. The oldest swathing system is the apron of Bell's, altered by Crosskill into the band delivery. These give entire satisfaction in a fine season—they cut their way into the corn, they deliver off on either side, to suit the place or the wind, and are the only machines by which you can cut up and down on one side of a piece. They have been known to cut as much as 25 acres per day. The screw system of Messrs. Burgess & Key has been very successful; but, like all swathe delivery machines, they are not always successful in a wet season with a laid crop.

The attempts at making the self-acting sheafing machine perfect have been legion, and no attempt has as yet proved a thorough success except the rotating rakes brought out by Messrs. Samuelson in 1861. This was an invention brought out in America by Mr. Dorsey, and singularly enough brought out in Australia by Mr. Robertson, of Melbourne, at the same date. The tendency of all improvements in agricultural machinery being to relieve the labourer of the heavy drudgery of his calling, these self-rakers perform the hardest part of harvest—that is, putting the corn off the reaper at the side ready to be tied up. The self-raker is undoubtedly the most desirable machine for a farm—it cuts easily with two horses at the rate of 15 acres per day, delivers off in nice straight-made sheaves at the side quite clear of the horses' track; the machine requires only a lad to drive the horses, thus setting at liberty valuable help. By adding more rakes the sheaves are changed to what may be said to be a swathe to all intents and purposes. On this the judges of the Royal Agricultural Society remark, some objection has been urged against the system of sheaf-delivery, on the ground that those crops which require to lie for a time before being tied up, are better in swathe; but this advantage is more apparent than real, as the sheaf is laid so lightly, and fanned out so nicely that the sun and air can penetrate almost if not quite as well as if the corn lay in swathe. An objection raised to the rotating rake was the rake travelling on at a fixed pace, going just as far in heavy crops as in light ones for a sheaf. This has been remedied by Hornsby, who has introduced a change of wheels to alter the speed of the rake according to the crop. The self-raker of M'Cormick was first shown at the 1862 Exhibition. One was also shown at the Paris Exhibition, where it took high honours. It consists of a revolving rake, with a most eccentric kind of action, but whether from the rake being unbalanced, or from its being driven by gearing of a complex character, it has not made so much progress, especially in the Eastern Counties. As regards combined machines, there is a great difficulty in getting a satisfactory combination. The best even of manual deliveries is not so good as separate systems, and the difficulties are much greater in the combination of mower and automatic reaper. The judges of the Manchester Show report as follows:—"As combined machines they were, on the whole, useful implements, working satisfactorily, both in the grass and in the Rye. In some instances machines were worked as reapers by one horse only, but in every case two horses were used for grass cutting. It may be easily understood that although the draft of a mower cutting 3 feet 9 inches width in grass which requires to be cut low, and is thick at the bottom, may be too heavy for one horse, yet a reaper cutting a moderate width, and from 3 to 4 inches from the ground, with the speed of the knife reduced 25 per cent., may be easily worked by one. We presume these combined machines are intended to economise farming capital, and also to supply small occupiers at a moderate cost with a convertible machine, adapted to cut both his grass and his corn. But it appears to us doubtful, if in general farm practice there would be much economy in purchasing one of these, seeing that for an outlay of 25 per cent. more money two separate and perfect machines may be had. Undoubtedly there may be occupiers of small or medium sized farms that would gladly avail themselves of a machine which would accomplish both mowing and reaping at a saving in outlay of £9 or £10; and there are seasons when a large breadth of corn requires to be cut in haste, and a machine of this kind might be brought into requisition on large occupations."

Progress of the Manufacture.—Having thus described the various classes of machines, I may mention that the manufacture has been gradually advanced to its present state of perfection, not only by an immense outlay of money, but by patience, perseverance, and continued trial, oftentimes with varying success. Frequently have manufacturers, after spending thousands of pounds, retired from the field downspirited by repeated failures. But by bringing a vast amount of skill and care to bear on every part and detail of the respective machines, and by adapting alterations shown to be necessary, after repeated severe trials the makers have succeeded in adapting them to every system of cultivation, and have the pleasure of knowing that the days of failure are past, and that a great measure of success attends them. The progress of the manufacture in England is shown by the Royal Agricultural Society's Shows. At Canterbury, 1860, only 32 machines were entered; in 1865, at Plymouth, there were 56; and at Manchester, last year, no less than 98 were put down for trial. The judges in their report remark—"Most of these machines are so equal and so perfect in their cutting powers, it struck the judges that the makers had turned their attention to the important point of endurance by adapting oil reservoirs by which continuous lucubration is brought to bear." The trial of so many machines necessarily extended over a long time—indeed, nine days were consumed; and the result of the trial is, without doubt, highly satisfactory to the farmers in the Eastern Counties, because nearly all those machines which have been extensively introduced to their notice were the successful machines asserting their superiority in many hard fights. To give anything like a detailed account of these trials would occupy too much of your time, so I will pass them by, mentioning that the grass-mower prizes went to Hornsby, Wood, Burgess & Key, Samuelson, and Bamlett. The prize offered by the Society for 1-horse mowers was not awarded, the judges considering the draft of all too excessive for one horse. The combined reaping and mowing machines went to Samuelson and Hornsby. The self-raking sheaf-delivery machines went to Hornsby and Samuelson. The

reaper, with swathe delivery, went to Bamlett, Burgess & Key, Hornsby, and Beverley Iron Works. The 2-horse reaper, with manual delivery, to Hornsby, Bamlett, and Samuelson. The 1-horse to Bamlett, Hornsby, Cuthbert, and Samuelson.

Conditions of Success.—Having thus briefly given the results of the last great trials, I will now proceed to state what I think highly necessary to ensure their success in the hands of the user. It is that care must be taken to have a plentiful supply of good oil to all the bearings of the machine; that the various spindles whilst running freely do not have too much room in their bearings; above all things, the knife should be kept sharp, and changed at least once every hour. You will see the necessity of this when I tell you that the knife of Wood's grass-mower makes at least 1,474,206 cuts in doing an acre of grass; also the Samuelson's Eclipse Reaper in cutting either an acre of Clover, Barley, or Wheat, makes 1,416,264 cuts. It will, therefore, be evident that cutting with a blunt knife at this rapid speed must add greatly to the draft of the horses, as well as tend to strain the machine. Care especially should be taken with the connecting rod that works the knife-bar, for this goes very fast. In Wood's mower it makes 43,210 strokes per acre, whilst in Samuelson's Eclipse the number is 16,006 strokes. The makers having perfected their machines so as to suit all cultivations and crops, there is nothing to be desired for general purposes except tying up the corn as it is cut; and, curiously enough, we have going on in our own county an effort to accomplish this. Also, in a letter I received from New York, dated March 5, the writer says:—"I can think of only one novelty that is troubling inventors at present, that is a machine with a patent binder attached to it, so one man with a machine can do all the work which now requires four or five."

Economy.—Messrs. Samuelson have sent out to a large number of their customers a special inquiry as to the saving in labour effected by their machines, and also the price paid in the various districts for cutting by hand; the result was, that taking an average of all reports, 4*s.* an acre in reaping was the actual saving, and in mowing 1*s.* 9*d.* per acre; and the average of actual time saved was 40 per cent. The average prices paid for reaping and shocking Wheat was 10*s.* 10½*d.*, cutting Clover, 3*s.* 6*d.*, and old meadow grass, 4*s.* The above may be slightly different in this county, but beyond the saving of time and money, what are the other advantages? In cutting grass you get 3' to 5 cwt. more per acre of hay; it is easier made, being already distributed over the ground. In reaping there is not one-fourth so much shelled corn, the sheaves are better laid, easier and quicker to bind, and being straighter and closer, they are easier to cart, pitch, and stack. The stacks, from the same reason, may be larger, and consequently not require so much thatching; and then in threshing you can get over two coombs per hour more work. The saving of time is frequently of great consequence in harvest, as if the corn remains about when the rain comes, it loses considerably in value. In cutting Barley, especially in a dry season, say as in 1868, when it became dead ripe quickly, the straw short and the ears down to the ground, the reaping-machine knife was able to slip along under without brushing any out, whilst the scythe, striking the corn with the bail, in cutting in and out, knocked out in some places 3 and 4 bushels per acre. The stubble is left perfectly level, there are scarcely any drag rakings, certainly not 1 peck where the scythe leaves a bushel. Cheaper labour may be employed in tying up, allowing full men to be put where strength is wanted in harvesting. There is no place so badly laid but that it may be cut by meeting or throating it. In these places, where cut by hand, it is frequently chopped, leaving lots of ears on the ground. I fear I have trespassed much too long on your time, but when we know that during the past year 90,000 machines were made and sold in America, and more than 12,000 in England, we may repeat the words of Sir Edward Kerrison, "That as the flail has of late disappeared from the barns of this country, so after this will the scythe and sickle gradually cease to be used in our fields."

IXWORTH, SUFFOLK.

A Breeding Flock on Heavy Land.—At a late meeting of this Farmers' Club, Mr. J. Fison, of Barningham, said:—The purport of this paper is to assert and show, from a practice of more than a quarter of a century, that farmers may be independent of bullocks. I will thank you to remember I am only pursuing a system of farming commenced by my late father, and continued by him for many years; his rough and useful appliances I found ready to hand, and my ignorance of farming detail prevented my attempting anything beyond what was well understood on the farm. Whether our system be or be not too elaborate and expensive, I must leave for you to determine. In order that you may arrive at something like a correct estimate, I beg to tell you that last year my labour, at 11*s.* per week per man, cost £1 18*s.* 6*d.* per acre for harvest, thatching, picking stones, threshing, chaff-cutting, draining, and a carpenter—everything, in fact, excepting steward's salary, lamb money, and shearing; with these addenda it cost £2 3*s.* 6*d.* I shall feel obliged by any opinion respecting this heavy item.

My occupation consists of two small farms, very inconveniently lying right and left. These collectively represent 280 acres of good land, requiring draining, 25 of which are pasture, not super-excellent, as our friend Mr. Goldsmith stated, but rendered prolific by the maintenance of an unusual quantity of sheep. We keep 420 half-bred Leicester ewes, purchasing, as a rule, the largest two-shear we can pick. With these and our horses we make our manure. For the long period mentioned heavy crops have been raised entirely without the agency of bullocks. We use Oakey's tups, which we think have a dash of Cotswold in them. Please note this, and subsequently give me your opinion, as I have been recommended to revert to a purer breed—to use the improved Hampshire as raised near Salisbury. Our fall of lambs averages heavy; last year and this are exceptional. Last year the absence of the usual stimulant, Rape, at the time the males were turned to the ewes, was against us; and that the Rape is a most useful food at that particular time we had a singularly plain proof. As we had a small quantity which lasted a fortnight of the time the tups were with the flock, the corresponding time for lambing cheered us with a good fall. The other portion, though we gave them best linseed cake, was miserably slow, and the fall small. If similarly again so situated, I would use Barley cautiously, or Beans. In 1866 we sold 614 lambs, realising £788; in 1867, 617, making £743 3*s.* 6*d.*; and in 1868, 596 sold for £602, and in 1869, 544 for £519 17*s.* 6*d.* for four years an average yearly sale of £668 3*s.* 3*d.* I am able to account for our small crop this year. Our quantity now rearing is about 27 score. For last autumn and the spring-feeding we provided 26 acres of Rape, 8 of which were after early dun Peas, now in Wheat; 4 acres of Cabbages, now in Barley, about half an acre being left for lambing; 20 acres of Turnips, six of which, after a bad layer, now in Wheat,—5 acres were Swedes, the latter partly drawn and partly fed on land where grown; 18 acres of Beet, 10 of which were autumn tilled, 8 after Rye—the 10 acres are in Wheat, the 8 in Barley. The flock was folded in autumn on Turnips, stubbles, &c., supplemented by barley-straw chaff, layers slightly run over. For spring feed—30 acres of layer, 8 Rye, now planted with Beet; 13 acres of Italian Rye-grass, to be broken up as early as we can and sown with Rape, followed by Wheat; 11 acres Tares and Oats. We began using Beet in January, pulping about 16 bushels daily, mixing them with chaff. You will understand the term chaff implies cut barley-straw; the quantity daily increases, till some days we have 300 bushels consumed, and as soon as we think it necessary we commence adding corn or cake ground, beginning at 4 stones daily, increasing to 18 stones. On March 26 our week's corn, &c., was 4 coombs of Barley, costing £2 10*s.*; 4 coombs of Peas, £3 8*s.*; 1½ linseed cake, 18*s.* 4½*d.*; 1¾ cotton cake, 10*s.* 6*d.*; grinding, 8*s.*; toll, 2*s.* 6*d.*: making £7 18*s.* 10½*d.*, or a daily cost of £1 2*s.* 8*d.* Here, again, for the ewes I have been advised to replace linseed cake by cotton, husked palm-nut meal, and corn. The flock is yarded when the weather becomes wintry, and there trough fed with the chaff mixture morning and night, or when necessary, having a run of a few hours, according to weather, on some pasture where is thrown out one or two Scotch carts of roots. Our usual time for turning in the males is October 9, but this year we advanced the time a week, as you may be sure we are anxious to clear our land as early as possible. Our farm is generally cleared by the middle of June, and as early as prudent our ewes go out to keep. Last year we kept them at home, but, judging by the experience of my late father and our observations, it is in our case no gain. It is considered by us that the change of locality benefits the flock and increases the fall of lambs. Of course it sweetens the farm. The lambs are dropped in the yard. Two long sheds are enclosed, with pens on each side, to which the ewes and lambs are conveyed, and from which, in a few hours, they are drafted off according to condition of mother and lamb into sundry small lots. They are still penned and daily drawn off, making three lots—singles, doubles, and weak mothers and lambs. The doubles, of course, have the best pick and the larger allowance of artificial food. Implements are unhoused, barn, straw-houses—in fact, every available space is devoted for a few weeks to the respective lots.

The management of the lambs afterwards is a repetition of other farmers' plans—layers folded, lambs running forward to an advanced fold, in which troughs with cake and Peas are placed. I omitted mentioning our sheep-yard has fresh straw almost every day. I buy the best cake, fearing cotton cake where so much dry food is used; but at Barningham Hall it is used without bad results. I am trying it this year, as you find. We find in wet seasons the following mixtures invaluable when diarrhœa follows too luxuriant or wet food:—Powdered catechu, ½ oz.; powdered ginger, ½ oz.; prepared chalk, 1 oz.; peppermint water, ½ pint; lamb dose, two table-spoonfuls night and morning. One very serious evil, resulting from over-stocking, is the foot-rot, which we minimise as much as possible by separation; all remedies I have tried are useful for a time, but nothing is so rapid in its effect or permanent as the following, which I give in the hope it may be useful: 1 oz. of quicksilver dissolved in 1 oz. of nitric acid, and to this subsequently add ½ pint of vinegar. Like other flock-masters, we have both scared and drawn successfully; we practise the latter now—but with the assistance of the knife we have lessened very much the exhaustion and indeed pain of the poor victims, to say nothing of the disgusting features of the old mode of drawing. You will observe that the bulk of our winter feed is cut barley-straw; we cart the Barley to the barn door, where the drum is so placed as to eject the straw into the straw-house, which will contain two days' threshing, the cutter converting it into chaff in about the same time—by steam, of course. We consumed in the winter of 1868-69, 69½ acres of barley-straw so converted, and more this winter. What remained was fermented with cut wheat-straw, Tares, and a sprinkling of salt; this we find admirable food for our horses, and lessens interruption in harvest. Our wheat-straw is converted into manure, as you see, by the agency of the flock. Ours, I am aware, is a system which cannot be carried out on every farm; and our returns simply consist of Wheat, Barley, and lambs. To make this as large as possible, we steal all we can, cropping in a very irregular way, and getting as large an acreage as possible. Our present corn growing is 84 acres Barley, 60 Wheat, and 16 early Peas, these to be followed by Turnips or Cole, and further followed by either Wheat or Barley. Our last year's crop was 86 acres of Barley, 64 Wheat, and 8 early Peas, followed by early Rape (now in Wheat), and 3 of Peas and Beans. Our crop in 1868, you will observe, shows the irregularity of acreage when we come to it. This striving after effect of course adds much to horse wear, labour, as also the careful treatment of the flocks; but the balance-sheet shows the figures on the right side. Yet the expenses are so heavy that I confess I am always vexed at the close of our farming year (Michaelmas Day), that the "per" side does not show a heavier result; further than this, it teaches me indisputably that farming, though a most enjoyable occupation both for mind and body, is very far from an El Dorado. It may interest you to hear a rough statement, which I found amongst my father's papers, of the supposed cost and profit of 20 score ewes from July 1, 1861, to June 30, 1862.

The following is the statement:—

To feed purchased	.. .. ..	£96 6 0
,, 280 sacks of chaff at 3*d.*	.. ..	3 10 0
,, 20 weeks ditto, 14*s.* per week	.. ..	28 0 0
,, malt culms	.. ..	11 4 0
,, cake	.. .. ..	70 12 0
,, oil-cake	.. ..	20 5 0
,, cleaning Beet	.. .. ..	7 0 0
,, carting ditto	.. .. ..	5 10 0
,, horse-mowing	.. .. ..	4 0 0
,, shepherd's wages	.. .. ..	16 0 0
,, 121 Lambs at 10*s.*	.. ..	15 6 0
,, 17 acres of Turnips	.. ..	17 0 0
,, 25 ditto Beet	.. .. ..	150 0 0
,, 28 ditto Italian	.. ..	14 0 0
,, 11 ditto Rye	.. ..	6 11 0
,, 2 coombs Beans	.. ..	1 6 0
,, keep of 4 sheep	.. ..	2 0 0
,, 20 acres of Layer	.. ..	20 10 0
,, extra labour, sheep	.. .. ..	11 0 0
,, replacing stores	.. .. ..	100 0 0
		£691 5 0
Profit	.. .. ..	190 5 0
		£881 10 0
By 608 Lambs	.. .. ..	£617 10 0
,, 4 ditto	.. .. ..	10 0 0
,, wool	.. .. ..	128 0 0
,, 72 acres folding	.. .. ..	72 0 0
,, 500 loads of manure	.. .. ..	50 0 0
		£881 10 0

This seems an approximation only, as there is no credit entry for sale of crones and skins. Further, as this is a case "Sheep *v.* Bullocks," and to more fully carry it out that farming may be successfully practised without the latter, I give you the corn valuations for 1868 and 1869, with their results:—

acres.	*Michaelmas Valuation, 1868.*		
70½	Wheat, 10 coombs per acre, at 25*s.*	..	£881 5 0
69½	Barley, 11 ,, at 20*s.*	..	764 10 0
10	Peas, 7 ,, at 20*s.*	..	70 0 0
14	Peas and Beans	..	104 0 0
			£1819 15 0
	Plus valuation .		334 1 9
	Result.		
	Wheat sold	..	£911 19 10
	Barley	..	1027 16 11
	Peas consumed	..	85 0 0
	Beans and Peas	..	91 0 0
			£2153 16 8

acres.	*Michaelmas Valuation, 1869.*		
64	Wheat, 11 coombs per acre, at 22*s.*	..	£774 8 0
86	Barley, 11 ,, at 18*s.*	..	851 8 0
8	Peas, 11 ,, at 17*s.*	..	74 16 0
3	Peas and Beans, 9 ,, at 20*s.*	..	27 0 0
			£1727 12 0
	Plus valuation ..	..	1 18 0
	Result.		
	Wheat sold	..	£906 11 9
	Barley sold, £642 2*s.*; 48½ coombs used for seed, at 17*s.*, £41 8*s.* 9*d.*; 21 coombs, winter, at 15*s.*, £15 15*s.*; 175 drawn, at 18*s.*, £115 14*s.*	..	821 19 0
	Peas consumed	..	76 19 0
	Peas and Beans ditto	..	24 0 0
			£1729 10 6

My Barley was very inferior, and manures, value £70, were worse than thrown away; though I grew 1041

coombs, the result, as you see, was considerably below the 69½ acres of the former year.

I must apologise for my discursive paper, and at the same time thank you for your polite attention. I appeal to you for the verdict—That these facts, running over so many years, indisputably prove that farming can be carried on with good results without bullocks.

In answer to a question, Mr. FISON said his sheep were put in the yard as soon as the weather became wintry, and kept there until the lambing.

Mr. HATTEN said it was more expensive keeping sheep in the yard than on the land, and he should like to know the total cost of keep for Mr. Fison's in the winter months. He kept his on the land, and it cost 7*s.* a-week to feed them, but Mr. Fison's cost him a good deal more.

Mr. FISON said his cost £1 2*s.* 8*d.*

Mr. HATTEN said it cost more, taking into consideration the carting of the roots to the yards.

The CHAIRMAN said there was a great deal of extra labour in keeping sheep in the yard, and he wanted to know if Mr. Fison included that in his average per acre.

Mr. FISON said every farthing for labour was included in his calculation, and it was a great deal too much. He wanted to learn, whether by expending money in that extra labour he was on the right track.

Mr. MANFIELD thought sheep on heavy land paid better than bullocks, and Mr. Fison not only got a good return for his sheep, but also a good return of corn. He should like to know how much land was given up to sheep.

Mr. FISON said about 25 acres.

Mr. MANFIELD said he was of opinion that keeping sheep on light land on Mr. Fison's system would not do, as drawing the roots off impoverished it. Mr. Fison did not farm on the four-course system, and that was a point to be considered. The feeding off roots on heavy land often did more harm than good.

Mr. S. W. HUNT said in Barningham there was land that would not be found in many parishes, and besides Mr. Fison kept profitable sheep, and his was altogether an exceptional case, and should not be put forth as an average one. People would be led to suppose that farming was a very paying occupation, but it was not so. Mr. Fison's land was far superior to many people's, although there was great credit to him for what he had done. His system would not pay on an average farm.

Mr. HARRISON said they were all indebted to Mr. Fison for bringing the subject before them. He had not had much experience in feeding sheep from yards; but what he had had gone against him. If sheep were kept on the land, there was the manure already spread, and on mixed soil and light land it would be ruinous if the sheep were not folded on the land. Mr. Fison's item for labour was very heavy. By the request of Mr. Fison, he had looked into his (Mr. Harrison's) labour account, and he found that from 1833 to 1844 his wages were for three years 9*s.* a week, and for four years 10*s.*, making an average of £1 9*s.* 10*d.* per acre. From 1863 to 1869 they varied from 9*s.* to 11*s.*, and averaged 10*s.* 4¾*d.* per acre; and this was far below Mr. Fison's average, for his labour was very heavy compared with labour throughout the country.

Mr. FISON contended that his corn and lamb returns were satisfactory, and his experience after three years was that feeding on the land was injurious instead of beneficial. As to wages, Mr. Harrison's averaged £1 10*s.* per acre; and his, which included a farm steward and the extra carting, only averaged £1 18*s.* 9*d.* The four-course system was the most simple; but, at the same time, great results might be obtained by farming as he did, although it entailed a large amount of labour. His farm had been farmed well for 50 years, and that made a great difference.

Notices of Books.

How Crops Feed. A Treatise on the Atmosphere and the Soil as related to the Nutrition of Agricultural Plants, with Illustrations by S. W. Johnson, M.A. Large 12mo, pp. 375. New York: Orange Judd & Co. London: Trübner & Co.

Some time since we had occasion to speak in favourable terms of a volume by the same author, entitled—"How Crops Grow." The most unsatisfactory portion of the work just alluded to was decidedly that relating to vegetable anatomy and physiology. It was evident that in these departments the author was by no means so much at home as in the more purely chemical parts of his subject. The English reprint, which was edited by Messrs. Church and Dyer, is in many respects an improvement on the original edition, and particularly so as regards the more purely physiological subdivisions. The present treatise, intended as a companion volume to "How Crops Grow," is necessarily devoted specially to the consideration of chemical and physical agencies and substances in their relation to plant life. In handling them the author is using tools to which he is accustomed, and the results are correspondingly satisfactory. The first portion of the book is devoted to the consideration of the atmosphere as related to vegetation, while the second division treats of the soil as related to vegetable production. In this manner all the substances, liquid or gaseous, mineral or organic, which constitute the food of plants, come under review; their sources are indicated, and the probable condition in which they are absorbed explained. How they are absorbed is told in the earlier volume. In a book of this character, filled with details, there is little scope for criticism. The author's aim is rather to present in a readily available form the fact relating to his subject, than to discuss them in all their bearings. Nevertheless, in marshalling his facts it is evident that he has employed great care and discrimination, and is not led away by the greatness of a name. The inferences and conclusions he draws from the facts are not strained, but seem, so far as we have been enabled to test them, to be cautiously and conscientiously drawn. By way of illustration, let us take the case of humus. Most of our readers will remember the fierce battles over this subject between those who upheld and those who denied its nutritive value. Our author gives a brief summary of the arguments, *pro* and *con*, interspersed with his own remarks, and then sums up as follows:—

"From the facts just detailed we conclude that some kinds of organic matters may be absorbed and chemically changed (certain of them assimilated) by agricultural plants. We must, therefore, hold it to be extremely probable that various forms of humus, viz., soluble humates, ulmates, crenates, and apocrenates, together with the other soluble organic matters of the soil, are taken up by plants, and decomposed or transformed, nay, we may say assimilated by them."

The concluding passages of Professor Johnson's work are among the most suggestive in the whole treatise. After showing that the term "exhaustion of the soil" is relative merely, and signifies "a reduction of producing power below the point of remuneration," he continues, "the speedy and absolute exhaustion of a soil, once fertile, that has been so much discussed by speculative writers, is found in their writings only, and does not exist in agriculture."

"A soil may be cropped below the point of remuneration, but the sterility thus induced is of a kind that easily yields to rest or other meliorating agencies, and is far from resembling in its permanence that which depends on original poverty of constitution. * * * * Disintegration and nitrification would lead to a waste of the resources of fertility were it not for the conserving effect of those physical absorptions and chemical combinations and replacements which have been described. The two least abundant ash ingredients, viz., potash and phosphoric acid, if liberated by the weathering of the soil in the form of phosphate of potash would suffer speedy removal did not the soil itself fix them both in combinations which are at once so soluble that, while they best serve as plant-food they cannot ordinarily accumulate in quantities destructive to vegetation, and so insoluble that the rainfall cannot wash them off into the ocean. * * * * The great beneficent law regulating these absorptions appears to admit of the following expression:—Those bodies which are most rare and precious to the growing plant are by the soil converted into and retained in a condition, not of absolute but of relative insolubility, and are kept available for the plant by the continual circulation in the soil of the more abundant saline matters. The soil, speaking in the widest sense, is then not only the ultimate exhaustless source of mineral (fixed) food, to vegetation, but it is the storehouse and conservatory of this food, protecting its own resources from waste and from too rapid use, and converting the highly soluble matters of animal exuviæ as well as of artificial refuse (manures) into permanent supplies."

We trust we may soon have to welcome an English edition of this useful volume, but in the meantime beg to recommend to those whom it may concern the original edition now before us.

Farm Memoranda.

FLODDEN FIELD.—Leaving Grindon, we proceeded westwards, crossing the Till at Ford Castle, and continuing through Crookham to Flodden Hill. Here a crowd of historic points rush before the mind's eye, but on them we cannot now dwell. Here, however, and on the slopes of this classic ground, we found some farms that may be taken as model occupations, or rapidly advancing to that degree of economical management.

One of these consists of upwards of 1000 acres, about 600 acres of which are arable, and something over 400 acres are grass pastures and shifts. Of Turnips here grown there are 150 acres per annum, and, as no Rye is cultivated for spring feed, not only is this crop, as the basis of the farm's fertility, required to be of the best possible character, but great care in storing the best keeping Swedes, that they may last, is necessary. When we were there, we saw some that were sound and of good quality, considering the trying winter which they had to endure. The plan of storing these is to put them into heaps of three or four loads each, and to cover them with 6 or 8 inches of soil and nothing else. The practice here adopted of cutting off the roots and a part of the top of the Swedes when they are heaped is, in our opinion, wrong. In a forwarder and warmer county, where these roots ripen more fully, they would not only lose much of their quality by having the skin thus broken, but more than half of them would be rotten by April, and the whole of them more or less decayed by May Day. Here, too, it is quite certain that, if these Swedes were stored as they were pulled up, they might be drawn earlier, and thereby protected from December frosts; which would not only more completely preserve their quality, but cause them to remain sound to a later period of the spring. This point, however, we will discuss at greater length previous to the storing season.

To work the land there are nine pairs of horses used, there being two steadings, at a suitable distance apart.

The manures used for these roots cost about 30*s.* per acre, and the quantities, which are judiciously selected, will be gathered from the following Table:—

Name of Field.	Acres.	Guano.	Nitre.	Crushed bones.	Dissolved bones.
		cwts.	cwts.	bushels.	cwts.
Kings Stone ..	16	8	4	64	24
Castle Hill ..	19	10	5	80	30
Gravel Hill ..	23	11	5	96	35
Twelve Acres ..	12	6	3	48	18
Golden Knolls..	19	10	5	80	30
Clear Pool ..	20	10	5	80	30
White Wells ..	24	12	6	96	36
Flodden ..	12	6	3	48	18
	145	73	36	592	221

In addition to this mixture there are used 10 cartloads of farmyard manure, highly charged with excreta, the waste of much corn and cake.

The courses practised are—five crops on light land, and four crops on the stronger and better soils, the difference consisting in the grass or "seeds" being kept down two years on the lighter soils. Here, as well as in the south of the county, Wheat will not take after Clover or seeds, and, therefore, Wheat is sown after Turnips, and Oats or Barley after the seeds. A few Potatos are grown, but these are taken after a part of the "seeds" also, as the Turnips are too valuable and necessary for the stock to have any part of the Turnip "break" occupied by this crop. The course will, therefore, stand thus:—1, Turnips; 2, Wheat and Barley; 3, Clover or "seeds," and Pulse, when necessary; 4, Oats, Potatos, and Barley, when suitable; 5, over-year "seeds."

The sheep kept are Cheviots, half-breds, and Border Leicesters. The basis of the flock is 50 score breeding ewes, the whole of the produce of which is kept on the farm and fatted off, some before this time of the year, some are going now, and some will not ripen off till later in the season. The cattle kept are also as numerous as the requirements for making the straw into manure may occur. These are all bought in, for beyond the produce of the hinds' and cottagers' cows, and the few there are kept for private household purposes by farmers and well-to-do villagers and townsfolk, there are no breeding cattle kept in the Border districts. These cattle are bought in at this season and in the autumn. Thus two sets of stock are continually coming on, the one growing on the poorer fields and pastures, and the other fattening on the good meadows and in the yards and byres.

The hinds or labourers are paid largely in kind, which consists in 7 bolls of Oats (a north Northumberland boll being 6 bushels), 4 bolls of Barley, 2 bolls of Peas or Beans, while a cow is kept and a house and garden found, the money payment being £5 per annum. Much of the lighter labour is done by women, and they all look well and comfortable, and their general bearing and character are better than that of the women who earn a livelihood of similar value in towns.

The Border farms, as a whole, contain some singular features. One of these features is, the greater part of the corn is sown broadcast. This is practised, not only because the work itself is cheaper than drilling, but because there is less treading of the seed-beds by horses, while the plants are more regularly spread over the ground, which, it is said, gives them a better chance to make strong roots, and to branch into healthy and vigorous stems. This sight was refreshing to our eye, and these opinions fell like the charm of common sense on our ear, as we have been compelled to hear and read so much nonsense during the last 25 years about thinner and thinner seeding by means of dibbling-machines and drilling apparatus. Much of this broadcasting is done by hand, and most artistically performed it is. But a large portion is done by broadcasting machines, large numbers of which are made in the northern towns.

It is fair only to remark, however, that this plan can only be adopted with adequate success when land is as clean, or as free from weeds, as are the fields of the Border farms.

Another striking feature is the character of the ploughs, which are principally of local make, and the breasts, or mouldboards, are short and concave in their form. The Border farmers like to have the furrows lifted by the plough, and then dropped and left without side pressure, which the long convex breasts produce. These views are followed by the makers of Firie's ploughs, who say that the long convex breasts merely "spoil" the land for a seed-bed or aërating purposes. These matters, however, are now recorded as news only, as we have not at our disposal on this occasion the space it would require to argue them out.

The Week's Work.

June 25.—Vetch and Clover Stubbles should be ploughed as soon as the crops are removed for soiling, so as to gain the benefits of a short summer fallow, to neutralise the bad and souring effects of lying in a consolidated state during the autumn, winter, and spring months. Not only the soil itself but the vegetable matter in it becomes sour, to such a degree in

some soils as to counteract decomposition, even when folded with sheep. But when exposed to the atmosphere the bottom, although it breaks up harsh, it soon crumbles down after the first summer shower, mellows, and becomes a fine seed-bed.

Cabbages not unfrequently follow Vetches, whether folded or removed for soiling off the land. Folding is seldom a sufficient manuring for this crop, but it greatly conduces to neutralise acidity and set up a healthy decomposition of the roots and stubble; and for this purpose the land should fallow a week or so before it is manured, as all harshness should be thoroughly removed before Cabbages are planted. Some apply lime to neutralise acidity, but this is superfluous, and even wasteful, unless lime is wanting in the soil, and if wanting the lime should have been applied to the Vetch crop, which is a great consumer of lime; for many clay soils, redundant in lime, naturally become very sour when lying under winter crops, unless grown in drills sufficiently wide apart to permit of horse-hoeing. Some manure heavily on the stubbles, plough in, and plant on the flat, after the land has lain a week or ten days to fallow; others give the tall stubble a clean fallow, manuring in ridges when the land is ready. In both cases the farmyard manure should be well soaked in the hill before it is applied. Some defer planting until rain falls, others use the watering-pan freely to start the plants. In the latter case, the ground about each plant should be thoroughly soaked down to the roots and manure, for a small dribble on the surface in dry weather is worse than none. The early planted crops horse and hand hoe frequently, as keeping the earth loose and well up to the plants is greatly in favour of their growth. The more advanced crops, as they begin to heart and cover the ground, set up close with the double-mouldboard plough.

Meadow Hay, from water meadows or sewage meadows, should be as early as Rye-grass and Clover hay, but the general crop not irrigated is later. Some grasses flower in April, others in May, June, July, and August; so that, according to the old rule, "cut when the bulk of the crop is in flower," some sacrifice of the early and late sorts must be made. In the field there is seldom much difficulty experienced when to begin, if the weather is good. When cut with the scythe, a boy follows each scythe, throwing out the swathe evenly and loosely over the ground. When cut with the mowing-machine, the haymaking-machine follows as close as the condition of the grass and state of the weather will permit. The hay-rake comes next, gathering the half-made hay into wind-rows for cocking before night. Next morning the cocks are shaken out into wind-rows, and may be turned by the reverse action of the tedding-machine as the day requires; and so on, the work proceeds until the hay is fit for carrying. In making hay two extremes should be carefully avoided when it is possible, viz., roasting in sunshine, and blanching in rainy weather.

Hay Stacking is a very nice operation, requiring every forkful of hay pitched to be shaken out evenly over the stack. Some prefer green hay, others stack with a sufficiency of sap to produce heating and eventually brown hay. Rye-grass and Clover hay from trampcocks is generally stacked green, often in a single day—seldom more than three being required to finish a large stack. But meadow hay, when properly heated, requires to be stacked slowly, 4 or 5 feet in height daily, so that a number of days is required to complete a stack. Hence on large farms two or more stacks proceed together, the one a day or two in advance of the other, each being under its own rick-cloth at night or when rain falls.

Thatching should follow stacking without unnecessary delay. Rye-grass and Clover hay may be thatched as soon as the stack is up, if the weather is unsettled; but if there is no appearance of rain the stack may be allowed to settle down. Meadow hay requires the heat to be nearly out of the stack before it is thatched, granting that the roof settles down evenly, which it does not always do. The better plan is to stack in hay-barns, and then thatching is not required.

Sheep Washing and Shearing Cheviot and Black-faced hill flocks continue up to the beginning of July. Both breeds are active and excellent swimmers, especially the Blackfaced, and from being annually washed for four or five seasons old sheep become accustomed to it, so that the younger follow. A pool in a clear running stream, with a pebbly shore, is chosen for washing, with a large fold on each side to hold the flock. When one old sheep takes the water the others follow, one after the other, jumping in between the shepherds as fast as allowed, and walking out at the other side. Three or four times across the pool completes the process of washing, without a single hand being laid upon a sheep. The poet Dyer appears to allude to this old plan of washing when he says—

"Gay shearing time approaches. First, however,
Driven to the double fold, upon the brim
Of a clear river, gently driven the flock,
And plunge them one by one into the flood."

As soon as the wool is dry shearing commences. In the large hill flocks of the North the shepherds join, shearing first one flock and then another, each flock being thus put through the shears in less time than could otherwise be done without clubbing.

Newly shorn Sheep are washed for the twofold purpose of cleanliness and healthy action of the skin, so as to obviate cold—just as some shepherds wash their own heads when newly shorn to avoid colds. A bright sun is liable to blister or injure more or less the skins of newly shorn sheep, hence they should have shade to go under.

Sheep Washes.—The skin of the sheep is liable, after shearing, to get into an unhealthy state; ticks and lice follow, and, to prevent these, sheep are dipped in various solutions termed washes, poisonous to such insects, and more or less to the sheep also. Were these newly shorn sheep washed with water and shaded from the sun during dry, and sheltered from cold during night or bad weather, and then properly fed until their wool form a natural covering to defend them, there would be no need of poisonous washes.

The Fly now, early and late, requires watching, and, as it is easy to know when a sheep is struck, the eye of the shepherd should always be abroad over the pastures. On no account should he leave his charge during the day, and at night the flock should be carefully examined before he leaves for home. *W. B.*

Notices to Correspondents.

INDIAN HORSE DISEASE: *A Correspondent* writes as follows:—"Amongst our foreign items, too, will be found an account of an extraordinary disease, which is carrying off a large number of horses in and about Calcutta. It appears to be somewhat similar in its nature to a complaint to which the natives themselves are liable, called burra-burra—we cannot answer for the spelling, but give it phonetically; the body swells, the head frequently becoming an enormous size, whence the name, for we believe burra means 'big.' The patient generally lies down to die, but if he has good pluck and keeps at work he stands a better chance of getting over it." I have seen something of the disease described in the above paragraph, which I have cut from the *Wilts and Gloucestershire Standard* of last week. I have always heard the name called "berry-berry," not "burra-burra"—but what is it? It isn't mere dropsy, for in dropsy the water collects very slowly, but with this disease I have seen a man at work one day, feel ill, lie down in the afternoon, and dead next day, or the following. In a ship I was in we buried three and four of our men a day. [We believe the disease to be of the nature of that which is known as "bighead" in America. The malady is undoubtedly a "blood disease," allied to splenic apoplexy and black-leg of this country—only of a more virulent kind. It is in no way related to dropsy.

Markets.

ENGLISH WOOL.

During the past week, without any apparent cause beyond the uncertainty as to the effect of the new clip coming to market, we have had a dull trade, and to effect sales of any quantity a small reduction would have to be submitted to. Lustres and demi-lustres form, however, an exception, being in good request.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	*s. d.*	*s. d.*
FLEECES—Southdown hoggets	.. ..	1 1 to 1	2½
Half bred ditto	.. ..	1 2 — 1	2
Kent Fleeces	.. ..	1 3 — 1	4
Southdown ewes and wethers	.. ..	0 0½ — 1	1
Leicester ditto	.. ..	1 2 — 1	3
SORTS—Clothing	.. ..	0 10 — 1	6
Combing	.. ..	1 0 — 1	8

HOPS.

BOROUGH MARKET, June 23.

Messrs. Pattenden & Smith report a steady retail inquiry for all descriptions, at late rates. The reports from the Hop growing districts are generally very favourable.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, June 23.

Prime Meadow Hay	110s. to 120s.	Clover, old	130s. to 145s.
Inferior do.	70 — 90	Inferior do.	115 — 125
New Clover	95 — 110	Prime 2d cut	115 — 125
Inferior do.	80 — 90	Inferior do.	90 — 100
Straw	24 — 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, June 23.

Sup. Meadow Hay	118s. to 126s.	Inferior Clover	110s. to 126s.
Inferior do.	100 — 110	New do.	110 — 120
New do.	90 — 105	Straw	30 — 36
Superior Clover	138 — 150	JOSHUA BAKER.	

WHITECHAPEL, Thursday, June 23.

Fine Meadow Hay	120s. to 128s.	Prime old Clover	140s. to 147s
Inferior do.	90 — 110	Inferior do. do.	115 — 126
Prime New Hay	95 — 97	Prime 2d cut do.	120 — 140
Inferior do.	75 — 84	New Clover	100 — 120
Straw	28 — 36	Inferior do.	95 — 105

METROPOLITAN CATTLE MARKET.

MONDAY, June 20.

The number of Beasts is nearly as large as on Monday last; trade is very slow at about Thursday's rates. The supply of Sheep is rather heavier, and the demand is very limited, consequently prices are not better on the average. Choice Lambs are scarce, and realise rather higher rates. Trade is dull for Calves, at our quotations. Our foreign supply consists of 1400 Beasts, 5020 Sheep, 455 Calves, and 20 Pigs; from Scotland there are 19 Beasts; from Norfolk and Suffolk, 1580; and 921 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	4 8 to 5	0	Best Long-wools	.. to ..	
Best Shorthorns	4 6—4	8	Do. Shorn	4 6—4	10
2d quality Beasts	3 8—3	8	Ewes & 2d quality	.. — ..	
Best Downs and Half-breds	.. — ..		Do. Shorn	4 0—4	6
Do. Shorn	5 0—5	2	Lambs	5 4—6	8
			Calves	3 4—5	0
			Pigs	3 4—5	4

Beasts, 3320; Sheep and Lambs, 28,700; Calves, 508; Pigs, 170.

THURSDAY, June 23.

We have a short supply of Beasts; trade is, however, very dull, yet for choicest qualities prices have rather advanced. The number of Sheep and Lambs is nearly the same as on Thursday last; for Sheep trade is dull, at Monday's quotations. Choice Lambs, being scarce, make rather higher rates in some instances, but generally speaking trade is not better. The supply of Calves is very large; prices are lower, and many remain unsold. Our foreign supply consists of 170 Beasts, 3700 Sheep, and 551 Calves.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5 0 to 5	2	Best Long-wools	.. to ..	
Best Shorthorns	4 8 — 5	0	Do. Shorn	4 8 — 5	0
2d quality Beasts	3 0—4	0	Ewes & 2d quality	.. — ..	
Best Downs and Half-breds	.. — ..		Do. Shorn	4 0—4	6
Do. Shorn	5 0—5	2	Lambs	5 8—6	8
			Calves	3 0 — 5	0
			Pigs	3 4—5	0

Beasts, 760; Sheep and Lambs, 14,220; Calves, 707; Pigs, 60.

METROPOLITAN MEAT MARKET.—June 23.

Best Fresh Butter .. .. .. 16*s.* per dozen lb.
Second do. do. .. .. .. 14*s.* „
Small Pork, 5*s. 0d.* to 5*s. 4d.*; Large Pork, 3*s. 8d.* to 4*s. 0d.* per 8 lb.

MARK LANE.

MONDAY, June 20.

The supply of English Wheat to this morning's market was very small, nevertheless the prices of this day's ennight could not be exceeded. The attendance was moderate, and foreign Wheat was generally held for the advance quoted on Friday of 1*s.* per qr., and the little business transacted was at that improvement. Spring Corn of all descriptions was 1*s.* per qr. dearer, with less business doing in Oats than last week. Flour was a slow sale, without change in value.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	49	55	Red	47	55
— — fine selected runs..do.	52	60	Red	50	57
— — Talavera	53	62			
— — Norfolk	—		Red	—	
— — Foreign	42	60			
BARLEY, grind. & dist.	26	30	42	Malting	34	38
— Foreign ..grinding and distilling	22	30	40	Malting	30	40
OATS, Essex and Suffolk	22	24				
— Scotch and Lincolnshire..Potato	24	26	Feed		—	
— Irish Potato	23	25	Feed		21	24
— Foreign ..Poland and Brew	25	27	Feed		20	25
RYE	32	36	Foreign		33	36
RYE-MEAL, Foreign						
BEANS, Mazagan	34	36	Tick	34	46	
— Pigeon	40	50	Winds	—		
— Foreign			Small	41	43	Egyptian	38	40
PEAS, White, Essex, and Kent	Boilers			37	38	Suffolk	37	40
— Maple, 33*s.* to 40*s.*	Grey			32	35	Foreign	33	37
MAIZE	—			Foreign	30	32
FLOUR, best marks delivered..per sack				39	47	
— 2d ditto ditto				29	41	Country	29	41
— Foreign per barrel				24	27	Per sack	32	58

WEDNESDAY, June 22.

At Mark Lane to-day the arrivals of English Wheat were on a limited scale. For both red and white produce the demand was less active, but no change took place in prices. With foreign Wheat the market was moderately supplied; sales progressed slowly, at about late rates. The show of Barley was moderate; the trade was firm, at improving currencies. Malt sold quietly, on former terms. Oats were in request, at fully the late advance. Beans and Peas were steady, and tending upwards in value. Flour was dull, at the recent enhancement.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 450	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	1010	7020	26,430	1850 / 140 brls.
	1460	7020	26,430	

LIVERPOOL, June 21. There is only a thin attendance, and a smaller business was done in Wheat than for some time past; where sales were made holders submitted to a reduction of 3*d.* per cental from Friday's prices. Flour was quiet, but kept pretty steady. Beans and Peas steady. Barley neglected. Kiln-dried Oats, on a Continental inquiry, advanced considerably but other sorts were unchanged. Indian Corn slow of sale.

AVERAGES.

	Wheat.	Barley.	Oats.
May 14	44*s.* 5*d.*	33*s.* 9*d.*	23*s.* 1*d.*
„ 21	45 1	32 5	22 0
„ 28	45 4	32 11	23 10
June 4	45 3	32 0	23 0
„ 11	46 1	33 1	22 0
„ 18	48 0	32 5	25 0
Average ..	45 7	32 10	23 2

SEED MARKET.

The severe and protracted drought continues to exercise a hardening effect upon the prices of agricultural seeds. In Rye-grass especially there has been a rapid advance in values, and a brisk speculative demand has sprung up. Of French Italian the small stock left over has been eagerly bought up; and some quantity has been actually re-shipped to France. Very high prices are asked for Trifolium incarnatum. White Mustard seed is in good request, at high rates. Sowing Rape seed is also very dear and scarce. Blue Peas meet with an improved inquiry. Canary seed is held with much firmness. Feeding Linseed has during the last three weeks advanced fully 6*s.* per qr.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

CARSON'S ORIGINAL ANTI-CORROSION PAINT.

PATRONISED BY HER MAJESTY THE QUEEN,

THE BRITISH GOVERNMENT, THE INDIAN GOVERNMENT, | THE COLONIAL GOVERNMENTS, 7000 of the NOBILITY and GENTRY, | RAILWAY and CANAL COMPANIES, COLLIERIES, IRONMASTERS, &c., &c.

It is extensively used at Home and Abroad for all kinds of

OUT-DOOR WORK,

VIZ.,

IRON, WOOD, BRICK, STONE, COMPO.

	Per Cwt.
WHITE	30s.
LIGHT STONE	
BATH DO.	
CREAM COLOUR	
LIGHT PORTLAND STONE	
DRAB OR PORTLAND DO.	
BUFF FOR STABLES	
OAK COLOUR	
LEAD COLOUR	26s.
BRIGHT RED	
DARK DO.	

TRADE MARK.

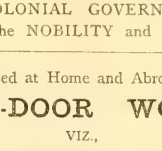

	Per Cwt.
CHOCOLATE COLOUR	26s.
PURPLE BROWN	
BLACK	
BRONZE GREEN	
LIGHT LEAD	28s.
INVISIBLE GREEN	36s.
BRIGHT GREEN	42s.
MEDIUM GREEN	
DEEP GREEN	
BLUE	

3 CWT. Free to any Station or Port in the United Kingdom.

CAUTION.—All Casks bear the Trade Mark, without which none are genuine.

PRICES, TESTIMONIALS, AND PATTERN CARDS, POST FREE ON APPLICATION.

PREPARED OIL MIXTURE FOR THE ANTI-CORROSION.

OILS, TURPENTINE, AND BRUSHES. VARNISHES, BOTH FOR OUTSIDE AND INSIDE PURPOSES.

"ARCHIMEDEAN" LAWN MOWER.

The "ARCHIMEDEAN" is the only Lawn Mower that **cuts wet or long grass without clogging**, thus enabling the man to work it in the morning or cool of the day, instead of waiting for the grass to dry and toiling under the heat of a mid-day sun. It is extremely easy to work, and will preserve its perfect cut whilst traversing mounds or sloping banks.

The "ARCHIMEDEAN" is admitted to be the best Machine ever brought out for the purpose, because it is durable, simple, and performs its work better and with less than half the power required for any other Lawn Mowers, and will do double the amount of work.

The "ARCHIMEDEAN" leaves the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

The Mower is warranted to give ample satisfaction, but if not approved of may be returned within a month and exchanged for a machine by any other maker, or the amount will be refunded.

NO CHARGE FOR PACKING CASES, which are most convenient for storing the Machine during the winter.

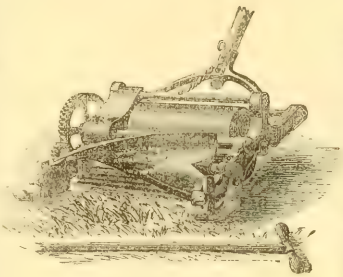

LIST OF PRICES.

11-inch, suitable for a Lady or a Boy ..	£4 5 0
14-inch, suitable for One Person	£5 10 0
16-inch, suitable for One Person	£6 10 0

Delivered Carriage Free to all Railway Stations in the United Kingdom.

From "THE FIELD," *August 21, 1869.*

"We have tried it carefully against machines by two of the best English makers, and have no hesitation in recommending it to our readers as being by far more easily worked than either of them, and a the same time leaving the turf with a beautifully even and close cut."

From A. F. BARRON, Esq., *Royal Horticultural Society, Chiswick Garden, &c.*

"November 11, 1869.

"Gentlemen,—We have now had your 'Archimedean' Lawn Mower in use several months, and without hesitation I can truly say it is the best and most efficient implement of the kind we have ever used."

From Mr. GEORGE WYNESS, *Royal Gardens, Buckingham Palace.*

"September 11, 1869.

"Gentlemen,—I beg to say that we have had your Patent 'Archimedean' Lawn Mower at work in Her Majesty's Gardens at Buckingham Palace for some time past, and I have much pleasure in testifying that it has given every satisfaction, as it does its work we and quickly."

From the Rev. EDWARD OWEN, *The Lodge, Bradwell juxta-Mare, Maldon.*

"May 10, 1870

"Gentlemen,—I am happy to say that the 'Archimedean' gives us great satisfaction; it is by far the best machine I have seen. My gardener, who, like myself, was afraid of it at first, is now delighted with it."

From Colonel FORBES, *The Holmes, St. Boswells, N.B.*

"June 11, 1870.

"Gentlemen,—I beg to enclose cheque (£6 10s.) in payment of the 'Archimedean' Lawn Mower, and have great pleasure in bearing testimony to its high merit."

IMPORTANT NOTICE.

Since the introduction of the ARCHIMEDEAN LAWN MOWER into this country, it has met with a success that has surprised even the Manufacturers, confident as they were of its merits. During this, its first season, a larger number has been already sold than most of the English manufacturers sell in a whole year. Of course, it is not pretended that every purchaser thinks as highly of the Machine as do the high authorities quoted in the Circular; prejudice or clumsiness on the part of working men often condemning the most useful inventions. The Advertisers, however, feel great gratification in stating that, although a trial is allowed with every Machine, very few indeed have been returned out of the very large number sold. This unprecedented success has, of course, materially affected the manufacturers of other machines, and some of them are naturally annoyed that a stranger should in so short a time upset the whole trade. One firm in particular, modestly premising that its machines are the best, has published a violent attack on the "Archimedean"—thus tacitly admitting that the New Lawn Mower is its most formidable opponent. The same firm, in another advertisement, gives an account of a so-called "interesting trial of Lawn Mowers," the result of which was, of course, in favour of their own Machine. Considering that the Manufacturers of the "Archimedean" were not only *not present*, but *knew nothing* of this "trial" (?) till they saw it announced in the advertisement, the *interest* is rather on one side. This method of attacking a successful opponent in business, however "interesting," has neither the advantage of originality nor the merit of fairness.

It is preferred to leave the merits of the ARCHIMEDEAN with the Public, to whom is offered a month's trial with each Machine, in order that its advantages may be fairly tested in working. This must be much more satisfactory to intending purchasers than any other plan for testing the invention, and is the best reply to the unscrupulous attacks of persons interested in the sale of other machines, whether made openly by manufacturers, or by their friends under the guise of disinterested advice to the Public. Continued use will but confirm the good opinion generally held of the ARCHIMEDEAN LAWN MOWER.

Illustrated Catalogues and Testimonials Post Free on application.

WHOLESALE AND RETAIL AGENTS,

WALTER CARSON AND SONS,

LA BELLE SAUVAGE YARD, LUDGATE HILL, LONDON, E.C.; and

21, BACHELOR'S WALK, DUBLIN.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING, AND COLLECTING MACHINES FOR 1870.

Referring to the Letter published in the columns of this Paper, June 18, 1870, at pages 829 and 830, signed "A. D.," we agree with him that the following are the essential requirements of a really good Lawn Mower, viz. :—

1st, Lightness of draught.
2d, Easy and convenient to handle.
3d, It should perform its work neat and smooth, and leave no notches or scores to mark its path.
4th, It should be as noiseless as possible in working.
5th, The driving power simple in construction and not easily put out of gear. [convenient to oil.
6th, The bearings should be properly protected from dust and

We guarantee our Lawn Mowers to possess the above essentials to a greater extent than any other.

LEEDS HORTICULTURAL AND FLORAL SHOW, JUNE 3, 1870.

TRIAL OF MOWING MACHINES.

EXTRACT FROM *Yorkshire Post.*

"During the Show, a very interesting trial of Lawn Mowers took place on the ground. The competitors were the well-known manufacturers of these Machines, Messrs. THOMAS GREEN & SON, Smithfield Ironworks, Leeds, and the maker of a Machine called the Archimedean. The judges were the gentlemen who had made the awards at the flower show. The merits of the competing Machines were decided by setting them to work to cut long coarse grass, the style and time in which they accomplished their task, and the draught of each, being elements in guiding the judges in giving their award. The following was their unanimous conclusion :—

"'We, the judges of the Leeds Horticultural and Floral Society, having tested Lawn Mowing Machines manufactured by Messrs. Thos. Green & Son against the one called the 'Archimedean,' in an open field where the bents were from 5 to 8 inches long, have come to the unanimous conclusion that the 'Archimedean' is perfectly useless, either for long or short grass, the superiority of Green's Machines having proved on this, as on many other occasions, pre-eminent. We find the 'Archimedean' is only suitable for banks and steep rising grounds.'"

EXTRACT FROM *Leeds Mercury.*

"Amongst the other interesting features of the Show to which attention has not yet been called was a public trial on the opening day of Lawn Mowing Machines, manufactured by Messrs. GREEN & SON, of Leeds, and the American Machines known as the Archimedean. The test took place before all the judges in an open field where the bents were from 5 to 8 inches long, and at the close the decision was unanimously in favour of the Machines made by Messrs. GREEN & SON. That firm had an excellent stand on the ground occupied by horticultural machines of various descriptions."

Judges.—Wm. Carmichael, John Wells, F.R.H.S., M. Saul, W. Culverwell, J. McIndoe, James Fowler, Wm. Stewart, T. S. Holloway, late Chairman of the Society.

JAMES BIRBECK, Secretary.

GREEN'S PATENT LAWN MOWERS HAVE PROVED TO BE THE BEST, AND HAVE CARRIED OFF EVERY PRIZE THAT HAS BEEN GIVEN IN ALL CASES OF COMPETITION.

EVERY MACHINE IS WARRANTED TO GIVE ENTIRE SATISFACTION, AND IF NOT APPROVED CAN BE RETURNED WITHOUT ANY COST WHATEVER TO THE PURCHASER.

The following are a few of the principal places where Green's Patent Lawn Mowers are the only Machines in use, and have been for a number of years giving entire satisfaction :—

THE ROYAL GARDENS, WINDSOR.
BUCKINGHAM PALACE GARDENS.
MARLBOROUGH HOUSE GARDENS
SANDRINGHAM HALL GARDENS.
CHISWICK HOUSE GARDENS.
ROYAL HORTICULTURAL SOCIETY'S GARDENS, SOUTH KENSINGTON.
ST. JAMES'S PARK.
GREEN PARK.
KENNINGTON and BATTERSEA PARKS.
ROYAL BOTANICAL GARDENS
ROYAL HORTICULTURAL GARDENS.
KENSINGTON PALACE GARDENS.
TEMPLE GARDENS
ZOOLOGICAL GARDENS
CRYSTAL PALACE GARDENS
SOUTH KENSINGTON MUSEUM.
BERKELEY SQUARE GARDENS.
RUSSELL SQUARE GARDENS.
GORDON SQUARE GARDENS.
PARLIAMENT SQUARE GARDENS.
BRUNSWICK SQUARE GARDENS.
ROYAL HOSPITAL, CHELSEA.
ROYAL NAVAL SCHOOLS
HYDE PARK GARDENS.
LIVERPOOL PARK.
BIRKENHEAD PARK.
PRESTON PARK.
SUNDERLAND PARK.
HALIFAX PARK.
BRADFORD PARK.
LEEDS ROYAL PARK.

Testimonial from the Council of the Royal Horticultural Society, South Kensington, May 28, 1870.

"GENTLEMEN,—I am directed by the Council to inform you that your Lawn Mowing Machines have been in constant use in their Gardens at South Kensington during the last 10 years, and that they have always given the greatest satisfaction, doing their work excellently and with so much ease as to be generally preferred by our workmen.

"THOS. GREEN & SON. "I remain, gentlemen, your obedient servant, JAMES RICHARDS, Assistant Secretary."

PRICES OF HORSE, PONY, AND DONKEY MACHINES,

Including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary chaise traces or gig harness.

DONKEY AND PONY MACHINES.		HORSE MACHINES.	
To cut 26 inches	£13 0 0	To cut 30 inches	£21 0 0
,, 28 ,, ...	15 0 0	,, 36 ,, ...	24 0 0
,, 30 ,, ...	17 0 0	,, 42 ,, ...	27 0 0
Leather Boots for Donkey	0 18 0	,, 48 ,, ...	30 0 0
,, ,, Pony ..	1 2 0	Leather Boots for Horse	1 6 0

The 26 and 28 inches can easily be worked by a donkey, the 30 inches by a pony, and the larger sizes by a horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away, or in any way damaging the Machine.

HAND MACHINE.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned unconditionally.

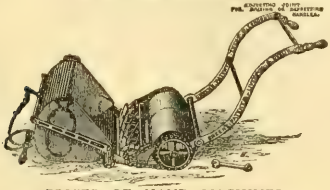

PRICES OF HAND MACHINES.

To cut 10 inches	£3 10 0	To cut 18 inches	£7 10 0
,, 12 inches	4 10 0	,, 20 inches	8 0 0
Suitable for a Lady.		,, 22 inches	8 10 0
To cut 14 inches	£5 10 0	,, 24 inches	9 0 0
,, 16 inches	6 10 0		
Suitable for one person.		*Suitable for two persons.*	

Packing Cases are charged at the following low rates, viz.:—For the 10 and 12 inch Machines, 3s.; 14 and 16 inch, 4s.; 18 and 20 inch, 5s.; 22 and 24 inch, 6s. Parties providing themselves with Lawn Mowers are recommended to purchase the cases in which to stow them away when not in use, to prevent them from getting damaged; if returned, two-thirds will be allowed for them.

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Ireland, and Scotland.

GREEN'S PATENT TUBULAR HOT-WATER BOILERS.

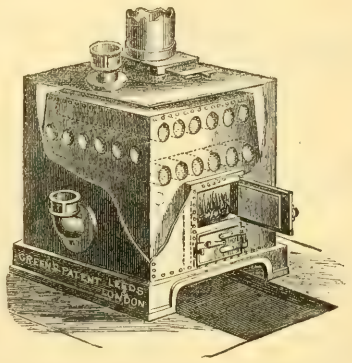

The following are the advantages of these Boilers :—

1st. They require no setting in brickwork.
2d. They are complete in themselves, having perfect means of regulation.
3d. They take up little room, and can be put in places inaccessible to other Boilers.
4th. They are economisers of fuel, owing to the great amount of heating surface upon which the fire acts in a direct manner, and the consumption of smoke.
5th. Any number of Flows and Returns can be annexed to the Boilers by means of T pipes.
6th. By means of mud doors, they can be readily cleaned out when required.
7th. The Chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation that it may be fixed in.

They are warranted to be the most Economical Boilers extant. Price Lists free on application.

THOMAS GREEN AND SON,

SMITHFIELD IRON WORKS, LEEDS; and 54 and 55, BLACKFRIARS ROAD, LONDON, S.E.

Bee-Hives.—Two Silver Medals Awarded to GEO NEIGHBOUR AND SONS, at the Paris Exhibition of 1867. The only English Exhibitors who obtained a Silver Medal for Bee-hives.

NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE, as originally introduced by Messrs. Neighbour & Sons, working three bell glasses, is neatly and strongly made of straw; it has three windows in the lower Hive. This Hive will be found to possess many practical advantages, and is more easy of management than any other Bee-hive that has been introduced

Price complete ..£1 15 0
Stand for ditto .. 0 10 0

The LIGURIAN or ITALIAN ALP BEE, being much in request, G. N. & Sons supply a Swarm of Bees with genuine Italian Queen, in the Improved Cottage Hive, at £4 4s., Hive included. (Such will shortly have wholly yellow Italian Alp Bees.)

An Italian Alp Queen, with full directions for uniting to Black Stocks, 21s. each.

ENGLISH BEES.—Stocks and Swarms may be obtained as heretofore.

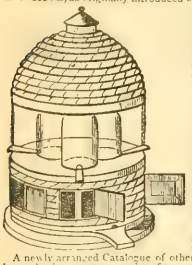

A newly arranged Catalogue of other Improved Hives, with Drawing and prices, sent on receipt of two stamps.

Address GEO. NEIGHBOUR AND SONS, 127, High Holborn, W.C. (or 149, Regent Street, London, W.

AGENTS.—Liverpool: JAMES CUTHBERT, 12, Clayton Square. Manchester: J. WILSON, 59, King Street. Dublin: EDMONSTON BROTHERS, 10, Dame Street. Glasgow: AUSTIN & MCASLAN, 76, Buchanan Street.

PAXTON'S STRAWBERRY CRINOLINE.

"Rock Hills," gave his approval of their usefulness.

The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, The right to Manufacture them was transferred to

R. HOLLIDAY, PRACTICAL WIRE WORKER, 2A, PORTOBELLO TERRACE, NOTTING HILL GATE, W.

Illustrated Catalogues of Horticultural Wire Work free on application.

GARDEN ARCHES, ARCADES, VERANDAHS, ORNAMENTAL FENCING, TRELLIS WORK for CREEPERS, FLOWER STANDS, SUSPENDING BASKETS, AVIARIES, PHEASANTRIES, &c.

Every description of Wire Work for Gardens, Conservatories, &c.

JOHN WARNER & SONS, HYDRAULIC ENGINEERS,

Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

8, CRESCENT, CRIPPLEGATE, LONDON, E.C.

No. 547a.

GARDEN ENGINE.

10 Gallons ..	..£3 0 0	Price, complete	£1 8 0
16 ,, ..	.. 3 16 0	Small size for the	
24 ,, ..	.. 5 1 0	hand, as an ordi-	
28 ..	.. 5 13 0	nary Syringe ..	0 15 0

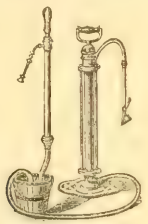

WARNERS' **AQUAJECT.**

Useful for every variety of purpose—in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.

THE CRYSTAL PALACE **GARDEN or FIRE ENGINE.**

No. 35.

CAST-IRON PUMPS.

2½ inches	..£1 0 0	4 ,, ..	.. 2 15 6
3 ,, ..	.. 2 2 0	4½ ,, ..	.. 3 3 0
3½ ,, ..	.. 2 7 0	5 ,, ..	.. 3 10 0

No. 579½.

SWING **WATER BARROW.**

20 Gallons ..	..£2 2 0	40 ,, ..	.. 3 18 0
30 ,, ..	.. 2 14 0	50 ,, ..	.. 5 14 0

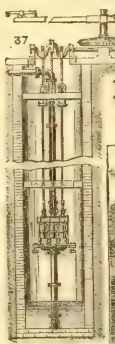

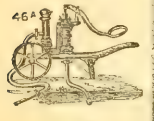

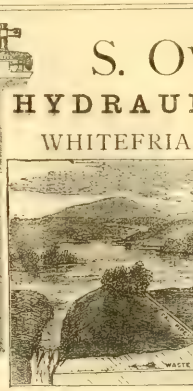

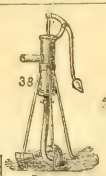

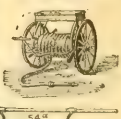

S. OWENS & CO.,

HYDRAULIC ENGINEERS,

WHITEFRIARS STREET, LONDON, E.C.

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

No. 37. DEEP WELL PUMPS for Horse, Hand, Steam, or other Power.
No. 63. PORTABLE IRRIGATORS with Double or Treble Barrels for Horse or Steam Power
No. 46a. IMPROVED DOUBLE ACTION PUMPS on BARROW for Watering Gardens, &c.
No. 49a. GALVANIZED SWING WATER CARRIERS, for Garden use.
No. 50 and 54a. FARM and MANSION FIRE ENGINES of every description.
No. 38. PORTABLE LIQUID MANURE PUMPS, on Legs, with Flexible Suction.
No. 49. GARDEN ENGINES, of all sizes, in Oak or Galvanized Iron Tubs.
No. 54b. THE CASSIOBURY FIRE EXTINGUISHER, as designed for the Right Hon. the Earl of Essex.
No. 44. WROUGHT-IRON PORTABLE PUMPS of all sizes.
No. 4. CAST-IRON GARDEN, YARD, or STABLE PUMPS.
No. 39b. IMPROVED HOSE REELS for Coiling up Long Lengths of Hose for Garden use.

S. OWENS AND CO. Manufacture and Erect every description of Hydraulic and General Engineers' Work for Mansions, Farms, &c., comprising PUMPS, TURBINES, WATER WHEELS, WARMING APPARATUS, BATHS, DRYING CLOSETS, GAS WORKS, Apparatus for LIQUID MANURE distribution, FIRE MAINS, HYDRANTS, HOSE PIPES, &c., &c. *Particulars taken in any part of the Country. Plans and Estimates furnished.*

ILLUSTRATED CATALOGUES CAN BE HAD ON APPLICATION.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.

The best Shading is "Frigi Domo" Netting.

White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for

PROTECTION from the COLD WINDS and MORNING FROSTS

"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
"FRIGI DOMO" CANVAS.

Two yards wide	.. .. ..	1s. 9d. per yard run.
Four yards wide	.. .. ..	3s. 6d. per yard.
An improved make, 2 yards wide	.. ..	1s. 9d. per yard.
An improved make, 3 yards wide	.. ..	2s. 8d. per yard run.

Scrim Canvas, 72 inches wide, 70 yards long, 5¾d., 6¾d., 7¾d., 7¾d. and 8¾d. per yard.

Hessian Canvas, 54 and 72 inches wide, 6¼d. and 8¾d. per yard; 3d extra for cut lengths.

ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom.

FOR SALE, cheap, a splendid large GREENHOUSE, with domed top, now standing at Barkly Hall, Leicestershire, which has to be removed in consequence of extensive alterations

NEALE AND SONS, Builders, Peacock Lane, Leicester.

THE CLOCHES, or BELL GLASSES, named in Mr. Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now in stock. Prices and particulars of the Aire and Calder Glass Company, 83, Upper Thames Street, where a Stock is kept; also at 36, Long Acre. J. GOODERIDGE, Agent

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—

GLASS for FORCING HOUSES,

As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.

Each Box contains 100 feet. The prices only apply to the sizes stated

Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15.

	16 oz. to the foot.			21 oz.
Fourth quality	.. ..	15s. 0d.	.. ..	19s. 6d.
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11 by 11	12 by 11	..	..			
11 by 12	12 by 12	15 by 11	16 by 11			
18 by 12	19 by 12	16 by 12	17 by 12			
16 by 13	17 by 13	20 by 12	..	15 0	16 0	18 6
16 by 14	17 by 14	18 by 13	..			
..	20 by 14	18 by 14	..	16 10 17 0	to the foot	
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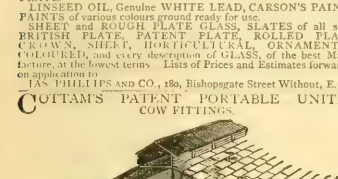

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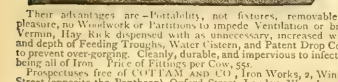

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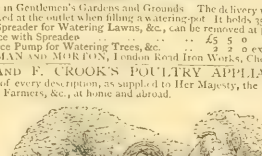

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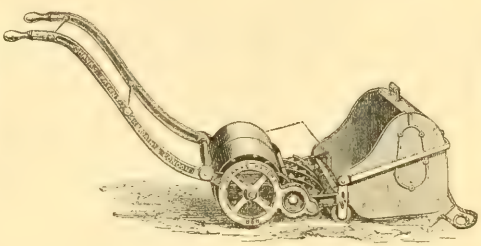

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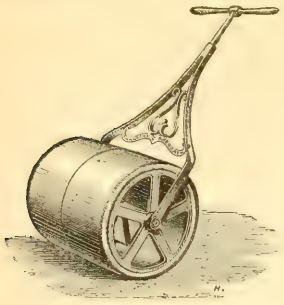

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AND

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THE ROMFORD and ESSEX FLORAL and HORTICULTURAL SOCIETY.—The FIRST SHOW, Open to All England, will be held in the PARK, ROMFORD, on TUESDAY, when PRIZES to the amount of ONE HUNDRED and TEN POUNDS will be awarded. ENTRIES to CLOSE JUNE 30. Schedules and full particulars on application to F. S. PALMER, } Secs.
R. HULSE, }

Committee Room, White Hart Hotel, Romford.

BIRMINGHAM ROSE SHOW, JULY 7 and 8.—For PRIZE LISTS, apply to Mr. A. FORREST, Secretary, Cherry Street, Birmingham. ENTRIES CLOSE JULY 2.

LOUGHBOROUGH HORTICULTURAL SOCIETY'S EXHIBITION, JULY 13.

SPECIAL PRIZES FOR ROSES (open to all England).

1st, For the best Collection of 72 Roses (72 varieties), single trusses, 1st Prize, a Cup, or £10 10s; 2d, £5 5s.; 3d, £2 2s.

2d, For the best Collection of 48 Roses (48 varieties), single trusses, 1st Prize, a Cup, or £5 5s.; 2d, £2 2s.; 3d, £1 1s.

3d, For the best Collection of 36 Roses (36 varieties), single trusses, 1st Prize, a Cup, or £3 3s.; 2d, £1 1s.

SPECIAL PRIZES FOR PLANTS.

For the best 12 Stove or Greenhouse Plants (distinct varieties), 6 foliage and 6 in flower (Orchids excluded), 1st Prize, £10; 2d, £6; 3d, £4; 4th, £2.

Full information may be had from WM. PALLETT, Secretary.

Notice.

H. CANNELL'S FUCHSIA SHOW.—In consequence of all the buds dropping, through the unsuitableness of the pots, the Fuchsia Plants staging in, H. C. is obliged to REMOVE them to Woolwich immediately
H. CANNELL, F.R.H.S., Woolwich.

Seeds from Prize Flowers, saved by

MESSRS. DOBSON and SONS, SEED GROWERS, &c., Woodlands Nursery, Isleworth, from their unequalled collections.

CALCEOLARIA.—From plants which have been so successfully exhibited this season at the Crystal Palace and Royal Horticultural Exhibitions. In sealed packets, 12 6d., 21 6d., 3s. 6d, and 5s.

CINERARIA.—Splendid, mixed, 1s., 2s. 6d., and 5s.

PRIMULA.—A particularly fine strain of fringed flowers, of a brilliant colour; also ALBA; 1s., 2s. 6d., and 5s.

SCARLET INTERMEDIATE STOCK.—Very rich in colour. 6d. and 1s. All the above post free.

Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted; each 1s., and 2s. 6d. per packet.

SCOTT'S WASP DESTROYER will quickly rid any place of Wasps, Cruckets, Cockroaches, and other Garden pests. "It completely cleared the place." *Vide* Testimonials, sent on application. Price 1s. 6d and 2s 6d. per bottle, in stamps.
J. SCOTT, The Seed Stores, Yeovil, Somerset.

PAUL and SON'S ROSES, Cheshunt.—The COLLECTION at the Old Nurseries, Cheshunt, is NOW in BLOOM; it is considered the largest and most varied in England. Frequent Trains from Bishopsgate to Cheshunt Station, or to Waltham, where conveyance may be had.

Roses.

JOHN FRASER, of the Lea Bridge Road Nurseries, begs to announce that his COLLECTION of ROSES is NOW in FULL BLOOM. An inspection respectfully solicited.

The Nurseries are easily reached by Train on the Great Eastern Railway to Lea Bridge Station.

Roses.

THE COLLECTION of ROSES at Woodlands Nursery, Maresfield, near Uckfield, Sussex, occupying an area of many acres, are NOW COMING INTO SPLENDID BLOOM.
WM WOOD and SON.—June 25.

CHOICE ROSES, in pots. TEA-SCENTED, CHINA, NOISETTE, &c.
The largest stock in the kingdom, consisting of many thousands of strong healthy plants
WM WOOD and SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Roses for Bedding, &c.

ROSES, New and Old, strong plants, in pots, now ready for delivery; also large stock of VERBENAS and FUCHSIAS, Herbaceous and Bedding PLANTS, which contains a selection of the best varieties only. CATALOGUES free.
WM. KNIGHT, Floral Nursery, Hailsham, Sussex.

Roses, Roses, Roses.

H. LANE and SON'S magnificent COLLECTION of over 100,000 PLANTS is NOW IN FULL BLOOM. An early inspection is very much solicited.

One hour's ride by rail from Euston Station, London. Convenient trains to and fro.
The Nurseries, Great Berkhamstead, Herts.

A Glorious Show of Roses,

TEA, BOURBON, CHINA, and NOISETTE, May be secured and enjoyed all the Summer BY PLANTING NOW.

Good plants of finest kinds, from pots, mostly 48's, are ready to be presented to all, in exchange for cash, at 40s. per 100 if sent in pots 50s per 100. Packing charged extra
CHARLES NOBLE Bagsho

New Roses of 1870.

CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application.

ROSES for BEDDING.—Superb plants, in 5-inch pots, for planting out or for growing for pot culture. Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.
JOHN CRANSTON, The Nurseries, King's Acre, Hereford.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses, uniform, strong and healthy, in Pots. DESCRIPTIVE PRICED LIST on application to RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

NATURAL GRASSES: their Names and Derivations; Quality, Produce, Elevation, Situation, Soil, Use, Peculiarity, Season, Growth, Increase, Time of Flowering, Price, &c. Free by post.
RICHARD SMITH, Seed Merchant, Worcester.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

PEACHES and NECTARINES.—Fine healthy Pyramids, in Pots, each bearing from 12 to 18 good Fruits. Price 7s. 6d to 10s. 6d each.
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AGERATUM IMPERIAL DWARF (CHATER'S).—Good plants in pots at 12s. per dozen.
RICHARD SMITH, Nurseryman, Worcester.

AGERATUM IMPERIAL DWARF.—Well-rooted plants, out of stores, 4s. per dozen; strong, in pots, 6s. per dozen.
S. BADMAN, Eltham Road Nursery, Lee, S.E.

Bedding Plants, Florists' Flowers, &c.

MESSRS. LITTLE and BALLANTYNE, Nurserymen and Seedsmen, Carlisle, are prepared to send out very choice selections of the above, at very moderate prices, and will be glad to send their new priced CATALOGUE free on application. North of England Nursery and Seed Establishment, 44, English Street, Carlisle.

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FREE BY POST.

SUTTON and SONS can now supply New Seed of the following, the finest strains in the country:—
JAMES' SUPERB CALCEOLARIA.
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THOMSON'S SUPERB CALCEOLARIA.
FINEST CHOICE CINERARIA.
FINEST CHOICE PRIMULA.
And other FLOWER SEEDS, for present sowing.
SUTTON and SONS, Seedsmen to the Queen, Reading.

JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, offers for Sale—
100 CAMELLIAS, ALBA and FIMBRIATA PLENA, without flower buds, £4, £5, £6, £8.
100 CAMELLIAS, IMBRICATA, PLENA, without flower buds, £3, £4, £6, £8.
100 CAMELLIAS, named best sorts, without flower buds, £3, £4, £6, £8.—For September.
100 CAMELLIAS, with flower buds, named and best sorts, £6, £8, £10, £12.
100 AZALEA INDICA, best named sorts, with flower buds, fine plants, £6, £8, £12.
100 AZALEA INDICA STOCKS, 15s. [Three months' credit.]

TO BE SOLD, by Private Contract, in One Lot, the celebrated Collection of ORCHIDS, one of the largest in Europe, containing many unique specimens, collected by the late Consul Gustavus Schiller.

For further particulars apply to HERR WINKLER, the Head Gardener, Schiller's Landhaus, Ovelgonne, Altona, Prussia.
Ovelgonne, June 25, 1870.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
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FERNS, BRITISH and EXOTIC, in more than 1000 beautiful species and varieties.—The Subscribers beg to intimate that their CATALOGUE of the above will be forwarded to any applicant on receipt of three postage stamps.
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WILLIAM BRYANT begs to offer extra strong Plants of the above, at 20s. and 30s. per 100.
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Beautiful Columbine.

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"This is perhaps the handsomest hardy perennial in cultivation."—LINDLEY.

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The Best Turnip for the Main Crop is

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Price 10d per lb; much cheaper by the bushel.
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EARLY CABBAGE PLANTS.—Fine strong plants, 3s. per 1000; 25s. per 10,000; £10 per 100,000
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Cabbage and other Plants, not to be Excelled.

F. GEE can supply, for cash, Plants in any quantities, carefully packed, and sent to any part of the Kingdom.
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Packages charged cost, and full price will be allowed when returned in good condition.
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F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IDA WHARF), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

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PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,
With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

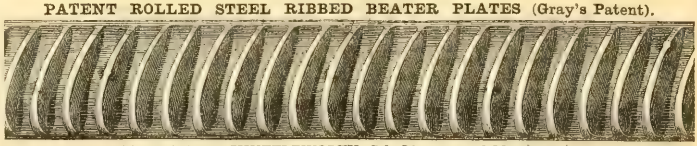

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

C. AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

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BY HER MAJESTY'S ROYAL LETTERS PATENT.

TO MEET A WANT WHICH HAS BEEN LONG FELT BY THE HORTICULTURAL PUBLIC,

MAW & CO.'S PATENT IMPERISHABLE TERRA-COTTA PLANT MARKERS

Are offered as a cheap and permanent substitute for WOODEN and ZINC TALLIES for the Labelling of Plants in Pots and in the Open Border, and for suspending to Roses, Orchids, Ferns, Fruit Trees, &c. These Labels, unlike Wood and Zinc, combine perfect durability with a lasting legible inscription, and form an elegant adjunct to the Garden and Conservatory for the naming of Horticultural and Botanical Collections. They are also invaluable for the labelling of Wine Cellars and for general use in situations where other materials are perishable by damp.

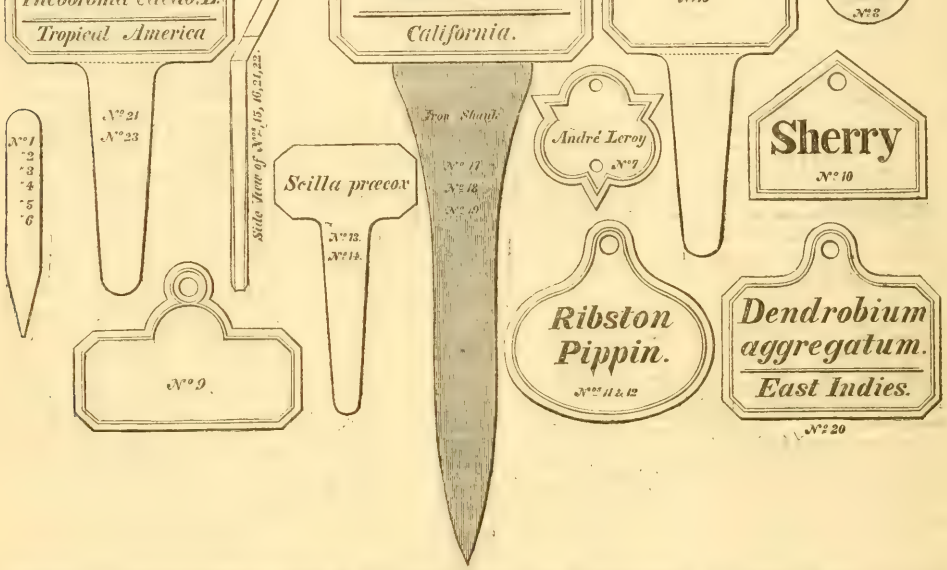

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Can be procured from the Manufactory, or through any Nurseryman, Seedsman, or Ironmonger.

Specimens sent Post Free on application.

No. 1 .. .. .. 3½ by ½ inch.	No. 6 .. .. .. 8 by 1 inch.	No. 11 .. .. .. 3½ by 3 inch.
No. 2 .. .. .. 4½ ,, ⅝ ,,	No. 7 .. .. .. 2½ ,, 2 ,,	No. 12 .. .. .. 5 ,, 4½ ,,
No. 3 .. .. .. 5½ ,, ¾ ,,	No. 8 .. .. .. 1½ inch diam.	No. 13 .. .. .. 2 ,, 4 ,,
No. 4 .. .. .. 6 ,, ⅞ ,,	No. 9 .. .. .. 3½ by 2½ inch.	No. 14 .. .. .. 3 ,, 5 ,,
No. 5 .. .. .. 7 ,, 1 ,,	No. 10 .. .. .. 2¾ ,, 2½ ,,	

Can be seen in use at the Royal Gardens, Kew; the Gardens of the Royal Horticultural and Royal Botanic Societies, Battersea Park, the Royal Botanic Garden at Edinburgh; and Botanic Gardens, Glasnevin, near Dublin, &c.

Directions for writing on the Labels with Black-lead Pencil.—Apply a little white-lead paint thinly over the part to be written upon, and *whilst wet*, write with a hard fine-pointed black-lead pencil. The writing will be perfectly indelible and unaffected by wet immediately the paint is set.

Black Enamel Writing on the Labels.—All the above sizes can be supplied in several colours, ready written upon, with black enamel, having the appearance of jet black ink, but perfectly permanent. On receipt of Lists of Names, Estimates of Cost will be sent for any quantities of Pot or Border Labels, Suspending Labels for Orchids, Roses, Ferns, Fruit Trees, &c. Consecutive Sets of Numerals printed on the Labels, and Labels for Wine Bins, ready written with Enamel, kept in stock.

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Printed Patterns of various Designs suitable for the above will be forwarded on application, and Drawings, free of charge, of any of the Designs adapted to the given dimensions of spaces proposed to be Paved, will be supplied, accompanied by estimates of cost, including the expense of laying or otherwise. Applications for Estimates should be accompanied by an exact plan of the space drawn to scale, with all the dimensions marked in figures, and care should be taken that the size and position of all door-entrances and recesses that have to be paved are correctly represented; and when the walls are not exactly parallel, the measurements between the *opposite* angles, as well as along each wall, should be given.

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"Rock Hills," gave his approval of their usefulness.

The STRAWBERRY CRINOLINE is in the form of a table, made in halves, so as to be used without disturbing the plant. It is 16 inches in diameter, and stands 4 inches above the ground, galvanised. Its use is to preserve Strawberries from slugs, contact with the soil, superfluous moisture, and other nuisances. They are considered to last 10 years at least with care.

Price per Gross, £4.

The STRAWBERRY CRINOLINES are declared by all who use them to be of the greatest use in keeping the Fruit clean and assisting its growth—thus in the production of large crops. For particulars see Illustrated Catalogues, and Testimonials sent to us by our patrons last year.

The contrivance is by the late Sir Joseph Paxton, who, after testing them for one season in his own gardens, The right to Manufacture them was transferred to

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Every description of Wire Work for Gardens, Conservatories, &c.

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THE MOST IMPORTANT IMPROVEMENT EVER INTRODUCED.

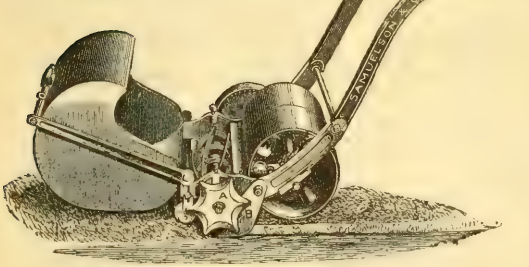

MESSRS. SAMUELSON & CO. Beg to draw special attention to their

NEW

Lawn Mowers for 1870,

which are fitted, when required, with a NEW PATENT EDGE-CLIPPING arrangement, entirely superseding the old and tedious operation of Edge-Clipping by hand.

All Machines fitted with new Silent Gearing, insuring perfect freedom from noise when at work.

Catalogues, with full descriptions and prices of the New Patent Edge-Clipping Silent Lawn Mower, on application to

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GARDEN ROLLER BARROW.

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H. BROOK AND CO., Sole Manufacturers of the CHELTENHAM GARDEN ENGINE, which weighs only 3 lb. 1 oz., throws water in a continuous stream over 35 feet. The large size, worked by the foot, throws over 60 feet, and is strongly recommended as a fire-engine. To be had of all Ironmongers, and Wholesale only at 10, Featherstone Buildings, Holborn, London, W.C.

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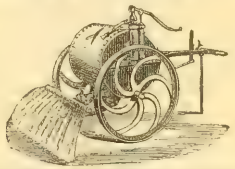

For use in Gentlemen's Gardens and Grounds. The delivery valve can be worked at the outset when filling a watering pot. It holds 15 gallons.

The Spreader for Watering Lawns, &c., can be removed at pleasure.

Price with Spreader £5 5 0
Force Pump for Watering Trees, &c. .. .. 2 2 0 extra.

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NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE,

as originally introduced by GEORGE NEIGHBOUR & SONS,

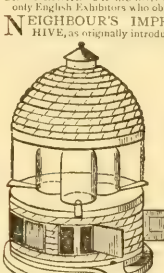

working three bell glasses, is neatly and strongly made of straw; it has three windows in the lower Hive. This Hive will be found to possess many practical advantages, and is more easy of management than any other Bee-hive that has been introduced.

Price complete .. £1 15 0
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The LIGURIAN or ITALIAN ALP BEE being much in repute, G. N. & Sons supply a Swarm of Bees with genuine Italian Queen, in the Improved Cottage Hive, at £4 4s., Hive included. (Such will shortly have wholly yellow Italian Alp Bees.)

An Italian Alp Queen, with full directions for uniting to Black Stocks, £1 each.

ENGLISH BEES.—Stocks and Swarms may be obtained as heretofore.

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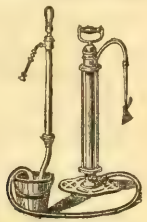

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ROYAL HORTICULTURAL SOCIETY

SHOW of ROSES, FUCHSIAS, &c.,

JUNE 29, 1870.

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PRIZES offered by HIS GRACE the DUKE of BUCCLEUCH, President of the Society.

CLASS 1.—GROUP of 3 PLANTS suitable for Dinner-table Decoration.
1st Prize, Mr. W. Bull, Nurseryman, Chelsea, W., £3.
2d, Mr. B. S. Williams, Nurseryman, Holloway, N., £2.
3d, Mr. G. Fairbairn, Gr. to the Duke of Northumberland, Syon House, Isleworth, £1.

CLASS 2.—3 GROUPS suitable for the Decoration of the Dinner table, to consist of Flowers or Fruit, or Flowers and Fruit combined, at the option of the Exhibitor.
1st, Mr. W. Soder, Gr. to O. Hanbury, Esq., Howe Hatch, Brentwood, Essex, £5.
2d, Mrs. R. Hawkins, Redland Bank, Dorking, Surrey, £3.
3d, Messrs. Lucking, Bros., Nurserymen, &c., Bayswater, W., £1.

PRIZES OFFERED BY THE SOCIETY.

CLASS 3.—72 CUT ROSES, distinct, 1 truss of each. (Nurserymen.)
1st, Messrs. Paul & Son, Old Nurseries, Cheshunt, Herts, £6.
2d, Mr. J. Cranston, Nurseries, King's Acre, Hereford, £4.
3d, Mr. B. R. Cant, St John Street Nurseries, Colchester, Essex, £3.
4th, Mr. J. Keynes, Nurseryman, Salisbury, Wilts, £2.

CLASS 4.—48 CUT ROSES, distinct, 3 trusses of each. (Nurserymen.)
1st, Messrs. Paul & Son, £6.
2d, Mr. C. Turner, Royal Nurseries, Slough, £4.
3d, Mr. J. Fraser, Lea Bridge Nurseri), Leyton, £3.
4th, Mr. J. Keynes, £2.

CLASS 5.—24 CUT ROSES, Hybrid Perpetuals only, 3 trusses of each. (Nurserymen.)
1st, Mr. J. Cranston, £4. | 3d, Mr. B. R. Cant, £2
2d, Mr. C. Turner, £3 | 4th, Messrs. Paul & Son, £1.

CLASS 6.—24 CUT ROSES, distinct, 1 truss of each. (Nurserymen.)
1st, Mr. C. Turner, £3. | 3d, Mr. J. Cranston, £1.
2d, Mr. J. Keynes, £2. | 4th, Mr. B. R. Cant, 10s.

CLASS 7.—48 CUT ROSES, distinct, 1 truss of each. (Amateurs.)
1st, Rev. E. N. Pochin, Sileby Vicarage, Loughborough, Leicester, £4.
2d, Mr. W. Ingle, Gr. to Mrs. Round, Birch Hall, Colchester, £3.
3d, Thomas Laxton, Esq., Stamford, £2.
4th, R. B. Postans, Esq., Brentwood, Essex, £1.

CLASS 8.—36 CUT ROSES, distinct, 1 truss of each. (Amateurs.)
1st, Rev. E. N. Pochin, £5.
2d, Dr. Cooper, The Limes, Slough, £3.
3d, Mr. J. Hollingworth, Turkey Mills, Maidstone, Kent, £2.
4th, Mr. W. Ingle, £1 10s.
Extra, Mr. P. Stoddart, Gr. to J. G. Rebow, Esq., M.P., Wivenhoe Park, Colchester, £1.

CLASS 9.—24 CUT ROSES, distinct, 1 truss of each. (Amateurs.)
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2d, Mr. P. Stoddart, £3.
3d, Mr. F. Mould, Gr. to J. Stratton, Esq., Marlboro', Wilts, £2.
4th, Mr. G. Marlow, Gr. to J. Wigan, Esq., Mortlake, S.W., £1.

CLASS 10.—12 CUT ROSES, distinct, 1 truss of each. (Amateurs.)
1st, Mr. W. Soder, £2.
2d, Mr. J. C. Quinnell, Brentwood, Essex, £1 10s.
3d, Mr. T. Unpter, Upper Assenden, Henley-on-Thames, £1.
4th, Mr. F. Mould, 10s.

CLASS 11.—13 ROSES of 1868 or 1869, single trusses, distinct kinds. (Open.)
1st, Messrs. Paul & Son, £2 | 3d, Mr. B. R. Cant, £1
2d, Mr. C. Turner, £1 10s | 4th, Mr. J. Keynes, 15s.

CLASS 12.—12 Trusses of any ROSE of 1868. (Open.)
1st, Messrs. Paul & Son, £1 10s. | 3d, Mr. B. R. Cant, 10s.
2d, Mr. C. Turner, £1. | 4th, Mr. J. Keynes, 7s.

CLASS 13.—6 Trusses of any ROSE of 1869. (Open.)
1st, Messrs. Paul & Son, £1.
2d, Mr. C. Turner, 15s | 3d, Mr. J. Keynes, 10s.

CLASS 14.—Collection of YELLOW ROSES, not fewer than 12 trusses. (Open.)
1st, Messrs. Paul & Son, £3.
2d, Mr. J. Keynes, £2 | 3d, Mr. B. R. Cant, £1.

CLASS 15.—12 TEA-SCENTED and NOISETTE ROSES, single trusses. (Amateurs.)
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2d, Mr. Wigle, £1 10s. | 4th, Rev. E. N. Pochin, 10s.

CLASS 16.—12 TEA-SCENTED and NOISETTE ROSES, single trusses. (Nurserymen.)
1st, Mr. J. Keynes, £3 10s. | 3d, Messrs. Paul & Son, 15s.
2d, Mr. B. R. Cant, £2. | 4th, Mr. J. Fraser, 7s 6d.

CLASS 17.—12 ROSES, distinct, single blooms. (Open.)
1st, Mr. J. Cranston, £1 10s. | 3d, Mr. J. Keynes, 15s
2d, Mr. C. Turner, £1 | 4th, Mr. B. R. Cant, 7s. 6d.

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2d, Mr. J. Keynes, £2 | 3d, Mr. B. R. Cant, £1.

CLASS 19.—24 ROSES, in pots, not fewer than 10 varieties, the pots not to exceed 8 inches in diameter. (Open.)
1st, Mr. C. Turner, £6. | 2d, Messrs. Paul & Son, £4.

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1st, Mr. H. Cannell, Nurseryman, &c., Westwich, £4
2d, Mr. J. Weston, Gr. to D. Martineau, Esq., South Road, Clapham Park, £3.
3d, Mr. J. James, Gr. to W. F. Watson, Esq., Redlees, Isleworth, £2.

CLASS 21.—12 FUCHSIAS, distinct, in 8 inch pots. (Open.)
2d, Mr. J. James, Gr. to W. F. Watson, Esq., Isleworth, £3.
3d, Mr. J. James, North Road, Highgate, £2
4th, Mr. J. Weston, £1.

CLASS 22.—8 PALMS. (Open.)
1st, Mr. B. S. Williams, Nurseryman, Holloway, £5.
2d, Mr. G. Fairbairn, £4.
3d, Mr. J. Burley, Albert Nursery, Pembridge Place, Bayswater, £3.

CLASS 23.—6 PALMS. (Amateurs.)
1st, Mr. G. Fairbairn, £4

MISCELLANEOUS.—EXTRA PRIZES.

Messrs. J. Veitch & Sons, Nurseries, Chelsea, Collection of Plants, £1.
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Messrs. W. Rollisson & Sons, Nurserymen, Tooting, Collection of Orchids, £1 10s.
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CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes last season at the Royal Horticultural, Royal Horticultural, and other places. Per packet, 2s. 6d.

CALCEOLARIA, finest hybrid. Per packet, 2s. 6d. CALCEOLARIA, finest spotted. Per packet, 2s. 6d. Saved with the greatest care, and from one of the largest collections in the Kingdom

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PRIMULA.—New scarlet. Per packet, 2s. 6d.
PRIMULA.—Rose fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved white, 2s. 6d.
PRIMULA FIMBRIATA.—Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.

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CALCEOLARIA, from show flowers	1s and 2 6
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PRIMULA, Stuart's superb varieties	1s and 2 6
CYCLAMEN, Wiggins' Prize strain	1s and 2 6
CARNATION, from flowers of great beauty	1s and 2 6
in colours	3s. 6d. and 5 0
HOLLYHOCK, from finest show varieties	1s and 2 6
POLYANTHUS, from finest show varieties	1 0
WALLFLOWER, finest double varieties	1 0
PANSY, from exhibition varieties	1s. 6d. and 2 6

CANVAS HOSE, for Watering Gardens, much more durable than India-rubber, will stand any amount of pressure, and about half the price, from ¾inch to 2 inches in diameter, from 1s 2d to 2s 3d per yard. Any length can be had. Samples on view at 27, South Row, Covent Garden Market, where also may be seen the AMERICAN "ARCHIMEDEAN" LAWN MOWER.

BUTLER, McCULLOCH, AND CO., 27, South Row, Covent Garden, London, W.C.—Established upwards of a Century.

The Gardeners' Chronicle

SATURDAY, JULY 2, 1870.

MEETING FOR THE ENSUING WEEK.

MONDAY, July 4—Entomological .. .. 7 P.M.

IF the hearing of lectures sufficed to make people learned, the Parisians ought to be the most learned folk on the face of the globe. In every quarter of Paris you may see announcements of courses of lectures on everything-something delivered by men of world-wide reputation, at a cost to the auditor of nothing beyond time: attention, even, he need not give, provided he remain orderly. Whether or no it is a fruitful expenditure of material to employ the time and energies of masters in Israel in teaching by lectures the A, B, C, of science, which could as well be taught by subordinates, is open to question. Certain it is that the lectures, though elementary, are, in many instances, truly admirable for the clearness, force, and precision with which they are delivered; but they are not as a rule sufficiently well illustrated by specimens and diagrams.

The auditory do not "assist" at the lecture, though the idiom of their language says they do. They merely sit and listen—quietly no doubt, but comparatively few among them seem to take much interest in the proceedings, nor does the Professor do much in the way of making them do so, further than by word of mouth. This strict limitation of the professorial duties is no doubt supplemented, in theory at least, by the tutorial instruction provided in the laboratories, &c. See how grandly this inscription reads: it was copied from a placard in the streets not long since:—

"MINISTRY OF PUBLIC INSTRUCTION.
Practical school of the higher studies.
Section of physical, chemical, and natural sciences.
Laboratories of instruction."

Then comes a list of the laboratories for physics, chemistry, mineralogy, geology, botany, zoology, directed by MILNE EDWARDS, histology by ROBIN, experimental physiology by BERT, &c. The botanical laboratory is placed under the direction of MM. BRONGNIART and DECAISNE, professors held in as high esteem here as in their native country; and under their direction provision is made for practical instructions in the use of the microscope, the practice of dissection (of plants), herborisations, "conferences," and the like. We may as well mention, by the way, that the course of lectures on botany and vegetable physiology is now delivered for M. BRONGNIART by M. A. GRIS, a botanist well known for his researches in physiological botany, and also for his papers on systematic botany, several of which have been written in conjunction with M. BRONGNIART. In addition to this M. DECAISNE, who acts as Professeur de Culture, introduces the more strictly practical portion of his course by some elementary lectures on the structure and functions of plants, and directs in person an occasional botanical excursion.

The lectures we have alluded to are delivered at the Jardin des Plantes, and in spite of the high eminence of the professors of that establishment and the completeness of the arrangements—on paper—we do not think the results are of such a nature as to lead the Scientific Commission now sitting to introduce a similar plan here. It seems to have been assumed that there was a demand for such instruction, or if there was not that there ought to be, and therefore a paternal and centralising government has furnished them. Here, on the other hand, our rulers wait till a demand is made. Sometimes we have to wait a long while, and have to demand clamorously before we get what we want. But to return to Paris and its means of botanical instruction: there are, in addition to the public lectures at the museum, others which form part of the academical curriculum of the Faculty of Sciences—stay! we must not omit to specify the class, order, genus, and species, or we shall not convey a characteristic impression of the logical precision of our neighbours—we ought to say University of France, Academy of Paris, Faculty of Sciences of Paris. At the latter institution — the world-renowned Sorbonne—the lectures on botany are delivered by M. DUCHARTRE, well known as a physiological botanist, and the author of an admirable handbook of the science,—a gentleman, moreover, filling much the same functions in the Imperial and Central Horticultural Society of France as Mr. BERKELEY does in our own Royal Horticultural Society. No garden is attached to the Faculty of Sciences.

In the case of the Faculty of Medicine, in which M. BAILLON holds the office of Professor of Botany, there is a small garden so close to the Jardin des Plantes that one wonders why one establishment should not serve both purposes. We may hereafter have occasion to speak of the garden at greater length, but in the meantime we may say that, small and unpretending as it is, it contains a very considerable number of interesting plants. Here, also, there is provision for botanical observations and anatomical researches "daily," and, thanks to the zeal and energy of the professor, much has been done. Still another botanic garden is that of the Ecole de Pharmacie, corresponding to the garden of the Apothecaries' Society at Chelsea, and directed by M. CHATIN, well known for his researches in vegetable anatomy. This garden has been lately shorn of its fair proportions by the formation of a new street. Paris improvers are no respecters of persons or places; the Quartier Latin of our student days—where is it? We hardly like to attribute the popularity of M. CHATIN'S "herborisations" to the fact that his garden has been cut through by a new street—because the street is new and the botanical excursions are not,—but the fact remains.

It must not be thought that the more practical departments of horticulture are forgotten. We have already alluded to the Professeur de Culture, who, while among the foremost botanists of the age, is at the same time the foremost pomologist. And this is not all: lectures and demonstrations on the culture of fruit trees are given not only in Paris but in all the chief towns and rural centres of France, and these lectures are, we have reason to believe, admirable for the purpose for which they are intended. At any rate, a glance at the fruit gardens is sufficient to show that the lessons are not thrown away, and that, although climate may do much, yet care and skill have a vast deal to do with the perfection to which fruit culture is carried in France. Have we not said enough to show that the French are well be-lectured? Doubtless the Royal Commission now sitting for the purpose of inquiring into the claims and requirements of science in this country will not fail to make inquiries as to the system followed in Paris, where they have had so long what we still want—a Minister of Public Instruction.

—— WE are informed that the following arrangements have been made for the OXFORD MEETINGS of the ROYAL HORTICULTURAL SOCIETY:—

"Contemporaneously with the Society's Provincial Show, which is to take place in the grounds of the Observatory at Oxford, it is intended to hold a general meeting of the Society. At this meeting an opportunity will be afforded for the election of new Fellows; and the most remarkable novelties exhibited will be made the subject of comment. This general meeting will be held on Wednesday, July 20, the chair to be taken at 1 o'clock.

"Additional meetings will be held on July 20 and 21 for the reading and discussion of papers on subjects of horticultural interest, after the manner of a Congress. The gardeners of the United Kingdom, as well as other persons interested in horticultural pursuits, are invited to attend, and to take part in these discussions. Ten minutes will be allowed to each speaker. At these meetings the chair will be taken punctually at 2 P.M. Those who have the intention of speaking upon any of the subjects to be brought forward, are requested to communicate with the Society's floral director, Mr. THOMAS MOORE, of the Chelsea Botanic Garden, who has been good enough to undertake the organisation of these meetings.

"On Friday, July 22, the special prizes will be distributed by the Lord HENRY GORDON LENNOX, M.P.

"South Kensington, London, W., June 29."

Programme of the Congress Meetings.

Wednesday, July 20.—W. WILSON SAUNDERS, Esq., F.R.S., in the chair.

1. Dr. VOELCKER, F.R.S., a member of the Society's Scientific Committee, will give a short lecture on "The Principles of Manuring."
2. Mr. WILLIAM INGRAM, gardener to his Grace the Duke of RUTLAND, K.G., at Belvoir Castle, will give a short lecture on "The Distribution of Soils, and their Influence on Vegetation."

Thursday, July 21.—Major TREVOR CLARKE in the chair. The following papers will be read and discussed:—

1. Professor LAWSON, M.A., F.L.S., "A Short Account of some of the more Eminent Oxfordshire Botanists and Gardeners."
2. Rev. S. REYNOLDS HOLE, M.A., F.R.H.S. "Roses."
3. Mr. WILLIAM PAUL, F.R.H.S. "On Colour in the Tree Scenery of our Gardens, Parks, and Landscapes."
4. Dr. HOGG, F.L.S., Pomological Director R.H.S. "On Judging Fruits."
5. Mr. THOMAS MOORE, F.L.S., Floral Director R.H.S. "On Judging Plants and Flowers."
6. Mr. BENJAMIN S. WILLIAMS, F.R.H.S. "On Pitcher Plants." Illustrated by living specimens.

—— The DINNER-TABLE DECORATIONS at the Crystal Palace, on Saturday last, have been the subject of much comment. Undoubtedly the best was that arranged by our correspondent, "W. T.," on whose success the *Standard* thus dilates:—

"In decorating a dinner-table it is necessary to bear in mind the fact that a dinner-party is essentially a party for conversation, and that every person must therefore be able to obtain a fair view of his *vis-a-vis* at table. It is, therefore, essential that with the exception of flat or nearly flat decorations upon the table, no masses of flowers in vases, plateau, or other holders should be much less than 20 inches from the table, or otherwise they will seriously interfere with the line of sight. For supper-tables this rule is immaterial, but for a dinner decoration it is most important. Another rule is that the flowers selected for the decoration of dinner-tables should not be strongly perfumed; masses of roses, for example, would be altogether out of place, as their perfume would become very trying before the conclusion of the meal. The tables upon the present occasion were all decorated from Mr. THOMPSON'S designs, the large central oval table being dressed by amateurs, the two circular tables by professional florists. The first circular table upon entering was ornamented with both foliage, fruit, and flowers; the central table with foliage and flowers alone, without fruit; the third with foliage and fruit alone, without flowers. The great novelty in them all consisted in Palms, growing apparently through the table-cloth. For this purpose the ordinary top of the table is taken off, and a rough deal cover, with holes in it, is substituted. The plants, in their pots, stand below, and the tablecloth, which is in strips, is carefully ironed down round the stems, so that they appear to be actually growing through the cloth. The effect of the light and graceful foliage of the Ferns forming a tracery of green over the table is novel and beautiful in the extreme. The effect in the first table was, however, somewhat destroyed by the masses of colour in the flowers and fruit in vases. The great oval table, where the system was carried out in full perfection, was very lovely. The central Palm was slightly taller than the others, which averaged a height of 3 feet above the table, and, being dispersed all over it, formed a miniature Palm forest. Upon each side of the central Palm were tall and very slender glass vases, with a few small Ferns on their tops, and a spray or two of climbing plants twining round them. On the edge of the forest, it were, were six glass vases, each exquisitely decorated with Ferns and Geraniums, while a low plateau, supporting on a high top a flower or two of the large red Hibiscus, formed the only patches of prominent colour upon the whole table. By each plate were two clear and two coloured wine-glasses, and in front of each was a tiny vase, holding a single Rosebud. The finger-glasses were of colourless glass, and in the water of each were two or three leaves of Mrs. Pollock or other variegated Geraniums. The third table was more simple, but in its way equally beautiful. It was a circular table, and through it were two Vines, one white, one red, each forming an arch, crossing in the centre. These Vines were laden with Grapes, and the effect was admirable. Between these were four large flat vases of delicate Ferns, and between them again four dishes of fruits. Nothing could have been more simple, nothing more effective and beautiful."

—— Messrs. C. HUBER & Co., Hyères (Var, France), have forwarded us a coloured figure of DAHLIA ARBOREA, a Mexican species, long known in herbaria, and which, indeed, seems to have been introduced into English gardens many years ago, and to have been lost. It is by no means a variety of *D. imperialis*,

but a perfectly distinct species. It attains the height of about 7 feet, and it forms a well-branched clump, with large leaves of a dark green, which contrast agreeably with the foliage of other plants. This inferiority of height makes it take up less room in the conservatory than the D. imperialis, and enables it to resist the wind better in the open air. From the end of December, say MM. HUBER, it produces an innumerable quantity of well formed mauve-coloured flowers, the successive development of which does not suffer from a temperature of below freezing point. The form of the flower is moreover quite new in the genus, for it can only be compared to a gigantic Anemone, and its peculiarity of flowering copiously at a low temperature is a rare occurrence among succulent herbaceous plants. Specimens of what we take to be the same species are preserved in the herbarium at Kew. They were gathered in Mexico by Mr. BATES, who affixed to one of the specimens the following note :—"Tree Dahlia, or Gigantic Dahlia, collected in the valley of Mexico. It forms a shrub 30 feet in height, covered with double and single purple flowers." As we have not yet seen actual specimens of Messrs. HUBER's plant, we are not able to assert positively that it belongs to the same species as that just alluded to, and defer giving any more descriptive account till our material is more complete.

—— The 27th anniversary festival of the GARDENERS' ROYAL BENEVOLENT INSTITUTION was celebrated on Wednesday evening last, at the London Tavern, Bishopgate Street, under the presidency of the Right Hon. the Earl of DERBY, supported by His Highness the Nawab Nazim of BENGAL, and his two sons ; J. J. MECHI, Esq. ; Rev. S. KLYNOLDS HOLE ; R. GARTH, Esq., Q.C. ; Colonel MACDONALD, R. WRENCH, Esq. ; and several of the leading patrons and practitioners of horticulture. At the back of the chair a large group of Palms, Ferns, and flowering plants were very tastefully grouped. These were most liberally contributed by Messrs. B. S. WILLIAMS, TURNER, VEITCH & SONS, LEE, and CARTER & CO. The usual loyal toasts having been proposed and duly responded to, his Lordship gave the toast of the evening, "Success to the Gardeners' Royal Benevolent Institution." In mentioning the objects of the institution, his Lordship described it as one most deserving assistance, and as a charity which he thought was not sufficiently known, seeing that comparatively few, out of the great number of persons employed in horticulture, were subscribers to it ; and he thought that, whatever might be our agreements or disagreements, there was one thing about which there should be no difference of opinion, viz., that all should support benevolent institutions of this kind. Several other toasts were proposed, including those of "the Treasurer," responded to by Mr. WRENCH, and "the Secretary," responded to by Mr. CUTLER, who read a list of subscriptions amounting to over £500.

—— We are glad to see, from the subjoined letter, that the cause of the POTATO TOURNAMENT is so well advocated. Mr. FENN shall speak for himself :—

"At once, and perhaps very rashly, I step into the arena to pick up the Potato gauntlet which Mr. EARLEY threw down on p. 862. I promise him a sovereign, with possibly a crown ; for let the man who wins be 'King of the Potato," so long as he can maintain the honour. I hope to live to see the Royal Horticultural Society meetings at South Kensington become as famous for "great go's" with the Potato, as they are now for Pelargoniums and Pine-apples. By all means let the members of the Fruit Committee be the judges. I am personally perfectly willing to abide by their decisions. The award for the sweepstakes should be a silver-gilt cup at the least. I could mention at least ten connoisseurs of the 'noble tuber'—good men and true—who I hope will gird themselves up for the fight ; but who would feel the miserable doles of 10s. or £1—the usual prizes given for Potatos—anything but an honour to receive. I venture, moreover, to repeat in these pages that tilts with the tuber would cause more of the fair sex to congregate at South Kensington than it has yet entered the ideas of the authorities there to conceive ; and the importance of this, and of the article in question, in a public and private point of view, no one can question. I do not see under present arrangements how it could be done, albeit the authorities do cause two or three dishes to be cooked very well ; or I would suggest that four kinds of the newest varieties in each collection should be cooked on the spot for the approval of the judges, and each plate of a sort already in recognised cultivation which is considered palatably the best to count for six points. But if it be a new seedling or hybrid, of the competitor's own raising, and it is considered superior in form, in whiteness of flesh and flavour, let it count for 12 points ; and 24 kinds divided into sections of Early, 2d Early, Medium, and Late varieties, containing 12 tubers for each plate, are the fewest, I think, that should form each collection to win a £10 cup. They should be *bonâ fide* of the exhibitor's own growing. The description of soil in which the tubers were grown should be written ; they should be locally correctly named, and their know *aliases* given. I propose the month of September for the trial. It would be quite soon enough this season for the show to take place, because, speaking for myself, my Potatos have only received the 'tail of a storm' since they were planted."

—— A correspondent (Mr. R. DRAPER) forwards us from the ballast hills on the coast at Seaham, a specimen of TELLIMA GRANDIFLORA, which is naturalised in that situation. Judging from the abundance in which it comes up in shrubberies into which it has once gained an entrance, we should say it is likely to establish itself as a naturalised subject before many years are over. The plant is a native of North America, and has long been known in gardens in collections of hardy perennials.

—— A correspondent, Mr. SMITH, of Exton Park, has handed us the following reply to an inquiry as to the best method of PRESERVING PEACHES :—"The following is the recipe given to me by the *chef de cuisine* here :—Split the Peaches in halves, scald them in thin syrup to remove the skins. Arrange the halves in clean pint tins filled up with rather thick syrup, made of 2 lb. sugar and 1 pint cold water, boil 4 minutes ; have the tins covered ; put them into a vessel, pour sufficient cold water on to them to reach within half an inch of the top. Submit them to 20 minutes' gentle ebulition. Keep in a cool place for use."

—— We quote from the *Daily News* the following account of the annual flower show of the SOCIETY for PROMOTING WINDOW GARDENING amongst the working classes in the parishes of St. Margaret and St. John, Westminster, held a few days since, in Great Dean's Yard :—

"In numbers and variety the display was a very great improvement upon that of last year, and many of the specimens were so well grown, so green in their foliage, and so perfect in their blooms, as to elicit surprise that they could have been reared and nurtured on window-sills in the narrow courts and dirty streets of the lowest parts of Westminster. The general prizes, open to all competitors, were for Fuchsias, Geraniums, and other plants, and the competitors were, in class 1, limited to working men or women ; and in class 2, to children in parochial, national, infant, Sunday, and ragged schools. The local prizes appropriated to each district were competed for by those who were unsuccessful in the competition for the general prizes. Tufton-street, Westminster—an ancient and well-known locality in the immediate precincts of the Abbey—supplied the largest number of specimens, and took the greatest number of prizes, especially for Fuchsias, of any street, court, or place ; but why it should be so much more favourable to window gardening than the rest of Westminster remains an unsolved problem. Lillington Street, Rochester Row, Romney Street, and even Pie Street were well represented. The workhouse in Petty France, and the workhouse at Kensington, both sent capital collections of fancy Geraniums, Fuchsias, and Calceolarias, and one of the aged inmates, BETSY BRETT, secured the first local prize for an exceedingly well developed fancy Geranium ; and from the garden of the last-named institution came also a splendid bouquet of white Lilies, Roses, and miscellaneous flowers. The prizes were, with the exception of the society's bronze medal (given in addition to 1st prize holders), all in money, and varied in amount from 6*s.* and 4*s.* for working men and women to 4*s.* and 2*s.* for the school children. There was a very full attendance of visitors during the day, who were admitted by shilling tickets, and of the working classes in the evening, when the admission fee was reduced to a penny—the whole of the receipts being devoted to the prize fund and support of the Society. The Earl of SHAFTESBURY distributed the prizes shortly before the closing of the exhibition, offering a few appropriate remarks upon the occasion."

—— During the week ending June 25 the MAXIMUM TEMPERATURE of the AIR (see Mr. GLAISHER'S Tables in our present issue) was 90°.2, which was recorded at Blackheath, and at several stations the maximum temperature exceeded 86°. The mean of the highest temperatures at the stations south of Nottingham was 84°.9, at those to the north 79°.3, and for all stations in Scotland it was 74°.2. The MINIMUM TEMPERATURE for all stations was 43° at Hull, whilst south of Nottingham the mean of all the lowest temperatures was 46°.1, to the north of that station 47°, and for all stations in Scotland it was 45°.2. The MEAN TEMPERATURE for the eight stations, Portsmouth to Nottingham (inclusive), was 62° ; for those places to the north of the latter town, 60°.2 ; and for all stations in Scotland it was only 55°.5. The RAINFALL was pretty evenly distributed, for at stations south of Nottingham the mean fall was 0.20 inch ; for those to the north it was 0.29 inch ; and for all stations in Scotland it was 0.27 inch. The largest fall was at Norwich, viz., 0.73 inch ; and at Portsmouth no rain was recorded.

—— Some ENORMOUS STRAWBERRIES, as large as Apples, have appeared in the windows of certain shops and restaurants in Paris, and the following is the method stated in a Paris paper to be employed in producing them :—Take a decanter or white glass bottle, and half fill it with mould, water the mould so as to consolidate it, then with a stick make a hole in the mould, and drop into it six Strawberry seeds, cover them with more earth ; add more water, close the mouth of the bottle hermetically, and leave the latter in a warm place. In 15 days' time, you will see the young plant appear, and a month afterwards you will have a Strawberry [plant ?] which will fill the bottle.

—— The Prefect of the Seine, accompanied by several of the chief engineers of the city of Paris, has recently visited the plains of Gennevilliers, opposite to Clichy, where the experiments in the application of SEWAGE are being carried on, and the report is highly favourable. Nearly every kind of plant, from fruit trees and cereals to vegetables, salad, medicinal plants, and flowers, both for perfumery and ornament, have been tried, and have nearly all succeeded within twelve months, over an extent of about 100 acres. Great tracts of gravel and sand, which seemed condemned to sterility, have been converted into market gardens by means of the sewage waters. The plain of Gennevilliers has an area of 5000 acres, and the soil is generally as poor as it can well be, so that a better spot for the application of sewage could not well have been found, while its proximity to Paris will give it increased value as a market garden. If the area submitted to the action of the sewage shows an important increase during the present year, it will be a pretty positive proof that the market-gardeners have verified the benefits promised by the engineers.

New Garden Plants.

VANDA PARISHII, *Rchb. fil.*

Sepalis petalisque cuneato-oblongis acutis subundulatis, labelli auriculis angustis apice lineari ligulatis, in calcar gibbum parvum basi excentribus, antice in laminam rhombeam sub apice globam, linea media carinatam expansis, callo conico in basi lamina. *Vanda Parishii*, Rchb fil. Xenia 1, p. 138, 1858.

Planta minor ea icone Parishiana nunc spithamaea ; folia late ligulata apice inæquali bilobo densa, valde carnosa ; pedunculus arcuatus pauciflorus (8-florus grandiflorus ; sepala et petala flava maculis multis rotundis brunneis, basi intus alba ; labellum parte inferiori album striis geminis aurantiacis, parte anteriori venacea, columna alba ; calli in fundo cornuus violaceus ; caudicula longius ligulata subpollinis, dilatata ; glandula triangula.

We have known for some years this glorious thing, which was discovered in 1862 by the indefatigable Rev. Mr. Parish, which was lost, and was rediscovered on April 5 of the present year. It is a very novel plant. Its growth would appear to be unusually short and very strong, provided the discoverer has not taken an extra small specimen for preparing his very interesting representation. Even if small it would on that account the better suit amateurs who are apt to be very limited as to space in their stoves. The erect, strong, stiff peduncle bears flowers as large as those of the Vanda gigantea and lissochiloides (Batemani), and much like these, but with much broader sepals and petals. They have a white base inside, except that they are yellow, with many brown dots. The upper part of the lip, with ligulate auricles, is white, having two yellow threads under the column. The anterior part of the lip is rhomboid and violet, having a keel over the middle line and a keel beneath the point, as in many Vandas.

All that is very nice. But to come to the point. Where is the Vanda ? for what good to us is its lurking in the hot Burmese empire ? Well, some specimens are expected at Upper Clapton, at Mr. Low's. We are afraid they will not stay a long time at that place, and that they will never see one another any more, unless they should meet at some grand show. *H. G. Rchb. fil.*

ARTISTIC TRAINING.

A TRENCHANT paper of Mr. Alexander Forsyth, some time since, forced this matter on my attention. Nothing can be easier than to condemn formal training ; few tasks more difficult than its avoidance. Formality may be irregular as well as even, and Nature is often as stiffly formed as art. In attempting to copy from Nature two very difficult questions meet us on the threshold of our work. One is, what natural models are to be chosen, for although Nature is generally regular she is sometimes erratic, and accidental interference often reaches a grace of form beyond the reach of art—or Nature either for that matter. Some have a strong bias in favour of the grotesque ; they are in such love with the exceptions that, to them these have all the charm of the best rule, they hate all regularity, and call it unnatural. Another question is, whether Nature, pure and simple, is always our best model, within the limited dominion of art. Considerations of space often lead us to dwarf or cramp Nature within narrow bounds : the same circumstances bring plants closer to the eye, under artificial culture, than in a state of Nature. The conditions of growth and the points of observation are consequently somewhat different, and it may be well to inquire whether both considerations may not be permitted to modify and control to a considerable extent natural forms. Limitation of space must do so : in this we have no choice. We have, therefore, only to consider what, if any, modification of shape may be allowed for the closeness to the eye of plants under glass. The truly picturesque can hardly either be attempted or desired within such a limited area.

Our business as trainers is to copy Nature's most regular forms, and occasionally to alter or improve upon even these. I will choose two common and well known, and almost universally trained, species for illustration—Indian Azaleas and Fuchsias. What is their natural form ? That of a fat squat bush, and a thin ragged shrub or semi-tree. Are these the best forms for the artistic purposes for which these plants are grown ? Assuredly not. Perhaps no forms are more difficult to dispose of to artistic advantage than a huge lump of shapeless colours, and a ragged irregular shrub. The eye instantly demands that the lump be lightened by arrangement into a pleasing outline, and that the lanky thinness be filled up. Why not supplement these fine Fuchsia branches of bending grace and beauty by many more, to bear them company, and give the whole the completeness and finish inherent to a perfect cone ?

All mechanical helps in the matter of training are but expedients, and in recommending one in preference to another it is but a choice of expedients; while it is obvious that we cannot do without props of some kind. No house was ever built without a scaffolding, and but few plants were ever perfected into form without mechanical *media*—either as supports or trainers. Such things are needed either to bear the weight of branch, leaf, or flower, or to form durable base lines of the desired form. I do not, therefore, join in the general outcry against stakes or "crinolines." These are not to be condemned as a choice of evils, but welcomed as useful helps, and those are to be preferred which do their work with the greatest efficiency and last the longest. For it must be borne in mind that trainers are not simply our only scaffolding to enable us to build the house aright, but in the case of many plants they are the foundation of the entire floral structure. If they fail the whole plant sinks into a shapeless ruin. Hence, the importance of stability and durability. A prop that itself needs propping is an anomaly; and yet such is the character of many training appendages. There are some who condemn all crutches for plants. Their theory is, that any plant should be forced to grow into the desired form, and made to stand alone—admirable theory, but somewhat difficult to embody in practice. Plants lack the great art of imitation. In a house of perfect models of form, an untrained plant will enter upon the most erratic developments. Neither can they be cast into moulds like molten metal, and cooled down into permanent shape ever afterwards. Vitality is at once our help and our hindrance in securing form. It may be guided into every shape, but without constant control will not long continue in any. However, the first act of good training consists in the utilisation of vital force to special material or desired forms. For instance, with care in the regulation of growth, Fuchsias may easily be moulded into well-furnished cones. It is seldom, however, under cultivation, that they can be made to support themselves. The very improvement of plants tends to make them more helpless. The hybridist has added size and weight to the flower, the cultivator massiveness and crispness to the stems, and both increase the necessity for a stouter prop for the plant to lean upon. In fact, if the plant is to be developed to the utmost, and especially if it has to be conveyed to an exhibition in full flower, a prop of some kind it must have. Some give it a wooden stake, some one of iron split at the bottom into three claws, to pass through an iron hoop attached to the pot, and others adopt other expedients. It matters little what method is used so long as the whole plant is made fast to an immovable centre, and this centre does not prove destructive to the roots. With such plants as Fuchsias, a central stake of sufficient strength is all that is needed to form a core. The strength and flexible grace of the vertically disposed branches will do the rest. But the case is otherwise with Azaleas. As already observed, they naturally grow into a shapeless mass. Their branches, especially on old plants, become very flexible; their flowers are massive and weighty, and the whole plant is forced, as it were, into a heap when in full blossom. Moreover, the delicate blooms are easily injured by chafing or friction, and it would be almost impossible to carry huge Azaleas in glorious blossom to exhibitions, unless every separate branch was so trained and firmly fixed as not to rub against its neighbour. Such being the fact, the question occurs—What is the best means of providing this fixity of twig and flower? Many have tried one or a multitude of stakes, but the result has been rather disappointing. The labour has been excessive, the appearance cumbersome, and the risk of a breakdown imminent. Iron or wire stakes have been tried, to the oxidation of the soil and corrosion of the roots. Relief has been sought from such evils in a crinoline, firmly fixed to the pot. Thenceforward a general chorus of ridicule and abuse has been poured over the wire.

But it is strong, it is hidden, it is convenient, and it is perfectly efficient in every respect, and is wholly hidden in pyramidal shaped plants. For standards the clean, straight stem may be usable, but all the umbrella, balloon, or other shaped top is covered with a mass of leaves and flowers. More than this, I contend that such expedients are not unnatural. On the contrary, Nature may be said to crinoline it all round. Almost every plant, bush, and tree has an underwood of framework, of sufficient resisting and sheltering force to distend the amplitude or enlarge the capacity of an outer trailing robe of beauty. The only unnatural thing about them is that we use iron, while Nature perforce uses wood; but in many instances the hard indurated tissues of the wood offer as stubborn a resistance to a drooping gracefulness as our iron stays, while the iron possesses for us the rare merit of durability.

Great mistakes are made in the use of the word natural in regard to this matter of training. Scarcely any of our plants are, or can be, in a natural state. Does Nature ever require her beauties to take a journey of 100 or more miles in full bloom? Thus the exigencies of exhibiting complicate the science of training with an entirely new and unnatural element. Props must not only be strong enough to sustain the wear and tear of life in a state of rest, but of plants in a condition of motion—and through all the special and extraordinary trials of a modern exhibition. And yet, forsooth, we are to be laughed to scorn for giving those plants that have to be jolted over rough roads, bumped into sidings, unloaded, it may be, in the teeth of the east wind, exposed to pelting rains, dragged up and down stages, set in cutting draughts, the support of iron stays. I verily believe if Nature could be consulted, she would vote decidedly for the crinoline, and probably more emphatically against the entire practice of exhibiting, as fraught with downright cruelty, if not absolute danger, to her subjects. Doubtless one of the likeliest means of reducing this cruelty and danger to a minimum, is by affording a strong durable base for the plant and its flowers to rest upon, either in a state of rest or motion. *An Exhibitor.*

NEW HYBRID PASSION-FLOWER.

To Mr. Munro, of the Abercorn Nurseries, Edinburgh, we are indebted for a specimen of a new hybrid Passion-flower, which has just flowered in the gardens of W. P. M. Innes, Esq., of Parson's Green, near Edinburgh. It is stated to have been raised by fertilising the flower of Passiflora alata by the pollen of P. macrocarpa, and certainly bears evidence of its mixed parentage. The plant will ultimately be distributed under the name of Passiflora Innesii. Its leading characteristics may be thus stated:—

× PASSIFLORA INNESII.

(Hybrida inter P. alata form et P. macrocarpa mascul.) Branches quadrangular, smooth, green, with a reddish tinge in the centre of each side, the angles produced into a narrow membranous wing. Leaves 6 inches long, 5 inches wide, smooth, entire, 1-nerved, broadly ovate, obtuse, ending abruptly in a short acumen. Petiole 1¼ inch long, channelled above, slightly carinate below, with four sessile glands, arranged in pairs on the upper surface. Stipules linear-lanceolate, acute, 1½ inch long, very few lines wide at the base. Bracts ovate, lanceolate, acuminate, about an inch in length, finely serrated towards the base, partially concealing the flower-tube. Flower-tube 5–6 lines long, smooth, fleshy, broadly campanulate, umbilicate at the insertion of the stalk. Sepals 1¾ inch long, oblong obtuse, fleshy, green externally, white internally, almost destitute of dorsal appendage. Petals longer than the sepals, broadly strap-shaped, obtuse, whitish, densely speckled with minute red spots. Corona in many rows. The two outer rows spring from the mouth of the tube, and consist of thick fleshy compressed threads, longer than the petals, white banded, with red at the base, violet-spotted above the middle, white at the apex. Within these are four or five rows of much shorter filaments, directed inwards. Immediately within these series rises a membranous process directed upwards, and divided into a number of irregular teeth, or threads, at the top. The median corona (operculum), springing from the centre of the tube, is membranous, directed horizontally inwards, and then upwards, so as to form a sheath around the gynophore, and completely to shut off the upper portion of the flower from the lower honey-secreting portion. This latter division of the tube is marked in the centre by a rudimentary annular process. Gynophore stout, cylindrical, half the height of the petals, marked below the middle with a lobed pulley-like process. Ovary sessile, ovate oblong, smooth, yellowish; style reflexed, club-shaped, stigmas capitate. Fruit...

The plant above characterised has the stem, leaves, glands, and stipules of P. alata, while the bracts and floral organs are more like those of P. macrocarpa as to form, though the colour of the petals and outer threads of the corona is very similar to that of P. alata. It is an interesting addition to our stock of climbing plants. Whether or not the fruit is edible we do not at present know. *M. T. M.*

ROYAL GARDENS, KEW.

THE following passages are extracted from the Director's report on the progress and condition of the above gardens during the year 1869, and dated January of the present year, but only recently printed:—

There was during 1869 an unusually large increase (of 128,225) in the number of visitors to the gardens and museums of this establishment, amounting in all to 630,594 persons. They were thus distributed:—

Number on Sundays	324,523
,, on week-days	306,071
Total	630,594
Greatest monthly attendance (May)	131,364
Smallest monthly attendance (December) ..	3,825
Greatest week-day attendance (May 17) ..	33,517
Smallest week-day attendance (February 12)	
Greatest Sunday attendance (June 13) ..	20,260
Smallest Sunday attendance (January 3) ..	230

MONTHLY ATTENDANCE.

January	5,251
February	8,283
March	22,074
April	39,402
May	131,364
June	111,622
July	126,251
August	168,769
September	46,560
October	21,146
November	6,647
December	3,825
Total	630,594

Of the new works completed or continued during the year, the most important were the new range of stoves, &c., and the excavations, earthworks, &c., contingent on the deepening of the lake-bed (the water supply), and the laying out of its banks in a more picturesque manner, and with the view of forming a classified collection of Pines and other Conifers on its southern bounding slopes.

I. BOTANIC GARDENS.

The New Range.—A detailed account of the dimensions and construction of this building as approved by the board in 1868, was given in my last year's report (p. 2); where I stated that it was proposed to erect it in three portions, and distribute the vote over as many years. In the meantime, however, the opening of the "Kew Gardens" station of the South-Western Railway necessitated the construction of new entrance gates to the gardens on the Richmond Road, close to the site of the new range; and this again rendered it so desirable that the range should be finished at once, that I received orders to complete it during the year now elapsed. A modification was at the same time introduced into the original plan, by which, instead of a back wing of 150 feet by 24, and 22 feet high, divided into two portions, one of 170 feet by 20 feet, and 11 feet high, divided into three portions, has been adopted; thus providing a cool end for Cape Heaths, Mesembryanthemums, &c., and enabling us to devote the house lately occupied by these plants (and which stands near the Tropical Fern House) to the culture of Temperate Ferns.

This range, now completed by Mr. Ormson, is not only very commodious, and suited both for the cultivation of plants and their inspection by the public, but is one of the best proportioned and purpose-like buildings of its kind that I have seen. The growth of the plants in the two divisions devoted to economic plants, and in the two devoted to Orchids, is much superior to that in the old houses; and though, owing to the influx of so many thousand visitors, and the consequent constant opening and shutting of doors, and the draughts and dust thereby engendered, the condition of its contents can never rival that to be found in private establishments, I believe that as good conditions for culture have been secured as the exigencies of so frequented an establishment admit of.

The erection of this building has entailed great alterations in the walks and shrubberies immediately around it, as well as in those around the eight buildings which it replaces. These are now being proceeded with, but cannot be completed before the early summer, when the whole grounds will wear a very different appearance from what they have hitherto presented.

Heating Apparatus.—The alterations, &c., in the heating apparatus by hot-water pipes, throughout the houses and museums, recommended in my report for 1867, are now all carried out, with the exception of the heating of Museum No. 2, and have proved very efficient, and have reduced the amount of fuel previously consumed by fully one-half; and this, together with the replacement of the old stoves by one new range of stoves, effects a saving of about £200 per annum.

A series of hardware tallies for the green and hothouse Economic Collections, with the English and Latin names, and native countries burnt in, has been presented by the Messrs. Maw, of Broseley Works; they have a very neat appearance, and are admirably adapted to their purpose.

The Cumberland Gates.—The completion and planting of the approaches to these new gates, and the formation of Rhododendron and other clumps of evergreens in gradual replacement of those worn out, or destroyed by the frost and snow of 1865-6, have occupied the spring and winter months of 1869.

The length of gravel paths, either altogether new, or re-made and widened, from 8 and 10 to from 12 to 18 feet, is 1,460 yards.

The terrace on which the new range stands has been formed, but neither levelled nor planted, and the paths around it and leading to the doors of the house have still to be made.

The ground opposite Museum No. 2 is being levelled, and laid out as a sunk garden.

The Herbaceous Collection, which was thrown into confusion, first by the alterations and earthworks near the Cumberland gates, and since by the pulling down of the stoves, is in course of completion, and will be screened off from the other parts of the garden. The new potting sheds for this department, a seed room, and a room for unpacking, &c., museum specimens, have replaced the old lean-to stove at the back of Museum No. 2, and are now all heated by hot-water pipes; and when the frames, &c., of this department are brought within the same area, the whole will form a very commodious arrangement.

The increasing interest taken in rock plants, hardy perennials, &c., renders this department one of the most useful in the establishment, whether for decorating the shrubberies, flower-beds, &c., or for supplying correspondents in India and the colonials. For spring decoration of greenhouses and conservatories these ornamental hardy plants are most useful, and though it is only quite recently that they have begun to be appreciated, the demand for them is already considerable.

Much still remains to be done towards rendering these collections as useful and instructive as they might be, and especially by providing tallies or labels of a more permanent character, thus avoiding the great expense attendant on their renewal every few years. To this point Messrs. Maw, of Broseley, have been giving their attention, and after many trials have manufactured an enamelled Parian tally, which in point of appearance, legibility and durability, leaves nothing to be desired: a series of these for the genus Aster has been liberally presented to the gardens by Messrs. Maw; along with another and larger series for lawn specimens of trees, also extremely well adapted for the purpose.

II. PLEASURE GROUNDS.

The Lake and Water Supply.—In my report for 1868 I observed that owing to the condition of the lake-bed the water supply was both deficient and bad; this is now being remedied. A sum of £500 has been expended on one-half of the area occupied by the lake, which has been deepened throughout, half an acre of water has been added to the upper end, and the banks have been sloped, varied in outline, and rendered more picturesque. In the course of these operations the only beds of good loamy soil in the grounds and others of excellent gravel were reached, and from these about 10 years' supply of gravel for garden walk purposes has been stored, and 4000 to 5000 loads of loamy soil for tree planting; besides which, 400 loads of the same soil were given to the Deodars and Limes along the Sion vista. There are 88 of these trees, of which those on the right, owing to the extreme poverty of the soil, have not yet attained an average height of 10 feet, though they are upwards of 22 years old. The stuff

from the lake bottom, consisting of an accumulation of mud and vegetable matter, has been mixed with gravelly soil, and heaped on the slopes flanking the lake on the south, where it will be trenched into the poor soil, and form a good compost for the growth of the Conifers which it is proposed to plant in groups in that position.

The deepening, &c., of the lower or western end of the lake is now being proceeded with in like manner, and it is hoped that the whole will be finished and the grounds put in order during the ensuing season.

The King William Temple.—The hill on which this stands, having become almost denuded of trees, has been replanted, and the ground between it and the north end of the Temperate House has been levelled and planted, and gravel paths made over the hill and round the temple from the walk by the fence to the north end of the terrace on which the Temperate House stands. This area was devoted to the collection of Prunus, Cerasus and allied trees, which were planted about 20 years ago, but owing to the extreme poverty of the sandy soil all have been starved, and many have died. Those that remain have now been taken up and (together with other Natural Orders of the tree and shrub collection) replanted in made beds, parallel to the path, and divided from it by broad turf borders with alternate Cypresses and evergreen shrubs.

I regret to add that I am compelled to recommend that this pretty temple be inclosed within a wire fence, as neither entreaty, warning, nor punishment avails to prevent mischievous and vulgar minded persons from disfiguring its walls with pencils and knives. This practice of writing on the walls, alcoves, &c., and of cutting the seats, is the only serious complaint I have to make of the conduct of visitors; and I very much hope that the public papers will take cognisance of this matter, which public opinion alone can control.

The Old Gravel Pit by the walk bordering the Richmond Road has been greatly extended, with the view of making a sunk garden. It has hitherto consisted of a mere pit with shelving sides, and was devoted to the collection of Berberis, Clematis, Gum Cistus, &c.; but being much too small for the purpose, and difficult of access, owing to the steepness of the banks, advantage was taken of a request for coarse gravel, on the part of a neighbouring proprietor, to remove the bad soil from the pit, and to enlarge it very considerably. There now only remains to cart in good soil (of which there is ample store from the lake-bed), and to lay out and plant the grounds, which will be done by degrees by our own labourers.

Tree Planting.—This, both in the garden and pleasure-grounds, has been incessantly prosecuted during all but the summer and early autumn months; especial attention being paid to screening the houses now building along the Richmond Road, by evergreen trees; and to replacing the old trees, which perish annually in increasing numbers, and will continue to do so for years to come. This is due to the simple facts, that the majority were planted at about the same time, 150—200 years ago; that most them, especially Poplars, Birches, Beeches, Hemlocks, &c., are naturally short-lived trees, and especially so in our hungry sandy soil; and that the root action of the Elms, and the drip of their branches (which trees were always disproportionately numerous) are fatal to young trees in their neighbourhood. My predecessor's plantations by the river and in the Queen's cottage grounds, supply a stock of fine young trees; but the time, cost, and labour of transplanting, and the necessity of trenching the ground and supplying several cart-loads of good soil to every newly-planted tree, render the operation a slow one.

III. Interchange of Living Plants and Seeds.

The number of plants received and sent out during the year 1869, almost wholly as gifts or exchanges, have been:—

	Received.	Dispatched.
Of hardy trees and shrubs	7,055	308
Of stove and greenhouse plants	1,241	4,294
Herbaceous plants	923	631
	9,219	5,103
Of seeds (packets)	2,136	9,386
Of Ward's cases of live plants	29	30

The total number of donors, 162; of recipients, 122.

IV. Museums.

The principal Museum, No. 1, has been heated by a hot-water flow and return pipe round each of the three storeys of the whole building, and supplied from a small boiler and furnace outside. This arrangement answers perfectly; the amount of heat, the dryness, and the ventilation, are all that can be desired, and the economy of fuel (the new apparatus replacing twelve open grates) is very great.

It still remains to heat Museum No. 2 upon the same inexpensive plan, as it suffers much from damp in two of the rooms. The apparatus in the Museum No. 3 continues to work perfectly well.

The great increase of visitors, and the popularity of Museum No. 1, render it very desirable that another and better staircase, providing for both ascent and descent, should be built to it. The present staircase is not only wholly insufficient, but being placed immediately opposite, and not 10 yards from the only doorway, and serving for all the storeys of the building, the effect is, that when the Museum is much frequented it is all but impossible to get in or out of the door, or up and down stairs. A staircase should be constructed at the back of the Museum, with a double flight of stairs, and an exit at the bottom from the building. There is plenty of space for such an arrangement, which would further allow of the very valuable collection of portraits of botanists, &c., being much better displayed than they now are.

In the Museum the substitution of printed labels for written ones is still being proceeded with. The collection of cones of North American Coniferæ has been examined and accurately named by Dr. Engelmann.

V. Herbarium and Library.

This building has been heated, like the two Museums, with a hot-water apparatus, consisting chiefly of coils in the various apartments of the ground and first floors, fed by a boiler and furnace placed outside. *Jos. D. Hooker, Director.*

THE CHATSWORTH CONDUIT EDGING TILE.

In a season like the present, when the supply of water to our gardens is of more than usual importance, it is gratifying to find that Messrs. H. Doulton & Co., of Lambeth, the eminent earthenware manufacturers, have brought out a new form of border edging tile for gardens, which promises to be a very material aid in securing a supply of water of the best kind—viz., that

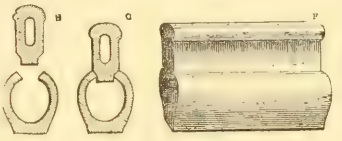

Fig. 164.

which falls from the heavens—for garden purposes. The tile has been named the "Chatsworth Conduit Edging Tile," and is the joint contrivance of Mr. Speed, the Duke of Devonshire's talented gardener at Chatsworth, and myself. Mr. Speed, noticing after a storm a quantity of water standing inconveniently upon a garden walk, and in a place where water was always scarce, the thought suggested itself, "Why could

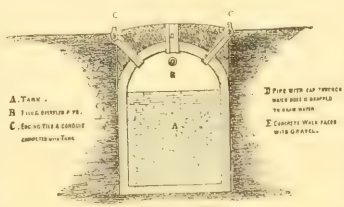

Fig. 165.

not that water, and all the water that falls upon the walks be stored in tanks underneath them ready for use when wanted? The notion was mentioned to me, when I happened to call shortly afterwards, and the result is the tile (fig. 164) which is now presented to the public.

From the annexed section and perspective view it will be perceived the edging tile consists of two parts,

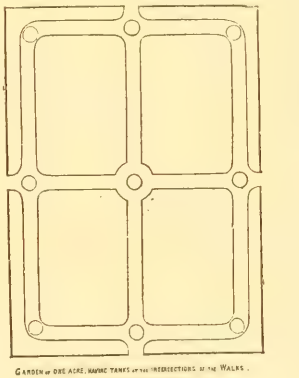

Fig. 166.

first, a flat soled conduit with a slot along the upper side, into which the tile H fits, and which is held in its place by means of a little weak cement. At the time of fixing the tiles a piece of thin zinc or tin is placed between them on the lower side until the cement becomes set, and through the chink thus formed, when the pieces are withdrawn, the water finds its way into the conduit, and thence to the tanks provided to receive it, or if not wanted it passes away into the general drains of the garden. As will be seen by the section of the tank and walk (fig. 165), the latter covers the conduit completely, and if the walks are formed of superior materials, as all walks ought to be, it is clear that the greater part of the water which falls upon them must be carried into the tank. The conduits are connected with the tanks, as shown at C, and at D we have a cast-iron pipe, with a plug through which the feeding hoze of the garden-engine may be dropped to draw up the required supply of water. At B is shown the end of a common drain-pipe, through which, when the tanks are full, the waste water passes from the highest to the lowest point of the garden, and thence to the main drain. The advantage of this arrangement is, that if there is an extra supply of water from any outside source, it is only necessary to convey it to the tank at the highest point of the garden, and from it all the tanks will be filled.

It is not necessary to dilate upon the desirability of these arrangements. Too many feel at the present time the want of a copious supply of water, and it may be safely averred there is no labour of the garden so liable to be scamped as that of watering, be it the washing of wall trees, or the soaking of their roots, when the water necessary for the purpose has to be carried or wheeled a considerable distance prior to use. Here, as will be seen by the annexed plan of a garden (fig. 166), the tanks are so placed as to admit of the water being distributed with the greatest ease; and it is not too much to assume that, with an arrangement of this kind, two men with a garden engine, or a lady with her "handy man," would do more effective watering in a few hours than half-a-dozen men with the usual means would in a day. If it is desired, a pound or two of guano, or any other concentrated manure, can be dropped into the tanks, and there will be a supply of liquid manure, or by the same rule lime may be thrown in, and there will be a supply of lime-water, in a few minutes.

It will appear from this short detail of the contrivance, that, whether we look to the palatial gardens of the nobility, or the simple plot of the artisan or labourer, it will confer a great boon upon the gardening public. Of course the form of tile may be varied to suit the requirements of designers, but the conduit is equally applicable to the architect in the forecourt, or the elaborate geometric garden, as it is to the gardener. Tiles for edging grass verges are, we understand, in preparation, and those once properly fixed will do away with the edging knife and the raw, dark edgings which are such a dissight in most gardens every spring, and secure what has long been desired, a perfectly true and even grass verge to our walks. These tiles will be exhibited at the meeting of the Royal Horticultural and Agricultural Societies at Oxford. They are manufactured in terra cotta, and, considering the material employed, are sold at a reasonable price. *W. P. Ayres, Nottingham.* [These tiles, of which we have seen a sample, are well-made, and have a very clean and neat appearance. Eds.]

THE GENUS MUSCARI.

M. botryoides (Mill.). Of late much eloquence has been poured forth over this little spring flower. Indeed its praises have been so well sounded that it only remains for me to attempt to give a practical description along with a few cultural remarks. The leaves are about 2 lines broad, 8 to 10 inches long, and grow nearly erect. The scape is generally longer than the leaves, and ends in a raceme of pale blue, deep blue, or more rarely white flowers. The perianth is contracted at the mouth, nearly ovate, 2 lines broad, and often 2½ long. This is frequently classified along with alpines, although it is really a native of the plains of Europe. It glories in a light loamy soil and abundance of light, parting with much of its beauty, if not also of its strength, when in the shade. After the foliage withers the earth about the roots should be kept moderately dry. Young bulbs occur at the base of the old ones, and rapidly increase this species.

M. commutatum (Guss.).—This is nearly related to M. racemosum. Here, however, the leaves are flaccid, there they are the very reverse. To be treated like M. botryoides. Flowers blue or purple, and produced in spring. Well worthy of a place where ornamental bulbous plants are grown, and quite hardy. A native of the plains of Italy and Sicily.

M. Heldreichii (Boiss.).—Without doubt this is the most beautiful species of the genus to which it belongs, and I hope some master of eulogistic adjectives may soon fall in love with it, and usher it into the public favour which it so well deserves. Each full grown bulb produces two or three scapes, and five to seven leaves. These extend themselves in graceful curves, are 2 to 3 lines broad near the base, but less near the apex, concave on the upper, convex on the under side, and 6 to 9 inches long. The perianth is about 2 lines long, and of a delicate blue colour, except around the white and contracted mouth. This is a native of Greece, and even if without any claim to the name of alpine, it deserves a conspicuous position on the rockwork, and looks remarkably pretty in a pot. The blossoms begin to expand about the close of spring, and in favourable seasons continue gay for a couple of months. For treatment see under M. botryoides, from which it may be known at a glance by its spreading, instead of erect leaves, and by its dense, rather than loose racemes. Second only to the subject of this paragraph is M. grandiflorum, of Baker, a species to which the attention of nurserymen should be directed, for though in the country it is still absent from the trade.

M. moschatum (Desf.).—This is not by any means

handsome. On the contrary, it verges on the ugly, but it is deliciously scented, and on this account should be considered one of the most important of early flowering plants. In fact it is capable of taking up a position during the first part of the year, to be vacated on behalf of such as the Mignonette further on. At one time no British garden of any pretensions was without it, but, like many more delightful old things, it is now of rare occurrence. It is a native of the Levant, and stands in no danger of being confounded with anything else worthy of cultivation. For treatment, see M. botryoides. M. moschatum var. flavum is superior both in fragrance and appearance to the typical plant.

M. fallens (Fisch.).—This, a native of Tauria and Caucasus, is less than either M. Heldreichii or M. botryoides, and technically it may be known from both of those by the mouth of the snow-white ovate perianth being quite open. The leaves are about 6 inches long, 1 line broad, and grow erect. The flowers are sweetly fragrant, are in full beauty in the middle of spring, last for six weeks, and are disposed in lax racemes, each of which is about an inch long. Several scapes are generally produced by a single bulb. For culture, see M. botryoides.

M. racemosum (Willd.).—The leaves of this are very slender, being seldom above a line broad, though not unfrequently a foot long. The scape is about half the length of the leaves, and the raceme of flowers is about an inch in extent. The perianth is of an exceedingly rich violet colour, contracted at the mouth, about 2 lines long and one broad. M. racemosum var. neglectum has larger as well as coarser leaves and flowers than the typical form. A native of Greece. For treatment see M. botryoides.

Besides the above there are some other species about in botanic gardens, but they are not ornamental unless the overgrown M. comosum var. monstrosum be considered so. It is worthy of notice that in M. pallens, for instance, with a white perianth, the pollen and anthers are violet coloured, whereas in several if not in all the species with purple or blue perianths the anthers and pollen are white. *John Duncan.*

PALMS.—No. VIII.

Licuala (Wurmb.).—Another genus of Asiatic Fan Palms, with unarmed trunks, prickly petioles, axillary hermaphrodite flowers, and red or yellow drupes. Of the 20 species described by botanists about a dozen are in our gardens, among them the beautiful L. peltata, with its almost orbicular leaves, so much esteemed in Assam for making Palm-hats. The other species under cultivation are L. elegans, gracilis, horrida, nana, pumila, Rumphii, spinosa, amplifrons, &c. We have not got yet L. acutifida, which supplies the walking-sticks known as "Penang Lawyers."

Pericycla (Bl.), a monotypic genus of Asiatic Fan Palms, represented by P. penduliflora of New Guinea, and not yet in our gardens. It may possibly be identical with either Licuala or Livistona.

Copernicia (Mart.).—One of the Wax Palms of tropical America—which, however, secretes the wax, not on the trunk, as the Ceroxylons (Klopstockias) do, but on the under side of the young leaves—belongs to this genus; it is C. cerifera, a native of Brazil, and an inmate of our gardens. The real use to which this wax may be turned has not yet been discovered, but candles have been made of it in England by Price's Candle Company at Vauxhall, and they retained the lemon colour peculiar to the raw material. In habit this tree is like Sphærodendron angolense, having a straight stem supporting a globular crown. All the species yield a hard wood, and their leaves are much used for thatch, notably those of C. tectorum and hospita, whilst the fruit of some is eaten. They are middle-sized unarmed trees, with erect trunks, covered with the remnants of the leaf-stalks; their leaves are palmate, their flowers hermaphrodite or polygamous, and on axillary spadices, and their fruit a 1-seeded elliptical berry. C. barbadensis, maritima, robusta, tectorum, and the abovementioned C. cerifera are inmates of our gardens.

Brahea (Mart.).—Two species, B. dulcis and calcarea, both natives of the mountains of Mexico, a few thousand feet above the sea level, and both inmates of our gardens, are the only representatives of this genus of Fan Palms, the habit of which is well shown in a recently published plate (Illust. Hort. t. 379). They are middle-sized unarmed trees, the trunk of which yields timber; their flowers are hermaphrodite, and their fruit a sweet edible berry.

Sabal (Adans.).—If Palms are associated, on the one hand, with much that is glorious in man's history, they are on the other connected with events of which our race has not much reason to be proud. It has been the fate of the Palmetto of the United States, now Sabal Palmetto, to furnish the emblem which produced the same effect on the non-slaveholding American as the red piece of cloth does upon the animals in a Spanish bull-fight. At an early date the settlers in the Southern States found out that trunks of this Palm were extremely tough, and during the War of Independence they were frequently used with advantage for making stockades; hence the Palmetto became associated with much of what the Southern people were proud, and they consequently introduced it in the coat of arms of South Carolina, and it was they who, on the breaking out of the Civil War, raised the "Palmetto Flag" to the dignity of a national emblem of the Southern Confederacy. S. Palmetto has about a dozen congeners, several of which are in our gardens, Kew boasting of large specimens of S. umbraculifera (S. Blackburniana, Hort.) All the species are confined to the southern parts of the United States, to Mexico, Central America, and the West Indies, the Island of Trinidad producing three species, viz., S. mauritiæformis, Griseb. et Wendl. (Trithrinax mauritiæformis, Karst.), S. Woodfordii and S. glaucescens. They are either entirely stemless (S. serrulata) or have a middle-sized unarmed trunk; their leaves are palmate, their flowers hermaphrodite, and arranged in branched spadices, and their fruit is a round, dark green berry.

Chamærops (Linn.).—If all the species referred to this genus really do belong to it, which is by no means clearly demonstrated, Chamærops would be the only genus of Palms geographically distributed over three continents—Europe, Asia, and America. Moreover, it marks the northern limit of this order, three genera of pinnated Palms (Kentia, Micrococos and Phœnix) marking the southern. C. humilis of Southern Europe, C. excelsa of Japan, and C. Fortunei of Northern China, have proved hardy in the milder parts of England, and impart quite a new feature to our gardens. Even during the last severe winter specimens of C. Fortunei, which are planted at Kew in a rather exposed position, were not killed by the frost, though some of their leaves were injured, more, it would seem, by the continued strong easterly winds than by the effects of low temperature. C. Fortunei was at one time held to be identical with C. excelsa of Japan, but the latter has shorter petioles and is not so elegant a Palm as the former. It is to be regretted that, after the success which has attended the naturalisation of some of these Chamærops, efforts are not made to introduce their congeners, all of which thrive in a low temperature. Dr. Hooker found C. Martiana in the Western Himalayas, at an elevation of 8000 feet, where it is annually covered with snow. Indeed, it is difficult to understand why those who have the charge of large gardens, or gardens of their own, where a lot of "duplicates" must always be thrown away, do not plant them on separate ground, and allow them to struggle for existence as best they may. They might then discover many species to be perfectly hardy that are now supposed not to be so. At present we cultivate the following species of Chamærops:—C. arborescens (tomentosa, Hort.), callosa, cochinchinensis, excelsa (chinensis, Hort.), gracilis, Griffithiana, guianensis, humilis (conduplicata, Hort.), Hystrix, Martiana, and Fortunei. Most of the species of the genus have a low trunk, often creeping, and only a few attain the height of 40 feet. The petioles are furnished with prickles, the blade is fan-shaped, the flowers are axillary and polygamo-dicœcious, whilst the berries are generally 1-seeded, and resemble Olives in appearance. The fibre and foliage of several species are used for making ropes, paper, fans, carpets, dresses, matting, and various other useful purposes; the berry of some is edible.

Rhapis (Linn. fil.).—The species belonging to this genus are natives of Eastern Asia, where they form underwood in forests, and are cultivated in gardens. They have a cæspitose rootstock, which sends forth several slender trunks, used for walking and umbrella sticks. Their leaves are palmate, and their petioles are surrounded at the base by a brown fibrous matting. The flowers are dicœcious or polygamous, with six stamens and three carpels, which later develop into three (or by abortion fewer) drupes. There are about half-a-dozen species, the best known of which is R. flabelliformis, long an inmate of our gardens. Of this Siebold and Veitch have of late years introduced a much esteemed sport with variegated leaves, of which Van Houtte has given an excellent figure in Flore des Serres, tab. 1844, 1845. The Japanese, great admirers of foliage plants, had long ago cultivated it for ornamental purposes. We have besides R. aspera, R. humilis (Chamærops Sirotsik), and R. Kwanwortsik in our collections, all of which are in most establishments injudiciously treated as hothouse plants.

Acanthorrhiza (Wendl. in Regel's Report on International Exhibition at St. Petersburg).—No technical description of this genus has as yet been published, but in the publication quoted Wendland states that Acanthorrhiza differs from Trithrinax by the aërial roots of the trunk hardening into spines (which are horizontal or pointed upwards), and by the blade of the leaf being divided down to the petiole. There are only two species known, one, A. aculeata, Wendl. (Trithrinax aculeata, Sieb.; Chamærops stauracantha, Hort.), a native of Chiapas and Mexico, and grown in our gardens, and the other, A. Warscewiczii, Wendl. (Thrinax argentea, Seem. Bot. Herald, p. 203, non Lodd.), a native of Costa Rica and the Isthmus of Panama, in which latter country it is known by the name of "Palma de escoba" (Broom Palm), from the use made of the leaves. This Palm does not attain more than 20 feet in height. It grows as underwood in forests, and is the only Fan Palm as yet discovered in the Isthmus, differing from its congener by the more irregularly divided leaf-blade, which, moreover, is white below.

Thrinax (Linn. fil.).—A genus of beautiful Fan Palms inhabiting the West Indies and adjacent continent, and composed of about 10 species, all of which have a low or middle-sized unarmed trunk, but often clad with the persistent bases of the petioles. The leaves are terminal and fan-shaped, and manufactured into baskets, hats, and other articles, not only in the West Indies, but also at St. Alban's, Herts ("Chip hats"). The flowers, arranged in axillary branched spadices, are hermaphrodite and yellowish green, and the fruit is a round, 1-seeded berry. T. argentea (valued on account of the lower side of leaf being of a silvery white), T. ferruginea, graminifolia, parviflora, Pumilio, radiata, rupestris, stellata, and others are in cultivation. T. elegans, Hort., is much recommended for "exhibition purposes."

Phœnix (Linn.).—The Date Palm and its congeners are readily distinguished from all other pinnated Palms by the leaflets being more or less conduplicate at their base, and by the lowermost being converted into spines. In some species the trunk is so short as hardly to appear aboveground, in others it attains 40—50 feet in height. The leaves are pinnate, the leaflets linear, and of a more or less ashy or glaucous tinge. The flowers are axillary, and the male and female are borne on different trees, so that in order to insure a rich crop recourse must be had to artificial fertilisation. The drupes are globular or oblong, generally bearing one seed, but in one of the varieties of the Date there is no "stone." This variety was not a sport of Nature, but produced by St. Diego, losing one of his teeth in eating dates at the Canary Islands, and commanding in a state of irritation that the tree which occasioned him this loss—there were no artificial teeth in those days—should henceforward bear Dates without stones! Phœnix is distributed over Asia and Africa, and is cultivated in Europe and America; even at Nice, Genoa, and other places too cold to allow the fruit to ripen, P. dactylifera is grown for the sake of its leaves, of which whole shiploads are sold for Jewish and Roman Catholic festivals. Dr. Hance, H. M. V. Consul at Macao, has also sent P. farinifera (pusilla, Lour.?), for which he takes the species common in southern China, to M. Naudin, in hopes that it may be naturalised at Hyères, &c. (Journ. of Bot., 1869, p. 17). It would not be difficult to write a volume on the Date Palm and its associations from the earliest ages with the history of man, and its present uses by millions of human beings. There are as many varieties of it as there are of our Apples and Pears, and my friend, E. Vogel, the Central African explorer, afterwards so barbarous murdered, sent me a list of 37 kinds which he collected at Murgukong. There are Dates of all sizes and colours (except pure white and black), and, of course, good, bad, and indifferent sorts. Next to P. dactylifera ranks P. sylvestris, one of the sugar-yielding Palms of the East Indies; and P. farinifera, a sago-producing one. Most of the species are now in our gardens, and large specimens of the common Date are frequently used with effect at the great Continental hotels and mansions, for decorating courtyards and staircases. *Berthold Seemann.*

Home Correspondence.

The Archimedean Lawn Mower.—Having been a mower for 30 years—for I turned out as a raw laddie to mow on the slopes at Scone Palace from five to nine—and having found it a heavy business from those days till now, notwithstanding the wonderful help afforded in the matter by the lawn-mower, I naturally felt an interest in this new "notion." These mowers have enabled us to do the work of 10 or 12 men with a horse, one man, and a boy; and they do this work better than the best mowers with a scythe could do it. I have been at some trouble to test the above-named mower, and feel it a duty I owe to the public to publish my estimate of its capabilities. I need hardly add that I have no interest in any lawn-mower whatever, other than every reader has who has many acres of short grass to keep. "Remarkably easy to work." I found it no easier than one of the usual make of the same size. Indeed, it is difficult to see how scudding along upon sole irons in front, instead of upon rollers, can make it easier to work. "Far superior to any of ours," &c. This is too general an assertion to be met or confuted by arguments. I leave it with the admission that I fail to see it. Now I come to your own criticism—"the quickest," &c. I presume you mean that it cuts more grass in less time? That of course depends upon the speed of the driver. If it is dragged over the ground faster than other machines of course it may be called quicker, not otherwise. But possibly you do not mean that it will cut more grass in a given time, but that the knives revolve faster than in any other machine. If so, of course it must be granted that in this peculiar sense of the word "quick" you are right. Such an acceleration of speed is a structural necessity of the "Archimedean," for it is not furnished with four, six, or eight knives, but with two only. And if these did not revolve faster than those with more knives it could not cut to any purpose at all. Applied to the knife, your character of "most simple" is strictly true. A whole plate twisted in the usual way, and faced with two cutting sides, is more simple than a number of knives fixed on a spindle. But the mode of fixing the knives on the usual machine is simple enough, and it has its advantages over the "Archimedean." Let the "Archimedean" going at full

speed pick up a rusty nail or a bit of flint, and knife or plate must give way. If the former, the whole cutter is ruined, or must be refaced; in the usual machines, only one knife is injured, and a single knife can be replaced cheaper, and in less time, than the whole-plate knife of the "Archimedean." As to the greater efficiency you claim for the "Archimedean," in what does it consist? I read in the advertisement before me that it cuts wet grass without clogging, thus enabling the men to work in the morning, with the dew, &c., instead of toiling under the heat of a mid-day sun, &c. But does not every machine do likewise? For the last 20 years I have worked Shanks', Green's, Ransome's, or, indeed, any of the lawn-mowers, from 7 to 5 daily in all weathers, and never been blocked up by the wet grass. Unless the rain is too heavy for man or beast, our machine goes as regularly from Monday morning to Saturday noon, as if the entire process was carried on under cover. "Cuts grass 6 inches long," I think I have read somewhere, Such is not the length of grass on lawns. When it reaches that height better have the long grass cutting machine used in the meadows. The "Archimedean" will cut longer grass than the usual lawn mower, but it would need a donkey to make even a 14-inch machine do it. Many machines will take grass 4 inches long if set accordingly, and that is surely 3 inches too tall for a well kept lawn. But it seems that other machines injure the roots of the grass, and this does not. All I can say is, I have not found out that the machines do any such thing. If set too low, and the ground is uneven, the knives will occasionally shave a slice off root and branch; but this is wholly the fault of the man or the ground, not of the machine. But the greatest merit is yet to be noticed; it does not simply cut the top of the grass, but it nourishes its bottom; and it does both by the same means. It scatters the cut grass on the surface of the closely shaven lawn, and leaves the dead litter as a plaister for the wounded surface, and a replenisher of the exhausted earth. And it is upon these grounds that the new mower chiefly rests its claims for support, and which are set forth as the highest possible merit in a lawn mower by this horticultural process. To cut and scatter by the same process seems to me an admirable combination of useful qualities in a long grass cutter in the meadows, as likely to lessen the labour of haymaking. But on lawns the one point to be guarded against is the scattering of grass about, or indeed any other litter. The grandest feature of our lawn-mower was the emancipation of so much labour power from the drudgery of lawn sweeping. "But," say the "Archimedean" admirers, "our machine cuts the grass so fine, and scatters it so evenly, that it is at once lost to sight, and no sweeping is needed." This is at least a new mode of rendering matter invisible. Its effectiveness will, however, depend wholly upon the quantity we start with. Even the proprietors of the "Archimedean" could not pretend to dispose thus of the 6 inches of grass that they warrant their machine to cut. But will it thus dispose of 3 inches, of two, of one, week after week in continuity, and in all other weathers, whether the sun dries it or not? The thing is utterly impossible. There is the grass, and there the *débris* of it will remain, and it must be visible. The "Archimedean" may manage Daisy mowing and the thinnest, poorest grass lawns, but even these it will neither cut, scatter, nor render the crop invisible one whit better than any other mower. Whip the box off any ordinary lawn-mower, and you have an improved "Archimedean" at once. I use the word "improved" advisedly. The common mowers scatter the cut grass equally well, and spread it out with the same regularity, while at the same time they keep it nearer home. The knife of the "Archimedean," from its form and its greater speed, acts like the whiff of a blow-pipe or the wings of fanners, and sends the grass flying in all directions. It will cover the surfaces of grass, gravel, or flowers with equal impartiality. We have plenty of weeds without thus sowing these broadcast and wholesale where they are not wanted. Even Daisy lawns do not need to be sown afresh with millions of new seeds in the form of full blown flowers. To prevent such evils and keep the surface of cut grass clean, the collecting box is needful even on the poorest lawns, but it is essential and indispensable on those of average quality. It is preposterous for any one to try to persuade those practically acquainted with the subject that such a crop can be rendered invisible by minute subdivision and regular distribution. Why every inch of ground must dispose of its inch cube of grass (nearly), divide, scatter, or dry it as you will. Such a quantity can never become invisible to mortal eyes on the surface of a well-kept lawn. Few things could prove more annoying than such weekly hay-makings on such a baby-scale. In fact, the advocates of the machine almost admit that the dead grass is visible on the surface of the living, for while they claim the merit of scattering, they at the same time praise it for mulching and manuring the roots. The one claim well nigh destroys the other. Either it is worthless as a mulching or it is visible as a nuisance. It may be one or the other, but it can hardly be both. I also protest against any such mulchings for the enrichment of grass land. On poor soils, sewage, soot, guano, &c., applied in winter will strengthen the grass; but on ordinary soils, short grass needs no such strengthening. The more you cut it the faster or stronger it seems to grow, indeed, I wish any one would give me a recipe for reducing the strength of its growing force. The "Archimedean" must put its box on if it is to make any way in England, and then it may humbly take its place in the ranks with other mowers, but I do not believe it will ever supersede them. My impression is that it would do its work better with a four-edged knife than a two. Fast as the cutter revolves, grass and even Daisies escape between the sets. The mowers with six cutters take the grass cleaner, and it would of course be easy to multiply speed to any extent in the gearing of the spindle if the knives do not go fast enough. It is needful that a knife should be ready to cut at every advance forward, and then, of course, no grass can escape between the cuts. I have never found that the rollers in front keep the knives from cutting; but if they do, it would be easy to balance the machine upon the small rollers projecting beyond the line of the plate and the cutters. This would be a better arrangement than the iron soles of the "Archimedean." As will be seen by the foregoing, I agree pretty well with Mr. Featherstone's estimate. As to your statement about the bents, it is quite the opposite of my experience: the "Archimedean" cuts bents better than any other mower, as might be expected from the more rapid revolutions of its smashing cutter. A practical gardener of considerable experience has just told me that he will keep his "Archimedean" for the cutting of bents, which it does better—and he adds, it is the only thing it does better, or so well, as the other mowers. *D. T. Fish.* [As our opinion has been called in question, we give the reason for the faith that is in us without overlooking the merits of our English lawn-mowers, whose good qualities are beyond disparagement. We have stated that in many respects we admire the "Archimedean," and, with all due respect for the opinion of our correspondent, we repeat that further experience does not incline us to alter our favourable estimate. We repeat that for certain purposes—for amateurs, for small gardens, for uneven ground, for rough grass, for steep banks, &c., the "Archimedean" is, in our opinion, the best mower yet introduced. It will not accomplish everything desirable in the matter of mowing, and we presume the remark is applicable alike to our English mowers, excellent as they are generally acknowledged to be. There are several points of merit, however, belonging to it, which sufficiently deserve our attention. It is the "quickest," through no time being lost in stopping to empty the grass-box, which is known by practitioners, when the grass is at all thick, to be a somewhat tedious operation, and to take up nearly as much time as the actual cutting, especially with small machines. It can also be propelled at a quicker rate over the ground than the ordinary mower, and perform its work effectually. It is most "simple" in the sense of its being free from complications, and all its parts being easily seen and readily understood. If the knife should happen to get injured, which is an occurrence likely to happen to any mower, we find a new knife can be procured for a mere trifle, and easily replaced. In the case of the ordinary mower, when any repairs are necessary the implement has generally to be returned to the makers, and considerable expense incurred. Indeed, it is a standing rule with some of our best makers to have all their mowers returned for repair every winter. This is a great objection. The simplicity of the construction of the "Archimedean" does away with the necessity of so much skilled supervision, and thus renders it more generally useful. It is "most efficient." It can be used with greater facility, and to greater advantage in many places than any other, and will perform good ordinary work. We believe our English mowers will, on well kept level smooth lawns, make a much finer finish, and cut more finely than the "Archimedean." It is, however, a necessity that our lawns shall be well kept if an English lawn-mower is to be used at all. We are not, however, arguing the question as to what condition our lawns should be in. We take them as they are, and based our favourable opinion of the new comer accordingly, as it will cut the grass in almost any condition. It will cut grass where our ordinary mowers would be of no service. To the scattering of the grass instead of gathering it up, there is decidedly some objection, but where, as it is recommended, the lawn is cut regularly once a week, as it should be, the objection is very trivial; and in the other cases the time saved in the cutting compensates for the loss in having it swept up, if found desirable. EDS.]

Pelargoniums at the Leeds Show.—As I was not present myself at the Leeds show, I am not going to enter into the individual merits of the specimens of Gold and Bronze Geraniums exhibited there, as, of course, I can only judge by hearsay; but there are two or three things in Mr. Wills' reply which I wish to take notice of. He says: "It was well known that some varieties named in the first lot would be cultivated long after the others were forgotten." This is a clear case of begging the question. Mr. Wills, as a raiser of Gold and Bronze Pelargoniums, is prejudiced in favour of his own seedlings, and ventures to predict that his will be grown when those sent out by Downie, Laird & Laing are forgotten. I happen to be acquainted with all the varieties mentioned by "Looker-on," and, with one or two exceptions, have got them all bedded-out at present in my garden. There is an amount of constitution in Beauty of Calderdale which amounts to coarseness, and in point of form of leaf and in colouring (which in a bicolor seems to me the most important point) there are none of Mr. Wills' seedlings that are equal to those raised by Downie, Laird & Laing, and I for one cannot help thinking that the decision will be reversed, and that many of Downie, Laird & Laing's seedlings, as Kentish Hero, Crown Prince, Impératrice Eugénie, and others, will be in cultivation when Beauty of Oulton, Beauty of Calderdale, &c., will be discarded. If, as Mr. Wills says, there was only one point in favour of Messrs. Downie & Co.'s collection, how could they have been awarded equal 1st? "Looker-on" is certain to have sent his name and address to the Editors of the *Gardeners' Chronicle*, even if he did not choose to have his name published, and run the risk of being called over the coals by Mr. Wills. I, for one, cannot see that "Looker-on" indulged in any personalities. I have seldom read a more temperate letter, and in fairness to all exhibitors of Bicolor Pelargoniums, he had the right to inquire whether size and coarseness of habit are to constitute the basis on which plants are to be judged. *C. P. Peach.*

Gold and Bronze Pelargoniums.—When I stated to you a few plain facts, and asked a simple question respecting the Gold and Bronze Pelargoniums at the Leeds exhibition, I had not the slightest idea that by so doing I should draw down upon myself the indignation of Mr. Wills. Indeed I was in hopes that he would thank me for giving him an opportunity of publicly explaining, what no one except the judges at the Leeds show could understand, viz., the points that made Mr. Butler's six plants equal to Messrs. Downie, Laird & Laing's six. Now we have got them—"size, uniformity of the plants, and good constitution." This, according to Mr. Wills' way of thinking, makes "three points, whilst only one point could be given to the other lot, namely, colour." And yet these three judges (for three there seems to have been) managed to make them equal! Rather odd reasoning this. In my opinion the colour was more than worth all the three put together, no matter how large or how grossly they were grown. Without the colouring matter in the foliage, I hold they cannot have a claim to be called Gold and Bronze Pelargoniums. Mr. Wills has indulged in a bit of tall talk when he says, "And it was well known (to whom was it known?) that some of the varieties named in the first lot would be cultivated long after the others were forgotten." Now my experience of Gold and Bronze Pelargoniums leads me to a very different conclusion; and by way of giving some practical effect to it I will, with Messrs. Downie, Laird & Laing's consent, challenge Mr. Wills to show the same six varieties against the six they exhibited at the Leeds show. It is not necessary that they should be large specimens, say plants in 6-inch pots; and I propose that they be shown at the exhibition to be held at South Kensington on August 17, or at the one to be held at the Crystal Palace on September 6, whichever Mr. Wills may select: and if the judges of the exhibition award the 1st prize to Mr. Wills I will cheerfully pay into the funds of the Gardeners' Royal Benevolent Institution the sum of £5 sterling, on condition that Mr. Wills will pay a like sum into the same fund if the judges award the 1st prize to Messrs. Downie, Laird & Laing. I have done nothing to be "ashamed of," and have no object in keeping back my name and address, which are known to the Editors; and if they think proper Mr. Wills is at perfect liberty to see it. *Looker-on.* [It is only necessary to state that our correspondent is well known to us by repute as a thoroughly competent practitioner, and we see no reason why his *incognito* should be broken. EDS.]

Early Peas.—I have myself tried the planting-out system several times, and seen it extensively carried out, but I never saw the crop so good as those sown in the open border. They might have been a few days earlier than those sown in the borders; but, taking into consideration the extra trouble, and the crop not being so good, the few days earlier will not compensate for that extra amount of labour. I have grown for my early crop Dickson's First and Best. I sowed on February 28, and gathered on June 7, and in one of the coldest and bleakest parts of England, and one of the highest elevations in Leicestershire, if not in England. *J. C. Mitchell.*

French Nursery Catalogues (p. 862).—All nurserymen who now ask for their goods a higher price than they did 25 years ago, and all gardeners who ask a higher salary than they received 25 years ago, must be hanged. Messrs. L. Van Houtte, J. Linden, Simon-Louis, E. Benary, P. Lawson & Son, Carter & Co., &c., must be hanged, because they publish their catalogues in two or three languages. The publisher of the *Gardeners' Chronicle* must be hanged, because he inserts their advertisements, with English prices attached: is this what you ask for Mr. Greenhorn? *A Napoleoniste.* [To this extraordinary lucubration, the best reply is, "Oh hang it!" EDS.]

Stealing Cuttings at Flower Shows.—I wish to make known another instance of stealing cuttings of Pelargoniums. On Thursday last I was an exhibitor at the Accrington annual flower show, and, amongst other things, I had a collection of Gold and Bronze Pelargoniums, chiefly seedlings, with a good plant of Model (Wills). This latter possessed a very pro-

mising sport, which some unprincipled individual stole from the plant. Two of the seedlings were also mutilated: one branch had been cut away by a sharp knife, but the sport, and the branch of the other seedling were in a ruthless manner torn away from the plants, which makes me think that there was more than one person engaged in these nefarious transactions. To an humble exhibitor, like myself, it is very disheartening to be served in such a manner; but when others, who spare no expense in getting up their plants, nor let inconvenience restrain them from exhibiting, get their plants mutilated by robbers, it is quite necessary that something more should be done by the authorities to give all the protection which is in their power to plants, &c., at exhibitions. In well-kept parks, the public are directed by numerous notices not to walk on the grass, or to touch the flowers, and are at the same time called upon to preserve order in others, which has, in general, good effect. The same result might be obtained in checking the evil complained of by displaying at floral fêtes notices of a similar character, which might run thus:—"To Gardeners and Others. —Several instances having come to light of cuttings having been stolen from plants at exhibitions, Notice is hereby given, that any persons found meddling with plants will be forthwith expelled from the exhibition. N.B. All who may see this order violated, are earnestly requested at once to point out the offenders." A notice of this character, stuck up in prominent positions at our horticultural exhibitions, might deter evil disposed persons, and at least it would make men think that the public were watching, and thus might prevent this pilfering. *Andrew Meikle, Read Hall, Whalley, Lancashire.*

Cherry Tree Dropping its Fruit.—At p. 862 of your last Number mention is made of a Cherry tree, which drops its unripe fruit (cause unknown), and at p. 863 is another story of an Apricot tree, which did not bear until some heavy stones were placed around it. I conjecture that the effect of the stones was to shade the roots and steady the tree during storms. Would it not be worth while to try the effect of stones with the Cherry tree also? *Civis.*

Mignonette.—The origin of this fragrant little favourite, like that of many other plants which have been cultivated from time immemorial, is somewhat doubtful, though it grows to all appearance spontaneously in many localities on the Mediterranean coast. Linnæus, and others of the old writers, called it an Egyptian plant, and it has also been reported as wild in Syria and Natolia; but Boissier, in his "Flora Orientalis," says of it:—"Hab.?—ubique culta, olim indicata in Syriâ et Ægypto ubi tamen spontanea non legitur." But however obscure our information is respecting its precise habitat, there seems to be no doubt that it belongs to the Mediterranean region. It was probably first brought to this country from Italy, and has, according to the books, been in cultivation here for upwards of a century; but it is not long ago that we were reproached, I believe by Mr. Robinson, for not doing it justice, and we were told that the growers for the Parisian markets far surpassed our own people in this particular branch of floriculture. Doubtless there was, and still is, some truth in the remark; for, although the plant has always maintained its position in the garden and window, few cultivators have accorded to it that amount of attention that other plants of equal interest in their wild state have received. Some growers, however, and notably Mr. Parsons, of Brighton, whose specimens of Reseda odorata eximia have lately obtained certificates at all the principal metropolitan exhibitions, have bestowed more than usual care in selecting their seed-plants; and the result shows that the extra trouble expended in this way has been amply repaid by the superiority attained in a few years. I have several times during the last few years had opportunities of inspecting the fine establishment at Hassock's Gate, belonging to Mr. Parsons, where Mignonette growing forms one of the principal features. Whole ranges of pits and small span-roofed houses are occupied by beautiful plants—some "tree" and some branching, exhaling the most exquisite scent imaginable. Two varieties were pointed out to me, the one with nearly white flowers, and the other having anthers of a rich brown, both greatly exceeding the "common Mignonette" not only in size of flower and foliage but also in length of flowers, spike, and in fragrancy. In most works the directions given for growing "Tree Mignonette" are faulty, in so far as they recommend plants of several years' duration, for, as a rule, after the first season of flowering, the plants begin to show signs of decay, and betray the attempts of the cultivator to prolong the natural life of the plants. I need adduce no further proof of this affirmation than that afforded by the specimens exhibited at many of our shows. I am assured by Mr. Parsons' manager that there is no difficulty whatever in raising and flowering the finest plants in one year; but on the contrary fresh plants require less care and produce far better specimens than older ones. Indeed he affirmed that those exhibited at the Crystal Palace were from a batch of seedlings raised last September; and what could be finer than those plants were, with their rich dark green foliage and numerous spikes of flowers, about 6 inches in length? But the "Tree Mignonette" as usually grown for sale, is even better, in my opinion, as only one stick is necessary to support each plant with a stem of from 15 to 20 inches in height, and no more than six months are requisite to bring such plants to perfection. Before leaving this subject I cannot refrain from recommending my mode of procedure for stocking mixed borders with Mignonette. Last season I was favoured with a few seeds of the brown variety alluded to above, and to make the most of them I sowed them in pans, potting them off singly when large enough into 2-inch pots. I then placed them in a pit, where they remained until the pots were well filled, and afterwards they were transferred to the borders. In the course of the summer, many of those plants covered a square yard of ground, and yielded an almost unlimited supply for cutting. I was so well pleased with the success of my plan, that I have repeated it again this year; and as there is no more labour in it than in the usual method of sowing in patches—which must be done before bedding plants are put out—I am induced to believe that others, if indeed it is not already done, will be induced to resort to the same practice. *H.*

Growth of Melons.—I have recently built gas-works within about 10 yards of my Melon and Cucumber pits. Until the present season I have had a plentiful yield of both Melons and Cucumbers, but this year the Melons have utterly failed, and Cucumbers are not equal to past years. Can any of your correspondents inform me through your columns whether the fact of the gas being so near is the cause of this failure, or whether failures in Melons are general this season? *A Subscriber.*

Large Melon.—On the 27th inst. I cut a Victoria Melon weighing 12½ lb. Is it usual for this Melon to attain the weight above mentioned? *J. Housego, Woodcote Park Garden, Epsom, June 28.*

The Goat Moth.—On passing by a Turkey Oak this morning, I observed a number of holes in the trunk, about 12 feet from the ground. It appeared as if some one had been practising with a rifle; there

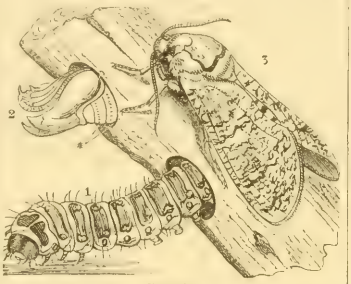

Fig. 167.

were about 15 holes altogether, varying from 1 inch to 6 inches in depth. I procured a hammer and chisel, and went to work, the result being that I found about 30 large insects like those inclosed, and there were hundreds of smaller ones, many of them about a quarter of an inch in length, and some larger. I shall feel thankful for any information respecting them. I intend to cut all the affected portion away, and give it a good coating of gas-tar; or could you recommend a better remedy? *William H. Bannister, Gr. to G. H. Ames, Esq., Coat House, Westbury-on-Trym, June 28.* [The insect is the Goat Moth (Cossus ligniperda) of which we give an illustration (fig. 167), reproduced from an old volume. For suggestions as to its destruction, see p. 924, 1869. EDS.]

Acclimation.—A few facts, illustrating the facility with which particular habits induced by climatal conditions become perpetuated, may perhaps be worth recording. Firstly, as to the relative power of withstanding frost by individuals of the same species from different localities. Last summer I planted side by side Frankenia lævis from Kew, and the same species from Gibraltar: the Kew plant remained uninjured, but the Gibraltar plant was killed. Of Sedum album, well-known to be perfectly hardy, I have a number of specimens from northern localities, all of which stand year after year without the slightest injury. Last year I planted, under similar conditions, examples from Gibraltar and the north coast of Barbary, most of these were severely injured by the late winter's frost, and some killed outright. Other species of Sedums from Barbary and the South of Spain proved similarly tender; which is remarkable, as several of them also occur on the high plateau of Spain, where they are subject in winter to most severe frost. Sedum altissimum was an exception. I possess it from various localities in the South of Europe, and it invariably withstands injury by frost, although its northern range is not nearly so wide as that of Sedum album. Salvia verbenacea and Verbena officinalis, from Tetuan in Barbary, were cut off by the winter's frost, though quite hardy from the north of Europe. Cistus cyprius, from Tangiers, was killed, the frost splitting open the bark; but the same species, from the Escorial, at an altitude of 2000 or 3000 feet, and subject to severe winter frosts, survives. The vegetation of the centre and south of "Tawny Spain," after the first outburst of brilliant spring flowers, soon becomes parched up by the summer sun on its granite rocks and sandy plains; and the habit of withering up in June, notwithstanding our cooler and moister climate, seems to be curiously perpetuated in several Spanish plants I have in cultivation. My Saxifrage bed includes a variety of alpine and northern species. I have also a species from Barbary allied to geranioides, Saxifraga gibraltarica from Gibraltar, and another species from the Escorial, &c. Last summer all these southern species looked as though they were dead, and did not revive till the autumnal rains, which I then attributed to their long transport, and to having been so recently planted; but this year, after making a healthy vigorous growth, they have one and all put on the same tawny death-stricken appearance, and contrast strikingly with the fresh bright green of the northern and alpine species still in vigorous growth. A perennial species of Sedum from the Escorial, which I have not yet identified, has the same habit; after flowering at midsummer its foliage turns brown, and the entire plant appears dead, but reappears from the root with a vigorous growth after the first autumnal rains, and remains green through the winter. It seems impossible to resist the conclusion that this is merely a habit perpetuated by the circumstances under which the plants have been exposed, as in the cooler and moister climate of England there is nothing to directly induce it. Again, the particular time of flowering of individuals of the same species from different latitudes is a character which seems to be retained for years, examples from southern latitudes being always in advance of those from colder climates. This I have observed in several species, and it is particularly noticeable in bulbous plants. *George Maw, F.G.S., Benthall Hall, Broseley.*

Viola Blue Perfection.—I have just gathered another small piece of information respecting this much debated plant, that may add a little more to our scant stock of knowledge concerning its origin. In the garden of a gentleman in this neighbourhood are growing a few large bunches of it, and which has been in his possession for several years. He states that he got it originally from Jersey, so that if this information be correct we may ultimately discover that this "seedling from Viola cornuta" is not only not the progeny of that variety, but possibly enjoys a more venerable age. *A. D., Southampton.*

A Plea for Small Birds.—The season has again arrived when most gardeners are put to their wits' end as to the best way to protect their fruit from the ravages of birds. If you will kindly allow me, I will endeavour to show my brother gardeners the plan which I have adopted, and which I have no doubt can be applied in almost every establishment in the country. There are few noblemen's or gentlemen's establishments where the kitchen and fruit gardens are not more or less surrounded with shrubberies and woods, consequently there are great numbers of birds of most kinds, and especially blackbirds and thrushes, which are generally most unwelcome to the gardener when he sees them fly off with his best Strawberries and Cherries; but I fully believe that the amount of good birds do in destroying insects (to say nothing of their beautiful notes in spring and summer) more than repays us for the small quantity of fruit they steal in the season. The plan that I have adopted is this:—In the autumn of 1867, when clearing off the Strawberry runners, instead of consigning them all to the rubbish heap, I had a large quantity of them pricked out amongst the shrubs to provide food for the birds; the following season they well established themselves and produced a fair crop last year; this year they cover a piece of ground about 40 feet square, and are loaded with fruit, which is now ripening, and looking as well as those in the kitchen garden; and during the past week I have seen very few fruit-eating birds in the garden, as they prefer those provided for them amongst the trees and shrubs. I will also mention a fact which might be interesting to gamekeepers. I have discovered to-day (June 20), when looking through the above, a fine brood of young partridges (17 in number), and the nest in the centre of the clump, which is adjoining a park of about 40 acres (and game is by no means plentiful here), the above brace of old birds being the only one I have seen in the park this year. I believe game are fond of Blackberries, and if so I have no doubt they are fond of Strawberries. I would certainly advise both gardeners and keepers to adopt my plan, as Strawberries will grow in any soil and situation: where Nettles and Docks grow Strawberries will grow. They may be planted in hedgerows, coppices, or in any rubbish yard at the back of the garden, and will produce abundance of fruit for game, small birds, and also for the garden boys and labourers, who seldom get a dish of fruit, although employed in cultivating it for years. Those who wish to try the above, and gain one season, may do so by planting out old forced plants, as no doubt there will be a good many about to be consigned to the rubbish heap. At an early date gamekeepers will find that they will not lose so many young birds in July if they provide Strawberry beds in their preserves for the young ones to moisten their mouths with in the absence of water. I planted a second piece last autumn, and these are also growing very well. There are many spots amongst shrubs which are not immediately under the

eye or seen from the mansion, in which weeds often establish themselves, and those are the places I recommend to plant the Strawberries in, as I find they generally master the weeds, and help to keep them down. If any gardener or keeper wishes to try the above plan, and would like to see the result for himself, I shall be most pleased to show him. *William Lee, Whiteknight's Park, near Reading, Berks.*

Prize Gardening.—Thanks to Mr. Mason and the Royal Agricultural Society of England, farmers will this year have pointed out to them what first-class farming is, and where it is carried on. The best farmer will be pointed out, and we may safely assume that the winner of the agricultural "blue ribbon" for Oxfordshire will henceforth deservedly take a place in the front rank of English farmers. There can be no fairer or better test of first-class farming than that of the judges visiting and inspecting the farms. The veriest ploughboy knows that the feeder of a monstrous prize ox, or the grower of a few big Turnips, is not necessarily a first-class farmer, often the reverse, as the whole resources of the farm are sometimes made subsidiary to the prize stock, other things being left pretty much to take their chance. It is often the same in gardening. Where is there a gardener who has not at some time or other made a pilgrimage to some noted exhibiting place, expecting to see a bit of good gardening carried on, and found instead a muddle? There are the huge specimens of whatever speciality the place is noted for, and there is nothing else worth looking at. I do not for a moment say that is always the case, there are honourable exceptions, but they only go to prove the rule. Where a noted exhibitor carries on a system of first-class general gardening as well, there is all the more honour and credit due to him. Any gardener worthy of the name knows good gardening when he sees it, but what we want is to know where the best practice is carried on, and we want to know it in the cause of horticulture and of progress. What Mr. Mason and the Royal Agricultural Society are doing this year for agriculture, I hope to see another Mr. Mason, or a body of subscribers and the Royal Horticultural Society do next year for horticulture. And there is no reason why it should be confined to a single county. Supposing a "Grand Prix" could be got up, to be given, together with the "horticultural blue ribbon" for the year, to the gardener who was carrying on the best system of thorough good gardening, I am convinced that the competition which would ensue would give general gardening an impetus such as has not been felt for years. By means of a local committee in each county, local judges could be appointed to determine the first in their respective counties. The judges specially appointed to award the "Grand Prix" with the "blue ribbon," would thus have their work simplified and confined to one garden in each of the competing counties, and would have more time to collect information for their reports. Were the matter vigorously taken in hand, I believe there would be no lack of funds, as we feel sure there are several "Masons" among the nurserymen and the gentlemen of England. I have no intention of "counting chickens before they are hatched." The proposition is merely thrown out to see which way the horticultural wind blows, and with a hope of eliciting the opinions of gardeners and the "powers that be" on the subject. *D. M.*

"Sports" on Laburnums.—If your correspondent, I. Simpson, and others, will refer to Darwin's work on the variation of animals and plants, it will afford them the information they require on the supposed origin of sports in Laburnums such as they have so recently alluded to; they will find moreover that it is of very ancient date, and is nothing new in some parts of England. It has existed here a number of years, and is very common. *G. F., Castle Ashby.*

Hybrid Linarias.—During the summer of last year I planted, side by side, Linaria tristis, from Gibraltar, and Linaria spartea, from the Pyrenees. Both species flowered continuously throughout the autumn, and produced seed. The parent plants were lost during the winter, but an abundant crop of seedlings appeared in their place. These are just coming into flower; some of them are identical with the parent plants, but the majority are evidently hybrids, combining the clear yellow or orange of L. spartea with the more sombre bronze hue of L. tristis. I enclose flowers of each parent, and also of some of the progeny, no two of which are exactly alike. Some of them are highly ornamental, with singular mixtures of bronze, bright yellow, and orange. The facility with which the Linarias hybridise will perhaps account for the variable colour of L. tristis, which ranges from intense velvety brown to pale dun colour. It is a good plant for rockwork decoration, a continuous flowerer, of a nice compact habit; and although not able to withstand severe frost, readily perpetuates itself by self-sown seedlings. There are a number of other species of similar habit well worthy of cultivation, including spartea, supina, &c. Three weeks ago I found near Avila, on the high plateau of Spain, a species with the habit of L. tristis, but with flowers of rich velvety crimson. The brilliant purple of Linaria alpina is well known to cultivators of rock plants. Bearing in mind the great variety of colours that are included in this beautiful genus, I believe some highly ornamental hybrids might be produced by judicious crossing. *George Maw, F.L.S., Benthall Hall, Broseley.* [Some of the hybrid flowers had three spurs, thus showing a tendency to assume the peloriate condition. Eds.]

The Fungus Question.—Without any pretension to a knowledge of Fungi, that is, their variety and supposed evil effects, I am at the same time confident that water is destructive to the mycelium of some of them; and I believe that the same amount of clear water given to the Peach tree mentioned by Mr. Bennett, at p. 862, would have been as effectual as that containing the gas water. That, however, I will leave as it is, and will ask Mr. Bennett when he is not quite so busy, and the weather has become cooler, to try the effect of a good soaking of water to a Mushroom bed full of spawn. This may be more tender than some of its allies; but I ask, if one extra dose will destroy this, why should not more have a similar effect on some of the most formidable ones? Mr. Bennett evidently believes in the destructive effects of Fungus, I am not yet one of that school of disciples. I have not yet been taught how healthy roots can succumb to it. What would become of vegetation if such had been the case? For we meet with it at every turn of the spade in some form or other. I am not going to be dogmatical, and would rather say that it may in some cases accelerate death; indeed, one almost fears to use this small sign of the potential mood within hearing of such an eminent mycologist as the Rev. M. J. Berkeley; for the fungological sermons he has preached to us from time to time on the evils of Fungi ought to convince the most sceptical; but I fear he will always have unbelievers amongst his audience, and amongst them myself—indeed, so heretical am I that I would undertake to bury a bushel or two of soil containing the most destructive Fungi at the roots of any tree. Why have not some of our scientific bodies tried this experiment? Why not have sent to Bishop Stortford, Eatington Park, or to Mr. Ayres, for a few bushels of the compost, and mixed it with soil at Kew or Chiswick, and planted in it Vines or other trees corresponding with those destroyed? I hope that whenever the cry of "Wolf, wolf!" is raised again, he will be trapped and treated as above, care being taken to barricade him in a certain spot. Let me conclude with the motto of the fungological Drs. Miller and "Tell Fact," in opposition to that of Dr. Richards; it is this—"Keep it away," as prevention is better than cure; and as I am made sponsor for a recipe for destroying Fungus, though I did not positively offer one, I boldly step in now to form a trio, and will give one to keep it away, and it is this—plenty of water. *W. P. R., Holwood.*

Blight Composition.—In answer to the appeal from "Amygdalus," at p. 862, respecting my experience of the blight composition in question, I beg to say that he is quite correct in his summary of the advantages derived from the use of it; for not only is it destructive to green and black fly, but it entirely destroys thrips and scale; and from the fact of its leaving no stain or disagreeable odour behind, it can be applied with the greatest ease to conservatory and stove climbers, which are often beyond the reach of any other application than that afforded by the syringe. Suffice it to say that it has for years been my sole agent in destroying those pests that we are so subject to, and I can testify that it is perfectly harmless to the most tender plants. I cannot conclude without remarking that I have been continually in receipt of letters asking for small quantities to be sent, which in all cases I have complied with; but as this system is rather injurious to the pocket, I must in future decline to do so, and think that the better plan will be for me to place it in the hands of some firm, so that it may be distributed at a fair price. *A. Wilkie, Oak Lodge, Kensington, W.*

Hardy Ferns.—I observed in the *Chronicle*, a few weeks ago, the following question submitted—"Trichomanes radicans and Adiantum Capillus-Veneris—are they hardy?" The answer was "No," which I confess very much astonished me. Had the question been put to me, I should have said, "Yes." However, I may be wrong, and am anxious to obtain information on what seems to me an important subject. That there is great diversity of opinion about the matter I am quite sure, and the majority of persons I have spoken to are opposed to the *dictum* of the *Chronicle*; but I am quite aware that wisdom is not always with the majority. I was speaking to a gentleman on the subject a few weeks ago, and he asked me "if I ever saw the two Ferns named growing in an exposed place on a rockery out-of-doors." I said "No:" his reply was "they cannot be hardy;" but I need not say that this is another subject altogether, namely, one of conditions; and I do hope that any lady or gentleman who may have any remarks to make on the subject will stick to first principles and natural facts, which are as follows, as most of your readers are aware:—Trichomanes radicans is found in a wild state in Ireland and in North Wales attached to dripping rocks, and in frosty weather gets frozen. Adiantum Capillus-Veneris is found in a wild state in England, Wales, Scotland, and Ireland, and otherwise has a wide geographical range, and in frosty weather gets frozen. I am quite aware of the fact that many of our hardy Ferns thrive much better when submitted to greenhouse treatment; but I cannot see that this has any thing whatever to do with the subject, which is simply this: "Is a native plant a hardy plant?" It appears that some persons, more competent perhaps than I am, say they are not, but how they arrive at that conclusion is to me a puzzle: it would be quite as reasonable to say that Gentiana verna and Primula farinosa are not hardy as the two above-named Ferns; and yet let any one collect the lovely Gentian and Primula I have named, and plant them in his garden in an exposed place, and they will die. What, then, is the inference—that they are not hardy? Decidedly not; but having failed to supply the natural conditions the plants died: and so it seems to me it is with the two Ferns I am writing about. Give the natural conditions on your rockery out-of-doors, the plants will thrive, and in my opinion must be hardy. Suppose a collection of hardy Ferns staged at an exhibition for competition, among the number are these two Ferns,—would any judge disqualify the group in consequence? *Bruce Findlay, Botanic Gardens, Manchester.* [It may seem paradoxical to assert—and this, we take it, is Mr. Findlay's argument—that a native plant is not hardy. Nevertheless we believe it may be practically true in certain cases, and we look upon the Ferns above-named as furnishing very good illustrations. What is the meaning, horticulturally, of the term "hardy," as applied to any plant? Surely this, that it may be grown in our climate without artificial protection. That would be understood of—say a Conifer, and why not of a Fern? Mr. Findlay argues that if we gave these Ferns their "natural conditions," we could grow them out-of-doors in our climate. Exactly so; but then that would demand artificial protection, and hence we conclude the plants are not hardy. We haven't much faith in the endurance of either the Trichomanes or Adiantum under a freezing *régime*. We can at least vouch from experience that we have had the latter killed when standing under favourable conditions in a greenhouse to which a few degrees of frost had penetrated. Even if they did, in certain cases, survive, they would be too wretched-looking for exhibition purposes—the point which has raised the question. To be grown fit for exhibition they *must* be treated as tender plants, and hence we think they cannot fairly be shown as hardy ones. Better to admit them to competition, if that is the object, by inviting them as "British," not as "hardy." Eds.]

Schedule-making: Ferns, Fuchsias.—Being appointed a judge at a large provincial flower show, I should be glad to hear your opinion as to how I am to decide in the following classes, taken *verbatim* from the prize schedule:—(1). "Six exotic Ferns, tree varieties excluded;" (2). "Six Fuchsias, in 6-inch pots, spring struck." As to the Ferns, what length of stem above the surface of the soil constitutes a Tree Fern? [The known habit of the species should determine this.] Would Lomaria gibba, Blechnum corcovadense, or Leptopteris superba, with stems from 6 inches to 12 inches high, be disqualified for such a class? [Yes: they are arborescent or sub-arborescent.] Would Alsophila excelsa, or Dicksonia antarctica, without any perceptible stem, but with fronds from 6 to 7 feet long, be admissible? [No: the above terms expressly exclude species (varieties is the word used) known to be Tree Ferns.] As to Fuchsias: spring commences March 20—the show is to be held on July 14. At the corresponding show last year there were three extremely well-grown lots shown for similar prizes. One lot was struck in October, another in November, and the other in February; they were as nearly as possible equally well done, but none were really "spring struck," and, according to the strict reading of the schedule, they ought to have been all disqualified. But, then, who can tell besides the exhibitor, when Fuchsias, shown 4 feet high, were struck? A month, more or less, would be a close guess, and only a guess. The above lots won the prizes as follows:—November struck, 1st prize; October, 2d prize; and February, 3d—being equally good in all other respects, size decided their relative position. What say you? Should such stupid clauses be put in prize lists? *D. P. M.* [We take "spring struck" in this case to mean young plants, not old ones, of the preceding year. The wording is certainly objectionable, if this is really the intention, as of course, taken literally, all such as those referred to would be excluded. "Yearling plants" would be a better definition. Eds.]

Home-grown Hyacinths.—At an early period of my gardening career I was passionately fond of Hyacinths and other spring bulbs. I had not then visited Holland, but I felt that Hyacinths could be as well cultivated in England as in the "little kingdom." I saved seeds of many kinds, and had the good fortune to see many of them produce flowers, and I remember well how struck I was at the circumstance that the single yellow seedlings all came like their parents, with scarcely an exception. The white mostly retained the parental type, the pink had some of their progeny almost white, but the blue of a pale colour became whiter and paler, whilst the darkest kind retained from the parent its intensity of colour. A few semi-double ones attracted my notice, but I never continued them generation by generation, or feebler flowers, I doubt not, would have been the result. My next effort was directed to the growth and ripening the bulbs for

market. In this I succeeded so perfectly that my home-grown roots were scarcely to be distinguished from the imported ones. Then came the question of cost; to effect perfect growth it was necessary to remove at least half the earth, and replace it with good manure: in the end I gave up my idea, after having proved that from seeds or from offsets as good bulbs could be grown at home as are imported from Holland, but that they could be bought cheaper than they could be grown in this country. Still I cherished the idea, and thought that there must be spots where the culture of them could be effected with less expense. Such a spot I have found at Stourmouth Court, the property of G. Dowker, Esq., a short distance from the sea at Pegwell Bay. Here I found Hyacinths, double and single, grown by name, in full flower, that had been grown for 10 years from offsets; and it is not too much to say that I have blown no finer either for abundance of flower or quantity of bells on a spike than I saw here. I believe the Hyacinth has a liking for the sea air, which it can breathe at Stourmouth, but, in addition, the soil is so well adapted for its growth that no earth has to be moved away; and with the ordinary dressings of manure, the Hyacinth grows with a degree of vigour of leaf and stem similar to that which we see about Haarlem. *William Masters, Canterbury.*

Palms at Kew.—Your correspondent, Dr. Henry Bennet, suggests that many "hardy" Palms in the crowded Palm-house at Kew, and the large Aloes, Cactaceæ and Crassulaceæ, in the Succulent-house, should be annually placed out-of-doors in the summer, for their own good, as well as for the ornamentation of the grounds and the relief of the houses. This was done in early years, when the plants were small, and has been repeatedly tried of late, but always with disastrous effects. Such plants, when about to "make their growth," can withstand neither the burning heat nor the sudden chills of our summer climate in the exposed grounds of Kew. In 1866 a great many of these very plants were put out along the walks, with every available protection, when fully a score of the finest specimens were sacrificed to the experiment. In spite of all precautions in putting out, and all care afterwards, not one recovered the effects of that cold and variable summer and autumn, and most had to be destroyed. So, too, would it be this year, when, after many weeks of drought, and a temperature of above 80° in the shade, we had in two days a fall of the thermometer of 30°, and a high north-east wind. The conditions of Kew differ widely from those of the subtropical garden at Battersea, whose peculiar beauties and striking effects, so well suited to its objects, reflect so much credit on its manager. With regard to the crowding of the Palms, your correspondent is not aware that it is found to be absolutely necessary to pack them close in order to retain the necessary heat and humidity in so large, draughty, and dry a building as the Palm-house, where evaporation is excessively rapid, and where the doors are opened to thousands in all weathers, whether in the hottest driest summer months, or the bitterest spring ones. Take, for example, last Whitsun week, when upwards of 80,000 persons visited the gardens, and on Whit-Monday alone 38,000. I am well aware of the advantages of placing many half-hardy plants out-of-doors during the summer months, and have studied the subject, with especial reference to our failures at Kew and in other gardens, both in England and on the Continent. The plan answers well in sheltered places in a good season, or in cases where the plants are grown for the purpose, and can be easily taken in again when bad weather comes on; but very large plants alone are suited to the decoration of the great terraces and wide walks of Kew, and the removal of these is a work of great difficulty and expense; the Palms especially suffer severely in root and foliage by the shaking, the tubs are strained, the flagstones of the houses often broken, and the gravel paths are torn up during their transport. No one who has not had experience of the process has any idea of the labour, expense, and risk of removing large established Palms in tubs or pots out of a crowded house: added to which the temporary removal of even one such large plant requires that all those around where it stood (most of them larger than itself) should be shifted too, and this both when it goes and returns—entailing a great amount of labour and inevitable damage. Lastly, so far from the Palms cited being "hardy," as stated by your correspondent, all have been tried in the temperate house, and but two of them succeed there; one only exists in the open air at Kew, and does very badly indeed. *J. D. Hooker, Royal Gardens, Kew.*

Foreign Correspondence.

CANTERBURY, NEW ZEALAND.—The third and last horticultural show of the season took place on March 3. It was a fine one, most of the exhibits being of a high order of merit for a new and young country like Canterbury.

Amongst the pot plants shown were some very fine specimens, which I will note briefly: Billbergia gigantea, Hemerocallis variegata, Phormium tenax variegata—this last named plant is scarce here, hence its being grown in a pot though indigenous to New Zealand. These were good-sized plants, as were also the Begonias and Fuchsias, which I will state something about presently. Variegated plants, tender and hardy, are very fashionable here just now. We have amongst Begonias at the present time some new introductions of great promise. The culture of pot plants has very much improved here of late years, particularly since we have commenced to manufacture our own flower-pots. I noticed particularly fine plants of Cissus discolor, Dracæna regina, Caladium Wightii, Calathea zebrina, Begonia Baronne d'Astermoff(?) whose large hairy leaves were very conspicuous; Todea superba, Isolepis gracilis, a beautiful ornamental grass-like plant; Hydrangea japonica aureo-variegata, Ficus macrophylla, Hibiscus Cooperi, and a large Fan Palm. The beautiful Iresine Herbstii, not in flower, was exhibited for the first time, and proved very attractive; Asplenium lucidum, very healthy; Meyenia erecta, with flowers in the way of Achimenes, exhibited for the first time; Coleus Wolfii, with very pretty foliage; Veronica Andersoni variegata; Pteris intramarginalis, Æschynanthus floribundus, Begonia Marshallii—the three last-named very handsome and good specimens; Symphoria glomerata variegata, Elæagnus aureo-variegata, Bambusa Fortunei variegata. This is about the whole of the best pot plants exhibited.

Of Pelargoniums, Mrs. W. Paul and Lady Darling bore the largest trusses of blooms. Gloire de Nancy and another double-flowered variety arrived here last year from home, and created on being first exhibited quite a consternation amongst us. Mrs. Pollock has been largely cultivated here for these last two years, and has since produced a large quantity of seedlings of a very interesting character. Zonals were pretty well represented on this occasion; the Fuchsias attracted general admiration. Only one collection of indigenous Ferns was shown. These plants are seemingly of little interest to exhibitors, though we dwell among them, as it were.

The competition in cut flowers was keener than I ever recollect. Dahlias were shown in large numbers, and are much improved in quality. I was sorry to see only one collection of 12 cut Roses. Double German Asters were good, and helped to fill up the gap made by the absence of hybrid perpetual Roses, &c. Hand bouquets were numerous and good. Only one second-rate collection of Gladioli was exhibited, the season being over for them. These have become very fashionable amongst us, and at the present day we possess some very superb varieties. A good round sum of money has been spent in procuring them from home. I noticed for the first time a fine flower of Magnolia Soulangeana; M. grandiflora flowers and grows well with me.

The fruit exhibited at this time of year on former occasions has generally been of a very superior character, and evinced great progress; but this season proves to the contrary, for fruit growers have had an adverse season. Peaches were not well represented, and Melons were scarce—only two small specimens were to be seen. Only one middling collection of Apples was shown; and of the collection of Pears which obtained the 1st prize my notebook states, "Bad; not worthy of the prize." Indoor Grape growing is on the increase. The judges highly commended what they considered some splendid Black Hamburgh Grapes sent for competition, the largest bunch weighing 3 lb. 6 oz. The judges state in their award that the berries were "well coloured." In this point I beg to differ with them, for they were only partially so, and a very long way from being ripe. However, the grower deserved the position he has attained as an amateur, and I hope he will continue to direct his zeal in the right way in the culture of the Grape, his specimens being, there can be no doubt, the best ever produced in Canterbury.

Of vegetables, this season having proved very favourable for their growth, most of the collections were unusually well grown. Cabbages were exhibited free from blight—for a wonder, I may say—for the first time on record here. This was the largest and best show of vegetables I have seen here. Probably it will be a long time before its like will be seen again, our climate is of so variable a character. Potatos and Onions were unusually large and clear-skinned. Healthy, healthy, turn your head which way you might. I think our vegetables would have stood a very good chance in the competition at Manchester, Bury St. Edmund's, and elsewhere at home.

Of miscellaneous subjects I observed a design of a geometrical flower garden in full bloom. It certainly was very pretty, and very much in advance of anything of its kind shown in former years. Raw silk from Canterbury, reared silkworms and cocoons spun by worms fed on the Black Mulberry; bright in colour, and plenty of them.

At the subsequent annual dinner of the Society it was stated that the interest in horticulture was in no way abated, amongst amateurs especially. The secretary read a report on the best kept amateurs' gardens in and within ten miles around Christ Church — the decision of the judges being received with rounds of applause by the company present. A wealthy barrister-at-law here gave three valuable prizes for the above object. I must say the winners of the prizes deserve them, for I have seen the three gardens to judge for myself. The same gentleman has offered similar prizes for next season, the present winners not to compete. *William Swale, Avon Side Botanic Garden, Christ Church, Canterbury, New Zealand.*

Societies.

ROYAL HORTICULTURAL: *June 29.*—W. W. Saunders, Esq., F.R.S., in the chair. The usual preliminary business being completed, and the awards of the Fruit and Floral Committees having been announced, the Rev. M. J. Berkeley stated, in reference to the Luffa fruit exhibited at the last meeting, that though perhaps not positively poisonous in the young state, it was excessively acrid. Attention was then directed to the hybrid Ferns from E. J. Lowe, Esq., which were extremely interesting; and it was remarked that those who wished to raise abnormal forms should, as demonstrated by this collection, take spores from abnormal fronds. The hybrid Begonias from Messrs. Veitch were then particularly noticed, and the Acarus producing pustules on the leaves of the Pear afterwards occupied attention, some account of which will be found in the report of the Scientific Committee.

Major R. Trevor Clarke made some remarks on the Dioscorea, exhibited at a former meeting, observing that public taste appeared to have undergone a change, and that more attention was now bestowed on artistic elegance than formerly. Such plants he considered were most desirable during the terrible colour-worship we had been absorbed in for the last few years. The Chairman, alluding to the specimen of Hyacinthus candicans, said that he had had it in cultivation for 45 years, and that he believed it to belong to the genus Hyacinthus, though very unlike in general aspect—and although it was a South African plant it was almost hardy, and thrived well under the protection of a wall.

Scientific Committee.—Major Trevor Clarke in the chair.—After the formal business of the meeting had been completed, Dr. Gilbert reported as follows on the manna-like substance found on the leaves of Peach trees:

"The white exuded matter was flaky and semi-translucent. A small portion heated on platinum over a spirit lamp gave the odour of a burning fat. It was scarcely, if at all, affected by either water or alcohol, but readily dissolved in ether. It was, therefore, no doubt a solid fat of some kind, but the quantity at command was too small to determine more respecting it."

Rev. M. J. Berkeley showed radical shoots from a Pear tree, some of the leaves of which were markedly 3-lobed. With reference to this he was stated that certain Indian species of Pear constantly produced leaves of this character. The secretary also alluded to the worts on Pear leaves, which he had found to be inhabited by a very minute acarus (see p. 858).

Mr. Wilson Saunders exhibited specimens of Papaver nudicaule var. crocea, in which the stamens were partially metamorphosed into carpels. Dr. Masters recalled the circumstance that the opium Poppy is occasionally the subject of a similar change.

Some conversation then took place as to the Dioscorea exhibited by Messrs. Veitch at the last meeting of the Floral Committee. It was stated that this was a heretofore undescribed species, a description and figure of which will be given in these columns at a future time.

The President then exhibited some Vine leaves, showing a deficiency of chlorophyll in the leaves. This was attributed to a want of sufficiently nourishing food. A discussion followed as to which grasses bore drought the best in this season, in the course of which Mr. Saunders mentioned that he had found a species of Bromus (?), from California, the best in this respect. It began to grow early, and resisted drought well. Dr. Gilbert stated that at Rothamsted, in those cases where, from the application of manures or other causes, the root development was good, the produce had been as great as in ordinary seasons, but where the plants were not so well established there had been great deficiency. The meeting then adjourned.

Floral Committee.—Rev. J. Dix in the chair. The most interesting feature at this meeting was a beautifully grown collection of Lobelias, shown by Mr. Moon, gr. to F. Stanton, Esq., Lewisham, some being trained as pyramids, upwards of 2 feet high, and covered with blossoms; and others grown in their natural form, equally well bloomed. A Special Certificate was awarded for their good cultivation. To Messrs. Veitch & Sons First-class Certificates were awarded for a species of Dendrobium, in the way of Veitchianum [macrophyllum] with greenish yellow flowers, on which purple dotted lines are marked; to Barkeria spectabilis superba, a fine variety: and to a Begonia Chelsoni, a fine new large scarlet-flowered hybrid from boliviensis. From Messrs. Rollisson & Son came Chamædorea graminifolia, a very graceful Palm, to which a First-class Certificate was given. With it also came a variegated form of Coffea arabica, several Gloxinias, &c. Special Certificates were awarded to Mr. Wood, gr. to W. B. Kellock, Esq., Stamford Hill, for very finely grown specimens of Agave ensiformis and A. hystrix; and one of the First-class for A. cuculata. From E. J. Lowe, Esq., Highfield House, Nottingham, came a very numerous collection of seedling Ferns raised from various parents, to the following of which First-class Certificates were awarded:—Scolopendrium vulgare Axion, asumbleton, euplices, Flora, inusitatum, kompsotes, megeratum, pictorium, prodonton, transformatum; Lastrea dilatata spectabilis, Asplenium marinum admirabile; and to Athyrium Filix-fœmina kephalobares and another. Mr. Bull sent a small collection of plants, amongst which Erythrina Parcelii, a new yellow variegated species, from the South Sea Islands, was awarded a First-class Certificate. Specimens of new show Pelargoniums were sent by Mr. Turner, to one of which, named Polly, a First-class Certificate was given. It is somewhat dwarf in habit, with flowers darkly veined, of a mulberry-crimson colour, shaded with magenta, &c. Mr. Mann, Brentwood, sent several new Zonals, as also did Dr. Denny, including one called Sir Charles Napier, a very good scarlet-flowered kind, possessing high quality. First-class Certificates were given to Mr. T. Malyon, Lewisham, for Scolopendrium vulgare Malyoni, an elegant new variety; and to Hyacinthus candicans, a large, white-flowered Hyacinth, from South Africa, sent by Mr. Green, gr. to W. W. Saunders, Esq., who also received a special award for a beautiful collection of small-flowering Orchids.

A similar award was also adjudged to Lady Hill, for a panful of beautifully grown plants of Woodsia alpina.

Fruit Committee.—G. F. Wilson, Esq., F.R.S., in the chair. Messrs. James Carter & Co., of Holborn, sent dishes of Laxton's Quality and Laxton's Quantity Peas, the former raised by Mr. Laxton from Prolific and Little Gem, and the latter was a selection from the former, both parents have been Commended by the committee. Mr. H. Clayton, Hackwood Gardens, Basingstoke, sent an excellent dish of Laxton's Supreme Pea. Messrs. J. & C. Lee exhibited a Lettuce called Lee's Nonpareil Cos, a large broad-leaved variety, the great recommendation of which was said to be that it does not run in a dry season, an opinion which the committee endorsed. Messrs. Minier, Nash & Co., sent a fine sample of New Early White Italian Tripoli Onion, to which a Special Certificate was awarded. Mr. Gilbert, gr. to the Marquis of Exeter, Burghley, sent a collection of 10 sorts of vegetables, which also received a Special Certificate. From Mr. Trotman, Spring Grove Nursery, Isleworth, came several seedling Strawberries, of which Royalty, a cross between Black Prince and British Queen, of excellent flavour, was awarded a First-class Certificate. Mr. Elcome, gr. to W. W. Wagstaff, Esq., Rhug, near Corwen, sent pots of Sir Harry Strawberry laden with fruit. Mr. Gilbert also sent fruit of Victory of Bath Melon, a very excellent variety, which received a First-class Certificate. Messrs. Bell & Thorpe, of Stratford-on-Avon, sent four varieties of Potatos, named Cedilla, Beta, Clipper, and Ruby. The three former are white kidneys, and the last a red round variety. The committee commended Beta as a good early kind.

The Rose Show.—The conclusions arrived at, after an inspection of this exhibition, were that the Roses were not so plentiful and scarcely so good as those shown at the Crystal Palace a few days before; and that at the latter place the appointed day found the blooms in grand condition, whereas the few intervening sunny days made a considerable difference in the substance and colour of those shown on this occasion. Another noticeable thing is that the Colchester Roses, which stood pre-eminently 1st at Sydenham, were a long way behind here. Of Roses, the best 72 came from Messrs. Paul & Son, comprising grand blooms of Baronne de Rothschild, Madame Furtado, Alfred Colomb, very fine; Sénateur Vaisse, Marquise de Mortemart, Madame Thérèse Levet, Dr. Andry, Marie Baumann, Black Prince, Pierre Notting, Prince Camille de Rohan, Leopold Hausburg, and Xavier Olibo, &c. The 2d prize collection, staged by Mr. J. Cranston, Annie Wood, Alice Dureau, Lord Herbert, Reine du Midi, Françoise Fontaine, Alfred Colomb, Charles Lefevre, Duc de Rohan, Centifolia rosea, and Madame Charles Crapelet, were shown in prime condition. Mr. B. R. Cant came in 3d, and Mr. Keynes 4th, with excellent collections. Messrs. E. P. Francis & Co., Hertford, also competed. The best 48, three trusses of each, also came from Messrs. Paul & Son,—magnificently coloured blooms of Prince Camille de Rohan, Madame Rivers, Alfred Colomb, Prince de Portia, Antoine Ducher, Marguerite Dombrain, Camille Bernardin, Marquise de Mortemart, Madame Clémence Joigneaux, &c. The next best lot came from Mr. Turner, amongst which Duke of Edinburgh, Alfred Colomb, Jean Lambert, Madame Charles Crapelet, Maréchal Niel, Camille Bernardin, Xavier Olibo, and La Duchesse de Morny, were in very fine order. Mr. J. Fraser, Lea Bridge, came in 3d. In his collection, Duc de Wellington, John Hopper, Horace Vernet, Felix Genero, Fisher Holmes, Lord Macaulay, and Baronne de Rothschild, were particularly fine and bright. For 24 hybrid perpetual varieties only, three trusses of each, Mr. J. Cranston was 1st, with a capital lot, comprising, amongst others, large well finished blooms of Alfred Colomb, Madame Vidot, Annie Wood, Antoine Ducher, Alfred de Rougemont, Josephine de Beauharnais, and Marie Baumann, &c.; Mr. Turner took 2d honours, and Mr. B. R. Cant 3d. In Mr. Turner's collection, Pierre Notting, Lælia, Françoise Fontaine, and Madame Charles Wood, were exceedingly good. Mr. Keynes, Messrs. Paul & Sons, Messrs. Perkins & Sons, and Messrs. E. P. Francis & Co., also exhibited. Class 6 was for 24, one truss of each, open to nurserymen only; and the 1st prize was secured by Mr. Turner. His best blooms were Maréchal Niel, Alfred Colomb, Miss Ingram, Exposition de Brie, Black Prince, Baronne de Rothschild, Prince Camille de Rohan, and Ten Acres. Mr. Keynes came in 2d, showing large and good blooms of Josephine de Beauharnais, Xavier Olibo, Antoine Ducher, and Madame Charles Wood. The 3d prize was awarded to Mr. J. Cranston, and the 4th to Mr. B. R. Cant.

In the amateurs' class for 48 the Rev. E. N. Pochin stood pre-eminently 1st, his blooms of Charles Lefevre, John Hopper, Charles Niel, Dr. Andry, Alfred Colomb, Comtesse de Chabrilland, Monsieur Boncenne, Comte Cavour, Fisher Holmes, Duchesse de Caylus, Pierre Notting, Léopold Premier, Comte de Nanteuil, and Triomphe de Caen, were really magnificent. Mr. W. Ingle, gr. to Mrs. Round, Colchester, took the 2d prize; T. Laxton, Esq., the 3d, and Mr. R. B. Postans the 4th. In class 8, for 36, the Rev. E. N. Pochin again occupied the 1st position. In this collection were grand blooms of Prince Camille de Rohan, Duc de Wellington, Dr. Andry, Victor Verdier, Louise Peyronny, La Duchesse de Morny, Maréchal Niel, Madame MacMahon, Fisher Holmes, Sénateur Vaisse, Comtesse Chabrilland, and the best finished and most refined bloom of Felix Genero in the exhibition. Dr. Cooper, The Limes, Slough, came in for 2d honours, and Mr. J. Hollingsworth the 3d. Admirable collections were also staged by Mr. W. Ingle, Mr. R. P. Postans, Mr. J. James, and T. Laxton, Esq. For 24, the Rev. G. Arkwright, Pencombe Rectory, Broomyard, Hereford, was 1st; Mr. P. Stoddart, gr. to J. G. Rebow, Esq., M.P., Colchester, was 2d; and Mr. F. Mould, gr. to J. Stratton, Esq., Marlborough, Wilts, 3d. Several other exhibitors also competed, with first-rate collections. The best 12 new Roses of 1868 or 1869 were sent by Messrs. Paul & Son, consisting of Reine Blanche, Edward Morren, Julie Flouvais, Duke of Edinburgh, Marquise de Mortemart, Devienne Laing, Mdlle. Eugénie Verdier, Perfection de Lyon, Souvenir de Monsieur Poiteau, Nardy Frères, Thyra Hammerich, &c. Mr. Turner supplied the next best, his finest blooms being Clémence Raoux and Miss Poole. Mr. B. R. Cant came in 3d, and Mr. J. Keynes 4th. The best new Rose of 1868 was Duke of Edinburgh, from Messrs. Paul & Son; Miss Ingram, from Mr. Turner, coming in 2d. Edward Morren, shown by Messrs. Paul & Son, was the best of the new varities for 1869; Emelie Heusburg, a beautifully formed hybrid perpetual, from Mr. J. Fraser, Lea Bridge, was placed 2d; Mr. Turner was 3d with Comtesse de Hainault, and Mr. Keynes 4th with Edward Morren. Amongst yellow Roses Maréchal Niel occupied the 1st position, Messrs. Paul & Son and Mr. Keynes both exhibiting this variety in fine order. The classes for Tea-scented and Noisettes were not well represented so far as numbers are concerned, but some excellent blooms were contributed by Mr. B. R. Cant, Mr. Ingle, Mr. Hollingsworth, &c.

In addition to the Roses, prizes were offered for Fuchsias and Palms. Of the latter the best 8 came from Mr. B. S. Williams, Mr. Fairbairn being 2d, and Mr. J. Burley 3d. The only exhibitors of Fuchsias were Mr. J. Janes, Mr. Cannell, Mr. J. Weston, and Mr. J. James, Isleworth. Some very fair plants were shown, of which we need not give the names. Mr. Cannell also sent a very large collection of Fuchsias, which were staged in the Western Arcade; in which position, though well grown and generally looked exceedingly dull. With them also came a collection of Gold and Bronze Zonal Pelargoniums. From Messrs. Rollisson & Son came a beautiful group of Orchids, Palms, and Gloxinias, and a large box of cut Roses. Mr. Denning, gr. to Lord Londesborough, again sent a beautiful group of Orchids, including the strongly-scented Acineta Humboldtii, also A. densa; a large flowered variety of Stanhopea insignis, and a magnificent spike of Oncidium Lanceanum, a fine species with petals and sepals of a cinnamon-brown colour, and with a rich lilac lip. A specimen of Cypripedium Veitchii, with two fine flowers, also came from the same exhibitor. From Messrs. Veitch & Sons came a collection of new plants, consisting of Orchids, Ferns, Palms, Begonias, Gloxinias, &c. Messrs. Bell & Thorpe also sent a small collection of Palms, &c.; and from Messrs. George Jackman & Son, Woking, were three boxes of cut flowers of seedling Clematis, from the open ground, &c.

CRYSTAL PALACE: *June* 25.—The Great Rose Show, the most popular and attractive of the series of horticultural exhibitions held here, passed off with great *éclat* on Saturday last. It was a "perfect feast of Roses." They were shown in abundance, and for size, form, and brilliancy of colour, have seldom been surpassed. The dark kinds were remarkably bright and fresh, and the yellows were perhaps even more so. Amongst the latter Maréchal Niel reigned supreme. Many of its blooms were of a wonderfully rich quality, and received, as they deserved, unqualified praise. In addition to the show of Roses an additional treat was provided in the form of a display of table decorations showing three different styles of ornament in a manner [illegible] arranged in the new opera room, which was fitted up in the fashion of a banquet hall for the purpose. Mrs. Dickson, Addison Gardens, and Mrs. Green, Cranford Street, Bryanston Square, both contributed very tasteful arrangements, but the most elegant and original in design was furnished by Mr. W. Thompson, which consisted of a beautiful group of Palms, arranged after the manner described in our columns at pp. 245, 889.

Of Roses, 72 varieties, distinct, eight most excellent collections were shown, the 1st prize, after a very close competition, being carried off by Mr. B. R. Cant, of Colchester, whose blooms were superbly rich in colour. Amongst his collection the best were Madame Noman, remarkably fine white; Dupuy-Jamin, very rich; Madame Charles Wood, very fine; Alfred Colomb, first-rate; Marie Baumann, very fine; Baronne de Rothschild, large and good; Maréchal Niel, first-rate; and the following, all good blooms:—John Hopper, Madame Caillat, Mrs. Rivers, Souvenir d'Elise, Madame Crapelet, and La Rhone. Messrs. Paul & Son came in 2d; Mr. J. Cranston, King's Acre, Hereford, 3d; and Mr. J. Keynes, Salisbury, 4th; some really splendid examples being contributed in their collections. Messrs. Paul and Son sent the best 48, three trusses of each, including, besides several of the above-named, remarkably fine specimens of Beauty of Waltham, Mrs. George Paul, Charles Rouillard, Comtesse de Chabrilland, Marie Rady, Abel Gand, and Victor Verdier, &c. The other prizes were taken by the following exhibitors, in the order named:—Mr. Turner, Mr. J. Fraser, Lea Bridge, and Mr. J. Cranston. In the nurserymen's classes for 24, three trusses and one truss of each respectively, Mr. B. R. Cant again supplied the 1st-prize groups, from his Colchester nursery; and it was noticeable that most of his varieties were exceedingly rich in colour, and were as fine in size. His blooms of Edward Morren, Marguérite de St. Amand, Maréchal Niel, Alfred Colomb, Xavier Olibo, Prince Humbert, and Antoine Ducher, are deserving of the highest commendation. Amongst amateurs, the Rev. E. N. Pochin was credited with the greatest number of 1st prizes, which he took for 36, 24, and 12 respectively, with, amongst others, capitally finished blooms of Maréchal Niel, Madame Clémence Joigneaux, Comtesse de Paris, Alfred Colomb, Louise Peyronny, Madame C. Wood, and Xavier Olibo, &c. The best 48 were a capitally put up collection, from Mr. Ingle, gr. to Mrs. Round, Colchester, comprising Thyra Hammerich, Fisher Holmes, Duc de Rohan, Beauty of Waltham, Duchesse de Caylus, Madame Annie Wood, and Madam Fillion, in the best possible condition. The competition in these classes was very spirited, first-class blooms being the order of the day. Among the next successful exhibitors were Mr. C. J. Ferry, Castle Bromwich; T. Laxton, Esq., Stamford; Mr. T. Draycott, gr. to T. T. Paget, Esq., Humberstone Hall, Leicestershire; and Mr. W. Soder, gr. to O. Hanbury, Esq., Brentwood. The best new Rose of 1868 was Miss Ingram, white, blush centre, shown in excellent condition by Mr. Turner; the next best was Dupuy-Jamin, a very bright cerise, a fine variety, shown by Mr. B. R. Cant; Messrs. Paul & Son came in 3d with Nardy Frères; and Mr. J. Keynes 4th, with Edward Morren. The collections of 24 new varieties of 1868-69 were scarcely up to the mark in point of condition; Mr. Keynes was 1st, Messrs. Paul & Son 2d, and Mr. Turner 3d. A magnificent collection, comprising 11 boxes, came from Messrs. Paul & Sons, to which a 1st prize was awarded. Many of the blooms were of immense size and substance, especially those of Baronne de Rothschild, Alfred Colomb, Marie Baumann, Duke of Edinburgh, and Felix Genero, which latter well merits all the praise bestowed upon it by our correspondent, the Rev. W. F. Radclyffe. The 1st prize for a collection of yellow Roses, any one or more kinds, was taken by Mr. Keynes with very fine examples of Maréchal Niel, the 2d prize being carried off by Mr. H. Thorneycroft, Floore, near Weedon, with highly meritorious specimens of the same variety. The first-named exhibitor also came in 1st in the nurserymen's class for Tea-scented or Noisette varieties; the same position in the corresponding class for amateurs being taken by Mr. W. Ingle. The best group of not less than 100 blooms came from Messrs. Paul & Son, and the best 20 in 8-inch pots were contributed by Mr. Turner. To Messrs. Dick Radclyffe & Co. prizes were awarded for a Fern case and rustic vase. First-class Certificates were awarded to T. Laxton, Esq., Stamford, for a seedling Rose named Princess Louise; to Messrs. Downie, Laird & Laing for Caladium Louis Porrier and a fine bright scarlet Zonal Pelargonium named George Peabody; and to Mr. C. J. Perry for Verbenas John Laing and Mrs. George Prince.

Florists' Flowers.

NOTWITHSTANDING the advice (from a high quarter) given to florists in 1847, to the effect that, having at that time reached the limits of hybridisation in the show Pelargonium, and obtained all the results required, they should put their ship about, proceed on another tack, and cruise in other seas, if they would still go on improving these favourite flowers, the cruisers in the old waters have never yet found them destitute of prizes, and year by year they bring into harbour something in which they may well glory.

It is true that the show Pelargonium has declined to some extent as an exhibition plant, but in regard to general cultivation, it is as much grown as ever. It would be difficult to meet with another plant capable of doing such good service in the greenhouse and conservatory during the summer months; and therefore it will yet hold its own till something better assumes its place. The batch of new flowers shown by Mr. Turner at the meeting of the Royal Horticultural Society on June 8, proves that the raisers are as busy as ever, and the results of their labours as cheering as in any bygone time. First-class Certificates were awarded to the following, of Mr. Foster's raising:—Admiration, pink lower petals flushed with carmine, white throat, dark blotch on the top petals with fiery orange border, and a thin edge of pale pink; a fine and pleasing flower, and good habit. Charlemagne, in the way of Mary Hoyle, but having a much deeper glow of colour; lower petals bright carmine, bold white throat; small dark blotch on the top petals, lit up with a slight border of fiery orange, and a broad margin of carmine-rose, rather deeper in colour than on the bottom petals; fine form, good truss, and excellent habit. Iron Duke, orange-carmine lower petals, with a slight margin of pink, pure white throat; dark top petals, broken into with fiery rose, and narrow margin of rosy pink; fine form and substance. Syren, pink lower petals, slightly marked and veined with orange-maroon, white throat; a very smooth and pretty flower, of extra fine quality; and May Day, pale pink lower petals, large and striking white throat, very dark, almost black, blotch on top petals, bordered with fiery red, and broad margin of pink; very smooth and pretty, and good bold truss. Mr. Hoyle was credited with but one Certificate, but it was for probably the best and most showy flower in the batch, viz., Duke of Edinburgh, a very fine stained or painted flower; fiery rose lower petals, heavily pencilled with dark lines; dark top petals, with narrow margin of pink; good truss, pip of fine form, free blooming, and good habit.

In addition to these there was a numerous batch of new flowers, inclusive of the following:—Pretender (Foster), orange-red, lower petals with slight maroon blotches, dark top petals, bordered with fiery red, which runs into the deep colour, giving it a broken appearance; a good high-coloured flower. Polly (Foster), a flower having a rich glow of colour; lower petals fiery crimson, veined with dark; glossy dark top petals, with narrow margin of fiery red, breaking into and lighting up the blotch; very free blooming and showy. Brigantine (Foster), pink lower petals, slightly flushed with rose and veined with crimson; white throat, dark top petals, with narrow edge of pink; flowers not of the best form, but very free blooming and good habit. Black Prince (Foster), carmine lower petals, flushed with orange, and having slight dark blotches; dark top petals, with narrow margin of rose; free blooming, and good habit. Sultana (Foster), pink lower petals, with a small fiery dark blotch on each; glossy dark top petals, with regular narrow margin of pink; free blooming, and good habit. Warrior (Foster),

a fine high-coloured flower, having rich bright orange-red lower petals, dark blotch on top petals, with broad margin of fiery red; good form, very showy, free and fine habit. Exemplar (Foster), deep pink lower petals, with small dark blotch, and slight veins of dark; dark top petals, with narrow margin of rose; free blooming. Kingcraft (Foster), fiery orange lower petals, heavily veined with dark; bold white throat, and dark top petals; a showy painted flower, though, as shown, the blooms rather undersized. Sultan (Foster), violet-pink, lower petals stained and veined with dark orange-brown; dark top petals, with regular narrow margin of pink; a fine and promising flower. Rubens (Foster), soft bright violet-rose lower petals, very dark blotch on top petals, with broad orange-rose margin; fine truss, and very free. Prime Minister (Foster), bright carmine-pink lower petals, dark blotch on top petals, bordered with fiery orange, and margin of pink; flowers bold and habit good. Superb (Foster), rich deep rosy pink lower petals, white throat, dark top petals, with broad margin of fiery orange-rose; very free and pretty. Pasha (Hoyle), a dark painted flower, the lower petals fiery red, heavily stained with dark, and narrow margin of pink; pure white throat, dark top petals and margin of rose; somewhat rough, but free blooming. Eldorado (Hoyle), magenta-rose lower petals, dark blotch on top petals, with broad margin of fiery red; free, and showy, but somewhat deficient in form: and Purple Gem (Hoyle), violet-purple lower petals, veined and stained with dark; dark top petals with narrow edge of violet rose; novel in colour, good habit, but wanting quality.

In one of the arcades Mr. Turner staged some small plants of last, and the preceding year's new varieties of show Pelargoniums. The following were of fine quality, and should be noted by cultivators:—Troubadour (Foster), Heirloom (Hoyle), Envoy (Hoyle), Maid of Honour (Foster), Example (Hoyle), Emily (Hoyle), Bonnie Charlie (Hoyle), Empress (Foster), Corsair (Foster), exceedingly fine; and Claribel (Hoyle), a very pretty white variety, with a small spot of the brightest carmine in each top petal. Add to these, Charles Turner (Hoyle), and Prince of Orange (Foster), for their colour, and the exhibitor would have a dozen fine varieties for exhibition purposes. *R. D.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE numerous *Stove and Greenhouse Plants* which are propagated every spring, and are grown on into neat specimens for winter or early spring blooming should now absorb some amount of attention. These comprise such subjects as *Begonia*, *Pentas*, *Impatiens*, *Libonia*, *Monochatum*, &c. Before each "shift" these young plants should be pinched back, so as to form more bushy specimens. In process of growth they should receive as much sunshine and air as possible, without causing an undue strain upon their growing capabilities. Exotic and other *Ferns* should now have every care taken of them as regards shading when the sun shines freely, as at this particular season, when the young fronds are formed, and are growing freely, too much light has a decidedly dwarfing influence upon them. For moisture rely more upon humidity in the atmosphere, than on actual syringing. Many of the more fragile varieties soon show signs of objection if too frequently drenched in this manner. Shade and atmospheric moisture in a not over-heated atmosphere is the most suitable condition, and most in keeping with their wants. *Liliums* of the lancifolium type should now have all the light possible, with plenty of fresh air. Carefully guard the balls containing the roots of *Lilium auratum* against becoming too wet after the flowers have expanded, and by moderate exposure induce them to form fine healthy bulbs for another season. See that *Fuchsias* which are entering on their blooming period, are not allowed to become too dry at the root, as they will quickly do, unless constantly watched. Be particular not to afford them any more artificial shading than is absolutely necessary. Indeed, I lean to the belief that, not only is the compactness and symmetrical growth of the branches due to the influence of light, but that their lasting in flower and beauty is also influenced favourably from the same cause, and that in fact, unlike many other flowering plants, bright sunshine is conducive to a multiplicity of flowers, and does not destroy them half so quickly as we are led to suppose. Good wholesome liquid manure is of the utmost importance at this time, and should be given alternately with clear water.

FORCING HOUSES.

The crops in very many *Vineries* are, at this period, hastening on the stoning process; hence they may be considered to be as hard at work as during any period of their growth. The uninitiated should, therefore, not relax one iota of the many attentions requisite, because a good crop seems to be hanging within his grasp. With the colouring process, when the final strain is being placed upon the parent Vines, shanking, and its attendant evils, too frequently exhibit themselves. See, therefore, that they want for nothing which foresight can supply. If there be anything approaching to dryness at the roots, it should be remedied without a moment's delay. In a week or two the need will have passed away, and what is now a necessity will then have become a source of injury. When the Grapes commence colouring a drier and more rarified air must be maintained. To further these objects yet more, remove all manure coatings off the Vine borders, and so let the fresh air permeate the surface soil to as great a depth as possible. Little, save in general terms, can be added this week regarding *Pines*. During this month the full maximum summer heat must be attained, which, as regards artificial heat pure and simple, must not by any means exceed 80°. Be particular not to permit the bark-bed to become too cold at this period, and use equal caution to prevens it not exceeding a safe maximum, as it will readily do when the sun-heat is great, if the least indiscriminate use of materials occur. According to the ordinary course of Pine culture, it is often necessary to renovate the beds somewhat in July. This is done by turning the mass over, placing from 10 to 14 inches of fresh tan at the bottom, according to the age of the mass to be renovated; stirring all up together, and putting on a surfacing of new tan also. These means induce a nice steady heat to form. Any large successionals which need shifting should be well watered about three days previously. Coarse lumpy materials of the right sort should be used, and not over large pots. All suckers taken from the older plants may be potted off forthwith. Plants ripening their fruit should be released from the tan by having the pots slightly raised. Thus the balls dry more readily, and the process of ripening is far more complete. Check the growths upon those young *Fig trees* which were turned out a year or two since, by withholding water at the roots.

HARDY FRUIT GARDEN.

Thin-out the young shoots which emanate from the base of *Raspberry* stools, and so afford light and air to such as are chosen to remain. It is advisable at this season to thin out the smallest fruits upon all trees bearing excessive crops of *Pears*, whether they consist of dwarf pyramids, espaliers, or cordons, or any others that can be readily reached. Continue to syringe periodically all wall-fruit trees bearing heavy crops of fruit. This not only refreshes them, but tends to the development of finer fruit than would be produced under the influence of such arid weather as we have had lately.

HARDY FLOWER GARDEN.

This has been an exceedingly trying season for some kinds of bedding plants. *Pyrethrum*, Golden Feather, should be closely examined plant for plant, even in instances where seedlings alone have been employed, for already it will be seen that the majority of them are starting into flower. The peculiar beauty which the plant exhibits when well grown will be destroyed, if the shoots which are pushing up at the heart are not pinched in at the earliest moment after they have once started. The very useful and distinct *Iresine Lindeni*, which I spoke so favourably of some months ago, grows very freely amidst all this unusually dry weather, and another very great point in its favour is that it will bear pegging down remarkably well. Indeed, a row which I planted out here amongst other things, in ribbon fashion, has covered just as much space as the Pyrethrum, and such Pelargoniums as Indian Yellow. Those who wish to keep *Viola cornuta*, or any of its varieties, in full bloom to the end of the season, must have every old flower removed immediateiyit is past its best, otherwise heavily laden seed-pods are quickly formed which greatly impoverish the parent plants.

KITCHEN GARDEN.

Finish planting-out permanently all kinds of *Kales* and *Sprouting Broccolis*, and transplant more *Cauliflowers* for use in August. Make a small sowing also of *Onions*, which may prove very useful if an open winter follow. Sow also a good breadth of James' Intermediate *Carrots*, which will come in well for "drawing" late in the autumn, and prove fresher and more tender than such as have been taken up and stored away. Keep *Tomatos* properly nailed to the wall, removing any superfluous leaves which may form, and otherwise afford all possible encouragement to the flowers. Cut away and remove all unnecessary leaves from old stock stools of *Cabbages* as soon as these have formed young shoots, after removal of the heads or Cabbages. In the matter of routine a constant war must be kept up with every form of weeds. *Peas* which have yielded their crop must be pulled up and cleared away that further trenches of *Celery* may be formed, not forgetting to water the latter freely during dry weather. *W. E.*

TOWN GARDENING.

Pink pipings will still strike, if put in as directed last month. *Dahlias* that were planted out in May should be well mulched and securely staked. The best method of doing this is to drive in three stakes in a triangular form at about a foot from the roots, inclining outward from the top. By these means the shoots can be spread out, and the flowers will be seen to the best advantage. *Grass Lawns* that have been mown with the mowing machine during the summer should, after the next rain, be mown with the scythe, which will take off all the old bents, and render the grass smooth and agreeable to look upon. Clip *Privet* hedges a tonce, as they will break again, and require only as light trimming in the autumn. This will render them nearly evergreen. Take off all old flower-stalks and dead leaves from the bedding plants, and they will bloom more freely. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, JUNE 29, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition		
June	Barometer reduced to 32° Fahr	Dry Thermometer	Wet Thermometer	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg	Deg	Deg		Gr
24, Thurs.	30.04	60.5	61.2	55.2	67	4.8
24 Friday	29.89	58.3	51.7	45.8	63	3.5
25, Satur.	29.91	57.9	51.0	45.1	61	3.3
26, Sunday	29.78	61.1	56.2	51.0	63	4.1
27, Monday	29.70	60.9	55.5	48.2	58	3.8
28 Tues.	29.74	61.3	53.0	45.7	51	3.1
29 Wednes	29.92	66.1	55.2	50.2	60	4.3

1870 MONTH AND DAY.	TEMPERATURE OF THE AIR.					WIND.		RAIN.
June.	Highest	Lowest.	Range in Day.	Mean.	Departure of Mean of Week from Average of 50 Years	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg	Deg	Deg		Miles	
23. Thurs.	72.9	53.0	19.9	60.4	−0.3	N.N.E.	245	0.00
24. Friday	64.0	50.2	13.8	54.6	−6.0	W.S.W. N.W.	395	0.12
25. Satur.	68.0	47.7	20.3	56.9	−3.6	N.W.	345	0.00
26. Sunday.	68.6	50.0	18.9	57.5	−4.2	W.S.W. W.	350	0.00
27. Monday	71.4	55.3	16.1	61.5	−0.1	W. N.	253	0.00
28. Tues.	68.1	48.3	19.3	56.6	−4.9	N.E	105	0.00
29. Wednes	73.1	41.9	30.2	58.2	−3.2	N	175	0.00

June 23 —Cloudy through out the day. Cloudless about midnight
— 24 —Overcast till the evening, then generally cloudless.
Heavy showers of rain fell occasionally.
— 25 —Generally cloudy till evening, then cloudless. Fine
— 26 —Generally cloudy throughout.
— 27 —Generally overcast.
— 28 —Large amounts of cloud prevalent throughout the day.
Hazy. A few drops of rain fell at night
— 29 —Generally cloudy, but variable in amount Fine

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, JUNE 25, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR.							FALL OF RAIN.
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg	Deg	Deg.	Deg.	Deg.	Deg	Deg.	In.
Portsmouth ..	84.0	45.7	38.3	76.9	51.7	25.2	62.8	0.00
Blackheath ..	91.2	42.7	48.5	77.7	50.9	26.8	63.8	0.12
Bristol	82.0	41.3	40.7	70.8	51.0	19.2	59.4	0.03
Birmingham ..	82.0	47.9	34.1	74.5	54.2	20.3	62.5	0.10
Wolverhampton	83.3	45.5	37.8	73.7	52.8	20.9	63.3	0.23
Leicester	86.1	49.5	36.6	76.5	53.4	23.1	62.1	0.12
Norwich	80.4	47.0	33.4	72.2	53.6	18.6	61.1	0.73
Nottingham ..	86.5	44.9	41.6	76.5	52.3	24.2	62.6	0.25
Sheffield	70.5	47.0	23.5	71.3	54.3	17.0	62.8	0.18
Liverpool	70.8	49.8	21.0	67.9	54.5	13.4	59.4	0.27
Manchester ..	82.0	47.5	34.5	72.0	53.0	19.0	62.3	0.23
Salford	78.2	49.7	32.0	69.2	52.1	17.1	58.8	0.27
Bradford	77.8	47.1	30.5	71.6	54.2	17.4	61.1	0.39
Leeds	80.9	48.0	32.9	72.0	56.3	15.7	62.3	0.35
Hull	80.0	43.0	37.0	69.0	50.1	18.9	57.8	0.34
Newcastle	..	..	..	..	..	..	..	..
Edinburgh ..	74.7	46.0	28.7	..	..	..	56.5	0.40
Glasgow	68.8	46.2	23.0	..	..	..	53.7	0.16
Dundee	77.0	41.0	33.0	..	..	..	55.0	0.30
Aberdeen	85.5	41.7	35.8	..	..	..	55.7	0.17
Paisley	79.0	44.0	35.0	..	..	..	54.9	0.20
Greenock	69.0	48.0	21.0	..	..	..	51.7	0.53
Leith	70.8	45.0	30.0	..	..	..	50.7	0.18
Perth	77.0	44.0	33.0	..	..	..	57.4	0.20
Dublin	76.9	37.5	39.4	..	..	..	55.8	0.00

JAMES GLAISHER.

Notices to Correspondents.

BEE ORCHIS: *Mr. J. Traherne Moggridge* is anxious to obtain fresh specimens (cut spikes, without roots or root leaves, will do) of Ophrys apifera, Huds., from any English station. Should any person be able to oblige him with specimens, he requests that the produce of each locality, if more than one spot be visited for this purpose, may be tied up separately. It is desirable to have not less than 12 specimens from each locality. Address, 8, Park Villas West, Richmond, Surrey.

CALCEOLARIAS: *J. Stokes.* A very fine strain of spotted varieties, equal to any we have seen.

COTTAGE GARDENING ESSAYS: *Reader.* Apply to J. Richards, Esq., Assistant Secretary, Royal Horticultural Society, South Kensington, W.

DISEASED CURRANTS: *A. B. C.* Your Currants are in a very bad state from mealy-bug. If you examine the white masses carefully you will find the insect surrounded with a multitude of eggs. *M. J. B.*

DISEASED PEACHES; *J. C. Francis.* Your fruits are badly mildewed. Flowers of sulphur well dusted over the tree would have checked it in an earlier stage. You may still try it with advantage.

DISEASED VINE LEAVES: *A. B.* It is scarcely possible to come to any certain decision on a mass of diseased leaves sent by post, without any protection, and crushed into a solid cake. It appears, however, that portions of the leaves are badly nourished, and in consequence suffer from the sun. The roots are probably in an unsatisfactory condition, or the leaves would be supported properly nourished. Water one of the plants suffering most once with a weak solution of sulphate of iron, and see if that induces a more healthy action. *M. J. B.*

ENCEPHALARTOS: *Constant Subscriber.* They require ordinary greenhouse culture, very little water in winter,

a more plentiful supply when throwing up fresh leaves; no shade is necessary, and, once carefully potted in well-drained loamy soil, they will go on for several years without repotting.

FERNS AT SOUTH KENSINGTON: *Anti-hardy*. Lastrea decomposita is not a hardy but a greenhouse Fern. It was shown in one of the collections referred to, and was marked Lastrea sp.

FUNGUS ON PEACH LEAVES: *S. T.* Your Peach leaves are attacked by a parasitic Fungus, against which we know of no remedy. If only a few leaves are affected you had better pick them off and burn them; but if the whole tree has suffered you must live in hope that it may not come again next year. Please to send a few more leaves, directed, Rev. M. J. Berkeley, Sibbertoft, Market Harborough. *M. J. B.*

GLOXINIAS: *Mitchell*. Insert the leaf-stalk like an ordinary cutting; or cut the principal ribs into short lengths, with a portion of the parenchyma attached, and insert these edgewise like ordinary cuttings in silver sand, in well drained properly prepared cutting-pots. Place them in a hotbed or warm propagating pit, shade and water moderately. Or cut through the midrib at intervals, fix the lower end of each portion with a peg, run some silver sand about the cut, and keep shaded in a close moist frame with a brisk heat. They should root from every cut.

INJURED BEECH LEAVES: *W. W.* There have been many cases this year like that of your Beech trees. A cold driving wind has injured the leaves. Conifers have suffered very generally, and a very curious case occurred in Greenwich Park, where a Horse Chestnut tree was injured more than Beech trees. *M. J. B.*

INJURED LEAVES: *Wimbledon*. It is probable that there is something wrong about the roots of your Fuchsias. The Plum leaves seem to have an incipient Fungus on them; if so, it is quite in a rudimentary condition. *M. J. B.*

INSECTS: *L. R. S.* The parenchyma off one side of your Rose leaves has been gnawed off in patches by the small green larva of a sawfly, the history of which was given by the writer hereof in *Gardeners' Chronicle*, 1848, p. 524. We fear that hand-picking is

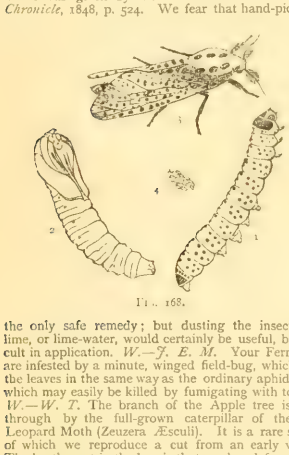

Fig. 168.

the only safe remedy; but dusting the insects with lime, or lime-water, would certainly be useful, but difficult in application. *W.—Y. E. M.* Your Fern leaves are infested by a minute, winged field-bug, which sucks the leaves in the same way as the ordinary aphides, and which may easily be killed by fumigating with tobacco. *W.—W. T.* The branch of the Apple tree is bored through by the full-grown caterpillar of the wood Leopard Moth (Zeuzera Æsculi). It is a rare species, of which we reproduce a cut from an early volume. The beetle sent in the box is that produced from one of the wireworms or larvæ of Elateridæ. It is the Elater murinus, Linn., and has no connection with the Zeuzera, nor do we think that it injures the foliage by feeding upon it; being, we believe, rather addicted to preying upon other insects in the perfect state, notwithstanding its larva feeds on vegetable matters. *I. O. B.*

LILAC: *T. K. & Co.* A very handsome variety, the name of which we do not know. We cannot undertake to name garden varieties.

NAMES OF PLANTS: *James Silver*. Some species of Sida or of Abutilon; we cannot determine which from your specimen. — *G. D. S.* Pelargonium cinctum, judging from your description of the flower. The others insufficient; but one is some Polygonum.—*G. A. H.* So far as we can judge from your specimen, it is Bromus racemosus (Smooth Field Brome-grass). It is certainly not much like Rye-grass.—*F. E. Currey.* Ranunculus peltatus (true). *J. G. B.—M. L.* Brodiæa grandiflora. —*M. E. J.* 1, Genista germanica; 2, yes; 3, Medicago orbicularis; 4, a Thibaudia, species not determinable.—*A Young Subscriber.* Erigeron speciosus. —*W. B.* Collinsia bicolor. *H. W.* Populus nigra, the Black Poplar. "The cottony substance which surrounds the seeds has been used in Germany and France as wadding, and it has also been manufactured into cloth hats and paper, but the expense of collecting it, and the want of length and elasticity in the fibre, prevented the success of the experiment." (Syme's "English Botany.")—*Z. A.* Epilobium angustifolium. —*John Clark.* Lycopodium dendroideum. —*A. E.* Ononis rotundifolia.—*Subscriber.* Pteris geranifolia.—*L. G.* So far as we can judge from the specimen sent, we believe it to be Amelanchier vulgaris.—*T. P.* Santolena chamæcyparissus. — *W. T.* Chrysanthemum coronarium var. aureum.

PELARGONIUMS: *J. O. W.* Apparently the result of a scald.—*H. W.* A good useful scarlet for home purposes, but of no use commercially.

ROSES: *A. Bye.* The blooms did not arrive in a state fit to be criticised, as the petals had all fallen. There does not appear to be any novelty in colour, and the flowers seem rough, but one is evidently full, and the foliage remarkably vigorous. So far as we could judge, we should say they were wanting in refinement, but their condition forbids us to condemn them. If No. 4 is a Rose, which reached us without any address, it is most remarkable for the size of the bud.—*E. T.* We cannot name Roses; we may, however, add that yours does not appear to be Devoniensis.

VINES: *H. B.* The small glass-like spots attached are natural to many species of Vine and of Cissus, and rather indicate exuberance than forbode evil.

COMMUNICATIONS RECEIVED.—B. D.—D. A.—W. D.—T. C. B. —J. W.—J. S.—Young Botanist.—W. L.—Nemo. Under Gardener.—J. C.—G. C.—T. L.—J. S.—W. M.—M. M.—W. K. A.

Markets.

COVENT GARDEN.—July 1.

A steady trade rules here, and the improvement noticed last week has been maintained. Heavy importations of foreign goods are again to hand, comprising the usual varieties of the season. Cherries are in great abundance, both foreign and English, and prices are ranging unusually low. Foreign Pears have commenced; at present they are of inferior quality. Large quantities of new Potatos are continually arriving from France, Holland, and the Channel Islands, realising from 8*s.* to 20*s.* per cwt., depending on the description and quality. Flowers comprise Orchids, Roses, Pelargoniums, Heaths, Fuchsias, Lobelias, Mignonette, Pinks, and the usual description of bedding plants.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apricots, per doz.	2 0	4 0	Nectarines, per doz	8 0	10 14 0
Cherries, per doz lb.	3 0	6 0	Oranges, per 100	8 0	12 0
Filberts, per lb.	0 6	0 9	Peaches, per doz.	10 0	24 0
Grapes, per lb.	5 0	8 0	Pears, per doz.	..	..
Lemons, per 100	1 0	2 0	Pineapples, per lb.	6 0	10 0
Melons, each	1 0	8 0	Strawberries, p. lb.	0 6	2 6

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Asparagus, p. bund.	8 0	10 0	Horse Radish, p. bun.	3 0	5 0
Artichokes, p. doz.	3 0	6 0	Leeks, per bunch	0 2	0 4
Beet, per doz	2 0	3 0	Lettuces, p. score	1 0	2 0
Broccoli, per doz.	1 0	2 6	Mint, per bunch	0 1	0 2
Cabbages, p. doz.	1 0	1 6	Mushrooms, p. pott.	1 0	1 6
Carrots, p. bunch	0 4	0 8	Onions per bunch	0 4	0 9
— young, p. bun.	1 6	2 0	Parsley, per bunch	0 2	0 4
Cauliflowers, p. doz.	1 6	3 0	Potatos, new, p. lb.	0 2	0 6
Celery, p. bund.	1 0	1 6	Shallots, per lb	0 8	—
Cucumbers, each	1 0	1 6	Spinach, p. bushel	2 0	3 0
Endives, per doz.	1 6	2 0	Radishes, per doz.	1 0	1 6
French Beans, p. 100	2 0	..	Turnips, yng., p. bun	0 9	1 0
Garlic, per lb.	0 8	..			
Herbs, per bunch	0 2	0 4			

Potatos, York Regents, per ton, 120*s.* to 150*s.*; Flukes, do., 110*s.* to 160*s.*; new round, 120*s.* to 140*s.* per ton; new kidneys, 140*s.* to 240*s.* do. Continental kinds, 80*s.* to 220*s.* do.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 29, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable Frame Mat, which gives the size of every class of Mat, forwarded post free on application.—JAS. F. ANDERSON & CO., Commercial Street, Shoreditch, London.

TANNED GARDEN NETTING, for Preserving Seed Beds, Fruit, Strawberries, from Frost, Blight, Birds, &c., and as a Fence for Poultry, &c. One yard wide, 1*d.* per yard, 25 yards by 2 yards wide, 1*s.*; 50 yards, 2*s.*; 100 yards, 3*s.* Made and sold by CHAS. WRIGHT AND CO., William Street, Newark-on-Trent, or their Agents, MESSRS. HOOPER AND CO., Covent Garden Market, London, W.C.

NETTING for FRUIT TREES, SEED BEDS, RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3*d.* per yard, or 100 yards, 20*s.*; 4 yards wide, 6*d.* per yard, or 50 yards, 20*s.* NEW TANNED NETTING, sized for use as the above purposes, 4 yards wide, 1*s.* per yard; 6 yards wide, 6*d.* per yard; 2 yards wide, 1*s.* per yard; 1 inch mesh, 4 yards wide, 1*s.* 6*d.* per yard. Can be had in any quantity of

JOHN SMITH, 346, 6 & 7 Crooked Lane, London Bridge, E.C.

GARDEN NETTING (at Reduced Prices) for the Protection of ready sown Seeds from Frost, Blight, and Birds; also as a Fence for Poultry, Rabbits, and Sheep, 1*d.* per square yard, carriage free, in quantities of 250, 500, or 1000 yards.

SCRIM, CANVAS, for Ward'ian, Greenhouse Shades, Tilt & Covers.

HAYTHORNS and WALLEKS NETTINGS, sample of material free on application. RICK COVERS, New and Second hand, with Poles, complete. Re-pairs done.

FREDERICK EDGINGTON AND CO., Marquee, Tent, Flag, and Rick Cloth Manufacturers, 60 and 62, Old Kent Road, London, S.E.

WANTED, a HEAD GARDENER, with a thorough knowledge of the profession. A married Man, without family, preferred. Application, personally or by letter, to Mr. JOHN VERNON, Ruthin, Beechhurst Park, Sunninghill, Berks.

WANTED, a GARDENER, who thoroughly understands the Management of Pits and Hothouses.—Apply by letter, stating age, whether married or single, and last place, to T. O. M., 42, Gerrard Street, E.C.

WANTED, a GARDENER (SINGLE-HANDED), in the suburbs of London, who thoroughly understands Stove and Greenhouse Plants, Vines, &c.—Apply by letter, stating age, wages required, &c., to Mr. JONES, care of Mr. Williamson, Law Stationer, Coleman Street, City, E.C.

WILLIAM HOOPER is in WANT of a YOUNG MAN to do Indoors at Work in a Nursery.—HOOPER'S Nursery, New Wanstead, E.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (HEAD).—Age 37, married, no incumbrance; well skilled in all branches of the profession. Highest references.—C. B., 14, Adams Square, Bromley, Kent.

GARDENER (HEAD).—Age 31, single; sixteen years' experience in the various branches of the profession. Can be well recommended.—A. B., Mr. Shaw's Nursery, Bowdon, Cheshire.

GARDENER (HEAD).—Age 30, married; understands the profession in all its branches. Five years' good character.—S. D., Church Lane, Beddington, Surrey.

GARDENER (HEAD).—Age 34, married; has a thorough practical knowledge of the profession in all its branches. Two and a half years' good character.—A. H., 1, John Street, College Place, Chelsea, S.W.

GARDENER (HEAD).—Age 40, married; has had considerable experience in all the higher branches of Horticulture. Twelve years' character from a good family. Can produce first-class testimonials.—I. B., Post Office, Hessington, York.

GARDENER (HEAD), to any Nobleman or Gentleman in want of a thoroughly experienced man.—Age 32, married; first-class character and abilities.—R. MOORE, Esq., Wigginton Lodge, Tamworth.

GARDENER (HEAD).—Age 41, married, no incumbrance; thoroughly understands the profession in all its branches. No single-handed place accepted. First-class testimonials, and eight years' character from last situation.—F. C., Milford, Godalming, Surrey.

GARDENER (HEAD).—Age 28, married, no incumbrance; thoroughly practical. Wife could manage Dairy or Poultry. Best references.—A. D., Cheshire's, 14, Grove Road, Holloway, N.

GARDENER (HEAD).—Age 30, married; thoroughly practical in all branches of the profession. Six years' excellent character from present employer.—M. J. CLARKE, Gardener to Sir W. H. Humphery, Bart., Peaton Lodge, Andover.

GARDENER (HEAD).—Middle-aged, married, no incumbrance; thoroughly practical. Over five years in last situation.—JAMES FOWLER, Plompton Hall, Knaresborough, Yorkshire.

To Nurserymen, Gardeners, and Others.

GARDENER (HEAD).—The Advertiser will give £3 to any one procuring him a suitable situation as above. Character will bear the strictest investigation.—Terms, &c., on application to G. K., Kingston, Tetsworth, Oxon.

GARDENER (HEAD).—JAMES HARDIE, Head Gardener for the last eight years to the Khedive of Egypt, is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener. First-class references.—169, Burngreave Road, Sheffield.

GARDENER (HEAD).—Age 30, married; thoroughly understands the Management of Pines, Vines, Early and Late Forcing, Stove and Greenhouse Plants, and Flower and Kitchen Gardening. Can be highly recommended.—T. S., Mr. Morgan's Library, Lewisham, Kent, S.E.

GARDENER (HEAD), or GARDENER and BAILIFF.—Married; thoroughly experienced in Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, also Pleasure Grounds, Fruit Flower and Kitchen Gardening. Has had the Management of large Grass Lands, Buying and Selling Stock, &c. Highest references.—R. B., Messrs. George Gibbs & Co., Seedsmen, 24, 25, and 26, Down Street, Piccadilly, W.

GARDENER (HEAD), or GARDENER and ESTATE AGENT.—Age 28; has had 11 years' practical experience in first-class establishments; thoroughly understands the Cultivation of Vines, Pines, Mushrooms, Cucumbers, Melons, Stove and Greenhouse Plants, Orchids, and Nepenthes; also Orchard-houses, Flower and Kitchen Gardening, and the Management of Land and Stock. As a good Accountant. Highest references.—A. B., Post Office, Uttoxeter, Staffordshire.

GARDENER.—Mr. WILKIE, Oak Lodge, Kensington, W., is anxious to procure a situation as above, for a middle-aged Man, who has had great and varied experience in all branches of the profession. Well acquainted with Horticultural Buildings and Ground-work. Every particular given on application as above.

GARDENER.—H. LANE & SON have on their List a first-class Gardener, age 38, open to an engagement; thoroughly competent in the branches of the Early and Late Forcing of Fruits, Orchids, Stove and Greenhouse Plants, Ferns, &c.; has been a successful Exhibitor at the Metropolitan and Provincial Shows.—The Nurseries, Great Berkhamsted, Herts.

GARDENER.—B. S. WILLIAMS will be glad to recommend a Lady or Gentleman requiring first-class Gardener a Man whom he has known for several years, and can testify as to his abilities; he held the position of Bailiff and Gardener in last situation, and can produce undeniable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

GARDENER (SINGLE-HANDED).—Age 25; two years' character.—THOMAS MUZZELL, Hanworth Park, near Hounslow, S.W.

GARDENER (SINGLE-HANDED, or SECOND).—Age 22, single; eight years' experience of Stove, Greenhouse, and Vinery, with the general routine of a well-regulated place. First-class testimonials from last two places.—J. H., Post Office, Broomfield, Chelmsford, Essex.

GARDENER (SECOND, or SINGLE-HANDED in a small place).—Age 24; of first-rate character, and considerable experience.—A. P. S., Mr. E. Jones, Seedsman, &c., Henley-on-Thames.

GARDENER, where two or three are kept.—No incumbrance; well understands Gardening in all its branches. Wife a good Cook or Dairywoman. First-class characters.—R. E. P., Westbourne, Emsworth, Hants.

GARDENER (UNDER), in a Gentleman's Garden, where there will be an opportunity of improving.—Age 20; four years' good character.—A. B. C., Post Office, High Road, Finchley, N.

GARDENER (UNDER).—Age 24; good character from former employer.—W. G., Tandridge, near Godstone, Surrey.

GARDENER (UNDER), wishes to improve himself.—Age 21; character unexceptionable; would be glad to assist a single-handed place. Five years' good character from last situation.—W. W. W., Keymer, near Hurstpierpoint, Sussex.

FOREMAN, in a Gentleman's Garden.—Age 27, respectable; has been accustomed to Plant and Forcing Houses, Propagating, and preparing for Flower Garden, &c. Character good.—R., Post Office, Odiham, Hants.

To Nurserymen.

FOREMAN.—A thorough practical hand at Budding and Grafting of Roses and Fruit Trees, the Management of Vines, Ornamental Trees and Shrubs, &c. Six years' good reference from last employers.—A. C., 1, Southgate Road, Islington, London, N.

PROPAGATOR (for PROPAGATOR and FOREMAN), indoors, of Roses, Rhododendrons, Conifers, &c.—Has been for the last six years in the celebrated North of England Rose Nursery. Satisfactory reference.—R. T., South End Gardens, Darlington.

AGENT or LAND-STEWARD.—A Gentleman, who has had many years' practical experience in the Management of a large Estate wishes to find a similar situation as above. Can give most satisfactory references.—H. J. A., Messrs. Thomas Gibbs & Co., Hillman Street, Lacemills, Wigan.

FARM BAILIFF.—Age 39, married, no incumbrance; thoroughly practical. Wife can Manage a Dairy and Poultry. Good reference.—F. B., Messrs. James Dickson & Sons, Eastgate Street, Chester.

To Nurserymen and Seedsmen.

BOOK-KEEPER and CORRESPONDENT.—Age 26, married; experienced. Will be shortly disengaged. First-class references as to character and competency.—P. C., Clapton Nursery, London, N.E.

HOUSEKEEPER.—A Lady (Widow) wishes a situation as above. References of the highest respectability.—M. S., 7, Buckingham Street, Adelphi, W.C.

W. M. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

WANTED, within 15 miles of London, a PIECE of GROUND, suitable for the erection of Glass for Market purposes; with Dwelling House preferred.
T. M., 2, Shepperton Terrace, Hoxton, London, N.

TO BE LET, a handsome CONSERVATORY, in the best part of Bayswater, well adapted for doing a good business Rent very low.
A. Z., 9, Queen's Road, Bayswater, W.

To Florists and Others.

TO BE SOLD, the 51 years' LEASE, at only £2 6s. ground rent, of HOUSE and large PIECE of GROUND, of 108 feet frontage to the high London Road, by 157 feet deep
Apply personally to Mr. NORRIS, Agent, Tooting, near the property.

TO BE LET, on LEASE, a first-class FLORIST'S, in the West End, with large and handsome Shop and Conservatory, and every convenience for carrying on a large Business in Plants, Cut Flowers, Birds' Seeds, and Miscellaneous Goods
For further particulars, address B. B., Mr. Samuel, 26, Westbourne Grove W.

To Florists, Nurserymen, &c.

TO BE SOLD, the LEASE, with STOCK, of an extensive NURSERY, 12 miles from London. The Glass, which is extensive, is well stocked, and includes Vineries (flourishing), and Peach House. There is a Dwelling House attached, with Cottage and Stabling
G. G., *Gardeners' Chronicle* Office, W.C.

To Nurserymen, Florists, and Others.

FOR SALE, with immediate possession, a first-class NURSERY and FLORIST'S BUSINESS, 15 miles S.W. of London, about 10 Acres in extent, with good connection; long Lease, rich loamy soil, surrounded by good roads, plenty of water, and adjoining Railway Station. The Stock consists of a good collection of Hardy Trees and Shrubs, some Soft-wooded Plants, a Show House, two Span-roofed ditto, Pits, Frames, and other appliances for carrying on a very lucrative trade. A portion of the Purchase-money may remain at interest on approved security if required.
Further information, and Cards to view, may be obtained on application to Mr. W. ABRAHAM, Horticultural Auctioneer, Valuer, &c., Goldworth Nurseries, Woking, Surrey.

SALES BY AUCTION.

Stove and Greenhouse Plants,

THE PROPERTY of the ROYAL HORTICULTURAL SOCIETY.

MR. J. C. STEVENS begs to announce that he has been favoured with instructions from the Council of the Royal Horticultural Society, to SELL by AUCTION, at the Great Rooms, 38, King Street, Covent Garden, W.C., on FRIDAY, July 8, at half-past 12 o'clock precisely, a Collection of valuable FERNS, AGAVES, ALOES, ANTHURIUMS, ARDISIAS, ARECAS, BEGONIAS, COCOS, CLIVIAS, CYCAS, DRACÆNAS, EUCHARIS, EUPHORBIAS, HOYAS, LATANIAS, PANDANUS, MUSAS, and a variety of other choice Stove and Greenhouse Plants, removed from Chiswick Gardens.
On view the morning of Sale, and Catalogues had.

Established and Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on Wednesday, July 13, at half-past 12 o'clock precisely, a Collection of choice ESTABLISHED and IMPORTED ORCHIDS, comprising a large number of East Indian and South American varieties. Also a fine lot of Imported ORCHIDS, consisting of Odontoglossums, Oncidiums, Maxillarias, Houlletias, Barkerias, Zygopetalums, Stanhopeas, Anguloas, Cattleyas, Dendrobiums, &c., all in very good condition, and many of them starting into growth.
On view the morning of Sale, and Catalogues had.

Most Important Sale of Orchids.

MR. J. C. STEVENS, having received instructions from John Booth, Esq., Hamburgh, to SELL by AUCTION, the famous COLLECTION of the late Consul Schiller, begs to state that the FIRST SALE will take place probably in the beginning of AUGUST, at his Great Rooms, 38, King Street, Covent Garden, London.
Catalogues are preparing, and will be ready in the course of a few days

Horndon-on-the-Hill.

Valuable BUILDING and MARKET GARDEN GROUND, adjoining the Stanford-le-Hope Railway Station.—The desirable FREEHOLD RESIDENCE known as HIGH HOUSE, and several ENCLOSURES of very valuable ACCOMMODATION LAND, with possession.

MESSRS. BEADEL will SELL by AUCTION, at the Mart, Tokenhouse Yard, London, on THURSDAY, July 21 next, at 1 o'Clock precisely, the above valuable PROPERTY, in Four Lots. Lot 1 will comprise two very eligible Closes of Freehold Land, eminently suitable for Building or Market Garden purposes, situate adjoining the Stanford-le-Hope Railway Station, with considerable frontage to the high road, and containing an area of 10a. 2r. 37p. Lot 2 a very desirable Private Residence, known as HIGH HOUSE, in the village of Horndon on the Hill, with Garden, Paddock, Stabling, and Outbuildings, in the occupation of Mr. J. G. Vincent, as yearly tenant. Lot 3 Three Closes of Freehold Building and Accommodation Land, fronting the High Street, also in the occupation of Mr. Vincent, with Cottage and Garden adjoining, containing together an area of 4a. 1r. 24p. Lot 4 The valuable Plot of Freehold Orchard and Garden Land, with frontage to the High Street, also in the occupation of Mr. Vincent, with Cottage and Garden adjoining, containing together an area of 1a. 2r. 19p., and capable of being advantageously laid out for building purposes, in the occupation of Mr. John Wright, as yearly tenant.
May be viewed by permission of the Tenants, and particulars, with Plan, obtained of Messrs. HICKS AND SON, Solicitors, Gray's Inn, W.C.; at the Mart, E.C.; and of Messrs. BEADEL, 25, Gresham Street, London, E.C.

To Breeders of Pigs.

ROYAL AGRICULTURAL SOCIETY'S SHOW, OXFORD, 1870.

MESSRS. JONAS PAXTON AND GEORGE CASTLE are favoured with instructions from T. Leslie Melville Cartwright, Esq., of Melville House, Fife, and Newbottle, Northamptonshire, to SELL by AUCTION, near the Showyard of the above Society, on THURSDAY, July 21, at 12 o'Clock, SEVEN GELTS and SEVEN BOAR PIGS of the improved Middlesex Breed.
Mr. Cartwright has been a very successful breeder of Pigs, having during the last few years, among other prizes, taken six First Prizes at Birmingham, besides three Cups for best Pigs in the yard and three First Prizes at Smithfield.
Catalogues will be forwarded on application to the Auctioneers, Dorester, Oxon

SHORTHORN SALES, 1870.

THURSDAY, August 25.—At Alloa, by Stirling, N.B., Messrs Mitchell's ENTIRE HERD, crossed with Bulls lately from Mr. Bruce's, for several generations
FRIDAY, September 2.—The very superior HERD, belonging to J. G. Dixon, Esq., bred for 50 years from Messrs. Charles and Robert Colling's stock, at Caister, Lincolnshire
WEDNESDAY, September 21.—A valuable Collection of COWS, HEIFERS, and BULLS, of Bates and Princess blood, from the first-class herd belonging to James Fawcett, Esq., at Scaleby Castle, near Carlisle
FRIDAY, September 23.—The ENTIRE HERD belonging to Chas R. Saunders, Esq., at Nunwick Hall, near Penrith, between 60 and 70 head, containing many remarkably fine specimens of the "Waterloo," "Fleda," "Gwynne," "Emma," "Wild Eyes," and other fashionable tribes; also the Prize Bull "Edgar" (10,680)
THURSDAY, October 6.—The late Mr. William Hewer's HERD, about 80 Head, and the stock of first-class BERKSHIRE PIGS, considered some of the finest in the kingdom, at Sevenhampton, Highworth, Wilts.
Catalogues, with Pedigrees, of these Sales, will be issued in due time. Further particulars can, however, be had on application to JOHN THORNTON, 15, Langham Place, London, W

Mere Old Hall, Knutsford.

IMPORTANT SALE of First-class SHORTHORNS, SHROPSHIRE SHEEP, PIGS, &c.

MR. STRAFFORD has received instructions from D. R. Davies, Esq., to SELL by AUCTION, without reserve, on WEDNESDAY, July 13 next, at Mere Old Hall, his entire HERD of First-class SHORTHORNS, consisting of about 50 head of Bulls, Cows, and Heifers, including the far-famed Cow "Moss Rose," with her daughter "Moss Rose 2nd," as well as her son "Royal Chester," and several other animals of the Kirklevington sort, whilst the Sires lately used have been principally of that renowned blood.
After which, Messrs. LYTHALL AND CLARE will SELL some prime RAMS and EWES, from Mr. Davies' famed Flock of Shropshire Sheep, which has been selected at great cost, and bred with care from the best blood in the country.
Also will be SOLD, a very superior PIGS of the White Breed, reared from the best sources.
Catalogues, with Pedigrees, and other particulars, may be had on application to Mr. STRAFFORD, 123, Euston Square, London; or of Mr. CHORLTON, the Bailiff, at the Bucklow Hill Farm, Knutsford, Cheshire.

MANCHESTER AND LIVERPOOL AGRICULTURAL SOCIETY.—The ANNUAL SHOW of HORNED CATTLE, HORSES (Hunters especially), SHEEP, PIGS, DOGS, POULTRY, CHEESE, GRAIN, ROOTS, IMPLEMENTS, MACHINERY, SADDLERY, and MISCELLANEOUS ARTICLES, will be held in WESTWOOD PARK, WIGAN, on SEPTEMBER 6, 7 and 8 (preceded by a Public Trial of Farm Implements on September 5), when PRIZES amounting to nearly TWO THOUSAND POUNDS will be awarded. ENTRIES for SHOW CLOSE AUGUST 1.
Prize Lists and Forms of Entry on application to the Secretary, THOMAS HIGHT, Over, near Winsford.

STAFFORDSHIRE AGRICULTURAL SOCIETY.
WALSALL MEETING—SEPTEMBER 20, 21, and 22.
In addition to the usual Prizes for Stock, Produce, &c., offered for competition within the limits of the Society's operations, Special Prizes of £25 and £15 for the best and second best Stallion for agricultural purposes, also Prizes for Poultry and Implements, are open for competition to the United Kingdom.
ENTRIES CLOSE AUGUST 20.
Prize Lists and Forms of Entry are now ready, and may be had on application to the Secretary
W. TOMKINSON, Newcastle, Staffordshire.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.

GREAT SHOW at OXFORD.

TRIALS of fixed STEAM-ENGINES, HORSE-GEARS, CRUSHERS, CHAFF-CUTTERS, OILCAKE BREAKERS, TURNIP CUTTERS, STEAMING APPARATUS, DAIRY IMPLEMENTS, &c., MONDAY, July 11, to SATURDAY, July 16.

Admission 5s. each day.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.

OXFORD MEETING.

SHOW of HORSES, CATTLE, SHEEP, PIGS, and IMPLEMENTS, MONDAY, July 18, to FRIDAY, July 22.

Admission.—Monday, 5s.; Tuesday and Wednesday, 2l. 6d.; Thursday and Friday, 1l.

Season Tickets, price 10s 6d., available from July 11 to 22, may be obtained of T. F. PLOWMAN, Oxford; or
H. M. JENKINS, Secretary.
12, Hanover Square, London, W.

The Agricultural Gazette.

SATURDAY, JULY 2, 1870.

MEETING FOR THE ENSUING WEEK.

July 6 { Royal Agricultural Society of England (Council Meetings), at Hanover Square—Noon.

IF the Customs Returns of the number of foreign animals which have been detained for slaughter on account of the existence of any contagious or infectious disease afford a criterion of the sanitary state of stock on the Continent, we may enjoy the conviction that foot-and-mouth distemper has very much decreased abroad, although we have still to deplore its continuance among our own animals.

No farther back than the month of October last, the number of foreign animals stopped by the Customs Inspectors amounted to 3997 within the month; all excepting about 200 being detained in the port of London. The following month (November) saw a great improvement, only 395 animals were seized for foot-and-mouth disease; but two cargoes of sheep, affected with scab, landed at Goole and Leith—278 at the former, and 246 at the latter place—swelled the total to 919 animals slaughtered by order of the Customs in November. A still further diminution was recorded in the returns for December last; the total number of cattle, sheep, and pigs slaughtered on account of foot-and-mouth disease during the month being 243, London, as usual, getting the lion's share. January is credited with 146 diseased foreign animals, all of which were slaughtered on account of foot-and-mouth disease; February's list sinks to a total of 100 animals; in March there are 88 returned, still on account of foot-and-mouth disease; and in April there are only 47 reported as having been slaughtered in consequence of the existence of this distemper among them.

In May the total number of cattle, sheep, and pigs detained at all the ports in Great Britain amounted to 20—a number which may fairly be called insignificant, in comparison with the huge total of nearly 4000 diseased animals which were slaughtered by order of the Customs in October. The uniform decrease in the number of infected foreign animals landed in this country from October to May will be interrupted in the report for June, owing to the spread of foot-and-mouth disease among animals in Cherbourg and the landing of infected cargoes recently in this country. The inspector at the port of Southampton detained some diseased sheep (36) which were brought from Cherbourg in April; in the early part of June a considerable cargo of pigs and some sheep were detained on account of foot-and-mouth disease at the same port, and according to the latest report the malady has not decreased. Excepting foot-and-mouth disease, and a few cases of scab in sheep, no infectious diseases have been detected among foreign animals landed in this country; it is impossible, however, to assert that all the infected animals have been detected by the inspectors. Even after the ordeal of 12 hours' detention, an ox having cattle plague or pleuro-pneumonia, the latter especially, in the incubative stage, would escape, notwithstanding the closest scrutiny; and under any system which permits the importation of cattle at all from abroad, we must in some degree trust to the care which is exercised by other countries to exclude infected animals from their dominions. And that the precautions which are taken by foreign States are not in vain, we may gather from the fact that cattle plague, although extensively spread on the Continent, has not again invaded us. Prussia, always on the alert, has more than once recently had to defend her frontier. Hungary has suffered severely. In Poland the pest still rages unabated; and in Galicia, Transylvania, Buckowina, and Roumania, cattle plague has for a long time past had a more or less active existence. Pleuro-pneumonia is known to be prevalent in many districts, but, probably on account of its constant presence, it excites less attention than other maladies. Its comparatively slow progress and long period of incubation also permit the removal of infected animals with little risk of detection; and we may imagine that the Belgian, Dutch, or German farmer is no more anxious to publish to the world the fact of his stock being affected with a contagious malady, than is the English farmer or dairyman in the like case. However this may be, an experience of some extent in the slaughter-houses at various ports, and especially in the port of London, enables us to say that pleuro-pneumonia is very rarely observed in foreign cattle slaughtered here; and probably the amount of risk which is incurred in this respect, from foreign stock, is of the most insignificant kind.

Scab in sheep, which is the only other infectious disease occasionally imported, is more than any other likely to be spread in this country; and in good truth we do not need any additions to the very liberal supply of the native malady, which is always on hand. In view however of the risk incurred, the regulations are very stringent, and the detection of the disease among any animals of a cargo of sheep dooms the lot to slaughter.

Among home-bred stock, pleuro-pneumonia, foot-and-mouth disease, scab in sheep, and glanders in horses, continue to prevail and cause serious losses. We shall take an opportunity shortly to trace the progress of these affections, and suggest an explanation of their persistence in this country, so favourably situated for the extirpation of contagious maladies; at present we can only remark that their prevalence is a reproach to our method of administering sanitary legislation.

AT the meeting of the Council of the Royal Agricultural Society of England next Wednesday, Mr. DENT, M.P., is to move—

"That it is undesirable to persevere with the agricultural examinations hitherto carried out by the Society; but that in lieu thereof the Society should give medals or other premiums for agricultural knowledge in such public county schools as may apply for them, and be approved of by the Council."

It is surely very desirable that any decision upon this question be postponed for mature consideration. If anything be needed to convince one of the unwisdom of hurry in such a matter, it

is given us in the example of patience which is set by the sister Society in the North in connection with this subject. The Highland and Agricultural Society many years ago organised a far more elaborate educational scheme than any which the English Agricultural Society has yet adopted. Its large and distinguished body of examiners have had nothing to do this year. No one has sought the diploma of the Society at their hands. But we hear nothing of any proposal to abandon the effort which is thus annually made to promote sound agricultural education. On the contrary, the paragraph of their report on another page relating to that subject specifies a field in which their educational efforts are still fruitful. They offer prizes to agricultural students in the Edinburgh College, and these have always been competed for, and, as the Professor of Agriculture would no doubt testify, they have always stimulated agricultural students.

Why should not the English Agricultural Society maintain just the same relationship with the Royal English Agricultural College which is claimed and used to such useful purpose by the Scottish Agricultural Society, with the only body of agricultural students anyhow incorporated in Scotland? It is hardly possible to avoid the impression which the whole history of the Society and of the College gives, that there is some unexplained distrust or displeasure at the bottom of this mystery. Undoubtedly to a mere outsider it is a mystery. Here is a distinguished educational staff expressly confined to the agricultural field, and incorporated for that purpose by Royal Charter—a most efficient and successful institution, having no personal ends to serve—devoted entirely to public aims of the very kind which the Society professes. Why should its agency be refused, or, at least, ignored? It is the very machinery through which the educational efforts of the Society might be most serviceably made. And how the Council can adopt Mr. DENT's proposal to accept the offer of county schools to supply it with agricultural students while it ignores the Royal Agricultural College, we are unable to imagine.

We are glad to see that a very good report was given of the proceedings of the Royal Agricultural College during the past session at the half-yearly meeting last week. We add here their prize list, and Mr. HOLLAND's remarks, as proving that there are still agricultural students in the country, although we somehow fail to meet with them in Hanover Square :—

Mr. HOLLAND presented the prizes, expressing his gratification on hearing how satisfactorily all had gone on during the last session. But he had something of a feeling beyond that, which was connected with that institution, and it was the pride and satisfaction he would express for those who had left the college and gone into life, and who were doing credit to themselves and to the institution. It was perfectly true in agriculture, more so perhaps than in any other trade or branch of industry, that it was absolutely necessary to know how to command men, and they could not command their labourers without knowing how the work of the labourers ought to be done. Still the same rule held good with every other science or trade, and especially did they see it in civil engineering. Practical work was connected with scientific knowledge, and the great engineers of the day, and in short he might say the great men of the day, had all more or less been connected in early life with the practical part of the science or profession they were teaching. It delighted him to find that the world at large was becoming acquainted with what they did at the College in that particular respect, because although the motto of the Royal Agricultural Society of England was "Practice with Science," he believed the members generally had little thought of its being absolutely necessary that those two elements of success should be united. He was quite sure that this year the College was taking a fresh and new start, and he judged that from the manner in which it was everywhere spoken of.

The successful competitors for the prizes were announced as follows :—

PRIZE AND CERTIFICATE LIST.

Diploma, awarded to Harry Willett, Vere Street, Lewes, Sussex; Alberta Gertrud Gramatzki, Coblenzerstrasse, Bonn, Prussia; Charles Hayes Jackson, 28, Market Place, Darlington; James Edwards, Trentham, Stoke-on-Trent.

1st Scholarship to Ashcroft, Ohrly, Sturge.

2d Scholarship to Smith, Blackett, Bourdillon.

Agriculture.—Prize—Sheep Shearing—Jenkyns. Cultivation Book.—Griffin. Farm Book.—Sturge.

Practical Farm Work.—College Certificate to Lane. (Prizes given by Mr. Swanwick). Stockman's Work.—Ashcroft, Hancock. Shepherd's Work.—Jenkyns, Dickinson.—Class 3. 1st, Ashcroft (certificate); 2d, Smith; 3d, Millard; 4th, Rooper; 5th, Callwell; 6th, Brumell. Class 2. 1st, Ohrly (certificate); 2d, Blackett; 3d, Woodgate; 4th, Griffin; 5th, Hall; 6th, Andlau. Class 1. 1st, Sturge (certificate); 2d, Ranken; 3d, Dodson; 4th, Holme; 5th, Wilson; 6th, Langshaw.

Book-keeping.—Class 3. 1st, Ashcroft (certificate); 2d, Smith (prize); 3d, Millard; 4th, Brumell; 5th, Wadlow; 6th, Rooper. Class 2. 1st, Ohrly (certificate); 2d, Andlau (prize); 3d, Blackett; 4th, Gotto and Woodgate; 6th, Dickinson and Hall. Class 1. 1st, Sturge (certificate); 2d, Dodson (prize); 3d, Betham; 4th, Langshaw and Ranken; 6th, Baller, E. Edwards, Holme, and Monnington.

Practical Chemistry.—Class 3. Quantitative Analysis, Ashcroft. Class 2. Qualitative Analysis, Blackett. Class 1. Chemical Manipulation, Bourdillon.

Chemistry.—Class 3. Agricultural Chemistry. 1st, Ashcroft (certificate); 2d, Smith; 3d, Brumell; 4th, Wadlow. Class 2. Organic and Analytical Chemistry. 1st, Blackett (certificate); 2d, Gotto; 3d, Ohrly; 4th, Woodgate; 5th, Griffin; 6th, Kerr. Class 1. Inorganic Chemistry. 1st, Sturge (certificate); 2d, Bourdillon; 3d, Baller; 4th, E. G. Edwards; 5th, Langshaw; 6th, Holme.

Botany.—Class 2. 1st, Ohrly (certificate); 2d, Blackett (prize); 3d, Gotto; 4th, Griffin; 5th, Hall; 6th, Woodgate. Class 1. 1st, Erskine (certificate); 2d, Bourdillon (prize); 3d, Baller; 4th Sturge; 5th, Holme; 6th, G. Wilson.

Geology.—Class 3. 1st, Ashcroft (certificate); 2d, Smith (prize); 3d, Brumell; 4th, Callwell; 5th, Rooper; 6th, Millard. Class 2. 1st, Ohrly (certificate); 2d, Woodgate (prize); 3d, Blackett; 4th, Griffin; 5th, Gotto; 6th, Dickinson.

Mathematics.—Class 3. Mechanics.—1st, Smith (certificate); 2d, Ashcroft (prize); 3d, Brumell; 4th, Millard; 5th, Rooper; 6th, Callwell. Class 2. Surveying.—1st, Ohrly (certificate); 2d, Blackett (prize); 3d, Woodgate; 4th, Gotto; 5th, Griffin; 6th, Andlau. Class 1. Mensuration.—1st, Sturge (certificate); 2d, Taylor prize); 3d, French; 4th, E. G. Edwards; 5th, Erskine; 6th, Bourdillon.

Veterinary Surgery.—Class 3. Therapeutics.—1st, Ashcroft (certificate); 2d, Smith (prize); 3d, Brumell and Millard; 5th, Callwell; 6th, Scott. Class 2. Pathology.—1st, Ohrly (certificate); 2d, Blackett (prize); 3d, Gotto; 4th, Griffin; 5th, Kerr; 6th, King. Class 1. Anatomy. 1st, Bourdillon (certificate); 2d, Sturge (prize); 3d, Langshaw; 4th, Baller; 5th, E. G. Edwards; 6th, Holme.

Drawing.—Class 3. 1st, Smith (certificate and prize); 2d, Ashcroft; 3d, Rooper; 4th, Brumell; 5th, Cotterell; 6th, Millard. Class 2. 1st, Ohrly (certificate); 2d, King; 3d, Blackett; 4th, Hall (prize); 5th, Gotto; 6th, Woodgate. Class 1. 1st, Langshaw; 2d, Bourdillon (certificate and prize); 3d, Erskine; 4th, Sturge; 5th, Dodson; 6th, Betham and Ranken.

Students who have passed the Preliminary Examination.—Class 3. Edwards, Jackson, Ashcroft, Smith, Millard, Brumell, Callwell, and Rooper. Class 2. Ohrly, Blackett, Griffin, and Woodgate. Class 1. Griffin, Sturge, Bourdillon, Holme, Langshaw, Dodson, Ranken, Baller, G. Wilson, Betham, Edwards, French, Erskine, and Hancock.

—— THE corn trade has been quiet during the week. The prices of Wheat sank about 2*s.* a qr. on Monday in Mark Lane, but on Wednesday they remained unchanged. —— The cattle trade on Monday had somewhat improved, and prices were, if anything, higher than those of last week, notwithstanding the quantity of stock shown was rather inferior.

—— The accompanying anonymous letter may amuse some of our readers as well as Mr. MECHI, to whom it was sent. It confirms the opinion (although the writer does not think so) that good cake and corn shed manure surpasses any guano or artificial manure, and that deep and clean tillage is (after drainage) the essential basis for profit. Incidentally the writer speaks well of the crops on properly farmed land—no doubt, in his case, of good natural quality :—

"You seem to want to inform us farmers how to manage. Now, sir, I should like to know where you have learnt your experience from. I have farmed myself now for these 20 years, and from all my experience I never yet found a man to tell me how to manage better than I know myself; for I know this well, if you intend to have any produce off your land you must put some tillage upon it, and not such stuff as guano, which only flushes one year, then the next it is gone like wind. It makes no tillage nor yet soil. Let me have plenty of good stable manure, and also some good lime, and I will bid defiance to all your artificial manures. This I have proved, and I do not care what sort of land you put it on, it will not excel good stable manure and lime. I have grown myself 20 loads of Wheat per acre, and this is quite plenty; but sometimes I have exceeded that. The only plan to make good farming is to keep your land clean from Wicks and Thistles and Woodbine. Now, suppose I set 20 acres with Potatos, and manure them well, next year I can get a very good Wheat crop, and the year after a good crop of Oats or Barley. But if you till with artificial stuff you have to do it every year. I don't believe at all in the sweeping that causes much rubbish to grow in your land. Now, sir, this year I have some good promising crops of Wheat, Oats, and Barley, and also Potatos, and Clover very good, and also Turnips. I think upon the whole that Divine Providence is smiling upon us with abundance. Fruit this year is excellent, and will be cheap. I sometimes think that God smites us for lying about the deficiency of crops, when He at the same time supplies us bountifully. *A Farmer of a Thousand Acres. Tuesday's Post June 24.*"

—— The *Pall Mall Gazette* calls attention to the neglect of irrigation, and even of water supply, general in England,—a neglect which seasons like the present prove to be a folly :—

"A season comes like this, and the farmer thinks with idle regret of the rain he thought such a nuisance when it was interrupting his field work in early spring. What little was suffered to accumulate in the small duckpond by the farmyard, or the little hollows by the field-corners, has long given out, and the last bucketfuls had been economised as carefully as waterskins in the desert. There is no sap in the shrivelled grass; the cattle and the very sheep have to be driven twice a-day to the distant stream. His horses, men, and waggons are hauling the precious fluid, and the expenditure of labour on water carriage is something heartbreaking. The truth is, his farming is conducted exclusively in deference to the popular idea and general character of our English climate. He makes his book solely to hedge against the rain, and never takes into account the chances of prolonged drought. If a man of enterprise and capital, he spends his money on drains until Rushes are nearly as rare as the Papyrus in his fields, and after a rainfall the water goes hurrying off his farm, gurgling and choking itself in its anxiety to escape. Very properly, too; but he should recollect that every medal has its reverse, and when water is so abundant he should provide not against a rainy but a droughty day."

On this we have only to remark that, sympathising entirely in the view taken of the importance of irrigation, the writer's reference to drainage is founded on a mistake. The fact is, that deep drainage is conservative, not wasteful of water. It is the deep cultivation which it renders possible that provides a deep and serviceable sponge in which water is retained; so that drought injures undrained clays much sooner than it injures clay lands which have been drained. We entirely agree, however, with the writer in his condemnation of the universal neglect of irrigation :—

"The man who will pay enormously for Peruvian guano to enrich his crops, for patent oilcake to fatten his beasts, will not expend one shilling on English water to fertilise his fields, or rather to guard them against utter starvation. It is that element of uncertainty that is fatal to the economical and common-place safeguard he might so often secure himself. If he knew he would have a visitation at stated intervals—lose £100, £1000, as the case might be, in a single season—he would never hesitate. Counting on a run of damp seasons, in his penny wisdom, he shuts his eyes and backs his luck. Besides, at a moderate outlay, he would often convert a curse into a blessing. In a blazing spring, with plenty of water, he might coin gold. The damp soil glows like a hotbed, forcing fabulous growth in a miraculously short time, yielding a second and a third crop."

OUR LIVE STOCK.

CATTLE.

THE following information from Kirkbank, Richmond, regarding the present condition of Mr. Alfred Stables' herd may be of interest to our readers. The herd consists of 42 animals, 32 of which are females. About four years ago Mr. Stables sold his then herd, and repurchased a nucleus from Mr. Willis, of Carperby, of 11 females of different ages, and hired a bull of Mr. Booth. One of these females, after giving birth to twin bulls, died of milk fever, another died from the rupture of a blood vessel, and three more refused to breed, and were sold to the butcher. Of the remaining six females and their offspring there are at present the following :—*White Rose*, by FIRST FRUITS (16,048), and three female descendants; *Eleanor First Fruits*, by FIRST FRUITS, and seven female descendants; *Currah Bell*, by ROYAL ALFRED (18,748), and four female descendants; *Christmas Rose*, by ROYAL ALFRED (18,748), and one female descendant; *Morning Zephyr*, by ROYAL ALFRED, and two male descendants; *Rose of Kirkbank*, by LORD FREDERICK (20,156), and one male descendant—in all 24 animals, descended from Mr. T. Willis's stock. Two females were subsequently purchased from Lady Figot one of them having been bred by Mr. Bruere, of Braithwaite Hall, and the other out of a cow bred by him. From these two last matrons there are at present at Kirkbank: *Cara Bellair*, by PRINCE GEORGE (13,150), and one male descendant; *Bloomer*, by Lady Figot's ASTELOID (21,193), by RAVENSUIT (20,628), and two male descendants—in all five representatives of Mr. Bruere's stock. *Gratitude*, a cow which was sold at Mr. Stables' sale, and bought back again about two years ago, is also in the present herd, as is also *Rea Roan*, by STRAWBERRY PRINCE (25,240), from *Red Rose*, and her daughter *Susannah*, by SERGEANT-MAJOR, which was originally sold as a calf, at the last Kirkbank sale, and recently repurchased. Eight animals, five females, and three bulls, have shorter pedigrees, but all are descended from first-class animals, though only three or four crosses appear. *Miss Bolton*, with her calf, the one with two and the other with three crosses, were bred from a cow sold as an in-calver for £38. *Miss Spence* was bred from a nearly pure-bred cow, whose pedigree was unfortunately lost, but the original cow was a truly grand animal. *Miss Rieth 2d* and family (in all four), although of short pedigree, are a valuable strain, and may do credit to any showyard; indeed, *Miss Rieth 3d* is an exceedingly taking and symmetrical heifer. The leading features of the Kirkbank herd are its health, good breeding, and Booth blood. The animals are in good but not forced condition. The older cattle are good milkers, and all the females except the youngest calves are in the pastures. The present stock bull is BRITISH HOPE (21,234); he is of pure Booth origin, as are all the sires which have been used in the herd. Among the purest bred Booth cattle may be mentioned *Cornflower's* bull, a yearling by LORD ALBERT (20,143), dam by PRINCE GEORGE (13,150), g.d. by KING ARTHUR (13,110), g.g.d. by LEO (13,150), all pure Booth bulls. Also *White Lilac*, whose pedigree is as follows :—

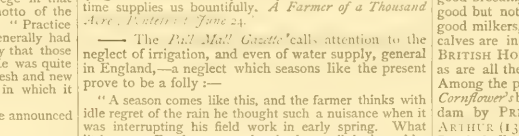

The family of *Eleanor First Fruits* are all red or dark roan, strong in constitution, quick breeders, large frames, and of capital quality. The *Currah Bell* tribe are all reds and roans, and are of very fine quality. Three of this tribe are fit for any showyard. *White Rose*, and all the Rose tribe, including *Rose of Kirkbank*, *Christmas Rose*, &c., are very nearly allied, being descended from the same cow as the successful *Rose of Lucknow*, the winner of the principal honours in the Birmingham fat show, 1868. *White Rose 2d*, by BRITISH HOPE, is a splendid beast, of perfect symmetry. The bull, BRITISH HOPE (lot 1), was

shown in the summer of 1868, and took the 1st prize at many of the principal Yorkshire shows. He has not been shown since, and is in good working order, and very active. LORD ALBERT, the sire of fourteen of the younger beasts, was nearly own brother in blood to the famous *Lady Fragrant*, the winner of so many high honours.

POULTRY.

THE tenth annual exhibition of the Spalding Poultry and Horticultural Society was held on Thursday last. The poultry and pigeons were certainly superior to those of previous years, and formed an exhibition highly creditable to the promoters. An esteemed contemporary thus speaks of the various classes :—

"Dorkings headed the list, Mr. White taking the cup with a pen of unmistakable merit. Game were very good ; in addition to the prize black-reds, those of Mr. Scrimminger must be mentioned as of admirable quality. Mr. Matthew's H.C. duckwings were very good, being neat, hardy, and close in feather. Cochins were much out of condition and plumage, one of the best pens containing a dark cinnamon cock and a buff hen. In dark Brahmas Mr. J. H. Pickles was an easy 1st, though Mr. Worthington sent a well-coloured pen, but came into the wrong class. In Spanish the 1st-prize cock, a good one, has seen his best season. In Hamburghs the entries were very small ; gold-pencilled were good, silver-pencilled poor. The 2d-prize gold-spangled had been regularly weeded on the face ; we had hoped that this dodge would have been confined to the Spanish. The silver-spangled winners were very good. Amongst the game Bantams the 1st-prize pile were very remarkable for their smartness.

"In pigeons the competition was very severe. In carrier cocks the Taunton decision was reversed, Mr. Fulton taking 1st over Mr. Yardley. The Birmingham bird is better in eye and skull, his antagonist in wattle and carriage ; the owner of either can have but little cause of complaint at being put 2d. The cup for the best carrier was given to a hen that was alleged to be ruptured, and some warm words passed respecting the award. Mr. Ord was 2d with a magnificent hen. In the four classes of pouters and tumblers Mr. Fulton swept the board. Barbs went to Mr. Crossley's old birds. In fantails we like an unnoticed pen of Mr. Newbitt, as well as any except the 1st prize. The 1st in owls was taken by a beautifully short-faced pair belonging to Mr. F. Crossley. The dragon awards we do not understand. The 1st prize was given to blues, not of remarkable excellence, and the second was withheld, for what reason we could not divine, as there was a good pair of whites belonging to Mr. E. Jones, and a most charming pair of young yellows of Mr. Ord.

"The selling class was admirable, Mrs. Paget winning with a very good pair of ice pigeons and German toys, and there being some good pens left unnoticed, particularly one of the Rev. A. G. Brooke."

The judges were—Mr. Hewitt for the poultry, and Mr. Corker for the pigeons.

FARM AGREEMENTS AND TENANT RIGHT.

YOUR correspondent "J. McK.," at p. 874, gives your readers a short description of what he would consider a fair farm agreement, or, as he terms it, "tenant-right ;" and I have very little doubt that 99 landlords out of 100 would agree to it (with some alteration-, which I will allude to further on), *provided the tenant had entered upon his farm subject to the same conditions.* On that fact, however, the whole question hinges. If a tenant comes to me or any other landlord, and takes a farm which has been in the landlord's hands for several years, does he ever offer to pay for bones or lime or dung applied to the land during the previous five years, and if he does not, on what principle, then, is he to be paid for them at leaving ?

Dung produced upon the land from the produce of that land is most unquestionably the property of that land, and ought to be returned to it : and to say that an outgoing tenant should be paid for that dung seems to me contrary to all right reason. If a tenant has brought in food not grown upon the farm, and by consuming it there has not only increased the quantity of dung but has also improved the quality of the dung, there is some reason in saying he should be paid for that increase, but the difficulty is how to appraise its value.

As to ordinary dung (the actual produce of the farm itself) I will, by a very simple example, show the injustice of valuing it. Let us suppose a tenant enters upon a light-land farm of 500 acres worked on a five year rotation, three years in crop and two years in grass. Such a farm, if in good condition, would in all probability have 1000 tons of dung in the yard, and the Turnip break, 100 acres, would represent the last year's dung of 1000 tons, half of which would have to be paid for. The new tenant, therefore, would have to pay the old tenant for 1500 tons of dung, say, at 5*s.* per ton, £375. Now suppose this new tenant immediately began to lay this farm down into permanent pasture, so as to make it a grazing farm. The existing grass being simply Rye-grass and Clover would be of no value to him, and it would, therefore, take him five years to finish it, and the outlay upon it would be very considerable, as seeds for permanent pasture cost fully twice as much as Rye-grass and Clover.

Suppose now at the end of six years this tenant had to leave, and another new tenant came in to take his place, there would not be a single ton of manure in the yards, and there would not be a single acre of land that had not produced a grain crop after being manured, except one single division of 100 acres, and that would have received 1000 tons the previous year, and therefore only 4-5ths of this (by "J. McK.'s" rule), or 800 tons, would be payable to the outgoing tenant, or say £200. This tenant, therefore, would be a loser of £175 in valuation of manure, and yet he would leave the farm in a better state than when he entered, and this at a heavy expense to himself, for grass seeds suitable for permanent pasture cost at least 15*s.* per acre more than common Rye-grass and Clover. But 500 acres at 15*s.* would amount to £375, and the loss on manure, £175, would swell his actual loss to £550. I think this illustration will show that the principle of paying for dung made on the land may work great injustice between incoming and outgoing tenants, quite irrespective of the landlord's interest.

But now let us carry on this comparison a bit further. Suppose it is the landlord who has put the farm all into pasture, and suppose he lets it with no dung in the yards. As a matter of course the tenant would pay no valuation at entry ; and suppose the tenant after a few years' grazing finds the farm getting out of condition (as it would do if no artificial manure be applied), and coming to his landlord asked him to break it up, and gets leave. Well, what happens if, in six or eight years after, he becomes an outgoing tenant, and the landlord has not provided another to take his place? Why if paying for dung had become a custom of the country the landlord would be bound to take the incoming tenant's place, and to pay the outgoing man for dung created out of his own land, although that outgoing man had not paid a single penny at entry ! I think that these two examples are sufficient to satisfy any unprejudiced man that paying for dung created out of the land is false in principle and unjust in practice.

Even as regards bought manure I am very sceptical as to the policy of paying any share of it, or of allowing any custom to grow up between incoming and outgoing tenant in regard to it. One thing is plain, that no tenant entering upon a farm would consent to pay the landlord for money expended by him in artificial manures, and I cannot see, then, on what principle a landlord should be called upon to pay a tenant for such outlay.

I have myself at this moment a large farm to let upon which I have expended in artificial manure, within the last three years, upwards of £2000, and, if I added on the cost of carting 10½ miles from the railway, the amount would exceed £3000, because the chief part was lime, costing 10*s.* per ton at the station, and to cart it home costs 8*s.* more. But if I were to ask an incoming tenant to repay me this outlay, he would laugh at me, although I am willing to let on a 21 years' lease. To illustrate my idea of a prudent farm agreement, I will, with your permission, give an extract from my printed particulars, which were drawn up some weeks ago, and which may possibly be interesting to "J. McK.," and others of your readers, who take an interest in this question of farm agreements. I may observe (in explanation of the quantities of manure and other things) that the farm is less than 1000 acres in extent, chiefly light land, in a hilly district, and with 800 acres suitable for rotation.

"The principal restrictions and conditions laid upon a tenant will be as follows :—

"1. To consume all hay, straw, and roots (Potatos excepted) upon the farm, and of course not to remove any dung made thereon.

"2. To bring in every year and lay down upon the farm as manure at least 120 tons of lime, 15 tons of superphosphate, 10 tons of salts of potash (kainite), and if Potatos are sold off the farm to bring in addition to the above 1 cwt. of superphosphate and 1 cwt. of salt of potash for each ton of Potatos sold.

"3. To sow every spring at least 80 acres with a mixture of good grass seeds and Clovers, which shall be left down at least two years, so that when leaving the farm, the incoming tenant may find at least 80 acres of young grass never cropped, and another 80 acres of young grass only once cropped.

"4. Not to take more than two successive straw crops out of the land without a root crop or a green crop intervening.

"5. The landlord will reserve all rights of shooting and sporting, but the tenant will be entitled to kill hares and rabbits during certain specified seasons, so as to keep down the ground game and prevent injury of crops.

"6. The customary reservations and conditions usually inserted in farm leases will of course be included.

"7. The usual time of entry to farms in this part of the country is Lady Day, March 25, and to the house and cattle buildings May 12 ; but the incoming tenant is entitled to go in and plough up the stubbles as soon as the crop is off, and the last which is to come up in rotation not later than February 2, if he desires it ; and he is also entitled to a share of the stable accommodation. In a general way the incoming and outgoing tenants arrange for certain prices to be paid for ploughing, and the conditions are put in simply in the event of the two not agreeing. There are no valuations of any sort either at entry or at leaving, and as the dung belongs to the land the incoming tenant can cart it out of the yards as it is made if he so pleases."

Although these conditions are proposed for a 21 years' lease, yet I feel sure they would do full justice to both landlord and tenant upon a yearly agreement, provided the tenant was entitled to 18 months' notice instead of only six months.

I feel sure that the system of not paying for dung is the true one, for it takes away all inducement to use stimulating manures in the last years of a lease. If an outgoing tenant were entitled to be paid for dung he could during the last two or three years of his lease apply either nitrate of soda, or guano, or sulphate of ammonia, all of which will swell enormously the amount of straw and hay, but of course at the expense of the land. But as he gets paid for dung it becomes his interest to swell the quantity as much as possible without caring three straws that the land is thereby impoverished. And it pays him to do it, for the extra produce of corn will more than cover the cost of the nitrate or the guano, and every extra ton of dung is an extra profit. But besides this it becomes his interest in the last year of his holding to cease stall-feeding and tread the whole of the straw into manure, for a ton of straw eaten will only leave a ton of dung, but a ton of straw trodden will leave 2½ tons. Your correspondent, "J. B. M." (see p. 875), is right well aware of this fact, and farmers now-a-days are quite as "wide awake" as any other class of the community.

G. A. H.

SORGO (*SORGHUM SACCHARATUM*) :

NORTHERN CHINESE SUGAR-CANE.

THIS remarkable plant, a native of the North of China, as the true sugar is of the South, is grown by the eccentric Celestials on a small scale only, and for the sole purpose of chewing the sweet stems. Its giant growth, and its beautiful and graceful appearance and refreshing greenness in the driest season, and the expectation of finding in it a rival to Sugar-Beet induced the French Consul at Shanghai to send some Sorgo seed to his Government. It was sown in the Merim Gardens at Toulon, and distributed by M. Roberts, the director, over France and Algeria. This was nearly 500 years after the Sugar-cane had commenced its journey from the same country to Arabia, and thence by Northern Africa through Spain across the Atlantic. In 1854, Mr. Browne, Agent of the United States Patent Office, took to America some French seed, which was distributed by the Government. The plant was cultivated by a few farmers, but it received little attention until an ex-governor of South Carolina reported the results of his trials to a farmers' club, which brought Sorgo into notice. Since 1855 its cultivation has steadily increased, and it is now one of the great crops of the country. It is grown in France and Algeria for alcohol chiefly, and in America for seed, forage, sugar, syrup, alcohol, vinegar, and beer. In the 10 North-western States, where it flourishes, there were in 1864, 366,670 acres of Sorgo, and sorgo-sugar was selling at Chicago at 4½*d.* per lb. But for sugar Sorgo has turned out a failure. Its great merit as a forage plant is its principal recommendation, and on this point an official report of the United States Agricultural Department has declared that the value of Sorgo for feeding stock cannot be surpassed by any other crop, as a greater amount of nutritious fodder can be obtained by it in a shorter time within a given space, and more cheaply. While grass yields a ton or a ton and a-half of hay, Sorgo will yield from 2 tons to 9 tons of dry fodder.

We scarcely know what the possibilities of yield are in England under high cultivation, especially with a revival in its favour of that neglected art of irrigation which Mr. Howard recommended in his paper on farming read at the Farmers' Club. Our further notes on this promising plant shall commence with the Chinese management. Sorgo (Loo-tsoh) flourishes wherever Indian Corn flourishes. The seed is sown for transplanting on warm ground, finely broken, in the middle of April. The young plants are watered with liquid manure as soon as they appear, and in three or four days watering is repeated night and morning if the weather is dry. They are pricked out, when 6 inches high, in rows 3 feet wide and 6 inches from plant to plant, and are again watered with liquid manure when a foot high. Weeds are kept down by hoeing until the cane matures, about November 1. The crop begins to come to market, however, early in September, or as soon as the stalks are sufficiently sweet for chewing. A Chinese labourer, earning 10*d.* a-day, can cultivate about 2 acres during the six months that the crop needs his labour.

In America it is found that Sorgo can be successfully grown on all lands where a fair crop of Indian Corn can be grown. Deep, loose, warm soil, even of poor quality, produce the sweetest and most juicy stalks. Irrigation is recommended, but can seldom be attained in the United States. In deep black loam Sorgo reaches a height of 16 feet or 18 feet ; what will it not do on our future sewage farms ? The juice of the giant growth is not so sweet, nor is it easily crystallised. The seed should be soaked 24 hours in tepid water, in which 1 oz. of saltpetre is dissolved to every 6 gallons. It is then dusted with gypsum, and drilled 2 feet apart, and 20 seeds per foot (for forage). In seven or eight days a 1-horse subsoil-plough is put between the rows, up one side down the other. This cultivation is repeated as the crop advances, but the plants must not be earthed up. The upper roots spring from the stalk above the ground, and they must be left exposed. The

first cutting may be made as soon as the crop is large enough for stock, and in ordinary seasons two others will follow. To dry the crop it should be set up in shocks, and the stack built with precautions for ventilation. One man with a subsoil-plough can cultivate 10 acres.

Sorgo is one of the giant crops of North China, which is remarkable, as Mr. Fortune informs us, for the great size of its vegetable and animal productions. The province of Shantung, it appears, produces the largest of fowls, merchants, horses, &c. The Egg-apples are 18 inches in circumference, the Sunflower 14 feet, the Sorgo 12 feet to 18 feet high. The stalk decreases in diameter very gradually, which is favourable to the weight of the crop. Tapering and drooping leaves spring from the nodes, which are 8 to 12 inches apart. As the seed ripens the stem becomes smooth, with a siliceous deposit, and it hardens as the starchy substances are converted into woody fibre.

An objection, in one sense, to this most productive crop is that it yields an enormous weight of forage in the summer and autumn months, when our natural Clovers and grasses, which do not require manual labour, are generally abundant. Still we hope that this notice of a plant, which will probably yield 60 or 70 tons of green forage on sewage farms, will prove interesting. The great desideratum on such farms, the number of which is likely to increase so rapidly, is an economical drying machine, so as to be able to store their enormous forage crops.

The American Broom Corn (Sorghum vulgare) is a species which hybridised freely with the plant we have described, and has been long cultivated in that country.

We have probably mentioned the reason that Sorgo has failed to obtain a footing in this country, viz., the labour it requires in July and August; nevertheless, some means of utilising so productive and nutritious a crop may yet be discovered on irrigated farms.

These notes on Sorgo are partly derived from a capital paper read before the Asiatic Society by Mr. V. D. Collins, an agent of the United States' Government, who was sent to China to observe the cultivation of Sorgo, and the mode of manufacturing sugar from its juice. Mr. Collins states that, in making sugar (in America), the mills express about 70 per cent. of juice to 30 of woody fibre; 5 gallons of juice yield a gallon of syrup, or about 333 gallons per acre: about a teaspoonful of thick lime-water is used to 4 gallons of juice, to neutralise the free acid (phosphoric) which exists in the cane. Sorgo is deteriorating in the United State, and the juice comes from the mill opaque, frothy, and of a yellowish green. "The great difficulty in manufacturing sugar from its juice is the existence of a gummy principle, which prevents crystallisation."

About eleven-twelfths of all the sugar extracted for general use is obtained from the ordinary Sugar-cane. The following is the estimated yield per acre:—Mauritius, 6000 lb.; Brazil, 5000 lb.; Cuba, 4000; Isle of Bourbon, 3300 lb.; Guadaloupe, 2000 lb.; Bengal, 1600 lb.; and Louisiana, 1000 lb. A gallon of alcohol is yielded by every 23 gallons of Sorgo juice. The processes of manufacturing sugar, alcohol, beer, and vinegar, from Sorgo syrup, are the same as in dealing with the syrup of the Sugar-cane. *H. E.*

THE PRINCE CONSORT'S WINDSOR FARMS.

[The following map, taken by permission from Messrs. Longmans' work on this subject, represents the relative position of the Windsor Farms.]

The Bagshot and Rapley Farms, which alone have not been yet referred to in our references to the Prince Consort's Windsor farms, lie some miles beyond the south-west of Windsor Great Park. They have not much special agricultural interest, being serviceable more as a shooting-ground.

Over the principal part of the land the soil is the poorest black peaty sand and gravel. This, however, is more especially the case at Rapley. The land attached to Bagshot Park is of better quality, and yields fair crops. The accounts of both are kept together, and we learn from them that besides the Barley and Oats grown on the farm (all consumed by stock), there has been an expenditure annually of nearly £200 on cattle food, and of £180 to £200 a-year on guano and artificial manures. In this way, then, besides attention to the drainage of the land, and its due cultivation in a restorative rotation of crops, it is plain that no means have been left neglected by which a gradual increase of fertility may be attained. That much of the increased produce is and will be destroyed by game is inevitable; the farms will nevertheless be serving the purpose for which they were intended, which no doubt has been both to furnish the requisite amount of sport when required, and to supply an example of poor and light land farming, of some interest to agriculturists.

The Bagshot Park, till lately occupied by Sir J. Clark, Bart., Her Majesty's Physician, includes about 60 acres of pasture and 100 acres of arable land. The adjoining Rapley Farm includes about 120 acres of pasture and 160 acres of arable land. The plough land in the former case is of fair quality. Very promising Wheat—a capital plant of red Clover and Italian Rye-grass (seeded with 20 lb. and 1 bushel per acre respectively)—fields on which Turnips had been fed by sheep, and lying then scarified so as to mix up the soil and sheep-dressing and avoid the loss of the latter in case of rain—and a ploughed Wheat stubble ready for the Mangel and Turnip crop taken over one quarter of the farm—made up the cropping as we saw it early in the spring.

The rotation includes two years in grass, the other crops being (1) Wheat or Oats; (2) Turnips, Mangels, and Potatos; (3) Barley. On comparatively little of the land can a good Wheat crop be grown; it is a light, poor soil, which would probably be improved by a dressing of the clay lying not very deep as a subsoil. It is being, and will be, greatly improved by liberal sheep-farming. Very poor Turnips, owing to a bad seed-time, and the subsequent attentions of rabbits and hares — comparatively poor grass—fair crops of Barley and Oats, also of Potatos, were grown here during the year of our visit.

The Lupine, too, has been successfully tried. Two bushels of seed are sown in May, without a dressing, in rows 9 inches apart. They need diligent hoeing while very young, but as soon as the plants have fairly hold of the ground they grow rapidly, flower in July and August, and by-and-by attain the condition of a half-ripe crop. A boy with basket and knife precedes the sheep, which are then folded over the land. He cuts the seed into his basket and the sheep feed after him. They eat readily the still succulent stems and leaves, and the crop has this especial advantage in the eyes of Mr. Graham, the energetic farm manager, that it appears to be distasteful to all kinds of game. A very valuable crop for poor, light land is thus available, especially where a great head of game exists—the principal points requiring attention during its cultivation being that it must be sown late enough, and folded early enough, to avoid frost, which at once destroys it, and that the land be kept clean by hoeing during its early growth. Buckwheat, for the use of the game, is also sown to the extent often of 20 or 30 acres; 1½ bushel is sown in May, and the crop cut when most of the seed is formed, and turned as carefully as possible until dry enough for harvesting, when it is stacked in the covers as the gamekeepers direct.

The coarse Irish cup Potato is grown to a considerable extent at Rapley. The crop is wholly consumed by pigs, being steamed and mixed with ground Oats and Barley, also the produce of the farm. The buildings are supplied with water-power for the various purposes of threshing, cutting chaff, and grinding corn; and the yards and sheds and stalls are filled with a good stock of horses, cattle, and swine.

The buildings, planned by the late Mr. Burness, include a couple of square yards, with threshing and other barns at either end, and divided by the central piggery, the one side including byres and feeding-

a, The Frogmore and Shaw Farms (see pp. 468, 472).
b, The Flemish Farm (see pp. 744, 745).
c, The Norfolk Farm (see pp. 189, 187).
d, The Bagshot Farms.

Fig. 169.—The Windsor Estates.

houses, and the other being open to the sun. Opposite one of these yards, on the open side, stand stabling and cart-sheds; and there are outlying houses, granary, poultry-house, &c. They are of wood and tile or thatch, and in a somewhat dilapidated plight.

The main items of receipt upon these farms are from cattle, sheep, pigs, and Wheat; the expenditure is, as we have said, large in manure, cattle food, and labour. In the last point especially the expenditure is large, as it must be in all establishments conducted on the patriarchal system of keeping on old servants long after they have lost their efficiency, and pensioning them off when utterly unable to work. It is not to be wondered at that land in these circumstances, and naturally poor, full of game, and being gradually brought into condition in spite of all these drawbacks, should be a tax upon the purse and capital of the tenant.

The Bagshot district is especially useful, because of the poverty of its natural condition, for all such operations as need mere standing-ground. This, considering its neighbourhood to London, they can find nowhere cheaper in the country. The manufacture of soldiers out of raw material supplied from lanes and pot-houses all over the country, has thus come to be conducted hereabout on a great scale. And no less true an example of a manufacture is furnished by the growth of Grapes under glass, also hereabout largely carried on. Compost heaps, bones and ashes, and other fertilising matters, furnish the materials out of which a living plant, in an artificial climate, manufactures produce for the Covent Garden market; and the very same means are in operation on the Prince's farms, under the natural climate, aided, however, by the meagre natural supplies which their poor soils afford, and resulting in the manufacture of material for Smithfield and Mark Lane.

LAND DRAINAGE AND STEAM TILLAGE IN DROUGHT.

On these subjects, and their relation to the drought of 1868, the following questions were distributed by Mr. Morton, and the following is his report on the information thus obtained, as published in the Journal of the English Agricultural Society.]

On Land Drainage:—Are there instances known to you of differences, as regards productiveness during so dry a season, between drained and undrained land, either arable or pasture? If so, please to give a particular history of them.

On Steam Cultivation:—Has deeply stirred and steam cultivated land suffered more or less than others from the drought? Describe any instances in detail.

It is plain that it is through their influence on the depth and thoroughness of tilth that both land drainage and steam cultivation influence fertility; and the answers to these questions may, therefore, be properly considered and arranged together. It is not to be supposed that a wet field, drained last spring and thus provided with so many additional exit holes below for the water which it held, would thereby be enabled the better to resist a drought which was drying it above. Neither can any one imagine that to break and stir and turn up deeply, whether by horse-power or by steam, any kind of soil during drought would not facilitate the drying process. The probability contemplated by the questions was, that both drainage and steam cultivation, by enabling deep and thorough cultivation, would, wherever they had been in operation for some seasons, have so enlarged the storehouse of moisture and of fertilising matter within the soil; and, by multiplying the inner surface presented throughout the substance of the soil, thus deeply drained and tilled, would have so increased the holding power of the storeroom thus enlarged, as to have proved a help against the drought. And this probability has been abundantly justified by the answers that have been received. Wherever the greater depth of land open to tillage operations by deep drainage had been properly worked—whether by steam-power or otherwise—for two or three years before 1868, the drought was effectually withstood. On grass land, of course, the deepening of the soil and its improvement by land drainage goes on more slowly than on ploughed land; and drained grass lands, equally with undrained, were burnt up last August; but they were not generally cracked so deeply, nor did they suffer so immediately, nor were they so long in recovering on the return of rain. On the clay arable lands of the country, on the other hand, there is not a doubt that deep drainage, two or three years old, proved very beneficial last year. Such lands were cultivated earlier in the season, and a deep tilth was thus obtained before the drought set in. They did not crack so much, or they did not crack at all. They were not so dry at a given depth as soils which had been wet; on which, therefore, the plough could not work until the drought had already come, and which were consequently cracked and fissured everywhere. Stiff soils, drained and cultivated, did indeed last year retain, up till the latest of the drought, moisture enough to feed all the early-sown crops, whose root-system had sufficiently developed before the dry weather of Midsummer. And thus Wheat and the earlier sown Barleys, and even Mangel Wurzel, yielded heavy crops on such lands wherever the plant as well as the soil had been managed properly. The explanation is simple enough. The quantity of water and of fertilising matter which a soil will hold depends on the extent within the soil of that surface of all its particles, by the attractive force of which this water and this fertilising matter are retained. Deepen the soil by drainage, and reduce it to tilth by cultivation deep enough, and you thus multiply the quantity of feeding ground to which the roots of plants have access, and on the quantity and wealth of which fertility depends. But, be the explanation what it may, the evidence is unquestionable that the drought of 1868 had more injurious influence on soils whose stores of food for plants lay within the shallow layer to which their usually wet condition had confined the cultivator, than on soils where deep land-drainage had both naturally spread the fertilising matter throughout soil and subsoil, and enabled a still more thorough artificial distribution of it by deeper cultivation.

The following report by Mr. Paget, of Ruddington Grange, near Nottingham, may be taken for an example. He says:—

"I have had a favourable opportunity this year of noticing the effect of draining. There is here a district divided by a stream for about four miles. On the right side of the brook the land is well drained, while on the left it is wet and undrained. The drainage was completed in some parts 40 years since, while in others it was only commenced five years ago. The district comprises both arable and grass land. The soil of the arable land is generally gravelly loam resting on a marl, and affords examples both of shallow and of deep draining. Where there is no under water except at a great depth, and the soil is too impervious to allow the rain water to escape with sufficient rapidity, tiles were put in 45 years ago, chiefly at a depth of 30 inches, but occasionally at 4 feet. They have remained perfectly efficient, and I have never discovered any advantage in the greater depth. In other parts drains have been put in at a depth of from 4 to 6 feet,—some of them by Elkington, others at different times during the last 40 years. These drains carry off the overflow of a 'water table'* supplied from below, so that moisture is always within reach of the deep rooted plants, such as Mangel, Beans, and Clover. The crops have in no case suffered from the drainage, whether shallow or deep. The soil at the end of July was moist at a few inches depth in the Mangel, Beans, and Cabbage plots; and the corn stacks in the drained district contrast favourably with those in the undrained. But where the water table was only a few feet from the surface, and the plants were always within reach of sufficient moisture, the crops were very good, the Mangel attaining 35, and in one instance 45 tons to the acre, and the Beans having a fair quantity of straw. The meadow land is chiefly a deposit from brooks descending from hills of the lias and red sandstone formations, and is a clayey loam. It is naturally very wet, but has been drained at depths varying from 4 to 8 feet. No amount of rain renders it unfit for stock unless accompanied by a flood; and 12 hours after the subsidence of a flood there is no trace of it except in its deposit. On comparing these meadows with the undrained grass on the other side of the brook, I believe that where the land had been very recently drained, and consequently the grasses proper to dry land were not fully established, they did not afford quite so much 'keep' as the corresponding undrained land; but as soon as the rain fell in August the advantage was on the side of the drained land. Those meadows which had been long drained had the advantage throughout, and where mowed, produced two-thirds of an average crop, and where depastured never lost a tinge of green. I have also aerated by steam; but having secured a deep tilth by subsoiling every fourth year for 20 years at least, I am satisfied that I derived advantage in the two last years, one being very wet and the other very dry, from the friable state of the subsoil."

Mr. Paget adds:—

"In Transylvania such a summer as we have passed through this year is by no means uncommon; and I have noticed that white Clover and grasses of the best quality grow very luxuriantly there, when the water table is not more than 2 feet from the surface. An intelligent agriculturist there expressed his conviction that to reduce the level to 4 feet below the surface would be injurious where the evaporation was so rapid as it is there. If this opinion is well founded, perhaps different rules ought to be applied to our dry Eastern Counties and the moist West; but my experience here does not confirm it. I have meadows where the supply of water to the drains is constant, in which the pipes are laid at depths varying from 3 feet 6 inches to 8 feet, and I fail to discover any advantage in the shallow drainage during the heats of this summer. I have never seen permanent bad effects from over-drainage. One field drained in 1863 became bare in May, 1865; but in the autumn of that year it was covered with white Clover, and it has now a good sward. I attribute this effect to the death of Carex, and of the water grasses which before occupied the surface. It is now well worth twice the rent compared with its former value. I have also satisfied myself that some drains which carry off the overflowing of the water table will cease to run when the evaporation is very rapid, and recommence on the recurrence of the soft moist wind without rain which often accompanies a falling barometer. This accounts for a phenomenon which some years ago puzzled draining engineers."

The next witness I shall call is Mr. Smith, of Woolston, than whom no one is better qualified to speak of the advantages of steam cultivation. He combines with his statement on this head some useful information also on the effects of land drainage during the late drought. He first describes his farm:—

"My farm, containing 112 acres of arable and 60 of grass land, consists of two distinct qualities of soil. The valley land is mixed gravel and clay. I have generally called it light land; it is, however, by no means light working land for ordinary horse culture; it always needed three horses to plough it. The hill land is very heavy clay. On grass land hereabouts the drained and undrained fields were both alike burnt up. I could not see that either of them had any advantage over the other in contending with the dryness of the summer. On arable land, that which was drained had the advantage, and greatly so in all cases,—in the Wheat crop, to the extent of more than a quarter per acre. All the crops on well drained land were fine and full, whereas all the crops on undrained land were thin on the ground, and nothing like so bulky when cut, yet they ripened well. The effect of drainage upon the Bean crop was very perceptible, for on the undrained lands they burnt up very early in the season; whereas on the well drained land they did not burn up so quickly; and on my own well drained and deeply cultivated lands they stood out to the last 10 days before harvest, and I had the honour of having the best Beans in the neighbourhood this dry summer, the result of drainage and deep steam cultivation. I can, however, give you one instance of drainage having done an injury to a good meadow. Forty years ago a mill in the adjoining parish was pulled down. I have a meadow that floods in the winter, and had always been mown. It is situated half a mile above this mill; and as soon as the mill was pulled down, this meadow gave a less produce than it had done before by more than half a ton per acre yearly; and it continued to do so for 15 years, until a weir was put up holding the water to the height it stood before the mill was removed; and then the meadow at once returned to its increased productiveness, and it has continued so ever since. Side main drains have been put in, so that the uplands are all well drained, although the water in the river stands at its former height. The deep stirring of my land by steam-power has enabled it to withstand the drought better than shallow horse-worked land had done. This was clearly shown in my Bean crop. They were planted at the same time that the neighbouring horse-farmers planted theirs, yet they came up first and kept first. They stood 5 feet high, and were well corned, and kept green longer than those on horse-worked land did, and were much the best crop in the neighbourhood."

The history of the river-side meadow, given by Mr. Smith, can hardly be taken, I think, to prove an injury by land drainage. Some of the advantages of the watercourse being obstructed by the mill, to which he testifies, have, no doubt, arisen from the top-dressings which the land obtained by winter floods, which were lost when the obstruction to which they were owing was removed. But even if we are to attribute the present heavier grass crops and those of former years to the higher "water table," as Mr. Paget calls it, within the soil, which is created by the impounded river, it is by no means certain that a different management of the land after the water had been permanently lowered, would not have resulted in still greater fertility. There is many an agricultural operation beneficial under proper management, of which those who maintain the old management under the new conditions, are unable to realise the advantage. To one instance of this reference will be made hereafter, and this may be another. It is possible that if the Woolston meadow, instead of being annually mown when thus incidentally laid dry, had been annually grazed, the report of its tenant might have been different.

(To be Continued.)

* This term is no doubt intended to convey the idea (probably the fact), that there is at a varying depth, within or below all soils, a surface, up to which water stands in a free and liquid form, and above which it is drawn by capillary attraction, moistening without wetting, being mingled with air as well as earth.—*J. C. M.*

Home Correspondence.

Present Appearance of the Crops.—*Essex:* Notwithstanding the long continuance of dry weather, my opinion is that in my parish and neighbourhood there will be some excellent crops of Wheat and of other kinds of grain, where the land has been decently farmed, that is, deeply and well cultivated and kept in good working condition; but on light lands, miserably cultivated and in impoverished condition, of course the crops must be light; but I will venture to state that, taking my parish altogether and some neighbouring ones, the crops will be nearly, if not quite, an average of former years. The Beets are also unusually promising, and I have seen some promising crops of Swedes. But I understand the fly has made great destruction among these and other kinds of Turnips in many places; but still, taking the prospects altogether, I think there is nothing to cause the least alarm, neither to lower the price of land, nor to any extent that of labour. Of course the hay and Clover crops must be light, but I have seen some exceptional crops of good Clover, and should also think that in low meadow lands there are some good yields of grass; and it should be borne in mind that where such is the case the hay will be unusually good. Landowners, therefore, need not fear that their farms will be thrown on their own hands, nor need labourers fear that they will not obtain employment so far as this neighbourhood is concerned. *Geo. Wilkins, Wix, June 27.*

—— *Somersetshire:* The crops and herds are suffering greatly from such protracted dry weather. The pastures have gone off like a dissolving view, whilst corn crops of various kinds have been gradually but surely turning worse and worse for pure lack of moisture. Wheat varies very much. I think, perhaps, in this district one-third is thick enough, and may turn out an excellent crop; another third is nearly an average in appearance, and the remaining part miserably thin, and will not produce half a crop; so on the whole

we must not expect an average. Barley promises to be very good, *i. e.*, all the early-sown; the late-sown on heavy stiff land is suffering much for want of rain. The hay crop will be very short indeed, in fact some pieces will not be worth mowing. There are many good plants of Mangels, and may be good if rain comes soon. *Walter Farthing, Stoney Court, Bridgwater.*

Estimate of the Crops.—This is a more unfavourable season for light-land farmers than even 1868, and must cause serious losses, unless we should be favoured with rain shortly. These, falling on the dry and heated soil, would promote a rapid vegetation, and probably give large second crops of hay and abundance of late green and root crops. The first hay crop may be considered the worst we have had for many years. There are, of course, local and climatic exceptions to this, as in the South of Ireland and in North Lancashire. Barley will be good in places on cool bottom land, though very short in the straw, but it is very deficient on all hot, thin soils. Potatos are generally very healthy, and promise to be a good crop. Oats on well-farmed clays look promising. Beans are very short in the straw, but well-bloomed. Peas a poor crop on light soils. Mangels plant well where the land has been manured and deeply cultivated before winter, which is best for all root crops. The fly has destroyed the early sowings of Swedes in many places. When we consider that one-half the kingdom (22,500,000 acres) is in permanent pasture, in addition to 7½ millions in green and root crops, and only nine millions of acres in grain crops, the loss of meat-and-milk-making substances in the first cutting must be very great and injurious to the pastoral farmer. Our country and climate are undergoing considerable changes, and we should adapt our crops to the altered circumstances. By drainage, and by the removal of woods, fences, and trees, we have rendered our climate and soil drier and warmer, and consequently more suited for deep-rooted plants, and more hazardous for the shallow-rooted. Wheat sends its roots down from 3 feet to 5 feet deep, and is thus a dependable plant in a dry season. Oats are also much deeper-rooted than Barley. Clover and Tares being much deeper-rooted than ordinary grasses, are more safe plants under our altered conditions. Mangel, with its deep roots and shining leaves, luxuriates in our southern and mountainous counties and bright sunshine. Winter Beans, winter Barley, and winter Oats will probably soon establish their superiority over late-sown spring crops. I observe that winter Beans and Wheat have suffered very little from the severe winter on well-drained soils, as compared with undrained lands. My own crops of every kind, except pasture, are very satisfactory on my heavy land, but not so good on the light land. Ireland this year is in a more favourable position as to her general crops. Nine-tenths of all our Wheat are grown in England, and only one-tenth in Ireland, Scotland, and Wales. *J. J. Mechi.*

"Opus, Digswell."—Your correspondent who affixes this humorous signature to his paper comes in to help Mr. Smith, and I suppose upon the good old English maxim of taking the weaker side. He finds fault with me for saying that farmers are manufacturers and merchants, and then goes on, "Does he ('G. A. H.') think before he writes? Where is manufactured hay this season? Is corn grown wholly by hand or art?" Dear me, what an old house I have brought about my ears! I have heard that grass grows, but I certainly never knew that it made itself into hay! I have heard that wool grows on the back of a sheep, but I never heard that it made itself into cloth! I have heard that Cotton grows upon a plant, which I daresay "West Indian" could tell us something about, but I never heard that it made itself into muslin! I have heard that Wheat grows, but I never knew that it sowed itself, or reaped itself, or threshed itself, or that it made itself into flour. "Opus, Digswell," is in doubt whether I think before I write, but I would like to ask him now if he thought before he wrote. If he did, will he then answer me these questions? Does Wheat sow itself? Does Wheat reap itself? Does Wheat thresh itself? I suppose he will admit it does not. Well, then, does Wheat grind itself into flour? and if not, is the man who grinds it into flour a manufacturer? and if he be, why is he a manufacturer one bit more than the man who sows it, who reaps it, and who threshes it? "Opus, Digswell," then goes into a serio-comic religious rhapsody. Does "Opus" believe the sun will rise to-morrow? He cannot be sure, but he hopes it will. When "Opus" (who tells us he is a gardener) informs his employer that he will have ripe Gooseberries to send in in a few days, how does he know he will have them? When he says there will be a splendid crop of Lady Downe's, Mrs. Pince, and Muscat of Alexandria Grapes, how dare he be so impious as look forward so far? Or when his employer bids him get the grassplot mown, how dare he say he will do it in the morning, when the dew is on it? How does he know he will ever see the morning light? "Opus" pays a compliment to my "literary" calibre, I hope he has gauged it more truly than he has his own "mental" calibre. *G. A. H.*

The Drought of 1870.—The present extraordinary summer has naturally evoked many comparisons between this and previous summers of a similar character. So far as I have observed, however, these comparisons have not gone back as far as the year 1818, of which my recollection is clear; and to its peculiarities, as respects the drought which then prevailed, I beg leave to call your attention. Some of your readers may be interested in what an old man can tell them. In 1818, at this place, we had no rain of any importance between early in May and late in September. The hay crop was of course very short, Lent corn deficient, Wheat fair. Of root crops I have no distinct recollection, but they must have been an utter failure. As autumn approached large trees, Elm and Ash especially, whose roots are superficial, lost their leaves. The meadows and pastures became perfectly brown, and my father, thinking that the future growth of grass might be stimulated by the removal of the withered herbage, set fire to it in more than one field. The flames ran along the ground with so much rapidity that the utmost efforts of my father, a workman, and myself, were required in order to prevent the flames from communicating with a wood. My place of residence is but little removed from an extensive chalk district, reaching many miles in every direction. Throughout this large tract the drought of 1818 was most severely felt. The usual water supply was then derived from catch-ponds. A few very deep wells existed, which, piercing through the chalk, reached the water-bearing beds beneath it, but these were too much scattered, even if they did not fail altogether to do much service. Tanks, now to be found on almost every farm on the chalk land, were then almost unknown. The resource for the farmers was to send their animals to the nearest water-course, either to the head of the Ravensbourne on Keston Common, or to the nearest accessible point on the Darent in the Holmsdale Valley. Water-carts were also extensively employed, and often had to travel many miles daily. We may still hope that the drought of 1870 will be less disastrous than that of 1818. It must not, however be forgotten that it commenced earlier in the present year, and will therefore last longer unless terminated before the autumnal rains. I have read and been told that 1826 was a summer of unusual dryness; I cannot say that my recollection bears out this statement, but then I was abroad for a great part of that summer. In conclusion, I will call your attention to a fact to which little attention is generally paid. I allude to the great difference in the amount of rainfall in places near each other as the crow flies. This is a fact which can hardly escape the notice of even an ordinary observer. It seems to me to depend much upon the existence and direction of deep valleys, up which the wind conveys the moisture-bearing clouds which do not reach the intermediate land. *George W. Norman, Bromley Common, Kent, June 23.*

Mr. Smith and his Straw.—When I first tackled Mr. Smith I thought he must be a good practical farmer. Every time he writes, however, only shows me how immensely I over-valued his knowledge. He finds himself beaten as to the fact that straw, when eaten by an ox, "goes in straw and comes out straw," and so now he tells me my little yearling ox "before it has eat half 3 or 4 tons will become lousy, and these lice will eat it up before it gets through the other half." If Mr. Smith wants experience, and wants to learn that young oxen wintered upon straw do not get lousy, I would advise him to travel through Wales next winter, where he will see thousands of them who get nothing but straw for 5 or 6 months, and yet do not get lousy. Let Mr. Smith try the experiment for himself next winter. It will do his farm more good than cramming his straw into a "water-cart," 1 ton of straw to 3 tons of water, and then putting it on to his land under the hallucination that he has converted it into manure! *G. A. H.*

Cambridgeshire Fens.—Around this district there is considerably more pasture and grazing land than in other parts of the fens, and some of the old bullock pastures in ordinary years compare favourably with the finest lands of the same class anywhere to be found; but the two months' drought, that only terminated a week or two ago, not only reduced the grazing lands to the barest possible state, but in many cases the farmers were obliged to stock the meadows, which should have been reserved for hay, and this, too, with considerably less stock on the farms than last year; for example, on a farm with which I am closely connected, consisting of about 600 acres, 180 of which are under grass, in 1869, on June 21, there were 80 head of horned cattle, and about 900 sheep; and at the present time the total number of cattle is under 40, and not more than 800 sheep. Thus, it is clearly evident that the grazier must be very much "the wrong side of the hedge" this season. The hay crop, too, is almost a complete failure. On the farm above-mentioned, from a meadow of 18 acres last year, were taken 47 good loads, and the same field last week was cleared in seven loads; so that, if the owner had not luckily a good supply of old hay left over, the horses and stock would have to fare very badly in the coming winter. I have heard complaints from some farmers—men of experience—who declare that it is the drainage, of which we are naturally so proud, that is the great cause of this scarcity of winter provender; they say that from the excessive drainage every particle of moisture is drawn out of the soil, and the consequence is, that the grass lands "burn" so much more quickly than they otherwise would do. As Shakespeare says—"Though this may be madness, yet there's method in it;" but these same grumblers would think twice before they consented to return to the amphibious condition in which the first cultivators of the fens existed. The proverb says, "There's a silver lining to every cloud," and I am pleased to see several pieces of very good Clover, although, of course, they are exceptions. May the happy possessors of such crops get them in in good condition. *Nemesis.*

Fisken *v.* Roundabout System.—"G. A. H." might have seen the cost of implement quoted by me was an error, but I will repeat his own estimate, p. 287: "The ploughing apparatus (Fisken's), exclusive of the engine, will cost £350. . . . Supposing an ordinary portable engine employed, it would cost at least £250." Here we have as the cost of Fisken's, with a 10-horse power engine (portable), £600. "G. A. H." does not answer my inquiry where tackle on Fisken's system is to be found averaging 13 acres a day, engine same power (10-horse) as Smith's. It seems requisite that I should bring to "G. A. H.'s" recollection, that farms, at a rule, do not consist of fields with old trees embedded in the ground; the stones that are to teach his plough such jumping tricks, are few and far between; exceptional work and ground require to be dealt with accordingly. "G. A. H." writes, p. 842, "neither can a good roundabout of Fowler's make be set to work for any such sum," viz., £525; let me supply him with the cost of the roundabout, as sent out by Fowler and Howard:—

	Tackle for ploughing Engine	Cultivating Apparatus	
Fowler's	£450	£150	= £600
Howard's	270	250	= 520

West Indian.

Trials of Reapers.—A public trial of one of Messrs. J. & F. Howard's (of Bedford) mowing-machines took place on Saturday, the 18th ult., within a mile of Shrewsbury, under the management of their agents, Messrs. Spence, who had conveyances to take the farmers to and from the field, free. The crop to be cut was such as to severely test the cutting powers of any machine, one end being a thick plant of Clover and Rye-grass, and the other end an extraordinarily thin and short crop of Rye-grass, enough to puzzle one of those wonderful razors that induce men to shave to perform its office. Cutting began at 9 o'clock A.M., and ended at 5 P.M., when 11 acres had been cut without a single hitch or stoppage, and the work was all that could be desired. Messrs. Spence made it quite a Howards' day, by having one of Howard's patent self-acting horse-rakes at work in the same field, raking the thin grass into wind-rows, lightly and beautifully wound together, with an aperture through the middle, like a lady's muff, for the drying wind and air to permeate and carry off the moisture that leaves grass hay; and exposing to the view of the large assembly of farmers present the level and closely shaven surface left by the mower, which called forth universal praise. I may just state that in passing from London to Salop spring grain crops did not appear to promise more than two-thirds of an average crop, and Wheat will be the worst that has ever been known in a dry season. Hay is very bad, but if we have the winters of 1844 and 1868 cattle will get fat without hay, though graziers are now giving their cattle hay in June. *Go-a-head.*

The Sheep Tick.—I have unavoidably been prevented from noticing until now the remarks made by your correspondent, "O. F.," on my letter about louping ill, and ticks as the cause of it. "O. F." says of my letter:—"There must be some error in your writer's idea of certain lands in certain districts being infested with sheep tick." This sentence makes it evident that when "O. F." and I write about ticks we respectively apply this name to two entirely different insects. His remarks apply to the fag or kaid (Melophagus Ovinus), which breeds upon the sheep, and is, I suppose, to be found in every flock, probably on every sheep, in Great Britain. My remarks had reference to the true tick (Ixodes Ricinus), which breeds in the ground, is found only in certain districts, and fastens itself on sheep and other animals during a part only of its existence. Instead of moving about amongst the wool like the kaid, the tick at once inserts its head deeply into the skin of its victim, and remains fixed in the same spot—so firmly fixed that it is difficult to pull it out—until it has completed its course, when it drops off into the ground. It makes its appearance among the herbage in spring in its active stage, gets upon any animal that comes in its way, and fastens upon it in the manner already mentioned. There are some grazings in the South of Scotland so infested by these ticks that the occupiers dare not put sheep upon them until midsummer or even later. Cows and Shorthorn yearlings also suffer severely from them; the only stock that sustain their attacks with impunity being West Highland and Irish cattle. A great deal of misunderstanding has arisen from the name tick being applied indiscriminately to these two distinct parasites, which differ so entirely in their habits, and in the effects which they produce on the animals upon which they are found. On consulting such books as I happen to have by me, including Youatt, Spooner, "The Book of the Farm," and "Morton's Cyclopædia," I find more or less of

this vague use of the name, tick; some of the statements made applying to the one parasite, and some to the other. In the *North British Agriculturist* of the 22d inst., there is an article on the dipping of sheep, all through which the name tick is used, although the context makes it evident that it is the Melophagus or kaid that is meant. The same thing constantly occurs in advertisements by the manufacturers and vendors of sheep-dipping stuffs. My object in now writing to you is to try to clear up this confusion; and in particular to explain to your correspondent, "O. F.," who appears to be an experienced flock-master, that my former letter had exclusive reference to the true tick (Ixodes Ricinus), from which his part of the country seems, happily, to be exempt. *John Wilson, Edington Mains, June 27.*

"West Indian."—If your readers care to refer to the short paper he quotes they will find my argument was that a man might rent a cowhouse in a town, and feed cows or cattle on bought food, but that did not make him a farmer. Now, what has that to do with the question I put to Mr. Smith? "West Indian" ought to know there is such a thing as *suppressio veri* as well as *suggestio falsi*. When a witness comes into the witness-box he is sworn to tell the truth, the *whole truth*, and nothing but the *truth*. Now, the question I asked Mr. Smith was, not "how much he spends on purchased food," but, "how much he has spent in *artificial manure* and bought food during the last 20 years." (Pray give the italics, for they are the horse's egg in "West Indian's" mare's nest.) As to the East Lothian farmers, I suppose the warm climate "West Indian" comes from prevents him venturing into the domain of east wind, and so he knows nothing of the crack farmers of Scotland. If he went there, however, he would find there are a great many long-headed fellows amongst them who grow a vast quantity of Potatos at high prices, but who also know right well that if they send away their roots their land will soon cease to be fertile; and as they have their farms on lease the loss would be their own. So they take good care to replace the Potatos with bought food and artificial manure. "West Indian" is a landlord; would he then like to let his lands on the Woolston form of agreement, which I have covered with so much ridicule? If so, let him advertise them, subject to no restrictions except "Pay your rent and keep your land clean," and I have little doubt he will have a crowd of applicants willing to go in and possess the land upon those terms even at an increased rent. If he has land enough, I dare say even an East Lothian farmer might think it worth his while to migrate southwards for three or four years, and suck "West Indian's" orange. *G. A. H.*

Foreign Correspondence.

PARIS: *Weather and Crops in France.*—The long-continued drought has given rise to intense anxiety; it is said that for two centuries such a prolonged absence of rain has not been experienced.

It is feared that the crop of cereals will be lamentably deficient, and the price of bread here in Paris has already risen to 9*d.* for the two kilogrammes loaf, equal to 4¼ lb., and it is expected to reach a franc; when, according to custom, the Government will step in and stop any further rise, by an arrangement with the bakers.

The harvesting is now commenced in nearly all parts of France, and the reports of the yield are terrible. Where some rain has fallen the crops range between a half and a quarter average, but in places where the drought has been absolute the crops are scarcely worth carrying. A great many breeders have been forced to drive their cattle to market for want of the means of feeding them, and a great depreciation has consequently taken place in prices: during the last fortnight the value of beef and veal at the Paris market has diminished by nearly 3*d.* per kilogramme. Should the drought continue, the feeding of cattle will become next to impossible.

All kinds of food are being resorted to for cattle, amongst others straw chopped up and steeped for 24 hours in water containing from 5 to 10 per cent. of molasses,—the cattle eat this food with avidity, and are found to thrive well upon it; another method is to steep the straw in water containing salt and powdered oilcake. Unfortunately the amount of straw itself is extremely limited, and the same is the case with Beet-root pulp and molasses.

Rye, Barley, Oats, and even Wheat, which seems to have suffered least of all the cereals this year, have not attained half their usual height, and the ears are poorly filled, so that straw and grain will be alike scarce.

An application has been made to the Minister of Agriculture and Commerce to throw open the forests and communal lands for pasturage, and the demand was immediately complied with. This will afford the breeders considerable relief; a great quantity of grass has been cut, and cattle and sheep are busily cropping away under the trees. The action of the Prefects and others in authority has been quickened by a discussion on the subject in the Corps Législatif.

Agriculturists are occupied with the subject of raising early green crops for forage, and the following plants are specially recommended:—Maize of several kinds, such as the Horse-tooth, Giant Caraqua, to be planted at the present time, and others, such as Auxonne and Quarantain in July; Millet, white, red, and black; Italian Panis, Moha of Hungary, and Alpiste, which may be sown until July 15, and being cut green and winnowed with care yield a coarse grass of good quality. The common Sorgo or Great Broom Millet is also strongly recommended for green fodder. Cabbage of various kinds, such as the Cavalier, Caulet de Flandre, Branchu of Poitou, Moelliers, and Scotch Kail, are being largely sown for autumn crops; also spring Colza, summer Turnips, white Mustard, and other plants of the same classes. It is recommended also to sow Beets, such as the Yellow Globe and Great Globe varieties, which under fair circumstances will still produce a half crop or more, and help to economise the small stock of dry fodder.

Unfortunately the drought has not only seriously injured the fodder and grain crops, but everything except fruit trees and deep rooted plants; summer fruit is, however, scarce and very poor. Three-quarters of the crop of Colza is said to be lost. Fortunately Algeria will afford some compensation. The harvest commenced in the early part of the month all along the Mediterranean shore. The hay is very abundant, the Barley is nearly all in, and the later Wheat is said to be magnificent; even that which was beaten down by the rain has recovered itself under the influence of the fogs which have this year visited the "granary of France." As to the Vines, Olives, and Tobacco, such abundance has scarcely ever been seen, and the Flax and Cotton plantations are reported to be in fine condition. The soldiers are employed in assisting to get in the harvest, and France will probably derive more benefit this year than she ever did from her costly military possession.

Some parts of France have been more favoured than others of late; thus, after many months' drought heavy rains have fallen in most of the southern departments, near the mouths of the Rhone. In the plains of Dauphiny around Lyons much of the grain is cut, but although the ears were well filled the grains are milky and poor, so that there will be a large amount of bran; the straw is very short. In the best wheat lands, however, the case is different. Where there is a cool subsoil the ears are full, and the grain well matured, while the crops are exceedingly clean, from the fact that the weeds have perished for want of moisture. The same remark applies to Colza, but the Potatos have suffered from dryness at flowering time.

A week since, when rain was falling in the Loire and other places, it was snowing heavily at Dessat and on all the heights around; near St. Dizier the whole country was under a white sheet.

At Alais a short time previously (on May 29) occurred one of the most remarkable hailstorms on record, the particulars of which have been communicated to the Academy of Sciences; the hailstones were as large as nuts, but pear-shaped, and in some parts they covered the ground to the depth of "30 centimètres," just 12 inches! At three o'clock the sky became suddenly obscured, and the hailstorm lasted just half an hour when the sun reappeared, and the heavens were as serene as before, but the work of destruction was accomplished, the Oats and Wheat were cut to pieces, and the Vines completely stripped of their leaves; the hailstones were so hard that many of them were found in the fields the next morning. M. Dumas, the secretary of the Academy, after the reading of the communication, added:—The storm, indeed, assumed unusual proportions; a large Olive, perhaps a hundred years old, was uprooted and carried to a distance of more than 100 feet; the Walnut and Quince trees were stripped of their bark: the storm raged over 20,000 hectares (50,000 acres), and the loss is estimated at many millions of francs. *G. Y.*

Societies.

HIGHLAND AND AGRICULTURAL.

Edinburgh, June 22.—A general meeting of this Society was held, the Duke of Buccleuch presiding. One hundred and forty-three new members were balloted for and admitted.

Proposed alteration of Bye-law.—A proposal to admit to the membership at the reduced fee of 10*s.* all tenant-farmers who are not also proprietors of land to an extent exceeding £500 per annum, and all secretaries and treasurers of local agricultural associations, resident agricultural factors, and others, whose incomes do not exceed £500 per annum, was remitted for further consideration to the board of directors.

The Dumfries Show.—Mr. KINLOCH, yr., of Gilmerton, convener of the General Show Committee, gave in a report of the arrangements for the show, which is to be held at Dumfries on July 26, 27, 28, and 29. The arrangements, he stated, were progressing very satisfactorily, and the entries, as made up on the previous night, showed that, with the exception of last year—which he presumed must be looked upon as an exceptional year for some time—there was a larger number of entries than had ever been obtained by the Society on former occasions. Comparing the entries with those for the Dumfries Show of 1860, he found there was an increase in the number of entries on this occasion in every department, with the exception of dairy produce. The following Table shows the entries which have been made for the forthcoming show, with the entries at the show in 1860, for comparison:—

	Dumfries 1870.	Dumfries 1860.
Cattle	360 ..	298
Horses	270 ..	196
Sheep	775 ..	538
Swine	72 ..	54
Poultry	375 ..	206
Dairy produce	623 ..	195
Implements	1650 ..	911
	3465	2398

Being an increase of above 1000 entries. The decrease in the number of entries of dairy produce might be accounted for by the fact that the autumn show at Kilmarnock had obtained a position for itself which it did not have in 1860. The most important thing to which he had to draw the attention of the meeting was to the special railway arrangements, which had now been completed. He had to call the attention of the meeting to the fact that the days on which the show was to be held had been altered. The show, it was now arranged, would commence on Tuesday, July 26. The meeting of the local committee would be held on Tuesday forenoon. The judges would commence work at 1 P.M. on Tuesday, instead of the morning of Wednesday, and the show will be open to the public as soon as the judges begin. On Wednesday, Thursday, and Friday the yard will be open from 8 A.M. to 5 P.M. each day. The price of entrance had been reduced for Thursday and Friday after 1 o'clock. That plan had proved very successful at the shows in Edinburgh and Aberdeen, and had now been adopted as the rule of the Society. He wished to call attention to two alterations in the regulations—in clauses 11 and 12. Clause 11 referred to cows and heifers in-calf and mares in-foal, and it is said, "with reference to regulations 7 and 9, birth of at least a seven months calf must be certified; and in regard to regulation 10, birth of at least a nine months foal." That clause was adopted in consequence of their having considerable difficulty in finding that any of the animals that were shown "in-calf" were in-calf. Clause 12 referred to the duties of the veterinary surgeon, and the position he would occupy with regard to the judges. It was as follows:—"A veterinary surgeon will attend each set of judges on horses. He shall examine those selected for premiums, and shall declare as to their soundness before the judges finally decide, but the veterinary surgeon shall in no way interfere with the judging."

Chemical Department.—The SECRETARY read the following report from Dr. Anderson:—

"That the business of the Chemical Department during the past half-year has been carried on in a satisfactory manner. The number of analyses, though not quite so large as during the corresponding period of last year, has been quite up to the average, and has embraced the usual variety of work. Although the state of my health has not enabled me to engage in actual analytical work, every analysis has passed through my hands, and I have been enabled to express my opinion as to the quality of the manure it represented. As regards the manures examined, the point which most especially merits the attention of the farmer is the general inferiority of the Peruvian guano imported during the present season. I have already, on various occasions, pointed out that during the last few years Peruvian guano has by no means reached the standard which it formerly had, but that the ammonia, which once generally exceeded 17 per cent., has latterly rarely reached 16 per cent., and has often been not more than 15 or 15.5, which, at present prices, is equal to a diminution in value of about £1 per ton. During the present season much Peruvian guano has been imported, containing from 5 to as much as 10 per cent. of sand, and only 12 or 13 per cent. of ammonia. Such samples are certainly not adulterated, but are in the condition in which they are taken from the deposit, and show that the excavators have come upon a portion which is of a lower quality than that with which we were formerly supplied. However this may be, it is obvious that the farmer should at the present time exercise unusual caution in the purchase of Peruvian guano, even when it comes from sources which, under ordinary circumstances, would be considered above suspicion. The deliberate adulteration of Peruvian guano is not frequent at the present moment, but several cases have occurred in which from 10 to 20 per cent. of gypsum had been used for that purpose. A good deal of inferior dissolved bones have been in the market, made either from bones which have been boiled for the extraction of gelatine, or by adding a considerable quantity of bone ash. The use of this article enables the manufacturers to obtain a more pulverulent and drier product than can be produced without it, while it is still guaranteed as made entirely from bone without admixture of mineral phosphates, although the diminution in the ammonia materially affects the value. Small quantities of coprolites and other cheap materials are also frequently used, and it is now comparatively rare to find dissolved bones made solely from raw bones and acid as those sold 12 or 15 years since usually were. Of course there is abundance of excellent dissolved bones in the market, provided the farmer uses proper precautions in purchasing, and it will generally be found that the best bargains are obtained by taking the higher-priced articles. The feeding-stuffs analysed have been of the usual kind, and have shown the usual proportion of good, bad, and indifferent samples. Two or three samples of adulterated rape cake have occurred, which is unusual, the low price of that substance making it difficult to find a substitute for it. In the cases examined, the material was a heterogeneous mixture, containing a little Linseed, Rape, Indian Rape, Mustard, and

a quantity of vegetable *débris* of various kinds so disintegrated that it could not be identified, and the best account I can give of it is that it might be the sweepings of a warehouse floor. It is not likely that adulteration of this kind can be carried on to a very large extent, but that it is possible is worthy of notice. The field experiments extending over a rotation are still in progress, and the plots this year are in grass for hay."

Mr. HUNTER of Thurston said he wished to read a letter from Messrs. Thomson, Bonar & Co., as follows:—"The object of the present is to announce that the price of Peruvian guano, heretofore £13 per ton, is advanced from this date to £13 10*s.* per ton." That statement was in direct opposition to what they had heard from Dr. Anderson.

Mr. GEORGE HARVEY, Whittinghame Mains, said he hoped that before the next half-yearly meeting the directors might see cause to make some alteration in the chemical department—namely, to have at least an officer in Edinburgh to whom the members could apply. They were aware that they had had two or three bad crops of Turnips in some districts, and a large quantity of manures and feeding stuffs had been used. He thought it would be of great advantage if they had a person in Edinburgh to whom they could apply; and he left the subject in the hands of the directors.

Agricultural Education.—Professor BALFOUR reported that the two prizes of £6 and £4 annually given by the Society to the students in the agricultural class in the Edinburgh University who pass the best and second best examination were this year awarded to John M'Dowall, Stewartry of Kirkcudbright, and Robert M'Cracken, Wigtownshire.

Forestry Department.—Professor BALFOUR, chairman of the Committee on the Forestry Department, stated that on a report by the Woods and Forests Committee, the directors had resolved to institute examinations in the Department of Forestry, and to grant first and second-class certificates bearing the arms of the Society, and signed by the president, the examiners, and the secretary of the Society. He said that the committee had felt it of great importance than those coming forward in this department should be properly recognised and examined, and competent to take charge of forests in India or elsewhere. They were anxious that something should be done in this country to educate men here, and not to necessitate their going abroad for that purpose. The Indian Department had taken up the view that, as there were large forests in Germany and France, young men should go there and learn. It might be useful that they should go there, but if they did so, these young men would, in the first place, have to study German and French, and have to be able to speak colloquially the peculiar language of the foresters there. A long time had to be spent before a person could speak the German and French languages; and he would say that it would be better to make them study Hindostanee. If they could give them the elementary education here, it would be of great importance. It did not require an immense extent of forest to teach a man; and he believed they had the forests and the men here who were suitable for teaching those who would go to India. Therefore they were anxious that the Society should take a step in the right direction, and show the Indian Department that they could do so. The report bore that candidates must possess—"1st. A thorough acquaintance with the details of practical forestry. 2d. A general knowledge of the following branches of study, so far as these apply to forestry:—The outlines of botany; the nature and properties of soils, drainage, and effects of climate; land and timber measuring and surveying; mechanics and construction, as applied to fencing, draining, bridging, and roadmaking; implements of forestry; book-keeping and accounts." The directors have appointed the following Board of Examiners:—1. Science of Forestry and Practical Management of Woods—Dr. Cleghorn, Stravithy, St. Andrews; Mr. John Macgregor, Ladywell, Dunkeld. 2. Elements of Botany—Professor Balfour, Edinburgh. 3. Nature and Properties of Soils, Drainage, and Effects of Climate—Professor Wilson, Edinburgh. 4. Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Draining, Bridging, and Roadmaking; Implements of Forestry—Mr. A. W. Belfrage, C.E., Edinburgh. 5. Book-keeping and Accounts—Mr. Kenneth Mackenzie, C.A., Edinburgh. A syllabus of the examination in each department had been prepared, and was recently published in the newspapers, and copies might be had on application to the secretary. It is proposed that the next examination should be held about November. There was a large number of zealous men connected with arboriculture in Scotland, and he trusted that they could show that in that department they could take their place without going to Germany and France. He suggested that in regard to forest appointments in India a memorial should be sent by the Society to the Duke of Argyll, Secretary of State for India, in the following terms:—

"The Highland and Agricultural Society of Scotland was established in 1784, and incorporated by royal charters granted in 1787, 1834, and 1856—the latter charter being to prescribe a curriculum for agricultural education and to grant diplomas. Your memorialists, as representing the nobility, landed proprietors, and all who are interested in the management of landed property in Scotland, and in the education and training of young men in every branch of practical knowledge connected therewith, have seen with satisfaction that the Secretary of State for India has thrown open to competition the appointment of forest officers in India, and laid down a general course of education to be followed by the young men who are selected. Your memorialists, however, observe that it is made obligatory that the selected candidates should, after the preliminary examination, proceed to the German or French forest schools for two years and a half to obtain special and technical education, on which they are to be further examined, before proceeding to India; and they understand that this has been deemed expedient in consequence of the absence of any recognised system of education in forestry in Britain. There can be no doubt that inspection of some of the great Continental forests may be advantageous to the candidate; but with great respect, your memorialists submit that, for the following reasons, such a visit of inspection is unnecessary:—1st, the subjects allied to practical forestry specified to be studied abroad—viz., Land Surveying, Levelling, Roadmaking, Elements of Agriculture, Botany, Zoology, Practical Mathematics, &c.—can be better studied at home. They are efficiently taught in our schools and colleges, and examinations are held therein, and certificates of competence granted either by them or by this Society. 2d, The plan of sending the young men to study forestry abroad is most inconvenient to parents, removing them entirely from their parental control at a critical age; and such a system of forestry education would be liable to interruption in the event of a Continental war. 3d, The valuable experience of those in Britain who have formerly lived in India, both as to Indian forestry and botany, and in the management of the natives, will be lost to the students, as will also the experience of the forest officers themselves who return here when their term of service expires. 4th, However proficient the students may be either in German or French, it is improbable that they will be able to acquire the technicalities of their education with so much facility as they would do in their native tongue. 5th, By pursuing their studies in this country, the candidates would have the opportunity of being instructed by persons skilled in the general land laws of India, which, it is submitted, would be more to the public advantage than that any large portion of time should be devoted to the study of the Continental forest laws. 6th, The knowledge, experience, and other requisites for education in forestry already exist in this country. The two millions of acres of woodland (of which 125,000 belong to the State) are amply sufficient for all educational purposes, and there are special advantages enjoyed in Britain which are not to be had on the Continent. 7th. That your memorialists have for more than 60 years directed their attention specially to advancement of practical forestry generally, and have given great encouragement by means of prizes for essays and reports on the management and general treatment of woods and plantations. They have contributed largely as a body, and by their members, to the introduction of many valuable forest trees suitable to the climate and wants of the country. 8th. Your memorialists have also recently instituted a system of examination in forestry, and grant certificates to candidates of merit, as exhibited in the accompanying syllabus. 9th. That while your memorialists consider the organisation of a system of forest education in Great Britain as a matter of the greatest importance for the education of forest officers in India, they deem it also a question of vast importance to this country, as well as her various colonies.

"Your memorialists would therefore propose that the candidates for all Government forest appointments be allowed to acquire their special technical education without any restriction.

"And your memorialists will ever pray,

(Signed) "TWEEDDALE, President.

"Edinburgh, June 1, 1870."

The Duke of BUCCLEUCH said that the statement by Professor Balfour carried out the views expressed in the memorial, which he approved of. He thought it was of great importance that candidates for India forest appointments should acquire a knowledge of Hindostanee and Arabic, in order that they might be properly understood by the people amongst whom they were located. It was also necessary that they should learn a great deal more—namely, in regard to the nature of the people with whom they had to deal, and the implements generally used in that part of the world. The Royal Horticultural Society in London had prepared a memorial very much to the same effect as that proposed by the Highland and Agricultural Society of Scotland, and it was intended, if possible, that both memorials should be presented at the same time. The precise time, however, would not be fixed before he (the Duke of Buccleuch) was able to go back to London, and to meet the Council on that subject.

The memorial was agreed to.

Veterinary Department.—Mr. GILLON of Wallhouse read the report of the veterinary department, which gave a detailed account of the results of the examination for the Society's veterinary diploma. He said that before he sat down he would make a few remarks in regard to a subject that came before them at last half-yearly meeting—viz., horse-shoeing. At last meeting there was a discussion about the Charlier system, and as he was about to leave home for the Continent, and having to be twice in Paris, coming and going, he thought it would be advantageous to inquire personally and practically on the spot whether Charlier's system was worth anything. He went entirely on his account, but he spoke to his Grace the Duke of Buccleuch before leaving as to what he intended to do; and his Grace heartily approved of his mission. After he had been at Paris the first time he wrote two private letters to the secretary telling him about the visits he had made to Charlier's forges, and Mr. Menzies wrote back asking whether he might make use of the letters. He (Mr. Gillon) wrote back stating that he might make use of them; and, as far as he was aware, there was only one mistake in the letters he wrote. In calculating the number of horses shod according to the new system, it was stated that there were 6000 in Paris, whereas it should have been in France. His first visit to Charlier's forges was very satisfactory indeed, but his second visit convinced him entirely of the great benefits that were to be derived from this system of shoeing. He knew that many people had objections to anything that was new; but he could not call this system a new one in France, because it had been in use there for five or six years. He had himself stood many hours in the forge looking at the operations, which were conducted under M. Charlier's own eye. The father had one forge, and the son had one also in another street. They had so much business that they could not overtake it all in one place. He was assisted in his inquiries by Mr. Mackenzie Greaves, who was well acquainted with the subject, and to whom he had been much indebted. He (Mr. Gillon) saw all classes of horses, and all kinds of shoeing. He saw them shod for the first time; the old shoes taken off, and the new ones put on. Some of the railway companies had the whole of their horses shod according to the new system. Some of them had as many as 500 horses, and required 1000 shoes in a month. These companies would not now have any other kind of shoe for their horses; and one result had been that half of the lameness of horses had been cured already. He had heard objections urged against the system, such as that the shoes were easily broken. No doubt if the shoes were made of bad iron that would be the case; but if they were of good iron, they would stand the wear and tear. The cost would in the long run be less, and the shoes were much lighter than the old ones. There were no doubt a great many prejudices to be overcome, and great difficulty in getting proper blacksmiths; but they must be taught. He was strongly in favour of giving the system a fair trial; and, for his part, he intended to have the whole of his horses shod according to it.

Mr. HARVEY asked if the French had as much road metal as there was in this country?

Mr. GILLON said he thought so. The only difference was that the roads were drier than ours; they dried up sooner. He knew that one of the objections was that the metal wore the shoes.

Mr. HARVEY said he was afraid it might injure the hoof.

Mr. GILLON said he believed that the difficulty would be met if more care were exercised on the part of the farriers. He had received a note from M. Charlier, stating that he was coming to this country to learn the language; and if the Society would assist him—for he was a poor man—he would exhibit his system here. He might also state that a report had been issued by an officer in the Italian cavalry, from which it appeared that the horses in the army had been shod according to the new system for two years, and that it had been attended with success.

Professor RANKINE said it was very common in France to roll the loose road metal by steam rollers; and the duty of consolidating the metal ought not to be laid on the horses as it was in this country.

Mr. WALDEGRAVE LESLIE said he thought that the Society should give a vote of thanks to the convener for the trouble he had taken in the matter. He regretted that there was no premium offered for improvements in horse-shoeing. He wished to know if there would be an opportunity of seeing horses shod on this principle at the Dumfries show? It was important that their country blacksmiths should see for themselves that it was not necessary to cut away the frog. The fact now was, that in the matter of shoeing they were imitating the high heels of the "Girls of the Period," and were giving their horses high heels, in order to give them a sort of graceful "Grecian bend."

The Duke of BUCCLEUCH said they were much obliged to M. Charlier for sending the specimens. He was not aware that there were so many entries for horse-shoeing. There was no difficulty in getting any number of specimens as to how horses ought not to be shod. They had not to go far from home for that. The idea of shoeing draught horses seemed to be to get the greatest amount of iron and the highest possible heel. It was not the driving of nails into the horses' feet that caused injury, but it was by making them go as the ladies did—with the wrong muscles brought into play. He had encouraged Mr. Gillon to go to France to learn what he could on the subject, and he thought they were much indebted to him.

Premiums Awarded for Reports.—Mr. WALKER reported that the following premiums had been awarded for papers in competition since the general meeting in January:—

1. The medium gold medal, or £5, to George Bruce, Veensgarth, Lerwick, for a report on the Improvement of Natural Pasture without Tillage.

2. The medium gold medal, or £5, to Charles Paterson, Camserney Cottage, Aberfeldy, for a report on the same subject.

3. The silver medal to George Carr, Westhill of Park, Drumoak, Kincardineshire, for a report of Improvement on the Farm of Westhill of Park.

4. The silver medal, to C. Y. Michie, forester, Cullen House, Cullen, for a report on the Effects of the Dry Season 1868 on Trees and Shrubs.

The Gun Tax.—Mr. KINLOCH moved—"That the Society petition Parliament against the tax on the use of guns being applicable to persons employed in protecting crops from birds, provided they hold a written authority from their employer." He wished to explain that this question had been, so to speak, taken out of the hands of Mr. Scot Skirving by the directors; not intentionally, or with any view to prevent him bringing forward the matter, but from the fact that the motion Mr. Skirving intended to propose was only submitted to the secretary within a few days of the meeting, and it was in order to abide by the rules that the directors had taken it up.

Mr. SCOT SKIRVING seconded the motion. He said he might mention that the reason why he did not give notice of the motion sooner was that he could not find out what was the exact meaning of the passage in the Budget which related to guns. The words were—"Any person carrying a gun, and showing a written authority from his employer." It might be that a man might carry a gun, but if he used it he would be liable to the penalty. This was just like the tax on the collie dogs; and if they allowed it to pass, they would possibly have the horses taxed 5*s.* or 6*s.* each. A gun was a necessary implement during certain seasons for various crops, and to make a man pay £1 for the use of it was the same as to tax an agricultural implement. Then, again, if an old man, who might be employed, were to turn ill, and if another person was sent to fill his place, an additional pound would have to be paid. On a large farm, five, six, or seven guns might be used, which would mean so many pounds of taxation. He therefore thought that the Society should petition Parliament against that portion of the Budget referred to. He was glad that the directors had taken up the matter.

The following is the memorial afterwards adopted on behalf of the Society:—

"Unto the Honourable the Commons of the United Kingdom of Great Britain and Ireland, in Parliament assembled, the petition of the Highland and Agricultural Society, incorporated by royal charter, humbly showeth—That it is proposed by the Budget now before your honourable House to impose a tax upon persons who use firearms or guns. That your petitioners consider it would be a grievous hardship to agriculturists and occupiers of land were they compelled to pay the said tax for persons employed by them in protecting their crops from the ravages of such birds as rooks, wood pigeons, &c., for the scaring of which it is absolutely necessary that guns be employed. That on some farms it is necessary at special times of the year, such as seedtime and harvest, to employ many persons in the protection of the seed and crops. That it frequently happens that the same person cannot be obtained throughout the year for that duty, imposing thus a double or treble tax for the use of one gun. That if this tax be imposed, it will create a heavy and unfair expense to all occupiers of arable lands. May it therefore please your honourable House to exempt from the proposed tax those persons employed in protecting crops from the ravages of birds, provided such persons have written authority from their employers, and do not trespass beyond their lands.

"Signed on behalf of the Society,

"GRAHAM BINNY,

"Chairman of the meeting of Directors.

"June 22, 1870."

International Assembly in France.—Mr. MENZIES laid on the table the following letter from the secretary of the Agricultural Society of France with reference to a proposed international assembly to be held in France in 1871:—

"Paris, June 14, 1870.

"Sir,—The skill or understanding of all agriculturists of different countries in Europe becomes now-a-days necessary, in order to resolve or determine a great number of rural economical problems. The Agricultural Society of France proposes, then, to organise an international assembly, which should take place towards the end of the month of June, 1871. It counts upon making an appeal to the great agricultural societies with which it is in direct relation. The society over which you preside can bring a valuable concourse to our international meeting. We should be particularly happy if your association would set forth briefly in a memorandum, which we should eagerly translate, the principal progress in Scottish agriculture of late years. It would be desirable that this document set forth the influence which civil legislation, the institutions of influence or of learning, the influence of Government, and the intervention of proprietors has had on them in this respect. The international congress or assembly would receive equally with the greatest interest the opinion of your society upon the question of salaries and the relations of cultivators with their workmen. We have not otherwise, Monsieur le Président, the idea or intention of tracing here a programme. The associations of each country are alone competent to judge of the importance of the questions and the manner in which they ought to be presented. If your illustrious company, sir, adhered to our wishes and views, it would appoint a certain number of delegates to represent it at the international congress at Paris. This would consider the cases of other congresses on divers points in Europe—societies already powerful—and would thus increase their action; and, in giving themselves up with harmony to the study of these important questions, they will contribute efficaciously to maintain everywhere agriculture in the rank which ought to belong to it."

On the motion of Mr. SCOT SKIRVING a vote of thanks was given to the Duke of Buccleuch for presiding; and the meeting separated.

NORFOLK.

HARLESTON: *June 24.—Annual Show.*—At the annual meeting of this Society, to which reference was made last week, Sir W. JONES, in giving the health of Mr. Read, and the county members, said: He would ask Mr. Read whether, in thinking of the future of the agriculture of this great country, he had ever thought it might not be of very great value to them if the routine and monotony of their crops were capable of being somewhat varied? For his own part, he could not see why the entire sugar duty should not be taken off, and why they should not grow sugar in this country as well as on the continent of Europe. He would point out that our climate was manifestly becoming drier and hotter as it was certain to do by the throwing down of hedges, and the cutting down of hedgerow timber. He would also observe that no one who had been through the country this year, and looked at the Mangel fields, could doubt what he was saying—that the hotter the weather and the drier the spring, the finer the crop of Mangels would be. There was no reason why they should not have in this country very fine crops of Silesian Beet, and he would remind them that 10 per cent. of Silesian Beet was purely crystallisable sugar, and if they could grow 10 tons of Silesian Beet in one of their fields (it varied from 9 to 11 tons, and the mean average he took to be 10), but when the soil was very wet, as in the West of England, the average probably would not be more than 8 per cent.—but then let them remember that if Silesian Beet would grow 10 per cent. of sugar, a 10 ton crop would grow a ton of sugar, which, at 1*d.* a pound would bring them £9, and at 2*d.* a pound £18. In one respect this was exactly like Wheat, because they would have one mill for a district or parish, and every labourer, however small his garden, might grow a cwt. or two of Beet, and if they had proper mills a cwt. of sugar would be just as saleable as a bushel of corn was now. Speaking of this fact reminded one of the great facilities with which fortunes were acquired on the Continent by the making of sugar, and he could not see for the life of him why fortunes should not be made here by the same process. Sugar was a thing which old and young could eat with pleasure, and the consumption of which would increase to any amount. He did not see why they should not be able to manufacture it here as well as in Belgium. He asked them to read the report of farming in Belgium which appeared in the last number of the Royal Society's Journal, and besides this to go on to the continent of Europe and see the sort of land and farms on which they grew Beet there, and then say whether, with their appliances and means, with their intelligence, with their excellent roads and railways, and their enormous command of artificial manures, they could not be successful in this matter? As to the manufacture of artificial manures, he reminded them that the bones of the old Egyptians were being shipped into England for this purpose, and the country which had the energy to bring guano, superphosphate of lime, and artificial manures from all parts of the world, might grow a good crop of sugar and with profit, if the county members would only get the sugar duties taken off.

Mr. C. S. READ, M.P., in responding, said: Sir Willoughby Jones has put forth a very important and interesting subject for discussion this evening, and that is whether we, in England, can compete with the Continent and with the West Indies in the growth of sugar? Sir Willoughby rightly says that it is very important indeed that we, in Norfolk, should have, if possible, some new crop on which to fall back to meet our present deficiency. There can be no doubt whatever that the Potato crop in Scotland has been a perfect godsend to them after free trade was introduced, and the only thing I can say is, that I look upon agriculture in Norfolk and in the Eastern Counties generally, as going from bad to worse. That whereas they, in Scotland and Ireland, can grow roots and grass to the best advantage, and the proceeds they make are not at all affected by free trade, we, in this county, being entirely a corn growing district, do feel the depression most severely. I have never myself had any experience in the growth of Beetroot sugar, and I may say it is a problem that has not yet been solved, whether it may be advantageously grown in this district; but I do say, that we have one article, and that our chief, in the growth of which we can compete, not only against the United Kingdom, but against the whole world—that is to say, our Barley. And without saying what I should wish to be done with the sugar duties, I should like to have first a very sensible repeal of the Malt-tax.

We had a very large surplus this year, and we naturally expected that there would be some reduction of that tax, which presses so much upon the agriculturists of Norfolk; but instead of that we were told we were going to receive a great boon, and that boon was that we were to be permitted to germinate our Barley as in days of yore. Well, how was this great boon given to us? Not only were we when we were going to germinate Barley to give notice to the exciseman of what we were going to do—not only was he to come into our houses where the grain was being germinated and where it was kept, but if we steeped any corn we were also to give that gentleman notice of our intention that we were going to steep it. Now, you would hardly fancy that this great boon should be clogged by such a most iniquitous restriction as this. Yet, I can assure you, it took all my time one night to convince the House of Commons that there was really in this boon a most oppressive restriction imposed upon us; and all that I have been able to obtain is this—that we may steep our corn as we please, but that if any of you will germinate your grain you must first of all give the exciseman notice of what you intend to do, and, next, you must let him have access to the place where that grain is being germinated and being kept, and if you fail in any one of these particulars you will be liable to the small penalty of £100. Whether or no you will like to incur that risk, I don't know. I can only answer for myself; I shall not avail myself of this very great considération. Well, we have lately had in the House a very sensible concession granted to us, and that is with regard to agricultural horses. It was said in the House that this was an extension of the exemption which the farmers enjoyed. I entirely repudiate that idea; it is no extension whatever. It is simply a definition of that exemption. If the Parliament of the country exempts agricultural horses from the payment of a license of 10*s.*, or whatever it may be, the Parliament of the country at the same time tells you that the farmers have to repair the roads. I need not say that in nine parishes out of ten the only persons who can cart materials on the roads are farmers; therefore it is perfectly monstrous that, in doing what Parliament puts upon us, we should entirely abrogate the small exemption which Parliament had previously conferred upon us. I can only say, that if it had not been for Mr. Speaker, I don't think even that small concession would have been made.

There is one other subject I will mention. We are told that we agriculturists ought to be greatly pleased that we have in Prince's Street, Westminster, what they call a veterinary department. Now that veterinary department will this year cost the country £10,000 for the payment of salaries, without any estimate at all being made for the legal expenses, stationary, and such like little matters. Now, I will ask you, as practical farmers, whether you believe the Veterinary Department of the Privy Council has ever been of any benefit to you whatever?—(No)—or, on the other hand, whether, whilst costing you £10,000, it has been of 10,000 pence benefit to you? Mind you, I am quite ready and willing to admit the great service the veterinary professors themselves—Professor Simonds and Professor Brown—have rendered to us; but, on the other hand, when I come to consider the extraordinary salaries that are paid for this department, and that in addition to this there are £15,000 a-year spent annually for the collection of statistics, I mean to say that if we had that £25,000 devoted, as it ought to be, to some agricultural department of the Board of Trade, that we really might have then some substantial benefits conferred upon us. Sir, it is just twelve months ago that I, at Attleborough, drew a somewhat gloomy picture of agricultural prospects; I then said that the very cold, wet weather, which we had experienced, was telling most unfavourably upon the county of Norfolk. It pleased Providence to send us a change of weather, and we had a most beautiful harvest, but enough injury had been done to us in Norfolk for us to grow only a small crop of corn, and to sell it at a small price. This, following upon the drought of 1868, was enough to break the backs of many farmers, but now we have, unfortunately, another drought, and what the result of these three disastrous years will be I cannot contemplate without serious fears.

I should like to say a few words with regard to the show itself and upon our agricultural Society. I think we must congratulate ourselves that in this very pleasant but somewhat out-of-the-way part of the world, we have had so successful a show. It only confirms my idea of what a county show ought to be. You cannot make a county show a great national agricultural exhibition. What you ought to do is to endeavour to confer the greatest possible amount of good upon the county in which you live. It was this idea that always pervaded my mind when I was a somewhat active member of the committee of the Norfolk Agricultural Society. Another idea I had was this—how necessary it was to improve the native breeds of stock, and this we have in a measure succeeded in doing. I would ask any one to look back 15 years and think of what the Norfolk home-breds were then, and in what condition were our Norfolk cart-horses. As a Norfolk man, and in the presence of so many of our Suffolk brethren, I hope I shall not be considered egotistical, but I say that our Norfolk cart-horses, especially the mares and plough-horses, are a credit to any country, for work and endurance, and, perhaps, I may say, superior to some of the highly fed Suffolks.

Mr. HOWARD responded for "The Judges of Cattle." He said: We have seen to-day some very excellent displays of stock. The Shorthorns, in some of the classes, were, perhaps, some of the finest specimens you could see in any showyard; but I only regret to tell you, gentlemen, they don't come from Norfolk. They are what I call outsiders. They are sent here to show you gentlemen in Norfolk what you should do.

I don't believe that any progress is made when people wrap themselves in supposed excellence; and I should not be doing my duty towards you, after you have done me the honour of asking me to come here and act as judge, if I allowed some observations to pass unnoticed. I have the honour and privilege of attending very many agricultural shows in this kingdom, and although excellent as your show is—exceedingly good—yet I would not have you to lay to yourselves the flattering unction that you are pre-eminent in this matter. If you do, you may depend upon it success won't follow your efforts. I have disposed of Shorthorns. But there is a class of stock (Norfolk polls) which is famous in Norfolk, and which I think does the breeders and feeders of that stock infinite credit. I have watched that stock, having attended your shows for some years past, with great interest, and it is a class of animal worthy of being cultivated in other districts besides Norfolk; and as it succeeds so well here I am surprised that gentlemen in other parts don't take it up. What I say to-night you will not suppose that I say in a spirit of unkindness; but you have long been held up to us in distant counties as patterns of agriculturists and as a county in which there is the best farming in the world. Now, I have had the opportunity of seeing a good deal of farming in Norfolk during the last few days. I am not going to find fault with your farming, but I should tell you this—that if you don't look out you will no longer hold the position you have done—that other counties will very soon trip you up, and you will lose that position you have so long and so worthily held. There is one other point to which Sir Willoughby Jones has referred—the change of climate produced by the cutting down of hedgerow timbers and woods. Well, it is certain that has not had that effect in Norfolk, for I never was in a county in my life where I saw so much useless hedgerow timber. I am quite certain of one thing—that the farmers of Norfolk do all they can to meet the exigencies of the times; it now rests with the landlords to help them. The first thing they should do would be to allow them the privilege of cutting down this beastly rubbish—pieces of timber which if they stand 50 years will never be worth a sovereign—to cut down many of the hedgerows, and to destroy the great pest of the farmers—the tenants of these wild hedgerows (rabbits).

Sir SHAFTO ADAIR proposed the "Successful Exhibitors in the Cattle Classes." At agricultural meetings they saw the noblest animals that could be produced, whether as horses or stock, and they admired them; but he regretted to say, that when they proceeded to the place where those animals had been bred, they did not find that care taken with regard to the houses and dwellings in which they were placed as he should desire. They had that day been shown what had been done by the tenant-farmers, and, with regard to the housing of the cattle and horses employed in the labour of their farms, the whole landed interest, the proprietors of Norfolk and Suffolk, and England generally, would agree that when the tenant exerted himself to produce these noble animals, the landlord on his part was bound to provide the buildings.

Notices of Books.

Hindrances to Agriculture. (From a Scotch Farmer's Point of View.) By George Hope, Esq. Edmonston & Douglas, Edinburgh.

We take the following extracts from the essay in Sir Alexander Grant's recently published book, entitled "Recess Studies," in which Mr. Hope, of Fenton Barns, gives the results of his large experience and consideration.

Security of Tenure.—If there is one thing more necessary than another in order to produce successful farming, it is security of tenure for a specified period. So long as human nature remains as it is at present, there must be a certain prospect of reaping what has been sown to induce such a liberal expenditure as is required for putting land into and keeping it in its most productive state. Any uncertainty on this point must quickly dissipate all ideas of improvement from the minds of tenant-farmers. There are instances enough of tenants having been speedily called on to pay increased rents as the result of their outlay of skill and capital, where they have been so bold or so foolish as to farm liberally and effect expensive improvements under yearly agreements; while the more cautious occupiers on the same property were left undisturbed. The practice in Scotland has shown that a 19 or 21 years' lease for arable lands is undoubtedly the best term for duration of occupancy. And this applies to both landlords and tenants. The longer term mentioned—namely, 21 years—does not, for an undue period, deprive the landowner of the power of making such arrangements with regard to his property as he may deem advisable. And it affords to the tenant security for undisturbed possession for such a lengthened term as may induce him to farm with spirit and effect improvements and ameliorations, in the confident hope of repayment of the capital so expended, before the expiry of his term, with ample interest.

It may be said that there is no such thing in Scotland as land farmed by tenants-at-will, though the leases granted too frequently contain indefensible conditions and restrictions, and some of them clauses anything but flattering to the self-love of the tenants. Still it is owing to these leases that the agriculture of Scotland has risen to the high condition it occupies in comparison with the sister kingdoms, in spite of an unfavourable climate, comparatively poor soil, and at least one great legal grievance peculiar to Scotland alone. In England, on the other hand, leases are the exception, and land is generally let subject to the tenant's removal on receiving six months' notice to quit. Under such a system it is vain to expect that a tenant will venture to make any large outlay on improvements, when, from mere caprice on the part of the landlord or his agent, the rent may, at any moment, be raised, or the tenant even be deprived of his farm and improvements. It is true that in Lincolnshire and some other counties in England, the land is farmed under agreements which insure to the tenant payment for draining, liming, and manuring performed within a recent number of years, and for which it is calculated the tenant has not had the necessary time in order to be fully repaid. When these agreements are really liberal, which many of them are, they at least prevent the confiscation of the property of a tenant when compelled to remove. Still, under them, tenants may be deprived at any time of their farms, the instruments by which they gain their daily bread. This is a serious matter, as farms cannot always be got when wanted. A sale of the farm stocking, crop, and implements, may be forced at a time when the value of them is unduly depressed; and what is worse, it may be several years before the unfortunate tenant has again an opportunity of exercising his calling. All this deprives tenants-at-will of independent action, and certainly does not leave them free men. In politics and other important questions they must feel they are mere tools in the hands of their landlords; and, however unable they may be to think alike, self-interest, or it may be self-preservation, causes the poor tenants to vote as they are told. It seems to be commonly understood in many parts of England, that the vote does not belong to the man but to the land, so much so that proprietors would feel astonished if any candidate for parliamentary honours were to presume to canvass their tenants without first obtaining their permission. Progress in any profession is ever the result of free and independent minds. From tenants under such bondage as has been just described, it is useless to expect more than adherence to hereditary routine.

It does not militate against this last statement to admit that the science of agriculture has made considerable strides within the last 20 or 25 years. Though this advance may be considered general, it is much more distinguishable in some parts of the kingdom than in others, and it has been mainly due to causes which have compelled the most backward of tenants and landlords to follow in the wake of progress, however unwillingly. Since 1846, when the late Mr. Smith, of Deanston, first promulgated his system of thorough drainage, a vast extent of the arable land of the kingdom has been thus drained. The result of this improvement was so marked, and it was so obviously for the interest of the landlord to have it undertaken, that the Government were soon empowered to grant loans for this purpose, repayable in instalments within 25 or 26 years, under conditions which, in Scotland at least, tenants readily undertook to fulfil. Then, when the millions advanced by Government were exhausted, societies or companies were formed for advancing money for the same purpose, and others related to it, such as building cottages and farm-offices, and forming plantations. Almost all soils have been greatly increased in value by means of tile-drainage—in many instances clay lands, stiff and stubborn until freed from excessive moisture, have been rendered fine friable soils, suitable for the growth of root crops; and in not a few cases wet bogs, totally unfit for cultivation, have been converted into good arable land.

Following upon this, an extraordinary increase has taken place in the value of beef and mutton, which have risen in price from 60 to 80 per cent. This last fact of itself is sufficient to account for the great rise in the value of land which undoubtedly has taken place, even under the most unfavourable circumstances in which tenants may be placed. By means of the introduction of guano and bones, and the manufacture of various descriptions of manures, all more or less valuable, plain fallows have been replaced by root crops for feeding purposes. The rearing and feeding of live stock on strictly arable farms has become the most profitable branch of husbandry. Cattle are now kept and fed on account of the profits derived from them, and not as formerly merely to trample straw into almost worthless manure. Besides the feeding stuffs raised and used on the farm, energetic farmers annually expend large sums in the purchase of linseed cakes and other stuffs to be consumed by cattle and sheep. A ton of linseed cake is fully equal, for feeding purposes, to an acre of ordinary Turnips; while the nitrogenous matter contained in good cakes adds greatly to the value of the manure, and this again improves the productiveness and quality of such grain crops as are grown on the farm. It is obvious from all this that the fertility of land is, to a great extent, the result of the management pursued, and that good crops are now much more dependent on this management than on the natural qualities of the soil. But this difference remains, namely, that the inferior soils require a greater annual outlay, and their productiveness is more easily diminished by poor or niggardly management than that of the better class of soils. Money can do everything in the way of producing crops, but it requires skill and prudence in management to grow them with profit on land of poor quality. The capital, per acre, which a farmer now requires is more than double, perhaps three times, the sum that was necessary 40 years ago. On well-managed farms the annual expenditure for manures and feeding stuffs is generally as much as, frequently more than, the rent itself. Stock has now become dearer, and a larger head of it is required. The wages of agricultural labourers have risen from 40 to 50 per cent. Rents have also risen nearly in the same proportion, while the value of the grain crops, particularly Wheat, is less per bushel than it was formerly. It is doubtful if any large portion of the land in Scotland could be cultivated at all without leases; at least, if it were so cultivated, the rents would be merely nominal, and on the very best soils they would be much reduced.

Scotch farmers are right in holding it as an axiom, as true as any in Euclid, that security of tenure is absolutely essential to produce profitable husbandry. There is one, and only one, objection to the system of leases worthy of notice. It is admitted that leases encourage tenants to do their utmost by large outlays to put their lands in the best condition during the greater part of their terms of occupancy. But it is objected that the knowledge that their leases are coming to a close may induce them to refrain from maintaining the previous high cultivation. This, indeed, would only be a natural deduction on the part of the tenants from the consciousness that they may have to pay additional rent for their own capital invested in the soil, or perhaps have to leave their farms altogether. Either alternative they would consider a great hardship; though the best practical farmers aver that the true interest of tenants, even in a pecuniary point of view, is to maintain their lands in the highest state of cultivation to the very last crop. Be that as it may, if there is no wish for change, it is obviously the interest of both landlords and tenants that new arrangements should be entered into some years previous to the termination of the current leases. Again, it would be a great encouragement to continued good farming, and thus a benefit to the country, if all tenants under leases were entitled by law to allowances similar to those granted in the Lincolnshire agreements, whereby payments are made for improvements executed, and for manures left in the ground by the outgoing tenants. Common honesty dictates, that when a tenant is compelled to leave his farm, the presumption in law should be that payment should be made for his property left on or in the land, and without this provision no lease can be a truly liberal, or even a fair arrangement.

Farm Memoranda.

BANFFSHIRE, BOYNE DISTRICT: *June* 27.—After a long-continued drought we were yesterday favoured with some fine showers, which have already altered the face of the earth. Many of the Turnips on stiff clays have had a hard struggle for existence, but if we get some showers and anything like geniality there will to all appearance be few blanks. Swedes that were sown about the middle of May have mostly done well, and are all hoed, but yellows that were sown about the end of May have been very stiff, and suffered greatly from the "beastie," as the fly is generally called, and only thick-sowing prevented many of them from being eaten off altogether; in this district very little reswing has taken place. Oats look well, and promise to be a heavy crop, but were just in want of rain, which will benefit them greatly, as it came in time. Barley does not look so well, and a good deal of it is already in the ear, but may come to be a fair crop yet. The only failure we have is winter Wheat, which, to all appearance, will not be half a crop. Only very little was sown in this district last autumn, and a great deal of what was sown was killed by the bare frosts in winter. Hay looks very thin, and very little Clover among it; a good deal of it was thrown out by the frost. Pasture grass has been generally good, but was beginning to need rain very much. About Potatos, I hardly know what to say. Some fields look well, while others do not appear to be half a crop; and on examination they are found to be growing underground with young Potatos growing close on to the seed, but no haulm appears aboveground. Something of the same kind occurred here in 1868.

Our live stock are in a healthy condition, and realising good prices; while grain is nearly double what it was a short time ago, but very little to thresh out here now.

The topic of most importance among farmers here is the Game Laws, and, as far as I can learn, abolition would find most supporters around here; but in this district we are not over-stocked: so if we had genial showers to bring up the Turnips on our stiff clays, we would have little reason to complain. Preparations are now being made for the summer shows. The Banffshire takes place at Cornhill, in this neighbourhood, on July 12, where we expect a great turn-out. Hoeing Turnips and making of hay will be the chief occupation of the farmers for the next month. *W. I.*

The Week's Work.

July 2.—Buckwheat has been sown successfully as late as the first week of this month, and as brank-meal is capital seasoning for cattle food, it is often sown when other crops fail. Anything is better than having the land lying bare and even wasting under the searching influence of the sun, light soils more especially.

Haymaking will this year be an exceptional affair in many places. In the southern counties of England the bulk of the hay is generally in the stack by this time, but this year the practice is very diversified. Thus some commenced cutting before the middle of last month, to prevent the scanty crop being burnt off the ground; others, owing to the bareness of the pastures, turned in their cattle into the hay meadows; a third, with a late but promising bottom, waited for the much needed summer showers, and so on behind their usual time. Perhaps more hay will therefore be made in July this year than usual; whilst in the North of England and South of Scotland meadow haymaking may not be finished before August. Generally, however, they have had more rain in the North, so that hay harvest will not be so far behind that of the South as it generally is. Another class of exceptions may come in this year for consideration, viz., hay of irrigated meadows, either with river water or town

sewage, owing to the lateness of spring, the shortness of the pastures, and the necessity which thus arose for keeping the stock upon the meadows longer than usual. Where farmers have the command of river water or town sewage "they have the ball at their foot," so to speak, and therefore they may take their hay crops after the corn harvest, six weeks of summer weather being sufficient to force it forward when laid down soaked with sewage, or with river water, and guano or grass manure.

Turnip sowing after Rye, Vetches, &c., is common this month, and although the season is exceptional the practice will be common. The mode of preparing the stubbles for Turnip sowing will depend upon the nature of the land, and whether farmyard manure or artificial manure is to be used, whether the Turnips are to be grown in the flat or on stetches, and whether the land is clean and free from Couch and other weeds, and so on. If clean, and to be grown on the flat with superphosphate, a single ploughing with a steam coulter and weighted chain for turning down the stubble to the bottom of the furrow, and then well covering this with the furrow slice, followed by the necessary harrowing and rolling, will complete the work. In dry weather the liquid manure drill, with plenty of water, as directed last month, should be used. Sowing Turnips in dry July weather with the liquid manure drill is a hopeless work. If the Turnips are to be grown on the flat, after farmyard manure, skim-plough, well soak the manure with liquid from the tank, spread and plough in with the sap, harrow fine, and sow immediately, rolling down hard. If, on the other hand, the land is full of Couch, &c., and has to be cleaned, the nature of the land will determine whether the plough or the cultivator is the first implement to yoke. One imperative rule in dry weather has to be attended to, viz., to keep the natural sap in the land, and to get the manure covered with as much moisture as practicable; and this is equally true whether farmyard manure or artificial manure is used. In the dry, scorching sun of July 1000 gallons of water is very soon removed from the surface of an acre of land, even when reduced to a fine mould, and well rolled down; so that when three or four times the surface is exposed to the weather, the result is manifest.

Turnip hoeing this year will be a very unequal work as to time, owing to the many failures and second sowings and the filling up of blanks with the gapping-drill. The horse-hoe should be yoked as soon as the plants will bear it, and when the gapping-drill has been recently used the horse-hoe may have to be set narrower than it otherwise would be, so as not to disturb the plants that are brairding. In such cases, the singling will have to be done at two different periods and operations, for no greater mistake can be made than to leave the first plants until the second are ready for the hand-hoe. And the thicker the plants braird in the row the sooner they require to be singled, to prevent blanching at the bottom, and the pulling each other out of the ground as it were; for when thus blanched and pulled up the plants when singled out are weakly, sickly, so that many of them die, leaving blanks. Even those that survive seldom bulb well, and so on. In Scotland, sowing being earlier, hoeing is earlier, so that the second hoeing may be finished by this time. As soon as the bulbs begin to form, and the leaves rise off the ground, the last horse-hoeing is given. The finishing operation is setting up with the double-mouldboard plough, when the land is dry, and the Turnips to be eaten off with sheep, or to be pulled and stored; some do not set up with the double plough, or, if they do, only very lightly.

Mangels and *Kohl Rabi* will generally require to be gone through a second time with the horse and hand hoes, and when blanks in the former have been filled up by sowing fresh seed, the second hoeing of the early sown and the first of the second seeding may be the practice. Mangels may be transplanted if abundantly watered, but the season has been against the operation: blanks of the latter should be filled up by transplanting and watering, as they stand the weather better.

Sheepfolding on Rape and Vetches sown in early spring may be said to commence this year as soon as the crops will permit. Sheep should not be turned on to the former fasting. Indeed this applies to all folded crops, but more so perhaps to Rape than Vetches. Both plants should also be dry. The best plan is to mow both crops, and to allow them to dry sufficiently in the sun for a short time before they are placed in the troughs or cribs. Some feed on the fresh ground daily taken on, which answers in dry weather with old sheep; but all green forage should be cut into chaff and seasoned with less or more meal, in troughs, with a suitable allowance of salt, the whole being well mixed together. *W. B.*

Notices to Correspondents.

BARLEY: *Constant Reader, Ireland.* Your stalk with grub has not reached us. It is not probable that there is any remedy practicable connected with the seed-time of the plant. Early sowing, however, places the plant in better circumstances to resist most of its enemies. We have often "seen Barley threshed out of the swathe without stacking, when weather suits." It is often harvested without binding in sheaves; but when the straw is long it is better to stook it in sheaves, especially in a wet climate like yours. Barley threshed from the swathe will be perfectly suitable for seed the following year.

BOOKS: *S. P. Shaw.* We know no work specially on the science of breeding. You must look at the index of the Journal of the Royal Agricultural Society of England, and you will find papers by Tanner, and Spooner, and others; also in Youatt's work (Useful Knowledge Society) there is information.

COST OF MANURE MATERIALS: *Pincton.* It does not vary much from month to month, and the prices given in the "Farmer's Almanacs" may be taken throughout the year. The following is the present list of prices:—Peruvian guano, direct from the importers' stores, £13 10*s.* to £13 15*s.* per ton; bone, £7 to £7 15*s.* per ton; animal charcoal (70 per cent. phosphate), £5 per ton; coprolite, Cambridge, whole £3, ground £3 10*s.* per ton; ditto, Suffolk, whole £2 10*s.*, ground £3; gypsum, £1 10*s.*; superphosphates of lime, £5 5*s.* to £6 5*s.* per ton; sulphuric acid, concentrated 1.845, 1*d.* per lb., brown 1.712, 0¾*d.*; sulphate of ammonia, 16*s.* 10*d.* to 19*s.* 10*d.*; salt (in London), 25*s.* per ton.

MANURE: *L. G.* asks any of our correspondents to be good enough to furnish an approximate estimate of the quantity of manure which can be supplied during a year from a stall or box in which a fatting beast shall be constantly kept—that is, as soon as one beast is sold off, another taking its place; the object being to use the beasts as manure-making machines, an unlimited amount of straw or other material may be assumed, and also that the animals be kept on the best food, without reference to the cost of producing the meat. [He will find the whole subject thoroughly discussed in the article Manures, "Blackie's Cyclopedia of Agriculture." The quantity of dung produced by a stall-fed beast, littered with straw, will be about 15 tons a year.]

Markets.

ENGLISH WOOL.

We have had a dull trade during the week, and to effect sales of any quantity a small reduction would have to be submitted to. Lustres and demi-lustres form, however, an exception, being in good request.

CURRENT PRICES OF ENGLISH WOOL. Per lb.–	*s. d.*	*s. d.*
FLEECES—Southdown hoggets	1 1	to 1 2½
Half bre 1 ditto	1 2	— 1 2
Kent Fleeces	1 3	— 1 4
Southdown ewes and wethers	0 0½	— 1 1
Leicester ditto	1 2	— 1 2
SORTS—Clothing	0 10	— 1 0
Combing	1 0	— 1 8

HOPS.

BOROUGH MARKET, June 30.

Messrs. Pattenden & Smith report that the accounts from the plantations continue favourable. Rain certainly is wanted; but, so far as can be at present ascertained, prospects are decidedly satisfactory. In the position of the trade no alteration can be perceived. The business doing has been very moderate, and prices have been unaltered. Current prices:—Mid and East Kents, £7 to £12 12*s.*; Weald of Kents, £6 to £8; Sussex, £5 15*s.* to £6 12*s.*; Bavarians, £6 6*s.* to £9; French, £5 to £6 10*s.*; Americans, £4 5*s.* to £6; Yearlings, £1 10*s.* to £3 15*s.* per cwt.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, June 30.

Prime Meadow Hay	110*s.* to 120*s.*	Clover, old	130*s.* to 145*s.*
Inferior do.	85 95	Inferior do.	115 125
New Clover	95 110	Prime 2d cut	115 125
Inferior do.	80 90	Inferior do.	90 100
Straw	24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, June 30.

Sup. Meadow Hay	118*s.* to 126*s.*	Inferior Clover	110*s.* to 128*s.*
Inferior do.	100	Prime 2d cut do.	118 126
New do.	90 100	New do.	118 120
Inferior do.	76 84	Straw	32 36
Superior Clover	140 150	JOSHUA BAKER.	

WHITECHAPEL, Thursday, June 30.

Fine Meadow Hay	120*s.* to 128*s.*	Prime old Clover	140*s.* to 147*s.*
Inferior do.	90 100	Inferior do. do.	115 126
Prime New Hay	95 98	Prime 2d cut do.	130 140
Inferior	75 84	New Clover	100 120
Straw	28 36	Inferior do.	95 105

METROPOLITAN CATTLE MARKET.

MONDAY, June 27.

We have a much smaller number of Beasts than on Monday last, and the average quality is middling; a good clearance is effected, at advanced rates. The supply of Sheep is also shorter; prices are higher for all descriptions. The number of Lambs is larger, but choice qualities are by no means plentiful; Thursday's quotations are well maintained for the best; other kinds are, however, dull of sale. Calves are rather dearer. Our foreign supply consists of 1310 Beasts, 6420 Sheep, 295 Calves, and 45 Pigs; from Scotland there are 16 Beasts; from Norfolk and Suffolk, 1160; and 934 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5 2	10*s.* 4	Best Long-wools	—	to —
Best Shorthorns	4 10	— 5 2	Do. Shorn	4 10	— 5 2
2d quality Beasts	3 4	— 4 4	Ewes & 2d quality	—	— —
Best Downs and Half-breds	—	— —	Lambs	5 8	— 6 8
Do. Shorn	5 2	— 5 6	Calves	3 4	— 5 4
			Pigs	3 4	— 5 0

Beasts, 3520; Sheep and Lambs, 25,080; Calves, 350; Pigs, 120.

THURSDAY, June 30.

We have a very large increase in the number of Beasts as compared with last Thursday, but the average quality is very inferior; prices are lower for all kinds, and a clearance cannot be effected. The supply of Sheep is also larger, and of middling quality; trade is active, especially for choicest descriptions, which are scarce, and Monday's quotations are pretty well maintained. Lambs and Calves are not selling so well as on Monday. Our foreign supply consists of 510 Beasts, 3720 Sheep, 612 Calves, and 15 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c.	5 0	10*s.* 2	Best Long-wools	—	to —
Best Shorthorns	4 8	— 5 0	Do. Shorn	4 10	— 5 2
2d quality Beasts	3 0	— 4 0	Ewes & 2d quality	—	— —
Best Downs and Half-breds	—	— —	Do. Shorn	4 4	— 4 8
Do. Shorn	5 2	— 5 6	Lambs	5 4	— 6 4
			Calves	3 0	— 5 2
			Pigs	3 0	— 5 0

Beasts, 1521; Sheep and Lambs, 17,790; Calves, 768; Pigs, 50.

METROPOLITAN MEAT MARKET.—June 30.

Best Fresh Butter	17*s.* per dozen lb.
Second do. do.	15*s.* ,,
Small Pork, 4*s.* 10*d.* to 5*s.* 0*d.*; Large Pork, 3*s.* 4*d.* to 3*s.* 6*d.* per 8 lb.	

MARK LANE.

MONDAY, June 27.

There was a fair supply of English Wheat to this morning's market. Millers showed little disposition to purchase; the few sales made were at a decline of 2*s.* per qr. upon the prices of this day s'ennight, and some quantity remained unsold at a late hour. The attendance was poor, and the little business transacted in foreign was at a similar reduction. Barley, Beans, and Peas were unchanged in value. Oats were rather cheaper. Flour was 6*d.* to 1*s.* per barrel cheaper.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	47	—53	Red	45	—53
— — fine selected runs	50	—58	Red	48	—55
— — Talavera	51	—60			
— — Norfolk	—		Red	—	
— — Foreign	42	—60			
BARLEY, grind. & dist., 26 to 30*s.* Chev.	39	—42	Malting	34	—38
— Foreign ... grinding and distilling	22	—30	Malting	30	—40
OATS, Essex and Suffolk	22	—24			
— Scotch and Lincolnshire Potato	24	—26	Feed	—	
— Irish Potato	23	—25	Feed	21	—24
— Foreign Poland and Brew	25	—27	Feed	20	—25
RYE	32	—36	Foreign	33	—36
RYE-MEAL, Foreign					
BEANS, Mazagan 34*s.* to 42*s.* Tick	34	—46	Harrow	34	—46
— Pigeon 40*s.* to 55*s.* Winds	—		Longpod	—	
— Foreign small	41	—43	Egyptian	38	—40
PEAS, White, Essex, and Kent Boilers	34	—38	Suffolk	37	—40
— Maple, 33*s.* to 40*s.* Grey	32	—35	Foreign	33	—37
MAIZE	—		Foreign	30	—32
FLOUR, best marks delivered per sack	39	—47			
— 2d ditto ditto	29	—31	Country	29	—41
— Foreign per barrel	24	—27	Per sack	32	—38

WEDNESDAY, June 29.

Coastwise as well as by rail the quantity of Wheat received from Essex and Kent to-day has been small, and the arrivals from abroad have been but moderate. There has been a continuance of quietness in the trade. The demand for all descriptions has ruled inactive, but no further change has taken place in values. With Barley the market has been moderately supplied; the trade has been quiet, on former terms. Malt has been quiet, at late rates. Oats have been in moderate request, at previous currencies. Beans have been dull, and the demand for Peas has been inactive. Flour has sold slowly at the recent decline.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch	Qrs. 640	Qrs. —	Qrs. 250	Sacks. —
Irish	—	—	—	—
Foreign	6010	6620	28,110	{ 750 / 5220 brls.
	6650	6620	28,360	

LIVERPOOL, June 28.—We had a moderate attendance at to-day's market, and Wheat met but a restricted inquiry at a reduction in value of 5*d.* per cental from the currencies of this day week. Flour also neglected, and 1*s.* per sack and barrel cheaper. Indian Corn partook in the general depression, only a small business being done, at a decline of 6*d.* per qr. on the week.

AVERAGES.

	Wheat.	Barley.	Oats.
May 21	45*s.* 3*d.*	32*s.* 5*d.*	22*s.* 0*d.*
— 28	45 4	32 11	23 10
June 4	45 3	32 0	23 0
— 11	46 1	33 1	22 0
— 18	48 0	32 5	25 0
— 25	50 5	31 5	25 1
Average	46 7	32 9	23 6

SEED MARKET.

We have nothing new or important to report this week concerning the seed trade; the continued absence of rain prevents any great consumptive demand for seeds. Values of all descriptions remain very firm. There has been some speculation in red Clover seeds; French Italian is again dearer. A sample of new Trifolium incarnatum has been exhibited in Mark Lane. Bird seeds are without alteration. Tares are scarce and dear. The Linseed trade is steady.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—June 29.

Holywell Main, 17*s.*; West Hartley, 15*s.* 9*d.*; Walls End Braddyll's Hetton, 16*s.*; Walls End Elliot, 15*s.* 9*d.*; Walls End Heugh Hall, 16*s.* 6*d.*; Walls End Original Hartlepool, 17*s.* 3*d.*; Walls End South Kelloe, 16*s.* 6*d.*; Brancpeth Cannel, 18*s.*—Ships at market, 34; sold, 21; unsold, 13; at sea, 10.

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BUFF FOR STABLES	
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BRIGHT GREEN	42s.
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DEEP GREEN	
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OILS, TURPENTINE, AND BRUSHES. VARNISHES, BOTH FOR OUTSIDE AND INSIDE PURPOSES.

"ARCHIMEDEAN" LAWN MOWER.

The "ARCHIMEDEAN" is the only Lawn Mower **that cuts wet or long grass without clogging,** thus enabling the man to work it in the morning or cool of the day, instead of waiting for the grass to dry, and toiling under the heat of a mid-day sun. It is extremely easy to work, and will preserve its perfect cut whilst traversing mounds or sloping banks.

The "ARCHIMEDEAN" is admitted to be the best Machine ever brought out for the purpose, because it is durable, simple, and performs its work better and with less than half the power required for any other Lawn Mowers, and will do double the amount of work.

The "ARCHIMEDEAN" leaves the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

The Mower is warranted to give ample satisfaction, but if not approved of may be returned within a month and exchanged for a machine by any other maker, or the amount will be refunded.

NO CHARGE FOR PACKING CASES, which are most convenient for storing the Machine during the winter.

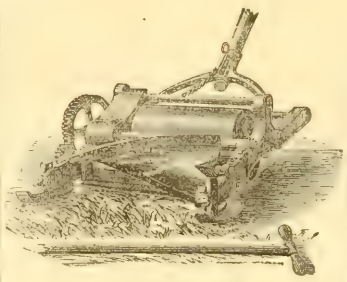

LIST OF PRICES.

11-inch, suitable for a Lady or a Boy ..	£4 5 0
14-inch, suitable for One Person	£5 10 0
16-inch, suitable for One Person	£6 10 0

Delivered Carriage Free to all Railway Stations in the United Kingdom.

The EDITOR *of the* "FIELD," *August* 21, 1869.

"We have tried it carefully against Machines by two of the best English makers, and have no hesitation in recommending it to our readers as being by far more easily worked than either of them, and at the same time leaving the turf with a beautifully even and close cut."

From A. T. BARTON, Esq., *Royal Horticultural Society, Chiswick Garden, W*

"November 11, 1869

"Gentlemen,—We have now had your 'Archimedean' Lawn Mower in use several months, and without hesitation I can truly say it is the best and most efficient implement of the kind we have ever used."

From Mr. GEORGE WYNESS, *Royal Gardens, Buckingham Palace.*

"September 13, 1869.

"Gentlemen,—I beg to say that we have had your Patent 'Archimedean' Lawn Mower at work in Her Majesty's Gardens at Buckingham Palace for some time past, and I have much pleasure in testifying that it has given every satisfaction, as it does its work well and quickly."

From the Rev. EDWARD OWEN, *The Lodge, Bradwell juxta-Mare, Maldon.*

"May 10, 1870.

"Gentlemen,—I am happy to say that the 'Archimedean' gives us great satisfaction; it is by far the best machine I have seen. My gardener, who, like myself, was afraid of it at first, is now delighted with it."

From Colonel FORBES, *The Holmes, St. Boswells, N.B.*

"June 11, 1870.

"Gentlemen,—I beg to enclose cheque (£6 10s.) in payment of the 'Archimedean' Lawn Mower, and have great pleasure in bearing testimony to its high merit."

IMPORTANT NOTICE.

Since the introduction of the ARCHIMEDEAN LAWN MOWER into this country, it has met with a success that has surprised even the Manufacturers, confident as they were of its merits. During this, its first season, a larger number has been already sold than most of the English manufacturers sell in a whole year. Of course, it is not pretended that every purchaser thinks as highly of the Machine as do the high authorities quoted in the Circular; prejudice or clumsiness on the part of working men sometimes condemning the most useful inventions. The Advertisers, however, feel great gratification in stating that, although a trial is allowed with every Machine, very few indeed have been returned out of the very large number sold. This unprecedented success has, of course, materially affected the manufacturers of other machines, and some of them are naturally annoyed that a stranger should in so short a time upset the whole trade. One firm in particular, modestly premising that its machines are the best, has published a violent attack on the "Archimedean"—thus tacitly admitting that the New Lawn Mower is its most formidable opponent. The same firm, in another advertisement, gives an account of a so-called "interesting trial of Lawn Mowers," the result of which was, of course, in favour of their own Machine. Considering that the Manufacturers of the "Archimedean" were not only *not present*, but *knew nothing* of this "trial" (?) till they saw it announced in the advertisement, the *interest* is rather on one side. This method of attacking a successful opponent in business, however "interesting," has neither the advantage of originality nor the merit of fairness. A jury of gentlemen should hardly have adjudicated publicly between two rival machines when BOTH were exhibited by one competitor.

It is preferred to leave the merits of the ARCHIMEDEAN with the Public, to whom is offered a month's trial with each Machine, in order that its advantages may be fairly tested in working. This must be much more satisfactory to intending purchasers than any other plan for testing the invention, and is the best reply to the unscrupulous attacks of persons interested in the sale of other machines, whether made openly by manufacturers, or by their friends under the guise of disinterested advice to the Public. Continued use will but confirm the good opinion generally held of the ARCHIMEDEAN LAWN MOWER.

The ARCHIMEDEAN will be EXHIBITED at the ROYAL AGRICULTURAL SHOW, OXFORD, STAND No. 79.

Illustrated Catalogues and Testimonials Post Free on application.

WHOLESALE AND RETAIL AGENTS,

WALTER CARSON AND SONS,

LA BELLE SAUVAGE YARD, LUDGATE HILL, LONDON, E.C.; and

21, BACHELOR'S WALK, DUBLIN.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

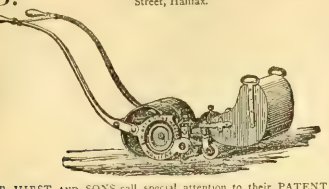

B. HIRST AND SONS call special attention to their PATENT FLEXIBLE SELF-SHARPENING and SELF-COLLECTING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST and SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

American Lawns.

THE AMERICAN PATENT

"ARCHIMEDEAN" LAWN MOWER

is admitted the best Machine ever brought out for the purpose; because it is durable, simple, and performs its work better and with less than half the power of other Lawn Mowers, and will do double the amount of work.

Leaving the cuttings in small particles, evenly scattered, never looking untidy, serving as a mulch to protect the roots from heat and drought.

OPINIONS OF THE PRESS.

The *Gardeners' Magazine* says—"This new Mowing Machine has been fairly tested at Stoke Newington, and the verdict is, 'valuable invention.'"

The *Field* says—"The Americans have been beforehand with us in many Machines, but we were not, however, until now aware they possessed a Lawn Mower which is far superior to any of ours."

The *Gardeners' Chronicle* says—"We are indebted to our American cousins for many ingenious devices and remarkable contrivances, adapted not only for our amusement but for the benefit of mankind generally. We owe to them many thanks for improvements amongst implements whereby labourers' toil has been much lessened. The 'Archimedean' Lawn Mower will cut grass equally well when wet as when in a dry state, or if 5 or 8 inches long. The 14-inch machine is easily worked by a boy. It has been tried in the gardens of the Royal Horticultural Society at Chiswick during the past season, and is reported as the quickest, most simple, and most efficient Lawn Mower ever used; and such is our opinion."

Sole Wholesale Agent for the United Kingdom,

JOHN G. ROLLINS, American Merchant, Old Swan Wharf, London.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.

The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

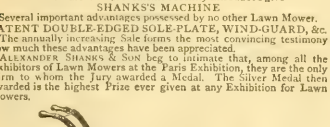

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen, at once, that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole plate must be entirely renewed when the edge is worn down.

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Dens Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING AND COLLECTING MACHINES FOR 1870.

IMPORTANT NOTICE.

T. GREEN AND SON have to state that they would not have noticed for a moment the assertions made by the advertisers of the Archimedean Lawn Mower, but seeing that several statements have been made by Editors of different papers with reference to the Archimedean Lawn Mower, they thought it just and right to offer a challenge for a Public Trial, knowing that what was stated was untrue; in doing this they had nothing to win, having carried off every prize that has been given in all cases of competition.

It is not their intention to continue the discussion further, all they have to add is that they are prepared to prove all previous statements made by them, as to their Lawn Mower being superior to any other, to be correct, by another Public Trial, leaving the time, place, and conditions to be named by the friends of the Archimedean.

LEEDS HORTICULTURAL AND FLORAL SHOW, JUNE 3, 1870.

TRIAL OF MOWING MACHINES.

Extract from *Yorkshire Post*, June 8, 1870

"During the show, a very interesting trial of Lawn Mowers took place on the ground. The competitors were the well-known manufacturers of these machines, Messrs. Thomas Green & Son, Smithfield Ironworks, Leeds, and the maker of a machine called the Archimedean. The judges were the gentlemen who had made the awards at the flower show. The merits of the competing machines were decided by setting them to work to cut long coarse grass, the style and time in which they accomplished their task, and the draught of each, being elements in guiding the judges in giving their award. The following was their unanimous conclusion

"'We, the judges of the Leeds Horticultural and Floral Society, having tested Lawn Mowing machines manufactured by Messrs Thos. Green & Son against the one called the "Archimedean," in an open field where the bents were growing to 8 inches long, have come to the unanimous conclusion that the "Archimedean" is perfectly useless, either for long or short grass, the superiority of Green's machines having proved on this, as on many other occasions, pre-eminent. We find the "Archimedean" is only suitable for banks and steep rising grounds.'"

Extract from *Leeds Mercury*, June 8, 1870

"Amongst the other interesting features of the show to which attention has not yet been called was a public trial, on the opening day, of Lawn Mowing machines, manufactured by Messrs Green & Son, of Leeds, and the American machines known as the 'Archimedean.' The test took place before all the judges in an open field where the bents were from 5 to 8 inches long, and at the close the decision was unanimously in favour of the machines made by Messrs. Green & Son. That firm had an excellent stand on the ground, occupied by horticultural machines of various descriptions."

JUDGES.—Wm. Carmichael, John Wells, F.R.H.S., M. Saul, W. Culter-ell, J. McHattie, James Fowler, Wm. Stewart, T. S. Holloway (late Chairman of the Society).

JAMES BIRBECK, Secretary.

Copy of Letter received from the Council of the Royal Horticultural Society, South Kensington.—May 28, 1870.

"GENTLEMEN,—I am directed by the Council to inform you that your Lawn Mowing machines have been in constant use in their Gardens, at South Kensington, during the last 10 years, and that they have always given the greatest satisfaction, doing their work excellently, and with so much ease as to be generally preferred by our workmen.—Your obedient servant, JAMES RICHARDS, Assistant Sec."

"To Messrs. GREEN & SON."

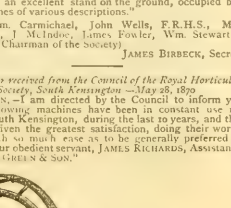

HAND MACHINE.

To cut 10 inches	£3 10 0	To cut 18 inches	£7 10 0
,, 12 ,,	4 10 0	,, 20 ,,	8 0 0
[*Suitable for a Lady.*		,, 22 ,,	8 10 0
To cut 14 inches	£5 10 0	,, 24 ,,	9 0 0
,, 16 ,,	6 10 0	[*Suitable for Two Persons.*
[*Suitable for One Person.*			

Prices of Horse, Pony, and Donkey Machines, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness:—

Donkey and Pony Machines.		Horse Machines.	
To cut 26 inches	£13 0 0	To cut 30 inches	£21 0 0
,, 28 ,,	15 0 0	,, 36 ,,	24 0 0
,, 30 ,,	17 0 0	,, 42 ,,	27 0 0
Leather Boots for Donkey, 18s.; ditto for Pony, 22s.		,, 48 ,,	30 0 0
		Leather Boots for Horse, 26s.	

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Scotland, and Ireland.

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away or in any way damaging the Machine.

Both the Horse, Pony, Donkey, and Hand Machines possess (over all other makers) the advantage of self-sharpening; the cutters being steel on each side, when they become dull or blunt by running one way round, the cylinder can be reversed again and again, bringing the bottom edge of the cutters against the bottom blade, when the Machine will cut equal to new. Arrangements are made that the cylinder can be reversed by any inexperienced person in two or three minutes.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once unconditionally.

THOMAS GREEN AND SON,

Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

N.B.—REPAIRS to LAWN MOWERS done at the London Establishment in the most expeditious manner, having every necessary appliance of Steam-power and Machinery same as at Leeds.

The Grass Land Mower.

BURGESS AND KEYS MOWERS will be found pre-eminently adapted for Cutting the difficult Crops of the season, whether Grass or Corn. As much as 18 Acres of Grass in a day have been cut by one of these Machines. Immediate execution of orders insured by the Makers, 66, Newgate Street, London. Agents in every district.

Automaton Lawn Mowers, Manufactured by

RANSOMES, SIMS, AND HEAD, Ipswich. The best, simplest, and most durable Machines. They leave no ribs in the grass, and are unsurpassed for keeping a Lawn or Croquet Ground in first-rate order; 4000 are now in use. Prices from 55s. Sizes 8 to 20 inches. A large stock kept, and orders executed on receipt. Illustrated Lists free by post, and Testimonials from Thirty English Counties. (Please refer to this Advertisement when ordering).

REGISTERED HAND GARDEN SEED DRILL.—Four thousand sent out in 1868 and 1869. At the Great German International Agricultural Exhibition, Altona, Hamburgh (1869), the First-class Silver Medal was awarded to JOSIAH LE BUTT for his Manufactures; also at the Great German International Horticultural Exhibition, Hamburgh, 1869, another First-class Silver Medal was awarded. By simply turning a screw, this Drill can at once be adapted for sowing Onions, Cabbage, Cauliflowers, Broccoli, Barley, Wheat, Sainfoin, Mangel Wurzel, Tares, Rape, Turnips, Flax, and Carrot Seeds. It is an invaluable implement for a Market Gardener, and to all who possess a Kitchen Garden; and for the Farm it will be found useful for the purpose of filling up the places where the horse-drill has missed. It can easily be worked by a lad.

Full directions sent with each Drill. On receipt of stamps or Post-office Order, made payable to JOSIAH LE BUTT, Patentee and Manufacturer of the Champion Haymaker, Bury St Edmund's, a Drill will be sent immediately. Price 12s. 6d. The name of the nearest station should be given.

GARDEN CANOPIES, of various sizes, suitable for Croquet Lawns, Children's Playing Grounds, and general Garden use, may be seen erected at BENJAMIN EDGINGTON'S Establishment, 2, Duke Street, foot of London Bridge.

CROQUET, CRICKET, and GARDEN TENTS of all sizes and shapes. An Illustrated Catalogue free on application. Address, BENJAMIN EDGINGTON (in full), 2, Duke Street, London Bridge, S.E. No other Establishment. Illustrated Catalogues post free.

GARDEN and LAWN TENTS, of the most elegant form, easily erected and removed, at BENJAMIN EDGINGTON'S, 2, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine article, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

THE CLOCHES, or BELL GLASSES, named in Mr Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 83, Upper Thames Street, where a Stock is kept; also at 36, Long Acre. J. GOODERIDGE, Agent.

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

	Each.—s. d.		Each.—s. d.
2 inches in diameter	.. 0 3½	12 inches in diameter	.. 1 9
3 ,, ,,	.. 0 4½	13 ,, ,,	.. 2 0
4 ,, ,,	.. 0 5½	14 ,, ,,	.. 2 6
5 ,, ,,	.. 0 6½	15 ,, ,,	.. 3 0
6 ,, ,,	.. 0 8	16 ,, ,,	.. 3 6
7 ,, ,,	.. 0 9	17 ,, ,,	.. 4 0
8 ,, ,,	.. 1 0	18 ,, ,,	.. 5 0
9 ,, ,,	.. 1 2	19 ,, ,,	.. 6 0
10 ,, ,,	.. 1 4	20 ,, ,,	.. 7 0
11 ,, ,,	.. 1 6		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	.. 0s. 6d.	9 inches in diameter	.. 1s. 8d.
5 ,, ,,	.. 0 8	10 ,, ,,	.. 2 0
6 ,, ,,	.. 0 10	11 ,, ,,	.. 2 6
7 ,, ,,	.. 1 1	12 ,, ,,	.. 3 0
8 ,, ,,	.. 1 4		

Either flat or conical tops.

CUCUMBER GLASSES.

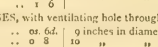

24 inches long	.. .. 2s. 0d.	16 inches long	.. .. 1s. 4d.
22 ,,	.. .. 1 10	14 ,,	.. .. 1 2
20 ,,	.. .. 1 8	12 ,,	.. .. 1 0
18 ,,	.. .. 1 6		

HAND GLASSES, WITH OPEN TOPS

	Each.—s. d.		Each.—s. d.
12 inches	.. .. .. 6 6	20 inches	.. .. .. 10 6
14 ,,	.. .. .. 7 6	22 ,,	.. .. .. 11 6
16 ,,	.. .. .. 8 6	24 ,,	.. .. .. 12 6
18 ,,	.. .. .. 9 6		

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Monro's Cannon Boiler.

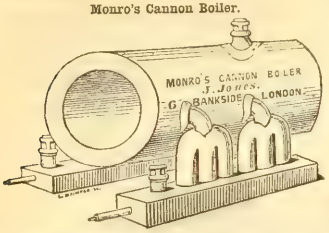

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at their wharf in London. Lists on application

J. JONES AND SONS, Iron Merchants, 6, Bankside, Southwark, London, S.E.

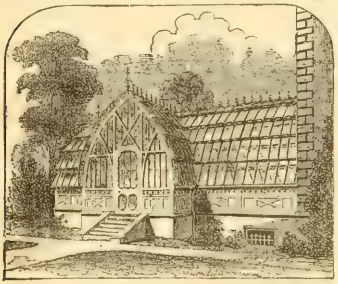

CRANSTON'S PATENT BUILDINGS for HORTICULTURE, Parkfield, Pershore Road, Birmingham

Descriptive Book, fully illustrated with Wood Engravings by the late Orlando Jewitt, from existing houses in various parts of the kingdom. Post free for 30 stamps.

SPECIAL NOTICE—NEW PATENT

The "GARDENERS' GREENHOUSE," including Conservatory and 12 Pits and Frames, with floor and stages in one structure, all complete, made to stand upon any level space, and not requiring walls. These houses, of two spans, 12 ft., 24 ft., 18 feet, and 21 by 10 feet, are kept in stock ready to send off at three days' notice.

Mr. Cranston's Patent Houses are for inspection at his residence, Parkfield, Pershore Road, Birmingham, and may also be seen by permission in most parts of the country.

"Perfect ventilation without admitting cold or making any of the glass sweat."

"Thoroughly sound and dry glazing without the use of putty."

"Glass in large panes without 'laps.'"

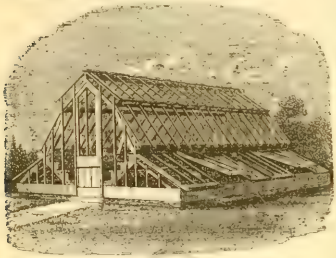

"THE GARDENERS' GREENHOUSE."

Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.

Victoria Works, Bury St. Edmund's

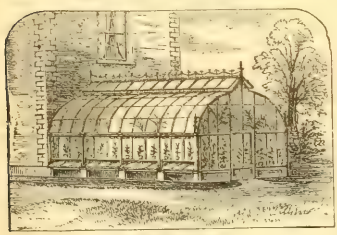

MANUFACTURED BY

CHARLES BEARD, Senior Partner in the late Firm of Sanders, Frewer & Co., which Firm was dissolved by mutual consent.

The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866;

The First-class Certificate at the Grand Manchester Horticultural Show, 1867;

The Three First-class Certificates at the Royal Horticultural Show, at Bury St. Edmund's, 1867, viz.:—One Prize for Patent Glazing without Putty; One Prize for Best System of Patent Ventilation; One Prize for S., F. & Co.'s Improved Flower Stands.

These much-approved Patent systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c., &c.

Full particulars and Prices of the Patent Houses, glazed with 26 oz. Sheet Glass from 1s. 2d. per foot super and upwards; as also Illustrated Catalogues for 12 postage stamps; may be obtained on application to CHARLES BEARD, Victoria Horticultural Works, Bury St. Edmund's.

PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelope.

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEREMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

JAMES BOYD AND SONS, HORTICULTURAL BUILDERS and HEATING ENGINEERS, Pardey, N.B.—CONSERVATORIES, GREENHOUSES, VINERIES, FORCING HOUSES, PITS, and every description of Horticultural Building, manufactured in Wood or Iron by Steam-power Machinery, and erected in any part of the United Kingdom. Manufacturers of Hot-water Apparatus for Heating Churches, Mansions, Warehouses, &c.

Plans and estimates on application.

POLLARD, JEPHSON, AND CO.'S CONICAL BOILERS for HEATING, by HOT-WATER, Pineries, Greenhouses, Conservatories, Mansions, Churches, Chapels, Halls, Warehouses, &c. Fixed at seats of Duke of Newcastle, Lord Belper, &c. At Viscount Sydney's replaced, after being 30 years in constant use. Apply at

Bear Garden, New Park Street, Southwark, London, S.E.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

GRAY'S OVAL TUBULAR BOILER.

INTERNATIONAL EXHIBITION, CLASS IX., NO. 2119.

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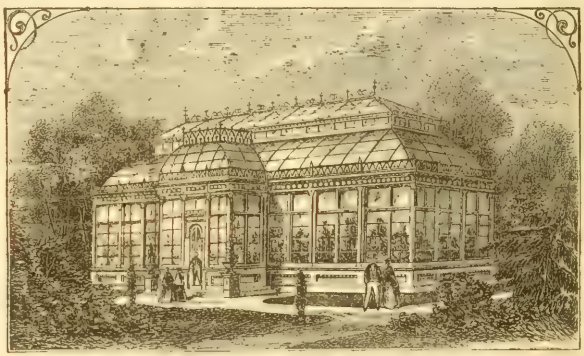

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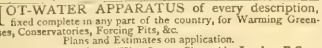

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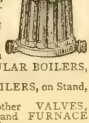

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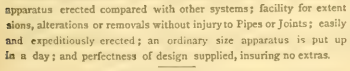

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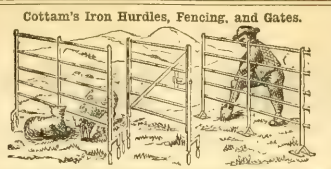

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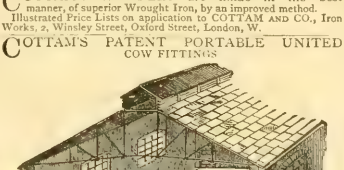

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AND
AGRICULTURAL GAZETTE.

No. 28.—1870.] SATURDAY, JULY 9. {Price Fivepence. / Stamped Edition, 6d.

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Season Tickets, admitting to the opening ceremony, price £1 1s each, to be had at the Office of the Exhibition, Barford Street, Liverpool Road, Islington; and at the Working Men's Club and Institute Union, 150, Strand, W.C.

£10 REWARD.—Some Person or Persons having Torn off a Branch of Pelargonium Prince of Wales, and Lady Sheffield, and the same off Fuchsia Champion of the World, while standing in the Arcade of the Royal Horticultural Gardens, H. CANNELL will give the above reward to any person who will give information sufficient to lead to a conviction. The above Varieties are now striking, and will soon show the variety, which can easily be detected; and H. C. earnestly appeals to all honest persons having suspicions to give the required information immediately

H. CANNELL, The Nursery, Woolwich

GERANIUMS, of Mrs. Pollock, Sunset, Sophia Dumaresque, Gold Pheasant, Stella variegata, Eastern Beauty, Amy, Italia Unita, Beauty of Sweetwoode, Luna, Mrs. Benyon, Kenilworth, Artemus Ward, Madeline Schiller, Beauty of Ribbledale, Lady of Shallot. Of Show, French, and Fancy PELARGONIUMS, fine blooming Plants, in 50 select varieties. The above are offered per dozen or 100. Price on application.

H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

Bedding Plants, Florists' Flowers, &c.

MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, are prepared to send out very choice selections of the above, at very moderate prices, and will be glad to send their new priced CATALOGUE free on application.

North of England Nursery and Seed Establishment, 44, English Street, Carlisle.

JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, offers for Sale—

100 CAMELLIAS, ALBA and FIMBRIATA PLENA, without flower buds, £4, £5, £6, £8.
100 CAMELLIAS, IMBRICATA PLENA, without flower buds, £3, £4, £6, £8.
100 CAMELLIAS, named best sorts, without flower buds, £3, £4, £6, £8.—For September.
100 CAMELLIAS, with flower buds, named and best sorts, £6, £8, £10, £12
100 AZALEA INDICA, best named sorts, with flower buds, fine plants, £5, £6, £8, £12
200 AZALEA INDICA STOCKS, 15s. [Three months' credit.]

Roses.

JOHN FRASER, of the Lea Bridge Road Nurseries, begs to announce that his COLLECTION of ROSES is NOW in FULL BLOOM An inspection respectfully solicited

The Nurseries are easily reached by Tram on the Great Eastern Railway to Lea Bridge Station

Roses.

THE COLLECTION of ROSES at Woodlands Nursery, Maresfield, near Uckfield, Sussex, occupying an area of many acres, are NOW COMING INTO SPLENDID BLOOM.

WM WOOD AND SON.—June 25

CHOICEST ROSES, in pots. TEA-SCENTED, CHINA, NOISETTE, &c.
The largest stock in the kingdom, consisting of many thousands of strong healthy plants

WM WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Roses, Roses, Roses.

H. LANE AND SON'S magnificent COLLECTION of over 100,000 PLANTS is NOW IN FULL BLOOM. An early inspection is respectfully solicited.

One hour's ride by rail from Euston Station, London. Convenient trains to and fro.

The Nurseries, Great Berkhamstead, Herts.

Paul's Roses.

WM. PAUL begs to announce that his ROSES are NOW IN BLOOM, all the varieties recently exhibited by him in his "Garden of Roses" at the Crystal Palace, and many other novelties, may be seen

Image too respectfully invited. Entrance from the platform, Waltham Station, Great Eastern Railway; half-an-hour's ride from London. PAUL'S Nurseries, Waltham Cross, N.

Roses.

WM. KNIGHT, of the Floral Nursery, Hailsham, Sussex, begs to announce that his splendid collection of upwards of 20,000 ROSES is NOW in FULL BLOOM An inspection respectfully solicited.

Also an immense stock of the choicest varieties of ROSES in Pots, for planting out or growing on for pot culture

New Roses of 1870.

CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application to

ROSES for BEDDING.—50, 100, 150, 200, 250, 300, 400, 500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2100, 2200, 2300, 2400, 2500, 2600, 2700, 2800, 2900, 3000, 3100, 3200, 3300, 3400, 3500, 3600, 3700, 3800, 3900, 4000, 4100, 4200,

B. S. WILLIAMS',
NEW and CHOICE FLOWER SEEDS,
Post Free.

	Per packet—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 5s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice strain	2s. 6d., 5s. 6d., and 5 0
CINERARIA, Weatherill's extra choice strain	2s. 6d., 5s. 6d., & 5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d., and 3 6
CENTAUREA CANDIDISSIMA	1s. and 2 6
ECHEVERIA METALLICA, new bedding plant	2 6
HOLLYHOCK, from Chater's finest varieties	1s. and 2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 7 6
PYRETHRUM (Golden Feather)	1s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance	1s. 6d. and 2 6
EAST LOTHIAN STOCKS, per collection of three colours	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 6
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
WALLFLOWER, New Golden Tom Thumb	1 6
WALLFLOWER, Saunders' fine dark variety	1 0
Hunt's Auricula-eyed SWEET WILLIAM	0 6
MYOSOTIS AZORICA, var. CŒLESTINA	1 6
TACSONIA VAN VOLXEMII, splendid greenhouse climber	2 6

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Early Feed for Sheep and Cattle

May be obtained by sowing, during July and August,

SUTTONS' MIXTURE of RAPID GROWING GRASSES and CLOVERS, for Autumn Sowing.—This will be found invaluable. It consists entirely of the quickest growing varieties, and will produce a heavy crop of green food [illegible] off in November, when a good aftermath is obtained in the following spring. [illegible] may be fed off in the autumn. Sown 2 bushels per acre. Price [illegible] per bushel.

SUTTONS' IMPROVED ITALIAN RYE GRASS.—The best and most productive in cultivation. Per bushel 7s. 6d. Cheaper by the quarter.

TRIFOLIUM INCARNATUM.—Lowest price per cwt. on application.

These are invaluable articles for early spring feed, either grown separately or together. The proper quantity of Italian Rye-grass Seed, if sown alone, is 3 bushels per acre, or of Trifolium [illegible] bushels per acre. We have found it most profitable to grow them together, sowing 2 bushels of the former, and 12 lb. of the latter per acre, in July and August.

Also BROMUS SCHREDERI, MUSTARD, RAPE, TURNIP SEEDS, &c. All goods carriage free (except very small parcels).

SUTTON AND SONS, Seedsmen to the Queen, Reading.

CABBAGE SEED
for Present Sowing

FOR THE GARDEN.
For sowing at once, to come in next spring and summer

SUTTONS' IMPERIAL, the finest in cultivation and earliest for spring use, per oz., 6d.
LONDON MARKET, EARLY DWARF YORK, ENFIELD MARKET, NONPARIEL, each 6d. per oz.

FOR THE FARM.
SUTTONS' IMPROVED DRUMHEAD.—The largest in cultivation. Should be sown in July and August, per lb. 2s. 6d.
ROBINSON'S CHAMPION DRUMHEAD, 2s. 6d. per lb.
COMMON DRUMHEAD, or FLAT DUTCH, 2s. per lb. Also GRASS SEEDS, TURNIP SEEDS, MUSTARD, RAPE, &c., for autumn sowing—particulars of which may be had on application.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

Choice New Seeds for present Sowing.

SCOTT'S superb strain of PRIMULA and CINERARIA, also CALCEOLARIA, carefully hybridised, from plants 9 to 18 inches high. Flowers perfect in shape, colours in great variety, including the beautiful mottled and spotted; each 1s., and 2s. 6d. per packet.

SCOTT'S WASP DESTROYER will quickly rid any place of Wasps, Crickets, Cockroaches, and other Garden pests. "It completely cleared the place." *Vide* Testimonials, sent on application. Price 1s. 6d. and 2s. 6d. per bottle, in stamps.

J. SCOTT, The Seed Stores, Yeovil, Somerset.

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Packets 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 5s. 6d. each

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—Miss Hayes, Superintendent, Royal Horticultural Society's Garden, South Kensington, May 7, 1868.

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Walworth, S.

Red Spider. Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1869, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in the proportion of from 1 to 2 ounces to the gallon of soft water, and of from 1 to 10 ounces as a Winter Dressing to Vines and Fruit Trees. Destroyed many preparations intended to supersede it.

Sold Retail by Seedsmen, in Packets, 1s., 3s., and 10s. 6d.

Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
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SILVER SAND and PEAT, from Bedfordshire, also KENT and HAMPSHIRE PEAT, in any quantity.—This Sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depot.

EPPS'S SELECTED PEAT for Choice Plants, Fuchsias, Azaleas, Ferns, Orchids, &c., will be found very superior to anything of the kind yet sold. Divested of all crude, sour, superfluous matter, fit for immediate use, tightly pressed into strong 4 bushel cases, unglazed. Testimonials and reports of its superiority, from the most celebrated exhibitors and growers in England, sent on application. Post Office orders to W. JAS. EPPS, Horticultural Depôt and Peat Stores, Eastdown Park, Lewisham.

COLIN PULLINGER'S newly-invented SULPHUR DISTRIBUTOR, for VINES, PLANTS, &c., is acknowledged by every Gardener who has seen it to be the most simple and effectual machine invented for the purpose. Price, complete with bellows, 4s. Retail of Seedsmen and Nurserymen.

Sole Wholesale Agents, ADAMS'S NURSERY, Chichester.

The Noted French Cold Grafting Wax
(MASTIC LHOMME LEFORT),

For Grafting, Budding, Healing, &c., may be obtained of HOOPER AND CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsman and Nurseryman.

ORNAMENTAL SHELLS (MOTHER-of-PEARL) FOR SALE, just imported from the China Seas.—Very beautiful and suitable for Shell-houses, Grottoes, Garden Walks, Edgings, &c. A bag containing 2500 will be forwarded on receipt of a Post Office order, or postage stamps, from any part of the kingdom, at the following rates:—

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E. AND F. CROOK'S POULTRY APPLIANCES of every description, as supplied to Her Majesty, the Nobility, Gentry, Farmers, &c., at home and abroad.

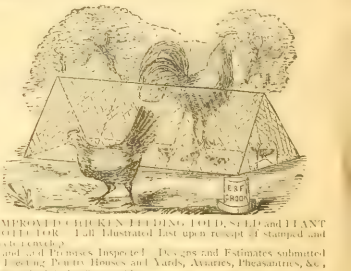

IMPROVED CHICKEN FEEDING TOOL, SEED and PLANT DIBBLE TOOK. Full Illustrated List upon receipt of stamped and addressed envelope.

Estimates Inspected. Designs and Estimates submitted for Erecting Poultry Houses and Yards, Aviaries, Pheasantries, &c., in any Colour, to Scale or Order.

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The Grass Land Mower.

BURGESS AND KEYS'S MOWERS will be found [illegible] adapted for cutting the difficult Crops of the season, whether Grass or Corn. As to their [illegible] Grass in a [illegible] manner, one of these Machines [illegible] execution of Prizes awarded by the Masters, 27, Newgate Street, London.

Agents in every district.

B. HIRST AND SONS, Britannia Works, Portland Street, Halifax.

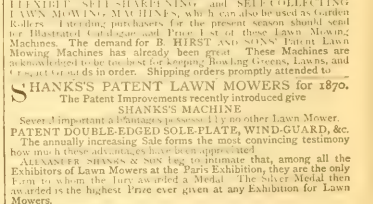

B. HIRST AND SONS call special attention to their PATENT LEVELLER and SELF-SHARPENING and SELF-GUIDING LAWN MOWING MACHINES, which can also be used as Garden Rollers. Intending purchasers for the present season should send for Illustrated Catalogue and Price List of these Lawn Mowing Machines. The demand for B. HIRST AND SONS' Patent Lawn Mowing Machines has already been great. These Machines are acknowledged to be the best for keeping Bowling Greens, Lawns, and Croquet Grounds in order. Shipping orders promptly attended to.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give
SHANKS'S MACHINE

Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

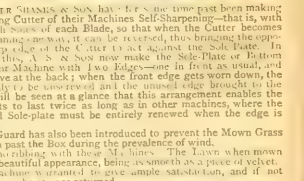

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with steel on both Sides of each Blade, so that when the Cutter becomes blunt in running one way, it can be turned, thus bringing the opposite or Sharp edge of the Cutter to act against the Sole Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machines with Leg Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.

A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.

There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

Illustrated Circulars, with full particulars, sent free on application.

A. SHANKS AND SONS, Deus Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.

☞ A Stock of all Sizes of Lawn Mowers always kept at 27, Leadenhall Street.

GENERAL PLANT CATALOGUE FOR 1870.

JAMES VEITCH & SONS

Beg to announce that their GENERAL PLANT CATALOGUE for 1870, including STOVE and GREENHOUSE PLANTS, ORCHIDS, FERNS, PALMS, ORNAMENTAL FOLIAGED PLANTS, CAMELLIAS, AZALEAS, &c., is now ready and will be forwarded Post Free on application.

ROYAL EXOTIC NURSERIES, KING'S ROAD, CHELSEA, S.W.

NEW LARGE
ITALIAN TRIPOLI ONIONS.

No. 1. LARGE FLAT BLOOD-RED.
No. 2. GIANT ROCCA, the largest Onion known.
No. 3. LARGE FLAT WHITE.
No. 4. EARLY WHITE, earliest of all.

The enormous and increasing demand for these Onions has exceeded our most sanguine expectations—and in consequence of the short crop last season the Seed is very scarce.

Having at an early period secured a good supply, we hope to be in a position to meet the demand; but would, nevertheless, recommend our friends to make early application for what they require, if they would prevent disappointment.

WAITE, BURNELL, HUGGINS, AND CO., SEED GROWERS and MERCHANTS, SOUTHWARK STREET, LONDON, S.E.

WILKIE'S BLIGHT COMPOSITION.

This well-known Mixture, referred to in the *Gardeners' Chronicle*, pages 862 and 896, is most effective in its operations; it quickly destroys all kinds of Aphis, Thrips, &c.; is not injurious to the most tender foliage; leaves no stain and no disagreeable odour. One Gallon will bear diluting with three of water.

Price as follows—1 Gallon, 3s. 6d.; 2 Gallons, 6s.
A further reduction, if taken in larger quantities.

SOLE AGENTS—
OSBORN AND SONS, FULHAM NURSERY, LONDON, S.W.
Of whom Testimonials may be had on application.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & CO.,
IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

87, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

THE CLOCHES, or BELL GLASSES, named in Mr Robinson's interesting Book on the Parks, Promenades, and Gardens of Paris, are now ready. Prices and particulars of the Aire and Calder Glass Company, 83, Upper Thames Street, where a Stock is Kept; also at 86, Long Acre. J. GOODERIDGE, Agent.

Horticultural and Window Glass Warehouse.

JAMES MILES, 6, High Street, and 12 and 13, Blossom Street, Shoreditch, London, E.
CONSERVATORY and ORCHARD HOUSE GLASS.
GENUINE WHITE LEAD, OILS, COLOURS, BRUSHES, &c.
GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TOPS, CONNECTIONS, &c.
Prices upon application

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

NOTICE.

ROYAL HORTICULTURAL SHOW, OXFORD.

THE FORCING GARDENER'S SUMMUM BONUM.

ORMSON'S NEW PATENT VENTILATING HOT-WATER APPARATUS, combined with his NEW PATENT SYSTEM of VENTILATING HOTHOUSES, by which the EVIL EFFECTS of admitting COLD CURRENTS OF AIR, and the equally INJURIOUS EFFECTS OF A STAGNANT VITIATED ATMOSPHERE in Forcing Houses or other buildings is EFFECTUALLY OBVIATED, by insuring at all times the ingress of a well regulated current of FRESH WARM AIR and the egress of IMPURE AIR, by means so simple, and laws so natural that there is no danger of the apparatus (by which so important a desideratum is attained) getting out of order. Provision is made for carrying off ALL CONDENSATION, so that ALL DRIP and DAMPNESS is EFFECTUALLY PREVENTED. These structures are remarkably strong and light in appearance. The GLASS used being in LARGE SQUARES and of GREAT THICKNESS the usual REPAIRS will be DONE AWAY WITH, and it will also be HAIL PROOF. There is NO PUTTY exposed to the action of the sun and atmosphere, EITHER INSIDE OR OUTSIDE of THESE HOTHOUSES, and PAINTING will be REDUCED to a minimum.

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,

AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.

STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

JOHN WARNER & SONS, HYDRAULIC ENGINEERS,

Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

8, CRESCENT, CRIPPLEGATE, LONDON, E.C.

No. 547A.
GARDEN ENGINE.

10 Gallons	..	£3 0 0
16 ,,	.. ..	3 16 0
24 ,,	.. ..	5 1 0
28	.. ..	5 13 0

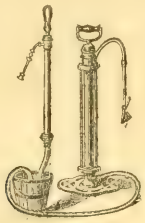

WARNERS'
AQUAJECT.
Useful for every variety of purpose in watering or washing Flowers or Trees in Gardens, Conservatories, &c.; also for washing Carriages or Windows, laying Dust, &c.
Price, complete £1 8 0
Small size for the hand, as an ordinary Syringe .. 0 15 0

THE CRYSTAL PALACE
GARDEN or FIRE ENGINE.

No. 35.
CAST-IRON PUMPS.

2½ inches	..	£1 9 0
3 ,, ..	..	2 2 0
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No. 579½.
SWING
WATER BARROW.

20 Gallons	..	£2 2 0
30 ,,	.. ..	2 14 0
38 ,,	.. ..	3 13 0
50 ,,	.. ..	5 14 0

Prize Medals, 1851 and 1862.

BUTLER, McCULLOCH, AND CO.'S EXTRA CHOICE FLOWER SEEDS for Present Sowing, sent post paid.

	Per packet.—s. d.
CALCEOLARIA, from show flowers	1s and 2 6
CINERARIA, Smith's splendid varieties	1s and 2 6
PRIMULA, Stuart's superb varieties	1s and 2 6
CYCLAMEN, Wiggins' Prize strain	1s and 2 6
CARNATION, from flowers of great beauty	1s and 2 6
,, in collections, 12 colours	3s. 6d. and 5 6
HOLLYHOCK, from finest show varieties	1s. and 2 6
POLYANTHUS, from finest show varieties	1 0
WALLFLOWER, finest double varieties	1 0
PANSY, from exhibition varieties	1s. 6d. and 2 6

CANVAS HOSE, for Watering Gardens, much more durable than India-rubber, will stand any amount of pressure, and about half the price, from ¾-inch to 2-inches in diameter, from 1s. 2d. to 2s. 3d. per yard. Any length can be had. Samples on view at 67, South Row, Covent Garden Market, where also may be seen the AMERICAN "ARCHIMEDEAN" LAWN MOWER.

BUTLER, McCULLOCH, AND CO., 67, South Row, Covent Garden, London, W.C.—Established upwards of a Century.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.

CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes last season at the Royal Botanic, Royal Horticultural, and other places. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

CALCEOLARIA, finest hybrid. Per packet, 2s. 6d.; smaller packets, 1s. 6d. CALCEOLARIA, finest spotted. Per packet, 2s. 6d.; smaller packets, 1s. 6d. Saved with the greatest care, and from one of the largest collections in the kingdom.

CINERARIA, choicest, hybridised.—Saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.

PRIMULA.—Choicest, mixed, fringed. Per packet, 2s. 6d.
PRIMULA.—Dark carmine, fringed. Per packet, 2s. 6d.
PRIMULA.—New scarlet. Per packet, 2s. 6d.
PRIMULA.—Rose fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved white, 2s. 6d.
PRIMULA FIMBRIATA.—Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

Smaller packets, 1s. 6d.

Forwarded immediately on receipt of Post-office Order.

JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

New and Extra Choice Flower Seeds.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old Established" Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

	Per packet.—s. d.
AURICULA, from finest named flowers	1 0
CALCEOLARIA, James's, Shirley, and Purple, each	2s. 6d. and 5 0
,, from the Dalkeith collection	1s. 6d., 2s. 6d. and 5 0
CINERARIA, very choice strain	2s. 6d. and 5 0
CARNATION, from superb flowers	1s. and 2 6
,, in collections, 12 varieties	3s. 6d. 10 0
CYCLAMEN, Wiggins' prize strain	1s. and 2 6
GLOXINIA	1 0
,, erect flowered	1 0
HOLLYHOCK, from choicest named varieties	1s. and 2 6
MYOSOTIS DISSITIFLORA	1s. and 2 6
,, SYLVATICA	1s. and 2 6
,, ALBA	1s. and 2 6
PANSY, from finest named varieties	1s. and 2 6
,, Belgian, or Fancy	1s. and 2 6
PETUNIA, from choicest varieties	6d. and 1 0
PINK, from finest varieties	1s. and 2 6
POLYANTHUS, from finest flowers, extra	1 0
PRIMULA SINENSIS FIMBRIATA RUBRA	2s. 6d. and 5 0
,, ,, ,, ALBA	2s. 6d. and 5 0
,, ,, ,, Mixed	1s. and 2 6
,, ,, ,, FILICIFOLIA RUBRA	2s. 6d. and 5 0
,, ,, ,, ALBA	2s. 6d. and 5 0
,, ,, ,, Mixed	1s. and 2 6

All these Primulas are from the finest strains in cultivation, and cannot be surpassed.

STOCK, East Indian, Scarlet, White, and Purple, each	1 0
,, German Brompton, first mixed	1 0
,, ,, collection, 12 varieties	3 6
SWEET WILLIAM, Auricula-eyed	1 0

TACSONIA VON VOLXEMI, a superb greenhouse climber, which flowers most abundantly almost the whole year. The flowers are about 5 inches in diameter, and of the richest scarlet. Grows very rapidly. 1s. and 2 6

VIOLA CORNUTA	1 0
,, ALBA	1s. and 2 6
WALLFLOWER, fine dark	6d. and 1 0
,, Double German, finest mixed	1s. and 2 6

*** All Flower Seeds sent post free.

Choice Seeds for Present Sowing, Free by Post.

JAMES DICKSON AND SONS (old established Nursery and Seed Business), 109, Eastgate Street, and "Newton" Nurseries, Chester.

	Per packet.—s. d.
ANTIRRHINUM, choice mixed	6d. and 1 0
AURICULA, from choice varieties	1s. and 2 6
CALCEOLARIA, herbaceous, choice strain	1s. 6d., 2s. 6d. and 5 0
CARNATION, from prize flowers	1s. and 2 6
,, collection, 12 varieties	3s. 6d. and 5 0
CENTAUREA, candidissima	6d. and 1 0
CINERARIA, from newest named flowers	1s. 6d., 2s. 6d. and 5 0
CYCLAMEN, Wiggins' prize strain	1s. 6d. and 2 6
ECHEVERIA METALLICA	1 0
GLOXINIA, erect and other varieties	1s. and 2 6
HOLLYHOCK, from choice named sorts	1s. and 2 6
,, collections of 6 and 12 varieties	
MYOSOTIS DISSITIFLORA	1 0
PANSY, from prize flowers	1s. and 2 6
PETUNIA, from choice varieties	6d. and 1 0
,, double, fine hybridised	1s. and 2 6
PINKS, from choice named sorts	1s. and 2 6
POLYANTHUS, from a show strain	1s. and 2 6
PYRETHRUM AUREUM, Golden Feather	6d. and 1 0
PRIMULA SINENSIS FIMBRIATA ALBA, 1s. 6d., 2s. 6d. and	5 0
,, ,, ,, RUBRA, 1s. 6d., 2s. 6d. and	5 0
,, ,, ,, Mixed, 1s. 6d., 2s. 6d. and	5 0
,, ,, ,, FILICIFOLIA ALBA 1s. 6d., 2s. 6d. and	5 0
,, ,, ,, RUBRA, 1s. 6d., 2s. 6d. and	5 0
,, ,, ,, Mixed, 1s. 6d., 2s. 6d. and	5 0
SOLANUM, new hybrid	2 6
STOCK, Brompton finest German	1s. and 2 6
,, ,, choice mixed, 12 varieties	3 6
,, Cocardeau or Winter	1s. and 1 0
,, East Lothian Collection, 3 colours	2 6
VIOLA CORNUTA ALBA	1 0
,, LUTEA	1 0
WALLFLOWER, finest Double German	1s. and 2 6
,, collection, 12 varieties	3 6

The following, for early Spring blooming, can be supplied by weight, or in packets, 3d. and 6d. each :—

Alyssum saxatile.	Myosotis palustris
Calandrinia, of sorts.	Nemophila, of sorts.
Candytuft, of sorts.	Saponaria, of sorts
Collinsia, of sorts.	Shortia californica.
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Iberis sempervirens.	Sweet William, fine mixed.
Limnanthus, of sorts.	Viola cornuta, blue.
Lupinus, of sorts.	Wallflower, fine mixed.

CATALOGUES of SEEDS and PLANTS post free on application.

BENJAMIN S. WILLIAMS' GENERAL AND NEW PLANT CATALOGUE FOR 1870,

Contains LISTS of select ORCHIDS (many being now in flower), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS (both of which are extensively grown, and many fine specimens are now in full beauty), CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

B. S. WILLIAMS respectfully invites inspection of his numerous Collection of Plants, which at all times well repay a visit, but at this particular season are specially interesting.

CONSERVATORIES FURNISHED ON REASONABLE TERMS.

Choice Plants supplied for Balls or Dinner-table Decoration.

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VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

ROYAL BOTANIC SOCIETY.

THIRD SUMMER EXHIBITION, July 6 and 7.

AWARDS OF PRIZES.

GOLD MEDAL.

Miss F. Blair, 10, Spencer Road, New Wandsworth, for Table Decorations. Given by H.R.H. the Princess of Teck

Mr. A. Johnson, Gr. to the Marquis of Aylesbury, Savernake, for a Collection of Fruit

LARGE SILVER-GILT MEDAL.

Miss E. Harris, Clarendon Park, Salisbury, for Table Decoration.

Mrs. Lermitte, Knutsford, Finchley, for Table Decoration.

Mr. Jas. W. Chard, Clarendon Park, Salisbury, for Table Decoration.

Mr. Chas. Wood, High Street, Marylebone, for Table Decoration.

Mr. T. Bannerman, Gr. to Lord Bagot, for a Collection of Fruit.

Messrs. Veitch & Son, Chelsea, for a Collection of New and Rare Plants

LARGE SILVER MEDAL.

Mr. H. Clark, Gr. to Earl Cowper, Brocket Hall, for a Collection of Fruit

SILVER-GILT MEDAL.

Mr. John Hepper, Gr. to E. H. Walmsley, Esq., The Elms, Acton, for Hanging Baskets with any kind of growing plants.

Mr. J. Tibbles, Gr. to A. Haines, Esq., Kensal House, Harrow Road, for Hanging Basket with hardy plants

Mr. J. Tibbles, for Hanging Basket with greenhouse plants.

Mr. W. Gear, Gr. to F. Rodgers, Esq. Ealing Dean, for a Pair of Rustic Standing Baskets, furnished with greenhouse plants.

Mr. G. Wheeler, Gr. to Sir F. H. Goldsmid, Bart., Regent's Park, for a Pair of Standard Bay Trees in tubs.

Mr. T. Russell, Rose Cottage, Child's Hill, Hampstead, for a Pair of Window Boxes, furnished with growing plants.

Messrs. A. Henderson & Co., Pine-apple Nursery, for a Large Fern Case with growing plants.

Mr. John Gardener, 453, Strand, for Groups of Growing Plants in fancy pots for drawing-room table.

Messrs. F. & A. Henderson & Son, Wellington Road, for a Group of Plants arranged for a special decorative purpose.

Mr. B. S. Williams, Holloway, for a Collection of New and Rare Plants.

Messrs. J. & C. Lee, Hammersmith, for a Collection of Plants.

Mr. G. Wheeler, for a Collection of Plants.

SILVER MEDAL.

Miss Burton, 9, Hyde Park Place, for a Small Fern Case.

Mr. J. Tibbles, for Hanging Basket furnished with growing plants.

Messrs. A. Henderson & Co., for Hanging Basket with hardy plants.

Messrs. A. Henderson & Co., for Hanging Basket with greenhouse plants.

Messrs. Dick Radclyffe & Co., for a pair of Rustic Standing Baskets with greenhouse plants.

Mr. W. Cole, for a Standing Basket with any kind of growing plants.

Mr. W. Cole, for a Pair of Large Vases furnished with one plant each.

Messrs. Dick Radclyffe & Co., for a Pair of Window Boxes with growing plants.

Messrs. Dick Radclyffe & Co., for a Large Fern Case with growing plants.

Miss Barnard, 62, Russell Square, for Epergne with cut flowers.

Miss E. Harris, for a Wedding Bouquet

Miss L. Harris, for a Ball-room Bouquet.

Miss F. Harris, for a Table Bouquet

Miss Hassard, St. Ronan's, Church Road, Upper Norwood, for Lady's Hand Basket with cut flowers.

Messrs. Dick Radclyffe & Co., for Epergne furnished with growing plants

Mr. J. Tibbles, for Group of Plants for special decorative purposes.

Mr. John Gardener, 453, Strand, for Epergne with cut flowers.

Mr. F. Perkins, Regent Street, Leamington, for Wedding Bouquet.

Mr. F. Perkins, Regent Street, Leamington, for a Ball-room Bouquet

Mrs. Green, 28, Crawford Street, Bryanstone Square, for a Table Bouquet

Mr. F. Perkins, for Cut Flowers, arranged for special decorative purposes.

Mr. G. Bruce, Gr. to W. S. Burton, Esq., South Villa, Regent's Park, for a Collection of Plants.

Mr. Richard Carr, Gr. to J. N. Micklethwaite, Esq., Tavernham Hall, Norwich, for a Collection of Fruit

Mr. W. Gardiner, Gr. to W. P. Shirley, Esq., Stratford-on-Avon, for a Collection of Outdoor Fruits

Mr. James Ayre, Gr. to — Copestake, Esq., Highgate, for 1 Queen Pine-apple.

Mr. C. Penford, Gr. to Lord Radnor, Longford Castle, Wilts, for 1 Pine-apple, any variety.

Mr. G. T. Miles, Gr. to Lord Carrington, Wycombe Abbey, for 2 Pine-apples in pots, any variety.

Mr. G. Ward, Gr. to T. N. Miller, Esq., Bishop Stortford, for 12 lb. Black Grapes.

Mr. Penford, for 1 dish Black Hamburgh Grapes.

Mr. D. Pizzey, Gr. to Sir E. Perry, Esq., Fulmer, Slough, for 1 dish Grapes.

Mr. D. Pizzey, for 1 dish of Grapes of any kind.

Mr. W. Lynn, Gr. to Lord Boston, for 2 dishes of Peaches.

Mr. W. Miller, Gr. to the Earl of Craven, Combe Abbey, for 2 dishes Nectarines.

SMALL SILVER MEDAL.

Messrs. Austin & Seeley, Euston Road, for 1 Standing Basket with any growing plant.

Mr. J. Gardener, 453, Strand, for Pair of Large Vases, with 1 plant each.

SMALL SILVER MEDAL.

Messrs. Dick Radclyffe & Co., for Small Fern Case with growing plants.

Messrs. Claudet & Houghton, for Small Fern Case with growing plants.

Mrs. Green, 28, Crawford Street, for Epergne with cut flowers.

Messrs. A. Henderson & Co., for Wedding Bouquet.

Messrs. A. Henderson & Co., for a Collection of Plants.

Mrs. Green, Crawford Street, for a Ball-room Bouquet.

Mr. F. Perkins, for a Table Bouquet.

Messrs. Rollisson & Sons, for a Collection of Plants.

Mr. H. Clark, for a Collection of Outdoor Fruit.

Mr. R. Smith, Gr. to H. Walker, Esq., Calderstone, Liverpool, for 1 Queen Pine.

Mr. H. Balram, Gr. to R. T. Crawshay, Esq., Cyfarthfa Castle, for 1 Pine-apple, any variety.

Mr. C. Acres, for 1 Pine-apple, any variety.

Mr. R. Laing, Gr. to P. W. Flower, Esq., Furze Down, Tooting, for 2 Fine apples in pots.

Mr. Wm. Davis, New Lodge, Whetstone for 12 lb. of Black Grapes.

Mr. Wm. Davis, for 12 lb. of White Grapes.

Mr. Wm. Davis, for 1 dish of Muscat Grapes.

Mr. T. Bannerman, for 1 dish of Black Hamburgh Grapes.

Mr. C. Penford, for 1 dish of Grapes, any kind.

Mr. W. Miller, for 2 dishes of Peaches.

Mr. W. Lynn, Gr. to Lord Boston, for 2 dishes of Nectarines.

Mr. G. T. Miles, for 2 dishes of White Cherries.

Mr. G. T. Miles, for 1 dish of Plums.

Mr. J. Pottle, Gr. to D. B. Colvin, Esq., Bealings Grove, Suffolk, for 2 dishes of Black Cherries.

Mr. G. T. Miles, for 4 dishes of Strawberries.

BRONZE MEDAL.

Miss E. Harris, for an Epergne with cut flowers.

Miss Hassard, for a Wedding Bouquet

Miss Hassard, for a Ball-room Bouquet.

Miss Hassard, for a Table Bouquet.

Miss Katie Looker, Cromwell House, Kingston-on-Thames, for a Lady's Hand Basket with cut flowers.

Mr. W. Gardiner, for 1 Queen Pine-apple.

Mr. G. Ward, for 1 Pine, any kind.

Mr. G. T. Miles, for 1 Pine, any kind.

Mr. Thomas Crane, for 1 green-fleshed Melon.

Mr. J. Cross, Gr. to Sir F. H. Goldsmid, Rencombe Park, Gloucestershire, for 1 scarlet-fleshed Melon.

Mr. Cosman, Gr. to R. Holland, Esq., Stanmore Hall, for 1 dish of Figs.

Mr. W. Cole, for 1 dish of Grapes of any kind

Mr. J. Widowson, Gr. to J. H. Barnes, Esq., Rickmansworth, for 4 dishes of Strawberries.

Messrs. Paul & Son, Cheshunt, for a collection of cut Roses

Messrs. Carter & Co., for a Collection of Double-flowered Pelargoniums.

CERTIFICATES.

Mr. Harvey, Gr. to B. Wroughton, Esq., Wooley Park, Wantage, for a Collection of Outdoor Fruits.

Mr. J. Banting, Gr. to Lady E. Pringle, Bonchurch, Isle of Wight, for 1 green-fleshed Melon

Mr. J. Banting, for 1 scarlet-fleshed Melon

Mr. J. Burnett, Gr. to Mrs. Hope, The Dwepdene, Dorking, for 1 scarlet-fleshed Melon

Mr. J. Banting, for 2 dishes of Peaches.

Mr. W. Gardiner, for 1 green-fleshed Melon.

Mr. J. Hepper, for 2 Pine-apples in pots

Mr. J. Hepper, for a Collection of Pine-apples

Messrs. J. Standish & Co., Ascot, for 12 lb. of Black Grapes.

Mr. Bannerman, for 12 lb. of Black Grapes

Mr. W. Davis, for 1 dish of Black Hamburgh Grapes.

Mr. George Pearce, for 2 dishes of Nectarines.

Mr. Charles Ross, Gr. to C. Eyre, Esq., Newbury, for 2 dishes of White Cherries.

Mr. J. Widowson, for 2 dishes of White Cherries.

Mr. G. T. Miles, for 2 dishes of Black Cherries.

Mr. J. Cross, for 2 dishes of Black Cherries.

Mr. James Douglas, Gr. to F. Whitbourne, Esq., Loxford Hall, Ilford, for 4 dishes of Strawberries.

Mr. D. Pizzey, for a Stand of Picotees.

Mr. D. Pizzey, for a Stand of Carnations.

CERTIFICATES OF MERIT.

Mrs. Bodkin, Merton Lane, Highgate, for Model Flower Garden.

Messrs. F. Brown & Son, 23, High Street, Marylebone, for Garden Engines

Mr. Geo. Smith, 52, Red Lion Street, Clerkenwell, for Enamelled Labels

Messrs. Brook & Co., Holborn, for Garden Engines.

Mr. E. A. Puig, Grove Road, St. John's Wood, for Designs in Rockwork

Mr. F. A. Puig, Grove Road for Nature printed Ferns.

Messrs. Weeks & Co., for Hot-water Apparatus.

Silicated Carbon Filter Company, for Filters.

Mr. H. Appleby, Dorking, for Fumigators.

Messrs. Geo. Neighbour & Son, for Beehives.

Mr. Benjamin Looker, for Earthenware Plant Protectors.

Messrs. Dick Radclyffe & Co., for a collection of Window Boxes.

Seeds from Prize Flowers, saved by

MESSRS. DOBSON AND SONS, SEED GROWERS, &c., Woodlands Nursery, Isleworth, from their unequalled collections

CALCEOLARIA.—From plants which have been so successfully exhibited this season at the Crystal Palace and Royal Horticultural Exhibitions. In sealed packets, 1s. 6d., 2s. 6d., 3s. 6d., and 5s.

CINERARIA.—Splendid, mixed, 1s., 2s. 6d., and 5s.

PRIMULA.—A particularly fine strain of fringed flowers, of a brilliant colour; also ALBA; 1s., 2s. 6d., and 5s.

SCARLET INTERMEDIATE STOCK.—Very rich in colour. 6d. and 1s. All the above post free

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—At a Special General Meeting of the Members of this Institution, held on the 5th inst., for the purpose of ELECTING SIX PENSIONERS, the following was the RESULT of the BALLOT:—

CANDIDATES.

Name	Age.	Votes.
CATHERINE BROWN	84	799
HENRY DALGLEISH	76	774
MARY McARDELL	71	711
ROBERT PETRIE	75	458
JAMES SOUTER	79	404
DAVID BROWN	78	668
CHARLES COLLINS	71	450
JOHN GIBSON	70	205
WILLIAM KATES	63	172
MARIA SHUARD	65	405
DONALD SINCLAIR	67	541

The Meeting then declared Catherine Brown, Mary McArdell, David Brown, Donald Sinclair, Robert Petrie, and Charles Collins, as having the greatest number of Votes, duly elected Pensioners.

EDWARD R. CUTLER, Sec.,
July 6. 14, Tavistock Row, Covent Garden, W.C.

The Gardeners' Chronicle

SATURDAY, JULY 9, 1870.

MEETING FOR THE ENSUING WEEK.

TUESDAY, July 12 { Royal Horticultural Society (Examination of Gardeners), at South Kensington—10 A.M.

EXCELSIOR must in future be the password of the VINE EXTENSIONISTS. An interesting illustration has just come to hand in the form of a magnificent bunch of Black Hamburgh Grapes, grown at Chatsworth by Mr. SPEED. In another column will be found some particulars of the history of the bunch, and here we will record some additional facts. The Vines have, it appears, been planted about 33 years, and occupy one of the first houses built at Chatsworth upon the ridge-and-furrow system. The border has been well raised above the surrounding soil, and Vines have been growing both inside and outside the house, but in distinct borders. For years, we are informed, the Vines had been failing; the bunches, in the first year of Mr. SPEED'S charge, being disfigured by shanked berries, and some of them shanked altogether; the leaves, though of good size, were flaccid and poor, indicating the presence of too much moisture both in the border and atmosphere, and considerable prostration of vital energy. All the Vines were in nearly the same state, the more recently planted ones, though immensely strong, being soft and pithy, so much so that in the leading shoots an ordinary pencil might be inserted down the centre with little or no trouble. The consequence of this immaturity in the wood was the development of long lean loose bunches, shanked berries, and deficient colour and quality.

The gardens at Chatsworth lies low and damp, considerably lower than the flood level of the River Derwent, which runs close to it. Consequently Mr. SPEED knew that the Vines were not likely to suffer from the want of water, but they were more likely to receive injury from the want of heat. To this end he at once arranged the surface of the borders, sloping them so as to afford a ready discharge at the surface for storm water. Where the bottom-heat of the borders had been disconnected it was restored, and through the parching summer of 1868 not a border, inside or outside the vineries, received any water beyond that which fell from the heavens, or an occasional surface sprinkling. The rents in the borders were such as to suggest a copious watering, but Mr. SPEED'S object was the perfect maturation of the wood, and he knew that could only be effected by encouraging short sturdy growth, with clean, well developed foliage and buds. Air, so soon as the foliage was sufficiently hardened, was admitted by a free circulation night and day, and when the fruit was cut, heat was kept on until the leaves at last fell from the Vines from sheer maturation. Under such treatment the practised eye could soon detect that the wood was close grained, and hard as ebony, and hence in a fit state to produce well formed bunches of finely coloured fruit. In 1869 the Grapes were much superior to what they had been the preceding year; and this season we should say there can scarcely be a finer series of vineries in the country.

Several of the vineries at Chatsworth are stocked with old Vines, some of them planted, we believe, prior to Sir JOSEPH PAXTON going there. In these, and also in the house to which we have specially referred, there was a confusion of branches, in fact the leaders were laid in so closely together that it was impossible that the foliage could be properly exposed to the light. These, last winter, were reduced in number, so that now the main branches are 3 to 4 feet apart, giving ample room for lateral extension of the foliage. In the ridge-and-furrow house the inside Vines have been entirely removed, and the advantage of giving the foliage ample room for development is now conspicuously manifest. Shanked Vines are things of the past, each bunch is a compact cube of immense berries, finely hammered and coloured, and with the bloom laid on with an unsparing hand. The 264 bunches, which form the crop, average 3 lb. each, and some of them weighing double that weight. The kinds are Black Hamburgh and Black Prince, and below we give statistics of the crop:—

Name.	Girth, 2 ft from ground.	Number of rods.	Number of bunches.
	inches.		
Mill Hill Hamburgh	5	2	27
Black Hamburgh	7	2	22
Black Prince	5½	3	43
Black Hamburgh	5¾	2	28
Black Hamburgh	4½	2	33
Black Hamburgh	5	3	40
Black Hamburgh	6¼	3	46
Mill Hill Hamburgh	5½	2	25
			264

The stems, it will be seen, are not remarkably large, but the girth below where they divide would double, perhaps treble, that of the branches. The average number of bunches is 33, and taking the weight at 3 lb. each, or, for the sake of even numbers, at 150 lb. to each Vine, and the value at 5s. per pound, which they would readily bring, the value of the crop would be £200, and that from Vines which two years ago were condemned to the hatchet and the fire pile. Nothing can be finer than the bunch which we have received, the berries are in every respect superb, and yet we are assured it was one of the smallest in the house.

We regard this as one of the most extraordinary instances of the revivification of plant life which has ever been recorded, and we congratulate Mr. SPEED upon his well-merited success. Although there are at Chatsworth many houses of young Vines, varying from two to seven years old, not one of them is equal to this house of veterans. The extensionists may well be proud of this success, and those who visit Chatsworth (and we should advise all who have the means, to do so) will find that extension is not confined to Vines, but extends to orchard-house trees, upon which may be seen splendid crops of Peaches, Nectarines, Plums, &c., the young shoots free from a single pinch, and many of them 2 to 4 feet long. Mr. SPEED contends that to have weight of fruit it is indispensable to have breadth of foliage. Not a shoot will be stopped before the middle of August, and then, when the fruit begins to ripen, it will be necessary to do so to admit light and give full flavour.

We are authorised to say, Mr. SPEED will be glad to show the Grapes to any person who may call to see them; and if visitors can advise him of their visit, it may be convenient to both parties. Cutting from this house will commence next week, and hence those who wish to see the full crop should go at once. Finally, let us hope that, if not already entered for competition, Mr. SPEED will send some examples of his remarkable success for exhibition at Oxford.

WE have lately had our attention drawn to the extraordinary rapidity with which the SUBURBAN CEMETERIES are being surrounded by houses. If building goes on much longer at its present rate, we shall in a few years have the same evils reproduced in them which, some 15 or 20 years ago, led to the enactment prohibiting interments in the City graveyards.

The interest which we, as a gardening periodical, have in the subject is no doubt somewhat indirect; but although indirect, it is very tangible. Nothing connected with the lungs of our great city, nothing connected with vacant spaces where gardening is more or less practised, is alien to us; and we can foresee that whatever course may be taken with these burying-places, many points must arise in which our interest and that of our readers will be direct. We therefore make no apology for broaching the subject, and inviting attention to it while its consequences are still in embryo.

No one who remembers or has heard or read of the old state of things in the City graveyards can doubt that the suppression of City interment was a most proper step, called for alike on grounds of public health and public decency; and if it be so, it seems a necessary corollary that whenever the same evils re-appear beyond the bounds of the Act, its limits ought to be extended so as to bring them within its operation. Now, whoever will take the trouble to inquire, will find that the metropolis has extended so much since the passing of the Act that many of the suburban cemeteries, originally established to relieve the pressure on the London parish churchyards, are now as bad, if not worse than many of the yards they were intended to relieve. Compare, for example, Kensington Old Churchyard (St. Mary's) as it was some 20 years ago, with Brompton Cemetery as it is now. Kensington Churchyard was, and is, a small churchyard, such as is suited for a country parish, divided into burial-places belonging to the different proprietors of the land in the parish, in which, consequently, burials were neither very many nor very frequent. The population which could suffer from an evil emanation from the graveyard was comparatively small. The houses which now cover Campden Hill and South Kensington were not in existence, the district being then chiefly composed of fields and market gardens; and yet the privileges of burial in that churchyard were suppressed, and the parish was obliged to get a sort of chapel of ease cemetery, which they still have, somewhere about Hanwell we believe.

Look now at Brompton Cemetery—scarcely further from the centre of London than Kensington—and covering a large tract of ground in which a vigorous trade in funerals is carried on from morning to night. Some idea of the extent of the business carried on in it may be formed by paying a visit to the office in London (where a melancholy duty carried us the other day), where the visitor will find half-a-dozen clerks or officers all busily employed in attending to the constant succession of customers that crowd into the office. Let the visitor extend his explorations to the cemetery itself, and he will find that streets and houses now surround the cemetery on every side, and on three sides of it actually come up to the very walls, or are only separated from them by the breadth of the road. And up to the present moment vaults and burying-grounds are being sold in perpetuity, as if the purchaser and his heirs were to be allowed to use them for hundreds of years to come—and the best of the joke is (if we may be so irreverent on such a serious subject as to use the word) that the Brompton Cemetery belongs to Government, who, we may presume (it is only a supposition on our part, but it seems warranted), acquired it for the very purpose of having it in their power to close it when sanatory reasons should seem to them to call for that step.

The visitor to the Crystal Palace will see the same thing taking place at Norwood or Nunhead—houses being built close to the wall of the cemetery. So a great town is rising up around Kensal Green, although that has advantages in its greater space and position, which will protect it for a longer period.

Now it is true that everything is done decently and in order in these burying-grounds. There is no exhuming of half-decayed remains, no burning of flesh or coffins to make room for newcomers; but is it possible that such great accumulations of putrifying animal matter, buried no doubt 5 feet underground, but extending in layers over an immense space, can be made without some prejudicial effect on the earth, air, or water of the neighbourhood?

We must remember that we have no data for making any comparison between the insanatory effects of a large much-frequented cemetery like Brompton, and those of a small City churchyard. In the one there are acres of dead bodies in every stage of decay. The other is scarcely larger than a Scotch kailyard; and however closely packed, its powers of contagion are confined to a trifling radius.

Would it not be wise to look a little a-head in the matter?—and if at no distant day all these suburban burying-places must be closed, would it not be well to anticipate the coming evil, and take steps to have them removed before some fearful epidemic springs from the mass of fester-

ing humanity, over which so many windows now look, and whose exhalations so many of our fellows now breathe ?

—— A deputation waited upon Mr. Ayrton a few days since on the subject of the Works now being carried out at the Serpentine. The deputation said there was a general impression that what was now being done to the Serpentine would not render it safe and healthy, and it was urged that the whole of the mud should be removed, that the depth should be lessened, and that the slopes should be reduced to 1 foot in 10 feet. One of the speakers, Mr. Crosley, said that if the removal of the mud was only to be partial, he felt convinced that after a short time, when the water was let upon the gravel in the Serpentine, from the greater gravity of the gravel it would sink to the bottom of the mud, the latter ultimately coming to the top. Mr. Ayrton said that the Board had acted under the advice of an engineer of considerable eminence. He mentioned that on the previous day, when riding on the Serpentine Bridge, an engineer accosted him and expressed his approval of what was now being done. He was disposed to act upon the advice of the gentlemen who had prepared the specifications, notwithstanding that the deputation had brought an engineer to find fault with the present arrangements. Lord Harrowby here warmly interposed, and assured the Chief Commissioner that he had entirely mistaken the object of the deputation, which was to urge upon him points, not of an engineering character at all, but simply of common sense. His lordship asked whether the engineer employed on the works was prepared to assert that the mud would not ultimately ooze up through the loose gravel, or whether 14 feet of water was not dangerous to the majority of the bathers who could not swim. Mr. Ayrton said that nothing had been said by the deputation to induce him to alter the course commenced by his predecessor. He thought the slope was very suitable, and if it were considered unsafe for bathers to go there it would be better for them to go elsewhere to bathe. To reduce the depth would cost a great deal of money ; and would the parishes in the neighbourhood of the park be prepared to bear the expense of it? In answer to a remark made by Sir H. Hoare, Mr. Ayrton said that he thought the whole of the money voted for the improvements would be expended. There would be no surplus.—How fond Mr. Ayrton must be of mud ! and what a thoroughly official way of doing things is here revealed. Great expense has been incurred, and if our head gardener be not, as the public prints hint he is to be, drafted off speedily to India or the colonies, the money now spent will be literally "bogged" in the Serpentine, and as large a sum will be required in a few years' time to do what ought to be thoroughly well done now. That this is a matter of common sense, as Lord Harrowby says, is true : but perhaps on that very account it is not intelligible to official minds.

—— We have received from Messrs. Cripps & Son, of Tunbridge Wells, a blooming plant of Siebold's Hydrangea Thunbergii floribus persicis, which they describe as a perfectly hardy shrub, to which interesting group it will form a most valuable addition. It has ovate sharply serrate leaves, a couple of inches long, and the corymbs of flowers are of a pale rose colour, the outer sterile ones having from three to four roundish segments. We shall shortly publish an illustration of this novelty.

—— We extract from the *Builder* the following particulars relating to the Buildings for Annual International Exhibitions :—

"The buildings in which the Exhibition of 1871 will be held have been designed by Lieut.-Colonel Scott, R.E., and are to be of a permanent character. Those persons familiar with the Horticultural Gardens know the long ornamental arcades parallel with the Albert and Exhibition roads. At the back of these arcades is a piece of waste ground, some 200 feet wide, extending to the road. On these strips of land the two main exhibition buildings are to be built. At their northern ends, these main buildings will be placed in communication with the conservatory of the Horticultural Gardens, and through it with the new Albert Hall of Arts (the grand promenade of which will be utilised for exhibition purposes, the educational collection being placed therein) by covered approaches, which are being made upon the top of the arcades connecting them with the conservatory. The southern ends of the main buildings will communicate with the permanent portion of the Exhibition building of 1862, which forms the southern boundary of the Horticultural Gardens. This building is now used for the exhibition of objects in connection with the South Kensington Museum. By this means the building will completely surround the gardens, to which the public will be admitted at certain times, and under special conditions, which have yet to be decided upon. It is also proposed to connect this series of buildings with the South Kensington Museum, by means of a covered way under the Exhibition Road, and also in the same manner with the Metropolitan Railway.

"The length of the main buildings on the ground floor at each side, will be 1100 feet, on the upper floor at each side, 600 feet. Their width throughout will be 30 feet, and the height of the two floors, 60 feet. The level of such a length of building will be broken each side by four raised pavilions or dwarf towers ; four of these, on either side of the north and south extremities, will be 35 feet wide, the two centre ones being 65 feet.

"The ground-floors of the buildings consist of a series of chambers, broken in equal lengths by the varying dimensions of the central portions, the light for which is obtained from large windows in the east and west sides of the respective buildings, but there can, of course, be no windows in the sides which adjoin and continue the present arcade walls.

"The lower storey will be set aside for the exhibition of woollen fabrics, manufactures, tools and machinery. The upper floor will be a repetition, on a smaller scale, of the picture-gallery of the Exhibition of 1862 ; the galleries will have no side windows, but will be lighted with a single centre ridge glass roof. The floor will be fireproof, made on the Fox & Barret principle, of rolled iron girders filled in between with 10 inches of concrete, and tiled on the upper surface. Provision is made in the built girders for heating the buildings by means of hot-water pipes, and also for ventilation. These galleries, which are to be 30 feet wide, by 25 feet high, will be used exclusively for the exhibition of works of art and art-manufactures, such as painting, bronzes, sculpture, porcelain, decorative furniture and jewellery ; in fact every kind of artistic work, whether applied to objects of ornament or domestic use.

"On the side of the Albert and Exhibition Roads, the buildings will not be excessively decorated. In the front, overlooking the Horticultural Gardens, a greater endeavour in that respect will be made. The arcades of the Horticultural Gardens, which are only 12 feet wide, are being finished, and their stone capitals and cornices are being carved from designs by the South Kensington art-students. The arcades, which are at present only temporarily covered, are being roofed over in a permanent manner, and will form a promenade on a level with the floor of the picture and art-galleries of the upper saloons, with which they will communicate through wide doorway entrances. The side next the gardens will have a terra-cotta balustrade, from which rise light ornamental carved wood columns, supporting a trellis-work of iron running along the whole length and breadth of the walk. This trellis-work will be interwoven with vines and creepers. The balustrade will contain vases filled with flowers, and a view will be obtained over the whole extent of the gardens beneath.

"The buildings are in the Decorated Italian style, with mouldings, cornices, and courses in buff-coloured terra-cotta ; the brickwork being of the red Fareham bricks, so as to match the garden architecture, and harmonise with the new museum buildings which are rising in front of them. The buildings altogether will accommodate, it is stated, 50,000 people.

—— We are informed that the Oxford Sub-Committee has decided to charge all gardeners (producing their master's cards), for admission to the Oxford show, at the following rate, viz., first day, 2*s.* 6*d.*, instead of 5*s.* ; second day, 1*s.* ; third day, 6*d.*

—— We insert the following protest from "Nature," because we think it calculated to stop a growing evil :—

"We have just seen a bill-head or order to which we think it necessary to call attention. On a scroll at the top is a name which, together with the address, which is on another scroll, we suppress, as we do not wish to assist this person in his advertisements. On other artistic scrolls we find the occupations of the advertiser, dyeing and printing works being set forth on one of them. In the centre is a coat of arms and crest surrounded by a garter, on which is printed 'Fellow of the Chemical Society, London.' We have no wish to infer that this gentleman is not a most eminent chemist, but we do most emphatically protest against the membership of a learned society being turned to account for advertising purposes. We hope that the Council will not allow this to continue unnoticed, for nothing could be more damaging to the welfare of a scientific society."

In the case of a society like the Royal Horticultural or the Royal Botanic, into which the trade element of necessity and with perfect propriety enters largely, the above protest does not apply. The obligation is mutual, and the relation of the Society to the man of commerce is perfectly well understood by every one ; but when merely for trade purposes a parade is made of the circumstance that the advertisers are members of sundry learned societies, we hold that the societies in question run a risk of damaging their reputation, while the advertisers place themselves in a false position.

—— We learn that the magnificent gardens and pleasure-grounds at Shrubland Park, Suffolk, the residence of Sir G. B. Middleton, Bart., are to be thrown open to the public on or about the 21st inst. A charge of 1*s.* each will be made for the benefit of the "Ipswich Shipwrecked Seamen's Society."

—— The Meteorology of the Week ending July 2 was chiefly remarkable for the low temperature which prevailed throughout England and Scotland (see Mr. Glaisher's Table in our present issue). The Maximum Temperature of the air was 79°.7, which was recorded at Edinburgh in Scotland, the highest temperature in England being at Portsmouth, viz., 76°.2. The mean of the highest temperature for the several stations south of Nottingham was 70°.5 ; to the north of that station, 65°.8, and for all stations in Scotland, 69°.3. The Minimum Temperature of the air was 38°, which was observed at Hull in England. The mean of the lowest temperature for all stations in England was 45°.5, and for the several stations in Scotland was 45°.7. The Mean Temperature for the several stations south of Nottingham was 56°.1, and for those to the north of that station was 54°.1. The mean for all stations in Scotland was 54°.3. The Rainfall varied at the different stations in England from 0.00 in. at Bristol to 1.36 in. at Newcastle ; the mean rainfall for the stations south of Nottingham (with the exception of Norwich, where the fall was 0.77 in.) was only 0.15 in., and for all stations to the north it amounted to 0.58 in. In Scotland, the fall varied from 0.10 in., at Paisley, to 1.38 in., at Perth, with a mean fall for all stations of 0.62 in.

—— In consequence of some misapprehension which appears to exist, we have been requested to state that the *Conversazione*, announced to be given by the Duke of Buccleuch, President of the Royal Horticultural Society, will commence at 8.30, on the evening of Wednesday, the 13th inst.

—— Mr. Meehan continues his suggestive researches into the Sexual Conditions of Plants. In a recent number of the "Proceedings of the Academy of Natural Sciences of Philadelphia," we find the following observations on the cross fertilisation and the law of sex in Euphorbia, and some of which are of the same nature as those detailed in a paper of Mr. Worthington Smith, in the "Journal of Botany :"—

"The list of plants which seem to avoid self-fertilisation is already very large. I think Euphorbia may be added to the number. Certainly this is the case with Euphorbia fulgens, Karw. (E. jacquiniæflora, Hook.), which I have watched very closely in my greenhouse this winter. Several days before the stamens burst through the involucre, which closely invests them, the pistil with its ovarium on the long pedicel has protruded itself beyond, exposed its stigmatic surface, and received the pollen from the neighbouring flowers. The way in which the pollen scatters itself is curious. In most flowers a slight jar or a breath of wind will waft the pollen to the stigmas, but I have not been able to notice any to leave the flowers in this way ; for as soon as the anther cells burst, the whole stamen falls from its filament-like pedicel, and either drops at once on the pistils of other flowers or scatters its pollen grains by the force of the fall.

"This Euphorbia also furnishes another contribution to the theory of sex which I have advanced. The plan on which the male and female organs are formed is evidently a common one ; and the only reason why some flower heads have a pistil in the centre, and others are wholly staminate, is, that there is greater axial vigour when the female flower is formed. Whenever the common peduncle (below the scarlet involucre) is weak, a pistil never appears in that head of flowers. A few which seem strong never have them, but the great majority of the strong peduncles are those which bear the female blossoms. Another interesting fact is, that the number of male flowers is less in those heads which also bear a female than in those which are wholly staminate. This seems to add to the point I made in my paper on Ambrosia, that after the flowers have been partially formed in embryo, and before the sex has been finally determined, the female flower, being primordially the stronger, has the power of absorbing the males or their partially formed elements into its system. It is certainly remarkable that in both these instances the number of male flowers should decrease in proportion to the existence or vigour of the central female one.

"The male and female flowers of Euphorbia fulgens are formed much alike. The female occupies the centre, and seems really but a prolongation of the main stem, on the top of which is an articulation from which the ovarium springs. The capsule readily falls from this articulation when mature. From the base of the female central pedicle spring weaker peduncles, colourless, appearing indeed almost like filaments, articulated at about the same height as the female, only above the point bearing a short filament and anther — the caducous part before referred to. No one can fail to see the correspondence of plan in these different parts, and I think that nothing but the favourable position in the direct line of axial vigour made the central flower a female one.

"Cases occasionally occur in which a tolerably strong head of wholly male flowers will develope the central axis into a pedicel almost as long and vigorous as those which bear female flowers. But the flow of vital force—if I am correct in using this term—not being quite sufficient, the final goal of natural perfection in the female form was not reached. These cases do not occur often, but are well worth looking for, as they show so clearly the dividing line between the forces which govern the male or female sex."

—— We learn that, owing to special military duty, the band of the Royal Horse Guards will be prevented from going to Oxford, but that the splendid Band of the Royal Artillery will attend at the Observatory Ground during the exhibition.

—— The last number of the Pharmaceutical Journal is the commencement of a new series, and promises to be an improvement in matter as it is in form over its predecessors. One of the articles is devoted to the description, by Mr. M. C. Cooke, of a very curious product "occasionally and locally employed" by the natives of India for medicinal purposes by the name of Hasan-i-Yusaf. Great doubts have been expressed as to the real nature of this substance, some comparing it to unripe Poppy seeds, others calling it a "minute siliceous shell of triangular form found floating on lakes and ponds in the hills of Kashmir," and others, again, considering it to be the siliceous frustule of some Diatom or some Foraminifer. The conclusion arrived at by Mr. Cooke, whose figures seem to us conclusive, is that the bodies in question are the spores of a species of Isoëtes.

—— We are glad to see, from an announcement in the current number of the "Journal of Botany," that a new edition of Dr. Prior's work on the Popular Names of British Plants is in active preparation.

—— We learn from a statement in the last number of Scientific Opinion, that that Journal is to pass into other hands, and to be merged in future with the "English Mechanic and Mirror of Science." One

result of this change will be that the Journal will lose the services of its former Editor. "Scientific Opinion" has been so spiritedly and straightforwardly carried on, that we cannot but regret the change, and look anxiously for the periodical in its new phase.

—— The Earl of STAMFORD and WARRINGTON has recently presented to the Crystal Palace Company several fine plants, including some large Dracænas and Araucarias.

—— Professor HUXLEY, on the occasion of the distribution of prizes to the medical students of University College, expressed his opinion that the study of MATERIA MEDICA—*anglicè*, drugs—should, so far as medical students are concerned, be abolished. This is such strange doctrine that we suspect a paradox was intended. We suspect Professor HUXLEY would be loth to trust his life in sickness to the care of a practitioner who did not know opium when he saw it. We have known a case where a large bottle of tincture of opium (laudanum) was accidentally sent by a wholesale druggist to a medical practitioner and labelled as tincture of gentian !—and in medical practice cases frequently occur where a knowledge of poisonous or medicinal plants is of the utmost consequence.

—— The Minister of Public Instruction in Italy, says "Scientific Opinion," has promised a grant of 1600 lire towards the expenses of instituting a LABORATORY of CRYPTOGAMIC BOTANY in Pavia, and it is hoped that a contribution will also be received from the Minister of Agriculture.

—— According to a report now before us, the AGRI-HORTICULTURAL SOCIETY of MADRAS is in a prosperous condition. But little is said of the operations of the society. We notice, however, that the services of Mr. DENHAM, the superintendent, are to be exchanged for those of some other person not appointed at the date of the report.

—— The "Journal of Botany" mentions the decease of an Austrian nobleman, who has rendered good service both to botany and to horticulture. Baron CHARLES VON HUGEL died on June 2 at Brussels, where he filled the office of Minister Pienipotentiary. To horticulturists he is known from his researches in Australia, and as the founder of the Imperial Horticultural Society of Vienna.

—— The *employés* of Mr. B. S. WILLIAMS, of the Victoria Nursery, Upper Holloway, numbering between 40 and 50 men, had a pleasant day's outing on Tuesday last. After a beautiful drive over Wimbledon Common to Hampton Court, they sat down to an excellent dinner. Mr. WILLIAMS' health was drunk with hearty cheers, as was that of Mrs. WILLIAMS, after which the party dispersed, some to boating, others to quoits and various games, while others again, with a taste for art, entered the Palace, to enjoy the beautiful pictures. After tea the party returned to town by a different route, highly delighted with the day's relaxation.

New Garden Plants.

BRASSIA FARINIFERA, *Lind. & Rchb. fil.*

Glumacea. brachysepala, bra hypetala, labello pandurato-antice emarginato cum denticulo interposito, limbo antice serrulato, callis prostratis angulatis, voluteis, quorum in basi, dente ubprospositi, area farinosa semicirculari antepositis.

A new Brassia, in the way of B. glumacea, with red flowers deeply blotched with brown. A pandurate retuse lip, with a nearly semi-circular mealy circle, is quite a novelty. The mealy matter is derived from decayed cells, and occurs also on some other parts of the lip. It is quite the same thing in the five flowers at hand. The plant was discovered by Mr. Wallis in Ecuador, and is sent by M. Linden, of Brussels.

SPIRANTHES WEIRII, *Rchb. fil.*

Aff. Spiranthi Funckianæ, A. Rich & Gal.; cuttute retrorso-acuto (nec rectangulo), labelli angulis postico-semifalcatis membranaceis acutis nec brevibus retusis mucronatis), labelli disco reflexo medio unguiculato (nec linea angulata, signato, papulis supra quaternis (nec geminis), labello intus ante basin velutino (nec in lævi et glabro sulcato).

Racemus elongatus. Rhachis bracteæ glandulosæ. Bracteæ lineari-lanceolatæ, flores aequantes aut superantes, pilosulæ. Sepalum dorsale cuneato-oblongum acutum brunneum extus glandipilæ. Sepala lateralia cuneato oblonga acuta, brunnea, glandipilia, longe cuneato-ovato-acuta, extus minute glandulosa. Petala linearia, supra basin ovaria extensa. Petala linearia sursum dilatata acuta, oblique, binervia, alba, sub apice pagine externæ antice dense glandipilia. Labellum cum columna connatum, tamen una basi liberum unguiculatum sigmatum, ligulatum antice dilatatum, utrinque plica insiliente inflexum, apice reflexo ovato triangulum, carinulis obscuris quaternis ante basin limbi reflexum. Fovea subquadrata in processum postellarem linearem extensum. Anthecinium angulare. Anthera a basi cordata late rostrata attenuata quadriloculares. Pollinia gemina, farinosa alba, superne sulcata, involuta. Caudicula brevis rufa glandula elongata linearis acuta.

We have a very neat sketch, representing a plant with short-stalked oblong acute leaves, nearly in the way of those of Plantago major. They are, "above dark purple green, regularly spotted with numerous spots of cream colour. The underside is of a dark purplish colour, 3½ inches broad, 7 inches long in the blade, 3 inches in the stalk. These leaves are remarkably beautiful." We have to thank W. Wilson Saunders, Esq., for these valuable remarks, as also for the specimen. The inflorescence, a raceme of reddish flowers with white cuspidate bracts, made us think immediately o the Spiranthes Funckiana, A. Rich. & Gal. A very careful study of the typical flowers has, however, given us the certainty that these species are totally different, as pointed out above. We have thought it only our duty to name the plant in honour of Mr. Weir, who collected it, he having given to horticulture the best that a man has to give—his health. *H. G. R fil.*

THE KNOWN FORMS OF YUCCA.—II.

SECTION II. —*Filamentoso-marginatæ.* — Species in which the edge of the leaf habitually splits up into filamentous threads.

The numerous forms of Yucca that fall under this section may be divided into two sets; first, those in which there is no distinct stem, and in which, consequently, the rosette is sessile on the surface of the soil; and second, those in which there is a more or less distinct barren stem below the rosette of leaves. So far as I know, the forms of the first set are more northern in their distribution as wild plants, and will all bear the winter in the open air in this country, whilst the less numerous forms of the second set require protection in winter in England. In the present paper, I shall only have space to enumerate and to characterise briefly the hardy forms, and shall have to leave the tender caulescent ones for another time. The following are the acaulescent, filamentose forms with which I am acquainted, arranged according to the breadth of their leaves, going from narrower to broader :—

13. *Y. angustifolia*, Pursh, Flora i. 227; Bot. Mag. t. 2230; Haworth, Suppl. Pl. Succ., p. 33; Kunth, Enum. iv. 273.—Leaves in wild specimens 15—18 inches long, 3—4 lines broad, pale glaucous green, much thicker and more rigid in texture than in any of the following, rounded on the back and slightly narrowed in the lower third; nearly flat in the middle half on both sides, narrowed in the upper third or quarter to a decidedly pungent point, beneath which the face is concave, the marginal filæ copious, white, thread-like, straight, or recurved. This is much the smallest of the present group, the whole plant in flower being sometimes not more than a couple of feet high, with the inflorescence a simple raceme. The notes just given are taken from specimens gathered by Wright and Fendler in New Mexico. Haworth describes it as having leaves 2 feet long by half an inch broad. The figure in the "Botanical Magazine" is a very indifferent one, and there is no other. We are not aware that it is in cultivation in the country at present, and should be very glad of a drawing and a description made from the living plant. It is not the Y. angustifolia, Carrière, Rev. Hort. ix., p. 20, t. 3, which is a caulescent form.

14. *Y. parviflora*, Torrey, Bot. Mex. Bound., p. 221.—This is a plant which inhabits New Mexico, with which I am only acquainted from seeing a couple of dried specimens in the Kew Herbarium, and which has never been introduced into cultivation. The leaves in measurement come very close to those of the last, and are nearly as thick, and rigid in texture, and as pungent at the point, but they are much duller in colour, with the edges rolled together from the base to the apex, the marginal filæ copious, irregular, thread-like, dirty white, 2—3 inches long. The panicle is simply racemose, or slightly branched, attaining in one of the specimens just mentioned a height above the base of the stem of about 3 feet. The flowers are extremely different, not only from those of angustifolia but also from those of any species known in cultivation, being not more than three-quarters of an inch long, with divisions an eighth of an inch broad, with slender thread-like filaments and very small anthers,—in fact the whole flower more like that of an Ornithogalum of the pyrenaicum group than its neighbours of the same genus; so that there can be no doubt about its being a thoroughly distinct species.

15. *Y. stricta*, Sims, Bot. Mag. t. 2222; Kunth, Enum. iv. 273; Carrière, Rev. Hort. viii., p. 467, t. 101-2. —Leaves 40—50 in a tuft, just like those of filamentosa in texture and colour, reed-like, pale green, with a glaucous bloom, the ones spreading horizontally, the inner erect, 16—18 inches long, 7—9 lines broad at the middle, flattish, except beneath the very point, which is not firm or pungent; the marginal filæ very slender and few in number. Of this the wild specimens we have seen were gathered in Texas and near New Orleans, both by Drummond. It is altogether like filamentosa on a reduced scale, the leaves being not more than half as broad, and the separate flowers considerably smaller, 15—18 lines long, with oblong-lanceolate divisions not more than three-quarters of an inch broad. The plant attains a height of 4—5 feet, and the inflorescence is copiously panicled with as many as a dozen flowers on the lowest branches. We are not yet provided with a good figure of the species, and that in the "Botanical Magazine" is an extremely indifferent one.

16. *Y. glaucescens*, Haworth, Suppl. Pl. Succ., p. 35; Sweet, Flow. Gard., t. 53; Kunth, Enum. iv. 273.—Of this I have not seen any reliable specimen, and should be very glad of a drawing or description. It is said to come very near to the next, but to have firmer more glaucous narrower leaves (not more than an inch broad), attaining a length of 18 inches, the edge less distinctly filiferous, the point pungent, and concave on the face the panicle 3—4 feet high, with short densely downy branches. Carrière gives it as a synonym of flaccida, but that is clearly a mistake. Has it any claim to be regarded as more than one amongst the numerous slight forms of filamentosa?

17. *Y. filamentosa*, Linn. Sp. Plant. 457; Bot. Mag. t. 900; Redouté, Lil., t. 277-8; Kunth, Enum. iv. 271.—Carrière, Rev. Hort. ix., p. 212, t. 47-8.—A very common and well-known species, to be seen in every collection. Leaves 30—40 in a dense sessile rosette, between coriaceous and reed-like in texture, apple-green, more or less conspicuously furnished with glaucous bloom when young, in the ordinary forms from 15—21 inches long by 1½—2 inches broad at the middle, the outer ones spreading, the central ones erect or slightly recurved, the point not pungent, the marginal filæ moderately copious, grey, thread-like, 2—3 inches long; panicle 5—6 feet high, copiously branched, the flowers 2 inches deep; leaf concave at the apex, and very slightly so in the lower third. Varies principally in the length of the leaves and of the scape. *Y. concava* (Haworth, Suppl. 34), is evidently a variety with short strong broad leaves, more concave on the face than usual; the panicle of this form is stated to be about 3 feet in height. Var. *maxima*, Carrière, *loc. cit.*, the other extreme, has leaves nearly 2 feet long by 2½ inches broad, with a panicle 7—8 feet in height. A native of the Southern United States.

18. *Y. puberula*, Haw. Phil. Mag. 1828, p. 186; Sweet, Flow. Gard. t. 21; Kunth, Enum. iv. 272.—This again is a form of which I know very little, and about which we should be glad to get further information. According to information from Rev. H. N. Ellacombe, it comes between filamentosa, flaccida, and recurvifolia. Leaves 18—20 inches long, 16—18 lines broad, similar to those of filamentosa in texture but not quite so firm, the central ones decidedly recurved; the point not pungent, the marginal filæ extremely scant and short, not more than three or four slender grey threads about an inch long, being detached from each edge. It is said to attain a height of 4—5 feet, and to have densely pubescent branches.

19. *Y. flaccida*, Haworth, Suppl. Pl. Succ. 34; Kunth, Enum. iv. 272; Bot. Reg. t. 1895; Carrière Rev. Hort. viii. 555, t. 119-120.—A well-marked form, to be seen in all collections. Acaulescent; rosettes close, numerous, of 20—30 leaves each, 18—24 inches long, 18—21 lines broad at the middle, the young ones erecto-patent, but the old ones of so thin and reed-like a texture that they become abruptly decurved about the middle, almost as if broken, so that the tufts may be known at a glance from any of the forms of filamentosa by their irregular untidy appearance, the young ones slightly glaucous, the point not at all pungent, only the apex slightly concave on the base, the breadth narrowed just above the base to 6—8 lines, the edge copiously filiferous, the threads grey, 3—4 inches long. Panicle 3—4 feet high, with pubescent branches, the flowers 2 inches deep.

20. *Y. baccata*, Torrey, Bot. Mex. Bound., p. 221.—Of this I know nothing except from the description given in the work just quoted, from which it would appear that the habit of the rosette is like that of filamentosa, but that the flowers are considerably larger, the divisions measuring 2½—3 inches long by 6—7 lines broad. It is a native of New Mexico, and is said to have a fruit the size of a large fig, with a sweet edible pulp.

These are all the acaulescent forms of which I am aware of the filamentose series. To complete this series I have still to notice several that possess a distinct stem beneath the rosette of leaves. *J. G. Baker.*

FOREIGN INSECT ENEMIES.

Iphipus Roei, Sch.—Some 18 months or two years ago, Professor Regel of St. Petersburg received one or more plants of Zamia media from Australia. One of these he found swarming with a black weevil, just as the plants of Encephalartos, alluded to at p. 699, were with Phacecorynes funerarius. The beetle in this instance was a known species (Iphipus Roei of Schönherr), or perhaps I should rather say, a variety of that species. On close examination of the specimens, which Prof. Regel was good enough to give me for identification, I find that his specimens are a little smoother and more finely punctate on the head and thorax, and a little more coarsely punctate on the underside of the body, than is the case in the normal form; they are moreover all quite black, and without pubescence, while the normal specimens are sometimes purplish black, and with transverse patches of a few light-coloured hairs towards the termination of the elytra, but this is generally absent (probably rubbed off).

I notice the importation and the destructive powers of this species, not only to record the facts, but for the sake of drawing an entomological inference from them. Iphipus, and the allied genus Tranes, have a great outward resemblance to the Sphenophori, to which the destroyer of the Encephalartos belongs; and they have, moreover, some of the most important characters of the tribe to which it belongs, such as the two first segments of the abdomen being soldered together. Now I am becoming more and more convinced that outward *facies* is a much more valuable guide to generic character than is generally allowed, and that we almost always commit a breach of natural affinity when we separate two forms belonging to the same group that are very like each other. Schönherr, and even Professor Lacordaire, who rarely errs, have, however, placed these genera far away from the Calandridæ, or Cossonidæ, as Lacordaire names the "phalanx" in which he places them; and this chiefly because of the deep cotyloid cavities in which the haunches of the limbs are set. But for this Professor Lacordaire would have placed them alongside of Calandra. After mentioning the calandroid characters above alluded to, he says: "Now these are the characters of Cossonidæ, and it is only with hesitation that I have determined not to place them among these latter, and to regard them simply as their intimate representatives in this section. The structure of the cotyloid cavities of their legs is what chiefly determines me to take this course."

This seems to me an erroneous conclusion. The outward resemblance and the concurrence in structure of the segments of the abdomen seem to me of more importance than concurrence in the cotyloid cavities, which besides do not differ (especially in the genus Phacecorynes) so much as might be supposed from Professor Lacordaire's view. And now, in addition to

these grounds of affinity, we have a remarkable coincidence both in the food and in the mode of attacking it; and as the character of their food, Zamia and Encephalartos, is special and unusual, I may be allowed to attach more importance to it. I have no hesitation in saying, therefore, that the proper place of Iphipus and Tranes is among the Calandridæ, near Sphenophorus. It will be interesting to know what their larvæ are like. Perhaps some one who reads this may hereafter visit Australia, and see Zamias growing in the open air. If, when they do so, they find any crumbling under the attack of a blackbeetle or a white grub, we pray them to call the *Gardeners' Chronicle* to mind, and to send home a grub or two in spirits, to clear up the question. *Andrew Murray.*

MARANTAS vel CALATHEAS.

Amongst pictorial-leaved plants there are few that can compare with the beautiful species of Maranta which have of late years been introduced. The Begonias are, some of them perhaps, equally striking as to colour, but they are mostly wanting in the refinement of character which is a prominent feature in the Marantas. Did we say Marantas? Well, that is, perhaps, a moot point. Some at least of them have been determined on good authority to be Calatheas, and it is assumed that many, if not all of them, are so; but, whether Calatheas or not, there is probably no family which has so rapidly as this filled up its ranks with distinct and beautiful forms, one of the most prominent of which, known as Maranta Veitchii (fig. 170) is here introduced, thanks to the Messrs. Veitch, as evidence of the ornamental character of these plants.

This Maranta Veitchii occupies, in my estimation, the first place in point of beauty, on account of the size and rich and varied colouring of its leaves, the paler portions of which are transparent, and contrast most admirably with the purple and dark green tints of the upper and lower surface. Closely allied to it, however, in aspect, and scarcely, if at all, inferior to it in beauty, comes M. Lindeniana, a plant of the same character, and with similar colouring in the leaves. M. Vanden Heckei is a smaller-growing species of the same type, referred by some authors, as a variety, to M. picturata.

Of another type, but also of exquisite beauty, is the M. roseo-picta, whose rounder leaves have shorter footstalks than in the foregoing, and are most charmingly tinted with darker and paler green, and marked by a rose-coloured zone. M. illustris is a variety of this, according to Dr. Regel's opinion, but, variety or not, it is a most ornamental plant, being barred transversely with light and dark green, and zoned with pink. Under the name of M. ornata (but not the ornata of Veitch), Dr. Regel brings together sundry beautiful forms known as albo-lineata, roseo-lineata, regalis, and majestica, which are marked by transverse lines of bright colour, red or white, on a green ground. Another set has green leaves with white zones, M. virginalis being one of the most striking, with its broad almost orbicular leaves, and white band and costa; M. Baraquiniana is smaller, with ovate-lanceolate leaves, and broader belts of white on each side the costa.

Still another beautiful type is represented by M. splendida, which has the leaves of a deep bright green, with transverse yellow grand bands, looking very much as if a pale green pinnate Fern had been painted on the Maranta leaf. Mr. Veitch's original ornata was of this type, only the Fern portrait was dark green on a pale ground. The old M. zebrina is another most beautiful plant, as our exhibitions sometimes testify.

Space would, however, fail to note the many charming objects which this genus presents, and I pass on to observe that, as stove plants, they are by no means difficult to grow. What they need is liberal treatment. In spring, when they may be divided if necessary, or taken to start on into growth, they require a brisk moist heat to be maintained about them. Later, when growth is mature, they may be used to decorate the temperate conservatory. The soil should be fibry peat and sharp silver sand, with an admixture of charcoal fragments, and at the last potting of a little sweet fibry loam; and the drainage must be good, as they require an abundance of water while growing freely. During winter they should be at rest, and should have comparatively little moisture at the roots. *C. I.*

PHALÆNOPSIDS.

It is a common exclamation now-a-days, "Ah! Orchids are coming down in the market," or, "They won't fetch the high prices they have done;" and perhaps this in many cases may be true, but are there really any signs of Phalænopsids coming down in price? I should say, certainly not. They are imported into this country by hundreds. What becomes of them? Undoubtedly a large proportion die on the voyage; perhaps out of 500 or 600 plants imported, not a dozen recover; add to this state of affairs the difficulty attending their propagation at home, and it is easy to see why they should not come down in price. Certainly some species propagate themselves occasionally, by producing young plants on their flower stems—P. Luddemanniana, and P. equestris, Rchb. f. (P. rosea, Lindl.), doing this most frequently. When this occurs the young plants should be fixed upon small blocks with a little living Moss, and not removed from the parent plant until thoroughly established. Still but few—very few—plants are produced in this way, compared with the demand; and this accounts for the large importations from the tropics. How long will the supply last there? Let us take the delicate little P. Lowii, for example, of which Lieut.-Col. Benson has kindly given us some valuable information (at p. 631). Such information cannot but be beneficial to those who, lacking the advantage of travel, can have but a very indistinct idea of the climatic conditions under which particular plants flourish.

To return to my subject. Who can say how many of the blooming plants of P. Lowii are relentlessly torn from their calcareous habitat when in flower, either for specimens, or perhaps merely for the sake of the delicate flowers. I sincerely hope that it is very difficult to find, by a certain class, of which we have many representatives at home—our British Cypripedium Calceolus having been nearly extirpated by these Vandals, to say nothing of many other rarities well known to British botanists. It seems highly probable that if we destroy so many Phalænopsids by importing, and lose so many by unskilful cultivation, the supply will eventually be cut off. What is to be done? Seed—try seed. Ah, my friend! has it not been stated in these columns that seedlings cannot be raised? Why? asks the philosophical thinker; is not the nucleus of the seed properly developed, or does the fault lie with the material upon which the seed is sown? Does the fault lie in the heat, or in the humidity of the atmosphere? Perchance they will not grow if exposed to the influence of light, in which case we must of course try them where light is not present—*i.e.*, in the dark. Does the seed germinate in Borneo, Java, Sumatra, or Moulmein, where these plants are principally found? If so, under what conditions? As a matter of course, whenever the plants are found on rocks, or on the trunks and ramifications of trees, there the seed must have germinated; seeing that plants, being fixtures, cannot in general shift their quarters to any great extent.

Phalænopsids are very easily fertilised, compared with some other genera. I have this year fertilised P. Schilleriana with the pollen of P. grandiflora — a very fine variety with large flowers, the sepals and petals being beautifully undulated — and then crossed the plant of P. grandiflora with pollen of the former, and have five pods on the two plants swelling off rapidly. This fact makes me naturally feel very anxious about the germination of the minute dust-like seeds. Will some of those who have raised seedling Orchids give me a hint or two?

I have no doubt many others, as well as myself, would be delighted to hear of anything that will throw additional light on the gloomy prospect of raising seedling Phalænopsids. When fertilising, or rather after fertilisation, I noticed a rather curious alteration of the column. Before the pollinia are applied to the stigmatic cavity, the latter is wide open, but in a few hours after fecundation the sides become connivent, and finally clasp the pollen so firmly that the column must be either cut, or forcibly torn, before it can be removed from the stigma. The same thing occurred on a plant of Odontoglossum maculatum, and also on several Oncids and Vandas, but still it does not appear to extend through all the Vandean section, as neither Phaius nor Calanthe seem to act in the same manner.

What is the best material to sow Orchid seeds upon? Living Sphagnum has its advantages, so has a block with the rough bark left on; and I have very serious notions of trying some on Selaginella apus—a dense growing moss-like species, which, like the Sphagnum, can be kept sufficiently moist without the necessity of watering overhead.

How are established plants rendered so short-lived? What causes those yellow patches we so often find disfiguring what ought to be vigorous dark green foliage? Sometimes the leaves look to all appearance from above healthy, but on holding them up to the light the spots can be seen, a very slight touch of debility, or etiolation brought on by giving too much water and maintaining the atmosphere in a humid state during the dark winter months. Any one at all acquainted with physiology knows very well that all plants elaborate their watery juices in proportion to the intensity of the light they receive; that is, supposing

other circumstances to be favourable, as heat, moisture, &c. It is then easy to understand that if the light is diffused the functions of the leafy organs are impeded, and keeping the air nearly at the point of saturation makes the case still worse, by checking what little evaporation or elaboration may be going on; while by supplying them with moisture at the roots, by watering, we induce them to absorb more than they can possibly give off. Hence by the aqueous matter remaining too long in the vessels it produces etiolation and induces decay. In the warm light days of summer the case is different; light is intense, we have a genial warmth, very different from the scorching dry heat from the hot-water apparatus, and the plants, growing vigorously, quickly get rid of all superfluous water imbibed by them.

I have found that syringing the plants once or twice during the day is beneficial. When syringing, I use the jet, and place a finger over the orifice, thus forcing the water over the plants in the form of a gentle dew, always using tepid water. As the plants cease growing, this must be discontinued; less water given at the root, and a drier atmosphere maintained. We must not forget that naturally Phalænopsids have no winter, that is, their season of rest is during the hot dry period of the year; hence the difficulty of treating them in any but an artificial manner. In their natural habitats they are subjected more or less to the cool sea-breeze all the year; while we we can scarcely give air at all, certainly nothing like a breeze, in our East Indian houses at home, for several months together. Perhaps this close atmosphere may have much to do with their rapid exodus from our collections. It would be comparatively easy to allow currents of warmed air to pass through our Indian houses all the year, thus imitating Nature to some extent; but the expense would be the chief drawback, as the consumption of fuel would be enormous, indeed, it is so in many cases under the present system. As an instance of plants growing under artificial circumstances, perhaps as well as in their natural habitats, may be mentioned the epiphytal Thunias, which are here cultivated as terrestrials; this showing that it is not exactly impossible to succeed, even though Nature be in some measure disregarded. *F. W. B.*

GERMINATION OF PALMS.

Some two or three years since the double Cocoa-nut (Lodoicea sechellarum) became an object of special interest, both from the fact being brought to the notice of the Linnean Society of the species being likely to become extinct, owing to the trees being cut down and none others planted, as well as from the peculiar and,

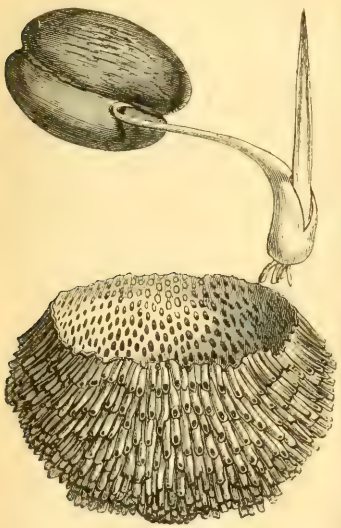

Fig. 171.

as was then thought, its unique habit of forming a bowl or socket around its root. An article appeared at the time in the *Gardeners' Chronicle*, and a figure was given both of the germinating seed and of the root socket, then newly received at the Kew museum (fig. 171). The specimen was not perfect, and was moreover broken in transit from its native country, and in the process of clearing out the soil and stones for the purposes of exhibition in the museum; nevertheless, it was carefully put together and gave some idea of what position it actually occupies with regard to the root and base of the trunk. There seems no question but that this first specimen was obtained from the base of a decayed tree, but the bases of two good sound trunks, with these rooting portions attached (fig. 172), have since been received at the museum, and these entirely disprove the theory of the motion of the root in the socket or bowl, as was stated to be the case, inasmuch as the two are perfectly united, indeed appear as one. One of these trunks has been cut through longitudinally, root and

Fig. 172.

all, so that the union of the trunk with the socket is very clearly shown.

With regard to this story of the root actually moving in the socket during the swaying of the trunk, it is possible that the flexibility of the trunks themselves, which all travellers speak of as a peculiar character of the Coco de Mer, by which in high winds the leaves of contiguous trees flap and strike against each other,

Fig. 173.

producing a loud noise, may have misled the writer of that account.

In the double Cocoa-nut, as most of my readers are aware, the seed is generally two-lobed, from which fact its common name has been derived, but it is often three or four, and sometimes five and even six-lobed. The mode of germination at first sight appears striking, inasmuch as the cotyledon pushes its way out

Fig. 174. Fig. 175.

from between the lobes, and frequently lengthens to a foot or 18 inches, and having a diameter of 1⅛ inch. This prolonged cotyledon terminates in a swollen axis, whence proceeds the radicle and plumule or first bud. There is, in fact, nothing remarkable in the germination of this Palm, except in the length the outside portion of the cotyledon assumes: all the Palms germinate in a similar manner, the cotyledons in the various species lengthening, more or less, according to the size or form of the fruit, and so carrying the radicle and plumule out with it till it has reached a sufficient distance from the seed to give plenty of room for the young plant to grow upwards and downwards without meeting with any interruption by coming in contact with the seed. This appears to be one of the special reasons why the cotyledon should so lengthen outwardly, and another reason may be found in the apparent impossibility of actual germination taking place within so hard a shell as a Palm seed usually has. During the process of the lengthening of the cotyledon, and while the plumule is still enclosed within its swollen base, a simultaneous growth is all the time going on with cotyledon, plumule, and radicle; so that when the former has attained its full length the young bud bursts its sheath, as seen in figs. 173 and 175, starts upwards, and in time maintains a separate existence from the seed. A somewhat similar form of germination is seen in many other monocotyledonous plants.

In the Palms the embryo is not always seated at the same point of the seed; in some species it is at the base, in others at the apex, and in others, again, on one side. The embryo itself consists of a very small cellular body of a cylindrical shape, seated in a mass of horny, often ruminated albumen.

In the Cocoa-nut (Cocos nucifera) the embryo is buried in the albumen at the base of the seed, or near the point of attachment of the fruit to the tree; and this point of germination is distinctly marked by three small holes which are familiar to every one; these, however, are not peculiar to the genus Cocos, but occur in several genera belonging to the same tribe.

In a young Cocoa-nut the albumen is of the consistence of jelly, never becoming, even when ripe, thoroughly hard or horny, as it does in the vegetable ivory, and many others. To produce germination the nut or fruit is usually laid partially buried in tan or loamy soil, with a good bottom heat. The cotyledon pushes its way through the shell, increases at once its circumference by the simultaneous growth of plumule and radicle which it encloses, but it does not proceed to any length, as in the Lodoicea; and from this exterior swollen portion of the cotyledon a young folded leaf rises, and the roots slowly push their way through the lower part of the sheathing cotyledon into the ground.

In the genus Attalea the embryo is situated in a similar position to that of Cocos, namely, at the base of the seed. Here also, so soon as it has pushed through the pericarp, the same kind of sheath is formed at the base of the cotyledon, not fleshy, but rather membranous in its earliest stage, from which the young folded leaves and the roots subsequently appear. In Corypha the embryo is seated at the apex, and in the process of germination the cotyledon is prolonged some 2 or 3 inches: from thence the long root proceeds downwards, from the sides of which rootlets are given off; about the same time the plumule bursts through the upper portion by a longitudinal slit (see fig. 173).

In the genus Hyphæne, and those Palms belonging to the same section, the embryo is likewise situated at the apex, and the mode of germination is similar.

In Caryota urens and Arenga saccharifera the embryos are similarly placed, namely, at the top, both of which push down their cotyledons to some distance before exhibiting either plumule or radicle; this, however, is more particularly the case in the latter plant. The seeds of this Palm, which are about an inch long and half an inch in diameter, after they have germinated, and the young plants are several inches above the ground, may frequently be seen still attached, but themselves pushed some distance above the soil.

In Raphia the position of the embryo is at the side of the seed, midway between the apex and the base. On the removal of the imbricated scales, the presence of which is one of the distinctive and beautiful characters of the Raphias and Calami, a series of irregular markings or channellings is seen, many of which converge at one point, denoting the position of the embryo. Here, again, as in the other species mentioned, a similar membranous sheath is formed. In a Palm known as Orania macrocladus, a native of the Malay Islands, the process of germination is the same, but the development of the cotyledonary sheath seems to come nearer to that of Lodoicea than any I have seen. The seed, which is round and about the size of a Walnut, has its embryo at the side, the cotyledon lengthens 2 or 3 inches, and the young buds and roots grow in the usual way. (Fig. 175.)

The dictates of Nature in regulating the period when the plant may cast off the supply of nourishment stored up in the albumen of the seed, is well illustrated by the act of separating itself from the seed and pushing it above the soil; it seldom takes up the whole of the albumen, showing that Nature always supplies abundant material, under ordinary circumstances, to propagate its species. About a sixth part is usually left at the end of the seed opposite to the embryo, and this unused portion, after being buried in the earth, frequently for a long period, is mostly as hard as it was before being planted.

Such, then, are the earliest movements of the young plant, the plumule being sheathed by the base of the cotyledon or first leaf while the upper part of the leaf remains still attached to the seed; and this continues so long as the young plant requires its nourishment from the albumen. By the time a sufficient number of roots are formed to take in nourishment enough from the

earth to maintain the growing plant, it separates from the seed, the cotyledonary leaf gradually dying down as first one and then another leaf is produced. In like manner as the woody fibre deposited by the leaves of a fully-grown Palm go to form the hard trunk, so the fibre here deposited by the rudimentary leaves goes to form the socket, or bowl (fig. 174); and this is borne out by the length of time most Palms—and the Coco de Mer in particular—occupy before forming what may be called a true stem. As an instance of the slow growth of this Palm, it may be mentioned that no seeds planted in the Seychelle Islands since they came into our possession have yet produced mature plants. A plant 15 years old, growing in the garden at Government House, is said to have at present no indication of stem, the leaves, 16 feet long, springing from a small crown near the ground. In the case of the double Cocoa-nut, it was at first thought that the vital connection between the root-socket and the plant itself ceased at some regular period, which must have been the case had the trees rocked in the sockets as at first described; but the specimens now in the collection at Kew, and the constant occurrence of a woody formation analagous to this at the roots of other Palms, proves the contrary; and it is evident from an examination of the roots of many Palms and germinating seeds, that the Coco de Mer is not unique in possessing this appendage, if we may so call it. It is certainly more largely developed in this Palm than in any other I have seen, and the possible reason of its never having previously attracted notice is no doubt due to its limited geographical range, and its home being cast in a country somewhat out of the track of European travellers, together with the difficulty of rearing the plant in our stoves. *John K. Jackson, Kew.*

MAIZE AS A FORAGE PLANT.

THE useful communication of "Vectis," from Toronto, which appeared in the number of May 21, reminds me of my responsibility as the introducer of Maize to be used as a table vegetable in this country; and a few observations will be useful at times, as so much seed has been sold this season in Covent Garden that many readers of this Journal, here and in the colonies, will like to hear what progress has been made.

The subject has attracted considerable attention in France also, and I have even received many letters, asking for information as to the earliest sorts, and, last week, one from a large farmer in Brittany, who, having cattle in much distress from want of green food, asked me in pressing terms for some early sort of Maize which, sown now, would be high enough to cut in August as forage for the cattle. I have such sorts, but not in sufficient quantity for sowing many acres. So I referred the inquirer to M. Vilmorin of Paris, with whom I have, this season, exchanged sorts, as he has about 20 varieties under trial—American, Peruvian, and French. The description he gives me, and my own experiments, have shown convincingly that the subject of growing Maize for food for cattle is an important one, and should be undertaken by English farmers on a fair scale.

We may have seasons like the present, in which such nutritive crops would be very valuable. There are kinds of Maize much more suited for forage crops than others. Thousands of acres are now planted in France with "Horsetooth" and "Caragua," which are late American kinds, as a general crop. Earlier sorts are much in demand. Both M. Vilmorin and myself are growing the Boston Ten-weeks (kindly sent me from this Journal), and the earliest of all French varieties, the "Quarantaine" (rather a shy bearer), to see which is the most valuable. We are also trying the "Jaune d'Auxonne," which is early and prolific. All these varieties are too coarse for the table, or at least would be thought so in this country. In fact, no yellow-coloured Maize is suitable for European tastes, but the white and sweet corn is eminently delicious in flavour, and can be as easily grown in this country as Peas, requiring about the same treatment and care in selection of sorts, good rich soil, watering in dry seasons and staking, being even ready for table when at about the same ripeness the one as the other. "Vectis" describes this fully enough, as I have also done on former occasions.

I have not found any practical difficulty in keeping sorts distinct for seed, though Maize is very apt to sport, of course, from its structure. The plants here at present are about 30 inches high, having been sown in boxes under glass, and planted out late in April. Precautions were taken by planting in well manured trenches, which we found very advantageous this dry season, and raising mounds on either side for shelter, earthing up, and weeding regularly. The height of 2 feet, mentioned by "Vectis," to stake at, we found last season too low. But then in September we had a hurricane in Guernsey of 55 lb. pressure to the square foot, which prostrated every plant; nevertheless, being raised and re-staked, they ripened their seeds. Some people affected to doubt if they could even partially ripen them at the time, but Maize has wonderful vitality, and showed it under such a serious trial. Plants 10 feet high are easily affected by such violent winds, of course; it is to be doubted if any others of such a height would not have succumbed completely. Foreigners and others living in our colonies are much surprised at Maize reaching to this height. I believe it to be unsurpassed in any but very favourable tropical localities. I have grown ears—cobs we call them, wrongly it seems—of Maize weighing 15 oz., each grain perfect, highly developed, and quite as fine as the originals I had from America. We may thus fairly claim that seed can be always secured from these islands, or from the South of England. But I believe it can be ripened in most gardens in England with due attention. Our season for taking the Maize to use for the table is one month later than in Canada, owing to the extreme heat of the summers there; but at that period of the year such a delicious vegetable is doubly welcome. For nutritious qualities what can exceed it? It grinds into a white flour of great beauty, and which would form the staple of highly important preparations for invalids, children, and aged persons, if required.

There is a great variety of uses, as we know, to which Southerners put the husks and stalks, so that there is no waste; and when we consider that the London Omnibus Company annually saves many pounds by using dry Maize for its horses, and how valuable it is for poultry, I hope to see the time when many acres shall be devoted to it for a green forage plant also; but most of all do I recommend the choice, sweet, white sorts for the table, as "green corn," in the autumnal season. The ears should not be gathered too soon, but be just passing out of the milky state. Before this they are rather insipid; a little experience will show this. *J. C. Bidwell, Richmond, Guernsey.*

[We have never succeeded in cooking the ears properly. Will our correspondent give us a hint how to do it. EDS.]

Home Correspondence.

The Fungus Pest.—When persons write under a *nom de plume*, and take fact for its foundation, it is a pity they do not act up to the spirit of it. Had "David Tell Fact" done so, he would have saved you an amazing quantity of printer's ink, and me the trouble of exposing his sophistry. One of our great thinkers has said, language was given us to hide our thoughts. Your correspondent applies it to another purpose, that of developing his fancies and ignoring facts. He has now perched himself upon the Fungus pest, and if he does not jump too high, and fall over on the other side, he will be fortunate. "David Tell Fact" surely knows little of Fungus poisoning. John Bull may have lost tens of millions sterling in his wooden walls through dry rot—the same portly individual may have tens of thousands of dwelling-houses tottering to their fall through the same enemy—the most learned of the faculty, not only here, but throughout the world, may say that all our most deadly zymotic and contagious diseases, as smallpox, typhoid fever, diphtheria, &c., are fungoid in their action, and that the molecules of sporules float in atmospheres suitable to their development, ready to seize upon and poison the blood of any poor subject fit to receive it—the leading gardening authorities of the last half century, from Lindley and Berkeley, down through the most recent exponents, Thomson, Sheppard, Munro, Pearson, Ingram, Speed, and scores beside, to your humble servant, may have told their faith in the deadly effects of Fungus poisoning; but what of that! Our dearly-bought experience does not square with our veracious friend's fancies, and therefore of course we must be wrong, he right. We have watched the sacrifice of our Vines and most cherished plants, but "David Tell Fact" knows nothing of Fungus poisoning; and on the principle, I suppose, that all truth must square with his preconceived prejudices, we are written down as dolts, or something worse. The modesty of our anonymous monitor is most amusing. On the Fungus question, some years back, I myself occupied a niche in that paradise of fools, the school of scepticism, but I bought my experience "o'er dear," and truth compelled me to renounce it. Mr. Sheppard, of Woolverston Park may tell of the effects of Fungus poisoning, but what matters that to "David Tell Fact?" He, ostrich-like, has got his head in the bush of fancied security, and hence whistles the rest of us down the wind at his leisure. He has used hoof-parings for pot plants for years without any injurious effect. Just so. No doubt he has occasionally used that earthy compound called Mushroom spawn without the desired result, a crop of Mushrooms. Why? Because the mycelium was not there, or if there, the condition of the bed was not suitable for its development. I do not say that hoof-parings have the power of developing a poisonous Fungus, nor can I say to the contrary; but this much I may aver—the parings I used had been accumulating for months, perhaps years, and when put into the Vine border were a fermenting mass, full of spawn such as may be seen in bone heaps; but whether generated by the parings, or carried to them from no one knows where, on the feet of the animals which produce these parings, I am not prepared to say. The origin of the poison is yet in the womb of Time, and I should be glad if the effect had remained there also. "Mr. Fact" before he mounts his *cacoethes scribendi*, and tilts at those who do not like "pesero," and have found death in their plant pots, should reflect that there are Funguses and Funguses—some delicious vegetables, which all the world are fond of; others, scarcely dissimilar to the ordinary observer, which, if eaten, will quickly find employment for the doctor, and not infrequently for the coroner also. If such is the effect upon the human subject, is there any heresy in assuming, after due experience, that plants have their poison pests also? If there is not—and there is not—does it not savour of a rent in the roofing when men set up fancies to destroy facts, dig deep into the coal measures, or go back to the Deluge, to fish up fancies in support of their hallucination. "Mr. Fact" has appealed to the fairies in support of his heresy, but the facts are dead against him, for with some kinds of Fungus, the Fairy Ring to wit, not a blade of grass can be found upon it when it is growing, though in the following season the crop of herbage may be dark and unusually luxuriant. Any schoolboy can testify to this fact in the history of Fungus culture. Our friend prescribes a water cure, but that certainly will not hold water. A deluge of cold water may destroy a crop of Mushrooms, but a deluge of warm water enriched with stable urine or guano and salt, applied when the first crop is gathered, will frequently bring up a second crop, and sometimes a third and fourth crop, equal if not superior to the first. My borders are little more than large flower-pots, certainly not affording more than half a cubic yard of soil to each Vine. Upon them, from the commencement of growth to the colouring of the crop, we pour fortnightly 3 inches of water at the temperature of 80°, or 3 feet for the six months of active growth, and yet under such a deluge the Fungus poison pest luxuriated until the soil was bodily removed. "Mr. Fact" says the Stortford Vine borders contained "no Fungus." If this statement is founded upon his unaided visual powers, I must put in the plea of non-content. The poison pest is an enemy far too insidious to be detected by such means, and therefore the statement is not worth discussing. Our friend labours under the pleasing delusion that he has written the history of the Stortford Vines; but I, who know as much of their early history as his preceptor, can only laugh at his credulity. He has not told us how many Vines were destroyed before any were induced to grow in that "fine porous border," nor has he said anything of the rape-dust used in its concoction. If he takes exception to the term "London street garbage," the fish, flesh, and fowl of the market sweepings, perhaps he will tell us what it was that emitted such a "most villainous stench" when the manure was being removed. If this does not satisfy him of the use of garbage, let him examine the books of the Stortford fellmongers of that day, and ascertain what quantity of raw "fleshings" was used in forming the border, and when he has done so he will not feel so squeamish about the use of garbage. What I saw with my own eyes I have some little confidence in repeating, and certainly more than I have in the statement of "Mr. Fact's" preceptor, who, without wishing the slightest offence, I may say had received his gardening education in the charge of a malt kiln, and who was promoted to the vineries because he answered to the *sine qua non* of Mr. Crawshay in a gardener, viz., "perfect obedience to routine, and to the orders given." Knowing what I do know, and without the intention of being personal, I must tell "Mr. Tell Fact," plainly and emphatically, that if his diagnosis of the failure of the Vines be in any way correct—viz., that the roots and leaves were healthy, the border in good condition and free from mildew—Mr. Nash has committed a frightful blunder in destroying them, and his advisers, if he had any, ought to be scourged to the utmost ends of the earth for an act of such gross Vandalism. Surely our veracious friend does not believe in the want-of-water theory. Or has the Storm King turned off the supplies for the last few years at Stortford? If not, why, in the name of common sense, should not that natural supply which made the Grapes the admiration and envy of the horticultural world for some 20 years be insufficient in more recent times? The true explanation of the failure, if not Fungus poison, is paralysis, brought about by excessive pruning, as set forth in your articles on "pollard Vines;" and that I will in a few words undertake to demonstrate. With this I forward you a bunch of Black Hamburgh Grapes, which you will find equal to the productions of the Stortford Vines in their most palmy days. The history of the bunch is this. It was cut from Vines growing in a large ridge-and-furrow vinery at Chatsworth, planted 37 years ago, which, at the time Mr. Speed went there—two years ago—did not carry 10 lb. of even moderate Grapes, almost every bunch being more or less shanked, and some bunches being shanked altogether; indeed, so bad were they that it had been determined to grub them out and replant the house. Mr. Speed, however, wished to try an experiment, and finding the leaves thin and flimsy, little better than tissue paper, he knew that it arose from constitutional debility and enfeebled root action. Knowing that leaves are the parents of roots, he gave orders that no laterals should be removed from the Vines, but that they should be encouraged to make all the foliage they could, and care was taken, by the judicious application of heat, to ripen the wood thoroughly to the tips of the lateral branches. No water was given to the border, though in the dry summer of 1868 there were cracks in it into which you might insert your hand a foot deep, and directly the cold rains began to fall the whole surface of the border was covered with pantiles to carry the water away. In 1869 the

Grapes were passable, with few shanked berries, much better than they had been for years previously. The same treatment was continued, and the result is this year the finest crop of Grapes which was ever seen in the world upon Vines of that age. The modern farmer when he produced 40 tons per acre of Swedes upon land which the popular voice said "never could grow Turnips," when interrogated as to the manure he used, replied "brains." Let me ask "David Tell Fact" if he does not think, if a similar amount of that article had been used at Stortford, a similar result might have followed, those fine old Vines been rejuvenised, and Vine growers saved a great scandal? I ask no man to believe my statement. The gardens at Chatsworth are open to every respectable person; and I say to all sceptics, go and judge for yourselves. To "Mr. Tell Fact" I would say, waste not another drop of ink upon this discussion, but go at once to Chatsworth; and after seeing the crop, and taking council with Mr. Speed, I believe he will admit, that in his diagnosis of the Stortford difficulty he has been describing a "mare's nest." I commend all "extension" sceptics to Chatsworth; and I invite such men as Thomson of Dalkeith, Ingram of Belvoir, Tillyard of Brocklesbury, and others who saw the Vines in 1868, to go, see, and speak out. *W. P. Ayres, July* 5.

The Fungus Controversy.—Grappling with the Fungus question is something like grappling with a thief in the dark—a very dangerous undertaking. And I am quite content to abide by the sensible advice given by my father's old friend, Dr. Richards, with finding out a remedy for the destruction of the disease, without trouble, expense, or injury. There are known to be about 2,400 species of Fungi; and some of these are so mysterious that hundreds of them sometimes spring up in a single night. Here there is a mystery to cope with. And where is the man that is bold enough to stand up and say he will trace their origin, or stop their appearance? Now I do not for a moment dispute that drenchings of water will destroy some species of Fungus. Whether cold water will or will not kill this Fungus, I leave to those more experienced in the cold water cure; but of this much I am certain, it was not the drenchings of cold water that killed the Fungus I alluded to in my last communication, for whilst the experiment was being tried the tree did not receive the copious waterings it had previously had weekly, and during that time it was kept more dry than it had been ever since the fruit was set; so on that point I feel certain it was not the pure water that effected the cure. I decline entering further into the Fungus battle with any anonymous writers. We have first-class men that may continue the contest, but so little is really known respecting the origin of many of the different species of Fungus, that writing upon a subject merely on supposition is quite absurd. I quite agree with "W. P. R." that prevention is better than cure, but who is the man to prevent it? Did ever "W. P. R." succeed in destroying the mildew, which is certainly a species of Fungus, with drenchings of water? I have never succeeded in doing so. *Edward Bennett, Enville Gardens.*

Entries at Exhibitions.—I am glad to see your remarks on this subject. You cannot use too strong language in condemning the practice of making large entries and small exhibitions. Nothing is so damaging to the general effect of an exhibition as the system of making entries of the kind, and if it is persevered in, some means must be found to prevent it. A substantial entrance fee, as a guarantee of good faith, may possibly be the best means; but as exhibitors must be aware how it militates against their own interests, and as they have the remedy in their own hands, they should individually use their best efforts to discourage so unworthy and dishonest a practice. *Fair Play.*

Early Rose Potato.—I shall be glad to know the verdict of others who are growing this kind as to quality, &c. It confirms my opinion, expressed in your columns last year, that it would turn out a good and useful variety. I have it growing side by side with a fine stock of Fortyfolds, than which it is earlier (nearly as much so as Rivers' Ashleaf) and better in quality now. The crop is nearly as many in number, and a good sample, double and treble the size of the Fortyfolds; I anxiously wait until both are fully ripe. Should the Early Rose then be comparatively good in quality, I shall not hesitate to urge all to plant it as one of the most valuable second earlies, and a godsend to the market gardener. *Robt. H. Poynter, Taunton, Somerset.*

Golden Champion Grape.—For some reason or other many gardeners have failed to grow this Grape. Last summer a fruiting Vine which I got did not at all come up to my expectations; but knowing the Grape from its earliest history, and that it could be grown, I did not lose faith, and, having another weak Vine—one of the cheapest—I cut it down, started it, and when about 1 foot high I inarched it on a side shoot of a Black Hamburgh in our second house, in the month of June. It made a weak growth, which I stopped when about 5 feet in length, to induce it to ripen its wood early. The cane afterwards swelled up to the thickness of my little finger, and at pruning time it was shortened back to 3 feet. The vinery was started in December, and the Golden Champion broke regularly and vigorously: it showed eight bunches, which were reduced to four. They set well, and swelled their berries splendidly, and made fine bunches that attracted the eye at once on entering the vinery, being generally taken for well-set samples of the Canon Hall Muscat. I entered two of the bunches for the best dish of any new variety at York, on June 15, and they were awarded the 1st prize; also two bunches in a collection of fruit, which also received the 1st prize. The samples exhibited were not quite up, however, in that fine amber colour which the Grapes assume when quite ripe, but would have been in another 10 days. It dwarfs all other early white Grapes in size of bunch and berry. The Vine in question has made one of the most vigorous canes in the house this season, and a pot Vine propagated from an eye of our own growth is one of the strongest plants in the lot. *J. Simpson, Wortley.*

Wild Plants in Ayrshire.—When out botanising lately in a wood here (in Ayrshire), I found some plants of the Valeriana pyrenaica growing very luxuriantly, also the Galeobdolon luteum, Arum maculatum, Meconopsis cambrica, Geum rivale, with white flowers; Symphytum officinale, with purple, white and yellow flowers; Polemonium cœruleum, and a kind of Claytonia (?), with pale lilac flowers. The Claytonia perfoliata also grows very plentifully in this locality. *A Young Botanist.*

The Oxford Meeting.—I think it would be of great service to intending exhibitors at Oxford, if the Editors, or some correspondent conversant with the neighbourhood, were to give a few notes concerning the gardens within a radius of, say, 50 miles round Oxford worth visiting, with distances and names of railway or other routes. Where time is short, and our knowledge of districts but scant, we make sad mistakes in such matters. Last year, when at the Manchester meeting, I ran down to Liverpool to see the shipping and Birkenhead Park, and missed seeing the best Muscat Grapes in the kingdom, probably, through not knowing Mr. Wooley's whereabouts. Through a mistake I also missed Mr. Meredith's, and had to take a second journey to see the vineyard. All such loss of time and money would be saved by a few notes in the *Chronicle*, which I trust you will be able to give. I like not only to see the products of different localities on the exhibition tables, but to see the places from whence they come. Either alone gives a somewhat deceptive estimate of rural gardening, but the two enable us to gauge all aright; and by such comparings among ourselves we become wiser. How far is Nuneham from Oxford? *A Gardener with little time for visiting.* [See p. 930 of our present issue. Eds.]

Allamanda nobilis.—Mr. Baines, gr. to H. L. Micholls, Esq., Southgate Park, N., has now in bloom a splendid specimen plant of this magnificent new Allamanda. The bright glow of primrose-yellow on the flowers make it very effective, and it is very profuse of bloom, as well as a good grower. Mr. Baines thinks it an invaluable exhibition plant. In the same house was a plant of another Allamanda, sent by Mr. Bull for trial, that may be said to be intermediate between nobilis and cathartica, but profuse of bloom in an extraordinary degree. It flowers in long racemes, giving a succession of bloom from one flowering shoot. It is said to be an imported plant, and is unnamed. A plant of A. grandiflora was literally clothed in flowers; in fact, all the Allamandas appear to find a very congenial home at Southgate. *R. D.*

Gold and Bronze Pelargoniums. I shall be quite willing to accept "Looker-on's" challenge at the same time and place next year—namely, Leeds. I have grown the varieties exhibited by Mr. Butler, equal in point of colour to those exhibited by the Messrs. Downie, Laird & Lang; and should I fail to do so again, I will pay the five guineas over to the Gardeners' Royal Benevolent Institution, and admit myself fairly beaten. This will also prove whether the assertion I ventured to make is right or wrong. I should not have replied again to "Looker-on" had there not been a public interest attached to the question, as I make it a rule never to fight in the dark. I still think the Editors would do well to insist on the name of the writer of any criticism being published. Your correspondent knows my address. I shall be glad to hear from him; or, if he prefers it, he can arrange the terms of the challenge through the medium of your Journal *J. Wills, Ashburnham Park Nursery, King's Road, Chelsea, S.W.*

A Plea for Small Birds.—Being a lover of birds, and yet so infested with them that I am perforce compelled to wring many necks in the fruit season, I turned with interest to Mr. Lees' letter. The plan of feeding the birds outside to keep them away from the fruit inside is good as far as it goes, and may answer at a place like White Knights, which, in its present state, is not a bird-infested locality; but it must not be trusted to where birds are plentiful, and good judges of fruit. I have frequently tried it in the garden. I have left rows of small fruit unnetted, and of inferior sorts; but the birds here will rather risk their lives in the nets than be degraded to eat common fruit. There is no sure remedy but to kill the birds, or place the fruit beyond their reach. Practically we do both on a large scale. We don't intend to kill the birds; only all who come into the nets, amounting probably to 200 blackbirds and thrushes in the year, have the death penalty meted out to them. Sentiment would save them all, but stern necessity compels their reduction within some bounds. And yet the woods are full of large Geans and wild Cherries, and during the very time they are ripe the blackbirds and thrushes are constantly driving their heads and bodies through the nets, and making a rush at our Bigarreaus, Eagles, &c. Still Mr. Lees' plan would, I believe, be useful for game, and might, when birds are in moderate numbers, tell as decoys. Raspberries and Blackberries should be added to Strawberries and Currants, and Gooseberries also do well in most woods. I wish the birds could have their own spread, and keep to it. Every spring the sweetest of their song seems marred by recollections of autumnal slaughterings. There are meltings of heart and relentings of purpose as one listens to their divine melody; but when autumn comes, and their sharp, ravenous beaks are seen everywhere devouring or mauling all our best fruits, then the dogs of war are once more let slip upon the birds. *Francis Smith, Dinell.*

—— It is not quite clear to me that the plan proposed by Mr. Lees, for preventing gardeners being put to their wits' end in endeavouring to protect their fruit from the ravages of birds, is really a panacea for that evil. However, if it be as easy a matter to grow abundant crops of good Strawberries as he seems to make of it, I don't think we need much of a remedy; for why should they cumber the garden any longer if "they will grow in any soil and situation, in hedgerows, coppices, and plantations, and will produce abundance of fruit." Is not this a delusion and a snare? If not, then away with all trenching, manuring, and watering. I would also ask if the absence of birds from the garden is proof positive of the efficacy of Mr. Lees' plan? I think not; they may be absent for several other reasons; but where they abound, as in most country places they do, I feel sure that there is no getting on without plenty of good netting, and that when required upon Strawberry beds it must be carefully propped up with framework or forked sticks to keep it sufficiently high above the plants. At the same time it must be well secured round the sides by running pegs through the meshes and into the ground, otherwise the blackbirds will either creep under or peck through the net, and spoil not a little fruit. Mr. Lees speaks of the mortification of seeing the birds fly off with one's best Strawberries and Cherries; and if no better fruit could be obtained than that yielded by plants planted amongst trees in the shrubbery and plantations, I should not be surprised to see even a tomtit fly off with them; but it would be a little astonishing to see a blackbird winging his way through the air with a Strawberry weighing from 1 to 2 oz. stuck on the end of his bill. Such fruit is surely worth a bit of netting, which I still think is the only thing that will keep the birds off. *F. H., Osmaston Manor, Derby.*

Stealing Cuttings at Flower Shows, or from Gardens.—It would seem, from Mr. Meikle's letter, that these practices still prevail to some extent. I am very sorry to find that it extends to visitors to gardens as well. Within a week or two, Fuchsias and other plants have lost their heads in the conservatory here. I have no faith in such notices as Mr. Meikle advocates. All such stealers are thieves, and should be treated accordingly. A single detective in plain clothes, and a conviction or two for theft, would do more to stop such pilfering than all the entreaties and cautions that were ever penned. I would show no mercy in such cases. All societies should be held responsible for the safe keeping of subjects committed to their care, and should employ means to detect pilferers and at once prosecute them. I once saw this done with excellent effect. The stealing of a cutting cost a gardener about £20, his place and his character. I never heard of another cutting being lost at the shows of that Society. The secretary prosecuted, and fear forthwith fell upon all the thieves. *A very true.*

—— I am sorry to say that I have to make a similar complaint to that of Mr. A. Meikle, in reference to the Rose Show held at South Kensington. It seems evident that this wrenching of cuttings off the best varieties of plants shown by various exhibitors is so frequent as to become alarming to those who are accustomed to show new and rare plants, and unless put a stop to, will prevent many persons who show from allowing their plants to remain for the public to see and admire. On the above occasion I showed plants of the Tricolor Pelargoniums, Prince of Wales and Lady Sheffield, and when taking the plants from the stage my man discovered that one of the side shoots had been torn off. Official attention was at once drawn to the fact, and a search was made, but ineffectually. I am sorry to say Fuchsias shared the same fate. *H. Cannell, F.R.H.S., Woolwich.*

Extraordinary Peach Grove.—Your readers may be interested in the contents of the following paragraph from an American newspaper just received:—"One of the most singular sights growing out of the war is a continuous line of Peach trees, of nearly 50 miles in length, around Petersburgh, and extending toward Richmond. They are growing from the breast-works thrown up by the rebel army, and are the only legacy left by the poor fellows who were on the advance line within 100 yards of our forces. Having eaten the fruit while

on picket duty, they cast the seed aside, and now they appear in one continuous line of 45 miles of beautiful trees, which yielded an abundant crop the last year." *E. S.*

The "Archimedean" Grass Mower.—I had thought, as many others did, that this was a slovenly machine for using on our well-kept English lawns, from its scattering the cuttings on the grass, and there leave it to quail up, or mulch; but a few days since I was convinced otherwise by the kindness of Mr. Barron, of Chiswick, in putting the machine to work. I have also now had the opportunity of seeing the "Archimedean" at work in two places in the north of London, and have had the satisfaction of noting its clean, even, smooth, and quick cutting and dispersing of the grass. The operators in both cases had previously imagined, as I and others had done, that it was a slovenly machine; but when it was brought into practical use they were convinced of their error, and now would not be without it on any account. Their grass was in first-class keeping. How could the little that has to be cut off a well kept lawn, that so quickly quails up, or washes down with rain, become an eyesore?—besides, the "Archimedean" can be made to cut close round any tree, shrub, or clump, or along any narrow margin, leaving only the edge to be cut with the edging shears, as previously in the case of the other mowers. *James Barnes, Exmouth.*

Lawn Mowers.—Like your correspondent, Mr. Fish, I have been a mower for many years, and from the recommendations given in the *Gardeners' Chronicle* and elsewhere of the "Archimedean," I procured one, and have given it as good a trial as was necessary to prove its capabilities in its present form. For rough grass and steep banks neither "Shanks'," "Green's," nor any other can compete with it, so far as simple cutting only; but in our English climate, rough grass when cut must be gathered, and from the way in which the "Archimedean" cuts and scatters, this has been found with me a very tedious process; I therefore consider a collecting-box a necessity. It is true that other machines will "cut wet grass," but they make very sorry work of it, and I have found it more advantageous to have two machines at work, when the grass is dry, and in good order for cutting, than to have one constantly at work at all times. Mr. Fish's proposal regarding a "four-edged knife" I think excellent, for, when working the "Archimedean" on a well-kept lawn, as recommended, it left the work so uneven that a "Shanks" was sent to take its place. I have always thought it a mistake in other machines to have the rollers going in front of the knife. "Bents," &c., are by them pressed down to the earth, leaving the knife no chance to cut them. On newly-made lawns, in April and May, this is often so intolerable a nuisance that the scythe has to finish the work. I think, therefore, a little praise is due to the "iron soles." They are in practice quite as easy to drive as the rollers; whatever theory may think or say, no mark is left by them even on a recently sown lawn. When repairs from accidental injuries are required, they must be met. Not long ago my pony, usually very quiet and obedient—he will not set foot on a bed nor put mouth to a Rose bush—from some foolish fancy came home to the shed at the gallop, leaving his manager to his own soft conjectures. There were in consequence more than knives wanted before the intricate piece of machinery was fit for duty. It is not too much to claim for the "Archimedean" simplicity of construction. We admit that now in its present form it leaves the work in an imperfect condition, but no donbt this will be improved. It is seldom the lot of any individual to turn out a machine perfect in all its parts on a first trial, and it is unwise to totally condemn as worthless that which only requires a second touch of the inventor's genius to make the best lawn-mowing machine yet offered to the public. *John Richardson, Scotland Gardens, Darlington.*

—— I freely confess that I was somewhat prepossessed in favour of this implement after reading the glowing description and the high testimonials in favour of it, but, after long and repeated trials I feel bound to state that, in comparison with other machines by well-known makers, I find it valueless. One of my men, a droll, shrewd Irishman, pithily described it as "a messer," and I am of opinion that Pat was right, for a piece of grass cut by the "Archimedean" on Thursday last (June 30) looked very "messy," indeed so much so that this morning I was glad to send our 25-inch machine over it, and make clean work of it. I tried it again on two grass verges, each 4 feet wide by 400 yards long, the grass was about 1½ inch in height, with a good many Daisies in places; the result was that the grass and Daisies were cut well and close enough, but they were strewn right and left, both on flower border and gravel path—it was emphatically a "mess." I hardly think that the "mulching and nourishment" theory of the promoters of the "Archimedean" applied in this case. Now, we can cut the above-mentioned verges with a 12-inch machine (by another maker) in precisely the same time, and with the same amount of strength, and make a neat, clean job of it. Where, then, is the boasted superiority of the "Archimedean;" perhaps some of your correspondents are in a position to show us. *Geo. Neville, Gr., Leigham Court, Streatham Hill, S.W.* [We hope that a fair trial of lawn mowers will be made at the ensuing Oxford show. Eds.]

Zephyranthes rosea.—In the conservatory at Southgate Park, Southgate, N., the residence of Mr. H. L. Micholls, late of Manchester, can now be seen a large pot of this beautiful half-hardy bulb. It is so pretty and attractive that one wonders it is so rarely met with. It cannot be difficult to cultivate, as Mr. Baines states it will not be killed. It remains in flower quite two months, and when in bloom is kept in the shade; previously, however, to the flowers expanding, it should have plenty of light and air. The pretty Anomatheca cruenta was growing in the same pit with it, and Mr. Baines encourages it to grow as much as possible by sprinkling the seed on the surface of pots of Amaryllis, &c., as it is so extremely useful to cut from. Both the foregoing are among the "neglected plants" highly deserving of being largely cultivated. *R. D.*

Phalænopsis Luddemanniana.—Have any of your readers noticed the fact that this plant has an accrescent perianth after fertilisation? I fertilised a flower a month or six weeks ago, when the flower, instead of immediately withering, turned to a green colour, the form remaining the same, except that the lobes becoming slightly connivent. *F. W. B.*

Orchid Cultivation.—I cannot let the letters Colonel Benson was so good as to address to your Journal pass without writing to thank him, particularly as they were to some extent in response to my appeal; and in doing so, I beg to assure him that I place great value upon them, and feel that I am under obligation to him for the information they contain. As Colonel Benson wishes to avoid expressing any opinion upon the various plans now in use, which are supposed to assist in rendering our artificial treatment suitable to Orchid climatic requirements, I will not in this letter enter upon such a discussion. In concluding, I cannot help regretting that your pages have not contained many letters from Orchid cultivators, written with a similar intention to this of mine. Surely they cannot but have felt thankful, when reading from the pen of such a close observer a description of this extraordinary climate; and I regret this the more, as it might have induced him to again send you his renewed impressions on his return to this country. I again thank him for the trouble he has taken. *C. H.* [It is difficult to over-estimate the value of such communications as those of Colonel Benson, so modestly expressed, and yet so much to the point. Eds.]

The "Potato" Tournament.—With every desire to run a tilt at some of my friends by-and-by, should the proposed competition take place, I feel that at present it would be very unwise to make any definite engagement in the matter, as the drought, should it continue much longer, will totally cripple my Potato resources. My trials this year include over 100 distinct kinds, but I fear that much patient care and labour will be almost lost. Still I live in hope. With Mr. Fenn I agree that September is early enough, and that the nature and quantity of the collections should be distinctly specified. *Alex. Dean.*

A Notable Nectarine Tree.—In the fine old gardens at Hursley Park, near Winchester, I lately had the pleasure of inspecting a fine standard trained Violette Hâtive Nectarine, which is growing there in a corner, under the shelter of a tall Yew hedge. I found it not only in the most perfect health, but also literally loaded with fine fruit. Its history is somewhat as follows:—Close by stands a large span-roof plant-house and vinery, in the centre of which is a raised bed. In this, some years ago, it was planted with other trees, and was trained umbrella fashion; but as the fruit trees did not eventually answer, the Nectarine in question was roughly planted out into its present position, without any special purpose in view. The gardener, Mr. Heath, however, finding that the tree throve, had a horizontal trellis erected, to which to train it, and it has continued to grow, and occasionally to bear a crop of fruit, until it has covered a space of 14 feet in length by 9 feet in breadth at one end, and tapering into a point at the other. The trellis is about 5 feet from the ground. The most remarkable feature connected with the present abundant crop is, that it was obtained without any kind of protection being afforded during the blooming period. In previous years this care has been bestowed, with generally indifferent results; this season the neglect has been attended with complete success. *A. D.*

Yucca Treculeana.—In addition to the just description of this plant given by Mr. Baker, at p. 828, it may not be out of place to add the following observations:—The first plant which flowered in France was at Angers, in May, 1862 (see "Journal de la Société d'Horticulture de Paris, August, 1862"). Another plant flowered last year (1869), and produced many hundreds of seeds, which have since grown very well. During the present year another specimen has flowered, and has produced numerous pods of seed. This splendid variety lives in the open air during our winters, and will withstand frost to the extent of 10° to 14° Centigrade. *Delépine aîné, Nurseryman, Angers.*

Lælia majalis is now flowering in the collection of C. Stead, Esq., Baildon, near Leeds. This is one of the most beautiful species of the genus, but rarely evinces a tendency to flower in this country. It is pretty well known as the May Flower, or Flor de Maio, of the Mexicans, and may be easily recognised by its large rosy lilac flowers, which are borne one to two together on a peduncle shorter than the leaves, and are produced with the young growth. The 3-lobed lip is white margined, tipped with purple-lilac and spotted with deep purple. *F. W. B.*

Aerides maculosum var. Schrœderi.—A fine plant of this is flowering in Mr. Stead's collection. The plant is about 2 feet high, and has two fine branched spikes. It appears to be a near relative of A. crispum, Lindl., but is far superior to any other form of that species. The sepals and petals are white, suffused at their apices, and transversely spotted or streaked with soft lilac; lip rich amethyst-purple. *F. W. B.*

Hardy White Dutch Cabbage Lettuce.—This capital little compact Lettuce is one of the most useful varieties in cultivation. For winter work it is very hardy, can be planted thickly, and has no superfluous leaves. It is a first-rate variety to put out under frames or handlights, to keep up a supply of salad through severe weather. I wish especially to commend it for its extraordinary capacity to withstand drought, as in the driest soil it will heart in nicely, and remain longer before running to seed than any other variety. Its texture is fine and crisp to eat, and the flavour is sweet and good. Its only drawback is that it is small, but that is easily got over by planting an extra quantity. *A. D.*

Muscat Vines at Wells.—Since my return from Egypt, about a month ago, I have made it my business to visit Wells, in Norfolk, for the purpose of inspecting the Muscat Vines, which I planted there for J. Haycock, Esq., in the beginning of the year 1862, and which I cut back to 3 feet from the ground, afterwards fruiting them the same season. This caused a good deal of discussion at the time as to their future success. Mr. Haycock informs me they have never failed to produce an excellent crop since they were planted. And at the present time, I can assure you, I would not desire to see Vines in better health, nor more productive. The stems now measure from 4½ to 5 inches in circumference, and are pruned on the short spur system. Should any of my brother gardeners be sceptical as to the possibility of fruiting Vines within a year from the time of planting, I would recommend them to go to Wells, and judge for themselves. I am sure Mr. Haycock would have much pleasure in showing them to any one interested. *James Hardy, late Gardener to His Highness the Khedive of Egypt.*

Agapanthus umbellatus.—It may not be known to many of your readers that this very elegant plant will grow and flourish in the open ground. Late in the autumn of last year, when I was housing my plants for the winter, I happened to have three of these beautiful plants, for which I could not find room in the greenhouse. I at once selected places in the flower garden, and taking them out of the pots planted them in the flower beds, taking care before the hard frost came to cover them with common hand-glasses and a little matting, and then leaving them to take their chance. Once or twice, as opportunity offered, I took off the glasses and cleared away the dead leaves. In the early spring, and when I thought the frost had quite gone, I uncovered them, and was pleased to find two of them alive and shooting vigorously. I removed all dead leaves and loosened the earth about them, and the result is, that I have two fine plants; one has thrown up a spike of bloom almost as forward and quite as fine as any of those which had the protection of the greenhouse. Whether I shall manage to keep them through next winter remains to be seen, but I shall do my best to succeed. *B. S. R. Adam, Manor House, Staines.*

The Vines at Broomfield Lodge.—I have yet another word or two to say, in reply to your correspondent at p. 862. The reason why I mentioned "Mr." Robert Harris was, because I believed that he planted these Vines, and that the border must have been well made, and the Vines well treated in their youth, for them to have survived so long, and to have done so well under the treatment they are alleged to have received. In the absence of any distinction being made as to who the "different gardeners" were to whom the "barbarous treatment" was imputed, I consider that all who have had any hand with these old Vines stand condemned alike; hence my reason for speaking in defence of Mr. Payne, whom I know to be a good Grape grower. It would occupy too much space to give detailed information of the 26 years' interval which your correspondent names; besides, if the Vines had received any rough handling during that time, it had nothing to do with the state in which they were found in 1867, as Mr. Payne left them in good condition. Your correspondent still maintains that the "ten months' supply" is no exaggerated statement. I am not the only one who holds a contrary opinion, because the accommodation is unequal to it, when the "quantity" is to be equal to "any in the country." I am not going to say that he did not cut the last of his old Grapes this year on February 5, as he states, but he must have had a short supply during the month of January, as he had only three or four bunches left about Christmas, and I believe he did not cut new ones until some time in

May, thus leaving a space of three months in which he cut no Grapes at all. There is one more statement in your correspondent's last letter to which I would call attention. He says he always gives the Vines a "heavy crop." Does he call four bunches to a Vine a "heavy crop?" That is about the "crop" the Vine carried from which he cut his "exhibition Grapes" last September. I approached this subject in no spirit of animosity, and do not wish to enter into any further controversy respecting it, but I am none the less persuaded that the statement made by your correspondent at p. 568, that he can "supply his employer's table with Grapes ten months in the year, equal in quality and quantity with any in the country," savours somewhat of boasting. *One who "honours" old age.*

Societies.

ROYAL BOTANIC: *July* 6 and 7.—In a horticultural point of view, the exhibition held here on Wednesday and Thursday last was but of mediocre importance, but as a display of works of art, and of table decorations, it was eminently successful. The weather—upon which depends the success or failure of exhibitions of this kind—was anything but promising on Wednesday morning, but fortunately turned out particularly fine about noon, and remained so to the end. A very large company assembled to witness the ceremony of presenting the gold and silver medals to the successful lady exhibitors, which was performed by H.R.H. the Princess of Teck, who was afterwards presented with a bouquet by the secretary's youngest son, and a medal commemorative of the event. Of the many tasteful and even exquisitely beautiful arrangements for almost every form of table and indoor decoration we can of necessity say but little beyond bestowing our meed of praise to the garden superintendent, Mr. Don, for his very successful grouping of the many "bazaar"-like subjects at his command, a task requiring no ordinary amount of judgment.

We must not, however, omit to mention an innovation in the matter of dinner-table decorations. The tables were placed 18 inches higher than usual, so that the spectators were enabled to see the display at about the same height as they would do if seated at an ordinary table.

Turning to those subjects which have special claim on our attention, we find that of collections of new and rare plants there were several—Mr. B. S. Williams, Messrs. Veitch & Sons, and Messrs. Rollisson & Son, being the principal exhibitors. Messrs. J. & C. Lee sent a very large collection of miscellaneous stove and greenhouse plants, as also did Mr. G. Wheeler. From Messrs. E. G. Henderson & Son came a beautiful group of bedding and other ornamental decorative plants, and from Messrs. Carter & Co. a large and good collection of double-flowered Pelargoniums. The prize list was principally composed of bouquets, table decorations, hanging baskets, rustic stands, window boxes, Fern cases and pairs of such plants as are generally used for "padding" strictly horticultural exhibitions. Of Fern cases, and such like household adornments, Messrs. Dick Radclyffe & Co., Holborn, had a very fine display, as also had Messrs. Claudet, Haughton & Co. Mr. E. A. Puig exhibited miniature designs of indoor and outdoor ferneries; and from E. Brown & Co., Marylebone, came a large assortment of garden requisites. Messrs. Deane & Co. had a large collection of garden seats, &c. Mr. Looker exhibited several of his patent capped frames, and Mr. Appleby several specimens of his new fumigator.

The fruit was the principal feature in the exhibition, though, in consequence of several intending exhibitors withdrawing, this department was not so well represented as on former occasions. In point of merit, however, the various productions left little to be desired. Four collections, arranged as a dessert, were exhibited; Mr. Johnson, gr. to the Marquis of Aylesbury, Savernake, coming in 1st with excellent examples of Black Hamburgh and Tottenham Park Muscat (Muscat of Alexandria) Grapes, the former good in bunch and berry; two very good Queen Pines; fine Bellegarde and Teton de Venus Peaches, the latter being larger and more beautfully coloured than we had before seen it exhibited; Elruge and Violette Hâtive Nectarines, very fine; Golden Perfection and Triomphe de Nice Melons; fine Black Tartarian Cherries, Strawberries, &c. The 2d best collection came from Mr. Bannerman, gr. to Lord Bagot, Blithfield Hall, Rugeley, who set up first-rate examples of Black Hamburgh and Grizzly Frontignan Grapes, with a very fair sample of the new Golden Champion; two Queen Pines, smaller than in the former collection; two specimens of the Trentham white-fleshed Melon, large, and in shape like a Vegetable Marrow; very good Noblesse and Royal George Peaches, with Strawberries, Cherries, Currants, &c. Mr. H. Clark, gr. to Earl Cowper, Brocket Hall, Herts, came in 3d. Mr. W. Carr, gr. to G. W. Micklethwaite, Esq., Taverham Hall, Norwich, also competed. The best 6 dishes of outdoor fruits were furnished by Mr. Gardiner, gr. to E. P. Shirley, Esq., Eatington Park, and consisted of Cherries, Currants, Gooseberries, Strawberries, &c., in excellent condition. Similar kinds of fruit were also shown by Mr. Clark, and Mr. Harvey, gr. to B. Wroughton, Esq., Wooly Park, Wantage, to whom the 2d and 3d prizes were awarded. In the class for one fruit of the Queen Pine-apple, Mr. J. Acres, gr. to — Copestake, Esq., Highgate, came in 1st with a beautiful specimen, weighing 6 lb.; the next best weighed 4lb. 10 oz., and showed very fine and regularly formed pips; this came from Mr. R. H. Smith, gr. to H. Walker, Esq., Calderstone, Liverpool. The 3d prize was taken by Mr. Gardiner with a nice Moscow Queen. Mr. C. Penford, gr. to Earl Radnor, Longford Castle, Wilts, was placed 1st in the class for any other variety, with a good-shaped Providence weighing about 8 lb.; a longer fruit of the same variety, and the same weight, from Mr. Bertram, gr. Cyfarthfa Castle, was placed 2d; whilst Mr. J. Acres came in 3d with a good Queen; equal 4th prizes being awarded to Mr. Ward, gr. to T. N. Miller, Esq., and Mr. Miles. Peaches and Nectarines were not shown in nearly such abundance as at the corresponding shows in former years, though, be it said in extenuation, they were all good. Two exceedingly fine dishes of Grosse Mignonne came from Mr. Lynn, gr. to Lord Boston, Hedsor, and secured the 1st prize; the same variety and Royal George, shown in fine condition by Mr. Miller, Combe Abbey, being placed 2d; Mr. T. Burnett, gr. to Mrs. Hope, The Deepdene, coming in 3d, Royal George being also his representative. Good specimens of Galande and Noblesse came from Mr. Clark, and Violette Hâtive from Mr. W. Davis. For the best two dishes of Nectarines Mr. Miller stood 1st and Mr. Lynn 2d, the former with large and well coloured examples of Oldenburgh and Violette Hâtive. Pitmaston Orange, Elruge, and the above also figured conspicuously in other collections. In the class for two Fine-apples in pots, any kind, the best came from Mr. Miles, the 2d best from Mr. R. Laing, gr. to P. W. Flower, Esq., Tooting Common; and the 3d from Mr. J. Hepper, gr. to J. Walmsley, Esq., Acton, Queens being the principal variety exhibited. Of Cherries, Mr. Miles again sent 2 splendid dishes of Bigarreau Napoleon, and took the 1st prize in the class for white varieties; while Mr. J. Potter, gr. to B. Colvin, Esq., Bealings Grove, came in 1st for black kinds with Black Circassian; Mr. Miles being 2d in the latter class with good specimens of the same variety and May Duke. Only one dish of Plums was shown, and this, a very good one of Orleans from Mr. Miles, was considered worthy of the 1st prize. The same exhibitor also staged the best four dishes of Strawberries, first-rate specimens of Dr. Hogg, Admiral Dundas, Mr. Radclyffe, and Sir C. Napier. The 2d prize in this class was taken by Mr. T. Widdowson, gr. to J. W. Barnes, Esq., Rickmansworth, with a similar collection; and the 3d by Mr. J. Douglas, gr. to F. Whitbourne, Esq., Loxford Hall. In the class for scarlet-fleshed Melons, a small fruit of Scarlet Gem, very fine in flavour, contributed by Mr. J. Cross, gr. to Sir F. H. Goldsmid, Bart., was placed 1st; the next best being Meredith's Hybrid Cashmere, exhibited by Mr. Burnett; whilst the 3d prize was taken by Mr. Bunting, gr. Lady Pringle, Bonchurch, Isle of Wight, with Queen Victoria. A small round Melon, named Marquis of Ailsa, shown by Mr. T. Crane, was the best in the class for green-fleshed varieties; a medium-sized fruit of Dr. Hogg, shown by Mr. W. Gardiner, taking 2d honours. Neither class was at all well represented. For the best 12 lb. of Black Grapes, Mr. G. Ward came 1st, Mr. W. Davis 2d, and Messrs. Standish & Co. 3d; the former with excellent examples of Black Hamburgh, and the latter with Royal Ascot, good on all points. Mr. Bannerman also sent a very good sample. In the corresponding class for white Grapes, fair specimens of Muscat of Alexandria were contributed by Mr. G. Osborn, Kay's Nursery, Finchley, and Mr. W. Davis, New Lodge, Whetstone, the prizes being awarded in the order named. Mr. C. Penford, gr. to Earl Radnor, sent the best dish of Black Hamburgh, the bunches being large, well-coloured, and good in berry and colour. Mr. Bannerman had the 2d best, and Mr. W. Davis the 3d. The last-named exhibitor also came in 2d in the class for white Grapes with Muscat of Alexandria, Mr. D. Pizzey, gr. to Sir E. Perry, being 1st with the same variety. He also held the same position in the class for any other kind, showing a first-rate dish of Royal Muscadine; very fair examples of Black Prince were shown by Mr. Penford and Mr. W. Cole; and Messrs. Standish & Co. sent Golden Champion, produced by a last year's graft on the Royal Ascot, which partakes very much of the flavour of that variety. Very good bunches of Foster's White Seedling also came from Mr. Miles.

WEST OF ENGLAND ROSE SHOW.—The fourth exhibition of Roses for the Western Counties was held in the Shire Hall, Hereford, on Tuesday last. There was a very large company, including many of the leading residents in the neighbourhood of Hereford, the Rose show being a kind of select *fête* day for the entire district. The show of Roses was unquestionably the best ever brought together in the West of England. All the classes were well filled, and the competition in each extremely close. The leading awards were as follows:—

Nurserymen. Class A 1, open to the United Kingdom.—No 1, 72 vars., single trusses: 1st, Mr. John Cranston, King's Acre, Hereford; 2d, Messrs. Paul & Son, the "Old" Nurseries, Cheshunt; 3d, Mr. B. R. Cant, Colchester; 4th, Mr. Jackson, Blakedown.

No 2, 36 vars., 3 trusses: 1st, Mr. Cranston; 2d, Messrs. Paul & Son; 3d, Mr. Cant; three trusses: 4th, Mr. Cranston.

Class A 2, Herefordshire nurserymen not allowed to compete in this division. 72 vars., single trusses: 1st, Mr. B. R. Cant; 2d, Messrs. Paul & Son.

Class B (open to non competitors in Class A).—No 5, 36 vars., single trusses: 1st, Messrs. Perkins & Sons, Coventry; 2d, Mr. Davison, Hereford; 3d, Mr. R. H. Vertegans, Edgbaston; 4th, Mr. S. Williams, Hereford.

No 6, 24 vars., three trusses: 1st, Messrs Perkins & Sons; 2d, Mr. Vertegans; 3d, Mr. Davison. No. 7, 24 vars., single trusses: 1st, Messrs. Perkins & Sons; 2d, Mr. Vertegans; 3d, Mr. Davison; 4th, Mr. Hailstone, Abergavenny.

Amateurs.—Class C, open to the United Kingdom.—No. 8, 36 vars., single trusses: 1st, Mr. C. J. Perry, Castle Bromwich; equal 2d, Rev. P. M. Smythe, Solihull, and Rev. Geo. Arkwright, Pencombe Rectory; 3d, Mr. S. Dobree, Wellington, Somerset; 4th, Mr. John Clarke, Abergavenny.

No. 9, 24 vars., single trusses: 1st, Mr. John Moore, gr. to T. Lloyd, Esq., Warwick; 2d, Mr. R. N. G. Baker, Heavitree; 3d, Mr. C. J. Perry; 4th, Rev. P. M. Smythe.

No. 10, 12 vars., three trusses: 1st, Rev. Geo. Arkwright; 2d, Mr. C. J. Perry; 3d, Rev. P. M. Smythe; 4th, Mr. J. Moore.

No. 11, 12 vars., single trusses: 1st, Rev. H. C. Keay, Stretton Sugwas; 2d, Rev. P. M. Smythe; 3d, Mr. C. J. Perry; 4th, Mr. J. Moore.

No. 12, 12 blooms, single trusses of some Rose: 1st, Mr. Dobree, for Alfred Colomb; 2d, Rev. G. Arkwright, for Paul Verdier; 3d, C. J. Perry, for Auguste Mie; extra prize, Rev. C. H. Bulmer, Credenhill Rectory, Hereford.

The prizes open only to residents in Herefordshire were divided among the Rev. Sir George Cornewall, Bart.; Rev. B. Stanhope, Rev. C. H. Bulmer, Rev. H. Dew, Rev. E. Bulmer, Mr. W. Lewis, Mr. A. H. Wall, Mr. Hawkins, Mr. Colley, and Mrs. Downing.

The principal prizes in Class E (new Roses, 1868 to 1870), open to the United Kingdom, were awarded as follows:—Messrs. Paul & Son, Mr. John Cranston, Mr. Jackson, Mr. B. R. Cant, Mr. R. H. Vertegans. Duke of Edinburgh proved the winning flower in two cases.

The new and recent Roses shown included the following:—Clémence Raoux, Victor le Bihau, *Reine Blanche, *Nardy Frères, Souvenir de M. Poiteau, *Paul Neron, *Thyra Hammerich, *Edward Morren, *Adrienne de Montebello, *Emilie Hausburgh, *Julie Touvais, Charles Lee, *Marquise de Montemart, *Devienne-Lamy, *Mdme. Jacquier, *Duke of Edinburgh, Perfection de Lyon, *Dupuy-Jamin, *Henri Ledechaux, *Jean Tury, Montplaisir, *Berthe Baron Minerva, *Adolphe Brongniart, *Leopold II., *Julia Treyve, *Charles Fontaine, *Madame Creyton, Monsieur Journeaux, *Madame Clert Réné Daniel, Marie Sisley. Of older hybrid perpetuals, the following were uniformly good wherever shown:—Alfred Colomb, Abel Grand, Annie Wood, Baroness Rothschild, Beauty of Waltham, Camille Bernardin, Caroline de Sansal, Charles Lefebvre, Charles Rouillard, Comte de Nanteuil, Comtesse de Jaucourt, Duke of Wellington, Elie Morel, Exposition de Brie, François Louvet, Horace Vernet, John Hopper, Lælia, Mdme. Rivers, Mdme. Thérèse Levet, Mdme. Victor Verdier, Marguerite Dombrain, Marie Baumann, Marie Rady, Miss Ingram, Mons. Boncenne, Paul Verdier, Princess Mary of Cambridge, Reine du Midi, Sénateur Vaisse, Victor Verdier, Xavier Olibo. Teas and Noisettes were generally good, but were not very numerous, these kinds being earlier than usual this season, and in most Rose gardens nearly over. The following were well shown:—Maréchal Niel, in almost every stand; Climbing Devoniensis, Duc de Magenta, Gloire de Bordeaux, Gloire de Dijon, Louise de Savoie, Madame Falcot, Madame Villermoz, Marie Ducher, Niphetos, Souvenir d'un Ami, Céline Forestier, and Triomphe de Rennes.

The general quality of the stands was excellent. The chief nurserymen's exhibits were admirable, the Roses being invariably large in size, brilliant in colour, excellently shaped, and well set up. Mr. Cranston was well 1st with his 72 singles and 36 trebles. Messrs. Paul & Son were placed 2d for 72's in the limited class, but we thought their exhibit, superior to that of Mr. Cant, to which the 1st prize went, although that gentleman's stand was very even, and contained some fine blooms. Messrs. Perkins & Sons, Mr. Davison, and Mr. Vertegans, all sent praiseworthy contributions. In the new Roses, Messrs. Paul & Son were well 1st.

Of the amateur class we cannot speak too highly. Mr. Perry's 36 were the best we have ever seen put up by that gentleman. Mr. Smythe's and Mr. G. Arkwright's exhibits in same division were so evenly balanced in merit as to be awarded equal honours. In the other divisions the contest was very close, and the judges had considerable trouble in adjudging the prizes.

A very interesting feature of this show was the large and varied collection of dinner-table and room decorations, no flowers but Roses being used, but in some cases the employment of wild foliage in conjunction being permitted. We have no room to give the awards. The bouquets were numerous, but the prizes were to our thinking incorrectly awarded. Two entirely passed over merited, in the estimation of many competent judges, the 1st and 2d prizes: we refer to one exhibited by Mr. Walters, King's Acre, and to another exhibited by the Rev. C. H. Bulmer. Mr. Walters' bouquet was a most exquisite one, consisting entirely of just opening blooms of Mdlle. Bonnaire and Moss buds, relieved by a judicious intermixture of Rose foliage. The arrangements of the show were admirably carried out under the direction of Mr. George Barter.

TUNBRIDGE WELLS HORTICULTURAL.—At this exhibition, held on the 1st inst., some new bedding plants were staged that are likely to become very useful in our gardens. One was a white form of Lobelia Erinus speciosa, with flowers of the purest white, without a trace of blue, of dwarf and yet vigorous growth, the flowers fully produced, and as large as those of any form of Erinus speciosa used for bedding purposes. It was named Purity, and was exhibited by Mr. J. Chambers, Beddington, Croydon. The plant had such a wiry, hardy growth, that it could not have been (judging from its appearance) grown under glass to keep the flowers pure. In addition, Mr. Cattell, of Westerham, staged several plants of a dwarf growing variegated Pelargonium, called Minnie Warren, the leaves green, broadly edged with pale cream, very dwarf in growth, and yet free, and said to stand exposure well; it will not only prove a valuable companion to Mr. Turner's golden-leaved variety, Ochroleuca, but a capital contrast to it. Like Mr. Turner's, it is a chance seedling, capable of reproducing the variegation. Messrs. Thomas Cripps & Sons, Tunbridge Wells, had a shrubby Calceolaria, named Matchless, producing huge bunches of brownish crimson flowers, of large size, in a singularly free manner. The habit is essentially shrubby, of a particularly hardy, wiry growth, dwarf and yet robust. It is recommended as a bedding variety; certain it is, rain would not bend the stiff rigid flower-stems. As a plant for house decoration, it will prove of great value.

Notices of Books.

Mushroom Culture: *its Extension and Improvement.* By W. Robinson, F.L.S., Author of "The Parks, Promenades, and Gardens of Paris," "Alpine Flowers," &c. With numerous illustrations. London: F. Warne & Co.

The object of the author in the production of this book appears to have been that of giving his readers a taste of Mushrooms of every kind, and under every form and phase; and hence the neat little volume in

* Those which were shown in good form in several stands we have marked with an asterisk.

which this bill of fare is presented is largely made up of selections from his own previous publications, and from the works of preceding authors on fungology, amongst whom the names of Berkeley, Badham, and Smith must be prominently mentioned. The result is a sort of Handbook of Mushrooms, including kinds, culture, and cooking; and inasmuch as its scope and object is to urge the more extensive and more general cultivation of these delicious and nutritious esculents, we trust the book may find many readers, and may induce many unbelievers in Fungi to become mycophagists.

The work is divided into twelve chapters, in the first of which the house-culture of Mushrooms is treated on, with many illustrations of Mushroom houses, as Ormson's, the Frogmore, Forsyth's, Oldaker's, &c. Chapter 2 describes the preparation of materials, in which the practice of Earley, Barnes, Cuthill, Ayres, &c., are quoted, the conclusions drawn being these:—1. That very careful preparation and frequent turning over of the manure under cover are not necessary to success, and that it is quite needless to prepare the manure under cover, except when it is gathered in a very small quantity. 2. That carefully picked droppings are not essential, though they may be more convenient. 3. That the best way of preparing manure for the general culture of Mushrooms indoors, is to gather it in some firm spot, and allow it to lose its fierce heat. 4. That stable manure may be used when fresh, but it should always be mixed with more than a fourth of good loamy soil; beds thus made are well suited for cool sheds and the open garden. 5. That a portion, say nearly one-fifth to one-third of good and rather dry loam may always be advantageously mixed with the stable manure; the fresher the material the more loam may be used, 6. That a thickness of from 1 foot to 15 inches for the beds, in an artificially heated house, is quite sufficient. Chapter 3 describes and illustrates the spawn; chapter 4, the spawning and after treatment; while chapter 5 describes culture in beds, cellars, &c.; chapter 6, cave-culture near Paris; chapters 7 and 8, culture in the open garden; and chapter 9 culture in pastures. With chapter 10 commences a description of the common Mushroom and other edible Fungi, which is carried on through chapters 11 and 12, and is illustrated by some excellent woodcuts by Mr. Worthington G. Smith. The book winds up by quoting Dr. Curtis' letter to Mr. Berkeley on American Fungi, and Mr. La Touche's paper on eating Fungi, communicated to the Woolhope Naturalist's Field Club.

We have thus made up a little volume of some 172 pages, which in its elegant cover will be an ornament to the shelves of a garden library, and from its varied contents will not be likely to disappoint those who, being interested in the subject of Mushroom growing, may turn to its pages for an epitome of modern practice, and a digest of the published information bearing on the subject.

Window Gardening for Town and Country (Routledge & Sons), is the title under which one of the essays sent in, in competition for Mr. Hubbard's prize, has been published by one of our correspondents, Mr. Meikle, gardener at Read Hall, Whalley. It is a very commendable treatise on the subject. The general hints for cultivation are judicious, though necessarily brief, while the space given to special objects of culture is taken up by such subjects as Ferns, spring bulbs, and a few popular flowers, as Calceolarias, Cyclamens, Primulas, Fuchsias, Pelargoniums, &c. One of the author's maxims, though trite, should be impressed on all window gardeners. It is this—Cleanliness is essential to healthiness, therefore the plants must be frequently cleansed.

Garden Memoranda.

NUNEHAM PARK, ABINGDON, THE SEAT OF THE REV. WILLIAM VERNON HARCOURT.—The traveller proceeding to Oxford by the Great Western Railway from London, sees on passing the Abingdon Road Station this fine demesne lying away to the right hand on the high ground above the course of the Isis, which here fringes the woodland at the point where it and the pasture fields meet on either side of the silver river. Access can be had to the grounds from Culham Station, between Didcot and Abingdon; also from Oxford by road, to the entrance from the Henley Road on the north side of the grounds. The demesne is something like 1500 acres in extent, of which 33 acres are flower garden and pleasure-ground, and 8 acres kitchen garden.

The deer park is of considerable extent, and from the point where it falls down to the river at the south-western extremity of it, up to the high ground by Nuneham village, there is a gradual ascent. The park is stocked with magnificent timber, there being many fine examples of Oak and Elm, and about the park are dotted many Thorns, that are sheets of white blossom at the blooming season. Here and there can be seen clumps of lofty Scotch Firs, and occasional groups and solitary specimens of coniferous plants planted somewhat recently.

The kitchen garden occupies a somewhat higher elevation than the dwelling-house; and is a fine walled-in garden of 8 acres, the soil a rich deep black loam, thoroughly holding, and capable of producing fine crops. Two tiers of walls run from east to west, thus dividing the garden into three compartments. The Pear wall is considered the best in the county, and is planted with many of the leading kinds, most of which succeed well in such a position. In the days of the late Mr. Henry Bailey, who was for several years gardener at Nuneham Park, it gained a great reputation for the Pear crops produced here, and this is still maintained. This season most of the trees are heavily hung with Pears. The vegetables produced here are of a high order of quality; as a soil for growing Onions it is perhaps scarcely surpassed.

Of glass structures there are five large vineries for succession, and four large Peach-houses, two of them having Sweetwater Grapes planted along the front. There are also six plant-houses, and about 126 lights, forming Pine-pits, Cucumber and Melon frames, &c.; the whole of the glass occupying about an acre of ground. The plant houses contained specimen stove and greenhouse plants, &c., which have occupied good positions in competition at the exhibitions of the Royal Oxfordshire Horticultural Society.

The flower garden is by no means extensive, rather there is a series of flower gardens, met with at different points during a walk through the grounds. The pleasure-grounds are somewhat extensive and varied, and are much admired for their quiet beauty and repose.

Close to the entrance to the gardener's house, access is had to the rosary, round and about which is a flower garden. The rosary is of circular shape, and though airy, is yet sheltered by a belt of trees on either side. From here an archway of Roses and other climbing plants gives access to Mason's Garden, so named from having been designed by the Rev. William Mason. At the foot of the trunk of a fine specimen of Abies pendula, standing on the west side of this garden, can be seen a tablet inscribed to the memory of the designer of this garden by his friend, George Simon, Earl Harcourt. In the spring months this garden is made very gay by the various species of Magnolias dotted about—conspicua, of which there are fine examples; tripetala, also very fine; Soulangeana, nigra, and gracilis. There are also fine banks of Rhododendrons, deciduous and evergreen trees, with statuary and vases on pedestals interspersed, with here and there cheerful beds of flowering plants. An old orangery occupies the north side of the garden, and at this season of the year it is occupied by specimen Pelargoniums, Humea elegans, &c.; at the back is a trellis-work covered with Clematises, Roses, and other creepers; and above the orangery is seen, through a break in the line of lofty forest trees, the dome of the parish church of Nuneham, situated very close to the mansion. Formerly the village of Nuneham occupied a space near the church, but was subsequently removed to its present site on the highway, on the east side of the park.

Following a winding shrubbery walk for a short distance, the North Terrace Garden is reached, a small garden situated by the side of the right wing of the mansion. The ground-plan of the garden forms a kind of irregular triangle, and comprises 29 beds of various shapes, some large and others small, and so disposed as to fit in the shape of the garden. From the park this garden, as well as the terrace along the front of the mansion, is divided by a stone balustrading. The west front of the mansion gives a broad terrace walk, with creepers trained against the house; and the grass land next the terrace falling away towards the "silver Isis," which can be seen gliding along in the valley below. That portion of the park stretching away to the river is nicely undulated, with here and there groups of magnificent Elms and other trees. To the right, looking away over the course of the Great Western Railway, can be seen through an opening in the trees the city of Oxford; in front, away in the distance, is Abingdon, with the ranges of Wiltshire hills rising beyond; to the left is that stretch of pleasure-ground known as Brown's Walk, regarded as one of the masterpieces of "Capability Brown." From the west front the terrace takes a turn to the left, and here the South Terrace Garden is seen. Situated in front of the south wing of the dwelling, this garden shows a symmetrical arrangement of 28 beds, of varying sizes in the parallel divisions, with a broad gravel walk between them. The size of the beds of this garden makes it necessary they should be planted with dwarf-growing plants, hence there is always a refinement about it; and in spring and summer alike Mr. Stewart, the late gardener at Nuneham, always made a most effective display on this spot. From this garden a pleasant broad walk of considerable length, leading away under high trees, takes a bold sweep, and ultimately returns again to the point from whence it started. A gentle ascent leads to an eminence, opening up fine views of the surrounding country; and, ere this is reached, exquisite gaps are opened up through woody vistas, among which are views of Oxford at different standpoints. Almost on this eminence is Whitehead's Oak, now a fast decaying trunk, under which the then poet-laureate, William Whitehead, composed many of his pieces, and a tablet records this was his favourite resort. Near to this, but occupying a commanding position in the park, is an old conduit of Gothic structure, which formerly stood in Carfax churchyard at Oxford, and which was presented to Lord Harcourt, and erected here. Fine trees line this walk, among them some splendid Acacias that are quite timber trees, a very fine specimen of Pinus insignis, the only one saved from the ravages of the memorable frost of 1860-61; while many of the surrounding trees are of fine and vigorous proportions.

The Pinetum occupies a space of 12 acres on the east side of the mansion towards Nuneham village. It is enclosed, and much overgrown with underwood, Whitethorn, &c. A visit here, when the last named is in full bloom, surrounding the dark outlines of the coniferous plants, is one of a very pleasant character. There are many very finely furnished and handsome specimens, such as Pinus Cembra, 30 feet in height; P. ponderosa, 35 feet; P. Lambertiana, 40 feet; P. Morinda, 30 feet; P. Douglasii, 60 feet. Of Abies, there are rubra coerulea, 30 feet; canadensis nigra, 25 feet; Menziesii, 65 feet; Pinus sylvestris horizontalis, 40 feet; Pinaster, pyrenaica, 30 feet; Pallasiana, 30 feet; sylvestris rigensis, 20 feet; Benthamiana, 40 feet; Banksiana, 24 feet; Cedrus atlantica, 40 feet, and Deodara the same; Picea cephalonica, 30 feet; Nordmanniana, Webbiana, 25 feet; Douglasii, 40 feet; and others, of much interest to those who make a study of these noble plants.

Mr. James Stewart, who succeeded the late Mr. Henry Bailey as gardener at Nuneham, and who conducted the gardening operations here with much ability and success, has just left; and he has been succeeded by Mr. Isaac Watson, recently gardener at Casewick, the seat of Lord Kesteven, near Stamford. *R. D.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Orchids which are growing freely will now require much personal supervision. The young leaves formed upon Cattleyas, Aerides, Saccolabiums, and the like, under a favourable artificial regimen, will in many instances be so fine as to need some slight support to keep them in a proper growing position until they have become sufficiently strong to be self-supporting. It will not be necessary in the majority of instances to do more than to fix a neat stake into the pot in such a manner as to cause it to press firmly against such leaves as are likely to grow irregularly. Any delicate or recently imported plants of Orchids should have every possible encouragement by frequently sprinkling them overhead with tepid water, and by shading them in the usual manner, &c. Look well after such of this class as are grown upon blocks of wood. Do not rest with constant syringings or the like, but take every block down singly, and dip it well into a vessel containing water, so as to immerse every part. Stanhopeas, Gongoras, and the like, which require growing in baskets, the better to exhibit their quaint blooms—and many of the former will flower about this time—will likewise delight in having a plentiful supply, if they are forming fresh pseudo-bulbs at any stage of growth. Give the final shift to *Feathered Cockscombs*, a most showy variety, which stands remarkably well in cool greenhouses when once grown to the flowering stage. *Balsams* will also in many instances need to be potted on into the blooming pots. These latter like a rich diet. Good strong "spit manure" (as gardeners term such as is thoroughly decayed, and of a seemingly unctuous nature), in admixture with fine fibrous loam, will suit them admirably. Prick out seedlings of *Cinerarias*, *Primulas*, &c., immediately they become large enough to handle, giving them thus early a very open soil, and potting them lightly. Place *Herbaceous Calceolarias* which it is intended to propagate out-of-doors in a cool, shady situation. Here they will form young shoots around the base, which are most suitable for propagating purposes. Be careful not to overcrowd greenhouses at this season. It too often happens that many plants of inferior merit are pushed in here to fill up—such, for instance, as ordinary scarlet Pelargoniums—a practice which tends materially to displace the more valuable hard-wooded greenhouse plants that are wanted for display in the winter, and which therefore ought to have more space allotted to them.

FORCING HOUSES.

It generally happens that fruit trees, which are in a healthy thriving state, when they have completed the process of stoning, make a vigorous effort to grow again. As *Vines* are no exception to this rule, it will be necessary to look frequently through vineries which are at such a stage, and to remove all excess of growth then forming upon the older sublateral shoots. Where breaks or primary lateral shoots happen to exist without bearing any fruit it will be judicious, if there is room, to permit a little extension for a time, by not pinching back the young growths. By permitting these to grow awhile, a greater amount of reciprocity will be kept up between the roots and the foliage. Gradually inure all crops which are colouring to a more free admission of air, without which good flavour is not easily attainable. In referring to the attacks of red-spider at this period, I do not speak of Vines alone, but of almost every other sort of fruit trees that is forced. Especially will it be necessary to use every form of preventive in connection with all trees or subjects which have ripened their crops or are now engaged in so doing. It is at the period when the leaves have attained to something like their full size, and have become somewhat hard

and matured, that this pest makes its presence known. Wherever its presence is detected let a decisive movement be made for its destruction, half measures are worse than useless in this case. Either with a garden engine or with a strong syringe dash the water amongst the foliage, so as to dislodge them if possible. Sprinkle sulphur about wherever possible, using the new form of sulphur distributor to do so more efficiently beneath the foliage and wherever the pests have gained a lodgment. Regulate the shoots of *Melons* as they continue to grow, giving every encouragement to such shoots as are likely to produce fruit, and thin out such as are not likely to do so. Always encourage the leaves from the base, or near to the base of the fruit, as these contribute very materially towards their proper support. Attend now to the linings or fermenting materials around all beds which are heated by these means, for we may now expect a somewhat cold period at any moment, and may be at such a time when the plants will be in need of a nice amount of bottom-heat to push them along.

HARDY FRUIT GARDEN.

Now that the *Strawberry runners* which have been layered require a goodly amount of support, do not neglect to water them as frequently and as constantly as they require it. To permit these to flag too frequently, or indeed at all, is sure to tell unfavourably upon them, if they are intended to form good plants for forcing. Fasten all young *Vine shoots* of the current season's formation firmly against the wall, as they continue to grow, removing all tendrils, which only tend to impoverish the plants. Where the plants are young, and the roots are near the surface, it will be an excellent plan to give them a good soaking of manure water. I have before suggested that all the useless shoots should be removed from red and white Currants, in such a manner as to afford to those which remain as much light and air as possible. This operation should now be done forthwith, where it has been delayed. Some few young growths will now have formed upon the apex of the young *Pear tree* shoots, which were previously cut back. Permit these to remain a week or two longer, for if cut off thus early, the young fruit buds, which should be forming at their base, will be induced to start prematurely.

HARDY FLOWER GARDEN.

By way of security from the risk of disappointment, I advise that small sowings be made now of all such subjects as are used for spring bedding. They consist of *Silenes*, *Myosotis*, *Saponarias*, and the like ; which, if they become too strong, may be readily transplanted, in view of moderating their growth. Such subjects as *Nemophila*, *Limnanthes*, &c., should remain unsown for a few weeks longer. Take up the roots of *Ranunculuses* as soon as the foliage assumes a yellow ripened hue. Layer *Ghent Azaleas* where propagation is intended to be done by this means. Finish gathering Rose petals for making *pot pourri*. Divide old plants of *Pansies* and *Polyanthuses* as soon as the weather becomes suitable. They should be planted into a shady border for a time.

KITCHEN GARDEN.

Sow a little *Cabbage* seed for the first planting, for winter and early spring use. It must be understood, however, that I do not yet advise making a main sowing. Thin out *Leeks* where planted in drill rows, and when suitable weather arrives transplant others from the seed-beds into the permanent quarters. Sow an early kind of *Broad Bean*, such as the Mazagan, which will come on quickly, and afford a last supply in the late autumn. Sow seeds of *Cucumber* to furnish plants which will afford a winter supply. Make also another sowing of *Chervil* and *Parsley*. Earth up and stake successional crops of *Peas*, sowing more of an early bearing kind if necessary ; and do not fail to transplant *Endive* where such is in active demand in the autumn. *W. E.*

TOWN GARDENING.

Town Gardening has now become an important feature in town decoration, and the managers of our public parks have set a very good example, by making such a display of beautiful flowers that it is often said : "We don't want to go into the country to see beautiful *parterres* ;" though they are not entirely free from the effects of smoke. Of course the plants are better situated in the parks than in squares and gardens in the town, yet with fresh soil in sufficient quantity to plant in, and with due attention to the matter of selecting such plants as will thrive satisfactorily, it is quite certain that in the very centre of the town much may be done. I should recommend that at this season those Londoners or others who are so disposed should pay a visit to such places as the Temple Gardens, Lincoln's Inn, and to a little spot called "New Inn," which is surrounded on all sides by lofty houses, close to St. Clement's Church in the Strand. In these places they can judge for themselves what is the most suitable. *Carnations* and *Picotees* should now be propagated. If fresh mould is procured from the country to plant them in, they will increase freely and flower splendidly. The method of propagation which I adopt is as follows :—I procure fresh soil, and pegs cut from old birch brooms, and then loosen the mould round the plant, adding a portion of the fresh soil, so as to raise up a bed to lay them in. I then cut with a sharp knife under the second firm joint upwards, then make a second cut below, taking out a wedge-like piece, which prevents the cut from closing. Peg down the shoots so treated, and cover them with fresh soil, and water occasionally if the weather is dry. I find that nine out of ten so managed strike roots and make good plants. They will also strike from cuttings, like the Pink, but this method I should not recommend as a general rule, but only where varieties are scarce, for they seldom flower the following summer ; but if potted, and wintered in a greenhouse, they will flower early in the following spring. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON, FOR THE WEEK ENDING WEDNESDAY, JULY 6, 1870

1870 Month and Day. June and July	At 9 A.M. Readings of Barometer reduced to 32° Fair	Dry Thermometer	Wet Thermometer	Hygrometrical Deductions from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.	Temperature of the Air Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 39 Years	Wind. Direction	Wind. Movement	Rain In Inches
	Ins.	Deg.	Deg.	Deg.	Deg.	Gr.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
30. Thurs.	29.83	61.3	54.3	48.0	67	4.8	69.0	50.5	18.5	59.8	−3.1	N W	260	0.00
1. Friday	29.80	69.1	54.5	43.5	48	4.0	78.0	54.2	23.8	66.1	+3.1	N W	280	0.15
2. Satur.	29.85	68.3	57.8	49.1	55	4.6	63.0	44.2	18.8	53.6	−9.6	W by S	190	0.00
3. Sunday	29.80	67.4	51.5	37.1	39	3.7	68.5	47.0	21.5	57.8	−5.5	W N W	295	0.00
4. Monday	29.65	65.5	52.2	41.4	50	4.0	71.3	51.8	19.5	61.6	−1.6	W N W	190	0.00
5. Tues.	29.81	69.1	62.7	59.7	82	5.6	69.0	57.6	11.4	63.3	+0.3	S W	180	0.04
6. Wednes.	29.81	64.1	57.7	51.5	79	4.8	71.1	58.9	12.2	65.0	+2.2	W	240	0.00

June 30—Generally overcast throughout the day. Heavy rain from 1 to 2 P.M.

July 1—Very fine throughout the day. Slight rain at night.

2—Generally overcast.

3—Fine throughout the day.

4—Fine early, generally covered with cloud through the day. Cloudy at night.

5—Overcast throughout the day.

6—Fine early, cloudy at noon, and heavy rain from 2 to 3 P.M. Fine in the evening.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, JULY 9, 1870

Names of Stations	Temperature of the Air. Highest in Week	Lowest in Week	Range of Temperature in Week	Mean of all Highest	Mean of all Lowest	Mean Daily Temperature	Mean	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	76.8	48.1	32.3	67.9	49.4	27.0	58.7	0.68
Blackheath ..	73.1	41.8	31.3	69.9	51.1	29.8	57.7	0.16
Bristol ..	73.3	31.7	29.6	69.6	46.2	17.6	57.9	0.00
Birmingham ..	69.1	42.0	27.1	66.9	49.2	14.7	55.8	0.15
Wolverhampton	67.2	45.2	22.0	66.3	48.7	15.1	54.7	0.21
Leicester ..	66.1	41.7	23.0	66.1	48.7	19.6	53.1	0.30
Norwich ..	69.8	40.0	29.8	67.3	49.6	12.4	54.2	0.01
Nottingham ..	66.8	45.3	24.5	65.1	49.5	17.6	56.1	0.12
Sheffield ..	69.0	47.0	22.0	66.6	51.5	14.1	54.9	0.17
Liverpool ..	66.8	48.0	18.8	65.1	51.5	8.2	57.3	0.14
Manchester ..	69.1	46.0	19.4	67.2	51.0	11.3	54.7	0.77
Salford	69.1	45.7	19.4	66.0	51.3	11.7	53.1	0.65
Bradford ..	66.0	37.5	20.5	66.9	50.2	15.4	52.1	0.45
Leeds	66.0	38.0	28.0	65.1	48.1	15.4	53.0	0.18
Hull	66.0	38.0	28.0	64.1	48.3	15.8	52.7	0.15
Newcastle ..	62.0	32.0	30.0	62.3	42.2	10.8	51.6	1.36
Edinburgh ..	70.2	46.0	24.2	..	..	..	54.8	1.20
Glasgow ..	66.2	41.0	25.2	..	..	..	53.1	0.41
Dundee ..	64.0	41.0	22.0	..	..	..	51.0	0.75
Aberdeen ..	62.2	37.5	24.7	..	..	..	51.2	0.27
Paisley ..	67.5	41.2	26.3	..	..	..	53.3	0.00
Greenock ..	64.0	36.0	28.0	..	..	..	51.2	0.87
Leith	71.0	44.0	27.0	..	..	..	54.6	0.73
Perth	74.0	41.0	30.0	..	..	..	56.7	1.18
Dublin	69.7	43.5	23.2	..	..	..	52.7	0.00

JAMES GLAISHER.

Notices to Correspondents.

Cucumbers : *J. C. & Co.* A pure case of bad cultivation. Your Cucumbers are defective through want of vigour, or too cold a temperature in the house. They are like those produced on over-cropped plants at the fag end of their existence, when little attention is paid to them.

Diseased Torenias and Achimenes : *Zero.* We have done the best we could with your specimens, which were dreadfully crushed from being in a chip box, not in one of tin. Tin boxes may be made of thin tin, so as to be quite as light as chip boxes, and none other ought to be used for the transmission of specimens for microscopic examination. The Torenia was hopelessly crushed. We find on the Achimenes a disease of the hairs, which is referrible to the spurious genus Erineums. We suspect, however, that the leaves have been attacked by thrips. *M. J. B.*

Flower Pots : *A. S.* asks if any of our readers can tell him whether flower pots are made with wide bottoms or flanges, to prevent the wind from blowing them over, and where they may be had ; also if any are made of sufficient size and strength to take the place of small tubs ?

Gall on Rose Leaf : *B. Hibbert.* We submitted your specimen to Mr. Albert Müller, who has made a special study of these formations, and who kindly reports as follows :—"The gall on the Rose-leaf sent is the work of Rhodites rosarum, a cynipideous insect. It is the first British specimen I have seen."

Insects : *C. C.* The apricot Thorn hedges in Cheshire have been infested with the social larvæ of the common small ermine moth (Yponomenta padella). They are now in chrysalis. We know no other more available remedy than hand-picking the webs carefully whilst the caterpillars are inclosed. *W.—C. L.* Your Strawberry roots were attacked by the larva of the common cockchafer. Kill as many of the perfect insects as you can, if not too late. *W.*

Keeping Pears : *Cuidich.* If, as you say, you have only a few Pears of a sort, you will find it very convenient to place those of each kind in a paper bag and tie it up. You may then lay them upon shelves, in a cool room, free from frost, and they will keep without shrivelling or losing their natural flavour.

Large Trees for Planting : *A Subscriber.* We cannot undertake to recommend nurserymen. Any of the large nurserymen could supply what you require.

Lygodium scandens : *A. G.* As this plant is a Fern and not a Lycopodium, it is clear it ought not to be exhibited in the latter class.

Melons : *A Subscriber.* Your failure in getting the fruit to swell may result from various causes, which we of course ignorant of your management, can only guess at. A fertile cause is a confined atmosphere, or the crowding of the leaves and shoots. It may also be due to dryness at the root. Give plenty of air, keep the shoots thin, with all the leaves fully exposed to the sun's influence, with good firm soil and plenty of moisture while the plants are growing, and you need not fear for want of fruit.—*X. Y. Z.* The same remarks, in part, apply to your case. Do not despair, your plants will yet show fruit if you will have patience. Stop the main shoots when they reach the side of the frame, when the fruit will then be produced on the lateral shoots. You do well to give a little night air. Pursue the same methods which you have previously done when you were successful.

Musa Ensete, &c. : *J. S. H.* A conservatory would scarcely be warm enough in winter for this plant. Apply to any of the leading London nurserymen. Funckia subcordata is quite hardy, but not proof against the attacks of slugs.

Names of Plants : *Bath.* Pinus Pinaster. *A. M.—B. D.* Veronica longifolia.—*W. L.* Vicia caroliniana, Walt. —*J. W. 1*, Aira flexuosa ; 2, Festuca pratensis ; 3, Another Festuca, probably large rubra.—*Rev. Dr. M.* 1, Campanula rhomboidalis ; 3, Coronilla varia ; 4, Campanula persicifolia ; 5, Lathyrus (no leaves sent, and cannot tell species without them) ; 6, Dianthus monspessulanus ; 7, Geranium, specimen too imperfect to say what species ; 8, Potentilla hirta ; Campanula with out number, patula.

Potatos Growing on the Stalk of the Plant : *An Irish Potato.* It is not very uncommon, but yours is an unusually good illustration.

Primulas : *B. H.* From the appearance of the leaves sent, we should think that the plants have been allowed to become too dry at the roots, and have been kept in a position much too hot for them at this season. Remove them to a cool frame, having a northern aspect. Give them plenty of air, and as much water as they require, with occasional applications of weak liquid-manure—that made from cowdung we have found the best. See that they do not become pot-bound, and treat them liberally, and you may expect to succeed with them yet.

Communications Received : W. J.—E. M.—M. N.—V. S.—W. S.—W. S.—Luxembure—J. M.—F. H.—W. E.—G. N. J.—E. C. F.—Le Gras—A. G.—R. I.—J. S. H.—E. S. H.—T. A.—Stamp Reader—W. T.—D. T. J.—R. B. (Sure to do that, with thanks)—J. W.—Bromley, 1867.

Markets.

COVENT GARDEN.—July 8.

We have a good attendance at this market, with a fair amount of business. The supply of hothouse fruits is ample. Of Grapes and Pines we have a better supply, and prices are lower. Continental goods, comprising Peaches, Nectarines, Apricots, Melons, &c., are more plentiful. Amongst flowers we have nothing different from those mentioned last week.

Fruit.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz.	2 0	4 0	Nectarines, per doz.	8 0	10 0
Cherries, per doz. lb	3 0	6 0	Oranges, per 100	8 0	12 0
Filberts, per lb.	0 6	0 9	Peaches, per doz.	10 0	24 0
Gooseberries, per bush.	2 0	6 0	Pears, per doz.	..	..
Lemons, per 100	6 0	12 0	Pine-apples, per lb.	6 0	10 0
Melons, each	4 0	7 0	Strawberries, p. lb.	0 6	2 6

Vegetables.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	3 0	10 0	Horse-Radish, p. bun.	3 0	5 0
Artichokes, p. doz.	3 0	6 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 0	2 0
Broccoli, per bdl.	1 0	2 6	Mint, per bunch	0 1	0 0
Cabbages, p. doz.	1 0	1 6	Mushrooms, p. pott.	1 0	1 6
Carrots, p. bunch	0 4	0 6	Onions, per bunch	0 4	0 0
Cauliflower, p. bun.	1 0	2 6	Parsley, per bunch	0 2	0 4
Celery, p. bundle	1 0	1 6	Parsnips, new, p. lb.	0 2	0 0
Cucumbers, each	1 0	1 0	Shallots, per lb.	0 8	..
Endive, per doz.	1 0	2 0	Spinach, p. bushel	2 0	3 0
French Beans, p. 100	2 0	..	Radishes, per doz.	1 0	1 6
Garlic, per lb.	0 8	..	Turnips, young, p. bun	0 0	1 0
Herbs, per bunch	0 2	0 4			

Potatos, York Regents, per ton, 120s. to 150s. ; Flukes, do., 220s. ; new round, 8s. to 12s. per cwt. ; new kidney, 9s. to 14s. do. Continental kinds, 8s. to 20s. do.

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ONLY GOLD MEDAL
ever offered for Double Furrow Ploughs, in competition with the most celebrated makers of the United Kingdom, at Stannington, near Newcastle, February 3, 1870.
G. W. MURRAY & Co.'s celebrated PATENT COMBINED PLOUGH and SUBSOILER is acknowledged to be the most important adaptation of the Double Furrow Plough made.
They will also exhibit their CORN DRILL, COMBINED LAND ROLLER and GRASS SEED SOWER, CHAIN PUMP, FIELD GATE, &c. Catalogues and particulars on application at the Banff Foundry, N.B.

INDIA-RUBBER GARDEN HOSE, 60 feet ½ inch hose, with brass tap, rose, and jet complete, 19s. 6d.
60 feet ½ inch do. do., extra strong, 21s. 6d.
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application.
E. G. CAPON, India-rubber Manufacturer, Quadrant, Birmingham.

Dry Earth Closets, and Inodorous House Commodes.
A MOST IMPORTANT IMPROVEMENT; all Self-acting; will not get out of order; low in price; good for the Bed-room, the House, and the Garden.
Patentee and Manufacturer, JOHN PARKER, Upholsterer, Woodstock, Oxford. AGENTS WANTED.

Caution to Gardeners.—When you ask for
SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years.

E. T. ARCHER'S "FRIGI DOMO."—Patronised by Her Majesty the Queen for Windsor Castle and Frogmore Gardens, the Duke of Northumberland, Duke of Devonshire, late Sir J. Paxton for the Crystal Palace; Royal Gardens, Kew; Professor Lindley for the Horticultural Society, &c.
The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
PROTECTION from the COLD WINDS and MORNING FROSTS.
"FRIGI DOMO" NETTING, 2 yards wide, 1s. 6d. per yard run.
"FRIGI DOMO" CANVAS.
Two yards wide .. .. 1s. 6d. per yard run.
Four yards wide .. .. 3s. 6d. per yard.
An improved make, 2 yards wide .. 1s. 9d. per yard.
An improved make, 3 yards wide .. 2s. 8d. per yard run.
Scrim Canvas, 72 inches wide, 70 yards long, 5¾d., 6¾d., 7¼d., 7¾d. and 8¼d. per yard.
Hessian Canvas, 54 and 72 inches wide, 6¾d. and 8¼d. per yard; ½d. extra for cut lengths.
ELISHA THOMAS ARCHER, Whole and Sole Manufacturer, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen and Seedsmen throughout the Kingdom.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E.; Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses.—14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

THE GRANITIC PAINT, the best for the finest painting, and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.
39A, King William Street, London Bridge, London, E.C.

DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.
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SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 20, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

NETTING for FRUIT TREES, SEED BEDS, RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 1½d. per yard, or 100 yards, 20s.; 4 yards wide, 3d. per yard, or 50 yards, 20s. NEW TANNED NETTING, suited for any of the above purposes, or as a Fence for Fowls, 2 yards wide, 6d. per yard; 4 yards wide, 1s. per yard; ¼-inch mesh, 4 yards wide, 1s. 6d. per yard. Can be had in any quantity of
EATON AND DELLER, 6 & 7, Crooked Lane, London Bridge, E.C.

GARDEN NETTING (at Reduced Price), for the Protection of newly-sown Seeds from Frost, Blight, and Birds; also as a Fence for Poultry, Rabbits, and Sheep, 1d. per square yard, carriage free, in quantities of 250, 500, or 1000 yards.
SCRIM CANVAS, for Wall Fruit, Greenhouse Shades, Tulip Covers.
HAYTHORN'S and WALLER'S NETTINGS, sample of material free on application. RICK COVERS, New and Second-hand, with Poles, complete. Be particular—
FREDERICK EDGINGTON AND CO., Marquee, Tent, Flag, and Rick Cloth Manufacturers, 60 and 62, Old Kent Road, London, S.E.

JAMES PHILLIPS AND CO. beg to submit their prices as follows:—
GLASS for ORCHARD HOUSES,
As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each box contains 100 feet. The prices only apply to the sizes stated.
Squares 20 by 12, 20 by 13, 20 by 14, 20 by 15.

	16 oz. to the foot	21 oz.
Fourth quality	15s. 0d.	19s. 6d.
Third quality	16s. 0d.	22s. 6d.
Seconds	18s. 6d.	26s. 0d.
English	22s. 0d.	27s. 0d.

The above prices include the boxes, which are not returnable.
HORTICULTURAL GLASS.
Stock sizes, 16 oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated.

				4ths s. d.	3rds s. d.	2nd s. d.
11 by 9	12 by 9	13 by 9	14 by 9			
12 by 10	13 by 10	14 by 10	15 by 10	13 6	15 0	17 0
13 by 11	14 by 11					
14 by 12	15 by 12	15 by 11	16 by 11			
15 by 12	16 by 12	16 by 12	17 by 12			
16 by 13	17 by 13	20 by 12				
16 by 14	20 by 13	18 by 13		15 0	16 0	18 6
	17 by 14	18 by 14		16 to 17 oz. to the foot		
	20 by 14					

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	6½ by 4½	7 by 5	7½ by 5½	12s. 6d.
8 by 6	8½ by 6½	9 by 7	9½ by 7½	
		10 by 8	10½ by 8½	13s. 6d.

Boxes 2s. each, returnable at full price.
London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

WANTED, an active GARDENER, to PURCHASE HALF SHARE in a SMALL NURSERY, FLORIST, and JOBBING BUSINESS in Islington. Long Lease. £50 cash.—G. R., 12, Rotherfield Street, Islington, London, N.

FOUR GARDENERS REQUIRED for Tea Gardens in Cachar, India. They must possess unexceptionable qualifications, and be well recommended for sobriety and honesty.—All applications to be made by letter, before July 20, addressed to A. B., care of Housekeeper, 110, Cannon Street, E.C.

WANTED, a PROPAGATOR and GENERAL PLANT GROWER.—Must well understand Pot Roses, Clematis, Camellias, Azaleas, &c., also Soft-wooded Plants. Must have good reference.—Write, stating wages and where last lived, JAMES W. TODMAN, Eltham Nursery, S.E.

WANTED, an experienced SEEDSMAN.—Preference given to one having a knowledge of Plants. Salary to commence at £2 per week.—Address, with particulars, P. B., 12, King Street, Covent Garden, W.C.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.
WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

GARDENER (HEAD).—Age 32, single; has had extensive practice in the various branches of the profession. Sixteen months' good personal character.—G. H., 2, Boundary Villas, St. Ann's Road, Notting Hill, W.

GARDENER (HEAD).—Age 30, married; thoroughly practical in all branches of the profession. Six years' excellent character from present employer.—M. J. CLARKE, Gardener to Sir W. H. Humphery, Bart., Penton Lodge, Andover.

GARDENER (HEAD).—Married, no incumbrance; understands Stove and Greenhouse Plants, Early and Late Forcing, and Flower and Kitchen Gardening. Good reference.—C. B., Post Office, Southend, Catford, Lewisham, S.E.

GARDENER (HEAD).—Age 30, married; has a thorough practical knowledge of the profession in all its branches. Four years first-class testimonials.—A. B., 7, Bishop's Road, Highgate, N.

GARDENER (HEAD).—Age 31, single; sixteen years' experience in the various branches of the profession. Can be well recommended.—A. B., Mr. Shaw's Nursery, Bowdon, Cheshire.

GARDENER (HEAD).—Age 35, married; highly recommended for Pine, Grape, and Plant Growing, and Gardening in all its branches. Character unimpeachable.—A. A., Dudbridge, Stroud, Gloucestershire.

GARDENER (HEAD), to any Nobleman or Gentleman in want of a thoroughly experienced Man.—Age 32, married; five years in present situation. First-class character and abilities.—R. MOON, Esq., Wigginton Lodge, Tamworth.

GARDENER (HEAD).—Middle-aged, no incumbrance; thoroughly understands the profession in all its branches. Has been a very successful Cultivator of Orchids, and understands the Management of Farm Land. Testimonials of the highest order.—J. B., Mrs. Bradford's, Market Place, Selby, Yorkshire.

GARDENER (HEAD).—JAMES HARDIE, Head Gardener for the last eight years to the Khedive of Egypt, is at liberty to treat with any Nobleman or Gentleman requiring the services of a thorough practical Gardener. First-class references.—169, Burngreave Road, Sheffield.

GARDENER (HEAD).—Age 30, married; thoroughly understands the Management of Pines, Vines, Early and Late Forcing, Stove and Greenhouse Plants, and Flower and Kitchen Gardening. Can be highly recommended.—T. S., Mr. Morgan's Library, Lewisham, Kent, S.E.

GARDENER (HEAD), age 40, married.—JOHN BROWN begs to give notice that he will be disengaged on Sept. 6, and offers his services to any Nobleman or Gentleman in want of a first-class practical Gardener. Well versed in the Early Forcing of all kinds of Flowers, Fruit and Vegetables, having lived five and a half years as Head Gardener in present situation, and previously 12½ years Head Gardener to the late Sir Charles Knightley, Bart.—For abilities and character, reference can be made to present employer, the Right Hon. Earl of Harrington, Elvaston Castle, Derby.

GARDENER (HEAD), or GARDENER and ESTATE AGENT.—Age 28; has had 13 years' practical experience in first-class establishments; thoroughly understands the Cultivation of Vines, Pines, Mushrooms, Cucumbers, Melons, Stove and Greenhouse Plants, Orchids, and Nepenthes; also Orchard-houses, Flower and Kitchen Gardening, and the Management of Land and Stock; is a good Accountant. Highest references.—Mr. HENRY SLATER, High Street, Uttoxeter, Staffordshire.

GARDENER (HEAD), or GARDENER and BAILIFF.—Married; thoroughly experienced in Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, also Pleasure Grounds, and Flower and Kitchen Gardening. Has had the Management of large Grass Lands, Buying and Selling Stock, &c. Highest references.—B. B., Post Office, Exeter.

GARDENER (HEAD, Working).—Age 28; married, one child; 16 years' experience in every branch of the profession. First-class recommendations.—J. F., Mr. Eyles, R.H.S. Gardens, South Kensington, W.

GARDENER (HEAD, or SINGLE-HANDED), to take charge of Greenhouse, Kitchen and Flower Garden, &c.—Age 26, single; six years' good character.—W. W., Post Office, Earley, Reading.

GARDENER (HEAD), where two or more are kept.—Age 34, married, no incumbrance; thoroughly understands the Culture of Stove, Hothouse, and Greenhouse Plants; also Forcing, Kitchen Gardening, &c.—P. P., 4, Hyde Park Garden Mews, Bayswater, W.

GARDENER.—Married; understands Forcing of all kinds, also Flower, Fruit, and Kitchen Gardening. Good character.—M. R., Easter's Terrace, Kemsing.

To Head Gardeners.
GARDENER.—J. HALL, Sandbeck Park, Rotherham, begs to recommend an active, steady, and respectable Man (age 26), who wants a change. He is used to Glass, and a good workman. Four years in present situation. Address as above.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man whom he has known for several years, and can testify as to his abilities; he held the position of Bailiff and Gardener in last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

GARDENER (UNDER).—Age 18; good character.—A. POULTON, [illegible], Epping, Essex.

GARDENER (UNDER).—Age 23; has a knowledge of Flowers, Fruit, and Vegetables. No objection to a small Farm.—F. D., Hambrook, near Bristol.

GARDENER (UNDER).—A Gentleman is desirous of recommending a young Man (age 20), who has been with him two years.—R. COURTENAY, Esq., Beechcroft, Sevenoaks, Kent.

GARDENER and BAILIFF.—Age 28, Scotch; 6½ years' good character from the Gentleman he has just left, where he had the entire superintendence of a large Garden, Pleasure Ground and Farm, and the general Management of a large Estate.—M., Holwood, Hatton, Tresswick, Cheshire.

JOURNEYMAN, or SECOND GARDENER, in a good Establishment.—Age 20; is the Son of a Gardener, and has had good experience. Good character.—W. M., Mr. R. [illegible], Tamworth.

FOREMAN (GENERAL), or to take entire charge of the Glass Department of a First-class Nursery, where energy and thorough ability would be appreciated. Testimonials unexceptionable.—T. SMITH, Stafford's Nurseries, Hyde, near Manchester.

FOREMAN.—Understands Vines, Pines, Cucumbers, and Melons, also Stove and Greenhouse Plants. Two years' first-class character from last situation. Highly recommended for sobriety. Would have no objection to give a small Premium for a comfortable situation.—J. S., 10, Crown Terrace, Lower Sydenham, Kent, S.E.

To Nurserymen, &c.
PROPAGATOR (SOFT-WOODED).—Age 28, married; could also take charge of a department in a Nursery. First-class testimonials both for ability and sobriety.—F., Wade's Library, Lower Philimore Place, Kensington, W.

STEWARD or BAILIFF.—Age 45, married, no incumbrance; has had the Management of an Estate of 500 acres. Two good references.—Mr. STEVENSON, Sillwood Park, Sunninghill, Staines.

CARPENTER, PAINTER, and GLAZIER.—Age 40, married; a useful Man for General Repairs.—G. E., 6, Park View Cottages, New Park Road, Brixton Hill, S.W.

Hothouses, Building, or Repairing.
A THOROUGH PRACTICAL WORKMAN.—Fitter of any description of Hot-water Work, good Painter and Glazier, also understands all kinds of Horticultural Building, Rockwork, Laying Ornamental Tiles, and Brickwork if required. Terms moderate.—E., 20, Charles Street, Hatton Garden, London, E.C.

TRAVELLER, to the Seed Trade.—A young Man, of good address, appearance, &c. Thirteen years' experience in a good Scotch house. Can show all the requisites as to character, &c.—A. S., Frederick Mays, 6, King Street, St. James's, W.

SHOPMAN, or to Manage a small Establishment.—Age 24, married; first-class references.—A. B. C., Messrs. Hooper & Co., Covent Garden Market, W.C.

To Seedsmen.
SHOPMAN.—Wanted, an immediate engagement in a Retail Business, by a thoroughly experienced Man, with first-class references.—X. Y. Z., Smithers & Crichton, Seedsmen, 1, Bunhill Row, Finsbury Square, London, E.C.

GROOM and GARDENER.—Age 30, married, respectable; nearly four years in last place. Used to Cows, and willing to make himself useful; understands Vines if required. Good character.—Y. Z., Post Office, Hoddesdon, Herts.

THE LONDON MANURE COMPANY,
(ESTABLISHED 1830)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
NITRATE and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
Offices, 116, Fenchurch Street, E.C.

A Boon for Grape Growers.
MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s 6d; ½ cwt., 21s; 1 cwt., 42s, with full directions for use. For further particulars see Descriptive Circulars, to be had post free on application to JOSEPH MEREDITH, the Vineyard, Garston, Liverpool.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, and which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample contains the combined value of 21 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(Signed) "AUGUSTUS VOELCKER.
The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

WM. DILLISTONE
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

WANTED, within eight miles of London, a SMALL NURSERY, or about TWO ACRES of GARDENING GROUND, with Small Dwelling House. State full particulars to A. BROWN, 28, Wellington Street, Islington, N.

SALES BY AUCTION.

Established and Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on Wednesday, July 13, at half-past 12 o'clock precisely, a Collection of those ESTABLISHED ORCHIDS, comprising a large number of East Indian and South American species. Also a fine lot of Imported ORCHIDS, consisting of Odontoglossums, Oncidiums, Maxillarias, Houlletias, Barkerias, Lælias, Cypripediums, Anguloas, Calogynes, Dendrobiums, &c., all in very good condition, and many of them starting into growth.
On view the morning of Sale, and Catalogues had.

Most Important Sale of Orchids.

MR. J. C. STEVENS, having received instructions from John Booth, Esq., Hamburgh, to SELL by AUCTION the famous COLLECTION of the late Consul Schiller, to state that the FIRST SALE will take place probably in the beginning of AUGUST, at his Great Rooms, 38, King Street, Covent Garden, London.
Catalogues are preparing, and will be ready in the course of a few days.

PREPARING for SALE by AUCTION, a small desirable FREEHOLD ESTATE, situate close to Herne Bay, 63 Acres of excellent Land, with Possession of Michaelmas next.
Particulars will appear in future Advertisements.

Horndon-on-the-Hill.

Valuable BUILDING and MARKET GARDEN GROUND, adjoining the Stanford-le-Hope Railway Station.—The desirable FREEHOLD RESIDENCE known as HIGH HOUSE, and several ENCLOSURES of very valuable ACCOMMODATION LAND, with possession

MESSRS. BEADEL will SELL by AUCTION, at the Mart, Tokenhouse Yard, London, on THURSDAY, July 21 next, at 2 o'clock precisely, the above valuable PROPERTY, in Four Lots. Lot 1 will comprise two Enclosures of Freehold Land, eminently suitable for Building or Market Garden purposes, situate adjoining the Stanford-le-Hope Railway Station, with considerable frontage to the high road, containing altogether 4a. 2r. 29p. Lot 2. The very desirable Freehold Residence, known as High House, in the village of Horndon-on the Hill, with Garden, Paddock, Stabling, and Outbuildings, in the occupation of Mr. J. Thurston, as yearly tenant. Lot 3. Three Closes of Freehold Building and Accommodation Land, fronting the High Street, also in the occupation of Mr Vincent, with Cottage and Yard adjoining, containing together an area of 4a. 1r. 14p. Lot 4. The valuable Plot of Freehold Orchard and Garden Ground, with frontage to the High Street, admirably adapted for building purposes, in the occupation of Mr John Wright, as yearly tenant.
May be viewed by permission of the Tenants, and particulars, with Plan, obtained of Messrs. HICKS and SON, Solicitors, Gray's Inn, W.C.; at the Mart, E.C.; and of Messrs. BEADEL, 25, Gresham Street, London, E.C.

Shardeloes, Amersham, Bucks.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to SELL by AUCTION, without reserve, on FRIDAY, July 15 next, at Shardeloes, about FIFTY HEAD of very superior SHORTHORNS, the property of Thomas Tyrwhitt Drake, Esq., consisting mostly of Young Cows and Heifers that have been long and carefully bred from the famed Herds of the late Sir Charles Dilke, Maxstoke; Rev. Mr. Thursby, Abingdon Rectory, and of Mr. W. Torr, Aylesby. The Strains represented are of the famed Knightley sort, such as 3d Patrick (12,038), and Scapulary (15,244), followed by Final Hope (17,848), from Aylesby; Lord Lieutenant (22,167), from Bushey Grove; and Wizard (15,468), from Shobdenbrook Lodge the latter is now in service, and included in the Sale. The whole are in a fine healthy and regular breeding state of condition, not having been pampered; and will be found worthy the attention of purchasers of superior Shorthorns, as they will be sold in the most *bona fide* manner and without any reserve.
Catalogues, with Pedigrees, may be had of Mr. STRAFFORD, 13, Euston Square, London; or of Mr. WINFIELD, the Bailiff, at Shardeloes, Amersham, Bucks.

To Breeders of Pigs.

ROYAL AGRICULTURAL SOCIETY'S SHOW, OXFORD, 1870

MESSRS. JONAS PAXTON AND GEORGE CASTLE are favoured with instructions from T. Leslie Melville Cartwright, Esq., of Melville House, Fife, and Newbottle, Northamptonshire, to SELL by AUCTION, near the Showyard of the above Society, on THURSDAY, July 21, at 12 o'Clock, SEVEN GELTS and SEVEN BOAR PIGS of the improved Middlesex Breed.
Mr. Cartwright has been a very successful breeder of Pigs, having during the last few years, among other prizes, taken six First Prizes at Birmingham, besides three Cups for best Pigs in the yard and three First Prizes at Smithfield.
Catalogues will be forwarded on application to the Auctioneers, Bicester, Oxon.

THE LANDS IMPROVEMENT COMPANY.—
(Incorporated by Special Acts of Parliament.)
DIRECTORS.
John Clutton, Esq., 9, Whitehall Place, S.W.
Frederick L. Dashwood, Esq., Kirtlington Park, Oxford.
Henry Farquhar, Esq., (Messrs. Herries, Farquhar & Co.), 16, St. James Street, S.W.
Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
John Horatio Lloyd, Esq., 11, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool, N.B.
The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.
The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.
No investigation of title is required.
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ROYAL AGRICULTURAL COLLEGE CLUB.—The HALF-YEARLY DINNER will take place at the RANDOLPH HOTEL, OXFORD, on WEDNESDAY, July 20, at 6.30 P.M. EDWARD HOLLAND, Esq., in the Chair. Each Member can introduce a Friend. Gentlemen intending to be present are requested to communicate as early as possible with
CHAS. GAY ROBERTS, Hon. Sec., Haslemere, Surrey.

MANCHESTER AND LIVERPOOL AGRICULTURAL SOCIETY.—The ANNUAL SHOW of HORNED CATTLE, HORSES (Hunters especially), SHEEP, PIGS, DOGS, POULTRY, CHEESE, GRAIN, ROOTS, IMPLEMENTS, MACHINERY, SADDLERY, and MISCELLANEOUS ARTICLES, will be held in WESTWOOD PARK, WIGAN, on SEPTEMBER 6, 7 and 8 (preceded by a Public Trial of Farm Implements on September 5), when PRIZES amounting to nearly TWO THOUSAND POUNDS will be awarded. ENTRIES for SHOW CLOSE AUGUST 1.
Prize Lists and Forms of Entry on application to the Secretary, THOMAS RIGBY, Over, near Winsford.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.
GREAT SHOW at OXFORD.
TRIALS of fixed STEAM-ENGINES, HORSE-GEARS, CRUSHERS' CHAFF-CUTTERS, OILCAKE BREAKERS, TURNIP CUTTERS, STEAMING APPARATUS, DAIRY IMPLEMENTS, &c., MONDAY, July 11, to SATURDAY, July 16.
Admission 5s. each day.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.
OXFORD MEETING.
SHOW of HORSES, CATTLE, SHEEP, PIGS, and IMPLEMENTS, MONDAY, July 18, to FRIDAY July 22
Admission—Monday, 5s.; Tuesday and Wednesday, 2s 6d; Thursday and Friday, 1s
Season Tickets, price 10s 6d, available from July 11 to 22, may be obtained of J. F. FLOWMAN, Oxford; or
H. M. JENKINS, Secretary.
12, Hanover Square, London, W.

The Agricultural Gazette.
SATURDAY, JULY 9, 1870.

MEETING FOR THE ENSUING WEEK.

July 11 to July 16 | Implement Trials of the Royal Agricultural Society of England at Oxford.

WE are at length to have irrigation used upon a great scale as a remedy for the sewage nuisance of large towns. The Blackburn and Reading Town Improvement Bills have passed the ordeal of committees of both Lords and Commons, and will no doubt shortly be enacted. The drainage of some 120,000 people will thus be poured upon 1000-acre farms in Lancashire and Berkshire respectively, and we shall probably learn more than we yet know, if not of the wonderful fertility of sewaged land, at least of the power of soil to cleanse the filth of great volumes of foul water And this will be a capital lesson for all England, whose population is getting more and more clustered around centres, thus making the rivers which run by them a nuisance to all upon their banks. It will be a capital lesson, not only on social and sanitary but on agricultural grounds. It is impossible to doubt that the 20,000,000 of "man" who occupy Great Britain south of the Tweed must one day contribute to the fertility of the soil, in some such degree as that is already benefited by our corresponding 20,000,000 of sheep. And as town drainage is becoming more and more the vehicle for all the waste of town populations, so the hopes of this result are becoming more and more exclusively dependant on our realising everywhere the results of sewage irrigation.

No other remedy for the nuisance exists as yet in any practicable form, and no other method of carrying house waste to the land exists at all. We are of course aware of the advocacy, both of the dry-earth method of house scavenging, and of the so-called "A. B. C." process. They are both discussed in the Reports of the Rivers Pollution Commission, and both are pronounced failures. The dry-earth method, however well adapted to the case of the isolated cottage, whose house slops are thrown upon the adjoining garden, is not adapted to the circumstances of towns, where house slops necessarily find their way into the sewers. And the "A. B. C." process is a failure, both sanitarily and economically. It takes hardly any of the filth out of the sewage, and it produces a manure of very insignificant value. The character given of it by the Rivers Commissioners is extracted in another page from their recently issued report. No evidence indeed is quoted beyond that of the chemist in that report on this subject; but that is, because hardly any other evidence exists. We made personal inquiry around Leamington the other day for any exact information which farmers who had used it could supply to us; and we came to the conclusion that, except a single instance, no such information exists. One gentleman, occupying land near the town, had bought 3 tons of it early enough to try it on a summer crop last year. He had put 1 ton of it on an acre of land for Swedish Turnips, alongside of two other acres, on one of which 25 one-horse loads of stable-dung had been put, and on the other 5 cwt. of PROCTOR & RYLAND'S Turnip manure. The dung produced much the best crop. PROCTOR & RYLAND'S acre looked better than the other all through the season, but in the end the roots were as heavy where the ton of "A. B. C." manure had been applied; in neither case, however, was there a very good crop. Considering that for a ton of "A. B. C." manure £5 is now demanded, this is not an encouraging result.

We conclude, accordingly, with the report of the Commissioners, that the hopes founded on the "A. B. C." process are doomed to disappointment.

If, indeed, one looks only for the defæcation and purification of town sewage, there is still a plan—untried as yet, however, upon a working scale—about which hopes have been excited by the report of the Commissioners. By a system of intermittent downward filtration,—filling some 10,000 cubic yards of filter bed first with air and then with the foul drainage water of about 3000 people, time about—and thus performing a sort of act of respiration on their sewage—it is believed, from certain laboratory experiments, that it may be possible in that way thoroughly to oxidise and defæcate all the organic matter in that quantity of sewage, so that the whole filthy stream may be virtually cleansed and added to the river without polluting it. Certainly, however, such a plan for sending a valuable property adrift can find no advocate in the columns of an agricultural journal. And as it is happily proved now by ample experience that the process of irrigation by which the whole of this valuable material is conveyed to the soil, and directly to the roots it is to feed, can be conducted without nuisance, and in a perfectly wholesome manner, it has been sanctioned by Parliamentary Committees, in the case of Blackburn and Reading; and we shall hereafter see the plan in universal operation beside all large towns.

It will have an influence on fertility beyond the limits of the sewage farms. They will be great manufactories of farmyard dung, as well as manufactories of wholesome food. We shall have by means of them, not indeed the whole milk supply of a population provided by its waste water, but a very considerable contribution to that result will be made, and the cattle which will yield it will at the same time fertilise the neighbouring farms. We do not doubt that in addition to much valuable growth of market garden stuff—Cabbages, Celery, Strawberries—for which small occasional dressings are alone

required, there will be on many a sewage farm in this country one of milk produced for every 1000 of ordinary town sewage poured upon the land. The ordinary water supply of a town population is 20 gallons a head each day. This is fouled and converted into sewage. One-thousandth part of 20 gallons is but a small teacupful, not a quarter of the milk each individual of a town population ought to have. A gallon of milk, however, is at least worth 8*d.*, and 1000 gallons of sewage weigh 4 tons; and we may therefore yet approach, in the agricultural experience of our sewage farms, the old standard estimate of 2*d.* a ton as the value of the drainage water of a town, which is now nothing but a filthy, noxious nuisance.

—— Notwithstanding a short supply of Wheat at Monday's corn market in Mark Lane, the prices of last week were barely maintained, and all inferior qualities were cheaper.——In the Metropolitan Cattle Market trade was less active than it was on Monday last, though prices were not quotably lower.

—— The accounts of the Crops on the Continent are very bad, and the continued drought causes great uneasiness. In the Côte d'Or, always a hot place, the heat has been terrible, and water has become more scarce almost than wine; the hay crop is not half what it was last year, and in some places the value is scarcely equal to the cost of mowing. In the Indre the case is even worse, there is neither food nor water for the cattle, except at a ruinous cost; not only the rivulets and the ponds are dried up, but the wells and marshes also; cattle are offered for sale at ruinous prices, but purchasers are not to be found. The minor crops are all in a sad condition, but fortunately the Wheat still looks well on stiff soils, and the rain that it requires can scarcely be much longer delayed. The ground is cracked in all directions in the most extraordinary manner, opening to a depth of several feet, so that nothing but a half deluge would suffice to soften it. Some districts of France are better off: in the Jura, for instance, although no rain has fallen for a month, the Wheat promises well, though the straw is very short; the Barley and Oats are very poor. The green crops will certainly not reach two-thirds of last year's crop. In the Loire the Wheat also looks well, better than usual; in some places the harvest has commenced, and the yield is good, but little straw. In the Gironde the state of the Wheat is the same. Unfortunately these favourable cases are exceptional, at least such is the general opinion. The accounts from Rhenish Bavaria are lamentable; the Wheat there is poor; the Rye worse, and the Barley and Oats all burnt up, nearly destroyed. As to Trefoil, the crop is fair where watering is possible, and almost utterly lost in dry situations; seed is also wanting for next year's crop. Vetches and other green fodder there are none, and the price of hay is fabulous. The price of cattle under such circumstances has naturally fallen considerably; at the last fair at Guernbach there was a fall of £4 per pair of oxen; beef is selling at 6½*d.*, veal and mutton at 6*d.*, a pound. Cases have occurred of butchers selling beef at 4*d.*, and veal at 3*d.* The picture is, however, not all so dark; the rain will doubtless come at last, and repair a good deal of the mischief; the Potatos and Beetroot promise well, and the fruit crop is expected to be large.

—— Messrs. Carter & Co. have forwarded to us specimens—small bundles—of various forage plants, which they think likely to be serviceable to English farmers. Of these a bulky bean-looking plant, a Vetch —V. platycarpus, appears the most promising. The Vicia tricolor is also a leafy good-looking forage plant. The so-called Trifolium cœruleum is also a leafy, upstanding, likely plant; the Melilotus italica is another of the series. We have not had an opportunity of submitting them to judgment in the feeding-stall, but V. platycarpus, if liked by cattle, will probably be also liked by those who grow forage for cattle. It is a stiff grown bean-like plant, and would be serviceable among ordinary Vetches, if only for holding them up.

—— The Irish Land Bill has passed through the Lords with alterations, which are thus enumerated and criticised by the *Times*:—

"The points of essential difference between the Lords and Commons are thus reduced to three. The Commons proposed that all the difficulties about compensation on disturbance should be got rid of if a landlord gave a tenant a lease at rack rent for 31 years certain, but the Lords have altered the term to 21 years. There is no reason on the ground of common sense why one or the other term should be selected, but Irish tenants are accustomed to 31 years, and in the absence of arguments to the contrary a statesman respects the customs of a country. The next point is the power proposed to be intrusted to the Courts of giving existing tenants the benefit of the scale even though they are in arrear of rent, if they can show that the rents of their holdings are exorbitant. We do not know how far this would be operative, but its principle seems unassailable. Parliament is about to give protection to tenants in the future, and cannot well refuse to extend to existing tenants advantages such as they would have possessed had their tenancies commenced a little earlier. The third point of difference is the re-arrangement of the scale of damages the Lords made, on the motion of the Duke of Richmond. What is to be said of the alteration? Here is the sum of it. The compensation of a tenant between £4 and £10 is cut down from seven to six years' rental, and of a tenant between £20 and £30 from five to four years' rental; and it must be remembered that the compensation can be demanded only in case of arbitrary disturbance. What infatuation, it may well be asked, can have provoked the change? It is important to the tenant, it is unimportant to the landlord. The difference makes the tenant secure, and does not touch the landlord at all, unless he wantonly disturbs the relations between himself and the occupiers on his estate. We have commented on the puzzle before, but the difficulty recurs, why the majority of the Lords, who would themselves shrink from the arbitrary acts against which the scale is aimed, should go out of their way to provoke a collision with the Lower House in the interest of men who are the worst enemies of their Order."

—— The Regional Concours of the Nord has been brilliant this year, and the fine weather doubtless increased the number of visitors, which was very large. There were 350 head of cattle, 160 lots of sheep, only a few pigs, 180 lots of poultry, &c., 935 machines and implements, and 183 lots of agricultural produce. The Concours proper is confined to French exhibitors, but a large number of English machines and implements were shown by agents of English houses in France; thus, Messrs. Aveling & Porter won the 1st prize—a gold medal, with 500f. in money, for their great steam-ploughing machinery; M. Hamoir, of Saint Saulve, obtaining the 2d prize for a steam-plough of the Fowler model. The steam ploughing was highly successful, the ground was excessively hard, and it was admitted on all hands—and the crowd of agriculturists was great—that the results were magnificent. In addition to the general exhibition, however, was an international show, with competitive trials, of agricultural machinery and implements, for which there were 154 entries, many of them including several machines or implements. To this show the English makers contributed very largely, and all who exhibited won prizes except Messrs. Hornsby & Sons, who were placed, or placed themselves, *hors concours*. The following is a list of the prizes awarded in this section:—

Messrs. Aveling & Porter, the great gold medal for their double steam ploughing [machinery; and a gold medal for their steam roller.

M. Cogniaux, of Haulchin, silver medal for double Brabant plough; and

Messrs. Howard & Sons, bronze medal for two-wheeled plough; gold medal for deep subsoil-ploughing, and silver medal for Anglo-American and subsoil ploughs. The same firm won the only prize given, for their collection of harrows.

Messrs. Aveling & Porter, the only medal awarded for ordinary and Crosskill roller.

M. Cogniaux 1st, and M. Pronier, of Orchies, 2d prize for extirpators.

M. Bagni, of Orchies, 2d, and M. Pronier 3d class prize for seed drilling machines.

M. Bauvin, of Wattigny, sole medal for a horse-hoe.

Messrs. Howard & Sons, the only medal given for threshing-machines; and 1st and only prize for a winnowing-machine and horse-rake.

The contest for the prizes between reaping and mowing machines was highly exciting, and the performances admirable, the results being as follows:—

Mowing-machines.—Mr. Samuelson, 1st prize, a gold medal; Messrs. Walter & Wood and Messrs. Howard & Sons, 2d prizes, *ex æquo*

Reaping-machines.—Mr. Samuelson, gold medal; Messrs. Howard, silver medal; Messrs. Brigham & Bickerton, bronze medal; Messrs. Aveling & Porter, gold medal and 100f. for road locomotive.

Messrs. Woods & Cocksedge, silver medal for collection of implements and machines, the cake-crushers being specially named.

The results of this international competition must be regarded as peculiarly favourable to English machine-makers, and of all the more importance as taking place in a department which is near our own shores, and in intimate relations with us; and one, moreover, in which the soil and climate closely resemble our own, and where the farmers are not cramped for capital so much as in other parts of France, so that they can afford to purchase costly implements. The agricultural machine-makers deserve all the success they achieve; they have set an example for years to other constructors in constantly improving and completing their models; and although our neighbours have also made immense advances, especially in the smaller kinds of implements, it is fairly admitted that the English makers maintain their ground with a firm foot. More of these competitive exhibitions are coming on in other parts of France, and we trust they have in store more honours for our energetic agricultural machinists.

—— On Wednesday evening, Mr. A. Brown's Bill for repealing Sir Baldwin Leighton's Poaching Prevention Act was thrown out in the House of Commons by 140 to 62.

OUR LIVE STOCK.

CATTLE.

The Thornville sale, County Wexford, conducted by Mr. Thornton, cannot rank with the great successes of the past spring and early summer. The hundred guineas for any one animal was never reached, and the close relatives of—identical in pedigree with—the bull Bolivar, so greatly distinguished two years ago at Leicester—were bought for prices which appear low. No doubt the severity of the drought operated prejudicially upon buyers, and other causes may have contributed their influence to lower the average. Twenty-eight animals disposed of made an average of £35 14*s.*, and a total of £999 12*s.* Twenty-five cows made an average of £35; and three bulls, including Prince of the Realm, brought £42 each. *Chemisette*, by Famous, the mother of four well-known prize winners, was first offered; she is now 12 years old, and was knocked down at 20 gs. to Mr. Deveru, M.P. Next came two members of the Thornville "Fanny" tribe, the highest priced of which became the property of Mr. W. J. Bryan, at 31 gs. These were followed by two other low-priced lots, after which came *Fanny 14th*, which was withdrawn. *Chintz*, by Fugleman, was bought by Mr. J. King for 41 gs.; *Chansonette* made 64 gs., and became the property of Mr. M. Gumbolton, and *Bloom*, own sister to Bolivar, was sold at 50 gs. to Mr. Brierly. Again there intervened a succession of prices only equivalent to what would be realised by ordinary good dairy stock, after which *Fanny 25th*, by Agamemnon, a 1st prize heifer at Tralee last year, was disposed of at the very moderate figure of 50 gs. *Bloom of the May*, by Victor (25,371), a 2-year-old heifer, out of the dam of Bolivar, *Blossom 5th*, by Duke of Bedford, was purchased by Mr. Tait, for Australia, for the sum of 90 gs.; *Chaumontel* became Mr. Bolton's (The Isle) property, for 63 gs.; *Polly Hopkins* was sold to Mr. M. Gumbolton, at 42 gs.; and *Bloom of the Heather*, by Prince of the Realm, and out of *Bloom* (lot 10), became Mr. Tait's property at 51 gs., and goes to Australia. Of the three bulls we need only mention Prince of the Realm (22,627), bred by Mr. Carr, late of Stackhouse, by a pure-bred Booth sire, Prince George (13,510), and a direct descendant of *Bonnet* by Buckingham and *Bliss* by Leonard. This well-bred and not unknown bull was bought for 70 gs. by Mr. J. How.

—— The promoters of Leicester sheep and Shorthorn cattle will hear of the death of Mr. John Angus, of Whitefield, Northumberland, with regret. When very young Mr. Angus assisted in purchasing, at St. Boswell's, Lord Polworth's ewe lambs, which laid the foundation of the present Bromley and Whitefield Leicesters. In conjunction with the late Mr. George Angus, of Bearl, he assisted Mr. Coats in the formation of the first volume of the "Herd Book," and during the time he resided at Hindley he took a deep interest in the breeding and development of the quality of pure Shorthorns; and although the farm at Whitefield was not so well adapted for following out this branch of his profession, yet the zeal with which he threw himself into every movement connected with it, proved that he had lost none of his early passion. At the Bromley sale of Shorthorns last August he detailed with vigour the history of a herd which even in his boyhood was waxing into adolescence. Though excellence was the prevailing characteristic of Mr. Angus' farm stock in all its branches, the perfection of the Border Leicesters latterly engrossed his attention and the trophies he won on many a well-contested field of competition bear witness to the high qualities of his flock.

—— A catalogue has been sent to us of the Winterfold and the Turner's Hill herds; the first the property of Mr. John Harward, and the second of Mr. Isaac Downing. In very briefly reviewing the publication, we may say that it is "got up" with the care which characterises all similar productions emanating from Langham Place, and that the names of the breeders of sires is a pleasant addition to the subject-matter of the pedigrees. The earlier portion of the catalogue, which comprises the Winterfold herd, commences with *Joan of Arc* by Cupid (1435), a cow that comes of a Gloucestershire strain, originating in the herd of Mrs. Strickland, subsequently in the possession of the late Earl Ducie. Following *Joan of Arc* are her four daughters by the Duke of Devonshire's Charleston (21,400). Next come eight representatives of the famous *Wild Eyes* by Emperor (1975), all by excellent sires, among which may be mentioned 3d Duke of Claro (23,729), Earl of Glo'ster (21,644), and Charleston (21,400). There are two *Waterloos*, one by Cherry Duke 4th, and the other by 3d Duke of Claro; six descendants of *Sweetbread* by Belshazzar 2d. (14,154); a large number of *Blanches*, from *Constance* by Selim (6454), and *Blanche* by Belvedere (1706), and six *Katurahs*—all, with a single exception, by Captain Gunter's bulls. We must not omit to mention the five *Lallys* descended from *Lally* by Earl of Derby (10,177), and by "Oxford," "York," "Wild Eyes," and "Duchess" sires. It will be remembered that at Sholebroke the highest price (450 gs.) was given for *Lalage 4th* by Grand Duke 7th, a grand-daughter of *Lally* by Earl of Derby, and previously, like the Winterfold *Lallys*, from *Lady Bowington* by Son of Hubsman (304). Four exceedingly well-got Kirklevingtons, and *Florentia 19th*, bought at Didmarton, conclude this portion of the list. The second portion, devoted to Mr. Isaac Downing's herd, embraces many similarly bred animals to those we have just spoken of. It opens with the pedigree of four representatives of *Clara Novello*, by Mr. Sainsbury's Cupid (14,359); after

which are six descendants of *Sweetbread* by BELSHAZZAR 2D (14,154), under the names of *Lady Dudley* 1st to 7th. Next follow some members of the Tottworth *Surmise* by DUKE OF GLO'STER and *Silence* by EARL OF DERBY tribes. Representatives of *Lady Glo'ster* by HARRY OF GLO'STER (14,624), *Geneva* by HENWOOD and *Sweet* by LEO (4208); the "Bates," "Wild Eyes," and "Kirkleyington" tribes; and lastly 5th *Duchess of Oxford*, a grand-daughter of Mr. Bates' *Oxford* 5th by DUKE OF NORTHUMBERLAND, concludes the notes of the female portion of the herd. The bulls recently jointly used in the two herds have been 3D DUKE OF CLARO (23,720), 5TH DUKE OF WHARFDALE (26,033), both bred at Wetherby, and 8TH DUKE OF GENOA, bred by Mr. Sheldon. All three sires will at once be seen to be of the famed "Ducie" tribe.

—— Next Friday will witness the sale of Mr. T. T. Drake's Shorthorns, at Shardeloes, Amersham, by Mr. Strafford. This herd is of Booth origin. The sires formerly used were of the famed Knightley sort, such as SAINT PATRICK (12,038), and SCAFULARY (15,244), followed by FINAL HOPE from Aylesby (17,848), LORD LIEUTENANT from Bushey Grove, and WIZARD (25,468) from Sholebroke Lodge, the sire now in service.

—— We hear from Old Mere Hall, Knutsford, that the grand old cow, *Miss Rose*, by MARMADUKE, which Mr. D. R. Davies purchased at Killhow sale for 400 gs., produced a very beautiful roan bull calf, by GRAND DUKE 10TH, on the 20th inst. This calf is therefore own brother to ROYAL CHESTER, a young bull which is likely to attract notice at the approaching sale on Wednesday next.

PIGS.

IT will be seen from our advertising columns that Mr. Cartwright, of Newbottle, Northamptonshire, is to dispose of his white pig stock at the meeting of the Agricultural Society at Oxford. He has taken many prizes at both the Birmingham and Smithfield Club Shows of late years, and the sale is well worth attention from breeders of that sort.

POULTRY.

HOW TO KEEP EGGS.—I have noticed that the above question has recently excited a good deal of attention among your correspondents, and I am induced to give the following recipe for what it is worth, by finding that the experiments on which it is based have been lost sight of by scientific men of the present day.

Reaumur, the great French natural philosopher, was a great poultry fancier, and of course it was impossible for him to throw himself into even such a simple amusement as this without importing into it those powers of intelligent observation and philosophical research for which he was so distinguished. He was, I believe, the first to try artificial hatching, and his experiments in this direction soon led him to observe the curious apparent caprice which caused eggs, under precisely the same conditions, some to develope into healthy chickens and others "to spread the most offensive smell," and to become quite rotten. He discovered the real cause of this to be, that the eggs which rotted had not been fertilised; and he then tried isolating some hens; and when all their fertilised eggs had been exhausted, testing the length of time that the unfertilised eggs would remain sound in a cool place, and he records the fact of finding in the month of January that such eggs laid in the previous month of May were perfectly good and fresh. He attributes the speedy putrefaction of fertilised eggs kept in a like temperature to the death of the "germ."

There is no reason to doubt the accuracy of these experiments of Reaumur, so far as they went, but it does not follow that they have much practical value, because it remains to be seen what length of time hens would continue to lay eggs if separated from the cocks. Reaumur's experiments are also incomplete, from a scientific point of view, because they did not include microscopic examinations of the eggs in different stages, but they are of considerable interest at the present time when the controversy of "spontaneous generation," or "heterogeneous evolution," *versus* the "germ theory," has been again so energetically revived by Dr. Bastian.

I intend, so far as my other work will permit, to test the truth of Reaumur's conclusions, and to supplement his experiments with a few others; and if I ascertain anything of practical value to the hen-wife will not fail to communicate it. *W. Hope, Parsloes, July 3.*

COMPENSATION FOR UNEXHAUSTED IMPROVEMENTS.

[The following paper on the subject was read by J. Lynch Bletcher, Esq., agent to the Earl of Suffolk before the Abingdon Chamber of Agriculture, at a meeting held at Chepstow last week.]

AT no period of our history has the public mind felt more keenly the need of a well-digested tenant-right than now. Chambers of Agriculture have spoken on the subject of leases, tenant-right, and compensation for unexhausted improvements, but as yet no scheme has been devised for recognising and regulating the value of a tenant's improvements. It is impossible that matters should remain in this state. Agricultural interests are too powerfully advocated to permit of delay; there never was more capital, greater intelligence, and vigour devoted to the cause than at this period; on every side are seen improved husbandry, valuable live stock, and contented and well-to-do peasantry. Men are no longer content to farm as our forefathers did. Cattle must be housed and artificially fed, lands drained and artificially manured, and education and energy are necessary to direct. Yet the one great question remains unsolved—"How to establish a tenant-right which should give greater encouragement to the expenditure of tenants' capital, at the same time that it affords security for the outlay?" Arguments have been used ascribing the delay to insecurity of tenure, the absence of leases, and an imperfect system of compensation; to these we might add the objections both felt and expressed to putting down a large sum on entering a farm, the want of capital at that period, and then, again, the natural anxiety of both incoming and outgoing tenants to keep down expenses, and to secure themselves in every possible manner in both quitting and entering upon a farm. Also, there is so much vagueness connected with valuations, that dissatisfaction often arises to one or both of the parties negotiating. We have no scale of prices for produce, or "unexhausted improvements;" such as is acknowledged in one district is ignored in another, as if the property and operations of a farmer were such as could not be priced, and the items published and paid for. I feel sure these causes produce a slackness, and retard agricultural progress. I have before now met with a tenant, who, after having agreed to take to a farm, became so alarmed at the amount of valuation that he prayed to be released, and immediately afterwards I have let the same farm to the next comer without raising an objection. I give this fact by way of illustration, for I fear it is a circumstance of too common occurrence.

If it is really intended to bring about a more simple and perfect mode of action on changing holdings, we must be up and stirring. What do we find? Customs in some localities, none in others, leases and agreements in existence exhibiting absurd differences in their clauses, until no two counties possess identical rules for letting land. These are points in which occupiers alone are almost entirely concerned, they are essentially tenants' questions, and they must be argued and pursued until a general system is attained. Inasmuch as it is not likely or possible that leases will become general, or that owners will subscribe to one form of tenancy, so we must abandon our hope of finding relief entirely at the hands of the landlord. Agriculturists must invite debate, and agree upon a broad measure for compensating each other for works of "improvement," which I hope to show appertain exclusively to themselves.

It has been asked, what are "unexhausted improvements?" In the first instance they appear to be works of a permanent character, such as the landlord does, or should supply, or the tenant performs with the permission of the owner. They include buildings, drainage, road-making, ponds, and construction of fences. These operations should never be undertaken by an occupier except under a distinct understanding with the proprietor. Draining is best carried out at the sole cost of the owner, who charges the interest upon the tenant in the form of an increased rent. Where the tiles are buried, and labour is performed by the latter, a special guarantee extending over at least seven years should be granted him. They are entirely matters of agreement between landlord and tenant, such as cannot be arranged or settled by us. It would occur to a man of business that operations for the mutual benefit of two individuals can be effected without consulting a third party, therefore I contend that a tenant has only himself to blame if he embarks capital on another's property, without first obtaining a guarantee that his outlay shall be secured. Believing this to be the legitimate course for arranging matters of a permanent character between the landowner and occupier, I come to the subject of game, and as far as I can judge it is a question that must be settled by the same means. I do not see how the Legislature can with justice dictate what amount shall be kept on an estate. It is hardly policy for you to attempt to do so, but it is perfectly competent for an occupier to make terms with the proprietor which shall secure him from injury or loss. A large head of ground game is most improper, a tenant should protect himself against it.

There is no denying the fact that agriculture prospers, in proportion to the desire and power of those possessing land to perform improvements. There are extensive estates but partially developed by reason of the want of funds to open them out; and on these very estates reside tenants willing to undertake the cost and responsibility of works of improvement, whose efforts are drowned by the powerless position of the tenant for life: he cannot charge the property with an outlay for improvement by himself, and the occupier's lease is not long enough to allow him to commence the work with his own capital. It is a matter of regret that proprietors do not avail themselves more generally of the Act of Parliament which permits the employment of capital, from whatever source, towards benefiting the freehold, securing the outlay by the ordinary mode of rent-charge. Tracts of poverty-stricken land might be redeemed by granting leases; tenants would be forthcoming who would pay the interest on the money expended, in addition to the old rent; but these are matters hardly connected with our subject.

But there is another question in which landlords and tenants are deeply concerned, not of the character of an improvement, although it is of essential importance to both parties. I refer to the agricultural products, which custom requires should be left for his successor by the outgoing tenant. By this I mean hay, straw, and manure, which are as necessary to the profitable working and existence of the farm as food is to the support of man. No matter in what season the tenancy begins, a portion of these articles should be present. What is an occupation without them? Where is the man that would quietly enter upon a holding robbed of its fodder and manure? What would be his first complaint, and what the first request? There is no hay, litter, straw for thatch, or dung. I must be allowed the equivalent in money, or the farm rent free for a period. Here, then, we observe the relationship between the ownership or freehold, and certain products appertaining to it. Having proved this connection, we establish at once the broad principle which requires that a reasonable proportion of hay, straw, and of yard manure, should of necessity be taken to by the owner or incomer. I say of necessity, because I cannot imagine there being a doubt on the subject: the materials in question are the very life and soul of the farm; without them there could be no length of existence. We know that, as a rule, hay, straw, and manure in fair proportions are or should be left; but we also know that this rule is most irregularly and imperfectly observed, causing dissatisfaction, and not unfrequently loss and injury, to the incoming tenant. He either finds fodder in unreasonable abundance or cruelly short, and no manure, or rubbish called by that name which he has to pay for. This unsatisfactory state of things arises from there being no established general rule or custom in the country.

Now, it is this very word "custom" which appears to annihilate all good practice, and acts as a barrier to anything like uniformity of action. The variety in customs in this land would make the largest volume of contradictions ever met with. In some instances hay, straw, and manure are valued; again, only hay and a portion of straw, and no manure; then we find none of these commodities, except hay, recognised by those valuing. I will give you a few examples from different counties. The information is obtained within the last few days from the localities, and I now take this opportunity of thanking my correspondents:—

	Customs	Customs
	As to the Manuring with Lime, Chalk, Bones, Artificial Manure, and the Consumption of Artificial Food.	As to the Purchase or Transfer of Hay, Straw, and Farmyard Manure.
Northumberland:—	No general system of payment, nor any tenant-right.	Manure left, but not paid for; nothing said about hay and straw.
Derbyshire:—	Lime considered to last four years, a quarter delivered yearly. Grass seeds seven years, bones on ploughed land, three years. Artificial manure, two years. Artificial food, a quarter of the bill allowed.	Hay and straw purchased at market price, with an allowance for delivery. Farmyard manure purchased by the ton.
Buckinghamshire:—	No particular custom; that used for roots in last year of tenancy, full value allowed.	Wheat-straw goes off; hay and Lent corn consumed. Manure not paid for.
Kent:—	If crop taken after use of artificial manure, no allowance; nor any for artificial food.	Hay paid for in some instances at market price, some at spending. Manure not purchased.
Sussex:—	If no crop taken after application, full cost—in addition, carriage and applying; afterwards yearly deduction. Consumption of artificial food, nothing allowed (but ought to be).	Hay, 60*s.* per ton; straw charged as near cost of cleaning and carrying corn to market,—that thatched before Michaelmas paid for. Manure in heap, of good quality, *good.* per yard.
Hampshire:—	No allowance for lime, chalk, or bones, or artificial manure, except in rare cases.	Hay and fodder of straw valued. Straw and dung left free
Dorsetshire:—	An outgoing tenant gets no allowance, or next to it.	Hay and straw, consuming price. Dung, for what it may be worth
Somersetshire:—	Unexhausted manure, one-third allowed.	Hay and straw consuming price. Manure not paid for.
Devonshire:—	Lime, before a crop, full cost; after one crop, half; two crops, quarter. Bones, same proportion. Guano and superphosphate used in last year, two-thirds of cost, provided latter does not exceed 40*s.*	Hay and straw at consuming price, one-half to two-thirds. Manure not paid for.
Herefordshire:—	Not at all, except by special agreement.	Hay, consuming price; straw and manures not paid for.
Monmouthshire:—	The same, except under special agreement.	Ditto

Now the payment we are speaking of becomes a serious question in the event of a Michaelmas entry,

seeing at that season the corn is harvested, hay abounds, there are large breadths of roots, some fallow, and yards and boxes swelling with dung. At Lady Day the quantities of the several commodities are reduced to the lowest convenient scale (and it may happen that a careless extravagant tenant does not leave sufficient hay or straw to supply the needs of his successor) : to meet such an emergency, and for the carrying out of those views, I think a limit should be named to regulate the quantity of both hay and straw which the incomer should take to at Lady Day. For every 25 acres of land under corn, say, 5 tons of straw should be left ; for do. of grass mown for hay, 5 tons of hay ; hay to be paid for at one-third of the market price, and straw at one-fourth do. Straw is now such an important ingredient in feeding that it must become an article of purchase, and more care, it is to be hoped, will be bestowed upon it. Manure, properly thrown together, to be paid for at the rate of 3*s.* per cubic yard. At Michaelmas, of course, the quantity of these several products would be very large, but I would adopt the same scale of payment. I believe a general system of this sort would induce greater care for both straw and manure, and that the purchaser would be the gainer. It seems unreasonable that the excrement from animals receiving corn should be left in exchange for a valueless compound of dirt and straw called manure, and yet this may occur when it is the custom to leave the material without payment. Too much encouragement cannot be given towards maintaining a higher state of fertility at the termination of a tenancy, and, therefore, I argue strongly in favour of payment for indispensable produce, such as has been named to you. I have given you my ideas on the principles which should regulate arrangements between landlord and tenant in the matter of permanent improvements, as well as on the absolute purchase of certain farm products by the owner or incomer at the termination of a tenancy ; I have started subjects worthy your consideration, and upon which I hope we may hear valuable opinions this evening.

I now invite your attention to what I feel is the important part of the question under discussion, viz., the necessity for recognising and defining what are the remaining unexhausted improvements and regulations you would establish between the outgoing and incoming tenant for maintaing the condition of the soil, and for fairly remunerating the former.

The words "unexhausted improvements," as concerns an occupier, I take it, signify "an existing interest in an investment which cannot be immediately realised." These investments take a variety of forms, their effects are unequal in duration, and the cost of employing them differs, more or less, according to circumstances : they purpose to impart condition and fertility to soils ; and there is no doubt that, under proper management, the investments become highly beneficial and valuable. We are accustomed to speak of them as acts of husbandry and cultivation, manuring with lime, chalk, bones, rape cake, and various artificial compounds, such as guano, superphosphate of lime, &c., and the spending of cake and corn in yards or upon the land. Acts of husbandry and tillages, when carried out in a reasonable, workmanlike order, are of the utmost importance and advantage to an incoming tenant ; and, subject to limitations, they might be legally and regularly performed by the outgoer at a published scale. As for the manures, and other material just named, they have become the chief elements in modern farming ; the necessity for them is best evidenced by the extensive manner in which they are adopted, and it is a matter of national regret that a check to their use should ever occur. That it does happen we all know too well, for it is the common habit, long before the term for quitting a farm arrives, to discontinue the use of artificials. Professor Low, in speaking of them, says :—"No farm can be cultivated in a suitable manner unless the farmer can look forward to a future time in which he can recover, with a profit, the capital expended by him." Now it is most desirable that all farms should be cultivated in a good and proper manner, and that their fertility should be preserved ; and if this can only be attained through a system which recognises a tenant's outlay, and provides for the repayment of it, the sooner a scheme to effect such a desirable end is framed and adopted the better.

Cultivations and acts of husbandry assume almost the same form throughout the country, now that the implements employed are so similar, that a universal scale of prices might be agreed upon for steam and horse labour, and other ordinary works of tillage, care being taken that only a reasonable number of ploughings or other costly operations would be sanctioned. Since steam has effected such marvellous works of cultivation, some of its operations would need to be specially considered ; for instance, smashing up heavy clays by Fowler's digger, or subsoiling with steam-cultivators, are tillages which confer lasting benefit on such soils, and they should be valued accordingly.

The old system of summer fallow is rapidly disappearing ; where it still exists, the ploughings should be confined to not more than three. I remember perusing a lease in Surrey, in which no less than five ploughings to fallow were covenanted to be done by the outgoing tenant. I did not hear that the farm, though, was let upon those terms. The outlay for cultivations and acts of husbandry would vary according to the season a tenant entered on his farm. I am decidedly of opinion that Lady Day, March 25, and Michaelmas, September 29, are in every respect the fittest periods for dating a tenancy, and of these seasons I prefer Lady Day. The bulk of the material grown on the land is then either consumed or sold, the interest of the outgoing tenant is comparatively simple to value, and that most undesirable practice of tenants sharing the same house and homestead is avoided. In districts where chalk, lime, marl, and bones are applied, the utility and value of these substances are well known and appreciated. You could only frame a table of payment for them on assumption, since the quality of the materials themselves, and the properties of the soil to which they are applied, have no uniformity of action. Nevertheless the matter is capable of adjustment, and prices might be agreed upon, in localities where such things are used, which would satisfy the man who incurred the cost of the operation, and be perfectly fair to his successor.

Guano and superphosphate of lime should be allowed for under certain circumstances, for instance, where either or both are applied to the root crops, and the acts of husbandry and cultivation to that crop are charged. In the case of the roots themselves being valued, the manures are not calculated. I have never detected lasting results where these manures are used ; they appear to act as a stimulant, and no doubt do largely increase the bulk of the root crop, but the benefit to cereals and grasses may be purchased at the expense of the soil, and for that reason I am not sure that I should allow anything for their use any more than I should for nitrate of soda or sulphate of ammonia. I have no doubt that these opinions will be unpalatable to some of our great experimentalists and theorists, and whilst declaring my great respect for their talents and labours, I cannot forget that we have yet to debate and pass a scheme to deal with plain simple facts ; and that until this is carried it is impossible to go into the far deeper question of top-dressings and their influences.

The consumption of oilcake and corn on land has a highly beneficial and comparatively a lasting effect, such as warrants a valuer in taking cognisance of it. So much depends upon the quality of the cake and corn used that I submit an analysis of them should accompany the invoice ; this course would prevent the employment of inferior food. Most of us have tried and discovered the manurial effects of these feeding substances, whether on pasture or arable. Poor grass lands have been improved 200 per cent., and shallow, hilly ploughs have been profitably cultivated, since the secret of feeding oilcake and corn on them has been discovered. Permanent benefit has been produced on meadows by the use of oilcake ; and heavy crops of Barley and seed have followed the use of it on inferior arable land. Who could deny the right of an outgoing tenant (consuming such food within the last year of his term) to remuneration ? Surely not the man who succeeds, and will therefore reap the fruit of the practice. Feeding and penning land is viewed as one of the most beneficial acts a farmer can pursue. The animal penned becomes the vehicle by which you manure. On our hills, sheep previously folded on Sainfoin or ley, are given a pen of Rape or Turnips, or corn is given to the flock folded alone on Turnips ; either process greatly enriches the land, the benefit being valued at from 30*s.* to 50*s.* per acre, sometimes more. Green crops, when only partially fed, such as old or new seeds, not depastured after June, and Vetches or Rape ploughed in, may fairly be reckoned in a valuation. Before quitting the subject of cultivation, acts of husbandry, manures, and artificial food, I wish to explain that I have avoided entering into detail upon their cost or agricultural value, because I felt it would be presumptuous and of no avail for me to attempt to introduce a scale of payment for them. The precise worth of these operations is still a matter of doubt, as the reports you have had read to you this afternoon prove. It will require the knowledge and experience of the first agricultural authorities to compile a just and acceptable table of payment for such things. My object has been to draw your attention to those matters which bear more immediately on the question.

I don't care to enter upon a series of calculations and figures (at all times distasteful enough, and which at the present moment are useless) ; this business, I trust, will follow a few such debates as these. It is enough for us to ascertain and declare that certain facts require to be placed on a satisfactory footing, and having discovered what that should be, to invent the proper means for effecting it. I want this meeting to affirm that most or all of the points referred to form a basis or framework for a broad system of tenant-right : if we once get this idea accepted by the majority of our agriculturists the machinery for working it out lies in our Chambers of Agriculture. Here the landlord and tenant meet for the purpose of discussing their mutual interests. One and all of them are deeply concerned in the settlement of our subject to-day, their united efforts and wisdom must produce a scheme which shall grapple with the difficulties of our situation, and give us the benefits we have a right to demand. Suppose we take a view of their several interests. The landowner is personally concerned in securing liberal treatment and good management to the soil, the rent and facility of letting depend upon the condition in which a farm is left. It is no uncommon circumstance for a proprietor to allow half a year's rent, or the equivalent in money, for an exhausted or ill-managed holding. It would be to his interest if the custom became legalised, and a stop was put to that wretched course of running out, and otherwise abusing his land ; far better that the owner should take his share in a measure which would ensure a more equitable and profitable working of his estate. What if he consented to take all reasonable cultivations, fodder, and manure at the expiration of a tenancy ? The step is to his advantage, no tenant could object to take such matters off his landlord's hands. Beyond the responsibility he would rarely have to find money to pay the valuation, the latter being transferred to the new occupier.

Next take the tenant. Surely it is not to the interest of either outgoing or 'incoming tenant to treat for a wilderness. Far better for both that there is something to bargain for. A man on quitting a farm might do worse than think of his successor ; that too common practice of neglecting cultivations, hoeing, and dispensing with corn for stock in the last year of a tenancy is not always profitable ! As I have before observed, there is a vagueness attached to valuations which we cannot now explain. I take it that many is the pound a tenant has lost through his mistaken economy on leaving. Valuers are good judges, and observe how land is left, and make their calculations accordingly.

There are too many instances of farms given up in woeful condition and disorder, which would scarcely be the case if those quitting them could claim compensation for better management ; not that I am inclined to recommend payment for fences, roads, watercourses, gateways,—these things should, as a matter of course, be regularly kept up, and any neglect to do so should be a penalty on the outgoing tenant. See again of what advantage it would be to the incoming tenant to succeed to clean fields rich in manure, sufficient portions of well-stored fodder and straw ; his course is thenceforth clear, there is no interruption to ordinary rotations nor check to his energy, but an immediate opportunity for commencing operations with fair promise of success. Surely these are circumstances of no small importance, nor can I imagine there is a farmer in this kingdom who would object to a fair payment for a farm so left. Whilst boasting of our supremacy as agriculturists, it is remarkable, but nevertheless true, that the first and grand rule, acknowledged by the earliest nations, is neglected in this generation. I refer to the importance of maintaining the fertility of land. I was much interested by some remarks in an agricultural work by Pliny, who is reported to have lived A.D. 35, upon this very question of condition in land. He observes :—"Many hold opinions that negligence and ill-husbandry of the former tenant is good for him that shall come after :" but he goes on to say, "nothing is more dangerous and disadvantageous to the incomer than land so left to waste and out of heart." Besides other valuable maxims in this book, one other particularly struck me, which I must give to you. The great Cato, being asked "what was the most assured profit rising out of land," made this answer :—"To feed cattle well."

It might be well to remember these plain, practical remarks, although uttered by men in the first days of the Christian world. Mechanics and chemistry rendered but little aid then, yet their ideas and practices were identical with our own, with this exception, that the ancients tilled and preserved the qualities of the land, whilst we till and sometimes lose them.

There is a class that I have not yet referred to, whose very existence and prosperity is so essential to the safety and success of the proprietor and occupier that agriculture would cease without them. I mean the labourer. We must acknowledge the importance of good and competent hands, and the necessity for retaining in our employ those who labour cheerfully and manfully for us. As a rule we find the best and most intelligent workmen in districts noted for the superiority of their agriculture. Here the enterprising tenant follows his pursuit with vigour ; there is constant occupation for the labourer, who prospers with an enlightened system of farming. Take another view of the working man's state. We have a wild ill managed district, sluggishly and wretchedly farmed, neither capital nor energy, with the tenants' farms only half cultivated, and the peasantry lowly paid and often unemployed. Occupations change hands, the fields are left to slumber, and the labourer starves. Then follows crime and all its attendant horrors. Now as "tenant-right" becomes general this melancholy but too true picture will alter, land will not then be allowed to deteriorate, capital will be poured into it (now that it is secured), and constant employment will be found for the labouring man.

A great authority wrote many years ago—"That the wealth of a nation takes its decisive turn in proportion as the earth is well or ill cultivated."

This is precisely what we are now seeking to do. It is our desire this evening to pronounce an opinion in favour of a "general scheme" "to promote the better tillage of the land, and to secure the cultivator in his outlay on it." To the best of my ability I have endeavoured to define what "unexhausted improvements" are, distinguishing those of a permanent

character appertaining to the landlord from others of a less enduring nature belonging almost entirely to the occupier. I have made an effort (a feeble one, I fear) to press upon you those features of my subject which appear of most importance, viz., the necessity for recognising certain operations and treatment of soils, with the view of preserving their fertility, and remunerating those parties who incurred the expense.

I have spoken of the advantages to both landlord, tenant, and peasant, which would arise in the event of a broad measure of tenant-right being framed and enforced; and, in drawing my paper to a close, I would allude to the national importance of such a law. We have just observed that a nation suffers if its agriculture fails, which signifies, I take it, that it is to its disadvantage and loss if any portions of the cultivated area is imperfectly tilled or allowed to run to waste, and this undoubtedly is the case with us. Had we statistics of the quantity of land depreciated, or thrown out of cultivation, by reason of the terms of letting and change of tenancies in one year, I believe it would be astounding. What occurs in our immediate neighbourhood happens of course elsewhere. We daily see the evil consequence of no tenant-right and removal from farms, and therefore you will believe reports which I now lay before you from other parts of the kingdom as to the condition in which farms are left:—

QUESTIONS AS TO CUSTOMS OF TERMINATION OF TENANCIES.

	Is the Fallow Shift usually left in good order?	Are Cultivations, Manuring, and Roots willingly paid for by Incoming Tenants?	Are Farms as a rule run out and left in bad condition on a Tenant's Removal?
Northumberland:—	The terms being in such a way, the fallow shift is found by the incoming tenant	For the same reason.	I am sorry to say it is so on some estates.
Durham:—	Very often left in an unsatisfactory condition	Entirely left to the valuer; the incomer has no power to object	Depends upon the agreement; a chance of compensation.
Bucks:—	Usually good	I believe they are	Only in exceptional instances
Kent:—	Good	Yes.	No.
Sussex:—	Good	Yes.	Not run out, and generally left in good order
Hants:—	Landlord or incoming tenant put in roots	Landlord or tenant put in roots	Where capital needed, on land over rented, ran out
Dorset:—	Usually in very bad order	As a rule unwillingly.	Decidedly so.
Somerset:—	As there is usually a certain portion of going-off crop, it is taken, or the fallow, which is put in good order.	Taken to at a valuation, if in the county.	As a rule, I think the tenant usually looks to himself
Devonshire:—	Bad generally	Yes.	Yes.
Shropshire:—	Bad	Yes, when stipulated for under special agreement	Yes, and until a more equitable arrangement than that of the custom of the county is pursued, it is natural that it should be so.
Monmouthshire:—	Depends upon circumstances: an outgoing tenant does not generally trouble.	This depends on circumstances; there is no claim—good tenants prefer to pay.	Yes; and we want a more liberal arrangement of compensation.

The facts come from the same source as the particulars on customs which you have already heard. Accepting these reports as a fair reflection of what prevails throughout the land, we have good cause for urging this question, not only amongst ourselves, but for the consideration of the Legislature. The question, I maintain, is of national importance, when it is shown that the producing area of the country is being constantly reduced from causes which are not in themselves insurmountable. As we should seek to remedy this evil by recognising and remunerating a higher and continuing condition of agriculture, so we ought to provide retributive measures against all those who wilfully neglect their duties as husbandmen.

I have before observed that we possess the machinery for carrying out our object in these Chambers of Agriculture. In the first instance, it is necessary that all prevailing customs should be as nearly as possible assimilated. One way of achieving this is by the appointment of experienced men in every county to collect facts relative to the customs in that county for the respective Chambers to review and debate upon. So soon as these meetings come to a decision, commissioners might be appointed to assemble at the Central Chamber in London, there to compare their several reports, and to urge the opinions of the several bodies who delegated the task to them. An agricultural assemblage of this character, taking for their guidance the Lincolnshire form of tenant-right, could surely produce a practical and comprehensible measure, proposing a national and permanent tenant-right, which Parliament might be petitioned to legalise in those particulars where its influence was necessary. I do not mean that the Government should interfere between proprietor and tenant; but there are certain operations which go towards increasing the fertility of the land of this country, which need encouragement and legislative protection to ensure their permanency. If it became law that a tenant could claim payment of his successor for unexpired investments in his occupation, we should hear less of the insecurity of tenure, unremunerative compensation, and there would be few, if any, exhausted farms or complaining occupiers. I would remark that the words compensation and improvement, as composing part of the title of this paper, appear totally to misrepresent the case. For compensation I would use the word payment; there is no need to compensate a person for what he can legitimately sell; the term is vague, and suggests a doubtful claim. So, again, the term improvement: for this I would substitute interest. As a rule, men do not care to pay for another's improvements; what one deems an improvement another condemns; far better that we speak of a *bonâ fide* interest, such as the Legislature and custom declare is marketable; and therefore I submit that it is more correct and preferable to speak of "payment for unexhausted interest."

SIXTY YEARS OF THIN SEEDING.

IT is now some time since I troubled you last on my favourite subject of agricultural development and improvement, and though I confess I have not now much new matter on which to ask you to cause what I may write to appear in print, yet I have a wish again to write, and on two or three matters, if not more; and in the first place I am anxious to obtain some information from the members of the Royal Agricultural Society on subjects in which I for very many years have, as it is pretty generally known, taken much interest.

At a meeting held by some of those members it was reported that they came to the conclusion that 2 bushels of Wheat was the proper quantity of seed for an acre of land. What I wish to learn from them is, whether 2 bushels of seed is the proper quantity for all the various kinds of Wheat, that is, for long-strawed kinds equally with short-strawed kinds; and for rich wheat-producing land equally with light poverty-stricken land? and does this learned Society recommend that the same quantity of seed Wheat should be sown in September that should be sown very late in the autumn or early in the spring? If some members of the Society would be so kind as to solve these questions, and add some other valuable information to them, they will confer a great boon upon agriculturists in general, and especially on those of their own country; and I myself should feel greatly indebted for the answers also, and for these reasons: in my limited practice I have been accustomed to use less seed of the long-strawed kinds than I did of the short-strawed kinds, just as I sow a less quantity of Marrowfat Peas, that run 10 feet high, than I should of dwarf kinds that do not exceed 1 foot high. And I sow less seed on rich and highly cultivated land than I should on poor and badly cultivated land, and because on the rich land the roots throw up many shoots or branches, but on poor poverty-stricken land they branch but very scantily, or not at all.

But I put these questions chiefly as they concern myself, and on this account:—In the year 1810 I assisted in dibbling an accurately measured acre of land hurdled in in the middle of a large field with one peck of seed Wheat only, and which at harvest, when threshed and measured on the land on which it grew, produced a crop of 204 pecks, or 204-fold; and I observe the dibbling was done in the presence of several gentlemen of good position and education, and the crop was reaped, threshed, and measured also in the presence of the same gentlemen, who attended as witnesses, and one of these gentlemen, Mr. Editor, you will recollect, attended the lecture that I delivered at the Royal Agricultural College, and confirmed what I have now stated, and added, moreover, that he also assisted in dibbling the acre, and that the result was so gratifying that although he had farmed nearly all his life and very extensively, he had never used more than 1 bushel of seed an acre of any kind of Wheat, and he had his drill so made that his men could not put into the ground by it more than a bushel. Four other gentlemen also dibbled each his peck an acre, and the results were equally as gratifying; and thus 60 years back it was proved by experiments that 1 peck of seed, if in good hands, and in properly prepared wheat land, would produce 51 bushels of produce an acre.

And now permit me to give some little further account of my own doings. It will be recollected that I have been frequently and almost continually charged with garden farming, as if such were a crime, but I reply that I never used spade or fork husbandry, but the plough, scarifier, roller, harrows, and a drill only, though I acknowledge that the spade or fork is by far the better, if men could be obtained properly to use it. But I further acknowledge that I learned what I know of land cultivating in nursery and market gardens, and in this way, when at a school in the parish of Hackney, near London, at which I remained several years, I spent all my leisure time in a nursery and a kitchen garden which were near the school, and therein I learned both how to cultivate land and to put in the seeds for crops, and I not unfrequently saw land cultivated as many feet deep as farmers in general plough inches deep, plough, I repeat, but I consider mere turning the land over with a plough, and that but 3 or 4 inches deep, and then smoothing the surface over with the roll and harrows, or even with other implements, is but a miserable substitute or a distorted caricature of land cultivation wherever the soil is deep enough to permit it to be comminuted deeper. But in 1818-'19 and '20 I was residing on a curacy near Blackburn, in Lancashire, where at that time were much fearful riotings, amounting almost to rebellions, under the pretence of the dearness of provisions; I, witnessing what was done by machinery directed by scientific energy and industry in the production of manufactured fabrics, with which the whole civilised world could have been supplied, conceived the idea that if equal science, energy, and perseverance were employed in the production of food as there were in that of clothing, England might then throw open her ports for the free importation of corn, and that farmers, instead of being nursed and, as it were, enervated by the high import duties under what was called the sliding-scale, would themselves not only supply all their fellow countrymen with all the productions of their country's soils, but have some to spare also for exportation to less favoured peoples. With these thoughts I published a series of letters in those years, in a provincial paper, in favour of free importations of the necessaries of life, and I am inclined to believe that they were the first, or among the first of the articles that were so printed on the subject in favour of free importations into this country of all the necessary articles of food; but before I did so I had procured and carefully studied Dr. Adam Smith's "Wealth of Nations," from an edition published in 1805. I also purchased Sir H. Davy's "Lectures on Agricultural Chemistry," which were delivered between 1802 and 1812 for the Board of Agriculture; and I also closely studied the works of that great honour to his country and mankind in general, Jethro Tull, and of many other writers on husbandry and gardening, both modern and ancient, and particularly the "Œconomics of Xenophon" among the latter, from which I obtained very much valuable information.

From those works and my own little practice, experiments and observations, I came to the conclusion that the lands of England, if science, energy, and industry were applied to them, might be made to produce all the food necessary for England, and, as I have said, leave a surplus to spare for less favoured people; and though the population has so vastly increased since those letters were published, I am convinced of the same now, whatever the population may now be, and I am further convinced that should a war break out between England and other powerful countries the lands of England must be made to produce all the requisite food for the people of England, or dearth and famine will very soon depopulate the land. But here, Mr. Editor, I must stop for the present. *Geo. Wilkins, Vicarage, Wye, July* 4.

LAND DRAINAGE AND STEAM TILLAGE IN DROUGHT.

[On these subjects, and their relation to the drought of 1868, the following questions were distributed by Mr. Morton, and the following is his report on the information thus obtained, as published in the Journal of the English Agricultural Society.]

On Land Drainage:—Are there instances known to you of differences, as regards productiveness during so dry a season, between drained and undrained land, either arable or pasture? If so, please to give a particular history of them.

On Steam Cultivation:—Has deeply stirred and steam cultivated land suffered more or less than others from the drought? Describe any instances in detail.

THE following are short communications on the above subjects—land drainage and deep tillage:—

Captain Dashwood, of Kirtlington, Oxford, occupies two farms comprising 1072 acres, of which 927 are arable, and 100 meadow or pasture. The soil is on the limestone formation, commonly called stonebrash. He says, that though unable to give particular instances, he believes his crops on land well drained have been superior to those of neighbouring fields on soil of a similar quality, but badly drained. His conviction is, that land overcharged with water for part of the year must suffer the most in a dry summer like that of 1868. And as to steam cultivation: having cultivated by steam-power for some years he is convinced that deeply stirred land has undoubtedly suffered less from the drought. Horse-hoeing the corn and thus keeping the surface in tilth, prevented the land from drying up and cracking.

In the same county Mr. Savidge, of Sarsden Lodge Farm, Chipping Norton, believes that if the gentlemen who conducted the steam-plough inspections for our Society could have gone their rounds again last autumn, they must have returned with a load of useful information, for never did deeply stirred steam cultivation do so well. He adds:—"I fear in some districts during the long dry time many began to think they had over-drained some of their land, and at agricultural meetings (Warwick to wit) during August and September several speakers stated that it had been overdone, and that we were suffering from that. My own experience is, that in no season did good deep

draining tell a better tale; and we have a fine prospect upon such land for the next crop."

Mr. Mitchell, of Rainham, farming on the edge of the Thames-side marsh lands, Essex, describes an example, in which the effects of both deep tillage and of drainage are singularly combined; for he refers to the appearance of the crop directly over the line of a freshly made deep drain, cut so lately as last spring. Its purpose was to carry off the water from a lowlying pasture, and it had to be taken through a field of higher land, apparently dry. Both over the drain and for some distance on each side of it the Mangel crop was finer than on any other portion of the field.

Mr. Coleman, late of Woburn, now writing from Park Nook, near Derby, says:—

"I have noticed that in this dry season very much of the land that has been drained during the past two or three years bore much better crops than usual, and did not seem so much affected by the dry weather as the adjoining fields, which are still undrained. The drained land did not crack so much, nor were the cracks so wide or deep as upon the undrained portions; and I may safely say that the drained land was moister than the undrained during the latter part of the summer. Some boggy land certainly produced more herbage than usual, and this is the only case I noticed of undrained land being more productive than that which had been drained."

The following is a report from the "Britannia" Farm of Messrs. Howard, Bedford:—

"The soil is a stiff retentive clay, which under the old shallow horse culture was very hard working (requiring three or four horses to a plough), and not very productive. After deep drainage and deep cultivation by steam-power the land has become much more porous and productive, and the water gets very quickly into the drains. Although the real nature of the soil is not altered, the appearance of it is much so, and the greatly increased productiveness is beyond all doubt. Some parts of it are of so strong a clay, that if a small hole is dug, the friction of the spade in making it causes it, when filled with water, to retain it for almost any length of time. Under the old system the treading of the horses up the furrows, even when drained, caused the water to stand upon the surface for some time after a heavy rain; now, although the land is laid perfectly flat, without a single open furrow, no water is ever seen to stand. We cannot speak from experience on our own farm of any contrast between drained and undrained land last year. But there was an example plain enough on the farm adjoining, in a field next to one of ours, which was in Wheat last season, the whole of it being farmed alike in every way, both as to manuring, tillage, and drilling of the seed, except that part was drained. On that portion of the field the plant all through the winter looked the strongest, healthiest, and best colour in the spring it grew earlier, and kept its superiority up till harvest, when it was evident to any passer-by that there must be a quarter of Wheat more to the acre, and about half a load more straw than in the rest of the field undrained. That which was the wettest in winter suffered the most from the drought in summer, it having cracked so much more. Our experience is that the wetter the land in winter the wider the cracks when exposed to the summer's sun. There were many instances last summer of fissures 3 to 4 inches wide, and 3 to 4 feet deep. A few years ago we had two fields of Wheat adjoining, one drained, the other undrained; both were good crops, but the drained field, although all had been drilled together, was ready for harvest fully a week earlier than the undrained field. Ours is emphatically a steam cultivated farm, the whole of the breaking up of the land being done and the seed-beds formed by steam-power; and our experience is that very deeply cultivated land suffers much less from drought, as well as from wet. On our soil the deeper it is broken up the greater amount of moisture it will retain; and the quicker the extra water is drawn away the lighter it leaves the soil, and the more the roots of the corn will penetrate. The sun also has not such a baking effect: whilst it dries, it does not harden in the same unyielding manner as it does the ground under the shallow cultivation. One of our fields cropped with Wheat this season has never been inverted for the last eight years; the crop was a remarkably heavy one, there being as much as could possibly stand; notwithstanding the dryness of the season, it was much laid in places, and at harvest many competent judges estimated it at 6 to 7 qr. to the acre. The past summer was exceedingly favourable for steam cultivation. The long dry, hot weather made the land so rotten and friable, that we were able to prepare most of our seed-beds at one operation with the cultivator, nothing more being done to them before drilling and harrowing in the seed."

From Foulness, Mr. Harvey has sent the following report, which describes an experience on low-lying alluvial land:—

"The land of this island has all been redeemed from the sea, and consists of a mixed soil on the east and south next the river Thames, and a heavier, stiffer soil on the north and west next the rivers Crouch and Roach. Land draining has only just begun, but as far as I can see it has done good, even during this dry year. Land that has all the water drained out of it in the winter does not dry up so hard in drought. It is in a more kindly state for the roots to work in, and does not crack so much as when it is undrained, therefore holds the moisture better in hot seasons like the one just past. My land, which has been steam cultivated, has, I think, withstood the dry weather better than the land that has not been done. I have as good, if not better, fields of Mangels this year on steamed land than I have generally grown."

Mr. Bailey Denton, of 22, Whitehall Place, S.W., has kindly taken great interest in the inquiry to which the above have been replies. Having taken pains to inquire among people of information what has been the relative produce in 1868 of drained and undrained lands of similar quality and with similar climate, he has found the general opinion to be, that in spite of the excessive drought more corn and grass were produced on drained land, where the work had been efficiently done for some years, than on undrained land. His own observations have led to the conclusion that in corn lands generally, and in grass lands of fair quality, there has been more and better produce than on similar lands undrained.

The following are the replies of some of Mr. Denton's correspondents. Mr Wortley, of South Collingham, Newark, says:—

"With the exceptions hereafter noticed, my belief has always been that the underdraining of wet land, whether arable or grass, increases the productive power, even in such seasons as the last; the advantage being most apparent in the arable land, but on the whole very decided (taking the improved quality of the herbage into account) in the case of grass. Since I received your circular I have been receiving rents on an estate in Wilts, on which, during the last eight or ten years, I have done a good deal of draining. It comprises one parish, entirely dairy land, on the Oxford clay; another parish and part of a third on the chalk, comprising a large area of grass on the chalk marl, the undrained part of which at times is very wet; a fourth parish, and part of a fifth, on the middle oolite, varying from the thinnest stonebrash, with springs breaking out on the hill sides, to the heaviest clay. Bearing your circular in mind, I asked most of the tenants separately whether, during the past season, they would rather have had the pipes in their land or not; there was all but a common consent among them, including even the small dairy farmers, that the land was better for having bren drained. I must say in conclusion, that according to my experience there is some foundation for the popular belief that a certain kind of grass land is injured by underdraining; that is to say, the inferior plants which previously made a show, if they did little more, are destroyed by the drainage, and they are very slowly replaced by better if the land is left to itself. I ought to add also, though it does not touch the question as to underdraining, that, in my opinion, some fen land (arable) is injured if the water is altogether removed from it, though a certain amount of drainage is, of course, essential."

Mr. James Rawlence, of Salisbury, says:—

"I quite think with you that more corn and grass have been grown on drained than on undrained land, except on grass land that had been drained in the previous autumn, in which case the aquatic plants all died out from the long drought and heat, and the more nutritious grasses had not time to fill up their places; besides which, no fissures had been made by the contraction of the soil, and, therefore, it had not become aerated, which is one of the benefits of thorough draining, and one which enables the strong clay land to withstand the ill effects of a long drought."

Lastly, Mr. Castree, of Gloucester, may be quoted:—

"The dry and hot summer of this year has not yet shown its full effect on drained grass land; former hot seasons dried up and withered the grass lands for the season, but in subsequent years the herbage was much improved in quality by the roasting it had undergone.

"The drained clay lands have not been so much cracked as the undrained, and have been more verdant.

"The meadows on the banks of the Severn are improved by draining off water that lies in hollow places, or wet places; but drainage is no improvement of sound meadow or pasture land."

There is thus a general concurrence of testimony to the fact that both deep cultivation and thorough land drainage have contributed to fertility, even during such a drought as that of 1868; the latter both directly, wherever it had been long in operation, by the gradually deepening cultivation effected by the passage of rainwater through soil and subsoil, and the deepening, therefore, of the area to which the roots of plants extended in search of food, and also, indirectly, by preparing both soil and subsoil for their deeper cultivation by steam-power.

I have kept three additional witnesses till the last, as their evidence, though hardly dissentient from what has been already given, may yet be classed together, as representing exceptions to the general rule. It will be acknowledged that they are all excellent and trustworthy observers.—Mr. Clare Sewell Read, M.P., occupying land at Honingham Thorpe, near Norwich, varying from a stiff soil to a light sandy loam, says:—

"I have two marshes drained by a windmill: one lies higher than the other, and generally grows a fine crop of grass: the other is lower, and grows but little grass, and that sour stuff. This year the high marsh is burnt up, and the lower one grew more grass and of better quality than usual.

"Last autumn I ploughed deeply by steam, and also dug (with Fowler's plough and Cotgreave's digging mould-boards) a quantity of land 12 inches deep. This was a clay loam, and the Barley on it was an excellent crop. The Wheat and winter Oats after the deep steam ploughing were also very good. I have, however, seen deep steam culture in the spring entirely destroy all reasonable hopes of a root crop, not only this year, but in the average run of seasons."

Mr. J. J. Rowley, of Rowthorne, Chesterfield, whose farm is on the edge of the magnesian limestone, part of it being old grass over the coal formation, says:—

"I have every reason to believe that drained grass land has suffered less from the drought of the present year than undrained lands, chiefly because the latter began to crack the soonest; the open fissures in this kind of land before the rains were remarkable. Even now [December 14], from their depth and width, the cracks are not yet closed. The cracks on the well drained loams were small in comparison, and are now closed up.

"There is little or no steam cultivation on our thin limestones. On a farm near to me the Turnip fallows were steam cultivated in the autumn of last year, and the Turnips are a complete failure. On the adjoining lands, cultivated in the ordinary way, there is a partial crop only;—perhaps one-quarter of a crop. The roots are generally a failing crop in the district. I am, however, satisfied that the greater amount of evaporation occasioned by deep cultivation is damaging to the Turnip crop. This I have seen after a shallow subsoil ploughing."

Mr. Rowley also declares that the 4-feet drainage sanctioned by the Inclosure Commissioners, in his neighbourhood, has not been successful.—Mr. Henry Evershed, late of Halstead, writes as follows:—

"On a farm in this parish the Wheat suffers greatly from being sopped in water during wet winters. This year the yield is very great, and land that is undrained, and usually much injured by the retention of the surface water, has not suffered this season. There are many marked instances of this kind within my knowledge. It is probable that the crop, on undrained heavy land, is so much the greater this year because of the small amount of plant food removed by the small crops of ordinary years.—As regards steam cultivation, deep tillage must be useless in many cases; for instance, on thin chalks, and—speaking of anything over the usual depth of good cultivation, say 6 inches or 8 inches—I have found it so on poor clays, sand clays, gravel clays, and soils generally with poor subsoils. Such soils are often improved under deep cultivation, subsoiling, &c., with high farming; but would they not have been equally improved by the high farming without the deep cultivation? Has the latter paid its cost? In many cases I believe not. The crops have been increased by a variety of means on my farm, and deep cultivation by steam, by plough, and by spade, has been tried without distinct benefit. A friend who farms on the chalk,—which is covered, however, by several feet of earth of very mixed character, varying from light land to stiff clay,—subsoiled a strip across a large field, cutting through his mixed soils; no benefit was observed. On the adjoining farm subsoiling was practised on a large scale without advantage—no experiments could be more comprehensive and conclusive or adverse to deep cultivation on that land. A field of mixed loamy land in this neighbourhood was partly cultivated, and in dry weather, by steam, during an agricultural meeting. A subsoiler made very deep and efficient work, but the subsequent crops have not been the better for the operation. Deep cultivation by the spade, in cottagers' gardens, would tell a different tale if it were not for the pig, the road scrapings, the ashes, the nightsoil, and the enormous dressings which follow the spade."

I do not think that either the facts or the opinions here advanced can outweigh the evidence already given in favour of deep drainage and deep tillage, supported as that is by the enormous probability in favour of the deeper, fuller storehouse of food for plants outlasting any other during an exhausting drought. Among the facts are the history of Mr. Read's lower marsh and his instances of injury from deep spring cultivation—Mr. Rowley's case of Turnip failure, last year, after steam cultivation during the previous autumn; and his general observation of the value of 4-foot drainage—also Mr. Evershed's example of superior Wheat, last year, from water-sopped clay land; and his instances of the failure of deep cultivation on various soils.

Amongst the opinions are Mr. Rowley's impression that there is a greater amount of evaporation from lands that are deeply stirred and cultivated; and Mr. Evershed's idea that poor wet clays benefit in drought, owing to their ordinary yield having been a comparatively small draught upon their resources.

Mr. Read's marsh land most likely benefited by the higher "water-table" underneath it, due to standing water in its neighbourhood; and his experience of the advantages of deep cultivation, properly conducted, is perfectly consistent with the fact that it has been found injurious to the current crop to plough up soil and subsoil in the spring of the year. Mr. Rowley's instance of a total failure of the Turnip crop last year, cannot be considered as a stigma on any preceding peculiarity of management whatever. The Turnip crop was almost universally, last year, as great a failure under good management as under bad. Nothing sown in June, 1868, had any chance of growing, whether the land had been deeply tilled or not. His belief that the greater amount of evaporation occasioned by deep cultivation is damaging to the Turnip crop, ought to have been preceded by a proof that the assumed increase of evaporation is a fact. The probabilities are all against it. The last showers before the drought left undrained clay land in a waterlogged condition. This water all escaped by evaporation; and the subsoil, if any of it could get there, was searched by deep fissures. The case in favour of deep drainage and deep tillage is, that the last showers before the drought sank into soils so treated beyond the reach of evaporation, where the roots of plants already were at work to use them, and where no cracks could reach them. Mr. Rowley's examples of the failure of 4-feet drainage, and Mr. Evershed's instances of the failure of deep tillage, have, I think, considerable light thrown upon them by Mr. Evershed's own concluding sentence. These examples, like that of the Woolston meadow, seem to me to prove that the true opinion of any agricultural operation, defended by one farmer and condemned by another, can be gathered only in those places where the full use has been made of the advantages it offers, and where due regard has

been paid to the subsequent management of the land. There is many an example of deep drainage having failed through the poaching and mismanagement of subsequent shallow cultivation. And, from Mr. Evershed's reference to the garden tillage of the cottager with his pigstye, we may properly infer that there are instances of deep cultivation proving useless, simply from the tenant having failed to treat his doubled land with corresponding liberality. He has virtually doubled his field by the doubled depth of its cultivation, and it needs an almost corresponding increase of capital to "stock" it properly, or so as to do it justice. Notwithstanding, therefore, the exceptional examples referred to by Mr. Read, M.P., Mr. Rowley, and Mr. Evershed, I believe that the testimony thus presented to the reader is conclusive of the fact that deep drainage and deep tillage are conducive to fertility, not only during seasons of unusual rainfall, but during seasons of unusual drought.

THE CATTLE CONTAGIOUS DISEASES ACT.

As the *Agricultural Gazette* has taken up the subject of contagious and infectious diseases amongst cattle, I beg leave to send you a report of what has recently been done in this county with reference to this most important subject, of which you can make any use you think proper. I hope the *Agricultural Gazette* and all the other leading agricultural papers will take up and agitate this question till some vigorous and united action is taken throughout the United Kingdom with respect to it, for it is a disgrace to our sanitary laws as well as to our agriculturists that we cannot go into a public fair or market and purchase stock without the imminent risk of bringing upon our farms one or more infectious diseases. This need not be the case, and therefore ought not to be, and if the provisions of the Cattle Contagious Diseases Bill were everywhere enforced simultaneously, I believe they would be as easily and as certainly extirpated as the cattle plague was. *Owen Wallis, Overstone Grange, Northampton, July* 4.

[The following is a report (abridged from the *Northampton Mercury*) sent us by Mr. Owen Wallis of the proceedings on this subject before the recent Northamptonshire Quarter Sessions.]

The Cattle Contagious Diseases Act.—General CARTWRIGHT rose to draw the attention of the Court to the great expense incurred in the work connected with the cattle plague. He, however, wished the deputation from the Chamber of Agriculture, consisting of Mr. William Shaw (Vice-President of the Chamber), Mr. Owen Wallis, Mr. H. J. Little, and Mr. Smith, who were accompanied by the Secretary, Mr. J. M. Lovell, to present a memorial on the subject. The following is a copy of the memorial:—

"The Council of the Northamptonshire Chamber of Agriculture having been informed that a proposal was about to be made by General Cartwright to the magistrates in Quarter Sessions assembled, to discontinue the Cattle Contagious Diseases Bill in this county, on the ground of the great expense attending its administration, it was resolved, at a meeting held on June 25, that the magistrates be requested to continue the said Bill in operation for the following reasons, viz., 1st, That the diseases against which the said Bill is directed being propagated by contagion only, and are thus preventible, the powers of the said Bill should be rigorously enforced with respect to them, in order that they may be stamped out whenever they appear. 2d, That though the cost of carrying out the provisions of the Bill is undoubtedly great, that cost is trifling in comparison to the loss which would ensue from any general dissemination of foot-and-mouth disease amongst cattle, sheep, and pigs; of pleuro-pneumonia amongst cattle, or of scab or small-pox amongst sheep. 3d. That the results of the operation of the Bill are not so satisfactory as they ought to be, owing to other counties not having put its provisions in force, is attributable to the Bill being permissive as to its adoption, instead of compulsory, and the Council beg to express their disapproval generally of permissive legislation, and especially in reference to the extinction of contagious diseases—to effect which prompt and united action throughout Great Britain is an essential requisite. 4th. But though, for the above reason, the Bill has not accomplished all the good of which it is capable, it is nevertheless desirable to protect our own stock as far as possible from infectious diseases, and this seems all the more a duty after the concessions which we have obtained with respect to the importation of foreign cattle, for we cannot reasonably ask for stringent regulations in regard to them, and at the same time allow infection to spread indefinitely amongst our own flocks and herds."

General CARTWRIGHT was glad the memorial had been read before he made his remarks, as the gentlemen from whom it emanated were quite under a false impression as to the main object of his notice. There was a mistake made. The Bill was compulsory, not permissive; but it was the mode of carrying it out which was permissive. Inspectors must be appointed for every county, and it was only the mode of action which was permissive. His object was merely to draw the attention of the Court to the great expenses incurred in the work connected with it. It was on that point he really thought the county should know something. In this county they were doing everything they could to get rid of these contagious diseases amongst animals; but what was occurring in neighbouring counties? In other counties they had a different mode of proceeding. He was very happy to see a Bucks magistrate (Mr. Duncan) present, and he (the General) thought he would bear him out when he said that in the county of Bucks the police were employed entirely as inspectors. In Oxfordshire they had the police. Neither of those counties went to the expense which was incurred in this county. If the neighbouring counties were right, let Northamptonshire do the same thing. If they could reduce their expenditure, and still do their duty thoroughly, let them do it; but if what they were doing was necessary to accomplish the object they had in view, he did wish that some higher authority would make the neighbouring counties do the same. In the case of the foot-and-mouth disease, out of 492 cases, 93 could be traced to the fairs. If that was the case, certainly the fairs were not attended to as they ought to be. If any person could go into a fair and buy a diseased animal, what was the use of their doing all they could to keep the disease out? However, let them look at the expense—and one was always anxious to keep down county expenditure. £856 had been expended already on the cattle account, and there was now due about £400, making a total of £1,256. It was a very great expense, but he did not grudge it if the same measures were adopted elsewhere. He suggested to the committee that they should consider the desirability of appointing the police inspectors. There were two modes of doing it, one was by having the police their general inspectors, and the other was by having sub-inspectors, so that it should not be necessary for a veterinary surgeon to attend every small case.

Lord HENLEY said it was most important that they should know what were the wishes of the ratepayers, whose money it was their duty to administer. They knew that it was the wish of the ratepayers that the expenses now being incurred should be continued, but what they needed was that neighbouring counties should adopt the same precautions which were being carried into effect in this county. Whilst in this county they were incurring a large expenditure in the endeavour to stamp out the diseases provided for by the Bill, neighbouring counties, to a certain extent, by their less stringent measures, were frustrating the good which might otherwise be accomplished if they all acted with the same strictness. That matter had been mentioned to him by one of the most important agriculturists in the county. The difficulty sprung from that unfortunate system they were getting into, of permissive legislation, than which nothing was more hurtful and unfortunate. The more he saw of it, the more deeply he was convinced that such was the case.

Mr. R. AUBREY CARTWRIGHT suggested whether it was desirable to include the foot-and-mouth disease with pleuro-pneumonia and the other diseases mentioned in the Bill. Some agriculturists left the foot-and-mouth disease to take its own course.

Mr. W. G. DUNCAN said they adopted in Bucks almost the same course that had been adopted in this county, but they found the expense so terrific that they thought the better plan would be to try the police. Last week, as chairman of the finance committee, he passed bills to the amount of £17 for the quarter for carrying out this Bill, and the Clerk of the Peace made the remark that if they had gone on in the old course, it would have been upwards of £400. The chief constable stated that there were only three reports of foot-and-mouth disease all over the county.

Mr. SHAW begged to call the attention of the Court to the circumstance that the Daventry division had expended something like £100 for two inspectors, whilst the Northampton division had only cost £46. The Council of the Chamber of Agriculture thought that two inspectors were not necessary.

Captain STOPFORD, as chairman of the Daventry committee, stated that now there was but one inspector. The committee, thinking that only one was necessary, had dismissed the other.

Mr. SHAW thought also that two visits from the inspector would be sufficient, one for condemnation, the other for release, and that would materially alter the expense.

The CHAIRMAN said the suggestions were valuable, and he hoped that Mr. Shaw and his colleagues would meet the committee and aid them with their suggestions. He had felt these expenses were great, but it was in deference to the wish of the ratepayers that the present system had been continued. He quite agreed with Lord Henley that permissive legislation was bad. He was somewhat doubtful whether it would be wise to have police inspectors instead of veterinary surgeons; indeed, he thought it would be something of a farce. If the police were to be used as a machinery for conveying intelligence, well and good; but certainly he should not like the notion of a policeman going into a man's yard to see what disease his animals were suffering from.

General CARTWRIGHT moved that the memorial presented be referred to the committee, and that notice be given to the Chamber of Agriculture as to the day on which it would be considered, with a request that the members of the committee would attend.

The motion was carried.

THE STRAW QUESTION.

MUCH discussion has been going on about straw, whether it should be sold, consumed, or trodden under foot. On all these points I have long since come to decided conclusions, and, I think, sound ones, for they rest on scientific as well as practical bases. These conclusions are:—

1. That all straw returns the greatest profit when consumed.

2. The next best alternative is to sell it, provided it will return not less than 32*s.* per ton.

3. That the least profitable mode is that of treading it down for manure.

Mr. Horsfall's papers (Vols. 17 and 18, Royal Agricultural Society's Journal) give conclusive evidence as to its feeding value. Mr. Lawes tells us it is worth very little as manure. If I could have my own way I would consume every particle of my straw, and I do consume a great deal; but then I should have to largely increase my capital invested in live stock and purchased food, which I cannot afford. But I fancy I hear a crowd of farmers exclaiming, "Where will you find bedding for your cattle?"

At present I have only a portion of my cattle on sparred floors, and the remainder in covered and enclosed yards with paved floors—the latter only requiring one fourth as much straw as the open yards; but if I could afford to have more cattle I would put them all on sparred floors, for 20 years' experience has proved it to be a profitable system. As bedding for our horses we should always have enough Rivett Wheat straw, which is less desirable for cutting up. Mr. Young, a livery-stable keeper in Leeds, always kept his horses on boarded floors, with intermediate openings, and found it a great economy of straw. Much of my straw in a fine season is sold for paper-making, being free of weeds. By-the-by, beware how you buy your straw. I once bought of a farmer a straw stack at a very reasonable price. It stocked my farm with weeds, especially Docks, which cost me three to four years to eradicate. I shall be very shy of buying straw in future. Do we not have abundant supply of weeds in town stable manure? I consume an immense quantity of straw cut into fine chaff, and mixed with other food. Probably to every ton of straw so consumed fully 5 cwt. of cake and corn are added. All my bean-straw is consumed; the long hard stems cut by the chaff-cutter, and afterwards moistened and softened by hot water, become mucilaginous, and are nearly two-thirds the value of hay; very few farmers are aware of its value as food. Our folks would as soon think of treading good hay under foot as to use the strong Bean stems for litter.

Many farmers are not aware that a strong standing crop of green Beans (pods, stalks, and leaves) passed through the chaff-cutter, forms the very best of food for sheep and cattle, but is apt to gripe horses; and also do not know that Bean crops are regularly fed off by sheep.

In conclusion, my experience has taught me that the more live stock I can afford to keep, fed to fatness by the consumption of cake and other food not produced by the farm, aided by an abundant supply of finely comminuted and prepared straw, is the true and cheap way to produce abundant manure of the best quality, and by thus greatly increasing the fertility of the soil, maximum crops and profit are secured.

Puny and unprofitable crops are the consequence of shallow and imperfect cultivation, the absence of drainage, and, above all, the want of a full supply of good rich home-made manure. The best of us don't half farm for certain crops, and I never heard of a farmer being ruined by the over-richness of his soil.

Tell me how much fat meat you make, and, as the manure is in exact relation to the meat, I can tell you how much corn and other produce you are likely to grow.

Nobody ever over-manured or too deeply cultivated for green and root crops, pulse crops, or grasses. The corn crops in rotation never can suffer from excess of fertility, provided the climate be cereal, and the quantity of seed duly apportioned to the condition of the soil and climate. *J. J. Mechi, July* 4.

THE CROPS.

[The following letter appeared in the *Times* of Monday Last.]

THE current transactions in the corn trade, together with anxiety as to the condition of the growing crops of the United Kingdom and France, have, during the last three weeks occasioned fluctuations and invoked a speculative spirit that have quite changed the position of the grain trade under circumstances that make the present level of prices uncertain and dangerous, since a temporary effect appears to be regarded as a permanent influence. While the great sources of supply forward grain fully to the extent expected and required, and while no serious misgivings exist as to the yield of the coming foreign harvests, from which our next season's supplies must come, a sudden, casual, and not extensive demand by French buyers has quite subverted the usually quiet summer business in Mark Lane, Liverpool, and the east coast markets, where weekly increasing prices have stimulated demand until those members of the corn trade who commonly stand aloof from speculative purchases have joined the movement, and the value of English Wheat has risen to 50*s.* 5*d.* per qr., from 40*s.* 9*d.* in March, or about 10 millions sterling advance on the year's consumption of Wheat in this country.

To indicate the extent of recent transactions, a reference to the reported sales effected in floating cargoes, on passage or for shipment, shows a total of 48 cargoes of Wheat, 174 of Maize, and 54 of Barley; and as most of these cargoes cannot be expected to arrive until August and September, and being purchased at rapidly advanced currencies, they infer value must rule high for some time to come,—an opinion in direct opposition to the action of millers and the basis of trade on which buyers and sellers agreed in March and April. Whatever the influences at work, they were strong enough to raise English red Wheat to 54*s.* 6*d.* per qr. for export to France; Russian Wheat was held off coast at 49*s.*, Canadian and Pacific Wheat, 52*s.*; and English white qualities realised 58*s.* per qr.; the above quotations being exceeded on special occasions. Next to

Wheat, Oats were raised in price several shillings, while Maize, Barley and Beans paid a handsome profit to importers and holders. These direct changes in value, occurring at a time when our prospects of summer supplies adequate to our wants were admittedly good, could have but one effect, which is already noticeable, the return of grain ships estimated on passage showing an increase of 123 vessels in one week, and a large portion of the additional number is made up of Wheat cargoes: the total number on passage is 544, bringing probably 1,500,000 qr. of grain. In ordinary years the imports of July, August, and September are nearly double those of the three previous months, and this season, as we received less than usual during April, May, and June, we are justified in expecting future supplies will increase in their full ratio a calculation that any merchant of experience would make as a matter of course. The late advances in price have, therefore, become a superstructure built entirely upon the dry character of the season in these islands, and especially in France. The drought is now broken, and the sound of falling rain on June 16 and 17 was the first note of the reaction in value which is now in progress, and which, having reduced the price of Wheat 3*s.* to 4*s.* per qr. from its highest point, seems likely to me, after viewing the cornfields in Kent, Essex, Suffolk, Norfolk, Cambridge, Lincoln and other Wheat-growing counties, to carry back the average price of British Wheat from 50*s.* 5*d.* to 45*s.* per qr. as rapidly as the advance was gained; nor can I suppose this week's currencies for other corn can be maintained under falling markets for Wheat. At present importers show a bold front in face of the general decline in price reported in London and the provinces, a position they may well maintain while the coast is nearly clear of cargoes, but no longer.

Choosing the fortnight when the Wheat has come into bloom, I have inspected between June 18 and July 1 a wide area of growing crops in several counties, and speaking with the reserve of one who has not seen all the fields—an impossible feat—I find the one decided impression I now hurriedly record is that there will this year be an average crop of Wheat, made so by an excess on the best lands, compensating for the deficiency that everywhere arrests the eye when looking over light, skinny soils, where the drills can be followed from headland to headland, and no more than 2 qr. per acre is likely to be reaped.

Anyone engaged in agriculture will know how critical has been the last fortnight, which has been unexceptionably favourable for the blooming corn. There has been some hot sunshine, oftener a cloudy sky, and the winds have been either light or so calm that, when at Cambridge on the longest day, the anemometer over the Observatory was motionless, and the weather-cocks of the several colleges each had distinct notions of the air currents they could not indicate. For the whole fortnight there have been no storms, but several showers, the mean rainfall of the last three weeks being 1 inch, while in east coast counties 2 inches had fallen before the two hours' rain of last Friday. After such a period, and with ordinary summer weather, two ears of Wheat this year will be worth three ears of such years as 1867. I had Wheat ears in bloom on June 14, and believe cutting may be expected to commence by the 24th inst., and will be general before the month is out.

To refer in more detail to the different crops and localities, I find my notes show in Kent the proportion of good Wheat fields were 90 to 34 of middling and 16 of bad, and the probable yield will be from 2 to 7 qr. The battle is one of acres—good land against poor land; and I estimate the soil cultivated with Wheat as three-fourths heavy, suitable land, to one-fourth of shallow, poor ground, which the system of rotation of crops misplants with Wheat. The crops of Barley and Oats in Kent and Surrey I should certainly not expect to reach an average. Beans are also deficient of promise, while Peas seem likely to make a fair return. The marshlands of the Isle of Thanet look green and flourishing; London and the Surrey hills having had, apparently, less rain than any other districts I have visited. With the hay crop noticeably short everywhere, the fields of yellow Clover in Kent were thick and healthy, and the Hops, clean and strong, looked very promising.

The crops round London, say in Herts and Essex, 20 miles, have only one good quality about them, and that is, a healthy colour—the Wheat looking thin and starved; Peas and Beans short and poor; the hay crop, well saved, half an average. To show the season there are fields of Wheat where strips and patches of the soil are deeper than the common area, and there the plant formed a strong contrast to its neighbour a few yards distant. Round Kelvedon and Colchester the Wheat and Barley fields were satisfactory, and are likely to give a fair yield. Round Ipswich they are poor, but Suffolk, as a county, I fully expect, will have an average crop of Wheat, Barley, Beans, Peas, Potatos and roots. In Cambridgeshire the general aspect of the fields is healthy, promising good crops without reserves or important exceptions, an opinion which was naively endorsed by a resident bidding me visit a certain district as the only one he knew "where the Wheat did not look well." Here the meadows and parks have fully recovered a green appearance. I was somewhat surprised to find the few Turnip, Rape, and Mustard seed crops all look well, with heavy tops. Barley, Peas, and Potatos were here and there especially good crops. Round Ely, on the light black soil, I should only call Wheat, Oats, and Beans middling and fair. The districts round March are important from the wide area planted, and, with exceptionally bad fields, the several crops, including Flax and Mustard, will certainly, with a fair summer, yield a fair crop, fine fields making up for the poor ill-farmed ones; the latter being creditably few. I include in the above remarks Whittlesea, Peterborough, and Grantham districts. I did not notice heavy fields, but most of them were fair, the straw of Wheat being stiff and strong, bearing good ears. Much of the land approaching Lincolnshire, gravelly on sandy rock a few inches below the surface, recalled the phrase "poor land, poor crops," but a drive of 25 miles over Lincoln Heath, with its 50 and 100-acre fields fenced with stones, showed a large area sown with Turnips, the Wheat and Barley both even, promising a fair yield, neither deficient nor heavy,—the whole country showing a happy medium between the Kentish clay soils and the shallow gravels of Norfolk, Essex, and Suffolk. I may mention that, in support of the view as to the general vigour of garden vegetation expressed in my last letter, I noticed on the seed farm of Mr. Charles Sharpe, at Sleaford, every description of seed—Onion, Turnip, Wurzel, Parsnips, &c.—had, without exception, matured, or was maturing, in the most satisfactory manner; and I judge that if the want of forage had not generally compelled farmers to feed off their Clover and other fields, the yield of seed would have been excellent. There are many notes I could wish to add of the districts round Boston, Spalding, throughout Norfolk and Suffolk, by different routes, but as they do not modify the above impressions, and as I propose to refer to foreign as well as home prospects in a future letter, I may only add that at present the late rains have given the Eastern Counties a second spring-green appearance, the newly-mown meadows looking as healthy as their occupiers can desire, while the forage stacks of last year are far from being exhausted. *H. Kains-Jackson, 60, Mark Lane, London, E.C., July 2.*

Home Correspondence.

Harvest Prospects, &c.—We are looking forward with much interest and no little anxiety to the approaching harvest. The past year's harvest proved very unsatisfactory both in product and quality, and, coupled with low prices for all kinds of grain, it left the growers in a very unenviable position. We trust the coming harvest may enable them to recoup themselves. This, however, is very problematical, particularly if it is to depend upon the yield of the crops. In some well-farmed districts, and upon good loams and loamy clays, the crops are good; but upon most of the light lands—*i. e.*, chalks, sands, gravels, peats, &c.—they are inferior, as also upon many heavy clays. Upon many of these soils they have seldom been more defective, and, had the drought continued much longer, very many fields would scarcely be worth the reaping. We cannot be sufficiently grateful to God for the seasonable relief accorded. The growth of every kind of vegetation is now exceedingly rapid, and the copious rains have proved of immense value, but they have come too late to be of any considerable value to these meagre crops on the light soils named above, but in the other districts and soils named the crops have wonderfully improved, and have seldom looked better—the bulk not great, but the saving of the Wheats and Barleys and the shagg of Oats is excellent. The Beans are short but well flowered, and Peas are a good crop. This showery season will probably do injury during the flowering process of the Wheat, but otherwise it must be satisfactory. It may be presumptuous to give any opinion relative to the price of corn during the ensuing year; but judging from some of the Continental reports it would be fair to say that the probabilities are greatly in favour of a higher average in price than the past year. I read in this day's report (June 30) from France, or rather Paris, that no rain has yet fallen there. The crops, too, are said to be very indifferent, so that France will no doubt be a competitor in the world's markets. Moreover, if we look to the state of the commercial, manufacturing, and trading interests of this country we find an astonishing increase at a very late date, and that of a healthy character. The exports are marvellous as compared with last year at this time. It is to be regretted that the agricultural returns just asked for do not include a request for the opinion of growers as to the probabilities of yield, or state of their corn crops. It is highly important that growers should obtain the earliest information upon this point, in order to guide their course of sales more immediately after harvest. The *Agricultural Gazette* is worthy of all praise for obtaining and making public the earliest reliable information thereon, and I trust it will pursue the like invaluable course at once; the earlier the better. Notwithstanding the reports may not be so truly reliable, they will sufficiently approximate to the truth for the growers' serious consideration if not safe guidance. Farmers are still slow in looking after their own interests. The returns are theirs and for their benefit chiefly, but there are yet a few to be found objecting to make them. *O. F.*

Crops in the Wisbech District.—I am very glad to be able to report a vast improvement in all our crops, both corn and root. I will not quote the hackneyed proverb referring to a wet June, as it has already been "done to death," although I am much impressed with the truth of it. The Wheat has greatly benefited by the rains which we have had lately, the short under-stems having lengthened considerably, and now support a good well-filled ear, which is far more than we expected of them a month ago. Oats have also filled well, and, although short in the straw, seem to promise a fair amount of corn. The few pieces of Barley look well; the thickest of these have gone down, and all chance of a sample of malting Barley from them is of course impossible. Of Peas I cannot say much from personal inspection, but am told that they are well podded, and free from filth. Beans are short. Mustard, of which I gave you such a bad account a short time ago, is looking a good deal better, having grown both stouter and taller since the termination of the drought. The yield will thus be increased, and I think that the average may yet reach 20 bushels per acre, if it can be well harvested. Potatos are growing apace, and may yet pay for the heavy dressings of Peruvian guano and superphosphate with which they were treated, in many places to the value of £4 10*s.* per acre. Mangels require two separate reports, as in some fields they nearly cover the land already, whilst in other places they are not forward enough to single out; in almost every instance where they were put in in the early part of May they have grown capitally, but where late sown they got no start until about a month ago, and are naturally very small at present. Of Turnips and Swedes I cannot report, except that they are not much grown, our land not being suited for their growth; Kohl Rabi has superseded them. I cannot finish without saying a word or two with reference to the crop of hay; as I reported last week it is almost a complete failure, and where the rain has prevented the farmer from touching it after being mown the eddish has grown quite through it, and the hay cannot be seen at all. If we have fine weather from this time, I think we may rely upon beginning harvest the latter part of this month. *Nemesis, July 4.*

Crops in Essex.—All the crops on the heavy cold lands in this neighbourhood are looking well, where well farmed, especially Wheat. The prolonged drought has prematurely dried up many Barley and Oat fields, and even some Wheat fields on sharp and dry soils. *T. J. Mash.*

Mr. Smith, of Woolston, and the Land Agents.—On looking over some late numbers of the *Agricultural Gazette* this morning I got interested in a somewhat animated discussion between "G. A. H." and Mr. Smith, of Woolston, on the merits of Mr. Lawes' last paper on tenant-right. I was surprised and sorry to find Mr. Smith using the following words:—"I must take exception to another of Mr. Lawes' conclusions—2d. That excepting under special agreement, and with the purchase of stable dung, no straw or root crops should be sold off the farm." "Here," says Mr. Smith, "is Mr. Lawes taking up the cry of the old hound, the land agent, who, in everything he does, tries to please the master who pays him, so in all agreements he puts in this stupid clause." Long ago, when farming down in Scotland, I have spent many a winter night in reading Mr. Smith's speeches and papers, and I had learned to look up to and respect him as a man who had done a great deal for the cause of agricultural improvement. You may imagine then my surprise to find him using such language as this, and that, too, when talking of a class which, only the other day, comprised among its numbers such men as John Grey, of Dilston. I could scarcely believe my eyes, and looked twice at the signature to make sure that it was really Mr. Smith who was writing. If Mr. Smith had used these words in the heat of debate it would have been bad enough; but the very fact that they were written deliberately, and most likely in the quietude of his own library, adds, if possible, to the grossness of the insult. I should certainly have expected more courtesy from a gentleman of his position. In these days of agitation and excitement there can be no greater folly than that of the demagogue who trys to set class against class. In spite of all the progress we have made, agriculture is only yet in its infancy. There are many important improvements required in the general position and surroundings of the English farmer before he can find himself in as comfortable a position as his Scotch friends. In order to effect this happy change, owners, farmers, and agents, must work hand in hand: what a mistake, then, to make each believe that the others are adverse to their interests. Mr. Smith says, that land agents, as a class, try to please the owner, to the detriment of the farmer,—in fact, that we are not in the habit of conducting our business impartially. There could be few graver charges made, but we are quite content to leave the agricultural public to judge of its correctness by their experience of our dealings between man and man. I have been intimately acquainted with English landowners for many years, having had them as pupils on my farm, and also conducted their business as an agent: I thoroughly believe that as a class they would spurn with the utmost contempt any man who meanly toadies

to their interests, or who—to quote Mr. Smith—like a faithful hound in everything he does tries to please the master who pays him, and stupidly introduces one-sided clauses into leases and agreements, which, if carried out, would help to deprive the energetic and industrious farmer of the larger share of his well earned profits. *Wm. Scott*, 82, *Mark Lane*.

Straw and Dung.—"G. A. H." is not over kind in his attempt to give me a lesson upon farming, inasmuch as I am required "to travel through Wales next winter." Rather cold work this (as well as costly), for I already know what Wales is. I am to see thousands of young cattle wintered upon straw and nothing else, for five or six months, yet do not get lousy. They must get shut in at their straw in November, and they must keep at it till the end of March. In England straw is dry stuff in March, but Welsh straw may be a better sort for cattle feeding, *i. e.*, full of grass. If so, "G. A. H.," "nothing else" will not hold good. Now, to make the lesson as complete as I can, I want "G. A. H." to give to me, through your paper, the names and addresses of men in various parts of Wales who do feed their young cattle for "five or six months" in the winter on straw and nothing else; I will then give to you the results of my inquiry for publication. "G. A. H." is not very consistent; one day he tells us that straw feeds an ox, or rather increases its weight. Now he tells us that if I pass my straw through cattle "it will do my farm more good" than the same quantity of straw well watered would. Now, I want to know how this straw, passed through cattle—leaving, as "G. A. H." tells us, the fat and sinew making qualities in the cattle—can do my land more good than though it was well watered and sent to my land with those qualities retained in it. *William Smith, Woolston, Bletchley Station, Bucks, July* 4.

Farm Agreements.—From the spirit that pervades the letter of your correspondent, "J. M'K.," in last week's impression, one would be led to suppose, either that he was a landlord or the representative of one. Still there is an amount of candour in what he says, that both landlords and tenants individually entertain their pet opinions on farm agreements and tenant-right. Both incline to be narrow in their ideas, and in their obstinacy miss the correct decision of the matter. The commercial man, whether or not his course lies between the two, as a rule takes a more liberal view of matters than either. He looks on the borrowing or leasing of land as so much money hired at interest or rent for an agreed term. He may be a shorter or longer time in reaping his expected fruits, but to disturb him in possession, or hang over him "surrender at pleasure," cramps his energies, and he cannot give that play to them which he would otherwise do were his tenure more satisfactory. Even so with the tenant, who with the counterpart of his lease in his pocket, considers himself a little independency, and, knowing his terms, is prepared to stand or fall by them. Such a usufruct for the landlord's land or money, or whatever it be, cannot be contrary to his interest, having sold in the best market; and it is, what the commercial man would say, only business-like. Notwithstanding what has been written, read, or spoken—if not sung—about the Game-laws, as "J. McK." does not favour us with his independent chirp, perhaps he may listen to mine. This is an age of progress, and our old coach notions relative to game, as everybody's right and nobody's wrong, are being left behind. If a landlord is to have ground or winged game subsisting on the hard earnings of his tenant, he ought to pay for them. No loose "understandings" about that—so that before the term is over, by some accident or other, the landlord and tenant break through their good intentions. The landlord resents, and then the tenant, like the spoilt child, goes crying to the Legislature, "No protection." If the tenant has not the moral courage at the first of the lease to insist, let the Legislature reduce it to a £ *s. d.* transaction for him, and enact that tenants have damages for injury by game, all stipulations to the contrary of none effect—rabbits to be game, so that a landlord may keep a warren in the heart of a farm, if he has a mind to, but he may have to pay for it. I quite agree with "J. McK." about the delivery between tenants, that it be made when there is least to deliver; and this is during the dormant or winter season. Farms changing hands in summer, there is twice the battle with them that there is at a winter or November entry, and this introduces the subject of tenant-right. There are some improvements effected by a tenant — always with the landlord's consent, of course—and which he may not have been compensated for; draining, surface reclamation, unexhausted manures, &c., are some of these. Take, for instance, a tenant not 40 miles north of Inverness:—He had to leave his farm at the Whitsunday old term—May 26; amongst a world of other things on a farm of 600 arable acres on a five and six-course shift, he had to be paid for young grass. This he took care to have on the finest of his land. It may surprise some of your readers, but just three months before, this said grass had to be valued—be it told to his credit—he top-dressed it with 3 cwt. of nitrate of soda per acre, and so being luckily favoured with a wet or droppy spring, he, and everybody about him, considered, by the magnificent crop presented at valuation time, that he had all his top-dressing money and more to boot by the speculation. As to restrictions on cropping, &c., as the landlord lets his land in the dearest market so let the tenant do the same with the produce; and let him dispose of straw for paper-making, for instance, if it pays. If drains are of proper construction, and in good working order, they are almost worth the money they cost at first; but shallow drains, badly arranged—the materials of these are worth nothing to anybody. As to substantial manures, be they animal, vegetable, or mineral, see first that they have been put into the land, and of what quality and quantity by voucher, and trust to fair arbitration for what may remain. About lime, the old theories of a septennial dose are well nigh exploded now. Farmers will find it more to their advantage to use it frequently and in small doses. What we want for settling all these questions of rights, is some such court as Mr. Gladstone has prepared for the Irish folks to settle their matters by. True it is these are referred at present to arbitration, but arbitration is an expensive business in the end; something cheaper is wanted, and as effective. Are there not gentlemen, be they real or ostensible farmers, who as they would aspire to the bench of a magistrate's court, might feel as much honoured in being appointed to the honour of administering right, be it tenant's or landlord's, from a civil bench at term-times, and who ought like J. P.'s to hold a degree, not of Justice of the Peace, but of J. R.—Justice of the Right? *A. Scott, June* 29.

The Clover Dodder.—The men engaged in cutting a field of Clover in this parish discovered many large patches (say from 2 to 3 yards square) of the enclosed. It was so tenacious and so interwoven with the stalks of the Clover that they covered themselves with it, and literally wore it home, causing no little excitement by their "bearish" appearance. Can it be that, owing to the excessively dry season, a large portion of fibres or roots have extended themselves along the surface of the ground, or is it some weed unrecognised by me? A large piece, in the shape and of the size of a bearskin, and of about a couple of inches thickness, should be seen before the very strange appearance of it can be realised. *W. Y. Pope, Symondsbury, Bridport, July* 4. [The patches are the growth of a parasite, Cuscuta trifolia, the Clover Dodder—unfortunately common enough now in a Clover field.]

"G. A. H." and "West Indian."—The quotation I gave referred to Tiptree Hall farm, and the practice pursued there, and urged on the farming community at large by Mr. Mechi at pp. 14 and 109, 1868, entitled "Stock Feeding and Meat-making." Most of your readers will think with me that it does not require "G. A. H.'s" assurance to convince us that "any dairyman who has a few cowhouses without an acre of land, can feed cattle with bought food; but he is not a farmer." At the same time, if the dairyman had the acre of land on which he could use the manure from his cowsheds, he would (even in "G. A. H.'s" opinion) be able "to replace the Potatos with bought food and artificial manures," though on a smaller scale than the East Lothian farmer. In the quotation, p. 875, "G. A. H.'s" opinion as to good farming in 1868 is placed side by side with his opinion, matured, it may be, from practical experience, in 1870. The East Lothian evidence is qualified by "G. A. H.," who says, "if I am rightly informed;" and I fancy my experience of East Lothians and their doings is more of a practical nature than his, and I find I can "venture into the domain of the east wind" with less "borrowed wool" on my back than a long West Indian residence would lead even "G. A. H." to "suppose." "G. A. H." should cast aside personalities and metaphor, and his writings, or, as our old friend Mr. Mechi would put it, "the sayings and doings of 'G. A. H.'," may prove of some service to the agricultural community. *West Indian.*

Foreign Correspondence.

EVRY-SUR-SEINE: *July* 5.—The reaping-machine competition, announced in the *Agricultural Gazette* of June 24, commenced here to-day on M. Decanville's farm at Petit Bourg, and will be continued to-morrow. The exhibitors have warm work of it just now in France. The other day they were at Lille, in the North; to-day they are here. On the 18th they are invited to repeat their trials on Count Rottolan's estate at Buisson-Garambourg, near Evreux, westward of Paris; and again, on the 25th inst., at M. Sagny's farm of Charmant, near Senlis, on Northern line, and there is little doubt that more work is in store for them.

The *concours* has been organised by the Society of Agriculturists of France, in concert with the societies of the departments of the Seine and Oise, the management of the whole being entrusted to a body of eminent agriculturists, 15 in number, members of one or other of these societies. The jury consists of seven gentlemen elected from this body by the competitive exhibitors themselves, with Professor Wilson, nominated by the Royal Agricultural Society of England. This introduction of an English jury shows a consideration on the part of the associated societies which should not be overlooked.

The English machines present are those of Mr. Samuelson, Messrs. Howard, Messrs. Hornsby & Son, and Mr. Mattison. Mr. Woods', and Messrs. Brigham and Bickerton's did not arrive in time for the day's work, and I do not know whether they will now be permitted to take part in the competition. Four French makers exhibit, but only one, that of M. Sallier, can be called an original machine, the others are, properly speaking, English or American; however, during the short trial of this morning all went well, and are again doing so while I write, but the time of the departure of the post in these parts shuts me out from saying more.

To-morrow it is understood that every one will put on all the steam possible, and I hope to send you some account of the results in time for your next issue.

The weather is magnificent, hot but not oppressive; the soil like a board, and the grain spare and stunted in the extreme, little corn and less straw, a sad spectacle for farmers. It is well ripened, but green ears are to be seen here and there. *G. A. Y.*

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, July* 6.—Present, the Duke of Devonshire, K.G., President; the Earl of Lichfield, the Earl of Powis, Major-General Viscount Bridport, Lord Kesteven, Lord Tredegar, Lord Vernon, Sir Massey Lopes, Bart., M.P., Sir A. K. Macdonald, Bart., Sir H. B. Vane, Bart., Sir Watkin W. Wynne, Bart., M.P., Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Davies, Mr. Dent, M.P., Mr. Druce, Mr. Holland, Mr. Wren Hoskyns, M.P., Colonel Kingscote, M.P., Mr. Leeds, Mr. Pain, Mr. Randell, Mr. Ridley, M.P., Mr. Shuttleworth, Mr. Statter, Mr. Stone, Mr. Thompson, Mr. Torr, Mr. Webb, Mr. Wells, M.P., Mr. Whitehead, Mr. Jacob Wilson, Professor Simonds, and Dr. Voelcker. Earl Howe, of Gopsall Atherstone, Warwickshire, was elected a Governor of the Society.

The following new members were elected:—

Allix, W. Townley, Campsea Ash, Wickham Market.
Baker, Rev. R. Loubridge, Ramsden, Emstone, Oxford.
Bayley, Rev. W. R., The Vicarage, Cassington, Oxford.
Blagrave, Edward, Oxford.
Bowen, Edward H., Kingslow, Bridgnorth, Salop.
Bowen, Humphrey C., Chesterton, Bridgnorth, Salop.
Boydell, Harry S., Sulham, Reading.
Bridgland, Stephen, Springfield, Tooting.
Briggs, D. Grant, Calcethorpe, Louth.
Coley, Henry, Neachley Hall, Shifnal.
Croysdale, John, Whitley Bridge, Pontyfract, York.
Devaux, Alexander, 20, Avenue Road, St. John's Wood, N.W.
Douglas, James Bryant, 1, Hampden Street, Notting ham.
Ellett, Robert, Cirencester.
Everett, William Spencer, Carlton Colville, Lowestoft.
Fox, John, Coalbrookdale, Wellington, Shropshire.
Furness, Captain M. W., Rugby.
Garland, T. Bland, Hillfields, Reading.
Gibson, Joseph, Whelprigg, Kirkby Lonsdale.
Gillart, Richard, Llynlloedd, Machynlleth, Montgomery.
Greenaway, George Cattell, Binswood Cottage, Leamington.
Griffin, George, Torton, Kidderminster.
Hathornthwaite, W., Lower Lee House, Higher Wyersdale, Dolphinholme, Lancaster.
Hill, John, Wistaston Manor House, Nantwich.
Howman, Henry A., Halloughton, Coleshill, Warwick.
Humphrey, Arthur, Walpole St. Peter, Wisbeach.
Isham, Arthur C., Weston Turville, Tring, Bucks.
Jones, Thomas, English Frankton, Ellesmere.
Kelsall, George, Marton, Baschurch.
King, John Robert, North Ormsby, Louth.
Knight, William Edward, 14, Carter Gate, Newark, Notts.
Marker, Richard, Combe, Honiton, Devon.
Martin, Antoine, Malagnow, Geneva.
Martin, Henry W., Littleport, Isle of Ely.
McHattie, John, Chester.
Meridith, David, Yeatsall, Rugeley.
Middlemore, Colonel, Thorngrove, Worcester.
Mildred, Daniel, Preston, Cirencester.
Miller, T. H., Singleton, Kirkham, Lancashire.
Mort, William Martin, Baschurch, Salop.
Moss, Benjamin, Ashington Hall, Rochford.
Newton, John, Manor Road, Bermondsey, S.E.
Nevell, Edward, Chawley Farm, Cumnor, Oxford.
Noel, Captain Charles Perratt, Bell Hall, Stourbridge.
Norris, W. G., Coalbrookdale, Wellington, Salop.
Pickstock, Henry, Baschurch, Shrewsbury.
Pratt, Frederick, Westmon, Petersfield.
Ridley, William Wells, The Abbey, Southam.
Spiers, Richard James, 14, St. Giles Street, Oxford.
Stratton, James, Chilcombe, Winchester.
Stunt, Walter C., Brogdale, Ospringe, Faversham.
Teece, Richard, Weston Villa, Baschurch, Salop.
Thompson, T. Warren, 1, Claremont Bank, Worcester.
Thorpe, Henry, Buckingham.
Turnor, E. Weston, Brereton, Rugeley.
Turton, Rev. H. M., Berkeley, Gloucester.
Waldo, E. Waldo Meade, 20, Calverley Park, Tunbridge Wells.
Walker, Joseph, Chorlton, Nantwich.
Ward, William, 41, St. Giles, Oxford.
Weaver, William Richard, 108, Eastgate Street, Chester.
Welch, Alfred, Southall, Middlesex.
Weston, Philip, Coaldbrook Hall, Wellington.
Williams, Hugh, Chesterton, Bridgnorth.
Worley, William, Stanton Harcourt, Eynsham, Oxford.

FINANCES.—Major-General Lord Bridport (chairman) presented the report, from which it appeared that

the secretary's receipts during the past month had been duly examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and found correct. The balance in the hands of the bankers on June 30 was £2308 9s. 3d., and £3800 remains on deposit. The quarterly statement of subscriptions and arrears to June 3, and the quarterly cash account, were laid on the table.

JOURNAL.—Mr. Thompson (chairman) reported that the Secretary had received a letter from the Secretary of the Société des Agriculteurs de France, stating that the subscriptions promised to defray the expenses of the Congrès International of 1871 already amounted to a large sum, and that it has been decided to hold the Congrès during the last fortnight in May.—This report was adopted.

CHEMICAL.—Mr. Wells, M.P. (chairman), stated that the secretary, having reported to the committee that Messrs. Bradburn & Co. had addressed a letter to the Editor of the *Agricultural Gazette*, threatening them with legal proceedings, in consequence of their publication of the quarterly report made by the Chemical Committee of the Council last March, the committee therefore recommended that the secretary inform the Editor of the *Agricultural Gazette* that the Society are prepared to hold themselves responsible for the publication of their own proceedings, and the reports of their committees, as furnished by the secretary. The committee also reported that Professor Voelcker had reported to the committee the papers which he had furnished since 1855, based upon actual experiments made by himself or under his direction. Up to the year 1865 these experiments were carried out on the farm of the Royal Agricultural College at Cirencester; since then, by friends of the Professor, under his direction, and the papers published in the Journal are the result. The committee and the Professor request the co-operation of any member of the Society who will suggest and assist in carrying out further experiments of the same nature. The following is the list of papers published:—

In 1855—Experiments on the comparative value of different artificial manures for raising a crop of Swedes.

In 1858—Experiments upon Swedes, with remarks on the manures employed, made in 1856 and 1857.

In 1860—Experiments with different top-dressings upon Wheat, made in 1859.

In 1860—Experiments on Swedes.

In 1862—Experiments with different top-dressings upon Wheat, made in 1859-'60 and '61.

In 1863—Experiments with different top-dressings upon Wheat, made in 1862.

The preceding experiments were done on the farm attached to the Royal Agricultural College, Cirencester.

In 1864—1, Salt experiments on Mangels; 2, Field experiments on Clover seeds; 3, Field experiments on Clover in relation to the changes which take place in the field and stack in haymaking; 4, Field experiments on crude German potash-salts and common salt on Mangels; 5, Field experiments on root crops; 6, Field and laboratory experiments in relation to the causes of the benefits of Clover as a preparatory crop for Wheat; 7, Field experiments on seeds and permanent pasture; 8, Field experiments on Mangels for the last Journal.

At present there are in hand for publication in the forthcoming Journal:—Experiments on Potatos. And have in hand the results of several series of experiments in Clover seeds and permanent pasture, extending over several years.

Experiments are in progress this season on Swedes and Turnips, Potatos, artificial grasses, and permanent pasture. They are undertaken by Messrs. Coleman & Hull, York; Mr. Roberts, Haslemere; Mr. Cadle, Gloucester; Mr. B. Lloyd Baker, Hardwick Court, Gloucester; Mr. Norman, Aspatria, Carlisle; Mr. Wall, Durham; Mr. Lloyd, Hertford; Mr. Sharpley, Stilthorpe, Louth; Mr. Kimber, Abingdon, who also has in progress experiments on the different forms in which phosphates are most beneficial to vegetation; comparative experiments with coprolites, precipitated phosphates, bones, soluble phosphates, &c.

The question of the variation in quality of guano having been again brought before the committee, and suggestions having been made that some standard of quality should be settled by the importers, and all cargoes valued accordingly, the committee advise that a communication be addressed to Messrs. Thompson, Boran & Co., the agents of the Peruvian Government, calling their attention to the many complaints sent to the Society as to the variable and inferior quality of guano as now imported, and asking them if they can propose any method of placing the trade on a more satisfactory footing, and giving some more certain guarantee of the quality of the cargoes imported.—This report was adopted.

GENERAL, OXFORD.—Lord Kesteven reported the following recommendations of the committee:—That Professor Simonds be allowed the travelling expenses of not more than three veterinary assistants at the Oxford meeting; that the charge for additional land at Oxford, obtained at the request of the Council, amounting to £43 2s. 6d., be paid by the Society; and that a further sum, not exceeding £100, be granted for advertising the Oxford meeting.—This report was adopted.

SHOWYARD CONTRACTS.—Mr. Randell reported that the committee recommended that the approaching termination of the existing contract for showyard works be advertised before the Oxford meeting; that certain additional works at Oxford be executed according to the suggestions of the honorary director and the surveyor; and that the surveyor be instructed to prepare a draft plan of the showyard for Wolverhampton.—This report was adopted.

IMPLEMENT.—Mr. Thompson reported that, after full discussion of the different modes of dealing with the trials of steam-cultivating machinery, and of the kinds and amounts of prizes to be offered, it was resolved to refer to the Council the following questions:—

(1.) What sum shall be allotted to the implement trials for 1871, bearing in mind that the published rotation restricts these trials to "machinery for the cultivation of the land by steam-power and traction-engine?"

(2.) When shall the meeting of the committee be held which shall fix the classification and conditions of the trials at Wolverhampton?

The committee recommended that the exhibitors of steam cultivating machinery at Oxford be invited to attend a meeting of the Implement Committee to be held in the showyard on Saturday, the 16th, at 3 P.M., and to offer for the consideration of the committee any suggestions which seem to them advisable with reference to the prizes to be offered at Wolverhampton. This report having been adopted, it was moved by Mr. Thompson, seconded by Col. Challoner, and carried unanimously, "that a sum not exceeding £800 be granted for implement prizes in 1871." The special meeting of the Implement Committee to fix the classification and conditions of the trials to take place at Wolverhampton was fixed for Saturday, the 16th, at 3 P.M.; and the committee were ordered to report to a special Council meeting to be held in the showyard at Oxford, on Tuesday the 19th inst.

A deputation, consisting of the Mayor of Wolverhampton and Mr. R. H. Masfen, on behalf of the authorities of Wolverhampton, was then received, to present an application for leave to substitute other fields for those which were originally offered, for the trials of steam cultivators in 1871. The question having been carefully discussed, it was moved by Mr. Randell, seconded by Mr. Jacob Wilson, and carried unanimously, "that this application be granted," it being understood that the Society could obtain, if required, 50 acres of strong land, at a cost not exceeding £10 per acre.

The following noblemen and gentlemen were appointed a General Wolverhampton Committee:—Duke of Devonshire, K.G.; Lord Walsingham, Earl of Lichfield, Earl of Powis, Viscount Bridport, Lord Chesham, Lord Kesteven, Lord Vernon, Sir Massey Lopes, Bart., M.P.; Sir A. K. Macdonald, Bart.; Sir Watkin W. Wynn, Bart., M.P.; C. E. Amos, Mr. T. C. Booth, Edward Bowly, Charles S. Cantrell, John Clayden, D. R. Davies, Joseph Druce, W. J. Edmonds, W. F. Fryer, B. T. Brandreth Gibbs, Richard Hornsby, C. Wren Hoskyns, M.P.; Colonel Kingscote, M.P.; Robert Leeds, R. H. Masfen, Richard Milward; Mayor of Wolverhampton for 1870 and 1871; Charles Randell, R. C. Ransome, M. W. Ridley, M.P.; William Sanday, Joseph Shuttleworth, Thomas Statter, William Torr, Sir H. R. Vane, Bart.; F. Walton, James Webb, William Wells, M.P.; Charles Whitehead, Lieut-Col. Wilson, Jacob Wilson, the Stewards.

On the motion of Mr. Thompson, the following rotation of districts,* recommended by the Country Meeting Districts Committee, was unanimously adopted:—

Years.	Present Designation of District.	Proposed future Order of succession.	Place of the Exhibition Meeting.	Date of the Meeting.	Interval between the Meeting on the Present and the next Occasion.	Interval between the Meeting on the Present and the next Occasion but one.
1870	A	1	Newcastle	14	9	11
1871	D	2	Bury	13	7	11
1872	F	3	Plymouth	16	10	8
1873	C	4	Leicester	8	8	
1874	B	5	Maidstone	14	7	15
1875	G	6	——	13	6	14
1876	E	7	Oxford	13	9	11
1877	H	8	Wolverhampton	14	8	11

Mr. J. Dent, M.P., having withdrawn the motion of which he had given notice, Mr. Holland (chairman of the Education Committee) gave notice that at the next monthly Council he would move for a renewal of the education grant.

Mr. C. Whitehead gave notice that at the next monthly Council he should move that implements and machines used in the cultivation and preparation of Hops be inserted in the Society's classification of implements for which prizes are offered.

* The district (with the counties contained in each) for the following year (A. Durham, Northumberland, and North and East Ridings of Yorkshire. (D.) Bedfordshire, Cambridgeshire, Hertfordshire, Huntingdonshire, Norfolk, and Suffolk. (F.) Cornwall, Devonshire, Dorsetshire, Somersetshire, and Wiltshire. (C.) Derbyshire, Leicestershire, Lincolnshire, Northamptonshire, Nottinghamshire, Rutlandshire, and Warwickshire. (B.) Cumberland, Lancashire, Westmoreland, and West Riding of Yorkshire. (G.) Gloucestershire, Herefordshire, Monmouthshire, Worcestershire, and South Wales. (E.) Berkshire, Buckinghamshire, Hampshire, Isle of Wight, Middlesex, Oxfordshire, Surrey, and Sussex. (H.) Cheshire, Shropshire, Staffordshire, and North Wales.

A letter from Mr. A. Welch in reference to a patent cattle truck, was referred to the Implement Committee.

A memorial from exhibitors of carriages was received, and the secretary was instructed to inform the memorialists that the conditions of the Society's prize-sheet must be complied with.

Farmers' Clubs.

DARLINGTON.

Fat versus Dairy Stock.—Mr. WILSON, of Woodlands, lately read the following paper before this Club:—

This is a subject of very great importance, and well worthy of being discussed by such a meeting as this. I am at a loss to understand how it was not taken up long ago, and that by abler hands. Whatever view we make take as to which of the classes is the most profitable, I am sure we shall all agree that it is second to none in all our agricultural departments. In the management of our respective holdings we must always keep prominently before the mind how we are to provide for our stock—the greatest quantity and finest quality of food, for according to the amount of stock we can keep on a given portion of land depends to a great extent our success or failure. It is a bad sign of an occupant to see a small stock on a common rotation farm. But whatever be the number of our stock, the principal thing is to have them well fed, well housed, and properly attended to, with plenty of grass in summer and an ordinary amount of house-feeding in winter, being always careful to guard against waste or extravagance, as there is a limitation in feeding that will pay to come to, but won't pay to go beyond. We must always keep in view wherein the profit lies.

But to come to the point at issue, whether a dairy or a fattening stock is the most profitable, we are apt to look at certain things from certain standpoints, and, according to the view we take, to fix our opinions, and these opinions may not easily be changed unless something is brought forward to prove that we are wrong. I have tried both ways. I had my own suspicions at first, but I have found that a fattening stock is the most profitable.

The expense of utensils and working a fattening stock is very small in comparison with that of a dairy, and the income per head will only, in exceptional cases, be in favour of the dairy; whereas one-third more in number can be kept of fattening than dairy cows on the same portion of land in summer. Therefore the balance comes to be greatly in favour of fattening stock. To make it as clear as possible, we might take, for example, two parties entering into two farms at the same time. The farms are of ordinary size, alike in every point, and in the same locality. Both tenants start with their respective farms under very propitious circumstances. A. prefers a dairy and B. a fattening stock. A. purchases for his grass land, at May 1st, 30 cows at £12—£360, and B. 45 young cattle at £8, which makes £360. So far both are alike. Both have to see that their fences are secure before turning their cattle on their pastures. B. has now only to see that his cattle are looked to once or twice a-day, during summer, to see that they are all right; while A., on the other hand, has a great deal of expense and anxiety to encounter that B. knows nothing of.

In the first place, he has to provide a considerable number and variety of utensils, for the proper management of such a dairy; and in the second place, he must look out for a first-class dairymaid, and I am sure all will be at one in this, that such an individual is not easy to be got. There must be two other women to assist, for where there are 30 cows you can't do with less than three women, whose board and wages will take about £60 a-year—certainly they will do the ordinary house work, and, if necessary, one of them occasionally outdoor work, which will reduce the above sum by about £20, leaving £40 for attendance on cows.

Then to keep up this dairy in its original state must take about £20 a-year for tear and wear of cows and utensils. I think the most systematic mode is to sell out a certain number of the oldest and least productive cows every year, and fill their places with queys in calf. Still in this way there is a loss of produce, if we consider that a quey the first year does not give as much produce by one-third as an ordinary cow. We might adopt other methods, but the above, in my opinion, is the simplest in practice. To keep a cow one year will take about £11 5s., in the following proportions, viz.:—£4 for pasture, £1 for cut grass, Vetches, and soft Turnips, £3 for straw and hay, 35s. for Turnips, and 30s. for bean meal and bran. There is to be added 10s. for wear of cows, 4s. for tear and wear of utensils, and about 26s. for work, making a total of about £13 5s. The dung might stand against the last two items, and thereby reduce the expenditure by 30s.

Still, after all, it is questionable if there are many dairy stocks in this district, in ordinary seasons, giving produce to that amount. Now, what is the use of a large income if our expenditure go beyond it? We are sure to get into difficulties, and may not get easily extricated. As to a fattening stock, they are allowed to roam on their pastures at full liberty until the 1st or the middle of October. They should then be brought into well-ventilated byres and kept warm and quiet,

the byres should not have more than eight or ten double stalls each, so that one lot may not be disturbed while the others are being fed, and care should be taken as to the kind, quantity, and quality of the food they receive, so as not to allow them to fall off in condition, as cattle at first are apt to do when taken from pasture to stall-feeding.

I think the most economical plan of feeding is to grow on the farm nearly all they require, and anyone who has accommodation could not send their produce to a better market, according to present rates, than to consume it with feeding cattle. I would begin them with Cabbage, which are in a good state for lifting at this time, and nothing suits the constitution of the cattle better at the first stage of stall-feeding. About half an acre will supply 45 cattle with two meals a-day for two weeks, at a cost of a little less than 1½*d.* each per meal. I would prefer boiled unmarketable Potatos for the third meal, mixed with a variety of stuffs, such as chaff, corn dust, and a mixture of Beans, light Wheat, Rye, Barley, and Oats, all ground up together, giving about 3 lb. of this bruised grain to each every day.

Under this treatment they are sure to improve from the first day they are housed. When Cabbage and Potatos are done, give them Turnips instead twice a day, 28 lb. sliced raw, and once boiled, with the usual mixture of chaff and bruised grain. I approve, during the last six weeks or two months, of giving them per day twice boiled and once raw food, and with double the quantity of bruised grain and a little oilcake, always giving straw or hay after each diet. To provide food as I have described, will take, for pasture, from May 1 to October 1, £2 10*s.*, and for stall feeding, from October 1 to May 1, £10 10*s.*, and 15*s.* for attendance and implements, making a total of £13 15*s.* The manure will reduce the expenditure about 48*s.*, which leaves £11 10*s.* to be added to £8 inlaid price, which makes £19 10*s.* for each animal. With ordinary markets they can be made worth fully that sum.

The kind of stock I prefer for stall-feeding is either pure Ayrshire bullocks and heifers, or a cross between Ayrshire and Shorthorn. But I would not be too partial to any particular breed. Get a well-moulded frame, be careful in making purchases, and there is less difficulty at the end. In ordinary cases, we don't allow such a length of time for stall-feeding well-conditioned cattle, but by giving seven months' stall-feeding after five months' good pasture is the sure way to bring them to perfection. In a herd of any considerable size there is always a percentage that don't require much stall-feeding. After good pasture, place these into a byre by themselves, and send them off as soon as ready, and fill their places with lean cattle; by adopting this plan, a double profit may be gained at no extra cost of feeding stuffs.

Notices of Books.

Second Report of the Commissioners appointed in 1868 to inquire into the best means of Preventing the Pollution of Rivers. *On the "A. B. C." Process of Treating Sewage.* Her Majesty's Stationery Office.

The work of this Commission has great agricultural significance and interest, because the principal sources of river pollution are matters which have great value as fertilisers. Town sewage, which is the principal offender, has undoubted agricultural value; and the present report is a discussion of the "A. B. C." patent plan for its defæcation and for the manufacture of useful manure from it. We may shortly say that the investigation results in a conclusive proof that it is a failure as a cleanser of filthy water, and we may say therefore a failure as regards the value of the manure which it extracts. The conclusions to which the Commissioners arrive are stated in the following extract:—

"1. The process removes a large proportion of the suspended impurities from sewage, but on no occasion, when we have seen it in operation, has this removal been so complete as to render the effluent sewage admissible into running water.

"2. The 'A. B. C.' process removes a very small proportion of the soluble polluting matters from sewage. After treatment by this process, the effluent sewage is very little better than that which is obtained by allowing raw sewage to settle in subsidence tanks.

"3. The manure obtained by this process has a very low market value, and cannot repay the cost of manufacture.

"4. The manipulations required for the extraction and drying of this manure are attended with a nauseous odour, especially in warm weather, and would occasion a serious nuisance if the works were situated in or near a town."

We add the following passage relating to the agricultural value of the "A. B. C." manure, and the contrast which the "A. B. C." process presents when it is compared with irrigation, whether as a defæcator or a utiliser of river sewage:—

"*The 'A. B. C.' Manure.*—We have now to consider this process as a manure-producing operation, because if it be true that a valuable manure can be thus extracted from sewage, it might be advantageous to prefix this method of treatment to some other method capable of purifying the effluent liquid; thus it might be advantageous to make it preliminary to irrigation, since, as we have shown, the effluent liquid still retains the whole of the valuable soluble constituents, and has lost only matters in suspension. It is true that the field for profitable enterprise is here greatly narrowed by the circumstance that only about one-eighth of the manure value of raw sewage attaches to the suspended matters, still, taking into consideration the enormous annual value of the sewage now for the most part wasted in this country, it might be worth while to extract even this small fraction if it could be obtained in a sufficiently portable and concentrated form.

"The chemical analysis of the precipitated mud which, under the guidance of the Messrs. Sillar, we extracted for this purpose from one of the subsidence tanks on May 10, does not afford any encouragement to such an enterprise. This mud, acidified with dilute sulphuric acid to prevent loss of ammonia, and dried in the air, contained the following ingredients:—

Organic matter containing 18.15 parts of carbon and 1.55 parts of nitrogen	34.27
Ammonia	.16
Phosphoric acid	1.93
Clay and other useless mineral matters	56.13
Water	7.40
	100.00

Total nitrogen calculated as ammonia = 2.05 per cent.

"In the preparation of the manure at Leamington, the mud is pumped into centrifugal drying machines, which were not at work on the occasion of our recent visit. We were, however, informed that one-half or more of the water which the mud contains is thus driven off in a filthy black stream, which is sent back to the tank for repeated treatment. The comparatively dry soil is then taken out of the revolving cages and spread abroad to lose a further portion of its water; being ultimately sold in much the condition as to dryness of an ordinary commercial superphosphate, with probably from 10 to 15 per cent. of water still remaining in it. Notwithstanding the small proportion of fertilising matter which our analysis proves it to contain, the manure is said to have commanded a ready sale at £3 10*s.* per ton. We are bound, however, to say that the evidence hitherto obtained of its agricultural value is of the weakest kind. No agricultural experience of the manure resulting from the process was, indeed, possible in 1869, for we put altogether aside the possibility of determining the value of a fertiliser by its influence on autumn-sown catch crops, whose produce generally depends much more on the character of the weather than on the composition of any manure that has been applied to them; and the weather of 1870 has hitherto been such that spring top-dressings of even the strongest artificial manures have been useless. The whole testimony is thus necessarily that of mere garden beds and flower-pots, where enormous quantities per acre are almost certain to have been applied, so that they are entirely insufficient to justify an agricultural opinion.

"In the absence of that test of the manure over acres of various crops during several seasons, which alone can enable a farmer to speak confidently of its value, we must fall back on the ascertained composition of the sample taken from the tank, and it offers the following comparison with such manures as a good bone superphosphate, worth perhaps 90*s.* a ton (wholesale price), and Peruvian guano worth £13 a ton.

Ingredients in 100 Parts.	'A. B. C.' Manure.	Bone Superphosphate.	Peruvian Guano.
Combined nitrogen	1.695	4	14
Equal to ammonia	2.05	5	17
Phosphoric acid equal to soluble phosphate of lime	3.56	26.0	7
Neutral phosphate of lime	..	19.0	22
Soda salts	..	..	8
Potash	..	..	

"If on valuing these manures we take the ammonia to be worth £56 a ton, the soluble phosphate to be worth £15, the neutral phosphate £5 a ton, and the alkaline salts £8 a ton—nearly the prices at which they are sold in imported manures—the superphosphate comes out worth about £4 14*s.* per ton, which is more than its value in the wholesale market; the guano comes out worth upwards of £12 per ton, and the 'A. B. C.' manure appears to be worth about 32*s.* per ton. That is to say, 160 cwt. of the 'A. B. C.' manure would be worth as much as 20 cwt. of guano, or 55 cwt. of the superphosphate, supposing both to have been deposited upon and within the soil. It is plain, however, that this supposition cannot be realised without a much larger expenditure on the weaker manure for carriage and labour of distribution than in the case of guano or of superphosphate,—an expenditure which indeed very soon altogether destroys the commercial value of a manure as it diminishes in strength. The dried lime mud from the Leicester sewage works, for example, which, according to Dr. Voelcker's analysis is worth 15*s.* 5*d.* per ton, commands only 1*s.* per ton in the actual market. It is, therefore, certain that the theoretical value of the Leamington 'A. B. C.' manure will not be nearly realised when its price shall have been determined by the ordinary process of competition with other purchasable fertilisers. On this point we refer to the testimony of Messrs. Lawes and Gilbert (in the Appendix), as still more conclusive of the comparative worthlessness of such manures as have their fertilising ingredients, like those of the 'A. B. C.' manure, mixed with a great mass of inert matter. No doubt a higher value may be obtained if the process of manufacturing a manure, of which the precipitated sewage mud is only one of the ingredients, shall be adopted, as it is at Stroud. Guano or superphosphate, nitrates or ammonia salts may be added to the 'A. B. C.' mud until the composition of the mixture shall make it worth the farmer's while to pay £3, or even more, per ton for it at the works, even though he should have to cart it several miles to his fields. But in that case it deserves the careful consideration of the agriculturist, whether, if he desires to use a fertiliser of diminished strength, he will not be better served by carrying only the pure guano, superphosphate, nitrate, or ammonia salt from the market to be mixed with a sufficient quantity of diluting material at home.

"An artificial fortification of the comparatively worthless sewage mud thrown down by the 'A. B. C.' mixture is, however, occasionally practised. It will be seen in the Appendix that added crystals of sulphate of ammonia were found in the 'A. B. C.' manure at Leamington by Dr. W. A. Miller, F.R.S., and Dr. W. Odling, F.R.S., who visited the Leamington works on April 4, this year, under instructions from the Metropolitan Board of Works, to inquire especially into the value of the manure made there. As these gentlemen have as yet made no formal report upon the subject, we called Dr. Odling before us, and his evidence is reported in full in the Appendix. It will be seen from his answers to our questions that when a sample of the genuine manure was examined, its ingredients indicated a value corresponding to about 1-24th that of Peruvian guano, or 11*s.* 3*d.* per ton, which is considerably below the value based upon our analysis. These were indeed analyses of samples, not of the manufactured manure, but of the raw sewage mud thrown down by the 'A. B. C.' mixture, and afterwards treated in the laboratory with greater care for the preservation of its volatile ingredients than is possible on the large scale of an ordinary manure manufactory. There can be no doubt, therefore, that our results are especially favourable to the character of the 'A. B. C.' manure."

We shall next week make a further extract from this report, in which the "A. B. C." process is compared with irrigation.

Farm Memoranda.

WESTER ROSS: *June* 29.—In a farmer's prospects, even during the course of one season only, there are many changes. From the long continuance of frost it was supposed, in early spring, that labour would remain far behind, and that all the crops would be late in being laid down; but the weather was so continuously fine, and the soil was so thoroughly pulverised and easily wrought, that the labour of the farm was completed somewhat earlier than usual. All the spring crops were laid down in a condition so fine that they came away in an unusually promising manner; Wheat, however, had suffered severely from the winter's severity. It was by far too thinly planted, was puny in the stalk, and was uncommonly narrow and sharp in the blade. Since then it has improved greatly, but is still thin, and inferior to the Wheat crops of the last few years. Although there was a sufficiency of moisture in the soil to braird, and carry on for a while the spring crops, yet there was not enough to hold them on, even through a short continuance of dry weather. Very little snow or rain fell after the previous Martinmas, and the long-continued bare frost left the land in a very dry condition. A short season of dry weather, with scorching winds, set in, and at once the crops very much gave up growing to straw, and began to run all too rapidly to seed. Oats on dry soils were coming into ear before they were more than 6 inches long, and Barley was rapidly following in the same line. Within these few days, however, we have had some fine showers, which will yet do much in the way of lengthening the straw, although the crop can now by no means be heavy. To have a full supply we would require a large additional quantity of rain. Many of the well cultivated, lighter fields bear heavier crops this season, both of Wheat and Oats, than the strong, clayey land. Seldom, in so short a time, has a change so great come over the farmer's expectations. Within a fortnight of the time at which we thought that our crops would be unusually abundant, the fear came upon us that they would be deficient by one half. The rains have again somewhat brightened the prospect, but the crops will yet be deficient in bulk. Potatos have come away unusually promising, and are now far advanced for the season; Swedes, in some cases, were destroyed with fly, and are re-sown; but in general they have thriven well, and their singling is now about completed. Common Turnips are coming away very satisfactorily, and the singling of them will be begun immediately. On some farms the hay crop is very heavy, but generally it is light. The whole grass on one farm was estimated by arbitrators at over £11 per imperial acre,—the highest average ever reached in the North. Pastures are now abundant, and stock of all kinds are selling well.

HAMPSHIRE: *June* 29.—The drought still prevails, and in looking to the past we are unable to find a parallel season. The nearest approach to the present was the year 1864, but the register of rainfall at Greenwich for that season records nearly double the amount of rain up to this date than it does for the six months now expired of 1870. Let us, however, take for comparison the year 1868, which gave us the heaviest crop of hay, quantity and quality combined, ever grown in England. Up to this date, too, the roots promised well.

At the present time there has been secured in good condition one of the lightest crops of hay from the arable land ever known. The parks and dry pastures, of which there is so much in the southern division of the county, have scarcely given a produce worth cutting, whilst hundreds of acres have from necessity been fed by cattle. This will, no doubt, keep hay at a rather high price; but it should be remembered that we have now so many substitutes in our catalogue of feeding materials, and most of them capable of being supplied by foreign importation, that the value of these will regulate the price of hay. Straw, too, will be a very

short produce, and as it now enters so largely into consumption for sheep and cattle, its scarcity will have to be estimated. The crop of Sainfoin is an exception, and is a fine crop this year and well got up.

In reporting upon the prospect of our grain crops we must bear in mind that dry and hot seasons are always favourable for the Wheat crop. The plant of Wheat on the chalk hills and gravel soils have suffered so much by loss of plant, through the effect of frost in winter, that considerable breadths have been ploughed and re-sown with spring corn. At the same time we should remember that the seed time was so favourable throughout that a larger breadth was sown than usual, and this, too, upon the heavy and difficult soils; and it is precisely upon such lands where the crop is very promising this year. Therefore, too much stress must not be laid upon the ploughing up or loss of plant, for even the thinnest Wheat, where the land has been farmed well, has made great improvement—the ears are large and filling well. We will, in consequence of the Wheat being so good on the strong and loamy soils, refer to an old saying, "When the vales feed the hills, then the crop is over an average in England."

Barley and Oats are very deficient, and should rain come now, the damage done is too great and serious to be mitigated. These crops must, therefore, be estimated as much under the average; in fact, some farmers are cutting the lightest of the crops, and feeding horses and cattle with the green fodder; others are doing so, and intending to fold over with sheep, as much of it will never pay the expenses of harvesting, threshing, &c.

Beans, both winter and spring, are very short, and, although not infested with aphis, cannot yield half a crop where they are a regular plant. Peas on strong land are looking fairly and podding well, but on all light soils are dying off, the bloom falling, and will, in many instances, be cut for hay. Both Beans and Peas will, therefore, fall far short of an average produce.

Vetches and Trifolium have produced so little feed this year, and so large a portion entirely destroyed, that but little has been saved for seed. We shall, therefore, have to depend greatly upon importations from France and other countries.

The prospect for the roots is very poor at present, large breadths of early Turnips and Swedes have been carried off by the fly, and where there is a plant they cannot make progress without rain. The Mangel crop is generally well planted, and a larger acreage put in than usual. They are, however, making some progress, as they do not suffer from the absence of rain like other roots. If we may judge from the effect that drought, in 1868, had upon prices of lean cattle and stock sheep, they must be at a low price this year, for the comparison is certainly unfavourable to the present season. There is, however, a probable difference as regards the stock in hand, which may make some difference, for the breed of lambs in 1867 and 1868 were both much over the average, whereas this year they are considered only a bare average, besides which the stocks of sheep have been unduly drawn upon during the past two years, so much so that if we are to believe the statistics of last year, we were actually 1,360,000 sheep short of the previous year, and, without doubt, all these matters must be considered in estimating this year's prices. *Joseph Blundell, Southampton.*

CHEVIOT HILL SHEEP BREEDING.—By the courtesy of Mr. Smith, of Melkington, we were one among a small party of his friends who paid a most enjoyable visit on Tuesday last to his hill farms. These are seven in number, and are composed of some thousands of acres, and they lie on the slopes of the Cheviot, the Coldlaw, and other hills. Here the calculation of sheep to the acre is not made; but the estimate often is, how many acres will maintain a sheep. In fact, the value of these hills is reckoned, not so much by their extent as by the number of sheep they will keep alive through the winter, and carry them, with the lambs they breed, through the summer. The Cheviot Hill, the height of which is 2,658 feet, and those which run close up to it are, of course, very inclement, and the herbage they bear is of a very scanty and poor kind. The consequence naturally is, if these hills are required to be stocked, the sheep must be inured to the food and climate of them. To effect this in a manner which will enable them to stand a severe winter and spring like the last, they must be bred and reared on the hills, and never allowed to come down until their service is at an end.

The ewes are sold at the age of five years, and, that they may be as strong and active and as lasting as possible, they are not tupped as lambs or gimmers, but are kept another year on the highest ground, and then tupped as young ewes. By this plan the constitution is strengthened, while their muscles become well developed and set by exercise, and they are thereby the better able to rear a lamb. A sufficient number of female lambs are kept annually to preserve the required number of the several flocks. The smaller and weaker ones are, of course, picked out for sale, and these are sold to farmers of lower hills, where Cheviot sheep only would live, and for these descendants of the hardier flocks of the higher hills there is a good demand, as they breed, thrive, and grow on lower ground as though they had been removed from a land of scarcity to one of plenty, which to them is indeed the case. The Cheviot rams used are selected with great care as regards form for ranging, and constitution and wool for keeping them warm, that they may stand the snow and northern and eastern winds. When we say this, we always mean of course that this care is bestowed that the same characteristics may be imparted to their issue. The male lambs are brought in the autumn to the low country farms occupied by Mr. Smith, where they are fed and fattened off for sale in the regular Tweedside fashion.

The great importance of the above care in selection consists in the way in which the sheep thus bred instinctively find their food. Up to this time they have lived entirely on what they could get. In the summer season there is, of course, some grass and a variety of mountain herbs; but, in the winter, they have to fall back on the short heather, which grows in large and small patches on the various parts of the hills that are suitable for this herbage. In the character in which these sheep now are, however, they will scrape through the snow a foot or more deep, and if they can get a few mouthfuls per diem, they will look happy and contented in their elevated and solitary regions. As a means of providing for such a season as the last, however, Mr. Smith is about to enclose and break some of the more favoured spots of the valleys, with a view of producing some hay to feed his flocks at the more scarce periods of the winter and spring. To effect this, in addition to the cultivation, lime will have to be carried 20 miles, a greater part of which are rugged hill-side roads, which are not easy for a riding horse to travel, and to fetch a ton will be two hard days' work for a pair of horses.

The lighter incidents of this excursion, and the hospitality we met with at "half-way houses," as we went and returned, and the more picturesque parts of the hills, we must refer to in another article. In the meantime, we may say this hill ride was among the pleasantest of our long experience in agricultural expeditions. [*North of England Farmer*, from which we borrowed an article, a fortnight ago, descriptive of Flodden Field, accidentally omitting to acknowledge it.]

The Week's Work.

JULY 9.—*Rape* or *Colewort* sow on land that has been pared and burned. Manure and sow as for Turnips, two to four quarts of seed per acre, according to the state of the land and the weather at the time of sowing. The crop succeeds well on fenny and peaty soils that have been pared or burned, better than Turnips. Where Turnips sown last month fail, or are eaten up with the turnip-fly, many prefer sowing Cole to the greater risk of sowing Turnips a second time. Coleseed that was sown towards the middle of June, if it has brairded freely, will require a rough hoeing by the close of the week, or early part of next, and blanks may be filled up by transplanting in moist weather, or after a heavy shower.

Cabbages planted last month, if they have rooted freely, will now require horse and hand hoeing. The earth should be loosened and drawn up to the plants as soon as they have started growing; and this is all the more needful if the surface has been crusted by heavy rains, or by the liberal use of the watering-pan at the time of planting. Hoe deep, keeping the fine dry mould on the surface, as a protection to the moist earth and roots below.

Lucerne, Sainfoin, and Lupine, when grown as forage plants for soiling, ought to be gone over after every cutting, and all weeds either hoed or pulled out by the hand. The successful growth of these crops depends greatly upon their being kept clean.

Turnips, Carrots, and Sugar-Beet, also Chicory, when grown for its roots as a part substitute for coffee, horse and hand hoe, as directed last month, keeping the earth well up to the plants. All these crops luxuriate in a finely pulverised and well aërated soil, consequently frequent and deep hoeing when the land is sufficiently dry for the hoes, are greatly in their favour. Avoid the paring-plough in seasons like this, as it is essential to keep the winter-made mould as much upon the surface as possible, both as protection from drought and "running together," or "caking," after heavy summer showers. The contrary of this is the practice when a continuance of wet weather is experienced, and when weeds spring up, for then the horse and hand hoes must be avoided, and the paring-plough used vigilantly to bury the weeds, first ploughing the land from the one side of the ridglet or drill, going as close to the plants as not to earth them up, and turning the earth close to the plants on the opposite drill. In a day or two, as the weather and growth of the weeds may direct, pare the opposite half, thus reversing the former, and as soon as the weather breaks up yoke the horse and hand hoes, giving the land a thorough loosening, to let in heat, fresh air, and night dews, to serve the requirements of the rapid growth of the plants.

Green Manuring is now an exceptional practice, artificial manures having taken its place, the Rye, Vetches, Rape, and other green crops being folded off with sheep; and this year the old practice will be more exceptional than usual, owing to the general scarcity of pasture for live stock.

Irrigation is a golden practice at the time we write, wherever farmers have been fortunate enough to lay on either rainwater or town sewage; and the current season, so far as gone, will do much to extend the practice. Last month much hay was made "on its foot," so to speak, many farmers being obliged to yoke the mowing-machine and rake what little they had together to prevent its being burnt to tinder. As to the weight per acre, a neighbour (Surrey) told us "he could carry it home on his back." Close by they were carting off about 10 tons of sewage grass per acre, and will mow more than this weight before the end of the current month, and so on for the following two—August and September. When the hay crop and the pastures are being burnt to snuff, and when live stock are either pinched or being prematurely sent to the shambles, and when the prospects of a coming winter loom so unpromising in the distance, the facts of the case on both sides speak for themselves. There is no use in complaining that all cannot get sewage or river-water, or in chiding the prospects of a 'run on the banks" for the golden treasure, thus, raising the price—for the practical question is, irrigate who can with sewage or river-water at its current value. As for the dry sewage system, it is hopeless for it being the exclusive practice during the summer months, when the crops are being burnt up for the want of the water which such systems remove. They may utilise the sewage more profitably in the winter time, when the land does not require the water. There is reason and hope in the future of this. No stronger argument can practically be used in support of sewage irrigation, for if farmers are not called upon to pay for it in winter, when it is worth nothing, or less than nothing, they can give the more for it in the summer time. But in the summer time, when the liquid portion of the sewage is of more value than the solid, the practical conclusion is obviously to the land with the sewage nett as it comes from the sewers.

The Watering of Cattle with pure water is at all times an important question, but doubly so at this season, when ponds and rivers become so full of animal and vegetable life as to be unwholesome. Such water, when given to milch cows, not only injures their health, but the quality of their milk. Galen discovered that by giving medicinal plants to milch cows he could physic his patients more successfully than by the common *modus operandi*. The lesson is plain—such water should be filtered, and the troughs washed out clean daily. *W. B.*

Markets.

ENGLISH WOOL.

There has been a moderate business during the week, but prices are a shade easier. At the Leicester Wool Fair, which was held on the 29th ult., wool was sold to the amount of £15,675 11s., at prices varying from 32s. to 42s. per tod; last year the quantity sold realised £17,401, and the prices ranged from 32s. 6d. to 45s.

CURRENT PRICES OF ENGLISH WOOL.		Per lb.	s. d.	s. d.
FLEECES:	Southdown hoggets		1 1 to 1	2½
	Half-bred ditto		1 2 — 1	2
	Kent Fleeces		1 3 — 1	4
	Southdown ewes and wethers		0 0½ — 1	1
	Leicester ditto		1 2 — 1	3
SORTS:	Clothing		0 10 — 1	6
	Combing		1 0 — 1	8

HOPS.

BOROUGH MARKET, July 6.

Messrs. Pattenden & Smith report that there is no new feature to notice in the position of the Hop trade. The demand for all descriptions is very dull, and lower rates would be accepted to close sales. The accounts of the growing bine are very satisfactory, though there are complaints of loss of colour in some districts; this, however, is of quite a local character. Prices are as follow:—Mid and East Kents, £7 to £12; Weald of Kents, £6 to £7 10s.; Sussex, £5 to £6; Bavarians, £6 to £8 10s.; French, £5 to £6; Americans, £4 to £6; Yearlings, £1 5s. to £3 3s. per cwt.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, July 6.

Prime Meadow Hay	110s. to 120s.	Clover, old	130s. to 140s.
Inferior do.	90 100	Inferior do.	110 120
New Clover	110 120	Prime 2d cut	— —
Inferior do.	90 100	Inferior do.	— —
Straw	24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, July 6.

Sup Meadow Hay	118s. to 126s.	Inferior Clover	110s. to 120s.
Inferior do.	100 110	Prime 2d cut do.	— —
New do.	84 100	New do.	115 126
Inferior do.	70 76	Straw	32 30
Superior Clover	130 145	JOSHUA BAKER.	

WHITECHAPEL, Thursday, July 6.

Fine Meadow Hay	112s. to 120s.	Prime old Clover	135s. to 145s.
Inferior do.	100 110	Inferior do. do.	105 115
Prime New Hay	90 100	Prime 2d cut do.	130 140
Inferior do.	80 85	New Clover	115 120
Straw	28 33	Inferior do.	90 105

METROPOLITAN CATTLE MARKET.

MONDAY, July 4.

Although the number of Beasts is larger, the average quality is so inferior that choice descriptions are rather dearer than on Thursday. We have a large supply of Sheep and a limited demand, prices are consequently lower, and a clearance cannot be effected. Lambs and Calves are lower, except for very choice qualities. Our foreign supply consists of 1260 Beasts, 7820 Sheep, 450 Calves, and 10 Pigs; from Scotland there are 19

Beasts; from Norfolk and Suffolk, 780; and 1721 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5	0 to 5 4	Best Long-wools	..	.. to ..
Best Shorthorns	4	8—5 0	Do. Shorn	4	10—5 0
2d quality Beasts	3	0—4 0	Ewes & 2d quality	..	.. —..
Best Downs and Half-breds	..	.. —..	Do. Shorn	4	2—4 6
Do. Shorn	5	0—5 4	Lambs	5	0—6 0
Pigs	..	.. —..	Calves	3	0—5 0
			Pigs	5	4—5 8

Beasts, 3780; Sheep and Lambs, 28,250; Calves, 472; Pigs, 160.

THURSDAY, July 7.

The number of Beasts on offer is considerably smaller than last Thursday, and the average quality is very middling. Trade is slow, but the few choice qualities make nearly as much as on Monday. The supply of English Sheep is smaller, but of foreign it is much larger; best descriptions of the former are readily disposed of; it is, however, difficult to obtain any higher prices. Choice Lambs are not plentiful, and meet with rather a better sale; trade is bad for other kinds. Trade is very dull for Calves, at lower rates. Our foreign supply consists of 635 Beasts, 6000 Sheep, 645 Calves, and 30 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5	0 to 5 4	Best Long-wools	..	.. to ..
Best Shorthorns	4	8—5 0	Do. Shorn	4	10—5 0
2d quality Beasts	3	0—4 0	Ewes & 2d quality	..	.. —..
Best Downs and Half-breds	..	.. —..	Do. Shorn	4	2—4 6
Do. Shorn	5	2—5 4	Lambs	5	4—5 4
Pigs	..	.. —..	Calves	3	0—4 10
			Pigs	3	4—5 4

Beasts, 985; Sheep and Lambs, 16,640; Calves, 764; Pigs, 50.

SEED MARKET.

Our markets during the past week have been thinly attended, and only a limited amount of business has been transacted. Some welcome and genial rains have fallen in certain districts; these will create a brisk demand for Mustard and Rape seed; a more general and continuous downfall is, however, much needed. A few samples of new Trefoil and new Trifolium have been offering, but values are not yet fixed. The stocks of foreign Italian being now quite exhausted, we have an inquiry for seed of English growth. In bird seeds there is but little doing. Tares and Linseed meet with a rather slow sale. There has been some speculation in Alsike seed. Clover seed of all descriptions is very firm, but at this quiet time of the year no large quantity of seed is changing hands.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

MARK LANE.

MONDAY, July 4.

There was a very small supply of English Wheat to this morning's market. The finest samples were taken at the prices of this day sennight, but other descriptions were 1s. to 2s. per qr. cheaper. For foreign there was very little demand; the business done was at a decline of 2s. per qr. upon American and 1s. per qr. upon other sorts. Barley, Beans, and fine boiling Peas were unchanged in value; feeding Peas were cheaper. The Oat trade was quiet, at a reduction of 1s. to 2s. per qr. To effect sales of Flour it was necessary to submit to a decline of 6d. per barrel and 1s. per sack.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	47	—53	Red	45	—53
— — fine selected runs..do.	50	—57	Red	48	—55
— — Talavera	51	—60			
— — Norfolk			Red		—
— — Foreign	42	—60			
BARLEY, grind. & dist. 26to 30r.. Chev.	39	—42	Malting	34	—38
— Foreign .. grinding and distilling	22	—30	Malting	30	—40
OATS, Essex and Suffolk	22	—24			
— Scotch and Lincolnshire.. Potato	24	—26	Feed		—
— Irish	23	—25	Feed	21	—24
— Foreign .. Polish and Brew	25	—27	Feed	20	—25
RYE	32	—36	Foreign	33	—36
RYE-MEAL, Foreign					
BEANS, Mazagan.... 34s. to 42s. Tick	34	—46	Harrow	34	—46
— Pigeon ....40s. to 55s.. Winds.		—	Longpod		—
— Foreign		.. Small 41	—43	Egyptian	38	—40
PEAS, White, Essex, and Kent.. Boilers	34	—38	Suffolk	37	—40
— Maple, 33s. to 40s. Grey	32	15	Foreign	33	—37
MAIZE			Foreign	30	—32
FLOUR, best marks delivered.. per sack	39	—47			
— 2d ditto per sack	29	—41	Country	29	—41
— Foreign per barrel	24	—27	Per sack	32	—58

WEDNESDAY, July 6.

There was a limited attendance of millers here to-day, but the supply of English Wheat was very small. The Wheat crop is rapidly approaching maturity, and the accounts received to-day were generally good; trade consequently was very dull, and, in the absence of large sales of either foreign or English produce, prices were nominally unaltered. Barley was quiet, but firm in value, while a ready business was transacted in Oats, at late rates. Malt was dull, at nominal currencies. Beans and Peas were little inquired after, and Maize was unchanged in price. The Flour trade was very inanimate, and both foreign and country marks tended downwards.

ARRIVALS OF GRAIN, &C., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 340	Qrs. —	Qrs. 20	Sacks. —
Irish ..	—	—	—	—
Foreign ..	7110	870	16,860	38 brls.
	7450	870	16,880	

LIVERPOOL, July 5.—There was an average attendance, but millers took only a limited quantity of Wheat, sellers making a concession on white of 1d., and 1d. and 2d. on red per cental, from the prices of last week. Flour was quiet, and scarcely maintained its value. Beans 1s. per qr. cheaper. Peas and Barley unchanged. Oats 1d. per bushel, and Oatmeal 6d. per load lower. Indian Corn declined 6d. to 9d.

AVERAGES.

	Wheat.	Barley.	Oats.
May 28	45s 4d	32s 11d	23s 10d
June 4	45 3	32 0	23 0
— 11	46 1	33 1	22 0
— 18	48 0	32 5	25 0
— 25	50 5	33 5	25 1
July 2	51 6	32 0	25 10
Average ..	47 9	32 8	24 0

METROPOLITAN MEAT MARKET.—July 7.

Best Fresh Butter .. .. .. 17s. per dozen lb.
Second do. do. .. .. .. 16s. ,,
Small Pork, 4s. 4d. to 4s. 8d.; Large Pork, 3s. 4d. to 4s. 8d. per 8 lb.

COALS.—July 6.

Holywell Main, 16s. 6d.; West Wylam, 15s. 6d.; Eden Main, 15s. 3d.; Walls End Elliot, 16s. 3d.; Walls End Framwellgate, 15s.; Walls End Haswell, 17s. 6d.; Walls End Hetton, 17s. 6d.; Walls End Hetton Lyons, 14s. 9d.; Walls End Kelloe, 15s. 6d.; Walls End East Hartlepool, 17s.; Branepeth Cannel, 18s.—Ships at market, 23; sold, 15; unsold, 8; at sea, 15.

Notices to Correspondents.

GUANO: *Labourer.* It would probably prove more immediately efficient on a light than on a heavy soil, much of its value being due to substances which require the free access of air and water to bring them into the condition of vegetable food. It should have been applied broadcast in April over the young Wheat.

IMPORTS FOR FIVE MONTHS: *K.*

Articles.	Quantities Imported. 1869.	1870.
Animals, living—Oxen, Bulls, and Cows .. .. No.	78,063	45,936
Calves	7,502	9,160
Sheep	335,654	263,044
Lambs	4,867	4,712
Swine and Hogs	16,222	37,420
Bark, for Tanners' or Dyers' use cwt.	172,361	157,279
Peruvian	4,517	1,459
Bones (whether burnt or not, or as Animal Charcoal) .. .. .. cwt.	26,543	29,050
Corn—Wheat—From Russia .. cwt.	3,015,148	4,269,272
Denmark	160,318	197,101
Prussia	1,734,641	984,241
Schleswig, Holstein, and Lauenburg	24,909	6,011
Mecklenburg	276,860	304,634
Hanse Towns	293,881	137,311
France	117,726	15,987
Illyria, Croatia, and Dalmatia ..	390,170	42,127
Turkey and Wallachia and Moldavia	604,822	181,162
Egypt	329,341	95,559
United States	3,411,897	5,274,745
Chili	165,074	74,534
British North America..	43,061	194,070
Other countries	104,767	132,229
Barley	4,477,477	3,171,548
Oats	1,584,968	3,263,455
Peas	318,229	576,453
Beans	891,425	636,171
Indian Corn, or Maize	5,837,048	5,536,660
Wheat meal and Flour—Hanse Towns	243,822	378,743
France	649,222	500,072
United States	808,414	920,934
British North America..	18,421	24,556
Other countries	437,662	265,805
Indian Corn Meal	2,608	2,795
Flax (dressed and undressed) and Tow or Codilla of Flax—Russia	107,860	160,895
Holland	70,669	103,889
Belgium	92,602	104,565
Other countries	98,085	150,511
Guano—Cape Coast of Africa .. tons	597	340
United States	363	..
Peru	25,010	77,288
Bolivia	1,612	530
British West India Islands	254	..
Other countries	1,019	12,809
Hemp (dressed and undressed) and Tow or Codilla of Hemp—Russia cwt.	19,344	12,830
Venetia	117,055	89,623
Illyria, Croatia, and Dalmatia ..	27,033	6,801
British India	2,160	6,498
Philippine Islands	38,260	44,558
Other countries	43,190	25,434
Hops	110,990	64,061
Oil Seed Cakes .. .. tons	66,957	50,272
Potatoes .. .. cwt.	632,234	202,764
Provisions—Butter	429,021	407,390
Cheese	134,879	182,019
Eggs .. .. No.	200,885,760	138,778,560
Fish, cured or salted .. .. cwt.	203,274	305,522
Lard	88,740	108,879
Meat, fresh or slightly salted—Beef	4,069	6,156
Pork	10,490	17,560
Meat, salted—Bacon and Hams ..	299,120	317,900
Beef	127,943	81,303
Pork	79,690	86,615
Meat, not otherwise described ..	27,362	41,107
Saltpetre	64,022	68,478
Cubic Nitre	365,583	404,949
Seeds—Cotton .. .. tons	61,576	116,631
Clover .. .. cwt.	150,589	..
Flaxseed and Linseed—From Russia, Northern Ports .. .. qr.	27,105	26,272
Ports in the Black Sea	112,033	128,356
British India	197,371	76,557
Other Countries	38,340	44,983
Rape	55,892	89,203
Tallow .. .. cwt.	388,419	425,543
Wool, Sheep and Lambs'—From Europe .. .. lb.	6,797,552	4,159,417
British Possessions in South Africa ..	12,792,449	11,843,976
British India	5,466,058	3,246,160
Australia	78,688,672	100,992,233
Other countries	6,826,338	6,435,606
Alpaca and the Llama tribe	1,099,959	1,418,911
Yeast, dried.. .. .. .. cwt.	44,270	46,829

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING AND COLLECTING MACHINES FOR 1870.

IMPORTANT NOTICE.

THOMAS GREEN AND SON would not again have referred to the Archimedean Lawn Mower, but seeing the Editorial remarks following the letter signed "D. T. Fish" in the *Gardeners' Chronicle* for last week, at page 894, they are induced to do so for several reasons.

1st, The Editors claim for the Archimedean that it is the best "for amateurs, for small gardens, for uneven ground, for rough grass, for steep banks, &c." We take it, and believe that we shall be borne out by every practical Gardener, that the best Lawn Mower is the one that produces the best results with the least labour.

2d, They say that the Archimedean is the quickest, through no time being lost in stopping to empty the grass-box, which is known by practitioners—when the grass is at all thick—to be a somewhat tedious operation. Then they go on to say:—"To the scattering of the grass, instead of gathering it up, there is decidedly some objection, but where, as it is recommended, the lawn is cut regularly once a week, as it should be, the objection is very trivial; and in the other cases the time saved in the cutting compensates for the loss in having it swept up, if found desirable."

To the above remarks we make the undeniable assertion, that we can Mow and Collect with greater ease, either thick or short grass, and in less time than it can be swept up after it has been cut with the Archimedean Lawn Mower.

Either the Editors or we are at fault with regard to the merits of Lawn Mowers. We have offered and are still willing to have our Machines publicly tested again by competent judges, and if they do not bear out our statement, then the Editors' opinions will have proved to be correct; but if, on the contrary, our assertions are borne out by practical results, they must admit their error.

Copy of Letter received from the Council of the Royal Horticultural Society, South Kensington—May 28, 1870

"GENTLEMEN, I am directed by the Council to inform you that your Lawn Mowing machines have been in constant use in their Gardens, at South Kensington, during the last to years, and that they have always given the greatest satisfaction, doing their work excellently, and with so much ease as to be generally preferred by our workmen. Your obedient servant, JAMES RICHARDS, Assistant Sec."

"To Messrs. GREEN & SON."

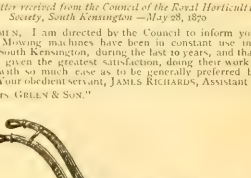

HAND MACHINE.

To cut 10 inches	£3 10 0	To cut 18 inches	£7 10 0
,, 12 ,,	4 10 0	,, 20 ,,	8 0 0
[*Suitable for a Lady.*		,, 22 ,,	8 10 0
To cut 14 inches	£5 10 0	,, 24 ,,	9 0 0
,, 16 ,,	6 10 0	[*Suitable for Two Persons.*	
[*Suitable for One Person.*			

Prices of Horse, Pony, and Donkey Machines, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness:—

Donkey and Pony Machines.		Horse Machines.	
		To cut 30 inches	£21 0 0
To cut 26 inches	£13 0 0	,, 36 ,,	24 0 0
,, 28 ,,	15 0 0	,, 42 ,,	27 0 0
,, 30 ,,	17 0 0	,, 48 ,,	30 0 0
Leather Boots for Donkey, 18s.; ditto for Pony, 22s.		Leather Boots for Horse, 26s.	

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Scotland, and Ireland.

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the larger sizes by a Horse; and as the Machines make no noise in working, the most spirited animal can be employed without fear of its running away or in any way damaging the Machine.

Both the Horse, Pony, Donkey, and Hand Machines possess (over all other makers) the advantage of self-sharpening; the cutters being steel on each side, when they become dull or blunt by running one way round, the cylinder can be reversed again and again, bringing the bottom edge of the cutters against the bottom blade, when the Machine will cut equal to new. Arrangements are made that the cylinder can be reversed by any inexperienced person in two or three minutes.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once unconditionally.

THOMAS GREEN AND SON,

Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

N.B.—REPAIRS to LAWN MOWERS done at the London Establishment in the most expeditious manner, having every necessary appliance of Steam-power and Machinery same as at Leeds.

CONSERVATORY BASKETS.

Strained Wire Espalier Trainers, for all kinds of fruit trees, &c.; Garden Fencing, about 9 feet; Trellis Wire Work, for gardens and other subjects; Wire Work Covered Ways, for gardens, pleasure grounds, &c.; Wire Work Rose Fences, Kiosques, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, and opposite windows, or elsewhere; Suspending Baskets for conservatories; Wire Work Flower Stands, for conservatories; Arches for conservatories, pleasure-grounds, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Mipton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

F. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Perrin's Jello Terrace, Notting Hill Gate, London, W.

Illustrated Catalogue, and Testimonials, sent on application.

Bee-Hives.—Two Silver Medals Awarded to GEO. NEIGHBOUR AND SONS, at the Paris Exhibition of 1867. The only English Exhibitors who obtained a Silver Medal for Bee-Hives.

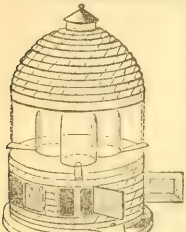

NEIGHBOUR'S IMPROVED COTTAGE BEE-HIVE, as originally introduced by GEORGE NEIGHBOUR & SONS, working three bell glasses, 18 to 7th, and straight to the of straw; it has three sections in the lower Hive. This Hive will be found to possess many points of advantage, as well as more easy of management than any other Bee-hive that has been introduced.

Price complete ... £1 15 0
Second ditto ... 0 15 0
Ditto LIGHT ITALIAN ditto ... 2 0 0

ITALIAN ALP BEE. being the best, GEO. NEIGHBOUR & SONS supply a Swarm of Bees, with genuine Italian Queen, in the Improved Cottage Hive, at £2 2s.; Hive included. Such will shortly have wholly yellow Italian Alp Bees.)

An Italian Alp Queen, with full directions for uniting to [illegible] ... £1 1 0

ENGLISH BEES.—Stocks and Swarms may be obtained on application.

A newly arranged Catalogue of other Improved Hives, with Drawing and prices, sent on receipt of two stamps.

Address GEO. NEIGHBOUR AND SONS, 127, High Holborn, W.C.; or 149, Regent Street, London, W.

AGENTS.—Liverpool: JAMES CHILBERT, 12, Clayton Square, Manchester: J. WILSON, 58, King Street. Dublin: EDMONDSON, BROTHERS, 15, Dame Street. Glasgow: AUSTIN & MACKAY, 16, Buchanan Street.

Registered GARDEN ROLLER BARROW.

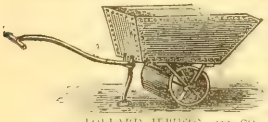

This light, elegant, and useful combination of the necessity for [illegible] Implements, the Labour and the Barrow, for Lawns and Walks, is supplied by

DOLLARD, JEPHSON, AND CO.,
Bear Garden, New Park Street, Southwark, London, S.E.
Price Lists free on application

COLEMAN AND MORTON'S HAND WATER-CART and GARDEN ENGINE.

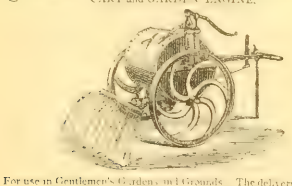

For use in Gentlemen's Gardens and Grounds. The delivery valve can be worked at the outer end when watering; it holds 25 gallons. The spray may be used for Watering Lawns, &c., can be removed at pleasure.

Price with Spreader ... £5 5 0
Force Pump for Watering Trees, &c. ... 2 0 0 extra

COLEMAN AND MORTON, Lindsey Road Iron Works, Chelmsford

The Perfect WATERING CAN.

Registered according to the Act.

(Any person infringing will at once be proceeded against.)

The advantages this Watering Can possesses over the old kind are:—First, watering can now be done in about half the time; second, a bed 12 feet wide can be watered without treading on the soil, or having to lift the can an extra height; third, about half the usual exertion is required. For Greenhouses and Potting Pits it will prove invaluable, as large areas can be watered with ease; and being made of strong zinc they will last a lifetime. Price, No. 1 12 gallon, 6s. 6d.; No. 2 (2 gallons), 8s. 6d.; No. 3 (4 gallons), 10s. 6d.; No. 4 (6 gallons), 12s. 6d.

Made and turned by JOSIAH LEE BUTT, Hayward Works, Bury St. Edmunds; to whom Post Office orders must be sent and made payable when ordering.

THE HYDRONETTE (ROBIN'S PATENT),

FOR GARDENS, GREENHOUSES, CONSERVATORIES, HOTBEDS, WASHING WINDOWS, CARRIAGES &c., &c.

Unrivalled Ease of Action, Simplicity, Convenience and Force.

The HYDRONETTE is a more useful, easy-working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz.: No. 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12s. 6d.; No. 2, 15s. 6d.; No. 3, £1 1s.; No. 4, £1 5s.; No. 5, £1 10s. Extra Hose and Union Joints to order. To be had of HAYNES AND SONS, 227, 229, and 231, Edgware Road, W.

CAUTION.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

"Every Cottage should be provided with a Water Tank." *Dunedin.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IDA WHARF), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage.

ROYAL AGRICULTURAL SOCIETY—OXFORD SHOW, JULY 11 to 22.

JOHN FOWLER & CO.

Will exhibit, at STAND 91, various sets of STEAM PLOUGHING MACHINERY, TRACTION ENGINE on SPRINGS, and TRACTION ENGINE with JIB CRANE attached. Also PIRIE DOUBLE FURROW PLOUGHS.

For further information, apply to

J. FOWLER AND CO., STEAM PLOUGH WORKS, LEEDS; or, 71, CORNHILL, LONDON, E.C.

STAND No. 329.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD, 1870.

CLAYTON & SHUTTLEWORTH,

LINCOLN,

WILL EXHIBIT AT THIS SHOW, commencing JULY 11, as follows:

PORTABLE STEAM ENGINES, 4 to 10-horse power,
HORIZONTAL FIXED STEAM ENGINES,
TRACTION ENGINE for Common Roads,
THRESHING MACHINES of various sizes,
STRAW ELEVATORS,
STACKING MACHINES,
CORN-GRINDING MILLS,
CIRCULAR SAW BENCHES, &c., &c.

At the last Public Trials of the Royal Agricultural Society of England, in competition with the principal Manufacturers of England,

ALL THE FIRST PRIZES FOR STEAM ENGINES,

THE PRIZE OF £15 FOR THE FINISHING THRESHING MACHINE,

Also the SOCIETY'S SILVER MEDAL, were awarded to

CLAYTON AND SHUTTLEWORTH, LINCOLN, and 78, LOMBARD STREET, LONDON.

Catalogues, &c., Free by Post.

SAMUELSON & CO.'S

Newly Patented EDGE-CLIPPING SILENT LAWN MOWERS.

THE MOST IMPORTANT IMPROVEMENT EVER INTRODUCED.

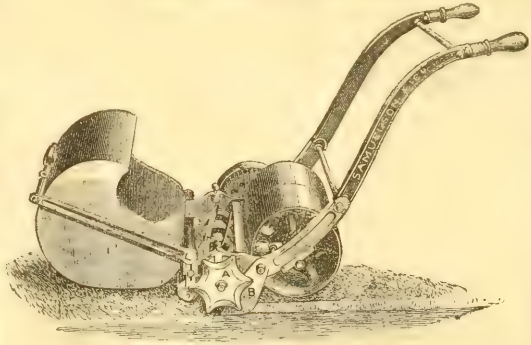

MESSRS. SAMUELSON & CO. beg to draw special attention to their

NEW

Lawn Mowers for 1870,

which are fitted, when required, with a NEW PATENT EDGE-CLIPPING arrangement, entirely superseding the old and tedious operation of Edge-Clipping by hand.

All Machines fitted with new Silent Gearing, insuring perfect freedom from noise when at work.

Catalogues, with full descriptions and prices of the New Patent Edge-Clipping Silent Lawn Mower, on application to

SAMUELSON AND CO., BRITANNIA WORKS, BANBURY.

Monro's Cannon Boiler.

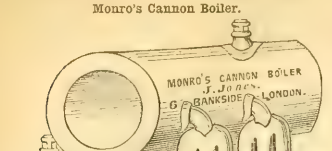

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at our wharf in London. List on application.

J. JONES AND SONS, Iron Merchants, 6, Bankside, Southwark, London, S.E.

Heating by Hot Water.

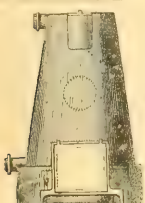

PUBLIC and PRIVATE BUILDINGS, MANUFACTORIES, CONSERVATORIES, &c., heated on the most improved system, combined with perfect ventilation.

These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require no BRICKWORK

POLLARD JEPHSON, AND CO
(Successors to John R. Feill),
Sole Manufacturers of the Improved CONICAL BOILERS,

Which have in general use, and which Boilers have for their durability and economy obtained a celebrity for surpassing any other Boilers ever invented

Bear Garden, New Park Street, Southwark, London, S.E.

Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.

Victoria Works, Bury St. Edmunds.

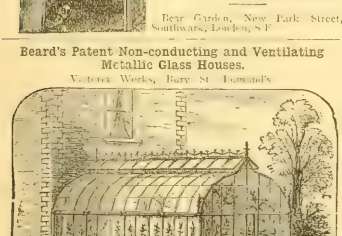

MANUFACTURED BY

CHARLES BEARD,
Senior Partner in the late Firm of Sanders, Brewer & Co., which firm was dissolved by mutual consent.

The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866;

The First-class Certificate at the Grand Manchester Horticultural Show, 1867;

The Three First-class Certificates at the Royal Horticultural Show, at Bury St. Edmunds, 1867, viz.—One Prize for Plant-glazing without Putty; One Prize for Best System of Patent Ventilation; One Prize for W., P. & Co.'s Improved Flower Stands.

These much-approved Patent Systems of Glazing and Ventilation are also extremely adapted for Ad Agricultural Buildings, Public Halls, Churches, Factories, Rifle Stations, &c. &c.

Full particulars and Terms of the Patent Houses, glazed with 26 oz. Sheet Glass from 2s. 2d. per foot super and upwards; also an Illustrated Catalogue, for 13 postage stamps, may be obtained on application to CHARLES BEARD, Victoria Horticultural Works, Bury St. Edmunds.

PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelope.

Portable and Fixed Hot-water Apparatus

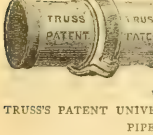

FOR
HEATING CONSERVATORIES,
HOTHOUSES,
CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,
WITH
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to

T. S. TRUSS, C.E., Sole Manufacturer,
Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder,
Friar Street, Southwark Bridge Road, London, S.E.

West of England, Ireland, and Wales.

VINCENT SKINNER, Seed Grower, Breeder, Hop Merchant, and HOP FACTOR, 11, MANOR PLACE, Bridgwater, formerly Partner with J. Weeks & Co.)
10 Bushels at Work

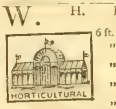

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

		Each.
6 ft. by 4 ft.	Lights, 2 in. thick, unglazed..	£0 5 0
" "	Primed and Glazed with 10 oz. Sheet	0 11 0
" "	with stout portable Box, not Painted	1 3 0
" "	Painted four coats, and Handles on	1 8 0
" "	Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do		2 15 0

GREENHOUSES Per ft. super

Woodwork only Prepared and Fitted	.. ..	0 0 6
" Primed and Glazed with 16 oz. Sheet	.. ..	0 0 9
" Delivered, and Fixed with Ironwork	.. ..	0 0 0
" Painted four coats, two sides, ready for use	.. ..	0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.

Improved Conical. *Tubular Boiler.*

WROUGHT and CAST IRON CONICAL and TUBULAR IMPROVED CONICAL, also Elliptic Boilers, from £25 each

Improved and extra stout, CAST-IRON TUBULAR BOILERS, with or without Water Pans, from £10 each

CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use with or without brickwork, from £10 each

Portable Boiler *Elliptic Boiler*

STOVE and GREENHOUSE VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description in Stock.

INDIA-RUBBER RINGS for Pipe Joints; Sockets require no other packing. *Egyptic Boiler.* and are perfectly water tight.

Goods, of the very best manufacture, delivered at Railway or Wharf in London

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground Street, London, S.E. (Surrey side Blackfriars Bridge). Price List on application.

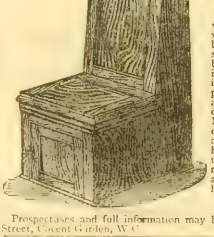

MOULES PATENT EARTH SYSTEM.

From Mr. W. GIBBLE,
Lawford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty, the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble or attention during. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them

"W. GIBBLE.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

First Prize,

ROYAL AGRICULTURAL SHOW, 1869.

Also 22 other PRIZES FOR LIQUID MANURE CART AND PUMP

BONE OR STONE CRUSHER FOR HAND OR POWER.

I. JAMES,
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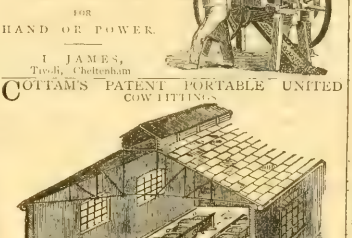

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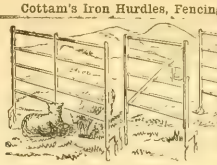

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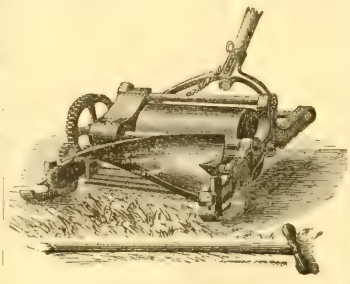

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 29.—1870.] SATURDAY, JULY 16. { Price Fivepence. / Stamped Edition, 6d.

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NOTICE TO ADVERTISERS.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE for JULY 23 and 30 will contain a FULL REPORT of the PROCEEDINGS at the Royal Horticultural and Agricultural Shows.

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A SPECIAL EDITION of JULY 23 will be published in the Agricultural Show Yard.

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ROYAL HORTICULTURAL SOCIETY.—NOTICE A SPECIAL MEETING of the FRUIT and VEGETABLE COMMITTEE will be held at OXFORD, on JULY 20, at the GREAT PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY. All Subjects for Adjudication by the Committee, to be delivered or forwarded, Carriage Paid, addressed to the Secretary, Fruit Committee, Royal Horticultural Society's Show Ground, Oxford, by 9 o'clock A.M. Committee at 11 A.M precisely

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ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

Bedding Plants, Florists' Flowers, &c.

MESSRS. LITTLE AND BALLANTYNE, Nurserymen and Seedsmen, Carlisle, are prepared to send out very choice selections of the above, at very moderate prices, and will be glad to send their new priced CATALOGUE free on application.
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PRIMULAS, PRIMULAS, PRIMULAS.—Williams' superb strain, strong Seedlings, fit for potting into 3-inch pots, 1s. 6d. per dozen, 10s. per 100, free by post; seed, 1s. and 2s. 6d. per packet. JOHN STEVENS, The Nurseries, Coventry.

NEW CHILIAN MIMULUS.—This is a new strain, of dwarf habit, perpetual bloomers, and quite hardy, of very diversified markings and colours. 1s. 6d. per packet, post free, for 30, from B. W. KNIGHT, Florist, Battle, Sussex.

NEW AGERATUMS. Four fine varieties, Imperial Dwarf, Tom Thumb, Prince Alfred (the deepest blue), Conspicua (white), invaluable for winter bloom. The four varieties forwarded free by post for 2s., from
B. W. KNIGHT, Florist, Battle, Sussex

NEW COLEUS of 1870.—Twelve New Coleus, sent out by Mr. W. Bull, &c., this season, 1870. The set of 12 varieties sent post free for 2s. 6d., from
B. W. KNIGHT, Florist, Battle, Sussex

NOTICE.—On and after August 1, 1870, the prices of our PRIMULA, CINERARIA and CALCEOLARIA SEED will be 1s. 6d., 2s. 6d., and 5s. per packet.
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New Seed of 1870 Growth.

DOBSON AND SONS CALCEOLARIA, BALSAM, CINERARIA, and PRIMULA, may be depended upon as unsurpassed by any other strain in the country.
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CALCEOLARIA SEEDS, the best strain in cultivation, fine foliage, dwarf habit, flowers large, and beautifully marked, carefully hybridised, every inferior flower excluded. Have been a great attraction, and admired by thousands who have come to see them. All genuine seed; a trial particularly requested. Packets 2s. 6d., forwarded on receipt of Post Office order or stamps.
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Seeds from Prize Flowers, saved by

MESSRS. DOBSON AND SONS, Seed Growers, &c., Woodlands Nursery, Isleworth, from their unequalled collections.
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H. AND F. SHARPE have on offer to the Trade fine selected stocks of the above-named Seeds, all of 1869 growth, and raised from picked transplanted bulbs. Prices moderate.
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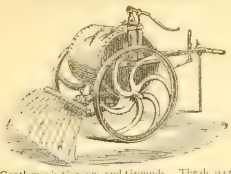

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Price with Sprinkler £5 5 0
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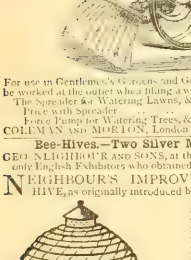

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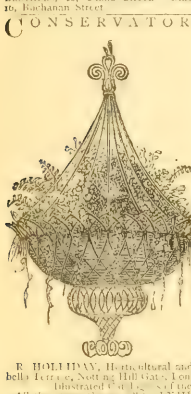

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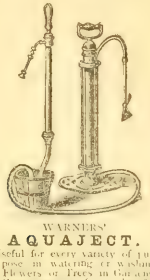

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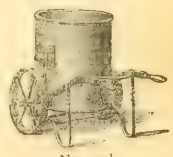

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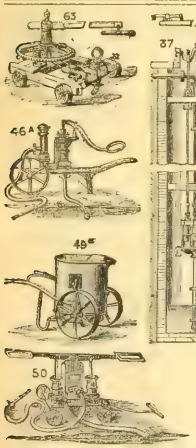

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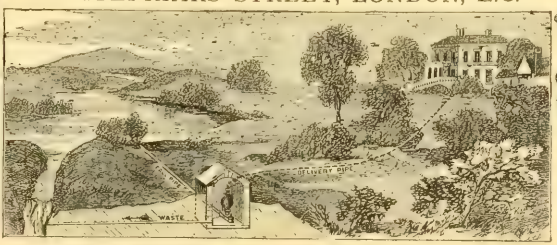

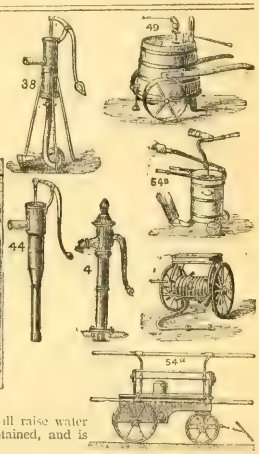

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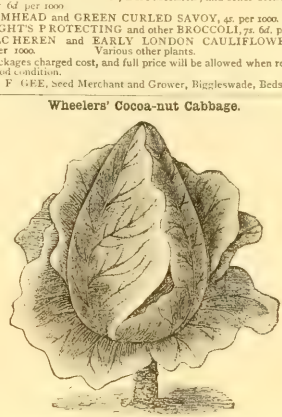

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FOR THE GARDEN

For sowing at once, to come in next spring and summer

SUTTONS' IMPERIAL, the finest in cultivation and earliest for spring use, per oz. 8d

LONDON MARKET, EARLY DWARF YORK, ENFIELD MARKET, NONPAREIL, each 6d. per oz.

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SUTTONS' IMPROVED DRUMHEAD.—The largest in cultivation. Should be sown in July and August, per lb. 2s. 6d.

ROBINSON'S CHAMPION DRUMHEAD, 2s. 6d. per lb.

COMMON DRUMHEAD, or FLAT DUTCH, 2s. per lb. Also GRASS SEEDS, TURNIP SEEDS, MUSTARD, RAPE, &c., for autumn sowing—particulars of which may be had on application.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

Early Feed for Sheep and Cattle

May be obtained by sowing, during July and August,

SUTTONS' MIXTURE of RAPID GROWING GRASSES and CLOVERS, for Autumn Sowing.—This will be found invaluable. It consists entirely of the quickest growing varieties, and will produce a very heavy crop of green food to feed off in November, and a heavy crop for mowing in the following May or June, after which it may be ploughed up. Sow 2 bushels per acre. Price 12s. per bushel.

SUTTONS' IMPROVED ITALIAN RYE GRASS.—The best and most productive in cultivation. Per bushel 7s. 6d. Cheaper by the quarter

TRIFOLIUM INCARNATUM.—Lowest price per cwt. on application

These are invaluable articles for early spring feed, either grown separately or together. The proper quantity of Italian Rye Grass to sow, if sown alone, is 3 bushels per acre, or of Trifolium incarnatum, 28 lb. per acre. We have found it most profitable to grow them together, sowing 2 bushels of the former, and 12 lb. of the latter per acre, in July and August.

Also BROMUS SCHRŒDERI, MUSTARD, RAPE, TURNIP SEEDS, &c. All goods carriage free (except very small parcels).

SUTTON AND SONS, Seedsmen to the Queen, Reading.

BENJAMIN S. WILLIAMS'

GENERAL AND NEW PLANT CATALOGUE FOR 1870,

Contains LISTS of select ORCHIDS (Post Free on application), beautiful PALMS (of which this establishment contains the largest collection in the Trade), elegant TREE FERNS, STOVE and GREENHOUSE FERNS, HARDY FERNS, FILMY FERNS, &c.; graceful and high-coloured DRACÆNAS, massive AGAVES and YUCCAS, BEAUCARNEAS, DASYLIRIONS, ANTHURIUMS, ALOCASIAS, &c., &c.; and many other Variegated and Ornamental-leaved Plants (eminently adapted for the decoration of apartments and the dinner table), also choice AZALEAS and CAMELLIAS, CAPE HEATHS, NEW HOLLAND PLANTS, and AMARYLLIS (for which this Nursery is celebrated), &c., &c.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.

Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

STAND No. 354.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND SHOW AT OXFORD, 1870.

JAMES DICKSON & SONS

Are now Exhibiting at the above SAMPLES of their AGRICULTURAL SEEDS, SPECIMENS of the principal CULTIVATED GRASSES, &c.

(Old Established Nursery and Seed Business)

102, EASTGATE STREET, and "NEWTON" NURSERY, CHESTER.

THE EXHIBITION OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

OXFORD 1870.

STAND No. 362.

JAMES CARTER & CO.,

THE ROYAL SEEDSMEN,

237 and 238, HIGH HOLBORN, LONDON, W.C.,

Will Exhibit an extensive and varied Collection of samples of CARTER'S PRIZE MEDAL MANGEL, SWEDE, TURNIP, and other FARM SEEDS, harvested on their own SEED FARMS; also specimens of their SELECT STOCKS of NATURAL GRASSES in GROWTH, TURNIPS for PRESENT SOWING.

Orders received during the Show at STAND No. 362, facing to the right of the main entrance.

JAMES CARTER AND CO., SEED GROWERS, 237 and 238, HIGH HOLBORN, W.C.

Prize Medals, 1851 and 1862.

BUTLER, McCULLOCH, AND CO.'S EXTRA CHOICE FLOWER SEEDS for Present Sowing, sent post paid.

	Per packet—s. d.
CALCEOLARIA, from show flowers	1s and 2 6
CINERARIA, Smith's splendid varieties	1s. and 2 6
PRIMULA, Silver's superb varieties	1s and 2 6
CYCLAMEN, Wiggins' Prize strain	1s and 2 6
CARNATION, from flowers of great beauty in rollet, tree, and picotees	1s and 2 6 3s. 6d. and 5 6
HOLLYHOCK, from finest show varieties	1s and 2 6
POLYANTHUS, from finest show varieties	1 0
WALLFLOWER, finest double varieties	1 0
PANSY, from exhibition varieties	1s. 6d. and 2 6

CANVAS HOSE, for Watering Gardens, much more durable than India-rubber, will stand any amount of pressure, and about half the price, from ¾ inch to 2 inches in diameter, from 1s. 2d to 2s. 4d per yard. Any length can be had. Samples on view at 27, South Row, Covent Garden Market, where also may be seen the AMERICAN "ARCHIMEDEAN" LAWN MOWER.

BUTLER, McCULLOCH, AND CO., 27, South Row, Covent Garden, London, W.C.—Established upwards of a Century.

B. S. WILLIAMS'
NEW and CHOICE FLOWER SEEDS,
Post Free.

	Per packet—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d, 3s. 6d, and 5 0
CALCEOLARIA, Neill's extra choice train	2s. 6d., 3s. 6d, and 5 0
CINERARIA, Weatherill's extra choice strain	2s. 6d., 3s. 6d., & 5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain	1s. 6d, 2s. 6d., and 3 6
CENTAUREA CANDIDISSIMA	1s and 2 6
ECHEVERIA METALLICA, new bedding plant	2 6
HOLLYHOCK, from Chater's finest varieties	1s. and 2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 3
PYRETHRUM (Golden Feather)	1s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance	2s. 6d. and 2 6
EAST LOTHIAN STOCKS, per collection of three colours	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
WALLFLOWER, New Golden Tom Thumb	1 0
WALLFLOWER, Saunders' pure dark variety	1 0
Hunt's Auricula-eyed SWEET WILLIAM	0 6
MYOSOTIS AZORICA, var. CŒLESTINA	1 6
TACSONIA VAN VOLXEMII, splendid greenhouse climber	2 6

Victoria and Paradise Nurseries, Upper Holloway, London, N.

New and Extra Choice Flower Seeds.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old Established" Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

	Per packet.—s. d.
AURICULA, from finest named flowers	1 0
CALCEOLARIA, James' choice strain from the Dalkeith collection	2s. 6d. and 5 0 1s. 6d., 2s. 6d. and 5 0
CINERARIA, very choice strain	2s. 6d. and 5 0
CARNATION, from superb flowers in rollet, tree, picotees	1s. and 2 6 3s. 6d. and 5 0
CYCLAMEN, Wiggins' prize strain	1s. and 2 6
GLOXINIA erect flowered	1 0 1 0
HOLLYHOCK, from choicest named varieties	1s. and 2 6
MYOSOTIS DISSITIFLORA	1s and 2 6
" SYLVATICA	1s and 2 0
" ALBA	1s and 2 6
PANSY, from finest named varieties Belgian, or Fancy	1s and 2 6 1s and 2 6
PETUNIA, from choice varieties	6d and 1 0
PINK, from finest varieties	1s and 2 6
POLYANTHUS, from finest flowers, extra	1 0
PRIMULA SINENSIS FIMBRIATA RUBRA	2s. 6d and 5 0
" " " ALBA	2s. 6d and 5 0
" " " Mixed	1s and 2 6
" " " FILICIFOLIA RUBRA	2s. 6d and 5 0
" " " ALBA,	2s. 6d. and 5 0
" " " Mixed	2 0

*** *All these Primulas are from the finest strains in cultivation, and cannot be surpassed.*

STOCK, East Lothian, Scarlet, White, and Purple, each	1 0
" German Brompton, first mixed	1 0
" collection, 12 varieties	1 6
SWEET WILLIAM, Auricula-eyed	1 0

TACSONIA VON VOLXEMII, a superb greenhouse climber, which flowers most abundantly almost the whole year. The flowers are about 5 inches in diameter, and of the richest scarlet, grows very rapidly | 1s. and 2 6

VIOLA CORNUTA	1 0
" ALBA	1s and 2 6
WALLFLOWER, fine German Double German, finest mixed	6d and 1 0 1s and 2 6

*** All Flower Seeds sent post free.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.

CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes last season at the Royal Botanic, Royal Horticultural, and other places. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

CALCEOLARIA, finest hybrid. Per packet, 2s. 6d.; smaller packets, 1s. 6d. CALCEOLARIA, finest spotted. Per packet, 2s. 6d.; smaller packets, 1s. 6d. Saved with the greatest care, and from one of the largest collections in the kingdom.

CINERARIA, choicest, mixed.—Saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.

PRIMULA, Choicest mixed, fringed. Per packet, 2s. 6d.
PRIMULA.—Dark carmine, fringed. Per packet, 2s. 6d
PRIMULA.—New scarlet. Per packet, 2s. 6d
PRIMULA.—Rose tinted. Per packet, 2s. 6d
PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest fern leaved carmine. Per packet, 2s. 6d
PRIMULA.—Choicest Fern leaved white, &c. 2s. 6d
PRIMULA FIMBRIATA.—Fern leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

(Larger packets, 5s. and 10s. 6d.)

Forwarded immediately on receipt of Post-office Order

JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

Carter's Select Stock of Onions.

JAS. CARTER AND CO. beg to offer the following excellent varieties of ONIONS for present sowing:—

NEW GIANT ROCCA ONION, of NAPLES, a splendid variety, per packet, 1s.

EARLY WHITE NAPLES ONION, per packet, 1s

NEW WHITE GLOBE TRIPOLI ONION, per packet, 1s.

NEW RED TRIPOLI ONION, per packet, 1s.

A Special Certificate was awarded to JAMES CARTER AND CO. by the Royal Horticultural Society, December, 1869, for three specimen varieties of Onions, the weights of which were as follows:—

GIANT ROCCA, one bulb, weight 1lb 9oz.

ITALIAN RED TRIPOLI, two bulbs, weight 2 lb. 11 oz., and 2 lb. 6 oz. respectively

GLOBE TRIPOLI, one bulb, weight 1lb.

JAMES CARTER AND CO., The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

WELCH-POOL HORTICULTURAL SOCIETY, SEPTEMBER 15.—The following (Open) Prizes will be given. The entrance money in each class (to be paid to the Secretary at the time of entrance) will form second or more Prizes in such class in proportion to the number of Entries.

	£ s. d.		£ s. d.
Four Bunches of Grapes, any sort or sorts	1 0 0	Entrance	1 0 0
One Pine, any sort	2 0 0	"	2 6
Collection of Fruits, 5 kinds distinct (Grapes and Pines excluded)	5 0 0	"	5 0
Collection of Vegetables, 8 kinds, distinct	2 0 0	"	5 0
Cut Roses, 24 distinct, 1 truss of each	5 0 0	"	5 0
Dahlias, 24 blooms, distinct	5 0 0	"	5 0
Hollyhocks, 12 spikes, distinct	5 0 0	"	5 0
Gladioli, 48 spikes, distinct	5 0 0	"	5 0
Asters, 12 blooms, distinct	2 10 0	"	2 6
Most tasteful Table Bouquet	2 0 0	"	2 6

ALL SKILLS to be made to the Secretary on or before THURSDAY, September 8, stating amount of space required, and all articles to be ready for the Judges by 12 at noon on the day of Show. The articles are to be the bona fide property of the exhibitors' own growing. The Show Ground is within a few yards of the Railway Station.

Welch Pool, July 2 D. P. OWEN, Hon. Sec.

Royal Horticultural and Agricultural Show, Oxford.
NOTICE TO ADVERTISERS.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE, of JULY 23, and 30 will contain a FULL REPORT of the PROCEEDINGS at the Royal Horticultural and Agricultural Shows.

ADVERTISEMENTS should reach the Office NOT LATER than THURSDAY MORNING in each week.

A SPECIAL EDITION of JULY 23 will be published in the Agricultural Show Yard

STAND 366, SEED and MODEL SHEDS.

The Gardeners' Chronicle

SATURDAY, JULY 16, 1870.

MEETING FOR THE ENSUING WEEK.

TUESDAY, July 19, Royal Horticultural Society, Great Promenade and Show of Fruit and Flowers, at 1.
FRIDAY, July 22, Oxford.

LONDONERS are so apt to consider their city as the centre of the Universe (may the Parisians pardon us for the moment), that it partakes of the nature of a new sensation to see and experience the interest that is felt in the forthcoming PROVINCIAL SHOW of the ROYAL HORTICULTURAL SOCIETY at OXFORD. Oxford the venerable, the learned, the beautiful, the idle—it is all of these, and all become it! What boldness to invade its territories with such things as steam ploughs and Adiantums. What did CATO COLUMELLA, and the "scriptores de re rustica" know of steam ploughs? What did VIRGIL, though knowing in bees, and that which relates to the *cura boum*, know of Phalænopsids and Tree Ferns? TITYRUS, we presume, knew enough of Beech trees to find out that their shade was grateful on a hot day, and MARTIAL certainly had some idea of window culture, and PLINY of villa gardening; and so Oxford, which delights in such reminiscences, should welcome, and will welcome—Oxford is always hospitable, even in the depth of the long vacation—the representatives of agriculture and horticulture so shortly to assemble within its classic bounds. Westminster hath its memorials—nor few nor light, Canterbury is not deficient in associations, York and Lincoln are not wanting either in history or architectural beauty, Cambridge may fairly lay claim to some beauty and much interest, but where among the cities of Europe will you find such a combination of all that is learned, historic, beautiful, as in the city by the Isis? and this is the spot where, for the second time, the Royal Agricultural Society, and for the first time the Royal Horticultural Society, are to hold their annual tournays. Would that we could celebrate the event in graceful elegiacs; would we could, as the learned doctors did when the Botanic Garden was founded, "speak an elegant oration;" but as that is not to be, let us, dismissing the associations of the past, confine ourselves now to the actualities of the present.

We have said that the interest felt in the forthcoming meeting is great, and those who could see the letters and inquiries that bestrew our table would admit the truth of our assertion. In point of fact these provincial gatherings of the Royal Horticultural Society (we confine ourselves now, as we ought to do, to our own side of the Paper) have surely and gradually got to be considered as the trysting place of gardeners of all degrees, from north to south, from east to west. The Society must have cognisance of this fact, and will take note accordingly. We put in, *currente calamo*, two suggestions, more for the future than the present: 1st, that the shows should be made worthy of the occasions, not mere repetitions on a larger scale of what every country town now-a-days does in the matter of flower-shows; 2d, that means be taken to establish a convenient meeting-place where friend might meet friend, and strangerhood be welded into acquaintance. Oxford has no lack of "common rooms," and some of these may profitably be used for the purpose we have indicated. But whether this be so or not, the question may be asked, what ought we to see in Oxford? We might answer, go to the foot of Magdalen Bridge—take care to call it "Maudlin"—and walk thence up "the High;" we might say explore the college and grounds of the same name. We might say, visit Christ Church Meadow and the Broad Walk, and be thankful; but we remember that, after all, the interest of the coming week centres, in so far as gardeners are concerned, in horticulture. Have Oxford and its environs nothing to show in this department? Assuredly they have; Nuneham and its lovely grounds were alluded to last week; Blenheim and its tree glories are chronicled in our present issue. Swyncombe will ever be memorable for the first flowering of the Bougainvillea; Woodstock is not an unknown name among the growers of the Potato, nor Banbury among those of Onions. In Oxford itself are the Botanic Garden and the several college gardens, all of which are deserving notice. Before Kew was, Oxford was in existence. SHERARD, DILLENIUS, BOBART, SIBTHORP, DAUBENY, were professors; MORISON, BOBART, BAXTER, and others known to fame, and of whom Prof. LAWSON will probably tell us more on Thursday next, were or are curators. Oxford professors tell, with pardonable vanity, that MILLINGTON, an Oxford professor, suggested to GREW the idea of the sexuality of plants, illustrating his notion by plants in the garden—and that when LINNÆUS once visited the garden and had an interview with DILLENIUS, the latter, thinking LINNÆUS would not understand English, made some disparaging remark to a companion, to the effect that LINNÆUS was "confounding" botany by his innovations, and which LINNÆUS, with an acumen almost superbotanical, is stated to have been able to interpret by tracing the word confound to its Latin root!

In our own times the Oxford garden has been famous for its collections of herbaceous and of succulent plants, for plants forgotten by the colour-mad gardeners of the present day, for aquatic plants, Nymphæas, and the like,—plants which, thanks to the loving conscientious care of the BAXTERS, father and son, have been preserved, as witness the true Fuchsia coccinea, while they have been lost in other establishments more infected with the fashion of the times. With its library, its herbarium, and its garden, Oxford well may boast of an establishment singularly complete in the essentials of botanical teaching. Like other establishments of a kindred nature, with insufficient endowments, the garden has sometimes languished; but, taken for all in all, it is difficult to find any garden of its size more replete with interest than the Oxford Botanic Garden. The visitors, moreover, will do well to look into the college gardens, those of St. John, Wadham, Worcester, New College, Magdalen especially—all different—all excellent in their way—all well adapted for the purpose they are intended to fulfil—models, in fact, of what college gardens ought to be. Of the other localities of garden interest—the "Parks," Christ Church Meadow, &c.—space forbids us now to speak. They will be visited by hundreds within the next few days, and when, in addition to these, the Radclyffe Library and the New Museum, with all its appliances, and its staff comprising such men as ACLAND, PHILLIPS, ROLLESTON, WESTWOOD, are duly considered, it will be acknowledged that Oxford, however much addicted to learned ease and classical lore, has not been unmindful of the claims of modern science, nor niggardly in her endeavours to meet them in an appropriate manner.

—— We print the following letter, on the subject of OBSTRUCTIONS at FLOWER SHOWS, which has been addressed to us by a correspondent, in the hope it may tend to mitigate a real inconvenience, but in doing so we are not prepared to admit that gardeners are the only delinquents:

"The peroidicity of certain events apparently subject to no law is a curious phenomenon, which is generally forced upon our attention about this time of the year.

There seems, at first sight, no particular reason why, immediately after the Rose shows, one's ears should be stuffed with complaints about the admission of non-paying gardeners to the shows simultaneously with the paying public, but the phenomenon is sure to appear with as much regularity as any of the evidences of the reign of law referred to by BADEN POWELL or the Duke of ARGYLL. A little consideration will make it evident how it comes to pass. At most of the shows a cursory inspection is sufficient for the general public, and even for the professionals there is not often occasion for any very long appropriation of the space in front of particular plants, and so when cause of complaint occurs it is not sufficiently intense or long continued to break out into print. But with Roses it is different, especially cut Roses. Forty-eight cut Roses will go into the space of a single ordinary specimen plant, and as each is named—and many are new, and all are lovely—it is not only the professional, but also the Fellows and the public that desire to pause over them, to examine them and to take a note of their names. One would suppose that this should only make things go smoother, for 'a fellow feeling makes us wondrous kind,' but it doesn't; and the reason is, that the magnitude of the task makes the visitor anxious to get on; and as there happens to be a great difference between the rapidity with which an educated man and an uneducated man makes not only his notes but his observations, the paying public have finished their notes before the non-paying gardener has half finished his, and then they fret at the block caused by the slowness of their neighbours: and I am bound to confess that there is too often reason in the complaint. I have watched the progress of the crowd round the stages at the recent Rose shows, and have seen repeatedly a long string of impatient weary and heated visitors who adhered to the line of order, stopped for ten minutes in one spot by a couple of slow thick-fingered gardeners, who criticised the merits of each bloom between themselves, and with infinite pains and labour entered the names in their note-books, while dozens of irregular infantry, that are always hovering about the skirts of the line of march, darted in at the opening before them and obtained an unfair advantage over the more orderly crowd blocked by the gentlemen in question.

"It has generally been supposed that this is an evil without a remedy. The only remedy at least which has hitherto been proposed for this and some other disagreeables attendant on the mixture of working gardeners with the general public, is one which has been felt to be too extreme a course of treatment for the mischief, viz., the exclusion of the gardeners from the shows during the public hours. It is acknowledged by all that it is desirable on public grounds, and still more on private ones, to give every facility for one's own and one's neighbour's gardeners (and they are all either our own or our neighbours) to acquire as thorough a knowledge of their profession as possible. Not that I would for a moment adopt the argument, which is a favourite one among themselves, that it would be very hard to prevent those by whose skill and care the flowers have been produced from participating in the enjoyment to which they have contributed: that is no argument. There is no more hardship in their not seeing their own show, than there is in the wine grower not tasting his own wine, or the fisherman not partaking of the fish he has caught. They get their *quid pro quo* in another shape. As with everything else, they receive their remuneration in payment for their labour. But on the other and higher grounds, I should be very sorry to see the exhibiting gardeners or their assistants deprived of the gratification of seeing the show to which they have contributed. But then, let it always be borne in mind that their admission is not matter of right, but of concession and grace. If our friends the gardeners would remember this, and import into the exhibition some of the consideration and desire to accommodate which they would show if they were invited to their employer's drawing-room, I feel sure that cause of complaint would be comparatively rare. Some will say: 'It is useless to try them; there is no making a silk purse of a sow's ear;' but I deny the application of the proverb. Within my own recollection I have seen one very great amendment in the behaviour of gardeners at these shows. They used to come unwashed, in their everyday clothes; but now, thanks in great measure to Dr. Lindley, the fitness of things is better understood. A man's own sense of propriety should tell him of the incongruity beween his dirty working clothes, and a fine lady's silks and satins. Such a sight is rarely, if ever, seen now. If, then, this amendment on the outward visible man has made its way, may we not also look for a like amendment in the inward invisible part. If the gardeners (and not only the gardeners but every one else, for they are not the only men who do not 'put themselves in his place') will only try to practise the great rule of politeness and gentlemanly conduct, as well as of moral duty—'Do to others as you would be done unto,' they would soon achieve a much higher feat than interrupting the periodicity of complaints at Rose shows. By overcoming the demon of selfishness, which is at the root of all these faults, they will raise the standard of their whole body, at the same time that they go a long way towards securing the happiness of themselves and families both here and hereafter." *X.*

We may just add that an excellent plan is adopted at the great fruit shows held at Edinburgh—perhaps at all the shows held there, but of this we are not sure. Gardeners only are admitted early in the morning, and up to a certain hour of the day, and during this time they have ample opportunity to examine and discuss the merits of the exhibition. At the appointed time they take their departure, and leave the show open to visitors. We believe the arrangement works very well.

— Mr. GRIEVE has kindly sent us further specimens of his CUCUMBER PLANTS with a gouty swelling towards the base of the stem even more strongly marked than that which was before submitted to our inspection. He writes that the plants show abundance of fruit, which never swell off, but decay at the flower end, and ultimately drops off. It is difficult at first to understand why this should be the case, as the swelling is full of moisture, and merely seems to be hypertrophied (over-nourished) like the stem of a Kohl Rabi, in which latter case the development of seed is not prevented. On closer inspection, however, we perceive a slight disco-

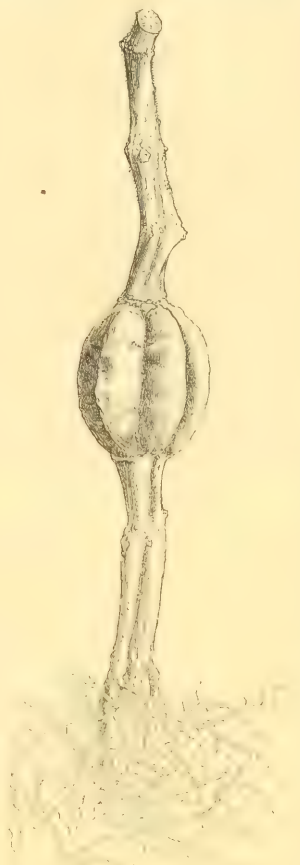

Fig. 176.

loration of the vascular tissue, showing a tendency to decay, and we believe, therefore, that it does not thoroughly perform its function. Enough remains sound, or sufficiently healthy, to ensure the formation of flowers, but not enough to perfect the fruit. The

Fig. 177.

swelling is not sufficiently large to make it probable that the energies of the plant are exhausted in its development, and we are inclined to think that the true source of mischief is to be found in the vascular tissue. The cause of the swelling itself is altogether unkown. Our figure, 176, shows the swelling in question, and at fig. 177, a transverse section through the centre is shown. *M. J. B.*

— On a former occasion we alluded to the [illegible] new HARDY AZALEAS which had been raised at the Knaphill nursery by crossing the older varieties with Azalea sinensis, and we have now the satisfaction of reporting that some of these novelties have been named, and will shortly be distributed. In the early days of "American plant" culture, the glowing colours of the hardy Azaleas bore no mean part in making up the brilliant display; but, somehow or other, except the little that was done in Belgium, the Azalea was for a considerable time neglected, while its evergreen relative, the Rhododendron, was making rapid strides towards perfection. This neglect, however, has come to an end, and the first results are the very interesting set of new varieties to which we have alluded. Of these two were figured a short time since in the "Florist," namely, Nancy Waterer, the finest of all the yellows, rich and deep in colour, and grand in form; and Bessie Holdaway, a bright rose with bronzy spot, remarkable for its lively appearance. The others which have been named are:—amœna, rosy, with a rich buff spot; cuprea, coppery orange, shaded with salmon; fulgida, bright fiery orange, deeper in the centre; ochroleuca, pale straw colour with golden spot; primulina, a lovely delicate primrose-yellow; pulchra, shaded rose with orange blotch; sinensis rosea, pale shaded rose; straminea, straw-colour, another extremely delicate tint of colour; and sulphurea, sulphur, with deeper yellow blotch. Some of the pale tints are exceedingly chaste and beautiful. No doubt this improvement, once set going, will be carried much further. We may add that too much praise can scarcely be given to the double-flowered varieties of this hardy race of Azaleas, on account of the long endurance of their flowers. At present that called Van Houttei is the most conspicuous variety of the group, and a very charming and showy plant it is, with its glowing orange-scarlet and yellow flowers, —so attractive, indeed, that one wonders how it is that we so seldom meet with it outside the "American plant" nurseries.

—— At last we have a street to be proud of in London. On Wednesday the whole line of the VICTORIA EMBANKMENT, as it is henceforth to be called, from Westminster to Blackfriars, was formally opened by H.R.H. the PRINCE of WALES and the Princess LOUISE, acting on behalf of HER MAJESTY. The roadway is about a mile and a quarter in length, follows the curve of the river, and affords grand views of the Palace at Westminster, Somerset House, and St. Paul's. The two latter buildings especially harmonise with the style of the Embankment, and are seen to better advantage than ever before, and noble indeed do they look. In spite of ugly granite plinths, to be ultimately devoted, we presume, to statuary, the work as a whole reflects great credit on all concerned, and when further adorned, as it will be, by judicious planting, here and there, there will be no further need for the parrot-cry that we have nothing to show in the way of street architecture in London.

—— "Nature" says that the hygrometrical balance compensating for the severe drought under which Western Europe has been suffering for the past three months, appears to have been maintained by an unusually HEAVY RAINFALL, reported at the Paris Observatory as having been experienced in Egypt, Lybia, Asia Minor, and Russia. The Paris correspondent of the *Daily News* states that two theories to account for the drought have been broached among French *savants*. One of these attributes to the cutting of the Suez Canal a displacement of the atmospheric currents which regulate the weather of Europe and North Africa. The other theory is grounded on the statement that the spring rains in France are caused by atmospheric commotions resulting from the breaking up of the ice-fields to the east of Newfoundland, and that for this reason a long and severe winter in the Arctic regions is followed by a dry spring, and severe and destructive summer storms in Central and Western Europe. The author of this theory suggests that science should be employed in breaking up the ice-fields at the end of a severe winter by nitro-glycerine and picrate of potassium. This scheme is advocated in the pages of "Cosmos," by a civil engineer of the name of V. PROU, who proposes forming an "Insurance Company against Drought," for the purpose of assisting Nature in the disintegration of the Polar ice, and thus forming a more equable temperature!

—— The METEOROLOGY of the WELK ending July 9 was remarkable for high temperatures and heavy rainfalls recorded at the several stations in England (see Mr. GLAISHER'S Tables in our present issue). The MAXIMUM TEMPERATURE in England was at Blackheath, viz., 89°.7, and in Scotland, at Glasgow, viz., 74°. The mean of the highest temperature at the several stations to the south of Nottingham was 83°.4, to the north of that place was 80°, and for the stations in Scotland was only 71°.1. The MINIMUM TEMPERATURES ranged in England from 45°.8 at Portsmouth to 53° at Liverpool, with a mean for all stations of 49°.7. In Scotland they ranged from 42° at Paisley and Perth to 51° at Edinburgh and Leith, with a mean for all stations of 47.°1. The MEAN TEMPERATURE of the stations to the south of Nottingham was 61°.8, and of those to the north was 60°.5. In Scotland the mean amounted to 56°.7 only. The RAINFALL in England varied in amount from more than 1 inch at Bristol, Birmingham, and Wolverhampton to 0.12 inch at Blackheath; the mean for all stations was 0.60 inch. In Scotland it varied from 1.67 inch at Glasgow to

0.19 inch at Leith, with a mean fall for all stations of 0.70 inch.

—— We learn that a FÊTE on a large scale will take place at LAMPORT HALL, the seat of Sir CHARLES ISHAM, on the 25th and 26th inst., for the benefit of the Northampton Orphanage, admission 1*s.*, when numerous special trains will run from Northampton and Market Harborough to Lamport Station. In addition to the many objects of interest in the admirably kept grounds we would call attention to the unrivalled alpine garden, which has lately been noticed in Mr. ROBINSON'S work on alpine plants.

—— A CRICKET MATCH, played by Married *v.* Single, celibates and Benedicts alike in the employ of Messrs. CARTER & CO., was played at Battersea Park on the 9th inst., when the "married" won the day by two wickets.

New Garden Plants.

TACSONIA (BRACTEOGAMA) TOMENTOSA, *Juss., var.* SPECIOSA, *Mast.*

Caule anguloso demum glabrato; foliis superne glabris subtus mollitor tomentosis; subcordatis, 3–5 nervis, profunde glandulis 6–8, vel pluribus stipitatis; stipulis obliquè-ovatis, longè-acuminatis, denticulatis; bracteis sesquipollicaribus, pubescentibus, in tubum cylindraceum apice irregulariter 2—3-lobatum vel fissum lobis obtusiusculis arcte coalitis; floris late rubri speciosissimi tubo cylindraceo, 3–4-pollicari, puberulo, limbi diametro 3-pollicari, lobis biseriatibus, subæqualibus oblongis, obtusis, calycinis extus viridibus dorso medio carinatis, carina sub apice in aristam exeunte; corona fasciali e tuberculis parvis albidis basi violaceis constante; gynandrophoro gracili elongato; ovario oblongo, subclavato, puberulo, stylis elongatis cylindraceis (ex vivo).—*Tacsonia speciosa*, H. B. K. Nov. Gen. et Sp. Plant. ii.; D. C. Prod. iii. 334.

In one of the greenhouses of the Royal Horticultural Society at Chiswick is now flowering a very beautiful Tacsonia, quite distinct, in the clear rosy red or carnation colour of its flowers, from any in cultivation. The plant in question was introduced to the garden by Mr. Bowmann from New Grenada. On comparing the living specimen with the type in the Paris herbarium, we have no doubt that our plant, in spite of a few trifling differences, is properly referred to Kunth's T. speciosa, a plant which we can only distinguish as a variety from T. tomentosa of Jussieu. There are, indeed, some half-dozen Tacsonias, which are so variable that it is impossible to separate them by any absolute character. Such characters as the slightly angular or cylindrical form of the stem, the pubescence of the leaves and other parts, the glands of the leaf-stalks, &c., are all liable to variation even on different parts of the same plant, according to age and other circumstances. The colour of the flowers is not to be ascertained in the dried specimen, while in the living plant the shades almost defy accurate discrimination.

The Chiswick plant partakes in habit of the general characters of the group. Its branches are slightly angular, downy, at least when young. The leaves are smooth and shining above, downy beneath, deeply divided into three oblong, lanceolate, serrated lobes, the serratures being hooked. The petioles are about an inch long, three times shorter than the blade, and provided on the upper surface with four to six pairs of stalked glands. The stipules are leafy, obliquely ovate, recurved and dentate at the margin, prolonged at the end into a long tail. Peduncles axillary, downy, cylindrical, or somewhat dilated upwards, as long as the leaf-stalk. Bracts connate into a cylindrical downy tube, about an inch and a-half long, and irregularly divided at the margin; lobes ovate, sometimes cleft completely down on one side. Tube of the flower cylindrical, distended at the base, puberulous, green, 3—4 inches long; sepals externally green, downy, internally red, oblong obtuse, slightly keeled on the back, the keel prolonged into an awn below the apex. Petals as long as the sepals, oblong obtuse, pure rosy red or carnation coloured. Corona of two rows, the upper at the margin of the tube consisting of small whitish purple spotted tubercles, the lower, near the base of the tube, membranous, white, deflexed. The stamens and pistil have much the same character as in all the Tacsonias. Ovary oblong, somewhat pyriform, downy, obscurely lobed.

There are in cultivation two or three forms which approach this one, and it may therefore be well to indicate the points of difference. The leaves are a little like those of T. Van Volxemi, but the resemblance is only slight, and in all other points the difference is great. From T. mollissima our plant may be known by its leaves, glabrous and shining above, its longer involucral tube, the downy flower tube, &c. From T. quitensis and T. eriantha (*Gardeners' Chronicle*, p. 388, 1869), the longer narrower leaf-lobes, with their recurved serratures, and the stalked petiolar glands, furnish a ready means of discrimination. The colour of the flowers is, as before said, quite different. Of this a coloured illustration, which, we believe, will be given in a future number of the "Florist," can alone give an adequate idea. It is a splendid accession to an already beautiful group of greenhouse climbers, and appears to be a free flowerer, requiring the ordinary treatment bestowed on its fellows.

As these Tacsonias grow high up on the Andes, some of them close to the snow, it is greatly to be desired that some of our growers would try the hardihood of these plants against a south wall. We believe in the south-western counties the experiment would be successful, though we learn that in East Kent one of the species was thus tried with ill-success. Grafting on Passiflora cœrulea, which is quite hardy near London, might also be tried. *M. T. M.*

ORCHID IMPORTATION.

YOUR correspondent "F. W. B." at p. 924, expresses some apprehension for a continuance of the supply of Phalænopsids, suggesting efforts being made to raise these plants from seed. In a horticultural point of view it is most unquestionably worthy of trial, but I am afraid amateurs are far too impatient to wait for the result of such experiments as to make it commercially profitable. Amateur Orchid growers are generally well-to-do people and can afford to pay, hence they prefer "established plants," or in common market gardening parlance, such as are "All a growing and a blowing." No! I am afraid before these plants could be raised from seed so as to compare in form and size with imported specimens, the interest may have passed to some other favourite exotic or new species. There is, in my opinion, much yet to be done in the introduction of new plants. Vast tracts of accessible country still remain unexplored; for instance, range upon range of mountains running north and south from Siam to China, bordering on the Burmese Empire and British Burmah, contain unknown botanical wealth (if not mineral gold); also the level range of the Himalaya Mountains can have been but very partially searched—making it, I should suppose, worth the consideration of an enterprising nurseryman, as a pecuniary speculation, to send a collector to these parts; independent of such a course being more in furtherance of botanical science than the mere hybridisation of known species.

I am perfectly sensible of the difficulties nurserymen must have in procuring trustworthy, energetic, and experienced men willing to become collectors in foreign, and almost unknown countries; wild beasts, snakes, fevers, or sudden death from other unknown causes, are what many picture to themselves as their almost certain fate—making it somewhat expensive to maintain men having a sufficient practical knowledge to become successful in this particular pursuit; yet with all those drawbacks I am inclined to think it would pay.

There is another point in your correspondent's letter I will offer remarks upon, and that is as to the number of plants which he states are lost in transport. Could this not be remedied by more careful packing? I know Phalænopsids are delicate plants, having a less decided season of rest than many other Orchids, and that they are, therefore, more liable to dry during the voyage home. My experience has taught me this, not only in Phalænopsids, but also with most of the delicate plants growing at great elevations. A short sojourn on the plains, awaiting opportunity of dispatch, will often, unless the plants are properly cared for, effect their destruction. However, with proper attention, the percentage in loss in transit can be obviated. A gentleman of my acquaintance, who has carried out my instructions partially only, has been more than usually successful in obtaining from his agent abroad a small consignment of Phalænopsis Schilleriana, and when the instructions are fully carried out he anticipates the mortality *en route* to be trifling in comparison to the old system which obtained in forwarding these plants. Plants are like human beings in some qualities, requiring their peculiar idiosyncrasies to be studied; their mode of travelling, and how their boxes are to be packed, must not be neglected. *R. Benson, Lt.-Col.*

POTATO CULTURE.

ALTHOUGH an enormous breadth of land is annually planted with Potatos, yet in how few instances do we find a crop exhibiting the appearance of really good cultivation? The reason of this, I imagine, is, that Potatos, however roughly handled, are almost sure to grow and yield a crop, in some favourable seasons giving a fair return, whilst in seasons of scarcity or disease the failure is so general that few indeed have the slightest suspicion that their system of cultivation is in any way to blame. The truth is, that Potato cultivation in its highest development is but little understood, or indifferently acted upon, judging by annual results.

In many gardens the idea is prevalent that Potatos may be grown almost anywhere, consequently, they are grown anyhow. In others it is considered that the ground cannot be too rich for them, they are therefore planted in some of the most heavily manured soil, too frequently, however, on ground that has lain throughout the winter in exactly the same condition as when the summer or autumn crops were removed, without being even rough dug, and the rank manure dug in when the Potatos are planted; the remaining points of culture consisting in this, that so soon as they commence growing the stems are smothered with soil, to support their shoots, and are ultimately left propped on both sides by sharp ridges of soil. The consequence is that in cold, wet seasons the Potatos do not ripen, owing to their being so deeply covered with soil; and in dry seasons their sharp ridges throw off the rain, whilst the dew collected during the night, instead of being conveyed to the tubers, is absorbed by the great amount of soil encasing their stems.

As to the seed, it sometimes happens that until required for planting very little is thought about them, and the seed is then taken from the general store, when if, as most probably will be the case, some of them have sprouted, the sprouts are rubbed off, and the tubers are committed to the ground, there to give an uneven, and, in some cases, an unripened crop; whilst in other instances the seed, if previously reserved, through not being carefully stored, produces sprouts of irregular length and texture—a sure prelude to an uneven crop, which, with early Potatos in particular, is of serious consideration. Taking last season as an example of our latest experience, I doubt not that the majority of gardeners were indifferently satisfied with their crop. In the cold late spring many were the complaints of Potatos failing to make growth. In this immediate neighbourhood this failing was very general, which enabled me to compare notes with others, and these I may say turned out greatly in my favour. All of our Potatos grew away at once with great vigour and regularity; in fact, many remarked their appearance as being as compact in growth as if they had been clipped. Only three tubers failed out of nearly 2 acres. They continued to progress favourably, and yielded me an excellent crop of well ripened and weighty Potatos. The whole were lifted and stored by August 20, free from all disease.

My method of culture, which is very simple, is as follows:—The seed should be selected from a well-ripened crop, from which at the time of growing all of indifferent growth had been marked, and when fit had been used. Having decided upon the size of the tuber required for seed (which with me is from 4 to 6 oz.), choose at once from the whole crop on the ground as many as are required, the sample being selected as evenly as possible. These should then be laid out for a week to harden, after which each Potato should be stood singly, crown uppermost, either on a floor or on shelves, or in shallow boxes. This takes some time to do, but amply repays one all the labour expended on its performance. Allow plenty of air to circulate amongst them, at the same time keep them cool. The topmost eyes will soon begin to enlarge, and will continue doing so very slowly until early spring, when the shoots will be nearly half an inch in length. When required for planting take each tuber singly, and with the thumb remove any weak growths which may be found on it, leaving only two of the stoutest shoots on each; then with a knife make a cut across the base of the Potato about an inch in length and depth: this answers the same purpose as the ordinary method of cutting the end clean off, and will not be found so wasteful. They will then be fit for planting, and great care should be taken not to break or bruise the young growths in moving them.

The ground cleared of summer crops should be chosen for Potatos, and if heavy or much compressed by trampling upon, its surface should be broken some 4 inches in depth with a Canterbury hoe. In the course of a week the whole should be rough dug, and after lying in this condition for a month or six weeks, the required quantity of manure should be wheeled on, with the aid of planks, &c. Our ground being heavy, lying on cold Wealden clay, I use the manure in a fresh littery state, and spread it at once over the surface, allowing the rains to wash the fertilising materials into the ground. After it attains a bleached appearance, the ground is double dug, and the littery portion worked in at a good spade's depth. This is usually done during January, when if visited with sharp frost it becomes a capital job for the men, the manure acting as a protection from frost to the undug ground, and which as soon as dug becomes at once exposed to the sweetening influence of frost. Just previous to planting I scatter leaf-mould over the whole surface of the ground, an inch or so in thickness, for should showery weather occur at planting time it acts as a capital protection to the soil from the trampling of feet during the operation.

Planting for the open crops should be done in March, when in case great breadths of land are to be planted, it will be safest to commence with second early varieties first, and to finish with the earliest by the end of March at the latest. They do best if planted as the ground is dug, using a steel fork for the operation, and unless the ground is lumpy it is not necessary to turn it, but simply to move it, by which means the work can proceed faster. The top of the Potato should be 5 inches below the surface of the ground, which should be left as light as possible. I plant in rows 1 foot apart, the distance between the rows being 30 inches. This I find to be sufficient space for the short-top varieties which I grow, stronger growing kinds requiring 36 inches by 15 inches. When the growth is first perceived it is well to break the crust around the shoots with the Canterbury hoe. This is best done by getting astride each row and finishing each plant as the work proceeds, taking care not to smother the young shoots with soil. When the growth is 6 inches above the ground, the whole of the soil should be dug with a light 4-tined steel fork, taking care when quite near the plants that it is turned to the depth of 3 inches only, within 9 inches of the stems, but to the full depth of the fork in the middle, and working it among the young shoots on either side, 2 inches in thickness and 9 inches wide from the stems; this will leave a very shallow bay of 4 inches in depth, along the middle between the rows, and the Potatos will have a slight mound of soil to grow in, 18 inches

in width with a flat surface. This is all the earthing-up the Potato stems require, and as to the tubers, the nearer they are to the surface without being exposed to light, the better for earliness and quality. *T. C. Sage, Surrenden.*

INSECT LARVÆ.

THE practical question remains, whether any general rules can be established by which we can know what form the noxious larvæ we meet with will ultimately assume?

In order to understand what follows, it is necessary to state that larvæ have legs of two kinds: first, the true legs, representing the legs of the perfect insect, which are comparatively firm, conical, and jointed, and which, when present, are almost always six in number, and attached to the first three segments of the body. Secondly, the spurious legs, or prolegs, which are short, thick, muscular, and unarticulated, varying in number from two to sixteen, and attached to one or more of the eight last segments.

1st. *Generalization.*—All larvæ generally known as caterpillars, and distinguished by having both legs and prolegs, produce either Lepidoptera, or saw-flies in the order Hymenoptera; and the larvæ of the saw-flies are distinguished from those of the Lepidoptera by having more than five pairs of prolegs; and by having only two eyes, whilst the true caterpillars have ten or twelve, and also by their habit of rolling themselves into a spiral coil.

2d. As a general rule, hairy caterpillars produce moths, whilst spiny or naked ones produce butterflies or sphinges. The rule may be more accurately stated thus: all densely haired caterpillars produce moths, but all the larvæ of moths are not hairy. The caterpillars of the butterflies and sphinges are either naked or ornamented with spines, or with very short or scattered hairs.

3d. Wood-boring larvæ belong mostly to the Coleoptera; but also to a few families of the Lepidoptera, namely, the Ægeridæ, the Hepialidæ, and a few exceptional Tortricidæ. The larvæ of the Lepidoptera can always be distinguished from those of the Coleoptera, by the presence of prolegs on the intermediate segments. A few coleopterous larvæ have one pair of prolegs on the anal segment, but more generally only one such leg.

4th. All leaf-sucking larvæ belong to the order Hemiptera (including the Homoptera).

5th. All leaf-gnawing larvæ, excepting grasshoppers, and the caterpillars above treated of, belong to one tribe of Coleoptera, distinguished by the title of Phyllophaga, or leaf-eaters, and comprising the four families Criocerida, Galerucidæ, Cassididæ, and Chrysomelidæ. These larvæ, moreover, can generally be identified by their short, wrinkled forms, their sluggish motions, and some of them by the singular habit of protecting their bodies by their own excrement.

6th. All larvæ found underground, excepting those which enter it only for the purpose of undergoing their transformations, are divisible, according to their habits, into two sections. First, the subterranean larvæ, properly so called, which live underground, and feed upon the roots of plants; and, secondly, those which subsist aboveground, but burrow into it, when not feeding, for the purpose of concealment. True subterranean larvæ are found in the orders Coleoptera, Hemiptera, Homoptera, and Diptera. None of the last order, except a few of the Tipulidæ, have ever been known to multiply so as to be seriously injurious to vegetation. But in the Coleoptera we have the well known white grub of the may-beetle, and the large grape-root borer, in the family Prionidæ; and, belonging to the Homoptera, is the pernicious Apple tree root-louse. The second section is limited almost exclusively to the notorious tribe of cut-worms, all of which belong to the family of Noctuidæ, in the order Lepidoptera.

These are a few of the more obvious general results which we derive from the observation of insects, under the two limitations of noxious habits and the larval state. Others, less remarkable, perhaps, but equally interesting, would be suggested by a more minute study of the subject. *Dr. W. Le Baron, in "American Entomologist."*

THE DEGENERATION OF VEGETABLES AND SEEDS.

FLORISTS and horticulturists are frequently and greatly disappointed in the produce of their seeds and plants. Failures may be accounted for in many ways, such as giving too much or too little manure, bad seed, &c. The persons supplying the seeds frequently get the lion's share of the blame, while it often happens that the grower destroys the seeds and plants with an over-quantity of manure. To illustrate this I may mention that in February last 100 pots were filled with soil which had been frequently watered with urine without the knowledge of the gardener; a quantity of seed, which had been proved to be of first-rate quality, was put into each pot, and all the pots were afterwards placed in a favourable position for growth, yet scarcely a seed grew, having been destroyed by the urine, with the exception of three or four which produced very weakly plants.

In order to show how the quality of plants can be destroyed by manure it may be mentioned that about ten years ago I grew three plants, in pots, of my Russian Parsley, for the purpose of competing in July at the horticultural shows of Partick and Paisley, and with these I carried off four 1st prizes—two from the gardeners' class, and two from the amateurs'. The plants then were all remarkably fine, about 14 inches in diameter, with no perceptible difference as to quality. After the exhibitions they were all removed out of the pots, planted in the garden, and treated with a very liberal quantity of manure, for the purpose of showing them again at the September shows. Two of the plants retained their fine quality, the other became of a very dark green colour, with large plain leaves like that of a coarse green Kale stock; in short, it turned out one of the coarsest plants of Parsley I ever saw.

The following article on the cultivation of French Marigolds, written by myself, about five years ago, under the name of "Observer," for the "West of Scotland Horticultural Magazine," may tend to prove still further the results produced by the application of manure, as well as the advantages of selecting from plants most likely to produce the best results:—"The French Marigold is a half-hardy annual, and has long been a favourite flower with the florists, cultivated by them sometimes successfully, and not unfrequently unsuccessfully. The failures generally arise from the seed not having been gathered from the best sorts, and also for want of the necessary treatment to bring out the colours to suit the tastes of the cultivators. Some growers prefer the blooms of a dark glossy colour, without stripes, but the great majority of florists are partial to the striped ones. Those who like that variety best should gather their seed from well-formed yellow flowers, imperfectly striped, and grow their plants in a liberal quantity of good rich manure, and the result will be a goodly quantity of striped flowers, and of a good size. If blooms are wanted for competition purposes, then remove all the flowers from the plant except those for exhibition, and while the plant is in bloom give it a good supply of water, and the flowers will, in that way, be considerably increased. Should some of the petals of the flower be yellow and without stripes, or partly striped, a few doses of liquid manure will not only improve the colour of the stripes, but increase their number. On the other hand, should the blooms be of a darker colour than is wanted, the very opposite course should be pursued; it is necessary to be very sparing with manure and water, and to slacken or raise the roots of the plant a little with a spade. I have, by this sort of treatment, caused many plants to throw striped blooms which were throwing dark ones before the plants were so treated. I have likewise made pure yellow blooms become beautifully striped by nursing them with manure and water, so as to produce growth. As a proof of this, I have no doubt many cultivators of the Marigold must have observed that even the darkest of the blooms become striped in the autumn, and more and more so as the season advances. This is simply on account of the growth being less about the end of the year than in midsummer. About the middle of April is a very good time for the sowing of the seed. Growers commonly err in selecting the best plants, which generally turn out the darkest flowers; except when the seed is selected from light flowers with a few stripes, in which case the strong plants will produce the best stripes. I remember having been the first to purchase three dozen plants of the Marigold from a fine bed of them. The seller, being a friend of mine, naturally enough gave me the strongest plants, thinking that they were the best, and, to my great disappointment, I had not a single stripe in the whole of my stock until the end of October. An acquaintance of my own also purchased some out of the same bed, after all the best of the plants had been disposed of, and nearly all his plants produced as finely-striped blooms as ever I saw. Since that time I have never selected the best plants, unless I had gathered the seed from the light varieties myself. The lovers of this beautiful flower should take care that no inferior variety should be allowed to bloom along with or near to those varieties from which seed is intended to be collected. A slight inattention to this will tend to affect the quality of the seed, and disappoint the inexperienced."

Good vegetable and flower seeds command a high price, and hence many unskilled persons are induced to reproduce them, and the consequence is that the seeds raised by them are frequently, if not always, found to be very inferior to those of the original stock, owing to the seed having been raised too near to other inferior flowering plants of the same genus, and thus giving bees and flies the opportunity of hybridising them. Besides, both vegetables and flowers have a great tendency to degenerate, and it is found that there are constitutional differences in plants from seeds saved even of the same plant without having been hybridised, such as a difference of colour, bulk, hardiness, and form. The same things are seen in children of the same parents. This being admitted, we are forced to the conclusion that there are new varieties of seeds just as often as they are raised, and that the quality will be to a considerable extent in proportion to the judgment and care of the cultivator. Plants are too often chosen for seed that ought to be rejected by those who look more to quantity than quality, and also by others who don't know the properties that the various flowers and vegetables should possess; and thus flower and vegetable seeds become degenerated. Last year I bought a quantity of seed for the Nuneham Park Onion, from three quarters. In two of the lots I found a mixture of about ten varieties, not at all like that of the Nuneham Park; the other lot was in a sealed packet from Messrs. W. Cutbush & Son, which turned out very well. One of the persons from whom I got the bad seed excused himself by saying that he had got it for genuine from a most respectable wholesale merchant. If I had called the merchant in question he would probably have given the raiser credit, and the raiser might, in turn, have retaliated on the merchants. It will thus be seen that when a mistake of this kind occurs it is difficult to place the saddle on the right horse unless the article is got direct from the raiser. Names of vegetables and flowers which have been raised from the seed tend much to mislead many of the inexperienced, as they generally believe that the quality as well as the variety raised year after year from the same class of vegetables and flowers remains the same, while it is well known to intelligent professional gardeners that the varieties change for the better or worse as often as they are seeded. Those who may doubt this will be convinced of the truth thereof by purchasing a small quantity of seed—say of the Musselburgh, or any other Leek—from half-a-dozen growers (not sellers, as they may get all their seeds from one quarter) who have in different localities raised the seed of it, as they may suppose. After testing the whole of the seed, they will, in all likelihood, find at least six varieties from which it will be difficult to select the Musselburgh, or any other named variety of Leek. *From a Lecture given by Mr. Dobbie before the Paisley Florist Society.*

Home Correspondence.

The Chatsworth Conduit Edging Tile.—It strikes me that these conduit edging tiles will be a very useful invention to many gardeners with a limited supply of soft water. When making the new kitchen garden here I took care to have plenty of tanks made to contain all the rain-water from the different ranges of hothouses, and have never been without soft water since. The last three summer seasons have been trying ones to many gardeners, for copious supplies of soft water were out of the question. I had suffered much in the old kitchen garden for want of rain-water, having had to dispense with syringing in dry summers, for the carbonate of lime in the hard water used disfigured the foliage and fruit. In many gardens there are always places in the walks where in heavy rains the water collects, and tanks placed there would be invaluable in dry weather. Besides, these edging tiles would look neat and appropriate on walks in kitchen gardens, and, unlike Box, would give no shelter to the legions of snails and other crawling things that hide themselves therein. *William Tillery, Welbeck.*

Early Peas.—Continuing the discussion on Peas, it is well known to all that the influence of locality has its advantages and its disadvantages. Mr. Meikle says the turn of a wall will make a week's difference; if so, it must be a very great turn indeed. Most gardeners make it a rule to sow under a wall with a south aspect, if they have one; if they have not, then I quite agree with Mr. Meikle that such a turn would give a week's advantage. And, again, what man with reason, under such disadvantages, would ever pretend to outdo his neighbour and discuss the matter through these columns? Mr. Meikle's open sown Peas were ten days in the rear of his indoor sowing; I don't dispute his word, but why need the difference have been so great, and what were the enormous advantages he gained, considering the extra time and trouble? Probably his advantages were a scanty crop of half-filled pods, fit only for the dunghill. As to the time of Peas flowering, I take no notice of that, for with me this year Sutton's Ringleader flowered several days sooner than Dillistone's Prolific, but was three days later in gathering; the same with Beck's Gem, which flowered a week later than Taber's Perfection, but there was only a day or two's difference at the time of gathering. It will be well for me to correct a small error made by Mr. Draper at p. 863: I did not say Sutton's Ringleader was three days later than the other sorts; if you refer to p. 830, you will see that I state Sutton's Ringleader was three days later than Dillistone's Prolific, which rather surprised me, for until this year I have grown no Pea earlier than Sutton's Ringleader. I intend testing the same two sorts together next year, as there may have been some mistake in the seed, but as it came from one of the largest and oldest establishments in London I cannot doubt but that I received it true. Respecting the discussion on early Peas I may say that we all have the privilege of enjoying our own opinion and of acting as experience teaches us. At all events I am no advocate for the sowing and planting-out system of early Peas, neither do I agree with November sowing, which is the practice of a great many gardeners. *E. Morgan, The Butts, Harrow-on-the-Hill.*

The Potato Tournament.—I am pleased to see that Mr. Fenn—who is acknowledged to be one of our most successful Potato cultivators—has come forward so manfully to support the cause of a Potato tournament. But I think, upon more mature deliberation, he will agree with me that if we are to succeed in diffusing

wider the spirit of high cultural emulation amongst the large class of Potato growers, and in supplying an opportunity where cultivators may meet in common and exhibit their produce in close competition, we must begin modestly and proceed safely, or, as he would say, "upwards and onwards." It is not by entering into very severe trials of strength with large collections that this end can be attained. Mr. Fenn will agree with me that Potato growers do not as a rule grow more than from eight to a dozen varieties. Now it is here that we must meet in common, and as I originally suggested. Then, if a sufficient number of exhibitors can be found to enter into competition on a limited scale this autumn, we may hopefully look forward to an increase in numbers and in strength in a succeeding season. It should be understood that such a "little go" need not necessarily entail any secondary expense upon subscribers beyond the carriage of their parcels, as there will be no absolute necessity to attend in person. I suggest, should subscribers enough be forthcoming, that the following classes be formed:—1. For 12 distinct varieties, 6 of each, kidneys and rounds; 2. Best dish of kidneys, any sort; 3. Best dish of rounds, any sort. With regard to the amount of subscriptions, I think that should be limited to, say, 5*s.* or 10*s.*, to entitle the subscriber to the right to compete, with the option of paying any sum under a guinea. As regards the date when the competition should take place, it matters little, as it will be alike to all. No one suffers more during a season of drought than I do here; hence, for my part, I can expect very little good to accrue from this kind of competition. *William Earley, Dysewell, Welwyn.*

Flower Shows and Judges.—I sent six plants of Gold and Bronze and six of Tricolor Pelargoniums to the South Notts show, which was lately held at Newark. The six Gold and Bronze were quite equal in colour to those exhibited by Messrs. Downie, Laird & Laing at Leeds; they were: Plutus (Smith), 3 feet through; Canary Bird, 2 feet 6 inches; Golden Rule, 2 feet; E. G. Henderson, 2 feet 6 inches; Princess of Wales, 2 feet; Princess Alice (Wills), 3 feet—all perfect specimens, and rich in colour. These were awarded a 2d prize, while the 1st was awarded to six plants with no more colour than ordinary zonals—Beauty of Calderdale, 9 inches across; Beauty of Oulton, with not one particle of high colour in it; Beauty of Calderdale again, named Mr. Richards; E. G. Henderson, named Duke of Edinburgh; Artemus Ward, and Beauty of Ribbledale; the above from 9 to 12 inches through. For the Tricolors I was again awarded the 2d prize, with splendidly coloured plants of the following:—Italia Unita, 3 feet through; Light and Shade, 2 feet 6 inches; Impératrice Eugénie, 2 feet; Earl of Derby, 2 feet; Sunray, 2 feet; Charming Bride, 2 feet—every plant perfect in shape and rich in colour. The following six were placed 1st—plants that could be bought in any nursery at 2*s.* 6*d.* each:—Sophia Cusack, Lady Cullum, Lucy Grieve—a plant with three branches about 4 inches long, with all the colour washed out; Mrs. Pollock, with as much colour as Golden Chain; Sunset, and Sophia Dumaresque,—the above from 6 to 12 inches through. On appealing to the officials I could get no redress. *William King, Nurseryman, Lincoln.*

Chapman's Patent Flower Box.—Mr. Chapman deserves great credit for this admirable contrivance. From the first I considered it would be a great boon to all who had occasion either to send cut flowers to exhibitions, or for private use, but I was not aware of all its advantages until I took with me to the Crystal Palace Rose Show a box of seedling Verbenas, which carried better than any I had ever taken to any show. The India-rubber bands not only keep the water in the tubes, but so embrace the stalks of the flowers that the blooms do not twist round and round on their transit, consequently they retain at their journey's end the exact position they occupied when placed in the board. Few who have occasion to transmit flowers will be without these boxes when they have once seen their advantages. *Charles James Perry, Castle Bromwich, near Birmingham.*

Lawn Mowers.—Allow me to add a few words on the lawn-mowing controversy. I have been away from home for nearly three months, and during my absence I ordered an "Archimedean" lawn-mower, which has been in use here ever since it was first necessary to cut the grass in spring. I find my lawn much greener than I ever remember, after such a continuance of dry weather, and I attribute it in a great measure to the use of the "Archimedean," as the grass which is cut and scattered over the lawn not only acts in the first instance as a mulching, but eventually as a manure. I was decidedly prejudiced against it in the first instance, as I thought the grass must always look untidy if not swept up, but have been agreeably surprised in this respect to find how little it really shows. I have had between twenty and thirty persons to see my garden within the last few days, and the general remark was, "But you must have swept the grass up after mowing," and they could hardly believe me when I said that every bit of grass that had been cut from the first commencement of mowing with the "Archimedean" had been left on the ground. Mr. Fish can hardly have sufficiently reflected on the subject when he says: "Why, every inch of ground must dispose of its inch cube of grass (nearly), divide, scatter, or dry it as you will." Has he ever thought, when grass is collected in a box before a machine, how many cubic inches he would have to mow before he could get a cubic inch in the collecting-box? If the quantity of grass on a lawn, where the grass was an inch long, was anything approximating to what Mr. Fish here suggests—36 yards a yard wide would give a cubic yard (nearly) to be collected in the box in front of the machine; and as very few boxes will take more than 6 inches in depth, an 18-inch machine would have to stop about six or eight times in 36 yards, 18 inches wide, to dispose of the grass, if this calculation were even approximately correct; whereas a Green's or Shanks' machine will generally run about 100 yards, even if the grass were an inch long, before the collecting-box gets too full. Again, if the grass is cut as often as it should be, there need be no fear of any Daisy seeds ripening. Has Mr. Fish ever tried to work one of Green's or Shanks' machines without the collecting-box? because he would find, if the grass was long or wet, that as the grass is always thrown in front of the cutter, it is repeatedly collected again, and consequently soon chokes. I have often tried it, and soon find that it is impossible to work the machine long if the grass is the least thick, so that in my opinion it is not correct to assert, as Messrs. Green do, that it is simply necessary to take their grass collecting-box off in order to make their machines scatter the grass like the "Archimedean." A few hours' sun reduces succulent cut grass to one quarter its bulk and weight, and as soon as the grass begins to grow again it covers what little *débris* is still to be seen, and that little is only seen when you especially look for it. As I am writing now I am looking upon a lawn only a few yards from the window, and though mown only two days ago I cannot see a vestige of the old grass from here, but there are two or three places, where the grass was left too long before it was mown, where it can still be seen if looked for, but it would never be observed without one's attention being especially directed to it. *C. P. Peach.*

—— Whilst this discussion is being carried on I think the opportunity a favourable one for me to ask the question, if any of your correspondents have used the "Philadelphia" lawn-mower? My employer brought me one the other day from America, and I think, when better known, it will be found to be a very useful machine. The fault generally found with the "Archimedean" is remedied in this machine. The knife is four-edged, and there are shields to put on to collect the grass. It has no large roller, but two driving wheels, one on either side. The knife is behind a small roller, which regulates the cutting. It is much easier to work than the "Archimedean," and will do its work well on uneven ground. Has any of your correspondents worked this machine? if so, what is their opinion of it? *J. C. Mitchell, Oakham.*

Agapanthus umbellatus.—I would caution your readers against trying more of this plant than they can afford to lose, unless in the warmest and most sheltered situation. With a glass top it will stand in warm sheltered places; without it, even if thatched over, it will mostly perish. Some years ago I had a splendid stock, as it was a great favourite; the plants, however, became very troublesome and expensive to keep, through their great fleshy roots bursting all the pots every summer. They were planted out in consequence, and left out carefully thatched over. The result was, that the whole perished. *Observer, East Anglia.*

Variegation in Double-flowered Plants.—You have recently noted the production of a double variegated Stock. There can be no inconsistency in these cases, and they ought not to be exceptional. In my paper on "Sex," I have pointed out that variegation was one step in the male direction, when plants are departing from their normal hermaphrodite form. Doubling of the stamens or petals is also a step in the same direction, and we may safely infer the two can exist together. I should look for them rather than suspect antagonism. We have here a semi-double Vinca minor, with variegated leaves; and a very double Althæa (Hibiscus syriacus), with a beautiful variegation. The single variegated Althæa already exists in European gardens. [And the double also. EDS.] *Thos. Meehan, Philadelphia.*

Rose Shows.—As the number of these is yearly increasing, and some of those held this season have taken place two or more on the same day, to the injury of the shows and the annoyance of exhibitors, I beg to submit, for the consideration of all concerned, the following suggestion:—That to utilise the showing power to the utmost, and consult the convenience of the leading exhibitors, as well as to prevent for the future two shows falling on the same day, a conference be held in London, or wherever else might be fixed upon, early in the spring of every year, at which a delegate from each of the leading shows should attend, and to which the principal exhibitors should be invited,—that the business of the conference should be to fix the days for holding the various exhibitions. I have mentioned the subject to many of the principal exhibitors, and, from what I have ascertained of their views, I think it probable that if the proposal meets with the approbation of Mr. Hole, and other leading Rosarians, there is some prospect of a satisfactory settlement of the dates for the various shows being made in future years to the advantage of all interested. Such a conference might be rendered useful in many ways, as various questions relating to Rose shows, regulations for their government, suggestions for improvements in schedules, modes of staging the blooms, &c., might be thoroughly discussed at it by those most qualified to look at them from every point of view, and most interested in their proper settlement. Perhaps you will allow Rose exhibitors to express their views in your columns? [We shall be glad to further the interest of Queen Rose in any way. EDS.] *Edsel. H. Badger, Moseley, near Birmingham.*

Phœnix farinifera.—Some seeds of this plant, which were sent to me from Southern China by Dr. Hance, H. M. Vice-Consul at Whampoa, were sown here (Collioure) last year in the open ground, and although during my absence for the greater part of the year in Paris the plants received but little attention, they are now doing well. They passed the winter in pots without protection of any kind, and although they were buried for 12 days beneath the snow, and were subjected to the influence of severe frost, they are now in vigorous health. I am rather doubtful whether this is the true Phœnix farinifera of Von Martius. I am inclined to think it is quite a different species; and if so, I would suggest that it receive the name of P. Hanceana, in compliment to the distinguished botanist who first described it in the "Annales des Sciences Naturelles," and by whom it has been re-introduced into Europe. I say re-introduced, because some 12 or 13 years ago, probably through the mediation of M. de Montigny, seeds of a Phœnix identical with those sent by Dr. Hance were received at the Jardin des Plantes. The young plants thus obtained did well, and I have a specimen here in the open ground which is growing wonderfully. Its trunk is forming, and I have reason to think that, in a few years' time, it will assume an arborescent form, and produce flowers. It is at least as hardy as the Date Palm. Last winter, which was exceptionally severe (7° Centigrade below zero = 19 Fahr.) it was entirely unprotected. It was buried for 12 days beneath more than 3 feet of snow (mètre). It was then deluged with water, produced by the melting of the snow. Almost all its leaves were broken by the weight of the snow. It was so disfigured that I looked upon it as lost. Nevertheless, this maltreated Palm seems all the better for the exposure. Since March it has sprouted vigorously, and has entirely reproduced its crown of leaves, which are larger and finer than they were before the accident. I am hence disposed to consider the P. Hanceana as an excellent acquisition for the subtropical gardens in the South of France. I notice that Dr. Seemann commits an error, or rather repeats that of others, by admitting several species into the genus Chamærops. Up to this time there is only a single species well known, that is to say C. humilis of Southern Europe and Northern Africa. All the Palms so-called, and which are natives of North America, the Himalayas, China, and Japan, certainly belong to other genera. In my opinion the nearest genera to Chamærops are Livistona and Phœnix, in spite of the pinnate leaves of the latter. Their affinity, moreover, is proved by the fact of the crossing of the Chamærops with the Date Palm. Several of the hybrids thus obtained differed from the seed parent (the Chamærops) in their pinnate leaves. In 1867 one of these hybrids was sent to Kew. *Charles Naudin, Collioure, Pyrénées Orientales, France.*

The Drought.—The average annual rainfall for the last eight years is 33⅛ inches, it consequently appears that the fall of the first three months of this year was scarcely up to the average; and the last three, including also that which has fallen during the present month (0.115 in.), shows a deficiency of rather more than 6 in., which, in round numbers, equals 3000 hogsheads to the acre. Clear sky and bright sun have been the rule, and clouds the exception, and the thermometer frequently indicating over 80° in the shade. The pastures are very bare, except those irrigated. The hay, in many instances, was made before it was cut. Fruit is plentiful, but small. The root crops are very light. Mildew is rampant, and the timber trees are now beginning to show signs of thirst. I fear Mr. Miller's Fungus theory will be too fully verified as this season. *T. Challis, Wilton.*

The Drought in France.—The second fortnight in June was very hot here. For several days in succession we had from 33° to 36° Centigrade. The mean temperature for this fortnight was 25°.61 (78°.09 Fahr.), which of itself would not have been injurious, but the drought has been such that some young trees planted last winter have perished, and even some Vines are nearly dead. The Opuntias even, such as O. inermis, O. Ficus indica, O. vulgaris, &c., in spite of their succulent habit, are dried up like horn. *Charles Naudin, Collioure, Pyrénées Orientales, France.*

Growth of Melons.—In answer to "Subscriber's" inquiries respecting the effect of gas upon the growth of Cucumbers and Melons, I beg to say that my employer has small gasworks 12 yards from our Cucumber and Melon pit, and I have not found them injured by being placed so near to the works. The only thing I feared would do me an injury was the sulphur from the furnace heating the retorts, but being private it is only used once a week in winter, and once in three weeks in the summer. I should say the cause of

failure was canker, as I know that many gardeners were troubled with it in the spring, when the sun was very clear and the wind bitterly cold; the foliage had the appearance of being scorched by the sun, and small spots followed in the stems of the Melons, which caused them to die. *W. Saunborough, gr. to E. Jekyll, Esq., Warguave Hill, Henley-on-Thames.*

Verbena Culture.—I am in want of the following information concerning the successful culture of Verbenas in pots for exhibition, which perhaps some of your correspondents will kindly afford:—Is liquid manure, made with sheep droppings, good to water them with, or would that made from cowdung be better? How long previous to the show should the points be pinched out for the last time? One of my finest plants is going black at the points; is there any cure for this, or means of checking, it? Any information concerning the above will greatly oblige *A Would-be (successful) Exhibitor.*

Protection of Wall Fruit.—I enclose you a sketch (fig. 178) of what I believe to be the cheapest, most effective, and simple plan I have yet seen, and which may be carried out with the assistance of any ordinary workman. I have proved it on a small scale, and mean to extend it next season to a wall 100 feet long. Although my plan was imperfect in some of the details, I found that the lowest temperature during the nights of March, April, and May, was from 4° to 6° higher than on the unprotected portion of the wall. The mode of carrying it out is as follows:—Take a strip of deal, of the required length, 1¼ inch square (A), and nail it against the highest part of the wall to be protected. Nail another strip of the same size half an inch below (B); you will then have a groove of half an inch between the two strips. Take 1¼ inch angle-iron, of the required length, and fix it 2 feet from the wall, on upright rods of ¾ or 1 inch iron, fixed firmly in the ground at about 7 feet apart (I have had one fixed at 7 feet 6 inches, and it has answered very well); the top of the rod must be flattened, and a hole drilled into it to receive a screw, a corresponding hole in the angle-iron on the lower flange, and countersunk, will (with a small wooden washer) be all that is required. In order to keep the iron rods steady, and at fixed distances from the wall, I take a small piece of flat bar iron ¼ inch thick, and ¾ wide (C), of the required length, with a hole drilled at each end, one of which will receive the screw which fastens the rod to the angle-iron, and the other must be screwed to the under part of the lower strip of wood. The frame is now ready to receive the glass; the panes may be 26 inches long, by 12 to 15 inches wide: place the one end between the two strips of wood, and let the other fall on the lower flange of the angle-iron, on which it would be better to place a strip of felt for the glass to rest upon. I omitted to say that the upper flange of the angle-iron should have holes drilled in it about a foot apart, for hook screws, as shown. A strip of wood should then be prepared about three-quarters of an inch square, and placed in the angle-iron on the glass, and fixed in its place by the screws with hooks at the end. If nicely managed, the glass will slide to right and left as required, without removing the strip of wood. The frame as then fixed may be used as a permanent or temporary glass coping, as desired. At night I cover the trees more effectually by attaching scrim canvas to the screw-hooks, to be removed in the morning; or during cold boisterous days the canvas may be left up, as the light is very good through panes of such a length. It will be seen that the structure is of such a light character that little or no shade is thrown on the wall, while the hook-screws in the angle-iron afford great facility for the extra protection required during the night, and if kept up during the day there is room for the gardener to pass between it and the wall for any work he may require to do. If the wall already has a coping, only the lower strip of wood will be required, half an inch below the coping; and in any case this lower strip should have the upper edge planed off to the angle required for the glass to rest upon. I should have stated that some fine copper wire (D), or even fine twine, passed round each rod, and carried from one to the other, about 2 feet apart, will be useful to prevent the canvas from being blown about. The cost of mine, with panes 26 inches long, exclusive of workmanship, which I did entirely myself, was as nearly as possible 1s. per foot run. *E. H.*

Trichomanes radicans.—I have thought that my little experience with this plant might not be uninteresting to your amateur readers who, like myself, have only a very limited amount of either convenience or time. I purchased a small plant from Mr. Sherratt, of Knypersley, in November last, and forthwith potted it, or rather, I should say, I got a large pan, something like a seed-pan, and filled it, in the form of a depressed cone, with broken sandstone, and placed the plant on the top. I then put a bell-glass over it, the glass fitting on the rim of the pan, and placed it in a home-made fernery, of very humble pretensions, with plenty of chinks and holes all over it. I placed a bit of stone between the top of the pan and the glass, to admit air. I had rarely any occasion during the winter to sprinkle it, and during the severe frost it was frequently frozen for several days together, for I had no means of heating the place, and only intended to grow some hardy Ferns in it. In the spring it commenced to grow, and has made three nice fronds. It is throwing up more, and the few fronds that were upon it when I bought it are in as good condition now as they were then. *Samuel Eyre, Leek, Staffordshire.*

Candle-bearing Tree.—Near the river Chagres, on the Isthmus of Panama, is found a tree the fruit of which very closely resembles unbleached wax candles, giving rise to its popular title, *Palo de velas* (the Candle-tree). The botanical name is Parmentiera cerifera, and its fruit is eaten by sheep. Can any of your readers, who has seen this curious tree growing, give me its usual dimensions, and the shape of its leaf? *E. S.* [The plant was introduced to this country by Dr. Seemann, and is in cultivation at Mr. Bull's nursery and elsewhere. Eds.]

Yellow Roses.—Allow me to suggest that the time has now arrived when the Crystal Palace Company and the Royal Horticultural Society should offer prizes for the best 12 or 18 yellow Roses, distinct kinds. The last few years have brought several good yellow varieties into cultivation, and I cannot but think that the great mistake which the judges have made this year in awarding prizes to stands containing Maréchal Niel only (when the schedules of both societies distinctly stated the best collection) will prevent any other variety of yellow Rose from being shown, while on the other hand if yellow varieties are properly encouraged they will become the most popular class at all the Rose shows. At least, such is the opinion of *Vicomtesse de Cazes.*

Vines.—Liquid sheep manure poured round Vines is said to protect them from the ravages of the bug. *E. S.*

Gold and Bronze Pelargoniums.—Mr Wills would have been more candid if he had given his reasons for declining to submit his plants to the judgment of the Royal Horticultural Society's Floral Committee, or the judges at the Crystal Palace show. Is it because he is afraid to put them before gentlemen of known ability, and whose decisions are unimpeachable? or has he no faith in their opinions, that he wishes this question to stand over for another 11 months? Has Mr. Wills any proof that the Leeds Horticultural Society will hold a show at all next year? The local newspapers say it is very doubtful if there will be one. Presuming there is to be one—and, so far as I am personally concerned, I have no objection to Leeds being the place of exhibition—would it be reasonable for me to ask Messrs. Downie, Laird & Laing to be at the expense of bringing down their plants to Leeds, and this, too, while it must be fresh in their memories how they were treated by the judges this year, and how some unprincipled person or persons had the impudence to strip some of their most valuable plants of their cuttings? I ask Mr. Wills if this is not enough to make them, or any one else, similarly treated, rather shy at again visiting Leeds? In my former letter I made a fair and reasonable challenge, and if Mr. Wills declines to accept it, after making the statement that his sorts would be cultivated long after Downie, Laird & Laing's were forgotten, the readers of the *Gardeners' Chronicle* will be able to draw their own conclusions. *Looker-on.*

Figs grow very abundantly in South Carolina; they ripen twice a-year, and compete, when dried and packed, with the foreign imported ones in the home (U.S.) fruit market. *E. S.*

Raising New Roses.—I was struck some time ago, I think about December, 1869, by a paper reported in the *Gardeners' Chronicle* as having been read at a meeting by a gentleman, whose name I forget at this moment. The subject was new Roses. He remarked truly that the raisers of new Roses do not give the attention they might to producing particular qualities; that by crossing a handsome and delicate with a hardy Rose, others with the good qualities of both might be obtained, the same as to form and colour. This probably is done to some extent, but it is impossible to believe that it is very generally so; and no doubt there must be a good deal of chance about a batch of young plants. But what is a standing proof of the assertion that Roses are not always "bred" with a view to the best possible combination of qualities, is the fact mentioned in the paper alluded to, that there is not such a thing as a really fine white Rose in existence. At least what is said amounts to that, and it is the case as far as my knowledge goes. My purpose in writing this is to recommend to all those concerned an old Rose, which seems as if it might be the parent of better white Roses than any we have. I know it under the name of "Lady Harrington;" it is not old in the sense of the Cabbage and Damask Roses, but I should think must have been new about 25 or 30 years ago. It is quite unlike the old gardeners' Rose and white Moss, and has, except for being pure white, a good deal of likeness to Coupe d'Hébé; it has not its vigorous growth, and is less double, having generally visible stamens, but the beautiful form of the half-blown flower is much the same. It is rather milk-white than snow-white, like Aimée Vibert, but a Rose combining the size and form of the one with the qualities of the other would be worth having indeed. *Old Subscriber.*

New White Lobelia Purity.—To the notice of this, which appeared on p. 929, I may add that Mr. Chambers raised two seedling white Lobelias, the second of which promises to be quite as valuable as the one named Purity, though having smaller flowers allied to a dense dwarf habit. They have been planted out-of-doors since the middle of May, and on the flowers of neither has the faintest tint of blue appeared. They have been purchased by Messrs. Cripps & Son, of Tunbridge Wells, and will be shortly exhibited by them at one of the meetings of the Royal Horticultural Society. Shrubby Calceolaria Matchless, exhibited by Messrs. Cripps & Son, is in commerce; it was sent out about three years ago by Mr. H. Walton, Marsden, Lancashire, and said to have been raised by Mr. J. Wills. *K. D.*

Flower Sermon.—Some few weeks ago there was a paragraph in the *Chronicle* stating that in one of the London churches there had been a special service illustrated, if I may use the expression, with flowers. Not only did the members of the congregation bring handsome bouquets, but the church was also gaily decorated with plants and flowers. Such an assemblage of worshippers in holiday dress with their sweet-scented posies could not fail to produce an excellent effect, so like an offering of the sweetest and fairest products of the year to the Giver of all Good. This truly graceful service is not confined to City churches, although it is evidently a relic of the past, and seems dying out. There is a country parish in Cheshire, on the borders of Denbighshire, on the banks of the Dee, about 8 miles above Chester, called Farndon, where Flower Sunday is annually observed; the church is tastefully decorated with flowers, and some reference to the flowery fête is expected in the sermon preached on the occasion, but what is most remarkable in this custom consists in the devices in flowers placed on the graves of friends on a groundwork of green Rushes, laid side by side, like some green-corded web of cloth with a highly coloured pattern or device worked in flowers on its face. The attraction of Flower Sunday never fails to draw together a large and an attentive congregation. Whether attracted by curiosity, or for holiday making, those who come remain to pray, and as they visit the church-

yard to see the gay garlands on the graves of their friends, it looks as if the flowers and the evergreens had a mission to perform of blessed hope, as the poet has so elegantly expressed, that even "the woes (of death) were not too wide to see beyond."* In Mrs. W. P. Byrne's work on Spain ("Cosas de Españo"), she mentions the annual visit of the inhabitants of Madrid to the Campo Santo, on the festival of All Saints, to place a fresh wreath of flowers and a lighted taper to adorn the last resting place of their departed friends; and in the evening, when all these twinkling lights are burning, the effect is strange and impressive. The same ceremony is said to prevail in France. Surely the beautiful custom of a Flower Sunday would be worth a trial where there is a complaint about getting the labouring classes to attend Divine service. The charms of flowers alone are sufficient to draw crowds to horticultural exhibitions, it would, moreover, encourage the cultivation of flowers, and make cottagers and others vie with each other as to who should be able best to adorn the house of God and the narrow house appointed for all living. *A. F.*

Orchid Cultivation.—At p. 564 of your Journal I asked if Dendrobiums had been raised from seed, and I now see your correspondent "F. W. B.," at p. 924, says, he thinks Phalænopsids can be raised in this manner, and asks for information. I should be equally obliged, and venture to ask you to draw the attention of the scientific gentlemen at Kew to the subject, in the hope that they can help us. I do not think that this method can ever make Orchids more plentiful than by means of such propagation as is suited to their habit, and I do not find Phalænopsids more difficult to propagate than other Orchids; but I should like to try what can be done in this way, and have made the first step towards obtaining the seed. In doing so I had observed that the flowers of P. cornu-cervi and P. Luddemanniana do not wither, as in the case of P. grandiflora and P. Schilleriana, but, after losing their colour, retain their form, the substance of the flower sepals and petals becoming thicker and harder, being slightly transparent, and of a light green colour. As regards propagation I find that all Orchids propagate themselves as soon as they are strong enough, and Phalænopsids are not exceptions to this rule. On a previous occasion I sent you a photograph of a plant of P. Schilleriana having two spikes upon it, the one a flower-spike, and the other showing a young plant; since the flowers have been cut that spike has not made any more, but the other made a second growth immediately under the young plant: and when this was taken off, young plant No. 3 had begun to form at the end; the plant is also throwing up another spike, but what it will be we cannot tell. I have also another smaller plant producing its first young plant. Botanists say that a flower-spike is only a dwarfed growth, and this theory is supposed to be the most clearly proved by the habit of a Pear tree. Last year I had a young plant formed upon a spike on P. grandiflora, that commenced with two leaves simultaneously, and after these had grown a little, a single flower pushed up between them. In Dendrobiums the near connection between flowers and growths is shown very often, when they are growing strongly—roots will push from the base of a flower-stalk, which on examination will be found to be formed like those of growths: again, growths after making two or three leaves, will finish by producing flowers. To understand how to grow any race of plants, we must first thoroughly comprehend their native climate and habit. "F. W. B." says, "We must not forget that naturally Phalænopsids have no winter, that is, their season of rest is during the hot dry period of the year." Their native places he gives as Borneo, Java, Sumatra, and Moulmein; of this last place Lieut.-Colonel Benson has given us a full account, proving that it is hot and dry enough. Last year I bought a small plant of P. Lowii, and I assure you it wanted great faith not to throw it away during its rest; now it is growing vigorously, but I have no desire to reduce any of the others to the like state to rest them. "F. W. B." also says—"they are more or less subject to cool sea breezes all the year." I have not Mr. Wallace's "Malayan Archipelago" at hand, but my impression is that he says Borneo enjoys the most uniformly hot and humid temperature in the world, and speaks of the sea being exceedingly shallow, and the water hot. The equator runs through both Borneo and Sumatra, and I very much doubt there being a dry season in either of them; but perhaps "F. W. B." will be kind enough to give his authority. My only object is to obtain correct information, and as he gives no authority, he will perhaps excuse my doubts. Do you think this subject is of sufficient importance to warrant you in asking Mr. Wallace to give us some information upon the climate of these islands? I am reading with great interest his "Essays on Natural Selection," and regret I have not as yet found a chapter on Orchids. I bought Darwin on the "Fertilisation of Orchids," which work helped me so far, but there he stops. I do not think the plan of raising Orchids by seed can ever be of much commercial advantage, but this manifestly depends upon their speed of growth, and the care and attention required in rearing them; should any one be successful in obtaining ripe seed, it will require about as much skill on the part of the propagator who has the care of them as if he were producing by slow degrees some scientific hybrid. *G. H.*

* Robert Pollok.

The Fungus Pest or Mildew.—In reply to Mr. Bennett, I beg to say that my experience in the destruction of mildew is very limited, but I am most favourable to a warm, humid atmosphere, when it can be secured, for its destruction, and in further supporting our water cure, I think I cannot do better than refer him to "Lindley's Theory and Practice of Horticulture," p. 176, where he says that it "may all be stopped or prevented by abundant watering," &c. Mr. Bennett's cure for Fungus reminds me of an instance which was pointed out to me about four years ago. A house of Vines had been planted for the third time, and very well they looked; the first refused to grow, the soil was removed and fresh procured,—many attributed the failure to Fungus; the second acted in the same way. The spirited proprietor, at the request of the gardener, determined to have the soil analysed, and it was found to contain obnoxious gaseous matters; it was afterwards remembered that the field from which the soil was procured both times had received a dressing of gas-lime, or some other refuse, from the gasworks. I mention this, not in opposition to Mr. Bennett's remedy, but to show how easy it is for us to form wrong conclusions; and I am quite sure that this has been frequently done with Fungus. I hope, in future, that we shall have a thorough explanation, from everyone who may be troubled with it, of the particular way in which it has acted on the various subjects it may attack. One of your correspondents has explained this—I believe, Mr. Sheppard—by telling us that the stems of the Vines were split asunder. In this case it must have acted as a wood-cleaver's wedge! Oh, Phœbus! what power for a thread-like substance. Was this the case in Mr. Ayre's Vines? This gentleman, in his last, has brought us back again to the extension system. But I would ask—is leaving laterals to grow really what is usually understood by the extension system of Vine culture? Your correspondents, Mr. Bennett and Mr. Ayres, seem to have a dislike to correspondents who do not give their names. As this controversy has little to do with individuals, but Fungus, it is not of so much consequence. As far as I am concerned, I have a little dislike to have my name paraded before the public every time I think fit to give my opinion. To prove that I am not writing in opposition from any animosity, I may say that I have never exchanged words with any one who has entered into this controversy: at the same time, I should be glad of a fraternal shake of the hand with them all. *W. P. Roberts, Gr. to Earl Derby, Holwood, Kent.*

Fungus on Vine Roots.—Your correspondent, "David Tell Fact," seems particularly anxious to smother the Fungus controversy, especially that which relates to the Bishop Stortford Vines, and makes short work of every other opinion by the most positive assertion, that the Vines in question had not Fungus in root or stem; and yet we have the testimony of Mr. Monro, that the roots sent him had Fungus on them. "David Tell Fact" says the Vines had healthy roots, stems, and leaves, and bore good crops to the last, and "only shanked." What caused the shanking, if it did not proceed from an unhealthy root action? If a copious supply of water will cure shanking, as a cultivator assures us that it will, is it not likely that it does so by destroying any mycelium that may have attached itself to the roots, and thereby at once allowing a freer and more healthy root action? That copious supplies of water will arrest the spread of Fungus, I have not the least doubt, and I always apply it *ad lib.* the moment I detect its presence. The last three dry seasons have been eminently favourable to the spread of Fungus, and there are but few gardens where water can be had in sufficient abundance to wash it out. The discussion has been productive of some good, for it must be comforting to know that we need no longer dread Fungus in our borders as an evil, but hail it as a positive benefit; for, according to your correspondent, it is the *pabulum* on which roots feed—that they make a meal of it, and revel in it. My experience of it is quite in the opposite direction, for I believe the meal is made at the expense of the plant which the parasite attaches itself to, and that it eats into the very heart and core of plant life, poisons the sources of supply, and utterly paralyses the action of the root. But we need not despair, for Mr. Bennett has come to the rescue with gas-water. Madame Rachel need not have gone far for Sahara water to renew the bloom and vigour of youth, for have we not a water close at hand far more potent, that will act as a charm—kill, and yet invigorate, and all in the space of a few short weeks? What can we want more? I for one thank Mr. Bennett; and if I find its effects so magical in killing and restoring, I shall be most grateful for his letter, as I fear I have some Peach trees that are still suffering from an attack of Fungus: but as I have sent some roots and leaves to the Rev. M. J. Berkeley for examination, I hope to hear more of it anon. Mr. Miller, "David Tell Fact," and others may pooh-pooh it as they will, but my little experience teaches me that Fungus is one of the evils a gardener has to contend with, and that all decomposing vegetable matter tending to breed the same should be strictly guarded against in the formation of fruit-tree borders. *J. Sheppard, The Gardens, Woolverstone Park.*

The Self-fertilisation of Boronia viminea.—This plant is a native of New Holland, and flowers in England during November and December. At first the stamens are bent inwards, but ultimately they become erect, except at the base, where they curve out from their place of adjustment, and the anthers are introrse and dehisce longitudinally. The side of the filament facing the ovary, and also that turned directly away from it, are both glabrous, but the other two sides right and left are thickly beset with long hairs; these meet and interlace all round, and the result is what may be called a very small basket, with hairs for wicker-work, filaments for ribs, and pollen and ovary for contents. The farina is safely kept in the neat little construction just described until the stigma becomes receptive, and this rarely takes place sooner than a week after the bursting of the anthers. The filaments, if not hygrometrical, are sensitive in some way, for they press towards the centre of the flower when the days are dull or damp, and recede from that point when the sky is clear and the air dry. They are also unequal in length, one-half being longer than the other. The connection extends beyond the anther cells, and looks like the tip of a small petal. The ovary swells, and what seems like sound seed results, but I have never seen the quality tested by sowing. *John Duncan.*

Garden Crops up to Midsummer.—That the past spring and early summer season have been, in a meteorological point of view, an exceptional one, there can be no two opinions. Here in South Herts we were not favoured with any, what I might term "ground rains," throughout some part of March, April, May, and June. It is true that a very heavy thunderstorm raged over these parts on the evening of June 16. But though the flashes of lightning, which continued in quick succession from dusk in the evening far away towards midnight, and that during the early hours of the night the thunder was terrific, no great depth of rain fell, not sufficient in fact to enter beyond 1 inch into the ground. In the spring, garden prospects were good here. Though we experienced a somewhat sharp frost on Monday, May 9, which cut the Potato tops off to the "ground line," and in some parts—such as the valley of the Thames—injured hardy fruit crops materially, yet taken as a whole our prospects in this department were good in the extreme, and were followed by a happy consummation. Apricots, Peaches, Nectarines, Apples, Pears, and bush fruits of all descriptions are an abundant crop. The Potatos recovered the frost and grew away vigorously, whilst Pea prospects never were better, especially in regard to such as survived the long-continued keen easterly winds, which prevailed through a greater part of early winter. Those Peas which were either sown or transplanted out into the open ground late in February and March, did by far the best, the later sown ones "bringing up time" remarkably, speaking in a comparative sense. The last week in May found most of us actively engaged in bedding out, the plants thriving quite as well as could be anticipated for a few weeks, and until the long-continued want of rain, dewless nights, and an arid atmosphere forced their ungenial presence upon us too severely. Wherever the beds were planted when moderately firm, as many were here, not having been freshly dug immediately before planting out—a point in practice which I have advocated some years—the plants soon filled the requisite space, and the garden has looked gay up to the present time. On the contrary, where beds were freshly dug to receive the plants, as some portions which contained spring bedding plants were of necessity here, the plants did not thrive half so well. A great outlay for artificial waterings was the natural addendum to the outlay for labour, and yet the utmost perseverance in this direction seemed abortive, in so far as thoroughly soaking the soil is concerned, for repeated and constant applications seemed to flow through the freshly dug soil as though it were a sieve; and as though the soil were dispossessed of its capacity for retention. About the second week in June the long drought made itself felt here greatly, as a shallow surface of stony, hungry soil, overlies a greedy bed of red gravel. Be it remembered we were blessed with no spring, or proverbial "April showers," which, as our juvenile recollections remind us, "bring forth May flowers." Early Peas came into bearing with a rush, and what should have been four successional sowings were head for head together in the race, and for a time there was abundance, but one which proclaimed a future scarcity. I must not omit to mention that Advancer, a moderate growing and excellently-flavoured variety, with the full yielding characteristics of the Marrowfats, when somewhat old, was not a neck behind, and offered an excellent stop-gap between these "early racers" and what should have been "second croppers." Amongst Salading, Lettuces and Endives became impatient to seed; even the true old Brown Cos, a great favourite here, and the best flavoured of all, was not to be obtained good and "as firm as a drum," as is its wont when well grown in the early summer months. My favourite summer Lettuce, named by some "Can't run to seed,"

"bolted like a pickpocket" for once and all. To-day, July 5, things are little altered. We have occasional showers, the air being impregnated with a nice humidity, aiding very materially such subjects as Celery, late Peas, and the winter Greens, But the poor man's mainstay, the Potato—a crop often slighted, but seldom neglected when on the table—is here growing again, as it is commonly said—*e.g.*, the young tubers, or Potatos, have young shoots emanating from themselves, which is, to say the least, a very serious waste of substance; for when once this takes place, the young parent tuber ceases to increase in size, the haulm also takes to growing again, and so to make a useless surface-growth at the cost of a profitless root. Even rain when it does come fails to renew the original tuber-producing tendency, though we still hope many late crops have not taken the initiative therein. But of all the evils that a gardener is heir to—and they are many—I need but name "the birds!" during a season of drought and when fruits are ripening. Bush fruits of all sorts, Strawberries—where, oh where are they? The fine show of red and white Currants and Raspberries is gone, in every instance where not so protected as to prohibit our present enemies (as past and future friends I do not disclaim them) from reaching them with outstretched neck through the meshes of the nets. Gone, I know, to keep a feathered population from absolute starvation. What tons upon tons of our cultivated fruits have not these "feathered friends" consumed in this one exceptional season. Will they, can they possibly repay us by their attacks upon other evils that beset us—injurious insect agency? Apricots have commenced their final swelling. All wall fruit is abundant. *William Earley, Digswell, Welwyn, July 6.*

Societies.

LINNEAN: *March* 17.—G. Bentham, Esq., President, in the chair. W. Carruthers, Esq., exhibited a specimen of a fossil Osmunda, from the Lower Tertiaries, and which was remarkable not only for the perfect preservation of the tissue, but also of the starch contents of the cells, and the mycelium of a parasitic Fungus. The following papers were read:—I. *Notes on the Flora and Fauna of Round Island*, by Sir Henry Barkly, K.C.B., and Col. Nicolas Pike; communicated by Dr. Hooker.——II. *Extract from a Letter to Lieut.-Colonel Reid, Surveyor-General of Mauritius, on the Natural History of Round Island and Serpent Island*; also communicated by Dr. Hooker. It was stated that the highest point of the island is 1049 feet above the level of the sea. The summit is smooth, with three large and remarkable blocks of granite. It is entirely composed of tufa, mixed with volcanic sand in perfectly preserved strata. The deeper ravines are crowded with lofty Palms. Of the 26 flowering plants gathered, the greater number belong to the orders Graminaceæ, Pandanaceæ, Palmaceæ, Ebenaceæ, Cinchonaceæ, Compositæ, and Asclepiadaceæ. The proportion of Endogens to Exogens is very large, viz., 12 to 14; but this proportion by no means represents the enormous preponderance of the former in individuals, probably amounting to 99 per cent. Some of the Exogens are specifically identical with those on Mauritius, but few of the Endogens; those of the former class which are common to the two islands have probably been introduced at some remote period. Of the three cryptogamic plants observed, one was a Moss, probably a Sphagnum, one a Selaginella, certainly a new species, and one a widely-spread Fern, Adiantum caudatum. Of the five grasses the most abundant is identical with the Indian Lemon-grass. The Cyperaceæ are represented by one species, Scirpus maritimus. The Pandanaceæ are very remarkable; Pandanus utilis occurs in one spot only, rare, and no doubt introduced; whilst the other, an allied species (P. Vandermeerckii), is quite peculiar to the islet. Of Palms there are no less than three species, probably all peculiar, the most remarkable being a bottle-stemmed species of Hyophorbe. The only other Endogen belongs to the Liliaceæ, and is probably a new species of Aloe; this grows on the summit of the island. There are three species of Ebenaceæ, two asclepiads with trailing stems, one Myrsinea, two Compositæ, one a Sonchus, both probably introduced; one Combretacea, one Myrtacea, two Cinchonaceæ, and a small tree about 12 feet high resembling the Mauritian Blackwellia. The genera of the Round Island flora, it will thus be seen, are Mauritian, while the species are most peculiar. It is probable that the whole group of islands—Mauritius, Bourbon, Round Island, Ile de Serpents, Rodriguez, with the smaller islets, and even Madagascar, are fragments of a vast continent.

April 7.—G. Bentham, Esq., President, in the chair. C. Packe, Esq., was elected a Fellow. The following papers were read:—I. *Notes on some Algæ found in the North Atlantic Ocean*, by Dr. Dickie.——II. *On the Occurrence of Pleiotaxy of the Perianth in Philesia*, by Dr. Cunningham. Of this abnormal form of the flower three specimens were found in the western part of the Strait of Magelhaens, and the channels on the west coast of Patagonia. In these flowers, instead of the six divisions of the perianth, there were 18, all of the same form, and differing from that ordinarily produced in their more oblong form; the colour was the same as usual. There were only three perfect stamens, one of them being partially coherent to a fourth which had become petaloid in its nature, though still retaining an anther-lobe. The pistil presented a distinctly two-cleft, instead of a three-lobed stigma. Though usually a low suberect shrub, Philesia frequently assumes a scandent habit, attaining a height of from 12 to 14 feet when supported by the trunk of a tree. In illustration of this, Dr. Cunningham mentioned having had on more than one occasion to climb a tree in order to reach its fine rose-coloured flowers.——III. *Descriptions of some New Species of Jonidium and Gyrpyrea, in the Collections of the British Museum*, by Dr. Baird.

April 21.—G. Bentham, Esq., President, in the chair. Mr. J. Britten was elected a Fellow. The following paper was read:—I. *On the Vertebrate Skeleton*, by St. George Mivart.

May 5.—G. Bentham, Esq., President, in the chair.—Professor Spencer F. Baird, of Washington; Ritter G. von Frauenfeld, of Vienna; Dr. William Lilljeborg, Professor of Zoology at Upsala; Drs. Ch. Naudin, of Collioure, and Sig. Roberto di Visiani, Professor of Botany at Padua, were elected Foreign Members. The following papers were read:—I. *Libanothamnus novum Compositarum genus, e Venezuela*, proponit Adolphus Ernst; communicated by Dr. Hooker. This peculiar plant is known at Caracas under the name of "incense;" it is a small tree, forming a striking feature in the scenery.——II. *Letter from Dr. Kirk to Dr. Hooker, containing further Observations on the Copal of Zanzibar;* and, III. *Letter from Colonel Grant to Dr. Hooker, on the same subject*; both communicated by Dr. Hooker. Dr. Kirk observes, that in the dense forest of the Zanzibar coast he was struck with the immense number and size of Copal or Animi trees, far exceeding anything he had before imagined. In no instance, he adds, did he see the soft juice flowing; where found on the tree, it was invariably hard. Specimens removed from the living tree show that large masses, equalling the fossil in size, are still produced, and are as full of insects as were those of the ancient forests. Dr. Kirk found an old Baobab that had been cut down in clearing the ground; the tree was, on the average, 6 feet in diameter; it had been cut about two years, and had lived for at least one year after being completely severed from the ground. On tearing off the layers, that gaped open and parted from one another far more easily than the bark of common trees from the wood, he found that the last vital act had been to give out a lace-like network of rootlets between each annual layer, so coarse as in some places to resemble a fishing-net. These woody plates, separated by layers of matted roots, varied in thickness from a quarter to half an inch—this exactly corresponding with observations made on the growth of living trees of the same sort,—observations which had long ago convinced the writer that the huge Baobabs of Africa do not possess the great age usually ascribed to them. A tree of 6 feet may be 100 years old. In this instance, the last formed circumferential layers were fully as thick as the central. That the central layers are indications of annual growth Dr. Kirk thinks is proved by his observations on young trees, of which he has examined many. Colonel Grant stated that the true Copal gum tree is a climber, climbing to a great height amongst the forest trees, and finally becoming detached from its original root, when the copal exudes from the extremities.

May 24 (*Anniversary*).—G. Bentham, Esq., President, in the chair. From the financial statement submitted to the meeting it appeared that there was a balance against the Society on the year's account of £223 3*s.* 3*d.* The Society's invested property, however, which had been increased during the past year, amounted to £1,000. The Secretary reported that since the last anniversary the Society had lost by death 14 Fellows, 5 Foreign Members, and 1 Associate, and by withdrawal 8 Fellows; and that 19 Fellows and 5 Foreign Members had been elected. At the ballot for Council and officers, Dr. Bastian, Dr. Boycott, Dr. Campbell, D. Hanbury, Esq., and O. Salvin, Esq., were removed, and their places were filled by Dr. T. Anderson, J. Ball, Esq., Dr. Michael Foster, H. Lee, Esq., and Major Parry. The following were elected as office-bearers:—G. Bentham, Esq., President; W. Wilson Saunders, Esq., Treasurer; F. Currey, Esq., and H. T. Stainton, Secretaries. The President's address and the Secretary's obituary notices were then read; the thanks of the meeting being voted in each case, with a request that the papers might be printed.

June 2.—G. Bentham, Esq., President, in the chair. The President nominated J. J. Bennett, Esq., G. Busk, Esq., J. D. Hooker, Esq., C.B., and W. Wilson Saunders, Esq., Vice-Presidents for the year ensuing. Mr. Bell exhibited a flowering specimen of the wild Tulipa sylvestris, of which a patch of about 3 feet diameter occurs in the park at Selborne, which Mr. Bell regards as an undoubtedly wild habitat. It was also stated that the plant occurs in two other localities within a few miles of Selborne, namely, at Froyle, and near Theddon Grange, Alton. D. Hanbury, Esq., exhibited the dried fruits of two species of Ziziphus, called by the European residents in China, red and black Dates. These fruits are used by the Chinese as articles of food, and are exported in large quantities from the city of Che Foo. The red Dates appear to be identical with the Jujubes of the North of Europe. The Rev. T. A. Marshall was elected a Fellow. The following papers were read:—I. *On some New Forms of extra-European Trichopterous Insects*, by R. M'Lachlan, Esq.——II. *New Lichens recently discovered in Great Britain*, by the Rev. J. M. Crombie.

June 16.—G. Bentham, Esq., President, in the chair. F. Crisp, Esq., LL.B., and J. C. Mansell, Esq., were elected Fellows. The following papers were read:—I. *Petaloty of the Sepals in Serapias*, by J. Traherne Moggridge, Esq. A specimen of Serapias Lingua which was gathered at Mentone in April, 1867, had five expanded flowers, in all of which the lateral sepals were modified, so as to become semilabelliform, that is to say, presenting all the characters of one-half of the labellum along one side, and this side adjacent to the true labellum. In one flower the column was perfect, while in the others it was reduced to a mere rudimentary process above the callus or guiding plates, neither anther nor stigmatic surface being traceable. The same form of monstrosity was this spring met with in Serapias cordigera, of which six specimens were found reproducing the kind of modification above described, except that the column was perfect in all.——II. Mr. Darwin's hypothesis of pangenesis enables us to form a conception of the mode in which tendencies of any kind may be transmitted through a lapse of time incalculably long either in a dormant or active state. I have lately, during my attempts to arrange and draw deductions from a series of observations on minute variations in wild plants, become more and more impressed with the belief that each individual includes within itself a great variety of latent tendencies, the development of which is occasionally facilitated by the disturbing action of changed surrounding conditions."——II. *Notes on the Reptiles, Amphibia, Fish, Mollusca, and Crustacea obtained during the Voyage of H.M.S. Nassau in the years* 1866—69, by Dr. R. O. Cunningham.——III. *Memoir on the Spermogones and Pycnides of Cryptogamous Lichens*, by Dr. W. L. Lindsay.——IV. *The Fungi of Ceylon (Hymenomycetes)*, by the Rev. M. J. Berkeley and C. E. Broome, Esq.——V. *Notes on Gerania*, by F. B. Balkwill, Esq. The author observes that the beauty of colouring, symmetry of arrangement, and graceful forms of the essential organs of these plants, suggested to him that they would afford good models for jewellery and other art designs. The paper was illustrated by coloured drawings. Mr. Balkwill also exhibited a specimen of Plantago lanceolata, with a proliferous head of leafy bracts.

BURY AND WEST SUFFOLK HORTICULTURAL: *June* 30.—The midsummer exhibition in connection with this Society was held on the above date in the grounds at Hardwicke, the residence of Lady Cullum, which it is well known are under the care of our correspondent, Mr. Fish, and which have, owing to the unvarying kindness of her ladyship, been on many previous occasions placed at the disposal of the Society.

The marquees were pitched, as usual, in a meadow adjoining the pleasure grounds, the approach from the terrace being by means of two temporary foot bridges. At the entrance to the tents the first thing to claim attention was the cut flowers, confined almost exclusively to Roses, which formed a really magnificent display. The 1st prize 24 were a beautiful collection, consisting of well known kinds; singularly uniform in size, and many of them exhibiting great perfection of form and colour. They were exhibited by Mr. Nichol, gr. to T. H. Powell, Esq., Drinkstone. The 2d prize went to Mr. Barrett, of St. John's Nursery, Bury, whose stand also contained some remarkably fine flowers. Mr. Last, of Rougham, who took the 3d prize, had also a very good collection. Fine, however, as the Roses shown in this class undeniably were, they were eclipsed by the 24 shown by Mr. Nichol for the Royal prize—*i.e.*, the prize given from the Royal Horticultural Society at its Bury meeting in 1867. The kinds were for the most part the same as contained in the preceding 1st prize lot, but the flowers were fine and in full beauty. There were five competitors for these prizes, the 2d of which fell to Mr. Raynham, gr. to the Rev. T. Anderson, Felsham. Mr. Fish, who came in for 3d honours, had also a very handsome stand, including many beautiful specimens. Mr. Nichol was equally successful in the dozens. Mr. Fish being 2d with very symmetrical flowers but lacking the size of the Drinkstone Roses. In the half-dozens the judges placed Mr. J. Barrett 1st, Mr. Nichol 2d. Altogether the Roses were a most brilliant display—such as never was excelled in Bury; and the interest which the public took in the competition was manifested by the stands being constantly surrounded by visitors.

There was also a very fine collection, and included some noble specimens; but they were not comparable with the magnificent exotic Ferns at the extremity of the large marquee. On the centre table were the ornamental foliage and flowering greenhouse plants shown for the Royal prize, which formed also a very noteworthy collection, including many good plants. Mr. Nichol was placed 1st, with a very meritorious collection. Beneath them (placed on the ground), were the Begonias, a superb group, so even in quality that the judges were unable to decide between those shown by Mr. Fish and those of Mr. Snelling, gr. to B. B. H. Rodwell, Esq., Ampton Hall, and they got out of the difficulty by awarding a double 1st, There was a fair show of both double and single Petunias, but the number of Calceolarias was extremely limited. The show of fancy Pelargoniums was not perhaps equal to those seen at former Bury shows. There were nevertheless some very fine plants exhibited, especially by Mr. Fish and Mr. Fulcher, gr. to W. Burrell, Esq., Westley. There were also some very good specimens among the Zonal and nosegay varieties, and some splendid Tricolor Pelargoniums, the best of which were shown by Mr. Grieve, from the Culford gardens. Fuchsias also were a grand display, the plants being well covered with flowers. Gloxinias were likewise very fine; and a few good Orchids were shown. For the challenge cup for bedding plants there was again a good competition between Mr. Grieve and Mr. Allan, gr. to Sir Charles Bunbury, Barton. The judges had some trouble in deciding between the merits of the two collections, but after a careful examination they awarded the cup to Mr. Grieve, who has now gained it two years in succession, and should he be able to win it again next year it will become his property. The bouquets were not very numerous, there being only 9, including one or two baskets, which was probably not the worst of the number. The display of fruit was of about the usual extent, but the quality was never surpassed at a June show in Bury. Mr. Squibb, gr. to the Marquis of Bristol, carried off the 1st prizes for both black and white Grapes, after a somewhat severe contest with those shown by Mr. Dring, gr. to W. Gilstrap, Esq., Fornham Park. Third honours in these classes were divided between Mr. Grieve and Mr. Fish. Strawberries were remarkably fine, especially those of Mr. Squibb, who may almost be said to have "walked over" for the 1st prize, his fruit being so far superior to any other exhibited. Vegetables were not a great feature so far as quantity was concerned, but for the most part they were remarkably good.

BIRMINGHAM ROSE SHOW: *July* 7 and 8.—The ninth annual exhibition was held in the Town Hall on Thursday and Friday last, and proved a decided success. Though the collections of Roses were fewer than in 1869, and there was a greater disparity than usual between individual blooms in most of the collections, yet there were

large numbers of Roses as fine as could be desired; and this was notably the case with regard to the newer kinds. The colours, too, were pure and brilliant; and if sufficiency of substance was sometimes lacking, perfection of form and freedom from coarseness were almost invariable characteristics. The continued advance made by local contributors was more prominently displayed even than last year; and this was the case with both nurserymen and amateurs. The absence of old varieties was strikingly obvious. Of all the Roses exhibited, three-fourths, and probably more, were unknown, or nearly so, eight years ago. A few of these were then the new Roses of the year, and of course rare. Each succeeding year has brought a fresh batch of improved kinds, and as only the really good ones are retained, and but few of the varieties shown on the first occasion—good as they then seemed—are up to the standard of excellence now required, all but those few have been cast out. It will thus be seen that Rose shows are really doing the work for which they were designed—promoting the cultivation and improvement of the "Queen of Flowers." The Roses were not the only attractions. As in former years the orchestra, and other parts of the hall were decorated with a profusion of well-grown plants from Messrs. Felton & Sons, by whom this portion of the programme was gratuitously carried out.

In the "department of horticultural implements and garden ornaments," Messrs. Mapplebeck & Lowe were large contributors. Their large and miscellaneous collection of articles included lawn-mowers, garden seats of new designs, stands for flower-pots, watering engines and syringes, improved shears, and garden cutlery of all kinds, pruning hooks, fumigators, water barrows, ornamental iron vases, croquet chairs, and croquet sets. Mr. G. H. Harris, of Bristol Street, Birmingham, had an improved swing water-barrow, furnished with an oval cistern, which, owing to the customary axle tree being dispensed with, is placed near to the ground, and may be easily moved. By the insertion of hose, moreover, it may be converted into a water-engine. He also showed an improved geared wheel lawn-mower, which shuts up into a small compass, and can be used as a garden roller with reversible cutters; garden engines, improved croquet and garden seats, one of which folds up, and may be easily carried from place to place; garden tables, and a lady's lawn seat, composed of oilcloth, to prevent the rising of damp, Brussels carpet back, and galvanised iron legs. Messrs. Wright & Co., of Broad Street, Islington, showed improved garden syringes, hydronette, portable fountains, the patent Leamington shower—a semi-circular tube, which is so perforated as to water gently, as well as effectually, a space of 3 or 4 feet at a time, and which may be attached either to engines or ordinary watering pots; the Cheltenham garden-engine, extremely light and portable, and capable, we were informed, of throwing a perfectly continuous stream of water a distance of 35 feet; garden pumps, and a patent new reel for winding up hose. The annual dinner took place at the Acorn Hotel, Temple Street, on Thursday evening, and was attended by about 20 exhibitors, judges, and members of the committee. The Mayor presided, with Mr. G. P. Tye in the vice-chair.

Notices of Books.

On Food, &c. — the substance of four Cantor Lectures, by H. Letheby, M.B., &c. London: Longmans. 8vo, pp. 273.

This work may be described as a condensed summary of knowledge on all matters relating to food. When the reader glances at the contents of this volume, he will find that the subject is by no means exhaustively treated. So far, however, from feeling any surprise at this, the wonder will rather be how the lecturer contrived to introduce so many varied scraps of information into four lectures. A severe attack of mental indigestion must surely have visited those who attempted to follow the lecturer throughout his cyclopædic enumeration of the details relating to food and feeding. Even the title-page groans as sideboards are said to do when bearing a heavy load of viands. "On Food: its varieties, chemical composition, nutritive value, comparative digestibility, physiological functions and uses, preparation, culinary treatment, preservation, adulteration, &c." And the etcetera is no unmeaning addition. It seems to us an utter impossibilty that all this could be satisfactorily treated in four lectures. The lecturer, as it appears to us, could neither collect his material with sufficient discrimination, nor dress it satisfactorily; and assuredly his audience could not digest it properly. It might have been supposed that the author, in publishing his notes, would have availed himself of the opportunity, and to some extent remedied these evils. We do not find this to be the case. Morsels of information are pitchforked together into a heap of great dimensions; but, after all, it is a heap of scraps. Here is a passage relating to Maize, that will illustrate our remarks:—"The young grain, called cob, is more palatable, and forms, when boiled in milk, an American luxury, which takes the place of green peas. * * * The farina of Maize is peculiar when examined under the microscope, and will thus serve to recognise it." The latter sentence is sufficiently ungrammatical; but taking it in the sense in which we presume the author intended it to be understood, we are still left in the dark as to what the peculiarities are which will enable the observer to recognise the starch grains of Maize under the microscope. The account of sugar is dismissed in a page of large type, a considerable proportion of which is occupied with the information that treacle and molasses have more flavour than sugar, and are cheaper. Such an article as Beetroot-sugar is, so far as we see, not even alluded to.

The author's conclusions are hopeful. "Shall we ever," he writes, "be able to follow through all the intricacies of change, the countless transitions of both matter and force in their passage from the mineral kingdom (through the vegetable) to the animal, and then back to the mineral again? It is easy to connect by a correlation of force the muscular movements of the animal body, and even the highest efforts of the human mind, with the sunbeam which the plant had arrested, but shall we ever be permitted to unravel those mysterious functions, those intermediate changes which constitute the phenomena of life? Why is it, for example, and how comes it, that the living cell of the plant is able to aggregate mineral matter in opposition to the common laws of affinity, and transform light and heat into cell force? How is it, too, that the animal, in reversing the process, and so restoring the play of affinity, is able to transmute it into other manifestations of force? At present the utmost we can say of it is, that organic matter is the appointed medium of all these changes, and is designed for the exhibition of vital phenomena, just as mineral matter is the appointed medium for the phenomena of electricity and magnetism; and yet to some extent, perhaps, we are able to penetrate the mystery, for by finding the clue to the peculiar action of the vegetable in reducing chemical compounds, we can, by operating on such substances as carbonic acid, water and ammonia, produce a large number of organic principles; in fact, of the three great classes of alimentary substances, namely, the oleaginous, the saccharine, and the albuminous, it may be said that the first is already within the manufacturing power of the chemist, and the second is nearly within it, so that there is abundant proof that the agency of a vital force is not necessary to the formation of organic compounds; and there is even hope that the fabrication of food may not be altogether beyond the capabilities of man."

The Apiary.

We give what has never been clearly given by any bee writer, or any naturalist—the history of the bee egg, the larva, and its organisation and metamorphosis into the proper and perfect bee, and we trust that every bee-keeper will test the statement for himself before the season closes, so that he may perfectly carry out the common-sense operations of an apiary, with confidence and satisfaction to himself, and not be led astray by books, compiled from all sources, advocating some system in which their author's own supposed improved beehive will give the happy possessor of the book and hive an eternal harvest of honey and everlasting bees. Bee-life, then, commences thus:—A normal queen, properly impregnated by the drone, commences to lay her eggs in succession—the worker eggs first; and as the one ovary is exhausting, the last laid eggs are those of drones. The same is the case with the second ovary, in the second season; but all these eggs are fertilised as they are deposited in each cell, be it worker or drone, as the spermatazoa are carried with the eggs when passed down the oviduct: and thus when the egg is fixed at the base of the cell and agglutinated there, in due time the egg (for this egg has a shell or "chorion") bursts, and the small transparent larva may be seen bathed in sugar or honey and water, whereas previously it was seen standing upright—an elongated egg, like "Columbus' egg," flattened at one end. This little curled-up larva is daily lubricated with the honey and water until it arrives at the required age and size of the cell, when the workers build around the mouth of the cell, and leave the larvæ to spin their cocoons, which are very peculiarly done; and the silken respirators, which the larvæ spin at the mouth of their cells, are incrusted over by the bees, as they act as "stepping stones" for the workers to pass along. This process is correct, and whether the term "endosmose" or absorption or feeding be accepted, it is peculiarly desirable that all bee-masters should be aware of this truth, and decide for themselves, whether 20 days for the workers and 24 days for the drones be the true time or not from the hour of the eggs being laid to that of their issuing as perfect workers or drones. We shall hope to hear the results of observations from many of our readers. As to the process of the worker egg being raised into the queen, we need hardly remind bee-keepers of the fact (which has been long established by Schirach, tested by Huber, and practically worked out by the Greek and Italian bee-keepers for many centuries), that there are but two kinds of eggs—the males or drones, and the workers or undeveloped females, from which class the queen is invariably raised by the process called, we believe correctly, "endosmose," or absorption of sugar and water, and the lubricating honey and water poured in by the nurse-bees, besides the large hotbed of white jelly of honey and pollen which always occupies nearly one-third of the cell of the queen larva. But the building up and raising of a queen is too interesting a matter to be stated at the fag end of a communication, but we hope to supply the information in our next article, after showing what the hive should be to enable the bee-keeper to follow out the autumnal uniting plan or system, combined with the artificially-formed swarms, when the hives are sufficiently supplied with bees.

Book information we do not rely on, nor are the observations of bee-keepers, even of a quarter of a century, of any avail, unless the observers can give accurate statements from their note-books of each hive and queen, and of the internal economy of each hive experimented upon. The magnificent aid afforded by the microscopes of later days leave no opening for any doubtful statements on the part of observant naturalists. We only require facts, not fictions, or the descriptions of the vivid imaginations of sanguine bee-masters. We shall therefore prefer to await the experience of even this season's novice in bee history, rather than attempt to refute any contradictions of bee hive makers or bee-sellers, who seem to write merely to bring some newly-named bee or hive into notice.

M. D.

Garden Memoranda.

Blenheim Palace, Woodstock, the Seat of the Duke of Marlborough.—The demesne of Blenheim is situated about 8 miles from the city of Oxford, and can be reached by road or by Great Western Railway to Woodstock Road Station, from whence the visitor proceeds to Woodstock by omnibus, the grounds of Blenheim being close to the confines of the well-known borough. The grounds have been lauded, by some, as superior in beauty to those of Windsor Park. About the park there can be seen happy undulations, a rich variety of walks, rides, and drives, and fine views of more or less distinctiveness of character. Its circumference is about 14 miles, its area about 3000 acres, but its real boundary is generally concealed from view by a belt of trees, broken and varied, however, in its outline towards the park, by clumps and groups of trees, so as to avoid stiffness and too great uniformity. The palace is a noble building, occupying a great space, but somewhat heavy in appearance, in common with many other erections of the once famous architect, Sir John Vanbrugh.

The visitor going to Blenheim by railway from Oxford proceeds along the main street of Woodstock to the top of the town, where access is gained to the park by means of a spacious gateway, or triumphal arch, built by the celebrated Sarah, Duchess of Marlborough. On entering, the lake, a fine expanse of water fed by the river Glyme, is seen to the right, and to the left the grand bridge, a substantial erection of three arches, the principal one in the centre spanning 101 feet. The formation of the lake, and the general arrangement of the grounds was the work of "Capability Brown," and by erecting a barrier at the lower extremity of the lake, and causing the waters of the Glyme by that means to accumulate and expand, a mere meandering thread of a rivulet was converted into a fine artificial sheet of water. A short distance to the west, on the north side of the river, is the supposed site of Fair Rosamond's Bower, and the labyrinth in which she is said to have been concealed by her royal lover, Henry II., and close by is Rosamond's Well, a fine and never-failing spring of water, which gushes out near the bottom of a precipice, and is received in a square basin of freestone, and thence conveyed by a subterranean passage into the adjoining lake. About midway between the well and the bridge a remarkable echo is heard, if the visitor will stand by the water's edge, and shout loudly towards the centre niche. The effect of it, however, depends in a great degree on the state of the atmosphere. Farther on, towards the north, the column erected to commemorate the achievements of John, Duke of Marlborough, occupies a commanding position; and tradition, if not historical evidence, assigns to a spot on the east of the bridge, at about the same distance from it as Rosamond's Well is on the other side, the site of the ancient palace or manor house, the stirring scenes enacted in which give so much interest to Sir Walter Scott's novel of "Woodstock."

Proceeding from the grand bridge towards the garden fine glimpses of wood and water are caught, with views of the Palace through the trees; and the visitor passes across an avenue of Elms, getting views of the pleasure-grounds on the right, and fine park scenery on the left, with ancient Oaks, Elms, and Thorns dotted about. About three-quarters of a mile along this road, a turning to the right by a plantation skirting the south side of the kitchen garden, entrance is gained to it by means of large folding doors. The kitchen garden and its surroundings are about 12 acres in extent. Immediately on entering can be seen on the right a range of three new vineries. In one house, at the time of my visit, was a fine show of Black Alicante and Muscat of Alexandria Grapes, swelling off well. The next house, divided from the preceding by a glass partition, has as occupants some established Vines, such as Trebbiano, Muscat of Alexandria, and Mrs. Pince's Black Muscat; the remainder has been renewed with Black Alicante and Madresfield Court Black. The bearing Vines not only carry a fine crop, but the bunches are large, as well as being well developed. It is intended to train Vines and the Cape Gooseberry to trellis-work along the back of this house. The third house of this range is occupied by Black Hamburgh Vines, that have yielded a fine crop this season. Some plants of Foster's Seedling have been placed in this house, to take the place of some of the Black Hamburghs to be removed. The length of this range of houses is 150 feet, by 20 feet in width, and it is heated by one of Weeks' upright tubular boilers. The

outside borders, which are five yards in breadth, have been lately surfaced with maiden turf and charcoal. It was to be noticed that in his method of training the Vines Mr. Lee appeared to be feeling his way on to the extension plan. Near to this range are the two Peach-houses, 20 yards in length by 15 feet in width, in each of which are Royal George, and a sort known here as the Early Purple, bearing good crops of fruit—clear, healthy, and of vigorous growth. Next comes another vinery, planted with Muscats, West's St. Peter's, and Black Hamburghs. In one house the old plants of Black Hamburgh have been removed, and Mr. Lee intends to plant young plants of this and Foster's Seedling. A leaf pit occupies the centre of each house. In the last are growing some Queen and Black Jamaica Pines. Leaving these, another range of vineries is reached, in one of which, planted with young Vines, the Golden Champion is seen to be doing very well.

For the growth of Pines there are two ranges of pits, 50 feet in length by 15 in width; and there is another range of pits, 100 feet in length by 10 in width, used for early Potatos, Cucumbers, Melons, &c.

Notwithstanding the drought, the kitchen garden crops had a vigorous appearance, but both the reservoirs or large tanks in the centre of the garden contained no water, notwithstanding the urgent necessity there appeared for them to be kept filled for use. On a south strip was a ribbon border, in which could be seen Dell's crimson-leaved Beet showing a good colouring in the leaves, and forming a capital contrast to the silvery foliaged Cerastium tomentosum. Generally the Apple trees have excellent crops; Pears on walls, an average crop; Apricots, a good crop. One of the chief features here is a fine new orchard-house, 68 feet in length by 18 feet in width, with the Rev. W. Fountaine's railway truck system added. A double line of trucks occupy the body of the house, each containing nine pot plants, consisting of Peaches, Nectarines, Plums, and Cherries; the trees are in 9-inch pots, plunged in revolving pans about 18 inches in diameter. The trees have good crops of fruit, and are in fine health; Cherries have been ripe for some time past; the Plums are very promising, among the most noticeable are July Green Gage, Reine Claude de Bavay, Bryanston Gage, Prince of Wales, Peach, St. Etienne and Victoria, the old Green Gage predominating. Of Peaches there are Princess of Wales, Comet, Early Victoria, Crawford's Early, &c. The rails on which the trucks run are continued outside the house, and the trucks are run outside every evening, and returned again early in the morning. Some portion of the inside surface of the house will be utilised for Vine culture, and when the necessary details are completed, it will be a fine example of an orchard-house. In the open garden pyramid fruit trees have been removed to make room for espaliers trained to wire trellises; and there were fine quarters of Strawberries in prime condition, consisting of such sorts as Keens' Seedling, Sir Charles Napier, British Queen, &c. Plums on walls have excellent crops also. In the centre of the kitchen garden is a large flower-bed planted with divers plants, among them Clematis Jackmanni, used as an edging to the old Mangles' bedding Pelargonium. About the garden are other beds and borders, nicely planted, and which will be thoroughly effective when the plants get established. Further on, late Peach-houses and late vineries were reached. One had Muscat of Alexandria and West's St. Peter's, the Vines about eight years old, planted on an outside border; but a new inside border has been formed, and planted with Mrs. Pince's Black Muscat, Madresfield Court Black, Black Alicante, and Lady Downe's Grapes. The range of houses is 80 feet in length, by 15 feet in width.

The plant-houses are well filled with New Holland and soft-wooded specimens; the stoves with a general collection, among which were the beautiful Pancratium fragrans, and some fine examples of variegated and handsome foliaged plants; also collections of Ferns, &c. In one of the Melon-houses the new Royal Ascot Scarlet-fleshed Melon was highly spoken of by Mr. Lee, and the Blenheim Hybrid, which he raised, appears to be an excellent sort also. In the way of decorative plants there are Camellias and Azaleas, a new house being in course of erection to contain them.

The conservatory occupies the site of the Titian Gallery, which, with a valuable collection of pictures on leather, more curious than beautiful, was destroyed by fire in 1861. It contains a good collection of plants. On the east side of the palace is a geometrical garden, containing nine large beds and six smaller ones edged with Box, with gravel paths intersecting them. At the west front of the Palace is an Italian garden on the geometrical system, and this and other gardens and beds require some 150,000 plants to furnish them during the summer.

The pleasure-grounds and gardens at Blenheim occupy an extent of nearly 300 acres of land, of which about 140 acres are constantly kept mown. Against the walls of the west front of the palace are trained grand examples of Magnolia grandiflora and other climbing plants; and in the descent towards the lake are fine standard Magnolias, coniferous plants, &c. Roses abound in the gardens, a great number of species and varieties being cultivated in the rosary, and other parts; and in this neighbourhood can be seen fine specimens of Cedars, a gigantic Portugal Laurel, Golden Yews, Catalpa, Chestnuts, Thorns, Scarlet Oak, Copper Beech, &c. There is also an Anemone garden, near which is the grand cascade; also a rock garden, and other objects of interest.

Altogether Blenheim is a place that horticulturists should visit. The grounds are very fine, the vistas and bold sweeps of landscape charming and varied. Its contiguity to Oxford will no doubt induce many to pay Blenheim a visit in the coming week. The gardener at Blenheim, Mr. William Lee, has not occupied his post a great time, but under his care and good management the gardens and grounds appear likely to bear as high a reputation as they have ever enjoyed in times past. *R. D.*

Miscellaneous.

THE TENDENCY OF TREES TO BEND TOWARDS THE EAST.—In the "Scientific American," of March 5, 1870, is inserted a paragraph headed "The growth of Tree Trunks." It is there stated that a French naturalist had been measuring the tree trunks in a forest, and had found them all broader in the east-west than in the north-south direction, while another arborist of Toulouse, similarly gauging the trees, found the greatest swelling of their trunks towards the east-south-east; the forming attributing this want of symmetry to the rotation of the earth, while the latter thinks that it is due to the early action of the sun upon the sap. As this paragraph reminded me of some observations which I made some five or six years ago, and which bear closely upon the same subject, I will present them to the Society, thinking they may have some value in a scientific as well as in a practical point of view. While in the country, if we observe attentively the tree tops, we shall soon perceive that many species seem affected by a steady wind, though there is not the least breeze to be felt. Soon we notice that the branches of a great many trees have a general tendency to obey an unknown force which bends their extremities towards the east, or perhaps more correctly in a direction perpendicular to the magnetic meridian. This bending of small branches cannot be observed so plainly upon all kinds of trees; some species having it well marked in every instance, while other species have it less visible, and even some others not at all noticeable. Most prominent for this peculiarity is the Cherry tree, sometimes bending its branches towards the east, from head to foot. Next to this come the Maple, the Button Wood tree (Platanus), then the Pear tree, then the Oak, &c. In the last named it is not always noticeable, though if the tree is isolated from others it is very plain in every instance. With the Cherry tree it is so certain, that one could almost invariably determine the cardinal points by looking at the direction of its branches. At first I thought this might be due to the action of the prevailing winds, but this hypothesis was somewhat shaken, when I saw in many instances Cherry trees sheltered entirely from the west winds by high blocks of houses within a few feet of them, exhibiting the same phenomenon. Whether this direction of the branches of trees is to be attributed to the prevailing winds, or to the rotation of the earth upon its axis, or to the heat or light of the sun, or again to terrestrial magnetism, I shall not inquire at present, not having sufficient data to establish any theory. It would be of value, I venture to say, if observers would direct attention to this subject, and see if the direction is the same all over the globe, or if it is a local phenomenon, and also ascertain what species of trees obey this unknown force. It is not only in a theoretical point of view that this observation has some value; there is in it a practical lesson for the cultivators of shade and fruit trees. Soon after my observations, it struck me that something practical could be derived from this truth. All country people know by experience—sometimes dearly bought—that the transplantation of trees does not always succeed, and especially when the transplanted trees have arrived at a certain age. Fruit growers tell us that the Cherry tree is one of those least likely to live when transplanted, while the Apple tree will almost invariably succeed. My observations on many thousand Cherry trees have shown me that this tree is very sensitive to the unknown force, while the Apple tree is a great deal less so, and it is very seldom that an indication of bending will be seen. Has not this anything to do with success in transplanting? If, without regard to the direction of the branches of a Cherry tree, we set this tree in a position contrary to the one it occupied before, its branches now bending towards the west, then it is plain that the force which gave it the bend is acting in an opposite direction, in consequence of which the tree is suffering. But with the Apple tree it is different, as this is far less sensitive; therefore it will not suffer much. Ten years ago I bought a fine Cherry tree and transplanted it to my garden, of course without regard to direction; the tree is now living; it has not grown a particle; there has not been one inch of new wood added to the length of its twigs since it was put there; the branches have no bend. Five years ago another Cherry tree from the same place was also transplanted in my garden; the tree is now treble the size of the other, its branches are strongly bent east. Why this difference? Was the one set in a suitable position, and the other not? I could not tell. But here is something more positive. Three years ago I saw in Malden 20 beautiful Pear trees transplanted with the greatest care; all these trees were of pretty good size, being some years old, and they all bent very strongly. They were set without regard to direction; five or six of these trees happened to be placed in about the position which they must have had when growing, the remainder were set in all directions. I went many times that way to watch the success of this small orchard. The very first year about one half were completely dead. The second year took five more, which had been languishing all the summer, and now five out of the 20 are living and in good condition, and strange to say, these five are those which were set with their branches dipping east. Do we owe their life to the fact that after being transplanted they occupied the same relative position with regard to the points of the compass as before, or is it only a curious coincidence? It is more than I can tell. My experience is not sufficient to allow an opinion in this matter; time will throw light upon the subject. *Mr. L. Trouvelot, Natural History Society, Boston, U.S.*

FOOD PRODUCTION IN CHINA.—The basis of Chinese food is vegetable; and when we remember that from 400 to 500 millions of Chinese live in a country not more than four or five times larger than France, which has not a tenth part of the population, it is easy to form an idea of the pitch to which cultivation has been carried. There are from 70 to 80 kinds of vegetable substances grown in China, 25 of which at least are produced as food. Rice is the most important of all, and the pains that are taken in its cultivation are extraordinary; in order to supply the Rice grounds with water, enormous mountains have been pierced, immense lakes excavated, the waters of rivers and small streams are carefully retained, and turned into small canals and ditches, which surround and intersect the fields in every direction. M. Simon says that he believes the world never saw a greater or more admirable work than that vast system of irrigation which, from the west of China to the sea, places all the water under the hands of the farmer and gardener. Not only Rice, but every kind of crop is cultivated with the utmost pains. The result is magnificent; the yield of Rice is nearly 5 tons per acre, and that of other crops in proportion. Labour alone, even with the most complete irrigation, would not yield such a result; the secret is in the application of manure; every atom of refuse is returned to the land in China, and where the supply is small, it is made up from the sea; without any great science, the Chinese have established a complete system of manuring in which nothing is lost, and fœcal matter of all kinds, decayed vegetables, bones, lime, oyster shells, fish and sea-weed, are used up. They have a dozen recognised methods of preparing manure according to the soil, the crop, and other circumstances; they are not very fastidious, and the smells in the villages and towns are not agreeable; but the grand problem is solved, of employing the entire refuse of hundreds of millions of people—with immense labour, it is true, but with great profit also—in the production of food. So complete is the system, that the manure is carried in barges, and in pails slung on bamboos wherever it is wanted, often to great distances. In the use of fuel the Chinese show the same economy; with a few pounds of dried vegetable matter, which does not cost a farthing per pound, they will cook a meal for a whole family. We boast of our science, our industry, our wealth; but how long will it take us to arrive at a state of economy which has existed throughout the Chinese empire during so many centuries? *Food Journal.*

STOKE NEWINGTON GREEN.—The Parks and Open Spaces Committee of the Metropolitan Board of Works have under consideration the improvement of this green. There are many literary and historical associations connected with the place. The house in which the late Samuel Rogers, author of the "Pleasures of Memory," was born is still in existence there. It is in contemplation to erect by subscription a statue of De Foe, who was educated and afterwards resided at Newington Green. *Builder.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE season has now so far advanced that, in anticipation of a less sunny sky and more dewy nights, we must take action in regard to hardening all greenhouse plants by natural exposure. Turn out-of-doors at once all such things as *Azaleas, Camellias, Libonias, Daphnes, Abutilons, Acacias*, &c., which, in consequence of the heat of the sun and the dryness of the air, have been kept indoors so long. Choose a nicely sheltered and somewhat shady situation for them. Prepare the place for their reception either by placing slates, or a good layer of cinder ashes, upon which to stand the pots, either of which will not only keep worms from entering the balls, but will also tend to insure better drainage. Be particular at this season not to overwater plants of that beautiful but much neglected genus, *Blandfordia*, because if a season of rest be not in a measure afforded to them now, a healthy growth, with fine bloom, cannot well be expected afterwards. Some growers recommend placing them in any out-of-the-way place, such as beneath a stage, at this time; this, however, I do not advise doing, unless the last vestige of activity in the leaves is past for the season. I need

scarcely add that I refer only to such varieties as bloom in the spring months. Old plants of *Brugmansia*, when planted out in the conservatory, should have a little manure-water afforded them, and which should be followed by a good soaking of clear water. Few plants are more benefited by an occasional syringing overhead than are these. When it is intended to bloom any suitable kinds of *Bromeliaceous plants* in small pots, young cuttings or growths of the current season should be taken off close to their base with a keen-edged knife, and be potted into small pots and pushed along quickly. I allude more especially to Æchmeas, Bilbergias, Tillandsias, &c. Ripen off the young growths of the useful old *Burchellia capensis* by exposure to the sun; the flowers produced in April will then be far finer and more plentiful. *Cape Pelargoniums* must be cut back, according to the time when different batches are past their best. Some little judgment must be used to guard against two extremes in performing this operation. It is not well to cut down too closely to the old wood; the better way is to cut them down to within three good buds or so of the base of the current season's growth. *Hydrangeas* which have done blooming should be fully exposed to the sun and air out-of-doors.

FORCING HOUSES.

With a continuance of such warm days and nights as we have lately experienced, air may be afforded with tolerable freedom to all *Vines* which are actively engaged in ripening their fruit. Encourage by every proper means all young Vines planted out last March to make as strong and robust a growth as possible. Do not in any way pinch back any of the shoots, whether they consist of laterals or side shoots in any form. Even those vineries from which the crops have been cut must not be neglected in consequence. Scrupulous cleanliness should be the order of the day in such houses, and this will not entail any great amount of labour. In all instances where the foliage is still in a green and thriving condition it will be necessary to keep up a healthy state of humidity within the structure, so to aid them in performing the functions they are engaged in for the due preparation of the embryo buds which are to do all the work of fruiting next year. In regard to *Pines*, there can be no doubt that, during this and the next month or two, those plants which have been properly treated, no matter what their age may be, will be able to make a good growth and to establish a firm basis for winter and early spring shows of fruit. In a word, the period I have described will be peculiarly suited to their wants in so far as forming a fine growth is concerned, and should therefore be made the most of. As it is known from actual observation that Pine plants, even in an active growing state, make fresh roots more freely in a somewhat dry soil, it will be necessary even at this stage to use very great caution in giving root waterings. A brisk bottom-heat, which should average constantly a mean of about 87°, must be maintained without fail. Air is likewise all-important, if given with judgment, during mild periods. At no time should cold draughts be allowed to pervade the structure. Watch carefully the foliage upon such Vines and *Peach* or *Nectarine trees* as have long been denuded of their fruit, and if the least symptom of *red-spider* is found on them, let the hotwater pipes or flues be immediately smeared over with a wash formed of flowers of sulphur; then by lighting up the fires, and causing a moderately brisk warmth, the fumes will prove destructive to the pests. Do not keep the fire on longer than is required to heat the pipes moderately, or keep the lights close longer than an hour or so, and always perform the operation when the sun does not shine brightly.

HARDY FRUIT GARDEN.

Finish cleaning all straw or other litter away from *Strawberry plants* immediately they have done fruiting; cut away all runners that are not wanted, and remove everything in the form of decayed leaves, old fruit-stalks, &c.; afterwards hoe the ground well amongst them, leaving all neat and tidy. I hope I need not add in this place that the barbarous practice of cutting away every old leaf should not be followed. Keep *Strawberry runners* intended to form plants for forcing well supplied with water, and do not permit small runner shoots which emanate from around their base to grow, but pinch them off immediately they are detected. Any fruit tree stocks which are kept for budding upon, such as Plum stocks for Peach, Nectarine, and Apricot trees, Quinces and varieties of seedling Apples, for Pears and Apples, &c., may now be operated upon in a similar manner to that which is practised in the case of Rose budding, with the exception that these may be budded more generally on the main stems instead of on the young side shoots.

HARDY FLOWER GARDEN.

Rock Plants may now be divided with advantage in many instances, more especially in the case of Sedums, and the like. Look over all such as these, and also the extra stock of *Herbaceous Plants* which may be growing in pots. These may now be trimmed up and shifted into larger pots with advantage. Give to all *Gladioluses* grown in pots a mulching with rich manure, and water afterwards with liquid manure. Give the necessary support of a stake to those of this class which are grown in open borders. Tie them up firmly, so that the wind cannot blow them about, or cause them to fall aside, or snap off at the base, which they sometimes will do in boisterous weather, when the weight of the elongating flower-spikes is felt. Remove the old flower-spikes from *Delphiniums* of the herbaceous type immediately the flowers are past their best. Do not remove any portion of the main stem with leaves, as these are required for the uses of the plant whilst they continue green and in health. *Russian Violets* (of which a variety called the Czar is the finest) may still be divided, though they will not do so well as those which were parted some time ago.

KITCHEN GARDEN.

Push forward the preparation of trenches and the planting of *Celery*, as previously suggested, with all possible dispatch. Plant out successional batches of *Brussels Sprouts*—the most useful of all greens for all classes—in every suitable vacant place, and bring to a close the necessary transplanting of all other kinds of *Borecole*, *Broccoli*, &c. We may now anticipate longer and more dewy nights with more genial weather, befitting their wants. Place a little loose earth from the sides of the trenches around the earliest rows of *Celery*, and pick off any leaves which are injured by the celery-fly, which should be removed at once to the fire or other place of safety. Thin out late sowings of *Lettuces* and *Endive*, transplanting such as are likely to be useful, the weather being fitting. Where not previously done, proceed with the earthing up of all kinds of "winter stuff," which is growing freely, and likely to receive support or benefit from this process. Though somewhat late it may be possible yet to transplant *Beet* advantageously, where the crop is an irregular one. *W. E.*

ORCHARD HOUSE MANAGEMENT.

DURING the past month the crops of fruits in these structures have, to mere outward appearance, made but little progress; stone fruits—Peaches, Apricots, &c.—have seemed, indeed, actually to become smaller instead of larger, and to assume a very scrubby, stunted look. During this time they have been what is termed "stoning," *i. e.*, perfecting the true seed, or kernel. Now, however, the earliest of the Peaches, &c., will show signs of swelling again; this is called "the second swelling," and the fruit will very speedily be ripe. *Atmosphere and Ventilation.*—Still maintain a close humid atmosphere, keeping every part of the house saturated with moisture, until there appear signs of the ripening of the fruit, then ventilate more freely, and keep the atmosphere drier. As the fruit progresses towards maturity, more and more air must be given by night and by day, otherwise the fruits will be flavourless. It is air, cool bracing air, which imparts flavour more than any other thing. It is a good plan indeed to throw the house entirely open and expose the fruit and trees to the free and full action of the weather for a few days, just as they are ripening; this will not only add piquancy to the flavour, but depth to the colour of the fruit. In the orchard-house where there is much variety, some early and some late, it is perhaps a little difficult to give each tree its proper treatment. Trees in pots, with the fruit ripening, can be, however, placed nearest to the ventilators, or even placed in the open air. *Watering.*—Continue to give abundance of water to everything, to plants in pots as well as to those planted out, with a little liquid manure or guano-water occasionally to the pot-plants. One of the best articles we have found for this purpose is the Urban Manure, a small handful of which in a pailful of water has a wonderful effect. Another way of using it is to sprinkle some of the powder on the surface of the pot, and water it in. When the fruits show signs of ripening it is well to withhold stimulants, and, indeed, to water with extreme caution. Pot plants should receive a much smaller supply, and should be allowed, in fact, to get rather dry than otherwise. An excess of water at this period will materially impair the flavour. *Stopping the Shoots.*—Continue to do this as previously recommended, pinching closely off every fresh growth as they may be produced, and at the same time expose the fruit of Peaches, &c., to the full influence of the sun. This may be done by pushing the nearest leaves just a little on one side, or pinching some of them off altogether. It is by exposure that colour is produced on Peaches and Nectarines, and the best coloured are frequently the best flavoured. In any instance where the tree is not in sufficiently good health, reduce the quantity of fruit accordingly. *Insects.*—Keep clear of these, as before recommended. Red-spider will now be the most troublesome, and this can be most effectually kept in check by plenty of water, a sufficient supply at the roots, a humid atmosphere, and thorough syringing of the leaves with clean water. *B.*

TOWN GARDENING.

Pompon Chrysanthemums should now receive their final stopping; for many of the varieties, if left later, are apt to go blind. In performing this operation now, merely pinch off the top with the thumb and finger. The large flowering Chrysanthemums should have all laterals removed as fast as they appear. About the 20th of the month prepare a spot on which to sow *Intermediate Stocks* by taking out the mould about 6 inches deep, and throwing in about an inch of fine ashes to keep down the worms, then fill in with fine mould, and give the bed a good watering. Sow the seed the next morning, sift a little fine mould over it, pat it down softly, and cover it with glass until the seedlings appear, when plenty of air should be given to them. The double-flowered *Pyrethrum*, and the variety Golden Feather, both of which are most useful plants for the town garden, will likewise do well under the same treatment if sown now. *Balsams*, *German Asters*, French and African *Marigolds*, if removed now with as much fibrous root as possible (not compressed into a lump), and potted off, will make a gay show for windows during autumn. The *Ficus elastica*, or India-rubber Plant, should now have as much air as possible, and be repotted, if pot-bound, in a mixture of peat and sand. Its leaves should also be well sponged. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, JULY 13, 1870.

1870 Month and Day.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.
July.	Ins.	Deg.	Deg.	Deg.		Gr.
7. Thurs.	29.97	68.7	58.2	49.8	59	4.0
8. Friday	29.85	75.0	62.9	54.0	47	4.5
9. Satur.	29.71	72.0	60.9	51.3	43	4.1
10. Sunday	29.71	67.7	62.7	58.7	73	5.4
11. Monday	29.56	68.6	60.2	51.5	53	4.3
12. Tues.	29.84	62.5	57.6	51.2	71	4.5
13. Wednes	29.65	69.5	59.4	51.7	61	4.0

1870 Month and Day	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 29 Years.	Wind. Direction.	Horizontal Movement.	Rain. In Inches.
July.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
7. Thurs.	81.1	55.2	25.9	67.8	+ 5.9	S.W.	140	0.00
8. Friday	89.7	50.0	39.7	69.9	+ 7.9	S.	120	0.00
9. Satur.	78.0	62.0	16.0	67.6	+ 5.6	N.E. to S.W.	150	0.01
10. Sunday.	81.5	61.2	20.3	69.4	+ 7.6	S.W. to W.	265	0.08
11. Monday	76.3	55.8	20.5	64.1	+ 2.3	N.N.E. to N.W.	160	0.38
12. Tues.	74.1	57.0	17.1	63.8	+ 1.8	N.W. to W.	175	0.00
13. Wednes	74.8	53.8	21.0	62.4	+ 0.1	W.S.W. to W.	305	0.62

July 7.—Small amounts of cloud prevalent. A fine day.
" 8.—Light clouds were prevalent during the morning and afternoon; overcast at night. A little rain fell at night.
" 9.—Large amounts of cloud were prevalent throughout. Rain fell occasionally. Flashes of lightning at night.
" 10.—Generally cloudy. Rain fell during the early morning.
" 11.—Very wet throughout. Heavy rain fell at night.
" 12.—Variable amounts of cloud till the evening; then cloudless.
" 13.—Generally cloudy. Frequent showers of rain fell during the afternoon and evening.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, JULY 9, 1870

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	89.2	45.8	44.4	73.5	51.2	20.3	61.5	0.21
Blackheath ..	89.7	47.1	42.6	77.0	55.4	22.5	65.0	0.12
Bristol ..	90.1	47.4	42.7	74.1	52.6	21.5	63.2	1.04
Birmingham ..	87.1	52.7	34.4	71.5	55.2	16.3	63.3	1.17
Wolverhampton ..	83.4	49.1	34.3	71.9	53.6	18.3	60.8	1.15
Leicester ..	87.7	50.0	37.7	71.4	54.8	16.6	63.1	0.79
Norwich ..	80.5	51.0	29.5	72.8	55.3	17.5	62.1	0.21
Nottingham ..	84.6	50.4	34.2	72.6	53.8	18.8	61.3	0.96
Sheffield ..	82.5	50.0	32.5	71.9	53.7	18.2	59.0	0.75
Liverpool ..	85.6	51.0	27.9	70.4	55.5	14.9	61.1	0.20
Manchester ..	84.0	51.0	33.0	72.9	53.9	19.0	61.5	0.58
Salford ..	87.4	50.0	37.1	71.8	52.7	19.1	60.3	0.55
Bradford ..	79.8	50.0	29.8	67.5	53.3	17.1	62.0	0.28
Leeds ..	84.0	50.0	34.0	71.0	54.8	16.2	62.1	0.56
Hull ..	82.0	47.0	35.0	71.4	51.1	20.3	59.4	0.20
Newcastle ..	73.0	51.0	22.0	67.5	53.3	14.2	58.6	0.29
Edinburgh ..	77.7	51.0	26.7	..	..	..	59.2	0.60
Glasgow ..	71.0	49.0	28.0	..	..	..	58.1	1.07
Dundee ..	69.0	50.0	19.0	..	..	..	56.0	0.15
Aberdeen ..	73.3	47.2	26.1	..	..	..	57.2	0.27
Paisley ..	68.0	42.0	26.0	..	..	..	55.3	0.50
Greenock ..	71.0	47.5	23.5	..	..	..	55.8	1.50
Perth ..	68.0	51.0	17.0	..	..	..	57.0	0.19
Perth ..	73.0	42.0	31.0	..	..	..	56.1	0.51
Dublin ..	78.9	38.5	40.4	..	..	..	58.8	0.16

JAMES GLAISHER.

Notices to Correspondents.

APRICOTS SPLITTING: *M.* The splitting of the fruits of your Apricot tree in a pot is caused through access of water at the roots. They should be kept rather dry after they begin to ripen. It is a common failing with pot fruits.

CUCUMBERS: *Amateur.* There is no need to fertilise the blossoms, if the object is merely the growth of the fruit for use—and not for seed. When fertilisation is necessary, there is no better way than to pluck the male blossoms, tear off the corolla, and place the stamens just as they are, on the stigmas of the flower to be fertilised.—*X. Y.* Your Cucumber plants are weak, probably from something wrong about the roots, and, in consequence, the tissues give way, both from heat and moisture. It is quite useless applying sulphur. Attend

to soil, water, and ventilation. It is possible, however, that the seed may have been derived from unhealthy plants, and, in that case, no pains will insure good stock. *M. J. B.*

CUTTING A MAGPIE'S TONGUE: *Lattenbury asks*—"Can you, or any of your correspondents, inform me as to the advantage, if any, to be got by cutting a certain string under a magpie's tongue, in order to enable the bird to talk?"

DECAYED PELARGONIUM LEAVES: *F.* Your Pelargoniums seem to have a complication of disorders. The leaves, from some cause or other, are not properly nourished; the cellular tissue is imperfect, and a drop of water resting on the tender leaf destroys the subjacent cells, with the exception of the cuticle. We suspect, too, that insects have been at work, and there are traces of the common black smut. Even in healthy plants a petal falling on the leaves will often induce decay. *M. J. B.*

EXCELSIOR: *Somerset.* Your criticism is perfectly just. Excelsius would have been more correct. Longfellow has much to answer for in this matter.

FLORAL CRITICISM ESSAYS: *Enquirer.* We believe the prize has not yet been awarded.

INSECTS: *Quercus.* The caterpillar is that of the Puss moth (Dicranula Vinula), and it feeds on the leaves of Willow and Poplar. *A. M.*—*A. F.* The grub of the common cockchafer. See remarks on it and its attacks on Strawberry plants in last number. *A. M.*

LONICERA AUREO-RETICULATA: *E. W.* The flowering of this plant is no uncommon occurrence now.

NAMES OF PLANTS: *C. W. Strickland.* We do not remember to have seen your Dendrobium before. It is probably one of the kinds represented (though so imperfectly that it is all but impossible to recognise them) in the "Herbarium amboinense" of old Rumphius.—*W. Muir.* We can only repeat what we said on a former occasion, when a specimen of the same plant was sent us from the same place, *i.e.*, that it appears to be merely a (very fine) variety of Oncidium Wentworthianum.—*J. L.* We cannot undertake to name wretched scraps, without flowers.—*B. G.* Lysimachia nummularia.—*Thau.* Certainly a Poa; apparently trivialis.—*F. A. S. P.* 1, Sisymbrium, species; 2, Bellis sylvestris, or perennis, with all the florets ligulate; 3, Campanula medium.—*M. N.* Potentilla fruticosa.—*Constant Reader.* 1, Orchis maculata; 2, Geranium sylvaticum; 3, Geum urbanum; 4, Geranium Robertianum.—*W. P.* Campanula rapunculoides.—*M.* Sedums; 1, elegans of English Botany; 2, album, L.; 3, hispanicum, L. (glaucum, W. and K., non Smith)'; 4, anglicum, probably; 5, sexangulare; 6, spurium, B. M.; 8, Aizoon, L.—*C. Quinet.* Cordyline australis.

RASPBERRIES: *A. G. G.* Your Raspberries are very curiously changed; there are no true petals and no stamens, but in their place a number of green scales, like the calyx-lobes. If the pistils, which seem to be perfect, had been artificially fertilised, they would probably have set.

VIOLA CORNUTA: *T. Challis.* The plant figured in the "Botanical Magazine" (t. 791), as quoted in the letter to the "Wilts County Mirror," is the typical Viola cornuta, the same plant as is grown extensively under this name for bedding purposes. The variety Perfection, about which there has been so much dispute, is quite another thing, though it may be the result of a cross in which cornuta was one of the parents.

WEEKS' BOILER. In our report of the last show at the Royal Botanic Society we omitted to mention that a First-class Certificate was awarded to Messrs. Weeks for their boiler and models.

ERRATA. At p. 929, for dwarf-growing variegated "Pelargonium" read "Tropæolum."—In the account of Nuneham, p. 930, some misprints, relating to the size of trees, occur—thus, Pinus Benthamiana should be 14 feet, P. Nordmanniana 15 feet.

CORRESPONDENCE RECEIVED.—A. P.—A. J.—R. L.—F. André.—T. C. B.—T. B.—C. G.—O. M.—J. R. C. G.—R. J. H.—D. T. F.—W. S.—T. Meehan.—J. L. J. C. T. W.

Markets.

COVENT GARDEN.—July 14.

We have to report a very steady trade in this market, and a good supply. The wholesale markets are very brisk, and the growers' stands are generally cleared Peaches and Nectarines are sufficient for the demand. Pines are in excess, and fetching a very low price. Amongst flowers we have nothing different from those mentioned last week.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz	2 0	4 0	Oranges, per 100	6 0	12 0
Cherries, per lb.	1 0	6 0	Peaches, per doz.	10 0	24 0
Grapes, per lb.	1 0	7 0	Pears, per doz.	—	—
Lemons, per 100	10 0	15 0	Pineapples, per lb.	3 0	6 0
Melons, each	2 0	6 0	Strawberries, p. lb.	0 6	2 0
Nectarines, per doz	8 0	14 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Asparagus, p. bund.	2 0	4 0	Horse Radish, p. bun.	3 0	5 0
Artichokes, p. doz.	1 0	3 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 0	3 0
Bean-pli, per doz.	1 0	2 6	Mint, per bunch	0 0	0 3
Cabbages, p. doz.	1 0	1 6	Mushrooms, p. pott.	1 0	1 6
Carrots, p. bunch	0 4	0 6	Onions, per bunch	0 4	0 6
— young, p. bun.	1 0	2 0	Parsley, per bunch	0 2	0 4
Cauliflowers, p. doz.	1 6	3 0	Potatos, new, p. lb.	0 0	0 0
Celery, p. bund.	1 0	1 6	Shallots, per lb.	0 8	—
Cucumbers, each	1 0	1 0	Spinach, p. bushel	2 0	3 0
Endive, per doz.	1 6	2 0	Radishes, per doz.	1 0	1 0
French Beans, p. 100	2 0	—	Turnips, yng., p. bun.	0 0	1 0
Garlic, per lb.	0 8	—			
Herbs, per bunch	0 2	0 4			

Potatos, York Regents, per ton, 110s. to 140s.; Flukes, do., 200s.; new round, 50s. to 75s. per cwt.; new kidney, 75s. to 85s. do. Continental kinds, 85s. to 90s. do.

The Oxford Show.

ROYAL AGRICULTURAL and HORTICULTURAL SOCIETIES

DENNIS AND COMPANY, Anchor Works, Chelmsford, will exhibit their famed specimens "NEW ERA" GREENHOUSES, from £5 each, and Rafter Wrought iron Glazing Bars, £20 Gudge's PATENT GLASS ORCHARD, the latest novelty for Training and Cultivating every description of Fruit Trees.

Patent MINERY FRAMES, from £10 each
Patent Galvanised Metal HAND GLASSES, from £2 each
Patent HORIZONTAL TUBULAR BOILERS.
STAND 484

Royal Show, Oxford.

EVERYBODY SHOULD SEE

BEARD'S PATENT GLASS WALLS,
BEARD'S PATENT GATE WALLS,
BEARD'S PATENT SLATE SLIPS,
BEARD'S PATENT CONSERVATORY,

At STAND 388, Machinery in Motion Department; and at the Horticultural Show.

Manufactured at the Victoria Works, Bury St Edmunds, by C. BEARD, Patentee

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEREMAN, SMITH, and MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

HORTICULTURAL EXHIBITIONS.
NOTICE TO COMMITTEES.
Upon application to the Undersigned, Plans and Prices for the HIRE of elegant Ornamental TENTS are forwarded free of charge. All orders should be addressed to 42, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.
BENJAMIN EDGINGTON

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched performent, 4 inches long, 4s. per 1000; 6 inches, 6s. 6d., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free to London by JOHN TISHER AND CO., Label Works, Boston, Lincolnshire

The Grass Land Mower.

BURGESS AND KEYS'S MOWERS will be found [illegible] adapted for Cutting the difficult Crops of the season, such as Rye, Tares, Wet Grass, &c. [illegible] Price List, and Testimonials, may be had of the Makers, No. 3, Soho Square, London

Agents wanted [illegible]

THE CLOCHES, or BELL GLASSES, named in Mr. Rivers's article on the Early Forcing of Strawberries, and Gardens of Utility, are to be had only of the Manufacturers, the Alder Glass Company, 84, Upper Thames Street, where a Stock is kept. [illegible] Agent.

Horticultural and Window Glass Warehouses.

JAMES MILES, 6, High Street, and 12 and 13, Princes Street, Cavendish Square.
CONSERVATORY AND HARDWOOD GLASS
Glass in Boxes, Crates, Hampers, &c.
GARDEN ENGINES, PUMPS, SYRINGES, INDIA RUBBER HOSE, TAPS, CONNECTIONS, &c.
[illegible]

To Architects, Landscape Gardeners, and Others.

SCARBOROUGH CEMETERY. The Burial Board [illegible] Cemetery [illegible] Scarborough [illegible] Wednesday, the 27th day of July, 1870, at Twelve o'clock at Noon, at the Board Room, in the Town Hall, in the said Parish. Copies of the conditions, with Plan and Sections of the Ground, may be had on application to the Clerk, at his Office, or to the Surveyor [illegible]

[illegible] Premium of £30 will be given for the Plan which shall be approved by the Board, and a Premium of £20 for the Plan which shall be approved by the Board next in merit to the Plan to which the first Premium shall be awarded.

Competitors are requested to forward their Plans, respectively marked by a motto only, and accompanied by a separate sealed Letter, containing the name and the Competitor's address, to the Cemetery Plans, and send the same to the Clerk to the Board, at his Office, 45, Saint Thomas Street, Scarborough, on or before the 8th day of August next.

By order of the Burial Board, J. J. P. MOODY, Clerk.
Scarborough—July, 1870.

A LAND AGENT, having the Management of the Estates of [illegible] Norfolk, [illegible] Country, [illegible] Agent, Mr. [illegible] Lincoln's Inn Fields, London.

MR. ALEX. JEMMETT, of Murrell Hill Farm, [illegible] CENTLEMEN requiring a thoroughly practical Man to [illegible] Farm. A comfortable home is offered. [illegible] Mr. LOVEJOY, The Library, Reading.

FOUR GARDENERS REQUIRED for Tea Gardens [illegible] Gardens. They must possess a knowledge of [illegible] Applications to be made by letter, before July 20, addressed to A. B., care of Hasleden, 121, Oxford Street, W.

WANTED, a GARDENER used to Growing and Forcing Grapes, Pines, and other Stove and Greenhouse Plants. [illegible] Cowley, Uxbridge.

WANTED IMMEDIATELY, TWO efficient BUDDERS and GRAFTERS.—Good wages required and references to FRED. PERKINS, Bedford Road Nursery, Northampton

WANTED, an industrious MAN, to assist in Growing Plants for Market. One used to Tying and who has been in the Trade preferred.—Apply at The Orchard, Mortlake, Surrey, S.W.

WANTED, a YOUNG MAN to assist in the Glass department of Lessons, Hyde Heath. He must [illegible] some practical Gardening and Potting. Apply to WM. PAUL, Paul's Nurseries, Waltham Cross.

WANTED, an experienced SEEDSMAN.—Preference given to one having a knowledge of Plants. Salary to commence at £[illegible] Address, with particulars, P. B., 12 King Street, Covent Garden, W.C.

Seed Trade.

WANTED, a TRAVELLER; one who has had [illegible] Apply by letter only, stating full particulars, to Messrs. MINIER AND CO., 69, Strand, W.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they [illegible] Gardeners [illegible] NEW Vacancies [illegible] whose testimonials will bear the strictest scrutiny. An Out-man [illegible] application would be [illegible] Cutbush's Nurseries, Highgate, N. Also a Single-handed Gardener [illegible] Suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS for as GARDENER and BAILIFF [illegible] Various qualifications, recommended to Gentlemen [illegible] Direct [illegible] application to Messrs. E. G. HENDERSON & Son, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (HEAD).—JAMES HARDIE, Head Gardener for the last eight years to the Khedive of Egypt, is at liberty to [illegible] Gentleman requiring the services of a thorough practical Gardener. Testimonials references.—160, Burnt-rise Road, Sheffield

GARDENER (HEAD), in a Gentleman's Garden.—Married; 30 years' character.—E. W., Post Office, Green Street, Sittingbourne, Kent.

GARDENER (HEAD).—Age 37, married, no incumbrance; well skilled in all branches of the profession. Highest references.—G. B., 11, Adam's Square, Bromley, Kent.

GARDENER (HEAD).—Age 34, married; has a thorough practical knowledge of the profession in all its branches. Good education and references.—A. B., Post Office, West Green, Tottenham, N.

GARDENER (HEAD).—Age 30, married, thoroughly understands Early and Late Forcing, and Kitchen and Flower Gardening. Total Abstainer. Can be well recommended. Would not [illegible] much an object as a good [illegible] situation.—G., Messrs. Lee's Nursery, Hammersmith, W

GARDENER (HEAD).—Age 29, married, one child; has a first-class practical knowledge of the profession in all its branches, including the Management of Vines, Pines, Peaches, Cucumbers, Melons, Strawberries, Mushrooms, &c.; Greenhouse and Stove Plants, Kitchen and Flower Gardening. Character will bear the strictest investigation.—G. R., Kingston, Tetsworth, Oxon.

GARDENER (HEAD).—MATTHEW BALLS offers his services to any Nobleman or Gentleman requiring the above. Is a good Accountant, and has spent 20 years' good character. References can be made to the Right Hon. the Earl of Chatteris, the Lord Templemore, and to Henry Rogers, Esq., Recreation Square, Hamilton, by whom he has been upwards of Ten years.—MATTHEW BALLS, Stagenhoe Gardens, Welwyn, Herts.

GARDENER (HEAD), age 36, married.—R. W. PRICE is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener, having lived four years and eight months as Head Gardener in a present situation, and previous to [illegible] years with a Nobleman—any abilities and character required can be made to present employer, JOSHUA DIXON, Esq., Winslade House, Exeter, Devon.

GARDENER (HEAD), age 40, married.—JOHN BROWN begs to give notice that he will be disengaged on Sept. 6, and offers his services to any Nobleman or Gentleman in want of a first-class practical Gardener. Well versed in the Early Forcing of all kinds of Flowers, Fruit and Vegetables, having lived five and a half years as Head Gardener in present situation, and previously [illegible] years Head Gardener to the late Sir Charles Knightley, Bart.—For abilities and character, reference can be made to present employer, the Right Hon. the Earl of Harrington, Elvaston Castle, Derby.

GARDENER (HEAD, or good SINGLE-HANDED).—Age 27, single; has a thorough knowledge of Fruit, Flower and Kitchen Gardening, Vines, Forcing, &c. Two years' first-class character.—X. Y., Denmark Cottage, Denmark Road, Hammersmith, W.

GARDENER (HEAD), where one or more are kept.—Age 35, married, no incumbrance, understands Forcing Grapes, Cucumbers, Stove Plants, Fruits, &c., and used to large Grounds and Extensive Establishments. Best of character. Tunbridge, Kent.

GARDENER (HEAD), where three or more are kept.—Age 30, married; thoroughly practical in all branches of the profession. Can be highly recommended.—E. S., Mr. Mitchell's Library, Lewisham, Kent.

GARDENER.—Understands Kitchen and Flower Gardening, Grapes, Cucumbers, and Melons; no objection to look after a Horse or Cow. Good character.—A. B., [illegible] Mitcham, W.

GARDENER.—The RECTOR of CHEDGRAVE seeks to [illegible] Gardener, married, no incumbrance; well-conducted, honest, respectable. Wife a Frenchwoman; skilful as [illegible] Lady's-maid.—Rev. H. A. BARRETT, Chedgrave Rectory, Norwich

GARDENER.—E. S. WILLIAMS will be glad to recommend a [illegible] Gardener, [illegible] Gardens [illegible] Mere, whom he has known for several years, and can testify as to his [illegible] qualities; he held the situation [illegible] to retire from it, and can produce unexceptionable testimonials.—Vicarage and Paradise Nurseries, Upper Holloway, London.

GARDENER and BAILIFF.—Age 28, Scotch; 6½ years' good character from the Gentleman he has just left, where he had the entire Superintendence of a large Garden, Pleasure Ground and Farm, and the general Management of a large Estate.—J. M., Hallwood, Halton, Prestonbrook, Cheshire.

GARDENER (SECOND), in a Gentleman's Garden.—Age 22. Two years' good character.—W. L., Manor House, Great [illegible], Acton, W.

GARDENER (SECOND, or SINGLE-HANDED).—Age 22; has [illegible] Early and Late Forcing, and Flower and Kitchen Gardening [illegible] A. B., Post Office, Bottesford, Bucks.

GARDENER (SECOND, or SINGLE-HANDED).—Age 24; has [illegible] year's experience. Can be highly recommended.—State wages, W. L., 39, Park Place, Park Road, Haverstock Hill, N.W.

GARDENER (UNDER).—Age 19; lived in former place two years, present place [illegible] and a half year. Good character.—J. H., The Gardens, Pyrnes Park, Edmonton, N.

GARDENER (UNDER), wishes to improve himself.—Age 21; trustworthy. Would not object to a small single-handed place. Has always [illegible] character from last situation.—W. W., Keavner, near Hurstpierpoint, Sussex.

GARDENER (UNDER), where he can improve himself.—Age 20; trustworthy, and will make himself useful. Has been [illegible] and a half years' good character.—J. B., E. Long, Waxeswell, Pinner, Middlesex.

FOREMAN, in a Gentleman's Garden.—Age 27; is accustomed to the Work of Forcing and Plant Houses, also a good Propagator and Raiser of Plants for the Flower Garden. Good character.—R., Post Office, Debenham, Hants.

FOREMAN (GENERAL), or to take entire charge of the Glass Department of a First-class Nursery, where energy and thorough ability would be appreciated. Testimonials unexceptionable.—J. SMITH, Stafford's Nurseries, Hyde, near Manchester.

GROUND FOREMAN and PROPAGATOR (WORKING), in a first-class Nursery, where economy, energy, and thorough ability would be appreciated.—He is successful in the [illegible] of Fruit Trees, Roses, Ornamental Trees, Deciduous Shrubs, and Evergreens; is conversant with value of the same, and the general [illegible] of a first-class Nursery work. An opportunity where a pushing Trade is required. Character will bear strictest investigation.—J. B., 19, Holly Terrace, Holloway, N.

To Nurserymen.

FOREMAN.—A thorough practical hand at Budding and Grafting of Roses and Fruit Trees, the Propagation of Florist Flowers, the Management of Vines, Ornamental Trees and Shrubs, &c.; also a good Salesman.—A. C., Cutbush's Nursery, Highgate, N.

PACKER, &c.—Age 25, active; well up in the general routine of Packing, either in Nursery or Seed Establishment.—J. H., 21, East Street, Reading, Berks.

IMPROVER, in a Nobleman's or Gentleman's Garden, [illegible] Age 17; has [illegible] the profession. Address, A. C., 2, Sand Hills, Bedford, N.

TRAVELLER, to the Seed Trade.—A young Man, of good address, appearance, &c. Thirteen years' experience in good Scotch house [illegible] Address, A. B., Messrs. Dickson & Turnbull's, W.

To Seedsmen.

SHOPMAN.—Wanted, an immediate engagement in a Retail Business, by a thoroughly experienced Man, with first-class references.—S. & C., Struthers & Crichton, Seedsmen, 1, Bunhill Row, Finsbury Square, London, E.C.

The Royal Agricultural and Royal Horticultural Societies' GRAND SHOW, OXFORD. STAND 350.

SUTTONS' GRASS SEEDS for all soils. SUTTONS' IMPROVED BROWN TARGUEN FARM SEEDS. PRINCESS WALES

SUTTONS' SELECTED VEGETABLE and FLOWER SEEDS. SUTTONS' SPECIMENS of AGRICULTURAL ROOTS.

SUTTON'S NEWS must be the special attention of Visitors to the extensive and interesting display at STAND No. 350, immediately in front of the Prize pavilion.

SUTTON and SONS, Seedsmen to the Queen, Reading.

Stand No. 350.

ROYAL AGRICULTURAL SHOW, OXFORD.

THE FARMERS' SUPPLY ASSOCIATION, Limited.—Capital £20,000, in 10,000 Shares of £2 each.

Directors.

The Hon. Henry Petre, Chelmsford, Essex.
The Rev. William R. Bayley, Cassington Vicarage, Oxford.
Thos. L. Melville Cartwright, Esq., Melville House, Fife; and Newbattle Manor, Brackley, Northamptonshire.
Fredk. S. Champion, Esq., 5, Great Winchester Street Buildings, London.
Charles Spooner, Esq., 11, Poet's Corner, Westminster.
John Trask, Esq., Northington, Hants.

Secretary—Mr. John Spencer.

Offices:—69, King William Street, London, E.C.

Annual Subscription of One Guinea entitles the holder to purchase all kinds of AGRICULTURAL REQUISITES through this Agency.

Stand No. 329.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND. OXFORD, 1870.

CLAYTON and SHUTTLEWORTH, Lincoln, will exhibit at this Show, commencing July 11, as follows:—

PORTABLE STEAM ENGINES, 4 to 10-horse power.
HORIZONTAL FIXED STEAM ENGINES.
TRACTION ENGINE, for Common Roads.
THRESHING MACHINES, of various sizes.
STRAW ELEVATORS.
STACKING MACHINES.
CIRCULAR SAW BENCHES, &c.

At the Royal Public Trial (July, 1867) of the Royal Agricultural Society of England, in competition with the principal manufacturers of England, all the First Prizes for Steam Engines, the Prize of £15 for the Fastest Threshing Machine, also the Society's Silver Medal, were awarded to

CLAYTON and SHUTTLEWORTH, Lincoln, and 78, Lombard Street, London, E.C.

Catalogues, &c., free by post.

Patronised by Her Majesty the Queen, and H.R.H. the PRINCE of WALES.

STAND | G. W. MURRAY and CO., | STAND 217. BARN FOUNDRY, N.B. 217

Will exhibit at the ROYAL AGRICULTURAL SHOW, OXFORD, their New Series of DOUBLE FURROW PLOUGHS.

These Ploughs, from their extraordinary lightness, the perfect position, winning, in addition to numerous other First Prizes, the

ONLY GOLD MEDAL

ever offered for Double Furrow Ploughs, in competition with the most celebrated makers of the United Kingdom, at Stannington, near Newcastle-on-Tyne, in 1869.

G. W. MURRAY & Co.'s celebrated PATENT COMBINED PLOUGH and SUBSOILER is acknowledged to be the most important application of the Double Furrow Plough made.

They will also exhibit their CORN DRILL, COMBINED LAND ROLLER, and GRASS SEED SOWER, CHAIN HARROW, FIELD GATE, &c. Catalogues and prices on application to the Barn Foundry, N.B.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.

For particulars apply to JOHN FOWLER and CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

THE GRANITIC PAINT, the best for the finest painting, and the roughest work. Used in the Crystal Palace, Sydenham, the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.

39A, King William Street, London Bridge, London, E.C.

DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.

39A, King William Street, London Bridge, London, E.C.

SALES BY AUCTION.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, July 26, at half past 12 o'clock precisely, a Collection of CHOICE IMPORTED and WELL-ESTABLISHED ORCHIDS, comprising a magnificent new Odontoglossum, described by the collector as the finest yet discovered, but in comparably finer, the common Comparettia falcata, the showy Lælia Perrinii, Cattleya Mossiæ, Schomburgkia tibicinis, the new Oncidium pumilum, a new pure white fragrant Masdevallia, with flowers the size and shape of Lælia Jongheana, several new and rare Odontoglossums, Vanda suavis fragrans, magnificent established specimens of Oncidium marianthum, Odontoglossum crispum, Veitch's Hookerianum, &c., &c.

On view the morning of Sale, and Catalogues had.

Imported and Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, July 26, at half past 12 o'clock precisely, a Collection of CHOICE IMPORTED and well-ESTABLISHED ORCHIDS, comprising a magnificent new Odontoglossum, described by the collector as the finest yet discovered, but incomparably finer, the common Comparettia falcata, the showy Lælia Perrinii, Cattleya Mossiæ, Schomburgkia tibicinis, the new Oncidium pumilum, a new pure white fragrant Masdevallia, with flowers the size and shape of Lælia Jongheana, several new and rare Odontoglossums, Vanda suavis fragrans, magnificent established specimens of Oncidium marianthum, Odontoglossum crispum, Veitch's Hookerianum, &c., &c.

On view the morning of Sale, and Catalogues had.

Caversham, near Reading, Berks.

IMPORTANT SALE of SPECIMEN PLANTS.

MR. J. C. STEVENS, HORTICULTURAL AUCTIONEER and VALUER, 38, King Street, Covent Garden, W.C., begs to announce that he has been favoured with instructions from C. H. Marshall, Esq., of Caversham, near Reading (who is going abroad), to SELL by AUCTION, on the Premises, on WEDNESDAY, July 27, at 12 o'clock precisely, the valuable COLLECTION of STOVE and GREENHOUSE PLANTS, FERNS, ORCHIDS, &c., including many fine Specimen Plants that have taken Prizes at the various Shows.

On view the day prior and morning of Sale; and Catalogues had on the Premises, and of Mr. J. C. STEVENS, 38, King Street, Covent Garden, London, W.C.

Kirkbank, near Richmond, Yorkshire.

MESSRS. WETHERELL will SELL by AUCTION, without reserve, at Kirkbank, near Richmond, on TUESDAY, August 2 (the day previous to the Richmond Agricultural Society's Show), the entire HERD of superior bred SHORTHORNED CATTLE, the property of Mr. Alfred Stables, consisting of 42 Bulls, Cows, and Heifers, descended from the best and purest strains. Amongst the sires will be found Crouper (23,660), Lord Frederic (22,150), Asteroid (21,193), Lord Albert (20,143), Royal Alfred (18,748), King Alfred (16,334), Sir Roger (16,991), First Fruits (16,098), Prince George (13,519), King Arthur (13,110). The Cows and Heifers are served by British Hope (21,324), and Serjeant Major, bred by J. E. Booth, Esq., of Killerby Hall, Catterick.

Catalogues may be had of Mr. THOMAS WETHERELL, Durham; or of Mr. JOHN WETHERELL, Richmond.—June 23.

Extensive Sales by Auction.

MESSRS. PROTHEROE AND MORRIS respectfully invite the attention of Noblemen, Gentlemen, Nurserymen and others, who are contemplating planting the following and one, to the undermentioned Advantageous Arrangements, announcing important CLEARANCE SALES by AUCTION, of many acres of the most thriving NURSERY STOCK in this country; and which may be inspected any day (Sunday excepted) previous to the Sales.

Levtonstone, July 16, 1870.

Preliminary Notice of Sales in Surrey.

MESSRS. PROTHEROE AND MORRIS are instructed to prepare for UNRESERVED SALE by AUCTION, the most EXTENSIVE COLLECTIONS of EXOTIC and other PLANTS, FRUIT TREES, FOREST TREES, LARCH GREENS and DECIDUOUS SHRUBS, STANDARD and DWARF ROSES, &c., to take place as under:

OCTOBER 24, 25, 26, 27, 28, 29, 31, NOVEMBER 1, 2 and 3, on the Premises, ST. JOHN'S NURSERY, WOKING, SURREY, by order of the Executors of the late Mr. George Jackman, Senior.

OCTOBER 17, 18, 19, 20, 21, and 22, on the Premises, SUNNINGDALE NURSERY, BERKSHIRE, by order of Mr. Charles Noble, a large portion of the PERKSHIRE NURSERY being required for building purposes by the Proprietors of the Sunningdale Estate, and further particulars will shortly appear.

OCTOBER 24, 25, 26, 27, 28, 29, 31, NOVEMBER 1, 2 and 3, on the Premises, ST. JOHN'S NURSERY, WOKING, SURREY, by order of Executors of the late Mr. William Jackman, Senior.

Further particulars will shortly appear. Leytonstone, E.

Shacklewell.—To Nurserymen, Florists, and Others.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at Garraway's, Cornhill, E.C., on TUESDAY, July 26, at 12 o'Clock, the valuable LEASE, with possession, of the WORKSHOPS, YARD, and PREMISES, No. 1, Grosvenor Terrace, Shacklewell Lane, and 1 and 2, Nursery Ground, with 10 Greenhouses, Ranges of Pits, Sheds, Stable, and other Erections thereon, &c. Lease about 16 years unexpired. At present rent £25 per annum. Estimated to produce £100 per annum. Held for a term of about 16 years, at a ground rent of £25 per annum.—View prior to Sale.

Particulars and Conditions of Sale may be had of the Auctioneers and Valuers, Leytonstone, N.E.

Established Orchids.

LUDLOW AND DANIELL have received instructions to SELL by AUCTION, at their Rooms, Stour Street, Birmingham, on WEDNESDAY, July 20, at 11 o'Clock precisely, a CHOICE COLLECTION of ESTABLISHED ORCHIDS, in good condition, clean and true to name, comprising Aerides, Calanthes, Catleyas, Cypripediums, Dendrobiums, Odontoglossums, Oncidiums, Saccolabiums, Vandas, &c.; amongst which will be found many varieties well worth the attention of Collectors.

Catalogues on application.

Horndon-on-the-Hill.

Valuable BUILDING and MARKET GARDEN GROUND, adjoining the Stanford-le-Hope Railway Station.—The desirable FREEHOLD RESIDENCE known as HIGH HOUSE, and several FREEHOLDS of very valuable ACCOMMODATION LAND, with possession.

MESSRS. BEADEL will SELL by AUCTION, at the Mart, Tokenhouse Yard, London, on THURSDAY, July 21 next, at 1 o'Clock precisely, the above valuable PROPERTY, in Four Lots, at the request of several parties desirous of forming Freehold Land, eminently suitable for Building or Market Garden purposes, situate adjoining the Stanford-le-Hope Railway Station, with considerable frontage to the Turnpike Road, and comprising about 17 acres, as follows:—

Lot 1. The very desirable Freehold Residence, known as High House, in the village of Horndon-on-the-Hill, with Garden, Paddock, Stabling, and out-Buildings, the whole approached by a carriage drive, and well timbered.

Lots 2, 3, and 4. Three Closes of Freehold Building and Accommodation Land, fronting the High Street, also in the occupation of Mr. Vincent, with Cottage and Garden attached, producing a rental of £30 per annum, and held on lease for a long term of years at a low rent.

Lot 5. The valuable Plot of Freehold Orchard and Garden Ground, with frontage to the High Street, admirably adapted for Villa purposes, in the occupation of Mr. John Wright, as yearly tenant.

May be viewed by permission of the Tenants, and particulars, with Plans, obtained of Messrs. HICKS and SON, Solicitors, Grays Inn, W.C.; of the Auctioneers; and of Messrs. BEADEL, 25, Gresham Street, London, E.C.

To Breeders of Pigs.

ROYAL AGRICULTURAL SOCIETY'S SHOW, OXFORD, 1870.

MESSRS. JONAS PAXTON and GEORGE CASTLE are instructed to SELL by AUCTION, near the Showyard of the above Society, on MONDAY, July 25, at 12 o'clock, SEVEN SHEARLING and SEVEN BOAR PIGS of the improved Middlesex Breed.

Mr. Cartwright has been a very successful breeder of Pigs, having during the last few years, among other prizes, taken six First Prizes at Birmingham, besides Champion Cups for best Pigs in the yard and three First Prizes at Smithfield.

Catalogues will be forwarded on application to the Auctioneers, Bicester, Oxon.

Bulbridge Farm, Wilts.

Ten minutes' walk from the Great Western and South-Western Railway Stations at Wilton.

ANNUAL SALE and LETTING of RAM LAMBS and RAMS of the LEICESTER, SOUTHDOWN, and HAMPSHIRE DOWN BREEDS.

MESSRS. EWER and WINSTANLEY will SELL and LET by AUCTION, on the Premises, Bulbridge Farm, Wilts, on WEDNESDAY, August 3 (Refreshments will be provided at 12, and the Sale will commence at 1 o'Clock), about 140 RAM LAMBS and RAMS of the improved Hampshire Down Breed, the property of Mr. James Rawlence.

The Auctioneers again have the pleasure to announce that in addition to the numerous Prizes awarded to this flock in previous years at the Royal, Bath and West of England, and Local Exhibitions of Sheep Stock, Mr Rawlence has to the present year been awarded at the Bath and West of England Shows, held at Exeter, Taunton, and Bristol, a Prize for Shearling Ewes, the 1st and 2d Prizes for Old Rams, and the 2d Prize for Shearling Rams; also at the Berks and Hants Agricultural Show at Basingstoke, the two 1st Prizes for Rams of any age; and at Stockbridge Cattle Show, the 1st Prize for Rams of any age, and the 2d for Teg Rams.

Auction and Estate Agency Offices, Endless Street, Salisbury.

SHORTHORN SALES, 1870.

THURSDAY, August 25.—At Aiket, by Stirling, N.B., Messrs Mitchell's ENTIRE HERD, crossed with Bulls bred from Mr Booth (or several generations); also the pure-bred FLOCK of BORDER LEICESTERS.

FRIDAY, September 2.—The very superior HERD, belonging to J. G. Dixon, Esq., bred for 50 years from Messrs. Charles and Robert Colling, at Darlington, Yorkshire.

WEDNESDAY, September 21.—A valuable selection of COWS, HEIFERS, and BULLS, of Bates and Princess blood, from the first class herd belonging to James Dent, Esq., at Sandy Close, near Carlisle.

FRIDAY, September 23.—The ENTIRE HERD belonging to Chas. R. Sanday, Esq., of Ingleby Greenhow, Darlington, Yorkshire, to avoid a sale, containing many remarkably fine specimens of the "Waterloo," "Oxford," "Cowslip," "Lucina," "Wild Eyes," and other valuable families; also the Pure Bull "Prince Oxford."

THURSDAY, September 29.—The ENTIRE HERD belonging to W. Cox, Esq., at Bradshaw Hall, Derby, bred from Mr W. Leeke, Mr. J. Booth, and Mr. T. Dixon Stocks.

WEDNESDAY, October 5.—Mr. William Torr's ENTIRE HERD, about 70 head, with several fine specimens of the "Darlington," "Oxford," "Lavender," and "Minnie" tribes; crossed at his sale by the 1st Prize Bull at Rudmanton, Chippenham, Wilts.

THURSDAY, October 6.—The late Mr. William Hewers HERD, about 80 Head, and the stock of first class BERKSHIRE PIGS, many first prize winners of the finest in the kingdom; at Sevenhampton, Highworth, Wilts.

Catalogues, with Pedigrees, of these Sales, will be issued in due time. Further particulars can, however, be had on application to JOHN THORNTON, 15, Lincoln's Inn Fields, London, W.

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.

Directors.

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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.

Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.

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No investigation of title necessary, and no legal expenses incurred.

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(Incorporated by Special Acts of Parliament.)

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The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, for Owners entitled and other Estates, and to the Clergy in respect of their Glebe Lands.

The whole outlay and expenses are liquidated by a rent-charge upon the land, reducing principal and interest, over 25 years.

No investigation of title is required.

For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

ROYAL AGRICULTURAL COLLEGE CLUB.—

The HALF-YEARLY DINNER will take place at the RANDOLPH HOTEL, OXFORD, on WEDNESDAY, July 20, at 6 for 6.30 P.M. EDWARD BROWN, Esq., of the Chair. Each Member can introduce a friend. Gentlemen intending to be present are requested to communicate as early as possible with

CHAS. GAY ROBERTS, Hon. Sec., Haslemere, Surrey.

MANCHESTER and LIVERPOOL AGRICULTURAL SOCIETY.—The ANNUAL SHOW of HORNED CATTLE (Shorthorns especially), SHEEP, PIGS, DOGS, POULTRY, CHEESE, GRAIN, ROOTS, IMPLEMENTS, MACHINERY, SADDLERY, and MISCELLANEOUS ARTICLES, will be held in WESTWOOD PARK, SALFORD, on SEPTEMBER 6, 7 and 8 (preceded by a Public Trial of Farm Implements on September 5), when PRIZES amounting to nearly TWO THOUSAND POUNDS will be awarded. ENTRIES for SHOW CLOSE AUGUST 1.

Prize Lists and Forms of Entry on application to the Secretary, THOMAS RIGBY, Over, near Winsford.

STAFFORDSHIRE AGRICULTURAL SOCIETY.

WALSALL MEETING, SEPTEMBER 20, 21, and 22.

In addition to the usual Prizes for Stock, Produce, &c., offered for competition within the limits of the Society's operations, Special Prizes of £25 and £15 for the best and second best Stallion for agricultural purposes, also Prizes for Poultry and Implements, are open for competition to the United Kingdom.

ENTRIES CLOSE AUGUST 20.

Prize Lists and Forms of Entry are now ready, and may be had on application to the Secretary.

W. TOMKINSON, Newcastle, Staffordshire.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.

OXFORD MEETING.

SHOW of HORSES, CATTLE, SHEEP, PIGS, and IMPLEMENTS, MONDAY, July 18, to FRIDAY July 22.

Admission—Monday, 5s.; Tuesday and Wednesday, 2s. 6d.; Thursday and Friday, 1s.

Season Tickets, price 10s. 6d., available from July 11 to 22, may be obtained of T. F. PLOWMAN, Oxford; or of

H. M. JENKINS, Secretary.

12, Hanover Square, London, W.

Royal Agricultural and Horticultural Show, Oxford.

NOTICE TO ADVERTISERS.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE for JULY 23 and 30 will contain a FULL REPORT of the PROCEEDINGS at the Royal Horticultural and Agricultural Shows.

ADVERTISEMENTS should reach the Office NOT LATER than THURSDAY MORNING in each week.

A SPECIAL EDITION of JULY 23 will be published in the Agricultural Show Yard.

STAND 466, SEED and MODEL SHEDS

The Agricultural Gazette.

SATURDAY, JULY 16, 1870.

MEETING FOR THE ENSUING WEEK.

MONDAY, July 18 to FRIDAY, July 22 | Great Annual Meeting of the Royal Agricultural Society of England, at Oxford.

THE Royal Agricultural Society of England has seen almost a generation pass, and the youngest survivors of its first Oxford meeting are already greyhaired men. Its founders, who met in 1839—earnest, wise, far-seeing,—have had like-minded followers; and we, in the fourth decade of its career, can look back on an uninterrupted progress, which is largely due to persistent and untiring, public-spirited, laborious, and disinterested leadership, of which Englishmen have reason to be proud. Accordingly, the present Council of the Society, inheriting and carrying on the performances of their forerunners, can now present, if not to a largely increased membership, at any rate to the enormously increased special public whom they interest, a

picture of English agriculture which, compared with that exhibited in 1839, strikes one with astonishment.

We cannot, indeed, during the ensuing week, expect a more distinguished company to enjoy the spectacle which is thus provided for them—to receive its lessons for themselves, or urge them upon others—than were gathered under the late Lord SPENCER's presidency at the first of the Society's annual exhibitions. Such men as Baron BUNSEN, who was then the Prussian Minister, and DANIEL WEBSTER, who represented the United States, are rare. The agricultural ranks of our own country at that time were also unusually distinguished. Earl SPENCER and the Duke of RICHMOND, PHILIP PUSEY, Dr. BUCKLAND, HENRY HANDLEY, THOMAS BATES, are names, already then well known, whose agricultural reputation has been growing ever since; Sir JAMES GRAHAM, Sir WILLIAM MILES, and Sir THOMAS ACLAND, were all then leaders of the Society, and the last two are members of it still.

Neither will the opportunities afforded for mutual acquaintanceship or intercourse offered by the Society in 1870, be anything like so good as they were in 1839. There will be no public meeting at the Town Hall for the reading and discussion of agricultural papers—no "Council dinner," where the authorities at the same time that they entertained, or were entertained, had an opportunity of profiting by the criticism of their friends and guests. Nor will there be the annual banquet for the members which there used to be at the earlier meetings of the Society, and by which, more than by any other thing connected with the meeting, the sense of membership was cultivated, and the strength of the Society was fostered.

The show of 1870 is nevertheless infinitely more significant and true, as representing English agriculture, than that of 1839. We are not now dependent upon leadership or stimulant. It is the ordinary rank and file of English agriculturists to whom the display is due; and it is the common-place trustworthy motive of self interest which is at the bottom of it all. Great names are no longer needed—not one in a hundred ever sees the President of the year—the Society itself keeps more and more in the background—and the mere opportunity which it offers to men who have well-bred stock and good implements to sell, and to men who desire well bred stock and implements to buy, is nearly all. The opportunity of winning reputation is valuable, chiefly as that will hereafter command custom. Meanwhile the demand for all our best breeds of live stock is unprecedented, the need of every aid which agricultural machinery can give is constant, the market for good seeds, manures, and cattle foods is annually increasing. International demand as well as home demand is every year widening and deepening. Here is an arena where the best specimens of rival dealers and producers are pitted against each other, and where carefully selected judges place them on the scale of merit. Customers are glad of it, and all who can supply them, therefore, congregate.

But if the show of 1839 was a less natural expression of our actual power and position as agriculturists than the show of 1870 is—if the former rather than the latter be pronounced the result of artificial inflation and excessive effort—what an impression of our extraordinary progress in the interval must not those receive who may have been present at them both. Guano, superphosphate, steam-cultivation, horse reaping, were unknown in '39; manure manufactories had no existence; even agricultural machine factories, in their present sense, did not exist; locomotive engines had no place in English agriculture till many years afterwards. The village carpenter and blacksmith, and the seedsman of the neighbouring market town, supplied the country side with all that was required. Fallows upon clays, and green manuring upon sands, were the highest farming of that day, and well-bred stock was met with rarely. Now, every true breed has its herdbook, and every herdbook has its hundreds of clients and advertisers; every farmer buys cattle foods and artificial manures; almost every parish has a steam-cultivator at work in it; every county town has a first-class machine-factory; the locomotive threshing-machine is seen everywhere; and mowers and reapers are sent out by single firms at the rate of £10,000 a week.

How much of all this is due to the Royal Agricultural Society of England? It has been the exponent, rather than the active cause, of the progress it has witnessed. We have all had a share in it. Agricultural Journals have had to do with it as well as agricultural societies, but they too chiefly by spreading the influence of example, making known the best instances, and publishing failures and successes. Invention and discovery, and railways, and the printing press, and agricultural societies have all helped to awaken the energies and perceptions of the agricultural classes, whether landlords, labourers, or farmers; and self interest, thus enlightened, has been quickened into profitable and productive activity.

—— MONDAY's corn market, in Mark Lane, was firm; there was a moderate supply of English Wheat, and in some cases an advance on last week's prices was obtained. On Wednesday prices remained unaltered. ——In the cattle market everything, except the highest qualities, was lower on Monday. On Thursday the demand was somewhat better.

—— The House of Commons discussed the Lords' amendments to the IRISH LAND BILL on Tuesday morning last. At the outset, Mr. GLADSTONE stated generally that the Government in substance proposed to agree with all the amendments except the alterations in the scale of compensations, the shortening of the dispensing or alternative lease from 31 to 21 years, the clause relating to permissive registration of improvements, and certain portions of the clause defining what is and what is not to be considered disturbance by the act of the landlord. The first point taken was the scale of compensation, with the alterations in which, the Commons disagreed. At the end of this clause, too, the Commons inserted, on Mr. FORTESCUE's motion, the proviso which the Lords struck out, giving the tenants an option of claiming under a lower scale of rent. An amendment by Mr. SAMUELSON to the conacre clause, excluding white crops, was agreed to, after considerable objection from Sir J. GRAY. On the amendment relating to the length of lease there was no debate; the House restored the original figure, 31 years. On the Lords' clause for the registration of improvements, Mr. SAMUELSON suggested an addition requiring the joint action of landlord and tenant, which was adopted by the Government. The last important disagreement was on the clause defining and limiting disturbance in holding. Mr. FORTESCUE stated that the Government would agree with the Lords in adding "breach of any condition against assignment, subletting, bankruptcy, or insolvency" to the causes of ejectment which are not to be deemed disturbance; but they would not agree to the omission of the words giving the Court the power to decide that they shall be so deemed on special grounds.

OUR LIVE STOCK.

CATTLE.

THE ninth number of "Thornton's Circular" has just been issued, accompanied with an excellent index from the commencement of the publication up to the present time. Volume I. is now complete and ready for binding, and a well-known engraving of Charles and Robert Colling, neatly executed, forms a fit commencement to a work devoted to Shorthorns. We can well believe Mr. Thornton when he says, "The excessive labour and care, and the long journeys undertaken in collecting the materials for this work, occupy more time than the public might expect; whilst the abstruse nature of the subject renders it peculiarly liable to error." Errors, however, are exceedingly rare, if present at all, and we think Mr. Thornton may be congratulated upon the correctness as well as the good style which alike characterise his Circular.

—— The following Shorthorn sales will engage attention during the next few weeks:—Messrs. Mitchells' entire herd, at Alloa, Stirling; Mr. J. G. Dixon's herd, at Caistor; a selection from the herd of Mr. Fawcett, of Scaleby Castle; the entire herd of Mr. Charles R. Saunders, of Nunwick Hall, Penrith; the entire herd of Mr. Wm. Cox, of Brailsford House, near Derby; Mr. Wm. Butter's entire herd, at Badminton, Wilts; and the late Mr. Wm. Hewer's herd, at Sevenhampton.

—— A proof of the sale catalogue of the Nunwick Hall herd, the property of Charles R. Saunders, Esq., lies before us. The sale, which will be conducted by Mr. Thornton, takes place September 23. The entire herd, all of which will be disposed of, consists of 62 animals, 46 of which are cows and heifers. Among the most attractive features of this catalogue we may name several representatives of the "Waterloo" tribe; a considerable number of descendants of *Furbelow* and *Flourish*, both by the famous LITTLE JOHN (4232); some members of the *Elvira* by DUKE (193) tribe, known also as Mr. Crofton's "Emma" tribe; several *Gwynnes*, descended from *Orphan Gwynne*, by DUKE OF GLO'STER, and got by PRINCE PATRICK (18,633); WALLACE (23,166), EARL OF EGLINTON (23,832), and WILD BOY (25,447). There are also a few *Wild Eyes* and other well-bred cattle, which we cannot further notice at present.

—— The following important additions, by birth, to well-known herds claim attention:—At Havering Park, *Grand Duchess 21st*, bought as a calf at the Preston Hall sale for 320 gs., has produced a very excellent roan bull calf to 3D DUKE OF GENEVA; *Sweetheart 6th*, now the property of Mr. W. W. Slye, and recently purchased for 120 gs. at Edenbridge, has dropped a red bull calf to PATRICIAN (24,728); the Wateringbury herd has also been increased by the birth of a white heifer calf, a daughter of *Wild Duchess 3d* by LORD OXFORD 2D and LORD OXFORD 2D.

—— Mr. Davies, of Mere Old Hall, may be congratulated upon the result of his sale on Wednesday. Mr. Strafford commenced selling at 1 o'clock, and disposed of 48 lots, which realised the sum of £3550. Thirty-one cows and heifers made upon an average £87 16*s.* each, and 17 bulls brought £19 each; while the general average was £73 19*s.* 2*d.* We have not space to speak in detail of the competition, but the subjoined list contains an account of the prices and purchasers. Old *Moss Rose*, now 12 years old, was purchased by Mr. Cheney for 350 gs.; her daughter, *Moss Rose 2d*, went into the same hands at the extraordinary figure of 800 gs., and her two sons, ROYAL CHESTER and ROYAL LANCASTER, both by 10TH GRAND DUKE, made respectively 200 gs. and 130 gs., the first becoming the property of Mr. Barnes, and the second, now three weeks old, of Captain Gunter. These four representatives of the "Cambridge Rose" tribe therefore realised the enormous sum of £1450. We hope on a future occasion to again refer to this most important sale.

Name of Animal.	When Calved.	Price.	Purchaser.
Cows and Heifers.		Gs.	
Moss Rose	1857	350	Mr. Cheney
Cleopatra 5th ..	1861	80	Duke of Devonshire.
Duchess	1862	40	Mr. Hamer.
Wild Duchess ..	1862	105	Mr. Slye
Claudette 4th ..	1865	41	Mr. Thornton.
Candidate's Duchess ..	1865	35	Mr. Halsall.
Cleopatra 6th ..	1865	60	Mr. Harward
Grand Duchess 2d ..	1865	40	Mr. Thom
Flirtation 3d ..	1865	31	Mr. Watson.
Lavinia 3d	1865	36	Mr. Thom.
Rose of Lancaster 3d ..	1865	31	Mr. Thom.
Beauclerk	1866	70	Duke of Devonshire.
Island	1867	45	Duke of Devonshire.
Moss Rose 2d ..	1867	800	Mr. Cheney.
Flirtation 4th ..	1867	33	Mr. Thom.
Princess Royal 3d ..	1867	28	Mr. Highfield.
Claudette 5th ..	1867	25	Mr Owen
Rose of Lancaster 4th ..	1868	30	Mr. Thom.
Cleopatra 10th ..	1868	47	Mr. James.
Flirtation 4th	1868	20	Mr. Robinson.
Cleopatra 13th	1868	16	Mr. Lockett.
Rose of Lancaster 5th ..	Feb., 1869	21	Mr. Brooks
Candidate's Duchess 2d ..	Feb., 1869	105	Mr. Thornton.
Lavinia 3d	Jan., 1870	29	Mr. Cooke.
Princess Royal 3d ..	April, 1869	25	Mr. Highfield.
Cleopatra 14th ..	April, 1869	57	Mr. Fawcett.
Wellingtonia 2d ..	May, 1869	—	Mr. Jones.
Cleopatra 15th ..	Jan., 1870	40	Mr. Rad[illegible]
Rose of Lancaster 6th ..	Mar., 1870	26	Mr. Statter.
Lavinia 4th ..	Mar., 1870	12	Mr. Hart
Cleopatra 15th ..	Mar., 1870	Dead	
Charlotte 9th ..	Jan., 1870	13	Mr. Thom
Bulls.			
GRAND DUKE OF ESSEX 4th	1866	43	Mr. Thom.
[illegible]	1867	29	Mr. Statter.
ESSEX 3rd	1867	50	Mr. Howard
[illegible]	1868	29	Mr. Middleton.
[illegible]	1868	40	Mr. Murton.
[illegible]	1868	27	Mr. Radcliffe.
[illegible]	1868	30	Mr. Thom.
THORNHILL DUKE	Feb., 1869	35	Mr. Harrison.
PRINCE LEONARD	April, 1869	31	Mr. White.
ROYAL CHESTER	April, 1869	200	Mr. Barnes.
[illegible]	July, 1869	36	Mr. Robinson.
[illegible]	Aug., 1869	36	Mr. Wyatt.
[illegible]	Dec., 1869	27	Mr. Platt.
[illegible]	Jan., 1870	8	Mr. Wright.
DUKE OF WELLINGTON	May, 1870	30	Mr. Tindal.
ROYAL LANCASTER	June, 1870	130	Captain Gunter.
THORNDALE BARONET	July, 1870	—	Mr. Thom.

—— In 1863 Mr. Clark Irving exported some good Shorthorns, including *Drawing-room Rose*, and other members of the "Cambridge Rose" tribe, purchased at the late Mr. Jonas Webb's sale. Mr. Irving died in 1865, but Mrs. Irving still keeps up the herd, and Mr. Foster, of Killhow, has just sent out to her the following bulls, to further improve the stock:—DUKE OF FLORENCE, roan, calved November, 1868, bred by Mr. Foster, got by 2D DUKE OF COLLINGHAM, dam *Florentia 11th* by 7TH DUKE OF YORK; LORD COLLINGHAM, a roan bull, calved last August, bred by Mr. J. P. Foster, Killhow, got by 2D DUKE OF COLLINGHAM, dam *Carolina 5th* by 7TH DUKE OF YORK (17,754); FAMOUS GWYNNE, a roan bull, calved June 30, 1869, bred by Mr. Howard of Biddenham, got by GRAND DUKE 5TH (19,875), dam *Faustina Gwynne* by MAY DUKE (13,320). These three bulls were shipped on the 4th ult. to Mrs. Clark Irving's station on the Richmond river, Australia.

POULTRY.

REARING YOUNG TURKEYS.—My method of procedure is to follow Nature as far as possible. I make my turkey nests on the ground; or if in a paved house, in large shallow boxes half-filled with mould that can be damped at intervals. The hens, unless they come off regularly, are lifted off to feed, and then supplied with grain with a liberal hand. When the young ones are hatched, they are left undisturbed under the hen until the next day. No attempt is made to cram them, —an absurd practice, which interferes most injuriously with the due digestion of the yolk that is absorbed into the intestines at birth, and constitutes all the food

required for 20 or 30 hours after hatching. The first food given them is egg beaten up with an equal bulk of milk, and baked into a soft custard; this is alternated with crumbled bread mixed with milk, to which oatmeal is added in a gradually increasing proportion. Ants' eggs are given if I can get them, but if not the custard is continued for a fortnight or three weeks. Quite as important as any other part of the dietary of young turkeys is the supply of green food, and many persons chop up Nettles, Onions, &c., with the meal; but if young turkeys are watched when grazing, it will be observed that they prefer eating bitter herbs belonging to the natural family Compositæ, or compound flowered plants, such as the Dandelion, &c. The common Lettuce belongs to the same tribe, and I have this year fed largely on it. The greediness with which young turkeys devour this plant is remarkable. At three weeks old a dozen turkey chicks will eat four or five large Lettuces in a day, and they even seem to prefer them when running to seed, at which time there is abundance of bitter milky juice in the plants. At the age of a month they will begin to peck a few grains of Wheat or Barley; but bread and milk, and meal, should form the staple of their food for the first two or three months of their lives. Most persons say that young turkeys are particularly delicate when they are "shooting the red." This is not to be wondered at when it is remembered that they are generally put on whole grain, without milk, long before they arrive at that age, and suffer accordingly. Another point of the highest importance in feeding turkeys, or young birds of any kind, is the hour at which they get their first repast. It is daylight now at four o'clock in the morning. If the birds have their first meal deferred until six or seven o'clock, they have been hungry for two or three hours, and suffer very much. To be successful in rearing these, and any other young birds, they must either be supplied over night with their first meal, or the poultry maid must be up with the lark. There is no better plan than putting the hen and chicks, for the first month or two, in a closely wired aviary at night, which is open to the early sun, and Lettuce and a good supply of soft food can be put under a coop, so that the hen cannot eat it; and there will be found but little left an hour after daybreak. *W. B. Tegetmeier.*

To Preserve Eggs.—Here is another very simple and effective method, which we have had in use for 21 years, to my knowledge, and 17 of them under my own hand. At the end of 12 months they may be used for the most delicate puddings and sponge-cakes, and will whip up very nearly equal to new laid eggs; but they must be preserved perfectly fresh. We use stone jars that will hold about 50 eggs each, wide enough in the mouth to admit the hand easily with an egg in it. Place the eggs on the small end, which may be done by leaning two together, and place them all round the jar; but put them as upright as possible; fill the jar up to the shoulder, and let there be full two inches between the eggs and the top of the jar. Place the jar in a cool place in the cellar, where it will never be moved again until the eggs are wanted for use; then take 1 lb. of fresh lime to 1 gallon of spring water, and a heaped tablespoonful of salt; put all together in any old jar that will hold as many gallons as may be required at once. Let it stand 24 hours, then stir it up well, and let it settle 15 minutes; then pour off the thin part, leaving the thick behind. We use a watering-pot without the rose into which to pour the water off the lime, and from that very gently on to the eggs, so as not to displace them. In mixing three or four gallons of lime-water it is necessary to be careful not to put too much salt, as that would float the eggs, and they would not keep so well; also the jar should be filled nearly edge-full with the water, and covered with bits of tile or slate, or lids,—anything flat. We put down sufficient eggs to serve the winter, and begin the end of February generally to put them down; sometimes not before March is partly over, depending a little upon the season, and the quantity of eggs we are getting. A bad egg is almost unknown. *J. Hughes, Swn Hill, near Kidderminster, July 8.*

NOTEWORTHY AGRICULTURISTS.

James Allen Ransome.

A man who has for half a century been constantly engaged in the provision of improved machinery for English agriculture—who has taken an active share in the establishment and management of agricultural societies, both national and local—and whose influence, extraordinary for the force it owes to both personal character and strong social instinct, has always been exerted chiefly among the agricultural class, is a "noteworthy agriculturist," whether he be himself an occupier of land or not.

Mr. Allen Ransome has been connected with the firm which bears his name since 1820. His fiftieth professional anniversary was celebrated the other day. During those years, and especially during the last three decades, a wonderful change has passed over English agriculture; and to the alterations he has seen he has himself materially contributed. He has been the founder of many farmers' clubs, and the heart and life for many years of such of them as he continued member of. He was one of the founders of the London Farmers' Club, and was long an active member of the Council of the Royal Agricultural Society of England. He has been the ready and able representative of agriculture and of agriculturists whenever public address or eloquent speech was needed. He was one of the earliest writers on the possibilities of steam-power in connection with farm practice, and is the author of a well-known work on agricultural machinery. Long before the formation of the Royal Agricultural Society of England, and marvellously since that time, he has sent all over England, and all over nearly all other countries, the best agricultural machines. Travelling everywhere in the prosecution of his rapidly increasing business as a manufacturer, he everywhere introduced whatever was both trustworthy and new, not only in invention and construction within his own particular department, but in idea, discovery, and experience in agriculture generally. No man was ever better equipped by Nature for securing that cordial welcome, whether by the fireside or at the public meeting, which everywhere awaited him; and the apostle of farmers' clubs, as he was at one time called, has in this, and many other ways, largely helped the agricultural progress he has witnessed.

For several years Mr. Ransome has been partially disabled by paralysis, but he has maintained under so hard a trial the same exuberance of good nature, good spirits, and good fellowship which have always provided for him troops of friends. And we rejoice to hear that he will be able next week to revisit Oxford, where in 1839 he was almost the only exhibitor of agricultural machinery. What a change will he not witness between the first and latest years of the Agricultural Society's career. A single stand of ploughs, Biddel's scarifier, and Gardener's turnip-cutter, a few gaudily painted waggons, and a whimsical weed-scorcher, are nearly all that one remembers of the implement show of 1839. That of 1870 requires a double alphabet to enumerate its sheds; and the enormous area it covers is surrounded by an army of steam-engines. In the great growth thus measured the Ransomes have always taken a prominent part—helping, directing, sharing in it throughout; and Mr. Allen Ransome, the leading member of their firm, has been a leader among the leaders of it all.

Mr. J. Allen Ransome, of Ipswich.

Mr. Ransome is in his 65th year. The portrait, while satisfactorily recognisable, fails, almost necessarily, of conveying that expression of geniality and *bonhomie* which shines in the living face.

WHEAT AS A BIENNIAL.

Botanists usually reckon all plants biennials which in our climate require the growing seasons of two years to perfect their seeds. I need not say that Wheat is certainly an annual, for when it is sown in autumn the plant usually makes so little progress during the dull months of winter that its condition may be regarded as one of suffering rather than as one of progress, so that whether sown in November as winter Wheat, or in February as spring Wheat, it has but one growing season, and is to be regarded in no other light than as an annual. When Wheat is too forward in spring it is said to be "proud," and to remedy this it is sometimes cut over with the scythe, and sometimes cropped short by sheep; these are trivial remedies for a very doubtful disease, but it is not so with the evils arising from weakness,—the thin crop and the yellow blade tell a mournful story, for which no remedy can be found; hence it is our duty to endeavour to prevent the disease rather than to attempt its cure.

The tyro in agriculture reads with amazement of the way that corn is produced in Egypt against all rule and order, for in September, just about the time of our Northern harvest, they harrow the seed into the mud left by the overflowing of the Nile, and in the March following they have their harvest. Not a word do we hear about rotation of crops, and they never think of rain; so that we need not wonder at the Weedon Wheat growing on the same land year by year for a lifetime, when we read in Holy Writ of Abraham being fed with Egyptian corn about 2000 B.C. And again, read in Baker's Travels of what he saw in Egypt only the other day, that the corn growing capacity of the soil remains unaltered after a lapse of nearly 4000 years; for the Nile, being the gigantic engine of fertility, prepares annually a seed-bed for the sower, and by means of one irrigation or warping, brings corn in abundance. Once in July, as I was travelling from London to Bristol, through Wiltshire, I could not help observing as I went along by the mail coach road, the various productions of the land—from that near London, elaborately enclosed, planted, and cultivated, to that in sight of Salisbury Cathedral, all so open and bleak that outside passengers were warned to look to their hats or other headgear, as once lost upon the plain they could not be recovered; it was, therefore, evident from the surroundings that we were

on exceptional ground, for the farmers were busy sowing Wheat at that unseemly time, and, what to my Northern notions was equally odd, the shepherd with a flock of sheep and a couple of dogs was equally busy harrowing and rolling after his own fashion the fallow field.

We read of the Eastern nations using the cloven foot of the ox to tread out the corn, but here the West of England farmer was using the cloven foot to tread it in. It was evident that the situation of shepherd's dog on Salisbury Plain was no sinecure, for the team of at least 200 head had to be kept in line of march, and had to be turned at the headland for every journey up and down, and this took a deal of yaffling, and no end of dancing from side to side on the part of the dogs. Now in regard of the time of sowing, the Wilts farmer was far more removed from our normal seed-time than the Egyptian, and seemed, at least by all appearance, to spoil two growing seasons in order to secure one crop, but on going into the matter I found it very far otherwise. His object in sowing Wheat so early was first of all to get an autumnal crop of long rich grass or wheat hay from it, which he would eat down to the ground before winter with his sheep, and they being folded on it would fatten themselves, and soil or manure the land thoroughly and tread it firmly together, so that an early and an abundant crop of Wheat would be got; but without this in that vast unsheltered plain the loose and friable soil would be altogether unsuited for Wheat, and could hardly be kept from blowing away with the wind; and when we weigh a sheep, and then look at the area of its trotters, it is clear that we get a pressure of 10 or 15 lb. to the square inch. But if I were addressing inexperienced men, and spoke of sheep working on the farm, I should not expect a hearing, as the thing does not belong to the common-sense class; but it is nevertheless a fact, and, though uncommon, is not the less important.

The extraordinary way in which Wheat accommodates itself to soil and climate is marvellous, when we consider that whole tribes of plants, such as the Heaths of various countries, the Epacrises of New Holland, and the Rhododendrons of America, all require the peat and sand peculiar to their native habitats, and when planted in loam only linger out a miserable-looking existence, producing no flowers, and therefore ripening no seeds to propagate the species; Wheat thrives just as well on the peat as on the clay, and is improved by the change of seed from one to the other; but, notwithstanding all this few would have thought that it would bear with impunity to be eaten down to the ground, and, after all, perfect a full crop of corn.

In treatises on horticulture we find instructions for growing "Tree Mignonette," and the successful grower takes great credit to himself for ingenuity in getting the plant to alter its character so far as to flower at an unusual time and with unusual strength to adorn the greenhouse, and to be wondered at; but the same change from the annual to the biennial character in the all important article of the best bread corn is little noticed, because this particular character of the plant is but little known. In localities where the climate will hardly admit of this high class grain to ripen, the Wiltshire system would lengthen the season considerably, and thus alter the character of the grain crop on many a Northern farm where flocks of lean sheep sadly in want of fattening are seldom wanting, and where the sagacious sheep dogs ("collies") would certainly do their part, or indeed what any dog could do in the way of driving sheep. The great losses sustained by our forefathers in the North were chiefly caused by late harvests, and these were affected by late kinds of Oats and also by the lateness induced by the cold, undrained state of the farms, not to name the bulk of weeds left in the soil, which always had their share of the manure, &c., first, before the corn seedlings could get established. The days allotted to plants in which they may grow and perfect seeds, are as accurately fixed as the hours on the sun-dial, hence we grow Barley where Oats will hardly ripen, and Oats where Wheat will hardly ripen. In the North of Scotland the improved varieties of Oats and Barley grow and ripen freely, but it is not so with the Wheat; and it would vastly improve our Northern bread corn if we could ripen Wheat freely in the North and not only would the Wiltshire system benefit Scotland, but it would have a very wide range in other high-lying districts where the sheep runs tell but too clearly that the wild moorland and the mountain waste are near at hand.

Most farmers are aware of the serious loss sustained by such biennials as Mangels and Turnips when sown too early, or when checked in their growth—they run to seed the same year, thereby rendering the crop of no value, for the so called "bulbs" or "roots" of these biennials is what Nature secretes, in order to send up a strong flower-stem the second year, and they are just what the farmer wants to feed his bullocks with (for it is the annual growth only that he wants), leaving the seed-grower to take to the biennial process; but when the first part is well done, and fine large Turnips or Mangels are got, the chances of failure from fine transplanted "roots" are very small. And this is just what ought to be aimed at with the Wheat plant, for if the roots are strong and well established at the close of the first growing season, there is very small risk indeed of the crop being thin when the second year's growing season sets in. The heading down of the Wheat plant makes it reserve its season of running to seed till the following year, or in other words makes it a biennial, and thereby enables it to get much better established under ground than it otherwise could have been with months of less time to grow in, and a weaker plant with which to grow to seed. Now, if this system had been the project of some spirited farmer it would certainly be feasible enough to be well worth trying where the land is light and the locality just within the limits where we can grow Wheat profitably; but when the theory, as in this case, comes after the practice, and the thing has been perhaps a hundred years or more a settled system of husbandry, I see no reason why it should be confined to one locality, since any early crop, such as white Peas, could be got off the land early enough for the July sowing of the Wheat and thus get, first an autumnal crop of grass or green corn, and then a summer crop of grain from one sowing. Wheat sown in July, the best growing season in the whole year, has every advantage that any crop can have in our climate; the roots will be deep in the earth and well established, and quite beyond the reach of danger from frost, and that alone will frequently make all the difference in the risk of losing or gaining a crop. *Alex. Forsyth*, 9, *Islington Square, Salford, Manchester.*

ON CROSS BREEDING.

[In a paper lately read before the Doncaster Farmers' Club, "On the Principles involved in Breeding," Mr. W. C. Spooner, of Elmsthorpe, made the following remarks on the breeding of sheep:—

He thought the most perfect specimens of crossing were found to exist with regard to sheep. He was not too bold when he said more science and more practical knowledge had been used in the breeding of sheep than in any other class of domestic animals, if not all the other classes put together. A certain idea had taken possession of the mind with regard to breeding, and then practice and experiment had been adopted in order to produce the result which the mind at first conceived to be just, proper and right. This had been most successfully done. With regard to horses, he thought there had been less science, less practical knowledge, and less success than with regard to any other animals. It was well known, with respect to cattle, that the prizes at the shows had been confined to almost one purpose alone,—that of producing the best animal for the butcher. Although it was exceedingly desirable, and very important, to afford food for the million and profit for the graziers, yet he thought the subject of milking qualities had been too much neglected,—had not met with that encouragement in the fact of prizes being offered as had been the case with other animals. In Scotland the subject had received some attention. No doubt it had been neglected in this country because of the bother which it would occasion the leading societies. The consequence was that time after time the great object had been to produce the most perfect animal in its external appearance, one the most profitable, coming the earliest to maturity. The result of this had been advantages very good and desirable as far as they went. We had now three breeds, and it might be said we had none other of comparative importance; he referred to the Shorthorns, the Herefords, and the Devons. The old milking breeds had been done away with, there being scarcely left a herd of the old Longhorns, which were of great repute for the dairy. He thought it a matter rather for regret that we could not have the dairy breeds as well as the pure animals for the butcher.

Dwelling on sheep, he spoke to the eminent services rendered by the late Mr. Ellman in bringing out and improving the latent qualities of the South-down breeds. Great credit, he thought, was due to those who, whether profitably or not, had perpetuated this breed. The public were greatly indebted to the breeders of pure animals, because when the cross was wanted there was the source from whence to procure it; at the same time a compliment was justly due to the successful breeders of the cross-bred sheep. Eight or ten years ago he was applied to by the Editor of the "Journal of the Royal Agricultural Society" to prepare a paper on the subject of cross-breeding, particularly with regard to sheep. His compliance with this request brought him into contact with some eminent breeders, amongst others the late Mr. Humphrey. This well-known gentleman was a breeder of Hampshire sheep before the Oxford show of the Royal Society. He was struck with the inferiority and uncouthness of his own breed in comparison with the different other breeds exhibited there. He determined, if possible, to effect an improvement. "With this object," stated Mr. Humphrey in a letter, "I wrote to Mr. Jonas Webb to send me one of his best sheep, and he sent me a shearling by his favourite sheep Babraham, which made some good stock out of my large ewes. I went down the next two years, and selected for myself; but the stock did not suit my taste so well as the one he sent me, and I did not use them. I then commissioned him to send me his sheep which obtained the 1st prize at Liverpool; and from these two sheep, the first and the last, by marking the lambs of each tribe as they fell, then coupling them together at the third and fourth generation, my present flock was made. Not having used any other blood on the male side for more than 20 years, I found some difficulty at first, when putting the first-produce ram to the first-produce ewe, the lambs coming too small to suit my customers. To obviate this difficulty I drafted out the finest and smallest-bred ewes, replacing them with the largest Hampshire Down ewes I could meet with that suited my fancy; still continuing to use the most masculine and robust of my rams to keep up my size. Some of my friends advised me to use a large coarse sheep to these small ewes, to remedy the defect; but the larger ewe seemed to me the better way, and that course I pursued. I got rid of my smallest ewes, and replaced them with large ones, which gave me what I thought to be an advantage,—then using no male animal but of my own blood, the pedigree of which I am now acquainted with for more than 20 years. It has succeeded hitherto beyond what I could have expected. My object has been to produce a Down sheep of large size with good quality of flesh, and possessing sufficient strength and hardiness to retain its condition while exposed in rough and bad weather to consume the root-crops on our cold dirty hills. Independently of the value of the Hampshire or West Country Down in an agricultural point of view for such localities as ours, they produce when slaughtered a valuable carcase of mutton, giving the consumer a good proportion of flesh to the fat, which is a point that may be too much lost sight of. I will, in proof of it, relate an instance which a gentleman told me the other day. When residing in another county he sent to his butcher for 3 lb. of mutton. The fat seemed so much out of proportion to the lean that he had the curiosity to weigh the lean. After carefully cutting it out, he found it to weigh ¾ lb., or only one-fourth of the whole. This anecdote indicates to those who are attempting by crosses to establish a new breed, or to improve an old one, the importance of producing an animal in which the flesh forms a due and sufficient proportion of the whole."

Previous to Mr. Humphrey's time—60 or 70 years ago—the original sheep in Hampshire and Wiltshire was uncouth and bony, and had a large Roman nose, with a white face, although the descendants had black ones. It was the custom, in order to effect an improvement, for some of the best men in North Hants to go into Sussex and select the largest, coarsest, and blackest-faced rams they could get. The effect was greatly to improve the breed, but unfortunately for a very long time the North Hampshire men attached too much importance to large coarse heads, thinking that to that circumstance the early maturity of the lambs was due,—which Mr. Humphrey afterwards so well corrected. There was a portrait of the old Wiltshire sheep in his essay on "Cross Breeding." The Hampshire sheep had been greatly improved by crossing the ewes with the Sussex rams,—the class of sheep upon which Mr. Humphrey first operated. It was worth consideration to show how different breeders had operated in the improvement of the breeds. Crosses had taken place in Wiltshire and Hampshire, and improvements effected by the famous breeders Mr. Rawlence and Mr. Humphrey, the former of whom acknowledged readily the vast improvement obtained from the sheep of the latter. Some breeders clung with superstitious tenacity to purity of blood, and you would suppose from their talk that their breeds came originally out of the Ark. The New Oxfordshire sheep was a very valuable breed, originating from a cross between the Improved Cotswold and the Hampshire or West Country Down.

Passing on to speak of horses, he had officiated as judge of horses on many occasions, particularly at the shows of the Royal Society. He had had good opportunities of witnessing what had been done and what had been lamented over and undone. If he were asked in what breed of horses the greatest improvement had been made with regard to the shows, he should say unquestionably the heavy cart-horse. In this class an amount of improvement had, he thought, unquestionably been established. The horses used for the cultivation of the soil and other purposes in this country were now superior to what they were 25 years ago. For the guidance of the judges had been set the excellent rule that they were not to pay too much attention to size and strength, but that they were to consider likewise activity and symmetry. This operated as a useful precaution. A great improvement had been effected, he said, with regard to the breed of horses. It was much to be regretted that the subject had been so neglected. He considered that the Royal Agricultural Society—to which he himself belonged, and which he greatly respected—had greatly injured the breed of horses in this country, because they had encouraged a certain system of breeding, the inevitable tendency of which was obvious. You could not keep up a certain type without falling into a great error. After crossing and re-crossing, and after improving the animals, you got rid of those very improved animals, and got coarser and inferior ones altogether, in order to carry on the improvement. He mentioned that in the tenth generation there would remain in the offspring only the 1024th part of one cross. Of late years it had been customary, he said, to give prizes for horses best calculated to produce hunters; one of the conditions laid down was that they must be thorough-bred. Now he thought there was great mischief involved in that. The

object of a Society should not be to produce a rare-show; utility ought to be the leading object. He was glad that this important subject of the breed of horses was receiving public attention in the country. It was fully recognised, he said, that when thorough-bred horses were introduced in the time of James I., they produced an immense improvement in the breed of animals. No one could deny the improvement that racing had established, and one of the strongest pleas in its favour was that it effected an improvement in horses generally. Queen's Plates were consequently offered for competition. Amongst other breeding establishments was one at Hampton. The prizes offered for competition at the Derby and other races were of sufficient importance to induce breeders to try to produce the best and fastest animals. He questioned himself that the slightest benefit arose from the Hampton Court establishment. He should like to see a system for providing useful mares, the rest of the animals being of sufficient weight and power for mounted cavalry and other purposes.

MILLET.

We inhabitants of the British isles frequently hear the remarks of travellers and foreigners on the general uniformity of the foliage of our native vegetation. Botanically considered, of course a great diversity exists even amongst our forest trees, but we have no striking contrasts like Musas, Palms, and similar plants of the tropics. Amongst our grasses, also, a general uniformity runs through the whole, and amongst our cereals still less diversity exists. Wheat, Barley, Oats, Rye, are the staple products of our fields, and with constant yearly abundant crops of these useful plants it might almost be said, what more do we want; but it appears from the immense quantities of corn annually imported from foreign countries that we do want a very great deal more to feed our dense population than the soil of this little island can produce, or we should rather say the soil and the climate combined, for it is of course due more to the effect of climate than to anything else that we do not see more variety in our fields. We do not intend in this paper to advocate the possibility of successfully cultivating as food crops any tropical plants either of known or unknown value.

Rice and Indian Corn or Maize are both food grasses, of the importance of which we have daily evidence, but the home cultivation of Rice is, of course, beyond the range of possibility, and various trials have shown that, as a field crop, Maize is likewise. It may be grown in gardens, and made to ripen its seeds, but it never attains a luxuriant growth. There are besides these, several grasses, the seeds of which, though not so popular as an article of food, are nevertheless sufficiently well known to be good and useful; we allude to the many varieties of Millet. Here, again, in the matter of cultivation, we are met by the unsuitability of climate; but while we receive Rice and Maize in immense quantities from such distant parts of the world as the East Indies and the Northern and Southern States of America, our importations of Millet are comparatively small. As the term Millet is a very general one for the seeds of many small-grained grasses, it may not be without profit if we examine rather more carefully what is usually classed under this head, and inquire why these wholesome seeds are not more in use amongst us. It must, however, be acknowledged at the outset that the species of plants producing these edible seeds are not at all well known to botanists. The genus Panicum is undoubtedly the most important, and furnishes true Millet, or that which is known in Germany, Italy, and England as such, the seeds of P. miliaceum and P. italicum being commonly sold for feeding cage birds. An attempt has been made in the South of England to cultivate it, but the experiment failed, probably owing to its habit of ripening late in the season. Several varieties of this species are known as the grey-seeded, white-seeded, black-seeded, &c., differing very slightly from each other, except in the colour of their seeds, and perhaps a slight difference in the period of ripening.

In Germany, and other parts of Southern Europe, Millet is an essential article of food, the people using it either whole, as we use Rice, or ground into flour for puddings, as well as for bread. In America the Millet crops are said to be very prolific, yielding as many as 20 bushels per acre from a quarter of a bushel per acre sown; besides this yield of seed the hay is eaten by cattle, who prefer it before that of many other grasses. It is largely cultivated in India, where the seeds are used for food, and, as we have just said, the straw as fodder for cattle. Panicum italicum is likewise grown in many parts of India, as well as in the South of Europe. It flourishes best in a light, dry soil, producing the first crop about June or July, and the second in the months ranging between September and February. In Italy a flour is prepared from the seeds, and a coarse brown bread is made from it. In India it is used for making cakes, pastry, &c., also for making porridge; boiled in milk it is esteemed as a light and wholesome food for invalids. A kind known as German Millet, probably a variety of the above, is largely cultivated in Hungary, Lombardy, &c., the seeds of which are either made into bread or boiled and used as Rice in soups or for puddings, and are also used largely for feeding cattle and domestic animals. Other species are grown in India—Panicum miliare, Linn., called the Millet Rice, and P. frumentaceum being amongst the most important.

In Africa Penicillaria spicata furnishes an important food grain. The seeds are closely seated on a spike about 18 inches or 2 feet long, and about 1 inch diameter, and as straight as a poker; the natives frequently plait the stalks of these spikes together; 100 or more are often so arranged, and are thus carried on the backs of oxen for great distances. The seeds are valuable as an article of food, being in daily household use amongst the natives, and most of the native beer is prepared from them.

Of the genus Sorghum several species are cultivated as food plants, the most valuable for this purpose is S. vulgare. In Arabia and Asia Minor, as well as in many parts of Italy, Spain, and other Continental countries, this grass is as extensively cultivated as Oats and Barley are in the more northern parts of Europe. The seeds yield a very white flour, which is much used for making bread as well as for various other culinary purposes. In the southern provinces of France it is grown for feeding poultry, and it is also largely employed in many parts for feeding horses and pigs. Its cultivation has been tried in this country, but without success, the climate being too cold and damp. Another species of this genus (Sorghum saccharatus) was a few years since brought prominently into notice as a sugar yielding plant, suitable for cultivation in this country. It is an undeniable fact that the stems of the Sorghums contain a quantity of sugar, and those of S. saccharatus in particular; but, as with the whole group of these plants, our climate is not warm enough for its profitable cultivation: therefore we cannot hope ever to have these grasses grown with us as field crops, but we think something might still be done towards importing the seeds in larger quantities, so as to increase our present grain supplies. *John K. Jackson.*

THE FARM BOTHY.

[Taken from an Essay on "The Condition of the Agricultural Labourer," by Mr Hugh Wilson, of Manchester, read in February last before the Hexham Farmers' Club.]

Farm servants in the North of Scotland are engaged at hiring markets, which do not differ in any material point from those that are common in the North of England. There are three modes of boarding and lodging the farm labourers. There is no "hinding," but there is a great lack of cottage accommodation. The foreman, when he is married, generally has a house on the farm; but except on some farms where cottages have recently been erected, all the married men have to find houses for their wives and families at the nearest town or hamlet, often several miles distant. So much for the cottages. Then there is the farm kitchen, which has gradually gone down as the large farm system has grown, and now prevails only to a small extent. The great and favourite method is the bothy, an agricultural institution so little known elsewhere, that it is perhaps necessary to explain what it is. It is simply an outhouse, in which the men as a rule cook their own victuals, and which does duty at once as kitchen and parlour, and sometimes as bedroom to the inmates. Generally the men's sleeping place is in a loft above the stable.

I shall describe the bothyman's mode of life. Suppose it is the winter time, say this month of February, and it is one of the hardest in the farm labourer's lot. The hour of rising is 5 o'clock: with clothes hurriedly thrown on and heavy boots unlaced, he descends to the stable, and feeds and cleans his horses. He then takes breakfast. The threshing-machine, we will say, is driven by horse-power. In that case the horses are put into it at 6 o'clock, and the preparation of the day's straw occupies the time till daylight. If the threshing-machine is worked by water-power he is employed all the same, only his horses are spared. At daylight he has to turn out to cart or plough. At 11 o'clock he comes home to dinner, and is allowed two hours, but during this time has in some cases to prepare food for his horses. Work is then resumed outdoors as before, and continued until dark. On some farms, after coming home, he is kept at barn or other indoor work till 6 o'clock. Thus he has accomplished 10 hours' labour, besides the time taken up in attending to, and preparing food for, his horses. But his daily task is not yet finished. He has to "do up," to "sup," his horses at 8 o'clock. At the time of which I am speaking this was the unvarying routine in foul weather and fair on a considerable number of farms which were known as farms on which there were no wet days. I believe the same system still prevails, but not to so great an extent. It will not be denied that a man almost constantly employed from five o'clock in the morning till six o'clock at night in all weathers must stand much in need of good food and sufficient lodgings. But what is the fact? He is allowed absolutely nothing to live upon save oatmeal, a little milk almost invariably skimmed, for which he is charged from 1*d.* to 1½*d.* per day, with an occasional meal of potatos as a gratuity, not as a right, and which is esteemed a great luxury. Then look at his lodgings. Imagine a very low apartment with rough unplastered walls, the roof occasionally not watertight, without ceiling, and the rafters exposed, with a clay floor, and window of a few small panes, one or two perhaps boarded up, and most of the others stuffed with straw or rags. The furniture is in keeping with the house. The farmer supplies a rough form, a deal table, a table, a meal-chest, a pot and a bucket. This is all. The occupant has to furnish himself with the few other articles necessary to enable him to cook and eat his meals, and which consist of a spoon, an earthenware bowl, and a pail for holding his milk. Into such a habitation the wearied man has to come, sometimes soaked with wet. He has to light his own fire and cook his own victuals, for the women employed on farms where strict regulations prevail are not allowed to enter or give any assistance in the bothy. The hardship of the poor man is increased by the kind of fuel with which he is supplied. It consists principally of peat and brushwood, the latter in a green state and very difficult to light, the only compensation for this being that when fairly kindled it emits a cheerful blaze. The pot is put on, and the man cooks his meal porridge or brose—the latter consisting of oatmeal mixed with boiling water—which he takes off his knee as a table. His food is rarely or never taken off the table. That article of furniture is only used for scullery operations, and these are rarely indulged in, for the pot may serve a week or more without cleaning, and the bowl being scraped clean is laid past with the spoon on the meal in the chest, and is always considered in a condition to be used when required without being indebted to the cleansing properties of water.

It could scarcely be expected to find cleanliness studied under such circumstances. In fact, the genuine bothyman has an utter contempt for it, so far as the bothy is concerned. The floor is unswept for weeks. Indeed, it could not be decently swept by any amount of art. It is considered superfluous labour to be at any trouble in disposing of the slop water. The bothy floor or the doorstep is made its receptacle, the result being that the holes in the former are converted into filthy pools, while the entrance to the rude cabin presents a spectacle anything but attractive to the eye or agreeable to the nostrils. The ashes are allowed to accumulate in the fireplace for weeks together, the accumulation of dust and dirt might be scraped off the furniture, especially the table, which is often wet; and what with brushwood, pins, and other matter on the floor, the accumulation of mud and dirt is something fearful. When the bothyman of the type of which I am speaking proceeds to clean out this apartment he calls his work a "mucking," that being the epithet he applies to cleaning the stable, and in both cases he generally uses the same implements.

It is not of choice married men occupy a bothy, but, strange as it may appear, the young men prefer the bothy to the kitchen. They exult in the freedom which they enjoy in the former. The farmer is not troublesome. He seldom thinks of looking in, and when he does so he is considered an intrusive and unwelcome visitor. The men are left almost totally unrestrained to the devices of "their own sweet will." The more coarsely they live in the bothy they look for the greater applause from their comrades, and when they boast of their experience of bothy life the description is generally an exaggeration of the reality. I knew a man who delighted to tell that he never washed the pot until it became so silted that it would not hold a sufficient quantity of porridge! This man was the roughest specimen of his class I have ever seen, yet he was a man of education and intelligence. He was a teacher for some time of a school in his native parish, and chose farm service purely out of love for the work. He was for 20 years to my knowledge—I cannot say how much longer—in the service of the Member of Parliament for the county, and died in harness at an advanced age as cattleman at the home farm.

The description I have given is accurate in every particular as regards six bothies—three on farms in the hands of landlords and three on farms let to tenants on 19 years' leases. They are, or were—for I am speaking of 15 years ago—the worst in the county, but they do not by any means exhaust the list of that class of habitations. At that time clean, well-kept bothies, although the accommodation might be deficient, were not uncommon, but these were in charge of women who did the cooking, or where the men were not hard worked and one of them day about or week about did the cleaning and cooking, while his mates looked after his horses in the stable. Considerable improvements have since been effected in the house accommodation for this class generally, and they now enjoy more cleanliness and comfort. But still their condition is far from being what it might be and ought to be.

The lot of the bothyman, as I have described it, is a hard one, but he certainly does not make the best of it. No one would expect a man who worked hard in the fields to take very kindly to the duties of cook and housemaid. But it is not easy to conceive of a man, not altogether ignorant, so low in self-respect as to systematically neglect the most obvious laws of cleanliness, health, and comfort. It is a matter of astonishment to many to find these men with well-developed frames and in robust health. If it is borne in mind, however, that only a small portion of their time is really spent in the bothy, and that they follow a most healthy occupation in the fields, there is nothing in the circumstance in the least to create surprise. But could you expect to find here the moral and intellectual orna-

ments some philanthropists would have us believe our farm labourers might be? Where are the time and the comfort, and what can be the will for self-improvement? I have shown how the man is employed for long hours from morning till night. At the most his leisure time cannot but extend from 6 till 10 o'clock, and we must deduct from these hours the time he is occupied in cooking and eating and in attending to his horses. He requires at least seven hours' sleep, and in order to have that and be up at 5 o'clock he must go to bed at 10. The practice is to go about 9 or half-past 9. Supposing the bothyman has a taste for reading and study, is it reasonable to expect that he should indulge it? A man who labours all day hard in the fields has little disposition for mental work at night, even if at home he has his meals prepared for him and the comforts of a cleanly house, a good fire and plenty of light, the last being a luxury which is not afforded in the class of bothy which I have described. Coming in from the cold to the warmth of the house produces a feeling of drowsiness, and when reading is attempted there is immediately a nodding over the book. To the other evils of the bothy must be added a want of quietness for reading; a coarse conversation or revelry goes on which is fatal to such an exercise. The habits of the men, as is well known, are such as help to swell considerably a certain black column in the lists of the Registrar-General, and their conversation is scarcely an improvement on this phase of their moral character.

Yet a regard for truth compels me to tone down some of the darker parts of this picture. There is much ignorance of many things they should know among bothymen—among farm labourers generally—but with all their disadvantages they will as a class bear favourable comparison with the common artisans in our large towns who are so much and so absurdly lauded for their intelligence. On this point I speak with the authority of experience. For some years I associated with mechanics on terms of equality in one of our largest centres of industry. These men, so far as a practical knowledge of their business is concerned, are worthy of all the praise that has been lavished upon them, but it is a mistake to suppose that in an educational point of view they are much superior to our ordinary ploughmen. It is true they possess a little more knowledge of the world, and are, so to speak, more nimble-minded, but these are merely the results of the necessary associations in a large town. As regards reading, writing, and general knowledge, they possess little superiority over the ploughmen, while a much larger proportion of the latter rise into positions of trust and responsibility through the cultivation and exercise of their talents. Not to mention other occupations I could name seven newspaper reporters, and three newspaper editors, who, with no advantages of early training, but by self-cultivation, have raised themselves from the plough to the positions which they occupy.

THE PEA-NUT.

THE Pea-nut (Arachis hypogæa) is a leguminous plant, remarkable for its habit of thrusting its fruit into the ground to ripen. After the flower has fallen the seed-vessel, which is very small, is gradually raised upon a stalk which in time attains a length of from 2 to 3 inches, and in its growth curves downwards, so that at length the small ovary at its extremity becomes buried in the ground. After this peculiarity in the way of development has taken place, it begins to enlarge and to ripen into a pale yellowish, wrinkled, slightly curved pod, generally contracted in the middle, and containing two seeds. The latter, which are about the size of an almond, are used for dessert. Unroasted, their flavour somewhat resembles that of an ordinary garden Pea; but when roasted this is altered sufficiently to make it a favourite, especially in New York, where these Nuts may be seen going through the roasting process in the streets, just as one may see Chestnuts roasted in the streets of London; only, the Pea-nuts being of an oily nature, require constant turning and stirring, to prevent them from burning. In short, they are roasted just as one would do coffee, and when cold they are bought by the pint or quart, as nuts are here.

Norfolk and adjoining counties on the Chesapeake Bay possess just such a light alluvial soil as suits this nut, and on that account it is fast becoming an important item among the productions of that region. Cultivators there are delighted with it, and say that it will soon make their fortunes. They maintain that there is no crop which produces like it, taking into consideration the certainty of yield, readiness of sale, and the high price which it commands. Strawberries, always a crop held in high esteem in the neighbourhood of Norfolk City, may produce more to the acre when the season is very favourable for them, and prices run high before the market is glutted; but, taking the cost of raising them into account and the accidents affecting their sale—for most of them have to be transmitted to the markets of the North—the Pea-nut is considered to be a much safer crop, and one, taking one year with another, which is really more profitable. Besides, Strawberries and similar fruits must be sold at once, whereas Pea-nuts will keep good from autumn until next planting season, which is in May.

Ground for Pea-nuts, like that for most other crops, requires special preparation. In the first place it must be in good condition, and, whatever manure is used, lime and ashes must form a part. Lime, it is said, prevents "pops," a name given in Virginia to pods without kernels. The Nuts are planted in rows about 3 feet apart, and from a foot to 18 inches asunder, according to the quality of the land. On naturally good ground the yield is often 125 bushels to an acre, which, at say 3 dols. a bushel, is as profitable a crop as can be grown. Skilful husbandry will, however, produce much heavier crops than that, and when smaller areas than those on which the crop is now grown shall have been devoted to it, and manure more scientifically applied, I can see no reason why the yield should not amount to 200 and even 300 bushels per acre, and of a finer quality than that now generally obtained.

By far the larger portion of the Pea-nut crop raised about Norfolk is sent to the North, where it readily brings from 2½ to 3 dollars a bushel. Pea-nuts may sometimes be seen on hawkers' barrows in the streets of London, where they are known by the names of ground nuts and Gouba Peas. These nuts, however, are destined to become an article of much larger exportation to England than they are at present. Hitherto, as far as I know, they have merely been bought as matters of curiosity; but the time cannot be far distant when they will form an article for dessert here as well as in America, that is, when a taste shall have been acquired for them, for it is not everybody who likes them at first. They will also, doubtless, be made to form a component part in confectionary, somewhat in the way in which we use Almonds, and as an oil producer they will be found to be invaluable, the oil pressed out of them being reported to be equal in quality to that of Olives. Indeed, it is sold largely in France as pure Olive-oil.

I may add, that since this nut has been cultivated on Virginian soil, and under the influence of the fine climate of that country, it has lost much of the greasy rankness which pertained to it in Africa, thus rendering the American article more valuable than that imported direct from Guinea, or other parts of its native country. I doubt not, therefore, that in time in the seaboard counties of eastern Virginia, as well as in the interior, will be grown Pea-nuts sufficient, not only for America but also for the whole of Europe, large as their consumption must become when the many useful properties which they possess shall have been made more universally known Even the herbage, or haulm, makes a valuable hay in Virginia, of which cattle are very fond, and probably a good oilcake might also be made of the refuse seeds after the oil has been pressed out of them. As a fodder plant it is just possible that it may be grown profitably in this country, but on this, as well as on other points, I have directed some experiments to be made with the few nuts which I brought home with me; and when these shall have been matured I shall send you the result. *J. Nicolay*, 74, *Oxford Terrace, Hyde Park.*

HOME-MADE MANURES.

NO one can look into the *Agricultural Gazette* (English), the *Farmer* (Scotch), or the *Farmer's Gazette* (Irish), without this subject being placed before him, either by lecture or paper read before some farmers' club, the result of experiments by societies or private individuals, or field experiments by the Royal Agricultural Society of England (see last Journal, and Mr. Lawes' famous paper, read before the Central Farmers' Club a few weeks back). And it is charming to find the Irish Farmers' Club practically at work (giving an example worthy of imitation), collecting samples from different vendors, submitting them to analysis, giving the results to the public through the proper channels, the agricultural papers; showing money value, as well as agent's price, enabling the farmer to estimate the chemical as well as monetary value of artificial manures. But, with all these advantages, we are yet lacking much, to ensure the right manure being applied according to the state of the field, and the kind of crop we wish to grow.

What guide have we, speaking in a general sense, to point out to us that farmyard dung is better than guano, or "certain chemical mixtures," for any particular crop on any particular kind of land? For instance, the field experimented on by the Royal Agricultural Society of England produced better results from artificials than farmyard dung. What combination of circumstances presents itself which would lead us to expect that we should obtain a better crop from rotten dung than from certain chemical mixtures? Are there no means of foreseeing that artificials, at much less cost of money, of time, and of labour, would produce better results, preventing this waste of manure? We are not told that these manures were applied, knowing that certain constituents—promoters of vegetable life—existed in the soil, requiring but aid from the hand of man to increase their power, forming by combination with those manurial or chemical ingredients, which are added according to his will, a stronger reproductive agency of vegetation, forcing up the grain or plant with increasing vigour, giving it a more robust constitution, if we may so express it, which will enable it to obtain greater supplies of food from the atmosphere and from other sources which an all-wise Providence has appointed. We do not observe that this is the case; but the manures are applied, chancing what card may turn up. It may, or may not, be successful—a profit or a loss. Let us hope, ere long, we may be able to apply manures to our soils with a degree of certainty, weather permitting, of its being a success, obviating that blindfold practice of applying farmyard manure when certain chemical mixtures would produce far better results.

Let us not be mistaken: we do not advocate the use of artificial in preference to home-made dung, but we do say that as it is in our power to recognise the land on which it is next to waste to apply such manures, that we ought in practice to make use of that knowledge which chemistry is daily making more familiar to us, enabling us to give a reason why we apply such and such manures, not waiting until we see the result before us, then putting our heads together, endeavouring to account for our failure or success as the case may be. The experiments of the Royal Agricultural Society of England, and, indeed, those of Mr. Lawes himself, give no reason why such manures were applied. They do not say, following the dictates of practice, such and such a course would be adopted, believing such results to be obtainable; or, having invited science (chemistry) to deliberate with them, she (science) counsels a departure from such practice, though backed up by experience. Such is not the case. The manures are applied, the results are plainly before them; then, and not until then, do they endeavour to reconcile their failure or success to the peculiarities of the soil—or, may be, of the season, the drilling or broadcasting of the seed, or the manure.

Mr. Lawes assures us that land can be kept in condition, whether under grain crops, rotation, or natural grasses, equally by farmyard dung or artificial manures, and refers us to the fourteen years' experiments on meadow land; but it must be remembered that the last six of the fourteen years the farmyard dung was withheld, while that manured by artificials received its quantity. And we find that the yield of these six years, unmanured, was, on the average, 1⅛ cwt. less than the average of the eight preceding years, when 14 cwt. of farmyard dung was applied. But if we withdraw the year 1865 (that is, the second year after the manure ceased to be used, the return on these two plots, as well as on plot 3, Table 5, was very poor, no doubt influenced by season), the yield for the five years unmanured would show an increase of 1⅝ cwt. over the eight years manured. It is to be regretted that the manures were not withheld from the Wheat, plot 2, Table 1, and meadow, plot 9, Table 4, at the same time as was done on plot 16, Table 1, and plot 2, Table 4. Now, mark the result. On the meadow plot the return (less the year 1865) was, on the average, greater without manure than that of the preceding eight years, in which manure was applied; whereas Wheat, plot 2, Table 1, had the regular supply, viz., 14 tons, continued from 1865 to 1869 inclusive, the yield being about 2½ cwt. less than the five preceding years, under the same treatment. It will also be observed that the meadow plot, on withholding its usual supply of manures, does not decrease in the same proportion as the Wheat, plot 16, Table 1, which falls away on an average of five years manured, and five years unmanured, rather more than half. What would have been the result had the artificial manures on meadow plot 9, Table 4, been withheld, we are left to conjecture. Mr. Lawes does not give any reason why he discontinued the farmyard manure on the meadow plot 2, Table 4, at the same time continuing "certain chemical mixtures" on plot 9. Had they been dropped together, the result would have been a proof which manure was most lasting in after effect.

Were the plots analysed previous to these experiments, and if so, was the quantity of ammonia therein found less, or greater, or equal, to the quantity found after the experiments? A very great omission, in my humble opinion, in these Tables is, the value of the manures applied per acre, for gold may be bought beyond its value, as if one should broadcast five-shilling pieces, and get half-crowns in return. We find plot 2, Table 4, received for eight consecutive years 14 tons of dung—estimated value, 5*s.* per ton = 70*s.*; the next six years unmanured, the yield is lessened but 1⅝ cwt. per acre, worth, at 80*s.* per ton, 6*s.* 6*d.* Now it is evident that the application of yard manure is more lasting in its effects, or it must be tantamount to waste, for we have no reason to expect that the continuance of its use would have resulted in larger returns,—at least, from the experience of the preceding eight years.

During these eight years we have been applying 70*s.* worth of manure, getting hay worth only 6*s.* 6*d.* over the average of the six years unmanured. Are there no means of anticipating the requirements of the soil for the kind of crop we wish to grow, economising our manures, being able to say before we sow—the land requires such and such, or is deficient in this or that constituent requisite for the remunerative growth of the kind of crop we are desirous of sowing; not, after the crop is reaped, guessing that it ought to have had this or that applied? Are we not more advanced in our agricultural tests than the negroes of the West Indian Islands, who are guided in their choice of land for any particular plant by the appearance of the soil, its situation, the natural growth of trees, and brushwood, grasses, &c., many asserting they can judge of the capabilities of the land by the

taste of the subsoil? They can recognise the soil on which the Nutmeg, Coffee, Cocoa, as well as the Guinea Yam, Plaintain, Tanna, &c., grow together luxuriantly. And were you to plant these on soils where the yellow Yam, known as *à tout temps*, Cassava (Jatropha manihot) Pigeon Pea, &c., only can flourish, you would certainly be classed as a bad planter; and were you to ask why, you would simply be told it was "not its land." Land on which the Pomrose tree, Razor-grass, Fern tree, Orange Briar, and wild Rice-grass, &c., grow to perfection, is not the soil on which the first-named plants will thrive; but why or wherefore must be answered in the same sense as we say in England that such and such land is, or is not, fit for Wheat growing.

Our agricultural chemists tell us that the Wheat crop draws such and such mineral constituents from the soil, that certain chemical mixtures contain the ingredients which we must restore to the soil for the successful growth of the crop, putting it into the condition it was in the preceding year. This would lead us to ask: 1. What amount of mineral ingredients is in the soil particularly suited to the crop we desire to grow? 2. What quantity of these ingredients do we require to add in home-made manure or artificials, so as to ensure, weather permitting, a yield of say 6 qr. Wheat, at the same time leaving the soil in a condition equal to that we found it in? 3. It being requisite we should add such and such mineral ingredients to this soil, for the production of a Wheat crop of 6 qr. so as to ensure leaving the land in the condition we found it, what will be the cost of said ingredients (from whatever source added) and would it have been more to our purpose or more remunerative to us to grow Barley or any other crop, leaving the land in the condition we found it? To carry this out we must have a Table to record what we find in the soil, what we may add in manures, what our crop takes from it, state of ground after harvest, cost of what we have added, value of crop; thus enabling us to ascertain whether our cultivation has been a profit or a loss, and we will at the same time be able to account for the condition of the soil. *West Indian.*

Home Correspondence.

Farm Agreements and Tenant Right.—Not having seen the last numbers of your Paper, I can neither agree with nor differ from your correspondent "J. McK." in your number of July 2 (p. 903). The systems proposed by your correspondent "G. A. H." as a panacea for tenant-right, appear to me to be so antiquated that they are not adapted to the present times. There are many things to be taken into account before any general rule can be laid down—1st, the nature of the soil; 2d, the climate; 3d, in all cases it must be supposed that the subject in question is farmed on a lease of at least 14 or 21 years; 4th, the term of entry ought in all cases to be a full entry, viz., that full possession be given at Michaelmas (Sept. 29), or immediately after the separation of the crop from the ground. The covenants of the lease might be as follows:—1. The tenant with his family to reside upon the farm during the currency of the lease. 2. That he shall neither underlet any portion nor sublet under any pretext whatever. 3. That the proprietor drain the whole lands that require to be done. 4. That suitable buildings be erected, and all gates, fences, and pillars put in substantial repair. 5. The whole straw, hay, and roots, haulm, and green crops to be consumed upon the farm, and all manure expended yearly thereon. 6. Not to have more than two-thirds of the whole arable land in any one year under white crops, nor under any pretext to sow two white crops in succession. 7. The game to be reserved *in toto*. [For the tenant?] 8. Should the whole farm be capable of growing Turnips and Potatos, the seven or even the eight course system will be found far preferable to the five; the land is not so apt to become Clover-sick, the grass seed being at a greater interval. 1st year, Oats; 2d, green crops; 3d, white; 4th, green crops; 5, white crops, sown down either two or three years; if on the seven-shift you have two-sevenths of green crop and two-sevenths of white crop, thus enabling the farmer to feed more stock, and consequently to make a far larger amount of manure. It will thus be seen that it is impossible to grow such a quantity of green crops without the aid of artificial manure; but the quantity of this article ought to be left to the discretion of the tenant. Were half the Turnips to be drawn where the land got half solid and half artificial manure, and the remaining half consumed where grown by sheep—and where sown entirely with artificials, three-fourths of the crop at least to be consumed as aforesaid—you would have to consume at the home-stead, if the seventh were Turnips, over 50 acres, which, with the horses kept, would be quite enough to make the whole straw into manure. No restrictions as to quantity of lime or artificials ought to be imposed upon a good tenant. 9. The tenant to keep at all times a sufficient stock of cattle, horses, and sheep, his *bonâ fide* property. 10. That he shall not deteriorate or run out the land by undue labouring or cropping, that he shall keep the same clean and in good heart and condition. 11. That he shall keep and leave the said premises in all things thereunto belonging in good and tenantable repair, he having received them in the like condition; but should he neglect to do the necessary repairs, the landlord or his agent may cause the same to be done, and recover the charges thereof as if for rent in arrear. 12. The landlord or his agent to be at liberty to enter upon any portion of the premises at any time to inspect the same. 13. All ditches, drains, and watercourses to be kept clean and running. 14. During the last five years of the lease to be bound to proper rotation and proper manurings, sowing proper grass seeds, &c. 15. At the end of the lease, should he at his entry have paid for the dung, to be paid in like manner, also for the seeds sown with waygoing crop, provided they have not been furnished by the landlord or incoming tenant. Should he have paid for the straw at entry, to be paid in like manner. Your correspondent, "G. A. H.," in his communication savours much of the lawyer, not of the practical farmer. Were the estates of England more in the hands of practical men, to manage the rural affairs, there would be much less grumbling, not only as to restrictive (dogs and cumbrances) clauses as to farms, but poachers would decrease and the game grievance become one of the things that were. I must apologise for the length of my letter, and will perhaps give you my opinion of a clay land lease shortly. *J. H., Sussex.*

—— On this subject "G. A. H." says, "If a tenant comes to me from any other landlord and takes a farm which has been in the landlord's hands for several years, does he ever offer to pay for dung, or bones, or lime, applied to the land during the previous five years; and, if he does not, on what principle is he to be paid for them at leaving?" Why, simply on the principle that an outgoing tenant stands in a very different position to an outgoing landlord. As soon as the farmer's tenancy ends his interest in the property ceases. Not so the outgoing landlord: either he himself or his agent fixes the rent at its full letting value in its improved condition, and his outlay is recouped in the shape of an annual extra payment, familiarly known by the name of rent. To take the case of "G. A. H.'s" own farm (and, by the way, if his character is good for anything as a landlord, and he is prepared to treat fairly, he need not wait long for a man with money and pluck enough to farm his 1000 acres):—If the rent had been settled previous to his laying out £2000 or £3000 in manures and otherwise improving the property, no reasonable tenant would object to paying a fair proportion for the unexhausted improvements; but I am afraid that "G. A. H." wants, like too many others, to take an improved rental and swallow the tenant-right also. For my own part, I would prefer, on entering a farm, to pay fairly for unexhausted manures or cake rather than go into one free when the very vitals had been sucked. When a tenant has dealt liberally by land, and leaves it as it ought to be left, he ought to be fairly paid for it, either by the landlord or incoming tenant. *Looker-on.*

Mr. Mechi's Crops.—Our good friend, Mr. Mechi, kindly informs us from time to time of the state of his and other crops, and also is very good to offer his opinions; but as yet his annual balance-sheet has not made its appearance. I have no doubt that many, like myself, are anxious to note his progress; and I hope that it will not long be withheld. *Clodhopper.*

La Beauce.—At a period like the present, when agriculture has become a most important and very exciting subject, it appears to me singular that, among the writers and speakers on the cultivation of wheat land, no notice has been taken of the system of farming in the part of France called La Beauce, a table-land of considerable extent, lying between Paris and Orleans, from which the former city is said to derive its main supply of bread corn. In the year 1829 I travelled leisurely across the above-named district without being able to discover any other green crop except that of red Clover. *An Old Subscriber to your Paper.*

Thick and Thin Seeding.—Your readers have often heard of Hallett's Pedigree Wheat, sold, I believe, at one guinea per bushel for seed. Would it not be well if those who take an interest in the matter should see Mr. Hallett's crops of Wheat, and then judge whether they should follow his example. By going to the extreme east end of Brighton, and turning sharp to the left up the valley towards the race-course, one of Mr. Hallett's Wheat crops may be seen on the left of the road. I would suggest that a committee be sent down to Brighton to inspect this crop of thin-seeded Wheat; and after doing so, the members of it might go to the other end of Brighton, and look at a piece of Wheat on the farm of a well-known sheep-breeder at Hove, sown in the ordinary manner; they would be able then to form an opinion as to thin or thick seeding. At any rate, I hope any of your readers who have the opportunity will inspect both crops. *Spectator.*

Nitre for Potatos.—I see in a recent issue of your Paper that favourable mention is made of the effects of nitrate of soda on growing crops, and cereals in particular. Now it is very many years since I sent the Editor of the *Gazette* my experience with this stimulant on the Potato crop, and by using it in a particular way I was enabled to gain three weeks in advance of my neighbour's usual mode of cropping, and a weighty, healthy crop to boot. But since then I have tried it upon cereals, and Wheat especially. I have not time just now to enter into particulars, but the difference was so great betwixt the dressed and undressed that it appeared something like magic; so much so, that many professional men who saw it gave the thing up as beyond their ken. It may, however, be right to say that the ground operated on was a worn-out lot, on the limestone formation, and my duty was to put said lot in paying condition, by cleaning, deepening, &c., hence the occasion of my reported experience. Now, as I remarked in my first communication, the whole pith of the matter is this—can we, by any stimulating manure, gain three weeks, two weeks, one week, or even a few days, upon the season, with large increase of crops? Therefore, seeing that something can be done in that way, would it not be well to try it out? I fear that there will be a terrible deficiency of food this coming year, both for man and beast, and to meet a similar visitation we should deepen the soil and manure it. Just let a farmer take a peep at the market gardens (managed by somebody like Cuthill) this blazing weather, and he will be astonished how cool and easy everything looks,—even the very Cauliflowers have no intention to button prematurely, for their roots are happy and well in a deep and healthy field of food. Why cannot all copy from the scientific and practical market-gardener? *William Jones, Kilboy, July 4.*

Mr. Mechi on the Straw Question.—I have looked through Mr. Mechi's article upon the straw question. He concludes, "1, That all straw returns the greatest profit when consumed." I do not agree with the word "all." Bean and pea straw is profitable to consume. For 30 years I kave kept a flock of ewes upon it, and they have always done well, giving me a good supply of lambs yearly. I know of no other more profitable way of using it. Oat and barley straw is profitable to consume with cattle; giving each 4 lb. of cake per day, and leaving it to eat the best part of the straw. I do not know of a more profitable way of using that. Wheat-straw, if it is the produce of a good crop, is hard, sticky stuff, and costs as much to cut into chaff as its feeding properties are worth—Rivetts' straw is not worth cutting up; therefore the most profitable way of getting them into manure (if they cannot be conveniently sold and manure bought in exchange) is to tread them down into manure at the least cost possible. For a farmer must pay rent, labour, and keep himself. The chaff-cutting system will not do that. *William Smith, Woolston, Bletchley Station, Bucks, July 11.*

Woolston Straw.—Mr. Smith asks for addresses of men in Wales who keep young cattle on straw, I may answer in the language of Sir Christopher Wren's monument, "look around." Mr. Smith also asks how his straw, if passed through cattle, will do his farm more good "than the same quantity of straw well watered would." I might, on this point, refer him to the previous page (939), where Mr. Mechi gives a short dissertation upon straw, which Mr. Smith would do well to study; but as he is unfortunately afflicted with "Mechiphobia" I will tell him how it will do his farm more good. If he passes straw through cattle he will find that he makes money upon the cattle, and although the manure which comes away is less in quantity, its value weight for weight is much greater, although its total value is rather less; but as he has a smaller weight to carry out upon the land the cost of cartage is diminished, and the profit upon his cattle will enable him to buy some artificial manure, which, if mixed with the cattle dung, will do his farm a deal more good than carting out straw in a water-cart. Or, if he likes to follow Mr. Mechi's plan, he may spend the money beforehand on a little purchased food, which will enrich his dung, and so enrich his farm. But there is another way, which it appears has not struck Mr. Smith, and that is, to consume it on the farm with roots and refuse or tail corn. Mr. Smith may soon learn, by reading the experiments of others, that straw possesses in itself, not only a large amount of food, but that it is also a splendid vehicle for profitably consuming other farm products in conjunction with it. Many practical farmers know that to keep sheep on roots alone, especially if they are ewes in lamb, is by no means a prudent thing; but if you give them plenty of chaff they will do well. The great majority of practical farmers will agree in saying that if a certain number of cattle are fed during winter on 500 tons of Turnips pulped, and mixed with 50 tons of straw cut into chaff, they will give a greater money return than if a portion of them were fed only on the Turnips, and another portion only on the straw. In conclusion, let me tell Mr. Smith that when he has got the wrong side of the argument, it would be infinitely more becoming, and not one bit more humiliating, if he openly acknowledged himself to be well beaten. *G. A. H.*

A Hint to Butchers.—They should remember what Mr. Banting says, that by mere change of diet he and those obese folks who benefit by and adopt his practice lose, in the course of the first week, 6 or 7 lb. (I lost 5 lb. of fat in five days); so it is, in the same or even a greater degree, with animals. Some butchers don't seem to quite see this, but I think I can convince them. The other day a little lot of my sheep went into

a neighbouring town as fat as pigs, and were much admired; they had been accustomed to good Italian Rye-grass, and, in addition, cake, oats, bran, malt combs, a little cut hay, with a plentiful supply of water, and kept quietly in a shed. The butcher who bought them kept them a fortnight on what he called "good high feed," which, in plain words, was "high and dry bents," possibly they had no water. However, one fortnight of change of food and short commons so changed their condition that they had become comparatively lean. In fact, I have since stipulated that for the future, to protect our own character as feeders, the animals we sell should be slaughtered soon after leaving the farm. This is not a singular instance, for the practice extends also to bullocks; therefore, when we hear that sheep and cattle do not suffer on railways by the absence of food and water, I beg respectfully to dissent entirely from such a proposition. Grass-fed bullocks removed to other equally good grass, will probably suffer little, except, perhaps, a little discontent at change of place and company, but it is otherwise with comfortably and highly fed stalled animals. In fact, to adopt the country saying, "they waste like dew against the sun." Those who doubt this statement had better satisfy themselves by "going to scale." I heard of a veterinary who was celebrated for curing ladies' obese lapdogs, which were supposed to be not well because they would not eat. He tied them up for a fortnight, water always being within their reach. After "burning their own candle," or living on their own surplus fat, for fourteen days, they were sent home "as fine as spars," full of activity, and with a most ready appetite. My good and jolly friends, the butchers, will no doubt apply the moral. I don't wonder at the low price obtained for the cattle brought the long voyage from South America; it could never pay, for the reasons I have mentioned. *J. J. Mechi, Tiptree, July* 11.

Foreign Correspondence.

EVRY: *July* 6.—After the despatch of my short notes yesterday, I went over the farm and saw the conclusion of the day's reaping, which, with one or two exceptions, was admirable; one mistake was, however, made by the managers—the sheaves were tied up as soon as the reaping was done, thus obliterating the behaviour of each machine with respect to the disposition of the grain on the ground.

To-day science has taken the place of direct work—a number of General Morin's dynamometers have been brought down from the "Conservatoire," in charge of the able director, M. Resca, and his son; and these are being employed, with the co-operation of the English juror, Professor Wilson, in the same manner that he used them in the United States, I am afraid to say how long since—that is to say, after the mètre is carefully attached to the pole of the machine three trials are made with each: 1st, with the machine merely considered as a carriage; 2d, with all its parts in full gear, moving but not doing work; and, lastly, in full operation—the time of performance being registered. When there are added to the results thus obtained the former time trials, and the results of the scientific examination of the parts of the machine, we have certainly admirable data for the appreciation of the relative merits of the various reapers present. In the present case, however, the jury will not pronounce until the second series of trials shall have come off at the Chamant Farm on the 25th inst.

I may mention here that we have just got the results of another trial which took place at Dreuze, in La Meurthe: Samuelson 1st prize, Hornsby 2d; two other awards made—telegram does not say to whom.

Having said all I have to say for the moment about the trials at Petit Bourg, I should like to add a few words about Petit Bourg itself. The farm is known to many Englishmen, as the trials in steam ploughing were carried on here in 1867, and no agriculturist travelling for information could fail to hear of M. Decanville's magnificent estate, which is the largest, or largest but one, in France. M. Decanville is not a proprietor of land, he is a tenant-farmer prince, with some dozen landlords, and 750 hectares (1875 English acres) under cultivation, for which he pays something like £4000 sterling a year. In addition to farming M. Decanville is a large Beetroot distiller, and also a machine and boiler maker, the whole of the buildings being in connection with each other. Between 300 and 400 men are employed on the farm and in the various works, and all are participators to a certain extent in the general profits. The schools attached to Petit Bourg are admirably arranged, as I have been told, for I had not time to visit them; no boy is employed there who cannot read and write, and none under 13. M. Decanville has established large stores where the men, who receive tokens daily representing their pay, may exchange these for whatever they require in the way of eating, drinking, or clothing,—everything being sold at cost price. The Decanville family has been famous in agricultural annals for 300 years; and as M. Decanville is full of vigour and health, and has four brothers besides himself farmers, and four sons to follow him, the name is not likely to die out of the land very soon. Petit Bourg once had a courtly connection, but the emperor coach-builder occupies the old château of Madame de Montpensier, and Decanville reigns in her stead. A mere single passage through Evry and the surrounding neighbourhood, which is only an hour's trip by railway from Paris, at once reveals the presence of an important agricultural power; and a visit to Petit Bourg and its homestead, with its gardens and glasshouses, completes the information. Petit Bourg has all the substantiality of a rich yeoman's home in England, with a certain French charm superadded.

—— The following figures, extracted from the report of the Director General of the French Douanes, are important at the present moment:—

Imports.	First Fortnight of June.	From 1st to 15th June.	Total.
	Quintals.	Quintals.	Quintals.
Wheat	[illegible]	760,770	778,441
Do. flour	410	14,571	14,981
Rye	1,857	10,700	12,557
Do. flour		917	917
Maize	1,503	114,143	115,646
Do. flour	139	7,310	7,449
Barley	1,112	11,121	12,233
Do. flour			
Exports.			
Wheat	5,[illegible]	143,721	151,[illegible]
Do. flour	[illegible]77	27,773	28,[illegible]
Rye	1,[illegible]	4,[illegible]	4,[illegible]
Do. flour	[illegible]	[illegible]47	2,[illegible]
Maize	2,[illegible]	144,[illegible]	153,394
Do. flour	[illegible]4	[illegible]4	[illegible]
Barley	4,[illegible]	345,616	350,[illegible]
Do. flour	60	180	240

The inference from these figures is evident, and quite in accordance with the most trustworthy agricultural reports, namely, that the Wheat crop is very short, but Rye and Barley certainly not below the average. The "Journal d'Agriculture" thus summed up the reports last week:—If some large farms in the North and East have relatively good crops, they still get less than an ordinary average, and the rest of the country is badly off. A quarter of a crop of forage, one third of Colza, half a crop of Flax, and a three-quarter crop of cereals, is the sad account from the quarters where the harvest is finished.

—— Trials of mowing-machines are going on all over France. At Baronville two of Woods' model had a great triumph, and Lallier's mowing and reaping machine worked well. One of Woods' machines was managed by its owner, M. Prosper Comte, of Vic. On the same day the Woods machine won all the three medals at the competition at Dreuze. (This fact deserves to be recorded, as a false telegram of the results of that competition was in circulation immediately after the trials.) In this case two of the reapers were exhibited by French owners. There was another trial at Lunéville on June 15, when no less than 19 mowing machines competed; the awards were:—1st prize, M. P. Comte, with a Woods' mower; 2d, M. Paul François, with a Samuelson's mower; 3d, M. Marin, with a Woods' machine. Lastly, at a trial at Saintes, on June 19, Mr. Pilter, of Paris, obtained the 1st prize with a Woods' machine; and M. Peltier, a French maker, the 2d prize with a machine of his own construction.

—— The great International Exhibition of agricultural machines, implements, and the national exhibition of animals organised for 1867 by the Society of the Agriculturists of France, seems now sure of being carried into effect. The guarantee fund demanded was £12,000. Already £11,680 has been subscribed, and the list is not yet closed. This exhibition will be due entirely to private initiative; for the Minister of Agriculture stated, in reply to an application from the President of the Society, that he regretted he could not award any subsidy. The Council of the Society subscribed £2000 to start the proposal, and there is no doubt that the guarantee will surpass the amount fixed; agriculture, to quote the same Journal, can therefore do without the Government. An International Congress is to be held at the same time as the exhibition. *C. A. Y.*

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

THE MEETING AT OXFORD.

ALTHOUGH it is not till next week that the great annual show is opened in completeness, and crowds collect to witness it, yet all through the current week the Society has been hard at work. A dozen gentlemen have been examining the various classes—steam-engines, chaff-cutters, grinding and crushing mills, root-cutters and pulpers, oilcake-breakers, &c.—which this year come into competition. Thirty years ago two or three judges spent an hour in awarding medals to a few, out of about a score or thereabouts of articles which, on the whole, competed at the first annual exhibition of the Society. This year five times as many men have been all the week employed in examining and testing the comparatively small section of the agricultural machine class, which is in its annual turn submitted to competition. The whole, including 400 stands—nearly 8000 articles—covers many acres of land, occupies 50 or 60 sheds, and is surrounded by what must be more than half a mile in length of outer stands, including a perfect army of steam engines.

On entering the yard, you face the large and handsome stands of the great seedsmen, bidding fair to be well furnished in a day or two; and beyond these "Broad Street" lies, on either hand of which lie implement sheds A., B., C., &c., on one side, AA., BB., CC., &c., on the other, right away to Z. and ZZ. in the distance. All around are the outdoor and larger implements, including steam-power in every form; and in the midst an Aveling locomotive, with a crane suspended in front, is hurrying to and fro, carrying and placing heavy goods; and a Thomson's road-steamer is trotting about, carrying passengers or drawing implements.

The following gentlemen are engaged in the inspection of those implements which are this year on the list for the Society's prizes:—

Fixed steam-engines, horse-gears, and steaming apparatus—F. J. Bramwell, C.E., 37, Great George Street, London.

Mills, crushers, and coprolite mills—H. Cadell, Monkton Farleigh, Bradford-on-Avon; H. Stephenson, Frockley House, Newcastle-on-Tyne; John Ogilvie, Mardon, Coldstream, N.B.

Chaff-cutters, oilcake-breakers, turnip-cutters, and guano-breakers—John Hemsley, Shelton, Newark; Matthew Savidge, Sarsden Lodge Farm, Chipping Norton; Henry Cantrell, Baylis Court, Slough.

Bone mills, flax-breaking machines, tile machinery—John Thompson, Badminton, Chippenham; J. W. Kimber, Tubney Warren, Abingdon; G. M. Hipwell, Elmore Lodge, Sutton, Surrey.

Dairy implements—J. K. Fowler, Prebendal Farm, Aylesbury; George Jackson, Tattenhall Hall, Chester; Gilbert Murray, Elveston, Derby.

Draining tools and miscellaneous awards—F. Sherborn, Bedfont, Middlesex; John Hicken, Dunchurch, Rugby; John Wheatley, Neswick, Driffield.

Their awards will not be made till long after we go to press; and such broken indications of merit and performance as we can gather from the trials, dynamometrical and otherwise, would not in their imperfect state be instructive. We prefer, therefore, for the present to be satisfied with a short general reference to the contents of the showyard, leaving it till next week to give a more detailed report.

In stand No. 1, Mr. Barford, of Banbury, exhibits nearly 200 implements by various makers—reapers, rollers, chaff machines, haymakers, &c.—Near to this Messrs. Amies, Barford & Co. exhibit a large collection of their own manufacture—water-ballast rollers and steaming apparatus, for both of which they are specially distinguished.—Campain's anchor for steam cultivation, a frame on sharp disc-wheel carrying the pulley, which stands in one corner of the wire rope in an all-round arrangement. It is drawn along the headland by the pull of the draught-rope, and stopped by a boy holding the lever, which works a clutch for the purpose of regulating the movement of a revolving anchor. This boy occupies the place, and does the work, of two men under the ordinary plan.—Messrs. Ashby & Co., of Stamford, have a large collection, including steam-engines, horse-gear, haymakers, rakes, &c.—The British Waggon Works Company exhibit a large collection of carts, waggons, trucks, rakes, &c.; among them a cart carrying endless rails, a series of shoes held on by springs, enabling the wheel to rest on a large flat surface.—Messrs. Croskill, of Beverley, have a large stand of carriages and carts; together with their other specialities, Bell's reaper, Archimedean root-washers, farm railway trucks, pig troughs, &c.—Messrs. Barrow, of Banbury, exhibit sets of the Woolstone steam cultivating machinery, also threshing machine, steam-engines, straw elevator, &c.—Mr. T. Baker, of Compton, near Newbury, whom we remember years ago with a single water-cart as his whole exhibit, has here a large and well-filled stand occupied by useful tillage, harvest, and food implements of all kinds.—Mr. Bailey's useful pyrometer, for indicating the temperature inside a stack, is exhibited, among many other articles, at the stand of Messrs. Follows & Bate, of Manchester.—Mr. Bentall, of Maldon, has a large collection of just those implements which this year come into competition.—Mr. Cambridge, of Bristol, has ribbed rollers, chain-harrows, &c., many of them implements for which English farmers have to thank him personally.

Messrs. Ransome, Sims & Head, have a capital stand of all classes of implements; among them the double-plough, which has latterly come so largely into use. Their form of it is distinguished by an ingenious facility given it for turning at the land's end, whereby, at the will of the ploughman, it lifts itself out of work. A three furrow-plough, also for horse draught, is also shown, possessing the same very ingenious contrivance, to which we shall next week direct attention.—Messrs. Hornsby & Grantham have a great collection of their form of reaper and mower, drills, ploughs, washing-machines, &c. We hear of their success at recent implement trials in France, and of the enormous sales of their reapers both in this country and on the Continent.—Mr. Boby, of Bury, shows his well-known patent corn-screens and corn dressing machinery.—The Beverley Iron Company show bone-mills, reapers, carts and waggons, farm railways, &c.—Mr. Haslam, of Henley, exhibits ploughs, harrows, rakes.—Messrs. Smith & Grace show mills, chaff-cutters, and other implements for competition.

At the stand of Messrs. Coleman & Morton, of Chelmsford, we have their well-known cultivator,

Hansom potato-digger, oilcake-breakers, &c.—Messrs. Gower, of Market Drayton, show corn-drills and pressers. Then comes a large collection of broughams and carriages, exhibited by Thomson, of Perth; Cousins, of Oxford Street; Mulliner, of Baker Street; Hinson, of Nottingham; Barton, of Carlisle; Howes, of Norwich; Ayshford, of Fulham; Windover, of Huntingdon; Thorn, of Norwich; Roberts, of Bridgwater; and M'Naught, of Worcester.—Messrs. Cottam, of Oxford Street, show stable arrangements in elaborate perfection. —Messrs. Hart, of Wenlock Road, City Road, show weighing machines. One is a self-acting revolving weigher, which records all the grain, whether in weight or bulk, which passes through it. We shall refer to it next week.—Messrs. Burgess & Key have a large collection of mowers and reapers.—Mr. Ball, of Rugby, exhibits carts and ploughs.—Messrs. Hunt & Pickering, of Leicester, show horse-gear, crushers, turnip and chaff cutters, reapers, rollers, tillage implements, and various other tools, among them cheese-presses and milk-cans.—Messrs. Holmes, of Norwich, exhibit barn and seed machinery.—Messrs. Bamlett, of Thirsk, show their well known reapers; and Messrs. Ball, of Kettering, their well known ploughs and carts. Then follows a number of stands containing fencing, wire-work gates, hurdles, articles of domestic use, &c.

Messrs. Carson & Toone, of Warminster, show chaff-cutters, cheese-presses, horse-hoes, scarifiers, &c. —Mr. Willacy, of Penwortham Priory, at stand 82, shows a section of a cowhouse which is well worth examination, containing gangway with rails, trough, and flooring, with arrangements for tying up, &c.*; and a travelling turnip-cutter and oilcake-breaker, by which food is delivered into the trough as it passes along in front of the cattle. The whole cowhouse arrangement is provided at the rate of £3 per lineal yard.—Mr. Rendle shows his ingenious ground vinery and plant protector.—Messrs. Cornes, of Nantwich, exhibit chaff-cutters, cheese-presses, &c.

Messrs. Fowler & Co. exhibit steam-ploughing machinery, and they also show it at work in a field near the showyard.—You may here see Mr. Campbell's pair of 30-horse power locomotive engines, weighing nearly 30 tons apiece, and capable of ploughing 20 or 30 acres a day.—Other engines of smaller size also are exhibited—balance ploughs which turn over eight furrows at a time!—turning-harrows, covering 5 yards at a time, large scarifiers, and diggers, &c.; in fact, all the machinery of most energetic cultivation.—Messrs. Burrell, of Thetford, also show Fowler's steam cultivating apparatus.—Messrs. Musgrave, of Belfast, exhibit stable arrangements and cowhouse fittings of very great completeness; so do the St. Pancras Ironworks Company.—Mr. Maynard, of Whittlesea, exhibits his famous chaff engines.—Messrs. Picksley & Sims show reapers, corn-cutters, chaff-cutters, pulpers, turnip-cutters, mowers. —Messrs. Brown & Maude, of Shrewsbury, show useful cattle cribs and sheep racks.—Mr. Carr, of Bristol, shows his disintegrator, a useful machine for mixing and breaking artificial manures.—Messrs. Barnard & Bishop, of Norwich, show rollers, mowers, fencing, netting, &c.—Mr. Smith, of Kettering, exhibits his horse-hoe.—Messrs. Tasker, of Andover, threshing-machines, steam-engines, winnowers, &c.—Mr. W. S. Underhill, of Newport, Salop, shows steam-engine and threshing-machine with Bruckshaw's blast lift; also turnip-drills, &c.—A large collection of useful implements is exhibited by the Salopian Ironworks Company, Shrewsbury.—Messrs Samuelson, of Banbury, show reapers, mowers, and turnip-cutters.—The Reading Ironworks Company exhibit steam-engines, grinders, with horse-rakes, &c.—Messrs. Woods & Cocksedge show horse-gear, and a large collection of the tools of this year's competition.—Messrs. Mapplebeck & Son, of Birmingham, as salesmen, exhibit a large collection of all kinds of agricultural machines.—Mr. Nicholson, of Newark, shows many vertical engines and portable engines, haymakers, cake-brakers, horse-rakes, rollers, &c.—Mr. Tinkler, of Penrith, shows a number of his simple and substantial churns.

Messrs. Page & Co., of Bedford, have a good collection of horse-gear, root-pulpers, horse-rakes, &c.—Mr. Hayes, of Stony Stratford, exhibits steam cultivating machinery and portable engines for working it.—Messrs. Wallis & Reeves, of Basingstoke, show threshing-machines, ploughs, and harrows.—Messrs. Turner, of Bedford, show engines, grinding-mills, linseed-crushers, oilcake-breakers, &c.—Messrs. Richmond & Chandler, of Salford, have a large collection of their implements, which are this year competing, especially of their well-known chaff-cutters, corn-crushers, &c.—Messrs. Mellard, of Rugeley, show horse-combs, pulpers, cheese-presses, chaff-cutters, &c. —Messrs. Reeve, of Westley, show drills of all kinds, for seed, water, and manure.

Messrs. Howard, of Bedford, at their large and well-furnished stand, show their steam cultivating machinery and implements of horse tillage, including double and other ploughs and harrows, harvest implements, including reapers, mowers, rakes, &c. An extremely ingenious horse-rake is shown, containing the very best device yet invented for causing the driving wheels to lift the teeth as soon as a load is gathered. A pedal movement tightens the rocking cradle on the wheel-shaft of the machine, and up go the teeth—the pressure on the pedal is relaxed, and they drop into work again upon the ground.—Steam-engines and threshing-machines are shown by Messrs. Gibbons, of Wantage; reapers and mowers by Mr. W. A. Wood, of 77, Upper Thames Street; bone-crushers and liquid-manure pumps and carts by Isaac James, of Cheltenham; a number of ingenious implements for both farm and garden use, by Mr. Le Butt, of Bury; earth closets by Mr. Moule's Company, and double ploughs by Murray & Co., of Banff.

Messrs. Garrett & Son, of Leicester, who, with Messrs. Ransome, were exhibitors at the first annual meeting of the Society at Oxford—then showing the earliest form of threshing-machine upon wheels—are here exhibitors again of engine threshing-machines, corn-drills, horse-hoes, and barn implements.—Mr. Gilbert, of Evesham, also shows steam-engines and corn-drills, also cider presses. From Carlisle we have horse-rakes, shown by Messrs. Houghton & Thompson,—from Ripon, reapers, chaff machines, and turnip-cutters, shown by Messrs. Kearsley —from Malden, in Essex, chaff machines and ploughs and harrows, shown by Mr. J. Warren—from Kingston-on-Thames a large collection of drills and horse-hoes, shown by Priest & Woolnough—from Uddingston, near Glasgow, many double-furrow ploughs, shown by Messrs. Gray & Co.—from Stony Stratford, among other things, a self-acting sheep feeding-cot, so designed that the sheep open it when feeding, closing and securely bolting itself when not in use; keeping the food perfectly dry and sweet in the most stormy weather; it will hold 40 bushels of chaff and corn, which descends into troughs below as it is consumed; it is mounted on four wheels. From Lincoln ploughs in great number and variety are shown by Messrs. Cooke—Hancock's butter machines, Sawney's corn-screens, Headley's hydraulic apparatus, Corbett's guano-breaker, the atmospheric churn, Morton & Co.'s wire fencing, Whitehead's pipe and tile machines, Merryweather's fire-engines, Owen's pumps, Aveling and Porter's draught locomotive, Tasker's steam pumps, Tye's corn-mills, Gwynne's pumps—all these are well-known implements. They are all exhibited by the manufacturers here.

Besides all these there is a profusion of all kinds of domestic implements and inventions,—sewing-machines, washing-machines, cutlery, chairs, tables, mantelpieces, ornamental work of every kind. Messrs. Tuxford, of Boston; Nalder, of Wantage; Marshall, of Gainsborough; Foster, of Lincoln; Robey, Ruston & Proctor, Riches & Watts, Clayton & Shuttleworth, and many other implement makers, some of them, like the last named, in the very front rank of the profession, occupy large stands around the yard, which are filled with machinery in motion. Among them must be mentioned Hodgkins' flax machinery for breaking and scutching fibre, to which particular notice must be given next week.

It will be gathered from this hurried sketch that there is not much novelty in this year's showyard. It is not, however, the less interesting and useful on that account. We have no doubt it will gratify spectators, instruct the general body of agricultural visitors, and satisfy intending purchasers, as well as any showyard of agricultural machinery that the Society has ever known.

NEWBURY.

The Corn Averages.—Mr. TANNER lately gave a good lecture on this subject before the Newbury Club, from which we make the following extracts:—

The mode of collecting tithes in kind, as adopted for many years (though scarcely in the recollection of many of the farmers of the present day), was a fruitful source of irritation, and constantly disputes arose between the clergyman and his parishioners. Dr. Payley, in his "Moral and Political Economy," chapter 12, says, "No measure of such extensive concern appears to me so practicable, nor any single alteration so beneficial, as the conversion of tithes into corn-rent." This principle of commutation was first proposed to be applied by the Legislature to Ireland. The Act of Parliament for the Commutation of Tithes in England and Wales, is the 6th and 7th Wm. IV., dated April 13, 1836, and which has been generally carried out. There can be no doubt that, on the whole, the substitution of a rent-charge in lieu of tithes has been a most beneficial change; and the fact that the general average for the last 34 years for £100 apportionment amounts to £100 19*s.* 5*d.*, speaks for itself. The basis for that apportionment was—

Wheat ..	7*s.* 0¼*d.* per bushel.	—65*s.* 2*d.* per quarter.	
Barley ..	3*s.* 11½*d.*	—31*s.* 8*d.*	,,
Oats ..	1*s.* 9*d.*	—22*s.* 0*d.*	,,

If that was a fair basis under the law of protection, is it so under free trade in corn? I think not. I think it operates against the interest of those who have to pay the rent-charge. At that time £100 represented—

		Average for Dec. 1869.
Wheat	..282 bushels.	320 less.
Barley	..512 ,,	442 70
Oats	..720 ,,	640 80

You will thus see that while Wheat has decreased, Barley and Oats are increased in price.

Averages of British Corn.—In obedience to the Act before-mentioned for the commutation of tithes, the Comptroller of Corn Returns is required to give, on January 1 in every year, the price of a bushel of Wheat, a bushel of Barley, and a bushel of Oats, computed from the weekly average of the corn returns during the seven preceding years. A rent-charge is of the value of a certain number of bushels of corn—that is to say, one third Wheat, one-third Barley, and one-third Oats. Supposing a rent-charge to be worth £300 per annum, the average price of Wheat being 10*s.* per bushel; Barley, 5*s.*; Oats, 2*s.* 6*d.* per bushel; the £300 would then represent 200 bushels of Wheat, 400 bushels of Barley, and 800 bushels of Oats. Thus we see the great importance that the average price of British corn should be obtained with as much correctness as possible, both for the calculation of the rent-charge and corn-rents regulated by the same. The Act of Victoria, sec. 2, cap. 14, passed on April 29, 1842, entitled "An Act to amend the Laws for the Importation of Corn," contains a schedule of the towns from which returns were made for ascertaining the averages to regulate the duty on corn; the same returns have been adopted for the tithe rent-charge. The schedule contains the names of 273 market towns taken from the 40 counties of England, and 17 Welsh towns, making the total number 290 from which returns were made. That Act was partially repealed on July 29, 1864, so far as that 140 towns and 4 counties were struck out of the schedule altogether, and also 11 of the Welsh towns. I think you will agree with me, that districts growing secondary qualities of corn are not represented, while other districts growing the best qualities are represented. If it is necessary to have a larger number of towns to get an average to regulate the duty on corn, surely it must be equally so for the tithe rent-charge. Here, then, we have a most important Act of Parliament affecting the averages of British corn passed, of which those who are most concerned know very little. I think I am correct in saying so, because I have found but few men, either buyers or sellers, that know or are able to give me any information on the subject. At first sight it may not appear likely to affect the question; but when you consider the fact that one-half of the towns, or nearly so, are now struck out of the schedule, is it likely that so correct an average can be obtained? I consider the larger the number of returns the better, provided they fairly represent the district from whence they come. Every corner of the kingdom where corn is grown should be represented. The towns now left out ought to show the same average as those from which returns are made; but to get those would be an undertaking much too gigantic and expensive for a private individual, but which ought to have been done before those towns were excluded, and may have been obtained for aught I know to the contrary; but the chances, I think, are against it. I have taken the average from the Reading paper for eleven towns in our immediate neighbourhood; but I do not place much reliance on their correctness.

	Wheat.	Barley.	Oats.
Abingdon	48.8	39 5½	29 4½
Alton	49 3	34 6½	32.0½
Henley	50.8	32.10½	25.5½
Hungerford	47 4	37.2	27.5
Newbury	47 1½	36.1	27 9½
Oxford	46 10	30 3	26 0
Wallingford	47 2	34 1	26.9
Reading	50.7½	35 10½	27 1½
Basingstoke	47.9½	36.6½	27.3
Dulcot	49 1	37.6	29.0
Wantage	50 5½	38.5½	26.10
	48 6	36 3	26.10
Willich	48.2	39.5½	26.0
		2 9½	

There are eight counties, and some of the large ones only represented by one market town. I think you will agree with me, that one town in any large county cannot give a fair average; because, as many of us know to our cost, that at times one district of a county suffers from drought, or blight, or wet, while the other parts of the county are less so, or do not suffer at all perhaps. It often happens the Wheat is blighted, the Barley is thin, or the Oats light in one part of the county and not elsewhere, particularly in wet and cold seasons. Take, for instance, our own county of Berks. Can it be right that Reading, which shows the highest averages in the list to which I have alluded to just now, and Windsor, the district for white Wheat, of a good quality, should be chosen to represent the county, while Newbury and Wantage, the large red Wheat markets of Wheat of secondary qualities, should be unrepresented? Take Surrey. That is represented by Guildford, while Croydon, Kingston, and Dorking are left out. Wiltshire, again, is represented by Warminster only, leaving out Swindon, Salisbury, Devizes, and others.

In Hampshire we find that, from some cause or other, only one town was crossed off the schedule—that of Christchurch—and it is represented by nine towns (I do not complain of that being too many); but if necessary for Hampshire, why not for other counties? Why should four counties be left out altogether? Rutland, it is true, has a very small area. Well, then, take Hereford and compare it with Westmoreland, the area of the two counties being nearly the same. By the statistics taken from the agricultural returns of Great Britain (which, by-the-by, I do not consider at all a good authority, but may give some approximate return sufficient for this purpose) it is

shown that Hereford has 178,405 acres of land under corn, green crops, &c., not including permanent grass, such as meadows. This county is not represented at all, while Westmoreland, having only 50,680 acres is represented by two market towns. Compare Durham, famous for coal and mustard—quite a coal district, has five selected towns; while Herefordshire, Middlesex, and Surrey, the three counties, together with a much larger area, and much more of a corn-growing district, have only the same number among them, viz., Herefordshire, 2; Middlesex, 2; Surrey, 1. Shropshire shows 300,000 acres under corn and green crops (omitted altogether); Staffordshire, 216,270 do. ; and yet Westmoreland, with only 50,680, is represented by two markets, and the area of Stafford-shire and Shropshire, being nearly four times as much, is not represented at all; yet Shrewsbury, Stafford, and Wolverhampton are very important markets, as I know personally. Take some of the Eastern Counties, about the same area, and compare with some of the Southern Counties :—

Norfolk	.. 12	Somerset	.. 4
Suffolk	.. 9	Gloucester	.. 4
Cambridge	.. 3	Dorset	.. 1
Huntingdon	.. 2	Wilts	.. 1
Bedford	.. 1	Hants	.. 9
Hertford	.. 2	Berks	.. 3
Middlesex	.. 2	Oxford	.. 1
Essex	3	Bucks	1
Surrey	1		
	35		23

Unfair Character of the Averages.—I may be asked, what has all this to do with the corn averages? Simply this—Take the counties I have just mentioned, the Eastern Counties, as a rule, grow the finest Barley, and some of the finest corn generally. Now, if these counties send in 35 returns against 23 in those counties where the corn generally is of an inferior character, the result is obvious. The present mode of taking averages, I think, tells more on the average prices of Barley than either of the other sorts of grain, which averages, as I mentioned before, have increased, while Wheat has gone back; and though we know Barley has taken a high price for the last year or two, I do not think many of us have made an average equal to the average shown in Willich's Tables for the year ending December, 1869, viz., 39*s.* 5*d.* per quarter. There is no doubt that farmers using, as they do generally, all their tailing corn, both of Barley and Oats (more so, I think, than Wheat), all has its effect on the average.

You will now ask me—What remedy do you propose? First, I should say, let all the counties in England and Wales be properly represented. Secondly, That the sellers should make returns as well as the buyers. Why are not the sellers in the country to be trusted to do as in London?—there it is the seller and not the buyer. Agricultural statistics are collected with great expense, and are not very satisfactory after all. Why cannot the same machinery be used? Say once a quarter, let every farmer return the corn he has sold, and to whom, and the quantity of tailing corn used, and let the price be put on that, after a certain rate, 10*s.* below the best, or any sum that may be thought right. The number of market returns need not, I think, be even so numerous as now, only with more apparent regard to the corn growing districts and the area. It has often been remarked that seven years is too long a time over which to throw the average for the rent-charge. There are some cases in which it operates harshly. Take, for instance, a man with a farm on a short lease. At the end of his lease it does so happen that sometimes he has to pay for several years a high rent-charge, while taking a low price for his produce. His successor, perhaps, pays a low rent-charge, and in the meantime getting a much higher price for his produce. I think myself three years would be better, or perhaps best of all, to take it annually. Some say, why not make the tithe apportionment a fixed charge? But that could not be fairly done until the annual rent-charge and the apportionment should be equal; and then, if that good time, of which we have so often heard as "coming" for some years past, should come, the owner of the rent-charge would not participate in it. I do not wish by any means to impute that the corn averages are otherwise than fairly taken, but with these facts before us, I do not think it unreasonable to suppose that some improvement might be made, both in the area and the present mode of obtaining the average price of British corn.

Notices of Books.

The Quarterly Journal of Science. Conducted by Sir W. Fairbairn, &c., and J. Samuelson, of the Middle Temple, Barrister-at-Law, Editor. No. XXVII. July, 1870.

The current number of this very instructive periodical is more agricultural than usual; several of its papers have a side especially presented to the farmer. He is thus interested in the opening article on beer—in the authorship at any rate of a geological article which is contributed by Mr. Jenkins, the Secretary of the English Agricultural Society—in the subject of air pollution by chemical works, which is discussed in another contribution; and in the list of foreign trees and plants for English gardens, which is made the subject of a paper. We extract the usual agricultural chronicle :—

"The extreme drought of the past three months is by far the most important of recent agricultural events to put upon our record. Already, in early June, throughout the Southern Counties, pastures are becoming bare and brown, and spring-sown crops are dwindling. Clover and other forage crops are not yielding half their usual produce to the scythe; Wheat alone has not yet materially suffered, but a continuance of dry weather must injure the Wheat harvest too. Wheat, indeed, 'needs no rain after May;' but that is only when May itself has soaked the ground. The usefulness of artificial manures depends very much on the wetness of the growing season. No applications in the way of top-dressings to growing crops are made when they would obviously be useless; and this great aid and stimulant to fertility being lost, the year's produce thus suffers indirectly also from the drought. The Cirencester Chamber of Agriculture has reported the favourable results of top-dressings of nitrate of soda and superphosphate of lime on the Wheat and Barley crops of the Cotswold soils. On three experimental plots, the average increase of grain per acre per 100 lb. of the former dressing by itself was 276 lb. The average increase per acre of four plots per 100 lb. of the former together with 200 lb. of the latter dressing was 517 lb. of grain. In other cases the difference due to the added superphosphate was not so great; but the conclusion, upon the whole, seems to have been that nitrate of soda, applied as a spring top-dressing to Wheat, whether by itself or not, yields a satisfactory increase of produce; though the result of the combined dressing of superphosphate together with the nitrate was still more satisfactory. The practice of top-dressing grain crops in spring is a growing one; and as no one thinks of making this application except in wet weather, this is an advantage which this year's harvest will have lost.

"Dr. Voelcker continues to report to the Royal Agricultural Society of England the results of his constant analyses of commercial manures and cattle foods—showing to how much fraud and roguery English agriculturists are exposed. Guano is this year unusually various in its composition—even genuine Peruvian guano is sometimes damaged by sea-water, or contains an excessive quantity of sand. Samples are reported containing as much as 17 per cent. of water and 5 to 9 per cent. of useless mineral matter, and only 12 to 13 per cent. of ammonia—being thus worth less by 30*s.* or 40*s.* a ton than the price at which Peruvian guano is now sold. Another artificial guano, containing 26 per cent. of water and 60 per cent. of lime and sand, &c., and not 1 per cent. of ammonia, is sold at 70*s.*, while it is not worth carrying a mile if it could be had for nothing. Other manures still occasionally find purchasers, though absolutely worthless, or even mischievous. Oilcakes of various kinds, as well as fertilisers, pass through Dr. Voelcker's hands, and faulty samples, under analysis, lose the character under which they have been bought and sold; and the publication by the Royal Agricultural Society of the investigations by their chemist must ultimately prove serviceable.

"A very instructive discussion by Mr. Lawes on the wasteful food-using respiration has been published with a view to the elucidation of sound farm practice in the meat manufacture. It is obvious, as he points out, that in the case of animals fed for the butcher the economy of the feeding process will be the greater, the less the amount of food expended by respiration in the production of a given amount of increase; and it is equally obvious that one ready and efficient means of lessening the proportion of the waste or expenditure to the increase produced, is to lessen as far as possible the time taken to produce it; in other words, to fatten as quickly as possible. From numerous experiments made at Rothamsted it appears that a pig weighing 100 lb. will, if supplied with as much barley meal as he will eat, consume 500 lb. of it, and double his weight—that is, increase from 100 lb. to 200 lb. live weight—in seventeen weeks. Of the 420 lb. of dry substance which the 500 lb. of barley meal contain, about 74 are stored up in the 100 lb. of increase in live weight, about 70 are recovered in the manure, and 276, or nearly two-thirds of the whole, are given off into the atmosphere by respiration and perspiration—that is to say, are expended in the mere sustenance of the living meat-making machine, during the 17 weeks required to produce the 100 lb. of increase.

"Mr. Lawes points out that if instead of allowing the pig to have as much barley meal as he will eat, the 500 lb. of meal had been made to last many more weeks, the result would have been that the animal would have appropriated a correspondingly larger proportion of the food for the purposes of respiration and perspiration, and a correspondingly less proportion in the production of increase. In other words, if the 500 lb. of barley meal were distributed over a longer period of time, it would give less increase in live weight, and a larger proportion of it would be employed in the mere maintenance of the life of the animal. Indeed, if the period of consumption of the 500 lb. of meal be sufficiently extended, the result will be that no increase whatever will be produced, and that the whole of the food, excepting the portion obtained as manure, will be expended in the mere maintenance of the life of the animal.

"The conclusion is obvious, that, provided the fattening animal can assimilate the food, a given amount of increase will be obtained with a smaller expenditure of constituents by respiration, the shorter the time taken to produce it. In fact, by early maturity, and the rapid fattening of stock, a vast saving of food is effected.

"Mr. Lawes has lately made a practical use of the conclusions to which his Rothamsted researches have led him in connection with another branch of farm practice. In a paper read before the London Farmers' Club, on the exhaustion of the soil in relation to landlords' covenants, and the valuation of unexhausted improvements in favour of an outgoing tenant, he drew a distinction between the natural fertility of the soil, which is the property of the landowner, and the 'condition' of the soil, which is often properly the property of a tenant. The following are the practical results which he considers follow upon his discussion of this subject :—

"'Condition' is a quality distinct from natural fertility of soil, and is mainly dependent on the amount of capital expended by the tenant in the purchase of cattle food or manures. It is, therefore, his property, and may be easily and rapidly reduced.—The natural fertility of a soil, on the other hand, whether high or low in degree, is, comparatively speaking, a permanent quality; it can only be injuriously affected by the continuance of an exhaustive system of cropping for a long period of time; it is the property of the landlord; and, excepting in the case of very light soils, it is the chief element in determining the rent-value of the land.—No injury is likely to result to the landlord in the case of the heavier soils from granting the tenant permission to crop as he pleases, provided he be bound to keep the land free from weeds, and to leave a fixed proportion under fallow and green crops at the termination of his occupation.—By the valuation of so much of the farmyard manure, and of so much of the manure constituents derived from purchased cattle food, as have not yet yielded a crop, and also of the straw of the last harvest, fair compensation may be made to the outgoing tenant.—If abundant capital is to be attracted to the soil, it is essential that liberal covenants, in regard to cropping, should be adopted, and fair compensation for unexhausted improvements made.

"Among the remaining principal events which have lately happened in the agricultural world, must be named the remarkable favour with which the so-called 'A. B. C.' process, for dealing with the town sewage nuisance, has been received by many towns on which the adoption of it has been urged. Chemical analysis does not endorse the extravagant assertions which have been made regarding the merits of the process. The water is still foul after sewage has beeen acted on by the 'A. B. C.' mixture; and the dried mud which it throws down, for which 70*s.* a ton is the price demanded, is not worth, even theoretically, one half that sum; while, practically, it must be pronounced of very little value indeed. The valuation of 1 or 2 per cent. of 'combined nitrogen' in the midst of a mass of clay and other inert mineral matters, cannot be conducted on the same scale as is applicable to the ammonia of a manure in which it forms 1-6th or 1-7th of the total weight. And in addition to the lower theoretical value of 'combined nitrogen' in this diluted form, it is practically so much the less valuable on account of being loaded with a lot of worthless stuff, the expense of applying which to the land has to be deducted from any result of the application, which may be due to the small quantity of fertilising matters with which it may be charged. Nothing connected with this or any other scheme for sewage utilisation has at all shaken the conclusion, to which the Rivers Pollution Commissioners had been led by their investigations, that sewage irrigation is not only the best method of sewage defæcation, but the only known plan by which its filth may be profitably converted into fertility."

Second Report of the Commissioners appointed in 1868 to inquire into the best means of Preventing the Pollution of Rivers. *On the "A. B. C." Process of Treating Sewage.* Her Majesty's Stationery Office.

The following is an additional extract from this Report, referred to last week :—

"*The 'A. B. C.' Process compared with Irrigation.*—In thus humbly submitting to your Majesty these results of our investigation into the 'A. B. C.' method of treating sewage, we have endeavoured to confine ourselves to a positive statement of the case; but it would not be right to conclude without comparing them with those which have been obtained, where sewage has been submitted, not to the action of limited quantities of chemicals in a tank, but by means of irrigation, to the action of a vast mass of soil, whose surface is covered with growing plants which it feeds, whose depth is penetrated by their hungry roots, and whose whole substance provides an immensely greater quantity of material efficient for sewage defæcation than can be supplied by any of the so-called chemical processes which have been or can be invented for this purpose.

"If we except the laboratory experiments in the treatment of sewage by intermittent downward filtration described in our first report (Report on the Mersey and Ribble Basins, vol. i., pp. 63-70), no other method of sewage defæcation approaches irrigation in the uniform excellence of its results. It is no doubt very desirable, in the interest of those towns where sewage cannot be dealt with by irrigation, that an experiment in intermittent downward filtration should be conducted on what may be considered a working scale, when all those difficulties would arise which do not show themselves in a laboratory experiment, and when it would be proved whether the process can be conducted on the drainage water of, say, 20,000 people with the efficiency to which our laboratory experiments pointed, and without creating a nuisance. But the best result under that system would simply be the conversion of a polluting into a non-polluting stream. The injury done by town sewage would in that case disappear, but the agricultural value of it would be wholly lost. By using it in irrigation, on the other hand, the nuisance vanishes, while the fertilising influence is retained and utilised.

"By the 'A. B. C.' process, again, it is plain from our investigations that neither of these results is attained. Considered as a method of merely cleansing sewage, it is compared with irrigation in the following Table, where the composition of the effluent water at both Leicester and Lennington is contrasted with that of the effluent water from the sewaged fields at Norwood and at Croydon, the one a clayey soil, and the other gravelly and open.

"It is plain from the figures in these two Tables, and especially from those in the 1st, 2d, and 3d columns, not only that the 'A. B. C.' method falls altogether below irrigation in its powers as a mode of sewage defæcation, but that it altogether fails—never in any instance approach-

ing even in its maximum results those standards of purity below which we have recommended (Report on the Mersey and Ribble Basins, vol. i., p. 130), that no water shall be discharged into running streams. And if this failure be charged upon any alleged unfairness in the conditions under which the experiments took place at Leicester and at Leamington, it must be pointed out in reply, that when the experiment was tried in the laboratory under circumstances which excluded all possible sources of error, the same result was still more unmistakeable; and the contrast of this failure with the uniform success of irrigation in sewage defecation becomes still more remarkable.

PURIFICATION OF SEWAGE BY IRRIGATION.—Results of Analysis expressed in Parts per 100,000.

Locality and season.	1 Total solid matters in solution.	2 Organic carbon.	3 Organic nitrogen.	4 Ammonia.	5 Nitrogen as nitrates and nitrites.	6 Total combined nitrogen.	7 Chlorine.
Norwood: raw sewage	94·9	3·072	1·580	6·032	0	6·454	8·69
Norwood:							
Spring effluent water	57·1	1·580	·393	·816	·220	1·104	5·37
Summer do.	80·9	1·883	·412	·496	·097	1·301	11·03
Autumn do.	87·3	1·342	·203	·585	7·14	1·023	8·54
Winter do.	87·0	1·271	·173	·870	·313	1·225	7·71
After seven days' frost (effluent water).	89·8	1·350	·413	1·145	·156	1·504	8·84
Croydon, raw sewage	45·7	2·598	1·951*	3·066	0	3·527	4·28
Croydon:							
Spring effluent water	37·4	1·514	·164	·072	2·25	3·80	2·32
Summer do.	33·4	·607	·126	·093	·155	3·00	2·57
Autumn do.	42·1	·699	·139	·188	·589	·762	3·20
Winter do.	47·6	·632	·145	·094	5·3	·840	2·72
After seven days' frost (effluent water).	45·1	·591	·239	·371	·415	·092	2·78

* The average quantity of organic nitrogen in 100,000 parts of the raw sewage of Croydon is erroneously stated as 1·576 in page 88, vol. i. of our first report (Report on the Mersey and Ribble Basins), where the amount has been miscalculated from analyses accurately given in a previous Table, p. 29 of that report.

PURIFICATION OF SEWAGE BY "A. B. C." TREATMENT. Results of Analysis expressed in Parts per 100,000.

Locality and season.	1 Total solid matters in solution.	2 Organic carbon.	3 Organic nitrogen.	4 Ammonia.	5 Nitrogen as nitrates and nitrites.	6 Total combined nitrogen.	7 Chlorine.
At Leicester:							
July, ... { Raw sewage	111·5	[illegible]	7·15	1·705	·215	2·16	—
... { Effluent water	110·0	[illegible]	·005	·265	0	2·18	—
At Leamington:							
Dec. 11, { Raw sewage	83·5	4·873	2·693	7·071	0	7·807	11·0
... { Effluent water	90·0	1·129	1·102	5·345	0	6·342	11·0
At Leamington:							
May 10, 11, { Raw sewage	118·1	5·745	2·1	8·647	0	9·666	14·15
... { Effluent water	119·5	4·727	1·532	5·070	0	6·330	14·15

"We have, in our previous report (Report on the Mersey and Ribble Basins, vol. i., p. 88), given the composition of 31 samples of effluent water taken at regular intervals throughout an entire year as it flowed from the irrigated meadows at Croydon; on only one occasion was the condition of the water unsatisfactory, and even then but slightly so. We also analysed this water twice during the severe frost last winter, when it might be expected that the purifying action both of soil and plant would be at its minimum; but even under these unfavourable circumstances the effluent water was perfectly satisfactory, being much within the standards of purity suggested in our first report. Only on two occasions were the authorities connected with the irrigation aware that samples were about to be taken.

"At Croydon, indeed, the conditions are very favourable for the cleansing of the foul liquid; the soil is very porous and the raw sewage weak; but at Norwood the conditions are unfavourable; the soil over the greater part of the farm is a stiff clay and the raw sewage strong; consequently, as might have been expected, the effluent water was not so completely purified as at Croydon. Yet even here, and in its worst condition, it was much superior to anything that has ever been achieved upon a working scale by any other means. Here also 30 samples were analysed, taken at regular intervals throughout a whole year, and, except on one occasion, without any previous notice to the manager.

"On the other hand, we have never taken a sample of effluent sewage that had been subjected on a working scale to any other cleansing process, which was not still so highly charged with putrescible animal matters as to be utterly unfit for admission into running water.

"Irrigation is the only process of cleansing sewage which has stood the test of experience, and unless it be extensively adopted, there is but little hope of any substantial improvement in our sewage-polluted rivers.

"Considered merely as a method of utilising the valuable manuring substances which town sewage carries with it, the contrast between the 'A. B. C.' and irrigation processes is no less obvious. Thus the first Table shows (col. 6) that at Norwood (where the results are not complicated by the mixture of any unpolluted water with the effluent liquid) a proportion, varying from less than three-quarters during autumn and winter to nearly five-sixths during the growing season, of the total combined nitrogen of the sewage was extracted and utilised during irrigation; while at Leamington the proportion extracted by the 'A. B. C.' process, taking the average of the three experiments reported in the second Table was not one-eighth; and from the laboratory experiment it appeared that no influence whatever was exerted by the 'A. B. C.' process on the total combined nitrogen, which is the characteristic manure ingredient of sewage—the quantity in the original sewage being actually increased in the effluent water by a portion of that present in the added chemicals. In fact the 'A. B. C.' manure is little more than the original suspended solid matter of raw sewage, *plus* the insoluble materials added in the 'A. B. C.' mixture, 19-20ths of these being merely clay. The suspended solid matters of sewage arrive at the works after being roughly driven through the sewers of a town—every 10 cwt. of them carried along in 1000 tons of water,—and it is not possible to imagine that they retain in them on their arrival much that is soluble or valuable. They are then allowed to subside along with an equal quantity of clay; being indeed materially helped to subside by the added alum, which may also throw down a trifling proportion of the organic nitrogen dissolved in the sewage water; a proportion which, though insignificant considering the quantity it leaves untouched, may nevertheless be enough, over the immense flow of sewage passing through the exit sewer of any considerable town, to add 1 or 2 per cent. of nitrogen to the subsided mud. The result is a manure theoretically worth probably one half more than that resulting from the Leicester lime process, 20 tons of which, according to a chemical valuation, ought to be worth as much as one ton of Peruvian guano, but for which not more than one shilling per ton can be obtained from the farmers of the district.

"Contrast this with the efficiency of irrigation as a utiliser of the manure ingredients of town sewage. All these ingredients are in this case taken to the land; and three-fourths of them in winter, four-fifths or five-sixths of them in summer, are left there for the use of growing plants; the remainder being rendered harmless. These manure materials are thus carried, distributed, and buried; and thus, without the costly labour of the dung cart, manure distributor, or plough, they are brought to the very roots they are to feed; and the fertility they accordingly produce is unexampled otherwise in English agricultural experience. The process can be carried on without offence to any but those who go close to the tanks or channels; and it can be conducted, as the experience of many years at Edinburgh and Croydon proves (see Report on Mersey and Ribble Basins, vol. i., p. 90), without injury to health. We have therefore no hesitation in recommending irrigation as the only plan of dealing with the sewage difficulty at present known to us which at once abates a nuisance and turns to profitable account an otherwise valueless material."

Farm Memoranda.

Isle of Ely: *July* 2.—At length the weather has broken, and the extreme drought of the spring and early summer has been followed by copious showers, which have fallen very partially. The electric display of Thursday night the 16th ult., which appeared to be more general, will not soon be forgotten. The effect of the change upon vegetation has been marvellous. Some of the corn which was short and seemed as if it would have difficulty in shooting into ear at all, is now well out, and much longer in the straw than was thought possible before the rains came. The Wheat crop varies considerably. There was a great loss of plant in the late winter and early spring months, all over the Fens. Some of these thin crops have improved greatly, whilst others still continue very poor. Perhaps we should not be far wrong if we were to take these improved crops as about the average of the whole. The uninjured and good crops, with the poorest and worst, would together probably about equal these. Taking this view of it, we think Wheat will require to ripen up kind and well in every respect for it to produce an average yield, which we put at 4½ quarters per acre. The Wheat has a very good ear, which appears to be filling well; the weather has been favourable hitherto, and requires to be generally fine, if we are to have the grain ripened to the fullest perfection. Too much moisture might occasion mildew, a disease to which thin crops are always extremely liable, and from which in nine years out of ten they suffer: and should they be thus affected this season, the yield will be considerably diminished. With everything favourable up to and during harvest, we may approximate to, possibly realise, an average crop. Oats are generally a good plant, less injured by wireworm than usual, and bid fair to be a yielding crop, not being so long in the straw and so liable to be lodged by heavy showers as in moist seasons. Winter Beans are poor, and spring Beans vary according to the nature of the soil; on cool clays they look very well, on warm lands they are short. Barley, too, has suffered on gravelly soils, and will vary very much both in quality and quantity. Potatos look extremely promising and hopeful. Mangel and Kohl Rabi are not uniformly good in plant, but are generally growing well, and there is the prospect of a good supply of this description of winter food. Hay is unusually short, and the pastures perfectly bare and barren where full stocked, and even the good showers we have had appear to produce but little growth at present. A constant succession of showers is required to make these lands speedily fruitful. The corn trade has been somewhat active, but has again become slow and heavy. *A. S. R.*

Mersey of Berwickshire: *July* 4.—If gusty winds are good for blooming Wheat, then are our prospects good indeed. No doubt they will not fill up blanks, but then "fine" weather puts everything right. Snuffy heads have been very bad among Oats these two past years (it is too early to speak for this year), but we do not recollect seeing them among Wheat until now. This immunity of Wheat we have hitherto ascribed to the sulphate of copper with which the seed is dressed, as a preventive of ball or bunt. Early-sown Barley looks well, and Oats on rich land; all other sorts want rain very much. Rain we have had to the depth of 3 inches since the beginning of the Turnip season; but, a few hours' wind, and all trace of it is gone. This it is that has given the fly such a vantage, and placed the general root crop of the country in such a serious position; for, if some of us are fortunate enough to have a large portion of our braird in comparative safety, it seems to be owing to our luck in catching a showery day or two just after brairding. Previous experience is confirmed—the first sowing of Swedes is the best, if there be but two or three plants left to the yard. The second sowings have just served as fresh salad for the beetles. Many large fields show nothing but dirt, especially where brilled up before seed time; and many a farm has not a Swede plant to show. With one or two exceptional fields, hay is the lightest crop seen for many years. Potatos are very blanky, forming young tubers without having sent any show aboveground. *T. T.*

Miscellaneous.

Damage to Crops by Hares.—Mr. Angas, of Beeford Grange, having been urgently requested by the committee of the Burlington Chamber of Agriculture to give them the substance of his address, delivered before the Beverley Chamber, said:—"It has, on several occasions, fallen to my lot to take cognisance of the mischief caused by hares to growing crops of corn and Turnips; and I can conscientiously affirm that the awarded amount has always, in my opinion, fallen short of what any disinterested and competent person could pronounce the true one. Farmers do not like to place the full extent before landlords, and they admit this. Let anyone some evening in the middle of June pass through a field of Wheat where hares abound; and let him observe how in five minutes one hare will clip off twenty heads of Wheat to obtain the small quantity of saccharine matter above the top joint; let him remember this may be done, and is done, by any given quantity of hares 20 times in a night, and 20 nights in the ripening season. Let him ascertain the multiple of the first 20 ears, and then say if 'farmers over-estimate;' if hares, as they overrun hundreds of English farms, are not literally 'pestilence walking in darkness, and a destruction wasting at noonday.' Of all the cants in this canting world that to me is the most tormenting, which, in the face of absolute and demonstrated proof, goes on quibbling and doubting and misgiving, which advocates larger investments of capital and bolder conceptions in culture; and becomes blind or apologetic when actual mischief is brought to light; and when a deficiency is pronounced of 33 quarters or 17 acres, exclaims, 'Farmers always over-estimate their damage.' A member of Parliament, in writing the other day, said, 'There are many sides to the question.' In reply, I stated my belief that there were but two—the right and the wrong, and that if the one was allowed to preponderate and override the other, however Chambers of Agriculture might oppose or stand neutral, Government would inevitably interfere."

If we had had a Minister of Agriculture, the reclamation of wastes or enclosure of commons would have proceeded with more order; earlier provisions would have been made for the drainage of settled estates; but, above all, had there been such a minister, it would have been impossible that in the last twenty years manure sufficient to grow 400 million quarters loaves could have been consigned to pollute the rivers and waste in the sea. Such a minister, with a few clerks, would have looked after these and other

matters. He could also have inquired into the cattle plague; and he would long ago have organised an agricultural census. His small yearly blue-book on the state of agriculture would have let us know, step by step, how far we were right, or how much we could rely upon; and more than that, it would have enforced on us our deficiencies. It is not an expensive administrative staff which necessarily follows from the establishment of a ministry,—it may be a small staff,—but it is the constant and organised supervision, and the adequate enforcement of responsibility, which does the effective work. *Food Journal.*

The Week's Work.

JULY 16.—*Summer Meetings* during the month, more especially the Oxford meeting of the Royal Agricultural Society, serve the twofold purpose of a holiday and practical education. And the latter is not confined to implements and live stock, for the crops along the various railways leading to Oxford and other places afford this year more than an ordinary amount of educational information. It is, in short, the best education farmers' sons and daughters can get; for besides what they see and hear at the time, it turns the mind, on their return home, out of the antiquated path of the past into a new channel; thus, like the straightening of a river, giving greater force to the current of thought.

Labourers' Holidays.—The growing practice of sending farm labourers to their respective county meetings, and to the meeting of the Royal Agricultural Society of England, when within reach, is attended with the best results. No class stands more in need of practical education of this kind, for when confined at home for life they are apt to treat the introduction of improvements by their employers as an innovation of their own rights, and to carry them out accordingly with an unwilling hand and unfriendly spirit; whereas when they see the competition at these meetings, they are able to appreciate their practical worth often better than their employers—consequently they return home big with a spirit of enterprise, anxious for an opportunity to show what they themselves can do. We do not approve of sending farm-servants to learn the catch-penny extravagance too common in all our large towns; but a farmer cannot invest his capital better than by giving his labourers a holiday at our agricultural shows, ploughing matches, &c.

Rye-grass seeds are generally harvested about this time. In the northern counties, where a fourth or fifth part of the farm is annually sown with Rye-grass, most farmers grow their own seed. Like Wheat, the crop is cut a little before it is dead ripe, and it is better to cut rather green than otherwise, for when too ripe the best seed is lost in the harvesting. It is generally bound in sheaves, when newly cut, and stooked and stacked the same as Oats and Wheat. It requires to be thoroughly dry in the stook, in order to prevent heating in the stack, to which it is very liable. Farmers who allow their land to lie two years in grass, as in the five-course shift—(1) Turnips, (2) Barley), (3 and 4) grass, (5) Oats—require to be very careful, so as to avoid sowing annual Rye-grass. For this purpose they frequently grow their seed from the second year's grass. To avoid heating some thresh out the seed in the field as soon as the threshed hay is fit for the "trampcock," and then spread the seed thinly over the granary, turning it frequently until thoroughly dry. Others thresh out what seed they require with flails, in the field, during the ordinary operation of haymaking, the hay from the temporary threshing floor being built into trampcocks. This method, however, is not generally commended, for two reasons,—(1), either the grass is too ripe before it is cut, or else there is much inferior light seed in the sample, whilst the seed is liable to injury in the granary; (2), the threshing breaks and injures the hay. Some farms produce a finer sample of Rye-grass than others, and therefore it is common for the occupiers of such farms to grow for market, and for those farmers whose seed degenerates in quality to bespeak at this season as much as will give them a change.

Turnip seed is generally ready for harvesting this month. It should always be cut with a sharp reaping-hook. Some leave it in small loose parcels, and when ready for the threshing-floor, thresh out with the flail, the threshing-floor (a few boards nailed together in in the form of a door) being placed on canvas to save the seed. Small quantities are often threshed cut with a rod; others tie up the crop in small sheaves as fast as cut, stack and thatch immediately. In stacking, the bottom sheaves are placed upon their butt-ends erect, the others are then laid slanting over them, the butts outward, and as loose as possible. If the stack is of any considerable size, there should be a tripod of three poles in the middle to prevent it settling down before the straw and seed are thoroughly dry, so as to obviate mouldiness and insects. Threshed seed in the granary is also liable to be eaten with insects, and therefore it should be frequently examined. Some fumigate with weak fumes of sulphur or pyrolignic acid, others mix a small quantity of soot with the seed, to prevent the ravages of insects. Small quantities are hung up in bags in the kitchen chimney, and when sufficiently smoked to prevent insects touching the seed, the seed bags are then removed, and hung up in a dry place until seed time. In each of these plans the necessary care requires to be taken, so as not to injure the vegetative powers of the seed, otherwise it will braird weakly and unequally. In some of our great stock-breeding and fattening districts, where Turnip husbandry is the soul of farming, very great attention is paid to the harvesting and procuring of Turnip seed.

Corn Harvest commenced last week with the cutting of Oats. We never saw this crop so unequal, and care requires to be taken to prevent it becoming too ripe, as a single day makes a great difference. *W. B.*

Notices to Correspondents.

TO IMPROVE GRASS LANDS: *J. F. M.* says: "We have a pasture of about 1 acre, or less, which is divided into two parts by a fence, so as to afford a change of feed for two Alderney cows; but apart from the supply of fodder this affords, they have oilcake, hay, &c. Originally this pasture was a lawn belonging to a residence; so that it was closely mown during the growing season. The soil is a sandy loam, and the situation somewhat elevated, so that the drainage is good, and there is every facility for giving it plenty of water during dry weather. Now, we are anxious to improve this pasture, so as to obtain from it as much pure feed as possible, and that of a luxuriant growth—for at present it abounds with weeds that have outgrown the grass in many spots of it. We should be thankful for any advice as to the best means of changing its present condition into a state of fertility." [To get rid of weeds, and promote the growth of grass, give repeated dressings of 1 cwt. of sulphate of ammonia, and 3 cwt. of Peruvian guano per acre, in wet weather, during spring.]

Markets.

HOPS.

BOROUGH MARKET, July 13.

The favourable accounts received from the Hop plantations continue to exercise an influence upon the market, and prices are very weak. Brewers are well supplied, and will not resume operations until the effect of the new yield upon prices has been ascertained. Scarcely any business is passing, therefore, and our quotations are nominal—Mid and East Kents, £7 to £12, Weald of Kents, £6 to £10, Sussex, £5 5s. to £9 0s., Yearlings, £1 5s. to £3 3s. per cwt.

ENGLISH WOOL.

CURRENT PRICES OF ENGLISH WOOL. Per lb.

	s. d.	s. d.
FLEECES: Southdown hoggets	1 1	to 1 2
Half-bred ditto	1 2	1 2½
Kent Fleeces	1 3	1 4
Southdown ewes and wethers	1 0	1 1
Leicester ditto	1 2	1 3
SORTS—Clothing	0 11	1 0
Combing	1 0	1 8

HAY: per Load of 36 Trusses.

SMITHFIELD, Thursday, July 14.

Prime Meadow Hay	110s. to 120s.	Clover, old	130s. to 140s.
Inferior do.	100	Inferior do.	120
New Hay	100	Prime new do	110 120
Inferior do.	70 80	Inferior do.	90 100
Straw	24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, July 13.

Sup. Meadow Hay	115s. to 126s.	Inferior Clover	110s. to 120s.
Inferior do.	105 110	Prime 2d cut do.	— —
New do.	90 100	New do.	105 126
Inferior do.	70 80	Straw	32 36
Superior Clover	130 140	JOSHUA BAKER.	

WHITECHAPEL, Thursday, July 13.

Fine Meadow Hay	112s. to 126s.	Prime old Clover	135s. to 147s.
Inferior do.	100 110	Inferior do. do.	105 115
Prime New Hay	90 100	Prime 2d cut do.	130 140
Inferior do.	85 95	New Clover	115 130
Straw	25 34	Inferior do.	99 105

METROPOLITAN MEAT MARKET.—July 14.

Best Fresh Butter .. .. .. 17s. per dozen lb.
Second do. do. .. .. .. 15s. "
Small Pork, 5s. 6d. to 5s. 4d.; Large Pork, 4s. 6d. to 4s. 4d. per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, July 11.

Although the number of Beasts is smaller than on Monday last, it exceeds the demand; our top quotations are quite the extreme for choicest qualities, and several lots of inferior remain unsold. The supply of Sheep is also smaller, but the demand is very limited, and our quotations are with difficulty obtained; a clearance cannot be effected. Trade is dull for Lambs and Calves. Our foreign supply consists of 1670 Beasts, 9490 Sheep, 260 Calves, and 20 Pigs; from Scotland there are 19 Beasts; from Ireland, 20; from Norfolk and Suffolk, 480; and 1251 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5 2	10 5 4	Best Long-wools	..	to ..
Best Shorthorns	4 10	5 2	Do. Shorn	4	10—5 0
2d quality Beasts	3 4	4 4	Ewes & 2d quality	..	.. — ..
Best Downs and Half-breds	..	.. — ..	Do. Shorn	..	4 4—4 8
Do. Shorn	5	2—5 6	Lambs	..	5 4—6 4
			Calves	..	3 4—5 4
			Pigs	..	3 0—5 0

Beasts, 3440; Sheep and Lambs, 23,780; Calves, 280; Pigs, 240

TUESDAY, July 14.

We have a larger supply of Beasts than last Thursday; we are not overdone with choice qualities, and the demand has increased, consequently prices on the average are better. The number of Sheep is about the same as last week; trade is more active, and prices are rather better. Choicest Lambs are in demand, but inferior are still with difficulty disposed of. The Calf trade has improved. Our foreign supply consists of 331 Beasts, 3640 Sheep, 442 Calves, and 110 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5 2	10 5 4	Best Long-wools	..	to ..
Best Shorthorns	4 10	5 2	Do. Shorn	4	10—5 2
2d quality Beasts	3 4	4 4	Ewes & 2d quality	..	.. — ..
Best Downs and Half-breds	..	.. — ..	Do. Shorn	..	4 4—4 8
Do. Shorn	5	2—5 6	Lambs	..	5 4—6 4
			Calves	..	3 4—5 4
			Pigs	..	3 0—5 0

Beasts, 1127; Sheep and Lambs, 15,670; Calves, 600; Pigs, 130.

MARK LANE.

MONDAY, July 11.

There was a moderate supply of English Wheat to this morning's market, which was sold at the extreme prices of this day se'nnight. The attendance was fair, and with a moderate demand for foreign factors were in some instances enabled to obtain an advance of 1s. per qr. upon Russian and American. Barley was 6d. per qr. dearer. Beans and Peas fully as dear. The Oat trade was firm, at an advance of 6d. to 1s. per qr. Barrel Flour brought 6d. more money.

PRICE PER IMPERIAL QUARTER.	s.	s.
WHEAT, Essex, Kent, Suffolk. White	47—53	Red..... 45—53
— — fine selected runs..do.	50 57	Red..... 48—55
— — Talavera	51—60	
— — Norfolk	—	Red..... —
— — Foreign	42 60	
BARLEY, grind. & dist., 26s to 30s...Chev.	39—42	Malting .. 34 38
— Foreign .. grinding and distilling	22—30	Malting .. 39—40
OATS, Essex and Suffolk	22 24	
— Scotch and Lincolnshire.. Potato	24—26	Feed .... —
— Irish ..... Potato	23—25	Feed .... 21—24
— Foreign .....Poland and Brew	25 27	Feed .... 20—25
RYE	32—36	Foreign .. 33—36
RYE-MEAL, Foreign		
BEANS, Hazagan.....34s. to 43s.	Tick	34—46 Harrow .. 34—46
— Pigeon .....40s. to 55s.	Winds. —	Longped .. —
— Foreign.....	Small	41—43 Egyptian . 38—40
PEAS, White, Essex, and Kent..	Boilers	34—38 Suffolk .. 37—40
— Maple, 33s. to 40s.	Grey	32—35 Foreign .. 33—37
MAIZE		Foreign .. 30—32
FLOUR, best marks delivered.. per sack		39—47
— 2d ditto	ditto	29—41 Country .. 29—41
— Foreign.....	per barrel	24—27 Per sack.. 32—58

WEDNESDAY, July 13.

The supply of English Wheat on sale here to-day was small, but fully equal to the demand. Millers acted very cautiously, and for immediate consumption only, but there was no disposition on the part of factors to accept lower rates. The more pacific appearance of Continental politics holds out the hope that our import trade will not be interrupted, and an important feature has accordingly been removed from the market. Foreign Wheat changed hands to a fair extent on former terms. Barley was more inquired after, and both grinding and distilling sorts ruled steady in value. Malt was dull at nominal currencies. There was a fair demand for Oats, which sold at the full rates of Monday last. Beans and Peas were held at extreme rates. The Flour trade was inanimate; town-made Flour was unaltered, but foreign and country marks were drooping in value.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	600	—	—	—
Irish ..	—	—	—	—
Foreign ..	5090	1880	35,050	880 (1330 brls.
	5690	1880	35,050	

LEEDS, July 12. We have no great chance of drawing supplies from the east coast or any Baltic port, so long as Wheat is worth so many shillings more in the producing Market than in these, and stocks in warehouses are all but exhausted; this, with the agitated state of the political world, tends to impart much firmness to the trade, and holders of Wheat are scarcely disposed to offer anything for sale. No alteration in other articles.

AVERAGES.

	Wheat.	Barley.	Oats.
	45s 3d	32s 0d	23s 0d
June 4	46 1	33 1	22 0
— 11	48 0	32 5	25 0
— 18	50 5	33 3	25 1
— 25	51 6	32 0	25 10
July 2	50 7	30 3	25 8
— 9			
Average ..	48 7	32 2	24 5

SEED MARKET.

The past week, as must be expected at this time of the year, has been rather a quiet one in the agricultural seed trade; the recent rains have, however, caused an improved demand for seeds required for present sowing, such as Mustard and Rape seed; both these descriptions move off freely, at full rates. Parcels of new Rape and Mustard seed will be offering in the course of a week or two. We have a fair inquiry for new Trifolium. There has been some speculation in Alsike seed. In Clovers and Trefoils there is nothing passing just now. Bird seeds are without alteration. Feeding Tares and Linseed are firm.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—July 13.

Walls End Hetton, 17s. 6d.; Walls End Hetton Lyons, 15s.; Walls End Hartlepool, 10s. 6d.; Walls End Kelloe, 15s. 9d.; Walls End Original Hartlepool, 17s. 9d.; Walls End South Kelloe, 16s. 6d.; Brancpeth Cannel, 18s.—Ships at market, 17; sold, 12; unsold, 5; at sea, 30.

BY H. M. ROYAL LETTERS PATENT.

WEEKS'S

PATENT DUPLEX COMPENSATING UPRIGHT TUBULAR BOILER.

IS INDESTRUCTIBLE.

IS GUARANTEED FOR PERFECT SAFETY.

CAN BE EASILY CLEANED OUT.

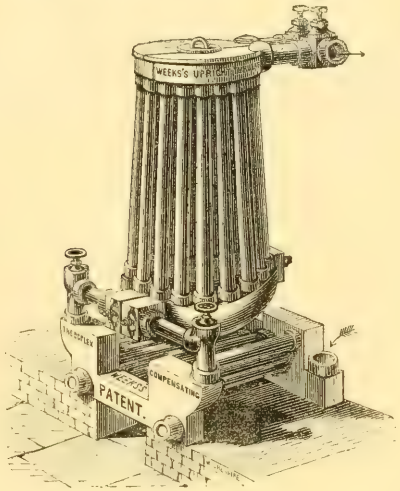

TEN YEARS GUARANTEE GIVEN.

EITHER HALF MAY BE WORKED SEPARATELY.

NO OTHER BOILER OFFERS THESE ADVANTAGES.

WEEKS'S PATENT DUPLEX BOILER

Is the ONLY ONE to which a FIRST-CLASS CERTIFICATE was AWARDED at the July, 1870, EXHIBITION of the ROYAL BOTANIC SOCIETY, REGENT'S PARK, LONDON.

WEEKS'S PATENT DUPLEX UPRIGHT TUBULAR BOILER

Will be EXHIBITED in the HORTICULTURAL DEPARTMENT of the FORTHCOMING OXFORD SHOW, July 18, 1870.

WEEKS'S "BOOK OF DESIGNS" (12TH EDITION)

Post Free on application.

John Weeks & Co.

HORTICULTURAL BUILDERS AND HOT-WATER APPARATUS MANUFACTURERS,
KING'S ROAD, CHELSEA, LONDON, S.W.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING AND BUDDING KNIVES, see that you get them Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (Iron Wharf), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers

N.B. Open Tanks of different sizes packed one in another to save carriage.

Cottam's Iron Hurdles, Fencing, and Gates.

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.

Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

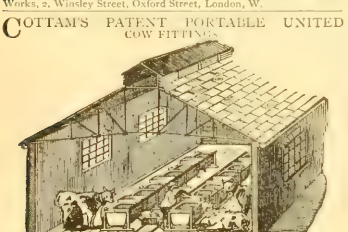

Their advantages are—Comfortable, not restless; removable at pleasure; no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, in reason with and depth of Feeding Troughs, Water Storm, and Patent Drop Cover to prevent over-gorging. Durable, detached, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street opposite the Pantheon, Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES

	Each—s. d.		Each—s. d.
2 inches in diameter	.. 0 4½	12 inches in diameter	.. 1 0
3 " "	.. 0 4½	13 " "	.. 2 0
4 " "	.. 0 6	14 " "	.. 2 6
5 " "	.. 0 6½	15 " "	.. 3 0
6 " "	.. 0 8	16 " "	.. 3 6
7 " "	.. 0 10	17 " "	.. 4 6
8 " "	.. 1 0	18 " "	.. 5 0
9 " "	.. 1 2	19 " "	.. 6 0
10 " "	.. 1 4	20 " "	.. 7 0
11 " "	.. 1 8		

BELL GLASSES, with ventilating hole through knob

4 inches in diameter	.. 0s. 6d.	9 inches in diameter	.. 1s. 8d.
5 " "	.. 0 8	10 " "	.. 2 0
6 " "	.. 0 10½	11 " "	.. 2 6
7 " "	.. 1 1	12 " "	.. 3 0
8 " "	.. 1 4		

Either flat or conical tops.

CUCUMBER GLASSES.

24 inches long	.. .. 2s. 6d.	30 inches long	.. .. 4s. 3d.
27 " "	.. .. 3 3	36 " "	.. .. 5 6
20 " "	.. .. 1 8	12 " "	.. .. 2 6
18 " "	.. .. 1 6		

HAND GLASSES, WITH OPEN TOPS

	Each—s. d.		Each—s. d.
12 inches	.. .. .. 0 6	20 inches	.. .. .. 10 6
14 "	.. .. .. 7 6	22 "	.. .. .. 11 6
16 "	.. .. .. 8 6	24 "	.. .. .. 12 6
18 "	.. .. .. 9 6		

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

GREEN'S PATENT SILENS MESSOR,

OR

NOISELESS LAWN MOWING, ROLLING AND COLLECTING MACHINES FOR 1870.

IMPORTANT NOTICE.

THOMAS GREEN AND SON would not again have referred to the Archimedean Lawn Mower, but seeing the Editorial remarks following the letter signed "D. T. Fish" in the *Gardeners' Chronicle* for July 2, at page 894, they are induced to do so for several reasons.

1st, The Editors claim for the Archimedean that it is the best "for amateurs, for small gardens, for uneven ground, for rough grass, for steep banks, &c." We take it, and believe that we shall be borne out by every practical Gardener, that the best Lawn Mower is the one that produces the best results with the least labour.

2d, They say that the Archimedean is the quickest, through no time being lost in stopping to empty the grass-box, which is known by practitioners—when the grass is at all thick—to be a somewhat tedious operation. Then they go on to say:—"To the scattering of the grass, instead of gathering it up, there is decidedly some objection, but where, as it is recommended, the lawn is cut regularly once a week, as it should be, the objection is very trivial; and in the other cases the time saved in the cutting compensates for the loss in having it swept up, if found desirable."

To the above remarks we make the undeniable assertion, that we can Mow and Collect with greater ease, either thick or short grass, and in less time than it can be swept up after it has been cut with the Archimedean Lawn Mower.

Either the Editors or we are at fault with regard to the merits of Lawn Mowers. We have offered and are still willing to have our Machines publicly tested again by competent judges, and if they do not bear out our statement, then the Editors' opinions will have proved to be correct; but if, on the contrary, our assertions are borne out by practical results, they must admit their error.

Copy of Letter received from the Council of the Royal Horticultural Society, South Kensington.—May 20, 1870.

"GENTLEMEN,—I am directed by the Council to inform you that your Lawn Mowing machine has been in constant use in their Gardens, at South Kensington, during the last two years, and that they have found it to work well, and to do its work in a satisfactory manner. I am, Gentlemen, your obedient servant,

"To Messrs GREEN & SON." JAMES BARNARD, Assistant Sec.

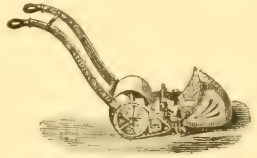

HAND MACHINE.

To cut 10 inches	£3 10 0	To cut 18 inches	£7 10 0
" 12 "	4 10 0	" 29 "	8 0 0
Suitable for a Lady.		" 22 "	8 10 0
To cut 14 inches	£5 10 0	" 24 "	9 0 0
" 16 "	6 10 0	*Suitable for Two Persons*	
Suitable for One Person.			

Prices of Horse, Pony, and Donkey Machines, including Patent Self or Side Delivery Box; Cross Stay complete; suitable for attaching to ordinary Chaise Traces or Gig Harness:—

Donkey and Pony Machines.			Horse Machines.		
To cut 26 inches	£13 0 0		To cut 30 inches	£21 0 0	
" 28 "	15 0 0		" 32 "	27 0 0	
" 30 "	17 0 0		" 48 "	30 0 0	
Leather Boots for Donkey, 18s.; ditto for Pony, 22s.			Leather Boots for Horse,		

The above Prices include Free Delivery to all the principal Railway Stations and Shipping Ports in England, Scotland, and Ireland.

The 26 and 28 inches can easily be worked by a Donkey, the 30 inches by a Pony, and the 32 inches by a Horse; and as the Machine increases in size in working, the most spirited animal can be employed without fear of its running away or in any way damaging the Machine.

Both the Horse, Pony, Donkey, and Hand Machines possess (over all other makers) the advantage of self-sharpening; the cutters being steel on each side, when they become dull or blunt by cutting one way round, the cylinder can be reversed again and again, bringing the bottom edge of the cutters against the bottom blade, when the Machine will cut equal to new. Arrangements are made that the cylinder can be reversed by any inexperienced person in two or three minutes.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned (carriage unconditionally).

THOMAS GREEN AND SON,

Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

N.B.—REPAIRS to LAWN MOWERS done at the London Establishment in the most expeditious manner, having every necessary appliance of Steam-power and Machinery same as at Leeds.

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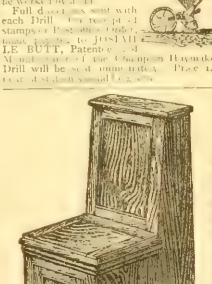

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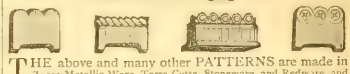

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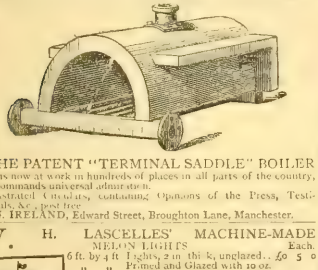

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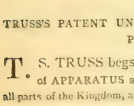

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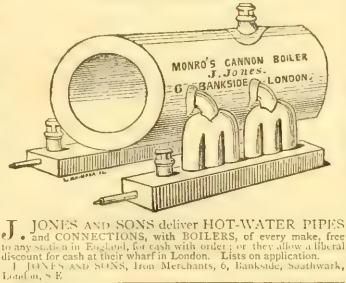

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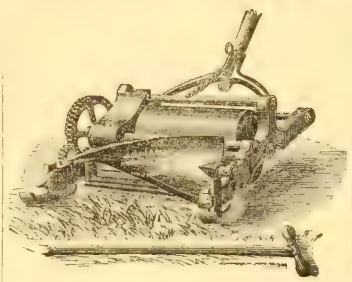

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The EDITOR *of the* "FIELD," *August* 21, 1869.

"We have tried it carefully against Machines by two of the best English makers, and have no hesitation in recommending it to our readers as being by far more easily worked than either of them, and at the same time leaving the turf with a beautifully even and close cut."

From A. F. BARTON, Esq., *Royal Horticultural Society, Chiswick Garden, W.*

"November 11, 1869.

"Gentlemen,—We have now had your 'Archimedean' Lawn Mower in use several months, and without hesitation I can truly say it is the best and most efficient implement of the kind we have ever used."

From Mr GEORGE WYNESS, *Royal Gardens, Buckingham Palace.*

"September 13, 1869.

"Gentlemen,—I beg to say that we have had your Patent 'Archimedean' Lawn Mower at work in Her Majesty's Gardens at Buckingham Palace for some time past, and I have much pleasure in testifying that it has given every satisfaction, as it does its work well and quickly."

From the Rev. EDWARD OWEN, *The Lodge, Bradwell-juxta-Mare, Maldon.*

"May 10, 1870.

"Gentlemen,—I am happy to say that the 'Archimedean' gives us great satisfaction; it is by far the best machine I have seen. My gardener, who, like myself, was afraid of it at first, is now delighted with it."

From Colonel FORBES, *The Holmes, St Boswells, N.B.*

"June 11, 1870.

"Gentlemen,—I beg to enclose cheque (£6 10s.) in payment of the Archimedean' Lawn Mower, and have great pleasure in bearing testimony to its high merit."

IMPORTANT NOTICE.

Since the introduction of the ARCHIMEDEAN LAWN MOWER into this country, it has met with a success that has surprised even the Manufacturers, confident as they were of its merits. During this, its first season, a larger number has been already sold than most of the English manufacturers sell in a whole year. Of course, it is not pretended that every purchaser thinks as highly of the Machine as do the high authorities quoted in the Circular; prejudice or clumsiness on the part of working men sometimes condemning the most useful inventions. The Advertisers, however, feel great gratification in stating that, although a trial is allowed with every Machine, very few indeed have been returned out of the very large number sold. This unprecedented success has, of course, materially affected the manufacturers of other machines, and some of them are naturally annoyed that a stranger should in so short a time upset the whole trade. One firm in particular, modestly premising that its machines are the best, has published a violent attack on the "Archimedean"—thus tacitly admitting that the New Lawn Mower is its most formidable opponent. The same firm, in another advertisement, gives an account of a so-called "interesting trial of Lawn Mowers," the result of which was, of course, in favour of their own Machine. Considering that the Manufacturers of the "Archimedean" were not only *not present*, but *knew nothing* of this "trial" (?) till they saw it announced in the advertisement, the *interest* is rather on one side. This method of attacking a successful opponent in business, however "interesting," has neither the advantage of originality nor the merit of fairness. A jury of gentlemen should hardly have adjudicated publicly between two rival machines when BOTH were exhibited by one competitor.

It is preferred to leave the merits of the ARCHIMEDEAN with the Public, to whom is offered a month's trial with each Machine, in order that its advantages may be fairly tested in working. This must be much more satisfactory to intending purchasers than any other plan for testing the invention, and is the best reply to the unscrupulous attacks of persons interested in the sale of other machines, whether made openly by manufacturers, or by their friends under the guise of disinterested advice to the Public. Continued use will but confirm the good opinion generally held of the ARCHIMEDEAN LAWN MOWER.

The ARCHIMEDEAN will be EXHIBITED at the ROYAL AGRICULTURAL SHOW, OXFORD, STAND No. 79.

Illustrated Catalogues and Testimonials Post Free on application.

WHOLESALE AND RETAIL AGENTS,

WALTER CARSON AND SONS,

LA BELLE SAUVAGE YARD, LUDGATE HILL, LONDON, E.C.; and

21, BACHELOR'S WALK, DUBLIN.

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 30.—1870. | SATURDAY, JULY 23. | Price Fivepence. Stamped Edition, 6d.

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LEE and BLACKHEATH HORTICULTURAL SOCIETY.—The FIRST SHOW of the season will be held in Blackheath Park, on WEDNESDAY and THURSDAY, July 27 and 28. Schedules, Forms, and all particulars may be obtained on application to the Secretary, SAMUEL BADMAN, Eltham Road Nursery, Lee, S.E.

WARRINGTON FLORAL, HORTICULTURAL, and POULTRY SHOW.—The EXHIBITION of PLANTS, FLOWERS, FRUIT, &c., will be held in WARRINGTON, on TUESDAY and WEDNESDAY, August 16 and 17, when upwards of THREE HUNDRED and FIFTY POUNDS will be awarded in PRIZES.

CLASSES OPEN TO GENERAL COMPETITION.
Extra Class.—10 Stove or Greenhouse Plants, in flower, 1st Prize, £12; 2d, £6; 3d, £3
8 Stove or Greenhouse Plants, 1st, £5; 2d, £3.
8 Ornamental Foliage Plants, 1st, £4; 2d, £2.
8 New or Rare Plants, 1st, £4; 2d, £2

CUT FLOWERS.
36 Roses, 1st Prize, £2; 2d, £1 18 Dahlias, 1st, £2; 2d, £1.

FRUIT.
Extra Class.—For the best Collection of Fruit, not less than 10 varieties, four of which may be Grapes. 1st Prize, a Silver Cup, value £5; or money if preferred, presented by Gilbert Greenall, Esq., Walton Hall, Warrington; 2d, £3; 3d, £2 (presented by the Society).

PRIZES GIVEN BY THE LADIES OF WARRINGTON
Group of Natural Flowers, in vase or ornamental stand, for centre of table, 1st Prize, £2; 2d, £1; 3d, 10s.
Bouquet for the Hand, 1st, £1; 2d, 10s; 3d, 5s.
Lady's Wreath, 1st, £1; 2d, 10s; 3d, 5s
The Exhibition Ground is within two minutes' walk of the Railway Station
A limited portion of ground will be set apart for Horticultural Erections, Implements, Vases, Pots, and other Garden Requisites. No erections will be provided, but Tents may be hired at reasonable charges. Applications for space to be made to the Secretary on or before July 25, and from whom Prize Entry Forms, and all other information may be obtained. ENTRIES for PLANTS, &c., close on AUGUST 8. CHAS. LAYLAND, Secretary.
Morris Brook, Warrington.

New Flower Seeds for Present Sowing, Free by Post.
SUTTON AND SONS can now supply New Seed of the following, saved from the finest strains in the country:—
JAMES'S SUPERB CALCEOLARIA, 1s. 6d. and 2s. 6d. per packet.
INGRAM'S SUPERB CALCEOLARIA, 1s. 6d. and 2s. 6d. "
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FINEST CHOICE CINERARIA, 1s. 6d. and 2s. 6d. per packet.
FINEST CHOICE PRIMULA, 1s. 6d. and 2s. 6d. per packet.
And other FLOWER SEEDS, for present sowing.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

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WM. JACKSON and SON, Nurserymen, Kingston-on-Thames.

NEW CHILIAN MIMULUS.—This is a new strain, of dwarf habit, perpetual blowers, and quite hardy, of very diversified markings and colours 12 splendid varieties, post free, for 30s, from B. W. KNIGHT, Florist, Battle, Sussex

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Roses.
MITCHELL'S renowned ROSES are NOW in FINE BLOOM. The largest stock and the best plants in England. Pitt Down Nurseries, Uckfield, Sussex.

CHOICEST ROSES, in pots. TEA-SCENTED, CHINA, NOISETTE, &c.
The largest stock in the kingdom, consisting of many thousands of strong healthy plants.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

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WM. PAUL begs to announce that his ROSES are NOW IN BLOOM. All the varieties recently exhibited by him in his "Garden of Roses" at the Crystal Palace, and many other novelties, may be seen.
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WM. KNIGHT, of the Floral Nursery, Hailsham, Sussex, begs to announce that his splendid collection of upwards of 20,000 ROSES is NOW in FULL BLOOM. An inspection respectfully solicited
Also an immense stock of the choicest varieties of ROSES in Pots, for planting out or growing on for pot culture

New Roses of 1870.
CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application
ROSES for BEDDING, herbaceous perb plants, in 5-inch pots, for planting out or for growing on for pot culture Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application
JOHN CRANSTON, The Nurseries, King's Acre, Hereford.

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JOHN FRASER, of the Lea Bridge Road Nurseries, begs to announce that his COLLECTION of ROSES is NOW in FULL BLOOM. An inspection respectfully solicited.
The Nurseries are easily reached by Train on the Great Eastern Railway to Lea Bridge Station.

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JOHN HARRISON begs to inform his Friends and the Public that his ROSES are NOW in SPLENDID BLOOM, and will continue through the season. Upwards of 100,000 Dwarfs on the Manetti, and 60,000 on their own Roots; also, 20,000 of the finest Standards perhaps ever seen in one quarter.
THEY can still supply his friends in the Trade with plants of the NEW ROSES, at from 30s. to 60s. per dozen, and Buds of the same at 2s. 6d. per dozen, and all the older varieties of ROSES in buds at 8s per 100, or 70s. per 1000. TEA ROSES in pots, 40s. to 80s. per 100; the latter price will include the new ones of the present season.
AGERATUM IMPERIAL BLUE (6 inches), 6s. per dozen.
North of England Rose Nursery, Darlington

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots. DESCRIPTIVE PRICED LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

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JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

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THE ORCHARD HOUSES at SAWBRIDGEWORTH are OPEN to the INSPECTION of all who are interested in their culture. The Harlow Station, Great Eastern Railway, is the most convenient.

CALADIUMS.—Fine large plants of this. Eight of the most beautiful varieties, 9s. per doz. Cash. Post Office Order, Old Ford
B. G. ROBINSON, Royal Nursery, Ford Road, Old Ford.

Centaurea ragusina compacta.
CHARLES YOUNG begs to intimate to the Trade and his Customers, that he has just harvested a fine stock of the above seed, and he can supply those Firms he related for want of stock late last season
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Transit Agency for Plants, Seeds, &c.
C. J. BLACKITH AND CO., of Cox's and Hammond's Quays, Lower Thames Street, London. Forwarders to all parts of the World
N.B.—Mr. BLACKITH is sole Survivor of the late Firm of BLACKITH and BLACKITH.

FERNS, BRITISH and EXOTIC, in more than 1000 beautiful species and varieties.—The Subscribers beg to intimate that their CATALOGUE of the above will be forwarded to any applicant on receipt of three postage stamps.
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Early Feed for Sheep and Cattle.
SUTTONS' IMPROVED ITALIAN RYE-GRASS.
Lowest price per bushel on application.
TRIFOLIUM INCARNATUM, New Seed.—Lowest price per cwt. on application
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SUTTONS' MIXTURES of PERMANENT PASTURE GRASSES and CLOVERS, for Laying Down New Pastures. May be Sown with safety up to the end of August. For prices and full particulars, apply to
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IMPERIAL GREEN GLOBE.. .. .. 0 10
HARDY GREEN ROUND 0 10
GREY STONE 1 0
SUTTONS' SHORT-TOP SIX-WEEKS 1 0
Cheaper by the hundred, carriage free.
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F. GEE can supply, for cash, Plants in any quantities, carefully packed, and sent to any part of the Kingdom
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DRUMHEAD and GREEN CURLED SAVOY, 4s. per 1000.
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Packages charged cost, and full price will be allowed when returned in good condition.
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H. AND F. SHARPE will be glad to quote special prices to the Trade of all the best sorts of Cabbage Seeds grown last season from the finest selected stocks. Prices very moderate.
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New English Sowing Rape Seed.
H. AND F. SHARPE have fine clean samples of the above ready for immediate delivery, which they can offer to the Trade at reduced prices Samples and price on application.
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JOHN K. KING, SEED GROWER, Coggeshall, Essex, exhibited at the Royal Agricultural Show, largest and best Collection of PRIZE ROOTS of MANGLE WURZEL ROOTS. Seeds for present sowing
KING'S GREEN ROUND TURNIP seed, 8d.
KING'S WHITE GLOBE, 9d.
KING'S EARLY SIX WEEKS, 9d.
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NEW, GENUINE, SELECT, AGRICULTURAL and FLOWER SEEDS Special prices and advantageous offers on application to
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Especially recommended to Rose and Fruit Growers
For further particulars, see printed handbills, which may be had on application, also previous Advertisement in these columns, page 918.
Sold in tins, containing: 1 gallon, 3s. 6d.; 2 gallons, 6s.
One gallon will bear diluting with three of water.
Sole Agents: OSBORN and SONS, Fulham Nursery, London, S.W.

COLIN PULLINGER'S newly-invented SULPHUR DISTRIBUTOR, for VINES, PLANTS, &c., is acknowledged by every Gardener who has used it to be the most simple and effectual machine invented for the purpose. Price, complete with bellows, 4s. Retail of all Ironmongers and Nurserymen.
Sole Wholesale Agents, ADAMS and GRANT, Chichester.

The Noted French Cold Grafting Wax
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For Grafting, Budding, Heading, &c., may be obtained of
HOOPER and CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsman and Nurseryman

Indestructible Terra-Cotta Plant Markers.
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Upon application to the Undersigned, Plans and Prices for the HIRE of elegant and commodious TENTS are forwarded free of charge. All letters should be addressed to 2, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.
BENJAMIN EDGINGTON.

ROYAL HORTICULTURAL SOCIETY.

GREAT FLOWER SHOW, OXFORD, JULY 19 TO 22, 1870.

AWARDS OF THE JUDGES.

GENERAL PRIZE LIST.

PLANTS and FLOWERS.

CLASS 1.—9 STOVE or GREENHOUSE PLANTS, HEATHS included, distinct (Open)

1st Prize, Messrs. E. Cole & Sons, the Nurseries, Withington, Manchester, £9

2d, Mr. F. Perkins, Nurseryman, Leamington, £7

3d, Messrs. Bell & Thorpe, Nurserymen, Stratford-on-Avon, £5

CLASS 3.—9 FINE-FOLIAGED or VARIEGATED PLANTS, distinct (Amateurs.)

1st, Mr. A. Johnson, Gr. to the Marquis of Aylesbury, Savernake Forest, Marlborough, Wilts, £7

2d, Mr. A. Wright, Gr. to C. H. Crompton Roberts, Esq., Regent's Park, £5.

CLASS 4.—9 FINE-FOLIAGED or VARIEGATED PLANTS, distinct (Nurserymen.)

1st, Mr. B. S. Williams, Upper Holloway, London, £7.

2d, Messrs. Bell & Thorpe, £5

3d, Mr. J. J. Chater, Gonville Nurseries, Cambridge, £3.

CLASS 5.—6 FINE-FOLIAGED or VARIEGATED PLANTS, distinct. (Amateurs.)

1st, Mr. G. Harris, Headington Hill, Oxford, £4.

CLASS 6.—6 EXOTIC ORCHIDS, distinct. (Amateurs.)

1st, Mr. A. Wright, £6.

CLASS 7.—6 EXOTIC ORCHIDS, distinct. (Nurserymen.)

1st, Mr B. S. Williams, £5.

2d, Messrs. W. Rollisson & Sons, Nurserymen, Tooting, £4.

CLASS 8.—6 PALMS, not fewer than three kinds. (Open.)

1st, Mr. B. S. Williams, £5.

2d, Messrs. W. Rollisson & Sons, £4.

3d, Messrs. Bell & Thorpe, £3

CLASS 9.—6 FUCHSIAS, distinct, in 13-inch pots. (Amateurs.)

1st, Mr. J. E. Mappleback, Woodfield, Moseley, near Birmingham, £4.

CLASS 10.—6 FUCHSIAS, distinct, in 13-inch pots. (Nurserymen.)

1st, Mr. J. Walker, Thame, Oxon, £3.

CLASS 11.—3 STANDARD FUCHSIAS, distinct. (Open.)

1st, Withheld

2d, Mr. J. Coppock, Headington Quarry, near Oxford, £1.

CLASS 12.—9 ZONAL PELARGONIUMS, distinct, excluding Variegated sorts. (Amateurs.)

1st and 2d, Withheld

3d, Mr. T. Anstiss, Bull, Bucks, £2 2s.

CLASS 13.—6 ZONAL PELARGONIUMS, distinct, excluding Variegated sorts. (Nurserymen.)

1st, Messrs. Bell & Thorpe, £5.

2d, Mr. J. Walker, £4. | 3d, Mr. J. J. Chater, £2.

[CLASS 16.—3 DOUBLE-FLOWERED PELARGONIUMS, distinct. (Open.)

1st, Mr. F. Perkins, £3.

2d, Messrs. Downie, Laird & Laing, Stanstead Park Nursery, Forest Hill, London, S.E., £2

3d, Messrs. Bell & Thorpe, £1.

Extra, Mr. J. House, Eastgate Nursery, Peterborough, 15s

CLASS 17.—6 VARIEGATED PELARGONIUMS, distinct. (Open.)

1st, Mr. C. Turner, Royal Nurseries, Slough, £3.

2d, Mr. J. E. Mappleback, £2. | 3d, Mr. F. Perkins, £1.

CLASS 18.—6 VARIEGATED ZONAL PELARGONIUMS, distinct. (Open.)

1st, Mr. T. Welsh, Gr. to D. Rutter, Esq., Hillingdon, £3.

2d, Mr. J. Stevens, Ealing Terrace, £2.

3d, Mr. J. Tomkins, Sparkbrook, Birmingham, £1.

Equal 3d, Mr C. Turner, £1

CLASS 19.—6 ACHIMENES, distinct. (Open.)

1st, Mr. G. Hinton, Gr. to the Mayor of Oxford, £2.

2d, Mr. Wm. Earley, Gr. to F. Pryor, Esq., Digswell, Welwyn, £1.

CLASS 20.—6 GLOXINIAS, distinct. (Open.)

1st, Mr. C. Turner, £2.

2d, Mr. W. Hickman, Gr. to Lord Valentia, Bletchington Park, Oxon, £1.

CLASS 23.—3 DRACÆNAS or CORDYLINES, distinct (Open)

1st, Mr B. S. Williams, £2 | 2d, Messrs. Bell & Thorpe, £1 10s

3d, Mr. J. D. Daniels, Swincombe Park, Henley-on-Thames, £1.

CLASS 24.—4 HARDY CLEMATISES, in pot or tubs.

1st, Messrs. G. Jackman & Son, Woking Nursery, Surrey, £4.

CLASS 25.—6 EXOTIC FERNS, distinct. (Nurserymen)

1st, Mr. B. S. Williams, £4.

2d, Messrs. Bell & Thorpe, £3. | 3d, Mr. J. J. Chater, £2.

CLASS 26.—6 EXOTIC FERNS, distinct. (Amateurs.)

1st, Mr. T. Baines, Gr. to H. L. Micholls, Esq., Southgate, Middlesex, £4.

2d, Mr. J. E. Mappleback, £2.

CLASS 27.—12 BRITISH FERNS, distinct. (Nurserymen.)

1st, Messrs. J. Ivery & Son, Nurserymen, Dorking, Surrey, £3

2d, Mr. J. J. Chater, £2.

CLASS 28.—12 BRITISH FERNS, distinct. (Amateurs.)

1st, Mr. J. T. K. Castell, St. John's Terrace, Oxford, £3.

2d, Mr. J. E. Mappleback, £2.

3d, E. J. Lowe, Esq., F.R.S., Highfield House, near Nottingham, £1.

CLASS 29.—4 PAIR of TREE FERNS. (Open)

1st, Mr. B. S. Williams, £3

2d, Mr. C. Walton, Cowley Road, Oxford, £2

3d, Mr. J. J. Chater, £1 10.

CLASS 30.—6 DICOTYLEDONS, distinct. (Open)

1st, Messrs. Bell & Thorpe, £3. | 2d, Mr. J. House, £2.

CLASS 31.—6 PETUNIAS, distinct. (Open.)

1st, Messrs. Bell & Thorpe, £2.

CLASS 32.—12 SUCCULENTS, distinct. (Open)

1st, Mr B. S. Williams, £2

2d, Mr T. S. Ware, Hale Farm Nurseries, Tottenham, London, £1.

3d, Messrs. Bell & Thorpe, 15s

CLASS 33.—6 DELPHINIUMS, distinct, in 12 inch pots (Open)

1st, Mr C. Turner, £2.

CLASS 34.—6 LOBELIAS (fulgens type), not fewer than 3 kinds, in 8-inch pots. (Open.)

1st, Withheld. | 2d, Messrs Bell & Thorpe, £1 10s.

CLASS 35.—6 PHLOXES, distinct, in 8-inch pots. (Open.)

1st, Messrs. Bell & Thorpe, £2.

2d, Messrs. Downie, Laird & Laing, £1 10s.

3d, Mr. H. Hooper, Vine Nursery, Widcombe Hill, Bath, £1.

CLASS 36.—6 PENTSTEMONS, distinct, in 8-inch pots (Open)

1st, Mr. J. J. Chater, £2. | 2d, Messrs. Bell & Thorpe, £1 10s.

CLASS 39.—24 CARNATIONS, distinct, cut blooms. (Nurserymen.)

1st, Mr C. Turner, £2

2d, Mr. G. Edward, Clarence Nurseries, York, £1 10s.

3d, Mr. W. Jackson, Blakedown Nursery, Kidderminster, £1

CLASS 40.—12 CARNATIONS, distinct, cut blooms (Amateurs)

1st, Mr. S. C. Buttram, Woodbridge, £2.

2d, Mr. N. Norman, Plumstead, £1 10s.

3d, Mr. D. Fizzey, Gr. to Sir E. Perry, Slough, £1.

CLASS 41.—24 PICOTEES, distinct, cut blooms. (Nurserymen.)

1st, Mr. C. Turner, £2.

2d, Mr. G. Edward, £1. | 3d, Mr. H. Hooper, 10s.

CLASS 42.—12 PICOTEES, distinct, cut blooms. (Amateurs)

1st, Mr. D. Fizzey, £2. | 2d, Mr. N. Norman, £1.

3d, Mr. G. Kirtland, Bletchington, Oxon, 10s.

Equal 3d, Mr. W. Broadbridge, Gr. to Sir C. Mordaunt, Walton Cammon, Marston, Oxford, 10s.

CLASS 43.—12 PINKS, distinct, cut blooms. (Open.)

2d, Mr. D. Gammon, Marston, Oxford, 7s.

3d, Mr. A. Evans, Marston, Oxford, 5s.

CLASS 44.—12 ZONAL PELARGONIUMS, distinct, cut flowers, in bunches of 3 trusses each. (Open.)

1st, Mr. J. Walker, £2.

2d, Mr. C. J. Perry, Castle Bromwich, near Birmingham, 15s.

3d, Mr. H. Minchin, The Nurseries, Henk Norton, Oxon, 10s.

4th, Mr. D. Daniels, 5s.

CLASS 45.—12 VERBENAS, distinct, cut flowers, in bunches of 5 trusses each. (Open.)

1st, Mr C. J. Perry, £1 | 2d, Mr H. Minchin, 15s.

3d, Rev. R. H. Charley, Woodstock Road, Oxon, 10s.

4th, Mr. J. House, 5s.

CLASS 46.—48 CUT ROSES, distinct, 1 truss of each. (Nurserymen)

1st, Mr. J. Cranston, The Nurseries, King's Acre, Hereford, £4.

2d, Mr. C. Turner, £3.

3d, Messrs. Paul & Son, Old Nurseries, Cheshunt, £2.

Equal 3d, Mr. B. R. Cant, St. John's Street Nursery, Colchester, £2.

4th, Messrs. J. & C. Lee, Royal Vineyard Nursery, Hammersmith, London, £1.

CLASS 47.—48 CUT ROSES, distinct, 1 truss of each. (Amateurs.)

1st, Mr. C. J. Perry, £5.

2d, Mr. J. Moore, Gr. to T. Lloyd, Esq., Warwick, £3.

3d, Mr. J. W. Chard, Gr. to Sir F. Bathurst, Salisbury, £2.

CLASS 48.—24 CUT ROSES, distinct, 1 truss of each. (Amateurs.)

1st, Mr. T. Mease, £2.

2d, Mr. W. Johnson, Uxbridge, £1 10s.

3d, Mr. C. J. Perry, £1. | 4th, Mr. J. W. Chard, 15s.

CLASS 49.—12 CUT ROSES, distinct, 1 truss of each. (Amateurs.)

1st, Mr. J. E. Cavell, Walton Manor, Oxford, £1.

2d, Mr. J. Tranter, Upper Assenden, Henley-on-Thames, 15s.

3d, Mr. T. Anstiss, 10s.

CLASS 50.—6 CUT ROSES, distinct. (Amateurs.)

1st, Mr. J. Tranter, 15s.

2d, Mr. A. Evans, 10s. | 3d, Mr. T. Penn, Thame, Oxon, 6s.

CLASS 51.—12 CUT ROSES, distinct, 1 truss each, of kinds sent out in 1867, 1868, or 1869. (Open.)

1st, Mr. C. Turner, £1 10s.

2d, Messrs. Paul & Son, £1. | 3d, Mr. B. R. Cant, 15s.

CLASS 57.—GROUP of WAX FLOWERS.

1st, Miss Sutton, Oxon, £1.

CLASS 58.—GROUP of ARTIFICIAL FLOWERS, of any material other than Wax.

1st, Messrs. D. Radclyffe & Co., 129, High Holborn, London, £1.

CLASS 59.—MISCELLANEOUS, for Plants not contained in any of the above Classes. (Open.)

1st, Messrs. J. Veitch & Sons, Royal Exotic Nursery, Chelsea, £5.

2d, Mr. B. S. Williams, £4 3d, Messrs. W. Rollisson & Sons, £3.

Extra, Messrs. J. & C. Lee, £2.

Extra, Mr. J. House, for Collection of Bedding Plants, £1.

Extra, Messrs. Bell & Thorpe, £1.

Extra, Mr. T. S. Ware, for Collection of Herbaceous Plants, 15s.

Extra, Mr. T. S. Ware, for Collection of Hardy Cut Flowers, 10s.

Extra, Messrs. Paul & Son, for Collection of Cut Hollyhocks, £1.

Extra, Messrs. Kelway & Son, for Collection of Cut Hollyhocks, 10s.

Extra, Mr. J. Kaye, for Case of Anatomised Leaves, 5s.

FRUIT.

ALL OPEN CLASSES.

CLASS 60.—COLLECTION of FRUIT, 12 dishes, 6 distinct kinds.

1st, Mr. H. Clark, Gr. to Earl Cowper, Brocket Hall, Welwyn, £6.

CLASS 61.—3 PINE-APPLES.

1st, Mr. T. Paton, Gr. to H. L. Lucy, Esq., Warwick, £5.

2d, Mr. C. Allen, Gr. to J. B. Gleeg, Esq., Congleton, £3.

3d, Mr. W. Gardiner, Gr. to E. P. Shirley, Esq., Stratford-on-Avon, £2.

CLASS 62.—PINE-APPLE, any variety.

1st, Mr. T. Paton, £3. | 2d, Mr. W. Gardiner, £2.

3d, Mr. G. Ward, Gr. to T. N. Miller, Esq., Bishop Stortford, £1.

CLASS 63.—BLACK GRAPES, single dish.

1st, Mr. W. Coleman, Gr. to Earl Somers, Ledbury, £3.

2d, Mr J. Smith, Gr. to the Earl of Gainsborough, Rutland, £2

3d, Mr C. Turner, £1

CLASS 64.—WHITE GRAPES, single dish.

1st, Mr J. Thomas, Gr. to Mrs. Drake, Bicester, £3

2d, Mr C. Turner, £2

3d, Mr R. Lawson, Gr. to J. Slatter, Esq., Manchester, £1.

CLASS 65.—Basket of GRAPES, 12 lb.

1st, Mr. W. Coleman, £5. | 2d, Mr. J. Thomas, £3

3d, Messrs. J. Standish & Co., Royal Nurseries, Ascot, £2.

Equal 3d, Mr. R. H. Smith, Gr. to H. Walker, Esq., Liverpool, £2.

CLASS 66.—PEACHES, single dish

1st, Mr J. Walls, Gr. to J. Dickson, Esq., Congleton, £2

2d, Mr G. F. Miles, Gr. to Lord Carrington, Wickham Abbey, Bucks, £1

3d, Mr. G. Sage, Gr. to Earl Brownlow, Great Berkhampsted, 10s.

CLASS 67.—NECTARINES, single dish.

1st, Mr. H. Turvey, Gr. to R. Nichols, Esq., near Leeds, £2.

2d, Mr. J. Miller, Gr. to the Duke of Newcastle, Worksop, Notts, £1.

3d, Mr. J. James, Gr. to the Duke of Leinster, Maynooth, 10s.

CLASS 68.—APRICOTS, single dish

1st, Mr. J. Smith, £1 10s. | 2d, Mr. W. Earley, £1.

CLASS 69.—FIGS, single dish.

1st, Mr. G. Sage, 15s.

2d, Mr. H. Harvey, Gr. to P. Wroughton, Esq., Wantage, 10s.

3d, [Mr. J. Day, Gr. to A. Seymour, Esq., Daventry, 7s.

CLASS 70.—CHERRIES, single dish.

1st, Mr C. Turner, 15s

2d, Mr. J. J. Chater, 10s. | 3d, Mr. J. Smith, 7s

CLASS 71.—STRAWBERRIES, 6 dishes, distinct kinds

1st, Mr. T. D. Irving, Gr. to the Duke of Hamilton, Wickham Market, Suffolk, £3.

CLASS 72.—STRAWBERRIES, single dish.

1st, Mr T. Maunders, Southborne, Oxford, 15s.

2d, Mr T. Bloome, Rhug Gardens, Corwen, North Wales, 10s

3d, Mr. T. D. Irving, 7s

CLASS 73.—MELON, Green-fleshed.

1st, Mr. W. Gardiner, £1.

2d, Mr. D. James, 15s. | 3d, Mr. J. W. Chard, 10s.

CLASS 74.—MELON, Scarlet-fleshed.

1st, Mr. T. Bailey, Gr. to T. T. Drake, Esq., Amersham, Bucks, £1.

2d, Mr. W. Carmichael, Gr. to H.R.H. the Prince of Wales, Sandringham, 15s.

3d, Mr. W. Earley, 10s.

CLASS 75.—PLUMS, single dish.

1st, Mr. G. T. Miles, £1. | 2d, Mr. Iansan, 15s.

3d, Mr. T. Lockie, Gr. to F. W. Berger, Esq., Great Marlow, Bucks, 10s.

CLASS 76.—OUT DOOR FRUITS, 4 dishes, distinct kinds.

1st, Mr T. D. Irving, 10s. | 2d, Mr W. Broadbridge, 8s.

Equal 1st, Mr. C. Turner, 10s. | 3d, Mr. G. Craddock, 6s.

CLASS 77.—MISCELLANEOUS, for Fruits not mentioned in Schedule.

2d, Mr. R. Scott, Kidlington, Oxon, £1.

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2d, Mr. A. Wright, £3.

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1st, Mr. H. Surman, £5.

Prizes offered by H. Griswood, Esq.

CLASS 84.—EXOTIC FERNS, distinct.

1st, Mr. A. Wright, £6. 2d, Messrs. Bell & Thorpe, £4.

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CLASS 85.—20 BRITISH FERNS, distinct.

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2d, Mr. J. E. Mappleback, £3. | 3d, E. J. Lowe, Esq., £2.

Prizes offered by the Rev. W. V. Harcourt.

CLASS 87.—6 Double-flowered PELARGONIUMS, distinct.

1st, Mr. W. Bragg, Earley, Gr. to R. Palmer, Esq. | 2d, Messrs. Bell & Thorpe, £2.

Prizes offered by Sir A. W. Peyton, Bart.

CLASS 88.—6 TRICOLORED PELARGONIUMS, distinct.

1st, Mr. T. Welsh, £3. | 2d, Mr. J. Stevens, £2.

Prizes offered from the Local Prize Fund.

CLASS 89.—4 ZONAL PELARGONIUMS, distinct.

1st, Messrs. Bell & Thorpe, £2.

2d, Mr. H. Minchin, £1 5s. | 3d, Mr. T. Anstiss, 15s.

Prizes offered by the Rev. R. H. Charsley.

CLASS 90.—6 VERBENAS, in pots, distinct

1st, Rev. R. H. Charsley, Oxford, £1 | 2d, Mr H. Surman, 15s.

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CLASS 91.—SPECIMEN STOVE PLANT, in Flower.

1st, Mr T. Baines, £1 10s

2d, Messrs. J. Standish & Co., £1. | 3d, Mr. F. Perkins, 10s.

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CLASS 93.—LILIUM AURATUM.

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CLASS 94.—6 DOUBLE PETUNIAS, distinct, in Flower.

1st, Mr. G. Harris, £2. 2d, Mr. Surman, 15s.

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3d, Mr. G. Harris, 10s.

Prizes offered by Jno. Thomson, Esq.

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1st, Mr. B. R. Cant, £1 1s.

Prizes offered by the Earl of Abingdon, the Rev. H. O. Coxe, and Mr. Willoughby.

CLASS 103.—CARNATIONS, 12 blooms, distinct.

1st, Mr. C. Turner, £2 10s.

2d, Mr. N. Norman, £1. | 3d, Mr. G. Edward, 10s.

Prizes offered by the Earl of Abingdon, the Rev. H. O. Coxe, and Mr. A. Hedges.

CLASS 104.—PICOTEES, 12 blooms, distinct.

1st, Mr. C. Turner, £2 10s.

2d, Mr. N. Norman, £1. | 3d, Mr. J. Payne, £1.

Prizes offered by J. G. Henderson, Esq.

CLASS 105.—PINKS, 12 blooms, distinct.

1st, Mr. D. Gammon, £2 10s.

2d, Mr. W. Bragg, £1 15s. | 3d, Mr. D. Pizzey, £1.

Prize offered by Mr. George Prince.

CLASS 106.—VERBENAS, 30 varieties, 3 trusses of each.

1st, Mr. C. J. Perry, £3 3s.

Prizes offered by Herbert Parsons, Esq.

CLASS 107.—Double-flowered PELARGONIUMS, 12 varieties, 3 trusses of each.

1st, Mr. F. Perkins, £1 5s.

2d, Messrs. Kelway & Son, 15s. | 3d, Messrs. J. Carter & Co., 10s.

Prizes offered by H. Parsons, Esq.

CLASS 108.—CUT FLOWERS of BEDDING PLANTS, 24 varieties in separate bunches.

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CLASS 114.—6 Dishes distinct Varieties of FRUIT.

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3d, Mr. G. Goldsmith, Gr. to Sir W. Farquhar, Bart., Dorking, Surrey.

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2d, Mr. G. T. Miles, Gr. to Lord Carrington, Wycombe Abbey, Bucks, £1 1s.

3d, Mr. F. Perkins, Gr. to Lord Henniker, Eye, Suffolk, 10s. 6d.

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3d, Messrs. Bull & Thorpe, 10s. | 4th, Mr. W. Farley, 5s.

Prizes offered by Messrs. Hall & Co.

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Mr. Daniells, Swyncombe Park, Henley-on-Thames
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Mr. Carmichael, Sandringham
Mr. Gibson, Battersea Park
Mr. Speed, Chatsworth
Mr. Baxter, Botanical Gardens, Oxford
Mr. Moore, Botanical Gardens, Chelsea
Dr. R. Hogg, St. George's Road, Pimlico
Rev. S. R. Hole, Caunton Manor, Newark
Mr. Parsons, Danesbury Park, Herts
Mr. Sage, Ashridge, Berkhamsted
Rev. C. P. Leach, Lockington, Bristol
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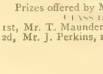

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The Gardeners' Chronicle

SATURDAY, JULY 23, 1870.

WE do not know how many more experiments the Royal Horticultural Society intends to make before it decides on its future course of action in the matter of provincial shows. At any rate, the necessity of holding an exhibition in the provinces independently of the Royal Agricultural Society seems to us to become more and more apparent. The OXFORD SHOW is in some respects a repetition of the Manchester muddle. The show is good, but the arrangements are bad; not so bad as they were in Manchester, by any means, because, thanks to the courtesy of the Radcliffe Observer, a very good site in the Observatory grounds has been secured, while the arrangements with the local society have apparently been more amicably conducted than they were at Manchester. Nevertheless, the stranger visiting Oxford, and enquiring for the Horticultural Show, is almost as much at a loss as he was at Manchester last year. Railway porters, police, omnibus-drivers, fly-men, scarcely one knew of the existence of the Royal Horticultural Society. One cab-driver, indeed, said there was a flower show, but "it wasn't much." No wonder, then, that up to the time of our writing the attendance had been scanty. If the Royal Horticultural Society wishes its provincial shows to be the successes they ought to be, it should, to our thinking, undertake them on broader principles, with greater spirit, and take affairs entirely in its own hands. The Oxford Society's show, *per se*, does not deserve much more than the cabman said of it. It adds in no way to the brilliancy of the Royal Horticultural Society, but rather the reverse, while the Agricultural Society, of course, swallows up, metaphorically, its smaller, less attractive colleague. So completely is this the case—so completely is the Horticultural Society ignored—that even the local authorities, while complimenting the Royal Agricultural Society, by inviting its representatives to a quasi-public reception, wholly overlooked, if we are rightly informed, the kindred Society, not one of whose representatives was asked to be present.

We give full details of the Exhibition in other columns, so that here we need merely say that the show, if not so extensive as its predecessors, is, in point of quality, quite up to the average. The fruit is unusually good. The competition for Professor LAWSON'S prize for six varieties of Grapes was brisk, that for the prizes offered by the Proprietors of this Journal was also well contested. The Congress may be stated to have been very successful. Dr. VOELCKER'S paper on "Manures" was an admirable summary of points concerning the food of plants, the nature of manures, the proper time for their application, and the characteristic effects of various fertilisers on certain plants or parts of plants. The discussion which followed was also highly interesting. Mr. PEACH, as an outsider practically unfamiliar with chemical evidence, naturally enough demurred to some of the current chemical doctrines, as to the sources of nitrogen, carbon, and silica, and their respective uses in plant economy, and offered plausible, but, as it seems to us, wholly untenable explanations. The objections, as it appears to us, are overwhelmed by the mass of evidence cited by Dr. GILBERT, than whom none is more competent to express an opinion on such a subject. Mr. D. T. FISH also made some excellent practical remarks, and some paradoxical ones of a less important nature. Then followed Mr. INGRAM'S capital paper on the Origin and Nature of Soils, which we give in another column. Of the proceedings on Thursday, conducted while these pages are passing through the press, we shall speak next week.

On the whole then, in spite of certain minor defects, apparently arising from timidity and want of enterprise on the part of the Royal Horticultural Society, we believe the Oxford show will turn out a success, while the surpassing interest and beauty of the place, and the friendliness of its inhabitants, will, we imagine, send most visitors home very favourably impressed.

THE recent publication, in the columns of "Nature," of Dr. BASTIAN'S paper concerning SPONTANEOUS GENERATION, is certain to attract great attention amongst the learned, and to excite considerable interest outside the circle of *savans*. The question to be solved is this:—Do living beings necessarily and invariably spring from other pre-existing organisms, or may they not sometimes, and under certain conditions, originate independently of any former being of like nature with itself? The question, in some shape or another, is as old as the hills. It has "cropped up," to use a geological phrase, in each succeeding age, only to be disproved and repudiated. Now it comes before us in a much more subtle and refined form than ever before, and in a way that must lead every naturalist at least to admit the possibility, if not the probability, of the occurrence.

The organisms now supposed by Dr. BASTIAN to be formed *de novo*, and independently of any direct parental agency, are for the most part of the simplest possible character and of the most minute size. The "heterogenists," of whom Dr. BASTIAN is the latest representative, maintain that these organisms originate in the manner we have indicated. The "panspermists," on the other hand, consider that earth, air, or water teem with germs of extreme minuteness—germs so minute and so abundant that it is next to impossible to escape from their presence, or to imagine a spot where they are not. Under favourable circumstances these germs become developed into organisms. The answer made to this is, that it is a mere assumption to suppose the existence in such numbers of minute germs. Observation fails to detect them in many cases, though they are sufficiently obvious in others. But direct experimental research, of course, has been more relied onto prove or disprove the matter.

Take every conceivable precaution to exclude or destroy germs, supposing them to exist, and then see if any organisms are developed. This is what PASTEUR and POUCHET, CHILD and BASTIAN, have done with more or less success, and more or less divergence of opinion. It must be remembered that the experiments are of the utmost delicacy, require the most scrupulous exactitude, and when apparently conducted with rigorous precision may yet involve some flaw which may invalidate the whole experiment. It behoves outsiders, then, to be very cautious in forming their opinions, the more so as, from the very nature of the experiments, there are few who have the requisite ability and means to conduct them; and thus the task of confirming, verifying, or invalidating results must be left in the hands of a very small number of observers. One thing requires to be borne in mind by the general public before coming to a conclusion,—the miracle, or rather we should say

the manifestation of Divine power, will remain unaffected whichever view may ultimately prevail. Reverting to Dr. BASTIAN'S experiments, we may say that, in conjunction with Dr. FRANKLAND, he has adopted the most rigorous means of preventing the access of germs to the fluids experimented on. Access of air seems to have been entirely prevented, the fluids themselves were submitted for hours to a heat of 150° C. = 334° F., and even more. Exposure to a much lower temperature, for seconds even, is known to be thoroughly destructive to all forms of life, and yet living forms have appeared, some of them altogether different from what has been previously known. Some of the bodies shown in Dr. BASTIAN'S figures are so precisely like the spiral fibres of flowering plants, that it seems difficult to assign them any other nature. Nevertheless, the conditions under which they are formed, the care taken to exclude foreign bodies, and the differences pointed out by Dr. BASTIAN, must at least lead us to give conditional assent to his interpretations. It is noteworthy, also, that these organisms show themselves not only in organic solutions,—liquids containing in solution the elements of former organisation, vegetable or animal, as the case may be, but also in solutions of saline substances, such as tartrate of ammonia, potash and ammonia alums, &c., the solutions in question having been closely examined, in order to ascertain their freedom from germs. These liquids have only remote relation to previous organic life, but they are nevertheless made up of the same chemical elements as those essential in the case of living organisms. Arrange those elements differently, and a living being would, so far as chemistry is concerned, be the result.

Plagued as gardeners and agriculturists are with invasions of Fungus and other similar pests of low organisation, the decision of the questions we have alluded to is one of consummate importance to them. At present the contest must be left to the *savans*, and whatever the ultimate result, it can hardly be but that some facts of direct practical importance must be evolved; and thus out of a question at first sight far removed from the daily pursuits of the practical man, may spring results of immeasurable importance to him.

It is only just to Dr. BASTIAN to cite in full the conclusions at which he arrives, though it is, of course, impossible for us to give the details upon which those conclusions are based.

"My principal objects," says Dr. BASTIAN, "in the paper have been to show:—

"1. That there is a strong *a priori* probability in favour of the possibility of the occurrence of the heterogenous evolution of living things, and that the most reliable scientific data which we possess do, in fact, fully entitle us to believe in this as a possibility.

"2. That microscopical investigation, whilst it teaches us as much concerning the mode of origination of the lowest organisms as it does concerning the mode of origin of crystals, enables us to watch all the steps of various processes of heterogenous evolution of slightly higher organisms, such as may be seen taking place in a pellicle on a fluid containing organic matter in solution.

"3. That the kinds of organisms which have been shown to be destroyed by a temperature of 100° C. may be obtained in organic fluids, either acid or alkaline, which, whilst enclosed within hermetically sealed and airless flasks, had been submitted not only to such a temperature but even to one varying between 146° and 153° C. for four hours.

"4. That a new and direct evolution of organisable compounds may, in all probability,* be capable of arising, sometimes by isomeric transformation of the atomic constituents of a single saline substance, such as tartrate of ammonia, and sometimes by a re-arrangement of certain of the atomic constituents belonging to two or more saline substances existing together in solution. It is not only supposed that this may occur, but that even living things may subsequently be evolved therefrom, when the solutions have been exposed, as before, in airless and hermetically sealed flasks to a temperature of 146° to 153° C. for four hours.

"On account of this *a priori* probability, and in the face of this evidence, I am, therefore, content, and as I think justified, in believing that living things may and do arise *de novo*. Such a belief necessarily carries with it a rejection of M. PASTEUR'S Theory of Putrefaction, and of the so-called 'Germ Theory of Disease.'"

* It is not pretended that this is proved. The aid of the best and physical must be much more extensively resorted to before such a point could be proved. I hope, soon, however, to be able to bring forward additional evidence bearing upon this part of the subject

—— THE following remarks on the EFFECTS OF LIGHTNING ON TREES in the Botanic Gardens, Calcutta, made by Mr. J. SCOTT, the curator, in the *Indian Daily News*, will, no doubt, be read with interest:—

"Doubtless some of the readers of this note must have, on last (Friday) night, seen and been struck at a highly elevated and huge, blazing, torch-like object, standing out in the Garden Reach vista of the Hooghly, and which, in the distance, would have all the appearance of the main-mast of a ship on fire. This it fortunately was not. It proceeded from an old tree of Terminalia bialata, which stands on the banks of the Hooghly, in the Botanic Garden, a dead and dry limb of which was struck and ignited by lightning. The peon who observed it informs me that the tree was struck about 9.30 P.M., and for the instant presented a sheet of flame, followed by a crash of falling branches. He observed nothing further until the flames burst out about twenty minutes later (as he thought), when he at once came off and reported it to me; this was about 10 P.M. On going out the smouldering, glowing limb, fanned by the wind into occasional flames, was most conspicuous. I could not go sufficiently near the tree to see the extent of the damage, as glowing, charred masses were continually dropping all round the trunk. The ignited portion was confined to about 6 feet in length of a central limb, where it passed off from the main trunk. The limb was fully 5 feet in circumference, and rather more than half ignited when I saw it. On inquiry the peon told me that the fire burst out simultaneously over about one square foot of the limb, close on its junction with the main trunk. The limb smouldered on the whole night, and about 4.30 A.M. it had broken over. On visiting it about 5.30, I found it still smouldering on the ground. I examined it carefully, but could find no traces of the electric force having passed down it. All was throughout intact, so that the lightning would seem to have first struck it towards the base, or, perhaps more probably, was conducted and concentrated there by the numerous other smaller-sized limbs which have their origin around it. One of these, over 30 feet in height, was rent and splintered from top to bottom. The main trunk was nearly completely stripped of bark, the lightning having been diffused around it, and concentrated more especially on the lines of the branches and buttressed roots. On these lines the upper woody layers were rent and splintered, and the current had thence passed along the surface into the ground in a diffused state. There were none of those marked upturnings of the soil which usually result from the penetration of such concentrated shocks; the herbaceous vegetation, in contact with the roots, was alone scorched and blackened. In the night of June 1 a large specimen of Melia composita was also struck by lightning, and is singular in the fact that the current passed down the stem in a spiral manner. In this case the original impact was on the extremities of a large limb, along which it seems to have passed in a skating-like mode, alternately impinging (and rending the upper woody layers and bark), and deflecting until it reached the main trunk, where it divides into five lines, each of which is distinctly spiral, and more or less nearly completes a cycle of the stem. In one of the spirals the course is marked by the splintering of the upper woody layers, and the stripping of the bark at an average breadth of 2 inches. Another has its origin at the base of a large branch which had been riven off. In this case, the course, still distinctly spiral, is as clearly defined as if a blunt pointed instrument had been passed down between the wood and the bark; the line is scarcely half an inch broad, and regular and continuous from its point of origin, at an elevation of 11 feet, until it passes into the soil. There were also portions of the wood riven from the tree and thrown to considerable distances; one portion, weighing 50 oz., was thrown to a distance of 130 feet, and the height from which it was torn was only 10 feet. In Britain I have seen the effects of lightning on many of the native trees, but in no instance have I seen its course marked in the distinctly spiral manner as assumed in the above case. Indeed, I have rarely seen it deviate at all from a straight line, as being that of least resistance; whereas, from some unknown cause, we have it here passing right athwart those lines. As the actual ignition of trees by lightning is rather a rare phenomenon, I may note the following other cases which have been afforded me by the garden overseer, Baboo P. C. Sein:—The first is that of a Date Palm, Phœnix sylvestris, in this garden about eighteen years ago, and which had all the dry persistent foot-stalks of the fronds ignited, and the plant destroyed. The second was as to a Palmyra tree, Borassus flabelliformis, which also had its dried fronds and persistent foot-stalks set on fire, some twenty-seven years ago, in Alipore. Besides those afforded me by the Baboo, I find the following recorded in the "Calcutta Journal of Natural History for 1842:"—1. A Dutch ship was completely burned by lightning, in 1746, in the roads of Batavia; when the fire reached the powder, the ship blew up. 2. The Modeste, a French frigate, was completely burned in 1766 from lightning. 3. The Desire, a British frigate, struck near Jamaica, August 2, 1804; many parts of the ship burned by the lightning. 4. The Dædalus, British frigate, at Jamaica, in 1809. Some of the crew struck down, and the lightning fired the powder. Besides these, there are twenty-six other vessels recorded in the same Journal as having been seriously damaged, or utterly destroyed by lightning, between the years 1675 and 1834."

—— In consequence of a short notice in "Nature," June 16, 1870, in which, with reference to the effect of USTILAGO ANTHERARUM in causing the development of stamens in the female plants of Lychnis diurna, Mr. BERKELEY is reported to have stated before the Scientific Committee of the Horticultural Society, that "the Ustilago penetrates the plant, but as it can only fructify in the stamens, it would appear to be the determining cause of the production of the organs in the normally female flower." We have had a letter from Miss BECKER, stating that this view was exactly what she held at the meeting of the British Association at Exeter. The words, however, were not Mr. BERKELEY'S, but were quoted from an editorial article in this Journal for October 23, 1869, in which it is shown that M. CORNU had recently published this opinion in a number of the Bulletin of the Botanical Society of France, but whether previous to the meeting at Exeter or not does not appear. It is stated, moreover, that the fact had been previously noted by TULASNE in his "Monographie des Ustilaginées." We have not been able to verify this last remark, but having lately had an opportunity of reading Miss BECKER'S paper from her own manuscript, we can state most decidedly that her view is precisely that of M. CORNU, and is, we believe, the true explanation of a very curious matter. If anything were wanting to prove that this is the case, the circumstance which we have before mentioned, that when uninfected flowers are produced on the same plant with those which are diseased, there is no departure whatever from the normal structure. Miss BECKER'S views have certainly been misconceived by many, and we must ourselves confess that we have been led astray by an imperfect verbal report of what took place at Exeter, and we are therefore glad to take this opportunity of stating what her explanation really was, which we shall also do in the Journal of the Horticultural Society. Miss BECKER says most distinctly that it is no case of reversion. The part of her paper with which we do not quite agree is that which relates to the propagation of the Fungus, through the healthy stigma. The spores must germinate and produce their secondary spores before the plant can be propagated, and it is probable that the germination does not take place till a later period, when it either attacks the tender shoots of the plant early in the spring, or the roots themselves before the new shoots are developed. We do not deny that it is possible that the spores may germinate on the stigma, and, in conjunction with the pollen tube, affect the ovule; but this does not seem very probable, if we may judge from the analogy of the common smut of cereals, which, like Bunt, certainly affects the plant which has just germinated. Unless it were possible to find the spores of the Ustilago actually germinating and producing their secondary spores on the stigma of the Lychnis, we should be unwilling to adopt this view. This is, however, matter for future investigation. We feel greatly obliged to Miss BECKER for entrusting us with the manuscript of a very interesting paper, which is certainly deserving of far greater credit than it seems to have met with when delivered orally. *M. J. B.*

—— A valued correspondent has forwarded to us two species of FUNGUS, with a view to ascertain whether either of them is Agaricus nebularis, which seems to have universally a good character. Neither of the species is the Agaric in question, one being Russula nigricans, the other Russula furcata, both of which are, to say the least, very doubtful. It is true that suspicious kinds are eaten in Russia, but their evil qualities are probably destroyed by the vinegar and salt in which they are preserved, and it is certain that accidents very frequently occur. Our correspondent states that he has eaten frequently Boletus luridus without any ill effect following. If there has been no mistake about the species this certainly seems surprising, if we are to believe the accounts which have been published as to its deleterious properties, and the reported result of actual experiments. It must, however, on the contrary, be remarked, that though it is proscribed in the Vienna market, it is frequently eaten after it has been dried under the name of Schuster. It is also brought to market at Prague, under the name of Kowar, is considered wholesome, the water, however, in which it has been cooked being always poured away. LENZ states that he has eaten it fresh, but does not recommend it. The older reports cannot indeed be strictly relied on, as several species which are now considered distinct were formerly included under the single name of B. luridus. One of those which LENZ names, B. Satanas, appears to be pre-eminently poisonous. The late Mr. SALTER, when employed on the Geological Survey, used Boleti indiscriminately to a considerable extent, but we have no information what the species were which he gathered. We should at least recommend caution in the use of species with whose qualities we are not perfectly familiar. *M. J. B.*

—— The Duke of ARGYLL received deputations at the India Office on Friday last from the Highland and Agricultural Society of Scotland, the Royal Horticultural Society, and the Institution of Surveyors, on the subject of FOREST APPOINTMENTS IN INDIA. The deputations from the first two societies were introduced by the Duke of Buccleuch, the third by the Hon. J. K. Howard. The deputation from the Highland and Agricultural Society consisted of the Duke of Buccleuch and Queensberry, the Earl of Dalkeith, the Hon. James Grant, M.P., Sir John Richardson, of Pitfour, Bart., Sir G. Graham Montgomery, M.P., Alexander Forbes Irvine, of Drum; Æneas Mackintosh, of Raigmore, M.P.; Peter Maclagan, of Pumpherston, M.P.; William McCombie, M.P.; and Fletcher Norton Menzies, Secretary. The Royal Horticultural Society were represented by the Duke of Buccleuch, President; John Clutton, Andrew Murray, William Marshall, Lieut.-Colonel Scott, R.E., Honorary Secretary; James Richards, Assistant Secretary. The Institution of Surveyors by the Hon. J. K. Howard, John Clutton, past President; — Huskisson, Vice-President; William Menzies, Windsor Park; and J. W. Penfold, Secretary.

—— We extract the following from the *Daily News*:—

"While the hardships of overworked milliners are being noted and looked after with at least a desultory

vigilance, another branch of ornamental industry is said to be carried on with an unfeeling disregard for the health of those engaged in it. Within the last four or five years the use of flowers for decorative purposes has become more and more popular in society. Worn in button-holes, worn in riding-habits, formed into bouquets, prepared for epergnes, arranged for weddings and balls, the demand for them has not only enormously increased, but a taste for their artistic grouping has been developed which necessitates the employment of skilled and practised hands by the Covent Garden florists. The girls retained in this business have during the season frequently to labour from 6 in the morning until 10 o'clock at night, and are obliged to perform most of their task in a standing position. They suffer, we are told, not only from fatigue, cramped fingers, and the thorns of the Moss Roses, but from the perfume which, however grateful taken in moderation, has quite another effect when a weary head is charged and surcharged with it. In fact, the women complain of feverishness and brow-ache from the overpowering odours, and although they have not to deal with the deadly materials which shorten the lives of file-cutters or saw-grinders, they are frequently obliged to succumb to the severities of their occupation. These would be obviated by better ventilation—an impossible boon in Covent Garden as it at present exists. With respect to the hours of work, surely flower-girls are entitled to as much consideration as young dressmakers."

—— Mr. ADOLF MEYER announces, in the columns of "Nature," his intention of shortly proceeding to CELEBES on a natural history expedition, and will be happy to learn the wishes and supply the desiderata of any naturalist who takes a special interest in the fauna or flora of the island. We hope Mr. MEYER may be enabled to make known and transmit specimens of the rich vegetation of the island. Letters should be addressed to Poste Restante, Menado Celebes.

—— We have received from Mr. W. BULL some fine spikes of an ANTIRRHINUM, remarkable not only as "double flowers," from a florist's point of view, but also for the singularity of their conformation; the stamens are detached one from the other, and have each the form of the lower lip or palate. The ovary forms, as it were, a calyx to an adventitious flower in the centre; so that we have here what technically would be classed as an instance of petalody of the stamens, and median prolification of the flower, with many other subsidiary changes.

—— The METEOROLOGY of the WEEK ending July 16 (see Mr. GLAISHER'S Tables in our present issue) did not present any particular feature to distinguish it from the usual state of the elements at this particular season. The MAXIMUM TEMPERATURE recorded in England (85°.5) was at Leicester; and the mean for all stations was 79°.2; the highest recorded in Scotland (74°) was at Greenock and Perth; and the mean for the several stations was 71°. The MINIMUM TEMPERATURE observed in England (46°) was at Sheffield, and the mean for all stations was 49°.7; the lowest observed in Scotland (47°) was at Paisley, and the mean for the several stations was 51°.3. The MEAN TEMPERATURE for the several stations south of Nottingham was 63°.4, and for those to the north was 61°.3, and for the stations in Scotland was 58°.2. The RAINFALL varied in England from 1.14 inch at Norwich to 0.00 at several stations; the mean for the stations to the south of Nottingham was 0.38 inch, and for those to the north was 0.08 inch. In Scotland the falls varied from 2.53 inches at Aberdeen, with a mean for all stations of 0.76 inch.

New Garden Plants.

NOTYLIA ALBIDA, *Klotzsch, in Otto and Dietrich. Allg. Gartenzeitung*, 1851, p. 281.

"Pseudobulbus caespitosis, minimis, compressis, leviter 10-costatis umbilicatis;" Klotzsch, *l. c.*; folio cuneato ligulato oblongo obtuse acuto; racemo pendulo densiflore; floribus magnis candidis ochraceo-aspersis; sepalo dorsali ovali, sepalo inferiori ligulato acuto, nunc bidentato; petalis ligulatis acutis, labelli ungue brevissimo, subcalloso, lamina trulliformi basi obtusangula; columna crassa lævi, subfovea utrinque obtusangula; anthera elongata.

When one sees only the inflorescence of white flowers, very large for a Notylia, with some hue of ochre, one is led to think of some Eria or small-flowered Angræcum, rather than of a Notylia. The excellent Dr. Lindley had the pleasure of seeing this common plant a short time before he gave up botany, it having been left at the Royal Horticultural Society's gardens after that lamentable sale of their old historical Orchids. It had been grown from some remainders of Warscewicz's collection. The Doctor was much astonished at the plant, and the writer of these lines well remembers that he was blamed for having overlooked (in Xenia Orchidacea) the very broad, quite unusual nature of the upper sepals. The Doctor had, however, the advantage of seeing the plant alive, while we had seen nothing but the shrivelled dried flowers. We are pleased to see at length a beautiful inflorescence of this odd and rare plant, sent by Messrs. Veitch,—no doubt forwarded by one of their Central American travellers from Costa Rica or Nicaragua. *H. G. Rchb. fil.*

ODONTOGLOSSUM PRASINUM, *Lind. Rchb. fil.*

Pedunculo fractiflexo; ramulis fractiflexis; bracteis minutissimis; ovario pedicellatis elongatis; sepalo dorsali cuneato-oblongo apiculato, sepalis lateralibus deflexis extus viridi carinatis; petalis subæqualibus brevioribus, labello columnæ appresso oblongo obtuso utrinque limbo lobato, callis angulatis geminis in basi; columna brevi, aptera, angulis buccarum prominulis superne obtusangulis.

A very insignificant Myanthium, with sordid greenish flowers, covered with innumerable blackish dots. The lip is whitish, the calli ochre-coloured; there are a few violet dots beneath the apex; the androclinium and limb of stigmatic hollow are brown; other parts of the lip green. Discovered in Ecuador by Mr. Wallis; flowered with M. Linden. *H. G. Rchb. fil.*

THE FORMATION OF SOILS.

[The following paper was read at the Congress at Oxford on Wednesday last, by Mr. W. Ingram.]

AFTER a few preliminary remarks, Mr. Ingram proceeded as follows:—Investigations into the history of soils lead us far back to a voiceless, but not unrecorded, antiquity; and, tracing effects to their causes, we shall find ourselves carried beyond the written records of men, beyond the ages of iron, and bronze, and stone, and we shall be left stranded amidst the bewildered and struggling creatures whose destruction was accomplished during that eventful time, called by geologists the glacial drift period. Some writers on soils have attributed their occurrence and formation to atmospheric causes alone. This theory will be found insufficient to account for all the various circumstances of soil occurring in this country. The preparation of the surface soil for the growth of plants is mainly due to the action of the weather, and we all know that rocks, and marls, and clays, exposed to the action of the elements, are disintegrated and pulverised, and that the particles scattered by the wind, or spread over the land by rain, enriched and carbonised by vegetation, form, during long periods of time, considerable accumulations of soil; but such causes as these are not adequate to account for the immense masses of earthy material composed of matters derived from the rocky crust of the earth, and consisting, in one place, of deep beds of clay, in another of sand and gravel, or loam, and distributed, with more or less irregularity, over the hills, and valleys, and plains of this island.

After the deposition of the lower tertiaries it would seem that Britain and the north of Europe underwent a vast revolution as to climate, and that some new arrangement of sea and land took place at the same period. At all events the large mammalia of the earlier tertiaries disappeared, and the land was submerged to the extent of several hundred feet, for we now find water-worn boulders on the tops of our hills at an altitude of 1800 or 2000 feet.

A cold period ensued, and icebergs, laden with boulders and gravel from other regions, passed over these latitudes, and dropped their boulders on our then submerged lands. How long this process continued it is impossible to determine, but by-and-by a gradual elevation of the submerged lands took place. Our hill tops and ranges appeared as islands, and our valleys as straits. These islands were now covered periodically with glaciers, during a brief season avalanches descended, glaciers smoothed the hill-sides, and left the *débris* as morasses of sand and gravel.

In process of time the land was elevated to its present level, another distribution of sea and land took place, and the glacial epoch passed away.

The agencies in action during this time were eminently calculated, as no doubt they were designed, for the production of results of the greatest possible importance to us, "the latest gifts of time." It appears to me to have been the most evident period of preparation for the race of beings that was to become dominant on the earth, and to glorify by intelligent appreciation the gracious gifts of God.

To the action of these great forces of Nature, turbulent seas, icebergs, glaciers, and the streams from the great ice fields, as the climate changed, may be referred many of the drift soils which I have already said are widely distributed, and which wherever they occur give their own character to our agricultural and horticultural productions. Looking broadly over the vast fields of Nature, we see a ceaseless round of causes and effects, of processes and products. Change alone is dominant. While we enjoy the great results of time, we must not omit to read the great lessons written in what I may call the ripple marks of these ancient sea margins, which, while carrying destruction to the mighty race of mammals of that time, caused the production of vast areas of soil fertilised more or less by the decay of animals and plants which were coeval with and commingled in the *débris* of a vast disrupted world of matter.

The causes which have subsequently contributed to produce the more important deposits of soil, are less in magnitude, and in the process of soil-making are fortunately unattended by such wide-spread destruction as that which occurred during the drift periods. The ceaseless and prolonged action of rivers, commencing in periods incalculably remote, and coming down to the present time, have necessarily produced immense deposits of soil. We have all had opportunities of seeing how the devious course of a river is changed by the waters acting upon the banks that bound it. Masses of sand, silt, mud, and gravel are annually displaced and deposited, and loam beds, for future fattening fields, are being formed, inch by inch and year by year. Our true and best loam beds are our ancient and matured river deposits.

While the rivers pierce and ramify through the land, displacing and reforming new beds of the matters through which they pass, they still carry onwards some of the spoils of the land into the bosom of the sea. Sea and land, like rival monarchs, are ever striving for mastery. At the mouths of our great rivers we have islands or deltas constantly increasing, which are destined some day perhaps to be rich pastures, where prize stock will fatten, or fair gardens where champion Grapes will win future medals.

But the sea is sometimes generous, and gives tribute to the land. This is attested by the rich alluvial tracts along our eastern coast, for where the land slopes smoothly to the ocean, and the waters roll over a shallow strand, every tide leaves a deposit which, increasing thus, is at last embanked, and forms the rich alluvial fields that Lincolnshire delights in.

I have already referred to the operation of the forces of the atmosphere, on the exposed surfaces of the earth. In the comparatively equable climate of our own country such causes as heat and cold, wind and rain, are in constant operation, and, as we all know, assist us greatly in the preparation of land, and the labour we bring to bear upon the earth's surface assists the process of disintegration.

Having thus cursorily glanced at the causes which have contributed in the greatest degree to the accumulation, dispersion, and deposition of the earthy matters that result in soils, before proceeding to trace out in detail the various deposits of soil, spread like a garment over the stony framework of the earth, it will be as interesting as it is important to our inquiry to examine the great rock system of England. We shall by so doing be better able to trace back to their natural beds or formations some of the drifts or accumulations of soil which are found to occur, more or less abundantly, on differently places.

From the western end of the Cheviots a mountain range commences, termed the Pennine Chain. It stretches due south through Northumberland, Cumberland, Lancashire, Yorkshire, Derbyshire, and with a break terminates in the small mountain range of Charnwood, in Leicestershire. A great part of this range is composed of carboniferous rocks, lying in an anticlinal ridge, and having the lower series of rocks in the centre and the upper in the flanks. Connected with this chain is a group of mountains, occupying part of Cumberland, Westmoreland, and Lancashire; these form the Cambrian group of the lake district, and present the highest summits in England (Helvellyn, 3,055 feet). The stratification of these rocks has been disturbed by intrusive masses of granite and igneous rock. The old red sandstone or Devonian has a considerable development in Herefordshire. That important section of the carboniferous system, the coal measures, occurs extensively in the north of England, Yorkshire, Lancashire, Derbyshire, Notts, Lincoln, and Stafford. The lower red sandstone fringes the northern cold field, and appears in Shropshire associated with the coal formation. The magnesian is found in Northumberland, Durham, Yorkshire, and Nottinghamshire. The new red sandstone spreads from the foot of the rocks already described into great rolling plains which occupy a large part of some of the Midland Counties; an extension of this system runs down the valley of the Severn, through Somerset and Devon, to the mouth of the Teign. A similar extension runs through the county of York to the Tees, while a third occupies nearly the whole of Cheshire.

The secondary rocks, from the lias to the chalk, strike regularly across it in a S.W. and N.E. direction, and presenting escarpments to the W. and N.W. The softer portions of these formations make plains or valleys, and the harder and stronger rocks long ridges of hills. We have thus the plain or valley of the lias running from Lyme Regis to Whitby. Over this comes the oolitic escarpment. As the chalk dips towards the east, it becomes overlaid by tertiary beds, which extend from Norfolk to Hampshire, with one remarkable interruption. This is a broad and elevated ridge of chalk that extends from Salisbury Plain to the N.E. of Winchester, where it divides into two ridges, one the North Downs the other the South Downs. In the centre of this valley rises a ridge composed of Hastings sand, the beds of which have been largely removed by denudation.

The tertiary beds of the south-east of England are separated into two parts, occupying two basin-shaped depressions, called the London and Hampshire basins. Every rock formation which I have described has been more or less denuded by the operation of the various causes incident to the drift period, but notably by glacial action, and by the great boreal and the subsequent eastern drift. Had the carboniferous and red sandstone formations been composed only of rock, however powerful the action of the agencies brought into play during the pleistocene period, the resulting *detritus* would have been great plains of gravel and boulders—fragments, in fact, "confusedly hurled like relics of an earlier world." The preparation for the great events that caused the dispersion of soil had preceded the time of their occurrence. The ancient seas of the carboniferous period had formed from the waste of the granite, silurian and Devonian systems, immense beds composed of shales, clays, slates, and sandstones, while the profuse vegetation of the period added the coal-beds. The displacement, amalgamation, and dispersion of these matters is evidenced throughout the system. The deep valleys that intersect the mountain

masses of the carboniferous rocks show the amount of denudation they have suffered; and the *débris* are scattered far and wide over the land. Some of the best soil in the Northern Counties is composed of the matters borrowed from those ancient rocks.

Chatsworth, amongst other places, owes some of its deep loam beds to the degradation of the neighbouring rocks; and the feeding meadows that surround ancient Haddon have lost none of their fertility although they fattened beeves for the hospitable owners of the Hall centuries ago.

The upheaval of the millstone grit in Derbyshire, and the subsequent waste of the stone, has formed over a wide extent of surface a poor, siliceous soil, which sustains heath and endless moors. This is an example of what I call a primitive soil, one obtained directly from the wash or decay of rocks or marl beneath. This, too, is first in my list of peat soils, on which I shall comment presently. The mountain limestone, which is one of the divisions of the carboniferous, is associated, but not intermixed, with grit. Its purely calcareous character separates the vegetation of the two rocks as widely as the poles; and while on your right you see the purple Heather blooming, on your left you have woods and corn-fields.

The next important soil-producing formations to be noticed are those derived from the permian and triassic systems. These, by their subordinate elevation and central position, the previous character of their shells and marls, suffered greatly from the denuding action of the various drift currents to which they were exposed, and consequently contributed an immense amount of earthy matter over the whole face of the Midland and South-Eastern Counties. The red loams, of which, fortunately, we have many examples, are derived from these marls, intermixed with gravel and vegetable *débris*. The Bunter conglomerate of this system gave rounded pebbles, the gypseous beds of the lower series sulphate of lime; altogether the mineral matters from this system are of incalculable value in fertilising vast tracts of land.

An example is offered in this formation of benefits conferred but not enjoyed. The pebbly beds of the conglomerate remain undisturbed, a poor siliceous gravelly soil is the result, the marl beds below being out of reach. This affords some of the least profitable land in Nottinghamshire. A crystallised form of magnesian limestone occurs at Mansfield, but this is overlaid to a depth of 10 feet by beds of marl, interstratified with a band of limestone. As a rule, it is not safe to assume that the surface soil partakes exclusively of the character of the substrata, and contains its essential principles; and in recent discussions some eminent gardeners have made the mistake of supposing the surface soil above the dolomite rocks to be invariably made up of their *débris*, when in reality the rocks are too far below the surface to affect vegetation.

Descending in the series, we find the upper beds of the oolite, the lias, have suffered extensive denudation; an immense quantity of limestone, clay-ironstone, has been swept away from the oolites throughout Leicester and the adjoining counties. The sweeping effects of the currents of the drift, as the land gradually rose, are very evident. The relics of our rocks, in fragments of stone, fossils, and ironstone nodules, may be found scattered through the gravel beds of the counties south-east of us, as well as filling some of our own valleys.

We hear occasionally of great agricultural as well as of horticultural achievements in our Eastern Counties. Sporting gentlemen tell of turnips whose growth reaches the knees, and gardens eminent for the excellence of their products are known to us all; but while conceding a great deal to skill, I must, as a faithful chronicler of soils, attribute not a little to their influence in securing such favourable results. Throughout the Northern and Midland Counties we find, as I have described, the great rock system scored, and rent, and abraded of a portion of the mineral treasures of the red sandstone, the oolite lias, chalk, swept away, and this grand compost spread as a dressing over the limy, craggy beds of Norfolk and Suffolk Can we wonder that turnips grow? or that "Mrs. Pollocks" are evoked? or that Man has been rendered eloquent, when half a country has been broken up, and its fertile stores given to these happy lands in the East?

The cretaceous groups which comprise the chalk and the greensand are not very extensively developed, although the white chalk cliffs have given a name to our country. We are all more or less acquainted with one of the products of the Downs, which have given us a breed of sheep (Southdown) few fail to appreciate.

But little drift rests on our chalk hills, and the sparse flinty soil, though fertile with management, requires good farming or good gardening to bring it up to the mark. The numerous valleys which intersect the formation contain deposits of detrital loam, while beds of clay and gault occur in the system. The associated greensand formations are developed largely in Surrey, Bedfordshire, and Kent. The greensand of the latter county forms a base for the peat soils, which, according to certain notions, produce a wonderful effect on the growth of Heaths. The upper and lower greensands are, under good cultivation, valuable for early cropping and for seed lands. The two well-known examples of the tertiary systems which I shall instance, are the London clay and the Bagshot sand. I cannot speak in terms of very high commendation of the horticultural capabilities of London clay. It is very hard to work, and, like a dull boy, requires a good deal of keeping up when it reaches the friable point. It does not equal the lias, plastic or gault clays, when made into a soil.

I have spoken a little regretfully of the waste of some of the formations, but when I approach the Bagshot sand, that dreary waste of comminuted silica that runs through parts of Surrey, Sussex, and Hampshire, I can only say that it is a matter for regret that some of it at least was not overwhelmed, like Norfolk, and either its sandy wastes swept away or covered over with a few feet of loam, which, were it spread upon these heathy barrens, would make this tract of country smile like a garden. The pebbly beaches and sand beds, poor and hungry as they seem, are gradually submitting to reclamation, and being healthy, are attracting the smoke-dried Londoner, who may gather health, if not profit, in the pursuit of gardening under difficulties. But we must forgive the general sterility of this formation when we remember the Rhododendrons and Azaleas, and the vision of beauty we have before us now in Oxford in Mr. Jackman's varieties of Clematis.

The natural world is replete with examples of agencies compensating wasted powers, and effecting restoration—evolving new forms. We have seen how the hills have been riven and washed, and the fragments spread far and wide over the land and sea. An illustration of the saying, that nothing is ever lost, is before us in the rich, alluvial plains that are found in Lincolnshire and elsewhere along the coast. If any one wants a proof of the influence of soil and situation on animals and plants, he should go first to a hilly inland district in Derbyshire, and after looking at the cattle and the crops, he should proceed to Peterborough, Wisbeach, Sutton Bridge, or to Sleaford and Boston—he would find cattle double the size, and corn crops at least twice as productive as in the colder county. Here we come to a grand result, and a great example, in showing what soil and situation will do. A realisation of an almost perfectly fertile condition of land is a sort of philosopher's stone to gardeners; and what often gives additional value to these fine alluvial plains, is that beds of silty gravel are found beneath them, and form the best natural drainage. Nothing is wanting in such fortunate districts but increased elevation (50 feet heavenward). Some of our best seed grounds are found on these rich tracts, and the principle is quite right, to grow seed stocks on the most fertile land; there will then be no retrogression of type.

It would be interesting in a horticultural point of view, and at the same time it would tend to illustrate my subject, if I could follow out the river system of England, and write the story of all the streams that, springing from the heart of the country, flow ever onwards towards the sea. In the present instance I can only venture to indicate very slightly the influence of rivers, regarded in the light of soil producing agents. A great arterial river is a great power moving through the land, and together with its tributary streamlets, which gather their quota of earthy matter from the land adjacent, effects great changes in the distribution of soil.

The gravel beds of a river help us to understand the history of its wanderings. Pebbles of quartz and grit, and eroded fragments of granite, a lump of mountain limestone, tell us that the water has passed over an ancient drift bed. The Trent gravels are very much made up of the pebbles from the Bunter conglomerate, and the meadows that spread out through its wide valley show, in occasional sections, that the rich loams that belong to it were borrowed from the marls and red sandstones, through which it has for so many miles forced its way.

An immense gravel bed fills up the valley of the Thames to a distance of 50 miles. The gravel is composed chiefly of chalk flints. The great beds of loam which rest from one to several yards in thickness on the gravel bed, appear to be an alluvial deposit of the post-pliocene time. This loam, derived from calcareous formations, clay, greensand, and gault, is an extremely valuable soil for garden purposes. I know three tributaries of the Trent; one passes through a great clay formation, another comes from the iron beds of the inferior oolite, and passes through lias clay and marl stone,—its gravel is but the stone from the beds over which it flows. Another takes its rise amongst oolite hills, and in ancient times has given large sandy deposits to the valley through which it runs. An unwary gardener might look upon these light soils as suitable for American plants, he would be woefully deceived; derived from limestone they still possess some of the properties of that mineral, and are inimical to Heaths and Rhododendrons when planted in them. Each of these rivers, in a comparatively restricted area, has formed loamy deposits, which, derived immediately from, are exclusively characteristic of, the formations through which they pass. From these examples I judge that tributary streams bring down more waste in proportion from the land than the main streams, and give a more varied character to the loam beds that are formed in the main valleys.

I must not conclude my story of the soils without referring to the peaty deposits and the bog lands, which, having a special botany, are of greater interest and importance to gardeners than many ordinary soils. Nature has infinitely multiplied her forms of life, and adapted them to every circumstance of soil and position found in the world; nothing seems so abhorrent as utter barrenness. The desolation of our moorlands would be complete were it not for the Heather and Gorse, the Fern, Moss, and Lichen.

The weathering of the millstone grit gives us a poor siliceous soil; decaying Moss, and Lichen, and Heath, in process of time add the vegetable *pabulum* necessary to support these hardy denizens of the mountains. The greensands in Kent and Surrey, the Bagshot sands in Sussex and Hants afford examples of peat soils. Wherever poor sandy drifts occur heath and peat soil is found.

Bog is a product of decayed vegetable matter due to moisture; an alteration in the level of a district has caused the submergence of extensive forests, and so a black vegetable soil is formed. Most large rivers have boggy deposits, due to inundations, and to the course of the river being encumbered with weeds and rubbish, just as the Upper Nile is at the present day.

The value to us of either peat or bog is due to the fact of their perfect freedom from the taint of stronger soils. Pure sands and vegetable matter are always safe to employ.

In endeavouring to recal instances of an exceptionally favourable development of vegetation arising from the influence of soil, the magnificent Oaks in Bagots' Park, North Stafford, are vividly brought to my recollection. The Park is 1000 acres in extent, and splendid specimens of Oak timber occur all over it, but notably in the case of the Beggar's Oak, the Squitch Oak, the King and Queen Oaks. These are giants amongst trees, and exhibit perfect vigour and health.

Knowing that red marl occupied to a great extent the country about Bagots, I had assumed that these trees were luxuriating, as they often do, in the rich marl beds of the red sandstone. A subsequent and closer inquiry proved my assumption erroneous.

The Park is thinly covered by beds of the lower lias which have escaped denudation. These beds have not been disturbed by cultivation. A section on the north side of the Park shows 1 foot of drift clayey soil, few pebbles, 2 feet clay, 2 feet laminated shale with micaceous particles, 3 feet mixed clayey rubble, 3 feet shale.

Nothing can be more unpromising, on first looking on this section, than the soil. The secret lies in the fact that all these apparently poor beds contain an exact balance of the mineral constituents of fertility in a state of slow decomposition. They are compact, without being too retentive of moisture.

I may, in conclusion, advert to the singular advantages enjoyed, in an economical point of view, by the assemblage within a comparatively restricted area of all the more important rock formations that belong to the earth, and by the position of those rocks, by which they are rendered accessible to, and their peculiar products more readily available for, the uses to which they are applied by man. England epitomises the world in its rocks and rich mineral products; such a land is a fitting home for representatives of the great races of the world, whose energy and intelligence have found a home and fitting field for the exercise of the best and highest human faculties. A land endowed like this is a fitting school for a hardy and enterprising nation, and the varied knowledge gathered in the pursuit of the industrial arts, manufactures, mining, agriculture, and horticulture, has fitted the adventurous men, the pioneers of civilisation and Christianity through the world, for the great works they are destined to accomplish. I think I may truly say that Englishmen generally are content to win laurels by successes achieved in prosecuting the arts of peace, in conquering the unproductive soil of those countries whose undeveloped resources remained too long in abeyance, under the sway of the savage. The agricultural and horticultural productions brought together in this city of learning, help to illustrate my remarks. The cereal riches and the blessings spread far and wide over the world, in fruits that gratify every sense, and flowers that gladden the very soul of man, are presented to us. The lessons gained in these bloodless encounters, these modern Wars of the Roses, are carried by our ever-departing pilgrims to their distant habitations; and it is the glory and delight of our brothers in their far-off homes to gather together their flowers and fruit, and emulate the work of this, the parent society of the world of horticulture.

SEXES OF PLANTS.

I WAS much interested in the article at p. 826 from the pen of Dr. R. Spruce, on the "Sexuality of Plants." I could not but feel a trace of regret that there is not a more frequent contribution of facts between observers in different countries than there is. With other countries there are the difficulties of language—between America and England there should be no obstacle. I think, in this question of sex, that if American observations had received due weight in England, the true law of sex would have been understood long ago. Soon after I came to the United States, in 1848, I noticed the peculiar effect of the intense light of American summers on the vigour of vegetation. The whole ratio of growth was altered. I had been accustomed to believe that it took hundreds of years to mature an Oak, and that even an Apple tree would last several generations. Here an English Oak would grow up to its 60 or 70 feet, and decay away, all within 100 years; and, in most cases,

50 years would be the old age of an Apple tree. I say the influence of light, but that was but an hypothesis. I supposed, from my experience as a cultivator, that increased light gave increased power of decomposing carbonic acid, and thus adding to the more rapid increase of the bulk of the tree. I noticed further that this peculiarity of climate interrupted the sexual arrangements I had been cognisant of in Europe. Fragaria vesca, and the varieties of European Strawberries with which I had there been familiar, were mostly hermaphrodites, here varieties of the same stock were chiefly unisexual. I pointed out these facts in the American Journals between 1852 and 1855, and showed from them that sex in plants was not the result of any fixed constitutional tendency, but was influenced solely by external circumstances. People who like to read rather than to observe, quoted the writings of the best authorities in Europe against me; and I received no aid from any one, but the late Dr. Wm. Darlington, author of "Flora Cestrica," who furnished in some papers valuable facts confirming what I had seen. I was charged with teaching the absurd doctrine that "a bull could be transformed into a cow," and so on, showing—what must have become very apparent to other botanists besides myself—the errors which arise in people's minds from taking up too closely analogies from the animal world. However, I took hermaphrodite Strawberries, and by growing them on the shelves along the back wall of a lean-to hothouse, and manuring them with as strong manure-water as they would bear, the influence of the strong American light was great enough to produce pistillate flowers on them. I was young then, and had not the wide experience necessary to generalise properly; but I am satisfied now, that if English botanists had given any thought to the facts then produced by myself and Dr. Darlington, it would not have been left to my good fortune, nearly 20 years later, to discover the law which regulates the production of plant-sexes in the simple fact that it is the highest condition of vigour only which produces the female sex.

During the last ten years I have published many papers recording facts and detailing observations—some of them, from the Proceedings of the Philadelphia Academy of Natural Sciences, have been reprinted in the *Chronicle*—which I supposed must tend to show the ancestral type of many polygamous plants was hermaphrodite, and that sex was governed by simple powers of nutrition; and I was somewhat surprised to find, when my paper on sex was read before the American Association, in which I only took up enough of the time of the members to give a few of the strongest facts, that they were unprepared to receive any of them. Yet there is scarcely a tree or plant of any kind that will not furnish the evidence of the truth of my theory. Sometimes I have met with facts which seemed to indicate that the male flowers resulted from superior vigour, but I ultimately discovered facts have shown them rather to favour it. For instance, if we take the flower-scape of a Typha, we see there the fact very clearly that the female flowers are in the greatest line of vigour; only after the female flowers have been formed does the plant from its very weak apex produce the puny male flowers. But when we observe perfectly dicecious plants, or plants "practically dicecious," it is quite likely that we find apparently vigorous plants barren, and weaker ones fertile. The Lonicera brachypoda of the gardens is a remarkably fruitful plant in the United States. It is usually loaded with black berries. We have here also another form, known as L. Halliana. I take them both to be varieties of L. japonica. But the latter is far more floriferous than the former, and every way a more vigorous grower, but I have never been able to get a berry from it. American nurserymen regard it as a male, through its barrenness; but an examination shows that though the anthers are apparently perfect, there is not a trace of pollen in them. The pistils are remarkably perfect, and the Hallianum is a grade in the female line, and rather helps than opposes the law. The brachypoda is hermaphrodite, and self-fertilising, not so strong a grower, because hermaphroditism is not the highest type of vigour.

The Dock, also, furnishes excellent illustrations of the grades of vigour in its relation to the sexes. Take two species common here, Rumex crispus and R. oblongifolius. I must have examined these closely when in England, as it was my wont to do with most things, but I have no recollection of their being anything but hermaphrodite. However, here only the plants of average vigour are such, the strongest plants being almost all pistillate, the male flowers only appearing abundantly, as in Typha, when the axial growth has nearly exhausted itself at the apex of the racemes. Rumex Patientia is also of this character here, but I cannot compare it with its growth in England, not remembering gathering it well, or particularly examining it.

When you noticed in the *Gardeners' Chronicle* my paper before the American Association, you suggested that probably some exceptions would be noted. I have watched your columns since with much interest, as well as other Journals, but none have been suggested that I have seen. None have been offered here either, with the single exception of one by Prof. Agassiz, who suggested when the paper was read that many tropical Scrophulariaceæ, with their scarlet bracts (which I showed to be a tendency in the male direction, when such colouring was a departure from the normal type in the species), were remarkably seed bearing. But when it is remembered that the whole tribe of Scrophulariaceous plants is noted for the great tendency to staminate abortions, the objection aided rather than injured the theory.

It has been thus in all cases I have known, and I think I may venture the proposition that no exception can be found wherein the female organs are not on the strongest axial parts, and the male on the weakest if all other circumstances are equal.

In the quotation from Dr. Spruce some Maples and Ashes were referred to. In one of my papers before mentioned I noted how frequently branches of a different sex will push out from trees which have for years been of another, in Acer dasycarpum; and it is remarkable that all the trees of Fraxinus excelsior that I know in a flowering condition here are unisexual, with the exception of the weeping variety, which is always hermaphrodite. But this of course is perpetuated by grafting. The tree is only of a moderate degree of vigour—just the conditions we look for in hermaphrodite plants. The variety monophylla (heterophylla?) is our most vigorous growing form of excelsior, but I know of no one which has flowered.

But, as I have said, other vigorous tendencies must be present as well as vigour of growth, though in the average it is so in growth alone. The male Spinach or the male Hemp is in most cases much the weakest plant, and in all cases dies before the female plant.

There is a strong disposition just now to see how far this theory of vigour applies to animals. I suppose Professor Thurig's theory has been abandoned. At any rate, agriculturists here have not had the results which favoured the experiments of M. Cornez with them. In fowls the results have proved rather the reverse. In the case of plants our theory indicates that the formation of the sex is a matter entirely between nutrition and the mother plant, and one with which the male parent has nothing to do; a theory far removed from Professor Thurig's idea. *Thomas Meehan, Philadelphia, U.S.*

PALMS.—No. IX.

Desmoncus (Mart.).—I agree with Dr. Spruce in declining to accept Karsten's proposal to merge Desmoncus into the older genus Bactris. Its very obvious differences from Bactris are, "the scandent habit, the opposite pinnæ, whereof the lower are so narrowed at the base as to be spuriously petiolate and almost exactly lance-shaped, and the upper six or eight pairs are transformed into straight, tough, subulate spines, so reflexed at an angle as to catch firm hold of any soft substance that brushes against them; the petiole consisting almost entirely of sheath, and the sheath prolonged upwards into an ocrea 3 inches long; whereas in the Bactrides the sheath has either only a ligule at the mouth, or it extends into a very short oblique ocrea, and besides the sheath there is a proper petiole of from 1 to 2 feet long. Besides these differences, no Desmoncus has leaves ciliated with aculeoli, while every Bactris has them so, if not along the margin, at least in the pencil at the point of the leaf." Desmoncus holds about the same position in the forests of tropical America that the Rattans and their allies do in those of Asia, climbing over trees, and throwing out armed pinnated leaves to catch the unwary traveller. Their flowers appear in the axils of the leaves, and are monœcious, and their drupes 1-seeded, generally of a bright colour. About 18 species are known, of which D. major, aculeatus, dubius, latifrons, macranthus, mitis, orthacanthus, mexicanus, polyacanthus, &c., are cultivated by us.

Bactris (Jacq.; Augustinea, Karst.).—About 80 species compose this genus, all of which are prickly Palms, very seldom attaining the size of trees, generally forming underwood in tropical American forests, and frequently making their appearance on newly cleared land. In many cases several trunks issue from the same root-stock, and form thickets difficult to penetrate. They share with Desmoncus the peculiarity that the leaves, instead of being confined to the apex of the trunk, are scattered over nearly the whole surface; and, moreover, the lower leaves retain their verdure long after the upper ones have fully developed. These features, and the small size of the species, recommend this genus to the notice of cultivators, and out of the 80 species known about 20 are already in our gardens. The leaves are pinnatisect, and their segments generally linear and entire, but in B. caryotæfolia and others delta-shaped and erose. The peduncle of the spadix bursts through about the middle of the leaf sheath. The drupes are small, ovate or nearly round, and generally of a dark blue colour.

Guilielma (Mart.).—This genus so closely approaches Bactris in its technical characters that several botanists, following Karsten, seem inclined to combine them. The species now grouped under that name are lofty trees with slender trunk, armed with black spines and crowned with terminal pinnated leaves, having linear segments and prickly petioles. The flowers are monœcious, and the drupes of a reddish yellow colour. The best known species is G. speciosa (Bactris Gasipaes, H. B. K.), the Peach Palm, one of the cultivated Palms of the Amazon and Orinoco regions, about which the writings of Wallace and Spruce should be consulted. It grows to 60, and even to 90 feet in height, the numerous curling and drooping leaves rarely exceed 9 feet, and they have from 40—60 leaflets on each side, aggregated in threes and fours, and pointing in all directions. The fruits are massed in large pendulous corymbs, and may be likened to a well-ripened Peach in colour; their thick mealy flesh, when cooked, is between a Potato and Chestnut in flavour, but superior to either. A seedless variety is common. Dr. Spruce traced this Palm from the Brazils and Venezuela to the Cordillera, where, however, it is also only cultivated; nobody seems to have as yet found it truly wild, though hopes are entertained of doing so somewhere in the Andes. It has long been an inmate of our gardens. With the exception of G. utilis, Oerst. (the "Pechevaga" of Costa Rica), all the species are natives of the Orinoco and Amazon regions.

Martinezia (Ruiz et Pav.).—This genus is closely allied to Bactris and Acrocomia, but differs considerably in habit; its trunk seldom exceeds 8 feet in height, and is clad with prickles, bearing at the extremity a few leaves with spiny petiole and midribs, and wedge-shaped erosed segments, resembling those of Caryota and Wallichia of tropical Asia. Martinezias inhabit the Andes of South America, or the banks of the rivers having their sources there. M. caryotæfolia, long an inmate of our gardens, is one of the numerous fine plants gracing that botanical treasure-house, the mountains of Quinditu. M. Aiphenes (aculeata, Kl.), Lindeniana, truncata, and others, are under cultivation.

Acrocomia (Mart.).—I have often been struck when travelling during the dry season in the western parts of Nicaragua, by the noble groups of Wine Palms of the country, known by the vernacular name of Coyol, and described by Oersted as A. vinifera, and which supplies the natives with a delicious beverage. Like most of its congeners, and unlike the allied genus Astrocaryum, A. vinifera prefers the light of the open plains to the gloom of the virgin forests. We know about nine species, natives of the central parts of America. Their trunk is from 20—50 feet high, and clad with long prickles; their leaves are pinnatisect; their flowers, which appear in the axils of the lower leaves, are greenish or yellow, and their drupes of a greenish olive or yellowish colour. The nuts are either eaten or converted into oil. A. lasiospatha, and sclerocarpa, are in cultivation.

Astrocaryum (G. F. W. Meyer).—The species of this genus delight in humid or swampy places, being often found on river banks exposed to occasional floods, and luxuriating in rich vegetable mould of the virgin forests of tropical America, principally Brazil. A few of the species are stemless plants (A. acaule, &c.), but the bulk of the species are trees, some attaining to 60 feet in height. Trunk, foliage, fruit-stalks, spathes, and in some cases even the fruit itself, are covered with spines. The leaves are pinnate, having linear segments, dark green above and often of a silvery white below. The flowers develope from the axils of the old decayed leaves; the drupes are orange or yellow, and in some instances sweetly scented. We cultivate in our gardens A. aculeatum, Ayri (Toxophœnix aculeatissima, Schott), A. campestre, Murumuru, rostratum, mexicanum, Tucuma, vulgare, &c. Most of the species are useful to man—A. vulgare supplying cordage of superior quality, employed for purposes where firmness combined with strength is required. The fruit of A. Tucuma is edible, as also that of A. acaule and A. Murumuru.

Manicaria (Karst. in Linnæa, xxviii., p. 393). M. bicuspidata and M. erinacea, two prickly Palms, with pinnated leaves, inhabiting Columbia, compose this genus. It differs from Guilielma in having the calyx of both sexes, as well as the corolla of the males, 3-phyllous, but it agrees with it in the adnate androecium and other characters. But the stability of the genus requires to be inquired into, and can only be ascertained by working up all the other prickly Cocoineæ.

Elaëis (Jacq.).—This is one of the numerous genera which the west coast of Africa has in common with the east coast of America, and which furnish some of the facts sustaining the hypothesis of a former connection between those two continents. E. guineënsis supplies the palm oil of the West Coast, now a commercial article of great importance, whilst E. occidentalis furnishes the inhabitants of tropical America with a considerable portion of the oil used in their households. The trunks are decumbent, and have so few roots to hold them fast that I have often kicked over a tree. The leaves are pinnate and terminal, and the fruits of a bright red colour. The oil resides in the husk (mesocarp), and is separated by boiling the fruit in water, and pounding it in wooden mortars until all the fatty mass is floating on the top. Both these oil Palms are in our gardens. Their natural habitats are swamps. *Berthold Seemann.*

HARDY VERONICAS.

Veronica Teucrium (L.).—This is a beautiful, and also very variable, species. It blossoms freely early in summer, and if not disturbed the plant becomes a large tuft, rising from 1 to 3 feet in height. Every part aboveground, and outside the calyx, is more or less hairy. The leaves are opposite as a rule, stalkless, ovate, or sometimes lanceolate, obtuse, and deeply and irregularly cut, although now and then only roughly

serrate. From the axils of the leaves, a considerable way up the stem, emerge large racemes of the most lovely blue flowers imaginable. The limb of the corolla is spreading, and about half an inch across, and the entrance to the short tube is closed by a ring of pure white hairs. It is a native of Germany and several other European countries, and is not scarce in nurseries, although far too rare in our gardens. This, like nearly all its relatives, grows quite freely in any rich loamy soil, and is readily increased by division in the autumn, or by seed sown either when ripe or in the spring. It should have plenty of moisture during the growing season; and it suffers from being under trees. Unless stated to the contrary, these remarks are intended to apply to the following in the matter of cultivation.

V. prostrata (L.)—The botanists who are opposed to the multiplication of names put this along with the foregoing, but such a view is sure to be set aside by gardeners; and no wonder, for, comparatively speaking, the present plant is a little thing with a weak and slender stem; but, although so dwarf, it produces a great quantity of blossoms. The leaves are opposite, sessile, oblong, or ovate, serrate, and obtuse. The racemes are not half the length of those of V. Teucrium, even when the two are grown side by side for years. The corolla is of a delicate, or more rarely, rich blue colour, and the spreading limb is about one-fourth of an inch across. The flowers open early in summer. It is better adapted for the rockwork than for the ordinary border, but it is beautiful wherever it can be induced to thrive. A native of most European countries.

V. orientale (Ait.) is near to the next species, and its chief peculiarity is in its leaves, which are cut into very narrow strips. It is very neat, and also free flowering, and should enter into every collection of herbaceous alpines. It is not, I regret to say, in very many of our nurserymen's catalogues, but is easily procured from the adjoining Continent, where it grows wild.

V. taurica (Willd.).—Mr. Bentham makes this only a variety of V. Teucrium, but it seems a very fair garden species, standing in no danger of being confounded with anything else. The stem is slender, and mostly less than a foot high. The leaves, unlike those of any other nearly related kind, are entire and almost acicular. The limb of the corolla is blue and spreading during the early part of the day, the entrance to the tube being white. The blossoms are at their best about midsummer. A native of Tauria, and fit for the rockery.

V. latifolia (L.).—This is much larger in all its parts than any of the preceding, and the specific name has the great and uncommon merit of being descriptive. On account of its size it should be at the back of a mixed border, or else should occupy a spot requiring something high as around the margin of a shrubbery. The technical peculiarity of this is to be found in the great, rough, semi-amplexicaul, serrate-dentate, broadly ovate, and obtuse-pointed leaves. The racemes are axillary and a foot long or less. The corolla is spreading and of a rich blue colour, penetrated at regular intervals by darker and sunken lines. The flowers open about midsummer. A native of Austria.

V. caucasica (Bbrst.).—This is exceedingly graceful and curious, and not very unlike V. orientalis, but still readily known by its characteristic bipinnatisect leaves, the segments of which are linear. The racemes are axillary, a foot or less long, and not by any means dense. The spreading limb of the corolla is over a quarter of an inch across, the three lower petals are white or pale red, and the upper one is marked by very fine purple lines. The centre of the flower is green, and the stamens are blue. Suitable for the rockery or the front of a mixed border. A native of Tauria.

V. nummularia (Gouan.).—This is a little thing, which creeps along the ground, roots as it goes, and is covered in spring with large white or pale blue flowers. It is one of the most admirable of alpines, and delights to ramble over damp stones or anything similar. The raceme is dense, and a few inches long. Unlike the sorts already treated of, this has not an axillary inflorescence, but, like all those which are to follow, it has a terminal one. A native of the Pyrenees.

V. saxatilis (L.) is one of the most brilliant and rare of our native highland flowers, and though of a larger growth than V. nummularia, it is, on the other hand, far less given to spread than that species. The leaves are opposite, oblong, or elliptical, and with a few teeth along the margin. The racemes are dense and corymbose at first, but ultimately look scantily furnished. The rich blue spreading limb of the corolla is wonderfully beautiful. The blossoms open towards the end of spring.

V. fruticosa (L.).—This is another gay mountaineer, of small stature, answering admirably to its specific name, and libellously figured in at least one edition of "English Botany." It grows upright, and forms a neat and compact tuft. The leaves are opposite, and, unlike those of V. saxatilis, are linear-oblong, and about 1 line broad and 6 lines long. When full grown the racemes are only a few inches in extent. In the books the flowers are mostly represented as either blue or rose coloured, but in the specimen now before me the lower petal or lobe is pure white, whilst the upper ones differ only in being marked by nearly parallel red lines of exquisite delicacy. Though almost, if not quite, extinct as a native of Britain, it is plentiful on the Alps. Blossoms about midsummer.

V. gentianoides (Vahl).—This is perhaps more widely distributed in our gardens than any other species of the genus, and assuredly its beauty fully entitles it to all the attention it has received. The leaves are pale green, or sometimes variegated, and all the more perfect ones are radical, opposite, oblong-lanceolate, entire, glabrous, and obtuse. The scape ends in a long plentifully-furnished raceme of flowers, which open in spring. The corolla is eminently pleasing, and with a nearly circular pale blue or white and spreading limb. The prominent colour of the upper and side petals is generally heightened by intensely deep blue lines, whilst around the margin of the whole is a regular fringe of hairs. Fit for the centre of a mixed border, and handsome on rockwork. Very fond of water, particularly during the early part of the year. A native of Tauria, Caucasus, and Asia Minor.

V. spicata (L.) is a sturdy as well as a very handsome and variable sort, and is to be met with in most of our gardens. The stem is from 1 to 3 feet high, and usually strong and erect. The leaves are opposite, petiolate, and either ovate, lanceolate, or linear, serrate, acuminate, and of a rich green colour. The raceme is 9 inches or less long, and generally so dense and compact as to make the specific name descriptive. The flowers are not individually large, but collectively they manage to make an excellent display about midsummer; fit for the rockwork or mixed border. There is a variety called "alba," on account of its white instead of blue corolla. Some botanists put V. hybrida, with its elliptical leaves and impoverished raceme, as a form of the subject of this paragraph.

V. grandis (Fisch.).—The look of this is so very different from that of V. spicata, that one very naturally expects to find characters by which to separate the one from the other directly, but so soon as this impression is tested, it breaks down. For the worst of it is, there are intermediates to connect the extreme forms, and it is amongst those in a state of transition one is apt to get bewildered, and take to lumping. The only guidance which can be given in the present instance is to the effect that we find much more length of stem, foliage, and raceme in this than in the adjoining species, and besides, here the base of the leaf is generally cordate. The blossoms open about midsummer. This is a first-rate plant for the back of a mixed border or the margin of a shrubbery. A native of Siberia.

V. syriaca (R. S.).—This cannot have too wide a distribution, for it is quite a gem, but it has the drawback of being an annual. The corolla is blue and white, or else altogether white. Those who know Linaria alpina will easily perceive how very beautiful this must be, when I say that this is quite as pretty as that, and also quite as hardy and as ready to reproduce itself.

Some of the forms of V. longifolia, V. candida, V. paniculata, V. corymbosa, V. elatior, V. elegans, V. incurva, V. virginica, V. repens, V. maritima, V. pinnata, and V. sibirica, for the sake of variety, are worth keeping. The English reader does not, of course, need to be reminded of the lovely Speedwell, so familiar to us all, but our American and Australian friends may desire to make its acquaintance, and if they do so they are certain not to repent. All the above are now in this country, but several of the very best of them seem to be confined at present to botanic gardens. And also, I regret to say, that certain of the foremost trade lists are swelled by such names as V. linlinoides, V. campanulata, V. floribunda, and V. lactea serphyllifolia. Now these are all without any authority whatever, and therefore often lead people to purchase what they already have under a fair title. *John Duncan.*

Home Correspondence.

Fungophobia.—We have another wondrous manifestation of this malady in the *Gardeners' Chronicle*, p. 926. Mr. Ayres' performance vividly reminds me of some of the incidents of my schoolboy days. Certain boys had a strong *penchant* for puff-balls, and for emptying their contents in dangerous proximity to the eyes or faces of others. A mischievous boy, with a ripe puff-ball, could thus put half a school to flight; a crush and a squeeze sent all scampering. I think it must be admitted that your correspondent has made vigorous use of his puff-ball. But patience and a few counter puffs of common sense and logical sequence clear the air, and behold we find all things exactly as they were before the Fungus dust was raised. I am only careful here and now to repeat that this storm of Fungus dust has neither covered over, nor obscured, nor weakened the force of one fact recorded by me in your columns. Neither has it helped by a hair's breadth to solve the impossible enigma of making fine Vine borders out of London street garbage. This is what Mr. Ayres affirmed had been done, and what I challenged as impossible. And your correspondent, instead of setting himself to explain or reconcile his statements, so utterly antagonistic, attempts to ride roughshod over my facts, on the single issue of the Chatsworth Vines, and amid a Fungus storm of his own raising. For I wish your readers carefully to note that I have never directly challenged the destructive powers of certain Funguses. I have asserted that the Bishop Stortford Vines did not die of Fungus, and every case of Fungus poisoning that has appeared in the *Chronicle* since has but confirmed me in that belief, and for this reason, that the Vines that did so perish had not a symptom in common with those at Bishop Stortford. I adhere to every word I have written on the Stortford Vines and the Fungus question, as printed at pp. 384, 495, 565, and 863; and reaffirm with the utmost confidence that the roots and leaves were perfectly healthy and free from Fungus and mildew. The borders were also in good condition, and the number of roots enormous. Months have elapsed since I stated in these columns that Mr. Monro's Vine doubtless contracted Fungus on its journey, and no one has contradicted that statement. Mr. Ayres declared that the destruction of Vines in such a condition was an act of Vandalism, deserving of scourging. I offer no opinion upon this; it was my province to record facts, and I did it. The Vines were destroyed because the Grapes shanked, and for no other reason, as I have already stated. Before Mr. Ayres applies the scourge he would do well to propound a sure and certain remedy for this worst of all evils in Grape growing—shanking. The Bishop Stortford Vines are certainly not the first, and I fear they will not be the last, that have succumbed to this insidious and often invisible malady. As to the borders, I adhere to my description of them. I have three grounds for doing so: the test of observation, the testimony of others, including that of some of the very first Grape growers in the country, and the glaring contradiction involved in your correspondent's definition of them: since that is a good border formed of London street garbage. And the borders might be either one or the other, but they could not be both. Mr. Ayres seems fond of these contradictory utterances, for he now goes out of his way to reflect upon the man who has managed these famous Vines from first to last, to tell us that he received his gardening education while in the charge of a malt-kiln. But there is a little change of ground here. The place is changed from the London streets to the fellmongers' yards at Bishop Stortford, and I am referred to the fellmongers' books of that time to find out the quantities of these abominations used. If your readers will turn back to p. 496, they will find that I was not too delicate to write down the truth; for there they will find that hide shavings formed a constituent part of these borders. How came your correspondent to ignore this fact? I am then plainly told that I am labouring under the delusion that I have written the history of the Stortford Vines. It so happens that the title of my paper was, "Probable Causes of Failure." Certainly their past history was glanced at, so far as it was likely to throw light on their condition. This was all I attempted; and doubtless even in this I may have failed to tell all that needed to be known. But it seems that after all this dust and this severe handling of my writing by Mr. Ayres, there is little or no difference between us; for he now writes:—"The true explanation of the failure of the Bishop Stortford Vines, if not Fungus poison, is paralysis, brought about by excessive pruning, as set forth in your articles on pollard Vines." Now, if Mr. Ayres, or any of your readers, will turn to the *Gardeners' Chronicle* for this year (pp. 495, 496), they may read exactly similar news, strongly expressed. Restrictive training and pruning are dwelt upon at considerable length as the probable causes of failure. Mr. Ayres offers a demonstration from Chatsworth, and I give the demonstration of the double Vines which for years carried 80 bunches—more than as many again as either of the double rods at Chatsworth. The average on the double and treble rods at Chatsworth is 33 bunches. The single rods at Bishop Stortford carried 40, the double, 80 bunches each. Nor was this all; when these double Vines were removed, they were furnished with double root power. I saw the vineries at Chatsworth last year, and the Grapes were such as to establish Mr. Speed's fame as a Grape-grower; otherwise I do not think many practical men would care to undertake a long journey to see old Vines with two or three rods carry an average of 33 bunches each. Reading your leader and Mr. Ayres' letter together, it seems doubtful whether the success at Chatsworth can fairly be put down to the extension. His Vines have been curtailed, not extended, as I read your leader—their strength concentrated into fewer not more rods than before. If this is true, then they shanked on the extended, and have ceased shanking on the restrictive system, or rather the present success has been reached by a happy mean between the two. I agree with your correspondent in advocating such a mean, and if he will but throw aside his puff-ball, which seems to blind himself, though it fails to obscure the vision of others, and turns to p. 496, and reads with common care, he will find that part of my mare's-nest is built up with his panacea, of which he is so enamoured as to counsel a general run upon Chatsworth to see the great sight of extended Vines carrying a load of 33 bunches a-piece. *David Tell Fact.*

Suburban Cemeteries.—In your admirable remarks upon these you have left one great source of danger unnoticed—the vaults. The last time I entered the Brompton Cemetery I went down into these, and the stench was so intolerable that I had some difficulty in getting up again. The cholera was very bad at the time, and the number of funerals was very great. But I think the system of so-called burial in open vaults,

wherein the coffins are arranged on shelves, ought to be abolished. The slightest flaw in one coffin renders the whole place dangerous. And it seems a barbarous mode of interment to expose the coffins of the dead to the eyes of the living. The vault system aggravates the evils of which you complain, as it renders the air much more impure than it otherwise would be. Doubtless the time will come when most of our suburban cemeteries must be removed. The intention of the Legislature is being frustrated by the rapid growth of houses in all directions. Extramural Interment Bills could not anticipate, nor provide against, the extramural enclosure of graveyards; but now the houses follow, and overlap our cemeteries. The homes of the dead are surrounded by overlooking cordons of the living. Until more radical measures can be applied, perhaps the best thing to do would be to plant the infection out. Place a broad boundary of living trees and shrubs between the living and the dead. In future it might be enacted that every cemetery should be bounded by a plantation so many yards deep. Fragrant trees and shrubs and plants should, as much as possible, be chosen for the formation of this boundary line. There are no antidotes against smells equal to perfumery. If, as Dr. Tyndall has proved, the perfume of a Rose, traversing a beam of light, checks the radiation of heat in a most extraordinary manner, the probability is that the fragrance of the Lime, the Chimonanthus, Rose, Mignonette, and other sweet plants, would arrest or dilute into harmlessness the exhalations of the dead arising from graveyards. This is a point of the utmost practical importance, as perfumed plants may at once be planted on the walls and over and around the graveyards of our cemeteries. If the high walls of the Brompton Cemetery for instance, could be covered with Honeysuckles, Jasmines, Roses, and immense groups of Lilies were planted here and there, from the Lily of the Valley up to L. giganteum, Mignonette, Violets, sweet herbs and flowers were scattered everywhere, and belts of Limes, Birches, Lilacs, Syringas, and other sweet trees and shrubs were planted around it, its miasmous exhalations would speedily be neutralised by an invisible wave of sweetness floating over from vegetation. Even in winter the Chimonanthus and the Violet, the Aralia, the Aubrietia and early Forget-me-Not would diffuse sufficient sweetness to neutralise the effect of dangerous gases. The keen air of that season is of itself the best possible deodoriser. And were that found insufficient, the lack of living vegetable odours in winter or early spring could be supplemented by chemical compounds, while during the summer it would be comparatively easy to literally saturate the air with sweet scents, to the exclusion of all sensible appreciation of any other. But the plants while thus neutralising the poisonous exhalations of death and corruption by the dispersion of their own sweet secretions, would likewise lessen the amount of the poison by economising it as food. They would thus exert a twofold sanitary influence by lessening the amount of dangerous matter in the air, and neutralising the effect of what remains. All living plants consume such dead and poisonous matters; but the perfumed tree not only eats its portion of such food in due season, but its sweetness forms an inaccessible but safe wall around us, preserving us from injury, and keeping us in safety in the midst of such dangers as arise from the proximity of cemeteries. It thus seems that the first law of Nature, self-preservation, would prompt us to the discharge of a duty that most of us have tenderly undertaken at the solicitation of sentiment. Enwreathe the restingplaces of our dead with the sweetest of living things. This, like all other virtues, is its own reward. In thus recording our affection and reverence for the dead, we are but promoting the comfort and insuring the safety of the living. Therefore let us fight the exhalations that must arise from suburban and other cemeteries, by converting them into well finished gardens of beauty, and let them be belted round with lofty trees that will drop down sweetness to perfume the memory of the dead, and increase the safety of the living. *Croque-Mort.*

July Pippin Apple.—On the 13th I gathered ripe fruit of the July Pippin Apple. This is the earliest season I recollect to have had good table Apples. The fruit was mellow, with a fine aroma. Doubtless this is owing to the intense heat and drought. Until recently we have had but trifling showers for three months. *George Bunyard, The Nurseries, Maidstone.*

Wilkie's Blight Composition.—After giving this a fair trial, I am fully convinced of its efficiency. It is certainly the most effectual destroyer of black and green aphis, thrips, &c., I have ever used. It also instantly kills the common and winged ants; all who are troubled with these little pests in their Peach and other fruit houses will, I am sure, have great cause to thank Mr. Wilkie for having introduced such an efficient means of destroying them. There is no unpleasant smell with it, and the most tender foliage is not injured by its application. In destroying a colony of ants in the stove here, some young plants of Sanchezia nobilis variegata were completely wetted with it, and have not shown any ill effects therefrom. I have therefore much pleasure in endorsing all that your correspondent, "Amygdalus" (see p. 862), has said in favour of it. *J. Wills, F.R.H.S., Royal Ashburnham Nursery, Chelsea, S.W.*

Bedding Pansies.—With this I send some blooms of bedding Pansies, which were raised here last year, and perpetuated by cutting, which were planted out early this spring, and which have bloomed through storm and sunshine the whole spring, and are now yielding finer blooms than ever. Blue Nymph I consider the greatest acquisition, taking its intense colour, habit, and endurance of weather into consideration. Charles Dickens is a wonderful bloomer, and notwithstanding the drawback of a shade of brown in the under petal, it is, owing to the intense colour of the other petals, most effective. The bloom sent of Purple Gem, as you will observe, is an old one, which I send in order to show how it stands the weather. The blooms of Cliveden Purple and Blue are sent to show by comparison how these varieties keep their colours growing under the same conditions. All of them are taken from the open beds. The yellow Viola sent is a seedling of this year's blooming. *D. Thomson, Drumlanrig Gardens, July 15.* [A very fine batch, of different shades of violet-purple. Blue Nymph is upwards of 2 inches across, rich and deep in colour, with a small yellow eye, surrounded by three rather large feathery black spots. Charles Dickens is of about the same size, somewhat rounder in outline, deep violet-purple with a feathery yellow eye, and dark feathered spots, the lower petal taking on a bronzy tint, apparently produced by a suffusion of yellow. Thomas Moore is even larger than Charles Dickens, and of similar form, deep purple-violet, with the yellow eye small, and the black spots feathering outwards. These three are very showy telling varieties. Purple Gem is of a very rich red-violet, and in the sample sent, perfectly fresh and bright, though it was said to be an old flower. Queen Victoria is rather smaller than the foregoing, and a shade paler, with similar feathered eye and spots. Princess of Wales, still smaller but very smooth, is of a bluer tint with a large velvety black patch on the lower petal, and a rich orange pencilled eye. Nithsdale Beauty is the largest of the batch, being nearly 2½ inches across, reddish violet with a broad yellow eye. Of several other numbered sorts, No. 2 is the best, in the way of Thomas Moore. The yellow is good, but others closely resembling it have been sent to us. Eds.]

Large Rose Tree.—Enclosed I send you a photograph of what I believe to be one of the finest white Rose trees in England. It is 9 feet in height by 6 in diameter, and has been loaded with thousands of flowers for the last month, and I find now my worthy friend Mr. Charles Lee says it is the old Reine des Belges. Old or new it is a glorious rose, and would even form an interesting feature in the collection of that giant amongst the Roses, the Rev. S. R. Hole. It was windy at the time the photograph was taken, so that it does not give my pet tree anything like justice. However, you will see it is pyramidal in form, which is the best of all, in my opinion. *D. Ferguson, Whitton Nurseries, Hounslow.*

Flowers in Religious Ceremonies.—The communication in your last number relating to the use of flowers in churches (p. 958) recalls the very touching and beautiful custom of scattering flowers upon the grave, a custom so general in some form or another that it might almost seem a natural instinct of our race. Only the other day I read of the grave of a child in far-off British Columbia being thus bedecked by the poor child's former playmates. It may be interesting to note what the flowers were:—Camassia, Aquilegia, Erythronium, Sisyrinchium, a sweet-smelling Orchid; and Sweet Brier Roses in profusion—all wild flowers of the district. *Y.*

A Plea for Small Birds.—As my letter, at p. 805, has called forth a little criticism on the part of your correspondents, Francis Smith and "F. H.," I wish to make a reply to both. Mr. Smith gives a certain amount of credence to my statement, but certainly thinks his fruit is safest when placed beyond the reach of birds. I think the same; but, as Mr. Smith admits that he kills, or causes to be killed, annually, about 200 thrushes and blackbirds who find their way into his nets, it is a proof that he cannot place his fruit quite beyond the reach of birds; as, in spite of the most clever netting, the birds will find an ingress, and spoil some of the best fruit. Let Mr. Smith, and others, act on my suggestion, and plant a few patches of Strawberries outside the fruit garden, amongst shrubs, or as near them as is practicable, and I am quite sure that he will not have the chance to wring the necks of half the number of birds that he now does during the fruit season. It is hunger that forces birds into the snare, and also through the net where the finest fruit are. I quite agree with Mr. Smith, that birds will not eat wild Cherries, while they can find better kinds; neither do I recommend planting wild or alpine Strawberries; it is the best kinds that I plant, and recommend the same practice to your readers. I must beg to correct Mr. Smith in one place, where he states that Whiteknights is not a bird-infested locality. Whiteknights Park, and the ornamental grounds connected with it, were formed (I believe) by George Spencer Churchill, Duke of Marlborough, about 70 years ago, and almost all the hardy kinds of shrubs and trees which had been brought to this country at that time were planted here, and many are still existing. Rhododendrons, at the present time, vary from 2 to 15 feet high, and some of the Laurels are more than 20 feet high; forming the most suitable cover for small birds, and amongst which many thousands enjoy themselves. With regard to the observations made by "F. H.," it appears to me that, just before writing his letter, he was very much annoyed at seeing one of his fine Strawberries being conveyed through the air, through the agency of my friend Mr. Blackbird, and fain would he have twisted its neck, could he have got hold of it; and whilst in the same temperament, I presume, he sat down to write the letter which appeared in your impression of the 9th inst., and to which he is evidently ashamed to append his name. I will ask "F. H." to point out the "delusion" and the "snare" which he sees in my plan. What I have suggested is very simple, and the cost trifling, as any labourer might plant a great number of Strawberry runners in the time it would take him to hoop and peg down a net that would make a bed of Strawberries secure from birds when pressed by hunger. "F. H." would have your readers believe that my proposed plan would do away with all trenching, manuring, &c., and that nets would no longer be required—far from it; such a fiction has not entered my head, neither does my letter convey any such ideas. I have not said that I have found Strawberries of better quality on those planted amongst shrubs; but I find, that after the birds have taken their share of the best, there are plenty left for preserving purposes, &c., which alone repays me for the expense of planting them. When my early Strawberries began to ripen in in the garden, I found, as "F. H." does, that ordinary netting was not sufficient to keep the fruit safe, as many thrushes and blackbirds found their way in (but were not killed), and as soon as those planted amongst the shrubs began to ripen, I saw no more in the nets, and very few in the garden, which quite convinces me that my plan will answer, so far as to keep them to a certain extent from the fruit garden. It is not a conjecture of the present moment; the plan suggested itself to me three years since: I acted on it, and found it to answer far beyond my expectations; and I therefore commend it to your readers. Should they feel disposed to try the plan, and find it does not answer their purpose, they will not fall into any very great "snare," as "F. H." would have them suppose; and I would certainly advise "F. H.," when he feels disposed to criticise what common sense suggests, in such a simple matter as the one in question, that he will not use such formidable weapons as "delusions" and "snares" to support him in endeavouring to demolish a fact which common sense will confront him with at all hazards. *William Lees, Whiteknights Park, Reading.*

Early Rose Potato.—My experience of this American "notion" entirely corresponds with that of Mr. Poynter. I planted a small quantity at the same time with Myatt's Prolific and Royal Ashleaf, and find that it is quite as early as Prolific, is a very abundant bearer, and a very delicately flavoured Potato. I look upon it as a great acquisition. Of course I speak only so far as my own garden is concerned. *D., Deal.*

Early Peas.—Mr. Morgan, in filling my boots full of Peas, is quite at liberty to enjoy his own opinion respecting the few days advantage of one method over another in the cultivation of early Peas. Some places make no account of such trivial advantages, the entailed extra trouble quite overbalancing their virtue, and "Harrow-on-the-Hill" may be such a place. It is true that the crop gathered from transplanted Peas may be only fit for the dunghill, but this may arise from bad management, and not from any unsuitableness in the system; nothing being more likely to make the crop a failure than over-nursing previous to planting-out. If gardeners submit the seed to germinate and the young plants to grow in a humid atmosphere, and a temperature bordering on summer heat until they become almost ready for staking, no doubt the crop will be, as Mr. Morgan states, only fit for the dunghill. The season is too far advanced for the Pea question to be seasonable, and I will only add that wherever a little extra trouble acts like an incubus, other crops than the one under discussion will merit the unpleasant distinction of being only fit for the dunghill. *Andrew Meikle, Reed Hall, Whalley.*

Kentia.—In a recently published number of his excellent "Fragmenta" Dr. F. Von Mueller describes the two new Kentias discovered by Mr. C. Moore in Lord Howe's Island, as K. Canterburyana (Umbrella Palm of the colonists), and K. Mooreana (Dwarf Palm of the colonists), adding also a new K. Wendlandiana from Liverpool River, which may be identical with the new one alluded to in my previous account of this genus. Areca monostachya is transferred to Kentia, and doubts are expressed about the stability of the genus Veitchia, which is held to be identical with Kentia. *Berthold Seemann.*

Fungus.—I have been greatly interested with a great deal that has been written on this subject, and wish to add my mite of limited experience in the matter. Happening to belong to the rank and file, "David Tell Fact" will perceive that we are not so easily perplexed as he imagined. I do not agree with the maxim that a good saturation with water is an effectual antidote for that pest under all circumstances, as I have seen Fungus revelling in an inside border in the wettest part of it. The remedy pursued was a sprinkling of hot lime in the surface where affected, and pricked in

with a fork, which had the desired effect; for, examining the border about three months afterwards, the Fungus was not to be found. I can also speak in favour of horse parings, for I have seen them used liberally in the top-dressing for outside borders, and also for pot Vines. The outside borders were operated on three years ago, and the Vines are in a luxuriant condition, bearing a splendid crop of Grapes this season, and are free from all diseases and parasites. Perhaps the Fungus in Mr. Ayres' case originated from some other source, and the horse-parings were a great attraction to it. *Nemo.*

Fungus in Roots.—It would seem as if we know very little about the commonest things, but what little we do know is often obscured, for want of a little pains in distinguishing accurately; the principle which is inculcated by the poet in the story of the chameleon is of very general application. Every gardener, I suppose, has turned plants out of pots with roots embracing in all directions small pieces of decaying wood; and on the other hand, probably, there is no gardener who has not had experience of plants ready to perish, which, on examination, showed the roots preyed upon by Fungus, which must have been introduced along with vegetable refuse intended as *pabulum* for the plant. Hence, partly, the reason why careful gardeners char all such refuse before employing it. It is the same with the human constitution. Healthy persons may be engaged with impunity among influences noxious to health, under which, if sickly, they would succumb, as delicate constitutions would at any time. The application of water to Vines is recommended as a cure for Fungus at the root; it seems strange that such should be the case, but the remedy acts probably by securing strong and vigorous growth to the Vine, which enables it to laugh at the invader; and it may be that heavy and constant moisture is not favourable to Fungus, although some moisture is necessary to its development. Any prolonged absence of moisture, however, suspends root action more or less, and puts the plant in a weakly state, so as to be less able to resist disease when the moisture comes which might otherwise revive it. *Isis.*

Chamærops.—M. Naudin (*Gardeners' Chronicle*, 1870, p. 957), when he charges me with committing an error, or rather repeating that of others, by admitting several species into the genus Chamærops, has overlooked that I distinctly said in my account of that genus:—"If all the species referred to this genus really do belong to it, which is by no means clearly demonstrated, Chamærops would be the only genus of Palms geographically distributed over three continents," &c. I was fully aware that Mr. Wendland had some years ago written a letter on the subject to M. Gay, which was laid before the Botanical Society of France; but I understood Mr. Wendland to say, when I recently asked him about the subject during my visit to Herrenhausen, that the subject was not fully worked out. I was also aware of the note which Prof. Karl Koch in his "Wochenschrift" has on the subject. About the Hong Kong Phœnix, M. Naudin may be right; it may be a new species. Mr. Bentham and myself held, as will be seen from Dr. Hance's *resumé* in my "Journal of Botany," views opposed to those of Dr. Hance. *Berthold Seemann.*

The Potato Tournament.—Allow me to make an amendment to Mr. Fenn's remarks, at p. 890, on this subject. I propose that the section, consisting of 24 varieties, which Mr. Fenn suggests, should be divided into two sections—1, for 10 varieties, distinct, of medium and late sorts, eight tubers of each; and 2, six varieties, distinct, of early and second early kinds, the same number of tubers to be shown. I think the prizes should be a cup, value £10, for section 1, and a £5 cup in section 2. I quite agree with Mr. Fenn's observations as to cooking and the propriety of giving the nature of the soil upon which the Potatos were grown. I shall be most happy to subscribe 10s. to each cup; and I hope the exhibition will take place in September. *J. S. R., Liverpool.*

Societies.

Royal Horticultural. General Meeting. Oxford.

Wednesday: *July* 20.—G. F. Wilson, Esq., F.R.S., in the chair. After the usual formal business of the meeting had been concluded, Dr. Masters exhibited, on behalf of Dr. Hooker, some of the nuts of the Macadamia ternifolia, described in these columns, 1869, p. 1231. The nuts are fully equal to a good Filbert, and, indeed, would probably have secured a First-class Certificate had they arrived in time for the Fruit Committee. Dr. Hooker's note runs as follows:—

"A year ago I received from Australia ripe seeds of the Macadamia ternifolia, for the garden, and happening to taste one, I found it to be so excellent in texture and flavour that I at once wrote to my friend, Mr. Hill, of the Brisbane Botanic Garden, to send me a supply for trial as a dessert fruit. The box has now arrived, and Mr. Hill requests me to forward a sample to the Scientific Committee for an opinion, which I now do.

"I should add that, the box having been delayed considerably in transmission, some of the nuts have deteriorated in consequence. *J. D. Hooker.*"

We shall shortly give an illustration of this interesting nut, and offer further remarks on this new addition to our dessert fruits.

The Congress Meeting.—This, which was numerously attended, commenced immediately after the General Meeting. Dr. Voelcker, whose remarks on "The Principles of Manuring" we may have occasion to advert to in a subsequent issue, commenced by stating that horticulturists in point of practice were far in advance of any theory that could at present be laid down for their guidance. The agriculturist's practice, on the other hand, was inferior to that of his horticultural colleague, though the agriculturists were aware of the principles which ought to guide them in the application of artificial manures. The farmer could, by the judicious use of farmyard manure, increase his crops, but the important point he had to determine was how, in the absence of a sufficient quantity of dung, to apply artificial manures, to determine of what nature they should be, and in what proportions they should be used. Agriculturists know by experiment what manures to use for certain purposes, and when to use and when to withhold them. Gardeners, said Dr. Voelcker, amid expressions of dissent, had the command of as much stable manure as they wanted, which was not the case with the farmer. In alluding to the general principles of successful manuring, Dr. Voelcker arranged his remarks under the following heads—the nature and sources of organic and of mineral food—the constitution of stable manure and of fertilisers, the proper time for their application, and the characteristic effects of certain manures on vegetation. Alluding to nitrogen, Dr. Voelcker stated that it is not absorbed in the free state from the air, but in the form of nitric acid or ammonia, although he admitted that the supply of nitrogen in ammonia or nitric acid is not sufficient, and that nitrogenous manures of some kind must be used, and ordinary dung was the most serviceable means of supplying it. The mineral ingredients were derived from the soil, and certain of them were much more important than others. Nitrogen was present in dung in a great variety of combinations. Another point which the growth of plants in various solutions (water culture) had conclusively demonstrated, was that growth was impeded if the solution were too strong, on which account Dr. Voelcker recommended top-dressings, or well made composts, in preference to strong liquid applications. He also advocated the application of manures in early autumn rather than in any other season. The characteristic effects of certain manures were very evident in some cases, as in the instance of phosphates, which were of special value in the case of root crops; and if a due supply of phosphates was withheld the roots had a tendency to revert to their original fibrous condition. Again, if manures of a too forcing character were used, we were likely to get abundance of leaf at the expense of wood and fruit. The effect of ammoniacal manures was well seen in the case of Italian Ryegrass, the leaf development of which was greatly increased by their use. Other manures favoured early maturity, a most important matter for fruit growers. A combination of phosphatic substances with potash, as in the case of the admixture of wood ashes and phosphate of lime, was particularly valuable. The best form in which phosphate of lime could be used was that of bones partially deprived of their nitrogenous matters. Salts of ammonia are useful when the plant is weak. By the use of a manure, consisting of certain proportions of phosphate of lime, potash, and ammonia. Dr. Voelcker had succeeded in doubling the weight of a crop of Potatos, while, by omitting the ammonia, the produce had been considerably less. Dr. Voelcker concluded by again recommending that quick acting manures should not be applied directly, but by the judicious use of a carefully prepared compost.

In the discussion which followed Dr. Voelcker's paper, the Rev. C. P. Peach took occasion to object to the prevalent views as to the source and importance of nitrogen, the quantity of which in the plant was so very small as contrasted with that of the carbon, which makes up half the bulk of the plant. He considered ammoniacal manures to be valuable more from their power of dissolving and rendering available carbonaceous matters, than from any direct merits of their own. Plants, he considered, get their carbon principally from the soil, and as pure carbon is very insoluble, anything which helps the plant to absorb it is valuable, and in this way ammonia is particularly serviceable. Silica also, a substance soluble with great difficulty, is taken up by the roots, its solution being facilitated by alkaline salts, and hence the value of nitrate of soda. He considered silica as more valuable than nitrogen to the plant. Adverting to the question of natural and artificial manures, he considered that though temporarily guano might be of great service its effects were not permanent. Nitrogenous matters were important as facilitating the formation of diastase, which as a solvent of starch was of the highest importance in plant nutrition, and on this account, rather than for any direct value, nitrogen was important.

Dr. Gilbert, in reply to Mr. Peach, said that questions relating to the mere percentage of nitrogen were irrelevant. Boussingault had conclusively proved, and Mr. Lawes and himself had amply confirmed the statement that free nitrogen is not absorbed by plants. Even M. Ville, who once advocated the notion, is now recommending the use of nitrogenous manures. Dr. Gilbert then gave some account of his own and Mr. Lawes' experiments for determining this point, and by which it was conclusively shown that plants do not absorb free nitrogen—and that where combined nitrogenous substances were withheld, and only free nitrogen allowed access to the plant, no increase in the quantity of nitrogen in the plant itself took place. On the other hand, where only an infinitesimal proportion of ammonia was added, its effects were detected in the plant in less than 24 hours. The quantity of carbon in water and air was amply sufficient for the requirements of the plant. As to silica, it had been found that an increased percentage of silica does not, as incorrectly stated, strengthen the straw, a better crop of straw being procured when the proportion of silica is small. In conclusion, Dr. Gilbert expressed his approval of the way in which Dr. Voelcker had treated his subject.

Major Clarke confirmed Dr. Voelcker's assertion as to the superiority of well made composts over liquid manures, and stated with reference to Dr. Voelcker's assertions as to the effects of phosphates on root crops, that carefully conducted experiments would enable us to cause the plants to revert to a form like that of their original wild state, or on the other hand to develope into new races.

Mr. D. T. Fish, after expressing the thanks of practical men to Dr. Voelcker for his paper, proceeded to controvert his assertion that gardeners had a sufficiency of manure. What gardeners specially wanted was "a free run to the muck heap." If gardeners used more manure they took out from the land much more than the farmer did. The latter was contented with one crop and a "scratch crop," while the gardener took three or four crops out of the land in the same season. He considered the time of applying manure most important, and he had been surprised to see how some good farmers adopted, with great success, the apparently wasteful practice of putting manure on the land during the winter. Mr. Fish, then referring to Dr. Tyndall's recent experiments, threw out the suggestion that plants derived their silica from the dust of the world [!], and in this way he accounted for the presence of silica and mineral matters in the case of epiphytes having no direct connection with the soil.

A vote of thanks having been cordially expressed to Dr. Voelcker, that gentleman made some comments on the points that had been raised in the discussion, specially pointing out that all soils and all water contain an appreciable and sufficient quantity of silica in a soluble form.

Mr. Ingram then read his paper on soils, printed at p. 987, at the conclusion of which Mr. Fish made some commendatory remarks.

The Great Show.—This, the fourth exhibition held in the provinces by the Society, was opened on Tuesday last, in the Radcliffe Observatory grounds, which were kindly placed at the disposal of the Society by the Rev. R. Main, the Radcliffe Observer. The site was one of the best that could be obtained for the purposes of the display, and was an immense improvement upon the exceedingly rough ground occupied at Manchester last year. The ground, although not contiguous to that of the Agricultural Society, was not more than half a mile distant from it, and had at least the advantage of being in the direct line to the Royal Agricultural Society's show. As regards the quality of the exhibition, it must be recorded that it was about equal to any of the provincial shows, but not so good as many we have seen at Kensington. There were not so many plants shown as at Manchester, but there were not so many bad ones here as there, and the arrangement of the show was much superior, and indeed highly satisfactory. The number of visitors on the two first days was small, and we have yet to learn whether "the million," at the popular price of one shilling, have stepped in boldly and saved the Society from the financial loss, which seemed to be the inevitable fate on the high-priced days, and which will surely be their doom as long as they tack themselves on to the tails of the more popular and better known Society. There are no valid reasons why the Royal Horticultural Society should not hold a provincial meeting, and with much success, but to attain this end it must be held independently and apart, the farther the better, from that of the sister Society. Then, again, it must be understood that the Society and its objects are not sufficiently well known in the provinces, and that "a great flower show" is far more attracting and much better understood than the awe-inspiring words, "Royal Horticultural Society's Show," which, doubtless, in many instances, act in a similar manner to the Somersetshire gentleman's scientific caution to tramps.

The most noteworthy plants in the classes for stove and greenhouse and fine foliage plants were staged by Mr. B. S. Williams, Mr. Baines, gr. to H. Micholls, Esq., and Mr. Johnson, gr. to the Marquis of Aylesbury. These plants were all staged in a large circular tent, 100 feet in diameter, supplied by Mr. Unite of Paddington. The competition for the £25 prize, given by the Royal Horticultural Society, and the 2d prize of £15, given by the Royal Oxfordshire Horticultural, was confined to two competitors—Mr. Baines, and Mrs. Cole & Sons, Withington, near Manchester, the 1st being won easily by the former. Mr. B. S. Williams exhibited largely, and succeeded in carrying off most of the leading prizes. Only one competitor appeared on the scene of action for the "Florist and Pomologist" prize, which, after some hesitation, was awarded to Messrs. Bell & Thorpe, of Stratford-on-Avon. Palms were shown very well; Ferns very fairly, with the exception of the tree forms, which were only exhibited by two exhibitors. British Ferns, however, were very numerously and well shown, as also were collections of new and rare plants, from Messrs. Veitch, Mr. B. S. Williams, Messrs. Rollisson & Son, and others.

In the class for the best 20 fine foliage and flowering plants, Mr. Baines, gr. to H. Micholls, Esq., was well 1st, with large and excellent specimens of Bougainvillea glabra, well bloomed Ixora aurantiaca, Allamanda nobilis, Dipladenia amabilis, Erica obbata, very good; Ixora coccinea, very fine trusses of flowers; Croton angustifolia, large and well coloured; Yucca variegata, Cordyline indivisa, Verschaffeltia splendida, first rate; Stevensonia grandifolia, very handsome; Gleichenia rupestris, a grand specimen; and a first-rate Croton variegatum. In Mrs. Cole & Sons' collection, which came in 2d, were a large well grown plant of Kalosanthes punica, Aphelexis humilis grandiflora, Hedaroma tulipifera, very fair; Erica

Fig. 180

Cavendishiana, very good, but a very "old stager;" and good specimens of Crotons, Dracænas, Dicksonias, Palms, &c.

In the open class for 9 stove and greenhouse plants, Heaths included, distinct, Mrs. Cole & Son came in 1st with similar plants to those shown in the above collection. The 2d prize lot came from Mr. F. Perkins, nurseryman, Coventry, and consisted of a good example of Statice imbricata, Vinca rosea alba, Allamanda Hendersoni, Clerodendron fallax, &c.; Messrs. Bell and Thorpe being placed 3d. In the amateurs' class for 6 there was no competition.

The best 9 foliaged or variegated plants in the amateurs' class were shown by Mr. Johnson, gr. to the Marquis of Aylesbury, who had splendid specimens of Pandanus elegantissimus, Sanseveria angolensis, Croton variegatum, Alocasia macrorhiza variegata, very handsome; Sphærogyne latifolia, very good; Alocasia metallica, a very good specimen; Caladium Bellemeyii, &c. The next best group came from Mr. A. Wright, gr. to C. H. C. Roberts, Esq., Avenue Road, Regent's Park, with very good and familiar specimens of well-known plants. In the corresponding class for nurserymen, Mr. B. S. Williams came in 1st with, amongst others, a very handsome specimen of Cycas revoluta, Cordyline indivisa, Croton pictum and angustifolium, Alocasia metallica, very fine; Chamærops humilis, &c.; the 2d prize being taken by Messrs. Bell & Thorpe, with a very good group.

The 1st prize for the best 6 fine foliaged plants in the amateurs' class for that number, was taken by Mr. G. Harris, Heddington Hill, Oxford, in whose collection, amongst others, were exceedingly fine examples of Chamærops excelsa and Pandanus elegantissimus, &c.

The best specimen stove plant in flower was a remarkably fine Allamanda cathartica, from Mr. Baines; Messrs. Standish & Co. being placed 2d with a very good specimen of A. Hendersoni. Mr. Perkins exhibited a large plant of the curious, but offensively smelling, Aristolochia ornithocephala. Mr. Baines also supplied the best specimen greenhouse plant in flower—Erica Fairreana, very large and wellflowered. The 2d prize was taken by Mr. A. Wright, with a large nicely flowered specimen of Kaloisanthes Madame Celeste Winnans. From Mr. B. S. Williams came the best 6 Palms, which were very handsome specimens of Livistonia Jenkinsii, Stevensonia sechellarum, and Verschaffeltia splendida, &c., large and well clothed specimens. Messrs. Rollisson & Son were placed 2d, with a very neat group; and Messrs. Bell & Thorpe 3d. The best 4 Dracænas, large handsome examples of D. atrosanguinea, lineata, australis, and umbraculifera, also came from Mr. B. S. Williams, who also exhibited in the same tent one of the largest and most beautifully furnished specimens of Cycas circinalis we have ever seen, and of which we give the annexed

Fig. 181.

figures (180, 181), to show its extremely handsome habit and qualities as a useful decorative plant. It will be observed from fig. 181 that the plant is in fruit, though, from the absence of male flowers, ripe seeds will unfortunately not be produced.

Of Orchids, only 3 collections of 6 were shown, all coming from the neighbourhood of London. Oxfordshire is apparently not such an Orchid-growing county as Lancashire, for at Manchester the local exhibitors were very successful in this particular. Mr. A. Wright, who was the only exhibitor in the amateurs' class, showed very fair specimens of Cattleya crispa superba, Odontoglossum Schlipereanum, Lycaste Deppei, and Aerides affine, &c., and to this collection the 1st prize was awarded. In the corresponding class for nurserymen, the best came from Mr. B. S. Williams, who had specimens of Vanda suavis, Aerides quinquevulnerum, Cypripedium barbatum superbum, and C. superbiens, in fine condition. Messrs. Rollisson & Son were the other exhibitors in this class and to them the 2d prize was awarded for a nice group. Exotic Ferns were not shown so largely as usual, but the British species were unusually good. In the nurserymen's class for nine of the former, collections were shown by Mr. B. S. Williams, Messrs. Bell & Thorpe, and Mr. J. J. Chater, Gonville Nursery, Cambridge, the prizes being awarded in the order named. In the capital collection from the first-named exhibitor, the most noticeable were grand specimens of Cyathea dealbata, Dicksonia antarctica, Todea africana, Cyathea princeps, Cibotium Schiedei, and C. furcans, &c. The best six in the amateurs' class were contributed by Mr. Baines, who put up, amongst others, a fine specimen of Todea superba, Gleichenia speluncæ very good; and well grown examples of Davallia bullata, and D. ternifolia, &c. In the class for 6 distinct, for the prizes given by H. Grisewood, Esq., Mr. A. Wright came in 1st, and Messrs. Bell & Thorpe 2d. In the former exhibitor's group the most noticeable were well-grown specimens of Lomaria gibba, Adiantum Farleyense, Cyathea princeps, &c. Mr. B. S. Williams sent the best pair of Tree Ferns, and Mr. C. Walton, Cowley Road, Oxford, the 2d best. In the amateurs' class for 12 British Ferns, distinct, the competitors were Messrs. Ivery & Son, Dorking, and Mr. J. J. Chater, the 1st prize being awarded to the former for an exceedingly fine group, composed of varieties of Lastrea, Polystichum, Athyrium, and Osmunda, &c. For the prizes given by the Right Hon. E. Cardwell, M.P., for 20, Messrs. Ivery & Son were again placed 1st, J. E. Mapplebeck, Esq., Moseley, near Birmingham, coming in 2d, and E. J. Lowe, Esq., F.R.S., Nottingham, 3d, each exhibitor showing first-rate specimens.

Two large collections of hardy Ferns were also shown by the last named exhibitors. To the following varieties of Scolopendrium vulgare, from Mr. Lowe, First-class Certificates were awarded, viz., margine, kraspedon, corculum, krosson, stephanedon, perikallon, poluskiston, and semnon. Also to Athyrium Filix-fœmina var. exemplum and strombomeuon, and to Asplenium marinum var. Ochmithianum, in the same collection. [We protest strongly against these uncouth and barbarous names as violations of established rule, and we cannot guarantee their accuracy. Eds.] Also to Athyrium Filix-fœmina

vars. furcillans, Jonesii, defecto-sectum, densissimum, Gilsoniæ furcans, flabellifolium cristatum, Craigii splendens, and comicum ; and to Polystichum brachiato-cristatum, Smithii, &c., from Mr. Mapplebeck. Messrs. Wood & Ingram also exhibited a handsome new species of Lomaria from New Zealand, to which the same award was made.

Of Heaths, 3 collections only were shown, but they were of great merit for the season. Mrs. Cole & Sons took the prizes given by W. Wootten-Wootten, Esq., and the Warden of New College, with good specimens, well flowered, of E. feruginea superba, ventricosa magnifica, venosa, Parmentieriana, rosea, &c. Mr. A. Wright came in 2d for the prizes given by Lord Valentia ; and Messrs. Grimbly & Co., with, amongst others, E. tricolor flammea, tricolor Wilsoni, Candolleana, ventricosa, Bothwelliana, &c.

For the "Florist and Pomologist" prize Messrs. Bell & Thorpe were the only exhibitors, and to them the prize was awarded. In their collection was the best specimen of Abutilon Thompsoni (in flower) yet seen, very good Lilium auratum, Lantana Adolphe Hwass, Diplacus grandiflorus, &c. Mr. Turner was the only exhibitor of 4 Lilium auratum, and Messrs. Jackman & Son of 4 hardy Clematises in pots or tubs. The latter plants were one of the special features of the show, and attracted a large share of attention on account of their extreme beauty. They were grown in pillar form, from 3 to 5 feet in height and about 3 feet through, and were well covered with blooms. Several other specimens were also shown in addition to those above noticed.

In the miscellaneous class, Messrs. Veitch took the 1st prize with a large and exceedingly fine collection of new plants, consisting of Orchids, Palms, Ferns, Dracænas, Begonias, &c., most of which have been exhibited at previous shows, and commented upon at the time. The same must also be said of the 2d and 3d prize groups, which came from Mr. S. Williams and Messrs. Rollisson & Son, both of which were excellent. Extra prizes were also awarded to Messrs. J. & C. Lee, of Hammersmith ; Mr. Ware, Tottenham ; and Mr. J. House, Eastgate Nursery, Peterborough, for excellent miscellaneous collections.

FLORISTS' FLOWERS.—In this department there was a noticeable falling off as compared with previous years, perhaps in a great measure traceable to the prevailing drought. Fuchsias were of an indifferent character ; show and fancy Pelargoniums were not even represented ; the variegated and double-flowering Pelargoniums were very well done ; on the other hand, the specimens of zonals were decidedly below the average.

The best Fuchsias were those from J. E. Mapplebeck, Esq., Moseley, Birmingham. They were about 4½ feet in height, of conical shape, and somewhat closely trained. The sorts were :—Shakespeare, a seedling, dark, double, corollaed variety ; Venusde Medici, Conqueror, Criterion, Roderick Dhu, and Duc de Castille. There was no other competitor. In the nurserymen's class for the same number, Mr. J. Walker, Thame, was the only exhibitor, with some old plants grown as fair bushes, but not in nice condition, though fairly flowered. Singular to state, seeing how easily they are grown, there were no standard Fuchsias. Only one lot was staged for the special prizes offered by the Mayor of Oxford, those from Mr. H. Surman, Witney, Oxon ; and it was a pity that such poor plants—poor in growth and quality, as well as being old sorts,—should receive the 1st prize of £5. The eight plants would have been dear at 5s. Many a small provincial show seen this season could have beaten these at Oxford hollow in the matter of Fuchsias.

In the amateurs' class for 6 Zonal Pelargoniums, a very indifferent lot were staged by Mr. Anstiss, and awarded a 3d prize. The nurserymen's 6 from Messrs. Bell & Thorpe, Stratford-on-Avon, were neatly grown and flowered plants of the following kinds :—Eleanor, Fairy Princess, Rose de Madrid, John Thorpe, a fine hue of cerise-scarlet ; Queen of Beauties, and Lord Derby. 2d, Mr. J. Walker, with Amelina Grisau, Tintoret, Mr. William Paul, Clipper, Amy Hogg, and Madame Vaucher. 3d, Mr. J. J. Chater, Cambridge. The special prize for 4 kinds was also taken by Messrs. Bell & Thorpe. 2d, Mr. Henry Minchin.

The class for 3 double Pelargoniums brought several competitors, and some very well grown and flowered plants. The best three came from Mr. F. Perkins, Regent Street, Leamington, whose plants were of medium size, a trifle deficient in habit, but well formed. The sorts were Madame Lemoine, Marie Lemoine, and Wilhelm Pfitzer. Messrs. Downie, Laird & Laing were 2d, with larger and well grown plants, not carrying so much flower : the sorts were Madame and Marie Lemoine, and Gloire de Nancy. Messrs. Standish & Co., Ascot, were 3d, with Gloire de Nancy, Capitaine l'Hermite, and Madame Lemoine. The best 6 plants competing for the special prizes offered by the Rev. W. V. Harcourt, came from Mr. Wm. Bragg, Star Nursery, Slough, and were nice young plants, well grown and bloomed, the sorts being Gloire de Nancy, Madame Lemoine, Capitaine l'Hermite, Victor Lemoine, Marie Lemoine, and apparently Victor, though named Victor Lemoine. 2d, Messrs. Bell & Thorpe, with Triomphe de Thumesnil, Marie Lemoine, Hector, Miss Evelyn, a deep-coloured Madame Lemoine, with fine full flowers ; Gloire de Nancy, and Wilhelm Pfitzer. These were larger and well-grown plants, but somewhat spare of bloom. The best 6 variegated Pelargoniums came from Mr. Turner, who had young, finely grown, and healthy plants of Princess Alexandra, May Queen, Miss Bridges, Jane, Albion Cliffs, and Compactum ; 2d, Mr. J. E. Mapplebeck, with large but old plants, having the usual defect of small growth ; 3d, Mr. F. Perkins—but this group contained two gold and bronze kinds, not usually classed with the variegated kinds. In class 18, for 6 variegated Zonals, not only were the plants extremely well done, but the competition was very close also. The best 6 came from Mr. J. Walker, prize to D. Keiller, Esq., Dundee, for Mr. J. Hodgson, Leadgate, having similar examples. Lady Grieve, Sophia Cusack, Countess Tyrconnell, Italia Unita, Sophia Dumaresque, and Lady Cullum ; 2d, Mr. J. Stevens, Ealing, with plants scarcely inferior, but losing, perhaps, about half a point in the matter of growth ; his kinds were, Mrs. Turner, Gamos Sophia Dumaresque, Sophia Cusack, Lady Cullum, and Italia Unita ; equal 3d, Messrs. C. Turner and J. Tomkins, Spark Hill Nursery, Birmingham : the former with small but finely developed plants, the latter with large ones. The special prizes offered by Sir A. W. Peyton, Bart., for 6 "tricolored" Pelargoniums, brought another close competition between Messrs. Welch and Stevens, the former being placed 1st.

The best 6 Achimenes came from Mr. G. Hunton, gr. to the Mayor of Oxford. They were by no means up to what are frequently seen at country shows. The sorts were Dazzle, Sir Treherne Thomas, Dr. Hopf, longiflora, longiflora rosea, and Ambroise Verschaffelt. There was a decided originality about the orthography of these names, though they were inscribed on printed cards, very much more to be admired than the plants themselves. The next best came from Mr. W. Earley, The Gardens, Digswell, and consisted of Dazzle, grandis, Parsonii, Sir Treherne Thomas, Margaretta, and Mauve Queen.

Mr. Turner was 1st with 6 exquisite varieties of Gloxinias, the plants, though small, were finely grown and flowered, and beautifully coloured. The sorts were Rubens, Rose d'Amour, Ernst Benary, Distinction, Glowworm, and Henry Hasson, the two last erect-flowering kinds. Mr. Hickman, The Gardens, Bletchington Park, who was 2d, had Queen Victoria, very pretty ; Princess Royal, Sultan, Bridesmaid, Princess Beatrice, and Nimrod, the last four erect-flowering.

The best 6 Petunias came from Messrs. Bell & Thorpe. They were single varieties, the plants large and well-flowered. Beauty, Laura, and Isabel were very good. There was no other competitor. The special prize given by the Warden of Wadham College, for 6 double Petunias, was won by Mr. G. Harris, Headington Hill, Oxford, with some large plants, about 2½ feet in diameter, but cut to circular wire trellises, like Zonal Pelargoniums ; Mr. Henry Surman was 2d. In consequence of the age of the plants shown by Mr. Harris, the flowers were small. Mr. Surman's younger and more vigorous plants had large and better developed flowers.

The attempt made to encourage the growth of Delphiniums, Lobelias, Phloxes, Pentstemons, Antirrhinums, and such like, in pots, was certainly encouraging up to a certain point, though much more remains to be done. The Delphiniums staged by Mr. Turner were of the most praiseworthy character, and showed most conclusively the superiority of young over old plants when well grown.

Mr. Turner was a long way 1st with 6 Delphiniums in 12-inch pots, having the following beautiful varieties, all superbly bloomed :—Madame Chate, L'Elégante, very fine ; Mons. Stenger, Le Grand, Imperial Blue, and Bella Donna ; 2d, Messrs. Bell & Thorpe, with plants of inferior growth ; 3d, Mr. H. Hooper, Bath. A 2d prize was awarded to Messrs. Bell & Thorpe, for 6 Lobelias, fulgens type, they being the only exhibitors. They had Ringleader, rosy purple ; Marvel, cerise-crimson ; Carminata, rosy carmine ; and some seedlings. They were somewhat large plants, not nicely grown, and only just coming into flower. The group of Phloxes to which the 1st prize was awarded consisted of Mdlle. Trotter, Madame Rendatler, these two being very much alike ; James Veitch, Liervalli, Charles Rouillard, and Mdlle. M. Saison. Three or four of these were well done, the others were somewhat deficient. Messrs. Downie, Laird & Laing came next with more even and very well bloomed plants of Mons. Linden, Mrs. Campbell, Comtesse de Malart, James Veitch, Deacon, and one other. The flowers of these were a little undersized. Mr. Henry Hooper was 3d, and there were several other competitors. The best 6 Pentstemons came from Mr. J. J. Chater, Gonville Nurseries, Cambridge. They were well grown and bloomed.

Verbenas in pots were shown by the Rev. R. H. Charsley, the donor of the special prize for them, and by Mr. H. Surman, Witney. The former had some large but not well grown plants, in enormous pots, carrying fine heads of bloom. Mr. Surman, who was 2d, had much smaller plants, scarcely in bloom. Balsams we large plants in very large pots, a common mistake in growing them for exhibition. The best came from Mr. Maunders, Wytham Abbey Gardens.

Of the seedling florists' flowers, or garden hybrids, staged on this occasion, the following were selected for First-class Certificates :—Variegated Tropæolum compactum, Minnie Warren, described on p. 929, from Mr. John Cattell, Westerham ; to Verbenas, John Laing, pale rosy carmine, rich crimson centre, very fine pip and truss ; Perfection, soft lilac-pink, very pretty and good quality ; and Mrs. George Prince, pale pink with orange-red centre, fine pip and bold truss,—all from Mr. C. J. Perry. Also to Verbenas, Mrs. Dodd, pale pink, with rosy violet centre, very fine pip and truss ; Grand Monarque, orange-red, shaded centre, a very fine hue of colour ; and George Peabody, bright reddish plum colour with conspicuous brown eye, a striking and fine flower,—all from Mr. H. Eckford, Coleshill Gardens. Mr. Perry staged Carnation, rosy crimson with slate stripes ; Singularity, purple and white stripes ; and Clara Perry, white with rosy violet centre, all very promising ; and Mr. Eckford, Premier, bright rosy salmon ; Charles Dickens and Willie Eckford, in the same way but quite distinct in hue ; and Mrs. Brunton, pale pink with dark rosy crimson centre, all very promising also.

FRUIT.—The fruit department was quite as well represented as at Manchester, and occupied the central staging of a long tent. Pines were not quite so numerous, Black Grapes were scarcely up to the average, Muscats and other white Grapes were very good. The show of Peaches and Nectarines was not very large, though some very good fruit was shown. The *Gardeners' Chronicle* prizes, as will be seen below, were taken by Mr. Miles, gr. to Lord Carrington, Wycombe Abbey, and Mr. J. Simpson, gr. to Lord Wharncliffe, Wortley, though the prize in the latter instance was not awarded in accordance with the wording and proper interpretation of the schedule, more than 6 distinct kinds of fruit being shown ; whilst the "Journal of Horticulture" prize fell remarkably easily to Mr. J. Miller, gr. to Lord Foley, Worksop Manor ; there being no other competitor. The exhibits were certainly not worth the prize, and it is a question whether the judges would not have done better by withholding it altogether. Most of the classes were well represented, and this was especially the case in the classes for vegetables, which, considering the dryness of the season, were shown in wonderfully good condition.

The best 3 Pines came from Mr. Paton, gr. to H. S. Lucy, Esq., Charlcote Park, Warwick, and were very fine specimens of Moscow Queen ; the next best were large examples of the Providence variety, exhibited by Mr. Allen, gr. to J. B. Glegg, Esq., Withington Hall, Congleton ; whilst the 3d position was occupied by Mr. W. Gardiner, gr. to E. P. Shirley, Esq., Eatington Park, with two Moscow Queens and a Providence. Mr. G. Ward, gr. to T. W. Miller, Esq., Bishop Stortford, sent specimens of smooth Cayenne, weighing 7 lb. ; a Queen, 4 lb. 11 oz., and a Charlotte Rothschild, 7 lb. 10 oz. ; other examples of Black Jamaica, Queens, &c., were shown. Mr. Paton also came in 1st in the class for a single fruit, any variety, with a fine Enville, weighing 8 lb. 14 oz. ; the 2d best was a Moscow Queen, 4¾ lb. in weight, from Mr. Gardiner ; and the 3d a specimen of the smooth-leaved Cayenne, weighing 7 lb., from Mr. G. Ward. Only one collection of 12 dishes, 6 distinct kinds, was shown in that class, which came from Mr. Clark, gr. to Earl Cowper, and consisted of Pines, Grapes, Peaches, Nectarines, Apricots, Melons, &c. Eight dishes of Black Grapes were staged, the best being contributed by Mr. Coleman, gr. to Earl Somers, Eastnor Castle, Ledbury, which consisted of three exceedingly well-finished bunches of Black Hamburgh, weighing 12 lb. 6 oz. ; Mr. J. Smith, gr. to the Earl of Gainsborough, Exton Park, came in 2d with fine examples of the same variety ; and to Mr. Turner, Slough, and Mr. J. Ralty, gr. to C. Scholefield, Esq., Turville Park, Henley-on-Thames, equal 3d prizes were awarded, the competition being so close. The number of competitors in the class for white Grapes exceeded the former by one, the specimens shown being uniformly good. The 1st prize was awarded to an excellent dish of Muscat of Alexandria, large in bunch and berry, and of a good colour. These came from Mr. J. Thomas, gr. to Mrs. T. Drake, Bignell, Oxon. Mr. Turner came in 2d with good bunches of the same variety ; Mr. R. Lanson, gr. to R. Statter, Esq., Stand Hall, Manchester, was 3d. Mr. Colegrave sent large bunches of Buckland Sweetwater, but deficient in colour. Several examples of Muscat of Alexandria were shown, in very green condition. Mr. Coleman sent the best basket of Grapes, good specimens of Black Hamburgh, the next best coming from Mr. J. Thomas, and consisting of very fine Muscat of Alexandria ; Mr. R. H. Smith, gr. to H. Walker, Esq., Calderstone, Liverpool, and Messrs. Standish & Co., were placed equal 3d. Eleven baskets were shown, among them one of Gros Colmar attracted much attention from the highly finished style in which it was shown by Mr. Ward, gr. to T. W. Miller, Esq.

For the best 6 varieties of Grapes, 3 bunches of each, there were several competitors. Mr. Turner took Professor Lawson's prize of 5 gs. with very fair specimens of Royal Ascot, Buckland Sweetwater, Muscat of Alexandria, Foster's Seedling, Black Hamburgh, and Black Alicante ; Messrs. Lane & Son secured the 2d prize, given by S. Davis, Esq., with, amongst others, Golden Champion, fine in size, but quite green, and apparently unripe, Foster's Seedling, Buckland Sweetwater, &c. ; Mr. J. Wallis, gr. to J. Dixon, Esq., Astle Park, Congleton, secured the 3d prize, given by Mr. Sheriff Hanley, with fruit of a very moderate quality. Whilst noticing the Grapes, we must not forget to mention a fine exhibition made by Mr. Speed, gr. to his Grace the Duke of Devonshire, K.G., Chatsworth, which were "cut from Vines 37 years old, rejuvenised upon the extension system." The exhibition consisted of three remarkably fine, compact, and well finished bunches each of Mill Hill Hamburgh, Black Prince, and Black Hamburgh. The berries of the former were very large, as also were the bunches of Black Prince.

Fourteen dishes of Peaches were shown, the best being very fine well coloured Barringtons from Mr. J. Wallis ; Mr. Miles, gr. to Lord Carrington, came in 2d, with fine specimens of Grosse Mignonne ; and Mr. Sage, gr. to Earl Brownlow, Ashridge, 3d, with Bellegarde. Good examples of Royal George, Galande, Violette Hâtive, Barrington, and Noblesse were also staged by other exhibitors. In the corresponding class for Nectarines, 10 dishes only were staged : Mr. H. Tuke, gr. to R. Nicholls, Esq., Bromley, Leeds, came in 1st with Violette Hâtive, large and finely coloured ; specimens of the same variety, from Mr. J. Miller, were placed 2d. Pitmaston Orange, Elruge, and Hunt's Tawny, were also very fairly represented. In Apricots there were only three competitors ; Mr. J. Smith took 1st honours, and Mr. W. Earley, Digswell, 2d. The best dish of Figs was a very good one of Brown Turkey, from Mr. Sage ; Lee's Perpetual, from Mr. H. Harvey, gr. to P. Wroughton, Esq., Wantage, came 2d ; and White Marseilles, rather small, from Mr. J. Day, gr. to A. Seymour, Esq., Daventry. Mr. Turner had the best dish of Cherries, Bigarreau Napoléon ; Mr. J. J. Chater, Gonville Nursery, Cambridge, came in 2d, and Mr. J. Smith, 3d, both exhibitors showing the same variety. Strawberries were but poorly represented, therefore we pass on to the Melons—rather a formidable host. Of green-fleshed varieties there were about two dozen specimens, the best being Golden Perfection, from Mr. W. Gardiner, a very good flavoured fruit. Mr. D. James, gr. to the Duke of Leinster, was 2d, with a large unnamed fruit, of very superior quality. Mr. D. T. Fish was placed 3d. Golden Queen, Cox's Golden Gem, Queen Emma, and Excelsior, were also

shown, but not in very good condition, so far as flavour was concerned. A fine specimen of Royal Ascot, shown by Mr. Bailey, gr. to T. T. Drake, Esq., Shardloes, was adjudged the best in the scarlet-fleshed class. Mr. Carmichael, gr. to H.R.H. the Prince of Wales, Sandringham, came in 2d with a seedling variety named Blooming Victoria, of no particular merit; and Mr. W. Earley was 3d, with a small Scarlet Gem. The 1st prize, from the local prize fund, for the best-flavoured Melon, any variety, was awarded to Mr. T. Maunders, for a medium-sized, pale green-fleshed fruit, of very good quality. Plums were very poorly shown. In the class for outdoor fruits, 4 dishes, distinct kinds, some very good fruit was shown; but on account of the vagueness of the word "kinds" the judges were some time before they arrived at a definite decision. In some cases 2 dishes of Cherries were shown, quite distinct as varieties, but scarcely so as kinds, according to the interpretation of the schedule. Mr. Turner and Mr. T. D. Irving, gr. to the Duke of Hamilton, were placed 1st; Mr. Broadbridge, gr. to Sir Charles Mordaunt, Bart., 2d; and Mr. Craddock, gr. to Lord Willoughby de Broke, 3d.

For the prizes offered by the Proprietors of this Journal, there were five competitors. It was a very close race between Mr. Miles and Mr. J. Simpson, Wortley, for the 1st prize, and had it not been for a mishap on the railway it would have been even more so, with the probability of the prize going to Mr. Johnson, gr. to the Marquis of Aylesbury, Savernake, whose fruit, from some cause or other, was much bruised. In Mr. Miles' collection were three very fair bunches of Buckland Sweetwater Grapes, a good Queen Pine (weighing 5¾ lb.), nice Scarlet Gem Melon, very fine Barrington Peaches, Downton Nectarines, and Kirk's Plum; and of vegetables, Globe Artichokes (good), flat Tripoli Onions (of immense size), French Beans, wonderful Broad Beans, and Myatt's Prolific Potatos. In Mr. Simpson's collection the Grapes—Black Hamburgh and Muscat of Alexandria—were good in bunch and berry, but wanting in colour. His other fruit were very good Pines, Melons, Peaches and Nectarines—and of vegetables, Cauliflowers, Peas, Artichokes, Turnips, Potatos, and Cucumbers, &c. Mr. Johnson came next in order of merit; his vegetables were first-class, but the fruit was rubbed and disfigured. The other competitors were Mr. Challis, gr. to the Earl of Pembroke, Wilton House, Salisbury; and Mr. R. Kean, gr. to J. G. Sheppard, Esq., Haigh House, Campsey, Suffolk. In Mr. J. Miller's collection, which took the "Journal of Horticulture" prize, the Pines and Nectarines were of a very fair order, but the Grapes, Peaches, and Strawberries were of the poorest description, and in one or two instances were positively bad. Only one collection of 3 varieties of Vines in pots, and 6 orchard-house trees in fruit was exhibited, and to these, from Messrs. Lane & Son, the prizes, given by the Baroness Wenman and Mr. H. M. Gammon, were awarded.

VEGETABLES.—Of these there was a very nice display of well-grown products. Mr. T. Maunders came in 1st for Mr. David Day's prize for three half pecks of Peas, whilst for Messrs. Withery & Son's prizes, offered for the best 6 dishes of the same vegetable, Mr. G. Simmonds, The Union, Thame, Oxon, came 1st, and Mr. Walker, Thame, 2d. In judging the latter class, preference was to be given to collections containing the Fortyfold and Multum-in-Parvo varieties. In Mr. Simmonds' collection there were good samples of the former, Maclean's Wonderful and Premier, Yorkshire Hero, and Veitch's Perfection. The best 9 distinct dishes, of baskets of vegetables, came from Mr. G. Craddock, and consisted of excellent Parsnips, Beet, Walcheren Cauliflowers, Globe Artichokes, Italian Red Onions, Prince of Wales Potatos, Orangefield Tomatos, and Rollisson's Telegraph Cucumbers. This collection took the prize offered by W. Minton, Esq.; whilst Mr. Miles took the one given by the "Oxford Journal;" and the 3d, given by Mr. M. A. Wheeler, was taken by Mr. Perkins, gr. to Lord Henniker: Mr. Johnson, Mr. Broadbridge, and Mr. Henwood (gr. to M. H. Turnbull, Esq., Abingdon), also competed with highly creditable productions. From Mr. Craddock also came the best 8 baskets of round and kidney Potatos, well grown, large, clean, and handsome. Mr. Miles was 2d, and Mr. Earley 3d in the latter class; whilst in the former the 2d prize was secured by Mr. Minchin, nurseryman, Hook.

CUT FLOWERS.—The cut flowers helped the exhibition very much, and covered a great space of tables. Carnations and Picotees were very fine indeed, especially the Slough flowers, and they are numerously represented. Pinks were not so well done, it being somewhat late for them. The Roses were past their best; especially was this the case in the amateurs' flowers, many of them being thin and comparatively colourless. The nurserymen's flowers were much better, some fine flowers being shown by Mr. Cranston, of Hereford. Verbenas were scarcely so good as usual, but the cut flowers of double Pelargoniums were finely shown. Zonal Pelargoniums and bedding plants were nicely done. It is much to be regretted that at these great provincial shows, and especially on this occasion, when the great heat within the tents was almost stifling, that the cut flowers cannot be judged earlier; some time before they could be judged many of them had withered.

Mr. Turner's 24 Carnations, which took the 1st prize in the nurserymen's class, consisted of—Scarlet Bizarres: Dreadnought, Lord Lewisham, Lord Raucliffe, Oliver Goldsmith, and Prince Albert. Crimson Bizarres: Anthony Dennis, Captain Franklin, Eccentric Jack, Graceless Tom, Rifleman, and Young Milton. Pink and Purple Bizarres: Princess Royal and Twyford Perfection. Purple Flakes: Colonel Wyndham and Squire Meyneil. Scarlet Flakes: Annihilator, Coronation, Mr. Battersby, and William Cowper. Rose Flakes: Aglaia, Flora's Garland, Prince Merryweather, King John, and Rose of Stapleford; 2d, Mr. George Edward, York, with smaller flowers, the best being—Rose Flakes: Mr. Patey, Mr. Walton, and James Merryweather; Purple Flakes: Mrs. Gunning and Mayor of Nottingham; Scarlet Flake: George Edward; Crimson Bizarres: Rainbow and John Davidson. 3d, Mr. H. Hooper. The best 12 in the amateurs' class came from Mr. S. C. Buttrum, Burgh Mills, Woodbridge, who had S. B. Lord Raucliffe and Sir J. Paxton; C. B. Rainbow, John Bright, and Tenby Rival; P. and P. B. Hannibal and Sarah Payne; P. F. Premier; S. F. John Bayley and Marmion; R. F. Flora's Garland and Uncle Tom. 3d, Mr. D. Pizzey, gr. to Sir E. Perry, Fulmer, Bucks. In both these classes 6 collections competed. The Earl of Abingdon's special prize for 12 Carnations was also taken by Mr. Turner, with S. B. Admiral Curzon, Duke of York, and Lord Lewisham; C. B. Eccentric Jack and Rifleman; P. and P. B. Princess Royal; P. F. Colonel Windham; S. F. Sportsman and Mr. Battersby; R. F. Flora's Garland, James Merryweather, and King John. 2d, Mr. N. Norman, Plumstead, with a good stand of flowers, mostly seedlings. 3d, Mr. George Edward. The best 24 Picotees, in the nurserymen's class, also came from Mr. Turner, and consisted of Red-edged Chancellor, Colonel Clerk, Exhibition, Forester, Lavinia, Lord Valentia, Mrs. Norman, and Miss Turner; Purple-edged: Frances, Jessie, Mary, Mrs. Summers, Mrs. May, Picco, and Admiration; Rose-edged: Elise, Lucy, Juliana, Obadiah, Alfred Ingleton, Mrs. Rollings, Queen Victoria, Purity, and a bright looking seedling purple-edged flower. 2d, Mr. George Edward, with nice flowers of the following:—Red-edged: Fairest of the Fair, George, and John Feather; Purple-edged: Lord Mayor of York and Mrs. Hanaford; Rose-edged: Hannah Maria and Harriet. 3d, Messrs. Wood & Ingram. In the amateurs' class for 12 Picotees, Mr. D. Pizzey was 1st, with fine flowers of the following—Red-edged: Eliza Forester and Rosetta; Purple-edged: Frances, Ganymede, Jessie, Margaret, Mary, Admiration, and Mrs. May; Rose-edged: Lucy and Princess Alice. 2d, Mr. N. Norman, with Purple-edged Jessie and Margaret; Red-edged: Mrs. Newhall and Prince of Wales, and some good seedlings. 3d, Mr. W. Broadbridge, The Gardens, Walton House, Warwick. Mr. Turner also took the Earl of Abingdon's special prize for 12 varieties, with a fine lot of unnamed flowers; 2d, Mr. Norman; 3d, Mr. J. Payne, Oxford. The best 12 Pinks came from Mr. G. Kirtland, who had Rev. Geo. Jeans, Annie, Brilliant, Mary Ann, Attraction, Blondin, President, C. Turner, Gem, John Bull, Victory, and a seedling. 2d, Mr. H. Gammon, Marston, whose best flowers were Marion, C. Turner, and John Bull. 3d, Mr. A. Evans, Oxford. The best 12 competing for the special prize offered by J. G. Henderson, came from Mr. D. Gammon, and consisted of Alfred, Diadem, Charles Turner, Rev. George Jeans, Bertram, Miss Nightingale, John Bull, Royal Standard, Device, Blondin, Mrs. Norman, and Marion. 2d, Mr. W. Bragg, Slough, whose best flowers were Attraction, Blondin (two flowers of this variety being staged), Victory, Exhibitor, Nonpareil, Mary Ann, Koh-i-Noor, and Marion. 3d, Mr. D. Pizzey.

Several collections of cut Zonal Pelargoniums were staged, the best came from Mr. J. Walker, Thame; the 2d best from Mr. C. J. Perry; 3d, Mr. H. Minchin. A very fine dark crimson variety, named Madame Amelotte, was in Mr. C. Perry's stand. Mr. Perry had all Zonal kinds, Mr. Walker had one or two Nosegays. The cut blooms of double-flowering varieties were an interesting feature, and the competition taught how much a little taste in setting up helped their appearance. The best came from Mr. F. Perkins, Leamington, and were set up in nice bunches, backed by their leaves. Twelve varieties of 5 trusses each were required, and they consisted of Andrew Henderson, Gloire de Nancy, Madame M. Buckner, rather darker than Madame Lemoine; Marie Lemoine, Wilhelm Pfitzer, Triomphe de Thumesnil, Capitaine l'Hermite, Madame Lemoine, Victor, Triomphe, Victor Lemoine, and Madame Rose Charmeux. 2d, Messrs. Kelway & Son, with some very nice trusses, but not so well set up, including Sparkhill Beauty, and Rosetta, in the way of Capitaine l'Hermite. 3d, Messrs. Carter & Co.

The best 12 cut Verbenas were staged by Mr. C. J. Perry, and consisted of Edwin Day, Rev. C. Peach, James Birbeck, Rev. P. M. Smythe, Firefly, Butterfly, Rising Sun, Mrs. George Prince, Thomas Harris, and seedlings. 2d, Mr. H. Minchin, who had good examples of Champion, Charmer, Mrs. Pochin, Richard Dean, James Birbeck, and Géant des Batailles. The special prize offered by Mr. George Prince for the best 36 varieties was also taken by Mr. Perry, he being the only exhibitor. His sorts consisted of Nebula, Jas. Birbeck, Madame H. Steuger, Champion, Rev. C. Peach, Carnation, King of Lilacs, Rose Imperial, Kate Lawden, Thomas Harris, Ada King, Géant des Batailles, Model, Leah, Mr. George Prince, Rising Sun, Annie, Rev. P. M. Smythe, Velocipede, Apollo, Black Prince, Lord Leigh, Firefly, Thomas Lawden, Rev. J. Dix, Magnificus, and seedlings.

The best 24 varieties of cut flowers of bedding plants in separate bunches were staged by Mr. J. Daniell, The Gardens, Swyncombe Park, Henley-on-Thames. They consisted of Clematis Jackmanni, various Pelargoniums, Ageratums, Verbenas, Petunias, Tropæolums, Calceolarias, &c. Mr. F. Perkins was 2d with a very nice lot also, but the fact that he had staged a variety of Diplacus told rather against him. There were in the lot, Salvia patens, Lantanas, Viola cornuta, Campanula carpatica, &c.; 3d, Mr. J. J. Chater.

The best 48 cut Roses in the nurserymen's class came from Mr. J. Cranston, Hereford, and, considering the lateness of the season, were a very fine lot. The leading flowers were Madame Victor Verdier, Edward Morren, Devoniensis, Duc de Rohan, Xavier Olibo, Celine Forestier, Duke of Wellington, Lælia, La Boule d'Or, Duchesse de Caylus, Niphetos, Dr. Andry, Louise de Savoie, Annie Wood, Sophie Coquerelle, Sénateur Vaisse, Comte de Nanteuil, Duke of Edinburgh, La France, Rushton Radclyffe, Reine du Midi, Madame Margottin, Marquise de Mortemart, Alfred Colomb, Souvenir d'Elise, Lord Herbert, Cloth of Gold, Exposition de Brie, Gloire de Vitry, Charles Lefebvre, Mdlle. M. Dombrain, Marie Ducher, Fisher Holmes, Maurice Bernardin, Beauty of Waltham, Triomphe de Rennes, Henri Ledechaux, Black Prince, Solfaterre, Pierre Notting, and Baron Gonella; 2d, Mr. Charles Turner; 3d, Mr. B. R. Cant. The best amateurs' 48 came from Mr. C. J. Perry, the foregoing representing the leading flowers in this collection; 2d, Mr. J. Moore, The Priory Gardens, Warwick; 3d, Mr. J. W. Chard, Clarendon Park Gardens, Salisbury. Mr. Moore had the best 24, Mr. T. W. Johnson, Uxbridge, being 2d; and Mr. C. J. Perry, 3d. The best amateurs' 12 came from Mr. J. E. Cavell, Oxford; the best 6 from Mr. J. Tranter, who was also 2d with 12 varieties.

The best 12 Roses of 1867, '8, '9, came from Mr. C. Turner, the sorts being Comtesse de Hainault, Marie Cirodde, Charles Perry, Baronne A. de Rothschild, François Fontaine, La France, Duke of Edinburgh, Nardy Frères, Edward Morren, Miss Poole, and Elie Morel; 2d, Messrs. Paul & Son; 3d, Mr. B. R. Cant. The best 9 varieties of yellow Roses came from Messrs. Paul & Son, and consisted of Maréchal Niel, very fine; Mons. Furtado, Madame Falcot, Triomphe de Rennes, Madame Villermoz, Gloire de Dijon, Madame Margottin, Lamarck, and Celine Forestier; 2d, Mr. C. Turner, who had Solfaterre, Reine du Portugal, and Narcisse, differing from the foregoing; 3d, Mr. J. Cranston. The special prize offered by the Oxford Rose Society for the best collected set of cut Roses sent out in 1867, '68, '69, '70, was taken by Mr. C. Turner; 2d, Mr. B. R. Cant. The best 6 varieties of new Roses sent out in 1868, '69, '70, also came from Mr. Turner, and consisted of Duke of Edinburgy, Reine Blanche, Henri Ledechaux, Lord Napier, Montplaissier, and Edward Morren. In the class for the best 24 Roses of any one variety, a special prize being offered by Mr. George Prince, no award was made, the judges considering those staged unworthy the prize. The best three blooms of any one variety was Pierre Notting, from Mr. B. R. Cant, very fine. Mr. Cant also had Comtesse de Paris, fine also; and Maréchal Niel.

In the miscellaneous class, Mr. J. Walker, Thame, contributed a very fine lot of double Zinnias, some of the colours being very bright; Mr. T. S. Ware, Tottenham, some boxes of herbaceous and other flowers of a very interesting character; and Messrs. Kelway & Son, Langport, and Paul & Son, cut Hollyhocks, in very fine condition—Messrs. Kelway's flowers being particularly fine.

For bouquets and dinner-table decorations, there were two classes, the prizes being given by W. Wootten-Wootten, Esq., and Mr. Charles Turner. The best handbouquet, judged by the taste displayed in the arrangement, was contributed by Mr. Earley, gr. to F. Pryor, Esq., Digswell. It was not a large one, but was prettily made up of Orchids, and other small flowers, and a great improvement upon the cumbrous handful of ugliness we have seen this season at other exhibitions. Mr. C. Hill, Rowley Nursery, Oxford, was 2d; and Mr. G. Harris 3d. Mr. F. Perkins, nurseryman, Leamington, showed the best 3 groups of flowers; Mr. J. W. Chard, gr. to Sir F. Bathurst, Bart., Clarendon Park, Salisbury, came in 2d; and Mr. F. E. Spiers, Oxford, 3d—all showing very creditable designs.

The special prizes offered to cottagers for collections of wild flowers brought what is usually seen in such classes, while the vegetables and fruits were generally of very good quality indeed. The wild plants were ruined by being pinned against the almost red-hot sides of the tent. In the matter of Potatos, the drought appears to have affected the crops in the Oxfordshire gardens much less than in many of the more southern parts of England.

ROYAL OXFORDSHIRE HORTICULTURAL.—This show, the competition in which was restricted to the members, was held in those tents immediately contiguous to the Royal Horticultural Show, and to which visitors to the latter had access also. Stove and greenhouse plants, as well as Heaths, were sparsely represented; among the former was a plant of Asclepias curtasavica, very well flowered; and a nice pot of Lilium eximium, though perhaps scarcely admissible as a greenhouse plant.

Exotic and British Ferns were well represented, the latter comprising fine crested varieties of several species. Achimenes, Fuchsias, and Pelargoniums were somewhat poor, excepting the variegated kinds, which were nicely grown and coloured. Phloxes, Cockscombs, Petunias, and Balsams were not of a character to call for special remarks.

In the department of cut flowers the quality of the show was much better. Collections of 36 bouquets of cut flowers in not less than 30 kinds, shown by nurserymen, were well done, and were at once a novel and interesting feature. Verbenas were not first-rate; Carnations and Picotees were better done; Mr. R. Parsons had a capital stand of nine Dahlias, the flowers remarkably fine for the season; some magnificent blooms of Hollyhocks were shown by Mr. H. Surman, who was well seconded by Mr. H. Minchin, the flowers large, full, and very clean. The cut Roses and Sweet Williams were also good.

In the matter of fruits, Grapes were indifferent, but other sorts were very creditable; there was a dish of Morello Cherries of remarkable size. The prime feature of the show was the vegetables. The Potatos were numerous, and of remarkably fine quality, leading one to indulge the hope that in Oxfordshire, at least, the crop will be a good one. The Carrots, too, were remarkably fine. Peas were largely represented, though generally somewhat old. Broad and Kidney Beans, as well as Scarlet Runners, were in plenty, and generally finer.

No doubt the larger show had somewhat affected the extent as well as the quality of the smaller one, but the plants that otherwise would have been here were elsewhere on the grounds.

HORTICULTURAL STRUCTURES, &c.—The exhibition of horticultural buildings and garden requisites was probably better than at Manchester. At all events they were arranged in something like order, and conveniently together. This is a department, in connection with the development of horticulture, which the Society has never thoroughly taken in hand. We should like to see them following in the steps of the

Agricultural Society, by offering prizes, and holding trials of, say one or two, or even more, subjects each year, varying them so that the same article would not be tested again until the merits of others had been duly tried; and we should, moreover, like to see the manufacturers taking to the thing with more spirit. They may at least show the public more ingenuity, and originality in design, and better workmanship. Worse specimens of bad work could not possibly be turned out by any garden-loving village cobbler, than some of the erections and appliances shown here. The mania for cheapness has much to answer for, for the shortcomings in these and many other things.

For some time past our readers have been asking how frequently horticultural buildings ought to be painted, and with what materials. We know this is a vexatious question. It is a matter which is costly if done at the proper time and in a proper manner, and still more costly if neglected. We therefore think those who have still to build will hail with pleasure the "imperishable hothouse and other roofs," which, under a recent patent, Mr. W. P. Ayres, of Nottingham, is about to introduce, and which were exhibited here for the first time. These are free from sashes, sashbars, putty, or paint; and when manufactured in galvanised iron, as they may be in the most elegant manner, they will wear for a lifetime without further attention. For this purpose, ordinary glass jointed with transparent cement may be used, or instead "rough plate glass turned up at the sides," or any other form of bent glass may be substituted. In this manner a roof of any size can be formed without any projecting rafters, further than such as may be necessary to carry scaffolding for repairs; and consequently, even when wood is used in the construction, the painting will be reduced to a mere fraction of what it has been under the ordinary system of building. The glass is held in its place by clips at the corners, and a square can be taken out and replaced by any careful person in as little time as it takes to record the fact. Then the floors, plant stages, and side or partition walls are formed of cement concrete, strengthened in a peculiar manner, so as to bear any amount of pressure that may be placed upon it, and yet admitting of being perforated for the air to pass through, panelled to hold water for evaporation or for the plants to stand in, or both perforated and panelled. These slabs can be manufactured of any required strength, and, consequently, are suitable for fireproof floors, partition walls, tabling or shelving for shop, office, or warehouse fittings, or for any situation where slate or marble slabs have hitherto been used; they can be left rough for ordinary use, or be finished plain or in columns with the face of polished marble. Thirdly, Mr. Ayres introduces a new system of heating, dispensing with plunging or fermenting material for bottom-heat, and brings forward a system by which a stream of warm air, moist or dry, is constantly passing through the centre of the earth containing the roots of the plants, as well as impinging upon the sides of the pots, thus securing a supply of heat which can be regulated at the will of the cultivator. The advantages claimed are economy in first construction and subsequent repairs, perfect portability (when required), and when manufactured of iron, galvanised with the slab fittings, so imperishable as to wear for a lifetime without further cost. This may be considered to be taking the horticultural world by storm.

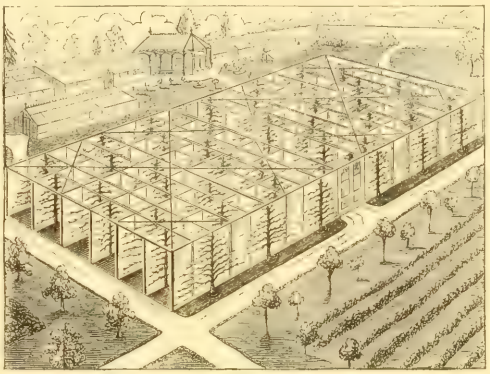

Fig. 182

PLAN OF A QUARTER ACRE

Fig. 183

From Messrs. T. H. P. Dennis & Co. we have another novelty in Gilbey's patent glass orchard, of which we are enabled to give a cut (figs. 182, 183,), which will better explain the nature of the arrangement than any description of ours. The plan has an air of simplicity about it worthy of a trial, and if it should be found to answer half as well as it is stated to do, it will be a great boon to amateurs and others. The same firm also exhibit two light, strong, portable lean-to houses, in which the sashes and sash-bars are made of patent galvanised metal; and also specimens of their powerful horizontal tubular boilers. Mr. Cranston, Birmingham, had a specimen of his "gardener's greenhouse," and Mr. F. J. Perry, Banbury, a few feet run of his "improved Peach-house," a well-made, substantial, and serviceable-looking building. Mr. B. Wheeler, of Nottingham, also showed one of his portable span-roofed houses, in which his improved system—a very easy one—of opening the ridge ventilators, is well displayed. Mr. Beard, Victoria Works, Bury St. Edmund's, had specimens of the glass walls described and figured at p. 861. Messrs. Ormson, and Messrs. J. Weeks & Co., showed their own particular forms of boilers, and Mr. Rendle the patent plant protectors. Mr. R. Halliday had a very nice stand of wire flower-baskets and other garden elegancies. A very large collection of the latter articles was also exhibited by Messrs. Gill & Co., Oxford. To some of the novelties in this department, including a contrivance for winter ventilation, new forms of boiler, &c., we propose to allude on a future occasion.

Florists' Flowers.

THE decorative value of the popular class of EARLY SINGLE TULIPS was well illustrated at the nurseries of Messrs. Veitch & Sons, King's Road, Chelsea, during the past spring, as several beds of them were at one time in full bloom. They had been planted late in the season when the sale for them had passed, and the bulbs were somewhat weakened by long keeping; the beds had not been specially prepared and manured so as to ensure a fine bloom; and there had also been the disadvantages of a wet winter, keen, cold, cutting winds, and a dry spring; and yet the floral service they rendered was one of no mean order. The varieties so planted were those that generally figure in a list of early Tulips, but it was extensive enough to afford a very good comparison.

The yellow self flowers gave Yellow Prince, pale yellow, a good bold flower, with green stamens, a most useful flower for massing; Canary Bird, not identical with the foregoing, as some have supposed, being both earlier to bloom and deeper in colour, and with yellow instead of green stamens—one of the very best yellows; Prince de Ligne, pale yellow, small in size, and pointed in the petals, not to be recommended; Yellow Pottebakker, a fine bold yellow flower, but apt to come pencilled with red, and which when so marked is sent from Holland as the red-striped Pottebakker; Chrysolora, very similar in colour to Canary Bird, but the petals not so good or the flower so large—it is also somewhat lanky in growth; and Yellow Eagle, a very late blooming variety, apparently its best recommendation. Of buff coloured self flowers, Thomas Moore still stands unrivalled for its peculiar shade of colour, fine flowers, and decorative effect.

White self flowers gave the grand old White Pottebakker as the very best of all; large, full, and very fine. Princess Helena must also be noticed as a very fine new flower; very dwarf in growth, scarcely so early as White Pottebakker, pure white in colour, in fact the purest of all the white flowers; a capital variety for pot culture. Others were Grande Blanche, dwarf in growth, petals very pointed; Pax alba, a dwarf-growing white Pottebakker in build, but not so pure, so large, or so good; Grande Blanche Royale, a little late and appearing to be poor; Comte de Mirabeau, medium-sized, somewhat pointed petal, the next finest in colour to Princess Helena; and Alba regalis, White Swan, and Alida, late in blooming, not sufficiently advanced to judge of their quality, but appearing to be inferior to others in this section. One characteristic of these white self flowers was noticeable, that in proportion to the amount of yellow in the base of the flowers would be the want of purity in the petals; those flowers having least of yellow in the base being purest in the colours of the petal.

Self scarlet and crimson Tulips afford some of the best and most effective flowers. Very good and very early to bloom is Scarlet Van Thol, extremely useful for early work in pots. Vermillon Brillant, one of the very best of the crimson self flowers, rich in colour and fine in build; Vermilion Van Thol, deeper in hue than Scarlet Van Thol, but with long thin petals—two and three flowers, poor in quality, being produced from the same bulb; Crimson Van Thol, apparently not different from the scarlet variety; Carmine Van Thol, really cerise, a very poor flower; La Belle Alliance, petals broader than those of Scarlet Van Thol, deeper in colour, a good dwarf and early crimson Tulip. Artis, which appears to be a selection from La Belle Alliance, retained on account of possessing a greater depth of colour, though there appeared to be little or no difference between them. De Keizer, very like La Belle Alliance; L'Aimable Rouge, a crimson flower with pointed petals, not to be compared with La Belle Alliance; Purple Crown, or Couronne Pourpre, the deepest coloured of all the crimson flowers, early to bloom, and, though somewhat pointed in the petals, most effective as a bedding kind for its rich hue of colour; Sampson, a bright crimson self flower, apparently apt to come slightly flaked with pale yellow in the form of a feather, lanky in growth; Paul Morelse, rich rosy crimson, with a tendency to have a pale flame up the centre of each petal, good habit, and a distinct shade of colour, having more of cerise in the colouring than any other of the crimson flowers; and Morgenzen, pale crimson, of a tall lanky growth, not worthy of cultivation.

The edged flowers, which are rather numerous, give some of the finest and most showy varieties in cultivation. The varieties grown on this occasion were:—Duchesse de Parma, reddish crimson, edged with pale yellow, a very fine and extremely showy bedding Tulip; Le Matelas, bright rosy violet, edged with blush—very pretty, of good quality, and one of the earliest to bloom; La Remarquable, deep bronze-crimson, feathered and edged with pale cream, into which the ground colour somewhat runs—the petals pointed, but the flowers of poor size; Holbein Feu le Mort, bronzy purple, crimson base, edged with pale buff, dwarf in growth, and of good quality, but, like all the pale-edged forms, having a somewhat confused appearance; Cerise Gris de lin, cerise-crimson ground flushed with purple, and broadly edged with blush, a novel and pretty variety for pot culture; and that best and showiest of all the edged forms—Keizer Kroon, shaded reddish crimson, broadly edged with gold.

Flowers having a pale base and darker colour in the form of a feather or edge, were represented by the following:—Couleur Ponceau, a most useful and effective bedding variety, the base of the flower white, which also runs at the centre of the petals in the form of a flame, and broadly feathered with rosy red; Rose Luisante, pale base, feathered with rosy violet, very pretty; Rouge Luisante—this differs from the foregoing in having a little more colour in the feather; Rosa Mundi, flamed with rosy red on a pale ground; Cottage Maid, pale ground, heavily edged with pinkish rose; La Précieuse, very similar to Cottage Maid; Rose Applatie, pale ground, with streaks and pencillings of carmine-rose, very distinct and pretty, growth short and rigid—a capital bedder; Rose Tendre, in the way of the foregoing, but having rather more colour; and Rose and White, pale ground, feathered with bright carmine rose: very pretty but small in size.

Flaked flowers furnish some very pretty things, and are among the choicest of these gay flowers. The following varieties were in bloom:—Monument, feathered and flaked with white on a rich cerise-crimson ground; very pretty and good. Royal or Silver Standard, rosy crimson, much flaked with white, very pretty; a lively and useful flower for bedding purposes. Dorothea Blanche, an inferior form of Royal Standard. Bride of Haarlem, in the way of Royal Standard, but not so finished a flower. Comte de Vergennes, pale ground, with regular narrow feather of deep rose, very pretty when in its true character, but seldom comes so. Cerise de France, white, flaked and flamed with deep red; very pretty, but rather small in size. Beauté Parfait, in the way of Royal Standard, but not so good. Admiral Renier, pale ground, heavily feathered and flamed with rosy carmine; very pretty and good. Drapeau de France, similar in character to Monument. Admiral Florida, a broken form of the pale violet self flower Florida, with feather and flakes of white. Grande Duc de Russie, pale rosy lilac, feathered with white; very pretty. Duc de Brabant, feathered and flamed with gold on a rich deep crimson ground, of dwarf growth, and very pretty and effective; Duc de Holstein, in the same way, but with more gold in it; Marquis de Wessenrode, deep yellow, flaked and pencilled with red, very pretty; and Louis d'Or, very like the preceding, but scarcely possessing so much colour.

Cerise self-coloured flowers—a very pretty hue of colour among the early Tulips—gave the glorious Proserpine, soft silken rosy cerise, one of the very finest of these useful flowers; Cramoisie Royale, deep rosy cerise, a good, showy, and effective flower, the

petals a little pointed; and Jan Lukyn, cerise-red, very lively in colour, and early to bloom.

Violet and purple self-coloured flowers are now getting somewhat numerous, and include some good things. They comprise Wouvermann, deep purple, the darkest of all in this division, the petals somewhat pointed; Van der Neer, violet-purple, large and of fine shape, the next in point of depth of hue,—a superb flower; Molière, in the way of Van der Neer, but not of such good quality, the petals pointed, and the growth taller; Florida, very similar to Molière: in foliage, colour, build of flower, and habit of growth, these two appeared to be identical; and Queen of Violets, pale violet, a very pretty flower, quite distinct, and one of the best for pot culture.

Edged flowers on scarlet and crimson grounds also afforded some pretty examples, as, for instance, Duc Major, feathered with yellow, the petals somewhat pointed; Duc d'Aremberg, bright reddish crimson, feathered with gold, a showy and good flower; Cardinal, very slightly feathered with yellowish buff. This, as well as Ardemus, Brutus, and Commandant, all in the same way, are scarcely worth cultivation. Duc Storm, like Duc Major; Duc de Lorraine, a dwarf-growing form of Keizer's Kroon, the flowers rather smaller, but very good; Yellow and Red of Leyden, in the same way, but not so good; and Feu Rouge, with slight feather of orange-yellow, a very useful dwarf Tulip, but not first-rate in quality. Couleur Cardinal has a deep crimson base, and a feathering of bright vermilion. Cardinal's Gold is this variety broken, and having gold stripes up each petal; Rit Royale is the same as Couleur Cardinal.

The Dutch catalogues give somewhat lengthy lists of double flowers, but only a few of the leading kinds are cultivated, and of these the older flowers appear to be the greatest favourites. The length, however, to which this paper has run necessitates that some details should be given in a separate form. *R. D.*

Obituary.

At Woodlands, Victoria, British Columbia, on Whit Sunday, June 5, 1870, Henry Hooker, second son of the Hon. Mr. Justice Crease and Sarah his wife, *née* Lindley.

The Apiary.

We left the matter, so far as the economy of the life of the bee is concerned, showing from our own experiments that the worker lives only six or eight months, longer or shorter, according to the seasons and the chances of bee life. Of the drone we have stated four months to be the limit of life, and we had the experience of about 200 drones in the winter months, viz., from October to February. The queen, as we have stated, lives until the two ovaries are exhausted, which would be, in climates and under circumstances favourable to promoting the continuous laying of the eggs, under two years, or, as is proved by bee-masters' statements, the first 11 months in each season being the most prolific, conclude the egg-laying life about the twenty-second month; but this is occasionally protracted in cold and uncertain climates, according to the flower-blooming season of each locality. The reports of the German bee-masters and the statements of travellers fully verify these statements. The isolated instances of queens being supposed to live over four and five years, or seasons, must be accepted with all due respect, but with the belief that some error or accidental exchange of queens has not been noted. We have never accepted any facts of our own observations on this most difficult point unless confirmed by a series of experiments extending over years upon distinctly marked and mutilated queens, as the casualties and exchanges are very great. We could give notes of from 20 to 30, and even more, queens being raised in one hive, and at one period of the season. If, then, we find men mistaken as to the identity of their own sheep, or even dogs, how difficult is the task of reporting upon the queen bee as the identical bee we saw raised the year before; for if free to fly out of the hive, no certainty can be secured, and if constantly confined, the nature of the queen bee is completely changed, and those delays of egg-laying occur which give the appearance of a naturally prolonged life. We have found all queens with their wings clipped invariably struggling to escape, on the ground, in the second season; but we must hasten to practice, and not fill these pages with statements of experiments. Well raised and young prolific queens should be encouraged each year to throw as many swarms and casts as possible, as these naturally build combs, and store up honey and pollen, and commence the great breeding of workers in the autumn, that is to say in July and August, when the drones are generally destroyed or driven out by the workers. After the great egg laying should be the period for the practical bee-master to unite all the casts and swarms, proportioning the stocks of bees for the winter season, and taking care to secure a fertile queen. Four average swarms and casts make one good winter colony, and as the winter deaths are numerous, the survivors make good use of the stores, and form strong stocks for the spring time, and invariably thrive, and would throw early swarms if allowed. All the bees saved during the autumn contribute their warmth and life to the good of the whole colony, and may be seen frequently yielding up their little lives at the very entrances of the alighting boards of a hive, when returning laden with pollen for the brood, over which the bees which remained at home were seemingly so watchful.

In the early spring months of a favourable bee season the results of such bee management is just this—as we have proved in former years, and still more exemplified this season—that the bees, being strong and healthy, those that have survived the winter trials, are ready to avail themselves of the few weeks of fine weather, come when it may. This spring was fatal to all stocks of bees that had only their usual average bees left, and we have letters from all quarters asking the reason why the bees died, although the combs were left full of honey. We saw hives with bees perish even in May from the want of the assistance of sufficient nurses, and workers, or whatever names we may fancifully give them, like the "good old Huber's" enumeration of nurses, workers, wax-workers, and guards, &c.; but it is the union of two or three stocks in the autumn that has kept a supply of these very requisite numbers to fill up the vacancies by the deaths, and yet have workers to secrete wax, or feed the brood, or rove the fields for pollen, and collect water to mix the larvæ food in the early spring. We give only the facts of this season: whilst so many complain, the few stocks we were working—and some, too, being experimented upon—the one old stock placed in a box-hive at once built combs, and the fertile queen filled the cells shortly after with eggs, and in June six bars and four top-glasses of honey had been collected; whilst an early colony separated from these very bees has now (June 15) four combs completely filled with brood, a queen having been given them from another stock of bees where queen cells and young queens were being reared artificially, but in this instance the combs were already prepared in the "box frame hives," and, consequently, the bees had only to store up the honey, of which they collected 5¼ lb. in little more than four days, besides caring for the brood. But this is not a singular instance of this kind of management. Before inviting attention to this kind of hive where this thorough command over the bees can be obtained, and which is requisite for economical bee-keeping, we wish to call attention to the facts of raising the bee brood, which seems to agitate the German bee-masters, and also are copied into our various bee articles in such papers as discuss the subject, without going into those hard and scientific words of "parthenogenesis," "endosmosis," &c. *M. D.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Strong growing summer plants in *Aquaria* will have made a goodly amount of growth by this time, and will, therefore, need special attention to keep all the surroundings as neat as possible, and so to set off their fuller display and enjoyment. The large *Victoria Lily* (Victoria regia) will be pushing up its gorgeous flowers, as well as the several sorts of *Nymphæas*, some of which are fragrant, and others very distinct, the one from another, in colour, *e. g.*, red, blue, white, spotted, &c. The flowers will afford pleasing relief from the mass of vegetation around, rising as they do above the surface of water and amid the floating leaves. There are two distinct evils to be fought against in cultivating these tropical aquatics. The first of these consists in a want of a natural movement in the water itself, and the second, which is but a natural sequence, of the former, consists in the too ready formation of fungoid slimy growths in the water, which quickly deteriorate its fresh wholesome character, and if not frequently seen to, bring about a most adverse state of things. The term "stagnant" is in too frequent use to render it necessary for me to dilate on the consequence of a neglect of the requisite attentions. To obviate these evils we must first permit as much fresh water to flow in constantly without unduly decreasing the necessary heat of the water. Next, with a like view, a nice stream of water should be ejected into the air, fountain-wise, so as to communicate somewhat of surface commotion to the water; but the best form of contrivance is to poise or hang in mid-air, up under the roof of the house in fact, a kind of light tin scoop, in form like that which bakers and millers use to weigh flour in. This, if hung so as to swing freely, will, if water be conducted into it by means of a small pipe, become filled and tilt up at one end, and so eject the water into the tank below. It is almost needless for me to remark that the inner sides of the tank, basin, or whatever it be, must have a good rubbing or scrubbing over occasionally, to remove the filthy matter which continually collects and grows thereon. In the case of the larger tanks, wherein are grown such plants as the Victoria Lily, it will be absolutely necessary to enter into it bodily, and to lay about well with a cloth or scrubbing-brush. Sundry slimy aquatic growths will attach themselves to the leaves of the plants and around the crown; these should be removed with the hand. The huge leaves have a kind of projecting framework beneath, to which this slimy greenness becomes attached. Now the only way to free the under side of the leaf entirely from this growth is to turn each over on to its upper side, a very easy matter if properly set about. Instead of taking hold of one side and hoisting that as you would a slab, place the hand and lower portion of each arm from the elbow firmly on one side of the leaf, and press it down underneath the water at such a depth as not to injure it by bending it too closely together, keeping the other side somewhat raised the while, and the leaf will quickly be turned over, and may be readjusted in a similar way. Care must be taken not to injure the beautiful reflexed edges of the leaves. When the place is thoroughly scrubbed throughout, the plug should be pulled up, and as much of the dirty water removed as possible. Of course it will be necessary to push the fire along briskly, and to turn the heat on full into the pipes which pervade the tank, that the fresh water admitted may be brought up to the requisite heat with the least possible waste of time.

FORCING HOUSES.

Grapes, it will be said in the annals of horticulture, were a fine crop in 1870, so good are they generally, If I am to believe what is occasionally told me, and confirmed as far as possible by my own observation, there are many fine crops grown upon what may be termed the artificial root watering restriction system—in other words, by allowing no more water to the borders than what falls thereon naturally from the heavens. Of course I do not advocate this departure from all rules of artificial culture. It only shows what an enduring plant the Vine is, and perhaps something more, which is, that it may be safer to err somewhat on the side of affording a rather limited supply than of giving a superabundance, and so causing an over-moist border. Let it be borne in mind, beside, that the advocates of this system are prone to use a rough covering of litter as a surfacing in winter, in lieu of the boarded or asphalte covering, which ward off all superficial moisture so effectively, and which have really very little to commend them from a strictly natural point of view; though in the case of heavy snows and penetrative frosts they act well and are useful. Whether, however, artificial waterings are resorted to, or such as falls naturally is alone to be depended on, a moderate amount of aid may be given to all Vines laden with fruit by judicious applications of artificial manures of known merit. And perhaps there is none better for this kind of liberal distribution than superphosphate of lime or crude soot. These should be scattered freely over the surface of the borders before being well watered, when the strength will be well washed down to the roots, and, unlike such rank materials as are often applied from farmyard tanks, &c., will cause no risk to be run of forming an unwholesome deposit which may at a later period prove antagonistic to the real well-being of the roots. If any *Pines* refuse, amidst a too congenial treatment and general atmospheric surroundings, to "show" as quickly as is desirable at this season, it will be necessary to give the plants a check by withholding water altogether from the roots, &c., for a time. And again, as soon as the embryo show commences forming in the inner heart, to have resort to the former treatment, little by little, until all the most favourable conditions to a free and healthy growth are assured, and the flower proceeds steadily to the formation of fine heavy fruit or fruits. Do not neglect to shade regularly all sucker cuttings which are now rooting. If taxed too greatly from the want of it at this time, though they do not show it readily, the young roots will have to make the check good, whilst otherwise they should have been engaged in making an advanced growth substantially throughout. Give to Melons which are ripening their fruit all the air and full sunlight possible, as this is conducive to good flavour.

HARDY FRUIT GARDEN.

Proceed with the active manipulation needed by all *Wall-fruit trees* in matter of pruning, nailing, &c., by way of a secondary operation. As it will be seen that young growths will continue constantly to form and push forth, more especially upon Peach, Nectarine, and robust Apricot trees, the shoots which were previously tacked or hitched up to the wall will also now require further support. Those trees of the two former which produce upon strong young shoots very large leaves, will be far more likely to produce flower-buds, as opposed to wood-buds only, if all the large leaves are cut in twain right across the middle. Give frequent syringings as a preventive of red-spider. Finish planting out into permanent beds, previously prepared by trenching and the addition of good strong dung in abundance.

KITCHEN GARDEN.

Now transplant a good batch of *Cauliflowers* for early and late autumn use upon a good rich piece of ground—the Walcheren is a good variety for this purpose. Take up the autumn-sown *Onions* which have now finished "bulbing," during a dry period, as they keep so much better. *Coleworts* should then be planted on the ground without any further preparation, as the firmer it is the better, and the weather keeps so dry. If rain comes it will soften it for the good of the crop besides. Save a piece of open ground for

Winter Spinach, which should be sown about the 10th of next month. If it requires digging over, let that be done immediately, that it may stand a chance of catching what rains may fall before that date to settle it down well. Those who have not sown *Cucumber seed* for winter growing and supply should do so now. Make also a good sowing of *Parsley*, where this has not been done, as advised a week or two ago. Transplant *Hardy Herbs*, such as *Mint*, *Marjoram*, *Sorrel*, &c., if fresh plantations are needed. Water *Celery* effectively, and frequently, so as to keep it uniformly wet at root. *W. E.*

TOWN GARDENING.

CLEAR the beds of all annuals that have done flowering, as the seed produced in town is not worth saving, and put in their place *Pompon Chrysanthemums* that were struck last month. *Herbaceous plants* that have done flowering can now be propagated by dividing the roots, and planting them in some reserve border until the spring. The *Christmas Rose* can be propagated now in the same manner, but they should be planted where they are intended to flower, and unless numbers are required, they should never be disturbed, for, if undisturbed, they flower freely in town. The *Starwort*, or Michaelmas Daisy, will well repay attention at this season: they should be thinned out to about three stems, and neatly tied. As they advance in growth they should be kept well watered. They will then make a gay show just before the Chrysanthemums. A descriptive list of Starworts would be very acceptable to townsmen, as they are famous plants for town gardens. *Holly* and *Aucubas* can be safely removed now, if kept well watered. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON

FOR THE WEEK ENDING WEDNESDAY, JULY 20, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer	Wet Thermometer	Hygrometrical Deduction from Glaisher's Tables, 81st edition: Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
July.	Ins.	Deg.	Deg.	Deg.		Gr.
14. Thurs.	29.82	68.2	61.6	55.8	61	5.2
15. Friday	29.85	73.2	65.2	57.0	51	5.2
16. Satur.	29.69	67.3	63.2	58.3	64	5.7
17. Sunday	29.69	68.3	63.8	58.3	66	5.8
18. Monday	29.83	66.3	60.4	53.5	51	4.5
19. Tues.	30.05	70.3	63.1	55.6	56	5.3
20. Wednes	30.13	71.0	62.8	52.5	55	4.9

1870. MONTH AND DAY	Temperature of the Air: Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Mean of 15 Years.	Wind: Direction.	Horizontal Movement.	Rain: Amount.
July.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	In.
14. Thurs.	79.7	57.3	22.4	66.8	+ 4.3	{ N.W. / S.S.W. }	137	0.00
15. Friday	85.0	52.0	33.0	68.8	+ 6.3	{ S.S.E. / S.W. }	192	0.00
16. Satur.	77.1	56.3	20.8	66.4	+ 3.6	{ W. / W.S.W. }	287	0.15
17. Sunday	77.1	51.0	23.1	61.7	+ 1.5	{ W.S.W. / N.W. }	216	0.00
18. Monday	79.4	56.7	13.7	61.7	− 0.2	{ W. / S.W. }	141	0.69
19. Tues.	84.2	61.0	23.2	70.7	+ 0.1	{ S.W. / N.W. }	142	0.00
20. Wednes	80.7	59.2	21.5	71.1	+ 0.7	N.W.	161	0.00

July 13.—Cloudy during the day, cheerless at night. Fine.
— 15.—Small amounts of cloud were prevalent throughout. A very fine day.
— 16.—Variable amounts of cloud were prevalent. A violent thunder storm raged between 4 A.M. and 5 A.M.
— 17.—Generally cloudy. A little rain fell at night.
— 18.—Generally cloudy. Fine.
— 19.—Cloudy throughout, but very hot.
— 20.—Cloudless till evening. Very fine.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, JULY 16, 1870.

NAMES OF STATIONS.	Temperature of the Air: Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	75.5	52.4	23.1	72.0	54.7	18.2	63.0	0.14
Blackheath ..	80.0	52.0	31.0	78.1	50.4	27.1	65.7	0.80
Bristol	78.1	50.8	27.3	71.5	52.0	18.6	61.3	0.79
Birmingham ..	79.0	49.0	30.1	74.1	53.0	19.1	63.6	0.70
Wolverhampton	74.4	49.1	25.3	73.3	52.2	21.1	62.8	0.00
Leicester ..	85.5	49.7	35.8	78.0	55.1	22.7	64.8	0.00
Norwich	78.5	50.4	24.1	74.7	52.5	17.7	63.2	1.44
Nottingham ..	81.7	47.0	34.7	77.9	53.2	24.7	63.1	0.17
Sheffield ..	78.0	46.0	32.0	73.0	54.1	20.9	62.6	0.00
Liverpool ..	77.2	50.4	26.8	73.6	54.0	19.6	63.8	0.12
Manchester ..	79.5	47.8	31.7	73.9	53.4	17.6	63.6	0.00
Salford	78.4	49.0	31.5	72.9	52.0	18.9	62.5	0.02
Bradford	81.0	51.2	29.8	77.5	55.5	22.0	66.1	0.00
Leeds	82.0	51.0	31.0	75.9	55.3	20.6	65.7	0.01
Hull	80.0	47.0	33.0	76.4	49.6	26.8	63.1	0.45
Newcastle ..	77.0	51.0	21.0	69.0	54.3	14.7	59.8	0.00
Edinburgh ..	72.7	53.0	19.7	..	..	..	58.8	1.00
Glasgow	67.8	47.5	20.3	..	..	..	52.2	0.20
Dundee	71.0	53.0	18.0	..	..	..	58.2	0.55
Aberdeen	66.6	51.6	15.0	..	..	..	57.7	0.53
Paisley	73.0	47.0	25.0	..	..	..	57.4	0.05
Greenock	74.0	53.0	21.0	..	..	..	60.4	0.51
Leith	79.3	51.0	19.3	..	..	..	59.3	0.00
Perth	74.0	54.0	20.0	..	..	..	61.4	0.41
Dublin	70.9	46.0	24.9	..	..	..	57.1	0.54

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *A.* It is utterly impossible to get a knowledge of the seed trade from books. In general matters, "Cassell's Popular Educator" will suit you. As an elementary introduction to Botany, you cannot do better than make yourself thoroughly familiar with "Oliver's Lessons in Elementary Botany."

CENTAUREAS: *Vigilans.* To propagate Centaurea ragusina compacta and candidissima, cut off the heads of your stock plants so near the points as just to cut into the solid part of the stem; thus all the leaves will be removed, and the stools should be placed in nearly every eye from the naked stems; place the stools on a shelf in the greenhouse, and by spring they will produce a quantity of side shoots, which, as soon as they are large enough, strike freely.

FLORAL COMMITTEE: *Rusticus.* As the meetings are announced beforehand, and not capriciously altered, we do not see that you have a fair ground for complaint.

NAMES OF PLANTS: *The Man of the Hill.* The Wig plant, Rhus Cotinus. — *Gallinagh, Newry.* Rhus Cotinus. — *T. S. M. T.* Elæagnus, sp.; 2, Spiræa salicifolia; 3, Ægopodium Podagraria.—*S. M. O.* Astrantia major.

SCHŒNIA: *Nullins.* Schœnia oppositifolia is a beautiful annual, native of the Swan River, whence it was introduced to Kew, and flowered there about 24 years since. We are not aware if it is still in cultivation; but, if not, it is well worth re-introducing. You will find a figure in the "Botanical Magazine" for 1851, tab. 4560.

SPECKED GRAPES: *G. B. S.* If the specks in question are white and transparent we believe it is nothing more than little fleshy excrescences, produced by high cultivation and gross growth. The same thing is very frequently to be met with in the young shoots. It will do no harm. It is advisable in all such cases to send an example, then we could reply with certainty.

ERRATA. At p. 929, col. *a*, for "E. Brown & Co., of Marylebone," read "E. Brown & Son, 24, High Street, Marylebone."

COMMUNICATIONS RECEIVED: Owing to the Oxford meetings, and the consequent pressure on our space and time, replies to several communications must be delayed till next week.—Australian.—J. H.—Miller.—J. F.—A. M.—E. W.—Thos. Mills.—J. W.—C.—J. Carr.—A. G.—M. F. F.—J. O. W.—Alfred M.—J. E. M.—G. E. S.—F. L. H.—E. S.—W. B.—E. B. & Son.—P. G.—B. S. R. A.

Markets.

COVENT GARDEN.—July 22.

Markets maintain their tone, and the present dry weather being favourable for getting bush and other soft fruit, we may expect a continuous and steady demand. Continental imports are heavy, and comprise all the usual varieties. Amongst flowers we have nothing different from those mentioned previously.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz.	2 0	4 0	Oranges, per 100	8 0	10 0
Cherries, per lb.	3 0	6 0	Peaches, per doz.	10 0	30 0
Grapes, per lb.	0 6	7 0	Pears, per doz.	2 0	3 0
Lemons, per 100	10 0	12 0	Pine apples, per lb.	3 0	6 0
Melons, each	2 0	6 0	Strawberries, per lb.	0 6	1 0
Nectarines, per doz	8 0	14 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, per doz.	2 0	4 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, per score	1 0	2 0
Cabbages, per doz.	1 0	1 6	Mint, per bunch	0 3	0 6
Carrots, per bunch	0 4	0 8	Mushrooms, per pott.	1 0	1 6
— young, per bunch	1 6	2 0	Onions, per bunch	0 4	0 9
Cauliflowers, per doz.	1 0	2 0	Parsley, per bunch	0 2	0 4
Celery, per bund.	1 0	1 6	Potatos, new, p. lb.	0 2	0 6
Cucumbers, each	1 0	1 6	Shallots, per lb.	0 8	1 0
Endive, per doz.	1 6	2 0	Spinach, p. bushel	2 0	3 0
French Beans, p. 100	2 0	..	Radishes, per doz.	1 0	1 6
Garlic, per lb.	0 2	0 8	Turnips, yng., p. bun	0 0	1 0
Herbs, per bunch	0 2	0 4			
Horse Radish, p. bun.	3 0	5 0			

Potatos, York Regents, per ton, 110*s.* to 140*s.*; Flukes, do., 200*s.*; new round, 5*s.* to 7*s.* per cwt.; new kidney, 7*s.* to 10*s.* do.; Continental kinds, 80*s.* to 200*s.* do.

To Architects, Landscape Gardeners, and Others.

SCARBOROUGH CEMETERY.—The Burial Board for the Parish of Scarborough are prepared to receive PLANS for LAYING OUT the LANDS adjoining and near to the West-end of, and intended to be formed into, the Burial Ground or Cemetery of the said Parish. Copies of the conditions, with Plan and Sections of the Ground, may be had on application to the Clerk, at his Office, or to the Superintendant at the Cemetery.

A Premium of £20 will be given to the Author of the best, and of £10 to the Author of the second best Plan, to be determined by the Board.

Competitors are requested to forward their Plans, respectively marked by a motto only, and accompanied by a separate sealed Letter, containing the name of the Competitor, both endorsed "Cemetery Plans," and send the same to the Clerk to the Board, at his Office, 45, Saint Thomas Street, Scarborough, on or before the 8th day of August next.

By order of the Burial Board,
J. J. F. MOODY, Clerk.
St. Mary's End, July 1870.

A LAND AGENT, having the Management of an Estate of 18,000 Acres in the North of England, upon which extensive improvements are now being carried out, has a VACANCY for an INDOOR PUPIL, who would be treated as one of the family.—Apply to A. B., Post Office, Kirkby Lonsdale, Westmoreland.

WANTED, for an English House of high standing, a MANAGER and SECOND ASSISTANT, to whom Liberal Terms will be given, and who should possess a general Knowledge of the Seed Trade, especially Agricultural Seeds. Applicants to state terms expected, age, whether married or single, also present and previous employers. All communications treated confidentially.—Address, SEED TRADE MANAGER, *Gardeners' Chronicle* Office, W.C.

WANTED, an experienced ASSISTANT, for a first-class Fruiterer's and Florist's Shop.—TALBOT AND PRYOR, St. Leonard's-on-Sea.

WANTED, in a Wholesale Seed Warehouse in London, an active Young Man as UNDER SHOPMAN.—Apply by letter only, X., *Gardeners' Chronicle* Office, W.C.

To Dairymaids.

WANTED, near Kingston-on-Thames, a DAIRY MAID, for a small Dairy.—Apply, first by letter, with full particulars, to Lady J. P. G., 5, Lowndes Square, London, S.W.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Hedge Nurseries, London, N.

EXPERIENCED GARDENERS, also UNDER GARDENERS.—J. HARRISON having a number of Clever Men on his Books, waiting for engagements, any Gentleman requiring Gardeners can be supplied at once with Men of first-class character and abilities.—North of England Nurseries, Darlington.

GARDENER (Head), in a Gentleman's Garden.—Married; 30 years' good character.—E. W., Post Office, Greenstreet, Kent.

GARDENER (Head).—Married, no incumbrance; well skilled in all branches of the profession. Highest references.—A. B., Post Office, Southend, Catford, Lewisham, Kent.

GARDENER (Head), in Suburbs or Country.—Age 29 (Scotch), married, one child; thorough practical Man; highly recommended.—M. M., 18, Stanford Road, Fulham, S.W.

GARDENER (Head).—Age 32, married, no incumbrance; is at liberty to engage with any Lady or Gentleman requiring the services of a thorough practical Man. Unexceptionable references.—The GARDENER, Barton Court, Canterbury.

GARDENER (Head).—Middle-aged, married, without incumbrance; has a thorough knowledge of the profession in all its Branches. Wife can undertake Dairy, or Cooking.—W. P., Mr. May, Seedsman, 35, Brydges Street, Covent Garden, W.C.

GARDENER (Head).—Age 30, married; thoroughly understands Early and Late Forcing, and Kitchen and Flower Gardening. Can be well recommended. Wages not so much an object. No Single-handed place accepted. Total abstainer.—G., Messrs. Lee's Nursery, Hammersmith, W.

GARDENER (Head), age 40, married.—JOHN DAVIS begs to give notice that he will be disengaged on Sept. 6, and offers his services to any Nobleman or Gentleman in want of a first-class Head Gardener. Well versed in the Early Forcing of Grapes, Pines, Cucumbers, Tomatos, Melons, Stove and Greenhouse Plants, Orchids and Nepenthes, also Orchard-houses, and Flower and Kitchen Gardening. No objection to Stock. Is a good Accountant. Highest references.—Mr. HENRY SLATER, High Street, Uttoxeter, Staffordshire.

GARDENER (Head), or GARDENER and BAILIFF.—Married; thoroughly experienced in Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, also Pleasure Grounds, and Flower and Kitchen Gardening. Has had the management of large Estates, Buying and Selling Stock, &c. Highest references.—E. B., Messrs. George Gibbs & Co., Seedsmen, 24, 25, and 26, Down Street, Piccadilly, W.

GARDENER (Head), where one or two others are kept.—Age 30; could take Charge of a few Acres of Land. Wife could take Charge of Small Dairy. Good Character, to live at the Lodge. Well recommended as to character, ability, &c.—W. P., Post Office, Two Keepham Common.

GARDENER.—The Advertiser will give £10 to any Gardener or Nursery Traveller, who will get a Situation for him before the end of September. He was above, with two or more Assistants as kept, and where the wages would be £70 per annum. Good reference.—B. C., 3, Conduit Street, Upper Clapton, London, E.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man whom he has known for several years, and can testify as to his ability and trustworthiness. He has had the present Gardener's last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

GARDENER (Under).—Age 29, single; well up in Greenhouse, and Flower and Kitchen Garden Work. Can Milk. Good character.—A. B., 26, Ashburton Grove, Hornsey Road, N.

GROUND FOREMAN and PROPAGATOR (Working), in a first-class Nursery, where economy, energy, and thorough ability would be appreciated.—Is a successful Cultivator of Fruit Trees, Roses, Ornamental Trees, Deciduous Shrubs, and Evergreens; conversant with value of the same, and the general routine of Nursery work. An opportunity where a pushing Trade is required. Character will bear strict investigation.—B. B., 12, Holly Grove, Balham, S.W.

To Nurserymen, &c.

NURSERY MANAGER, CLERK, FOREMAN, FOREIGN CORRESPONDENT, or SALESMAN.—A. A. VANDER MEERSCH wishes for an Engagement as above; has had 15 years' experience in England and abroad; six years' character from his present employer, James Gaines & Co., Nurserymen, Hounslow, leaving. He has had considerable practice in Drawing Designs for Landscape Gardening and Horticultural Building.—Crystal Palace Nursery, Forest Hill, S.E.

IMPROVER, in a Nobleman's or Gentleman's Garden, where he could get a good insight into the profession.—Age 17; a small Premium given.—J. HUNT, Messrs. Sutton & Sons, Reading, Berks.

PACKER, &c.—Age 25, active; well up in the general routine of Packing, either in Nursery or Seed Establishment.—J. HUNT, Messrs. Sutton & Sons, Reading, Berks.

TRAVELLER, to the Seed Trade.—A young Man, of good address, appearance, &c. Thirteen years' experience in a good Scotch house. Can show all the requisites as to character, &c.—A. S., Frederick May, 9, King Street, St. James's, W.

Seed Trade.

SHOPMAN.—Sixteen years' experience; knowledge of Plants. Good references.—F., 145, Drummond Road, Bermondsey.

SHOPMAN, CLERK, &c.—Wanted, an immediate re-engagement in a Wholesale or Retail Establishment, as above, or to Manage a small Establishment, by a thoroughly experienced Man, with first-class Metropolitan and Provincial references. Would not object to Seed and Corn.—SEED, Post Office, Gloucester.

To the Seed Trade.

SHOPMAN (ASSISTANT).—Mr. WILLIAM PAUL can recommend a Young Man (who has been with him about seven years), as above, to a good London house.—W. T. J., Paul's Nurseries, Waltham Cross, N.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 27 per cent. of Soluble Phosphates, 5 to 7 per cent of Ammonia with salts of Potash. See reports of Dr. Voelcker, Dr Anderson, Professor Way, Mr. Ogston, and Mr Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken

REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves, and need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed "AUGUSTUS VOELCKER.
"The Secretary, REES AND CO'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

THE LONDON MANURE COMPANY,
(ESTABLISHED 1830)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Laying Down Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
and POUDRETTE and POUDRETTO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
Offices, 216, Fenchurch Street, E.C.

MATTHEWS' CORN CAKE, a substitute for Linseed Cake
Manufacturers of MATTHEWS' specially prepared MANURES for all CROPS.
F. C. MATTHEWS SON AND CO., Manufacturing Agricultural Chemists, Driffield. Established 23 years.
STAND No. 134, SHOW YARD, OXFORD.

A Boon for Grape Growers.
MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of 14 cwt., 10s 6d; ½ cwt., 5s 6d; and 7 lbs., 2s 6d, with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

DRY EARTH CLOSETS.—Important improvement, all self-acting. Get particulars from the Patentee and Manufacturer, JOHN GRAY, Dalry, Ayrshire.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

Stand No. 329.
ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

CLAYTON AND SHUTTLEWORTH, Lincoln, will exhibit at this Show, commencing July 11, as follows
PORTABLE STEAM ENGINES, 4 to 10 horse power
HORIZONTAL FIXED STEAM ENGINES
TRACTION ENGINE, 8 horse power nominal
THRESHING MACHINES, of various sizes.
STRAW ELEVATORS
STACKING MACHINES
CIRCULAR SAW BENCHES, &c.
At the last Public Trials (May, 1869) of the Royal Agricultural Society of England, in competition with the principal manufacturers in England, all the First Prizes for Steam Engines, the Prize of £15 for the Finishing Threshing Machine, also the Society's Silver Medal, were awarded to
CLAYTON AND SHUTTLEWORTH, Lincoln, and 78, Lombard Street, London, E.C.
Catalogues, &c., free by post.

THE GRANITIC PAINT, the best for the finest Painting, and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.
394, King William Street, London Bridge, London, E.C.

DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.
394, King William Street, London Bridge, London, E.C.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

WANTED, to RENT, a SMALL NURSERY near Ground well situated
A. B., 4, Elizabeth Street, Pimlico, S.W.

NURSERY for SALE, near Manchester.—A good and prosperous one, with great capensibility and ready Sales.
Mr. BREEN, 109, Market Street, Manchester

To Seedsmen, Fruiterers, &c.
A GENUINE CONCERN for SALE, eight miles from town. It comprises—Double-fronted Plate-glass Window, Four Bed-rooms, Drawing-room, Parlour, large Kitchen and Breakfast-room, and Stable and Coach-house. Agreement for long Lease; rent only £42, worth £60. Price, including Stock, Fixtures, &c., £150. Apply to Mr. ARTHUR, 10, Mansion House Place, E.C.
A. B. C., James Fairhead & Son, 7, Borough Market, S.E.

To Nurserymen, Seedsmen, and Others.
TO BE LET, on Lease, an OLD ESTABLISHED NURSERY and SEED BUSINESS, in an increasing and respectable neighbourhood, about eighteen miles from London, consisting of about Two Acres of Land, with young Stock, good Dwelling House, Seed Shop, Greenhouses, &c. Stock to be taken at a valuation in the usual way.
For particulars apply to Mr CHANDLER, Horticultural Agent and Valuer, 10, Wynell Road, Forest Hill, S.E.

A Lease to be Sold or Let.
To NURSERYMEN, FLORISTS, SEEDSMEN, and MARKET GARDENERS
TO BE DISPOSED OF, an EXTENSIVE and OLD ESTABLISHED BUSINESS, which has been carried on with success by the present proprietor since 1827, and who now wishes to retire from the same. The estate is in the best in Exeter, beautifully situated, close to the city. On it is a very good Dwelling House, with every convenience, Shop, Glass Houses, Frames, Stabling, Sheds, with all other necessary buildings, a good supply of soft and hard water. For further particulars apply to
CHARLES SCLATER, Summerland and City Nursery, Exeter.

SALES BY AUCTION.

Postponement of Sale, in consequence of the War between France and Prussia.

MR. J. C. STEVENS begs to announce that the SALE of the fine Consul Schiller's COLLECTION of ORCHIDS, which was to have been removed from Hamburgh and SOLD next month by AUCTION in London, is POSTPONED
Auction Rooms and Offices, 38, King Street, Covent Garden, W.C.

Caversham, near Reading, Berks.
IMPORTANT SALE of SPECIMEN PLANTS.

MR. J. C. STEVENS, HORTICULTURAL AUCTIONEER and VALUER, 38, King Street, Covent Garden, W.C., begs to announce that he has been favoured with instructions from C. H. Marshall, Esq., of Caversham, near Reading (who is going abroad), to SELL by AUCTION, on the Premises, on WEDNESDAY, July 27, at 12 o'Clock precisely, the valuable COLLECTION of STOVE and GREENHOUSE PLANTS, FERNS, ORCHIDS, &c., including many fine Specimen Plants that have taken Prizes at the various Shows.
On view the day prior and morning of Sale; and Catalogues had on the Premises, and of Mr J. C. STEVENS, 38, King Street, Covent Garden, London, W.C.

Established Orchids.
MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, August 1, at half-past 12 o'Clock precisely, a Collection of choice and valuable ORCHIDS, chiefly for cool house, perfectly established and in the best condition; Twelve Casks of AMARYLLIS BULBS, &c.
On view the morning of Sale, and Catalogues had.

To Nurserymen, Exhibitors of Plants, and Others.
IMPORTANT and ATTRACTIVE SALE of the MAGNIFICENT SPECIMEN PLANTS of MESSRS. FELTON AND SONS, of the BIRMINGHAM NURSERIES, HARBORNE ROAD, EDGBASTON.

MESSRS. LUDLOW AND DANIELL will SELL by AUCTION, at the Nurseries as above, on WEDNESDAY, July 27, at 12 o'Clock, the splendid COLLECTION of SPECIMEN SHOW PLANTS, comprising 200 very fine grown and beautifully trained AZALEAS of the choicest sorts; FERNS, for noble proportions and in fine condition; grand Ornamental STOVE and CONSERVATORY PLANTS, including the noble Dracæna Tenax variegata (a fine thing), sickneriana, &c., to be the finest in any of its kind in Europe; the Cycas revoluta (6 feet), Cordyline indivisa (6 feet high); large PALMS, amongst which are Phœnicophorium seychellarum (6 feet high), Latania borbonica, Dæmonorops, &c.; several fine grown CAMELLIAS; a variety of large specimen PELARGONIUMS, chose LILIUMS in pots, &c.
NOTE.—Many of these plants were exhibited at the National Exhibition at Manchester last month, and took First Prizes; and Messrs. Felton & Sons have invariably taken Prizes wherever they have exhibited with the plants grown on their Nurseries. To be the interest of their general Nursery business precludes their holding this description of stock any longer.
Catalogues may be obtained at the Nurseries, as above; or of the Auctioneers, and will be remitted free by post upon application

Bulbridge Farm, Wilts.
Ten minutes' walk from the Great Western and South-Western Railway Stations at Wilton.
ANNUAL SALE and LETTING of RAM LAMBS and RAMS of the NEW LEICESTER BREED.

MESSRS. EWER AND WINSTANLEY will SELL and LET by AUCTION, on the Premises, Bulbridge Farm, Wilts, on WEDNESDAY, August 3 (Refreshments will be provided at 12), and the Sale will commence at 1 o'clock), about 140 RAM LAMB and RAMS, of the improved Hampshire Down Breed, the property of Mr. James Rawlence.
The Auctioneers again have the pleasure to announce that in addition to the numerous Prizes obtained, 29 years in succession, at the Bath and West of England, and Local Exhibitions of Sheep Stock, Mr. Rawlence has in the present year been awarded at the Bath and West of England and South Wilts Shows the 1st and 2d Prizes for Shearling Rams; also at the Lewes and Hants Agricultural Show at Basingstoke, the 1st Prize for Shearling Rams; and at Stockbridge Cattle Show, the 1st Prize for Rams of any age, and the 2d for Teg Rams.
Auction and Estate Agency Offices, Endless Street, Salisbury.

Model Farm, Upper Winchendon, Bucks.
Seven Miles each from the Aylesbury Station on the London and North-Western Railway, and Thame, on the Great Western Line, at which places Conveyances will meet the Morning Trains on the Day of Sale, returning in time for the Evening Trains.

MR. JOHN TREADWELL has fixed his ANNUAL SALE of about 150 OXFORDSHIRE SHEARLING RAMS, and a few older SHEEP, for WEDNESDAY, August 3, when hope to be favoured with the company of his friends. This year's Sheep fully maintain the high character of this Flock, being big, dark in features, and of excellent quality.
J. A. MUMFORD, Auctioneer.
N.B.—This Flock obtained in 1867-8-9 Forty First and Fourteen Second Prizes at Bath, Birmingham, Liverpool, and other Shows. They may be seen previously.
Train leaves at One o'clock. Business at Half-past Two.

SHORTHORN SALES, AUTUMN, 1870.
THURSDAY, August 25.—At Alloa, by Stirling, N.B., Messrs. Mitchell's ENTIRE HERD, also the pure-bred FLOCK of BORDER LEICESTERS.
FRIDAY, September 2.—The very superior HERD, belonging to J. G. Hamilton, Esq., at Chatelherault, Lanarkshire.
TUESDAY, September 13.—A DRAFT from the Rev. T. Stanforth's HERD, at Storr's Hall, Windermere.
WEDNESDAY, September 28.—A valuable selection of COWS, HEIFERS, and BULLS, from the first-class Herd belonging to James Fawcett, Esq.; at Scaleby Castle, near Carlisle.
FRIDAY, September 30.—The ENTIRE HERD belonging to Chas. R. Saunders, Esq., at Norwich Hall, near Penrith.
THURSDAY, September 29.—The ENTIRE HERD belonging to W. Cox, Esq., at Braidsford Hall, Derby.
WEDNESDAY, October 5.—Mr. William Butler's ENTIRE HERD, of about 70 Head; at Badminton, Chippenham, Wilts.
THURSDAY, October 6.—The late Mr William Hewer's HERD, of about 80 Head, at the stock of his class BERKSHIRE PIGS; at Sevenhampton, Highworth, Wilts.
JOHN THORNTON, 15, Langham Place, Regent Street, London, W.

Sale of Shorthorns.—Preliminary Notice.
MESSRS. THORNTON AND KIRBY are instructed by the Rev. Thos. Stamford to SELL by AUCTION, at Storr's Farm, Windermere, on THURSDAY, September 15, the DRAFTS from the HERD of about Fifty Head, including Bulls, Cows, and Heifers, of fashionable and well bred tribes. Mr Cary's "Peer of the Realm" (27,057), and Mr. Booth's "High Sheriff" (26,392), are in use.
Catalogues, with further particulars, may shortly be had of JOHN THORNTON, 15, Langham Place, London, W.; Mr. KIRBY, Saurey, Windermere; and Mr. SMITH, Storr's Farm, Windermere.
Storr's Farm, July 12.

Now Ready,
THORNTON'S SHORTHORN CIRCULAR, from JULY, 1868, to DECEMBER, 1869, bound in One Volume, complete, with Title Page, Index, and Portraits of the "Brothers Colling." Price 21s
JOHN THORNTON, 15, Langham Place, London, W.

1870.—Shropshire Sheep Sale Appointments.
THE GREAT CENTRAL SALE of RAMS and EWES, on THURSDAY, August 4, at BINGLEY HALL, BIRMINGHAM: 200 RAMS and 100 EWES, including several Royal Agricultural Society Show Sheep, from

Right Hon. Lord Willoughby de Broke	Mr. W. Lort
Right Hon. Lord Sudeley	Mr. E. Lythall
Sir George Jenkinson, Bart., M.P.	Mr. G. A. May
H. J. Sheldon, Esq.	Mr. T. Nock
Z. Walker, Esq.	Mr. Owen
Mrs. Beach	Mr. Shuttleworth
Mr Chilwell	Mr. E. Tongue
Mr. Jenkins	Mr. Tidy
Mr. Harrison	Mr. W. Yates
	And others.

Willoughby Wood, Esq., Holly Bank, Burton upon-Trent—35 RAMS, 60 EWES and THEAVES; TUESDAY, August 9
Mr. Henry Smith, Sutton Maddock, Shifnal—60 RAMS and 120 EWES and THEAVES; MONDAY, September 5
Mr. Wm. Baker's, Moor Barns, Atherstone—25 RAMS and 80 EWES and THEAVES; FRIDAY, September 9.
LYTHALL AND CLARKE, AUCTIONEERS.
Offices—39, New Street, Birmingham.

THE LANDS IMPROVEMENT COMPANY.—
(Incorporated by Special Acts of Parliament)
DIRECTORS
John Clutton, Esq., 9, Whitehall Place, S.W.
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HIGHLAND and AGRICULTURAL SOCIETY of SCOTLAND.—DUMFRIES SHOW, 1870.
TUESDAY, July 26.—Stock Yard open at 1 P.M.—Admission, 10s.; Members and Exhibitors, 5s. Implement Yard open at 1 P.M.—Admission, 2s. 6d.; Members and Exhibitors, free.
WEDNESDAY, July 27.—Yard open at 8 A.M.—Admission, 2s. 6d. President's Dinner in Mechanics' Hall at 6.30.—Tickets, 20s. 6d., to be had from the Secretary.
THURSDAY, July 28.—Yard open at 8 A.M.—Admission, 1s. till 1 P.M.; from 1 till 5 P.M., 6d. Lecture by Mons. Henri Charlier on his System of Horse-Shoeing, in Market Hall, at 8 P.M.—Reserved seats, 2s. 6d.; back seats, 1s. Ball in the Assembly Rooms.—Patroness, Her Grace the DUCHESS of BUCCLEUCH and QUEENSBERRY. Tickets (including Ladies), 10s., to be had from Messrs. J. Anderson & Son, Booksellers, Dumfries
FRIDAY, July 29.—Yard open at 8 A.M.—Admission, 1s. till 1 P.M.; from 1 till 5 P.M., 6d.
A Military Band and Pipers will perform during the Show.
F. S. MENZIES, Secretary.

MANCHESTER AND LIVERPOOL AGRICULTURAL SOCIETY.—The ANNUAL SHOW of HORNED CATTLE, HORSES (Hunters especially), SHEEP, PIGS, DOGS, POULTRY, CHEESE, GRAIN, ROOTS, IMPLEMENTS, MACHINERY, SADDLERY, and MISCELLANEOUS ARTICLES, will be held in WESTWOOD PARK, WIGAN, on SEPTEMBER 6, 7 and 8 (preceded by a Public Trial of Farm Implements on September 5), when PRIZES amounting to nearly TWO THOUSAND POUNDS will be awarded. ENTRIES for SHOW CLOSE AUGUST 1.
Prize Lists and Forms of Entry on application to the Secretary, THOMAS RIGBY, Over, near Winsford

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, DOMESTIC POULTRY, CORN, ROOTS, IMPLEMENTS, and MACHINERY will be held in BINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.
Prize Lists, Certificates of Entry, and every information may be obtained from the Secretary.
The ENTRIES CLOSE on TUESDAY, November 1.
JOHN B. LYTHALL, Secretary.
Offices—39, New Street, Birmingham.

The Agricultural Gazette.
SATURDAY, JULY 23, 1870.

MEETINGS FOR THE TWO FOLLOWING WEEKS.

JULY 26 to JULY 29	Great Meeting of the Highland and Agricultural Society at Dumfries.
AUG. 3 to AUG. 5	Annual Meeting of the Royal Agricultural Improvement Society, at Ballinasloe
	Annual Meeting of the Yorkshire Agricultural Society, at Wakefield.

ONE of the most successful meetings of the ROYAL AGRICULTURAL SOCIETY has ended. The contrast between the magnificent meeting just concluded, and that of 1839, and the difference between the seven-acre field with its few implements and live stock, and the present year's immense display, has been much dwelt upon. The real fact is, that the size of the Royal Agricultural Society's show has ceased to be a matter of congratulation, and we entirely agree with Mr. HOWARD, who, at the general meeting of the Society, protested against the variety of objects introduced. Perhaps the reporters at such shows may feel the burden of having to travel through six or seven miles of closely packed shedding more than the general public; but we are inclined to agree that the limit of the show is rapidly passing beyond all bounds. The *Times* has lifted up its voice on this subject most rightly, and we would fain see some sort of restriction imposed, both upon the style of article and the number of duplicates exhibited. To see an immense number of chaff-cutters, or ploughs, or winnowing-machines exhibited is certainly no treat, and yet it seriously adds both to the size of the show and the difficulty of the observer.

How completely the Oxford show has eclipsed those of past years in the matter of entries is readily seen by comparing the relative number of exhibits in each class. In so doing we would lay stress upon the live stock classes, rather than those of implements, for reasons just given. The Manchester meeting was an undoubted success, and yet how completely it fell short of the latter show is readily seen from the following figures :—At Manchester there were 338 cattle, 461 sheep, 132 pigs ; while at Oxford there were 435 cattle, 548 sheep, and 191 pigs. The quality was well maintained throughout, and universal satisfaction was expressed by every one capable of forming a judgment. The awards of the judges in the Shorthorn classes were not always well received, and in both the aged cow and yearling bull classes great dissatisfaction was expressed. In one case, also, among the Herefords, the decision of the judges was a good deal challenged ; but we have no wish to dwell longer on this somewhat old story. Great activity prevailed among the lovers of Shorthorn cattle, and several animals changed hands at very high prices. The fact of Mr. T. C. BOOTH absolutely refusing 2000 gs. for Lady Fragrant is worthy of notice, as is also the purchase of two Duchess heifers by Mr. COCHRANE, of Canada, for the enormous sum of 2500 gs. Sheep, and especially Oxfords and Shropshires, were exceedingly well represented ; and there never was such a show of pigs at any previous meeting of the Society.

The interest of the Annual Meeting of the Society on Tuesday was enhanced by the award of Mr. MASON'S (late High Sheriff of the County of Oxford) prizes for the best managed farm in a large district. A report of the First Prize Farm appears in our columns ; but we may mention that the judges decided in favour of Mrs. MILLINGTON, who farms about 6 miles south-east of Bicester, under the Duke of Marlborough. Mr. TREADWELL, of Winchindon, Aylesbury, is second; and Mr. CRADDOCK, of Chipping Norton, secures the third place. Several interesting meetings took place during the early portion of the week, among which we may mention the Central Chamber of Agriculture Reunion as well as that of the Royal Agricultural College Club.

The contrast between the agricultural showyards of Oxford, 1870, and Oxford, 1839, does more than represent the progress of English agriculture during the interval, if that be measured between the extreme points reached by it at the two periods respectively. Our agricultural maxima can hardly be considered greater now than then. The Kirklevington Shorthorns shown in '39 remain unbeaten, and our heaviest crops of Wheat and Grass are no heavier than they were. But looked at from another point of view, the difference which strikes the visitor of '39 who has this week again seen the showyard of the English Agricultural Society, is no greater than his knowledge of the general agricultural progress of the country since that period would lead him to expect. To what has this progress been owing? To the multiplication and extension, rather than the improvement, of our then best specimens. There are 100 flocks and herds represented in our annual showyard now as compared with 10 or 20 represented then ; and the number throughout the country worthy of being thus exhibited is more than tenfold what it was. So with our manufacturers of implements—with our dealers and producers of farm seeds—the increase here has indeed been more than tenfold, and, in some particulars, entirely new businesses and manufactures have arisen for the provision of the agriculturist.

We have but noticed in the showyard samples of Peruvian guano, to which perhaps, as much as anything, our progress has been due, but all kinds of artificial manures, whose manufacture has arisen since the guano imports have begun are abundant ; and this whole class of manufacture is entirely the creation of the last 30 years. Facilities and helps of other kinds are also multiplied. Agricultural machinery is a new and altogether different thing. The best farmers, no doubt, used to put in their seed on soil as well tilled, and sent the produce to the market as well harvested and prepared in 1839 as their successors of the present day—but with how much greater labour and expense ! Our steam-ploughs, steam threshing-machines, steam mills of all kinds, and our reapers and mowers, driven by horse-power—represent an immense reduction in the human toil of agriculture. And the multitude of devices of a more domestic kind (and the class of stands at our shows, which offer articles of this class, is a rapidly growing feature of the last few years) represent an equally diminished labour in another field. Great, however, as is the energy which has so readily availed itself of all these aids, our pluck and enterprise are not greater than that of the generation past. We have no more public-spirited men among our landowners than Earls DUCIE and SPENCER. Messrs. HANDLEY and PUSEY have indeed worthy successors, but no one has excelled them ; nor is there more spirit among our tenant-farmers than there was. We have not heard of any man of late offering the challenge which we heard a Sussex tenant-farmer offer at the "Council Dinner" 30 years ago—Lord SPENCER at once accepting it—to show his whole herd against all England. Probably, most men of any note engaged in agriculture know more of the herds and flocks of England generally, in addition to the special pride and knowledge they may have in their own, than their predecessors of a similar rank knew then. It may have been ignorance as well as enterprise which prompted that celebrated challenge ; and the former certainly has been diminishing, whether the latter has been increasing or not.

The extension of this better knowledge, and the spread of this better practice, is indeed the great characteristic of the agricultural progress of our times ; and it is very much due to the way in which the agriculturists of England have been bound together and made interested in each other's doings by the annual shows of the English Agricultural Society.

Their display of this year is at once proof of the more general knowledge and interest which has been thus exerted, and another great contribution to that progress, of both of which we have been speaking.

WE have less faith than our vigorous correspondent, "G. A. H.," in the practical benefits of restrictive clauses in farm agreements. The following, we may suppose, illustrates by an extreme case his views on this subject. They are his own words :—

"Suppose the owner of that farm" (viz., one reclaimed from a grouse moor) "were silly enough to adopt Mr. SMITH'S silly rule, 'Pay your rent and keep your land clean,' and were to let it on those conditions for a few years to the owner of an adjoining piece of moorland ; and suppose that tenant were to carry away every year every atom of grain and straw and hay and roots, and were to consume them with sheep and cattle upon his own adjoining moorland, and not upon the rented land. He would not have broken his agreement in any way, and yet in four or five years he would have converted his own barren moor into a fertile farm, and could then restore the rented land like a sucked Orange to its owner, clean, no doubt, but so poor that it would hardly even grow the natural plant of the country, Heather."

This fanciful picture, in illustration of the necessity of restrictive clauses in farm agreements, is not very accurate, either in an agricultural or scientific point of view. A dry grouse moor will no doubt require an amazing amount of manure and high-farming before it becomes the "good and useful farm" which "G. A. H." describes ; but though it is like a sponge in its capacity of absorption, it cannot so easily be squeezed dry again. To impoverish a farm, to any great extent, is a process which usually impoverishes its occupier as well ; for it is a most important and serviceable fact in the economy of Nature that the roots of crops require a rather heavy balance, so to speak, of available plant food in the soil. They require a surplus beyond their actual needs. And although the land may contain the constituents of a hundred crops, the spoliator, whom "G. A. H." dreads so much, will not be able to get hold of them. In his hands the land will become in a few years—perhaps in five instead of a hundred years—agriculturally exhausted, and will cease to pay the cost of cultivation unless it be manured ; so that a very few years put an end to the squeezing process, and the landlord who, according to "G. A. H.," is so defenceless, has, in fact, a protector in Nature herself.

"But," he may tell us, "the landlord requires legal protection for the surplus, whatever it may be." Our own opinion is, that the land ought not to be let to spoliators, and if it be, restrictive clauses are of very little practical use. Mr. SMITH'S aphorism, "Pay your rent and keep your land clean," though it does not include the whole art of agriculture, contains a large amount of truth and common sense. We agree with "G. A. H." that farming, to be successful, "requires great skill, great tact, great judgment, much experience, and great knowledge ;" but although he adds, "for it is the two businesses of a manufacturer and merchant combined," no young farmer of energy and industry need doubt his ability to succeed. We are assured by a practical and successful agriculturist, "that it is easy to farm—when once you know how !" One of his golden rules is "to clean the land *before* it is foul ;" and we need scarcely add that he feeds it *before* it is hungry, and rests it *before* it is weary."

On some other points "G. A. H." seems to us to take a narrow view : as for instance when he describes a certain system as "huxtering," and when he inquires how much artificial manure Mr. SMITH uses. The most remarkable example of reclaiming a barren waste and converting it into highly productive land is in the case of the Campine plain, in Belgium, where artificial manures are seldom used ; yet the rents now paid are higher than those of our best counties. It may, perhaps, surprise "G. A. H." to hear that restrictive clauses are unknown in that productive district, yet the exhaustion of the land by spoliating tenants does not take place. Let us add that land agents do not, as a body, exist there.

—— AN advance, in some cases, of 6*s.* per quarter, was reported upon Wheat last Monday ; and Barley, Beans, and Peas were quoted about 2*s.* dearer ; flour advanced 2*s.* per sack of the best quality. On Wednesday the grain market was quieter, but late rates were maintained. Flour also was in firm request. The finest runs of white Essex and Kent Wheats have made as much as from 63*s.* to 66*s.* per qr., and reds from 51*s.* to 60*s.* The effect of the war excitement has been to raise Wheat, and to lower wool from ½*d.* to 1*d.* per lb.——In the dead meat market increased demand enhanced prices for all descriptions ; choice qualities of sheep are scarce, and readily disposed of. In the hop market the demand is of an entirely retail nature, the accounts from the plantations continue generally favourable.——The seed market is quiet—Mustard, Rape, and Trifolium seed being the articles which have chiefly engaged attention.

—— Mr. P. TAYLOR'S GAME LAWS ABOLITION BILL was thrown out by a majority of 88, on Wednesday night. The measure was on all hands evidently looked upon as too extreme. Mr. M'LAGAN could not, he said, vote for the withdrawal of all legal protection from animals now included in the game list. Mr. C. S. READ also eulogised the partridge as "the best bird that ever flew," although he was opposed to the protection of ground game. Sir G. JENKINSON advocated the plan of making game property, and passing a stringent trespass law. Mr. G. GREGORY and Mr. HERMON also opposed the Bill, as also did Mr. BASS, on the ground of its being a preposterous attack upon property. Sir H. HOARE and Mr. ANDERSON supported the Bill, the first as opposed to the multiplication of ground game, and the second because the whole law on this subject appeared to him to be in a condition of "unintelligible muddle."

—— We see the PHOSPHO-GUANO COMPANY (Limited) is announced for the purchase from Messrs. Peter LAWSON & SON of that part of their extensive business which has been carried on as the Phospho-Guano Company. Their sources of supply include various islands in the Pacific, which are said to contain several millions of tons of guano, of an average of 80 per cent. phosphate of lime, and, in addition to these, the whole of the phosphatic deposits on William's Island, near Charleston, containing over one million of tons measured. The works of the company (described some years ago in these columns) are situated at Seacombe, close to the banks of the Mersey, and are admirably adapted for the manufacture. The prospectus is guaranteed by a number of well-known and trustworthy names in the agricultural world.

—— Professor BUCKMAN informs us that having the other day shot a number of turtle-doves out of a large flight which had alighted on a field of white Peas then just ripening, he examined their crops and gizzards, in order to the exhibition of evidence sufficient to justify their execution, when, to his great surprise, he found them to contain an immense quantity of what afterwards proved to be furmitory seed, with a sprinkling of the seed of Knot-gras (Polygonum circulare). Four hundred and eighty furmitory seeds were thus discovered in one individual bird. In no instance was there any vestige of Peas or other crop plant seen.

—— "A Light Land Farmer" has thus referred in the *Times* to his experience on a light land farm for the last three years, during two of which half the usual produce has been lost through the excessive drought. He has accordingly tried to turn to account two streams, about 400 yards distant from his land. The following is his statement :—

"I have had fitted to a traction engine, just completed

by Messrs. HOWARD, of Bedford, a powerful force-pump, capable of delivering through a hose or pipe 2½ inches in diameter 1 ton per minute. In the meantime I ask your permission to bring the subject of the construction of a cheap and efficient means of delivering water before the notice of the public. The prices of 2½ inch hose, as used for fire engines, are nearly as follows :—leather, 4*s.* ; vulcanised rubber, 2*s.* per foot. The expense of these materials, and their liability to excessive wear if used on a gravelly soil, would probably preclude their extensive use, and in any case materially diminish the profit that might be expected from irrigation. I do not, however, think that in this inventive age we should consider ourselves limited to those materials. Pipes of thin sheet-iron, similar to those used for so many years in watering the streets of Paris, could probably be made at half the price of vulcanised rubber, and possibly some of the numerous fibres used in the manufacture of paper might be waterproof and turned to account. As the height to which I propose to raise water will not exceed 30 feet, the required strength of the pipes will be very much less than that of ordinary hose. To conclude, —the points to bear in mind are that the cost of the apparatus should not exceed 1*s.* per foot ; that it should be light, durable, and with a strength sufficient to bear a pressure equal to the work that will be demanded of it. Taking my loss of hay for the present year at £4 per acre, an expense of £400 in irrigation would still have left me a gainer by the outlay ; but I believe that a quarter of this sum invested in coals would have made me independent of the season."

Hereupon Messrs. S. E. NORRIS wrote to state that the market price of 2½-inch leather hose ranges from 2*s.* to 2*s.* 4*d.* per foot, subject to an abatement for large quantities ; not 4*s.* per foot, as mentioned by "A Light Land Farmer." And Mr. MECHI contributes the following to the discussion of the subject :—

"The questions of water irrigation and sewage irrigation are being forced upon us by altered conditions, and when properly carried out will not only employ much capital profitably, but considerably increase the food of the people. I am glad to see that towns and cities are obtaining Acts of Parliament giving them powers to take land for such purposes. Let me remind them that an essential element of success is the proper under-drainage of such soils as are not naturally filtrative. So far as the practical part goes there is really no difficulty, for steam-power has made the operation easy and cheap. The evidence of two eminent hydraulic engineers, taken before Lord ROBERT MONTAGU'S Sewage Committee, proved that 1000 tons of sewage or water could be raised 300 feet high at a cost of 13*d.* to 14*d.* ; and with our best Cornish pumping engines 112 lb. of coal will raise 107,000,000 lb. of water 1 foot high ; so that 1 lb. of coal produces steam enough to raise nearly one million times its weight of water 1 foot high. Well may we rejoice in our wonderful gain of power by steam. One thousand tons of sewage or water on one acre represent a rainfall of 10 inches, or nearly half a year's rainfall in our southern and eastern counties. The question of conducting it to our fields is merely one of pipes or open water carriers. Twenty years ago I laid down 3-inch cast-iron pipes for irrigation, 18 inches deep. On recently examining those in the light land, I found them as perfect as when first put into the ground. Those in the heavy land were perfectly sound, but were rusted outwardly, apparently by the rust of iron contained in our stiff yellow clays. Their cost was £4 5*s.* per ton, or £5 delivered on the farm. This gives a cost of less than 8*d.* per foot. Iron is, however, dearer now. I know of no other medium so cheap. Stout paper pipes, exhibited at our exhibitions, proved a complete failure, becoming soft, pappy, and collapsing. I tried a few lengths in our clay. I have used gutta-percha, vulcanised india-rubber, and the ordinary fire-engine leather hose. The latter I find most durable and dependable under pressure, care being taken to keep them empty and well oiled when not in use. Before your correspondents attempt to take water out of a river let them be quite clear as to millers' rights, which are very stringent, and before the introduction of steam, when our daily bread depended on wind or water, were legally strictly guarded. At present water-mill property has so deteriorated that it is a pity that they should be allowed to impede our great arterial drainage. Their rights should be bought up."

—— The importance of "doing" live stock well from the very first, if they are to be profitable in the end, received another illustration from Mr. PURVES, of Linton Burnfoot, who, at the late meeting of the Kelso Farmers' Club, spoke thus on the best system of summering lambs :—

"He said when lambs were not well summered they never turned out well. His practice had been to change them from the farm where they were bred, but that was not always necessary, and it was better to put them on Clover at home than take them to bad summering. Clover was better than any other thing for keeping them in a fine healthy state and improving them afterwards. It was difficult, however, to get good Clover, and they were therefore often obliged to take grass, which was not so good for the constitution of the lambs. Where lambs had been bred on a farm where there was whinstone, it was better, when changing them, to take them to ground where there was freestone or limestone, with plenty of grass for them to eat ; and, on the other hand, when they had been reared on limestone or freestone, it was an advantage for them to be summered on whinstone. If they were badly summered, there were always a great many deaths afterwards."

OUR LIVE STOCK.

CATTLE.

CAPTAIN GUNTER has sold his Duchesses, 101 to 103, to Mr. Cochrane, of Canada, for 2500 gs. Mr. J. C. Booth has sold *Lady Grateful*, own sister to *Lady Fragrant*, also to Mr. Cochrane, for 1500 gs. ; and at the same time refused 2000 gs. for *Lady Fragrant*. These events created a profound sensation in the showyard at Oxford last week. Mr. Cochrane is taking out a large number of first-class cattle and Cotswold sheep to Canada, and we wish him success in his undertaking.

—— Our readers will be sorry to learn from the accompanying communication that *Patricia*, sold by Mr. J. C. Booth to Messrs. Walcott and Campbell of New York, is dead :—

"The 'Daniel Webster' arrived on June 24, after experiencing a good, but rather long passage ; unfortunately the day she arrived in port was extremely hot (98° in the shade), and some of the animals, being very fat, suffered severely. *Patricia* stood the passage well until the 23d, when she began to suffer from the heat, and kept getting worse, and died about 11 o'clock, on the evening of the 24th—the day that they arrived in New York. I had a *post mortem*, and there is no doubt she died from the effects of the heat. It is a severe loss, and one that cannot be easily replaced."

—— The following is an extract from Mr. Gibson's note regarding recent exportations of Shorthorns :—

"I am glad to be able to report more favourably of your purchase. *Baron Oxford's Beauty* is well named. She is indeed a grand heifer. We are all delighted with your choice. I call her the best of her age I have ever seen. She has evidently lost flesh, especially about her chine and fore-ribs, but is very hearty, and recruiting rapidly. I am glad to hear the transaction has been so pleasant throughout, and can assure you it is entirely so on our part, and that it is perfectly satisfactory. Mr. Campbell is delighted with her."

—— Considerable changes have occurred in the Sidlington herd since the publication of the last catalogue, which, if we remember rightly, was dated 1867. The "Musical" family, that formerly occupied so important a position in the herd, is reduced to *Musical 7th*, which, owing to weakness of the spine, was kept back in the draft sale of 1869, and has since produced a promising calf, *Minstrel* by 6TH EARL OF WALTON. The "Gazelle" family, headed by *Selina* by 4TH DUKE OF OXFORD (11,387), and representing a fine old "Tortworth" tribe, since crossed with sires such as 7TH DUKE OF YORK and 13TH GRAND DUKE, occupies an important place in the catalogue, and is represented by no fewer than 18 females and 2 bulls. Next follows *Ruby* by LORD RAGLAN (13,225), and her two daughters, both by 7TH DUKE OF YORK ; and finally, what is no doubt the pride of the herd, four *Siddingtons* (Kirklevingtons), one by 4TH DUKE OF OXFORD, two by 7TH DUKE OF YORK, and one by Colonel Kingscote's 3D DUKE OF CLARENCE. The list of females concludes with *Wild Eyes 28th* by 3D LORD LALLY (24,408). 6TH EARL OF WALTON by 3D LORD OXFORD, and out of *Kirklevington 15th* by 4TH DUKE OF OXFORD, has lately been used in the herd, and 2D DUKE OF TREGUNTER is fast approaching a useful age. This last bull is by 4TH DUKE OF THORNDALE, and from *Duchess 94th*, and previously his pedigree may be traced through twelve Duchesses to the first cow of the name by COMET. He is a rich roan, very lengthy, of superb quality, and in every way worthy of his lineage. 2D DUKE OF TREGUNTER will serve a limited number of cows at 25 gs. each. We cannot close this brief review of the present Siddington herd without mentioning an exceedingly promising and very well bred bull calf, DUKE OF SIDDINGTON, by the *Duchess* sire, 2D DUKE OF COLLINGHAM, and from SIDDINGTON 5TH, a daughter of 4TH DUKE OF OXFORD and *Kirklevington 7th*.

—— We learn from "Thornton's Circular" that a telegram announces that the herd belonging to Mr. J. O. Sheldon, Geneva, New York, U.S., will be sold by auction on August 24. As the herd consists of about 80 head of well-bred animals, including seven Duchesses and Dukes, nine Oxfords, and several of the Princesses, Blanches, Barmpton Rose, Fame, Victoria, and other well known English tribes, the sale will in all probability be one of the greatest that has yet taken place in America. The Shorthorn trade, too, seems particularly good just now in the States. At Mr. M'Millan's sale, Xenia, Ohio, June 8, 35 animals made upwards of 100 gs. each ; six cows and heifers made over 500 gs. each, the highest price being about 760 gs. for *Mignonette*, a red 6-year-old prize cow, descended from *Stapleton Lass* of Mr. R. Thornton's "Beauty" tribe ; and 730 gs. for *4th Louan of Oxford*, a red yearling prize heifer, bred from Col. Powell's imported stock, which left England more than fifty years ago, from Mr. Curwen, Cumberland ; and 720 gs. for *Louan 21st*, a red 8-year-old prize cow, by DUKE OF AIRDRIE. The Louan appears to have been the highest priced and most fashionable family. Mr. Sheldon's OXFORD LAD (24,713) was in use, but the bulls did not sell as well as the cows, 260 gs. being the highest price for a red 2-year-old son of *Mignonette*.

POULTRY.

WHITE DORKINGS. — We select the following excellent description of white Dorkings from the pen of Mr. F. W. Zurhorst, one of the most successful exhibitors and breeders of these birds :—

"Let us look round the yard. There is my favourite hen. Notice her great depth, bringing her straight and pointed breastbone apparently close to the ground, sunk between two very short and widely-set shanks, covered to the end of the outer and middle toes with thickly-placed, laterally-spreading feathers. My favourite hen has some sign of vulture hock ; I know well that she ought not, but I also know that rare shank feathering cannot be had without it, and if I do not see it so accompanied in the show pen, I have my own idea as to what has become of it. Look at her fine broad back, where, 2 inches from the fall of the thick and ample neck feathers, the rightly-named cushion begins to rise—softening, thickening, and widening till it reaches the short, round, blunt tail feathers. Notice that short and well-set neck, with its rich soft feathers, the small head, the bright hazel eye, clear yellow bill, surmounted by the straight, fine-grained, and evenly-serrated comb, not high nor thick, but just enough to set off, with her orange legs, that soft and pure white plumage, which makes this hen the most attractive feature in my yard."

THE FIRST PRIZE FARM.

FEW competitions have created more interest than that which has occupied attention during the last week, between the various candidates for Mr. Mason's prizes. We hardly need remind our readers that a cup valued at £100 was offered by Mr. Mason, late High Sheriff of the county of Oxford, for the best managed farm held by a tenant, in a certain large but circumscribed district. The fact has for the last few months been well known in agricultural circles, and considerable interest has been expressed as to the result. Mr. Torr, Mr. Keary, and Mr. Gibbons formed a very well qualified committee of inspection, and these gentlemen, after visiting the candidate farms, first in April, and again within the last fortnight, have arrived at a decision already before the public. It is well known now that what was a matter of report a few weeks ago is true, namely that the judges, after mature consideration, have decided to award the first prize to a lady. We regard this as a significant fact. Much has lately been said and written upon the capabilities of the fairer and gentler sex to engage in more masculine duties than have hitherto engaged their attention. The subject is a difficult one, and it is far from our intention now to discuss it. One thing is however clear, namely, that three experienced and accredited agriculturists have, after the closest scrutiny and the greatest care, concluded that, in an area of some hundreds of square miles, the best managed farm is in the hands of a woman. When the decision was known on Tuesday, we were naturally anxious to visit so notable a farm, and accordingly on Wednesday morning we left Oxford, its crowded showyard and throng of visitors, and sought the privilege of a quiet walk round this distinguished piece of nineteenth century cultivation. Claiming to be country bred, and not altogether unacquainted with rural operations, we did not expect to meet with that startling complication of modern improvements so well described in "Talpa Loquitur," by Mr. Wren Hoskyns. Any one who will look into the inimitable illustrations which enliven that refreshing work will find a picture of what the cockney expected on a real go-a-head farm. He was disappointed. His imagination pictured the steam cultivator at work breaking up the soil, the drill sowing the seed, the liquid manure hose distributing fertility broadcast, the reaping machine cutting down a perfect jungle of crops, the steam threshing-machine preparing the same for market, the mill grinding corn, cattle feeding on cooked viands of the most approved scientific composition, and all going on at once, giving a picture of high farming consistent with express travelling and Transatlantic telegraphy. He was disappointed. What actually met his gaze was the unobtrusive quiet of a well-managed farm not the rattle of a factory, the natural development of a vegetable and animal growth assisted but not substituted by modern applications.

We were courteously received at Ashgrove Farm, and although our time was short, we saw something of the management which will now be unmercifully criticised. The prize farm is situated upon the Duke of Marlborough's estates. It is 14 miles from Oxford, and lies about 5 or 6 miles to the south-east of Bicester. The soil rests upon the stone brash of the oolite, and is of uniformly poor quality, free working, and pleasant to farm, capable of growing sheep well, and producing a nice malting sample of Barley. The soil is thin, and rests on a rubbly, rocky subsoil, which precludes the possibility of deep cultivation. The poorness of the soil is doubtless one of the points which attracted the attention of the judges, and it should be steadily kept in view in inspecting the farm. Almost the whole of the occupation is arable. It embraces 880 acres more or less, 70 of which are very poor pasture. The farm was taken on lease by the late Mr. Millington, in 1854, for 21 years, and was under his management until his lamented death, about a year ago. Mrs. Millington now holds the farm, and much of her success in the recent competition is due to the able management of her brother, Mr. Ormond, who has carried out the ideas and system of management pursued by the late Mr. Millington. In a report so brief as the present per force must be, we cannot do better than attempt to give some idea of the general impression conveyed to a visitor. First, then, he will be struck by the buildings. He will see yards without sheds, generally poor accommodation for cattle ; he will not see cattle boxes or elaborate barn arrangements. The stables are devoid of stalls,

the design of the buildings is altogether inconsistent with those rules which should guide the architect in planning them. He may perhaps be staggered by the sight of wooden ploughs, antiquated drags, clumsy waggons, and old-fashioned utensils of various kinds: a very different assortment of implements will meet his eye from what perhaps he has recently witnessed at the Oxford meeting; and, in a word, he may be a little discouraged with what he sees. Again, when he glances at the live stock he will see a mixed and moderate class of cattle, a shabby lot of pigs, no grand sheep, and a poor lot of poultry. If he looks at the fences he will find nothing to admire particularly, and as he walks over the grass land he will be offended by the presence of rushes, unstubbed Thorns, ragged ditches, and not very neatly-filled drains.

Again, as he extends his observations from the buildings over the farm itself, he will fail to see the prescribed sheepfold, with its hurdles and its fresh Vetches or Cabbages, its troughs for artificial food, its watercarts, and its shelter from the noonday heat. Lambs will be seen, still unweaned, on large bare pieces of seeds, with their mothers, looking anything but blooming, under the blaze of this tropical July sun.

Such were some of the features of the best-managed farm in Oxfordshire which struck us, and after observing them we were tempted to ask why, under such circumstances, the judges awarded a prize that we might have expected to see associated with something more in harmony with modern ideas? We do not desire to carp at the decision of three experienced and reliable men, and we have not compared the Ashgrove farm with its competitors. We had rather proceed to point out those features that are worthy of attention. We have before noticed that the land is poor, and we now add that it bears a magnificent crop of Wheat and Barley. The portion under corn is indeed a pleasant sight, both from its joyful luxuriance and, so far as we could judge, its cleanness. Then again when the roots are looked at, they are surprisingly good for the season and for the district. There is nothing like them for miles around. It is, then, in these main features of corn and roots that the great charm of this occupation lies, and far be it from us to underrate their importance. There are 18 horses kept, and the work is partially performed by steam cultivation in the spring. The horses are now receiving one bushel per week of Indian Corn, crushed, and straw chaff. The steam cultivation is hired and the grubber or cultivator is preferred to the plough. The rotation followed is that pursued in Lincolnshire, and the general management partakes of that of the same county.

The rotation is as follows:—1st, roots, principally Swedes and Turnips; 2d, Barley; 3d, seeds; 4th, two-thirds Wheat and one-third Barley, including a portion of Vetches. Catch crops are seldom sown, and the Vetches occupy any portion of the seed land not thought to be in good enough condition to bear a corn crop. Vetches therefore on the farm follow seeds, and are again followed by roots, and this brings any land out of condition into a good state. The rotation is also slightly deviated from by ploughing up some of the seed land early for Mustard, afterwards to be followed, like the remaining seed land, with Wheat; and the result is said to be two quarters more Wheat than after seeds at once ploughed for the Wheat crop. Glancing at each crop in rotation, we find that the cultivation for roots embraces one deep (as possible) three-horse furrow in the autumn, followed by steam cultivation in the spring. Up to last year, when Fowler's tackle was employed, Smith's cultivator had been in use. The land is afterwards worked with Coleman's cultivator, and the roots are sown with 4 cwt. of Hale's superphosphate put in with water on the flat. Two-thirds of the Turnip crop is eaten on the land with cake and corn, and one-third is drawn off for the cattle. No farmyard manure is ever applied to the root crop, but all is devoted to the seed land, and is now being spread over the land as a preparation for Wheat, according to Lincolnshire usage. No top-dressings are used, and, to quote from Mr. Ormond, the opinion at Ashgrove is, that top-dressing is like "putting on a false coat." All is put under the soil. Still, oilcake in the form of sheep-dung is top-dressed on the land, and the condition of the farm must be well supported by the 1000*l.* to 1200*l.* worth of cake annually spent on the farm. There is also an expenditure of about 300*l.* per annum in the form of superphosphate, no other purchased manure being imported.

There is a flock of 400 Lincoln ewes maintained, and all tegs are either fatted or find their way into the flock. Ewes, culls, theaves, and lambs constitute a standing flock of 950 sheep, and the clip is estimated at from two to three fleeces per tod. The lambs remain till late with their mothers, as above stated, and the first summer the management appears to be anything but forcing.

Twenty-five calves are usually weaned every spring upon linseed gruel, and with the assistance of two cows. These cattle are kept until they are three years old, and are then disposed of at from £16 to £18 each. The stores receive from 2 to 5 lb. of linseed cake per day according to their age, with a restricted amount of roots.

Labourers are well cared for in the matter of wages. We were informed that the average wage of the men amounts to close upon 18*s.* per week, while that of the neighbourhood is very much less. The increased wage is principally the result of a judicious use of taskwork. We could not learn that any special method was used in the arrangement of labour upon the farm, excepting that the people do not work in gangs, and as much of the work is let by piece as possible. The labour bill is £1200 per annum, or close upon 30*s.* per acre over the arable land. This is an amount which agrees well with former carefully-made estimates as to what labour ought to cost. Lastly, we may say that the impression conveyed by a visit to Mrs. Millington's farm is, that the scene of a paying business has been inspected. There is little trace of what is known as the model or amateur farm, and we should certainly like to have seen the live stock and buildings more in accordance with the year we live in.

We believe, however, that we anticipate the probable answer of the judges to such a criticism when we say that, after all, the application of tenants' capital was to be considered, and not the expenditure of landlord's money in expensive buildings.

We sum up our remarks by adding, that the land on the prize farm is well done, but the live stock is unmistakably below par.

THE ROYAL AGRICULTURAL SOCIETY AT OXFORD.

We at once proceed to report upon the various classes which constituted probably the most successful show ever held by the Royal Agricultural Society. Without dealing too much in generalities, we may mention that the live stock section as a whole was exceedingly excellent, the horse classes being an exception. It was indeed well remarked, that a better assortment of horses might be looked for at any Yorkshire show of good standing, than was to be witnessed at Oxford. The Shorthorns were well represented, and the sale of same first-rate Booth and Bates females created much interest in this section of the show. Herefords also appeared in great force, as well as Devons. Oxfordshire is essentially a sheep district, and this accounts for the large number of entries under this head, especially of Oxford and Shropshire Downs. The show of Berkshire pigs has never been equalled. We now pass on to details.

HORSES.

The number of animals in the 24 classes devoted to horses falls far short of that presented at the annual gathering of Manchester last year; with the exception of one or two classes, the horses on exhibition at Oxford fall behind the collection at the cotton-spinning city in 1869: 203 numbers appear in that catalogue, the horses present are considerably less than this, many classes having blanks in them. Commencing with class No. 1, we find no competitors for the prizes of £25, £15, and £5, respectively offered in that class. Much merit belongs to the stallions for agricultural purposes foaled before January, 1868. It is to be regretted that an exhibition commencing so creditably should lose favour as we pursue our inspection. The ball opens with three beasts of no particular merit. Messrs. Price and Platt have colour and coat, but their beasts lack body, and are cobby, like No. 3, the property of Mr. Buller. No. 4, the 1st prize animal (owner, Mr. William Welcher), is long, low, and powerful, with a back as broad as a boat, excellent legs, well put on, and is deservedly sustaining his reputation as a prize-taker here. We call attention to the fact that Norfolk is stepping into the place which our Western and Midland Counties should occupy in winning the honours which certainly belong to breeders of horses (not qualified to compete as Suffolks). No. 5, Mr. Wynn's dapple grey is compact, and carries a fine crest; his neighbour from Basildon has many excellent points, but is too short from withers to ears. These beasts, and those beyond them, are dwarfed directly we look at "Black Prince" (No. 8), the property of Lord Norreys, of Tetsworth, near Oxford; one rarely sees a horse of this size with such perfect symmetry and freedom of action. It may be objected that "Prince" is too big for "agricultural uses," but in the neighbourhood he serves, the breeding of dray horses is pursued, and the qualifications of an animal for such uses would disqualify him for a prize in a competition with the agricultural plough horse, even if "Black Prince's" feet were pronounced first-rate. We pass several dots wanting in shoulders, and much too fat, and we come to No. 17, the property of J. Manning, from Northamptonshire, which takes the 2d prize deservedly; "Young Champion" is an exceedingly well-grown colt, he only needs to rise at his shoulders to be a real good one. "England's Glory," No. 15, carries off the 3d prize, which (unless we are mistaken) his short neck and fore-legs do not entitle him to. No. 14, "Lyon," the property of the Rev. J. Hitchcock, has greater or equal claim to the honour. The prevailing feature in these cart stallions is an excess of beef—an extreme error, and one likely to mislead both the judges and the public.

In class No. 2, stallions of two years old, Mr. Wynn again steps in and takes first honours with "Nonpareil," a colt with famous body, plain head, and low wither; the 2d prize goes to a brown colt, the property of Mr. Anger, of Wilts, an animal of merit, wanting at the shoulder; and Mr. Enston, of Warwickshire, takes the 3d prize with a powerful bay colt with great liberty, having all the character of an "agricultural sire." The cloth is again represented here in a cobby "Brown," with good forelegs, No. 26; and Lincolnshire contributes a pretty little roan called "Warrener," No. 25. The horses in this class vary so much in size and quality that many merits are lost in competition.

Class 3 brings us once more into the society of the deservedly popular "Clydesdales." Again we repeat our high appreciation for this breed: here is length, height, width, quality, and power combined in the most perfect manner. It is only to see a Clydesdale move to swear to its excellency. The stallions of this breed foaled before Jan., 1868, are represented by three specimens. Earl Beauchamp takes the 1st prize with his "Young Lofty," a horse of some merit, superior to Her Majesty's "Sandy," with sour head and heavy neck. The younger series of this breed both hail from Sussex, and the Duke of Richmond takes both 1st and 2d prize, because nothing competes with him. A very different description of beast now arrests our attention, the "Suffolk Punch," and never was this appropriate title more truly merited than by the animals at Oxford.

In class 5, stallions foaled before Jan., 1868, the familiar names of Boby, Garrett, and Rist appear in the lists. The 1st prize horse, "Harwich Emperor," as well as that receiving 2d honours, "Royal Prince," resemble mammoth porpoises on legs, they are simply absurd to look on in any pace—beyond the curiosity of seeing such beasts attempt to move, there is really no gratification to a lover of the horse for his usefulness. If breeders of this deservedly popular animal would regard more the size of bone and fat, and get rid of the superabundant pot on these horses, a great step would be taken for the better. Mr. Rist and Mr. Boby take 1st and 2d prizes with animals that can scarce support their own weight, whilst Col. Tomline, M.P., walks in 3d with his "Earl," which we like less than Mr. Badham's "Hercules," a horse with good bone, and not too fleshy, which cannot be said of other animals in his class. The Suffolk stallions in class 6, foaled in the year 1868, are to our mind more taking and presentable than their progenitors. Mr. Rist steps in again for 1st prize with "Young Emperor," a clean, fine-coloured colt; the 2d prize goes to the well-known stud of the late Mr. Crisp, more for the merits of the deceased owner than for that of the animal, which has thick shoulders, and is calf-kneed; whilst Mr. Wilson takes the 3d prize with a colt with plenty of liberty. Suffolk may feel proud of her contribution of sires.

Taking leave of agricultural horses for the present, we approach thorough-bred stallions, represented by some 12 or 13 animals, possessing more quality than substance. The second number in the class, 53, exhibits the familiar red rosette and card of the winner, "Knowsley." None but the most dainty could pick him to pieces,—such form, shape, colour, and quality, beautiful shoulders, great girth, big arms, and a head and eyes that would captivate a savage. We could but regret that an animal of such merit lacked the bone which undoubtedly our hunting sires should possess. Thanks to the noble owner of "Black Prince," in class 1, a horse of "Knowsley's" qualities is available to residents in Oxfordshire, as we learnt that Lord Norreys hires him of his late owner's trustees. "Blackdown," in the adjoining box, possesses great bone, and is a strong horse, but wants more style and a longer neck. His neighbour, "Sydmonton," is remarkably neat, but requires more muscle and bone to show off his otherwise good points. "Redoubt" we were disappointed with, his head is not pleasant, and he is low in the withers, although he has big arms and a good back and loin. No. 58, a chestnut, weak in the neck, low in the shoulders, with very small bone, might have enjoyed his cribbing at home; he certainly is not now entitled to sit with that fine old gentlemanlike horse, "Laughing Stock," whose colour, head, and action entitle him to the 2d honours which he wears; his neighbour, 60, "Chevalier d'Industrie," is a neat beast, and looks like carrying 10 stones to hounds. "General Peel," the property of Mr. Gulliver, has much in shape and colour to attract the eye, if you won't look too low: the horse's fore-legs betoken something. 62, like 58, must have crept in unadvisedly. The 3d prize is bestowed upon a worthy competitor, "Sincerity," who has not parted with his merits or looks in the course of 12 long years. The hunting sires fully equal, if not surpass, those at Manchester, although we have not a "Dalesman" amongst them.

In class 8, for stallions not exceeding 15 hands, there is not great competition. Mr. John Grout, of Woodbridge, Suffolk, comes in 1st with his lucky animal, "Sportsman." In the box one could not pronounce him deserving the medals he possesses, but once see him out, and his figure and action win you. "Ambitious," the property of Mr. Beart, from the adjoining county, Norfolk, took 2d prize, notwithstanding his upright shoulders and small girth. The pony stallions are well represented: Yorkshire well merits the 1st prize with "Sir George," and Mr. Ransome's sweet little pony, "Perfection," well deserves the 2d honours, as it does its name.

Agricultural mares in foal, or with foal at foot, not entitled to compete as Clydesdale or Suffolk, next claim our attention. Class 10 includes some 19 animals of considerable merit; strength, activity, and clean

legs, free from hair, or nearly so, is now the chief desideratum with this description of horse, and several of the specimens at Oxford truly represent that character. Foremost amongst them is the 1st prize mare, "Fanny," the property of F. Statter, jun., of Whitefield, Manchester: united with great power and substance is a clean build, fine shoulders, excellent joints and feet, and great activity; at the same time that this animal showed herself equal to quick van or road work, the mare has enough weight and strength for all farm purposes, and most fairly does she win the 1st honour. The 2d prize animal, "Star," owned by Mr. Garfield Coldicott, near Banbury, is a roomy, showy, very useful beast, all over a farmer's brood mare, a fine mover, and well merits the distinction she receives. "Nelly," the property of Mr. Thursby, from Warwickshire, a fine lengthy mare, perhaps somewhat light in the bone, takes the 3d honour. No. 87, the property of Mr. Gunnell, of Milton, near Cambridge, also somewhat low in condition, is a fine roomy beast, walks well, and has good joints. No. 83, the property of Lord Norreys, moves well, as she should with such good shoulders, notwithstanding her quarters droop a bit too much. Her neighbour, No. 84, is superior, having greater liberty; 91, a blue roan, "Darling," the property of Mr. Adams, of Oxford, is a clever beast, with clean legs, good shoulders and quarters, and deserves greater merit than was bestowed on her—a striking contrast to 93, "Smiler," from Gloucestershire, not an exhibition animal at all, but for the remarkably fine colt at her side. In some classes the character of the foal has clearly influenced the decision of the judges, although it is a question whether a circumstance of this nature should confer a prize upon a dam deficient in important qualities herself.

The Clydesdale mares were easily disposed of by the judges. The 1st prize fell to "Isabel," the property of R. Waugh, Carlisle; she is undoubtedly a grand beast, but too big, and we preferred "Darling" and "Maggie" to her, or Her Majesty's, which took the 3d prize. We were glad to see "Darling" awarded the 2d distinction. The Suffolk mares, in class 12, showed very great quality: the 1st prize animal, 108, the property of the late Mr. Capon, of Wickham Market, Suffolk, has a beautiful top, grand body, and would be almost faultless with greater bone. Colonel Maitland's "Bury Empress" is also a splendid made animal, wanting bone. All these mares were far too big and fat, and this appears to be the reigning fault with our Eastern Counties breeders; we yet hope to see less regard for flesh, and greater attention to bone.

Mares for breeding hunters, class 13, gives us 19 animals or thereabouts; not many of them, we regret to note, deserve special mention. There can be no doubt that the 1st prize fell to the most worthy animal, "Go-a-head," owned by Mr. Robinson, from Thirsk, Yorkshire. It has most of the qualities we look for in an animal for breeding hunters—shape, substance, and quality. We failed to observe these features in the 2d prize mare, "Marigold;" although no doubt "good as gold," she has not quality or size to recommend her, and the owner must congratulate himself upon his luck. Perhaps "Marigold's" foal strengthened her claim to distinction. The 3d prize fell to "Heliotrope," a Lincolnshire mare. The "Queen of Sheba" deserves notice, for there are the signs of a good one about her, which we cannot say of the brace of "Brunettes" on either side of her.

Class 14, for mares under 15 hands, presents a charming variety of beasts, and it is really incomprehensible that animals varying so in size and character, should be equal to compete. The 1st and 2d prize animals differ as far as is possible from No. 131, Earl of Craven's fine stepping chestnut hackney. "Kate," the property of Lord Norreys, compared to the Ashdown hack, is a big loose mare, possessing none of the qualities of a hackney; she has, it is true, a remarkably good foal by her side, and this no doubt brought distinction to the dam. The mares are naturally low in condition, but this is not an objection to one versed in horseflesh. The 2d prize animal (132), Mr. Sheratt's, of Hereford, has a fine forehand, good stern, and is parkish looking. 133 ("Pet") we do not care for, although the judges gave her the 3d prize.

Classes 16, 17, 18, 19, 20, and 21 included fillies for agricultural purposes, of all breeds. Messrs. Howard took 2d prize in class 16, for a nice animal, "Rosebud;" and Mr. Druce, of Eynsham, 3d, for "Poppet," a neat chestnut. In class 18, Mr. Wolton took 1st and 2d prizes, for two very useful promising fillies; and Bucks and Oxon came in for prizes in class 19. Colonel Tomline, M.P., again gets a prize in class 21, for a nice 2-year-old filly, "Moggy."

Much interest was felt in judging the next class (22), for hunters four years old (mare or gelding). Thirteen animals came before the judges; after a few preliminary parades the numbers were speedily reduced to four or five, and these varied as much as is possible. The 1st prize was conferred upon a black gelding of Mr. S. Berridge's, of Banbury; the animal went like a gentleman, and showed himself to the greatest advantage, but in anything like company "General" would have found himself in the ranks. Ace of Clubs, No. 170, from Woodbridge, who gained the 2d prize, and 175 (not noticed), "The Count," might in some hands have been placed before "The General." A spicy-looking white legged, excitable chestnut, "May Fly," 171, looked like winning a chase, and "George," the property of Mr. A. Sheratt, of Herefordshire, who took third honours, was equal to anything, from a heavy dragoon to a parcel delivery cart. Many demurs were raised to the decision of the judges in this class, but we dare say the latter would tell us, that in selecting from animals so different and varied in quality the task was no light one.

Class 23 presented us with hunters of five, six, and seven years (mares and geldings): here only six or seven competed in the place of ten, and of these not above four were to be called weight carriers. Lord Norreys again came to the front (or nearly so) with a fashionable strong gelding, No. 181, "Strathnairn," an Irish horse (so the catalogue says), although showing a deal of Yorkshire character about him. His gallop was not so clean or regular as it ought to be, and it was thought doubtful if he could go through dirt as easily and pleasantly as the 1st prize horse, "Brian Boru," from Catterick, Yorkshire: the latter, a strong, well grown chestnut, found favour with many, as did 190, "General Hood," of the same hue, a slashing goer, but deficient in bone. A lack of quality evidently prevailed in both this and the previous class, and it is no compliment to England to suppose that the representatives at Oxford at all reflect the high class hunters of our country.

The hackney (mare, or gelding) class (24) produced nine or more animals, out of which number four were rapidly drawn to compete for the prizes. More than half the class had no pretensions to be exhibited; they simply could not move in the smallest degree creditably. Why owners should incur the risk and cost of sending their property to receive condemnation at the hands of the Society's judges is incomprehensible. The 1st prize in this class was awarded to an aged hack, "Ada," No. 194; she moved fairly, although short, and was not, we thought, so deserving the 1st honour as No. 199, "Fanny," from Carlisle, the property of Mr. Moffat. This pony went clean and well, and has some character, which could hardly be said of either of the 1st or 3d prize hacks. Mr. Blake's "Leah," No. 192, went in a round style of her own, common enough in a butcher's cart in the metropolis, but not the form one would expect to see applauded at the Royal Agricultural Society's meeting. The Royal show fails to attract the best animals, from causes which cannot be controlled, but sufficient are collected at their exhibitions to display the horses of the kingdom.

In concluding our remarks we would observe that the original views and purposes of the "Royal" society, so far as encouraging the exhibition of agricultural horses, are eminently realised this year at Oxford. The classes for draught animals are well furnished with highly creditable specimens, and it is pleasant to observe that many of the distinctions for beasts of the kind fall to landed proprietors. It is evidence of their desire to promote the interests of the tenantry by encouraging a good breed of farm horses. Such consideration on the part of the landlords has its result in the well-filled ranks of all classes of live stock at this exhibition, and it does honour to the tenant-farmers of the land also.

The following is the prize list:—

Judges.—M. Birdsall, Playford, Ipswich; Robt. Calders Kellow Mason, Esq., Nun Nook, Ryton, Wetherby, Leeds; J. Smith, Humberton, Boroughbridge. A. Turnbull, Cresswell, Morpeth; J. C. Woodhouse, Wellingore, Grantham.

Special Prizes offered by the Oxford Local Committee are marked thus (*).

Class 1. Agricultural Stallion, foaled before January 1, 1869 (not qualified to compete as Clydesdale or Suffolk).—1st, £25, William Welcher, Mouse Hall, Weston Toffs, Brandon, Norfolk; 2d, £15, John Manning, Orlingbury, Wellingborough, Northamptonshire; 3d, £5, John Hutt, Water Eaton, Oxford.

Class 2. Agricultural Stallion, foaled in the year 1868 (not qualified to compete as Clydesdale or Suffolk).—1st, £20, William Wynn, Cranhill Lays, Grafton, Alcester, Redditch, Warwickshire; 2d, £10, Thomas Anger, Little Hinton, Shrivenham, Wilts; 3d, £5, Wm. Enston, Claverdon, Warwick.

Class 3. Clydesdale Stallion, foaled before January 1, 1868.—1st, £25, Earl Beauchamp, Madresfield Court, Worcestershire: 2d prize withheld.

Class 4. Clydesdale Stallion, foaled in the year 1868.—1st, £20, the Duke of Richmond, K.G., Goodwood, Chichester, Sussex; 2d, £10, do.

Class 5. Suffolk Stallion, foaled before January 1, 1868.—1st, £25, Isaac Rist, Tattingstone, Ipswich, Suffolk; 2d, £15, Charles Boby, Alderton, Woodbridge, Suffolk; 3d, £5, Colonel Tomline, M.P., Orwell Park, Ipswich, Suffolk.

Class 6. Suffolk Stallion, foaled in the year 1868.—1st, £20, Isaac Rist, Tattingstone, Ipswich; 2d, £10, the Executors of the late Thomas Capon, of Bennington, Wickham Market, Suffolk; 3d, £5, William Wilson, Bayham Hall, Ipswich, Suffolk.

Class 7. Thoroughbred Stallion, suitable for getting hunters.—1st, £50, General Peel, Marble Hill, "Knowsley;" 2d, £25 Charles and James Moffat, Kirklington Park, Carlisle, Cumberland, "Laughing Stock;" 3d, £10, Joseph Casson, Burgh-by-Sands, Carlisle, "Sincerity."

Class 8. Stallion, not less than 14 hands 2 inches, not exceeding 15 hands 2 inches, suitable for getting hackneys.—1st, £20, John Grout, Woodbridge, Suffolk; 2d, £10, Charles Beart, Stow, Downham Market, Norfolk.

Class 9. Pony Stallion, under 14 hands 2 inches.—1st, £15, Henry Roundell, Queen's Head Hotel, Otley, Yorkshire; 2d, £10, James Allen Ransome, Carr Street, Ipswich. Highly Commended: John Andrew Doyle, Plas-dulas, Abergele, Denbighshire.

Class 10. Agricultural Mare, in-foal, or with foal at foot, not suitable to compete as Clydesdale or Suffolk.—1st, £20, Thomas Statter, jun., Stand Hill, Whitefield, Manchester; 2d, £10, Henry Garfield Coldicott, Lower Heyford, Banbury, Oxford shire; 3d, £5, Arthur Harvey Thursby, Wormleighton, Leamington, Warwickshire.

Class 11. Clydesdale Mare, in-foal, or with foal at foot.—1st, £20, Richard Waugh, of Seathill, Irthington, Carlisle; 2d, £10, Lieut.-Col. R. Loyd-Lindsay, M.P., Lockinge Park, Wantage, Berkshire; 3d, £5, the Queen.

Class 12. Suffolk Mare, in-foal, or with foal at foot.—1st, £20, the Executors of the late T. Capon, Bennington, Wickham Market, Suffolk; 2d, £10, Lieut.Col. Fuller Maitland Wilson, Stowlangtoft Hall, Bury St. Edmund's, Suffolk. Highly Commended: Lieut.-Col. F. M. Wilson, Stowlangtoft Hall.

Class 13. Mare, in-foal, or with foal at foot, suitable for breeding hunters.—1st, £25, John Thomas Robinson, Leckby Palace, Thirsk, Yorkshire; 2d, £15, Robert Aldworth, West Hagbourne, Didcot, Berkshire; 3d, £5, Wheatley Tindall, Ashfield House, Lincoln.

Class 14. Mare, not less than 14 hands 1 inch, nor exceeding 15 hands 1 inch, in-foal, or with foal at foot, suitable for breeding hackneys.—1st, £20, Lord Norreys, Tetsworth, Oxford; 2d, £10, Alexander Sheratt, Oclepitchard, Hereford; 3d, £5, Earl of Craven, Ashdown Park, Shrivenham, Berkshire.

Class 15. Pony Mare, not exceeding 14 hands.—1st, £10, G. Bowes Morland, Abingdon, Berkshire. (The only entry.)

Class 16. Agricultural Filly, 3 years old, not qualified to compete as Clydesdale or Suffolk.—1st, £15, Charles Lister, Coleby Lodge, Lincoln; 2d, £10, James & Frederick Howard, Bedford; 3d, £5, Joseph Druce, Eynsham, Oxford.

Class 17. Clydesdale Filly, 3 years old.—1st, £15, George Head Head, Rickerby, Carlisle; 2d, £10, George Hampton, Findon, Worthing, Sussex.

Class 18. Suffolk Filly, 3 years old.—1st, £15, and 2d, £10, Samuel Wolton, Newbourn Hall, Woodbridge, Suffolk.

Class 19. Agricultural Filly, 2 years old, not qualified to compete as Clydesdale or Suffolk.—1st, £15, Stephen Davis, Woolashill, Pershore, Worcestershire; 2d, £10, John Denchfield, Burston House, Aston Abbotts, Bucks; 3d, £5, Sir Henry W. Dashwood, Bart., Kirtlington Park, Oxon.

Class 20. The Queen, disqualified.

Class 21. Suffolk Filly, 2 years old.—1st, £20, Samuel Wolton, Newbourn Hall, Woodbridge, Suffolk.

Class 22. Hunters, 4 years old (Mare or Gelding).—1st, £30*, Samuel Berridge, Drayton Lodge, Banbury, Oxfordshire; 2d, £15*, John Grout, Woodbridge, Suffolk; 3d, £5*, Alexander Sheratt, Oclepitchard, Hereford.

Class 23. Hunters, 5, 6, or 7 years old (Mare or Gelding).—1st, £30*, John B. Booth, Killerby Hall, Catterick, Yorkshire; 2d, £15*, Lord Norreys, Tetsworth, Oxford; 3d, £5*, John Watson, Waresley, Hartlebury, Kidderminster (reserved).

Class 24. Hackney (Mare or Gelding), not exceeding 15 hands 1 inch, under 8 years old.—1st, £15*, Herbert S. Woodcock, The Helms, Wigan, Cumberland; 2d, £5*, Charles Moffatt, Crosby-on-Eden, Carlisle. Reserved: John Charles Blake, Oxford.

CATTLE.

Shorthorns.—This breed was largely and well represented. The judges in the bull classes were Messrs. Aylmer, Singleton, and Bowstead, and in the cow classes, Messrs. S. Rich, M. Stephenson, and Howard. The competition was exceedingly keen, and the task of judging proportionately difficult. The decisions were in some cases regarded unfavourably by men qualified to offer an opinion on so delicate a subject. The two sets of judges commenced their labours at about 8·30 A.M., and concluded by a little before 1 P.M. The weather was much more favourable than usual, both for spectators, judges, and cattle, the sky being overcast, and the heat tempered by a pleasant breeze. In the class of bulls above three years old there were 16 entries, many of the animals being of first-class quality, and drawn from all parts of England as well as from Ireland. As this grand array of sires was led round the ring we noticed the famous SOVEREIGN, lately so successful at Dublin, but apparently rather dashed with his journey; and what with this disadvantage and the fact of his coming in contact with really better animals, he was obliged to rest content with the reserve number. Mr. Saunders, of Nunwick, showed his excellent bull EDGAR, 7 years and 6 months old, and well he looked as he moved round the ring, exhibiting a tremendous depth of carcase, a very level top, especially over the hind-quarters, but a little faulty (narrow) over the shoulder top: his hocks are straight, and set wide apart, and his rich colouring is an additional point in his favour. Some judges preferred this bull even to the now famous Leicester winner, BOLIVAR, which appeared in blooming condition and excellent form—very massive, deep, and showing admirable quality, albeit a shade close grown, or "shut-up," as we heard it expressed: in other words, showing a slight want of expansiveness of frame. The set on of the tail also was scarcely so neat as in the 2d prize bull EDGAR, but we were content to see him finally take the *pas* over every other competitor. BOLIVAR is a commentary upon what is known as fashionable breeding: he boasts no tip-top blood, and yet how proudly he marches past every candidate for honours! What would have been the result in the conflict had Mr. Torr's motion been carried, and had the judges been transposed, with the additional complication of weighing FIRST FIDDLE, the sire of BOLIVAR, against GRAND DUKE 3D, the sire of the unnoticed but yet excellent bull, 9TH GRAND DUKE? Mr. T. E. Paulett's BARON KILLERBY (23,364) was eventually placed 3d, and may be described as good in front, but with plain hocks and hams. Mr. Garne's ROYAL BUTTERFLY 20TH, 1st at Taunton, was not even placed here, and was no doubt thrown away by his plain hind-quarters, that were scarcely compensated for by his excellent fore-end. Mr. W. F. Faviell also showed a good bull, SHUTTLECOCK (25,126), bred by Mr. Fawkes, of Farnley.

In the class for bulls above two and not exceeding three years old, Mr. Robert Bruce, of Newton of Struthers, Forres, Scotland, was placed 1st with a very good bull, SCOTSMAN, whose pedigree, for some reason, is not even hinted at in the catalogue. 1st at the Highland and Agricultural Society at Edinburgh in 1869, and the Royal Northern at Aberdeen, as well as at other Scotch shows, this bull may be considered as well worthy of his place, and excels his competitor, BARON HUBBACK, exhibited by Colonel Towneley, by being more level. He has a famous girth of 7 feet 10½ inches, good thighs and twist, massive form, and good colour, but is a little too weak between his rump and hip bones. Colonel Towneley's bull, which has obtained the 2d place, is

rather patchy and plain at the shoulder; and Mr. Wright's MAN'S ESTATE, the 3d prize bull, although a good animal, is a little narrower, although deep between his forelegs, but has proved himself a good bull in the local shows of his native county. Mr. Christy's DUKE OF BABRAHAM claims the reserve number, and is by DUKE OF GRAFTON (21,594), and from *Babraham Duchess*. This, although a good animal, was probably thrown away by his narrowness over the shoulder-top.

The yearling bull class contained 18 entries. Heading the list was Mr. Challoner's SIR LEOPOLD, which although 1st at the Dublin Spring Show was fairly beaten into obscurity when competing with English stock. The Earl of Aylesford's MAGDALA attracted public attention, partly through his good looks, but more from his exhibition of an unruly temper, and secured the reserve number. Mr. William Linton's white bull, LORD IRWIN, was not likely to take the public eye, but on a careful inspection of the class he might be singled out as among the best, although far from worthy of the place assigned to him—that of 2d. All eyes were upon Lord Braybrook's HEYDON DUKE, the winner of the 1st place at the recent Essex show, which, although perhaps a trifle narrow over the shoulder-top, was considered by many good judges to be decidedly the "best of the bunch." Much dissatisfaction was therefore expressed when, instead of 1st, this bull came out 3d. But what of the winner of the 1st place? He has been known as a prizetaker at local shows, and is Lady Pigot's BYTHIS (25,700), a nice red and white red bull, lengthy, and good in front, but decidedly weak behind, and was promoted to undeserved dignity. Mr. W. W. Slye's GRAND DUKE OF FARNLEY, although a grand bull, was probably unsatisfactory on account of his turning-out toes, which made him move awkwardly. Lord Walsingham also showed a good bull, GRAND SIGNOR 2D, but not quite stylish enough to be placed. The Rev. William Holt Beever's bull, HUSH, although large and showy, was deficient in quality, and was passed over.

There was an extraordinarily good show of bull calves, and much time was occupied by the judges in awarding the honours. The 1st place was secured most deservedly by Mr. H. Dudding's ROBIN HOOD, a massive and good bull, with hind-quarters rather defective. The excellent quality and rich coat of Mr. Stratton's MASTER GLANVILLE reminded us of BOLIVAR when he appeared at Leicester two years ago. Although wanting in size, this young bull well deserves the high honours he has achieved. Mr. Garne's (Broadmoor) FIRST WRANGLER must have struck all observers as an exceedingly well-grown thick calf, of good quality, but his colour was against him, and to that he probably owed his modest position of merely receiving a high commendation. Among other calves, in an excellent class worthy of special notice, was Colonel Towneley's TOWNELEY OXFORD, which attracted much attention; and also Mr. H. J. Sheldon's 3D EARL OF WARWICKSHIRE by DUKE OF BRAILES, and a grandson of 7TH DUKE OF YORK. Although lathy and narrow this calf shows high quality, and will probably some day make a grand bull. This class was no doubt difficult to judge, and we heard no objections to the decision. Lastly, we must just notice Mr. Robart's CARACTACUS, a good bull, which was somewhat curiously sent back at an early period of the judging among those animals which were weeded out as decidedly below par.

Much was said in the yard with reference to the decision of the judges in the Shorthorn cow class. Mr. Garne's cow, *Lady Lavinia*, although, no doubt, an animal of excellent quality, is, first, small; and, secondly, patchy—and inferior, we should say, to the same breeder's highly commended cow, *Pride of the Heath*. The unsophisticated would, in every case, pronounce in favour of that substantial cow, *Queen of Rosalea*, exhibited by Lady Pigot, but which is only awarded a second place. The 3d prize was given to Mr. James How's *Lady Anne*, a nice cow by PRINCE OF THE EMPIRE, and, as every one knows, exceedingly well bred. The cow class is undoubtedly a grand one, but the manner in which the decision of three undoubtedly good judges was received is another indication of the difficulty of pleasing everybody.

Few decisions created more surprise to the bystanders than that which gave Mr. Mumford's *Camilla* the 1st place among the heifers in-milk or in-calf, not exceeding three years old. A nice heifer she may be, but patchy all over, light in the thighs, and disfigured by the mark of a seton which has rendered her bosom unsightly. As a redeeming point we may mention that this heifer was certainly very good over the shoulder-top. The 2d place was given to Mr. Richard Eastwood's *Double Butterfly 3d*, by HERO (20,058), and a grand-daughter of ROYAL BUTTERFLY (16,862). To a taking form she adds an exceedingly rich colour, and the judges were evidently long divided between her and *Camilla*. The worst point we observed about this heifer was her very awkward walk, owing apparently to stiffness at the hocks. No one could look at Mr. Stratton's *Peeress*, by BUDE LIGHT, without admiring her charming appearance, and she well deserves the 3d prize awarded to her. Mr. How's *Windsor Butterfly* holds the reserve number. She may be described as a very good heifer, grand over the shoulders, and thick, square, and level; she has, however, a light neck and ugly horns. Lastly we must mention Lady Pigot's *La Belle Hélène*, by PRINCE OF THE EMPIRE, which, although thick, substantial, and in many respects beautiful, has to be contented with a commendation.

The yearling heifers would have made a grand show alone. There are 31 entries, and many were so excellent that to judge between them was by no means easy. As these beautiful and promising young animals were led round the ring the faults of some and merits of others became more evident. Mr. McIntosh's *Lady Knightley 2d*, by 3D DUKE OF GENEVA, a sire whose stock has been remarkably successful this summer, at once challenged attention by her substance (she is two months younger than the 2d prize), her growthiness, and her rare abundance of hair. Well did she deserve the 1st place which the judges finally gave her, after much consultation. Mr. Dudding's *Countess of Yarborough* early caught the judges' eyes as a level, deep heifer, good at all points, but scarcely possessed of the quality of the 1st prize animal. We must confess to having overlooked Mr. How's *Vesper Queen*, the winner of the 3d prize, which, however, probably she well deserves. A pair of remarkably pretty twin heifers, identical in colour, size, and general form, were shown by Mr. Statter, which, had they been a few months older, might have competed successfully with some of their older and larger rivals. Mr. Stratton's heifers, *Gertrude* and *Flower Girl*, were also conspicuously excellent: the former was 1st and the latter 2d at Taunton, but in the show yard of the "Royal" the second heifer was only highly commended, while the Taunton favourite was not placed. After the dispersion of the Coleshill stock last autumn it is pleasant to see that the present Earl of Radnor has not entirely given up the breed so beloved by the late lord. Although passed over, his heifer *Debate* was a great beauty, and in a less keen competition might have worthily been decked with 1st class honours. Mr. W. Bolton's *Ally Gwynne* was also much admired, as was also Mr. G. A. Fawcett's *Highland Maid*, bred by the late Mr. Roberts, of Kings' Walden—a nice coaty heifer, but deficient between the hip and rump, and weak at the neck. Mr. Garne's heifer *Genevieve* was also exceedingly well haired, and a good deal looked at by the judges, although she only received a commendation. Heifer calves above six and under 12 months old were represented by 19 entries. Eight of the more inferior calves were presently weeded out, leaving 11 very handsome animals, among whom Col. Towneley's *Baron Oxford's Duchess* was conspicuous as a well-formed heifer, with well carried out rumps, showing much quality, and promising withal. Mr. R. Marsh's *Blossom* is a large, good-looking heifer, a fortnight older than the *Baron Oxford's Duchess*. She is seen to the greatest advantage from before, when her deep and prominent breast is brought into view. Still, we noticed a degree of hardness, of want of quality, in this calf which probably acted prejudicially against her. Lieut.-Col. Lindsay, M.P., exhibited a very nice calf by DUKE OF JAMAICA, and out of a cow bought from the late Mr. Lampton, of Sarsden. Although excellently haired, she was too high at the rumps, but otherwise attractive. Mr. Stratton's (of Burderop) heifer, *Fair Rosalie*, was commended, and had many admirers around the prize ring; and being the youngest heifer exhibited, her want of size was excusable, as it was also probably the cause of her not occupying a more important position. We conclude by mentioning Mr. T. Statter's *Stanley Rose*, which holds the reserve number, and Lord Walsingham's *Oxford Belle*, a pretty calf, just within the required age, which received a commendation.

Considered as a whole, the show of Shorthorns at Oxford must be looked upon as most successful. If discontent exist with reference to any of the decisions of the judges, it must be remembered that the classes were large and the competition very keen, so that there was often room for two opinions. We have once more to protest against fatness in animals intended for breeding purposes. This is an evil that no amount of writing and talking as yet appears to touch, and we still hear the old and absurd remark that such an animal, although good, is not in condition for showing, which simply means that it is not disgracefully and unhealthily fat. Until judges systematically pass over such overfed animals or Societies take the responsibility upon themselves, and disqualify for over-fatness as they would for age or unfair clipping, we can hardly expect to see an improvement. For is it not natural, when high feeding can secure the honours of a Society, that exhibitors should overload their animals, even at the risk of ruining them, for the sake of winning prizes? Young breeders must thus overfeed their animals, while the evil effect of this vicious custom is still further shown by the fact that many of our oldest established and most famous breeders will not exhibit at all. Having achieved their reputation, they no longer choose to risk the health of their best animals by the training required for the showyard.

Herefords.—Some discontent was expressed with reference to the awards of prizes in the Hereford classes. It has been for some time the custom of the Royal Agricultural Society to send round circulars to local societies in order to obtain the names of men who are considered by such societies to be qualified to act as judges in the various departments. It is stated on first-class authority that on no one occasion has a single judge named by the Hereford Agricultural Society been requested to function in the Hereford classes by the Royal Agricultural Society. In other words, the Hereford Society has been regularly asked to name fit men for the post of judge, and its nominees have been systematically set aside. This appears the harder when we remember the local character of the Hereford breed, and how important it is to recognise the opinion of a society like the Hereford Society in a matter which so closely concerns them. This is, perhaps, rather a digression from the subject in hand, and we now turn to consider the various classes of Hereford cattle.

In the aged bull class Sir Joseph Russell Bailey took the 1st place with the well-known STANWAY, bred by Mr. Judge, and sold to his present owner for the sum of 200 gs. He may be described as a grand table-backed bull, very good above, and not quite so good in his under-meat. Her Majesty's PRINCE LEOPOLD, the 2d prize bull at Manchester, and the taker of a 3d place at Leicester, made a very good 2d, and is a fine heavy-fleshed bull. SIR JOHN 3D (3456), the 1st prize Taunton bull, was placed 3d, and this to the satisfaction of most persons. Nothing, indeed, could show more conclusively the excellence of this class than the fact that No. 1 at Taunton was justly only No. 3 at Oxford. SIR JOHN 3D is the property of Mr. Thomas Thomas, of Saint Hilary, Glamorganshire, and is a grand bull. Again, it is somewhat remarkable that Mr. J. Morris' STOW, which was 1st at Manchester, should be nowhere on the occasion we report upon, although he, too, is a very good bull.

In the class for bulls above two, and not exceeding three years old, Her Majesty won the first place with PRINCE ALBERT EDWARD, own brother to PRINCE LEOPOLD, the winner of the 2d place in the previous class. His sire, DECEPTION, was purchased by Mr. Duckham for Her Majesty at the Monaughty sale, and claims SIR BENJAMIN as his sire. This was the first appearance of this excellent young bull in any showyard, and a magnificent animal he is, possessed of strong constitution, good quality, level form, heavy flesh, and almost every quality that is valued in a sire of stock. Mr. Warren Evans showed MONAUGHTY 3D, a famous bull, which was awarded the 2d place; and Mr. Thomas Edward's LEOMINSTER 3D, 1st at Manchester as a yearling, was placed 3d. In this class, again, is a singular instance of the reverses of fortune at shows. LORD ASHFORD, the property of Mr. Baldwin, of Luddington, which was 2d at Taunton, was completely unnoticed at Oxford. Mr. Philip Turner, of Lean, Pembridge, Herefordshire, took the 1st place with his TROJAN, a famous bull, by the celebrated FRANKY, the sire of the gold medal ox at Smithfield both in 1863 and 1868. TROJAN is a grand bull, and we are informed he has been purchased by Mr. Duckham for exportation to Sidney. The 2d prize bull, COUNT FOSCO, had little to recommend him but his heavy mane; he is a large patchy bull, and we should have preferred seeing the 1st prize, supported by Mr. John Morris' CAMBRIDGE, an excellent bull, that now holds the reserve number. The 3d place was awarded to Mr. Hill's PRESIDENT (3331) who, although a fair bull, may be characteristically designated as "aldermanic" in his appearance.

There was a good show of bull calves, the 1st place being given to Mr. Taylor's (of Showle Court) THE OXFORD LAD, a nice, level, young animal, but overloaded a little at the rump. The 2d prize was taken by Mr. Richard Hills, MELTON 2D, whose weak point is drooping hind-quarters, but which may be spoken of as possessing good quality, with plenty of flesh and depth of carcase. The reserve number is held by Mr. Thomas Rogers, of Coxall, for STUDENT, a nice calf, but not quite in "show condition." He will probably be heard of on a future occasion, as his pedigree is good. He is by BATTENHALL, the 1st prize bull both at Worcester and Leicester, and from *Silk*, the 1st prize cow in the same showyard.

In the Hereford cow class a handsome, good-fleshed level animal took the first prize, after producing a fine calf, scarcely an hour before the judges decided in her favour. This cow, *Silk*, the mother of the young bull we last noticed, was 2d at the Worcester Royal meeting, and 1st at the Neath meeting last year. She is the property of Mr. Thomas Rogers, of Coxall, and was bred by Mr. David Rogers, The Rodd, Kingston. Mr. Pitt, of Chadnor Court, after an absence of many years, again appeared as an exhibitor, and took off the 2d prize with *Highlass the 4th*, a beautiful young cow of very superior quality. Mr. R. Tanner's 3d prize cow, *Queen*, is also a nice animal.

There were only three entries in the class for heifers in-calf or in-milk, and three prizes were offered. The first prize was awarded to Mr. W. Tudge, of Adforton, for *Silver Star*, winner of the first place at Manchester in the class for 2-year-old heifers. She was also first at Hereford, and again at Taunton, and is a splendid heifer of rich fine quality, inclined to be patchy at the rump, but with grand loins. Mr. Philip Turner's *Livia* occupies the same position she held at Taunton, that of 2d, and the 3d prize was very properly withheld from an animal which should never have been exhibited in a class of breeding cattle.

The yearling heifers were a truly magnificent class, both in numbers and quality. Mr. Fenn took the 1st prize with a heifer of great size and substance, of beautiful character, and almost perfect in the fore-quarters, although not quite so well covered on the loins as she

might have been. She is also a little plain between the hips and rump-bone. This heifer was one of a pair placed first at the Hereford show last October, and has been selected with Mr. Thomas Thomas' 3d prize heifer in the same class—which, by the way, was 1st at Taunton—for exportation to Sydney. The 2d place was obtained by Mr. Tudge, of Adforton, with *Lady Brandon*, the cow that held the reserve number at Taunton. We have therefore a singular reverse, in which the 1st prize Taunton heifer is placed 3d, and the reserve number at Taunton is placed 2d at Oxford. We would not, however, harshly criticise this apparent contradiction of opinion. The three heifers are all so remarkably good, in fact so near perfection, that there is room for difference of opinion, and it is easy to imagine three good judges each selecting one of the above as the best. The heifer calves, above six and under 12 months, appeared in great force. Mr. H. Rawlins Evans took the 1st place with a beautifully proportioned calf, but scarcely of the finest quality, and Mr. Thomas Thomas secured the 2d prize with a heifer of greater substance than the last-named one. Mr. Tudge was highly commended for *Bonnie Belle*, and by SYMMETRY (2799).

The Hereford section of the show was in every way satisfactory, and we have no hesitation in saying that it has never been surpassed.

Devons.—There was a very excellent show of Devon cattle, and the usual names appeared in competition for the Society's honours. In the class for bulls there were five entries, and the 1st prize was awarded to Mr. Walter Farthing, for an admirable bull, MASTER ARTHUR, bred by Sir A. G. Hood, Bart. Mr. James Howard Buller came 2d; and the 3d prize was not awarded. In the class for bulls above two and not exceeding three years old, Viscount Falmouth again takes the 1st place, with his excellent bull NARCISSUS; and Mr. Farthing makes a good 2d, with a capital bull, furnished with excellent hams and twist, but slightly narrow at the rump. Her Majesty the Queen was highly commended for a very good young bull, NAPIER, bred by Mr. W. Farthing. The yearling bull class was fairly represented by seven animals, all of which, with one exception, were noticed. Mr. James Davy, of Flitton Barton, was 1st, with an excellent bull, DUKE OF FLITTON 5TH, with first-rate loins, and a somewhat hollow back; Viscount Falmouth was 2d with a very nice bull, but which was decidedly plain at the set on of the tail. Mr. Smith, of Hoopern, made a good 3d, and Mr. Azariah Smith obtained the reserve number with his DUKE OF YORK. The bull-calf class was especially good, and again, with one exception, every animal was noticed. Mr. James Davy took the 1st place with DUKE OF FLITTON 6TH, a straight calf of excellent quality.

We must very briefly speak of the Devon cow classes, which may be said to have been peculiarly excellent, and judging from the free sprinklings of high commendations and commendations, as well as prizes, the judges of Devons appear to have been pleased with the animals submitted to them. We must refer our readers to the accompanying prize lists, where full information is given as to the successful exhibitors.

After passing through the long lines of Shorthorns, Herefords, and Devons, there was still an interesting residuum of cattle, comprising other established breeds. The consideration of these need not detain us long. The Channel Islands cattle were well represented, and it was interesting to note the evident change in form when the object of the existence of the animal was altered from a feeding or grazing purpose to that of yielding a large supply of milk. The hard-looking coat, the narrow withers, the angular hips, and hollow back, all attested the fact that flesh production was not the object of their lives, while other indications as clearly pointed to their adaptability to the production of milk. Again the scene changed, and we found ourselves among the Norfolk and Suffolk Polls originally derived from the Galloway cattle, which, finding their way into Norfolk for grazing purposes, were retained as milking cows, and finally laid the foundation of an established East of England breed. We greatly admired Mr. Benjamin Brown's NORTH DUKE, the winner of a large number of 1st prizes in his own and neighbouring county, and on the present occasion, the 1st prize bull in a considerable class. This bull was not overloaded with fat, was very level, and possessed splendid shoulders and good buttocks. Next followed a good cow class, and a fair show of heifers in-calf or in-milk, which concluded this interesting section. The "other established breeds" might be characterised as a somewhat motley assembly, embracing the pied Longhorns, which appeared in moderate force; some fair examples of Welsh cattle, black, and with thin coats over the greater part of the body, but furnished with longer hair on the neck. We noticed the same peculiarity in the examples of the small Kerry breed, where a black colour, thin coat, and developed mane, seem to point back to the period of partially reclaimed cattle, far remote from the age of improved Shorthorns, Herefords or Devons. The magnificent black Angus was not wanting, neither was the Brittany, which never fails to attract the admiration of the ladies. Jersey and Guernsey cattle completed a somewhat mixed but certainly interesting portion of the show.

The following is the list of awards in the cattle classes:—

JUDGES.—Shorthorns: H. Aylmer, West Dereham Abbey, Stoke Ferry; W. Bowstead, Hackthorpe Hall, Penrith, C. Howard, Biddenham, Bedford; S. Rich, The Cedars, Fearnall Heath, Worcester. Herefords: J. R. Singleton, Givendale, Pockhington; M. Stephenson, Fourstones, Hexham. Herefords and other established breeds: G. Morgan, Lanchirabo, Hereford; S. W. Urwick, Leinthall, Ludlow. H. Yeomans, Stone's Court, Hay. Devons and Norfolk and Suffolk Polled: J. Overman, Burnham Sutton, Lynn; T. Pope, Horningsham, Warminster; R. B. Warren, Childe Okeford, Blandford. Channel Islands: C. P. Le Cornu, Trinity Manor, Jersey; G. Morgan, Lanchirabo, Hereford.

SHORTHORNS.

CLASS 25. Bull, above 3 years old.—1st, 40*l.*, Charles William Brierly, Rhodes House, Middleton, Manchester; 2d, 20*l.*, Charles Richardson Saunders, Nunwick Hall, Penrith, Cumberland; 3d, £10, Thomas Edw. Rawlett, Beeston, Sanday, Bedfordshire. Highly Commended: William Frederick Faviell, Down Place, Guildford, Surrey. Commended: George Garne, Churchill Heath, Chipping-Norton, Oxfordshire.

CLASS 26. Bull, above 2 and not exceeding 3 years old.—1st, £25, Robert Bruce, Newton of Struthers, Forres, Elgin, Scotland; 2d, £15, Col. Charles Towneley, Towneley, Burnley, Lancashire; 3d, £5, John Wright, Green Gill Head, Penrith, Cumberland.

CLASS 27. Yearling bull, above 1 and not exceeding 2 years old.—1st, £25, Lady Emily Pigot; 2d, £15, Wm. Linton, Sherat Hutton, York; 3d, £5, Lord Braybroke, Audley End, Saffron Walden, Essex.

CLASS 28. Bull Calf, above 6 and not exceeding 12 months old.—1st, £10, Henry Dudding, Panton House, Wragby, Lincolnshire; 2d, £5, Richard Stratton, Burderop, Swindon, Wilts.

CLASS 29. Cow, above 3 years old.—1st, £20, George Garne, Churchill Heath; 2d, £10, Lady Emily Pigot, Branches Park, Newmarket, Cambridgeshire; 3d, £5, James How, Broughton, Huntingdon. Highly Commended: George Garne. Commended: William Bradburn, Widnesfield.

CLASS 30. Heifer, in-milk or in-calf, not exceeding 3 years old.—1st, £10, Henry Dudding, Panton House, Wragby, Lincolnshire; 2d, £5, Richard Stratton, Burderop, Swindon, Wilts.

CLASS 31. Yearling Heifer, above 1 and not exceeding 2 years old.—1st, £15, David M'Intosh, Havering Park, Romford, Essex; 2d, £5, Henry Dudding, Panton House, Wragby, Lincolnshire; 3d, £5, James How. Commended: Edmund Alderson Fawcett, Childwick Hall, St. Alban's, Hertfordshire; George Garne.

CLASS 32. Heifer Calf, above 6 and under 12 months old.—1st, £10, Colonel Charles Towneley, Towneley, Lancashire; 2d, £5, Richard Marsh, Little Offley House, Hitchin, Hertfordshire.

HEREFORDS.

CLASS 33. Bull, above 3 years old.—1st, £25, Sir Joseph Russell Bailey, Bart., M.P., Glanusk Park, Crickhowell, Breconshire; 2d, £15, Her Queen; 3d, £5, John Morris, Town House, Madley, Hereford.

CLASS 34. Bull, above 2 and not exceeding 3 years old.—1st, £25, the Queen; 2d, £15, Warren Evans, Landowlais, Usk, Monmouthshire; 3d, £5, Thos. Edwards, Wintercott, Leominster, Herefordshire.

CLASS 35. Yearling Bull, above 1 and not exceeding 2 years old.—1st, £25, Philip Turner, Leen, Pembridge, Herefordshire; 2d, £15, John Harding, Bicton, Shrewsbury, Salop.

CLASS 36. Bull Calf, above 6 and not exceeding 12 months old.—1st, £10, William Taylor, Showle Court, Ledbury, Herefordshire; 2d, £5, Richard Hall, Eardisley Hall, Eardisley, Salop.

CLASS 37. Cow above 3 years old.—1st, £20, Thomas Rogers, Coxal, Brampton Bryan, Herefordshire; 2d, £10, George Pitt, Chadnor Court, Dilwyn, Leominster; 3d, £5, Richard Tanner, Frodesley, Dorrington, Salop.

CLASS 38. Heifer, in-milk or in-calf, not exceeding 3 years old.—1st, £15, William Tudge, Adforton, Leintwardine, Herefordshire; 2d, £10, Philip Turner.

CLASS 39. Yearling Heifer, above 1 and not exceeding 2 years old.—1st, £15, Thomas Fenn, Stonebrook House, Ludlow; 2d, £10, William Tudge, Adforton; 3d, £5, John Harding, Bicton, Shrewsbury, Salop.

CLASS 40. Heifer Calf, above 6 and under 12 months old.—1st, £10, Henry Rawlins Evans, jun., Swanstone Court, Leominster; 2d, £5, Thomas Thomas, St. Hilary, Cowbridge, Glamorganshire.

DEVONS.

CLASS 41. Bull, above 3 years old.—1st, £25, Walter Farthing, Stowey Court; 2d, £15, James Howard Buller, Downes, Crediton, Devon. Commended: Wm. Taylor.

CLASS 42. Bull, above 2 and not exceeding 3 years old.—1st, £25, Viscount Falmoth, Tregothnan, Cornwall; 2d, £15, Walter Farthing. Commended: the Queen.

CLASS 43. Yearling Bull, above 1 and not exceeding 2 years old.—1st, £25, James Davy, Flitton Barton, Devon; 2d, £15, Viscount Falmouth; 3d, £5, William Smith, Hoopern, Exeter.

CLASS 44. Bull Calf, above 6 and not exceeding 12 months old.—1st, £10, James Davy; 2d, £5, Walter Farthing; 3d, William Smith. Highly Commended and Commended: William Taylor.

CLASS 45. Cow, above 3 years old.—1st, £20, Wm. Smith; 2d, £10, William Taylor, Glynley, Arlesford, Sussex; 3d, £5, Wm. Taylor. Commended: W. Smith, J. A. Smith, W. Farthing, George Turner.

CLASS 46. Heifer, in-milk or in-calf, not exceeding 3 years old.—1st, £15, Walter Farthing; 2d, £10, Wm. Taylor; 3d, £5, John Azariah Smith, Bradford Peverell, Dorset. Commended: the Queen.

CLASS 47. Yearling Heifer, above 1 and not exceeding 2 years old.—1st, £15, James Davy; 2d, £10, William Taylor; 3d, £5, William Smith.

CLASS 48. Heifer Calf, above 6 and under 12 months old.—1st, £10, James Davy; 2d, £5, William Smith. Commended: the Queen, and J. A. Smith.

CHANNEL ISLANDS.

CLASS 49. Bull, above 1 year old.—1st, £15, George Deller, Greywell, Odiham, Hampshire; 2d, £10, Henry John Le Feuvre, Les Nièmes, St. Peter's, Jersey.

CLASS 50. Cow, above 3 years old.—1st, £15, Joseph Pulley, jun., Lower Eaton, Hereford; 2d, £10, Philip Gaudin, Spring Farm, St. Martin's, Jersey.

CLASS 51. Heifer, in-milk or in-calf, not exceeding 3 years old.—1st, £15, Philip Gaudin; 2d, £10, George Huyshe, Rosenheim, Guernsey.

NORFOLK AND SUFFOLK POLLED.

CLASS 52. Bull, above 1 year old.—1st, £15, Benjamin Brown, Thursford, Norfolk; 2d, £10, Jeremiah James Coleman, Carrow House, Norwich.

CLASS 53. Cow, above 3 years old.—1st, £15, John Hammond, Bale, Thetford, Norfolk; £10, Samuel Wolton, Newbourn Hall, Woodbridge, Suffolk.

CLASS 54. Heifer, in-milk or in-calf, not exceeding 3 years old.—1st, £15, John Hammond, Bale, Norfolk; 2d, £10, Lord Sondes, Elmham Hall, Thetford, Norfolk.

OTHER ESTABLISHED BREEDS,

Not including the Shorthorn, Hereford, Devon, Channel Islands, or Norfolk and Suffolk Polled Breeds.

CLASS 55. Bull, above 1 year old.—1st, £15, the Duke of Buckingham and Chandos, Stowe, Bucks; 2d, £10, Thomas Statter, jun., Stand Hill, Whitefield, Manchester.

CLASS 56. Cow, above 3 years old.—1st, £15, John Godfrey, Wigston Parva, Hinckley, Leicestershire; 2d, £10, Tilden Smith, Beckley.

CLASS 57. Heifer, in-milk or in-calf, not exceeding 3 years old.—1st, £15, T. Statter, jun., Stand Hill; 2d, £10, Jacob Watson, Long Crendon, Thame, Oxon.

CLASS 58. Pair of Cows, to be shown in full milk, without reference to breed, specially adapted for dairy purposes—1st, £12, T. Statter, jun., Stand Hill; 2d, £8, Henry Middleton, Cuttleslowe.

SHEEP.

THE show of sheep generally was very good. Cotswolds, Oxfordshire Downs, and Shropshires were very numerous, and of pre-eminent merit. We are glad to find that more spirit is being infused into the exhibition of so old and important a breed as that of the Cotswolds, and are led to hope that the showyards of future years may receive an increasing supply of these sheep, which we know to be brought to such a high standard of perfection on their native hills.

Leicesters.—The numbers of the Leicester sheep exhibited were as follows: Shearling rams, 42; rams of any other age, 17; shearling ewes of the same flock (in pens of five), 35 — total, 94. The show of shearling rams was particularly good, there being many sheep of great merit among them, consequently visitors were not slow to call in question the decision of the judges. Mr. John Borton's sheep, which obtained the 1st prize, at once attracted attention, being well-formed and symmetrical, with a mellow touch and a good fleece, but it was rather deficient in size, and its head, which in a ewe would have been considered faultless, was far too feminine to be appreciated in a ram. The 2d prize sheep (exhibited by the executor of the late Lieut.-Col. William Inge), though lacking the beauty of its more successful competitor, was of larger size, and certainly appeared to us to be the better sheep; though, perhaps, the lover of the leg of mutton might have detected a certain lightness in the thigh. The 3d prize sheep, exhibited by the same gentleman, was of good form, but smaller. With the rams "of any other age," Mr. John Borton was again successful, gaining both the 1st and 2d prizes. The first was a fine sheep, firm to the hand, with a good head and neck, broad chest, and heavy fleece; the 2d was lighter in fleece. The 3d prize sheep (exhibited by Mr. George Henry Sanday) last year obtained the 1st prize as a shearling. In the 1st prize pen of five shearling ewes (exhibited by the executor of the late Lieut.-Colonel William Inge) were sheep of first-rate quality, in good condition, and with capital coats. Mr. William Brown's fine sheep, which had the 2d prize, were of large size, but inferior in quality.

Cotswolds.—Of this breed were shown—shearling rams, 39; rams of any other age, 23; shearling ewes of the same flock (in pens of five), 65; ewes that had suckled lambs to June 1 (in pens of ten), 30; ram lambs (in pens of ten), 50; rams of any age, 4—total, 211. Mr Thomas Brown's 1st prize shearling ram was a fine sheep, with a slightly grey face, generally good in form, and having plenty of wool, but, as is often the case with Cotswolds, it handled loosely. Mr. Robert Lane's 2d prize ram was also a good sheep. Mr. T. Beale Browne's 1st prize ram "of any other age" handled well, and Mr. John Godwin's 2d prize ram was a useful sheep. Mr. John Gillett obtained the 1st prize for shearling ewes with a capital pen of sheep, conspicuous for good fleeces, and showing excellent quality on handling. The 2d prize and the reserve number were given to the same exhibitor for two good pens. The 2d prize pen was made up with grey-faced shearlings. To judge from the sheep exhibited in the different classes it would seem that grey-faced Cotswolds are coming more than ever into fashion. To this no objection can be taken so long as the wool maintains its quality, but when closeness of fleece and loss of length in the back accompany the darker faces, which was the case this week with some of the sheep shown as Cotswolds, suspicion with respect to the purity of the breed is reasonably awakened. Mr. John Gillett carried off the prize for ram lambs. His was a good pen of dark-faced sheep; they had capital fleeces, but, owing probably to the dryness of the season, were in rather poor condition. The prize for the best ram "of any age," offered by the Right Hon. J. W. Henley, M.P., was awarded to Mr. John Godwin for a fine sheep, with a good head and neck; it was, however, too fat.

Lincolns.—Of this breed were shown—shearling rams, 16; rams "of any other age," 9; shearling ewes of the same flock (in pens of five), 25—total, 50. Mr. Thomas Gunnell was the exhibitor of the 1st prize shearling ram, an excellent sheep. Mr. Robert Wright was the winner of the 2d prize, with a sheep of lesser size, but of good quality and possessing an abundance of wool. Mr. Henry Dudding obtained the 1st and 2d prizes for rams "of any other age," with two fine sheep. The 1st prize one was especially good in the fore-quarters, displaying great breadth and depth of chest. "Put your hand down there, sir," said the shepherd, "and you'll never

forget it." Both sheep showed indications of heavy fleeces.

The 1st and 2d prizes for shearling ewes went to Mr. Thomas Cartwright, who exhibited two good pens. The 1st prize pen was particularly good, containing an even lot of sheep, which handled well and were of the right size and shape, with pretty heads and plenty of wool.

LONG-WOOLS.

Ryland and other.—No shearling rams were shown under this head, but there were—rams of any other age, 4; shearling ewes of the same flock (in pens of five), 5—total, 9. Mr. John Lynn's 1st prize ram was a big sheep, of good form and fleece, but one which on handling revealed a want of firmness. Mr. John Thomas Pinches obtained the 2d prize with a sheep which handled well, but whose close short wool rendered it unfit for exhibition among long-wools. Mr. Thomas W. D. Harris was the prize-taker and only exhibitor in the class of shearling ewes. The character of his sheep, which appeared to be a cross between the Lincoln and the Leicester, was very good. They were a pretty pen, satisfying both the eye and the touch of practised judges.

Oxfordshire Downs.—Of this breed were shown—shearling rams, 60; rams "of any other age," 18; shearling ewes of the same flock (in pens of five), 105; ewes that had suckled lambs to June 1 (in pens of ten), 30; ram lambs (in pens of ten), 50; ewe lambs (in pens of ten), 20—total, 283. Mr. George Wallis' 1st prize shearling ram was a sheep of moderate size, with a rather heavy-looking head, good neck, back, and loins, and close wool. It was scarcely broad enough between the shoulders. His 2d prize sheep, whilst possessing a good head and fore-quarters, was certainly hollow behind the shoulders. Its wool was not so close as that of the 1st prize ram. Mr. Charles Hobbs' 3d prize shearling was a nice sheep, square and level, with wool short and thick. Had it been longer, it must have gained a higher place. In the class of older rams, as in that of shearlings, Mr. George Wallis carried off the 1st and 2d prizes. The first, which at Manchester took the 2d prize as a shearling, was a fine sheep, handling well, but a little light in the fleece. The second, which at Manchester was also 2d in the same class, and 1st this year at Taunton, had a better head and fleece than the 1st prize sheep, but was inferior in other respects. The 3d prize was given to Mr. A. F. Milton Druce, for a ram with a firm, wonderful back, but which carried its head badly. At Manchester it was 3d among the shearlings. Mr. George Wallis' 1st prize pen of shearling ewes would by itself have been a sufficent reward for a long journey. Superior in general character, and excellent in detail, they could not fail to please even those who do not admire Oxfordshire Downs. "*O si omnia!*" The 2d prize fell to the lot of Mr. A. F. Milton Druce, for a pen of more than ordinary merit, good in size, quality, and condition. Mr. Frederick Gillett won the 3d prize. His sheep were lighter in the face, and much more delicate in the head, than the 1st prize sheep. Mr. John Treadwell showed a pen of capital ewes, for which he obtained the prize offered by the Oxford Local Committee. Mr. James Smith Parker carried off the prize for ram lambs with a good pen of strongly-coated sheep. The colour of their heads, however, was not quite uniform, and they were not in first-rate condition. Only two pens of ewe lambs were exhibited, and in regard to these the decision of the judges gave much dissatisfaction. The prize was awarded to the Executor of the late Mr. W. Button for a pen of small lambs with dark faces and long heavy fleeces. The other pen, which, in the opinion of most of the bystanders, ought to have received the prize, contained lambs which had also long wool, were of much larger size, and, perhaps, in better condition. Any grazier would, unquestionably, have given them the preference. On the other hand, a breeder of Oxfordshire Downs regarding their general character, and noticing the black patch extending from the head down the neck, and half hidden by the wool, would certainly have passed them by. It may be argued that, once admitted into competition with Oxfordshire Downs, they were fairly entitled to the prize, as being the better sheep, and that the only way of rejecting was to disqualify them on the ground that they were simply a cross-bred lot, not true Oxfordshire Downs. We must leave our readers to form their own judgment upon this point.

Southdowns.—Of this breed were shown—shearling rams, 32; rams "of any other age," 24; shearling ewes of the same flock (in pens of five), 55—total, 111. Lord Walsingham carried off all three prizes for shearling rams. The 1st prize sheep was longish in the neck, but otherwise very good in front. A prospective glance at the leg of mutton did not quite give satisfaction in point of size. The second was a little weak in the head. The third was hollow in the back, and narrow behind the shoulders. One of Sir William Throckmorton's sheep, No. 982 in the catalogue, took the 1st prize at Taunton, but it was light in fleece, small in girth, and had a dark face. In the class of older rams, Lord Walsingham was again successful, taking the 1st and 3d prizes. The first was a very good, heavy, thick-set sheep, with a beautiful head. The third was, perhaps, better in the neck than the first, but had a light thigh, and was weak in the head. Sir William Throckmorton gained the 2d prize with a sheep very good in front and generally level, but deficient in rump. For shearling ewes, Lord Walsingham obtained the 1st prize. His five sheep had grand carcases, but the eyes were fiery, and the heads not well covered. The Duke of Richmond gained the 2d prize with some fine sheep, with plenty of wool behind the ears and on the head. Mr. William Rigden's shearlings, which had the 3d prize, were rather small, but of good character. As a class, the Southdowns exhibited were undoubtedly of first-rate quality.

Shropshires.—Of this breed were shown—shearling rams, 66; rams of any other age, 17; shearling ewes of the same flock (in pens of five) 19—total, 99. The 1st prize for shearling rams was won by Mr. John Coxon, with a very symmetrical sheep, neat and thick, and having a capital head and close good fleece. Its neck was not big, nor was it altogether a large sheep. The 2d prize ram, the property of Mr. Thomas Mansell, was a long sheep, but narrower between the hind legs than, and inferior in touch to, the one which gained the 1st prize. The 3d prize sheep, exhibited by Mrs. Sarah Beach, was good in shape, but deficient in wool, in the thigh, and in girth behind the shoulders. In the class of older sheep, Mr. John Evans obtained the 1st prize, with a very good sheep, excellent behind, and displaying much aptitude for fattening. The 2d and 3d prizes were awarded to Mrs. Sarah Beach. The 2d prize ram was good in front, but a little wanting behind. The 3d was a fine sheep, better than the 2d, in the opinion of some, but its head was most peculiarly wrinkled. Lord Chesham carried off the 1st prize for shearling ewes, with a pen of pretty, well-bred, and symmetrical sheep, which had plenty of wool, but were not so large as some in the other pens. Mr. John Hanbury Bradburne obtained the 2d prize. His sheep were good in size, but not so finely bred as those shown by Lord Chesham. The 3d prize was awarded to Lord Sudeley for ewes of good quality, but rather small. Mr. Thomas Nock received a well-earned commendation for a good pen of large shearlings. We suppose that the white patches on their heads kept the judges from awarding them a prize.

Hampshire and other Short-wools.—Of these breeds were shown—shearling rams, 13; rams "of any other age," 8; shearling ewes "of the same flock," 30—total, 51. The 1st prize was awarded to Mr. Alfred Morrison, for a ram which, in its breed and class, could not easily be surpassed. It was a sheep of good size and quality; good in front and behind, as well as on the back and loins. Mr. James Rawlence won the 2d and 3d prizes. The 2d prize sheep had a queer, thin neck; but was generally level, with a good head and plenty of wool. The 3d was narrow across the shoulders, but in other respects a sheep worthy of the exhibitor, who is well known for his excellent flock. In the class for rams "of any other age," Mr. James Rawlence carried off the 1st prize with a very fine sheep. We should have liked to have seen a little more width between the hind legs. The 2d prize went to Messrs. John and Matthew Arnold, for a heavy, well-shaped ram, with very good fore-quarters and good thighs. It was, however, wanting in rump, rather open in the fleece, and a little hard on handling. Mr. James Rawlence won the 1st and 2d prizes for shearling ewes. His were two excellent pens, showing great character. Mr. John Barton's ewes, which obtained the 3d prize, were inferior in quality to, and were more open in the fleece than, their more successful competitors.

Dorsets.—Of this breed were shown—shearling rams, 6; shearling ewes (in pens of five), 25—total, 31. Mr. Henry Mayo's 1st prize shearling ram was a good sheep, but not faultless. It had a coarse head, was slightly hollow behind the shoulders, and a little light in the hind-quarters. The 2d prize sheep, exhibited by Mr. James William James had a better head, and was very good in front. It was, however, a smaller sheep, falling away behind the shoulder, and very deficient in the hind-quarters. Mr. Herbert Farthing showed a good pen of shearling ewes, for which he received the 1st prize. They were, however, faulty in the horns, which fell back instead of coming nicely forwards. In this point they were surpassed by the 2d prize sheep, the property of Mr. Abraham Bond, whose pen was very nearly equal in excellence to that of the one which had the 1st prize.

The following is the list of awards:—

JUDGES.—Leicesters: C. Clarke, Scopwick, Sleaford; S. Jefferson, Preston Hows, Whitehaven; G. Walmsley, Rudston House, Bridlington.—Cotswolds: J. G. Attwater, Britford, Salisbury; T. Porter, Barnton, Cirencester; E. Ruck, Castle Hill, Cricklade.—Lincolns and Ryland and other Long-woolled: W. Bartholomew, Wadington Heath, Lincoln; J. H. Casswell, Laughton, Folkingham; H. Mackinder, Langton Grange, Spilsby.—Oxfordshire Down: A. Edmonds, Longworth Lodge, Faringdon; H. Overman, Weasenham, Brandon; Z. W. Stilgoe, Adderbury Grounds, Banbury.—Southdown: T. Cooper, Bishopstone, Lewes; H. Fookes, Whitchurch, Blandford: H. Lugar, Ingham, Bury St. Edmund's.—Shropshires: B. Bond, Swansmoor, Great Haywood, Stafford; W. Kemp Bourne, Fisherwick, Lichfield; R. H. Masfen, Pendeford, Wolverhampton.—Hampshire and other Short-woolled and Dorset: W. E. Canning, Elston, Devizes J. R. Newton, Campsfield, Woodstock; H. Thurnall, Royston, Herts.—Inspectors of Shearing: H. Bone, Avon, Ringwood; R. Brown, Wiggiston House, Tamworth; W. Jobson, Butcland, Hexham.

LEICESTERS.

CLASS 59. Shearling Ram.—1st, £20, John Barton, Barton House, Barton-le-Street, Yorkshire; 2d, £10, and 3d, £5, the Executor of the late Lieut.-Col. W. Inge, Thorpe Constantine, Staffordshire. Highly Commended: John Barton, Barton House, Barton-le-Street, Yorkshire. Commended: Geo. Henry Sanday, Holme Pierrepoint; John Barton.

CLASS 60. Ram of any other age.—1st, £20, and 2d, £10, John Barton, Barton House; 3d, £5, G. H. Sanday, Holme Pierrepont.

CLASS 61. Pen of 5 Shearling Ewes of the same flock.—1st, £15, the Executors of the late Lieut.-Col. W. Inge, Thorpe Constantine; 2d, £10, Teasdal H. Hutchinson, Manor House, Catterick, Yorkshire; 3d, J. Borton, Barton House. Commended: Edmund Riley, Kiping Cotes Farm, Beverley, Yorkshire.

COTSWOLDS.

Special Prizes offered by the Oxfordshire Agricultural Society marked thus (†), and the Special Prize offered by the Right Hon. J. W. Henley, M.P., marked thus (††).

CLASS 62. Shearling Ram.—1st, £20, Thomas Brown, Marham Hall Farm, Downham Market, Norfolk; 2d, £10, Robert Lane, Cottage Farm, Eastington, Northleach, Gloucestershire; 3d, £5, T. Brown, Marham Hall Farm.

CLASS 63. Ram of any other age.—1st, £20, T. Beale Browne, Salperton Park, Andoversford, Gloucestershire; 2d, £10, and 3d, £5, John Godwin, Troy Farm, Somerton, Deddington.

CLASS 64. Pen of 5 Shearling Ewes of the same flock.—1st, £15, 2d, £10, John Gillett, Minster Lovell, Witney, Oxon; 3d, £5, Robert Garne, Aldsworth, Northleach, Gloucestershire.

CLASS 66. For the best 10 Ram Lambs.—£10†, Richard Hall, Barford House, Deddington, Oxon.

CLASS 67. For the best Ram of any age.—£5†, John Godwin, Troy Farm, Somerton.

LINCOLNS.

CLASS 68. Shearling Ram.—1st, £20, Thomas Gunnell, Milton, Cambridge; 2d, £10, and 3d, £5, Robert Wright, Nocton Heath, Newton.

CLASS 69. Ram of any other age.—1st, £20, and 2d, £10, Henry Dudding, Panton House, Wragby, Lincolnshire; 3d, £5, W. F. Marshall, Branston. Commended: T. Cartwright, Dunstan Pillar, Lincoln.

CLASS 70. Pen of 5 Shearling Ewes of the same flock.—1st, £15, and 2d, £10, T. Cartwright, Dunstan Pillar, Lincoln.

RYLAND AND OTHER LONG-WOOLS.

Not qualified to compete as Leicesters, Cotswolds, or Lincolns.

CLASS 71. Shearling Ram.—No entry.

CLASS 72. Ram of any other age.—1st, £20, John Lynn, Church Farm, Stroxton, Grantham, Lincolnshire; 2d, £10, John T. Pinches, Hardwicke, Pembridge, Herefordshire.

CLASS 73. Pen of 5 Shearling Ewes of the same flock.—1st, £15, Thomas W. D. Harris, Wotton, Northamptonshire.

OXFORDSHIRE DOWNS.

Special Prizes offered by the Oxfordshire Society marked thus (*).

CLASS 74. Shearling Ram.—1st, £20, and 2d, £10, George Wallis, Old Shifford, Bampton, Faringdon; 3d, £5, Charles Hobbs, Maisey Hampton, Cricklade, Wilts. Highly Commended: G. Wallis. Commended: John Treadwell, A. F. Milton Druce, Sir H. W. Dashwood, Bart., Kirtlington Park, Oxfordshire.

CLASS 75. Ram of any other age.—1st, £20, and 2d, £10, George Wallis; 3d, £5, A. F. Milton Druce, Burghfield, Reading, Berkshire. Highly Commended: J. Longland, Crendon, Northampton.

CLASS 76. Pen of 5 Shearling Ewes of the same flock.—1st, £15, George Wallis; 2d, £10, A. F. Milton Druce; 3d, £5, Frederick Gillett, Upton Downs, Oxon.

CLASS 77. For the best 10 Ewes, without reference to age, who have suckled lambs in 1870.—£15*, John Treadwell, Upper Winchendon, Aylesbury, Bucks.

CLASS 78. For the best 10 Ram Lambs.—£10*, James S. Parker, Iffley, Oxford.

CLASS 79. For the best 10 Ewe Lambs.—£10*, the Executor of the late W. Button, of Eynsham, Oxon.

SOUTHDOWNS.

CLASS 80. Shearling Ram.—1st, £20, 2d, £10, and 3d, £5, Lord Walsingham, Merton Hall. Highly Commended: W. Rigden, Hove, Brighton; W. Throckmorton, Bart., and Lord Walsingham. Commended: Lord Sondes, H. Humphrey, Ashington, Sussex; and J. and A. Heasman, Angmering, Sussex.

CLASS 81. Ram of any other age.—1st, £20, Lord Walsingham; 2d, £10, Sir W. Throckmorton, Bart., Buckland, Berks; 3d, £5, Lord Walsingham. Highly Commended: W. Rigden, Lord Walsingham, the Duke of Richmond, K.G., J. and A. Heasman, and Lord Sondes. Commended: the Duke of Richmond, K.G., and Henry Humphrey.

CLASS 82. Pen of 5 Shearling Ewes of the same flock.—1st, £15, Lord Walsingham; 2d, £5, the Duke of Richmond, K.G., Goodwood; 3d, £5, W. Rigden, Hove, Brighton, Sussex. Highly Commended: the Prince of Wales, Lord Sondes. Commended: the Duke of Richmond, K.G., Colonel Tomline, M.P.

SHROPSHIRES.

CLASS 83. Shearling Ram.—1st, £20, John Coxon, Freeford Farm, Lichfield, Staffordshire; 2d, £10, Thomas Mansell, Adcot Hall, Baschurch, Shropshire; 3d, £5, Sarah Beach, The Hattons, Prees, Stafford.

CLASS 84. Ram of any other age.—1st, £20, John Evans, Uffington, Shrewsbury; 2d, £10, and 3d, £5, Mrs. Beach, The Hattons. Highly Commended: Wm. Baker, Thomas Mansell. Commended: W. G. Preece.

CLASS 85. Pen of 5 Shearling Ewes of the same flock.—1st, £15, Lord Chesham, Latimer, Chesham, Bucks; 2d, £10, J. H. Bradburne, Pipe Place, Lichfield, Staffordshire.

HAMPSHIRE AND OTHER SHORT-WOOLS.

Not qualified to compete as Southdowns or Shropshires.

CLASS 86. Shearling Ram.—1st, £20, Alfred Morrison, Fonthill House, Tisbury, Wilts; 2d, £10, and 3d, £5, James Rawlence, Bullbridge, Wiltshire.

CLASS 87. Ram of any other age.—1st, £20, James Rawlence; 2d, £10, John and Matthew Arnold, Westmeon, Petersfield, Hants; 3d, £5, Stephen King, Bockampton Farm, Lambourne, Berks.

CLASS 88. Pen of 5 Shearling Ewes of the same flock.—1st, £15, and 2d, £10, James Rawlence; 3d, £5, John Barton, Hackwood Farm, Basingstoke.

DORSET.

CLASS 89. Shearling Ram.—1st, £20, Henry Mayo, Cokers Frome, Dorchester; 2d, James William James, Mappowder Court, Blandford, Dorset.

CLASS 90. Pen of 5 Shearling Ewes.—1st, £15, Herbert Farthing, Nether Stowey, Bridgwater, Somerset; 2d, £5, A. Bond, Hunstile, Bridgwater.

PIGS.

THE show of pigs was never excelled at any previous show. Following the order of the catalogue we first

find a class of boars of the "large white breed," in which the Messrs. Howard, of Bedford, secure the 1st place with a pig of wonderful height and length, so much so that the pen was manifestly too small for him. When aroused from his slumbers and made to rise, he struck us as rather narrow.

The 2d prize pig, "Cultivator 5th," was exhibited by the Messrs. Duckering, and although a fine boar, he was not equal in quality with the 1st prize. In the large white boar, young class, we particularly noticed Mr. Matthew Walker's "Hero," a pig of high quality and great size. The same exhibitor was also successful in obtaining a 2d place with an animal barely within the prescribed age, a lengthy, promising pig—"Alfred the Great;" and Mr. Duckering's "Cornet" deserves special notice as a remarkably good-headed and well-formed animal, only 8 months old, or a month younger than the 1st, and more than three months younger than the 2d prize. Mr. G. Chapman brought a good boar all the way from Scarborough in Yorkshire, but was only successful in securing the reserve number.

Among the small white boars Mr. Henry Neild, of Worsley, Manchester, led the way with "The Doctor," an excellent young boar, with a most rare back, beautiful head, and, in fact, admirable throughout. Mr. Peter Eden came 2d with a good 3-year-old boar; and Mr. Hatton secured the reserve with the youngest boar of the class (13 months), a pattern pig in form, with a pretty face, and quality to satisfy the most fastidious. This was an excellent class, and well worth spending more time over than we could well spare. The young boars, below 12 and over 6 months, formed another capital class, in which Mr. Eden took the 1st place with "Young Prince," a pig of admirable quality, covered with silky hair, showing a well carried out broad back and a good style of head. The same remarks are applicable to Mr. Hatton's "Dreadnought," the 2d prize animal; and we could not but pity the judges who were called upon to decide in so fierce a competition, where almost every animal deserved a place.

There was a wonderful show of black pigs, and all persons qualified to judge considered that it had never been equalled. Commencing with the boars of the small black breed, we found the award had been made to Mr. George M'Cann's "Wallace," a somewhat patchy pig, and, in the estimation of many judges, decidedly inferior to the more level and smarter 2d prize, the property of Mr. S. G. Stearn, of Suffolk. So far as carcase is concerned, the 2d prize is a more compact, better grown, and withal a younger pig. His head is defective, but this last remark also applies to the 1st prize pig. Nay, further, there was a little band of knowing ones who admired Mr. G. M. Stearn's "Kingcraft," a smaller, but, on the other hand, younger pig, more than either of the above.

We next arrived at the Berkshire classes, which were remarkably well filled. In the class for boars of any age, Mr. G. Griggs, of Oaklands, near Romford, exhibited a most extraordinary pig. His length is splendid; he girths 6 feet 10 inches; he is of great depth, and carries his meat close to the ground. Both shoulder and loins cannot be surpassed, and his general style and quality indicate abundance of constitution. Good indeed must Mr. Griggs' boar have been, to have beaten Mr. Swanwick's "Sambo 2d," the 1st prize winner at Taunton. Mr. Swanwick takes the 2d place with the boar just mentioned, now 1 year 1 month old, and therefore a year and 4 months younger than the 1st prize. For thickness, liveliness, and quality, it would be difficult to find his equal; but if we must find fault with him, it will be on account of a little narrowness at the loin. We cannot close this notice of a grand class without a word upon Mr. H. Humfrey's pig, which now holds the reserve number, a very nice boar, with a good head, but falling away a trifle in his hindquarters. The boar section of the show concluded with a class for animals not eligible for the preceding prizes. Mr. Fox, of Great Horton, Bradford, and Mr. Peter Eden, obtained respectively the 1st and 2d place; and Mr. Elmhurst Duckering holds the reserve—all with white pigs. We must defer our notice of the sow classes until next week.

The following is the prize-list:—

Judges.—J. Fisher, Woodhouse, Crosshills, Yorkshire; J. Smith, Henley-in-Arden; J. S. Turner, Chyngton, Seaford.

Class 91. Boar of a large white breed, above 12 months old.—1st, £10, Jas. and Fred. Howard, Britannia Farm, Bedford; 2d, £5, R. E. Duckering, Northorpe, Kirton-Lindsey.

Class 92. Boar of a large white breed, above 6 months and not exceeding 12 months old.—1st, £10, and 2d, £5, Matthew Walker, Stockley Park, Anslow, Staffordshire.

Class 93. Boar of a small white breed, above 12 months old.—1st, £10, Henry Neild, The Grange, Worsley, Manchester; 2d, £5, Peter Eden, Cross-lane, Salford, Manchester. Commended: G. M. Sexton, and Mathew Walker, Stockley Park, Burton-on-Trent.

Class 94. Boar of a small white breed, above 6 months and not exceeding 12 months old.—1st, £5, Peter Eden; 2d, £2, William Hatton, Addingham, Leeds. Highly Commended: John Linn, Church Farm, Stroxton, Grantham. Commended: G. Chapman, Seamere, Scarborough.

Class 95. Boar of a small black breed.—1st, £10, George M'Cann, Court Farm, Malvern, Worcestershire; 2d, £5, Samuel G. Stearn, Brandeston, Wickham Market, Suffolk.

Class 96. Boar of the Berkshire breed.—1st, £10, George Griggs, Oaklands, Romford, Essex; 2d, £5, Russell Swanwick, R. A. College Farm, Cirencester.

Class 97. Boar of a breed not eligible for the preceding classes.—1st, £10, John E. Fox, Mansion House, Great Horton, Bradford, Yorkshire; 2d, £5, Peter Eden, Salford, Manchester.

Class 98. Breeding Sow of a large white breed.—1st, £10, Matthew Walker, Stockley Park, Burton-on-Trent; 2d, £5, Jas. and Fred. Howard, Britannia Farms, Bedford.

Class 99. Breeding Sow, of a small white breed.—1st, £10, William Hatton, Addingham, Leeds. Commended: the Prince of Wales; John Wheeler, Long Compton, Shipston-on-Stour, Worcestershire; and G. M. Sexton, Wherstead Hall, Ipswich.

Class 100. Breeding Sow, of a small black breed.—1st, £10, Samuel Geater Stern, Brandeston, Wickham Market, Suffolk; 2d, £5, G. M. Sexton, Wherstead Hall.

Class 101. Breeding Sow, of the Berkshire breed.—1st, £10, Arthur Stewart, Saint Bridge; 2d, £5, Russell Swanwick, of Royal Agricultural College Farm. Highly Commended: A. Stewart. Commended: H. Humfrey, Kingstone Farm, Shrivenham, Berks; and E. C. Clarke, Manor Farm, Haddenham, Thame, Oxon.

Class 102. Breeding Sow, of a breed not eligible for the preceding classes.—1st, £10, Peter Eden, Cross Lane. Highly Commended: P. Eden, and William Halton, Addingham, Leeds. Commended: Francis H. Everett, Bridgham, Thetford, Norfolk.

Class 103. Pen of 3 Breeding Sow Pigs of a large white breed, of the same litter, above 4 and under 8 months old.—1st, £10, R. F. Duckering, Northorpe, Kirton-Lindsey.

Class 104. Pen of 3 Breeding Sow Pigs of a small white breed, of the same litter, above 4 and under 8 months old.—1st, £10, George Mumford Sexton, Wherstead Hall, Ipswich; 2d, £5, Peter Eden.

Class 105. Pen of 3 Breeding Sow Pigs of a small black breed, of the same litter, above 4 and under 8 months old.—1st, £10, George Turner, jun., Alexton Hall, Uppingham, Leicestershire.

Class 106. Pen of 3 Breeding Sow Pigs of the Berkshire breed, of the same litter, above 4 and under 8 months old.—1st, £10, Russell Swanwick; 2d, £5, Richard Fowler, Boughton Farm, Aylesbury.

Class 107. Pen of 3 Breeding Sow Pigs, of a breed not eligible for the preceding classes, of the same litter, above 4 and under 8 months old.—1st, £10, Matthew Walker, Stockley Park, Burton-on-Trent; 2d, £5, George Chapman, Seamere, Scarborough.

Class 108. For the best Berkshire Boar, Sow, and their Offspring, the latter to be under 12 weeks old.—£10, Heber Humfrey, Shrivenham, Berks.

Class 109. For the best pair of Berkshire Boars, from one litter, under 6 months.—£10, Heber Humfrey.

IMPLEMENT YARD, &c.

Last week we gave a general notice of the Implement Department of the Oxford Meeting. We continue the subject, with an illustrated description of the annexed articles, an account of the steam culture trials, and a general review of the prize classes, seeds, roots, and manures.

Hornsby's "Governor."—The annexed illustrations (figs. 184, 185) show a back and front view of the "Governor" self-raker reaper of the Messrs. Richard Hornsby & Sons, with the improvements made upon it since it gained the 1st prize last year at Manchester, and from the subjoined list of prizes the reader will perceive the "Governor" has won its laurels this year also at the Royal Agricultural Society of France. Such results in England and France prove a very high standard of perfection.

With the general mechanism of the reaper, we may take it for granted, the reader is familiar. The simplicity of the movement of the rakes and reels is universally acknowledged to be without a rival, the manner the revolving standard carrying the rakes and reels bends its back automatically, as it were, to the work, being free from the objection of cam friction, &c. Another peculiarity of this machine is the centering of the crank shaft, the length of the connecting-rod, and the working of the knife in a slide-box, so as to give the knife what has been technically termed a direct thrust, *i.e.*, the to-and-fro strokes of the knife are very nearly of uniform velocity and cutting power. It was otherwise with most of the machines shown at Manchester, the one stroke being slow, and the other fast, owing to the obliquity at which the connecting-rod works. The slide-box of Hornsby's knife also acts as a shield, protecting the articulation of the knife with the connecting-rod from dust, &c. Hence its easy action and freedom from heating in the harvest field, and consequent reduction of tear and wear. Hence also the economy of time in sharpening, and the clean cut made. "A sharp scythe makes a good mower," is an old saying, which in principle applies to the reaping-machine.

The knife is now thrown out of and into work by a foot-lever, seen on the pole at the seat of the driver. At Manchester this was done by a hand-lever; but as successful work depends upon the steady driving of the horses—the working of the hand-lever less or more interfered with the steadiness of the rein-hand of the driver; but this objection, which is greater in practice than generally credited, is obviated when the driver can operate the lever with his foot. The end of the foot-lever is held down by a weighted bell-crank lever, seen on the side of the pole, with a catch at the top, and to relieve this catch the driver has only to force it backwards with his heel.

The calculations of the gearing and rakes are made to cut six different sizes of sheaves, as the nature of the crop and season may require; and the sheaves, from the shortness of the platform, are brought round with the least possible injury to the corn. At the outside, or standing corn side of the platform, there is a divider which also lifts laid corn to the knife; and at the other, or inside, a patent lifter for raising fallen heads or laid corn, thus bringing all round on to the platform, thereby making clean work and preventing much waste experienced prior to the use of this invention, more especially in corn over-ripe or much broken down with the weather.

The above improvements, so far as applicable, are shown at Oxford on all the other reapers and mowers of this firm, and the following is the award of prizes and medals recently gained by them at the reaper and mower trials at Charleamoux by the Royal Agricultural Society of France ("Société des Agriculterues de France"):—

1st prize, £40, and gold medal, to Hornsby's Governor self-raker.

2d, £20, and silver medal, to Hornsby's Progress self-raker.

1st prize to Hornsby's Paragon grass-mower.

Campain's Anchor.—Campain's self-acting and self-moving anchor is an important improvement of what is now known as the roundabout system of steam culture. It possesses a twofold advantage over the old plan, 1st, in the economy of manual labour, and, 2d, in affording better anchorage,—two results whose practical importance is borne out by all those who have adapted Campain's anchor to the roundabout system. Thus the two men required to dig the pits at the opposite land's end for the anchors are not required, so that their wages is saved, which is something considerable per acre, more especially with an engine of only 8, 10, or 12-horse power; and, besides the economy of labour thus effected, the digging of pits is objectionable on other grounds in most soils; for, however carefully filled in and levelled, they involve bad cultivation of both headlands. All such objections are obviated by Campain's anchor, whose mechanism and working we shall now proceed to describe with the assistance of the annexed illustration (fig. 186).

The invention, it will readily be seen from the engraving, consists of a self-acting rotary grapnel anchor, placed by means of a transverse axis to the rear end of an improved construction of Fowler's well-known disc anchor. The axle of the two rear disc wheels is rigidly fixed to the carriage frame, but the front one turns on a centre-pin, on the principle of the front wheels of a carriage or waggon; and by means of the lever on the further side, shown in dark ground, and the requisite catch and connecting apparatus, the distance between the disc wheels on each side can be regulated so as readily to pass round a curved headland. The box over the carriage frame is so loaded with earth or stones as to sink the disc wheels to the proper depth, and upon the axis of each disc wheel is a roller to prevent the discs sinking too deep in soft ground on being drawn forward. Under the box is seen the pulley, with the hauling-rope passing over it—the end across the side bar to the implement, and the other end across the end bar round the field. In hauling the implement and the anchor by means of the rope passing over the end bar the anchor is hauled along the headland, provided the rope has sufficient bite on the periphery of the pulley; in other words, provided the angle formed by the two ends of the rope is not obtuse—*i. e.*, greater than a right angle (90°). To regulate the angle at which the rope passes on and off the pulley, two regulating guide pulleys are placed one upon the side bar and the other on the end bar, and these, by means of a slide, each lead on and off the rope at a desired angle. It will be observed that the anchor is hauled forward by means of the axis of the pulley, the mechanical question involving not only the friction or bite of the rope but the revolution of two forces in motion. Into the details of this question we need not go, suffice it to say that the end rope is found in practice to haul the implement forward, and it is only when working at an obtuse angle that the two small guide pulleys are required. The two guide pulleys are not shown in the illustration, but they are placed upon the anchors exhibited.

It will be understood that there is an anchor on each headland, and that between the two anchors the implement is hauled to and fro. As, therefore, the end or roundabout rope hauls one anchor forward, and, by the reverse action, the other, the problem which Mr. Campain had to solve is to stop the anchor on the opposite headland from the implement when it has advanced twice the breadth of the implement, *i. e.*, one "bout;" and this he does effectually by means of his rotary grapnel anchor at the rear end of his disc anchor frame, and the mechanism and working of this grapnel anchor we shall now describe to the reader.

The grapnels are of the common form, and placed two and two on the barrel of the axis, a quadrant between each pair, thus making four pairs; but they may be placed at a sextant, six pairs, or octant, eight pairs: the quadrant, however, is found to meet all the requirements of practice. At one end is seen a quadrant ratchet cam, into which works the tooth or check of the lever, shown white. When the implement comes up to the anchor the porter-boy lifts the lever just so as to relieve the check from the catch of the quadrant ratchet cam. It is then in a self-working position for the reverse action of the rope, or the porter-boy may relieve the check at the opposite headland for immediate action. As the anchor is hauled forward, the two grapnels in the ground give rotation to the grapnel anchor, and as they rise out behind the two grapnels in front enter the ground, so that by the time the disc anchor travels a "bout" of the implement, the lever check comes up the ratchet catch, and thus holds the anchor fast. On the side of the lever is seen rivetted a slide-bar angular-shaped cam, the object of which, by means of two pins put into two holes, and projecting on opposite

sides, is to raise the lever check over every alternate ratchet cam catch, so as to allow the disc anchor to travel twice the distance along the headland before it is stopped by the grapnel anchor. Thus the disc anchor suits implements of twice the breadth. By putting in only one pin, the lever check would pass over one catch for every revolution of the grapnel anchor, and thus adapt the disc anchor to an implement of one and a-half the ordinary breadth. (Siver medal awarded.)

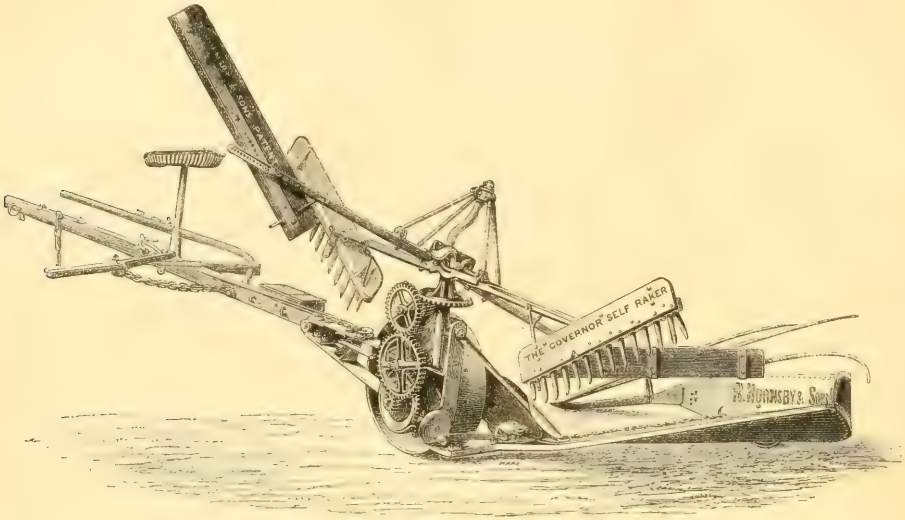

FIG. 184. THE "GOVERNOR" SELF-RAKER (*No. 2 size*).

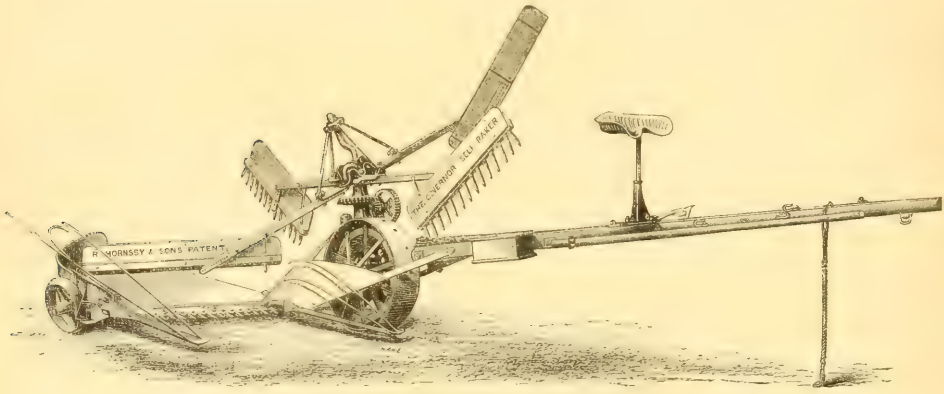

FIG. 185.—THE "GOVERNOR" SELF-RAKER (*front view*).

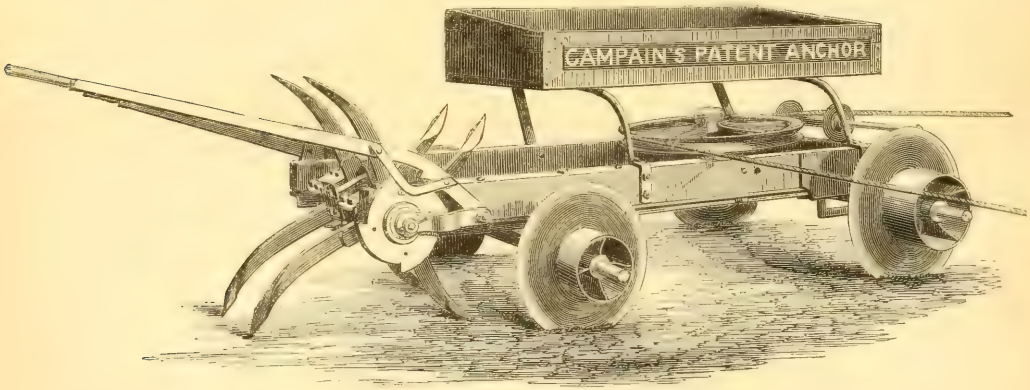

FIG. 186.—PATENT ANCHOR.

Ransome, Sims & Head's new Patent Double-furrow Plough.—The long-vexed problem of turning a double-furrow plough at the headland has been successfully solved by the Messrs. Ransome, Sims & Head, of Ipswich. It is an old remark, that the headland tells us who is the good ploughman and who the bad; and if this is true with a single-furrow plough, how much more so is it with a double-furrow plough? Not one ploughman in a hundred ever kept with the latter his headland in a workmanlike manner, but with the drop-lever lifting wheels the two-furrow plough is more easily managed at the land's-end than a single-furrow one.

The invention is as simple in mechanism as it is effective in operation. The annexed illustration (fig. 187) shows the implement from the turn-furrow side, with the lever-lifting wheels, B, C, in ploughing position. The lifting and lowering levers and apparatus are seen on the land side of the plough for being actuated by the left hand of the ploughman. The two wheels, B and C, have their axes in the extremity of two levers with the fulcrum behind, so that when the plough comes to the headland the ploughman has simply to relieve the lifting apparatus —when the two wheels, B and C, drop down to the same plane — somewhat lower than the plough sole. At wheel B is a spur which lays hold of the ground, thereby necessitating rotation, so that the team hauls the plough out of the ground on to the two-wheeled turn carriage thus formed. All this is done without slackening the pace of the team on the headland, and as B and C rotate independently, each upon its own axis, their movements on the headland are the same in principle as those of a cart, so that they follow the horses along the headland and turn in completely under the control of the ploughman, and when the team turns in, B and C are again, by means of the levers at the left hand stilt placed in the position as seen in the engraving. Wheel C acts as a land wheel, and can be raised and lowered according to the depth of the furrow; and the breadth of the furrows can be readily adjusted, by the expanding beams, from 7 to 12 inches. The wheel B on a two-furrow plough is in the centre between the two beams, as shown in the illustration, but on a three-furrow plough shown at Oxford it is on the outside or turn-furrow side of the front or leading plough: the spur at B remains where shown in the illustration. A being a spur to the common axis of B and C.

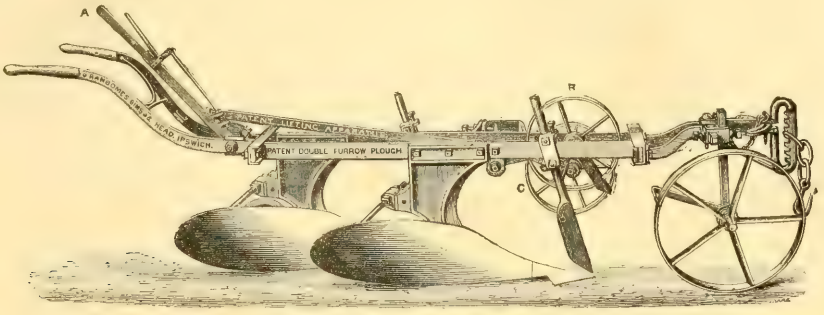

Fig. 187.—DOUBLE FURROW PLOUGH.

The plough has been used successfully on various kinds of soil, one ploughman and three horses doing as much work as two men and four horses in two teams with two ploughs, each turning a single furrow; and when we look at the manner single ploughs wedge their way through the land, friction-fast on side, sole and turn-furrow, there is no difficulty in accounting for the economy of labour.

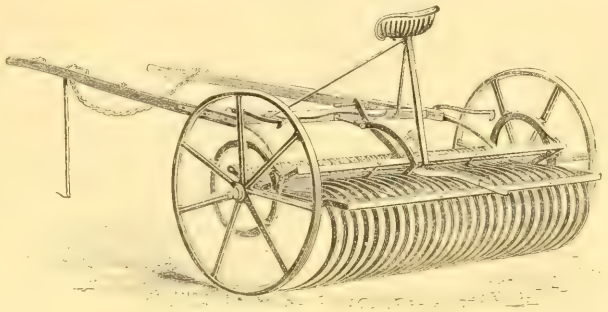

Fig. 188.—SELF-ACTING HORSE-RAKE.

Howard's Patent Self-acting Horse Rake.—The extended use of mowing and reaping machines, hay-making machines, and the growth of heavier crops, is throwing upon the horse-rake a corresponding increase of work. Plodding behind a horse-rake, moving at a brisk pace in the sultry sun of hay harvest, emptying the implement and jumping over the windrows at every few yards, is toilsome, sweaty labour, more than many can endure throughout the length of a long summer day. Hence the manner the driver is dragged along, and hence the way this affects the even working of the rake. Far better for the poor horse to carry the driver on the rake, a proposition which experience has proved sound long ago. But emptying the rake when seated on the implement less or more interferes with its effective working, while most drivers require both hands to guide the horse. This latter difficulty was got over by a foot lever; but foot levers, like hand levers, in heavy crops, are apt to destroy the equilibrium of both the driver and implement, and hence interfere injuriously with the smooth and steady working of the rake and the draught of the horse. The difficulties involved in this brief outline are patent to all who have any experience in the harvest field, and who understand applied mechanics. A farther relief is necessary in the economy of labour both for man and horse, and this is just what the Messrs. Howard have effected by the recent improvement made upon their horse-rake, of which we give an illustration (fig. 188); and besides relief to man and horse, the implement, from moving more evenly and smoothly, makes cleaner and better work. These several improvements we shall now describe.

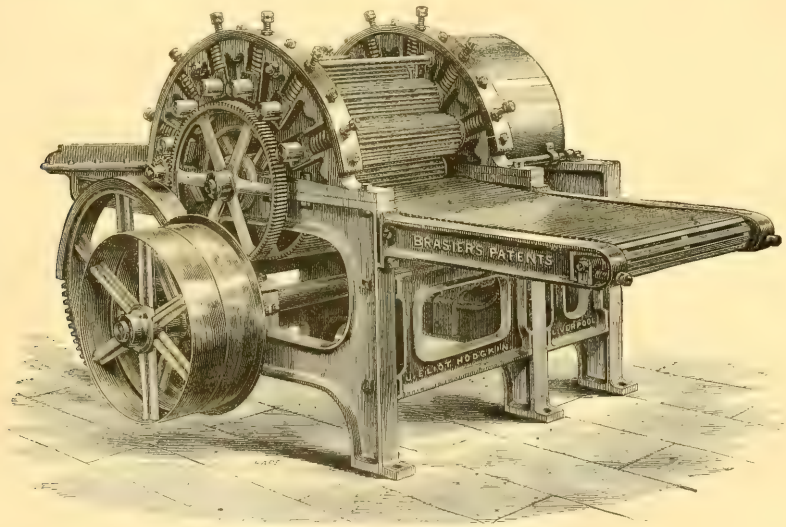

The mechanism is simple, and consists of two drums, one on each wheel, with friction straps, a foot lever,

and the necessary connecting apparatus for making the onward movement of the wheels lift the rake with a very slight pressure of the foot upon the tread of the foot lever. When the rake was lifted wholly by the foot lever the fulcrum pressure of the lever upon the implement was more than twice the resistance, owing to the shortness of the tread end of the foot lever. This extra pressure is objectionable in more ways than one, as it damages the even working of the rake, and entails upon the driver heavy work, and on the working parts much tear and wear. The Messrs. Howard remove this fulcrum pressure from the implement on to the ground, the wheel being in this case an endless lever, and the ground over which it rolls the fulcrum. And as the fulcrum pressure of the foot lever is almost *nil*, such data are sufficient practically as well as scientifically to demonstrate the smooth and easy working of this machine to both driver and horse, and the superior work it makes in raking. As to the extra horse-power expended in raising the rake such is more than compensated by the gradual descent from hauling a loaded rake to hauling an empty one. The hauling of a rake is not a uniform draught that can be represented by two parallel lines, on the contrary, it is a series of inclined planes. In Howard's case the descent from the highest part of one plane to the lowest part of another may be represented by a short incline, but in the old plan a violent jump down, very irksome to the shoulder of a horse—a fact with which all must be familiar who study facts in horse-raking. A silver medal has been awarded this implement.

Frasier's, Hodgkin's, and Bromme's Patent Flax Machinery.—On stand No. 333, John Eliot Hodgkin, of West Derby, Liverpool, and 78, Gracechurch Street, London, exhibits at work hand and power machinery for breaking, scutching, softening, and preparing Flax, Hemp, Jute, China-grass, and other fibre-producing articles, without the waste now experienced from "hards" and coarse tow, turning out at the same time a finer quality of flax, &c. We give an illustration of a 1½ or 2-horse power breaker, with one large fluted roller under six small ones, which, with the attendance of two men, will break from 20 to 30 cwt. of flax-straw in a day. The trials were chiefly confined to the breaking of retted and unretted Flax for spinning, and in both cases the Flax came out so completely separated from the "shive" and softened as to be ready for the "hackler" without scutching, thus avoiding waste from "hards" and "tow." The unretted flax came out somewhat hard and coarse or brittle in the fibre, having evidently suffered from exposure to the sun in harvesting. We draw special attention to this, as an opinion is gaining ground that Flax may be grown and harvested as corn, and afterwards taken from the stack to the breaking and scutching mills; but it must be borne in mind that the fibre sustains less harm in passing through the processes of "water-retting" and "grass-retting," than in drying in the sun so as to fit it for stacking under ordinary management. Whether improved plans of harvesting can be devised so as to obviate injury to the fibre is another question, one into which we do not go. Suffice it to say at present we had the unretted Flax and also the machine illustrated so tested as to prove that the injury to the fibre was due to the harvesting and not to the machine. Indeed the peculiar novelty of this machine is the manner in which it loosens and separates the "shive" or "shove" from the fibre, so that what remains is easily removed by the blades of the scutch mill, the resistance being comparatively *nil*, so that no wasting force, "hards," and "tow" beyond the ends of the flax-straw, is the result. According to the old mode of breaking Flax, the Flax-straw is merely flattened, the fibre being left adhering normally to the "shive," consequently the resistance to the arms of the scutch-mill is great, and as the force of the revolving arms is sufficient to overcome all resistance, the result—technically "roughing"—need not be told to those who have any lengthened experience in growing Flax. The grand desideratum is to separate gently, but effectually, the fibre from the shive, and to soften it, *i. e.*, break the broad flat fibre up into fine threads, as in hackling, so as to reduce the waste in scutching and hackling to a minimum; and this is just what Hodgkin's breaker does most successfully.

We shall now give a general description of the machine illustrated (fig. 189). The application of the power by means of a band over the drum will be understood. A small wheel on the axis of the drum drives the large one seen on the left, the axis of which passes through, and by means of an eccentric gives a reciprocating but gaining rotary motion to, the fluted rollers, which can be diversified by different intermediate gearing, as the requirements of the article operated upon demand. Thus the large fluted roller is seen from below, and the six small ones from their projecting axes. The small ones are held down to the large by means of spiral springs, each of which is screwed down to any desired pressure. A reciprocating but gaining rotary motion is given to a toothed wheel on the axis of the large fluted roller or cylinder by means of the eccentric and intermediate gearing, say six teeth forward but only four teeth backward, so that the Flax is carried forward two teeth at every revolution of the eccentric. If two teeth is too fast the gain may be reduced to one tooth. From the small rollers pressing upon the large one the latter gives a corresponding reciprocating but gaining rotary motion to the former. At the further end of the machine there is a feeding-bench, where the Flax is fed in by the hand of one of the attendants, and as it passes through between the large and small fluted rollers it is completely broken and softened, and at the near end it is removed from the rollers by an endless slotted web, or traveller band, an attendant removing it from the web. The eccentric, connecting-rod, crank, and reciprocating gearing, on the further side, is covered by a shield, seen in the form of a drum. At first sight the working parts appear somewhat complicated; this arises from the number of parts in use; but when the function of each is seen the whole is remarkably simple and easily kept in working order. The fluting of the rollers is different for different sorts of materials, but, in other respects, the mechanism is similar. And the machine not only prepares fibre for spinning and for textile fabrics, but also for the manufacture of paper. This machine gained the 1st prize.

Baxter's Patent Automatic Self-weighing and Registering Machine.—D. Hart & Co., London, the sole manufacturers for Great Britain and Ireland, exhibit this machine on stand 56. In principle, as will be seen from the accompanying illustration (fig. 190), it is a steelyard weighing-machine with a self-acting revolving scale, feed hopper, and registering apparatus the dial and index hand of which is seen near the top of the side standard that supports the feed-hopper. When once the weight of the unit has been determined, the weight upon the graduated beam is placed accordingly, when the revolving scales discharge their contents with unerring accuracy, while the index hand reads oft and registers the number of units—1, 2, 3, and so on, as long as the hopper supplies the revolving scales with the article being weighed; and if the measure of the unit is also determined, the weight and measure will both be ascertained with far greater accuracy than can be effected by manual labour on the common modes of measuring and weighing. It is a well-known fact, for example, that in filling a bushel two people will not put the same or an equal quantity of corn into it. The sack of Wheat or other corn has afterwards to be weighed to check the measure, and as the sacks are not of uniform weight each sack requires to be weighed before it is filled. Now, much, if not all this expense of labour is obviated by the machine under notice, if proper attention is paid to the weight and measure of the unit at the commencement. Thus, if a bushel of Wheat is first carefully measured and then weighed, or the average of several bushels where greater accuracy is desired, and if the weight is found to be 64 lb., then 64 lb. is the unit registered. The weight is then placed upon the graduated beam at 64 lb., and the moment 64 lb. of Wheat flows into the angular scale, so as to raise the beam by "down weight," the descent of that end of the beam shuts off the feed of the hopper; and as the Wheat in the revolving scale is on one side of the axis, the discharge is instantaneous. The turning of the scale on its axis brings the next quadrant compartment under the shute of the hopper, and the instant the 64 lb. of Wheat is discharged down drops the weighted beam—thus opening the hopper again for another 64 lb. of Wheat, and, on doing so, the index registers one unit. The machine is capable of weighing and measuring 10 tons per hour, or 20 tons with twice the size of hopper—128 lb. on the graduated beam, and twice the capacity of the revolving scale. In short, machines may be made of any desired capacity.

The machine is capable of weighing, measuring, and registering all sorts of corn and meal, small seeds, artificial manures—in short, any substance that will flow from the hopper into the revolving scale. It may be attached to any dressing or threshing machine, and thus register the number of bushels, dressed or threshed, and the corn from the machine may be discharged into sacks for market, or it may be conveyed to the granary by means of a traveller-band, or a machine may be so placed as to weigh and measure whatever corn is put into or taken out of the granary.

During the trial week of the show, the accuracy of the weighing-machine was called in question in our presence thus by a maltster—"Would the weight and measure registered satisfy the gauger?" The question is easily answered, for the balance is as delicate and sensible as that of any other, so that the gauger has only to say what the weight of the unit of malt is, when the machine will register the number of units with greater accuracy than can be done on the old plan. With every weighing-machine a certain weight over and above what the scale indicates is required to turn the beam, say, for the sake of argument, half an ounce, and just so is it with Baxter's automatic weighing-machine. We had not time to test with reliable accuracy how much was required to turn the machine under notice, but whatever it is, once known, that if desirable may be added to the weight of the unit, so that the nett weight and measure will thus be registered with greater honesty than can be done by the human hand; and from the simplicity of the mechanism in cutting off the feed from the hopper and in registered, the working parts are easily kept in order and renewed when worn out. The machine, it may be noted, has been highly commended.

Steam Culture, in complete sets, is represented by Fowler & Co., J. & F. Howard, Fiskin & Co., Burrel, Hayes and Thomson, and in parts by various exhibitors. Three exhibit their systems at work in the field, viz., Fowler & Co., Fisken & Co., and Thomson, and these we shall notice separately.

Fowler & Co. have two sets at work on two adjoining fields on Cutteslowe Farm, Banbury Road (A. Sotham, Esq.). The one set consists of two 12-horse engines, each with a winding drum working between them occasionally, as purchasers require; a four-furrow balance plough, two cultivators, a light and a heavy; a heavy harrow with curved tines, covering 15 feet in breadth; a light harrow with straight tines, and a clod-crusher. The second set consists of two 20-horse engines with winding drums, four-furrow plough for deep tillage, a heavy cultivator with leading bridle for the road, a six-furrow digger, a three-"knifer" sub-soiler, heavy harrows with straight tines, a water-cart for supplying the two sets with water, and a portable steam culture bothy for the accommodation of the workmen. Both sets were making excellent work, and the land was well adapted for testing their working capabilities, being very dry, and having imbedded in the subsoil large nodules of stone, which were brought to the surface. And besides the above, which we saw at work in the field, there were on the stand in the yard an eight-furrow light land balance-plough, a steam seed and manure drill with harrows attached, and a large assortment of other implements at the command of intending purchasers for trial in the field.

Fiskin & Co. exhibited their light rope system in a field about three quarters of a mile from the showyard, on the Woodstock Road. It was not at work during the trial week, but occasionally during the show week, to prove its working capabilities to intending purchasers, and was giving very general satisfaction.

Thomson's "road steamer" was at work in a field adjoining the showyard, hauling by direct traction when we saw it a four-furrow plough, the manufacture of John Gray & Co., of Uddingston, near Glasgow. The trial appeared to us rather like a beginning than a matured practice of successful steam tillage, and no doubt it was only intended to show the tractive power of the engine, which, from its proximity to the yard, was attracting much interest. We did not measure the speed of the engine, but it was moving very slowly, and, what surprised many, slower down the slight inclination of the land than uphill. The ploughs were going from 8 to 9 inches deep, and turning a good round furrow. Nothing was done when we were in the field with a dynamometer to test the resistance of the implement and the tractive force the engine can supply for tillage purposes. The dryness of the land was favourable to the bite of the wheel; but making every allowance for this, the opponents of this system of steam-culture were very much at a loss how to account for what they saw done—comparing the nominal horse-power of the engine with the resistance overcome. There has been no little controversy on this subject. The Royal Agricultural Society of England has even proved that a traction-engine, after propelling itself, had not power to spare sufficient for overcoming such a resistance as that which Thomson's little road steamer overcame at Oxford; but mechanical secrets, like other secrets, are sometimes found where least expected, and the fact is, that the force which a stationary engine expends uselessly against its fulcrum on the headland Thomson's engine expends in propelling itself along the land, with something over to add to its tractive powers in hauling the implement. The objection to this system is not an extra expenditure of steam, but the injury done to the land during the season when it is generally ploughed—and as the advantages of steam tillage are greatest when the land is ploughed dry, the prudent course is to leave the objection an open question for the future to settle. Meantime, throw no obstacle before the wheels of progress.

The *Prize Classes of Implements* are fairly represented, generally speaking, but a few of them fall short. Considering the occasion we expected a greater force of steam-engines, but the awarding of the prizes has brought to the test the abilities of the judges, a proof of the standard quality of the manufacture. Both classes of horse-gear are a fine show.

Grinding mills, Sect. 3, are numerous in each of the three classes under this section—stone-grinders and metal-grinders. J. D. Pinfold, Rugby, exhibits a new mill, which may be said to fall under neither of the above classes, the bed being metal, and the runner a stone (Derbyshire Peak stone) or *vice versâ*. The mill has considerable power in grinding, but the meal came from it rather hot.

Sect. 4. Crushers.—A fine show in each of the four classes; and the same may be said of Sect. 5, chaff-cutters; Sect. 6, oilcake-breakers; and 7, turnip-cutters.

In Sect. 8, steaming apparatus, Amies, Barford & Co., are as usual the most extensive and successful exhibitors.

Sect. 9.—Dairy implements form an excellent show. Mr. Hathaway, who takes the second prize, appears as an exhibitor for the first time with a barrel-churn of novelty, the stopper and beaters being placed obliquely to the axis,—a mode of construction which proved highly successful during the trials last week.

Sect. 10. Bone Mills.—The Beverley Iron and Waggon Company and Crosskill & Sons are the most successful exhibitors in this class. Sect. 11 falls below merit. Coprolite mills, Sect. 12, are shown by E. R. & F. Turner, of Ipswich.

Sect. 13. Flax-breaking Machines.—Three exhibitors enter, but only two appear; and the flax-breaker of Mr. John Eliot Hodgkin, of which we give an illustrated description in another place, is the best machine of its class.

Sects. 14 and 15, tile machinery and draining tools, remind us of the Leicester meeting, the same exhibitors being opposed to each other; but at Oxford Mr. Pinfold is first, and Whitehead second. The draining tools exhibited by Hunt & Pickering are those which took the 1st prize at Leicester.

The miscellaneous awards of silver medals and commendations extend over a great variety of articles, and it is very gratifying to notice that two silver medals and a high commendation have been awarded to three of the articles illustrated in another place since they were selected—viz., Campain's anchor and J. & F. Howard's patent self-acting appliance to horse-rakes; and the same may be said of Mr. Hodgkin's flax-breaker, which has obtained the 1st prize in its class.

SEEDS AND ROOTS.

THE number of seedsmen in this department falls rather below what we expected, but those present have done their duty, and in a style of artistic grandeur far beyond anything we have ever seen. Such was the imposing sight that the first impression was to photograph the whole, and it was some consolation to see the "tripod box" in use opposite Sutton & Sons' stand: we trust it has gone along the whole. And what is more, the quality of the articles exhibited is in keeping with the display of artistic ornament, taste, and harmony of arrangement. We take exhibitors in the order of their stands.

No. 349. *Harrison & Sons, of the Royal Midland Seed Warehouse, Leicester*, show a collection of dried grasses the most suitable for permanent pasture, also seeds and roots of the best quality. Their Potatos show very high germinating powers, thus proving their adaptation for seed. Their grasses growing in pots also prove the vitality of the seed sown.

No. 354. *James Dickson & Sons, of* 102, *Eastgate Street, and "Newton" Nurseries, Chester*, show specimens of dried grasses, fine roots of Mangel and Swedes, the Welsh shepherds' favourite; samples of the different farm seeds, with a select assortment of choice evergreens in pots, in a row along the front of the stand, thus showing it off with great effect.

No. 356. *Sutton & Sons, Seedsmen to Her Majesty the Queen, Reading*, exhibit as usual a splendid selection of the different kinds of seed required by the landed interest, grown with great care by themselves, with a variety of dried specimens therefrom; preserved roots of last year's growth, young plants growing in pots, and, what forms the chief novelty, Mangels of the present year's growth of a very large size, transplanted into a narrow bed of virgin soil along the back of the stand. Along the back the dried specimens are tastefully arranged, immediately below is the narrow bed of the different kinds of Mangels, &c. These, when we first saw them, were fresh and luxuriant, producing a most attractive and telling effect; but before we left the yard the amount of foliage evaporation, from the excessively high temperature, was greater than the supply of sap from below. The long rows of snow-white bags, uniform in external appearance, but agreeably diversified within from the different colours of the seeds, enlivened with the bright green tufts of grasses growing in pots, gracefully placed at suitable distances, appeared as if done by the hand of Nature. And this fine display of agricultural produce was guarded in front by a light crown gilt ornamental fence of antique style, which gave to the whole a very agreeable and harmonious appearance.

No. 358. *Thos. Gibbs & Co., Seedsmen to the Royal Agricultural Society of England*, corner of Half Moon Street, Piccadilly, London, W., have made a move in advance. As usual the quality of the seeds and roots on this stand is first-rate, and the improvement made in the arrangement and mode of exhibition is highly intelligent and satisfactory. In short, the dried specimens, seeds, and roots on this stand will unquestionably form an interesting and instructive study to more than the members of the Society during the period of the show.

No. 360. *J. C. Wheeler & Son, Gloucester*, have a very superior collection of grasses, Clovers, and other agricultural seeds and roots, including their fine varieties of the Potato plant. What chiefly characterises this stand is the manner in which it is divided into panels, each panel representing a geological formation of soil with the grasses best suited for it. This embodies more than a mere ornamental effect; for the moment the eye of the agriculturist catches this or the other formation with its productions, he naturally turns in search of that formation in which he himself is chiefly interested, and when he has found it he will not go away disappointed, the selection being made with very great care.

No. 362. *James Carter & Co., the Royal Seedsmen, High Holborn, London*, have a most excellent selection of seed in seed bags, arranged in long rows, but intersected transversely by rows of pots of growing grasses, which give an enlivening and pleasant appearance to the whole. Instead of dried specimens of the grasses they exhibit coloured engravings of the different kinds of Mangels, Swedes, &c., the colour and form having been taken from roots produced by their own seed. Along the back of the stand they have a life-giving effect. They exhibit, however, dried specimens of their Alpha and Laxton's Supreme Pea, and also of their Hundredfold Pea. Their new White Tripoli Onion and their new Giant Rocca of Naples Onion merit special notice. Flower baskets suspended from the roof, and the golden-rod fence in front, are highly ornamental.

No. 363. *John Kempt King, Great Coggeshall, Kelvedon, Essex*, shows a splendid assortment of seeds and roots, all of his own growing, and of the very best quality.

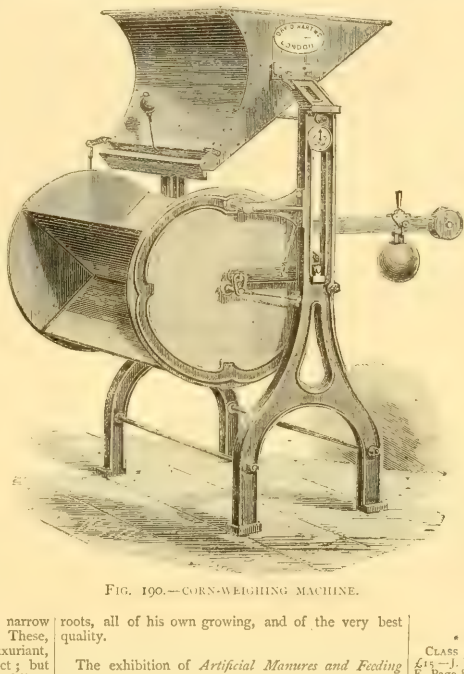

FIG. 190.—CORN-WEIGHING MACHINE.

The exhibition of *Artificial Manures and Feeding Stuffs* in this department of the show is increasingly large, and so are the other *etceteras* equally innumerable in detail.

The following is the prize list:—

JUDGES.—Fixed Steam Engines, Horse Gears, and Steaming Apparatus: Mr F J Bramwell, C.E., 27, Great George Street, and Mr F A Cowper, C.E., 1, Great George Street, London, S.W.—Mills, Crushers, and Coprolite Mills: Mr. H. B. Caldwell, Monkton Farleigh, Bradford-on-Avon; Mr. H. Stephenson, Throckley House, Newcastle-on-Tyne; Mr John Ogilvie, Mardon, Coldstream, N.B.—Chaff Cutters, Oilcake Breakers, Turnip Cutters, and Guano Breakers: Mr. John Hemsley, Shelton, Newark, Mr Matthew Savidge, Sarsden Lodge Farm, Chipping Norton; Mr. Henry Cantrell, Baylis Court, Slough.—Bone Mills, Flax-breaking Machines, and Tile Machinery: Mr John Thompson, Badminton, Chippenham; Mr J. W. Kimber, Tubney Warren, Abingdon; Mr G. M. Hignell, Elmore Lodge, Sutton, Surrey.—Dairy Implements: Mr J. K. Fowler, Prebendal Farms, Aylesbury; Mr. George Jackson, Tattenhall Hall, Chester; Mr. Gilbert Murray, Estate Office, Elvaston, Derby.—Draining Tools and Miscellaneous Awards: Mr J. Sherbin, Boffont, Middlesex; Mr John Hudson, Danchurch, Rugby; Mr John Wheatley, Newick, Driffield.

SECT. I.—FIXED STEAM ENGINES.

CLASS 1.—Fixed Steam-engines of 4-horse power, with boiler complete, £20.—Clayton, Shuttleworth & Co., £9; Brown & May, £6; Reading Ironworks, £5. Highly Commended: Marshall, Sons & Co. Commended: Robey & Co., and Davey, Paxman & Davey.

CLASS 2. Fixed Steam-engines of above 4-horse power, and not exceeding 10-horse power, to be worked by an independent boiler, £30.—Clayton & Shuttleworth and Reading Iron Works Company (equal), each £11 5s; Marshall, Sons & Co., £7 10s.

SECT. III.—MILLS.

CLASS 1. Mills, with stone grinders, for grinding agricultural produce into meal, by steam or horse power, £20.—John Weigheli, £8; E. R. & F. Turner, £7; Marshall, Sons & Co., £5. Commended: Reading Iron Works Company, South & Grace.

CLASS 2. Mills, with metal grinders, for grinding agricultural produce for feeding purposes, by steam or horse power, £20.—Amies, Barford & Co., £8; Thomas Corbett, £7; E. & H. Roberts, £6.

CLASS 3. Mills, with metal grinders, for grinding agricultural produce for feeding purposes, by hand power, £10.—No award.

SECT. IV.—CRUSHERS.

CLASS 1. Corn Crushers by steam or horse power, £15.—Ransomes, Sims & Head, £6; F. H. Bentall, £5; Woods, Cocksedge & Warner, £4. Commended: E. R. & F. Turner.

CLASS 2. Corn Crushers by hand power, £10. E. H. Bentall, £6; Woods, Cocksedge & Warner, £4.

CLASS 3. Linseed Crushers by steam or horse power, £5.—E. R. & F. Turner, £5.

CLASS 4. Linseed Crushers by hand power, £10.—E. R. & F. Turner, £6; Pickseley, Sims & Co., £4.

SECT. V.—CHAFF CUTTERS.

CLASS 1. Chaff Cutters to be worked by steam or horse power, £20.—Richmond & Chandler, £10; E. H. Bentall and Pickseley, Sims & Co. (equal), each £5. Highly Commended: Carson & Toone. Commended: J. Cornes & Co., and Allcock.

CLASS 2. Chaff Cutters to be worked by hand power, £10.—Richmond & Chandler, £6; Pickseley, Sims & Co., £4. Highly Commended: Smith & Grace, E. H. Bentall.

SECT. VI.—OILCAKE BREAKERS.

CLASS 1. Oilcake Breakers, for large and small cake, to be worked by steam or horse power, £15.—Amies, Barford & Co., £6; E. R. & F. Turner, £5; Hunt & Pickering, £4.

CLASS 2. Oilcake Breakers, for large and small cake, to be worked by hand power, £10.—Withheld.

SECT. VII.—TURNIP CUTTERS.

* For steam or horse power. † Specially adapted for hand power.

CLASS 1. Turnip and Root Cutters, £15.—R. Hornsby & Sons, £7; Hunt & Pickering and R. Hunt (equal), each, £4.

CLASS 2. Root Pulpers, £15.—Richard Hornsby & Son, £7*; Pickseley, Sims & Co., £4*; R. Hornsby & Sons, £4†. Highly Commended†: Pickseley, Sims & Co. Commended*: T. Corbett. Commended†: S. Corbett & Son.

SECT. VIII.—STEAMING APPARATUS.

CLASS 1. Steaming Apparatus for the preparation of food for stock, £20.—Amies, Barford & Co., £12 and £8.

SECT. IX.—DAIRY IMPLEMENTS.

CLASS 1. Churns worked by hand power, £10.—Robert Tinkler, £4; George Hathaway, £3 10s.; Thomas Bradford & Co., £2 10s. Highly Commended: Thomas & Taylor. Commended: Richardson & Robertson, W. Wade.

CLASS 2. Churns worked by any other power, £10.—Robert Tinkler, £4 10s.; Robertson & Richardson, £3; Thomas Bradford & Co., £2 10s.

CLASS 3. Cheese Tubs, £10.—Mellard's Trent Foundry, £3. (The judges have withheld the balance of the amount offered for this class.)

CLASS 4. Cheese Presses, £10.—Southwell & Co., £4 10s.; Mellard's Trent Foundry, £3; J. Cornes & Co., £2 10s.

CLASS 5. Other Dairy Utensils, £10.—J. Cornes & Co., for curd drainer, &c., £2 10s.: Southwell & Co., for curd mills, £2 10s.: Carson and Toone, for cheese turner and general collection of cheese-making apparatus, £2 10s.: Allway & Son, for general collection of utensils for butter making, £2 10s.

SECT. X.—BONE MILLS.

CLASS 1. Bone Mills to be worked by steam or other power, £20. Beverley Iron and Waggon Company, £9 and £6; W. Crosskill & Sons, £5.

SECT. XI.—GUANO BREAKERS.

CLASS 1. Guano Breakers worked by hand power, £20.—Prize withheld for want of merit.

SECT. XII.—COPROLITE MILLS.

CLASS 1. Coprolite Mills, £10.—E. R. & F. Turner, £10.

SECT. XIII.—FLAX BREAKING MACHINES.

* For steam or horse power. † For hand-power.

CLASS 1. Flax-breaking Machines, £10.—John Eliot Hodgkin £6*; J. E. Hodgkin, £4†.

SECT. XIV.—TILE MACHINERY.

* For steam or horse power. † For hand-power.

CLASS 1. Machines for the Manufacture of Draining Tiles, £15.—J. D. Pinfold, £8*; J. Whitehead, £7†. Commended†: E. Page & Co.

SECT. XV.—DRAINING TOOLS.

CLASS 1. Draining Tools, £10.—Hunt & Pickering, £6; Clarke & Son, £4. Highly Commended: F. Parkes & Co.

MISCELLANEOUS AWARDS.

To agricultural articles and essential improvements therein, 10 Silver Medals.

Amies, Barford & Co., portable metal corn-grinding mill with dressing apparatus; Amies, Barford & Co., Campain's patent anchors for steam cultivation; W. Barton, cottagers' patent cooking stove; J. & F. Howard, patent self-acting appliance to horse rake; G. Murray, collection of models for a cheese factory; Pooley & Son, automatic grain scale; Robey & Company, patent self-feeding apparatus for threshing-machine; J. & B. Sainty, patent wood covering for temporary buildings, &c.; James Sinclair, chemical fire-engines. The remaining medal has not been awarded.

Highly Commended.

Amies, Barford & Co., steam cooking apparatus; T. Baker, tip cart; W. Ball & Son, patent double break on waggon; Barrows and Stewart, improved windlass for steam cultivation; Beverley Iron and Waggon Company, self-acting sheaf delivery to reaping-machine; Thomas Corbett, improvement in hand Clover-seed barrow; James Davey, improved cart harness; J. Fowler & Co., traction-engine on springs; Hart & Co., self-registering corn-weighing machine; Holmes & Sons, improvement in hay and corn elevator; Hornsby & Sons, combined corn-dressing and screening machine; T. Hunter, Dickson's patent double-drill Turnip-cleaner; T. MacKenzie & Son, reaper and mower knife-grinder; G. W. Murray & Co., combined double-furrow plough and subsoiler; Thomas Perkins, patent folding shafts for reaping and mowing machines; Rainforth & Son, improved patent corn-screen, Raymond & Chandler, litter-cutter; J. & B. Sainty, improved cattle crib; Southwell & Co., improvement in ridging plough; William Smith, sheep-rack; R. W. Thomson, patent road steam-engine.

Commended.

J. P. Barford, improved carriage jack; Henry Denton, improvement in a chain-harrow carriage; MacKenzie & Son, improvements in Turnip and Mangel drill; H. J. & C. Major, roofing tiles; J. & B. Sainty, improvements in field gate, and in sheep fencing; R. Winder, machine for tarring sheepfold netting.

STEWARDS OF DEPARTMENTS.—Live Stock: Mr. Davies, Mr. Jacob Wilson, and Sir Watkin W. Wynn, Bart., M.P.—Implements: Sir A. K. Macdonald, Bart., Lieut.-Col. Wilson, Mr. C. Wren Hoskyns, M.P., and Mr. W. J. Edmonds (Steward Elect).—Finance and Showyard Receipts: Major-Gen. Viscount Bridport, Col. Kingscote, M.P., Mr. Davies, Mr. Randell, and Mr. Torr.—Forage: Mr. J. Druce.—General Arrangement of Show: Mr. Brandreth Gibbs.

ANNUAL MEETING OF MEMBERS.

THE Annual Meeting was fully attended, a good deal of interest being excited by the recent competition for Mr. Mason's prizes for the best-managed farm in a large district around the city of Oxford. The Duke of Devonshire occupied the chair, and was well supported by noblemen and numerous other friends and promoters of agriculture. The successful competitors for Mr. Mason's prizes are as follows:—1st, Mrs. Millington, Ardly, Bicester; 2d, Mr. John Treadwell, Lower Winchindon, Aylesbury; 3d, Mr. Craddock, Lyneham, Chipping Norton; 4th, Messrs. N. & Z. Stilgoe, of Adderbury, Banbury; and Mr. Denchfield, Easington, Banbury, all of whom were highly commended.

Another important point in connection with this meeting was Mr. Howard's protest against the unwieldly dimensions of the showyard. He vigorously impressed upon the Council and members the importance of restricting the exhibition of implements to agricultural machinery, and to refuse show room to the many miscellaneous articles, remote in their connection with agriculture, which now claim the attention of visitors. He also suggested the propriety of limiting the number of duplicates which now crowd the miles of canvas through which the public have to find their way.

The meeting terminated with the installation of Lord Vernon in the presidental chair for the next year.

HIGHLAND AND AGRICULTURAL.

AT a special meeting of the directors of this Society, held the other day, the Board having taken into consideration the proposal by Mr. Harvey, Whittingham Mains, at the general meeting, that the Society should have a chemist in Edinburgh to whom members might apply, were of opinion that no very great inconvenience was imposed on members by the chemical department being conducted in Glasgow, and under existing circumstances they saw no reason for making any change, as the work can be more satisfactorily performed at the head-quarters of the Society's chemist than in a smaller establishment under his superintendence in Edinburgh.

Judging of Stock.—The following letter from Lord Kinnaird, and the Secretary's reply, were laid before the Board on the 22d ult.:—

"DEAR MR. MENZIES, I wish you would ask the directors of the Highland Society, at their first meeting, if they would agree to appoint a small committee of gentlemen who have acted as judges to consider whether it would not be possible to frame a set of rules for the guidance of judges at the shows, according to points, after the manner in which prizes are accorded in rifle matches. It might be tried first with the Shorthorn class. This plan would, I am sure, give very general satisfaction. Certain points being specified, the judges would have to report their opinion on each individual point, rather than their impression of the merits of the animal generally, and by this means the exhibitors would be satisfied on what grounds their animal was rejected or approved. I do not like generally to question the decision of judges, and I know how difficult it is to obtain the services of experienced hands, owing in many instances to their having some interest in the stock exhibited; but still this difficulty can be overcome. Witness the judging at Inverness, Aberdeen, and Dundee, where it was at once seen, by the way the judges set to work, that they were well qualified for their duties. How different was the case in Edinburgh. There the gentlemen evidently had no experience in judging. There was scarcely a decision which was in accordance with the opinion of the many good judges in the yard. I should prefer not bringing my own case forward, but it was so singular, and so much to the point, and being naturally better acquainted with my own case than any other, that I must mention it. Mr. Young, the manager for Sir W. Stirling-Maxwell—and there is not a better judge of Shorthorns in Scotland—volunteered to tell me, before the judges went round, that his heifer was fairly beaten by mine; and I will venture to say, though the surprise of those looking on was great, no one could have been more surprised than Mr. Young himself at finding his heifer placed before mine. I may say, '*Ex uno disce omnes.*' I am certain that a small committee of practical men would find no difficulty in fixing the relative value of the different points in a Shorthorn; and a schedule attached to these rules—'very good,' 'good,' 'indifferent' or 'bad,' with relative numbers—each judge filling these up in the schedule—would lead to very satisfactory decisions, and allay much of the dissatisfaction which prevailed to a very great extent at the last show in Edinburgh among the fanciers of Shorthorns.—Believe me, &c., (Signed) "KINNAIRD."

"Rossie Priory, Inchture, N.B., June 4, 1870."

"P.S.—June 7.—I am not sure whether this is a *copy* of my letter to you, or whether it is the original copy which has not been posted. If it is a copy please return it to me."

"3, George IV. Bridge, Edinburgh, 8th June, 1870.

"DEAR LORD KINNAIRD,—I have this morning received a letter from you, dated 4th June, with a P.S. dated the 7th, and as I have not received any other letter from you on the same subject, I presume it is the original, and intended for me. I have a meeting of directors on the 22d, but as it is purely to arrange the business for the general meeting, which is held immediately after it, I fear there will not be time to discuss your scheme. I will, however, lay your letter before them, and as there is another meeting of the Board on the 29th, it will likely be postponed till then.—Yours faithfully,

(Signed) "F. N. MENZIES."

The Board, on the 22d, having taken the subject under careful consideration, unanimously directed the Secretary to send the following answer:—

"3, George IV. Bridge, Edinburgh, June 22, 1870.

"DEAR LORD KINNAIRD,—I laid your letter of the 4th of June before the Board of directors to-day, when I was instructed to inform your lordship that they were unanimously of opinion that it would not be advisable to alter the present system of judging stock adopted by the Society.—I am, dear Lord Kinnaird, yours truly,

"F. N. MENZIES.

"Lord Kinnaird, Rossie Priory, Inchture."

On Wednesday Mr. Menzies read to the Board the following letter, received that morning from his lordship:—

"Coburg Hotel, Charles Street,
Grosvenor Square, June 28, 1870.

"DEAR SIR,—I am not surprised, though I may regret, the refusal of the directors even to entertain the question of judging by points the merits of Shorthorns, having some experience of the unwillingness of the directors of the Highland Society to consider any new proposal; and I have little doubt that to the end of all things the same routine in the management of the affairs of the Society will be observed which has existed ever since I have been a member of it—that is to say, for forty years at least—causing the Society to act as a drag on, rather than a leader in, agricultural improvement, with an occasional waste of power by a somewhat questionable interference in political matters. I trust that you will be able to secure the services of judges for the show at Dumfries who at least understand their duties, in order that there may be some chances of a fair judgment of stock.—I remain, yours faithfully,

(Signed) "KINNAIRD.

"F. N. Menzies, Esq."

The Secretary was directed by the unanimous finding of the Board to write to Lord Kinnaird in the following terms:—

"3, George IV. Bridge, Edinburgh, June 29, 1870.

"DEAR LORD KINNAIRD,—At a meeting of the Board, held here to-day, I was instructed to acknowledge receipt of your lordship's letter of the 28th inst.—I am, yours faithfully, "F. N. MENZIES.

"The Right Hon. Lord Kinnaird, K.T."

The other business before the Board had reference to the appointment of judges and other matters connected with the Dumfries show.

Miscellaneous.

THE RELATIONS OF MASTER AND SERVANT are most unsatisfactory. The servants have always seemed to me to regard the masters as their natural enemies. There is an extraordinary lack of sympathy and a feeling of co-operation between them. Their interests are identical; they act towards each other as if their interests were diametrically opposed. It is difficult to apportion the blame: it is certainly not all on one side. On both sides the connection is regarded as more purely a money one than perhaps in any other avocation of life which brings the contracting parties so long and so closely together. It is a common remark that good masters make good servants. There is much truth in the saying. A harsh, overbearing, unreasonable master rarely finds a kindly, obedient, willing servant. I am not desirous to say anything uncomplimentary of the farmers before what I know to be a respectable portion of their class, for if farmers deserve to be spoken of respectfully anywhere I believe it is in Northumberland. But Northumberland, though an important agricultural county, is unfortunately only a small portion of the whole country. Any man with the slightest power of observation who has stood in a hiring market, especially if he has been there looking for an engagement, cannot have overlooked the principles on which the farmer, as a rule, proceeds to make a selection. He is partial to bone and muscle; his object is to secure the greatest amount of work at the smallest possible cost. He strives to secure the man with the most likely *physique* to go through the work on the farm; very little inquiry is thought necessary as to his moral character. It is needless to say that many a gross mistake is committed in this way. Intelligence is not made of sufficient account in the farmer's calculations. The most intelligent men and the best and the most trustworthy servants are thus often entirely overlooked, and a man of this class may go to a hiring market wishing to make an engagement and yet return without once having been asked his price. Yet from those who knew him he would receive the highest wages. I have known instances of this kind. From these facts I venture to draw the conclusion that many farmers are deficient in an important branch of their education as agriculturists. *Essay read before the Hexham Farmers' Club.*

The Week's Work.

JULY 23.—*Winter Peas*, in our southern counties, are generally harvested by the close of the month. The crop is commonly cut with a long-handled bagging hook, and left loose in parcels on the stubble. In dry weather harvest operations are simple, both in the field and stackyard, all that is necessary being once turning in the field, to prevent the haulm roasting and the pods from opening. In wet weather the reverse is experienced, for when soaked with rain in the field more frequent turning is necessary, whilst the crop, when carried, is liable to mould in the stack. Pea-stacks are bad defenders of rain, and, therefore, they should be covered with the rick-cloth until thatched. Some thatch to the eaves, others thatch down to the bottom, so as to protect the grain and haulm on the sides. The sides may be covered with machine-wove webs of straw, and made fast with pegs, in the same way as the roof, gables, and eaves are secured.

Winter Beans are also generally ready for harvesting in the South in ordinary seasons. In the North the crop is, for the most part, spring sown, and late, being often in the field in October. Beans are sometimes pulled like Flax, but more commonly either cut low with a short scythe or bagging hook. The cut crop is allowed to lie for a short time, the length depending upon the weather. The haulm makes excellent fodder, and, therefore, like Lucerne, Sainfoin, and Clover, it should be turned to prevent roasting. When ready for stacking, the crop is bound up in sheaves with straw ropes, or ropes of some kind previouly laid down for the purpose. Some tie up and stack at the time of cutting, which is the safest plan late in the season, but in July, under a southern sun, the outsides of the sheaves are burnt to snuff before the inside is fit for the stack. Beans stand wet weather better before cut than after, and, therefore, in prospect of rain, it is better to allow the crop to stand for a week or so, until the weather breaks up, as it will be sooner in the stack the one way than the other. Thatch immediately.

Flax intended for the finest description of linen fabrics, as muslins and cambrics, is generally ready for pulling by this time, and before this in early seasons; that grown for rippling-seed, and the coarser sorts of linen, is also, when the Flax is early, ready for pulling by the close of the month. A considerable diversity in the primary and secondary processes of preparing Flax fibre for the market has recently been introduced, but the old plan of pulling, steeping, and dew-retting on the grass is still the common practice. When fit for yielding the finest quality of fibre it is pulled when in full flower, or shortly after, as the quality of the crop may direct. The person in pulling stands with his side to the standing Flax, going backwards, and laying hold of small parcels at a time firmly with both hands, so as not to raise earth and injure the fibre, and when he gets a handful it is laid down so that the next handful or two can be laid across,—the object of laying the handfuls crosswise being to keep the Flax off the ground as much as possible. In this position it is allowed to lie for a short time, when it is bound up in small sheaves, not larger than you can grasp round with both hands, with a band made of a few stems of the Flax. The sheaves are next carted to, and placed upright in, the steep, and loaded with wood and stones to keep them under water. A slow fermentation sets in, and when sufficiently far advanced to allow the fibre to separate freely from the stem when broken, which in warm weather will be in about a week's time, or from ten to twelve days in cold weather, the Flax is ready for dew-retting, which is done by spreading it evenly and thinly over the grass; the grass should previously be mown so as to have an even surface. In spreading the spreader goes backwards, shaking out gently with both hands sheaf after sheaf thinly and evenly over the points of the fingers of both hands equally. It is a very dirty but nice manipulation, and we have always found women better spreaders than men. When sufficiently dew-retted the fibre separates freely from the stem by rubbing. The retted Flax is then tied up in large sheaves and stacked, where it remains until sent to the flax-mill. When the bolls are to be given to cattle, or the seed crushed or used for sowing, the Flax is allowed to become more ripe, as already stated, before it is pulled, but the degree of ripeness is as diversified as the opinion of growers. In Ireland it is a very common practice amongst the larger farmers to ripple into the body of a cart, one person supplying two or three ripplers with the handfuls as pulled, a second person binding up the rippled Flax for steeping. In other respects the steeping, spreading, and dew-retting are the same as above described. Some defer the preparatory processes until an after period, but delay in bringing the flax to market involves a greater sacrifice of time and capital than numbers of the small farmers of the sister country can comply with, a practical reason why the older plans are generally observed.

Sheep Shearing in the Highland walks of the North is generally finished by the middle of the month in ordinary seasons, and the end in late ones. Disastrous results often attend too early shearing; a few days prior to passing the sheep through the shears they are washed by swimming them through and through a pool in a running stream until they are clean, and some

shepherds put them once or twice through the pool as they come from the shears, in order to clean the skin and keep up a healthy action to the surface so as to obviate catching cold by a partial stoppage of the insensible perspiration, naturally very great, of the sheep.

The Dairy.—July weather generally tries the patience of the dairyman, either in making butter or cheese. Great improvements are doubtless being made to prevent the quality of the milk from being injured before it reaches the dairy by the exposure of milch cows to scorching suns, gad-flies, hot weather, improper food, driving before milking, or carrying the milk home joltingly when the milking takes place in the field; but after all the progress made much injury is still sustained before the milk is put into the milk dishes for throwing up cream, or into the cheese-tub for cheese making; hence the conclusion. Again, the milk room in too many instances is not sufficiently cool, and separated from the heat and smells of the other departments of the dairy, as the scullery and cheese-room, while the cream has to be sent to the cool but muggy cellar below for the want of a proper place to keep it in. Such being the rough outline of the facts of the case, there evidently remains much room for further progress in the dairy. *W. B.*

Markets.

ENGLISH WOOL.

The outbreak of hostilities on the Continent has affected the price of English wools, and the market is very unsettled, at a decline of ½*d.* to 1*d.* per lb. For Colonial wools, the sale of which is now in progress, descriptions suitable for Continental buyers are 15 to 20 per cent. cheaper. The decline on home trade descriptions is, however, confined to ½*d.* and 1*d.* per lb., at which there is good competition.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.– *s. d.*	*s. d.*
FLEECES—Southdown hoggets	1 1 to 1	2
Half-bred ditto	1 2 — 1	2½
Kent Fleeces	1 3 — 1	4
Southdown ewes and wethers	0 0½ — 1	1
Leicester ditto	1 2 — 1	3
SORTS—Clothing	0 10 — 1	6
Combing	1 0 — 1	8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, July 20.

Prime Meadow Hay	110s. to 126s.	Clover, old	130s. to 145s.
Inferior do.	90 100	Inferior do.	110 120
New Hay	90 105	Prime new do. ..	110 120
Inferior do.	70 80	Inferior do.	90 100
Straw	24 36	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, July 20.

Sup. Meadow Hay	120s. to 128s.	Inferior Clover ..	115s. to 124s.
Inferior do.	105 112	Prime 2d cut do. ..	—
New do.	100 110	New do.	120 130
Inferior do.	90 95	Straw	32 36
Superior Clover ..	130 145	JOSHUA BAKER.	

WHITECHAPEL, Thursday, July 20.

Fine Meadow Hay	112s. to 120s.	Prime old Clover ..	135s. to 145s.
Inferior do. ..	100 110	Inferior do. do. ..	105 115
Prime New Hay ..	90 100	Prime 2d cut do. ..	110 140
Inferior	80 85	New Clover	115 120
Straw	28 33	Inferior do.	90 105

METROPOLITAN MEAT MARKET.—July 21.

Best Fresh Butter .. .. .. 17*s.* per dozen lb.
Second do. do. .. .. .. 15*s.* „
Small Pork, 4*s.* 8*d.* to 5*s.* 0*d*; Large Pork, 4*s.* 0*d.* to 4*s.* 4*d.* per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, July 18.

There are a few more Beasts than on Monday last, but the demand has considerably increased, and prices have advanced on all descriptions. The number of Sheep is very much smaller, and consequently they are all disposed of at higher rates; choice qualities are very scarce. Choice Lambs and Calves are rather dearer, but the average quality of the supply is very inferior. Our foreign supply consists of 1660 Beasts, 5100 Sheep, 260 Calves, and 60 Pigs; from Scotland there are 20 Beasts; from Ireland, 50; from Norfolk and Suffolk, 390; and 1420 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Here-fords, &c. ..	5 2to5	6	Best Long-wools ..	5 to ..	
Best Shorthorns..	5 0—	5 4	Do. Shorn ..	5 0—5	4
2d quality Beasts	3 8—	4 6	Ewes & 2d quality	.. — ..	
Best Downs and Half-breds ..	.. — ..		Do. Shorn ..	4 4—4	10
Do. Shorn ..	5 4—5	8	Lambs	5 6—6	6
			Calves	3 8—5	6
			Pigs	3 0—5	0

Beasts, 3540; Sheep and Lambs, 21,300; Calves, 290; Pigs, 170.

THURSDAY, July 21.

We have a large supply of Beasts, and the hot weather makes buyers cautious; prices are lower for all kinds, and several remain unsold. The supply of Sheep and Lambs has greatly increased, and the demand is only limited; a clearance cannot be effected, and prices are lower for all descriptions. Calves are also lower in price. Our foreign supply consists of 230 Beasts, 4000 Sheep, 505 Calves, and 20 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Here-fords, &c. ..	5 0to5	4	Best Long-wools..	5 to ..	
Best Shorthorns ..	4 10—5	4	Do. Shorn ..	4 10—5	4
2d quality Beasts	3 6—4	4	Ewes & 2d quality	.. — ..	
Best Downs and Half-breds ..	.. — ..		Do. Shorn ..	4 4—4	8
			Lambs	5 4—6	4
Do. Shorn ..	5 4—5	6	Calves	3 6—5	4
			Pigs	3 0—5	0

Beasts, 1480; Sheep and Lambs, 18,340; Calves, 670; Pigs, 75.

MARK LANE.

MONDAY, July 18.

There was a moderate supply of English Wheat to this morning's market; factors commenced by asking an advance of 8*s.* per qr., with which millers were unwilling to comply. Some few sales were made at about 6*s.* per qr. more money, and some quantity remained unsold at a late hour. For foreign very irregular prices were demanded, and some considerable sales were made at an improvement of 5*s.* to 6*s.* per qr. upon Baltic, and up to 8*s.* upon American qualities. Barley, Beans, and Peas were 2*s.* to 3*s.* per qr. dearer. The Oat trade was firm, at an advance of 2*s.* 6*d.* per qr. The top price of town-made Flour was advanced 7*s.* per sack, and barrels were held for 4*s.* to 5*s.* more money.

PRICE PER IMPERIAL QUARTER.	*s. s.*		*s. s.*
WHEAT, Essex, Kent, Suffolk. White	53—59	Red.....	57 —59
— — fine selected runs..do.	56—63	Red.....	54—60
— — Talavera	57—66		
— — Norfolk		Red.....	—
— — Foreign	45—66		
BARLEY, grind.& dist.,29to33*s.*..Chev.	42—45	Malting ..	36—41
— Foreign .. grinding and distilling	25—33	Malting ..	33—43
OATS, Essex and Suffolk	25—27		
— Scotch and Lincolnshire..Potato	27—29	Feed	—
— Irish .....Potato	26—28	Feed	24—27
— Foreign .....Poland and Brew	27 29	Feed	22—27
RYE	32—36	Foreign ..	33—36
RYE-MEAL, Foreign			
BEANS, Mazagan....37*s.* to 46*s.*..Tick	37—49	Harrow ..	37—49
— Pigeon ....43*s.* to 58*s.*..Winds.	—	Longpod..	—
— Foreign .....Small	44—46	Egyptian.	41 43
PEAS, White, Essex, and Kent..Boilers	37—41	Suffolk ..	40—43
— Maple, 36*s.* to 43*s.* .....Grey	35—38	Foreign ..	36—30
MAIZE	—	Foreign ..	32—34
FLOUR, best marks delivered..per sack	46 -54		
— 2d ditto .....ditto	35 —47	Country ..	35—47
— Foreign .....per barrel	29—31	Per sack..	35—61

WEDNESDAY, July 20.

The grain trade at Mark Lane to-day was not so excited as on Monday. The supply of English Wheat on offer was small, but of foreign was moderate. Factors asked for an advance of 1*s.* per qr., which consequently checked business. For all qualities the demand was quiet, but late rates were fully maintained. There was a fair supply of Barley on sale, and the demand was steady at previous currencies. Malt was inactive, at barely late rates. Oats, Beans, and Peas experienced a moderate inquiry on former terms. Flour was in firm request, and prices were well supported.

ARRIVALS OF GRAIN, &c, INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 150	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	24,920	5340	21,180	940 13,770 brls
	25,070	5340	21,180	

HULL, July 19.—At our market to-day the war excitement ran high, and, notwithstanding the prospect of greatly increased prices should the European complications continue, there was a fair show of Wheat from farmers. A moderate business was done, at an advance of 6*s.* to 7*s.* per qr. Foreign was held for a similar rise. English white was quoted at 60*s.* to 63*s.* per qr.; red, 55*s.* to 60*s.*; Dantzic and Konigsberg white, 58*s.* to 63*s.*; mixed, 54*s.* to 56*s.*; Baltic, red, 56*s.* to 57*s.*; Danish and Hamburg, 54*s.* to 56*s.* Barley was about 2*s.* per qr. dearer, and Beans, Peas, and Oats held for a similar improvement.

AVERAGES.

	Wheat.	Barley.	Oats.
June 11	46*s.* 1*d*	33*s.* 1*d*	22*s* 0*d*
— 18	48 0	32 5	25 0
— 25	50 5	33 5	25 1
July 2	51 6	32 0	25 10
— 9	50 7	30 3	25 8
— 16	49 8	31 2	25 6
Average ..	49 4	32 1	24 10

HOPS.

BOROUGH MARKET, July 21.

Messrs. Pattenden & Smith report the market without alteration, the demand being of an entirely retail nature, at nominally unchanged rates. The plantation accounts continue on the whole favourable, though in some instances, especially on the light soils, the plant is turning yellow from want of rain.

SEED MARKET.

Our markets continue in the quiet state described in our last; the articles which have chiefly engaged the attention of the trade during the past week have been Mustard, Rape, and Trifolium seed. Several samples of new English Rape seed have been shown, but prices seem scarcely yet fixed. New Mustard seed may be expected in about a fortnight's time. The samples of new Trifolium vary very much in quality; it appears probable that values will be on a high level. English winter Tares are now being harvested; the new crop will, it is thought, be very deficient. New home-grown Trefoil seed is offering at moderate rates.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—July 20.

Holywell Main, 17*s.*; West Hartley, 16*s.* 6*d.*; Walls End Braddyll's Hetton, 16*s.* 9*d.*; Walls End Hetton, 18*s.*; Wall's End South Hetton, 17*s.* 9*d.*; Walls End Hartlepool, 17*s.* 3*d.*; Walls End Heugh Hall, 17*s.*; Walls End Kelloe, 16*s.* 6*d.*; Walls End South Kelloe, 17*s.* 3*d.*; —Ships at market, 23; sold, 20; unsold, 3; at sea, 40.

"Every Cottage should be provided with a Water Tank." *Disraeli.*

Iron Cisterns.

F. BRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (ERA WORKS), are prepared to supply WROUGHT IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

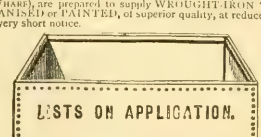

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.

F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.

N.B. Open Tanks of different sizes packed one in another to save carriage.

Cottam's Iron Hurdles, Fencing, and Gates.

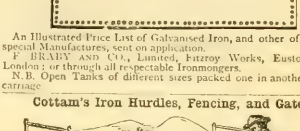

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55*s.*

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings not secured by Patent.

MOULE'S PATENT EARTH SYSTEM.

From Mr. W. GILBERT,
Lansford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

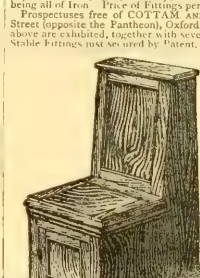

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

Kosher's Garden Edging Tiles.

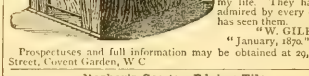

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GARDEN VASES, FOUNTAINS, &c, in Artificial Stone, of great durability and superior finish, and in much variety of design.

F. & G. KOSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balcomes, &c, as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.

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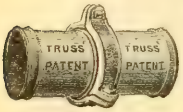

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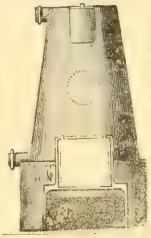

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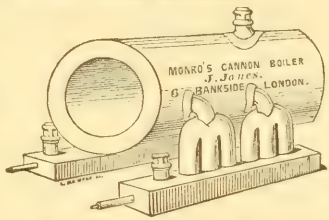

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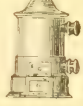

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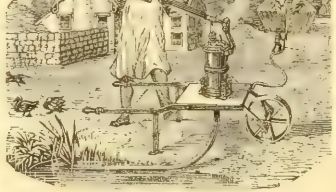

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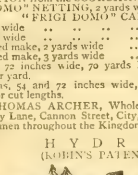

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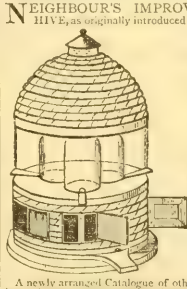

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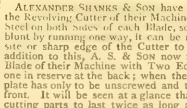

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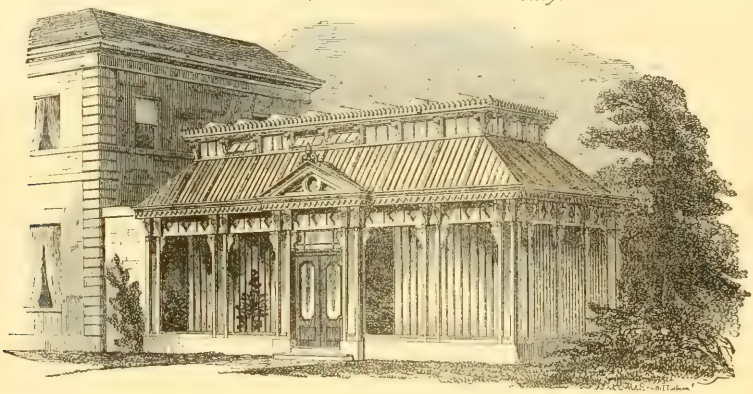

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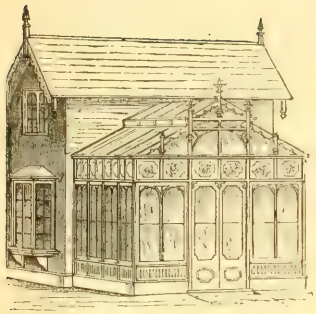

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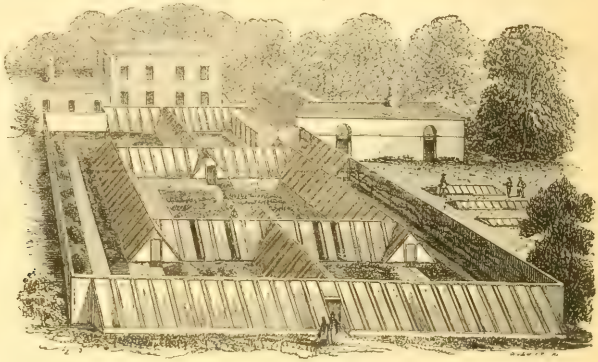

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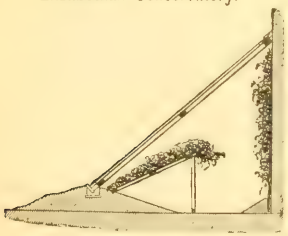

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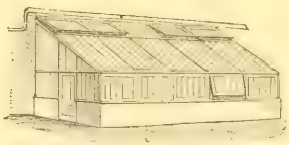

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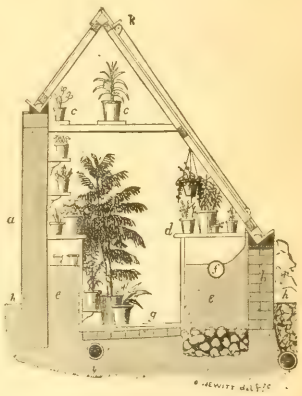

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No. 31.—1870.] SATURDAY, JULY 30. {Price Fivepence. / Stamped Edition, 6d.

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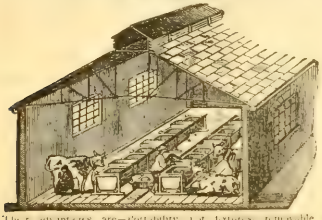

The advantages are—Portability, for Litters, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Draft Cover to prevent overgorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 5*l*.

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Full directions sent with each Drill. On receipt of stamps or Post-office Order, mail to the above JOSIAH LE BUTT, Patentee and Manufacturer of the Crimpon Haymaker, Jury St. Leonards. A Drill will be sent immediately. Price 12*s.* 6*d.* The name of the nearest station should be given.

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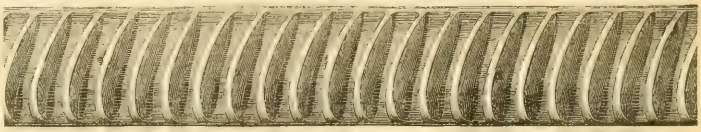

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Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

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"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

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DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

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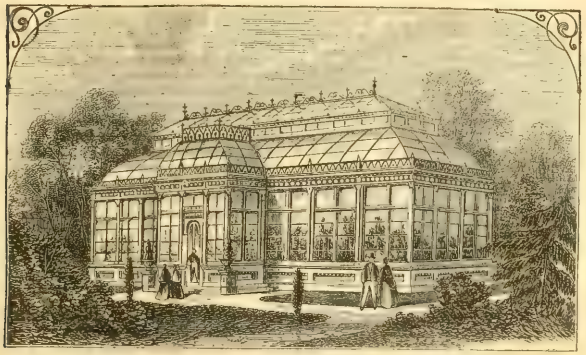

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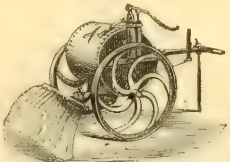

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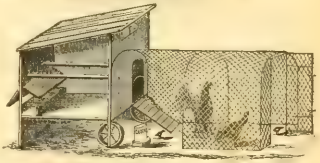

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10 Gallons	.. ..	£3	0 0
16 ,,	.. ..	3	16 0
28 ,,	.. ..	5	1 0
42	.. ..	5	13 0

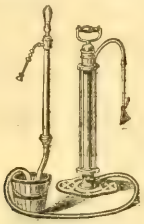

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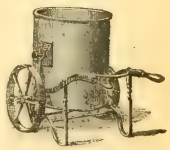

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HAVE WON, EVER SINCE 1852, WITH ONE EXCEPTION,

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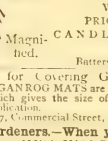

Each.—s. d		Each.—s. d
2 inches in diameter .. 0 3½	12 inches in diameter	.. 1 9
3 " " .. 0 4½	13 " "	.. 2 0
4 " " .. 0 5½	14 " "	.. 2 6
5 " " .. 0 6½	15 " "	.. 3 0
6 " " .. 0 8	16 " "	.. 3 6
7 " " .. 0 10	17 " "	.. 4 0
8 " " .. 1 0	18 " "	.. 5 0
9 " " .. 1 2	19 " "	.. 6 0
10 " " .. 1 4	20 " "	.. 7 0
11 " " .. 1 6		

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter ..	os. 6d.	9 inches in diameter ..	1s. 8d.
5 " " ..	0 8	10 " " ..	2 0
6 " " ..	0 10	11 " " ..	2 6
7 " " ..	1 1	12 " " ..	3 0
8 " " ..	1 4		

Either flat or conical tops.

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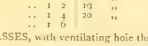

21 inches long ..	2s. 6d	16 inches long ..	1s. 4d.
20 " ..	1 11	14 " ..	1 2
20 " ..	1 8	12 " ..	2 0
18 " ..	1 6		

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Each.—s. d		Each.—s. d
12 inches	0 6	20 inches 10 6
14 "	7 6	22 " 11 6
16 "	8 6	24 " 12 6
18 "	9 6	

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*** All Flower Seeds sent post free.

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The Gardeners' Chronicle

SATURDAY, JULY 30, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, Aug. 3 { Royal Horticultural (Fruit and Flora Committee), at S Kensington .. 11 A.M. / Ditto (General Meeting) .. .. 3 P.M.

UP to the time of our writing last week we had hopes that the attendance at the OXFORD SHOW of the ROYAL HORTICULTURAL SOCIETY would have been sufficient to have secured the Society from absolute loss. We hear, however, that our hopes were not well founded, and that the result will show that our doubts, expressed at the time when the meeting at Oxford was first projected, will turn out after all to have been more than justified. It is easy after the event to say we prophesied this or we feared that, but if we now call to remembrance our unfavourable opinion on the policy of the Society in going to Oxford at all, and criticise the way in which the arrangements were carried out when it was decided once more to hunt in couple with the Royal Agricultural Society, it is from no feeling of hostility, but rather with the hope that the experience now gained may be profitable for the future.

We have always been the advocate of provincial shows, because we have from the first seen what advantages to the body horticultural were likely to accrue from them. Moreover, we have had as good, nay, probably better, opportunities than the Society itself for estimating the importance set on them by the *élite* of the gardening fraternity. We have been in a position to see how excellent was the opportunity for the Society to assert itself as the leader and upholder of horticultural progress.

The cream among the exhibitors, the best among the practical devotees of the art, the leaders among the scientific *attachés*, all gave in their adhesion to the project, and lent it what assistance they could. Everyone, with the exception of a very small band of implacables or noncontents, confided in the Society—wished it well, and a large number helped with brains and hands to secure a favourable issue ; and the result is something very like a failure. Where is the fault? will be the natural inquiry. Let our readers judge for themselves as to this matter ; in the meantime, as we have adverted to past shortcomings, it is incumbent on us to offer suggestions—mere suggestions, to be taken for what they are worth, and to be moulded by circumstances—as to the general course to be followed in the future.

We presume that the general proposition as to the desirability, at least once a year of holding a large exhibition in the provinces, may be taken as affirmed. The question then arises as to how this should be carried out, and this turns very much on the locality to be selected, the arrangements to be made, and the time when the show should be held. Obviously the locality should be in or near some town with a large population, easy of access and in the centre of a horticultural district. Oxford failed, as we believe, in two of these requirements : its population is relatively small —especially in long vacation, and hence both societies, agricultural as well as horticultural, suffered severely. Oxford, again, is not—in the sense that York or Leeds, Nottingham or Manchester, Edinburgh or Glasgow are—a horticultural centre.

The arrangements to be made should be on such a broad and liberal scale as to create at once an impression in favour of the Society, and secure for it a due amount of respect from outsiders. Amongst the population and local magnates of Oxford—nay, even among those who by the nature of their avocations might be reasonably expected to know somewhat of the Society, its objects, and its whereabouts—how very few knew anything at all about the matter ! Again, the relation to the local societies is a matter of great importance. At Manchester the Royal Horticultural Society got embroiled with the local horticulturists, the value of whose assistance may be measured, not only by what they did not do for the Royal Horticultural Society, but by what they do for themselves every year. At Oxford, where matters seem to have been at least conducted in a more friendly spirit, the conditions were different ; but we may ask what benefit accrued to the Society from the well meant but inefficient aid given by the local Society. Where was the zeal so conspicuous at Bury and at Leicester?—zeal to which the Royal Horticultural Society then owed almost the whole of what success it then attained. Consider how much depends on the local arrangements, and if these fail, or are defective, how great is the disaster. Remember the local arrangements which at Manchester positively, for a time at least, prevented all access by carriage to or egress from the horticultural exhibition ! At Oxford it was only half as bad —the traffic was only stopped in one direction.

Then as to the time when the exhibition should be held. There were at first good reasons to suppose that the presence of so large a concourse of visitors, as the meeting of the Royal Agricultural Society always brings, would of necessity secure a large attendance at the exhibition of the sister Society. But has it been so in any one year? No ; the number of people who visit both exhibitions is very small. Who, in a July day, after visiting the seven miles or so of sheds in the agricultural showyard, has energy enough left to make his way, in spite of local obstructions, to the horticultural tents?

It is a common arrangement in our Cathedral towns to find within a stone's throw of the larger, more important edifice a parish church, it may be in itself replete with interest, but how many strangers, with limited time at command, visit both churches? How much fewer there would be if a turnpike-gate intervened, or an unbridged river, compelling the sightseer to go a mile or two out of his way before he could reach the church. Now this is precisely the position in which the two societies have stood, one to the other. We believe if the Royal Horticultural Society would boldly emancipate itself from the companionship of the Royal Agricultural Society (and which, we believe, would prefer to be left by itself), and carry out its arrangements on so comprehensive a scale as to command the respect of the town they intend to visit, it would, while conferring a great benefit on horticulture and horticulturists, avoid the financial deficit which will be the consequence of the Oxford Show.

VEGETABLE organisation is plastic. There is an inherent hereditary tendency in plants to vary, a tendency which often shows itself we know not why nor wherefore, but which sometimes is traceable to the influence of external conditions. For instance, on physiological grounds, we have good reason to conjecture that, if the present exceptionally dry season be followed by a wet autumn, we shall find all sorts of DEVIATIONS from the ORDINARY FORM. The wood and buds which have been formed this season have necessarily been precociously, and therefore imperfectly. developed. Plants have been quickly driven into flower, and have as quickly shed their blossoms. Leaf development and root growth have been proportionately checked. Indications of these facts are only too plentiful around us, and they will leave their impress also on next season's vegetation. Growth is not only checked now, but as a consequence the amount of material stored up in the plant tissues ready for use when occasion demands is less than it should be. The deficiency may be greater in some cases than in others, it may be compensated for in some instances by the action of favourable conditions ; but these possible exceptions will not invalidate the general truth of our proposition.

Adverting to the variations in form dependent on climatal conditions, everyone has noticed the greater tendency to develope flower-buds this season, or rather, it would be more correct to say, that leaf growth having been checked, the development of flower has become more conspicuous. It is not that more flower-buds have been formed ; in many cases that work was done last year ; but those that have been formed have had a better chance than the leaves. Again, it must be borne in mind that all buds in the initial stages of their existence are alike. There is a period in the life of every bud when no one can tell (except in some cases from a consideration of its relative position) whether it will develope into a leaf-bud, or into a flower-bud. Now, suppose such a baby growth to be placed under circumstances favourable to the production of flowers, it will stand as good a chance of becoming a flower as it would of becoming a leaf-bud under the reverse conditions. The remembrance of this fact will materially help us in understanding the true nature of formations which seem to set every rule of floral construction at defiance. A bud or any growing portion of a plant may be arrested in its development, or its growth may be unduly excited, or in other cases perverted. The results will, of course, be different in all three instances. But this is not all, the result of either of these three disturbing causes arrest, exaltation or perversion of development respectively will be different, according to the age of the plant, or rather according to the particular stage and condition in which the plant is when subjected to the change. This sounds very like a truism, but it is one, nevertheless, that is constantly overlooked both by practitioners and theorists. The former often unconsciously regulate their proceedings in greater or less accordance with these facts, but their practice is not so perfect as it might be were the laws of growth better known and appreciated by them. The theorists, on the other hand, often pass unnoticed practical illustrations of the truth or falsity of their theories, illustrations which, rightly apprehended, would lead to valuable results.

Some curious malformations that have lately come under our notice have suggested these considerations. The first was a Potato which attracted the attention of Mr. MARSHALL, of Ely, by its yellow flowers. On picking a flower to pieces, as so good an observer was sure to do, it was soon seen that in place of a purple or white corolla of five united or partially united petals there were five segments, more staminal in their appearance than petaloid, and united together at the very base (fig. 191). There was thus a series of imperfect stamens outside the normal ones, and hence the yellow colour of the flower. The explanation of this anomaly, so far as we can give it, is this. All the parts of the flower were well and truly laid, growth went on for a time without arrest, exaltation, or perversion of any kind. Suddenly a change took place ; the petals, instead of running on in a proper petaloid course, assumed the appearance and functions of the stamens. That the change took place after the formation of the normal anthers is sufficiently attested by the perfect condition of the latter. What caused the sudden perversion of development in a few plants out of hundreds in the same patch is more than we can tell. A similar state of things has been observed in some Potatos in the Royal Horticultural Society's Gardens at Chiswick.

FIG. 191.

A very similar condition occurred in specimens of Kalmia latifolia, described in another column by Professor ASA GRAY ; the outer petal-like stamens, in this case, however, are much less perfectly developed than in the Potato. As this Kalmia was deprived of the peculiar pockets in the corolla in which the stamens are retained till suddenly released by a spring-like action which serves to scatter the pollen, it follows of course that the whole mechanism of the flower was altered. Here, then, we have a flower which as to appearance, conformation, and mechanical action is widely different from the normal Kalmia. We have abundant reason for the inference that the physiological processes in those flowers must be different from those which take place in ordinary Kalmia blooms. Perhaps Dr. GRAY can, or has already, put this inference to the proof, and if so, can tell us whether or no we may expect in due time first a "race," then a variety, and last a new species of Kalmia—if, indeed, the great difference from the ordinary structure of Kalmias

would not in such a case necessitate the formation of a new genus. On the Darwinian hypothesis, if this particular variety should be advantageous to the plant under certain conditions, it will be perpetuated; if not, as seems at the outset most probable, it will disappear, unless artificially propagated and protected. Another possible alternative remains: these particular malformations may be due to the sudden reappearance of a former and, as it were, now obliterated condition. We do not ourselves attribute either of the unusual formations we have alluded to to a reappearance of an ancestral condition, but upon this point it will be well to wait for the publication of Dr. SPRUCE'S test, by which, as he tells us, he is enabled to determine whether any particular change should be credited to progressive or retrogressive development.

EVERGREEN PARTERRES filled with dwarf shrubs, having foliage of different colours, green and variegated, are often found very beautiful and full of interest, and indeed are most desirable for winter decoration. One of the prettiest effects of the kind we have seen, was attributable to mere diversity of habit in the plants made use of, rather than to difference of colour, and the hint deserves to be recorded and turned to account. The effect was due to the association of erect habit with horizontal growth, and the two plants were Thuja aurea and Picea Nordmanniana. The first consisted of little bushy plants of a foot or 15 inches high, forming blunt erect cones of a pale but lively green. The plants of the second were of about the same size, and in summer at least were not very different in colour, but their horizontal branches, tier above tier, showed in admirable contrast with the erect spray of the Thuja.

This and several other pleasing effects have been nicely brought out in a parterre of dwarf evergreen shrubs, planted by Mr. GEORGE JACKMAN in the Woking Nursery, and intended, no doubt, as suggestions to aid purchasers in making useful selections for similar purposes. Thuja aurea, one of the finest of evergreen shrubs, and which originated in this vicinity—viz., at the Knaphill Nursery, has been for many years sufficiently abundant to be used in this way; and now, small seedlings of Picea Nordmanniana are so plentiful, that they may be readily utilised for so useful an object as that of clothing our flower beds with beauty during the dreary winter months.

—— THE PACHA of EGYPT has established a large GARDEN in the island of Ghezireh, near CAIRO, for the acclimatisation of plants and animals, as well as for a public promenade, and including glasshouses and an aquarium. The formation of this garden has been entrusted to M. BARILLET-DESCHAMPS, the late gardener to the city of Paris, and M. DELCHEVALERIE, one of his former pupils, is appointed keeper of it. This latter gentleman has established an agricultural and horticultural Journal at Cairo, entitled "L'Egypte Agricole." The first number contains, amongst other articles, one by the Comte DE MAILLARD DE MARAFY a distinguished agriculturist, living near Alexandria, on a new application of Eucalyptus in dyeing, and a study of Abyssinia from an agricultural point of view.

—— The IMPERIAL and CENTRAL HORTICULTURAL SOCIETY of FRANCE the other day distributed its prizes for the year. Amongst the awards were several to the engineers and the market gardeners of Asnières, for the results obtained by the application of sewage-water on the plain of Gennevilliers. The gardeners of that locality exhibited a magnificent collection of vegetables, and the Society awarded a first-class prize nominally to the Prefect of the Seine, a Gold Medal to M. VIVET, one of the chief promoters in this cultivation, and six Silver Medals and eight honourable mentions to gardeners who had followed his example. Amongst other awards made by the Society was a Gold Medal to M. LEROY, of Angers, for his "Dictionnaire de Pomologie."

—— Dr. POEPPIGER has, it is said, shown by repeated experiments that the GROWTH of TREES and SHRUBS is not interfered with by any quantity of COAL GAS that may escape in the soil, and find its way to their roots, and, consequently, that the illuminating gas escaping from mains does not injure the trees growing along the streets and promenades of cities, as many persons have supposed.

—— The Minister of Agriculture and Commerce in France has offered a prize of 20,000f. (£800) for the discovery of an efficacious and practical remedy for the NEW DISEASE which has attacked the VINE, and the rapid propagation of which threatens to endanger the production of wine. The disease is known as the *pourridie*, or rotting, and is due to the agency of the Phylloxera vastatrix (figured in our columns, p. 109, 1869), and all the studies and experiments to the present time have given very unsatisfactory results. A special Commission has been appointed to draw up a programme of conditions, examine memoirs submitted to it, settle the experiments to be made, collect evidence from local Commissions, and, if they see reason for so doing, to award the prize offered by the Government. The Commission is composed of M. DUMAS, M. MILNE EDWARDS, and M. DUCHARTRE, of the Paris Academy of Sciences, M. GERVAIS, M. PLANCHON, M. HENRI MARES, and M. LOUIS VIALLA, of Montpellier, the COMTE DE LA VERGUE, of the Gironde, M. BEDEL, of Vaucluse, and three members of the Ministry of Agriculture.

—— M. DROMAND, in "Annales du Genie Civil," referring to the large tracts of land in European countries which produce nothing but HEATHER, or similar plants, recommends their utilisation in the production of charcoal, acetic acid, tar, and other useful products; and insists that the soil, when cleared, should be prepared for the cultivation of various kinds of Fir trees.

—— The Hon. MARSHALL WILDER, the Nestor of American horticulturists, together with Messrs. DOWNING, BARRY and ELLWANGER, are announced as now visiting CALIFORNIA for the purpose of examining the horticultural and agricultural peculiarities of that State. A party from San Francisco are reported to have gone to the summit of the Sierra to meet their distinguished visitors, and escort them down to the sea. "They will," says the *Alta California*, "be received with due honour and respect by the farmers, wine-growers, orchardists and nurserymen wherever they may go in California." The ovation they are likely to receive may be surmised from the following biographical memoranda, which we extract from the *California Farmer*. We in the old country are not wont to be quite so fervid in expressing our sentiments, nevertheless the name of MARSHALL WILDER is deservedly held in the highest esteem here as in America:—

"No one man in the United States has done more, or shown greater devotion to, these great pursuits than President WILDER, who is now, and has been for years, the head of our National Pomological Society, and as its president, has led it on with his earnest spirit and teachings, with the generous co-operation of others, several of whom now come with him, to its present high standing and influence. The name of MARSHALL P. WILDER, therefore, need only to be announced for many thousands to recall his great and noble efforts to the cause he so dearly cherishes, and for which he comes to the Pacific shores with his friends, that he and they may take full cognisance of the vast wealth that is here unfolding in our orchards, vineyards, grain-fields, and flower gardens. Mr. WILDER himself has been most fortunate in the introduction of new varieties of fruits and flower of new and rare kinds, all of which have added to his name and fame great credit and honour. The famed Camellias 'Wilderi' named for himself, as the grower of this rare flower, while he was President of the Massachusetts Horticultural Society, and also 'Mrs. Abby Wilder,' another very beautiful Camellia, both named by the above-named Society. These, with the 'Wilder Pear' and the 'Wilder Strawberry,' just now made known, are among the results of a life labour in this cause. But it is not our purpose to eulogise by these remarks; they are cited that we may briefly make known to those who know him not, a little of the great good he has done, and which is a matter of history now. With Mr. WILDER come men identified also with the same great cause,—each prominent,—men who have done a world of good by their labours, which are also a matter of history. DOWNING! That is a name that is indeed bright with honour on the pages of the horticulture of our country, and the present visitor is one of the same family on whose shoulders the mantle of the elder DOWNING now rests, and we are glad to say he keeps the ermine robe faithfully pure and wears it most worthily, BARRY! another name too, identified with the literature of horticulture (from New York), in BARRY'S "Fruit Book"—and many works and writings that reflect great credit upon him as the author. ELLWANGER! the world-renowned nurseryman of Rochester, N. Y., whose hundreds of acres of nurseries can truly be said to be the largest and most extensive and most complete of any in the United States. Long years of practical experience place him at the very head of the nurserymen of our country. These are the men named as coming to us—these and others, with their *compagnons du voyage*—to see for themselves the wonders of this country, called Garden of the World. We hail them now as we write in the name of all on the Pacific coast who love horticultural science. We hail them with a hearty, earnest and sincere welcome, as they are now coming over the 'Great Highway of our God,' foretold in the sacred volume."

—— The Paris Academy of Sciences has awarded the prize established by M. THORE, to M. HENRI BONNET, vice-president of the agricultural committee of Apt, Vaucluse, for his book entitled "La Truffe," a treatise on edible Truffles, from botanical, entomological, and commercial points of view. M. BONNET has continued the work to which his father devoted many years of his life, so that the book in question is the result of two minds occupied in the same research. M. BONNET pronounces against all the popular notions respecting Truffles; he denies that there is any truth in the idea that certain Oaks possess the property of engendering Truffles beneath their shade, and of transmitting that power to their offspring. He declares that no one has ever succeeded in discovering the slightest parasitic connection between the Truffle or its mycelium and the living roots of the neighbouring trees, whence he infers that this, like other Fungi, derives all its nutrition from unorganised matter. His opinion respecting the fabled Truffle fly, or any other insect supposed to give rise to the Truffle by perforating the root of the Oak, is equally decidedly in the negative; the Truffle, he says, is not the result of any such accident, but is a perfectly independent plant of a peculiar construction. The same society divided its DESMAZIÈRES prize between M. L. RABENHORST, for his work entitled "Flora Europea Algarum aquæ dulcis et submarinæ," and M. A. HOFFMANN, Professor of Botany at the University of Giessen, for his memoir on the Bacteria.

—— We have our doubts as to the strict ethical propriety of Bazaars, but in relation to the alleged financial failure of the OXFORD SHOW, and the possible causes contributing to it, we may call attention to the grand BAZAAR lately held in the large conservatory at ENVILLE, by permission of the Earl of STAMFORD and WARRINGTON. It is difficult to see the connection between the performances of the "I Zingari" and the "United South of England," of the Royal "Original Christy's" (doubtless no connection with any other of the same name), and the tremulous gyrations of the much-daring "Ethardo," to say nothing of the "educated monkeys," and the restoration of the parish church! Nevertheless, the fact remains that, in consequence of the spirit manifested on this occasion, more than 20,000 people visited the gardens, and the receipts amounted to about £2700. We are glad to hear that the damage done to shrubs or flowers was—*nil*. Incidentally we learn that nearly 4 cwt. of Black Hamburgh Grapes were cut and sold, "on this occasion only," from the vineries at Enville, for the benefit of the Bazaar, and that some of the bunches realised 20s. each. We do not wish to recommend the Royal Horticultural Society, on the occasion of its provincial shows, to seek to "draw" by means of a troupe of Italian acrobats, or even by the potent aid of aristocratic lady-shopkeepers; but we do recommend them to emulate the spirit, if not the letter, of the Enville Bazaar.

—— The METEOROLOGY of the WEEK ending July 23 was remarkable for the extremely high temperature which prevailed throughout the country (see Mr. GLAISHER'S Tables in our present issue). The MAXIMUM TEMPERATURE of the AIR varied in England from 90° at Manchester to 79° at Norwich, with a mean for all stations of 85°.2. In Scotland it varied from 87° at Perth to 73° at Paisley, with a mean for all stations of 79°.8. The MINIMUM TEMPERATURE varied in England from 55°.7 at Liverpool to 47° at Hull, with a mean for all stations of 52°.1. In Scotland it varied from 53° at Greenock to 49° at Perth, with a mean for all stations of 50°.9. The MEAN TEMPERATURE of all stations to the south of Nottingham was 65°.9, and to the north of that place was 64°.1, and for the stations in Scotland was 59°.3. The RAINFALL varied greatly in the two countries, for whilst in England it ranged from 0.11 inch to 0.00 at the majority of the stations, with a mean of 0.02 inch, in Scotland it varied from 0.61 inch to 0.00, with a mean fall of 0.22 inch.

—— The use of TOBACCO-WATER to clear trees of insects is common in France, the Government selling a concentrated liquid for the purpose, but the following mixture is now recommended for Peach and other trees:—Four parts of road dust, 2 parts of pulverised tobacco of any kind, and 1 part of sulphur; the mixture to be distributed by hand on the branches infested by insects, after sprinkling with water, if the weather be dry.

—— The admirers of choice Orchids will be glad to know that the beautiful DENDROBIUM MACCARTHIÆ is now blooming magnificently with the Messrs. VEITCH & SONS, of Chelsea. This plant has more than 100 expanded flowers—a sight which we believe has never before been witnessed.

—— A French gardener has adopted a NEW METHOD of GRAFTING and BUDDING PEAR TREES The wild stocks, he says, succeed best when budded, as their branches then continue to grow as if no operation had been performed, while in the case of grafting, the stock, being cut down to the ground, wastes vitality, which the graft is not able to supply for a long time, so that during the first year progress is very slow. In order to remedy this he leaves two shoots on each side of the stock, which he splits half-way down, and then shaving away the sides of the lower end of the scion, he inserts the latter in the cleft and binds up in the usual way. If the operation is performed in the opening spring you pinch off the shoots, in order to prevent the stem from growing too fast, and cut back at the end of the year; if the grafting is performed in the autumn the cutting is executed at the end of the winter. The graft having then taken well, it has force enough to excite the action of the spongioles, so that much trouble and loss of time are saved. He has a like plan for budding. It is well known that this operation cannot be adopted after the rise of the sap has ceased; he therefore cuts his bud with a small portion of wood attached to it, so that the lower part of the eye is, of course, not only uninjured but supported by the ligneous matter; the budding piece is then inserted either in a slit in the

top of the stock, or into an opening made in the middle of the stock with a knife, and into which the bud, or rather the small piece of wood attached to it, is inserted. The operation may be regarded, in fact, as grafting with a single eye. The grand advantage is, that the operation succeeds as well in October or November as in August or September.

PALMS.—No. X.

Cocos (Linn.).—The typical species of this genus, C. nucifera, is now found in every part of the tropics, though never much beyond them, and chiefly on the sea-coast; some varieties, however, have been met with far inland. But there is reason to believe that at one time its geographical range was much more limited; indeed, we know that in our own days it has been extended to the west coast of Africa; and the great puzzle to botanists has been, to determine whence the Cocoa-nut originally sprang. I incline to the belief that it is indigenous to the west coast of America, though it is true that the principal uses of the Palm were not found out in the New, but the Old World. The arguments for and against this opinion will be found in my "Flora Vitiensis," p. 275. There are a great number of varieties of this Palm, one of the dwarf ones of which has fruited twice at Syon House, and was figured in the *Gardeners' Chronicle* (see fig. 192); but none of the others have ever attained any size in gardens, though numerous attempts have been made to raise them from the germinating nuts frequently brought home by trading ships. All the other species of the genus (about 20) present no particular difficulty to the cultivator; and C. australis, butyracea, flexuosa, oleracea, plumosa, schizophylla, and others, are permanent inmates of our gardens. All the species are unarmed trees, with smooth, ringed trunks, and pinnatisect leaves, with linear segments. Their spadices appear in the axils of the lower leaves, and the drupes have a fibrous husk, and a solitary seed ("nut"), with three holes at the base, which, though not peculiar to the genus, but common to most other genera of Cocoineæ, deserve special notice, as they are said to have given rise to the name Cocos, the Portuguese first perceiving the resemblance between that part of the fruit and the face of a monkey (Cocos or Coquin). No other species of the genus is equal in importance to man to C. nucifera, about which volumes might and have been written, but several of the other species are devoted to various useful purposes by the natives. C. coronata yields an edible "pith" which is made into bread, and a nut producing oil. The juice of C. schizophylla is employed in slight ophthalmic attacks. C. butyracea yields an oil compared to butter, and also a vinous beverage.

Fig. 192.

Syagrus (Mart.).—Allied to Cocos, and inhabiting tropical America, this genus consists of half a dozen unarmed trees with ringed trunks, terminal pinnated leaves, monœcious axillary flowers, and oblong 1-seeded drupes. Our gardens can boast of the following species, which in several catalogues are enumerated under Cocos, viz., S. amara, S. botryophora, S. campestris, S. Mikaniana, plumosa, reflexa, &c.

Platenia (Karst. in Linnæa, xxviii., p. 250). — P. Chiragua is the only species of this genus. It is found on the banks of the Magdalena in New Grenada, and is an unarmed tree, from 50 to 60 feet high, with pinnate leaves, and narrow linear segments, simply branched flower-spikes, monœcious flowers, and orange-coloured drupes, containing a horny seed.

Diplothemium (Mart.). -A small genus of Brazilian Palms, which are either almost stemless, or develope a short ringed trunk. Their leaves are pinnate, with linear segments, the underside of which is of a silvery white or a glaucous hue. The flowers are monœcious, rather large, and the drupe has a fibrous acid flesh which is eaten by the natives. D. maritimum is an inmate of our gardens.

Microcoos (Philippi in Bot. Zeitung, 1859, p. 362; Jubæa, Gay, non Kunth; Molinea, Bert. non Juss.).—This Palm, which goes in Chili by the name of Coquito, was until recently supposed to be identical with Jubæa spectabilis of Kunth, though even Kunth himself had expressed his doubts on this point, and Bertero had positively asserted (Mercurio Chileno, 1829, p. 606, and perhaps also in Silliman's Journal, xix., which I have not seen) that the two belonged to different genera. Professor Philippi, in the place above quoted, has shown that there are at least two, if not three, genera confounded under Jubæa. To the Chilian one he gives the name Microcoos, though he admits that Molinea is the oldest generic name of the plant, and he shows it to differ from Jubæa by its monœcious flowers, as well as by several other important technical characters. There are at present but few forests of this Palm in Chili, most of them having been cut down for "miel de palmas," a kind of syrup, of which each tree yields about 40 lb., worth about £1 sterling. The leaves are used for decorative purposes on Palm Sunday, but the wood, we are told, is soft and useless. The Coquito is restricted to Chili below latitudes 31° to 35° S., where it grows wild, but it has been cultivated as far south as 37°. It is, in fact, one of the hardy Palms which have of late been grown in the open air in the milder parts of England.

Jubæa (H. B. K.).—Humboldt and Bonpland found their J. spectabilis cultivated in the gardens of Popayan, in New Grenada, and though plants bearing that name are frequently offered by nurserymen, it is very doubtful indeed whether we possess any specimens of it in Europe.

Maximiliana (Mart.).—A small genus of Palms, chiefly Brazilian, with arboreous unarmed trunks, terminal pinnatisect leaves often of gigantic dimensions, with linear aggregated segments, large woody spathes, monœcious flowers, and 1-seeded fruits. M. elegans and regia are much admired species of our gardens, but the other congeners do not seem as yet to have been introduced. M. Caribæa, Grisb. et Wendl., of the West Indies, and M. Inajai, Spruce, of Brazil, are recent additions to the genus. M. Yagua, Seem., has been transferred to Attalea by Dr. Spruce.

Scheelea (Karst. in Linnæa, xxv.). A small genus of unarmed Cocoineæ, with pinnated leaves, inhabiting Columbia and the Brazils, and closely allied to, if indeed generically different from, Attalea.

Attalea (H. B. K.).—To this genus belongs the Yagua Palm, on which, in the language of Humboldt, "Nature has lavished every beauty of form," but which, unfortunately, is not yet introduced. Dr. Spruce was fortunate enough to re-discover it, and in his valuable paper on the Palms of Equatorial America (Linn. Journ. xi., p. 163), he has given us as full a description of it as his specimens and opportunities would allow. The most striking feature of this Palm is that the pinnæ are arranged vertically and not horizontally as in other Palms, a peculiarity due to the rachis being so much thinned away at the sides—so very narrow in proportion to its thickness—that it bends in the plane of the pinnæ, and not in a plane perpendicular to that plane as in the generality of Palms. The leaves spring up almost perpendicularly at the base, but in the upper part arch over to one side or the other as the wind sways them. The pinnæ stand at right angles to the rachis, and while those of the lower side of the arch hang straight down, those of the upper side point straight up, and from the constrained position quiver and flutter with every breadth of air. The genus Attalea comprises about 20 species, several of which are devoted to economic purposes. A. Cohune yields oil, A. funifera furnishes part of the fibre known in commerce as Piassaba, and A. excelsa is used for smoking India-rubber. All Attaleas are robust trees, frequently forming extensive groves by themselves, their large almost perpendicular leaves forming bold arches, forcibly calling to mind Gothic architecture. To behold such groves at sunset, or illumined by the light of the moon, is a spectacle not easily forgotten. Our gardens are as yet not well stocked with representatives of this genus, though we cultivate A. amygdalina, Butiros, Cohune, compta, coronata, excelsa, funifera, Maripa, speciosa, spectabilis, &c. Whether A. limbata, Hort. (a provisional garden name), introduced by me from Central America, really belongs to this genus is doubtful. The leaves of the young plant are simple and green, but furnished with a curious brown scarious margin.

Orbignya (Mart.).—O. phalerata and O. humilis of Bolivia, are the two typical species of this genus of Cocoineæ, the fruit of which contains from three to seven seeds. A third doubtful species comes to us from

the Brazils, but none of the species are as yet in cultivation. With these genus terminates that series of the Palms of which the Cocoa-nut tree is the type. The whole of these genera are greatly in need of revision, which must necessarily result in considerable changes in the synonymy. *Berthold Seemann.*

OXFORD BOTANISTS.

[This paper, announced as "A short Account of some of the more Eminent Botanists and Gardeners of Oxfordshire," was read by Professor Lawson at the Congress at Oxford on July 21. We are indebted to the courtesy of the Professor for permission to publish it.]

HAVING been honoured with a request that I would write for this occasion a short paper, I chose for my subject "The History of the more Eminent Botanists and Gardeners connected with the County." But had I written my paper first, and then selected my title, instead of adopting the opposite course, I should have entitled it, "The History of the more Eminent Botanists and Gardeners connected with the University;" for when I came to examine the subject more closely, I found the amount of information that might be given was so great, that to do it justice I should require several papers in which to treat it, instead of one.

Thus I have to apologise for having departed in some degree from my original intention.

I will make use of this opportunity, and take the liberty of suggesting to the committee the propriety of engaging, on each succeeding year, the services of some person well acquainted with the history of the city and neighbourhood in which their meeting may be held, who shall undertake to give us a short account of all who have advanced the botany or horticulture of their county. By these means we should gain a vast amount of valuable information that might otherwise be irretrievably lost; while many a name worthy of being chronicled would also be saved from oblivion.

The first item of interest connected with this place, to which I will now direct your attention, is the founding of the Botanic Gardens, by Henry Earl of Danby, in the year 1632.

This event established a new era in British botany; for, with the exception of a private Physic Garden belonging to Gerard in Holborn, none in England as yet had been set aside for scientific purposes.

Lord Danby obtained from Magdalen College a lease of nearly 5 acres of ground, which he surrounded with the present noble wall, and built the gateway that adorns the principal entrance to the gardens. He erected, also, greenhouses and stoves for exotics, and a house for one Jacob Bobart, whom he appointed as the first curator. At his death, also, this generous nobleman added to his former liberality by bequeathing the rectory of Kirkdale in Yorkshire, from the funds of which he hoped to maintain the efficiency of the gardens, and secure the services of a professor.

Bobart, of whose name I have already made mention, was a German by birth, having been born at Brunswick. On his appointment as superintendent he set himself most industriously to fill the new gardens with all kinds of rare plants, both English and exotic; and in the year 1648 he published a catalogue in which he enumerates no less than 1600 species as having been grown by him at that time. Of these, however, many were doubtless only varieties; but even after allowing a liberal margin for them, the number must have been great for one man alone to have collected, in those days, in so short a time. Ten years afterwards he republished his catalogue, with the assistance of his son; Dr. Stephens, then a Fellow of New College, afterwards Principal of Magdalen Hall; and Mr. William Browne, who was afterwards Senior Fellow of Magdalen College. The number of species in this second list was greatly increased, but owing chiefly, it would appear, to a number of palpable varieties being raised to that rank. The great value of this work lies in the plan which was here first adopted, of quoting the synonyms of other authors, and of giving references to the pages of their works.

Jacob Bobart died at his house in the gardens, in the year 1679, at the advanced age of 81.

Although the gardens were begun in 1632, and Bobart appointed to them, Lord Danby's second intention of establishing a professorship was not accomplished till the year 1669; owing partly to the unhappy state into which the country had fallen in those times, and partly owing to the insufficiency of the funds arising from the estate in Yorkshire. But in this year Dr. Robert Morison received from the University his appointment to the chair.

Morison was a Scotchman, born at Aberdeen in 1638. In that town also he received an education which it was intended should fit him for the Church. But finding the study of theology less in accordance with his tastes than that of physic, he fitted himself for that profession instead; and his reputation rose with such rapidity among the learned, that, before he was 30 years old, he was chosen by Charles II. as King's Physician.

In his younger days he had espoused the Royal cause, and fought in the battle at Brigg, near Aberdeen, where he was dangerously wounded in the head. In consequence of this display of his loyalty he was compelled to fly from his native country, and take refuge in France. While there he was brought under the notice of the Duke of Orleans, who, quickly perceiving his merit, appointed him superintendent of his gardens at Blois, and furnished him with the means of travelling through France, in order that he might collect plants and information.

During his stay in France he published a new edition of the "Hortus Bloisensis," in which he sets forth his new method of classification. From this work he gained much honour among the scientific men of the day; and it established his character as an original writer and thinker. On the restoration of Charles II. he returned to England, though earnestly solicited to remain where he was.

On his appointment to the professorship at Oxford he commenced a course of lectures, consisting of three every week during the summer and autumn terms. From this time to his death he occupied himself chiefly with the preparation of his "Historia Plantarum Oxoniensium." Of this work, however, he lived only to complete a portion, his life being cut short by an accident that happened to him while crossing a street in London. He died in the year 1683, and lies buried in the church of St. Martin's-in-the-Fields, Westminster.

After Morison's death Jacob Bobart, son of the first curator, was appointed professor in his place. He finished the second volume of Morison's "Historia Plantarum," and in the preface to this book he gives an interesting account of all the botanical authors, both English and foreign, who had flourished up to that time. He appears to have been a man of some humour, for Dr. Grey, in his edition of "Hudibras," relates the following amusing story concerning him. He says:—"Mr. Smith, of Bedford, observes to me upon the word 'Dragon' as follows:—Mr. Jacob Bobart, Botany Professor of Oxford, did, about 40 years ago, find a dead rat in the physic garden, which he made to resemble the common pictures of dragons, by altering its head and tail, and thrusting in taper sharp sticks, which distended the skin on each side till it mimicked wings. He let it dry as hard as possible. The learned immediately pronounced it a dragon; and one of them sent an accurate description of it to Dr. Malibechi, librarian to the Grand Duke of Tuscany. Several fine copies of verses were wrote on so rare a subject. But at last Mr. Bobart owned the cheat. However, it was looked upon as a masterpiece of art, and as such deposited in the museum, or anatomy school, where I saw it some years after."

Whether the Ashmolean Museum or Dr. Rolleston still possess this variety I cannot say; but if not, I can, unfortunately, produce abundance of material from the same place, for any who may again be inclined to exercise their ingenuity. Bobart died in 1719, being 79 years old.

The next botanist of whom I have to speak is Dr. William Sherard, or Sherwood. This indefatigable worker and liberal patron was born at Bushby, in Leicestershire, in 1659. From the Merchant Taylors' School, where he laid the foundation of his knowledge, he matriculated at St. John's College; and in his twenty-fifth year was elected fellow of the same society. Leaving Oxford, he travelled, as tutor to Lord Townsend, on the Continent, and there made such excellent collections as won for him the esteem and friendship of Ray. The encomiums passed upon him by this immortal naturalist served to increase his ardour, and we find him next making tours throughout England and the Channel Islands in search of new and rare plants, which were communicated to Ray for insertion in his "Synopsis Plantarum." About the year 1702 he was appointed consul at Smyrna, and the opportunity being thus afforded him of collecting Eastern plants, he set himself with wonderful diligence to obtain all that were to be had from Natolia and Greece. These collections were the beginning of that magnificent Herbarium, which, with his Pinax, made his name to stand so high amongst botanists. After residing in Asia fifteen or sixteen years, he returned to England in 1718, when the University, in consideration of his learning, conferred upon him the degree of Doctor of Law.

Remaining in England a few years, he again visited the Continent, travelling through Holland, France, and Italy, renewing personal intercourse with his older friends, and making the acquaintance of those with whom he had before only corresponded. Among these latter stood Dillenius, for whom he soon learned to entertain so high a regard that he persuaded him to come over and cast in his lot with him in England. Here he directed his studies, urging him in particular to turn his attention to the cryptogamic portion of the vegetable kingdom – a class of plants that had as yet been greatly neglected, and, in consequence, but little understood. Although possessor of ample means that had been accumulated by him during his residence in Smyrna, Sherard lived with the greatest unostentation in London, devoting his whole time to the study and arrangement of his collections and the advancement of his Pinax. Shortly before he died he gave £500 to the Botanic Garden, for the enlargement of the conservatory, and otherwise testified to his zeal for botanical science, as well as to the love he bore for his "alma mater" by presenting to the gardens a great number of new and rare plants, and by endowing them with his unrivalled collections of dried specimens, and with his library of botanical works, perfect for the time in which he lived.

On his death, in 1728, he left by will £3000 to provide for a professor, stipulating that the University should add annually to that sum £150 for the maintenance of the garden and library, and that Dillenius, his friend, should be elected to the chair. The bargain was accepted by the University, and John Jacob Dillenius was elected professor. He was a native of Darmstadt, and was born in the year of our Lord 1687. He received his education at the University of Giessen, and practised in that city as physician, occupying himself also with the study of botany, and publishing the results of his observations in the "Miscellanea Curiosa" or the papers of the "Academia Curiosorum Germaniæ," a Society into which he was elected at a very early age. But the work that contributed mainly to bring him into notice was his "Catalogue of Plants growing in the neighbourhood of Giessen," published in the year 1719, and it was probably owing to this work that Sherard was led to form so high an opinion of him, and to desire so earnestly to gain his permanent assistance.

Of the manner in which Dillenius was persuaded by Sherard to leave his native land, and return with him to England in 1721, I have already spoken. His effort, after settling down in his adopted country, was a new edition of Ray's "Synopsis Stirpium Britanicarum," with some improvements of his own. During the life of Sherard he lived chiefly with him in London, or with his brother James Sherard, who had an estate at Eltham in Kent, and who took such pleasure in botany and horticulture, that his garden was said to be the richest of the time in England. While staying in this congenial place, Dillenius projected an illustrated description of all such plants as were new or rare growing in this garden, a work he afterwards published under the title of "Hortus Elthamensis." In this work he describes and figures with wonderful accuracy and faithfulness 417 plants, and quotes the synonyms of other authors.

In 1728 his friend and benefactor died, and he removed to Oxford, where he was chosen Professor of Botany in the University, according to the agreement made by Sherard. His first desire and highest ambition was thus realised. In 1736 Dillenius was visited by Linnæus, who was then a young man, and had been sent over by Clifford to collect plants for his garden in Holland. Dillenius, who had thoroughly imbibed the doctrines inculcated by Ray, had naturally no love for one who was, as he supposed, endeavouring to upset his system, by introducing a new one of his own. Consequently, it was with no very friendly feeling that he first made his acquaintance. But how long this unfriendliness lasted may be best inferred from the following passage, which I will quote from the "Diary of Linnæus." He says:—"In 1736, Linnæus went over to England at the expense of M. Clifford; and here he saw not only the gardens at Chelsea and Oxford, but also procured many of the rarest and non-descript plants sent thither. He likewise became acquainted with all the learned at that time in the kingdom. At Oxford, Linnæus was received in a friendly manner by Dr. Shaw, who had travelled in Barbary, and who declared himself a disciple of Linnæus, having read his system with great pleasure. The learned botanist, Dillenius, was at first haughty, conceiving Linnæus' 'Genera' (which he got half printed in Holland), to be written against himself. But he afterwards entertained him a month, without leaving Linnæus an hour to himself the whole day long; and at last took leave of him with tears in his eyes, after having given him the choice of living with him till his death, as the salary of the professorship was sufficient for them both."

Can anything be more touching than this description of the change of sentiment that Dillenius manifested towards the young man he had at first looked upon as an innovator, and one personally hostile to himself? But although the feelings of suspicion and dislike were so completely obliterated that others of admiration and affection took their place, still Dillenius never adopted Linnæus' views, but remained constant to the system of Ray.

There is another version of this story current, that makes Linnæus appear in company with Sherard. According to this account, Sherard received him with affability, Dillenius with coldness, the latter remarking in English to Sherard, "This is the young fellow who is putting all botanists and all botany into confusion." Linnæus, for a time, took no notice of this unmannerly remark, the meaning of which he gathered from the way Dillenius pronounced the word "confusion;" but after he had explained away some difficulties respecting the "Linaria Cymbalaria," which neither Sherard nor Dillenius had been able to do, he revenged himself by saying quietly, he hoped he had not brought "confusion" into the Botanic Gardens at Oxford. Dillenius blushed, and apologised for his expression.

There is no reason for disbelieving the correctness of this story; only we must substitute the name of Dr. Shaw for that of Sherard. For Linnæus did not visit England till 1736, eight years after Sherard's death.

All this while Dillenius had been collecting material, and investigating the class Cryptogamia, making considerable excursions into Wales and other parts of the country in search of new species, more especially of Mosses; and when the publication of his "Hortus Elthamensis" had furnished him with more leisure, he gave his whole attention to this particular branch of

botany, and in the year 1741 he gave to the world that excellent digest of his labours, the "Historia Muscorum."

Six years after the publication of this work he was seized with a fit of apoplexy, which ended his life on April 2, 1747, at the comparatively early age of 60.

Dillenius was succeeded in the professorship by Dr. Humphrey Sibthorp, of Magdalen College, who continued in possession of the chair till the year 1784, when he made way for his illustrious son, Dr. John Sibthorp, of Lincoln College. This gentleman is well known for his labours in the European flora. He made two excursions into the East of Europe, collecting and describing, and with the assistance of Ferdinand Bauer, the celebrated draughtsman, illustrating by the most beautiful drawings, everything of interest in natural history, and before his death, which took place, alas ! in the year 1796, when he was but 38 years old, he had prepared for publication those wonderful monuments of perseverance and learning, his "Flora Græca," and "Fauna Græca." Stricken down with consumption, induced by a cold caught when on his travels, he died after a short illness at Bath. After his death it was found that he had left in his will £300 a year to defray, first the expenses of his "Flora Græca," and after its completion to found a Professorship in Rural Economy, and to furnish funds for making additions to the herbarium and library. The successor to Dr. Sibthorp was Dr. George Williams of Corpus Christi College. During his lifetime many preparations were made for the improvement of the gardens. The lower parts, which during rains used to be flooded, were raised a considerable height, and this led the way for the changes that were effected by Dr. Daubeny, who succeeded to the chair on the death of Dr. Williams in 1834.

Dr. Charles Giles Bridel Daubeny was born at Stratton, in Gloucestershire, in 1795. From the school at Winchester, where he remained six years, he went, in his 20th year, to Magdalen College, where he obtained, first a "demyship," and afterwards a fellowship. After taking his degree, he sought to extend his experience by studying at other universities, and for this purpose went to London and Edinburgh, and afterwards, at Geneva, attended a course of De Candolle's lectures on botany, of which he took the most ample and elaborate notes.

One of his earliest works, and one on which his reputation as a great philosopher may fairly rest, was his "History of Volcanos." Into this work he compressed a wonderful amount of original information ; and, notwithstanding the gigantic strides geology has made since then, it is one that may be read with the greatest profit at the present day.

In 1822 he was elected Professor of Chemistry, and in 1834 Professor of Botany. The first of these chairs he held till 1865, when he resigned it in favour of the present professor. Of the changes that Dr. Daubeny effected on his appointment it is difficult to speak too favourably. In the place of the old herbarium and library, he built the present dwelling-house, while he removed the herbarium to a new and more commodious building on the north side of the gardens, away from the river. The garden itself, too, was entirely remodelled, the rabbits that infested its walks routed out, and the garden laid out partly on the natural system and partly on the Linnæan. The improvements that were made during both Professor Williams' time and Dr. Daubeny's were conducted entirely by Mr. Baxter, sen., and his son, Mr. William H. Baxter, who together have for the last 57 years devoted their whole time with the greatest ability to their accomplishment ; and with what success they have laboured I am not permitted to speak, but I leave it for you discerning gentlemen to inspect the gardens, and judge for yourselves. The greater number of the present conservatories also are the result of Dr. Daubeny's indefatigable exertions. In all matters relating to horticulture or agriculture he took, as most of you will well remember, the deepest interest. For the furtherance of both he purchased a piece of ground in the parish of Iffley, with the intention of carrying on experiments with different kinds of manures ; and this ground he caused to be conveyed to the University to be held in trust by them for the use of the Professor of Rural Economy. For some years, however, before his death his health was such as to prevent his undertaking any fresh experiments, so he let it, and when he died it had run into great disorder.

Dr. Daubeny was one of the earliest supporters of the British Association, and in 1856 he presided over its deliberations at Cheltenham ; and so great was his popularity there, that a medal was struck in his honour to commemorate the occasion—a tribute of respect that has never been paid to any other president by his friends and admirers.

It would be beside my purpose in this paper to enlarge upon other matters than such as are purely botanical ; but I cannot, before concluding, refrain from drawing your attention to the fact that Dr. Daubeny was one of the earliest and strongest supporters of scientific instruction being given in this University. With but few sympathisers on his side he did battle for a natural science school, at a time when its introduction was dreaded by the majority of his contemporaries. But he lived to see his early dreams realised, and before he died he had the satisfaction of beholding a young but flourishing school, with ample opportunities for teaching, and an efficient staff of professors and tutors labouring in all its various branches. What he aided in establishing it is our part to maintain ; and you, I am sure, will wish us "God speed."

ON COLOUR IN THE TREE SCENERY OF OUR GARDENS, PARKS, AND LANDSCAPES.

[Read before the Horticultural Congress at Oxford, July 21, 1870, and forwarded for publication by the Author.]

LAST year I had the privilege of reading a paper at the Manchester Congress of this Society "On the Improvement of Races," which subject may be said properly to belong to the "science" of gardening. To-day I have the pleasure of submitting to you my thoughts "On Colour in the Tree Scenery of our Gardens, Parks, and Landscapes," and here I find myself dealing more directly with the "art" of gardening. While fully recognising the progress, both in the art and science of gardening, which has taken place in my day, I yet think that in this outlying but important province, our professors have not made so free and effective a use as they might have done of the various tints of foliage which are to be found amongst trees and shrubs. Lest I should be misunderstood, permit me to state at the outset, that I hold the prevailing green with which the earth is clothed to be the best colour that could have been devised for the purpose, as blue is the most appropriate colour for the sky. But the sky, which is beyond our reach and power, is naturally subject to constant and considerable variation, and is singularly free from monotony. It is not altogether, or long together, of one colour. There are light fleecy clouds continually breaking up the hemisphere of blue ; varying in substance and colour ; sometimes hanging motionless, but oftener sailing noiselessly along, more or less rapidly, and every moment changing in form. Then there are the dark thunder clouds, and the golden, silvery, purple and roseate hues, which often give both life and brilliancy to the morning and evening sky.

But we have the power given unto us to vary and adorn the surface of the earth, and I would here invite public attention, and invoke the artist's aid in behalf of colour. There appears to me a monotony on the face of our English landscapes arising from one uniform and all pervading colour—green. This monotony I would seek to remove by the introduction of trees with purple, white, and yellow leaves. With the same end in view, I would also plant more freely the transitory red, yellow, brown and purple tints of spring and autumn, supplementing these effects by the introduction of berry-bearing trees—trees with white, red, black and yellow berries, and trees with white, red, and yellow bark for winter ornament. With these preliminary remarks I shall endeavour to show—1st, that the object I seek is desirable ; next, that it is attainable, and shall conclude with a few general remarks and brief examples in support of my views. I am free to confess that there is nothing in the whole range of Nature which yields me more pleasure than the contemplation of a beautiful landscape. To stand on some elevated spot in the English or Scotch lake district, for example, and look down on a broad and varied expanse of country ; to row upon the surface of the lake, and look upwards upon the towering masses of rock and tree ; to trace the lake shores, the lake islets and waterfalls, is, I believe, a recreation of a higher intellectual and more æsthetic order than the many who have not practised it might, at first sight, take it to be.

A highly cultivated American gentleman once said to me, "England is a series of varied and improved landscapes. Now and then in remote districts one catches a glimpse of Nature, unaided and unadorned, but generally throughout the length and breadth of the land high art has been so skilfully applied as to effect the artist's object without leaving behind any traces of the artist's hand. But I miss the brilliant autumnal glow of the American forests : your landscapes lack colour." This very nearly expresses my ideas of English scenery ; the natural beauties of our landscapes have in many cases been improved or developed at a sufficiently distant date, that the old and the new have become blended in one harmonious whole, leaving no strong lines of demarcation between the work of Nature and the work of Art ; but the landscapes are generally cold and monotonous—wanting in variety and colour.

If we proceed to analyse a beautiful English landscape we shall find it composed of diversity of surface, light and shade, wood, water, rock, and many minor accessories, which may or may not be present, either singly or in combination. These I mention not to dwell upon, but to dismiss, as the recognised features of the landscape. My business at present is with tree scenery, and principally with one feature of it—colour. Our earth tints are prominently neutral, often sombre, and to correct this should, in my judgment, be a leading idea with the true artist in landscape gardening. A piece of country, however beautiful by Nature ; a garden, however perfectly planned, yields more or less pleasure according to the skill and taste exercised in the planting, just as the proportions and beauty of the human form are improved or otherwise by the style of dress—trees, shrubs, and flowers constituting, in fact, the exterior dress of the garden and the landscape. Now it must be patent to those even who are but slightly acquainted with this subject, that the labour of our plant collectors abroad, and plant cultivators at home, have placed within our reach many trees with coloured leaves—purple, yellow, and white—of various shades, and I hold that these colours should be so blended with the prevailing green as to remove the monotony which at present obtains. That the effect of colour in the landscape would be generally appreciated was once brought home to me in a peculiar manner. I was riding in company with some friends through the park at Chatsworth, in Derbyshire. Suddenly we sighted a tree with reddish-brown leaves rising from the greensward, and surrounded at some little distance with the usual green trees. Remote as it was, we could not at the moment make it out, but all admired it, and agreed that it was at once telling and beautiful. Led by admiration as much as by curiosity, we approached it, and discovered a dead tree retaining its reddish brown withered leaves.

I think that any cultivated observer who may dwell ever so briefly on the tree scenery of Great Britain will admit, that the contrasts of colour, weak and little varied as they generally are, present to him one of its most pleasing features. If, then, the slight existing variation of colour, restricted principally to the contrast between light and dark green, is admitted to be an element of beauty, may we not justly infer that we should gain something if we varied and increased the contrasts by the use of stronger and more distinct colours ? I think then that I may fairly assume that, on a free and full consideration of this subject, it will be generally admitted that a greater variety of colour would be an improvement in the tree scenery of our English gardens, parks, and landscapes.

I have next to show that the object I seek is attainable. The arrangement of the colours of flowers in the flower garden has of late years been worked out with wonderful skill and effect. What were our flower gardens in this respect 30 years ago ? I remember that results predicted then were considered impossible by the many, although they have been accomplished, and more than accomplished, long ago. Now, as far as I am aware, no one has yet applied the same principles in the arrangement of trees and shrubs with coloured leaves. I have been told that it cannot be done. But after a long study of the question and numerous experiments, I have come to a different conclusion, which I submit with all deference to those who think otherwise. I believe that here, as in the flower garden, there only needs a beginning, and progress will be rapid and success certain.

Many years ago I formed a collection of pictorial trees and shrubs, and planted them closely together, with the view of watching their development and eradicating those kinds which might prove undesirable on more mature acquaintance. This plan I vigorously pursued, and now find myself in possession of a select list, which I believe is sufficient to carry out all that I shall advance.

In addition to the ordinary or prevailing green, I find that I have five colours, or tones of colour, with which to work :—1. Light green ; 2. Dark green ; 3. Reddish purple ; 4. Yellow or golden ; 5. White or silvery ; and these may be combined in a variety of ways. Dark bluish green has a good effect when placed in contrast with light yellowish green ; white with dark green ; reddish purple with light green ; reddish purple with yellow ; yellow with dark green. And these contrasts by no means exhaust our resources. I merely quote them from among a number of experiments which I have actually tried and found agreeable to my taste. I have indeed no intention here of laying down any precise or definite rules for the application of these principles ; I aim at no more than to show that the materials in colour exist, leaving their combination to be dealt with by the ingenuity and industry of a cultivated taste. It would be chimerical to suppose, unfair to expect, that any person taking this subject in hand without previous study, or without the fullest acquaintance with the materials which exist—some of them newly introduced—would at once realise any great measure of success. To such an individual the scheme would probably appear Utopian. He might, by a momentary effort, call up in his mind the short list of old and familiar trees with purple, white, and yellow leaves,—the purple Beech, the white Poplar, the variegated Turkey Oak, and some few others still among the most valuable, but so few in number that he would dismiss the subject as impracticable. But unless familiar with the black and yellow Oaks, the yellow Elm, Acacia, and Alder, the white-leaved Acer Negundo, and the many beautiful Maples recently introduced from Japan—the host of richly variegated trees only now becoming plentiful,—in a word, unless familiarly acquainted with the latest introductions of this kind, he would, I submit, be drawing his conclusions from incomplete information.

In order to bring my views to a practical test, I have here a diagram, in which I have merely sought to obtain the identical colours existing among trees and shrubs, and must refer you to the specimens exhibited to show that these colours really exist. This diagram, hastily executed, will perhaps also give some idea of the effect of the arrangement of the colours which we possess. The light green here is supposed to represent

the Larch, the dark green the Yew, the reddish purple the purple Beech, the yellow the golden Oak, and the white variegated Acer Negundo. There is also introduced here the ordinary green of Nature, which may fairly be taken as the groundwork of our operations.

Now, I am well aware, and would not ignore the fact, that the colours of the leaves of trees are influenced in some degree by cultivation and soil, but this does not affect our argument, as in the majority of cases they still bear the same relation to each other.

I have now to offer a few general remarks, with brief examples in support of the views which I have advanced. Let us remember that we are working with pictorial trees for pictorial effect. We may have spring pictures, summer pictures, autumn pictures, and permanent pictures. Summer and permanent pictures are the most valuable because of their greater durability. Specimens of these are before you, and a list of their names will be given at the end of this paper. The materials for spring and autumn pictures can only be shown in spring and autumn. The varying tints of the unfolding leaves of some trees in spring, and the glowing colours of the leaves of other trees in autumn, must be familiar to all observers, and these trees are beautiful in their seasons, whether regarded individually or in combination. But they are transitory. The varied and telling colours of spring, ordinarily, quickly subside into the universal green; and the bright leaves of autumn fall speedily before the frost and gales of that season. Yet both are desirable. The warm red and yellow tints of the unfolding leaves are peculiarly cheering in the cold days of early spring, and should be introduced freely when planting. The splendour of the American forests in autumn is a theme on which many travellers have loved to dwell, and leaves from these forests may be seen in that admirable institution, the South Kensington Museum. The trees we have long had under cultivation, and they are not only available but capable of being wrought up with magnificent effect in this country. Among the most effective of spring trees the Corstorphine Plane (Acer Pseudo-Platanus flavo-variegatum), yellow; the Acer colchicum rubrum (red); the purple Horse Chestnut (Æsculus Hippocastanum purpureum), purple; and the Silver Poplar (Populus argentea), white, may be instanced. The shades of green at this season are also innumerable, although for the most part gradually subsiding into one nearly uniform tint. The brightest among the leaves of autumn are perhaps the Scarlet Oak (Quercus coccinea), the Liquidambar (L. styraciflua), the Stag's-horn Sumach (Rhus typhina), the Ostrya virginica, and several varieties of Cherries, Pears and Maples; these usually die off bright red. Of yellow shades may be instanced the Lombardy and Ontario Poplars (P. fastigiata and P. candicans), the Norway Maple (Acer platanoides), the Horse Chestnut (Æ. Hippocastanum), the Salisburia adiantifolia, the Lime (Tilia europæa), the Tulip tree (Liriodendron tulipiferum), the White Mulberry (Morus alba), the Gleditschia triacanthos, the Magnolia tripetala, the Juglans amara, the Acer Negundo, the Kölreuteria paniculata, the Birch (Betula alba), and certain varieties of Cherries, Pears, Thorns, and Maples.

As examples of planting for pictorial effect, nothing can be more beautiful in the flower garden than pillars or columns of Ivy, provided that they be appropriately placed. Here we have dark green, light green, green blotched with gold, and green edged with silver, all calculated to form permanent pictures. Standard and pyramidal golden Yews and golden Hollies also form beautiful permanent pictures in the garden. All permanent pictures are of course also winter pictures, but the common Beech (Fagus sylvatica) deserves special notice; it holds its reddish brown leaves throughout the winter, and this colour stands in warm and beautiful contrast with the Pines and other evergreens at that season. The white bark of the Birch, the white, purple, and yellow bark of certain species of Willows, the red and yellow berries of the Holly, and the yellow and black berries of the Privet, are also invaluable for winter decoration. I have often admired the effect of three large trees placed in juxtaposition in a garden in my neighbourhood, whether by accident or design I have no means of ascertaining. Near the bend of a river is a Weeping Willow, the pale green drooping branches appearing in the distance almost to sweep over the stream. Behind rises a mass of the dark feathery Yew, the plumes of foliage waving in beautiful contrast of motion, form, and colour. Still farther behind there appears in spring rigid masses of Apple blossom, the snow-white crimson-tinted flowers blending in beautiful contrast with the dark and pale green of the Yew and Willow. Here we have the evergreen and deciduous forms in combination, but they are most effective as a spring or summer picture. Of all the errors to be avoided in the association of colours, I would caution the planter against an arrangement that should present a "spotty" appearance. Broken lines, or irregular shapes of colour, appear to me more desirable in forming plantations or belts than figures with a more easily definable outline. On the face of belts or woods, three or five plants of a kind may be planted in a group, the outline being so broken that there are bays or promontories. In parks and gardens, single trees or groups of trees, each group of a distinct colour or shade of colour, would seem most appropriate. In working out these ideas we must never lose sight of harmony, remembering, however, that there are harmonies of contrast as well as of analogy. There is another point which should on no account be lost sight of. There are some trees the effect of which is beautiful close to the eye, but which lose their distinctive character in the distance. Such are more appropriate to the garden, where brought in close contact with the eye, than in the distant landscape. But there are others which lose little or nothing from a distant view, and these facts must be taken into account and acted on when planting. As a rule, trees with variegated leaves are best placed near to the eye, and those of one uniform tint are most effective in the distance. I have already instituted a comparison between the colours of flowers and the colours of leaves, but there is an important difference in them, which I must not omit to mention. The colours of flowers are often so bright and pronounced that certain of them cannot be judiciously brought into close contact; they require an intervening mass or line of some intermediate or neutral colour to render the effect agreeable and satisfactory. Not so, however, with the colours of trees; they are so subdued in tone that the association of the strongest colours does not produce violent contrasts. Again, for this very reason, the colours of leaves being less bright than those of flowers, it becomes necessary here to accomplish by breadth of colour that which, with flowers, is effected by brilliancy of tone. Thus it follows that great breadths of scenery may be dealt with most effectively. It is, indeed, a mere question of outlay, and nothing more, whether variety of colour shall or shall not be extended from the garden to the outer pleasure ground and shrubberies, the hills of plantations, the outskirts of woods and forests, and the most distant mountains and plains.

A.—Summer Pictures.

1. *Light Green.*

Larix europæa.	Acer Negundo.
	Tilia europæa.
Taxodium distichum.	Catalpa syringæfolia.
Gleditschia triacanthos.	Robinia Pseud-Acacia.
Juglans laciniata.	Platanus occidentalis.

2. *Dark Green.*

Fraxinus crispa.	Æsculus Hippocastanum.
,, monophylla.	Betula nigra.
Acer platanoides.	Fagus sylvatica.
Cytisus Laburnum.	Ulmus, various kinds.
Pyrus Aucuparia.	Quercus Cerris.

3. *Reddish Purple.*

Fagus sylvatica purpurea.	Corylus Avellana purpurea.
Ulmus campestris fol. purp.	Quercus pedunculata purpurea.
Acer Pseudo-Platanus fol. purp.	Quercus nigra.
Acer japonicum atropurpureum.	Berberis vulgaris fol. purp.

4. *Yellow or Golden.*

Quercus Cerris variegata.	Sambucus nigra aureo-variegata.
,, Robur var. Concordia.	Symphoricarpos vulg. fol. aureis.
Fraxinus aucubæfolia.	Spiræa opulifolia lutea.
Castanea vesca variegata.	Robinia Pseud-Acac. aurea.

5. *Whitey or Silvery.*

Populus argentea.	Pyrus salicifolia.
Acer Negundo variegatum.	Salix argentea.
Tilia argentea.	Shepherdia argentea.
Pyrus vestita.	Hippophae rhamnoides.

B.—Permanent Pictures.

1. *Light Green.*

Pinus pyrenaica.	Ilex balearica.
Cedrus Deodara (the green variety).	Juniperus thurifera.
Abies orientalis	,, virginiana.
,, rubra.	,, chinensis.

2. *Dark Green.*

Pinus insignis.	Quercus Ilex.
,, austriaca.	Cerasus lusitanica.
Picea Nordmanniana.	Phillyrea.
Araucaria imbricata.	Garrya elliptica.
Cupressus Lambertiana.	Hollies and Yews, various.

3. *Purple.*

There are no suitable purple evergreens, consequently this colour is restricted to summer pictures.

4. *Yellow or Golden.*

Abies excelsa finedonensis.	Thuja Lobbiana.
Cupressus thyoides variegata.	Taxus baccata aurea.
	Euonymus japonica flavescens.
Ilex Aquifolium aurea.	Retinospora pisifera aurea.
Thuja aurea.	

5. *White or Silvery.*

Cedrus Deodara (the glaucous variety).	Abies alba glauca.
	Ilex Aquifolium argentea.
Pinus excelsa.	Juniperus virginiana glauca.
,, monticola.	Rhamnus Alaternus fol. argentea.
,, nivea.	

W. Paul, Paul's Nurseries, Waltham Cross.

Home Correspondence.

The Oxford Show.—Of the financial failure of the Royal Horticultural Society at Oxford there can, I fear, be no doubt. As to the cause or causes of failure, there may be diversity of opinion. On the spot most visitors rushed to the conclusion that the Royal Horticultural Society failed to draw visitors because the larger show exerted the stronger pull; there was no room for two suns, and the larger one put the smaller out. This is a plausible view of the matter; but I think it would be more true to say, that the smaller sun permitted its light to be hidden under a bushel. The Horticultural Society seemed to suffer itself to be eclipsed; even its whereabouts was not known to "Cabby," nor to the general population of Oxford. Neither could any one proceed from the agricultural show to the horticultural without being driven round in another direction into Oxford, and then back again, thus losing time and doubling the expense. Is it any wonder, under such circumstances, that the flower show was starved? Most visitors would naturally take the larger show first and return to the other. But when they found they could not do so, but must proceed into the town and then return again, the wonder is that any one returned. It seemed as if this arrangement had been made on purpose to starve the flower show, for the street or road was wide enough to allow of any amount of traffic passing under proper regulations; and at night, when both shows were closing, the absurd regulation of "no return past the flower show" was abolished. I know not who was responsible for such an absurd arrangement; but this I do know, that had I been a member of the Council of the Royal Horticultural Society, I should have tried a tilt with the town and police authorities, and endeavoured by every means to have secured for Flora a fair field and some favour into the bargain. Again, though the special prizes were liberal, there seemed an entire lack of local enthusiasm. Even the members of the local Society had a show among themselves, side by side with the Royal show, and confined to their own members, as I understood the matter. Surely for once localism might have been merged into nationalism. One thing is quite certain, these permanent shows of the central Society will never succeed without great zeal and enthusiasm, and this seemed altogether wanting, or at a very low ebb, at Oxford. Now, it is scarcely possible that the Royal Agricultural Society can be responsible for the cab arrangements, and it certainly is not the fault of the sister Society that little enthusiasm was excited on behalf of the Royal Horticultural Society; therefore if either of these causes contributed to the financial failure, it is neither just nor logical to assume that it was in consequence of the two meetings being held together. Another cause of failure was the distance between the two shows. If held in the same town, I have always contended, they ought to be held in the same place, or as close to it as possible, and the communication between the two ought to be made conspicuous and visible to all. This was very far from being the case at Manchester, and at Oxford the shows were more than half a mile apart. It seems singular that room could be found for menageries, stalls, refreshment tents, shows of all kinds, down to a wonderful fat pig, admission one penny, and ginger-bread stalls and drinking places without number, and that no place could be found for poor Flora. I heard on the spot that a meadow had been offered to the Royal Horticultural Society contiguous to the great show, and declined,—I know not with what truth; but better to have paid £50 for a site against the other show, than have one free in the Observatory, with the cab arrangements and other conditions as I have described them. It may be that the time has come to separate the two Societies, but the necessity for such a separation is by no means established by our past experience. Oxford and Manchester might both have been brilliant successes had equal facility of access been afforded to both societies, and sufficient local enthusiasm aroused, and local assistance tendered. If the Horticultural Society takes the road alone, she can only succeed by making herself known, respected, loved, and I think it was quite possible to have done all this in company with her stronger sister, Agriculture. The secretary, or manager, or some member of the Council, might surely have seen the Mayor or police authorities, and inquired into the cab and carriage arrangements. Every cab-stand might have been placarded with information, so that the Manchester difficulty of being set down at the Agricultural, instead of the Horticultural, need not have been repeated at Oxford. Such may seem small matters,—but success or failure mostly turns upon very small hinges. I am well aware that other causes of failure are advanced, such as the immense size of the Royal Agricultural Society's show, and the consequent exhaustion of inspecting them; also the positive antagonism of the big show to the lesser one, which I do not believe in. There are horticulturists who speak as if every lover of bullocks longed to place his heavy boot on poor Flora's fair and gentle form: I don't believe it. The Society is too strong and too gallant to fear the rivalry of Flora and Pomona, and I still think the stronger might be induced even to render active help to the weaker. But if we must part company let us at least part amicably. It is of no use blaming others for failure which might have been averted by greater forethought, tact, and zeal. The fault is not "the other Society" but our own, if failure is our lot. What else, indeed, could be expected under the circumstances? Flora was ignored in the councils and arrangements of Oxford magnates, and her empty exchequer is the legitimate consequence. She blushed unseen in the Observatory grounds without observers and their offerings, while the roar of the traffic rushed past, and the return stream, which might have nourished and comforted drooping

Flora, was diverted in other directions. Local enthusiasm and ready access would have laid golden offerings at her feet. I shall be sorry to see the two societies separated. Horticulture gives the finishing touches to Agriculture. It crowns the latter with beauty, and enwreathes it with grace and elegance. Gardening cultivates, refines, ennobles its more utilitarian sister. They ought to meet once a year at least, and take sweet consel together. But the meeting, to be useful, must be cordial and real; no sneering at each other in cold indifference a mile off, but a warm, cordial embrace of those two societies whose mission it is between them to replenish the earth with plenty and adorn it with beauty. *D. T. Fish.*

Plants for Dinner-table Decoration.—In the different reports of plants lately used at the exhibitions for decorating the dinner table, I do not see that sprigs of the variegated Maple (Acer Negundo variegatum) have been tried. I find when sprigs of this tree are used in combination with trusses of high-coloured flowers, such as scarlet, purple, or pink Pelargoniums, Ageratums, and yellow Calceolarias, the effect is very good. Take from four to six sprigs of this Acer, and spread them out on low glass baskets or vases, with the flowers in the centre, and not overcrowded. The sharp pointed leaves of the Acer naturally droop down on each side, and their fine variegation of white and light green show off all high-coloured flowers to the best advantage. A fine effect is likewise produced by using a few sprays of it in little vases for chimney and window decoration; the leaves will droop down 5 or 6 inches; and when a few flowers are placed in the centre, according to taste, the effect is charming. I procured young grafted plants of this fine ornamental Acer, when it first came out, and they are now fine, bushy little trees of from 12 to 14 feet in height. In shrubberies this tree produces a fine effect, when mixed with Golden Yews and other ornamental shrubs. For massing in clumps it equals on a large scale the best of the silver variegated Pelargoniums, and will be, when better known, used in quantities for such purposes in shrubberies, and for giving effect to the foreground in park scenery. *Wm. Tillery.*

Small Birds and Fruit.—I can fully endorse what Mr. Smith says at p. 927, for, like him, I have frequently left rows of inferior sorts of Strawberries, such as the Grove End Scarlet, also Cherry trees of common sorts, unprotected, in the hope that the birds would feed upon these and leave the others alone; but I have always found that they are determined to have the best of everything, either in or out of season, if possible; hence my doubts as to whether a few patches of Strawberry runners planted in the shrubberry or any out-of-the-way corner will, as Mr. Lees says they will, produce sufficient fine fruit to satisfy the hungry birds, and leave lots to spare. Else I wonder who would not wish to have such an elysium as he would have us believe he has created. Of course there can be no harm in anybody trying the plan, provided they risk nothing by so doing, but, as I said at first, Mr. Lees does not make it clear from the facts he brings forward, that the plan either does, or will answer. Moreover, he says things that don't tally very well; for instance, at p. 895, after speaking of the "ravages" of birds, he in a few lines tells us that they eat very little! Again, at p. 991, he recommends planting Strawberry runners according to his plan, in preference to netting the beds, and in the same sentence says, "that such a thing as doing without nets has never entered his head." He must also admit either that he has over-estimated the number of birds, or understated the extent of his feeding ground—he cannot seriously expect us to believe that the "many thousands" he speaks of feed mainly upon the bits of patches he names. Those who know the gorging capacity of blackbirds and thrushes will take a deal of coaxing to swallow this. In conclusion, I beg to commend these and other discrepancies to the notice of Mr. Lees, in the hope that he will bring that common sense to bear upon them of which he felt himself possessed when giving me his piece of advice. *F. H., Osmaston Manor, Derby.*

Flower Show Appeals.—I exhibited at Chelmsford on July 14, in a class for 6 foliage plants, and the judges disqualified me for having two plants of the same species, viz., Croton variegatum, and Croton angustifolium. I always had an idea that they were distinct species. Am I right or wrong? *Walter Burder, Chelmsford.* [The plants named are considered by botanists to be varieties of one species, and hence, strictly interpreting the word "species," the judges were right; but horticulturally it is not usual to interpret so rigidly. Thus, the two plants cited are generally considered distinct species for all garden purposes, and practically they are different enough to pass as distinct. Eds.]

—— At the recent Chertsey Horticultural Show I exhibited a collection of 8 Caladiums, but the judges disqualified it because it contained Lowii and Veitchii, which they held to be, to all intents and purposes, Alocasias and not Caladiums. I have protested against this decision, as all the principal London firms enter these plants in their catalogues as Caladiums. Our collection exhibited at the Royal Horticultural Society four years ago obtained the 1st prize, and contained a plant of C. Lowii; and even last year, at the Chertsey show, our collection of Caladiums, which won the 1st prize, contained a plant of Veitchii. Please give me your opinion. *J. Carr, gr. to P. L. Hinds, Esq., Byffect Lodge, Weybridge.* [Another case of rigid botanical interpretation, which is not quite desirable from a horticultural point of view. No doubt, strictly speaking, Alocasias are not Caladiums, and the plants in question are Alocasias, but then in gardens they pass under the general name of Caladium, and A. Veitchii was originally described in these pages as Caladium Veitchii; so that for garden purposes, it seems to us that there is a general sense attaching to the name Caladium which suffices to include these plants, and hence the collection should not have been disqualified. Such cases only show how desirable it is in framing schedules to be exact and particular, and even explanatory, when there is any possibility of misapprehension. Eds.]

Yellow Roses.—I venture to indorse "Vicomtesse de Cazes'" proposal that the Crystal Palace Company, Royal Horticultural Society, and indeed any other Society, should offer prizes for the best 12 or 18 yellows, distinct kinds, or at least as far as varieties will admit. And why not? I supplement this suggestion with another,—to give the same distinctness or prominence to Moss Roses. Surely a few of the best of this beautiful variety are worthy of special distinction. Who with the slightest taste for the Queen of Flowers would not welcome this innovation in all our leading Rose shows, of a box of some three trusses each of such as the following, exhibited in the bud, with occasional partially expanded flowers:—Henri Martin, Céline Moss, White Bath, Meynell Ingram, Luxembourg, Crested, Lanei, and several others, which are well mossed and exquisite in the bud; not forgetting of course the ever renowned old favourite, the Common Moss, which still, and ever will, probably, maintain its supremacy as a button-hole favourite, alike esteemed by the prince, the fair lady, and the peasant. *Archibald Godwin.* [Some few years since prizes were annually offered for Moss Roses, and brought little or no competition, and proved to be the veriest rubbish as an exhibition; and this led to their omission. Yellow Roses are still invited. Eds.].

The "Archimedean" Lawn Mower.—I repeat, the simplicity of the construction applies to the knives alone; that the gearing, &c., is no simpler than others; and that what is gained in simplicity is lost in efficiency. Other machines, by a simple adjustment, can be set to cut any grass, from 4 inches long to 1. The "Archimedean" can only cut long grass with its scuds on, or very close with them off. As to the overhauling of other machines annually, if they will cut daily for eight months, surely this is a very small matter, to see to the gearing, the plate, and the knives once a year. Under this view of efficiency we say our ordinary mowers will only cut well kept lawns. I have never yet met with grass under 4 inches that most of them could not cut. But if they could not cut long grass at all, that I should not consider a demerit. Most lawns are well kept, and it is less labour in the end to mow once a week than once a fortnight or three weeks. That is the most efficient lawn-mower that will keep lawns in the best condition, and mow them best when so kept. I am glad you do yield a little about the grass scattering; but what you give up with the one hand you instantly take back with the other, when you add that the time saved in cutting compensates for the loss in having it swept up. This I totally deny. I contend there is no saving of time at all unless the men run and the horses trot or gallop; and that if there were, the drudgery of sweeping is far, very far indeed, from the trivial matter you state it to be. It will take as much time to sweep the entire surface as it does to mow it. Do you mean to affirm that the "Archimedean" would do as much work again in the same time as other mowers of the same size? I had hoped with you that a fair trial of lawn-mowers would have been made at Oxford; the draught and speed should be tested by proper instruments, and, above all, it should be tried on a well-kept lawn. I once saw a so-called trial of lawn-mowers at a horticultural show. Two or three gentlemen, one an Editor, another a gardener, and I think the other a member of the Council, were hot and excited and terribly hard at work thrusting certain lawn-mowers through coarse hay stubble several inches long. As usual, when I saw what I considered was a perfect farce going on, I asked what it meant. "Oh! we are trying the mowers for the prize."—"Why not, then, take them down to the lawn yonder?"—"Oh!" replied one of the jurors, with two or three tremendous thrusts of his machine into the hay roots, "the machine that will cut this well will cut the best lawn in England." The others laughed at this, and I went on my way. In a few minutes more I saw 1st, 2d, and 3d cards on certain machines. Will any one affirm that these cards were worth a single fraction as tests of merit? I trust we shall have no such farcical trials as this, but fair, patient, lengthened tests of the capacities and powers of the varied implements. *D. T. Fish.*

Raising New Roses.—"Old Subscriber" suggests that a white Rose, known to him of some 25 or 30 years' standing as Lady Harrington, would have been a good one for the purpose; I will venture to correct him in the name, which must have been local. Globe White Hip is undoubtedly the Rose he means, answering in every particular to the one named—a beautiful globular pure white, a counterpart of Coupe d'Hébé, as to form of flower, habit of plant, &c., and an immense favourite with the ladies 30 to nearly 40 years ago. In the year 1832 I got this identical Rose from Messrs. Rollisson & Son, Tooting, with Rivers' George the 4th, Margined Hip, and several other summer Roses—as then named in Paxton & Harrison's "Horticultural Register," and considered wonders of the day. What a change since then!—not one of the present magnificent race of hybrid perpetuals was in being. I believe this good old white Rose never left any offspring, and believe it to be nearly extinct; if not I should be much pleased if any of your numerous Rose-loving correspondents could inform me where to procure it again. *Archibald Godwin.*

The Palms at Kew.—Subtropical Gardening.—Few letters that have ever appeared in your columns are likely to render a greater service to gardeners, or save the lives and conserve the beauty of more plants, than that of Dr. Hooker upon this subject, at p. 897. I have always held that what is called sub-tropical gardening is a mistake in the open air in England, excepting in a few specially sheltered localities. Every one goes to see and admire Battersea, and it is almost impossible to overpraise its beauty. But thousands go and come without noting that the disposition of the ground is as unique as its clothing. Sheltering banks of rich earth, mostly topped with shrubs, send the winds bodily over the top of the fine sub-tropical plants, or sift them down into weakness before they can touch them. In fact, Mr. Gibson is perhaps a greater master of shelter than of artistic arrangement, and this is saying a very great deal. But it so happens that while the larger sub-tropical plants fill the eye of every beholder, the shelter that nourishes them into beauty and developes their strength is noted by but few. Hence it follows that ladies and gentlemen, and gardeners also, fresh from Battersea, commence a raid amid their greenhouse and even stove plants—Ferns, Palms, &c., the moment they get home. Valuable specimens are hurried out of snug quarters indoors, and set in the teeth of the wind, in the eye of the sun, and thus speedily rent into shreds, or burnt into brown or black deformity. Too often such disheartening failures have been put down to the want of skill of the parties in charge. But the only fault they could justly be charged with, was a too prompt obedience to orders without allowing the protest of their better judgment to be heard. The fact is, subtropical gardening requires a Battersea site, shelter, and soil. With these subtropical gardening is as simple as most other styles; without these it is a mockery, a delusion, and a snare. And Dr. Hooker has earned the gratitude of hundreds of gardeners by making this so very obvious in his thoroughly practical remarks upon the proposal of placing some of the Palms out-of-doors in the open bleak gardens at Kew. The result of doing so would simply be to ruin the plants that were placed outside, and render those less sightly that remained under glass. Such a compound of outward losses and internal deformity is far too common in many gardens. Many plants, most beautiful in temperate houses, have been ruined for ever by being Batterseaised for a few months in the open air. While admiring the taste and the genius of Mr. Gibson as much as most people, I wish to utter my earnest protest against bringing that style of gardening with which his name will always be associated, into disrepute, by attempting to grow semi-tropical plants on open terraces and in bleak situations, to their utter ruin. *Quercus.*

The Fungus Pest.—Mr. "Tell Fact," with the proclivities of his youth, has inflated a puff-ball with the dust of his genius, and though he refers us to page after page of the *Gardeners' Chronicle* which he has soiled with it, is not satisfied; but when brought up under the fear of the ferule, sticks his finger in his cheek, and cries, "It was not me, sir; it was Ayres." Fortunately the mycelium of his mischief is inert; the dust he has so industriously distributed has injured no man's eyes; the world sees through it, and values it accordingly. In the refinement of language our friend admits that "hide shavings were used in the Stortford border,"—a statement which I must confess had taken me so much aback that I did not know whether it was "leather or prunella" that he was alluding to. We, when I resided in the neighbourhood, called them "fleshings," and what difference there is between them and garbage it is not my place to define. Then as to the London street garbage. It was certainly not the good sweet muck of our farmyards; had little affinity with it; and what else it was, since he will not admit my version, he had better ascertain from his confidential adviser. The early history of these Vines was a series of blunders; their subsequent life—pinched at the spigot of growth, and drained at the bunghole of supply—might be classed under the head of cruelty to plants; while the recent trial and awful execution displays an amount of ignorance which makes one blush for the gardeners (so-called) of the present day. The fact is, we have lots of Grape growers, but few cultivators of the Vine. One man, by the use of "brains," makes worn-out Vines smile with a harvest of magnificent Grapes; another grubs them out and casts them on the fire-pile. "David Tell Fact" gives his faith to the latter, and becomes the champion apologist

of the system. He is welcome to do so, for the world has now the facts before it, and can choose between the bunches of Chatsworth, and the sour grapes of the Stortford imbecility. Our veracious friend says he saw "good Grapes at Chatsworth last year." If he means upon old Vines, Mr. Speed will not endorse his statement; that gentleman considers the present crop a mark of progression, but by no means so good as those Vines will in all probability display in another season or two. This will be attained by apportioning the burthen to the back, and not by the homicidal practice pursued at Stortford, of crying "Give, give," until the life blood of the plant has been dried out. Mr. "Fact" says the Chatsworth system savours "more of restriction than extension." Does it? The house contained a double set of Vines, one planted in an inside border the other outside, the branches being so crowded together as not to allow breathing space for either. The inside Vines are cut away, the outside ones fill the double space, and that is restriction! Not content with that, the Vines this season are making leading shoots from the top outside the house 6 to 8 feet long, and the same from the main stems outside the house upon the border. This also, perhaps, is restriction. The fact is, and its importance cannot be too strongly impressed upon Vine growers. Mr. Speed knows the measure of his success is dependent upon the increased development of roots which he can obtain; and the only way to obtain this, and at the same time secure the perfect maturation of the wood, is to encourage every leaf that can obtain breathing space without being crowded. I have now done with the Stortford controversy. Iteration and reiteration are not argument, and it is quite certain the Stortford historian's stock of ammunition is exhausted, and the only resource left is to cry "You're another." He freighted a sinking ship with weak arguments, and if, as the catspaw of ignorant prompters, he has been engulfed in an ocean of his own idiosyncrasies, it is his fault, not mine. I still commend him to Chatsworth, where he will find the friendly parting "grip," intensified by the previous hearty welcome which he will receive. *W. P. Ayres, July* 26.

The Fungus Question.—Some of your correspondents seem to infer that because water has proved itself an enemy to one kind of Fungus it will have a killing effect on all kinds. This is contrary to all experience. It is well known that some forms exist and even increase under the constant drip of water. Others, again, condemn the use of "sticks," and all forms of vegetable matter for the construction of a border for Vines, because of the liability of that material to produce Fungus. Do they forget, when recommending this or water for the destruction of that "horrid" thing, that the material used may generate a score of varieties of forms, neither of which would live on any other matter? Half of them may be produced by dampness of the material, the other half by circumstances quite the reverse, and none of them come under the category of those which live on living subjects. I have proved water to be an enemy to that form of Fungus known as mildew, as it completely cured Vines which yearly became attacked; but from the present knowledge I have of that form which is said to attack the roots I should hesitate to recommend water. While mildew on the leaf is brought about by certain conditions of the air, the other on the root most likely is by certain disease or decay of the root itself, when water would only help its decomposition. That Fungus will attack living plants is proved in many instances; what is wanted is a knowledge of the varieties and the conditions favourable to its growth. That all kinds of Fungus will hurt roots or leaves nobody will believe. If all who send specimens of Fungus to your office will describe all the circumstances connected with their growth which come under their observation, your eminent mycologist, "M. J. B." may some day give us a classification of the varieties in this direction, which would help to solve the mysterious problems which hang around this horrid Fungus question. From the little experience I have had with diseased roots, I have come to the conclusion that "warts" or decayed excrescences on the roots, brought on by extravagant growth or feeding, are the cause of the production of the kinds of Fungus found on them, and not anything in the shape of vegetable matter in the soil. If inquiries had been made 20 years ago, what an amount of information would be now collected. *H. Mills.*

—— I, in common with many others, have read with keen interest the various letters which have appeared in the *Chronicle* regarding Fungus, and now that the subject is fairly before the gardening world, it would be well that any who can throw light upon the matter should do so. I have just cause, as I imagine, to throw upon the Fungus "bugbear" the blame for a great amount of havoc committed, but if it can be clearly proved that it is not the dangerous pest it is generally thought to be, why I for one shall be glad; or if some simple and easily administered remedy can be pointed out, it will be of great benefit to all gardeners. About 12 years ago I was engaged upon making a Peach border, and, like most young practitioners, I intended to do great things. I removed the soil to the depth of 3 feet, and the subsoil being of a very strong yellowish clay, that I was most anxious to keep the roots of my Peaches from, I had placed at the bottom of my trench 6 inches of rough stones, brickbats, clinkers, &c.; the bed was made to slope from the wall, and a drain which ran immediately in front of the rubble carried the spare water into one of the main drains of the kitchen garden. So far: o well; but now came upon the scene of operations one who was master, who would be master, and who would not be convinced of anything contrary to what he imagined would answer. There was a hedge being cut on the back of one of the plantations, which, because it was out of sight, had been neglected in the summer trimmings, and these brushings he at last, after my telling him about Fungus, &c., insisted upon my laying over the rubble, as he said it would answer as well "as any manure," and all about Fungus was nonsense. This was done, the border completed with suitable loam, and in November the young Peach and Nectarine trees were planted. For three years all went on well, they grew splendidly, and almost covered the wall, to the great delight of my then employer, who often used to twit me before visitors about my "folly," and advised them to lift all their Peach trees and put under them hedge trimmings. The fourth year they again started well, and grew most promisingly until some time towards the latter end of March; but then came a change, the leaves at the points of the young shoots fell off, then mildew entirely spread itself over the foliage, and in fact the trees looked as though they were dying, as indeed they were. In this state I examined the roots, and not only the roots but the whole earth about them was one mass of Fungus. Here, then, was a clear case of Fungus poisoning. Can any one explain it away? Another case I will mention. Last autumn I had made a Mushroom bed, the frame of which was constructed of unplaned boards of native deal, which is perishing from the attack of a variety of Fungus which is well known to attack and destroy native timber. The bed was made in the orthodox manner, but the period of probation came to an end and no signs of Mushrooms; eight weeks went by and still no Mushrooms, but instead the surface of the bed was completely covered with little one-sided white Funguses, which for a time entirely destroyed my hopes of Mushrooms, but at the end of ten weeks some genuine Mushrooms showed themselves, and, after a time, quite overpowered the intruders, and a better crop of Mushrooms no one could have, or of better quality either. How was it, then, that in the one case Fungus gained the entire mastery over the Peach trees, and the other they had to succumb to their relative the Mushroom? I can only account for it by the rule of Greek meeting Greek, and the stronger member of the same family eventually gaining the entire mastery. Of this much I am so far convinced, that Fungus is a dangerous pest, and one to be very carefully guarded against, and, although my mind is disabused of some of the teaching of my old masters, I still cling to the belief in the power of Fungus to do a vast amount of harm, and to cause my brethren much disappointment and annoyance. *Kalmia.*

Malformation of Kalmia latifolia.—I have before me a case of teratology which will interest your readers—some fresh specimens, gathered in Deerfield in the western part of the State of Massachusetts, of Kalmia latifolia, in which the corolla is resolved into five filiform petals, not broader than the calyx-segments; and these not only resemble filaments, but bear each an imperfect anther; so that it is an instance of both dialysis and staminody. These staminodia are flat and strap-shaped at the base, but their margins are soon revolute above, so as to become terete, and the anther they bear is adnate, sometimes subapical, extrorse, and the cells show a disposition to open longitudinally. In some of them the sac which holds the anther in the normal flower is indicated by a slight hollow on the upper side above the middle, and a small boss on the lower side. I enclose some flowers. We have also found to-day among blossoms of Aristolochia brasiliensis one in which the upper lip is 3-parted, *i.e.*, there are three narrow upper lobes; while the dilated lower lip is of only about half the normal size. *Asa Gray.*

One Young Thrush Feeding Another.—At this season of the year in most garden establishments in this country, war is remorsely waged against blackbirds and thrushes; and certainly the depredations committed by those sweet songsters upon the fruit crops renders this, if not quite necessary or defensible, at least to some extent excusable. But the circumstance I am about to relate may be new and interesting to some of your readers (as it certainly was to me), and is moreover so much to the credit of one of the above-named songsters, viz., the thrush, that I am induced to send you the particulars, which are simply as follows:—Some five or six weeks since a nest of young thrushes were removed from the shrubberies here, with a view to being reared by the hand; and one of the nestlings having survived this ordeal, has for some time been able to feed itself. About a week since a partially fledged bird of the same species was taken from a nest and placed in the cage along with the former bird, the person who did so intending to feed the later introduction, but soon found that he was forestalled in his good intentions by the elder bird, which had taken this duty upon itself, performing the same in a most efficient manner. The food supplied consists of small pieces of uncooked meat, small earthworms, soaked bread, and an occasional Strawberry or Cherry. And strange to say, however hungry the elder bird may be, he never swallows anything until he has quite satisfied the wants of his young *protégé*. This being done he helps himself, and then assumes the quiet satisfied demeanour of an individual who is conscious of having performed his duty. It may be interesting to many to know if similar instances have been observed by your readers, as regards this and other species of birds when in confinement. *P. Grieve, Culford, July* 18.

Agapanthus umbellatus.—The place I selected for the trial of the hardiness of this plant is an open flower bed in the middle of a large lawn; the soil is light, and such as is to be met with all through the valley of the Thames. As I before stated, I have succeeded with two plants out of three, and I believe I should have succeeded with the third, but by an accident it was not covered up at the same time with the others. I attribute my success to three things—1st, to keeping the plants as dry as possible; 2dly, to the removal of all decayed leaves; and 3dly, to taking every favourable opportunity of giving them air. *B. S. R. A., The Manor House, Staines.*

—— As the remarks of "Observer," East Anglia, may lead many in "West Anglia" to believe this plant more tender than experience has proved it to be, I beg to say it has been out-of-doors at Enys over 30 winters without protection, and has often endured from 10° to 20° of frost. Last winter I registered 25° Fahr. of frost (Negretti & Zambra's instrument). It is now showing its heads of blue flowers, although their number is less than in some previous years, owing more to drought than cold. They grow in batches from a dozen to a score or more bulbs together. The stunted growth of leaves and bulbs when grown in this way, ensures that they are well ripened or prepared for winter, and also favours quick development in spring, which may be the secret of giving the power of resistance to cold. *Cornubiensis.*

Potatos and the Drought Experiences.—It may not be altogether purposeless to look about and take note of our gains or losses during the droughty season, as we can reap therefrom numerous lessons for future guidance, that will no doubt be remembered by practical men when the need arises. Growing Potatos largely and in various ways, I have to confess that, amidst all the experiences thus obtained respecting the needs and necessities of this valuable vegetable, I am even now quite unable to say with confidence which mode of culture seems to suit it best. A considerable quantity went in with the spade, and of these the least robust kinds succumbed to the drought first, and in most instances are now effectually doubled up This has indeed been the rule throughout all my stocks, and should be taken rather as a caution to growers who, like myself, have dry soils, to plant robust growers that will more easily stand against the lack of moisture. Then a large portion were dibbled in, the soil having been previously just dug. Of these it is noteworthy that where the soil was before hard and lumpy, and did not become well pulverised when dug, the effects of the drought were earliest visible and most severely felt. On lifting the crop in such soil, I have found it by far the driest and in a very knotty condition, whilst in those parts where the soil had gone well to pieces before planting, the crops still look in excellent condition. In another case, where a good dressing of manure was worked in, the crop succumbed earlier than where there had been none placed. Of course this is not intended as an argument against the use of manure, but it rather points to the desirability of its application during the previous autumn and winter months. Usually an advocate for moderate earthing up, I have been constrained this year somewhat largely to depart from my customary practice, as I waited for the soaking that never came, consequently the earthing-up never followed. As to the difference in crop between those that are earthed and those that are not, it would be premature to say; but with respect to its result upon the present appearance of the haulm, I can safely aver that I see no sensible difference. One great advantage that I find resulting from a moderate ridging is this, that the rows are more easily found and forked out late in the year than when no earth is drawn up. I know that some writers lay great stress upon the absence of earthing-up as being conducive to increased fruitfulness, but my own experience hitherto has not favoured that opinion. For the first time I have this year devoted about 20 rods of ground to the growth of Potatos upon the ridge-and-furrow system, as recommended to me by Mr. Fenn. When I had the pleasure of a short, but practical chat with that gentleman at South Kensington on March 18, I purposely asked his opinion as to the merits of his plan when applied to dry soils, and he commended it to me in the strongest terms. Early in the month of April I put it into operation on a piece of very poor and weedy land, by first marking out the rows at intervals of 3 feet, with a line, then turning up deeply with the fork a spit in width; along the centre of this the Potatos were placed, and over them a light dressing of Lawson's superphospho guano, then a spit on either side: weeds and all were turned over upon the centre, thus forming a ridge, and thus it remained until all the Potatos were through. A few large weeds that shortly came up were pulled out. And then the hoe was used to draw up a little more soil, and at the same

time to destroy weeds, and thus the required culture was concluded. From the time of planting until now all the rain that has fallen has not penetrated half an inch into the ridges, the soil when planted having been comparatively dry, and yet the crops so treated have all through borne an appearance fully equal to those planted under the usual and most favourable conditions, and promise a capital yield. On turning out a few roots here and there I find that there is more moisture in the soil under those planted upon the ridge than there is under those planted upon the flat. This I attribute to the much greater depth of soil beneath the tubers in the former case to that in the latter, certain it is that the prognostications of my neighbours have been entirely unfulfilled ; and so far from the crops being dried up, there is more of promise for me in the experiment than I had anticipated. One writer stated that the produce of a given piece of ground so planted would equal that produced on the old system at 2 feet apart. Should this prove to be a fact, it will be considerable gain, as so much valuable seed is thus saved, and in addition to which there is a decided advantage in favour of successional green crops, as by digging in some manure into the furrows, and putting in winter plants, these can get several weeks start to what they could possibly have if left until the Potato crop was lifted. I have particularly observed that of the new American kinds, the Early Rose and the Early Goodrich have been the first to succumb to the heat. No doubt this is owing somewhat to their early habits, but some English kinds that are quite as early have not gone down so speedily. The Rose has, however, greatly benefited in quality if not in quantity by the drought, as it boils first-rate this year. It is evidently a Potato for dry soils. Of Mr. Turner's two new kinds I find Union to be an early round that fell prostrate, and lost its haulm, whilst Beaconsfield was still robust and growing. Thus the sun has been no respecter of Potatos, but has found for each its level. I want to have a word or two about Peas and the drought next. *A. D.*

Princess Royal Lettuce.—I transmit for your inspection examples of a Lettuce growing here, and which I procured under the name of Princess Royal. I am not, however, assured as to its identity. I have recently cut several, each weighing about 4 lb., and in texture exceedingly tender and crisp. I may remark that the old black-seeded Bath Cos, growing under exactly the same conditions, has failed to perfect a single specimen, having bolted by wholesale. *William Gardiner, Eatington Park.* [A very fine crisp Lettuce, with no sign of "bolting" about it. Eds.]

Vines at Broomfield Lodge.—I cannot conceive that any useful public good will ensue by prolonging this controversy, but from the strain in which your correspondent writes at p. 928 I am compelled to trouble you with another reply. I will commence by stating that I adhere strictly to all I have written on this subject, and if your correspondent is prepared to prove to the contrary, he ought surely not to be ashamed of his name. In order to defend myself, I must give some little information as to the state in which I found these Vines in April, 1867, and yourselves and your readers will draw your own conclusions as to whether they were in that perfect state of health, and receiving that proper treatment, which characterises good Grape growing, and which your correspondent maintains they were. Well, the first house was just ripe, the berries not larger than a British Queen Pea, full of mildew and thrips, and too full of rust to be described. How was this? Why, in my predecessor's haste to ripen the head he had totally neglected the roots, 90 per cent. of which were outside ; and it is a fact that while the head was living in a temperature of 70° to 80°, the roots were exposed to all the mercies of heaven, not a single bit of covering, to say nothing of fermenting material, being employed. The border must often have been frozen to the depth of 6 inches or more, and it is difficult to conceive how the young rootlets could be expected to ramify in a cold wet border, with an occasional crusting of 6 inches of frozen earth. All the borders were alike uncovered all the year through. I here take the liberty to mention the name of Mr. Saltmarsh (Saltmarsh & Son), who, among others, was called in to see these Vines, about a fortnight previous to my coming, who, if necessary, could testify to my statement. I have made the above assertion with great reluctance, but have felt compelled to do so through the aspect this controversy has assumed, and therefore, if your correspondent has made a rod for his own back, let him not blame me. With regard to my "ten months' supply," the principal reason for your correspondent denying it seems to be because he holds a "contrary opinion," but surely a mere opinion is not capable of disputing a positive fact ; and as his opinion is his only groundwork for calling my statement in question, it may be taken for what it is worth. I emphatically deny that I had only three or four bunches of Grapes at Christmas, as on New Year's Day I had 18 bunches hanging. I equally deny, too, that the Vine from which I cut my "1st prize" Grapes last September only carried four bunches, and I can call witnesses to prove that it carried nine good bunches, although only a young Vine. Allow me in conclusion to inform your correspondent that I again secured the "1st prize" for Grapes at our annual exhibition on Thursday the 14th inst., amid 13 competitors, making the third consecutive time I have carried this prize, twice with the produce of these old Vines, and each time carrying a heavy crop. I have now done with this controversy ; and any impartial authority your correspondent may name shall be allowed to come and inspect these old Vines, to prove or disprove my statements. *Thomas Simpson.* [We think enough has been said on this matter. Eds.]

Names of Ferns.—Every one must have been pleased with the beautiful collections of British Ferns and their varieties shown this week at Oxford. But I wish to ask why it is necessary to give each new variety a long semi-scientific name, barbarously compounded from Latin and Greek words. The usual rule is to give Latin names to plants which are true species or varieties actually found wild, but to give to gardeners' varieties English or French names ; I see no good reason why this rule should be departed from in the nomenclature of Ferns. At the present rate of increase, we shall soon have as many varieties of British Ferns as we have of Roses or Geraniums ; and it seems to me very desirable that we should know at once, by a simple glance at their names (as we can with Roses and Geraniums), whether they are true species or gardeners' varieties. *Henry N. Ellacombe.* [We are quite of your opinion, and have often protested against the practice, but when the present plan of naming Fern varieties was commenced no one ever dreamed they would become so numerous. The difficulty of making a change now would be that it would introduce two sorts of names. Eds.]

Prize Gardening.—This is a capital idea, and our thanks are due to "D. M." for mooting it. I cannot, however, join in disparaging the general practice of leading exhibitors. Many of them are among our best general practitioners, though others who rank high on prize lists are sad messers and meddlers at home. Prizes are often the products of other men's labour, the nurserymen being the producers. Prizes for one thing may represent neglect of others. For all these, and many other reasons, the whole garden is a much safer test of merit than a patch of it merely, which the prize mostly is. But we need not put prize gardening in opposition to prize Grapes, Melons, Pines, or what not, but abreast of it. Let us go on by showing specialities by all means, and have a tilt among gardeners as well. The visits of the Royal Horticultural Society into the provinces would furnish a suitable opportunity for such wholesale competition. The best gardens in the district might on these occasions compete together, and the different counties and divisions might wrestle for the mastery. The task of selecting the competing gardens would be somewhat invidious. I question whether local committees could manage this delicate matter of selection ; perhaps it would be better to invite all that would to enroll themselves as competitors ; or a central committee might be authorised to select the gardens for competition. The following considerations, among others, ought to determine the awards :—Furnishing of the gardens with flowers, fruit, vegetables, shrubs, and trees ; cultivation of the garden, quality, quantity, and proportion of produce ; keeping of the garden—neatness, cleanness, order, system, &c. ; expense of garden—for plants, seeds, manure-water, labour, per acre ; special and general estimate of the whole, with a summary of the grounds upon which the prize was given. The number of points to be given under each of these and similar heads could be stated before-hand, and every one could thus count the chances of success, as it were, before they entered the lists. In all cases in which gardeners had either designed or remodelled the plans of gardens, or formed the landscapes, such facts to be stated, and the merit or demerit of such work to be placed to their account. By taking cognisance of all such points, the comparatively smaller garden might compete with and defeat the larger one. All considerations of size to be balanced against expense, and the prize to go to him who can exhibit the highest results at the least expense. By thus checking area with the money expended on it, all would be placed on an equality, and thorough good gardening be encouraged. Without such a check money, rather than skill, would generally win. Here, for instance, is a garden of 20 acres, and 30,000 feet of glass furnished and kept well for £1000 per annum. Here is another of 2 acres, and 1000 feet of glass that costs £300. The gardens are alike. Then the large one ought to have the prize. But suppose the small garden had been equally well kept for £100 a-year, then it ought to have had the prize. As a rule, I believe it will be found that the largest gardens are not only kept better, but cheaper, in proportion, than small ones. Prize gardening would throw much interesting light upon this and many other subjects, for all which reasons I hope some attempt will be made to carry it out. Few of us would like to be beaten perhaps, but still this would not make us worse gardeners than we are, and it would do many good to be forced to acknowledge that others can do things as well, perhaps better, than ourselves. *David Tell Fact.*

Garden Roller Barrow.—Have any of your readers used this garden "help," introduced by Pollard & Co.? It seems to me useful for all places where lawns are kept in good order, and where they are bordered by flower beds ; as it obviates entirely the ruts and marks made by the wheel-barrow in wet weather, and in fact makes the lawn better by its use. It is, as being made of iron, light, and very durable ; and although its first cost is greater than that of a wooden barrow, it is far more lasting. I have tried one in my own garden, and find it very useful. *D., Deal.*

Foreign Correspondence.

Cranberry Culture.—In reply to a request for information on the culture of the above, I may mention that, with perhaps the exception of the district of Cape Cod, there are more Cranberries cultivated in the State of Jersey than in all the rest of the United States, chiefly for the reason that the plant grows here very extensively in a state of Nature, and also from there being hundreds of acres fit for nothing else, and which can be at a small expense converted into one of the most productive and paying crops in the States. If this can be done where labour is scarce and double the price of the same class of labour in England, why should not some of the similarly unproductive spots in your country be turned to as good a use? I can call to mind hundreds of such spots which at the present time produce nothing but frogs and weeds, which at a comparatively moderate expense might be made to pay ten times the amount per acre of any other part of the estate ; but looking at it in the paying light there is another view of the case—it would find work for some of the unemployed labourers, and keep the poors' rate down,—at the present time a very desirable object, if the English newspapers and magazines are correct in their statements. There are three things required to make a first-rate Cranberry bog—sand, peat, and the power to flood it suddenly. Cranberries will grow in almost any peat or bog, but grow too much to foliage ; the sand or gravel checks the growth, makes them fruitful, and keeps the weeds down, which is necessary until the plants cover the ground, after which the weeds will have a poor chance of growing : the water guards them from frost.

To prepare the ground, strip off the weeds and rubbish to about a foot in depth, making it level for the water to flow evenly all over ; mark out drains about 2 feet deep at about 40 feet apart ; then cover the beds with 4 inches of sand or fine gravel, either will do, if clean and free from seeds of weeds. It is now ready for planting. Mark off rows 18 inches apart each way, and dibble the plants, three or four in each corner ; turn on the water for a day to settle the sand, and the work is done ; and if thoroughly done at first, there is nothing more to do but to gather the fruit and receive the money.

It is necessary to flood the plants if a frost threaten while they are in bloom, or in the autumn when in fruit—and if there is head of water sufficient, over the plants ; to prevent them being frozen into the ice in the winter it is good, although if run off and neglected in the spring a frost would probably then find them more tender. I may mention, what your correspondent "H. S. H." is probably already aware of, that it is no use to plant the English Cranberry. Of course that would not pay for his trouble, but the American plants are very cheap, could probably be delivered in Liverpool for 30*s.* per barrel, and about 12 barrels would plant an acre, or even more. If if ordered at the end of the year, they would travel well in the cold weather. Seed has been tried in this country, but did not answer.

As regards the profits in Cranberry cultivation, a writer in the "American Agriculturist" states that it cost him 600 dollars to start a patch of 2½ acres, and it has paid him 1000 dollars nett per year for the last 10 years. Then the first year he would have nothing, and only a partial crop for two years after, but after the first full crop following years are a certainty.

As a fruit for taste and jelly I consider the Cranberry has no equal, and it is easy to keep the fruit in perfection into May, or even later, in a cool cellar in clean water, occasionally changing the water, so that there is no trouble or expense of sugar or boiling. *James Taplin, South Amboy, New Jersey, U. S. A.*

Societies.

Royal Horticultural Oxford Meeting: *The Congress.*—Thursday, July 21. Major Trevor Clarke in the chair. The first paper read was that of Professor Lawson, on the Botanists of Oxford, which, through the courtesy of the Professor, we are enabled to print in full (p. 1024). Following the reading of this paper, the Rev. S. Reynolds Hole proceeded to descant upon the Rose. After a few introductory remarks, he proceeded as follows :—

"There were three main elements required to grow good Roses, site, soil, and sustenance. As to site, the Rose should be protected from blusterous winds, and yet at the same time have plenty of fresh pure air. It did not much matter whether they were grown on hills or on table-land, provided there was plenty of timber to make natural screens, or broken up so that the wind came in as through a respirator. Shelter and not shade was an imperative requisite. The shade of overhanging boughs was fatal, as also were the main roots of trees. There was a Rose called the Royal Horticultural Society, which had been attempting to bloom for the last three or four years under the shade of a large tree called the Agricultural Society ; and, although it had had the most

consummate skill and the best attention paid it, still its efflorescence was not satisfactory. Let it come away from the ye large timber," said Mr. Hole, "and then gather ye your golden Roses." Then as to soil. Where Potatos will grow well, there is the Rose to be found in its glory. Plenty of lime in Rose soil adds additional brightness to its glowing colours. With regard to sustenance, he would recommend good farmyard manure as the best food for Roses. Much good had been done by the use of artificial manures, but they would always remain second and supplemental to farmyard manure. Manure should be laid on liberally in November, and be dug in in March, and then one more dressing should be given when the buds begin to swell, and the colour to show. Pruning should be done in October, and the weak wood cut out in March. The great enemies of the Rose were aphis and mildew, but if it had proper soil and sustenance these would never appear, unless caused by spring frosts. For the caterpillars there was no remedy but to employ children at 6*d.* a day to pick them off by the hand. The best stocks from which to select Roses are those which most frequently take the great prizes at our exhibitions. If Roses were only wanted for a Rose garden, and growers did not care about exhibiting, let them buy in a large proportion of Roses upon their own roots, because they are prettier, more abundant in producing flowers, more enduring, and therefore more economical."

After a vote of thanks had been awarded to Mr. Hole for his address, Mr. W. Paul proceeded to read his paper "On Colour in the Tree Scenery of our Gardens, Parks, and Landscapes," which will be found in another column, and which elicited some comments from Mr. Barron and Mr. Fish. Then followed the papers of Dr. Hogg, whose rules for Fruit judging met with evidences of dissent; of Mr. Moore, "On Judging Plants and Flowers," and of Mr. Williams, "On Pitcher Plants," which papers, thanks to the courtesy of the writers, or the exertions of our own special correspondents and reporters, we hope to print next week; when we shall also take occasion to allude to some of the horticultural appliances &c., exhibited at the show, and for which woodcuts are in preparation.

GLASGOW AND WEST OF SCOTLAND HORTICULTURAL: *July* 13.—This, the third exhibition of the season, took place in the City Hall. Nominally, it was a Rose show, but with those glorious kings of vegetation, Palms and Ferns, and plants beautiful either for foliage or flower, the general character of a great floral display was maintained. The post of honour was allotted to the Royal Botanic Gardens, and the exhibition which Mr. Bullen, the curator, made comprised scores of plants that must have been both interesting and instructive to botanists and horticulturists; here were great Palms, with huge Sugar-cane-like stems (Seaforthia elegans), towering above the lesser groups of vegetation, and combining to reproduce a happy bit of picturesque scenery, in which were to be seen the noble Sanchezia, the particoloured Hibiscus Cooperi, the beautiful and graceful variegated Fuchsia gracilis and Acer Negundo — two plants so cheap, and good, and common, that any and every citizen florist should secure them; the handsome Marantas, the marbled Alocasia, the dark green and crimson-veined Gymnostachyum, some curious insect-like Orchids; Pitcher Plants in good variety and of curious forms; the Fly-trap of Venus (Dionœa muscipula), &c.

Groups of flowering plants containing Heaths, Everlastings, Periwinkles, Achimenes, Bougainvilleas with their profusion of fine mauve bracts, Clerodendrons, the drooping flowered Hoya with umbels of flowers as if dipped in honey, and the great scarlet-flowered Anthurium Scherzerianum, were contributed by Messrs. Hogg, Murray, and Boyd. Fuchsias, Pelargoniums, Achimenes, Ferns, and plants of fine foliage, were also in numbers, the two former genera being well done—especially the Fuchsias from Mr. Blair, and the variegated Pelargoniums from Mr. N. Campbell and from Mr. Boyd. Nothing could be more elegant as plants and as varieties of Fuchsias than the sorts named Madame Cornelissen and Rose of Castile, and then the gold and silver and Maidenhair Ferns were in fine condition. Fancy Pelargoniums were well exhibited by Mr. M'Culloch, Hamilton Crescent. By far the most interesting exhibits of Messrs. Smith & Simons were Roses, and such wonderful Roses that they captivated every one; among them was Maréchal Niel, so rich and full and of that deep tone of yellow to which all other tea-scented flowers must succumb. Then, if we were to select any others, it would be the deep shaded crimson Alfred Colomb and the charming, soft, rose-coloured Louis Peyronny. Collections of garden tools are nice things to show, but they were *outré* alongside of these fresh, lovely Roses. Messrs. Austin & M'Aslan had a seedling Phlox, raised by Mr. Turnbull, of Bothwell Castle, and named Mrs. Hunter, which obtained a First-class Certificate; it seems to be of excellent habit, bearing a full, fine spike of large white flat flowers, with a prominent deep pink eye—one of the finest we have ever seen of its kind. Of Pansies some very good seedlings came from Mr. Gibson, Fairholm, particularly the yellow ground variety, named J. D. Ritchie, and the white ground, named Eliza Anderson. Messrs. Fowler & Co. exhibited a fine lot of Tree Ferns, and particularly a nice group of the pretty New Zealand Fern, Todea superba, some of the specimens measuring quite a yard in diameter.

Fruit was an interesting group. Mr. M'Connachie had some magnificent bunches, with great berries, of Golden Hamburghs; and Mr. Campbell had quite as wonderful fruit of Black Hamburgh. Mr. Connon, gr. to the Duke of Montrose, had much the finest Elruge Nectarines we have ever seen exhibited—perfect in colour, large in size, and well put upon the table; and his Peaches were scarcely inferior. The fruit in general, indeed, comprising Grapes, Peaches, Nectarines, Strawberries, Cherries, Gooseberries, and Currants, was very good. By far the most interesting group came from Mr. John Anderson, Sauchiehall Street. It was arranged somewhat after the *dîner à la Russe* style, but the groundwork was scarcely pure enough, although the fruit in general was such as to give credit to any exhibition. It consisted of Pines, Grapes, and all the other fruits named above, with the addition of fruits of the Passion Flower, fruits of the Tomato, fruits of Egg Plants, and fruits of Capsicums, with plants in ornamental pots grouped effectively among them. The directors and judges dined at the Clarence Hotel, Mr. Anderson, Meadow Bank, presiding.

QUEKETT MICROSCOPICAL CLUB.—The fifth annual general meeting of this Club was held on Friday evening, July 22, at University College, Gower Street. Peter Le Neve Foster, Esq., President, in the Chair. According to the annual report of the committee, which was read, the Club still maintains its popularity and success. It numbers over 500 members and meets for the prosecution of microscopical inquiry and discussion twice a month throughout the year. Professor Lionel S. Beale, F.R.S., was elected President for the ensuing session; and Messrs. Arthur E. Durham, Henry Lee, F.L.S., Peter Le Neve Foster, M.A., and Dr. Robert Braithwaite, were elected Vice-Presidents; while Messrs. Allbon, T. W. Burr, F.R.A.S., Witham M. Bywater, and Charles F. White, were elected to fill four vacancies on the committee. The proceedings terminated with a *conversazione*.

Notices of Books.

Narrative of a Spring Tour in Portugal. By the Rev. A. C. Smith, M.A. 8vo, pp. 220. Longmans.

No one knows how long Central Europe may be closed to the tourist and pleasure-seeker by the wretched war, whose commencement we have so lately had to mourn. For aught we know, Portugal, whose claims on the attention of the tourist are advocated in the above volume, may, before next spring, be as inaccessible to the ordinary traveller as the Rhine provinces now are. In this dilemma two alternatives are presented to the traveller—the one to visit some country purely neutral, and likely to remain so; the other to content himself with reading what others more fortunate than himself have written on the countries he is debarred from visiting in person. Admitting the possibility that before the spring—the only time when Portugal can be visited with pleasure—the progress of the war may have rendered the Iberian peninsula inaccessible, this book will have acquired a value that otherwise it would not have had. In style it is light and gossiping, but laden with petty details and incidents of travel, very interesting to the writer and his immediate friends, perhaps, but for the most part matters of indifference to his less interested readers. Nevertheless, we should do the author a great injustice if we did not admit that he has presented us in small compass with a great deal of interesting information. His reflections on the University of Coimbra may raise a smile; but it should be remembered they are the impressions of a traveller sojourning but a few days in the city, and with no special means of gauging the merits or demerits of the university curriculum.

To our readers, probably, the most interesting portions of the book will be those in which the natural history of the country is mentioned. The author is well known as an ornithologist, and his appendix concerning the birds of Portugal will be useful to students of that branch of science. Here and there, too, throughout the book we come to glowing descriptions of the gardens of Lisbon, Cintra, and Oporto. The Bougainvilleas at the first named, and the Camellias at the latter seem specially to have attracted our author's attention. We may, by way of illustration, extract part of an account of the garden of the English chaplain at Oporto. In this garden are, amongst other things, a Tulip tree and a Magnolia.

"Both are large forest trees, throwing out their branches laterally with great vigour, well grown, and still growing and overshadowing a wide extent of ground. * * The Tulip tree, at 3 feet above the ground, measures 17 feet 1 inch in circumference, while it attained an altitude of 90 feet, and was literally covered with blossom. A perennial spring of water trickled near its roots, and, doubtless, this was the secret of its vigorous growth and rapid increase. The Magnolia tree was, perhaps, even more extraordinary, as it extended over a larger area of ground, and some of its branches were huge limbs. It measures 60 feet in height, and 13 feet 4 inches in girth at 3 feet from its base. It is in the height of its vigour, and is annually increasing, though, during the siege of Oporto, it was struck by a cannon ball, which inflicted a severe wound on the trunk, and threatened extensive damage. By judicious treatment, however, it has recovered from the hurt, and, beyond an honourable scar, which it will always carry, is none the worse for the hard blow; indeed, Mr. Whiteley confidently asserts that it is the largest Magnolia in the world. The buds were swollen, though no flowers were opened during the time of our visit; but we could well believe its enthusiastic owner's statement, with what delicious perfume the whole garden would be scented, and what a noble spectacle it would be when in full blossom, and no less than a hundred gigantic flowers blooming at once upon the tree.

"In the same garden grew a very fine Judas tree,* a splendid Pimento or Pepper tree, some large Shaddocks, and a Japanese Apple, the fruit of which we had bought at Coimbra under the name of "nesperas," though here it was known as "laconte." Here, too, Camellias, of every variety of tint and of great size, were abundant, while the garden was bounded by a belt of Cork trees, which offered a grateful shade during the mid-day heat. I do not mention Oranges, because they abound in every part of Portugal, of a size and flavour, and with a profusion I have never seen elsewhere. But I must remark on the Oporto Strawberries, which were very abundant in the market, and which we saw in perfection at Mr. Whiteley's table; they are of very large size, white in colour, and of excellent flavour, though, in my judgment, not to be compared with their exact contrasts, the diminutive, dark red, mountain Strawberries, which one meets with in Norway and Sweden.

"It is not difficult to explain the cause of the luxuriant vegetation we found in this favoured garden; it is exactly the same cause as that which produces an oasis in the sterile desert. A trickling spring bursting from the rock, and conducted through the garden, is the secret which, in this splendid climate, works wonders in the vegetable world. And so we found throughout northern Portugal, in the rich province of Minho, an abundance of water was the true source of its fertility; and as no district in the country is so well furnished with brooks and streams, so none other is so fruitful. Even the famous Vines of Traz-os-Montes, which notoriously can endure long-continued drought, are at stated seasons carefully supplied with water; and, indeed I may close this botanical chapter with the aphorism well known in the thirsty, water-loving, water-drinking Peninsula, 'a perennial spring is the greatest earthly gift which God bestows on man.'"

* The Cercis Siliquastrum, the traditional tree on which Judas hanged himself: hence its English name.

The Apiary.

THE fact that the QUEEN BEE, when not impregnated at all, or when not impregnated until after a certain number of days after she has arrived at the winged state, only deposits eggs which produce males, seems to be unknown to your correspondent "M. D.," or he would never have written the first paragraph of his account of "Bee Life" (*Gardeners' Chronicle*, p. 961), which is thereby proved to be completely erroneous. His physiological views of the condition of the ovaries of the queen, and his "sugar and water," "honey and water," and "honey and pollen," lubrification of the larvæ will astonish most of your readers. *T. O. W.*

Miscellaneous.

PROGRESSIVE CHANGES IN PLANTS.—In plants, at least, we may almost watch, as it were, the process of specific change actually going on; or at least we may observe different races now living in different stages of progress, from the slight local variation to the distinct species and genus. As a first step we may take, for instance, those races which are regarded by the majority of botanists as very variable species, such as Rubus fruticosus, Rosa canina, Zornia diphylla, Cassia mimosoides, &c. We shall find in each some one form, which we call typical, generally prevalent over the greater part of the area of the race, whilst others, more or less aberrant, are more or less restricted to particular localities, the same varieties not occurring in disconnected stations with precisely the same combinations of character, and in the same proportions; local and representative varieties and subspecies are being formed, but have not yet obtained sufficient advantages to prevent their being kept in check by their intercommunication (and, probably, cross-breeding) with their more robust type. The British Rubologist or Rhodologist, transported to the South of France or to Hungary, will still find one, or, perhaps, two or three forms of Bramble and Dog Rose with which he is familiar; but if he wishes to discriminate the 30 or 40 varieties or subspecies, upon which he had spent so much labour and acuteness at home, he will find that he must recommence with a series of forms and combinations of characters quite new to him. The species is still the same; the varieties are changed. As examples of what we may call a second stage in the formation of species, we may adduce such plants as Pelargonium australe or grossularioides, and Nicotiana suaveolens or angustifolia, to which I alluded in my paper on Cassia. Here we have one race, of no higher than specific grade, in the ordinary acceptance of the term, inhabiting two countries which have long been widely dissevered (in the one case, South Africa and Australia; in the other, Chili and Australia), which, if originally introduced, by accident, from one country to the other, have been so at a time so remote as thoroughly to have acquired an indigenous character in both; in both they are widely spread and highly diversified; but amongst all their varieties one form only is identical in the two countries (Pelargonium australe, var. erodioides, and P. grossularioides, var. anceps; Nicotiana suaveolens, var. angustifolia, and N. angustifolia, var. acuminata), and that so comparatively a rare one that it may be regarded as being in the course of extinction; whilst all other varieties, some of them very numerous in individuals over extended areas, and all connected by nice gradations, diverge nevertheless in the two countries in different directions and with different combinations of characters, no two of them growing in the two countries being at all connected but through the medium of that one which is still common to both. When that shall have expired, the distinct species may be considered established. A still further advance in specific change is exemplified in Cassia itself, in which I have shown that no less than eight or nine different modifications of type, sectional and subsectional, are common to

South America, tropical Africa, and Australia, but without any specific, or at least, subspecific identity, except, perhaps, in a few cases where a more modern interchange may be presumed. The original common specific types are extinct, the species have risen into sections. Common types of a still higher order have disappeared in the case of Proteaceæ, an order so perfectly natural and so clearly defined that we cannot refrain from speculating on the community of origin of the African and of the Australian races, both exceedingly numerous and reducible to definite groups—large and small well-marked genera in both countries, and yet not a single genus common to the two; not only the species, but the genera themselves have become geographical. As in the case of the varieties of Pelargonium and Nicotiana, so in that of the species of Cassia and of the genera of Proteaceæ, it is not to be denied that precisely similar modifications of character are observed in the two countries; but these modifications are differently combined, the changes in the organs are differently correlated. In Asiatico-African Chamæcristæ a tendency to a particular change in the venation of the leaflet is accompanied by a certain change in the petiolar gland; in America the same change in the land is correlated with a different alteration in the venation. In Australian Proteaceæ the glands of the torus are constantly deficient with a certain inflorescence (cones with imbricate scales) which is always accompanied by them in Africa. *From Mr. Bentham's Presidential Address to the Linnean Society, 1870.*

A Californian Vineyard.—The Buena Vista estate, now owned by a joint-stock company, contains 5000 acres, of which 800 are suitable for wine culture; about 450 are so covered at the present time. I do not think that any of the large wine and brandy companies organised of late years on the Continent own as much land as this, although they may control more. The Vines are usually planted in ridges 7 feet or 8 feet apart; this is rendered necessary by their great luxuriance. On the Continent the stunted varieties are usually grown only 2 feet or 3 feet apart. The varieties mostly raised at Buena Vista are the Riesling, Muscatel, and the native "Mission" Grape; but almost every other kind is to be found in this vineyard, which owes its first start to an intelligent Hungarian gentleman, Major Haraszthy. Some patches of mixed Grapes have on occasions yielded delicious wines; one kind, a perfect Burgundy in character, tasted by me in the cellar, came from such a patch. From the rather ambitious wooden mansion at this vineyard the view is superb. Buena Vista and Belle Vue have identically the same meaning; the former term is fortunately not so hackneyed. Immediately surrounding the house are well laid-out gardens, with beds of gay flowers and artificial lakes. The situation is not greatly unlike that of the regal vineyard of Johannisberg; but in place of the blue, green, or silver Rhine, whichever it may be, in the middle distance, Buena Vista has San Pablo Bay in the far distance. To the right one sees the little town of Sonoma, a place older as a town than is San Francisco itself, and far and near a mass of vineyards, orchards, and fields of waving grain. Sonoma valley altogether is well worth a visit, and is beginning to be much appreciated by many in the "Bay City." Such of the farmers and residents who will take boarders have their houses full during summer. The vintage commences in October, often going far into November. At that time gangs of workpeople, principally Chinamen, are busily engaged in picking the Grapes and in expressing the juice. Although "John Chinaman" had barely seen a Grape before he came to California, he makes a careful and discriminating workman, and many of the proprietors will employ no other labour. The cellars on this vineyard are already extensive; some of them are cut in the hill-side rock. They may some day be extended, so as to rival those of Reims and Epernay. The company made in 1868 about 100,000 gallons of wine; last year the yield was smaller. The nice processes adopted in the manufacture of sparkling wine may be seen there carried out precisely as in France—in fact, by French workmen. Really excellent champagne is turned out from these cellars, and is sold at rates about half those ruling for foreign wine. The demand for sparkling wine will perhaps increase faster than that for still wines, as the Americans are not yet truly a wine-drinking people, any more than are the English. So far as California is concerned, wine is much drunk by the masses. At cheap restaurants and lager-bier cellars in San Francisco it can be obtained for 12. a bottle. Wholesale it brings from 30 cents to 1 dollar and upwards per gallon, according to quality and age. It will be a happy day for California, and for the whole United States, when wholesome native wines take the place of whisky and other spirits in popular estimation. *F. Whymper, in the "Field."*

Preservation of Wood.—In the *Annales du Génie Civil*, of April last, Dr. Reinsch gives the following directions for this purpose:—The wood, unplaned, is to be placed for 24 hours in a liquid composed of one part of concentrated silicate of potassa and three of pure water. After being removed and dried for several days, the wood is again to be soaked in this liquid, and, after being again dried, painted over with a mixture of one part of cement and four parts of the above liquid. When the first coat of this paint is dry, the painting is to be repeated twice. This paint mixture should only be made up in small quantities, as it rapidly becomes dry and hard. Wood thus treated becomes uninflammable, and does not decay underground.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

I have frequently urged upon all plant growers the importance of carefully attending to all "hard-wooded" and winter blooming plants, at this particular season of the year. This care should be bestowed not in the matter of growth alone, but more especially in regard to the very necessary proper ripening of the wood which has been formed during the current season. I scarcely need say that a well-ripened, or to use a very familiar term, and one very applicable here, a well-seasoned condition of the wood, is the mainspring of all successful culture; and in proportion as we succeed in attaining this, so will our success be great. The dry ripening influence of an autumnal air is all-important, and this we may obtain by affording more or less air, by partially depriving our structures of an aërial humidity, by placing a little fuel on the fire when necessary, by curtailing root-waterings, and by turning the plants round occasionally, that all sides may be favoured alike—a point impossible in Nature, &c. If these simple rules are acted upon success must follow. Of course insect pests, such as *thrips* and *red spider*, must be kept at a distance. Surface formations, which are injurious, such as *mildew*, must be met, wherever they occur, with the infallible remedy, flowers of sulphur. Do not permit the old faded blooms upon *Aphelexis* to remain a day after they are past their original beauty, as the plants require all possible attention at the earliest moment to enable them to attain a fresh vigorous start into new growth. Stop all *Chrysanthemums* the last time, in all instances where it is wished to obtain fine large blooms rather than bushy heads of growth with more numerous but smaller flowers. Sprinkle them frequently overhead in the cool hours of early morning and late in the evening. Do not overcrowd them, but expose them as much as possible to the air and light.

FORCING HOUSES.

Where early forcing of Grapes is intended, induce the foliage to ripen off at the earliest possible moment without resorting to violence. Finish pruning the *Vines* and well wash the bare rods with spurs attached all over with the usual insect destroying and preventive remedies. Whitewash the walls with freshly slaked lime, scrubbing and washing the paint and any dirty glass there may be; and, by removing an inch or so of surface soil from any inside borders, and placing in lieu a layer of fresh, from a distant pasturage or wood, leave nothing undone to secure thorough cleanliness to start well with. In instances where red spider has attacked a crop of Grapes which have done stoning, and are now making the final swelling—a very likely period for their attacks—I advise that a thorough good syringing be given to the foliage of the Vines, if necessary, by means of a garden engine, properly used. Of course the stream of water should not be directed against the bunches themselves. By giving the foliage a good sousing, it will be possible to destroy or wash off very many of the pests; a far better process this than having resort to sulphur and its many disagreeable unsightly consequences; not the least of which is that it attaches itself to the berries themselves, and is not to be removed without difficulty. Remove all *Pine suckers* intended to form plants after this date at the earliest moment, when sufficiently large for the purpose. Where any scarcity of strong young stuff exists, to keep up a proper succession for fruiting, it may be advantageous to leave one of the strongest suckers upon some of the healthiest old plants; and so, when they have attained to sufficient size, by removing the remaining leaves from the old parent plant, let the side shoot form itself into a plant upon the basis of the roots of the old plant, which will give it great vigour. This is in the way of the Hamiltonian system, save in the fact that one sucker only is allowed to grow, and that the ball or roots are turned out into a border, instead of being confined within the limits of a pot. Be very careful not to afford to *Melons* grown with the advantages of a good house, &c., too much root moisture just previous to their ripening. This may be known by attention to the time when they have performed the "netting" process; or in instances when varieties do not assume this very natural embellishment, by a slight change of colour from a growing leaf-like green to a more decided olive or yellow tint. The red spider is a great antagonist to such plants at this stage, and must be destroyed or crippled in the simple manner and by the ready means which I have suggested above.

HARDY FRUIT GARDEN.

Speaking of *Strawberry culture* in this department last week, an omission occurred, owing to the great press of matter. I allude to the necessary trenching and preparation of the beds, which are planted with old plants from pots which have been forced previously for a crop, and which come in well for fruiting in the open ground again next year. Bring the summer pruning of *Wall-fruit trees* to a close with all despatch, the guiding principles for this operation I have previously alluded to. Trap *Wasps*, and other fly-like pests, by the usual means, and cover up to the best of your means all fruits which are ripening, so that they cannot get to them, otherwise no art or contrivance will save to any their crops. Even the poor bees are driven to Apricot and Gooseberry eating here, so exceedingly scarce has their habitual food become.

HARDY FLOWER GARDEN.

We are in daily hopes that rain will fall to us soon; but it will be advisable not to delay making the main sowings of all plants intended for spring bedding such as *Myosotis*, *Silenes*, and the like. They should, however, be sown in a somewhat shady position, if the present weather continues, and be thoroughly watered and have a mat or something of the sort placed lightly over the seed-beds until first symptoms of germination appear. Sow *Intermediate Stock* seed for early spring blooming.

KITCHEN GARDEN.

It has now become imperative to use such artificial means as are available to ensure the necessary supply of young *Cabbage plants* for early spring hearting and use. Sow, therefore, in any vacant cold frame, and having well watered the seeds in, tack a mat or so along the rafters. With the next rain transplant a good breadth of June-sown *Coleworts*, to come in for use as late autumn Collards. Gather the seeds of *Nasturtiums* for pickling before they become too old. Give to *Cardoons* which are forward enough a thorough good soaking of liquid manure, tie the leaves up together carefully, and commence earthing up. Have a good breadth of *Turnip* seed sown, in anticipation of rain. All *Celery* plants must be kept well watered and moist at the root if anything like progressive growth is to be attained to—advice which I give with heartfelt weariness, knowing, as I do, the hard labour it entails with no commensurate returns. *W. E.*

TOWN GARDENING.

Pelargoniums that have done flowering should be at once cut down to the new shoots, and placed out in the garden. The sooner cuttings can be put in the more likely they are to strike, and they will also make the better plants for spring; these can be dibbled in a shady border, and potted when struck; but the best method is to put one in a 60-size pot, so that it will not have to be disturbed till spring. *Pink pipings* that were put in last month will now be starting, and should have the glass lifted about an inch on one side, and the cuttings lightly watered, or they will grow weak. *Carnation layers* should be kept well watered, which will induce them to root freely. *Dahlias* should be kept securely tied, and the buds thinned where they come in clusters. Where it is intended to flower *Pompon Chrysanthemums* in pots, they should now be potted into 32-size pots, in a compost of two-thirds loam and one rotten dung; they should then be plunged in the following manner:—Dig a trench in a shady part of the garden, about 4 inches deeper than the pots intended to be plunged, then turn a small pot, bottom upwards, to stand the potted plant on, which will keep out the worms, and prevent the roots taking hold of the soil beneath the pots, and will allow the plants to grow equally on all sides; then close the earth round within an inch of the top. By this treatment nice bushy plants will be produced, which can be removed into the house without drooping. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
For the Week ending Wednesday, July 27, 1870.

1870 Month and Day.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
July.	Ins.	Deg.	Deg.	Deg.		Gr.
21. Thurs.	30·00	72·0	67·8	58·1	61	5·4
22. Friday	30·03	71·3	65·0	58·5	57	5·3
23. Satur.	29·99	71·4	61·0	50·3	60	5·1
24. Sunday	29·89	73·3	63·4	55·6	57	4·7
25. Monday	29·64	68·9	62·5	57·6	77	5·3
26. Tues.	29·57	61·7	61·5	61·3	100	6·0
27. Wednes.	29·87	64·5	64·0	63·0	97	6·5

1870 Month and Day.	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean	Departure of Mean from Average of 35 years.	Wind. Direction	Horizontal Movement.	Rain. In Inches.
July.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
21. Thurs.	88·1	59·3	28·8	72·5	+ 11·0	WSW. to N.W.	290	0·00
22. Friday	87·6	61·0	26·6	72·0	+ 10·5	N.W. to E.S.E.	155	0·00
23. Satur.	79·1	53·7	25·4	66·1	+ 4·5	E. to E.S.E.	245	0·00
24. Sunday	82·2	59·3	22·9	68·8	+ 7·1	E. to E.	200	0·00
25. Monday	88·8	59·6	29·2	72·3	+ 10·5	E. to S.W.	190	0·00
26. Tues.	76·8	60·6	16·2	69·8	+ 4·9	Calm to N.N.E.	100	0·03
27. Wednes	82·3	59·9	22·4	69·3	+ 7·3	N.N.E.	324	0·00

July 21.—Small amounts of cloud were prevalent throughout the day. Fine.
— 22.—Cloudless throughout. Very fine.
— 23.—Generally cloudless and fine.
— 24.—Generally cloudless.
— 25.—Generally cloudy but fine.
— 26.—Generally overcast. A violent thunder-storm raged between 6 A.M. and 10 A.M., accompanied by heavy rain.
— 27.—Cloudy till night; then cloudless

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

During the Week ending Saturday, July 23, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	81·1	53·7	29·6	80·0	56·2	23·8	66·2	0.00
Blackheath ..	88·1	53·7	34·4	81·9	57·8	24·1	68·5	0.00
Bristol	86·9	53·9	33·0	76·4	56·4	19·8	64·1	0.03
Birmingham ..	86·0	52·7	34·2	78·9	52·7	21·7	66·1	0.00
Wolverhampton	87·2	51·7	35·5	70·0	56·4	22·6	63·8	0.00
Leicester ..	80·5	50·7	38·8	80·9	56·1	24·8	66·6	0.00
Norwich	79·5	51·6	27·9	75·4	57·2	18·4	63·3	0.08
Nottingham ..	84·7	50·7	34·0	78·1	55·7	22·4	65·1	0.01
Sheffield	80·1	51·1	38·0	76·5	56·5	20·0	64·5	0.00
Liverpool	79·6	54·7	28·9	74·0	59·0	15·0	63·6	0.01
Manchester ..	00·0	51·0	30·0	78·1	57·1	21·0	65·1	0.11
Salford	83·4	49·0	39·4	76·0	54·9	21·1	63·6	0.11
Bradford	82·4	55·4	26·8	76·1	58·4	17·7	65·4	0.00
Leeds	82·0	52·0	30·0	75·7	56·3	19·4	64·1	0.00
Hull	81·0	47·0	34·0	76·1	52·6	23·5	62·8	0.00
Newcastle ..	83·0	52·0	31·0	72·8	50·5	16·3	62·8	0.00
Edinburgh ..	73·7	52·0	21·7	..	..	..	00·0	0.10
Glasgow	82·5	50·3	32·2	..	..	..	59·4	0.37
Dundee	84·0	51·0	33·0	..	..	..	61·8	0.10
Aberdeen	76·0	50·3	25·7	..	..	..	60·4	0.61
Paisley	73·0	50·0	23·0	..	..	..	58·2	0.05
Greenock	76·0	53·0	23·0	..	..	..	59·1	0.55
Leith	86·0	52·0	34·0	..	..	..	62·0	0.19
Perth	87·0	49·0	38·0	..	..	..	63·6	0.00
Dublin	85·4	47·5	37·9	..	..	..	62·2	0.49

JAMES GLAISHER.

Notices to Correspondents.

BLIGHT IN AN ELM-GALL: *Mrs. E. Curteis.* The name of the Aphis from the galls which you have sent is Schizoneura lanuginosa, Hartig. If you wish to preserve your other Elms from its attacks, and if the infested tree is not too large, we would advise you to have as many of the blighted leaves as can be reached picked and burned. This should be done at once, as the galls are just now crammed with the winged brood, each individual of which will eventually found a new colony on a fresh leaf. *A. M.*

CUCUMBER: *An Old Subscriber.* The leaves of your Cucumbers are one mass of greenfly and their deposits, the result of gross mismanagement or negligence. Cleanliness or timely attention to fumigation would have prevented this. The idea that the proximity of the gasworks was the cause of this is absurd.

DELL'S BEET. A correspondent who has been disappointed in Dell's Beet, asks how others have fared. We have no experience with this plant, but we may say that, on a heavy clay soil, Iresine Herbstii has this year uniformly produced green leaves like our correspondent's Beet.

DISEASED PEACH: *G. F. T.* Your fruit is smothered with mildew—too common this year.

GALL ON BRIAR-LEAF: *B. Watson.* Your present specimens are the work of another Rhodites, named centifoliæ by Hartig, because it causes similar galls to appear on Rosa centifolia. It is very abundant in the London district.

YOU are correct in stating that your former specimens were covered with spikes, whilst the present are smooth. The distinction holds good as regards these two kinds of gall. The female insect, by means of an ovipositor, punctures the surface of the leaf; the thin end of an elongated bag-shaped pedunculated egg is then propelled into the wound, and a small drop of irritating liquid injected; the result of this operation is the gradual growth of the Gall, from the internal fleshy coating of which the grub, when hatched, derives its nourishment. When full-fed it turns to a pupa, which shows in transparent sheaths most of the parts of the perfect insect. After emerging from the pupa, and when ready for flight, the Rhodites uses its horny mandibles to cut a round hole through the side of the gall, through which it escapes. *A. M.*

INSECTS: *T. S. P.* The yellow larvæ found in a web on your Peartrees are those of a rare kind of Sawfly, Lyda sylvatica (figured in the first volume of the "Entomological Magazine"). Can you oblige us by sending a specimen of the web to Professor Westwood, Oxford? *W.—J. W.* The insect is Sirex gigas, which lives in Fir timber, occasionally doing considerable mischief. *W.—T. S. P.* Your Ladybirds are not Coccinellæ. Their shape, antennæ, and feet, show them to belong to the Chrysomelidæ. They were named Chrysomela 10-punctata by Linnæus. *W.*

LILIUM AURATUM: Mr. W. Bull forwards us flowers of two fine varieties of this noble Lily. One, which he calls Virginalis, is of a pure white, like L. candidum, but with a rich golden stripe on each segment, and with the bulbicles also tinged with gold. The other, called Beauty is a fine bold flower, with broad segments, marked with the golden stripe, and with the numerous prominencies of a claret colour. It is a splendid variety.

NAMES OF PLANTS: *W. Phillips.* 1, Lastrea dilatata; 2, Lastrea spinulosa.—*J. Hudspeth.* 1 and 2, Asplenium fontanum, No. 2 being apparently a weak specimen of the form sometimes called Halleri; 3, Polypodium Dryopteris; 4, Polystichum angulare; 5, Polystichum aculeatum lobatum.—*O. A. O.* Dianthus Armeria.

NINE-POUNDER CABBAGE: *G. G.* Apply to the Secretary. You are not perhaps aware that there was no meeting of the Committee in London on the day you mention.

OXFORD SHOW: *T.* We agree with you; the failure was not so much attributable to the presence of two suns as to the fact that one of them has lost the art of shining at the right time, and in the proper place.

STEPHANOTIS: *J. N. T.* It is unusual, but not unprecedented, for the Stephanotis to produce seed in this country.

VERBENAS DISEASED: *F. J. H.* It appears that your Verbenas turn black a little above the surface of the soil and then perish. It is probable that the cause consists in some peculiarity in the soil, and the disease is apparently of the same nature as that which destroys so many cuttings just after they become well rooted. No one knows precisely how the disease arises. The only chance of getting rid of it is to vary the treatment. What may succeed in one place will not always succeed in another. We have had very diseased individuals of several kinds sent to us, which recovered perfectly in their new locality. *M. J. B.*

CORRESPONDENTS RECEIVED.—M. D.—H. H. C.—A. V.—T. H.—D., Deal.—T. G.—F. T.—G. W.—W. P. A.—W. D. F.—E. M.—J. Linden.—B. W.—J. B.

Markets.

COVENT GARDEN.—July 29.

There is a very steady business doing, and the chief articles in demand keep up their prices, both in fruit and vegetables. Hothouse produce, however, has generally declined. Strawberries are nearly over for this season. Amongst flowers we have Balsams, Pelargoniums, single and double Gladioli, Heaths, Coleus, Hydrangeas, Fuchsias, Crassulas, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz. ..	2 0	— 4 0	Oranges, per 100 ..	8 0	10 12 0
Cherries, per doz. lb.	3 0	— 6 0	Peaches, per doz. ..	6 0	—12 0
Grapes, per lb. ..	3 0	— 6 0	Pears, per doz. ..	1 6	— 3 0
Lemons, per 100 ..	6 0	—12 0	Pine-apples, per lb.	3 0	— 6 0
Melons, each ..	2 0	— 8 0	Strawberries, p. lb. ..	0 6	— 2 0
Nectarines, per doz.	4 0	— 8 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, p. doz. ..	2 0	— 4 0	Horse Radish, p. bun.	3 0	to 5 0
Beet, per doz. ..	2 0	— 3 0	Leeks, per bunch ..	0 2	— 0 4
Cabbages, p. doz. ..	1 0	— 1 6	Lettuces, p. score ..	1 0	— 2 0
Carrots, p. bunch ..	0 4	— 0 8	Mint, per bunch ..	0 3	— 0 6
— young, p. bun.	0 4	— 0 6	Mushrooms, p. pott.	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch ..	0 4	— 0 9
Celery, p. bund. ..	1 0	— 1 6	Parsley, per bunch .	0 2	— 0 4
Cucumbers, each ..	1 0	— 1 6	Peas (Shelled), p. pint	0 4	— 0 6
Endive, per doz. ..	1 6	— 2 0	Potatos, new, p. lb.	0 1½	— 0 2
French Beans, p. sieve	2 0	— 3 0	Shallots, per lb. ..	0 8	— ..
Do., retail, p. lb. ..	0 4	— 0 6	Spinach, p. bushel. .	2 0	— 3 0
Garlic, per lb. ..	0 8	— ..	Radishes, per doz. ..	1 0	— 1 6
Herbs, per bunch ..	0 2	— 0 4	Turnips, yng., p. bun.	0 9	— 1 0

Potatos, York Regents, per ton, 140*s.* to 180*s.*; Flukes, do., 200*s.*; new round, 5*s.* to 7*s.* per cwt.; new kidney, 7*s.* to 10*s.* do.; Commental kinds, 8*s.* to 20*s.* do.

To Hard-wooded Plant Growers.

MESSRS. VEITCH AND SONS REQUIRE a thoroughly efficient MAN to take the entire charge of their New Holland Plants, previously accustomed to a Nursery preferred. Very good and progressive salary will be given.—Apply personally or by letter to the Royal Exotic Nursery, King's Road, Chelsea.

To Budders and Grafters.

WANTED, an active MAN, capable of taking charge of the Clonal Apple Propagation Department in a Nursery. A good Budder and Grafter indispensable. Wages to commence at 25*s.* per week.—Apply by letter to W., *Gardeners' Chronicle* Office, W.C.

WANTED, a married MAN, without family, who understands Forcing, Kitchen Gardening, and Flowers. Wife to undertake Dairy, Poultry, and Baking.—ARTHUR HENDERSON AND CO., Pine-apple Place, Maida Vale, London, W.

WANTED, a good PROPAGATOR AND PLANT GROWER.—One accustomed to Grow for the London Markets, and who has a thorough knowledge of the Florist Flower business. Must be active and intelligent, with unexceptionable references.—Apply by letter, in own handwriting, to the MANAGER, Melbourne Nursery, Anerley Road, Norwood, S.E.

WANTED, a GARDENER, used to Watering Soft-wooded Plants.—The Orchard Nursery, Mortlake, Surrey, S.W.

WANTED, a steady, hard working, married MAN, without incumbrance, who thoroughly understands the Breeding and Rearing of Pigs in small numbers, and who could also undertake the Management of about Thirty Acres of Grass Land, and a Market Garden of Eight Acres, including Glass, &c. To a Man who would be willing to reside on the premises, and whose character and wages will be given. Testimonials and character for honesty and sobriety indispensable.—Address, stating wages, &c., to B. C., Post Office, Newport, Monmouthshire.

WANTED IMMEDIATELY, a good COUNTER MAN; one well up in the Seed business. Wages to commence at 30*s.* per week.—B. S., 12, King Street, Covent Garden, W.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (HEAD).—Good practical knowledge of Gardening in all its branches. Six years' good reference.—W. P., Post Office, Stapelton Road, Bristol.

GARDENER (HEAD), in Suburbs or Country.—Age 29 (Scotch), married, one child; thorough practical. Can be highly recommended.—M. M., 28, Stanford Road, Fulham, S.W.

GARDENER (HEAD), in a Gentleman's Garden.—Age 30, married; good character.—E. W., Post Office, Greenstreet, Sittingbourne, Kent.

GARDENER (HEAD).—Middle-aged, married; no incumbrance; thorough practical man.—JAMES FOWLER, Plompton Hall, Holloway, Yorkshire.

GARDENER (HEAD).—Married, no incumbrance; well skilled in all branches of the profession. Highest references.—C. B., 14, Adam's Square, Bromley, Kent.

GARDENER (HEAD).—Age 28, married, no incumbrance; thorough practical knowledge of the profession in all its branches. Best references and character.—J. D., Cheshire's, 14, Grove Road, Holloway.

GARDENER (HEAD), age 32, married.—T. C. SAGE begs to offer his services to any Nobleman or Gentleman requiring a thorough practical Man. Can be well recommended.—T. C. SAGE, Gr. to Sir E. C. Dering, Bart., Surrenden Dering, Ashford, Kent.

GARDENER (HEAD).—Age 31, married, one child; 14 years' practical experience in every branch of the profession. Leaving in consequence of the death of his late employer. Good character. Can be highly recommended.—J., W. T. Jackson & Son, Nurseries, Kingston-on-Thames.

GARDENER (HEAD).—Age 33; thoroughly experienced in the Culture of Pines, Vines, Peaches, Melons, and Cucumbers, and in Stove and Greenhouse Plants, Orchids, &c., also Kitchen and Flower Gardening, and the Formation and Alteration of same. Highly recommended by the gentleman he has left and previous employers.—C., Messrs. J. & C. Lee, Royal Vineyard Nursery, Hammersmith, W.

GARDENER (HEAD).—A Gentleman about to give up his Establishment will be glad to obtain a comfortable situation for his Head Gardener, where Under Gardeners are kept. He is very steady and honest, and very attentive to his duties, and thoroughly understands Forcing. He has been nearly five years in his present situation.—Applications made by letter, addressed H. M., Mr. Ingram, 33, King Street, Westminster, S.W., will have immediate attention.

GARDENER (HEAD), age 40, married, one child, aged 16 years.—JAMES MAY, Head Gardener for seven years to W. P. Butt, Esq., Arle Court, Cheltenham, and since then fifteen months in charge of Messrs. Veitch & Sons collection of Hard-wooded Plants, is open to engage with any Nobleman or Gentleman requiring the services of a thorough practical Gardener. Good experience in Forcing, the Cultivation of Stove and Greenhouse Plants, also the general routine of Kitchen Gardening. Unexceptionable references can be given.—Address, care of Messrs. Veitch & Son, Royal Exotic Nursery, Chelsea, S.W.

GARDENER (HEAD), or GARDENER and ESTATE.—Age 28; has had 13 years' practical experience in first-class establishments. Thoroughly understands the Cultivation of Vines, Pines, Mushrooms, Cucumbers, Melons, Stove and Greenhouse Plants, Orchids and Nepenthes, also Orchard-houses, and Flower and Kitchen Gardening. No objection to Work. Is a good Accountant. Highest references.—Mr. HENRY SLATER, High Street, Uttoxeter, Staffordshire.

GARDENER (HEAD), or GARDENER and BAILIFF.—Married; thoroughly experienced in Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, also Pleasure Grounds, and Flower and Kitchen Gardening. Has had the management of large Grass Lands, Buying and Selling Stock, &c. Highest references.—B. B., Messrs. George Gibbs & Co., Seedsmen, 24, 25, and 26, Down Street, Picadilly, W.

GARDENER (HEAD), where three or more are kept.—Age 30, married; thoroughly practical in all branches of the profession. Can be highly recommended.—T. S., Mr. Morgan's Library, Wrotham, Kent, S.E.

GARDENER (HEAD), where three or four are kept.—A highly respectable, trustworthy, and well educated young Man, who thoroughly understands the entire routine of a first-class Garden. No objection to go to America. Unexceptionable references.—Smith and Son, 18, Cornhill, E.C., to Mr. Smith's Residence, Peckham.

GARDENER, and to look after Grass Land and Cows.—A Gentleman wishes to recommend a married Man, age 34, no children; disengaged in consequence of family leaving the neighbourhood. Excellent character.—D. B., Wraysbury House, Staines.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man who has been known for several years, and can testify as to his abilities; he held the position of Bailiff and Gardener in last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway.

GARDENER (SINGLE-HANDED, or otherwise).—Age 26; understands Kitchen and Flower Gardening, and Forcing Vines, Cucumbers, &c. Four-and-a-half years' character.—W. W., Post Office, Farley, Reading.

To Noblemen and Gentlemen.

GARDENER or BAILIFF (age 38).—Mr. R. WEDDLE is now open for an engagement as one of the above capacities.—Cannon's Park Farm, Edgware, London, N.W.

GARDENER, or GARDENER and BAILIFF.—Age 40, two children; well acquainted with Early and Late Forcing, also the Culture of Fruit, Flowers, Vegetables, &c. Wife can manage Dairy.—SURREY, Royal Nurseries, Slough, Bucks.

GARDENER (SECOND), in a Gentleman's Garden.—Two years' good character.—W. J., Manor House, Gunnersbury, Acton, W.

GARDENER (SECOND, or good SINGLE-HANDED).—Well understands Gardening in all its branches. Good references.—A. B., Mrs. Moxham's, 6, Wood Street, Upper Clapton, N.E.

GARDENER (UNDER, or IMPROVER).—No objection to pay 2*s.* per week as Premium. Good character.—A. M., Post Office, Chichester, Sussex.

GARDENER (UNDER).—Age 29, single; well up in Greenhouse, Flower, and Kitchen Gardening. Can Milk. Good character.—A. B., 26, Ashburton Grove, Hornsey Road, N.

FOREMAN.—Understands Forcing in its various branches, Flower and Kitchen Gardening, &c.—W. H. B., 171, Malden Road, Haverstock Hill, London, N.W.

To Nurserymen.

FOREMAN.—A thorough practical hand at Budding and Grafting of Roses and Fruit Trees, the Propagation of Florist Flowers, the Management of Vines, Ornamental Trees and Shrubs, &c.; also a good Salesman.—A. C., Cutbush's Nursery Highgate, N.

PROPAGATOR (FOREMAN), in a Nursery.—Has had a great many years' experience in Growing and Propagating Stove and Greenhouse Plants, Hard and Soft-wooded, Roses, Rhododendrons, Vines, &c. Good references.—A. B., 66, Westbourne Park Road, Bayswater, London, W.

STEWARD and GARDENER.—Middle-aged; is thoroughly practical. Understands Farming, Woods, and Plantations. Wife as Housekeeper. Satisfactory reasons for trusty which she has been accustomed to.—F. L., Prestwich Hills, near Manchester.

FARM BAILIFF (age 38, Scotch, daughter aged 17).—A Gentleman in South Wales, who is about to retire from Farming, is desirous of procuring a situation for his Farm Bailiff, with whom he can safely confide and commend. Wife good Dairy Superintendent.—J. B., Post Office, Swansea, Glamorganshire, South Wales.

BAILIFF (age 40, no incumbrance).—W. TOOGOOD, the Queen's Seedsman, Southampton, begs to recommend to Noblemen or Gentlemen a most competent and trustworthy Man. Wife a good Dairy Woman.

IMPROVER, in a Nobleman's or Gentleman's Garden, under Glass.—Age 21; two years' character from present situation. A Premium given.—F. M., Post Office, Dillingdon, near Uxbridge, Middlesex.

ASSISTANT, &c., where he would make himself generally useful.—Age 19; country preferred.—E. W., 32, Netley Street, Hampstead Road, London, N.W.

HOTHOUSE BUILDING or REPAIRS, PAINTING, GLAZING, HOT-WATER WORK, BRICK WORK, &c.—Thoroughly practical workman; Daywork or Contract Labour only.—E., 23, Harlington Street, Sadler's Wells, London, N.

SHOPMAN, in London.—First-class references for character and ability.—M. M., Messrs. Smithers & Crichton, 1, Bunhill Row, London, E.C.

SHOPMAN, CLERK, &c.—Wanted, an immediate re-engagement in a Wholesale or Retail Establishment, as above, or to Manage a small Establishment, by a thoroughly experienced Man, with first class Metropolitan and Provincial references. Would not object to Seed and Corn.—SEED, Post Office, Gloucester.

To Nurserymen and Seedsmen.

SHOPMAN.—Age 24, married; first-class character from previous employers.—A. B. C., Messrs. Hooper & Co., Covent Garden Market, London, W.C.

THE LONDON MANURE COMPANY,
(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES OF LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c.
Offices, 116, Fenchurch Street, E.C.

MATTHEWS' CORN CAKE, a substitute for Linseed Cake
Manufacturers of MATTHEWS' specially prepared MANURES for all CROPS
F. C. MATTHEWS SON AND CO., Manufacturing Agricultural Chemists, Driffield Established 21 years
STAND No. 134, SHOW YARD, OXFORD.

A Boon for Grape Growers.
MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 21s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantities to suit all consumers. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with 30 per cent. of Bone. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
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"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and half the quantity of insoluble phosphate which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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Messrs. Harrison & Son, Leicester.
Mr. Bartlett, High Street, Exeter.
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The best Shading is "Frigi Domo" Netting.
White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for
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MALAY FOWLS.—Some fine Cockerels and Pullets, hatched in April and May last, from Prize Birds, for Sale.
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NURSERY GROUNDS and FARM TO BE LET in Lancashire.—About 130 Acres, 30 of them stocked with Trees and Shrubs, Six Plant Houses erected thereon, good Dwelling House, with suitable Farm Buildings. Convenient to several market towns.—Further particulars by applying to
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TO BE DISPOSED OF, an EXTENSIVE and OLD ESTABLISHED BUSINESS, which has been carried on with success by the present proprietor since 1827, and who now wishes to retire from the same. The estate is the best in Exeter, beautifully situated, close to the city. On it there is one good Dwelling House, with every convenience, Shop, Glass Houses, Frames, Stabling, Sheds, with all other necessary buildings, a good supply of soft and hard water. For further particulars apply to
CHARLES SCLATER, Summerland and City Nursery, Exeter.

SALES BY AUCTION.

MESSRS. PROTHEROE AND MORRIS respectfully inform the Public that the LEASES of the FOUR DWELLING HOUSES, known as 3, 4, 5, and 6, Norfolk Terrace, Norfolk Road, also of the NORFOLK NURSERY, shortly will be offered by AUCTION at Garaway's on TUESDAY last, were NOT SOLD; and may be PURCHASED, with IMMEDIATE POSSESSION, for the very low sum of £525. The whole of the extensive ranges of Greenhouses, Pits, Sheds, &c., to be included in the purchase.
American Nurseries, Leytonstone, E.

Established Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, August 8, at half-past 12 o'Clock precisely, a COLLECTION of choice and valuable ORCHIDS, chiefly for cool house, perfectly established and in the best condition; Twelve Cases of AMARYLLIS in Bulb; also
On view the morning of Sale, and Catalogues had.

Important Sale of Palms from the Continent.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, on SATURDAY, August 6, at half-past 12 o'Clock precisely, a magnificent COLLECTION of Rare and valuable PALMS, comprising a great variety of beautiful specimens, from one of the most renowned Nurseries on the Continent
On view the morning of Sale and Catalogues had.

Manchester.

SALE of a CHOICE COLLECTION of ORCHIDS, including fine and healthy Specimens of the following:—Aerides, Angræcum sesquipedale, Dendrobium, Miltonias, Phalænopsis, Saccolabiums, Vandas, Cattleyas, Cœlogyne cristata, very fine plant; Lælias, Odontoglossums; also some fine Stove Plants, Rare Ferns, &c.

CAPES AND DUNN have received instructions from C. Henry Hoskyns, Esq., who is changing his residence, to SELL by AUCTION, on TUESDAY, August 2, at 11 o'Clock, prompt, at their Gallery, Clarence Street, Manchester, a CHOICE COLLECTION of ORCHIDS, which will be removed from Beech House, Pendleton.
Catalogues can be had, three days prior to the sale, on application at No. 8, Clarence Street. The Orchids may be viewed on the morning of Sale.

Model Farm, Upper Winchendon, Bucks.

Seven Miles each from the Aylesbury Station on the London and North-Western Line, and Thame Station on the Great Western Line, at which places Conveyances will meet the Morning Trains on the Day of Sale, returning in time for the Evening Trains.

MR. JOHN TREADWELL has fixed his ANNUAL SALE of about FIFTY OXFORDSHIRE SHEARLING RAMS, and a few older SHEEP, for WEDNESDAY, August 3, when he hopes to be favoured with the company of his friends. This year's Sheep will be found of high character of this Flock, being big, dark in features, and of excellent quality
J. A. MUMFORD, Auctioneer.
N.B.—This Flock obtained in 1869-8 Forty First and Fifteen Second Prizes at the Royal, Birmingham, Liverpool, and other Shows. They may be seen previously.
Luncheon at One o'Clock Business at Half-past Two.

Bulbridge Farm, Wilts.

Ten minutes' walk from the Great Western and South-Western Railway Stations at Wilton

ANNUAL SALE and LETTING of RAM LAMBS and RAMS of the IMPROVED HAMPSHIRE DOWN BREED.

MESSRS. EWER AND WINSTANLEY will SELL, and LET by AUCTION, at Bulbridge Farm, Bulbridge, Wilts, on WEDNESDAY, August 3 (Refreshments will be provided at 12, and the Sale will commence at 1 o'Clock), about 140 RAM LAMBS and RAMS, of the improved Hampshire Down Breed, the property of Mr James Rawlence.
The Auctioneers again have the pleasure to announce that in addition to the successes achieved during the last 20 years at the Royal, Bath and West of England, and Local Exhibitions of Sheep Stock, Mr. Rawlence has in the present year been awarded at the Bath and West of England Society's Show at Taunton, the 1st and 2d Prizes for Shearling Ewes, the 1st and 2d Prizes for Shearling Rams, and the 1st Prize for Shearling Rams; also at the Berks and Hants Agricultural Show at Basingstoke, the 1st Prize for Old Sheep without restrictions as to feeding, and the 1st Prize for Shearling Rams, both not been house fed; and at Stockbridge the 1st Prize for Old Sheep, and the 1st and 2d Prizes for Shearling Rams; at the Royal Agricultural Society's Show at Oxford, the 1st Prize for Shearling Rams, and 1st Prize for a Ram of any other age, and 1st and 2d Prizes for Shearling Ewes.
The Express Trains will stop at Wilton Stations on the day of Sale.
Auction and Estate Agency Offices, Endless Street, Salisbury

Shropshire Sheep.

THE TENTH GREAT CENTRAL SALE, at BINGLEY HALL, BIRMINGHAM.

MESSRS. LYTHALL AND CLARKE will SELL by AUCTION on THURSDAY NEXT, August 4, at 11 o'Clock, 200 pure-bred SHROPSHIRE RAMS and 300 EWES, including several Lots of Agricultural Society Prize Sheep at Oxford, from the noted Flocks of

Right Hon. Lord Willoughby de Broke	Mr W. Lott
Right Hon. Lord Sudeley	Mr. J. Small
Sir George Jenkinson, Bart., M.P.	Mr. G. A. May
H. J. Sheldon, Esq.	Mr. T. Nock
Z. Walker, Esq.	Mr. Shuttleworth
R. Wyatt, Esq.	Mr. Dorgue
Mrs. Beach	Mr. W. Yates
	&c.

Auctioneers' Offices, 30, New Street, Birmingham.

Shropshire Sheep.

HOLLY BANK, NEAR BURTON-UPON-TRENT.
MESSRS. LYTHALL AND CLARKE will SELL by AUCTION, on TUESDAY, August 9 (Luncheon at 12, Sale at 2 o'Clock), THIRTY-FIVE SHEARLING and other RAMS, SIXTY SHEARLING and STOCK EWES, ONE YEAR and TWO Pure-bred SHORTHORNS, the property of Willoughby Wood, Esq.
The Flock was founded on Ewes selected with judgment from the old Packington Flock, and has been maintained by the introduction of the best blood, regardless of cost, as a reference to the Catalogue will show. The Rams are of great size, excellent Wool Cutters, and possess plenty of bone and muscle.
The high and exposed situation on which these Sheep are bred renders them particularly hardy in their constitution.
Conveyances will meet Trains at Barton and Walton Station, Midland Railway.

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.
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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.
Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.
The outlay, with all official expenses, may be charged on the Estate, being paid off by a rent-charge in 31 years, or at the option of the Landowners in a shorter term.
No investigation of title necessary, and no legal expenses incurred.
Application to be made to ARTHUR MILMAN, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

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John Horatio Lloyd, Esq., 1, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.
The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.
The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.
No investigation of title is required.
For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

GREAT AGRICULTURAL SHOW at KEIGHLEY, on FRIDAY, August 19.
Best three Shorthorns, 1st Prize, £50 | Best Hunter .. 1st Prize, £50.
FOUR HUNDRED PRIZES given at this Show for PIGS, POULTRY, FARM IMPLEMENTS, &c. ENTRIES CLOSE AUGUST 10. For Prize Lists apply to R. FAWCETT, Secretary.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, DOMESTIC POULTRY, CORN, ROOTS, and IMPLEMENTS will be held in BINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.
Prize Lists, Certificates of Entry, and every information may be obtained from the Secretary.
The ENTRIES CLOSE on TUESDAY, November 1.
JOHN B. LYTHALL, Secretary.
Offices—39, New Street, Birmingham.

The Agricultural Gazette.
SATURDAY, JULY 30, 1870.

MEETINGS FOR THE ENSUING WEEK.

AUG. 3 to AUG. 5	Annual Meeting of the Royal Agricultural Improvement Society, at Ballinasloe. Annual Meeting of the Yorkshire Agricultural Society, at Wakefield.

ALL the provisions of the Contagious Diseases (Animals) Act notwithstanding, pleuro-pneumonia, foot-and-mouth disease, scab in sheep, and glanders in horses, continue to flourish in the midst of our stock.

In over fifty counties in England, Wales, and Scotland foot-and-mouth disease exists among cattle, sheep, and swine, and if we roughly estimate the number of attacks at 5000 weekly for some time past we shall not overstate the fact, while the statement will convey some idea of the loss and annoyance which is caused by the disease. Pleuro-pneumonia, not being so contagious in its character, advances more slowly than does the other epizootic, but its effects are infinitely more serious; once established in a locality its progress is irregular and erratic: the most experienced stockowner can hardly with safety deem his herd to be secure in the vicinity of the disease, no matter how careful he may be in isolating the animals, and all calculations as to the final disappearance of the malady are constantly upset by its unexpected recurrence, after such an interval of absence that its extinction seemed to have been accomplished.

The number of reported attacks is not alarming, but it is not satisfactory to reflect that for some months the disease has continued its ravages among the cattle in several widely separated localities. The number of infected counties has varied from 30 to 40 week by week; and if the attacks were fairly distributed among them they would not amount to more than three or four for each county. There is always, however, a concentration of the disease in large dairy establishments, and in reference to them it is quite impossible to obtain reliable information. Local authorities do not feel justified in incurring the expense of systematic inspection, and without some such precaution no true idea of the extent of prevalence of the disease can be gained; it is, however, always safe to conclude that the reported attacks fall far short of the actual number.

Shab or scab among sheep is very extensively spread, having centres in more than 20 counties.

Considering the ease and certainty with which the disease can be cured, and the number of remedies, more or less efficacious, which are constantly being offered to the flockmaster's notice, it is somewhat remarkable that a malady which does so much mischief in a flock, and is so quickly propagated should be allowed to continue its course almost unchecked.

Vague is rife in many places, although there is a vague general impression that the disease is almost an evil of the past. The fact is, however—and it is true of all the diseases which have been alluded to—the difference between the present and past sanitary condition of stock is more apparent than real. Cattle Diseases Acts, with all their machinery of inspection and reports, have done a great deal towards rendering obvious what was previously occult. Pleuro-pneumonia, foot-and-mouth disease, scab, and glanders, have for many years done a vast amount of injury without exciting public attention, which has only been aroused on occasions of extensive prevalence of epizootic affections in a particular locality; but now, when energetic officials are waiting to pounce upon diseased animals, and every seizure of infected beasts forms the subject of a sensational paragraph, it is impossible for the former state of happy ignorance to be maintained even by the least curious. There is nothing in this new state of things to call for objection; on the contrary, it is most desirable that every attack of disease among animals should be a matter of public knowledge. As a first step towards a recognition of the necessity for the institution of sanitary measures, it is required that the mischief which has been quietly going on should be openly exposed. In spite of all that is being done to prevent it, there is yet too much hushing up, in respect of new outbreaks of disease, and the surreptitious removal of infected stock is quite as common as it was before Contagious Diseases Acts or Orders were thought about. We do not assert that matters are worse now than they have been for years past; but we complain that, with all the modern appliances, they are not far better.

If by any means stockowners all over the country could be induced to act as self-appointed and self-interested inspectors and sanitary committees, we might hope to see the spirit of the existing law, in relation to the subject, fairly carried out; but while the action which is taken is intermittent in application, spasmodic in its force, and now and then contradictory in its character, it is to be feared that little advantage will be gained. For the purpose of arresting the spread of contagious diseases the one essential is isolation of all diseased and even probably infected animals. The law enjoins this course, but without the aid of stockowners it can only be enforced by means of an expensive and complicated machinery.

All the epizootic diseases which are now existing among stock would die out if we would only cease to insist upon perpetually renewing their vitality by constantly extending the sphere of their influence, and always, in fairs and markets, and even in our homesteads and highways, providing new victims.

THE whole class of implements connected with the preparation of food for cattle came under official adjudication last week at Oxford:—

If we turn for a moment to the subject of trituration, what a field is open for agricultural discussion? What a mine in which the agricultural economist may dig. Here and there we see a few guide lines set up by Nature for us, but much is left to our own resources. Take the cow for example, and look at the food prepared for the calf in the first instance. In looking at that we look, as a matter of course, on the fact that all mammalia are also fed by a fluid, the particles of which are so fine that we cannot discern with the naked eye the form of any one of them in the milk.

The cow by herself is a marvellous instructor, for we should not have known the importance of wet grinding if the cow had not brought her own machinery for chewing the cud into the world with her, and used it daily in milling her provender. After the food of the cow has been soaked for some hours in the first stomach, it is subjected to the cud-chewing process of her powerful jaws, and when its remnants have been voided at last in the form of manure, we see clear evidence that the process of trituration has been well and honestly performed—grass, Clover, hay, straw, roots, and even corn have all been ground to pulp. Now, if all the food of the cow could be reduced by power to pulp or powder by artificial means, the rough work of rumination would be less laborious. The cow might even almost feel young again, having her food, like that of the calf, reduced to fine particles; for this labour, small though it may seem, is no doubt, like the heat of the body, maintained at the farmer's cost. The idea of breaking up their food for the beasts of the field is indeed already taking firm hold of agricultural practice, for we see the roots and the hay and straw cut, and the "food for cattle" is always supplied finely ground and highly flavoured. All this seems to point in one direction, and shows that we are drifting towards a more natural treatment of our domestic animals.

As regards the milling process, not only the cow but all other ruminating animals have an immense advantage over the horse, and therefore it is to milling for the horse that we have most need to turn. It has been proved a thousand times over that the Oats given to a horse will grow after passing through his stomach, and rooks may be seen picking the corn out of the horsedung on the highway. Now, had the corn been reduced to fine meal before it was given to the horse, there would have been no Oats growing on the manure heap in the field, neither would there have been any food for the rook on the high road. But the poor horse is grievously wronged in another way too little understood, for he has frequently to work half the night at least, standing on his weary legs, cutting his own hay with his teeth and grinding it, instead of having it done for him, in which case he might have been lying down to rest. The horses belonging to a noted railway contractor, above one hundred in number, were put upon a system of feeding which was extended over a period of three and a half years, and it agreed so well with them that the contractor realised a large profit when they were sold by public auction after the contract was completed; but their food was all so well prepared for them that in 20 minutes after getting to the stable they were watered, fed, and lying down to rest. No tugging at long wisps of hay from the rack for a living, but well seasoned messes ready for eating without any labour of grinding; the mere driver of the horse had nothing to do with the preparation of the food, nor did he know the ingredients of which it was composed. Experiments were made in London at the time of the Potato failure by scientific men to find some practical substitute for the Potato. One medical man exhibited biscuits made of hay-meal and biscuits made of straw-meal; and we can ourselves easily see any day meal made of Rice husks, which, being literally straw cut and dry, is a great temptation to the dealers in "cattle food" to mill it into meal, adding, as cookery-books direct, flavour and seasoning to suit the taste of the market. Once the hay or straw or husk has been subjected to the triturating process we have the power of mixing various articles with it that could not otherwise be done, such as aromatic seeds, salt, linseed jelly, &c., according to the purposes for which the cattle are kept. By the use of roots in winter, and of grass in summer, cows giving milk, and cattle put up to fatten, are often kept in a state of chronic looseness for months, whilst the store beasts in the straw-yard, on the contrary, suffer from constipation all the winter long, with their dry hair standing on end, waiting for the grass to grow once more, when their bowels, too, shall be loosened, and kept so for six months at the least. Common sense cries aloud that all this is wrong; but what is to be done?—the cow must eat grass and gather it for herself, short or long, young or old, wet or dry, for the farmer has no alternative. It is truly a case of "Hobson's choice." "It was always so in old times," he would say; "and see what cattle they reared." True; but at what cost? Who would now give whole Turnips to cattle in frosty weather in the unthawed state, just as they come from the field, and nothing else, for them to get fat upon? We do not always know what is practised by bad farmers, but this we do know was done by our best men—the crack farmers of the North of Scotland, whose practice has often been held up for our imitation.

Were straw reduced to meal, how easy would it be to give that, and with that any other condiment to correct the looseness so common with cattle on very young grass in early summer as well as on roots in winter. Surely the straw, or culm of all the corn plants on the farm, may be turned to better account than to be trodden under foot as it is, or given to beasts tied up by the neck to a stake, until, driven by hunger, they are but too glad to eat whatever comes within their reach. When the dung of the hay-fed horse in summer has been dried and scattered about, we find it composed of hay in lengths of about half an inch, and the shape and substance of split hay still remaining; part of this fodder, therefore, has filled the stomach but has not been reduced from its original state for want of grinding, owing to the horse not being a ruminating animal. The cab horses on the stands, with a nose-bag containing cut hay and straw, with Maize or Indian Corn, may be taken as a sample of the most heartless stupidity, for the horse is expected to grind this hay, straw and hard corn to pulp, and that with a bridle-bit of iron in his mouth. We know that in the feeding of plants the sponge-like process (spongioles) can admit nothing that does not take the form of a liquid containing nothing larger than an impalpable powder; and in this the tree and the tiny herb are alike, for they are all sucklings, drawing their supplies in this way from the bosom of Mother Earth, not in crude lumps, but finely milled as the dew that falls on their foliage; and as the herbivorous animals for the most part merely reconstruct the atoms of the vegetable kingdom on which they feed, there is every reason to believe that what is not in fine powder already, or can easily be made so, will be rejected, as we see it is done by the horse. That marvellous agent, fermentation, so powerful in destroying as well as setting up, proceeds but slowly when the particles of matter lie wide apart; but let it have fine powder, and moisture, and warmth, and it will reconstruct rapidly. If we go one step further back still, it may not be too much to affirm that the great success of the sewage system is owing to the way that decoctions are served up to the plants by means of the watery agent, giving them just the milk immediately available to build up tissue, whereas all dry substances, however rich in themselves, lack water before the spongioles can take them up. *F.*

—— AT Mark Lane on Monday a small supply of Wheat sold at about 3*s.* per qr. under previous week's rates. On Wednesday the demand was inactive, and prices stationary. —— In the Cattle Market on Monday a supply of inferior quality beasts enhanced the prices of choicer kinds; on Thursday prices generally improved. —— Wool greatly depressed; several failures reported.

—— In the absence of the published official returns of the Oxford Showyard and its visitors, we give the following:—Monday, July 11, by payment of 5*s.* each, 34; season tickets, 370. Tuesday, 12th, 5*s.*, 68; tickets, 375. Wednesday, 13th, 5*s.*, 182; tickets, 578. Thursday, 14th, 5*s.*, 140; tickets, 470. Friday, 15th, 5*s.*, 118; tickets, 507. Saturday, 16th, 5*s.*, 83; tickets, 470. Monday, 18th, 5*s.*, 1809; tickets, 1004. Tuesday, 19th, 2*s.* 6*d.*, 8409; tickets, 864. Wednesday, 20th, 2*s.* 6*d.*, 9209; tickets, 760. Thursday, 21st, 1*s.*, 33,580; tickets, 548. Friday, 22d, 1*s.*, 18,423; tickets, 423.—Total by payments, 72,053; by season tickets, 6364; grand total of visitors, 78,417.

—— The Highland Society's annual show, held at Dumfries during the past week, and reported in another page, is interesting, as being the scene, 33 years ago, of one of the earliest attempts to apply steam power to cultivation. It was in 1837 that HEATHCOTE'S steam-plough first inserted its coulter in Scottish soil. About two months before, the engine and all the other machinery pertaining to the plough had been landed at Glencaple Quay, and thence transported to the farm of Grain, parish of Carlavarock, which forms part of the extensive swamp well known by the name of Lochar Moss. This spot was selected by the committee in compliment to the liberality of the proprietor (Mr. PATERSON, of Mousewald) in subscribing for the bringing of the plough, and also from the adaptation of the land, as being situated at a convenient distance from Dumfries—six miles. Mr. PARKES (the engineer), Mr. HEATHCOTE (the inventor), and three English ploughmen were present. After several trials, it is understood that the plough stuck in the moss, where it remains, so says a Glasgow contemporary, till this day. The Society has visited Dumfries previously—in 1845 and 1860.

—— The present suffering time for village communities is a good one for dwelling upon the positive necessity of compulsory action for sanitary improvements. At this moment the poor labourer is paying for water by the pail, in very many villages; and, if the drought continues, with increasing heat, there will soon be no water to be got for love or money in some places. We cannot do better, at such a time, than refer to Mr. BAILEY DENTON'S valuable paper on "Sanitary Village Economy," in the "Journal of the Royal Agricultural Society." It goes fully into

water supply, and we commend it to special notice just now, because it is the only treatise that has attempted to go to the root of present village wants.

—— A joint committee of the Central Chamber of Agriculture and the International Decimal Association have agreed upon a report in which the following recommendations are made :—

"1. That, in the opinion of this committee, it is desirable that the Government should be requested to act upon the recommendations of the Standards Commissioners in their second and third reports, by legislating, with the least practicable delay, in reference to the introduction of the metric weights and measures in this country, and facilitating their use by making proper arrangements for the legal verification and stamping of such weights and measures.

"2. That the Chambers of Agriculture and the Chambers of Commerce be recommended to petition the Legislature to pass, with the least practicable delay, such enactments as will establish the kilogram with its decimal multiples and divisions as the standard unit of weight in lieu of the present pound avoirdupois and other imperial and customary weights.

"3. That, in the opinion of your committee, the use of such standard weights should be made compulsory within a definite time ; and, thenceforth, contracts made by any other weights should be invalid.

"4. That, although the Central Chamber of Agriculture has recommended that grain should be sold by the 'cental' of 100 lb., which is in use at Liverpool, yet, as your committee find the general average weight of a sack of the different kinds of grain to be about 224 lb., or the tenth part of a ton, they are of opinion that it would be desirable to substitute for the 'cental' a weight of 100 kilogrammes (or, in other words, a 'quintal'), which only differs by a fraction from 220 lb.

"5. That this report be printed, and copies transmitted to all the Chambers of Agriculture and Chambers of Commerce, to Agricultural Societies, Farmers' Clubs, and Municipal Councils, with the request that they will circulate the same, and consider the recommendations of this committee at their earliest convenience.

(Signed) "FORTESCUE, Chairman."

"July 6, 1870."

—— A practical farmer from the neighbourhood of Wisbeach thus speaks of the distribution of artificial manure by the use of the water-drill :—

"I have this year drilled over 200 acres of Oats, Mustard, Barley, Mangels and Kohl Rabi, and Rape or Cole seed, &c., with one of these machines (by Reeves, of Stratton—Chandler's patent), and I find that the addition of the water to the manure considerably hastens the germination of the seed, and forces forward its growth, thus giving the young plant a better chance of withstanding the attacks of insects or unpropitious weather ; nor is the extra labour required for working a water-drill of any great amount, at least in this neighbourhood, as one man has ample time to keep a large tub filled with water on the headland ready for replenishing the drill when required, and the manure which I use needs no sifting, being prepared expressly for me for use with a water-drill. As water is always ready to hand in this district, in the drains and ditches which divide the fields, the only drawback which I think can be brought forward to prevent the universal adoption of these implements is, that should dry weather precede and follow the process of sowing, the seed is germinated by the water used, and then dies from lack of further moisture to carry it on ; but this is never experienced in the spring, and seldom in our damp Isle of Ely, even in the season (June and July) for sowing Cole seed. The construction of the drill is so simple, that an ordinary labourer can easily understand the working of it, and the manure may be as equally distributed as the seed. I usually sow from 8 to 10 acres a-day, with a drill of 6½ feet between the wheels, which is a fair day's work for three horses."

—— The GALEGA OFFICINALIS, false Indigo, or Goat's Rue, which formerly had a bad character in France, is coming into favour as a forage-plant. M. MARTINET, who has written a pamphlet on the subject, says the Galega has proved valuable as a forage crop, even where Trefoil, Lucerne, and Cinquefoil refused to grow, and that is a milk-producing and fertile plant. Galega succeeds in almost all conditions of climate and soil, but best of all in light ground, when the latter is well manured the results are excellent ; one necessity of the plant is the calcareous element, carbonate of lime, forming 32 per cent., and phosphate of lime, 18 per cent. in the ashes of the plant. The nutritive value of Galega is asserted to be very great ; the amount of azote, however, renders it necessary to give it with caution to cattle, but it contains no injurious principle whatever. Cows fed with Galega are said to give 50 per cent. more milk than those fed on ordinary grasses. The plant may be sown at almost all seasons, but February, March, and April are the best months ; the quantity of seed is given at from 17 lb. to 25 lb. per acre. The average for five or six cuttings is from 45 to 60 tons per hectare, equal to 2½ acres of green food, representing 10 to 15 tons when dry. M. MARTINET adds that the stalks of Galega yield excellent fibre for paper-making.

OUR LIVE STOCK.

CATTLE.

PRESS of matter, consequent upon the Oxford show, must be our excuse for not having sooner mentioned the result of Mr. T. T. Drake's sale at Shardeloes, conducted by Mr. Strafford, on the 15th inst. The drought had been peculiarly severe in the locality of this herd, insomuch that for a long period the cattle required to be fed on hay. The character of the season no doubt exerted a depressing effect on buyers, resulting in a low average. *Vestris 5th*, by LUCIFER, and of the Aylesby "Meadow Flower" family, was bought by Mr. Heanley for 25 gs. ; and other well-bred representatives of the same tribe only made prices which we should expect to see at any time realised by ordinary dairy cattle. The descendants of Mr. Torr's *Climax*, by Mr. Booth's VANGUARD (10,994), scarcely fared better, and the Madrigals also, of Aylesby origin, and tracing back to VANGUARD, were sold at low prices, considering their breeding. The highest figure was given for a member of this last strain, *Madrigal 18th*, which was secured by Mr. Thornton for 63 gs. *Madrigal 12th* became Mr. Heanley's property at 31 gs. *Madrigal 17th* was bought by Mr. Cox for 34 gs. *Meadow Flower* by WIZARD (25,468) made 37 gs., and went into Mr. Thornton's hands. *Lætia 8th*, by MAINPRIZE (22,260), was sold to Mr. Dunn for 40 gs. ; and lastly, among the bulls, WIZARD (25,468), by 7TH GRAND DUKE (19,877), and of the Aylesby "Water Witch" family, only made 28 gs. ; and his son, VALOROUS, of the "Vestris" family, was knocked down to Mr. Arabin for 40 gs. The remaining animals were disposed of at prices varying from 18 to 30 gs. The average over the 57 head of cattle sold was £24 1*s.* ; 49 cows and heifers made £24 17*s.*, and eight bulls £19 11*s.* 1*d.* each, giving a grand total of £1372 7*s.* May we be permitted to draw a lesson from this result ? It seems to point to the fact that the present state of feeling in the Shorthorn world is against mixing the two great rival factions of the race. Pure Booth, pure Bates, pure Knightley, all bring large prices, but mixtures are made with peril.

—— The principal events in the cattle sales of this country, within the last week or two, have been connected with Mr. Cochrane's purchases. Last week we mentioned the startling prices he had just given for Wetherby and Warlaby animals. From Killerby the same spirited buyer has purchased *Lady of the Lake*, by KNIGHT ERRANT (18,154), and of the "Hecuba" tribe ; *Queen of Beauty*, by the same bull, and from *Queen of the Glen*, by VELASCO ; and *Fairy Gem*, by K.C.B. (26,492), a yearling. The first named cow, now eight years old, was bought for 500 gs., and the latter two animals, respectively two years and one year old, were sold for a similar sum. Further, Mr. Cochrane secured from the same herd *Milliner*, by BRIGADE MAJOR (21,312), and from Mr. Sergeantson's *Lady Percy*. At Braithwaite the same purchaser secured BOOTH'S MARKSMAN, a bull calf (ten months old), by BOOTH'S KINSMAN (25,658), from a "SUTLER" cow ; and *Rosa Louisa*, by ROYAL BOOTH (22,772), and out of *Rosa Sybilla*, by BARON BOOTH (21,212).

—— The following note relates to Captain Gunter's sale of two Duchess yearlings, announced last Saturday :—"Captain Gunter has just sold to Mr. Cochrane, of Compton, Canada, *Duchess* 101 and *Duchess* 103, for 1000 gs. and 1500 gs. respectively : one, from *Duchess* 84, for which Mr. Betts offered 1000 gs., and the other from *Duchess* 92, which is also dam of the last 1000 gs. heifer two years ago. She is due to calve again on Sunday next ; a large sum has been refused for her, offered by Mr. Cochrane. The two yearlings are both by 4TH DUKE OF THORNDALE. *Duchess* 101 is just the original Duchess colour, and the other a Bates roan.

—— We translate the following remarks from MM. Mole and Gazot's work on cattle :—

"The term aptitude is used with reference to an organic and functional disposition, in virtue of which the animal endowed with it is especially fitted for particular employments, destinations, or products, rather than to any other. Between conformation and aptitude there is at once a connection and a close correlation, for the correspondence is reciprocal between principle and consequence. Both are acquired and become fixed by descent, aided by food and what may be called education. It is here that the influence of man shows itself paramount over the animal organism, for such aptitudes change more or less according to the wish of the master mind. The ox tribe offers the most remarkable proofs of the above remarks. From his origin, towards the domestic condition it contained in a latent condition, if one may so speak, the three faculties which make it valuable—work, secretion of milk, and production of meat—in a degree more or less advanced, or more or less latent. Each individual considered separately presents to the observer certain signs of its special natural disposition ; one can sustain fatigue for a long period, another gives abundance of milk, a third shows an aptitude to lay on flesh and to become fat. Thus there are special aptitudes adapted to the temperaments of each. In cultivating these special aptitudes they have been developed to a high degree, and in the course of time, and through great care, have almost reached perfection, and become hereditary. This specialty is the result arrived at. The original inclination existed as a simple organic tendency : it is now a large and transmissable aptitude, a valuable attribute of a race. According as the faculty is developed the conformation is modified * * * *. The working ox should be rough and powerful, but he will not distinguish himself in the shambles. The milk cow only lives for the secretion of milk ; she labours without ceasing towards that end, and if she is not allowed sufficient materials to elaborate she feeds upon herself, and gives her own substance. The stall-fed beast, of lazy nature, unadapted for work or for yielding milk, consumes exclusively for the increase of her own body, and strives to surpass all others in fatness. She will be valuable at the slaughterhouse, but there alone will she excel."

These various aptitudes are not found developed in a high degree in one and the same animal. It is upon this general principle that these authors argue against the wisdom of attempting to develope more than one of these aptitudes in a race of cattle. Whatever is gained by increasing the secretion of milk, for instance, is lost in the inclination to develope flesh ; and, again, the encouragement of a disposition to withstand the hardships of toil is followed with a diminution of both the other valuable qualities.

SHEEP.

WE are just entering on the season of ram sales, and advertising columns are filled with notices of auctions for this and the following weeks. Mr. W. G. Preece calls attention to numerous important sales of Shropshires ; the Leicester men invite the inspection of their friends ; Mr. Strafford announces the Buckland sale of Southdowns for the 18th inst. ; and the auctioneers of the Cotswold district have published the days on which the most important Hill sales are to take place. Never, perhaps, have ram breeders had a more difficult season to contend against, and yet, judging from many sheep we have lately seen, they have triumphed over their difficulties in a surprising manner ; and we may expect to see the same grand size and thoroughly covered backs and ribs which we have met with on former occasions. The means by which these indefatigable ram breeders succeed in contending against an unpropitious season are worthy of notice, and may be summed up in few words —constant care from birth, and, during the present scorching summer, shelter, water (in moderation), and a supply of Cabbages, Vetches, cake and corn.

—— We have received a very interesting series of photographs of sheep from Mr. Milton Druce. Sheep look better in photographs than cattle, and the granular surface of the wool shows out to great advantage. The 3d prize ram in the class of old Oxford rams at the late Royal meeting, is well depicted in different positions, but all showing his wonderful breast and width through from blade to blade. This sheep was 2d at Southampton, and 3d at Manchester last year. There is also a very taking likeness of one of the 2d prize pen of ewes exhibited at Oxford, showing her to be a sheep of no ordinary merit.

—— There is an evident hitch regarding disqualification for prizes, on the ground of shearing. Mr. Milton Druce is disqualified at Taunton, and the same sheep are passed at Oxford. Another breeder is passed at Taunton, and disqualified at Oxford. This points to an indefiniteness of standard likely to be attended with mischievous results, and something ought to be done to set the matter right. Either inspection should cease altogether, and the length of wool should be left entirely as a private consideration for the judges—an alternative we by no means approve,—or an affidavit, properly and satisfactorily signed, should witness to the very day upon which the sheep exhibited were shorn, as well as to the manner in which the operation was performed.

POULTRY.

MR. EDITOR, will you allow me, through your valuable Journal, to ask Mr. Mechi what are the kinds of fowls he keeps that will not do injury to corn seed when first sown, and to the crops when ripening? I think I remember that Mr. Mechi has published that he had about 300 fowls, which had free access to his fields of corn, and which join his homestead, and yet that they do his crops no injury. I, myself, have about a third of that quantity, and these do our crops so much injury, scratching up the seed in dry weather when first sown, and pulling down and eating and trampling upon very much as it is ripening, that I have no doubt when the fields adjoining our homestead are in Wheat or Barley that the fowls destroy nearly or quite an acre each year ; and this annoys my husband so much that he is continually grumbling, and threatens to shoot the whole of them, which I am unwilling he should. I have consulted my neighbours, and one showed me a field of Rye-grass and Clover which was near his premises, and from it, to the extent of full an acre or more, the fowls had picked out every blade of the Clover, and so far ruined the crop. I then went to another neighbour, and he replied, "Fowls, fowls !—I wish the d—l had them all ; they have positively spoiled me more than an acre of Wheat, for what they do not eat they pull down and trample upon and entirely spoil." I then went to another neighbour, who always, after his corn is sown and as it is ripening, shuts up his fowls in a barn ; but here a great nuisance occurs, for this neighbour holds religious meetings in the barn into which he shuts his fowls, and the consequence is that whenever I and my family go to the meetings—my husband never goes—we are always for some time afterwards tormented with fleas. I ask, therefore, Mr. Mechi to be so kind as to inform me and the public, what kind of fowls he keeps which will not eat and trample down his corn ? or whether he has any secret method for instructing them not to do so ; and if so, I should be greatly obliged to him if he would publish it in the *Agricultural Gazette*. M. C., *July* 18.

OF COTTAGE BUILDING.

[The following notes on this subject are taken from the work on the Prince Consort's farms, published by Messrs Longmans, whom we have to thank for the use of the engravings.]

THE drawings in the following columns represent a house containing sufficient accommodation for four families, which was erected by H.R.H. the Prince Albert, near the Great Exhibition building of 1851, as an illustration of the kind of accommodation which a family required—and of the means by which it might be compendiously and economically provided.

As stated in a pamphlet issued by the Labourers' Friend Society, his Royal Highness had this building tected central open staircase, with the connecting gallery on the first floor, formed of slate, and sheltered from the weather by the continuation of the main roof, which also screens the entrances to the dwellings. The four tenements are arranged on precisely the same plan, two on each floor. The entrance is through a small lobby (*a*), lighted from the upper part of the door. The living room (*b*), has a superficial area of about 150 feet, with a closet on one side of the fireplace, to which warm air may be introduced from the back of the range. Over the fireplace is an iron rod for hanging pictures; and on the opposite side of the room a shelf is carried above the doors, with a rail fixed between them.

The scullery (*f*) is fitted up with a sink (*f'*), beneath its separate access, and a window into the open air; two have fireplaces.

The children's bed-rooms (*c*, *d'*) contain 50 feet superficial each; and, opening out of the living-room, an opportunity is afforded for the exercise of parental watchfulness, without the unwholesome crowding of the living-room, by its use as a sleeping apartment.

The parents' bed-room, with a superficial area of about 100 feet, is entered through the scullery an arrangement in many respects preferable to a direct approach from the living-room, particularly in case of sickness. The recess in this room provides a closet for linen. In each of the bed-rooms a shelf is carried over the door, with a rail fixed beneath it.

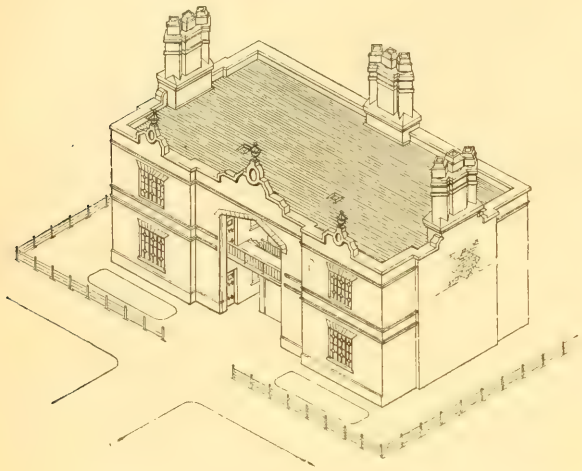

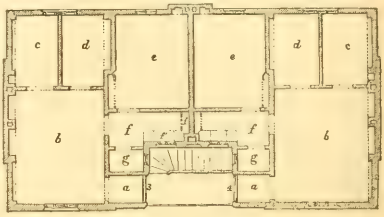

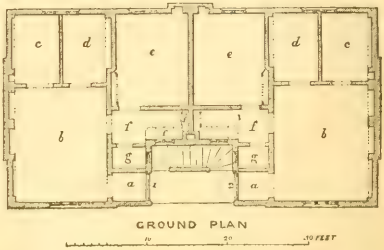

FIGS. 193, 194.—THE MODEL COTTAGES OF 1851.

raised on his own account, with the desire of conveying practical information calculated to promote the much-needed improvement of the dwellings of the working classes, and also with the hope of stimulating visitors to the Exhibition, whose position and circumstances might enable them to carry out similar undertakings.

In its general arrangement the building (figs. 193, 194) is adapted for the occupation of four families, of the class of manufacturing operatives who reside in towns, or in their immediate vicinity. The most prominent peculiarity of the design is that of the receding and projecting central open staircase, with the connecting gallery on the first floor, formed of slate, and sheltered from the weather by the continuation of the main roof, which also screens the entrances to the dwellings. The four tenements are arranged on precisely the same plan, two on each floor. The entrance is through a small lobby (*a*), lighted from the upper part of the door. The living room (*b*), has a superficial area of about 150 feet, with a closet on one side of the fireplace, to which warm air may be introduced from the back of the range. Over the fireplace is an iron rod for hanging pictures; and on the opposite side of the room a shelf is carried above the doors, with a rail fixed between them.

The scullery (*f*) is fitted up with a sink (*f'*), beneath which is a coal-bin of slate; a plate-rack at one end, drained by a slate slab into the sink, covers the entrance to the dust-shaft, which is enclosed by a balanced self-acting iron door. The dust-shaft leads into a closed depository under the stairs, and has a ventilating flue, carried up above the roof. The meat-safe is ventilated through the hollow brickwork, and shelves are fixed over the doors. A dresser-flap may be fixed against the partition.

The sleeping apartments (*c*, *d*, and *e*) being three in number, provide for that separation, which, with a family, is so essential to morality and decency. Each has its separate access, and a window into the open air; two have fireplaces.

The children's bed-rooms (*c*, *d'*) contain 50 feet superficial each; and, opening out of the living-room, an opportunity is afforded for the exercise of parental watchfulness, without the unwholesome crowding of the living-room, by its use as a sleeping apartment.

The parents' bed-room, with a superficial area of about 100 feet, is entered through the scullery an arrangement in many respects preferable to a direct approach from the living-room, particularly in case of sickness. The recess in this room provides a closet for linen. In each of the bed-rooms a shelf is carried over the door, with a rail fixed beneath it.

The same pipes which carry away the rain-water from the roof serve for the use of the closets (*g*).

The peculiarities of the building in respect of constructive arrangement, are the exclusive use of hollow bricks for the walls and partitions (excepting the foundations, which are of ordinary brickwork), and the entire absence of timber in the floors and roof, which are formed with flat arches of hollow brickwork, rising from 8 to 9 inches, set in cement, and tied in by wrought iron rods connected with cast-iron springers, which rest on the external walls, and bind the whole structure together; the building is thus rendered fire-

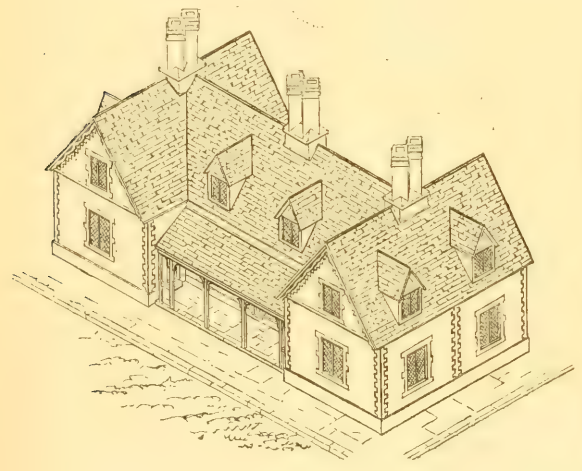

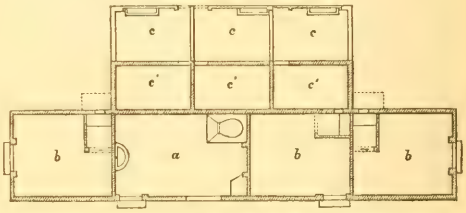

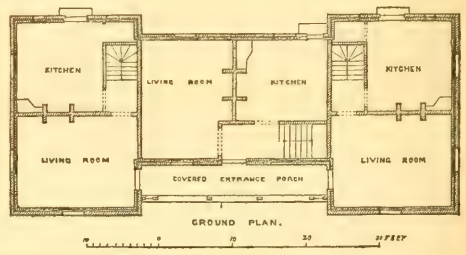

FIGS. 195, 196.—BRICKFIELD COTTAGES, OSBORNE ESTATE.

proof, and much less liable to decay than those of ordinary construction. The roof-arching, which is levelled with concrete, and covered with patent metallic lava, secures the upper rooms from the

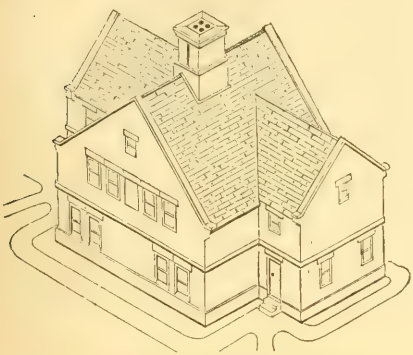

FIG. 197.—ALVERSTONE DOUBLE COTTAGE.

(threefold) and Alverstone (double) cottages respectively. It will be seen that, better than the plan on which the model cottages of 1851 were built, these have provided a kitchen and a living-room in addition

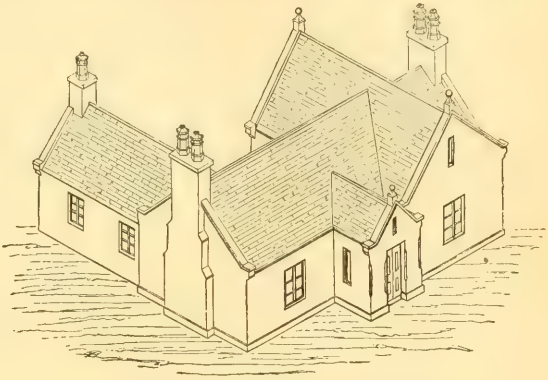

FIG. 198.—TRADESMAN'S COTTAGE AT ABERGELDIE.

liability to changes of temperature to which apartments next the roof are generally subject, and the transmission of sound, as well as the percolation of moisture, so common through ordinary floors, is effectually impeded by the hollow-brick arched floors.

The external and main internal walls are of patent bonded brickwork, which has the important advantages of securing dryness and warmth, with economy of construction: and another great benefit arising from the use of hollow bricks is, that where they are laid double, in parallel courses, without headers, as in the patent bonded brickwork, the internal face of the wall is sufficiently smooth to render plastering unnecessary.

The advantages afforded by the use of hollow bricks in securing an effective system of insensible ventilation, deserves particular notice.* Fresh air is admitted from any suitable point of the exterior of the building to a chamber at the back of the living-room fireplace, and, being warmed there, it may be conducted to any convenient place of exit above the level at which the fresh air is admitted. Vitiated air may be conveyed either into the chimney flue, or to any other suitable place of exit through the upper wall courses.

The mode of fire-proof construction, and the general arrangement of the fittings of Prince Albert's model cottage, have since been used in the model houses built by the Society for Improving the Condition of the Labouring Classes, under the direction of Henry Roberts, Esq., F.S.A., who has acted as their honorary architect.

This model house was removed at the close of the Exhibition, and it has been since rebuilt in Kennington new park, Surrey.†

The following are references to index letters in the plan on opposite page (figs. 193 and 194 :—*a*, porch ; *b*, living-room ; *c*, *d*, children's bedroom ; *e*, principal bedroom ; *f*, scullery, containing — *f'*, sink, plate-rack, *f''*, meat-safe, &c. ; *g*, water-closet. (Experience proves that the closet should always be in an out-house, never in the house itself.)

We have given thus, in some detail, an account of the first specimen of cottage-building in which the Prince Consort particularly interested himself. We have yet to describe the improvements in respect of the cottage accommodation which he directed on his estates at Osborne and Balmoral.

The drawings (figs. 195 and 196) represent blocks of cottages erected on the Osborne estate — the so-called Brickfield

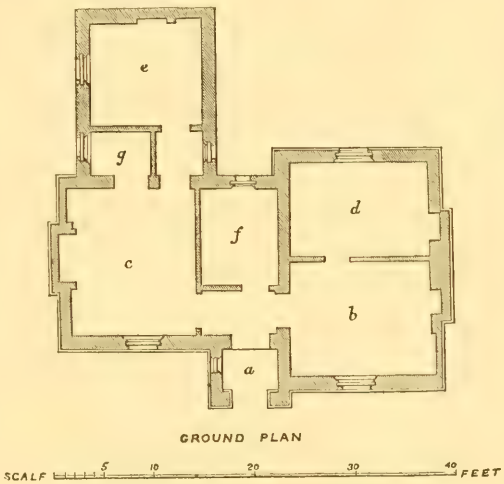

FIG. 199.—PLAN OF ABERGELDIE COTTAGE.

to three bedrooms. The plan of the Brickfield cottages —a block of three—seems to us to unite ample accommodation with great elegance of elevation. The designs are by Mr. Mann, the architect on the estate. The outhouses, of which a good plan is given in the drawing on the opposite page, provide a common washhouse (*a*), with separate wood-house (*b*), piggery (*c'*, *c*), &c., for the three cottages respectively.

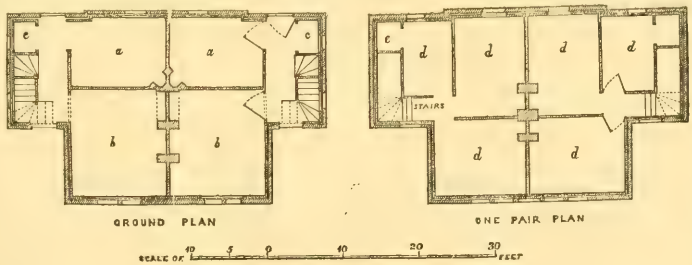

FIG. 200.—PLAN OF DOUBLE COTTAGE.

In the case of the Alverstone double cottage, again, we have (figs. 197, 200) kitchen (*a*), living-room (*b*), larder (*c*), necessary to add that the rents charged vary from 1*s.* 6*d.* to 2*s.* 6*d.* weekly—that throughout all the cottages the system of double external walls is adopted; the full width of 15¼ inches being made up of 9 inches and 4½ inches respectively, with a separating interval of two inches, adding greatly to both warmth and dryness.

Mr. Chadwick, C.B., informs us that the death-rate on the Osborne estate amongst the labouring classes is only 12 in 1000, the rate for the whole kingdom being 23 in 1000, and that of the best rural districts known elsewhere being about 17. There can be no doubt that the reduced rate at Osborne has been due to the intelligent attention paid to the sanitary condition of the cottages. "It may be said," adds Mr. Chadwick, "that if all the cottage property in the United Kingdom were maintained in the same condition as that of Her Majesty and H.R.H. the Prince Consort, the death-rate would be reduced more than one-third, or nearly one-half. It would be as if every third year there were a jubilee, and there was no sickness and no deaths."

To these illustrations we add others of the cottages erected at Balmoral. In figs. 198 and 199 are given elevation and plan of cottages built for tradesmen, and on p. 394 will be found illustrations of cottages for labourers.

The plan (fig. 199) represents the superior accommodation provided for the class of small tradesmen on the Abergeldie estate. In the case of all these cottages the plans were prepared upon the suggestion of his Royal Highness, receiving corrections from his hands during their design, and receiving superintendence from him during their erection. Moderate rents have been in every case charged—the advantage to the estate being considered, not in the direct addition of annual money return, but in the establishment upon it of a healthy, well-conditioned labouring population.

THE SECOND PRIZE FARM.

IN presenting to our readers a short report of the farm to which the second place in the competition created by Mr. Mason has been awarded, it will probably be expected that a strict comparison between it and the first prize farm, upon which we reported last week, should be made. It is here, however, that we feel the difficulty of our task, and also what must have been that experienced by the judges in deciding between the competing farms. We shall endea-

* It is right, nevertheless, to mention the fact that where hollow bricks have been used, as at Windsor, difficulty has arisen in getting at water pipes, &c., without destroying the bricks; and that the houses built with them are certainly colder.

† To this short notice of the model cottages of 1851, we add the account which Mr. Roberts, F.S.A., Honorary Architect to the Labourers' Friend Society, gives of them in his pamphlet "On the Essentials of a Healthy Dwelling" (Ridgway). Mr. Roberts says:

"The Commissioners for the Exhibition of 1851 having replied to an urgent application made for a site, 'that a model lodging-house does not come within the design of the Exhibition,' a memorial on the subject was presented to his Royal Highness, who immediately expressed the most lively interest in the project, and a desire that the contemplated model houses should be con-

vour to point out some of these difficulties. We have to compare a large farm of 880 acres with one of 420 acres—the first confessedly a poor land farm, which might be considered as high rented at 24s. per acre, while the second is rented at near double that amount. The first is almost exclusively arable, the second mostly pasture; the first devoted to sheep and Barley, the second a dairy as well as arable farm, where 50 cows are milked; the first held under a 21 years' lease, the second from year to year. Again, one farm exhibits especially good management in certain departments in which, perhaps, it eclipses its rival, but at the same time, when that rival is further examined, good points are discovered wanting in the other. It is a clear principle, which ought to be kept in view, that the late competition was between tenants, and not between landlords. Not that we would go the length of an eminent authority it was our fortune to meet with quite recently, and consider that the tenant who erected any building or made any improvement usually looked upon as landlord's work, should, so far from being commended, be to a certain extent disqualified in the competition. Such a verdict is too harsh, and most certainly unpractical. Why has a tenant possessed of valuable sheep or cattle, each animal probably valued at a sum far beyond the expense of erecting shed room—why, we ask, should such a man be looked upon as foolish for erecting shelter in the form of sheds in the field or at the homestead? Certainly it ought to have been done by the landlord, but in case the landlord refuses, why should not the tenant make a calculation as to whether it will pay him better to spend a certain sum in such necessary shelter rather than in some application to the soil or some extra food? While, then, we agree with the general principle that tenants' capital ought to be devoted to what is understood as tenants' improvements, and the stocking of the farm, we think that circumstances may arise in which the expenditure of tenants' capital upon what should have been done by the landlord may not be altogether unwise or worthy of deprecation.

Last week we summed up our remarks upon Mrs. Millington's farm by stating, that in general the crop was excellent, and the root crop especially worthy of commendation, while the live stock could not be spoken of as good, nor the provision for summer sheep keep as effective. There was also a general want of style, best understood by contrasting this farm with the best managed occupations of Norfolk, Lincolnshire, or the Lothians. We have now had the pleasure of inspecting Mr. John Treadwell's farm, and, without further preface, proceed to chronicle our impressions upon it.

Mr. Treadwell's holding is situated seven miles west of Aylesbury, and the same distance north-east of Thame. It lies upon the Winchendon Hills, on the west slope of the celebrated Vale of Aylesbury, into which a portion of it stretches. The form of the farm is singular, and may be described as a table-land, with a downward slope on every side of it. It was spoken of some years ago by Mr. Love (for this is not the first time that the "model farm" has been before the public) as a basin turned upside down in a basin of larger diameter; or, in other words, a rounded hill in a valley which surrounds it on all sides. This peculiarity of form is accompanied with the disadvantage of a large proportion of bare, easily burnt hill ends, peculiarly exposed to the evil effects of a long-continued drought. The farm is 420 acres in extent, 240 acres of which are permanent pasture. The land may in general be spoken of as good deep stone brash, but very various, as is best seen by the sudden changes in vegetation as the observer walks over certain fields. Although a portion of the farm has for many years been occupied by members of the Treadwell family, the present tenant has only had possession for five years, and he holds under the Duke of Marlborough from year to year. The lease contains an indefinite and unsatisfactory clause, which may be looked upon as a kind of imperfect tenant-right.

As in the case of Mrs. Millington's farm, it is our wish to present a general impression of Mr. Treadwell's management, and afterwards to furnish a few particulars as to details. Farming may be well divided into attention to crops, to stock, and to a smaller class of important, but more minute objects of care. Unquestionably on passing over Mr. Treadwell's farm the fences will be pronounced weak. Let it be remembered, however, that all gaps are neatly railed; it is as living fences, and not as divisions and protections, that they are deficient. The Thorns are evidently old, and we would ask how far a tenant without any lease can be held responsible for this? Since it would be the height of folly for Mr. Tread. well to throw down his old fences and plant new ones at his own expense, and since such would be the only way of rectifying this the most disfiguring feature on his farm, it appears to us that the condition of the fences should not be marked against it in contrasting it with one held under lease for 21 years, in which the fences are in somewhat better order. The first crop we noticed was a very fine piece of Mangel Wurzel, fully equal to what we witnessed at Ashgrove Farm. The Swedes are so far a failure. A nice plant of young Turnips, drilled between rows of Beans and Peas, which were being removed on the day of our visit, attests the thrifty character of the management pursued. The corn crop is everything that could be wished. One magnificent and impenetrable crop of Rivett's Wheat struck us as remarkably excellent, while the finer Wheats and Barley were promising in the extreme.

This district has not been in the slightest degree favoured during the present unpropitious season. We walked over one small piece of land, for instance, that had been sown with Oats. These Oats never came up, and finally it was thought best to plough and sow with Rape. Now, in the latter end of July, the Oats have just made their appearance with the Rape, and give promise of yielding a piece of nice autumn keep. So much for the crops. Turning to the live stock, we found, as above stated, a good stock of 50 dairy cows, which produce butter for the London market. The herd has long been crossed with first-rate Shorthorn bulls, and has assumed a stylish and uniform appearance. Reference to Mr. Treadwell's private herd book reveals the names of CHANCELLOR (25,738), WHARFDALE WILD EYES (27,788), MARMION (22,288), ALBION XII (21,152), and other good bulls, many of which are of Penrhyn origin. MARMION, a serviceable and well-bred young bull, is now being used in the herd. Twenty calves are weaned annually on skimmed milk, and are early introduced to an allowance of cake. The greater number of cows calve in late autumn and winter. During their first summer the calves receive 1½ lb. of cake with grass; the second winter chaff and a few pulped roots, or no roots and cake; the second summer grass alone; the third winter straw and 3 lb. of cake, and about this time, if heifers, they drop their first calves. The steers are fed off in sheds.

Nine working horses are kept; in winter they receive cut food wholly, viz., straw, with very little hay cut up, and 2 bushels of Oats each per week; in summer they lie out at grass, and have about half a bushel of Oats each per week, when working hard, no corn when not very busy. The labour costs about £700 a year. The cattle men receive 12s. or 13s. per week, and beer or milk for breakfast in winter, 3s. or 4s. more in haytime and harvest; the other men, 10s. and 11s. in winter, more in summer, but all is let by the piece that will allow of it, and they earn as much as 15s. or 16s. in spring, of course much more in hay and harvest-time.

We need hardly say a word on the subject of Mr. Treadwell's sheep. He has been for so long a successful exhibitor of Oxford Downs, that his flock is known to every visitor of our great shows. Unfortunately 200 of his 220 ewes were from home. We, however, had again the pleasure of seeing some of the animals shown at Oxford, and of seeing 60 magnificent shearlings which will be sold by auction next Wednesday, when the farm will be open to inspection. Here we saw what we missed at Ashgrove, namely, the Vetches, the Cabbages, and the sheepfold, the shelter from the sun, and the usual appliances for carrying sheep on well through the summer. The lambs were weaned in June; 220 ewes yield 270 lambs now alive, and we were told by Mr. Treadwell that he had been bid £5 a head for 200 ewes. As an interesting fact in connection with Oxford Down sheep, we may mention that in one quite recent year 448 fleeces gave 123 tods, 18 lb. of wool; and, we believe, this year 474 fleeces gave 134 tods, 21 lb. of wool.

A remarkably good stock of well-bred Berkshire pigs is kept to consume the skim milk, the residue from the butter manufactory. Boars have been purchased from Mr. King Tombs and other breeders, and as level, thick, well headed pigs it will be difficult to find a better stock. A few horses are bred for keeping up the working team of the farm. Poultry does not appear to evoke the same enthusiastic interest shown in the management of the other sections of live stock.

With regard to the rotation of crops, a six course is followed:—1st year, roots; 2d, Barley or Oats; 3d, half seed and half broad Clover, about four acres being reserved for Cabbages; 4th, Barley or Oats on the seeds and Wheat on the Clover and Cabbage land; 5th, Winter and spring Beans and Peas drilled, 16 inches apart, with Turnips drilled between; 6, Wheat after the early, and Barley after the late fed Turnips. Vetches occupy about one-half of the sixth or last year's stubbles, and this portion comes in for Swedes and Turnips. The remaining half is kept free, and worked for Mangel. This management is alternated in consecutive rotation, so that Mangel only comes once in 12 years on the same land. Five acres of Mangel is also usually taken out of the 5th or pulse section of the rotation, and these are drawn for cattle. The cultivation for roots consists in forking stubbles, after which a very thick coating of dung is applied. This is ploughed in with Robinson's subsoiler, an implement furnished with two following coulters, that completely break the bottom of the furrow. This plough is drawn by six horses, and penetrates 10 inches in depth. The land is thus left for the winter, and in the spring the cultivator or scuffler, and sometimes, as in the present season, the drag only is used to obtain a tilth. The Mangel is drilled 16 inches, and the Swedes 22 inches, apart, and are put in with the Bedford drill without water, ashes, or artificial manure of any kind whatever; 10 lb. of Mangel and 3 lb. of Swedes and Turnips are sown per acre, and only 1 lb. of seed when Turnips are sown between Bean or Pea rows. The farmyard manure is applied to the Mangel and Vetch land at once from the folds, and any which is left over is heaped and carted when convenient on to the permanent pastures or reserved for early Vetches after harvest.

Considering the size of the farm, a very large amount of purchased food and home-grown corn is consumed; £1300 per annum is thus expended, £800 of which is for bought food. It is, however, a singular fact that no manure is ever bought, either in the form of artificial or dung, Mr. Treadwell preferring to keep up the fertility of his land through food consumed rather than by direct manuring.

Such are a few of the leading facts elicited during a short and interesting visit to the second prize farm. We conclude by saying that an excusable defectiveness in the fences was the one fault we remarked, and that both stock and crop are everything that we should desire to see.

"Instructed on his own account, in effecting which it was my privilege to act for his Royal Highness as honorary architect. Without much personal trouble to the Prince, the requisite official consent of four Government departments was obtained for placing the houses in the Cavalry Barrack yard, opposite to the Exhibition.

"Amongst the number of visitors to the Prince's model houses, amounting to upwards of 25,000, many have evidenced that having duly appreciated the object for which they were placed in the Exhibition, viz., the conveyance of practical information, calculated to promote the much needed improvement of the dwellings of the working classes, and also the excitement of those whose position and circumstances enable them to carry out similar undertakings, and thus, without pecuniary sacrifice, permanently to benefit those who are greatly dependent on others for their home and family comforts. (The point of pecuniary sacrifice was justly held by H.R.H. to be of primary importance to the adequate extension of the work. The detailed estimated cost of the model block of four houses was £458 5s. 6d.) The building was adapted for the occupation of four families of the class of manufacturing and mechanical operatives who usually reside in towns, or in their immediate vicinity—those, in fact, by whose labour the larger portion of the objects in the Exhibition had been produced.

"The open staircase and gallery, giving access to the upper-floor tenements, were prominent features in the arrangement of these dwellings, and their subsequent adoption in buildings constructed for working people in towns, has come under my notice in Edinburgh, at Liverpool, Ramsgate, Brighton, Windsor, and other places, as well as in London and on the Continent.

"The example which may, perhaps, be pointed to in London as having the closest resemblance to the original structure, and as fully answering, in a pecuniary point of view, is at Cowley Street, Shadwell, close to a station on the Blackwall Railway, where a number of miserable dwellings, tenanted by the lowest class of persons, came by inheritance into the possession of a private gentleman, W. E. Hillyard, Esq., of Gray's Inn. Actuated by the most philanthropic views, he decided on endeavouring to improve, not only his own property, but also, by example, the immediate neighbourhood; and his efforts have been crowned with signal success. The old dwellings have been replaced by an entire street of considerable length, on both sides of which houses, for accommodating in the whole 112 families have been built, on the general plan of the Prince Consort's Exhibition model houses, with open staircases, giving access to the upper-floor tenements. The 28 blocks of four houses cost £487 each; and, after allowing for ground-rent and all charges, I can state, on the authority of the owner, that 'they continue to pay upwards of 6, in fact nearly 7 per cent. as a nett return on the investment; and what,' he adds, 'is perhaps of more consequence, they are almost constantly let, and are appreciated by the tenants, who, as a rule, are pretty stationary, and not migratory, as that class frequently are.'

"Scarcely any foreigners who visited the Exhibition of 1851 returned without examining the Prince's model houses, and but few left without carrying back to their several countries some of the publications bearing on the improvement of the dwellings of the labouring classes, which were there abundantly distributed. My own opportunities of judging of the effect of this little structure enable me to say that it gave to the movement an impulse such as it has not received from any other single effort. The descriptive account of the building was subsequently translated into German and published at Berlin; much of it also appeared in French."

PRESENT APPEARANCE OF THE CROPS.

ABERDEENSHIRE: Our crops looked very stunted until about the 1st of this month, when we had a good deal of rain, which improved their appearance much. Wheat, of which there is but little grown in this district, is of fair length of straw, but generally thin of plant, and will be under an average. Barley is an average crop, both as to thickness and length. Oats are short in straw, thick on the ground, but will be rather under an average. Hay (Rye-grass and Clover) is above an average. Pastures are getting bare. Turnips are looking well, except on stiff clay soils. Potatos good generally. *A. Cruickshank, Sittyton, July* 18.

BEDFORDSHIRE: I consider the Wheat crop of this neighbourhood promising, more than an average. Barley, Oats, Beans, and Peas about an average. Hay a failure, and roots, on the contrary, very good. *William Lavender, Biddenham, July* 18.

BUCKS: Wheat on strong soils good, on shallow and gravelly soils bad. Barley certainly much below an average. Oats rather below an average. Beans very short in straw but fairly podded; still below average. Peas good, above an average. Mangel various, but on an average only two-thirds of a crop. Swedes very late, and probably only half a crop. Kohl Rabi good; quite an average. Hay the worst crop I ever remember; not a quarter of a crop. Pastures still very bare, no grass at all this season. Potatos not grown as a field crop. Harvest will begin about August 4. *W. G. Duncan, Bradwell, Stony Stratford.*

DURHAM: The Wheat crops in this district will, I think, yield nearly an average crop. Turnips have nearly in all cases to be sown over again, owing to want of rain. Potatos and Beans will be average. Hay 30 per cent. below usual yield. *Robt. B. Dixon, Darlington, July* 18.

ESSEX: When, about a month since, the report of the crops I sent was read in this neighbourhood and copied into several provincial papers, there was nearly a general opinion that the report gave a too favourable account, but I had not then, nor have I now, a doubt but the opinion I formed was substantially correct. Indeed, taking the crops in the aggregate in my parish and immediate neighbourhood, I unhesitatingly pronounce them to be very, I may write unusually, fine, and that they will be unusually yielding ones. Most crops of Wheat and Barley are wonderfully so, and the Beans and Peas are all good where the ground was well cultivated and in good condition. Some few crops of Oats are not so good, but still, I have seen what will be very fine yielding Oat crops. The Mangels also are super-excellent, and there were some very heavy Clover crops. But I wish it to be understood that my reports refer to my own parish and the neighbouring parishes. The season having been unusually dry, the corn did not tiller as generally in other years, nor, consequently, has it run so high as to expend itself by thickness and production of loads of light, puffy, and worthless straw. And, in referring to straw, I will observe that Mr. Smith, of Woolston, and others should make this distinction} when they are praising or condemning straw—that is, as to what kind of straw they mean, for the value of straw does not consist in its bulk, but in its weight, unless it has been injured whilst in the field or elsewhere, any more than the value of manure does. But farmers and others write and talk of straw and manure as if their values were measured by the number of waggons or carts they will fill; but there is nearly as great difference in the real value of both straw and manure that will fill waggons and carts as there is in coins that will fill purses,—a distinction, however, that is but seldom made by writers and talkers. *G. Wilkins, Wix Vicarage, near Manningtree, July* 18.

—— The excessive heat and drought hastened the ripening of the crops. We commenced harvest on the 22d; nearer the coast they began earlier. Harvest is now general in Essex. The Wheat and Barley are both of fine quality, excepting on the hot, dry sands, gravels, &c. *J. J. M. de Viefville, July* 28.

FIFESHIRE: Wheat, under average. Barley, full average. Oats, under average. Beans and Peas, average. Hay, far under average. Potatos, full average. Turnips, average. *John Morton, Lambeletham, July* 20.

GLOUCESTERSHIRE: In this neighbourhood, with few exceptions, the Wheat crop is looking very well, and I think may turn out a fair average crop. Barley on good and well-farmed land, and where sown early, promises to be a good crop, but where sown late, and on thin soils, is very poor indeed. Oats are not grown much in this neighbourhood, but the same remarks as for Barley will hold good. Peas are an excellent crop and well-podded, and are now being cut. Beans are a poor crop, especially winter Beans, which are very short of straw, and patchy. Clover hay a pretty good crop, and well got; but as to English hay, I never knew a worse crop; indeed, the crop is all but a failure. Swedes and Mangels are a good plant, and looking well, and at present promise fair to be a good crop. Potatos never looked better, and early kinds are yielding a good crop. On Lord Ducie's farm we have cut our Peas, and are busy cutting Oats. All our crops are good, and as promising as I can desire. *John Cobham, Westfield, Berkeley, July* 17.

HANTS: We had a considerable number of acres of Wheat ploughed up in this county in the spring, and there are still left many acres with less than half a plant. Of course this must tell against the crop in the aggregate, with these exceptions the crop promises fairly, but not for anything beyond an average yield per acre: it is true the ears are well filled, and the grain promises to be large, but on close investigation there is a thinness of bulk even upon the best fields in the majority of instances. It is very rare to meet with a heavy well planted crop of straw; hence my conclusion is, that we shall not realise an average crop of Wheat in Hampshire on the acreage sown. Early-sown Barley is a fair crop, but is going off prematurely ripe in very large patches in the best fields, from which the yield will be lessened, and the quality much injured; about half the acreage sown will not yield half a crop of either corn or straw. Oats are very unpromising—less than half the usual bulk of straw, and very little more than half a crop of corn. The few winter Oats sown are the exception, and are a fair crop. We have a fair plant of Swedes, and some which may yet produce tolerably good roots if favoured at once by a soaking rain. Turnips most unpromising. Less than half a crop of all hay, except Sainfoin, which is about two-thirds of an average produce. *J. T. Twynam, Winchester, July* 18.

HERTS: The Wheat crop on well farmed, cool land is very good, above average, but on gravelly soils very bad, much under average. The Barley crop, where sown early, in well farmed cool land, good; but on gravel very bad, even where the land is farmed very highly. Oats, generally very bad crop, very much under an average. Peas, about an average. Beans, very bad crop. The pastures have produced literally nothing, the low-lying meadows a good crop. The artificial grasses about half a crop. The Mangel Wurzel crop varies very much; where sown early on land in a good state, generally good, but when sown late, very poor. Swedes generally very unpromising, likewise white Turnips. *Guy Webb, Beaumont Hill, July* 19.

HUNTINGDON: I think the Wheat in this neighbourhood is a good average crop, or a little above, except on the gravelly land; there it will be below the average. Barley will be about an average, except on the hot land. Oats are but very little grown, but I think what few there are are pretty good. Winter Beans are very thin in plant and very short in straw, but exceedingly well podded. Spring Beans are short in straw, and many people complain that they are badly podded, but I cannot join in the complaint; I think they will be a fair yielding crop. Peas about an average. Hay crop I think the lightest ever known; but the root crop has every appearance of being very good. Harvest will commence about the 28th or 29th inst. *Robert Barton, Wigan, St. Ives, July* 20.

—— With regard to the crops in this county and district, I would say of Wheat that it presents at present a most promising appearance. On all the clay soils it will be considerably over an average crop, the ears being very large and well set. Of Barley, the crops vary, those after roots being light, whilst those after a naked fallow, on clay soils, are very good. Altogether, I consider we shall have an average crop. Oats are universally a light crop, and below an average. Of pulse crops, Beans are short in the straw, but are well podded; and Peas are an extremely fine crop—the finest, I think, I have ever seen. All root crops are now well planted, and growing very rapidly, and will be a full crop—Kohl Rabi, of which a great breadth is grown in this county, especially. The later crops of Potatos promise to be very fine. Our hay crops have been a total failure, and our pastures have all along been, and at present are, very short of keep. *Peter Purves, Brampton, July* 21.

KENT: The Wheat crop varies so much this year in this district that there is much difficulty in forming a correct opinion as to what the produce will be when harvested; in some instances on the same farm, and even in the same field, there is one-half difference. On all deep, cool, well-cultivated land the crop will be abundant; but on thin soils, chalk, and gravel, there will be a very short crop, and I think on the whole of this district the crop will be below an average. The same remarks will apply to Barley, but I think Barley will be more inferior in quality. Our Oats are nearly all cut, and they are better than were expected; the slight rains we had last month improved them much. Peas are a fair crop, mostly harvested; Beans are generally very bad. All feed for cattle, sheep, &c., is very short; rain is much wanted for all green crops. We have but few Swedes or Turnips that have planted well, and those are almost dying for want of rain. Mangel Wurzel, generally, a good plant, but many have been attacked within the last week with grub, similar to those that did so much damage in 1868. The prospect before us is by no means cheering, as food for man and beast must be scarce and dear during the coming winter. *Wm. Manser, St. Peter's, Thanet, July* 21.

MIDDLESEX: In answer to yours of the 16th, I may state that the great heat and want of rain have seriously affected all crops in this neighbourhood except Wheat, winter Oats, and Barley on the best holding land. Spring Oats are everywhere deficient. Potatos are still looking well. *T. Hewett, Cranford Park Farm, July* 23.

MONMOUTH: Wheat and Beans will be fully one-third deficient. Barley and Oats a fair average. Hay about one-eighth of the usual crop, with the grass fields very bare. Swedes and Wurzel look promising. Turnips too young to pronounce upon. Harvest will be general the first week in August. *H. Pride, The Crom, Monmouth.*

SUFFOLK: The Wheat round this is looking well, excepting now and then a piece; the straw is shorter than usual, but there will be an average crop. The Barley, generally speaking, is good, short in the straw but fine ears. Oats, none grown. Beans and Peas are very short in the straw, but generally well hung with pods. The Beetroot scarcely half a plant. Turnips on some farms have come up well, on others a complete failure. Clover very scarce, and grass hay still more so, but what there is well secured. Potatos very good, but not many to the root. *Sam. G. Stearn, Brandeston, Wickham Market.*

WARWICKSHIRE: The hay crop in this locality, owing to the spring drought, is a complete failure, and the cattle must suffer much through the ensuing winter. The old saying will be verified as regards the Wheat crop, "drought never brought dearth in England." Some of the Wheat crops are very thin, but the rain of June wonderfully improved them, and the ears are very large, and give promise of an abundant yield, much more than last year, which was worse as regards quantity per acre than any season in my remembrance. I think we have promise of nearly an average crop of Wheat except on the very light soils, which have suffered from the drought. Barley has very much improved also, and the early-planted will be an average crop. The later-sown Barleys are not good, and I do not think we shall have an average crop of this grain. Winter Beans are almost a failure. Spring Beans are short on light soils, but well corned on the clay land; they are not an average crop. Peas are short, but promise abundance of corn; many are gathered in. Seeds, I fear, are killed in many places, from the dry weather. Mangel Wurzel promises a great crop; I never saw it better. There are not many Swedes planted in this neighbourhood, but what I have seen promise well. The Pea stubbles are being rapidly planted with white Turnips. The pastures are still very brown, and want rain. We shall not have harvest before the beginning of August. *J. Baldwin, Luddington, Stratford-on-Avon, July* 18.

WIGTONSHIRE: Wheat promises well for a good crop, with favourable weather till harvest. Oats never looked better; in many cases too luxuriant. Barley is also very good. Hay, a good well-saved crop. Potatos good, and Turnips very promising; they grow rather slowly at first, but are now making rapid progress. Harvest will be fully a fortnight later than last year; very little will be cut in August, unless the weather is very dry and warm. Grass is very abundant, and Clovers have done remarkably well this year. *A. H. M'Clean, Auchnul, Stranraer, July* 18.

WORCESTERSHIRE: The general report is in favour of the Wheat crop being good. I have a doubt respecting it, it having lost stalk so much in the early part of the season, and being very short in straw and thin upon the weak land. I do not consider the winter or spring Beans half a crop. The early Peas are very good, some of the late ones indifferent. I may repeat the same respecting the Barley. Oats good, not many grown in this neighbourhood. The Potatos are very healthy, but small, from the dry season. The grass, the worst for many years, will not average 4 cwt. per acre. *J. Matthews, Great Malvern, July* 18.

—— In my opinion Wheat will be under average; the price being low, coupled with a bad yield, a less breadth was sown, and a portion of that the winter destroyed, having to be resown with Barley or some other crop. Oats and Barley, I think, under average. Beans the worst crop of the year. Peas, not many grown here, but the few I see seem to have done better, and possibly may be an average. Also Vetches, where left for seed, are very well podded. The hay was a miserable crop, except on water meadows, and the root crops, unless we get a good soak of rain soon, will be a very poor crop. I should say harvest will be general on August 1. I have cut one field of spring sown Oats, but shall not have any Wheat ready before the date named. *John Rawlings, Stoke Farm, Tenbury, July* 20.

YORKSHIRE: Wheat is average; Barley average, being much improved; Oats 1 quarter per acre short of average; winter Beans variable, 4 bushels short of average; Peas average crop; Tares about average; Turnips and Potatos variable, and will be a light crop; Barley and Wheat good in quality, and free from any disease at present. *John Clark, Hessle, Hull.*

—— The Wheat in this neighbourhood is above an average, and if the present fine weather continue, will be fine in quality and heavy in weight. Barley is also very good; Oats, Beans, and Peas under an average; Turnips variable, and if rain does not come quickly they will be a failure, being in some localities attacked by the white maggot. Potatos look exceedingly well and healthy. *B. Nicholson, Sturton Grange, Garforth, Leeds, July* 20.

—— In answer to yours of the 16th inst., I am glad to inform you that the late rains have very much benefited all crops in this neighbourhood. The Wheat is too thin upon the ground to be an average crop. Barley on strong-bodied soil is an average, but on light soils only a light crop. Oats considerably under average; they seem not to have improved since the rain in the same way as the Wheat and Barley crops. Beans a much smaller breadth than usual, and not particularly well podded. Peas, none grown. Root crops: Mangels promising; Potatos very good, so far; Turnips for the most part have been resown twice and thrice—the last sown look the most healthy. Meadows only one-third of a crop. Pastures quite burnt up. White Clovers have done well, and still are promising good keep for sheep. I have noticed this year an unusual number of small ears half the height of the main crop, both among Wheat and Barley, and this, independent of the thinness, must cause a deficiency of yield. *P. Stevenson, Rainton, Thirsk, July* 18.

HINTS FOR HOT AND DRY WEATHER.

Live Stock.—Having sold our fat beasts, I have just purchased 20 yearling and nine 2-year Shorthorns. These, in addition to our usual 200 sheep and lambs, are a fair supply for 170 acres of land, out of which 100 acres are in corn. But how are we to keep them this dry weather, for we have only had one good two hour's rain in Essex for near five months? I see no difficulty, so long as our chaff-cutter is at work, giving us ample supplies of finely cut straw chaff, green Beans, stems and all, also passed through the chaff-cutter; Cabbage pulped, malt combs, bran, rape, and cotton cake; rock salt in the mangers, and a never-absent supply of water. We shall add a little taste of Clover,

second crop, passed through the chaff-cutter; and all these mixed together, with steam and plenty of straw chaff, flavoured with a little hay chaff if you have it, it is surprising how much stock can be kept going. Then comes the question, where do we put the cattle? Certainly not in the fields, but comfortably under an enclosed and slated shed, with paved floor, the slates lime-washed with thick gruel-like lime-wash, done by our labourers. Consequently, instead of the slates being burning hot they are cold, the white lime reflecting or throwing off all the heat which would otherwise be absorbed and transmitted by the slates, to the animals' great discomfort. The lime must be applied when first made, and it must be of a thick gruel-like consistence. No rain will wash it off in summer, but in winter the frosts will do so, and the slates will always appear new, because the hot lime-wash kills all vegetation on the slates. This lime-washing renders our houses and cottages comfortably cool. The outside of bricked cottages should also be lime-washed. There must be ample openings under the wall-plate, and ventilation in the roof by a long dependent board, dividing the openings into two parts; or have Watson's ventilators in the roof.

There is no place so cool as under a wide-spreading, well-foliaged tree, but then you are wasting your manure on the tree, while in the shed it is all saved for your crops.

By the way, talking of trees and small fields, let me entreat landowners travelling by rail to keep their eyes upon every Mangel or Turnip crop, and reflect on their condition, and on the ruinous loss that the trees occasion to farmers, especially in such a dry season as the present. In the centre of these small and wooded fields the Mangel look green and healthy; but as they approach the sides of the fields they become beautifully less, until their terminus is *nil*. The thirsty roots of the trees and fences extending from 10 to 50 yards into the field have taken all the moisture and rendered useless and unavailable all the costly manure and cultivation. And all this for what? A neighbour of mine threw down a tremendous fence, a real rasper: I bought of him two gigantic Oak pollards, minus the branches, for gate-posts—they must have been at least two centuries old. I paid him 9*s.* for the two, the tops probably brought as much. These robbers had exercised their calling for centuries, doing a damage that in its total would be astonishing, injuring alike landowner and tenant; for they must have tended, and always do tend, to prevent that increase of rent which accompanies progress and improvement. It is only when these horrid fences have been removed, and the reclaimed ground planted with a new crop, that one can appreciate the enormity of the loss of area and of waste that has been so long inflicted and endured.

I remember finding roots as thick as cart-whips 33 yards away from the fence, and, on tracing them to their source, found that they belonged to some wretched little Elms not worth 7*s.* 6*d.* each. It was only by forking under the ploughed land that we discovered them; they impeded the digging, and were robbing the ordinary farm crops of their food. As a source of profit we cannot compete with the unrented forests of Canada in wood growing, and as to the picturesque, farming is a business or trade, and by the removal of my neighbour's fences I can take an enlarged view of agriculture in more senses than one.

My iron wire fences, erected 25 years ago by my friends, the Garretts, are as good as new for use now, and much cheaper than insect-and-weed-harbouring and food-destroying natural fences. My sheep and lambs are all iron folded, and my experience has taught me that this is a more satisfactory mode of feeding the animals and the land than the roaming at large system.

Water.—I am afraid that sheep are often injured or retarded by want of water. Nature in fresh green pastures has taught us that the right proportion of dry food to water is as one in four of weight. Green grass contains 75 per cent. of moisture, but when seared or scorched by a burning drought, such as we now have, the absence of a proper supply of moisture must be supplied by water; when we give cake, malt combs, bran, &c., the sheep must have all the water they choose to drink, or they will cease to eat enough to fatten them. The Cruelty to Animals Society should look into some bad cases of this kind. Well may sheep lose flesh when on "roast meat," as our farmers call dried grass. My cattle under cover always have free access to water.

One of the best things I did on this farm was by draining, from 6 to 10 feet, and thus tapping springs, to get a permanent supply of some 40 gallons of pure water per minute. A previous owner of this farm bored 150 feet in the strong clay and found no water. The constant flow of pure water from my springs has been a comfort to the inhabitants along a line of brook miles below me. Animals, like ourselves, are influenced in their desire for water according to circumstances, such as the state of dryness of their food and temperature of the atmosphere. To compel them to fill themselves with succulents, Turnips, containing 90 per cent. of water, often at a very low temperature, is as unprofitable as to deprive them of a supply of water under an opposite condition of food.

If animals could speak to us, how often would man be reproached for a neglect cruel as it is unprofitable. The water question is becoming a serious one. By drainage, removal of trees and fences, and by deep railway cuttings, tunnels, wells, we have rendered our soil and climate drier and warmer. The consumption of water by our steam-engines and locomotives is something amazing. One-horse power of steam evaporates every hour 6 gallons. The population of London use 100 millions of gallons daily, which goes into the river instead of back to the land.

A sagacious friend of mine practises and suggests a rule by which every cottage or house can be always naturally supplied with water. The average of British rainfall is 26 inches, so that a house 10 by 10, with a roof having a flat area of 100 feet, would receive in the course of a year 208⅓ cubic feet of water, or 1251 gallons. A tightly built well or underground tank with a pump in it would receive and store nearly this quantity provided the roof were properly guttered and troughed, and some slight deduction might be allowed on account of evaporation and waste. Now a roof of 100 feet flat superficial would represent a house or room only 10 feet square; when, therefore, I hear of farmers sending miles after water when they have an enormous area of roofing which would supply them ten times over with all the water they could require in a year, I feel that landlords and tenants should combine to have proper underground tanks to receive the winter water from the at present untroughed roofs, instead of using it to wash away all the best and most soluble portion of their manure. Let me entreat my friends on high hills, porous chalk, dense clays, and light lands, to consider this suggestion, and especially all owners of cottages. Union infirmary rates will then be considerably diminished, and we shall have plenty of water for irrigation and other purposes. A bricked underground tank can be built and cemented at a very moderate cost.

By allowing the water to accumulate for a month or two before you begin to use it, it will probably never be again empty. In my case the rain-water from my roof filters through sand, gravel, and a little charcoal. This is taken out and washed clean about once in two or three years.

In our Eastern Counties the rainfall only averages from 16 to 22 inches. Mr. Hope states that the sewage of London on the north side only of the Thames would daily fill a lake of 92 acres 3 feet deep. What would that be worth this dry weather, or indeed at any time, on the land? *J. J. Mech.*

FARM AGREEMENTS AND TENANT RIGHT.

YOU will, perhaps, afford me a little space to make a short reply to the remarks of "G. A. H." (p. 903), and those of A. Scott (p. 941), on my letter (p. 874) on the above matter.

If, as "G. A. H." says, 99 landlords out of 100 would agree to the conditions I proposed, provided the tenant had entered on his farm under the same conditions, I may congratulate myself on having succeeded in my object as regards the landlords, for the qualification which he attaches to the remark is easily disposed of. The tenants may not have entered under the same or similar conditions, but if not, they must be put into the same position as if they had done so. The very act of discussing the question implies that it is thought a change in many cases should be made, and I cannot see that in general cases there would be any difficulty in effecting it. It would be needless and impossible to state how the change would be made in every case, but for illustration I will take that in regard to payment for dung left on the farm.

Now dung on a farm, not paid for by the tenant, belongs to that farm, or, in other words, to the landlord. In order that it may belong to the tenant, that he may be entitled to payment for it at his removal, he would simply have to pay the landlord for the dung on the farm at the beginning of his year when he comes under this new arrangement. A landlord certainly could not object to this, to get payment for all the dung on his estate, which, by existing agreements, does not belong to the tenants. Neither ought tenants to object to it, for, although it involves the possession or use of a little more capital, it would place them at liberty to go on improving their farms, raising larger crops, and consequently making more manure, with the certainty of being paid at their removal for the increase in quantity, and also in quality, for I cannot think that there would be any justice in having a price fixed for dung, but by all means let it be paid for according to its quality. Then, again, the example by which "G. A. H." tries to show the injustice of a tenant being paid for the dung is an exceptional one, and which should be provided for in another way; it is that of a tenant sowing down land to grass. I did not endeavour to state all the items that it might be necessary or desirable to include in a rule for tenant-right, but in some parts of the country it is the custom to allow an outgoing tenant as much as £5 an acre for having sown down land to permanent grass, and this item should be considered; but it has always appeared to me that a full valuation should only be allowed for it when it has been done with the approval or consent of the landlord. As paying for the dung on a tenant's entry to a farm is supported by so good an authority as Mr. Lawes, and also by the present custom in some parts of England (Mr. J. L. Fletcher, p. 935) and many parts of Scotland, and is being adopted in the latter, where it has not previously been the case, it might be argued on these grounds alone that it stands on a sound basis. But I will point out one other argument in its favour. Much has been said lately, especially in Scotland, about the evil of letting farms to tenants with insufficient capital, and the loss to their creditors should they become insolvent. Now the having to pay for the dung at entry would be a test of their capital so far as it goes, and should insolvency unfortunately occur, their being entitled to payment for it would assist in paying their debts. The fact is, that giving the dung to a tenant free is neither more nor less than the landlord lending him so much capital to carry on the farm. They may thereby be entitled to rather more rent for the farms, but it would be much better, if they incline to have money at interest on the farms, that they should execute necessary improvements of a permanent nature, such as buildings, draining, &c. As to "G. A. H.'s" remark about a tenant entering on a farm nearly all in grass, and breaking it up, and getting paid for a large quantity of dung at the end of his occupation, it is so exceptional a case that it scarcely deserves notice; for surely no landlord would be so stupid as to let such a farm without specifying conditions as to such land. And if the tenant were allowed to break it up he ought to pay for the privilege.

I will now notice the principal restrictions and conditions laid down by "G. A. H."

1. I will pass this over, the condition is noticed in my former letter.

2. To oblige the tenant to buy so much lime, superphosphate and potash. This is too dogmatic. When will landlords allow their tenants to be free agents in selecting the manures suitable for their farming—in fact, allow them to use their own brains? Then and not till then need they expect to have intelligent and skilful tenants.

3. To sow every season a certain breath with a mixture of grass seeds and Clovers is not objectionable, but I think it is preferable to attain the object desirable in a different way, viz., the tenant being bound not to take two corn crops successively in the case of light soil, and to be entitled to an away-going crop of Wheat, or to half tillages (manure) after green crop off a portion of the arable lands not exceeding one-fourth thereof; as the corn crops are restricted to two-fourths, and the land sown with Wheat, or left after green crop, and for which he can receive a valuation to another fourth, the remaining fourth must either be sown with seeds, or have been green crop, or bare fallow, and left without any valuation. Under similar rule I have always seen the seeds sown, and should they not plant them, the tenant is at liberty to fallow or green crop the land.

4. Two successive corn crops are only advisable on heavy soils, and that only in alternate rotations.

5. The condition as to game might work tolerably well.

6. Does not require any remark, as the reservations are not specified.

7. For time of entry, Lady Day is certainly preferable to Michaelmas. I think a term between the two better than Lady Day, for any occupation of the land which the outgoing tenant can have after February 2 must be detrimental to the incoming tenant, without any sufficient benefit to the outgoing one.

I will now very shortly notice one or two points referred to by your correspondent, A. Scott. His suggestion as to game does not seem such as would give satisfaction; but, on the contrary, lead to endless contention about the damages done. The reason is, because it is impossible to estimate with certainty the damage done to a crop for six months or so, and which has been growing and constantly, we may say, repairing the damage all that time. The only satisfactory solution of the matter must be some law by which game, and especially hares and rabbits, will be kept down to a limited number. It is of no use for the Government or any other party to frame a Game Bill, unless this principle be kept in view. It seems to be rather too soon to do away with arbitration in settling questions as to what valuation an outgoing tenant is entitled to, and to refer it to a court such as that enacted for Ireland. But a great evil attending arbitration in England is the employing of licensed valuers, who often have no sound judgment of such matters. There ought to be men specially licensed (if licensed valuers must be employed) for valuing farming matters, and before obtaining such a license they ought to pass a rigid examination as to competency and uprightness of character. *J. McK., July 14.*

Home Correspondence.

The Prize Farm.—The prize so nobly offered by the High Sheriff of Oxfordshire for the best-managed farm within 50 miles of Oxford has been contended for, and has been won in fair fight by a lady. The gentlemen selected as judges have acquitted themselves of their difficult and delicate task in a manner which, I think, must satisfy not only the public but all the competitors likewise. I walked over the farm the day after the prize was awarded. It consists of between 900 and 1000 acres, the whole of which, with the

exception of 3 acres, is arable land. Having known the farm intimately some 30 years ago, I could not fail to be struck with the almost miraculous transformation it has undergone. On a considerable portion of it the Bramble, the Brier, and the Fern struggled with miserable crops of corn for the possession of the soil, and some acres of it were planted with Fir trees, it being considered not worth cultivation. Straw, hay, or anything else that was marketable was sold off. Where goodly waving crops of grain now grow Gorse faggots were sold off, to heat the bakers' ovens. In some seasons the Wheat was carted straight into the yard for dung, on account of mildew rendering it not worth the threshing. Since that period, owing, I believe, to the fact that no tenant could be found for it, the farm was taken in hand by its noble owner. A good bailiff, with ample means, in a few years put a new face on it, and it then commanded a tenant in the husband of the lady who now so worthily occupies it, but who has been deceased for some years. This farm is situated in the parish of Ordley, in Oxfordshire, and through it the turnpike-road leading from Brackley to Oxford passes. On nearing it, I could not fail to be struck with a fine field of Swedes on the left, consisting of 43 acres, which appeared a full plant, and nearly covered the ground. On the right was a smaller field still better, the ground being entirely hidden. The root crop this year consists of 140 acres, the greater portion of which are safe; in fact, the fields I went into were as luxuriant as Lettuce. Those who complain so much about the difficulty of growing roots in a dry season should go and learn the secret how to get a plant at the Ordley prize farm. I will tell them this much, that the chief means used are steam cultivation, superphosphate, and the water drill. I was shown a spot in a magnificent crop where the liquid was stopped for a yard or two. The plants here were about the size of Cabbage plants as usually pricked out. Within a few yards thereof I measured a bulb which was 12 inches in circumference. The root crop being here reduced to something like a certainty, is eaten off by sheep (which are of the Lincoln breed), with a liberal supply of cake or corn, and thus a foundation is laid for the corn crops which are to succeed. Knowing, as I do, more or less of nearly every one of the competing farms, all of which consist of superior land, and some of them of the finest in England, I cannot help remarking that Mrs. Millington has won with the odds greatly against her, and the honour is thereby greatly enhanced. I hope that she may be spared many years in good health to cherish her prize, and the Duke of Marlborough may be justly proud of having two tenants on his estate who could go in and win both the first and second prizes offered for the two best managed farms in a radius of 100 miles. At some future time I hope to return to and give a more extended notice of this noteworthy farm. *F. W. B.*

—— The First Prize Farm makes us all look to see where it is and who its occupant is. Your report shows that the farm is at Ordley, and that Mrs. Millington is its occupier. Some years back Mr. Millington wrote to me for information as to the use of steam-power upon his farm, and it now turns out that he and his wife have been using that power to aid them in the preparation of their seed-bed for roots, and the results are shown in their rotation of cropping, viz., "1st, roots, principally Swedes and Turnips; 2d, Barley; 3d, seeds; 4th, two-thirds Wheat and one-third Barley, including a portion of Vetches. Catch crops are seldom sown, and the Vetches occupy any portion of the seed land not thought to be in good enough condition to have a corn crop." Then according to this there are upon this farm 400 acres of Wheat and Barley, excepting the Vetches, and 400 acres of roots and Clover consumed, with £1000 to £1200 of cake, &c., by sheep and cattle. Now comes the question, What is the produce of this farm? The 400 acres of roots and seeds, with £1000 to £1200 for cake, are used upon the farm to make its corn crops productive. I will give the Vetches in and call it 400 acres of Wheat and Barley, giving an average produce of 40 bushels per acre. If this estimate is wrong, Mrs. Millington can correct me. 400 acres, multiplied by 40 bushels per acre, gives a total of 16,000 bushels as the corn produce of the farm containing 800 acres arable. Now divide the 16,000 bushels by 800, and we find that the average produce of corn on "the first prize farm," is only 20 bushels per acre. In Oxfordshire there are many poor clay land farms, and I now ask the men who occupy them what they have been at to allow Mr., and now Mrs. Millington to outstrip them in the race to honour. For 15 years I have been working poor clay land by steam-power. This clay land of mine, under horse culture, was worked upon the four-course system, viz., dead fallow, Wheat, Beans, and Wheat, mainly, and the produce stood about thus:—

	Bushels.
Fallow	..
Wheat	30
Beans	25
Wheat	25
Total	80

—or an average of 20 bushels per acre a year. At the end of my 15 years working by steam-power my produce stands thus. This poor clay land of mine is all in Wheat this year, half of it after Beans, and the other half after Wheat, and there is a produce upon it of over 40 bushels per acre: that can be seen by any man. Upon this evidence I say that the Oxfordshire clay land farmers have been asleep to allow Mrs. Millington to outrun them. She may well be proud of her position upon her poor "stone brash," that must mainly be improved by the consumption of cake and clean working, when the poor clay needs little else besides deep and clean working, a little superphosphate for Wheat, and that is all. *William Smith, Woolston, Bletchley Station, Bucks, July 25.*

Farm Agreements.—Under this heading in your Paper of July 9, A. Scott mentions a farmer north of Inverness, who, when an outgoing tenant, applied nitrate of soda to his new grass—"be it told to his credit," says A. Scott. Well! in our locality we would count it anything but to his credit, and would look upon it as a trick whereby to obtain an extra value for his grass at the expense of future years. Such things are done, no doubt, south of Inverness; but the outgoing tenant who does so fully expects to be repaid in the extra value he obtains for it, and he deserves no credit, neither does he obtain it, for so doing. *Land Steward, Pitcaple.*

Thick and Thin Seeding.—I read with more than ordinary good humour the letter in your last number [July 16] under the above heading, and signed "Spectator." Had it but occurred to him to call upon me he would have learned that the field of Wheat to which he refers was not "thin-seeded" at all, but drilled with 9 gallons of seed per acre. From circumstances over which I had no control, this was not done until January 4. The plants were scarcely up when severe and long-continued frosts totally upheaved them out of the ground, and left this field, in common with many another field on light land and with an exposed aspect, apparently without any plants upon it. After doing all I could in the way of consolidating the soil when the winter was over, I waited patiently to see if there might be any plants surviving. It was the 9th of May before these were sufficiently discernible to enable the men to commence hoeing, and this was done solely and avowedly at the time in the expectation of possibly obtaining half a crop. I should like "Spectator" to point out anything I have ever written or said, to the effect that a crop could be expected under such circumstances. I have a 28-acre field of Golden Drop Red Wheat, and a 28-acre field of Chevalier Barley, which I will show against any two similar fields of equal extent and not grown from my seed; and these I should have been happy to offer for "Spectator's" scrutiny. So much in merest fair play to myself; and I will rest content with only adding, in reference to his observation as to others "following my example," that half of my present Wheat crop is already sold, in nearly all cases, to purchasers of former years—gentlemen who have, after trial made (and in many instances after years' experience) of my pedigree cereals, found it to their interest to continue their cultivation. *Frederick F. Hallett, The Manor House, Brighton, July 19.*

The Road Steamer.—On Thursday last a somewhat exciting trial took place of Thompson's steam traction engine, drawing Mr. Gray's (of Glasgow) 4-furrow plough, working at a depth of 6 inches by 9 inches wide. The ploughs did their work well, but the frame that united them being too light, and the steerage very defective, the ploughs could not be made to follow the engine with regularity, and the crooked and irregular work thus told against the traction engine system. The engine was, however, at all times master of its work, and drew the four furrows at the rate of 3 miles per hour, with a pressure of 125 lb. per inch. My opinion, and that of other experienced lookers-on was, that in practice three horses with a single plough would have enough to do to work the same depth and width in the same field; therefore, this little engine carried itself over the land, and thus did the equivalent of at least 10 horses' work, and could work from dawn to dark, whilst it would require a relay of horses to accomplish the same work. It was really a labour of great amusement to follow the work and catch the remarks of those whose life has been spent in our present system of traction steam-engines and modes of cultivation, and observe how the soft and elastic cushion-like pressure of the wheels of Thompson's engine smoothed down their prejudices without quite crushing them, allowing them, indeed, life enough to restate all the old arguments and experiences brought against the Boydell engine, with its self-laying railway, forgetting that 1 cwt. of feathers dropped 10 feet on to a pile would drive it but a little way into clay, while 1 cwt. of iron dropped so, would drive it a long way down—in fact, the soft and elastic india-rubber tire of these engine wheels gives them the same grip on loose sand, &c., as the foot of the camel and the elephant, which enables them to travel alike the sandy desert and the water-worn, rugged, pebbly beds of mountain streams, when droughty summer dries them up into natural roads for the infantile commerce of unsophisticated Man. Let us now reason a little together about the evil caused by this 8-ton engine going over the soil, compressing and consolidating it, much to the deterioration of its fertility. The wheels are 12 inches wide, and three in number, each pressing on more than 18 inches in length, therefore giving only a pressure of about 28 lb. per inch, while the foot of an ordinary farm horse gives a pressure of above 40 lb. per inch, therefore doing greater injury than this engine. Again, the ordinary farm horses will weigh about 7 tons, which, when standing, will rest on about 800 superficial inches, but when in motion will only be thrown on 400 inches, while the 8 tons of engine both rest and move upon about 650 superficial inches; therefore the light land farmer at least may hail this as the thing that will suit his purpose best, inasmuch as it will perform the haulage as well as the cultivation of his farm, and allow a large proportion of food used by horses to be used to produce beef, mutton and wool, and so increase our supply of food and raiment. *L. P.*

Welsh Agriculture.—"G. A. H." has turned a bit crusty with me for asking for the address of men in Wales who keep cattle upon straw, for, instead of giving the information, he coldly tells me to "look around." Well, I have done so. The agricultural statistics, 1868-9, show that in 1869 there were in Wales, under all kinds of crops, bare fallow, and grass, 2,530,639 acres. Of these, 135,562 were in Wheat, 157,582 in Barley, 252,970 in Oats, 2610 in Rye, 3944 in Beans, 3160 in Peas; green crops, 127,452; bare fallow, 58,786; Clover, &c., 260,899; permanent pasture, 1,527,534. This shows that three-fifths of Wales is in permanent pasture. Now, from my own knowledge and by inquiry, I find that thousands of cattle in Wales have the range of rough pasture in the day and straw in the yard for night during a considerable portion of the winter, therefore this range of rough pasture in the day time is "G. A. H.'s" "nothing else." In addition to this, I find that Mr. "G. A. H." has been carrying out in Wales a reclamation of some unsubdued mountain land 1000 feet above the level of the sea, on which he has succeeded in growing some straw, but not corn, for the Oats will not come to maturity. Such "straw" surely would be good food for cattle, and with a good range on rough grass in the day time it ought to keep them from getting lousy. Nevertheless, sheep will get the scab, and cattle will get lousy, even in Wales. "G. A. H." will see that I have done my best to "look around," and I do assure him that "when" I get "the wrong side of the argument" I will "openly acknowledge myself beaten," but the "when" has not yet arrived. *William Smith, Woolston, Bletchley Station, Bucks, July 16.*

Sorgho as Forage.—If the "Sorgho (Sorghum saccharatum)" or Northern Chinese Sugar-cane, is identical, as I suppose, with the common Indian Joar, or Jowar, or Juwaree, I wish to add my testimony to that in your number of the 2d inst. to its merits as a forage plant. The stem and leaves are used in India in many places for cattle and horses. In Scinde I fed my own horses entirely on this food, and a very small allowance of pulse, and so I believe did everybody; and I have never in any country seen the horses generally in such health and condition as they were there. The plant used in India is called in Bombay commonly Joaree or Jowaree (properly Joar), and the name is rendered in Thompson's Hindoo Dictionary by Sorghum vulgaris, in Shakespear's Hindostanee Dictionary by Indian Millet (Andropogon Sorghum, Roxb., or Holcus Sorghum). The name given by Shakespear, Indian Millet, may mislead, for several very different grains seem to be called Millet, and Shakespear himself translates Bajree, another Indian grain, a "kind of Millet (Panicum spicatum, Roxb.)." In India the Joar grows from 5 to 7 or 8 feet high, according to soil, season, &c., and the stem is very sweet to the taste. Horses and cattle are very fond of it. *Alif.*

Land Agents.—Let Mr. Wm. Scott go fully into the question, and he will admit that those clauses about cropping and sale of straw, &c., introduced into agreements by the land-agent are not only childish, but stumbling-blocks in the way of agricultural improvement. *William Smith, Woolston, Bletchley Station, Bucks, July 9.*

Foreign Correspondence.

NEW ZEALAND.—[The following communication may be of interest to our readers, it has been received from a person who has resided many years in New Zealand, who says that it is the colony for the working steady man, and children are a fortune to him; the work is rough, but plenty abounds everywhere.]

"A beggar is never seen, and no one is without plenty of meat and other necessaries; many of the labourers have a horse and pigs. If a man is sober and steady, nothing can stop his getting on; ploughmen are especially needed, and may depend on getting work immediately. Persons emigrating had better make up their minds to do without luxuries, and even many things they consider necessaries at home, and be content with little furniture, and that of a common description. All the cottages are simply weather boarded, roof shingled with wood-like tiles; many cottages have only clay chimneys, as bricks are expensive: the cottages usually consist of two rooms and a lean-to at the back with a sloping roof. Most cottages have enough land to grow plenty of vegetables, and even some Wheat. Bread is 6d. the 2 lb. loaf; butter, 1s. 3d. per lb.; milk, 6d. per quart; beef, 4d. per lb.; mutton, 3d. per lb.; sugar, 7d. per lb.; tea, 3s. per lb.; coffee, 2s. per lb. Candles are dear, 1s. 3d. per lb.; at most stations they have moulds and make them. A female servant can obtain 7s. or 10s. per week for wages. The climate cannot be surpassed; everything planted thrives. One of the roughest farmers here has told me that off each

100 acres he has cropped he has made £1000; this was after the land had been once cropped. Things considered necessaries in England are quite superfluities in New Zealand. A farm here considered in good working order would be thought at home going to ruin, as everything is done in a rough way. There are small townships scattered about the colony at which there are post offices and stores, where you can obtain clothing of every kind, crockery, hardware, groceries.

"At each township are bakers, butchers, blacksmiths, carpenters, shoemakers, and public-houses. Furniture is not to be had at the small towns, our nearest place for the purchase of it is 30 miles off, and we have to pay £4 a ton carriage of it from there. The same kind of clothing is worn here as in England. Dress and blankets are dearer here than in England; good boots are to be had at 15s. per pair.

"A common labourer gets 5s. a day. Machinery is almost unknown, so all farm work has to be managed in a primitive way. If a person emigrating had a little capital, it would be quite worth his while to invest it in agricultural machines, of strong make, adapted for rough land, as they must remember after the land has been cleared Cabbage tree roots, roots of Flax, and pieces of conglomerated gravel are often found. These implements would sell at a profit; farmers want them, but do not like to order them without seeing them. Saddlery is expensive here; agricultural seeds and grains would sell well. It is not desirable to take out English furniture, which, besides not being generally adapted for colonial use, would not pay for the expense of carriage."

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

The Oxford Meeting.—The following is a further report of the sow classes. Thirteen pigs were exhibited in class 98 for breeding sows of a large white breed. Mr. Mathew Walker, of Stockley Park, secured the 1st place with "Thalia," a remarkably good animal, and the 2d prize finds its way to the "Britannia Farms" at Bedford. The class for small white sows was equally well filled, and besides the 1st and 2d prizes, respectively taken by Mr. Hatton, of Addingham, Leeds, and Mr. Peter Eden, Cross Lane, Manchester, four animals were commended. The small black sows were only represented by three competitors. The 1st prize was awarded to Mr. T. J. Stearn, of Brandeston, Suffolk, for a pig scarcely equal in merit to one shown by Mr. Mumford Sexton, which only received a commendation. Mr. Sexton also obtained the 2d prize.

There was a wonderful entry of Berkshire sows—33 in all. Following the order of the catalogue, we noticed two pigs shown by the executors of the late William Hewer, of Sevenhampton—good sows, but a bad colour, approaching to a sort of dun upon the skin, instead of the rich black of the breed. The 1st prize was carried off by Mr. Arthur Stuart, of Gloucester, with a pig of good quality, and Mr. Swanwick took the 2d place with an exceedingly level, true grown sow, "Sally 5," by the 2d prize boar "Othello." Mr. H. Humfrey, although only successful in being commended, showed two capital sows, as did also Mr. Chapman Clarke, of Manor Farm, near Thame, Mr. Parsons, of Elsfield, Oxford, and Mr. John Spencer, of Villiers Hill, Kenilworth.

In the class for breeding sows not eligible in the foremention classes there was a good entry, in which Mr. Peter Eden and Mr. R. E. Duckering specially signalised themselves. Next followed classes 103—105, in which the entries were small and names already mentioned were associated with the Society's honours. Class 106, for the best three hilts of the Berkshire breed, was a very interesting one, both for its excellence and from the beauty of even pigs at that attractive age. Mr. Swanwick's three hilts, 6 months 3 weeks old, were most properly placed 1st; and, indeed, for size and quality it would be difficult to find their equals. Mr. Fowler, of Broughton, Aylesbury, made a very good 2d, with three capital hilts of just the same age as those which received the 1st prize. M. Heber Humfrey, and Mr. Bailey, of Swindon, were both commended. We must also notice the class in which a prize was offered for the best boar, sow, and litter. Here Mr. Humfrey was deservedly placed 1st. Lastly, there was a good entry for the best pair of Berkshire boars, under 6 months old, and from the same litter. Mr. Heber Humfrey was again placed 1st, and the executors of the late Mr. Hewer, of Sevenhampton, hold the reserve number.

HIGHLAND AND AGRICULTURAL AT DUMFRIES.

THE annual meeting of the great Society of Scotland began on Tuesday, and is being held under the most favourable conditions in respect to situation and weather. On our passage here, we could not but remark the great change between the face of the North-west, and the South and East as something extraordinary. West Lancashire, Cumberland, Westmoreland, West Berwickshire, and Dumfriesshire—counties and divisions of counties which have generally been too humid and accustomed to too much downfall—have this year been favoured by the small average of rain which has fallen throughout the kingdom, and, if reports be accurate, throughout Western Europe. Taking a line from Accrington to Skipton, northwards to Appleby and Haltwhistle (which is a few miles west of Hexham), and on to Hawick and Peebles, the country to the west appears to belong to another climate altogether. For here the exception is a field of faulty Turnips of the first sowing, while elsewhere a full first plant is seldom seen, and most of the late Swedes are small and weak, or white, or "soft" Turnips have been substituted. In the moist quarter, too—excepting where the Wheat is a thin plant from the severity of the winter and spring frosts—the fields are full of corn, while "seeds" and hay are abundant. So marked, indeed, is this difference in regard to feed and hay east and west of the line named, that bargains are being made in Cumberland, Westmoreland, Dumfriesshire, and Berwickshire, to supply the large hay consuming districts of the coal and iron mines, and relative industries, in East Northumberland and East Durham. In the two divisions there is something like a difference of 30s. to 40s. per ton in the price of grass and Clover hay. But to return to the showyard.

The Highland and Agricultural Society, like our own Royal Agricultural Society, has increased greatly in importance and popularity during the last few years. As a proof of this, a brief retrospect will be interesting. The Highland Society is one of the oldest associations in the kingdom. For some years, however, it did not make much progress, but a few brave spirits continued the even tenor of their way through wars and rumours of wars, and through evil report and good report, till they safely came to more peaceful and settled times. From a recent statement which has been published by the authorities of the Society, we learn that in 1822, when the annual meeting was at Edinburgh, there were, to modern eyes, the ridiculously small collection of 59 cattle, no horses, eight sheep, and no implements, the prizes awarded amounting to £78. The three following years the annual meeting was held at Edinburgh, without much increase in either the prizes offered or the entries made. Then it went to Glasgow, where the premiums ran up to £186, and 447 entries of live stock. The next year (1829) it returned to Edinburgh, when the live stock fell to 188; but in this year there was an innovation—implements were added—the number of entries being 11! After this the Society became regularly migratory, and met at all the leading towns of the country, till it went back to Edinburgh in 1842, three years after our own Royal Society had its first meeting at Oxford. The following Table of its returns to Edinburgh at various intervals will be an interesting key to its rise and progress:—

Date.	Cattle.	Horses.	Sheep.	Swine.	Poultry.	Total.	Dairy Produce.	Implements.	Prizes offered.
1842	215	179	47	53	—	494	40	200	£1000
1848	351	240	266	68	185	1439	167	167	1153
.. ..	295	183	283	60	227	1248	54	076	1500
1869	410	312	704	42	747	2255	—	194	1600

By this Table will be perceived the very marked manner in which this Society has grown. The premiums had been increased £500 within a few years of the first date, which no doubt greatly encouraged competition for the prizes. But it is in the implement department that the great stride of all has been made, for here there has been a rise from 20 to 1900 entries. At Dumfries the present entries are equally satisfactory, considering that this town is almost at the extreme south-west corner of the country. They are as follows:—374 cattle, 171 horses, 732 sheep, 76 swine, 401 poultry—total, 1754: 130 specimens of dairy produce, and 1873 implements,—the premiums offered being the same as last year, viz., £1600.

CATTLE.

The bovine animals may be termed a great show, but, as may be anticipated, they consist mainly of pure Scotch cattle. The improved York, Durham, or Shorthorn cattle, as this popular breed in England is variously named, are, however, well represented, the greater portion of the entries, too, being by Scotch breeders. But the polled black cattle of the Galloway and Aberdeen breed stand first in the list. Of these there is a very great show. Their heavy and fine flesh on their ample bone, in the form of thick, rotund frames, on short, stiff legs, make these pictures to look at, as well as equal to any breed in producing joints for the butcher, and fine cuts for the *connaisseur*.

The gold medal bulls in our prize list are truly grand animals for form and weight; so are Mr. Fisher's and Mr. Thompson's animals, that are awarded 1st prizes. This is not a good season, however, for seeing these cattle to the best advantage, as their new coats, although silky, are too short to set them off as they appear in the colder months. The cows are even more handsome than the males, and the elegant young heifers, with their long, black shiny hair, are as handsome, as well as good, as they can possibly be.

The Shorthorns, although not numerous, have among them some grand animals. Among these the 1st prize, EDGAR (19,680), 7 years and 7 months of age, is an excellent beast. Mr. Bruce's BARONET (25,564), is another good beast. Mr. Jacob Wilson's DISRAELI is also a great and good bull, but as he appears in working condition, and in such extraordinary good company, he was not placed by the judges. The 2-year-old bulls are the same as they were at Oxford—SCOTSMAN 1st, and Mr. Beattie's 2d; the former, we are informed, having been sold to Mr. Cochrane, through Mr. Thornton, to go to Canada, at a high figure. The cows are not a remarkable collection. The first is very handsome, but light of bone and flesh. The heifers are much more striking, particularly the yearlings, in which Lord Kinnaird took 1st with a daughter of GREAT HOPE (24,082) and *Duchess of Lorn*. This heifer, *Forlorn Hope*, is a red animal, with very fine forequarters but somewhat weak thighs. In this class Mr. Jacob Wilson is 2d, with a very elegant heifer, with ample bone placed in a correct form. By a good regulation of this Society there are no prizes offered for calves.

The Ayrshires are an extraordinary collection, although many of the stalls are empty, in consequence of some delay in the trains. Sir Michael Stewart's gold medal bull, and Mr. Ballantyne's and Mr. Meikle's 1st prizes, are model stock of this fine dairying breed. In the cows, too, there are some beauties, and the bags they carry would double the size of many, if not, indeed, most, of the Shorthorns, which in themselves may be double if not treble the weight of the Ayrshires. Of these cattle there were no less than 151 entries.

The Highlanders are as picturesque and good of quality as ever, with the exception of some deficiency in their usually long shaggy coats. The cows of this breed are remarkably pretty, and the calves are even more exquisite, for the ones that will be sandy are as nearly as possible the colour of cocoa-nut fibre, and with their bristling coats they might be taken for a moving body tightly fitted with that material in the form of matting.

There are some excellent fat oxen, both pure Angus and Aberdeen, and crosses and Highlands. These we shall, no doubt, have the pleasure of seeing again at Bingley Hall or the Smithfield show.

The following is the list of awards:—

JUDGES.—Galloways: J. Grierson, Brandedleys, Croketford; A. C. Pagan, Innergeldie, Comrie. Attending Members: J. Jardine, Dryfesholm. J. Brown Hardgrave. Polled Angus: R. Hutchison, Montrose. A. Paterson, Mullion, Keith. Attending Members: C. Johnstone, Dunwoodie Lodge; T. Welsh, Frostone, Moffat.—Shorthorns: L. C. Chrisp, Hawkhill, Alnwick; R. Hardie, Harrietfield, Kelso; J. Unthank, Nethersides, Penrith. Attending Members: J. Connell, Conheath; S. Parish, Richland Ayrshires: R. Gourlie, Crosshaun, Troon; J. Maclachlan, Blairover, Dreghorn. J. Waugh, St. John's Kirk, Biggar. Attending Members: W. H. Maxwell of Munches, M.P.; J. S. Wightman, yr., of Courance.—Highland: D. M'Intyre, Tighnablair, Comrie; J. Macfarlane, Faslane, Helensburgh; P. Robertson, Achilty, Dingwall. Attending Members: A. Shaw, Grand Crieve; N. Matheson, Whitehills.

GALLOWAYS.

1st prize Bulls at former shows, exhibited for medium gold medal—Glasgow, 1867, when the property of J. Cunninghame Tarbreoch, Dalbeattie: the Duke of Buccleuch and Queensberry, K.G. Edinburgh, 1869, when the property of the late James Cochrane, Esq., Dunston Grange, Dunglee, Newcastleton.

SECT. 1. Bulls, calved before January 1, 1868.—1st, £20, John Fisher, Knells, Carlisle; 2d, £15, Sir F. U. Graham of Netherby, Bart., Longton; 3d, medium silver medal, J. Graham, Parcelstown, Carlisle. Commended (minor silver medal): J. Cunningham, Tarbreoch, Dalbeattie. Breeder of best Bull silver medal: J. Graham, Parcelstown.

SECT. 2. Bulls, calved after January 1, 1868.—1st, £20, John Thomson, Blaiket, Dumfries; 2d, £10, Peter Morton, Laws Hall, Longtown; 3d, medium silver medal, Robert Jardine, Balgray, Lockerbie. Commended (minor silver medal): J. Carruthers, Shiehill, Moffat.

SECT. 3. Bulls, calved after January 1, 1869.—1st, £10, T. Biggar, Chapelton, Dalbeattie; 2d, £5, and 3d, medium silver medal, W. Keir, Whithaugh, New Castleton. Commended (minor silver medal): J. Cunninghame, Tarbreoch.

1st prize Cows at former shows, exhibited for medium gold medal.—Glasgow, 1867, when the property of the present exhibitor: J. Graham, Parcelstown, Aberdeen, 1868, when the property of the present exhibitor: J. Cunninghame, Tarbreoch. Edinburgh, 1869, when the property of the present exhibitor: T. Biggar, Chapelton, Dalbeattie.

SECT. 4. Cows of any age.—1st, £15, J. Cunninghame, Tarbreoch; 2d, £8, W. & J. Shennan, Balig, Kircudbright; 3d, medium silver medal, J. Gifford, Torhouskeie, Newton-Stewart. Commended (minor silver medal): Thomas Biggar, Chapelton, Dalbeattie.

SECT. 5. Heifers, calved after January 1, 1868.—1st, £10, 2d, £5, and 3d, medium silver medal, the Duke of Buccleuch and Queensberry, K.G. Commended (minor silver medal): the Duke of Buccleuch and Queensberry, K.G.

SECT. 6. Heifers, calved after January 1, 1869.—1st, £8, T. Biggar, Chapelton, Dalbeattie; 2d, £4, J. Cunninghame, Tarbreoch; 3d, medium silver medal, R. Wallace, Langhaus, Kirkcudbright. Commended (minor silver medal): J. Cunninghame, Tarbreoch.

POLLED ANGUS OR ABERDEENS.

1st prize Bulls at former shows, exhibited for medium gold medal.—Aberdeen, 1868, when the property of the present exhibitor: Alex. Morison, Bogen, Mountblairy, Turriff. Edinburgh, 1869, when the property of the present exhibitor: W. J. Tayler, Rothiemay House, Huntly.

SECT. 7. Bulls, calved before January 1, 1868.—1st, £20, R. Walker, Portlethen; Aberdeen; 2d, £10, George Brown, Westertown, Fochabers; 3d, medium silver medal, W. J. Tayler, Rothiemay House, Huntly. Commended (minor silver medal): J. Scott, East Tulloch, Stonehaven. Breeder of best Bull silver medal: R. Walker, Portlethen.

SECT. 8. Bulls, calved after January 1, 1868.—1st, £20, Sir G. M. Grant of Ballindalloch, Bart.; 2d, £10, Colonel C. Fraser, Castle Fraser, Aberdeen; 3d, medium silver medal, W. D. Fordyce of Brucklay, M.P., Aberdeen. Commended (minor silver medal): J. Scott, East Tulloch, Stonehaven.

SECT. 9. Bulls, calved after January 1, 1869.—1st, £10, G. Brown, Westertown, Fochabers; 2d, Colonel C. Fraser, Castle Fraser; 3d, medium silver medal, J. Scott, East Tulloch, Stonehaven. Commended (minor silver medal): T. Ferguson, Kinnochtry, Cupar-Angus.

1st Prize Cows at former shows, exhibited for medium gold medal.—Aberdeen, 1868, when the property of the present exhibitor: Colonel C. Fraser, Aberdeen. Edinburgh, 1869, when the property of the present exhibitor: G. Brown, Fochabers.

SECT. 10. Cows, of any age.—1st, £15, Col. C. Fraser, Castle Fraser; 2d, £8, Sir G. M. Grant of Ballandalloch, Bart.; 3d, medium silver medal, J. Skinner, Drumin, Ballindalloch. Com-

mended (minor silver medal): W. M'Combie, Easter Skene, Aberdeen.

SECT. 11. Heifers, calved after January 1, 1868.—1st, £10, Sir G. M. Grant, Bart.; 2d, £5, and 3d, medium silver medal, Col. C. Fraser, Castle Fraser. Commended (minor silver medal): Sir G. M. Grant, Bart.

SECT. 12. Heifers, calved after January 1, 1869.—1st, £8, J. Skinner, Drumin, Ballandalloch; 2d, £4, G. Brown, Fochabers; 3d, medium silver medal, J. Skinner. Commended (minor silver medal): the Earl of Dunmore, Dunmore, Stirling.

SHORTHORNS.

SECT. 13. Bulls, calved before January 1, 1868.—1st, £20, C. R. Saunders, Nunwick Hall, Penrith; 2d, £10, J. Bruce, Burnside, Foxhabers; 3d, medium silver medal, Sir T. B. Hepburn of Smeaton, Bart., Prestonkirk. Commended (minor silver medal: T. Marshall, Howes, Annan. Breeder of best Bull silver medal): R. W. Saunders, Nunwick Hall, Penrith.

SECT. 14. Bulls, calved after January 1, 1868.—1st, £20, R. Bruce, Newton of Struthers, Forres; 2d, £10, R. Binnie, Seton Mains, Longniddry; 3d, medium silver medal, J. Beattie, Newby House, Annan.

SECT. 15. Bulls, calved after January 1, 1869.—1st, £10, J. Beattie, Newbie House, Annan; 2d, £5, J. Bell, Fans, Barbachlaw (medium silver medal), Sir D. Baird of Newbyth, Bart., Prestonkirk. Commended (minor silver medal): J. Johnstone, Halleaths, Lochmaben.

1st prize Cows at former shows, exhibited for medium gold medal.—Edinburgh, 1869, when the property of the present exhibitor: J. Currie, Halkerston, Gorebridge.

SECT. 16. Cows, of any age.—1st, £20, J. Beattie, Newbie House, Annan; 2d, £8, J. Currie, Halkerston, Gorebridge; 3d, medium silver medal, W. Lambert, Elvington Hall, Hayden Bridge. Commended (minor silver medal): S. Campbell, Kinnellar, Blackburn.

SECT. 17. Heifers, calved after January 1, 1868.—1st, £10, R. Scott, Manbeen, Elgin; 2d, £5, J. Beattie, Newbie House, Annan; 3d, medium silver medal, the Duke of Buccleuch and Queensberry, K.G., Dalkeith.

SECT. 18. Heifers, calved after January 1, 1869.—1st, £8, Lord Kinnaird, K.T., Rossie Priory, Inchture; 2d, £4, J. Wilson, Woodhorn Manor, Morpeth; 3d, medium silver medal, J. Beattie, Annan. Commended (minor silver medal): J. Beattie.

AYRSHIRES.

1st prize Bulls at former shows, exhibited for medium gold medal.—Edinburgh, 1869, when the property of the present exhibitor: Sir M. R. Shaw Stewart, of Ardgowan, Bart., Greenock.

SECT. 19. Bulls, calved before January 1, 1868.—1st, £20, R. Wilson, Kilbarchan; 2d, £10, Wm. Marshall, Kepcraftlee, Balfron; 3d, medium silver medal, J. Meikle, Seafield, Bathgate. Commended (minor silver medal), R. M'Kean, Lumloch, Bishopbriggs. Breeder of best Bull (silver medal): George Bartlemore, Auchensale, Kilbarchan.

SECT. 20. Bulls, calved after January 1, 1868.—1st, £20, T. Ballantyne, Netherton, East Kilbride; 2d, £10, J. Fleming, Strathaven; 3d, medium silver medal, J. Parker, Broomlands, Irvine. Commended (minor silver medal: J. Hewetson, Auchenbainzie, Thornhill.

SECT. 21. Bulls, calved after January 1, 1869.—1st, £10, J. Meikle, Seafield, Bathgate; 2d, £5, D. C. Willison, Whiteleugh, Douglas; 3d, medium silver medal, J. Parker, Broomlands, Irvine. Commended (minor silver medal): G. Dunlop, Castle Farm, Stewarton.

SECT. 22. Cows, at former shows, exhibited for medium gold medal.—Glasgow, 1867, in-calf, Aberdeen, 1868, in milk: property of present exhibitor: R. Wilson, Forehouse, Kilbarchan.

SECT. 22. Cows, in-milk, calved before January 1, 1867.—1st, £15, R. Wilson, Kilbarchan; 2d, £8, J. Moffat, sen. and jun., Gateside, Kirkconnel; 3d, medium silver medal, J. Fleming, Strathaven. Commended (minor silver medal): J. Fleming.

SECT. 24. Cow, in-milk, calved after January 1, 1867.—1st, £10, J. Fleming, Strathaven; 2d, £5, R. Wilson, Forehouse, Kilbarchan; 3d, medium silver medal, J. Mitchell, Lochinger-burch, New Cumnock. Commended (minor silver medal): J. Meikle, Bathgate.

SECT. 24 Cows, in-calf, of any age.—1st, £10, J. Fleming, Strathaven; 2d, £5, G. Dunlop, Castle Farm, Stewarton; 3d, medium silver medal, R. Wilson, Forehouse, Kilbarchan. Commended (minor silver medal): R. M'Kean, Lumloch, Bishopbriggs.

SECT. 25. Heifers, calved after January 1, 1868.—1st, £10, J. Brown, Castleburn, Kilwinning; 2d, £5, John Carruthers, Lockerbie; 3d, medium silver medal, John Fleming, Strathaven. Commended (minor silver medal): Abram Kerr, Castle Hill, Durrisdeer.

SECT. 26. Heifers, calved after January 1, 1869.—1st, £8, A. M'Dowall, Stranraer; 2d, £4, J. Meikle, Bathgate; 3d, medium silver medal, G. Dunlop, Stewarton. Commended (minor silver medal): J. Fleming, Strathaven.

HIGHLAND.

1st prize Bulls at former shows, exhibited for medium gold medal.—Edinburgh, 1869, when the property of the Duke of Athole: the Earl of Seafield, Castle Grant, Grantown.

SECT. 27. Bulls, calved before January 1, 1868.—1st, £20, D. M'Laren, Callander; 2d, £10, J. Stewart, Portree; 3d, medium silver medal, J. M'Keehnie, jun., Glenmore, Oban. Commended (minor silver medal): J. Stewart, Portree. Breeder of best Bull silver medal): D. M'Claren, Callander.

SECT. 28 Bulls, calved after January 1, 1868.—1st, £20, C. N. Campell, Ballimore, Tigh-na-Cruaich.

SECT. 29. Cows, of any age.—1st, £15, J. Malcolm, Poltalloch, Lochgilphead; 2d, £8, the Earl of Seafield, Castle Grant, Grantown.

SECT. 30 Heifers, calved after January 1, 1867.—1st, £10, J. Malcolm, Poltalloch; 2d, £5, and 3d, medium silver medal, J. Stewart, Duntulm, Portree. Commended (minor silver medal): J. Malcolm, Poltalloch.

SECT. 31. Heifers, calved after January 1, 1868.—1st, £8, and 2d, £4, J. Malcolm, Poltalloch; 3d, medium silver medal, the Earl of Seafield. Commended (minor silver medal): J. Malcolm, Poltalloch.

HORSES.

The horses are, without exception, the best collection of agricultural workers that we have ever seen together. They are nearly all pure Clydesdales. The 1st and 2d prize stallions in the aged class have here exchanged places, and, as we think, very fairly, for Mr. Anderson's "Emperor" has grown from a 3-year-old at Edinburgh last year to a perfect-looking 4-year-old now. His symmetry is excellent, and his power is immense. He was awarded the £50 prize offered at the spring show of the Mid-Calder Society. His rival, Mr. Riddell's "Prince of Wales," is a good horse, but his hind legs are slightly defective, while the "Emperor" is almost perfect in these important points. The mares are something marvellous for uniformity in goodness of form. We never saw anything to be compared to these classes. They are as handsome, too, as they are hardy and strong. Mr. Adam Smith's "Bell," with an extraordinary foal by her side, is a grand mare, with a head and neck for form and position that we have never seen surpassed. In the yearling fillies the judges did not appear to be consistent, for the 1st prize is more like a daughter of a Lincolnshire dray-horse than Clydesdale parents. Size of bone, body, and head appear to be the only qualification in this case for receiving the award, and her plainness is not improved by her dirty brown colour. Big dray animals can be bred at other parts of the country, and Scotchmen will, we should say, do well to stick closely to their own fine breed and prevailing models of the Clydesdales.

The hunters, hackneys, cobs, and ponies are somewhat select, but they are so few and comparatively inferior a part of the show, that they are only worthy of being mentioned to show that they have not been overlooked.

The following is the prize list:—

JUDGES. — Draught Horses: J. Coubrough, Blairtummoch, Campsie; R. Jack, North Gyle, Corstorphine; A. Wyllie, Bolton, Haddington. Attending Members: W. F. Hunter, Arundel, Barjarg; O. Brown, Shiel. Veterinary Inspector: Prof. Williams, Edinburgh.—Extra Horses; J. Curror, Comiston, Edinburgh; J. A. Thomson, Charlton, Colinsburgh. Attending Members: R. Maxwell, Breoch; A. Lusk, Howell. Veterinary Inspector: Robert Paterson, V.S., Dumfries.

HORSES FOR AGRICULTURAL PURPOSES.

SECT. 1. Stallions foaled before January 1, 1867.—1st, £30, P. Crawford, Strathblane; 2d, £15, D. Riddell, Kilbowie, Duntocher; 3d, medium silver medal, W. Moffat, Kirkintilloch. Commended (minor silver medal): J. Macdonald, Porterfield, Renfrew. Breeder of best Stallion (silver medal): J. Murdoch, Hallside, Cambuslang.

SECT. 2. Entire Colts, foaled after January 1, 1867.—1st, £20, P. M'Robie, Sunnyside, Aberdeen; 2d, £10, Sir W. G. Gordon Cumming, Bart., Forres; 3d, medium silver medal, R. Brewster, Barnbeth, Bridge of Weir. Commended (minor silver medal): S. Clark, Kirkbarchan.

SECT. 3. Entire Colts, foaled after January 1, 1868.—1st, £15, R. M'Kean, Lumloch, Bishopbriggs; 2d, £8, A. Yuill, 33, Cathedral Street, Glasgow; 3d, medium silver medal, S. Clark, Kilbarchan. Commended (minor silver medal): L. Drew, Merryton, Hamilton.

SECT. 4. Entire Colts, foaled after January 1, 1869.—1st, £10, D. Riddell, Kilbowie, Duntocher; 2d, £5, J. Robertson, West Mitchellton, Lochwinnoch; 3d, medium silver medal, R. Frederick, Glenlee. Commended (minor silver medal): J. N. Fleming, Maybole.

SECT. 5. Mares, with foal at foot, foaled before January 1, 1867.—1st, £20, A. Smith, Stevenson Mains, Haddington; 2d, £10, T. Marshall, Howes, Annan; 3d, medium silver medal, R. Hamilton, High Cairngan, Drumore. Commended (minor silver medal): J. Mitchell, Tremland, Dunscore.

SECT. 6. Mares, in foal, foaled before January 1, 1867 1st, £15, Sir W. S. Maxwell of Kirr, Bart., Dunblane; 2d, £8, J. Graham, Rosebank, Muiravonside; 3d, medium silver medal, A. Kerr, Durrisdeer. Commended (minor silver medal): J. Young, Newbie, Annan.

SECT. 7. Fillies, foaled after January 1, 1867.—1st, £10, A. Weir, Newhouse Mill, East Kilbride; 2d, £5, A. Buchanan, Garscadden Mains, New Kilpatrick; 3d, medium silver medal, J. N. Fleming, Knockdon, Maybole. Commended (minor silver medal): L. Drew, Merryton, Hamilton.

SECT. 8. Fillies, foaled after January 1, 1868.—1st, £8, J. N. Fleming, Knockdon, Maybole; 2d, £4, L. Drew, Hamilton, 3d, medium silver medal, A. Kerr, Castlehill, Durrisdeer. Commended (minor silver medal): R. C. M'Culloch, Kirkland of Longcastle, Kirkinner.

SECT. 9. Colts, foaled after January 1, 1869.—1st, £6, J. N. Fleming, Maybole; 2d, £3, H. M'Clean, Achneel, Stranraer. 3d, medium silver medal, W. & J. Shennan, Balig, Kirkcudbright. Commended (minor silver medal: W. & J. Shennan.

SECT. 10. Draught Geldings, foaled before January 1, 1866.—1st, medium gold medal, A. Johnston, Lochburn, Maryhill; 2d, silver medal, the Duke of Buccleuch; 3d, medium silver medal, the Duke of Buccleuch. Commended (minor silver medal): T. Gibbons, Burnfoot-on-Esk, Longtown.

SECT. 11. Draught Geldings, foaled between January 1, 1866, and January 1, 1867.—1st, medium gold medal, the Duke of Buccleuch.

SECT. 12. Mares or Geldings, foaled before January 1, 1865, suitable for field.—1st, medium gold medal, M. Teenan, Lochside, Dumfries.

SECT. 13. Mares or Geldings, foaled between January 1, 1865, and January 1, 1866, suitable for field.—1st, medium gold medal, J. M. Borthwick, Georgefield, Langholm; 2d, silver medal, W. Dickie, Balgerran, Castle Douglas; 3d, medium silver medal, J. Laat, Annan.

SECT. 14. Mares or Geldings, foaled before January 1, 1866, suitable for carriage.—1st, medium gold medal, J. Rithet, Pennersaughs, Beckfechan.

SECT. 15. Mares or Geldings, between 15 and 14 hands high 1st, medium gold medal, R. Scot Skirving, Drem; 2d, silver medal, J. Hewetson, Auchenbainzie, Thornhill; 3d, medium silver medal, W. Davidson, Sibbaldie Mill, Lockerbie. Commended (minor silver medal: J. Smith, Boreshawside

SECT. 16. Mares or Geldings, 12 hands and under.—1st, medium gold medal, P. Dudgeon, Cargen, Dumfries; 2d, silver medal, F. C. Trotter, Chamfieurie, Lanlithgow; 3d, medium silver medal, R. Scot Skirving, Drem. Commended (minor silver medal: W. Ritchie, Middleton, Gorebridge.

EXTRA HORSES.

Commended and medium silver medal.—Geldings: W. J. H. Arundell, Barjarg Tower, Dumfries; Major Fletcher, Kelton House, Dumfries; E. H. Maxwell, Teviotbank, Hawick; R. Wallace, Langbarns, Kirkcudbright; D. Kennedy, Newlands, Dumfries. Mare: J. Richardson, Drysdalegate, Lockerbie.

SHEEP.

Here the Cheviots and blackfaced hill sheep reign supreme, and a very large and excellent muster of both breeds there are. In the Cheviots, Mr. Elliot, of Hindhope, has some perfectly formed sheep, both male and female. But among his ewes, especially, he has one that might be taken as a model female of this breed. This flock is somewhat finer than some of the Cheviot families, which is particularly indicated by the colour of their skin and their black spots. These are not admired or approved by some of the hill breeders, but Mr. Elliot prefers fine form and quality, or "breeding," to mere clumsiness and less disposition to fatten. There are some other excellent sheep shown by the breeders named in our prize list. The blackfaces were never more picturesque with their large horns and long hanging tails, nor more active on their stiff and fine legs. No sheep walk like these blackfaced hill sheep. The specimens here, however, have had something more than they had ranged for on hillsides. But taking them as they are, they are a grand instance of animals and hills being adapted for each other.

Oddly enough, a few pens of Shropshires, that would cut a good figure in the Midland Counties, are shown, some of which, too, came from Glamis Castle, nearly 200 miles further North. There are 17 pens of these sheep, some of the ewes being as fine and handsome as any one in Shropshire or Staffordshire could wish to see. Southdowns, too, are on the ground, 13 pens having been sent from East Lothian and Aberdeenshire. These are in capital condition, while their breeding is excellent.

The Border Leicesters are spreading in the Lowlands, as they grow so fast, and do so well on both grass and roots. The males of this breed are also used much for crossing with the Cheviots when the land is good enough to allow of the introduction of this larger breed. Although these sheep are known by the name given, their origin is in obscurity, and there is no doubt, from present appearances, that their great size and substance of flesh is largely due to a strain of Lincolns, the present improved breed of which they greatly resemble. Mr. Laing, Mr. Simson, Mr. Hope, the Duke, and other well-known breeders, show some of the finest character, the firmness of their touch being superior to that of any other tribe of white-faced sheep that we have ever handled.

A few pure Leicesters are shown, and very fine of form and character they are, while the colour of some of their coats, in imitation of the more southern fleeces, in contrast with the general whiteness of the Scotch breeds, gives them a quaint appearance. These, as will be seen, came from Montrose, Dumfriesshire, Castlemains, and other Scotch lands.

A more interesting and meritorious gathering of the ovine tribes than all these sorts make we have seldom seen.

The following are the awards:—

JUDGES.—Cheviots: W. Aitchison, Linhope, Hawick; R. Paterson, Highouse, Thurso, W. Thompson, Belville, Coldstream. Attending Members: T. Graham, Snaw, J. Kennedy, Beaudleys. Blackfaced: D. Foyer, Knowehead, Campsie; D. M'Intyre, Inghmhlair, Comrie; D. Stewart, Achalader, Lyndrum. Attending Members: M. Clark, Culnain; J. M'Conal, Glasnacardoch. Leicesters and Long-woolled: J. Bell, Scalehill, Lazonbury, Penrith; T. Ferguson, Kinnochtry, Cupar Angus; J. Wilson, Haughton Mains, Chirnside. Attending Members: T. S. Gladstone, Capenoch; W. Beattie, Riggheads.—Southdown and Shortwoolled: W. Borthwick, Whitehaven Castle, Whitehaven; J. H. Buckley, The Cottage, Loughborough. Attending Members: A. Mitchell, Alloa; J. Mackenzie, Barnhill.

CHEVIOTS.

SECT. 1. Tups above 1-shear.—1st, £10, and 2d, £5, J. Brydon, Kinnelhead, Moffat; 3d, medium silver medal, T. Elliot, Hindhope, Jedburgh. Commended (minor silver medal): J. Brydon, jun., Holm of Dalquhairn, New Galloway.

SECT. 2. Dinmont or Shearling Tups.—1st, £10, J. Brydon, Moffat; 2d, £5, and 3d, medium silver medal, T. Elliot, Jedburgh. Commended (minor silver medal): G. M'Call, Burrance, Lockerbie.

SECT. 3. Ewes above 1-shear, with Lambs.—1st, £8, J. Brydon, Moffat; 2d, £4, T. Welsh, Eriestone, Moffat; 3d, minor silver medal, T. Elliot, Hindhope, Jedburgh. Commended (minor silver medal): J. Archibald, Glengelt, Lauder. Best pen of Lambs (silver medal): J. Archibald. Commended (minor silver medal): J. Brydon, jun., New Galloway.

SECT. 4. Shearling Ewes or Gimmers.—1st, £8, T. Elliot, Hindhope, Jedburgh; 2d, £4, J. Brydon, Kinnelhead, Moffat; 3d, medium silver medal, Sir G. Montgomery, Bart., M.P., Stobo Castle, Stobo. Commended (minor silver medal): T. C. Borthwick, Hopsrig, Langholm.

BLACKFACED.

SECT. 5. Tups above 1-shear.—1st, £10, and 2d, £5, J. Archibald, Overshiels, Stow; 3d, medium silver medal, C. Howatson, Mauchline. Commended (minor silver medal): C. Howatson.

SECT. 6. Dinmont or Shearling Tups.—1st, £10, and 2d, £5, J. Archibald, Overshiels, Stow; 3d, medium silver medal, J. Moffat, sen. and jun., Gateside, Kirkconnel. Commended (minor silver medal): C. Howatson.

SECT. 7. Ewes above 1-shear with lambs.—1st, £8, J. Archibald, Overshiels, Stow; 2d, £4, J. Moffatt, sen. and jun., Gateside; 3d, minor silver medal, J. Malcolm, Poltalloch, Lochgilphead. Commended (minor silver medal): C. Howatson, Mauchline. Best pen of Lambs (silver medal), J. Archibald, Stow. Commended (minor silver medal): J. Moffat, sen. and jun., Gateside.

SECT. 8. Shearling Ewes or Gimmers.—1st, £8, J. Archibald, Stow; 2d, £4, J. Malcolm, Poltalloch; 3d, medium silver medal, J. Brydon, Moffat. Commended (minor silver medal): J. Malcolm.

BORDER LEICESTER.

SECT. 9. Tups above 1-shear.—1st, £10, J. Lees, Marvingston, Haddington; 2d, £5, J. Nisbet, Lambden, Greenlaw; 3d, medium silver medal, W. Lambert, Haydon Bridge. Commended (minor silver medal): the representatives of the late T. Watson, Gorebridge.

SECT. 10. Dinmont or shearling Tups.—1st, £10, G. Torrance, Sisterpath, Dunse; 2d, £5, T. Simpson, Blainslie, Lauder; 3d, medium silver medal, J. Lees, Marvingston, Haddington. Commended (minor silver medal): J. Nisbet, Lambden, Greenlaw.

SECT. 11. Ewes above 1-shear.—1st, £8, G. Simson, Courthill, Kelso; 2d, £4, J. & G. Laing, Wark, Coldstream; 3d, medium silver medal, A. Smith, Castlemains, Gifford. Commended (minor silver medal): L. Drew, Merryton, Hamilton.

SECT. 12. Shearling Ewes or Gimmers.—1st, £6, G. Torrance, Sisterpath, Dunse; 2d, £4, G. Simson, Courthill, Kelso; 3d, medium silver medal, J. Lees, Marvingston, Haddington. Commended (minor silver medal): the Marquis of Tweeddale, K.T., Yester, Haddington.

LEICESTERS.

SECT. 13. Tups, above 1-shear.—1st, £—, T. Wilkin, Tinwald Downs, Dumfries; 2d, £—, J. Mackenzie, Barnhill, Dumfries; 3d, medium silver medal, C. Lyall, Old Montrose. Commended (minor silver medal): John Mackenzie, Barnhill, Dumfries.

SECT. 14. Dinmont or Shearling Tups.—1st, £—, A. Smith, Castlemains, Gifford; 2d, £—, R. Jefferson, Preston Hows, Whitehaven; 3d, medium silver medal, the representatives of the late T. Watson, Esperston, Gorebridge. Commended (minor silver medal): R. Jefferson.

SECT. 15. Ewes, above 1-shear —1st, £4, R Jefferson, Preston Hows, Whitehaven.

SECT. 16. Shearling Ewes or Gimmers —1st, £4, R. Jefferson, Preston Hows; 2d, £2, C. Lyall, Old Montrose.

LONG-WOOLLED OTHER THAN LEICESTERS.

SECT. 17. Tups of any age.—1st, £10, T. Wilkin, Tinwald Downs, Dumfries; 2d £5, and 3d, medium silver medal, J. Gibson, Woolmet, Dalkeith. Commended (minor silver medal): J. Gibson.

SECT 18. Ewes of any age, or Gimmers —1st, £8, J. Bell Irving, Whitehill, Lockerbie; 2d, £4, W Norman, Hallbank, Aspatria; 3d, medium silver medal, J. B. Irving. Commended (minor silver medal): J. Gibson, Woolmet, Dalkeith.

SOUTHDOWNS.

SECT. 19. Tups of any age.—1st, £10, and 2d, £5, Sir W. G. Gordon Cumming, Bart.; 3d, medium silver medal, J. Gordon, Parkhill, Aberdeen. Commended (minor silver medal): J. Gordon.

SECT 20. Ewes of any age, or Gimmers.—1st, £8, J. Gordon, Parkhill; 2d, £4, and 3d, medium silver medal, R. Scot Skirving, Camptown, Drem. Commended (minor silver medal): J. Gordon.

SHORT-WOOLLED OTHER THAN SOUTHDOWN.

SECT. 21. Tups of any age.—1st, £10, and 2d, £5, J Gibson, Woolmet, Dalkeith; 3d, medium silver medal, Earl of Strathmore, Glamis Castle, Glamis. Commended (minor silver medal): Earl of Strathmore.

SECT. 22. Ewes of any age, or Gimmers —1st, £8, and 2d, £4, the Earl of Strathmore; 3d, medium silver medal, J. Gibson, Woolmet, Dalkeith. Commended (minor silver medal): J. Gibson

EXTRA SECTIONS.

SECT. 23. Cheviot Shearling Wethers.—1st, minor gold medal, R. Jardine, of Castlemilk, M.P.; 2d, silver medal, T. Biggar, Chapelton, Dalbeattie; 3d, medium silver medal, R. D. Barre Cunninghame, Hensol, Castle Douglas. Commended (minor silver medal: J M'Gill, Rotchell, Dumfries.

SECT. 24 Blackfaced Wethers of any age.—1st, minor gold medal, the Earl of Strathmore, Glamis; 2d, silver medal, Sir W. Forbes, Bart., Fintray House, Aberdeen; 3d, medium silver medal, G. Hewitson, Auchenleck, Newton-Stewart.

SECT. 25. Half-bred Hoggs.—1st, minor gold medal, T. Biggar, Chapelton, Dalbeattie; 2d, silver medal, and 3d, medium silver medal, R. Jardine, M.P., Lockerbie. Commended (minor silver medal): T. S. Gladstone, Capenoch, Thornhill.

SECT. 26. Cross-bred Hoggs —1st, minor gold medal, R Jardine, of Castlemilk, M.P., Lockerbie; 2d, silver medal, J. M'Gill, Rotchell, Dumfries; 3d, medium silver medal, R Jardine, M.P., Lockerbie. Commended (minor silver medal) T. Biggar, Chapelton, Dalbeattie.

EXTRA SHEEP.

Commended and medium silver medal.—5 Shropshire lambs: the Earl of Strathmore, Glamis. 5 ewes (with lambs by Lonk tups), 2-shear: Miss Hope Johnstone, Annandale. 5 Lonk ewes: Miss Hope Johnstone. 5 cross-bred wethers: Lawrence Dalgleish, West Grange, Culross. 5 Cheviot wethers: R D Barre Cunninghame, Hensol, Castle Douglas.

SWINE.

The pigs are few but the kinds are various, and the character of them is above the average, for while there is nothing bad there are several which are first-rate sorts. Most of the principal Scotch breeders' names will be found in the prize list, while even here Messrs. Duckering & Sons are not absent.

The following is the prize list:—

JUDGES.—T. D. Findlay, Easterhill, Glasgow; J. M'Laren, Millhill, Inchture. Attending Members: R. Smith, Ladylands; R. Picken, Barnkirk.

SWINE.

SECT. 1. Boars, large breed.—1st, £8, R. E. Duckering & Sons, Northorpe, Kirton Lindsey; 2d, £4, George Mangles, Great Givendale, Ripon.

SECT. 2. Boars, small breed.—1st, £8, G. Mangles, Great Givendale, Ripon; 2d, £4, Sir W. Forbes of Craigevar, Bart., Aberdeen; 3d, medium silver medal, G. Mangles. Commended (minor silver medal): R. E. Duckering & Sons.

SECT. 3. Sows, large breed.—1st, £6, R. E. Duckering & Sons, Northorpe, Kirkton Lindsey.

SECT. 4. Sows, small breed.—1st, £6, R. E. Duckering & Sons; 2d, £3, G. Mangles, Great Givendale; 3d, medium silver medal, T. Wilkin, Tinwald Downs, Dumfries. Commended (minor silver medal): R. Philp, Royal Hotel, Bridge of Allan.

SECT. 5. Pens of 3 Pigs, not exceeding 8 months old, large breed.—1st, £4, R. E. Duckering & Sons; 2d, £2, George Mangles, Great Givendale; 3d, medium silver medal, N. Milne, Dryhope, Selkirk. Commended (minor silver medal): N. Milne.

SECT. 6. Pens of 3 Pigs, not exceeding 8 months old, small breed.—1st, £4, R. E. Duckering & Sons; 2d, £2, G. Mangles; 3d, medium silver medal, J. B. Storey, jun., Milnhead, Dumfries. Commended (minor silver medal): R. Philp, Bridge of Allan.

EXTRA SWINE.

Commended and medium silver medal.—Pigs: R. E. Duckering & Sons.

ROYAL AGRICULTURAL COLLEGE CLUB.

THIS dinner was held at the Randolph Hotel, at Oxford, on Wednesday evening last week. The College Club meeting is always a pleasant feature among the numerous gatherings which take place during the "Royal" meeting. It is a reunion of old College friends, and serves as an introduction and bond of union between past and present Cirencester students. On the present occasion, owing to the unavoidable absence of Mr. Holland, who was suffering from the effects of a sprained ankle, Mr. Bowly, of Siddington (a member of the College Council), occupied the chair. He was supported on the left by the Right Hon. Earl Bathurst, and on the right by the Rev. John Constable, Principal of the College. There were also present, Professors Church and Wrightson, and Messrs. D. R. Davies, of Mere Old Hall; T. C. Booth, of Warlaby; J. Coleman, Escrick (late Professor of Agriculture at the College); E. Fox; R. Swanwick, College Farm; Jacob Wilson, H. Stevenson, E. G. Roberts, H. Rivington, E. Fox, jun., Donne, Miller, and many other gentlemen, at present or formerly connected with the College. The dinner was well served, and, thanks to the exertions of the Secretary of the Club, Mr. C. G. Roberts, the arrangements were excellent. After dinner, the Chairman gave the usual complimentary toasts, and "the College," "the Club," "Mr. Holland," "the Strangers," &c., were given, and responded to by various gentlemen present. Perhaps the leading feature of the meeting was the proposition made by Mr. J. Wilson, and seconded by Professor Church, that the Club should show in some definite manner its esteem for Mr. Holland, the chairman of the College Council, who has so long and so actively interested himself in the welfare of the Agricultural College. A meeting of the Club was accordingly convened in the showyard early the next morning, and steps were then taken to put the wishes of the Club into practice.

Farm Memoranda.

A MELBOURNE TALLOW FACTORY.—The "establishment" was the property of Messrs. Leonard & Symerton, and consisted of a group of buildings strongly constructed of rough timber fresh from the bush. Some of the workmen's huts were built of branches of trees, *mia-mia* fashion. The works had been recently set up, and had a new and unfinished appearance as a whole; still, the concern was in full working order, and numbers of sheep were sent to the slaughter-house daily. The manager, in a most obliging way, showed me over the premises, and gave me all the information in his power. "What is your first process in your boiling down business?" I inquired of the manager. "The first process," he jocularly answered, "is to follow the instructions of Mrs. Glass as nearly as we can; first catch your sheep. The other stages in our mode of proceeding you can see for yourself; whatever is not clear to you I shall be happy to explain." And with this brief instruction, he took me at once to the large sheds and pens, where active operations were in progress. When duly "caught" and brought into the premises, the sheep were put into pens, where they were knocked on the head by the "barrowman" with the blunt head of an axe. Thus stunned, they were forthwith dragged out of the pens up into a shed, where they were laid on a large floor in rows—about 50 sheep to each row—with their heads towards a gutter. The heads were then cut off, the blood being carried away by the gutter to a receptacle or trough, where it was speedily consumed by a host of pigs. The headless sheep were next hung up on hooks by the hind legs, skinned, and "viscerated." A good hand will skin on an average about 200 sheep per day. The entrails were sent down below through a trap door to the "gutmen," to take off the fat. From 20 to 30 of these carcasses, thus "gutted," were then placed on a truck working on a tramway, and taken to another higher floor, called the "boiler platform." Here two large iron boilers were fixed standing on their ends, with man-holes at the top, and capable of holding from 500 to 600 carcasses packed and wedged close together by a man placed inside the boiler for that purpose.

This man's occupation appeared to me to be anything but pleasant, with the sun at 90° in the shade. Under the old boiling down system the boilers were supplied with furnaces, and in skipper's lingo, "when the cargo was duly stowed away in the hold, the hatchways were battened down," or, in other words, the manhole at the top was closed and the fires were lighted. The boilers being heated, made their own steam for separating the fat and oil from the other parts of the carcasses. This was the old process. By the new mode the steam is generated by means of two other boilers fixed at some distance from the carcase-boilers, the steam being conveyed by pipes from the former to the latter. The carcases are then allowed to steam in the two boilers for about five hours, at a pressure of from 25 lb. to 30 lb.

When the steaming process is completed, cold water is poured on the sodden and seething mass of sheep's flesh to "settle" the dirt, which is thus precipitated by the cold water to the bottom of the boiler. This operation effects a two-fold purpose, for it serves to raise the fat or tallow and oil to the level with the "fat-cock," or tap, which is fixed about half way up the boiler. The tallow and oil issuing from this tap are then conveyed, by means of spouting, and made to pass through strainers, to a large cooler. This cooler is first prepared by water being placed in it; the fat is then allowed to run into it, and more water poured upon the fat. This process of running water under and over the fat has, as I understood, the double effect of purifying the tallow and of raising it up to the "fat-cock." This done, the tallow is still liquid enough to be run off into casks, and finally, when in the cask (which holds about 7 cwt.), the entire mass of fluid matter is well stirred up to mix the oil with the tallow, and at the same time to allow the remaining steam to escape. The process of tallow making for the English market is thus completed. The casks are then headed up and sent off by railway to Melbourne.

In these great "tallow factories," as I may call them, all sorts of sheep are boiled down, young and old, male and female, fat and lean; nothing comes amiss. A good fat sheep will yield about 24 lb. of tallow; one moderately fat, of average condition, about 15 lb.; but an old, lean, and scraggy animal will only yield from 1 lb. to 2½ lb. of tallow. Besides the tallow, there are the skins of the slaughtered sheep. These skins are "fell mongered" for their wool by a process of soaking in water and sweating, by which means the wool is easily separated from the skins, leaving the pelts to be dressed for sale. Over-stocked sheep-owners wishing to have their sheep slaughtered for their tallow and skins, send their flocks, great and small, to this establishment, to be boiled down at so much per head. The prices charged for this operation were, for any number under 5000, 1*s.* per head; from 5000 to 10,000, only 9*d.* per head. By special arrangements, these prices might probably be varied, but these were the terms as given me by the manager. The owner of the sheep agreeing to these terms, takes the tallow and pelts as his share, the former being casked and delivered to his agents in Melbourne, free of expense. The pecuniary result of this arrangement is that for certain flocks of sheep, which average per head 15 lb. of tallow, the nett proceeds accruing to the owner will amount to from 3*s.* 9*d.* to 4*s.* per head, at the present market price of tallow. The amount will, of course, vary with the size and fatness of the sheep. The proprietors of the boiling down establishment employ a large number of men at a considerable expense; but they work on safe principles, for they are sure of their 9*d.* or 1*s.* per head. Besides this, there is a little short wool from each skin, and all the raw offal and boiled mutton to feed pigs with.

Passing along, I looked into a shed where a gaunt Scotchman was engaged in curing thousands of sheep's tongues; and as it was a little enterprise of his own, he seemed much interested in his work. Among other matters, I asked him if the mutton-fed pigs turned out well as to the quality of their flesh. He told me that when they were "corned up," and hardened with Maize, they made excellent bacon and hams for the Melbourne market. I should expect, however, that the flesh of animals fed in this way would savour somewhat of mutton; for it is a well-known fact that in parts of Great Britain where swine are fed to a great extent upon fish and offal, the flesh of this omnivorous animal tastes strongly of its fishy diet. It was intended, when these works were completed, that they should be devoted to the several operations of tallow making, tanning, wool washing, tongue curing, and pig feeding on a large scale. *Melbourne in* 1869.

Miscellaneous.

PRAYER FOR LANDLORDS IN THE PRIMER OF EDWARD VI.—In a local weekly newspaper appears a paragraph stating that "It is not generally known that in the primer of Edward VI. there is a prayer set apart especially for landlords." The Editor of "Notes and Queries" is requested to state if this is correct; and if so, to give the prayer at length. *O. D. G.* [The statement is correct, and the following is a copy of the prayer as reprinted at p. 458 of the very useful volume entitled "The Two Liturgies, with other Documents set forth by Authority in the Reign of King Edward the Sixth," edited by the Rev. Joseph Ketley, M.A., for the Parker Society in 1844:—"The earth is thine, O Lord, and all that is contained therein; notwithstanding that thou hast given the possession thereof unto the children of men, to pass over the time of their short pilgrimage in this vale of misery: We heartily pray thee, to send thy Holy Spirit into the hearts of them that possess the grounds, pastures, and dwelling-places of the earth, that they, remembering themselves to be thy tenants, may not rack and stretch out the rents of their houses and lands, nor yet take unreasonable fines and incomes after the manner of covetous worldlings, but so let them out to other, that the inhabitants thereof may both be able to pay the rents, and also honestly to live, to nourish their families, and to relieve the poor: give them grace also to consider, that they are but strangers and pilgrims in this world, having here no dwelling-place, but seeking one to come; that they, remembering the short continuance of their life, may be content with that that is sufficient, and not join house to house, nor couple land to land, to the impoverishment of other, but so behave themselves in letting out their tenements, lands, and pastures, that after this life they may be received into everlasting dwelling-places: through Jesus Christ our Lord. Amen."]—*Notes and Queries.*

The Week's Work.

JULY 30.—*Corn Harvest* progresses rapidly in our Southern Counties, and the forcing weather is bringing it forward in the north earlier than was at one time expected. The change in harvest prospects is interesting, but our notice of such we shall defer until next week, in order to bring up the arrears of odd jobs that require to be done between hay and corn harvest.

Hedges.—Finish the summer cutting. A sharp hedgebill is far better than shears. The stroke should be smart, and slanting upwards, so as to make a clean cut. A slow, lazy cut, as every intelligent hedger knows, often bruises without cutting, and what is cut is rough, as if "gnawed by a donkey," whilst slashing downwards splits and rots the branches and hard wood. The ground under the hedge should be kept clean by Dutch hoeing with the small hedge spade, pulling out every weed with the hand. The too common practice of allowing grass and all sorts of weeds to grow and choke the hedge at the bottom, and then, when the hedge is thus injured, to dig down the green sod, or what is worse, removing it along with the spray and burning both for the sake of the ashes, is

out of date, and merely remains as a remnant of the slovenly mismanagement of times long gone by.

Ashes for mixing with artificial manures, if not already in store, should be made without delay. Now that artificial manures are used for growing stubble Turnips immediately after harvest and onwards for most crops until harvest return, it follows that a suitable supply of ashes should always be ready, and that the burning if possible should be concluded during the slack time before harvest. When old pastures have been pared and burned, ashes for the coming season may be obtained from this source. Roadsides, the borders of the accessible arable fields, are yearly growing a green sward, which may be pared and burned so much oftener yearly, to supply ashes; and when all other sources fail, the headlands must supply the raw materials for burning, and so on.

Rivers and open Ditches, if not already finished, should now be gone over, and the grass and cleanings removed as soon as circumstances will permit. So far as accessible to carts the cleanings may be burned for ashes. The deepening, straightening, and embanking of rivers and watercourses require also to be finished before harvest in many cases, so that unless now done a whole year is lost.

Warping artificially may, in many cases, be more profitably done at this season than at any other, where there is a command of water and warping materials. Thus land about to be laid down to grass, stubbles after the removal of meadow or Rye-grass hay, winter Pea and Bean stubble, and in many exceptional cases peculiar at this season, as burnt-up gravelly and sandy pastures, may have any required depth of clay spread evenly over them by means of water. Generally the water required to convey the clay or warp, whatever it may be, will sink into such soils at this season, leaving the warp on the surface. In other words, apply the warp no faster than the land drinks in the water. Applied to burnt-up pastures the warp as soon as dry may be chain-harrowed in, and grass seeds sown with artificial manure when required for renovation. The result will be a fine greensward in a short time. Applied to burnt-up stubbles it will fit them for a crop of Turnips, and so on. In examples of this kind it will be observed that the water supplies food directly to plants, whereas in the winter season it is otherwise, and the difference may make warping at this season remunerating, when in the winter season it may not pay immediately.

Repairing and Making New Roads should be done before the corn harvest commences.

Carting stones and bricks for building purposes, and draining-tiles for draining after harvest, may supply work to the teams, and thus lessen the pressure upon them after harvest. At this season such carting does comparatively no harm to farm roads and the land; whereas in the winter time it cuts up both, the teams at the same time hauling barely half the loads they now do.

The Homestead and Labourers' Cottages should now be put into a thorough state of repair, including, of course, roofs, doors, windows, cattle-stalls, boxes, &c. Tillage implements require painting, reaping-machines and harvest carts to be put in order, thatch provided, and the stackyard got ready for the stacks. The steam-engine, threshing, dressing and weighing machines, require overhauling, so as to have them in proper working order. When the threshing-machine is driven by water, July is a favourable time for cleaning the mill-dam and watercourses, &c.

Sewage farms yield during July from 10 to 12 tons of Italian Rye-grass per acre, *i. e.*, a 31-acre field, 12 tons daily for livestock,—Mangels, Cabbages, &c., growing equally fast.

Live Stock soiled at the homestead, or in hovels and yards in the field, require to be carefully attended to, so that all may have pure air, clean water, proper temperature, and an equal share of suitable foods. When doors and windows are left open, or openings purposely made to effect ventilation, the excessive heat of the sun gives rise to chilling currents, very injurious to live stock—more especially the teams when they return from work in a state of profuse perspiration. All through currents and down draughts should be obviated. They are generally produced on the principle of Æsop's fable of blowing hot and cold, and hence may be obviated by the counter practice. Bad smells may be greatly neutralised on the principle of Moule's earth closet, by spreading dry earth over the litter.

Weaned Lambs put upon the best pasture—the ewes upon the worst, and let the distance between them be as far as can be. Ewes that are good nurses, and in full milk, may require milking for a short time, but bad milkers run dry without experiencing harm.

Scab, Lice and Ticks in Sheep obviously indicate a filthy state of the skin and wool which ought not to exist, consequently cleanliness is the proper rule for getting rid of such parasites. Farmers are familiar with the propriety of this rule as regards themselves and families, and the day is not far distant when it will be applied with equal success to newly weaned lambs and shorn sheep.

Roasted Pastures.—With plenty of "roast-meat," pure water, and shelter from the scorching influence of the sun and torment of flies, live stock do well, but an abundance of "roast-meat" has generally been the exception, and in a greater degree in most cases this year than usual. Southern pastures have much improved since the rain. From the success now attending irrigation with town sewage, and with river water and guano, many graziers are beginning to reason in this way:—If 10 tons of grass be got daily from an irrigated meadow, of 30 acres, why should the grass be allowed to cease growing in the pastures? Why not shift the cattle and sheep into a fresh close, and water artificially the pasture from which they have been removed? This is what all intelligent graziers virtually do when heavy showers of rain fall at this time and throughout the summer months, and no good reason can be shown why Art should not improve upon the natural example. There is nothing to prevent the land being kept sufficiently moist for a maximum growth of grass, with a full bite equally throughout the whole of the summer.

The Fly, as the temperature increases, becomes more and more annoying to sheep, and in this case, as in that of scab, &c., a dirty and unhealthy state of the skin powerfully attracts the fly as a suitable place for nursing its offspring. Various washes have been proposed of a repulsive character, but it cannot be said that an antidote to fly has yet been discovered. *W. B.*

Notices to Correspondents.

MANAGEMENT OF LANDED PROPERTY: *J.* An agent's charge may be from 2½ to 5 per cent., according to the extent under his charge.

OAT STUBBLE: *An Ignoramus.* If your Oat stubble can be got ready before September, you can sow Rye or Vetches, or Italian Rye-grass, or you can plant Cabbages. And with any of them, if your land is in good heart, and you have put it in good tilth, you will get a good spring crop. If you want merely to get a crop without much labour of tillage or manure, sow 20 lb. of Trifolium incarnatum per acre, broadcast, over any clean stubble in August, after rain, or just harrow it in.

TURNIP GRUB: *F. W. B.* says: "I wish some of your correspondents would tell us how to get rid of the Turnip grub. I have been lucky enough to get a fine plant of Swedes, and I fear the rascals will spoil them. The rascally rooks are eating my Wheat and winter Beans, instead of attending to their proper business."

Markets.

ENGLISH WOOL.

During the past week the market, owing to the war on the Continent, has been much depressed, and prices are largely nominal. Several failures have taken place, and foreign orders for yarn and goods being in many instances either cancelled or deliveries delayed, manufacturers are in many instances resorting to short time.

CURRENT PRICES OF ENGLISH WOOL. Per lb.	s. d.	s. d.
FLEECES—Southdown hoggets	1 1	to 1 2
Half-bred ditto	1 2	— 1 2½
Kent Fleeces	1 3	— 1 4
Southdown ewes and wethers	0 0½	— 1 1
Leicester ditto	1 2	— 1 3
SORTS—Clothing	0 10	— 1 0
Combing	1 0	— 1 8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, July 27.

Prime Meadow Hay	110s. to 126s.	Clover, old	130s. to 145s.
Inferior do.	90 100	Inferior do.	110 120
New Hay	100 110	Prime new do.	120 130
Inferior do.	75 85	Inferior do.	95 105
Straw	24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, July 27.

Sup. Meadow Hay	126s. to 135s.	Inferior Clover	110s. to 126s.
Inferior do.	105 115	Prime 2d cut do.	— —
New do.	105 120	New do.	115 130
Inferior do.	90 97	Straw	32 36
Superior Clover	140 150	JOSHUA BAKER.	

WHITECHAPEL, Thursday, July 27.

Fine Meadow Hay	112s. to 120s.	Prime old Clover	135s. to 147s.
Inferior do.	100 110	Inferior do. do.	105 115
Prime New Hay	90 100	Prime 2d cut do.	110 140
Inferior do.	80 85	New Clover	115 120
Straw	28 33	Inferior do.	90 105

COALS.—July 27.

Holywell Main, 17s. 6d.; West Hartley, 16s. 6d.; Walls End Kelloe, 16s. 6d.; Walls End East Hartlepool, 17s. 6d.; Walls End Original Hartlepool, 18s.; Eden Main, 16s.; Brancpeth Cannel, 18s.—Ships at market, 9; sold, 9; at sea, 30.

METROPOLITAN CATTLE MARKET.

MONDAY, July 25.

We have a large increase in the supply of Beasts; the average quality is inferior, and consequently a few of the choicest have exceeded our top quotations; a clearance cannot be effected of middling qualities. The number of Sheep is also very much larger, and trade is dull, but there is very little alteration in price of choicest descriptions. Lambs and Calves are plentiful; trade is slow, at lower rates, but a fair clearance is made. Our foreign supply consists of 1750 Beasts, 7700 Sheep, 385 Calves, and 35 Pigs; from Scotland there are 14 Beasts; from Ireland, 120; from Norfolk and Suffolk, 480; and 2326 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5 0	to 5 2	Best Long-wools	5 0	..
Best Shorthorns	4 8	— 5 0	Do. Shorn	4 8	— 5 2
2d quality Beasts	3 4	— 4 2	Ewes & 2d quality	..	— ..
Best Downs and Half-breds	..	— ..	Do. Shorn	4 0	— 4 6
Do. Shorn	5 2	— 5 6	Lambs	5 0	— 6 0
			Calves	3 4	— 5 2
			Pigs	3 0	— 5 0

Beasts, 4690; Sheep and Lambs, 28,360; Calves, 449; Pigs, 100.

THURSDAY, July 28.

The number of Beasts is not so large as on last Thursday, and the cold weather is more favourable for slaughtering, prices are consequently rather better than on Monday. The supply of Sheep is also smaller, with a better demand. Lambs and Calves are sold more readily, and prices have advanced a little. Our foreign supply consists of 440 Beasts, 4300 Sheep, 500 Calves, and 30 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5 0	to 5 4	Best Long-wools	..	to ..
Best Shorthorns	4 10	— 5 2	Do. Shorn	5 0	— 5 4
2d quality Beasts	3 6	— 4 4	Ewes & 2d quality	..	— ..
Best Downs and Half-breds	..	— ..	Do. Shorn	4 4	— 4 8
Do. Shorn	5 4	— 5 6	Lambs	5 4	— 6 4
			Calves	3 4	— 5 4
			Pigs	3 0	— 5 4

Beasts, 1225; Sheep and Lambs, 15,400; Calves, 610; Pigs, 70.

MARK LANE.

MONDAY, July 25.

There was a small supply of English Wheat to this morning's market, only a part of which was sold at very irregular prices, generally about 3*s.* per qr. below those of this day se'nnight; very few transactions took place in foreign, at a similar reduction. Barley was 6*d.* per qr., Beans and Peas 1*s.* per qr. dearer. The Oat trade was very firm, at an advance of 6*d.* per qr. Sack Flour was unchanged in value, but barrel was rather easier.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	50	—56	Red	48	—56
— — fine selected runs	53	—60	Red	51	—67
— — Talnvera	54	—63			
— — Norfolk	—	—	Red	—	—
— — Foreign	42	—63			
BARLEY, grind. & dist.	29	to 33	Chev.	42	—45
— Foreign .. grinding and distilling	25	—33	Malting	33	—43
OATS, Essex and Suffolk	25	—27			
— Scotch and Lincolnshire	27	—29	Feed	—	—
— Irish	26	—28	Feed	24	—27
— Foreign	27	—29	Feed	22	—27
RYE	32	—36	Foreign	33	—36
RYE-MEAL, Foreign					
BEANS, Mazagan	38	to 47s.	Tick	38	—50
— Pigeon	44s.	to 50s.	Winds.	—	Longpod. —
— Foreign			Small	45	—47 Egyptian 42—44
PEAS, White, Essex, and Kent.	Boilers			38	—42 Suffolk 41—44
— Maple, 37s. to 44s.	Grey			36	—39 Foreign 36—40
MAIZE	Foreign			32	—34
FLOUR, best marks delivered	per sack			46	—54
— 2d ditto	ditto			35	—47 Country 35—47
— Foreign	per barrel			29	—31 Per sack 35—61

WEDNESDAY, July 27.

The grain trade throughout the day has been characterised by quietness, although the attendance was tolerably good. There have been very few samples of English on offer, while the arrivals from abroad have been only to a moderate extent. The demand for all qualities has been inactive, at about Monday's quotations. Barley, the supply of which was limited, met with a fair inquiry, at fully previous rates. Malt was dull, and drooping in value. The show of Oats was large, the demand was slow, and prices were unsettled, but not lower generally. Beans and Peas were in steady request, at fully the rate of Monday. Flour experienced a quiet sale, at scarcely previous currencies.

ARRIVALS OF GRAIN, &C., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch	Qrs. 310	Qrs. —	Qrs. —	Sacks. —
Irish	—	—	—	—
Foreign	24,860	620	69,730	1230 / — brls.
	25,170	620	69,730	

LIVERPOOL, July 26.—We had an average attendance at to-day's market, and in Wheat a good consumptive business took place, at prices somewhat irregular, and about 6*d.* per cental lower than on Friday. Flour inactive, and 1*s.* to 1*s.* 6*d.* per sack and barrel lower. Oats neglected. Oatmeal slow. Indian Corn in moderate consumptive demand, at a reduction of 9*d.* per qr. on the week.

AVERAGES.

	Wheat.	Barley.	Oats.
June 18	48*s* 0*d*	32*s* 5*d*	25*s* 0*d*
— 25	50 5	33 5	25 1
July 2	51 6	32 0	25 10
— 9	50 7	30 3	25 8
— 16	49 8	31 2	25 6
— 23	49 9	31 2	26 11
Average	49 11	31 9	25 8

HOPS.

BOROUGH MARKET, July 28.

Messrs. Pattenden & Smith report the market without alteration, the demand being of an entirely retail nature, at nominally unchanged rates.

SEED MARKET.

We have a somewhat improved inquiry for Clover seeds, the stocks of which are without doubt very light. Mustard and Rape seed are in fair demand; more rain is, however, needed to enable sowing operations to be carried on to any extent. New Rape has come to market in good condition, and is obtainable on considerably easier terms than those which have ruled of late. Hemp seed has advanced 2*s.* to 3*s.* per qr. Canary seed is without change. Samples of new winter Tares, Oats, and Barley, and also of new Rye, Wheat, Peas, &c., are now offering in Mark Lane. Trifolium continues scarce and dear. New English Trefoil seed comes out freely, at moderate currencies. The stock of foreign Italian is now quite exhausted; there is a little new home-grown offering, which meets with a very ready sale.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

INDIA-RUBBER GARDEN HOSE, to feet ½ inch hose, with brass tap, rose, and jet complete, 10s 6d
50 feet ½ inch do. do. extra strong, 1l 5s
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application.
E. G. CAPON, India-rubber Manufacturer, Quadrant, Birmingham.

TANNED GARDEN NETTING, for Preserving Seed Beds, Frost, Strawberries, from Frost, Blight, Birds, &c., and as a Fence for Fowls, &c. One yard wide, 1d; two yards, 2d; three yards, 3d; and four yards, 4d, per yard in any quantity. May be had of CHAS. WRIGHT AND CO., William Street, Newark-on-Trent, or their Agents, Messrs. HOOPER AND CO., Covent Garden Market, London, W.C.

GARDEN CANOPIES, of various sizes, suitable for Croquet Lists, Children's Playing Grounds, and general Garden use, may be seen erected at
BENJAMIN EDGINGTON'S Establishment, 2, Duke Street, foot of London Bridge,

CROQUET, CRICKET, and GARDEN TENTS of all sizes and shapes. An Illustrated Catalogue free on application.
Address, BENJAMIN EDGINGTON (late Tall), 2, Duke Street, London Bridge, S.E. No other Establishment
Illustrated Catalogues post free.

GARDEN and LAWN TENTS, of the most elegant form, easily erected and removed, at
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Illustrated Catalogues post free.

Registered
GARDEN ROLLER BARROW.

This light, elegant, and useful combination of the necessary Garden Implements, the Roller and the Barrow, for Lawns and Walks, sold, supplied by
POLLARD, JEPHSON, AND CO.,
Bear Garden, New Park Street, Southwark, London, S.E.
Price Lists free on application.

CONSERVATORY BASKETS.

Strained Wire Espalier Trainers, for all kinds of fruit trees, &c.; Garden Fencing, rabbit proof; Trellis Wire Work, for gardens and conservatories; Wire Work Covered Ways, for gardens, pleasure grounds, &c.; Wire Work Reservoirs, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for planting in position, on the lawn, and opposite windows, or to be used as Suspending Baskets for conservatories; Wire Work Flower Stands for conservatories; Aviaries for conservatories, pheasantries, &c.
Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.
Minton's Ornamental Tile Flower Boxes.
All kinds of Wire Work made to order
R. HOLLIDAY, Horticultural and Floral Wire Works, 23, Portobello Terrace Notting Hill Gate, London, W.
Illustrated Catalogue and the name on application.

SHANKS'S PATENT LAWN MOWERS for 1870
The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE EDGE SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
After Sharp Shanks & Son beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole Plate. In addition to this, A. S. & Son now make the Sole Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application
A. SHANKS AND SONS, Prens Iron Works, Arbroath; and
27, Leadenhall Street, London, E.C.
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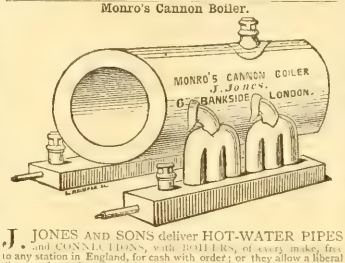

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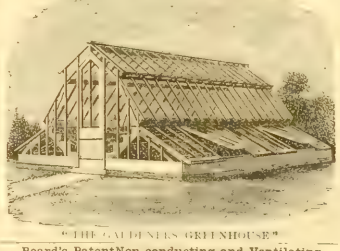
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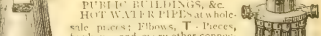

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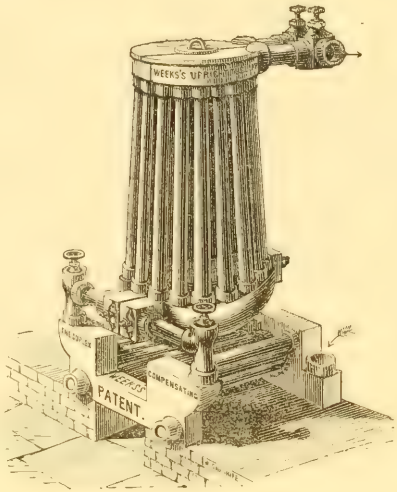

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State of the Crops, 1870.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE of SATURDAY, August 13, will contain a FULL and EXACT REPORT of the ESTATE of the CROPS throughout the UNITED KINGDOM. Order of any News Agent. A Single Copy sent for 8*d*. Stamps.
Published by W. RICHARDS, at the Office, 41, Wellington Street, Strand, W.C.

WARRINGTON FLORAL and HORTICULTURAL SOCIETY'S EXHIBITION, AUGUST 16 and 17
In addition to the Prizes previously advertised, the Committee has resolved to award the beautiful Gould Medal value £10, to the exhibitor of the best Collection of New or Rare Plants, in EXTRA Class 116
ENTRIES CLOSE on MONDAY, August 8.
CHARLES LAYLAND, Secretary.

READING HORTICULTURAL SOCIETY.—The AUTUMN SHOW will be held on THURSDAY, August 25 (by permission of the Mayor), in the Abbey Ruins, Reading. A Band will attend as usual. The Show will be Open to the holders of Subscribers' Tickets at 11 o'Clock, and to the Public at 1 o'Clock, on payment of 1*s*. Schedules and Tickets may be obtained of
CHARLES COLLINS, Hon. Secretary.
24, Chain Street, Reading.

NEWCASTLE-UNDER-LYME HORTICULTURAL and ALLOTMENT SOCIETY, 1870.
Patron—HIS GRACE THE DUKE OF SUTHERLAND, K.G.
The SECOND EXHIBITION this year will be held on THURSDAY, August 25.
SPECIAL PRIZES OPEN TO ALL ENGLAND.
Class 1. Eight Stove or Greenhouse Plants.—1st prize, £6; 2d, £4; 3d, £3; 4th, £2; 5th, £1; 6th, 10*s*
Class 2. Fruit, 9 distinct kinds.—Fruiterers excluded —1st prize, £3; 2d, £2 10*s*; 3d, £2; 4th, £1 10*s*; 5th, £1; 6th, 10*s*
Class 3. Flowers arranged for Table Decoration.—1st prize, £1; 2d, 15*s*; 3d, 10*s*; 4th, 7*s* 6*d*; 5th, 5*s*; 6th, 2*s* 6*d*.
Class 4. Basket of Flowers.—1st prize, £1; 2d, 15*s*; 3d, 10*s*; 4th, 7*s* 6*d*; 5th, 5*s*; 6th, 2*s* 6*d*.
Class 5. Bouquet for the hand.—1st prize, 10*s*; 2d, 7*s* 6*d*.; 3d, 5*s*; 4th, 2*s* 6*d*.; 5th, 1*s*. 6*d*.; 6th, 1*s*.
Class 6. Premier Dahlia. 1st prize, 5*s*.; 2d, 2*s* 6*d*.; 3d, 1*s*. 6*d*.
Particulars, with Forms for Entry, may be had from
H. DAWSON, Hon. Sec.

Worcestershire Agricultural Society.

A GRAND HORTICULTURAL EXHIBITION, in connection with the above, will be held in the SHOW GROUND at KIDDERMINSTER, AUGUST 30 and 31, and SEPTEMBER 1, when PRIZES to the amount of ONE HUNDRED and FIFTY-FIVE POUNDS will be awarded. For Lists of Prizes and Rules, &c., apply to Mr. H. J. COCHRANE, 27, Clarence Street, Cheltenham, Hon. Secretary to Horticultural Show; or to
ALBERT BUCK, Secretary, Worcester

Gardeners' Royal Benevolent Institution.

DAVID BROWN, GARDENER, Brook Lane, Chester, desires to RETURN his most SINCERE and HEARTFELT THANKS to those Subscribers who, by their votes, kindly assisted to place him among the successful candidates at the Election of Pensioners on July 5.

NEW CHILIAN MIMULUS.—This is a new strain, of dwarf habit, perpetual bloomers, and quite hardy, of very diversified markings and colours. 12 splendid varieties, post free, for 3*s*.; from B. W. KNIGHT, Florist, Battle, Sussex.

NEW AGERATUMS.—Four fine varieties, Imperial Dwarf, Tom Thumb, Prince Alfred (the deepest blue), Conspicua (white), invaluable for winter bloom. The four varieties forwarded free by post for 2*s*., from
B. W. KNIGHT, Florist, Battle, Sussex.

NEW COLEUS of 1870.—Twelve New Coleus, sent out by Mr. W. Bull, &c., this season, 1870. The set of 12 varieties sent post free for 2*s*. 6*d*., from
B. W. KNIGHT, Florist, Battle, Sussex.

Miscellaneous Plants suitable for Bedding and Decorative Purposes.

ROBERT PARKER begs to announce that his SELECT DESCRIPTIVE PRICED LIST, including the finest varieties of ECHEVERIAS, PANSIES, SEMPERVIVUMS, TRITOMAS, VIOLAS, &c., &c., is now published, and will be forwarded to applicants.
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New Flower Seeds for Present Sowing, Free by Post.

SUTTON and SONS can now supply New Seed of the following, saved from the finest strains in the country :—
JAMES' SUPERB CALCEOLARIA .. .. 2*s*. 6*d*. per packet
INGRAM'S SUPERB CALCEOLARIA, 1*s*. 6*d*. and 2*s*. 6*d*. ,,
THOMSON'S SUPERB CALCEOLARIA, 1*s*. 6*d*. and 2*s*. 6*d*. ,,
FINEST CHOICE CINERARIA, 1*s*. 6*d*. and 2*s*. 6*d*. per packet.
FINEST CHOICE PRIMULA, 1*s*. 6*d*. and 2*s*. 6*d*. per packet.
And other FLOWER SEEDS, for present sowing.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

Dutch Bulbs and Roots, &c.

ANT. ROOZEN'S CATALOGUE of above for 1870 is now ready, and will be sent free on application.
Overveen, near Haarlem, Holland.

Lilium auratum.

THOUSANDS of this beautiful LILY to offer, JUST COMING INTO BLOOM. Good plants with one bud each, 30*s* per dozen; two buds each, 42*s* per dozen.
Apply to Mr. WILLIAM BULL, Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

PRIMULAS, PRIMULAS, PRIMULAS.—Williams' superb strain, strong Seedlings, fit for potting into 3-inch pots, 1*s* 6*d* per dozen, 10*s* per 100, free by post; seed, 1*s* and 2*s* 6*d*. per packet JOHN STEVENS, The Nurseries, Coventry.

Roses.

MITCHELL'S renowned ROSES are NOW in FINE BLOOM. The largest stock and the best plants in England. Fitt Down Nurseries, Uckfield, Sussex.

PAUL and SON'S ROSES.—The COLLECTION, now usually the Tea-scented kinds, are NOW RICH MASSES of BLOOM. 120,000 plants, in vigour and health perhaps never surpassed
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PAUL and SON have now several thousands, in pots, ready for delivery for immediate planting. For beds, for lasting effect, Roses in this way are unequalled. Special LIST free on application. The "Old" Nurseries, Cheshunt, N.

CHOICEST ROSES, in pots. TEA-SCENTED, CHINA, NOISETTE, &c.
The largest stock in the kingdom, consisting of many thousands of strong healthy plants
WM. WOOD and SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Roses.

WM. KNIGHT, of the Floral Nursery, Hailsham, Sussex, begs to announce that his splendid collection of upwards of 20,000 ROSES is NOW in FULL BLOOM. An inspection respectfully solicited.
Also an immense stock of the choicest varieties of ROSES in Pots, for planting out or growing on for pot culture

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WM. PAUL begs to announce that his ROSES are NOW IN BLOOM. All the varieties recently exhibited by him in his "Garden of Roses" at the Crystal Palace, and many other novelties, may be seen.
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CRANSTON'S selection of the best and most distinct NEW ROSES of the season. Extra strong plants now ready. Descriptive LIST on application.
ROSE BEDDING.—Superb plants, in 5-inch pots, for planting out or for growing on for pot culture. Leading varieties of Tea-scented, Noisette, Hybrid Perpetual, &c. Descriptive LIST on application.
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TO BE SOLD, a choice Collection of very large INDIA-RUBBER PLANTS, of more than 25 years' growth; broad-leaved MYRTLE TREES, OLEANDERS, &c., all grown in French square boxes. For full particulars apply to
Mr ROBT. KENNEDY, Florist, 5 & 7, Bedford Covent Garden, W.C.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

JOSEPH BAUMANN, Nurseryman, Ghent, Belgium, offers for Sale—
100 CAMELLIAS, ALBA and FIMBRIATA PLENA, without flower buds, £4, £5, £6, £8
100 CAMELLIAS, IMBRICATA PLENA, without flower buds, £3, £4, £6, £8.
100 CAMELLIAS, named best sorts, without flower buds, £3, £4, £6, £8.—For September.
100 CAMELLIAS, with flower buds, named and best sorts, £6, £8, £10, £12
100 AZALEA INDICA, best named sorts, with flower buds, fine plants, £5, £6, £8, £12.
100 AZALEA INDICA STOCKS, 15*s*. [Three months' credit.]

Genuine Seeds.

WM. CUTBUSH AND SON'S CATALOGUE of KITCHEN GARDEN, FARM, and FLOWER SEEDS, is now ready, post free on application. It contains a selection of the best kinds in Cultivation, with such novelties as can be recommended.
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IMPROVED GREEN-TOP YELLOW SCOTCH	..	..	1 0
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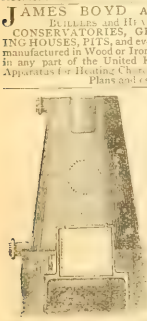

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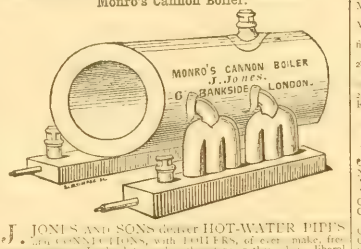

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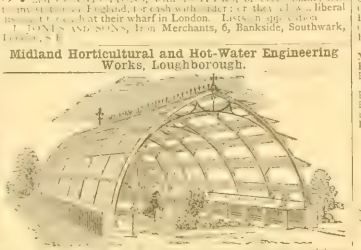

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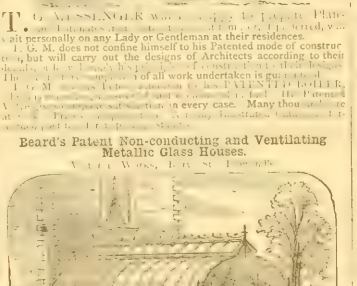

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SUTTONS' IMPROVED DRUMHEAD.—The largest and earliest. Should be sown in July and August, per lb. 2s. 6d.

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COMMON DRUMHEAD, or FLAT DUTCH, 2s. per lb. Also GRASS SEEDS, TURNIP SEEDS, MUSTARD, RAPE, &c., for autumn sowing—particulars of which may be had on application.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

COLOURED SHELL GRAVEL, for Gardens, Conservatories, and Terraces, presenting a very novel appearance, and of a mottled roan colour; also the usual SHELL and GRAVEL. Sold by FRANCIS AND CO., Surrey foot of Vauxhall Bridge, London, S.E.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 19, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 22 and 28, Western Road, Brighton, and at Hassocks Gate Nurseries, Keymer, Hurstpierpoint; post-office, Hassocks Gate.

The Agents for the above will be advertised shortly.

Choice Seeds for Present Sowing, Free by Post.

JAMES DICKSON AND SONS (old established Nursery and Seed Business), 102, Lastgate Street, and "Newton" Nurseries, Chester.

	Per packet.	s.	d.
ANTIRRHINUM, choicest named		0	6
AURICULAS, from choice varieties		1	0
CALCEOLARIA, herbaceous, choice strain, 1s. 6d., 2s. 6d. and		5	0
CARNATION, from prize flowers		1	0
"	collection, 12 varieties	3	6
"		5	0
CENTAUREA, candidissima		1	0
CINERARIA, from newest-named flowers	1s. 6d., 2s. 6d. and	5	0
CYCLAMEN, Wagner's prize strain	1s. 6d. and	2	6
ECHEVERIA MULTICAULIS		2	6
HELIOTROPE, from choice varieties	1s. and	2	6
HOLLYHOCK, from choice named varieties	1 and	2	6
"	collections of 6 and 12 varieties	1	0
MYOSOTIS DISSITIFLORA		1	0
PANSY, from prize flowers	1s. and	2	6
PETUNIA, from choice varieties	6d. and	1	0
"	double, fine hybridised	1s. and	2	6
PINK, choicest named sorts	1s. and	2	6
POLYANTHUS, from choice strain	1s. and	2	6
PRIMULA, CARTER'S ALPINE, finest	6d. and	1	0
PRIMULA SINENSIS FIMBRIATA ALBA,	1s. 6d., 2s. 6d. and	5	0
"	" "	JUBILEE, 1s. 6d., 2s. 6d. and	5	0
"	" "	WHITE, 1s. 6d., 2s. 6d. and	5	0
"	" "	FILICIFOLIA ALBA		
		1s. 6d., 2s. 6d. and	5	0
"	" "	RUBRA,		
		1s. 6d., 2s. 6d. and	5	0
"	" "	Mixed,		
		1s. 6d., 2s. 6d. and	5	0
SCHIZANTHUS, choice		1s. and	2	6
SCABIOUS, from best German		1s. and	2	6
"	"	collection, 12 varieties	1	0
STOCKS, Ten Weeks,		1s. and	2	6
"	Emperor, from California		2	6
VIOLA CORNUTA ALBA			1	0
"			2	6
WALLFLOWER, finest Double German		1s. and	2	6
"	collection, 12 varieties		3	0

The following, free by Post, 1s. each, or, can be supplied by weight, at 1s. per lb.:—

Alyssum saxatile.	Mignonette, sorts.
Calandrinia, mixed sorts.	Nemophila, of sorts.
Candytuft, Empress.	Saponaria calabrica.
" Giant Rose.	Shortia californica.
" Snowflake.	Silene, of sorts.
Convolvulus, Major.	Sweet William, fine mixed.
Larkspur, Stock-flowered.	Virginian Stock.
" Dwarf, mixed.	Wallflower, fine mixed.
Lupins, of sorts.	

CATALOGUES of SEEDS and PLANTS post free on application.

Early Cabbage Seed for Present Sowing.

THE ROYAL SEEDSMEN.

JAMES CARTER AND CO., 237 and 238, High Holborn, London, W.C.

CARTER'S EARLY, the best for spring use, 8d. per oz.

CARTER'S MATCHLESS, an excellent variety, 8d. per oz.

ENFIELD MARKET, a well known sort, 6d. per oz.

LONDON MARKET, IMPROVED NONPAREIL, and all other sorts, each 6d. per oz.

Carter's Select Stock of Onions.

JAS. CARTER and CO. beg to offer the following excellent varieties of ONIONS for present sowing:—

NEW GIANT ROCCA ONION, of NAPLES, a splendid variety, per packet, 1s.

EARLY WHITE NAPLES ONION, per packet, 1s.

NEW WHITE GLOBE TRIPOLI ONION, per packet, 1s.

ITALIAN RED TRIPOLI ONION, per packet, 1s.

A Special Certificate was awarded to JAMES CARTER AND CO. by the Royal Horticultural Society, December, 1869, for three specimen varieties of Onions, the weights of which were as follows:—

GIANT ROCCA, one bulb, weight 3 lb. 9 oz.

ITALIAN RED TRIPOLI, two bulbs, weight 2 lb. 11 oz., and 3 lb. 6 oz. respectively.

GLOBE TRIPOLI, one bulb, weight 3 lb.

JAMES CARTER AND CO., The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

Wheelers' Cocoa-nut Cabbage.

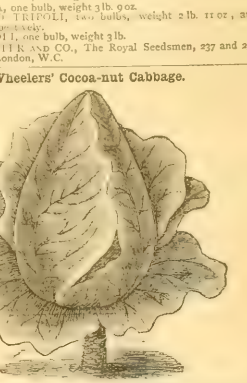

WHEELERS' COCOA-NUT CABBAGE is a new and very early variety, perfectly distinct, and of most excellent flavour. It should be sown now, and planted out 18 inches apart in September. 1s. per packet, post free. Free to the Trade on application.

WHEELERS' TOM THUMB LETTUCE (true), 1s. per packet; small packet, 6d., post free.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

New and Extra Choice Flower Seeds.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the "Old Established" Seed Warehouse, 106, Fastgate Street, and the "Upton" Nurseries, Chester

	Per packet —s. d.
AURICULA, from finest named flowers	5 0
CALCEOLARIA, James's choice strain .. .. .. 2s. 6d. and	5 0
" from the Dalkeith collection is 6d., 2s. 6d. and	5 0
CINERARIA, very choice strain .. .. .. 2s. 6d. and	5 0
CARNATION, from superb flowers .. .. .. 1s. and	3 6
" in collections, 12 varieties .. .. 3s. 6d. to	5 0
CYCLAMEN, Wiggins' prize strain .. .. .. 1s. and	2 6
GLOXINIA	1 0
" erect flowered	1 0
HOLLYHOCK, from choicest named varieties .. 1s. and	2 6
MYOSOTIS DISSITIFLORA .. .. .. 1s. and	2 6
" SYLVATICA .. .. 1s. and	2 6
" ALBA .. .. .. 1s. and	2 6
PANSY, from finest named varieties .. .. .. 1s. and	2 6
" Belgian, or Fancy .. .. 1s. and	2 6
PETUNIA, from choicest varieties .. .. .. 6d. and	1 0
PINK, from finest varieties .. .. 1s. and	2 6
POLYANTHUS, from finest flowers, extra	1 0
PRIMULA SINENSIS FIMBRIATA RUBRA.. 2s. 6d. and	5 0
" " " ALBA .. 2s. 6d. and	5 0
" " " Mixed .. 2s. 6d. and	5 0
" " " FIMBRIFOLIA RUBRA. 2s. 6d. and	5 0
" " " ALBA. 2s. 6d. and	5 0
" " " Mixed	2 6

☞ *All three Primulas are from the finest strains in cultivation, and cannot be surpassed.*

STOCK, East Lothian, Scarlet, White, and Purple, each ..	1 0
" German Brompton, first mixed	1 0
" collection, 12 varieties	3 6
SWEET WILLIAM, Auricula-eyed	1 0

TACSONIA VON VOLXEMI, a superb greenhouse climber, which flowers most abundantly almost the whole year. The flowers are about 5 inches in diameter, and of the richest scarlet. Grows very rapidly.. .. .. .. 1s. and 2 6

VIOLA CORNUTA	1 0
" ALBA .. .. .. 1s. and	2 6
WALLFLOWER, fine dark .. .. .. 6d. and	1 0
" Double German, finest mixed .. 1s. and	2 6

*** All Flower Seeds sent post free.

B. S. WILLIAMS'

NEW and CHOICE FLOWER SEEDS,

Post Free.

	Per packet.—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed.. .. .. 2s. 6d., 3s. 6d., and	5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain .. 2s. 6d., 5s. 6d., and	3 6
CENTAUREA CANDIDISSIMA .. .. .. 1s. and	2 6
ECHEVERIA METALLICA, new bedding plant	2 6
HOLLYHOCK, from Chater's finest varieties .. 1s. and	2 6
Williams' New Hybrid SOLANUMS .. .. .. 2s. 6d. and	3 6
PYRETHRUM (Golden Feather) .. .. .. 1s. and	2 6
PANSY, from Prize Flowers .. .. 1s. and	2 6
PANSY, finest Belgian varieties .. .. .. 1s. and	2 6
PANSY, Cliveden Blue, Purple and Yellow .. .. each	1 0
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance 1s. 6d. and	3 6
EAST LOTHIAN STOCKS, per collection of three colours ..	2 6
POLYANTHUS, Wiggins' Prize Strain .. .. 1s. and	1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA .. .. 1s. 6d. and	2 6
WALLFLOWER, New Golden Tom Thumb	1 0
WALLFLOWER, Saunders' fine dark variety	1 0
Hunt's Auricula-eyed SWEET WILLIAM	0 6
MYOSOTIS AZORICA, var. CŒLESTINA	1 6
TACSONIA VAN VOLXEMII, splendid greenhouse climber	2 6

Victoria and Paradise Nurseries, Upper Holloway, London, N.

NEW ROSE, PRINCESS CHRISTIAN.

THE BUDDING SEASON.

WILLIAM PAUL

Has still a few Plants, established in pots, of this NEW and BEAUTIFUL ROSE, with six buds on each plant. *If budded now on the Dog-rose or Manetti, the plants will bloom freely next summer.* The colour ranges from rosy peach to deep salmon, the flowers are large and globular, the plant is hardy and free. Three First-class Certificates.

Price 10s. 6d. each.

"One of the finest peach-coloured Roses in cultivation."—*Gardeners' Chronicle.*
"One of the grandest Roses in cultivation."—*Journal of Horticulture.*
"One of the best new Roses sent out for many years past."—*Gardeners' Magazine.*
"A good Rose for exhibition, and a grand Rose for the garden."—*The Field.*

PAUL'S NURSERIES, WALTHAM CROSS, LONDON, N.

DUTCH FLOWER ROOTS.

JAMES VEITCH & SONS,

ROYAL EXOTIC NURSERIES, KING'S ROAD, CHELSEA, S.W.,

BEG TO ANNOUNCE THAT THEIR

ANNUAL CATALOGUE OF DUTCH FLOWER ROOTS,

Containing DESCRIPTIVE LISTS of all the finest kinds of HYACINTHS, TULIPS, CROCUSES, LILIUMS, GLADIOLI, &c., and also including

A SELECT LIST of VEGETABLE and FLOWER SEEDS for AUTUMN SOWING,

is now ready, and will be forwarded Post Free on application.

NEW CHOICE FLOWER SEEDS.

DOWNIE, LAIRD, & LAING

HAVE THE PLEASURE OF OFFERING THE FOLLOWING

CHOICE FLOWER SEEDS:—

	Per packet.—s. d.
ANTIRRHINUM, extra choice, saved from our magnificent collection of the newest named flowers, 6d., 1s., and	1 6
CALCEOLARIA, hybridised, saved from the flowers that gained the First Prize at Kensington, 2s. 6d., 3s. 6d., &	5 0
CALCEOLARIA, hybridised, saved from the celebrated strain at Dalkeith Palace .. 1s. 6d., 2s. 6d., and	3 6
CINERARIA, extra choice, saved from an unequalled assortment of named flowers .. 1s. 6d., 2s. 6d., and	3 6
COLEUS (Golden), hybridised, saved from our First Prize Crystal Palace Collection .. 1s., 1s. 6d., and	2 6
CYCLAMEN, superb, saved from the Amateur's Collection who was first at Kensington.. .. 1s., 2s., and	3 0
HOLLYHOCK, extra superb, saved from the most distinct of our famous assortments of prize flowers, 12 colours .. .. (Collection)	5 0
HOLLYHOCK, ex. fine, saved from the finest vars. of our magnificent collection, mixed, 1s. 6d., 2s. 6d., and	3 6
PANSY (Show), extra choice, saved from our own unrivalled exhibition flowers .. .. 1s., 1s. 6d., and	2 6
PANSY (Fancy), ex. choice, saved from the most beautiful colours of our admirable collection, 1s., 1s. 6d., and	2 6
PENTSTEMON, most superb, saved from our own collection of the choice varieties introduced last season, 1s., 1s. 6d., and	2 6
PRIMULA (Fringed, Red and White), saved from the finest strain in cultivation .. .. 2s. 6d., 3s. 6d., and	5 0
PRIMULA (Fern-leaved, Red and White), saved from a most magnificent strain, specially for ourselves, 1s. 6d., 3s. 6d., and	5 0
PYRETHRUM (Golden), very select, saved from a very carefully selected strain of this popular bedder, 6d., 1s., and	1 6
STOCK, Intermediate (Scarlet, Purple, and White), saved from our celebrated strain of these flowers, which rival the East Lothian varieties.. .. .. 1s., 1s. 6d., and	2 6
SWEET WILLIAM, extra dark, saved from Hunt's choice strain, carefully selected and improved, 6d., 1s., &	1 6

Stamps may be sent in payment. Packets forwarded Free by Post.

STANSTEAD PARK, FOREST HILL, LONDON, S.E.; and at EDINBURGH.

ROYAL HORTICULTURAL SOCIETY.—REVISED GLADIOLUS SCHEDULE [illegible] AUGUST 17, 1870.

FOR FOREIGN GROWERS.

CLASS 1.—36 GLADIOLI, cut spikes, distinct .. .. .. £10, £5, £4.

FOR NURSERYMEN.

CLASS 2.—36 GLADIOLI, cut spikes, distinct .. .. .. £5, £3, £2.

CLASS 3.—GLADIOLI, cut spikes, distinct [illegible] Gold Medal given to the Duke of Buccleuch, and G. F. Wilson, Esq., F.R.S.) .. £5, £3, £2.

CLASS 4.—GLADIOLI, 18 cut spikes, distinct. [illegible] Extra Classes not showing in Class 3 .. .. £5, £3, £2.

FOR AMATEURS.

CLASS 1.—12 GLADIOLI, cut spikes, distinct .. .. £5, £3, £2.

CLASS 2.—12 GLADIOLI, cut spikes, distinct .. .. £3, £2, £1.

CLASS 3.—6 GLADIOLI, cut spikes, distinct. [illegible] Extra Classes not showing in Classes 1 and 2 .. £2, £1, 10s., £1.

CLASS 4.—6 GLADIOLI, cut spikes, distinct, of [illegible] New Varieties sent out in the Autumn of 1868, 1869 .. £2, £1.

CLASS 5.—6 GLADIOLI, cut spikes, distinct .. (Open) £1, 15s., 10s.

CLASS 6.—24 HOLLYHOCKS, cut blooms, distinct. (Nurserymen) 10s., 7s., 5s.

CLASS 7.—12 HOLLYHOCKS, cut blooms, distinct. (Amateurs.) 10s., 7s., 5s.

CLASS 8.—12 PHLOXES, cut, distinct .. (Open) £1, 15s., 10s.

CLASS 9.—APRICOTS, single dish .. (Open) £1, 15s., 10s.

CLASS 10.—NEW PLANTS and FLOWERS .. (Open) Certificates.

CLASS 11.—NEW FRUITS and VEGETABLES. (Open.) Certificates.

ROYAL HORTICULTURAL SOCIETY.—SHOW of VARIEGATED PELARGONIUMS, &c., WEDNESDAY, August 3.

AWARDS OF THE JUDGES.

CLASS 1.—1 Golden Variegated Zonal (Tricolor) PELARGONIUM. (Open.)

1st, Messrs. J. G. Henderson & Son, Nurserymen, St. John's Wood, 15s.
2d, Mr. J. Mann, Nurseryman, Battersea, 10s.
3d, Mr. J. Stevens, Ealing Terrace, Ealing, 5s.

CLASS 2.—1 Silver Variegated Zonal (Tricolor) PELARGONIUM. (Open.)

1st, Messrs. J. G. Henderson & Son, 15s.
2d, Mr. A. Turner, Royal Nursery, Slough, 10s.
3d, Mr. C. Edmonds, Nurseryman, Hayes, 5s.

CLASS 3.—1 Gold and Bronze Zonal (Bicolor) PELARGONIUM (Open.)

1st, Messrs. Downie, Laird & Laing, Nurserymen, Forest Hill, 15s.
2d, Mr. H. Cannell, Nurseryman, Woolwich, 10s.

CLASS 5.—1 Silver-edged PELARGONIUM. (Open.)

1st, Mr. C. Turner, 15s.

CLASS 6.—1 Ivy-leaved PELARGONIUM, in bloom. (Open.)

1st, Mr. C. Turner, 10s.

CLASS 7.—1 NOSEGAY PELARGONIUM, in full [illegible] (Open.)

1st, Mr. G. Smith, Nurseryman, Hornsey Road, 15s.
2d, Mr. H. Cannell, 10s.

CLASS 8.—1 ZONAL PELARGONIUM, in bloom. (Open.)

1st, Mr. J. Mann, 15s.
2d, Mr. J. George, Putney Heath, S.W., 10s.

CLASS 9.—1 Double-flowered ZONAL PELARGONIUM, in bloom. (Open.)

1st, Messrs. Downie, Laird & Laing, 15s.
2d, Mr. J. Mann, 10s.

CLASS 10.—EARLY PLUMS, single dish .. (Open.)

1st, Mr. J. Douglas, Gr. to F. Whitbourn, Esq., Loxford Hall, Ilford, 15s.

State of the Crops, 1870.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE of SATURDAY, August 13, will contain a FULL and TABULAR STATEMENT of the STATE of the CROPS throughout the UNITED KINGDOM. Order of any News Agent. A Single Copy sent for Six Stamps.

Published by W. RICHARDS, at the Office, 41, Wellington Street, Strand, W.C.

The Gardeners' Chronicle

SATURDAY, AUGUST 6, 1870.

THE following remarks upon the subject of the ROYAL HORTICULTURAL SOCIETY in the PROVINCES were received from Mr. AYRES in November last, but as at that time the Oxford experiment had been determined upon, we thought it best to hold them over until the result of the Oxford meeting was known. Unfortunately their force has been in no way impaired, and now it appears quite clear that there are only two courses open for the Society, either to abandon the country project or to act independently and with greater spirit. And we agree with our correspondent that the latter course is the right one to follow.

I am rather surprised to find Mr. FISH advocating the joint visit of Flora and Ceres to Oxford next year. I think horticulture has had sufficient experience of the refrigerating influence of agriculture upon her finances to see the impropriety of seeking any further partnership in that line of business. The fact is, there is not sufficient room for two Richmonds in the same field at the same time; not that I think there is any indisposition on the part of the public to patronise both, but from the simple fact that the longest summer's day is not long enough to see both shows, and therefore as the persons who pay, viz., the million, cannot afford to make two journeys, the flower show goes to the wall, to make way for the tame beast show and its thousand attractions. The mental and physical endurance of the strongest men, those who are schooled in the work of the daily Press to observe almost with seeing, is unequal to the task of grasping with one of these exhibitions, much more two in one day; and if they fail, what a state of bewilderment the head of the common observer must be in. At Leicester last year, having both departments to attend to, I had three weeks of this incessant toil—little less than 20 hours a day; and though I am blessed with a constitution stronger than the majority of men, my left arm, from physical exhaustion, fell useless by my side, and for several weeks I was unable to use it. No man knows the consequence of this kind of mental and physical exhaustion better than Mr. FISH himself. It made work for the doctor of him at Bury St. Edmund's, and therefore I am the more surprised that he should advocate the Society's continuing the past game of "follow my leader."

The Royal Agricultural Society, the British Association, the Social Science Congress, and congresses of many other kinds, go to the country annually with marked success, and it is only for the Royal Horticultural Society to select its district, and it will quickly find plenty of large towns ready to compete for its favours. As, however, profit in

the present condition of the Society is, if not the primary, the secondary object of these visits, it is indispensable that great centres of population should be sought, and centres where facilities of railway access are unquestionable.

Here in Nottingham any necessary guarantee would be subscribed in a few days, hundreds of pounds would be collected for special prizes, and we could offer sites of unquestionable suitability for the show. First, our Arboretum of nearly 20 acres, which is kept in as good condition as Kew or Battersea. Secondly, a park a few minutes' walk out of the town, 50 acres in extent, bounded on one side by the Trent, on the other by the Northern and Midland Railways, each within two minutes' walk of the ground, nobly wooded. And, thirdly, a spot nearer the town, finely undulated, and where 20 acres could be enclosed at almost a nominal cost. This may be considered a gardening centre; few counties, of its size, contain so many fine gardens, while our artizans would, in the Rose season, beat all the artizans in creation. And, lastly, I will venture to say we could offer the great Rosarian himself, the Rev. S. Reynolds Hole, and Mr. E. J. Lowe, F.R.S., as joint local secretaries. If any town in England can offer greater securities for success I should be glad to hear of it. Some financial data I may as well add. In our Arboretum, a few years back, with no attraction beyond those of music and fireworks, £560 was taken in one afternoon for admission, in sixpences! In the park before indicated, a few weeks back, a party of upwards of 40,000 congregated one afternoon, at 6*d.* and 1*s.* each, for a mere rural *fête* and political demonstration, those present being almost exclusively townspeople, not a single special train being run; and on the occasion of the visit of the British Association, though little more than 48 hours' notice was given of the show, nearly £400 was taken at the floral *fête* in sixpences. These are facts of recent occurrence, and demonstrate what a four days' *fête* here might be expected to produce.

I say a four days' *fête*, because I believe six days to be too long to keep a show of this kind open. My notion now is to receive and arrange the plants on the Monday, and, as far as possible, to judge them; on the Tuesday morning to receive the cut flowers, which should be staged ready for the judges by 8 o'clock, and for the privileged members and full-priced ticket-holders to be admitted from 10 till 4, when the prices should gradually decrease until the admission, on the after-part of the two last days, should not exceed sixpence. It is the maintenance of high prices that is the great barrier to pecuniary success in these exhibitions. Devote the early part of the day to high prices if you like, but let the afternoons and evenings be as cheap as possible. On Saturday the plants would be cleared away, and be got home without any desecration of the day of rest. Four days so managed, keeping the gates open for admission from 8 A.M. to 8 P.M., would yield more money than six days upon the past exclusive plan. The money comes from the million, and the privileges of the upper classes would not be curtailed if early admission became the rule. For real comfort in seeing the plants give me two or three hours in the early morning, in preference to a day in a crowd of visitors.

The great drawback to these exhibitions is the want of novelty and variety. We see the same things over and over again, staged nearly in the same manner, and the consequence is, the more extensive the show the greater the monotony. If, as I have explained before, some artistic effort could be made and some bits of plant grouping be introduced that persons would be glad to transfer to their greenhouses or conservatories, something would be done to advance the national taste; but as it is, elephantine plants alone are encouraged, many of them being, in point of real beauty, little superior to the Hollies and Aucubas which we find upon our lawns. These plants are looked upon as impossibilities to the majority of gardeners, and merely regarded as "show plants;" and fortunate is it that it is so, for many of them are not worth house room. The Society appears to have gone as far as it can in the encouragement of huge plant growing; let it now try another tack, and see what will be the effect of diversified collections. I see no reason why soft-wooded plants should not be allowed in the collections of stove and greenhouse plants. A really well grown Fuchsia, scarlet or fancy Pelargonium, Calceolaria, or Orchid should certainly be as good as a flowerless Fern, or other foliage plant. The fact is, stove and greenhouse plants have been starved into the very narrowest limits of those that can be readily grown and will bloom for the longest period; and the gem of to-day must not be grown, because it will not be a gem at all the shows of the district for two or three months to come. Speaking to a metropolitan exhibitor upon this subject a week or two back, he said, "I admit the plants you name are very beautiful, and their cultivation meritorious; but the judges of the present day would call them 'weeds,' as they do every plant which is not familiar to their overstrung gaze." Well, if such is the fact, the sooner such judges are allowed to stay at home, to make room at the shows for wiser men, the better. To revolutionise the arrangement of these shows altogether would not require any great effort of either mind or taste, and I am sure profit would be found in it. Nor would I confine the changes to plants only, but I would extend it to fruits and cut flowers. Why Roses should be condemned to the rule of line and compass—to be shown everlastingly in flat boxes—I do not know. Surely the Queen of Flowers would not disgrace a handsome vase, and I think even my neighbour the champion Rose grower at Caunton would not take exception to each flower being placed in a glass tube, and that tube so placed that the flowers would jut out from a pyramid of Lycopod, Isolepis, Maidenhair, or any other delicate foliaged Fern. Pyramids of this kind, rising 2 to 3 feet high, and studded thinly with finely grown Roses, would, I think, either for the exhibition table or the drawing-room, look quite as well as half dead flowers reposing upon wholly dead Moss. Finally, and not to trespass further upon your space, if the Society desires to abandon the connection with the Agricultural Society, it will then be free to go to the country at any time it pleases and not, as is the case now, at the fag end of the season. This of itself would be a great advantage, as it would enable the Society to present the best phases of gardening in their best season. *W. P. Ayres, Nov.* 1869.

The London Flower Market has long been a disgrace to the metropolis. Inadequate in size, ill-suited for its purpose, in bad repair, a dilapidated shed, in fact, it has long been an eyesore and a laughing-stock to bystanders and a source of vexation and annoyance to those whom business leads into its precincts; nor does there seem any nearer prospect of improvement than there does in the case of the adjoining "Covent Garden." Both alike fall far short of the requirements of the trade and of the public. Under these circumstances it is natural that those most interested should look elsewhere, in the hope of securing some site more convenient for their operations than the present. One correspondent, as it would appear, in accordance with the homœopathic dogma - *Similia similibus curantur*— suggests that Leicester Square, whose forlorn condition has for many years excited the mirth of the wags, would form an admirable site for a properly constructed flower market.

Leicester Square is, we believe, the property of private individuals, and the law is powerless to compel them to take measures for its improvement, but probably if the owners saw a way of making their property remunerative, they might so far conform to the general habit of mankind, and entertain a proposition which, while enriching them, would be of material benefit to the public. We can hardly anticipate so large a dividend as that said to be paid by the Alhambra Company (whose garish concert-room abuts on the square we have mentioned), of 25 per cent., but there can, we imagine, be little doubt that a good dividend might be obtained from the profits of such a market as we are advocating.

London improvements in general have a very long incubatory stage. Years of talk are expended before anything more substantial is effected, but at length, when the stage of action really is arrived at, the results are sufficiently satisfactory, as witness the Victoria Embankment, the Holborn Viaduct, and, as cognate to our present subject, the markets at Islington and Smithfield. With these accomplished facts in view, we need not despair of seeing ultimately improved markets for fruit, vegetables, and flowers. The area of Covent Garden is far too small for the business transacted there, nor can it well be extended without a very large sacrifice of property. Occasionally, as leases fall in, some slight extension may take place, as in the instance of the present flower market; but the relief to be looked for by such means is but trifling. The site mentioned by our correspondent would, in our opinion, be an excellent one for the purpose; and we should rejoice to see some steps taken to secure it for the purpose. This is a matter which specially concerns the growers and dealers, and we should be glad to learn their views on the subject.

—— In the House of Commons, on Tuesday last, a vote of £6000 was granted towards the erection of a Natural History Museum at South Kensington. The Chancellor of the Exchequer, in moving the vote, took occasion to say, "that the want of accommodation for the national collection was continually increasing. Such a building as was required to do justice to the collection would cover 4 acres of ground, and the question was where that quantity of ground could be found, with sufficient space for further extension. One proposal was that the ground between Charing Cross and Waterloo Bridge should be taken, but that would involve the taking away of land that was intended for the purposes of recreation, and after what had taken place he did not think that such a plan could be carried out. Then it had been suggested that there should be an addition to the British Museum, but the land there would cost £50,000 per acre. Another plan was to erect a building between Westminster Bridge and Charing cross, but the objection to that plan was, that the space of ground was insufficient for the purpose. After considering the various propositions, he had come to the conclusion that the best position that could be selected was near the South Kensington Museum. About 16½ acres had been sold to the Government at the rate of £7000 per acre. The value was £120,000, but if it now went into the market it would fetch £100,000 more. One of the conditions of sale was, that the land must be applied to purposes of science and art. For seven years that land had been a kind of potter's field. What he proposed was, to place on that land the museums required for the natural history collection, and he considered the site a most eligible one. The cost of the erection of the necessary buildings would be £350,000."

—— We hear that Mr. Morris, well known as a raiser and grower of Zonal Pelargoniums, intends to offer Prizes to the amount of ten guineas for the best seedling Golden Variegated Zonal Pelargoniums. The intention of Mr. Morris is, we believe, to give a prize of £5 5*s.* for the best group of any number of seedlings, not exceeding six, and a further prize of £5 5*s.* for the best individual variety selected out of the prize group. The points to be insisted on are novelty, distinctness, and vigour of growth; the plants are to be shown in their natural condition, without thinning or mutilation, and the winning one at least is to be named. The prizes are, we believe, to be competed for next year at one of the South Kensington meetings, and no doubt further particulars will in due time be forthcoming.

—— We have been requested to publish the following rules adopted by the Metropolitan Society for the Encouragement of Florists' Flowers, the first exhibition of which Society will be held at the Crystal Palace, Sydenham, on Tuesday, September 6, Wednesday, September 7, and Thursday, September 8, 1870:—

1. Exhibitors must give notice on or before Wednesday, August 31, of the classes in which they intend to compete, and cards corresponding to these entries will be furnished on the morning of the exhibition.

2. No specimens can be received after half-past eight on the morning of the first day of exhibition, and the judges will make their awards at 10 o'clock.

3. The judges will have the right to withhold the prize where they consider the subject not worthy of it.

4. No exhibitor can take more than one prize in each class.

5. All specimens must be grown by the exhibitor, or, in case of gardeners, by their master; and in any case of dishonesty or mutilation of flowers, not only will the stand where this takes place be disqualified, but all stands of the same exhibitor.

6. The exhibition will be closed at 5 o'clock on the last day of the show, when, but not before, exhibitors may remove their productions.

9. Exhibitors who are not members of the Society must pay an entrance fee of 5*s.*

The schedule is now ready, and may be had on application to the Hon. Secretary, the Rev. H. H. Dombrain, Westwell Vicarage, Ashford, Kent.

—— Those who possess the luxury of an orchard-house should by no means omit growing a Pot Mulberry or two with their other fruit trees. The Mulberry is perfectly amenable to pot-culture, bears freely under glass, and ripens its fruit to perfection—indeed, to such perfection as is never attained out-of-doors. The fruits hang on till they become thoroughly ripened, and when eaten in that state they melt away entirely, and have a rich luscious flavour with which outdoor Mulberries cannot compare. We, therefore, recommend a pot Mulberry for every orchard-house, where the owner values this wholesome fruit.

—— We are informed that a fine specimen of Littæa geminiflora (often called Buonapartea juncea) is now in bloom in Mr. Yates' Palm-house at Lauderdale House, Highgate.

—— Among the economical matters exhibited at the Royal Agricultural Society's show at Oxford, Major Munn's Honey-trough and Bar-frame Hives, which are highly spoken of by skilled apiarians, deserve to be noticed. They are thus described:—

"The frames are 9 inches by 12 inches outside measure, ½-inch-thick deal; the top bar, or guide bar, being only 9 inches, gives the bees the shortest space to build upon in a direct line where the two sides of the ½-inch square bar have been waxed for the purpose of the bees building the foundations of the combs. The depth leaves the bees the choice of filling the frames only half way in a bad season, whilst they are all made to overlap each other, with parallel combs, as if in their natural habitat. Eight, ten, or twelve bar-frames are given to the bees to build within; and these frames, resting on the projecting ends of the top bar, which is elongated for the purpose, lodge on the two edges of the outer hive, or box rim, and the frames are kept apart with ½-inch bars, to which the inch zinc slides are fixed,—and thus fitted and closed, a complete hive (or miniature apiary) is constituted, with inclined floor boards, one acting as an alighting board, and the other made to slide out to admit the swarm through when first stocked. This hive within a hive has a coverlid, and is thus perfectly secured from weather, with an equal circulation of air around the bar-frames; prevents damp or disease, and all dead bees or effete matter is discharged out of the hive by the inclined floor boards, whilst the bees have a clear dry landing place and shelter on the alighting board in all sorts of weather."

—— Among Recently Published Books we may notice the *Guide to the Royal Botanic Gardens and Pleasure Grounds at Kew*, by Daniel Oliver, F.R.S., Keeper of the Herbarium of the Royal Gardens (Macmillan). This is the 25th edition of a handbook originally drawn up by the late Sir W. Hooker, and always noteworthy as a marked exception to the usually worthless books sold as "guide books" to similar public institutions. In the present edition the editor has entered completely into the spirit of the original author; and has shown himself thoroughly conversant with the requirements of the general reader. The result is a most interesting, and, it is needless to say, accurate account of Kew Gardens in their present condition. —— A reprint of Mr. Samuelson's article in the "Quarterly Journal of Science" on *Beer, Scientifically and Socially Considered* (Longmans). We have, on a former occasion, expressed our concurrence with the author's views as to the necessity of introducing a pure, mild, cheap beverage for the working classes, in place of the pernicious compound that too often goes under the name

of beer, and recommend the perusal of the author's present *brochure*.——The second edition of the late Professor Henfrey's *Elementary Course of Botany* (Van Voorst), revised and partly rewritten by Maxwell T. Masters, M.D., F.R.S. —— The second portion of the second half of Dr. Rabenhorst's *Kryptogamen Flora* of Saxony, Thuringia, and Northern Bohemia (Leipsig: Edward Kummer; London: Williams & Norgate), has recently been published. It contains the completion of the enumeration of the Lichens, and is illustrated with excellent woodcuts. To those students of Lichens who read German, this little volume is indispensable.—*Flore Analytique de la Suisse*, par P. Morthier (Neufchâtel: Sandoz; London: Williams & Norgate). Just the book for the knapsack of the tourist. When the atrocious war shall have ended tourists may be in a position to test the value of the present publication. At present we can only say that its form is very compact, and that it seems well adapted for its purpose. The genera are, for purposes of discrimination, arranged according to the Linnean system, but are disposed according to the natural method in the body of the work.

Notes of a Course of Seven Lectures on Electrical Phenomena and Theories, by John Tyndall, LL.D., F.R.S. (Longmans). These contain, in short compass, an admirably clear summary of the main facts of electrical science, and the inferences to be derived from them. As a companion to more voluminous treatises, or as a guide in the lecture room, this little book can hardly be too strongly recommended.—Prefaced by an appropriate quotation from Molière, which represents the final resource of medical skill to consist in sending the patient off to "drink the waters," Mr. Burney Yeo's *Notes of a Season at St. Moritz* (Longmans) contain a good deal of information, but do not convince us of the suitability of the Engadine for invalids; indeed the author is by no means enthusiastic in his remarks on the advantages of the health resorts of this district. He has nevertheless written a gossiping account of St. Moritz and Tarasp, and added a list of the plants and insects to be found there.—Church's *Laboratory Guide* (Van Voorst), appears in a second edition. It is well adapted for its purpose, that of giving students a practical insight into chemical manipulations and processes.—Pewtner's *Comprehensive Specifier*, edited by W. Young (Longmans), will be very serviceable to builders or contractors, or those who have dealings with those craftsmen; a good index adds much to the value of the book.—*The Transactions of the Woolhope Naturalists' Field Club*, 1869 (*Times* office, Hereford), contains, among other things, an analytical key to the genera of British Agaricini, with illustrations by Mr. W. G. Smith, which is likely to be very useful.—The second volume of the *Prodromus Floræ Hispanicæ*, by Professors Willkomm and Lange (Stuttgart; London: Williams & Norgate), will be welcomed by all botanists. It is in Latin, and contains admirable descriptions of Spanish plants, and analytical Tables to facilitate their determination. The present volume begins with Valerianeæ and ends with Ebenaceæ. The arrangement of the families is peculiar, and is that proposed by one of the authors of the present book, M. Willkomm, now Professor at Dorpat. His colleague, Dr. Lange, is the Professor of Botany at Copenhagen. Another peculiarity, embarrassing to English botanists who use the words "order" and "family" synonymously, is the subordination of the "family" to the "order"; in fact, the orders in this work are more like the cohorts and alliances of other authors. The work will be essential in all botanical libraries, and merits our hearty commendation.

—— Owing to the paralysis which has befallen most branches of commerce on the Continent, and especially horticulture, from the recent atrocious outbreak of war, a large collection of New and Rare Palms, including many of those mentioned in Dr. Seemann's articles in our columns, will be sold at Stevens' Sale Rooms, Covent Garden, on this day (Saturday, August 6). Among the plants are Acanthorhiza Warscewiczii, Calyptrogyne elata, Calamus asperrimus and ciliaris (Dæmonorops plumosus). Ceroxylon niveum, Cocos Wallisii, Dæmonorops cinnamomeus, Euterpe antioquiensis, Geonoma Schottiana and pumila, Glaziova elegantissima (Leopoldinia pulchra or Cocos Weddeli), Latania aurea, Malortiea speciosa, Martinezia Lindeniana, Mauritia Carana, Phœnicophorium sechellarum, Thrinax elegans and elegantissimus, Verschaffeltia melanochætes, Welfia regia, &c.; and also fine specimen plants of Dracæna Guilfoylei, and other plants.

—— The Meteorology of the Week ending July 30 will be remembered for the intense heat which prevailed during the first part of the week, as well as for the heavy thunderstorm which passed over London on Tuesday morning, the 26th ult., during which nine-tenths of an inch of rain fell (see Mr. Glaisher's Table in our present issue). The Maximum Temperature of the week in England was at Bristol (90°.2), and in Scotland at Leith (86°). The mean of the highest temperatures at the eight southern stations, including Nottingham, was 86°.2, and of the eight northern was 83°.3. In Scotland the mean amounted to 80°.4. The Minimum Temperature of the air in England ranged from 46° at Bristol and Salford to 54° at Norwich, with a mean for all stations of 50°; in Scotland from 40° at Perth to 51°.5 at Greenock, with a mean for all stations of 45°.8. The Mean Temperature of the eight southern stations of England was 64°.1, and of the eight northern was 62°.6; the mean temperature of the eight stations of Scotland amounted to 60°.1. The Rainfall was confined to the eight southern stations of England, little or no rain being recorded at the northern stations or at the stations in Scotland, the maximum fall took place in the neighbourhood of London, viz., 0.93 inch, and at Portsmouth 0°.64 inch.

New Garden Plants.

Oncidium lepidum, *Lind. Rchb. fil.*

Affine Oncidio Boothiano, Rchb fil Panicula ampla pluriflora; sepalis unguiculatis, petalis subflationibus, labello basi utrinque obtusangulo, isthmo brevi, antice reniforme, quadrilobo, callis acutis sex in una basi; columna alis utrinque acutis antice retusis.

Flores parvi illis Oncidii Boothiani aequimagni. Sepala et petala albidoflava maculis paucis fuscis. Labellum flavum isthmo purpureo et lineola purpurea utrinque in basi. Maculæ purpureæ duæ sub fovea.

A very tiny thing, with a large panicle of pale, blotched, small flowers, in the way of the old Oncidium Boothianum. It is very botanical, and yet it is not without merits for a lover of modest plants. M. Linden obtained it from Ecuador through his lynx-eyed collector, Mr. Wallis. *H. G. Rchb. fil.*

Oncidium vernixium, *Lind. Rchb. fil.*

Pentapetala macropetala. Sepalis unguiculatis oblongis acutis crispis; petalis unguiculatis hastatis oblongis apice acuto incurvo crispis; labelli unguiculis 3 gulatis retusis retrorsis, lamina latere ligulata 3 carinata reniformi, retuso-bicorni valde vernicosa, callo retuso sat et antrorsum bicruri in basi, columnæ alis angustissimis angulatis minutis utrinque juxta foveam, tabula vix porecta.

A highly curious Oncid, quite unlike anything known up to this time. The sepals and petals are like those of a small Cyrtochilum, yet the wide lip is much more like that of Oncidium planilabre or O. pardothyrsus, yet totally different. It bears a thyrsoid very coarctate panicle, cinnamon petals and sepals with yellowish borders and a yellow lip, very singular in its retuse retrorse basilar auriculæ, yellow at the reniform end, and having a very shining brown disc, with a very curious callus. Discovered by Mr. Wallis near Paccha. We obtained it from M. Linden. *H. G. Rchb. fil.*

Cœlogyne ispiticina, var. Huttoni, *Rchb. fil.*

Labelli lacinia antica cuneato-oblonga nec cordata, carina in nervo medio nodis expressa. Pseudobulbus 5—6 pollices altus, costis validis septem obtusis, pyriformis, diphyllus, folium plicatum cuneato-oblongum acutum, ultra pedale. Pedunculus 0. Sepala ligulata, acuta, pallide viridia, valde carinata. Petala sepalorum aequimagna, albellum tridilum. Labellum lacinæ lateralis semiovatæ, antice acutangulæ, lamina media cuneato-oblonga acuta. Carinula transversa acutangulæ, bicristatæ in basi confluentes, anticam usque in basin laciniæ anticæ divergentes, utrinque bicristatæ, extra medianam valde oblaceratæ. Color albus, laciniæ lateralis basi petala, fimbriatulis, carinulæ cumes atro-luteæ. Columna trigona, antice supra antherifera expansa, superne dentata, albida antice flava. Unes luminis genamus antica sub fovea, foveæ limbus inferne bidentatus.

This plant, very nearly related to Cœlogyne speciosa, Lindl., yet widely differing both in colour and in the crests, was originally only known from Amboyna. We were most agreeably surprised when we obtained it from Messrs. Veitch, who got it from their lamented collector, Hutton. It is, indeed, different as a variety, but a very careful comparison with the type has persuaded us that both belong together. *H. G. Rchb. fil.*

Oncidium rusticum, *Lindl. Rchb. fil.*

Affine Oncidio cimiciifero, Rchb. fil. Panicula ampla, sepalis petalisque ovatis obtusis basi paulo cuneatis, labello utrinque obtusangulo antrorsum angustato retuso, callo amplo utrinque quadrilobo, antice retuso, medio unipapuloso in basi; columnæ alis submullis, lobulis minutis, juxta foveam sistentibus, tabula retuso, in una fasciculo trata.

This plant has a zigzag inflorescence in the way of that of Oncidium cimiciferum, and its allies. Flowers onion-green, with very light brownish clouds. Callus of lip orange. Many brown bars over the pallid yellow ground of lip. M. Linden obtained it from Ecuador through Mr. Wallis. *H. G. Rchb. fil.*

HERBACEOUS PERENNIALS.

In a season of drought and dryness like the present, when we gardeners have gone round our gardens in sackcloth and ashes, and viewed our withering and dying flowers with feelings of mourning and woe, it may not be amiss to jot down a few hardy perennials, which, alike regardless of heat and drought, have reared their heads in undiminished luxuriance and beauty, and shed beams of encouragement and gladness into many a desponding horticulturist's heart.

I cannot, I think, begin with a brighter example than that most beautiful of Fumitories—

Corydalis nobilis.—This lovely plant grows with unusual luxuriance in my garden here, forming quite a little bush some 1½ foot high, and covered with large dense heads of yellow and brown flowers. I never knew it finer than during the past spring. It is, unfortunately, not easy to propagate; the root divides with difficulty, and it ripens its seed very sparingly.

Corydalis bulbosa (Fumaria solida), *Corydalis cappnoides*, and *C. cava pallida* have also been very beautiful, though, also, short-lived. This, however, cannot be said of their congeners, *Dielytra spectabilis* and *eximia*, which for weeks wore an unfailing raiment of bright rose-coloured flowers.

Arabis blepharophylla.—This beautiful Rock-Cress seems to be specially at home in my chalky shallow soil, and so completely smothers itself with its large mauve flowers that the leaves can scarcely be seen. It always reminds me of a miniature Stock.

Cheiranthus mutabilis.—Whilst its handsome congeners, *C. alpinus ochroleucus* and *Marshallii* have been almost shorn of their usual beauty by the heat and drought, this pretty but little-known Wallflower has flourished and bloomed with extraordinary luxuriance. It is rather tender, and it is advisable to keep a plant or two in the cold frame during the winter. I have, however, several plants which have remained out without any protection, during very severe weather, and in a most exposed situation, without sustaining any injury. It is very easily struck from cuttings, and grows with great rapidity.

Lactuca sonchifolia.—I never remember to have seen this beautiful plant in greater beauty than during the present season; for weeks and weeks its dense bushes of lilac stars have been one of the principal attractions of the garden.

Matthiola incana.—Some few years since, when visiting Ventnor, I was struck with the beauty of this plant—which grows wild in great abundance on the cliffs. I brought away both plants and seeds, and have annually had a bed of it in the garden; and I know of nothing more striking and effective when in full bloom.

Petrocallis pyrenaica.—This, like the last, is one of our rarest and most beautiful British wild plants. It is confined to one rocky hillside, Craig Breiddon, in Montgomeryshire. From this locality, through the kindness of a friend, I received some seedling plants; and for several weeks during the past spring their dense masses of large white flowers, on stalks about a foot high, were one of the prettiest things in the garden.

Cyclamen ibericum.—Through the kindness of my friend, Mr. Atkins, of Painswick, I was able to add this choice little gem to my collection last autumn. I planted it under a south wall; and for about a fortnight this spring its lovely little French-grey flowers smothered the leaves, and were a sight to gladden the heart of every true florist.

Anemone ranunculoides.—This bright little gem of British gold has never been brighter than during the past spring.

Anemone sulphurea.—This delicately-beautiful Windflower came up with unwonted luxuriance this spring, throwing up its flower-stalks, crowned by large pale sulphur-coloured blossoms, quite a foot high.

Anemone apennina.—This true blue Tory flower ought to be grown by every Constitutional Conservative gardener, in these degenerate Radical days. Its long-lasting azure clumps will continually cheer and brighten his heart. [In some counties true blue is the emblem of the Radicals. We strongly urge *both* parties to grow the plant! Eds.]

Dentaria digitata.—This pretty spring Crucifer, with its deep purple Rocket-like flowers, ought to be grown by every lover of a spring garden. It has been particularly fine during the past spring. There is, I believe, a white variety, which I shall be glad to hear of.

Glycine apios.—This pretty, Vetch-like plant is so rampant in its growth that it requires to be continually kept in check; but its beautiful heads of blue flowers render it an indispensable ornament in every herbaceous garden.

Papaver nudicaule—the Iceland Poppy—with its crowded stems of deep orange blooms, is a *sine qua non* in every mixed flower border; it is so tidy in its growth, and so continuous in its inflorescence, that no one would wish to be without it.

Papaver bracteatum and *orientale.*—These two gorgeous perennials—the one with immense orange and black, and the other with the deepest scarlet blossoms—are invaluable for the centre of a mixed border, or to plant along the edges of a kitchen garden. They make a grand mass of colour, which is effective at the distance of nearly half a mile.

Meconopsis cambrica—the Welsh Poppy—with its numerous pale yellow flowers, is most effective dotted about here and there; and as, when once established, it becomes a perfect weed, it is no trouble to keep.

Barbarea vulgaris flore-pleno—the Double Yellow Rocket—ought to be much oftener grown than it is. Its densely crowded heads of deep golden flowers are most ornamental when tidily tied to a stake. It is not very easy to strike, and the old plants are very apt to die after blooming.

Salvia pratensis flore-rubro.—I was struck with this pretty variety, in a garden in Ireland, some few years ago, and have grown it ever since. It has numerous sepals of bright rosy pink flowers, which are very ornamental when nicely tied up.

Salvia bicolor, with its dense masses of blue and white blossoms, and *Salvia chionantha*, with its large showy white bloom, have, like their preceding congener, been unusually fine this year.

Salvia bracteata, a deep purplish crimson species, is also very effective.

Viola palmaensis.—This pretty little blue and white Pansy forms such a dense bright compact mass of bloom, that, though somewhat insignificant in size, it cannot be dispensed with in any good collection of herbaceous plants. The same remarks will apply to *Viola montana*, with its delicate sky-blue flowers, and *Viola sempeflorens*, a species covering itself with large

blossoms of the snowiest white, for which I am indebted to Mr. Tyerman.

Silené Saxifraga.—This pretty little Catchfly, with its tidy clumps of little white stars, has been very ornamental this season.

Pentstemon Kellermanni.—Under this name I received from a friend some seedling plants a couple of years ago. It has been one of the chief ornaments of the garden for the last few weeks; a perfect bush of large bright purple flowers, with handsome dark green foliage.

Pentstemon ovatum.—This pretty species ought to be far more grown than it is. Its densely crowded heads of flowers of various shades of blue are most effective both in the bouquet and the border. Can any one send me a cutting of the white variety.

Dianthus Seguierii.—This pretty Pink, with slender grass-like leaves, and bright rosy pink flowers on tall stalks, I found growing on the rocks at Fiesole near Florence some three years since. I carried the roots about in a box for nearly three months; but they grew when I got home, and have ever since had an honoured place in the garden.

Dianthus petræus.—A very dense-flowering low-growing species, with prettily fringed white flowers with a darker eye, has been more than usually fine this year. The same may be said of *Dianthus deltoides*, both red and white, and the different varieties of *D. arenarius*, another prettily fimbriated species with purple-eyed white or blush flowers.

Campanula coronata alba has blossomed with unusual beauty this year (can anybody give me tidings of the blue variety?). I have also been much pleased with *Campanula lactiflora*, *C. Trachelium flore-pleno alba*, and *C. macrorhiza*, the latter species from the South of France, resembling our British rotundifolia, both more than double the size. *C. patula* is now in great beauty.

Nierembergia rivularis, under a very dry south wall, has been very beautiful, its long white Colvolvulus-like blossoms completely hiding the leaves. It ought to have a place in every collection of hardy herbaceous plants.

Phlomis fruticosa, the Jerusalem Sage of old-fashioned gardens, has blossomed with extraordinary splendour this year, and so has the large-flowered *Philadelphus Gordonianus*. They are two of our most beautiful flowering shrubs, and not nearly so much grown as they ought to be.

Santolina Chamæcyparissus is now in great beauty—a dense bush of little golden balls.

Lilium testaceum.—This lovely Lily seems to flourish in drought. Its tall many-blossomed heads of buff flowers are a sight from which it is difficult to withdraw one's gaze.

Calamintha grandiflora alba.—This plant has been finer this dry summer than ever I remember it to have been; one large plant, covered with its large snow-white blooms, was one of the most effective things in the garden for about a fortnight.

Œnothera marginata has been for the last three weeks quite the evening star of the garden. In inflorescence it closely resembles *Œ. taraxacifolia alba*; but its much neater growth and foliage render it a far more desirable plant.

Gundelia trisectula.—This pretty neat growing Composite I raised from seeds imported by Mr. Thompson, of Ipswich, from California, where it is known by the name of "Varnish Cup," I suppose from the fact of the unexpanded flower-buds being filled with a white varnish-like liquid. Its pretty bright, large, yellow flowers make it a very pleasing addition to the mixed herbaceous border. *H. Harpur Crewe, Drayton Beauchamp, Tring, July 25.*

THE ORCHARD HOUSE AT CHISWICK.

AMID the dismantling at Chiswick, so grievous, but unfortunately so necessary a step, it is highly satisfactory to have to call attention to the fruit houses. The fine conservatory, now used as a vinery, is well known to many of our readers. The large orchard-house, which was so beautiful a sight in the spring, has not belied the promise it then held out, as will be seen from our illustration (fig. 201), representing its appearance at the present time. Both this and the Peach wall are at this time well worth a visit, and greatly redound to the credit of the superintendent, Mr. Barron.

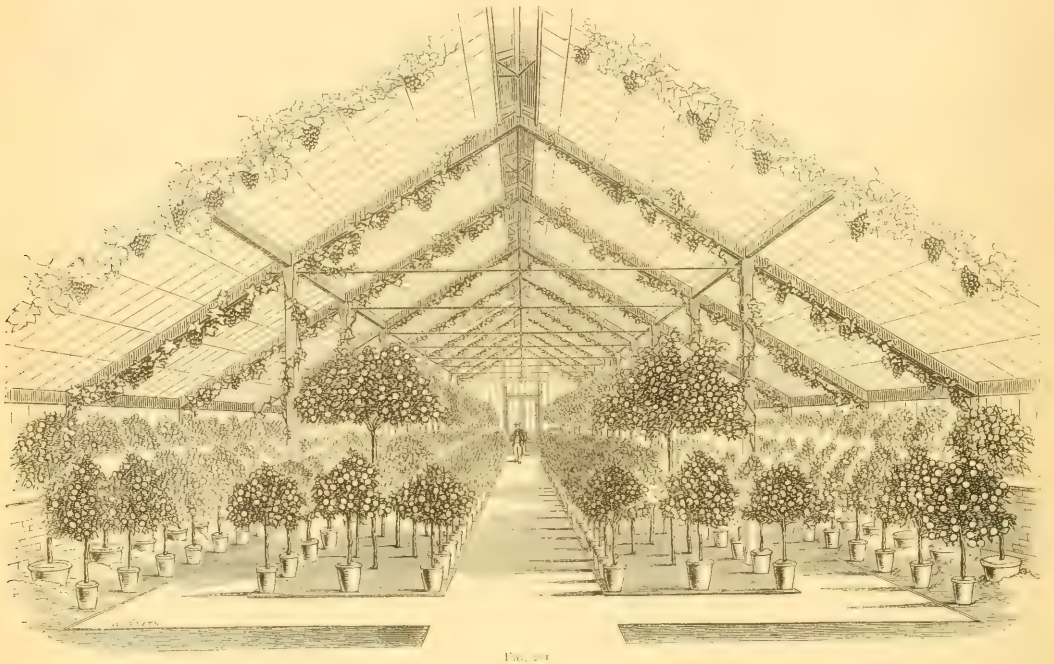

FIG. 201

We purpose shortly to print a more detailed account of the orchard-house and also of the Peach wall, accompanied by an illustration, and therefore defer further comment for the present, merely recommending those who may be able to do so not to delay their visit, but to see for themselves, that "there is life in the old dog yet."

THE GALL-MIDGE OF THE PEAR TREE.

(CECIDOMYIA PYRI, Bouché.)

FROM May till September the younger leaves and top shoots of pyramid and other Pear trees are often found twisted and doubled up, mostly in the shape of close rolls, presenting in some instances the form of a crescent. On examination such leaves will be found to harbour a greater or lesser number of footless, whitish, 14-jointed, flattened larvæ, about two lines in length when full grown.

It may be said of them, that whilst feeding they build up their own homes, because the irritation produced by their abstracting the juice of the leaf causes the latter to assume the rolled appearance mentioned above. A fortnight suffices for their full growth, when, wriggling out of the rolls, they drop to the ground and bury at once, but never deeper than about an inch. Here they turn to sculptured pupæ, each about 1⅛ line in length, showing the wings and limbs of the future fly, enclosed in separate sheaths, the head laid down on the chest, the six leg sheaths stretched straight down and along the body, the short wing-sheaths bent forward towards the leg sheaths. After the lapse of 14—21 days, the mature pupa forces its way in an upright direction out of the soil, until all the limbs are disengaged, whilst the body itself remains buried in the ground. By internal struggles the skin of the back and upper part of the body of the pupa bursts, and gradually the head, feelers, wings, legs, and body are withdrawn.

The insect, after a short rest to dry its body, is now ready for flight. It belongs to the family of the two-winged gall-midges, the greater part of which in their earlier stages live in various excrescences on sundry wild and cultivated plants. The upper part of its body is of a brownish black, the abdomen of a red, bright colour, the wings transparent and iridescent.

We will now watch the female deposit its eggs. It alights on the outer edge of the Pear leaf, and protruding its telescope-like ovipositor, it deposits a row of eggs in a straight file along the outer edge. These eggs are very minute, elongated, round, and bag-like; they hatch according to the weather, sometimes in a few hours, sometimes only after a day or two. The young larvæ begin to extract the juice of the leaf soon after their birth, and the irritation thereby produced soon induces the curvature of the edges, and the gradual formation of the rolls above described.

Having thus traced the life of this fly through its various stages, I may be permitted to point out how best to check the pernicious influence it exercises on the trees inhabited, by their leaves being rolled up, and their top shoots similarly disfigured.

As a succession of broods follow each other through the summer, the removal of the infested leaves and their destruction would only partly stay the evil; but as observation has proved to me that the last autumnal brood hybernates in the larva, and subsequently in the pupa state, sometimes in the fallen leaves and sometimes openly, just beneath the tree under the surface of the soil, I would recommend the removal of the latter to the depth of a couple of inches, either late in autumn or early in spring, before the vernal brood can make good its escape. This remedy must prove successful if carried out with all the trees infested; and if, notwithstanding, the rolls should again appear in numbers on any of the trees, the starting point of the flies will be found to be some chance seedling outside the garden wall, or in the hedge, and measures should be taken for its removal. *Albert Müller.*

ON JUDGING PLANTS AND FLOWERS.

[Read at the Horticultural Congress at Oxford on July 21, 1870, by Mr. Thomas Moore, F.L.S.]

THE object of this paper is to bring out as briefly as possible, and rather in a suggestive than an exhaustive manner, a few practical thoughts in reference to the more important of the laws which should regulate the judging of plants and flowers at horticultural exhi-

bitions. The subject is one of the greatest importance, and it is also so extensive that I can do little more than touch upon some of the more salient points. To do this effectually, it will be necessary to treat separately of:—I. Plants staged in collections; II. Plants staged as individual specimens; III. Plants and flowers staged as novelties; IV. Flowers staged in the cut state.

§ I.—As examples of the subjects which fall under the head of Plants staged in Collections, the groups of Pelargoniums, Heaths, Roses, Orchids, miscellaneous stove and greenhouse plants, &c., may be cited. In judging groups of this character, the following points should be carefully estimated, and their true value credited to the several collections, in the following order:—

1. *Conformity with the Terms of the Schedule* under which they are shown. This, it must be evident, is the first and most important point to be decided, since, if the group, as a whole, or in respect of any of its component parts, does not meet the terms under which it has been invited, it is at once removed beyond the pale of competition, and must be set aside or disqualified. On this account, it is of the utmost importance that prize schedules should be explicitly and clearly worded. Moreover, in making up a schedule, undefined groups should be avoided. They are fair neither to exhibitors nor judges; the former are uncertain what to stage, the latter cannot possibly compare and adjust the points of merit between objects which are not comparable.

2. *Health and Vigour.*—Plants which are in an evidently sickly or moribund condition are not likely to be often exhibited, but when they are, they are to be regarded as blots and blemishes. What are more likely to be seen at exhibitions are old, worn-out, debilitated specimens—plants which have served a good purpose in their day, and which still have, it may be, the recommendations of size, and of producing abundance of blossoms, but beneath which the experienced eye can detect the signs of decrepitude. Such plants as these should not be preferred before younger and more vigorous specimens merely because they happen to be larger, if the younger plants are fairly over what would be known as half-specimen size, and are otherwise good examples of cultivation as to growth and bloom. In other words, young vigorous growth, with its robust, high-coloured flowers, is to be preferred to stunted growth and starved flowers, even though the plants may be considerably smaller. This is equally true in respect to plants grown for their foliage; vigorous youth must here also come before stunted old age.

3. *Freshness and Unimpaired Condition.*—The foliage of exhibition plants should not only be well-developed, but fresh and in an uninjured state; the flowers should be perfect, and without blemish. Such plants come decidedly before others that from any cause may have become bruised, broken, or disfigured, as regards either stem, leaves, or flowers. Injuries of this sort chiefly occur in packing and transit, but all such defects must count as decided blemishes.

4. *Intrinsic Beauty.*—This may be of two kinds, floral beauty or leaf beauty, and both may sometimes count in the same group. Thus in a collection of miscellaneous flowering plants, while flowers are essential, and the floral display may carry high marks, yet where elegant or ornamental foliage is associated with these handsome flowers, still higher marks must be allowed. In florists' subjects, Pelargoniums or Fuchsias for example, on the other hand, the floral beauty of the subjects has mainly to be considered, the foliage being similar in all, while any differences it may present will have been estimated under the heads of health and freshness. Singularity of form may sometimes compensate for want of colour beauty. There may also be subjects whose beauties, such as they are, are of a plain or ordinary character, and which are not therefore effective; and such plants count rather as blemishes than otherwise.

5. *General Compatibility.*—In all collections there should be an evident fitness of plant to plant, a general resemblance, though not necessarily a rigid uniformity of character, especially as to size, quality, and style. Sometimes in marshalling his forces an exhibitor will bring into his collection some one or two magnificent specimens as a makeweight against sundry inferior ones, and with inexperienced judges the artifice now and then succeeds, since they cannot free themselves from the impulse to reward the superior plant or plants. This, however, should always be discountenanced, and a certain average amount of merit throughout the group, higher or lower according to circumstances, insisted on. The whole of the plants in the group, whether many or few, should fit into their respective places as though they had been prepared for them. There may be some larger to occupy the back or centre of a group, and some smaller to take the front places; but there should never be one or two very large plants mixed up with several very small ones, nor one or two small plants associated with several large ones. If there cannot be an approximate equality of size, there should be a gradation, and that not too sudden. As to the form of individual plants, that must vary to some extent with the subjects, especially in miscellaneous groups, but the contrast even here should not be too violent; and in the case of collections of particular flowers, as Pelargoniums, Roses, &c., there should be an approximation to symmetry and uniformity of outline, as well as of size.

6. *Size* should only count where other conditions are equal. In urging this point, it is not intended to depreciate fine, large, and really healthy specimens, since these, of whatever kind, are the pride and glory of our plant shows, but only to insist that mere size is never to be preferred to perfect health and irreproachable condition and finish. The old proverb comes in very true here—the biggest not always the best. Size is of course comparable only between different classes, some subjects naturally attaining larger dimensions than others.

7. *Variety* is an element which must be allowed to have weight after the few first and most essential points. There must be some variety, and the greater the variety after the essential points are met the better; but beyond the avoidance of positive sameness too much importance must not be attached to the mere circumstance of a group being highly varied. This is one of the points upon which schedules should be made especially clear, so that it may be thoroughly understood if distinct species or varieties are required, and whether or not duplicates are admissible.

8. *Facility of Culture.*—The least weight should be attached to the plants which are most easily cultivated, other points being equal, though, as a considerable amount of skill is necessary to bring any plant into a state fit for exhibition, too much importance should not be attached to plants of difficult culture. An easily grown plant, thoroughly well done, perfect in every point, may even be better than a moderately good plant of a more difficult subject, and is certainly better than an inferior one of that class.

9. *Rarity and Intrinsic Value* take about the same position as facility of culture and variety. All these may be, and should be, taken into account, but they are scarcely essential, and certainly not of primary importance. Rarity is the least important of them all, since it may add nothing to the beauty of the show; and the money value of the objects is not the ground upon which the plants are brought into competition. As auxiliary points in collections that come near together in merit, these may be fairly considered; but certainly too much importance should not be attached to them. Horticultural exhibitions are held for the display and reward of cultural skill, not for the appraisement of the objects shown. The latter is a consideration more suited to an auction room than a flower show.

§ II. The considerations which give importance to the several points of merit in the case of plants staged as Individual Specimens, and which may include such subjects as Azaleas, Heaths, Pelargoniums, Orchids, Palms, Ferns, or any of the plants included in miscellaneous collections, are almost, if not exactly, the same as those already advanced, and therefore need not be repeated. They should be taken in the order indicated, and perfection in each should in these cases be insisted on.

1. *Conformity with the Terms of the Schedule.*

2. *Health and Vigour* as opposed to weakness and infirmity.

3. *Freshness and unimpaired Condition* as opposed to decay and mutilation.

4. *Intrinsic Beauty*, which must here include, so far as they properly attach to the particular kind of plant under examination, such points as free and symmetrical habit, profusion of well-displayed flowers, pure or pleasing colours, firm and enduring flowers, and succession of bloom,—points which will be more specially noticed under § III., New Plants.

5. *Facility of Culture.*

6. *Size.*—The comparison in respect to size must not be absolute but relative, in those classes where mixed subjects compete together.

7. *Rarity and Intrinsic Value.*—Where specimens of one particular kind of plant—say Azaleas or Heaths—are brought together for adjudication, there is comparatively little difficulty in arriving at a correct decision by such stages as those indicated by the foregoing points; but it is not so easy to arrive at a satisfactory conclusion in the case of miscellaneous specimens when shown together in the same class, since the consideration of the value of the plant will obtrude itself, and will affect different minds in a different manner, according to peculiar tastes or fancies. Hence, at least special subjects, Orchids for example, which generally bear a high money value, should have separate classes assigned to them, and should not be left open to compete with such plants as Fuchsias, or even such as Ixoras, Allamandas, &c.

§ III. The consideration which should govern the award of prizes to New Plants and Flowers—that is, subjects staged as novelties, have been already noted in a paper published in the first volume of the Society's Journal, but in order to present a more complete view of the subject, I will here briefly recapitulate what I have therein advanced.

(*a*). Flowering Plants.—The features which are the most desirable in a plant cultivated as a decorative object for the sake of its flowers, that is, in an ornamental flowering plant viewed as a whole, are the following:—

1. *Free and Symmetrical Habit of Growth.*—Whether naturally slender or robust an ornamental plant should at least be free in the development of its parts, and should present something like regularity in its growth, so far as that can be realised in conjunction with its natural habit. The plant should not be of a stubborn immovable character, resulting in a stunted aspect, nor must it be of a delicate constitution, such as gardeners call "miffy." In a general way it should be compact and bushy, so far as its natural character permits—the opposite of lean and straggling in its mode of growth. Sometimes, it is true, a bad habit may be overcome by the skill of the cultivator, but it is better that a good habit should be inherent. Even in a climber lanky long-jointed growth is not desirable.

2. *Profusion of Flowers well displayed.*—There should not only be an abundance of flowers produced, but they should be so disposed as to be effective; that is, they must not be hidden amongst the foliage, nor, if their beauty depends upon a view of their face, must they hang about loosely so that the face cannot be seen. If they are pendent, it should be with natural grace. They should not be crowded by foliage, nor crushed among themselves by being over numerous, or disadvantageously set on.

3. *Healthy Leaf-development.*—No plant can be really beautiful which has not well-grown and well-coloured healthy foliage; but the leaves should generally be subdued in comparison with the flowers, and must not in any case be disproportionately large or numerous. If the foliage is handsome, so much the better, but it must be healthy and wholesome-looking.

4. *Bright, pure, dense, or pleasingly-contrasted Colours.*—All dull dingy colours stamp a flower with inferiority, though they may sometimes be permitted as curiosities, especially if the flower is of some very remarkable form in its family, or presents some peculiar novelty.

5. *Form and Substance of Flowers and Endurance.*—Unless flowers put on some of the best forms which their particular type may be capable of yielding, and are stout and durable in texture, they neither present the highest beauty of which they are capable, nor do their beauties of whatever order continue. Flimsy flowers soon perish, and are hence much inferior to those of stout enduring substance.

6. *Succession of Bloom.*—It is a greater merit to produce a succession of flowers, in order that the blooming season may be prolonged, provided they are not thereby rendered scanty and scattered, than to give a flush of flowers, the beauty of which is fleeting, and then not to blossom again for a considerable period. Next in merit to a plentiful succession of flowers, comes a good head of bloom; and those plants are of the least value for ornamental purposes which only bear a few scattered blossoms at long intervals of time.

7. *Size of Flowers* is an advantage, all other points being equal; but size is apt to degenerate into coarseness, and hence it is not a feature to be estimated too highly.

8. *Distinctness.*—If it were not for the development of this characteristic, our flowers would lack half the charms they now have, owing to the almost endless variety they present; and hence this feature of distinctness should be made a *sine qua non*. A new flower which has not appreciable distinctness has no advantage over the older ones which resemble it.

9. *Grateful Odour.*—A pleasant perfume is a great advantage in any flower, and must have its full weight in making every award to a new plant.

10. *Novelty.*—A decidedly new character is worth recognition in the absence of any other merit; for if the plant presenting it does not in other respects give us exactly what we desire, the new feature is to be regarded as the first step towards obtaining a new race; and to produce a new race is equivalent to the addition of a new province to the kingdom of Flora. If the new feature is some manifest improvement so much the better, but a new feature, though not in itself a direct and present advantage, may lead to something which is desirable. When, moreover, it is made an aim to develope, in connection with the novel character, the elements of beauty or utility, in which it may be deficient, this aim will in almost all cases be sooner or later realised, owing to the plasticity of vegetable development.

(*b*). Foliage Plants.—In regard to plants grown for the sake of their foliage, many of the points of merit are the same as those sought for in flowering plants. The most desirable features appear to fall under the following heads:—

1. *Free and Symmetrical Habit of Growth.*—This feature is even more essential here than in the case of flowering plants, as great part of the beauty of the specimen necessarily depends upon it.

2. *Healthy Leaf-development.*—As the beauty of the plant is to be sought in its foliage, the leaves must at least be developed in a healthy and vigorous manner.

3. *Gracefulness or Nobility of Aspect.*—Most of the plants grown for foliage alone are prized on account of one or other of these features. Hence a common-looking plant which does not possess either one or the other, and does not yield showy flowers as a compensation, must be held to possess little merit from the decorative point of view, however curious or interesting it may be in other respects.

4. *Endurance of Foliage.*—When the beauty of the plant depends on the appearance presented by the foliage, it is obvious that the more enduring the character of that foliage, the longer will the plant retain its beauty. Hence endurance in the foliage becomes a

very important quality. A deciduous plant is on this ground less valuable *per se* than an evergreen, although it may be good in its way, or in its season. But, then, evergreens and deciduous plants are not strictly comparable.

5. *Distinctness.*—When the beauty of a plant has to be sought in its leafage alone, there is much less scope for variety than when flowers are superadded; but it becomes all the more essential to avoid the sameness of aspect which must prevail, if distinctness of character is not insisted on.

6. *Pleasing and Well-marked Colour.*—The leaf, that is to say, should, if green, be of a good pleasant healthy-looking green, and if of any other colour, it should be of some decided and agreeable tint or tone.

7. *Well-defined Colours or Markings.*—This is an essential part of beauty in the case of variegated leaves, and variegation is a condition commonly presented by what are called ornamental foliage plants. A cloudy intermixture of colours in leaves, as in flowers, is seldom or never effective.

8. *Novelty of Character.*—Though only to be valued as the stepping-stone to the production of new races, as in the case of flowering plants, yet when combined with other elements of beauty, or as indicating features which may be improved upon and worked up to greater perfection, this is a property much to be desired.

It may here be observed that stove plants, greenhouse plants, and hardy plants, require to be judged independently of each other. At first sight it might appear needless to estimate separately the merits of these several groups, since it might be said that hardy plants, the lowest in value, intrinsically, stand really at an advatage in being suited to the means of a larger number of cultivators than would be able to accommodate hothouse plants, owing to the more costly nature of the conditions necessary to the successful production of the latter; while to some cultivators, who cannot command any such costly appliances, they would, of course, be all in all. On the whole, however, the several classes may be placed on an equality in so far as concerns the judgment on their merits as new plants; for whilst an advantage must be admitted in the case of the hardier subject, on the ground of its more general applicability, an advantage must certainly be accorded to the hothouse plant on the ground of intrinsic value. But still I would urge the adoption of this rule, that plants of the classes denominated stove, greenhouse, and hardy, should be compared only among themselves. This limitation should indeed be carried further, for annuals, perennials, and shrubs or trees should in the same way only be compared amongst themselves; and of the latter, deciduous plants and evergreens can only be fairly compared with plants corresponding in character. The same may be said in reference to plants of any specially marked group, such as Agaves or Orchids. To ascertain if a hardy Conifer was of first-class merit, it would be useless to compare it with a Fern or a Palm.

Further than this, plants adapted for blooming in the winter, or spring, or summer, or autumn seasons, must be judged in their relation to those particular seasons, and must not be rigidly compared except with those of their own season, because, in order to avoid a scarcity of flowers at any period, it is necessary to cultivate such as will extend the flowering period throughout the year. A plant may thus be really valuable on account of its blooming in winter, which would be regarded as comparatively worthless in summer, for the mere fact of producing blossoms during winter is sufficient to outweigh a multitude of minor defects. Hence may be deduced another conclusion, namely, that the rules by which new plants are judged must be relaxed in inverse proportion to the supply of flowers obtainable at the particular season in which they bloom. These general considerations must be allowed their full force in applying any set of rules for the determination of the merits of new plants.

(*c*). Florists' Flowers.—Though various in character, these admit of more ready and exact comparison than the subjects of the two preceding groups; for the number of organs to be adjudicated on are fewer, and hence the requisite features admit of more exact comparison and definition, which definition has been already well worked out by florists. The features to be specially sought, and their relative value, are these :—

1. *Form.*—In most single flowers this should be circular, or, where the circle will not apply, symmetrical. In double flowers there should be a semi-globular outline. Compound flowers follow the same law as double flowers. Tubular flowers, and some others of peculiar forms, offer exceptions, which can only be dealt with individually.

2. *Substance.*—The texture of the petals must be stout and dense if the flower is to be durable, for if flimsy it soon gives way, and loses both form and colour.

3. *Smoothness and Flatness of Edge and Surface.*—These qualities are eminently necessary to give refinement to the flower. A coarse rough-surfaced flower bears no comparison with one of velvet-like smoothness and softness, and evenness of margin is equally necessary. A regular series of wart-like spots, as in the case of some Lilies, is, however, admissible. In some cases, but not often, a well-developed fringe or frill is also admissible.

4. *Colour.*—This must be bright or pure and decided in self-flowers (that is, flowers of one colour), and clearly-defined and well-contrasted in striped or laced flowers.

5. *Fixity of Colour* is a quality of some importance, and depends partly, but not wholly, on the texture or substance of the corolla.

6. *Proportion of Parts to the Whole* is an essential element of beauty, but, as this depends on the actual form, it must be defined individually in the different kinds of flowers.

7. *Size* is an advantage, so that it is not disproportionate nor conducive to coarseness, but it is very apt to degenerate into coarseness.

8. *Distinctness* is absolutely necessary for the sake of variety.

9. *Novelty* is a quality always welcome, as it enlarges the field of floriculture; but to count as a point in judging the change must not be a mere variation, but a decided difference of form or feature. The merit of any novelty of feature, moreover, must always be estimated subject to the higher qualities of form, substance, smoothness, proportion, &c.

§ IV. Cut flowers for competiton are always shown in collections, *e. g.*, Roses, Carnations, Pansies, Gladioli, Hollyhocks, Asters, &c. Hence, many of the points advanced under the head of Plants staged in Collections (§ I.), apply to these also; but there are additional points, such as those advanced under New Florists' Flowers (§ III. *c*.), and over and beyond all these come in the special properties of each particular kind of flower. Time will not permit me to enter into detail on these points, and I will therefore merely mention those which are of general application, or nearly so :—

1. *Conformity with the terms of the Schedule.*
2. *Freshness, and unimpaired Condition.*
3. *Special Properties* of the particular flower under judgment, and more particularly as regards :—Form, substance, smoothness of texture and margin, purity and definition in colour.
4. *Variety.*

The only strictly accurate mode of judging is by allotting marks to each collection or plant in respect of each point of merit, and finally summing up the total. This may seem a tedious method of arriving at a result, but it need not be so in reality; and it is practically the method under which, by means of a mental process, our best judges arrive at their decisions. When this plan is adopted there is no guesswork, but the sum of the merits of a plant or a collection must come out accurately. I can only here briefly indicate how the method may be applied :—

In Section I., that is, Plants staged in Collections, the first point settles whether the collection is admissible or not—nonconformity with the schedule means disqualification. The other points must be gone over *seriatim*, and a decision arrived at whether each plant can be marked as good, bad, or indifferent, in respect to each point. As the points are not all equal I would allow double marks for the points of primary importance, and single marks for the secondary ones. Under the former good would be represented say by 6 marks, indifferent by 3 marks, bad by 1 mark. Under the latter good would stand at 3, indifferent at 2, bad at 1. With a little practice these numbers would be soon run out, even in a collection of a dozen or a score of plants, especially if prepared slips with columns for the different points were handed to the judges previous to their commencing their duties. I should put the points numbered 2, 3, 4, and 5 (health, freshness, beauty, compatibility) in the first category, and 6, 7, 8, and 9 (size, variety, facility of culture, rarity, and value) in the second, as regards collections of flowering plants; and 2, 3, and 4 (health, freshness, beauty,) in the first, and 5, 6, and 7 (facility of culture, size, rarity,) in the second category, as regards specimen plants. In this way the decisions in §§ I. and II., and even § IV. may be very accurately made out, these groups being all competitive.

In the case of new plants, the subjects require a different treatment, the object being to determine their intrinsic, not their comparative merit. Here, consequently, a fixed number, say 100, should indicate the highest degree of excellence, and any lesser number awarded will show the degree in which they approach this highest degree of merit. Practically those plants which gain 75 marks or upwards would be 1st class in merit; those which gain over 50 up to 75 would be 2d class; and those which gain only from 30 to 50 would be 3d class. In these cases the full number assigned to each meritorious feature is only to be awarded to the perfect condition of that feature, and any lesser proportionate number according to the actual degree of merit.

In reducing this to practice, the following would be the marks indicating the highest degrees of excellence in the case of New Flowering Plants :—

1.	Freeness of habit	15
2.	Profuseness and display of flowers	15
3.	Healthiness of leaf development	15
4.	Purity, brightness, or contrast of colour	10
5.	Endurance of substance, and form of flowers	10
6.	Succession of bloom	10
7.	Size of flower	10
8.	Distinctness of character	5
9.	Gracefulness of odour in leaves or flowers	5
10.	Novelty of a decided kind	5

= 100 marks.

Glaring defects amongst new flowering plants would be presented by the undermentioned peculiarites, each of which should reduce the award by 10 :—Straggling habit, flimsy flowers, muddled or dingy or fleeting colours, fœtid odour.

The following is the scale proposed for New Foliage Plants :—

1.	Freeness of habit	15
2.	Healthiness of leaf-development	15
3.	Gracefulness or nobility of aspect	15
4.	Endurance of foliage	15
5.	Distinctness of character	15
6.	Aggeableness of colouring	10
7.	Definition in markings	10
8.	Novelty	5

= 100 marks.

As glaring defects which may occur in this class of plants, may be mentioned the following peculiarities, each of which should reduce the award by 10 :—Straggling habit; flimsy, tender, rapidly perishing leaves; indistinct or fleeting colours or markings.

In the case of New Florists' Flowers, the points of excellence would bear the numerical ratio indicated below :—

1.	Form	15
2.	Substance	15
3.	Smoothness	15
4.	Colour	15
5.	Fixity of colour	10
6.	Proportion	10
7.	Size	10
8.	Distinctness	5
9.	Novelty	5

= 100 marks.

The most glaring faults in this class of subjects are to be found in the following features, which are in most cases altogether incompatible with a high position :—Open eyes, as they are called, when double flowers show any part of the disc or centre; split petals or florets; run or confused or fading colours; roughness of outline or surface.

JUDGING FRUITS.

[A Paper read at the Congress at Oxford, on July 21, 1870, and forwarded for publication by the Author.]

Dr. Hogg, after a few preliminay observations, said —Though the judging of fruit has on various occasions occupied the attention of those interested in the subject, and has from time to time been discussed in the public prints by those most competent to deal with it, I am not aware that any common understanding as to the bases on which fruit-judging should rest has yet been arrived at. Notwithstanding this want of a written law on the subject, the practice of judging fruit is followed with results which, though not always agreeable to unsuccessful competitors, are, upon the whole, generally accepted and acceptable.

It is not my intention to submit anything to this meeting which can be regarded in any light as a solution of the question—Upon what principles ought fruit to be judged? This I will leave to be dealt with by those of my audience who are sufficiently versed in the subject, and who feel themselves competent to do so. All that I shall do is to state the motives which actuate me in coming to the conclusion I do when I am acting the part of a fruit judge, leaving others to set up any other code they may think better and more in accordance with their own views.

And first, let me remark that, in judging fruit at exhibitions, I think we ought to do so upon different grounds to those upon which we should judge it at our own tables. We must bear in mind that exhibition fruit is exceptional, and is produced by the greatest effort of the horticultural skill of the exhibitor. It generally receives an amount of attention which he cannot afford to bestow on a general crop, provided his establishment is an extensive one; and we ought, therefore, to regard the exhibition fruit of a gardening establishment very much as we should the exhibition ox—as the exceptional animal on the farm. In judging fruit, therefore, we must first look to those points which exhibit the greatest amount of horticultural skill, and the first of these are size and symmetry.

In judging size and symmetry we must deal with each variety on its own merits. It would not be fair, for instance, to judge on the same grounds a bunch of Buckland Sweetwater Grape and one of White Muscat of Alexandria. A bunch of Buckland Sweetwater may be much larger than, and equally as handsome as, one of Muscat of Alexandria, and both may be in every point what gardeners call "well finished;" but the skill required in producing such a bunch of Muscat of Alexandria being much greater than that which is required to grow the Buckland Sweetwater, and the Muscat of Alexandria being a much superior fruit, I would give the preference to the latter, although inferior in size to the former. The same may be said of Black Hamburgh and Black Prince shown in the same class, though not on the ground that Black Hamburgh requires greater skill in the production of it, but because it is a superior fruit.

It matters not what description of fruit we may be judging; be it Grapes, Pines, Peaches, or any other fruit, size and symmetry are the features which first attract our attention, and therefore to size and symmetry, but not to size apart from symmetry, I attach, perhaps, the greatest importance when other points are not greatly deficient.

The next important feature is colour, requiring much skill in the development of it. This is by some regarded as of even greater importance than size and symmetry. I am rather inclined to give colour second place, except when it is unusually fine, and the difference of size and symmetry between the competing fruit

is not great. In such a case I would certainly give the preference to colour, for I conceive that in such circumstances there is a greater exhibition of horticultural skill in producing the highly-coloured fruit than in producing the larger, because it betokens attention to the maintenance of the just equilibrium between the action of the roots and that of the leaves, and a knowledge as to the crop the plant is capable of producing, without which I conceive no fruit can be well and perfectly coloured. One may feed and force a plant so as to induce it to produce large and showy fruit; but unless the treatment is so regulated as to preserve the just equilibrium between the root, which serves as the mouth, and the leaves, which perform the functions of digestive organs, there is no guarantee either for high colour or perfect flavour, which generally go together. Still, I say, when fruit has not an objectionably bad colour, and is not deficient in flavour, but has size and symmetry much in advance of another which possesses higher colour and better flavour, but is much inferior in size and symmetry, I would certainly give the award in favour of the larger fruit.

The next point on which I have to touch is flavour; and here I know there is a great diversity of opinion. Some hold that the beginning and the end of all fruit culture is flavour; no matter how large or how small, or however badly coloured, the fruit may be, if flavour is obtained the grower has got all he has ever striven for. Now that is very well when fruit is grown merely for private use; and so long as the palate is satisfied there is no other desire to be gratified; but we are now discussing the merits of exhibition fruit, into which the whole energy of the cultivator is thrown to develope, not one, but every feature of his production, and the greatest display of cultural skill is to succeed in gratifying the mind as much through the eye as through the palate. It is not to be supposed that I depreciate flavour. On the contrary, I consider it an important point in making awards to exhibition fruit; but it ought only to come in when the competition is otherwise so close that another point is required to turn the scale.

There is only one exception I would make on the question of flavour, and that is in judging Melons, which, if they have not flavour, have nothing whatever to recommend them. They may be Vegetable Marrows, or Pumpkins, or any other vegetable production, if flavour is absent; and I think experience will testify that if the flavour of a Melon is even but indifferent, then the fruit is not worth eating, and hence I think all Melons ought to be cut, and judged by flavour only.

In the discussion which ensued on the reading of Dr. Hogg's paper, Mr. Marshall said that flowers were grown to please the eye, and therefore were judged by the eye; but fruit being grown to please the palate, he thought that flavour should stand first as being more requisite, say to the Grape, than either size or colour.

Mr. Ayres remarked that it should be the duty of the Society to say that all fruit should be grown for use, and not merely for exhibition; he would certainly consider flavour as the first requirement.

Major Clarke thought that fruit was produced commonly on two distinct principles, one to obtain fruit for exhibition, and the other to obtain it for dessert. The man who could combine these two principles he should certainly choose for his gardener.

ON PITCHER PLANTS.

[Read at the Horticultural Congress at Oxford on July 21, 1870, and forwarded for publication by the Author.]

The plants upon which, with your permission, I intend to offer a few cultural remarks to-day, and of which I have brought a few small specimens for your inspection, are amongst the most curious of Nature's productions which have hitherto been introduced to our gardens. They are known popularly as "Pitcher Plants," from the curious ascidia or pitcher-like bodies which terminate the midrib of their leaves.

In treating of Pitcher Plants, I shall confine myself exclusively to the genus Nepenthes, although, did time permit, the genera Sarracenia, Darlingtonia, and Cephalotus would be found equally deserving of attention.

Of Nepenthes we have now a considerable number in cultivation. Some are hybrid forms, which have been produced in this country, but the majority are introduced species, and, what is very singular, we appear to have introduced the least interesting kinds first. There are many large and most remarkable forms yet to introduce, which will be grand acquisitions for our plant stoves. The names of those in cultivation are:—Nepenthes ampullacea, N. ampullacea picta, N. distillatoria, N. distillatoria rubra, N. Dominiana, N. gracilis, N. gracilis major, N. hybrida, N. hybrida maculata, N. Hookeriana, N. lævis, N. phyllamphora, N. Rafflesiana, N. sanguinea, and N. villosa.

Some of these are hybrids which have been produced in the establishment of Messrs. Veitch & Sons; but beautiful as many of them are, they are entirely eclipsed by some kinds yet unintroduced, such as Nepenthes Lowii, N. Rajah, N. Edwardsiana, N. Boschiana, and some others, which I am extremely anxious to see in cultivation.

Many absurd stories are in circulation respecting the uses of the curious ascidia developed at the extremities of the leaves of these plants. The most popular amongst these describe how the plants are endowed with such extraordinary vitality as to enable them to grow in arid sandy deserts, where nothing else in the shape of vegetation exists; that they have the power of distilling water to fill their pitchers; that the lids are closed down to prevent evaporation; and that birds, animals, and even man is accustomed to resort to them to allay their thirst with the cool and pure water found therein. It is scarcely requisite for me to state that these are nothing but pretty fancies, the fact being, that they grow in boggy swampy soils, and cannot exist long in an arid atmosphere.

In Nepenthes Hookeriana and N. Rafflesiana an extraordinary alteration in the form of the pitcher takes place as the plants attain height. Thus, the leaves which are near the base, and the lateral growths, produce pitchers broad at the base, broadly winged in front, with ciliated hairs at the edges, and the long petiole is attached in front, and passes up between the wings. But in the pitchers produced higher up the stem a wonderful alteration takes place: the petiole is attached behind, the pitcher becomes narrow at the base, and the wings entirely disappear. To the cause of this alteration of form I have utterly failed to obtain the slightest clue, and I should be extremely glad to hear the opinion of any gentlemen present who may have given some attention to the subject.

The species of Nepenthes appear to be entirely confined to the Old World, and chiefly find their homes in the islands of the Indian Archipelago, where they grow in boggy soil at considerable elevations—indeed, in some instances up to 9000 feet—the mountain of Kina Balou, in Borneo, appearing to be their headquarters. Two species (N. cristata and N. madagascariensis) are found in Madagascar; the Philippine Islands also produce one or two species, which, however, are not peculiar to them, and one species (N. gymnophora), which grows plentifully in Java and several other islands, is also found in New Caledonia. Another species (N. phyllamphora) is said to grow on the Khasia Hills, at an elevation of some 3000 feet, and this is probably the extreme northern limit of the genus.

Few people have had the pleasure of raising Nepenthes from seeds, and this brings me to my principal object in writing these remarks; for as there are a quantity of grand species yet to be introduced, a few of which I have already named, and as it is not generally known that the seeds of these plants do not long retain their vitality, I wish to impress upon the minds of any and all who are either about to proceed to the countries they inhabit, or who may have friends resident there, the absolute necessity there is that seeds should be sent home by post as soon as gathered; and I wish our home cultivators to remember that these seeds should be sown immediately upon arrival, irrespective of the season. It has been my good fortune, during the course of my gardening experience, to raise young plants of N. distillatoria both from home-grown and imported seeds, and I may safely say the pleasurable feelings created in watching their curious leaves unfold, far surpassed that derived from the growth of any other seedlings, but at the same time, the doubts, hopes, and fears for their welfare were equally increased.

Under the impression that an account of my system of raising these seeds may be of service to some, I shall in concluding this paper offer a few remarks on that subject. The seeds having been obtained, take a well-drained seed pan or pans, and fill up to within an inch or two of the top with a mixture of peat and Sphagnum moss in equal parts, adding a little silver sand to keep it sweet. Upon this the seeds should be sprinkled, and not covered with soil. This may seem wrong to those obtaining the seeds for the first time, because they will appear to be large, but, if examined, they will be found to be in reality very small, and enclosed in a long loose tunic-like covering, which is evidently a provision of Nature to float the minute seed to a safe position for its germination. This loose coat also serves to protect the roots during the early stage of existence, for it is some time after germination before roots are protruded from the tunic. The seeds having been sown, the pan must be either covered with a bell-glass, and plunged into a bottom-heat of about 80° or 85°, or what is better, the seed pans should be placed in a small close frame, where this heat can be maintained. In this temperature they should begin to germinate in the course of a month or five weeks; and it is very curious to observe that the very first leaf which is formed after the seed leaf is like a little pitcher—not like those you see upon the plants now before you, but very much resembling miniature leaves of the Sarracenia purpurea. These are produced freely and quickly, and the plant soon resembles a little ball, with its numerous almost sessile leaves. As soon as the roots begin to spread, the seedlings should be transplanted singly into very small pots, but still kept in the same temperature and close moist atmosphere until they begin to assume their normal form.

These plants will succeed either in pots or in baskets. I prefer the latter, because they display their beauties to the greatest advantage; but whether grown in pots, baskets, or tubs, or planted out in a prepared border, it must be borne in mind that they require more surface than depth, and that the soil must be open to allow their black woolly-looking roots to spread. Frequent applications of water over the foliage, through the agency of the syringe, will be necessary during the day, and a liberal supply to the roots will be found advantageous. These rules being attended to, and the plants shaded from the sun's rays to a greater extent than is usually done, Nepenthes will not be found difficult to cultivate, whilst their unique and peculiar beauty is a never-failing source of wonder and astonishment.

In conclusion, I sincerely hope to see the species we already have, cultivated to a far greater extent than has hitherto been the case, and the fine species from Borneo and the surrounding islands speedily introduced to our gardens. *B. S. Williams, Victoria Nursery, Upper Holloway.*

BURGHLEY PARK CHERRY.

In this we have a Cherry of rare excellence, fine in quality, of large size, and of handsome appearance. It is a seedling raised at Burghley Park, Stamford, the seat of the Marquis of Exeter, by the *chef de cuisine*, more than 30 years ago. The gardens at that time were under the charge of the late Mr. M'Intosh. Although it is thus old, it has never been brought very prominently into notice until now. The tree has had the reputation of being a shy bearer, the crop being generally very scanty, but so extremely fine, that Mr. Gilbert, the present clever gardener there, was instructed to use his best powers to obtain a full crop, and he has succeeded. By a simple stroke of common sense—by leaving a supply of the young wood at winter pruning, instead of cutting it all off as formerly—a most abundant crop has resulted, the whole tree being literally laden with glorious fruit. "It belongs to what is styled the Red Duke class. The fruit is very large, fully an inch in diameter, slightly elongated or oval in shape, and flattened at times on the sides. The skin is very thin, transparent, showing the flesh through when fully ripe: when commencing to ripen it has the appearance of a Bigarreau, but gradually changes to a brilliant dark red the longer it hangs; the stalk is long and rather slender; the flesh is of a dull yellowish red hue, veined or netted, very juicy and melting, with a sweet acid flavour, very pleasing and refreshing. Mid season."

The above fruit was awarded a First-class Certificate by the Fruit Committee at the Royal Horticultural Society's meeting at Oxford, and we think deservedly so. It is undoubtedly a seedling and a first-class fruit, which ought to have been brought forward many years ago. The question, however, arises as to its distinctness from other varieties now in cultivation, and of this we have some doubt. We are inclined to think it will prove to be the same as Reine Hortense, a well-known and much appreciated variety, which has time after time been raised from seed, and sent out as a new variety. In Hogg's "Fruit Manual" we find this variety enjoys no less than 19 synonyms, the better known of which are Lemercier, Merveille de Hollande, Monstrueuse de Bavay, Monstrueuse de Jodoigne, Belle Supreme, Seize à la Livre, &c. *B.*

STOCK AND SCION.

The following paragraphs are extracted from an essay read before the Warsaw (Ill.) Horticultural Society, at its February meeting, by its President, A. C. Hammond, Esq.:—

It is now generally conceded by intelligent writers and cultivators, that the stock affects the fruit of the scion in quality, productiveness, and time of bearing; and that the scion increases or retards the growth of the stock, and, in some instances, imparts its own peculiarities to the root. Because a tree, under certain conditions, is tender and unproductive, it does not necessarily follow that under all conditions it will be so. Every observing orchardist has noticed the difference in the growth, hardiness, and productiveness of the same variety, when a portion of his trees have been root-grafted and a portion top-grafted. Some varieties succeed best on their own stock, others on a borrowed one. It is therefore evident that we cannot be governed by any arbitrary rules in this matter, but must be guided by the light of experience, and should study the habits and peculiarities of each variety, if we would obtain the best results.

Some horticultural writers tell us that root-grafted trees are shortlived and unproductive; others, that they are superior to those propagated in any other way. Probably these opinions have been reached without proper investigation, and both are partly right and partly wrong; for, as I before remarked, it is very evident that some varieties are successful root-grafted, and others are not. For instance, the Red June, which has a great number of small fibrous roots, reaching but a short distance, soon absorbs all the specific elements necessary for the formation of perfect fruit, when the fruit becomes small, scabby, and worthless. But if double worked on a strong, free-growing stock, well supplied with strong, far-reaching roots, like the Pennock, or Pryor's Red, it succeeds much better, but it is longer coming into bearing. The Westfield Seek-no-further and Wagener, when root-grafted, throw up a great number of watery sprouts, which affect the growth and health of the tree. But when worked above the collar, this objection is obviated, and the tree is much more healthy and productive. Again, the Yellow Bellflower, Summer Queen, and Red Astrachan

root very readily from the scion, and thus soon become established on their own roots, which are very strong and numerous. In this condition they grow very rapidly, expend all their energies in producing wood, and therefore yield little or no fruit. But top-work them on a slow-growing stock, and they become productive. On the other hand, the Ben Davis, Little Romanite, and Maiden's Blush, being well supplied with both fibrous and large extending roots, grow very rapidly, come into bearing early, and annually produce large crops of perfect fruit. Top-grafted, they grow with less vigour and are not so productive.

But, says the planter, if all varieties do not succeed root-grafted, why is this mode of propagation so universally practised by our nurserymen? Why do they not rather propagate each variety in that way that will make the most successful tree? We must bear in mind that we live in an age of tree planting; that the demand is for cheap trees, and that it often exceeds the supply. And when we remember that root-grafted trees can be put into market in half the time and for half the price of those stock-grafted, we shall be able to understand why all are propagated alike. There are doubtless some varieties that, if double worked on such a stock as the Pryor's Red or Ben Davis, would be intrinsically worth five times as much as when they are propagated in the usual way. And in my opinion, the time is not far distant when our western farmers will understand this matter, and be willing to pay for trees in proportion to their value. And as the demand increases, our enterprising nurserymen will soon be able to furnish the requisite supply.

That I may not be misunderstood on this point, I will say that, in my opinion, root-grafted trees are just as reliable as they would be stock-grafted on promiscuous seedlings; and that to secure the best results we must work those sorts that do not succeed root-grafted, on certain cultivated varieties that we know will produce the desired results.

As to the propriety of grafting old orchards, there is much diversity of opinion. In the Eastern States they find no difficulty in changing the tops of their trees from one variety to another; but our climate is so fickle, and we have such great extremes of heat and cold, that it is very difficult to get a new top established on a tree after it has reached the age of twelve or fifteen years, without a portion of the old wood becoming diseased. Yet we have so many varieties that are but cumberers of the ground, that it becomes necessary to make many changes. And here the question arises—What varieties shall I work on my unprofitable trees to secure the best results? All of us have more or less of Red June, Summer Rose, and Newark Pippin, which are very slow growers, and have been found unprofitable. On these I shall work Yellow Bellflower and Red Astrachan, as the stocks will dwarf them sufficiently to bring them into early bearing. Some of us have planted quite largely of Winesaps—from 20 to 50 per cent. of our whole planting. While I would not think of discarding this variety, nevertheless it has suffered so severely from scab and spur-blight the past season, as to cause it to be looked upon with some suspicion, and I would therefore suggest the propriety of reducing it to 15 or 20 per cent. of the whole number of trees in the orchard. Upon my own trees of this variety I shall work Red Canada, Grimes' Golden, and Willow Twig.

In many orchards we find White Bellflower, White Winter Pearmain, Summer Queen, Limber Twig, Grindstone, and numerous varieties of sweet Apples, which have been found to be worthless. On these I should not hesitate to graft Peck's Pleasant, Red Canada, Maiden's Blush, and Willow Twig, as these varieties will succeed under any ordinary circumstances. True, many of these trees will not make first-rate or even second-rate stocks; yet when they are under ten or twelve years old, it will be found profitable to top-graft with some productive variety.

It is a melancholy fact that very many of the orchards in the West are cumbered with unprofitable varieties; hence, anything tending to a correction of the evil is worthy of consideration. *The Horticulturist, St. Louis.*

Home Correspondence.

The Oxford Show.—Adverting to the remarks upon the above project which I forwarded to you in November last, and which you suggested should remain unpublished until after the Oxford meeting, I am sorry to find that the force of my suggestions has been intensified, and that we have now to lament a decided failure if not a serious pecuniary loss. The impropriety of the union of these two great exhibitions must now be patent to every one; it is, I think, quite clear that the Society must either abandon its itinerary visits, or for the future go its own way. In suggesting this much I would say that the *impedimenta* of the assistance of local societies might well be got rid of, for what the Royal Oxfordshire Horticultural Society contributed to the exhibition, which would not have been there without its assistance, I am at a loss to determine. A small exhibition of really superior productions, neatly and artistically arranged, would be infinitely superior to tent after tent of subjects, not one of which, in the eye of a person of taste, exceeded the rank of mediocrity. They might be very good "for Oxford," but visitors do not want to travel hundreds of miles to see productions which they would find better represented in every decent market town in the three kingdoms. The Royal Horticultural Society should have an object above this peddling business. My objection to monster collections of monster plants has in no way abated, for though many of the things were superbly done, the predominance of what a friend of mine calls "Cabbage Rhubarb plants,"—foliage plants, which in reality require little skill to produce them—was so great, that I say emphatically the collections of to-day are infinitely inferior as collections to what we used to show 20 years ago. To my mind, and to the taste of every thinking person who attended the exhibition, the collections of new and rare plants, staged by Messrs. Veitch, Mr. B. S. Williams, Messrs. Rollisson, and others were much more interesting, and, in a gardening point of view, more instructive than any other exhibits upon the ground. Give these gentlemen a tent each, let them bring out the treasures of their various collections, and arrange them with that elegance and taste which they always display, and we shall have specimens of plant grouping and conservatory decoration that would be worth walking barefooted many miles to see. Then, for the large collections of fruit let tables *à la Russe* be prepared, so far as plate, cutlery, glass, &c., is concerned, and ask the directors of our larger garden establishments, as Chatsworth, Trentham, Dalkeith, &c., to furnish them with fruit, plants, and flowers, as they would for their employer's banquets, and we should have displays such as nine-tenths of the world have no conception of. I am not now a frequent visitor of the Royal Society's shows, but I see sufficient of them to know that the mode of 20 or 30 years ago has been stereotyped, and that "old mat" has been traversed until it is fairly worn out. To emancipate itself from this slavery of habit is the first duty of the Council, and to appoint a small committee of taste that could take evidence, and then make arrangements for the next great exhibition, should be the next duty. To go beyond the small coterie of South Kensington for such a committee is indispensable; indeed, men of original and independent thought are required—persons who would call a spade a spade, without being afraid of the consequences of so doing. Such a committee would change the aspect of our exhibitions, and that with very little trouble. Other changes I may suggest in a future communication; but in the meantime I will merely remark that, having taken soundings, I know the foundation at Nottingham to be good; and that if the Society should decide to come here, it will have a reception such as has never been accorded to it in any town in England. Since writing the preceding, I have seen Mr. Fish's remarks upon the Oxford failure. I am sorry he still holds to the old infirmity. It is of no use to court a girl who does not like you, and I am quite sure the Royal Agricultural Society would be glad to get rid of such hangers-on as her pretty sister, Horticulture. She must make "a home" for herself; and the sooner she sets about the task in earnest the better. *W. P. Ayres, August* 1.

Royal Horticultural Society's Provincial Shows.—I have read your article on the above subject with great interest, and quite agree with the suggestions it contained. Without pretending to be a prophet, or the son of one, I can only say that I predicted failure from the commencement, and there are several leading exhibitors who can bear testimony to the truth of this statement. It seems to me now, as it did in 1867, that the association with the Agricultural Society is a source of weakness—the first year at Bury there were the element of novelty and the almost superhuman efforts of Mr. Fish, and the thing answered, very fairly; but since then the show has not answered from the financial point of view—and this year I hear there is an actual loss of nearly £500 [£300]. Much as I admire Mr. Fish, he seems to me quite at sea on this subject. Let the local arrangements be as perfect as possible, my firm conviction is the result would be very nearly the same, and for this reason,—as a rule, you will find when people go out for a day the time is fixed for starting, and the place they intend visiting is settled in their own mind, and, when this is the case, a few difficulties are soon overcome. Mr. Fish alludes to the "roar of the traffic rushing past poor Flora to the agricultural show." Of course; people had come to Oxford to see the beast and implement show, and the most perfect local arrangements with regard to the flower show would not have turned them from their purpose. Then Mr. Fish says, had the arrangements been better the "return stream of visitors would have nourished and comforted drooping Flora." I spent a day at the agricultural show, at the close of which I felt as if I wanted nourishing and comforting myself, and I have a very strong impression that this was the case with the "return stream." I love horticulture as much as Mr. Fish, but I ask him seriously to consider this question—Is it likely that a number of people will, after having waded through a great agricultural show on a July day, visit a flower show? Experience says, and it appears to me common sense says, "No." Mr. Fish's notion about the union of the two Societies,—"taking sweet counsel together,"—is very pretty, very poetic; but, as they say in Lancashire, "what about brass?" Mr. Fish must pardon me for being so vulgarly practical, but to this we must come. Again, I ask, is it a dignified course for the Royal Horticultural Society to lean upon the staff of the other Society? Such a course seems to me unsound in principle, hostile to the purposes for which it was founded, and opposed to its prosperity. So much by way of complaint, but what about the future? This, of course, will rest with the Council of the Horticultural Society. I have always thought it the right thing for the national society to hold an annual horticultural show in the provinces; but it should get as far away from the Agricultural Society as possible—if 100 miles, well and good, if 200, better still—no "cordial embrace," and for the most potent of all reasons, namely, financial ones. I have always thought that July was the most unsuitable month in the summer to hold a show; the latter end of August or first week in September seems to be the best time for the purpose; but I do hope that the next time the Royal Horticultural Society visits the country (which I trust will be next year) it will let the world see, by the bold spirited policy it adopts, that there is vitality enough in horticulture, and vitality enough in the national representative of it, to "run alone." *B. F., Manchester.*

Amaryllis conspicua.—In an impression of yours a few weeks back was an account of a grand plant of Amaryllis Johnsoni, which must have set many lovers of this tribe longing for the possession of such a plant. I too have a noble plant of Amaryllis, a description of which may interest some of your readers. The bulb is 5 inches in diameter, with three flower-stems, each stem being 26 inches high and 4½ inches in circumference at the base, and surmounted by 17 magnificent flowers (two sixes and a five), each flower being from 7 to 9 inches in diameter. Why Amaryllids are not more generally grown I cannot understand, for when well grown few plants are more charming, and with ordinary care and attention bestowed upon them the difficulty is how not to grow them. *T. G., St. Lawrence, I. W.*

Nitrogenous Manures.—In Professor Voelcker's very interesting disquisition upon this subject at Oxford, he stated that guano and other manures containing a large portion of ammonia had been used with decided advantage by the coffee planters in Ceylon. At the time I could not call the facts to mind, but upon mentioning the subject to my brother-in-law, Mr. Peter Wallace, who had just returned from a sojourn of eight years as the director of large coffee estates in Ceylon, he assured me that the Professor's statement must be taken with considerable reservation. The fact is, guano and similar manures exercise immense influence the first season, the crop being enormous; the second year the crop may also be good; but in the third year the plants are forced clean off their feet, and have to be grubbed up and thrown away. He mentioned one plot of 150 acres which had recently perished from the use of guano, and proprietors are now so convinced of the injurious consequences that they prohibit its use upon their estates. The only concentrated manures now used are the phosphates or crushed bones, and cocoa-nut cake crushed in the same manner as we crush linseed cake. These answer perfectly. I mention the fact, as I doubt not Dr. Voelcker will be glad to be made aware of it; but it is more than likely that Mr. Wallace, who is an experienced and accomplished gardener, and who wields a ready pen, may be induced to give us something of his 10 years' experience of cultivation in "foreign parts abroad." *W. P. Ayres, July* 26.

Subtropical Gardening.—The letter of "Quercus," at p. 1027, has brought to my recollection another on the same subject, at p. 897, on which I should like to offer a few remarks. "Quercus" says, "he has always held that subtropical gardening in the open air in England is a mistake," but the fact of his holding that opinion is no proof of its correctness. He also speaks most flatteringly of the remarks in the letter at p. 897. For my part I see nothing practical in the remark that Aloes, Cactaceæ, and other succulent plants will stand out-of-doors during summer when they are young and small, but not when they get large; and I know it to be contrary to my experience, because I have for years used large Agaves, Yuccas, and such like plants out-of-doors, and that, too, in places where they are exposed to bleak east winds. Subtropical gardening should not be decried because the Palms, Dracænas, &c., would not stand out upon the terraces and by the sides of the walks at Kew, where they were exposed to all the rough and boisterous winds that blew; and that, too, as I have good reason to believe, without any preparation having been made for the change in the way of hardening gradually in a cooler temperature. The authorities at Kew would have done better never to have tried them in such places, but should have brought out some of their large (not the largest) Agaves, Aloes, Yuccas, &c., which would have been improved by exposure in the open air, and which at the same time would have formed a noble feature in the gardens; and they should have put their Palms, Dracænas, and many other suitable plants which they have at command, in sheltered places; plenty of which ought to exist in a garden like Kew—although they are certainly rarities now, for it seems to have been the policy during the last few years to lay the whole place open to all the sweeping winds and

currents of air it is possible to invite. I believe that with the numerous fine young trees and shrubs which have been removed, a much finer place for subtropical plants could have been made at Kew than the subtropical garden at Battersea Park. Nothing else but shelter is required to enable the plants to thrive equally as well at Kew as at Battersea. The two places are not far removed from each other, they are both on the banks of the Thames, and I do not imagine they have a very different climate; therefore, if shelter is all that is wanted, why not give it to plants of this character?—for they form a splendid addition to a garden, great or small, and render it, if private, a source of much greater enjoyment to the proprietor, or, if public, to the visitors. I cannot understand why Battersea Park is always spoken of scornfully whenever any one wishes to find fault with this style of gardening. Many say, "Yes, it can be done at Battersea, but it could not be done at my place;" but still the good example which has been set to us gardeners by Mr. Gibson is being followed by many persons throughout the three kingdoms, and it has been my good fortune to see fine Dracænas, Palms, Agaves, Yuccas, the soft but elegant Papyrus, Philodendrons, Musas, Tree Ferns, and many other tropical plants flourishing in the open air in Scotland, and also in Ireland, as well as at home—plants, too, which have been used several years in succession, and which are not ruined yet by being "Batterseaised." But then they are not left out late enough in the autumn for frost and snow to cover them, as some of those plants were at Kew in 1866, and which I do not call a practical mode of "using every precaution for their welfare." The remarks at p. 897, relating to the damage done to floors and tearing up of walks, are little to the purpose. No reasonable man would think of moving such monstrous specimens, for we have plenty of large and handsome trees on our lawns and in our shrubberies. What we want is moderate-sized tropical plants, with bold and distinct foliage to lend their beauties towards forming a charming whole; and plants sufficiently large for all such purposes can be grown in pots or tubs, which can be moved by about four men. Indeed, such removals are made daily by practical gardeners, without damage to floors, walks, or plants. Subtropical gardening in the three kingdoms is an established fact, and is rapidly extending, and it cannot fail to please every person of taste, neither can it fail to be effective if three things are attended to, viz., a proper selection of plants, a proper preparation of them before removing them to the open air, and a proper selection of site for planting them. These rules are equally applicable to planting generally; and "Quercus" may rest assured that subtropical gardening will never be damaged by the writings of those who have not the means to carry it out properly. *Tectona.*

Dell's Beet.—Seeing that one of your correspondents writes respecting my Beet, I take the liberty of forwarding two roots of it for your inspection. It is of a much better colour, later in the season, and has never failed to give perfect satisfaction, both in colour and habit. *J. Dell, The Gardens, Stoke Rochford, Grantham, August 2.* [Fine specimens, richly coloured. EDS.]

Potatos.—I have been much interested in the notices of Potatos lately, and more especially in the paper of my neighbour, Mr. Sage, the intelligent gardener of Sir Edward Dering, Bart., at Surrenden. I can bear witness to the truthfulness of all his statements, and I think all who read it must have been struck with the excellent common sense his paper displayed; perhaps, as the old adage is never more true than in such a case, "the proof of the pudding is in the eating," I may say that he has been obtaining the top price in Covent Garden Market for his produce. As to the Potato tournament, I am sorry to say that my experience of all Potato showing is that it is an utter sham. What is the use of the best-looking Potato in the world if it be not well flavoured?—and this can only be ascertained by tasting. Supposing, then, only half a dozen entries of a dozen Potatos were made, who is to taste 72 Potatos?—and without tasting I believe anything of a tournament to be valueless. Then, again, soil makes such an immense difference, that it is quite impossible to lay down any *dicta* on Potatos that will apply everywhere. Here Paterson's Victoria is worthless; yet elsewhere I hear it well spoken of. Flag of England I could never use when grown in my garden at Deal, yet my neighbours grew it, and it was fair enough. A good Potato, such as Myatt's Prolific, the Lapstone, or Yorkshire Hero, will work its way; but nothing will ever float a bad one. How much was done to induce people to believe that Prince of Wales was a good tuber, yet I do not suppose any one grows it now. *D., Deal.*

Early Rose Potato.—I beg to add my testimony to that of Mr. Poynter in regard to the Early Rose Potato. It is the best second early we have growing here. It is an abundant cropper, of good flavour, and fine floury appearance in the dish. This is the second year we have tried it, and we find it much better in flavour this year than it was last. I may say myemployer invited several highly respectable farmers to judge of its flavour, and to see the crop as we dug them up; and all present pronounced them to be excellent in both respects. *T. Hammond, Gr. to J. Muir Dixon, Esq., Whitstones, West Kirby, Cheshire.*

Hairbell, or Harebell,—which is the true spelling, and which the plant so named? The following conflicting authorities and quotations do not answer these questions:—(1). Campanula rotundifolia—Hairbell (Babington, "British Botany"). (2). Campanula rotundifolia—Harebell, or Blue Bell (Chambers' "Encyclopædia"). (3). Campanula rotundifolia—Hairbell. "The name Hairbell, is frequently though not correctly given to the Wild Hyacinth or Blue Bell (Scilla nutans, or Hyacinthus non scriptus), a plant with a thick juicy flower-stalk; but when applied to this Campanula is most appropriate, its stalks being exceedingly slender and wiry" (John's "Flowers of the Field"). (4). Campanula rotundifolia—Round-leaved Bell-flower or Harebell—

> "E'en the slight Harebell raised its head,
> Elastic from her airy tread."
> Scott's "Lady of the Lake," c. i., 18.

(5). Hyacinthus non scriptus—Harebell (Sowerby), Wild Hyacinth (Eng. Bot., 1836). (6). Harebell—a blue flower, campaniform (Johnson's "Eng. Dict.," 1784)—

> "Thou shalt not lack
> The flow'r that's like thy face, pale primrose; nor
> The azur'd Harebell, like thy veins."
> Shakspeare's *Cymbeline.*

(7). Harebell is the Scilla non scripta of Linnæus (Hartington's "Cyclop. Nat. Hist."). (8). Harebell—the English Hyacinth (Richardson's "Eng. Dict.") (9). Hairbel (*sic*)—the name of a flower, the Hyacinth (Johnson's "Eng. Dict.," 1784). (10). Hyacinthus non scriptus—Wild Hyacinth, Blue Bell: "It is sometimes, though incorrectly, called Hairbell, the true Harebell being Campanula rotundifolia (John's "Flowers of the Field"). (11). Campanula rotundifolia—"Begins flowering in July, a much later season than that of the true Harebell, Hyacinthus non scriptus, to which some poets have applied the same name (Sowerby's "Eng. Bot."). The sentence should read, "Campanula rotundifolia, to which some poets have applied the name of Harebell, begins," &c. It appears to me that the true plant is the Campanula rotundifolia; but for the spelling—who will settle that? *D. T. K.* [To this inquiry Mr. James Britten, who has paid much attention to the popular names of plants, thus replies:—There can be little doubt that the true Harebell is Hyacinthus non scriptus. Gerard and all the older writers apply it to this species only; and so does Withering in his earlier editions. In the 7th edition (1830), the editor observes that Campanula rotundifolia is "sometimes denominated Harebell in Scotland," and cites Scott's lines (quoted by "D. T. K.") in proof of his assertion. The spelling is doubtless Harebell; Hairbell is comparatively modern, but seems coming into fashion; and, were it not for the reference to Johnson (1784) given by your correspondent, which may perhaps be a misprint, I should suppose it to have been invented after the name had been transferred from the Hyacinth to the Campanula, in reference to the delicate flower-stalks of the latter. I have seen the spelling "Air-bell" suggested for this plant. With reference to the extract from "English Botany," the first edition (t. 866, April 1, 1801) is even more definite as to the Hyacinth being the true plant:—"We suspect poets sometimes take this (C. rotundifolia) for the Harebell. We have somewhere read of 'the trembling Rye-grass and the Harebell blue,' growing on 'mouldering turrets,' which could scarcely be the real Harebell."]

The Bishop Stortford and Chatsworth Vines.—Mr. Ayres, in the remarks made in his last letter, has, after all, only been leaping upon a dead lion. The Vines are gone, and he has vigorously picked their bones. His reasons for doing so are only known to himself. I cannot see how his attacks upon these Vines, or those who have described them, is likely to prove instructive to your readers. If brainless, homicidal, imbecile, ignorant practice leads to such splendid results, I boldly ask for many more Vine growers of the same stamp. If such are the failures of these men, what must their successes be? I care not what I might be called could I only grow such Grapes as brought national honour upon Mr. Nash for so many years. The world cares little for names—much for results. The Bishop Stortford practice will bear the latter ordeal—judged thus, it must be the very opposite of all Mr. Ayres has affirmed. If good Grapes elsewhere are accepted as the proof of brains—why not here? Judged thus, surely the 25 years' good crop at Stortford will outweigh one extraordinary crop at Chatsworth, or anywhere else. Let us multiply the brains by the years, and where will Mr. Ayres and his anti-brain charges appear. What though ultimate success were reached through a few preliminary failures—that but enhanced its value. The path to victory is often entered by the gateway of defeat. Failure, properly used, frequently proves the spring-board that raises on to the platform of success. But it would almost appear as if Mr. Ayres referred to other borders and other Vines than those I have truly described. He talks of Vines dying in the Stortford borders; it could hardly be that it was these that drew Dr. Lindley from London to Bishop Stortford, and called forth such eulogiums from his strong, steady pen. The causes of the shanking of these famous Vines is still involved in considerable mystery. It may have been restriction, or over-cropping. But if so, neither of these either crippled the roots, or drained the plants dry of vital force. The growth was good, the leaves large and fine, and the shows of fruit abundant and promising to the last. Instead of finishing the fruit shanked; and as shanked Grapes are useless, and the shanking could not be arrested, the Vines were destroyed. This destruction seems to have aroused the wrath of your correspondent to such a degree, that he cannot propound his extension remedy for shanking without pouring out his full vials on the dead Vines at Bishop Stortford, and all who have written about them. The Chatsworth case is interesting enough in itself to be able to stand upon its own merits. It was not needful to dance jubilantly over the dead Vines at Bishop Stortford, to brighten the Chatsworth results by the force of such contrasts. I regret, however, to add from the book of my experience, and the far larger one of my observations, that extension is no panacea for shanking. I have a Hamburgh, covering an entire roof of 1000 square feet, which shanks horribly; and I have seen many large Vines shank as badly as one rod Vines. I must also add, that a great deal too much has been made of one season's produce. The shanking Vines have exceptional seasons, when the malady is less virulent. Mr. Ayres indeed is not content to be a mere chronicler of facts, but assumes the functions of a prophet, and promises us greater results in the future. It may, or may not, prove so; I hope it will. No one deserves success more than Mr. Speed, and few will rejoice more heartily in it than myself. But old Vines, of 35 years and upwards, are capricious; those that have once learned the knack of shanking are apt to return to it again. One more word, as a matter of fact, and I have done. I ventured to question whether Mr. Speed's practice, as jointly described in your leader and Mr. Ayres' letter in the *Chronicle* of July 9, could fairly be called extension. It seemed more like restriction. Mr. Ayres now triumphantly answers, that the inside Vines are cut away, and the outside over-fill the double space, and that is called restriction! He also adds the new facts that leading shoots from 6 to 8 feet long are taken from the top outside the house, and from the main stems outside the house upon the borders, and adds, "this also, perhaps, is restriction." To which my reply is emphatically—No. Neither was it to either of these practices I alluded. Turning, however, to the leading article, p. 921, bottom of col. *a*, and top of column *b*, I read—"Several of the vineries at Chatsworth are stocked with old Vines, some of them planted, we believe, prior to Sir Joseph Paxton going there. In these, and also in the house to which we have specially referred (that is, the house adduced as an example of the extension system), there was a confusion of branches, in fact the leaders were laid in so closely together, that it was impossible that the foliage could be properly exposed to the light. These (that is, I presume, the leaders), last winter, were reduced in number, so that now the main branches are 3 to 4 feet apart, giving ample room for lateral extension of the foliage." Now, this reduction of main branches I call restriction, and surely the facts of the case, as well as the plain meaning of language, justifies and, in fact, necessitates, this reading of the matter. This sentence cannot refer to the Vines removed, but to the shoots or roots on the Vines left. The greatest number of rods on any of the extended Vines, as given by Mr. Ayres, or yourselves, is three; it therefore follows that if last winter these main branches were reduced in number, there must have been more than three before; and it does seem a new mode of extension to thus reduce the area of the entire plant. The shoots left may indeed be allowed to extend further into space, and a root maker is likewise left at their base—a plan already adopted by Mr. Ward, of Bishop Stortford, and duly set forth in your columns. But these statements were not before us till now, and even after giving due weight to these, it seems yet doubtful whether each Vine upon the whole is any larger than it used to be. If not larger it can hardly be said to be extended in the usual sense of the term. Thirty-three bunches per Vine is hardly consistent with any great extension; neither can the vexed question of Extension *versus* Restriction be decided by one crop, however good. I am the champion of neither system, but rather the advocate of a happy mean between the two, towards the establishment of which I know of few greater obstacles than the course adopted by your correspondent throughout this controversy. *David Tell Fact.* [No useful results will accrue from the further prolongation of this discussion. EDS.]

Old Roses.—I, like your correspondent Mr. Godwin, shall be most thankful to "Old Subscriber" if he can tell me where to procure a plant of the white Rose Lady Harrington, *alias* Globe White Hip. Can Mr. Godwin, or any one else, tell me how I can get a plant or cutting of the Marginal Hip, single or double? The latter variety I never saw, but the single one used to grow in the garden of a lady friend of mine in Gloucestershire, who was a lover of choice old things, and a very beautiful thing it was. As soon as I got a house and garden of my own I wrote to my friend to beg a bud

or cutting, but heard, to my dismay and grief, that in the absence of its master it had fallen a victim to the rage for novelties so prevalent among the gardeners of the present day. Where is the beautiful Rosa Hardii to be had? The old York and Lancaster I am always proud to grow, and I this year succeeded in getting for my button-hole some half-expanded blooms of the old Yellow Cabbage or Provence (Rosa sulphurea), which made everybody ask, "Whatever have you got there?" Can any one put me in the way of getting Rosa microphylla? *H. Harpur Crewe, The Rectory, Drayton-Beauchamp, Tring.*

Apricots.—It may be interesting, as chronicling a fact perhaps not very commonly met with, to say that out of a crop of Apricots exceeding a thousand in number, grown upon seven trees here during this present season, a few were found so large as to need but three to make a pound, or 16 oz. good. It must be understood, however, that these were produced upon young trees of remarkable luxuriance, and which have just reached to the top of rather high walls. The variety is the Moor Park, and is growing in soil and in a locality which seems specially adapted to its wants. *William Earley, Digswell.*

Grapes Shanking.—In the seasons of 1867 and 1868 a great deal of shanking occurred in the bunches of the Trebbiano Grape, a variety very subject to it when over-cropped. The three Vines of it which showed the shanked bunches grew in a late vinery, and they bore on an average 30 bunches to each Vine; the bunches were large, being at least 4 lb. each in weight. In 1869 I reduced the number of bunches on each Vine to about 15, and there was little shanking that year. This year the bunches are very large and fine, but only about a dozen bunches are left on each Vine, and I expect to see no more of the "shank fiend" attacking them. I should advise all gardeners whose Grapes are subject to shanking to try my plan, and *Chronicle* the result. I believe the shanking of Grapes proceeds from taking too heavy crops off Vines, and from want of sufficient attention to the borders. In my case I not only reduced the bunches on the Vines, but I had an addition made to the border outside; and I intend to leave more bunches on the Vines in the course of another year, when their roots have ramified in the border. Some fuss has lately been made, and a deal of fudge has likewise been written, about the Bishop Stortford Vines and their shanking propensities. If these Vines had been free from Fungus at the roots, there would not have been the slightest cause to grub them up. All that they required to bring them round to their pristine vigour was to have reduced the number of bunches to a moderate crop, and to have attended to their root action. This, is seems, was partly done by chopping off some of the roots on the outside of the border. I should, however, have proceeded in a different manner; that is, by forking the roots from the outside of the border to nearly half the width of it before adding the fresh soil. The Vine is such an accommodating plant, that it is hardly possible to kill it if attention is paid to its wants in soil, drainage, and in the matter of keeping its foliage healthy. I know of some Vines now nearly 100 years old still bearing fair crops. They have been restricted to one rafter ever since they were planted, and very little shanking has ever been seen on the Grapes grown on them. They have, however, been cropped judiciously, and no garbage of any kind has ever been applied to the borders, at least for the last 30 years, the soil being a natural one for the Vine, with a bed of gravel for the subsoil. *William Tillery.*

Ants.—Having been much troubled with ants in an orchard-house, I believe I have tried all the plans hitherto recommended for their extirpation, including that of pouring gunpowder down their runs and firing it. They seem to defy everything, and in order to preserve the fruit, I am obliged to tie some cloth round the bole of each tree, and paint it with tar and grease. But even this requires frequent renewal, or the ants will pass over it. Now in the *Chronicle*, p. 991, Mr. Wills recommends a new remedy, namely, Wilkie's composition. May I ask that gentleman to inform me whether it does more than kill the individuals it touches. For if not, it is no better than boiling water, and certainly more costly. Day after day I have soaked my border with boiling water, and killed the insects by the hundred, but they increased so rapidly in nooks beyond the reach of the water, that one seems to make no progress. The desideratum is to find something that will destroy or drive away the whole nest. Guano has been recommended, but has failed with me. Carbolic acid is distasteful to ants, but its effects are transient. *G. S.*

Lilium auratum.—Have any of your readers noticed the inconstancy of varieties of Lilium auratum? Some of them must have done so, or what has become of those exhibited or commented on at different times? I have been so disappointed with marking them that I have given up doing so. A few years back I took great pains in keeping separate a few remarkably distinct varieties. I had a genuine semi-double; another season I discovered a pure white variety with no spottings, and with scarcely the signs of the usual yellow band, also a fine large-flowered variety that had more dark red about it than any other colour. All these had several blooms, but the following year they invariably turned out the common kind, and I shall be glad to know the experience of other cultivators in this respect. *W. T. C.* [Why should not these Lily varieties be as constant as the varieties of other flowers? Is there no mistake about the cases referred to by "W. T. C.?" Eds.]

Garden Roller Water-cart.—I recently saw the idea of a "garden roller barrow" (p. 1029) considerably enlarged upon at Hursley Park Gardens, where a large galvanised iron cistern, holding some 50 to 60 gallons, had been mounted upon a framework that had a strong double-action roller underneath instead of wheels, and which was drawn hither and thither as required by a good-sized pony. The cistern was furnished with a closely fitting lid, to prevent slop, was oval in shape, and had fixed to it behind a strong tap, through which the water could be drawn off. The cart has proved most useful during the past severe drought, as it can be drawn to any part of the grounds without doing any mischief to the paths or grass, whilst it acts when full as a most formidable presser. If a movable spreader could be attached to the tap behind, it would be of great service to water grass, especially those portions that are devoted to croquet, and which would look none the worse for a good saturation once or twice a week. In all large places a water-cart of considerable dimensions is an absolute requisite. I may add that the entire breadth of the one mentioned is about 3 feet. *Alex. Dean.*

Globe White Hip Rose.—I am delighted to find some one who knows the merits of Globe White Hip, which is certainly the Rose I mean. I find a Rose of that name and description occurs in a list of Roses in the "Floricultural Cabinet" for 1834; the plant I know can hardly be so old, and may have been put in ten years later. I only know the Rose in one locality, and am only sure of one garden at present having it, but there it shows no signs of decay; there are several fine bushes of it, rather low growing, the younger ones transplanted suckers of the original. It was seeing it this summer in great beauty and vigour that induced me to ventilate the subject. I do not think there is the least chance of its being found in nurseries, and therefore if Mr. Godwin cannot hear of it elsewhere, and really wishes for it, and will give his address through the medium of the *Gardeners' Chronicle*, I will undertake, with great pleasure, to have cuttings enough sent him by post to ensure, with ordinary luck, his being furnished with the old Rose. It is a flower that should not be lost to horticulture, leaving hybrids out of the question; it is so unlike any other white, and so pure, I should almost suppose its immediate ancestor to have been an albino seedling of some coloured Rose. At the same time I have a great idea of what hybrids might do. Be it remembered, the Rose itself is little more than semi-double, and that it falls to pieces most provokingly when less than half blown, unless very carefully handled. The old White Provence, by-the-by, has good qualities, though strangely ugly. *Old Subscriber.* [Messrs. Gray & Sons, Brox, near Chertsey, catalogue this Rose. Eds.]

Societies.

Royal Horticultural: *General Meeting, August* 3.—G. F. Wilson, Esq., F.R.S., in the chair. After the transaction of the formal business of the Society, the Rev. M. J. Berkeley alluded to the paucity of specimens of Variegated Pelargoniums exhibited, although special prizes had been offered for them. This was partly attributable to the excessive heat of the weather, which had interfered with the due coloration of the leaves. Adverting then to the beautiful specimen of Renanthera Lowii, exhibited by Messrs. Veitch, Mr. Berkeley read an account of the plant written by Mr. Bateman and published in the "Botanical Magazine," November, 1864, and also mentioned in the *Gardeners' Chronicle*, 1864, p. 914. Apart from the beauty of the flowers, the plant has the peculiarity of producing dimorphic flowers: the two lower flowers on each raceme are of a golden yellow colour with dark spots, and the perianth segments are broader and blunter than in the ordinary flowers, which are of a light buff colour, marked with reddish brown bars and spots. In the case of some species of Cycnoches where dimorphic flowers occur, the difference of form has been shown to be dependent on sexual differences in the flower, the male and female flowers respectively being of different forms, but in the present instance it appeared that the stamens and stigmas were perfectly developed in all the flowers. It had been observed, however, that the lower yellow flowers were sweetly scented, while the others were destitute of perfume. The new and handsome Cycadaceous plant, Bowenia spectabilis, was then alluded to, and its habit of throwing up single leaves, like those of some Arads, was pointed out. In this case, however, more than one leaf is thrown up at one time. A hybrid Lily, called Purity, the result of a cross between L. auratum and L. lancifolium, then received notice, as also a very pretty, but modest-looking Orchid from Natal, supposed to belong to an undescribed genus. A branch of Abies Clanbrasiliana from the garden of Mrs. Lloyd Wynne, of Coed Coch, was then exhibited. It was interesting as showing in one branch a complete reversion to the form of the common Norway Spruce. Mr. Berkeley remarked that this case of "reversion" was interesting, as showing the origin of the Clanbrasilian Fir. Similarly stunted growths occasionally occur in the Douglas, and in the Silver Fir. Mr. A. Murray confirmed Mr. Berkeley's statement as to the origin of the Clanbrasilian Fir. The Chairman then announced that the next meeting would be on the 17th inst., when Gladioli and Hollyhocks would probably form the special features of the exhibition.

Floral Committee.—Mr. John Fraser in the chair. Some very interesting things were produced on this occasion, and there was no lack of subjects; the Council chamber was quite filled, and one of the lobbies outside had to be brought into requisition to contain the Pelargoniums. The Messrs. Veitch & Sons contributed a very fine group of miscellaneous plants, which obtained a Special Certificate. This group contained several of their fine new Dracænas and Crotons, as D. reginæ, D. Moorei, D. Chelsoni, C. undulatum, C. maximum, and C. Veitchii; also a good plant of Dracæna Guilfoylei, which proves to be a very ornamental species. The beautiful Aralia Veitchii, remarkable for its narrow undulated leaflets, was also shown in a very effective condition; and also a Sciadophyllum from New Caledonia. The group contained the following Orchids in bloom:—Saccolabium Blumei majus, Oncidium Kramerianum, O. obryzatum, O. Wentworthianum, Odontoglossum hastilabum, Cattleya Aclandiæ, Dendrobium Bensonæ, Cypripedium Veitchii, and Miltonia Regnellii purpurea. There was also a plant of the pretty Blandfordia aurea, and two of the smaller recent additions to the Marantas—M. Wallisii and M. chimboracensis, which are quite of second-rate merit. A First-class Certificate was awarded to the same firm for Bowenia spectabilis, a remarkably handsome compound-leaved Cycad, and Special Certificates for a fine, stocky, well-furnished plant of Encephalartos Lehmanni, and also for a small plant of Renanthera Lowii, remarkably well bloomed; this latter was considered a cultural feat well worthy of recompense. It may be mentioned that Mr. Seden, under whose care the plant has been grown, pointed out to us a few days ago that the dissimilar flowers at the base of the spike are highly fragrant, while the other flowers are scentless. First-class Certificates were awarded to Mr. W. Bull for Macrozamia magnifica, a very elegant slender pinnate Cycad from Australia, and for Cycas Broughtoni, another Australian species in the way of C. Armstrongii, but smaller, with smooth Fern-like leaves. Mr. Bull's group also contained Stangeria paradoxa obtusa, not very well marked; Bignonia Roezlii, a handsome New Grenada plant in the way of B. violacea, with coarsely toothed instead of entire leaves, the surface beautifully tinted with violet merging into dark green, and elegantly veined with grey; Dieffenbachia Wallisii, with green leaves blotched and banded with grey, but too dull and confused in the colouring to be effective; Croton maculatum, the same as one previously shown as Wrigleyanum, a limbate sport of C. variegatum; the broad-leaved Adiantum Seemanni; Syngonium Seemanni, from Central America, having a slender climbing rooting stem, and trifid or pedate leaves, having a broad white costate band; and a pretty gold and crimson toothed Coleus, named Golden Gem. First-class Certificates were awarded to Messrs. E. G. Henderson & Son for Hydrangea japonica speciosa, the leaves dark green, with a broad flame of cream-colour along the centre of each, a good addition to the class of ornamental foliage plants; and a plant of the same in bloom, the flowers large and of a pale greyish blue tint; and for Variegated Zonal Pelargonium Rev. E. R. Benyon, of vigorous habit and extremely well coloured. The group also contained Ageratum Tom Thumb, a variegated form of Phlox decussata, the leaves mainly pale yellow, with a strip of green along each; and some dwarf Antirrhinums in pots. Messrs. Downie, Laird & Laing had the following varieties of herbaceous Phloxes grown in 8 and 10 inch pots, and showing what can be done with these subjects when so cultivated if a little attention be bestowed on them, viz., Liervalli, violet-pink with white stripes, very pretty and attractive; Madame Domage, James Veitch, La Candeur, Charles Turner, Amabilis, Madame Barillet, Souvenir de Mons. Berryer, Mons. Guldenschuck, Géant des Batailles, Etoile de Neuilly, Madame Maria Saisons, and Madame Christine Nilsson. Mr. Green, gr. to W. Wilson Saunders, Esq., contributed a small group of plants of considerable botanical interest, consisting of a dwarf Agave, a species of Bruusvigia, from South America, with a large spike of flowers; Achimenes argyrostigma, and a very minute new species of Orchid from Natal, with long oval leaves densely spotted with black, and a spike of bright lilac flowers, the lip paler and spotted with rosy purple; the bracts were spotted in the same manner as the leaves. Mr. Stevens, gr. to J. Simpson, Esq., Reigate, sent two nicely grown and bloomed specimens of Disa grandiflora, somewhat dwarf in growth and well coloured. These were awarded a Special Certificate, and the same award was made to Messrs. W. Cutbush & Son, for 6 fine examples of dwarf crimson Cockscombs, that were well grown and of excellent quality. From Mr. Chitty, Stamford Hill, came the old dwarf-growing double white form of Pyrethrum Parthenium, which is useful as a bedding plant. Messrs. Thos. Cripps & Son sent two boxes of cut blooms of Clematis Crippsii, a finely formed reddish mauve-coloured addition to these valuable hardy creepers, the flowers taken from the open air, but too dull in colour compared with others already distributed.

Mr. Cattell, of Westerham, brought his variegated Tropæolum Minnie Warren; and Mr. Welsh, of Hillingdon, brought a basket of Cyclamens, several of them with high-coloured crimson flowers. The Society's collection at Chiswick furnished a group of pretty fringed-flowered Petunias of various colours, which have been raised from a fringed sport obtained a year or two since, and which will probably become favourites for decorative purposes; also a fine plant of Pteris serrulata major cristata, a handsomely tasselled variety of the tall-growing form of P. serrulata. The latter received a well-merited First-class Certificate.

One of the finest features of the show was a collection of Balsams, from Mr. Stevens, of Ealing, which received a Special Certificate; they were dwarf, stocky, branching plants, in 5-inch pots, and were literally a mass of bloom, the quality of the flowers being also excellent. From Mr. Barron, of Borrowash, came Abies canadensis argentea.

Nosegay and Zonal Pelargoniums were somewhat freely

produced, and the number of fine varieties staged on this occasion taught that a wise discretion is necessary in giving certificates of merit to new flowers. Mr. J. Windsor, gr. to J. R. Ravenhill, Esq., Leytonstone, had the following hybrid Nosegay varieties :—Prince of Orange, Emperor, Conflagration, Rosy Gem, and Pink Dwarf, the first four being of good quality. Mr. J. George, gr. to Miss Nicholson, Putney Heath, had Favourite, Anton, Little Pet, and Flame, all high-coloured hybrid Nosegay varieties. Mr. Eckford, gr. to the Earl of Radnor, Coleshill, Highworth, had hybrid Nosegay Magnificent, with fine and symmetrical trusses of bright orange-scarlet flowers ; Rosy Queen, and Crimson King, the last-named with rich dark crimson flowers. Messrs. Barron & Son, Elvaston Nurseries, Borrowash, received a Second-class Certificate for Zonal Pelargonium Magnificum, with large but somewhat rough trusses of pale orange-scarlet flowers. A salmon-pink flowered sport from the golden-leaved bedding Pelargonium Crystal Palace Gem, a very washy-looking subject, was shown by Messrs. Cripps & Son. Mr. S. Ford, gr. to W. E. Hubbard, Esq., St. Leonard's, Horsham, had a collection of Variegated Pelargoniums, among which silver-variegated Lady of the Lake appeared promising. Mr. Dodds, The Gardens, Bower Ashton, Bristol, sent a basket of Mrs. Upton, a compact growing, pink-flowered variety, very free, but which had suffered so much from the journey that no just opinion could be arrived at as to its merits.

Special Certificates were awarded to Messrs. Carter & Co., of Holborn, for cut blooms of double Pelargoniums, nicely set up in baskets, among which the following deep-coloured varieties were good additions :—Mons. de St. Paul, Le Duc de Suez, Ville de Nancy, Victor de Lyon, Sapeur Pompier, Triomphe de Lorraine, and Merveille de Lorraine ; also for a large collection of cut spikes of seedling Gladioli. The same firm also had flowers of the double Californian Sunflower. Mr. Cannell, Woolwich, staged cut blooms of Zonal and Nosegay Pelargoniums, among them Titan, King of the Roses, Jean Sisley, Coleshill, Fausta, and Mrs. Keeler, were very fine. Messrs. Standish & Co., Ascot, received a Special Certificate for a stand of fine spikes of Gladioli, including Elegans, Marie Stuart, J. W. Lane, Dr. Livingstone, a fine purple-flowered variety ; Horace, Agatha, Madame Desportes, white, very fine ; Robert Fortune, Meyerbeer, Monsieur Legouve, very fine ; Pericles, very fine ; Aurantia, Volunteer, Thomas Methven, Canova, Bob, Spectabilis, and Orphée ; and the same award was made to Mr. C. J. Perry, Castle Bromwich, Birmingham, for the following varieties of seedling Verbenas :—Singularity, flaked, deep lilac and white ; Black Diamond, Clara Perry, Purity, pure white, with bright violet-rose centre ; Colossus, Mauve King, mauve, with dark shading ; Diana, Leviathan, Day Dream, Constellation, and E. W. Badger, reddish-rose, shaded, large primrose eye. Mr. Eckford also contributed cut Verbenas.

Mr. C. Turner received a First-class Certificate for a fine and distinctly dark spotted variety of Lilium auratum, var. Charles Turner, a large flower, with the golden band replaced by a suffused tint of reddish-brown. Why a better variety, shown by Mr. Bull under the name of rubro-vittatum, was passed over we cannot imagine. From Mr. Bull also came other varieties of L. auratum, namely Virginalis, a pure white variety, with yellow band and spots on the petals, and Brilliant, a variety in which the petals were charmingly spotted with crimson. The same award was made to Mr. George Thomson, The Gardens, Stansted Park, Emsworth, for a hybrid Lily, named Purity, said to be a cross between L. auratum and L. speciosum, having broad petals in the way of the last named parent, but spread out flatter in the face, and a considerable perfume, like L. auratum ; the foliage also partook of the character of the latter species ; the flowers were white, beautifully spotted with crimson. From George F. Wilson, Esq., Weybridge, came Lilium tigrinum flore-pleno, with several tiers of petals regularly overlaying each other, like the petals of a hexangular Camellia. L. Leichtlinii, yellow, spotted with dark brown ; and L. speciosum, atro-purpureum, with a greater depth of colour than is usually seen. A First-class Certificate was awarded to Mr. W. Thompson, Ipswich, for Godetia (Œnothera) Whitneyi, having bright lilac flowers, with a spot of red on each petal ; it is of stout dwarf growth, of rigid branching habit, and blossoms very freely. Second-class Certificates were awarded to Mr. John Keynes, Salisbury, for Dahlias Incomparable, yellow ground, heavily tipped with bright purplish claret ; and Flora Wyatt, a fancy flower, buff ground, striped and flaked with dull red ; both of full substance, and very promising. Mr. Keynes also had Alice Purchase, primrose ground, tipped with claret, and shaded with dark—a flower of much promise ; Victory, rich shaded crimson ; Salmon, yellow, tinted with salmon ; Earl of Radnor, bishop's purple, a fine hue of colour ; Flossy Williams, pale yellow ground, tipped and suffused with bright purplish maroon ; Mrs. Bunn, pale ground, heavily tipped and striped with purple ; and Gladiator, pale ground, striped and flaked with deep purplish crimson. Mr. Porter, gr. to E. Benham, Esq., Sion Lodge, Isleworth, had cut flowers of seedling varieties of T. Lobbianum, double Zinnia elegans, &c.

The Pelargonium Show.—This showed a marked falling off as compared with what has been seen in previous years ; apparently the interest formerly felt in this class of plants has considerably abated, though the deficiency may have resulted from single varieties only, and not collections, being invited. With one or two exceptions there was but a slight show of competition, and the various subjects were scarcely above average quality. In each class three plants of each variety exhibited were required to be staged. The best Variegated Zonal Pelargonium, the Rev. E. R. Benyon, came from Messrs. E. G. Henderson & Son. To all appearance these plants had been grafted on a strong stock of some kind, giving the plants, therefore, some advantage over those on their own roots. This is a practice certainly to be commended to cultivators, especially in the case of the weaker growing varieties ; but in the case of exhibitions some stipulation should be made in relation to this practice. 2d, Mr. John Mann, Brentwood, with Gold Crown, a variety somewhat distinct in character, and very well coloured ; 3d, Mr. J. Stevens, Ealing, with Ealing Rival, in good condition, but the plants small. Messrs. E. G. Henderson & Son also had the best silver-variegated Zonal, Lass o' Gowrie, like-wise grafted, well grown and coloured, but a little rough in the leaf ; 2d, Mr. C. Turner, with Mrs. Rousby, somewhat distinct in character, and with nice smooth leaves ; 3d, Mr. C. Edmonds, Hayes Nursery, with Hayes Rival. This exhibitor also had Tom Whiffler, Mr. C. Turner, Miss Pyne, and Mr. John Mann, Leader. The best Gold and Bronze was Impératrice Eugénie, from Messrs. Downie, Laird & Laing, nicely grown and coloured, and having a bright fiery brown zone. 2d, Mr. H. Cannell, with Annie Keeler. Messrs. Downie & Co. also had Black Douglas and Reine Victoria, but no 3d prize was awarded. But one golden-leaved self Pelargonium was staged, viz., Golden Defiance, from Mr. S. Ford, gr. to W. E. Hubbard, Esq., Horsham. As only one plant was staged, no award was made. This appeared to be a very poor variety. The best silver-edged Pelargonium was May Queen, from Mr. C. Turner, nicely grown ; and the same exhibitor also had Bright Star and Princess Alexandra, but no other award was made. The best Ivy-leaved Pelargonium was Compactum, a variegated variety, from Mr. C. Turner, and the only one exhibited. The plants were nicely grown, and had a wiry habit, but somewhat rough. The best Nosegay Pelargonium was W. E. Gladstone, from Mr. Geo. Smith, Tollington Nursery, Hornsey Road, which had large trusses of bright crimson flowers in the way of Grand Duke, Eclat, &c. 2d, Mr. Henry Cannell, with Master Christine, a deep, pink-coloured, free-flowering variety of great promise, and in all probability the most useful, if not the best, of the two. Mr. Cannell also had Giant Christine, of dwarf habit, with very large flowers. The best Zonal Pelargonium was Lord Derby, from Mr. J. Mann, in fine condition. 2d, Mr. J. George, Putney Heath, with Annihilator, having orange-scarlet flowers. Mr. Mann also had Countess of Derby, Startler, Harvard, Edith Dombrain, Beauty, and Juno, all having that fine smoothness of form so characteristic of the Brentwood seedlings. The best double-flowered Pelargonium was Marie Lemoine, three finely-grown and bloomed plants of which were staged by Messrs. Downie, Laird & Laing. 2d, Mr. J. Mann, with Madame Lemoine, small plants, in 48 pots, with fine trusses of bloom. In addition, Mr. George had some seedling yearling varieties, mostly hybrid Nosegays.

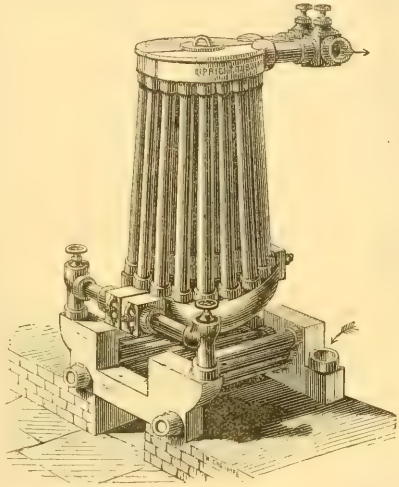

Fig. 202.

Fruit Committee.—G. F. Wilson, Esq., in the chair. Prizes were offered on this occasion for early Plums and Gooseberries. For the former there were eight competitors, Mr. Douglas, gr., Loxford Hall, Ilford Essex, being awarded the 1st prize for a fine dish of Green Gages ; and Mr. Potter, gr. to E. Benham, Esq., Syon Lodge, Isleworth, the 2d, for a good dish of Morocco ; Mr. Potter also exhibited fine examples of Early Orleans ; Mr. Gilbert, gr. to the Marquis of Exeter, Burghley, Stamford, had the Cherry Plum and the old Early Violet ; Mr. Miles, Wycombe Abbey, had Denyer's Victoria ; Mr. Roberts, gr., Holwood, near Bromley, had Rivers' Early Prolific ; and Mr. Beasley, gr. to — Isted, Esq., Ecton Hall, Early Orleans. In miscellaneous subjects Mr. Gilbert sent a fine dish each of Noblesse Peaches, Moorpark Apricots, and Brown Turkey Figs, for which a Special Certificate was awarded ; Mr. Beasley sent a dish of very fine Apricots ; Mr. W. Dods, gr. to Sir Greville Smythe, Barrow Ashton, Bristol, sent a Nectarine, stated to be a seedling, which was quite indistinguishable from Violette Hâtive ; Mr. Mills, gr., Wycombe Abbey, Bucks, sent three Apples, which proved to be the Irish Peach ; Mr. Stowe, fruit grower, Farnborough, Kent, sent some splendid examples of Black Naples Currant, showing very high cultivation ; some of the berries were as large as small Gooseberries. A Special Certificate was awarded. Mr. M'Laren, Ash, Surrey, sent examples of M'Laren's Prolific Raspberry, which obtained a Certificate last season as an autumnal bearing sort. It fully answered the expectations then formed of it. Mr. A. Henderson, gr. to Earl Manvers, Thoresby, Notts, sent a large Melon named Calder's Netted Hybrid Greenflesh, which proved of poor quality. Mr. S. Weekes, gr. to R. Fowler, Esq., Petersham, Surrey, sent two examples of Golden Perfection Melon, which were of no particular merit. Mr. Ford, Leonardslee, Horsham, sent a fine Melon, a hybrid from Golden Perfection, which proved of excellent quality. From the Society's Garden, Chiswick, came examples of Plums—Woolston Black Gage—which were of very fine flavour ; also Perdrigon Violette Hâtive, also well-flavoured ; and M'Laughlin Gage, a large roundish yellow variety, of first-class quality. A few Mulberries also were exhibited, which had been grown in a pot in the orchard-house, which were found much finer and more melting than those from the open air. Messrs. Lane & Son, of the Nurseries, Great Berkhampstead, sent examples of Vines, Peaches, Plums, and other orchard-house trees in pots, all in admirable condition, to which a Special Certificate was awarded. Of vegetables, Mr. Gilbert sent splendid examples of six varieties of Potatos—Milky White, Silver Skin, Early Shaw, Myatt's Prolific, Early Coldstream, and King of the Potatos. Mr. Bland, Fordingbridge, sent a seedling Potato. Messrs. Minier, Nash & Co. sent splendid examples of their late white and red Italian Tripoli Onions, to which a Special Certificate was awarded. Messrs. Carter & Co. sent examples of their Covent Garden Garnishing Parsley, a very fine curled variety, to which a First-class Certificate was awarded. They also sent a long green-striped Vegetable Marrow. Mr. Porter, Syon Lodge, Isleworth, sent a collection of vegetables, and examples of 8 varieties of Potatos.

Oxford Meeting.—We have still to allude to some of the horticultural appliances, &c., exhibited at the late exhibition of the Royal Horticultural Society at Oxford. Mr. Ormson, King's Road, Chelsea, showed a model house in which provision was made for winter ventilation, by ensuring that the air should be duly warmed before its admission. The accompanying illustration (fig. 205) will serve to explain how this is effected. The form of pipe employed is that of a hollow cylinder possessing a heating surface equal to four 4-inch pipes, or more if necessary. The external air is admitted through a tube, nicely adjusted to valves in the front wall, and connected to the interior of these cylinders, where, as a matter of course, it becomes rarified, and consequently forced out through openings provided in the cylinders, into the house, by the denser air which is constantly pressing in ; such a stream of warmed air rushing into either a hothouse or apartment will, according to the laws of pneumatics, keep the air of such places constantly moving through the displacement of the cooler particles by the warmer, and *vice versâ*, so long as a portion can find an escape ; and this Mr. Ormson has provided for by hollow rafters having zinc panels perforated on their lower side, and a valve at the top of each rafter communicating with the chamber shown at the top of the back wall, through which it escapes by iron gratings in the face of the wall above the glass roof. This plan of heating will also be highly beneficial in public and other buildings where large masses of people congregate together, as the vitiated air constantly passes away and its place is supplied by fresh warmed air, which, unlike the cold draughts usually admitted by windows, would neither chill tender plants nor give cold to individuals. The hothouses themselves, while possessing stability in an eminent degree, are rendered light in appearance by the use of very large glass, of extraordinary thickness, and the plan of glazing is such that no putty is exposed to the destructive influence of the atmosphere. Abundant means are also provided for opening sashes in hot weather in the usual way. The ventilators are opened and closed simultaneously by machinery. The plan elicited much approbation from practical men, and seems well suited for the purposes it is intended to fulfil. Mr. Ormson also exhibited numerous forms of boilers, with the peculiarities and excellencies of which the horticultural public is by this time pretty well acquainted.

Messrs. Weeks & Co., King's Road, Chelsea, also exhibited models, designs, and full sized illustrations of plant houses, as well as a model of their new upright tubular boiler, with patent duplex compensating improvements, of which we give an illustration (fig. 202). This boiler is so constructed that one-third of it can be removed in case of necessity without impairing the action of the remainder. To effect this one-half of the upright tubes can be removed at pleasure by means of an improved gun-metal screw. By means of mud valves the tubes can be readily cleaned and sediment of any kind removed. Messrs. Weeks guarantee the durability of their boiler, which is of cast-iron, for 15 years, and point out that owing to its being made in sections it can be passed through narrow doorways, and set up without interfering with existing structures. "The proof of the pudding is in the eating," but it certainly seems in this case as if the pudding would turn out satisfactorily.

Mr. T. G. Messenger, of Loughborough, showed a well-ventilated, curvilinear conservatory, and a vinery. The builder claims for the mode of structure that it combines strength with lightness and durability. The rafters are supported by iron uprights, braced by tension rods. The patented principles—says our contemporary the *Builder*, from whose report we extract some technical particulars—in Mr. Messenger's system of construction

are in the mode of ventilation, the form of the muntins, the use of tension rods, and saddles at the ridge. The houses have also neat wrought-iron crests at the ridge, and end finials; but this feature is not peculiar. The same patentee had also some valuable inventions in ordinary and in flanged valves for hot or cold water, gas, or steam; and in a triangular tubular boiler; also in pumps and garden engines.

Messrs. Dennis & Co., of Chelmsford, exhibited their lean-to and other galvanised metal structures for the growth and protection of fruit and flowers. These structures, which were awarded a first-class certificate of merit at Manchester last year, have, as main features, their bars and bindings of T and angle iron. Their heating and ventilating apparatus and arrangements are also effective.

Messrs. Wright & Co., of Birmingham, showed some very good garden pumps and engines, syringes, shower watering apparatus, and a very ingenious portable self-acting fountain (shown in the accompanying illustration, fig. 203.)

A hydronette, shown by Haynes & Sons, of Edgware

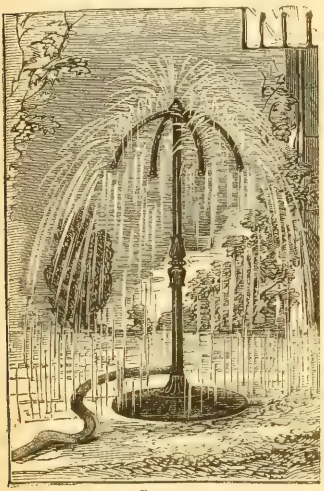

Fig. 203.

Road, supplied from a bucket placed on the ground, appeared to answer its purpose well. Pressure is obtained by the creation of a vacuum in the tube by means of an elastic ball (see fig. 204).

For heating purposes a meritorious novelty was exhibited by Mr. B. Harlow, of Macclesfield, in a safety back or

Fig. 204.

range boiler, in which the liability to burst is reduced to a minimum. The tubes are so arranged in section that each part is free to expand and contract without injurious result or danger from variable expansion.

A varied and meritorious display of brick, pipe, and tile work, was made by Messrs. Colthurst, Symons & Co., of Bridgwater; the ornamental ridge tiles, Roman tiles, garden borders, and others of an ornamental character, were shown in great profusion of colour and pattern, red, dun, and glazed black or in colour. Their exhibits also embraced drain and water pipes, with socket joints of various dimensions.

Mr. Parham, of Bath, had an excellent display of strained wire fences, unclimbable hurdles and fences, malleable iron entrance-gates and foot-passage ways through iron fences secure against sheep and cattle, with espaliers, and ornamental tree guards, gates, and railings.

Among the garden elegancies exhibited by Messrs. Gill, of Oxford, already alluded to, was a garden seat for three persons, admirably contrived; the sitters have ample room, and have their legs well out of each other's way, and yet face a common centre. It has a table attached, and is of light metal with cane-pattern seats and top. We saw a similar arrangement at the Exhibition in Paris in May, and were then, as now, much struck by its ingenuity. The shrubbery gates and fences, of very neat rustic patterns, in iron, exhibited by the same firm, were also very meritorious, as also their rosaries and other flower-garden accessories.

The Apiary.

We have dimly answered the first question raised, as to the life of the honey-bee after the autumn; and it is a natural one to those who have not studied the times and seasons of this country, and the periods when the queen bee lays the greater bulk of her eggs. As we have given our readers the pleasing task of studying the mysteries of bee-life from the egg until the insect flies into the flowering fields, to collect that which man cannot, and to carry out the great duty of making the fruits of the earth (for none can deny the importance of bees to the fructification of flowers), we will turn our attention to another fact—the number of cells, or series of cells, which form a comb in a common cottage hive, as this furnishes to some extent a standard of capacity. There are nine sheets of combs, and these have the bases of the cells formed of three rhombs, hung vertically, and from which the six-sided cells extend horizontally, and at a slight upward inclination, to keep in the honey whilst being filled by the bees. These horizontal cells, truly hexagonal from their bases, are also characteristic of the true honey-bee, of whatever colour, or size, or country, or local variety. The double row of these horizontal cells formed on either side of the rhomboid bases, contain 10,100 cells on an average of the nine combs formed. About 7940 are worker cells, true hexagons; about 2045 drone cells, and about 115 abortive cells, or those sacrifices of space made to allow of the transition from the smaller worker cells to the larger drone cells. The queen cells are the exception, and when emigration takes

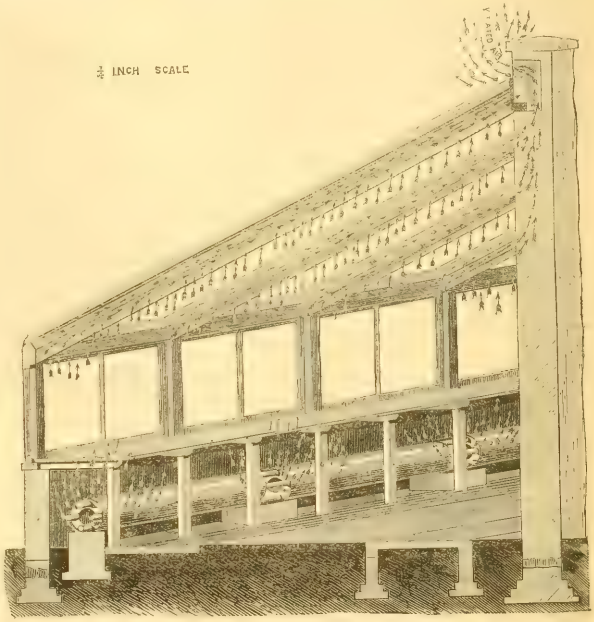

Fig. 205.

place in a normal condition, they are always formed on the edges of the combs. This position is adopted, not because there is any fear of the bee bread or queen jelly, or food, falling into the mouths of the workers if built in the centre of the combs, and where, in old-formed combs, no space could be found between the parallel sides of the cells—which they have invariably, by-the-by, to break away when so compelled to raise a queen from the worker brood—but because the queen must dispose of the workers' eggs with which her ovaries are charged before laying the drone's eggs, and again relieve herself of the burthen of the eggs before taking her flight. In this manner a large number of workers are left to succeed the older and younger bees of spring, which will certainly follow the old queen's fortunes. It is for this reason also that the old queen leads the first swarm of the season, as she is supposed to be prepared for the exodus in every way, and no delays may arise in establishing a new family of bees, as soon as the workers have built the combs. Indeed, the wax-workers are always prepared for this work, as scales of wax may be seen in their wax-pockets if any delay from weather has retarded the old queen's flight. But of this we shall state more.

Well, then, the eggs are laid in abundance, and as the edges of the combs are left with the bases of future workers' cells, in them the queen deposits the eggs; and here the bees find most space to erect the young queen's cradles, and have also more plastic wax to work up the acorn-shaped bases of the queen cell, as these deeper cups are required for the queen's jelly food, which is packed in at the back of the larvæ, whilst the honey and water still lubricate the whole body. This is the difference in raising the queen larva. Besides having a greater extent of cell for the expansion of the growth of the abdomen, and the weight of the body is not thrown on the abdomen in its early stage, as is the case in the limited space of the worker cells; although the transformation of the queen larvæ and worker takes place into the imago, and they are invariably found with all their mouths upwards, and consequently on their backs in the cells, but the queen has her head much lower inclined in the elongated pendulous royal cradle than the common horizontal worker cell. Indeed the prolific workers so mysteriously written about are after all queens raised in imperfectly enlarged cells, where the larvæ have not had the jelly given from the very foundation of the cell, but have been raised in an untimely manner and retarded in their growth. And Huber has shown retarded impregnation also invariably results in the production of queens laying only drone eggs; so these prolific workers only produce drone eggs. Where these exist, it is also very difficult to introduce a queen in the autumn, or to make any of those attempts at artificial swarms which the uniting of numbers for the winter so constantly requires.

We have given our own knowledge of the raising of queens and prolific workers, besides the period of the worker's life, and that of the drone; and before mentioning any form of hive in which these experiments may most simply and easily be carried out in almost any locality, and by every one possessing sight and time to devote to the amusement or instruction, we beg to call attention to one part of the bee life, and economy of Nature in which they seem to delight in baffling man's inquisitiveness. Many acts of their short lives take place in the night; thus after collecting honey or pollen, and storing it away, watching the brood, guarding the combs, and retaining the required temperature and ventilation of the interior of the hive, the bees take their repose at all times of the day; and, indeed, the queen herself may be seen taking her "siesta" after her many fatiguing travels and examinations of the cells for oviposition. The lazy humming drones constantly remind one of the lolling idling crowds of men on an Italian village green. The bees thus filling up the day time seem especially to devote the nights to the most important secret work of the interior of each cell: the rapidity also of their work really puzzles the most attentive observer. Now the art of depositing the queen jelly in the embryo queen's cradle, the quickness with which the bees close the mouth of this cell, and the watching of uniform periods of the worker larvæ,

are always done in the night, and prove the economy of time, as well as the certainty of the brood being raised within a given period; and by the marked cells bringing the young bees in due succession, show that the bees are seldom mistaken when left to flourish in their normal condition. We know when smoke, or other unnatural attempts have been made to subdue the bees to examine the cells and the brood or eggs, the time is much protracted, and the brood is injured; as combs with brood pressed in the slightest degree seldom thrive afterwards. But the most curious and mysterious work is the period the bee larvæ have to spin the silken cocoon within the narrow cell. We have stated that the larvæ, as they accomplish their sixth day's existence, have secreted the silken glands; and as the development is accomplished internally, and the larvæ have been nourished with the honey and water, lubricated by the bees, and the required quantity absorbed, and these filtered in by the mouth—a process which may be seen by a microscope in the older larvæ, vibrating like the bill of a duck when filtering in water,—whilst the sack of a body may be seen slightly expanding and contracting whilst the internal deposit is going on, and the spiracles and glands of the larvæ are also fulfilling their work, and forming that body which is to become a perfect bee. When, then, the larvæ have arrived at the age to spin the cocoon, the bees close in the mouth of the cells roughly, so that the larvæ are then able to attach the silken respirator. When they have finished the bases and sides of their cells, the maggot-shaped larvæ, having performed this most curious attachment of the cocoon, have grown into upright white mummies, the lower segments of the larvæ showing the marking and form of the future bee, the centre of the body a curious narrow waist, and a long neck, standing up with the "spinnerettes" projecting as when last used to finish the upper part of the cocoon, and to fasten the silken respirator to the lid of the cell; there, exhausted of this curious silken reel, the body seems to fall on its back, and await the final grand development, when with its jaws the bee has cut around the respirator, and can emerge a perfect bee, ready to undertake its task of duty as soon as the various nerves, &c., have given it, by expansion and circulation, the perfect use of its limbs and wings. We have, however, been led away by our subject, and have only space to beg that our readers will fully test these facts, and we will promise to give a description of the hive wherein these facts can be proved. *M. D.*

Miscellaneous.

Tree Mignonette.—As a winter decorative plant, this is a special favourite here for baskets, in the house or the conservatory, not only on account of its graceful appearance when grown in a tree-like form, on stems 2 feet high, with heads from 2 feet to 3 feet through, but also on account of the fragrance it diffuses throughout the house. Indeed, our plants are the admiration of all who see them. To have the plants in bloom by November, the seed should be sown by the middle of March. We use 3-inch pots, thoroughly cleaned and well drained, with a thin layer of moss over the crocks. The soil should be rather free, and put through a half-inch sieve. The pots are nearly filled, the soil gently pressed down, and a few seeds are placed in the centre of each, covering them over with soil to about the thickness of the seed. We give a good watering, and place the pots near the glass in a temperature of 60°; if shaded until the plants make their appearance, so much the better. At this stage, they don't relish being often watered. As soon as the plants are large enough to see which is the strongest, we take all the others away, and put a small stick to the one left, and to this it is tied as it grows, in order to keep it from breaking at the neck. When about 6 inches high, it will require another shift into a 6-inch pot, observing the same care as before in regard to drainage at this and all future pottings; the soil, moreover, should be only chopped, and some leaf-mould, a good sprinkling of sand, and a little soot should be well intermixed throughout the mass. A little of the soot sprinkled over the moss on the top of the drainage will be beneficial in keeping worms from getting into the pots during the summer. We find 11-inch pots large enough for making fine heads. The leading stem should not be stopped until it has reached the height required, and then the top side shoots will be found to make a fine head if properly attended to, in regard to pinching and tying down to a small trellis made of wire, of the shape of an umbrella. In pinching out the side shoots, a pair of Grape scissors will be found best, as they do not injure the stem leaves, which must be taken great care of all through. By growing in a temperature of 60°, near the glass, giving manure-water twice a week after they have filled the last pots with roots, and daily syringing overhead, they will by the month of November amply repay all the labour bestowed upon them. The same treatment applies to pyramids, only none of the side shoots must be pinched away. We have at present (December 28) plants which, when staked, will be 3 feet high, and as much through. *A. Henderson, in "Florist and Pomologist."*

Grafting.—"Nature" records an experiment performed by M. J. M. Philipeaux, in which he transplanted one of the incisor teeth of a guinea-pig into the comb of a cock:—On January 13, 1853, M. Philipeaux, after having made an incision into the head of a young cock, introduced into it the incisor tooth of a guinea-pig that had been born a few hours previously. The tooth, very complete, and furnished with its bulb, was so placed that the bulb was at the bottom of the wound, and the extremity of the tooth turned outwards. On the day the experiment was made the tooth was 8 millimètres long and 2 millimètres thick. The cock was killed 10 months after the operation. The tooth, which on the day of operation was entirely concealed and covered in the wound, projected, when the animal was killed, five millimètres from the surface. M. Philipeaux had dissected out in the specimen the whole length of the tooth, and found that it measured no less than 13 millimètres. It had consequently grown 5 millimètres. The interest of this experiment, which in other respects resembles those of Hunter and Sir A. Cooper, in which the spur of the cock was transplanted to the comb, consists in the circumstance that here a graft was accomplished in one animal of a part belonging to another and entirely different physiological class.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Hydrangeas, which are general favourites when well grown, may now be propagated. If cuttings are put in at two or three different times—say one lot now, and others in the first and last week of September—a fair succession of flowers may be anticipated. Choose stiff, moderately ripened wood of the current season's growth, cutting them in to about three joints, and plunging the cuttings when potted into a nice bottom-heat. It is always best to pot each cutting separately into a 60-sized pot. Place them near to the glass as soon as they are rooted, and shift them into 48's as soon as these are well filled with roots. When they have again rooted moderately into this fresh soil, it will be necessary to expose them to all the light and air possible. Some old growers used to plunge their specimen plants in any convenient places, and layer the young shoots into smaller pots placed around for that purpose. The Hydrangea is a very accommodating plant; it will thrive in almost any kind of soil; a stiff loamy one seems to suit it best. Fintelman, of Potsdam, a very successful grower, used the light mould formed of an aggregation of dead leaves, &c., found at the bottom of woody ravines, after it had been exposed to the air by turning over, &c., for some months. The Steeple Campanula (*Campanula pyramidalis*) may now be propagated by dividing the roots, or by breaking them into pieces, and planting four or five around the inner sides of 48 or 32-sized pots, plunging them in a cool frame and well watering them. As soon as they have made a good start they may be brought out into a more exposed position, and may be treated as ordinarily until the following spring, or till the first week in March, when they will require putting off into single pots, &c. All the host of winter blooming plants now in preparation for the dark and dreary months, comprising as they do such things as *Heliotropes*, *Primulas*, *Ageratums*, *Cinerarias*, *Salvias*, *Roses*, *Violets*, &c., must have every possible attention in regard to potting, pinching back to form bushy plants—full exposure, by turning each round and by changing their positions. Those successional *Cape Pelargoniums* which have been cut back some little time, and have formed fresh shoots, should be shaken out of the old soil, the roots washed if necessary, and trimmed in neatly, by removing all long irregular or superfluous roots with a keen-edged knife, so as not to lacerate in any way the wounds. Re-pot into as small size pots as the roots can be readily got into, and without undue pressure; place them in a somewhat close, cool, and moderately shaded, frame. I had omitted to say that the soil should consist of equal parts sand, fibrous loam, and leaf-mould, and that the pots should be thoroughly well drained and placed upon slates, in order that worms or other noxious things may not enter them. Do not delay the necessary sowing of *Herbaceous Calceolarias*. Be careful to diminish by small degrees the amount of root water afforded to pot plants of all sorts which have finished their growth, and which should be engaged in ripening their newly formed wood only.

FORCING HOUSES.

We may now anticipate a change from the excessive heat we have experienced up to the time I pen these remarks, for the season is advancing apace toward the colder nights of autumn; and according to the heat of the past, and its intensity, so will be our need of watchfulness in regard to all matters appertaining to forcing operations. It will therefore be necessary at the advent of a cooler period to have resort to closing up *late Vineries* early in the afternoon, say about 4 o'clock, and by this and every other means to obviate the too early use of fire-heat. Of course it will still be necessary to give all the air possible, and, to counteract the effects of early closing, the sooner a little is given in the morning the better. Upon mild, genial mornings, give a judicious amount of air soon after 7 o'clock, increasing it materially by 10 or 11, and up to the mid-day hour. The most forward successional *Pines* which may require a further or final shift, should have it at the earliest possible date. Thus time will be afforded to re-establish themselves before the short days set in. As I suggested last week, pot suckers a few hours after they are taken off the parents. To let them lie about too long at this period of the year, will be to tax their enduring capacity too greatly. Pay attention to all matters relating to the bottom-heat in all pits wherein fermentative materials are used exclusively to form bottom-heat for the roots of Pines—I allude to the supplies of tan more particularly. Attention must in like manner be given to all linings around frame or pit grown *Melons* or *Cucumbers*, for if there is any neglect in this matter neither will afford the necessary fruit much longer. It will be too late to wait until symptoms of suffering exhibit themselves in regard to either of these. Collect the necessary materials to form the beds within which to plant and grow *Winter Cucumbers*, and push forward the necessary operations relating thereto. Bear in mind the main fact, that a most wholesome atmosphere must be insured, and that a thorough cleansing of the structure, aided by whitewash, is the only means to secure this. If you have had any symptoms of Cucumber disease in the past—a malady which, I fear, is becoming more and more prevalent,—then procure your seed from a distant source, or one free from suspicion, and be extremely particular in exacting the matter of scrubbing and otherwise cleansing every cranny about the structure in which the plants are grown, even to giving at least one coat of paint to the woodwork. *Fig trees*, which give promise of a good late crop, should receive another and final root watering. Any gross or unnecessary shoots should be stopped by pinching off the points in the usual manner. Procure horse-droppings for *Mushroom beds*, from those horses which are fed on dry provender alone. There is, however, little risk of any horse having an excess of green food this season.

HARDY FRUIT GARDEN.

Pot off into their fruiting (32-sized) pots, with the utmost dispatch, all *Strawberry plants* intended for forcing, as not a moment is to be lost when once they are sufficiently established. Use rich fibrous maiden loam and good spit manure, and pot moderately firmly, giving a thorough good watering, to settle the soil down well.

HARDY FLOWER GARDEN.

As the period for taking cuttings of bedding plants is near at hand, notes should be made regarding such improvements as it is possible to introduce into the arrangements for a succeeding season, so that the proper stock be secured. I would again draw attention to the great usefulness of *Iresine Lindeni*, which I praised last summer; as a dark foliaged plant amongst the darkest it has no rival, and should be propagated to the requisite extent.

KITCHEN GARDEN.

I can add little to former Calendars. Do not omit to sow a good breadth of prickly *Spinach* not later than the 10th of this month, as it is important to secure a good winter crop. Water *Autumn Cauliflowers* well, or the produce will be but scanty. Sow *Chervil* for winter uses. Cut down *Fennel*, that it may shoot again before winter. Harvest *Summer Savory* and *Sweet Basil*. Sow *Lettuce* and *Endive* for a succession. *W. E.*

TOWN GARDENING.

Clear grass plots of Dandelion, Plantain, &c., which will make them appear rather rough, but if a little grass seed be sown, fresh mould cast over, and the plots well rolled, they will recover before the family comes to town. The leading shoots of *Ivy*, *Virginia Creepers*, &c., should be nailed close, and all straggling shoots cut out. Now is the proper time to increase the *Lily of the Valley*, but they should only be disturbed where the stock is required to be enlarged, as they flower much more freely when left to themselves. The best method of propagation is to lift the old roots with a fork, divide them into as many separate pieces as may be required, and plant them with a trowel, covering them with about 2 inches of soil. They flower very freely in the Temple under a south shrubbery, where they have been for many years, and all that I do after once planting them is to keep them from overrunning the walks and borders. The *Pelargoniums* for bedding purposes should now be propagated. The following old varieties are of dwarf growth and habit, and flower freely:—Christine, Cybister, Stella, and Madame Vaucher; at the same time I advise a visit to the Parks, where many other varieties may be selected. Strong shoots that are straggling away should be taken off and cut into pieces with two or three joints, and dibbled in a shady part of the garden to make roots, after which they should be potted where they can be wintered in a cold frame after the following manner:—Sink the frame, which should have a south aspect, within 3 inches of the surface, taking out the soil, and put in a false bottom of boards placed on bricks, burying it up so that the plants come nearly close to the glass. By this means they can be well protected from the frosts, and they are not so likely to damp off if kept close for several days. *Centaurea gymnocarpa*, *Stachys lanata*, *Cineraria maritima*—plants that make a great show—can all be propagated and kept in the same manner. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, AUGUST 3, 1870.

1870 Month and Day.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.			
July and August.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
28. Thurs.	29.50	59.6	57.6	55.8	88	4.9
29. Friday	29.66	59.7	54.8	49.4	69	4.9
30. Saturr.	29.85	64.9	59.0	55.9	73	4.9
31. Sunday	29.89	71.3	60.5	52.7	51	6.2
1. Monday	29.63	66.9	63.2	61	66	6.6
2. Tues.	29.75	64.1	61.1	57.6	69	6.3
3. Wednes.	29.69	62.1	60.9	57.2	91	5.6

1870. Month and Day.	Temperature of the Air.					Wind.	Rain.	
July and August.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg		Miles	
28. Thurs.	64.9	57.0	12.9	57.6	— 4.6	N.N.E.	350	0.00
29. Friday	67.3	49.7	17.6	58.2	— 4.1	N.E. to N.N.E.	270	0.00
30. Satur...	74.9	55.4	19.5	63.1	+ 0.7	N.N.E. to N.E.	210	0.00
31. Sunday.	80.5	60.3	20.2	67.9	+ 5.5	N.E. to E.	200	0.00
1. Monday	81.0	62.8	18.2	70.1	+ 7.7	N.N.E.	105	0.14
2. Tues.	79.1	61.0	18.1	63.8	+ 1.4	E.	136	0.01
3. Wednes	69.0	50.9	18.1	62.6	+ 1.3	N.E.	124	0.60

July 28 —Overcast till night, then clo dless.
— 29—Generally overcast. Rain fell about 6 A.M.
— 30—Cloudy throughout the day.
— 31—Generally cloudy. Distant thunder, accompanied by lightning, observed between 1 and 2 A.M. Occasional rain
August 1—Generally overcast. Rain fell during the early morning, and again in the afternoon. A thunder-storm between 1 and 2 P.M.
— 2—Overcast throughout. Occasional thin rain.
— 3—Overcast throughout.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, JULY 30, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg	In.
Portsmouth ..	83.3	47.3	37.8	73.5	50.9	22.6	62.2	0.00
Blackheath ..	88.8	49.7	39.1	76.7	50.6	26.1	63.8	0.03
Bristol	90.2	46.0	44.2	77.6	45.8	31.8	61.9	0.05
Birmingham ..	82.2	48.2	34.0	71.9	51.4	20.5	61.7	0.00
Wolverhampton	87.1	47.2	40.2	71.7	51.3	20.4	62.7	0.00
Leicester ..	88.7	51.7	37.0	76.7	50.0	26.7	63.5	0.10
Norwich	77.5	51.9	25.6	71.7	54.9	16.9	62.4	0.27
Nottingham ..	87.1	51.1	36.0	75.8	55.2	20.6	65.4	0.11
Sheffield	82.2	52.0	30.2	71.0	56.0	18.0	63.1	0.01
Liverpool	85.1	48.9	36.2	71.1	55.2	18.9	63.2	0.00
Manchester ..	88.1	49.0	39.1	73.7	51.8	21.9	62.8	0.00
Salford	87.3	46.0	41.3	70.3	54.3	22.0	62.3	0.00
Bradford	86.0	52.9	33.1	74.2	56.0	17.3	65.1	0.00
Leeds	86.2	53.0	33.2	74.0	56.0	17.8	65.0	0.00
Hull	79.0	47.0	32.0	70.3	51.3	17.0	60.0	0.01
Newcastle ..	74.0	51.0	23.0	64.5	55.7	8.8	58.3	0.00
Edinburgh ..	82.7	45.0	37.7	..	..	..	58.7	0.00
Glasgow	85.2	45.0	40.2	..	..	..	61.1	0.00
Dundee	74.0	44.0	30.0	..	..	..	58.7	0.00
Aberdeen	69.5	41.0	28.5	..	..	..	61.3	0.00
Paisley	88.0	41.0	41.0	..	..	..	61.4	0.00
Greenock	78.5	51.5	27.0	..	..	..	61.1	0.00
Leith	86.0	44.0	42.0	..	..	..	57.0	0.00
Perth	85.0	49.5	35.0	..	..	..	61.6	0.00
Dublin	86.9	48.5	47.4	..	..	..	58.6	0.00

JAMES GLAISHER.

Notices to Correspondents.

*** It is particularly requested that letters relating to the business department of the Paper, Advertisements, &c., be addressed to the Publisher, and not to the Editors.

BOLETUS: *W. C. T.* The specimen of Boletus arrived in a hopeless state of decay. The pileus was quite resolved into fluid. The stem was tolerably perfect, and apparently that of Boletus luridus, which we should suppose it to be, if the orifices of the tubes are red. The delay in its arrival arose from its having been carelessly forwarded to Market Deeping instead of Market Harborough, which was plain enough on the direction. *M. J. B.*

DOUBLE CONVOLVULUS TRICOLOR (minor): *E. L. S.* Not a novelty. Your specimen was so crushed that we could not ascertain whether the changes were so great as to preclude the formation of ripe seeds. If you succeed in getting seed, you must be prepared to find only a few seedlings produce double flowers.

ECONOMIC ENTOMOLOGY: *Horticultural Society's Collection in South Kensington Museum.* Permit me to acknowledge through your columns a contribution of specimens of the various kinds of honey bee made to their Collection of Economic Entomology, South Kensington Museum, by Messrs. George Neighbour & Son, of Regent Street. They have been placed beside the fine collection of comb, &c., contributed by Miss Eleanor A. Ormerod. *Andrew Murray.*

FRUIT CULTURE IN JAMAICA: *Inquirer.* We do not know of any book on this subject.

HYBRID BETWEEN CURRANT AND GOOSEBERRY: *W. D. Fox.* Your supposed hybrid is a distinct North American species, Ribes oxyacanthoides.

MOFFAT'S DUKE OF EDINBURGH STRAWBERRY: *A.* This fruit, stated to be a cross between Keens' Seedling and Elton Prince, and to be very prolific, is, judging from the samples sent, very large; but it is coarse and deficient in flavour. They were, however, not in good condition when they arrived.

NAMES OF PLANTS: *R. T. Stepney.* Ipomopsis elegans, sometimes called Gilia pulchella.—*A Young Botanist:* 1, Aspidium aculeatum; 2, Aspidium lobatum; 3, Aspidium dilatatum; 4, Sedum spurium; 5, Sedum Aizoon; 6, Filago germanica; 7, apparently Alchemilla arvensis; 8, Cichorium Intybus; 9, Juncus bufonius.—*Subscriber, W.C.* Apparently Melica uniflora, but too far gone for positive determination. It is of little value agriculturally. *James Britten.*

COMMUNICATIONS RECEIVED—H. M.—J. S.—S. D.—J. Silver.—T. G. M.—T. S.—Old Subscriber.—J. L.—G. G. & Son.—H.—D. F.—W. T.—B. C.—B. S. W.

Markets.

COVENT GARDEN.—Aug. 6.

We have but little to add to last week's report; prices remain much the same, and a steady course of business prevails in both markets. The last cargo of West India Pines has arrived for this season. Imports are heavy, comprising the usual varieties, and, in addition, Grapes both from Spain and Portugal. Amongst flowers we have Balsams, Pelargoniums, single and double Gladioli, Heaths, Coleus, Hydrangeas, Fuchsias, Crassulas, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz ..	2 0	— 4 0	Oranges, per 100 ..	8 0	to 12 0
Cherries, per doz lb.	3 0	— 6 0	Peaches, per doz...	6 0	— 12 0
Grapes, per lb. ..	3 0	— 6 0	Pears, per doz. ..	1 6	— 3 0
Lemons, per 100 ..	6 0	— 12 0	Pine-apples, per lb.	3 0	— 6 0
Melons, each ..	2 0	— 6 0	Strawberries, p. lb. .	0 6	— 2 0
Nectarines, per doz.	4 0	— 8 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, p doz...	2 0	— 4 0	Horse-Radish, p bun.	3 0	to 5 0
Beet, per doz. ..	2 0	— 3 0	Leeks, per bunch ..	0 2	— 0 4
Cabbages, p. doz....	1 —	1 6	Lettuces, p. score ..	1 0	— 2 0
Carrots, p. bunch ..	0 4	— 0 8	Mint, per bunch ..	0 3	— 0 4
— young, p. bun.	1 6	— 2 0	Mushrooms, p. pott.	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch ..	0 4	— 0 9
Celery, p. bundl. ..	1 0	1 6	Parsley, per bunch ..	0 2	— 0 4
Cucumbers, each ..	0 —	1 —	Peas-shelled, p. pint	0 4	— 0 6
Endive, per doz. ..	1 6	— 2 0	Potatos, new, p. lb.	0 1½	— 0 2
Fren. Beans, p. sieve	2 0	— 3 0	Shallots, per lb. ..	0 8	— ..
Dec. retail, p. lb. ..	0 4	— 0 6	Spinach, p. bushel.	2 0	— 3 0
Garlic, per lb. ..	0 8	— ..	Radishes, per doz...	1 0	— 1 6
Herbs, per bunch ..	2 0	— 4	Turnips, yng. p bun.	0 9	— 1 0

Potatos, York Regents, per ton, 140s. to 180s.; Flukes, do., 200s.; new, 1 cwt., 5s. to 7s. per cwt.; new kidneys, 7s. to 10s. do.

Romford Cemetery.

To NURSERYMEN and CONTRACTORS.

THE ROMFORD BURIAL BOARD are prepared to receive TENDERS for LAYING OUT a Piece of LAND for a NEW CEMETERY, forming a Footpath and Carriage Drive, sowing with Grass, Planting, &c., according to a Plan and Specification and Bills of Quantities deposited at the Office of the Architect and the Board, Mr. J. Allan, South Street, Romford, on payment of 2s. 6d. each set; and sealed Tenders are to be delivered at my Office not later than 12 o'clock, on Wednesday, the 17th day of August. The Board do not bind themselves to accept the lowest, or any Tender. By order, ALFRED JUTSUM, Clerk to the said Board.

Romford, July 29.

SEED TRADE.—JAMES DICKSON & SONS REQUIRE for the Seed Warehouse a respectable, painstaking, and experienced MAN, with thorough knowledge of the Agricultural Seed Trade; can very correctly Execute and Despatch Orders. He must be married, without family, or with not young children, as a dwelling-house could be provided. When applying, state all particulars as to age, experience, &c.—100, Eastgate Street, Chester.

SEED TRADE.—JAMES DICKSON & SONS REQUIRE an experienced YOUNG MAN, who can write expeditiously and very neatly, and correctly Execute Vegetable Seed Orders. Apply, in own handwriting, stating age, experience, salary expected, &c.—100, Eastgate Street, Chester.

WANTED, a GARDENER (SINGLE-HANDED), married; one who thoroughly understands Vines, Training Fruit Trees, the Management of a Kitchen and Flower Garden Walks, Pits a week, and prototage. Wife can undertake Laundry, if wished. Age and reference required, of which will be about 15s. per week.—E. M., Post Office, Huntingdon.

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Seed Trade.

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13 by 11	14 by 11	15 by 11	16 by 11			
14 by 12	15 by 12	15 by 11	16 by 11			
18 by 12	19 by 12	20 by 12	21 by 12			
16 by 13	17 by 13	20 by 12	..	15 0	16 0	18 6
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SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, PARTICULAR, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
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WEDNESDAY, September 21.—A valuable selection of COWS, HEIFERS, and BULLS, from the first class Herd belonging to James Fawcett, Esq., at Scaleby Castle, near Carlisle
FRIDAY, September 23.—The ENTIRE HERD belonging to Chas. R. Saunders, Esq., at Nunwick Hall, near Penrith.
TUESDAY, September 27.—The ENTIRE HERD, belonging to the late D. P. Waleran Esq., Highworth, Wilts.
THURSDAY, September 29.—The ENTIRE HERD belonging to W. Cox, Esq., at Brailsford Hall, Derby.
FRIDAY, September 30.—The small select HERD, the property of Thomas Robinson, Esq., Burton on Trent
WEDNESDAY, October 5.—Mr. William Butler's ENTIRE HERD, of about 30 Head; at Badminton, Chippenham, Wilts.
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Best three Shorthorns, 1st Prize, £50; Best Hunter .. 1st Prize, £50.
FOUR HUNDRED PRIZES given at this Show for PIGS, POULTRY, PIGEONS, DOGS, &c. ENTRIES CLOSE AUGUST 10. For Prize Lists apply to R. FAWCETT, Secretary.

WIRRAL AGRICULTURAL SOCIETY.—The ANNUAL SHOW will be held on AUGUST 24, 25, and 26, in a field belonging to Sir William Jackson, Bart., adjoining the Park, Birkenhead, when PRIZES to the amount of about SEVEN HUNDRED POUNDS, among which are Silver Cups, and Twenty Silver Medals, will be offered for HORSES (Special Prizes for Leaping), HORNED CATTLE, SHEEP, PIGS, POULTRY, and PIGEONS, IMPLEMENTS, and MACHINERY, CHEESE and BUTTER, &c. Special Prizes are also offered for thoroughbred entire HORSES.
ENTRIES CLOSE AUGUST 3. Forms of Entry, Schedule, or any other information may be obtained on application to
WILLIAM HENDERSON, Jun., Secretary.
2, Market Cross, Birkenhead

STAFFORDSHIRE AGRICULTURAL SOCIETY.
The SMALL SHOW will be held at STAFFORD, on WEDNESDAY, SEPTEMBER 7, and in addition to the usual Prizes for Stock, Produce, &c., offered for competition within the limits of the Society's operations, Special Prizes of £25 and £15 for the best and second best Stallion for agricultural purposes, also Prizes for Poultry and Implements, are open for competition to the United Kingdom.
ENTRIES CLOSE AUGUST 20.
Prize Lists and Forms of Entry are now ready, and may be had on application to the Secretary.
W. TOMKINSON, Newcastle, Staffordshire.

State of the Crops, 1870.
THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE of SATURDAY, August 13, will contain a FULL and IMPARTIAL STATEMENT of the STATE of the CROPS throughout the UNITED KINGDOM. Order of any News Agent. A single Copy sent for Six Stamps
Published by W. RICHARDS, at the Office, 41, Wellington Street, Strand, W.C.

The Agricultural Gazette.

SATURDAY, AUGUST 6, 1870.

THE Wheat crop appears in many places this year to have suffered in a more than usual degree from the ravages of a Wheat fly.

An intelligent observer in the *Farmer* says that that crop, "from presenting a full average appearance in thickness as well as health of plant when commencing its spring growth, has so completely failed in many districts that thousands of acres have been ploughed down and resown with Barley, or thickened up with a seeding of the well-known early maturing bearded April Wheat." He describes the injury as having been caused by a small footless grub of a lighter yellow than the wireworm-grub, about three-tenths of an inch in length, and in form thickest at the tail end, and tapering gradually to the head, where a small, longitudinal, blackish, internal portion, apparently the mouth and throat, is seen through its transparent surroundings, the extremity of which presents a forked hook-like appearance when protruded in the act of feeding. It attacks the inside of the leaves of the Wheat plant immediately below where the leaves open or spread out, "from whence it eats downwards, devouring the tender inner leaves, the tops of which have become withered, followed by the others as the grub progresses and attains to full size, at which stage it has generally reached near to one of the upper roots of the plant, when it changes into its chrysalis form, which is a little shorter as well as thicker than that of the grub, and of a

dull orange colour." He adds that this is the stage of existence to which the grubs of the present season have recently attained, and at which they may be gathered in or near the remains of the plants on which they have fed; and he "defers further description for the present, as entomologists have not yet furnished trustworthy data in regard to the after transformation, habits, and reproduction, or are even agreed as to the name, of this most unwelcome visitant."

We have more faith in the attainments of entomologists at the present day, but even were it otherwise, surely their ignorance should be no reason (it ought to be the reverse) for not giving all the information already acquired by the writer on a subject of such importance. A fuller description (especially if accompanied by a figure) would very probably be recognised by some entomologist, and we say so with the more confidence that the description, imperfect as it is, contains sufficient indications to set an entomologist on the track. The insect apparently does not belong to the Cecidomyias, or true wheat-flies or wheat-midges. The grub is said to be three-tenths of an inch in length, that is, about one-third of an inch. None of the Wheat or Barley Cecidomyias exceed a twelfth of an inch in length. Its colour is said to be paler yellow than that of the wireworm,—their colour is bright orange: we have seen them almost vermilion. Its form, too, is different from that of the Cecidomyias. They are oblong-oval, not broader or larger at one end than the other. This is (like the grub of the common fly) said to be thickest behind, tapering in front. Lastly, it is said to have something black in the throat under the skin, and a forked hook-like projection at the mouth, protruded when eating. This, probably, is the apparatus of two retractile hooks at the mouth, which is characteristic of the Muscidæ, and which can easily be observed in the maggot of the cheese hopper (Piophila Casei), that insect using them to lay hold of its tail preparatory to throwing its wonderful somersaults. The grub described in the passage above quoted is therefore probably a fly, and very possibly belongs to the genus Anthomyia. If this meets the eye of the writer, and he has preserved or can procure specimens of grub, of the pupa, and of the damage done, we venture to beg him to send specimens to the collection of economic entomology, now forming at the South Kensington Museum, where they will be properly appreciated and duly displayed and acknowledged by *M.*

A RAPID railway journey through several counties of Lowland Scotland, and through both Eastern and Western England—as far north as Perthshire, and as far south as Folkestone—has left the impression of great crops in the North, both grain and green, and of a productive Wheat crop of good quality generally in England. There has been an abundant hay crop in the North, there seems also to be a noble crop of Barley. The Potatos are magnificent all through the Lothians—we heard of crops sold unharvested on the ground for £30 an acre. The Turnip crop is various, though often very good. Farther south the evidence of drought increases, and at length one sees, as in 1868, that fire from the passing train has often burned up whole acres of grass land. The Wheat crop, however, maintains, in most counties, its usual power of resisting drought, and generally appears excellent. Barley and Oats, and other spring-sown crops, are short and stunted. The county of Kent—where the drought has been as severe as anywhere, and where, notwithstanding his astonishment of only the previous day at the fertility and beauty of Lothian farming, one is forced to acknowledge the most perfect bits of country loveliness and luxuriance, and good farming too, that can anywhere be seen—is, in many places along the railway lines, unusually fine this year. The Hop grounds, so far as an unaccustomed eye can judge, have not suffered, and Wheat is very often extremely good. In other places there is evidence of mildew and premature ripeness. The Clover stubbles are in some places perfectly riddled with circular patches of Dodder. Harvest is proceeding everywhere south of the Forth, and in some places, especially about Peterborough, we saw the Wheat stubbles already cultivated for an autumn crop. We hope next week to give the detailed reports of our correspondents.

—— PRICES have been buoyant this week in Mark Lane, and flat in the Metropolitan meat market. Wheat was worth 1*s.* per quarter more money on Monday and Wednesday than during the previous week.

—— The Select Committee appointed by the House of Commons to inquire whether it is expedient that the charges locally imposed on the occupiers of rateable property should be divided between owners and occupiers, and what changes in the constitution of the local bodies administering rates should follow such division, have examined 30 witnesses in the course of the inquiry. At the close of the evidence Mr. GOSCHEN, the chairman, proposed a report which gave a summary of the information obtained; Mr. CORRANCE also proposed a report; but the Committee, after deliberating, did not proceed with either report, but, having regard to the reference to them, agreed to the following resolutions, which they have reported to the House:—

"1. That your Committee, without pledging themselves to the view that all rates should be dealt with in the same manner, are of opinion:

"(*a*). That the existing system of local taxation, under which the exclusive charge of almost all rates leviable upon rateable property for current expenditure as well as for new objects and permanent works, is placed by law upon the occupiers, while the owners are generally exempt from any direct or immediate contributions in respect of such rates, is contrary to sound policy.

"(*b*). That the evidence taken before your Committee shows that in many cases the burden of the rates, which are directly paid by the occupier, falls ultimately, either in part or wholly, upon the owner, who, nevertheless, has no share in their administration.

"(*c*). That in any reform in the existing system of local taxation it is expedient to adjust the system of rating in such a manner that both owners and occupiers may be brought to feel an immediate interest in the increase or decrease of local expenditure, and in the administration of local affairs.

"(*d*). That it is expedient to make owners as well as occupiers directly liable for a certain proportion of the rates.

"(*e*). That subject to equitable arrangements as regards existing contracts, the rates should be collected, as at present, from the occupier (except in the case of small tenements, for which the landlord can now, by law, be rated), power being given to the occupier to deduct from his rent the proportion of the rates to which the owner may be made liable, and provision being made to render persons having superior or intermediate interests liable to proportionate deductions from the rents received by them, as in the case of the Income-tax, with a like prohibition against agreements in contravention of the law.

"3. That in the event of any division of rates between the owner and occupier, it is essential that such alterations should be made in the constitution of the bodies administering the rates as would secure a direct representation of the owners adequate to the immediate interest in local expenditure which they would thus have acquired.

"5. That the great variety of rates levied by different authorities, even in the same area, on different assessments, with different deductions, and by different collectors, has produced great confusion and expense; and that, in any change of the law as regards local taxation, uniformity and simplicity of assessment and collection, as well as of economy of management, ought to be secured as far as possible.

"6. That the consolidation into one rate of all local rates collected within the same area is a matter of great importance; and that your Committee concur in the resolution of the Select Committee on Poor Rates Assessment, 1868, which recommended one consolidated rate,—viz., 'that a demand note should be left with each ratepayer on the rate being made, stating the amount of the requisitions, the rate in the pound for each purpose, and the period for which the rate is made, the rateable value of the premises, the amount of the rate thereon, and of each payment of the instalment of the rates.

"10. That by the terms of the reference to them, your committee were limited to the question of the division of the charges on rateable property between the owners and occupiers, and what changes in the constitution of local bodies administering rates should follow such division; and they have consequently been precluded from entering upon the inquiry of the relations of local and imperial taxation, and the nature of the property liable to the same.

"11. That your Committee are of opinion that the inquiry on which they have been engaged forms only one branch of the general question of local taxation, and that other considerations besides those which have been submitted to their investigation should be previously taken into account in any general measure giving effect to the above recommendation."

—— Prizes were awarded for reaping-machines after the trials by the jury, which took place at Petit Bourg, near Evry, on July 5 and 6, and at the farm of Chamant, near Senlis, on the 25th of the same month. The number of points to be given, both for reaping and trials with the dynamometer, being one hundred, the following were the results arrived at:—1st prize, awarded to Messrs. HORNSBY, reaper, "Progress," with 74 points. 2d, to Messrs. SAMUELSON'S machine, new model, with side seat for driver, and M. FAITOT, of Maisons-Alfort, Seine—*ex æquo*,—72½ points being given to each of these reapers.

—— The annual meeting of the Co-operative Society of Agriculture was held during the Royal Agricultural Society's exhibition, in the Town Hall, Oxford. It may also be stated that the Society had a stand at the show, at which samples of articles supplied to the members were exhibited. The report of the Council to the Society showed that there are now 738 members, that the sales amounted to £21,891, the gross profits on which amounted to £2411, which was nearly equally divided between the members and the working expenses and 5 per cent. paid upon capital. The resolutions passed included the adoption of the report, the election of four new members on the Council, the appointment of Professor ALFRED SIBSON as analytical chemist for the ensuing year, the determination to form a federation of all the existing local agricultural co-operative societies with the parent association (whose offices are at Parliament Street, Westminster), an agreement to return half the gross profits on purchases during the ensuing as during the past year. It was also resolved to hold the next meeting in London at Christmas. The business done by the Society during the progress of the exhibition was considered to be very satisfactory.

—— The Minister of Agriculture and Commerce in France has just issued an official notice relative to pupils of the Imperial Schools of Agriculture. Two degrees of examination are thereby instituted—the former is to take place before a jury composed of the director and professors of each school, and those pupils who pass in a satisfactory manner will receive certificates. The pupils will be examined in the subjects comprising two years' study, by means of written compositions, practical proofs, and orally. The second examination is only open to pupils who have obtained a fixed average number of marks with their certificates, and will be conducted by a jury composed of professors and agriculturists under the presidency of an inspector-general of agriculture. The programme of this second examination consists of a memoir drawn up by the pupil candidate between August 15 and October 15 on an estate, an industry, or a locality indicated; and of the discussion of the subjects treated in such memoir. The successful candidates will receive diplomas as agricultural engineers. This ministerial decree comes into operation next month.

—— On Thursday of last week we had the pleasure of seeing the small herd of wild white cattle in Cadzow Forest, one of the parks attached to Hamilton Palace, Lanarkshire. The large full grown cattle looked as if they might fatten to 7 or 7½ cwt. of beef; the bulls had light hind-quarters, but were heavy and deep in front—all had black muzzles, black ears, and, in the older beasts, black tips to their horns. We got quite near to the small herd of bulls, and they appeared to us to present on the whole almost as satisfactory a result (as regards form and symmetry), the breeding arrangements being entirely within their own province, and no one interfering, as in the case of nine-tenths of the ordinary herds of the country, where the breeding arrangements are directed by the higher intelligence of man! We were told that some years ago the herd numbered 80 or 90, but all fell victims to the cattle plague, except 13, of which 11 altogether escaped and two recovered. When the plague attacked them, they were driven individually between gradually approaching fences, leading to a large and strong waggon sunk to the ground level, and so captured and taken to separate sheds, where they were confined until all risk was passed. They have now increased to 37; and a very beautiful sight a herd of 30, standing and lying on the open grass of the park, presented in the bright sunshine of last Thursday. A smaller herd of bulls—two of them old and others younger—suffered us to get quite near them; indeed, of their alleged wildness we had no evidence whatever. In a couple of months, however, the bulls will be dangerous; and, in the late spring, when the calves are dropped, each cow picks out a lair for herself in the ferny retreats of the park, and is jealous of approach. The number of the males is kept down by shooting some of them annually. They are fed in winter on hay, which is left for them in sheds to which they can have access.

—— We learn from the *Lyttelton Times*, a New Zealand paper, that in that colony Thistle growing is an offence punishable by the magistrates. What will Irish, English, and even good Scotch farmers (for we have seen rare growths of Thistles in the Turnip fields in the upper reaches of Clydesdale within the current week) say to the following way of dealing with an obstinate Thistle grower:—

"Mr. J. C. WILSON, C.B., was charged on the information of Mr. HARROP, Surveyor to the Spreydon Road Board, with having failed to eradicate certain Thistles growing on his estate at Cashmere, after a notice had been served upon him to do so. The information was based upon the alleged neglect of defendant to take adequate measures for destroying the Thistles, respecting which he was summoned before the court on the 24th of last month. The surveyor said, during the past week he walked over the estate, and for a distance of two miles he found that nothing had been done to destroy the Thistles previously complained of. In defence, it was pleaded that men had been employed 10 days during the present month in striving to carry out the orders of the court in the previous case; also, that 10 donkeys were kept for the sole purpose of eating off the tops of the Thistles! It was urged as impossible, however, to effectually remove them until the whole of the Cashmere estate was ploughed up, and laid down in English grass. Thistle seed came in perfect clouds from the peninsula, and germinated faster than it was possible to eradicate them. Government allowed Thistles to grow on the hills, and the seed was carried in clouds on to private lands, rendering it beyond the scope of possibility to eradicate them, except by ploughing up every inch of soil. In reply to the Bench, the informant (Mr.

HARROP) said he was not prepared to deny that defendant had used the measures stated to eradicate the Thistles on his land, but those which informant had complained against previously were now in full bloom, and had never been touched. His Worship said it was not for the Bench to decide whether or not defendant could eradicate the Thistles on his land, but merely to carry out the law as it stood. The Bench must take it that, judgment having been suspended on a previous conviction against defendant, and no adequate steps having been taken to eradicate the Thistles then complained of by the Inspector, the fine stipulated by the Ordinance—5*s.* per day, since the conviction on February 24, amounting in the gross to £7 10*s.*—must be imposed."

—— At the beginning of the past week the thermometer at Boulogne stood at 39°.8 centigrade (103°.60 Fahrenheit). Such heat has not been experienced there since the year 1813—the first year of regular observations at Boulogne. The writer, however, remembers that at Havre, on a Sunday in August, 1808, the thermometer marked 104° in the shade. In Paris the heat reached 89°.60 Fahrenheit.

OUR LIVE STOCK.

CATTLE.

THERE will be sold at the Holly Bank ram sale next Tuesday some Shorthorn calves, among them MARQUIS OF STAFFORD, calved in April, by DUKE OF SUTHERLAND, a well-bred Bates bull, and out of *Florence 6th*, by LORD OF THE MANOR (16,437). EDGAR, the 2d prize bull at Oxford, secured the highest honours at the Highland and Agricultural Society's late meeting at Dumfries, but he had not at the latter meeting his formidable rival BOLIVAR to contend against. This excellent bull is roan in colour, of grand size, and is remarkably deep in front, and well developed behind. He is now fast approaching the completion of his eighth year, and was bred by his present owner, Mr. Saunders, of Nunwick Hall. EDGAR (19,680) was by PRINCE PATRICK (18,633), a bull also bred by Mr. Saunders, and descended from the Nunwick and previously Yanwath Hall "Pearl" tribe. The bull whose pedigree we are considering was out of *Young Emma*, by MCTURK (14,872), a sire which connects the pedigree through EARL OF DERBY with the best Bates blood, and *Young Emma* was grand-daughter to *Emily*, by CORNET (1854), from which sprung Mr. Crofton's well known "Emma" family.

—— Messrs. Panton of Wragby, Lincolnshire, have got four prizes at the Royal show, and sold a yearling heifer for £350 to go to America.

—— A few weeks since we mentioned that Mr. James O. Sheldon's American herd would probably be offered for sale by auction on the 24th of the present month. A telegram has been recently received by Mr. Thornton, announcing the important intelligence that the entire herd at Geneva, U.S., has been sold to Messrs. Walcott & Campbell.

SHEEP.

MR. GARNE'S sale of Cotswold rams on the 29th ult. resulted in an average of about £16 over 50 shearling rams. Last year 52 Aldsworth rams made £18 8*s.* each.

—— At Mr. Lane's sale of Cotswold rams, held at Broadfield, near Northleach, on the 28th ult., 50 shearlings and a few older sheep were disposed of by Messrs. Lyne & Acock, auctioneers. Mr. Swanwick, of the College Farm, Cirencester, gave the top price, 80 gs., for a very fine ram, own brother to the sheep which Mr. King Tombs purchased last year for 210 gs. A keen competition was kept up for some time between Mr. Swanwick and Mr. Aylmer, of West Dereham, Norfolk, which finally terminated by the first-named gentleman becoming the purchaser. Mr. Swanwick has now three excellent rams from Mr. Hewer's (Northleach) and the Broadfield flocks, and he also secured the best of the theaves, and some very first-class ewes at the dispersion of Mr. Hewer's flock last autumn and the present spring. With such a good foundation we hope to hear of the College Farm flock soon taking a high position among those of the Cotswold Hills. The average of the Broadfield sale was only £14 8*s.*, which contrasts unfavourably with the averages of £20 3*s.* in 1869, £31 18*s.* in 1867, and £26 18*s.* 9*d.* in 1866.

—— There was only a "middling" demand for rams last Monday at the Cirencester annual fair. A considerable number remained unsold, and we have not heard of any high prices. Ewes met with a sale at from 35*s.* to 38*s.* per head, and this at a market in which mutton was commanding extreme prices. The low prices for store animals is, of course, readily accounted for by the scarcity of keep. Messrs. Moore & Hill have kindly favoured us with the following prices of shearling rams :—Mr. Clarke, of Frampton Mansell, showed 10 shearlings, which were sold at an average of 6½ gs. each. Mr. Charles Barton showed 12 shearlings, eight of which were disposed of at 8 gs. each, the highest price obtained being 15 gs. Another breeder showed 20 rams, but only succeeded in selling a very small number of them. It is, however, in the private sales and lettings, rather than in the public markets, that the highest prices are usually obtained, and we may expect to hear of the usual run of good prices on the Cotswold Hills.

—— Mr. E. Waters' sale of rams, ram lambs, and ewes, as one of the first of the season, commands considerable interest. This auction was held by Mr. Waters, of Salisbury, upon the 27th ult., and attracted a large company of flockmasters interested in the propagation of Hampshire Down sheep. 100 ram lambs, 13 shearling rams, and 216 ewes were sold. The two former classes went off very well, but the ewes sold badly. Among the highest prices given we may mention the following :—Lot 2, Mr. Mayo, 15 gs. ; lot 10, Mr. Rawlence, 44 gs. ; lot 15, Mr. Kent, 14½ gs. ; lot 20, Mr. Lyne, 25 gs. ; lot 25, Mr. Compton, 25 gs. ; lot 26, Mr. Russell, 15½ gs. ; lot 19, Mr. Hoddinolt, 14½ gs. ; lot 36, Mr. Symes, 13½ gs. ; lot 42, Mr. C. Long, 15½ gs. ; lot 49, Mr. Noteley, 16 gs. ; lot 50, Mr. Kellow, for Mr. A. Morrison, 39 gs. After this prices gradually lowered to 4 gs., and the average over 100 lambs disposed of was £9 18*s.* 6*d.* For shearlings, prices ranged from 4 gs. up to 21 gs., given by Mr. Barton for lot 101. Mr. Hoddinolt gave 20 gs. for lot 102, and Mr. Moore gave 30 gs. for lot 106. The average for the older sheep was £15 3*s.* 8*d.* So far as the rams went the sale was considered satisfactory, but the ewes brought less than they might have been expected to have sold for in any fair or market away from home.

—— We have received a catalogue of the Holly Bank ram sale, which takes place on Tuesday. Thirty-two shearlings and three 2-shear rams will be offered, besides 60 ewes. The shearlings are nearly all by "The Nugget," bred by C. R. Keeling, Esq., by "Competition," bred by Mr. S. Byrd, and are from ewes by first-rate Holly Bank and other rams.

—— What is meant by "show condition?" We are tempted to reply that the term implies hopeless obesity, a constitution endangered, a system forced to an unnatural extent, a pampered condition of body anything but fitted to withstand the hardships to which cattle are constantly subjected. Every one cries out against the extreme fatness of the breeding stock exhibited at our shows. Instances are not wanting of animals breaking down under the severe "training" to which they are subjected in bringing them into what is called show condition. In others the reproductive system, always sensitive and easily affected, is injured permanently. These effects are so well known that breeders who have achieved their reputation are chary of showing. We look in vain for the names of Gunter, Bowly, Kingscote, and Booth in the late Oxford catalogue, and we cannot but suspect that it is the dread of spoiling their valuable animals which keeps them from exhibiting. Again, a case in point is suggested by the absence of our most noted Cotswold sheep-breeders. One who bears a noted name among these widely known men informed us that the case was somewhat as follows :—To show a pen of ten theaves or of five ewes it is requisite to commence to prepare sheep for show a considerable time beforehand. To ensure success it is also necessary to prepare a much larger number than will eventually be exhibited, so as to allow of choice. The result of this is, that too large a proportion of good theaves or ewes must be placed upon unnaturally forcing food, at the risk of permanently injuring them. Hence many Cotswold men had rather preserve their flocks in moderate healthy condition than subject them to the critical course of training necessary for successful competition in the showyard. How this abuse of over-feeding is to be met it is not easy to say. Every exhibitor finds fault with it, and yet he is obliged to persevere in a course which, on principle, he disapproves. All judges condemn the practice, and yet it is plain to all spectators that "condition" will tell beyond its true value. A contemporary has suggested that this is a matter for societies to take up, rather than judges, and that over-fat animals should be disqualified from taking prizes, just as sheep are for unfair clipping. How far this is practicable we can hardly say, but it does not seem unreasonable that an opinion might be expressed by a competent inspector that a given animal is too fat to be considered in a healthy state for propagating its kind, and must, therefore, be removed from a competition between animals devoted to breeding purposes.

HOUSEHOLD BREAD.

IF there be any one subject more than another that may truly be said to come within the scope of the *Agricultural Gazette*, it is that of bread, or in other words the materials out of which it may be manufactured.

The subject, although an everyday one, is not thereby rendered vulgar, and never can be unimportant. Our English ideas of bread are embodied in the London 4 lb. loaf made in the shape of a causeway block or paving-stone, and is of two qualities, namely, "best bread" and "seconds," but the seconds may be considered the normal state of the article, for that assuredly is the London household bread, and all other fancy breads are looked upon as exceptions.

The French cooks are said to have some hundreds of recipes for cooking eggs, but what are these to the number of ways that bread has been manipulated under the heads of baking and pastry cooking. The difficulties attending the growing of Wheat in high latitudes, and the cost of wheaten flour, have caused all sorts of substitutes to be used as breadstuffs ; and as all the true grasses yield eatable seeds, there is a great range of breadstuffs in the grass tribe alone. I may here remark, in passing, that "Drunken Darnel" (Lolium temulentum) is said to be poisonous, but the statement that this well-known coarse annual Rye-grass has any poisonous qualities, is just about as well authenticated as the tale so well told by Homer of the Lotos, eaten by the companions of Ulysses, which made them forget home and friends, or, as we should say, made them so drunk as to want dragging home. Besides the true grasses, many other plants, as the Pea, Bean, Vetch, Potato, Buckwheat, &c., are invaluable, as all the world knows, in the way of breadstuff ; and we read that, in times of scarcity, the Norwegians have had to mix the bark of trees along with their breadstuff to eke out their supplies : and such was the importance of this practical hint, that in a country better situated, men have in times of scarcity been glad to sustain life by making soup or broth of the gummy young twigs of the Larch tree.

It is rather strange that although the London bake-houses are supplied from Scotland with professional bakers, there is nothing that the Scottish housewife is so deficient in as the use of the oven. She is neither baker nor pastrycook, and it is only by great self-sacrifice that she overcomes, by her strong good sense, the prejudice—almost like a second nature to her—that animal food should be cooked otherwise than by boiling, as if soup or broth were always to be the chief aim. The Scotchman in London has been often taunted with liking good dinners, and then finding fault with the extravagance of the Englishman for providing them ; and therefore as long as the husband cries out in this way, the wife cannot be blamed for taking him at his word ; but there can be no excuse for the low state of cookery everywhere throughout the kingdom. Many articles of the highest importance are lost to the community for want of the necessary knowledge as to how they are to be prepared ; I might name the article Mushrooms as one of these, and I could name many others, such as the salad tribe, and fish of most kinds, which few seem to be able to bring to the table, although often to be had cheap.

A good oven is indispensable before anything can be done with the baking of flour bread in loaves, or with pastry ; and a cheap one such I am going to describe will, I hope, help forward the movement. Mashed potatos mixed with a portion of wheaten flour make excellent hot cakes for tea in the North of Ireland, baked as they are wanted upon an iron plate over the fire. Oat cakes are baked in Scotland in the same way, over the fire, upon an iron plate. Still the wheaten flour, baked in loaves by the professional baker, is what Scotland and Ireland are fast getting wedded to ; and in lone districts, far out of the track of the baker's cart, it will be of great service to get into the way of having home-made bread ; and in the present unsatisfactory state of the Potato crop in Ireland and elsewhere, it may be well to know that a good deal of good meal, or farina, can be extracted by grating and washing from unsound Potatos, as the diseased portions separate readily from the sound ; and this meal, or farina, becomes a transparent jelly at the temperature of boiling water, and is equally well suited for the potato cakes above named, baked on the iron plate over the fire. The professional baker has often been blamed for, and occasionally convicted of, using foreign ingredients to mix with wheaten flour in the making of bread, but thrifty housewives make no secret of mixing a portion of mashed Potatos with the dough of the wheaten flour, and actually prefer the bread so made to that of wheaten flour alone. I need scarcely remark that even 20 per cent. in weight added to the batch would give just five loaves instead of four, from the same weight of flour.

Travellers in Spain admire the bread made there as something not to be equalled anywhere else, and I cannot help thinking that our Devonshire method of making excellent bread without an oven, properly so-called, must have been borrowed from the Continent or brought to our shores by some castaway family or ship-wrecked mariner from Spain. Their apparatus for baking bread exactly resembles a bee-hive mounted on its bee-board, for they get an ordinary three-legged pot of cast-iron, such as we see in any country house, only it has to be of the true bee-hive shape, and a little wider at the mouth than elsewhere, so that when baked in it the loaf may turn out freely. Besides the three-legged pot, there is an iron plate corresponding to the bee-board ; this plate is about half an inch thick and a little larger than the lid of the pot. This plate is to be had in the ironmongers' shops in Exeter and other West of England towns under the name of a "bake-stone;" and as the pot as well as the bake-stone are used for other household duties, there is no extra cost incurred in getting them to do the extra duty of baking bread, I have often thought what an immense boon these cheap ovens would be to emigrants, and how much does our own country lack such appliances. How many English labourers' homes would be made happy by the services that this little iron dome oven could render them, where a wisp of straw or stubble, or a Gorse faggot burnt over it would bake to perfection the bread for a family, and that gipsy-fashion, if necessary, under the shelter of any hedge, or in the open field or lane in a calm day.

In some parts of Devon, where they use faggot-wood for fuel, they remove the heap of hot embers accumulated during the day to one side, and after making the hearthstone quite clean, and dusting it with flour, put the ball of dough on it, and then whelm the pot over it, and put all the charcoal and hot embers carefully over the pot, and so leave the bread to bake during the night with no trouble or expense; but in South Devon, where I lived, the bake-stone as well as the iron pot was used. The iron plate or bake-stone is first warmed, or rather heated with a blaze of straw, and it is then wiped quite clean, and dusted over with flour, and then the ball of dough is put in and the pot whelmed over it; and when these preliminaries are got over, straw, or branches of trees, or dry stubble, are burnt over the pot until the whole is covered with a good coat of embers, and nothing more is needed for the next two hours, when the bread will be found nicely baked, and the loaf will have risen and filled the pot, and will of course have the semi-globular form of the oven which contained it. The heating of this oven can be regulated with the greatest certainty, and as it does not heat from below, like ordinary kitchen ovens, the bottom crust does not get burnt hard, for the fire is distributed all over, and is less felt at the bottom than anywhere else, and this principle is of great service in raising the bread. When the air in the oven heats and expands it finds an outlet at the junction of the iron pot with the bake-stone, and this action is always outwards and never the other way; thereby, insuring cleanliness. I mention this lest any one might say that bread baked in this way could not be clean, but when I state that my family lived in Devon many years, and that we had our bread baked in this way by the Devonshire girl who lived with us, and that it was excellent, I may surely be believed; for I have seen the best French cookery practised in the families of the English aristocracy, and therefore I claim to know good bread when I get it to eat. Baking and cookery of all kinds, like other household duties, are not considered respectable subjects to inquire into, but the end justifies the means, and good bread and good dinners are blessings of the highest importance; and if any poor family can be coaxed to make a thrifty loaf at home, or bake a fruit tart for the family dinner under a Dutch pot with a wisp of straw, I shall be very glad. Bear in mind this is no theory of mine, the whole thing is in good working order now, and no doubt has been for centuries daily bringing forth good bread and good pastry. As regards the respectability of the subject I might state that in the beautiful history of Joseph we read of the Egyptian Pharaoh having a baker; and in heathen mythology Ceres was appointed to the bread corn department in the councils of the immortals; but all these fade into insignificance when we read the sublime words of our blessed Saviour, teaching us to say to our Father who is in heaven, "Give us this day our daily bread." *Alex. Forsyth*, 9, *Islington Square, Salford, Manchester.*

POULTRY AND BIRDS.

It appears to me that I must say a word on behalf of farmers' wives who have to keep poultry as a source of profit, and who sometimes get considerably snubbed by their husbands, who grudge the destruction of a few rods of corn or Clover, and who evidently don't reason on the matter, and don't or won't understand either the habits or the profits of poultry.

A farmer will readily turn a large flock of sheep to trample on and drag down a fine field of Clover or grass, but he would be much annoyed to see half an acre eaten by his wife's poultry. He will give his pigs Barley and Beans by the sack, but objects to the poultry helping themselves to their kernels. By-and-by I will tell him which pay best for their food, for I am sure he has never entered into the question. Let us now consider the habits of poultry. Take my own as an instance, for some 300 of them have free access to all my fields (no fences to obstruct them) from the early morn to dewy eve.

As soon as the fowl-house door is opened they receive their morning meal of Barley; they then at once betake themselves to the fields—for what? Observe them. That wonderful eye of theirs examines everywhere, and, quick as thought, they appropriate every fly, slug, worm, or insect on every blade of grass or Clover. This is their occupation during the whole day, except when at rest or when grazing,—for poultry graze equally as do sheep or cattle,—and it is essential that a piece of pasture should be near the fowl-house, otherwise they will, and must, appropriate your young Cabbage, Turnip, or Mangel plants. They must also have free access to water.

What a mistake we make when we cage up poultry, and deprive them of their natural food—green food and insects, with some grain. They are first-class judges of weather. They know by instinct (where does instinct end and reason begin?) when and where their food—insects, worms, &c.—is to be most readily found. They watch for every load of green Tares or green Beans brought home to be passed through the chaff-cutter, and they at once set to work upon the myriads of insects that infest almost every crop.

They are the most industrious and economical of creatures—their ready claw and keen eye are ever at work—not a seed of weeds or grass is wasted. In fact, fowls and birds are true farmer's friends, and the farmer can have no idea how many enemies he has (invisible ones to him) in the shape of insects, until he devotes his attention to the operations of his poultry. Although he can neither see his enemies nor know of their whereabouts, the fowls and birds at once detect them, as you may see by their eager darts and rapid movements hither and thither.

Watch a company of ducks toddling along in regular line, for fair play, and they will show you slugs and insects where you never suspected them. In fact, within a week of leaving the shell the juveniles are on the alert for their natural food, the insect tribe. I could write a small volume on the value of birds, for it is only by watching their habits and good work that the farmer can realise how many enemies he has, and how many friends there are ready to seek for and destroy these enemies.

It is a well admitted fact by all my labourers that my best and thickest crops are in immediate proximity to the fowl-house—commencing at only 10 yards distance. Yes, but see how they are scratching up the seed corn, and what a mess they make. Well, I have seen them at work between the rows of young Wheat (and I only put in a bushel per acre at 9 inches from row to row), and I find in nine cases out of ten that they are in search of insects, and that they find them. Gardeners who are sensitively particular about the appearance of their gardens, hate fowls—See, however, what takes place: An intelligent chemist took to a garden where insects had long had undisturbed sway, and devoured everything. He was fond of poultry, and understood their habits, therefore he gave them free access to his garden; they cleared off the enemy, and he had plenty of everything. No doubt there are times when you would protect your fruit, or your shallow sown seeds. In my case I sometimes employ a boy for a fortnight immediately after drilling close to the poultry-house, but even when I have not done so, I have scarcely been inconvenienced if the grain was properly deposited by the drill. The hen-coops and broods of chickens are always placed on a patch of grass edging the Wheat or Barley fields; and if, when the crops are ripe, they help themselves to a few sheaves, I know they are good customers, for they must be fed (like sheep or pigs or cattle); and they always sell for double the price per pound, although they cost less to produce. Partridges are great friends to farmers, although they don't always believe it. There is no surer sign of imperfect tillage than when you hear of birds and game getting out the seed. What I call imperfect tillage is ploughing the land and then merely scratching the surface with light wooden harrows, so that the seeds are close to the surface, and under them are unbroken furrow slices—long, hard lumps of undivided and unbroken earth, in the case of strong soils almost as tough and impenetrable as weather boarding. In my case I always use heavy iron harrows and deep steeled teeth that cut the furrow-slices into mould, or sometimes cultivate with the cultivator-harrow before drilling, and generally the surface has been well scarified before ploughing, so that the seed is not only properly deposited, but where it grows the young fibres find mould below to work in.

For want of this proper tillage I have seen great losses; the fine fibres cannot work into the great lumps of undivided plough slices which, in stiff clays, are nearly as hard and as whole as weather board. I don't believe that one farmer in ten can tell me what price per pound, live weight, he gets for his poultry, and for his beef and mutton, but I will tell him;—5*s.* per stone of 8 lb. is 4½*d.* per lb. live weight of beef, and nearly about the same for mutton. Now as good poultry always sell for at least 9*d.* per lb., live weight (I mean wholesale), and as they cost no more per pound to produce than beef or mutton, it follows that we gain 100 per cent. by poultry, as compared with meat. I have tested this carefully. In fact I know that the difference is greater than this, because I have frequently sold poultry at 14*d.* and 16*d.* per lb., live weight, or more than three times the price of meat. When we sell a chicken, the purchaser pays for head, skin, feet, entrails, and all but feathers (which sell for more than the carcase per pound), but when they buy meat, the feet, skin, blood, entrails, &c., are all removed, and called offal; consequently, it requires no conjuror to convince heads of families that poultry is dearer food by 100 per cent. than meat.

But should poultry be so dear? I answer, decidedly not, if we, as farmers, did our duty to ourselves, our land, and our country. The demand is evidently in excess of the supply for both poultry and eggs, for we import immense quantities, and, in addition, 500,000,000 of eggs annually! In a former paper I gave you comparative trials of the consumption of Barley by a hen and a pig, much in favour of the hen. Of course, your poultry breeder must understand the business, as must the breeder of other farm creatures. The edge of the fields is the proper place for juveniles, and not cooped up in yards and sheds. Mine are not fancy poultry. I breed from pure stock on each side, say game, Cochin China, and Brahma Poutra, all running and mixing together. I like Dorkings, but they won't thrive on our stiff clays. Every two or three years I change the male birds, paying 21*s.* each for young well-bred ones. We send them to the wholesale salesmen in London, ready plucked.

The hen-houses should have asphalted floors, be kept clean, well ventilated, and occasionally lime-washed; the slated roof lime-washed in hot weather.

A farmer never grudges Barley by the load for his pigs, and cake and corn for his other stock; why should he regret feeding his poultry? We should consider that poultry manure the land the same as any farm animal.

As we are doing away with our trees and fences, there should be plantations on every farm for birds to build in; and we should have plenty of poultry and partridges—the latter for the farmer's table, if not for his sport. It is well known that many a farmer's wife clothes herself and her numerous family by the proceeds of her poultry. In some cases that I know of one of the farm hands receives a pint of beer when the governor is at market to carry in a sack of Barley on the sly for the use of the poultry, so as not to shock the farmer's excessive and unreasonable prejudice about the unprofitableness of poultry.

The hen-house floors being asphalted, and swept daily, and having no open farmyard, knee-deep in straw, we know nothing about fleas. *J. J. Mechi, Tiptree, Aug. 2.*

REPORT ON MANURES.

By Dr. C. A. Cameron.

[The following report has been addressed by Dr Cameron, of Dublin, to Mr Mowbray, Honorary Secretary to the Queen's County Agricultural Society.]

I beg to forward to you the results of my analysis of the 41 samples of artificial manure which I received from you some time ago. The samples were in bottles, which were sealed and numbered consecutively.

The average composition of the 41 specimens was exceedingly good—better, indeed, than I found any former series of specimens received from your Society to be. The superphosphates are of an unusually concentrated nature, three of them containing the enormous proportion of about 40 per cent. of soluble phosphates respectively. Two of the manures present the appearance of Peruvian guano; of these one is of excellent quality, while the other (if sold as Peruvian guano) is adulterated, or at least is mixed with one-third of its weight of ferruginous earthy matter.

With respect to placing a money value upon each of these manures, I may remark that many persons believe such a system to be an undesirable one, and that one or two agricultural chemists decline to appraise the commercial value of the manures examined by them. On the other hand, there are persons who believe that the system is a good one, but that the method of valuation, *i. e.*, the prices attached to the particular ingredients, are open to improvement, because they tend to make certain kinds of artificial manures appear to be more valuable than they really are. For example, highly concentrated superphosphates are usually sold at about £7 per ton, though their money values generally range from £8 to £9 per ton; while manures containing but little soluble phosphate, though rich in insoluble phosphates and ammonia, are sometimes valued by the chemist at lower rates than their selling prices. The explanation of this state of things is simple enough, and I shall endeavour to place the matter clearly before you. Chemists value insoluble phosphates and ammonia at the rates at which any farmer may obtain them respectively in bones and sulphate of ammonia, or combined, in the case of Peruvian guano—a manure not manufactured, and of pretty uniform composition. In bone ashes phosphate of lime exists to the extent of at least 75 per cent., and in that form it may be purchased at £9 per ton. Bi-phosphate of lime is a manufactured article, produced by treating some phosphatic substance, bones, bone ash, mineral phosphates, &c.—with sulphuric acid. It is a substance of definite composition, is purely inorganic, or mineral, and possesses the same fertilising value, irrespective of its source—that is, bi-phosphate of lime prepared from coprolites is in every respect identical with bi-phosphate of lime prepared from guano or bones. When superphosphate of lime was first prepared, and for some years afterwards, the amount of bi-phosphate in it was on the average 12 per cent.; this ingredient was consequently valued at a high rate, because in order to produce it the raw material had to be reduced to powder, to be treated with sulphuric acid, and to be subjected to various processes. As the bi-phosphate of lime is the only ingredient of the superphosphates, and other similar manures, which is artificially produced, the whole cost of the manufacture, the profits of it, the agent's commission, and expenses of every kind, are very properly placed upon it—the bi- or soluble phosphate. Different chemists placed different money values upon the bi-phosphate, but in general it was estimated to be worth £40 per ton. Valued at this rate, and the other ingredients of manures at the prices at which they could be procured in bones, guano, &c., it was found that a good superphosphate had a money value and a selling price which closely corresponded. Of late years, however, the proportion of soluble phosphate in commercial superphosphates has steadily increased, while their price has somewhat declined; and hence we find that in the case of many superphosphates the selling price is considerably lower than their money value, as deduced from their analysis. When a superphosphate is prepared solely from bones

and sulphuric acid, there is still in general a close coincidence in the selling price and money value, because such a superphosphate does not, in general, contain a very high proportion of soluble phosphates, and the raw material—bone—is costly. The manufacturer of mineral superphosphate has one great advantage over the bone superphosphate, namely, that he can manufacture his soluble phosphate at a lower rate, coprolite or other mineral phosphate being cheaper than bone phosphate. But that is a matter of no consequence to the farmer; he wants soluble phosphate, and the cheaper it is manufactured for him (seeing that soluble phosphate from bones is the same as soluble phosphate from coprolites), the lower is the rate at which he is likely to purchase it. I am aware that the makers of bone manures protest against the high price placed upon soluble phosphate; but if that ingredient were valued at a lower rate, whilst ammonia and insoluble phosphates were appraised at higher rates than are now in use, bone manures would appear to be excessively dear in relation to the price of guanos, bones, and bone-ash. I say, then, that the makers of bone superphosphates, with very low percentages of soluble phosphates, must choose between Scylla or Charybdis—between having their soluble phosphates valued at too low a rate, or their insoluble phosphates at too high a price.

It must be said in favour of the bone superphosphates that the insoluble phosphate which they contain is valuble, whilst the insoluble contained in mineral superphosphates is not believed to be possessed of much, if any, fertilising value. The amount of insoluble phosphate in rich mineral superphosphates is not, in general, very high, and the price set upon it does not greatly increase the money value of the manure.

After careful consideration, I have come to the determination to value the ingredients of the manures which I have this day examined for you at the following rates:—

	Per Ton.
Ammonia	£70 0 0
Bi-phosphate of lime	70 0 0
Phosphate of lime	9 0 0
Sulphate of lime	1 10 0
Potash salts	16 0 0
Soda salts	1 10 0
Alkaline salts, as usually contained in superphosphates	1 10 0

As compared with my former mode of valuing manures, my scale, now adopted, reduces the value of bi-phosphate by £4 per ton, and increases the value of ammonia from £60 to £70 per ton, and of insoluble phosphate by £1 per ton. Of late years the commercial price of ammonia has largely increased, whilst soluble phosphate appears to be more economically produced.

With respect to the superphosphates examined this year, it is not easy to say absolutely of any of them that it has been prepared exclusively from coprolites or mineral phosphate, because it is possible that bone-ash, which contains no organic matter, may have been employed.

Nos. 1, 2, 3, 5, 12, 13, 14, 15, 16, 20, 21, 24, 26, 27, 28, 29, 30, 33, 34, 35, 38, 39, have been prepared—some wholly, others in only very small part—from bones. Of the remaining samples I may say of them that (with the exception of the guanos) they are apparently prepared from mineral phosphates, with, perhaps, in a few cases, the addition of a very small proportion of an organic substance; possibly some of them may have, to some extent, been prepared from bone ashes (bones burnt to whiteness). In valuing the manures I show to what extent the percentage of insoluble phosphate of lime influences the total money value of the manure; those, therefore, who do not believe that the insoluble phosphate in mineral superphosphates is of any use need only deduct the value of the constituent from the manure, in order to arrive at the actual value of the manure.

In conclusion, I may remark that in the first year of my connection with your society I found that 50 per cent. of the manures on sale in their district were sold at prices varying from 10 to 50 per cent. higher than their money value, and one sample of superphosphate did not contain a particle of superphosphate. This year I venture to state that the money value of the manures examined will be found very much in excess of their selling price, as was the case last season.

The matter which you sent me, and which you say is probably used to adulterate guano, is simply a ferruginous or ochrey clay, of no manurial value whatever.

During the year three specimens of manures were analysed for your members at the usual reduced rates.

HOUSE SCAVENGING IN LANCASHIRE.—No. I.

In the towns and villages of this district the midden or ashpit system prevails, and watercloset are the exception. The alternative of watercloset or privy as the machinery for removing human excrement from dwelling-houses necessarily comes within the scope of our inquiry. It is indeed forced upon the attention in South Lancashire by the different views regarding it which have been maintained and carried out by the authorities of the two chief towns of the county. In Liverpool the corporation are rapidly converting privies into waterclosets; they have already thus displaced 13,229 during the past six years, at a cost of £37,719; and they forbid the erection of privies in connection with all new dwelling-houses. In Manchester, on the other hand, the municipal authorities strongly insist upon the superiority of the privy; and indeed when applying for their Waterworks Bill they sought for power to make a charge of one guinea per annum for the first watercloset in a house, a sum which would obviously have prohibited the use of waterclosets in all houses below a certain class.

The defence of the privy, as the better arrangement of the two, is confidently urged, and is not without its plausibility. Water-tight tanks or cesspools at a little distance from the dwellings, one to every household, which shall receive the whole solid and liquid excrement, to be there covered daily with the ash waste of the house fires, and thus kept so dry that foul effluvia will be hindered—these, it is declared, can dirty neither soil, nor air, nor stream. The subsoil and standing ground of the dwelling-houses cannot, it is alleged, be fouled by them, the air will not be made offensive, the river will not be polluted; and the contents of these tanks cleaned out periodically must place the whole excrement of the population at the disposal of the agriculturist. On the other hand the watercloset, draining immediately into a sewer and thence into the nearest natural watercourse, washes all this valuable matter, as quickly and completely as possible, clean away—a wholesome arrangement possibly, but a wasteful one; and moreover one which makes a direct and most serious addition to the pollutions of the river. Such is the case put by the defenders of the privy system.

The marked distinction between the two methods which is thus asserted, disappears however when we inquire into their practical working. The privy system is in reality both wasteful and offensive. Neither the cesspool nor the ashpit is water-tight, and their liquid contents soak into the land around them. Sewers are necessary whether waterclosets exist or not; and chamber slops with most of the liquid excrement and other house drainage find their way into them notwithstanding the existence of a privy. And that which is collected in the privy tanks or cesspools is occasionally so soaked with rain-water and at best so imperfectly dried up by the added ashes, that for the abatement of a nuisance it becomes necessary to give these middens connection with the town drains. The liquid part here too, therefore, drains away, and the remainder, while fouled for any other purpose, becomes of very little value agriculturally.

Even where the scavenging is organised and well directed, as it appears to be in both Liverpool and Manchester, much of the nuisance of the privy system seems unavoidable. Taking the latter town for an example of even better management than can be ordinarily expected, it is impossible for any one examining the poorer and even the second-class districts of the town to avoid the conclusion that most injurious accumulations of filth are suffered to exist. In spite of district inspection under an energetic and experienced chief, in spite of police assistance, and notwithstanding that the penny post enables every householder so easily to give notice to the scavenger, privies and ashpits are continually to be seen full to overflowing and as filthy as can be. Even in the outskirts and good districts of the town, long rows of houses stand back to back, separated by only a 10 or 11 yards interval; and this is divided by a midway narrow passage, on both sides of which the privies stand, singly, one to every house, or in pairs, each couple separated by an ashpit common to both. These middens are cleaned out whenever notice is given that they need it, probably once half-yearly on an average, by a staff of night-men with their attendant carts. Occasionally 20 or 30 "middens" are thus cleaned out in succession, the contents being wheeled along the whole length of the row, making the air offensive for several nights together, and creating a nuisance, none the less injurious because, the work being done when the people are asleep, the filthy smell is not perceived.

The contents of these ashpits are divided by the scavengers into so-called dry and wet; and it is a matter of serious importance that it is the latter or obviously filthy part alone which is carried to the manure depôt; the "dry" rubbish being carried to any place that may be in course of levelling in the outskirts of the town. Of course, such a division is most imperfectly made under such circumstances; and it follows that land is thus filled up with most objectionable stuff; and as building extends, the surface is gradually covered with houses which, on such a foundation, cannot fail to be unwholesome dwelling-places. There is now a "tip" in a ravine at Collyhurst, on the north side of Manchester, where land is thus being raised 15 to 20 feet over many acres, by the gradual accumulation of filthy rubbish. A sample of water from a pool at the foot of this tip on the outer side of the Queen's Road, which here crosses the ravine, taken a few days after rain, so that it represented the drainage water of this bank, and thus fairly indicated the nature of the stuff it had trickled through, and another sample taken at a later date, yielded the results on analysis given in the Table below.

It will be seen from the numbers that these liquids contained a very large proportion of highly offensive organic matter. They were in fact much richer in putrescible materials than any watercloset sewage we have met with. The whole of the made land, indeed, here smells most offensively and can never be built upon without great risk to the health of those who shall occupy the houses. And this is no exceptional example connected with the privy system. What to do with the fouled ashes which it accumulates—filthy stuff, too poor for use as manure—is one of the great difficulties of the local authorities almost everywhere in Lancashire. In Liverpool, indeed, wherever a privy exists the whole contents of the ashpit are taken to the manure barge, and it is only the dry ashes of watercloset houses that are used to level land; but in other towns the same necessarily imperfect division of the contents of the privy ashpit obtains which has been described as true of Manchester; and there cannot be a doubt that most mischievous results ensue as dwelling-houses are built over land thus levelled. (See vol. ii., "Minutes of Evidence," part 3, Q. 290 to 292—and 878 to 880—also Q. 2616, 2789.)

However perfect then in theory the ashpit privy may be as a means of house scavenging in towns, in practice it has been abominable; and though latterly improved by better organisation and more vigorous superintendence, and the gradual adoption of various ingenious contrivances, it can never be otherwise than highly objectionable. Land must get soaked with drainage water from these cesspools—the air must get fouled with their stinking vapours—the sewers must carry from them to the river that which is most filthy and yet most valuable.

It was a good suggestion by an opponent of the system that its friends should picture to themselves the sites of Manchester and Salford, with all their dwelling-houses removed, and only the privies left—nearly 60,000 of them—rows and streets, and crowds of them—scattered about almost as thickly in places as the heaps of manure upon a field that has just received a dressing from the dung-cart—each heap here, however, no mere deposit of a barrowload once a year, but a constant collection and continual soakage of filth, which has for years been polluting every corner to which air or water could have access. Is this the site on which to build a healthy town? Would it not be the first desire of every sensible man to sweep this filth away, to drain and aerate, and, if possible, sweeten this land before a single dwelling-place was built; at any rate, to put a final stop to the process which has accumulated so much dirt; to which, indeed, one may fairly attribute much of the responsibility for the high death-rate disclosed by the returns from most of the South Lancashire towns. The returns of the Registrar General, as well as the evidence given before us, show that typhoid fever, scarlatina, diarrhœa, and other zymotic diseases, commit fearful ravages amongst the populations exposed to such pestiferous influences.

It is mainly, of course, because it affects the pollution of the river, that the privy and ashpit method of removing human excrement from large towns has been described; and it must be clearly understood that the very small portion of advantage which it thus confers is won at the expense of great risk to health. *First Report of the Rivers Pollution Commission.*

Composition of Drainage Water from Collyhurst "Tip."
Results of analysis expressed in parts per 100,000.

Dates of Collection.	Total Solid Matters in solution.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen as Nitrates and Nitrites.	Total combined Nitrogen.	Chlorine.	Mineral Matters in suspension.	Organic Matters in suspension.
June 12th, 1869	1643.5	32.272	3.631	29.525	0	27.946	331.50	16.88	13.48
July 21st, 1869	2310.4	22.591	5.257	15.440	0	17.972	440.0	54.36	26.52

THE ECONOMY OF STEAM ROAD-ROLLING.

By Fredk. A. Paget, C.E.

Mechanical Effects of the Horse, compared with those of the Steam, Roller.—Mr. Newlands, the Liverpool Borough Engineer, who has had more experience in steam road-rolling than any other English surveyor, observes that horse road-rolling "is of little use in consolidating Macadam for such heavy traffic as that of Liverpool," to which we may add London, Glasgow, Manchester, Birmingham, Leeds, and Sheffield. The consolidating load must be in some ratio to the displacing load habitual on the road. A fully loaded ordinary cart presses with at least 5 cwt. to the inch run; and 10 cwt. to the inch wide is rather below the load of a great proportion of the metropolitan traffic. The railway vans of Messrs. Pickford and of Chaplin and Horne weigh 1½ ton, and carry loads of about

3½ tons, and on tires about 3 inches wide. This gives more than 16½ cwt. per inch run. If the Aveling and Porter roller at Liverpool, with its width of rollers of 9 feet 6 inches, were required to exert a pressure of only 10 cwt. per inch run, it would have to be weighted to 57 tons, though its present weight of 30 tons has been found more than sufficient in practice. It makes up for want of weight by an additional number of passages over the metalling, just as the paviour's rammer, though comparatively light, sets the paving stones by a series of repeated falls. Besides the action of the roller itself, the number of rollings required to effect the binding of the metalling will depend on the nature of the materials employed, somewhat on the nature of the soils, and also, and very considerably, on the actual thickness of the metalling. Messrs. Aveling and Porter, as the result of their experience, recommend a 15-ton engine; and this is also, we believe, the case with Messrs. Gellerat & Co., the Paris Road-rolling Company. This load, light enough for steam, is out of the question for horse-power. For one thing, horse-draught does not increase directly with the number of horses; and their hoofs, as it is, stir up the metal just in front of the roller in a way that it can never completely smooth over. It is for this reason that with horse-rolling the benefit obtained is much less on hilly roads, on account of the great number of horses required. This is more especially the case from the present fashion in many places of shoeing draught horses with very long toe-pieces and heels, which tear up the metal, and render the roads rough. Roughing or "frosting" the shoes of horses during the frosty weather of the winter months also leads to the metal being picked up when a thaw takes place; on the other hand, the action of the steam-roller, from its extra weight and its possession of a motive power not requiring the metalling for such fulcra as the horse's hoofs, is much superior. It is considered by Mr. Mann, the superintendent of the department of Her Majesty's Commissioners of Works—and his opinion is endorsed by Mr. E. A. Cowper, the consulting engineer of Her Majesty's Post Office—that the steam-roller has "the effect of turning down the sharp edges of the stones, and leaving their flat sides uppermost, bedding the stones together in the road so as to make a solid level surface."

Cost of Steam-rolling compared with that of Horse-rolling.—As regards the relative cost of rolling roads by steam or horse power, the result of the data—compiled with the usual care and completeness of the French engineers—gives 11*d.* per ton per mile for horse-rolling, or about 11¾*d.* including the cost of repairs. With the addition for interest of capital and depreciation, this would amount to 1*s.* 2*d.* per ton per mile. The Paris rollers are paid for at the rate of 7*d.* per ton-mile, or just one-half, including the contractor's profit. A somewhat less favourable estimate was made some years ago at the outset of steam-rolling in Paris. While road-rolling by horses was found by M. Homberg, Inspecteur-général des Ponts et Chaussées, to cost 0.15 of a franc per square mètre, steam road-rolling—even at the high price paid by the city of Paris to the contractors—costs only 0.108 of a franc per square mètre. In addition, from its great speed of execution, the accessory expenses for watering, strewing the roads, and superintendence, have been very considerably diminished. It is to be observed that M. Homberg here exaggerates the average speed of horse-rolling in Paris. He puts this at an average of 2300 mètres per hour, though it does not in practice exceed 1800 mètres per hour. According to Mr. Howell, the surveyor of roads in the district of St. James, the cost of a 7-ton horse-roller is £2 per day. More than double the weight, say 15 tons, can be moved by steam at about the same expense. Mr. C. C. Marten, the engineer to the Park Commissioners in the city of Brooklyn, New York, states, as the result of his experience with an Aveling & Porter roller, that "for one day's rolling with it, at a cost of 10 dols., as much work could be accomplished as in two days with the 7-ton roller, drawn by eight horses, at a cost of 20 dols. per day. Hence the work done by the steam roller was twice as much, and the cost only one-quarter that of eight horse roller." According to some particulars furnished us by Mr. Philip H. Wall, of trials made in India with Clark & Batho's steam road-roller by the engineer to the Calcutta municipality, the rolling of 44,631 square yards cost £146 4*s.* 6*d.*; the estimated cost of doing the same work by bullocks, £269 5*s.* 6*d.*, showing a saving in favour of the steam roller of £123 1*s.* in mere cost, without taking into account the improved work.

Economy in Road Maintenance produced by Steam-rolling.—As with respect to horse-rolling exact figures giving the comparative duration of roads rolled by steam with others rolled by horse-power, could, of course, only be safely deduced from experiments on a larger scale made during a pretty considerable time, and under identical conditions of comparison. The results obtained on the numerous roads steam-rolled in Paris for more than seven years have led to the general belief amongst those best fitted to judge, that, with the same expenditure, a road rolled by steam lasts double the time of that rolled by horses. Starting from these results, and assuming that the steam-rolled roads would last twice as long as at present, Mr. Heaton, of Birmingham, calculated that an annual saving of £5700 to that town would be effected by the use of the steam-roller; the present annual expenditure for road material alone amounting to as much as £13,000. Though hesitating to assign a precise figure to the amount of saving effected by road-rolling, Mr. Newlands, the Liverpool borough engineer, wrote in October, 1867, with regard to Messrs. Aveling & Porter's 30-ton roller:—"Our roads are in much better order, and easier kept clean than before its use, and our bills for Macadam are not so heavy." Mr. Newlands expects, however, that "the saving in Macadam by every coating being at once consolidated will be very great, though he cannot at present put a value on it." Mr. Howell, surveyor of roads in the district of St. James, wrote in October, 1868, that by means of steam-rolling "the material is saved. The stones being forced into a soft bed, will not be fretted away as they would be when exposed to horses' hoofs and wheels," and he considers "that the use of a heavy roller ought to reduce the cost of maintaining roads from one-third to one-half, with a better road." He says that two-thirds of the material are saved. Mr. Edward Buckham, the borough surveyor of Maidstone, writes us as to the steam road-rolling carried out there in March, 1868, that the "results obtained from using the roller are economy, durability, comfort, and uniformity of sections of road." Mr. Buckham considers that the constant use of a steam road-roller would effect an economy in road maintenance of "at least" 20 per cent. Mr. Tomkins, the surveyor of St. George's, Hanover Square, says that one-third of the material is saved. Mr. Mann, the superintendent of the department of Her Majesty's Commissioners of Works, informs us that his experience in steam-rolling, as compared with horse-rolling, "leads me to conclude that the estimate of a comparative economy of one-third in material and labour would be much below the mark." Mr. R. R. Arntz, the surveyor to the Board of Works of the Westminster district, in the report previously alluded to, of November, 1866, states his opinion that steam-rollers "are a valuable invention, and that they could be used with advantage on the Macadamised roads of London." Amongst other London parish and district surveyors, we may mention Mr. Pratt, the surveyor of Islington; Mr. Browning, of Marylebone; and Mr. Greenstreet, of St. Saviour's, Southwark; Mr. Pattison, of Chelsea, and yet others. The economy produced in road maintenance is evidently in proportion to the cubical contents of the metal required; or in proportion, *ceteris paribus*, to the amount of the traffic. There is an absence of exact determinations; but we believe that after the evidence we have adduced as above, the saving in maintenance may, under most conditions, be safely estimated at more than 50 per cent. per annum, as compared with no rolling at all. The French actually estimate the saving at 50 per cent. as compared with horse rolling.

Home Correspondence.

Appearance of the Crops.—*Northumberland:* I am now able to report to you on the crops in my neighbourhood. Harvest is, I may say, general—all crops are under average. Hay crop, one quarter of usual crop. The ground is much drier than in 1868, and all cattle and sheep are suffering much. Young seed mostly failure. *James Ross, The Hoo Park Farm, Luton, July* 26.

—— *Cumberland:* I am glad to state that we have been favoured with a very good season. Wheat and all other crops, both white and root, look extremely well, all being full average. *Thos. Gibbons, Burnfoot-on-Esk, July* 27.

—— *Essex:* The effects of the drought are quite as apparent on the light soils of this neighbourhood as anywhere. So general is the deficiency of produce that to the cereal crops we may almost write "failure" instead of the usual formula, "above" or "below average." Indeed, in some districts, the produce of the year will hardly meet rents and other cash outgoings; the higher the state of cultivation the more quickly have the crops disappeared, and in several instances Barley has been fed or mown for hay. The early market garden crops of Potatos, Peas, &c., have not yielded a moiety of their ordinary produce. We started with good plants on the heavy and mixed soils, and as the blooming time was favourable, we may expect a full average, although the straw is short and deficient in bulk. The puzzle has been for us islanders how to account for so great an absence of growth. Even the grass on our best marsh pastures never started with vigour, and they have not carried half the usual quantity of stock. At present Mangels are the only roots in plant, so there is little promise for any compensation in the way of winter feed. *S. W. Squier, Stanford le Hope, Essex.*

—— *Herefordshire:* The agricultural prospects of this county are, beyond any question, the worst ever known. The drought, which commenced with cold north-east winds in March, still continues. The meadows of our beautiful and usually fertile valleys, as also on the hillside, present one uniform sterile appearance; cattle bellowing and sheep bleating for food where there is none to give, their pitiful cries piercing the stoutest hearts; some are cutting their corn for their stock, others resort to artificial feed, but far more are allowing their animals to get into a wretched state of poverty, so that we fear great losses will be sustained when it pleases our Almighty Ruler to bless us with that fall of rain we have all so anxiously entreated Him to grant. Even when we are blessed, it will become a matter for serious consideration how best to manage to eke out our scanty stores during the coming winter. The hay and fodder are not more than one-fifth of the usual quantity. The straw of all kinds is very deficient; rarely a field of Swedes or Turnips to be seen. The Mangel is the only crop which appears to bid defiance to the scorching sun, and grow on in the thorough absence of moisture, but in this county there are only comparatively few of those valuable roots grown. As the Barley is cut it is hauled, the corn being very dry and hard, and, alas! no young Clovers to render fielding requisite, thus disclosing another serious loss. The Wheat crop is everywhere very thin, but very fruitful. Winter Beans are a very sorry lot. Spring Beans will prove an average. Peas are good upon strong deep soils. Oats are very deficient, and only the very early planted Barley can be pronounced a crop; much of the later will scarcely return the seed again. The Hops, until very recently, promised to prove an extraordinary crop, but they are changing in their appearance, and evidently want some moisture. The Apple and Pear crops are partial and small. Such is the present position of this county, and by it we are taught how utterly futile are all our efforts unless blessed by that Bountiful Giver from whom all good things flow. Harvest is now general. *D., July* 28.

—— *Lincolnshire:* The Wheat crops have improved very much of late, and I think will be an average. Barley and Oats are not heavy. Beans, moderate. Harvest will be general the first week in August. Turnips are good. The pastures are very bad. *H. Dudding, Panton House, Wragby, July* 25.

—— *Suffolk:* Wheat in this light land district thin plant, but well headed; not average, and very little straw. Harvest commences this week—general Aug. 1. Barley, short crop of straw and corn; premature ripeness; quality not promising. Peas are chiefly harvested, about an average. Mangels, good average. Swedes, backward; plants pretty good; rain very much wanted; have had very little in the neighbourhood. White Turnips promise to plant well. Clover and hay, very bad; not half a crop; secured pretty well; little or no aftermath. *G. W. Sexton, Wherstead Hall, Ipswich.*

The Clover Dodder.—The vast increase of late years in the spread of the Clover Dodder is, I trust, sufficient excuse for me to offer a simple suggestion to my brother agriculturists, which, if adopted by them, will, I feel sure, from practical experience in several instances, help to prevent further losses from this truly great "public nuisance," at least so far as the use of home-grown Clover seed is concerned. I have, during the last four years, particularly noticed the growth and habits of this nasty parasitic plant, and from experiments I have made I am now fully convinced that its propagation may be much lessened. I have spoken to several farmers on the subject, and I find that few of them know anything of the manner in which it grows; one, in fact, confessed he had never heard of it, although he had frequently noticed yellow matted patches in his seeds. By experiments made with seeds obtained from this parasite I find that if left wholly to its own resources it cannot long exist, but that the slender tendrils which spring up two or three days after planting the seeds in a flower-pot soon die away if they cannot find anything to cling to, but if a plant of the red Clover is within reach of them they clasp it at once, and so vigorously, that they become independent of the soil itself, and feed upon the tissues of the Clover, which they in a short time kill; but not until they have formed many little clusters of white seeds, besides putting out fresh tendrils to grasp any other surrounding objects, which, being other Clover, the mischief keeps spreading, until a large patch is soon formed. The method which I have adopted for ridding my seeds of this pest is to cut all the Clover away from the outer edge of the infected spot to the extent of a foot or 18 inches, and then to dig a trench 6 inches deep round, throwing the earth outwards, thus leaving nothing for the Dodder to lay hold of. There is another and better way of avoiding the growth of this plague, by buying Clover seed free from Dodder; but it is very difficult to get a parcel of seed entirely clear of it, and as there are about 250,000 seeds in a pound of Clover, the enemy may easily be concealed from the sharpest eye, until the mischief it has been the cause of shows only too plainly. Of Flax Dodder I know nothing, but I believe it is even a greater trouble to the Flax grower than the parasite of the Clover. *Nemesis, July* 25.

No Longer Pipe no Longer Dance.—Discussions have been going on as to how far a tenant can succeed in injuring his landlord by exhausting the soil without doing injury to himself. I think I can throw a little light on that matter by practice as well as observation. My success here as a farmer depends upon my making much good manure, cultivating deep and well, keeping the land clean, and thus growing maximum instead of minimum crops. Unless I do this I cannot make a profit. The term, "making much good manure," means, in plain English, keeping a great deal of live stock in a fattening condition. So sensitive is my farm in this matter that if we diminish our cattle or sheep from their usual number we see and feel it immediately in our crops, and our profit diminishes

pro rata. The farmer who keeps no stock, and sells his crops away from the farm, must come to grief unless he has rich unexhausted land, of which there is very little in Britain, or unless, near a town, he purchases abundant manure. Artificial manures, especially superphosphate, may answer very well on certain soils, as on the limestone of the prize farm and other suitable soils; but, with the exception of Peruvian guano, they are of very little use on our Essex non-calcareous clays. A good farmer may be left unrestricted as to cropping, but such a man will keep plenty of stock, grow plenty of root and green crops, and consume them, and the hay and straw, with plenty of cake and corn. One thing is certain, "no manure, no crop," or "no longer pipe no longer dance." That is a conclusion I have arrived at after 25 years of practical experience, and I believe it to be a sound one. Britain, as a whole, is not half-farmed. *J. J. Mechi, August 2.*

A. B. C. Manure.—It does not appear fair that only one side should be heard. I have read with great interest all you have published with regard to irrigation farms, artificial manures, &c.; but having myself tried the native guano manufactured by the A. B. C. process at Leamington, as well as at Hastings, I can only say that its effects are wonderful—not under the use of larger quantities in proportion to what would be employed on a grand scale, but with smaller quantities. I cannot do better than refer to a letter in the *Standard*, of Tuesday, July 12, 1870, on sewage utilisation, which I think places the matter in a very fair light: it runs thus:—

"'Inquirer' asks for an explanation as to the discrepancies between your account of the A. B. C. process at Hastings and the report of the Rivers Pollution Commissioners; also between the statements in our pamphlets and the results of the decision in the committees of Lords and Commons on the Reading Bill.

"As to the committees, it is impossible for me to give the reasons which dictated these decisions, but I may tell 'Inquirer' the fact that in the Reading case the Lords refused to admit any evidence whatever upon the A. B. C. or other schemes rivals to irrigation, because such objections had not been raised in Mr. Attenborough's petition.

"The quotation given by 'Inquirer' as to the opinion of the Royal Rivers Pollution Commissioners on the effluent water by the A. B. C. process is taken from the conclusion of their report on the Leicester experiment of three days in 1868, and not from trials either at Leamington or Hastings.

"At the old Lime Works at Leamington, I frankly admit, however, that the A. B. C. process has never had a fair chance to prove what it can really do in purifying the effluent water. The settling tanks are far too small, and the water has not time to deposit all its organic matter after mixing with the A. B. C. compound. Our uncertain tenure of these works, owing to the previous arrangement with Lord Warwick, has prevented this company from further outlay of capital in increasing the size of those settling tanks. It is only surprising that such good results have been possible there, and is strong evidence in favour of the A. B. C. system.

"At Hastings extreme chemical purity of effluent water is not an object. Flowing as it does into the sea clear and inodorous, the commercial results are there of greater consequence.

"Really well arranged works are now being built in several inland towns, where ample settling room will be given and where Dr. Frankland's filters will be added, so as to ensure extreme purity of effluent water.

"After all, the question of A. B. C. irrigation is one for ratepayers to consider and to decide. A large town in Yorkshire was prepared to spend over £100,000 on an irrigation scheme. Its whole expense by A. B. C. will not exceed £25,000.

"In the case of Reading the irrigation scheme, including the land, will cost at least £60,000; on the A. B. C. system £8000 would suffice for land, buildings, machinery, tanks, and filters, and this company have offered to guarantee 5 per cent. on this outlay, and to secure the authorities from all complaints from the Thames Conservancy as to the purity of the effluent water.

"C. RAWSON, Native Guano Company (Limited).

"1, St. Swithin's Lane, London, July 7."

It is not at all correct to say that the system is a failure, for it has succeeded commercially at Leamington, as well as practically, and the results for the short time the Hastings works have been in operation are, I understand, most satisfactory in every way. *Fair Play.* [See last report of the Rivers Commission.]

Mr. Smith's Report on Wales.—I am afraid Mr. Smith forgot his spectacles when he came to look around in Wales. In the month of January last I sent the Editor of the *Agricultural Gazette* a sample of Oats grown on recently inclosed land, and at p. 82, of January 15, 1870, his judgment is thus recorded:—"The sample sent is perfect, the Oats are short, plump, clean, and unstained." This is a sample of Mr. Smith's sound judgment when he speaks about "Welsh agriculture." I fear, too, that Mr. Smith has relied in other matters upon "hearsay." My young cattle do not get "only straw," for they get plenty of good roots also in winter. If Mr. Smith had made a "real" inquiry, he would have found that a regular Welsh farmer grows almost no roots and very little hay. What hay there may happen to be goes for the cows, what few roots there are go for the sheep in a snowstorm, and the young cattle get straw and nothing else, and, in the great majority of instances, are never turned out during winter except for water. The herbage round the homestead is fully stocked with sheep, and a Welshman never lets cattle and sheep run together if he can avoid it. The young cattle, however, are well and warmly housed, for cattle in Wales are often better housed than men; and every Welsh farmer knows right well if he turns out cattle from a warm house to shiver on a bare hillside, he will injure them instead of benefiting them. Strawyards in my part of Wales are unknown—all the cattle are tied up. For Mr. Smith's benefit I have sent him by post a few heads of Oats now growing on lately reclaimed land, picked to-day (July 30), and which are very nearly ripe for cutting. If he likes, too, I will be glad to show a sample of Oats, grown in 1869, and another sample grown in 1870, both upon newly reclaimed land, more than 1000 feet above the sea, and challenge him to beat them with a sample grown at Woolston, and you, sir, shall be the judge. If he likes, too, I will upon December 1 next, send a dozen Swedes, and challenge Woolston to match them. *G. A. H.*

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, August* 3.—Present, the Earl of Powis, trustee, in the chair; Lord Walsingham, Sir Massey Lopes, Bart., M.P.; Sir A. K. Macdonald, Bart.; Sir Watkin W. Wynn, Bart., M.P.; Mr. Acland, M.P.; Mr. Barnett, Mr. Cantrell, Colonel Challoner, Mr. Davies, Mr. Druce, Mr. Brandreth Gibbs, Mr. Jonas, Colonel Kingscote, M.P.; Mr. Leeds, Mr. Pain, Mr. Randell, Mr. Ransome, Mr. Shuttleworth, Mr. Thompson, Mr. Whitehead, and Dr. Voelcker.

The following new members were elected:—

Bennett, Alfred W., Wharton, Ross.
Compton, Thomas, Fisherton Delamere, Heytesbury.
Crofts, Lieutenant Richard B., R.N., Great Cozens, Ware.
Giles, John, Bradford House, Chaddesley, Corbett, Kidderminster.
Harding, Thos. King, Marden Bradley, Bath.
Hill, John, Severnstoke, Worcester.
Hope, Thos. R. Henfryn, Rhyl.
Jackson, George, Tattenhall Hall, Tattenhall, Chester.
Jeyes, Francis C., Buxworth, Northamptonshire.
Kynnersley, C. T. Sneyd, High Fields, Uttoxeter.
Laurence, Wm., Brockworth Park, Gloucester.
Martin, Joseph, Highfield House, Littleport.
Middleditch, E. Taylor, Blansdon House, Highworth.
Nock, Charles, Norton, Shifnal.
Pickering, James, Whitby, Chester.
Riddell, Major-General Charles J. B., Oaklands, Chudleigh, Devon.
Robinson, Wm. Wembdon, Bridgwater.
Scott, Louis G., 79, Eaton Square, S.W.
Snow, Thomas Owen, Lack Hall, Chester.
Stanton, Rev. J. John, Lovington Vicarage, Bath.
Swinnerton, Wm. Weston, Styvechall Grange, Coventry.
Torr, Thos. Joseph, Dummer House, Basingstoke.

The following recommendations of special Councils held in the showyard were unanimously adopted:—

(1). That as only £3 had been awarded by the judges in Section IX. Class 3, the remaining amount of £7 be specially given for churns adapted to small occupations.

(2). That a third prize of £25 be given to Mr. R. Craddock, for the reserve number and highly commended farm occupied by him.

(3). That the country meeting for 1871 should be held in the week commencing July 10, instead of that beginning July 17.

FINANCE.—Colonel Kingscote, M.P., presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on July 31 was £7608 7*s.* 4*d.*, the sum of £3800 remaining on deposit. Cheques to the amount of £9176 17*s.* 1*d.* were ordered to be drawn. The committee recommend that the Secretary be authorised to transfer £2000 from the deposit to the current account; that the office be closed at 2 P.M. on Saturdays from after the first Council meeting following the country meeting, until the April Council meeting. The committee also reported that on the appeal against the parish rating of the Society's house, the assessment was reduced from £280 to £160 per annum.—This report was adopted.

JOURNAL.—Mr. Thompson (chairman) reported that the judges had withheld the prize offered for the best essay on the preparation, preservation, and use of sprouted grain as food for horses, cattle, and sheep, based on practical experience, the candidates not having complied with the conditions on which the prize was offered. It was also reported that the judges had awarded the prize offered for the best description of the most improved form of kiln for burning lime for agricultural purposes to the writer of the essay bearing the motto "Improved Perpetual." This report having been adopted, the Chairman announced that the prize essay had been written by Mr. Charles Turner, C.E., of Magnolia Cottage, Shirley, near Southampton.

IMPLEMENT.—Mr. B. T. Brandreth Gibbs reported that the committee had discussed the conditions to be added to the Wolverhampton prize-sheet, and that they recommended that the Secretary be instructed to draw up a draft of those agreed upon, and to circulate a preliminary proof amongst the exhibitors of steam-cultivating machinery, inviting suggestions thereon, so that a complete prize-sheet may be published in November.—This report was adopted, subject to a proposed regulation prohibiting exhibitors from entering duplicate implements being postponed for further consideration.

GENERAL, OXFORD.—Lord Walsingham reported that the committee had examined the Oxford accounts, and recommended them for payment.—This report was adopted.

GENERAL, WOLVERHAMPTON.—Mr. D. R. Davies presented the report of the committee, recommending that Mr. R. H. Masfen be requested to accept the office of steward of forage for the Wolverhampton meeting, and that the Secretary be instructed to supply him with the particulars of quantities likely to be required. It was also reported that an agreement and plan had been arranged between the mayor and town-clerk of Wolverhampton, on behalf of the corporation, and the honorary Director and Secretary on behalf of the Society; and the committee recommended that the common seal of the Society and the signature of the Secretary be affixed to the said agreement.—This report was adopted.

SHOWYARD CONTRACTS.—Mr. C. Randell reported the recommendation of the committee that so much of the plan of the Wolverhampton showyard recommended by Mr. Gibbs, as shows the land required and the situation of the entrances and implement sheds, be adopted, leaving the completion of the plan to be afterwards settled by the honorary Director and the surveyor. The surveyor's report on the showyard works at Oxford had been received, and the committee recommended the payment of the fourth instalment of the contractor's account, the sum due for additions to the permanent plant, and the surveyor's account for travelling expenses and salary. The committee submitted the following comparative statement of the cost of showyard works, and of the sums paid by exhibitors at the last three country meetings of the Society:—

	Cost of Showyard Works.	Paid by Exhibitors.
Leicester, 1868	£4200 ..	£2041
Manchester, 1869	5476 ..	2724
Oxford, 1870	5390 ..	2774

—showing that the cost of showyard works at each place bears very nearly the same proportion to the amount paid by the exhibitors. An application having been made to the surveyor to furnish to the "Société des Agriculteurs de France" plans of the Royal Agricultural Society's showyard works, the committee recommended that the Secretary be requested to ascertain whether they are asked for on behalf of the Society, or for the use of intending contractors. In the former case, the committee recommended that such plans be furnished at the cost of the Royal Agricultural Society.—This report was adopted, after a conversation on the position of the entrance to the Wolverhampton showyard, Mr. Thompson being in favour of a central entrance, as at Oxford, and considering this the general opinion; while Mr. Randell maintained that the position of the entrances at Oxford entailed a loss to implement exhibitors, and was adopted in that case only because the form of the ground rendered it a necessity. The Secretary was authorised to sign and seal an agreement with the Corporation of Wolverhampton, and a supplementary agreement with the Society's contractor.

Mr. C. Whitehead moved—"That prizes be offered for implements and machinery used in the cultivation and management of Hops." In support of his motion he urged the agricultural and economic importance of Hop cultivation, and stated that while the cost of cultivation had formerly been estimated at more than £30 per acre, recent improvements in implements and machinery had reduced this cost to the extent of £5 or £6 per acre; he therefore expected that the stimulus which would be given by the Society offering prizes for implements and machinery used in the cultivation and management of Hops would still further reduce the cost of production, and enable English growers to compete on more even terms with those foreign and colonial Hop farmers who had the great advantages of cheaper labour and more favourable climate. Amongst the implements for which prizes might be offered by the Society he mentioned a plough or digging machine which would supersede the hand labour with the "spud," which is at present the general but costly method of turning over the soil, and ameliorate the physical condition of the labourers in the Hop growing counties, which are at present notorious for the labouring men being prematurely bent in consequence of this "spud" labour. As specimens of other *desiderata*, he mentioned a machine for packing Hops, and an adaptation of steam for drying them, and he concluded by stating that in the event of the Council accepting his motion, and referring the details to the implement committee, he would have pleasure in rendering them any assistance in his power. The motion having been seconded by Mr. T. Pain, who urged that the subject was too important for delay, a discussion ensued in which Lord Walsingham and Mr. Shuttleworth suggested that the details should be left to the implement committee, Mr. Ransome preferring that the subject should be dealt with as a whole irrespective of the Society's classification. Finally, the principle of Mr. Whitehead's motion having been adopted, it was referred, on the sugestion of the Chairman, to the imple-

ment committee to consider what prizes for implements and machinery for the cultivation of Hops can be inserted in the Society's prize-lists.

Mr. T. Pain, having called the attention of the Council to the implement entries at Oxford, which had no reference whatever to agriculture, and also to the number of duplicate entries, a discussion ensued, in which Lord Walsingham, Mr. Thompson, and Mr. Randell urged that by prohibiting the exhibition of duplicate articles the inconvenience would be removed, without drawing too hard a line; Mr. Ransome and Mr. Shuttleworth suggested that so large a subject should be allowed to stand over for more ample discussion in November, while Lord Powis, Col. Challoner, and other members of Council, advocated the admission into the showyard of certain articles not strictly agricultural, such as carriages, &c., for the convenience of farmers and others living in sequestered parts of the country. The distinction between the two portions of the subject having been insisted upon by the Chairman, who agreed with a suggestion from Lord Walsingham that, although it might be advisable to prohibit the exhibition of duplicates, an exception should be made in favour of implements belonging to the classes for trial, in each year, it was finally moved by Mr. Thompson, seconded by Mr Ransome, and carried unanimously, "That the implement committee be requested to consider and report in November, whether any and what restrictions should in future be imposed on the exhibition of duplicate implements, especially by agents, and on the exhibition of miscellaneous articles."

On the motion of Lord Walsingham, seconded by Mr. Thompson, it was unanimously resolved that the thanks of the Council be specially conveyed to Mr. J. Mason, late High Sheriff of Oxfordshire, for his liberality in offering the prize of a silver cup, value 100 guineas, for the best-managed farm in the Oxford district.

Protests from exhibitors of live stock were reported upon by the senior steward, and the Secretary was instructed to communicate with the several persons concerned, in accordance with the terms of the report.

The Council, having granted the usual leave of absence to the Secretary and clerks, adjourned over the recess until Wednesday, November 2.

ROYAL AGRICULTURAL IMPROVEMENT SOCIETY OF IRELAND.

Ballinasloe.—The annual show of this Society is being held here as we go to press. The show is a small one, the number of entries in almost every class being less than in former years. The Shorthorn bulls are fewer than at other shows, only 24 altogether, and, adding heifers and calves, there are only 58 Shorthorns. In the next class, Herefords, Devons, and polled Angus, there are 25 entries, and of other kinds there are 30. It is not from any illiberality on the part of the Society that the entries of stock are not more numerous, for there are two challenge cups, value 60 gs. (the Purdon Cups), each offered as inducements to competitors, besides money prizes of from 10 to three sovs. in the different sections. The show of horses is very limited; but this is not to be wondered at, seeing that the Royal Dublin Society, which enjoys the advantage of a public grant and a central position in the Irish capital, from which it never stirs, has arranged to have a show of horses on the 16th of this month on its own premises. The superior attractions of this exhibition, for which there are 497 horses entered, has drawn off competitors from Ballinasloe, and with a few exceptions only residents in the locality have sent any animals, although the Croker Challenge Cup, value 50 gs, with 20 sovs. added, for the best weight-carrying thoroughbred stallion, might be supposed to offer some temptation. There are only eight entries in the first section, four in the second, a dozen brood mares and geldings not thoroughbred, and as many agricultural horses. The sheep show is of small extent, owing to the same causes. There are several liberal prizes offered for the highest merit in this department. The Cork Challenge Cup, worth 50 sovs., for the best shearling ram, is the most valuable, and there are numerous money prizes and medals. There are 35 entries of Leicesters, 18 of Border Leicesters, 28 of Roscommon sheep, 18 of other long-wools, and 24 Shropshire and Lincolnshire Downs. There are 35 entries of swine, 87 of poultry, 34 of dairy produce, and 12 bundles of Flax. There are 40 stands of implements.

BATH AND WEST OF ENGLAND.

July 26.—This was the first meeting of the Council since the annual meeting at Taunton, and Mr. Herbert Williams, as chairman of the finance committee, took the opportunity of congratulating the members present on the very satisfactory position of the Society and the success which had attended its operations during the past year. He concluded by moving that £1500 additional stock be purchased in the name of the trustees, thus raising the funded capital to £7000. This proposition was seconded by Mr. C. Bush, and carried by acclamation.

Guildford Meeting, 1871.—For this meeting grants of money were taken to enable the several committees to arrange and mature their prize sheets on a scale of greater liberality and completeness than hitherto attempted by the Society. The Guildford local committee also announced their intention to offer liberal special prizes.

The Council unanimously voted a complete set of the Society's Transactions, from the year 1852 to the present time, to the library of the Taunton and Somerset Institution, in commemoration of the Society's second visit to the town, and of the hearty and cordial reception afforded by the inhabitants.

YORKSHIRE AGRICULTURAL.

Great Show at Wakefield: August 3.—A period of 24 years has elapsed since the Yorkshire Society held its show at "merrie Wakefield"—so named by old Fuller from its "plentie of good ale." We believe it is still entitled to the distinction for the same reason. Anyhow, at no market is shown finer Barley for malting purposes than at Wakefield.

Twenty four years, however—nearly a quarter of a century,—represents no inconsiderable period in the world's history, much less in that of a society. In the life of a man, it comprehends the full period of his physical vigour. More than this period has elapsed since we first recorded the doings of this important society in these pages.

For several reasons we remember the show in 1846. We had had a fine summer, and on our return from the show we found several Wheat ricks safe under thatch. This year, as we journeyed to the trysting place, we found ourselves in the midst of an early harvest, with much land cleared of crop, in a district where, a few months ago, a late harvest was deemed a certainty. We have retained a still more special record of the event, because we then scored our first win at the Yorkshire Society's Show, beating, as often happens to others at this show, the winner in the same class at the Royal Agricultural Society's Show at Newcastle a few week's previous.

Wakefield is admirably situated for an agricultural meeting, being nearly in the centre of the county, and sufficiently near the masses of population to secure a bumper attendance. In 1846 the show was a success—more so now. The Society has gone on working up to its promise, and improving each year with the continued development of agricultural improvement in the country, and in a parallel degree with the advance made in the other industrial arts of the kingdom. The extension of the railway system, which has placed Wakefield on the line of the Great Northern, the Midland, and the Lancashire and Yorkshire, and afforded facilities for the conveyance of stock and passengers to the place of meeting, is not the only point in which the present has the advantage over its predecessor 24 years ago. During that period nearly all the great practical improvements in the art of cultivation have been promulgated and adopted. The first drain-tile machine was exhibited at Richmond two years previous to the Wakefield show, in 1846; it was one of the wonders there. The threshing-machine was then simply a beater and blower, now it is a combined machine, bolting the straw unbroken, and winnowing, riddling, pummelling, and dressing and sacking the grain. Then, also, it was shown as adapted to hand-power, and, in ignorance or heedlessness of the false principles of economy involved in yoking intelligent human power to a machine which merely modified the form of the products of the soil without increasing the supply of the same (we bought one of these curiosities—mere toys); but now steam has been yoked to it, superseding the expensive power of horses, both for the purpose of threshing and for locomotion. Drain-tiles and bricks, by further extension of machine aid, have since then become so cheapened that the great work of the general thorough drainage of the country has been accomplished, if not to the fullest extent necessary, to such a degree that the want of drainage is now an exception where it was the rule. The steam power is also now breaking up and smashing the old hide-bound lands in this country, and trenching and cultivating the plains and prairies in all parts of the known world—and in every form adapted to farm machinery may be seen in the showyard to-day. To merely mention every improved form and implement, and every new process of agricultural practice exhibited now, and of which we had no signs in 1846, would be to catalogue the improvements of agriculture during the interval of a quarter of a century—and that the limited time between the opening of the yard at 9 A.M., and the closing of our despatch before post time, renders impossible. We must leave the tale of the introduction of the reaper in its multiplied forms, the grass-mower, the pulpers, the water-drills, the chaffers, the uses of guano, the preparations of bones and superphosphates, the systems of making cakes and feeding stuffs, the improved modes of keeping and housing feeding stock, to be condensed in the one fact that all these may be found to be illustrated in one shape or other at the present meeting in some or other of the long avenues which are now covered in and filled with specimens of the mechanics and science of agriculture. At the show in 1846 a couple of acres held the whole of the implements which were dotted upon the uncovered surface of the show field. In a similar manner the cattle and sheep and pigs were arranged in pens in the open air, and the horses were led about. At all times, however, this Society adopted the public judging of stock in rings set apart for that purpose, and the Royal Agricultural Society of England has been induced by the pressure o public opinion to adopt the same mode. Contrasted with this, it is interesting to refer to the works in the showyard, viz.:—31 compartments of special shedding for machinery in motion, 2670 feet of ordinary shedding for implements, 57 stallion boxes, 28 brood mare boxes, 225 stalls for horses in stable, 102 cattle stalls, 123 sheep pens, 123 pig pens—the two latter of iron hurdles—with secretary's offices, committee rooms, reporters' rooms, post-office reporter's room, and refreshment rooms. Upon "Wakefield Green," celebrated in many a stirring tradition—where bold Robin Hood ventured to contend for the first throw with the stalwart Pindar of Wakefield, and where the Duke of York, father of Edward IV., fell in the Lancashire victory which was so soon after avenged at Lowton—are the tents pitched and the ring arranged for the contests, not between knights and squires, kings and pretenders, the roses of Lancaster and of York, but between the houses of Bates and Booth, the Leicesters of Yorkshire and Lincolnshire, and the mechanical giants of Fowler and Hornsby.

In one point the Yorkshire Show has its decided idiosyncrasy: it is the arena in which the cases of the Royal Agricultural Society are tried over again and confirmed or corrected,—the two shows standing relatively as the Derby and the "Sellinger" do as races. Now the Yorkshire, though a county society, is only local in name,—the show is open to the United Kingdom; and it is only less national than the Royal because it confines its prizes to those leading classes of stock which are common to all England, and offers no prizes to the classes which are not so universally diffused. In Shorthorns, horses, pigs, and Leicester sheep, it offers the highest rewards, and obtains a show of the best animals the kingdom can produce.

The showyard, situated at Belleisle, is on a piece of fine sound old pasture, admirably adapted for its purpose, and the arrangements are, as usual, excellent.

The entries of the present show and those of last year are as follows:—

	1869	1870.
Cattle	570 ..	102
Horses	443 ..	308
Sheep and pigs	217 ..	246
Wool	8 ..	9
Implements	1456 ..	1554
Hounds	83 ..	59
Total ..	2233 ..	2288

No prizes are awarded for implements, and we must defer our remarks on the large and interesting display till next week. There are 107 stands filled with the specialties of the leading makers in the kingdom.

The Shorthorn show is a large one compared with last year, showing in numbers 25 per cent. increase. Of nine aged bulls, BOLIVAR again took his proper place as the premier bull of the class and of his day. The Wharfedale bull by Lord Cobham from Greenholm, where Miss Fairfax formerly held her Court, deservedly beat Mr. Statter's red bull, Charlie, and took 2d place. We are glad to see the Fawkes blood again in the field. At the Royal at Oxford Mr. Faviell's H.C. bull was also by Lord Cobham. The 2-year-olds were a small class, and an easy win to Col. Towneley; while in class 3 there was a fine competition of 12 good animals. Lady Pigot won, as at Oxford, with Bythis. Mr. Linton's Oxford 2d prize was placed similarly here, Lord Braybrook's Heydon Duke being 3d. This was one of the disputed decisions at Oxford, and it is here fully confirmed in every particular. Lord Feversham's roan Colonist well deserves his H.C.

Bull calves went—Messrs. Dudding's dark roan Robin Hood, 1st, and Col. Towneley's Oxford Butterfly and Maid of Oxford's Baronet were 2d and 3d; Major Stapylton showing a good H.C. in Lord of the Manor.

The cows were a small lot, and Queen of Rosalea was again put in her place at the head of the poll: it was Rosalea 1st, and the rest nowhere, though Lady Ann the 2d is a good Shorthorn, and Mr. Tennant's 3d, White Rose, full of quality and good looks.

The 3-year-old heifers were a grand class—a baker's dozen—with some difficulty in finding the odd number to cast. Mr. Eastwood's Double Butterfly is a roan of perfect character, to our mind; and the 2d Windsor Butterfly is no contemptible competitor; Mr. Outhwaite's 3d prize is a promising heifer.

The 2-year heifers are the show of the Shorthorns. Of 17 competitors Mr. How deservedly wins the 1st place with Vesper Queen, despite the whispers of the friends of the Branches Park beauties. Her ladyship has in Dame Swift a heifer that will train on; Seraph, the 3d prize, is a promising heifer, full of quality and kind looks.

The 10 heifer calves are worthily represented by Colonel Towneley's Baron Oxford's Duchess, a descendant through the Gunter line of the Bates tribe. Mr. Foljambe's Fleur-de-lis and Major Stapylton's Rose of Myton are two beautiful roans, and they take 2d and 3d honours worthily.

The £50 cup, the gift of the Corporation of Wakefield, for the best Shorthorn, and the £10 cup for the best Shorthorn bull, given by Lord Milton, M.P., have been both absorbed by Bolivar, who stands deservedly the king of his tribe now, after his successive victories.

The prizes for dairy cattle produced some good competition amongst Yorkshire cows in class 9, and in class 10 with Alderneys and Jerseys. A pure Shorthorn of the Duchess family, in the former, from Colonel Towneley, deservedly won. The Alderneys we do not understand the points of, and we leave the judges' decision without comment.

The show of sheep is a large one, as may be seen by the entries, and is a good one, and we find no fault with the decision, our only doubt being as to whether 1, 2, and 3 were put in their proper places.

The aged rams were a great lot, and Mr. Sanday took 1st place, Mr. Borton 2d, and Mr. Sanday 3d. This is contrary to the decision at Oxford; which was the right one we say not—many men may indeed have many minds when merit is so equal.

The Leicester gimmers brought our old nonagenarian friend, Mr. Wiley, to the front with his "little ladies." The very Nestor amongst Shorthorns and Leicesters, he still keeps to pure blood and quality in his sheep. Mr. Hutchinson's (the 2d prize) are very good animals.

The Lincoln rams are a splendid show; the shearlings of Mr. Wright very good. The aged rams are, however, an extraordinary lot: Mr. Torr and Mr. Wood were never better engaged than in sifting the lot. "I never saw four better sheep together," Mr. Torr ejaculates, and certainly they did honour to their county. With all due deference to the two judges, we venture to think that Nos. 1 and 2 should have held places the reverse of those they now hold in the prize list. A more perfect animal than Mr. Cartwright's 2d prize we never saw.

The pigs are a wonderful class, but we are compelled, by the time we go to press, to defer our remarks upon them till next week.

For the same reason we must reserve our observations on the horses. Moreover, there are many classes of these as yet unjudged, and our prize list refers only to such classes as have come under inspection—amongst these the two classes of hunters, viz., the 4-year-old hunting geldings for prizes of £20, £10, and £5; and the hunters, geldings or mares, five years old and upwards, and qualified for at least 12 stones with hounds, for 200 gs., apportioned to the best, 100 gs.; 2d, £50; 3d, £25; 4th, £15; 5th, £10; and 6th, £5: the former produced 26 and the latter 54 competitors. Mounted and ridden round the large enclosure, a finer sight connected with horseflesh we never saw. The Oxford prize hunter was placed 6th. Sir George Cholmley, the breeder of the celebrated Grand National Steeplechase winner, Emperor, obtained 2d and 4th honours; and Mr. S. J. Welfit obtained the prize cup of 100 gs. with Loiterer, by Un-Oc, d. by Darnley.

The following is the prize list:—

CATTLE.

JUDGES.—G. Atkinson, Hall Farm, Seaham, Durham; C. Garne, Churchill Heath, Chipping Norton, Oxon; W. Parker, Carleton Hill, Penrith, Cumberland.

SHORTHORNS.

CLASS 1. Bulls, any age above 3 years old.—1st, C. W. Brierley, Middleton, Manchester, "Bolivar;" 2d, W. Tison & Co., Greenholm, "Lord St. Leonards;" 3d, T. Statter, jun., Stand Hall, Manchester, "Charlie."

CLASS 2. Bulls above 2 and not exceeding 3 years old.—1st, Col. Towneley, Towneley, "Baron Hubback" (25,569); 2d, Crawshaw & Blakeley, Headfield, Dewsbury "Prince Leopold" (27,154); 3d, W. C. Worsley, Hovingham, York, "Duke of Roxburgh."

CLASS 3. Bulls above 1 and not exceeding 2 years old.—1st, Lady Pigot, Branches Park, "Bythis" (25,700); 2d, W. Linton, Sheriff Hutton, York, "Lord Irwin;" 3d, Lord Braybroke, Audley End, Essex, "Heyden Duke." Highly Commended: Earl Feversham, Duncombe Park, Helmsley. Commended: Messrs. Dudding, Panton House, Wragby; W. Bradburn, Wedensfield, Wolverhampton.

CLASS 4. Bull Calves, above 5 and not exceeding 12 months old.—1st, Messrs. Dudding; 2d, Colonel Towneley, "Oxford Butterfly;" 3d, Col. Towneley, "Maid of Oxford's Baronet." Highly Commended: Major Stapylton, Myton Hall, Helperby, York.

Silver Cup, value £10, the gift of Lord Milton, for the best Bull in the Show.—C. W. Brierley's "Bolivar."

CLASS 5. Cows of any age above 3 years old, in-calf or in milk.—1st, Lady Pigot, Newmarket, "Queen of Rosalea;" 2d, J. How, Broughton, Huntingdon, "Lady Ann;" 3d, J. R. Tennant, Scarcroft Lodge, Leeds, "White Rosa." Highly Commended: J. W. Botcherby, Darlington. Commended: W. Bradburn, Wedensfield, Wolverhampton (2); H. J. Robinson, The Cliff, Leyburn.

CLASS 6. Heifers, not exceeding 3 years old, in-calf or in-milk.—1st, R. Eastwood, Thorneyholme, Clitheroe, "Double Butterfly 2d;" 2d, J. How, Broughton, Huntingdon, "Windsor's Butterfly;" 3d, J. Outhwaite, Bainesse, Catterick, "Vivandiere." Highly Commended: J. R. Tennant, Leeds; Col. Towneley. Commended: W. Bradburn, Wedensfield.

CLASS 7. Heifers not exceeding 2 years old.—1st, J. How, Broughton, Huntingdon, "Vesper Queen;" 2d, Lady Pigot, Newmarket, "Dame Swift;" 3d, C. W. Brierley, Middleton, Manchester, "Seraph." Highly Commended: F. J. S. Foljambe, M.P., Osberton Hall, Worksop. Commended: J. R. Tennant, Scarcroft Lodge, Leeds; Lord Bolton, Bolton Hall, Leyburn.

CLASS 8. Heifer Calves, above 5 and not exceeding 12 months old.—1st, Colonel Towneley, "Baron Oxford's Duchess;" 2d, F. J. S. Foljambe, M.P., Worksop, "Fleur-de-Lis;" 3d, Major Stapylton, Helperby, "Rose of Myton." Highly Commended: Lady Pigot, Col. Towneley; T. Statter, jun., Stand Hall. Commended: B. Baxter, Elslack Hall, Skipton; Major Stapylton, Helperby, York.

Silver Cup, value £50, the gift of the Corporation of Wakefield, to the best Shorthorn exhibited in any of the foregoing classes.—Mr. Brierley's "Bolivar."

DAIRY CATTLE.

CLASS 9. Cow, for dairy purposes.—1st, Col. Towneley, "Duchess of Lancaster II.;" 2d, J. T. Robinson, Leckby Palace, Thirsk, "Dairymaid;" 3d, H. Crossley, Broomfield, Halifax. Highly Commended: T. Statter, jun. Commended: H. Crossley.

CLASS 10. Alderney or Jersey Cow or Heifer, in-calf or in milk.—1st, Major Stapylton, Helperby; 2d, J. Rhodes, Snydale-Hall, Pontefract, "Honeysuckle." Commended: the whole class.

CLASS 11. Guernsey Cow or Heifer, in calf or in-milk.—1st, West Riding Asylum, County Asylum Farm, Wakefield, "Guernsey Queen."

SHEEP.

JUDGES.—Long-woolled: W. Torr, Aylesbury Manor, Grimsby; J. Wood, Stanwick Park House, Darlington.—Short-woolled: H. Overman, Weasenham, Brandon, Suffolk; P. Purves, Brampton, Huntingdon.

LEICESTERS.

CLASS 12. Shearling Rams.—1st, 2d, and 3d, J. Borton, Barton House, Malton. Highly Commended: G. Turner, jun., Alexton Hall, Uppingham.

CLASS 13. Leicester aged Ram.—1st, G. H. Sanday, Holme Pierrepont, Nottingham; 2d, J. Borton, Barton House; 3d, G. Turner, jun., Alexton Hall, Uppingham. Commended: John Borton, Barton-le-Street (2); G. H. Sanday.

CLASS 14. Leicester Shearling Gimmers.—1st, S. Wiley, Brandsby, York; 2d, T. H. Hutchinson, Manor House, Catterick; 3d, J. Borton, Barton House. Commended: E. Riley, Kipling Cotes Farm, Beverley.

LINCOLNS.

CLASS 15. Shearling Rams.—1st and 2d, R. Wright, Nocton Heath, Lincoln; 3d, C. Lister, Coleby Lodge, Lincoln. Highly Commended: R. Wright. Commended: J. R. Kirkham; J. Pears, Mere, Lincoln.

CLASS 16. Lincoln aged Ram.—1st, Messrs. Dudding, Panton House, Wragby; 2d, T. Cartwright, Dunstan Pillar, Lincoln. Highly Commended: Messrs. Dudding; J. Byron, Kirkby Green, Sleaford. Commended: Messrs. Dudding.

CLASS 17. Lincoln Shearling Gimmers.—1st and 2d, T. Cartwright, Dunstan Pillar, Lincoln. Commended: J. Pears, Mere, Lincoln.

SHROPSHIRE DOWNS.

CLASS 18. Shearling Rams.—1st and 2d, Lord Chesham, Latimer, Chesham; 3d, W. Baker, Moor Barns, Atherstone. Highly Commended: W. Baker. Commended: R. Tanner, Frodesley, Salop.

CLASS 19. Shropshire Down aged Rams.—1st, W. Baker, Moor Barns, Atherstone; 2d, Lord Wenlock, Escrick Park, York.

Silver Goblet, value £5, given by D. Reynolds Davies, Esq., Mere Old Hall, Knutsford, for the best Ram exhibited in classes 18 and 19.—Lord Chesham.

CLASS 20. Shropshire Down Shearling Gimmers.—1st, Lord Chesham, Latimer, Chesham; 2d, T. Horton, Harnage Grange, Shrewsbury. Highly Commended: W. Baker, Moor Barns, Atherstone.

MOUNTAIN OR BLACK-FACED.

CLASS 21. Shearling Rams.—1st, J. M. Green, Black Hill, Keighley; 2d, J. Peel, Knowlmere, Clitheroe.

CLASS 22. Mountain aged Rams.—1st and 2d, J. Peel, Knowlmere, Clitheroe.

CLASS 23. Mountain Ewes.—1st and 2d, J. Peel, Knowlmere, Clitheroe.

PIGS.

JUDGES.—W. Gledhill, Corbridge-on-Tyne, Northumberland; J. Fisher, Wood House, Cross Hills, Yorkshire.

CLASS 24. Boars of large breed, 12 months old and upwards.—1st, P. Eden, Cross Lane, Salford; 2d and 3d, R. E. Duckering & Son, Northorpe, Kirton Lindsey. Highly Commended: W. Lister, Armley, Leeds.

CLASS 25. Sows, large breed, 12 months old and upwards.—1st and 2d, R. E. Duckering & Son, Northorpe, Kirton Lindsey; 3d, W. Hatton, Addingham, Leeds. Highly Commended: P. Eden.

CLASS 26. Boars, small breed, 12 months old and upwards.—1st, R. E. Duckering & Son, Northorpe, Kirton Lindsey; 2d, H. Neild, The Grange, Worsley, Manchester; 3d, P. Eden. Highly Commended: G. Mangles, Givendale, Ripon.

CLASS 27. Sows, small breed, 12 months old and upwards.—1st, W. Hatton, Addingham, Leeds; 2d, I. Nicholson, Lowther Street, York; 3d, P. Eden, Cross Lane, Salford. Highly Commended: Viscount Galway, M.P., Serlby Hall, Bawtry.

CLASS 28. Boars, black or Berkshire breed, 12 months old and upwards.—1st, F. Walton, 9, Foundry Street, Halifax; 2d, West Riding Asylum, County Asylum Farm, Wakefield; 3d, H. Crossley, Broomfield, Halifax.

CLASS 29. Sows, black or Berkshire breed, 12 months old and upwards.—1st, R. E. Duckering & Son, Kirton Lindsey; 2d, West Riding Asylum Farm, Wakefield; 3d, H. Crossley, Broomfield, Halifax.

CLASS 30. Boars, of any breed, not qualified to compete in classes 24, 26, and 28.—1st, J. E. Fox, Great Horton, Bradford; 2d, S. Appleby, Armley, Leeds; 3d, C. Roberts, Southgate, Wakefield. Commended: P. Eden, Salford.

CLASS 31. Sows, of any breed, not qualified to compete in classes 25, 27, and 29.—1st, P. Eden, Cross Lane, Salford; 2d, J. C. Taylor, Oatlands, Leeds; 2d, R. E. Duckering & Son, Northorpe. Highly Commended: W. Hatton, Addingham, Leeds.

CLASS 32. Boars, large breed, not exceeding 12 months old.—1st, G. Chapman, Seamer, Scarborough; 2d, R. E. Duckering & Son. Commended: C. W. Graham, Blackburn Buildings, York Road, Leeds.

CLASS 33. Sows, large breed, not exceeding 12 months old.—1st, P. Eden, Salford; 2d, R. E. Duckering & Son. Commended: F. Walton, 9, Foundry Street, Halifax.

CLASS 34. Boars, small breed, not exceeding 12 months old.—1st, P. Eden, Salford; 2d, Viscount Galway, M.P., Bawtry. Highly Commended J. Umpleby, Guisely, Leeds.

CLASS 35. Sows, small breed, not exceeding 12 months old.—1st, C. R. N. Beswicke-Royds, Littleborough; 2d, Crawshay & Blakeley, Headfield, Dewsbury. Highly Commended: W. Greetham, 108, Legrams Lane, Bradford.

CLASS 36. Boars, black or Berkshire breed, not exceeding 12 months old.—G. Knowlson, Thormanby, Thirsk.

CLASS 37. Sows, black or Berkshire breed, not exceeding 12 months old.—1st and 2d, J. Oldroyd, Fixby Park, Huddersfield.

CLASS 38. Pens of three Store Pigs, of any breed, from 4 to 9 months old.—1st, J. Bullock, Bradford; 2d, West Riding Asylum Farm, Wakefield. Highly Commended: W. Routledge, York; R. E. Duckering & Sons.

A Silver Cup, value £10, given by the Wakefield Local Committee for the best Boar in the Show.—Mr. Eden.

Silver Cup, value £10, the gift of T. K. Sanderson, Esq., to the best Sow in the Show.—Mr. Duckering.

HORSES.

JUDGES.—Hunters and Roadsters: J. M. K. Elliott, Heathencote, Towcester, Northamptonshire; N. Milne, Faldonside, Melrose; J. H. Skipworth, Howsham, Brigg, Lincolnshire.—Coaching and Agricultural: B. Spraggon, Nafferton, Stocksfield-on-Tyne, Northumberland; W. Robinson, Hutton Hall, Darlington; W. Godson, Normanby-by-Stowe, Lincolnshire.

CLASS 39. Stallions, thoroughbred, for getting weight-carrying Hunters.—1st, A. Beaumont, Honley, Huddersfield; 2d, J. Casson, Burgh-by-Sands, Carlisle; 3d, W. Moffatt, Kirklinton Park, Carlisle.

CLASS 41. Roadster Stallions.—1st, J. Leake, Drewton, Brough; 2d, P. Kirby, North Duffield, Selby; 3d, W. Axe, Doncaster.

CLASS 63. Four-year-old Hunting Gelding.—1st, T. H. D. Bayly, Ickwell House, Biggleswade, Beds; 2d, E. Paddison, Ingleby, Lincoln; 3d, J. B. Barkworth, Raywell, Brough.

CLASS 64. Four-year-old Hunting Fillies.—1st, J. Bulman, East Greystone, Gainford; 2d, S. B. Robson, Windle Beck, Ganton, York.

CLASS 65. Hunters, Geldings, or Mares, 5 years old and upwards, and qualified to carry at least 12 stones with hounds.—1st, S. J. Welfit, Tathwell Hall, Louth; 2d, Sir G. Cholmley, Bart., Howsham House, York; 3d, H. Jewison, Raisthorpe, York; 4th, Sir G. Cholmley, Bart.; 5th, T. H. Foden, Givendale Grange, Ripon; 6th, J. B. Booth, Killerby Hall, Catterick.

TYNESIDE.

HEXHAM, which is the home of a vigorous farmers' club, on Tuesday entertained this Association during its annual meeting, and a very neat and interesting little show was the result. The prizes were not large, but exhibitors at local meetings do not care so much about heavy premiums as they do to meet their friends and neighbours in honourable rivalry to match horse against horse, cow against cow, or bull against bull.

The horses were an excellent show, for nearly all of them were good. The draught horses were 21 altogether, young and old, all told. The seven full-grown horses were as good as anyone could wish to see. The 1st prize, which belonged to Mr. Wood, Thornborough, Corbridge, was a fine "banging" grey mare, and "Darling," by "Farmer's Glory," with foal at foot, was sent by Mr. George Angus, of Bromley, Stocksfield, and she deserved nothing less than the 2d place, which she received, as she was as neat and compact as could well be. The geldings and fillies were also a capital class, but the yearlings were hardly up to the mark. The mares for breeding harness horses were but few. Mr. Davidson, of Hatbridge, however, sent a very neat grey with a beautiful foal; and Mr. Stephenson, jun., Forestones, sent a filly for harness that made this class interesting, it and the grey mare taking a 1st prize each. In the mares for breeding saddle horses Mr. Spraggon, Wapperton, sent his wide chested and otherwise good and elegantly formed chestnut, which was 1st at Darlington last week, when it beat the Oxford prize mare. In this class, Mr. Thompson, Dilston Haugh, had a very neat chestnut mare. The 2-year-old geldings or fillies were a good class, Mr. Wood, of Thornborough taking 1st with a smart chestnut of very fine quality; and in the hackneys Mr. G. Leadbitter was 1st with a bright bay mare, as finely formed and as good a mover as one often meets with. The ponies were but an odd lot; but the 11 hunters, for which there was a jumping prize, were the best performers we ever saw in a showyard. Some of the riding was, however, a most ridiculous exhibition; but the elder Mr. Walker, Mr. Spraggon, Mr. Jobson, and one or two others, maintained a proper coolness, and their animals performed accordingly. Mr. Spraggon's 8-year-old bay may be described as a "thundering" horse at a gate or a fence, for he is strong enough for a carter, but his legs are as clean as a thoroughbred's, and, as one of the natives put it, "he can jump above a bit, he can, just." He was, of course, 1st. Mr. Walker's clever grey, which was 1st at another local show at Castle Eden last week, was 2d; Mr. Jobson's Paddy being a capital 3d.

The cattle were nearly all good. Six capital old bulls made a good show. Mr. Newton, Chollerton, took 1st with ACE OF TRUMPS, sire GYPSY, dam *Rose of Holeyn Hall*, and he is a large heavy-fleshed bull. Mr. R. Coulson, of Coastley, was 2d with LOFTY, by SILVER STONE (22,885), dam *Rosette 2d*, by DUKE OF BUCKINGHAM (14,429). In the yearling bulls, Mrs. White, of Haltwhistle, was 1st with an extraordinary white animal for size, while his form and quality were excellent. In the bull calves, cows and heifers, the prizes were about equally divided, for some splendid animals, between Mr. John Atkinson, of Bywell Farm, Stocksfield, and Mr. George Angus, of Bromley, Stocksfield. It is unnecessary to remind Shorthorn breeders, but mere general readers may not be aware of the fact, that Hexham is surrounded with several lands that for natural goodness and real practical value are not, taking them as a whole, to be surpassed in the kingdom. The sheep were an insignificant show, and the pigs were decidedly poor in character. The poultry, too, were shabby, but there was a capital class of shepherds' dogs, most of which were of the intelligent colley breed. There were besides a few specimens of butter, all of which was remarkably good for the weather, and Mrs. Cowing's was super-excellent, both in regard to quality and the manner in which it had been made. Altogether, as we have intimated, this was a very neat show, while the exhibitors and their friends appeared intent on making the meeting thoroughly enjoyable, and to all appearances they succeeded.

KINGSCOTE.

Wheat and Barley Growing on the Cotswolds.—At the last meeting of this Association, Mr. BURNETT said: We had lately a long account of what may be called new systems of Wheat cultivation, and we often hear and read of people at a distance growing double the quantity of Wheat and Barley they did a few years ago, either by using steam cultivation, or by some other new system. I would not say a word against those gentlemen who have given much of their time and exerted themselves to the utmost of their ability for the advancement of agriculture, which is of the utmost importance to all—and owing to our being situated on one of the highest ranges of the Cotswold Hills, where the soil is light and near the rock, we can

only feel an interest in hearing that man is succeeding in cultivating the land he occupies; but we are not to be discouraged in the position we are placed in. No one will doubt that a much larger quantity of Wheat and Barley is produced now per acre than was 30 years ago. I am of the opinion that this is not done by any new system, but by an improvement of the old—such as in the time of planting, using drills instead of sowing, cultivating, harrowing, and rolling with improved implements; and last, but not least, having the land in what is termed a higher state of cultivation through the application of richer manures. All this will be readily admitted, as it is that which every real practical man knows; but the object of our meeting is to gain information, that we may be worthy of the position we hold towards the nation at large, and also towards those with whom we are more intimately connected. The first question is, can the present system of Wheat cultivation in this neighbourhood be changed so as to yield a better remuneration without injury to the following crops and the farmer? Steam cultivation is one of the great improvements of the day on heavy lands, but where we can plough an acre per day with a pair of horses, taking all into consideration, it will not pay. Deep cultivation has been tried in this neighbourhood, and failed. The system of using the farmyard manure for the Wheat is good on heavy land, where the farmer is not so dependent on the root crop as he is on the hills; and on what might be termed light land. I have heard it spoken highly of, but having had no experience will not hazard an opinion as to the result in this neighbourhood. Next, as regards top-dressing with artificial manures in the spring. Many advocate this practice, although I doubt whether there are as many in this neighbourhood as there were 10 years ago; where the old system is practised, the cupboard of the Wheat plant is supplied in the growth of roots (the greater part fed on the ground, and the rest given by the two years' ley). This is admitted to be a good system, but many tell us to just add a top-dressing in the spring, and the results will be wonderful. In 1860, '61, and '62 I tried this system, and with similar results. The results of 1862 I will show you.

1862. Kingsclere Farm Experiment. Produce of Wheat.

Name of Manure applied.	Produce of one acre.	Wheat.	Straw.	Cost of Manure.	Increase.
		bushels.			
Proctor's Wheat	bus.	11	£ s. d. 2 0 0	£ s. d.	£ s. d.
a Manure	..	11 11	..	3 3 0	..
b Guano	..	6½ 11	19 0 0	2 12 6	11 6
c Nitrate of soda ..	..	13	5 11 6	2 0 0	9 17 6
Seed	..	9	6 9 11	2 12 0	7 16 0
d No manure ..	..	9	6½ 9 12 0	..	9 12 0

a Produced a larger quantity of straw than *c*, *d*, and *e*, but inferior sample.
b 2 cwt., similar quantity of straw and sample.
c Largest quantity of straw, and worst sample.
d Least, but much the best sample.

The other evening, when we heard the subject of top-dressing discussed, several were of the opinion that it was advisable where there is a thin, weak plant. I quite agree with them, and could bring many proofs in support of it; but I will only mention one supplied by a much better authority than myself—the late E. Drew. An application of 4 cwt. of Messrs. Proctor's Wheat manure per acre, at a cost of 32*s.*, to a thin plant on a light soil, calculating the Wheat at 6*s.* per bushel, and the straw at 20*s.* per ton, left a loss of 4*s.* 8*d.* Guano, under precisely similar circumstances, gave a profit of £1 4*s.* 9*d.*, and nitrate of soda £3 4*s.* 5*d.* The straw and corn, however, from the Wheat manure were of a better quality than from either of the others. What I have said only applies to Wheats planted on what we call old seeds. A quantity of autumn Wheat is planted after roots, and with better results than spring Wheat, even as late as the middle of March: the cultivation is very similar to the early planted. I would only say, where the land has been ploughed deep for the roots, the lighter it is done the better for the Wheat; or, if it is to be planted immediately after the roots are off, the cultivators going twice through it will answer better than ploughing. Spring Wheat will do well with the same cultivation as Barley. Wheat cultivation on heavy soils has been, and can be, much more improved by steam power. The rotation is also very different. One year's ley and Beans often take the place of roots, and on very heavy soils the system of bare fallow is practised with success. Ploughing up the seeds early, and working the land with the cultivator and other implements before planting the Wheat, is of very great importance. So much having been said at our late meeting respecting the time of planting and the quantity of seed per acre, I think it better to leave this matter until we hear the opinion of the meeting. Barley cultivation is a very important subject, especially in this neighbourhood, owing to the suitability of the soil for growing good Barley, as there is a wide difference between the price of a really good sample and an inferior one, and Barleys are not so good as they were years ago. Barley requires a seed-bed just the opposite to autumn Wheat. A stale furrow and heavy soil are most suitable for the latter, and a fresh furrow and light soil for the former; or, as the old saying has it, "Barley in the dust, and Wheat in the dirt." As a rule, we find the early-planted Barley the best sample; but I am of opinion that this has more to do with the condition of the soil than with the time of sowing. We all know that it is an easier matter to get a good seed-bed on land that has been fed off early, and raftered immediately after feeding-off—a plan with which I hold. But when a heavy crop of Swedes has been fed off through the months of February and March, especially if there has been a quantity of rain and snow, it is almost impossible to get such a seed-bed as one would like; neither is the crop a satisfactory one. It is an easier matter to point out the cause of the bad crops and quality of the Barley than to find a remedy, without making such an alteration in the rotation of cropping as, I fear, would not be to the improvement of the land, nor advantageous to the farmer.

After a discussion, it was resolved, "That, on the high lands and light soils of the Cotswold Hills, Wheat is best grown after a two years' ley, ploughed up in the end of July and through the month of August, then well rolled down, so that, in harrowing and preparing the same for the drill, care should be taken not to break up the bottom of the furrow. That drilling should not commence before the third week in September, and be finished by the middle of October. That it is not advisable to plant more than 2 bushels of seed per acre; and that only where the plant is thin, weak, or sickly-looking in the spring, it is advisable to top-dress with some kind of artificial manure, say nitrate of soda, at the rate of 1½ cwt. per acre, or better, the same money value of soot, in the months of March or April."

Farmers' Clubs.

Farm Fences.—The following paper on this subject was read at a recent meeting of the Farmers' Club, by Mr. H. S. Bennett. Sir G. O. Wombwell presided. Mr. Bennett said:—

The subject I have to introduce to your notice for discussion is one that perhaps may not be so interesting as many others relating to farming, but, nevertheless, I think it is one of great importance, for no farm, however well managed in other respects, can be considered complete and in a high state of cultivation unless the fences are neat and in good order. I think very often too little care and attention have been paid to this particular branch of the farm business. How often do we see large gaps and thin places in the hedges filled up with dead Thorns (often thrown carelessly into them) making them larger every year by their smothering, and consequently killing any young shoots that may be near them. No doubt there has been a great improvement in the management of fences during the last few years. The old high hedge with the wide hedge side, growing all sorts of rubbish, and producing a great crop of both insect and vegetable nuisance, is fast giving way to a better state of things, and where now seen it is generally more the landlords' than the tenants' doing, on account of the preservation of game. I know of no farming operations upon which there is such a diversity of opinion as to the best method of managing hedges, some being in favour of what is called cutting and laying or plashing; some advocating scotching or cutting one side, and leaving the other side to cut in a year or two after; others again advocate cutting off close by the ground, and by that means getting a young fence from the old roots. The old-fashioned plan of plashing an old thin hedge, leaving for stakes the live wood, and where thin filling up with dead Thorns, and then binding the top, I think a very bad one, and I have no doubt we can account for many of the wretched bad fences we see from this mode of proceeding. The description of fences vary a great deal in different localities. In some there are high sod banks with Furze on the top, and others are made by planting the Elm, Holly, &c. Some are walls made with the loose stones, so plentiful in their neighbourhood; but mostly they consist of the Whitethorn or Quick, and this being the case in this particular district, it will be better perhaps to confine the discussion to the best mode of treating young and good hedges of this description; and also the best way to restore an old bad one. In making a new fence, I think the Quicks should be planted early in the spring, before the buds show, about nine to the yard, a trench being dug and the sod turned down upon the roots on the level land, if there is sufficient soil; if not, a bank may be formed by cutting a ditch on one or both sides, and planting on the top, but I do not like the plan of planting on a bank unless necessary. The Quick should be allowed to grow for a year, and then be cut down, kept quite clean from weeds, and left to grow for two or three years, when it may be put into form, which should be very like the letter V, inverted. I would not touch with the knife the lower lateral shoots at all, but leave them to spread wide on each side of the bottom, and by that means preserve the hedge from the depredations of sheep and cattle. I think many of the hedges we see are trimmed too narrow at the bottom, and by so doing they let the sheep get their heads into the centre of the fence. It is indispensable in getting a young hedge up quickly to keep it clean and well defended by posts and rails or other means, and on no account should it ever be slashed by making the knife cut downwards, but always upwards, and I think the best time to do it is in the autumn. In the next place I come to a much more difficult part of the subject, viz., the best way to improve and restore an old bad hedge. No doubt it is the cheapest way, in the long run, to stub it up and plant a new one at a short distance from where the old one stood, but under many circumstances this cannot be done. I think the best way is to combine the two systems of scotching and plashing—scotching where there is plenty of live wood, and laying and lapping a Thorn from both sides of the gap, so that, if possible, they should meet in the centre, and be fastened down to the ground with some pegs that have hooks, and a nick or two cut in the layers to make them put out young shoots. All the roots and rubbish should be well forked out, and the hedge kept clean, or the tender shoots will not grow. When free from hedge-row trees, it would be perhaps the best plan to dig and manure the land in the gaps, and plant with young Quickwood, at least if the Thorns should not be long enough to reach each other. I have seen some very old bad hedges make great improvement by this way of management, although it is very seldom anything will thrive where there are many trees growing; and I may remark that nothing hinders and spoils the cultivation of a farm so much as having a quantity of hedgerow trees, especially Ash trees. Their roots, being so near top, take all the goodness out of the soil, besides breaking the implements used. Another plan I have seen adopted is to lay the Thorns on one side of the roots or stools, so that you have a guard fence during the time the young shoots are growing up. The objection to this way is that the guard fence is taking the greater part of the nourishment the old roots should give to the young shoots, and consequently they are not so strong and vigorous as they should be. With respect to the best and cheapest manner of forming dead fencing for thin places and gaps, I prefer Turnip trays. Some years since I brought several dozen from the neighbourhood of Peterborough. The cost, including railway carriage, was 2*s.* 6*d.* each, but I am told they cannot now be had for the same price. They were made of riven Oak heads, hooped. The rails were of Ash saplings, either whole or split down the middle. Trays made in this manner are far better and much more durable than those made of sawn wood. I had them in constant use for the purpose of putting down in gaps and at the sides of thin places. The labour is very little, and they can be soon shifted from one place to another when required. I had them I think 11 or 12 years, and they were sold when I left my farm for within a trifle of what they cost when new. Perhaps the neatest and most suitable wood fencing is what is called railway fencing, made of foreign timber. The expense I believe runs about 1*s.* per yard for sheep guarding and 1*s.* 4*d.* per yard for cattle. The standards are driven down with a mell, and the rails are fastened with clipped nails. Posts and rails are most generally used, the cost depending much upon the locality, but I prefer the railway fencing. I believe the material is very much the same price as the railway fencing, but the labour in putting them down is much heavier and more expensive. I have to thank you for listening to those remarks, and I hope they will the means of eliciting the opinions of those present on a subject which is too little thought about, and that we shall be able to learn something by mutually communicating our ideas to one another.

Discussion.

Sir G. O. Wombwell said he was very fond of rearing and training fences as they should be upon every farm and estate, for, in his humble opinion, nothing improved the look of a farm so much as neat, well-kept, and well shaped hedges, and he might also add, good gates. He meant nicely-painted gates, well hung, and capable of being opened, if required, without a person riding having to dismount his horse, or being obliged to strain his muscles in attempting to lift them—gates not fastened by an old halter or a broom handle. Whilst on the subject of gates, let him add that, hunting as he did every day in the week, on every side of the country, he saw the most remarkable gates and fastenings; and he could assure them he often envied the owners the brains they must have in inventing such fastenings; and he often thought what a pity it was that they did not turn their powers of invention to better account. But, to return to our farm fences; some 12 years ago it occurred to him that many acres of estate were wasted by growing wide, crooked old fences, full of hedge-row timber, and much of it of no value whatever. He therefore made up his mind to stub many of them up, and to throw small fields together, so as to have a few large enclosures instead of many small ones. He found it a slow and tedious process, and also an expensive operation; but being fortunately blessed with a set of tenants all anxious for improvements, with their assistance he had succeeded, and he might say that his tenants and himself had stubbed and grubbed up miles of their hedgerows. In this way they had thereby improved their farms and his estate. In this way, as many present well knew, the look of the country had been changed. With their permission, he would now tell them the system adopted with regard to planting Quickwood, and rearing it. In the first place, the planting of new Quicks on the site of the old fence was carefully avoided. It was then trenched 18 inches deep by 30 wide. If planting on sward land, the sods were first pared and then chopped into small pieces and thrown back into the soil. The Quickwood was next planted in a single row as soon after Christmas as possible,

and left for one year. After allowing it one year's growth, it was cut off close to the ground, and it then put forth very many shoots, which grew strong and well. In the third spring the tall shoots were cut down again, carefully leaving the lateral branches, which, of course, spread out, and made a good thick bottom. The fourth year, and every subsequent year, it was allowed to rise about a foot, and by training it in this manner, and shaping it like the English capital letter A, it became a good sheep fence between ploughing fields in seven years, and a good fence between grass fields in ten years, and not requiring any guard fencing. He measured one on his farm on the previous day. It was nine years old, and was 5½ feet high, whilst at the bottom it was exactly 6 feet in width. In rearing farm fences the great secret he had found was to keep the Quickwood well cut down the first four years, so as to grow thick at the bottom, and, above all, to keep it clean and well protected from sheep, especially lambs, which would injure it as much as hares or rabbits. He considered it a waste of time and money to attempt to get up young Quickwood fences where there was much ground game, it being impossible, as he had found out himself, to do so before he reduced the ground game upon his estate. These young fences, when seven years old, and trained in the way he had mentioned, were the best possible protection for winged game, as they were narrow at the top and wide at the bottom. A partridge could sit close to the Quickwood, perfectly protected by the side or lateral branches, which covered her so that no dog could get near her. And let him tell them for their information, and for the information of landowners generally, that when he first commenced to grub up these old fences, so dear to all gamekeepers, an old and excellent keeper of his informed him gravely that there would not be a place left for a bird to nest in, and that the new hedges would be useless. Last year, however, when out shooting, he came to a new hedge about eight years old, on one of his farms, and this good keeper's retriever could not extract a dead partridge from the bottom of the fence into which it had fallen, in consequence of the width of it. The keeper turned round to him with the remark that "these 'ere hedges are the best for birds to nest in I ever saw." The man was converted, and he saw and was satisfied that he had done right in the course he had adopted. He said nothing to the keeper in reply to this remark. There were several present who knew the fences on his farm and estate, but should anyone whom he then addressed have not seen them, and would like to see for himself, he should be glad to have a visit from him, and he would point out to him hedges from two to ten years old which no other estate in the three ridings could beat.

Mr. CALDER had recently spent an hour or two in riding over and looking at the Newburgh estate in company with Sir G. O. Wombwell, and he could say that he never saw better gates, and he had not once had to get off his horse to open one. The estate, from what he saw, was one of the best managed he had witnessed since he came from Scotland to England. The hedges, too, upon the estate were very good. The best time to plant a new hedge was in November and December or in February. In his opinion the best of all hedges was a stone fence, but the cost was great, and they could not be adopted except in a stone country.

Mr. SCOTT, the vice-chairman, quite agreed with Mr. Calder, considering that one of the most prominent features of the proper management of an estate was good fences kept in proper order and duly cared for. He was of opinion that in the planting of Quickwood fences the yard was sufficient, and that six to eight or nine was far more than necessary, and when planted the whole of them would not live. The Quickwood could be well manured for 1½*d.* per yard, and this treatment was the means of getting up the fence as quickly as possible. In the cutting of a new fence it ought to be struck upwards and never downwards, and the proper time for planting was, to his mind, in October. He deprecated the system of cutting down and laying old fences, as nothing was so detrimental to the Thorn, which was in fact murdering the plant itself. Speaking of guard fencing, he considered post and rails expensive, as they were rubbed against by by cattle, but the American fencing was smooth and handsome. No estate of any magnitude ought to be without a saw mill, as by it a great amount of timber would be made available for fencing which otherwise could scarcely be sold at any price. It was to the interest of both landlord and tenant to have good fences on a farm, more particularly to the landlord. The keeping of the bottoms of hedges perfectly clean, and encouraging the lateral shoots to grow, was the proper means for securing good fences. He agreed with the hon. baronet as to the importance of good gates, properly hung. Really good gates were scarce—such as would readily swing backwards and forwards and shut themselves. Many of them dragged upon the ground, and soon got out of order and were destroyed. They would not swing easily, and farmers who had such gates on their farms were rightly served if they found them left open.

Mr. JACOB SMITH spoke of railway fencing being good, but it was too expensive. As a guard fence there was nothing so good as Oak posts with a single line of rails in front of an old hedge, by which cattle were kept from injuring it.

Mr. BENNETT did not approve of stone walls as fences. Loose stone fences were always getting out of repair, and they gave the country a cold and bleak appearance.

Notices of Books.

Principles of Agriculture. By Albert D. Thaer. Translated by W. Shaw and Cuthbert Johnson. London: Ridgway, Piccadilly.

Three generations back the breeds of animals were inferior in fattening qualities to ours, but the economy of stock-feeding was well managed. As the supply of oilseed cakes and other artificial food was very limited, and but few roots were grown, the farmer's resources were restricted, and he used them with skill and economy. The German and Dutch farmers understood how to prepare and mix their dry and green fodder and grain far better than many English farmers do. He was a good cook, and wasted nothing; and to the present day the peasant's wife on the Continent knows how to provide for her family from her slender materials better than the wife of an English labourer; for example, she rubs off the skin of the potato, while the latter wastes a thick paring. Our English farmer is disposed to be lavish. An ox has large capacity of stomach, or rather of stomachs, but to surfeit him with linseed cake and bean meal, and drench him with turnips (nearly all water), is to feed him as he ought not to be fed. Our English farmer sometimes has grand ideas about the necessity of making dung, and very hazy notions on the subject of profit and loss.

Hay and straw are to the animal what bread is to the household, and equally necessary to health; yet they are often wasted, and in some districts straw is ignored as an article of food. On the light land districts of England, where roots are easily grown, and particularly in the southern counties, even the sweetest straw is despised; and instead of being stored away as the bread of the farmyard it is in general treated as refuse, and is either used as litter or rotted by exposure. Even seventy years ago the economical Germans and Belgians knew better, fodder was less abundant, and they could not afford to waste straw. Thaer's chapters on manure, fodder, and cattle are well worth the study of modern farmers: we propose to give a few extracts. An eminent farmer is quoted who—

"Allows 1 bushel, or 8 lb. per day, of chopped straw of spring corn for every draught ox, and three-fourths of a bushel for a cow. It is his opinion that a piece of land, sown with 3 bushels of Barley or Oats will yield 319 bushels of chopped straw; and that, as the duration of the winter feeding is 165 days, two oxen or cows may be kept on the produce of one sowing of 3 bushels of spring corn. He also thinks that the straw of Rye and Peas ought to be devoted entirely to sheep; that the number of cattle ought to be regulated by the quantity of straw, since the summer pasturage might be helped by green Clover in the stable; and that, by means of crops of roots, it might be possible to do without hay.

"A draught ox, according to him, requires 12 lb. of hay per day, from January 1 to June 1; a milch cow, 13 cwt. of hay in a year, besides grains, corn and *vesper*, or, if she is fed on hay alone, 18 cwt.; young or barren beasts require 4 cwt. if they are allowed other provender besides and otherwise, 11 cwt.

"According to Karbe, a draught ox ought to receive a daily provender of 18 lb. of chopped straw, 2 lb. of straw as litter (in all, 4800 lb.), 13 lb. of roots, or 60 bushels yearly, during the whole of the 240 days of winter.

"If roots and vegetables are scarce, or nearly all spent, 30 lb. per day of corn, chaff, hay, chopped straw, and of litter may be substituted. Thus an addition of perhaps 10 lb. of hay instead of roots, where the latter are altogether taken away, will amount to 2400 lb. per year.

"A milch cow ought to be allowed 18 lb. of straw and hay for food per day during the 190 days of winter, and 2 lb. of litter = 3800 lb. per year; and likewise 13 bushels of vegetables or roots per day, or 50 bushels per year. During the 175 days of summer a pasturage of 3 acres of Clover and grass, and 2 lb. of litter every night, or 350 lb. per year.

"An ox for fattening ought to receive in each of the 112 days, which are usually allowed for that purpose—

16 lb. of chopped straw and 2 lb. of litter	= 1344 lb. straw.
8 lb. of hay	= 896 lb.
26 lb. of vegetables or roots.	

"In my edition of 'Bergen's Anleitung zur Viehzucht,' I have given an account of the quantity of fodder consumed by my cows in the course of a year, at a period when all my cattle were of the heaviest breeds. It amounted to the following per head:—

White Cabbages ..	4,800 lb.	240 lb. reduced to hay.	
Potatoes	3,200 ,,	1,067 ,,	,,
Radishes	1,800 ,,	343 ,,	,,
Carrots	1,200 ,,	400 ,,	,,
Grass in Clover ..	14,000 ,,	3,889 ,,	,,
Hay	.. ,,	1,060 ,,	,,
Straw as fodder ..	.. ,,	2,312 ,,	,,
Do. as litter ..	.. ,,	360 ,,	,,
		14,921 ,,	,,

Which produced 32,938 lb. of dung, or very nearly 16 loads of 2000 lb. each.

"With such an amount of fodder, the cattle certainly ought to be completely satiated, but they did not at any time suffer from indigestion. In proof of this I shall state the daily quantity of milk yielded by each of my dairy cows, which amounted on an average to 10 quarts of Hanoverian or 8 quarts of Berlin measure, making 3650 Hanoverian or 2920 Berlin quarts per year.

"These variations in the data may suffice to prove that horned cattle require little for their actual subsistence, and also that they can consume a great quantity. On the whole, an abundant supply of food is, to a certain degree, far more profitable in the end than any great energy or economy on this head ever can be. I have, however, ascertained, by long experience, that large sized beasts can only be rendered profitable by being very abundantly fed. In order to establish the average quantity of food and straw on which a moderate-sized ox or cow can be most advantageously kept, I shall admit that a good milch cow or draught ox when fed in the stall will annually consume:—

In straw, for fodder and for litter	4500 lb.
In hay (the various kinds of green fodder being also reduced to it	4500 ,,

But when these beasts are pastured during the day they have an equivalent to 4000 lb. of straw, and also to the quantity of roots which, if reduced to hay, would amount to 2800 lb.; by these means, in the former case, 18,000 lb., or 9 loads, of dung will be obtained, and in the latter, 13,600 lb., or six loads and three quarters.

"A draught horse, when fed in the stable, requires 7500 lb. of gross fodder, one-third of which should be hay, and two-thirds straw, besides a sufficiency of corn.

"We shall find a still greater number of variations in the accounts of the winter feeding required by sheep. In 'Den Tax Prinzipien' (the Principles of Estimation) we find the amount of fodder necessary for 100 sheep, which were turned out at intervals during the winter, stated at 4950 lb., and that requisite for the same flock when turned out more frequently, at 3850 lb. of hay. On the other hand, a flock of sheep of an improved breed consumed:—

	Dry Clover.	Straw and Peas.
Per 100 of ewes	16,600 lb.	5,500 lb.
,, yearlings	22,000 ,,	
,, lambs and lambkins	5,500 ,,	16,600 ,,
,, wethers	..	22,000 ,,
	44,180 ,,	44,100 ,,

Thus on an average per 100 sheep, 11,025 lb. dry Clover, and 11,025 lb. straw and Peas besides straw for litter.

"In the sheepfold of Kunnersdorf, containing 466 sheep, in 1804, the following amount of produce was consumed:—Hay, 1200 cwt.; horse Beans, 108 bushels; Peas, 46 bushels; Oats, 7½ bushels; rape cake, 300 pieces. Which is, indeed, an astonishing difference."

"A great number of agriculturists are of opinion that 10 sheep will consume as much winter fodder or pasture as one cow; but this depends, in a great measure, on the nature of the pasture, for there are some kinds of mountain herbage, a certain extent of which, though quite sufficient for the keep of 10 sheep, will not support one cow, while on the contrary there are others perfectly adapted for pasturing cattle, and are by no means suitable or profitable for sheep. In fact, the number of animals which can be kept on a certain extent of pasture depends, in a great measure, on the breed of the animals, and the purpose for which they are designed. In those places where improved breeds of sheep are kept chiefly, if not entirely, for the quantity of wool which they may be made to produce, an extent of pasture which will generally keep a cow will barely suffice for seven sheep; while, on the other hand, an extent of pasture sufficient for 15 sheep will afford a very poor and meagre feeding for a cow belonging to one of the large breeds. But as these differences can only be duly appreciated in certain definite localities, and by reference to the lands or the animals in question, we shall not stop to include them in our average estimates, but confine ourselves to the original one."

As Thaer was a physician of the first eminence, as well as a farmer of great experience, and endowed with wonderful powers of observation, his opinions on cooking roots must be quoted. He says:—

"It has not yet been decided by comparative experiments whether, or to what extent, root crops, and especially Potatos, are improved for cattle by boiling. Experiments on a small scale seem, however, to show that the difference is not considerable, and does not compensate for the expense of the operation, how strongly soever this method may be recommended by theory and analogy. It is easily seen that cattle eat vegetables in a raw state with as much, and ultimately with more, pleasure than those which are boiled. Potatos are excepted, on account of their laxative properties.

He disapproves of pulping.

"Cattle certainly eat the roots more willingly when they are but coarsely cut; very minute division, indeed, cannot be of any use, except to prevent the animals from being swelled up."

"I am still less disposed to admit the utility of those machines which reduce the roots, either raw or boiled, to a semifluid consistence; they are only useful for the distillation of brandy and other preparations made with these roots.

"In constructing machines which mash the roots in this manner, the object in view is to mix them better with cut straw, so as to compel the cattle more effectually to eat the latter; but experience has quite altered my opinion on this point: in short, I have seen cattle which had been well fed, and had therefore become rather dainty, constantly endeavour to separate the cut straw from the pieces of root. I therefore have the roots given to them separately, and I find that they eat straw much more willingly when put before them whole, soon after they have eaten the roots, than that which is cut for the purpose of making them swallow it together with the roots.

"The method of giving food in the form of mash or soup has been very generally extolled, both from theoretical and practical considerations, as being well adapted to develope the nutritive principles. It is generally adopted in many countries, particularly in small rural establishments, where great attention is paid to the management of milch cows. Boiling water is poured, either alone or mixed with some nutritive substance, on the cut fodder; the mixture is then brewed and given to the cattle, after it has cooled a little. Roots, or some other farinaceous substance, like those already spoken of, may then be boiled in water and more intimately mixed with the cut straw. I once tried this kind of food for two winters on 12 or 14 milch cows, making up the total quantity required with roots and cabbages boiled in water, and obtained a quantity of milk much greater than I could have expected. The food was prepared twice a day, in two tubs—in the morning for the noon and evening meal, and in the evening for that of the following morning, otherwise the liquid would not be sufficiently cool. But though the vessels were frequently washed with lye, I could not prevent the occurrence of acidity during the slow cooling. This acidity when slight did no harm; but when it became stronger, in consequence of high

temperature, it made the food very unpleasant, so that none of the cattle, excepting those which were very hungry, would touch it. Moreover I found, in the ensuing summer, that my cattle were weakened, and that their digestive powers were impaired; and I lost during the time of feeding on green meat more than I had gained during the winter. I therefore abandoned this mode of feeding, which was likewise very troublesome. I do not think that it can well be adopted in large establishments, or anywhere, indeed, excepting in small concerns, where only three or four milch cows are kept, and the water can be warmed in pans; I think that it is fit only for cows from which we wish to obtain the greatest possible return for a time, and get rid of them afterwards.

"In winter cows should be induced to drink a great deal. They will not drink very cold water, unless compelled by excessive thirst, but tepid water they drink much more willingly. They may, however, be easily induced to drink by simply mixing a small quantity of farinaceous matter with the water; the oilcake already spoken of is particularly well adapted for this purpose. Cattle should not be made to drink immediately after their meals, but in the intervals.

"It is of great importance, in giving food and drink to cattle, to observe regularly the hours to which they are accustomed, and to give them at each time the kind of food which they are in the habit of receiving. At the beginning of the time of winter feeding the arrangement may be made in almost any way, but when once fixed it should be adhered to. In my establishment the winter feeding has usually been arranged as follows:—Early in the morning the cows are fed with cut straw and hay; at 8 or 9 o'clock they are watered; at 11 o'clock roots are given to them without any addition; then uncut straw. At 3 o'clock they are again watered, and after that a little uncut hay is given to them. In the evening they are again supplied with cut fodder, as in the morning, but in smaller quantity; and when they have consumed this they get another supply of roots. A quantity of straw is then put before them for the night; they eat as much of it as they like, and the rest serves for litter on the morrow."

"Alternate feeding on dry and green fodder is always agreeable and beneficial to cattle.

"Some cultivators have fed their cattle for the whole summer on dry fodder—chiefly on Clover, and speak very highly of the method; but the haymaking is attended with much greater outlay and risk than consumption in the green state, and the nourishment contained in the fresh juice of plants apparently passes more easily into the blood, and becomes more readily available for nourishment, than when redissolved in a foreign liquid.

"Milk and butter produced by dry fodder never have so good a flavour as that produced by green meat. It is also remarkable that all animals prefer green to dry food, though they willingly eat the latter for a change.

"I have known cattle to be injured by young Clover mown before flowering, when it was given to them in moderation. But it may be given to them in very large quantities, at a time when they are very eager for green meat, or if they are allowed access to the place in which it is kept, it may undoubtedly produce indigestion and its consequence, the hove, or blown. Besides, it is not economical to mow the Clover which has not put forth its flowers, because in the week during which the flowers come out the plant increases in volume more than it has done for the five weeks preceding. If a field of Clover be mown once a fortnight during six weeks, and each crop yields 30 lb. of fodder, making 90 lb. in the whole, the same extent of ground will yield 600 lb. if the crop be mown only once during the six weeks. This has been positively demonstrated by a comparative experiment expressly directed to this subject.

"This is one of the main causes which render the produce of a given extent of surface so much greater when the crop is mown than when it is fed off, the plants not being allowed in the latter case to attain their full development. Trustworthy persons assure us that certain cows, fed upon the best and most milk-producing pastures of the low countries have given from 90 lb. to 100 lb. of milk per day at the time of their greatest abundance, and I am not acquainted with any positive instance of stall-feeding cows having yielded more than 60 lb. in the same time."

"Straw contains very little nutriment, its value is greatly exaggerated when it is said to be equal to half that of hay; this can never be the case except when the straw contains a large quantity of grain. It, however, fills the stomach, and dulls the sensation of hunger." "The straw of leguminous vegetables and Buckwheat is more nourishing, especially when the crops have been taken while part of their leaves remained green."

Finally, the subject of "condimental food" is considered, and a recipe for the mixture of certain aromatic ingredients is laid before the reader. The compound, which looks sufficiently tempting, is to be made up at home, and Thaer thinks that "1 lb. of it will suffice a sheep for a year." The present purchaser of "condimental food" may perhaps double the quantity for our larger breeds, but he ought in future to mix the ingredients at home.

Farm Memoranda.

MAIDENHEAD.—The farms in this district include a great variety of soils, hence it is no easy matter in such a season as this to frame a report which shall state fairly the result up to the present time and the prospect for the future. One most important crop, viz., the Wheat, was put in well on the Clover leys, but the long period of frost and rain which followed caused many fields that would otherwise have been planted with Wheat during the late months of 1869 and the early ones of 1870 to be sown with Oats or Barley. In addition to this a large portion of Wheat on the lighter lands and gravels, and also some on the stronger lands, lost plant to such an extent that many acres were ploughed up and planted with other corn, whilst much that was left proves so thin in the ground that the yield, however fine the ears, must be exceedingly bad. On the other hand, much of the Wheat on the more holding land, although not long or stout in the straw is so fine in the berry and so free from blight, that it will probably turn out a good average.

With respect to all the other crops the report must be simply unfavourable. The long-continued drought has seriously affected all spring corn. Oats and Barley are very light and poor on all except the cooler soils in good condition. Beans and Peas, although in some instances fairly podded, are so short in the haulm that they must yield badly.

Clover on the lighter soils was hardly worth cutting, and much below an average on all soils, nor is there any prospect of a lattermath. That noxious weed, the Dodder, has also been very prevalent. Much of the meadow land intended to be cut was fed off, and the hay must be set down as almost a failure. The advantage of the machine over the scythe was most marked, for while it was found impossible with the one to cut the sparse and dry herbage, with the other, whatever Clover or hay there might be, was secured by a close and level cut.

Mangel Wurzel is generally a good plant, and up to the present time appears healthy, though needing rain, but Swedes and Turnips have been planted two, three, and four times, and have in many cases fallen as often victims to the fly or perished by drought. Nearly all fields intended for roots present the appearance of a bare fallow, with the exception of green patches of Wurzel and occasional thin lines of Swedes and Turnips just making themselves visible.

The prospect for cattle and sheep feed could hardly be worse, when we take into account the failure of the hay, of the roots up to the present time, and the shortness of the straw.

Horse keep, too, will be a very serious consideration, and the advantage possessed by the steam cultivator over its hay and Oat consuming competitor will be very apparent, and although what I am about to say may be hardly within the province of a report, I will venture to add that I cannot but hope and believe that one result of this most peculiar season must be to bring home to the minds of many the value and importance of steam cultivation by placing forcibly before them the fact that a large staff of unnecessary horses is a most expensive and unsatisfactory luxury.

Probably many who read this report will have looked with interest at the grand 30-horse power engines on Messrs. Fowler's stand at the Oxford show, but grand and excellent as are such machines for those who are strong in purse and strong in acres, they are not the machines for the tenant-farmers with their 200 to 500 acres. For them I feel convinced that the 10-horse power engine, equally applicable to threshing and cultivating, and the inexpensive and effective round-about tackle, is the thing to which they must look, and on which they may safely depend.

Harvest operations began on the 11th inst., on the light lands, and on such soils much of the corn is cut and some carried. On the later lands reaping commenced on the 25th inst., and is now progresing rapidly. *July* 27.

WEST SUSSEX: *July* 27.—We have now begun harvest, and this week it is general here. The weather is very hot and dry, and the Wheat is ripening fast, and will be in good order for threshing as soon as carried; and no doubt a good deal will be threshed out at once, as the price is now rather tempting. But still, if the war continues long, there is no doubt prices will be higher, as the supply from early threshing is being counted upon, and has, no doubt, had a tendency to check the rise that has taken place. We cannot say the Wheat is up to our expectations, the ear is well filled, but the plant is not thick enough on the ground; the bulk of straw will not be nearly what it was last year, but there is, perhaps, more old straw in store than there has been for many years. I should say that even on heavy lands the crop will be from one to two sacks below an average, and on the higher lands much more.

Barley is a fair average crop, and of good quality on the heavy lands when sown in time, but on light land, and late sown, it is a poor crop. Oats are far from an average, even where early sown, and the late sowings are almost a failure.

Peas are good, haulm rather light, but extremely well podded, and are now being harvested; and the haulm is so free from blight, and has had no rain upon it, that it will be very useful to us as a substitute for hay; and the oat-straw, being short, will be useful in the same way, if well harvested.

The root crops are a complete failure; there is hardly a Swede plant to be seen, and most of us have sown twice. But even the weeds do not grow. We shall have to sow the whole again, and it is not possible to have anything like a fair crop.

The pastures, as a matter of course, are burnt up, such as we have hardly ever seen them, and buying and selling lean cattle is at a standstill; but sheep are not quite so low as last year at this time.

The season, on the whole, has been very bad for the farmer, and worse for the labourer, as there has been no hoeing and very little haymaking; and the corn being short in the straw, and all standing, will suit the reaping-machines well, and a great deal will be cut with them.

Mangel is almost the only green thing that we have; it, on the whole, looks well, and we find Lucerne very useful when everything is so scorched. It sends its roots so deeply into the ground that it is some time before it feels the effects of a dry season.

Cabbages are also useful, though their growth has been much checked; still, they are a bulky, useful crop. Potatos are looking well, but are not large.

Summarising the state of the crops, we should say:—Wheat one-seventh to one-sixth below average; Barley nearly average; Oats one-half below average; Peas full crop; hay one-fourth of average crop; straw of all kinds three-fourths of average; Potatos a light, healthy crop; Mangel looking fair; Swedes none, or very few; Turnips none; pastures bare and burnt up; second cut of Clover, hardly any. Altogether, not a very cheering picture. *G. S.*

Miscellaneous.

A RUN AT GRASS.—Mr. B. Cartledge, of Sheffield, and a member of the Royal College of Veterinary Surgeons, writes as follows to the *Times* on this subject:—"Turning out to grass" is a subject of scarcely less importance than "watering horses;" and the popular belief that the horse is benefited by "a month's run" is a fallacy that needs exposure. Now that the pastures are beginning to look green, and the weather promises to become warm, owners are thinking of giving their horses a treat by turning them out to grass. "I have worked my horses hard," say they, "and they need a summer's run. It will rest their legs and feet; besides, green food is the natural provender for horses, and they will enjoy a few months' rest at grass, and be all the better for it." This is a very general impression, but in its application to worn or used horses nothing can be more erroneous. It is all very well for the young animal protected by long hair, lengthy mane and tail, whose time while young has to be got over one way or another, and it is found convenient to let him forage for himself. But with stale and "groggy" horses requiring rest, and whose owners turn them out with this object, the matter is entirely different. "Rest," properly so called, is not to be had in the pasture. In the simple process of gathering his food the horse walks many miles during the 24 hours if the pasture be bare, and the same process obliges him to throw extra weight on his fore legs and feet, which it has been the intention of the owner to "rest." What rest has a horse or any other animal with a fine coat and sensitive skin when even a single fly is crawling over it? Witness in the summer months the myriads of insects which surround all cattle when grazing, and watch the poor horses huddled together for shelter under trees or hedge-rows nervously tossing their heads, switching the tail, stamping, and thus jarring the legs and feet, moving to and fro in the vain hope of escape from their tormentors, and then ask if this be "rest?" When the sun is powerful the feet become hot and parched, the horn is rendered brittle, and breaks off in pieces. Besides, nothing throws a horse so soon out of condition as green food. The consequence in eight cases out of ten is that the animal comes up from grass in much worse form than when turned out "to rest"—if he escape getting staked, or being kicked by his companions. It is said, and I believe truly, that no hunter is in condition before he is seven years old; which means that he has had three years' hard keep and moderate work. The summering of hunters is now an altogether different matter from what it was formerly. If properly treated, the hunters will at most be allowed a small quantity of green food as a *bonne bouche*, for a week or so. This is gathered for him, is eaten in his box or in the yard attached, and his usual feeds of corn are not lessened. What, then, is the best method of dealing with horses in the summer, when either rest is a necessity or otherwise desirable. Put them into a loose box or shed, well littered with tan, bark, sawdust, or straw, or all combined; remove the shoes, and rasp off the sharp edges of the crust to prevent them breaking; supply water without stint; give a liberal allowance of oats, Indian corn, and bran, with cut chaff and hay, the whole of which will be the better for being made damp with water. If on the part of the owner there is a predilection for green food, give it in small quantities mixed by hand with the hay, always remembering that the fat which it invariably produces is so much lumber, not condition, and that when the horse returns to work the fat is thrown off at the cost of additional wear in the feet and legs.

The Week's Work.

AUGUST 6.—*Corn Harvest* is acknowledged to be always general in early August in our southern counties, and the current season will be no exception to the common rule, although at one time it was otherwise calculated. There appears, however, a greater diversity in the ripening of crops in the South than usual. Thus Oats are coming in before Wheat and Barley, or even winter Peas and Beans, and spring Wheat before winter Wheat, and so on. The different counties, too, do not

stand in the same harvest relation to each other as to time and weight of crop, owing to the greater than usual partiality of rain, night dews, and drought. The recent thunder showers, wherever they have fallen, have given a promise of autumn Turnips, and this for a time will drive all such peculiarities out of people's minds. At one time we thought the northern counties would be nearly as early as our southern, but having recently travelled over the length and breadth of the land, the extreme drought of the latter and growing weather of the former have nearly restored the harvest month to its common place in the calendar. But in the North there will also be early and late crops, as in the South.

Chalk, Marl, and Lime Composts, when required for immediate application after harvest, should now be got in readiness. In the olden time, when naked fallowing was common, they were frequently applied to the land prior to the seed-furrow. They may also be carted on to hay and Pea stubbles, and also burnt-up pastures. When the clay from pits contains no lime, chalk, shell, or gravelly marl, or lime from the kiln may be mixed with it in a compost heap, and afterwards be applied to the land should clay and lime both be required. Where clayey marl can be had, it will save the trouble of clay compost.

Crop Diseases, as smut, bunt, rust, mildew, and midge, and the vitality of seed from imperfect ripening, will this year require very great attention in the harvest field. Thus, some fields have a very fine uniform appearance, both as to the length of the straw, filling and form of the ear, and ripening; but others are quite the reverse, the crop presenting many shades of colour, length of straw, and so on. Much may be done to keep separate the good from the bad if proper attention is paid to the stooking and stacking. In some cases it may cost rather more money to harvest the good and bad separately, but we have occasionally done it at less expense, for, as a rule, crops of uniform quality harvest better than a mixed sample. Difficulties should never stand in the way of what is right in the harvest field.

Winter Peas and Beans harvesting, where not concluded, prosecute as the weather and state of the crops permit. Turn the newly cut bundles of Peas frequently in forcing weather, so as to preserve the quality of both corn and straw, and also to prevent shelling. Carry as soon as ready, and never allow the stacking to fall behind. Thatch immediately. Beans may lie abroad in the open sheaf for a short time in fine weather, but in wet they do better in the stook in small sheaves than lying on the wet land.

Winter Rye comes in early for the reaping-machine and stackyard. The crop grows more freely on poor sandy and porous soils than any of the other cereals, and the farmers of the Continent study their interest in this respect better than we do; although it grows longer in the straw than Wheat, it is more wiry, and stands better up to the weather and the reaping-machine. The sheaves also stand well in the stook, and the straw makes the best of thatch and litter. The corn is bought by distillers, bakers and confectioners, or it may be ground into coarse meal at home for seasoning cattle food.

Bere, or Bigg (a six-rowed Barley), is not much grown in the South, but perhaps more largely than formerly. It ripens earlier than the two-rowed sorts of Barley, and is hardy and prolific; but in Scotland, where it is very generally grown, the great objection to it was the difficulty of threshing and dressing for market, the awns being tougher, and adhering more firmly to the grain, and the grain to the rachis. But improved threshing-machines get over this difficulty. Sufficient attention, however, has not been paid to the improvement of this variety of Barley, or it would be grown more largely than it is South and North. We last month saw very heavy crops of Bere growing on the rich land about Campbeltown, Argyleshire; and in a conversation we had with one of the oldest distillers of Campbeltown, he said he could make a finer quality of whisky from Bere, 50 lb. to 52 lb. per bushel, than from Barley 54 lb. to 58 lb. per bushel—a conclusion deduced, not from an isolated experiment, but from a successful experience of upwards of 40 years. And as the fine flavour of the whisky depends upon the quality of the malt, the practical question arises, cannot we make a finer quality of home-brewed ale from Bere than from Barley?—a question which we believe was answered in the affirmative, in the days of good Queen Bess, in Herts. Hence the "wassail" song of "the old ale knights of England:"

"Bring us home good ale."

A larger quantity of spirit and ale can be made from heavy Barley, but the flavour and quality is inferior. In the South the crop may be left in the swathe as it falls from the reaping-machine or scythe. In fine weather once turning may fit it for the stack, but in catchy seasons, more especially early ones like the present, it should be got into small handcocks in the field, neatly built to throw off a shower, and then carted to the stackyard when ready. In the North the crop is invariably bound up in sheaves, stacked, and carefully "hooded" in wet weather, 10 or 12 sheaves to the stook, according to the length of the straw.

Autumn Turnip Sowing.—During the past month as the work of corn harvest has advanced, the team has been yoked, and the land ploughed close up to the stooks, and, as the stooks are ready for the stackyard, the narrow strips on which they stood are next ploughed, when the sowing of the autumn crop proceeds; and as it has been with the past month, so will it be with the current one. The practice is a very diversified one, according to the nature and state of the land, the tillage it requires, and the manure to be used. But however diversified in detail, the practice now extends over the whole of the southern counties, corn harvest and Turnip seed time forming a busy and doubly interesting season to the farmer. In front may be seen the reaping-machine, with the stooks rising up close to each other, but as wide between the rows as can be, for the greater breadth of tillage. No sooner are the stooks up than the whole force of tillage implements now in use is started—light implements for light land, and heavy implements for heavy land. The greater breadth is now grown with artificial manure, from 3 cwt. to 5 cwt. of superphosphate or Turnip manure being drilled in along with about 4 lb. of Turnip seed per acre, and as the land is generally clean, the work, although heavy and expeditious, is simple. But to this there are here and there exceptions, where the old practice of gathering and burning weeds, and the carting out of farmyard manure, gives variety to the practice. In dry weather the liquid manure drill should invariably be used with a plentiful supply of water, and if the seed is got in with a sufficiency of sap it brairds rapidly, and soon gets into rough leaf from the high temperature of the land in our southern counties. Much of the success of growing autumn Turnips depends upon this high temperature of the land, and the getting in the seed with plenty of sap. *W. B.*

Markets.

ENGLISH WOOL.

We have to report continued dulness in this matter, and prices are very flat and irregular, except for some of the lower grades of skin wool, which are inquired for by manufacturers of army blankets, horse rugs, &c.

Current Prices of English Wool.	Per lb.–	s.	d.	s.	d.
Fleeces—Southdown hoggets	.. .. ..	1	1	to 1	2
Half-bred ditto ..	.. ..	1	2	— 1	2½
Kent Fleeces	.. ..	1	2	— 1	4
Southdown ewes and wethers ..		0	9½	— 1	1
Leicester ditto	.. ..	1	2	— 1	3
Sorts—Clothing	.. ..	0	11	— 1	6
Combing	.. ..	1	0	— 1	8

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Aug. 4.

Prime Meadow Hay	120s. to 130s.	Clover, old ..	..135s. to 145s.
Inferior do. ..	..100 110	Inferior do. ..	..110 120
New Hay ..	..105 115	Prime new do.	..120 128
Inferior do. ..	..100 110	Inferior do. ..	..100 110
Straw	.. 24 30	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, Aug. 4.

Sup. Meadow Hay	130s. to 140s.	Inferior Clover	..120s. to 128s.
Inferior do. ..	..116 126	Prime 2d cut do..	— —
New do. ..	..110 126	New do. ..	..120 130
Inferior do. ..	.. 95 100	Straw	.. 32 36
Superior Clover	..136 147	JOSHUA BAKER.	

WHITECHAPEL, Thursday, Aug. 4.

Fine Meadow Hay	112s. to 120s.	Prime old Clover	..135s. to 145s.
Inferior do.	..100 110	Inferior do. do.	..105 115
Prime New Hay ..	.. 90 100	Prime 2d cut do.	..130 140
Inferior	.. 80 85	New Clover ..	..115 120
Straw	.. 28 34	Inferior do. ..	.. 90 105

COALS.—Aug. 3.

Eden Main, 16s. 9d.; Walls End Hetton, 18s. 6d.; Walls End Hetton Lyons, 16s.; Wall's End South Hetton, 18s. 6d.; Walls End Hartlepool, 18s.; Walls End Deaf Hill, 18s.; Walls End East Hartlepool, 18s. 3d.; Walls End South Hartlepool, 17s. 6d.; Walls End Tees, 18s. 3d. —Ships at market, 24; sold, 20; unsold 4; at sea, 10.

HOPS.

BOROUGH MARKET, Aug. 4.

Messrs. Pattenden & Smith report a steady retail demand for consumption, late prices being well maintained. The plantation accounts are very favourable, and the crop is set at about £250,000, old duty.

METROPOLITAN MEAT MARKET.—Aug. 4.

Best Fresh Butter .. .. .. 18s. per dozen lb.
Second do. do. .. .. .. 16s. ,,
Small Pork, 4s. 6d. to 5s. 0d.; Large Pork, 3s. 4d. to 3s. 6d. per 8 lb.

METROPOLITAN CATTLE MARKET.

MONDAY, Aug. 1.

We have a large number of Beasts on offer; a large proportion is of very middling quality, consequently prices are not much lower for choicest descriptions. The supply of Sheep is nearly as large as last week, and trade is slow at our quotations. We have a large supply of middling Lambs; several lots remain unsold. Trade is dull for Calves, at our quotations. Our foreign supply consists of 2060 Beasts, 9000 Sheep, 230 Calves, and 45 Pigs; from Scotland there are 40 Beasts; from Ireland, 200; from Norfolk and Suffolk, 50; and 2500 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5 0	to 5 4	Best Long-wools	5 0	— 5 4
Best Shorthorns ..	4 10	— 5 2	Do. Shorn ..	..	— ..
2d quality Beasts	3 6	— 4 4	Ewes & 2d quality	4 4	— 4 8
Best Downs and Half-breds ..	5 4	— 5 6	Do. Shorn ..	..	to ..
Do. Shorn ..	..	— ..	Lambs	5 4	— 6 4
			Calves	3 4	5 4
			Pigs	3 0	— 5 4

Beasts, 4850; Sheep and Lambs, 27,540; Calves, 245; Pigs, 240.

THURSDAY, Aug. 4.

The number of Beasts is small, and the demand is only moderate; Monday's quotations are, however, well maintained throughout, and a fair clearance is effected. The supply of Sheep is fully equal to the demand; trade is very dull, and Monday's rates are not generally obtained. We have a large number of inferior Lambs on sale, which realise very low prices; choicest descriptions are rather scarce, and make about the same as on Monday. Trade is very dull for Calves. Our foreign supply consists of 150 Beasts, 3500 Sheep, 524 Calves, and 30 Pigs.

	s. d.	s. d.		s. d	s. d.
Best Scots, Herefords, &c. ..	5 0	to 5 4	Best Long-wools..	5 0	to 5 2
Best Shorthorns ..	4 10	— 5 2	Do. Shorn ..	..	— ..
2d quality Beasts	3 6	— 4 4	Ewes & 2d quality	4 4	— 4 8
Best Downs and Half-breds ..	5 4	— 5 6	Do. Shorn ..	..	— ..
Do. Shorn ..	..	— ..	Lambs	5 0	— 5 4
			Calves	3 4	5 4
			Pigs	3 0	— 5 0

Beasts, 830; Sheep and Lambs, 16,200; Calves, 674; Pigs, 80.

MARK LANE.

MONDAY, Aug. 1.

There was a short supply of English Wheat to this morning's market, which brought an advance of 1s. per qr. upon the prices of this day se'nnight. The market was well attended, and there was a moderate demand for foreign, at an improvement of 1s. to 2s. per qr., the inquiry being mostly for Russian and American. Barley, Beans, and Peas were rather cheaper. The Oat trade was firm, at the rate of this day week. Flour was unchanged in value.

Price per imperial Quarter.	s.	s.		s.	s.
Wheat, Essex, Kent, Suffolk. White	50	—56	Red.....	48	—66
— — fine selected runs..do.	53	—60	Red.....	51	—57
— — Talavera	54	—63			
— — Norfolk	—		Red.....	—	
— — Foreign	42	—63			
Barley, grind. & dis. 29s to 31s.	Chev.	42—45	Malting ..	36	—41
— Foreign .. grinding and distilling	25	—33	Malting ..	33	—43
Oats, Essex and Suffolk	25	—27			
— Scotch and Lincolnshire..Potato	27	—29	Feed	—	
— Irish .....Potato	26	—28	Feed	24	—27
— Foreign .....Brew	27	—29	Feed	22	—27
Rye	32	—36	Foreign ..	33	—36
Rye-meal, Foreign					
Beans, Mazagan....38s. to 47s.	Tick	38—50	Harrow ..	38	—50
— Pigeon ....44s. to 50s.	Winds	—	Longpod..	—	
— Foreign	Small	45—47	Egyptian..	42	44
Peas, White, Essex, and Kent..	Boilers	38—42	Suffolk ..	41	—44
— Maple, 37s. to 44s.	Grey	36—39	Foreign ..	36	—40
Maize	—		Foreign ..	32	—34
Flour, best marks delivered..per sack	46	—54			
— 2d ditto	ditto	44—47	Country ..	35	—47
— Foreign ..... per barrel	29	—31	Per sack..	35	—61

WEDNESDAY, Aug. 3.

There was a fair attendance of millers at Mark Lane today, and the tone of the market was firm; nevertheless only a limited amount of business was transacted. The arrivals of English Wheat were small, and of foreign only moderate; the arrivals, however, were fully adequate to the demand; prices for all qualities were fully supported, and in some instances an advance of 1s. per qr. was held for. Barley was in fair supply and request at previous quotations. Malt was quiet at about late rates. Oats, the supply of which was tolerably good, experienced a moderate inquiry at the rates of Monday. Beans were inactive, but not quotably lower. Peas were purchased rather freely at about late prices. Flour was quiet, but firm in value.

Arrivals of Grain, &c., into London by Water Carriage.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 300	Qrs. 50	Qrs. —	Sacks. —
Irish ..	—	—	900	—
Foreign ..	14,290	7550	27,650	{ 400 { 2,600 brls.
	14,590	7600	28,570	

HULL, August 2.—At our market to-day there was a small show of English Wheat, and the business done in it as well as in foreign was small, an advance of 1s. per qr. being established. English white Wheat was quoted at 56s. to 58s. per qr.; red, 53s. to 55s.; Dantzic and Konigsberg white, 58s. to 60s.; mixed, 54s. to 56s.; Baltic red, 52s. to 55s.; Danish and Hamburgh, 52s. to 56s. Barley was very scarce, and rather dearer. Beans, Peas, and Oats were in retail demand, and without change in value.

Averages.

	Wheat.	Barley.	Oats.
June 25	50s 5d	33s 5d	25s 1d
July 2	51 6	32 0	25 10
— 9	50 7	30 3	25 8
— 16	49 8	31 2	25 6
— 23	49 9	31 2	26 11
— 30	52 10	33 5	26 9
Average ..	50 9	31 11	25 11

SEED MARKET.

The speculative inquiry for Clover seed, of which we spoke in our last, has continued during the present week, but as the comparatively small stock left over is held with great firmness, no heavy sales have taken place. New Trefoil seed is cheap and plentiful. The recent rains have, as was to be expected, created a brisk demand for seeds required for present sowing, such as Rape, Mustard, and Trifolium seed. New Rape, being in good supply, is easier. White Mustard and Trifolium incarnatum have advanced in value. New winter Tares are offering in small quantities, but prices are scarcely yet fixed; the same remark can be applied to new Rye, Barley, Oats, Peas, &c. Feeding Tares and Linseed are firm.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

INDIA-RUBBER GARDEN HOSE,
50 feet ½ inch hose, with brass tap, rose, and set complete, 10s. 6d.
50 feet ½ inch do. do. extra strong, 31s. 6d.
Carriage paid to all Railway Stations in Great Britain. Price Lists of every article made in India-rubber forwarded on application.
E. G. CAPON, India-rubber Manufacturer, Queen's Road, Birmingham.

H. BROOK AND CO., Sole Manufacturers of the CHELTENHAM GARDEN ENGINE, which weighs only 3lb 1 oz., throws water in a continuous stream over 15 feet. The large size, worked by the foot, throws over 60 feet, and is strongly recommended as a fire engine. To be had of all Ironmongers, and Wholesale only at 10, Featherstone Buildings, Holborn, London, W.C.

THE HYDRONETTE
(ROBIN'S PATENT),

FOR GARDENS, GREEN-HOUSES, CONSERVA-TORIES,

HOTBEDS, WASHING WINDOWS, CARRIAGES &c., &c.

Unrivalled Ease of Action, Simplicity, Convenience and Force.
The HYDRONETTE is a more useful, easy working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz. No. 1, with 4 feet 6 inches Hose, Strainer, Jet and Rose, 12s. 6d.; No. 2, 15s. 6d.; No. 3, £1 1s.; No. 4, £1 5s.; No. 5, £1 10s. Extra Hose and Union Joints to order. To be had of HAYNES AND SONS, 227, 229, and 231, Edgware Road, W.
CAUTION.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

WILKIE'S BLIGHT COMPOSITION.

See REPORT from Mr. WILLS, in *Gardeners' Chronicle*, page 991.

This desirable Mixture, referred to in the *Gardeners' Chronicle*, pages 862 and 896, is most effective in its operations; it quickly destroys all kinds of Aphis, Thrips, &c.; is not injurious to the most tender foliage; leaves no stain and no disagreeable odour. One Gallon will bear diluting with three of water.

Price as follows—1 Gallon, 3s. 6d.; 2 Gallons, 6s.

A further reduction, if taken in larger quantities.

SOLE AGENTS—
OSBORN AND SONS, FULHAM NURSERY, LONDON, S.W.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & CO.,

IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

87, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

JOHN WARNER & SONS, HYDRAULIC ENGINEERS,

Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

8, CRESCENT, CRIPPLEGATE,
LONDON, E.C.

No. 547A.
GARDEN ENGINE.

10 Gallons	£3 0 0
16 ,,	3 16 0
28 ,,	5 1 0
42	5 13 0

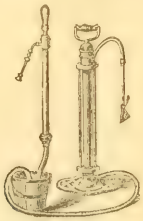

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AQUAJECT.
Useful for every variety of purpose—as watering of windows, flowers or lawns; to clean Greenhouses, &c.; also for washing Carriages or Windows, laying Dust, &c.
Price, complete £1 8 0
Small size for the hand, as an ordinary Syringe .. 0 15 0

THE CRYSTAL PALACE
GARDEN or FIRE ENGINE.

No. 35.
CAST-IRON PUMPS.

2½ inches	£1 9 0
3 ,,	2 2 0
3½ ,,	2 7 0
4 ,,	2 15 6

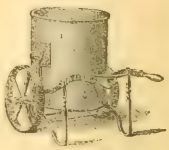

No. 579½.
SWING
WATER BARROW.

20 Gallons	£2 2 0
30 ,,	2 14 0
38 ,,	3 18 0
50 ,,	5 14 0

THE ROYAL OXFORD HORSE RAKE.

J. & F. HOWARD

HAVE WON, EVER SINCE 1852, WITH ONE EXCEPTION,

EVERY FIRST PRIZE

OFFERED BY THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND FOR

HORSE RAKES.

AT THE RECENT MEETING AT OXFORD,

A SPECIAL PRIZE—THE SOCIETY'S MEDAL—

WAS AWARDED TO THE ABOVE IMPLEMENT FOR ITS SIMPLE SELF-ACTING ARRANGEMENT.

The following extract is from the *Gardeners' Chronicle*:—"Messrs. HOWARD, Bedford, show an extremely ingenious Horse Rake, containing the very best device yet invented for causing the driving wheels to lift the teeth as soon as a load is gathered. A pedal movement tightens the rocking cradle on the wheel-shaft of the Machine, and up go the teeth—the pressure on the pedal is relaxed, and they drop into work again upon the ground."

Catalogues, with full particulars, sent free on application to

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LONDON OFFICE:—4, CHEAPSIDE (three doors from St. Paul's).

By Royal Letters Patent.

SHREWSBURY'S GAS CONSERVATORY BOILER, Registered Gas Oven, no gas inside
IMPROVED REGISTERED GAS BATH, £10.
Testimonials on application. Enclose stamp.
G. SHREWSBURY, Lower Norwood, S.E.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
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Manufactory, 6, Bankside, Southwark.

Wasps.—The Wasps are Coming.

HAYTHORN'S HEXAGON and CHISWICK GARDEN NETS are guaranteed to Protect all kinds of Fruit from Wasps, Birds, Flies, &c. They are used and recommended by all the principal Gardeners. For testimonials, patterns and prices, free by post, please direct to Mr. HAYTHORN, Nottingham.

NETTING for FRUIT TREES, SEED BEDS, RIPE STRAWBERRIES, &c.—TANNED NETTING for Protecting the above from Frost, Blight, Birds, &c., 2 yards wide, 3*d.* per yard, or 100 yards, 20*s.*; 4 yards wide, 6*d.* per yard, or 50 yards, 20*s.* NEW TANNED NETTING, suited for any of the above purposes, or as a Fence for Fowls, 2 yards wide, 6*d.* per yard; 4 yards wide, 1*s.* per yard; ¾-inch mesh, 4 yards wide, 1*s.* 6*d.* per yard. Can be had in any quantity of
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An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.
F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.
N.B. Open Tanks of different sizes packed one in another to save carriage.

Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E.; Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone, in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.
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FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

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The Patent Improvements recently introduced give
SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

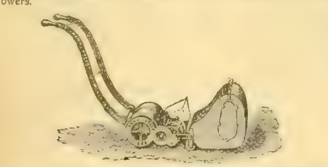

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application.
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☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

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Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof, Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.

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Minton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5*s.* each. GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England.

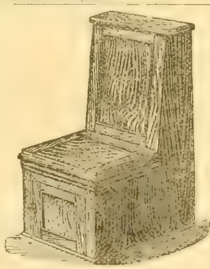

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From MR. W. GILBERT, *Lawford Street, Rugby.*
"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Moule's for my Kitchen, and emptied the whole of the contents into a bucket of water, and I have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT.
"January, 1870."

Prospectuses and full information may be obtained at 20, Bedford Street, Covent Garden, W.C.

Cottam's Iron Hurdles, Fencing, and Gates.

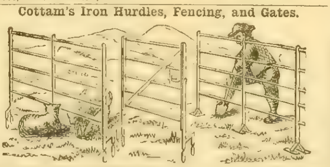

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
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COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

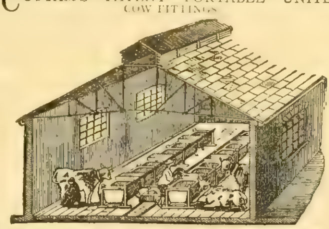

Their advantages are Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55*s.*
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NOTICE TO COMMITTEES.
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EMIGRANT'S HOUSE TENT, 3 Rooms, £17. Boarded Floor, Sides, and Partitions, Doors and Windows; a Comfortable Hut. Coach-house and Stable, £11; Tool-house, £3; Summer-house, 70*s.*; Poultry-house, 30*s.*
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Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4*s.* per 1000, or 10,000 for 35*s.*, cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sizes, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

Caution to Gardeners.—When you ask for

SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make, all of which are warranted both by Sellers and Makers.
S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years.

Red Spider. Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1*s.*, 3*s.*, and 10*s.* 6*d.*

Wholesale by
PRICE'S PATENT
CANDLE COMPANY
(Limited),
Battersea, London, S.W.

THE LEGAL and GENERAL LIFE ASSURANCE SOCIETY,
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It takes a leading part in freeing Life Assurance Contracts from all needless restrictions.

The "Proposal Form" is most simple in its terms.

The Policies are "Indisputable," that is, free from future challenge.

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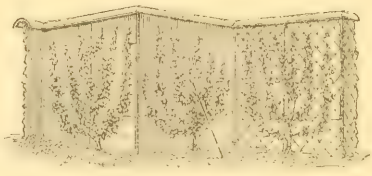

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 33.—1870.] SATURDAY, AUGUST 13. {Price Fivepence. / Stamped Edition, 6d.

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THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE of SATURDAY, August 20, will contain a FULL and TABULAR STATEMENT of the CONDITION of the FRUIT CROPS throughout the UNITED KINGDOM Order of any News Agent. A Single Copy sent for Six Stamps.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

SHOW of GLADIOLI, HOLLYHOCKS, &c., WEDNESDAY NEXT, August 17. Doors open at Two. Band of the Royal Horse Guards from Four. Tickets of the usual Agents. To friends of Fellows, if bought prior to the 17th, 1s. 6d ; or on the day, 2s. 6d.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

The COUNCIL are prepared to receive APPLICATIONS from Nurserymen and others interested in Horticulture for SPACE for the PERMANENT FLORAL SHOW, to be held in connection with the forthcoming Annual International Exhibition, at South Kensington The Space available being limited, early application is necessary. The Council reserve to themselves the absolute right of allotting the Space as they may consider advisable. All applications to be addressed to the ASSISTANT SECRETARY, South Kensington, W.

RICKMANSWORTH COTTAGERS' and MOOR PARK HORTICULTURAL EXHIBITION.—Held in the beautiful old Pleasure Grounds, by kind permission of the Right Hon. Lord Ebury, AUGUST 18. 1st Life Guards Band, as in former years. Large Exhibition of Plants, &c., from the neighbouring Gardens of the Nobility and Gentry of Herts, Bucks, and Middlesex. Open from 2 to 6 o'clock. Admission 1s. One hour from Euston and Kingston.

READING HORTICULTURAL SOCIETY.—The AUTUMN SHOW will be held on THURSDAY, August 25 (by permission of the Mayor), in the Abbey Ruins, Reading. A Band will attend as usual. The Show will be open to the Holders of Subscribers' Tickets at 1 o'Clock, and to the Public at 3 o'Clock, on payment of 1s. Schedules and Tickets may be obtained of

CHARLES COLLINS, Hon. Secretary.

34, Chain Street, Reading

Worcestershire Agricultural Society.

A GRAND HORTICULTURAL EXHIBITION, in connection with the above, will be held in the SHOW GROUND at KIDDERMINSTER, AUGUST 30 and 31, and SEPTEMBER 1, when PRIZES to the amount of ONE HUNDRED and THIRTY-FIVE POUNDS will be awarded. For Lists of Prizes and Rules, &c., apply to Mr H. J. CHRANE, 27, Clarence Street, Cheltenham, Hon. Secretary to Horticultural Committee.

ALBERT BUCK, Secretary, Worcester.

METROPOLITAN SOCIETY for the ENCOURAGEMENT of FLORISTS' FLOWERS.—The FIRST EXHIBITION of DAHLIAS, HOLLYHOCKS, GLADIOLI, and other Autumn Flowers, will be held at the CRYSTAL PALACE, on September 6, 7, and 8, when prizes to the amount of £150 are offered. Schedules may be had on application to the Hon. Secretary,

The Rev. H. HONYWOOD DOMBRAIN.

Westwell Vicarage, Ashford, Kent

ROYAL BOTANIC GARDENS, BELFAST.—GRAND EXHIBITION of FRUITS, FLOWERS, PLANTS, &c., SEPTEMBER 8 and 9 next. Two Military Bands in attendance. Patron—His Excellency the LORD LIEUTENANT of IRELAND and EARL SPENCER

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R. D. VONGE, Esq., and J. F. JOHNSON,

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JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, offers for Sale—

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100 CAMELLIAS, with flower buds, named and best sorts, £6, £8, £10, £12.

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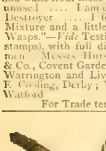

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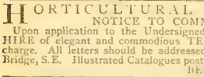

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AUTUMN 1870.

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ROYAL HORTICULTURAL SOCIETY.—NEWCASTLE-UPON-TYNE HORTICULTURAL and ALLOTMENT SOCIETY, 1870.

Patron—His Grace the Duke of Sutherland, K.G.

The SECOND EXHIBITION this year will be held on THURSDAY, August 25.

SPECIAL PRIZES OPEN TO ALL ENGLAND.

Class 1. Eight Stove or Greenhouse Plants.—1st prize, £6; 2d, £4; 3d, £3; 4th, £2; 5th, £1; 6th, 10*s.*

Class 2. Fruit, 8 distinct kinds—Fruiterers excluded.—1st prize, £3; 2d, £2 10*s.*; 3d, £2; 4th, £1 10*s.*; 5th, £1; 6th, 10*s.*

Class 3. Flowers arranged for Table Decoration.—1st prize, £1; 2d, 15*s.*; 3d, 10*s.*; 4th, 7*s. 6d.*; 5th, 5*s.*; 6th, 2*s. 6d.*

Class 4. Basket of Flowers.—1st prize, £1; 2d, 15*s.*; 3d, 10*s.*; 4th, 7*s. 6d.*; 5th, 5*s.*; 6th, 2*s. 6d.*

Class 5. Bouquet for the hand.—1st prize, 10*s.*; 2d, 7*s. 6d.*; 3d, 5*s.*; 4th, 2*s.*; 6th, 1*s.*

Class 6. Premier Dahlia.—1st prize, 5*s.*; 2d, 2*s. 6d.*; 3d, 1*s. 6d.*

Particulars, with Forms for Entry, may be had from
D. DILWORTH, Hon. Sec.

ROYAL HORTICULTURAL SOCIETY.—REVISED GLADIOLUS SCHEDULE for AUGUST 17, 1870.

FOR FOREIGN GROWERS.

Class 1.—36 GLADIOLI, cut spikes, distinct. £10, £6, £4

FOR NURSERYMEN.

Class 2.—36 GLADIOLI, cut spikes, distinct. (Prizes offered by His Grace the Duke of Buccleuch, and G. F. Wilson, Esq., F.R.S.) £7, £5, £3

Class 3.—GLADIOLI, 18 cut spikes, distinct. (For Exhibitors not showing in Class 2.) £5, £3, £2.

FOR AMATEURS.

Class 4.—12 GLADIOLI, cut spikes, distinct. £3, £2, £1.

Class 4A.—9 GLADIOLI, cut spikes, distinct. £3, £2, £1.

Class 4B.—6 GLADIOLI, cut spikes, distinct. (For Exhibitors not showing in Classes 3 and 4.) £2, £1 10*s.*, £1

Class 4C.—3 GLADIOLI, cut spikes, distinct, being New Varieties sent out in the Autumn of 1868, 1869. £2, £1

Class 5.—6 HOLLYHOCKS, cut spikes, distinct. (Open.) £1, 15*s.*, 10*s.*

Class 6.—24 HOLLYHOCKS, cut blooms, distinct. (Nurserymen.) 15*s.*, 10*s.*, 5*s.*

Class 7.—12 HOLLYHOCKS, cut blooms, distinct. (Amateurs.) 10*s.*, 7*s.*, 5*s.*

Class 8.—12 PHLOXES, cut spikes, distinct. (Open.) £1, 15*s.*, 10*s.*

Class 9.—APRICOTS, single dish. (Open.) £1, 15*s.*, 10*s.*

Class 10.—NEW PLANTS and FLOWERS. (Open.) Certificates.

Class 11.—NEW FRUITS and VEGETABLES. (Open.) Certificates.

Condition of the Fruit Crops, 1870.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE of SATURDAY, August 20, will contain a FULL and PARTICULAR STATEMENT of the CONDITION of the FRUIT CROPS throughout the UNITED KINGDOM. Order of any News Agent. A Single Copy sent for Six Stamps

Published by W. RICHARDS, at the Office, 41, Wellington Street, Strand, W.C.

The Gardeners' Chronicle

SATURDAY, AUGUST 13, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, Aug. 17 { Royal Horticultural (Fruit and Floral Committee), at S. Kensington .. 11 A.M.
{ Ditto (General Meeting) .. .. 3 P.M.

THE present would by no means be an inopportune time for some one with the requisite leisure and knowledge to review the present state of BOTANICAL SCIENCE, and to mark its progress during the last 10 or 15 years. During that period we in this country have had the misfortune to lose from among us some of the foremost workers of their time—men who will leave their mark deeply cut upon the tablets of their favourite science, and whose death marks with some distinctness an era in British science—ROBERT BROWN, Sir W. HOOKER, LINDLEY, HARVEY, and HENFREY. In one sense the greatest absolute loss to science was that of the last mentioned botanist (whose treatise on the elements of botany, and of which a new edition has just appeared, has suggested these remarks*) for the reason that he was taken from among us in the midst of his work; and had health and life been spared to him we might have anticipated much further valuable research in departments but little affected by British naturalists, with the exception of ROBERT BROWN, who in every sense may be deemed to have been exceptional.

In the period we have indicated, if our knowledge of the investigation of the outward structure or architectural conformation of plants has not materially advanced, at least the rational explanation of that conformation has been greatly facilitated on the one hand by the constant accession of new forms to serve as fresh points of comparison and to furnish new analogies, and on the other from the attention paid of late years to the progressive development of organs from the time of their earliest appearance as specks of cellular tissue to their full development in the adult stage. In this latter line of study we

* "An Elementary Course of Botany, Structural, Physiological, and Systematic," by Professor ARTHUR HENFREY, F.R.S. Second edition, revised, and in part re-written, by MAXWELL T. MASTERS, M.D., F.R.S. VAN VOORST: pp. 708, xylog. 559.

English have been too prone to overlook the researches of ROBERT BROWN, and to attribute what has been effected in this way too exclusively to German observers, such as SCHLEIDEN and SCHACHT, or to French ones, such as PAYER and others. We have but to glance over ROBERT BROWN'S papers to see how unjust we have been to that celebrated botanist in this particular. One result of this study of the mode in which the several parts of plants are gradually developed is rather embarrassing, and sooner or later it will necessitate a complete reformation in botanical terminology. Many the terms and expressions in constant use, and of at one time considered as correctly employed, are now known to denote apparent, not real conditions; for instance, the commonly-used terms—"polypetalous," to indicate a flower with several uncombined petals, or "monopetalous," to indicate a flower where there is apparently but one petal—are equally faulty, because practically, all plants, if they have petals at all, have more than one, and hence the term "polypetalous" loses its significance. Again, "monopetalous" avowedly conveys a wrong idea; while the proposed substitute, "gamopetalous," implying a union which never takes place, is equally incorrect. We are, therefore, at present placed in the dilemma of being obliged to use a set of terms in a conventional sense, and to disregard the inappropriateness of their application. This is a state of things that is likely to act as a serious drawback to the philosophical study of the classification of plants, and to make the so-called "natural system" as thoroughly artificial as any of the schemes avowedly so-called, and at the same time to act as a general hindrance to progress.

We cannot pretend in this place to enumerate our gains in the department of morphology, but that they have been real and substantial is indicated by the circumstance that the subjects remaining under dispute are for the most part of comparatively restricted interest. The general groundwork or foundation may be taken as satisfactorily established. It is as to the details of construction and arrangement in certain groups that further information is more especially needed.

Minute anatomy, as it has become the fashion to designate that department of the study of plant conformation which necessitates the use of the compound microscope, has also made solid and satisfactory advances. HENFREY did excellent work in this division of the science, but within the period we are speaking of it is to French observers, such as TRÉCUL, CHATIN, GRIS, that we are the most indebted.

The comparatively recent researches of GUILLARD and GRIS show that we may fairly look for greater results in this department than was at one time anticipated, and that in some cases natural orders, nay, even distinct genera, may be recognised from their internal conformation alone. Of course the larger groups have always been recognisable in this way, but, till lately, it had seemed doubtful if in the minor groups minute anatomy would to any extent be serviceable. Now, however, we are told that the inspection under the microscope of a fragment of tissue by a competent observer is sufficient to enable him to pronounce whether that tissue be from a plant of the Apple genus (Malus), or the Pear (Pyrus), of the Quince, or of the Medlar, &c.

So far as the classification of plants goes, botanists seem, as a rule, disposed to adhere pretty closely to the old Jussieuan arrangement, the modifications made in it being comparatively slight. Every day of course adds increased material to this portion of the science, and to that of botanical geography, which is dependent on it. Now and then, amid the continually increasing mass of facts, there burst upon us new lights, which come upon us suddenly, and give us all at once a mass of information of an inherent value so great, that its publication marks an epoch in the history of the science. So was it with the Welwitschia described by Dr. HOOKER; so is it with the researches on the structure of fossil plants so successfully carried out of late by CARRUTHERS, and which help to bridge the gaps existing between some of the Cryptogams, such as Equisetums, Lycopodium, &c., and the higher plants.

After all, the greatest advance within these few years has been made in vegetable physiology, the subject with which practical cultivators are most concerned—the department, as we might term it, of "machinery in motion." So great has been the progress that the horticulturist's stock text-book, the "Theory of Horticulture," has become in some degree obsolete. Physicists and chemists have done much to enlighten us on the constitution of plants, the movements of their juices, the changes they undergo, and the results of those changes. "Vital phenomena," as they were styled when any other explanation of their *modus operandi* seemed unattainable, are now in many cases shown to be the results of the self-same physical or chemical forces as those that operate in the inorganic world. The term "vital force," though it cannot yet be altogether abandoned, must no longer be made to serve as a cloak to our ignorance, or as an imaginary barrier beyond which there is no passage. But while vegetable physiology is becoming more and more a subject for laboratory experiments and observations, microscopical research, or the direct observation of changes in progress, keeps pace with the more tentative experimental research of the chemist and physicist. The mode of growth and development of the several organs of plants, the phenomena of fertilisation, have of late years received much attention. In particular, among Cryptogams, sea-weeds, Fungi, &c., have the accessions to our knowledge been numerous and important. Indeed it is impossible to overrate the value to physiological science of the researches of TULASNE, of BORNET, THURET, of PRINGSHEIM, DE BARY, and COHN, and many others that might be mentioned. The term Cryptogam bids fair to lose its appropriateness, for, thanks to the labours of the class of observers we have alluded to, many of the processes of life seem to be more easily watched and studied than in the so-called Phanerogams. We must not conclude this article, bald and hurried as it must necessarily be, without at least a passing allusion to the writings and observations of DARWIN. Almost all branches of science received an impetus from his famous publication on the "Origin of Species," and botany among the rest. It operated as a protest and a testimony against the prevalent notion that there was nothing more in botany than a string of terms and crack-jaw names—an impression that had probably arisen from the ignorance of the general public of the scope and variety of ROBERT BROWN'S researches, and from the too exclusive pursuit of systematic botany by our naturalists. The work we have alluded to, and its sequel on the "Variation of Animals and Plants," showed the proper place of the facts of botanical science in the investigation of the great problems of life in the past epochs of the world and life in the present age, and its diffusion over the globe. Add to these works—in one sense the digest of what has been done by others—the personal researches of their author on the vitality of seeds, the cross-fertilisation of plants, or the movements of climbing plants—and it becomes evident that whoever has to write the history of vegetable physiology in the last decade must place the name of CHARLES DARWIN in the foremost position. Whoever, wishing to eschew detail, desires to ascertain what is the bearing of the facts in all departments of botany upon the general history of living creatures, the mode and causes of their dispersion over the globe in the past as in the present, must study DARWIN, and familiarise himself with the writings of HOOKER and LYELL.

A SUMMER'S ramble through any well-furnished pleasure-grounds—those of Blenheim, to wit—could scarcely fail to convince a close observer of the picturesque that there are many, very many, DECIDUOUS TREES and FLOWERING SHRUBS of ornamental character which are generally either altogether omitted, or only half utilised, in the furnishing of our dressed grounds. A walk through a well-stocked nursery in which these subjects are made a speciality would confirm this conviction, with an overwhelming weight of evidence. In most instances we see a few of the common stock subjects repeated almost *ad nauseam*, while the rich variety which lies at the service of the planter is almost or altogether ignored.

How is this neglect for materials so choice, and so efficient for decorative purposes, to be accounted for? We believe, mainly because the subjects themselves are not so well known as they ought to be, though partly, perhaps, because planters hesitate to move out of the beaten track. We have ourselves, in our casual visits to nursery gardens during the present season, when admiring some choice specimens of an ornamental deciduous tree, of the merits of which there can be no question whatever, been struck by the information that it does not sell! And one of the reasons alleged, and which goes very far to establish our view of the matter, viz., that they are not sufficiently known, is this, that in winter, when planting is generally carried out, and when selections for that purpose are being made from the various nurseries, the trees of this character do not wear their robes of beauty, and are consequently passed by unheeded, especially by proprietors themselves, notwithstanding that attention may be invited to their merits. We cannot but think this want of appreciation of trees and shrubs of the character we here refer to is a great misfortune, since the proprietors or occupiers lose half the beauty of their grounds and plantations by not utilising the variety which is within their reach. In how few gardens do we find good examples—indeed, any representative whatever—of the Weeping Sophora japonica, a tree of wonderful and characteristic beauty, but one which, being without its attractive masses of foliage when planters go plodding over the nurseries in search of materials to work out their landscape effects, is consequently passed unnoticed. What, again, amongst variegated-leaved deciduous trees is so effective as the variegated Spanish Chestnut? and yet how rarely is a good, well-established plant of it seen in private pleasure-grounds? Instances of this kind might be cited almost without limit. Then again as to flowering shrubs; how little is the variety which exists amongst them appreciated, and how very scantily is it made use of. We see Lilacs in plenty, it is true, and very beautiful some of them are; and we see occasionally a few Mock Oranges, or Barberries, or Currants, affording some slight contrast amongst the general monotony; but how seldom do we meet with even a tithe of the riches which either Philadelphus, or Berberis, or Ribes, would afford to an intelligent planter, to say nothing of the various beautiful forms of Weigela and Forsythia, of Pyrus and Prunus, in spring, or of Althæa frutex, or the Yuccas and others, during the summer months. Yet in this department how rich and how varied are the subjects which only await the using, or rather, which invite the landscape gardener and pleasure-ground decorator just to step beyond the boundary of commonplace, and free himself from the bands of routine.

Perhaps, after all, the mania, which has apparently nearly run its course, for planting Coniferæ, whether or not adapted to the soil and situation, may have had something to do with the too frequent paucity of variety amongst deciduous trees and flowering shrubs of which we complain; but if so, we may look for better things, since planters begin to discover that every private garden cannot be turned into a pinetum. Let it not, however, be supposed that in making this remark we desire to decry the judicious use of coniferous trees and shrubs. On the contrary, we hold that they are beautiful in their proper place, and in proper proportions, but it is only here and there that they can appropriately be made paramount.

Our advice, then, is to plant freely the choicer and more ornamental of the numerous deciduous trees and deciduous flowering shrubs with which our trade collections abound; and on this hangs another piece of advice, which is specially seasonable—go at once and examine any and every accessible collection, and select such as may suit your individual taste—go now for the summer leafage of the trees and the glorious inflorescence of the Althæas—go by-and-by for the glowing autumnal tints taken on by the foliage ere it falls, and go in spring to catch a glimpse of the earliest of arboreal embellishments, repeating the visit anon to fall in with such subjects as blossom ere summer has reached its meridian. So may a garland of interesting subjects be got together capable of lighting up and enlivening the evergreens, which serve to bridge over the remaining dreary and—so far as trees are concerned—almost flowerless portion of the year.

—— IN the August number of the "Journal of Botany," is a short notice of a rapidly fatal case of POISONING by (ENANTHE CROCATA. This is an umbelliferous plant of common occurrence in the south of England, and has frequently been eaten by mistake for other allied plants with fatal effects. In the present

instance it was mistaken for "Wild Parsnip" by a carter, who thought himself afflicted with "scurvy." The man ate some of the root whilst at work, and about an hour after he fell back foaming at the mouth, and black in the face. He died before the arrival of medical aid, about half an hour after the first effects, one hour and a half after the ingestion of the poison. On *post-mortem* examination, about "half a small cupful" of the masticated root was found in the stomach. The horse, to which the man had given some of the root, lived half an hour longer than the man. Œnanthe crocata belongs to that group of narcotico-acrid poisons comprising the Solanaceæ, and characterised by producing convulsions with delirium. Death may even occur more rapidly than in the above case. It is of interest to note, as the point is one which has been several times observed, that the juice of the plant was yellow in colour. It has been said that the state of the plant with a colourless juice is less virulent in its nature.

—— Mr. Worthington Smith has, in the columns of "Nature," expressed his doubts as to the accuracy of some of Dr. Bastian's experiments on the existence of Spontaneous Generation. (See p. 985.) Mr. Smith very properly points out that the correct measurement of many of the objects figured by Dr. Bastian is not given, failing which, it is impossible to arrive at any definite conclusion as to their real nature. Mr. Smith points out that some of the bodies figured by Dr. Bastian as probable Fungus spores have a slight neck-like elongation or spot analogous to the placental scar or umbilicus of animals or of seeds, and indicating their prior attachment to a parent plant. If these things, says Mr. Smith, "were evolved without parents, surely Nature would not have given them an umbilicus; it is far more reasonable to suppose that true spores got into the infusions (and perhaps germinated) by some accident." Of course, this is much the most likely supposition, but it remains to be shown how the spores obtained access, or were enabled to resist so high a temperature; in other words, to detect the flaw in Dr. Bastian's experiments? On the umbilicus question, we may remark that our first parents are, probably by an oversight of the artist, always represented as provided with such a mark of previous attachment! There seems an *à priori* difficulty in admitting that the bodies, like spiral fibres and other comparatively highly organised substances found by Dr. Bastian, were really originally developed in the several solutions, and we are quite disposed to agree with Mr. Worthington Smith, who remarks: —"It seems to me rational enough to suppose that unicellular bodies and objects of the lowest possible organisation may be heterogeneously produced from the inorganic world, for here the line between one and the other is so fine as scarcely, if at all, to be perceived; indeed, the Brownian motion of monads, some spermatozoids and the particles forming many inorganic infusions, are scarcely, if at all, to be distinguished from each other. From monads and unicellular organisms, however, spore-producing Fungi are greatly removed, and the economy functions and structure of most of the latter are so well known that it would be simply impossible to convince any botanist that a spore, such as some of those figured by Dr. Bastian, could be produced from any other quarter than the hymenium of a well-defined parent."

—— Double Zonal Pelargoniums are proving, as they were expected to do, capital plants for exhibition purposes, witness some of those shown at Oxford the other day. In addition, however, they turn out to be excellent subjects for exhibiting in the form of cut flowers. Even ordinary single-flowered Pelargoniums are exceedingly showy when nicely set up, and their brilliant colours sensibly enliven an exhibition tent; but in hot weather they are apt to fall to pieces, and it is in this respect that the doubles have so much advantage over the singles. Stands of cut blooms of Double Zonal Pelargoniums may therefore be recommended as desirable elements of a summer show. They should be set up in the same way as Verbenas, namely, in bunches of three to five trusses.

—— A horticultural establishment, says "Nature," has been opened at Guatemala for the export of the seeds, flowers, and young plants of the country. Our contemporary should be a little more explicit.

—— The Maximum Temperature of the Week ending August 6 was recorded in England at Nottingham, 84°.2, and in Scotland at Perth, 79°. (See Mr. Glaisher's Tables in our present issue.) The mean of the highest for the eight southern stations of England was 80°.6, and for the eight northern was 79°.3, whilst for the eight stations of Scotland the mean was only 73°.8. The Minimum Temperatures ranged in England from 49°.9 at Salford to 57° at Norwich, with a mean for all stations of 52°.5; and in Scotland from 51° at Perth to 55° at Greenock, with a mean for all stations of 52°.7. The Mean Temperature of the eight southern stations of England was as high as 65°.5, and of the eight northern ones 64°; whilst for Scotland it was only 60°.1, or nearly 5¼° lower than the south of England. Rainfall: the heaviest falls took place in the south of England, and in Scotland; the largest fall in England was 0.89 inches at Bristol, and the mean for the southern stations was 0.29 inches, and for the northern was 0.11 inches, Liverpool being the only station at which much rain fell. In Scotland the maximum fall occurred at Greenock, viz., 1 inch, and the mean for all stations amounted to 0.45 inches.

—— Messrs. Williams & Co. have submitted to us for trial an improved form of their "Archimedean" Lawn Mower. The improvements consist in a knife-edge of steel fastened on to the revolving cutter, which renders the knife more durable; in the driving wheels being protected by a sheath of iron which prevents the cut grass from clogging the cogs; in an arrangement which very materially lessens the noise of the instrument in operation; and in a firmer mode of fastening the handle, which is of iron instead of wood. We fancy the machine so altered is heavier than before, and therefore not quite so easy for the amateur to work; but the movement is very rapid, and the cut of the grass is excellent and leaves nothing to be desired. It cuts the bents well, but these are certainly conspicuous this dry weather—not so the cut leaves. On a well-kept lawn there should be no bents, so that this objection is not worth much; moreover, if present, they are readily swept up.

—— We would remind those of our readers who are interested in Gladioli, that there will be an exhibition of these gorgeous flowers on Wednesday next, the 17th inst., at South Kensington, on the occasion of the next Floral Committee meeting. The extreme heat and drought of the season have been unfavourable to the Gladiolus, but judging from the samples produced at the last meeting on the 3d inst., and the subsequent cooler moist weather, an interesting display may be looked for. The revised schedule of prizes will be found at p. 1083.

—— The name of Ambrosine has been given by Mr. C. U. Shepard, of South Carolina, to a mineral resembling both amber and resin, which, he thinks, originated in some of the Coniferous trees that existed during the pleiocene epoch. It differs from any of the oxygenated hydro-carbons previously known. It melts into a clear yellowish liquid at about 450° Fahr., giving off a considerable amount of succinic acid before melting. After fusion it yields a volatile oil, which has a balsamic odour, unlike that from the resin of Pines. Ambrosine is very combustible, and, burning without ash, gives a yellowish white light. It is soluble in alcohol, ether, chloroform, oil of turpentine, and in a solution of potash.

—— The Royal Danish Scientific Society offers a Gold Medal, for an essay, to any botanist who shall resolve the question as to whether, in the Branching of Flowering Plants, a bifurcation of the terminal growing point ever takes place, and, if so, under what circumstances. In flowering plants the most usual mode of branching is due to the formation of buds in determinate situations, but in Lycopods and Ferns branching results from the bifurcation of the growing point, and the question to be solved is whether a similar forking ever takes place in flowering plants. For our own part, we believe it does, though it is often, as in the case of fasciated branches, for example, very difficult to say whether the appearances are due to a subdivision of an originally simple growing point or to the simultaneous development of a great number. A study of the mode of development of the inflorescence of Euphorbia is also demanded, with the view of deciding whether it be really an inflorescence or a flower. The essays may be written in Latin or any modern language, and should be sent to M. Steenstrup, the Secretary of the Royal Danish Scientific Society, Copenhagen, before the end of October, 1871.

—— The Royal Academy of Sciences of Belgium offers a prize of 800 f. for an essay on the Affinities of Lycopodiaceæ, &c., comprising the genera Lycopodium, Selaginella, Psilotum, Tmesipteris, and Phylloglossum. The essays should be written in Latin, French, or Flemish, and sent to M. Ad. Quételet, the secretary of the Academy at Brussels, before June 1, 1871.

—— Adverting to the attempts now being made to introduce and cultivate Ipecacuanha in India on a large scale for medicinal purposes, Mr. M. C. Cooke, in the "Pharmaceutical Journal," calls attention to several native Indian plants that might probably be serviceable in lieu of Ipecacuanha, and whose value might be tested prior to any extensive experiment on acclimatisation being made. Many Asclepiads are mentioned, such as Calotropis gigantea, the mudar of India, and others; but some of these are so acrid as to be unsuitable, while others have been found to be inert. The plant considered most likely to be valuable is Tylophora asthmatica, the Asclepias asthmatica of some authors, a common Indian plant; both leaves and roots are used.

—— Our readers are already aware that in connection with the International Horticultural Exhibitions of 1871, which are to take place fortnightly, it is proposed that space shall be provided for nurserymen and others who may wish to enter the lists, in order that a permanent exhibition of such subjects as may be in season may be kept up. The exhibitors in this department will be allotted space according to their demands, and this space they will engage to keep filled for any term which they may find convenient—one, two, or three months, or more. The opportunities which this will afford to nurserymen and florists to keep their specialities before the public—since all these horticultural displays will be open to the visitors to the Arts and Science Exhibition—will be very great; and as we understand that sales will be permitted under certain regulations, the opening seems an excellent one for those who enter into this class of business. These permanent exhibitions are, moreover, to be judged from time to time, and prizes or medals awarded according to their merit. We believe that the assistant secretary of the Royal Horticultural Society, at South Kensington, is prepared to receive applications for space, in order that some idea may be formed of the quantity to be provided, or that which is available may be fairly allotted.

New Garden Plants.

Cœlogyne viscosa, *Rchb. fil.*

Aff. Cœlogyne flaccidæ, Lindl. Folio lineari-lanceolato; sepalis medio extus carinulatis, linearibus, acuminatis, petalis paulo angustioribus, labelli lobo medio semiovato-acuto brevi, ovario viscoso.—*Cœlogyne viscosa*, Rchb. fil., in Allg. Bad. Gartz. 1856, 218; and in Bonplandia, iv. 328.

Pseudobulbus fusiformis rostratus tripollicaris. Folium petiolo basi attenuatum paucinerve. Pedunculus brevis paucillorus. Bracteæ deciduæ acuminatæ. Perigonium album sepalis petalisque longiora angustiora, quam in Cœlogyne flaccida. Labellum candidum latum, lobi laterales antice obtusangulati, lobus medius paulo prodiens, lineæ carinatæ circulato plicatæ a basi lobi medii, venæ radiantes brunneo-suffusæ plures quam in Cœlogyne flaccida. Columna antice brunneo-striata, latera in basin carinea.

A very pretty little species, in the way of the old Cœlogyne flaccida (Lindl.), yet totally distinct, having viscose red ovaries, narrower and more acute sepals, the anterior lobe of the lip broadest at its base, and very acute, and the veins of the lateral lobes all confluent. Let us add that the column is red on its back, instead of white, as in C. flaccida; that the anterior lobe of the lip is of the darkest yellow, and has two great spots of the same colour outside. The sepals and petals are white, and the streaks of the lateral lobe of the lip are beautifully brown, and very broad. It appears to be very rare. We obtained it in 1856 from Messrs. Booth, of Flottbeck, near Altona, the possessors of a choice collection of Orchids, and there is no doubt that they had the plant from England. It has reappeared quite recently, having just been sent from Messrs. Veitch. *H. G. Rchb. fil.*

Mormodes tibicen, *Rchb. fil.*

Sepala petalaque lineari-oblanceolato-acuta; labello revoluto cuneo-somatiformi acuto, supra medium fovea impressa triangula, latere altero alteri appresso, superficia superiori pilosa, limbo minute punctulato, superficie inferiori nervosa radiata.

Flowers the size of those of a very large Mormodes igneum, Lindl., yellow with purplish streaks, the lip whitish, with yellowish border and claw, and many purplish dots around the border. It is believed to come from New Grenada. We have to thank A. D. Berrington, Esq., of Abergavenny, for it. *H. G. Rchb. fil.*

Oncidium Hartwegii (*Lindl.*), var. parviflorum.

Perigonii phyllis magis acutis, colore pallidissimo, floribus dimidio minoribus.

A very odd plant, almost exactly like the old Oncidium Hartwegii, but having in lieu of its wonderful blackish brown a very light maroon-brown colour, and its flowers are only half as large. M. Linden obtained it from Ecuador through his indefatigable collector, Mr. Wallis. *H. G. Rchb. fil.*

Pandorea austro-caledonica, *Seem.*

Glaberrima; folio impari-pinnatis 2—3 jugis, superioribus 3 foliolatis; foliolis latissime ellipticis, obtusis sub acumine sæpe 2—4dentatis, interdum fere subrotundatis; paniculis terminalibus 2-natis oppositis compositis, 15—20-floris; floribus minimis, dimidio minoribus quam flores P. australis.—*Tecoma Pandorea austro-caledonica*, Bur. in Bull. Soc. Bot. France, 1862. Mountains of Balade, New Caledonia, Vieillard, n. 1092), and Lord Howe's Island (Milne et M'Gillivray! in Herb. Kew et Mus. Brit.

This graceful Bignoniaceous climber, which Vieillard collected in New Caledonia, and Milne and M'Gillivray in Lord Howe's Island, has recently been introduced by Mr. W. Bull, who has kindly allowed me to make a sketch of it. Mr. Bentham, in his Australian Flora, has not taken any particular notice of this plant, and probably mistook it for one of the many forms of Pandorea australis, from which species, however, it is perfectly distinct. *Berthold Seemann.*

PALMS.—No. XI.

The genera of Palms having scaly (loricate) fruit compose the Lepidocaryineæ group, with which I close my notes on Palms, and which are by some held to constitute even a distinct natural order. They comprise both fan-shaped and pinnated kinds, the former (fan-shaped) being strictly confined to the New World, whilst the pinnated are restricted to the Old, with exception of the genus Raphia, which is represented both in tropical Africa and in tropical America. Before Raphia was more closely studied than it has been recently, it was thought that the American R. tædigera might possibly be identical with one of the African species. But I believe this opinion is now abandoned. There are at least two, if not more, species of Raphia in America, which have nothing to do with the African, just as there is an African and an American species of

Elaeis. Fine groves of Raphia may be seen on the Isthmus of Panama, between Colon (Aspinwall) and the first railway bridge over the Chagres, and of which I long to procure specimens, as in my former explorations of that country no Raphia was ever met with. These may prove new, as nearly all Palms are very local, and R. tædigera would probably not be found so far north, nor R. nicaraguensis so far south as the Isthmus. Immense groves of the latter species cover the swampy banks of the river San Juan in Nicaragua, where the natives term it "Holillo." For three days my canoe was pushed on through such banks, and, although at last the scenery was felt to be monotonous, one could never help admiring the vigour and noble outlines of the immense leaves—the largest foliaceous expansions in the vegetable kingdom. All the scaly-fruited Palms, with fan-shaped leaves, have an erect, often tall trunk, but those with pinnate leaves are in several genera climbing, and form those impenetrable thickets of which travellers in Asiatic forests complain.

Ceratolobus (Blum.).—A genus of spiny climbing Palms, inhabiting the East Indian forests, having pinnated leaves with cuneate-rhomboidal segments, lateral panicles, and scaly berries. Only two species are known, viz., C. glaucescens and concolor,—the former an inmate of our gardens.

Plectocomia (Mart.). — About eight species, several of which are in our living collections, constitute this genus of climbing Palms. They have the habit of Rattans, climbing trunk, pinnate leaves, and petioles prolonged into whip-like thongs (two of which, tied to a long pole or handle, are used by the police of the Dutch possessions to catch a run-a-muck Malay). The flowers are monœcious, and arranged in large panicles, and their fruit 1—3-seeded. The spines of this genus are singular and are united "like the foot of a mole," to use Sir W. Hooker's expressive phrase.

Zalacca (Reinw.).—The Palms comprising this genus are almost stemless, and destitute of the whip-like elongation of the petioles characteristic of Calamus and Plectocomia. The petioles are armed with several series of rigid spines; the leaves are pinnate, the flowers monœcious and arranged in round catkins, and the fruit scaly and containing from one to three seeds. All the species inhabit the forests of tropical Asia, where they form underwood. Z. edulis Blumeana, and others are in our gardens.

Dæmonorops (Blum.).—A very extensive genus, confined to the forests of tropical Asia, principally to the East Indian Archipelago, and formerly associated with Calamus, from which it differs in having deciduous spathes, ruminate albumen, and other technical characters. Their stem is climbing and prickly, whilst the leaves are pinnate, and the leaflets generally linear. A very elegant Palm, which in our gardens goes under the name of D. plumosus, and of which Mr. W. Bull has allowed us to make a sketch (fig. 206), probably does not belong to this genus, but to Sagus. Whatever it may turn out to be, it is, when young, admirably adapted for table decoration. Its leaves are of a dark green, and handsomely plumed. A good many species of Dæmonorops are to be found in our gardens, often going under the older name of Calamus, and most of them are very elegant when young.

Calamus (Linn.).—Systematic works record about 100 species of this genus, all of which are confined to the forests of tropical Africa and Asia. The genus will probably receive considerable additions in species, as many Calamus-yielding countries remain to be explored; even the treasures of our herbaria are as yet insufficiently examined. Messrs. Mann and Wendland (Linn. Trans. xxiv., p. 429) have done good service in working up the African species, and Dr. T. Anderson (Linn. Journ. 1869, p. 9) those of Sikkim, but the bulk of the species are in a sad tangle. The genus differs from Dæmonorops, with which it agrees in habit, in having persistent spathes and even albumen, All the species are climbing, some to the enormous length of 500 feet; and it is chiefly the smaller kinds, of which C. ciliaris is the type, that are of permanent value in gardens. Several species supply canes of commercial importance, and nurserymen's catalogues tempt us with a long list of species.

Korthalsia (Blum.; Calamosagus, Griffith) has the habit of Calamus, the leaves of Wallichia, and the seed of Sagus. About 13 species are known, all confined to the forests of the Indian Archipelago, whence, as far as I am aware, few have as yet found their way to our gardens, though all would merit introduction on account of their wedge-shaped erosed leaflets, and the leafy expansion (ligula) at the base of the petiole—so characteristic of this genus. K. Lobbiana (Wendl. Bot. Zeit. 1859), from Borneo, is one of the most recently described species, for which we are indebted to Messrs. Veitch's collector, W. Lobb.

Eugeissona (Griff.).—E. tristis, the only representative of this genus, is a stemless Palm, which is known to the Malays under the name of "Bertam," and inhabits the forests covering the hills of Ching, Malacca, and Penang. It is readily distinguished by its inflorescence, its indefinite number of stamens, and the peculiar structure of the seeds, from all other scaly-fruited Palms. The leaves are very numerous, pinnate, and, like the petioles and spathes, covered with prickles. The flowers are terminal and dioecious, and the fruit covered with loose scales.

Fig. 206.

Sagus (Gaertn.; Cœlococcus, Wendl. in Seem. Bonplandia, 1859, p. 199; Metroxylon, Mart. *ex parte*).—These sago-yielding Palms differ from the allied genus Metroxylon, principally by their spadix being terminal, and by each individual flowering only once during the term of its existence, the appearance of the flowers being taken as the signal for the cutting down of the tree, for after the fruit has begun to form all the sago stored in the trunk disappears. All the species are found in low swampy ground, and should be cultivated in our gardens in conformity with their natural habitat. I brought S. vitiensis (Wendl.), planted in Bamboos, from Fiji to Sydney, when I gave some of the plants, which were in capital condition, to Mr. Moore, but the others died on the passage home; and at present I am not aware that, except S. lævis and the plant above alluded to as Dæmonorops plumosus, any true Sago Palm is in our gardens. S. Ruffia is, of course, identical with Raphia Ruffia, Mart.

Metroxylon (Rottb.). — M. filare and M. elatum, natives of Celebes and Cerama, are the only representatives of this genus, distinguished from Sagus by its being polycarpous, the flowers being lateral, and appearing annually. The trunk is tree-like, but does not contain any sago. The leaves are pinnate. None of the species appear to be in our gardens.

Raphia (Comm.). — Mann and Wendland (Trans. Linn. Soc. xxiv., p. 437) have done good service in describing and figuring the African species of this singular genus, so that we now know six species, two of them natives of tropical America; one of the latter (R. tædigera) seems to be confined to the tide-flooded lands of the lower Amazon, the other or others (R. nicaraguensis and the Panama species) to river banks and swamps, beyond the influence of the tide. The trunk in most species is very short, the leaves pinnate and of extraordinarily robust growth, and, as is the whole plant, unarmed. The fruit has a fine polish, and is generally a deep chestnut colour. Several species are in our gardens.

Mauritia (Linn.; Lepidocaryum, Mart.).—Sir W. Raleigh was the first who brought the fruit of Mauritia flexuosa, a Brazilian Palm, to England; and on account of their scales (which they share with all other Lepidocaryineæ), he compared them to Fir cones; Linnæus described them systematically, but fancied the plant was leafless. Since then our knowledge has been rapidly progressing, and Dr. Spruce (Journ. Linn. Soc. xi., p. 167) has recently considerably increased it by his excellent paper, in which he shows that the genera Mauritia and Lepidocaryum must be united, the former having polystichous flowers, and the latter distichous ones, — characters too insignificant to be considered more than of sectional value. The genus may be readily recognised from all of its allies by its palmate leaves and scaly fruit. Dr. Spruce enumerates 13 species, five belonging to the Leptocaryum section, miniature Mauritia, "the slimmest and most fairylike of all Fan Palms, which grow in the virgin forest, where the trees are not so thickly set as to exclude gleams of sunshine," and which, of "all Palms that flowers on the Orinoco," to quote the same authority, "would most delight the cultivator." But few species of this genus are as yet in our gardens, M. flexuosa I have seen at Herrenhaussen, growing well in a tank, together with other water plants.

With this rapid sketch of all the genera of Palms, too rapid, I fear, to give satisfaction to myself or my readers, I conclude for the present. Long ere the last lines will have been printed I shall once more be amongst Palm groves, and forcing my way through pathless forests.

Berthold Seemann.

THE ORCHARD HOUSES AT CHISWICK.

During the month of April I paid a visit to Chiswick, with a view of seeing the orchard-houses. It was on the 21st of the month, and the weather was warm and calm. A pure light air just stirred, and lofty cirri presaged further fine days. To those accustomed to the incessant action of the sea breezes, and a low cloudy sky, it seemed the perfection of temperature for Peach culture. I noticed the thermometer suspended at 4 feet from the soil within my school friend's cylindrical vinery, which had its glass removed. The reading was 57°, the instrument being protected from the direct action of the sun by a shade of wood. Subsequently I observed the temperature within the long orchard-house to be 70°, being just the relative proportions I have found to agree with the Peach.

The orchard-houses at Chiswick are three in number, consisting of a lofty span-roofed house (p. 1054), a much lower one of this form, and a long narrow house (fig. 207), having hotwater pipes, two rows along the front, and

one along the back wall. I did not inquire how much these had been used, but should judge only so much as to bring the trees well and steadily forward, no heat being required at the date of my visit. The trees were in full bloom then, seemed full of vitality, and well able to set their fruit without fire-heat in such weather. The previous spring was very different; a row of pipes would not have been out of place with any of us then, but my trees being steadily kept, year after year, within certain bounds of produce, the blooms did not fail to set, though the adjusting of the temperature required care. I ascribe the fine crop of that year, 1500 of which were sold in Covent Garden, mainly to the vitality of the trees, which are chiefly cordons planted in the border. Nor was the quality of the fruit less than usual. On the contrary, the Stanwick Nectarines were unusually fine, and Exquisite, that noble Georgian Peach, introduced by Mr. Rivers, and first fruited in Europe by myself, measured 12 inches in circumference, grandly coloured as usual.

The long lean-to house at Chiswick I liked very much. The length—about 200 feet, it seemed—was not at all disproportioned to the breadth, which was about 11 feet. The height seemed above 11 feet at the apex of the house, which has a short hip, and also 18 inches of glass at the back. The light is abundant, for the front, which appeared to me to be about 9½ feet high, was glazed to the ground with full-sized strong glass. Ventilation was by sliding windows—a good plan. I had designed a new house of somewhat similar proportions, but without so much back wall, and for cordons only—not a single potted tree—which would produce far more, the cordons being placed in rows parallel with the length of the structure, and closely pruned.

This long house is a pleasant one; and the row of diagonal cordons, trained on horizonal wires, 6 inches apart, at 18 inches from stem to stem, and at about this same distance from the glazed front, had a charming appearance, being then in bloom, and carrying it well and evenly. There was a row of very good bush trees and pyramids in pots along the back, also in bloom, and Vines—it is presumed for trial, trained vertically behind these on the wall—which last appeared to me much out of place. How much better, and more suited to the house, another row of diagonals running the reverse way to those along the front, would have been. This mixing up of Vines and Peaches is one of the worst features of orchard-house management. Surely the Peach, now that we have the new and valuable early sorts brought in by my good friend, and the succession of sorts now common, merits a whole house to itself. I, myself, had last season, without fire-heat, Peaches and Nectarines—the last might be advantageously crossed, so as to be much later than at present—from June to November—a season of six months.

A fruit which is so precious as this, and now, by these very orchard-houses, brought within the reach of so many—one so remunerative, when properly cultivated; so grand and varied in its appearance, and so universally liked—should not be allowed to deteriorate by a false idea of economy. No other fruit is ever allowed to grow side by side with it in my houses, and this simplifies the admission or otherwise of air, and all the light possible is admitted from the roof, front and sides. Light, heat, air, water, and moderately rich calcareous soil—of these, the Peach will never satiate. Its form it then generously confides to our intelligence.

In this long house at Chiswick the diagonal is selected. A single row of trees runs along the front. These are stout and healthy specimens; indeed, owing to the peculiarly deep and rich natural soil, the trees, which are about six years old, are as strong as mine which are 12 years old. This is not a gain free from counterbalancing loss, for the house at Chiswick is too low for them already. No better or more skilful hands than those of the present superintendent exist, but he will have an unremunerative task in the future in these strong trees.

As the introducer of diagonal Peach-training in England, 16 years ago now, and having some of the original trees (over which the houses have been built) in full bearing and health, I may be allowed to say something of the style of pruning. This, in Mr. Barron's hand, is perfect of its kind. The only regret is that a form now superseded by the more prolific close pruned cordons is still adhered to. The trees, however, as they are, form very fine and interesting studies, for though an imperfect style it is also excellent in its way and place. The shoots on each spur are trained long, though not so long as at Angers. The shoots, either single or double, were shortened to from 12 to 15 inches, and were full of bloom buds, being, in short, mostly "true fruit shoots." Some of a "mixed" character here and there, but the trees, being established, had reached the stage where we look for "true fruit shoots," clothed with good triple buds from heel to point. This style is better adapted for the open wall. It is larger than moderate close pruning for simple cordons, and, for the wall, gives more scope to the tree. On the open wall 15 inches would be a fair length when the shoots were ripe, and as thick as stout quills. But, under glass, we look to a closer form for produce. The same development is produced by multiplying the shoots on each spur, and small "bouquets or clusters" are frequent, from which the finest Peaches arise. This is lost in the longer style. Nor is it considered right by the majority of good pruners that the same shoot in the Peach should both bear fruit and grow the succession wood; indeed, it rebels naturally against this, and has to be bent to form a point from which the bud should elongate. All this the orchard-house pruner, accustomed to the close pruning required for pyramids in pots with little space to spare, ignores, and rightly too.

Fig. 207.

Space for space, there can be no question as to which form produces the most. Nevertheless, these long pruned trees at Chiswick are pretty models for the open wall, and might be studied as such; the bloom and health were perfect. We are on the eve of obtaining lovely flowers on our future Peach trees. Both here and at Sawbridgeworth were experiments by hybridising being carried on. Many valuable sorts have very small and rather mean looking flowers. Not always the most gorgeous blooms are seen on good kinds. The most beautiful were the Avant Pêche (which is a very poor Peach); the large pure white flowers were extremely conspicuous. Blanche d'Amerique has also snowy blooms, and Incomparable also. In future springs our orchard-houses will be self-dependent for colour—no mean advantage.

The sorts cultivated were various. Side by side they were readily tested, which is, no doubt, the chief end sought for in such a place as this. It is inevitable that sorts should decline in favour in these days of rapid improvement. Still there are many which long experience has proved, and these would more properly constitute the main portion of a row like this, for too frequent change would create ugly blanks. On the whole, then, this long house is very pretty, and it is a pity it had not been made about 2 feet loftier, for the sake of the future development of single cordons in such naturally extremely rich soil. A friend and "pupil" of mine, who has orchard-houses not far off, of thrice this length, has great trouble from this very cause. In houses of this height double cordons would have been safer. Of course the single cordon is the "*cordon par excellence*" in every way, but it requires height, which, as I shall attempt to show when we come to the span-roofed houses, is inconsistent with good orchard-house culture. *T. C. Bridaut, Richmond House, Guernsey.*

STREET PLANTING.

LONDON is an ancient city, populous, and gigantic; yet, singular as it may appear, the ornamentation of its streets with trees is yet in its infancy. Outside the St. James's Park enclosure are some examples of tree planted promenades, terminating in the parade ground at the Horse Guards on the one hand, and in the open space in front of Buckingham Palace on the other. We have also a few yards of Plane trees in Piccadilly, and Elms elsewhere, but to no unique specimen of street planting can a Londoner as yet point, with satisfaction to himself.

Many of our streets are wider than those in Paris, where trees are arranged so as to afford rest on seats and shade to fatigued pedestrians; but here we have little or nothing of the kind—yet what a noble Boulevard would Oxford and Cambridge Terraces make? Here the width from house to house is 172 feet, therefore what a vast improvement would be effected by pulling down the iron railings which now defend little, ill-kept, heterogeneous enclosures from the open roadway; and by planting in their place rows of trees with a gravelled promenade underneath them, this might be made to equal, as far as its extent goes, any Boulevard either on the Continent or in America. It already contains fully grown specimens of Planes, Ailantus, Poplars, Thorns, and other trees, many in good health and condition; therefore the cry, that "trees won't grow in London" does not apply in this case. This Boulevard or public avenue might be made one of the most beautiful of approaches to Hyde Park, through which it might be extended to the South Kensington Museum, passing in its route the late Prince Consort's Monument, the new Albert Hall of Arts and Science, and the Royal Horticultural Society's Gardens.

In the contiguous fine range of Westbourne Terrace, which is 100 feet in width from area to area railing (the areas counting 20 feet more from front to front), there are also strips of plantation enclosed with double rows of heavy Portland cement balustrades. This causeway, about half a mile in length, might be advantageously treated in the same manner as Oxford Terrace, and planted with shady trees. Along the Cromwell and Exhibition Roads, which are 90 feet wide, rows of Poplars have been planted; but these, though better than nothing, want the grace of the Silver Maple, or the western Plane. From this locality gracefully planted connections might easily be formed with the Thames Embankment, on which young Planes are already planted, and which, when larger in stature, cannot fail to produce a good effect. Our London streets, as a rule, manifest great diversity of width. The mean of Oxford Street being 60 feet from house to house; while in some parts Holborn is 50 feet, and in others 100 feet, the interval between Gray's and Furnival's Inns measuring even upwards of that width. The Strand also shows considerable inequalities as regards width, being opposite Somerset House 100 feet. Again, in Whitehall and Parliament Street there is also great diversity of width, which, opposite the Treasury, and across to the railings of Montague House, is 134 feet, but the proposed demolitions in Parliament Street will doubtless secure the continuation of suitable latitude to the terminal vista to Westminster Abbey, while at the upper end is Trafalgar Square, with its fountains and statues. This line of street, suitably planted, would form a beautiful avenue. Upright growing deciduous trees, such as the Italian Poplar, Quercus fastigiata, or Robinia fastigiata, all of which will live in towns, might also be advantageously introduced in little groups, say from three to four together, into Trafalgar Square, instead of the little Bay trees now placed there in tubs, which, though pretty enough in their way, have no kind of association with surrounding objects. Of the trees just named, the Poplar grows fastest, and of what may be done in the way of securing

expeditious effect, the plantations of that tree at Buckingham Palace afford an example, though I by no means recommend its general adoption as a town tree.

Street widening, I am glad to see, is now the order of the day in London; but I doubt whether the planting of trees in established thoroughfares will ever be carried out. Let us hope, however, that all new streets in freshly built on localities will be formed of sufficient width to afford this luxury.

In the older parts of the city of New York street-planting, though at one time in fashion, is now disregarded, the streets being too narrow for that kind of ornamentation. But in all the approaches to the new parks, to which I have already directed attention, trees have been planted so as to form avenues. Lord Bacon said that "men build first and plant afterwards," but in the formation of what may be called the new city of New York, parks have been formed and streets lined out and planted before any arrangement as regards architectural embellishments has been attempted. In the old portions of New York I observed some fine Ailantuses, mutilated to such an extent in order to keep them within bounds, that their natural character was wholly destroyed, and some of them were even dying under the operation. In Philadelphia, Baltimore, Richmond, and most other towns in America, the Silver Maple (Acer Wagnerianum) is employed for street planting, and well suited it is for such a purpose, being light and elegant in character, ever changing in colour with every breeze, like our White Poplar, and, above all, being hardy and of quick growth. I may here remark that whatever tree is used for street or avenue planting only one kind should be employed in each particular street, as two or three sorts in the same street produce a patchy appearance, and destroy that unity of expression which street planting should aim at securing. In proof of this, Norfolk in Virginia affords good examples. There is to be found there the most varied collection of ornamental trees that I have ever met with in one city; nevertheless, owing to their being planted without order as to kind, the grand effect which they would otherwise have produced is lost. One kind of tree might indeed be so uniformly employed as to give its name to the street or avenue with which it is planted; that is, when we shall have acquired sufficient knowledge of trees to be able to make extensive selections suitable for that purpose. Thus we shall have variety among trees in towns, according in some measure with what we have now in parks, and the same plan of planting might be followed in other countries. Hardihood will of course guide the selection of sorts to be employed in different climates. Thus in Arona and Verona occur avenues of Catalpa and Paulownia. In Paris, Elms, Ailantus, Planes, Limes, and other trees are employed in street decoration; but all these will doubtless soon be added to, now that the matter of street planting is widely gaining interest.

Let us now advert to open spaces, which with us are called squares, while in America they have hitherto been known as parks, and on the Continent as promenades. In London these are, as a rule, not quite so satisfactory as they might be, owing chiefly to the ground in them not having received in the first instance proper preparation for the reception of the shrubs and trees with which they are planted. In a few instances, however, we have some fine specimens of trees in our metropolitan squares and other open spaces. In the gardens belonging to Gray's Inn, for instance, there is a noble Catalpa, which, on account of its being reputed to have been planted by Lord Bacon, is called the "Bacon tree." Its aged limbs sweep the ground of this garden, which is 6 acres in extent, contains a noble walk, called Queen Elizabeth's Drive, and some good Elms and Plane trees, one of which is stated to have been planted by Addison. This garden during half the year is thrown open to the children of the neighbourhood, who so thoroughly enjoy the treat, that when they get home in the evening after rolling on the grass they are as black as negro minstrels.

Nothing delights a townsman so much as to get his feet upon soft turf, a gratification which thousands of all ages enjoy. This fact receives daily verification in St. James's Park, which can claim to be little more than an open space laid out rather prettily in the gardenesque style, and evidently with a view to public instruction as regards acquiring a knowledge of the correct names of trees and shrubs. These were, I believe, selected, arranged, and named by Don, somewhere about a quarter of a century ago, but now the grouping together of families, which was the system of arrangement that botanist employed, is in a great measure lost sight of; still attention is paid to labelling, an operation which adds interest to the shrub-masses in this park. Here, too, on the lake is an excellent collection of waterfowl, the feeding of which affords a never wearying source of enjoyment to children, and even to older spectators. As far as extent goes, St. James's Park must be admitted to be one of the most popular of London open spaces in which entire freedom of grass-promenading is permitted.

Lincoln's Inn, a fine town square of 7 acres in extent, unlike St. James's Park, is closed to the public, which is to be regretted, for to look upon the merry faces of the young on a fine summer's day in such places does one's heart more good than the small degree of quietude their closed condition can ever afford. In this square are a few fine Planes and Thorns. The shrub masses are mostly Privet relieved by Pelargoniums and similar flowers in summer, and by Chrysanthemums in autumn.

The Inner and Middle Temple Gardens, remarkable for their annual displays of Chrysanthemums, afford examples of fine open town spaces. Here, during a certain period of the year, children are admitted to romp and play on the grass as they please. The late Mr. Broome, the well-known advocate for throwing town enclosures open to the public, asserted that although there were often as many as 11,000 children daily in these gardens, neither flowers, shrubs, nor trees received any injury. The Temple Gardens, therefore, indicate the way in which open town spaces can be utilised for public benefit.

Setting aside the open spaces just adverted to, the newly made parks of Finsbury, Southwark, Kennington, and others, there are still plenty of other squares, as for instance Berkeley and Grosvenor Squares, which, if open to the public, would be real boons to the thickly packed inhabitants of the neighbourhood. But they are not open, and it is of this we have to complain. Closed as they are at present, they are, in fact, obstacles in the way of direct transit from one point to another; "they do things better in France" and other Continental countries, as well as in America, in which all have free access to such places, and in which recreation is as much sought for as in the parks. In London, it is true, there seems of late to be a disposition to improve its town spaces, and to throw them open to the public, but much in that way must yet be done before a perfectly satisfactory result shall have been arrived at. Among our town spaces lately opened and ornamented may be named Paddington and Islington Greens, Camberwell Green, and others, the use of which is evidently appreciated by the public. But it may be said, who is to maintain and keep in order our open spaces? I say some body of management similar to the Board of Works, to which some power in the matter has indeed already been given, but as yet it has been inoperative, else surely we should not have had so long such a standing disgrace among us as Leicester Square, and others to which allusion might readily be made.

As regards the treatment of town squares, I am of opinion that they should be wholly planted, or very nearly so, with trees of a stately character, which will grow up so as to allow people to promenade under them. In this way the most would be made of the space, which should consist wholly of walks, grass, trees, and a few low shrubs here and there. Fountains and basins with fish should also be provided, not in order that they may throw water to a great height, but tastefully constructed drinking places supplied from hydrants, to which, likewise, should be attached a hose for washing the trees and watering the turf. In this way the French manage to keep their grass and trees in beautiful condition, and without such an arrangement no London square, owing to the constant treading which it must necessarily receive, can ever be maintained in a fresh and green state. Without washing, too, trees lose their leaves much earlier than they otherwise should do, and when young especially their success is comparatively uncertain owing to the over drainage to which towns are subjected. Flowers, as a rule, I would reject, though in some places their introduction might not only be admissible but necessary. Thus, when private right in the matter of town squares shall have yielded up its interest for the public good—when it shall have allowed our at present enclosed spaces to be opened, those frequently unsightly shrub-masses to be removed so as to increase the grass surface—when broad, good, and dry walks shall have been made, and plenty of seats provided, then, and not till then, shall we acquit ourselves as Englishmen in this matter. Our thoroughfares are being yearly enlarged and improved, let, therefore, our squares be opened and improved also. They will then not only form delightful retreats for the aged and infirm from the more active scenes of public life with which they are surrounded, but will furnish healthy breathing spaces second only in importance, in a sanitary point of view, to our great parks themselves. *J. Newton*, 74, *Oxford Terrace, Hyde Park.*

THE KNOWN FORMS OF YUCCA.—III.

SECTION II. — *Filamentoso-marginatæ.* — Species in which the edge of the leaf habitually splits up into filamentous threads (*continued*).

Of this group I now come to the caulescent forms. Of these there are five in Mr. Saunders' collection, all of which he has cultivated so far under shelter, none of which, so far as I have been able to ascertain, have been described or named. I give now a provisional name for each of them, and an epitome of the notes which I have already made, reserving diagnosis and a full description for our intended monograph in the "Refugium."

21. *Y. periculosa*, Baker.—Stem 3—4 feet long below the leaves, 5—6 inches thick. Leaves, about 150, spread over 18 inches, none recurved, the lowest spreading horizontally at right angles with the stem, the upper ascending 2½—2¾ feet long, 8—9 lines broad at the middle, narrowed to half an inch above the base, as rigid and coriaceous in texture as those of aloifolia; colour a bright apple-green, not at all glaucous; a quarter of an inch thick above the base, the back decidedly convex throughout, the point pungent, the edge distinctly brown, splitting off, especially in the upper half of the leaf, into copious strong recurved threads, 1—3 inches long, the upper part below the point much hollowed out. In general habit, and in the colour and texture of the leaves, this most resembles aloifolia. It is probably the Y. angustifolia of Carrière (Rev. Hort. ix., p. 20, t. 3), but not of Pursh.

22. *Y. polyphylla*, Baker.—Stem about 3 feet long below the leaves, half a foot thick. Leaves, about 200, spread over 18 inches, the lowest much decurved, the upper ascending, the largest 2 feet by 7—8 lines broad at the middle, narrowed to half an inch above the base, rather less thick and rigid in texture than in the last, but the point dangerously pungent, and the face very concave below it, the back moderately convex all through, the base a quarter of an inch thick; the colour a pale bright green, the edge not distinctly brown as in the last, the threads less copious and finer, but extending through the whole leaf, scarcely at all recurved. This comes nearest to the last, but differs, as will be seen, from the characters given. It has the most numerous leaves of any form with which I am acquainted.

23. *Y. recurvata*, Baker.—Stem under a foot high, below the leaves; leaves 70—80, the lowest recurved, the upper ascending, the largest 27—28 inches long, half an inch broad at the middle, narrowed to a quarter of an inch above the base; texture similar to that of the last; colour a dark, not glaucous, green, with the face paler down the centre, the back much rounded all through; the base 2½—3 lines thick, the point pungent, with its face much hollowed out, the edge brown, and very distinct, as in No. 21, splitting off into copious much curled threads 1—2 inches long. Also closely allied to No. 21.

24. *Y. scabrifolia*, Baker.—Stem 6—8 inches long, below the leaves, tuberous at the base; leaves, about 40, spread over a space of half a foot, the lowest slightly recurved, the upper ascending, the largest 20—24 inches long, 4—5 lines broad at the middle, narrowed to a quarter of an inch above the base, the back much rounded throughout; colour a dark, not glaucous-green, but down the face paler; the upper surface smooth, but the lower remarkably scabrous, the point pungent, and the face much hollowed out near it; the texture as rigid as in the two last, but the leaf breaking much more easily; the edge distinct grey-brown, with a few long straight threads splitting off from it on each side.

25. *Y. fragilifolia*, Baker.—Stem about half a foot high below the leaves, which are 25—30 in number, the lowest decidedly decurved, the upper erecto-patent, 16—18 inches long, ½—¾ inch broad at the middle, narrowed to 3—4 lines above the base, the point pungent, the face beneath it much hollowed out, the back much rounded all through, the colour grey-green, not at all glaucous, the face smooth, the back scabrous, the edge sparingly filiferous, with 2—3 short nearly straight threads splitting off in the upper half. This and the last are very distinct, and are remarkable for the leaves breaking much more easily than in any other of the rigid-leaved forms.

26. In Torrey's "Botany of the Mexican Boundary" mention is made of an unnamed Yucca, gathered by Mr. Thurber on high table-lands near Cohahuila, with leaves 15 inches long by an inch and a-half broad, with a spiny point and a filamentous border, which forms a tree 25 feet or more in height, with several spreading branches, and a fruit 2—3 inches long, with a thin, sweet pulp. This is, no doubt, an undescribed species of the present group.

This concludes the filamentose group, and we have now only the entire-leaved species to notice. *J. G. Baker.*

CONCERNING PEAS.

SUCH a summer as this, with a drought in the London district as prolonged as it is severe, might have been thought a season of a very unlikely character to afford anything like a fair trial of Peas; and yet a very good trial has this season been obtained at the trial grounds of Messrs. Waite, Burnell & Co., the wholesale seedsmen of Southwark Street, which are situate at Woolwich. Until recently these grounds, about 7 acres in extent, formed a part of one of the celebrated Woolwich market gardens; and the soil being both deep and rich, it possessed a sustaining power in a remarkable degree. This trial comprised not only nearly all the so-called "leading varieties" in cultivation, but they were arranged according to the best ascertained times of coming in, beginning with the earliest known, and running down towards the latest.

The two earliest were Caractacus and Ringleader, the former a selection obtained by Messrs. Waite & Co. a few years ago, and which has been in commerce for the past two or three seasons. It can therefore scarcely pretend to be a new kind, but it is one decidedly worthy of being better known. As early as Ringleader, it is, judging from several growing samples of each, a much better cropper, with longer pods also; and it is not too much to state that the most impartial contrast would give nearly 50 per cent. more Peas on a given quantity of haulm of Caractacus than of Ringleader: the former averaged from seven and eight Peas to a pod, the latter four to five. I have the less hesitated in making this statement, inasmuch as Caractacus is not a new variety to be shortly sent out. In height it is about 2½ feet. A selected stock of Daniel O'Rourke was very fine, early, and productive. Next came samples of Early Warwick, Emperor, Auvergne, &c.—those old-fashioned kinds the wholesale seedsmen are bound to keep with which to supply certain districts of the country. Essex Rival has come out this season with a thoroughly good character; here, as elsewhere, it has withstood the drought, and cropped well; having a

much better pod than the old Ringwood Marrow, it is in that respect, besides others, a decided improvement on it. Princess Royal (Maclean), a fine and a prolific Pea, the trial samples even and true, as if well selected; it is one of the newer kinds, rapidly rising in public estimation. Advancer (Maclean) is a Pea that ought to be in every garden in the kingdom, as it suits North and South alike. It is strange that writers persist in recommending Warwick, Auvergne, and others of the old taller growing kinds, while such excellent sorts as the two first named can be had—as early, as prolific, much dwarfer, and incomparably better in flavour. Napoleon or Climax is not nearly so reliable as Advancer, though coming in at the same time. A comparison of several pods gave Napoleon as averaging three to four Peas; it is one of those varieties that does not fill up the pod to the point; Advancer averaged six and seven to a pod. Yorkshire Hero is a nice large Pea, of very fine flavour, and a good cropper, earlier than Veitch's Perfection by about four days. Bishop's Longpodded Dwarf, being a very heavy cropper, is worth recommending as a cottager's Pea, but it is not nearly so fine in flavour as Advancer. Little Gem (Maclean) was remarkably good, and in such a season as this was fit to gather two days after Ringleader, both being sown in February. Judging from the number of samples of Sugar Peas growing here, both tall and dwarf, they must be in considerable demand: the quality of the stock of one of the samples was very fine. The pods are cooked when quite small, and before the Peas have attained scarcely any size; they are said to make a very palatable dish. As an exquisitely flavoured Pea, mention must be made of Maclean's Dwarf Prolific, which Messrs. Waite & Co. appear to have true. The flavour is peculiarly sweet, but the original stock can rarely be met with, as Wonderful has by some reason been confused with it. Premier, another of Dr. Maclean's raising, is a very fine Pea, a prolific cropper, and very fine quality, and has the positive virtue of standing the drought well. In such a season as this it will be highly appreciated in consequence. Wonderful (Maclean) is a very useful Pea, but deficient in that fine flavour which Dwarf Prolific and Premier possess in such an eminent degree. Maclean's Epicurean is very similar in character to Dwarf Prolific, but inferior in flavour. Laxton's Supreme is certainly a very fine Pea, and very prolific of large long pods, but it does not turn in for use as early as was asserted of it. Laxton's Prolific Longpod was here found to be mixed as usual, a proportion bearing pods of a deep olive-green colour, like Prizetaker, the remainder being of the type of Dickson's Favourite, but longer. The latter is the form in which Mr. Laxton selected it, and at the recent show of the Royal Horticultural Society at Oxford, among the baskets of Peas staged on that occasion was a very fine lot of it in this form, without a green pod intermixed. Between the green-podded form of Laxton's Prolific and Prizetaker there appears to be but very little difference, but perhaps very much of what is grown as Laxton's Prolific is only Prizetaker. Veitch's Perfection was very fine, and, like Premier, looked as if a hot, dry season suited it very well, provided there was some support at the roots. The plan Mr. Stewart used to adopt at Nuneham Park of sowing Peas, especially such tall-growing kinds as Ne Plus Ultra and British Queen, in the Celery trenches of the previous winter, is no doubt a very good one, deserving of general application. That fine staple Pea, Champion of England, was very fine; several stocks of it appeared of excellent quality. Fortyfold appears to be a selection from this, certainly a good stock of it. Peabody is a close bushy growing dwarf Pea that would do excellently well for field purposes, but has no pretensions to quality as a table kind, if what was growing here represents it at its best. Dwarf Waterloo, a very dwarf-growing Pea, appeared on comparison to resemble very closely the old Bishop's Dwarf, and as we have now so many new dwarf wrinkled marrow Peas of undoubted quality, one is induced to ask what is the use of it? The Prince is also a very fine Pea, and not half enough grown; it has a peculiar shaped pod, which gives it the stamp of distinctiveness; it succeeds Veitch's Perfection, and like it also had done well this season. The Premier, on the other hand, is somewhat earlier than Veitch's.

Laxton's Alpha must, for its obvious good qualities, be set down as a decided acquisition to our first early Peas. Though growing from 2½ to 3 feet in an almost unexampled dry season, it yet turned in only three days later than Ringleader, and the same time as Little Gem; it is a capital bearer, and in point of general usefulness ranks as A 1. This season the pods were fit to gather some four days before those of Daniel O'Rourke; no doubt it is fully as early as that variety, with the advantage of possessing a higher quality.

Of the taller growing Peas, Imperial Wonder appeared as if it had been selected from Ne Plus Ultra, the pods rather larger, and a little later in being fit for table. Macmillan's Queen of the Marrows seemed to be identical with Ne Plus Ultra. Hundredfold, or Cook's Favourite, a round olive-coloured Pea in the dry state, similar to Laxton's Prolific, is a good late Pea, and a very prolific bearer, producing fine large green pods; it is a good exhibition kind, and appears worthy of general cultivation.

Besides Peas, a few other things were well worthy notice. Such a summer as this would fully test the capacities of Lettuces to stand without "bolting." Here could be seen growing two very large breadths of White Cos Lettuce, one known as Waite's White Cos, the other Burnell's Alexandra White Cos, both very fine, but yet somewhat distinct in character; and out of several hundreds of each, and especially in the case of the latter, scarcely one could be seen going to seed. The unbroken lines also suggested a considerable amount of hardihood. Some of the latter were of great size, and as full as could well be wished. They indicated what can be done by careful selection. Ne Plus Ultra is a good Summer Cabbage Lettuce, and stands well, but the dark brown tint on the leaves is against it. All the Year Round is a fine Summer Cabbage Lettuce, standing well; so does that excellent Cabbage variety, Tom Thumb. To show the importance of a trial ground to seedsmen, it may be stated that in a line of one stock of this variety, every plant had run to seed, and yet there was no doubt as to its being true. The practice of the wholesale seed trade is, in as far as it can be done, to test the quality of all stocks before sending them out. Such a stock of this, therefore, would be withheld from commerce. A stock of the ordinary White Cabbage Lettuce was so good as to illustrate the *beau ideal* of a Summer Cabbage Lettuce.

Here was growing a very large piece of the American Early Rose Potato, unquestionably a Potato for dry seasons. A root or two was dug up (this was about the third week in June); there was a good yield, the tubers of excellent size, and, when cooked, of very fine quality. Erin's Queen Ashtop is also a good prolific early kidney. Climax, another of the new American varieties, had the appearance of being a very late sort. *R. D.*

Home Correspondence.

The Provincial Meetings of the Royal Horticultural Society.—This subject just now assumes an importance which may be called urgent, hence no apology can be needed for returning to it. The proposal to separate the two shows is a much more serious one than it seems. On the face of it, it appears to be a false step. The success or failure of a flower show is dependent upon numbers. Whatever brings these together ought to favour its prosperity. On this very principle the Royal Agricultural Society is beset with, pressed upon by all other sights and sounds. None of these complain that the Royal Show swallows up their little shows; on the contrary, they trust to it to fill their coffers, and it does do it. Now, if men and women and children can "do" the wild beasts, the fat women, the giant, the dwarf, &c., after "doing" miles of bullocks, sheep, horses, pigs, and machinery at rest and in motion, why cannot they rest and be thankful in Flora's cool [?] and delightful tents? Clearly, if the flower show is not supported, the neglect does not arise from the want of power, but the want of will. And I heard it so put at Oxford, that these things were more highly valued by the frequenters of the cattle shows than flower or fruit shows. Very well. Let us weigh this view of the matter against this fact—that at the annual meetings of almost every provincial agricultural society throughout the kingdom, it is now becoming the rule to have a flower show, either associated with it, or held at the same time and place; and it is well known that, as a rule, these horticultural shows are very successful financially. One of the latest instances was that of the Suffolk Agricultural Association's last meeting, held a few weeks ago at Sudbury, in Suffolk. The town offered £50 towards the flower show; the matter was taken up by one gentleman, Mr. Groom, of Ipswich, and carried through with great spirit and liberality, leaving a handsome balance of profit. It is so almost everywhere; in fact, I have not heard of a local failure where the two branches of the same great art of culture combine their forces, or, at least, meet at this same time in the same place, unless when the weather has marred Flora's prospects. Of course, provincial shows are not so large as the Royal, but this objection is met by the counter statement that neither do they last so long. The Royal Agricultural in some of its departments is open for a fortnight or three weeks, the Royal Horticultural from four to six days; local shows often last but one day, and hardly ever exceed two; so that, measuring time against quantity, the local shows exact as much work from those that would visit both as the national shows. It is surely as difficult to see two good provincial shows in one day as to see the two national shows within a week or a fortnight. The fact is, where there's a will there's a way, and it would seem as if the will was wanting to visit the shows of the Royal Horticultural Society in the provinces. The most vital question is, will the mere fact of appearing alone inspire the public with that will? I very much doubt it. Which is the easier task, to evoke the enthusiasm of the public from the low level of normal indifference, or turn that enthusiasm to good account after it has been aroused? I should say the latter decidedly, and therefore the Horticultural Society ought to do best in company with the Agricultural. Those who so strenuously advocate separation overlook another most important fact. Supposing it effected, a great horticultural show would still be held in connection with the Royal Agricultural Society's annual exhibition. This fact ought to weigh heavily with the Councils of both societies. Agriculture and Horticulture are now joined together for better or worse, in bonds as close as those of holy matrimony. They cannot be sundered by any Council, however strong. It is a thousand pities if petty jealousies should find room on one side, or a sense of cold neglect exist on the other. It would be much better of both frankly to accept the inevitable course marked out for them by public opinion, and the two societies work amicably together to make one grand show between them. Should the Council of the Royal Agricultural Society really desire to be rid of the flower show, they will certainly not attain that object by getting quit of the London Horticultural Society. A flower show will be held all the same. The question is not flower show or no flower show, but the much smaller one of who is to hold and manage it—the central society or the local one? In the end it would matter nothing to exhibitors; but it might matter much to horticulture, and more to the London Horticultural Society. By giving up its show in conjunction with the larger society it would abdicate its functions of leadership, and limit the area of its usefulness; the difficulties in the way of success in the provinces would be increased by the rivalry engendered by the local shows that would still be held in connection with the Royal Agricultural Society. And if it failed alone, its failure would be irretrievable. Besides, if the Royal Horticultural Society gave up this show, the Royal Agricultural Society may be induced to take it up. As it cannot get rid of a flower show, it may think fit to enroll it into its programme; and if so, the London Horticultural Society will receive a heavy blow. All these things demand very earnest consideration. I still believe that these shows might be made to pay, though held in company with the other society. None of the causes of failure can be directly brought home to it. Such as I have already indicated might be avoided. Any other means might be adopted to render success more certain. The show itself could be arranged on a broader basis. Prizes should be offered for horticultural buildings, implements, boilers, machinery, means of ventilation, &c. Tests could be applied to new inventions to prove their efficiency, and trials of tools, machines, boilers, &c., made. All this, doubtless, would involve some expense; but it would make a greater interest, and serve to draw visitors. Again, more should be done to satisfy the wants of gardeners, and to gratify the special interest of the time of meeting. The questions of the day should be taken up, discussed, and if possible settled. At the present moment the horticultural world is agitated about mowing machines, restriction and extension in Vine growing, and Fungus; and yet no trial was made of the former, no word heard of the latter at the Oxford meeting. The Congress was thoroughly good, but it would have been even more absorbingly interesting had the veteran "M. J. B." read, or caused to be read, a paper upon the Fungus pest, and all the practical men present been invited to discuss it. Of course it would have taken time to do this, but, though some influential gentlemen do not seem aware of it, there are things more valuable than time, and one of them is the rooting out of error from any mind and the implanting of truth in its place. Perhaps few discussions could have been more efficient in both these directions than those I have indicated. Another equally important matter seemed ignored at the Oxford meeting by the Society as such. Nothing was attempted to promote good fellowship nor strengthen fraternal feelings among horticulturists. No common room or other place of meeting was provided. Every one had to make his own arrangements for a friendly chat at the "Sun," the "Bell," or the "Plough," as the case might be. Doubtless it is difficult for the Society as such to intermeddle with such matters, but the difficulties are not insuperable; and the very attempt to grapple with them would win golden opinions from those who, after all, are the backbone of the Society. Of this I am certain, that if the London Horticultural Society is to wield any influence deserving of the name of national, it must arrange its shows upon a broader basis, venture more in order to gain more, command greater consideration from the local authorities, and, above and beyond all, fraternise more thoroughly with, and cater more widely and better for, the wants and wishes of practical gardeners. Doing this it may be able to take the road alone, and ought to reach high measure of success, horticulturally and financially, in company with the Royal Agricultural Society of England. Since writing the above (on August 1) I have seen the *Gardeners' Chronicle* and *Notts Guardian* of the 6th inst., in which Mr. Ayres fully expounds his views upon the two points—of separating the two societies, and holding a great horticultural show at Nottingham next season. Mr. Ayres has treated the matter as one proposition. Separate the societies, and let the Horticultural come to Nottingham, he says. I would add, by all means go to Nottingham, whether the other show is given up or not. A good many object to July for the provincial show. Well, let June be tried at Nottingham, and, if thought desirable, the joint show at Wolverhampton all the same. The matter of which is best—a single show, or the two shows together—will thus be brought to a practical test. Only, to make the trial a fair one, the same amount of zeal and ability must be employed in each instance. I have no doubt of the success of the show at Nottingham, and would

be pleased, if help is wanted from outsiders, to render any assistance in my power, in the form of a moderate guarantee, or otherwise. There seems no reason why the Royal Horticultural Society should not go more than once a year into the provinces. Its presence there stimulates horticulture, and ought to help to fill its own coffers. The latter it will not do, either alone or in company with the Royal Agricultural Society, unless it succeeds in arousing local enthusiasm and public spirit enough to make localism merge itself for the nonce into nationalism, giving the utmost publicity not only at, but before the show, and managing horticulturists with a hearty, liberal, cordial geniality. When all this has been done, and failed to ensure success, then will I admit that it is hopeless to hold the two shows side by side. Local enthusiasm, for instance, is worth but little unless it can be persuaded to direct itself for a little season to objects broader, wider than mere local fame or wealth. This was the rock on which the preliminary arrangements at Bury split, and it was not until the whole matter was lifted bodily out of merely local horticultural grooves by individual effort that success was reached. And yet everything seemed against the Bury show—our position, the prior engagements of the great London nurserymen, the state of feeling in the county east and west, Bury and Ipswich being in such a state of antagonism that the *Ipswich Journal* refused to insert any letters about the show, except as advertisements. Yet, notwithstanding all these drawbacks, success was achieved. Of such importance did I consider publicity, that not only the Bury papers, but the Cambridge, Norwich, Sudbury, Colchester, and Ipswich men were constantly occupied with notes, lists of subscriptions, &c., to such an extent, that long before the show I doubt if there was a farmer in the county who did not know that the flower show was to be held, and where to find it, if he had not made up his mind that either he or his mistress should see it before they went home. But for the weather, and the absence of fat beasts through the cattle plague, and consequent reduction of the number of visitors, I believe that £1000 might have been cleared at the great horticultural show at Bury. As it was, the nett profits were £400. With such results, and knowing how much easier it might be to equal or exceed them in other localities, Mr. Ayres, "B. E." and others, must really excuse me for not yet admitting that the financial losses sustained by the Horticultural Society arose from the presence in the same place at the same time of the Royal Agricultural Society of England. I am so convinced that this is not the chief cause of failure, that, had I leisure at command, I would undertake to organise and carry through a great horticultural show in conjunction with the next meeting of the national representative of agriculture, and to pocket a handsome surplus; and I have no doubt that, should the London society decline to go to Wolverhampton, some local horticultural society will hold a flower show which shall at least have the merit that it shall pay. Had the London Horticultural Society not gone into the provinces, this course would have been pursued at Bury, Leicester, Manchester, and Oxford. And does any one really believe that either town would have lost money by the experiment? I do not, and surely the central society ought to be able to command as much or more business talent and financial capacity as is likely to be forthcoming in any local town. Mr. Ayres almost guarantees a financial success at Nottingham, and I cannot yet see why the Royal cannot command it elsewhere. Certain it is, the money will not come unbidden, whether the provincial show is held by itself or in company with the other society. *D. T. Fish.*

American Cranberries.—I am glad to find Mr. Taplin has informed us how they cultivate the Cranberry in its native situation, and I have no doubt they would do equally well in this country, as there are many acres of waste land well adapted for the purpose. From the knowledge I have of them in this country I believe that if they were planted in beds 4 to 6 feet in width, and irrigated similar to the treatment of grass, they would do well, as I have never found the frost injure them. When I went as gardener to Hylands, near Chelmsford, in Essex, in 1831, I found a beautiful hedge at least 3 feet in height, forming the margin of a pond some 150 to 200 yards in length, that up to the dry season of 1837 had produced annually bushels of fine fruit, and in place of the American cold water cure we gathered them when ripe and dry, and put them into dry bottles. I never had any complaints of their not keeping till succeeded by a fresh supply. I can fully endorse what Mr. Taplin says in their favour, as in my opinion there are no fruit equal to them for tarts, though I rather doubt if their fine flavour is not spoiled if they are treated on the cold water system, at least to my taste the imported ones fall far short of those reared at Hylands. About 2 feet had been boarded off the pond, and filled up with peat from Danbury Common, a third of which at least was sand; this when settled down was about 6 inches above the water level, and nothing could do better. A low wire trellis had been placed on the top of the boards to keep the water-fowl from getting into the garden; this they took possession of, and hence the beautiful hedge of Cranberries, 3 feet in height. I replanted them before I left Hylands in the autumn of 1839, and if this meets the eye of the present gardener at Hylands, I should be glad to know if there is a sample left, though the supply of water was so meagre that I fear they must have succumbed for the want of it. I would strongly advise those who may have a pond or lake, with a steady supply of water, to try the above method, which I have no doubt would end in a good addition to the dinner-table, as well as form a pretty effect on the margins of lakes, contrasted with Junipers, &c. *D. Ferguson, Watton, Hounslow.*

Fruit Judging.—I fear that few gardeners will concur with Dr. Hogg's opinion on this subject; at any rate I think he was one by himself at the Congress, and we should have heard many more joining in chorus with Messrs. Marshall, Ayres, and Fish, had there not been a kind of chairmanic solo at the end of every paper, "that time was scarce, and that all haste must be made." Others, like myself, would like to know how can a gardener bestow more care through the period of growth on the dish of Peaches, Nectarines, Plums, Cherries, or Grapes, which he may bring to the exhibition? Suppose he could do anything to improve a few and leave the others, is he sure that they are the ones that will be the fittest on the show day? What can be done to the bunches of Grapes in the way of colour or flavour any more than to the dozens of others left behind? In this case, as in every other, size may be gained throughout by having fewer bunches, and that is quite as essential for home consumption as it is for the exhibition. The Doctor's analogy of the fruit and the exhibition ox is to my mind inapplicable, for the latter has a separate stall and also a separate trough to feed from, but the Grapes, Peaches, Nectarines, &c., brought to the exhibition are selected from the herd and fed with the same food as those left at home; indeed, they are not selected for the exhibition until a day or two before the time, or even on the morning of the show day, but those selected may be taken as a fair representation of what is left behind. Sometimes they may be the cream of the crop, another time the second best, for we all know how perishable stone fruit is. Dr. Hogg's remarks respecting flavour will not gain favour with employers of gardeners nor yet with the employed. If flavour is to be a point, by all means let it be first. As tastes vary so much, why not discard it altogether, and go entirely by sight; all points could then be discussed without mutilation of fruit, and the gardening public could form their opinion more satisfactorily and would perhaps be better reconciled to that of the appointed judges. *W. P. R.*

Plants for Dinner-table Decoration.—Under this heading, at p. 1027, is a recipe for the use of Acer Negundo variegatum, by Mr. Wm. Tillery, who writes as follows:—"When sprigs of this tree are used in combination with trusses of high-coloured flowers, such as scarlet, purple, or pink Pelargoniums, Ageratums, and yellow Calceolarias, the effect is very good. Take from four to six sprigs of this Acer, and spread them out on low glass baskets or vases, with the flowers in the centre, and not overcrowded. The sharp-pointed leaves of the Acer naturally droop down on each side, and their fine variegation of white and green show off all high-coloured flowers to the best advantage." Now, with much respect, I venture to submit that this is a recipe for a dinner-table decoration which ought not to be followed. It is well known that flowers look best when arranged either with their own foliage or with Fern fronds of a similar shade of green to that of their own foliage; but in this recipe there is no green of any kind or description, excepting the little of a pale character, which is to be found in the leaves of the Acer, and that little is not amongst but outside the flowers. Again, this mode of using the leaves of Acer for dinner-table purposes is certainly not the way to give its very beautiful leaves a fair chance of showing themselves off to the best advantage; since the whiter the dinner-cloth, the dirtier would the leaves look if used as an edging for a "low glass basket." When brought into use for dinner-table decoration, they should be placed as far as possible from the cloth. They invariably look feeble and poor unless shown in contrast with foliage of a rich full green colour; in fact, they need the relief of foliage quite as much as flowers do. Dinner-table decorators would do well to read carefully Mr. W Paul's very able paper on "Colour in the Tree Scenery of our Gardens, Parks, and Landscapes," and to apply the principles which he advocates to their art, with such modifications as the nearness of the objects necessitates. Riband borders on the dining-table may suit those who take rum-punch with their plum-pudding, then old ale with their cheese, and port wine afterwards; but the number of those who can indulge in all these luxuries is daily decreasing. Each in its proper place is, doubtless, "not to be sneezed at;" but good taste objects to too many good things all at once, and especially to colour without foliage in a dinner-table decoration. *W. T.*

Tropæolum Lobbianum, vars.—Mr. Porter, gr. to E. Benham, Esq., Sion Lodge, Isleworth, has succeeded in raising some seedling forms of trailing Tropæolums that are well worth notice. He appears to have worked from crosses made between the crimson-flowered King of Tom Thumbs, and some of the Lobbianum section, such as Triomphe de Paris, and Ball of Fire, and the result was a batch of seedlings, from which he has selected about a dozen varieties for propagation. The depth of colour in some of them is a decided advance on anything we have in the Tropæolum way; and two or three of the yellow-flowering varieties, with crimson spots on the flowers, are particularly good. Though very useful indeed as bedders in the summer flower garden, the chief use to which Mr. Porter turns them is for winter work. In the autumn a plant is put into a 16 or 24-sized pot, and stood on the front rack of a small greenhouse, and trained up the rafters. They bloom with great freedom all the winter and spring, and, the flower-stalks being long, they are very useful for cutting from. Mr. Porter also uses them placed in small bunches among the foliage of Lycopodium denticulatum, grown in neat wire baskets, for table decoration. Three or four flowers of various colours make a small neat bunch, and look very pretty when blended with the bright green of the Lycopodium. *R. D.*

Monstrous Potato Flower.—In the interests of scientific accuracy, you must allow me to refer to the figure given by you in your leading article on deviations from ordinary forms occasioned by peculiar seasons (p. 1021). Your draughtsman (copying from a crumpled specimen) has shown the segments of the metamorphosed corolla as spreading out like a star at right angles to the column of regular stamens. This was not so. The staminoid petals were convergent, as well as being of a bright yellow colour and polleniferous, thereby affording additional evidence of their much nearer approximation to stamens than to petals. The mere subdivision [or rather defective union] of the ordinary patent monopetalous corolla of the Potato into well-defined sections, I apprehend, is not uncommon. I find St. Hilaire in his "Morphologie Végétale" (Paris, 1841, p. 391), refers to Solanum tuberosum (the Potato) as occasionally having five petals. Neither is the conversion of the ordinary stamens into perfect petals so very unusual, for I find Moquin Tandon, in his "Tératologie Végétale" (Paris, 1841, p. 212), refers to a remarkable example of that kind, noticed by M. de Schlechtendal. But the special feature in the present case is not the segmentation of the monopetalous corolla, nor the conversion of the ordinary stamens into imperfect petals (which would be only the common case of a double flower), but the perfect retention of the regular whorl of stamens coupled with the almost complete conversion of the ordinary corolline whorl into a second and outer whorl of stamens, affording a notable example of retrogressive metamorphosis, which Goethe in his famous essay calls "rückschreitende." As to the cause of such a curious change, I am disposed to agree with you, but I do not think the present abnormal season has produced it. I think the metamorphosis is of older date, and that the affected plants I saw at Cambridge, dispersed irregularly in the rows, must have proceeded from tubers, the produce of a sport of longer standing. My reason for thinking so is, that since I made the discovery at Cambridge of the plants I sent you, I have been shown a small plot of Potatos at Ely presenting precisely the same modifications of the floral organs, the seed tubers of which, I learn from the owner, were obtained from a village near Cambridge. This fact, taken together with another, viz., that, so far as I can discover, this small plot at Ely is the only bit of Potatos at Ely similarly affected, satisfies me that the change referred to probably took place in one plant only originally, and that the variety so produced has been since multiplied by means of seed-tubers. There was another feature about the metamorphosed flowers which you appear to have overlooked. The calyx, instead of being equally and distinctly five-parted in the normal way, was bilabiate, two of the divisions adhering together on one side, and the other three in like manner on the other. I noticed this feature in all the flowers I examined. Does it in any measure corroborate the alleged relationship between the two orders of Nightshade (Solanaceæ) and the Figworts (Scrophulariaceæ)? *W. Marshall, Ely, August 6.* [The flower was purposely forced open, the better to show its peculiarities. We quite agree with you in your remarks; we did not intend to imply that the changes in the Potato were due to the peculiar conditions of the present season, but merely that other changes of a similar nature might be expected to occur in other plants provided we have a wet autumn. The calyx was not two-lipped in the flower we examined, but such a change would bear out your notion, which is abundantly exemplified by other cases, of the transition from Solanaceæ to Scrophulariaceæ. Eds.]

Lilium auratum, Alexandra.—I have much pleasure in submitting to your inspection a variety of Lilium auratum, which is even of a purer white than Mr. Bull's variety as seen by me at South Kensington the other day, the yellow spottings being smaller and rarer. My attention was called to it this morning by one of our foremen, to contradict what I wrote to you last week, it having been marked from last year, as you will see by the label. This is really, however, the first instance of its happening; but whether the labels had been before wilfully or accidentally shifted I cannot say. *W. T. Cripps, August 7.*

The "Archimedean" Lawn Mower.—I am strongly of opinion that your excellent correspondent, D. T. Fish, must have seen something very unfavourable in his first trial of this machine, and made up his mind not to alter his former notion. I have got one

here that I find most useful, and which does its work well; in fact, for such a dry season as we have experienced and are still experiencing, even in the lake districts, I find it invaluable for cutting steep banks and preserving the grass green where, if we were using the ordinary machines, we should have nothing but brown grass. I am well aware that in the eastern and southern counties there is nothing else but brown grass, even after the "Archimedean" lawn-mower; but north of Lancaster there has been more rain, and the crops and grass look very different. *James Stewart, The Gardens, Belsfield House, Windermere.*

Gardeners' Incumbrances. — Being desirous of aiding a worthy gardener in his endeavour to procure another situation, I naturally turned to the columns of "wants" in the *Gardeners' Chronicle*, and there I find that men are wanted without incumbrance. In the name of our common humanity, I will not even say Christianity, what is this? Has it come to this, that wife and children are incumbrances? Who are they who thus write? Are they crusty bachelors whom no gentle love moves, and to whom children are only bores? And are we to regard those whom God has given us to be our joy and solace as weights about our neck? Is that man happy whose home no gentle prattle charms, or whose declining years no filial love soothes? And I protest there is an immorality in such advertisements that seems to me quite as bad as that which has made others be banished from all respectable papers; and then it begets its natural consequence—the man to whose married life children have brought not these joys or sorrows, looks up in the market; he, too, can advertise, "I have no incumbrance," I shall be sought after by Christian gentlemen, who think these a bore when they belong to others. Alas! how near akin are our high civilisation and savage life. If people do not want married men let them say so, but not cloak their meaning under the disgusting euphuism of "no incumbrance." *D., Deal.*

Cider-Presses.—I wish to obtain some information respecting cider-presses and apple-mills. Can any of your readers tell me whether the hydraulic cider-press is better than the ordinary two-screw press?—also, whether a stone apple-mill is superior to the common iron mill with teeth?—also the usual prices of mill, press, and horsehair bags. I shall be extremely obliged by any information on the subject. *R. B.*

Horticultural Buildings at the Oxford Show. —Now that the show of 1870 is numbered among past events, and busy exhibitors, with their productions, have returned to their respective places of abode, may it not be profitable and instructive to take a retrospective glance at the various objects which were exhibited, and ask ourselves the all-important question, What progress has been made in horticultural buildings since the show of 1869 at Manchester? Taking the show as a whole one cannot fairly exclude reference to the agricultural department, where, I am free to confess, it was with no small amount of satisfaction I saw many new and useful inventions, most of which cannot fail to be of service to the practical agriculturist. I was also favourably impressed with the general and uniform excellence of the articles exhibited, as each competitor seemed to rival his contemporary in superior workmanship, good materials, and generally in turning out the cleanest, best, and most highly finished implements. Now it is frequently stated that "comparisons are odious," but I venture to ask whether a similar compliment can be paid to the horticultural builders who exhibited in that department of the show. Being in search of a good horticultural structure, I naturally wended my way to this department, expecting to find, cut and dried, what I required; but, greatly to my disgust, I am obliged to state (although it may appear a very broad and comprehensive verdict) there was not a single structure but what I should have felt ashamed to have erected in my garden. First and foremost, there was the usual stereotyped lean-to house with its heavy rafters, cumbrous from their thickness, excluding light, and creating a broad shadow, its imperfect ventilation and cumbersome heating apparatus, and very little to recommend it either on the score of originality of idea or improvement upon a similar class of house erected 50 years back. Further on we arrive at the house, with its roof of many straight lines employed to produce a curvilinear form, in which, as is well known, it is impossible to maintain a uniform temperature. They become unbearably hot in summer, and just the reverse in winter, not to mention many other disadvantages often repeated. We next come to the metallic houses, and here I think no one can accuse me of exaggeration when I say, that with their flimsy material, trumpery soldered joints, tissue-paper-like hollow sash-bars, doors barely exceeding an inch in thickness, sashes to match, and the workmanship of the roughest character, it is almost impossible to conceive anything much worse than these, which surely cannot be styled a "step in the right direction." Next crops up what I will term the pantile glasshouse, which, judging from investigation, is (if I may be allowed to use the similitude) like Jack Straw's Castle, neither "wind" nor "water" tight, and requires considerable modifications before being fit for use. I had hoped, after viewing these structures, nothing more distasteful remained to be seen, but I had yet to reach the climax in the form of a so-termed "Peach-wall covering." Here is a horticultural structure with a vengeance. Fancy pieces of timber under 3 inches square, rough, unplaned, not even sawn straight, crooked and shapeless, with weather boarding of the roughest description at bottom, having squares of glass, unfitted, thrown from bearer to bearer in the most irregular and unworkmanlike manner possible, and fairly suggestive of hurdles pitched against a wall, and glazed by the farmyard labourer. This is styled "improvements in horticultural buildings." Why, I should imagine no country horticultural cobbler would attempt to present to us anything half so bad. It was, however, rather amusing to be told that this was the "last thing out," which, of its kind, I profoundly hoped would remain so. After concluding my survey, the impression created was that horticultural building is sadly degenerating, for more vile and wretched attempts at structural art I think I never witnessed. Another matter I forgot to mention, namely, the painting, which was on a par with the rest of the workmanship—one building in particular being covered with a coating of, I believe, red ochre and water. In the face of all these facts, one question forces itself uppermost, Who, or what, is to blame for all this? Is it the result of cheapness? If so, surely it is time some respectable firm endeavoured to counteract the evil influences by producing some specimens of the very best work, and so redeeming the general character of the trade from the declining state into which it is plunging. By these so-styled "light," "cheap," and "modern" structures, which are not to be compared with similar erections of 30 or 40 years back, horticultural building is losing much of its *prestige*, and promises to become unworthy of the appellation; for, instead of producing "buildings," they will degenerate into a species of roughly finished glass packing-cases,—structural design will be entirely lost sight of. I would advise horticultural builders to act on a similar principle to that adopted by agricultural implement makers, and that is, to see who can turn out the most superior, instead of the most inferior, class of manufacture; to base their reputation upon quality, not cheapness, and so endeavour to elevate the public taste for good buildings, rather than for the flimsy cases of which we hear so much, but which for use are worth so little. During the period which must elapse before our next show, I wait the result of another competition, which I trust may prove more favourable than the last. *X. Z.*

Jottings in East Kent: The Catalpa.—One of the pleasantest drives near Canterbury is the unfrequented road from Fordwich to Littlebourne. Passing the barracks on the right, and the Vauxhall Nursery on the left, from whence the Hales Place mansion and its noble plantations are seen to the greatest advantage, we pass by a straight and level road to the village of Sturry. The road is made in about what was formerly the centre of the course of a noble stream, the Stour, which must have occupied the entire valley from hill to hill, although now dwindled, by comparison, into a very small stream. Turning to the right we ascend the hill, and find fossil evidence of that having been at a former period covered with water. Indeed most of the cuttings show water-worn flints, such as we now meet with on many of our seashores. Having gained the level, we proceed half a mile, and then somewhat abruptly arrive at a second valley, through which the road passes on its way to the village of Littlebourne. The stretch of country produces the most varied and most beautiful scenery, on a small scale, that the neighbourhood affords; for we have hill and dale, occasionally a glimpse of the winding Stour, green meadows and cornfields, with occasional Hop gardens, which are most beautiful at this season. Then we have deep woods, plantations, and occasionally single trees, or groups, scattered as a painter would love. In the valley, or rather on the left bank, is seated the mansion of Ellbridge, which commands a small but most interesting park; and opposite, on lower ground, is one of the old and picturesque farm-houses to be met with in this neighbourhood only sparingly, and always welcomed; but in the rich variety of situation I had almost forgotten the object for which I took up my pen. Thirty-five years ago I planted a Catalpa syringæfolia on the lawn near the house, and now marvel at the size it has attained, and the profusion of flowers it is adorned with. At 2 feet from the lawn the stem branches in two; again, at 7 feet it ramifies, and five stems are then continued for some feet: its whole height is 32 feet, and it spreads to a diameter of 60 feet. Some idea of the number of spikes of blossom may be gained when I mention that I counted on 3 feet of the lower boughs 150 spikes. The tree resembles a mass of snow, enlivened with rich yellow and brown mottlings; the arrangement of the inflorescence is such as to develope a rich green mantle of foliage, from which the flowers spring. I have planted many of these trees within the last half century, but I have seen none to equal that which I am describing on the lawn at Ellbridge. *William Masters, Canterbury.*

Standard Apricots. — I forward you a branch of an Apricot tree, grown in the village here. The tree has been planted about 20 years, and during the last 16 years, I am told by the present owner, it has but on one or two occasions failed to produce fruit, while, as an average, the crop has once in three years been immense. Had the fruit been thinned out carefully, the result would have been finer fruit, while the energies of the tree would have been less exhausted. At the present time on this tree there are over five "pots" of fruit. The ripe fruit are from trees that are now under my charge near here. I am bound to say that the flavour is superior to that of those grown on the walls here. In consequence of the prosperity of the tree now referred to, there are many standard Apricots now grown in the neighbourhood, and in every instance successfully. I am persuaded that in every garden south of the Trent the Apricot might be grown with the best results, as the neighbourhood of Witley is both cold and exposed. For culinary purposes the fruit from standards will be found to be of the greatest service. *G. Westland, Witley Court.* [The branches were loaded, so as to resemble ropes of Onions, the fruit being of good average size. The riper fruit was of first-rate quality; one of the largest weighed 3⅜ oz. Eds.]

Cultivation of Indian Corn.—I think your Guernsey correspondent (p. 926) must sow and plant his corn too early, for we find here it does not make any progress until the ground is well heated by the sun. We sowed (outside, of course) on May 14; there came some cold rain before it was up, and it came up irregularly, but some sown ten days later is quite as forward. We gathered some for cooking from Early Dwarf Sweet to-day. The way to cook it is in boiling water and salt, like any other green vegetable; it requires from twenty minutes to three quarters of an hour's boiling, according to age. I think it is also a mistake to plant the very tall kinds in England, if it is intended to ripen it. We have some varieties over 10 feet high now (July 23) from the May 14 sowing, but then the temperature has been from 85° to 102° most days this month, and from 75° to 85° at night, and the soil where exposed to the full sun has been at 110° at 6 inches deep. I can only imagine Maize requiring staking from being drawn up indoors, for a wind which would blow it over would nearly uproot trees. The proper way to plant it is to line the ground out both ways at 3 feet apart, for the very dwarf, up to 5 feet for the tall varieties; put a good shovelful of manure at each corner of the square, and plant three plants. We usually sow five seeds and thin to three; the fresher and ranker the manure, the better; in fact, they use fish direct from the sea near the coast. As soon as up it is cultivated and hoed round the hills, and again at intervals two or three times, according to the time and carefulness of the grower. The best way, when grown only for forage, is to sow thin in drills, at say 4 feet apart, on well-manured edges, like Turnips, and cultivated and hoed, say once; the probability is there would be more forage from two plants, 2 feet apart, than from four at 1 foot. Since writing the above, I notice an article by Dr. Nicholas, the conductor of that excellent monthly, the "Boston Journal of Chemistry" (a paper, by the way, worth reading by those who state that manure loses none of its fertilising power by drying on the ground before being ploughed under), in which the Doctor states, from experiments, that the stalk of Corn sown thick in drills or broadcast—as often done in this country—is almost entirely wanting in the rich saccharine juice, in which the feeding qualities consist; and that cows gave 8 per cent. less milk when fed on these, in comparison with those fed on stalks grown on hills, and exposed on all sides to light and air. The Doctor concludes by stating that he considered the farmers might as well drive their cows to the nearest brook, as to place before them heaps of green Maize grown without light and air. *James Taplin, South Amboy, New Jersey, U. S. A., July 23.*

Lilium auratum.—The specimen of this plant which was exhibited and obtained the Lindley Medal at South Kensington in August, 1869, has now 190 blooms fully expanded on it, with two more to open. It is quite a picture. It would be very interesting to know how many blooms there are on the plant at Quarry Bank, which last year bore 193. Perhaps Mr. Smith will kindly oblige with the information. *James May, Meltchet Court.*

Vine Extension.—I was much pleased to read in your columns of the great success in Grape growing at Chatsworth, because that was the last border I renewed before I left there. Probably a few of your readers may be interested in the condition of the border. Your correspondent states that it is above the ground level, and, I may add, made on what was originally a limestone gravel road. It had apparently been made about 10 feet wide, but it was near the Pine stove, and had been for years made the deposit of all the old Vine soil and other waste, so that it had increased to perhaps 20 feet wide and high in proportion. I had all this carted away, and as much of the original border as possible was forked out without destroying the young roots, of which there were but few; in fact none of any kind more than 10 feet from the front wall. In some parts it was cleared to within 5 feet of the wall, and down to the drainage. All the dead roots were cut carefully away, and the live ones spread out over the surface in a mixture of charred turf, crushed bones, and old plaster, the details of which I gave in the *Field*. Before the border was chilled in autumn, it was covered with dry litter and old sashes, so that the roots worked beautifully all the winter, and I found it full of

roots a few days before I left, a fact which no doubt made Mr. Speed hesitate before using the axe. He has probably added more soil since, at least I should have done so. I had cleared out nearly all the inside Vines, intending to clear the other, raised the boiler out of the water, and added to the deficient ventilation; and Mr. Speed's good management, aided by a succession of dry seasons, has produced first-rate results. *James Tuplin, South Amboy, New Jersey, U. S. America, July* 23.

Vine Growing near Carlisle.—If any of your readers interested in the cultivation of the Vine should be passing the border city (Carlisle) and could spare an hour or two, they might see in the establishment of Mr. Thomas Hamilton, Botcherby, a very good specimen of the Black Hamburgh on the extension system, about 50 years of age, nearly filling a good sized vinery. The present crop is a most abundant one, and the wonder is, how they all get ripened under the circumstances, as there was no preparation at planting, and there seems to be little within its reach to sustain such a crop. There are three other large vineries in this establishment well worthy of inspection. The celebrated Pine and Cucumber grower's (Mr. Josh. Hamilton's) establishment, is near the former, and both places may be seen at the same time; a walk through the latter with this practical grower could not fail to be instructive. He is also an advocate of the extension system, and has had a new vinery erected with a view of carrying out this principle from the beginning. *John Taylor, Rose Hill Lodge, Botcherby, Carlisle.*

Potatos.—Again, as in 1868, the partially developed tubers, under the influence of the surface showers we have recently had, are growing out; but this season they are not "superuberating," but sending out long spindles or rootlets that have a very different character, and possibly may have a different effect, to the growing out of two years ago. The result of it upon the crops that were left standing was various, but I believe, in most instances, not altogether injurious, as the process of superuberation was so rapid that another crop was developed in a short space, and generally the new tubers were as fine as the old ones. It is a serious question with growers as to what is the best thing to do this year under existing circumstances, as the conditions are different. I advocate the lifting, as speedily as possible, of all crops where the tuber is fairly matured, and the haulm, though still green, yet verging upon ripeness, as with such crops the present growing out is likely to prove a serious evil. But with reference to all crops that are green and vigorous in the haulm, I say, let them stand and take their chance, as I shall allow what few of the latest I have still green to do. We have at least ten weeks of growing weather before us, during which the Potatos will develope with great rapidity, and doubtless yield a heavy crop. All ripened Potatos, if not yet lifted, can receive no present injury. *Alex Dean.*

Small Birds and Fruit.—Having both seen and gathered Strawberries from those planted in the shrubberies at Whiteknights Park, I can assure your correspondent "F. H." (p. 1027) that Mr. Lees has not written what he has not practised, as at the time of my visit (July 13) there were Strawberries in great profusion, and good ones too. Of course I can say nothing as to the plan of their planting keeping the birds out of the garden. Certain it is that I saw no birds; and Mr. Lees asserts that previous to planting in the shrubberies he was very much pestered with them, and no wonder, as that part of Whiteknights is very thickly wooded. *W. Wildsmith, Hatfield.*

Yuccas. I note with interest the papers by Mr. Baker on "The known forms of Yucca," of which the second, in the *Chronicle* of July 9, has just come to hand. Yucca angustifolia of Pursh ought to be extant in Kew Gardens, to which, if not live plants, seeds have more than once been sent, and these came up freely. Here the plants grow slowly. Yucca parviflora, Torr.: In publishing this species it may be noticed that Dr. Torrey affixed to the genus a mark of doubt, and well he might; and well might Mr. Baker remark that the flowers are extremely different from those of any species known. It flowered a few years ago in the Botanic Garden of Harvard University; and the plant is characterised in the Proceedings of the American Academy, under date of June, 1867, as Aloe yuccæfolia. It is, in short, an Aloe, which imitates a Yucca in foliage, and even in fruit and seeds. Dr. Engelmann of St. Louis is now engaged in the study of this genus, and has in hand all the available material on this side of the Atlantic, which chiefly relates to the little known western species. The older types may be best investigated in Europe. Mr. Baker and Dr. Engelmann might advantageously compare notes. *A. Gray, Cambridge, Mass., U. S. A.*

Coniferson Ploughed Land.—"Brown's Forester" says (p. 1288) that Fir trees, and, as I understand it, Coniferæ generally, do not endure long, or do well, for any length of time, if planted upon land which has for a number of years previously been under the plough. Can you tell me if this really be the case, and if so, if anything can be done, say by digging deep holes for the plants, to remedy it? I ask the question because I mean to plant a little plantation of Coniferæ here, and have chosen a piece of land for that purpose which has very evidently been under the plough, and that, too, for probably many years. I was rather startled on reading this paragraph in the book above mentioned, which is, I believe, a high authority on the subject. I have never heard of anything of the sort before; I hope Mr. Brown is mistaken. Anyhow, however, I think the question of some importance to lovers of trees, and worth the raising. *G. Meynell, Meynell Langley, Derby.*

Flower-Show Appeals.—As an eye-witness of the plants your correspondent, Mr. Burder, exhibited at Chelmsford, on July 14, and for which he was disqualified, and furthermore being officially connected with the Chelmsford Horticultural Society, I should like to say a few words in reply to Mr. Burder (p. 1027). I uphold the decision of the judges, as being exactly in order, as the wording of our schedule runs thus:—"Six plants for beauty of foliage (distinct species)," and as the two Crotons are certainly varieties of the same species, the judges had no alternative but to disqualify the lot. Had the wording of our schedule been "distinct varieties," then Mr. Burder would have been quite in order, even though his six plants had been all Crotons, but the "distinct species" in this case overrules all objection. As an illustration of the above let me cite another case. I was one of the judges at an exhibition on July 20, in another part of Essex, and a special prize was offered for six plants in bloom (distinct species), when one person exhibited six Fuchsias, large plants, well flowered, and various, but as they were all varieties of the same species, we were bound by the clause, "distinct species," to disqualify them. The cases are identical [Not quite], and the wording of both schedules is, I think, sufficiently clear to avoid misapprehension. The Caladiums of Mr. Carr offer a much nicer point to determine; but here, again, strictly speaking, the judges were in order, for although the Alocasias mentioned and the Caladiums are of one family, yet, as you well observe, Alocasias are not Caladiums; still, in the absence of any better in the same class, so nice is the point, that Mr. Carr ought to have received the prize. I have seen one instance of the kind before. *Thomas Simpson, Broomfield, Chelmsford.*

Ants and Wilkie's Composition.—Your correspondent "G. S." need only give the above a fair trial, and I am sure the result will be satisfactory. If "G. S." will, in the evening, after the ants have taken up their quarters for the night, pour down their run a good dose of the composition he will not be troubled with many the next day. If any should escape and form another colony all he has to do is to serve them the same, and I will guarantee if he follows this up he will get rid of all these little pests in two or three days. I send you a Nectarine partly covered with dead ants. Some of the composition was sprinkled over it, and the effect was instantaneous; very few of the numbers that were on the fruit and near it escaped. I never before heard of any one soaking fruit tree borders with boiling water. "G. S.'s" fruit trees must be of a very peculiar kind if they can stand such treatment. I wonder they have not left the house entirely to the care of the ants. *J. Wills.* [The fruit sent was covered with dead ants. EDS.]

Note on Indian Corn.—As the time of the flowering of Indian Corn has arrived, it may be interesting to supply some further information on the effects of cross-fertilisation, by completely removing the male flowers of one plant before flowering (see *Gardeners' Chronicle*, June 6, 1868). The experiment was last year made on a dwarf early variety from the Continent, called "Six-weeks Maize," and a considerable number of the seeds of the largest ear produced were planted by a gardener in the neighbourhood—Mr. Loudon. A great variety in the mode of growth is manifested, but the general result is more successful than was expected. One of the plants, 2 feet 10 inches high, consisting of three stems, has nine ears without a trace of a male flower, the principal stem ending in a soft spine slightly hooked at the apex. Another specimen, which is almost gigantic as compared with its parents, has three stems, the tallest being 3 feet 9 inches high, and the shortest 1 foot 9 inches, and bearing altogether nine ears. The shortest stem, which bears three large ears, has no male flowers, and the other two stems only a moderate quantity. Increased vigour of growth may, therefore, it appears, be safely expected as a constant effect of this mode of cross-fertilisation, and if so, hardiness as regards cold weather and capability of bearing slight frosts in May, may also be expected, so far as that the plant may become adapted for agricultural purposes in this country; for this purpose plants for seed would have to be selected, choosing the most vigorous, provided they had a sufficient number of ears. The seed produced by this mode of cross-fertilisation last year was planted on May 15 in the open ground, and began to flower in the last week of July; and Mr. Loudon's plants, which he raised about the same time under cover, are now some of them past flowering. *B. Clarke, F.L.S., Mount Vernon, Hampstead, August* 3.

Apricots.—Our crop of Apricots is this year a heavy one. Herewith I beg to send you a sample which I think, under the circumstances, you will acknowledge to be clean and good fruit, and especially for old trees thus far north. *G. B. Tillyard, Brocklesby Park, near Ulceby, Lincolnshire.* [Remarkably large and good. EDS.]

Societies.

EDINBURGH BOTANICAL: *May* 12.—Sir Walter Elliot, President, in the Chair. The following communications were read:—

1. *Botanical Notes of a Journey through Spain and Portugal.* By T. C. Archer, Esq. It is not intended by these notes to give any strictly scientific or even novel information, but rather to show by the number of interesting objects observed in a rapid railway journey how much our favourite science may be made to add to its pleasure, or rather to beguile its tedium; for a railway journey through these countries is usually very slow indeed.

I started from Bordeaux after a very early breakfast, and in the course of three hours was passing through the district of the Landes. No part of my journey afforded me greater pleasure, for special circumstances have made me for some time past take a peculiar interest in this remarkable district. This arose out of the fact that I made the acquaintance of M. Leopold Javal in the Exhibition of 1862, and then learned that in his youth the Landes were a desert of shifting sands; but owing solely to his foresight and industrious spirit, the whole district has become one of remarkable fertility, and probably no part of the soil of France is more remunerative to the cultivator. This wonderful change was wrought by M. Javal in this manner:—About 60 years ago (he is now over 85 years) he purchased a very large tract of this desert, and having found that the seaside Pine—Pinus maritima of the French arboriculturists (the Pinus Pinaster of botanists)—would thrive well in sand containing a small amount of salt, he established in a suitable spot extensive nurseries, and raised a vast number of this Pine from seed. When about 2 or 3 feet high, he began planting them out in lines across the desert, taking care to place them in the direction of the prevailing winds. These lines, or rather broad belts, of young trees were placed about 300 yards apart, and, where most exposed, were protected by hurdles made of reeds. When fairly established, these belts were intersected by others planted at right angles, and at such distances as to include about 4 acres of space in each division. As the young trees grew up they formed perfect screens, which soon prevented the sands enclosed from blowing, and the spaces were sown in wet weather during the summer with cruciferous seeds, such as Rape and other quick-growing species, so that they soon covered the ground with verdure, some of which was rapidly dried away, and helped to form a vegetable mould by the decomposition of the dead plants—some seeded and furnished material for further work of the same kind. In a couple of years, grass and Clover were tried, generally with success; after one or two light crops the plough turned the remainder under, and made way for other crops. By such methods these spaces of sand became very fertile, and crops of all kinds of cereals, including Maize, of Buckwheat, of Tobacco, of Potatos, and other roots, of Pumpkins, Melons, and other Gourds, and now very largely in some parts of Vines even, have been successfully raised. In the meantime, the Pine trees grew apace, and as they were thinned out, Oaks, cork trees, Mulberry trees, Poplars, Willows, and other useful timber trees, were put in, and throw well under the protection of the Pines. The Pines were tapped for turpentine, and large distilleries were established, and now supply France with enormous quantities of spirit of turpentine, resin, tar, and pitch. Thousands of people are employed in this trade, and the collectors of the fresh turpentine, who go by the name of Terebintières, live in villages prettily placed amongst the plantations, and they could be seen busily at work amongst the trees as we passed along. Either the carelessness of the workers or the sparks from the engines occasionally cause vast fires amongst the inflammable Pine trees, and one which we saw had left a track of more than 3 miles of charred stems, giving a hideous aspect to the landscape.

The Terebintière, by means of a curved axe, cuts out a portion of the bark and wood; he then fixes a piece of bent zinc, so as to form a spout, at the lower extremity of the cut, and under this suspends a small earthenware pot by means of a nail; into this pot the turpentine drops as it exudes from the incision made in the tree, and the pots are removed when full and replaced by others. I passed through 108 kilomètres of such cultivation sufficiently slowly to study closely all that was going on, and thus had an opportunity of seeing in actual operation those processes by which M. Javal and others subsequently have fertilised and rendered productive some hundreds of square miles of what was the worst desert in Europe; and of understanding more satisfactorily the long series of the interesting products of the Landes which were presented by M. Javal to the Museum of Science and Art.

Entering Spain by Irun, the grand mountain scenery, on the one hand, and the beautiful broad open views of the Bay of Biscay, calm, with a heavenly blue, as if it had never raged and hurled to destruction the brave men who trusted themselves on its treacherous bosom, so completely occupied my attention that I had no opportunity of noticing the plants on the railway sides. Losing sight of the sea at St. Sebastian, where we stayed nearly an hour, we passed on through a very beautiful country, highly cultivated, but with most of the crops gathered in, until nightfall, which brought us to Vittoria, and at midnight I reached Burgos. The next morning I spent in examining the details of its glorious Gothic cathedral; but in the afternoon I walked outside the walls and around about half of the town, hoping to see something of the plants or the neighbourhood; but in this I was completely disappointed, for so completely scorched up was every kind of vegetation, except the avenues of white Poplar which here and there formed a rather dismal shade, that it could not have been more complete had a fire passed over the land, from the plain on which the city stands, to the summits of the hills surrounding it. The

river Arlauzon, which passes by the town, has a very broad bed, but so dry was it that the small stream which was still flowing, was often lost amongst the pebbles, and nowhere formed any serious obstacle to the pedestrian. I thought it probable I might find some damp patches supporting vegetation, but not so. I did not find a green blade of grass. From Burgos to Madrid is a night journey; but the morning broke upon us as we were winding through the wild passes of the Sierra Guadarra, and I saw for the first time the Oak forests of Spain, with their detached trees, beautiful in shape, but sombre in aspect, from their dense dark evergreen foliage, which at first sight made me think they were Olives. Whenever we passed any peasants' habitations, immense droves of large black swine were seen busily feeding on the fallen acorns, proving by their well-fed appearance that the crop was abundant.

Madrid and its suburbs were nearly as bare of vegetation as Burgos. The roads leading out of the city are planted with rows of Gleditschia, I believe of the species latisiliqua, the broad large brown pods of which seemed quite to overpower the poor dull green foliage of the tree, and give anything but a pleasing aspect to the roads. The bare hills all around give one the idea of their having been just thrown up by railway navvys, no spot of green relieving their clay-coloured sides. The Prado, a magnificent drive and promenade on the south side of the city, is the only place where the visitor finds any variety of vegetation. This almost only attraction of Madrid is well planted and carefully watered, so that it almost equals, and even in some respects surpasses, the Champs Elysées of Paris, but the trees are chiefly Gleditschias, Cercis australis, Robinia Pseud-Acacia var. umbraculifera, which last is the favourite tree for ornamental purposes, and bears the scorching sun well if freely watered. In order to meet this requirement, the root of each tree is daily supplied by a system of covered drains, usually built of brick in such public walks as the Prado.

The Botanic Gardens of Madrid are rarely mentioned by travellers, and I was told they were rarely visited. This is a great mistake, for they are full of interest; and as they were once under Cavanilles, and still bear in every part traces of his skill and great scientific abilities, every botanist should certainly visit them. In looking through gardens in Spain and similar countries, those who come from genial climates like our own have to make great allowances; for, in order to protect a few plants from the scorching rays of the sun, many others which can bear it have to be planted as a protection; hence it is impossible to preserve anything like a careful systematic arrangement. Then, again, our carefully raked and level beds are impossible, for every large plant must have the earth raised around it, so as to form a receptacle for water, large quantities of which have to be frequently supplied. But, notwithstanding all this and many more difficulties, the Madrid Gardens are a credit to their director and to the country. At the time I walked through, about 2 o'clock in the afternoon, the thermometer, in the shade, was standing at 39 Cent., or a trifle over 102° Fahrenheit, so that most of the plants were hanging their heads and looking very flaccid. Great bushes, however, of the beautiful Barbadoes Pride, Poinciana pulcherrima, blazed away in all their splendour, and at a distance gave one the idea of fireworks. Hedges of Plumbago capensis, absolutely covered with its charming pale blue blossoms, and growing with more luxuriance than our Privet hedges, were common. The walls of some buildings, forming one of the boundaries of the gardens, were covered with a glorious sheet of lovely rose-colour, which, on examination, proved to be the Bougainvillea spectabilis, so much coveted by English gardeners, but so rarely seen in bloom in this country. The Date Palm and a few others were growing in the borders, and fine collections of Cacti and other succulent plants were placed in sheltered spots.

When I left Madrid it was again night, and the following morning found me going over the plains of La Mancha. The country was undulating, and occasionally hilly, or rather rocky and wild; but whether hill or plain, all was alike arid and parched. Sometimes, however, a land spring, or a small rivulet, revealed the nature of the otherwise parched up plants, which consisted of a low brushwood, chiefly various species of Cistus, amongst which I afterwards found the following species—Cistus albidus, C. crispus, C. salvifolius, C. monspeliensis, C. populifolius, C. laurifolius, and C. ladaniferus, the last very abundant. On the embankments, bright green bush-like plants of Euphorbia rupicola were frequent, and reminded me of tufts of Samphire on rocks. During the forenoon the country had all the same aspect—rock, covered with Cistus bushes, and uncultivated. Much of it seemed only capable of supporting game, amongst which is the wild boar, for we passed a hunt in full cry, and the poor brute ran for some little distance alongside the railroad, seeking the slight shelter of the Cistus bushes.

The progress of the train soon distanced the boar, and we could only imagine its fate. Here and there on the rocky declivities were small enclosures made of rough stones, in which sportsmen hide themselves, and fire through loopholes at the unsuspecting game; and we were informed that these "shootings" are exceedingly profitable.

At half-past 10 in the morning we were at Almaden, the centre of the quicksilver mines, where I intended stopping till the following day; but finding, on inquiry, that all the mines were stopped working, in consequence of the heat of the weather, I spent the three-quarters of an hour which the train remains there to get breakfast, and get a hasty look at the place. Immense rocky masses, as large, or larger, than Salisbury Crags, rose all around, and the adit openings of the mines were very conspicuous in their almost perpendicular sides.

A most beautiful effect was given to these cliffs by some Lichens or Algæ of a bright canary yellow, passing occasionally into a yellowish green colour, covering very large portions of their rocky sides; they were too far off for me to ascertain exactly what they were, which I much regret, as the effect produced was altogether new to me.

We were now in the province of Estremadura, and soon found the rocks gave place to vast undulating plains, the herbage of which, scorched by the burning sun, was of a dark-brown colour; the brushwood of Cistus became scarce, but where the hills were highest forest trees abounded, these were chiefly the Oaks, Quercus Gramuntia, and Q. Æsculus; and Chestnuts, Castanea vesca, amongst which numerous herds of black or brown swine, consisting of hundreds of individuals each, were feeding. During the afternoon we also passed two of the wandering flocks of merino sheep, with their picturesquely dressed shepherds; those flocks appeared to us to consist of some thousands each, and it seemed wonderful how they could gather sufficient food on plains where not a green blade of grass was to be seen. At Merida we stayed a short time, and here the river Guadiana, which is crossed by a bridge, rather altered the aspect of the country, and in many parts its banks were covered with crops of various kinds; Pumpkins and Melons were lying about in great profusion, plots of Tomatos glowing with their scarlet fruit, Maize stripped of its leaves stood ripening its cobs, and various kinds of Sorghum and Millet, bearing heavy crops, seemed ready for gathering in. The town is most picturesquely situated; but our attention was principally attracted by the ruins of the ancient Roman buildings, such as the aqueduct, forum, bridge, the great circus, and wall, of great extent, which, as they are scattered all around the railway station, are easily seen by the passengers.

Leaving Merida, we passed through a highly cultivated country, consisting of an extensive plain or vega, watered by the Guadiana, and its tributaries running down from the not distant Sierra de las Viboras; but from the plains the crops were all removed, and nothing was seen to interest the passer-by but a few cranes on the margins of the streams, watching their chances of a fish supper. At the small village of Montijo we saw a beautiful garden in the highest state of cultivation, surrounding the mansion in which resides the family of the present Empress of the French, and in which she was born; but it was rather too far distant from the railway to distinguish the species of the various beautiful climbers in flower which covered the verandah, and rose in festoons above the low boundary walls. Bougainvillea spectabilis was, however, too abundant and too prominent to leave any doubt about its presence, forming, as it did, a roseate curtain of several yards width. The garden hedges, too, were equally conspicuous from their being formed of the delicate pale sapphire-blue Plumbago capensis, which all through the Peninsula flourishes more luxuriantly than our Privet, and, like it, is a favourite hedge plant for gardens.

Just before sunset we reached Badajos. The station commands the finest view of the city, and from it we had a beautiful and interesting view, the Guadiana flowing between it and us, but spanned by a magnificent granite bridge of 28 arches. The half hour we remained here I spent in wandering around the station, looking for anything of interest; but the sun had done its work so effectually that vegetation seemed entirely destroyed, with one remarkable exception, and that was Euphorbia rupicola, which was abundant, and by its bright green colour and luxuriant growth formed a striking contrast to the parched and arid land on which it grew. On the dried up pasture lands and the stubble fields the dead flower-stalks of Asphodelus ramosus were very numerous, and by no means improved their appearance. Throughout the whole of the Peninsula, as also in Southern Italy, this plant is extraordinarily abundant, and in the latter country the tubers have lately been employed for making alcohol; and there is no doubt that both it and the corms of Colchicum autumnale, so amazingly abundant in most parts of Europe, but especially in Southern Germany, might be profitably used for this purpose, and their employment would in time remove a cause of exhaustion from the soil of the meadows and cornfields, which at present is serious.

Night soon closed in upon us, after leaving Badajos, and passing the Portuguese lines, which, like a series of sentry boxes, stretch right and left as far as the eye can reach. After journeying two nights and a day, the traveller is not in a very observant mood, and I must confess that some hours of daylight were lost by me, so that I was almost in Lisbon before I was aware of it.

We arrived there in time for breakfast, and after that refreshment and a bath, proceeded to view the beautiful city. Leaving our most comfortable quarters—Durand's Hotel—in three minutes we were in the Largo do Camoëns, in which, for the first time, I recognized the extraordinary beauty of the tree Schinus Molle. The large or square is not very large; in its centre is a most beautiful group of statuary, surmounted by a single figure of the poet Camoëns; around the square is a single row of the beautiful Schinus, or Pepper tree, as it is called, from the powerful pepper-like odour of the leaves. At the time I saw them their fine feathery foliage was exquisitely green, and contrasted most beautifully with the profusion of pendulous clusters of coral-like berries, resembling in form bunches of grapes, but in size of berries more like currants; some of the clusters were nearly a foot long. I had seen hundreds of these trees in Southern Italy, but never in their true beauty as I found them here. The public gardens in Lisbon are numerous, and beautifully planted, chiefly with tropical and subtropical plants, such as Bananas, Callas, Maranta, Date Palms, Dracænas, Azaleas, Caladiums, Aloes, Cacti, and many others; the trees planted for shelter and shade are Celtis occidentalis, which is as common as our Elm, Broussonetia papyrifera, Schinus Molle, Gleditschia triacanthos, Ceratonia Siliqua, Cercis Siliquastrum, Pittosporum undulatum, and P. coriaceum, &c. In the Passielo Publico, or principal promenade of the city, there are two magnificent trees of Araucaria excelsa, rising full 60 feet high, with lower branches sweeping the ground. There are two botanic gardens in Lisbon. As I saw nothing in the smaller one, attached to the Hospital of Sao Jose, which I did not see in the extensive one by the Ajuda Palace, I shall confine my observations entirely to the latter.

The Ajuda Botanic Gardens occupy the slope of a considerable hill, and have a south-westerly aspect. They are formed of terraces rising one above another, and reached by broad shady paths and broad flights of stone steps. The lower one is rather an arboretum than a general garden, although the fountains contain collections of aquatics; and many other plants requiring shade, are placed without much order under the trees. The latter are chiefly the common Celtis occidentalis, planted so as to form radiating avenues, and also grown as a hedge plant to enclose small spaces in which various economic plants are reared. Many varieties of Orange and Lemon trees are also scattered about; but the great glory of this lower garden is two gigantic Date Palms, not less than 40 feet high, from which were hanging huge bunches of golden-brown fruit, apparently ripe, but in reality not so, for they do not ripen their fruit in Lisbon. I will now give a list of the plants I specially noticed in the upper gardens, as being either in flower or fruit, attempting no classification, but giving them in the order in which they presented themselves to my notice.

Duranta Plumieri var. flore albo (from India), with white flowers, and very beautiful clusters of yellow berries in great profusion.
Lantana trifolia, lavendulacea, and nivea.
Grewia occidentalis, with handsome purple flowers.
Anona Cherimolia, 10 feet high. it ripens its fruit here.
Ehretea arborescens, with ripe fruit.
Styrax officinalis, 20 feet high.
Pistacia Lentiscus.
Persea fœtens, a large tree, covered with fruit, shaped like acorns; P. indica, and regia, also large trees.
Dracæna Draco, two remarkable specimens; one 6 yards in circumference, the other no less than 30 yards, and laden with large clusters of fruit. The latter is now supposed to be the largest known plant of this species.
Hartogia capensis, an elegant evergreen from the Cape of Good Hope, covered with bloom.
Schinus Areira, from Brazil.
Solanum verbascifolium, a very large bush, covered with fruit.
Cordia martinicensis.
Hex paraguayensis.
Grevillea robusta, with stem 3 feet in girth, and 20 feet high.
Pittosporum Tobira, in fruit, green; P. coriaceum, and undulatum, with the fruit ripe, orange coloured. The last two grow very large, and their beautiful berries render them exceedingly ornamental.
Celastrus lucidus.
Zizyphus vulgaris, laden with fruit.
Viburnum Tinus, of large size, but presenting a remarkable appearance, from its great profusion of fruit, of a metallic purple colour, looking, in the glowing sunlight, like some peculiar kind of bronze.
Gomphocarpus fruticosus.
Aralia papyrifera and japonica.
Aloe plicatilis, enormous plants; one rose about 10 feet high, and had more than 20 woody branches springing from the thick dwarf trunk. The whole plant was about 10 feet diameter
Chamærops humilis, with 10 feet of clear stem.
Schottia speciosa, a small tree in full bloom, forming a very beautiful object
Buddlea Lindleyana, very common about the shrubberies.
Opuntia Ficus-indica, one huge plant growing 12 feet high, the lowest part of the main stem having a girth of 4 feet.
Leonotis Leonurus, a fruticose Labiate, with pretty orange flowers, was common in the pastures.
Eugenia Mitchelii—the Pitungueria.
Laurus australis.
Vitex Agnus castus.
Rhododendron fragrans, a fine large shrub, in flower.
Acacia Farnesiana, small trees, covered with their delightfully-scented flowers.
Aleurites moluccensis.
Erythrina speciosa, a very clumsy-looking tree, but covered with its fine scarlet flowers. These trees were about 12 feet high, and of about 3 feet girth, but very marked, having more flowers than leaves, their ash-coloured gouty-looking stems being all exposed.

The shaded thermometer in the gardens at noon was standing at 101° Fahrenheit. Had it been a little less, my list would have been much longer; but the plants were flagging, and so was I.

Cintra, the "beautiful," is about 18 miles from Lisbon, and during a drive to that place I noticed a few interesting plants, chiefly growing in the quintas or estates in the suburbs of Lisbon itself. In most of the gardens, Bananas were plentiful, and bearing ripe fruit. Mandevilla suaveolens festooned the verandahs. Plumbago capensis was the common garden hedge. Passiflora kermesina covered many fronts, and hung clusters of its fruit from balconies. Two or three species of Erythrina threw up their masses of scarlet flowers above the garden walls, and in the plantations fine trees of the Goa Cedar, Cupressus lusitanica, perfumed the air for a great distance with their aromatic odour. When we came to the open country, the parched fields offered little chance of botanising; still some curious plants occurred at intervals, Cnicus pungens (?) in flower, and here and there Colchicum autumnale; everywhere over the fields the dead stalks of Asphodelus ramosus. On the banks occasionally, Asparagus horridus, A. acutifolius, and A. albus, Mentha Pulegium, and Euphorbium rupicola.

In the gardens of the Peno, on the heights of Cintra, Cephalotaxus Fortunei reaches a height of 40 feet, and about the same height were fine specimens of Araucaria Bidwillii, A. excelsa, A. Cunninghamii, and A. Cookii. A whole plantation of Camellias gave a most beautiful appearance to a large portion of the hill-side, offering a delightful contrast to its rocky peaks by the bright glossy green of their beautiful foliage; under their shade, and scattered amongst the surrounding forest trees, were hundreds of gigantic Hydrangeas covered with flowers.

Emerging from the gardens on to the moor leading to the cork-convent, we travelled on donkeys over an extensive moor covered with stunted Myrtle plants, closely resembling the Myrica of our own moorlands, except that it was in full bloom, and its delicious odour, as we crushed it, was unmistakable. In some of the surrounding quintas, ancient cork trees formed the most conspicuous objects, and were indeed magnificent adjuncts to the landscape. A recent author thus speaks of them:—

"His giant Cork-trees, centuries of time
Have hallowed, and all gnarled and silvered o'er
With age, yet spread they wide their beauties hoar.
Brave, stalwart, and heart-whole, they do divide,
With two great Cedars tall, which still abide
Since the olden time, the honours of the wood,
All waving peaceful there, one loving brotherhood."

From Lisbon I passed by sea to Gibraltar, thence to Tangier and Cadiz. As I have made a separate list of the plants I noticed on the rock, I will now speak of what

I saw in the small glimpse I had of Morocco. The city of Tangier is situated on the steep western bank of the bay, and being a walled city, presents nothing within its walls to attract the eye of the botanist. We unfortunately arrived half-an-hour after sunset in a violent storm, and as the gates were closed for more than an hour after we anchored, the Moors turned a deaf ear to the incessant screeching of our steam whistle, whilst all the time our small steamer threatened to part with her anchor. This she eventually did after we left her. At last two large boats, manned by noisy Moors, who seemed to be endeavouring to shout down the roaring storm, took us off from the steamer, and making for the rolling crest of surf, dashed boldly through it, much to our discomfort, and immediately we were in shallow water, surrounded by a host of half-naked, but powerful men, who carried us on their backs to the shore.

In the morning, before breakfast, we went out of the city by the gate called Bab-el-Sok, to the market place or Sok outside the town. Here I hoped to see the country produce well displayed, as it was the great market day, but there was little of vegetable produce, except a few piles of beautiful Tomatos, Prickly Pears, Brinjals (Solanum Melongena), and Melons. Some small bundles of various kinds of fodder were being sold for, and consumed by, the numerous camels which were lying about on the sandy plain. Smiths, carpenters, saddlers, and others were plying their avocations, and cooking establishments on a very small scale were ministering to the wants of the numerous sellers and purchasers, who seemed to carry on the business of the market in the sleepiest style imaginable. From the market we passed into the country, which, for miles, was all of the same character. Sandhills, with the rock occasionally peeping through, and the vegetation all of one character—Agaves and Opuntias everywhere, the latter of monstrous size, almost approaching to trees. The Agaves were less luxuriant, being often cropped by the camels and mules; myriads of the small Palm, Chamærops humilis, forming hummocks every two or three yards. These, with a few dwarf bushes of Ceratonia Siliqua, and Pistacia atlantica, formed almost all the vegetation left by the burning sun. Near to the sea, however, were extensive patches of the great reed, Arundo Donax, which serves the inhabitants for many useful purposes. One was especially interesting. The Jewish population, which amounts to about a third of the whole, were celebrating the Feast of Tabernacles, and in the patio, or courtyard, of every one of their houses was a pretty square erection of these beautiful green reeds, nicely wattled, and with the long green leaves left on, and always looking fresh as if watered. In these tabernacles they spend some part of each day. We spent the evening in one, at a merry-making in celebration of a betrothal, and listened to monotonous music, and saw strange dances, so utterly different to anything European, that we were much charmed by the novelty of the scene, and its accessories.

A few days after I landed at Cadiz, and after a brief sojourn started inland for Seville, stopping on the way at Xeres, the centre of the great wine district which gives its name to our favourite Spanish wine. Nothing of botanical interest met the eye in this part of the journey, which is 95 English miles; about 12 miles of the commencement of the journey was through the wonderful salines or salt marshes of La Isle de Leon, where salt is made by evaporation, on a scale which is truly surprising; the white pyramidal heaps of this material, often 30 feet high, were so numerous as to give the idea, as we passed rapidly along, of a vast tent-covered plain, and the mind naturally reverted to the days when the flower of the Spanish army embarked from this same spot on the galleons of the Armada, which was intended to enslave our own little island.

We arrived at Xeres at nightfall, and could see nothing of the vegetation except a few towering Date Palms, and the Vine-clad hills just visible in the last rays of the setting sun. We called for sherry, of course, and found it execrable; so bad, indeed, that it made us long for a sixpenny glass at Mugby Junction, and determined us to be champions in future for that much abused liquid. After an hour's stay in the capital of Sherry-land, a time only sufficient to recover from the one glass, we proceeded on in perfect darkness to Seville, which we reached at about half-past nine o'clock; and after the tiresome examinations at the station, we packed ourselves in an omnibus of small dimensions, and with one or two breakdown, reached our hotel in the town, situated in a magnificent square, the Plaza Nueva de la Constitucion, a name with which it had been newly christened. It is a perfect grove of magnificent Orange trees, and at the time of our arrival was a scene of splendid gaiety; a superb band playing, and senhoras in the gayest festa attire, for it was Sunday evening, were promenading and perfuming the air with the profusion of Jasmine flowers worn in their raven tresses; but we had scarcely been ten minutes in our balcony, looking down on the beautiful scene, before an alarm of a revolutionary rising made the promenaders and band fly in all directions in dire confusion.

Early in the morning we were moving, and visited the Alcazua, the most beautiful of Moorish palaces. Its garden is a marvel of beauty; but our time, and the rapidly rising sun, forbade more than a passing glance at it. The most striking thing, however, was the celebrated Orange tree of vast dimensions, and said to be 600 years old. Its stem is split into several, and covers the ground space of a good sized oak. In the courtyards were magnificent groups of Bananas laden with ripe fruit, and indicating that they grew almost spontaneously. We next went through most of the public gardens, and along the Alamanda, but there was little variety in the vegetation—avenues of the tiresome Gleditschias, Celtis australis, and similar trees, overgrown beds of Mirabilis Jalapa of every colour, and many similar plants, sadly in want of proper culture, were all that met the eye; and an early morning's work was brought to a close at 11 A.M. by finding ourselves on the Prado de San Sebastian, in presence of a vast crowd of 20,000 or 30,000 people, and some 5000 military, with a goodly array of artillery, met for the purpose of witnessing the execution of a horrible murderer by the garotte—a terrible scene on a terrible spot, for it was on the same square on which formerly was placed the Quenadera, or fireplace of the Holy Inquisition, where, first and last, its officers, under the conviction that they were serving God, destroyed 34,612 persons by the most cruel of all conceivable tortures. Our next stage was from Seville to Cordova, a pleasant journey through a country of vast cornfields and vineyards, with many Olive gardens. The Dwarf Palm was in wonderful profusion, and occasionally, where the level plain was cut through by ravines of no great depth, the hollows were filled with shrubs, amongst which the Oleander, covered with flowers, was the most conspicuous. Near the small towns and villages, the Pomegranate orchards have a most lovely appearance, far surpassing the most beautiful of our fruit orchards.

At Cordova, in the Court of Oranges of the old Moorish mosque, now the cathedral, the splendid avenues of Orange trees, all of them centuries old, and two stupendous Date trees, were a most interesting sight. The lines of Orange trees in the court corresponded with the lines of pillars, 1096 in number, in the interior.

From Cordova to Granada the scenery is often very grand and beautiful, notwithstanding the enormous extent of Olive grounds, which are not the most lively looking trees; but in this district the traveller is interested in noticing the admirable culture which the Olives receive, together with the apparently boundless extent of the Olive plantations through which the train flies for many hours in succession; and he here begins to understand how the enormous quantities of oil found in commerce are produced; the trees were heavily laden with the fruit, then closely resembling our Acorns in size and colour, but when ripe they are of a rich purple colour, not unlike Damsons, and the pulp is very oily. The harvest, I was told, took place in December. At a place called Bobadilla, a small branch line took us to Antiquerra, whence the diligence carried us by night to Granada. Of course we saw nothing on our journey; but had too many unpleasant intimations that we were going over mountain moors, by roads which scarcely deserve the name; and Granada itself offered nothing new except the beautiful avenues of Elm trees which overshadow the roads up the Alhambra hill; these have an especial interest, for they were planted under the directions of the Duke of Wellington, and were all sent out from England. They have thriven wonderfully, and are evidently quite at home in the cool air of the Sierra Nevada. On our return to Bobadilla, the train conveyed us through scenery of extraordinary beauty, commencing with the magnificent pass Guadalhorce; winding through stupendous ravines, crossing from precipice to precipice, by bridges which seemed in the distance to be aerial, gliding through numerous tunnels, we seemed to have left the cultivated country for a world of bare rocks and mountain sides, unclothed with any kind of vegetation; but after five or six miles of this we emerged into the open, and found ourselves in the glorious plains of Andalucia, the aspect of which was delightful in the extreme; for even the best portions of La Mancha and Estremadura, and even Granada, were so arid and brown that but little real beauty could be discovered in the scenery. Here, however, was a paradise of verdure, wide-spread Orange groves, vineyards, Olive plantations, vegetable gardens, orchards of Pomegranates, the trees bending under the weight of their beautiful fruit, green fields, watered by numerous streams, and, as we approached Malaga, numerous villages, chiefly made up of elegant villa residences and beautiful gardens, the country residences of rich merchants, all glowing with sunshine under a cloudless sky, with the mirror-like surface of the Mediterranean forming the horizon-line. This was the best portion I saw of the vegetation of Spain, the rest of my journey being along the coast by steamer, the political troubles preventing any stay at the various towns on our way to Marseilles.

II. *Botanical Note on the Garden of Monserrat, Portugal.* By T. C. Archer, Esq.——III. *Botanical Notes taken on the Rock of Gibraltar.* By T. C. Archer, Esq.——IV. *Report on the Open-air Vegetation at the Royal Botanic Garden.* By Mr. M'Nab. At the last meeting of the Botanical Society (April 14) I gave a long list of the open-air plants then in bloom. The April meeting generally exhausts all the plants usually quoted, but the extreme backwardness of the season has left a few of them still unnoticed. These I now supplement. The temperature during the past month has never been very low; but vegetation is still very much behind, caused in a great measure by the dry state of the weather which we have recently experienced. The six lowest morning temperatures during the past month were on the 18th, 20th, and 27th April; and 2d, 4th, and 7th May, when the thermometer indicated respectively 31°, 35°, 35°, 34°, 30°, and 33°; while the six highest early morning temperatures were on the 16th, 21st, 24th, and 25th April; and on the 6th and 10th of May, when the markings were respectively 43°, 45°, 44°, 47°, 45°, and 47°. The following Table exhausts the usual list of spring flowering plants, with the dates of their flowering last year:—

	Date of Flowering	Date of Flowering
	1869	1870
Fritillaria imperialis	April 25	March 24
Narcissus bicolor	,, 16	,, 29
Anemone nemorosa	,, 17	April 3
Cardamine pratensis	,, 19	,, 2
Menziesia empetriformis ..	,, 20	,, 1
Ornithogalum exscapum ..	,, 29	May 30
Primula elatior purpurea ..	,, 20	April 3
Erythronium rubrum	,, 21	,, 2
Ornithogalum nutans	,, 28	,, 2

Professor Balfour remarked, in reference to Saxifraga cernua, that although it was believed by some that S. cernua was only an alpine form of S. granulata, yet he doubted Mr. Christie's conclusion, as plants of S. cernua from Ben Lawers had been cultivated in the Botanic Garden for many years, and never changed their normal form. Mr. Sadler thought that, as S. granulata also occurred on Ben Lawers near the place where Saxifragra cernua grew, it was possible that the two species had been collected by Mr. Christie, and got mixed before planting them in pots. Mr. White stated, that as far as his knowledge of species went, he firmly believed that it would be yet fully proved that S. cernua was only a form of S. granulata.—Professor Balfour exhibited growing plants of Salvinia natans, which had recently been sent to the Botanic Garden from Hamburgh, and described its different stages of development and mode of reproduction.—Mr. Sadler exhibited dried specimens of Tupa rhynchopetala, a Lobeliaceous plant from Abyssinia, and called attention to the peculiar structure of its stem, in having a zone of woody cylinders arranged in a network through the cellular bark.

Thursday, June 9.—Sir Walter Elliot, President, in the chair. The following among other communications was read:—I. *Notes on the Ipecacuanha Plant.* By Dr. Gunning, Rio Janeiro; communicated by Professor Balfour. Dr. Gunning states that the Ipecacuanha plant is exceedingly scarce in the province of Rio Janeiro from having been pulled up, and no attention paid to its cultivation. It is exported from Sao Paulo, the province south of Rio, but chiefly from Matto Grosso, a thousand miles up the River Plate. At present Dr. G. is rearing a number of cuttings for transmission to India, where it is proposed to cultivate it extensively.

ROYAL BOTANIC: *August* 10.—The thirty-first anniversary meeting of this Society was held in the Society's house in the gardens, Regent's Park, on Wednesday, Sir Walter Stirling, Bart., in the chair. The annual reports of the Council, auditors, and secretary were read. It appears by these reports that the affairs of the Society are in a satisfactory condition: 124 new Fellows had been elected during the year. The total number of Fellows and members now on the books is 2472. The receipts, which for the three preceding years had not covered the expenditure, had during the year now closing much improved, and exceeded the expenditure by £262 9s. 9d., and the old liabilities of the Society have been reduced by that amount. Several novelties were introduced into the flower shows and fêtes, with marked success. The total number of visitors for the year was 114,776, being about 3000 above that of last year.

The facilities so liberally afforded to artists, students, and others, for the study of living plants, continues to be highly valued; 182 free admission orders for study for periods of three and six months were issued, and 10,712 cut specimens distributed to professors and to schools of design. A series of standard meteorological instruments, including several new forms more nearly relating to horticulture, had lately been presented to the Society, and a systematic course of observations commenced, which no doubt will be of interest to both sciences. H.S.H. Prince of Teck was re-elected President; W. M. Coulthurst, Esq., Treasurer; and the Hon. H. M. Best, Major Platt, and Mr. G. J. Symons, new members of Council. Thanks were voted to the President, Council, committees, and officers, and to the Chairman of the day.

Florists' Flowers.

THE lovers of the show or large-flowered PELARGONIUMS would find a visit to Worton Cottage, Isleworth, in the month of June, a very pleasant and instructive one. There they could see how Pelargoniums of all sizes can and should be grown. Not now an exhibitor, Mr. Wiggins does not grow specimens for exhibition, but he always has a small lean-to house of what is termed half specimens, grown as Pelargoniums should be grown, with a compact, bushy, and yet vigorous habit, and bearing numbers of trusses of fine flowers. Worton Cottage has been so long the home of the Pelargonium that no one wonders to find it still as well done as in the days of Beck's Rosa, Incomparable, and many others that in their day took a high position amang florists. Any one desirous of making a selection of varieties for cultivation would find an excellent opportunity of doing so at Isleworth, as for cross-breeding purposes, apart from other reasons, Mr. Wiggins cultivates all the best leading kinds; and the visitor would also gain some idea how they should be grown.

As respects the general cultivation of the Pelargonium, both for exhibition and decorative purposes, there is much cause for the regret that in the provinces, with a few notable exceptions, the cultivation of these showy flowers is of a somewhat low order. The general appearance of collections of this plant, so highly effective for decorative purposes, whether grown for the exhibition tent or to give life to the conservatory at the blooming season, invariably shows, instead of vigorous short-jointed specimens, lean and drawn-up plants, often sickly from aphides, and having an over-crowded appearance. It is a common fault to grow three plants in the space which one only should be permitted to occupy. Growers sometimes appear to be quite oblivious of the fact that a plant that has sufficient room allowed it, when making its growth, will at the blooming season cover a much greater space with flowers than when so crowded, nor do the plants bloom in fine character, especially when they have to make their growth wholly in the spring.

Provincial shows often, very often, reveal the existence of another evil too common to them—that is, the mistake of over-potting plants. The Pelargonium frequently gets over-potted, instead of having its roots kept within due bounds. Those who are so lavish of

root room lose sight of the important fact that the pots must become full of roots before there can be a fine head of bloom. No doubt many of the long lanky plants frequently met with, with which are almost surely combined imperfect flowers, are traceable to the injudicious practice of starting them into growth when they are throwing up their trusses of bloom.

By the beginning of January, all specimen plants should be in their blooming pots; good plants that break well in October in 48-pots should be repotted into 32-pots to bloom, or small 24's, if root action is too vigorous. Such plants as these will make fine specimens to flower at the end of May or June. Larger specimens require a shift corresponding to their size and requirements.

As far as possible, the exhibitor of the Pelargonium should have a house which can be mainly devoted to its culture. The fine plants seen at the London exhibitions are grown in houses they alone are suffered to occupy; and at times, when a course of special treatment is necessary, it can be applied without risk to other plants.

Year by year Mr. Wiggins raises a batch of seedling Pelargoniums; fancies he does not cultivate, but keeps himself solely to the large flowered varieties. Nearly all the yearling flowers of promise that bloomed in 1869 for the first time have this season answered the highest expectations formed of them, and a batch has been raised and selected for sending out. Some yearling flowers which have bloomed this season for the first time show novelty of character, size of flowers, and high class quality, and Mr. Wiggins has much reason to indulge the hope that next year will give him one of the finest batches of flowers he has ever raised.

The following are the names and descriptions of the 18 new varieties of Mr. Beck's raising Mr. Wiggins will distribute in the autumn of the present year:—Artemus, rosy salmon lower petals, white throat, rich dark upper petals, lit up brilliantly towards the edge. Cecilia, a pretty light flower, with deep maroon spot and veins on the lower petals, dark blotch on top petals, white throat. Cornelia, a large and bold flower, vermilion-rose lower petals, upper petals dark, with bright lining of vermilion; flowers of good shape. Fascination, pink lower petals, with distinct maroon spots on each, upper petals dark, with a well-defined pink edge. Georgiana, deep salmon lower petals, white throat, rich dark blotch on upper petals, with margin of delicate salmon; flowers stout, and of good shape. Henrietta, rosy purple lower petals, veined and slightly blotched with dark, white throat; rich dark upper petals, with an edging of pink. Hesperis, a small but high-coloured flower, of a brilliant scarlet hue, with dark spot on lower, and dark upper petals. Irene, light pink lower petals, upper petals dark, with a margin of pink; a flower of good shape, and a remarkably free bloomer. Letty, lower petals warm pink, white throat, dark upper petals, and edge of pale rosy pink. Lily, a pretty little white flower, with a lovely blotch on the upper petals, becoming paler towards the edge. Lizzie, pink lower petals, veined and blotched with maroon, upper petals rich maroon, with light edge. Lysandra, lively vermilion lower petals, with rich dark upper petals, somewhat deficient in shape, but a remarkably free bloomer. Placida, rosy pink lower petals, white throat, upper petals dark, lit up with bright scarlet as a margin, and edged with pink. Pulcheria, a striking and showy flower, the lower petals warm salmon, with deep scarlet spots, rich dark upper petals, with a well defined edge of bright rose. Rebecca, dark rosy scarlet, rosy petals, upper petals dark, with distinct narrow rose margin, a small but free-blooming and useful flower. Roxanna, rosy vermilion lower petals, upper petals dark, with a lively bright scarlet edge. Vesta, a good sized white flower, upper petals having large blotches of dark crimson, paling off into a broad pale pink margin; and Virginia, a pure white flower, with a distinct deep cerise blotch in the upper petals.

The top sods from a strong loamy soil, full of fibrous matter, stored away for a twelvemonth, added to some thoroughly decayed stable manure, chopped up and well mixed, makes an excellent compost for the large-flowered Pelargoniums. With these can be mingled a little good leaf-mould and some sharp sand, to keep it open. Such a soil as that, together with an intelligent cultural treatment, can scarcely fail to grow good Pelargoniums. *R. D.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Those *Orchids* which have made their growth should now be more exposed to the ripening influences of the sun, and have more air supplied to them than heretofore. So much depends upon the manner in which different houses and different sections of these plants have been treated, that it is rather difficult to lay down any definite rule as a guide in the matter of supplying the necessary amount of heat. It should, however, always be borne in mind that the operator must be mainly influenced by the condition, or rather by the stage of development in which the majority of the plants are. If they are well forward in their growth, the mean temperature may be gently lowered until the usual autumn maximum is gained. This should not exceed—by artificial means alone—70° in the Indian houses, or 60° in those where Mexican and such like cool growing varieties are cultivated. Of course with plenty of sun-heat this may be increased, provided plenty of air is given. In the early morning the mean artificial heat should be from 8° to 10° less than the amount above suggested. In all instances where growth is now being made, as is the case with such kinds as Cœlogyne cristata, Miltonias, Dendrobes, &c., these should be placed in the warmest and most shady parts of their respective houses, and have a supply of water commensurate with their state of activity. Keep all leaf surfaces scrupulously clean by sponging, &c., for now these are engaged in producing the fibre and sap necessary to carry the plants over the approaching season of rest. Look sharply after such injurious *insects* as are often found at this season nibbling the soft points of young growing roots, and especially of such kinds as *Vandas*, *Saccolabiums*, and *Aerides*. Cockroaches and other nocturnal visitors which are hard to be caught are most injurious, and must be destroyed by some means or other. For this purpose I have found pieces of bread and butter upon which honey has been smeared very effective. The pests feed upon this, and if it be elevated upon white deal stakes, which are conspicuous by night, they may be taken when feeding by holding a basin of water beneath the bread, and gently tapping the stick, which will cause them to tumble headlong into the water, as they become so impatient in retreating to a place of security that they do not wait to return by the same path as that they came by. Be particular not to stop or pinch back any *Chrysanthemums* after this date, as to do so will be to destroy the flowers which will shortly form.

FORCING HOUSES.

In all instances where the foliage and wood are well ripened in *Early Vineries* or *Peach-houses*, it will be advisable to remove the lights, so as to admit the sun and air to play freely on them. This will afford the best possible opportunity to cleanse, paint, or reglaze the lights, and to repair or paint the houses if this is deemed necessary. Do not remove any foliage with unnecessary violence, but let the leaves fall off naturally, if time can be allowed for that purpose. In instances where the removal of Peach or Nectarine trees is in contemplation, let those to be removed be stocked up forthwith, and the necessary preparations in regard to renovating the borders, &c., be entered on, bearing in mind that good fibrous maiden loam, of good consistency, is far preferable to any ordinary soil, however much or however good the manure added thereto. In another two or three weeks it will be possible to take the trees up and plant them in these prepared places, as it will not be necessary to wait until all the leaves are off—even though they are deciduous, if proper care be exercised in taking up each tree. *Fig trees* forming a crop, and which have no fruit now ripening upon them, should be frequently and copiously syringed, as very frequently red spider will attack such foliage as has stood the summer through.

HARDY FLOWER GARDEN.

Queen and Brompton *Stocks* should now be transplanted out permanently, or if not sufficiently large into cool nursery beds, moderately shaded. It may be possible in some instances to procure better pipings of *Picotees*, &c., than could be obtained earlier in the season. In all instances where this is so, it should be understood that it is not too late to do so yet. Prick out seedling *Polyanthuses*, *Garden Primroses*, *Pansies*, and similar seedlings, on to a cool, shady, north border. Pot off any rooted cuttings of *Auriculas*, placing them in a cool, shady position, which is free from any kind of insects or slugs, &c., which will find them out, now that we experience dewy nights. Give *Dahlias* a thorough good soaking with manure-water; trap earwigs by the same simple means as suggested above, and tie all the shoots securely to stakes. Sow now *Mignonette* in pots, placing them in a shady place; also *Lobelia*, in pans, for bedding out next spring. Sow also such hardy annuals as *Nemophila*, *Collinsia*, *Limnanthes*, *Erysimum*, *Silene*, &c., watching each narrowly, subsequently, in order to detect at the earliest possible moment any symptoms of unhealthy germination.

KITCHEN GARDEN.

Make now sowings of *Onions* of either the Tripoli, White Lisbon, or Strasburg varieties for spring bulbing, in all instances where size is needed. For quality, and hence all ordinary uses, none are better, however, than the White Spanish, which answers admirably so treated. *Carrots* may likewise be sown on sheltered aspects for spring pulling. Sow also *Cauliflower* for plants to be protected during the winter, to produce the earliest supply next spring. They should be so sown that they may need transplanting before the early winter months arrive, which will make them much more hardy and fitting to stand the hard frosts which may ensue. Make small sowings of *Lettuce* and *Endive* at intervals of a week or ten days apart for the next three weeks. *W. E.*

TOWN GARDENING.

The *Chrysanthemum* will now require special attention; if large blooms are required all side shoots must be removed as fast as they appear. At this season the crown of the plant divides itself into two or more leaders, and in selecting the growers must be guided by the strength of the plant. If it is strong, leave at least three to carry the bloom. The buds will begin to appear during the first and second weeks in August, on the tips of the leaders, surrounded by a cluster of smaller or later buds. If the centre one is sound and plump remove all the small ones, but if it is defective select the next best. If the roots show themselves on the surface of the soil, a top-dressing of rotten dung will be of great service. The plant being a gross feeder requires a great quantity of nourishment at this season, which should be given in a liquid form at least once a day. The manure-water which I recommend is made after the following manner:—Put into a two-gallon watering-pot about 1 lb. of cowdung and half a pint of soot, let it stand for a few hours before using, stirring it several times, and giving it about twice a week. *Pompons* in beds and borders, if growing disorderly, should be tied down; they will look awkward at first, but they will soon right themselves. If pinched back again they will be too late to flower this season. Syringing the tops every fine evening is of great service to the plants. *F. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON, FOR THE WEEK ENDING WEDNESDAY, AUGUST 10, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
August.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
4. Thurs.	29.65	63.5	61.5	61.9	88	6.1
5. Friday	29.58	67.4	64.0	65.1	66	6.9
6. Satur.	29.79	61.8	59.7	57.4	77	5.0
7. Sunday	29.69	64.3	59.6	57.9	83	5.0
8. Monday	29.71	70.0	64.4	57.6	76	5.8
9. Tues.	29.90	65.3	61.3	57.0	75	5.2
10. Wednes	29.94	61.0	58.8	55.0	79	4.8

1870. MONTH AND DAY.	Temperature of the Air.					Wind.		Rain
August.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 59 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
1. Thurs.	72.0	57.0	15.0	64.1	+ 3.8	S.W.	264	0.00
5. Friday	78.2	57.0	21.2	65.9	+ 3.7	S.W. to W.	239	0.00
6. Satur.	81.0	53.5	27.5	61.4	+ 2.3	W. to S.W.	156	0.00
7. Sunday	66.1	57.3	8.8	59.9	— 2.1	S.S.E.	169	0.12
8. Monday	78.1	50.5	27.6	61.8	+ 3.5	N.E.	214	0.13
9. Tues.	76.2	50.0	25.2	60.1	+ 4.9	N.N.E.	252	0.02
10. Wednes	71.4	58.0	13.4	64.0	+ 1.9	N.	271	0.29

August 4 —The amount of ozone was very variable throughout the day. Generally fine.
— 5 —Very fine day.
— 6.—Generally cloudy till night. Fine.
— 7.—Generally cloudy throughout the forenoon. Rain fell steadily during the early morning, and in occasional showers during the remainder of the day.
— 8 —Generally cloudy. Occasional heavy showers.
— 9 —Generally cloudy, but fine.
— 10 —The amount of ozone was very variable throughout the day. Occasional heavy rain.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, AUGUST 6, 1870.

NAMES OF STATIONS.	Temperature of the Air.							Fall of Rain.
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	78.5	53.2	25.4	75.0	57.5	17.5	64.5	0.69
Blackheath ..	81.0	53.5	27.5	77.0	58.8	18.2	65.3	0.15
Bristol	75.9	51.5	24.4	71.2	57.7	13.5	63.6	0.83
Birmingham ..	80.6	51.0	29.6	77.6	50.5	21.1	63.2	0.14
Wolverhampton	79.7	51.0	28.7	76.0	50.1	19.8	63.3	0.41
Leicester ..	81.7	51.0	30.7	81.4	57.1	24.3	67.7	0.00
Norwich	81.0	57.0	24.0	75.9	59.4	16.2	65.6	0.03
Nottingham ..	81.2	50.8	31.4	79.6	57.2	22.4	68.0	0.00
Sheffield	79.2	50.0	29.2	78.4	57.4	21.0	66.1	0.00
Liverpool	82.7	52.4	30.3	78.0	58.0	20.0	66.2	0.68
Manchester ..	..	..	..	..	..	..	..	..
Salford	83.5	49.9	33.6	81.2	57.0	24.2	67.3	0.00
Bradford	78.8	55.5	24.3	76.5	58.7	17.8	66.0	0.05
Leeds	80.0	52.0	28.0	76.9	57.7	19.2	65.3	0.03
Hull	79.0	56.0	23.0	73.7	59.9	13.8	66.8	0.04
Newcastle ..	77.0	52.0	25.0	69.2	54.8	14.4	58.7	0.01
Edinburgh ..	75.7	52.0	23.7	..	..	..	60.1	0.20
Glasgow	75.1	51.8	23.3	..	..	..	61.1	0.61
Dundee	69.0	51.0	15.0	..	..	..	58.8	0.05
Aberdeen	70.8	51.1	19.7	..	..	..	59.3	0.01
Paisley	77.5	52.0	25.5	..	..	..	60.5	0.65
Greenock	77.5	55.0	17.5	..	..	..	61.0	1.00
Leith	71.0	52.7	18.3	..	..	..	58.0	.7
Perth	70.0	51.0	20.0	..	..	..	62.1	0.03
Dublin	..	..	..	..	..	..	..	..

JAMES GLAISHER.

Notices to Correspondents.

ACHIMENES: *W. Bull.* Your seedlings, Admiration and Masterpiece, are very fine acquisitions of the grandiflora type.

AMATEURS: *Second Prize.* A man who grows florists' flowers, such as Fuchsias, Cyclamens, Pelargoniums, &c., and has a running advertisement in the leading gardening journals, and sells at trade price, is a dealer, and

cannot be an amateur; and such a person ought not to be allowed to exhibit as an amateur at a local show. Your remedy is to represent the facts to the managers of the show.

BOOKS: *S. D.* Williams' "Select Ferns."

COLEUS: *J. C.* It is impossible to name the varieties of Coleus, which are as numerous as florists' flowers, without having at hand a full collection for comparison. Probably your No. 3 is Queen Victoria; 5, Prince of Wales; and 6, Her Majesty.

DOUBLE HOLLYHOCK: *H. M.* The flowers are not only double, but have secondary flower-buds in the axils of the petals (axillary prolification).

EXHIBITING FRUIT: *Hortus.* A "miscellaneous collection" of fruit, open to all England, and not to exceed 3 dishes, such as you state, is invited at some country show, is surely an oversight; especially as you state that in the neighbourhood there are several gentlemen's seats, with good gardens.

FERTILISATION OF HOYA: *C. P.* This is effected by insect agency. You will find an elaborate account of the structure of the organs and their functions in a classical paper on Asclepiadeæ in Robert Brown's "Miscellaneous Works," vol. i., p. 529, Ray Society's edition.

GLOBE WHITE HIP ROSE: Messrs. Godwin, Ashborne, will be greatly obliged by the cuttings of Globe White Hip Rose "Old Subscriber" kindly offers.

GLOXINIA: *S. Nairn.* Your seedling is a promising one, of the drooping section, of good substance, blush white, with very rich crimson marking on the lower part of the throat. If the plant is in good condition, send it to the meeting of the Floral Committee, at South Kensington, on Wednesday next.

INSECTS IN ASH-TREES: *E. S.* The mischief is done by a small beetle (Hylesinus Fraxini), which is a native of Britain, but, so far as we know, never multiplies to such an extent as to do serious damage. On the Continent its ravages are sometimes considerable. The specimen sent is a very beautiful example of their work; and as the opportunity does not often occur of getting such good specimens in this country, it would be very obliging if "E. S." would send us some more for the Royal Horticultural Society's collection. *A. M.*

JUDGING PLANTS: *Justice.* It is impossible to decide on the merits of two competing specimen plants without seeing them. As you put it, the Stephanotis would seem to be the best; but we have not heard the other side.

LILIUM AURATUM: *Ignoramus.* In the way of the variety named rubro-vittatum; but there are better forms extant.

LILIUM TIGRINUM FLORE-PLENO.—We omitted to mention (at p. 1061) that this plant, exhibited by George F. Wilson, Esq., at the last meeting of the Floral Committee, received a First-class Certificate.

NAMES OF PLANTS: *M. E. F.* 1. An Anchusa, near A. calcarea, Boiss., but we do not match the species; 2. Solidago altissimum or S. neglectum; 3. Symphoricarpus racemosus, variety; 4. Solidago lanceolata.—*R. G.* Rhus cotinus,—the Wig Plant. South Europe. —*Constant Reader.* 1. Dolytaenia fœniculacea, Miquelon. Filix-fœmina; 3. Missing; 4. Eriophorum polystachyon.—*J. Silver.* Scolopendrium vulgare supralineatum, a well-known variety.

NEW PEAS: *F. T.* Evershed's West Surrey Marrow, of which you send a sample, is a fine variety, but it was too old for us to pronounce a definite opinion on its quality. Evershed's Munsted Marrow is, so far as we can judge, not so good a Pea as the other. Both require to be judged in a moister season than this has been. We advise you another season to send samples to the Fruit Committee of the Royal Horticultural Society.

OXFORD SHOW: *H.* writes in confirmation of our statement that few in Oxford knew the whereabouts of the show, and suggests to the Society the policy of, "advertise, advertise." "H.'s" Cherries are very fine. The Bigarreau Napoleon always produces large fruit, sometimes larger even than those sent.

PHALÆNOPSIS: *F. W. B.* The seeds appear to us perfect, but were dried up when we received them. Fresh seeds will probably germinate.

POTATOS: *H. S.* Your tubers are badly affected with the scab, a disease which is not considered very destructive. It is difficult to say what causes it. One or both of the suggestions you mention may have been the agent, as both are more or less suspected, according to circumstances.

SILK: *E. D. C.* asks what she ought to give an ounce for winding silkworms' silk, and if 12 or 16 oz. go to a pound for the silk? Perhaps some correspondent will oblige "E. D. C." with the necessary information.

SILVER FIRS: *Old Subscriber.* We should not anticipate any injury to your proposed plantation of Silver Firs from the accidental agricultural dressing of lime which has been given to the ground, especially if it is well worked before planting. They would be far more likely to suffer from drought if the situation is at all a dry one. We should have the ground deeply forked over before the winter, and left as rough as possible till spring, when you propose to plant.

SIZE OF FLOWER POTS: *Marquis.* There is no definite standard, or rather each maker abides by his own standard, and hence arise slight variations in size.

VANDA CATHCARTI: *F. W. B.* Your sketch is in the hands of the engraver; please send the sketch of the Phalænopsis.

WILLOW STEM PERFORATED WITH HOLES: *J. D.* Probably the work of some insect larva. Send a small piece of the wood, and we may be able to tell you what has caused the damage.

COMMUNICATIONS RECEIVED.—Will *H. & H. Weeks* be kind enough to be more explicit.—J. A. Newstead (thanks).—F. R. S.—Bromus.—C. P. G.—M. A. Felix.—A. F. B.—W. E. K.—S. N. & Son.—J. H. P.—F. C. P.—R. D.—H. H. D.—W.—W. H. P. apply to Messrs. Veitch.—A. T.—W. B.

Markets.

COVENT GARDEN.—Aug. 13.

There is scarcely any alteration worth noting in the state of the market. The supply of fruit, however, is beginning to fall off. Apples and Pears are abundant and cheap, the former comprising Williams' Bon Chrétien, Jargonelles, and Beurré d'Amanlis; the latter Nonsuch, Astrachan, and the Hawthornden. Amongst flowers we have Balsams, Pelargoniums single and double, Gladioli, Heaths, Coleus, Hydrangeas, Fuchsias, Crassulas, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz.	2 0	4 0	Oranges, per 100	8 0	to 12 0
Cherries, per doz. lb.	3 0	6 0	Peaches, per doz.	6 0	—12 0
Grapes, per lb.	3 0	6 0	Pears, per doz.	1 6	— 3 0
Lemons, per 100	6 0	—12 0	Pine-apples, per lb.	3 0	— 6 0
Melons, each	2 0	— 6 0	Strawberries, p. lb.	..	— ..
Nectarines, per doz.	4 0	— 8 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, p. doz.	2 0	— 4 0	Horse Radish, p. bun.	3 0	to 5 0
Beet, per doz.	2 0	— 3 0	Leeks, per bunch	0 2	— 0 4
Cabbages, p. doz.	1 0	— 1 6	Lettuce, p. score	1 0	— 2 0
Carrots, p. bunch	0 4	— 0 8	Mint, per bunch	0 3	— 0 6
— young, p. bun.	1 6	— 2 0	Mushrooms, p. pott	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch	0 4	— 0 9
Celery, p. bund.	1 0	— 1 6	Parsley, per bunch	0 2	- 0 4
Cucumbers, each	1 0	— 1 6	Peas (shelled), p. pint	0 4	— 0 6
Endive, per doz.	1 6	— 2 0	Potatos, new, p. lb.	0 1½	— 0 2
French Beans, per sieve	2 0	— 3 0	Radishes, per lb.	..	— ..
Do., retail, p. lb.	0 4	— 0 6	Spinach, p. bushel	2 0	— 3 0
Garlic, per lb.	0 0	- ..	Radishes, per doz.	1 0	— 1 6
Herbs, per bunch	0 2	— 0 4	Turnips, yng., p. bun.	0 9	— 1 0

Potatos, York Regents, per ton, 140s. to 180s.: Flukes, do., 200s.; new round, 5s. to 7s. per cwt.: new kidney, 7s. to 10s. do.

SHAW'S TIFFANY.

For Samples and Prices apply to

J. SHAW AND SON, 20, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TARRED MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.

JAS. ANDERSON & CO., 7, Commercial Street, Shoreditch, London.

Indestructible Terra-Cotta Plant Markers.

MAW AND CO'S PATENT.—Prices, Printed Patterns, and Specimens post free on application. Illustrated also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 1s. per 1000, or 1000 for 10s. 6d., with delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN TISHER AND CO., Label Works, Boston, Lincolnshire.

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H. FREEMAN AND SONS, HORTICULTURAL Builders and Hot Water Apparatus Manufacturers, 106, Mare Street, Hackney, E. Good substantial-made GREENHOUSES, of the most approved design, complete in all the woodwork, glass, and fittings, as follows, viz.:—

10 feet by 8 feet	£12	12 feet by 10 feet	£18	
12 feet by 8 feet	£14	15 feet by 10 feet	£20	

CONSERVATORY in stock, 30 feet long, 18 feet wide, £110. Estimates given for any branch in the above line, in Wood or Iron.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural District in England. For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.: and Steam Plough Works, Leeds.

GARDEN WIRE WORK, consisting of ARCHES EXHIBITION FLOWER STANDS, &c.

GARDEN VASES	.. ..	10 6d to 20s
GARDEN ENGINES	.. ..	20s 6d to 100s
GARDEN WATER BARROWS	.. ..	45s 0d to 90s
GARDEN ROLLERS	.. ..	45s 0d to 70s
GARDEN CHAIRS	.. ..	15s 0d to 30s
GARDEN SEATS	.. ..	15s 0d to 90s

GARDEN TOOLS and WATERING POTS.

TIMMS'S PATENT WIRE NETTING, 2d. to 13d. per yard.

To cut 10 inches, 4 yards; 12 do., 4 yds.

Suitable for a Lady.

To cut 14 inches, 5½ yards; 16 do., 6 yds.

Suitable for a Man.

PATENT ARCHIMEDEAN LAWN MOWERS

Twenty-inch, £4 5s.; 24-inch, £4 15s.; 30-inch, £5 15s.; 36-inch, £6 15s.; 42-inch, £7 10s.; 48-inch, £8 8s.

WILLIAM S. BURTON, Furnishing Ironmonger, by appointment, to H.R.H. the Prince of Wales, sends a CATALOGUE, containing upwards of 850 illustrations of his unrivalled Stock, with Lists of Prices and Plans of the large Show-Rooms, post free.—39, Oxford Street, W.; 1, 1A, 2, 3, and 4, Newman Street; 1, 2, and 3, Perry's Place; and 1, Newman Yard. The cost of delivering Goods to the most distant Parts of the United Kingdom by Railway is trifling. WILLIAM S. BURTON will always undertake delivery at a small fixed rate.

WANTED, a PARTNER, for a nearly new Nursery of about 6½ acres, with Residence, Cottage, Stable and Coach House. An unexpired Lease of 13 years.—C. P., Cudgers' Hall, Lect Street, E.C.

WANTED, a WORKING FOREMAN, for a Small Nursery, in a North-western County. Must understand Budding and Grafting Rhododendrons, Roses, and Fruit Trees; also Layering and Grafting Rhododendrons, Roses, and Fruit Trees; also Layering out and Planting Out Stock. Apply by letter, in own handwriting, stating wages expected and all particulars, to D., Nurseryman, Bridge Street, Northallerton, Yorkshire.

THE REV. S. REYNOLDS HOLE, Caunton Manor, Newark, WANTS a GARDENER, whose heart is with his work, and who thoroughly understands the Culture of Stove, Greenhouse, and Garden Fruits, Flowers, and Vegetables. An Under Gardener is kept, and a Labourer employed when necessary. Wages, £20 per week, lodging, and prize-money, except for Roses. It will be useless to apply without a reference to some well-known Gardener or Florist.

Nursery Trade.

WANTED, a thoroughly experienced and efficient MAN, to take charge of Fruit Trees and Evergreens, who cannot produce the highest testimony as to ability and character for Integrity, Sobriety, Steadiness, and Attention to Business.—Messrs. T. W. Waters, Fraser, Good & Co., 82, Bishopsgate Street Within, London, E.C.

WANTED an experienced PROPAGATOR and GROWER of PLANTS for MARKET.—Mr. M., 15, Sydenham Park, London, S.E.

SEED TRADE.—JAMES DICKSON & SONS REQUIRE for their Seed Warehouse a respectable, painstaking, and experienced MAN, who thoroughly understands Agricultural Seeds, and can very correctly Execute and Despatch Orders. If a married Man, with no family, or without young children, a dwelling-house could be provided. When applying, send all particulars as to age, experience, salary expected, &c.—Edgar Street, Chester.

SEED TRADE.—JAMES DICKSON & SONS REQUIRE an experienced young MAN, who can expeditiously and very neatly and correctly Execute Vegetable Seed Orders. Apply, in own handwriting, stating age, experience, salary expected, &c.—Edgar Street, Chester.

WANTED, a good WORKING GARDENER, for Kitchen, Fruit, and Flower Gardens. One Man under him. Wife to take Dairy.—M. C. M. SWABEY, Esq., Langley Marish, Slough.

Seed Trade.

WANTED, a YOUTH, about 17, in a Seed Establishment in the West of England. A capital opportunity for improvement.—Apply, stating salary and all particulars, to J. G., *Gardeners' Chronicle* Office, W.C.

Seed Trade.

WANTED, an experienced Man, as SHOPMAN, to take Entire Charge. Apply, in own handwriting, stating where previously employed and salary required, to C., *Gardeners' Chronicle* Office, W.C.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

FISHER HOLMES AND CO. can with confidence recommend to notice several experienced GARDENERS, of undoubted abilities, varying in qualifications, whose characters will be satisfactorily answered upon inquiry.—Handsworth Nursery, Sheffield.

GARDENER (HEAD), age 32, married.—T. C. SAGE begs to offer his services to any Nobleman or Gentleman requiring a thorough practical Man. Can be well recommended.—T. C. SAGE, Gr. to Sir E. C. Dering, Bart., Surrenden Dering, Ashford, Kent.

GARDENER (HEAD).—The Advertiser possesses a very superior knowledge of the Growth of Grapes in and out of pots, Melons and Cucumbers in Frames, Pits, or Houses. A first-class Mushroom grower, Kitchen and Flower Gardener. Can Draw Plans of Lawns, and manage Seed if required. Served in last place 9 years.—H. S., 5, Packenham Street, Gray's Inn Road, London, W.C.

GARDENER (HEAD).—Age 33; thoroughly experienced in the Culture of Pines, Vines, Peaches, Melons, and Cucumbers, and in Stove and Greenhouse Plants, Orchids, &c., also Kitchen and Flower Gardening, and the Formation and Alteration of same. Highly recommended.—Gardeners' Chronicle Office, and previous employers.—C., Messrs. J. & C. Lee, Royal Vineyard Nursery, Hammersmith, W.

GARDENER (HEAD).—Age 36; experienced; has lived five years in his last situation, and has had the entire Management of a large Garden, and thoroughly understands the Forcing of Grapes, Pines, and Peaches; has also had considerable experience in Stove and Greenhouse Plants. Satisfactory references as to character can be given.—DONALD ROBERTSON, Belsfield, Windermere.

GARDENER (HEAD, or SINGLE-HANDED).—Young, steady, industrious; thoroughly practical in every branch of the profession. Character indisputable.—Address, with full particulars, G. Z., Post Office, Great Bourton, near Birmingham.

GARDENER (HEAD, or good SINGLE-HANDED).—Age 30, married, no one else kept; has had 18 years in all parts of the Garden, charge of Cattle and Poultry, and Meadow and other Land. Good Character.—W. BLIZARD, 18, Bellevue Terrace, Seven Sisters' Road, London, N.

GARDENER (HEAD), where three or more are kept. —Age 30, married; thoroughly practical in all branches of the profession. Can be highly recommended.—T. S., Mr. Morgan's Library, Lewisham, Kent.

GARDENER.—Age 26, single; understands Gardening in all its branches. First-class character from present situation.—Mr. A. A. JAMES, Nurseryman, Lower Norwood, Surrey.

GARDENER.—Age 50, married; experienced and thoroughly practical. Good references.—Mr. J. MORSE, Nurseryman, Dursley, Gloucestershire.

GARDENER.—B. S. WILLIAMS will be glad to recommend to any Lady or Gentleman requiring a first-class Gardener a Man whom he has known for several years, and can testify as to his abilities; he held the position of Pulil and Gardener in last situation. He can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

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GARDENER (UNDER).—A Young Man offers himself for Garden good Gardener, for one year, in all branches of the profession can be learned. Will pay a Premium of £5—I. W., Leatherhead, Surrey.

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SEED TRADE.—Wanted, a situation in a Seed Warehouse, by a Young Man, aged 26. Accustomed to the Agricultural Trade. Salary moderate. Good references.—J. J., 15, Upper Emerton Street, Caledonian Road, London, N.

TO FLORISTS, &c.—Wanted, by a young Man, a situation in a Florist's and Nurseryman's Establishment. Has had practical experience, and has a good theoretical knowledge of Botany. Can give the most respectable references.—A. B., Messrs. Cummins Wilson, Chemists, Bath.

SEED TRADE.—Mr. SCOTT can recommend a YOUNG MAN, age 21, who has been accustomed to the Nursery and Seed Departments, and who will not object to be partly employed in the Nursery.—For further particulars apply to Mr. SCOTT, The Seed Stores, Yeovil.

TO NURSERY GARDENERS.—A Young Man wishes to place himself in a Nursery Garden for 12 or 18 months. A small Premium would not be objected to, for a commencing salary.—C. G., 1, Doddington Grove, Battersea Park, London, S.W.

IMPROVER, in a Gentleman's Garden, for 2 years.—Age 22, steady and respectable. A Premium given.—WILLIAM MITCHELL RUSH, 74, High Street, Wandsworth, Surrey, S.W.

IMPROVER, in a Nobleman's or Gentleman's Garden. Age 22; Premium given. Good references.—R. D., Newington, Hythe, Kent.

To Gentlemen's Gardeners.

IMPROVER, in a good Garden.—Age 16; has had four years' practice. A Premium will be given.—J. SHEPHARD, Fetcham, Leatherhead, Surrey.

SHOPMAN.—Single; 15 years' experience in all branches of the Seed Trade and Florist business. Good reference.—H. H., T. Pestridge's, Seedsman, Greenway, Uxbridge.

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REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.

"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in recommendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentage of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,

(Signed) "AUGUSTUS VOELCKER.

"The Secretary, REES AND CO'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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FLORIST'S PREMISES, TO BE LET, on Lease, with every convenience, Proprietor having a Farm. Excellent Business has been done. No premium. Fixtures only about £80. An excellent opportunity.—B. B., Mr. Samuels, 20, Westbourne Grove, W.

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AN ELIGIBLE PROPERTY, consisting of an excellent new Eight-roomed House, Three Acres of Land, well stocked with Fruit Trees, and about 15,000 feet of Glass Houses; which can be LET on LEASE, with immediate possession, for 25 years unexpired; or the same SOLD. Situated within 10 miles of London.
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TO BE DISPOSED OF, on LEASE, GOODWILL and FITTINGS of an OLD-ESTABLISHED SEED BUSINESS, in a leading thoroughfare in the City. Rent very moderate, a portion of the Premises being let off.
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TO BE LET, with immediate possession, a most eligible NURSERY GROUND, containing Six Acres, with Cottage and Greenhouse, pleasantly situated in the West Riding of Yorkshire. To a thorough practical person this is a most excellent opening for doing a first-class and profitable trade. The present Stock to be taken at a valuation. For particulars, address,
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Fifty-seven and a quarter Acres of FREEHOLD and TITHE-FREE MARKET-GARDEN GROUND, GLASS, and PACKING SHED, and sound investment, that will yearly increase in value; a portion would afford a good site for a Public Institution.

MR. EDWARD SAUNDERS has received instructions to SELL, 57¼ acres, in one lot, of first-class FREEHOLD MARKET-GARDEN GROUND, consisting of a deep loamy soil, well drained, and in a high state of cultivation, about half of which is planted with healthy, thriving, choice, and carefully selected Apple, Pear, and Plum Trees, and Fruit Bushes. The property, which is known as Lord's Field, and is situate about 1 mile from Harlington Corner, and 1½ mile from East Bedfont, having a frontage of about 750 feet to the high road leading from West Drayton to Bedfont, will be forthwith offered for Sale, and Tenders for the purchase thereof are to be sent to Mr. EDWARD SAUNDERS, Land Agent and Surveyor, 20, Bridge Street, Westminster, on or before September 1.
Forms of Tender will be sent on application to the Surveyor, at whose office a Plan can be seen.—The Bailiff at Heathrow Hall will show the land.

SALES BY AUCTION.

To Horticultural Societies, Archery, Croquet, and CRICKET CLUBS, and the PUBLIC GENERALLY.

MR. O. SHELLARD is instructed to SELL by PUBLIC AUCTION on the Race Course in the city of Hereford, at the close of the Horticultural Society's Show on THURSDAY, August 25, Two Large EXHIBITION TENTS (100 feet by 60 feet, and 60 feet by 30 feet respectively); 24 TABLES, of 12 feet each, on Trestles; a large quantity of GREEN BAIZE TABLE-COVERING; 8 dozen zinc SHOW STANDS (painted green), of various sizes; and other articles.
Sale at half-past Six o'Clock, P.M., punctually.

Buckland Annual Sale.

MR. STRAFFORD begs to announce that the ANNUAL SALE of SOUTHDOWN RAMS and EWES, with a few young BERKSHIRE PIGS, and SUFFOLK CART HORSES, bred by and the property of Sir N. W. Throckmorton, Bart., will take place at Buckland, on THURSDAY, August 18. A few of the Rams will be Let for the Season.
Catalogues, with particulars, may be had on application to Mr. STRAFFORD, 41, Euston Square, London, N.W.; or of Mr. WILLIAMS, Buckland, near Faringdon.

Sale of Messrs. Mitchell's Herd at Alloa.

MR. JOHN THORNTON will SELL by UNRESERVED AUCTION, on THURSDAY, August 25, at Alloa, by Stirling, N.B., the entire HERD of first-class SHORT-HORNS belonging to Messrs. Mitchell. It has been bred for many years from some of the best sources; several first-class Bulls having been hired from Warlaby, so that many of the animals have upwards of four crosses of pure Booth blood on strains that trace back to the days of the Brothers Colling. The Cattle are of large size, very symmetrical, with great substance, and of fine quality. In the Showyard they have been most successfully exhibited; Mistletoe and Blue Bell are well known Prize Cows, the latter won 3 Cups at the last Birmingham and Smithfield Club Shows, and this year gained the 1st prize at the Stirling Show, and challenge cup for the best cow or heifer in milk.
Three first-class yearling Bulls will be Sold, the property of the Earl of Dunmore. Also will be offered the entire FLOCK of pure BORDER LEICESTER SHEEP, bred for many years on both sides from the Polwarth blood.
Catalogues with pedigrees may be had of Messrs. Mitchell, Alloa, N.B.; or of JOHN THORNTON, 15, Langham Place, London.

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.
DIRECTORS.

Thomas Chapman, Esq., F.R.S.	The Right Hon. Viscount Combermere.
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Agricultural Drainage and Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.

Tenants may, also, by arrangement with their Landlords, procure the execution of such improvements.

The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge in 31 years, or at the option of the Landowner in a shorter term.

No investigation of title necessary, and no legal expenses incurred.

Application to be made to ARTHUR MILMAN, the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

THE LANDS IMPROVEMENT COMPANY.—
(Incorporated by Special Acts of Parliament.)
DIRECTORS.

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The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Owners in fee of their own Lands.

The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.

No investigation of title is required.

For forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

BIRMINGHAM HORSE SHOW—SIX HUNDRED AND FIFTY POUNDS in PRIZES.—The FIFTH GREAT HORSE SHOW will be held in BINGLEY HALL on TUESDAY, WEDNESDAY, THURSDAY, and FRIDAY, August 16, 17, 18, and 19. Admission—On Tuesday, from 9 to 4, 5s.; after 4, 1s. On Wednesday, from 9 to 2, 2s. 6d.; after 2, 1s. On Thursday and Friday, 1s. For Excursion Trains see the Companies' Bills and Time Tables.

STAFFORDSHIRE AGRICULTURAL SOCIETY.
WALSALL MEETING, SEPTEMBER 20, 21, and 22

In addition to the usual Prizes for Stock, Produce, &c., offered for competition within the limits of the Society's operations, Special Prizes of £25 and £15 for the best and second best Stallion for agricultural purposes, also Prizes for Poultry and Implements, are open for competition to the United Kingdom.

ENTRIES CLOSE AUGUST 20.

Prize Lists and Forms of Entry are now ready, and may be had on application to the Secretary,
W. TOMKINSON, Newcastle, Staffordshire.

Condition of the Fruit Crops, 1870.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE of SATURDAY, August 20, will contain a FULL and PUBLIC STATEMENT of the CONDITION of the FRUIT CROPS throughout the UNITED KINGDOM
Order of any News Agent. A Single Copy sent for Six Stamps.
Published by W. RICHARDS, at the Office, 41, Wellington Street, Strand, W.C.

The Agricultural Gazette.

SATURDAY, AUGUST 13, 1870.

THE returns from our correspondents in other pages do not give a very encouraging report of the year's harvest. Taken numerically, and classed under the lists of "average," "under average," and "over average" returns, respectively, they represent a poorer produce of all kinds of grain than we have had for some years. But an important correction must be made of any merely numerical estimate of this kind. These reports are not of equal value. Taking the Wheat crop especially into account, the returns from the clay land districts are more important than those from light land districts; and the former are generally good, though the latter are universally unfavourable. We believe, therefore, that the Wheat crop is not so bad as a mere enumeration of the several returns would make it out to be. It must, however, unquestionably be pronounced below an average crop, upon the whole; and all other spring-sown grain crops, excepting the Barley crop in Scotland, and perhaps the Pea crop throughout the country, are still more below an average. The hay crop is the shortest ever known; and green crops generally, although there is a more than usually full and even plant of Turnips, are stunted for want of rain. Neither in its return of food for man, nor in its promise of food for beasts, does the harvest of 1870 compare favourably with its predecessors. The following is the tabular classification of our returns:—

CROP RETURNS—HARVEST, 1870.

	Wheat.	Barley.	Oats.	Beans.	Peas.
Average	67	55	21	25	62
Over average .	16	12	6	4	7
Under average ..	40	57	93	72	16

We add that many returns are arriving as we go to press, too late for publication this week. They will be given next Saturday.

A COMPLAINT has been made in our columns alleging unfair "play," in that only one side of the sewage controversy has been represented in the *Agricultural Gazette*.

It is unquestionable that so well fed an animal as man ought to be good farm stock. Both sides to the controversy readily admit that. Compared with the sheep, he is both better fed and he takes less out of his food. Take any given human population; its average weight is a pretty constant quantity, and it increases in number not more than 2 per cent. per annum. The total weight of the population of England increases annually not more than 2 per cent.; that is all that "man" saves out of his year's food in this country. On the other hand, the total weight of a flock of sheep will increase in weight from 40 to 60 per cent. in the same time. There is a smaller waste of poorer food in the case of sheep than there is in the case of man, and yet the former is the best farm stock we have for maintaining the fertility of the land, and the latter is, in this respect, virtually good for nothing. What can be the explanation of the anomaly? It is plain enough. The whole excrement of the sheep-fold is deposited on the land which it is to benefit, while the whole waste from our houses finds its way into the river. It is this outrageous waste, and the great nuisance which is thus created, that has induced the Government to appoint a Commission of Inquiry into this subject, upon whose reports some legislation may ensue which shall forbid both the loss and the offence. Two Commissions have been thus engaged inquiring in various parts of England and Scotland into river pollution by both houses and factories, and four or five reports have been published. It has been their duty to inquire into various causes of river pollution, and as to all possible remedies; and seeing that most of these waste materials have an agricultural value, it has been our duty to lay before our readers the conclusions at which they have arrived. These conclusions have been almost uniformly of one kind, namely, that the only way in which to collect all the waste material from either house or factory is to load it on a self-acting carrier like water; and the only way in which to distribute the whole of the water, thus fouled, over the land which ought to receive it, is by ordinary irrigation.

The fact is, the greater part of this waste matter is actually laden on water, whether we will or no. The food brought into a town may be said all to leave it in the various waste results of the life which it has fed. Some is burned up in the lungs, and is breathed into the air; the remainder, diluted with 20 to 30 gallons daily per head of the water which the town supplies to its inhabitants, and with 20 to 30 inches of rainfall annually over the town area, is washed to waste. No doubt in towns where water-closets are not usual, a certain amount of filth is collected into cesspools and carted to the manure depôt, and so by rail or canal it finds its way to neighbouring farms, and a considerable area around such towns is thus benefited. But cesspools drain into sewers, and all chamber refuse finds its way into sewers, and five-sixths of the manure value of what Mr. MECHI calls "manfold" thus escapes. Indeed the sewage of Manchester, a town where water-closets are not common, is thus almost as strong as that of London, where they are universal.

In the face, however, of facts like these there has always been a school of manure economists, who declare that water-closets ought to be abolished, and that by well organised scavenging it is possible to cart away the whole refuse of a population—or, if the drainage-water should still carry filth to waste, it can be precipitated so perfectly that the effluent water shall be no longer a nuisance.

The last of the schemes founded on this idea is the so-called "A. B. C." remedy for the sewage nuisance—these letters being the initials of Alum, Blood, and Clay, the principal ingredients on which its efficiency depends. This method has obtained so strong a hold of public opinion that it has properly been made the subject of a special inquiry and special report by the Rivers Commissioners. It was not their business to condemn this process, but to investigate it. They would have welcomed its success, for it fitted well to the existing circumstances of many large towns; and had it been successful it would have enabled them, at comparatively little cost, to abate the nuisance in their rivers. But the report of the Commissioners is conclusively against the scheme. They find that it does not purify the sewage, nor does it throw down a valuable manure. We have published these conclusions and are

accused of unfairness; but we cannot help the conclusion of the Commissioners—they could not help the conclusions to which their investigation led. No doubt the sewage water can be clarified with or without the "A. B. C." ingredients, but it cannot be purified. The process does little else than merely throw down the suspended matter, which is nearly valueless. Every pound of it has been rattled through the sewers of a town, carried along in about a ton of water. What can it be worth at the end of its journey?—it has been washed to utter worthlessness. The effluent water is just as valuable with that out of it, and just as mischievous also. That is the conclusion to which the inquiry has led HER MAJESTY'S Commissioners, and accordingly we do well strongly to advise all towns plagued with their sewage nuisance to think well before they spend their money on this alleged remedy for their difficulties. And we do well to advise all intending purchasers of "A. B. C." manure—if the opinion of the Commissioners does not altogether change their minds—at any rate to be satisfied with its trial on a merely experimental scale.

—— PRICES remained unchanged on Monday in Mark Lane. New Wheat commanded extremely varied prices, according to condition. On Wednesday, prices rather fell. —— At the Metropolitan cattle market on Monday there was a short supply, and a good demand quickened trade. On Thursday, notwithstanding a much larger supply, Monday's prices were maintained.

—— On the proposition of M. LEFEBVRE DE SAINTE MARIE, Director of Agriculture, the Minister of Commerce and Agriculture has appointed a Commission to inquire into the probable value of the Urtica tenacissima as a plant for culivation in France. This variety of China Grass is known also under the name of Ramié, or Ramii; it came originally from Java, and is cultivated with success in India, China, Texas, and Louisiana. It possesses these advantages over its relative, that it produces more stems, and yields a strong and very silky fibre, with mother-of-pearl-like reflections. It has of late years been introduced into Algeria and the plains of the Crau, in the department of the Bouches du Rhône in France, with satisfactory results, and, being of a hardy nature, it is believed that it can be grown with success even in the North. The Commission consists of M. TISSERAND, Director of the Imperial Farms, President; M. FORLIER, Sub-Director in the Ministry of Agriculture; M. BOITEL, Inspector-General of Agriculture; M. DUDOÜY, an agriculturist who has grown the plant for some time; and M. PAYEN, silk merchant. The object in view is likely to be well studied, and it is to be hoped that an addition will be made to our stock of fibrous crops.

—— A correspondent of the *Mark Lane Express* calls attention to the sudden change made by the insurance offices in London on the mode of insuring farming stock and produce:—"Notices have been issued, that on and after June 24 last, the 'Average clause policy' system is to be introduced into insurances on farming stock. A special condition provides that 'If the sum insured on agricultural produce, either separately or in one amount with other property, shall at the breaking out of a fire be less than three-fourths of the value of all the property insured in that amount, then the company shall be liable only for such a proportion of the loss sustained as the sum so insured shall bear to the total value of all the property to which the sum applies.' This is not a particularly well worded clause, and I may say that it is not the rule of any office I know of to include any other property with agricultural produce, and that it is expected that the live stock be separated from the dead stock and implements. In the notice I have received, the meaning of the above clause is thus explained: 'If the sum insured on agricultural produce and farming stock be (say) £600, and the value of the property at the breaking out of the fire be not more than £800, the whole amount of any loss up to £600 will, as heretofore, be payable. But, if the value of the property be more than £800, then only such a proportion of any loss will be paid by the office as the sum insured bears to the value of the property, *i.e.*, if the property be worth £1000, then only 600-1000, or three-fifths of any loss, will be paid; if the value of the property be £1200, then only 600-1200, or one-half any loss, will be paid; and similarly in any other case where the sum insured is less than three-fourths of the value of the property.' Now, without dwelling on the fact that the stronger party in this contract for insurance chooses without more than a day's notice (for the circular is dated June 23, and comes into force at once) to break the agreement, I would ask, is it fair to apply this rule for mercantile insurances to farming stock? The very changeable value of the stock would require a constant alteration of policies. Take hay for instance, £3 5*s.* per ton in March, and £6 in July of this year. The variation in the price of Wheat has, as you well know, been 30 per cent. in four months. Are farmers to be constantly changing their insurances to protect themselves? It is, I think, a well-known fact, that for eight or nine months of the year the farmer rather over insures than not—that is from December until the following harvest; of this the insurance office takes no notice. When we see the flourishing condition of the principal fire offices, the large dividends and bonuses which they pay, it does not appear that this measure is called for, nor does it seem quite fair dealing that the offices should combine, as they have done in this case, without the pretence of consulting their customers, or obtaining any information or suggestions from them.

—— The *North British Agriculturist* thus refers to the Gun Licence Bill:—

"Previous to using a gun, those persons not exempted by the provisions of the Act must take out a licence to carry a gun. The persons exempted are those who have paid for a licence to kill game, persons in the naval, military, and volunteer service, and in the constabulary, using or carrying any gun in the performance of their duty, or who are engaged in target practice, and the occupiers of land using a gun to scare or kill vermin. The four-footed animals and birds which the occupier of land may regard as vermin, are not those embraced in the game list. The occupier of land who employs one or more persons to kill vermin requires to take out one licence, which licence will authorise any person employed by the occupier of land to scare vermin found on the lands. Volunteers cannot use other than bullets in their rifles without taking out the licence of 10*s.* The Gun Licence Bill is, by the CHANCELLOR of the EXCHEQUER's own showing, a measure to protect game, although he put forward the plea of morality. In his speech when the Bill was in committee he said:—'Though I care nothing about the Game Laws, on behalf of the morality of this country I wish to keep the poor out of crime. It is a good object to prevent poaching as far as we can, and there is no sentiment more mawkish than that of investing the practice of poaching with any sort of romance. It may do for making pretty stories and idylls, but nobody knows better than I do (for few have seen more desperate criminals than I have) that poaching is the beginning of much wickedness. I wish to check that demoralisation, without reference to the Game Laws, and we cannot do anything more efficient to check it than putting a moderate restraint upon the use of firearms. If a man wants to use firearms in the defence of his country, he can join a volunteer association.' The CHANCELLOR of the EXCHEQUER, when practising as a lawyer in Sydney, may have come in contact with 'desperate criminals,' who, but for the Game Laws of Great Britain, might have been respectable members of society. When in Paris, in June last, we conversed with a gentleman who was returning to Sydney, where he was a large employer of labour. In reply to a question, what was the position in society of those whose parents had been banished, he replied that they were not looked down upon in the colonies, as their fathers may have been banished for such a trifling offence as shooting a hare. It may not have occurred to Mr. LOWE that there is another way of 'keeping the poor out of crime,' namely, to abolish those laws which tend to lead men to become criminals, morally as well as legally."

OUR LIVE STOCK.

CATTLE.

SOME little dissatisfaction was expressed at Oxford when Lady Pigot's BYTHIS (25,700) was adorned with the red rosette, while Lord Braybrooke's HEYDON DUKE had to rest content with a third place. Such was, however, the judgment of the three judges at Oxford, and their opinion has been singularly endorsed by three accredited authorities at the recent Wakefield meeting of the Yorkshire Society. Nothing can be more satisfactory to the Oxford judges than this confirmation of the fairness of their award. Messrs. Dudding, of Panton, again took the 1st prize for bull-calves with ROBIN HOOD, the winner of the highest honours in his class at Oxford. *Queen of Rosalea*, from Branches Park, obtained the 1st prize, which, it will be remembered, was taken from her at Oxford by a cow of Mr. Garne's, a decision much criticised at the time. We should have much liked to have seen the battle refought on the Wakefield show ground. Mr. How's *Lady Ann*, as a good 2d to *Queen of Rosalea*, occupied her true position. The complete domination of Shorthorns in our northern counties could not be better exemplified than in the Yorkshire Society's showyard, where, with the exception of a few Channel Islands' cattle, no other variety was to be seen. Another feature in this principal north-country show was the growth of the Shropshire sheep classes. A few years ago these sheep were hardly known, but now they bid fair to run a close race with some of our oldest and best established breeds.

—— After a period of quietude, we again approach a season when Shorthorn sales may be expected. A spring of unusual briskness has been followed by a time of rest, and at present we hear of little else but ram sales. As a signal of reviving activity among cattle breeders we hail the catalogue just published by Mr. Thornton, of the Messrs. Mitchell's (Ailoa, near Stirling) Shorthorn sale on the 25th inst. The commencement of the herd dates back to 1858, and to stock bred by Mr. Gulland, Newton of Wemyss. In 1860 *Mistleto* was purchased at Stockwood Park, and *Lady Laura* at Warlaby, by the advice of the late Mr. R. Booth. The majority of the stock traces back to *Rolla*, bred by General Simpson, who hired Mr. Charles Colling's NORTH STAR (458). There are also a few of the "Cherry" and "Gwynne" tribes. The herd consists of 36 cows and heifers, and 12 bulls, and is reported to be in healthy condition. The page devoted to the sires used in the herd since its commencement announces the names of PRINCE ARTHUR (13,497), FIRST FRUITS, (16,048), SIR SAMUEL (15,302), BRIGADE MAJOR (21,312), THE SUTLER (23,061), LORD BLITHE, and BANNER BEARER, all familiar names to admirers of Booth blood.

—— An interesting catalogue has been published by Mr. Thornton of the cattle and other domestic animals purchased by Mr. Cochrane, of Hillhurst, Compton, Montreal, and shipped at Liverpool on the 2d inst. in the "North American." We have already noticed the Wetherby, Warlaby, Killerby, and Braithwaite purchases, but besides these, heifers were selected from the herds of Mr. G. S. Foljambe, of Osberton Hall; Mr. Barnes, Westland, Moynalty, Ireland; Rev. J. Storer, Hellidon, Davantry; Messrs. Dudding, Panton, and Messrs. G. Garne, of Chipping Norton; J. Christy, of Boynton Hall; R. Plummer, Carlton Husthwaite; W. R. Bromet, Tadcaster, Atherton Chapel House; J. Logan, Newport; D. R. Davies, T. T. Drake, Beattie of Annan, Barclay of Keavil, and Aylmer of West Dereham. Mr. Thornton further informs us that besides these Shorthorns the exportations of 1870 contained a number of first-class sheep and black and white pigs. The sheep comprised the 1st prize pen of Cotswold ewes at the recent Oxford meeting, bought of Mr. J. Gillett, of Minster Lovell; and 14 Cotswold ewes and five rams from Mr. H. Cole's stock, also successful at Oxford. A number of pure-bred Berkshire pigs were purchased at Her Majesty's farm, Windsor Castle. Seven pure-bred Berkshires were obtained from Mr. Heber Humfrey; several from Mr. George Griggs, winner of the 1st prize for boars at Oxford; and four from Mr. William Smith, of Bibury. The white pigs were purchased from Mr. J. T. Robinson, Mr. Aylmer, of West Dereham, and Mr. Atherton. There were also exported two pure-bred Alderney heifers and their calves, purchased immediately after their arrival in England; and a superior hunting bay mare, four years old, bred by Mr. J. Beattie, Annan, got by Laughing Stock, out of Nanny, by Nimrod, well known in the Cumberland Hunt.

SHEEP.

WE have received a sale catalogue of Southdown sheep, Berkshire pigs, and horses belonging to Sir N. W. Throckmorton, which are to be disposed of by Mr. Straffotd on the 18th inst. There will be 80 full-mouthed and younger ewes, and 28 rams disposed of, also 12 pigs and 5 Suffolk horses.

—— During the last fortnight the principal Cotswold ram sales have been held. In contrasting their results with those of former years the comparison is not favourable for the present season. In very briefly alluding to these sales we take the opportunity of presenting our readers with a tabular view, showing the average prices obtained the last two seasons. The depression during the present year is in part due to the scarcity of keep, and probably also to the brisker competition in this branch of pastoral life. We hear, for instance, that much fewer Cotswold sheep than usual have gone into Herefordshire, probably owing to the greater favour with which the Shropshire sheep is being received in the midland and western counties.

RESULTS OF COTSWOLD RAM SALES.

Names of Breeders.	1869.			1870.		
	No. of Sheep.	Prices.		No. of Sheep.	Prices.	
		£	*s.* *d.*		£	*s.* *d.*
Mr. W. Lane, Broadfield ..	54	20	3 0	50	14	8 0
Mr. R. Garne, Alsworth ..	52	13	8 0	51	16	4 0
Mr. C. Barton, Fyefield ..	46	12	11 0	50	10	14 0
Mr. H. Howell, Coates ..	40	10	7 6	27	10	11 0
Mr. G. Fletcher (Shipton) ..	49	13	10 2	50	12	14 0
Mr. R. Lane, Cottage Farm	16	25	14 6	16	12	3 9
Mr. E. Handy, Sierford ..	52	12	8 9	50	10	8 8
Mr. James Walker, Northleach ..	38	11	12 0	40	12	0 8
Mr. Clarke, Frampton Mansell	13	6	16 0	7	6	16 6

—— Messrs. Lythall & Clarke sold 165 Shropshire rams and 180 ewes, selected from 15 flocks, at Bingley Hall, Birmingham, on the 4th inst. The highest price, £66 3*s.*, was given by Mr. Webb for Mrs. Beach's 3d prize Oxford winner. Singularly enough, the 2d prize sheep, owned by the same breeder, only brought £36 15*s.* on the same sale day—a striking commentary on the difficulty of deciding prizes. The general result of the sale may be thus given:—Mr. Lythall, Radford Hall, showed 20 rams, half of which were sold at from 5½ gs. to 10 gs. each. Mr. Yates, Grindle, Shiffnall, showed 18 rams, half of which were sold at from 5½ gs. to 10 gs. each. Mr. Nock, Sutton Maddock, Shiffnall, showed 18 rams, all of which were disposed of. One excellent sheep was sold at 21 gs., another at 19 gs., a third at 17 gs., several at prices varying between 10 and 13 gs., six at from 7 to 10 gs., and one at 6 gs. Four of the above were purchased for Lord Falmouth. The representatives of other flocks did not command a heavy sale, the majority of the sheep being withdrawn. With regard to the ewes, Mr. Yates' ewes, most of which were shearlings, brought from 42*s.* to 44*s.* per head. Mr. Pilgrim showed a few pens, some of which went as high as 110*s.*, while others ranged down to 42*s.* Mr. Nock's ewes made from 50*s.*

to 60s. each, Mrs. Beach's from 54s. to 60s., and Mr. W. Lort, The Cotteridge, sold eight pens of five at from 40s. to 50s. per head.

THE POTATO PLANT IN GREAT DANGER.

In the past the great value of the Potato as an article of food for the million has been greatly overlooked, otherwise more attention would have been paid to its constitution and culture. Every variety of the Potato becomes gradually weakened by repeated planting, and ultimately becomes worthless, unprofitable, and dies away.

There were many kinds of Potatos before the great blight, almost all of which have become worthless as croppers, and for all that has been done the constitution of the old plants could not be brought back to their original strength. We have only one kind of the old standard yield Potato in existence which was in use before the great blight, viz., the Regent; it has been the general crop ever since. Before and after that period it flowered and bore plums or seed, latterly it has become so weakened that it bears neither. The next kind is the Rock, which I introduced into Scotland some years after the blight. On its first introduction it produced the heaviest of crops, but by repeated planting it has become also so reduced in constitution, and the crops have fallen off so much, that farmers have in a great measure left off planting it.

Now had we depended chiefly on these two kinds of Potatos, what would have been the result to man, leaving out the brute creation altogether, had blight appeared again and destroyed or made them worthless? And as every nation plants Potatos, it would have caused famine and misery throughout the world, which would not be easily overtaken, as there is not grown in one season sufficient grain to supply the want that might have been created by a Potato blight. After the year of the great blight, Wheat rose from 40s. to 100s. and upwards per quarter, in less than nine months.

I have made the Potato one of my chief studies for the last 40 years, and from experience can speak of its culture and the diseases it has been subject to in that period, and they have been many; and I find that my original idea is the only one by which there is the slightest chance of perpetuating the plant—that is, to propagate new kinds from the plum, or apple, or Potato, secured from the strongest and best varieties grown at home and abroad. By this means I have raised thousands of varieties, some of which I have given to the world. My aim was to discover new kinds having constitutions vigorous enough to combat successfully both atmospheric influences and the diseases inherent in the plant; and when it is borne in mind that as most of the kinds had ceased to flower the initial difficulty was great, and that every new variety has to be kept separate, and this continued for years, some idea may be formed of the vast amount of care and expense required from the propagator ere he is enabled to judge of his success or otherwise in regard to any one variety.

From the reports I have received from all quarters there can be no doubt of the superiority of the new kinds which I have introduced of my far-famed seedling Potatos, and of the incalculable value which they have proved to the community at large, although there are only a few of them to my entire satisfaction. However, two of them, called Paterson's Victoria and Paterson's Blue, are the heaviest in farina, and keep good for 12 months; but the most extraordinary of my productions is the new seedling called Paterson's Bovinia, or Cattle-feeding Potato, a variety distinct from all other sorts, and the heaviest cropper in the known world. It is an article much wanted, and when known will be a great boon to the nation, as it will supply the deficiency of Turnips and Mangel, and will store and keep all the year round. One thing is necessary with this (as well as all other Potatos), care must be taken in the pitting, on account of the large size of the tubers, some of them weighing 4 lb. and upwards. After they are lifted and put into the pits or clamps, they should be covered with plenty of dry straw, and just sufficient earth to keep it down, to let the air through till such time as they are sufficiently dry to cover up for the winter.

Potatos should be planted in rather light loamy soil, well drained, and which has been well manured the previous year for some green crop, as, when planted with new-laid-in manures in the furrows, the sets are often burnt up and partly destroyed, causing blanks which otherwise would not be. Let the manure be well trenched in, in the autumn; and when whole sets are planted, cut off a piece of Potato at the lower end, as, if this be not done, the set is apt to retain the moisture that should go to the young tuber as nourishment.

It is desirable that fresh seed should be obtained every year, as the liability to disease is increased if the last year's seed is planted on the same ground. Potatos, especially for seed, should be grown on newly taken in land or moss land; such seed always yields the heaviest crops. Early kinds should be planted 18 inches between the drills, and 12 inches from set to set; late Potatos require more room—20 inches between the drills, and 16 to 18 inches from set to set. When the plant appears above the ground, carefully draw the earth about it with hoe or plough, and keep the ground clean till the haulms meet in the drills. If the flowers of the plants are picked off before they run into plums, which can be done by boys at about 3s. per acre, the crop will be increased about a third more than if the plums were left to ripen; as much of the strength of the plant must go as nourishment to the seed.

As the propagation of Potatos is such an arduous undertaking, and far too heavy for private individuals, I would recommend that Government commence cultivating new kinds; and as all my seedlings bear plums, seeds can be easily transmitted by post to any part of the world. The sooner this is done the better, as the disease appears every year more or less, and might annihilate the plant in a week. [The above are remarks left by the late William Paterson, Potato seedling raiser, Dundee.]

OUR HOME PRODUCE.

What proportion of the British soil is now under cultivation? According to the last return, the relation of land under crop to the total area was as follows:—

	Total Area.	Land under crop.	Per cent
	Acres.	Acres.	
England	32,590,000	23,170,000	71
Wales	4,745,000	2,530,000	53
Scotland	19,700,000	4,438,000	22
Ireland	20,323,000	15,644,000	76
Great Britain ..	56,964,000	30,339,000	53
United Kingdom ..	77,513,000	46,100,000	59

Is this the maximum that can be cultivated, and is the land under cultivation rendered as productive as it might be? I will not now enter into the economics of agriculture, but I have no hesitation in answering that I am far from satisfied that we make the best use of the riches within our reach. Without attempting to give all the reasons which justify such an opinion, we all know that deer forests too often include acres and acres of productive soil; that sufficient facilities are not given to the investment of capital in agriculture; and that the relations of landlords and tenants are not in all cases calculated to encourage the maximum cultivation of land. But let us see what we get out of the British soil for the food of man and beast.

The first of all products is certainly Wheat, and it is a merciful thing that the article most in use, most wholesome of all, is also, perhaps, the most widely diffused. Wheat seems to grow everywhere; it abounds in Russia, it flourishes in Australia, it is the richest produce of France, it is grown in Asia and Africa; and if China regards rice as her staple food, most countries would not readily exchange fine Wheat flour for any other flour or grain in the world. The proportion of land in Wheat in the different parts of the United Kingdom was, in 1869, as follows:—

	Area under all kinds of Crops.	Wheat.	Per cent.
	Acres.	Acres.	
England	23,170,000	3,417,000	14
Wales	2,530,000	133,000	5
Scotland	4,438,000	170,000	3
Ireland	15,644,000	281,000	2
Great Britain ..	30,339,000	3,720,000	12
United Kingdom ..	46,100,000	3,853,000	8

England is, therefore, the only Wheat producing country of any extent in the United Kingdom. A marked distinction obtains in England between the grazing and corn districts. The Wheat cropped land is principally found in the eastern counties; it is in smaller area in the south-midland and south-eastern counties, and smallest in the southern and north-western. Of greater importance, however, than the acreage under crop is the quantity of produce obtained; and it is to be regretted that the agricultural returns give no indication whatever of the same, though the Irish statistics are in this respect complete. From experiments carefully made by Mr. Lawes, and related by him to the Royal Agricultural Society, as well as from observations and calculations made by Mr. Caird, who had large opportunities of testing the productive powers of the different counties, the average production may be estimated at 28 bushels per acre, which would give a total production of about 13,000,000 quarters. Compare this with the population, and we have the relative quantity per head as follows:—England, 4.63 bushels; Wales, 3.12 bushels; Ireland, 1.42 bushels; Scotland, 1.19 bushels. But let us calculate the quantity of bread obtainable from the home produce of Wheat in the whole of Great Britain. If we deduct from the total quantity produced one-seventh for the seed, and take 5 quarters of Wheat to make 7 sacks of flour of 280 lb. each, the total production will be about 0.33 lb. of bread per day. It is well known, however, that the consumption of Wheat is more than 1 qr. per head, or 1¼ lb. per day; and thus a deficiency of nearly ⅝ lb. per day exists under any circumstances, which must be made up by importation from foreign countries. In truth, our dependence upon foreign corn has been growing of late very extensively, not from any diminished production at home, but from an absolute increase in the consumption of bread by all classes of society. In the reign of Henry VIII. the gentry had Wheat for their table, but the poor used Rye, Barley, and Oats. In the sixteenth and seventeenth centuries rye-bread and oatmeal formed a considerable part of the diet of servants, even in great families; now Wheat flour has become the universal article of food in England. Considerable quantities of Oats, Rye, Barley, Beans, and Peas are also consumed for human food; but no estimate can be given, nor can we venture to say how much of other vegetables, such as Carrots, Turnips, Cabbage, &c., are annually consumed by the people.

There is one esculent, however, which deserves special mention, and that is the Potato. First imported into Ireland by Sir Walter Raleigh, in 1623, it was only towards the end of the 17th century and the commencement of the 18th, that it began to be an important field crop; yet from that time, and ever since, it has become a most valuable auxiliary to Wheat, as an article of food. Inconstant, indeed, it is, and subject to greater fluctuation than any cereal, but the production is comparatively easy and inexpensive; the cost of the seed is trifling, and the poorest farmer may cultivate Potatos enough for himself and his family. Hence a certain relation appears to exist between the state of material prosperity and the amount of dependence of any nation on the Potato crop for human food, as may be seen from the fact that in England there are 66 persons to each acre of Potatos, in France there are 13, and in Ireland 5⅝. The extent to which the Potato is cultivated in different parts of the United Kingdom will best appear from the following Table:—

	Area under all Kinds of Crops.	Potatos.	Per 100.
	Acres.	Acres.	Acres.
England	23,170,000	357,000	1.51
Wales	2,530,000	49,000	1.93
Scotland	4,438,000	179,000	4.03
Ireland	15,644,000	1,042,000	6.65
Great Britain ..	30,339,000	585,000	1.92
United Kingdom ..	46,100,000	1,635,000	3.54

And what may be the production? Taking the quantity sown in Great Britain at 585,000 acres, and assuming the production at 3 tons per acre, that will give a total of 1,775,000 tons, or 4000 million lb. But 4 lb. of Potatos at least are required to give the nutriment of 1 b. of Wheat; therefore, if we take the fourth, that will be equivalent to 1000 million lb., or less than 0.12 lb. of Wheat per head per day. In Ireland the proportion is much greater. There the quantity produced is estimated at 4,000,000 tons, or nearly 9000 million lb.; and, at the same proportion of four to one, that will give 2250 million lb. of Wheat, or more than twice the quantity produced in Great Britain, with little more than one-fifth of the population, or in the proportion of 1.12 lb. per head per day.

A still greater quantity of food is derived from pasture land than from arable land. In Great Britain there are about 16,000,000 acres of land in pasture, Clover, &c., to about 6,000,000 in grains of all kinds; and ever since it became easier and cheaper to import corn than cattle or sheep, the tendency of agriculture has been to diminish the home production of corn and to increase that of animal food. The farmer finds that it pays better, and he adapts his cultivation accordingly. Without giving the absolute quantities of acres in permanent pasture, and the number of cattle in the different parts of the country, the following proportions will indicate where animal food is mostly obtained:—

	Acreage under permanent Pasture.	No. per 100 acres under Crop, Fallow, and Grass.		
	Per cent.	Cattle.	Sheep.	Pigs.
England	43.2	15.9	84.8	7.0
Wales	60.4	23.3	107.5	6.8
Scotland	25.1	22.0	157.6	7.9
Ireland	64.2	23.3	29.7	7.0
Great Britain ..	42.0	14.0	95.8	6.3
United Kingdom	49.5	19.7	74.3	6.6

In proportion to area, therefore, Ireland and Wales have the largest acreage under permanent pasture, whilst Ireland has the largest proportion of cattle, Scotland of sheep, and Ireland and England of pigs. In 1869 there were altogether in Great Britain 5,300,000 cattle, 29,500,000 sheep, and 1,900,000 pigs; and the quantity of meat annually obtained from such stock may be calculated as follows. Probably about one-fourth of the cattle and one-third of the sheep are annually slaughtered. Taking the cattle to give on an average 500 lb. of meat, the sheep 50 lb., and the pigs 60 lb. each, we have a total of 1100 million lb. of meat, or in the proportion of 45 lb. per head of the population per annum, or 0.16 lb. per head per day. The pig is extensively used as an article of food, but it does not take the place of butchers' meat. There is, moreover, a large quantity of poultry consumed. In Ireland the agricultural statistics give the number of them at about 0.68 per acre, and at this calculation there may be in Great Britain as many as 20,000,000 head of poultry. The products of the dairy to be added are not less important. In 1869 there were in Great Britain upwards of 2,000,000 cows at 180 lb. of butter each, they will give 360,000,000 lb. of butter; and at 3½ lb. of cheese each, they will give 7,000,000 lb. per annum, besides some 4,000,000 gallons of milk per day. *Professor Leone Levi, in the "Food Journal."*

THE PRESENT APPEARANCE OF THE CROPS.

[FROM OUR OWN CORRESPONDENTS, AUGUST 8.]

COUNTY.	WHEAT.	BARLEY.	OATS.	BEANS.	PEAS.	ROOT CROPS.	HAY.	DATE OF HARVEST.	NAME AND ADDRESS.
SCOTLAND.									
MORAY	Generally thin; a light crop	Good; nearly an average	Short in the straw, and deficient.	....	....	Vigorous and promising	A light crop	Begun; general by middle of the month	John Grigor, Forres
BANFF	About average	Average	Half a crop	....	....	Very good; wants rain	Not half a crop	Last week of August	John Barclay, Braes of Enzie
ABERDEEN	Thin on the ground, and rather under an average	Average crop	Very short in straw, and much under average	....	....	Turnips look healthy; are beginning to suffer from drought	Average crop	August 18	A. Cruickshank, Sittyton
PERTH	Under average; much of it thin	Above average	Under average	Fair crop	....	Potatos good; Turnips indifferent; want rain	Fair crop; little aftermath	August 8	David Edie, Bridge of Earn, Elliothead
STIRLING	Rather under an average	Full average	About an average; affected by smut	Full average	....	Variable, but promise average	Full crop	August 20	W. Drummond & Sons, Stirling
FIFE	Average	Above average	Very much under average	Above average	....	Under average	Under average	August 12	John Pitcairn, Kinnaird, Newburgh
	Under average	Full average	Under average	Average	Average	Average	Far under average	About August 18	John Morton, Lambieletham
EAST LOTHIAN	Under average Full average crop	Above average Considerably above average	Under average Under average, but better than last year	Average Good; very healthy, and well podded	....	Very promising Turnips generally very poor and unpromising. Potatos strong	Under average A very light crop	August 10 Eight days earlier than last year	R. Russell, Pilmuir, Leven George Hope, Fenton Barns, Drem
RENFREW	Average	Full average	Full average	Good	....	A good crop	Full average	August 20	George Boyd, Renfrew
AYR	Early sown very good; late sown, thin	Above average	A fine crop on deep land; generally good	An excellent crop	....	Generally promising	Far above average	August 15	Andrew W. Ralston, Lagg, by Ayr
	Average	Average	Above average	Above average	....	Fair average crop, improving fast	Average	September 1	William Orr, Beith
PEEBLES	Full average, but not much grown	Heavy crop; above average	A little deficient in straw, and not filling well	....	....	Turnips fully better than last year	Heavy crop, and well got	August 3, and will be general in the district by the 10th	James Lyle, Innerleithen
BERWICKSHIRE	Average	Good	Decidedly under average	Average	Few grown	Potatos, good; Turnips have suffered from fly	Very light; pastures quite burnt up	August 10.	John Wilson, Edington Mains, Chirnside
WIGTON	Good promise	Good	Very good	Few sown	....	Turnips good	Good crop	About August 20	A. H. M'Clean, Auchnul, Stranraer
ENGLAND.									
NORTHUMBERLAND	Under average	Barely average	Half crop	Half crop	Average	One-third crop	Quarter crop	Begun; general by August 9	Thomas P. Dods, Anick Grainge, Hexham
	Generally a little thin, but healthy, and likely to yield well to the bulk; a very small breadth sown	Average	Very light	Short	Few grown	All the early-sown Turnips were eaten off by fly, and the land re-sown. They have grown, but cannot be average; great want of Swedes	Very light crop	Quite general on August 8	George Laing, Wark-on-Tweed, Coldstream
DURHAM	Near average	Average	Light	Light	Good	Bad	Very bad	August 5	R. P. Dixon, Darlington
	Under average	Nearly average	Bad	....	Few sown; average	Potatos good; Turnips partial	Very light	August 13	George Crofton, Kimblesworth
CUMBERLAND	Full average	Average	Average	Good, but few cultivated	....	Great promise	Very good	August 20	Thomas Gibbons, Burnfoot-on-Esk, Longtown
WESTMORELAND	About an average	Average	Under average	....	....	Under average	Good crop	Middle of August	Jonathan Robinson, Warcop
YORKSHIRE	Average	Average	Below average	....	An average	Good plant, wants rain	Not half a crop	August 6	R. Bell, Layton Fields, Caldwell, Darlington
	Light straw, but about average	Full average	Light crop	Moderate	Poor	A late plant, but wanting rain	One-third of a crop	Now cutting	Peter Stevenson, Rainton, Thirsk
	Much improved since the late rains, will be a full average crop	Much improved, and promises to be a full average crop	Full one-third below an average	Very short in straw, and light in corn	Below an average	Swede Turnips eaten by the fly, and re-sown with common Turnips	Well secured, but only about one-fourth of average	About August 8	John Outhwaite, Baines-e, Catterick
	Average	Average	Under average	Not many grown	Average	Very irregular	Not half a crop	August 13	H. J. Turner, Land Agent, Richmond
	Cutting up much lighter than was expected, and will be below average	Average crop, except late sown	Under an average; late-sown bad	....	Average	Very bad	The worst crop known for years	August 6	Edmond Riley, Kipling Cotes Farm, Beverley
	Average	Barely average	1 quarter per acre beneath average	4 bushels short of average	Variable	Turnips broken	One-third of crop well got	August 1	John Clark, Swiss Cottage, Hessle, Hull
	Variable; generally an average, on strong soils	Much improved by rain of June 16 to 25	Average	Straw good; not well podded	Moderate	Mangels good; Swedes suffering from drought and grub	Less than half a crop	August 5	John Coleman, Escrick
	Good	Good	Moderate; straw short	Fair	....	Good	Light	August 4	William Irvine, 20, Cheapside, Halifax
LANCASHIRE	....	....	....	....	....	....	We have had a splendid crop, and all well harvested; pastures are very full of grass	....	George Storey, Burnley
	Average	Over average	Under average	....	....	Average	Over average	August 8	John Croudson, Urswick, near Ulverston
DERBYSHIRE	....	....	Very good	....	....	Turnips average, but suffering	Very light, but well got	August 10	Benjamin Swaffield, Hartington
LINCOLNSHIRE	Over average	Average	Under average	Average	Average	Under average	Almost a failure	General about August 1	W. Fancourt, Aslackby
	Healthy, but in some parts very thin	Very good	Good	Very few grown	Very few grown	Much injured on the Wolds	Bad	August 5 to 8	Thomas Morris, The Chase, Ulceby
	Wheat full average crop; likely to yield well	A good crop of grain and straw	Not quite an average crop	Very short; thin on the ground; not average	A full average crop	Mangels good; Swedes and Turnips average	Very light; Clovers a fair crop	August 8	John Clarke, Lenz Sutton
	The early ripened good both in quality and quantity, all late sown and all that has tillered out much mildewed	....	Early sown very fair, but the larger proportion very light	But few grown, and very inferior	Tolerably good	Mangels good; Rabi fair, Rape late and deficient	Very little cut, and a very light crop	Oats, July 25; Wheat, August 4	Thomas Aitken, Decoy Farm, Spalding
	Good on heavy, very thin on light soils	Very good	Under average	Fair	Good	Various	Very light	August 8	Isaac Sharpley, Boswell, near Louth
	On part of the Wolds not half a crop; the low-lands good, but all injured by frost a fortnight ago	Good	Light crop	Very short in straw; will be a short crop	Good, but very few grown	Not an average, but improving	Very light; the worst ever known	Generally began	James G. Dixon, Caister
	Average	Good average	Under average	Very few grown	Very few grown	Turnips want rain very much	Very bad	August 4	Francis Sowerby, Aylesbury, Great Grimsby.
NOTTS	On sand land, bad; on clay, good	Bad on sand, fair on clay	Average	....	Fair	Look now promising, but late	Scarcely any	Nearly done	Wm. Chouler, South Muskham, Newark
	Quite an average crop	On strong lands quite an average, but small on the light soils	Not many grown, but a very bad crop	Better than the last 2 or 3 years, but scarcely average	A good crop	Mangel good; Turnips very bad unless rain comes	From nil to about one-fifth of the ordinary crop	August 8	George H. Sanday, Holme Pierrepont

THE PRESENT APPEARANCE OF THE CROPS—(*Continued*).

COUNTY.	WHEAT.	BARLEY.	OATS.	BEANS.	PEAS.	ROOT CROPS.	HAY.	DATE OF HARVEST.	NAME AND ADDRESS.
ENGLAND.									
NOTTS.....	* Over average	Over average	Over average	Average	Under average	Mangels very good	Very bad crop	July 27	Charles Doncaster, Ridding's Hill
* On good loamy soils									
† On sand and gravel	† Under average	Under average	Very bad	....	....	Under average	Very bad indeed	July 18	
STAFFORD	Cuts up clean and sound, whether an average, must depend on yield to bulk in threshing	Samples very various; below average yield	Under average	Under average	About an average	Mangels pretty good, Swedes need rain; Potatos good	Very poor crop, about one-third average	Wheat and Barley cut, some carted	Geo. A. May, Elford Park
SHROPSHIRE.....	Short; straw thin, but good in the ear, and will be average	On strong, well-farmed land, good; on light soils, bad	Various: not an average crop	Very short and thin, but well corned	Moderately good	Early-sown Swedes promising; cannot come to a full crop	The worst crop I ever remember	August 1	Richard Shirley, Bancott Munslow, Church Stretton
	Under average	Under average	Nearly average	Very bad	Average	Very variable	Lightest crop since 1844	August 1	John Rawlings, Stoke, Tenbury
	An average crop, and quality good	A full average	Much below an average	Much below an average	Almost a failure	Much improved since the rain, but must be below an average	Very deficient indeed, except on well watered meadows	August 8	Evan Davies, Patton, Much Wenlock
	Almost an average, although too thin in some places to make a good crop	Very bad, not more than 2½ qr. per acre on good peaty land	Very bad	Too short to cut, obliged to be pulled; well corned	Bad	Mangels fair; Swedes and Turnips bad; many fields quite failed	One-fourth of crops	August 5	Thomas Mansell, Ercall Park, Wellington
	Under average	Under average	Under average	Very few grown	Under average; not many grown	Mangels fair, Turnips deficient	Crop not much more than half last year	End of July	W. D. Green, Market Drayton
LEICESTERSHIRE ..	Short in straw, but looks promising	Very short in straw, thick on ground	Very short, but very well corned	Very well corned	Not grown much	Late-sown Swedes best; early-sown irregular	Very short crop, never less	In the midst of cutting; all ripe	R. W. Cresswell, Ravenstone
WARWICKSHIRE....	Average	Barely average	Under average	Under average	Average	Turnips many failures	One-fourth of an average	August	J. H. Burbery, The Chase, Kenilworth
	Thin on ground; good head, short straw	Fair in quality; light crop; straw short	Light crop; straw deficient	Fair crop	Straw deficient; tolerable crop otherwise	Mangel Wurzel good; second sown Swedes good	Quite a failure	End of July	James Arch. Campbell, Rugby
	A full average crop on deep soils, below an average on light land	An average crop	....	Small crop of straw, but thickly podded	A good crop	Turnips, none; Swedes promise badly; Mangel a full plant	Entire failure	End of July	J. C. Adkins, Milcote, Stratford-on-Avon
	Much below average on light land, average on strong; the straw from 1 to 2 feet shorter than last year	Much below average, and very short in the straw	Below average; very short in the straw	Much below average, and stunted in haulm	Average	Mangel above average; Turnips, second sowing fair; late for Swedes; Potatos promising	Not one eighth of usual crop	July 27	Charles M. Caldecott, Holbrook Grange, near Rugby
* The quality of my Barley is much improved by the introduction of Hallett's Pedigree Chevalier Barley from the chalk	On clay soils good as can be, but light on the gravelly soils; much larger yield than last year, which was the worst in my remembrance	Early planted quite an average crop; quality not quite good; late planted a short crop*	Few grown; not an average crop	Winter, an entire failure; spring, very short; very large pods, and unusually large corn	Not so much straw as usual, but full of corn, and average where planted early	Mangel Wurzel very good; Swedes mildewing; common Turnips will fail	Worst crop I ever knew; pastures miserable, cattle half starved, young seeds all dead; Clover crops very deficient	July 20 to 26	John Baldwin, Luddington, Stratford-on-Avon
	Average	Average	Few grown	Not an average, and a little blighted	Good	Mangels good, Swedes patchy	Very bad; pastures burnt up	July 28	Joseph Smith, Henley-in-Arden
NORTHAMPTON	Good average	Under average	Much under average	Under average	Under average	Under average, excepting Kohl Rabi	The worst crop I ever remember	July 30	J. Borlase Tibbits, Barton Seagrave, Kettering
	Full average	One-fourth below average	One-third below average	About half a crop	About half crops	Late, but promising for Turnips	Almost a failure	August 6	John Booth Smeeton, Cromwell House, Naseby
CAMBRIDGE	About four-fifths of a crop; good in quality	About half a crop	A full half crop	About half a crop	Half a crop	Very bad	Half a crop	August 4	Samuel Jonas, Chrishall Grange, Saffron Walden
	Light in bulk, and in many instances thin of plant, and not free from mildew	An average crop	Not bulky, but about an average crop	Winter, very short in straw, and thin; spring, a fair crop	Short in straw, but well-podded	Doing well	Bad	July 26	Alfred S. Ruston, Aylesby House, Chatteris
	Average; good quality	Not an average; bad quality	Good; average	Below an average	Good; average	Good	Failure	August 1	Serjeant Wallis, Grantchester
NORFOLK.....	Many fields lost plant in the winter; but, where there is a plant, a fair crop of straw in length and bulk, with promise of good yield of grain	On cool soils, a good average; but on other soils very thin in straw and grain	Only fair; hardly an average	Very poor crop; much below average	Very short; early ones the worst	Very fair crop, but various	First crop light; well secured	August 5	William H. Taylor, Wymondham Merchant
	Various; much thinly planted; bad on light lands; on the whole, under average	Very bad on light lands; generally under average; indifferent quality	Under average	Very short in straw, but fairly laden	Under average	Mangels good, but want rain; Turnips unpromising; suffering severely from drought	The lightest crop ever grown, but well saved	August 8	William Cubitt, Bacton Abbey, North Walsham
	Average	Average	Nearly average	About two-thirds average	Short in bulk; well corned	Likely to be good	Very short; Clover tolerable on cool soils	August 1	Thos. Browne, Manor House, Southery, Downham Market
SUFFOLK	Good on heavy land, on mixed and light land, one-third deficient	Good on heavy land; on light land very deficient	....	Very deficient	Well corned, but very little straw	Beet deficient; Turnips may succeed	Scarcely any *	August 2	Frederick Nunn, Rougham
* Acorns a good crop, and ought to be well looked after.	An average crop, but very short in the straw	On heavy land, very good; but straw very short on gravelly soils	....	Straw very short, but well-podded, not an average crop	Straw very short, but an average quantity of corn	Beetroot in places very good; Turnips in some fields a failure	Clover and hay the shortest ever known	August 5	Samuel G. Stearn, Brandeston, Wickham Market
	Over average	Average	....	Average	....	Various	Shortest crop remembered	August 1	George Edwards, Framlingham
	Above average on heavy and sound mixed soils, other lands very deficient	Slightly above average on heavy lands; very bad on lighter lands	Few grown	A miserable crop	Under average, except an occasional piece	Mangels, good; Swedes, good, but late	Clover, and upland pastures, a failure	August 11	Thos. Chapman Whiting, Barsham House, Beccles
BUCKS.....	Average	Under average	Under average	Average	Average	Average	Bad; under average	August 1	W. Smith, Woolston
	Average	Below average	Below average	Below average	Above average	Below average	One-fourth of a crop	August 1	W. G. Duncan, Bradwell, Stony Stratford
ESSEX.....	Good head, but not much straw; a fair crop	Not much grown; a fair crop	Not much grown; not good	Very little straw, but pretty well podded	A fair crop	Early Mangels good; late very bad	Very bad crop	July 25	Charles Harvey, Foulness, Southend
	A fine crop on heavy well drained lands; half a crop on lighter lands	A light crop	Average	Very good	Good	Good, where a plant was obtained	All but failure	July 21 to August 8	T. Mitchell, East Hall, Rainham
	Average	Under average	Under average	Under average	Under average	Average	Very bad crop	August 1	J. J. Mechi,* Tiptree Hall, Kelvedon

* Wheats fully average, and of fine quality on heavy land; much under average on light land. Nearly all crops are bad on the hot light soils; most crops are good on fair or heavy cold lands. A heavy storm has discoloured or darkened some of the grain crops.

THE PRESENT APPEARANCE OF THE CROPS—(*Continued*).

COUNTY.	WHEAT.	BARLEY.	OATS.	BEANS.	PEAS.	ROOT CROPS.	HAY.	DATE OF HARVEST.	NAME AND ADDRESS.
ENGLAND.									
ESSEX	Average	Under average on Turnip land	Under average	Much under average	Under average	Very bad	Almost a failure	August 26	G. D. Badham, The Lawn, Bulmer
	Last crop	Fair average	Barely average	Light	Below average	No prospect	Very light	August 1	A. Barfield, Dunmow
	Full average in places, but in gravelly and thin soils the yield not half a crop; altogether below average	Straw very short; sample, inferior	A very light crop; much below an average	Winter or spring sown much below average	Pretty well podded, but short in the straw; not average	Mangels promising; Swedes almost a failure, and swedes common Turnips; Rabi look well	A short crop, second cut Clover upon clay soils look promising	August 1	Henry Dixon, Dorward's Hall, Witham
	On light land very short in straw, and much below an average; on heavy land quite an average	Very much injured by drought on light soils; much better on stiff soils; below an average	Not a good crop, being affected by the long drought	Thin in straw, not an average crop	About an average	Mangels good on stiff soils; other roots late, but improving fast since late rains	Very light crop on all hands	July 28	William Impey, Broomfield Hall, near Chelmsford
	A short crop of straw on all the thin light soils—not an average; the stiff soils a full crop—over an average; quality in both cases good	Thin, uneven, and ripened prematurely on the thin light soils—by no means an average; the stiff soils a fuller crop	Not generally good, but much improved where they had the June showers; not average	Short in straw, but well corned; quite free from the aphis	Generally short in straw, but well podded; harvested well	Mangels generally well planted; Swedes very various; White Turnips fairly planted, but growing very slowly	Not half a crop; where cut not yielding half a ton per acre; the pastures are quite burnt up; not a good soaking rain since February	August 8	John Clayden, Littlebury, Saffron Walden
HUNTINGDON	Wheat has a good ear, about an average crop	The same as Wheat	Nearly an average	Winter, very thin and short, but well podded; spring, near average	An average	Good	Very bad	July 28	Robert Barton, Wigton Farm, St. Ives
* These remarks apply to the strong land of this district only.	Good	Average	Average	Short in straw, but well corned	Very good	Very good	The worst known	July 30	John Wallis,* Park Farm, Kimbolton
	Above average	Scarcely an average	Under average	Under average	Above average	Very promising	Very deficient	Great part July 25	Peter Purves, The Grove, Brampton
HERTS	A good crop on strong land where well farmed and the plant good, but very bad on light land	Good, but not even early, on deep land well farmed, but on gravels very bad; under an average	Very much under an average	Very bad indeed	Short of straw, but pretty well corned; scarcely average	Mangels looking well; Swedes and common Turnips almost a failure	The meadows by the side of rivers are good, but upland pastures very bad	July 25	George Webb, Beaumont Hall, Kneesworth
	Under average								
BEDFORDSHIRE	Very good on strong soils; rather thin on light soils	Early sown, very fair; later sown not so good	Very few grown	Short, but well filled; no fly	Very few grown	Mangels pretty good; other roots not promising	Scarcely any	General in the last week of July	Henry Trethewy, Silsoe
	Under average	Under average	Under average	Very bad	Under average	Not good	About quarter of crop	August 1	James Ross, The Hoo Park Farm
	Average, on a little over	Average	Not quite an average	Winter deficient; spring average	Average	Generally good	Very deficient	Last week in July	Henry A. Bottle, Tattenhall, near Kimbolton
	Average	Not average	Not average	Short and well podded	Average	Bad upon clays	A failure	August 1	William Lavender, Biddenham
WORCESTERSHIRE	Very variable in bulk of straw and grain, but under an average crop	Considerably below average crop, and much inferior quality	Few grown, and only a stunted crop	Autumn planted almost a failure, and spring ones greatly below average	Variable and short in straw; of good quality and fair yield	Mangels promising; Swedes and common Turnips only partial and late	About one-sixth of an average at most; the smallest crop since 1841	August 5	William Woodward, Bredon, near Tewkesbury
	Good on heavy land; very short and thin on light soils; scarcely average	Much below an average crop	Much below an average crop	Much below an average crop	An average crop	Mangels good; all other root crops are bad	About one-fourth of an ordinary crop	End of July	Charles Randell, Chadbury, near Evesham
	Short in the straw; well corned	Good	Good	Not half a crop	Early good	Very indifferent	Not 4 cwt. to the acre; aftermath burnt up	Half harvested	Joseph Matthews, Menbs' Farm, Newland
	Short in straw, part thin, good quality; rather under average	Badly for late sown light; under average	Much under average	Much under average	Good	Mangels fair; Swedes very different	Very light crop indeed, but well made	Will soon be finished	Stokes Pych, The Cedars, Fearnall Heath
	Average crop	Early planted, good; late planted, very indifferent, thin, hairy, and of a dull colour	Fine in quality, but deficient in straw	Under average	Early planted deficient; late planted, average crop	Mangels good; swedes rape and turnips all wanting	Very deficient crop	July 28	Henry Hudson, Wick, near Pershore
HEREFORDSHIRE	Straw very short, but fruitful and an average	Not nearly average	Not average	Very bad	Good	A failure in most places	Not more than one-third crop	July 25	D. Edwards, Brinsop Court
	Half a crop	Below an average	Below an average	Very bad	Average	Mangel very good; Swedes very bad	The worst remembered	August 8	T. Duckham, Baysham Court
	Good average crop	Average crop; straw short	Average, but few grown here	Very short; pretty well corned	Good average crop	Mangels fair; Swedes very inferior	Extremely light on all lands	August 1, middle of harvest	Thomas Farmer, Frome Bishop, Bromyard
	Fully one-third below an average	Average crop	Average	Much below the average	....	Very variable; late sown really very late	About 3 cwt. to the acre	The first week in August	Henry Pride, the Cwm, near Monmouth
	A light crop, but very fruitful	Good in this immediate neighbourhood	Not quite an average	Very poor	A fair crop	On the whole a failure	Very light	Cutting nearly half finished	Philip Turner, Leen, Pembridge
MONMOUTHSHIRE	Clean, strong straw well headed; average	Early sown, good; nearly average	Bad; under average	Bad; under average	Variable; under average	Mangels very good; swedes good	Very light; Clover not so bad	August 3	J. Lynch Fletcher, Chepstow
GLOUCESTER	Fine average	Under average	Under average	Under average	Under average	Not an average crop	Hardly worth mowing	End of July	Giles Edmonds, Eastleach, Turville, near Lechlade
	Average	Average	Average	Very poor	Excellent crop	Good plant; promise average	English hay the worst crop I ever remember	August 6	John Cobban, Whitfield, Berkeley
	Scarcely average	Scarcely average	Under average	Winter very bad, spring, a little under average	Average	Under average	The worst crop known	August 1	H. Scott Hayward, Frocester Court, Stonehouse
	20 per cent under average	Average quantity, quality and colour inferior to last year	10 per cent under average		Short straw, well podded	Very promising	Seanfoin, average; old pastures very light	August 1	Edw. Handy, Sierford, Andoversford
OXFORD	Very good on strong soils; under average on light land	Good on heavy land; under average on barley soils, and inferior quality	Under average	Winter beans failed; spring sown short	Average	Under average	The worst crop ever gathered	August 8	Matt Savedge, Sarsden Lodge Farm, Chipping Norton
	Average	Much under average	Bad	Half crop	Fair	Very bad; seed rabbit and ripe	Very bad	July 26	Sam. Druce, Eynsham
	Thin pod, but very full; a good average crop	Very much under average crop	Average crop	Very much below average	About average crop	Mangel, under average; Swedes and Turnips very bad	A very bad crop	August 8	John Bayzand, Southleigh, Witney
	An average crop of corn, but bulky straw	Generally very bad	Uncommonly bad	Scarcely worth harvesting	Much below the average	Early planted, moderately good	A very light crop, but well secured	The end of July	John Gillett, Oaklands, Chadlbury
BERKS	Under average; never remember so much thin Wheat	Under average	Much under average	Under average	Under average	Under average	Much under average	July 25	Thomas Owen, Clapton, Hungerford
	Under average	Under average	Under average	Under average	Under average	Not worth reporting	The lightest crop for many years	August 1	James Hulbert, Streatley, near Reading
	Barely an average	Under average	Under average	Under average	Under average	Very unpromising	Unusually bad	July 30	John Adnams, Hart's Hill, Thatcham
	Under average	Much under average	Much under average	Below average	Under average	Almost a failure	About one-third of a crop	July 23	William Dew, Southbridge, Reading

THE PRESENT APPEARANCE OF THE CROPS—(*Continued*).

COUNTY.	WHEAT.	BARLEY.	OATS.	BEANS.	PEAS.	ROOT CROPS.	HAY.	DATE OF HARVEST.	NAME AND ADDRESS.
ENGLAND.									
BERKS	Rather below average	Very much below average	Very much below average	Much under average	Under average	Wmed pretty good; Swedes and Turnips very late and bad	Clovers very bad; hay almost failure	July 18	W. Bulstrode, Mount Farm, Cookham Dean, Maidenhead
MIDDLESEX	Under average	Average	Much under average	Not half average	Under average	Turnips failure	Scarcely any	August 6	Thomas Hewett, Cranford Park Farm, Hounslow
SURREY	Straw very short; sample good; average	Straw very short, sample very poor; under average	Average	Very short, half a crop	Average; sample very good	Mangel very good; Turnips late and bad plant	Exceedingly light, except Low meadows	General July 25	Edward Hilder, Woking
KENT	About four-fifths of average	Average; quality inferior	Nearly average; quality good	Half our usual crop	Fair average	Mangel good; very few good Swedes and Turnips	Never knew less hay	August 5	William Manser, St. Peter's, Margate
	Thin in plant, but probably an average	On well farmed lands a good crop	Generally much under the average	None grown	Little straw; well podded	Mangel good; but no Turnips	A total failure	August 10	Mark Sandford, Marton, near Dover
	Above an average crop, in consequence of the drought, but blighted in places	Not two-thirds of an average; and not half of malting qualty	On the best lands a good average, on other lands not one-third of an average	Not half an average	Not two-thirds of an average	Mangel good; Swedes not a quarter of an average crop	Not one-twentieth part of the usual quantity		Robert Matson, Wingham
SUSSEX	Various; under an average	Under average	Very indifferent	....	Fair	Mangels good; no Turnips	Very bad	End of July	William Rigden, Hove, Brighton
	An average crop, straw short, but ears well filled	Not much grown on the coast; under an average	Very indifferent, not more than half an average	Good	Bad crop, but little haulm	Swedes nearly a failure; white Turnips promising	About half a ton to the acre	July 27	J. E. Heasman, Angmering
	Under average	Under average	Average	Under average	Average	Very late	Half a crop	August 8	John Brotherston, Rose Hill Observatory
HANTS	Very various; under average	Three fifths of an average; quality indifferent	Three-fifths of an average; quality indifferent	Few grown	Under average	Mangel fair; no Swedes or Turnips	One-third of a crop	August 1	J. T. Twyman, Winchester
	Over average	Under average	Under average	Under average	Over average	Never worse	Never lighter	July 28	Joseph Blundell, Land Agent, Southampton
	Thin, but nearly, if not quite, an average crop, with good quality	Generally a bad crop, also bad in quality	On most of the light lands very bad indeed	Fair crop	Short, but will yield tolerably well	Generally a complete failure	Sainfoin and water meadows an average crop; dry meadows very light	August 1	William Spearing, Winchester
WILTS	Average	30 per cent. under average	30 per cent. under average	30 per cent under average	Under average	Average, the Beet being good	Lightest crop ever remembered	July 25	Edmund Rack, Castle Hill, Cricklade
	Very much improved; many pieces good, others, where thinned by frost, green and uneven, straw short, but will certainly yield well in proportion to the straw	Good	About an average crop	Spring, good; winter, short, though well eared, at least half ploughed up in the spring	Very good	Thread-and-bead tolerably good; all late sown have hardly kept alive the last month.	Thread-and-bead most light	End of July	——, Swindon
	Red rust or blight commenced a week or ten days since; doubtful as to an average crop	Average	Not average	Not an average; winter bad, and in many instances left off	Good	Very backward, and not a good plant	Very short in quantity	August 5	George Brown, Avebury, Calne
	Varies much; scarcely an average	Under average	Near average	Winter, under an average; spring, an average	Average crop	Very uncertain, between drought, grubs, &c.	Very short crop indeed	July 25	Thomas Arkell, Pen Hill, Swindon
	Below an average	An average crop	Bad crop	Bad crop	Good	Very bad, except Mangel	Bad	July 25	James Rawlence, Bulbridge, Wilton, Salisbury
	About one-third of the Wheat a full average crop, one-third under average, and one third a very bad crop; altogether under average, with a very short breadth sown	The forward sown, a good crop; the later sown, some mildewed and some very bad; all ripening too quick for a fine sample	Under an average	....	An average crop	A few early Mangels and Swedes; the rest not sown, not half a crop; the later ones some eaten with fly	Under an average, but very good in quality	Began reaping July 28	J. A. Williams, Baydon
	Considerably below an average crop	Below an average	Half a crop	Much below an average	Much below an average	Not good, but large acreage	About half a crop; water meadows have been very valuable	July 27	Cyrus Combes, Land Surveyor, Tilbury
SOMERSET	Fine; over average	Good	Very good	....	....	Generally good	One-third crop; well saved	Now	John B. Collyns, Dulverton
	Under average, and very much sprouted	Average	Not many grown	Very much under average	Average	Mangels good, Swedes bad; Turnips late So far bad	Not half crop	July 30	Walter Farthing, Stowey Court, Bridgwater
DORSET	Under average	Under average	Under average	Not much grown	Average		One-third of a crop	August 8	R. Damen, Dorchester
	Under average	Under average	Under average	Not many grown	Average crop	Very backward	Not more than half a crop	Now	John Ford, Rushton, Blandford
	In bad condition from wet and heat	Good crop; improved by late rain	Short, and bad yield	....	Fair crop	Very backward, and much of them misplanted	A short crop; quality good	Began July 25	——, Wimborne
	A very irregular crop; some very good, and others very thin, and at the present time the weather much against it	The same as Wheat; the sample much improved by rain	The same as the other grain; none up to an average	Very few grown; what I have seen, very short and thin	A fair crop	Mangels very fair, and Swedes after fallow, last after artificials, very bad; all late Turnips very bad	A very light crop	General in this neighbourhood July 25	Henry Fookes, Whitechurch Farm, Blandford
	Below average; good yield for the straw	Good; laid in some places	Good	Short, but well podded	Good	Mangels good; Swedes very very much; common Turnips irregular	Very short crop	August 3	John Pope, Symondsbury, near Bridport
	Variable; average crop in good land; light land bad; much was ploughed up in the spring	Very variable, early sown; average crop on good land; light land burnt up	About half a crop	None about here	Good crop	Mangel good; Swedes and Turnips very bad	Dry meadows not a quarter crop; Sainfoin and field-grass average	August 2	F. H. Saunders, Watercombe Farm, Dorchester
DEVON	A bare average	Average	Under average	....	....	Mangel fair, Turnips *nil*	Very deficient	August 3	P. Cowan, Tawstock Manor, Barnstaple
	Thin in the ground, but well eared; under an average	Barley suffered much; under an average	Three-fourths of a crop	....	....	Turnips very backward; Mangel backward	Not half a crop	August 4	George Langdon, Ashford, Barnstaple
	Average	Average	Under average	....	....	Fail	Very bad crop	August 1	R. H. Watson, Dolsoly, Totnes
	Very thin, but well corned; under average	Average	Plain under average	....	....	Very plain	Very slight crop	August 5	R. W. Pollard, Blaydon, Paignton
	Average	Average; very short	Below average	....	....	Turnips tolerable here	Very deficient	August 5.	Samuel Cornish, Stancombe, near Kingsbridge
CORNWALL	Average	Under average	Under average	....	....	Mangels good	One fourth of a crop	August 1	T. Davey Simmons, Truro
	Average	Below average	Average	....	....	Want rain	One-third of a crop	July 27	John Wills, South Petherwyn, Launceston

THE PRESENT APPEARANCE OF THE CROPS—(*Continued*).

COUNTY.	WHEAT.	BARLEY.	OATS.	BEANS.	PEAS.	ROOT CROPS.	HAY.	DATE OF HARVEST.	NAME AND ADDRESS.
WALES.									
CARMARTHEN	Very good	About average	Under average	....	....	Promise well	Light crop	This week very busy	John Burnell, Penyfan, Hanelly
IRELAND.									
LONDONDERRY	Looks well, but thin	Very little sown	Good average crop	Scarcely any sown	Not sown as a crop	Very promising	Good; above an average	Early in September	Charles Pollock, Farmhill, Magherafelt
KERRY	First-rate	....	Very good	....	....	Fair enough	Short; too dry	August 15	John O'Sullivan, P.P. and V.G., Kenmare
CORK	Very good	Average	Under average	....	....	Need rain very much	A light crop; below average	August 4	James Byrne, Fallstown Castle, Shanballymore

HOUSE SCAVENGING IN LANCASHIRE.—No. II.

If we exclude from present consideration the various palliatives and remedies which have been recommended for the abatement of some of the evils connected with this system—and which will be described when we come to treat of the remedies for river pollution—the watercloset is practically the only alternative plan of house scavenging which is possible under the circumstances of large towns. Where it is systematically adopted, the town streets must of course be sewered with channels of smooth bore and constant fall, and these must be connected with every house by properly trapped branch pipes. This connection is generally twofold; through the scullery sink and through the watercloset pan. No doubt a certain amount of risk is incurred from the possible escape of foul and even of specifically infected gases through these channels, which may thus carry either general ill-heath or definite disease into the midst of the household. But the risk is diminished almost to zero, first, by that rapid flushing of the sewer which an abundant water supply ensures, so that they are kept constantly washed; secondly, by frequent artificial ventilation either through open street grids or into specially constructed ventilating shafts, so that there may be a draught inwards at every point excepting those at which an outward draught is permitted or created; and thirdly, by careful trapping. Notwithstanding, however, all these precautions, there will undoubtedly remain a small but indefinite amount of risk incurred by thus connecting, however indirectly, every house with every other in a locality. And to this drawback must be added, as especially coming under our consideration, the fact that the watercloset system directly and purposely pollutes the rivers by conducting as rapidly as possible all fœcal matter straight to the nearest natural watercourse.

To what then does a fair comparison of the rival systems lead? The former retains a good deal of excrementitious matter putrefying close by the dwelling-houses, the latter washes it all away before putrefaction has commenced. The former saves perhaps one-fifth of the fœcal matter of the population, wraps it up in 10 or 20 fold its weight of ashes, and, at much greater cost than it is worth, gets it carried to the land; the latter hitherto has carried the whole fœcal matter away, for whereas the former wastes four-fifths, the latter takes the whole directly to the nearest stream; in the former case, however, it is necessarily already putrid, in the latter case it is usually fresh.

To this comparison of the two it may perhaps be as well to add at once, although it will be more properly discussed hereafter, that the conveyance of filth to the river is no necessary part of the watercloset system. All that is done by the watercloset, as contrasted with the privy, is to load the filth upon a self-acting vehicle which will take it wherever it is wanted; a vehicle which will carry it more cleanly, more cheaply, more immediately than can be done by any organisation of man and horse and cart. The manure which must be collected from town privies by an army of scavengers and distributed from the depôt by barge or rail, to be afterwards loaded in carts and taken to the field, and spread abroad by hand, and covered by the plough, might, if water were the carrier, be virtually self-borne to the very place where it is wanted, taken almost direct from the watercloset to the field, and there washed in at once with really no labour at all among the very roots of the plant it is to feed. To this, however, we shall return. Meantime it must be added that apart from the final utilisation of the fœcal matter, which is more easily accomplished under the watercloset than the privy system, the cleanly wholesomeness of the former, and its greater comfort and convenience, are gradually leading to its adoption everywhere in all houses above the rank of a mere cottage; and it is impossible to doubt that as in Liverpool, so in other Lancashire towns, whatever may be the difficulties in its way, it will ultimately become the rule.

At present waterclosets are in use to only a very small extent in the districts we have been examining. A tabular statement of the number of waterclosets and privies respectively in some of the largest towns of South Lancashire and North Cheshire is given below. And the quantity of artificial manure that is collected in these towns, with the price that is obtained for it, and the cost of collecting it per annum and per individual of the population may be read in the following Table. It will be seen that on the whole a population of about 1,330,000 use 120,000 privies and 45,000 waterclosets, no fewer than 30,000 of the latter being in Liverpool alone; and any person making the calculation will find that after deducting an average household for every one of the latter, there are obtained from 1,110,000 persons using 113,000 privies, 347,000 tons of manure, realising less than 5*d.*, and costing to remove it a little less than 1*s.* per head per annum.

STATISTICS OF WATERCLOSETS AND PRIVIES.

Name of Town.	Population	Number of Houses	Number of Privies.	Number of Waterclosets	Tons of Manure from Privies.	Received for Manure.	Cost of Collecting Manure.	Per Head. Received.	Per Head. Cost.	Name of River.	Ammonia in 100,000 parts of the River Water passing through the Town. Before entering Town.	Ammonia in 100,000 parts of the River Water passing through the Town. On leaving Town.
						£	£	*d.*	*d.*			
Ashton (*a*) ..	30,000	7,200	6,250	200	6,647	95	..	3.2	..	Tame ..	.211	.640
Rochdale ..	46,000	9,000	4,000	300	4,800	..	1,302*	..	..	Spodden ..	.002	.423
										Roch ..	.322	
Bolton (*a*) ..	77,000	15,184	15,840	310	22,465	1,567	1,100	5	10.	Croal ..	.024	.052
Bury (*a*) ..	30,000	5,700	3,765	147	7,000	100	700	0 8	5 6	Roch ..	.542	Sample lost in transit.
										Irwell ..	.891	
Oldham (*a*) ..	82,259	16,294	2,385	700	50,000	2,000	6,000	4 4	16.	Medlock ..	.614	1.020
Manchester (*a*)	637,000	70,000	18,000	10,000	73,824	6,740	17,600	4 5	11.7	Irwell ..	.078	..
Salford (*a*) ..	133,627	23,525	21,042	1,580	46,000	3,850	6,800	6 9	11.9	Medlock ..	.019	1 660 740
										Irk ..	.220	1.250
Warrington ..	30,000	6,000	4,500	500	5,000	..	150*	..	..	Mersey ..	.082	.160
Widnes (*a*) ..	12,000	2,000	1,065	..	1,800	150	135	1	..	..	..	..
Runcorn ..	14,000	2,620	2,800	20	5,000	..	300*	..	..	..	..	..
Liverpool (*a*) ..	500,676	80,176	20,000	2,150† 30,000‡	138,777	8,000	21,000	3 8	10	..	..	..
Blackburn (*a*)	75,000	15,000	14,500	700	..	257	1,698	.8	5 2	Darwen ..	.360	.641§
										Blakewater ..	.008	
Chorley ..	10,000	4,000	2,000	200	5,000	100	200*	..	..	Chor ..	.001	3 170§
Clitheroe ..	7,000	1,600	1,850	..	1,700	40	70*	..	..	Ribble ..	..	..
Preston ..	93,000	17,241	17,000	2,300	3,000	..	1,413	..	..	.. ..	.0018	.080
Southport ..	20,000	3,650	3,050	1,050	6,000	740	1,000	3.3	4 6	.. ..	..	..
Stockport ..	54,682	12,000	5,660	..	..	..	..	..	..	Tame ..	.050	.622
										Goyt ..	.143	
Northwich ..	1,187	280	150	60	..	..	..	..	..	Weaver ..	.042	.017
										Dane ..	.002	
Macclesfield ..	36,000	10,142	2,145	200	3,000	..	250	..	..	Bollin ..	.0018	.142
Staleybridge ..	25,000	5,200	2,600	450	..	..	..	..	..	Tame ..	.040	.211
Glossop ..	17,000	..	..	..	..	..	..	..	..	Corse Brook	.002	.140
Wigan ..	41,000	6,500	1,500	210	..	..	800	..	..	Douglas ..	.078	.260

That the very large collection of feeble manure from the several towns mentioned in this Table does really very little to save the rivers, is plain to any one who visits them. Bolton receives its river water virtually clean, and hands it on in an extremely foul and offensive condition. Rochdale fouls the Roch and Spodden; and Bury makes a most obvious addition to the filth of both the Roch and Irwell passing by it. Over-Darwen adds most offensively to the pollution of its stream; and the Blakewater is entirely converted into sewage by the town of Blackburn. The Irwell and the Irk and Medlock come down already very foul, but the quantity of filth they bring is enormously increased as they pass through Manchester and Salford.

The last two columns of the above Table, showing the amount of ammonia, one of the most characteristic constituents of sewage, in the river waters before entering and again on leaving each town, prove the same thing by chemical evidence. These two columns also exhibit what is otherwise obvious enough, viz., that when the sewage of a large town enters a small river, as at Oldham and Chorley, for example, the polluting effect is enormously great as compared with that which results from the admixture of the sewage of a similar town with a large river, as at Warrington, Preston, and Stockport. *First Report of the Rivers Pollution Commission.*

Home Correspondence.

Appearance of the Crops. — *Cheshire:* First as to Wheat crops in this district. In the early part of this season that crop looked as unpromising as it well could do, and possibly a tenth of the whole crop was ploughed up or remained a failure,—nearly the whole happening on Turnip land, Wheat after Turnips being commonly sown here. However, a most marked improvement has taken place in the crop, and where there is sufficient plant the crop will be fine and yielding; the ears are large and well filled, except on some thin land where it is of course much burnt up, and the straw and ears are both fine and dwindling. It is, therefore, difficult to estimate the yield, but I think it may be some five or six bushels per acre below the average of the last seven years, and in the total produce of the district a deficiency of one-sixth. With regard to the Barley crop, there is not much grown about here, but somewhat more than usual because it has been sown where Wheat had been ploughed up. It is short in the straw, but if it does not dry up before it ripens properly, through the extreme drought, it may be nearly an average. Oats promised in the early spring to be finer than usual, but the drought has made them both very short in the straw and thin in quality, I therefore think they must be a little under average. Beans were almost gone in June, but a gentle rain came one day and they have fairly podded, but are very light in the straw, and I think will be under an average. No Peas grown. Potatos still stand the drought on land of fair depth, and look promising, but must soon dry up if no rain comes, and if it does they possibly will shoot again. No grass at all on the pastures, and no second crops of Clover; most of the cows in the district are being fed with cake and meal, same as in winter. What few Swedes there are have hard work to live, as, in addition to the drought, the black caterpillar has attacked them. Mangel Wurzel good. Bad and cheerless prospect for the winter. My own Wheat crop will be under two-thirds of my average, which is generally quite 4¾ qr., but will not exceed 3 qr. this year. Oats are cut about here, many carried; but Wheat cutting scarcely begun. *W. B. Burnham, Spital, near Chester.*

—— *Devonshire:* The Wheat crop here is thin in the ground, good ears, but will be under an average. The Barley crop considerably under an average. The Oat crop probably half an average crop. Hay not a fourth of a crop. Potatos an average crop, and, so far, of a good quality. Mangel, roots thin in the ground, and backward. Turnips very backward. *G. W. Langdon, Ashford, Barnstaple.*

—— *Dorsetshire:* We have had heavy rain, with hot close weather since. Some quantity of corn down, but

* The cost of collecting the manure is uncertain in these cases, because it is stated to be additional to the value of the manure (not declared) which belongs to the contractor, or because only a portion of the privies and ashpits are cleared by the authorities, the others being attended to by the householders themselves. The only effect of this fact, however, upon the Table is, that in some of the smaller instances which it quotes while the tonnage of manure collected is put below the truth, the cost of collecting it, both total and per head, is also somewhat understated.

† Liverpool has 2150 tank closets.

‡ August 5, 1868.

§ August 6, 1868.

(*a*) Only those marked thus are taken into the summation or calculation in the text.

little carried; has sprouted in sheltered spots and under the fences. Barley the best crop; this appears to be good both in quantity and quality. Wheat and Oats short in the straw and a poor yield, but generally a good sample. *J. T. Homer, Hemsworth, Wimborne.*

—— *Fifeshire:* Wheat in this neighbourhood, being deficient in plant in spring, is still thin on the ground, and both as regards quantity and quality will be under an average. The later pieces show a good many defective ears, from injury by fly. Barley is a very full crop. Oats short on all the lighter class of soils, and ripening rather fast. Turnips and Potatos are very promising, more so than they have been for years. Harvest will be pretty general by August 10. *R. Russell, Pilmuir, Aug. 2.*

—— *Kent:* The Wheat crop in this district, comprising Romney Marsh and the Weald, must be considered a full average crop; in some cases the plant is thin, but very generally it is a full crop, particularly on the old Hop grounds, where there will be a yield of 5 or even 6 qr. to the acre. The straw is most unusually erect and even, a patch of laid Wheat is hardly to be seen; it is beginning to change colour, and if this sunny weather continues will be ready for the reaper in a fortnight. All spring corn is very short; Oats less than half a crop. Beans, which looked well a month back, are stunted and short of pod; Barley something better, but far from a good crop. Potatos, though showing much bine, are small but healthy; Wurzel and Turnips are defective, particularly the latter. Clover and Tares have yielded a good hay crop, but there is no second cut. Grass there is none; the slight rains of last week started the growth, but the recent sunny and hot weather has burnt it up again, and meat half fat is forced into the market. Hops are luxuriant everywhere, their long roots find nourishment while surface crops can get none; there is every appearance of a very unusual crop. The rainfall for the year has been:—January, 2.390 inches; February, 1.125; March, 1.315; April, 0.090; May, 2.190; June, 0.154; July 20, 0.725; total, 7.989, or less than 8 inches—being little more than a third of the average supply. *Thos. Thurston, Ashford.* [The publication of this has unfortunately been delayed].

—— *Norfolk:* The harvest was general in this neighbourhood on Monday, August 1. I think there is not the usual breadth of Wheat sown this year; a very good crop. On the good lands above an average, but on the weaker lands they are below an average. An average crop of Barley. Of Oats the same, with a larger breadth sown. Beans above the average. Peas about an average. The shortest crop of grass hay ever grown, but mostly well secured. The artificial hay, such as Sainfoin, Clover, &c., a good average crop. Potatos and all root crops are doing well, with a good plant. *Hugh Aylmer, West Dereham, July 31.*

—— *Northamptonshire:* We are now busy with the harvest. On good stiff soils the Wheat is a splendid crop, and will be over the average; on the thin lands it will be very deficient. Barley and Oats under average, except on heavy land. Peas and Beans the same, but free from blight. There are a few good pieces of Mangel, but the crop is generally deficient, and unless there is a good rain very soon we shall have no Turnips. We have never had any grass, and the pastures are completely bare. Water very short. The hay crop is the worst I ever remember. *J. Borlase Tibbits, Barton Seagrave, Kettering, July 31.*

—— *North Wilts:* Harvest became pretty general the 25th ult. Opinions vary whether we have an average Wheat crop; there are some very good, and some bad and intermediate, but on the whole I think scarcely an average. Wheat: various, scarcely an average. Barley: under an average. Oats: various, nearly an average. Beans: spring, average; winter, under average. Peas: average crop. Hay: very much under an average. Roots: not very promising. *Thos. Arkell, Penhill, Swindon, Aug. 2.*

—— *Warwickshire:* Our crops vary very much; while on the deep Wheat growing lands that crop is highly promising, on the gravels and weak clays it is thin on the ground, short, and uneven; the plant on the latter two descriptions of land being very deficient, in consequence of the ungenial spring, and the weather has been too dry to enable it to tiller, as in ordinary seasons it would probably have done when growing on well-farmed land. An unusually favourable blossoming season was given us, and the ears are large and well filled. Even where the crop is short and poor, the heads are larger than often grow upon such straws. This account of the Wheat pretty accurately describes the Barley crop. Where sown early the promise is satisfactory, but where planting has been later the crop is so short and parched as to be almost a lost one. Beans are all short but are well covered, the pods are large and full. Peas are a satisfactory crop, and are principally harvested. Mangels and early Swedes, where sown on autumn-cultivated land, look likely to be a good crop. Wherever Rye, Vetches, &c., were grown previously, or where much spring ploughing and cultivating took place, the crop of roots succeeding fail altogether. Less hay has been gathered this year than in any previous one in my recollection. We have had no pasture at any period of this season, and the fields are so brown and bare that it is marvellous how stock exist upon them. Potatos look vigorous, and the early ones yield fairly well. *J. C. Adkins, Milcote, Stratford-on-Avon.* [The publication of this has unfortunately been delayed. Mr. Adkins' later report appears in another column.]

—— *West Suffolk:* Wheat, harvest general, crop very fine on good land; have seen none so good in any other county; on thin, poor, sandy soils, Wheat thin. Barley, short in the straw but fine in the ear on good soils, ready to cut, colour mostly fine golden; on very poor thin soils, grey in colour and light in yield. Oats, very few grown; a good crop on good soils. Potatos, scarcely grown as a farm crop, but never looked better on allotments and in gardens; good yield of early sorts, somewhat smaller than usual: the late varieties have grown immensely, strong in the haulm, and promise far above an average yield; saw the first disease in the garden on Aug. 1. Mangel and Sugar-Beet: where a plant came up these have done well, and there are some very fine pieces about. A great many fields are, however, patchy. Few plants stand the drought better than these. Turnips: about a month since we had some nice showers; those who waited for the rain have therefore got a capital plant. Early Turnips were frequently sown again, and the plough is following the reaper and the threshing-machine on the stubble for Turnips, Mustard, &c., so that probably there may be a fair supply of green food for the winter. The meadows, excepting those near the water level, are brown and bare. Peas and Beans have been very short, but wonderfully well podded. The weather is dull and close, but no rain, and harvest operations proceeding rapidly. *D. T. F., Aug. 3.*

Tiptree, August 4, 1870.—50 acres of corn cut. Began cutting Barley. A splendid rain on the 1st, which enabled us to plant several acres of Cabbage and Kohl Rabi after Tares. Rain saved the young Clovers, and vastly improved roots, green crops, and pastures. Lean stock will now rise in price. Some Wheat stacks already thatched near here. Heavy land crops good, light land very bad. Harvest wages, 7*s.* 6*d.* an acre for binding, stooking, carting, and stacking, three-fourths Wheat. Men pay driver for reaping-machine. Labour superabundant, giving evidence of poor crops, and of the more extensive use of reaping-machines. This has been a bad season for the agricultural labourer. Few weeds, and a light hay crop. *J. J. Mechi.*

A Whirlwind.—Last Thursday, in a field adjoining my garden, while several persons were engaged in raking the hay into cocks, at a short distance from where they were working one of the cocks was suddenly lifted and carried bodily, as well as the tops of two others beside it, in a corkscrew form, high up into the air, right over my garden, and deposited in a field beyond, in a scattered manner. The air was perfectly calm at the time, and the sun shining brightly. A lad who was standing near to the place where it occurred, says he felt a gust of wind go past him which nearly blew his cap off. On Saturday last a severe thunderstorm commenced in the west, and then veered to S., E., and N. The lightning was exceedingly vivid, and peals of thunder very loud; and although the rain came down in torrents all around, at a mile or two distant from hence, only a very few light drops fell here, and the sky above remained perfectly clear, so that the hay was harvested in excellent condition. Are not these two phenomena rather remarkable? *Subscriber, Whitland, Carmarthenshire, August 1.*

Estimate and Remarks upon Hay Drying.—The following items are based upon experiments during June and July, 1869:—

Labour-cost of Drying Hay by Horse-power.

	£	s.	d.
Two horses, and boy to drive, per working day of 10½ hours	0	5	6
One boy to pull wet hay off the cart	0	0	6
Two men to feed it into drying house, at 3*s.*	0	6	0
Two men to guide the lever forks, at 3*s.*	0	6	0
One man to throw dry hay out of house, at 3*s.*	0	3	0
(21*s.* for 10½ hours—2*s.* per hour.)	£1	1	0

When a load of hay (of 18 cwt., *i. e.*, 36 trusses) contains 2 cwt. of water, requiring to be expelled before it is fit for stacking, it can be dried in three quarters of an hour by half a cwt. of coke:—

	£	s.	d.
Three quarters of an hour, at 2*s.* per hour	0	1	6
Half cwt. of coke, at 1*s.* per cwt.	0	0	6
	£0	2	0

From this total cost of 2*s.* per load must be deducted the usual expense of finishing hay in the field, which varies very largely according to the climate and the nature of the weather at harvest time. On dry, cold, and cloudy days, the writer found, by careful estimate, that 6 loads of hay in the condition named above, took 10 men and 1 horse (in the hay-tedder) 4½ hours to render them fit for stacking; which would put a cost of fully 2*s.* per load upon the hay thus finished, besides which it is obvious that if rain comes on whilst hay is being shaken out in the field, all the previous labour-cost is wasted, and the hay itself injured; whereas by the help of the drying house, whatever cost is incurred has a positive and certain result, and whatever hay is made by this process is saved and stacked "weather or no." Taking the above estimate as a starting point, any practical farmer may find out with the greatest ease how much it will cost him to dry his hay in any condition of wetness in which he may be compelled to deal with it. He need only weigh 30 or 40 oz. of it from the field, dry it before the fire to the proper "stacking point," and note how much it has lost in weight by such drying. If the loss is in proportion of 2 to 18, it will cost 2*s.* per load to finish it; if 4 to 18, it will cost 4*s.* per load to finish it; if 8 to 18, it will cost 8*s.* per load to finish it; or if 16 to 18 (*i. e.*, nearly its own weight of water), 16*s.* per load. But when the season or the climate require us to deal with hay in this extreme condition of wetness, the steam-engine should be used instead of horses; the waste heat from the boiler will then largely reduce the charge for fuel, and the cheaper and greater power will materially lessen both time and labour. I do not think it is of any real importance to carry on the estimate so far as the drying of raw grass fresh from the scythe into hay; it can be done, and has been done several times over, and in the presence of a great many practical farmers, but I have always done it under protest, and merely to gratify a very natural curiosity. As far as my experience goes—and I have for the last nine years experimented upon this dryihg process under the most unfavourable conditions of weather—I have never found it needful to attempt to dry half-made hay, containing more than its own weight of water. The mere withering action of time will do much to reduce the grass to this point, and by taking every chance of a temporary lull in the rain, or short gleam of sunshine, to expose fresh surfaces to that action, I think it will be found that Nature will always help us so far on our way to the stack, and merely leave us the task of finishing what she has begun. For calculations of quantities and cost of drying Wheat and other grain crops, I would ask leave to refer to p. 15 of my Essay on this subject, which gives, as the highest cost of dealing with such crops in their wettest possible state, a nett extra charge of 2*s.* per quarter on the grain thus saved. *William Alfred Gibbs, Gilwell Park, Sewardstone, Essex, N.E.*

Autumn Culture and Crops.—We have such a revolution in harvest work through the almost universal introduction of the reaping-machine that it makes the harvest season comparatively easy and free from those anxious cares which used to attend it. Protracted harvests were always more or less injurious. Now a field is no sooner fully ripe than it is cut down in a day, and secured in stook, thus preventing the serious losses often experienced through strong winds and flooding rains. Harvest, which formerly occupied eight or ten weeks to secure, is now only the steady work of some two or three. This is a wonderful advantage in this fickle climate of ours, besides it sets the land at liberty for such purposes as the farmer may desire to appropriate it. What better course can he adopt in a season like this, than to commence its immediate culture, and get in some of our winter food seeds, *i. e.*, Turnips, Coleseed, or if Cabbage plants are at hand, to plant them. In a dry season like the past, many of the winter food crops have failed. Now is the time for the farmer to recoup. He should stay all other work, and bring the whole force of the farm to getting in these root crops. It is late to sow, but with a prolific autumn, and the land being in a heated state, the plants would grow very fast, and much excellent winter food may yet be secured. It was done very extensively only two years since with great success. The Rape or Coleseed plant is most likely at this season to produce the greatest amount of food. It is of easy growth and culture—a peck of seed nicely drilled in is quite sufficient for 3 acres. Much loss arises from drilling it too thickly—the stalks become thin and wiry, contain no good quality of food, and the leaf is small and also poor food. It is a plant requiring room, and when well grown is exceedingly nutritious. In the fens, where it is largely grown, sheep fatten rapidly upon it. It should be sown with artificial aid, *i. e.*, superphosphate or the like, so as to make it grow quickly as soon as up. If Turnips are preferred, some of the largest growing varieties should be selected, *i.e.*, the Tankard varieties are best. It must be borne in mind that these late sowings are for early feeding. They can scarcely be hardy enough to stand through the winter. It is to no purpose to sow Mangel or Swedes at this season; Mangel would not attain any useful size, and Swedes grow slowly. Tares, Rye, Trifolium, &c., might advantageously be sown for early spring feed, and the soil is easily prepared for such seeding. It is also a good season for preparing the land for early spring planting, *i. e.*, early Potatos, early Mangels, early Cabbages, Carrots, &c. Autumn culture is in every respect valuable. The exposure of the soil to atmospheric influences is of wonderful service at this season. The destruction of seedling weeds, seeds of weeds, &c., is of great importance. The preparation of the land intended for Wheat is highly beneficial, and surprisingly facilitates the seeding, and adds greatly to the safety of the crop from the attacks of grubs, slugs, &c. The repeated stirring of the soil is of great benefit. Steam power cultivation is at this season in its glory. Every intelligent farmer would gladly have his land immediately broken up after harvest. *O. F.*

Harvest in Wales.—Newtown, Montgomeryshire, 300 to 400 feet above the sea, August 5: Harvest is quite general here, and the crops are coming forward faster than is convenient.—Dolfor, Montgomeryshire, 800 to 900 feet above the sea: Cutting began here, August 1, but harvest will not be general for some days yet, say about August 15.—Pen Coom, Radnorshire, 1000 to 1200 feet above the sea: Cutting of Oats

began here, August 5, and will proceed daily, but harvest in the district will not be general until August 15, or thereabouts. *H.*

Societies.

ROYAL AGRICULTURAL OF IRELAND.

Show at Ballinasloe.—The following short notice of the show here last week is very much abridged from the *Dublin Farmers' Gazette*:—

We regret we cannot congratulate the Society on the success of the show of this year. We did not expect a large or superior show at Tralee, owing to the remoteness of that locality; but the Tralee show was superior, in numbers at least, to that which has been held at Ballinasloe, notwithstanding the many advantages possessed by the live stock metropolis of the western province. The comparative failure of the show does not, of course, rest with the Society. All it could do was to offer the usual premiums; and if the breeders of the west did not choose to come forward in the manner it was natural to expect they would do, and as it was represented would be the case when the Society gave the preference to Ballinasloe, after arranging that the show of 1870 would be held in Dublin, why the Society could not compel them. At the show held at Ballinasloe in 1845 the entries in the live stock classes were 418; at Athlone in 1856, the entries were 604; and at Sligo in 1864, which was by no means a first-class show, the entries amounted to 422. This year they only reached 331. It is also worthy of remark that while there were 39 stands of implements at the Ballinasloe show in 1845, there were only 40 at this year's show. No doubt some of the stands this year presented a much larger display than any of the stands did 25 years ago, but the number of exhibitors did not come up to what has been the case at previous shows of the Society.

Shorthorns.—Only 56 Shorthorns were entered, and of these some of the best were absent; while no less than about one-third of the number belonged to Mr. Ganly, who deserves a special medal for having done so much to bring up this important section of the show to something like moderate proportions. In the aged section of bulls, Mr. Chaloner's SOVEREIGN had it all his own way, getting also the Purdon Cup for the second time in succession. Mr. Smith came to the front in the 2-year-old section with THE EARL, out of Sovereign's dam, which was 1st at Tralee, and 1st at Dublin last spring. THE EARL goes on improving, and looks like having a good chance of being a cup bull yet. Mr. Cosby's COLONEL FRANK, a good-ribbed bull, bred by Mr. Meadows, was put 2d, and Mr. Moffat's sweet, but lighter-made, DEY OF ALGIERS, 3d, exactly reversing the position held by the two last-named bulls at the spring show. Mr. Reynell's yearling bull, PRINCE ARTHUR PATRICK, which was exhibited but not placed at the spring show, was put 1st in his section at Ballinasloe, the 2d being Mr. James Smith's CAVENDISH, bred by Mr. E. J. Smith, and highly commended at the spring show. Hon. John Massy's BARONET, of Mullinabro' blood, a nice calf, well brought out, was put 1st in the bull calves, the 2d place being given to Mr. Cosby's KING HEROD, a first-rate handler.

Mr. Ganly came out strong in the cow section, showing five of the eight entered for competition. The 1st prize was awarded to his *Leah*, a nice, even cow, bred by Major Stanley M'Clintock, and the 2d prize also was awarded to Mr. Ganby, for *Modesty*, an aged cow, bred by the late Major Wallis. Mr. Bolton's *Alley Gwynne*, 1st at Tralee, 1st at last spring show, and commended in a grand class at Oxford, was again put 1st in the 2-year-old section, and Mr. Ganly's *Queen of Denmark*, a thick, even, well-bred heifer, in mere store condition, was put 2d. Mr. Bolton was also 1st in the yearling heifer section with *Chaumontel*, bred by Mr. Meadows, which was 1st at the last spring show. Mr. Bolton's *Glossy Woodbine*, rather deficient in handling, but otherwise a nice heifer, was highly commended, and along with *Chaumontel* took the Purdon Cup as the best pair of yearling heifers in the yard. Mr. Bolton won the cup [at Tralee, so this is his second year of it.

Other Breeds.—In Ayrshires, that formidable exhibitor, Mr. David Patton, took every prize, leaving commendations to Mr. Pollok and Captain Boyle. In the tenant-farmer's class Mr. Patton took two 1st prizes with his Ayrshires, the 2d prize in the cow class going to Mr. Wood's Ayrshire cow, bred by Mr. Pollok. That wonderful man, Pat Quinn, the blacksmith at Priestown, Co. Meath, who manages to send every year to the Royal shows from his holding of 10 or 12 acres a large number of cattle and sheep, certain winners in the farmers' class, took both prizes in the section of yearling heifers. This year Pat had no less than three heifers and a score of sheep entered, and took home his 18 sovs. for the same, which was better work than hammering horse shoes.

Horses.—Mr. St. George's Tom King won the Croker Cup, but many of the outsiders seemed to prefer Solon, belonging to the same gentleman. Mr. Kerr's prize 3-year-old draught stallion is, we think by the pedigree, from Sir William Stirling Maxwell's stables at Keir, one of the best places for Clydesdale horses in the kingdom. Mr. Allan Pollok was a successful exhibitor in the agricultural class.

Sheep—Leicesters.—Eight entries in the class of Leicesters from Mr. Marris, Lincolnshire, were not forward, in consequence, we believe, of some hitch about certificates of health required under the Order in Council, which tended to limit the competition in a not otherwise large entry. Mr. Owen's 1st prize shearling, to which the Cork Cup was also awarded, is a thick, stylish sheep, and an extra good handler. Mr. Meade's 2d prize shearling is also a handsome sheep, but scarcely so good in the touch as Mr. Owen's. Mr. Mowbray's 3d prize shearling was second last week at Cork, beating Mr. Meade's second prize sheep at Ballinasloe. Mr. Mowbray's ram is an even, useful sheep. Mr. Owen took 1st and 2d prizes in the section of rams of any other age than shearlings. Both were thick, good backed, even sheep. Mr. Meade was the winner of the 3d prize in the section. In the section of shearling ewes Sir Allen Walsh took the 1st prize with a stylish pen by Blessinton rams, and Mr. Mowbray the 2d prize with another nice lot. Sir Allen Walsh's high-bred pen of ewe lambs took the prize in this section.

Roscommon Sheep.—For the first time, the Royal Agricultural Society has placed the Roscommon sheep in a separate class. Heretofore they have been exhibited in the class of "other long-wooled sheep," but we think the Society has done quite right in placing this noble breed of sheep in a class by itself—a distinction to which it is justly entitled, as having called forth the warm eulogium which Mr. Clare Sewell Read, M.P., pronounced upon them when he saw them for the first time last September at the show of the Strokestown Farming Society. On that occasion Mr. Read said:—"I am edified by what I have this day seen and learned of Irish sheep and stock. When you tell me your national and royal shows do not recognise your Roscommon sheep as a distinct class, and with their proper name, you astonish, nay, more than astonish me. Why, they ought to be their pride and boast. I saw this day such sheep as I never saw before, distinct in their types from all sheep I ever saw before, with heavy fleeces of silky wool, large meat-producing frames, such as cannot be equalled without artificial feeding, and combining with these great perfections very early maturity. In all these views I have the full concurrence of my friend, Mr. Pell—an authority, I can assure you, of no small weight on such subjects. We might as well say in England that Lincolns are Leicesters, and not a pure and distinct type, as deny the splendid Roscommon their class in any show, honoured, I will say, by their exhibition."

Considering the proximity of Ballinasloe to the great rearing grounds of this breed, we fully expected a large display, and were, therefore, much disappointed that in this class also the entries were limited. On the score of quality, however, there was no room for complaint. The shearling ram shown by Mr. Thomas Roberts fully corroborated the description given of the breed by Mr. Sewell Read. Mr. Richard Flynn took the 2d and 3d prizes, and in them, too, we had splendid specimens of this noble breed, which we hope to meet with a fortnight hence in larger numbers at the Royal Dublin show. In the section of aged rams, Mr. J. B. Smyth, Fedamore, Co. Limerick, too the 1st prize with a 4-shear ram, which had been 1st at the Royal Dublin Society's show in 1868, 1st at the Tralee Royal show, and also 1st at the Cork and Limerick local shows. He was bred by Mr. Roberts, and is named XX. Mr. Flynn's heavy and symmetrical ram took the 2d prize. This sheep weighed 27½ stones live weight, which, reckoning four-sevenths of the live weight as equivalent to the dead weight, gives us 220 lb. as his dead weight, or 55 lb. per quarter. Mr. Roberts took the 3d prize with a ram which has grand ribs, good style, and good wool. Mr. Wm. Cotton's commended ram weighed 22 stones 6½ lb., or a shade under 45 lb. per quarter. Mr. Cox Cotton and Mr. Wm. Cotton were the winners in the shearling ewe and ewe lamb sections, but the Roscommon breeders did not do their duty when there were only two pens of shearling ewes sent forward. Those sent, however, were so good as to make us wish for more; and now that the Royal has put the Roscommon sheep in their proper place, we hope that Roscommon breeders will support the Society by filling every section well at future shows.

Other Long-wooled Sheep.—Mr. Beale Browne was the principal exhibitor in this class, and the sheep shown by him were of a very good description. Mr. J. B. Smyth had also very good sheep.

Swine.—This was one of the best departments in the show, especially the coloured breeds, or Berkshires. Colonel Chichester took two 1st prizes, and was highly commended for his sow and litter of pigs.

—— At the banquet held in connection with the show on the Wednesday evening, a very interesting description and criticism of Irish agriculture was given in a speech by His Excellency the Lord-Lieutenant, to which we must refer next week.

YORKSHIRE AGRICULTURAL.

Second and Third Days at Wakefield.—In our report of this meeting at Wakefield, published last week, owing to our time of going to press we were only able to furnish an account of the proceedings of the first day of the show (Wednesday, the 3d inst.), and to supply a list of the awards made on that day. This included Shorthorns, pigs, sheep, and a few classes of horses. The judging of the greater portion of the latter was, however, reserved as a *bonne-bouche* for the thousands of town as well as country folks who rush to the showyard on Thursday, the first shilling admission day. The brilliant morning of Thursday brought the expected visitors, as may be gathered from the following statistics of the meeting:—

ENTRIES OF THE SOCIETY FOR SEVERAL YEARS.

Year.	Place.	Cattle.	Sheep.	Pigs.	Horses.
1858	Northallerton	142	192	102	211
1859	Hull	106	82	68	249
1860	Pontefract	83	74	70	203
1862	York	95	69	74	249
1863	South Stockton ..	76	49	63	203
1864	Howden	78	67	65	378
1865	Doncaster	86	93	92	388
1866	York	—	159	85	514
1867	Thirsk	—	168	120	563
1868	Wetherby	84	155	98	360
1869	Beverley	76	124	93	443
1870	Wakefield	102	121	123	305

Including wool, implements, and foxhounds, the comparative entries for five years are as follows:—

	1866.	1867.	1868.	1869.	1870.
Cattle	—	—	84	76	102
Sheep and Pigs ..	242	288	253	217	246
Horses	514	563	330	443	308
Wool	10	15	11	8	9
Implements ..	1745	1035	1260	1406	1564
Foxhounds ..	108	82	60	83	59
	2367	1730	2000	2233	2288

These figures indicate a more even competition in all classes than is usually the case—cattle, sheep, and pigs being equally above the average, and horses about an average entry.

The receipts for admission at this meeting, as compared with that of last year, are as follows:—

	Beverley. 1869.	Wakefield. 1870.
1st day	2,256	2,157 admissions.
2d day	15,118	13,444 ,,
3d day	10,000	10,000 ,,
Amount ..	£1,357 14 6	£1,336 10 6

These figures point to the show as successful in financial result, and as worthy of such from the excellent competition throughout the whole exhibition—of cattle, sheep, and pigs over the usual numbers being shown, and of horses about an average: while the show of implements was unusually large, and most effectively displayed, in the long rows of convenient shedding erected on the left of the entrance to the showyard, and where thousands sought refuge from the blistering sun in the garden houses, Bath chairs, and *impromptu* resting-places furnished by the step of a chariot, the shafts of a harvest cart, or the frame of a roller. Certainly hotter work than it was to get through the entries on Wednesday and Thursday we never experienced; and we are convinced that if an Indian sepoy or a tame salamander had accompanied us, they would have cried out, "*jam satis.*" We have however lived through the difficulty, and furnish now our remarks on the show of horses.

The show of horses at all agricultural meetings is essentially the popular scene in the play, and especially is this the case at the Yorkshire meeting. The large sum awarded in prizes of course stimulates this interest, and the competition draws the best animals from every part of England. It is indeed the crowning honour to take off a 1st hunter's prize here, and not unfrequently does it happen, as this year, that the victor at the Royal has to lower his flag at the Yorkshire. The number of horses shown, on the whole, though not as great as at Beverley, was large enough to offer good competition in most of the classes—the standard of merit being high where there were only few entries; but in the great prizes of 4-year-old hunters, and the 5-year-old and upwards, the competition was on a par with the prizes—magnificent. In this latter class 55 animals competed for 6 prizes—1st, 100-guinea cup; 2d, £50; 3d, £25; 4th, £15; 5th, £10; 6th, £5. The winner in this class, Loiterer, is the property of Mr. Welfitt, Tathwell Hall, Louth. He is a fine specimen of a hunter, and can carry 13 stones at a racing pace. That he is too slight for the highest hunting prize we cannot admit, inasmuch as the conditions of entry for hunters are—"Five-year-old and upwards, and qualified to carry at least 12 stones with hounds;" and therefore the power to carry any heavier weight than 13 stones—a stone above the requisite weight—is no merit in this competition, and consequently Loiterer beats Sir George Cholmley's 2d prize, Julius, who has much more power. This horse is a magnificent animal, nearly 17 hands high. At a distance he looks rather too much on the leg, but when near him he is full of power, and he "goes" in every pace splendidly. He can carry 16 stones through dirt for a day together; while he is fast enough for the flat, but he requires a good deal of pulling together when ridden. The nose-poking style in which he carried his groom was soon improved when Captain Skipworth mounted and worked him a bit. His forelegs are, however, not quite as perfect as those of the winner,

who has, in our opinion, shape, pace, and quality in rare excellence. With not an ounce of lumber, he has perfect shoulders and fine hindquarters, and to follow him he looks more like Gladiateur than any other horse we have met with since the French flyer was on the turf. His foreleg action appears, to an outsider a tr fle too round, but he saddles and mounts so well that, i as one who had mounted him said, "he feels every inch a hunter." Sir George's 4th prize horse, Don Juan, is nearly a match for the 2d, but is a shade less in size and a fine goer. Such a pair, taking them together, are rarely seen. His head is not quite right set on, and he wants a man upon him who has both head and hands, for a few weeks. Sir George can and does breed hunters, as this showyard demonstrates; but it also proves that he is by no means equally successful in breaking and training them.

Mr. Jewison's 3d prize horse, Cowthorpe, is a large chestnut, rather loose, and with a common head. He is however a strong, fine made horse, and can move. The 5th horse, Mr. Foden's Young Artillery, is a bay with three white legs. He is the finest mover we ever saw, and we think good enough to have been placed 2d, if the judges, ignoring the weight-carrying powers of Sir George's horses, had been determined to stick to the same style of horse as the 1st. Mr. Jewison's Knight, distinguished in the list at Bridlington and Driffield, was kept in the ring along with Mr. Darrell's Chorister to the final award, which placed Mr. Booth's Brian Boru, the winner at Oxford, 6th. He is a compact weight-carrier, but deficient in quality, style, and "go" for a 12-stone hunter competition. Amongst the undistinguished horses there were many that deserve notice, and the ring looked well when the first half of the lot were called out. Mr. Jewison's Marigold and Mr. Appleyard's Nobleman were noticeable. Major Stapylton and Mr. Smithson also showed two good hunters.

In the 4-year-old hunters, the class of 26 afforded good competition. Mr. H. D. Bayly, Biggleswade, took 1st, with Borderer; he is a clever compact animal, but showed badly when mounted; when ridden by the judges he came into hand better, and will work into a very good one when the effects of bad breaking are obliterated. Mr. Pattison's 2d prize horse is a good, plain, sound animal; he beat Conrade and Borderer at Sleaford, the winner here (Borderer) only getting a commendation, and Conrade taking 2d honours. At Islington they were placed—Conrade 1st and Borderer 2d, but here the latter is properly brought to the front, and Conrade again put behind Mr. Pattison's horse. The 3d prize chestnut, Lothair, is rather a nice horse, but has not hunting action. Amongst the rejected in this class, Lord Feversham's Goneaway is the most noticeable. He is a fine hunter and rare goer, and must have been cast too quickly at a venture. There were many other valuable animals in this class. The 1st prize 4-year-old hunting filly, belonging to Mr. Bulman, is a splendid mare, and the 2d and 3d are two good looking animals, the property of Mr. Robson, Ganton, York. The 3-year-old hunting gelding was won by Sir George Cholmley's Dandy, who is no pretender; and the 2d place in 3-year-old hunting fillies fell to his pretty Carnation; and Mr. Barkworth's 1st prize 2-year-old, Portland, will be heard of again in the field or the ring.

The hunter classes, six in number, produced an aggregate of 120 competitors—an average of 20 in each class—quite enough to cut out stiff work for the judges, which, nevertheless, they performed with patience, and accomplished very satisfactorily, we think. Next to the "hunters," the public is certainly most interested in the classes of roadsters, hackneys, &c. Animals that can carry a saddle on the road are of use to a much greater number of people than harness horses; and the boy at home for the holidays, the man about town, and paterfamilias, grave with years and responsibilities, each requires a cob that can lift his foot and go away. In this section of the horse show 53 animals appeared, some of which were worth their weight in gold. In the hackneys, equal to 14 stones, the 1st prize, Fugleman, is a black of extraordinary power and action. He is compact and handsome, but not nearly as stylish as the 2d, Breda, the property of Mr. James Hornsby, of Grantham. Fugleman's fore feet are too large and flat to wear, still he is so splendid a goer, and has such substance, that he is worthy of honours. Mr. Hornsby's grey mare has won at London, Islington, Lincoln, and at many other places, and for quality and genteel appearance she is unapproachable. She has carried 16 stones for years, and has legs as clean as a foal's at the present time. Whether or not she is in her right place here is matterless. She cannot lose any credit, and has simply, we think, to try again to come to the front. She is white, and the other is black, and it may be this that turned the scale against the fair lady. In the hackneys to carry 12 stones, Sir Lionel Pilkington beat Mr. Holmes of Beverley, for the 1st place, after a hard contest, and we think that in this case the result was not satisfactory. The public placed them otherwise. In ponies between 12½ and 14½ hands high, Mr. Darrel's Nancy and Mr. Hill's Lucy were the prize animals in a competition of 19. A better show of ponies has seldom been seen, and Mr. Milward, the greater breeder of ponies, at whose annual sales enormous prices are reached, could only obtain a "H.C." with his Don Carlos, by Prickwellow, the 3d prize pony, belonging to Mr. Simpkin, of Burton Agnes, beating him cleverly.

Coach-horses were a small show, and not particularly noticeable. There were, however, some capital 2-year-old and 3-year-old geldings. The horses for agricultural and dray purposes were a good entry in numbers and quality. Mr. Duckett's 1st prize 2-year-old Sharper; Mr. Charles Lister's 3-year-old 1st prize Royal Duchess, and Mr. Samuel Thompson's black mare, Diamond, 11 years old, were prime specimens. Diamond, indeed, is the finest cart mare we ever saw, her looks and quality being something beyond what we ever met with; and she properly beat Mr. Brierly's Sensation. Sensation is a fine dray mare, of great power and symmetry, and she moves on springs; but she has not the quality of the black mare. In horses for breeding, the thoroughbred stallions for getting weight-carrying hunters were a capital lot of 18. In these we had Vansittart, Ancient Briton, Spendthrift, Rowsham, Preceptor, Poynton, Brilliant, Cape Flyaway, Redoubt, Schuloff, Bertie, Provost, Volturno, and Grandmaster, as well as the prizetakers Stampedo, Laughing Stock, and Sincerity. Stampedo is a very fine horse, and beats Laughing Stock and Sincerity, two animals distinguished at Oxford. The decision in this case properly reverses the position of the two, placing Sincerity 2d, and Laughing Stock 3d. Stampedo is a fine horse by Alarm; he has quality, shape, and good limbs, if we shut our eyes to the curly form of the hock. Grandmaster is a neat horse, but his action, like that of Laughing Stock, is below par. The remainder of the lot we will not "damn with faint praise."

In coaching stallions the 1st prize, Emperor, the property of Mr. W. Laverack, Brough, is a very clever horse. He had, however, all he could do to beat Mr. Holmes' 3-year-old Richmond, to whom the 2d prize was awarded. This horse is out of Mr. Holmes' Battersea prize mare Betsy, and will come out satisfactorily another day. Emperor took 2d last year at Beverley, and is deservedly promoted here.

The roadster stallions were a good lot, and the winners were the animals that outside judges anticipated. Lord Derby and Bay President are both young and very promising horses. The agricultural stallions came out in full force, 18 animals making their appearance. Lincolnshire, the broken-eared, aged horse, who has been so often a winner, on this occasion only reached a commendation. The 1st prize went to Nonsuch, from Burley-in-Wharfedale; the 2d to Durham, to Mr. Reed's Clydesdale Tom; and the 3d to Mr. Johnson's Active. Nonsuch is a thorough good horse. We wish he had met the Oxford winner, Honest Tom, who was defeated at Beverley last year by Lincolnshire, who is himself now set aside without a place.

To those who like Cydesdale horses, the 2d prize horse may be commended. We hope, however, that the Yorkshire breeders will not cross their best blood with that strain. The hunting brood mares' prize fell to Go-a-head, the property of Mr. S. T. Robinson, of Leckby Place; for style, shape, and quality this animal is the very ideal representative of her class. At Oxford she went in and won, the rest being nowhere. Here, however, she had competitors worthy of her rank, and was placed 1st, with a capital mare (Lady Byron), the property of Mr. Joseph Clark, Beeston, Leeds, 2d; Mr. Jackson, of Wakefield, showing a fine aged mare by Pompey, in the 3d place; the whole class being, as they deserved, commended. Heliotrope, the 3d at Oxford and 2d at Sleaford, got no place here. The coaching, roadster, and agricultural brood mares were not large entries, but were of fair average merit.

The following completes the list of awards:—

HORSES FOR BREEDING.

Coaching Stallions.—1st, W. Laverack, Everthorpe Grange, Brough; 2d, G. Holmes, Beverley. 3d, J. Hind, Howden.

Agricultural Stallions.—1st, J. Forshaw, Burley-in-Wharfedale; 2d, M. Reed, Beemish Burn, Chester-le-Street; 3d, W. Johnson, Hatfield, Doncaster.

Hunting Brood Mares and Foals.—1st, J. T. Robinson, Thirsk; 2d, J. Clark, Beeston, Leeds; 3d, H. W. Jackson, Wakefield.

Coaching Brood Mares and Foals.—1st, J. Johnson, Driffield; 2d, S. Frank, Brandsby.

Roadster Brood Mares and Foal.—1st, W. Major, Skelmeie; 2d, J. Clark.

Agricultural Brood Mares and Foals.—1st, T. Makin, Fairburn, South Milford; 2d, T. Upton, Pallathorpe, Tadcaster.

HORSES FOR AGRICULTURAL AND DRAY PURPOSES.

Two-year-old Agricultural Geldings or Fillies.—1st, T. Duckett, Bentley, Doncaster; 2d, T. Baum, Emsworth Lane Ends, Pontefract.

Three-year-old Agricultural Geldings or Fillies.—1st, C. Lister, Lincoln; 2d, M. Reed; 3d, J. Wood, Beeston Royds, Leeds.

Four-year-old and upwards Agricultural Geldings and Fillies.—1st, S. Thompson, Skipwith, Selby; 2d, C. W. Brierly, Middleton, Manchester; 3d, J. Clark.

Four-year-old Geldings or Mares, suitable for dray purposes.—1st, C. W. Brierly; 2d, T. Statter, jun., Stand Hall, Manchester; 3d, S. Barker, Marr, Doncaster.

COACH HORSES.

Two-year-old Geldings or Fillies.—1st, T. Plummer, Birdforth, Easingwold; 2d, R. Prince, Chapel Haddlesey, Selby; 3d, J. H. Harris, Houndalee, Morpeth.

Three-year-old Coaching Geldings.—1st, J. Thomson, Bishop Burton, Beverley; 2d, J. Johnson; 3d, T. Plummer.

Three-year-old Coaching Fillies.—1st, Wm. Wadsworth, Dunnington Grange, York; 2d, Thos. Rennison, Holme-on-Spalding Moor.

ROADSTERS, HACKNEYS, AND PONIES.

Three-year-old Geldings, or Fillies.—1st, Wm. Moffat, Kirklinton Park, Carlisle; 2d, T. Shearman, Warmsworth, Doncaster.

Hackneys or Roadsters of any age or sex, equal to carry 14 stones.—1st, C. Stephenson, Newcastle; 2d, J. Hornsby, Grantham; 3d, J. Robson, Malton.

Hackneys or Roadsters, of any age or sex, equal to carry 12 stones.—1st, Sir L. Pilkington, Bart., Chevet Park, Wakefield; 2d, G. Holmes, Beverley.

Ponies, any age or sex, not less than 12½, and not exceeding 14½ hands high.—1st, J. S. Darrel, West Ayton, York; 2d, W. Hill, Doncaster; 3d, W. Simpkin, Burton Agnes, Hull.

Ponies, any age or sex, not exceeding 12½ hands high.—1st, F. W. Watkinson, Hull; 2d, Edward Green, Heath Old Hall, Wakefield; 3d, Crawshaw and Blakeley, Hadfield, Dewsbury.

HUNTERS.

Two-year-old Geldings or Fillies.—1st, J. B. Barkworth, Raywell, Brough; 2d, J. Cattle, Barton-le-Street, Malton; 3d, R. Brunton, Marton, Middlesborough.

Three-year-old Hunting Gelding.—1st, Sir George Cholmley, Bart., Howsham House, York; 2d, S. Wiley, Bransby, York; 3d, R. Brunton.

Three-year-old Hunting Fillies.—1st, R. Jackson, Normanby, Middlesborough; 2d, Sir G. Cholmley, Bart.

Hunters, Geldings or Mares, five years old and upwards, and qualified to carry at least 12 stones with hounds.—1st, S. J. Welfitt, Louth; 2d, Sir G. Cholmley, Bart.; 3d, H. Jewison, Raisthorpe, York; 4th, Sir G. Cholmley, Bart.; 5th, T. H. Foden, Givendale Grange, Ripon; 6th, J. B. Booth, Killerby Hall, Catterick.

Farm Memoranda.

NORTH RIDING OF YORKSHIRE.—In this district we were favoured with some fine showers at the beginning of July, which proved of immense benefit to the growing crops, all of which were at a standstill. The corn crops improved very much after the rain, Oats in the most marked manner. In some instances Wheat is rather thin, but with the very favourable blooming time experienced we anticipate little, if any, short of an average yield. Barley promises well in this district; the crop will be a full average. Oats will prove deficient both in straw and grain. We do not remember of ever before seeing so large a proportion of smutted heads as there has been in the Oat crop this year.

The root crops are very unsatisfactory. Occasionally a good field of Swedes may be seen, but the generality is patchy, thin of plant, and backward. White Turnips have been sown twice, and in some farms thrice. Like the Swedes they vary, but where there is a plant it is tolerably regular, though very backward; with the continued dry weather they progress very slowly, and moreover we hear of a general attack by "grub," a grey worm about the size of an ordinary caterpillar, which eats the root off a little below the surface.

Hay has been secured in prime order, but crops very bad, fully one-third under an average. Pastures are very bare, being much burnt up; and artificial foods are resorted to, to eke out the parched and scanty grass.

Fatting cattle have done little good, and are being pushed into the market prematurely. Sheep have not suffered so much, but yet good mutton is not plentiful.

Harvest will be general next week. *W. F. M., Aug. 2.*

THE BRITANNIA FARM, BEDFORD.—We take the following particulars of this farm from a report of the very agreeable day lately spent there, on the invitation of Mr. J. Howard, M.P., by the London Farmers' Club, of which he is this year President:—

Most of the visitors arrived at the Britannia Works about half-past 10 o'clock, and were met by Mr. J. Howard, by whom and by one of the foremen they were accompanied through the various departments, and had the different processes of manufacture explained to them. Thence the party proceeded to the Corporation Sewage Irrigation Farms, and afterwards to the Hoo and Green Farms, which bore ample testimony, especially by the magnificent crops of Wheat and roots, to the power of steam culture to develope the latent riches of the soil. The land is what is termed a boulder clay, and previous to the application of steam would have been worth about 15*s.* per acre. The crops which it now bears are not, we were assured, the result of heavy manuring. We have not been furnished with a detailed account of the various operations, but our readers will be somewhat surprised to learn that on the 600 acres, of which the farms consist, only £105 has been spent during the current year on artificial [manures, or about 3*s.* 6*d.* per acre. The secret of success is deep and thorough tillage. The land for root crops was wholly prepared in the autumn, or before Christmas, the only spring operations, except the drilling, being harrowing and rolling. By this course the winter moisture was kept in the soil; the beneficial effects of this plan were, however, more strikingly manifested on Mr. C. Howard's sharp gravel fields at Biddenham, where the party were gratified by an inspection of some exceedingly choice samples of some Oxfordshire Down rams, which are now at Oxford, and a flock of ewes, remarkably for their beautiful uniformity.

On returning to Bedford the visitors partook of the hospitalities of the worthy host, in a spacious tent adjacent to the river.

Mr. JAMES HOWARD, M.P., in responding to the toast of his health, which was heartily given and received, gave the following account of these farms:—Some present, many present, have in former years looked over the farm you have seen to-day, and I believe they will agree with me that, good as the crops are, they have seen better in former years and in more genial seasons. The crops you have seen to-day are not the result of very heavy applications of artificial manure, but, as has been expressed, of deep cultivation. On Saturday last I requested the

manager to get out the expense we had incurred during the past year in artificial manure for the crops you have seen growing, and when I tell you we have 629 acres—about 600 under crops and in grass, and that we have spent on artificial manure £105, or 3*s.* *6d.* an acre, you will agree with me we have not been very extravagant upon that head. Although the crops near this immediate neighbourhood look very promising, I regret we cannot rejoice together over the prospects of the British farmer for the ensuing year. We have but little stock in hand, and but little prospect of any for the winter, and with the vast number of animals sold off during the long drought for killing, meat is at a high price at the present time. When we look also to the deficiency of the crop upon the light lands, on the Continent, and in England, the staff of life must also be very dear, and you all know that a large importation of grain means a disturbance of the money market in this country, and whenever the money market is disturbed it means diminished employment for the people and the general depression of commerce throughout the country.

The toast, "Foreign Agriculture," was responded to by M. Laveleye. He said:—Allusion has been made to what I have published concerning the land systems, publications in which I have shown the good results emanating from small estates and small culture (*petite culture*) in Belgium. I confess that, in going to-day over the farms so admirably cultivated by Messrs. James and Charles Howard, admiring their superb animals, the steam application, or the tillage, and perceiving such extraordinary results during a year which has been so unfavourable, I was almost on the verge of recognising the superiority of farming on a large scale (*la grande culture*), had I not called to mind that in this respect England constitutes a very remarkable but unique exception. I have studied the rural economy of the agricultural systems of nearly all Continental countries, and everywhere—in Prussia, in Austria, in Italy, in Spain, in Portugal, in France, and in Holland—I have found large estates far less well cultivated and less taken care of than small estates. If it is otherwise in England, the difference arises from the fact that there exists in this country a class of men who are wanted elsewhere, that you have farmers who devote themselves to cultivation, that you are a nation of capital, and possess an intelligence, a perseverance, and a practical genius, which are truly worthy of admiration. I have always recognised the services which the large farming of England has rendered to the world at large, not only by creating improved breeds, but by producing agricultural implements of great excellence. On this head I would principally put forward the gratitude which is due to a man who, like Mr. Howard, has been instrumental to so remarkable a degree in promoting the progress of mechanical science in its application to agriculture. Everywhere I have been—not only in Belgium and Holland, but in Hungary, Italy, Spain and Portugal—I found agricultural implements which were sent out from these ironworks which now surround us. The benefits resulting therefrom are incalculable. The marvellous improvement of farming implements represents hundreds of thousands. Supposing it allows only the production of a half-hectolitre more per acre, multiply that by the number of acres under cultivation, and you will realise an enormous amount.

Mr. C. S. Read, M.P., responding for the House of Commons, soon came to the more congenial subject of the visit of to-day, first of all to the renowned Britannia Ironworks, whose fame is spread through the civilised globe, and then to the farms of Bedfordshire, taking a sweep around as pleasant and well farmed a country as I ever saw in my life. I have to propose a toast, with all heartiness, sincerity, and pleasure—"The farming order of Bedfordshire," and associated with it the name of my excellent friend, Mr. Charles Howard. He was good enough to come to Norfolk the other day to our show, and to give us two or three most useful hints. Would that other gentlemen, when they migrate from one county to another and attend agricultural dinners, turned their speeches to such good and practical purpose as Mr. Howard. Some people fancy the Norfolk farmers would be rather hurt at what he said. Let me tell you they were all pleased and delighted. I, as a Norfolk man, regard it as a pity we have not made the progress in late years we did in the early part of the century. I think the fault rests in a great measure with the climate and soil. With our present knowledge and resources we have come to the furthest on the light soil, but I believe there is a mine of wealth in the heavy lands of England, and we don't possess them. When Mr. Howard told us we had a large quantity of useless hedgerow timbering, I will engage that every farmer in that part thanked him for telling that. When he told them that there was another source of wastefulness by vermin in the hedgerows, they thanked him. A word now on the subject of steam cultivation. Everybody, however limited his experience, should try and give the result of his experience when he meets such a company as this, and mine is that the growth of Barley may be made a certainty. If you steam cultivate your land in autumn, you may, by the application of 3 cwt. or 4 cwt. of manure grow crops with a certainty utterly unknown before to farmers; and as Barley is a crop which exhausts the land least, a considerable advantage is gained by this course. I believe the men of Bedfordshire have gone a-head immensely within the last 25 years. May they go on again. I give you "Bedfordshire Farming," and associate with the toast one than whom there is no more worthy man, excellent farmer, and better specimen of Bedford agriculturists—Mr. Charles Howard.

Mr. Charles Howard said—It affords me great pleasure to meet once again many prominent men of the Farmers' Club. I have been long connected with the Farmers' Club, and I believe it is one of the most prosperous and valuable institutions in the country. I believe there is a great deal of good effected by these meetings. We go amongst agriculturists in different parts of the country, and any man who goes from home and opens his eyes, must carry back with him some information. I don't say it is possible for you to gain many wrinkles to-day. Bedfordshire has not been so far in advance as the county with which my hon. friend, Mr. Read, has been so long and so worthily identified. Norfolk has been long in the forefront of agriculture; we take a humble lead. Now, as to what I saw at Norfolk, and to which Mr. Read has alluded in a manner I don't deserve. I merely told them I did not believe there was great progress made when people wrapped themselves up in their supposed excellence. I am quite sure our clerical friends will tell us there is no man so unsafe as the man who considers himself safe. My remarks were made in a friendly spirit. Mr. Read said there was one class of members of the House of Commons that benefited us more than others, but I begin to think we got but little help from any party. Lately, if any one stood up for the farmers of England, it was men below the gangway. They have supported us, especially on the Game Police Bill, a Bill which shows the greatest class legislation of any in the kingdom, and I am sorry to say the country party supported it. If you touch a fellow's pocket you will feel the way to his heart; and to be eaten up by a parcel of four-footed vermin, and then ask the country to pay a lot of policemen to assist the gamekeepers, is beyond what an Englishman can bear. The Game Police Bill gives an undue preference to this above all other property. I put this to Mr. Greene. A policeman can stop a man who he thinks has got rabbits or game upon him, and without any prosecutor this man can be sent to prison; but if a man robs a hen roost I should be required to swear to the property; that damns the Police Bill—a Bill which 99 out of 100 farmers in England are opposed to. I am a progressive Conservative, and I would say to that party on such questions as these, be wise in time, or power and influence will be taken out of your hands for ever.

Mr. Greene, M.P.—Mr. Chairman, I have a toast to propose, but as I have been challenged by your worthy brother on the Game Preservation and Poaching Act of which I spoke, I will say in presence of this company that I am no preserver of game, and that in supporting the Poaching Act I did it in the interest of the farmer. If poaching is an offence at all it ought to be prevented, and by empowering a policeman to stop upon the road and to search a person with game in his possession you give a power which stops game poaching. I am adverse to over-preservation, and the man who over-preserves rabbits is an enemy to his country. But I do contend in the presence of farmers—and I think my friend Mr. Read will bear me out that I am never ashamed of my opinions in whatever company I stand—I contend that the Night Poaching Act has been a benefit to the farmers. I differ from you (Mr. C. Howard) entirely and totally, and not from any love of game, for I am a fox-hunter, and a day's ride with the hounds is better than shooting. What I say is truthful and honest, and as to the farmers, God knows they are men for whom I have the highest regard, for they have been my best friends through life. If you admit for a moment that a man has a right to take your game, that game must be protected; and every Englishman has a right to say what he thinks independent of the consequence. I rise to propose a toast which you will all receive with more satisfaction than any political question, although I rejoice that he who raised the foundation of the buildings we have seen to-day was a Tory. I give you "Success to the Britannia Works at Bedford," coupled with our worthy Chairman.

Mr. James Howard, M.P.—With regard to the Game Poaching Bill, I should have voted in exactly the opposite direction from that in which my hon. friend voted, but I did not expect that it would come on on that particular day. It is no part of the duty of the State to make exceptional laws for the preservation of any description of property, and I agree with my brother upon that point. I hope to see the day when there will be a clean sweep of the Game Laws, and game put on the same footing as other property. My hon. friend also touched upon very broad political ground, and expected finally that I should return to the faith. (Mr. John Howard: It is time you did.) He anticipated the day when I should return to the faith of my forefathers, but he has never emerged from the darkness to the light. When he shall have done so, and not till then, will he be in a fit condition to judge of my present position. Passing over politics, I have to thank you for the toast. Captain Dashwood and Mr. Greene have alluded to the fact that my father laid the foundation of these buildings; but no matter how good the foundation might have been, it would have been all unavailing if we had not lived in the times we have. Those works were commenced in the early days of the railway system, which has done more for farming and for the business in which we are engaged than all other causes together, although I admit there are other causes which have tended to the development and advancement of British agriculture. I thank you very kindly for the cordial manner in which you have received the toast.

Mr. Trethewy proposed the health of Mr. Corbet, secretary of the Farmers' Club, to which that gentleman briefly responded. Several other toasts followed, and the meeting then broke up.

The Week's Work.

August 13.—*Wheat Harvest* progresses northward at a more rapid pace, so to speak, than usual. Some 30 years ago we have heard Irish reapers boast of having cut half-a-dozen harvests—beginning in the south of England in July and ending in Scotland in October, but this year it will require railway speed to keep pace with harvest operations. Arthur Young begins his Calendar for August with "harvest-men," and the increase of wages. Had farmers this year been dependent on manual labour alone it were difficult to say what the cost would have been. Happily the force of reaping-machines now in the field enables farmers to cut down their crops in time, but it will require an effort, with perhaps rather more money in many places, to keep up the stooking and stacking operations, which on no account ought to be allowed to fall behind, more especially in seasons like the present, for although the days begin to shorten and the nights to lengthen so as to reduce the mean temperature of the atmosphere, yet from the high temperature of the earth, corn, whether lying on the ground or in stooks, sprouts rapidly and loses colour when overtaken by thunder-storms, or a period of wet weather. It has justly been said that in early seasons, like this, unless the weather is very settled, the corn should be bound up in small sheaves, as in wet seasons, so as to forward the operation of carrying and stacking; and on no account should the Wheat be allowed to lie abroad in the swathe or sheaf as it falls from the machine. The small sheaves should also be well tied, but rather loosely, so as to let them dry to the heart, and also to obviate injury arising from tightening when rain falls, so as to soak them through and through; for, when this takes place, the straw swells, and becomes so close in the band as to prevent drying in the stook, thus necessitating their being opened and spread out to dry. Small loosely tied sheaves and well-set stooks obviate the harm thus experienced. The crop is very far from uniform, more so perhaps than any of the other cereals. How far this is to be attributed to soil, season, steam tillage, manures, and management generally, is beyond our limits to say; but the question merits, and doubtless will receive, the best attention of those interested, for the facts of each individual case speak out practically and pointedly for themselves. We do not remember a Wheat harvest so pregnant with useful matter for after-harvest discussion. Where the crop has ripened uniformly, there has been, and will be, no difficulty in determining when to start the reaping-machine, but where ripe and green ears are growing together it will be otherwise. The old rule says, "split the difference."

Barley Harvest is similar to that of Bere or Bigg noticed last week. Perhaps a greater breadth than is yet credited has been prematurely forced forward, but the crop generally is reported more uniform than either Wheat or Oats, and is standing well up to the reaping-machine in our southern and midland counties, where reaping is begun, but further north it is heavier—some fields too close, from being too thickly seeded for the season, and in a state very liable to succumb to the weather. From the straw being dead ripe, standing crops of Barley, although short, are easily cut, but not so easily sheafed and stooked owing to the manner the ears hang down; stooks stand badly, and swallow rain rapidly, hence a greater breadth than usual of this crop will probably this year be harvested loose, especially where mown with the scythe. In a standing crop the reaping-machine makes the best work, encouraging sheafing; and much of the crop may be secured in handcocks and stacks directly from the machine. It has often occurred to us in the field that this crop should always be cut dry and secured under thatch immediately, and now that we have got artificial modes of thatching we do not see any difficulty of carrying the idea into practice. Taking one year with the other, the heavy loss sustained in the Barley field might thus be obviated, the crop at the same time being harvested at less expense.

Notices to Correspondents.

Poultry-yard Manure: *R.* If you doubt the value of fowl-manure, put a load on 10 rods of ground, and you will have 60 tons of Mangels per acre. *J. J. Mechi.*

Markets.

HOPS.

Borough Market, Aug. 11.

The market for Hops continues very inanimate, in consequence of the favourable prospect of a good crop. The annexed are the quotations:—Mid and East Kents, £7 to £12; Weald of Kents, £6 to £8; Sussex, £5 5*s.* to £6 6*s.*; Bavarians, £6 to £9; French, £5 to £6 10*s.*; Americans, £4 to £6; Yearlings, £1 5*s.* to £3 2*s.* per cwt.

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, Aug 11.

Prime Meadow Hay	120*s.* to 132*s.*	Clover, old	135*s.* to 145*s.*
Inferior do.	100 110	Inferior do.	110 120
New Hay	105 115	Prime new do. ..	120 128
Inferior do.	90 100	Inferior do.	100 110
Straw	24 32	Charles James Easton.	

Cumberland Market, Thursday, Aug 11.

Sup. Meadow Hay	110*s.* to 138*s.*	Inferior Clover ..	120*s.* to 128*s.*
Inferior do.	110 118	Prime 2d cut do. ..	—
New do.	115 126	New do.	120 134
Inferior do.	100 108	Straw	27 30
Superior Clover ..	136 147	Joshua Baker.	

METROPOLITAN CATTLE MARKET.

Monday, Aug. 8.

We have a very short supply of Beasts, and especially of English; prices have advanced for all descriptions, and some choicest qualities have rather exceeded our top quotation. The number of Sheep is smaller than last week; best qualities are readily disposed of, at rather higher rates, and a good clearance is effected. Choice Lambs are in request, but it is difficult to dispose of inferior. Trade is heavy for Calves at our quotations. Our foreign supply consists of 2140 Beasts, 8650 Sheep, 205 Calves, and 65 Pigs; from Scotland there are

50 Beasts; from Ireland, 60; from Norfolk and Suffolk, 50; and 1285 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	4 to 5 8	Best Long-wools	5	0 to 5 4
Best Shorthorns..	5	2—5 6	Do. Shorn ..	..	— —
2d quality Beasts	4	0—4 8	Ewes & 2d quality	4	6—4 10
Best Downs and Half-breds ..	5	4—5 8	Do. Shorn ..	..	— —
Do. Shorn ..	..	— —	Lambs ..	5	0—6 4
			Calves ..	3	4—5 4
			Pigs ..	3	0—5 0

Beasts, 3585; Sheep and Lambs, 25,040; Calves, 345; Pigs, 220.

THURSDAY, Aug. 11.

We have double the number of Beasts we had last week, yet there is a fair demand for them, and not many unsold; the average quality of the supply is only middling, and Monday's quotations are barely maintained. We have a shorter supply of Sheep; trade is about the same as on Monday. Good Lambs are scarce, and in some instances rather dearer, but middling ones are with difficulty disposed of. Choicest Calves are rather dearer. Our foreign supply consists of 500 Beasts, 3420 Sheep, 530 Calves, and 55 Pigs.

	s. d.	s. d.		s. d	s. d.
Best Scots, Herefords, &c. ..	5	4 to 5 6	Best Long-wools..	5	0 to 5 4
Best Shorthorns ..	5	0—5 4	Do. Shorn ..	..	— —
2d quality Beasts	4	0—4 6	Ewes & 2d quality	4	6—4 10
Best Downs and Half-breds ..	5	4—5 8	Do. Shorn ..	..	— —
Do. Shorn ..	..	— —	Lambs ..	5	0—6 4
			Calves ..	3	4—5 6
			Pigs ..	3	0 -5 0

Beasts, 1760; Sheep and Lambs, 14,580; Calves, 674; Pigs, 70.

METROPOLITAN MEAT MARKET.—Aug. 11.

Best Fresh Butter .. .. .. 18*s.* per dozen lb.
Second do. do. .. .. 16*s.* ,,
Small Pork, 4*s. 8d.* to 5*s. 0d.*; Large Pork, 3*s. 4d.* to 3*s. 8d.* per 8 lb.

MARK LANE.

MONDAY, Aug. 8.

There was a small supply of English Wheat to this morning's market; part consisted of the new crop, which varied much in quality and condition, and brought very irregular prices; last year's sold at the rates of this day se'nnight. The attendance was good, but the demand for foreign Wheat only moderate; the business done was at the quotations of this day week. In the value of Barley, Beans, and Peas we observe no alteration. The Oat trade was quiet, and Friday's advance was lost. Flour was unchanged.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	50	56	Red.....	48	56
— — fine selected runs..do.	53	60	Red.....	51	57
— — Talavera	54	63			
— — Norfolk	—	—	Red.....		—
— — Foreign	42	63			
BARLEY, grind. & dist. 29*s* to 33*s*.. Chev.	42	45	Malting ..	36	41
— Foreign .. grinding and distilling	25	33	Malting ..	33	43
OATS, Essex and Suffolk	25	27			
— Scotch and Lincolnshire.. Potato	27	29	Feed		—
— Irish ..... Potato	26	28	Feed	24	27
— Foreign .....Poland and Brew	27	29	Feed	22	27
RYE	32	36	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan ...38*s*. to 42*s*.. Tick	38	50	Harrow ..	38	50
— Pigeon ....44*s*. to 50*s*...Winds	—		Longpod..		—
— Foreign ..... Small	45	47	Egyptian ..	42	44
PEAS, White, Kent, and Kent.. Boilers	38	42	Suffolk ..	41	44
— Maple, 37*s*. to 44*s*. .....Grey	36	39	Foreign ..	36	40
MAIZE	—	—	Foreign ..	32	34
FLOUR, best marks delivered..per sack	46	54			
— 2d ditto ..... ditto	35	47	Country ..	35	47
— Foreign ..... per barrel	29	31	Per sack..	35	61

WEDNESDAY, Aug. 10.

Although there was a fair attendance of millers market to-day, the grain trade throughout the day ruled quiet, and the general tendency of values was drooping. The supply of English Wheat was very short, and of foreign it was only moderate. The inquiry for all descriptions was restricted, at the rates current on Monday last. The show of Barley was fair; the demand was steady for grinding samples, at about previous prices. Malt was dull, but unaltered in value. Oats, the supply of which was good, experienced a slow sale, at a reduction of 6d. per qr. on some occasions. Beans were fully as dear. There was a good show of Peas, which met a fair demand, but prices were with difficulty maintained. The Flour trade was inanimate, but unchanged in price.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. —	Qrs. —	Qrs. 100	Sacks. —
Irish ..	—	—	—	—
Foreign ..	31,320	3610	52,420	{ 780 / 12450 brls.
	31,320	3610	52,520	

HULL, August 9.—At our market to-day there was a small show of English Wheat, which farmers held firm for last week's rates; only needy millers complied with the demands of holders, and the transactions were therefore very limited. In foreign Wheat no business done. English white realised 55*s.* to 58*s.* per qr.; red, 53*s.* to 55*s.*; Dantzic and Konigsberg white, 58*s.* to 60*s.*; mixed, 54*s.* to 56*s.*; Baltic red, 52*s.* to 55*s.*; Danish and Hamburgh, 52*s.* to 56*s.*

AVERAGES.

	Wheat.	Barley.	Oats.
July 2	51*s* 6*d*	32*s* 0*d*	25*s*10*d*
— 9	50 7	30 3	25 8
— 16	49 8	31 2	25 6
— 23	49 9	31 2	26 11
— 30	52 10	33 8	26 9
Aug. 6	54 11	31 8	28 8
Average ..	51 6	31 8	26 6

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEREMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each.

6 ft. by 4 ft. Lights, 2 in. thick, unglazed.. £0 5 0
,, ,, Primed and Glazed with 10 oz. Sheet 0 11 0
,, ,, with stout portable Box, not Painted .. .. ,, 1 3 0
,, ,, Painted four coats, and Handles on 1 8 0
,, ,, Packed and Delivered in Railway van 1 10 0
6 ft. by 8 ft., Double Lights, do. 2 15 0
GREENHOUSES Per ft. super
Woodwork only Prepared to be Filled 0 0 6
,, Primed and Glazed with 16 oz. Sheet .. 0 0 9
,, Delivered, and Fixed with Ironwork .. 0 1 0
,, Painted four coats, two sides, ready for use 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

THE PATENT "TERMINAL SADDLE" BOILER is now at work in hundreds of places in all parts of the country, and commands universal admiration.
Illustrated Circulars, containing Opinions of the Press, Testimonials, &c., post free.
J. IRELAND, Edward Street, Broughton Lane, Manchester.

Monro's Cannon Boiler.

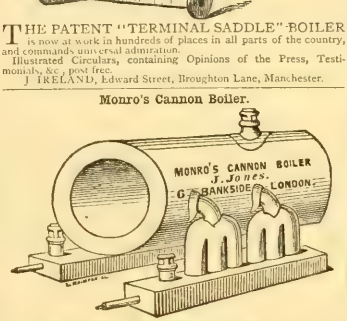

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at their wharf in London. Lists on application.
J. JONES AND SONS, Iron Merchants, 6, Bankside, Southwark, London, S.E.

JAMES WATTS AND CO., HOTHOUSE BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 353, Old Kent Road, London, S.E.

200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.
Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5*s.* each GLASSES, all sizes.
References to the Nobility, Gentry, and Trade in most of the Counties in England.

Beard's Patent Non-conducting and Ventilating Metallic Glass Houses.
Victoria Works, Bury St. Edmund's.

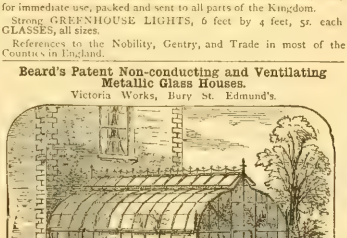

MANUFACTURED BY
CHARLES BEARD, Senior Partner in the late Firm of Sanders, Frewer & Co., which Firm was dissolved by mutual consent.
The Patentee wishes to observe his Patent Houses obtained the First and only Prize at the Royal Horticultural Congress, South Kensington, 1866;
The First-class Certificate at the Grand Manchester Horticultural Show, 1867;
The Three First class Certificates at the Royal Horticultural Show, at Bury St. Edmund's, 1867, viz.:—One Prize for Patent Glazing without Putty; One Prize for Best System of Patent Ventilation; One Prize for S., F. & Co.'s Improved Flower Stands.
These much-approved Patent systems of Glazing and Ventilation are also extensively adapted for all Agricultural Buildings, Public Halls, Churches, Factories, Railway Stations, &c., &c.
Full particulars and Prices of the Patent Houses, glazed with 26 oz. Sheet Glass from 1*s.* 2*d.* per foot super and upwards; as also Illustrated Catalogues for 12 postage stamps; may be obtained on application to CHARLES BEARD, Victoria Horticultural Works, Bury St. Edmund's.
PATENT GLAZING BARS, to screw on wood, may be had separately. Full particulars for stamped envelope.

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By Royal Letters Patent.

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IMPROVED REGISTERED GAS BATH, £10.
Testimonials on application. Enclose stamp.
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HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c.

Improved Conical. *Tubular Boiler.*

HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.
WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED CONICAL, also Elliptic, Boilers, from 24*s* each
Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Wars, from 50*s.* 6*d.* each.
CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60*s.* each.

Portable Boiler. *Elliptic Boiler.*

Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.
INDIA-RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water-tight.
Goods, of the very best manufacture, delivered at Railway or Wharf in London.
LYNCH WHITE, Old Barge Iron Wharf, Upper Ground Street, London, S.E (Surrey side Blackfriars Bridge). Price List on application.

Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,
WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to
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SHANKS'S PATENT LAWN MOWERS for 1870. The Patent Improvements recently introduced give SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

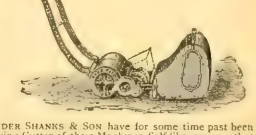

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no rubbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application
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A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
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Manufactory, 6, Bansside, Southwark

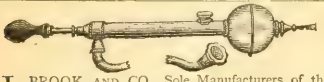

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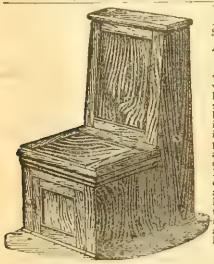

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From Mr W. GILBERT, *Lanford Street, Rugby.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

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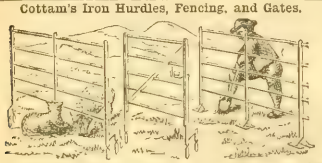

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW HOUSES

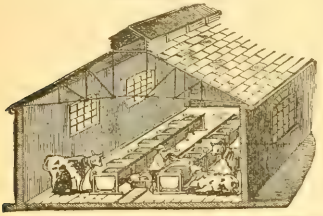

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, as received width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cheaply, durable, and impervious to infection, being all of Iron. Three of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

GARDEN CANOPIES, of various sizes, suitable for Croquet Lawns, Children's Playing Grounds, and general Garden use, may be seen erected at
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CROQUET, CRICKET, and GARDEN TENTS of all sizes and shapes. An Illustrated Catalogue free on application.
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GARDEN and LAWN TENTS, of the most elegant form, easily erected and removed, at
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Caution to Gardeners.—When you ask for

SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & CO.,

IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

87, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,

With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

CAUTION.—The Public are hereby cautioned against purchasing Machines, Plates, or Fittings of any description, which are stamped or otherwise marked with the name of CLAYTON AND SHUTTLEWORTH, or any name resembling it, or any other name implying that they are the Manufacturers, unless they are purchased direct from us, or from our authorized Agents. Purchasers are also cautioned against buying Machines which are sold as "Clayton and Shuttleworth's Pattern," or "Similar to Clayton and Shuttleworth's," as such Machines are not to be depended upon, and are generally of inferior workmanship and materials. Purchasers are requested to observe that every genuine Machine has a Brass Plate, bearing the Maker's Name and Address, fixed on the Driving Wheel. Any infringement of our Patents, or Trade Marks, will be promptly prosecuted, whether the Infringers be Makers or Users.

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INTERNATIONAL EXHIBITION, CLASS IX., No. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the tubes in closer contact with the fire. The usual form of a furnace being a parallelogram rather than a square, it seems feasible that the Boilers on the oval plan should bring the tubes more completely within range of the burning fuel; and this being so, the change, though a slight one, is no doubt an improvement."

☞ *They are made of all sizes, which, with prices, may be had on application.*

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DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

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Bell and Brass Founders to Her Majesty, Manufacturers of Hydraulic Machinery of every description, Wind Engines, Water Wheels, Water Rams, Deep Well Pumps and Frames for Horse or Hand Power, Garden Engines, Swing Barrows, Syringes, Fountain Jets, Branch Pipes for Rubber Hose, &c., &c.

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No. 547A.

GARDEN ENGINE.

10 Gallons	..	..	£3 0 0
16 ,,	..	..	3 16 0
28 ,,	..	..	5 1 0
42 ,,	..	..	5 13 0

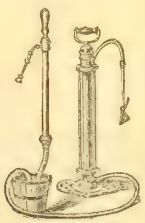

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3 ,,	..	2	2 0
3½ ,,	..	2	7 0
4 ,,	..	2	15 6

No. 579½.

SWING
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20 Gallons	..	£2	2 0
30 ,,	..	2	14 0
38 ,,	..	3	18 0
50 ,,	..	5	14 0

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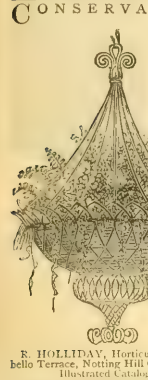

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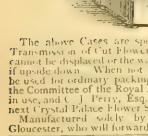

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The best Shading is "Frigi Domo" Netting.

White or Brown, made of prepared Hair and Wool, a perfect non-conductor of heat or cold, keeping a fixed temperature where it is applied. It is adapted for all Horticultural and Floricultural purposes, for

PROTECTION from the SCORCHING RAYS of the SUN.

"FRIGI DOMO" NETTING, 2 yards wide, 1*s.* 6*d.* per yard run.
"FRIGI DOMO" CANVAS.

Two yards wide	.. .. ..	1*s.* 9*d.* per yard run.
Four yards wide	.. .. ..	3*s.* 6*d.* per yard.
An improved make, 2 yards wide	..	1*s.* 9*d.* per yard.
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Scrim Canvas, 72 inches wide, 70 yards long, 5¼*d.*, 6¼*d.*, 7¼*d.*, 7¾*d.* and 8¼*d.* per yard.
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LONDON and COUNTY BANKING COMPANY.
Established 1836. Subscribed Capital, £2,500,000, in 50,000 shares of £50 each. Paid up capital, £1,000,000. Reserve fund, £500,000.

Directors.

Nathaniel Alexander, Esq. | Frederick Harrison, Esq.
Thos. Tyringham Barnard, Esq. | Lord Alfred Hervey.
Philip Patton Blyth, Esq. | William Champion Jones, Esq.
John William Burmester, Esq. | Edwd. Harford Lushington, Esq
Thomas Stock Cowie, Esq. | James Morley, Esq.
Frederick Franklyn, Esq. | William Nicol, Esq.

General Manager—William M'Kewan, Esq.
Chief Inspector—W. J. Norfolk, Esq.
Inspectors of Branches—H. J. Lemon, Esq., and C. Sherring, Esq.
Chief Accountant—James Gray, Esq.
Secretary—F. Clappison, Esq.
Head Office—21, Lombard Street.
Manager—Whitbread Tennant, Esq.
Assistant Manager—William Howard, Esq.

At the Half-yearly General Meeting of the Proprietors, held on Thursday, August 4, 1870, at the City Terminus Hotel, Cannon Street Station, the following Report for the half-year ending June 30, 1870, was read by the Secretary,—William Champion Jones, Esq., in the Chair —

The Directors, in presenting to the Proprietors the Balance sheet of the Bank for the half-year ending June 30 last, have the satisfaction to report that, after paying interest to customers, and all charges, allowing for rebate, and making provision for bad and doubtful debts, the net profits amount to £83,285 6*s.* 11*d.* This sum, added to £8,895 17*s.* 5*d.*, brought forward from the last account, produces a total of £92,181 4*s.* 4*d.*

They have declared the usual dividend of 6 per cent., with a bonus of 2½ per cent. for the half-year, free of income-tax (being at the rate of 17 per cent. per annum), which will absorb £85,000, and leave £7,181 4*s.* 4*d.* to be carried forward to the profit and loss new account.

Mr. John William Burmester, after 15 years' service, has requested, on account of his advanced age, to be relieved from office as one of the Trustees of the Bank, and Mr. Frederick Harrison, a Director, has been elected in his stead.

The dividend and bonus (together £1 12*s.* per share) will be payable at the Head Office, or at any of the branches, on and after Monday, the 15th inst.

BALANCE-SHEET OF THE LONDON AND COUNTY BANKING COMPANY, JUNE 30, 1870.

DR						CR
To Capital paid up	..	..	..	..	£1,000,000 0 0	
To Reserve Fund	..	..	..	..	500,000 0 0	
To amount due by the Bank for customers' balances			£13,371,794 4 5			
To liabilities, on acceptances, covered by securities	..	..	1,880,716 4 6			
					15,252,510 8 11	
To profit and loss balance brought from last account	..	..	8,895 17 5			
To gross profit for the half-year, after making provision for bad and doubtful debts, viz.	..	..	253,259 18 1			
					262,155 15 6	
					£17,014,666 4 5	
By cash on hand at Head Office and branches, and with Bank of England	..	..	£2,038,557 13 9			
By cash placed at call and at notice, covered by securities	..	..	1,665,015 7 0			
					£3,614,193 1 6	
Investments, viz —						
By Government and guaranteed stocks	..	..	1,378,222 7 6			
By other stocks and securities	..	..	72 601 4 4			
					1,450,823 11 10	
By discounted bills and advances to customers, in town and country			9,637,856 11 4			
By liabilities of customers for drafts accepted by the Bank, as per contra	..	..	1,880,716 4 6			
					11,518,572 15 10	
By freehold premises in Lombard Street and Nicholas Lane, freehold and leasehold property at the branches, with fixtures and fittings	..	..	..	..	249,322 19 4	
By interest paid to customers	..	..	..	..	43,992 14 6	
By salaries and all other expenses at Head Office and branches, including income-tax on profits and salaries	..	..	..	..	107,702 1 5	
					£17,014,666 4 5	

PROFIT AND LOSS ACCOUNT.

DR				CR	
To interest paid to customers, as above	..	..	£43,001 14 6	By balance brought forward from last account	£8,895 17 5
To expenses	..	..	107,702 1 5	By gross profit for the half-year, after making provision for bad and doubtful debts	253,259 18 1
To rebate on bills not due, carried to new account	..	..	18,280 15 3		
To dividend of 6 per cent for the half year	..	..	60,000 0 0		
To bonus of 2½ per cent	..	..	25,000 0 0		
To balance carried forward	..	..	7,181 4 4		
			£262,155 15 6		£262,155 15 6

We, the undersigned, have examined the foregoing balance-sheet, and have found the same to be correct

(Signed) WILLIAM JARDINE, WILLIAM NORMAN, R. H. SWAINE, } Auditors.

London and County Bank, July 28, 1870.

The foregoing report having been read by the Secretary, the following resolutions were proposed, and unanimously adopted :—

1. That the report be received and adopted, and printed for the use of the Shareholders.

2. That the remuneration of the Auditors be increased from £100 per annum to £150 per annum, to take effect from January 1 last.

3. That the thanks of this meeting be given to the Board of Directors for the able manner in which they have conducted the affairs of the Company.

(Signed) W. CHAMPION JONES, Chairman.

The Chairman having quitted the chair, it was resolved and carried unanimously :—

4. That the cordial thanks of this meeting be presented to William Champion Jones, Esq., for his able and courteous conduct in the Chair.

(Signed) F. P. BLYTH, Deputy Chairman.

Extracted from the minutes.

(Signed) F. CLAPPISON, Secretary.

LONDON and COUNTY BANKING COMPANY. —Notice is Hereby Given that a DIVIDEND on the Capital of the Company, at the rate of 6 per cent. for the half year ending June 30, 1870, with a BONUS of 2½ per cent., will be PAID to the Proprietors, either at the Head Office, 21, Lombard Street, or at any of the Company's Branch Banks, on and after MONDAY, the 15th instant. By order of the Board,

W. MCKEWAN, General Manager.

21, Lombard Street, August 5, 1870.

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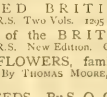

Each.—	*s.*	*d*	Each.—	*s.*	*d*
2 inches in diameter ..	0	3½	12 inches in diameter ..	1	9
3 " " ..	0	4½	14 " " ..	2	0
4 " " ..	0	5½	15 " " ..	2	6
5 " " ..	0	6½	15 " " ..	3	0
6 " " ..	0	8	16 " " ..	3	6
7 " " ..	0	9	17 " " ..	4	0
8 " " ..	1	0	18 " " ..	5	0
9 " " ..	1	2	19 " " ..	6	0
10 " " ..	1	4	20 " " ..	7	0
11 " " ..	1	6			

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter ..	0	6*d.*	9 inches in diameter ..	1	8*d.*
5 " " ..	0	8	10 " " ..	2	0
6 " " ..	0	10	11 " " ..	2	6
7 " " ..	1	0	12 " " ..	3	0
8 " " ..	1	4			

Either flat or conical tops.

CUCUMBER GLASSES.

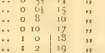

24 inches long ..	2	0*d.*	16 inches long ..	1	2*d.*
22 " ..	1	10	14 " ..	1	2
20 " ..	1	8	12 " ..	2	6
18 " ..	1	6			

HAND GLASSES, WITH OPEN TOPS.

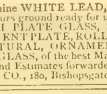

Each.—	*s.*	*d*	Each.—	*s.*	*d*
12 inches ..	0	6	20 inches ..	10	6
14 " ..	0	8	22 " ..	11	6
16 " ..	0	8	24 " ..	12	6
18 " ..	0	9			

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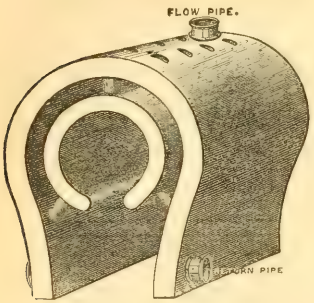

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AND

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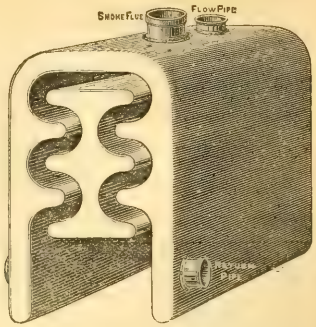

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Many of them have been used to replace cast iron tubular ones, and have proved in point of economy vastly superior.

Place no reliance in cast iron Boilers of any form or construction.

Cast iron is a short and brittle metal.

Cast iron Boilers of all forms are continually cracking and going to pieces.

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Winter is approaching, therefore have a safe wrought iron Boiler, and run no risk.

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AND
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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
The COUNCIL are prepared to receive APPLICATIONS from Nurserymen and others interested in Horticulture for SPACE for the PERMANENT FLORAL SHOW, to be held in connection with the forthcoming Annual International Exhibition, at South Kensington. The space available being limited, early application is necessary. The Council reserve to themselves the absolute right of allotting the space as they may consider advisable. All applications to be addressed to the ASSISTANT SECRETARY, South Kensington, W.

READING HORTICULTURAL SOCIETY.—The AUTUMN SHOW will be held on THURSDAY, August 25 (by permission of the Mayor), in the Abbey Ruins, Reading. A Band will attend as usual. The Show will be Open to the holders of Subscribers' Tickets at 2 o'Clock, and to the Public at 3 o'Clock, on payment of 1s. Schedules and Tickets may be obtained of CHARLES COLLINS, Hon. Secretary.
34, Chain Street, Reading

BANBURY HORTICULTURAL SOCIETY. Established 1847.—The SHOW will take place on TUESDAY, August 30. Prizes Open to all, whether Members or not, on payment of an entrance fee of 2s. 6d.
For Stove or Greenhouse Plants, either in Flower or Ornamental, but not Fuchsias, Achimenes, Geraniums or Annuals, 6 varieties, to be grown in not less than 8-inch pots: 1st prize, Silver Cup, value £5; 2d, £2.
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For the best 12 Verbenas (3 trusses in each), 1st, £1; 2d, 15s.
The Judges may withhold any prize if the production exhibited be not considered worthy. Intending Exhibitors must give notice to the Secretary on or before Saturday, August 27. The Society will, if requested, convey the productions from and to the railways.
E. J. HARTLEY, Secretary.

Worcestershire Agricultural Society.
A GRAND HORTICULTURAL EXHIBITION, in connection with the above, will be held in the SHOW GROUND at KIDDERMINSTER, AUGUST 30 and 31, and SEPTEMBER 1, when PRIZES to the amount of ONE HUNDRED and THIRTY-FIVE POUNDS will be awarded. For Lists of Prizes and Rules, &c., apply to Mr. H. J. CRANE, 27, Clarence Street, Cheltenham, Hon. Secretary to Horticultural Show; or to
ALBERT BUCK, Secretary, Worcester.

ROYAL BOTANIC GARDENS, BELFAST.—GRAND EXHIBITION of FRUITS, FLOWERS, PLANTS, &c., SEPTEMBER 8 and 9 next. Two Military Bands in attendance. *Patrons*—His Excellency the LORD-LIEUTENANT of IRELAND and EARL SPENCER.
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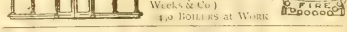

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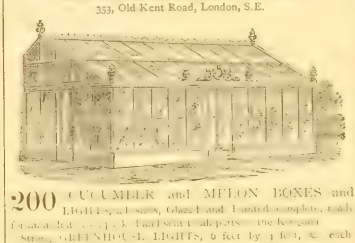

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STOCK of GREENHOUSE LIGHTS, 9 feet by 4 feet, & each
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Midland Horticultural and Hot-Water Engineering Works, Loughborough.

T. G. MESSENGER will be happy to prepare Plans and Estimates for the above Works, or, if preferred, will work from Plans and Estimates furnished by any Architect or Builder.
T. G. M. is a manufacturer of Hot-Water Apparatus on the most improved principles, and can supply Boilers of any description, with Pipes, Valves, and Fittings to match. These Boilers are constructed on the Saddle principle, and are fitted with T. G. M.'s Patent Self-Acting PATENTED BOILER, which renders them powerful and economical in fuel. His Patent Valve gives complete satisfaction in every case. Many thousands are at work. Terms on application. A fully Illustrated Catalogue forwarded post free for three stamps.

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HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
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	2-inch.	3 inch.	4-inch.
HOT-WATER PIPES, Nos. 6 and 7—per yard	s. d.	s. d.	s. d.
ELBOWS, No. 12 .. .. .. each	1 0	1 9	2 6
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W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

	Each.
6 ft. by 4 ft. Lights, 2 in thick, unglazed ..	£0 5 0
„ „ Sheet	0 11 0
„ „ with stout portable Box, not Painted	1 3 0
„ „ Painted four coats, and Handles on	1 8 0
„ „ Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do	2 15 0
GREENHOUSES	Per ft. super.
Woodwork only Prepared and Primed	0 0 6
Primed and Glazed with 16 oz. Sheet	0 0 9
„ Delivered, and Fixed with Ironwork	0 1 0
„ Painted four coats, two sides, ready for use ..	0 1 3

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Heating by Hot Water.

PUBLIC and PRIVATE BUILDINGS, MANUFACTORIES, CONSERVATORIES, &c., heated on the most improved system, combined with perfect ventilation.
These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require NO BRICKWORK.
POLLARD, JEPHSON, AND CO. (Successors to John R. Peill), Sole Manufacturers of the Improved CONICAL BOILERS,
Which are in general use, and which Boilers have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.
Bear Garden, New Park Street, Southwark, London, S.E.

Monro's Cannon Boiler.

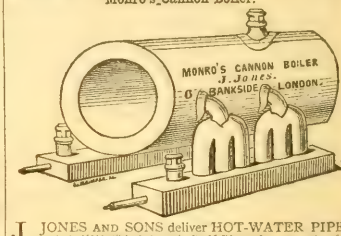

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order ; or they allow a liberal discount for cash at their wharf in London. Lists on application.
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Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c., WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship ; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance ; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems ; facility for extensions, alterations or removals without injury to Pipes or Joints ; easily and expeditiously erected ; an ordinary size apparatus is put up in a day ; and perfectness of design supplied, insuring no extras.
BATH and GAS WORK ERECTED in TOWN or COUNTRY The Trade supplied.
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JAMES' INTERNATIONAL PRIZE CALCEOLARIA.—The Plants of this splendid strain were awarded the 1st prize by the Royal Horticultural Society, at their Spring Show, May 3; and we beg to state, as a Caution to Purchasers, that we hold the Entire Stock of Seed saved by the Grower, and supplied to us direct. Price per packet, 2s. 6d. and 5s. Prices to the Trade on application.
JAMES CARTER AND CO., The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.
CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes this season at the Royal Horticultural, and other places. Per packet, 2s. 6d.
CALCEOLARIA, finest hybrid. Per packet, 2s. 6d.; smaller packets, 1s. 6d.
CALCEOLARIA, finest spotted. Per packet, 2s. 6d.; smaller packets, 1s. 6d. Saved with the greatest care, and from one of the largest collections in the kingdom.
CINERARIA, choicest, mixed.—Saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2s. 6d.; smaller packets, 1s. 6d.
PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.
PRIMULA.—Choicest, mixed, fringed. Per packet, 2s. 6d. } smaller packets, 1s. 6d.
PRIMULA.—Dark carmine. Per packet, 2s. 6d. }
PRIMULA.—New scarlet. Per packet, 2s. 6d.
PRIMULA.—Rose fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved white. Per packet, 2s. 6d.
PRIMULA FIMBRIATA.—Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.
Forwarded immediately on receipt of Post-office Order.
JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

The most Desirable Plant of the Season.
PARSON'S NEW WHITE MIGNONETTE. RESEDA ODORATA LUTEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to any other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are but little above existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz:—
The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.
The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.
The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.
The Brighton Horticultural Show, First-class Certificate, June 28, 1870.
The above will be sent out in October, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint, price 6d. per packet.
The Agents for the above will be advertised shortly.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited), CORN, SEED, MANURE, AND CAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent seed Corn and Seeds."

To the Trade.
JEAN VERSCHAFFELT begs to offer the following plants, of which he possesses a very fine stock, at the undermentioned low prices, viz.:—
CAMELLIAS, 2 to 2½ feet, with buds, all fine sorts, named, selections left to J. V., £6 per 100: ditto stronger, £8 to £10.
OLEANDER ODAMUS, fine plants, in full bud, 24s. per dozen
" extra sized plants, extra fine and strong, 36s. p. doz.
JASMINUM GRANDIFLORUM, grafted plants, very fine flowering species, 24s. per dozen.
LAURUSTINUS ROSEUS, 4yr. seedlings, in single pots, 40s. per 100.
AZALEA INDICA, £5 per 100: ditto, stronger, £6, £8, to £10.
Early orders for the above are solicited.
Steamers sail weekly from Ghent direct to Goole and London, and from Antwerp to all the principal ports of England. All letters to be directed to
JEAN VERSCHAFFELT, Nurseryman, Ghent, Belgium.

Superb New Bedding Plant,
VIOLA CORNUTA VAR. PERFECTION.
B. S. WILLIAMS has much pleasure in offering a new SEED of the above, and from the manner in which it has been tested in rich and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, seldom exceeding 8 inches in height, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceed radiating lines of still deeper purple; indeed, it resembles a gigantic V. cornuta in habit, and, whilst retaining its profuse blooming qualities, producing flowers which almost rival our florist Pansies for size and substance. Was awarded a First-class Certificate by the Floral Committee when exhibited under this name, Sept. 15, 1869, by Mr. Robson, of Rotherfield Park, its raiser, which no similar Viola has received.
None is genuine unless B. S. WILLIAMS' name and address is on each packet. Price 1s. 6d., 2s. 6d., and 5s. 6d. per packet.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

Suttons' Choice Flower Roots.
AUTUMN 1870.
SUTTONS' AUTUMN CATALOGUE of
HYACINTHS | TULIPS
CROCUS | NARCISSUS
RANUNCULUS | ANEMONES
&c., &c., &c.,
And SELECT LIST of SEEDS for AUTUMN SOWING, is now ready, gratis and post free on application.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

B. S. WILLIAMS'
NEW and CHOICE FLOWER SEEDS,
Post Free.

	Per packet.—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice train	2s. 6d., 3s. 6d., and 5 0
CINERARIA, Weatherill's extra choice strain	2s. 6d., 3s. 6d., & 5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain	1s. 6d., 2s. 6d., and 3 6
CENTAUREA CANDIDISSIMA	1s. and 2 6
ECHEVERIA METALLICA, new bedding plant	2 6
HOLLYHOCK, from Chater's finest varieties	1s. and 2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 3 6
PYRETHRUM (Golden Feather)	2s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance	1s. 6d. and 2 6
EAST LOTHIAN STOCKS, per collection of three colours	2 6
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PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
WALLFLOWER, New Golden Tom Thumb	1 0
WALLFLOWER, Saunders' fine dark variety	1 0
Hunt's Auricula-eyed SWEET WILLIAM	0 6
MYOSOTIS AZORICA, var. CŒLESTINA	1 6
TACSONIA VAN VOLXEMII, splendid greenhouse climber	2 6

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Choice Seeds for Present Sowing, Free by Post.
JAMES DICKSON AND SONS (old established Nursery and Seed Business), 102, Eastgate Street, and "Newton" Nurseries, Chester.

	Per packet.—s. d.
ANTIRRHINUM, choice mixed	1s. and 1 0
AURICULA, from choice varieties	1s. and 2 6
CALCEOLARIA, herbaceous, ex. choice strain	1s. 6d., 2s. 6d. and 5 0
CARNATION, from prize flowers	1s. and 2 6
" collection, 12 varieties	3s. 6d. and 5 0
CENTAUREA, candidissima	1s. and 2 0
CINERARIA, from newest named flowers	1s. 6d., 2s. 6d. and 5 0
CYCLAMEN, Wiggins' prize strain	1s. 6d. and 2 6
ECHEVERIA METALLICA	2 6
GLOXINIA, erect and other varieties	1s. and 2 6
HOLLYHOCK, from choice named sorts	1s. and 2 6
" collections of 6 and 12 varieties.	
MYOSOTIS DISSITIFLORA	1 0
PANSY, from prize flowers	1s. and 2 6
PETUNIA, from choice varieties	6d. and 1 0
" double, fine hybridised	1s. and 2 6
PINKS, from choice named sorts	1s. and 2 6
POLYANTHUS, from a choice strain	1s. and 2 6
PYRETHRUM AUREUM, Golden Feather	6d. and 1 0
PRIMULA SINENSIS FIMBRIATA ALBA,	1s. 6d., 2s. 6d. and 5 0
" " "	RUBRA, 1s. 6d., 2s. 6d. and 5 0
" " "	Mixed, 1s. 6d., 2s. 6d. and 5 0
" " "	FILICIFOLIA ALBA 1s. 6d., 2s. 6d. and 5 0
" " " "	RUBRA, 1s. 6d., 2s. 6d. and 5 0
" " " "	Mixed, 1s. 6d., 2s. 6d. and 5 0
SOLANUM, new hybrid	2 6
STOCK, Brompton finest German	1s. and 2 0
" " collection, 12 varieties	3 0
" Cauliflower Winter	1s. and 2 6
" East Lothian collection, 3 colours	2 6
VIOLA CORNUTA ALBA	1 0
" LUTEA	1 0
WALLFLOWER, finest Double German	1s. and 2 6
" collection, 12 varieties	3 6

The following, for early Spring blooming, can be supplied by weight, or in packets, 2d. and 6d. each:—

Alyssum saxatile.	Myosotis palustris.
Calendula, of sorts.	Nemophila, of sorts.
Candytuft, of sorts.	Saponaria, of sorts.
Collinsia, of sorts.	Silene, of sorts.
Erysimum, of sorts.	Sweet William, fine mixed.
Iberis sempervirens.	Viola cornuta, blue
Lunaria biennis, of sorts.	Wallflower, fine mixed.
Lupinus, of sorts	

CATALOGUES of SEEDS and PLANTS post free on application.

DUTCH FLOWER ROOTS.
JAMES VEITCH & SONS,
ROYAL EXOTIC NURSERIES, KING'S ROAD, CHELSEA, S.W.,
BEG TO ANNOUNCE THAT THEIR
ANNUAL CATALOGUE OF DUTCH FLOWER ROOTS,
Containing DESCRIPTIVE LISTS of all the finest kinds of HYACINTHS, TULIPS, CROCUSES, LILIUMS, GLADIOLI, &c., and also including
A SELECT LIST of VEGETABLE and FLOWER SEEDS for AUTUMN SOWING,
Is now ready, and will be forwarded Post Free on application.

ROYAL HORTICULTURAL SOCIETY.—SHOW of GLADIOLI, &c., AUGUST 17, 1870.
AWARDS OF THE JUDGES.
PRIZES offered by His GRACE the DUKE of BUCCLEUCH, and G. F. WILSON, Esq.
CLASS 2.—36 GLADIOLI, cut spikes, distinct. (Nurserymen.)
1st, Messrs. Kelway & Son, Nurserymen, Langport, Somerset, £7.
3d, Mr. D. Robertson, Helensburgh, Dumbarton, £3.
CLASS 3.—18 GLADIOLI, cut spikes, distinct. (Nurserymen.)
1st, Messrs. Downie, Laird & Laing, Forest Hill, S.E., £5.
2d, Messrs. W. Draycott & Sons, Leicester, £3.
3d, Messrs. Paul & Son, Cheshunt, Herts, £2.
CLASS 4.—12 GLADIOLI, cut spikes, distinct. (Amateurs.)
1st, Mr. R. Fry, Gr. to V. Stuckey, Esq., Langport, Taunton, Somerset, £5.
Equal 1st, Rev. H. H. Dombrain, Westwell Vicarage, Ashford, £5.
2d, Mr. J. Douglas, Gr. to F. Whitbourne, Esq., Loxford Hall, Ilford, Essex, £3.
CLASS 4A.—9 GLADIOLI, cut spikes, distinct. (Amateurs.)
1st, Mr. R. Fry, £3. | 2d, Mr. J. Douglas, £2.
3d, Rev. H. H. Dombrain, £1.
CLASS 4B.—6 GLADIOLI, cut spikes, distinct. (Amateurs.)
1st, Mr. J. W. Welsh, Gr. to J. Marshall, Esq., Belmont Park, Taunton, Somerset, £2.
CLASS 4C.—4 GLADIOLI, cut spikes, distinct, being new varieties sent out in the Autumns of 1868 or 1869.
2d, Rev. H. H. Dombrain, £1.
1st, Mr. R. Fry, £2.
CLASS 5.—6 HOLLYHOCKS, cut spikes, distinct. (Open.)
1st, Mr. W. Chater, Nurseryman, Saffron Walden, £1.
2d, Messrs. Downie, Laird & Laing, 15s.
3d, Messrs. W. Mincher, Hook Norton, Oxford, 10s.
CLASS 6.—24 HOLLYHOCKS, cut blooms, distinct. (Nurserymen.)
1st, Mr. W. Chater, 15s. | 2d, Mr. H. Mincher, 10s.
3d, Messrs. W. Draycott & Sons, 5s.
CLASS 6A.—12 HOLLYHOCKS, cut blooms, distinct. (Amateurs.)
1st, Mr. H. Mincher, Hook Norton, Oxford, 10s.
CLASS 8.—12 PHLOXES, cut, distinct. (Open.)
1st, Messrs. Downie, Laird & Laing, £1.
2d, Messrs. E. G. Henderson & Son, Nurserymen, St. John's Wood, 15s.
3d, Messrs. Paul & Sons, 10s.
CLASS 9.—APRICOTS, single dish. (Open.)
1st, Mr. W. Tallery, Gr. to the Duke of Portland, Welbeck Abbey, Notts, £1.
2d, Mr. W. Gardiner, Gr. to E. P. Shirley, Esq., Eatington Park, Stratford-on-Avon, 15s.
3d, Mr. J. Smith, Gr. to the Earl of Gainsborough, Exton Park, Oakham, Rutland, 10s.
MISCELLANEOUS.—EXTRA PRIZES.
Mr. B. S. Williams, Nurseryman, Holloway, N. (Collection of Plants), £1 10s.
Messrs. A. Henderson & Co., Pine-apple Place Nursery, Maida Vale, W. (Collection of Palms), £1.
Messrs. Paul & Son (Collection of Roses), 15s.
Mr. A. Wilkie, Gr., Oak Lodge, Kensington, W. (Collection of Plants, &c.), 15s.
Messrs. F. & A. Smith, Nurserymen, Dulwich (Collection of Plants), 10s.

The Gardeners' Chronicle

SATURDAY, AUGUST 20, 1870.

THANKS to the prompt courtesy of our correspondents, we are enabled to give in the following pages a tabular statement showing the general condition of the FRUIT CROPS in Britain for the present season. As our reports range over every district of the country, and are furnished by competent observers, they may be safely relied on as giving an accurate estimate of the various crops.

No doubt increased value would accrue to our report could we give in every case some account of the conditions under which the fruit was grown, the nature of the soil, the method of culture pursued, the kinds grown, and so forth; but it will be obvious that, even if the task of collating so much information were not too onerous, our space would be too restricted to allow us to give such details in a way likely to be serviceable, as offering fair points of comparison.

From the number of our reports, and the widely different localities whence they have been obtained, it may be assumed that certain local discrepancies are either eliminated or in some way or another compensated. Nevertheless, it would be most instructive if our correspondents would in another season add to the obligations under which our readers as well as ourselves lie to them, by giving as briefly as possible some account of the soil and the general climatal conditions under which their fruit is grown. As the nature of the soil, its physical and chemical qualities, often vary greatly, even within the limits of the same orchard or fruit garden, the reducing of these observations, so as to furnish useful results, would, no doubt, be a difficult task; still, however imperfectly it might be carried out, some useful information must be elicited. We all know that on certain soils and in certain localities, particular kinds of Pears, for instance, are worthless, while at a short distance, under different conditions, the same variety produces fruit of good quality in average abundance. What is the reason of the discrepancy? is the question to be solved—a question of great moment as a matter of science, a question of the greatest concern from a practical point of view, as on it hinges the determination of the gardener as to what sorts he should and what he should not plant in particular localities. On looking over the present Tables, we are at once struck with the general uniformity in the reports from the various counties—a similarity which in general terms is so close that one might be led to think

that a difference of some degrees of latitude and longitude, of some hundreds of feet in altitude, were of little moment in fruit growing; that soil, drainage, culture, and the other factors were really but little effective in producing variations in the quantity or quality of the produce. No doubt this general uniformity in the tone of our reports is much dependent on the general prevalence of hot and dry weather throughout the kingdom. Spring frosts do not seem to have effected so much mischief as usual, or at least they occurred more locally than they do sometimes. Speaking then in general terms, we may say, from the evidence before us, that fruit of all descriptions has been abundant, that much of it has been small, and that a very general complaint of insufficient flavour is made, probably from the want of sufficient moisture to develope to the full those subtle chemical changes on which flavour depends. Fruit trees, as a rule, are reported as in a clean and healthy condition—a favourable augury for next year's supplies. Insect pests do not seem to have been so troublesome as might have been expected. Adverting now to particular kinds of fruit, the general tenor of our reports runs thus:—Apricots generally plentiful and good; Apples and Pears abundant but small; Cherries very plentiful and of good quality; Plums much above the average; Peaches and Nectarines numerous but small; Strawberries not so satisfactory as most other crops, the flowers having, in many cases, withered from the drought. "Small fruits" have been produced in plenty, and for the most part of good quality. Nuts of all kinds, including (for the benefit of the pigs!) acorns, are plentiful—Walnuts especially so. On the whole, then, our fruit report is more satisfactory than that of the farmer's crops, given in the agricultural side of our Journal in the past week.

"SLACKEN your fire and give more air," was the terse but vigorous reply of the old gardeners when interrogated as to the best means of giving COLOUR to GRAPES. The directions were simple, but not less efficacious on that account, for if there is one phase of a bad practice in Grape growing more injurious and conspicuous than another, it is that of allowing moisture to condense upon the bunches in the early morning, consequent upon air not being given sufficiently early. The practice of the best of our Grape growers is never to close the houses at all after the fruit begins to colour, or, if they close them for a few hours' extra moisture and swelling power in the afternoon, they take care to give "a chink of air" before leaving them for the night. Without this we believe it to be utterly impossible to obtain colour, bloom, and extreme finish; and though these may be minor points with our modern "property" preceptors, they are, and ever will be, the major considerations with gardeners who pride themselves upon their calling, and also with employers who know what good fruit ought to be. Our friend HENDERSON at Cole Orton, when questioned as to the means he used to plaster the bloom and colour so thickly upon his Grapes, pointed to the broken panes so conspicuous in the roof; and though we do not suppose the glass was broken for the purpose of ventilation, the result was the same, viz., plenty of air, and no condensation of moisture upon the bunches, to be dried in the morning, leaving the sediment from the water, lime, or whatever else it may be, like so much pea-soup upon the berries. Some of the prize Grapes especially, in the collections at Oxford, were really disgraceful in this respect, and such as few gardeners who cared for their reputation would venture to send to their employer's table. They had, however, "size," but the symmetry was at the lower end of the scale, and formed a singular contrast to the produce of the young Vines at Eastnor Castle, and the veterans at Chatsworth. Injudicious syringing and the want of timely ventilation were the main causes of that failure.

When, a few weeks back, we took stock of these fine old Vines at Chatsworth, we "turned out," as is our bent at this season of the year, at 4 o'clock in the morning—for we have imbibed the notion that in gardening there is more than the worm to be caught by the "early bird"—and repairing to the vinery, we found a chink of air about an inch wide extending the whole length of the house, and that had been open all night. The roof of this house, a flat ridge-and-furrow, was insufficiently ventilated when Mr. SPEED took charge, and therefore he had sashes about 3 feet deep, extending the length of the house, placed in the back wall, and about a foot under the ridge. These are hinged at the bottom, and open from the top outwards, and consequently offer a much freer egress for air than they would do if hung from the top in the usual manner. Looking over the other forcing-houses—Pines, Grapes, Peaches, and plants—we saw everywhere the chink of air, so that that apparently small matter to some gardeners is evidently a great institution at Chatsworth; and we will not say at Chatsworth only, but in every place where fruit or plants are grown in a superior manner.

Let it not, however, be imagined, that the chink of air is the only requisite for superior colour. Something more than that is required, such as health and vigour, and, above all, their special concomitant—thorough maturation. By that term we do not mean "nice brown wood," but wood so hard and free from central pith that the foliage has assumed the fine golden tint and dropped from it leaf by leaf, not through early frost or autumn cold, but as the result of perfect cultivation carried out to its culminating point. With immature wood at the time of pruning, it is impossible to have thoroughly matured fruit in the following season. The two cannot go together, and never will do until the laws of Nature are changed. The season of growth and the season of maturation are two very important epochs in plant life, but the last is the finishing stroke which insures a perfect result in the succeeding crop. It is the ridge tile on the roof of cultivation, the Alpha and Omega, the beginning and end of superlative management in plant life.

Is it a Pelargonium that you desire to bloom and colour superbly in the coming season?—then maturation must be the cry. Is it a Heath or Epacris, a Vanda, Aerides, Saccolabium, Cyrtopodium, or Renanthera?—still cultivation and maturation must be the passwords to success. Is it a perfect crop of Turnips, Mangel, Ox Cabbage, Potatos, or any other agricultural crop that you covet?—and again maturation must be your hope and anchor. Without it success is impossible. We would therefore say to the young gardener, "Impress upon the tablet of your memory 'a chink of air;' and, properly observed, you will find it and maturation the main hinges of success in your gardening career."

—— A CORRESPONDENT writes concerning PEACHES in PARIS:—"Last week we were supplied in the ordinary way solely with Peaches from the South, the famous Peaches of Montreuil being comparatively expensive luxuries; now, the real Montreuil fruit, with its dark crimson velvet cheek, is to be found in every shop and in every street barrow, at prices rising from one and two sous upwards. I have eaten some at these prices about the size of the very largest Orleans Plums, which were delicious, and those sold at *2d.* or *3d.* each are really fine fruit. For 15 years I have never seen Peaches so good or so cheap. The cultivation of Peaches at Montreuil has been pursued with increasing care and success for more than 200 years, and the fruit produced there, and at Suresnes adjoining, has an European reputation. The neighbourhood is divided into very small lots of ground, and the soil is literally covered with walls, so that the produce of Peaches is enormous, and gives employment to many hundred cultivators. These Peaches are usually brought to the Paris market in Vine leaves, and the Vine is cultivated at Montreuil almost for that purpose solely. The season generally lasts till about the end of September, and it is only at that time the growers send the fruit to the market; previous to that time it is sold to fruiterers, who not only supply Paris, but export the Peaches to all parts of Europe, and especially to Russia. In the best hotels of St. Petersburg, Montreuil Peaches cost *8s.* to *10s.* each; and even in Paris, in the early season, they are often sold at 2 to 4, and even 5 francs. A very fine Peach is so highly prized that it has passed into the language as a type of perfection. The produce of the district, which passes under the name of Montreuil, is said to exceed on an average ten millions of Peaches annually. This year the fruit is small on account of the want of rain, but the quality is excellent, and the crop enormous. Peaches have been produced at Montreuil 4 inches in diameter, and sometimes growers have exhibited their ingenuity by producing the arms of France and other devices on their velvet jackets. The Montreuil Peach is very difficult to imitate, or rather to replace, for its colouring is remarkably fine and its skin exceedingly thin. It is a long time since the general population of Paris has had this fine fruit so within reach."

—— We extract from the *Builder* the following remarks relating to the use of THE SPADE IN DEFENSIVE WAR:—"Mr. EDWIN CHADWICK, C.B., has been recalling the public attention to a subject heretofore treated of in the *Builder*. This he does in a paper on 'What Art and Science in the new Arms of Precision give to Defence against Attack in War.' The paper is printed in the "Journal of the Society of Arts." Mr. CHADWICK is of our opinion, that the importance of the spade is greater than ever in connexion with arms of precision; and as for the bayonet and sword, they may be thrown away. In America it is proposed that soldiers should carry spades in place of bayonets. Neither the French nor the Prussians, however, are as yet very favourable to the use of the spade in defensive warfare. They still dislike to 'turn their troops into armies of sappers.' The time anticipated by the *Builder*, however, is evidently at hand, when bayonets will be turned into spades, preparatory, doubtless, to the happy time when spears shall be turned into pruning-hooks."

—— Some time since we received from Mr. MILLS, of Enys, Penryn, some specimens of a curious OUTGROWTH from the branches of a CAMELLIA. As will be seen from the accompanying illustrations (figs. 208 and 209),

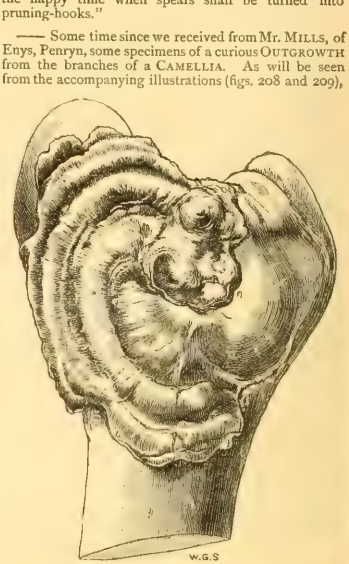

W.G.S

FIG. 208.

the growth in question has much the aspect of a Polyporus, or of some woody Fungus. The internal structure, however, shows that the excrescence in question is composed of woody tissue, covered with bark of precisely the same nature as those of an ordinary Camellia. "In many instances," says Mr. MILLS, "two branches were joined together by it," as shown in fig. 209. We are at a loss to account for this formation, as we are assured by Mr. MILLS that there was no wound of any kind perceptible, and no friction or ligature that might have given rise to it. Perhaps some of our Camellia growers may be able to throw some light on the matter.

FIG. 209.

—— M. GUILLARD, in a recent number of the Bulletin of the Botanical Society of France, enters at considerable length into the question of the MINUTE ANATOMY of the LEAF-STALK, and its continuation, the midrib. His researches are valuable from a physiological point of view, as indicating the structure of those organs through which the sap, after having been rendered available for use in the plant, passes into the stem. They are important morphologically as supporting the notion of the essential identity of leaf and stem. The general structure of the nerves of the leaf is that of the stem subject to some variations in particular instances. The structure of the petiole is similar to that of the nerves, and its variations admit of the following classification:—1. Cauloid or stem-like petioles, where the fibrous bundles are arranged in a circle—as Limes, Mallows, &c. 2. Hemicaul leaf-stalks, in which the bundles are arranged in a half circle—Crucifers, Poppies, &c. 3. Great arc petioles, when the bundles are united in an arc whose size is at least half or two-fifths of the diameter of the leaf-stalk—*e.g.*, Asclepiads, Solanads, Ericads, &c. 4. Small arc petioles, where the bundles form an arc less than the third of the

diameter of the petioles Conifers, Crassulaceæ, &c. In passing from the leaf-stalk to the stem, the bundles lose their woody bundles and liber-cells. The cellular cortical system, however, is continuous between the two organs, as also are the spiral fibres and the sap channels which pass into the bark of the branch, and constitute the channel or channels through which the elaborated sap returns from the leaf to the stem. These bundles of spiral vessels and sap channels are distinguished by M. GUILLARD as "folial cohorts," or sap channels, a name necessitated by the circumstance that though continuous with the fibro-vascular bundles they now contain neither fibre nor vessel (except the spiral vessels and *vasa propria* or sap channels). The way in which these folial cohorts or sap channels join with the stem differs in different cases, which admit of being grouped into two divisions, according as the sap channels in their passage from leaf-stalk to stem are aggregated together into one group or into three (or in some cases more). The multicohort and unicohort series are pretty equally distributed in point among the several families of dicotyledons; but as Compositæ and Papilionaceæ both belong to the unicohort series, the number of genera, having one cohort of sap currents is greater than that where the sap currents are arranged in three or more. The paper then goes into much detail, which would hardly be intelligible without the aid of figures.

—— Under the name of ANTIFLAMINE, a material has recently been introduced at Paris for the purpose of extinguishing fire in case of accident. It consists of aluminous and magnesian silicates reduced to fine powder and dried at 212° Fahr., 700 parts by weight; chloride of magnesium in crystals, 200 parts; sulphate of soda, 50 parts; chloride of lime, 50 parts; and tartaric acid, 1 part=1001. The article is supplied in a pulverulent form, and is perfectly soluble in water. It is proposed to mix it with the water in the fire-engines; the effect of which, it is said, is to lower the temperature, and to surround the burning material with gases which will not support combustion.

—— The MAXIMUM TEMPERATURE of the WEEK in England ranged from 85°.5 at Salford to 72° at Newcastle-upon-Tyne, with a mean for all stations of 80°.7. In Scotland it ranged from 84° at Perth to 72° at Dundee, with a mean for all stations of 76°.2. The MINIMUM TEMPERATURES ranged from 56°.3 at Blackheath to 48° at Hull, with a mean for all stations of 51°.1. It Scotland it ranged from 55°.5 at Greenock to 48° at Aberdeen, with a mean for all stations of 51°.4. The MEAN TEMPERATURE for the eight southern stations of England was 64°.5, for the eight northern was 63°.2, and for the several stations in Scotland was 61°.4. The RAINFALL in England ranged from 0.62 inch at Blackheath to 0.00 inch at several stations; nearly all the rain fell at the six southern stations. In Scotland rain was only registered at one station, viz., Aberdeen, and that to a very small amount. (See Mr. GLAISHER'S Tables in our present issue.)

—— The success of the recent FLORAL FÊTE at HYDE HALL, SAWBRIDGEWORTH, intended, as we learn, simply to encourage gardening amongst the cottagers of the neighbourhood, has been such, that it is understood that an institution, to be named the Essex and Herts Floral Society, will be inaugurated under the presidency of Sir H. SELWYN IBBETSON, Bart., M.P. The recent *fête* was held in the park at Hyde Hall, thanks to the kindness of H. L. BISCHOFFSHEIM, Esq., to whom and his gardener, Mr. WEEKS, much of the success obtained must be attributed.

—— The following are records of the weight attained by PRIZE GOOSEBERRIES during the present season. At the show at Kirklington, on August 1, the heaviest berry of any colour was of the variety named London, 25 dwt. 20 gr., shown by Mr. SANDAVER. The best reds were: London, 25 dwt. 1 gr., and Plough Boy, 23 dwt. 11 gr. The best yellows: Leveller, 21 dwt. 23 gr.; Leader, 21 dwt. The best greens: Stockwell, 24 dwt. 14 gr.; Shiner, 24 dwt. 13 gr. The best whites: Antagonist, 20 dwt. 22 gr.; Elizabeth, 20 dwt. 21 gr. At a show held at Southwell on the following day the heaviest berry of any colour was again London (30 dwt. 9 gr.), grown by Mr. SWIFT. The best reds were: Ploughboy, 25 dwt.; London, 24 dwt. The best yellows: Leveller, 23 dwt. 3 gr.; Peru, 18 dwt. 8 gr.; The best greens: Shiner, 24 dwt. 12 gr.; Stockwell, 22 dwt. 21 gr. The best whites: Antagonist, 21 dwt. 9 gr.; Miss Nightingale, 20 dwt.

—— We are requested by HER MAJESTY'S Commissioners to state that there is no foundation for the rumour that the International Exhibition appointed for 1871 is to be postponed by reason of the war. The first of the series of Annual International Exhibitions of Selected Works of Fine and Industrial Art and Scientific Inventions will take place next year, as already announced.

—— An important paper on the TEMPERATURE of the BRITISH ISLANDS has lately been read before the Scottish Meteorological Society by Mr. BUCHAN, illustrated by a series of charts, showing the temperature of the British Islands in each month of the year. The charts have been based on a mean of 13 years' observations on 68 Scotch stations, 54 English stations, and 11 Irish stations.

PORTRAITS OF GARDEN PLANTS.

CYMBIDIUM CANALICULATUM, *Bot. Mag.* t. 5857.

A neat and rather pretty stove epiphyte, with a short, compressed, almost pseudobulbous stem, broadly linear-elongate keeled leaves, and a drooping raceme of numerous moderate-sized flowers, the sepals and petals of which are purplish brown, edged with green, the lip greenish white, with a row of pink spots just within the edge. A native of Cape York, in north-eastern tropical Australia, where it was introduced by the late Mr. John G. Veitch. The plant seems to be variable, "and to have a very wide range in distribution, from the temperate climate of Hunter's River, in lat. 33° S., to the torrid and arid shores of Arnheim's Land, in 13° N., and Cooper's Creek in Central Australia, in which latter localities F. von Mueller states that it is the only known Orchid."

CYPRIPEDIUM CANDIDUM, *Bot. Mag.* t. 5855.

One of the hardy perennial group of Lady's Slippers, a neat plant of 8 or 10 inches in height, with lanceolate plaited leaves, and small flowers, of which the sepals and petals are green, the lip oblong, white, with purplish spots around the mouth. A native of the North American bogs, somewhat rare.

ERITRICHIUM NANUM, *Bot. Mag.* t. 5853.

A dwarf, densely tufted rock plant, with short stems, linear-obovate leaves, and brilliant azure-blue yellow-throated flowers. "To the skill and energy of Mr. Backhouse, of York, is due the credit of being the first to rear to perfection this most brilliant of all those diminutive alpine gems which inhabit the loftiest summits of the European mountains. In intensity of colour, the blue of Eritrichium nanum is equalled only by that of the alpine Gentians, whilst it is of a much more azure hue than any of these, approaching most nearly to the deepest blue of the sky, at a point of the heavens opposite the sun's position, as seen on a cloudless day from the elevation the plant itself inhabits."

HECHTIA GHIESBREGHTII, *Bot. Mag.* t. 5842.

An insignificant-flowered Bromeliad, with rosulate, recurved, spiny leaves, and tall, slender flower-scapes, bearing at intervals clusters of small whitish flowers. It is a native of Mexico, and was introduced by M. Ghiesbreght to the collection of M. Verschaffelt. "A very attractive greenhouse plant, on account of its remarkably beautiful purple and green foliage, which is silvery below."

MILTONIA WARSCEWICZII, *Bot. Mag.* t. 5843.

A remarkably beautiful stove epiphyte, discovered by Poeppig in Peru, and collected by Warscewicz and others. It has elongate flattened pseudobulbs, linear-oblong obtuse leaves, and a slender scape bearing a many-flowered panicle of large and handsome but variable flowers. The sepals and petals are obovate spathulate, wavy, reddish brown-yellow at the edge, the lip "oblong quadrate or subcuneate, two-lobed at the apex, margins recurved, obscure 3 to 5-keeled and two-toothed at the very base; margins broadly white; disk rose-purple, with a broad pale yellow-brown blotch below the middle, and a suborbicular white one at the base." It was first flowered by M. Linden, but the specimen figured was obtained from Mr. W. Bull.

MORMODES COLOSSUS, *Bot. Mag.* t. 5843.

A remarkable stove epiphyte, with pseudobulbs 6 inches to a foot long, elliptic-ovate plaited leaves, and a raceme of numerous flowers five to six across the tips of the opposite petals. The sepals and petals are narrow lanceolate spreading or reflexed, pink at the base passing into yellow at the tips; the lip is ovate cordate, incurved, very convex, bright yellow, inconspicuously dotted with red near the base. It is a native of the mountains of Central America, at elevations of about 7000 feet.

OPHRYS SPECULUM, *Bot. Mag.* t. 5844.

A remarkably pretty hardy Orchid, with globose tubers, linear-oblong acute leaves, and an erect stem bearing from three to six pretty insect-like flowers, the sepals green, the lip maroon-purple at the edge, with a broad disk of blue margined with yellow, and quadrate-oblong in general outline. It is a native of grassy hills in Spain and Portugal, extending to Greece, Asia Minor, and Algiers. "The brilliant polished surface of the disk of the lip, which shines like a blue steel looking-glass edged with gold, and that again set in a rich maroon velvety frame, presents," remarks Dr. Hooker, "a combination of colours quite unlike anything known to me in the vegetable kingdom."

RHYNCHOTECHUM ELLIPTICUM, *Bot. Mag.* t. 5832.

A tall-growing Cyrtandraceous plant, probably biennial, requiring stove culture. The stem is stout, erect, simple, 2 to 3 feet high, bearing large opposite obovate-lanceolate leaves, and crowded corymbs of flowers at the nodes beneath the leaves. The flowers are comparatively small, of a bright pink, with the throat white below, and a two-lobed blood-red spot at the base of the upper lip. It occurs in damp forests in the Sylhet district, and also in Assam, and the Sikkim Himalaya, from which latter habitat it was sent to Kew. The flowers are succeeded by small, transparent, white berries.

SOLANUM VENUSTUM, *Bot. Mag.* t. 5823.

A beautiful subtropical Solanum, "the most graceful and free-flowering species in cultivation." It flowers freely in the cool wing of the Palm-house at Kew, and is a slender unarmed shrubby plant, with bright green, entire, ovate-lanceolate or (about the inflorescence) pinnately trifoliolate leaves, and drooping terminal panicles of pale mauve flowers. It is of Brazilian origin.

STYLOPHORUM JAPONICUM, *Bot. Mag.* t. 5830.

An elegant hardy perennial Papaveraceous plant, with a branched rootstock, sending up from the extremity one or two long-stalked pinnatisect leaves, and a slender erect stem, 12 to 18 inches high, bearing at the top two or three leaves and axillary yellow flowers, twice as large as those of our Celandine, to which it is allied. It is a native of Japan, and the countries bordering the Amoor river.

TILLANDSIA LINDENIANA, *Bot. Mag.* t. 5850.

This fine plant has been fully described by us at p. 859. It was exhibited in flower by Mr. B. S. Williams, not by Mr. Ware.

VANDA CŒRULESCENS, *Bot. Mag.* t. 5834.

A very distinct and elegant epiphytal Orchid, with elongate leafy stems, the leaves distichous coriaceous lorate, truncately bilobed at the apex; the flowers in pendulous racemes, small, pale bluish lilac, with the disk of the lip deep violet. Introduced from Burmah by Col. Benson to the collection of the Messrs. Veitch & Sons. See p. 529.

THE LATE JOHN GOULD VEITCH, F.L.S.

SCARCELY twelve months have elapsed since we had to record the decease of Mr. James Veitch, the late indefatigable head of the firm, Veitch & Sons, of Chelsea, and one of the foremost horticulturists of our day. We have now the mournful task of chronicling the death of his eldest son, Mr. John Gould Veitch, who was, like his father, a devoted horticulturist, and who, although he has been taken from amongst us at an early age, will long be remembered as an intrepid voyager, and one to whom we are greatly indebted for many contributions to the enjoyment of our gardens in the introduction of valuable plants discovered in the course of his travels, and also as a young man full of zeal and enterprise in his profession—a worthy representative of his father's and his grandfather's name.

John Gould Veitch was born at Exeter in April, 1839, and had, therefore, only reached his 32d year. He was at an early age initiated in the mysteries of the nursery trade, and took an active part in the management of the establishment at Chelsea. It was in April, 1860, almost as soon as he had attained his majority, that he started on his voyage to Japan and China, whence he proceeded to the Philippine Islands. The result of this journey was the enrichment of our collections with many choice plants, among which the lovely Primula cortusoides amœna would of itself form no mean monument to his memory. Various handsome Conifers, as Abies firma and Alcoquiana, Cryptomeria elegans, and other plants, as Lilium auratum, Ampelopsis tricuspidata (Veitchii), and japonica, &c., were, however, also obtained as the fruits of that first journey, and our volumes for 1860-61 contain from his own pen the interesting records of his journeyings and discoveries during the two years which elapsed previously to his return in the spring of 1862.

The spirit of enterprise, and the desire of making discoveries, which prompted him at the first to set sail for Japan, then lately made accessible to Europeans, did but slumber for a season, for in 1864 we find him again *en route*, this time bound for Australia and the South Sea Islands, whence he returned in February 1866, after an absence of some 18 or 20 months, bringing with him some of the most beautiful plants of modern introduction: witness the numerous richly-coloured forms of Croton and Dracæna which are only now becoming known. Of the Crotons alone no fewer than 23 distinct kinds (described in our vol. for 1868, pp. 843, 943) were obtained; and of Dracænas, regina, magnifica, Mooreana, Chelsoni, Macleayi, and several others. To these must be added such distinct and popular subjects as Acalypha Wilkesiana (tricolor), Amaranthus melancholicus ruber, Coleus Veitchii, and Gibsoni; the more choice and valuable Pandanus Veitchii, Aralia Veitchii, and many others. During this journey Cape York in Northern Australia was visited, and here was obtained a new Palm, which has since been dedicated to his honour under the name of Veitchia Johannis. The record of this second journey, specially interesting as referring to many little known and rarely visited islands, will be found in our volume for 1866.

In the early part of 1867 Mr. Veitch, then recently married, was taken seriously ill with an affection of the lungs, and for some time his life was despaired of. He, however, rallied, under careful treatment and the potent aid of his indomitable spirit, and though subsequently obliged to winter in a warmer clime, his friends were not without hope that his life might have been for some time spared to them. But this was not to be. On the 9th inst. hæmorrhage from the lungs, under which he gradually sank, set in, and he expired on the evening of the 13th inst., at his residence at Coombe Wood, leaving behind him a widow and two boys. On Thursday last he was laid beside his father in the Brompton cemetery, having been borne to his grave by the same trusty workmen: some of whom had, moreover, assisted to carry his grandfather to his last resting-place. The Rev. Joshua Dix officiated at the funeral.

So we part sorrowing from one of the most gifted and promising of our younger commercial horticulturists, one who, if his life had been spared, and his health had permitted, would have worthily filled a prominent position in the world of horticulture; one, moreover, whose memory will continue to be cherished by those who had the pleasure to know him intimately as that of a manly, straightforward, single-hearted, earnest, and sincere friend. The Veitch Memorial will now, in most people's minds, possess a double interest, as it will be henceforth impossible to dissociate the memory of the son from that of the father. So long as British

horticulture lasts, so long will the names of these earnest labourers in its cause call up feelings of respect and regret. *M.*

GRAPE CULTURE IN POTS.

In the autumn of last year you noticed the pot Grapes grown at this place. Since then various inquiries have been made respecting the treatment which the Vines received, and though I do not profess to have anything new to impart, perhaps a short detail of my system of management may not be without interest to some of your amateur readers, if not to the practical ones. I must state, however, that part of my success may be attributed to the suitability of the houses in which the plants are grown. These were built by Mr. Messenger, of Loughborough, to whom I am indebted for the accompanying engraving (fig. 210), which shows the arrangement completely. It will be seen that the houses are span-roofed, with a path down the centre, on each side of which is a bed 4 feet 6 inches wide. The bottom of this bed is made of strong slate slabs, supported by brick ledges on each side of the bed, and which may be raised or lowered as the cultivator may require. A bed of soil 2 feet deep may be had, or the slabs can be raised to the top ledges, and the house is ready for forcing Strawberries, or anything in pots that require to be near the glass. Under these beds are placed the whole of the hot-water pipes, four rows being under each, part of which are troughed for evaporation. Again, beneath the piping is an air-drain supplied by shafts from the outside, and through these, in stormy weather, a copious supply of fresh air may be commanded, with the great advantage of its having had the "chill" taken off it before it comes in contact with the plants. This I find a great advantage in winter and spring forcing, and especially at night, when the ventilation of the house must be left to itself. Air is also admitted by the side perpendicular lights, and by the top ventilators.

In the case of the fruiting pot Vines, the houses the previous season had been used for Melons and Cucumbers, and consequently the soil was not removed from the beds, but after being turned over the pots containing the Vines were plunged into it about half their depth. The Vines, of course, sent a great mass of roots into the beds through the pots, which no doubt helped materially to mature the heavy crop which the Vines carried. My reason for plunging the pots only half their depth is, that I always like to know by the "ring" of the pot the requirements of each individual plant with regard to moisture, as I have always found that, although the drainage, pots, size of plant, and everything else, is apparently equal, some plants will require double the amount of water that others do. It may be said that the "ring" of the pot is not always a certain index to the state of the soil in the pot, but the waterer will soon learn to distinguish the exceptions to the rule. To enter into details of cultivation I may state that eyes for the purpose of propagation are selected at the time of pruning, a preference being given to those from well ripened wood on the leading shoot. I have seen the eyes prepared in various ways, and although I do not attach much importance to this part of the subject, I prefer the eye made about an inch and a half in length, with a third of the diameter of the wood cut off on the side opposite the eye. I think this gives a greater surface for callus, and of course for the emission of roots.

About the middle of January, which I consider soon enough, a single eye is put into a 3 or 4-inch pot, filled with rotted turf and leaf-mould, with a little silver sand to rest the cut part of the eye upon, the eye being pressed down until the point only appears on the surface. After watering, the pots are taken to a house where the temperature is from 55° to 60°, where they are placed on the bed without plunging until they have got well callused, when they are plunged into a gentle bottom-heat. They are damped regularly with the syringe until the leaves appear, when I find it safer to merely water at the root, as I have found them liable to damp off in the heart of the eye. When four or five leaves have been developed, the temperature of the house may be raised to from 60° to 65° at night, and 70° by day, or 80° by sun-heat. Should the bottom-heat prove to be much warmer than the atmosphere, the pots should be raised until it declines. This I think the most critical period in the growth of the Vine from the eye. The plants are certain to make a long stand at this stage of their growth, and it is better that they should do so than that they should be forced to make a weak growth in a strong bottom-heat before they have had time to make their proper feeding roots. When the plants have filled the pots with their small fibrous roots I shift them into 8-inch pots, and in order to prevent any check from cold, I have the soil and pots taken to the house where the Vines are growing the day previous to shifting.

In potting, great care is taken to preserve every fibre of root, and the soil into which they are shifted being of the same temperature as the house, the plants never feel the effects of the shift. The same process is repeated when the plants have filled the 8-inch pots with roots, the shift being this time into the 12-inch fruiting pots, great care being taken to secure perfect drainage, a layer of potsherds 2 inches in depth being put in the bottom of each pot, then a layer of half-inch bones to fill up the interstices, and next some lumpy pieces of turf; this will afford a quick passage for the water, a very important thing for the young roots of the Vine. If the pots are new so much the better, but failing that, they should be well scrubbed and dried before being used. The soil I use is light sandy turf taken from an old pasture, mixed with a little leaf-mould, charcoal, old lime rubbish, and half-inch bones. After this shift, water should be used sparingly at the root until the large body of fresh soil is occupied with roots. At this time syringing overhead, night and morning, with plenty of atmospheric moisture, will be required, and as a prevention to red spider the walls and pipes should have a light coat of sulphur.

At the time of the last shift, which will be about the beginning of April, the plants will probably be from 10 to 15 inches in height, and I have generally found that they will even fill the 12-inch pots full of roots when this size, before making their final start, but all this time they have been making thousands of feeding roots, and laying the foundation for a strong and rapid growth in the future, and by the middle of June they will have grown to the length required (8 feet).

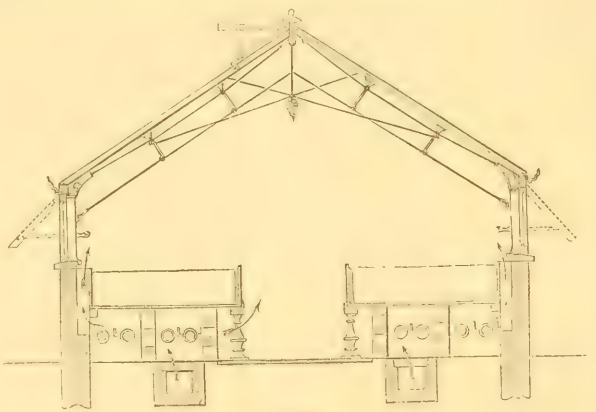

Fig. 210.

When in full growth, and up to the time when the wood commences to ripen, they are assisted with weak liquid manure about three times a week, and the surface of the pots well mulched over with manure. Should warts appear on the under side of the foliage, it is a certain indication—as Mr. Thomson states, in his able treatise on the Vine—that the atmospheric moisture is in excess of the requirements of the plants. A free ventilation and a drier atmosphere should therefore be maintained. When the canes have become thoroughly brown, which should be the case by the end of August, the laterals which have been allowed to make four or five joints are cut off, and the Vines are removed from the house and nailed to a south wall, the pots being covered with litter to prevent the sun from scorching the roots. The plants having completed their growth will not require so much water, but they should never be allowed to become dry. When the leaves fall off the Vines, the plants should be conveyed to a cool Peach-house or vinery at rest until they are required for forcing, but even at this stage, when the plants are at rest, I never allow the soil in the pots to become thoroughly dry.

In conclusion, allow me to state a few of the principal points which I consider essential in order to cultivate the Grape Vine successfully in pots, one of the most important of these being that the plants should be grown in the strongest light possible, each plant being allowed space to develope its foliage in the full light of the sun; by this means the foliage will be able to fulfil its proper functions, and the fruit-buds and wood will get fully matured. Care should be taken to avoid as much as possible any sudden check to the growth of the plants, resulting from such as cold draughts in ventilating, insects on the foliage, want of water at the root, or watering with water of a temperature which is beneath that of the house in which the plants are growing. When the Vines have been late in maturing their wood, I have seen what may be called the drying off and starving process tried in order to hasten the ripening. This was done by withholding water at the root, and subjecting the plants to 6° or 8° of frost. No doubt the foliage can be got rid of in this manner, but, so far from assisting the process of ripening, it is more likely to starve the vitality out of the plant. When heat with moderate moisture fails to bring the wood to maturity, I cannot believe that cold and draught will effect this object. The operations of the fruiting season being so well known, even to beginners, I do not think it is necessary that I should give any description of them here, but to those beginners who aim at a heavy crop of fruit, I would say that, unless a corresponding breadth of foliage is encouraged, it is useless to expect the fruit either to swell or colour properly. I am often asked by amateur friends as to how they may grow Grapes in pots, and I always think of the excellent recipe given by the celebrated Mrs. Glass for cooking a hare, the most important point being, in my opinion, the catching of the hare. So, to those who want Grapes in pots, I would say, "First get your Vines." *J. Anderson, The Gardens, Newstead Abbey, Nottingham.*

ON THE CULTIVATION OF OSMUNDA.

British Ferns in the open air, that is, in the hardy fernery, have long been favourites, and many persons have devoted a spare corner and some attention to their cultivation. In most intances it has been with moderate success. Lastreas, Polystichums, Athyriums, and some others are generally managed tolerably well; but the same cannot be said of other genera, several of which will not grow satisfactorily without special treatment. My object is to give an account of the plan I have adopted in cultivating the Osmundas and other analogous Ferns, a group of which I know many cultivators have failed to obtain fine healthy specimens.

About ten years ago my employers requested me to make a hardy Fernery, and after looking about for some time for a suitable spot, it was decided to convert an old chalk-pit to this purpose. In forming the collection, it was my desire to obtain all the normal with the best of the abnormal forms of British Ferns, and particularly the British and hardy exotic Osmundas, with Struthiopteris and others of a similar kind.

The Ferns were all planted out at the same time, and had an average amount of care bestowed upon them; but, to my great annoyance, the Osmundas and other Ferns of that class did not grow satisfactorily. They were tried for three or four seasons with no better results. Liberal waterings did not seem to avail much, the water passing off almost immediately, owing to excessive drainage and the great absorption by the roots of the surrounding trees, so that the plants soon became dry and looked badly. By means of these failures, however, I ultimately arrived at the method of growing them, which I now proceed to explain for the benefit of any who may have encountered similar difficulties, and may wish to obviate them.

A piece of ground, of irregular shape, large enough to contain about 20 plants, was staked out, and the mould, or, more correctly speaking, the chalk, was removed to the depth of 3 feet; a bricklayer followed, and put in a floor of three bricks laid on the flat, set in good Portland cement, and over that a layer of plain tiles, the sides being made up to the ground level with a 4½-inch wall, well built up in the same kind of cement; this made the whole water-tight, and prevented the roots of the surrounding trees from penetrating and robbing the Ferns of their moisture. The space was filled up with mould, compounded of good loam, peat, and leaf-mould, in equal proportions, with about one-fifth of good rotten dung added thereto; these ingredients were thoroughly mixed and well trodden in, and then the Ferns were planted. In forming this bed, provision was made for the escape of the surplus water, by introducing into the front wall, at about 4 inches from the bottom, a common 3-inch drain-pipe, which communicated with a small tank, about 3 feet square, sunk into the chalk, so that all waste water became absorbed. This method proved to be eminently successful, the plants far surpassing in size any I have ever seen under artificial cultivation, and rivalling their growth in their natural habits.

In concluding my remarks upon what I may term "growing Osmundas under difficulties," I would observe that the points to be principally attended to are (1) a deep water-tight and root-tight tank, the depth of which may, with advantage, be more than in the case I have described; (2) a rich nutritious soil; (3) a reasonable amount of water; and (4) a drain, as described, to carry off the surplus. *A. Parsons, in "Florist and Pomologist."*

REPORT ON THE CONDITION OF THE FRUIT CROPS.

[FROM OUR OWN CORRESPONDENTS, AUGUST, 1870.]

COUNTY.	APRICOTS.	APPLES.	PEARS.	PLUMS.	STRAWBERRIES	CHERRIES.	PEACHES AND NECTARINES.	FIGS.	SMALL FRUITS.	NUTS.	NAME AND ADDRESS.
SCOTLAND.											
ABERDEENSHIRE	Light crop	Abundant	Inferior; flowers destroyed by cold winds	A good crop in general, Green Gages light	Good crop; suffering from drought	Good crop	None grown out-of-doors	....	Abundant	....	George Donaldson, Keith Hall
AYRSHIRE	A failure	Very few	Very few	Few, except Victoria	Average crop	Average; Morellos good	Very few; unless first-rate	....	Average crop	....	R. G. Rae, The Gardens, Eglinton Castle
BANFFSHIRE..	Good average crop	Good crop	Few on wall trees, standards full crop	Average on walls, good on standards	Good crop; well flavoured	All sorts very abundant	Good under glass, but few outside	Average crop	Abundant and good	Very few	George Milne, Cullen House Gardens
BERWICKSHIRE	Good	Heavy	Medium	Scarcely half a crop	Of late varieties a heavy crop	Good crop	Heavy crop under glass	....	Very heavy crops of all kinds	Very heavy crop	Peter Loney, Marchmont House, Dunse
DUMFRIESSHIRE	Scarce	Good	Good	Poor crop	Good	Poor crop	Good	None grown outdoors	Very good	Good	David Thomson, Drumlanrig
EAST LOTHIAN	Above average	Large crop	Average	Good	Large crop	Good	Not grown outdoors, abundant under glass	....	Abundance of all kinds	....	Alex. Shearer, Gr. to the Marquis of Tweeddale, Yester
KIRKCUDBRIGHTSHIRE	Scarce: few grown in this district	A good crop where not exposed	Average crop on walls; poor on standards	Abundant crop of Damsons; other varieties thin	An abundant crop, and fine in quality	Very abundant crop	Very fine crop, and trees healthy	....	Most abundant and firm	Abundant crop	James Johnston, Terregles Garden
LANARKSHIRE	Better crop than usual	Very large crop	Good crop	Good; partial according to locality	Plentiful	Plentiful	Good crop	....	Large crop	....	James Anderson, Meadow Bank
PERTHSHIRE .	Good	Fair crop	Fair crop	Average	Plentiful	Average	Fine crop	Good under glass	Very fine	Small crop	H. Rintoul, Dupplin Castle Gardens
ROXBURGHSHIRE	Good on east walls, on south walls middling	Fine crops on all trees	Third-rate; in some cases a failure	Poor of the fine kinds	Good	Late	....	....	Excellent	Fair	H. Knight, Floors Gardens, Kelso
NORTHERN COUNTIES.											
NORTHUMBERLAND	A good crop, fruit very fine	On the Paradise stock a heavy crop; larger trees are much infested with the larva of the saw-fly	Very few, and small trees much infested with the larva of the saw-fly	Not over half a crop; blossom destroyed by cold winds in April and May	Have been most abundant, third to a plentiful supply of water	Bigarreau, May Duke, and Morellos are very great crops; fruit fine	Not half a crop, fruit very small; much injured by red spider	None grown out-of-doors	Raspberries the largest crops ever seen, also Black Currants and Gooseberries	Few, or almost none	Robert Bowie, Chillingham Castle Gardens
	Abundant crops; trees in excellent condition	Excellent	A fair crop, with few exceptions	Green Gages light crops; other sorts are abundant	Average crop	An excellent crop of all sorts	An abundant crop; trees making good wood	A very light crop; not much grown	Average crops	A fair crop	Alexander Ingram, Alnwick Castle Gardens
	Good average crop; trees healthy	Very heavy crop generally; trees healthy	Good crop on standards, light on walls	Green Gages a good crop, otherwise below the average	Abundant crops, and well flavoured, but dry; not large	Abundant crops; fruit rather small	Excellent crops; trees in a fine growing state	....	Abundant fruit large and fine	Common Nuts plentiful; Filberts not grown	Anthony Hedley, Wallington
DURHAM	Good	Superabundant	A good average crop	A very good average	Very good	Full crop of all kinds	Good	Bad; few grown	Abundant, of all kinds	Good	Richard Westcott, Raby Castle
YORKSHIRE ..	Most abundant; fruit clean and ripening well	Good, but not so abundant as in 1869	About an average; fruit small	An extraordinary crop	An abundant crop everywhere in this part	Everywhere abundant	A great crop; fruit had to be thinned	An extraordinary crop here	Very abundant, and fine everywhere	Not a heavy crop; in places light	Michael Saul, Stourton, Knaresborough
	Abundant, and very healthy in foliage	Excellent, and promises to be fine	Very heavy crop	Remarkably heavy, and swelling well	Abundant, large, and fine	Heavy crop	Abundant, but require well thinning	....	Gooseberries small; Currants first rate. Raspberries very poor	Walnuts very abundant; Filberts scarce	William Denning, Grimston Park, Tadcaster
	Average crop	Plentiful, but as yet very small	Generally speaking, very few	Too many by half, consequently small	Good crop; fruit fine, but soon over	May Dukes plentiful; Morellos abundant	Fair crop of Peaches; red spider troublesome	Promise of good crop	Gooseberries and Currants plentiful; Raspberries a fair crop	Filberts none. Cobs very few. Walnuts average	Jos. C. Nicholson, Mount St. John, Thirsk
	Good average crop	Abundant; free from insect	Good, fruit small and late	Good; trees healthy and clean	Abundant, suffered from scarcity of water	Abundant, but small	Excellent crop, swelling well	Good in pots, and on walls	Gooseberries thin; Currants plentiful	Walnuts abundant; Filberts a thin crop	Robert C. Kingston, Dearne Hall Gardens, Thorpe, Brough
	Some kinds abundant	Abundant	Good crop	Inferior	Heavy crops	Good	Good under glass	None outside	Plentiful	Moderate	J. Simpson, Wortley Hall Gardens
	Good; fruit large	Much above the average	Plentiful	Plentiful on walls; thin on standards	Good, but did not last long	Abundant, both on wall and standards	Good; trees healthy	Plentiful	An abundant crop of all kinds	Walnuts plentiful; Filberts scarce	G. Clifton, Bretton Hall Gardens, Wakefield
LANCASHIRE..	None grown out-of-doors	Abundant	Abundant	Very good	Abundant, and fine	Abundant, and fine	None grown out-of-doors	None grown out-of-doors	Abundant crop	Not a full crop	J. R. Petch, Gr. to Sam Mendel, Esq., Manley Hall
	Very good	Very abundant	Good	Heavy crop	Good	Full crops	Good	....	Good average	Good	Edward Green, Bank Hall, Warrington
CHESHIRE	Most abundant, but rather small	Good average crop	A small crop	Partial crop; Damsons plentiful	Very much above average	Plentiful, but small	Good crops, but small	....	Good abundance	Average crop	W. Mills, Oulton Park
	Above the average	Plentiful	Above the average	Abundant	Abundant, but did not last long	Very good crops	Good, but require watering	....	Very abundant	A good crop	William Whitaker, Crewe Hall, Crewe
	Abundance	Abundant, but small	Heavy crop	Abundant, but small	Abundance, and good	Good crop	Abundant; trees doing well	....	Abundance	....	Charles Allen, Withington Hall
SHROPSHIRE	Very good; small where not watered	Good crops in most places; somewhat thin here	Generally good; rather better here than Apples	Set abundantly, but many fell off through the drought	Very good here; many places suffered for want of rain	Very good: Morellos small where not watered	Very few grown out-of-doors	Tolerably good where grown	Gooseberries and Black Currants abundant; others moderate	Plenty in the hedgerows; Filberts moderate	Daniel Judd, Hawkstone, Shrewsbury
	Good	Moderate	Good, but small	Good	Poor; heat too severe for them	Good, but destroyed early by wasps	Good, but rather late	Thin	Good, and free from blight	Walnuts good; Filberts thin	John Pearson, Kinlet, Bewdley
MIDLAND COUNTIES.											
STAFFORDSHIRE	Heavy crop; fruit very fine	Average; good in some places	Good and plentiful	Very heavy, especially Damsons	Heavy crop, and fine	Very plentiful	Very heavy crop	....	Very heavy crops	Very plentiful	Edward Burnett, Enville Gardens
	Good	Very abundant	Generally good	Good	Very good	Never better	Good	....	Very abundant	Light crop	E. Simpson, Wrottesley, Wolverhampton
	....	Large crop; small in size	....	Very large crop	Very large crop	Good	....	....	First-rate	....	John Sherratt, Knypersley Nursery
NOTTINGHAMSHIRE	Plentiful; small	Good crop	Light crop	....	Heavy crop	Small	Plentiful: trees vigorous	Fair crop	Abundant and fine	Plentiful	John Miller, Worksop Manor
	Abundant, but small	Heavy crops	Average crop	Very heavy crops	Abundant and fine	Plentiful; Morellos heavy crop	Very good; required much thinning	Plentiful under glass	Abundant of all kinds; trees clean	Medium Filberts and Cobs; Walnuts plentiful	John Cope, Berry Hill, Mansfield
	Full crop; fruit clean	Heavy crop; fruit small	Full crop and good	Good crop	Moderate; finished well through drought	Heavy crop	Very fine crop; trees in fine condition	Good	Plentiful, except Raspberries, which were scarce	Filberts scarce; Walnuts heavy crop	Wm. Cragg-Bunch, Kingston
LEICESTERSHIRE	A large crop	Good crop of most kinds	Good	A great crop of all sorts	Good of all sorts excepting Keens' Seedling	Abundant, and very fine	Great crop; required much thinning	Full crop of Brown Turkey; others thin	Abundance of all kinds; Currants small	Walnuts plentiful; Filberts scarce	Montgomery Henderson, Cole Orton Hall, Ashby-de-la-Zouch
	Abundant, quality very superior; moderately large	Generally a large crop, but thinned through the drought	A good crop, but small	A full crop of all kinds	Injured by dry weather; deficient in size, but excellent in quality	Large crops of both early and late kinds	Fair crops	Abundant	Abundant and good	Inferior crop	Wm. Ingram, Belvoir Castle Gardens

CONDITION OF THE FRUIT CROPS—(*Continued*).

COUNTY.	APRICOTS.	APPLES.	PEARS.	PLUMS.	STRAWBERRIES.	CHERRIES.	PEACHES AND NECTARINES.	FIGS.	SMALL FRUITS.	NUTS.	NAME AND ADDRESS.
MIDLAND COUNTIES.											
LEICESTERSHIRE	Not a full crop	Good crop	Good crop	Very good	Good crop	Very good	Very full crops	Very good	Great crop	Good crop	E. Sage, Gopsal Hull, Atherstone
NORTHAMPTONSHIRE	First-rate	Full	Full on walls; shy on standards	Full crop	The best I have known for years	Full crop	Full crop	Plenty of fruit, but small	Full crop	A failure	R. Gilbert, Burghley, Stamford
RUTLANDSHIRE	Very heavy Crops; trees not protected	A magnificent crop of all kinds; trees clean and healthy	Plentiful on walls; on bushes and standards only moderate	On walls, good; on bushes and standards, below average	Suffered much from continued dry weather; Elton Pines the best	An abundant crop everywhere; Morellos very fine and large	Splendid crops, and promise to be very fine; trees very healthy	Average crop	Immense crops; Raspberries finer in flavour than usual	Filberts plentiful; Walnuts abundant, though rather small	J. Smith, Exton Park
OXFORDSHIRE	Great crop Abundant and fine, owing in great measure to the dry season	Average Good average crop; fruit about the medium size	Average Plentiful, and promise to swell off well	Heavy An extraordinary crop	Light The early crops very good	Average Abundant crop, and promise to finish well	Very good; required much thinning	Fair Average crop, but late in ripening	Good Much above the average	Heavy Good average	Mark Hall, Ayston Isaac Watson, Nuneham Park Gardens
	Great crop, and very fine	Abundant, but small at present	Average	Abundant, and very fine	Heavy crop, and very fine	Excellent	Abundant indoors and out	Nice crop, but will be late	Abundant	Very few	Wm. Lee, Blenheim Gardens, Woodstock
WARWICKSHIRE	Fair crop	Very plentiful	Good crop	Very plentiful	Heavy; suffered from drought	Very plentiful	Good crops	Good	Abundant	Filberts few; Walnuts abundant	S. Elworthy, Stoneleigh Abbey, Kenilworth
EASTERN COUNTIES.											
LINCOLNSHIRE	Heavy crop; fruit very fine	Abundant crop of all kinds	Excellent crop; required much thinning	The largest crop I have seen here	Abundant and very fine	All kinds a heavy crop	A great crop, and early	A good crop, and early	A very heavy crop of all kinds	Walnuts plentiful; Filberts and Cobs thin	George B. Tillyard, Brocklesby Park
	Very abundant	Very abundant	Very fair crop	Average crop	Very great crop	A good crop	A full crop	A fair crop	Very abundant	Walnuts heavy; Filberts poor	David Lumsden, Blokholm Hall, Sleaford
NORFOLK	Fair; average	Plentiful in places	Average	Above average	Plentiful	Fine crop	About average	Good	Abundant	Abundant	W. Carmichael, Sandringham
	A good general crop; fruit much diseased	Most abundant; fruit large; trees healthy	Good; fruit large and promises well	Very heavy crop; trees healthy	Good fruit; excellent where they were watered	Most abundant; fruit large and good	Good crops; trees very clean	....	Good crops; fruits large and good	Filberts very thin; Walnuts most abundant	William Smythe, The Gardens, Elmham
ESSEX.....	Very good, but many droped off	Very indifferent crop; fruit small, the frost on May 9 injured them very much	Not half a crop; caused by the frost on May 9	Very few on standards; a fair crop on walls; they suffered the same as Pears	Very abundant, but required plenty of water	A very fair crop, especially of Morellos	A very good crop	Very good crop	Gooseberries, Currants, and Raspberries, very abundant	A light crop; Walnuts very abundant	Geo. Young, Audley End Gardens, Saffron Walden
	Plentiful	Fair crop	Middling	Plentiful	Good	Good	Very fair	Large crop	First-rate	Quite a failure	Alexander Cranford, Thorndon Gardens, near Brentwood
SUFFOLK.....	Good crop; fruit fine	Plentiful	Good average	Plentiful	Abundant and fine	Plentiful	Great crop	Plentiful	Plentiful	Walnuts plentiful; Filberts average	Thomas Blair, Shrubland Park
	Full crop	Good crop; very heavy	Excellent and clean	Generally abundant; a partial crop here	Medium; much injured by spring frosts	Extraordinarily prolific	Very good crop; had to thin freely	Wonderful crop; literally covered with fruit	Gooseberries and Currants excellent; Raspberries injured by spring frosts	Very plentiful, especially Walnuts	D. T. Fish, Hordwicke House, Bury St. Edmund's
	Fine crop, but small; fine in quality	Good, but falling from want of rain	Very heavy; trees suffering from drought	Most abundant; trees clean and healthy	Full crops and of fine flavour	Most abundant and good	Full crop; spider troublesome	Very heavy crop	All kinds most abundant	Good crop	J. Sheppard, Woolverstone Park
	In great abundance; fruit fine under glass as well as on the open walls	A very heavy crop, branches breaking where not supported	Nearly all sorts producing great abundance of fruit	A light crop, but the fruit promising to be very fine	Plentiful, and fine in quality, but suffered from drought	Plentiful and fine in orchard-houses; Morellos out-of-doors abundant	Abundant in orchard-houses; a fair crop on walls	Exceedingly abundant, and fine under glass; good prospect on the walls	Gooseberries and Currants very plentiful, Raspberries a light crop	Walnuts exceedingly abundant; Filberts and Cobs a light crop	P. Grieve, Culford, Bury St. Edmund's
SOUTHERN COUNTIES.											
BEDFORDSHIRE	Abundant and fine	Abundant	Abundant and fine	Most abundant	On strong land good	Most abundant and good	Fair crops	Plentiful	Abundance of all kinds	Average crops	A. McKay, Woburn Abbey
	Good average	Under average	Not half a crop	About half a crop	A good crop, but did not finish well	Good average and fine in quality	A very good crop; trees clean	Plentiful in places	Under average	Under average	John Cadger, Luton Hoo Gardens
HERTS	Good crop	Plentiful	Abundant	Most abundant on walls	Have been extra good	Fine crop; Morellos extra	Plentiful, but small	....	Plentiful	Walnuts plentiful; Filberts scarce	D. Cunningham, Moor Park
	Abundant; fruit small	Very great crop; fruit small	A full crop	Plentiful	A full crop, but small	Abundant; fruit rather small	A great crop; trees clean	Moderate crop, but late	Gooseberries and Currants moderate; Raspberries abundant	Walnuts abundant; Filberts moderate	Richard Ruffett, Panshanger Gardens
	Great	Medium; fruit small	Medium; fruit small	Great	Great	Great	Great	....	Great	Medium	William Paul, Waltham Cross
BUCKINGHAMSHIRE	Good crop	Great crop, but small	Very fair crop	Abundant and fine	Very good here	Very good, but small	A splendid crop	Good crop	Abundant, except Raspberries	Filberts good; Walnuts abundant	Thomas Bailey, Shardelees Garden, Amersham
	A fair crop	In places excellent	Generally good, but small	Not generally good	Fine crop, except on light soils	A heavy crop, but not large	Generally good	Very scarce; fallen from drought	Very abundant, but small	Not a general crop	Philip Frost, Dropmore, Maidenhead
MIDDLESEX ..	On standards, none, on walls a fair crop	Scarce and small	Scarce and small	Plentiful	Killed by drought, both fruit and plant	Scarce, except Morellos, which are very plentiful	A large crop, but not large fruit	....	A moderate crop	Not many	Richard D. Blackmore, Teddington *
* There would have been an immense Pear crop but for roll of frost, May 4. The Plums, contrary to all prognostications, were not much injured.	Good crop, but not large	A good crop; fruit small and dropping	Most kinds are a very good crop	A good crop, but not large	A good crop, but suffered from drought	Plentiful, but small	A very heavy crop	Heavy crop, but suffered from drought	Heavy crop, but fruit small	Walnuts a heavy crop	J. Peel, Cambridge House, Twickenham
	Abundant	Abundant on standards, but small; failure on dwarfs	Fair crop	Heavy crop on tall trees, generally failure on dwarfs	Very abundant	Abundant on tall trees	Very abundant	....	Plentiful, but small	Moderate	A. F. Barron, R.H.S. Gardens, Chiswick
	Nearly a failure	Very good	Abundant and fine	Very heavy crop	Average crop; soon over	Very fair; Morellos very good	Excellent crops	Good crop	Abundant, of all kinds, and good	Walnuts very heavy crops	R. Henderson, Fulham Palace, S.W.
	Barely an average crop; fruit good	An enormous crop of good fruit	Average on walls; standards under average	A tremendous crop; far above average	Extraordinary crop, of good flavour	First-class crop of good fruit	A good average crop	A fair crop	Far above average	Walnuts, a wonderful crop; Filberts, under average	John Edlington, Wrotham Park, Barnet
BERKSHIRE ..	A heavy crop, but small	A heavy crop; over average	A good average crop, and promises well	Plentiful	A good crop, but suffered from drought	Plentiful	A good crop	. . .	Plentiful, with the exception of Raspberries	Walnuts in abundance	H. Rose, Royal Gardens, Windsor
	Above the average, and of good quality	Abundant crop, but much attacked by insects	Average crop; fruit small, and many deformed	Full average crop; Green Gages scarce	Good crops; fine in quality; late sorts ripened early	Average crop	The best crop we have had out-of-doors in 11 years	Average; fruit will not finish well	Abundant crop of all kinds	Enormous crop of Walnuts, no others grown	Charles Ross, Welford Park, Newbury
SURREY.....	Good under glass, also on walls	Good on espaliers, uneven crop on standards	Very abundant and good, requiring thinning	Prodigious crops everywhere	Abundant, and of excellent quality	Bountiful on the walls; quality excellent	Very abundant crop	Under glass a fine crop; good on wall trees	Gooseberries and Currants most prodigious crops	Walnuts heavy, small Nuts very scarce	James Drewett, The Gardens, Denbies
	Heavy crop of average-sized fruit	Full crop; fruit average in size	Full crop; fruit average in size	An immense crop	A failure	Immense crop; fruit small	An average crop; fruit small	....	Heavy crops, of inferior quality	....	Ransley Tanton, Epsom
KENT	Average; fruit rather small	Very abundant, but small	Good average crop; fruit small	Fair average crop	Very good on high ground; otherwise poor	Abundant, but small; flavour poor	Peaches abundant; Nectarines not up to the average	Abundant	Very abundant	Very poor	John Cox, Redleaf, Tonbridge
	Light crop	An abundance	Plentiful	Abundant	Perished through drought	Very good	An abundance	Good	Very good	Light crop	T. C. Sage, Surrenden, Dering

CONDITION OF THE FRUIT CROPS—(*Continued*).

COUNTY.	APRICOTS.	APPLES.	PEARS.	PLUMS.	STRAWBERRIES.	CHERRIES.	PEACHES AND NECTARINES.	FIGS.	SMALL FRUITS.	NUTS.	NAME AND ADDRESS.
SOUTHERN COUNTIES.											
KENT	Generally good	Good	Average	Very good in places	Rather short, owing to drought	Abundant crop of all sorts	An average crop	....	Gooseberries and Red Currants good	....	James Chapman, Birling Manor
SUSSEX	Over average, and good	Average, and good	Under average	Over average	Abundant	Average	Plentiful, but late	Good	Abundant, except Raspberries	Under average	Thomas Jack, Battle Abbey
	Abundant; trees healthy	Heavy crops; required thinning	Great crops; require thinning	Good crops	Abundant, and fruit fine	Good crops	Very good	Fair crop	Abundant, and good	Good crop	John Wilson, Castle Gardens, Arundel
HAMPSHIRE ..	A great crop, and well flavoured	Good generally; many dropping from the drought	Very good on walls, but thin on standards	A heavy crop of all kinds	Good, but small	Abundant, Morellos in particular	Most abundant, had to be thinned well	Good	Fine crops of all kinds	Average; Walnuts plentiful	William Wildsmith, Heckfield Gardens, Winchfield
WILTSHIRE ..	Good crop, but small	Abundant	Good crop	Very plentiful	Good crop; excellent in quality	Very good, Morellos in particular	Good	Leaves falling off for want of water	Plentiful, of all kinds	Under average	A. Johnson, Savernake Forest
	Very fair crop: fruit remarkably fine	Generally very good	Under average; fruit rather small	Very good	Good crop, but suffered for want of rain	Abundant	Extraordinary crops	Plentiful	Very plentiful	Very scarce	William Scammell, Bowood
	Half a crop	Good crop of all kinds	Very good generally	Very good	Very good	Abundant	Very good	An average crop	Abundant and good	Plentiful	James May, Melchet Court, Romsey
DORSETSHIRE	Average	Abundant; likely to be small	Average	Abundant, but suffered from blight	Heavy crop, and good	Good and plentiful of all kinds	Above the average: orchard-house fruit abundant	Fair crop	Gooseberries and Currants plentiful and good; Raspberries fair	Abundant; both hedge Nuts and Walnuts	H. Munro, Cleveland Gardens, Lyme Regis
	Best crop for some years	Trees generally well loaded; fruit small	A fair crop	A great crop generally	Extraordinary, and of good quality	Plentiful, and of fine quality	Good crops, but difficult to keep trees clean	Middling	All sorts abundant	....	T. C. Elliott, Melbury House Gardens
	Good	Fair crop	Very good	Fair crop	Wonderful	Very good	Wonderful	....	Most abundant	Plenty of Walnuts	W. F. Radclyffe, Okeford Fitzpaine
	Very few	Plentiful, but small	Fair crop, but small	Good crop	Very good	Abundant	Few	Fair crop	Plentiful	....	W. Dick, Canford Manor, Wimborne
WESTERN COUNTIES.											
WORCESTERSHIRE	Fine crop; good on standards	Full average	Good average	Abundant	Fine crops of good quality	Abundant	Full crops	Full average	Heavy crops; Raspberries good	Heavy crops; good in quality	George Westland, Witley Court
	Very abundant	Fair average	A great crop; fruit small	Enormous crop of all kinds	A partial crop	Plentiful and good	A fair average crop	Very moderate crop	Generally good; Currants fine	Filberts light; Walnuts heavy crop	Wm. Cox, Madresfield Court
	Heavy crop	Good average crop	Good average crop	Abundant crop	Light crop	Abundant crop	Very heavy crop	....	Abundant crop	Light crop	John Wyke, Shakenhurst
	Very few	Very good	Good crop	Very good	All sorts excellent	Very good	Peaches good	....	Abundant of all kinds	A fair crop	David Mackie, Hagley Hall
SOMERSET	Good average crop	Splendid crop	Some sorts a fine crop: others poor	Below the average	Fine, but did not perfect more than half	Below the average	A good average crop	Good average crop	Abundant	....	Wm. Dodds, Ashton Court, Bower Ashton
	Plentiful everywhere	A good crop, but not large	An abundance of most sorts	Very plentiful	A fair crop	Maydukes and Morellos very plentiful	Very good, but not ripe	An abundance, but not yet ripe	Currants, Gooseberries, and Raspberries a good crop	Walnuts very good	William Hallet, Cossington, near Bridgewater
DEVONSHIRE .	Abundant crop	A good crop on espaliers and standards	Average crop on walls; fruit small	Fine crops	Abundant, and of first quality	Plentiful; some trees loaded	Heavy crop where protected in spring	Immense crop under glass	Very plentiful	Average crop; Walnuts an extraordinary crop	Robert Begbie, Bicton Gardens
	Very abundant	Average crop	Under average	Very abundant	Very few	Very abundant	Full crop; fruit small	Promises well	Plentiful, except Raspberries	Exceedingly abundant	Alexander Ayson, Oxton House, Kinton
	Fair	Abundant	Good crop	Very plentiful and good	Very good; but season short	Extraordinary crop, and very fine	Immense crop, and very good	Fair	Abundant, and of excellent quality	Frizzled and Cosford, good; others below average	George Erskine, Lupton, Brixham
GLOUCESTERSHIRE	A most abundant crop; fruit rather small	Abundant, with the exception of a few shy bearing kinds	About an average; fruit rather small, but free from spots	Considerably above an average of most kinds	The largest crop for years, but would have failed had it not been for artificial watering	On open standards, heavy; against walls, particularly on a south aspect, lighter	Heavy, particularly on the more hardy varieties; the black aphis very annoying	....	Abundant, but small in size, and deficient in flavour	Abundant	Alexander Cramb, The Gardens, Tortworth Court
	Good crop	Abundant, and fine	Good crop	Abundant crop; fruit small	Excellent crop of fine fruit	Very plentiful	Good crop, but small	Fine crop; many dropped off	Very plentiful; excellent in condition	Heavy crop, especially of Walnuts	A. McNaughton, Badminton
HEREFORDSHIRE	Good	Good	Abundant	Abundant	Good; soon over	Abundant	Full crop	Fair crop	Abundant	Walnuts great crop	S. Wells, Holme Lacy
CORNWALL....	Very few grown out-of-doors	Good in places; very small	Above the average; winter fruit scarcer than usual	Good crops of all kinds	Abundant crop set; but suffered from drought	Abundant crops of all kinds	Extraordinary crops; thinning requiring much attention	Good crops of Brown Turkey	Abundant crops of all kinds	Filberts and the common plentiful	Henry Mills, Enys
WALES.											
MONTGOMERYSHIRE	Most abundant; required much thinning	Heavy crop where on Paradise stock; partial in orchards	Very good both in number and quality	Most remarkable; requiring much thinning	Good average crops	Dessert varieties good; Morellos enormously abundant	Very abundant: three weeks later than usual	Fair average	Most abundant and fine in quality	Of Walnuts and Nuts enormous crops	George Brown, Gardens, Powis Castle
DENBIGHSHIRE	A good crop	Fair average crop	Plentiful	Above average	An extra crop, but soon over	Abundant	Excellent; but red spider very bad	Good crops under glass	Plentiful, but ripened prematurely	Filberts scarce; Walnuts plentiful	Geo. Browne, Chirk Castle Gardens
	Excellent crops, but small where not watered	Excellent; some varieties rather small from drought	Excellent crops, also of Quinces	Very prolific and good size; Damsons good	Very prolific but small; alpines very good	Very prolific and good; Geans not so good	Most excellent crops; could not be better	Promise well; generally ripen about September	Currants heavy crops; Raspberries and Gooseberries middling	Filberts fair; Cobs poor; Walnuts extraordinary	P. Middleton, Wynnstay, Rhuabon
ANGLESEY	None grown in open air	Moderate crop; fruit generally small	About average crop; but suffering from the drought	Light crop	Plentiful, but suffered for want of rain	Abundant and good, especially Morellos	None grown in open air	....	Plentiful, and of average quality	....	Jos. Ellam, Bodorgan
CARMARTHENSHIRE	Average	Heavy crop	Average	Good on walls	Good crops	Very few grown	Best crops ever seen	Not many grown	Heavy crops of all kinds	Full average	James Tichurst, Dynevor Castle
IRELAND.											
WATERFORD ..	Average crop	Very plentiful	Very good	Large crop	Early sorts good	Over average	Large crop and good	Abundant and promise well	Very heavy crop and good	Over average	J. A., Curraghmore
CORK	A most abundant crop, but small	Not so heavy as last season	Very good	Better than for the last four seasons	A good crop: fruit fine	A splendid crop	None grown outside	Not good	Very heavy	Very good	J. Fraser, Gr. to E. Pike, Esq., Bessborough
KERRY	None grown out-of-doors	Good crops, but small at present	Good crop on walls, standards, &c.	Heavy crop on wall and standards	Abundant and fine at first, but soon over	Heavy crops of fine fruit	Good crops in this neighbourhood	Promise well if fine weather continues	Abundant; black Currants small	Not good	George Breese, Kenmare Gardens, Killarney
WICKLOW	Very good crop; fruit medium-sized, and ripening well	First-rate crop; fruit large and fine, and promise well	Good on walls; moderate on standards; fruit large and fine	Good crop, and fruit fine; Damsons heavy crop	Heavy crop; especially of certain sorts	Very good crop	Plentiful, and promise well, but late	Fine crop, and promise well	Very good crops of all sorts, and fruit fine	Walnuts and Filberts, &c., heavy crop, and fine	M. Dunn, Powerscourt Gardens
DUBLIN.....	Good	Middling	Very good	Abundant, but small	Good; season short	Very good	Plentiful, but small	Good	Very abundant	....	D. Pressly, Knockmaroon Lodge
GUERNSEY AND JERSEY.	Average crop; good quality	Good, but rather small	Good, but rather small, including Chaumontel	Heavy yield	Much below the average	Fine; few generally grown	Small; much mildew and red spider on open wall	Average	Average	Not an island produce	Rev. T. C. Brehaut,* Richmond House, Guernsey

* Not so much sea fog for 36 past years. Drought as in England.

REMARKS ON THE FRUIT CROPS OF 1870.

[In addition to the foregoing tabular reports, the following statements are extracted from our correspondents' returns.]

THOSE who have paid any attention to fruit growing, must have observed that generally, taking the country at large, the fruit crops are one season abundant and the following one deficient. This is caused by over-cropping, which exhausts the trees and leaves them unable to bear a crop the following season. When trees are properly pruned, and attention is given to the proper thinning of the fruit, they very rarely miss bearing a crop. If these were universally practised, we should have moderate crops of superior fruit yearly, instead of, as now, a heavy crop of inferior fruit one year followed by a deficient one the next season. When there is a failing crop, people generally attribute it to the fickleness of our climate and late spring frosts. That these are very unfavourable to fruit trees in blossom, I am well aware, but that the failure of the crops every alternate year is owing to these I am by no means prepared to admit, having for more than 20 years succeeded, in this northerly climate, in obtaining annually good crops of fruit. Overcropping is the great evil in fruit tree management. From trees heavily laden this year I cannot, and do not, expect a crop of fruit next year, but from all those trees that have a moderate crop this year I expect a fair crop next season, unless the weather be something extraordinary. The time when the young fruit crops require thinning is a very busy season with gardeners, and where there are a great number of large standard trees, it is hardly possible to give them that attention in thinning the young fruit that is required. But much good may be done by judicious pruning and well thinning the spurs during the winter months, when more attention can be given to these matters. The thinning of the spurs and buds in winter is a most important matter, and one too generally neglected. Here there are some old Apple trees that bore only every alternate year until they were operated on. A waggon load of wood was taken out of some of the trees, and the spurs and buds well thinned. These trees are gone over every winter when we can spare the time, and now they rarely miss bearing a crop. The same was done with Pear trees, and with like results. There are also some old trees of early Violet and early Orleans Plums, which were covered every season with blossom, but bore very little fruit, and that little small and cracked, until they were freely operated on. I had the wood and spurs well thinned out. The trees are now yearly gone over, and rarely miss bearing a crop. The Violets are this year larger and finer than I ever had them. We had more frosts in this neighbourhood last April and May than we had in the corresponding months of 1869, and they did some mischief in some places, but owing to the deficient crop of last year and the favourable summer for ripening the wood, the crops this year are abundant and fine notwithstanding the above drawbacks. Had the crops been deficient this year, all the mischief would be ascribed to the late spring frosts. The land is everywhere drier than it was in 1868 at this time, but fruit trees are looking well; they are clean and healthy, and have suffered much less from the drought than in 1868, and, where the crops are moderate, we may expect fair crops next season. From long experience, I am thoroughly convinced that where the soil and situation are favourable, with a proper selection of kinds on proper stocks, with proper attention in pruning, thinning, &c., and never overcropping, good fruit crops of all kinds may be obtained six years out of seven in our fickle climate. *M. Saul, Stourton, Yorkshire.*

—— The present season, so far, may be considered as one of extreme drought—the rainfall, as observed here, being, up to this date, only 7.66 inches; notwithstanding this circumstance both farm and garden crops are, generally speaking, good. The Turnip crop is looking exceedingly well, and Potato fields would furnish excellent concealment to French or Prussian riflemen; doubts, however, are being expressed as to the tubers increasing in proportion to the tops. Of all crops in the kitchen-garden the Pea crop has suffered the most on the light land here, and it is only by sowing in trenches prepared as for Celery that a crop is to be obtained. Onions are in abundance, but they will be very small. *P. G., Culford Hall, Suffolk.*

—— Considering the small amount of rain which has fallen in this neighbourhood during the summer, crops of all kinds are looking uncommonly well. Potatos look healthy and strong, with no appearance of disease, and what have been used have proved of excellent quality. Carrots on stiff soils have suffered from wireworm in some places, but as far as one can judge at present they will be an average crop. Fruit trees generally in the neighbourhood are all that one can wish for; in some few instances the crops are poor, but on inquiry I find it is not from the effects of the season, but from having heavy crops last year. The Peach trees were one mass of bloom this spring, and from the season being somewhat late, and favourable weather occurring whilst they were in bloom, every blossom set, making it quite a tedious matter to thin the fruit. I find Apricots come much larger on young wood than on old spurs, consequently I have had a quantity of young wood laid in, so as to do away with spurs; by so doing I hope to secure finer fruit and heavier crops. On light soils the Apples will be rather small, but on stiff soils, such as we have here, they will be very fine and large. Upon making an examination of a large quantity of trees planted in the grounds here late last spring, I find that Scotch Fir and Larch have suffered more than Spruce Fir or Limes. I think it an excellent plan for gardeners at this season of the year to make an examination of crops, &c., so as to see where they can improve for another season, for it will not do to rest and be satisfied. If we mean to hold our ground we must move onwards, and try to improve and assist Nature as far as we can. *J. Smith, Exton Park, Rutland.*

—— Blossom on all kinds of fruit trees was extremely abundant, and the season of flowering late. On May 4 and 8, whilst Apple blossom was just beginning to expand, and Pears and Plums were partially set, we experienced 12° of frost, which destroyed the greater portion of the bloom on the pyramid and dwarf trees, whilst those on the common orchard tall standards escaped. Fruit in general is very small and tasteless, owing to the great dryness and excessive heat. Some of the varieties of Plums suffer much more than others, such as the Prince of Wales, which has large leaves, whilst Denyer's Victoria stands the dry weather exceedingly well. Birds have been more than usually troublesome and destructive to the fruit crops this season, probably in order to allay their thirst in the absence of water. Peaches are extraordinarily abundant, in marked contrast to the almost universal failures of last year. *A. F. Barron, Chiswick.*

—— The rain has been so partial in this locality that an enterprising harvest man might assist in securing three harvests of the cereal crops within a radius of 30 miles. Merionethshire and Montgomeryshire look like a well-watered garden, while Denbighshire has scarcely a green patch of grass to be seen. Wild fruits are abundant, such as Barberries, Bilberries, Mountain Ash fruit, Brambles, Cranberries, &c. As a rule, the fruit crop of North Wales could not be finer, all things considered. The fine dry spring favoured the fertilising of the stone fruits so well that the usual protection was not required; but the long severe drought has very considerably diminished the quality and size of the smaller fruits. From May 16 up to present date, the rainfall here has only been 1.73 inch, and this quantity only averaged 0.07 inch per shower, which did not lay the dust at any time. From April 1 to May 16 only 2.71 inches of rain fell, and from April 1 the evaporation has been excessive. A pond here of 4 acres (exposed) gave off water in vapour to the depth of 2 feet 6 inches. Notwithstanding this severe demand on vegetation the foliage of all trees was never more perfect or more healthy. The sun was so strong on July 22 and 23 as to parboil red Currants and Cherries where they were entirely exposed to the mid-day rays. On the ground the direct rays registered 135°, in the shade 92°. *P. Middleton, Wynnstay, Ruabon.*

—— The drought has been very severe in East Kent, for whilst others were having rain, we still remained burnt up. With me it told worst on the Strawberries, which set their fruit very well, but not having any water for them, the majority perished. Some of my neighbours who could water them had good crops. The Apricots are small, and have cracked very much since the rains which we had a fortnight ago. Pears are clean, but not large. Peaches and Nectarines out-of-doors, as well as in the unheated Peach-house, set in abundance. The wood and foliage of fruit trees are very healthy. Potatos are a good crop, and of first-rate quality. Flukes, and other late varieties have commenced to grow out again in this neighbourhood, and would be better if lifted at once. Ivery's Nonsuch and Lee's Nonpareil Cos Lettuces have stood the drought exceedingly well. I have not lost 50 throughout the season. Deep cultivation has again proved its superior power of withstanding drought. *T. C. Sage, Surrenden, Ashford, Kent.*

—— As the Potato disease seems to be greatly on the decrease this year, a column in your Journal devoted to the "noble tuber" would be interesting, showing, as it would at a glance, the present state of the plant all over the kingdom. Very few instances of the disease appearing are heard of here; the haulm has dried off the early varieties without a spot. The late sorts are at present looking well, the haulm being quite green. Supertuberating has, however, set in where the Potato itself is approaching ripeness, and the haulm is still sappy. This is more common than where the haulm dies off as the Potato ripens. The prolonged growth of the haulm, through excessive manuring, is perhaps the cause in some cases. *Henry Mills, Enys, Penryn, Cornwall.*

—— The orchards in this neighbourhood are covered with fruit, and there is every prospect of a large quantity of cider being made. The Apples, however, will be small, the trees being heavily laden and suffering from severe drought. Our rainguage shows it to be the driest summer experienced for many years. In January we had 1.71, February, 2.36; March, 2.48; April, 0.45; May, 1.73; June, 1.07; July, 0.54; August, to the 6th, 0.10 inch. Hedge nuts, and Brambles in the hedgerows, are unusually abundant. Honeydew and aphis pests have been very troublesome and abundant this season. *Henry Munro, Clevelands Gardens, Lyme Regis, Dorset.*

—— For many years past we have not suffered so severely from drought as during the present. Adding occasional showers together they have not amounted to five days' rain from March 6 till the 8th inst. To maintain anything like a regular supply of vegetables we have been obliged to keep the watering-pots busy. Although the fruit crop is abundant flavour is deficient, owing to the want of wet and the excessive heat, which has hurried on maturation prematurely. Apples, Apricots, and Plums, where fully exposed to sunshine, are blistered badly, and soon begin to decay. Wasps are very numerous, indeed they were so plentiful as to threaten the destruction of everything in the shape of fruit; but we have so far reduced the number as to have now very little trouble. For some years past we employed the parish boys to catch the queens in spring at so much each, within a certain distance of the garden; but my offer was turned into a commercial speculation. Without noticing the different phases of their negotiations, I found I was purchasing wasps brought from a distance of five miles, and as I had no intention of surreptitiously appropriating what belonged to my neighbours, I at once stopped the transaction. The plan I have adopted for some years past is to send out a dozen labourers wasp hunting, and at night when the wasps have returned home we have given them a composing draught of gas-tar, which effectually puts an end to further depredations. *Alex. Cramb, Tortworth Court, Gloucestershire.*

—— On high-lying ground the crops generally are very good indeed, as the frosts in May, which on the low damp situations proved so destructive, were comparatively harmless, owing to the dry atmosphere. We applied no protection here, and find that Peaches and Apricots will submit with impunity to 7° of frost when the air is dry and rather brisk. Plums are rather more tender, but I am not surprised to see that trees fully exposed to the prevailing dry east winds are overloaded, whilst those on a western aspect are very moderately filled. *J. Cox, Redleaf, Penshurst, Kent.*

THE KNOWN FORMS OF YUCCA.—IV.

GROUP III.—*Integro-marginatæ.*—Edge of the leaf neither toothed nor splitting off in threads.

In this group, as in the last, there is a set of forms in which the rosette of leaves is sessile on the surface of the soil, and another set in which it is furnished with a distinct stem. Of the first or acaulescent set five forms are known, all of which are quite hardy round London, and are in cultivation at the present time. These five I will notice this week, leaving the entire-leaved caulescent forms, some of which are hardy but others tender, for the next paper.

27. *Y. orchioides*, Carrière, Rev. Hort. 1861, p. 369, t. 89-90.—The smallest of all the known Yuccas, an entire plant not reaching more than from 15 to 18 inches in height. Leaves about a dozen, in a rosette, as thin and reed-like in texture as in any known form, 9 to 10 inches long in the specimen now before me, for which I am indebted to the Rev. H. N. Ellacombe, by an inch broad at the middle, narrowed to 3—4 lines just above the base, the colour pale green, the point not at all pungent, the surface nearly flat throughout, the edge being involute only at the point and just beneath it, the margin quite entire, marked with a faint brown line. A plant has been presented by Mr. Ellacombe to the Kew collection, but I have not seen the flower. According to Carrière, the scape, including the usually simple racemose inflorescence, reaches a height of 15—18 inches, the deep red barren portion about equalling the raceme, and being clothed abundantly with grey pubescence, and the broadly campanulate perianth, with ovate divisions, is about an inch deep.

28. *Y. glauca*, Sims, Bot. Mag. t. 2662; Kunth, Enum. iv. 274.—My notes on this form are taken from a plant in the collection of Mr. Wilson Saunders, which is not named authentically, but which agrees fairly with the figure and brief description in the "Botanical Magazine." Leaves 25—30 in a rosette, 15—18 inches long, 15—18 lines broad at the middle, narrowed to half an inch above the base, the texture rather firmer than in the last and flaccida, but thinner than in filamentosa, so that the outer leaves of the rosette are falcately decurved, the point not at all pungent, and the middle of the leaf not at all plicate, the colour pale green, not in our own plant more glaucous in the early stage than in flaccida and filamentosa, the edge entire, or showing a very slight tendency to split off in threads. Inflorescence copiously paniculate, 3—4 feet high, the perianth shorter, and more saucer-shaped than in filamentosa.

29. *Y. tortulata*, Baker.—Leaves about 40 in a close sessile rosette, 18—21 inches long when fully developed, by 14—15 lines broad at the middle, narrowed to 6—7 lines above the base, apple-green, always retaining a glaucous tinge, more or less twisted to one side, moderately firm in texture, more so than in the last, but not so much so as in the two next, the outer ones not decurved, the point hard and pungent, the back distinctly rounded in the upper and lower quarters, the edge distinct and quite entire. This may be a plant which has been cultivated under the name of Y. undulata, Martius, but I have no means of ascertaining if such be the case, and am not aware that the plant has ever been described.

30. *Y. pruinosa*, Baker.—Leaves 70—80 in a close sessile rosette, 27—30 inches long when fully developed, 15—16 lines broad at the middle, narrowed to half an inch above the base, nearly as stiff as in some of the forms

of gloriosa, permanently glauco-pruinose, the point pungent, the back rounded in the lower and upper quarter, but nearly flat in the central half, above the base 3—4 lines in thickness, the edge quite entire, and marked with a distinct brown line, the outer leaves not recurved.

31. *Y. acuminata*, Sweet, Flow. Gard. 2, t. 195; Kunth, Enum. iv. 274.—Leaves 50 -60 in a dense subsessile rosette, 20—24 inches long when fully developed by 20—21 lines broad at the middle, narrowed to 8 -9 lines above the base, all erecto-patent, apple-green, only slightly glaucous in an early stage, the point pungent, the back rounded, and the face concave throughout, the edge distinct brown or grey, quite entire. Scape 3—4 feet high with flower 2 inches deep; described, like the preceding, from the collection of Mr. Wilson Saunders. It may be an extreme form of gloriosa with which, in a manuscript table of species, for the loan of which I am indebted to Mr. Ellacombe, Dean Herbert unites it. *J. G. Baker.*

Home Correspondence.

A Cottager's Show.—When, on the 4th of the present month, I paid my usual visit to the annual exhibition of the "Dibden and New Forest Horticultural Society," I was scarcely prepared to anticipate such a display of outdoor garden produce from the cottagers of the locality as was there exhibited. For four-and-a-half months South Hants has been suffering from a prolonged drought that has told with fearful effect upon the light lands of which that portion of the country so largely consists, and the belief was general that the show of vegetables by the New Forest cottagers would be thereby largely affected. It was, therefore, with a feeling of pleasant surprise that an inspection of the produce exhibited revealed its really superior character, and called forth from Mr. W. Rogers, of Red Lodge, one of the officiating judges, the opinion "that a better display of cottagers' vegetables would not be met with in England." That such results could be accomplished amidst such a period of drought as that through which we have just passed upon the arid soil of the New Forest and its environs affords pretty conclusive evidence that in the matter of cultural knowledge the poor inhabitants of that historical region are by no means deficient, thanks for which are chiefly due to the excellent Society and the great amount of practical interest displayed in its objects by those clergymen and private gentlemen who largely constitute its committee. The extent of ground covered by the Society's operations is, in such a thinly populated locality, necessarily very large, amounting probably to a square of seven or eight miles, and it includes within the list of its officers and committee six clergymen and nearly all the principal local gentry. Of course amongst these there are some whose position is simply an ornamental one; but on the other hand, especially amongst the clergy, there are men who work hard and diligently in striving to disseminate sound advice, and giving aid of the right kind—men who love gardening for its own benefits and pleasures, and heartily desire that those among whom they reside should possess the same enjoyments. Thus it is that at the Society's shows poor people for miles round bring their garden contributions, and look forward to the result of the awards with a degree of zest and interest that would make some of our veteran exhibitors, whose feelings have from long experience become almost blunted, look wistful and youthful again under the genial influence shed by the untutored comments and ejaculations of the New Forest cottagers. The show itself combines three classes of exhibitors, viz., gentlemen's gardeners, amateurs, and cottagers; but although the first-named class contributes the larger portion of the exhibition, that of the latter is invariably the most interesting; and one feature that gives it a special air of neatness is, that all vegetables and fruit shown in separate quantities are staged in small flat round baskets that are supplied by the committee for the purpose, whilst the collections of four or six sorts of vegetables are put into large square baskets, by which means tidiness reigns supreme. Cottager's plants are about of an average quality, but invariably healthy and neat; this is the most ornamental part of a cottager's produce, and consequently less extensively shown. Cut flowers are more largely staged, and consist of separate classes of Sweet Peas, Dahlias, Pansies, Stocks, Asters, nosegays, full and florid and of various dimensions and devices, in either baskets or boxes, most of them very pretty and attractive. Of course wild flowers would be largely represented in such a forestal locality, and some of the devices or arrangements were pretty, but the nosegays composed of them were ungainly and out of character, although displaying on the part of the exhibitors considerable outlay of labour and trouble. As wild flowers are usually shown, the practice certainly can answer no useful purpose [Hear!], but if prizes were offered for the best 6 or 12 bunches of distinct kinds, with the common names appended, and their botanical ones if possible, the awards being made in proportion to correct naming, a good educational work might be effected. The display of outdoor fruit was excellent. Apples, both for dessert and cooking purposes, Currants, of sorts; Gooseberries, Cherries, Pears, &c., put up in the little baskets, being quite an attractive feature. In the vegetable classes, Potatos were in strong force, as there were no less than 87 dozens staged, and which were divided into four classes, namely, white and red kidneys, and white and red rounds—five prizes to each class, the highest being 5*s*. Then there were fine broad Beans, and runner and dwarf ditto, 30 pods of each. Cabbages green and good, and Lettuces the same. Carrots and Parsnips, in bunches of six, very fine and clean. Vegetable Marrows are evidently largely grown by the cottagers, as there were a score or two put up, all fit for table; and ridge Cucumbers had also not been neglected. Onions were probably the least in favour, as only some seven or eight bunches were shown, but they were very creditable. The collection of sorts was competed in largely; the 1st prize for six kinds was 6*s*., and for four kinds, 5*s*. It would be unjust to this, or any other society of a similar character, to assume that its results are to be seen only at its shows. All who are familiar with our cottage homes know how great is the influence exercised for good therein where there is a real love for the garden existing; especially amidst a population such as that living within the boundaries of the New Forest, where ground is cheap and abundant, and manners or intellect not too highly cultivated, is a knowledge of, and love for, gardening valuable. May the Society long exist, to work a wholesome and permanent good amongst the people. *A. D.*

Lisianthus Russellianus.—I recently saw this plant in nice condition at Beckett Park, Shrivenham, the seat of Lord Barrington. The plants were so nicely bloomed, and were so valuable for decorative purposes, that it seems a great pity it is not more grown. Those who remember the fine specimen plants of this beautiful flower Mr. Green used to exhibit, must be led to infer it is not difficult of cultivation. According to the mode of treatment detailed by Mr. Smith, the gardener at Beckett Park, it appears a simple process. The notion held by some that in order to secure germination of the seed it must be sown as soon as gathered, appears to be an untenable one, as Mr. Eckford, of Coleshill Gardens, who used to grow this plant well, has informed me that he has raised plants from the same lot of seed for eight years in succession. Mr. Smith sowed his seed in March in pots, using a soil made up of loam and peat in equal parts, the pots were plunged in strong heat, and a piece of flat glass placed over the pots. The moist strong heat of a Cucumber bed would do well. The seed soon germinates, and the pots, as soon as the plants gain some roots, are removed to a cool house, and in the autumn potted singly in 24 pots. During the winter the plants are kept in a cool house, and on no account are they allowed to be kept dry. During the time of growth the pots are placed in a pan of water so that the roots be kept supplied with moisture by means of capillary action. The soil should be kept moist, not wet. Mr. Smith says he does not place his pots in a pan of water during winter; but Mr. Eckford stated he had repeatedly done so, without injury to the plants. I counted on one of Mr. Smith's plants 25 expanded flowers, besides buds. *R. D.*

Sources of Nitrogen.—Allow me to say a few words on the recent discussion at the Congress at Oxford, after the admirable paper which Dr. Voelcker gave on the Chemistry of Manures. In the leading article on the Congress (July 23), it seems to be implied that my remarks on the subject of the relative value of nitrogen were irrelevant, or at all events of little importance, because I was not familiar enough with chemical evidence. I began, indeed, by saying I did not profess to be a professor of chemistry, but having taken up the study of chemistry some 15 years ago, in order to enable me to follow out experiments in photography (which I began when the collodion process was first introduced), and having (owing to photography being in its infancy) to work out the chemical details for myself, it led me to take a great interest in the subject of chemistry, and I should not have ventured to make the remarks I did before the Congress at Oxford, had I not from time to time made myself familiar with the various chemical experiments which have been carried out with respect to the value of manures for growing crops, &c. I am perfectly aware that very small, at times almost inappreciable, quantities of any particular element may be productive of great effects, but in most cases, when this is so, the chemical substances in question are powerful ones either for their elective affinities or other causes. With the case of nitrogen it is different, the name itself, which chemists gave it, of azote or non-supporter of life, gives one an idea of the relative value attached to it; it is inert, inodorous, and with difficulty enters into combinations with other compounds, and in the air we breathe, of which it constitutes four-fifths, it only acts as a diluent to prevent the oxygen being too powerful, just as water added to brandy prevents the alcohol from acting as a poison. Granted, by way of argument, that a plant cannot absorb or assimilate nitrogen either from its leaves or roots, except in combination with some other element, as in the case of ammonia or nitric acid, &c., I still cannot admit that the only or greatest value of ammonia is to supply this nitrogen; a very small quantity of ammonia will supply all that is necessary, and in many cases it has been found by direct experiment that more ammonia has been given as manure than is sufficient to account for the nitrogen in the crop. It is very easy to say there is plenty of carbon in the soil and plenty of carbonic acid in the air, and that there is no need to supply more as manure; but a plant might have an extra supply of carbonic acid given in the atmosphere and abundance of carbon in the soil, and yet it cannot assimilate it without sufficient heat, light, and moisture. Some crops in our climate have only a stated period in which they can grow, owing to insufficient heat; and this summer also proves that however great the heat, if there is not sufficient moisture plants cannot assimilate the carbon of the soil or the carbonic acid of the air. I mention this because I consider it is productive of many errors to study the chemical nature of soils and the chemical analysis of plants without taking into consideration the physiological conditions of the plant as well. Chemistry is of great assistance, a useful handmaid to the study of physiology, both in plants and animals, but we know little or nothing yet of vital force, or in what the life of plants or animals consists. Chemistry can trace no distinction between the living tissue and the dead tissue. We do not know what may be the power of electricity in plant life, or how the different cells are formed and built up from the sap. Just in the same way, though we know food is absorbed and assimilated into the blood, we do not know how the different parts of our body are capable of selecting from the blood the different ingredients which they may require; how the bones appropriate the phosphates of soda and lime—how the same blood which gives flesh and fat should give to hair and nails what is necessary to increase in growth. In chemical analysis, therefore, of plants, I maintain we do not pay sufficient attention to the physical condition in which they grow, and by evaporating all the water from the tissues, and then taking an analysis after the water is abstracted, too great a relative value is placed upon the elements that remain. For instance, if a Potato or a Turnip, or still more a Cucumber, or a Water Melon, is analysed after dissection, the relative proportion of hydrogen and oxygen to the carbon and nitrogen, &c., are necessarily far different than what they are in the growing crop. When, then, I find that nitrogen is naturally an inert substance, that it is found in plants in only small proportions, that it does not constitute any part of sugar, starch, gum, cellulose, dextrine, and many other most important vegetable substances, I cannot think that ammonia, which is so valuable a manure, owes all its value to the nitrogen it supplies, but that its real value consists in its being also a solvent for carbon, and a stimulant to the growth of the plant, that just as a dose of *sal volatile* will revive a person in a fainting fit, so may ammonia act in a physical way to excite a plant into growth, and help it to assimilate carbon and also other mineral ingredients. It also, as I ventured to suggest, may act mechanically by increasing the endosmose and exosmose of the cell walls, and also by assisting the capillary action of the sap. As the power of gravity has to be overcome, and the sap rises in the plant contrary to the laws of gravity, this may be of great importance. As I have, however, before said, we know so little about vital force, or about the value of electricity, endosmosis and exosmosis, that this is purely speculative. Every year proves more conclusively that the value of food for man is almost in exact proportion to its digestibility, and nitrogenous foods are not valuable merely on account of the nitrogen but because, as a rule, those kinds of food which contain nitrogen are more complex, more highly organised, and contain nearly all the saline ingredients so necessary for the life of man. In the same way, then, I do not think it can be right, in estimating the value of substances as manures, to say the relative values are to be reckoned by the nitrogen they contain, or how is the value of potash, sulphate of lime, phosphate of lime, chloride of soda, sulphate of soda, magnesia, phosphoric acid, and other chemicals which do not contain nitrogen to be estimated? and I cannot help fancying that time will prove we are at present undervaluing the saline ingredients of our manures. It seems to me contrary to all the usual laws of an all-wise Providence, if nitrogen is so valuable, to place both plants and animals in the midst of an atmosphere of nitrogen, and yet deny them the power of assimilating it direct from that atmosphere. But this is entering upon a deeper phase still of the question, though I think it helps to strengthen my argument and to give an additional reason why the subject of the value of nitrogen should be more carefully investigated, and if I can induce any of our leading analytical chemists to reconsider the question, I shall feel that the few remarks I ventured to make at the Oxford Congress will not have been in vain. *C. P. Peach, Appleton-le-Street, Malton.* [We had no intention to reflect injuriously on our correspondent's chemical attainments: we merely stated that the overwhelming preponderance of opinion among chemists was against the notion of the direct absorption of free nitrogen by plants. Eds.]

Roses.—I have received from two distinguished Rose growers a confirmation of the high character that I gave to Felix Genero. I have fully proven Madlle. Marie Rady, and can recommend it as a beautiful and successful Rose. Marie Rady is of the same colour as Marie Baumann, but of a more erect habit—the stalks hold the blooms up. A long limp flower-stalk is the fault of beautiful Marie Baumann; Marie Rady, moreover, is a better grower. The new Roses, Marquise de Castellane, Madlle. Eugénie Verdier and Princess Christian, are superior Roses. The two last are of great substance,

When they are on strong stocks I have no doubt they will give great satisfaction. The two last are in the same line of colour, creamy white, with delicate suffusion of salmon—very beautiful. The "Princess" is giving a second series, and has now one beautiful expanded bloom. It is as full as one could expect in such weather, and on such a weak stock. Albion is a fuller Adolphe de Rothschild, but the plant is dying. The other three Roses appear to be good growers. Paul Neron is a good grower, but I have not yet had a flower. *W. F. Radclyffe.*

Fowler's Gardeners' Insecticide.—The Turnip fly, probably driven from the fields for want of food, is betraying a great fancy for Tropæolums. I have a line of that capital dwarf bedding variety, Beauty of Malvern, and on inspecting the plants a few days ago, I found the black fly clustering thickly on them, and riddling the leaves with holes as if pierced with small shot. Leaves and flowers alike were being rapidly devoured, and I saw a *coup de main* was necessary to rid the plants of the invaders. A rather strong dose of Fowler's Insecticide, sprinkled over the plants through a rose watering-pot, speedily cleared the plants, and a careful examination made the next and following days showed a thorough evacuation by the enemy. I was surprised to see, after a two days' absence from my gardens, how soon the plants had succumbed under the attack of the enemy. *Richard Dean, Ealing.*

The "Royal" and its Provincial Meetings.—Mr. Fish comes before us as a knight errant *in extremis*, a veritable Don Quixote, doing battle in favour of his persistent idea, that the two "Royals" are twin sisters, and loving ones. It is not the fault of one of them that she gets few wooers, and the other an abundance. In his estimation the charms of fair Flora are manifestly pre-eminent, but her "mamma" does not properly trot her out; consequently, she is literally outshone by her obese but more wealthy sister. This fact kindles the anger of the "Knight of Hardwicke," and he rushes forward manfully with the cry, "Fish to the rescue!" with what result we shall see. His lance, however, is not a formidable weapon, nor are his arguments so powerful as to knock down opponents. Here is one of them. He says that "at nearly all provincial agricultural shows in the country, it is now become the rule to have a flower show associated with it." I say, Hear, hear—it is a good feature; but the local show is a small one, and the exhibition of the twin arts, combined under such conditions, only offers a pleasant day's tour of observation to the visitor. One helps the other, and they both, either individually or in conjunction, are a financial success. Mr. Fish admits that the two big shows cannot be done in a day, but submits against that objection the fact that both are open for several days. That I grant, but would ask in return, how many of the masses are there who can afford to give two days to the shows? and is it not the masses who make the financial success? It is all very well to talk about the "will and the way," but until Mr. Fish can successfully demonstrate to the vast population of the visitors to the "Royal" show ground that they can comfortably see and do both shows in one day, he must admit that, let the "will" be ever so good, the "way" is beset with difficulties. But casting aside his lance of argument, he brings to bear upon his opponent a veritable *mitrailleuse* in the shape of a threat, that should the Royal Horticultural Society separate from its agricultural congener, there will be still a great horticultural show held in connection with it. Surely Mr. Fish must be *in extremis*, indeed, to find it necessary to make such a threat. He defies the horticultural powers, does this oracular Ajax, and exclaims, in anger, "a flower show will be held all the same." Very well, so let it be—if anybody chooses to stand the racket so let him. Mr. Fish's threat is a bogie's cry, and is too fretful to affect the judgment of the Council of the Royal Horticultural Society. The Agricultural Society has already too much on its hands to tack a flower show on to its own programme. Its yard's contents have so swelled beyond manageable limits that they will have to be greatly condensed, and in the face of that fact the declaration that the Royal Agricultural Society may be induced to take up a flower show may be taken for what it is worth. Mr. Fish would have enjoyed the Congress better if the "Fungus pest" had been discussed. Perhaps so; but I fancy other gardeners have had enough of the Fungus pest already, without being "pestered" with it at the Congress; still, if Mr. Fish could have had the opportunity to attempt the "rooting out of error and the implanting of truth," he would have no doubt done a public service. The one argument and the threat he has put forward are all he has to advance in support of his views. Let me offer one argument of a contrary character. The first consideration with the Council of the Royal Agricultural Society in its annual wanderings is to secure a good agricultural centre. Query: Does it always follow that a good horticultural centre is to be found in the same place? I trow not. If the Council of the Royal Horticultural Society is wise in its day and generation, it will look out for good centres also for its operations, and will at once show its acceptance of this rule of guidance by accepting Mr. Ayres' offer as to Nottingham, where, there can be no doubt, the Society would meet with an amount of support, both florally and pecuniarily, as to make it the most successful provincial show it has held. Mr. Fish lays great stress upon getting the full sympathy and support of the local bodies for aiding the flower shows; I agree with him in that opinion, but not in the opinion that when the whole of the resources of the locality have been exhausted to do honour to the Agricultural Society, that is the best time to appeal for horticultural aid. When men's time is otherwise engaged, and their pockets heavily taxed for other special purposes, it is the most unreasonable thing to do to expect them still further to make sacrifices. The good sense and judgment of the Council at South Kensington will surely see this proposition in its true light, and in spite of the threats of Mr. Fish will not hesitate to adopt that course in regard to its future operations that has already commended itself to sensible and thinking men. *A. D.*

Larch and other Bark.—I have recently had an opportunity of visiting Dunkeld, Blair Athol, and Taymouth, and was surprised to find the barking of Larch so general. I should be glad to learn, through some factor or forester, what is the relative value of Larch bark to that of Oak, which of late years has gradually dropped in price. This year we have only made 90*s.* per ton, out of which 35*s.* has to be paid for felling, barking, and carting to tan-yard. Between the Pass of Killiecrankie and the Queen's View, I passed through a plantation of Birch, many of which had been felled, and the bark stripped; but, unless better prices can be obtained than that quoted for Oak bark, I cannot see how it can pay. The Silver Firs at Inverary Castle and Dunkeld are truly magnificent. *William Brown, Land Agent, Tring.*

Asparagus Culture.—Considering the well-known fact that the greatest drain upon the energies of plants is in the perfecting of seed, I am trying the experiment of removing all the seed (as yet very immature) from my Asparagus. Should any one feel disposed to make the same trial, they will find that a coarse comb like a horse comb will enable them to get through a great quantity of work in a very short time. *J. H. Maw, Broseley.* [This appears to us so reasonable a suggestion as to be well worth carrying out. We hope our correspondent will kindly communicate the results of his experiment. Eds.]

The Country Visits of the Royal Horticultural Society.—I am sorry to find that my friend Fish still holds to the old mistake; but as he is, so far as I know, the only person who fosters that prejudice, it is not worth while to waste more words upon it. So far as the farmers are concerned, I believe the majority of them have not the slightest desire for a flower show. It is more than they can do to attend to their own affairs, the solidities of life, among the cattle and implements, to give the flower show a thought. Though I was at Oxford from Monday to Friday, the greater part of the time in the Observatory ground, and though I have a wide range of farming friends, it is a noteworthy fact that I only met with one farmer, Mr. James Charles, agent to Sir W. Heathcote, Bart.—and he, be it known, sprung from the "spade," is an accomplished gardener and botanist. Of many farmers who went from here not one saw the flower show, though I am glad to say some of our amateur florists did. When asked for their reason, the reply is: "I had not time." "I was so fagged with the cattle and implements that I wanted a rest;" while a third, an enthusiastic Grape grower, said, "No, I would have given anything to have seen Speed's Grapes, but I could not do so without losing my return ticket, and therefore it will be cheaper to go to Chatsworth to see them." It would be, I am convinced, a sheer waste of time, to say nothing of means, to make another effort in that direction. Besides, why should the senior partner in the art and science of cultivation play second fiddle to the junior in the firm. Mr. Fish is, as a rule, amongst the foremost to stand up for the rights of his order, but in this case I believe he would positively supplicate the great potentates of the Royal Agricultural Society to throw out a rope, to take poor Horticulture in tow. The Royal Agricultural Society is not willing to do so, and if it were, I believe it would be a rope of sand. No, we are bold enough and strong enough to go alone; all that we lack is the courage to start. When the Social Science Congress tacks itself to the tail of the British Association, it will be time enough for us to play tail to the agricultural comet. Till then let us trust to our own resources. Of the arrangements of the Society, both horticultural and social, I quite agree with Mr. Fish, there is vast room for improvement. The "stand off" policy of the leading officials is anything but inviting to their supporters, and I really think a member of Council might make himself affable, yea, genial, in such a company of gardeners as we saw at the Congress, without his dignity being in any way impaired. The "chairmanic" coldness and indifference, the sort of studied desire to get away from those fellows as quickly as possible, had a most refrigerating influence upon the Congress, for those were the fellows who had provided the show. Joking with a well-known amateur upon his indifference to the Royal Horticultural Society, he said: "No, I am not indifferent; I will pull as well as any horse in the team when I see the leaders run up to their collars; but until they do so I have determined to jib pertinaciously." This is the gangrene that is gnawing at the vitals of horticulture, and without the slightest fear of contradiction I tell the Council of the Royal Horticultural Society that to be successful showmen they must be more popular. Here every necessary accommodation, so far as ground suitable for the purpose, lecture rooms, meeting rooms, too, would be provided; and I will venture to say the authorities of the town would not give the Society the cold shoulder as they got it at Oxford. If at future meetings some general rendezvous could be provided for gardeners, it would be an immense professional and social gain to them. Why, for instance, should not a contractor be found who would provide us in the same room with breakfast, dinner, and tea, at certain fixed hours, at say 7*s.* or 10*s.* per day, local stewards being appointed, and the money being paid so as to render the provisioning a certainty? The creature comforts could also be provided, and then we should have that social communion for which Mr. Fish has been so long craving, with the comfort of a meeting room, to which no one would be admitted except subscribers and their friends. Then, again, a lavatory in the grounds, where exhibitors could wash and make their toilets, after the work of the day, would be a great boon. It was so at Chiswick a quarter of a century ago, and it would be regarded in the same spirit now. I do not ask for these things at the expense of the Society, but I say, provide the means and we will pay the cost. The Congress, I am convinced, should be taken in the evening—say from 8 o'clock, then men of business would not be harassed by the fear they were missing their customers, and there would be time for full and fair discussion. In conclusion, allow me to thank Mr. Fish for his offer of material assistance, should we require it at Nottingham. So far as the guarantee is concerned, success is so certain, that it must be a mere matter of form; and a good round sum for local prizes will, I doubt not, be forthcoming. A meeting of the town and county, if convenient to the Lord-Lieutenant, will be held on Wednesday, the 24th proximo, when an invitation to the Society will be formally inaugurated.—P.S. Could not the Horticultural Club, an institution which we hear of occasionally, do a little business in the catering and itinerary way? It appears to me, that it might popularise itself, and render service to the cause which it professes to espouse, by catering at these provincial gatherings. The hint may be worth the consideration of the managers of the club. *W. P. Ayres, Nottingham, August 15.*

"Ashamed of their Names."—Twice lately has this childish accusation been brought against correspondents of yours who have not given their full name and address. In charity to those who made such a silly remark, I will not mention their names. Bad habits in general are so catching, that I hope you will allow me to protest against this one in particular. The few who are addicted to it evidently are not aware that they lower themselves in the estimation of all sensible men whenever they assert as a fact that which can only be an assumption. They evidently require to be told that the assertion of an assumption, in a discussion upon matters of fact, is a sure indication of weakness. By making such remarks, they also show their ignorance of the various reasons which induce so many of your contributors to use *Initials*.

Foreign Correspondence.

Boulogne-sur-Mer.—About this time last year I told you that I saw an old market gardener mowing down his Strawberry plants, and was horrified at what my old friend Dr. Lindley would have called a barbarous custom. I reported to you my old neighbour's plan, and a well-known reverend correspondent of yours denounced the practice as "ignorant," and used other hard names. I translated this roughly to my old friend, and he smiled and said, "Theory was all very well, but he liked practice better; and as he had tried the plan successfully for 50 years, he did not feel inclined to change."

I have been looking out for the result of his last year's practice. His plants looked vigorous and healthy in the early spring, and were full of abundance of bloom, and when I went to England in the middle of May there was promise of a plentiful crop of good Strawberries. I was unfortunately detained in England till the middle of July, and therefore could not see the crop gathered, but the grower assured me that he had had a good and remunerative one; and when I tell you what it produced, I think you will agree with me that it was so. According to a rough measurement, his Strawberry beds were 45 of my ordinary walking paces long by 8 paces broad, in three beds of four rows each. The sort he called the "Alton," as far as I could catch; and after all expenses on them, he netted a clean profit of 100 francs, or £4 sterling.

On the first or second day of August he mowed them very closely, leaving about one leaf to a plant. The haulm he put over them for about ten days, when finding the plants had begun to sprout, he cleared it off, and has just dug among them lightly.

As I think I promised to send you the result of this unnatural proceeding, I now forward it to you, as it may prove of interest to your readers; and I should

only throw out in conclusion a question, whether, at any rate, a greater pruning of Strawberry plants than usual in England, as with other plants and trees, may not be beneficial? *Querist, Aug.* 11.

Societies.

Royal Horticultural: *August* 17.—W. Marshall, Esq., in the chair. The usual preliminary business being concluded, the Rev. M. J. Berkeley addressed the meeting, first directing attention to the beautiful Lælia elegans var. gigantea, exhibited by Mr. B. S. Williams, which had been considered by Mr. Bateman to be more properly Cattleya elegans var. gigantea; and next to Dendrobium triadenium, and Rodriguezia suaveolens, from the same exhibitor. The latter, said Mr. Berkeley, was the same as the Gomezia recurva of Loddiges' "Botanical Cabinet," so far back as 1815, and that the true plant was figured under the name of Pleurothallis suaveolens in the "Botanical Magazine." The beautiful Lilium Wilsoni then came under notice, as having at one time been supposed to be a form of L. Thunbergianum, but it was found to be quite distinct from that species; after which it was remarked, whilst referring to the handsome Golden Catalpa syringæfolia, that many plants in the hedgerows had this summer shown a tendency to produce yellow shoots, and which might be made permanent by grafting. Messrs. Paul & Son's collection of cut branches of hardy ornamental trees was then alluded to as containing a specimen of the true Rhamnus alpina. A small plant of a Heath, on which was growing a species of Cuscuta, was then shown. Referring to the large Onions shown by Messrs. Carter & Co., Mr. Berkeley stated, that what was known as the early Tripoli was obtained from seeds ripened near Naples, while the later kind was grown from seed ripened in a colder district. It was then stated, with reference to the fruit-bearing branches of Gleditschia, from Chiswick, that the fruit of another species was largely imported into this country, under the name of "Locust," as food for cattle.

The Gladiolus Show, though not a large one, was the means of bringing out some grand examples of good cultivation. The class for foreign growers, owing to the deplorable war on the Continent, was entirely unrepresented. In the nurserymen's class for 36, for prizes offered by his Grace the Duke of Buccleuch and G. F. Wilson, Esq., the 1st was taken easily by Messrs. Kelway & Son, Langport, Somerset, who staged truly magnificent spikes of Stella, Meyerbeer, Homére, James Veitch, Madame Desportes, grand white; Freemason, De Humboldt, Madame Vilmorin, Molière, Eugénie Scribe, Agnes, Mary, Norma, Prince Imperial, &c. No 2d prize was awarded, the 3d being given to Mr. D. Robertson, Helensburgh, Dumbarton, who staged a well selected collection, but his spikes and flowers were dwarfs in comparison with those shown in the 1st prize lot. Messrs. T. Bunyard & Sons, Maidstone, sent a group which would certainly have taken the 2d prize had they not, unfortunately, arrived too late for competition. Some very fine flowers were staged in this collection, especially of such varieties as Lacepede, Sultana, Elegans, Circée, Janire, Madlle. Müller, &c. The class for 18 was better represented, six collections being shown. Messrs. Downie, Laird & Laing, were pre-eminently 1st, with a very well finished lot. Their spikes of Canova, Hortense, Orpheus, Norma, Lacepede, Milton, &c., were admirable examples of cultivation. Messrs. W. Draycott & Son, Humberstone Nursery, Leicester, came in 2d, and Messrs. Paul & Son, 3d, with fair ordinary examples An excellent stand was sent by Messrs. Stuart & Mein, Kelso, but they arrived too late to be judged with the others. In this collection were admirable examples of Marie Stewart, Monsieur Legeve, Armide, Rossini, and Princess Mary of Cambridge. In the amateur class for 12, equal 1st prizes were awarded to the Rev. H. H. Dombrain, and Mr. Fry, gr. to V. Stuckley, Esq., Langport, Somerset. In the group from the former exhibitor were very excellent spikes of James Veitch, very rich; Marie Dumortier, Orphée, Madame Furtado, Eleanor Noman, &c. Mr. Fry staged, amongst others, Shakespeare, Madame Vilmorin, Legouve, Norma, &c., in splendid condition. The next best lot in this class were contributed by Mr. Douglas, gr. to F. Whitbourn, Esq., Loxford Hall, Ilford. Mr. Fry also staged the best 9. In this lot, Madame Desportes, Norma, Mathilde Landevoisin, Medina, Eugéne Scribe, James Veitch, &c., were very superior spikes; Mr. J. Douglas was placed 2d, and the Rev. H. H. Dombrain 3d. Mr. J. Welch, gr. to J. Marshall, Esq., Belmont House, Taunton, sent the best 6; and Mr. Fry the best 4; Rev. H. H. Dombrain being 2d in the former class. Hollyhocks came out in very good force, and were unusually good in quality for such a dry season. The best 6 cut spikes were contributed by Mr. W. Chater, Saffron Walden, and consisted of Eclipse, Cygnet, Scarlet Gem, Fred Chater, Conquest, and Fascination; Messrs. Downie, Laird & Laing came in 2d; and Mr. H. Minchin, Hook Norton, Oxon, 3d, both staging admirable examples. Of cut blooms Mr. W. Chater had the best 24, consisting of, amongst others, splendid specimens of Crimson King, Leah, Leviathan, and Walden Queen, both novel flowers, being faintly tipped at the edges; Champion, Walden Primrose, Jewel, Bullion, Mochanna, &c. Mr. H. Minchen was 2d, and Messrs. W. Draycott & Sons 3d, with very good specimens. Six collections of Phloxes were shown in competition for the prizes offered; but this flower has too ragged an appearance for exhibition, unless it is shown in pots. Messrs. Downie, Laird & Laing came in 1st with good examples of Mons. Charles Turner, Triomphe du Pare de Neuilly, Mons. William Bull, Magnificent, Mons. Hugh Low, Madame Domage, Princess Ghika, &c., all fine in colour. Messrs. E. G. Henderson were placed 2d, and Messrs. Paul & Son 3d, with very fair examples; Messrs. Kelway & Son, and Mr. W. Welch also exhibited. Amongst miscellaneous collections were a group of Orchids and other flowering plants from Mr. B. S. Williams, consisting of a very large specimen of Allamanda Hendersoni, well bloomed; the very quaint Cochliostema Jacobianum, which has continued to throw up spikes of flowers for the past three months; and of Orchids, Miltonia Morelliana atro-rubens, M. Regnellii, and M. spectabilis purpurea, Cattleya crispa, Aerides, and Dendrobium triadenium, white, faintly suffused with lilac, with a yellow blotch at the base of the lip; together with several neat specimens of Nepenthes. From Mr. W. Bull also came a very effective group of Palms, Encephalartos, Orchids, &c., and a very large specimen of Godwinia gigas, about 8 feet in height. Amongst the Palms were handsome little specimens of Welfia regia, Astrocaryum mexicanum, Areca Baueri, A. sapida, Hyophorbe Verschaffeltii, Dæmonorops melanochætes, Thrinax elegans, &c. Messrs. Arthur Henderson & Co. had also a very neat collection, consisting principally of Palms, Ferns, &c. A very fine group of double-flowered Balsams were contributed by Messrs. F. & A. Smith, Dulwich, and along with them came several well-flowered examples of the beautiful old scarlet-flowered Rochea falcata. Messrs. Paul & Son had a collection of Roses in pots, and another of hardy ornamental foliage trees, which was very interesting. From Mr. Walker, Thame, Oxon, came fine collections of Dahlias and double Zinnias, the latter especially being exceedingly fine.

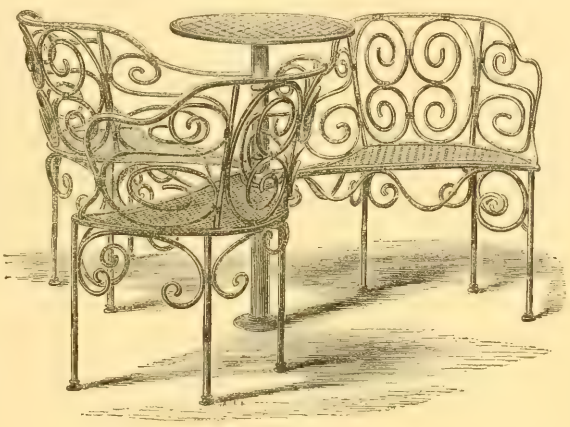

Fig. 211.

Floral Committee.—Rev. J. Dix in the chair. From Mr. Bull came a very interesting group of plants, amongst which Lilium tigrinum splendens, a very showy new variety, received a First-class Certificate. Mr. J. King, gr. to Rev. J. S. Wiggett, Allanby Park, Berks, had a collection of seedling Coleus, not distinct from varieties already in cultivation. To Messrs. E. G. Henderson & Co. a First-class Certificate was awarded for Pteris serrulata gleicheniifolia, a very handsome Fern; and to Messrs. Cripps & Son the same distinction was made for Clematis Victoria, a hardy variety, with very attractive purplish lilac flowers. Messrs. Cripps also sent specimens of Catalpa syringæfolia aurea, a fine bold golden-leaved tree, which was raised from a seedling on the Continent two or three years ago. Should it permanently retain this valuable characteristic, it will make a grand pictorial tree in landscape scenery. From Mr. Eckford, gr. to the Earl Radnor, Coleshill, came a collection of new Verbenas, amongst which two varieties, named George Peabody and Grand Monarque, were again honoured with First-class Certificates, having received the same award at Oxford a month ago. Mr. H. W. Warren, Salisbury, sent specimens of a double-flowered purple and white seedling Petunia, called Queen Charming; and from Mr. J. George, Putney, came a fine stand of cut blooms of Pelargoniums, which were thought deserving of a special award. Mr. Cannell, Woolwich, exhibited neatly grown plants of Pelargonium Crown Prince, a double-flowered free blooming variety of great merit. In colour the flowers are of a deeper shade of Peach than in any other variety, and in habit it appears to be very vigorous without the grossness of the older kinds. A First-class Certificate was awarded. To Mr. B. S. Williams the same mark of distinction was given for Lælia elegans var. gigantea, the name of which was disputed by Mr. Bateman, who recognised it as Cattleya elegans. Messrs. Carter & Co. exhibited a choice collection of French and African Marigolds; and Mr. G. Wheeler, Warminster, contributed a new Dahlia, named Marchioness of Bath, a large well-formed pale flower, tipped with rose; a First-class Certificate was awarded. Mr. Perry, Castle Bromwich, sent a stand of seedling Verbenas, amongst which Mrs. Boulton, large, white, with deep rich crimson eye, also received a Certificate of merit. A Second-class Certificate was voted a new Hollyhock, named Rose Queen, from Mr. Porter, gr. to E. Benham, Esq., Isleworth. From G. F. Wilson, Esq., came beautifully-flowered specimens of Lilium Wilsoni, L. lancifolium, true, very handsome; and L. longiflorum albo-marginatum, a white-flowered variety, to which a First-class Certificate was given. Mr. W. G. Smith had several specimens of Boletus, and from the Society's Gardens, Chiswick, came fruit-bearing branches of a species of Gleditschia.

Fruit Committee.—Geo. F. Wilson, Esq., in the chair. From Mr. G. Ward, gr. to T. N. Miller, Esq., Bishop Stortford, came four magnificent specimens of Charlotte Rothschild Pine, the total weight of which was 38 lb., and cut from plants 16 months old. They were remarkably even in size, colour, and finish, and deservedly received a Special Certificate. Mr. Wilkie, Oak Lodge, Kensington, exhibited dishes of Barrington and Bellegarde Peaches, to which an extra prize was awarded. A Special Certificate was also awarded to Mr. Record, Lillesden Gardens, Hawkhurst, for a fine dish of Morello Cherries. To Mr. Pearson, Chilwell Nurseries, Nottingham, First-class Certificates were awarded for two new white Grapes, one named Chilwell White, a very promising seedling, which in size and form more resembles the Black Hamburgh than any Grape in cultivation; and the other named Ferdinand de Lesseps, a white Grape, which created some interest when exhibited last year, as being a remarkably successful cross between the American Strawberry Grape and the Royal Muscadine. It is exceedingly rich in flavour, and though not particularly a showy Grape, it well merits the award given to it, on account of its interesting pedigree, and as the means through which further novelties may be obtained. A First-class Certificate was also voted to a fine new seedling Plum, named Duke of Edinburgh, exhibited by Mr. Dry, Hayes, Middlesex. Messrs. Carter & Co. sent growing examples of a new Chinese Mustard (black-seeded) which the committee were unable to recognise as being better than the common sort, though the leaves of those sent were larger than in the latter, which, however, may be due to cultivation. It will be grown at Chiswick, and shown again at the next meeting. Mr. Porter, gr. to E. Benham, Esq., Sion Lodge, Isleworth, sent specimens of Golden Perfection and a hybrid Melon, together with specimens of summer Apples. Mr. Tillery, gr. to the Duke of Portland, Welbeck, exhibited remarkably fine specimens of Barrington Peaches, grown on the magnesian limestone soil; and also a brace of White Cucumbers. Mr. J. Stone, Farnborough, Bromley, Kent, exhibited bearing branches of a fine Black Currant, distinct from the Black Naples, but bearing considerable resemblance to Lee's Prolific Black. From Messrs. Carter & Co. also came grand specimens of the Giant White Tripoli Onions; and from Mr. C. Bloomfield, gr. to W. Williams, Esq., Parkside, Wimbledon, came a large and good collection of vegetables. Prizes were offered for the best dish of Apricots, but in consequence of the lateness of the season, the fruits shown were small and very poor in flavour. The successful exhibitors were Mr. Tillery, Mr. Gardiner, gr. to W. E. P. Shirley, Esq., Eatington Park, Stratford-on-Avon; and Mr. Smith, gr. to the Earl of Gainsborough, Exton Park, Rutland, in the order in which their names are given.

Oxford Meeting.—We mentioned at p. 1062, a peculiar triclinium, as Horace might have called it, which was exhibited both in Paris and at Oxford, in the latter place by Messrs. Gill. The accompanying illustration (fig. 211) precludes the necessity of any further description.

Birmingham Flower and Fruit Show: *August* 12. —This show was superior to any that has taken place for several years past, in the quality if not in the quantity of the flowers and fruit exhibited, in which latter respect, indeed, it was quite equal to any of its predecessors. The magnificent display of fruit seemed to be the centre of attraction. The Grapes shown by Mr. J. Breedon deservedly carried off both 1st and 2d prizes, and they reflect the highest credit upon his gardener, Mr. W. F. Hunt; the 1st prize for the heaviest bunch was taken by Mr. W. Chambers, whose gardener is Mr. G. Boon. The Peaches and Pine Apples were also excellent. The Zonal Pelargoniums with ornamental foliage shown by Mr. C. J. Perry, carried off both 1st and 2d prizes; they were small in stature, but of great breadth. Mr. Perry also showed a collection of Zonal flowering Pelargoniums, which were one mass of rich bloom, and carried off 1st prize; the collection of 6, by Mr. F. Osler, taking a good 2d. Amongst the stove and greenhouse plants were some fine specimens shown by Mr. Daniels, whose gardener, Mr. J. Page, won the silver cup; while the plants shown by Mr. W. F. Hunt, gr. to Mr. Breedon, to which was awarded the 2d prize, fell but little short of those of the winner of the silver cup. There was, considering the advanced season, a good show of Roses, both by Mr. R. H. Vertegans and Mr. T. Collis, to whom were awarded extra prizes. The exotic and British Ferns exhibited by Messrs. Mapplebeck and Lowe, comprising 12 new varieties, were closely inspected by many of the visitors. Messrs. Felton & Son showed the beautiful Adiantum farleyense. Verbenas, whether great or small, are always beautiful and varied in colour; those shown by Mr. Perry were the largest that have been exhibited for many years, and he takes in this

class, as well as in Dahlias, all the prizes, the latter being of immense size, and well formed. Of Fuchsias there was a good show. A Chinese Cucumber, named the Sooly Qua, a curiosity from its immense size, being about 5 feet long, and of proportionate circumference, was, as the label on it stated, first introduced into England during the present year, and the specimen in question was grown by Mr. Temple, gr. to the Earl of Aylesbury.

Notices of Books.

Seaside Walks of a Naturalist with his Children. By Rev. W. Houghton, M.A., F.L.S. London: Groombridge. Crown 8vo, pp. 154. Illustrated.

Many of our readers will remember the scene depicted by that most kindly of humourists and keenest of observers—Leech—and in which Master Tom is being dragged along by a somewhat pompous-looking papa towards the "extinct animals" at the Crystal Palace, for the purpose of having his mind improved. Determination and the consciousness of a righteous purpose are not more clearly marked on the instructor's features than are disgust and alarm on those of the unwilling pupil. The legend, which informs us that the Master Tom aforementioned "objects to having his mind improved," is quite a superfluous addition to the tableau. We were not at all sure when we opened the book whose title is above given, and saw the didactic, somewhat pedagogic style in which some parts of it are written, that its perusal might be as little relished by the class for whom it was intended as the inspection of the megatherium at Sydenham was by Master Tom. Not so, however. We had forgotten the delights of "Sandford and Merton," which seems so preposterously "priggish" now-a-days, but which exercised so strong a fascination over us in our childhood. But the truth was brought home to us on placing the book in the hands of a youthful but impartial reviewer, unconscious of the work she had in hand, and by whom the book was greeted with hearty applause. Other reviewers of the same class being unanimously of the same opinion, we have the less hesitation in recommending the book to the very numerous visitants to our coast, or at least to those to whom the band on the esplanade does not constitute the only attraction. We can guarantee the general accuracy and excellent intentions of the author, and can only lament that in our childhood so capital a book was not available. The dialogue style in which it is written is not favourable for making extracts. Here, however, is a passage which shows the author's style to better advantage. The writer is descanting upon a salmon weir, and the exploits of a retrieving dog, by name "Jack:"—

"Look at the dog Jack, he is evidently getting a little impatient, as he sees in the retiring water of the pool every now and then a salmon darting along. And now Mr. Evans takes the silver collar off, and sets Jack free, and in a second he is in the middle of the pool. Now for the fun! Willy and Jack tuck up their trousers, take off their shoes and stockings, and, with nets in their hands, enter the water. Bah! it is rather cold at first, but the excitement soon warms them. There goes a salmon, full tilt, and Jack after him. What a splashing in the water, to be sure! There is another dog learning the trade, and Jack is his tutor in the art; he is a brown retriever, and dashes about the water after the salmon as if he enjoyed the fun immensely, but he has not yet learnt how to catch a slippery fish. There! There! See! See! Good dog! Now you have him! No! Off again! Well done, salmon! Now dog! Have at him!

"How immensely rapid is the motion of a frightened salmon. 'Quick as an arrow,' is hardly a figure of speech. Bravo, Jack, bravo! Do you see? he has caught the salmon firmly by the head. Good dog! Mr. Parry Evans is immediately on the spot, and takes the fish from old Jack, whom he kindly pats on the back, holds the salmon aloft for us all to see, and consigns him to the basket, which his man is guarding on the shore. See, see, again! off they go, dogs and men, and soon another salmon is captured; and there is lots of fun meanwhile, in catching the mackerel and gar-fish. How they rush about, poor things, and get dispersed in the commotion. 'Now, now, Jack, boy—not Mr. Evans' dog—you have that long-nosed gar-fish. 'No, he has wriggled off.' Well, try again. Well done, you have him this time. Take him to the basket. What! you think he will bite! Not he. There, you have let him go. 'Well, papa, he was so slippery, you know.' Never mind, there are lots more. Now, Willy, work away. There goes the dog again, helter skelter all, dogs and men, and another salmon. 'How beautiful the fish look now they are landed!' said Mr. Parry Evans. It was a very natural remark. To my eye, they looked prettier swimming in the pool, but practically, they were better for all, no doubt, in the net. Well the sport of catching the various fish in the pool—there were nine salmon, averaging about 5 lb. each—lasted about half an hour. Jack behaved admirably; it was wonderful to see his skill in the pursuit; he generally caught hold of the salmon by the head, on which he gave one strong bite, and the fish was rendered helpless almost instantaneously. Sometimes he would catch hold of the back fin. When the sport was finished we went to survey the spoils, and a nice kettle of fish there was."

We may add that the book is well illustrated with cuts and with some coloured illustrations, which are likely to take children's fancy immensely. All sorts of seaside objects are descanted on, and amusing illustrations of their habits cited; so that, fortified by the opinions of our amateur critics, we may confidently advise those with natural history tastes, and who are going to or at the seaside, to procure this volume at once.

Garden Memoranda.

GUNNERSBURY, THE SEAT OF BARON L. DE ROTHSCHILD.—I had lately the pleasure of looking over these gardens, which have long been favourably known among the gardening fraternity. Whilst there I learned that the gardener, Mr. Forsyth, was about to resign their superintendence, owing to a bodily affliction which incapacitates him for active service: Mr. Forsyth's name will not soon be forgotten in the annals of horticulture. It is not my intention to enter into a long report of all the departments, but just to give a rapid sketch of what I saw in passing through the establishment. Upon entering on the western side, opposite to the gardener's house, the first thing which attracted my attention was a Peach wall permanently covered in with glass, exceeding 400 feet in length, every tree in which, from end to end, exhibits rare health and vigour. This wall is divided into four divisions, which follow each other in producing a succession of fruit from May until the outdoor fruits are ripe. Some of the fruit at the time of my visit were from 8 to 9 oz. in weight, whilst the new wood for next season's fruiting was all that could be desired. Fronting this wall is a nice compact group of forcing-houses. Many of these are filled with miscellaneous collections of ornamental foliage plants, grown to a size suitable for the indoor decoration of the town mansion. Some fine bushy specimens of Coleus occupied two houses; these were growing in comparatively small-sized pots, considering the size of the plants, and appeared to be potted rather firmly, which may be conducive to brighter markings in the leaves. Then comes the Stephanotis-house, the inside of which is literally enrobed with its peculiar green foliage. Very nice plants of Lapageria alba in flower and L. rosea occupied either side of another house, and are travelling away quickly to the vicinity of a Plumbago, which is now in full flower. The effect produced by the trio of distinct colours was most charming. Next comes a vinery filled with young and apparently fruitful Lady Downe's Grapes, of a useful size, both in bunch and berry.

It is scarcely necessary to offer a word on the Pine growing at Gunnersbury, because Mr. Forsyth has long proved himself an adept at this kind of work. His system seems a most rational one. By giving air, sun, &c., with plenty of room, good fruit both in size and flavour are obtained, without a resort to an unnaturally high temperature, or to a close and excessively humid atmosphere, which produces size at the expense of flavour. The plants are in good health throughout. Many of them are planted out into beds prepared for them. Adjoining the above structures are the Orchid-houses, &c. Amongst a good assortment of these plants, which are all in good health, and growing in perforated Orchid pots, were some three or four very healthy specimens of Phalænopsis Schilleriana, grown on from imported pieces only. I should not forget to mention that, in another division, there is a collection of Odontoglots, which promise one day to make a mark in this establishment. In an Azalea-house adjoining, the plants in which were setting their flower buds, I noticed a nice specimen of the lovely old Cereus, a night-flowering plant, which deserves especial encouragement at this time, when rooms are so numerously decorated with living plants in pots for evening parties. In a range of pits were some fine Pines. Some of the plants of Charlotte Rothschild—a deservedly popular variety here—are making a show of fruits equal to 6 lb. in weight. We next entered a fine span-roofed vinery. The varieties planted consisted mainly of Black Hamburghs and Muscats, and the canes bore a very even crop, and quite heavy enough; the Vines are very healthy and vigorous.

In the beautiful pleasure-grounds the chief characteristics to be noted are the many fine Cedars, which are generally of such an age as to afford examples of rare grandeur. I cannot in these short notes enter into the arrangements of the flower-beds. I may say, *en passant*, however, that pink colours are used in preference to the more showy scarlet tints. In an Orange-house attached to the mansion was a specimen of Lilium auratum, having a fasciated spike, and which bore 100 blooms. The front of the mansion here overlooks a scene of beauty, suggesting calm and repose as the eye glances over the whole. Every inch of grass is kept constantly watered with the hose. The lawn is consequently, amidst all the surrounding drought, the "greenest of the green." Amidst a variety of plants turned out here and there to give effect, we pass to the flower garden proper, where the principal combinations of bedding plants are massed. The best beds are round in form and planted in plain rows, at angles, each one having a basket-like handle across, to which Roses are trained. Beds of foliage plants are met with in every appropriate corner or nook—the variegated Abutilon, Coleuses, Melianthus major (the Honey flower), Cannas, Castor-oil plants (verily the Latin name of Ricinus is preferable to the vernacular one in this case!), Agaves, &c., from amongst which in some beds fine heads in bloom of Lilium auratum are seen. Perhaps there is no more appropriate place for this grand flower than is here given, where, toned down with well selected foliage, it exhibits its markings and its size with more than usual effect. About the grounds, amongst a variety of fine Conifers, many Araucarias are to be met with—fine large plants, which unfortunately have lost their lower limbs through late severe winters. Trained to wires loosely fastened up to these branches are Jackman's Clematises, which are brought out with excellent effect. I must not omit to mention the fact that a fine Chamærops humilis, the so-called Dwarf Palm of Southern Europe, has now stood out here with slight protection for three or four winters.

The few notes jotted down as I went round the grounds with Mr. Forsyth's able foreman are necessarily meagre. I hope I have said enough, however, to show how well Mr. Forsyth closes a long and successful career of activity. By the time these notes appear his successor will doubtless have been named. All who know Mr. Forsyth I am sure will join me in wishing him God-speed at the close of his gardening career. *Opus.*

Obituary.

DIED at the Villa Lammermoor, Geneva, the property of Sir R. Peel, Bart., on the 9th inst., MR. JOHN A. WATSON, well-known as a gardener in England, and as a frequent contributor to the *Gardeners' Chronicle*. He was a native of Old Meldrum, in Aberdeenshire, and has left a wife and family, as well as a widowed mother, to lament his sudden death, whilst in the prime of life, and after an illness of only four days.

Miscellaneous.

TREE FERNS.—It is singular that no mention of the beautiful arborescent Ferns is to be found in the classic authors of antiquity; while reference is made to Bamboos, to the Banyan, or Indian Fig tree, and to Palms. The first mention of arborescent Ferns is by Oviedo, a Spanish writer, in 1535, in describing the vegetation of Hayti. "Among Ferns," says this traveller, "there are some which I class with trees, because they are as thick and high as Pine trees. They mostly grow among the mountains, and where there is much water." Between the tropics, on the declivities of the Cordilleras, the true region of arborescent Ferns lies between about 3200 and 5350 feet above the level of the sea. They seldom descend lower toward the plains than 1280 feet. The mean temperature of this region is between 64° and 70° Fahr.—*American Entomologist and Botanist.*

SUBTERRANEAN PODS OF ARACHIS.—Of the genus Arachis I have the A. hypogea, Linn., which is cultivated here on a small scale for its seeds, which are eaten raw or roasted, or for the oil, which is used for burning. In order to observe whether this plant might not produce aërial as well as subterranean pods, I last year sowed some seeds of it, as well as of the Voandzeia subterranea, imported here from the African coast, which is cultivated in some fazendas by the negroes for the seeds, which are eaten boiled; and I contrived to prevent the ovaries of both from penetrating into the ground, either by the interposition of a resisting body (a dry leaf or a slip of wood), or by raising the branch of A. hypogea (when the flower was not produced too low down) so that the ovary could no longer reach the ground. Under these circumstances, in the A. hypogea the stipes proceeding from the torus, at the end of which the ovary is formed, lengthened out even to 3 or 4 inches; but the ovary never enlarged, and remained in the same state till the plant perished; and this I observed in many ovaries of many individuals. On this occasion I made the following observations on the flower of this plant. The calyx-lobes are membranous, their base is produced into a filiform somewhat fleshy tube, the alary and carinal petals (wings and keel) are membranous and appear articulate on the calyx, at least they readily separate without laceration; but the vexillum, which is somewhat fleshy, especially at the base, is intimately consolidated at the base with the base of the staminal tube, and both are continuous with the calycinal tube—a circumstance which induces me to believe that the filiform part of the base of the calyx does not consist of that alone, but also of the consolidated bases of the vexillum and of the staminal tube. The Voandzeia subterranea, whose slender and somewhat compressed stems spread along the ground, and even penetrate under the surface when the soil is sufficiently soft and porous, produces on the surface of the soil its small pale yellow and slightly greenish flowers, the peduncle drying up immediately if the ovary cannot penetrate the ground; and thus I can affirm that neither the one nor the other of these Leguminosæ produces aërial pods. *M. Correa de Mello, in Journal of the Linnean Society.*

VIOLETS.—The little bouquets of Violets which in the spring months are generally sold by the flower-girls in the central streets of London are the produce of many acres of land in Mitcham and its neighbourhood. A short visit to Mr. Steedman's Violet farm gives an insight to its workings. There are 16 acres of land under Violet culture. The two varieties of this flower principally grown here are the Russian and the Giant. The first named is darker in colour, the latter is the most fragrant. The picking is done by boys and girls, who have a tin can suspended by a strap over the

shoulder on one side, and a bunch of short strips of bass on the other. When 25 Violets are plucked, they are tied together with a strip of bass, and placed in the can. Another "hand" is employed to pick leaves only. In about the centre of the little farm there is a shed or barn. Here the picked Violets are brought and placed in heaps, as are also the leaves; but the latter are all thrown into a water-vat and swilled, for the purpose of removing earthy rain-splashes. In the barn from 10 to 20 pair of nimble fingers are ready to make up the bouquets as soon as the flowers are supplied; this is done by tying two of the quarter hundred bunches of Violets together with two or three leaves outside them. This done, they are then packed in symmetrical rings in a small basket or skip. About 3 o'clock P.M. the work is done, and from 20 to 80 skips are put into the van for market. The quantity varies considerably, according to the weather and season. Mr. Steedman is a true philanthropist and trader, and is as well known in Covent Garden at 6 o'clock in the morning in March and the beginning of April, as Rothschild is on the Exchange at 3 o'clock in the afternoon. Many a poor flower-girl, without a penny, gets from him 50 bunches of Violets on credit, and at a price something less than half that the public pay for them retail. The girls frequently increase their profits by dividing every bunch of 50 they receive into two of 25; but this is done only very early in the year, or when the flowers are scarce. There are large Violet farms in the South of France (that of M. l'Hermine in particular), of more than 100 acres, near Nice. Last year the season there was so unfavourable that the Paris market could not be supplied from its customary source. In England, on the contrary, the weather was remarkably mild; and Violets were so abundant at Mitcham that they were forwarded by the night French mail, and sold freely in the Paris morning market. The Violets are cultivated at Mitcham in single roots, and are not allowed to run together. Nothing deteriorates these flowers more than when they become bedded together. They then grow leaves instead of blossoms. The roots require dividing every other year at least. *The Gardener.*

Engineering Difficulties.—Natural phenomena must be regarded by the engineer in the tropics. Here the boring worm will teach him salutary caution. In the East we have seen a railway train stopped on an incline by locusts. The locusts have a fancy for sitting on the rails, and when the engine-wheel touches them they are crushed, leaving the rails so oily that the engine slips. On one line, in the locust season, sand-boxes are used with the locomotive. Oysters are, however, a newly recorded enemy to the engineer. Some gourmand suggested the harbour of Tuticorin as a suitable place for oyster-beds, and the Madras Government, doubtless appreciative of the value of oysters either for eating or for pearls, turned a deaf ear to remonstrance. Time has, however, justified the remonstrants, for though the projectors have got an abundant supply of oysters, the harbour of Tuticorin is now said to be in danger of total destruction by the growth of the oyster beds, and the attention of the Government is seriously directed to cross the love of the oysters. The Madras coast is so ill-provided that harbours are more valuable than oysters, and a campaign will be directed against the latter, although the revenue authorities hanker after the taxes on the pearl fishery. *Nature.*

Glass.—In the nursery tale of "Cinderella" everything turned upon the slippers. What these were to the Prince and the fairy's favourite glass is to gardening. Horticulture walks, glides, slides along on glass shoes. The more of these and the better their quality, the greater the progress made. Cheaper, more, better glass, have each heralded in a fresh and higher epoch in gardening. The emancipation of glass from fiscal burdens by Sir Robert Peel has proved the most pregnant horticultural event of this century. It immediately brought forth the Crystal Palace. The cheapening of glass stirred the inventive genius of Paxton. And it is impossible to guage our indebtedness to that fairy palace of crystal that received and sheltered the industry and population of the world in Hyde Park—itself the noblest monument of the thinking brain and the skilful hand. It lifted horticulture out of the darkness and slow jog-trot ruts of past times, and placed it on the Express, with the engine Progress, driven by genius and enterprise, in front of it. Since then, horticulture has rested not day nor night. And, indeed, it is difficult to see how it ever can be brought to a standstill again. The line is smooth, for are not the rails made of glass, and the carriage wheels also. The gradients are more or less easy, the friction reduced to a minimum, due care has been exercised to prevent a smash; and the motive power—is it not sufficient? Its doings in the past is our best security for the future. *Anon.*

Lead Poisoning.—It is well known that workers in lead factories are apt, in the course of time, to suffer from lead poisoning; in fact, a constant series of patients proceed from the lead factories to the hospitals of London. In France, the evil effects of the mineral were usually prevented by giving the workpeople a draught containing dilute sulphuric acid, but it has now been discovered that regular potations of milk have an equally good effect. Dr. H. Schwarz, of Breslau, has discovered (re-discovered, we might more properly say) a means by which a portion of the lead forming the interior surface of the water-pipe may be converted into an insoluble sulphide, the natural consequence being that the water passing through will be as free from contamination as if glass were used. He merely passes a strong solution of the sulphide of an alkali through the pipe to be acted upon, and the process is completed. This solution, which is either a sulphide of potassium or of sodium, is used at a temperature of about 212° Fahr., and is allowed to act upon the metal for from ten to fifteen minutes. It is stated that in practice a boiling solution of caustic soda and sulphur is found to answer every purpose.—*Builder.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Few plants which are grown exclusively for the beauty of their foliage can compete with the very beautiful varieties of *Coleus*, which are now to be found in our gardens. As cool stove plants, even in midwinter, they may justly be said to belong to the hardy greenhouse in summer, and require little of either time, study, or attention to grow them perfectly. Taking the variety called Princess Royal as an example, what more charming object could we find amongst plants for decoration at Christmas? To have them in all their beauty, however, at that time, we must begin at once by giving such small plants as we may have in hand a moderate shift into a compost which is not over rich in active manure. From this time onward keep them pinched back, and well up to the glass. Give plenty of air to the structure in fine weather, but always avoid draughts, more especially when the wind is cold and cutting. Those who may not have plants of a moderate size at hand should put cuttings singly into small 60 pots at once, choosing strong robust cuttings only for that purpose. The growing point should be pinched out at the same time, which will save a week in the run of time. Give to *Egg-plants* which are actually swelling off their fruits some good wholesome manure waterings, and by frequent syringings imbue them with such a vigorous tone of health as to completely keep off red spider, which is very liable to attack them at this time when the full tax of fruit-bearing is upon them. Some *Amaryllids* will now need looking out and "bringing to the fore," as in a few weeks they will commence pushing up their flower-spikes—A. aulica especially, which is a most constant, free-blooming variety. Attention must now be given to the catalogues, which may be daily expected to arrive, respecting *Bulbs for winter and spring blooming.* Immediately on the receipt of the customary list the selection should be made, and the order given, so as to procure good bulbs, and for the purpose of potting a few for the earliest display. Of *Hyacinths* it will be found that, in a general way, single varieties are the best for display. Many old varieties from amongst the limited number that will force well, and which are marked in all catalogues, may be purchased cheap by the hundred, and should be sought for in such quantities in the three primary colours. Of *Tulips* the early Van Thol, single and double varieties, are desirable, though it is not nearly so showy as the good old Tournesol. Foreign *Crocuses* are generally short of the demand, a fact not to be wondered at when we consider what a display may be made with them for a little outlay. I should not omit to mention that the single white *Roman Hyacinths* are the earliest and best for forcing, affording, as they often do, most fragrant flowers of matchless purity of colour, when few other plants are in bloom in the dullest months before Christmas and afterwards.

FORCING HOUSES.

Push forward all necessary work in connection with *Pines*, whilst the weather is open and of moderate warmth. Those who leave matters to the latest moment, such as leaving suckers to enlarge considerably on turned-out Pines which have fruited, and have planted what suckers they have lately taken off in the old tan, will do well to get them into winter pots or pits at the earliest practicable time. It should be unnecessary for me to make the remark, but the careful practitioner will well test his heating medium, to see if it is in proper working order—bearing in mind that the least leak in a pipe at this time, even if within the tan pit, or flaw in a boiler, may become a source of much uneasiness hereafter if not attended to now that opportunity offers. Those winter fruiters which have set their blooms may now be treated to a more liberal supply of manure-water, keeping the fact well in mind that measures must be commenced in view of hardening the constitution of all established successionals preparatory to the advent of winter, with its unfelicitous attendants.

HARDY FRUIT GARDEN.

Attend well to *Strawberry plants* growing in pots for forcing purposes. The earliest batch, which are forming their crowns somewhat prominently, will require watering very frequently, as the pots will be now well filled with roots, and standing as they do, or should do, in fully exposed sunny aspects, will require much labour to keep them all right. A little soot dusted on the balls between the leaves previously to watering them will be beneficial in more ways than one, more particularly as a deterrent of worms. Keep the small secondary shoots or lateral growths well pinched back upon Vines, nailing all the stronger leading shoots to the wall, and into all vacancies they are intended to fill. Cut back now any young shoots which remain upon *Pears* to three or four leaves; these will then be better able to aid the parent tree in the formation of fruit or flower buds for the ensuing summer crop. Finish all *Strawberry beds* in course of formation. Keep the young shoots upon *Fig trees* pinched back, and moderately thin, to afford more light and air to the crop which is ripening. Remove without further delay all the old canes from *Raspberry plantations.* Encourage late varieties, such as Belle de Fontenay, to fruit well, by removing bodily all young shoots which grow beside those which are now in fruit.

HARDY FLOWER GARDEN.

Proceed with the propagation of "bedding stuff" where cuttings can be spared. Particularly see that cuttings of such *Coleus* as are to be propagated extensively are now struck quickly, and afterwards potted off singly, so as to establish them and enable them the better to stand through the winter. Of course this may not be necessary where every means are at command, but we write more particularly for those who have the misfortune to grow plants under difficulties.

KITCHEN GARDEN.

Make the main sowing of Bath Brown Cos *Lettuce* and Batavian *Endive* to stand through the winter as near the 21st of the current month as possible. Sow *Turnips* still, if necessary; they will in all probability come in well and useful. Take up all early *Potatos*, harden the tubers somewhat by exposure. The policy of allowing them to become thoroughly green is questionable, and, to say the least, not according to ordinary natural laws. Use *Tomatos* as soon as they are sufficiently ripe, and do not let any remain on the plants a moment longer, as there always remains plenty of others to ripen off, which the roots and leaves should have ample opportunity for doing. *W. E.*

ORCHARD HOUSE MANAGEMENT.

At the present time what source of pleasure is there not found within these structures? Fruits ripe and ripening, and such a variety! A great orchard in a little house. At the present time the chief labour, a very pleasant one, mainly consists in gathering and in eating the fruit. One by one they ripen unto us, and call upon us to gather them or they fall. There is no blowing of the fruit down in a half ripe state, as in the open air; they hang until they are dead ripe and delicious in flavour. As to management, we speak of *ventilation* first. Give abundance of air night and day, wherever the fruit is ripening. It would be better, indeed, if they could be exposed entirely to the open air, especially by night. It is this exposure; this cool bracing air, that deepens the colour and increases the flavour of the fruits. Shut up in a close, moist house whilst ripening, Peaches, &c., would be devoid of colour and wanting in flavour, therefore give all the air possible, and further expose the fruits individually to the full influences of the sun's rays, by pulling aside the leaves, &c., which cover the fruit. This is a matter which requires daily attention. *Watering.*—Whilst the trees, whether planted out or in pots, must in no instance suffer for want of water, an overdose just at the period of ripening, whilst it may increase the size, will deteriorate the flavour materially. Those in pots must be kept rather dry than otherwise. Maintain the *atmosphere* somewhat dry; to prevent the approach of red spider, the borders and pathways should, however, be damped frequently during the day, and those trees from which the fruit has been gathered should be thoroughly and regularly syringed to cleanse them. After the crop is gathered, the great object is the ripening of the wood and buds for next year's crop. The plants, therefore, must in no instance be neglected, as is frequently the case, but carefully attended to as to syringing, watering, and thorough exposure, &c. *B.*

TOWN GARDENING.

Continue to put in cuttings of *Pelargoniums* and other bedding plants, as directed last month. *Calceolarias* should not be put in till next month, for if put in now they will be inclined to start into flower. This has been a bad season for *grass under trees*, for want of moisture. It is in most places gone off. Now, where this is the case, the ground should be at once forked over, and after the first rain perennial Rye-grass should be sown, trodden in, and raked over, and it will soon come up and make a cheerful appearance during the autumn months. The *German Aster*, a very showy plant for window-boxes, pots, and borders, if removed now with plenty of roots, not compressed into a lump, will do well as a window plant. The dwarf varieties are particularly well adapted for the same purpose. One of the greatest enemies a town gardener has to contend against is the *earwig.* These will now be making their appearance in swarms, and if not at once trapped will do great mischief to *Dahlias* and *Chrysanthemums.* The most successful method I find, after trying many, and one always at hand, is to get a piece of paper, rubbed on one side with fat of some kind, then roll the paper with the grease inside, and place it on the plant. This will attract the insects; and the papers should be shook out, so that the pests fall into boiling water, every morning, by which means their number will soon be lessened. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, AUGUST 17, 1870.

1870. MONTH AND DAY.	At 9 A.M.						
	Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.			
August.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
11. Thurs. .	30.01	64.9	61.6	59.0	81	5.8
12. Friday .	30.05	70.8	65.7	59.7	71	5.8
13. Saturd. .	30.10	65.4	60.2	50.0	72	4.9
14. Sunday.	30.05	68.1	57.3	48.7	50	3.8
15. Monday	29.93	61.5	55.0	50.7	68	5.1
16. Tues. ..	29.97	61.9	58.2	55.6	68	4.6
17. Wednes.	29.92	61.2	58.7	54.3	70	4.7

1870. MONTH AND DAY.	TEMPERATURE OF THE AIR.					WIND.	RAIN
August.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg	Deg	Deg	Deg		Miles	
11. Thurs. .	75.0	56.1	19.3	61.1	+ 2.0	N.N.E.	320	0.00
12. Friday .	79.1	59.8	19.3	66.9	+ 4.9	N.E.	290	0.00
13. Satur. .	77.6	58.9	18.7	67.7	+ 3.8	N.E.	300	0.00
14. Sunday.	72.2	55.7	16.5	62.3	+ 0.6	N.N.E.	300	0.00
15. Monday	73.1	57.6	15.5	63.7	+ 2.2	N.N.E. N.E.	280	0.00
16. Tues. .	71.0	55.2	16.7	61.9	+ 0.6	N.E.	210	0.00
17. Wednes	71.9	53.0	18.9	60.8	+ 0.3	N.E.	145	0.00

August 11.—Cloudy throughout the day. Variable at night.
" 12.—Small amounts of cloud prevalent. A very fine day.
" 13.—Variable till night, then cloudless. Fine.
" 14.—Generally cloudy.
" 15.—Overcast till night, then cloudless.
" 16.—Cloudy till the evening, then variable.
" 17.—Variable during the day. Cloudless at night.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, AUGUST 13, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR.						FALL OF RAIN.
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.
	Deg	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	82.8	52.6	30.2	79.0	54.4	24.6	65.8	0.12
Blackheath ..	79.1	50.3	22.8	75.1	52.7	17.4	64.5	0.62
Bristol	81.8	50.0	31.8	75.5	53.0	22.5	64.7	0.17
Birmingham ..	82.6	51.0	31.6	77.8	53.8	23.0	65.6	0.12
Wolverhampton	81.9	49.6	32.3	78.3	54.1	24.2	65.5	0.05
Leicester ..	82.7	49.0	33.7	78.1	54.0	23.2	65.8	0.20
Norwich	77.5	49.2	28.3	73.2	52.7	20.5	62.9	0.00
Nottingham ..	81.7	50.6	31.1	79.2	54.6	24.6	66.2	0.13
Sheffield	82.0	49.7	32.3	76.4	52.9	23.5	64.9	0.02
Liverpool	79.3	49.0	30.3	74.3	55.7	18.6	65.3	0.00
Manchester ..	..	..	..	..	..	..	..	..
Salford	85.5	48.1	37.4	79.4	53.5	25.9	64.7	0.10
Bradford	81.3	50.3	31.0	77.2	56.0	21.4	66.6	0.01
Leeds	82.0	51.0	31.0	77.0	54.3	22.7	65.6	0.00
Hull	76.0	48.0	28.0	73.4	52.3	21.1	62.8	0.04
Newcastle ..	72.0	53.0	19.0	70.0	54.0	16.0	62.3	0.00
Edinburgh ..	78.7	50.0	28.7	..	..	..	62.2	0.00
Glasgow	79.2	50.5	28.7	..	..	..	62.6	0.00
Dundee	77.0	52.0	25.0	..	..	..	63.1	0.00
Aberdeen	72.8	48.0	24.8	..	..	..	59.1	0.02
Paisley	..	..	..	..	..	..	..	..
Greenock	71.0	51.5	17.5	..	..	..	62.7	0.00
Leith	74.0	51.5	20.5	..	..	..	60.0	0.00
Perth	81.9	50.0	34.0	..	..	..	63.8	0.00
Dublin	86.3	39.0	47.9	..	..	..	63.3	0.12

JAMES GLAISHER.

Notices to Correspondents.

CUCUMBERS DAMPING OFF: *M. F. B.* We should say owing to damp and want of vigour in the plants.

DISEASED PLUMS: *Eclon.* We would recommend you to take up the trees in autumn, and replant them in fresh soil as far as possible. The roots, it appears to us, are feeding in some ingredient in the soil which is unfavourable to them.

FRUITS FOR SCOTLAND: *Timid.* We should take the first eight, unless Plums or Cherries were exceptionally fine; in which case either might be substituted for Apricots, if the latter are not so good a sample. White and Black Grapes count as distinct, unless there a rule to the contrary – a very bad rule where it exists.

INSECTS: *F. R. S.* We know no means of preventing the attacks of the "harvest bug," except that of not frequenting the localities where it abounds. Should it have effected a lodgment in the flesh, we would recommend the surface to be slightly raised with the point of a needle, the skin to be then pressed sharply, and a drop of oil rubbed over the spot. This plan is also efficacious in cases of bee or wasp stings. *W.*—*W. H. (Bury).* The grubs which are now so seriously injuring your fields of Turnips and other roots are the caterpillars of a moth, Agrostis segetum, which, as the year 1864 have been produced during the present long dry summer in extra numbers, in consequence of the moths not having been checked in laying their eggs. We know of no better remedies than that of burying slices of vegetables as traps, and carefully examining the earth just round the crowns of the plants where the grubs secrete themselves by day. The smother fly on the Cabbages is the Aphis Brassicæ of Linnæus. Among the latter are a number of green footless grubs, which should be protected, as they feed on the aphides. They are the larvæ of a species of two-winged fly of the genus Syrphus. *J. O. W.*

MILDEWED VINES: *M. F. B.* Flowers of sulphur properly applied will arrest mildew and destroy it. If, however, it has become deeply seated on your Grapes, the injury effected cannot be effaced or cured. We suspect this to be the case with yours; the skin of the berries is injured, and now, although the mildew is killed, your berries crack and burst as you describe.

NAMES OF PLANTS: *Bromus.* It is B. secalinus.—*G. M.* Your plant is neither a moss nor a grass, but one of the Pearl-worts, Sagina procumbens, a very common weed on footpaths, walls, &c.—*W. A.* Echeveria gibbiflora of D.C., Mexico. The E. metallica, now so much grown, is but a variety of this plant, and is strictly E. gibbiflora, var. metallica; see Saunders' "Refugium Botanicum."—*C. F.* Lonicera Caprifolium, Solanum Dulcamara, Acer colchicum, Quercus nigra.—*T. M.* Some Umbelliferous plant—it is impossible to say what from your specimen.

COMMUNICATIONS RECEIVED:—J. T. M.—J. Scott.—C. W (your Orchid has not yet arrived).—W. A.—J. E. R.—J. J.—H. B.—E. E.—E. G.—T. M.—J. L.—A Constant Subscriber (next week).—Dipla.—W. S.—R. S.—W. M.—J. A.—R. W. G.

Markets.

COVENT GARDEN.—Aug. 20.

We have not so good a demand here, and prices have much fluctuated; the provincial markets being locally supplied tends to a greater quietness. Foreign and Channel Island imports very heavy. Amongst flowers we have Balsams, Pelargoniums single and double, Gladioli, Heaths, Coleus, Hydrangeas, Fuchsias, Crassulas, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apricots, per doz.	2 0	4 0	Oranges, per 100	8 0	10 0
Cherries, per doz. lb.	3 0	6 0	Peaches, per doz.	6 0	12 0
Grapes, per lb.	2 0	5 0	Pears, per doz.	1 6	3 0
Lemons, per 100	12 0	16 0	Pine-apples, per lb.	3 0	6 0
Melons, each	1 0	4 0	Strawberries, p. lb.	..	..
Nectarines, per doz.	4 0	8 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, p. doz.	2 0	4 0	Leeks, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 6	3 0
Cabbages, p. doz.	1 0	1 6	Mint, per bunch	0 3	0 6
Carrots, p. bunch	3 0	4 0	Mushrooms, p. pott.	1 0	1 6
Cauliflowers, p. doz.	1 6	3 0	Onions, per bunch	0 4	0 9
Celery, p. bund.	1 0	1 6	Parsley, per bunch	0 2	0 4
Cucumbers, each	1 0	1 6	Peas (shelled), p. pint	0 4	0 6
Endive, per doz.	1 6	2 0	Potatos, new, p. lb.	0 1½	0 2
French Beans, per sieve	2 0	3 0	Shallots, per lb.	0 8	..
Do., retail, p. lb.	0 4	0 6	Spinach, p. bushel	2 0	..
Garlic, per lb.	0 8	..	Radishes, per doz.	1 0	1 6
Herbs, per bunch	0 2	0 4	Turnips, yng., p. bun.	0 9	1 0
Horse Radish, p. bun.	3 0	5 0			

Potatos, York Regents, per ton, 120s. to 140s.; Flukes, do., 140s. to 160s.; new round, 5s. 0 7s. per cwt; new kidney, 7s. to 10s. do.

WANTED, an active GARDENER, to purchase HALF SHARE in a Small NURSERY, FLORIST, and JOBBING BUSINESS in Islington Long Lease £50 cash – C. R., 21, Aberfeldy Street, Poplar, N.

WANTED, in a Country Nursery, a MAN who thoroughly understands Growing Bedding and Basket Stuff and Greenhouse Plants, &c. Also one who can Grow in a first-rate style Cucumbers, Melons, Mushrooms, Tomatos, &c., and is a useful general Hand. Testimonials as to character and sobriety necessary, but none need apply whose characters is doubtful, or steady, and active, as will not object to fill inveigard on – Address, with full particulars to, stating wages without extra wages required, to H. M., *Gardeners' Chronicle* Office, W.C.

Nursery Trade.

WANTED, a thoroughly experienced and efficient MAN, for the Glass Department of a large Nursery. None who cannot produce the highest testimonials as to ability and sobriety need apply.—Address, stating age, experience, salary, and particulars, T. W., Messrs. Fraser, Good & Co., 82, Bishopsgate Street Within, London, E.C.

WANTED, a WORKING GARDENER, to go Abroad. £20 wages All expenses paid.—A. B., Hiscoke & Son's Library, Richmond, Surrey.

Seed Trade.

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GARDENER.—B. S. WILLIAMS will be glad to recommend a Lady or Gentleman requiring a first-class Gardener a Man whom he has known for several years, and can testify as to his abilities; he held the position of Bailiff and Gardener in last situation, and can produce unexceptionable testimonials.—Victoria and Paradise Nurseries, Upper Holloway, London.

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FOREMAN.—JAMES SHRIVES begs to offer his services to any Nobleman or Gentleman requiring a practical Foreman. Eleven years' experience, chiefly in Noblemen's Gardens. First-class references from all previous situations.—JAMES SHRIVES, Grotto Terrace, Brisham, Devon.

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NURSERY and SEED TRADE.—The Advertiser seeks a situation of trust and respectability, where energy and ability would be appreciated, being thoroughly and practically acquainted with every branch of the Trade.—B. S., 25, Kinglake Street, Liverpool.

TO FLORISTS, &c.—Wanted, by a young Man, a situation in a Florist's and Nurseryman's Establishment. Has had practical experience, and has a good theoretical knowledge of the business. Can give the most respectable references.—A. B., Messrs. Cummins Wilson, Chemists, Bath.

To the London Seed Trade.

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(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for spring 1871,
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATES of LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c. E. PURSER, Secretary.
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REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything to my commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the same proportion of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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A DESIRABLE HOUSE, containing 11 Good Rooms, Coach House, and Stable, nearly an acre of Walled-in Garden, stocked with Fruit Trees and Vegetables; Two Large Early Forcing Houses, each 60 feet by 12; Pits, Sheds, Bowls and Fowl Houses, &c. Lease 12 years. Close to Bus and Railway. Apply to present occupier, A. B., 5, Exeter Place, Walham Green, S.W.

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To Seed Growers, Market Gardeners and Others.
TO BE LET, by Tender, 63 ACRES (more or less) of very first-rate ARABLE LAND, with Cottages, Bailiff's Residence, and capital Buildings, known as Love Street, close to Herne Bay Town and Railway Station. This Farm is at present occupied by Mr. James Amos, whose Lease expires Old Michaelmas next.
Address the owner, Mr. GEORGE POWELL, Llangattock Place, Crickhowell, South Wales, who does not bind himself to accept the highest or any Tender.

SALES BY AUCTION.

Imported and Established Orchids.
MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, August 23, at half-past 12 o'Clock precisely, several Importations of CHOICE ORCHIDS from New Granada, Bahia, Rio Janeiro, and India, many of them in good plants, and in fine growth; also a SMALL COLLECTION of ESTABLISHED ORCHIDS.
On view the morning of Sale, and Catalogues had.

Palms, Tree Ferns, Conifers, &c.
IMPORTANT PUBLIC SALE of PLANTS, at Ghent, on SEPTEMBER 8 and 9, at half-past 2 o'Clock, P.M., on the Premises of Mr. Alfred Serdobbel, Nurseryman, Faubourg d'Anvers, under the direction of Messrs. F. VERHULST and JEAN VERSCHAFFELT, Nurserymen.—PALMS, large and middling sizes, and also of rare species; TREE FERNS and others, about 1800 PALM SEEDS, in various fine varieties; CONIFERS, AMARYLLIS DENDROBIUMS, and other PLANTS in bud, &c.

To Horticultural Societies, Archery, Croquet, and CRICKET CLUBS, and the PUBLIC GENERALLY.
MR. O. SHELLARD is instructed to SELL by PUBLIC AUCTION, on the Castle Green, in the city of Hereford, at the close of the Horticultural Society's Show on THURSDAY, August 25, Two Large EXHIBITION TENTS (100 feet by 30 feet, and 60 feet by 30 feet respectively), 12 CIRCULAR TABLES, of 12 feet each, on Trestles; a large quantity of GREEN BAIZE TABLE COVERING; 8 dozen zinc SHOW STANDS (painted green), of various sizes and other effects.
Sale at half-past Six o'Clock, P.M., punctually.

Sale of Messrs. Mitchell's Shorthorn Herd and Flock of BORDER LEICESTERS, at ALLOA.
MR. JOHN THORNTON will SELL by UNRESERVED AUCTION, on THURSDAY, August 25, at Alloa, Stirling, N.B., the entire HERD of first-class SHORTHORNS belonging to Messrs. Mitchell. It has been bred for many years from some of the best sources; several first-class Bulls having been hired from Warlaby, so that many of the animals have upwards of four crosses of pure Booth blood on females that trace back to the days of the Brothers Colling. The Cattle are of large size, very symmetrical, with great substance, and of fine quality. In the Showyard there have been most successful exhibited; Bates's red Duke Bell are well known Prize Cows, the latter won Premiums at the last Birmingham and Smithfield Club Shows, and this year gained the 1st prize at the Stirling Show, and challenge cup for the best cow or heifer in milk.
There first class yearling Bulls will be Sold, the property of the Earl of Dunmore. Also will be offered the entire FLOCK of pure BORDER LEICESTER SHEEP, bred for many years on both sides from the Polwarth blood.
Catalogues with pedigrees may be had of Messrs. Mitchell, Alloa, N.B.; or of JOHN THORNTON, 15, Langham Place, London

Caistor, Lincolnshire.
IMPORTANT SALE of SHORTHORN CATTLE.
MR. JOHN THORNTON will SELL by AUCTION, without reserve, on FRIDAY, September 2, at Caistor, Lincolnshire, the very superior HERD of pure bred SHORTHORNS, belonging to James Green Dixon, Esq., which has been in his possession upwards of 50 years. Many of the animals are in direct descent from the cow "Strawberry," which he bought at Rose's sale at Aldbrough, in 1820, and Bates are bred from Charles Colling's "Cathalene," and Mr. W. Hutton's and Mr. Watson's stocks. Bulls full of the best Bates blood have of late years been used, adding fashion to sound and superior form.
Catalogues with Pedigrees may be had of Mr. DIXON, at Caistor, or of JOHN THORNTON, 15, Langham Place, London, W

Southdown Sheep and Norfolk Polled Cattle.
ELMHAM HALL, THETFORD, NORFOLK.
MR. EDMUND BECK is honoured with instructions from the Right Hon. Lord Sondes, to announce that his ANNUAL SALE and LETTING of the above STOCK will take place on MONDAY, September 26, at 3 o'Clock precisely (Luncheon will be served at 2), and comprises 110 SHEARLING EWES, 60 DRAFT EWES, 90 EWE LAMBS, and 110 WETHER LAMBS, 25 SOUTHDOWN RAMS for Letting, 17 Blood Red Polled in-Calf HEIFERS, and THREE BULLS.
All Trains stop at the Elmham Station on the Great Eastern Railway, where conveyances will be waiting; and the 8 A.M. train ex Shoreditch arrives at 9.27 A.M.
Full particulars and Catalogues can be obtained of Mr. FULCHER, Elham Park, and of the Auctioneer, Oswick, Fakenham.

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The Agricultural Gazette.
SATURDAY, AUGUST 20, 1870.

MEETINGS FOR THE ENSUING WEEK.

Aug. 23 to Aug. 26 — Royal Dublin Society (National Horse and Sheep Show), in Dublin.
Aug. 24 to Aug. 26 — Wirral Agricultural Society, at Birkenhead.
Aug. 26—Badminton Farmers' Club.

A FEW remarks on the WHEAT FLIES, which were lately made in these columns, and especially on a Wheat grub which had been observed by a correspondent of the *Farmer* have led to our being favoured with various communications on the subject, which suggest the following remarks.

In the first place, the Editor of the *Farmer* has drawn our attention to a second communication (which had escaped our notice) in his paper of July 6, in which the author details the continuation of his observations on the grub referred to, which he succeeded in rearing, and gives a description of the perfect insect. As anticipated, it proves to be a fly, no doubt an Anthomyia, although the description scarcely enables us to identify the species—specimens of this we still desiderate. The Editor of the *Farmer*, with great kindness, has also endeavoured to supply them, and with that view has sent some cocoons, which he understood to belong to the insect in question. These he cannot have received from his correspondent, who is obviously too keen an observer and too much of an entomologist (although he rather disclaims the title) to have taken them to belong to the insect he describes. They are Lepidopterous cocoons, belonging to the small moth "Hyponomenta padella," the insect whose grub covers our Thorn hedges with webs in early summer, sometimes quite disfiguring and defoliating them.

From another correspondent, "P.," we have received some minute grubs, which prove to be only the common wireworm in a very young state.

From the Rev. J. C. CLUTTERBUCK, of Long Wittenham, Abingdon, we have received a supply of chrysalids of a fly, the grub of which had been feeding, in common with the wireworm and larger grub, on the Swede Turnip, to its destruction. He thinks that the chrysalis appears to correspond with that spoken of as injuring the Wheat plant. But the chrysalids of a multitude of different flies are undistinguishable from each other, and the presumption is against its feeding both on the Turnip and in a definite fashion on the Wheat. There are plenty of insects with a wide range of appetite, but when one attacks a plant, as the Wheat grub has been described as doing, always at one place and in one way, the chances are that its mission is confined to that one plant and its allies; we must also discriminate between insects which attack a plant in a healthy condition, and those which only appear as scavengers to clear away decaying vegetable matter in plants that are already diseased.

The eminent naturalist and explorer, Dr. SPRUCE, has also been kind enough to send from Yorkshire, where he is now located, some heads of Wheat which are suffering from the attacks of the grubs of one of the Wheat flies, properly so called—Cecidomyia, or one of its allies. He mentions that the Wheat fields throughout North-East Yorkshire are more or less infected, and that around Malton the plague is said to be serious, although he does not suppose that, on the whole, it will cause any marked deficiency in the yield.

These may either be grubs of one of the true Cecidomyias, as C. Tritici, described long ago by KIRBY and CURTIS; or it may be that it belongs either to the allied genus Lasiopteryx or Diormyza. The grubs of all three are undistinguishable—or nearly so—minute semi-transparent, varying in colour from pale yellow, citron, or orange, to red, about the twelfth of an inch in length—and the pupæ are like motionless grubs. So far as regards the known Wheat flies of this country, it is therefore impossible to say, from the grubs or pupæ alone, what is the insect that is doing the mischief. This can only be ascertained by discovering the parent. It is different with the Hessian fly. It has peculiarities both in its habits and development which enable it to be recognised, but we do not believe that it has ever been found in England. It is not without interest, however, to discover which species we have to deal with. It may seem, and no doubt is, a matter of very little moment to the farmer whose crops are being destroyed, whether they are destroyed by the grubs of a little yellow midge or a little black midge, which have nearly, if not quite, the same habits and the same appearance. But even for him the first step is to acquire a thorough knowledge of his enemies in every stage of their existence; and for the scientific man, whose researches take wider scope, there are many points of interest involved, even in the determination of this question.

When KIRBY, CURTIS, and HENSLOW studied Cecidomyia Tritici, it was, or was supposed to be, the chief scourge of the Wheat crop. From a somewhat limited personal knowledge, we would say that it has now given place to a species of Lasiopteryx. There are plenty of instances on record of one species being excessively injurious for a certain time, and then disappearing, or by-and-by giving place to some other scourge, which takes its place; and we are wholly in the dark as to how this change is brought about. We cannot *say* that this has taken place with the Cecidomyias, but the observations we are about to mention seem to point so far in that direction as to make it worth the while of other observers to repeat our experiments in other parts of the country, and to make known their results.

We have called them our experiments, but that is only a figure of speech. They are truly the experiments of our valued correspondent, Miss ELEANOR ORMEROD, Sedbury Park, Chepstow, who made them at our request; and our connection with them is confined to knowledge of their progress, and profit by their results. We wished illustrative specimens of injury done by the Wheat-fly for the collection of economic entomology at South Kensington; and as accuracy is of the first importance in a collection meant for public instruction, we endeavoured, as much as possible, to make the illustrations from specimens for which we were able to vouch.

To obtain these the attempts previously made by HENSLOW and others to rear Cecidomyia Tritici were repeated. It was a little after this time last year that they were commenced. Specimens of wheat-straw, of heads of Wheat, of roots of Wheat, of *débris* from the barn and threshing floor, and of young Wheat, were taken at intervals in autumn, in winter, in spring, and in the present summer. They were brought into the house, and each separately by itself carefully rubbed by hand over a white handkerchief or sheet of paper. The grubs were thus detached from the walls of the straw or ears to which they adhered, and were easily detected on the white surface. The same was done with Barley, and the result was that the grubs were found as plentifully on the one as on the other. It was also found that they were not restricted to any one part of the plant. At first, in autumn, they were found chiefly on the stalk, scarcely at all on the ear; but next, in summer, what was doubtless the new hatching was chiefly on the ear, although also on the stalk; in winter they were taken from the roots in the open stubble field, and from both

ear and stalk and *débris* from the stack. The grubs of C. Tritici have only been recorded as inhabiting the ears; but as HENSLOW found them plentifully, as we did, in the dust from the threshing floor, it is very possible that if sought for at the different periods of the year they would be found, at one time or other, on every part of the plant as we have found the Lasiopteryx.

The insect is not easily bred. Its first describer, Mr. MARKWICK, is said to have bred it, although his description of the insect scarcely corresponds with any of the known species of Cecidomyia. Mr. KIRBY bred only one, which seems to have come out at an exceptional time, viz., in September; but he did not succeed in breeding them at their proper period, and subsequently neither Mr. CURTIS nor Mr. HENSLOW, who both tried it, succeeded in breeding it at all. Miss ELEANOR ORMEROD also tried to rear it, her success was only partial. She succeeded in rearing it in wholesale but not in retail. She placed on earth in different flower-pots, grubs and pupæ, with the ears and stalks to which they respectively adhered, as well from Wheat as Barley, protecting each with a covering of gauze or muslin. These were kept in the most natural conditions, and carefully watched and tended all through the winter and spring, without producing anything; but a small heap of Wheat rubbish, which had been ascertained to be well supplied with grubs and pupæ, was left in an out-of-the-way corner by itself, and early in June was found to be swarming with a cloud of our small Cecidomyia-looking midges, viz., Lasiopteryx. Numbers of these were also obtained, and sent from the Wheat fields at different dates, but not a single specimen of the Cecidomyia Tritici reached us. Now, is this abundance of Lasiopteryx and scarcity of Cecidomyia confined to the neighbourhood of Chepstow, or is it general over the whole country? If so, another question, which, however, we can scarcely hope to fathom, is—when Cecidomyia ceased to be prevalent, and Lasiopteryx took its place. It may even be a question whether Cecidomyia ever was generally prevalent—it may have been so only in KIRBY's time and the London district.

It is noted by CURTIS, that Professor HENSLOW was inclined to think, from differences in the larvæ he had examined from various localities, that there was more than one species of Wheat midge. We have shown that this is the case, but we are not sure that Professor HENSLOW'S premises warranted the conclusion; for the larvæ which we have examined from Chepstow, and which there seems no reason to doubt all belonged to the one species, Lasiopteryx, which was the only Wheat midge obtained from there, were sufficiently various in appearance to have led to such a conclusion as HENSLOW'S.

Perhaps some of the readers of this Journal may be willing to help to clear up at least the former of the above questions, by looking for Wheat midges in their fields and stacks, and, if they have any doubt about them, by sending them to us* or some other entomologist. They can easily be sent in a quill. Our observations show that it lives through the winter in the grub or pupa state, and comes out in mass in the beginning of the following June. How long the perfect insect lives, and whether there are more broods than one in a year, we do not yet know, they are generally understood to be very shortlived. *M.*

—— On Monday prices receded 3*s.* or 4*s.* per qr. at Mark Lane, under anticipations of a speedy termination to the war. At the Metropolitan Cattle Market the best qualities of beef and mutton commanded the full prices of the previous week; but there were large supplies of half-fed animals, for which a reduction in price had to be submitted to.

—— The additional returns to our harvest inquiry, given in another page, are very much of the kind of those published last week. Wheat, on good Wheat soils, appears to be a full average; on poor, *i. e.*, ill-managed clays, and on all light and gravelly soils, it is decidedly below an average: and on the whole it will probably turn out barely an average crop. Barley. Oats, and Beans are decidedly under average all over England. Hay is a failure, and the promise of cattle food generally is very scanty.

—— The fifth annual meeting of the Birmingham Horse Show has been held during the past week, and has been one of the most successful of the series. A new rule, prohibiting the exhibition of a horse in more than one class, except as one of a pair, or in tandem, has occasioned a diminution in the number of entries, which are this year only 270, as against 309 in 1869, but the falling off is more apparent than real, seeing that the number of horses exhibited is substantially the same. These entries are distributed as follows:—Hunters and entire horses, 101; hacks and riding horses, 63; harness horses, 32; ponies, 62; dray and agricultural horses, 12; total 270: and among the exhibitors are represented some of the most celebrated breeding establishments of the country, including those of Her Majesty, the Boythorpe and Rawcliffe Stud Companies, and Mr. Blenkiron. The good effect of the alteration made last year in the time for holding the show, which was originally in June, has been shown by the marked increase in the number of stallions. Two years ago the entries of entire horses were only four; this year they are 17. There is also a very large entry in several of the hunter classes. Among the winners in the classes for hunters, were Messrs. Casson and James Moffat, of Carlisle; W. Robinson, of Tamworth; Thomas Percival, of Wansford; Westley Richards, of Oakham; Huxham Watson, of Totnes; George Holmes, of Beverley; H. S. Lucy, Charlecote Park, Warwick; Quentin, of Cheltenham; Blakmay, of Stowbridge; Alfred Newman, of Winchcombe; Hoey, of Leamington; C. Millward, of Moseley; Thomas Argyle, of Tamworth; John Mordaunt, of Warwick, and others. On the second day of the show prizes were awarded to Messrs. Holmes of Beverley, Haines of Ealing, Ballard of Cowbridge, Wilkes of Birmingham, Milward of Southwell, and others. The 1st prize for ladies' hunters went to Mr. Percival of Wansford, for the "Squire;" a decision which caused a good deal of dissatisfaction; and Mr. Jones, of Cheltenham, who was competing for it, refused the 2d prize, which was awarded him. The The prizes for agricultural horses went to Mr. Brierly, of Manchester; the Midland Railway Company, Messrs. Thursby, of Lavington; Bullivant, of Shirley; Wynn, of Redditch, and Lord Beauchamp.

—— The scarcity of hay, and the large demand for it on the Continent at the present time, gives importance to the news that there exists a considerable stock of last year's crop in the country around Christiania in Norway. It is added that recent falls of rain have dispelled the fears entertained respecting this year's crop also, so that there seems a fair prospect of Norway being able to export both old and new hay. A fortnight since Norwegian hay was quoted, at Havre, at about 16*s.* the 350 lb. The French army is said to have got its supplies of forage principally from abroad, so that the hay markets of Paris have been little affected by the war and the movement of troops, and no sensible rise has taken place in prices, to the surprise of most people. Hay is selling at £9 4*s.* to £9 12*s.* per ton, and wheat-straw at £2 to £2 2*s.* 6*d.*, first qualities; inferior qualities 10 and 20 per cent. lower.

—— The foot-and-mouth disease has broken out with virulence in the North and East Ridings of Yorkshire, spreading into the Ryedale, Pickering, and Malton divisions. Buckton, which the week before last reported six cases, has last week had 76 attacks to report. This epizootic is interfering with the success of the local agricultural shows whose meetings are now being held.

—— Several cases of sunstroke are reported from Yorkshire, one of which has proved fatal. JAMES LEADBY, of Sherburn, near Scarborough, was struck down in the harvest field a few days ago, and is since dead; others are mentioned as of doubtful recovery.

OUR LIVE STOCK.

CATTLE.

LAST week we noticed Mr. Thornton's catalogue of the late Cochrane exportations. Besides the animals recently sent across the Atlantic, this publication refreshes the memory by bringing once more before us several minor, but yet more important cargoes of stock which since 1867 have left our shores for Canada. The first experiment consisted in purchasing *Rosedale*, a daughter of Mr. Storer's *Rosy* and BELLEVILLE (11,708), from Lady Pigot, and BARON BOOTH OF LANCASTER, from Mr. Barclay, of Keavil. This was followed in 1868 by the shipment on board the "Germany" of *Duchess* 97, the 1st 1000 gs. heifer, and various Shorthorns, mostly of Booth origin, together with two Alderneys, about 50 Cotswold sheep, and three horses. In June, 1869, four Booth Shorthorns from the herds of Mr. Chaloner, of King's Fort, and Mr. Pawlett, of Beeston, were sent from Glasgow in the "Glenieffer;" and, lastly, we have the large consignment referred to last week.

SHEEP.

NOTWITHSTANDING the extreme drought in the midland counties, which during the last three months has scarcely been relieved by a passing shower, a respectable company assembled at Holly Bank to participate in the sale of rams. The excellence of the Holly Bank Shropshire is well known; and it is sufficient to say that, even in the present untoward season, the show of rams was considered fully equal to anything which had been witnessed during the present summer. The highest price, viz., 24 gs., was given for a beautiful sheep by the Nugget, which goes to Mr. Sale, near Leicester. Mr. North gave 15 gs. for another son of the Nugget, of great length and well woolled. One which was regarded with much favour was No. 3, similarly bred, bought by Mr. Bakewell for 10 gs. Another of our favourites was purchased for 12 gs. Although, owing to the untoward season, the average was only some £9, the sale presented the satisfactory feature that every sheep was disposed of. We understand that Ireland is the destination of several of them, and one—Stockly, a 2-shear commended at Derby—was purchased for South America, for the sum of 14 gs. The highest price among the ewes was 55*s.*, for a pen, worth at least that price to the butcher. A beautiful pen of shearlings went to Mr. Hardy, M.P., for 56*s.* per head.

—— We are favoured by Mr. Villar, of Cheltenham, with the following particulars regarding the late Cotswold ram sales. At Mr. Handy's sale, Sierford, on the 5th inst., Mr. Wm. Lane, of Broadfield, gave £43 1*s.* for a very excellent sheep; Mr. Fletcher, of Shipton, purchased lot 25 for £23 2*s.*, and Mr. Pope, of Coombend, gave 21 gs. for a very nice sheep. Other good prices were given, the lowest being £5 15*s.* 6*d.*, and the average £10 8*s.* 8*d.* At Andoversford, on the 9th inst., at Mr. T. Beale Browne's sale, Salperton Park, an average of £8 13*s.* was obtained. At Mr. G. Fletcher's sale, 50 rams were disposed of, the highest price, £37 16*s.*, being given by Mr. Barton, Cole St. Denis. Mr. Lane, of Broadfield, gave £32 11*s.* for lot 3, and £26 5*s.* for lot 2. Mr. G. Hewer, Leygrove, gave £33 12*s.* for lot 11, and Mr. Smith, of Sherborne, purchased lot 16 for £26 5*s.* Many other sheep were sold at from £23 to £20, and an average of £12 14 was obtained. We must refer our readers to last week's number for the averages of the principal Cotswold sales. Mr. Charles Hobbs, of Maisey Hampton, disposed of 22 Oxfordshire rams at the Cirencester Great Market, through Mr. Villar, and these realised an average of £9 1*s.* 4*d.* The highest price was £13 13*s.*, and the lowest £7 7*s.*

—— At Mr. Treadwell's (Upper Winchendon) sale, in the estimation of one who ought to know, some of the best sheep made the least money. There was a large local company, but few buyers from a distance, hence the want of competition for the best sheep. Fifty-nine rams were sold and one was let, and as this was the entire number offered, the result could not be considered unsatisfactory. The highest price given was £13, which contrasts unfavourably with £27 given last year, as does also the average of the present year, £8 8*s.*, with that of £12 18*s.* obtained in 1869.

—— We were glad to notice the increase in entries of Cotswold sheep at the recent meeting of the Gloucestershire Agricultural Society at Stroud. Last year but one pen of theaves was exhibited, and the prize for shearling rams was withheld. This season there was a good class of theaves, an imposing array of rams, and a very creditable show of lambs.

—— We are guilty of an oversight in not having sooner noticed the Bulbridge sale, which took place on Wednesday, the 3d inst. Through the courtesy of Messrs. Ewer & Winstanley, the auctioneers, we are able to state that the sale was well attended by about 300 of the leading agriculturists of the neighbourhood and more distant parts of the country. It is well known that Mr. Rawlence's Hampshire sheep rank among the finest in the kingdom, and in spite of the low range of prices this season some brisk bidding was witnessed. Mr. A. Morrison, of Fonthill, hired a very fine ram lamb for 60 gs., and a second for 40 gs. Mr. Dibden secured another for 31 gs., and Mr. Walter took one into Notts, at 21 gs. The remaining lambs were let at from 8 to 12 gs. each. The lambs which were sold commanded prices ranging from 36 to 9 gs. The top price was given by Mr. Dibden. Mr. R. K. Melsome bought lot 33 at 23 gs., and Mr. Rose bought a good lamb at 21 gs. The remaining lambs for sale made from 13 to 7 gs. Two-teeth rams let at from 10 to 6 gs., and sales were effected at from 8 to 11 gs. Ram lambs, both sold and let, averaged £11 3*s.* 6*d.* each, and the average over the 120 lots disposed of was £10 12*s.*

—— The following are notes of other ram sales:—

COTSWOLDS.

Mr. R. Garne's, Aldsworth: Messrs. Lyne & Acock sold 47, drafted from this well-known flock. Nos. 7 and 9 were knocked down at 50 gs. each. The 51 sheep averaged the handsome sum of £16 4*s.*

Mr. Walker's, of Northleach: 38 Cotswold rams were sold. Mr. Barton, of Cole St. Denis, purchased the highest-priced animal for 36 gs. The average was good, being £12 8*s.*

Mr. Hugh Aylmer's, West Dereham Abbey: The following is the result of the sale:—The animals brought to the hammer consisted of 100 ram lambs, 80 shearlings, and 10 2-shear rams. The ram lambs ranged from £4 5*s.* to £8 15*s.*, the average being £5 4*s.* 4*d.*; the shearlings from £6 5*s.* to £17 10*s.*, the average £8 5*s.* 9*d.*; the 2-shears from £6 5*s.* to £11, the average £7 10*s.* The gross receipts were £1360.

Mr. Cother's, Middle Aston: There were 46 lots sold, and the highest price realised was 15 gs.; the average was £7 12*s.* 3*d.*

* At the South Kensington Museum.

Mr. T. Allen, Markshall: 21 ram lambs averaged £3 16*s.*, and 34 shearling rams, £6 17*s.* 6*d.*

Mr. T. Brown's, Marham Hall, took place on Thursday. The animals submitted to competition comprised 80 ram lambs, 80 shearling, and 10 2-shear Cotswold rams. The 80 ram lambs averaged £6 0*s.* 10*d.*; the 80 shearling rams, £9 13*s.* The 10 2-shear rams averaged £5 19*s.* 5*d.*; one of the sheep sold at Harleston let for £31 10*s.*, and other good sheep for the same amount.

SOUTHDOWNS.

At the Dorchester fair, a large number of ram lambs from the flock of Mr. J. C. Fooks, of Cerne Abbas, were put up to auction by Mr. Ensor, prices ranging from 3½ to 12½ gs. each. Southdown rams from Mr. G. W. Horner, of Athelhampton, realised from 3½ to 8 gs. each; and for some from Mr. John Ford, of Rushton, from 5½ to 6 gs. each was given.

OXFORDSHIRE DOWNS.

Oxford Great Ram Fair: Messrs. Flanklin & Gale offered 70 very capital ram lambs, from the flock of Mr. H. Gale, of Cuddesdon. Those which were sold realised prices varying from £16 5*s.* 6*d.* to £3 13*s.* 6*d.*, making the very fair average of £6 10*s.* The same auctioneers then disposed of 60 ram lambs and a few older sheep, bred by Mr. W. Chillingworth, of Cuddesdon. The whole were sold at an average of £6 12*s.*, the highest price being £14 3*s.* 6*d.*, the lowest £3 13*s.* 6*d.*

HAMPSHIRE DOWNS.

Mr. Dibden: The prices ranged from £18 17*s.* 6*d.* down to £5 5*s.*, and included various prices between those extremes, such as 10, 12½, 13½, 14½, 15, 17 gs., and so on: the average of the 100 animals offered being £8 5*s.* 6*d.* each.

Mr. Coles, Boreham Road, near Warminster: The letting prices of lambs for the season, from September 6, ranged from 15 to 6 gs.; the lambs for sale ranged from 11½ to 3 gs.; and the 2-teeths from 8½ to 4 gs.

Mr. E. Waters, Salisbury: 100 ram lambs, 13 shearling rams, and 216 ewes were sold. Among the highest prices given we may mention the following:—Lot 2, Mr. Mayo, 15 gs.; lot 10, Mr. Rawlence, 44 gs.; lot 15, Mr. Kent, 14½ gs.; lot 20, Mr. Lyne, 25 gs.; lot 25, Mr. Compton, 25 gs.; lot 26, Mr. Russell, 15½ gs.; lot 19, Mr. Hoddinolt, 14½ gs.; lot 36, Mr. Symes, 13½ gs.; lot 42, Mr. C. Long, 15½ gs.; lot 49, Mr. Noteley, 16 gs.; lot 50, Mr. Kellow, for Mr. A. Morrison, 39 gs. After this prices gradually lowered to 4 gs., and the average over 100 lambs disposed of was £9 18*s.* 6*d.*; for shearlings the average was £15 3*s.* 8*d.*

SHROPSHIRES.

Mr. Horley's, The Fosse, near Leamington: The rams ranged from 6 to 35 gs.

Mr. Bradburne's, Pipe Place, near Lichfield: Rams only realised from 5 to 20 gs. each, a number being withdrawn.

Mr. C. Byrd's, Littywood: The rams made about similar figures.

Mr. Coxon's, Freeford: Forty rams averaged about £17 each, the highest figure being 52 gs., given by Mr. Clare; and others making 42, 35, 30, 26, 24, down to 6 gs.

ON CLAY LAND CULTIVATION.

A GENTLEMAN has forwarded the following letter, asking my opinion as to the value of clay land. I should be glad if you would publish it, for it puts the question plainer than I know how otherwise to put it:—

"In writing to you as a stranger, I trust that the same spirit which raised you to the position of a public benefactor will lead you to pardon such intrusion. My object in doing so is with a view to remove, if possible, what I conceive to be a common error in the minds of agriculturists, and which your letter in the *Agricultural Gazette* on the subject of the prize farm at Oxford may inadvertently tend to promote. In that letter you make use of the expression 'poor clay land' no less than three times—ironically, I believe, but as my experience leads me to think that the ordinary run of newspaper readers do not understand irony, and take every word literally, to such it may appear to be a contradiction that in one breath you are calling clay land poor, and in the next saying that it will produce 40 bushels of Wheat to the acre; and again, that 'it needs little else besides deep and clean working, a little superphosphate for Wheat, and that is all,' no consumption of cake, as 'the poor stone brash requires.' Now, with your great practical experience, the fact of your condemning clay to the class of poor soils cannot but be a confirmation of the general opinion which already exists in the minds of land surveyors, landlords, and tenants. It is the habit of nearly all to call clay land poor, and yet scientific men say that it is inexhaustible in mineral food for plants. My own humble opinion is, that when once the water is got out of it by drainage, with ordinary fair treatment it is a mine of wealth. I have a piece of heavy clay land which has borne alternate crops of Wheat and Beans for 20 or rather, perhaps, 30 years, the only variation being that every sixth year a crop of roots is substituted for Beans, and then only it gets a dressing of farmyard manure; that is, three crops of Wheat, two of Beans, and one of roots, in six years. The produce of Wheat is invariably up to 40 bushels per acre, and the roots, especially Mangels, are a heavy crop; the average crop of Wheat on the adjoining land, and of the neighbourhood, on similar soil, is considered to be 24 bushels; it is therefore set down as poor clay land, and mine also is concluded in the general condemnation. It stings me to the core to hear land that with ordinary fair treatment will produce 40 bushels to the acre, set down as poor land. If, therefore, you will have the kindness to state plainly what your opinion is, whether clay land is or is not poor, whether it is the soil that is poor, or whether it is the treatment which it receives, that is poor—if, as I expect, you will confirm my opinion, you will do as much as is possible for one man to do, in attempting to remove a blot from the intelligence of the age, the result as much of habit as of thoughtlessness.

"As my object will be attained by the publication of your opinion, will you be kind enough to state in your reply whether you have any objection to such a course."

I have informed the gentleman that I will answer the question publicly, therefore I proceed at once to do so. Clay land generally is rich in mineral food, especially so the subsoil. This land, that I call poor clay, is situated in what is called a poor clay district, extending from here right into and through large tracts of Oxfordshire. I call mine poor clay, to make the reader understand that it is of that character called poor clay, whereas I prove that it is not poor. It is the general management on such land that is poor, not the land. Those who look upon clay land as poor, therefore unworthy of good, deep, and clean management, do not appreciate the mineral qualities of the soil, neither do they the good there is contained in air and water.

Now, this land of mine, which under ordinary horse culture produced only 20 bushels per acre on an average of years, now under steam culture produces 40 bushels per acre, thereby proving that, under horse culture, it was not half farmed; and that represents the general state of things now-a-days under horse culture. So they call the land poor, instead of calling themselves poor farmers.

In November, 1859, I employed Dr. Voelcker to take samples and makes analysis of this clay land of mine. Here is what he says about it:—

COMPOSITION OF SURFACE AND SUBSOIL FROM FIELD NO. 1, HEAVY LAND.

Chemical Analysis.

	Surface soil.	Subsoil.
Moisture	4·39	3·60
Soluble in dilute hydrochloric acid:—		
Organic matter and water of combination	8·19	4·63
Oxides of iron and alumina	11·40	12·38
Phosphoric acid	·33	·19
Carbonate of lime	20·40	6·14
Sulphate of lime	·22	·22
Magnesia	·05	·24
Potash	·15	·69
Soda	·03	·14
Insoluble in hydrochloric acid:—		
Silica	49·82	62·71
Alumina	3·31	7·25
Lime	·49	·65
Magnesia	·35	·30
Potash	·22	·69
Soda	·12	·10
	100·00	100·00
* Containing nitrogen	·19	·14
Equal to ammonia	·47	·17

The preceding analysis exhibits several points of interest, to which I would briefly allude.

1. In the first place I notice that the proportions of organic matter and of phosphoric acid are much greater in the surface than in the subsoil. This difference arises from the organic remains of the preceding crop, and from the manure which was applied to the land.

2. The larger proportion of nitrogen in the organic matter of the surface deserves particular notice.

This proportion is capable of yielding one-half per cent. of ammonia, whereas the subsoil will yield ultimately only one-sixth of a per cent. of this important fertilising material. The greater part of the nitrogen, no doubt, exists in the soil in the state of organic remains, but some unquestionably is due to the action of the atmosphere on the well pulverised surface land. In other words, steam cultivation has rendered the soil capable of absorbing ammonia from the atmosphere; an improvement has thus been effected which cannot be too highly estimated.

This power of absorbing ammonia is mainly due to the presence of clay in the surface soil; and, as we have in the subsoil an inexhaustible supply of clay, deep cultivation, which admits air into the subsoil, must have a powerful influence in raising the productiveness of the land.

3. It will be observed that the total quantity of potash present in the surface soil is nearly the same as that contained in the subsoil; but there is this remarkable difference; that, whilst the surface contains by far the greater part of potash in a state of combination, in which it is readily soluble in dilute acid, the subsoil contains much less soluble potash, and a much larger proportion of insoluble silicates than the surface soil.

We may learn from this, that contact with air, induced by efficient cultivation of the soil, has had the effect of decomposing a large proportion of the insoluble silicates, and rendering the important alkali, potash, soluble.

At the same time time it will be observed that even the subsoil contains a good deal of soluble potash, which appears to me to indicate that the subsoil has been subjected to some extent to this ameliorating influence of the atmosphere, although it has not been turned up and brought to the surface.

It will thus appear that both surface and subsoil, the former to a greater extent than the latter, have undergone important chemical changes, in consequence the mineral food for plants has been rendered available, and the land acquired, in a higher degree than in its natural state, the power of absorbing ammonia from the atmosphere."

Now, sir, I have given my opinion, and I have supported it by results on my own farm, and Dr. Voelcker's analysis and report give a good reason why I should attain those results.

The clay lands of England are not poor, for they contain those qualities that will make riches if the farmers will only bestir themselves to let air and water freely at them. *William Smith, Woolston, Bletchley Station, Bucks, Aug.* 10.

TILLAGE AND SEEDING.

I PURSUE this subject not so much to advocate small quantities of seed for farming crops as to show the ruinous, or what I may call—whatever offence I may give by it, persevering in it as they have for so many years—the ignorant practice in general use, and recommended by the Royal Agricultural Society, of sowing 2 bushels of seed per acre, which is at least four times more than can grow and bring a crop to perfection, and especially when it is known that one kind of Wheat will seed the land nearly half as thickly again as another kind will; nearly the same as sowing the same quantity of the small Tick Beans would seed the land so much thicker than the seeding of it with the Broad Windsors would. And further, is it not erroneous to sow the magical 2 bushels at all seasons of the year—early in the autumn and late in the spring, and on all kinds of land—on rich and Wheat-producing land, and on poor, light, and poverty-stricken land, merely scratched over with a plough 3 or 4 inches deep only, and then the epidermis smoothed over with the roller and harrows.

But I will turn to my letter of July 4, p. 937, which I hear has excited some attention. In proceeding with this I shall prove how easy it is to sow land with small quantities of seed, and give the names of some gentlemen, who with care and attention sowed their acres with a peck of seed for each acre, the seed and the acres having first been measured by disinterested persons, the object being to prove what a peck an acre would produce on good and well-cultivated lands, so as to satisfy the minds of the scientific gentlemen who were engaged in the experiments, and not for the purpose of advertising; indeed, advertising then was scarcely thought of, and certainly but little resorted to.

The first were six gentlemen, whom I have often before referred to, who sowed their lands in the manner I have indicated. I had permission to make what use I pleased with the names of four of them, and of the practice and success of their operations. The experiments were made between the years 1810 and 1815, and I add, with the most gratifying success; proving that one peck of Wheat, of any kind, in skilful hands, and in good land, will produce crops equal to any larger quantities of seed, and for a succession of years far more profitable. The names of the four pioneers in thinner seeding (not thin seeding), were Mr. Bradley, Mr. Jackson, Mr. Smith, and Colonel Williams. I was, my respected readers, as you must know, but a young man 60 years back, but from my very earliest years nearly I took a great interest in land cultivation, hence my being able to record what I am now stating, which, though it has brought upon me much opposition and misrepresentation, and in some cases nearly personal injury, especially for my advocacy of machinery—which I then thought, and still think, might be so made and used as to render our country independent of all foreign corn supplies; but not, I add, whilst the Royal Agricultural Society professes that they are obliged to use four, or even eight times the seed, for producing not more than half the crop that the gentlemen with their one peck produced so many years back. In one of the cases, in 1810, I saw and assisted in measuring the peck of seed, and also in dibbling it, grain by grain, into an acre of land. I also saw the crop threshed and measured in the field, and the yield was 204 pecks, or 204-fold; and the experiments of the other one peck more were nearly as satisfactory, as I myself also witnessed. As for Colonel Williams, his cultivation of land and management of stock were the very best I have ever seen, and I have no doubt whatever but my scientific readers would agree with me had I time and space to describe what they were. A great impulse was given to farming in those days by the publication of Jethro Tull's system of tillage, and the agricultural lectures and chemistry of Sir H. Davy; and I think also by the "Wealth of Nations," by Dr. Adam Smith, which were then rather ardently studied; and several other works of the kind which drew public attention, and were studied by many landed proprietors of education and scientific attainments.

The names of several other gentlemen, who seeded their 2 pecks, I am at liberty to publish, namely, Rev. Mr. Close and Rev. S. Smith, who were disciples of Jethro Tull. Mr. Close's average produce was 24 bushels, and Mr. Smith's, 36 bushels; but it must be remembered that Tull seeded only half his land each year, seeding a narrow stetch, and leaving a narrow stetch fallow for the succeeding year. There followed several others who used their 3 pecks, ending with the Rev. Sir George Robinson, who farmed from 1819 to 1858, and their average produce was 33½ bushels an acre; but I have others, and by far the most interesting, who seeded land, and for many years, with only half a peck of seed an acre, and the produce from which was still larger than any of which I have already given par-

ticulars. But here I must stop for the present, reserving names, dates, and details, for another time. *George Wilkins, Vicarage, Wix.*

VILLAGE WATER SUPPLY.

ALMOST every summer there are gravel and chalk districts in this country, of enormous area, whose inhabitants are in positive distress for want of water. It is hardly possible to over-rate the importance, whether on the score of health, comfort, or economy, of the subject of village sanitary economy, which Mr. Bailey Denton has treated exhaustively in a recent number of the English Agricultural Society's Journal, and of which this subject is one principal section. We give here an extract, very much condensed, from Mr. Denton's paper, using the wood-cuts with which the article in the Journal was illustrated :—

"The sources of a private character which would be comparable with a public supply are :—

I. Wells sunk down to a shallow depth, affording a constant supply of water to be raised by a common lift-pump.

II. A running stream of unpolluted water passing the doors of the inhabitants, from which they can dip out all they require.

III. The storage of roof-water.

"I. *From Wells.*—As a positive condition upon the use of water from shallow wells in villages, no privies or cesspools nor leaky sewers should exist within such a distance of the wells as will allow of the infiltration of excrementitious matter. A proper system of impermeable sewerage for house refuse and of permeable drainage for subsoil-water will be found indispensable where this mode of supply is used.

"II. *By Dip from a Public Watercourse.*—Where dependence is placed on a supply to be obtained by dipping from a stream running through a village, the strictest care is necessary to prevent surface-defilement, and to see that steps are taken to lower the water standing in the soil, so as to prevent that complete saturation which is incident to the constant flow of water on the surface,—too frequently resulting in evils as great as those arising from the want of sewerage itself.

"III. *The Storage of Roof-water.*—It is, perhaps only by one or other of the two private sources already referred to that the whole of the water required for domestic use by villagers can be obtained with sufficient certainty. Much, however, can be done, by house and cottage owners, by the provision of tanks, in which to collect and store roof-water. The quantity and quality of the water to be obtained from the roofs of buildings, when the covering is slate, has not been generally appreciated. In the cases of thatch and tiles, the same remark does not apply, as much of the rain is absorbed by the roof itself, and that which is thrown off is not so pure as that discharged from slate roofs. Taking an ordinary middle-class house in a village, with stabling and outbuildings, the space of ground covered by the roofs will frequently reach 10 poles; while the space covered by a farm labourer's cottage and outbuilding will be 2½ poles. Assuming that the roof is slate, and the water dripping from it is properly caught by eave-troughing and conducted by down pipes and impervious drain-pipes into a watertight tank, sufficiently capacious to prevent overflow under any circumstances, and that by this method 20 inches of water from rain and dew is collected in the course of the year, the private house will have the command of 28,280 gallons, and the cottage 7070 gallons in a year. . . .

WATER SUPPLY BY PUBLIC CO-OPERATION.

"Failing sufficiency or proper quality from either of the three private sources enumerated, there remains to be considered how a village may be economically supplied by public co-operation. It is not improbable that, even where private sources now exist, a public supply may, under a combination of advantageous circumstances, be the cheaper means of service.

"The various means at command may be classified under the following heads :—

I. The use of a constant or an intermittent supply existing above the village, and conducted to it by gravitation.

II. The raising of subterranean water lying beneath or near the village.

III. The use of a stream near at hand, but at lower level than the village, both as a supply and as motive power to raise the required quantity ; and

IV. The use of steam-power in the place of other motors.

"I. *The Use of a Constant or an Intermittent Supply, existing above the Village, and conducted to it by Gravitation.*—This description of supply will include that to be obtained from a running stream or from under-drainage, either where the discharge is constant or intermittent.

"The writer has been enabled, in carrying out works of under-drainage on several estates, to originate a constant run of water from land which had been previously saturated, and had given off its excess of wetness by evaporation. In some few cases the advantage has been turned to account, and an immeasurable benefit conferred on the village poor, who have since continued to take their daily supply of water from the outlets. The discharge from waterlogged free soils is frequently constant, when the wet lands form part of large beds in which the rain-water from adjacent surfaces is conserved ; and as this is the result of under-drainage, which interferes only with undefined sources of supply, there cannot possibly arise

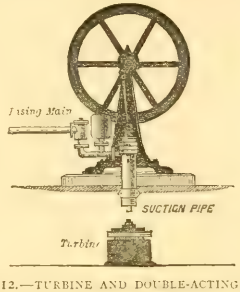

FIG. 212.—TURBINE AND DOUBLE-ACTING PUMP.

objections of the same character as those which attend any interference with the ancient rights of defined streams. The villages that could be thus supplied with the best

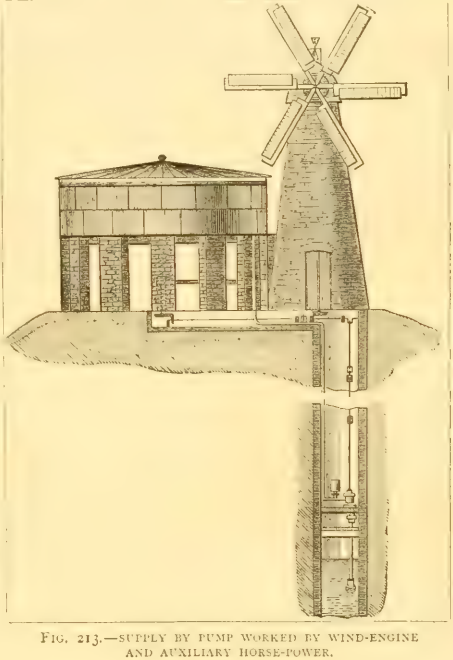

FIG. 213.—SUPPLY BY PUMP WORKED BY WIND-ENGINE AND AUXILIARY HORSE-POWER.

water are not few, and it is remarkable that, with such an advantage within reach, efforts are not more frequently made to obtain it.

"But for one instance in which under-drainage furnishes a constant discharge, hundreds of cases occur in which the outlets cease to run after the month of May ;

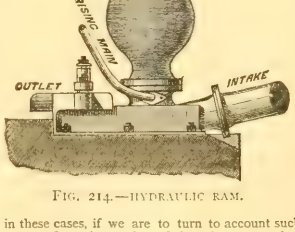

FIG. 214.—HYDRAULIC RAM.

and in these cases, if we are to turn to account such an intermittent flow, the surplus of the winter must be collected in a reservoir, from which the supply of the village may be taken when the outlets cease to flow. The difference between a constant run of water and the supply to be gained from an intermittent discharge by the aid of storage is very great, both with respect to cost and quality ; for, as the supply to a village is comparatively small, and the opportunities of collecting it in any deep natural receptacle rare, recourse must be had to comparatively shallow reservoirs, which are open to the objection that vegetable and animal life thrive in them, and when they decompose render the water less pure. This objection is, however, met by constructing the reservoir in such a manner as will allow of its being emptied every year and properly cleansed. The proportion of the rainfall discharged by under-drainage during the winter from clay lands will not be less than 3½ inches,* where the annual rainfall does not exceed 24 inches, and the proportion due to the winter is not less than 9 out of the 24 inches. This amounts to 79,183 gallons per acre. To supply a village of 400 inhabitants with 10 gallons each per diem, a total quantity of 1,460,000 gallons will be required for the year's supply, half of which (730,000 gallons) must be stored during the discharging period for use during the remainder of the year, with an addition of 50 per cent. for evaporation, waste, &c. By this means a village may be amply supplied with water all the year round, the quantity used during the winter being supplied direct from the outlets, and that of the summer from the reservoir. A reservoir capable of holding the quantity required would occupy about 4-10ths of an acre, assuming the depth of water not to exceed 10 feet. The whole expense of constructing such a reservoir, with supply-pipes, &c., would probably not exceed £400 (putting a fair value on the land required), which, if repaid with interest in 30 years, would involve an average annual charge upon each dwelling of about 8*s.* if 60 dwellings composed the village. This is rather lower than the minimum rate which it has been already stated the labouring cottager can fairly afford to pay.

"II. *The Raising of Spring or Subterranean Water lying beneath or near a Village.*—The depth from which the water will have to be raised may vary very considerably in different formations, but there is no limit to the height to which it may be raised if the motive power is appropriately selected. Three kinds of power present themselves for application, viz., horse, wind, and steam-power. Of these it is only intended to dwell upon wind as the most appropriate, if it be supplemented by horse-power when the force of the wind is not sufficiently great to drive the machinery. . . .

"The cost of the wind engine, with chain of pots and tank to hold 16,000 gallons, with horse-power appliances under the tank, as shown in the drawing (fig. 213), would probably reach £750, including a supply-main down the village street for a distance of half-a-mile but excluding connections with the dwellings, and this sum, if repaid with interest in 30 years, will result in an annual charge of 15*s.* on all dwellings, supposing 60 to compose the village. This would probably result in rather a higher rate upon cottages than it has been before stated it would be desirable to charge ; but in many cases the tank would not necessarily be raised above the ground, when the cost would be reduced very considerably. The number of days on which the wind would not have sufficient power to perform the required duty may possibly reach 100 in the whole year, but this depends so much on locality that no general rule can be stated. The cessation would seldom last more than a fortnight at the same time, and seeing that the service tank would hold four days' supply, and that the wind when at work would do duty during the night as well as the day, it may fairly be supposed that recourse would seldom be had to the supplemental power. When this should occur, a good strong horse working half a day would suffice to furnish the village with the supply of 4000 gallons, and thus two whole days' work would suffice to fill the tank of 16,000 gallons, or four days' supply. The current expenses, beyond the payment of the instalment, by which the original outlay would be repaid, would therefore be small, and there would be no difficulty in obtaining the use of a horse or two when required. . . .

"III. *The Use of a Stream near at hand, but at a Lower Level than the Village, both as a Supply and as Motive Power to raise the required Quantity.*—Three descriptions of machinery present themselves for consideration, each being preferable under certain conditions. The machines are the hydraulic ram, the turbine and pump, and the undershot wheel and pump.† Where the quality of the water is suitable, the power small, and the elevation to which the supply has to be raised is not more than 10 times the fall, there is nothing equal in simplicity, efficiency, and cheapness to the hydraulic ram. With a fall, for instance, of 8 feet, a ram will raise 4000 gallons daily to a village half a mile off, 40 feet higher than the supply if the quantity of water at command is 38 gallons a minute. The ram acts upon a principle different from that of any other hydraulic machine, inasmuch as by concentrating into a small quantity of water the force accumulated by motion of a larger body, the small quantity is raised to the required height. The greatest amount of water a ram will raise does not exceed half of what a horse would accomplish if its power could be brought to bear in the most favourable way ; but as the ram is self-acting, and never-ceasing if the water acting through it remains the same, the advantages of the ram over the horse,

* See Journal of the Royal Agricultural Society of England, vol. xx, p. 273 *et seq.*

† The writer is indebted for much of the information respecting the use of the ram, the turbine, and the wheel, as well as that respecting pumping machinery generally, to Mr. Arthur Rigg, engineer of the George Street Works, Chester.

though it apparently does only half the work, are very superior.

"The fall to the ram should in no case exceed 20 feet, as the stress on the valves then becomes too great for their long endurance. One of the special features of the ram is, that a portion of the same water that works it is raised as the supply; so that, unless the water of the stream is suitable for domestic purposes, the ram is inapplicable. One of the best forms of ram is shown in the drawing, fig. 214. As the hydraulic ram differs in principle from all other means of raising water, so its useful effect varies according to a different law. For example, when the elevation to which water has to be raised amounts to about eight times the fall which works it, the useful effect is 66 per cent.; but when the elevation is ten times the fall, the useful effect is reduced to 50 per cent., while at 20 times the fall the useful effect is only 18 per cent.

"To give an example reduced to gallons raised per minute, so as to judge of effects under different circumstances, let it be assumed that 40 gallons of water per minute are at command, having an available fall of 10 feet—then the following calculations apply to different heights:—

If lifted 80 feet $\frac{66}{100} \times \frac{40 \times 10}{80} = 3\frac{1}{2}$ gallons per minute.

,, 100 ,, $\frac{50}{100} \times \frac{40 \times 10}{100} = 2$ gallons per minute.

,, 200 ,, $\frac{18}{100} \times \frac{40 \times 10}{200} = \frac{1}{4}$d of a gallon per minute.

These figures will suffice to show that the hydraulic ram being fully effective, from imperfect design or construction. On a large scale, very high results have been obtained; but for small applications, such as those of water supply to villages, 70 per cent. of the power expended may be considered the limit of perfection, and from this must be deducted the further loss due to the pump and gearing, which will reduce the product to 50 per cent. To ascertain the quantity of water raised per minute, by a given fall and quantity, the following rule may be used for turbines:—

$$\frac{\text{gallons falling per minute} \times \text{height of fall}}{2 \times \text{elevation required.}} = \begin{cases}\text{gallons raised}\\ \text{per minute.}\end{cases}$$

$$\frac{2 \times \text{gallons to be raised} \times \text{height to be raised}}{\text{height of fall.}} = \begin{cases}\text{gallons falling}\\ \text{per minute.}\end{cases}$$

For instance, with a fall of 20 feet a turbine will raise 10,000 gallons daily to a height of 100 feet and a distance of one mile with a flow of 90 gallons per minute. As all the foregoing rules assume the machinery to be perfect, an allowance ought to be made in small machines and longer rises for the inevitable loss by leakage, &c. Indeed, in smaller works it is desirable to have the machinery from 1½ to 2 times as powerful as that which seems to be requisite.

"The cost of the several machines, appropriately applied, with rising-main and supply-pipe, may be approximately estimated as under:—

Hydraulic ram, working with a fall of 8 feet, and capable of raising daily to a height of 40 feet, and a distance of half a mile, 4000 gallons of the same water by which it is moved, with supply-pipe down village street, half a mile long, exclusive of connections with the dwellings, &c. £360 0 0

Turbine, working with a fall of 20 feet, and capable of raising daily 10,000 gallons of water (taken from the stream and filtered in its passage from thence to the pump-well) to a height of 100 feet, with pumps and rising-main for forcing the supply a distance of a mile, including supply-pipe down village street, half a mile long, but excluding the connections with dwellings £650 0 0

Waterwheel, capable of doing the same work as turbine, but working with a fall of 3 feet only instead of 20, with pumps, rising-main, &c., exclusive of house connections £750 0 0

"IV. *The Use of Steam-power in the Place of other Motors.*—Where none of the foregoing plans are available, the steam-engine forms the last and a never-failing resource. The kind of pump most suitable would be the double-acting lift and force-pump, or possibly three ram-pumps forcing water into one ascending main. To form a comparison between this description of power and that of wind or water, it will suffice to state that the first cost of a steam-engine to raise the same quantity, height, and distance as was assumed in the case of the turbine and wheel, would be £725; but with steam-engines the annual cost of fuel, stores, wear and tear of the machinery, and attendance, would amount to a considerable sum; while with rams, turbines, and waterwheels, worked by a constant flow of water, the annual outgoings are only nominal.

"In the foregoing observations on village water supply all reference to methods of a doubtful character has been avoided. Norton's Abyssinian pumps, for raising water out of shallow water-bearing beds, have been found extremely valuable in certain localities where geological conditions have favoured their use; and no doubt there are instances where they would be available in villages. The happy contrivance, too, of fog-ponds,* for collecting water from the atmosphere on the tops of the chalk downs, has been found useful for the supply of live stock; and when the scientific principle upon which they are founded is better understood, it is not impossible it may be found more generally applicable. Any treatise, therefore, which professed to deal with village sanitary arrangements, would be incomplete if some reference, cursory though it be, were not made to both these valuable expedients. Neither, however, possess properties sufficiently certain for general adoption."

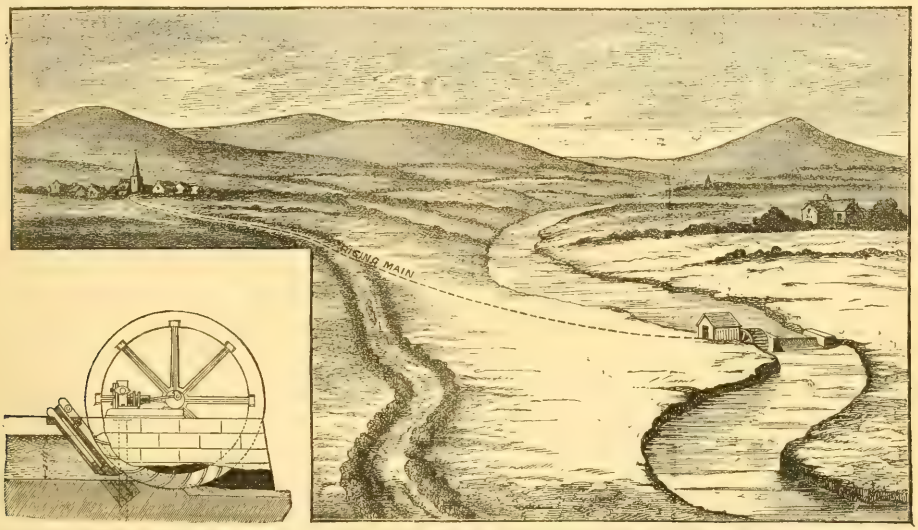

FIG. 215.—PONCELOT UNDERSHOT WHEEL.

FIG. 216.—SUPPLY FROM STREAM AT A LOWER LEVEL BY UNDERSHOT WHEEL.

should not have to lift more than 10 times the height of the fall, where economy is the object aimed at.

In cases where the water which furnishes the power is not of a quality suitable for domestic use, and where there is other and better water at hand, or where the quantity required is greater than the ram can lift, or where the elevation is higher than the ram can economically raise the required quantity, pumps worked by either waterwheels or turbines can be more appropriately used than the ram. The waterwheel is slow in movement, and therefore ought to be adapted to comparatively slow-moving pumps of large capacity and regular resisting power. The turbine, on the contrary, moves rapidly, and a double-acting lift and force-pump can be associated with it with advantage (see fig. 212). Where the stream has a fall of less than 3 or 4 feet, and particularly if great variations take place in the quantity of water constituting the motive-power, it will be found that the Poncelet undershot (fig. 215) or the breast-wheel will give the best result, which, having regard to the loss due to pumps and gearing, practically amounts to 35 per cent., or about one-third of the whole theoretical power due to the fall driving the wheel: thus,

$$\frac{1}{3} \times \frac{\text{galls. falling per minute} \times \text{height of fall}}{\text{elevation required.}} = \begin{cases}\text{gallons raised}\\ \text{per minute.}\end{cases}$$

"For instance, an undershot wheel (fig. 216) working with a fall of 3 feet will raise 10,000 gallons daily to a height of 100 feet, and a distance of one mile, with a flow of 945 gallons per minute. When the fall exceeds 4 feet the overshot wheel or the turbine may be used, but the latter is generally the cheaper of the two; and, as it occupies the least space and will work below water, it has advantages superior to the waterwheel. The turbine was brought very closely to its present perfection by M. Fourneyron, whose machines have not been superseded, although many attempts have been made to do so. There is, however, no machine which requires more absolute perfection in its proportions to give a good result than the turbine, and many that are sold are very far from

* The reader is referred to the second volume of the Society's "Journal" (Second Series), p. 273, and to White's "Selborne," Letter 71, p. 256, for very interesting descriptions of "fog-ponds;" also to the last number of the Society's "Journal" for some observations on the wold ponds of Yorkshire.

THE HARVEST AND THE CROPS.

In my harvest report of last year I estimated the Wheat crop to be 26 bushels per acre, or 13 per cent. below average, and low as that estimate was generally considered, yet the true test of the threshing-machine proved that actual results fell short of my estimated yield.

In the counties of Norfolk, Lincoln (excepting the fen districts), York, and in all the midland counties the yield proved sadly disappointing, and crops which, judging from their bulk, would in favourable seasons have yielded 6 qr. per acre, did not produce 3 qr. As I anticipated, the counties of Kent, Essex, and I can now add Northumberland, produced an average yield: but taking England throughout, I do not hesitate—after having obtained returns of several thousands of acres of Wheat that I inspected growing—to put the average yield of the Wheat crop of 1869 at 24 bush. per acre, or 6 bush. per acre below average; or, compared with the unequalled crop of 1868, one-third deficient. One thing is certain, that, partly from the inadequate prices—prices which the condition of the home crop did not warrant—and partly from the indifferent yield, the Wheat crop of 1869 has proved to be one of the least remunerative the exclusive Wheat grower of England ever experienced.

Turning to the present year, which has been characterised throughout by a severe drought, there has been much to awaken in the mind of the farmer alternate hopes and fears. In the early part of the season all spring crops gave promise of great abundance, but the absence of rain, and the prevalence of a scorching sun throughout May and the early part of June so stunted their appearance that at the middle of June we seemed, so far as all crops were concerned, excepting Wheat, to be on the verge of a famine. Fortunately, rain fell in most parts of England on the 16th of June, and the aspect of all crops rapidly improved. Stunted and withered stems quickly increased in length, ears which otherwise would have remained unsheathed soon became visible, and fields of Oats and Barley, which but for the rain could not have been cut by sickle or machine, have yielded about half a crop.

The forcing weather throughout June and July rapidly matured all crops, and by the middle of July the cutting of Oats commenced in several districts. The Oat crop was so much earlier this season than its sister cereals that in several districts there was a break between the Oat and Wheat harvests. Cereal crops are singularly well ripened, the general use of the machine is making short work of the reaping process, and from the withered state of the straw and hardened condition of the grain, the process of ingathering rapidly succeeds that that of cutting. With a continuance of favourable weather up to the end of next week

the greater proportion of the cereal crops will be secured.

But to deal with the different crops more in detail. The Wheat plant in its embryo stage was by no means promising, especially on light soils. A large area had got a too loose and dry seed-bed, the ravages of the wireworm proved unusually severe, and the frequent naked frosts, by "lifting" the soil, so decimated the plants and weakened those which were left with any vitality, that a considerable area under Wheat was ploughed up and sown with spring corn. Hence, on all shallow surface soils, incumbent on shale or gravel, the Wheat crop is thinly planted, very short in straw, and must give a very poor yield. On the other hand, on all compact, or, what farmers aptly term, "holding land," the Wheat plant passed the severe winter unscathed. Even on this description of soil, however, the appearance of the Wheat crop up till the middle of May did not promise an average yield. From the hot weather which then set in the Wheat crop greatly improved. The blooming season was most favourable, and, up to the time of cutting, the prospects of the yield gradually improved. The results are, that on all strong soils, as well as on light soils incumbent on cool subsoils, which embrace the deep chalk marls of Kent, Suffolk, and Norfolk, the London, Oxford, and Weald clays, the red sandstones of Hereford and Worcester, the carboniferous limestones of Derby and Northumberland, the red marls of Leicestershire, Northamptonshire, and Warwickshire, and especially on the Lincoln and Cambridge fens, the Wheat crop is considerably over average. The crop thus varies from that of the poorest description on shallow soils, which rest on porous strata, to that of the finest quality on really Wheat soils. The fact that I have walked through several fields, the yield of which will not exceed 6 bushels per acre, and through others which will produce 72 bushels, may indicate the varied character of the Wheat crop, but furnishes no data upon which to base the average yield. The question is simply that of comparative acreage, and after having carefully considered that point I estimate the average acreage yield of Wheat of this year's crop to be 30 bushels, or just an average crop.

Compared with those of 1868 the heads are short, but the pikelets are closely set and filled with bright, fully developed, and well-conditioned grain.

The results obtained from threshed-out fields are such as might be anticipated—viz., that the yield of Wheat on strong soils has exceeded, while that on light soils has fallen short of, expectations.

From the total failure of seeds in 1868, and their partial failure in 1869, together with Barley being the most remunerative crop last year, I estimate that the Wheat area this year is under average, and consequently that the total produce of Wheat will, from a diminished area, fall short of an average.

A review of the Barley crop is less encouraging. Unlike Wheat, the Barley crop was most promising in its earliest stage. A better seed-bed was never secured, and the finely pulverised soil, which tends to retain moisture and avert drought, warranted the prediction of a large crop. The braird was healthy, regular, and vigorous, but before the plants shaded the land the drought had the mastery, and on a large area of gravelly soils the plant died at the root before it was in ear.

The Barley crop, like Wheat, is good on deep cool subsoils, but while Wheat embraces by far the largest area of such soils, the proportion allotted to Barley is exceedingly small.

On one of the best farmed farms in the county of Rutland, which I walked over last week, there are 100 acres of Barley which will not yield 2 qr. per acre. The soil is light and gritty, and is easily injured by heat or cold. Taking the Barley crop altogether, I estimate it at 20 per cent. below average.

Oats were also put into the soil under favourable conditions. They assumed a fine healthy hue soon after brairding, but, like Barley, they eventually succumbed to the drought; like Barley, also, they are exceedingly short in straw, but the ears are comparatively large. I estimate the Oat crop to be 15 per cent. under average.

Of all farm crops, Beans are by far the worst. In many instances the stems are not a foot long, and, although well podded compared with the length of the stem, their yield must prove very inadequate. From being so short, and the pods being close to the ground, pulling instead of cutting has in several cases been resorted to. I estimate the Bean crop to be one-third deficient.

Peas are also short in straw, but singularly well podded, of excellent quality, and a large breadth has been secured in excellent condition. The crop is average.

In many parts of the southern counties the Potato crop is inferior, the tubers being few and small. In the chief Potato-growing counties, however, such as Kent, Cambridge, York, East Lothian, and Perth, the yield promises to be average, the quality good, and as yet there are no symptoms of disease.

Mangel, the most successful root in a dry season, is somewhat late, but the plants are regular and healthy.

No root crop suffers so severely from a dry season as Turnips. Fortunately this year, from the action of naked frosts, the soil was in the finest preparatory state for the reception of this hazardous plant, but, in the majority of instances, the crop first sown was taken by the fly, and resowing was imperative. Although rather late, and there are many fields which have proved a total failure, yet the crop generally is healthy, is rapidly improving, and, with a favourable autumn, may prove an average crop.

Hay—natural and artificial—in all the southern, midland, and eastern counties, has well nigh been a total failure.

Pastures up to the beginning of last week were severely scorched, and in no year since 1818 have they yielded so little "feed." Even the usually rich grazings of Northampton and Leicester have been almost as bare as the public road, and stock, cattle and sheep, upon them greedily fed on hay and straw, and, besides, required a liberal supply of artificial food. Pastures were as bare and barren during the months of June and July in 1868 as in the corresponding months of this year, but there is this difference between the two seasons, that in the early part of the grazing season of 1868 pastures afforded abundant "keep," whereas in the present year pastures, from the cold nights which prevailed throughout April and May, never made a start. The grazier has, therefore, this season suffered most severely, and unless favoured by a growing autumn and a mild winter, as in 1868, to enable him in some measure to recoup his summer's losses, the year 1870 will prove to him very disastrous.

Happily, the remarks I have made respecting one and all of the crops do not apply to every county in England. The counties of Lancaster, Westmoreland, and Cumberland, are exceptional. In these counties all the cereal crops are average, root crops are promising, hay—natural and artificial—is a double crop, pastures are abundant, and seeds, which elsewhere are a total failure, are luxuriant.

Although, as I have already said, the light land farmer and the grazier will suffer heavy losses, yet to the British farmer generally there is much in the present season that is cheering. Crops of every description have proved better than their appearance at one time indicated; beef and mutton command high prices; the value of store cattle, usually unsaleable in years of extreme drought, has been maintained, and at the great lamb fairs recentiy held in the North, the high prices of last year have been exceeded. *James Sanderson*, 11, *Pall Mall East*, *August* 11 (*in the "Times"*).

OAT GROWING IN WALES.

On Sunday, July 31, I received a packet by post. The post-office stamp showed that it was posted at Newtown. On opening it I found that it contained some thick-skinned Oats, with the following written upon a paper case containing them :—

"Sample of Oats of 1869. Grown by 'G. A. H.' on newly reclaimed land in Wales, the land being more than 1000 feet above the sea, where, Mr. Smith says, 'Oats will not come to maturity.'

"A few heads of this year's crop will be sent to-day (July 30), but will be too late for this day's post, as it leaves at 2 P.M."

On Tuesday, August 2, I received another packet, with the same post-office mark upon it. This second packet contained another lot of thick-skinned Oats, with the following written upon the inner case :—

"From 'G. A. H.,' ten ripe Oats, picked July 30, 1870, in Wales, about 1100 feet above the sea, on newly reclaimed land, which, Mr. Smith says, will not bring Oats to maturity. What an experienced 'hill country' farmer Mr. Smith is! Five or six weeks to harvest yet."

The last packet contained 146 Oats, which gives an average of 14½ per "head," "G. A. H." having picked them from ten ripe heads. What wonderful heads these ten heads must have been. How is it that he did not send them in the straw, as he said he would, and thus have enabled me to have seen the height of their maturity? He says, "five or six weeks to harvest yet." Does he mean to tell me that these noble Oats, after using the word "ripe," need all that time to mature them? If so, how would he get on in a late season? When would his maturity arrive?

Any one who would like to take a lesson upon Oat growing upon the mountain top in Wales, may do so by going to Shrewsbury, thence by rail 20 miles to Newtown, and then, as the post leaves "G. A. H." at 2 P.M., they will have to go about 10 miles ahead to the mountain top, to find the straw with 14½ Oats upon it, and "G. A. H." I want to know how many bushels he grows per acre, and a lot of particulars. He will perhaps tell me on Saturday next. I shall look out, for I shall expect to see him down upon me. If he would send me as well (as the Oats) a case of wine from his London mountain, I would refresh myself for the occasion.

"G. A. H." is much milder than I expected. His reference to your paper of January 15, 1870, agrees with my view of his Oats, except that I look at them as thick-skinned. Oats grown in this neighbourhood, especially upon newly reclaimed land, may not be so short and thick as his are, but they are vastly more prolific. For instance, the other day I passed through a poor clay district, in which a poor common had been reclaimed two years ago, on which Oats were grown last year, and again this year. The Oats were being carted when I passed, so I picked up three heads, from which I rubbed 630 oats. Just look at this against "G. A. H.'s" 146 oats from 10 heads; therefore, if we go to show we must go weight for weight: then I shall beat him. I could pick a dozen good Swedes to show against him, but they are not fairly grown, for they were grown in a thin crop of Mangels. The dozen are very large now, what they will be in December I will not pretend to say.

"G. A. H." may give his young cattle roots with straw, yet for all that there are thousands of cattle in Wales wintered upon rough grass and straw. *William Smith*, *Woolston*, *Bletchley Station*, *August* 6.

AGRICULTURAL STATISTICS, IRELAND, 1870.

THE following Table shows, in statute acres, the extent under Flax in each county and province in 1869 and 1870, compiled from information obtained by the Royal Irish constabulary and metropolitan police, who so efficiently act as enumerators; also the number of scutching mills in each county and province in 1869 :—

Counties and Provinces.	Extent of Land under Flax		Difference between 1869 and 1870.		Number of Scutching Mills in 1869.
	1869.	1870.	Increase	Decrease.	
ULSTER.	Acres.	Acres.	Acres.	Acres	
Antrim	20,075	17,955	..	2,120	176
Armagh	22,703	17,319	..	5,444	131
Cavan	14,803	11,118	..	3,745	37
Donegal	25,984	24,417	..	1,567	200
Down	37,526	31,134	..	6,392	259
Fermanagh	8,986	7,342	..	2,144	53
Londonderry	24,008	22,379	..	1,710	207
Monaghan	22,178	19,667	..	2,511	67
Tyrone	34,589	30,555	..	4,034	207
Total of Ulster ..	211,092	180,416	Decrease, 30,676 acres.		1,392
MUNSTER.					
Clare	696	538	..	158	3
Cork	2,268	2,655	46.7	..	22
Kerry	539	413	..	126	4
Limerick	106	110	4	..	1
Tipperary	350	420	70	..	8
Waterford	89	52	..	37	3
Total of Munster ..	3,808	4,188	Increase, 380 acres.		41
LEINSTER.					
Carlow	19	11	..	8	1
Dublin	7	2	..	5	..
Kildare	3	1	..	2	..
Kilkenny	62	49	..	13	..
King's	249	593	344	..	6
Longford	1,724	1,119	..	605	5
Louth	1,478	1,474	..	499	10
Meath	671	542	..	129	9
Queen's	74	102	28	..	3
Westmeath	228	222	..	66	6
Wexford	243	155	..	88	6
Wicklow	2	..	..	2	..
Total of Leinster ..	5,265	4,223	Decrease, 1,042 acres.		46
CONNAUGHT.					
Galway	848	498	..	350	5
Leitrim	1,954	1,119	..	835	5
Mayo	2,923	2,560	..	363	8
Roscommon	2,240	1,694	..	1,315	6
Sligo	953	779	..	174	8
Total of Connaught	6,687	6,050	Decrease, 3,037 acres.		32

Total acreage under Flax in Ireland in 1869 and 1870: 1869, 229,252 acres; 1870, 194,893 acres. Total decrease in 1870, 34,359 acres.

Total number of scutching mills in Ireland in 1869, 1511.

Total extent of Flax grown in Ireland in each of the following years :—

	Acres.		Acres.
1851 ..	140,536	1861 ..	147,957
1852 ..	132,208	1862 ..	150,070
1853 ..	174,579	1863 ..	214,609
1854 ..	151,491	1864 ..	301,693
1855 ..	67,675	1865 ..	251,433
1856 ..	120,311	1866 ..	263,507
1857 ..	67,721	1867 ..	253,257
1858 ..	61,746	1868 ..	206,948
1859 ..	136,282	1869 ..	229,252
1860 ..	128,595	1870 ..	194,893

The foregoing return exhibits a decrease of 34,359 acres in the total area under Flax in 1870, compared with 1869. In the province of Ulster the decrease is 30,676 acres. Of the entire number (1511) of scutching mills in 1869, 1392 were in Ulster, 46 in Leinster, 41 in Munster, and 32 in Connaught.

I do not apprehend that any important difference will be found in the acreage under Flax now given and that which will appear in the Tables of the general abstracts, which are being compiled, and will soon be ready for publication; they will give the acreage under the various crops, and also the number of live stock, by counties and provinces.

LIVE STOCK.

The numbers for 1870, in the following return, are unrevised, but I do not apprehend that any important alteration in the figures will be necessary.

The total estimated value of horses, cattle, sheep, and pigs this year (1870) is £35,553,404, being an increase of £589,814 compared with 1869.

The increase in the value of pigs amounts to nearly £460,000, and in cattle to upwards of £439,000.

The estimated value of live stock in Ireland in each year is calculated according to the rates assumed by the

Census Commissioners of 1841. These rates, which refer to stock of all ages, have been retained since 1841, in order to facilitate a comparison of the value one year with another. A percentage may be added, by any one at pleasure, on account of the increased value of live stock since that period.

I regret my being unable to give at present a return of the extent of land under tillage, but trust I shall be prepared to publish the general abstracts of tillage and live stock by counties at the usual period—early in September.

If we go into the subject further, we shall find that the number of cattle increased by nearly 67,000 since last year; and what is still more remarkable, the number of pigs in this country—an important item to the poor farmer, though one which is often laughed at—has increased by 367,468. The decrease I now give you is showing the number of exports from this country and Great Britain. I believe that these exports have not been much greater than former years. Up to May the trade in cattle was very brisk, but that in store cattle was very much diminished, in consequence of the

RETURN OF THE NUMBER AND VALUE OF HORSES, CATTLE, SHEEP, AND PIGS, BY PROVINCES, AND FOR ALL IRELAND, IN THE YEARS 1869 AND 1870, AND THE INCREASE OR DECREASE IN THE LATTER YEAR.

Provinces.		Horses.		Cattle.		Sheep.		Pigs.		Total Value of Horses, Cattle, Sheep, and Pigs.	Years.
		Number	Value at £8 each.	Number	Value at £6 10s. each.	Number	Value at £1 2s. each.	Number	Value at £1 5s. each.		
			£		£		£		£	£	
Leinster	1869	166,603	1,332,824	950,901	6,180,857	1,546,859	1,701,545	259,282	361,602	9,576,828	1869
	1870	162,848	1,334,704	946,020	6,149,130	1,421,618	1,563,780	341,464	429,336	9,476,950	1870
Munster	1869	138,027	1,080,216	1,163,159	7,560,534	1,186,041	1,304,645	414,720	518,400	10,463,795	1869
	1870	137,231	1,097,848	1,149,083	7,755,040	1,084,188	1,192,607	542,397	677,996	10,723,491	1870
Ulster	1869	166,216	1,329,728	1,061,347	6,900,755	577,140	634,854	229,607	287,084	9,150,421	1869
	1870	165,768	1,326,144	1,078,862	7,012,200	549,846	604,830	345,372	431,715	9,364,980	1870
Connaught	1869	60,355	482,840	558,268	3,628,742	1,341,155	1,475,270	148,555	185,694	5,772,546	1869
	1870	60,980	487,840	583,412	3,792,178	1,304,441	1,434,888	218,454	273,068	5,987,974	1870
Total of Ireland	1869	528,201	4,225,608	3,733,675	24,260,888	4,651,195	5,116,314	1,082,224	1,352,780	34,961,590	1869
	1870	534,817	4,246,536	3,801,315	24,708,548	4,351,096	4,786,205	1,449,692	1,812,115	35,553,404	1870
Increase or Decrease in 1870 compared with 1869		Increase 6,616	Increase £ 20,928	Increase 67,640	Increase £ 447,660	Decrease 300,099	Decrease £ 330,109	Increase 367,468	Increase £ 459,335	Increase in Value in 1870 £589,814	

RETURN OF THE NUMBER AND VALUE OF LIVE STOCK IN EACH YEAR, FROM 1861 TO 1870, INCLUSIVE:—

Years.	Horses.		Cattle.		Sheep.		Pigs.		Total Value in each Year.	Years.
	Number.	Value at £8 each.	Number.	Value at £6 10s. each.	Number	Value at £1 2s each	Number.	Value at £1 5s. each.		
		£		£		£		£	£	
1861	614,232	4,913,856	3,471,688	22,565,972	3,456,600	3,911,623	1,102,042	1,377,552	32,769,035	1861
1862	602,894	4,823,152	3,254,830	21,151,785	3,456,132	3,891,741	1,134,534	1,442,905	31,274,583	1862
1863	579,478	4,639,824	3,144,231	20,437,501	3,308,204	3,639,024	1,067,245	1,334,322	30,050,671	1863
1864	562,158	4,497,264	3,262,294	21,204,911	3,366,041	3,703,635	1,095,280	1,369,100	30,774,910	1864
1865	548,339	4,386,712	3,497,548	22,734,062	3,694,356	4,063,792	1,130,953	1,663,441	32,817,007	1865
1866	535,799	4,286,392	3,746,157	24,350,020	4,274,892	4,701,710	1,197,274	1,871,593	35,209,715	1866
1867	524,180	4,193,440	3,797,691	24,682,516	4,884,516	5,372,971	1,235,194	1,542,089	35,157,216	1867
1868	524,793	4,197,624	3,646,796	23,704,174	4,701,149	5,391,646	1,260,278	1,890,972	34,380,416	1868
1869	528,201	4,225,608	3,733,675	24,260,888	4,651,195	5,116,314	1,082,224	1,352,780	34,963,590	1869
1870	534,817	4,246,536	3,801,315	24,708,548	4,351,096	4,786,205	1,449,692	1,812,115	35,553,404	1870

I am happy to state that those members of the Royal Irish constabulary and metropolitan police who acted as enumerators discharged the duty with their usual efficiency. *William Donnelly, Registrar-General, General Register Office, Dublin, August* 1.

THE AGRICULTURE OF IRELAND.

[The following, somewhat abridged, is the speech on this subject of his Excellency the Lord-Lieutenant, at the late annual meeting of the Royal Agricultural Improvement Society at Ballinasloe.]

I BELIEVE that the famous green of Ballinasloe has not ever before been used to such useful purposes as it was applied to to-day, and to which during the next two days it will be placed for the benefit, I trust, of a great number of the inhabitants of this country. I may, perhaps, regret that a larger quantity of stock from different parts of the country, and from England and Scotland, had not been exhibited; for they, I must say, are rather delinquent in not sending animals to the show to-day, but altogether it was a satisfactory show. I am glad to recognise some old friends to-day, one who has been travelling in England—a bull by Mr. Chaloner, from the county of Meath. I am glad to see that after his journey to England he has returned to be able to gain renewed honours here. I am glad to say that other portions of Ireland have sent cattle to the show. I was glad to find that a tenant-farmer from the county of Monaghan ventured to try a lance with my noble host, Lord Clancarty, to carry off a prize in a very important branch of industry—that is, a prize in butter—to his native county of Monaghan. The county of Wexford, too, showed some admirable stock; here and there even other parts of the country were represented. I wish they were represented more satisfactorily. There was one portion of the show that I was very glad to see, and that was the part devoted to agricultural implements; for I believe that nothing is more important in regard to agriculture than the improvement of implements.

I would now refer to one or two more financial subjects—first of all I would wish to call attention to the stock of this country, which has had such a great reputation of recent years—which produces such wealth to the country, and which is so eagerly sought for on the other side of the Irish Channel. I believe that the stock in Ireland has been greatly increasing, and consequently, the wealth of the country, in regard to stock, has also increased very considerably during the past few years. I am not able to give you any statistics, but I can give you a few figures with regard to the stock of the country during the last year. I find that the value of stock in Ireland has increased over the value in 1869 by nearly half a million sterling, almost unprecedented drought that existed. I believe I am correct in stating that in England, and especially in my own neighbourhood of the midland counties, the stock had to be fed with oilcake. As far as the farmers of the country are concerned, I think they should look carefully to the stock; for if I am not much mistaken, towards the end of the year there will be great demand for cattle in Ireland, in consequence of the great number of ports closed up in Germany, for there is annually a great importation of cattle here from Germany, consequently, a vigorous demand will ensue for Irish cattle. The question of the cattle trade is one of great importance to this country. On a previous occasion I have been obliged to allude to it, and since I have been here I have had a good deal of business to transact on the subject. I believe that the value of the cattle trade in this country amounts to over £7,000,000 a-year.

Last year I referred to the Act for the prevention of contagious diseases of cattle in England, and expressed a hope that before another session had passed the same benefits would be extended to this country. I am glad to say the same benefit has been extended to this country, and has had the effect of diminishing the amount of disease in Ireland in store and other stock; but I would also wish to draw attention to an incident which recently took place in the House of Lords, and in which a noble peer who represented Scotland endeavoured to introduce a clause which would have hampered very much the cattle trade of the country. I am happy to say that the Government were able to resist that motion without going into a division. It shows that there is a very strong feeling on the subject of Irish cattle in Great Britain, and I was obliged when I had the responsibility of answering the objection raised, to undertake, on the part of the Government, that we should use in this country every possible means to check the spread of disease, and put the cattle trade of the country on the same footing as the rest of the United Kingdom. I most sincerely trust that we shall continue to receive the support which, I am happy to say, we have already received from the farmers and proprietors of this country in carrying out the necessary restrictions. After saying this, I am glad to be able to state that, in comparison with this time last year, the health of the stock in Ireland is exceedingly good, though we had an outbreak of pleuro-pneumonia. We have in existence at the present moment some regulations which were not legally in force in the spring, by means of which we were able to reduce the number of cases of this kind reported to us to 11. That is a satisfactory proof of the condition of the stock in Ireland, and I am happy to acknowledge the great support that the Government received from the farmers of the country in connection with the matter.

Having alluded to the stock of the country, I may be permitted to come to a subject still more important—I mean the tillage of the land of the country. I believe that every one who has travelled about in this country will admit that there is very great room for improvement in the manner in which the husbandry of the country is conducted. It is a mistake to suppose that if we advocate an improvement in the cattle of this country it is our wish to diminish the tillage of the land. If we improve the tillage of the land there is a great demand for manure and for store cattle, but I believe every one will admit that there is a vast room for improvement in this respect. Every one who goes over the country will see farms of all sizes, large and small, in a terribly backward condition, very little manure being put into it by the money of the tenant. We too often find the tenant living in a house which a stranger would hardly think fit for the habitation of his stock. The stranger would think that the tenant-farmer was exceedingly poor; but I am assured that that is not the case, and that the poor man who appears not to be able to have a decent house for himself, his wife, and his children, is really a man who has a large sum of money, which he hides perhaps in the thatch of his house. I do not know whether the story is true or not, but I was told it, and I was also informed that in the country banks of Ireland nearly £20,000,000 of money was deposited belonging entirely to the tenant-farmers of this country. I say that if that money were laid out on their farms it would return the farmers greater interest than it could when lying in the banks. There is really something terribly wrong in this state of thing. I know not with what truth it is said that the tenant is afraid to show his wealth and prosperity to his landlord. I myself don't feel such want of confidence in the landlords of Ireland.

This Society encourages various modes of agriculture; it encourages the growth and cultivation of new products. Flax, for example, was exhibited here to-day, and we saw some fine specimens from different parts of the country. It is of great importance to encourage the growth of those products, and I think that the encouragment in this way by the Government during past years has been attended with the best results. I believe that what is more wanting, and which must precede the general introduction of a new crop, is the more general knowledge of land throughout the country. All those new crops require very great agricultural care and skill to produce them. Flax requires great knowledge to select the seed, to prepare the land, and to select the rotations that should come, and other agricultural knowledge requiring great agricultural skill. I believe that the West and South of Ireland are admirably adapted for the growing of Flax; but I do not expect that it will be generally cultivated until there is a general improvement in the cultivation of the country. If that takes place, I feel sure you will be doing an immense amount of benefit throughout this country. The northern merchants would prefer home Flax to Flax grown in Belgium and Holland, and I believe that Irish land is able to produce, and that Irish land is able to compete successfully with the Flax growers of Belgium and Holland. On another subject I desire to say a few words. It is a question of very great interest, but it has been one of very great difficulty—the subject of small and large farms. No one who visits the country can fail to observe that it is a country almost essentially of small farms. I perceive that the total of agricultural holdings in 1856 was over 600,000. Of these more than half, or 317,457, were valued by Sir R. Griffith at under £8 a year. In Galway, out of a total number of 38,592, about two-thirds were valued at a valuation of £4 a year; and half, of 797, were valued at £9 or upwards. Now, that illustrates a significant fact, and one to which Englishmen and Scotchmen never have specially devoted their attention.

I do not intend for a moment to give a dogmatic opinion respecting large and small farms. It is a difficult question, and one which I will not, therefore, attempt to decide. If such ever became necessary, and if of necessity a reference should be made, and small farms had to give way to large ones, the change ought to be carried over a large period of time, in order that the political mind of the people should not be disturbed. But I am not at all prepared to go so far as that; for I believe if we look abroad, in various countries—in Switzerland, Italy, Belgium, and Holland—we find small farmers working the land as in this country of Ireland. We see whole tracts of small farms where the people are not only quiet and content, but exceedingly prosperous. I think a very great improvement can be made in small farms in this country—an improvement in those small holdings which it behoves all those who are interested in agriculture to foster and promote. I will not lay down any stringent rule on the subject, but I like to see large farms in districts to which they are suited, and small farms in others. I should like to see a variety in ranges of farms suitable to the capital of the people, the tenants, and of the district in which they are placed.

Now, I would like to instance our model farm, which I have recently visited—I refer to the school farms at Glasnevin, under the able direction of Mr. Baldwin, which are all of different forms and different sizes. It is a good thing to mention even an extreme

case of success. There is a plot of land, consisting of 5½ acres, at Glasnevin, and which had been in a very bad condition until it was taken for the purpose of a farm. I should wish any man to visit that 5½ acre farm, and he will then see different crops growing in succession. The produce of that farm affords maintenance for three cows, while a portion is reserved for other crops. I am told that the nett profits of that farm, which is worked by some of the pupils, whose labour is equal to that of a man and a boy, amount to over £50 per annum. I have said that this is an extreme case; but I think it is worth the while of everybody who has studied the subject to visit this farm, and to bear testimony to the admirable manner in which it has been cultivated. I do not wish to be misunderstood; I would not wish to say that these farms should be spread over this country more widely than at present; but I should wish to see a variety of farms suitable to the means and capital of the farmers, and the nature of the soil.

I acknowledge the energy and civilising influence of the large farmers; but at the same time I warmly sympathise with the small farmers, of whom the mass of the Irish tenantry consist, and in doing so I wish the prosperity and peace of the country to be increasingly secured. On the last occasion I had the honour of addressing this Society I was at Tralee. I then referred to a matter that was beginning to be warmly discussed in the country. I alluded to the Land Bill towards the conclusion of my speech. I called upon my hearers to treat that subject with fairness and impartiality and in a practical spirit. I do not know how far my advice can be said to have been followed during the past winter, but I think I may say that Her Majesty's Government did honestly endeavour to introduce a measure in the spirit which I then spoke. From being a party question it was now happily passed into a law of the land. I believe that no great question has ever been treated in Parliament with so much generosity, and so little of the bitterness of party feeling. I think we may congratulate ourselves on that result. I think that great praise is due to that numerous class in the country who hold responsible and difficult positions amongst us, and who, though they may have differed from the course the Government adopted, offered no serious opposition to the proposed measure. I think that the working of the Act will be marked with the same feeling in the future. I cannot pass from the subject without alluding to the conduct of my noble host, Lord Clancarty. In the House of Lords—in that spirit which has been always attached to his name, a spirit of generosity and patriotism—the noble lord said, that though he dissented from many provisions of the bill, though he thought it in many respects fraught with evil, he, for his part, as an Irish landlord, promised the House that he would do all that in him lay to make it successful. These, gentlemen, I think, are noble sentiments, and should be recorded as such; and I do believe and trust they will be widely followed by the proprietors of land in this country. I believe that the Land Act will set at rest the land agitation in Ireland. It is my honest conviction that good landlords will not be seriously affected by the measure; that their influence will not be diminished, but rather increased, and that the influence of their order will be much greater in consequence of the checks and restrictions which will now be placed on those whose conduct towards the tenants has hitherto lowered them in general estimation.

There is one thing which I hope will come about in consequence of the Land Bill, and that is a removal of the feeling of inactivity from amongst the tenants of the country—the small tenants of the country. I believe that it will be in favour of the prosperity of the small tenants, who will look upon it as a source of security. We hear allusion to the farming, the bad houses, and the want of investment of capital, and of other things which the farmers of Ireland have been accused of; but when the security has been given, when the Land Bill has been passed, that it will leave those illegally inclined without any excuse. The small farmers who have farms in the country will feel more secure than those in a similar position before; and I trust they will be able to show that they are more industrious and energetic than they have hitherto been. I sincerely hope and trust that this Society, which has wrought such great things in the promotion of the agriculture of the country, will have even a wider field in future for its operations.

THE PRESENT APPEARANCE OF THE CROPS.

[FROM OUR OWN CORRESPONDENTS, AUGUST 8.]

[*The following Reports were received too late for last week's publication.*]

COUNTY.	WHEAT.	BARLEY.	OATS.	BEANS.	PEAS.	ROOT CROPS.	HAY.	DATE OF HARVEST.	NAME AND ADDRESS.
ENGLAND.									
YORKSHIRE	Good	Good	Moderate	Bad	Bad	Turnips, a failure; Potatos, good	Bad	August 8	B. Nicholson, Sturton Grange, Garforth, Leeds
DERBYSHIRE.....	Average	Average	Under average	....	....	Looking well for the season	Not half a crop	Now general	John Parkin, Idridgehay, Wirksworth
NORFOLK.....	Variable; on light land there was a thin plant, and consequently the crop will not be an average one	Very variable; on well farmed lands the crop will be a fair one, but not a good sample; on light lands the crop is very indifferent	Not good as a whole, but much improved since the rain in July	....	A poor crop	Generally very good, but wanting rain	Very bad indeed	August 8	Henry Woods, Merton
LINCOLN	On heavy land, over average; on the heath and fens, under average	Much injured by the dry season on light land	A good crop, well corned	A great failure	Not any grown in this district	Swedes and Turnips, good for the season	The worst crop for many years	August	W. F. Marshall, Branston
LEICESTERSHIRE ..	Quite an average crop	Under average	Fair; above average	Under average	Variable; I should say not an average	Generally bad; a few good crops of early Mangel	Wretched; scarcely any mown	August 10	George Turner, Jun., Alexton Hall, Uppingham
SURREY	Average	Very deficient	Under average	Under average	Under average	Mangel, average	Failure	July 20	William Willis, West Moulsey
SUFFOLK	Thin plant; well headed; good quality; not average; very short of straw	Short crop of straw and corn, premature ripeness; quality not promising	Not average; few grown	....	About average	Mangels, average; Swedes, very backward; White Turnips, very late	Shortest crop ever remembered, little or no aftermath	July 25	G. M. Sexton, Wherstead Hall
BUCKS	Average	Light	Very light	Not half a crop	Generally light	Various; Swedes bad	Very light; about one-third of average	Half finished now	Edw. Evans, Boveney Court
	On good land, full average; on the stone gravelly soils, short in straw and thin	Under average	Fair average	Short crop	Good	Some Mangel crop, with deep tillage, excellent. Swedes great failure	The shortest known for years; Clovers half a crop	August 4	John Kersley Fowler, Prebendal Farms, Aylesbury
ESSEX	Above average; very fine	Below average; lean	Average; but short in straw	Average; no bloe	Average; no bloe	Good	Much below average	August 1	A. Hardy, sen., Maldon
NORTHAMPTON	Average; on strong land very good	Under average	Under average	Average, very short	Average	Good for dry season	Almost a failure	August 1	James Bartlett, Whitfield, near Brackley
IRELAND.									
KILKENNY	Blighted	Good	Light	....	....	Light	Light, but well got	August 4	Patrick Grace, Freshford
	Good	Average	Average	....	....	Light	Good	August 6	D. A. Melward, Tullogher
SCOTLAND.									
MORAYSHIRE	Thin; rather under average; fine quality	Fairly good; full average	Good, rather under average	....	....	Dry; suffering for want of rain	Rather below average	August 9	—, Hamilton, Forres

Home Correspondence.

Wheat Crop in South Essex.—The extreme continued heat during the longest days, accompanied with cool nights, has brought Wheat somewhat prematurely to its utmost perfection and healthfulness, insomuch that general operations of cutting began as early as July 25 in earnest in South Essex. Happily, however, notwithstanding this precociousness, the quantity, quality, weight, and brightness of its straw may be almost confidently looked for, on the best and well farmed lands, as quite equal to that of 1868, and many crops are as likely to realise from 6 to 8 qr. per acre (on light land 4 qr., and over) of heavy corn—quite double ordinary crops in wet and cold summers. What value or price it is to be is quite another matter. Long experience has taught us that a pretty fair estimate may be made of a good standing-up crop of Wheat by ascertaining the number of ears contained in a square yard of land, and the average number of grains in each ear; or, what is easier to calculate, any number of such ears gathered promiscuously, small and great ones, say 10 or 20, &c., will suffice as a standard rule, to be proportionately varied by rule of three, or by any school-boy. About 200 good ears of Wheat, from 1 bush. of seeding per acre, averaging 30 grains in each ear, may be fairly calculated upon in most seasons to be grown on one square yard, or a little less than 1,000,000 ears on an acre, which by calculation is equal to 45 bush. per acre, without the fractional parts, reckoning 20,000 grains to a quart, which in good samples very near approximates to truth. Or if 2 bush. per acre has been inadvertently sown, 300 ears, and sometimes more (but the more the worse), will result on the square yard, averaging not more than 20 grains in each ear, and the result, strange as it may appear, about the same, viz., 45 bush. per acre,—provided, however, it is in good dry seasons like the present and 1868, which only seldom happens; but, alas! in wet and cold seasons, of which we have most in England, it is quite different, be it remembered the crop then being much deteriorated, less, and valueless. But some farmers will argue, and say, "This is nothing, for I can produce thousands of ears, averaging not only 30, but even 50 to 80 and many more grains," and feel indignant when told their average growth is only 30 grains per ear; but really 9-10ths of the thickest crops in ordinary wet summers here in England and United Kingdom (and they are most frequently, as before said, in these uncertain climates) do not even realise 20 grains per ear, nay, not 15-fold for each grain sown, although it is possible from 1000 to 4000 fold could be produced naturally and without artifice from single grains. Seasons, however, like the present are always favourable even to both thick and thin sowings, but especially the latter. As a whole we consider this

season a productive and fruitful one for most things, and although hay and Clover for cattle is very deficient, still there is plenty of time yet for autumn productions to make up for a deficient spring crop, and for a full growth of grass feed, and Clover, Turnips, Mangel, &c. : witness 1868. For consolation, generally dry, hot summers are more productive and fruitful than wet and cold ones. It is true that sometimes insects in hot summers commit sad ravages on various crops, especially Peas and Beans; but, thanks to Providence, this year they are marvellously absent on most crops, almost unprecedentedly, from a recollection of 60 years' notice. *Experimenter.*

The Crops on the Blue Lias Stone Brash District of North Somerset.—Although a fair proportion of the land is given to Wheat, the produce of that plant but seldom amounts to 3 qr. per acre in damp seasons, which are most productive on such land; but the spring and summer of this year have been so dry as not to have sufficiently dissolved and washed into the soil the soot and other artificial manures thrown upon it to nourish the Wheat : in consequence of which and the almost absence of any heavy rain, the quantity of Wheat produced will probably not average 2 qr. per acre on the upland, but more on the meadows in the valleys; but that small produce appears to be of fair average quality, and by August 13 most of it will be harvested if the weather continues fine. In consequence of the continued dry, hot weather, except by a few showers, Barley has become ripe too quickly to be well fed, and will be light in quantity and quality, but better than Wheat in quantity; its straw not heavy enough to supply the deficiency of hay. Oats but little grown, and that little very light. Beans nearly an average crop in some places, but deficient in most others. Potatos appear to be a fair average supply, but since the few showers which have fallen within the last two weeks many of the late sorts growing in gardens have sprouted so much as to injure the quality of the Potato. But grass being nearly a surface production, the effect of the long dry spring and summer has been most felt upon the pasture lands, in consequence of which not only is the supply of hay less than half, if so much as one-third, of an average crop, but the grass has been and is still so deficient and scorched that some farmers have been compelled to supply hay to their cattle on good pasture land for a month or more; and the falling off in quantity of milk is so great that double the usual price of that product would not compensate for it. One farmer who rents at 40*s.* per acre, and gets an average of about 1 ton of hay per acre, has this year but 20 tons from 80 acres, including 15 acres of Rye-grass. Another, who pays £3 per acre for very superior land, has this year only 5 tons of hay off 15 acres of good old pasture land. Finally, it is not easy to estimate the actual average loss to the farmer by the very dry spring and summer, but in this district it may be estimated at from 20*s.* to 30*s.* per acre at least. *E. W., near Bristol, August* 9.

The Potato Crop.—Some of your correspondents, myself included, have hitherto reported, "All looking well, and no disease;" and certainly, standing by the side of a Potato field, and looking over it, you see a mass of luxuriant foliage waving in the breeze, and "telling a flattering tale" as to the crop; but, alas! the real underground tale is a very different one, for on examining the tubers, they are found to be growing out, and a brood of Potato parasites forming as in 1868, and tending to render the crop worthless. Therefore I should say, take the autumn sorts—those that are now approaching ripeness, and are thus affected—up at once, place them in small heaps temporarily on the ground where they have grown, keep dry with reed or straw, don't cover heavily with earth to induce fermentation, but very lightly, to avoid it, until again looked over and stored away. *P., August* 11.

The Reaping Machine Trials of the Agricultural Society of France.—Permit us to add a few words to the articles which you have published concerning the reaping-machine trials of the Société des Agriculteurs de France. We note that you repeat the phrase of the Count of Pourtalez, president of the jury, viz., that it was solely owing to the result of the dynamometrical trials that our machine was put behind. Will you allow us to recall the fact that there was a difference of opinion between the exhibitors and M. Tresca, the engineer in charge of the dynamometers, with regard to the manner in which Messrs. Hornsby's machine had been tried as well as our own. We asked at the time for a fresh dynamometrical trial, but those members of the jury who were there did not consider it necessary. As we considered that these trials were, so to say, preliminary, we did not insist, supposing that if there were any errors discovered they would be rectified during the Senlis trial. When the results of the dynamometrical trials at Petit Bourg were announced for the first time at Senlis we at once demanded fresh trials, but the dynamometers were at Paris. We were also informed that the decisions were definitive, and, in fine, that it was impossible to begin the trials over again under the same conditions. However, we are perfectly convinced by our own experience, and the universal testimony of those who use our machines, that a serious error has been committed in registering the traction of our reaping machine. All who know it bear witness to its light draught, and we are constantly on this ground urged to increase the width of cut. Both at Petit Bourg and at Senlis our lots were finished first, and yet our horses were in no way fatigued. M. Moquet, of Mont l'Evêque, and M. Léon Lagny, of Chamont, near Senlis, upon whose farm the last trials took place, judged, like practical farmers, of the draught of our machine by the state of the horses, and each of them bought one of our machines for his own use. The only dynamometrical results of our reaping-machine in competition with others, which are published, are those of the international reaping-machine trials of Ungarisch Altenburg, from July 5 to 10, 1869, the report of which, edited by Professors W. Hecke and G. Krafft, is published by Carl Gerold's Son, Vienna, 1870. At p. 107 of this report the results of the dynamometer trials in kilogrammemètres are given as follows :—Howard, 169; MacCormick, 231; Samuelson, 246; Hornsby, 254. Had the dynamometrical results of Petit Bourg been known before the Senlis trials, we should unquestionably have demanded fresh trials. *James Frederick Howard.* [The above has been sent to us as having appeared in the "Journal d'Agriculture Pratique," August 4.]

Tiptree Rents and Profits.—Your correspondent, "Clodhopper" (confound the clods), might have seen in your columns (see my speech to Newbury Farmers' Club, March 31,) that the sum available for rent and profit at Tiptree was, for 1869, £427 13*s.* 6*d.* As soon as I can find time, I will transcribe the whole of the balance-sheet for his information. I am sure he would feel rejoiced if I could have made a larger profit, but we must take things as they come in farming as in other trades. *J. J. Mechi, August* 4.

Everlasting Pea (Lathyrus latifolius) as a Fodder Plant.—The paragraph at p. 1035 recommending Galega officinalis as a forage plant or fodder, has brought again to my mind the question (which I have often asked myself before) whether the Everlasting Pea, which is so common in gardens and grows with such extraordinary vigour, would not make an admirable green food for cattle. It is a perennial like the Galega and Lucerne, forms a large woody deeply-penetrating root; is consequently independent of drought, and from its large, luxuriant habit would yield a heavy crop of succulent food. Left to itself, it grows from 6 to 8 feet high, and produces much straw, flowers, and seeds; but I apprehend for food purposes it should be cut when about 2½ or 3 feet high, and would, I imagine, have to be cut at least twice in the season. Has no one ever tried this promising plant? If not, I would respectfully suggest that Mr. Mechi, the farmers' pioneer, whose failures (if he ever make any) as well as whose successes equally conduce to the advantage of agriculture, should try the experiment on a small scale, and give the farming world the result of his experience. Before doing so, it would be well to see how horses and cows like it. Can any botanist point to a single species of the genus Lathyrus which is noxious? I would commend it also to the attention of Mr. Hope, at Romford, into whose soil, fed chiefly with sewage, the roots would spread both laterally and downwardly.* *W. Marshall, Ely, Aug* 6.

Leases and Agreements.—I have already referred to the discussion now going on in your paper between Mr. Smith, of Woolston, and "G. A. H." Allow me to make a few brief remarks on some of the opinions expressed by the latter on leases and agreements. He tells farmers they are making too much outcry about tenant-right, or "landlord's wrong," as he seems to think it; and he goes on to warn them that if they are not more cautious, landlords will introduce the system of leases, which would rack-rent the tenantry here, as it has done in Scotland. I scarcely expected such opinions from this gentleman, for having read his remarks with great interest, I found that he is greatly in advance of most of your English landlords. He has expended large sums of money in improving his estate by means of draining, liming, &c. On one farm alone he has spent upwards of £2000 in lime and manures, all of which he had to cart more than ten miles from the station. Having got that farm into good order, he is now letting it to an enterprising tenant on a 21 years' lease, so it is plain he has at least learned that leases are of advantage to the owner. I only wish other proprietors would believe so. He makes one mistake when writing about tenant-right. He first tells us that he, as an owner, has laid out all that money on manures, and then says that were he to ask an incoming tenant to repay him that outlay, he would simply get laughed at. This is a very poor argument. Does "G. A. H." wish us to believe that he laid out all that money without being very sure that he would be well repaid?—he will certainly take care to let his farm at such a rent as will refund his outlay with good interest. This is no similar case to that of an outgoing tenant at all; when the tenant leaves his farm, he is done with it for ever, and unless he gets repaid for unexhausted improvements, he must leave his hard-earned money behind him. Not so the improving landlord; he gets repaid through the increased rent. I might go on to take exception to some of the clauses in the agreement which "G. A. H." proposes to make with his tenant; for instance, the tenant has to bring 120 tons of lime on to the farm every year. Now lime takes 10 years to repay its cost, and if any tenant binds himself to expend £100 per annum on lime during the last eight years of the lease, if he knows his business, he will take care to offer a less rent than he would otherwise do. Considering lime as being a stimulant rather than a manure, I can scarcely see the advantage to be reaped by "G. A. H." from enforcing this condition. And now, as to leases. Is it not rather astonishing to see "G. A. H." telling us in one paper that he is willing to let his land on lease, while in his next he objects to the system theoretically? However, there is one thing plain, and that is—he believes they are beneficial to the landlords' interest, or he would not adopt the system practically. Whatever is really good for the landlord in the long run must also be good for the tenant. The bugbear which is here held up to frighten farmers is that leases have rack-rented the tenantry of Scotland, and will do the same here if introduced on a large scale. I should have given "G. A. H." credit for knowing better than that. The farmers of Scotland are not rack-rented as a rule. In some isolated cases estates are foolishly entrusted to lawyer-agents, who, in ignorance of their principal's true interest, have introduced the ruinous system of letting land by public tender, and in such cases things are bad enough. But the lease system is not responsible for that any more than science, which has brought the weapons of warfare to their present high state of perfection, is to blame for this horrid war which has so lately and so suddenly darkened the horizon of civilisation. The farmers of Scotland have to thank the lease system for their present high position in the agricultural world, and nothing else could have done so much for them; and if ever English farmers are to gain the same state of comfortable prosperity, the sooner leases are adopted the better. "G. A. H." says that the tenancy-at-will system, which has brought English farming to its present high position, cannot be a bad one, and that we ought to be content with it. This is no argument : had our fathers been content with things as they found them, we would still be travelling in stage-coaches, and it would have taken "G. A. H." as many days as it now does hours to travel from his Welsh hills to the agricultural show. This is an age of progress, and nowhere is it more required than in English agriculture; true, we have many instances of what energy and industry can accomplish even when trammelled with the swaddling bands of tenancy-at-will, but those are only to be found in cases where active farmers, indulgent landlords, and intelligent land agents, chance to be all interested in one estate. Tenant-right is but a makeshift at the best. So long as we are bothered by tenancy-at-will, by all means let us have tenant-right, just to assure the farmer (who has sunk his all, it may be his thousands, in his farm) that he can never be evicted without having left to him at least as much as will pay his family's passage to another land. *W. Scott,* 82, *Mark Lane.*

Live Stock for the West Indies.—If any of your readers have at any time sent out live stock (sheep and pigs) to the West Indies (Jamaica), will they kindly inform me what breed or breeds were considered best? I am rather in favour of Southdown sheep, and the small black breed (Berkshire) of pigs. Any information will oblige *A Colonist.*

A Light Land Farmer on Irrigation.—The letter of "A Light Land Farmer," quoted from the *Times*, in your impression of the 23d ult., p. 1000, is deserving of attention. The losses that must be written up in many ways by occupiers of light land this season, will amount to something serious. Surely, as "A Light Land Farmer" expresses it, "in this inventive age we can devise some means whereby, at least, the root-producing portion of the farm, as well as grasses, might be saved in a season like the present, and materially increased in ordinary seasons by irrigation." He will find the subject has engaged the attention of others at pp. 343, 540, 1869, and our practical friend, Mr. Mechi—apron-string farmer as he is pleased to style himself—and many others, no doubt, can give useful reliable data on this subject. *West Indian.*

* A great political authority would say "vertically," but that word seems to me to point upwards.

Societies.

NORTHUMBERLAND.

THIS Society held its annual show of agricultural produce and machinery at Morpeth on Wednesday of last week. The new spirit which has been infused into the management of this county association caused an increased number of entries to be made in the leading classes of live stock. The number of entries this year, and on the last occasion when the Society met at Morpeth, in 1865, are as follow :—

	1865.	1870.
Cattle	62 ..	113
Sheep	91 ..	110
Horses	140 ..	265
Pigs	38 ..	35
Wool	9 ..	26
Implements	136 ..	295
Dogs (shepherds')	— ..	52
Poultry	— ..	84
Total	476 ..	939

By this official statement it will be seen that this Society is making great progress, and now that so public-spirited and persevering a man as Mr. Jacob Wilson got through his first year of secretaryship, we have no doubt that this progress will continue at the same rate for some time to come. This view is further supported by the fact that a more genial and public-spirited body of men than the Northumbrian farmers we have never seen in any county in Great Britain. As regards the show itself, one of the experienced judges said—and in this we agree—that, next to the Yorkshire show, this was the best country meeting he had ever officiated at.

The only fault we saw arose from an attempt to make the arrangements scrupulously complete, and this consisted in reading the list of awards aloud after dinner, and the simultaneous delivering of cups and cheques by the Chairman. These proceedings are insufferably tedious after dinner to the greater portion of the company; besides, as so many members and visitors now travel by train, a "thin house" is sure to be the result before this list and a dozen toasts (and at Morpeth there were 17 toasts) are got through with. As to the show itself—

Of the Shorthorns, we may say the EARL OF CHESTER, the 1st prize aged bull, was an extraordinary animal for depth of body, and fine fleshy and masculine character, on short legs. He was by 9TH GRAND DUKE (19,879), and *Young Emma*. He was bred by the late Mr. Saunders, of Nunwick Hall, Penrith. The 2d prize, ACE OF TRUMPS, was 1st at Hexham (p. 1073, where we referred to his fine form and general character). Lady Pigot's *Queen of Rosalea* was among the cows, where she was 1st, and took the cup for the best female. BYTHIS was also there, and for this animal a cup was also awarded, for the best bull of any age; but the EARL OF CHESTER appeared to us to be more deserving of that special honour. The awards in the Shorthorns did not give general satisfaction, for the 2d prize cow was light of bone and flesh, as compared with Sir Mathew White Ridley's commended cow, *Evelina 6th*. But the latter was greatly over-fed, which might have had a proper influence with the judges. There was, however, not much to choose in this respect between her and the 2d prize. The calves were not strong classes, and these collections might, we think, be generally dispensed with at country shows, as they are in the Highland and Agricultural Society.

The few Scotch cattle there were present, shows how nearly they have been superseded by the more "growthy" Shorthorn. Of black cattle there were only two bulls, one in each class, and five females in the two classes, while the Ayrshires appeared as "extra stock," and numbered only five.

The sheep were a capital collection of the North country breeds. Cheviots, Border Leicesters and black-faced hill sheep were on their own ground. Mr. Thomas Eliott, of Hindhope, was great here as well as at Dumfries. His fine rams and splendid ewes were, however, well deserving of all the honours he got. The Border Leicesters could not well have been better. Their full coats, and long, broad, firm backs, were highly meritorious, as characteristics for paying the rent and feeding the people. Messrs. Laing, of Wark; the Rev. Mr. Bosanquet, of Rock; Mr. Torrance, of Sisterpath, Dunse; Mr. Simson, of Lauder, Jedburgh; and Mr. Langdale, of the Morpeth district, were the principal exhibitors; and the various positions in which they form show how highly this breed is estimated in the North. The blackfaced ram sent by Mr. Oliver was an extraordinary sheep. He was 1st at Hexham last year as a shearling, and has never been beaten; nor is he likely to be, if he continues his present good form. Mr. Hutchinson's four Leicester rams and pen of ewes were the only lots of the kind shown.

The horses were an extraordinary show. There is no mistake about the character of the horses in the North of England and Scotland. Their compact form and hardy character would enable them to walk clean round the showy but delicate Suffolks, if each breed was fed alike. Mr. Smith, of Welkington, Coldstream, sent a pair of the six he bought in May at an average of £57 16*s*. 8*d*.! These are 5 and 6-year-old Clydesdales, and such a price for purely working horses (geldings)—all these were on one farm—is, as far as we know, unprecedented. The 3-year-old fillies were a capital class, but the prize was awarded to Mr. Lister's Lincolnshire animal, which was 1st at Winchester and Oxford. This, in our opinion, was a mistake, for however good the Lincolnshire filly may be as regards size, and the promise she makes of breeding large dray-horses, she is not of the north country agricultural stamp. Her top and quarters are certainly perfect, but this cannot be said of the comparative size of her body and leg below the knee; nor of her feet, which are small. Mr. Spraggon's 2d was 1st at Dumfries, where he bought her, and we should have given her the 1st place at Morpeth. There were also some capital brood mares, pairs of geldings, and colts for farm work.

The field horses were also good in many instances. The hackneys were besides an excellent collection, and when we say that the judges deliberated for some time between Mr. Stephenson's black horse—which was 1st at Wakefield, beating Mr. Hornsby's grey—and six or eight others, this view of their good character is officially confirmed.

There was no jumping at Morpeth, and this redounded as much to the credit of the authorities as it added to the pleasurable and quiet business-like character of the meeting.

The pigs were not a numerous collection, but some of them were very large. The weakness of the home breed will be understood when we call attention to the fact that every prize went out of the county.

WHITBY.

Dairy Farming.—At the last monthly meeting of this Chamber of Agriculture, Mr. J. G. W. Farsyde in the chair, Mr. KERR, jun., said:—The first consideration in establishing a dairy must be the class of land and the quantity and quality of the animals it was calculated to carry. It was advisable to have them rather under than over the capabilities of the soil. In the former case, the animals would improve and the land have a better chance. This would apply to all breeds of animals, and its recognition in purchasing breeding stock would not fail to bring about a successful result. A man having a large capital might purchase a large framed animal, and endeavour to bring his land up in condition to be able to feed it; but whatever the outlay might be, he could not so easily alter the character of the soil in a short time. In fact, some men would never be able to keep such animals with advantage. It was, therefore, important to keep the land and the stock in about the same ratio in improving condition.

If the dairy was to be the principal source of profit on the farm, then, apart from every other consideration, the breed of the stock ought to be selected for its large milk-giving capacity. On the other hand, when milk, butter, and cheese were only a consideration in conjunction with the breeding and rearing of cattle as a source of profit, then a more valuable breed would be desirable—one which would reach maturity at an early age, so that in whatever condition it was sold off it would bring remunerative prices. For their quantity of milk, for keeping in good condition in such a country as this, he thought the Ayrshire breed could not be excelled, though they were little known or appreciated in this part of the country. The breed was characterised by hardiness of constitution, the cows keeping themselves in good condition, whilst giving a large quantity of milk in proportion to the food they consumed. There was a great objection to keeping large framed cattle on light land, as must be seen, and the loss was little more than covered by the whole season's produce. The Ayrshire cows had a compact frame, and were easily kept up, and at the close of the season they would invariably find the cows in good condition. He believed they could not try a better cross than one between a pure Shorthorn bull and a pure Ayrshire cow. A stock thus brought up would be very valuable, inheriting, as it would, the large milking capabilities of the one and the fattening qualities of the other.

In every case where the object was two-fold, the stock should be sufficiently well bred to be fattened and cleared off in two years, so that the permanent stock of milkers might be as little interfered with as possible. Pure breeding tended largely to economise food, and the quality of arriving at early maturity materially hastened a return of capital. A well bred bullock would bring as much at two years old as another would a year later, if its parents were coarser bred. The possession of well bred animals afforded a certain amount of honour and pleasure. Nothing could be more unsatisfactory than putting good food into a bad skin, and no amount of care could make up for a want of breed. If the animals had to be kept as stores, they were always remunerative in proportion to their quality.

At some dairy farms very good results were obtained by rearing only the heifer calves, keeping them till after the second calving, and disposing of them towards their third calving time, when they could generally be sold for high prices. By adopting this plan, the produce of the dairy might be lessened to some extent; but, on the other hand, there were never any old cows to be weeded out, which must be sold for less value, and thus make a great inroad on the profits of the season. Besides, the milk of the aged cows was not so pure in quality, and therefore not so productive, as that of younger cows; whilst, taking into account the greater amount of food they required, a consideration which could not be overlooked, there was an inducement to part as quickly as possible. They should seek to get a good name for turning out thriving animals, and good specimens of their respective breeds, in order to ensure success.

It was of the greatest consequence that no pains should be spared to procure purely-bred bulls. No cross-bred animals, no matter on what pretence, should be used for breeding purposes. However hardy the constitution, or however good looking, the stock would go down. A most inestimable boon had been conferred on farmers by those gentlemen who, with most untiring perseverance, devoted their time and capital to the selection and improvement of different breeds of cattle, and especially in Shorthorns. Such praiseworthy examples were by no means scarce in any part of the country, and many had now the good sense neither to pamper nor overfeed their animals, but turned them out in good breeding condition, such as they might be expected to be kept in by those who purchased them. At the present time it was an easy matter to procure shorthorned bulls of good quality at prices within the reach of men of moderate means. The extra price of such an animal now was not worth consideration, as it would very soon be covered by the improvement of the young stock, and by the time they were two years old the bull might be considered out of debt, and his influence for good would be felt for a long time afterwards. He was afraid that some people were too impatient of results on this point, because they did not see the full benefit of their outlay all at once, and would go on from year to year using the best animals they or their next neighbour happened to possess.

It must be admitted that the success accompanying the breeding of good cattle under proper management would be much greater than the breeding of inferior stock.

It was of great importance to the farmer owning a number of cows that his success in rearing calves should be as great as possible. Every calf lost was of great consequence. Not only had their places to be supplied, but he would find it impossible to replace them with animals of the same stamp as his own. The greatest care, therefore, should be taken during the time of gestation, and all cases of premature birth should be avoided as much as possible. All doorways should be made roomy enough to prevent crushing, and instead of the rough usage sometimes administered, there should be kind and gentle treatment, and anything conducive to the comfort of the animal ought to be studied. He felt sure that only a person of very narrow mind could regard these directions as unnecessary to the remunerative working of the dairy. Parturition in the cow might be attended with difficulty, and required judicious action, and ought to be well understood. It was most disgusting to see the way in which cows were treated sometimes under these circumstances. Main force was exercised, and the result of such treatment was often the death of the cow from inflammation and its consequences. Every man would agree that this conduct was cruel. A cow ought to be left to herself, and kept as quiet as possible, except under extraordinary circumstances, and then only such force used as was consistent with the case. Then, a calf should never be allowed to suck its dam when she was intended for milking purposes, as there was a difficulty in teaching it to drink afterwards, and the mother having taken kindly to its offspring, refused to let her milk down when it was taken away. The calf should be fed frequently with its mother's milk, in small quantities at first; and, in order to give it a fair start in life, it ought to feed on new milk for three weeks, or longer if delicate. Then oilcake, gruel, sliced turnips, and a little hay should be given in sufficient quantity, according to the age of the animal. It would thus be kept in a growing and thriving condition. It was a well-known fact that quarter-ill, a disease so prevalent and fatal amongst young cattle, was less frequent where they were liberally fed on cake.

No greater mistake could be made than to allow young animals to go back in condition. Wherever such was the case, and they became stinted in their growth, they could never fairly recover the effects of it. During the first month it would be found a safe plan to give three doses of castor oil, which might prevent many of the ailments to which the young animals were subject. Each calf ought, if possible, to have a separate compartment, and be left at liberty. They would do much better in this way than if tied up by the neck. If they could not find a separate compartment for each, they should put three or four in a loose box or comfortable shed, where they could be easily fed, and with a rack or manger for their use. The better they fed a cow, the better her produce would be, and the greater the profit. Yet how many owners of dairy stock acted as if it were of little importance whether the food was up to the mark, either in quantity or quality. Such treatment was just the reverse of the teachings of reason and common sense. No animal was more grateful, and gave a more liberal return for liberal treatment. Without good food a cow, however good her milking qualities might be, would not continue long in full profit. During the summer months the pasture was their principal dependence, and on good land nothing else was required, but much harm was done by allowing cows to remain in the fields far into the autumn while in a milking condition. During cold and wet nights they could only seek out the best shelter the hedges would allow, and there lie down, whereas a small quantity of food in the house would be as good as what they could get out-of-doors, and they would be kept warm and comfortable. If they lost flesh in the winter it was not easily made up again; besides, at that season butter was scarce and prices were rising, and so it paid to give both food and shelter to keep up the supply of milk.

The quality of the food and the regularity of giving were most important and essential matters. There was a striking difference between the milk and cream of cows fed on hay and straw and the milk and cream of those fed on cake or meal in addition, the former being comparatively thin and poor, while the latter was thick and rich. Not only was the produce of the dairy increased by cake, but the manure made was of very superior quality. This was a fact of great importance. It could not be expected that pastures would continue to yield the same quality of milk, butter, and cheese, unless some return was made to keep up their

fertility. Many of the large dairy farms of Cheshire had been allowed to get into such an exhausted condition, that the farmers had to resort to crushed bones, and apply them at the rate of 7 cwt. and 8 cwt. to the acre.

The construction and careful management of the dairy demanded serious attention. If this was neglected, it was in vain that good cows and good food were provided. There were many dairies in which no expense had been spared to render them perfect, but these were principally on the home farms of gentlemen. With the ordinary farmer the case was very different. The dairy ought to have a north or north-west aspect, and away from the vicinity of manure, refuse, or other sources of offensive smells, which were almost inimical to dairy produce. The floor should be laid with cement or tiles, to prevent damp. They knew in how many cases the dairy was the contrary of all this. With regard to the utensils, he had not much to remark, and he doubted much whether the leaden cooler could be surpassed, except by glass. There were a great many new inventions in the way of churns, many of which cost a lot of money, and were, at the same time, comparatively useless. The barrel churns, in simplicity, were scarcely to be surpassed. In making butter, the great desiderata were cleanliness, good ventilation, and the presence of pure air. The improvement in the art of cheese-making, especially in the large dairy districts, had been very great; but it could not be denied that the making of cheese was still in an imperfect state, and it was therefore desirous that men of patient research should apply themselves to this subject. It was well known that many individuals in this district had attained a high standard of perfection in this art, but many were still far behind. He believed that cheese-making was no exception to the rule which applied to other branches of agricultural industry—that science might yet do much to improve it, and materially add to the practical results.

Notices of Books.

Co-Operative Agriculture: *A Solution of the Land Question.* By W. Pare, F.S.S. Longman & Co.

Sufficient security of tenure to encourage the enterprise of a tenant seems to us the more probable "solution of the land question;" here, however, is a history of the Ralahine Co-operative Agricultural Association in County Clare, which the author contends leads to a different conclusion. It is indeed the history of disaster, but that is no condemnation of the principle which the author advocates, for the disaster was due, not to any failure on the part of the members of a prosperous association founded on that principle, but to the failure and disappearance of the landowner whose estate they occupied, and had to abandon. The story is well told, and has sufficient agricultural instructiveness to make it good reading for the readers of the *Agricultural Gazette*, to whom accordingly we commend it. We prefer, however, to illustrate the subject by an extract from an appendix to the work, giving the fortunes of the co-operative principle on our own side of the Channel:—

"In the year 1839 14 years, therefore, before the commencement of the enterprise of the Rochdale Pioneers, which has attained such gigantic proportions—the idea suggested itself to a Suffolk squire* that he would attempt to apply, by way of experiment, the principle of co-operation or co-partnership to a farm. Selecting 60 acres of land of medium quality, furnished with a rough but not unsuitable homestead, he formed his little company of shareholders, all of them taken from the class of farm labourers, to which he gave the name of the Assington Co-operative Agricultural Society. The number of the original shareholders was 15, who put £3 a-piece into the concern, by way of subscribed capital; the landlord—to give his bantling a chance of life—liberally advanced to the co-operators the sum of £400 without interest, on loan.† The Society has grown and prospered. The occupation has been increased from 60 acres to 130, the number of shareholders has been enlarged from 15 to 21. The present value of the shares, as the bailiff told me, is 'all of £50.' All years have not been equally remunerative; but there has not been one since the concern started without some little matter to divide. The company have repaid the landlord all the borrowed money, and all the stock and implements on the farm are now their own. The stock consists of 6 horses, 4 cows, 110 sheep, and from 30 to 40 pigs. The rent of the land is £200 a-year, the company paying tithes, rates, and taxes. The farm is held on a 14 years' lease, which is on the point of being renewed. The land is farmed on the four-course system of husbandry, and ordinarily employs five men and two or three boys. The members are not bound to work on the farm, which, indeed, could not find employment for all; but it is understood—though there is no rule to the effect—that if a co-operator is out of work elsewhere, he has a claim to employment before any other man. When a co operator works on the farm, he is paid wages at the usual rate; and if he were not an efficient labourer, there would be no scruple about discharging him. * * * The landlord chose the original members, and claims to have the approval of the new members; but he does not interfere with the company as regards the cultivation of the land, more than he would with any other tenant. The premises are required to be kept in repair by the tenants, the landlord finding rough materials. They are to be insured in the amount of £500, and every 12 years the farm is re-valued. A member failing into difficulties can have a loan advanced to him to half the current value of his share—a privilege, however, I was informed, which has rarely been used. The annual profits are divided equally among the shareholders. Among the members are four widows, one of whom has four small children; they do what they can for themselves, and up to the present time have been able to maintain themselves by their work and the dividend on their shares, without the aid of parochial relief. Indeed, the guardians would disallow relief in the case of any persons possessed of property of the amount represented by the value of a share, so that the scheme has a direct tendency to diminish pauperism."

* J. Gurdon, Esq., of Assington Hall, near Sudbury.

† The capital was below the ordinary estimate per acre, but seems to have been sufficient to keep the land in good heart, and cultivate it profitably.

Stables and Stable Fittings. St. Pancras Iron Works Company, London.

In this little book of 80 pages the St. Pancras Company claim to give capital and trustworthy advice on the subject, though perhaps "they say it who shouldn't say it," seeing that it is their own wares and manufactures which they recommend. We have, however, looked through the book, and are convinced that it is one which should be in the hands of every one about to erect or fit up stabling.

Farm Memoranda.

MERSE OF BERWICKSHIRE: *August* 13.—Harvest has now been in full swing for a week, and lucky it is that most of our crops can be cut by machinery, for there is scarcely an Irishman to be seen. Perhaps they are not aware that we are ten days earlier than last year; indeed, a daily blazing sun has brought things forward surprisingly, and has forced us to leave most of the second Turnip hoeing to a more convenient season.

The earlier Swedes and Turnips are broad enough to benefit by the nightly dews, but it is otherwise with the larger moiety of late and tender plants; and pastures are so thoroughly burnt up that stock must have corn and cake, unless they can fall back on a reserve of invaluable Vetches.

It is to be noted, by the way, that matters are worse since the thunder showers of the 5th, which shows that dry grey weather is better for grass than scorching sun after rain.

Barley is a grand crop, mostly of fine quality, yet not without burnt spots. On good and rich soils Wheat is fair, and Oats well feathered; such soils are sure to do well in a dry year, but they are quite exceptional. In general, Wheat is thin and unequal, and of limited average; while Oats are in every respect a short crop, although less injured by segg-root than they were two years ago. The snuffy heads were well washed before cutting, and the quality of the fodder will, with fair weather, be superb. Beans are well podded below. In Potatos the blanks are pretty fairly covered in, but the tubers must suffer from the new customary second growth when rain comes. In the meantime, streams are perhaps lower than in '68 even, and water-carts are in general use. *F. T.*

HAMPSHIRE.—It is somewhat difficult to estimate the Wheat crop this year, because on the light soils so much of it lost plant in the winter. There is, however, a compensation in the fact of a large breadth having been sown upon the cold and strong soils which in some wet seasons connot be sown with Wheat. There having been no impediment during the autumn, an unusually large lain of Wheat was sown, and upon this kind of land the crop is found to be very fine; and although the weight of the grain is not better than it was in 1868, yet its strength and quality have never been surpassed. On the light soils, where thin of plant, the crop of straw is of course very light, but the sheaves are heavy, and where the crop has been tested by threshing it is found to exceed the general expectation. The Wheat crop must, therefore, be written a full average, but will in all probability exceed an average.

The Lent corn has suffered from the excessive drought, so much so that Barley (although where early sown on good and strong soils is a very fine crop and a good malting sample) on all light, and what is commonly called Barley soils, the crop is very bad. It must, therefore, be considered much under the average.

Oats as a crop, for the generality of soils in Hampshire, require a showery season to come to perfection. This crop has in consequence felt the effect of the absence of rain so much that not only is it beneath the average, but is probably one of the worst ever grown.

Beans may be reckoned below the average, for although the winter Beans in some cases are well podded, yet the haulm, is very short, whilst spring Beans are very deficient.

Peas are always a precarious crop, and it is seldom they yield well in a dry summer. They are, however, this season podded well, and must be called over an average, whilst the haulm, being free from blight and well harvested, will go far to assist the deficient hay crop.

In our last report hay was stated as one of the worst crops ever known; the aftermath, or feed, is equally bad, in fact there is no second crop of field grasses. Root crops generally are very deficient. Mangel is a fair plant, but very much injured by grub. Swedes and forward Turnips are comparatively a failure, for on many important farms not a Swede is to be seen, on others the plant very irregular. Late Turnips, which are just coming up, may make a tolerable crop if the autumn proves favourable. Hay is selling at an exorbitant price, such as we think cannot be maintained, with corn and the substitutes at present prices. The prices of stock sheep and store cattle are comparatively low, and cannot rise much in the face of a deficient hay and root crop, and the adverse state of the money market. It is satisfactory to find that although the Potato crop is deficient, yet the tubers are sound and likely to continue good, and in the event of any serious rise in the price of corn it would be of some importance. New Wheat comes very slowly to market; as yet little has been secured in a state fit for immediate threshing, and nearly one third of the crop is still in the fields, whilst the heavy showers which are prevailing will retard the harvest very much, and in some instances the crop has been carted in bad condition. The peculiar dry spring and summer has affected injuriously all light soils, but it is interesting to compare the difference this year of well managed farms on the chalk and those on the gravel. The former having suffered far less than the latter, the inference is that high farming and liberal expenditure is safer as an investment on chalk soils than upon gravelly soils. All kinds of seeds for fodder crops are dear, but this may be met favourably by sowing early a lesser quantity of seed than usual of Trifolium, Tares, Rye, Winter Barley, &c. *Joseph Blundell, Southampton, August* 10.

THE ROMFORD SEWAGE FARM: The irrigation of land by sewage is a subject which has of late become of great interest and importance, and on Tuesday of last week a party of gentlemen, invited by Mr. W. Hope, visited Breton's Farm, Hornchurch, which has been purchased by the Romford Local Board of Health for the disposal of their sewage by irrigation. The main object of the visit appeared to be for the purpose of inspecting the result of the application of sewage to the land and crops, which has, notwithstanding the difficulties that surrounded him in the first place, been carried out with a great degree of success under the skilful management of Mr. Hope. On the arrival of the company at the house, they at once proceeded to look over the farm. One of the first crops to which attention was drawn was a piece of Italian Rye-grass, sown on March 19, since which four crops have been cut, averaging 7½ tons per acre, and sold for £1 per ton on the ground. Close by was a piece of Dalmahoy Potatos, planted on April 2, which were producing upwards of 1½ cwt. per rod, and worth about £25 per acre. Some of these were very large. Some Early Rose Kidneys were also shown, which produced 10 or 12 at each root, many being from 4 inches to 7 inches in length. Some Beans and Peas, sown on April 2, produced—the former £9, and the latter £15 per acre, without the straw. Another piece of Rye-grass, sown April 9, will be ready to cut for the fourth time in a few days. Next came some Dioscoreas, or Yams, planted on June 6; adjacent to which were some very large Jersey Cabbages, about 3 feet in height: these, if successful, and under favourable circumstances, may reach a growth of 10 feet. A little further on was a specimen patch of Clover, sown on May 23, which was very thick, and about a foot high. Adjoining were about 4 acres of transplanted Mangel Wurzel, looking rank and strong. Another crop of the same kind exhibited some very fine roots, many of the "globes" being over 2 feet in circumference, and some of the "long" 2 feet in length. Close to these was a crop of Parsnips, sown on April 28, which averaged from 1½ inch to 2 inches in diameter, and of a proportionate length; also a fine crop of Cauliflower, planted on July 19. Some fine Carrots, crimson Beetroot, and Runner Beans are also growing. In addition to those already named, there were some fine pieces of Bunching and other kinds of Cabbage, which promise good crops, having been planted about the middle of June, and being very regular. A strip of a newly-imported kind of grass, called Bromus odoratus australiacus, was sown on June 4, and was cut on August 1: this, if the trial proves successful, it is expected, will, to a great degree, supplant the Italian Rye-grass, being a perennial, and lasting much longer than the latter. Following this comes a fine crop of Maize, or Indian Corn, for ripening, sown on June 2: it averages from 3 feet to 4 feet in height, some of the heads reaching nearly, if not quite, 5 feet. A strip of American Oats looks very fine, though somewhat laid by the recent storms; these are said to produce 20 qr. per acre. Close by was a crop of intermediate Carrots, about 4 acres in extent, sown on April 4, a month later than they ought to have been. Some of these have already been cleared off and sent to market, where they fetched at the rate of £41 per acre. Those that still remained had been sold as growing at £21 per acre, it being worth the additional amount to prepare and get them to market. The above may be considered as the principal crops; but there are many others, most of which have been put in for the purpose of trial, and are not large in extent, but all appear to be more or less successful. As each crop is labelled, showing the time of planting and the results that have

been achieved, the beholder cannot but be astonished at the rapidity with which the various crops have sprung up, and reached their present state of growth.

With regard to the manner in which the sewage is put upon the land: it is first pumped to the top of the engine-house, and then conveyed in sheet-iron troughing to about the centre of the farm, where it branches off in all directions, there being outlets at short intervals, which can be opened for the discharge of the liquid or plugged up, or even set to a certain quantity, as required. The sewage eventually flows into channels of concrete or earth, and thence again into smaller off-shooting channels, which run along in the crown of the beds, the ground having been originally laid out in proper inclines; these smaller channels are then dammed up where required, and the sewage overflows the beds. Of course there is a large amount of effluent water, which percolates through the soil, and this is carried back again in a state of purity to the tank, or down to the river, at pleasure, by drainpipes laid at a depth of 6 feet from the surface, and at a distance of 150 feet apart. The effluent water was clear and sparkling; most of the company drank some of it, pronouncing it excellent. Though the system and works are not so complete as they will be after a time, yet, judging from the present appearance of the crops, there can be but little doubt of the success of the project when it shall have been carried out in its entirety; and we cannot but congratulate the Board and the rate-payers of Romford on being the owners of what appears to be so valuable a property, and one that will render such large returns. It is also a matter of congratulation that a gentleman of such experience as Mr. Hope has been secured as the first tenant.

The party, having completed their survey, were entertained by their host in a spacious barn, gaily decorated with flags, where a most *recherché* spread had been prepared under the management of Mr. P. Reynolds, of Romford. *Abridged from "Essex Herald."*

The Week's Work.

AUGUST 20.—*Corn Harvest Operations.*—Continue as directed for the previous weeks, with such difference as the change of latitude northward demands. Although the operations themselves, as working the reaping-machine, binding, stooking, and stacking, North and South, closely resemble each other, and are easily described, yet it is otherwise with the various details that call into exercise the judgment of the farmer, as the weather, state of the crops, and when they are fit for stacking, and so on. The lower temperature, often below freezing point at night, is in favour of the corn keeping in the stacks, but the increase of moisture so common at this season is the reverse; and if we are to judge of facts by the heating of stacks and sprouting of corn in the stooks, the balance, we are apprehensive, will be against the North of England and South of Scotland during the latter half of this month. There is nothing more difficult than the harvesting of corn when the atmosphere is highly surcharged with vapour, for instead of drying, the standing corn and stooks absorb moisture, and thus become more wet. In such weather corn and straw both lose colour, quality, and value. Small sheaves should be made with only eight or ten to the stook if the straw is long, and only six to the stook if the straw is short; some put on two hood-sheaves, and a well hooded stook will carry off rain for a long time, but when the stook is badly set, and the hoods improperly put on, they often do more harm than good, and on that account hooded stooks have become the exception—the object now aimed at in setting a stook to fend rain being to bind the straw straight in the sheaf, to plant each pair of sheaves opposite each other, and bring the stook to a fine ridge, as in thatching a stack, so as to carry off the rain to either side. A well-set stook has a workmanlike appearance, and nothing is more short-sighted on the part of farmers than to allow their servants to get into the slovenly habit of the contrary practice.

Oat Harvest continues in advance of Wheat northwards. It is easy accounting for this when the fine seed-bed and the early sowing of the former are taken into account. For a similar reason much spring Wheat will be cut before the winter crops. Most of the crop is standing, and easily cut and stooked, and will be soon fit for stacking. Laid fields of Oats are an exception, at least in the South, and we saw very few in the North. Much of the crop, on the contrary, is unusually short from premature ripening, and will require a sharp knife to make a clean cut. The straw generally this year is fine and rather wiry, especially at the roots, so that the knife of the reaper will require to be kept in proper cutting trim.

Drying Corn artificially in Harvest, so as to fit it for stacking or threshing, is one of the many improvements of the day. Like all others in farming, the practice now in use is doubtless subject to further improvement, for, as has justly been observed, "there is no end to improving a thing;" but the practical question is to make the most of inventions as they are, or it may be put in an interrogatory form, thus—What is the amount of advantage gained by those using drying machines and apparatus this year over those who are not using them? What are the profits of the one, and what the losses of the other? The losses in the harvest field are generally greater than credited, grumbled at as things unavoidable. Such, however, is no longer admissible. To look on at corn and straw being spoilt in the stook is now unpardonable, provided the expense of drying is less than the loss sustained.

Stacking Corn is a work requiring the highest degree of skill and art to perform it properly, the stacker being generally considered the best man in harvest. An apprenticeship is necessary to learn the art. A well built stack is not a question of mere form and outward appearance, although too apt to be viewed in this light. Thus a good stacker will "build out the rain," a bad one will "build in the rain;" the former will "prevent a stack heating," while the latter will "set the stack on fire," and so on. These are extreme but familiar expressions in most places, embracing a broad difference between the value of the labour of two workmen who too frequently look for the same amount of wages. Seasons of short straw, too, such as the present, in many counties call into exercise the highest talents of the stacker; and every farmer knows what a relief it is to have a man in the stackyard in whom he can place implicit confidence. Stacks, whether round or oblong, should always be built on stack-stands, and the stack-stands should be arranged so as to provide for the proper ventilation of the stacks, for an improperly ventilated stackyard will heat whilst a well ventilated one will keep cool, other things being equal. If a stack is confined and close on one side and free on the other, it will sit down unequally, however perpendicularly and uniform in density it may be built, but if equally ventilated all round, and built uniform in density, it will settle down fairly and cool, assuming the sheaves to be equally fit for stacking in both cases.

Thatching should be done immediately the stack is up. To delay until it is seen how the stack will settle down, is at best a poor apology for bad stacking. And the same remark applies to cutting the outsides of the stack—cut the outsides as you build, and let the thatcher follow close up, the stacker taking care to have the roof of the stack properly consolidated and raked down hard in the building.

Rye-grass and Clover Seeds, when intended to follow either Wheat, Barley, or Oats as a grass or hay crop, should be sown on the stubble as soon as the labours of the harvest will permit. Where the corn crop is harvested in August, seeding after harvest will be found preferable to seeding in spring, both for the corn crop and the seeds. Where the land is clean, as it always should be, and free from weeds, sow on the stubble, and bush or chain harrow in about the same quantity of seed as directed in spring. Where the seeds were sown in spring, and have braireded, but the plants are partially killed by the drought of summer or otherwise, blanks and thin places should be seeded with the hand, and the seed left to be washed in or covered by the first shower of rain, as the harrow cannot be used, and rolling is objectionable at this season.

Flax-steeping and grass-retting, where they extend into August, must be attended to even in the heat of corn harvest. Flax growers endeavour to have their Flax in the stack before reaping commences, but calculations often miscarry, unusually so this year.

Sewage Farming.—The yield of grass of Lodge Farm, Barking, for August, 1869, is given as 10 tons per acre, for which London cowkeepers gave 23*s.* per ton; and the increasing demand for the grass proves it to be excellent food for milch cows and all kinds of live stock. The consumption of sewage by all growing crops during the month is large, being at the rate of 100 tons of sewage to 1 ton of grass. Heavy crops of Cabbages are also grown of the best quality, fetching the top price in the London markets—also Potatos, stubble Turnips, after Wheat and Oats are sown, and heavy crops rapidly forced forward. The close of the month is also a favourable time for laying down land with Italian Rye-grass to renew the plant, whose constitutional energies are exhausted in a season by seven or eight cuttings, or about 60 tons of grass per acre. The close of the month, if the weather is fine, is also favourable for a heavy crop of hay, the ground afterwards to be broken up, or an aftermath crop of grass or hay may be taken should the vitality of the crop stand it. But as much of the plant dies out in taking a hay crop, particularly when it is allowed to shoot in the seed-ear, a second crop of hay is seldom advisable, breaking up the land for autumn crops being more profitable. The close of harvest is likewise the best time for laying-out fields or whole farms for town or farm sewage irrigation, or irrigation of any kind.

Live Stock find little in the stubble now as compared with the olden time. Autumn tillage amongst the stooks, and the seeding of the land with Turnips, Rape, &c., preclude the admission of either sheep, black cattle, or pigs into corn stubbles. The old bands of gleaners are likewise excluded. But the improvements thus taking place have all for their object more food for stock, not less, and as suitable provision for live stock in August is a cardinal point in stock management, the extreme drought of the current season renders the practical solution of the question no easy task on many farms, where farmers have been obliged to resort to the winter diet of hay, cake, and corn in July.

Lamb Weaning in Scotland (Cheviot and black-faced) usually takes place from the beginning to the middle of the month, but from the extra supply of grass this year in the North, and the scarcity of lamb in the South, a greater number than usual will be kept on, and drafted for the butcher as they become fat. Blackfaced and Cheviot ewes that have fattened cross-lambs will also be ready for drafting for the shambles. *W. B.*

Notices to Correspondents.

MARKET GARDENING: *Australia.* Ordinary farming land gets gradually into the rich and deeply cultivated condition of a market garden; and it is difficult to estimate the cost. But probably there is £8 or £10 per acre of cultivation and manure more in a market garden than on a well managed farm.

STRAW GROUND TO MEAL: *H. H.* says:—"I find by the leading article in the *Agricultural Gazette* of July 30, that straw can be ground into meal. Would you inform me where I could procure the mill that would reduce the straw as fine as meal, as it would be a most wonderful economiser of cake food." [The Messrs. Garrett, of Leicester, exhibited, we believe, at the Plymouth meeting of the Royal Agricultural Society, a straw-grinder attached to their threshing machine.

Markets.

ENGLISH WOOL.

During the last week there has been a more hopeful feeling with regard to future prospects, but at the same time the difficulties which stand in the way of Continental orders, both in the way of payments and also shipment, have kept transactions within narrow bounds, buyers offering low speculative prices, which holders are not disposed to accept. Lustre and combing wools generally are relatively flatter than clothing descriptions, but then they have for some time past been comparatively dear. Regular quotations are very difficult to give, each transaction being more or less subject to special negotiation, and prices depend on the position of the buyers or sellers.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.	*s. d.*	*s. d.*
FLEECES—Southdown hoggets	.. .. ..	1 1 to 1 2	
Half-bred ditto	.. .. ..	1 2 — 1 2½	
Kent Fleeces	.. ..	1 3 — 1 4	
Southdown ewes and wethers	.. ..	0 9½ — 1 1	
Leicester ditto	.. ..	1 2 — 1 3	
SORTS—Clothing	.. ..	0 10 — 1 6	
Combing	.. ..	1 0 — 1 8	

HAY. per Load of 36 Trusses.

SMITHFIELD, Thursday, Aug. 18.

Prime Meadow Hay	120*s.* to 135*s.*		Clover, old	.. ..	140*s.* to 150*s.*
Inferior do.	 100	110	Inferior do.	.. ..	110 120
New Hay	 110	120	Prime new do.	.. ..	120 130
Inferior do.	 90	105	Inferior do.	.. ..	100 110
Straw	 24	32	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, Aug. 18.

Sup. Meadow Hay	130*s.* to 138*s.*		Inferior Clover	.. ..	120*s.* to 128*s.*
Inferior do.	 110	120	Prime 2d cut do.	.. ..	— —
New do.	 115	126	New do.	.. ..	130 140
Inferior do.	 100	108	Straw	.. .. ..	32 36
Superior Clover	.. 135	148	JOSHUA BAKER.		

METROPOLITAN CATTLE MARKET.

MONDAY, Aug. 15.

We have a larger number of Beasts than last week, but the average quality is very inferior; the few choice qualities on offer make about the same as last Monday; other kinds are lower. The supply of Sheep is again small, and the demand is good, consequently prices are not lower. Choice Lambs and Calves are in demand, but middling ones still meet with a very dull sale. Our foreign supply consists of 1980 Beasts, 9410 Sheep, 250 Calves, and 60 Pigs; from Scotland there are 74 Beasts; from Ireland, 200; from Norfolk and Suffolk, 120; and 2013 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Here-fords, &c.	.. 5	4 10 5 8	Best Long-wools	5	2 10 5 6
Best Shorthorns	.. 5	2—5 6	Do. Shorn	..	.. — ..
2d quality Beasts	3	8—4 6	Ewes & 2d quality	4	6—4 10
Best Downs and Half-breds	.. 5	6—5 8	Do. Shorn	..	.. — ..
Do. Shorn	..	.. — ..	Lambs	..	5 0—6 4
			Calves	..	3 6—5 6
			Pigs	..	3 4—5 4

Beasts, 4310; Sheep and Lambs, 25,500; Calves, 260; Pigs, 135.

THURSDAY, Aug. 18.

We have not quite so many Beasts on offer as on last Thursday, quite sufficient, however, for the demand; there are not many left unsold, but Monday's quotations are not maintained throughout. There are a few more sheep, and trade is not quite so brisk; prices have not much altered on the average, but a clearance is not quite effected. Choice Lambs and Calves are not very plentiful; they readily find purchasers at fully late rates, but trade is dull for other kinds. Our foreign supply consists of 640 Beasts, 3370 Sheep, 306 Calves, and 60 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Here-fords, &c.	.. 5	4 10 5 6	Best Long-wools	5	2 10 5 6
Best Shorthorns	.. 5	0—5 4	Do. Shorn	..	.. — ..
2d quality Beasts	3	6—4 4	Ewes & 2d quality	4	6—4 10
Best Downs and Half-breds	.. 5	6—5 8	Do. Shorn	..	.. — ..
Do. Shorn	..	.. — ..	Lambs	..	5 0—6 4
			Calves	..	3 6—5 8
			Pigs	..	3 4—5 4

Beasts, 1530; Sheep and Lambs, 15,130; Calves, 445; Pigs, 95.

METROPOLITAN MEAT MARKET.—Aug. 18.

Best Fresh Butter	.. .. ..	18*s.* per dozen lb.
Second do. do.	.. .. ..	16*s.* ,,
Small Pork, 5*s. od.* to 5*s. 4d.*; Large Pork, 4*s. 4d.* to 4*s. 8d.* per 8 lb.		

MARK LANE.

MONDAY, Aug. 15.

There was a fair supply of English Wheat to this morning's market, consisting mostly of the new crop, the condition and quality of which was variable; white brought 48s. to 54s., and red from 44s. to 51s. per qr. The attendance was moderate, but there was little inquiry for either old English or foreign, and the few sales made were at a reduction of 2s. to 3s. per qr. Barley, Beans, and Peas were 1s. per qr. cheaper. Oats, of which the arrivals were very large, were a slow sale at a reduction of 2s. per qr. There was no change in the nominal top price of town-made Flour; country marks were 2s. per sack, and American 1s. per barrel lower.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	46	53	Red.....	44	53
— — fine selected runs..do.	50	57	Red.....	43	55
— — Talavera	52	60			
— — Norfolk	—	—	Red.....	—	
— — Foreign	42	63			
BARLEY, grind. & dist. 24s. to 33s. Chev.	42	45	Malting ..	36	41
— Foreign .. grinding and distilling	25	33	Malting ..	33	43
OATS, Essex and Suffolk	25	27			
— Scotch and Lincolnshire.. Potato	27	29	Feed	—	
— Irish ..... Potato	26	28	Feed	24	27
— Foreign .....Poland and Brew	25	27	Feed	20	25
RYE	32	36	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan.....43s. to 47s.. Tick	49	50	Harrow ..	49	50
— Pigeon ....51s. to 59s.. Winds.	—		Longpod..	—	
— Foreign..... Small	45	47	Egyptian .	42	44
PEAS, White, Essex, and Kent.. Boilers	38	40	Suffolk ..	40	42
— Maple, 40s. to 44s. .....Grey	36	40	Foreign ..	36	40
MAIZE	—		Foreign ..	32	34
FLOUR, best marks delivered.. per sack	46	54			
— 2d ditto .....ditto	35	47	Country ..	35	47
— Foreign.....per barrel	29	31	Per sack..	35	61

WEDNESDAY, Aug. 17.

Quietness has been the prevalent feature of the grain trade to-day, although the attendance was fair. The supply of both new and old English Wheat has been short, while of foreign it was moderate. The demand for all qualities has ruled inanimate, and the rates current on Monday have been with difficulty maintained. There has been only a limited supply of Barley on sale, notwithstanding the inquiry has been restricted, at about previous currencies. Malt has been quiet, but firm. Oats have been in large supply and limited request, at about Monday's reduced prices. Beans and Peas have experienced a slow sale, but without any material change in value. The Flour trade has ruled quiet, with the exception of barrel, which has been in request for French requirements, consequently prices have been fully supported.

ARRIVALS of GRAIN, &c., into LONDON by WATER CARRIAGE:

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	230	—	—	—
Irish ..	—	—	—	—
Foreign ..	6890	400	46,290	250 brls.
	7120	400	46,290	

LIVERPOOL, Aug. 16.—At to-day's market there was a fair attendance, including many millers from a distance. Wheat met with more inquiry, and a fair business resulted, at the extreme decline of Friday, the market closing with more firmness. Flour must be quoted 6d. per barrel and sack cheaper, but a fair sale was experienced. Oats and Oatmeal very difficult to move, and must be quoted fully 1d. per bushel and 1s. per load lower. Beans and Peas 6d. to 1s. per qr. lower. Indian Corn met with a fair sale, at a reduction of 1s. 6d. per qr., prime Danubian being obtainable at 31s. per 480 lb.

AVERAGES.

	Wheat.	Barley.	Oats.
	50s 7d	30s 3d	25s 8d
July 9	49 8	31 2	25 6
— 16	49 9	31 2	26 11
— 23	52 10	33 5	26 9
— 30	54 11	31 8	28 8
Aug. 6	54 10	32 11	28 0
— 13			
Average ..	52 1	31 9	26 10

SEED MARKET.

During the past week we have had a continuance of fine weather, with frequent drying north and easterly winds. Notwithstanding the uselessness of present sowing, all seeds required for autumn use have firmly maintained late values, and in the case of Trifolium we must note an advance of 2s. per cwt. We have a few samples of new Mustard on offer, quality good, which have been sold for present sowing. New Rape rather firmer than last week. Winter Tares more plentiful, and prices are likely to settle down about the same as last year. New Rye, winter Barley, and Oats, in consequence of the drought, are in slow request. Canary seed unchanged. Italian without alteration. We have but little doing in Clovers, the recent demand for France being stopped by the war. We anticipate when the long-wished-for rain comes we shall have a very brisk demand for all seeds required for present sowing, at enhanced values.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—Aug. 17.

Walls End Braddyll's Hetton, 17s. 9d.; Walls End Hetton, 19s.; Walls End Hetton Lyons, 16s. 9d.; Walls End Hawthorn, 16s. 6d.; Wall's End South Hetton, 18s. 6d.; Walls End Hartlepool, 18s.; Walls End Heugh Hall, 18s.; Walls End Kelloe, 17s. 6d.; Walls End Original Hartlepool, 19s.; Walls End South Kelloe, 18s.; Walls End Tees, 18s. 9d.—Ships at market, 30; sold, 26; unsold, 4; at sea, 5.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 29, Oxford Street, Manchester.

"Ever Cottage should be provided with a Water Tank." *Duraelis.*

Iron Cisterns.

FBRABY AND CO. having laid down more extensive and Improved Machinery on their Deptford premises (IDA WHARF), are prepared to supply WROUGHT-IRON TANKS, GALVANISED or PAINTED, of superior quality, at reduced prices, and at very short notice.

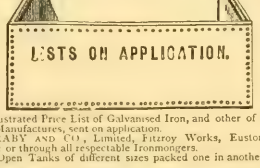

An Illustrated Price List of Galvanised Iron, and other of BRABY'S special Manufactures, sent on application.
F. BRABY AND CO., Limited, Fitzroy Works, Euston Road, London; or through all respectable Ironmongers.
N.B. Open Tanks of different sizes packed one in another to save carriage.

Cottam's Iron Hurdles, Fencing, and Gates.

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

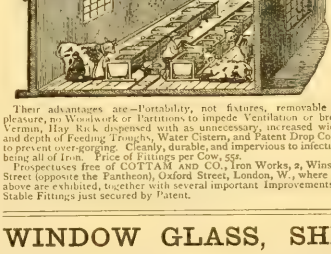

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 72, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT FLOWER PACKING CASE, and MEMBERS of PARLIAMENT, FAMILIES, and TOURISTS' SEASIDE COMPANION.

The above Cases are specially contrived for the Exhibition and Transmission of Cut Flowers. The flowers are packed in water, and cannot be displaced or the water spilled, if placed in any position, even if upside down. When not required for conveying flowers, they can be used for ordinary packing purposes. It has been pronounced by the Committee of the Royal Horticultural Society as the best case now in use, and C. J. Perry, Esq., will exhibit his flowers in them at the next Crystal Palace Flower Show.
Manufactured solely by WM. EASSIE AND CO. (LIMITED), Gloucester, who will forward Lists of Agents and Prices on application.

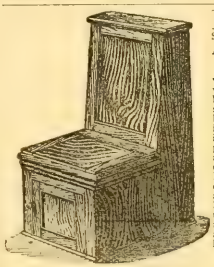

MOULE'S PATENT EARTH SYSTEM.

From Mr W. GILBERT, *Lansford Street, Rugby.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT.
"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

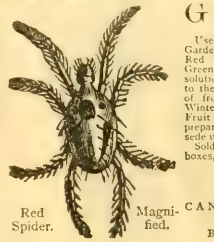

Red Spider. Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.

Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea, London, S.W.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & Co.,
IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

87, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

JOHN WARNER & SONS,
BELL AND BRASS FOUNDERS TO HER MAJESTY,
HYDRAULIC ENGINEERS,
8, CRESCENT, CRIPPLEGATE, LONDON, E.C.

No. 35.
CAST-IRON PUMPS.

2½ inches	£1 9 0
,, ...	2 2 0

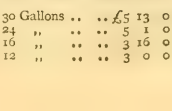

No. 547A.
GARDEN ENGINE.

30 Gallons	£5 13 0
24 ,, ...	5 1 0
16 ,, ...	3 16 0
12 ,, ...	3 0 0

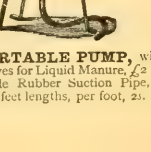

No. 42.—PORTABLE PUMP, with Improved Valves for Liquid Manure, £2 16s. 6d.
2-inch Flexible Rubber Suction Pipe, in 10, 12, and 15 feet lengths, per foot, 2s. 5d.

THE ROYAL OXFORD HORSE RAKE.

J. & F. HOWARD

HAVE WON, EVER SINCE 1852, WITH ONE EXCEPTION,

EVERY FIRST PRIZE

OFFERED BY THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND FOR

HORSE RAKES.

AT THE RECENT MEETING AT OXFORD,

A SPECIAL PRIZE—THE SOCIETY'S MEDAL—

WAS AWARDED TO THE ABOVE IMPLEMENT FOR ITS SIMPLE SELF-ACTING ARRANGEMENT.

The following extract is from the *Gardeners' Chronicle*:—"Messrs. HOWARD, Bedford, show an extremely ingenious Horse Rake, containing the very best device yet invented for causing the driving wheels to lift the teeth as soon as a load is gathered. A pedal movement tightens the rocking cradle on the wheel-shaft of the Machine, and up go the teeth—the pressure on the pedal is relaxed, and they drop into work again upon the ground."

Catalogues, with full particulars, sent free on application to

J. AND F. HOWARD, BRITANNIA IRON WORKS, BEDFORD.

LONDON OFFICE:—4, CHEAPSIDE (three doors from St. Paul's).

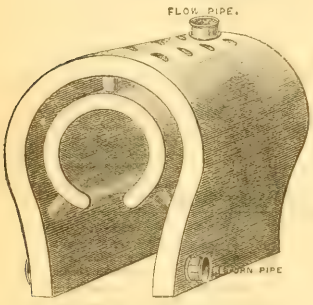

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REFORM YOUR COAL BILLS.

£700 A YEAR SAVED!

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WROUGHT IRON BOILERS

AND

HOT-WATER APPARATUS

In the Royal Gardens, Kew.

See Official Report in *Gardeners' Chronicle* for July 2, 1870.

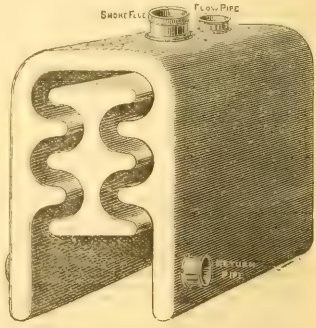

ORMSON'S PATENT CONVOLUTED BOILER.

The power, safety, and economy of these Boilers has now been thoroughly established.

Many of them have been used to replace cast iron tubular ones, and have proved in point of economy vastly superior.

Place no reliance in cast iron Boilers of any form or construction.

Cast iron is a short and brittle metal.

Cast iron Boilers of all forms are continually cracking and going to pieces.

Wrought iron possesses a vast amount of tension, and is quite free from these sad mishaps and breakdowns.

Winter is approaching, therefore have a safe wrought iron Boiler, and run no risk.

Thousands of feet of Pipe heated from one Boiler.

List of Prices on application; also, "Book of Designs of Horticultural Buildings."

HENRY ORMSON, HORTICULTURAL BUILDER TO HER MAJESTY,

AND HOT-WATER APPARATUS MANUFACTURER TO THE COMMISSIONERS OF HER MAJESTY'S ROYAL PALACES AND PUBLIC BUILDINGS, AND TO THE ROYAL HORTICULTURAL SOCIETY.

STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

W. M. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
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Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW and CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s., cash on delivery. Sample Label sent on receipt of a penny stamp. Orders delivered free in London by JOHN JENNER AND CO., Label Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, recommended by the Royal Horticultural society. The above can be had, of all sizes, wholesale of CHARLES J. BLACKITH AND CO., Cork Quay, Lower Thames Street, London, E.C. Retail of the principal Seedsmen. Prices on application.

By Royal Letters Patent.

SHREWSBURY'S GAS CONSERVATORY BOILER, Registered Gas Oven, as engravings. IMPROVED REGISTERED GAS BATH, £10. Testimonials on application. Price-stamp. G. SHREWSBURY, Lower Norwood, S.E.

HORTICULTURAL EXHIBITIONS. NOTICE TO COMMITTEES.

Upon application to the Undersigned, Plans and Prices for the HIRE of elegant and commodious TENTS are forwarded free of charge. All letters should be addressed to 2, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.
BENJAMIN EDGINGTON.

THE HYDRONETTE
(ROBIN'S PATENT),

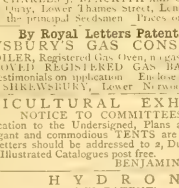

FOR GARDENS, GREENHOUSES, CONSERVATORIES, HOTBEDS, WASHING WINDOWS, CARRIAGES &c., &c.

Unrivalled Ease of Action, Simplicity, Convenience and Force.
The HYDRONETTE is a more useful, easy-working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz.—No. 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12s. 6d.; No. 2, 15s. 6d.; No. 3, 21s.; No. 4, 30s.; No. 5, £1 10s. Extra Hose and Union Joints to order. To be had of HAYNES AND SONS, 227, 229, and 231, Edgware Road, W.
Caution.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

CONSERVATORY BASKETS.

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencings, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Fencing, Rosaries, Arbours, Summer Houses, &c.; Iron Work Flower Baskets, with stem and pannets for placing in any position; Lawn Tennis and Cricket Wire Work; Lawn Stands for flowers, seats, tables, &c.; Wire Cases for Conservatories, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Manton's Ornamental Tile Flower Boxes.
All kinds of Wire Work made to order.

R. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Portobello Terrace, Notting Hill Gate, London, W.
Illustrated Catalogues of the above on application.

Horticultural and Window Glass Warehouses.

JAMES MILES, 6, High Street, and 12 and 13, Blosson Street, Shoreditch, London, E.
CONSERVATORY and ORCHARD HOUSE GLASS.
Genuine White Lead, Oils, Colours, Brushes, &c.
GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNECTIONS, &c.
Trade upon application.

JAMES PHILLIPS AND CO. beg to submit their prices as follow:—
GLASS for HOTHOUSES, &c.
As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each box contains 100 feet. The prices only apply to the sizes stated

Squares	20 by 12, 20 by 14, 20 by 15. 16 oz. to the foot.	21 oz.
Fourth quality	15s. 6d.	19s. 6d.
Third quality	16s. 6d.	22s. 6d.
Seconds	18s. 6d.	25s. 6d.
Englass	27s. 6d.	37s. 6d.

The above prices include the boxes, which are not returnable.
HORTICULTURAL GLASS.
Stock sizes, 10 oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated.

	24ths	30ths	36ths	42nds	48th
	s. d.	s. d.	s. d.	s. d.	s. d.
11 by 9	12 by 9	13 by 9	14 by 9	15 0	16 0 18 6
12 by 10	13 by 10	14 by 10	15 by 10	16 0	17 0
13 by 11	14 by 11	..	..	..	..
14 by 12	15 by 12	16 by 11	..	..	..
16 by 12	16 by 12	16 by 12	17 by 12	..	..
16 by 13	17 by 13	20 by 12	..	..	..
16 by 14	20 by 13	20 by 14	..	..	..
	17 by 14	18 by 14	..	..	16 to 17 oz. to the foot
	20 by 14	..	..	..	..

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	6d.	7 by 5	7s. 6d.	8 by 5	8s. 6d.	..	12s. 6d.
8 by 6	8s.	8 by 6	9s.	9 by 7	9s.	10 by 7	11s. 6d.
				10 by 8	11s.	12 by 8	13s. 6d.

Boxes 2s. each, returnable at full price.
London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of any of 36 colours ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

THE GRANITIC PAINT, the best for the finest painting, and the toughest as well. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters, and Shipbuilders.
Sole Agents, King William Street, London Bridge, London, E.C.

Caution to Gardeners.—When you ask for SAYNOR AND COOKES WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C.'s expert is having Gardeners, Nurserymen and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many persons to be made to suppose that S. & C.'s knives were not of their make all of which are warranted both by Sellers and Makers.
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-TWIST SOLE PLATES, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The SILVER Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

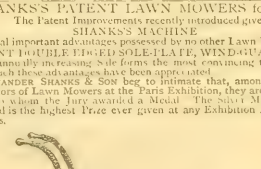

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutters of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or Sharp Edge of the Cutter to act against the Set Plate. In addition to this, A. S. & SON now make the Sole Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where only a single-edged Sole plate must be entirely renewed when the edge is worn down.
A Wind-guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no gibbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated circulars, with full particulars, sent free on application
A. SHANKS & SON, Diss Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.
☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

Rosher's Garden Edging Tiles.

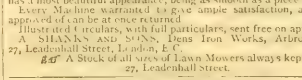

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Slate of great durability. The planier sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.
GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
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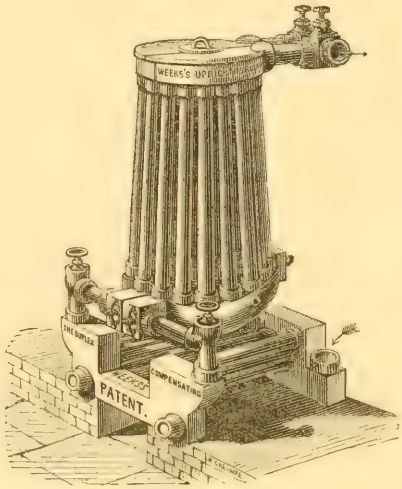

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ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

New Hardy Bulbs.—Brodiæa coccinea (A. Gray).
W. THOMPSON, Seedsman, Tavern Street, Ipswich, respectfully begs to state that he is now prepared to supply Bulbs of the above-named splendid and remarkable new species of BRODIÆA, to which a First-class Certificate was awarded by the Royal Horticultural Society, on May 4, 1870, last. It produces umbels of drooping tubular flowers, of a fine crimson-purple colour tipped with pea-green, on a scape 2 feet high. Price 3s. 6d. and 5s. per Bulb. A coloured figure will be found in the "Florist" for July last. The usual allowance to the Trade.

VIOLA LUTEA MAJOR.—A free growing and flowering variety, habit and strength of plant intermediate between Viola cornuta and the Cheviden varieties of Bedding Pansies; flowers brilliant golden-yellow, very large, borne in great profusion, from March to October. A valuable addition to Spring and Summer Bedding Plants. Per dozen, 18s.
First-class Certificate awarded at Royal Horticultural Society's Show, May 4, 1870
First-class Certificate awarded at Royal Botanic Society's Show, May 25, 1870
ROBERT PARKER, Exotic Nursery, Tooting, Surrey, S.W.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracenas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.
Conservatories furnished, and Choice Plants supplied for Balls or Dinner table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

Substitutes for the Clover Crop.

JAMES CARTER AND CO. can strongly recommend
TRIFOLIUM INCARNATUM (Italian Crimson Clover) for the above purpose. The seed must not be sown once upon lands where the Clover crop has failed, and will be certain to produce a valuable sward for consumption early in May and June.
Messrs. CARTER also prepare a special mixture of hardy, quick-growing Clovers and Grasses, which it soon at once with crops of most valuable character, early in the spring.
Too much importance cannot be attached to the quality of the Seeds used, so as to secure a clean after tilth, and the utmost care is taken by Messrs. CARTER to carry out that object.
Sow 15 to 2 bushels per acre. Price 18s. to 24s. per acre.
BROMUS SCHRADERI, if sown early, will produce a heavy crop of forage in spring and several after cuttings in one season. Sow 50 lb. per acre. 1s. per lb.
MELAKI, TRIFOLIUM INCARNATUM, CARTER'S SUPERFINE ITALIAN RYE-GRASS, RAPE. } Lowest price on application.
All goods carriage free.
JAMES CARTER AND CO., Seed Farmers, 237 and 238, High Holborn, London, W.C.

Wheelers' Cocoa-nut Cabbage.

WHEELERS' COCOA NUT CABBAGE is a new and very early variety, perfectly distinct, and of most excellent flavour. 1s. per packet, post free. Price to the Trade on application.
WHEELERS' TOM THUMB LETTUCE (true), 1s. per packet; small packet, 6d., post free.
J. C. WHEELER AND SON, Seed Growers, Gloucester; and 5, Mark Lane, London, E.C.

SILVER SAND and PEAT, from Bedfordshire, also KENT and HAMPSHIRE PEAT, in any quantity.—This Sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depôt.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 21s.; and 1 cwt., 42s. with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 3s. 6d. each.
"I find it extending, and useful for killing the Aphides on Roses and other plants."—GEO. LEWIS, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturers, T. A. POOLEY Bonded Warehouse, Sussex Wharf, Wapping, E.

Wasps.

SCOTT'S WASP DESTROYER is very simple in application, and the most effectual means of ridding Vineries, Houses, Gardens, &c., of Wasps, Hornets, Flies, &c. Tiffany and Nets unnecessary, and Poisoned Sugar, Treacle, &c. abolished. A hundred of your Mixture, we look at many pounds worth of Fruit saved to protect the houses and walls from these pests, but none of it has been required, and it has caused ..... I am delighted with the magical effects of your Wasp Destroyer ..... I feel truly grateful for such a boon. With your Mixture and a little patience, we have nothing to dread from the Wasps."—Vide Testimonials. Price 4s. 6d. and 7s. 6d. per Bottle (in stamps), with full directions. It may be had of the following Seedsmen:—Messrs. Hurst & Son, 6, Tichenhall Street, London; Hooper & Co., Covent Garden; Harrison & Son, Leicester; Pierpont & Co., Warrington and Liverpool; Pollett, Leicester; R. T. Veitch, Exeter; E. Cooling, Derby; W. H. Rogers, Southampton; and B. G. Wilson, Wattisfield.
For Trade terms apply to J. SCOTT, Yeovil, Somerset.

Red Spider.

GISHURST COMPOUND.
Magnified.
Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
Wholesale by PRICE'S PATENT CANDLE COMPANY (Limited), Battersea, London, S.W.

POLLARD, JEPHSON, AND CO.'S CONICAL BOILERS for HEATING, by HOT-WATER, Pineries, Greenhouses, Conservatories, Mansions, Churches, Chapels, Halls, Warehouses, &c. Also Pollard's Improved Vertical Tubular Boiler &c. At Vinemen Sydney's request, after being 20 years in constant use. Apply at Dear Garden, New Park Street, Southwark, London, S.E.

JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, offers for Sale—
100 CAMELLIAS, ALBA and FIMBRIATA PLENA, without flower buds, £4, £5, £6, £8.
100 CAMELLIAS, IMBRICATA PLENA, without flower buds, £4, £5, £6, £8.
100 CAMELLIAS, named best sorts, without flower buds, £3, £4, £6, £8.—For September.
100 CAMELLIAS, with flower buds, named and best sorts, £6, £8, £10, £12.
100 AZALEA INDICA, best named sorts, with flower buds, fine plants, £5, £6, £8, £12.
100 AZALEA INDICA STOCKS, 15s. [Three months' credit.]

Established Orchids.

JAMES BACKHOUSE AND SON offer Collections of healthy plants of the above
For 12 of the undernamed species, 84s.

Calanthe vestita	Acineta Humboldtii
Cattleya citrina	Miltonia Clowesii
,, maxima	Odontoglossum Cervantesii
Cypripedium barbatum nigrum	,, Lindleyanum
Dendrobium chrysanthum	,, maculatum
,, nobile	,, nutrantham
Lælia autumnalis	Maxillaria Harrisoniæ
,, altissima	Oncidium aurosum
,, majalis	Stanhopea tigrina

For 20 of the undernamed species, 105s.

Acrides virens	Lælia autumnalis
Anguloa Clowesii	,, majalis [Lælia pumila
Calanthe vestita	Lycaste Skinneri
Cattleya crispa	Miltonia Clowesii
,, maxima	Odontoglossum phalænopsis
Cælogyne cristata	,, grande
Cypripedium barbatum nigrum	,, Cervantesii or Ehrenbergii (?)
Dendrobium album-sanguineum	,, nutrantham
,, chrysanthum	,, Lindleyanum
,, densiflorum	,, maculatum
,, Falconeri	Oncidium aurosum
,, devonianum	,, tabulæ
,, Pierardi	,, bipharmaticum (?)
,, cretaceum	,, papilio
	Stanhopea tigrina

York Nurseries.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.
CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes this season at the Royal Horticultural, and other places. Per packet, 2s. 6d.
CALCEOLARIA, finest hybrid. Per packet, 2s. 6d.; smaller packets, 1s. 6d. CALCEOLARIA, finest spotted. Per packet, 2s. 6d.; smaller packets, 1s. 6d. Saved with the greatest care, and from one of the largest collections in the kingdom.
CINERARIA, choicest, mixed.—Saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2s. 6d.; smaller packets, 1s. 6d.
PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.
PRIMULA.—Choicest, mixed, fringed. Per packet, 2s. 6d.
PRIMULA.—Dark carmine. Per packet, 2s. 6d.
PRIMULA.—New scarlet. Per packet, 2s. 6d.
PRIMULA.—Rose fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2s. 6d.
PRIMULA.—Choicest Fern-leaved white, 2s. 6d.
PRIMULA FIMBRIATA.—Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.
Smaller pkts., 1s. 6d.
Forwarded immediately on receipt of Post-office Order.
JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

To the Trade.

F. GEE begs to offer (fine selected stocks) NEW SEEDS for present sowing, as follows, for cash:—
GREEN-TOP YELLOW SCOTCH TURNIP, 24s. per bushel.
HARDY STRATTON TURNIP, 22s. per bushel.
EARLY SIX WEEKS or STUBBLE TURNIP, 22s. per bushel.
Fine ESSEX RAPE, 13s. per bushel.
Fine WHITE MUSTARD, 16s. per bushel.
WINTER TARES, 12s. 6d. per bushel.
TRIFOLIUM INCARNATUM, 65s. per cwt.
New 4 Bushel Sacks charged 1s. 3d. Remittances must accompany all orders. Seed Establishment, Biggleswade, Beds.

HOOPER & CO.'S
CATALOGUE OF BULBS, &c., FOR THE COMING SEASON
IS NOW READY: ILLUSTRATED, CORRECT, AND INTERESTING.
Intending purchasers are solicited to send for a Copy.
The advantages of early planting, both for in-doors and out, cannot be overrated.
HOOPER AND CO., COVENT GARDEN, LONDON, W.C.

DUTCH FLOWER ROOTS.
BENJAMIN S. WILLIAMS,
VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.,
BEGS TO ANNOUNCE THAT HIS
ANNUAL CATALOGUE OF DUTCH FLOWER ROOTS,
Containing all the best varieties of HYACINTHS, TULIPS, CROCUSES, NARCISSUS, CYCLAMENS, LILIUMS, &c., also
A SELECT LIST of FRUIT TREES, ROSES, &c., for AUTUMN PLANTING,
is now ready, Post Free on application.

CARTER'S SEEDS, BULBS, &c.,
CARRIAGE FREE.
☞ From and after September 1, 1870, JAMES CARTER AND CO. (will PAY CARRIAGE on all GARDEN and AGRICULTURAL SEEDS, DUTCH FLOWER ROOTS, and POTATOS, without any increase on their published prices, so that purchasers in England will have their Goods delivered Free of cost at the nearest Railway Station, and in Ireland and Scotland delivered Free at the nearest Port.
CARTER'S COLLECTIONS of BULBS for Conservatory and Window Decoration, price from 10s. 6d. to 84s., including packing, and Carriage Free.
CARTER'S COLLECTIONS of BULBS for Conservatory and Outdoor Planting, price from 15s. to 84s., including packing, and Carriage Free.
CARTER'S COLLECTIONS of BULBS for Outdoor Planting only, price from 10s. 6d. to 84s., including packing, and Carriage Free.
JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

DUTCH FLOWER ROOTS.
JAMES VEITCH & SONS,
ROYAL EXOTIC NURSERY, CHELSEA, S.W.,
BEG TO ANNOUNCE THAT THEY HAVE RECEIVED THEIR
ANNUAL SUPPLY OF BULBOUS ROOTS FROM HOLLAND,
And are pleased to say that they are in splendid condition.
CATALOGUES are now ready, and will be forwarded Post Free on application.
J. V. AND SONS desire to impress upon those who patronise them, the great advantage of giving them their Orders early, as the successful cultivation of Bulbs depends in a great measure upon their being planted early in the season.

Palms and Palm Seeds.

PALMS, fine plants, from 1 to 3 feet high, of Calamus Roxburghii, Caryota Cumingii, Guilielmia speciosa, &c., &c., at from 2s 6d to 5s. each

NEW PALM SEEDS, consisting of Astrocaryum, Bactris, Caryota, Euterpe, Iriartea, Martinezia, Sabal, Thrinax, &c., at 10s per 100.

BROMELIADS, Cariagata, lingulata, tricolor, 2s 6d each

STRAWBERRIES, in Pots, for Early Forcing, 25s per 100.

PEACHES, NECTARINES, GRAPE VINES, SEEDLING FIGS, 12 to 18 inches high, fine bushy plants, 2s 6d. to 5s. each

The above are grown especially for Table Decorations.

W. PRESTOE, Nurseryman and Horticultural Agent, Basingstoke, Hants.

FERNS, carriage free to London or Goole.

1	Adiantum Farleyense	15	Gymnogramma Laucheani gi-	
20	" cuneatum	25	" Parsoni [gantea	
25	" " hitum	4	" gigantea, new	
30	" macrophyllum	15	" peruviana microphylla	
30	" Seemi	25	" Wettenhalliana	
50	Athyrium Goringianum	30	Pteris argyrea	
15	Gymnogramma calomela	30	" cretica fol. var.	
25	" Laucheana	35	" tricolor	

370 plants for £7 10s.

LOUIS VAN HOUTTE, Royal Nursery, Ghent.

To Gardeners and Amateur Florists.

MR. JOHN HAMPTON begs to intimate to Pansy growers that he will have much pleasure in supplying a selection of the best of his unrivalled strain of BELGIAN FANCY PANSIES, after September 1st, at 12s. per dozen plants named.

These flowers have been awarded the following Prizes and Certificates:—1st Prize and Silver Medal, Crystal Palace; 1st Prize and first-class Certificate of Merit for 50 varieties, exhibited at the Grand Floral Fete, held at Doncaster, on September 2, 3, and 4, 1869; 1st Local Prizes, including Gold Medal, and Silver Cup, at Bolton-le-Moors; and the Scottish Pansy Society's competition, held in Edinburgh, on June 17, 1870; and a Standard Collection, exhibited at the Glass, in Rose show, on July 13 last, was commended by the Judges.

East Newport, Fife.

To the Trade.

JEAN VERSCHAFFELT begs to offer the following plants, of which he possesses a very fine stock, at the undermentioned low prices, viz. :—

CAMELLIAS, in fine sorts, with buds, all fine sorts, named, selections left to J. V., 6s per 100; ditto stronger, £8 to £10

OTAHEITE ORANGES, fine plants, full of fruit, 24s. per dozen

ERICAS, very good plants, everything set for sale, 24s. per dozen

JASMINUM GRANDIFLORUM, grafted plants, very fine flowering specimens, 24s. per dozen.

LANTANA BOLIDO, 4s per 100; fine seedlings, in single pots, 40s per 100.

AZALEA INDICA, £5 per 100; ditto, stronger, £6, £8, to £10.

Early orders for the above are solicited.

Steamers sail weekly from Ghent direct to Goole and London, and from Antwerp to all the principal ports of England. All letters to be directed to

JEAN VERSCHAFFELT, Nurseryman, Ghent, Belgium.

The most Desirable Plant of the Season.

PARSONS'S NEW WHITE MIGNONETTE, RESEDA ODORATA ALBA. This new and lovely Mignonette will become universal favourite; it is so much superior in odour, habit, and colour being nearly pure white—it cannot fail to be grown in preference to the other variety. The spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are little better than existing varieties, but P. Parsons assures the Public this new Mignonette is a great acquisition, and cannot fail to take the pre-eminence of all others. It has been tested at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz. —

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 3, 1870

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, and may be had wholesale and retail of P. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks Gate Nurseries, Keymer, Hurstpierpoint, Sussex.

The Agents for the above will be advertised shortly.

B. S. WILLIAMS'S NEW and CHOICE FLOWER SEEDS, Post Free

	Per packet—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed .. .. 2s. 6d., 3s. 6d., and	5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain .. 1s. 6d., 2s. 6d., and	3 6
CENTAUREA CANDIDISSIMA .. .. .. 1s. and	2 6
ECHEVERIA METALLICA, new Ledding plant	2 6
HOLLYHOCK, from Chater's finest varieties .. 1s. and	2 6
Williams' New Hybrid SOLANUMS .. .. .. 2s. 6d. and	3 6
PYRETHRUM (Golden Feather) .. .. .. 1s. and	2 6
PANSY, from Prize Flowers .. .. 1s. and	2 6
PANSY, finest Belgian varieties .. .. .. 1s. and	2 6
PANSY, Cliveden Blue, Purple and Yellow .. .. .. each	1 0
LEUCOCARPUS ALATUS.—This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance .. 1s. 6d. and	2 6
EAST LOTHIAN STOCKS, per collection of three colours ..	2 6
POLYANTHUS, Wiggins' Prize Strain .. .. 1s. and	1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA .. .. 1s. 6d. and	2 6
WALLFLOWER, New Golden Tom Thumb	1 0
WALLFLOWER, Saunders' fine dark variety	1 0
Hunt's Auricula-eyed SWEET WILLIAM	0 6
TACSONIA VAN VOLXEMII, splendid greenhouse climber	2 6

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Superb New Bedding Plant,
VIOLA CORNUTA VAR. PERFECTION.

B. S. WILLIAMS has much pleasure in offering a new SEEDLING, the above, and from the manner in which it has been tested, both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance: the colour is shaded blue in the centre, orange-yellow, with a dark purple disc surrounding it, from which proceeds radiating lines of still deeper purple; indeed, it resembles a gigantic V. cornuta in habit, and whilst retaining its profuse blooming qualities, producing flowers which almost rival our florist Pansies for size and substance. Was awarded a First-class Certificate by the Floral Committee when exhibited before them on May 17, 1870, by Mr Johnson, of Rotherfield Park, its raiser, which no doubt Viola lovers will receive.

None is genuine unless B. S. W.'s name and address is on each packet. Price 1s. 6d., 2s. 6d., and 3s. 6d. per packet

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Choice New Seeds.

CHARLES TURNER can now supply the following, all of his own sowing, and from his unrivalled Collections:—

	Per packet—s. d.		Per packet—s. d.
Auricula, Stage	2 6	Pelargonium, in four classes	2 6
" alpine	1 6	Primula sinensis fimbriata	
Carnation	2 6	" rubra	2 6
Cineraria	2 6	Rotundifolia	2 6
Calceolaria	2 6	Picotee	2 6
Cyclamen	1 0	Tubiflora (new) ..	1 0
Pansy	2 6	" primula grandiflora	1 0

The Royal Nurseries, Slough.

CHOICE SEEDS for PRESENT SOWING, free by post. Per packet.—s. d.

CALCEOLARIA, Wheeler's superb unsurpassed strain .. 2s 6d to 5 0
CINERARIA of the finest strain, in great variety, 1s., 1s. 6d. and 2 6
PRIMULA, of the finest strain, mixed .. .. 1s 6d to 2 6

The Trade supplied with CALCEOLARIA and CINERARIA, TROPÆOLUM POLYPHYLLUM, a splendid hardy species for the open ground, golden yellow flowers, in long tresses, trailing on the ground. To the Trade.—DRY TUBERS at 100s. per 100.

GEO. WHEELER, Nurseryman, Seedsman and Florist, Warminster, Wilts.

Suttons' Choice Flower Roots.

AUTUMN 1870

SUTTONS AUTUMN CATALOGUE of

HYACINTHS	TULIPS
CROCUS	NARCISSUS
RANUNCULUS	ANEMONES

&c., &c., &c.,

And SELECT LIST of SEEDS for AUTUMN SOWING, is now ready, gratis and post free on application.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

The Gardeners' Chronicle

SATURDAY, AUGUST 27, 1870.

WE may appropriately call attention to some suggestive experiments recently made by M. ED. PRILLIEUX, on the DROOPING OF PLANTS (*fanaison*), and which are recorded in a recent number of the Journal of the Imperial and Central Horticultural Society of France. These experiments were suggested by the familiar fact that when a plant is exposed under certain conditions to bright sunlight, its leaves become flaccid and droop. We have had plenty of opportunities of witnessing this phenomenon during the present season, and also of seeing how rapidly plants have recovered when the sun's rays have been, from any cause, occluded, even though no water had been given them.

If the quantity of water given off by evaporation from the leaves is in excess of the amount of fluid absorbed by the roots the leaves flag, but when the balance is restored the firmness of the tissues is restored, and the plant resumes its normal condition. And this, under ordinary circumstances, seems to be entirely due to the restoration of the proper equilibrium between the absorbent faculties of the roots and the evaporating powers of the leaves. It appears from the experiments of M. DUCHARTRE, which have often been quoted in these pages, that the leaves themselves do not absorb moist vapour even when surrounded by it. That absorption of liquid water either through the roots or through the leaves, is not the sole cause of the restoration of the plant under these circumstances, is shown by the experiments we are now about to relate. M. PRILLIEUX recalls how M. UNGER, whose death we have recently had to lament, placed a branch of Sparmannia africana, the leaves of which were flaccid from exposure to the sun, in a vessel charged with air, which was saturated with moisture. The cut end of the branch was covered with mastic, to prevent either egress or ingress of water through that channel. Under these circumstances, after a time the faded leaves recovered their firmness, their freshness was restored, and it would have been a natural thing to infer that the leaves had profited by the moisture-laden vapour by which they were surrounded. The balance, however, gave the denial to such an inference. When weighed after the experiment the branch was found to have lost rather than to have gained in weight. M. PRILLIEUX has repeated the experiments of M. UNGER on various plants. He takes leaves or branches from a plant in its flaccid condition, covers the cut surfaces with mastic, weighs them, suspends them in a glass vessel filled with moist vapour, when the leaves are soon observed to recover their freshness, but on being weighed they are found less heavy than they were before the experiment. This is the simple story told by all the plants upon which M. PRILLIEUX has experimented. Another fact is elicited in the course of these experiments, a fact which every botanist who has kept plants in his collecting box or vasculum for some days without opening it must have observed, viz., that the younger portions of the branches, those nearest to the free extremity, recover their freshness at the expense of the lower portions, which yield up what little water they have to the upper younger tissues, which become filled and turgid in consequence. In reference to this point, M. PRILLIEUX cites an observation of M. NÄGELI on the Potato. If a Potato be left in an exposed situation where evaporation goes on freely the tuber becomes soft and spongy, but not uniformly so; the changes are greater at the base of the tuber, and proceed from below upwards; the lower half of the tuber may be soft and wrinkled while the upper is still firm and smooth. By-and-by the whole tuber becomes dry, while the terminal shoot still contains a turgescent tissue covered by a tense and smooth epidermis.

In all these cases, then, there is an evident current of liquid passing from below upwards, and in consequence of which the upper leaves recover their turgescence while the lower remain withered. In this we see once again the provision made to secure the young growing tissues from harm. The work of the older portions is accomplished, and every effort is made to secure the wellbeing of those portions on whose growth and activity the future life of the plant depends.

WE quote several of the following INSCRIPTIONS from SUN-DIALS from the "Belgique Horticole." Let us hope that some of our readers may be able to add to these pithy sayings. At the Jardin des Plantes, Paris, is an inscription worthy a *flâneur* :

"Horas non numero nisi serenas."

The Hôtel de Ville at Anet bids us—

"Ora ne te raptat hora."

—a punning piece of advice which reminds us of the inscription over the dial in the church of St. Germain l'Auxerrois in Paris :

"Vigilate quia nescitis horam neque locum."

At the Château de la Rochefoucault, the dial bears this truism :

"Eheu, fugaces labuntur anni,
Fugit irreparabile tempus."

Indeed one characteristic of these inscriptions is the Tupperian simplicity of their affirmations. Who, for instance, could deny the truth of the following :—

"Afflictis lentæ, celeres gaudentibus horæ?"

—a platitude thus repeated at Villenauxe :

"Præcipites, validis, tardæ languentibus horæ."

and thus served up for the special benefit of youthful students at the College of Avallon :

"Tardior umbra fuit, cum vos ad seria tempus
Alligat, et brevior, cum datur hora jocis."

Here, too, is a reminder for thoughtless youth from the Hôtel Cluny, Paris :

"Signat et monet
Stulto longo, sapienti brevis."

Who, again, could venture to dispute the truth of—

"Sta! fatalis hora veniet"?—

or who bold enough to call in question the truth of this inscription from Négrepelisse :

"Vulnerant omnes, ultima necat"?

After which reminders, another charitable sundial adds

"Sint tibi leves (horæ)."

At Mortefontaine is this somewhat unintelligible distich, recalling forcibly the third declension of the Latin grammar—

"Mors, mortis, morti mortem nisi morte dedisset,
Cœlorum nobis janua clausa foret :"

which, being interpreted, seems to say that had not CHRIST overcome death by dying, the gate of heaven would be closed to us. Here, too, is a grave reminder from Montois-la-Montagne—

"Ce n'est pas, ô mortels, cette ombre-ci qui passe.
Sont vos ans, sont vos jours qui ne font que passer,
Tous les ans, tous les jours, l'ombre passe et repasse,
Mais vos ans et vos jours passent sans repasser."

This is of a piece with an inscription at Caudebec, which runs thus :

"Prima fuit, præsens volat, ultima quando sonabit?
Hæc latet, imprudens ergo caveto tibi."

At Noyers (Côte d'Or), the dial asks—

"Quis melior vitæ monitor rerumque magister,
Cum doceat rapido quo fugit hora pede."

Another dial at the same place has—

"Ite reditque viam constans quam suspicis umbra,
Umbra fugax, homines non reditura sumus."
"Omar Veras."

At the hospice of St. Cenis on the Italian side—

"Tempore nimboso, securi sistite gressum.
Ut mihi, sic vobis, hora quietis erit."

Florence reminds us of our duties:

"Dum tempus habemus, operemur bonum;"

and Nice holds out encouragement by stating—

"Transit hora, lux manet:"

which, after the gloomy reminders we have had, comes with a gladsome brilliancy that lights up that dial, in imagination at least, with a richer glow than that which plays on its more lugubrious fellows.

Some indeed mix the sweet with the bitter very ingeniously; here, for instance, is a double sun-dial. On the eastern side we read—

"Me primum motat cœlum, mea regula cœlum.
Si tua sit cœlum regula, tutus abis:"

on the western side—*solis ad occasum*—

"Dum morior, morieris, moriens tamen hora renascor;
Nascere sic cœlo, dum moriere solo."

After all these sententious and somewhat exasperating platitudes it is a comfort to meet with a modest sun-dial that sees the beam in its own eye. Here is one at Montigny-Lecoup (and we have seen the inscription elsewhere), which has the modesty to acknowledge—

"Sine sole nihil;"

and another which has the grace to admit, in Horatian phrase, that it too is liable to change—

"Transeunt
Non sum qualis eram."

On which account we do well to bear in mind the inscription on the Middle Temple sun-dial—

"Pereunt et imputantur."

THE long-vexed question of the site of the NATURAL HISTORY COLLECTION of the BRITISH MUSEUM has at last been definitely settled. It is to go to the old Exhibition ground (of 1862) at South Kensington. Even Mr. BERESFORD HOPE acknowledges that it is useless to continue the opposition longer, and we may therefore regard it as beyond appeal. We are heartily glad of it. It is high time that this state of uncertainty and inaction should come to an end. We have never been great partisans on either side of the battle of sites. We may have had a trifling personal leaning to one more than another, but it was as dust in the balance compared with the urgent necessity that we felt that some decision should be come to. The position was in reality of little moment; what was wanted was the room—the space in which to arrange, display, and utilise the collection. We are now to get it, but when? £6000 has been taken for the first year, but it is to cost £350,000. We trust that the first dividend does not represent the intended rate of progress. At that rate it will take 50 years before we can begin to use the collection. At present every complaint of confusion is met by the answer "want of space;" and if that stereotyped answer is to be perpetuated for 50 years longer, it would be better that naturalists of the present generation should cast about and see whether a practical substitute might not be made to serve their purposes during their lifetime. We never visit the Museum but we come away depressed. We dare not trust ourselves to speak of the invertebrate collection, which, next to the botanical, is that which most concerns us. As to the botanical, of the late work in which we wish to speak with all respect, we are independent of it, for Kew has to a large extent replaced it; but as to the entomological collection, we have no other in London, and our occasional visits to it, in attempting to clear up any question relating to insect pests, invariably result in disappointment and bitterness of spirit. Its state is well summed up in the remark lately made by a very eminent foreign naturalist: "What you want here is a staff of 14 or 15 men for two or three years to bring the collection into shape, so that you may start fair with the science of the present day." It has long been lagging far behind, and is falling back year by year, for science is advancing more rapidly than the present over-worked and under-handed staff can keep pace with.

We trust, therefore, that the CHANCELLOR of the EXCHEQUER will advance with more rapid steps than the present bone he has thrown to the scientific public would lead us to suppose was his intention; and also that as part after part of the building is completed, it will immediately be utilised by transferring definite portions of the collection into it.

We have only been speaking of the outside of the platter. Will no attempt be made to cleanse the inside? Must the present system of government by trustees still continue? We respect the trustees, and know that many of them are men deserving the highest esteem, but the system seems radically wrong: if we may judge it by its fruits it does not answer. If it would work at all the excellent men who are in charge should make it do, but it seems beyond their power. We trust that this will also come under the consideration of Government, and that at all events, so far as regards the Natural History department, they will recast the whole institution, beginning by settling what its aim is, and adjusting its machinery so as best to carry it out. Whatever step is taken for this purpose now will doubtless regulate the course of the institution for a long series of years to come; and it is, therefore, most desirable that with our present improved lights and more expanded aims the whole question should be deliberately considered in all its bearings—not merely as an establishment *per se*, which is the only kind of consideration it has ever yet received, but in its general relations and power of influencing and aiding the whole Natural History instruction of the kingdom.

—— A CORRESPONDENT asks for information respecting GOURDS and PUMPKINS, in answer to which we may say that the words Gourd and Pumpkin are indifferently used for fruit belonging to at least four distinct species of Cucurbita, which, though producing numberless varieties, will not hybridise with each other. The four species are Cucurbita Pepo, C. maxima, C. melanosperma, and C. moschata. To the former belong such species as the little ornamental Orange Gourds, Elector's Bonnets, sometimes called Custard Apple Marrows, Patagonian Cucumbers, Vegetable Marrows, &c. The original Vegetable Marrow is the smooth unribbed white variety, but it is in our opinion surpassed by some of the green sorts. Most of these have whitish flesh. A few of the varieties are bitter and unwholesome. The foliage is rather deeply lobed. To C. maxima belong such kinds as the Turk's Cap Gourd, the Potiron Jaune, many of the cattle Gourds, the buff-seeded Valparaiso, and others very variable in size. Many of them have yellow flesh, and are in general more fit for making soup than to be used as a vegetable. They are, however, used for food in America, a sort of butter being made of them by a peculiar process. They are much relished by many, but except in soup we cannot ourselves speak in their favour, though prepared by an American according to the most approved recipes. The leaves in this are far rounder and less lobed in outline. The shell is sometimes sufficiently hard to make useful vessels, though not quite so hard as in some varieties of the Bottle Gourd. C. melanosperma has black seeds, and is sometimes called Malabar Gourd. It is useful as cattle food, and very ornamental, but it is not sufficiently good to replace the Vegetable Marrow, though occasionally grown in our gardens, but more for ornament than use. C. moschata, the remaining species, has very peculiar fruit, the carpels, as in the Pear, being confined to the upper portion. The plant is tender, and does not bear well except in very warm seasons. In hot countries the varieties, which are numerous, are preferred to C. Pepo. The seeds are rough, and have a peculiar appearance, which at once distinguishes them from those of other species. The leaves are in general beautifully marbled, and the lobes of the calyx are more foliaceous than is usual in other kinds. Gourds and Pumpkins must not be confounded with Bottle Gourds, which are very poisonous. Their flowers are white, which will at once distinguish them. They assume as many different forms as what are generally known as Gourds and Pumpkins. They belong to the genus Lagenaria. *M. J. B.*

—— Mr. W. GROOM, of Ipswich, sends a fine coloured plate representing seven of his NEW ZONAL PELARGONIUMS, of which descriptions were given at p. 947 of our last volume. They are various in colour, and good examples of the fine strain of flowers with which Mr. GROOM'S name has become associated. One of them, Mrs. Sach, a very fine white, is highly spoken of as a bedder by those who have seen it growing in the Eastern Counties, Mr. GRIEVE and Mr. BLAIR amongst others; and we can readily believe this, as the plants of this variety which have been shown in London, even after so trying a journey as that from Ipswich, have shown so much of good quality remaining, that they have challenged much scrutiny and a close discussion on the part of the members of the tribunal to which they were submitted.

—— Here is news from Belgium! It is only fair to say it is published S. G. D. R. The initials, we presume, represent the grains of salt to be taken with the report, which, however, has a basis of fact:—

"A curious wager has been laid in London as to the relative excellence of BELGIAN or ENGLISH BOUQUETS. M. Robert Owen White laid a bet in favour of Madame Marie Leys, of Ghent; and M. Brandt in favour of Mistress Howardt, boutiquière, of London. The bet was to the amount of £40 sterling, and a grand banquet. On Thursday, April 28, the bet was decided. The jury was composed of M. Eyles, Director of the Botanic Garden of London; Veitch, Nurseryman, of Chelsea; Thompson, private secretary and botanist of the London Club; Williams, of the Palace of Crystal; Boston, distinguished nurseryman of London, &c. The bouquet of Madame Marie Leys was composed of Orchids, of which there were 36 kinds employed. It surpassed the production of Madame Howardt. The bouquets were examined, weighed, measured in every way, judged according to considerations of theory, practice, art, fancy, originality (*invention*), &c. It was no slight honour to carry off the palm in such a contest."

We translate literally; our readers must furnish the interpretation for themselves.

—— M. H. LECOQ, in detailing his experiments on the FERTILISATION of STRELITZIA and HEDYCHIUM, calls attention to the impossibility of self-fertilisation in the flowers of the above-named plants, from the relative position of the stamens and the stigma, the viscid nature of the pollen, and other circumstances, preventing the access of the pollen to the stigma of the same flower, and, as a consequence, necessitating the intervention of insects. M. LECOQ remarks on the circumstance that in those plants in which the pollen is very glutinous, and therefore not readily removable by the wind, the quantity of honey secreted is very large, so that it would seem as if Nature provided a recompense for the insects to compensate them for their labours in securing the due fertilisation of the flower.

—— There is no question that the too prolonged use of stakes and ARTIFICIAL SUPPORTS is often disadvantageous; such, however, is not the moral of the following fable, which we extract from the "Belgique Horticole," where it is printed under the title "Le Tuteur." We give it in the original, as it would suffer as much in translation as the Hollyhock alluded to did when its stake was removed:—

"Délivre moi," disait une Rose trémière
A sa petite jardinière,
"De cette perche auprès de moi,
Qui me gêne et me nuit, qui m'étouffe et me blesse!"
"Je te l'ai mise exprès pour garder ta faiblesse.
"Me garder! Vraiment! et de quoi?
Je me tiens toute seule en parfait équilibre;
Je suis grande, et veux être libre!"
La jardinière enleva le tuteur.
Arrive un coup de vent—il emporte la fleur.

Songez-y, mes enfants, s'il vous prenait l'envie
D'échapper à la main qui fait votre soutien,
Que c'est un grand malheur pour l'enfance et la vie,
Que de n'être tenu par rien.

—— We have received from Mr. SCOTT, Nurseryman, Yeovil, Somerset, a small bottle of "SCOTT'S WASP DESTROYER," with directions for use, as follows:—

"*To Prevent Wasps Devouring Fruit.*—After well shaking the bottle, apply the mixture with a camel-hair pencil or a pointed stick by dropping two or three drops into the fruit the wasps have begun to eat, and if numerous put a few drops on some leaves scattered over the trees. As soon as the wasps have dispersed, care must be taken to pick off the partially-eaten fruit, which at once burn or bury, the mixture being poisonous."

Now, although we may have every confidence in the power of this mixture for destroying wasps, which are at times terribly destructive amongst our fruits, we have very grave objections to using POISON for that purpose, especially in the poisoning of fruit as here recommended, whilst hanging amongst other fruit upon the tree. We know not into whose hands or even mouths such fruit may fall. Amongst many Plums on a tree we may mistake the poisoned one ourselves, or even forget it. It is a mixture, however, which in all sincerity we would recommend to be used with the utmost caution. It is recommended for destroying wasps' nests by soaking some wadding or tow twisted on the end of a stick with the mixture, and putting it in the nest-hole. This may answer very well, but a little gas-tar poured in the nest-hole is equally efficacious, and as easily procured. Still further it is recommended "as the best thing for the destruction of cockroaches, crickets, and other garden pests, by putting a small quantity on thin slices of bread and placing it where they frequent." If it will do this effectually, we shall welcome it as a boon, and for this purpose we shall give it a trial. We find the French apparatus, figured at p. 461, extremely useful in trapping wasps and the larger flies, though less so in the case of the smaller house flies.

—— By the decease of Sir FREDERICK POLLOCK, Bart., we lose not only a man of unusual physical and mental powers prolonged to a very advanced age, in both respects like his compeer BROUGHAM, but also a true horticulturist, one who knew every tree and shrub in his grounds as only those do know who take a botanist's interest in the plants they cultivate. Conifers were special favourites with the late baronet, and hardy variegated plants of all kinds were collected and cultivated by him. His grounds at Hatton, near Hounslow, laid out by Mr. NEWTON, showed evidences at every step of taste, discrimination, and real love of plants.

—— The MAXIMUM TEMPERATURE of the AIR during the WEEK ending August 20 in England varied from 80°.6 at Portsmouth to 67° at Newcastle, with a mean of all highest for the several stations of 75°.1. In Scotland it varied from 81° at Perth to 68° at Aberdeen, with a mean for all stations of 74°.9. The MINIMUM TEMPERATURE in England varied from 49° at Norwich to 42° at Hull, with a mean for all

stations of 46°.2. In Scotland it varied from 47° at Greenock to 40° at Perth, with a mean for all stations of 43°.8. The MEAN TEMPERATURE of the air in England varied from 63°.5 at Portsmouth to 55° at Newcastle, with a mean for the eight southern stations of 59°.6, and for the eight northern of 57°.8. The mean for the several stations in Scotland amounted to 56°.5. The RAINFALL took place principally on the eastern coast, the maximum fall occurred at Norwich, viz., 1.04 inch. The mean fall for the several stations in England is the same as that for the stations in Scotland, viz., 0.20 inch. (See Mr. GLAISHER'S Tables in our present issue.)

—— The cultivators of Lilies, and we are glad to think they are increasing in number, owe their thanks to Mr. WILSON for directing their attention to the true LILIUM SPECIOSUM, sometimes known as lancifolium, of which he has on two separate occasions shown well-flowered specimens at the meetings at South Kensington. This Lily is occasionally met with under the name of cruentum, and is very far superior to the dark-coloured varieties usually seen cultivated under the names of lancifolium, rubrum, atrosanguineum, &c., all of which are apparently seedling forms, raised either in this country or on the Continent, and which, we suppose on account of their greater prolificacy, have gradually usurped in most collections the place which belongs rightfully to the variety which Mr. WILSON has again brought into notice. The characteristics of this Lily are the following:—A stature somewhat below the average; the flower-buds considerably shorter than ordinary, and consequently broader petals or perianth segments; more perfectly and evenly recurved, and consequently neater-looking flowers; a distinct white margin and tips, more apparent on the petaline segments—the colours not being so much run together as in the ordinary forms; very richly coloured spotting; and a somewhat later period of flowering. When seen there is no mistaking the plant, which at once asserts its pre-eminence over the long-petaled irregularly recurving forms commonly seen grown in its place. Since the plants above alluded to were exhibited, we have met with collateral evidence, supporting Mr. WILSON'S conclusion as to this finer variety being the form originally introduced from Japan. In one of the secluded bays of the Knaphill Nursery, the home of so many choice old plants, is a bed of Japan Lilies, a large group of which was pointed out to us as being the original L. speciosum, grown on from the original stock, which has never been lost. On examining the flowers we found they had all the characteristics of Mr. WILSON'S plants, and we have therefore now no doubt upon two points, that the Lily in question is the best of all the forms of speciosum, and that it is not beyond the reach of those who wish to obtain it.

—— The following case, lately tried in the Tunbridge Wells' County Court, is of interest to GARDENERS and their EMPLOYERS. It is not necessary to give the names of the parties concerned:—

"*Important to Hirers of Gardeners.*—The plaintiff in this case is a gardener, and an action was brought to recover the sum of £3 6*s.*, three weeks' wages. Plaintiff said he was engaged by the defendant as gardener and farm bailiff at the rate of 22*s.* per week, on the understanding that a month's notice should be given on either side. After remaining in the employ about 16 months, and having been generally paid by the week, he received notice to quit, signed by the defendant's mother. He lived with his wife and family in the lodge on the grounds. The son of the defendant said he gave notice to the defendant to leave his mother's employ personally, and handed him a week's wages in advance. (The notice to quit was in three places dated 1869, and his Honour said it could not be held a good one.) The defendant was also called, and she denied that any words had passed between the plaintiff and herself as to notice being given on either side. She engaged him in the ordinary way, at so much per week. His Honour said a gardener with a family living in a lodge could not be disposed of so readily as a cook or housemaid, or a single man, as they could get into lodgings directly. The law was in favour of a yearly hiring in this case. Payment by the week was merely the mode, as such persons required their money as early as they could get it, and he was strongly of opinion that a man who brought his wife and children into a lodge on the premises, really came under the ordinary meaning of a domestic servant. In that case he was entitled to a month's warning. He was inclined to think that gardeners hired generally, without any special agreement being entered into, were entitled to a month's warning, and therefore he should give a verdict for the plaintiff for the full amount claimed."

New Garden Plants.

DIOSCOREA (§ 16 Knth. En. Pl. v. 391) RETUSA, *Mast., sp. n.*

Ramis inermibus, teretibus, puberulis: foliis sparsis petiolatis, digitatis, 5—7-foliolatis, foliolis petiolulatis, membranaceis, puberulis oblongis, basi rotundatis, vel attenuatis, apice retusis vel acutiusculis abrupte longiusculeque acuminatis, margine sinuatis, vel integris, 1-nerviis: racemis masculis 4 vel pluribus, axillaribus, gracilibus pendentibus plurifloris, circiter 2-poll. long. rachibus racheolisque his floribus æquilongis puberulis; perianthii laboreteolati, clausi, conici, lacinis 6, biseriatibus, conniventibus, inæqualibus, externis ovatis cymbiformibus, margine ciliatis, internis oblongis obtusis intus concavis; staminibus fertilibus 3, sepalis oppositis, antheris didymis introrsis, staminodiis petalis oppositis petaloideis, spathulatis, apice concavis; styli vestigio apice tripartito: flore femineo adhuc ignoto.—In Africa australi, Burke, *n.* 266 pl. masc. in Herb. Kew; Cooper, v. v. in hort. Veitch.

FIG. 217

At one of the spring meetings of the Floral Committee, a very elegant climbing plant, with dark green, smooth, digitate leaves and graceful pendent clusters of flowers, was exhibited by Messrs. Veitch. The individual flowers were small and inconspicuous, of a dull yellow colour, but possessed of a very agreeable perfume. The plant was not recognised at the time, neither were the flowers examined, but shortly afterwards Dr. Seemann, who saw the plant, referred it conjecturally to a species of Dioscorea allied to D. pentaphylla. This conjecture is verified by the examination of the flowers. The general aspect is not at all that which we are accustomed to associate with Dioscorea, and in truth Kunth, who groups together a few species closely allied to our present one into a section, evidently doubted whether it would not be the better course to make a new genus to include sundry outlying species with closed flowers. This is a course which some one who studies the whole genus monographically may probably be led to do, but for the present it seems better to retain the old genus intact. The botanical characteristics of the present plant are as follows:—

The branches spring from a tuber, and are twining, cylindrical, and puberulous, destitute of spines. The leaves are alternate, loosely scattered (2—3 inches apart), provided with puberulous leaf-stalks, thickened at the base, and as long as the blade of the leaf, which latter is in general outline, roundish, and digitate. Leaflets 5—7, petiolulate (petiolules ½ inch long, thickened at the base), slightly downy, especially below and along the nerves, oblong obtuse, sometimes markedly retuse, rounded at the base, sinuous at the margins, 1-nerved, the midrib excurrent into a rather long slender acumen. Racemes axillary, slender, pendulous, as long as the leaf-stalks, 1½—2 inches long, many-flowered. Flowers pendent, less than a quarter of an inch long, on short downy pedicels, provided at the apex with two ovate-oblong acuminate bracts, unequal in size and shorter than the flower. Perianth of six connivent segments, the three outer broadly ovate-obtuse, concave, ciliolate at the margins, the three inner oblong, hooded; fertile stamens three, opposite the outer segments of the perianth and attached to their very base. Filaments very short. Anthers yellow, roundish, didymous, 2-celled, introrse, dehiscing longitudinally. Staminodes 3, opposite to and half the length of the inner segments of the perianth, petaloid, purplish, spoon-shaped. Rudiment of the style short, columnar, minutely 3-lobed at the apex. Female flower unknown.

The cultivated plant, above described (fig. 217), corresponds in all essentials with specimens gathered by Burke at the Macalis River, South Africa, and preserved in the Kew herbarium (n. 266). It is probable that a specimen (without number), gathered by Gerard at Natal, and also preserved at Kew, is the female of this plant. In the latter the leaf-lobes are narrower, more tapering, and much more tomentose than in Messrs. Veitch's plant; the flower-spikes are axillary, tomentose; the ovaries are also clothed with a dense coat of down, and are shorter than the subtending bracts; the segments of the perianth are oblong-obtuse.

The credit of introducing the present plant to this country belongs to Mr. Thomas Cooper; but in what portion of South Africa he detected it we do not know. The plant fell into the hands of that ardent horticulturist, Major Trevor Clarke, by whom, in spite of the adverse opinions of others, it was valued according to its merits. From him some plants passed into the hands of Messrs. Veitch, who exhibited a well-grown, elegantly trained specimen, which at once attracted attention to what might, under less favourable circumstances, have been passed over. The plant is nearly hardy, but requires stove heat to induce it to flower. *M. T. M.*

THE LATE BARON HUGEL.

WE extract from the "Belgique Horticole" the following details concerning this distinguished nobleman, whose death we have recently had occasion to record:—Charles de Hugel was born at Ratisbon, in 1795. We need not here concern ourselves with his military or diplomatic career, but may simply call attention to the services he has rendered to the sciences of geography, ethnography, and especially botany. His work on Cashmere and the kingdom of the Sikhs, which appeared in several volumes from 1837 to 1848, only gives a slight idea of his six years wanderings and explorations in Syria, in the district washed by the Red Sea, in Hindostan, Thibet, and many parts of Australia. The book which he wrote in 1860 at Vienna, on the Pacific and the Spanish possessions in the Indian Archipelago, was intended for private circulation, and hence came into the hands of but few. The value of these works has nevertheless been highly estimated not only

in Germany, but also in foreign countries, and especially in England. The voluminous dissertation inserted, in 1850, in the Memoirs of the Imperial Academy of Sciences, on the Cabool basin and the mountains between Hindou-Kosh and Sudledje, illustrate several of the author's qualities to advantage. To the lifelike description of the countries he traversed is joined the merit of enlarging out acquaintance with their natural products, and of affording us a critical examination of historical documents in their relation to the several localities. It is in this district, to use the words of the author, that the old civilisation of India and that of classical antiquity encountered innumerable hordes of nomads which, like the locusts generated in their immense steppes, made their appearance in a brilliant period of prosperity, so far as the arts and civilisation were concerned, and who, after a short sojourn, left behind them Nature in all its baldness. It was also in this district that the most ancient languages came in contact one with the other.

To the narratives of his travels must be added his researches on botany and ichthyology, the account of which was recorded by himself or drawn up by others from specimens collected by him. The services which Hugel rendered to geography and the natural sciences were highly appreciated on all sides. In his native country he was nominated President of the Imperial Societies of Horticulture and Agriculture. He was elected as member of the Academy of Sciences at its foundation. Oxford conferred on him the degree of Doctor of Civil Law, and the Royal Geographical Society of London awarded him a medal *ob terras reclusas*. Von Hugel was something more than a *savant* and a traveller. After having studied law at Heidelberg, he took part in the War of Independence, which was then drawing to a close, and at the laborious campaign of Naples. He was also engaged in the diplomatic service. Circumstances determined him to quit the army, in which he held the rank of Major, and to absent himself for a long period from his country. On his return from his travels, he devoted himself entirely to the completion of his work at Hietzing, near Vienna, when the events of 1848 gave a new direction to his pursuits. He wished, as he tells us in his book on the Pacific Ocean, to serve the cause of law and order, as personified by the Emperor. From this moment diplomacy occupied his whole attention. He took part in the different Italian negotiations. In 1849 he represented Austria in Tuscany, first as Chargé d'Affaires, and afterwards as Ambassador Extraordinary. Here he remained for ten years. His task was not easy, but it was rendered easier by his personal qualities. He was, indeed, a man of great nobility of sentiment, of cordial beneficence, a man of the world, cultivated and sociable; his manners were most attractive—in a word, he was a perfect gentleman. After ten years' sojourn at Florence, he spent one year in Austria, and then filled the office of Ambassador at the Court of Belgium. He left behind him at Brussels, as in Tuscany, the most endearing recollections. In 1869 he retired from active life, and lived henceforward in England, the native country of his wife. He passed the winter at Torquay, and the summer in the Isle of Wight. His health was good, but his sight was much impaired of late years. To the end he preserved a lively interest in science, literature, and especially in horticulture. In a note addressed to us in September, 1867, from the Isle of Wight, Baron von Hugel thus writes:—

"My travels have been very extensive, and I will tell you the different spots where, in particular, I have made large collections of plants, which are now to be found in the Botanic Garden, Vienna. After having visited Greece, Syria, and the whole of Egypt, I embarked at Cosseir, a town of upper Egypt, on the Red Sea, to explore the Arab coast, and to reach Bombay. The Mahableshwar Mountains and the Deccan were the principal fields of my botanical researches. I then traversed the Malabar coast, in order to get to the Neilgherries, where I made a large collection of plants. This district of Southern India was very little known before my journey in 1832, and for that reason I endeavoured to gather everything that appeared interesting in the plant line. Passing by the coast of Cochin and Travancore I went, by way of Cape Comorin, to Ceylon, where I remained six months, traversing the island in all directions. There the most elevated points, Nur-Min and Pedro della Galla, were examined by me with the greatest care. Proceeding from Trincomalee to the Coromandel coast I stayed a short time at Madras, from whence I embarked to visit Poulo-penang, Malacca, Sumatra, Singapore, and the Branca Islands. I stopped at Batavia, and explored the high mountains near Buitenzorg. I continued my voyage by the Sunda Islands, and remained for some time at Swan River and King George's Sound in Australia. Continuing my journey I stopped at Hobart Town in Tasmania, where Mount Wellington was the object of a careful examination. In New South Wales I remained eight months, exploring the interior in every direction. Resuming my peregrinations I remained six weeks in New Zealand, and traversed the northern island from one side to the other, a matter then of great difficulty. After having touched at Norfolk Island I embarked at Sydney to traverse the Pacific Ocean, and reached the Philippine Islands, where I remained six weeks; from thence I went to Macao, Lintiu, Canton, and after six more weeks I embarked, passing through the Straits of Malacca to Madras and Calcutta. Afterwards I went to the Himalaya Mountains and Simla, then through the Punjaub to Cashmire, which I explored as far as the mountains of Thibet, and then passing down the river Jhilum I came to Lahore. I went from thence to Delhi and Agra. Mounting then on a camel I went to Cudysoor and Ajmeer, in order to reach the mountain of Aboo, one of the most extraordinary spots on the globe, principally because its flora is that of the Himalaya. From thence I travelled by land to Bombay, where I embarked for the Cape of Good Hope and St. Helena. I was accompanied by a naturalist, M. Le Roux, who was recommended to me by the celebrated Cuvier, and whom I lost at Bombay. Through his exertions, and by the aid of the natives, I collected an enormous quantity of plants in all the countries I visited. These herbaria, as well as collections of animals, antiquities, medals, manuscripts, &c., are preserved in the imperial museums of Vienna."

This important voyage gave occasion for sundry botanical publications, drawn up by Endlicher, Bentham, and Lindley. As to the horticultural introductions, they are so numerous that their enumeration would transcend the limits of this notice. The greater part belong to what are termed New Holland plants, such as Proteaceæ, Myrtaceæ, Compositæ, Epacridaceæ, Rubiaceæ, &c., plants of elegant habit and beautiful foliage, but which are now neglected, because their culture is difficult, and because it often needs the trained eye of the botanist to appreciate their beauty.

DECORATIVE TREES AND SHRUBS.

YOUR observations (p. 1084) on this subject are remarkably well timed, and quite accord with my own experience in matters connected with planting. The only way by which I have been enabled to lead improvers of property to abandon the beaten track, has been to take them about this time of the year over some place in which I knew fine trees and shrubs were to be found, and get them to select for themselves what they would like to plant when the proper season for that operation arrived. The grounds at Fulham Palace, Kew, Chiswick, and Sion House, I have found to be fertile fields for this purpose, but as many of your readers may reside too far away from these places to visit them, I venture to furnish you with a list of materials for park and pleasure ground ornamentation, derived wholly from Kensington Gardens and St. James's Park, in which representatives of the subjoined names will be found. I may premise, however, that many of the specimens to which I wish to direct attention are not so large and fine as may be found in more favoured localities, but still they afford better illustrations of what we want than are to be seen in nurseries, where, as a rule, few things are allowed to remain long enough undisturbed to attain any great size:—

Acacia [illegible]
,, lophantha
A[illegible]
,, campestre
,, ,, austriacum
,, [illegible]
,, [illegible]
,, [illegible]
,, Lobelii
,, macrophyllum
,, [illegible]
,, Negundo
,, [illegible]
,, opulifolium
,, Opalus
,, platanoides
,, [illegible]
,, Pseudo-Platanus
,, ,, [illegible]
,, album
,, [illegible]
,, [illegible]
,, [illegible]
,, [illegible]
,, saccharinum
,, spicatum
,, [illegible]
,, [illegible]
,, Wagneri
,, ,, [illegible]
,, [illegible]
Æsculus Hippocastanum [illegible]
[illegible]
,, præcox
,, [illegible]
,, [illegible]
,, rubicunda
,, ,, fl.-pl.
Alnus [illegible]
,, [illegible]
,, cordifolia
Amelanchier Botryapium
,, florida
,, ovalis
,, sanguinea
,, vulgaris
Amorpha fragrans
,, glabra
,, ,, nana
,, canescens
Ampelopsis quinquefolia
Amygdalus communis
,, [illegible]
,, persica
,, ,, fl.-pl.
,, ,, alba
,, ,, [illegible]
,, ,, ,, fl.-pl.
Andromeda angustifolia
,, floribunda
Aralia japonica
,, spinosa
Arbutus Andrachne
,, procera
,, Unedo
Armeniaca sibirica
,, brigantiaca
Asimina triloba
Aucuba japonica

A[illegible]
,, [illegible]
Berberis aristata
,, [illegible]
,, dulcis
,, [illegible]
,, [illegible]
,, vulgaris [illegible]
,, ,, [illegible] marginata
,, atropurpurea
Betula alba
,, [illegible]
,, [illegible]
,, [illegible]
,, carpatica
,, fruticosa
,, [illegible]
,, [illegible]
,, nana
,, nigra
,, [illegible]
,, pendula
[illegible]
,, [illegible]
Bupleurum fruticosum
Buxus [illegible]
,, balearica
,, Fortunei
,, japonica
,, ,, nana
,, sempervirens
,, angustifolia
,, intermedia
,, marginata [illegible]
,, ,, ,, [illegible]
,, argentea
,, glauca
,, vulgaris
,, [illegible]
,, thymifolia
Calycanthus floridus
,, præcox
Caragana frutescens
,, triacanthoides
,, grandiflora
,, pygmæa
,, spinosa
,, carpina
,, americana
,, incisa
,, pendula
Carya amara
,, sulcata
,, olivæformis
,, pubescens
,, tomentosa
Castanea vesca
Catalpa syringæfolia
Celtis australis
,, variegata
,, Tournefortii
Cerasus japonica
,, Lauro-cerasus
,, ,, variegata
,, lusitanica
,, Mahaleb
,, Padus
,, ,, aucubæfolia
,, ,, pendula

Cerasus nigra
,, bracteosa
,, ,, fl.-pl.
,, sylvestris
,, vulgaris
,, virginiana
Cercis Siliquastrum
Chimonanthus fragrans
,, grandiflora
Chionanthus virginica
Colletia ferox
,, spinosa
Colutea sanguinea
Comptonia asplenifolia
Corchorus japonicus
Cornus alba
,, sanguinea
,, florida
Coronilla Emerus
Corylus Avellana
,, tubulosa
,, purpurea
,, Colurna
Cotoneaster acuminata
,, affinis
,, buxifolia
,, lævis
,, microphylla
,, melanocarpa
,, nummularia
Cratægus apiifolia
,, Aronia
,, coccinea
,, Crus-galli
,, Douglasii
,, [illegible]
,, Lavallei
,, glandulosa
,, heterophylla
,, lobata
,, macrantha
,, melanocarpa
,, mexicana
,, nigra
,, orientalis
,, ovalifolia
,, Oxyacantha
,, punicea fl.-pl.
,, [illegible]
,, fructu luteo
,, [illegible]
,, flexuosa
,, [illegible] pendula
,, præcox
,, stricta
,, eriocarpa
,, variegata
,, [illegible]
,, [illegible]
,, [illegible]
,, ,, [illegible]
,, ,, rubra
,, ,, rosea
,, [illegible]
,, [illegible]
,, Pyracantha
,, ,, fl.-pl.
,, [illegible]
,, [illegible]
,, [illegible]
,, [illegible]
,, [illegible]
,, trilobata
,, oxyphylla
,, Monktoni
Cydonia japonica
,, vulgaris
,, maliformis
,, lusitanica
Cytisus alpinus
,, [illegible]
,, pendulus
,, [illegible]
,, latifolius
,, purpureus
,, quercifolius
,, albus
,, [illegible]
,, nigricans
,, sessilifolius
,, Watereri
Daphne Mezereum
Datura [illegible]
,, [illegible]
Diervilla canadensis
Diospyros virginiana
Elæagnus argentea
,, parvifolia
Escallonia rubra
Euonymus angustifolius
,, europæus
,, nanus
,, Hamiltonianus
,, japonicus
,, argenteus
,, aureus
,, latifolius
,, verrucosus
Fagus sylvatica
,, ,, pendula
,, cuprea
,, purpurea
Forsythia viridissima
Fothergilla alnifolia
Fraxinus americana
,, caroliniana
,, curvidens
,, [illegible]
,, glauca
,, rubicunda
,, quadrangulata
,, elliptica
,, epiptera
,, excelsior
,, ,, aurea
,, ,, ,, pendula
,, ,, aucubæfolia
,, ,, nigra
,, jaspidea
,, serrata
,, heterophylla
,, juglandifolia
,, lentiscifolia
,, lucida
,, [illegible]
,, platycarpa
,, longifolia
,, Ornus
,, [illegible]

Fraxinus oxyphylla
,, pallida
,, pubescens
,, Richardii
,, sambucifolia
,, crispa
,, viridis
Genista ætnensis
,, virgata
,, radiata
,, tinctoria
,, ,, fl.-pl.
Gleditschia ferox
,, nepalensis
,, triacanthos
,, inermis
Glycine sinensis
Gymnocladus canadensis
Halesia tetraptera
Hippophae rhamnoides
,, angustifolia
,, salicifolia
Hibiscus syriacus
,, ,, variegatus
Hypericum Androsæmum
,, calycinum
,, elatum
,, hircinum
,, nepalense
Ilex Aquifolium
,, altaclarensis
,, fructu luteo
,, Hodginsii
,, latifolia
,, marginata
,, ciliata
,, crassifolia
,, recurva
,, serratifolia
,, ferox argentea
,, ,, aurea
,, crispa
,, balearica
,, opaca
Jasminum nudiflorum
Juglans nigra
,, cinerea
,, regia
Laurus nobilis
,, salicifolia
Ligustrum japonicum
,, ovalifolium
,, sinense
,, fl. luteum
,, variegatum
,, vulgare
Leycesteria formosa
Liquidambar styraciflua
Liriodendron tulipifera
,, [illegible]
,, [illegible]
Lonicera hirsuta
,, nigra
,, [illegible]
,, Ledebourii
,, tatarica
Lycium europæum
,, barbarum
,, ovatum
Magnolia acuminata
,, [illegible]
,, grandiflora
,, purpurea
,, tripetala
Mahonia Aquifolium
,, Beali
,, Fortunei
,, intermedia
,, japonica
Mespilus grandiflora
,, stricta
Morus nigra
Paulownia imperialis
Pavia hybrida
,, coccinea
,, flava
,, neglecta
,, rubra
,, [illegible]
,, humilis
,, pendula
Philadelphus coronarius
,, fl.-pl.
,, floribundus
,, Gordonianus
,, [illegible]
,, [illegible]
,, latifolius
,, verrucosus
,, Zeyheri
Photinia serrulata
Planera Richardi
Platanus occidentalis
,, acerifolia
,, orientalis
,, hispanica
,, umbellata?
Populus alba
,, acerifolia
,, balsamifera
,, canadensis
,, canescens
,, nigra
,, monilifera
,, hybrida
,, heterophylla
,, pendula
,, tremula
Ptelea trifoliata
,, variegata
Pterocarya caucasica
Pyrus accrifolia
,, americana
,, bollwylleriana
,, fastigiata
,, [illegible]
,, cretica
,, Aria
,, latifolia
,, Aucuparia
,, ,, pendula
,, amygdaliformis
,, baccata
,, Schottii
,, sanguinolenta
,, præcox
,, Michauxi
,, [illegible]
,, [illegible]

Pyrus pinnatifida
,, prunifolia
,, nivalis
,, hybrida
,, salicifolia
,, salvæfolia
,, sinensis
,, Sorbus
,, variolosa
,, vestita
Quercus Ægilops
,, ,, pendula
,, Ballota
,, agrifolia
,, alba
,, Cerris
,, ,, austriaca
,, ,, fulhamensis
,, heterophylla
,, Lucombeana
,, ilicifolia
,, Phellos
,, coccifera
,, coccinea
,, rubra
,, variegata
,, palustris
,, Ilex
,, ,, Fordii
,, fastigiata
,, imbricata
,, pedunculata
,, ,, pendula
,, ,, variegata bicolor
,, Primos
,, pyrenaica
,, sessiliflora
,, Suber
,, Turneri
,, virens
Rhamnus hybridus
,, maculatus
,, catharticus
,, infectorius
,, latifolius
Rhododendron dahuricum
,, hirsutum
,, ponticum
,, catawbiense
,, various hybrids
Rhus suaveolens
,, copallinum
,, cotinus
,, Cotinus
,, Toxicodendron
,, typhina
Ribes alpinum
,, diacum
,, sanguineum
,, Pcatoni
Ribes hybridum
,, nigrum fol. var.
,, sanguineum
Robinia hispida
,, Pseud-Acacia
,, fastigiata
,, inermis
,, elegans
,, spectabilis
,, stricta
,, tortuosa
Rubus fruticosus
,, laciniatus
,, nutkæanus
,, odoratus
Ruscus aculeatus
Smilax Sarsaparilla?
Sophora japonica
Spartium junceum
Spiræa ulmifolia
,, lanceolata
,, Douglasii
,, flexuosa
,, prunifolia
,, salicifolia
,, trilobata
Symphoricarpus racemosus
Syringa Josikæa
,, persica
,, vulgaris
,, Charles the 10th
,, Emodi
Tamarix germanica
Tilia americana
,, bignoniaefolia
,, flaccida
,, laciniata
,, europæa fl. pl.
,, stricta
Ulmus campestris
,, ,, nana
,, stricta
,, pendula
,, tortuosa
,, variegata
,, glabra
,, fastigiata
,, sapinea
,, ,, major
Viburnum Lantana
,, Opulus
,, ,, nanus
,, Tinus
,, ,, hirtus
Weigela rosea
Xanthorhiza apiifolia
Yucca gloriosa
,, filamentosa

In the foregoing list, which lays no claim to botanical accuracy, it will be seen that I have avoided giving names of Conifers, of which there are few good specimens, with the exception of the Cedar of Lebanon, a few Junipers, Yews, Hemlock Spruce, and Thujas; as a rule they thrive but indifferently near London. To the genus Aucuba great additions have been made since the list was prepared, which was in 1868. Therefore those who desire variety in that way must have recourse to the nurserymen's catalogues. I may remark that the Stag's-horn Sumach (Rhus typhina) has flowered unusually well this season, and that its fine foliage and handsome appearance have attracted general attention. As regards the Virginian Sumach (Rhus Cotinus), called in France and Germany the Periwig tree, few have seen it in such beauty as the late dry bright weather has induced it to assume. It has, indeed, been literally a "burning bush," as brilliant in colour as I have ever seen it in Virginia.

For the benefit of town planters, I may mention that no two classes of plants withstand smoke so well as Thorns and Pyruses, of which I have seen good examples, even about Liverpool, where the climate is less favourable than with us, and of both of these our Parks contain good collections. Of Planes there is a good avenue between Colebrookdale and Lancaster Gates, and of Poplars some fine examples may be seen along the Birdcage Walk side of the lake in St. James's Park. Of the utility of planting in family groups (a mode of arrangement which I have sometimes advocated in places where it is of importance to furnish arboricultural instruction) a good illustration will be found in a clump of Ashes close to Colebrookdale Gate near the Albert Memorial. This group is set off by an undergrowth of common Laurel and Privet, and contains a good collection of the different varieties of Fraxinus. Another group of different species of the same genus stands on the grass just behind the pretty little cottage by the side of the Serpentine, now, on account of its floral decoration, the admiration of everybody. This, too, like the one just alluded to, is rich in variety, and well worth careful inspection; the differences in the habit, foliage and general appearance of the trees are very remarkable, and well worth the special study of planters. *Joseph Newton*, 74, *Oxford Terrace, Hyde Park.* [Some of the above-named seem to be too tender for the purpose indicated. EDS.]

MINTS AND OTHER SWEET HERBS.

ONE has only to learn the natural order and the genus to which a plant belongs, and if these are not respectable one seldom need go further. Ground Ivy, Dead Nettle, Cat Mint, and Pennyroyal would condemn the Labiates and all that belongs to them as vulgar plants. Many of them, I must confess, are troublesome weeds, and strong smelling; some are Nettles, and others, as the Coleuses, are nettle-leaved. But what would lamb be without Spear Mint to make the sauce? and what would the druggist do without Pepper Mint, not to name the confectioner who manufactures Peppermint lozenges? When I was at home we grew Pepper Mint (Mentha Piperita), and sold it for distillation; and after it was cut we were at great pains to keep it dry, as rain would have rendered it of little value. "The Botanist" (*vide* Smith's "Flor. Brit.") marks this species as having "odor subcamphoratus," and from other botanical works we learn that the whole of the Labiatæ are, in their essential oils at least, tinged with camphor. It is, therefore, not without reason that the ladies put Lavender in wardrobes where furs are kept, to drive the moths away. Sage is quite as efficient for this purpose as Lavender, but sadly inferior in respectability.

I need not tell the readers of this Journal that, besides the respectable Mints that I have named, there are weedy Mints that infest cornfields, and it is to these, and such as these, which the botanist marks as possessed of "odor fortis" and "odor acris," that I must now beg leave to invite attention. In the Highlands of Scotland, in the olden time, a man's bed was made of Heather (Calluna vulgaris), set up on end, and over this groundwork was spread the bed tick filled with either feathers or oat-chaff; but in the Lowlands the part allotted to the Heather had to be done with oat-straw, which was well shaken every day, and very often changed on the score of cleanliness. In practice it was soon found that n one case the inmates would be devoured with fleas, whereas the next neighbour would be quite free, and this led to "comparing notes," when the secret oozed out, that where the oat-straw had a large portion of Mentha arvensis mixed with it the fleas sought better quarters. This was scientifically correct; for in the stuffing of birds, and such like processes, where the depredations of insects are feared, camphor is constantly employed. Now, as Mentha hirsuta is an equally strong-smelling species, it will no doubt be equally useful, and being a troublesome weed in wet ground, can be readily obtained in bulk.

The present hot and dry season has been very prolific in the way of the common house-fly in living rooms, and of the flea in bedrooms; and not only in these, but in the church, the school, and in public buildings and places of amusement, fleas abound, and cats, dogs, and domestic poultry are tormented with them; so that if the Mint family can only cure a few of the milder cases, it will do good service. A dog-kennel can easily be supplied with Mint, wild or tame; and if Lavender can be used in houses, why not use Pepper Mint or Pennyroyal? They will dry easily in the kitchen, hung up in bunches of a handful each.

I received the other day a sample of Mint from Mr. Stansfield, the eminent Fern grower at Todmorden. It is perhaps the smallest real shrub on the face of the earth. It was in full flower, and had a ligneous stem and branches, and its entire height was considerably under half an inch, but it had the strong Mint odour, showing its family claims. It was thought at first to be a species of Thymus, but on scientific examination it was pronounced to be a Mentha (Mentha Requieni), a hardy alpine of a beautifully spreading habit.

There are only three species of Mint usually cultivated; the green, or Spear Mint, for cookery; the Pepper Mint, for oil, &c.; and the Pennyroyal for the pork butcher's black puddings. All these strike root readily from cuttings in moist ground, and consequently there can be little excuse for lacking a supply of them. *Alex. Forsyth*, 9, *Islington Square, Salford.*

ENGLISH LOCAL FLORAS.

FEW works are more interesting to the British botanist than those which are devoted to the investigation of some portion of the British Isles. The large number of works which, especially during the last few years, have been issued on local botany, afford ample proof of this: and as these have, in many respects, more than a passing interest, a few remarks on the changes which have gradually taken place in their plan and arrangement may not be without interest.

In 1650 was published a small 8vo of 134 pages entitled "Phytologia Britannica, natales exhibens Indigenarum Stirpium sponte Emergentium." This was written by William Hows, whose name, however, does not appear in it, and is of especial interest, as being the first book exclusively devoted to British botany, all previous works having included foreign as well as native plants, no especial prominence being given to the latter. The plan of the book is very simple, the names being arranged alphabetically, with synonyms from Gerarde, Lobel, Matthiolus, Bauhin, Parkinson, Fuchsius, and others of the older authors; the habitat, or, in the case of less common species, the locality follows, with the English name, when one exists. A few plants are enumerated which have no claim to admittance, and the class of introduced species, which of late years has so rapidly increased, was not even then without its representatives: witness the following: — "Pæonia mas vulgaris. Male Peiony: Found growing in Mr. Feild's well close in Darfield, which though farre from any house, I believe it came first out of a garden with some dung: Mrs. Stonehouse." This "male Peiony," apparently P. corallina, which is said still to grow upon the island of Steep Holmes, in the Severn, is one of the earliest reported plants of garden origin which appeared in a subspontaneous state. Gerarde, who gives an admirable figure of the opened carpels, says:—"The male Peionie groweth wild upon a connyberry [rabbit burrow] in Betsome, being in the parish of Southfleet, in Kent, two miles from Gravesend, and in the ground sometimes belonging to a farmer there, called John Bradley." Upon this his editor, Johnson (1636), makes the following uncharitable comment:—"I have beene told that our author himselfe planted that Peionie there, and afterwards seemed to finde it there by accident; and I doe beleeve it was so, because none before or since have ever seene or heard of it growing wilde in any part of this kingdome." At Steep Holmes the plant was discovered by Mr. F. P. Wright, in 1803; and two fishermen, of whom this gentleman made inquiries about it, stated that they had known it there for 60 or 70 years.

The "Phytologia" contains 1220 plants, among which are about 22 Mosses, four Fungi, 11 Algæ, and three "Corallines;" the remainder are flowering plants and Ferns, of which many are mere varieties in colour or other trifling particulars.

My aim being at present to trace the progress of local Floras, rather than of those which apply to the whole of the country, it is interesting to find that the next work upon English plants is of the former description. This, the first local Flora, was the first work of the illustrious John Ray, a name which will always be remembered and venerated by British botanists. It is a small 12mo, of 182 closely, but clearly, printed pages, entitled "Catalogus Plantarum circa Cantabrigiam nascentium," and was published at Cambridge in 1660; and, besides indigenous species, it contains those in field cultivation. The author's name does not appear on the titlepage, or anywhere throughout the work; the body of which is preceded by a preface and list of authors consulted, with short notices of some of the former, and of their various works. The alphabetical arrangement is followed, the synonyms of Gerarde, Parkinson, the two Bauhins, Lobel, and very many others, being added; then come the English names, and the places of growth, with references to any published works bearing on the latter. Thus on p. 1 we have two plants, species of Artemisia, which Hows had reported from Newmarket Heath. Of these our author says:—"We have searched diligently, but can as yet find neither of them." And, again, of the Bladdernut (Staphylea pinnata), which was formerly, though without reason, included in lists of British plants, he says:—"Said to grow at Milton, three miles from Cambridge, by Parkinson. We could not find it out by search, nor hear of it by inquiry, howbeit we deny not, but possibly it may grow there." Following names and localities, we have one or more paragraphs, relating to the uses, properties, and varieties of the plants enumerated, with such other particulars as the author deemed interesting, all indicating an amount of reading and personal observation most creditable to him. Descriptions of several new plants are given, and of critical genera, among which Salix appears always to have occupied a prominent place. Very careful notes upon each species are added. When Ray describes a plant which he believes to be new, he is very precise in stating the locality where it may be found. Thus, of Sagina apetala, which he was the first to record, he says:—"If any one desires certainly to know what plant we mean, he may be sure to find it among the stones in the stone-walk in the Fellows' Garden at Trinity College." Professor Babington, in his more recent Flora of Cambridgeshire (1860) justly speaks of this as a "celebrated and singularly excellent work." He adds:—"After deducting all the plants which were cultivated or otherwise do not come within the plan of the present Flora (*i. e.*, the lower Cryptogams), it contains 671 plants found in this country by Ray." Professor Babington's work enumerates 1007 species; but of these a considerable number are more generally considered as sub-species or forms.

At the end of the catalogue is a second part, with separate titlepage and paging, but the same date, entitled "Index Plantæ Agri Cantabrigiensis," which commences with an alphabetical enumeration of the English names of plants, with their Latin equivalents; this occupies 29 pages, and may be considered as a complete list of the names most common in books at that time. Then comes a list of the more important localities, with the principal plants of each specified; and the volume concludes with an etymological account of the principal Latin names, and a glossary of terms, both in Latin, with a brief plan of classification: "capita seu divisiones plantarum usitatiores." "In 1663," says Professor Babington, "Ray published an appendix of 13 pages, in which 37 plants were added; and of this a second edition, consisting of 30 pages, was edited by Mr. Peter Dent, an apothecary of Cambridge, in 1685. Mr. Dent inserted in this edition 59 more plants unnoticed in the 'Catalogus.' These additions were made almost in the words of Ray, as found in his 'Catalogus Plantarum Angliæ.' The appendices, especially the second, have long been of great rarity." In this latter "Catalogus" (ed. i., 1670, ed. ii., 1677) a "C" is prefixed to the Cambridgeshire plants. In 1727 Professor John Martyn published a "Methodus Plantarum circa Cantabrigiam nascentium," which was merely an arrangement of Ray's catalogue and appendices according to the mode of classification then most in vogue; and of this his son, Thomas Martyn, published an altered and much extended edition in 1763, called "Plantæ Cantabrigienses."

I have been thus particular in giving details of this

work, because it is the first of its kind which was published in England. Ray's larger and more important works do not come within the scope of the present notice, but may suitably be mentioned. Besides one or two religious books, his miscellaneous papers, his collections of English words and proverbs, and some geological treatises, he published, in 1682, "Methodus Plantarum;" in 1686, the first volume (folio) of the "Historia Plantarum Generalis," a monument of perseverance and industry; in 1688, the second volume of the same work, and "Fasciculus Stirpium Britannicarum;" and in 1690, his "Synopsis," a work of which it is impossible to speak too highly. Of this a second edition appeared in 1696, and a third (edited by Dillenius) in 1724, after his death. His last work was the third volume of the "Historia," which was published in 1704. It must not be forgotten that it is to Ray that we are indebted for the catalogue of plants printed at the end of each county, in Gibson's edition of Camden's "Britannia," published in 1695; these may be looked on as forerunners of the "Botanist's Guide" of 1803, of which I shall speak hereafter. Ray died at Black Notley, in Essex, Jan. 17, 1704-5. *James Britten, F.L.S.*

OLD PLANTS IN NEW POSITIONS.—No. I.

I PURPOSE, under this heading, calling attention to a few well-known plants that might be more extensively grown in our gardens for purposes somewhat different to those for which they have mostly been employed. This field is inexhaustible, and there is no intention of attempting to explore its length, breadth, or untold wealth in your Paper. My mode of treating the matter is intended to be suggestive merely—simply to point the way to where useful treasure may be found, and not to save your readers the trouble of gathering it for themselves. Or rather, I hope to induce many others to become gatherers in this large but mostly neglected field, and then doubtless a rich harvest of beautiful though common gems may be collected for the general use of your readers. But all this will be better understood by an illustration or two, and I doubt if I could choose better for my present purpose than the two Cynaras—Scolymus and Cardunculus.

Cynaras—what are they? We never remember to have heard of them. Probably not; and yet you know them well, as they are amongst the handsomest plants we have for the subtropical department. These plants belong to the great natural order of Composite—so rich in plants of dignity, beauty, and utility, and yet somehow so little used as objects of ornament. The name Cynara is derived from kyon, dog—from the supposed resemblance of the spines of the involucrum to dog's teeth. There are several other varieties besides those named, perhaps the best of them being horrida, speciosissima, and integrifolia; but neither of them exceeding in beauty, nor so easily come-at-able as the two previously named.

The first, Cynara Scolymus, was introduced into England, from the South of Europe, over 300 years ago, and has been grown in most gardens ever since. It is a half-hardy perennial, readily increased, and grows freely in almost any soil; fastest and strongest, however, in the best. In mild seasons it makes an early growth. Now as I write (on August 2) the plants are 4 feet high, and of noble and graceful habit; the leaves are large, numerous, deeply pinnatifid, and sweep out with a stately and graceful curve; the midribs are deeply furrowed, as if gouged out. The colour approaches to that of the Cineraria maritima, and the entire leaf is covered with a soft down, as if it might have had some close love passages with the finest, purest wood ashes. The plant throws up an enormous number of leaves, forming a dense mass, when left for a year or two without division, 4 or 5 feet across. The under leaves curve gracefully out, as already described, and the centre ones stand upright, so that the whole plant forms a dense well-formed mass of beautiful rich foliage. It looks well when thus massed together, although it is probably even more graceful when the stools are divided and grown singly. Single stools planted on rich soil, well manured and salted, will produce plants 5 feet high, and leaves of immense size and beauty. The flowers of this plant are also curious and beautiful. The time of flowering varies according as the plants are well established or fresh planted. On old plants the flowers will begin to open in July; on fresh plants they will be much later. The flower-heads resemble in form immense Thistle heads, and as the involucre expands there is a gorgeous assemblage of ragged-looking, jagged, bluish purple florets, standing boldly up on stout flower-stems 1 foot or 18 inches above the leaves, that convey a most dignified and grand appearance. From the white ashy colour of its leaves, the beauty of its habit, and the regal grandeur of its blossoms, the plant is admirably adapted for either massing or single specimens in the subtropical department. In the northern and colder parts of the kingdom, it will need 6 inches of litter, or a few Spruce boughs to keep the frost off its crown in winter, and in warmer parts its own leaves afford sufficient protection. Thus, no expensive space or labour is needed to keep up the stock; the usual mode of increase is by division of the root, or where this fails to be sufficiently rapid for the demand, it may be raised from seed, though it is seldom that the seed ripens well in England. There would, however, be no difficulty in importing any quantity of seed from near countries.

A companion plant to this, and indeed so like it as to be a twin-brother, is the Cynara Cardunculus. This was introduced from Candia about a hundred years after the other, and has been more or less grown in most gardens ever since. It is, however, generally treated as an annual, though it is a more hardy perennial plant than the other. It differs from it in being taller, rising on good soils to a height of 6 or 7 feet. It is likewise furnished with formidable spines, that add greatly to its beauty; and altogether it is one of our noblest herbaceous plants. It flowers freely during the autumn, like its ally, Cynara Scolymus, and few plants could equal either as a centre or a back to masses of dark-leaved Cannas, Perillas, Iresine, or the taller varieties of red Beet. I need hardly add that the first brace of old plants that I have proposed to place in new positions, are the well-known Globe Artichoke, and the less generally grown Cardoon; and if any one knows any just cause or impediment why they should not be promoted from the domain of the useful into the presence of the beautiful, I invite them now to declare it, or for ever after hold their peace. *Quercus.*

HARDY PRIMULAS.

P. Auricula (L.).—Nearly every book on general gardening goes quite exhaustively into the treatment of this favourite flower; therefore I am not going to attempt more than a brief summary of what is known on the subject, and that, too, chiefly for the purpose of throwing some light on the management of the kindred caulescent species which are to follow. In referring to the stem as I have just done, I desire to draw attention to that part, because it is of considerable practical importance to notice its character, as will be made to appear in the course of the remarks which are coming. To start with the seed, let us say that it should be sown either when ripe or early the following season, and the soil may consist of loam, rotten dung, or leaf-mould and sand; and the former ought of course to predominate greatly over the others, and the proportion of the second should be regulated by the age and strength of the plants. In order to check evaporation during germination Sphagnum, or some such substance, should be used for scattering over the surface of the ground. In the case of seedlings which come up in autumn, discriminating care is needed to carry them safely through the winter, as they are very apt to damp off during that inhospitable period, particularly if they happen to be in an air liable to become very close or damp. The precautions to be taken under such circumstances are therefore quite apparent. Also, every one knows how to set about parting, which here is the only sure method by which to perpetuate any favourite breed, and further, this operation is absolutely necessary for the keeping up of vigour, and if it is not regularly attended to lankiness and a paucity of roots are the issue. As the ablest authorities are divided it seems of very small moment whether potting or transplanting along borders or on the rockwork should be seen to immediately after flowering is over, in the beginning of the year, or before an attempt is made to grow again towards the close. When plenty of moisture is not furnished by the natural surroundings, it should be supplied artificially, especially during the time of greatest activity, and in very dry porous soils stones may be used with marked advantage as a means of preserving a tolerably uniform temperature and humidity. Unless any one requires to be told of how gay the flowers are and of their great range of colouring, I do not know that more need be said about the present subject, so familiar to us all, as only those who make a special hobby of it care for fuller details; and indeed those comprehending the aspect most likely to preserve the blooms longest, the need of picking away decomposing flowers, leaves, and the like, had better be mastered, in any case, by experiment than by theory. A native of France, Switzerland, and other European countries. In a general way, the treatment recommended for this will serve for most of the other hardy sorts. In the case of the smaller and more delicate kinds, such as P. minima and P. Allioni, dung may be used for top-dressing, but not for mixing, as an essential part of the main body of soil.

P. marginata (Curt.).—This is a beautiful species, with a corolla nearly as large as that of P. Auricula, and of a delicate but very pleasing lilac colour, and in the "Botanical Magazine" this is stated in the letter-press, but not carried out in the illustration. Nearly the whole plant is dusted with farina, but the trivial name was given in consequence of this substance being especially abundant along the margins of the petiolate, obovate, serrate-dentate, and obtuse leaves. The peduncles rise out of the axils of these, and each one bears a large head of pedicellate flowers, which open in spring, and continue gay for six weeks. Admirably adapted for rockwork decoration, and not less so for a border where the soil is a rich loam. A native of the Alps and a few other places.

P. Palinuri (Willd.) is an immense species, often compared to Sempervivum arboreum, with large heads of bright yellow blossom, which open in spring, and emit a perfume of the same nature as that of the Cowslip, but much more intense. The stem is gouty, and the fleshy dentate leaves are produced plentifully near its apex. In the southern parts of England this may be grown on the rockery or open border, although probably on the whole it is incapable of resisting total exposure during a severe winter in any part of Britain. The soil should be nearly all loam. As might be expected from the texture of the foliage, it cannot be placed in too sunny a situation. Very hard potting and over-watering soon spoil it, the one by retarding the legitimate progress through the earth of the thick and cellular roots, and the other by rapidly producing rot. A native of Italy.

P. villosa (Jacq.).—This has a semi-woody stem which branches firmly, consequently the species is easily propagated. The leaves are nearly as large as those of P. Auricula, and are toothed from about the middle to the apex, but entire from that to the base. It is very near P. nivalis, but here the corolla is never white, whilst there it is always so. The flowers are purple, open towards the end of spring, and some of them are small and not raised above the foliage, whilst on other specimens they are large and in a considerable tuft at the top of a peduncle 3 or 4 inches long. Plants, too, are to be met with in a wild state not larger than P. minima, whilst others are taller than P. marginata, but whatever the size it is always very ornamental, and deserving of general attention. It is particularly well suited for the decoration of rockwork, and is pleasing as well as easily managed in pots. All the living plants which I have yet observed in English gardens under the name of P. ciliata, are no more than the kind now under consideration. A very important hybrid is also about, and originated in a cross between the present subject and P. Auricula, and is known amongst us as P. ciliata purpurata. A native of the Swiss and other mountains.

P. piedmontana (Thomas.).—The stem of this species seldom rises more than an inch above the ground; the leaves are spathulate, obovate, and entire, except near the ends, where a few minute teeth may easily be observed. The foliage is sprinkled all over with tiny glandular hairs, and these are especially plentiful along the margins. The flowers, which are of a rich and very pleasing purple colour, open in spring, and are produced in heads which, though often of considerable size, are never nearly so large as those represented in the "Botanical Magazine." When planted on the rockwork, this should not be fastened into a little crevice, but ought to have a small patch of ground to itself, where it can ripen and scatter its seed, and get naturalised. Garden borders during the summer time are mostly burnt up through the day, and as cold as the surrounding atmosphere during the night. This immense capacity for rapid change is entirely due to the want of stones in the ground, and of course this deficit must be met if anything like success is to be attained in the management of the species under notice. A good deal of shade is also desirable. A native of the mountains of Switzerland and Piedmont.

P. glutinosa (Wulf.).—This is a very well marked species. The leaves grow erect, are small stalked, very neatly toothed, for the most part of a uniform breadth, and furnished with sticky hairs. The scape rises twice the height of the foliage, and bears at its apex from one to five flowers; these expand about the same time as those of P. integrifolia, and are of a purple colour. A native of various mountains of Southern Europe.

P. Dinyana (Lagyer.).—P. glutinosa is more nearly allied to the present than any other species in cultivation; but the leaves of that species are small, and very neatly and sharply toothed, whereas the leaves of this are never either neatly or sharply toothed, and moreover they are not by any means small, being nearly as long as the scape; bears from two to four flowers: these are purple, very handsome, and open in the summer time. A native of Switzerland, and at present very rare in British gardens.

P. Allioni (Loisl.).—This is sadly wanting in the robust habit and strong constitution so prominent in P. villosa, and these are the only constant marks easily observed and expressed which can be given to the stranger to enable him to tell the one from the other. This species is exceedingly scarce, both on its native mountains and in our gardens, and is very likely to remain so, for it is difficult to increase under the most favourable circumstances. The flowers open in spring, and, although so delicate-looking as to be almost transparent, yet they are very pleasing. The corolla is large, and in the main of a pale red colour, but here and there are long spots of the purest white. Nothing short of complete exposure to every ray of light and heat is of any use, and when pot culture is tried plenty of stones should be used, and the soil ought to consist almost wholly of light loam. By the beginning of June development is over for one season, and so long as this state of inactivity continues no more water should be used than is needed to keep it from shrinking. A native of Southern Europe.

P. minima (L.).—This tiny mountain gem first covers the ground with thick-set rosettes of short green foliage, and then, in the spring of the year, come the flowers, which, for so small a plant, are really wonders, both of size and beauty, for while no single leaf is anything like so large as that of a Daisy, the lilac, rose, or purple corolla is not unfrequently more than an inch across. Planted in loam, in which there are

plenty of small stones, this succeeds admirably in a pot, so that it may be enjoyed by those who like such a treasure for its own sake, and not merely as a part of a grand rockwork. It stands exposure well, and is to be met with on nearly all the elevated regions of Southern Europe. One can easily tell P. Floerkiana from the plant just roughly described, but each scape bearing always, or, at least, mostly, more than a single blossom; but some go the length of supposing it to be only a hybrid.

P. nivalis (Pall.) might very well be considered as no more than a variety of P. villosa, but it is not usual for any but one school of botanists to look upon it as such. It is extremely beautiful, and early in spring is one mass of pure white sweet-smelling flowers, and by the colour of these, if by anything, it may be known from the species to which it comes so near. It is easily increased, is not very rare in our gardens, and is said to be a native of Siberia.

P. carniolica (Jacq.).—This, although not a common species, is nevertheless an excellent one, being very ornamental, and a vigorous grower. The leaves have long stalks, and also elliptical and entire blades, but sometimes the outline of these is broken. The scape mounts twice the height of the foliage, and bears a loose umbel of about five pedicellate flowers. These open in spring, and the corolla is of a beautiful red colour. A native of Austria.

P. spectabilis (Tratt.).—The leaves of this are spathulate, quite entire, and slightly cartilaginous along the margins, as well as quite glabrous all over. The scape, which as a rule is quite as long as the foliage, is crowned by a splendid head of flowers. These open in spring; the corolla is large and of a rich red colour. A native of the mountains of Switzerland and other countries adjoining.

P. cortusoides (L.) has long been a favourite with every admirer of hardy plants, and its graceful and modest beauty fully justifies all the high encomiums that have been passed upon it. It is of the easiest culture, and nothing more is needed to increase it rapidly than regular parting after the foliage withers, and in the case of pot culture a very moist soil during the period of dormancy is injurious. The flowers, the bulk of which are produced in spring, are in considerable umbels at the top of a long scape, and the corolla is of a rich or pale red colour. A native of Siberia. The visit of the late Mr. J. G. Veitch to Japan, amongst a host of other fresh introductions, caused our gardens to be enriched by a variety called "amœna," which completely eclipses the typical form, and, moreover, is said to be equally as able as the old kind to defy the severities of our winter.

P. sikkimensis (Hook.).—Dr. Hooker was the first, I believe, to introduce into England this gigantic, striking, and extremely curious, though not by any means extra beautiful species, and if I am rightly informed, he found it on the part of the Himalayan range indicated by the trivial name. The leaves are large, and grow in tufts, like those of the common Primrose, and the immense long thick scape bears a terminal umbel, and sometimes below this several verticels of pedicellate and sweet-scented flowers. These usually expand in summer, and continue gay for a considerable time. Messrs. Backhouse have been eminently fortunate in their treatment of this sort. At their place I saw a magnificent specimen a few years ago. It was in full bloom, and grew close to the edge of a small artificial pond, and at the base of some rockwork—so that plenty of moisture is amongst the conditions of success, and I may add a rich soil also. On the whole pot culture is here objectionable, and this observation I am led to make from experiments made upon two young plants which I once had charge of.

Whatever amount of snow P. denticulata and P. erosa may grow amongst on their native mountains they certainly are not able to stand a very severe winter in every part of England. Nevertheless, they are admirable sorts for the decoration of our greenhouses in spring. The latter is especially so, and frequently even in first-rate botanic gardens it bears the name of the former, from which it may very readily be known by its spreading and almost glabrous instead of erect and profusely hairy leaves. P. purpurea has the habit of P. denticulata, but its leaves are entire, and by this character it may be known from any of its near kindred. Its merits are also of the highest order, but it is as yet extremely rare with us. Then P. verticillata, from Arabia, is now and then found in lists of plants, and is reputed to be hardy, but a very slight attack of frost kills it.

P. Thomasinii, P. suaveolens, P. viscosa, P. auriculata, P. glaucescens, P. calycina, P. sibirica, P. rhaetica, P. Candolleana, P. graveolens, P. Muretiana, P. latifolia, P. integrifolia, and a few others, are occasionally to be met with in British gardens, and not a few of them are of sterling merit. Many of the very brightest ornaments of the genus have yet to be imported.

P. farinosa, P. scotica, and P. mistassinica, as well as P. longiflora and P. intermedia, are neat, interesting, and perhaps pretty, but not very gay kinds, with an almost unconquerable love for freedom, and therefore they thrive best when at liberty to spread about on a part of the rockwork which is rather moist. Moreover, they are nearly all rather closely related, differing in habit, size, the absence or presence of farina on certain organs, and such like characters, discussed at great length in books devoted to botany. There is scarcely a country boy who cannot tell a wild Cowslip from a Primrose, and an Oxlip from both; and for all practical purposes the three have characters sufficiently constant and conspicuous, although now and again deviations, hybrids, and monstrosities occur for people to puzzle over, and make dried specimens of. Nor can I see the advantage society would derive from a long and exhaustive treatise on how to multiply, plant, improve, and best enjoy these kinds, for such matters must be plain to everyone in the least acquainted with gardening subjects. In conclusion, I may mention that P. macrocalyx, to be met with in some collections, is very near P. veris, and the organ which the specific name directs the attention to, is wide-mouthed rather than very large. *John Duncan.*

ORIGIN OF PRAIRIE VEGETATION.

VARIOUS theories have been propounded to account for the existence of the Western prairies. By some they have been attributed to the annual burning of the grass by Indians; by some to the extreme fineness of the prairie soil, and by others to humidity and sourness of the soil, &c. One of the most recent theories on this subject is that of Prof. Winchell, whose views are developed in an article in the "American Journal of Science and Art," November, 1864; and again presented, somewhat amplified, in his recent work, entitled "Sketches of Creation."

These views are peculiar, and as the points involved come somewhat within the field of our department, we propose to discuss the principal propositions which Prof. Winchell advances.

The first proposition is that "the prairies are of lacustrine origin;" from which statement we see no reason to dissent, especially as it appears to be the view entertained by geologists generally.

The second proposition is that "lacustrine sediments contain no living germs." This is a somewhat sweeping assertion. Let us consider it a moment. It is well known that lake borders are the chosen locations of very extensive vegetation. Wherever there is a shallow margin, some species of plants find a favourite home. Extensive patches of gigantic Bulrushes (Scirpus validus, Vahl) grow in water 6 or 8 feet deep, and stretch up several feet above the water, spreading out in many cases a mile inward. Great beds of Water Lilies (Nymphæa and Nuphar), and allied plants, spread their broad leaves and expand their beautiful flowers on the bosom of the tranquil lake. Numerous kinds of Pond-weed (Potamogeton), Eel-grass, Water-weed (Anacharis), &c., form large subterranean meadows, through which the canoe of the Indian finds it difficult to penetrate. Here, too, on the lake margin, the Indian finds his spontaneous fields of wild rice (Zizania aquatica, L.). Sagittarias, Sparganiums, and water weeds of various kinds, inhabit the shallow borders in abundance. Every year these plants mature an immense crop of seeds, which, excepting such as are devoured by birds and other animals, fall into the water, and generally by their own gravity sink to the bottom, where they find, in the soft mud, a suitable place for their future germination. We know not how many of these seeds are carried out into the deep portions of the lake, beyond the reach of those conditions necessary to their growth. Evidently Nature intended these seeds to germinate at the bottom of the shallow lake margin, and the only means they have for reaching that locality is their specific gravity. As in the case of land plants, Nature provides a surplus of seeds in order to insure a continuance of the species in spite of all ordinary contingencies.

We then present a counter-proposition to that of Professor W., viz., that lacustrine sediments abound with living germs. [See Mr. Darwin's experiments on this matter, an abstract of which will be found in the "Origin of Species," ed. 4, p. 460. EDS.] We do not, however, desire to make use of this proposition in accounting for the vegetation of the prairies, for whenever our lake bottom is drained it furnishes no longer the conditions necessary for the germination and growth of these plants, and the seeds would probably soon perish. But, whenever the soil is thus drained, the aquatic plants are speedily succeeded by others adapted to the new circumstances, the germs or seeds of which are introduced from outside.

The third proposition of Prof. Winchell is as follows: "Diluvial deposits, on the contrary, are found everywhere replete with living germs." By diluvial deposits we understand those collections of sand, gravel, clay, &c., which have been carried down by floods, or heaped together by violent action of the sea, or have been ploughed up before the onward march of glaciers. Such deposits, Professor W. says, are replete with living germs. In other words, they are filled with living seeds. This proposition is illustrated by some examples which seem pertinent, and by some which do not.

It is stated that forests cleared of their timber are almost "always followed by the appearance of certain unwonted plants known as fire-weeds, and it can hardly be doubted that the germs existed in the soil ready to germinate whenever free sunlight, warmth and atmospheric air should be permitted to rouse their vital energy." The term fire-weed is commonly rather loosely applied to several different plants, chiefly to those botanically known as Erechtites hieracifolia and Erigeron canadense. These are almost as common as Thistles, and like them have light feathery seeds, adapted to be carried to great distances by winds. Now, it appears to us to be a good rule to explain any phenomenon by the simplest and most obvious causes; and to our mind it seems much more natural to account for the appearance of the fire-weeds by the introduction of the seeds by means of winds, than to do so by supposing that the seeds of those plants had lain dormant in the earth for generations.

The appearance of the Loblolly Pine upon abandoned plantations in the Southern States presents to our view no greater difficulty. The Professor inquires, "Let the waters of a brine saturate a meadow, and how long would it be before we witnessed the appearance of Scirpus maritimus, Triglochin maritimum, or some other salt-loving plant, whose germs, unless spontaneously developed, must have lain dormant in the soil at a greater or less depth." We cannot answer the inquiry as to how long, but we feel well assured that so much time will elapse that we shall not have to accept the dilemma of spontaneous generation or pre-existent germs. One of the plants mentioned, Triglochin maritimum, is not well chosen, inasmuch as it occurs in various places in the interior of the country, from the Atlantic to the Rocky Mountains, without any regard to salt springs. It is true that, in the vicinity of salt springs in the interior, we often find plants which are otherwise confined to the sea coast, but this is not more difficult to explain than the occurrence of strictly alpine plants on widely separated mountain peaks. We will not undertake to say how every mountain, sea, river, lake, forest and plain is first stocked with its appropriate vegetation: we confess ignorance.

Again, Prof. Winchell says: "How soon does a dressing of undecomposed muck or peat develope a crop of acid-loving Sorrel, and how readily it is again repressed by a dressing of some alkaline manure." Now, we are not very well informed in agricultural chemistry, nor in practical agriculture, but we would like to know if this method of producing and destroying Sorrel can be relied upon, particularly in a country like ours, where Sorrel (Rumex Acetosella) is considered to be a foreign weed. We know plenty of places where it has made its appearance without any such agency, and have no doubt that many unfortunate farmers will be overjoyed to learn that it can be easily repressed, if not eradicated, by the application of a dressing of alkaline manure.

One more assertion under this proposition deserves notice, it is this: "Earth thrown out of cellars and wells is generally known to send up a ready crop of weeds, and not unfrequently of species previously unknown in that spot." This statement is unsustained by any instances, except under the next proposition, where a case is related of the appearance of some Beach Plum trees on ground that had been covered by sand brought up from a well at the depth of 20 feet. It is concluded that, inasmuch as no other Beach Plum trees were known to be within 40 miles of the place, the seeds of these trees must have been brought up with the sand taken from the well. This example is hardly sufficient to sustain so general and sweeping a statement. But let us bring it to the test of experience.

There are many thousand cellars and wells dug every year, there are thousands of places where the drift has been exposed in grading for railroads, hundreds of places where the soil has been brought up from great depths in digging for coal and minerals—and we ask, with what result? In all this country how many new species have been brought to light by these means? We venture to assert not one. Is it true that earth brought up from even a few feet in depth sends up a "ready crop of weeds," for whose appearance we cannot readily account by the aid of winds, birds, and water?

We admit that there are some facts connected with the succession of forest trees that seem difficult to explain; but, even if we admit that, in such cases, the seeds of one kind of trees have lain dormant in the soil for the lifetime of another kind, and then have taken their turn in the production of a forest of a different kind, the adoption of that view does not give license to the opinion that these seeds would have retained their vitality for a geological age, if buried hundreds of feet beneath the surface.

Some very absurd stories have been related respecting the vitality of seed, and once started, these stories seem to pass without a question. Even Prof. Winchell is compelled to doubt some of the stories which he brings to the support of his theory; for instance, that of a beautiful Dahlia (?) having grown from a bulb found in the hands of a mummy 2000 years old. It is also stated that "it is generally believed that Wheat is now growing in England which was derived from grains folded in the wrappings of Egyptian mummies, where they must have lain for 2000 or 3000 years." We confess that we fully share the doubts of Prof. Gray on this subject.

We now come to the fourth proposition of Professor Winchell, viz.: "The living germs of the diluvial deposits were buried during the glacial period."

The argument in support of this statement is that the fossil plants which have been discovered in the tertiary deposits show a correspondence of genera, and in some cases of species, with those of the present date. During this tertiary period the seeds of plants accumulated in the soil; then came the change of climate and destruction of vegetation which attended the glacial

period, during which the surface was ploughed up by glaciers, and afterwards exposed to the commotion of the sea, which overspread the land, burying everything in promiscuous ruin; but yet by this very means storing away the seeds which, when brought to the surface after the lapse of a geological age, are possessed of vitality and able to reclothe the barren earth with verdure and beauty! Who can say that this prolonged vitality of seeds is impossible? Who can say that it possesses the slightest degree of probability?

Most cordially do we assent to the following observations of the Professor: "It must be confessed that the crucial observation is yet to be made. If vegetable germs exist in the drift they can be discovered beforehand; and until they have been actually detected, it is probable that even the convincing facts cited above will fail to secure universal assent to our proposition involving the prolonged vitality of the seeds of preglacial vegetation." It is the misfortune of science that too many plausible theories have been promulgated without first obtaining the crucial experiment.

We pass to the consideration of the fifth proposition: "In proportion as the diluvial surface became exposed, the flora of the preglacial epoch was reproduced." We may readily believe this to have been the case, if the fact be established that "the diluvial deposits were everywhere replete with living germs."

It will be observed that this proposition applies, not to the prairie region, but to the older portions of the continent. The former became "a vast inland sea, upon whose bottom gathered the lifeless sediments that were to be the soil of the prairies." When this surface was finally drained, it was left "a naked and lifeless expanse of vegetable slime," containing no vegetable germs, and by its nature preventing the development of any, in the diluvial matter below.

But we hasten to the consideration of the final proposition—"The vegetation which finally appeared on the drained lacustrine areas was extra-limital, and was more likely to be herbaceous than arboreal." The substance of this proposition seems to be that the vegetation which first clothed the prairie region was introduced from beyond its limits, by the three natural agencies of winds, running water and animals; and that because the seeds of trees, as the Oak, Hickory, and Walnut, were heavier than the seeds of grasses and herbs, they were not so easily dispersed, and therefore the prairie became covered with herbaceous vegetation exclusively. We do not see that in this proposition any use has been made of the theory which has been so extensively elaborated by Prof. Winchell, unless it be to account for the occurrence of that extra-limital vegetation which formed "a shining ridge of forest trees around the margins of the prairies." Where were these margins? The ancient lake, which finally became the prairie region, reached its arms into Iowa, and into northern Indiana and south-western Michigan. The margins of this lake, then, were in Iowa on the west, and in Indiana and Michigan on the north-east. The northern and southern boundaries are not directly given, but we may reasonably suppose them to have been as widely separated as those of the west and east. Here, then, was a "naked and lifeless expanse of vegetable slime."

Is this meant for a picture of a lake region rapidly drained? If rapidly drained, a large portion of the lacustrine sediment would have been washed away, exposing, in thousands of places, the diluvial deposits; the living germs with which they were replete would then have been exposed to the genial influences of sun and air, and would have reproduced the ancient vegetation. But no—the vegetation of the prairie region was "extra-limital," and brought in by the agency chiefly "of winds, animals and running waters." We have great faith in these agencies, and believe they are sufficient to account in great measure for the vegetation, not only of the prairie region, but of the continent. In the prairie region the forests principally form belts around the large water-courses. These drainage channels furnished favourable localities for the growth of certain kinds of trees, particularly the Willows and Cottonwoods. These may be called the pioneers of the forest; their seeds are light, and covered with a cottony down, which causes them to be easily carried before the winds for great distances. They would naturally find lodgment and development in advance of many other forest trees with heavier seeds. But having established a line of trees, or of scattered groves, on the margin of a stream, they would be constantly visited by birds and animals, which would gradually introduce the seeds of other forest growths, and thus the boundaries of the forest would be extended. The fruit of the wild Cherry and Plum, the Mulberry, Hackberry, Black Gum, and many other trees, are eagerly eaten by birds, and the pits are voided uninjured for purposes of vegetation. As the veins of a leaf all converge from the circumference to a common point, so the lines of timber, following the watercourses, converged to the great outlets, leaving many intermediate spaces which would earliest be occupied by the grasses and herbaceous plants. The beginning of these timber lines would naturally be at the points of earliest drainage, *i. e.*, near the sources of the streams; but a line of communication having once been established to the outlet, the seed distribution would also operate up stream, whence it comes to pass that some southern species have extended northward in the bottoms of the larger rivers nearly or quite through the extent of the prairie region, as the Papaw, the Persimmon, and the Kentucky Coffee tree.

We do not offer this as a full solution of the prairie question; probably the annual burnings by the Indians, and other influences not yet understood, operated in the production of these gardens of the West.

One element to be taken into consideration in the discussion of this subject is the peculiar character of prairie vegetation. If it shall appear that there is a class of vegetation which does not occur outside of the prairie region, we must then bring in other influences than those presented by the theory under consideration. We will refer to some of the plants which are usually regarded as of this character, viz., Ranunculus rhombideus, Viola delphinifolia, Linum Bootii, Amorpha canescens, Baptisia leucantha, Geum triflorum, Potentilla arguta, Eryngium yuccæfolium, Eulophus americanus, Solidago Riddellii, Silphium laciniatum, Silphium terebinthaceum, Ambrosia bidentata and psilostachya, Helianthus rigidus and mollis, Coreopsis palmata, Cacalia tuberosa, Hieracium longipilum, Troximon cuspidatum, Castilleia sessiliflora, Lithospermum longiflorum, Asclepias Sullivantii, Platanthera lencophea.

We present these criticisms on the theory we have been discussing, not in a captious spirit, but under a conviction that the cause of science demands a most rigorous investigation of all scientific theories. *The American Entomologist and Botanist.*

FRUIT GROWING AT ELY.

On my return from the Oxford show I called to see the somewhat famous fruit trees in pots in the gardens of E. Harlock, Esq. They have been several times noticed in your columns, and as I had not seen them for four years, and had heard that the same trees were still as fruitful as ever, they certainly seemed worthy of a visit. Furnished with the address of the gardener, Mr. Grix, I easily found my way to the place, which is about half a mile from the station. Arrived there, I began to think there must be some mistake, as a long piece of dead wall, which seemed almost to bury the river, was pointed out as the garden. It seemed impossible that such quantities of fine trees and fruit could be produced almost under the chimneys of two large breweries and the strong smell of grains, &c. Arrived inside, it soon appeared that this was the right place. Every portion of the garden seemed thoroughly stocked with fruit and vegetables; the walls were covered with well laden fruit trees. Two or three lofty span-roofed houses towered up to a great height, and a block of orchard-house trees in the open air seemed to burden the ground with their loads of fruit. On the central walk two gentlemen stood in earnest discourse, as if discussing the probabilities of rain or the plentiful fruit harvest around them. These I soon discovered were the proprietor and the gardener, so my visit proved most opportune. We entered the large orchard-house first. It is 100 feet long, 25 wide, 13 feet high at the apex and 6 at the sides. It is ventilated with a wooden shutter, 6 inches wide, along the top, movable sashes in the gable ends over the doors, and a wooden shutter, 1 foot wide, near the ground line. These ventilating spaces are found to be ample. The house was comfortably cool at the time of my visit, though the weather was hot.

The trees range from 6 to 12 feet in height, and have a massive, healthy, natural look. They are hardly pinched at all. The young wood ranged from 6 inches to a foot or more in length, and the trees had a free strong look, something between a perfect standard and a pyramid might assume if planted out-of-doors, and subjected to little pinching or training. The trees were not only strong, but healthy. I saw no canker and no insects upon them; most of them seemed to be growing in about 20-inch pots. The chief peculiarity in the management of these trees consists in this—they get no food beyond the narrow boundaries of the pots. The roots are not allowed to run through; the whole of the pots are placed upon a hard impenetrable bottom; the chief food is provided by means of an annual top-dressing during autumn or winter. From 3 to 6 inches of the upper portion of the soil are bodily removed, roots and all, and the space filled up with rich fresh soil. A great portion of the spongioles or feeding roots are thus treated as annuals. The roots left almost immediately strike up into the new food, and before the end of the season it is interlaced in all directions with roots, and thoroughly exhausted, to be thrown away in turn as effete after one season's use. More seems to be thought of this solid food than the stimulation of liquid manures. I understood on the spot that the trees were mostly watered with clear water only. But perhaps Mr. Grix will inform us more fully upon this point. It seems almost impossible that so little fresh soil, however rich, could support all those leaves, wood, and fruit to be found in this orchard-house at Ely. They exhibited no sign of weakness, gave no signal of exhaustion. The fruit, though so numerous, were of fair average size. The Apricots were just ripening when I saw them. I have always looked upon this fruit as the most difficult to grow in pots; critical at setting time, it is almost equally precarious through the process of ripening; if over-cropped, it frequently refuses to finish its fruit. I saw no appearance of such unwillingness on any of the trees. If any had dropped previous to my visit one can but wonder the more at the marvellous crop that they must have started with. In the entire house there are over 100 large trees in full bearing and about a score of smaller ones; the exact numbers are 40 Peach, 32 Nectarines, and 21 Apricots; there are also over 20 smaller Peaches and Nectarines that have been substituted for other sorts that have been weeded out on account of their inferior quality. This is the first season of these young trees, and of course they had not much fruit. Of the old trees, the Nectarines carried the heaviest crop, averaging from seven to eight dozen apiece; the Peaches and Apricots, from six to seven dozen each. The regularity of the crop was as astonishing as its great weight. I believe that not a single tree was much worse than all the rest; and certainly the house was such a sight as I have never seen before, though I have visited the Sawbridgeworth houses at their best. I may add that I am by no means an advocate for growing fruit trees in pots, so that my testimony is so far valuable—that if biased at all, it is biased in the opposite direction. But a walk round this house is the toughest argument I have yet met with in favour of the practicability and profitableness of the cultivation of fruit trees in pots. It might have been possible to have gathered as great a weight off the roof but hardly so many fruit. Three thousand Peaches alone out of one house would be a wonderful harvest, but if one comes to add nearly 4000 more of Nectarines and Apricots, we can only write or utter the word—prodigious! But it is not in this house only—wonderful as it is—that the marvels of the pot culture of fruit trees are to be found. From orchard-house trees under glass we naturally turn to the orchard-house trees in pots out-of-doors.

These consisted of 52 large Pears, carrying from 5 to 10 dozen each; 26 Plums, with from 2 to 2½ pecks each; 7 smaller Plums, burdened equally heavily in proportion to their size; and about 20 small American Apples, with but few fruit. The whole of these trees were ranged upon a block of ground 70 feet long by 25 feet wide. It was one of the richest sights I ever saw—such an immense harvest of fruit on such a small space. The usual practice, until last winter, was to place these trees in the orchard-house among the Peaches and Nectarines until the fruit was set—according to the plan advocated by Mr. Rivers; but last year they remained out, and, I believe, without any protection, all the winter and spring. Judged by the results this season the venturesome practice is as good as the other. And yet the place where they remained, without protection, is but little above the water level; and one would think the whole garden particularly liable to spring frosts. Whether the tower of the cathedral or the hill on which the grand pile stands, which begins to rise almost outside the garden walls, wards the frosts off I cannot say; but the fruit escaped last year. It did the same, however, in most other places, and I should certainly feel nervous about exposing those grand trees with their 200 dozen superb Pears in embryo to the caprice of our springs, when the pots afford such ready portability. But there, without doubt, is the success; and so Mr. Harlock and his enthusiastic gardener, Mr. Grix, can afford to smile at my words of caution as they gather their rich harvest of Plums, and enjoy their profusion of fine mellow Pears. Still, the original intention, which I believe has always been carried out till this season, was to flower and set all the Plums and Pears under glass, and then place the trees in the open when all danger from frost is past. Mr. Rivers and others adopt this method, which answers admirably. They thus get a double profit, an extra security, out of glass. It matters but little how closely (of course I do not use the word closely absolutely) trees stand together during the flowering period. The flowers throw but little shadow, intercept but little light. When flowers are succeeded by leaves the case is wholly altered. But soon after the development of leaves, the hardiest of the trees may safely go outside for the summer. Of course this presupposes that the orchard-house trees are kept late. In very few localities would it be safe to place trees that had flowered and set their fruit under glass out-of-doors until the end of May. But without the protection of glass such fruit trees as Pears, choice Apples, Cherries, Plums, might often have a much better chance of escaping frosts if grown in pots. Being portable they might at least be set at the most warm and sheltered position. After all danger from frosts were over, they could be arranged in lines on blocks for effect or convenience during the summer.

Again, the thick massing together of fruit trees in pots in winter and early spring would make each contribute somewhat to keep the others warm, and would enable them to be covered with canvas or mats with but little trouble. Finally, fruit trees in pots would form beautiful ornaments for large conservatories and other houses when in bloom. Why force many subjects for ornament alone—not half so beautiful as a Peach, Nectarine, Cherry, Apple, or Pear in blossom? Why not bring these quickly forward, and leave them to flower, push forward their tender shoots, and exhibit their baby fruits in the conservatory? By the time the trees begin to look common they could be safely placed out to develope and ripen their fruit in the open air. By such expedients many of our fruit trees could be made to do double, and even treble

duty. They would form good ornamental plants in the spring, fill their appointed niche in the summer, and many of the later varieties might once more enter the conservatory as ornamental fruited plants in the autumn. They would be none the less welcome for dessert for having gone through a preliminary apprenticeship in the art of decoration. They might fall into their place with more effect, and would probably be also of better quality than fruits that had never been indoors before. It is certain they could not be any worse; for, however hungry eyes may be in appropriating the beautiful, such longings can neither arrest the growth of fruit, nor drain it dry of its luscious juices. As we must grow fruit for eating, let us by all means get all the pleasure out of it we can during its progress. Much of the pleasure derived from fruit consists in looking at it; and if we can enjoy the sight of its growth, and provide for its safety together, this may well become a new plea for its cultivation in pots. *F.*

Home Correspondence.

The Herbaceous Border at Chiswick.—Notwithstanding the drought, and the fact that this border suffered very much during the long continuance of dry weather, I have found it very interesting indeed to look over it occasionally, as it has never been wholly destitute of some subjects of interest. Mr. Barron is just now working under many disadvantages, with the reductions going on around him, and with a circumscribed amount of labour at command; and yet the orchard-house, the long Peach-house, with the system of oblique cordon training, several other houses, the collection of Pentstemons and Phloxes, &c., have all been links binding horticulturists to the dear old garden, and its many pleasant associations in the past. Actually, the herbaceous border has had to take care of itself, and yet it was impossible to walk along by the side of it and not linger over it, as fine old plants were there in plenty. A look through this border in the second week in August gave the following in bloom. I had a little difficulty in transcribing some of the names, but in the main they will, I believe, be found correct. Campanula urticæfolia, double white, growing about 2 feet in height, and blooming freely; Statice latifolia, with a branching, bushy habit, and plenty of small, pale mauve coloured flowers — a good thing for borders; Borago laxiflora, pale blue, growing 6 to 9 inches, very pretty; Liatris elegans, pale purple, dwarf growth; Aster speciosus, pale lilac, growing about 18 inches; Aconitum Lycoctonum, with large bunches of many spikes of pale sulphur-green flowers, 4 to 5 feet, and a fine plant for shrubbery borders; Achillea Ageratum, golden-yellow, growing here some 5 feet in height, though stated in Mr. Ware's list of perennials to grow 2 feet only; Helenium autumnale, a yellow Composite, growing about 2 feet; Telekia speciosa, with a hard-quilled disc, and a fringe of golden threads, about 2 feet; Rudbeckia hirta, the centre of the flower a dense black cone, with a fringe of golden florets round it; Campanula rhomboides, with pretty clusters of violet-blue flowers, 18 inches (a double-flowering variety of this received from the Continent under the name of soldanellæflora, is much inferior to this in effectiveness); Aconitum ferox, blue; Aconitum Napellus bicolor, the flowers white, fringed with blue, very good; A. paniculatum var. Störckeanum, deep dark purplish blue, with fine branching spikes, very effective; Chelone barbata, very effective, despite its loose and somewhat uncouth growth, having a profusion of prettily veined carmine-crimson flowers; Campanula carpatica, very good; Statice incana, dwarf, and pretty, having rosy red flowers and a bush-like growth of about 18 inches; a dark crimson Potentilla, probably grandiflora coccinea; Pentstemon Jaffrayanus, the remains of what must have been a fine mass of bloom; an Echinops, apparently Ritro, with its dark indigo-coloured curious ball-like heads; a pretty bush of Plumbago Larpentæ, just coming into bloom; Monarda purpurea, rosy purple, 2 feet; Pulmonaria sibirica, the leaves nicely mottled with white and green; Geranium pratense fl.-pl., rosy purple; nice tufts of Oxalis tropæoloides; the remains of five patches of the glorious Prunella pennsylvanica; nice bushes of Sedum spectabile, just coming into flower, probably planted out there for the season to supply vacancies; Tunica Saxifraga, with a dwarf bushy habit like a Statice, and pale pink blossoms; Silene Schafta, with very pretty rosy pink flowers; and, as a fitting close, grand clumps of Hemerocallis fulva fl. pleno, with its large and showy blossoms of an orange hue. After all this was better than looking through the bed of gaudy-coloured bedding Pelargoniums planted out on the north side of the great vinery; as sameness could not be laid to the charge of these herbaceous plants,—there were manifold types of flowers, habits of growth, and colours of the flowers. The promise of a good collection of these plants at Chiswick, is, unhappily, somewhat blighted at the present moment; but it is to be hoped that at no distant time there will be established in the London district a select collection of these plants, as their undoubted rising popularity makes it necessary that there should be an opportunity afforded for studying their habits of growth, colours of flowers, and duration of bloom, with a view to their employment in our mixed flower borders. *R. D.* [There is a fine collection of these plants at Kew. Eds.]

The Provincial Meetings of the Royal Horticultural Society.—As Mr. Fish observes that this subject is of urgent importance, I beg to offer a few remarks. In the first place, allow me to state that for the last 20 years there has been a Horticultural Society in Wolverhampton, and as honorary secretary I can say that the committee has not been slothful in canvassing for the necessary funds demanded by the Royal Horticultural Society, before it consents to visit Wolverhampton next year. We had so far progressed that half the required sum was promised prior to the Oxford exhibition; but as that was a financial failure, we stayed our canvass for a time, feeling from various remarks in your Paper that an alteration might take place with respect to the Royal Horticultural's visits in company with the Royal Agricultural Society. Although I am confident that a provincial show held in a manufacturing and populous neighbourhood like that of Wolverhampton, under good local management, would be a success, yet from what we have heard we feel more inclined to decide upon a district show in connection with that of the Royal Agricultural Society. Our committee will hold a special meeting next week, when I shall be in a position to state our views on the subject. Meanwhile I can inform Mr. Fish that I have for some time past been in communication with Mr. Richards. *Richard Lowe, Hon. Secretary to the Wolverhampton Horticultural Society, August* 18.

Prolific Potatos.—In February last I purchased 1 lb. of American Climax Potatos (four in number), and before planting on March 22 I had one injured and destroyed, consequently I had only ¾ lb. (or (three Potatos) left; they were cut into 30 sets, and planted in two short rows, 22 inches apart from row to row, and 6 inches apart in the row. On July 26 (this adverse season) I dug them, and to my astonishment the produce amounted to 63 lb. (or equivalent to 84-fold) of good-sized Potatos, and but very few small ones. I find the Potato on cooking to be very mealy, of floury whiteness, and of excellent table quality. *Wm. Symonds, 6, Belfield Terrace, Weymouth.*

The Fruit Crops at Ombersley, Worcestershire.—Fruit of all kinds is grown very extensively in this parish. The crop of Gooseberries was a moderate one, the continued dry weather and the red spider having made many of the trees very unhealthy and most of the fruit small. Plums are a wonderful crop, hardly a tree without its load, and many of the trees breaking under the weight of Plums. Such a crop was probably never seen. Apples are a good crop, but the dry weather has caused many to fall off, and what remain are small. Early Pears have been abundant; late ones will be a good crop. Apricots and Peaches plentiful; Nectarines not so. Walnuts are an extraordinary crop; Nuts are partial. The Apple, Pear, and Plum trees are very healthy, and in fine foliage, in spite of the long-continued dry weather. All fruit is ripening earlier than in ordinary seasons. Plums, Pears, and Apples are being largely gathered, and the cidermill will soon be at work—a rare occurrence at so early a period. *R. W. G.*

Quercus coccifera Ripening its Acorns.—I should be glad to know of any instances of this shrub ripening its acorns in England. I have a good specimen, which produces hundreds of acorns, but they have always been abortive. This year, however, a few are perfect. From this I gather, that as a general rule they do not here become properly fertilised, and I wish to know if that is the case elsewhere. *H. N. Ellacombe, Bitton Vicarage, Gloucestershire.*

Standard Apricots.—We have here a very fine tree of the above, which is about the same age as that mentioned by Mr. Westland at p. 1091. I have somewhere seen from the pen of Mr. Rivers that standard Apricots only produce a crop about twice every seven years, but such a statement does not agree with my experience, as this tree produces an abundant crop about every other year, sometimes twice in succession; and I am persuaded that, if the same care was bestowed on them in the spring, as on the walls, by way of protecting the bloom and thinning the fruit, the crop would annually be found equal, if not superior, to those on the walls. I believe I could pick some few finer fruit from the standards this year than from those on the walls, notwithstanding the heavy crop of the former. I don't know what Mr. Westland means by "five pots" of fruit, but I shall have no difficulty in picking five bushels of fruit from this tree. While I would strongly recommend the more general cultivation of the Apricot as a standard, I would particularly recommend that the trees should not get out of bounds, and that too much "inside wood" should not be encouraged, as I find every gale of wind greatly damages the inside fruit on our large and thickly-wooded tree. *Thomas Simpson, Broomfield.*

Flower Show Appeals.—The other day I exhibited at the Malton Horticultural Show a collection of eight varieties of fruits, to which was awarded the 2d prize. The dishes were as follows:—Melon, Black Grapes, Frontignan Grapes, Peaches, Nectarines, Apricots, Cherries, Gooseberries. The 1st prize collection contained the same fruits, excepting that the collection contained a Pine, a dish of Plums, and White Grapes (unripe). All my fruit was ripe, well-coloured, and of good size. Those of the 1st prize collection were all very poor compared with mine, with the exception of a fair Pine. Under these conditions were the judges justified in awarding me the 2d prize? Has a Pine sufficient weight to throw out a collection very much superior in every other respect? *R. Sowerby, Newburgh Park, Easingwold.* [As the case is here stated, we think the award was wrong. A fair Fine-apple does not outweigh the general quality of a whole set of good and high-class fruit, such as our correspondent exhibited. We found this opinion, however, entirely on the above statement. Eds.]

Fruit Tree Borders.—I thank Mr. Wills (p. 1092) for his reply as regards ants; but as to his idea that my fruit tree borders are watered with boiling water, it is mere imagination. I stated that I so watered the border of an orchard-house. The trees are in pots, as usual in such structures, and in addition, there is a tile beneath each pot to prevent roots getting out, or worms getting in. *G. S.*

Disa grandiflora at Ferniehurst.—The splendid examples of this glorious Orchid in the collection of Edward Salt, Esq., are again in full beauty, and the excellent condition of the plants, as well as the brilliancy of the flowers, have called forth the highest encomiums from all who have seen them. The different specimens are marvels of good cultivation, as *connaisseurs* may readily imagine if they will only picture to themselves plants from 12 to 24 inches in diameter, well-furnished with young shoots, and not a spot or speck of any kind on a single leaf, all being of a beautiful dark green, which displays the supreme loveliness of the blossoms to the best possible advantage. The success which has attended their culture in Mr. Salt's establishment is rendered all the more marked by the fact that very few of even our best Orchid growers have been really successful in their treatment of the Disa, although many have tried experiment upon experiment, only to endure the vexation of failure. The system of culture pursued at Ferniehurst, and which has been attended with results so eminently successful, is of the most simple character, and possibly a record of it may induce others, who have hitherto failed to grow the plant as they could wish, to make another effort towards success. Mr. Salt's plants are grown in the shade of the gable wall at the end of the Odontoglossum house—a span-roofed house running pretty nearly east and west. The thermometer here is generally allowed to run, as nearly as possible, about 45° during the coldest winter nights, rising gradually in spring, and during the active growing season till the weather gets comparatively warm, when it is kept almost as cool as the temperature out-of-doors will permit. Shade is supplied by having a light netting nailed permanently over them during the summer months, in addition to the usual blinds, let down by rollers when the sun is strong and raised as it declines. The compost used for potting is rough, fibry peat, broken as lumpy as possible, to which nothing is added but a good proportion of potsherds and a little silver-sand. But perhaps the most essential item in their diet is the supply of water, and it is unquestionable that this is the particular point in which many cultivators go astray. It cannot be too strongly impressed on the minds of would-be growers, that the supply of liquid food should be *ad libitum*, and of this the plants at Ferniehurst are living proofs. These have generally been syringed and watered morning and evening, from the beginning of November, all through the winter months, and on to the middle of July, when they begin to flower, when of course syringing is discontinued, and water partially withheld till they again begin to grow in November; but even in their season of rest they are only allowed to become partially dry. It is thus evident that a cool temperature with abundance of shade, and a superabundance of moisture, are the elements essential to successful results; and all who have been fortunate enough to see the plants under Mr. Culley's care will agree that, in their case, they have done their work most thoroughly. In addition to the above there are many fine specimens of Orchids at present in fine bloom at Ferniehurst, notably some fine specimens of the splendid Oncidium macranthum, one of which bears 29 fine flowers, being one more than the plant exhibited by Mr. Salt at Kensington a year ago, and which it excels also in quality, the flowers being of a much deeper yellow, with dark bronze petals. *Scrutator.*

Lawn in Bad Condition.—I shall feel obliged if any of your correspondents can prescribe a remedy for my lawn (a very old and rather extensive one), which has been sadly attacked this season with an invasion of all sorts of weeds and tussocks of the coarsest grass, besides Couch, unknown before, and I am quite puzzled to understand the cause, unless it be the extreme drought, or that the turf requires to be refreshed. If the latter, can you suggest the best sort of dressing for it, and when it should be applied? *B. C.*

Grape Growing in Orchard-houses.—Whilst reading the interesting account of the orchard-houses at Chiswick by Mr. Brchaut, at p. 1087, I find that he condemns the practice of growing Vines in orchard-houses. I have a small span-roofed orchard-house, 25 feet square, which has the disadvantage of a dead wall at one end and a vinery abutting on one side, con-

taining about three dozen Peach and Nectarine trees, planted out, and seven Vines (Hamburghs of different sorts) are trained to the roof. From these I have this season gathered 850 Peaches and Nectarines, and over 100 bunches of really good Grapes, in size of berry, colour, and flavour. The Peaches have averaged 9 inches in circumference, some much larger. I gathered eight fruits last Saturday, which measured—the largest 11½ inches in circumference, and weighed 11¾ oz.; the other seven were 10½ inches round, and weighed 10½ oz. each. The foregoing statements, I think, plainly show that Vines planted in moderation are an advantage instead of an evil in an orchard-house, giving the owner the luxury of good Grapes, in addition to its ordinary produce. *T. H. Davis, Hazelwood, Upper Norwood.*

Generation of Heat by Fungi.—Dutrochet has observed that there is more heat generated by Boletus æneus than by any other vegetable, with the exception of Arum. This phenomenon is, however, by no means confined to B. æneus, but is, I believe, common to all Boleti; and when decomposition has set in, the heat evolved is considerable, but even when perfectly young and fresh all the Boleti give out heat. Whilst packing up the three large and beautiful specimens of B. colopus, Fr., exhibited by me at the last meeting of the Royal Horticultural Society, I noticed the decided heat evolved from the specimens. At the time of packing my plants were perfectly fresh and young, and after being placed in a light paper box for a short time, the heat evolved was apparent to the hand. I tested the heat with a thermometer, which stood outside the box in a shaded room at 70°, this after being placed in the box with the Boleti for half an hour rose to 75°. This fine species, though I believe rather rare elsewhere, is common in early autumn in Epping Forest, where it grows in company with another beautiful species, B. pachypus, Fr. Both attain here very large dimensions, and the former is extremely beautiful: the tubes are at first brilliant yellow, then orange; the stem deep carmine with a rich maroon base; flesh immediately changing to bright blue when cut or broken. *W. G. Smith.*

Mushroom Spawn (?).—I send you some spawn from the middle track of an old cart-road from a brickfield, not in use for the last two years, now covered with tufty sward, and being levelled for a lawn in a new garden near Norwood Junction. It occurs for a length exceeding 180 feet, and has spread under the turf for 5 or 6 feet, at a depth of 6 to 8 inches in the track, but close under the turf in the field. It is so abundant that, when first dug up, the soil looks like lumps of chalk. *H.* [We cannot say whether this is true Mushroom spawn or no; try it and see. EDS.]

Melon Seeds Vegetating in the Fruit.—In cutting a fine fruit of Prizetaker, one of the finest of our green-fleshed Melons, I found a quantity of the seeds had vegetated and formed their cotyledons; whilst several of the seeds, rather more than half, were perfect. I send you a sample of the young plants, and shall be obliged if you will inform me if this is often met with in Melons, as I have never before met with a similar case. *William Dean.* [We do not remember to have seen a similar instance in Melons, though it is constantly the case in the nearly-allied Sechium edule, figured in our pages, 1865, p. 51. In Pernettya mucronata a similar occurrence is frequently met with. EDS.]

Road Making and Repairing.—Having laid the foundation of a good road by making the earth beneath it dry (see p. 565), I now hasten to construct or build the road thereon. Of what shall it be formed? Briefly, of wood, straw, stones, gravel, or other surfacers. The first may be dispensed with. But, nevertheless, it forms a useful element in the making of carriage or other roads near a mansion. It puts elasticity into a road, and takes most of the noise out of it. It is impossible to over-estimate the comfort involved in this short statement. A road that bends beneath its burden, and springs up again when the load is removed, is an easy, joltless road to travel over The wood has other qualities of a mechanical character, which need not be dwelt upon; but these two—putting elasticity into and taking the noise out of roads—are sufficient merits to secure its general use in the formation of private roads. But straw, who ever heard of straw as a road material? But your impatient readers must suspend their judgments for a moment. The straw is to be used between the wood and the stones to prevent the waste of the latter. If wood is used next the earth, straw is necessary to prevent the stones tumbling down, through, and amongst it. This will be obvious to every one who has once used such materials. Presuming that the road space is dug out a foot or 15 inches in depth, and the drainage attended to, lay a layer 2 or 4 inches in thickness of twiggy faggots of any kind—White or Black Thorn, Beech, or Oak being amongst the best, but Spruce, Larch, or any other Fir, or even Furze, will do. No branches thicker than 2 inches in diameter should be used; 1 inch would be better, and the more uniform in size the wood is the better. Lay them in regularly and evenly across the road. If any of the pieces are too large to match well with the general run of the faggots, lay them in the centre of the road lengthways over the main drain. The faggots of wood should be forced compactly together, and any twigs that stand up or project too far be cut, bent, or broken into a horizontal position. The chief points are to have the same depth of wood over the whole of the road, and to preserve the upper surface as even as such material can be made. The faggots are at times very wayward, and must be compressed into submission with a heavy roller. Then comes a thin layer of straw, Rushes, Fern, long grass, stable litter, or anything else, to keep the stones out of the wood as much as possible. This prevents waste, and is likewise essential if we would secure those positive and negative qualities already noted as the chief merits of faggot-bottomed roads. Of course, if at intervals the stones pour through the faggots and rest on the earth beneath, the road will be noisy and unelastic at these points, as any other road. Hence the importance of preserving the line of wood as clear of stones as possible. The hard materials for the road follow the straw. Your correspondent may begin at this point if he chooses. As a matter of fact, this is where most roads are begun; and for public roads, with heavy and constant traffic, perhaps it is as well to dispense with the faggots. I know from experience that they are good, and therefore I have recommended them; but they are not, like drainage or stones, an essential and indispensable part of road-making. From this point the process is the same, whether they are used or not. All hitherto has been, as it were, foundation work. The first step gave strength, the second elasticity, and now we advance to hardness. This indispensable quality of all good roads is provided by a layer of stones from 6 to 9 inches in thickness, and of one uniform size, of from 3 to 6 oz. in weight, or from 1¼ to 3 inches by measure. If there is any difference in size, the largest should be placed undermost. The point of most moment is to have the stones of nearly one uniform size. To ensure this they ought to be sifted or sorted, and the largest either placed at the bottom or rejected, and the smallest used for a separate layer on the top. The greatest error in road-making is the use of stones of irregular size. Many seem to think if only a large stone can be buried out of sight there is an end of the matter. But every time the wheels pass over it the weight of the vehicle is pitched violently down on the other side of it, and the jolt wears a hole in the road. Next to evenness of size ranks hardness of stone, or other material; the harder and tougher the better. These two qualities are very distinct, as flint is as hard as iron nearly, but then it is as brittle as glass, and flies into fragments with every violent or sudden blow or concussion. Granite, on the contrary, is so tough that no ordinary wear and tear will break it. In the practice of road-making, however, we have generally to content ourselves with the stones to be found near the spot; and although granite is, doubtless, the best, almost any hard matters, such as clinkers, brickbats, or even chalk, may be used with more or less complete success. Always choose the hardest at command, smash to a uniform size, spread evenly and equally, and roll firmly down, and on such a base as I have prescribed a good road will be the result. After hardness we must have smoothness. These two qualities work together to reduce friction and to preserve the road surface. Heavy weights cannot sink into a hard surface, nor bite into a smooth way very deeply. On a rough road the wheels bite the road so deeply that they tear it into rough fragments; on a smooth one the wheels glide over it, as if on a tramway. Before surfacing roll. I repeat this advice, though it has just been given, that it may be the more certainly carried out. The more compactly the stones can be forced together the better; but the rolling also saves gravel, and keeps the stones to themselves as much as possible. Therefore the stones are rolled firm before the gravel is put on, exactly for the same reason as straw is used between the faggots and the stones. The stones are better without the gravel amongst them, and less gravel is needed. As to the depth of the gravel, from 2 to 4 inches will suffice—and the very best, clean, binding gravel should be used. Shingle is an abomination for roads, and a severe penance to walk upon. No surfacing can equal proper gravel for estate roads. Public roads need no surfacing, only the smallest stones on the top, and rolled in with heavy rollers; but private roads look best gravelled, but the gravel should be rolled and re-rolled until it is so hard and smooth that a horse's hoof, or carriage or cart wheel will scarcely make any impression. I had intended adverting to other surfacings besides gravel, but must defer it for the present, as I wish to give a few instructions upon the repairing of old roads. These may often be made as good as new, and perhaps better. Writing, however, of repairs, reminds me that new roads may need more repairs during the first six months than they will ever need afterwards, if properly made. After every rain and frost the rake and the roll must be down upon them. Every wheel-track must be levelled in at once, but the roller is the great repairing implement. Consolidation of road materials is the secret of its strength. Roughness of surface is not only cruelty to animals, but reckless extravagance, and a mere wanton useless waste of money. This remark applies to all roads, old or new. The roller upon roads is the stitch in time that saves, not merely nine, but ninety nines. A day's rolling at the right moment may save weeks or months of repairs. But your correspondent inquires what he is to do with roads in a very bad state? Well, the cheapest plan in the end is to remake them. He must begin by undoing. The whole of the road material must be picked up, sifted, sorted, and removed over to the sides, keeping the largest stones nearest to the road, as they will be wanted first. Then the roadway must be drained, and its surface of earth levelled to a uniform depth. The want of this uniformity is one great reason why so many roads are bad. In the remaking of old roads I have often found the stones at some points 3 feet thick, at others not more than 3 inches. The best mode is, remove all the hard materials, drain and level the earth line, and then proceed precisely as I have described. Neither is the labour of re-making roads so great as these full details may seem to make it. With a gang of four or six strong men, furnished with sharp picks, shovels, barrows, hammers, and a sieve, or a stone screen, it is astonishing how rapidly a bad old road may be converted into a first-rate new one. A clear head is needed to enforce system, and to see that the work is well done. Generally there will be found an excess of materials. These may be carted away for other purposes, or a portion of the surfacings and the smaller stones reserved near at hand for future use. From this point such thorough repairs are identical with the making of new roads, which I have already described. However, repairs may sometimes be effectual which are less sweeping than these. Presuming that the roads may have been properly made, but not drained, then it may be permanently improved by cutting a deep drain down the middle, and inserting side drains on the plan already given. This will dry the base of the road, and enable the hard materials to carry weight without sinking. And then even good roads are sometimes ruined on the surface by heavy carting—timber, coals, bricks, &c., are dragged over them in wet weather. Such roads may be made good by filling in the ruts with new materials, or raking or picking in the old matter into the tracks, and rolling them heavily into compactness and smoothness. *Macadamson.* [The publication of this letter has been unavoidably delayed. EDS.]

Foreign Correspondence.

DARDANELLES.—I quite agree with you that the forms affected by the Oaks are protean, but if you could walk with me a couple of hours, "*inter vasta fruticeta Quercuum*," I think I could show you forms not even dreamt of in your philosophy. I have leaves of Q. infectoria, exactly like those of the White Poplar; others cut, and indeed presenting endless varieties of shape, colour, and appearance. There is a remark in "Liston's Surgery" very pithy and to the point. He says: "The young surgeon finds out many new diseases; he also rediscovers many more." This may with truth be applied to the botanist. When I first began to look at the Oaks I thought there were a great number, but now they have dwindled down, as far as I have seen in this immediate neighbourhood, to five. Q. Ilex, Ægilops, Cerris, infectoria, and one other which I have been unable to determine, as I have never found a fruit. You speak of the varieties presented by the same plant in different parts of the world. Q. Ilex is a good example. No one would recognise the little stunted scrubby hedge which it forms here as the same as the broad-leaved tree it is in England; but it certainly here better deserves the name of Ilex. Its leaves are very prickly, grow very close together, and are as dark and nearly as gloomy as the Holly. Its acorn perfectly agrees with the description given by Grisebach. You speak of disregarding the *habitus* of a plant, but I assure you I find it here of great use in distinguishing some of the same species, which may vary very much in the leaves, acorns, &c. There are, for instance, endless varieties in the leaves of Quercus Ægilops, which bears the Valonia, so much so that for some time I took one for the Quercus Cerris, till one day, whilst riding through a wood, I was struck with the appearance of a tree, and on nearer examination I found it to correspond with the Quercus Cerris much more nearly than the former one, indeed, to present characters which might be regarded as specific. Now I can tell an Ægilops better by the habit than anything else that I know. In contradistinction to this, and in support of your original position, I may mention that I was overlooking the other day some plants collected by a brother botanist out here, on the great plateau of Olympus, in June last, and there were a large number of Cruciferæ so exactly resembling Saxifragas that it was some time before he could persuade me of the reality. *P.*

Societies.

SHEPTON MALLET AND EAST SOMERSET HORTICULTURAL.—This Society held their eleventh annual exhibition in Langham Park, Shepton Mallet, on Tuesday, August 16, when everything conspired to maintain the merits of this Society as being the foremost in the county of Somerset. We cannot give full particulars, but may mention that the Dahlias of Messrs. Keynes, Salisbury, Wheeler, Warminster, and Kelway & Sons, Langport, were especially good, and took the chief prizes. The Roses were scarcely up to the average,—owing, doubtless, to this very peculiar season. The show of fruit was very

good. Some Grapes exhibited by Mr. J. L. Phipps deserve especial commendation. One noteworthy feature of this Society is the large encouragement shown to cottagers; and certainly they contributed very substantially to the articles exhibited, especially in floral devices and vegetables. We shall have, on another occasion, some additional remarks to make on the Potatos exhibited at this show.

Notices of Books.

Transactions of the Woolhope Naturalists' Field Club. *Hereford Times* Office. 8vo, pp. 232.

Proceedings of the Birmingham Natural History and Microscopical Society. 1869. Birmingham: Jackett & Edmonds. 8vo, pp. 109.

We have on previous occasions had to notice the doings of the first named Club. Not content, as many similar institutions are, merely to provide recreation for their members in the form of pic-nics, or to afford the local magnates an opportunity for mutual glorification, the Woolhope Club has set before itself certain things to be accomplished, and it is doing its work well. The geological papers in the present volume are admirable examples of what such essays should be, and they are well supported by numerous papers on other subjects. One of the special objects of the Society has been to popularise the study of Fungi, with the view of rendering available the copious, though somewhat capricious stores of edible Fungi. To this end illustrations, mostly very faithful, and descriptions of the principal edible kinds, have been given, while the value of the vegetable viands has been put to the test at the dinners of the Club. In the present volume we also find Mr. Worthington Smith's useful tabular analysis of the genera and subgenera of Agaricini, with numerous illustrations, and a complete list of the species found in Britain. This has already appeared in the "Journal of Botany," but we are glad to see it in a form likely to be more readily accessible to the local botanists.

Another speciality with the Woolhope Club consists in the record and photographic illustration of the more remarkable old trees of the county; in this manner we have in the present volume a sketch of the Mistleto Oak of Deerfold Forest, one of the few (eight only) known instances of the growth of this parasite on the Oak.

"This very interesting tree," says Dr. Bull, "grows in the hedgerow of a field called the Harps at Haven Aymestry, in the ancient forest of Deerfold, on the property of the Messrs. Fortey. It was discovered in the spring of 1869, but the Mistleto must have been growing on the Oak for some years. The Oak is of the variety sessiliflora, and may be some 50 or 60 years old. At 5 feet from the ground it measures 3 feet 8 inches in girth. The Mistleto is a female plant, and grows high up in the Oak on the main stem of the tree, after it has bifurcated. It forms a large spreading bunch, with a diameter of 3 feet 6 inches, and springs out from the Oak in a single stem nearly 4 inches in circumference. The Mistleto is also growing on a Thorn in the hedge immediately below the bunch in the Oak, and has probably sprung from a seed dropped by the birds from above. The great rarity of the growth of Mistleto on the Oak is proved by the fact that there are but eight examples which have been well authenticated as existing at the present time. They are to be met with in the following localities:—Eastnor Park, Herefordshire; Tedstone Delamere, Herefordshire; the forest of Deerfold, Herefordshire; Frampton-on-Severn, Gloucestershire; Sudbury Park, Chepstow, Monmouthshire; Burningfold Farm, Dunsfold, Surrey; Hackwood Park, Basingstoke, Hants; and one near Plymouth.'

The existence of three such trees in one county leads to the inference that, if they were equally well searched for in other districts, many more instances might be found.

Another interesting plant recently discovered in the Forest of Deerfold is the Asarabacca, Asarum europæum. This singular plant once enjoyed a medicinal reputation, and it is conjectured that it may have been introduced by a recluse, one "William the Hermit," who is known to have lived at a chantrey in the forest, in the 14th century.

We do not know what the relations are between this society and kindred bodies in other counties, but we would suggest that a free interchange of publications between the several societies would be likely to lead to very beneficial results, one of which would probably be the omission from the permanent record of transactions of the pic-nic details, very interesting no doubt in the form of epistolary correspondence, but scarcely worth paper and print beyond those afforded by the local weekly Journals.

In the Proceedings of the Birmingham Society, perhaps the most useful paper is that of Mr. Fiddian, "On Lithography as applied to the Study of the Microscope, and the importance of Observers Delineating their own Work." Notwithstanding its somewhat infelicitous title, this paper gives in clear language some useful details not readily accessible elsewhere. The illustrations, too, all of which with one exception have been executed by members of the Society, are sufficiently good, and much above the average productions of ordinary amateurs. By way of appendix, lists of the flowering plants, Ferns, Mosses, Lepidoptera, and molluscs, indigenous in the neighbourhood of Birmingham, are given. It would be interesting and useful to institute a comparison of the existing flora with that catalogued in "Purton's Midland Flora," a work published many years since, but which time has raised to the dignity of a classic work.

Florists' Flowers.

In Mr. William Paul's interesting little book, "An Hour with the Hollyhock," he claims for that well-known garden flower "a 300 years' naturalisation on British soil." Fifteen and 20 years ago, in many parts of the United Kingdom, many skilled and enthusiastic florists were busy at work improving this flower, and had made and are still making wonderful strides in that direction. Then came a seeming cessation of labour, but subsequently a new start was made; and since then, Mr. Chater, of Saffron Walden, has never wearied in the work, and in his honoured age can look back on a series of achievements of a most satisfactory character; as also can Messrs. Downie, Laird & Lang, and others, who have gone on with the work. Some of the results came before the Royal Horticultural, at their show on August 17, in a very satisfactory manner. Size, substance, and variation, were reached some time ago. Since then the efforts of raisers appear to have been directed to giving the two first the higher touch of refinement, and to developing the latter into new shades and hues, or combinations of these, as they can be attained.

Naturally enough, the Hollyhock played to some extent a subordinate part to the Gladiolus on that occasion, but it by no means lacked admirers, even among those who love flowers because they are flowers, apart from any critical knowledge they may possess regarding them. Foremost stood the fine collection of 24 cut blooms staged by Mr. W. Chater. This contained some fine new varieties to be sent out in the coming autumn, as follows:—Alfred Chater, pale mottled rose, with a deeper flush of colour in the centre of the flower, of extra fine quality; Conquest, very rich bright crimson, fine quality, shown also as a spike, in which form it was highly effective; Marvellous, orange-buff, fine and full, very fine as a spike also; Champion, dull reddish crimson, a fine and full flower; Bullion, bright apricot-yellow, a fine close full flower, and an effective spike; Eclipse, pure satin-rose, a beautiful flower of fine quality, shown also a spike, and equally attractive in that form; and Talisman, pale sulphur, very distinctly margined with rose, a beautiful and novel flower of fine quality. The foregoing are all flowers raised by Mr. Chater.

Of the flowers distributed last autumn by Mr. Chater the following were well represented on this occasion:—Bijou, scarlet, suffused with buff, very fine and striking; Constance, a beautiful shade of delicate pale flesh, and in its fine finish quite justifying the award of a First-class Certificate by the Floral Committee; Jewel, bright pure yellow, and showing a great improvement in point of substance in a yellow flower; Leviathan, bright reddish rose, very fine; Perfection, delicate silvery flesh, a beautiful soft hue of colour, considered by Mr. Chater to be one of the finest Hollyhocks he has ever raised; and Scarlet Gem, a vivid hue of bright scarlet, fine quality, and forming a bold and effective spike.

Of flowers of older fame, shown by Messrs. Chater, Downie, Laird & Laing, and Minchin, there were Carnosa, flesh, flushed with rose, shown also as a good spike; Carus Chater, reddish crimson, very fine; Crimson King, deep cherry-red, fine quality; Fascination, rosy lilac, with a slight covering of silver, a very beautiful and novel flower; Fanny Chater, rosy carmine, very fine; Fred Chater, pale yellow, shown also as a spike, in fine condition; Joy, dark base, the edges of the flowers tinted with carmine, small, but very pretty; Junia, pale primrose, suffused and stained with purple, very fine and novel in colour; Mrs. Hastie, deep pink, a fine and full flower; King, orange-buff, fine quality; Leah, golden-yellow, very fine; Mrs. Downie, delicate soft salmon-rose, forms a grand spike; Midnight, deep glossy maroon, small in size as shown, but a very fine hue of colour; Mochanna, white, flushed on the edge with pale rose, small, but of fine quality; Miss Lizzie King, yellow, forms a good spike; Queen of Yellows, clear bright yellow, very fine spike; Quadroon Improved (Minchin), very dark maroon, a fine flower; and Walden Queen, soft delicate flesh, flushed with rosy carmine, in all probability one of the finest flowers ever sent out.

Probably a selection of a lot of finer flowers could scarcely be made from any one other division of florists' flowers. Summed up in them are all the lines of improvement of which the Hollyhock has been made susceptible during the past ten years, and they are both creditable to their raisers and an honour to floriculture. *R. D.*

The trial of Early-flowering Tulips made during the past spring at the Royal Exotic Nurseries, Chelsea, and of which some account was given on p. 996, also included some double varieties, though these were sparingly grown as compared with the single flowers. In comparison with the last, the list of distinct and good kinds is a much smaller one, hence the comparative paucity of the varieties tested on this occasion.

Of edged flowers the glorious old Tournesol still takes the lead, at present as unapproachable as it is fine and effective. Next to it comes Gloria solis, with a narrower but deeper coloured edging, very useful indeed for massing. Princess Alexandra is a new variety, early blooming, and of dwarf erect habit, in the way of Gloria solis, but having more of the build of Tournesol. Miaulis is a variety in the way of Tournesol, but not having so much edging of yellow; later in blooming also, and having good erect stiff petals.

Of self flowers, Yellow Tournesol was very fine, and as a yellow double Tulip is unequalled. A fine self-coloured Tulip is Purple Crown, of a deep crimson hue, and very effective in masses. Murillo appears to be one of the best of the newer rose-coloured double varieties; this opens pale crimson, tinted with rose, but it is doubtful if it will ever become a popular variety, being somewhat thin. Couronne des Roses, of a vermilion-crimson hue, is a very pretty self Tulip, though not of full substance, yet well deserving of cultivation for its nice hue of colour. Imperator rubrorum is a very fine bright crimson, self-coloured double Tulip, generally a little later to bloom than Rex rubrorum, on which it is a manifest improvement, though this season it came into flower quite as early.

To these should be added, for their usefulness, Blue Flag, purplish-violet, very distinct, and good for beds; La Candeur, creamy white, good both for beds and pots; La Belle Alliance, purplish plum colour, striped and edged with white; Velvet Gem, deep glossy crimson; Weenix, deep rose at the base, edged with pale puff, which is sometimes suffused with rose, according to the cultivation it receives; and Yellow Rose, pale bright yellow.

Couronne Imperiale and Mariage de Ma Fille, the late-blooming double kinds, prettily striped, in many respects partaking more of the character of double forms of the show kinds, are both good, because of such full substance; but they should be grown in pots, not bedded out, as the weight of the flowers requires some support. They should not be absent from a collection required for house decoration. *R. D.*

Garden Memoranda.

The Subtropical Garden at Battersea Park.—This year more than ever proves the strong claims which this ornamental and interesting style of gardening has upon popular sympathies and support. Thanks to the good arrangements carried out by Mr. Gibson, there is no lack of novelty in design, so far as the planting of the beds and arrangement of colour is concerned, whilst new subjects for that purpose are ever recurring. We do not intend to describe in detail all the good things in bedding-out to be seen at Battersea, but only to point out, for the benefit of intending visitors, a few of the special features of this year's arrangements. On entering the well-enclosed garden on the north side, and turning to the right, the first thing to challenge attention is a small but vigorous-growing specimen of the East Indian Musa superba, which is bedded-out here for the first time with very satisfactory results. A little further on is another specimen of the same size, under which is planted Coleus Princess of Wales, the warm, rose-coloured foliage of which has a very pleasing contrast with the bold bright green foliage of the Musa. In the same neighbourhood is a very effective bed composed of Acer Negundo variegata, plants about 4 feet high, planted underneath with Coleus Princess Royal, which sets off the variegated foliage of the Acer to great advantage, and edged with Heliotrope Voltairianum. The other principal features at this point are a grand mass of Canna Annei—the most vigorous grower of all—bordered with the dark bronze foliaged C. nigricans; and two beds of the beautiful white Funkia grandiflora, and Coleus Lamonti, each encircling the base of a tree, for which purpose they are admirably adapted, though we understand the latter is to be discarded on account of the dulness of its markings. A little further on, still facing to the right, is to be seen the most admired and most attractive bed in the place. It is looked upon with pardonable pride by the authorities as "the best bed in the garden," and justly so. It is about 15 feet long and 4 feet wide; the centre is planted with Abutilon Thompsoni, about 2 feet in height, underneath which is a dense mass of Coleus nigricans, the dark foliage of which shows up the golden-mottled leaves of the Abutilon with wonderfully good effect; then comes a row of the silver-edged Pelargonium Daybreak, and the whole is finished off with with an outer margin of Alternanthera amœna—certainly a more pleasing combination we have rarely or never seen. Proceeding onwards, a large group of Ferdinanda eminens is seen, the large, bold, green leaves of which have fortunately escaped being torn by the wind. At this point the grass slopes are studded with Palms, Zamias, and Cycads, of various heights; of the former Phœnix reclinata is much esteemed, as also is Zamia Lehmanni, which does well in the open air. A little further on are several specimens of Musa Ensete, growing up into grand and noble examples of Abysinnian vegetation. Unfortunately the wind has torn to shreds some of their largest leaves, which is very much to be regretted. At the time of our visit, (a few days ago) we noticed near here a well-grown bushy plant of Nerium Oleander in full bloom, its bright green lanceolate leaves and fragrant rosy red flowers rendering it very conspicuous. Still proceeding onwards we notice a magnificent bed of Canna Bihorelli, a comparatively new variety, of considerable merit, covered with its deep scarlet flowers. Another very promising variety is C. Ferrandi, which has

bright green foliage, and grows about 2 feet high. A bed of this is edged with the curious Amicia zygomeris, which gives it an interesting character. The bold green-foliaged Sparmannia africana produces a grand effect near here; being planted on a slightly rising bank, the effect produced is very telling. What a pity it is that it flowers in spring, when its beauty (so far as outdoor effect is concerned) is lost. Very useful subjects for the subtropical garden are Erythrinas, of which there is a large bed here, amongst which were E. Crista-galli, the earliest flowering kind; E. Hendersoni, a tall strong-growing species, which does not flower so freely as the former; and E. laurifolia, a moderately vigorous grower, which flowers in succession to the first-named. Two plants deserving of notice, and to be seen near this spot, are Canna Madame Schmidt, a new green-leaved variety, which flowers very freely, and Lantana Madame Thibaut, a capital bedding plant, which produces flowers at first of a beautiful orange colour, and which afterwards turn to a deep lilac tint. A good specimen of Cycas revoluta holds the central position of a circular bed, which strikes the eye as very unique; around it are several small specimens of Latania borbonica and

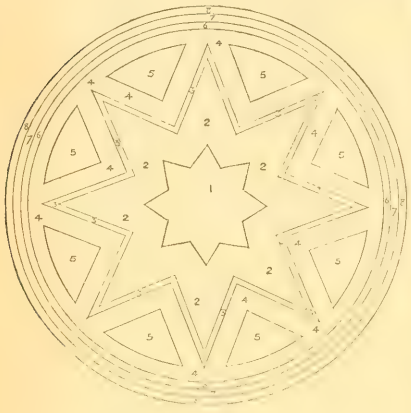

Fig. 220.

Chamærops Martiana, under which is a mass of Coleus Albert Victor; the whole being finished off with an edging of Santolina lavandulæfolia. This system of planting dark-foliaged varieties of Coleus underneath fine foliage plants, cannot be too highly recommended. It sets off the characteristic foliage of such subjects as Palms, &c., to the greatest advantage. Were fuller testimony needed we could not do better than refer to a grand mass of Aralia papyrifera, which is so treated, in the central portion of the grounds.

From the subtropical garden to the portion known as "the peninsula," is an easy transition. Here immediately on entering are the tropical vistas, which have been so much admired. To the left the group arranged underneath the shade of large trees is composed of Tree Ferns of various sizes, associated with Thamnopteris Nidus, some fine specimens of Dracænas, &c., whilst the avenue-like scene on the right has been considerably lengthened since last year. Here are fine specimens of the new Caladium metallicum, an acquisition of no mean order; Dracænas, including D. umbraculifera, which enjoys the shade; numerous Palms, and the curious Monstera deliciosa climbing up the stems of the trees, at the base of which it is placed. The other main features in this part of the grounds are some good examples of carpet bedding, of which we are enabled to give the annexed plans; and the truly interesting "alpine point," which has before been noticed in these columns. In addition to what has already been said, we can only add that the ground has become covered with the dwarf spreading plants planted upon it, and that the effect is unique.

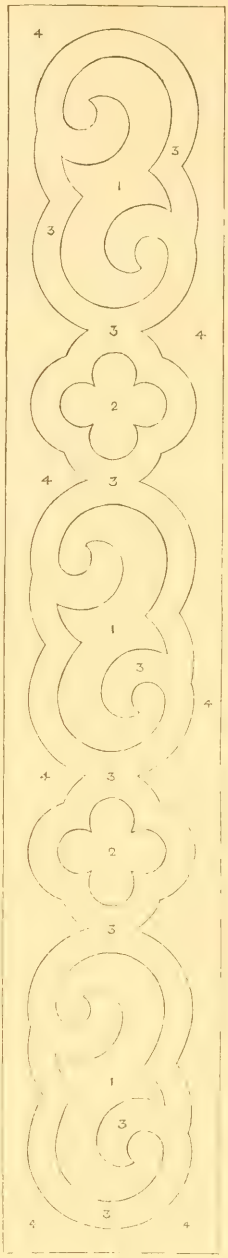

Fig. 219.

Carpet bedding has always been one of the specialties at Battersea, but we have never before seen anything to equal the illustrations of this style as here presented. By giving the names of the subjects with which the different beds are composed, the reader will be enabled, by referring to the numbers in the plans, to gain some idea of the beauty of the beds. The first bed (fig. 218) is planted as follows:—1, Pyrethrum Golden Father; 2, Santolina incana; 3, Alternanthera amœna; 4, Alternanthera paronychioides, and margined with Echeveria secunda glauca. In fig. 219, 1 is Antennaria tomentosa; 2, Alternanthera amœna; 3, A. paronychioides; 4, Pyrethrum Golden Feather; margin, Echeveria secunda glauca. Fig. 220 is composed of, 1, Pyrethrum Golden Feather; 2, Alternanthera amœna; 3, Santolina incana; 4, Alternanthera paronychioides; 5, A. magnifica; 6, Pyrethrum Golden Feather; 7. Alternanthera amœna; 8, Echeveria secunda glauca; and in fig. 221 the arrangement is, 1, Santolina lavandulæfolia; 2, Alternanthera magnifica; 3, Pyrethrum Golden Feather; 4, Alternanthera amœna; 5, Santolina incana; 6, Alternanthera amœna; and 7, Echeveria secunda glauca. All the plants used in these beds are of necessity small, and are kept pinched to a regular

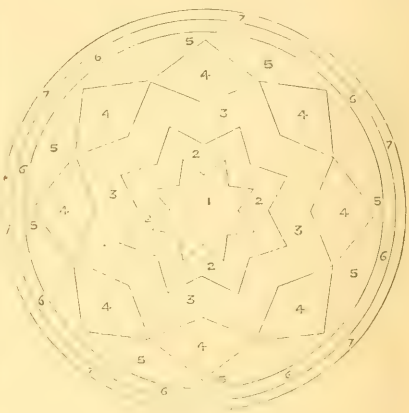

Fig. 221.

height in proportion to their habit, which produces panels, as it were, in the design, with most harmonious results. It is worthy of remark that flowers have never been so plentifully produced before at Battersea, doubtless in consequence of the drought. Watering has been a heavy item here this summer, to lessen which Mr. Gibson hit upon the capital method of raising the sides of the beds a little above the ordinary level, the edges being kept neatly in position by a stiff coating of a mixture of cow-dung and loam.

Miscellaneous.

An Undesirable Tenant.—The next tenant of Sayes Court was no other than "the Czar of Muscovy," as he was then called: the Peter the Great of Russian history. The Czar came to London in 1698 to study the art of ship-building, and desired to live near Deptford Dockyard. In an evil hour the house was let to him, and he became a great thorn in the flesh of poor Evelyn. The philosopher was approaching his seventy-ninth year, and all the philosophy left to him was severely tried by the ruthless proceedings of the semi-barbarian vulture whom he had unluckily admitted into his dovecot. The Czar desired to visit the dockyard by the shortest route from Sayes Court, and not finding such a route, he made it by cutting a hole through the wall of Evelyn's domain. But to destroy a wall is a small matter, for a wall can be repaired or rebuilt, and it is nothing but a question of money; but who shall repair a tree? Who shall make good the

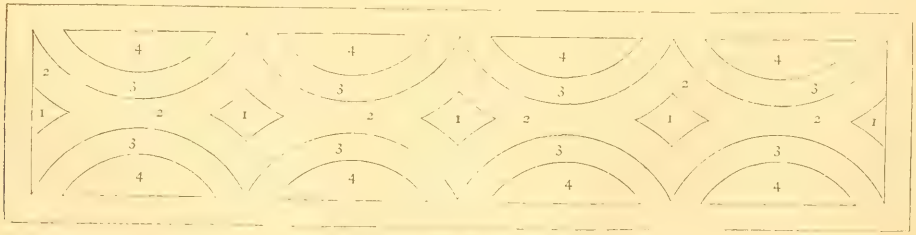

Fig. 219

destruction of an ancient and picturesque hedge of Holly, that it has taken the lifetimes of a man and his father to bring to perfection? This was what the Czar did. He was fond of robust exercise, and of trundling a wheelbarrow full of stones. In pursuit of this latter pleasure in his own grounds (for the time being, and as long as he paid the rent), he made a large gap through the Holly hedge, which was dearest of all other things in and about Sayes Court to the heart of John Evelyn. "Is there under the heavens," said the philosopher, in the last edition of his "Sylva," the fourth which he lived to see through the press, "any more glorious and refreshing object than an impregnable hedge of about 400 feet in length, 9 feet high, and 5 feet in diameter, which I can still show at this time of the year in my ruined garden at Sayes Court (thanks to the Czar of Muscovy), glittering with its armed and variegated leaves? It mocks the rudest assaults of the weather, beasts, and hedge-breakers." The "beast and hedge-breaker"—he was certainly one of the two in Evelyn's estimation, if not both—did other and more reparable damage, altogether to the amount of £150, which was assessed after the Czar's departure, and paid by the government of William III. "*All the Year Round.*"

GARDENING AS A RECREATION.—I would recommend every man, in the autumn of his life, to take to gardening, if he has not already experienced its pleasures. Of all occupations in the world it is the one which best combines repose and activity. It is rest-in-work and work-in-rest. It is not idleness; it is not stagnation—and yet it is perfect quietude. Like all things mortal, it has its failures and its disappointments, and there are some things hard to understand. But it is never without its rewards. And, perhaps, if there were nothing but successful cultivation, the aggregate enjoyment would be less. It is better for the occasional shadows that come over the scene. The discipline, too, is most salutary. It tries one's patience, and it tries one's faith. The perpetual warfare that seems ever to be going on between the animal and the vegetable world is something strange and perplexing. It is hard to understand why the beautiful tender blossoms and the delicate fresh leaflets of my Rose-trees should be covered with green flies, and destroyed as soon as they are born. It is a mystery which I cannot solve—but I know that there is a meaning in it, and that it is all decreed for good, only that I am too ignorant to fathom it. And even in the worst of seasons there is far more to reward and encourage than to dishearten and to disappoint. There is no day of the year without something to afford tranquil pleasure to the cultivator of flowers, something on which the mind may rest (using the word in its double sense) with profit and delight. If there is no new surprise, no fresh discovery for you, there is always something to be done. *The Cornhill Magazine.*

JOHN EVELYN AND HIS FRIENDS.—John Evelyn was not in a position to require offices of emolument from the state, but he accepted some offices of trust and honour. He was a commissioner for taking care of the sick and wounded in the Dutch war; a commissioner of Greenwich Hospital; a commissioner for the rebuilding of St. Paul's Cathedral; a commissioner for the regulation of the Mint; a commissioner for the improvement and widening of the streets of London, and one of the original Lords of Trade and Plantations—the precursors of the present Board of Trade. But none of these public duties interfered with his planting and gardening, or with his enjoyment of all the intellectual and convivial society of the time. He was personally acquainted with all the celebrated men of the day—except with those who, in his opinion, were defiled by their revolutionary politics, and by the support they had given to Oliver Cromwell—and was familiar with all the popular literature of the day, in which, it may be remarked, that the works neither of Shakespeare nor of Milton were included. The fashionables of that age had scarcely heard of the one, and only knew the other as a rebel. The most famous poet of the period was Abraham Cowley, betwixt whom and Evelyn there was much congeniality of taste, more especially in the matter of gardens. To the third edition of "Sylva," Evelyn prefixed a letter and a poem addressed to him by Cowley. In the letter, dated August 16, 1666, Cowley declared that he never had any desire so strong, or so like covetousness, as that which he still had, and always had, of being master of a small house and large garden, that he might there dedicate the remainder of his life to culture and the study of Nature. "*All the Year Round.*"

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE *Salanums*, popularly known as "Williams' Hybrids," or varieties of S. Capsicastrum, are amongst the most lively and enduring of the winter fruiting plants which are used for decorative purposes, whether it be in conjunction with blooming plants in the conservatory or show-house, or for what they are more particularly adapted—dinner-table or other decoration within doors. With regard to the culture of these plants, I advised some months ago that they should be planted out singly into good garden soil in well-exposed situations, as under such a system of treatment they do far better than when cramped up in pots throughout the long summer months. Where this suggestion has been followed, a fine growth has by this time been made, the flowers will have set profusely, and nice bushy heads of berries will now be forming. If at this time the plants are well supplied with manure-water, the fruit will be finer and the ripening process will be much forwarded. There need not be any hurry as to repotting them, as this operation can be performed with greater advantage to the plants when the berries have attained a larger size, and when the days are shorter and the sunlight is not so strong. *Salvia splendens* should now be pinched back for the last time, and as soon as the plants have pushed forth young shoots, and the pots are well filled with roots, manure-water must be given to them rather frequently. Seedling plants of *Schizanthus* must now be potted off singly into small-sized pots as soon as they are of sufficient size, and when they have commenced to grow should receive as much light as possible. A compost made up of two parts of maiden loam, one of fibrous peat, and a free allowance of clean silver sand, will suit them well. The *Mignonette* seed sown a week or two ago will now have germinated, and will require thinning; this should be done rather freely if a good crop has come up. Be particular to keep the base of each plant selected to remain as firm as possible in the soil. If necessary give them a surfacing or mulching of good fibrous loam. *Tropæolums* which require potting should undergo the operation at once. They require perfect drainage, the fibrous part of good loam only and plenty of sharp gritty sand in admixture. Place them out in a fully exposed situation for a week or two, that they may not be hurried prematurely into growth. Syringe occasionally in the early morning those greenhouse plants which are turned out-of-doors, and do not let any of them suffer from the want of water.

FORCING HOUSES.

In instances where *Grapes* are not colouring well do not by any means hurry them; rather suppose that the cause is to be found in a somewhat torpid state of the roots, hence more time, if allowed, will be the more likely to remedy the evil. Afford a free supply of air constantly during calm genial weather to all which are in the last stage of ripening. Gradually remove the shading from all *Pineries*, so as to imbue the plants with as much hardihood as possible, the better to withstand the hardships of the incoming long winter months. As soon as a sufficiency of materials is obtained with which to make *Mushroom beds*, let the whole be thrown lightly into a heap, so as to determine the temperature which it is capable of rising to before finally making up the beds. The drier it can be collected the better, as in that case the temperature will not run up so high, the beds will be made quicker, and the material will not be impoverished so much in the process of fermentation as it otherwise would be.

HARDY FLOWER GARDEN.

Though every kind of "bedding stuff" should now be propagated with despatch, I advise that shrubby *Calceolarias* should not be struck yet, as the later this is done with immunity from late autumn frosts so much the better and stronger will be the plants next spring. Give to *Dahlias*, which are now becoming attractive, all possible attention, such as removing every bloom as soon as it is past its best, tying all shoots that require it, and trapping earwigs, which eat away the flower-petals. In tying them, it should be borne in mind that such support is needed as will afford ample safety to every branch during the most boisterous weather. Cut down *Hollyhocks* to the ground line immediately they show symptoms of shabbiness, excepting in those instances where seed is to be saved. Attend again to growing shoots upon walls or ornamental trellis-work. A neat and tidy appearance can alone be assured by undeviating attention to these minutiæ of detail. Cut away all straggling ill-placed shoots and old flower-stalks from *Rock Plants*, and the latter from *Herbaceous Plants* generally, which look exceedingly bad if not so removed at the earliest time possible.

KITCHEN GARDEN.

Celery will now require to be slightly earthed up more or less throughout the whole successional stock. The small old seed-bed leaves should be weeded away from each separately, and all young shoots which may emanate from around the base of the plants should be removed bodily. Then give a good soaking with water if needed, and place a layer of soil from the sides of the trenches in a slanting position amongst the plants to about 2 inches in depth. Some growers tie each stick up neatly with matting, which is not a bad plan when time can be spared at first. Cut away all flower-stalks from those *Artichokes* from which the flowers have been taken off as soon as possible, as to leave them will be to impoverish the stool which should form other shoots before the advent of winter. *Sweet Basil*, *Summer Savory*, and such like *Herbs*, should be cut and dried without further delay. Plant out a few rows of the earliest plants produced from autumn-sown seed as soon as they are large enough. Make a last sowing of prickly *Spinach* if a rather large demand is likely to occur. *W. E.*

TOWN GARDENING.

Pink pipings that were put in in June should now be planted out. The best method of doing this is to plant them in a bed 6 inches apart, and there let them remain till spring, when they can be planted out where they are required to flower. *Carnations* that have been laid this summer will now be well rooted. Those which cannot conveniently be potted and kept in a cold frame during the winter should be left on the old roots till spring. In potting them, put two in a 48-sized pot close to the edge. *Intermediate Stocks* that were sown last month should be planted, three in a 48-sized pot, in loamy soil well pressed down, and with good drain age at the bottom. Water them, and place them in the shade for a few days, and afterwards let them be wintered in a cold frame. The *double Rocket* does well in town if wintered in a similar position. These plants should now be propagated by dividing the roots, which should be potted and placed in the shade, giving them plenty of water until they are placed in the frames, when they should be kept as dry as possible. Fill up all vacancies in the borders with *Pompon Chrysanthemums*, and pinch off all the laterals from the large-flowering varieties. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, AUGUST 24, 1870.

1870 MONTH AND DAY. August.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition: Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
18. Thurs.	29.89	68.5	60.4	56.3	73	5.0
19. Friday	29.67	69.7	54.6	49.1	60	3.9
20. Satur.	29.99	60.8	54.6	49.9	66	3.9
21. Sunday	30.02	65.1	55.5	48.6	54	3.6
22. Monday	29.93	59.4	55.0	51.0	74	4.2
23. Tues.	29.65	61.9	52.3	50.7	83	4.2
24. Wednes.	29.71	60.0	55.0	49.1	69	3.8

1870 MONTH AND DAY. August	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Mean of 50 Years	WIND. Direction	Horizontal Movement	RAIN. In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
18. Thurs.	70.0	46.1	13.6	61.4	+ 2.4	W.S.W. to N.W.	200	0.00
19. Friday	70.1	52.6	17.5	58.2	— 2.7	N.	350	0.00
20. Satur.	72.8	49.3	23.5	59.0	— 2.1	N.	175	0.00
21. Sunday	68.8	45.0	23.8	55.2	— 5.5	N.	170	0.00
22. Monday	68.9	45.8	23.1	55.7	— 5.0	N.W.	215	0.65
23. Tues.	67.1	47.1	20.0	57.1	— 3.5	N.W.	253	0.00
24. Wednes.	71.9	51.2	20.7	60.0	— 0.5	N.W.	285	0.01

August 18—Generally cloudless throughout. Fine. Lightning at night.
— 19—Cloudy till night, then cloudless. Lightning at night.
— 20—Cloudless during the early morning, cloudy afterwards till evening. A little rain fell about 3 P.M. Aurora at night.
— 21—The amount of cloud was variable throughout the day.
— 22—Generally overcast. Rain fell heavily from 5 P.M. till midnight.
— 23—Generally cloudy but fine.
— 24—Variable amounts of cloud were present till night, when cloudless. A light rain fell in the morning.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, AUGUST 20, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	80.6	47.0	33.6	70.1	51.2	27.0	61.5	0.00
Blackheath ..	79.9	46.1	33.8	72.8	52.4	20.4	62.9	0.03
Bristol ..	79.7	45.3	33.8	71.9	49.1	22.6	58.9	0.01
Birmingham ..	74.7	44.4	30.3	69.7	50.0	19.7	59.8	0.00
Wolv'hampton	72.0	43.5	29.5	69.2	49.2	20.0	57.5	0.00
Leicester ..	..	..	..	..	..	..	..	..
Norwich ..	73.5	40.0	21.5	67.4	51.0	13.8	55.8	0.04
Nottingham ..	78.0	45.1	33.5	72.1	49.7	22.7	59.3	0.01
Sheffield ..	71.7	43.9	27.7	69.3	51.1	18.2	59.5	0.05
Liverpool ..	72.1	48.7	23.4	67.2	52.1	15.1	58.2	0.15
Manchester ..	..	..	..	..	..	..	..	..
Salford	75.1	43.9	31.1	70.3	48.2	22.1	57.9	0.04
Bradford	73.5	46.1	26.4	69.8	51.7	17.8	58.9	0.21
Leeds	77.2	48.0	29.0	71.7	52.3	19.4	60.4	0.53
Hull	74.0	44.0	31.0	67.9	48.6	19.0	58.4	0.41
Newcastle ..	69.0	49.0	19.0	62.8	50.7	12.1	55.0	0.16
Edinburgh ..	76.7	45.0	31.7	..	..	..	57.1	0.40
Glasgow ..	77.7	43.3	34.4	..	..	..	57.9	0.12
Dundee	75.0	45.0	30.0	..	..	..	57.8	0.59
Aberdeen ..	68.0	41.2	23.8	..	..	..	54.5	0.13
Paisley	75.5	42.0	33.5	..	..	..	55.8	0.00
Greenock ..	70.5	47.0	23.5	..	..	..	57.5	0.12
Leith	..	..	..	..	..	..	..	..
Perth	81.0	40.0	41.0	..	..	..	58.0	0.12
Dublin	79.1	39.5	39.6	..	..	..	56.9	0.00

JAMES GLAISHER.

Notices to Correspondents.

AMARYLLIS: *H. B.* We fear you may have been resting your bulbs at a wrong period. Ordinarily Amaryllids, we refer mainly to Hippeastrums, flower during the spring months; they should then be grown on for foliage, and not rested till that shows signs of full maturity; then they may rest on a dry shelf, till the blooming season comes round again. If yours are really growing with fresh green leaves, do not check them, but let the leaves perfect themselves, and then rest the bulbs.

APRICOTS DECAYING: *J. Jones.* We are unable to inform you as to the cause of your Apricots decaying on the trees. The examples forwarded were so far decayed that we could not examine them. Apricots are subject

to many odd maladies, from which others of our fruits are exempt.

BOOKS: *W. S.* "Thomson on the Vine" is the best you can have on that subject. We do not know of any recent work solely devoted to the Cucumber.

DIPLADENIAS: *Dipla.* Either D. amabilis or amœna may be grown on the rafters of a stove, if the roots can be kept genially warmed. They are not specially subject to the attacks of insects.

EXHIBITIONS: *W. Hawkins.* Having received your entrance fee, the committee was not justified in holding you to be ineligible to compete, unless for some good reason; and having, on its own authority, transferred your articles to another class from that in which you entered, we do not see how it can justify withholding the award made in that class. The rules, as they now stand, do not exclude seedsmen and florists in a small way of bnsiness.

FIG CULTURE: *A. B.* If you pull off the leaves of your Fig tree "to enable the fruit to ripen," you will not only deteriorate the quality of the fruit, but materially lessen the chances of obtaining a crop next year. Better pull the leaves behind the fruit than remove them altogether.

HAYES' PATENT STOVES. Can any of our readers inform us where these are to be bought?

INSECTS: *T. G., Jr., Denmark Hill.* The spiders you have sent are male and female of Theridion tepidariorum. Put a toad into your Cucumber frame. *W.*

LAWN PLANT: *F. C. P.* Pyrethrum Tchihatchewii. Like some other composite plants, the Yarrow, for example, it keeps green in the driest weather, and for dry sandy banks it thus becomes useful, but on rich ground it is much too coarse for a lawn plant.

MULBERRY CULTURE: *H. H. E.* asks if any of our correspondents can refer him to any good directions for pruning and training a Mulberry tree against a wall.

NAMES OF FRUITS: *Constant Subscriber. Apples:* It is next to impossible to name many of the Apples you have sent us in their present half-developed state. Their distinctive characters are not yet fixed. We can but guess at the following:—1, Sturmer Pippin; 4, Old Nonpareil; 5, Hoary Morning; 7, Summer Pippin; 10 and 16, King of the Pippins; 15, Yorkshire Greening.

NAMES OF PLANTS: *A. Watkins.* Origanum Sipyleum—*J. D. M.* Rhamnus Frangula—*J. J.* The common Rest Harrow, Ononis arvensis. We never heard of its being injurious to the cows, though it is said to communicate a nasty taste to butter.—*C. H. D.* Petræa volubilis.

NECTARINE ON PEACH: *H. B.* Many instances of a like character have now been recorded.

PELARGONIUM: *W. Herod.* No doubt a good scarlet, but the flowers had mostly fallen. Under such conditions, it is impossible to say if it is better than the many other good strong-growing scarlets now in cultivation.

REMOVING TREES WHEN LEAVING: *F. E.* This is a question for your solicitor to answer.

ROOT: *Plasmeovydd.* Apparently the root of the common Buttercup, Ranunculus bulbosus.

SELECT PLANTS: *Dipla.* Epacris hyacinthiflora, hyacinthiflora alba, and hyacinthiflora carminata are all good for spring flowering. Erica hiemalis for winter, and any of the varieties of E. ventricosa, with E. Cavendishiana, are good for summer-flowering. Cyclamen europæum, Atkinsii and africanum. Gardenia florida intermedia and florida Fortuneana for stove; G. citriodora for greenhouse.

THE DEVONSHIRE STUBBARD APPLE: *W. A., Exbourne.* We have received with thanks your examples of the above celebrated Apple. The fruits were small in size, of conical form, very angular, the flesh very light and soft, with a hollow cavity like the Leadingtons; skin light greenish, a little coloured on the exposed side; somewhat acid and insipid to the taste, and to our fancy, quite third-rate.

VERBENAS: *G. Archer.* They will probably all make useful bedding sorts, if the habit is as you describe it. They, however, should be seen growing.

WATER LILY: *S. L. M., Thanet.* There is plenty of this in the ditches in your neighbourhood (Minster Marshes). Apply to a respectable nurseryman, if you cannot get it yourself. 2. Wait till the leaves fall, in the course of a few weeks, before you move the Ampelopsis.

CATALOGUES RECEIVED:—Sutton & Sons' Bulbous Flower Roots.—H. Cannell's Autumn Catalogue.—Jules de Coch & Sœur, Prix-Courant pour Marchands.—Groenewegen & Co., Catalogue d'Ognons, a fleurs de Haarlem.—Louis Van Houtte, Catalogue of Stove and Greenhouse Plants.—Ant. Roozen, Catalogue of Choice Hyacinths, &c.—Koning & Co., Catalogue of Dutch Flower Roots.—B. S. Williams' General Catalogue.—D. Radclyffe & Co.'s Autumn Catalogue of Dutch Bulbs.—Child & Lorimer's Catalogue of Dutch Bulbs—Downie, Laird & Laing's Dutch Flower Roots.—W. Cutbush & Son's Bulb Catalogue for 1870.—H. Curtis & Co.'s Selected Roses.

COMMUNICATIONS RECEIVED:—T. C. B.—Received with thanks. We cannot identify the seed.—*A. S.*—Will write.—F. J. P.—P.—W. H.—A. (next week).—A Constant Subscriber (next week).—T. C. C.—J. D. M.—W. B.—A. B.

MARRIAGE.—On August 10, at St. Mary's, Huntingdon, by the Rev. R. Wright, assisted by the Rev. H. M. Cole, WILLIAM BRYANT, of The Nurseries, Rugby, to SUSANNAH, eldest daughter of JOHN INGRAM, The Nurseries, Huntingdon.

Markets.

COVENT GARDEN.—Aug. 27.

Notwithstanding the interruption caused by the war, Continental supplies are heavy. The rougher description of goods are also supplied in large quantities, and in consequence has to be sold at a low rate to dispose of it. In Potatos, which are good, a steady trade is doing. Amongst flowers we have Balsams, Pelargoniums single and double, Gladioli, Asters, Lilliums, Oleanders, Tritomas, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	2 0	Nectarines, per doz.	4 0	8 0
Apricots, per doz.	2 0	4 0	Oranges, per 100	8 0	12 0
Figs, per doz.	1 0	4 0	Peaches, per doz.	6 0	12 0
Grapes, per lb.	2 0	5 0	Pears, per doz.	1 6	3 0
Lemons, per 100	6 0	16 0	Pine-apples, per lb.	3 0	6 0
Melons, each	1 0	4 0	Plums, p. half sieve	2 0	3 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 6	3 0
Cabbages, p. doz.	1 0	1 6	Mint, per bunch	0 3	0 6
Carrots, p. bunch	0 4	0 8	Mushrooms, p. pott.	3 0	4 0
Cauliflowers, p. doz.	1 6	3 0	Onions, per bunch	0 4	0 9
Cucumbers, each	0 6	1 0	Parsley, p. bunch	0 2	0 4
French Beans, p. sieve	2 0	3 0	Shallots, per lb.	0 8	—
Do., retail, p. lb.	0 4	0 6	Spinach, p. bushel	2 0	3 0
Garlic, per lb.	0 3	—	Tomatos, per doz.	1 0	1 6
Herbs, per bunch	0 2	0 4	Turnips, ying, p. bun.	0 9	1 0
Horse Radish, p. bun.	3 0	5 0			

Potatos, York Regents, per ton, 120s. to 140s.; Flukes, do., 140s. to 160s.; new round, 55s. to 75s. per cwt.; new kidney, 70s. to 100s. do.

WM. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Moor Hi ringham, Essex.

HORTICULTURAL EXHIBITIONS.
NOTICE TO COMMITTEES.
Upon application to the Undersigned, Plans and Prices for the HIRE of elegant and commodious TENTS are forwarded free of charge. All letters should be addressed to 7, Duke Street, London Bridge, S.E. Illustrated Catalogues post free.
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Indestructible Terra-Cotta Plant Markers.
MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 1,000 for 3s.; cloth can be sent. Sample 1 doz. and 1 gross on receipt of 1s. 6d. and 3s. respectively. Prize Medal awarded by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

THE GRANITIC PAINT, the best for the finest painting, and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity Brethren, the Brighton and Metropolitan Railways, and many Engineers, Builders, Brewers, Dyers, Engineers, Architects, Contractors, Breweries and Shipbuilders.
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DAMP WALLS PREVENTED by the use of the SILICATE POROUS COMPOSITION, and Porous Bricks and Stones. Consult Illustrated Catalogue, free by post.
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GARDEN CANOPIES, of various sizes, suitable for Croquet Lawns, Children's Playing Grounds, and general decoration, may be seen at the
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H. FRIEMAN AND SONS, HORTICULTURAL BUILDERS and HOT WATER ARCHITECTS, MANUFACTURERS, &c., Manufactory, Regent's Canal Bridge, City Road, Middlesex. HOT-WATER APPARATUS, Patent Saddle Boilers, Wrought Iron Tubular Boilers, Cast Iron Boilers, Flow and Return Valves, Expansion Pipes, Air Valves, Syphon Pipes, Stop Valves, Cocks, Pipes, Bends, Elbows, &c. Estimates for Heating Greenhouses, Conservatories, Vineries, Pine Pits, Forcing Pits, Propagating Pits, Dwelling Houses, Churches, Chapels, Schools, Factories, Warehouses, Public Buildings, &c. Illustrated Catalogues free by post.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars address JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and 15, Hough Works, Leeds.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND SON, 120, Fazeley Street, Manchester.

Archangel Mats.
J. BLACKBURN AND CO. have just received the FIRST CARGO, and are offering them at low prices. Lists on application at 4 and 5, Wormwood Street, London, E.C.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. F. ANDERSON, 7, Commercial Street, Shoreditch, London.

GARDEN WIRE WORK, consisting of ARCHES, BASKETS, FLOWER STANDS, &c.
GARDEN TRELLIS ... ... 45s. to 56s.
GARDEN EDGINGS ... ... 15s. to 15s.
GARDEN WATER BARROWS ... 45s. to 90s.
GARDEN ROLLERS ... ... 25s. to 50s.
GARDEN HURDLES ... ... 6s. to 30s.
GARDEN SEATS ... ... 16s. to 90s.
GARDEN TOOLS and WATERING POTS.
PATENT TUBULAR FLOWER POTS, 7 in. to 12 inches, 70s. to 130s.
Illustrated Catalogue, 32 stamps.
Suitable for a Lady—To cut 14 inches, 12oz.
Gentleman—To cut 16 inches, 16oz.
WILLIAM S. BURTON, Furnishing Ironmonger, by appointment, to H.R.H. the Prince of Wales, has a very handsome assortment of the above in his premises. GRATIS CATALOGUE, containing upwards of 850 Illustrations of his unrivalled Stock, post free.—39, Oxford Street, W.; 1, 1 A, 2, 3, and 4, Newman Street; 4, 5, and 6, Perry's Place; and 1, Newman Yard, London, W. With the present railway facilities throughout the Kingdom, all parts of the country are brought to London as to a town. WILLIAM S. BURTON will always, when desired, undertake delivery at a small fixed rate.

WANTED, a PARTNER, with from £100 to £200, to join the Advertiser, who is carrying on the business of a Seedsman and Florist, on one of the most commanding positions in the South-West suburbs of London, where a large and ready-money trade can be done. Or will be SOLD.—Apply to E. C., 21, Wimbourne Street, Hoxton, N.

THE REV. S. REYNOLDS HOLE, being unable to ANSWER individually the applications, 67, with which he has been favoured, in consequence of his Advertisement for a Gardener, desires hereby to state that he has engaged the services of THOMAS COCK.

MR. WILLIAM BULL is in WANT of a PERSON qualified to take the Management of the Seed Department. Salary, £80. Apply who are thoroughly competent for the appointment, both as regards character and ability.—Mr. BULL, Chelsea Nurseries, Chelsea, S.W.

WANTED, by the Advertiser, a SITUATION as Foreman in a Nursery, Seed, or Florist Business. Has had 12 years' experience in the Growing of Soft and Hard-wooded Greenhouse Plants, Roses, Fruit, and Kitchen Garden, and whose knowledge must be such as to enable him to conduct the same with first-rate ability. There is not much glass. Wife expected to attend the Lodge. State wages, which will be liberal to one perfectly conversant with his profession, and whose character will bear the strictest investigation. A knowledge of Grazing Land and Stock not objected to.—W., Messrs. Barr & Sugden, 12, King Street, Covent Garden, London, W.C.

WANTED, a GARDENER (SINGLE-HANDED), married: one who thoroughly understands Vines, Pruning Fruit Trees, the Management of a Kitchen and Flower Garden. Wages, 18s. a week, and a cottage. Wife can undertake Laundry, if wished, the average earnings of which will be about 15s. per week.—E. M., Post Office, Huntingdon.

WANTED, a GARDENER, where two Assistants are constantly kept, and the requisite extra labour supplied. Vineries and large Orchard House. Wages £90 per year, and good and good house. A first-class character will be required.—Major HARE, Docking Hall, King's Lynn.

Seed Trade.
WANTED, a JUNIOR ASSISTANT, who can neatly and correctly execute Vegetable and Flower Seed orders, and has a good handwriting.—to EDMONDSON BROTHERS, 10, Dame Street, Dublin.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. H. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the highest qualifications, both as regards character and ability, for the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

GARDENER (Head).—Young, steady, industrious, and thoroughly experienced in every department. First-class references given. Wages £30. Full particulars, H. B., 57, Blantyre Street, King's Road, Chelsea, S.W.

GARDENER (Head), married, without family.—J. MONRO will be glad to recommend to any Lady or Gentleman requiring a First-class Gardener, the above. Can manage Land if required.—J. MONRO, Nurseryman, Potter's Bar, N.

GARDENER (Head).—Age 33, married; is open to arrange with any Nobleman, Lady, or Gentleman, requiring the services of a First-class Gardener.—A. B., General Post Office, Exeter, Devon.

To Noblemen and Gentlemen.

GARDENER (Head).—Age 39, married, one child; thoroughly practical. Ten years in last place, where Gardening was carried on in all its branches, including the Growing of Pines. Good character from Mr. E. G. WILLIAMS, Victoria Nurseries, Upper Holloway, London, N.

GARDENER (Head), to any Nobleman or Gentleman.—Age 39, married, no incumbrance; thoroughly understands the profession in all its branches, including the Growing of Pines, Vines, Peaches, &c. Nine years' good character. Wages £60 per annum, with cottage, &c.—J. S., Jas. Tyman, 68, Great George Street, Liverpool.

GARDENER (Head), age 41, married.—A CALLER is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener, having lived 18 years as Head Gardener to one nobleman. Well versed in Propagation of all kinds of Stove, Greenhouse, and Hardy Plants. Good manager. Management of fruit, viz. Pines, Vines, and Peaches and Flower Gardening. Character will be given with best investigation.—WILLIAM CALLER, Gardener, Thames Ditton, Kingston, Surrey.

To Landscape Gardeners.

A YOUNG GARDENER is desirous of obtaining employment by a Landscape Gardener or others. He is a good Draughtsman, and writes a good hand. Good references given.—L. D., 33, Cochrane Street, St. John's Wood, N.W.

GARDENER (UNDER).—Age 19, strong, active; has been under a Foreman in a large Establishment nearly three years. Good character.—Y. Z., Mr. Smith, Post Office, Sawbridgeworth, Herts.

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FOREMAN, where Plants are grown for the London Market.—An experienced Man. First-class references given as to ability.—A. B., 22, Percy Road, Shepherd's Bush, W.

FOREMAN, or SECOND IMPROVER, in a Gentleman's Garden.—Age 20; will be well recommended by the Head Gardener with whom he has been several years.—B. W., Post Office, Bury St. Edmunds.

IMPROVER, in a Nobleman's or Gentleman's Garden, or Two Under-Gardeners.—A Premium given. Good references.—J. G., Post Office, Richmond, Surrey.

STEWARD or BAILIFF.—Age 45, no family; has had the entire Management of a Farm of 500 Acres, with Woods. Wife no objection to Dairy and Poultry.—A. M., 97, Westbourne Park Road, Paddington, N.W.

To Noblemen, Gentlemen, Agents, &c.

FARM BAILIFF.—Age 29, single; can be very highly recommended. Will Messrs. Hammond & Parratt, 10 and 11, High Street, Croydon, Surrey, S.

PLOUGHMAN (married, no family), from the neighbourhood of Tillyfour, near Aberdeen.—Thoroughly practical; lived seven years in Sussex on a large farm. Understands any Soils; gained prizes for Ploughing and the Fattening of Cattle and Sheep. Can be highly recommended by present and previous employers. Wife understands Dairy and Poultry.—B., *Gardeners' Chronicle* Office, W.C.

To the Trade Generally.

MANAGER or TRAVELLER.—Thoroughly and practically acquainted with every branch of the Trade; extensive experience. References unexceptionable.—SYD., 25, Kinglake Street, Liverpool.

Nursery and Seed Trade.

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Seed Trade.

SHOPMAN (Head), or WAREHOUSEMAN.—THOMAS KENNEDY & CO., Nurserymen and Seedsmen, Dumfries, can with confidence recommend a young Man to any house requiring the above.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 27 per cent of Soluble Phosphates, 2 to 3 per cent. of Ammonia with Salts of Potash. See report of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 13, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and reverted phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—I remain, Sir, yours respectfully,
"AUGUSTUS VOELCKER.
"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

THE LONDON MANURE COMPANY,
(ESTABLISHED 1840)
Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
DISSOLVED BONES, for Dressing Pasture Lands
SUPERPHOSPHATE OF LIME
PREPARED GUANO
MANGEL and POTATO MANURES
Also Genuine PERUVIAN GUANO, and NITRATE of SODA ex Dock Warehouse; SULPHATE of AMMONIA, FISHERY SALT, &c. E. PURSER, Secretary.
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Autumn Sowing.
ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
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This Company was originally formed by, and is under the direction of, Agriculturists, circumstances that have earned for it another title, viz.,
"THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
Particulars will be forwarded on application to the Secretary, or may be had of the local Agents.
C. T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

To Seedsmen and Florists.
TO BE DISPOSED OF, the LEASE, GOODWILL, and FITTINGS of a RETAIL SEED BUSINESS, in a leading thoroughfare in the City. Rent very moderate, a portion of the Premises being let off.
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TO BE LET, by Tender, a compact FARM of 63 ACRES of excellent LAND (or the FREEHOLD would be SOLD). Well suited for Seed Growing or Market Garden purposes. The Land is situate close to the Town and Railway Station, Herne Bay, and is in the occupation of Mr. Amos, whose Lease expires Old Michaelmas next.
Address Mr. GEORGE POWELL, 47, Montpellier Terrace, Cheltenham. No Agents need apply.

To Florists, Seedsmen, and Naturalists.
FOR SALE, in consequence of the death of the late Proprietor, the FREEHOLD PREMISES, known as the AVIARY GARDENS, Cheltenham, with the Houses, Buildings, Stock and Goodwill. The Business on the above premises has been carried on for many years as a Florists', Seedsmen's and Depot for the Sale of Live Birds and Poultry, Florist Plants, Seeds, and other articles connected with the Garden, Aviary, and Aquarium.
Immediate possession of the Land in particulars apply to
Mr. C. H. JESSOP, Solicitor, Cheltenham.

SALES BY AUCTION.

Bulbs from Holland.
MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, August 31, at half-past 12 o'Clock precisely, 600 Lots of first-class HYACINTHS, TULIPS, CROCUSES, NARCISSUS, RANUNCULUSES, and other BULBS, just arrived from well known farms in Holland Lotted to suit the Trade and private buyers.
On view the morning of Sale, and Catalogues had.

The Wilderness, Whiteknights, near Reading.
CLEARANCE SALE of VALUABLE STOVE and GREENHOUSE PLANTS.
MESSRS. PROTHEROE AND MORRIS are instructed by H. Vyse, Esq. (who is leaving the neighbourhood), to SELL by AUCTION, without reserve, on the Premises, the Wilderness, Whiteknights, near Reading, on TUESDAY, September 6, at 1 o'Clock precisely, the whole of the choice STOVE PLANTS, many of which are fine specimens, comprising Ardisias, Begonias, Eucharis, Gardenias, Franciscea, Ixoras, Generas, Rivinas, &c.; a quantity of handsome GREENHOUSE PLANTS, consisting of Alocasias, Anthuriums, Caladiums, Crotons, Dracænas, Marantas, Pandanus, Sanchezias, Panicum, Fittonias, and numerous others. Also some choice EXOTIC FERNS, comprising Adiantum, Gymnogramma, &c.; a few ORCHIDS, some Fruiting and Succession PINES, together with a quantity of FRUIT TREES in Pots.
On view the day prior to the Sale; Catalogues may be obtained on the premises of Mr. WM. LEES, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

Preliminary Notice.—Tooting, Surrey.
MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. R. Parker to SELL by AUCTION, without reserve, on the Premises, Exotic Nursery, Tooting, on THURSDAY, September 15, at 11 for 12 o'Clock precisely, thousands of Surplus STOVE and GREENHOUSE PLANTS, the whole of which are in a very thriving condition; also a large quantity of choice and rare ORCHIDS, EXOTIC FERNS, PALMS; an assortment of succulent and Hardy HERBACEOUS PLANTS, &c.
Further Particulars will appear in future Advertisements

Biddenham Annual Sale.
MR. STRAFFORD is instructed by Mr. Charles Howard, of Biddenham, near Bedford, to announce that the ANNUAL SALE by AUCTION will take place on FRIDAY, September 2, and will consist of about FIFTY OXFORDSHIRE DOWN SHEARLING RAMS, and a few older SHEEP.
London, 13, Euston Square.

Stand Hall, Whitefield, near Manchester.
IMPORTANT SALE of SHORTHORNS, and POLLED ANGUS CATTLE.
MR. STRAFFORD has received instructions from Thomas Statter, Esq., to SELL by AUCTION, without reserve, on WEDNESDAY, the 28th September, about 45 Head of very superior SHORTHORNS, consisting of Bulls, Cows, and Heifers, bred from some of the most famed Herds, and by Sires of the highest breeding and character—such as the Duke of Oxford (17,750), Grand Duke of Connaught (20,056), Thorndale Duke (25,300), and the prize Bull Charlie (25,715): the two latter Bulls are included in the Sale. Also a very choice lot of POLLED ANGUS CATTLE, consisting of some prime Cows and Heifers, as well as Bulls and Bull Calves, chiefly bred from the famed Herd of Mr. McCombie, of Tillyfour.
Catalogues with Pedigrees and other particulars will shortly be issued, and may be had on application to Mr. STRAFFORD, 13, Euston Square, London; or of Mr. STATTER, Stand Hall, Whitefield, near Manchester.

Churchill Heath, Chipping Norton, Oxon.
IMPORTANT SALE of SHORTHORNS.
MR. STRAFFORD begs to announce that he has received instructions to offer for SALE by AUCTION, without reserve, on TUESDAY, October 4, at Churchill Heath, about 50 HEAD of very superior young SHORTHORN COWS and HEIFERS in-calf, from Mr. George Garne's Herd, as well as that of his Father's, which have been long and carefully bred from the most fashionable Public Sales. The Sale will include a very choice selection from the two Herds; amongst them will be found most of the prize winners
Catalogues, with Pedigrees, will be shortly issued, and announced, with further particulars, in future Advertisements.
London, 13, Euston Square, August 25

Southdown Sheep and Norfolk Polled Cattle.
ELMHAM HALL, THETFORD, NORFOLK.
MR. EDMUND BECK is honoured with instructions from the Right Hon. Lord Sondes, to announce that his ANNUAL SALE by AUCTION of the above STOCK will take place on MONDAY, September 5, at 3 o'Clock precisely (Luncheon will be served at 2), and comprises 110 SHEARLING EWES, 60 DRAFT SOUTHDOWN EWES, 100 SHEARLING RAMS, 30 SOUTHDOWN RAMS for Letting, 17 Blood Red Polled in-Calf HEIFERS, and THREE BULLS.
All Trains stop at the Elmham Station on the Great Eastern Railway, where conveyances will be waiting; and the 8 A.M. train ex Shoreditch arrives at 2 o'Clock.
Full particulars and Catalogues can be obtained of Mr. FUTCHER, Elham Park, and of the Auctioneer, Oxnead, Falgate-cum-Buxton.

Caistor, Lincolnshire.
IMPORTANT SALE of SHORTHORN CATTLE.
MR. JOHN THORNTON will SELL by AUCTION, without reserve, on FRIDAY, September 2, at Caistor, Lincolnshire, the very superior HERD of pure bred SHORTHORNS, belonging to James Green Dixon, Esq., which has been in his possession upwards of 60 years. Many of the animals are in direct descent from the cow "Strawberry," which he bought at Robert Colling's sale at Barmpton, in 1820, others are bred from Charles Colling's "Cathalene," and Mr. W. Hutton's and Mr. Watson's blood. The Herd is full of the best Bates blood have of late years been used, adding fashion to sound old pedigrees.
Catalogues with Pedigrees may be had of Mr. DIXON, at Caistor, or of JOHN THORNTON, 15, Langham Place, London, W.

Sale of Shorthorns.
MESSRS. THORNTON AND KIRKBY are instructed by the Rev. Thos. Booth to SELL by AUCTION, without reserve, at Storr's Farm, Windermere, on TUESDAY, September 13, the DRAFTS from the HERD of about Fifty Head, including Bulls, Cows, and Heifers, of fashionable blood, among them are some of the "Duchess" tribe; also the Phyllis and Brompton Rose tribes; also several of Mr. Booth's noted "Isabella" or "Medora" family, and a few of the "Minstrel" branch of the "Gwynnes," as well as of Mr. Aylsworth's "Flora," and Mr. Wetherell's "Lancastrians." Others trace from well bred strains that are celebrated for their great milking properties. First-class Bulls of Booth blood have been in use, and the Cows and Heifers are largely of Mr. M'Carr's "Duchess" of the Realm" (27,057), or Mr. Booth's "High Sheriff" (26,892).
Also will be SOLD, a very fine lot of CUMBERLAND HEIFERS, most of which will be down Calving or in-Calf.
Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, W.; of Mr. KIRKBY, Sawrey, Windermere; and of Mr. SMITH, Storr's Farm, Windermere.

Branches Park, Newmarket.
IMPORTANT SALE of SHORTHORNS, SHEEP, and HUNTING STUD.
MR. JOHN THORNTON, in conjunction with Messrs. Newson & Stanley, will SELL by AUCTION, without reserve, on FRIDAY, October 7, at Branches Park, Newmarket, about THIRTY-FIVE HEAD of pure SHORTHORN COWS, HEIFERS, and BULLS, from the first-class Herd belonging to Lady Pigot. Among them are some exceedingly well bred animals of good Pedigrees, with several Booth crosses, and full of the same blood as that which has won prizes at the Royal, York, North Royal, the Yorkshire, the Northumberland, and other County Shows. Three pure Booth Bulls will be offered for service, subject to a moderate reserve price.
Also will be SOLD, the entire FLOCK of first-class SHROPSHIRE SHEEP, comprising about 400 Head, selected from some of the best and most fashionable Flocks in the whole of the Midland Counties. Farming Stock, Household Implements from two Farms, the whole of which are to be sold in consequence of the expiration of the Leases.
Catalogues, with Pedigrees, are in preparation, and will shortly be announced.—London, Langham Place, W.

Shropshire Sheep.
MR. H. MATTHEWS, of Montford, has given instructions for the SALE of about TWENTY highly descended SHEARLING, and a few older RAMS, including the noted Royal Agricultural Society's Prize Ram "Leviathan," and other Show Sheep; and FIFTY SHEARLING and older EWES, to be held in the Smithfield, Shrewsbury, on TUESDAY, August 30, at 11 o'Clock.
The Montford Flock of Shropshires was one of the first ever established, having been founded by the ancestors of the present Proprietor upwards of 120 years ago, since which period it has been looked upon by Ram breeders as one of the most valuable resources from which to obtain both blood and uniform character; and Flockmasters have always evinced a strong predilection for the Montford Sheep, having derived great advantage from the purity of their blood, hardihood of constitution, great size, high quality of form, robust flesh, and heavy class of wool.
LYTHALL AND CLARKE, Auctioneers.
Offices, 39, New Street, Birmingham.

Shropshire Sheep.—The Sutton Maddock Flock,
The PROPERTY of MR. HENRY SMITH.
MESSRS. LYTHALL AND CLARKE are instructed to SELL by AUCTION, at the New House, Sutton Maddock, Shiffnal, on MONDAY, September 5, at 1 o'Clock punctually (Luncheon at 12), SIXTY superior SHROPSHIRE RAMS, including the noted "Shrewsbury," "Ludlow," "Radford 2nd," "Blackbird;" 120 excellent SHEARLING and STOCK EWES, including the Royal Agricultural Society Show Theaves, and the dams of "Lutmer" and "Radford;" TWENTY YEARLING RAMS, principally by Mrs. Beach's Royal Agricultural Society's Third Prize Sheep at Oxford.
The Sutton Maddock Flock has attained a reputation second to none among the Shropshires. Its merits have secured it the highest honours at the Royal Agricultural Society of England, the Birmingham, Smithfield, and various local Shows; and its superiority has been acknowledged by the leading Flockmasters, who have frequently selected rams from it.
Conveyances will meet Trains at Coalport and Shiffnal Stations, and an Omnibus will also leave Shiffnal at 11 30, returning after the Sale.
For Catalogues apply to the Auctioneer, 39, New Street, Birmingham.

Stoney Lane, Bromsgrove, Worcestershire.
IMPORTANT SALE of SHORTHORNS.
MESSRS. LYTHALL AND CLARKE are favoured with instructions from Thomas Harris, Esq. (who has given up a considerable portion of his Grass Land), to SELL by AUCTION, without reserve, on TUESDAY, September 20, his entire HERD of pure bred SHORTHORNS, numbering upwards of 60 Head of highly descended young Cows, Heifers, and Bulls.
Catalogues, with Pedigrees, will shortly be published, and may be obtained from the Auctioneers, 39, New Street, Birmingham.

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The Agricultural Gazette.

SATURDAY, AUGUST 27, 1870.

"PREVENTION is better than cure," especially where contagious diseases are in question, because it may happen that, while one animal is being cured, a whole herd is exposed to the infection. Preventive measures are, however, more difficult of application than remedies, and it may always be expected that more complete and continuous care will be exercised in the administration of medicines, and the pursuit of the general routine of medical treatment, than in the enforcement of sanitary rule. The questions are asked, and pretty frequently, now that the affection is again spreading in several counties, What is the best treatment for foot-and-mouth disease? What are the means of prevention? The first question we can answer from observation and experiment; the second is only capable of being responded to generally, and perhaps vaguely; so much depends upon circumstances over which the inquirer may possibly have no sort of control. Treatment of foot-and-mouth disease must be carried out on the clear understanding that the natural termination of the affection is in what medical writers call "resolution;" in other words, a restoration to a state of health. It makes all the difference, in the selection of remedies, whether a disease has a tendency to destroy life or merely to cause some derangement of structure or functions for the time being; and if farmers would bear this in mind, they would be less inclined than they are to tolerate the mischievous interference of the cow-leech and the farrier. We could enlarge upon this subject considerably, but our present purpose is to deal with the one disease which has hitherto resisted all the attempts to get rid of it.

The general course of foot-and-mouth disease is not difficult to understand; there is first the moment of infection, the introduction of the virus from a diseased animal through the medium of air or water, or by other more palpable means of contact; next the invasion of the disease, after a short period of incubation, varying from 30 to 40 hours, indicated by signs of fever, usually of a slight character, the appetite is sometimes affected, the secretion of milk lessened, and there is commonly general depression. Lameness soon follows, associated with soreness of the mouth and tongue, owing to the formation of vesicles, which burst or are ruptured, leaving the raw structures beneath exposed to the action of the secretions,

or the rougher influence of foreign agents in the form of hard dry food or dirt and stones. In a few days, under ordinary circumstances, the fever abates, the raw places heal, the appetite returns, and the animal becomes convalescent in ten days from the date of the first signs of illness. Many instances of less favourable progress of the disease undoubtedly present themselves, and we are bound to say, as truthful exponents of our own experience, that the majority of the serious cases arise from bad management or severe treatment. Foot-and-mouth disease, like other eruptive affections, requires tender nursing. We do not scrape off the vesicles from the skin of a patient suffering from small-pox or measles, and afterwards apply tar to the abraded surface ; but some such treatment in the case of an ox affected with the vesicular epizootic seems to be in universal favour ; and so long as the sick animal manages to recover, in spite of his doctors, the ancient error is likely to be defended on the ground of success.

At the commencement of the affection care should be taken to protect the parts in which the eruption appears from injury ; it is not necessary to pull an animal's mouth open, or to probe the finger between the hoofs to find out if vesicles exist ; on the contrary, the beast should be kept in perfect quiet—in fact, prevented as far as possible from moving ; and mouth and feet should not be touched. No medicine should be given by horn or bottle unless under extreme necessity, and the cleansing and dressing of the feet should be done by dashing water and medicated fluid over them.

Succulent diet, oilcake macerated in water to form a sort of gruel, pulped roots, boiled Linseed mixed with meal, anything in fact which can be swallowed without much preliminary mastication, may be given.

Among medicines, carbolic acid has proved very useful, but has the disadvantage of having to be given by the horn or bottle. Hyposulphite of soda is a very good substitute, and may be dissolved in the drink water, about an ounce to the gallon of water, without giving any objectionable flavour to the fluid. A solution of carbolic acid, in 50 parts of water, may be frequently dashed over the sore feet, and no other dressing will be required.

If the sores in the mouth do not heal properly, a weak solution of sulphate of zinc, 1 drachm to the quart of water, may be gently applied by being poured into the mouth and then allowed to run out ; if any of the lotion be swallowed no harm will be done. Mineral acids, or tannic acid, in weak solution, will answer the same purpose, but the zinc lotion is most easily managed. Bleeding, purging, and all weakening remedies are objectionable ; the little which is required in the way of treatment must be applied with the object of assisting the progress of the disease to its natural termination, rather than with the intent to violently oppose or arrest its inevitable course.

Prevention of foot-and-mouth disease, and other epizootic affections, can only be secured by united action ; in vain is one farmer energetic and indefatigable in vigilance, if all around him are indifferent ; indeed, the carelessness of one may be fatal to a large district. In our last article on the subject of contagious diseases of stock, we advised stock owners to be their own sanitary policemen in carrying out the provisions of the Cattle Diseases Act, and any further provisions which circumstances in the locality may render necessary or possible.

We all know what is required in order to certainly get rid of contagious disease :—Complete isolation of diseased animals, stoppage of fairs and markets, shutting up of public roads—in short, the re-establishment of the cattle plague regulations, the enforcing of which finally led to the extinction of the plague, and the restriction of other contagious diseases to a minimum.

No doubt there would be considerable hardship inflicted by the adoption of summary and severe measures such as those which were found necessary a few years ago, but is it fair to anticipate that any less necessary measures will be successful? Is foot-and-mouth disease less contagious than cattle plague? If not, and there is ample proof that it is quite as infectious, stock owners ought to decide whether they will pursue the course which has during the last 12 months failed to check the progress of the disease to any appreciable extent, or submit to the inconvenience incidental to the institution of the only system which has ever been found effectual in arresting the spread of contagious diseases of animals.

To enable the reader to distinguish the different species of Wheat fly referred to in our last week's remarks, we add the following figures :—

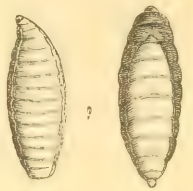

Fig. 222. Fig. 223.

Fig 222 represents the grub, and fig. 223 the pupa ; they have no characters by which to distinguish one Wheat fly from another ; they appear to be the same in all.

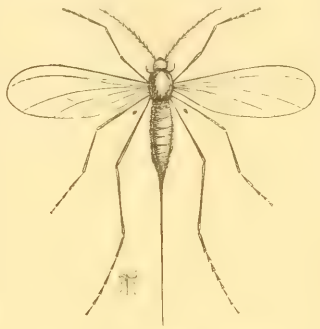

Fig. 224.

Fig. 224 represents the perfect insect of Cecidomyia Tritici—female, with its long ovipositor. The distinguishing points of the genus Cecidomyia are the nervation of the wing (which is made more pronounced than natural in the figure to show it more distinctly), and the small first article of the tarsi. The species figured (C. Tritici) is yellow. The engraver has omitted the junction between the median and post-median nerves on the right-hand wing. The last line in the wing is not intended for a nerve, but a slight fold.

Fig. 225

Fig. 225 represents the Lasiopteryx obfuscata, Miq., of which we have spoken as our present enemy. The distinguishing characters of the genus Lasiopteryx are the nervation of the wing, the median nerve being bifurcate at the extremity, and the first article of the tarsi being long. The species L. obfuscata is black, with smoke-coloured abdomen, and pale legs.

There is a third genus of the Cecidomyiadæ, named Diomyza, which it is unnecessary to figure, as it is not one that has come under our notice in relation to the matters of which we have been speaking. Its distinguishing characters are, having the wings of Lasiopteryx and the tarsi of Cecidomyia.

—— Wheat was a little lower in price again last Monday in Mark Lane. English Wheat lower by 1*s.* or 2*s.* per qr. Foreign Wheat not easy to sell at the prices of the previous week. Oats advanced 6*d.* per qr., and the top price of flour went down 4*s.* per sack. On Wednesday there were some excellent parcels of new Wheat on the stands, but trade ruled dull generally, without alteration in prices.——In the Cattle Market, on Monday, supplies were about equal to the demand, and prices were stationary. On Thursday choice qualities were scarce, and met a ready sale at higher rates. The lamb trade was bad ; only choicest qualities met with a sale.——In the Seed Market, Trifolium incarnatum, with little offering, advanced from 2*s.* to 3*s.* per cwt. ; Rape, Mustard, and Winter Tares, in better demand.

—— The report that Barnet Fair will not be held this year on account of the prevalence of foot-and-mouth disease, has no foundation, as far as we can learn ; at least no official notice has been issued, and it is hardly probable, now that animals are on their way to Barnet, that steps will be taken to prevent the fair taking place. On the last occasion the cattle, we remember, appeared to be remarkably healthy ; but many of them could not escape infection on their route, and doubtless the disease was conveyed to new centres, and will be in like manner almost as a matter of course in spite of every precaution which can be taken. During the period of incubation of foot-and-mouth disease no symptoms of the affection are manifested by the animal, and the most rigid inspection would fail to prevent the entrance of infected subjects. On the other hand, if an outbreak of foot-and-mouth disease occur during the fair, what is to be done? In the present state of the law all the diseased animals must be taken in charge by the local authorities, and "removed to a some convenient and isolated place, and there be kept for such time as the local authority think expedient." Are any arrangements in progress to meet a probable contingency? It will be very difficult to provide accomodation for a number of sick cattle at a minute's notice.

—— The committee appointed by the Central Chamber of Agriculture, in connection with the subject of the incidence of local taxation, have issued a report, signed by Sir Massey Lopes, M.P., their chairman, in which the following resolutions of various public meetings are once more published :—

(1.) That this meeting protests against the present unjust exemption of income derived from personal property from contributing towards the various objects for which funds are now raised by local rates, and is of opinion that this grievance affects owners and occupiers of house property in towns quite as much as the landed interest, and therefore that both descriptions of property are equally interested in the removal of this anomaly.

(2.) That the proposal to divide the payment of rates between owners and occupiers does not afford any relief or remedy for the grievance complained of in the unequal incidence of local taxation ; and that no settlement of the question can be accepted as final or satisfactory which is not preceded by a thorough inquiry to determine whether the objects now locally provided for are of local or national obligation.

(3.) That until the question of Local Taxation Reform has been satisfactorily dealt with, this meeting pledges itself to oppose most strenuously the imposition of any fresh rates on the present unjust basis, for such purposes as national elementary education, expenses of election, turnpike roads, emigration, &c.

We learn from the report that the committee have laboured earnestly in the discharge of their duties.

—— Mr. Bailey Denton has addressed to the *Times* the following letter on the subject of Village Water Supply, to which we called the attention of our readers last week :—

"The time has arrived when it is the positive duty of every one to do his best to fix on the public mind the deprivation from which the poorer classes are suffering in many hundred villages throughout the country. It is true that our present condition is very like that of 1868, with this difference, that the present drought commenced earlier in the spring, and has been relieved by frequent though partial storms, which were absent in 1868. This difference, however, affords very little satisfaction to those who are watching results. Storms really afford but a poor supply of water unless tanks are prepared to receive it, and means are taken to collect the rain in the tanks. The heaviest rain is swallowed by vegetation, or returned to the atmosphere, very shortly after it falls ; and as we have yet to endure, very probably, two or three months of scarcity and heat, I wish to point out to the wealthy and influential that in the frequent storms that occur we have a source of supply to the rural poor, if the owners of cottages will only provide underground tanks to receive all the water to be collected from the roofs. An ordinary cottage, with its little outbuildings, covers rather more than three poles of ground, and half an inch fall of rain in that space will provide one ton, or 225 gallons, which, with the frequent recurrence of storms we are now experiencing, would keep the cottager's family supplied. At present I know of many poor men who are paying out of their meagre wages a penny a day for water—*i.e.*, a half-penny and sometimes a penny per pail of three gallons. Upon these data a storm of half an inch rainfall would be worth 5*s.* if it were conserved for use.

"It is not a fortnight since that I found sheep dying in considerable numbers on Romney Marsh from the want of water and food. The pasturage was scorched, and the ditches were empty. But it must not be thought that the dry condition of the grass was the cause of the fatality, for it is well known to practical observers that scorched and bare pastures will maintain life with extraordinary tenacity if they be associated with good water.

"In Romney Marsh the provision of this essential of life is a matter of the utmost simplicity, if made at the right time, and by connected operations. Moreover,

villages for many miles round might benefit by the operations, for water of the purest character might be obtained. At present the inhabitants are obliged to resort to surface ponds, in which the sewage of farmyards and the village street is collected.

"But the benefit to the locality would not end here. It is well understood by the best farmers in the Marsh that a large number of sheep are killed by rot in wet winters, caused by excess of water,—the very excess which would save life and prevent disease in seasons like the present.

"Surely the time has arrived when some compulsory action should be taken to secure at least the improved sanitary condition of villages, even if we leave the sheep to die in winter from rot, and in summer from starvation."

—— The following statistics have been published of the immense farms of Mr. JOHN T. ALEXANDER, the great farmer and stock dealer of Morgan county, Illinois:—Number of acres of improved lands on his farms, 34,000; number of acres of unimproved land, 300; aggregate value of lands, 680,000 dols. Value of implements in use upon his farms, 50,000 dols. Amount paid for wages during the past year to hands employed on his farms, 76,800 dols. Number of live stocks on his farms: 90 mules, 50 cows, 150 horses, 200 oxen, and 7000 other cattle; hogs, 700. Total value of live stock, 536,900 dols. Products of his farm in 1869: corn, 277,500 bush.; Wheat, 7000 bush.; Oats, 8000 bush.; Rye, 2000 bush.; Potatos, 1000 bush.; hay 3000 tons. Value of animals sold from his farms during the past year, 498,400 dols. Mr. ALEXANDER has two farms, one of near 8000 acres in Morgan county, 12 miles east of Jacksonville, upon which he resides, and the other of almost 27,000 acres in Champaign county, Illinois.

—— The Rev. F. O. MORRIS thus refers to the York market and its water supply in the columns of the *Times*:-

"I do not suppose that there is, or can be anywhere, a better arranged or better situated cattle-market than that of York. It is placed in a large open space outside the city wall, on the south-east of the city; stands on upwards of 6 acres of land, and is divided by alleys of 22 feet and 25 feet wide, between which run the cattle-pens, separated from each other by divisions, the whole calculated to hold, as I have been informed by a letter from the town clerk, 3500 beasts and 30,000 sheep, and I learnt from him, in reply to an inquiry on the subject, that as many as 7000 beasts and between 50,000 and 60,000 sheep have entered and left it in a day. Another official gentleman in York informed me that it has held 80,000 sheep, and that as many as 100,000 have sometimes passed through it in a day, besides other animals.

"There were originally for the supply of water to this vast number of dumb animals but two small, or comparatively small, water-troughs, sadly neglected also, with almost as much mud as water in them, to which one has been since added, in consequence, I believe, of a representation I made about a year or more ago, my attention having been drawn to the matter by a very benevolent person.

"As such is the case with so spacious and admirably planned and well laid out a cattle-market as that at York, it is to be feared that it is much worse in many or most other places, and I earnestly hope that if you will do the poor animals the kindness of inserting these few lines in their behalf, a sufficient remedy may be provided for an urgent need.

"There ought to be half-a-dozen, at the least, or a dozen troughs within the area of all such places, and half-a-dozen or more ranged along the outside railings for the animals to use on their way in, seeing the great chance there is that they might not be able to get to those within, even the enlarged number I have spoken of, and that though there were ever such a wish or endeavour to supply their wants.

"I do think that these most necessary additions to the arrangements of cattle-markets cannot be too strongly recommended or insisted on, when we consider for a moment what great distances many of the poor animals have been driven, perhaps for days and nights, not always by the most kindly drovers, nor always (and least so towards the end of their journey) within reach of water, even if they had the good fortune to have such drivers, though some such, I am thankful to say, there are.

"Many of them, also, have been brought by railway, perhaps after a sea voyage from Ireland or the Continent, and we all know that only too well-grounded complaints have been made of the way in which they have been neglected in this and other respects on the journey. You may readily imagine the need of water, and a plentiful supply of it, to these poor creatures, often in hot, sultry weather, such as we have had this long droughty summer, crowded together, and I believe, as I have said, often greatly overcrowded, even in such a spacious and well-managed place as York-cattle market, exposed to every ray of the sun, in dust, and tired, frightened, in long passage through the town, if not ill-used in addition.

"I believe that the cost of the water at York is only 6*d*. per 1000 gallons, so that the expense cannot possibly stand in the way. The troughs outside should also have lower ones beneath them for the use of colley dogs, who deserve so well for the incessant care with which, with such wonderful sagacity, they tend the flocks and herds of their masters, and whose fatigue in doing so must often be even greater than that of the animals they drive so faithfully such long journeys."

—— Is it possible to turn bog turf to use as fuel on a great scale? Mr. MORLEY, M.P., has supposed so, and has offered the sum of £100, provided the Royal Agricultural Society of Ireland will present another £100, so that £100 may be given for the best, £75 for the second best, and £25 for the third best essay or invention tending to that end. This offer has been made through Mr. H. BROOKES, and a meeting of the Council of the Royal Agricultural Improvement Society of Ireland was called to consider it. The result of the discussion of this point by experienced men is not encouraging:—

The CHAIRMAN said that Mr. BROOKES had called upon him, and he (the Chairman) had explained to him that the only way of reclaiming the bog land was to cut it away.—Sir ALLAN WALSH said there had been numerous companies established in Ireland for the purpose of utilising peat, and they had all failed. If they succeeded in America it might be worth trial here; but he thought they had no funds to spare for the purchase of a machine of this kind.—Mr. DONNELLY thought it a pity that such an offer could not be accepted. He would be glad to subscribe £1 himself. They should communicate with the Royal Dublin Society before rejecting this offer. They had not funds to devote to this purpose, but he thought that perhaps the members would subscribe at least £50 for the purpose. — Mr. WADE: With regard to the Royal Dublin Society, I may say that a similar letter was brought before the Council at their last meeting, and the unanimous opinion was that they had not £100 to give, and that if they had, they would not give it. The fact is, there is very little or no difficulty in making a most valuable fuel out of the turf. Machines have been over and over again invented, which act perfectly, and produce the most beautiful fuel out of turf, but it costs too much. If anybody has a machine, or could invent a machine on a plan that will do the work economically and cheaply, he will surely not publish it to the world for any price you could pay him. The value of such a machine would be very great.—Mr. OWEN said it was a great pity to see so much fuel unutilised. He had seen coke sent to the country where abundant turf might have been had but for the rain.—The CHAIRMAN said there are 2,500,000 acres of bog in Ireland. In this country the fuel was above-ground, while the English had to dig for it. He did not think they should be in too much of a hurry to get rid of their bogs. What answer was it their pleasure to give to this letter?—Sir ALLAN WALSH said he thought there was only one answer. There were no funds to be devoted to this subject.—The CHAIRMAN requested Captain THORNHILL to state in reply that the Council did not think it expedient to take any action in the matter.

OUR LIVE STOCK.

CATTLE.

MR. R. M'DOUGALL has been for many years an extensive breeder of Shorthorns in Australia, near Melbourne, and is there looked upon as one of the greatest authorities upon the difficult subject of pedigree. A year ago he made a draft sale, and obtained an average of £60 each over 100 head. The following bulls have recently been sent out to Mr. M'Dougall, for use in his herd:—FIELD-MARSHAL BOOTH, calved December, 1869, bred at Warlaby, by Mr. T. C. Booth, by COMMANDER-IN-CHIEF, and from *Lady Mirth*. For this bull he gave the large sum of 800 gs.; also MAJOR (26,790), which he intends to name MAJOR BOOTH, an animal used in Her Majesty's herd, and also by Mr. W. Mitchell, of Cleasby, Yorkshire. We are not at liberty to name the price given for this bull. Mr. M'Dougall also bought ROBIN HOOD from the Messrs. Dudding, of Panton, the 1st prize bull calf at the recent Oxford meeting. He was calved last October, is by Mr. Foljambe's ROBIN (24,968), and out of *Countess of Wragby* by SIR ROGER. After taking the highest honours he was capable of at Oxford this young bull signalised himself in the Yorkshire showyard by securing the first place in his class. *Countess of Yarborough*, which was sold by Messrs. Dudding to Mr. Cochrane, for Canada, was out of the same cow as the calf we have been speaking of. Accompanying these Shorthorns is also the 1st prize Hereford bull calf, OXFORD LAD, bred by Mr. G. W. Taylor, of Showle Court, Hereford, by TRIUMPH (2863), and from *Hazel*, by TOM BROWN (2828). These are some of the best bred bulls that have been sent out to Australia. MASTER BUTTERFLY, exported in 1856, was sold for 1200 gs., but since that time no higher price has been given than that obtained by Mr. Booth for the calf FIELD-MARSHAL BOOTH.

—— We have received a catalogue of Mr. J. G. Dixon's herd, so long located near Caistor, Lincolnshire. This stock will be brought to the hammer by Mr. Thornton next Friday. Mr. Dixon is a veteran in the ranks of Shorthorn breeders; he was present at the Barmpton sale in 1820, when he bought *Strawberry* by WELLINGTON (680), dam by FAVOURITE (252); and directly descended from this purchase, which so intimately connects the Caistor with the Ketton Shorthorns, we find six females and three young bulls. Next we notice eight cows and heifers and seven bulls, some very young calves, which trace back to Mr. Charles Colling's *Cathaline* by WASHINGTON (674), sold to Mr. Parker, of Sutton House, Malton, in 1810, for 150 gs.; and four *Buttercups*, representatives of Mr. Hutton's *Sunflower* by GRACCHUS (3917), own sister to *Blossom*, dam of the celebrated prize bull EMPEROR (6973). Such are the principal sources of the Caistor Shorthorns, and upon this sound foundation has been built up a herd abounding in fashionable blood through the introduction of first-rate sires. The name of ORTHODOX is completely identified with Caistor, a name which does not appear to have been restricted to the representatives of any one family, although all trace back to good Ketton bulls and cows. We find it appearing, more or less, in all the pedigrees, and later the name of ORTHODOX is succeeded by that of PARADOX 1ST, 2D, 6TH, and 7TH. PARADOX 1ST and 6TH are father and son. The first named is by 7TH DUKE OF YORK, and both are out of *Bijou* by GRAND DUKE (10,284). PARADOX 2D is by 7TH DUKE OF YORK, and from *Pearl 2d* by LORD LYNDHURST (13,202), and PARADOX 7TH is by PARADOX 1ST, and also out of *Pearl 2d*. The following observations upon the present appearance of the herd by an eye-witness may be of interest to our readers:—The cattle are not in very high condition, but are in healthy useful order. They are looking well, have good coats, much style and elegance, and are of good colours. *Blush Rose*, by ORTHODOX 14TH (16,662), is a fine old cow, now 11 years old; *Queen of Diamonds*, of the "Cathaline" tribe, is a very nice cow, of fine character, and with a sweet head; *Mace*, a well-bred cow, whose pedigree takes us back to MERLIN (429), ALFRED (23), and SUWARROW (636), and *Mace 2d*, similarly bred on the female side, are both useful cows, and the last-named has a singularly nice countenance; *Blush Rose 2d*, out of *Blush Rose*, lot 1, is also a very good young cow, now five years old. Among the bulls, PARADOX 7TH is spoken of as of fine quality and style, with good head and well-developed breast; and lastly, ORTHODOX 46TH, a yearling of the "Cathaline" family, is described as a great beauty, very rich in colour, and full of promise.

—— We have to acknowledge the receipt of the sale catalogue of the Rev. Mr. Thomas Stainforth's herd, which will be disposed of on the 13th of next month, at Storr's Farm, Windermere. We must defer further notice of the many excellent animals it contains until next week.

SHEEP.

A PRACTICAL farmer has recently drawn attention, through the columns of the *Mark Lane Express*, to the rapid increase of importations of wool. During the last ten years these importations have increased from 130,873,000 lb. to about double that amount. The source of this immense influx of wool is principally our own colonies and South America, and the writer points out the fact that for the past two or three years there has been, and at the present time there is, a great colonial demand for Lincoln, Leicester, and Long-wool rams. Although the growth of the best quality of long wool may not be attainable in these countries, the use of such rams materially increases the weight of both carcase and fleece. The climates of New Zealand and Australia are unfavourable to the production of "lustre" wool, although the necessary conditions exist over extensive regions in South America. Short wool, on the other hand, can be produced in any part of the world, and imported into this country to almost any extent. Our climate is specially suitable for the growth of long wools, and the cultivation of races carrying the heavier and coarser class of fleeces is recommended, as safer from foreign competition than Short-woolled breeds. Besides the evident advantage of liberal feeding and the use of Indian Corn as a means for at once increasing the weight of the fleece and of carcase, we are told that the lambs should be dipped in some one of the many excellent popular mixtures immediately after the ewe is shorn, so as to free the entire flock from ticks. If these plagues subsequently reappear, dipping must again be resorted to. It is also recommended to dress the flock in the autumn with mercurial ointment of about half the usual strength, and this is said to improve the wool by removing scurf from the skin. In the spring and summer attention should be bestowed on the fences and surrounding pastures to prevent the wool from being torn off the sheep, and dirty places—foul ditches, ponds, and the like—should be seen to, the fleece being worth these little extra attentions to its safety.

—— In Professor BROWN's report on the sanitary condition of stock in the Taunton showyard, just published, he thus refers to the combined effects of heat and overfeeding upon animals exhibited:—

"Two valuable rams died on the way to the showyard, another died two days after admission, and two others required the care of a veterinary surgeon during the time they remained in the yard. In all these cases the disease from which the animals suffered was caused by the action of the sun upon the brain, leading, in the first place, to congestion of the vessels of that organ and nervous depression; secondarily, congestion of lungs resulted from the diminished force of the circulation; and as the animals had been fed before leaving home, and at every opportunity afterwards, under the mistaken impression that the condition is thereby kept up, their stomachs were distended, and by pressing on the diaphragm, caused a diminution of the already restricted respiratory space. Under such circumstances accumulation of blood in the lungs was quickly followed by suffocation. . . . Practical men know very well that fasting is often absolutely necessary for the safety of an animal during a journey, especially in hot weather. Water may be given in small quantities at short intervals, but food should be withheld for some hours before the animals are put into the van or truck to be conveyed to their destination."

POULTRY.

THE following is the prize-list of the Woodsome Poultry Show, Huddersfield, held on the 17th inst.:—

Spanish cock and hen—H. Beldon, Goitstock: 2d, H. Sugden, Woodsome Lees.

Cinnamon or buff Cochin Chinas, cock and hen—H. Beldon.

Cochin Chinas, any other variety: pair,—J. White: 2d, H. Beldon.

Brown, red, or black-breasted game (pair)—E. Aykroyd, Eccleshill; 2d, W. J. Cope, Barnsley.
Polands (pair)—H. Beldon.
Brahmas (pair)—E. Leech; 2d, H. Lacy; extra 2d, H. Beldon.
Gold pencilled Hamburghs (pair)—H. Beldon.
Silver pencilled ditto (pair)—H. Beldon.
Gold spangled ditto (pair)—H. Beldon; 2d, J. White.
Silver spangled ditto (pair)—H. Beldon.
Game Bantams (pair)—G. Noble, Staincliffe, Dewsbury; 2d, F. Steel, Stump Cross, Halifax; extra 2d, ditto.
Bantams of any other variety (pair)—T. Dyson, Clay Pits, Halifax; 2d, H. Beldon.
Aylesbury ducks (pair)—E. Leech, Greave House, Rochdale; 2d, H. Sugden.
Rouen ducks (pair)—E. Leech; 2d, J. White; extra 2d, J. Croslands, Royds Mount, Huddersfield.
Turkeys (pair)—E. Leech.
Chickens, any breed (pair)—F. Steel; 2d, J. Bradbury, Bradshaw, Austonley.

Many of the breeds were only poorly represented; thus there was no entries for Dorkings, and only one in the classes for buff or cinnamon Cochins, Polands, and three classes of Hamburghs. On the other hand, there was a fair entry of game, Brahmas, game bantams, Rouen ducks, and chickens.

IMPROVEMENT OF CEREALS IN EAST LOTHIAN.

BY PATRICK SHIRRIFF.

FROM the salubrious climate of East Lothian, the cultivation of cereals from the earliest age of civilisation has been a leading occupation of its agriculturists. History, however, does not throw much light on this subject. From the "General View of the Agriculture of East Lothian," by G. Buchan Hepburn, Esq., of Smeaton, published in 1794, we learn that Sir George Suttie had raised from "three years of particular growth" a variety of Barley, which was known by his name; and also that Sir David Kinloch, of Gilmerton, had lately got from Switzerland a species of Barley with six rows in the ear. These early attempts at improvement were creditable to the men as individuals, but were productive of little advantage to the community. We also learn from the same author, as well as from contemporary writers on agriculture, that "latterly the red Oat had been introduced by Mr. Brodie at Upper Keith, and several others in the high parts of the county." It is not anywhere stated that this variety was discovered by Mr. Brodie, but it is generally admitted that the chief merit of introducing it into the county lay with him, and oral tradition has handed down that Mr. Brodie raised the red Oat from seed picked over a table by his daughters—an example deserving imitation at the present time. Mr. G. Buchan Hepburn enumerates the varieties then cultivated in East Lothian, being the common, the Blainslie, and the Dutch—describing the red Oat of Upper Keith as having a reddish shade when ripening, and not quite so apt to shake as Dutch Oat, and, though not so early, was more so than the other kinds. There is no account of the discovering and raising of the red Oat of Upper Keith, neither is it known to have been extensively grown at any time in East Lothian. It is, however, certain that the name has seldom been heard after the early part of the present century, and may be said to be now altogether forgotten.

Some considerable time ago, we made the attempt to trace out the red Oat of Upper Keith, but all the samples under this name obtained from the best sources produced grain undistinguishable from the sandy Oat of the present day. A second attempt showed the same result, but hopes are entertained that the third, which is being made this season, may go far to settle the point. In the meantime, it may be mentioned that the sandy Oat is said to have been discovered in 1824 or 1825 on the farm of Milltown, o North Aberdeenshire. When alluding to the different varieties of Wheat, Mr. Buchan Hepburn says, "the seed most in repute at present is called velvet Wheat," known now as woolly ear, and said to have been raised from a few ears by Mr. Mackie, tenant at Ormiston. There are several varieties of Wheat with velvet or woolly chaff, and there is little reason to doubt that Mr. Mackie's velvet Wheat is the same as the close-cut, short-strawed woolly ear of the present day, and known centuries ago. Mr. Brown, the well-known author of "Rural Affairs," writing on this subject in 1805, stated that Mr. Mackie's velvet Wheat yielded a goodly return in dry seasons, but in wet it suffered severely from mildew. In 1799, the loss sustained by those who sowed this Wheat was immense. Then in 1805 some farmers lost greatly by foggy weather coming on while the grain was filling. Since then it has gradually disappeared. Mr. Brown also states that a variety of red Wheat, originally of an excellent kind, "was selected by the same gentleman about 10 years ago," but being liable to the same defect which attended the velvet or woolly white, it is now also given up. Mr. William Mackie, Ormiston, seems entitled to be considered the first person who seriously attempted to improve the cereals of East Lothian.

The next cereal which came into note was the well-known Hunter's Wheat. It is still pretty extensively grown in this county. This kind is known to have been introduced by Mr. William Hunter, farmer, Knowes, Prestonkirk, but we have been unable to find any account by him of the discovery and propagation of this variety. We are told by his neighbour, the author of "Rural Affairs," that while riding over Coldingham Moor, then a poor ill-farmed district in Berwickshire, Mr. Hunter plucked from a fine field of Wheat a handful of ears, which formed the origin of his Wheat. The plucking of a handful of ears while on horseback did not show anxiety for purity of sample, and all along Hunter's variety has been a mixture of sorts.

In 1802 or 1803, two patriotic individuals connected with East Lothian, General Fletcher Campbell, of Salton, and Lord Sinclair, Hermiston, founded an agricultural institution under the name of the "Salton Farming Society." From the constitutional rules and regulations of this Society there is nothing indicating an intention of improving the cereals. In 1820, the "Salton Farming Society" merged into the present "United East Lothian Agricultural Society"—one of its leading objects from the first being the improvement of farm seeds. The proceedings of the United East Lothian Society in the improvement of cereals have never been submitted to public notice in a tangible form, and may perhaps excite little interest at the present time, but the scheme for attaining this important object was altogether so novel, and its treatment by some members of the Society so inconsistent, if not culpable, that a statement of the particulars can hardly fail of proving beneficial in after times to improvers of cereals, as well as to agricultural associations generally. With such objects in view, and as an acknowledgment to the subscribers to our testimonial as a successful improver of agricultural plants, the following statement is submitted, as consistent with our own knowledge and experience:—

When we joined the Society, everything was in working order, and there were ample funds for carrying out its legitimate objects. By-and-by, we became one of the committee of directors, and while discharging the duties of this appointment attentively observed what passed before and behind the scenes. With growing experience of committee meetings, show grounds, and farm inspections, the conviction strengthened that certain premiums as awarded were injurious rather than beneficial to East Lothian agriculture, and that almost every premium on the list might be improved in detail, if not in principle. And, particularly, the two early farm premiums of 20 gs. each were found to be so objectionably awarded that ultimately members could not be got to compete for trophies so discreditable. The Society was not organised in the best manner. Having for many years liberally given premiums for samples of seed grain, which were required to be pitched in bulk for inspection of judges, great exertions were made to prepare grain for inspection by repeated dressings in the ordinary fashion, supplemented by picking out seeds of weeds by the hand over white plates, and by running the grain over rough woollen cloth. We conntended that such kind of preparation had no beneficial effects beyond removing the seeds of weeds, and the cereals which were mixed could not be rendered genuine, or materially altered by such means—that there was much resemblance between an egg and a grain of Wheat, both containing a germ of life which requires for development certain conditions of heat, air, and moisture; and that a pure breed of fowls might as reasonably be expected from a basket of promiscuous eggs of dunghill fowls as a genuine crop from seed taken from the bin of an ordinary farmer.

The first cereal brought under the notice of the Lothian Agricultural Society was the Hopetoun Oat, which attracted our attention by its height when growing on the farm of Mungoswells, in the parish of Haddington, in 1824. At this period the Oats generally grown in this county were the Bainslie, or common Oat, the Potato, and the late and early Angus. The opinion then prevailed that the properties of short straw and early ripening were united in the Oat tribe, but this fallacy was dispelled by the long-strawed Hopetoun Oat, which soon spread over a considerable portion of Europe as well as of America. And in modern times, no cereal was so favourably received throughout East Lothian at first introduction, and it still occupies a place in the Society's premium and it still occupies a place in the Society's premium list. Application was made with this Oat for the seed corn; but for years the applicant and his Oat were treated with studied contempt. At length, however, at a general meeting of the Society, it was moved and carried, that the correspondence relative to obtaining the premium with the Hopetoun Oat be laid before a committee, to report to the next meeting whether the Hopetoun was entitled to the Society's premium for new plants. A report on such a subject could hardly have failed to expose mismanagement, and the matter was settled by the following minute of a general meeting of the Society:—"That upon reconsideration of the minute agreed to at last meeting of the Society, as to the correspondence relative to the Hopetoun Oat, the Society are now of opinion that the appointment of the committee was unnecessary, inasmuch as the chief reasons for the culture of the Hopetoun Oat having now been fully established by three years' experience, and its superiority acknowledged, the Society do not require any further investigation to induce them to award the premium to Mr. Shirriff as the original introducer of this variety of grain into the county. The meeting therefore recall the appointment of the committee made at the last meeting of the Society, and hereby award Mr. Shirriff the premium for the introduction of new plants in terms of the annual list of premiums offered by the Society." . . . .

The next new cereal brought under the Lothian Agricultural Society's notice was Mungoswells' Wheat, which sprung from a single plant selected for its vigorous growth on the farm of Mungoswells, in the spring of 1819. The plant, having been carefully raised, produced at harvest 63 ears, which yielded 2473 grains, from which a stock was soon raised and sold to the public. Mr. Jaffray, minister of Dunbar, got from us seed of this variety to sow his glebe, and the succeeding crop formed a data for the large damages that the North British Railway Company afterwards paid for the glebe. The crop was carried to Oxwell Mains, and the grain threshed—the whole Wheat brake of that fine farm being sown with a portion of the produce. In the following autumn, the Mungoswells' Wheat of this farm was found to be particularly fine in quality, and after being purchased at the markets of Dunbar and Haddington, was resold in Mid-Lothian as Hunter's Wheat. In this manner Mungoswell's Wheat obtained many names, and it afterwards became conspicuous in carrying out our scheme for improving the cereals, as will be seen in the sequel.

The first part of our scheme was adopted by the Society, and intimated to members in the following terms:—"1st, for the most satisfactory experiment in growing on heavy soil, not less than three varieties of white and brairdless Wheat, £10 10s.; 2d, ditto ditto, on light soil, £10 10s. *Note.*—Intention to compete for growing Wheat to be lodged with the secretary, in writing, by October 10. Wheat to be sown by November 8, and inspected by individuals appointed by the Society in the beginning of December and April, when the crop is coming into ear, and when reaching maturity. Inspectors to report appearance of the crop at each visitation, with regard to the numbers of plants in the ground, the characteristics of the varieties with regard to colour, tillering, leaf, straw, ear, and time of ripening. Competitors to report to the Society date of sowing, earing, and ripening of the varieties, with the products of each in grain and straw, and any other circumstances attending the experiments deserving of notice. Each variety of Wheat to occupy not less than 1 acre of ground."

Two individuals competed for the premiums—namely, George Hope, Fentonbarns, and Patrick Shirriff, Munogswells—the judges or inspectors of the crops being Mr. James Tod, Castlemains, and Mr. Francis Shirriff, Muirton. Reports were made to the Society by the different parties connected with the experiments—all the conditions being fully carried out. The judges concluded their report as follows:—"In conclusion, gentlemen, after a minute examination of both experiments, which we hope the above report will testify, we, without hesitation, state that we are highly pleased with both trials, and recommend both experimenters as well deserving the best thanks of the Society, and give it as our candid opinion that each is equally entitled to whatever premium the Society may think fit to bestow." Both competitors were awarded the full premium, and the members were generally well pleased with the manner in which the experiment had been conducted from first to last. But competitive trials of this kind must embrace a series of years to be of much value, and unfortunately this premium was not again competed for—the most noteworthy feature of the experiment being the small difference between Hunter's and Mungoswells Wheat. All the reports were published at the time with the proceedings, and may also be found in a pamphlet along with the nineteenth report of the society. *Somewhat abridged from the "Haddingtonshire Courier."*

THE LABOURERS AND POULTRY OF TIPTREE FARM.

WITH your permission, Mr. Editor, I will address a letter of thanks to Mr. Mechi for his prompt reply to what I wrote to him. I wished my husband to have written, as Mr. Mechi's letter applies more to general farming and gardening than it does to the novel mode of cheap poultry breeding and fattening, with which, particularly, I wished to be made acquainted, but my husband says Mr. Mechi's letter is too sensational and theoretical for him to understand it; and besides, he adds, he never troubles him with anything that has not something practical in it, and so the task of writing is left to me. But one thing my husband desires me to state in reply to Mr. Mechi, that he himself has no enmity to poultry in general; and as for game, this belongs to his landlord, according to agreement, and so he himself never kills any, but preserves all in the best way he can; and hence our landlord, who is a most generous gentleman, seldom or never comes on our farm to shoot, but he leaves us as much game as we require, or more. And as to small birds, my husband never allows them to be interfered with except when they become too numerous, as fowls also do, and then destroy much more sown seed or ripening grain than they are worth. But there is one passage in Mr. Mechi's reply to my letter which first excited my husband's mirth, but after laughing a little time he asked for the paper, and was about to set fire to it, when

I sprung up and prevented him. The passage which excited his emotion more than any other was this:—"I have seen," says Mr. Mechi, "them," that is the fowls, "at work between the rows," implying, of course, that they do not work or scratch in the rows. On the *Agricultural Gazette* being lent to our schoolmaster, he returned it with this note to this passage—"Credat Judæus Appella," which, he said, meant, let the Jew Appella believe it, but he could not; and again—

> "The silly Jew, Appella, may receive
> This wond'rous Mechian tale, which I can ne'er believe."

No, it is quite certain that fowls will not "work" between the rows of corn for insects only, but are scratching up and devouring the corn also at the same time.

But another thing almost excites my husband's wrath, and that is, Mr. Mechi is always appealing to his paid labourers to confirm whatever his tongue utters or his pen writes. Thus, when he wants the world to believe that he can produce extraordinarily large crops of Wheat from nearly nominal quantities of seed, he appeals to these paid agents, whom he keeps in his employ, to confirm that the report is a truth; and they, of course, do confirm it as far as labourers' affirmation of their master's sayings and doings can go. But my husband bids me write again and ask, is it not a painful reflection that Mr. Mechi, with all his tact and persuasive eloquence, cannot bring forth the farmers in his neighbourhood, or some educated gentlemen, as evidence of his doings, and not his paid labourers only? "It is a well admitted fact by all my labourers," he writes, "that my best and thickest crops are in immediate proximity to the fowlhouse."

Now suppose Mr. Mechi wished his labourers to affirm that the best and thickest crops were in the immediate proximity of the top of his house—judging from previous examples, should we be wrong in concluding that they would at once comply? My husband and some neighbouring farmers say they would, painful as it is to for them to come to such a conclusion, but plain and out-spoken people can arrive at no other. But to give a few examples of these appealings to labourers. There is on the opposite hillside, facing our garden, the remains of an ancient stone building. This from our garden has long been known as a celebrated echo, returning, on calm evenings especially, 12 syllables. Here our family and visitors often amuse themselves with the echo, and lately the stones of the building have obtained the distinctive name of Mr. Mechi's team of labourers; and a nephew of ours, whose Christian name is Simon—a young man full of his pranks—has the *soubriquet* of Mechi; and here is a specimen of what took place yesterday evening between Simon, representing Mr. Mechi, and the walls of the old ruin, representing Mr. Mechi's labourers.

Simon (in a clear voice).—A bushel of Wheat an acre for seed.
Old Burlding (in equally as clear a voice).—A bushel of Wheat an acre for seed.
Simon.—Seven quarters an acre crop.
Old Wall.—Seven quarters an acre crop.
Simon.—A peck an acre seed.
Old Wall.—A peck an acre seed.
Simon.—Six quarters and a half crop.
Old Wall.—Six quarters and a half crop.
Simon.—Mine are not *fancy* fowls.
Echo.—Mine are not *fancy* fowls.
Simon.—I have game, Cochin Chinas, and Brahma Pootras.
Old Wall.—I have game, Cochin Chinas, and Brahma Pootras.
Simon.—I give 21*s.* each for well-bred young male birds, changing them every two or three years.
Old Walls' Echo.—I give 21*s.* each for well-bred young male birds, changing them every two or three years.

Simon was proceeding further, when a gentleman asked him to try the house-top question, when Simon at once shouted,—

> It is a well admitted fact by all my labourers——

Echo.—It is a well admitted fact by all my labourers——
Simon.—That my best and thickest crops——
Echo Walls.—That my best and thickest crops——
Simon.—Are on my house-top.
Echo Walls.—Are on my house-top.

My husband then happening to come up, exclaimed, "Now ladies and gentlemen, pray walk into the house out of the damp of the evening. You have seen clearly exhibited by my nephew, Simon, and the walls of the venerable ruin, with what facility farmers' labourers echo back whatever their masters affirm, and especially when those labourers instinctively know that their masters' high characters require that they should do so;" and on this we all retired into our house, and entered into an animated discussion on the novel method invented by Mr. Mechi for supplying London, east and west, with cheap, fat, and delicious poultry; but at the same time all allowed that though such a plan was feasible and practicable in the management of Mr. Mechi at Tiptree Hall, yet that at any other estate or on any other farm it would become such an intolerable nuisance, and engender diseases of all kinds, as to demand the interference of the law to put a speedy end to it.

But still, my husband and the company desired me to submit the following additional questions for Mr. Mechi's solution:—First, as to how many hundreds of poultry Mr. Mechi keeps on his system, since he says "some 300 of them have free access to his fields from early morn to dewy eve;" implying, of course, from this word "some," that these 300 are drafted from his main army, leaving that to bivouac at home in his yards to clear the vegetables from the myriads of flies, slugs, and worms, which, he writes, are brought home on them. I was also to inquire by what discipline Mr. Mechi instructs the 300, which he drafts from the main army, not to enter his neighbours' fields? or are there none near him? For it is quite certain they would cause great destruction on other farmers' crops, though, like the Tiptree Hall labourers, they would aim only at benefiting their masters.

I was also asked to inquire (and the answer to this question will greatly concern myself), how Mr. Mechi teaches his poultry that have meadows to graze in not "to eat Cabbage, Turnip, and Mangel plants?" And further—but this I observe is my husband's question—how many males, at 21*s.* each, does Mr. Mechi supply for the 300 females he allows to wander abroad and mix together, and also how many of the same sex for the main flocks which he keeps at home? My husband says 40 males would not be too many, and the huckster who purchases my fowls and eggs says the same; and these 40, at 21*s.* each, and all "changed every two or three years," would deter, I fear, most farmers from adopting Mr. Mechi's poultry-keeping plan. But we had proceeded so far in wonderment at the order at which Mr. Mechi's poultry had arrived—getting fat with one meal a day only, and never straying into neighbours' fields, but wandering about and mixing, and lounging and flirting alone in his own—when a gentleman dropped in and explained the whole of the cheap Mechian system to us of keeping, breeding, and fattening poultry for the wholesale London dealers; and as it is worth being recorded, I here give it in our visitor's own words for the benefit of my readers. And here it is:—Mr. Mechi sinks deep and capacious excavations in the earth directly under the roofs of his cattle-sheds, and over these he lays wooden gratings, and on them confines his cattle, so that all their droppings fall through the gratings until the sunken vaults are full of excrement and urine. He has also a deeply sunken and capacious vaulted-over cellar, containing many thousand gallons, or barrels, of liquid, and into this are thrown all the dead and putrefying animals that can be procured, and the garbage from the plucking of the hundreds of poultry which are despatched daily for the supply of the markets, East, West, North, and South. The vaults having thus become full under the cattle, and the monster cellar also, the contents of them are forced out by powerful steam machinery, through iron pipes, into all Mr. Mechi's fields, where, through the heat of the sun and the vivifying influences of the air, the myriad swarms of flies, and grubs and worms of all shapes and sizes, are generated, which Mr. Mechi so graphically describes, and on which his hundreds of poultry so quickly and cheaply fatten. Now, though we concluded this novel plan of producing dainty food for his fowls may well suit Mr. Mechi—and we gave him all praise for the invention of it—it can never be permitted to be put in practice on any other farm, on account of the innumerable various "insects, grubs, and worms" it would produce. But it has this advantage, which our friend said ought to be taken into account,—as Mr. Mechi will not of course waste his precious life-producing liquids in any but his own fields, so his poultry will not uselessly wander and mix about where their dainty repasts are not to be found, in the fields of his neighbours. *M. C., Aug.* 16.

HOUSE SCAVENGING.—NO. III.

The Common Privy and Ash-pit, and some of the modifications which they have undergone, since the attention of the authorities has been turned to the condition of these ordinary receptacles of filth, must be named among the contrivances alluded to. It would, however, be unnecessary for us to comment upon the inefficacy of this method of dealing with human excrement, were it not that it has found so many supporters among the authorities of numerous Lancashire towns. The present condition of the rivers and streams, which is co-existent with the general prevalence of these very receptacles, shows clearly that this mode of dealing with human excrement has but litttle action in keeping the river free from fæcal matter; indeed, as already stated in the descriptive part of this report, the privy only professes to receive a portion, and that the least injurious portion, of the excreta; the greater part of the urine, and the whole of the fluid refuse from the kitchen and the house generally, is passed direct into the sewer; and as rainwater finds admission to most of the ashpits, except a few of those more recently constructed, this must act upon the soluble portion of the solid refuse, and carry it into the sewer by the drain which nearly always connects the ashpit with the sewerage system. It is true that in some towns the ashpits do not communicate with the sewers, and are, in fact, simply enlarged cesspools; but these are exceptional cases, and the state of the rivers in the vicinity of these towns is in no marked respect more satisfactory than elsewhere.

If then the privy and ashpit does not succeed in keeping human refuse out of the streams, all those modifications of it, such as Moule's dry earth system, Goux's system, &c., of which we will give a brief description as exhibited to us in action, are liable to the same objection. None of them proposes to deal with other than the solid excrement mixed with so much of the urine as is passed at the same time; they are, in fact, but modes in which a portion of the human refuse can be made temporarily inoffensive, so as to admit of its retention on the premises till it can be removed by human labour; the object of some being to retain the fæces in such a condition as may render them more valuable as manure, while that of others is merely to prevent the offensive smell, considerable mechanical ingenuity having been displayed in the applications of the disinfecting material.

We will first refer to such attempts as have been made to improve the privy and ashpit by placing them more immediately in connection with each other, with the view of absorbing much of that which now drains away. To this end the Manchester Corporation recommend an ashpit under one roof with the privy, and furnished with a side grating through which the ashes of the house are thrown and directed on to the filth below, while at the same time all large and coarse rubbish is kept out. To this end also Mr. Beech has devised an arrangement which has been adopted in one of the poorer streets of Manchester:—A space is left in front of and below the privy seat, under which the house ash is thrown, and necessarily alights exactly where it is wanted. The flooring and seat are both hinged, and fold back out of the way when the scavenger comes to clear the pit out. The whole filth, dry and wet, is then thrown out of the doorway directly into the street, and when the pit is empty, floor and seat fold down again into their original position, and take their place without having been soiled during the removal of the pit contents. Mr. Morrell has also patented a contrivance for effecting the same object, a description of which will be found in vol. ii., part 4.

The only methods, however, which can rightly profess to wholly correct the evil of river pollution by town drainage are those which claim to remove the whole of the human excrements directly from the house. But at the very outset they have, as already stated, to confess a failure. It is only privy stuff with which they deal; all the other liquid household waste, chamber slops and laundry slops, are thrown down the back yard grid or scullery slop-stone and find their way through these sinks to the nearest water-course.

The Dry-earth Closet.—The so-called dry-earth closet is much the best of these plans; and it is undoubtedly capable of being made an admirable scavenging expedient, so far as privy refuse is concerned. Of this we convinced ourselves at the Broadmoor Criminal Lunatic Asylum, where a large number of earth closets have been introduced, and are worked to the satisfaction of Dr. Meyer, the resident medical officer. At Wakefield prison too, all the lower cells are provided with earth closets; and although the closeness of a confined and narrow room was perceptible (the prisoners having been kept in till a later hour than usual on our visit), there was no offensiveness recognisable of the special kind that might have been expected. Here, however, the plan has been found applicable only to the cells on the male side of the house, in which separate vessels for the urine are provided. The earth for the Wakefield prison is dried in a kiln and supplied weekly to the closets, and the pans are removed as soon as filled; their contents, taken to a shed, are turned and pulverised, and used in the prison garden with advantage. At Halton in Buckinghamshire, a pretty country village of 50 or 60 cottages, the roadside chalky soil is used successfully in the dry-earth closet with which every cottage is provided. For this purpose it is screened and dried upon a kiln floor about 9 feet square; 100 bushels of coke being used in this way per annum for the 50 closets in the village. When hot and dry the earth is carried to the hopper in the back wall of each privy, which holds about 60 lb.—enough for 40 uses of the seat. The floor beneath is cemented so as to hold the liquid as well as the solid excrement; and the seats are hinged and on springs, so that on rising from them a portion, about 1½ lb., is discharged from the hopper, and thrown upon the mass below. We came, without notice, one evening into the village, and examined about a score of these cottages, and found everything as clean and sweet as possible. Seats and floors in front, hoppers and cesspool floor behind, were all clean; and there was nothing to be seen but white dry earth, and no smell was perceptible. Moreover we were told that the cesspool, cleaned out as required three or four times a year, furnishes a material, which, after lying in a heap for some months under a shed is put upon the kiln again and used a second time. Last year 70 tons of stuff were taken out of the privies of the 50 cottages; 30 tons, however, had been used twice, so that only 40 tons were available for use upon the land; and it had proved a capital fertiliser, producing an abundant crop of grass where the manure had been applied.

In all these cases, however, the chamber slops are kept separate; and independently of that the success depends not upon the people using the privies, but upon an officer whose business it is to look after them and keep them clean. Even at Halton one man is set apart for this work, who attends to the kiln, to the provision of dried earth, to the keeping the hoppers

full, and to the removal of the manure. Elsewhere we have known earth closets introduced for the use of cottages accustomed to the old privy seat and cesspool; and, requiring special service and attention which the average man or woman will not give, they soon became filthy and offensive. Add to these circumstances the enormous aggravation of all the difficulties of the plan when not 50 but 50,000 households have to be provided with the necessary appliances and induced to work them properly, and we can have no hesitation in pronouncing the dry-earth system, however suitable for institutions, villages, and camps, where personal or official regulations can be enforced, entirely unfitted to the circumstances of large towns.

At Lancaster, indeed, an attempt has been made by a neighbouring landed proprietor, Mr. W. J. Garnett, of Quernmore Park, to get the house scavenging of the town done upon a modification of this plan, and to deal with the whole excrement of the household upon the dry-earth system. By constant and even daily collection in tubs and pans the whole excrement is collected from a large number of houses, and the payment of 1*d.* a week per house is said to secure the collection of the chamber slops as well as of the privy contents. Nearly one-tenth part of the town is thus dealt with. Earth is sent round daily, and thrown into the privy holes, and when the pit is full the whole is taken to a depôt where it is mixed with material derived partly from street sweepings and ash-pit refuse; and being thereafter piled beneath a shed built upon a farm near the town, the whole is soaked with the collected urine.

A sample carefully taken being analysed in our laboratory proved to contain:—

Organic matter and ammonia containing 2·7 of total combined nitrogen	6·671
Mineral matter containing 3·26 of phosphoric acid	6·672
Water	86·657
	100·000

These figures indicate a practical value certainly much below that at which we had been led to estimate it by mere inspection; and it is manifest, from the very small amount of total combined nitrogen, that much of the urine escapes preservation. An inordinate quantity of earth appears also to have been added to the excrementitious matters, since more than 93 per cent. of the finished manure consisted of nearly worthless mineral matters and water.

The "Eureka" System.—Some mention should be made of the plan of dealing with human excrement which was carried out a few years ago at Hyde, near Manchester, although it has been abandoned owing to the great local nuisance which the manufacture created, and the insufficient returns realised by its promoters, and we have not, therefore, had an opportunity of examining it. It has been thus described by Mr. J. B. Lawes, F.R.S., and Dr. J. H. Gilbert, F.R.S.*:—

"Some few years ago a company contracted to carry out what they called the 'Eureka system' here. They provided boxes to fit in at the back of the privy or closet of nearly every house, leaving scarcely a water-closet in the place. Some disinfecting or deodorising mixture is put into the box before it is placed in its position, and the box is exchanged for a fresh one after a certain number of days, according to the number of individuals frequenting the place; and it is stipulated that neither extraneous water nor any other than human excretal matters should be accumulated in these receptacles. The boxes, when removed, are covered with closely fitting lids, and so transported in close vans to a manure manufactory close to the town. Here the matters are first well mixed, and then strained to remove rags, which are washed and sold for paper-making. More disinfectant is then added, and the matter concentrated by distillation, the distilled water being sold to dyers and bleachers. The residue thus thickened is then mixed with coal ashes, which are collected in the houses in casks left for that purpose, and before being used are re-burnt in a reverberatory furnace, and finely ground. On visiting Hyde in 1863, it certainly appeared that the mode of collection and preparation adopted was attended with, at any rate, very little unpleasant odour, and it was maintained by the advocates of the system that its adoption had been successful in a sanitary point of view; though, even at that time, some difference of opinion existed, and a controversy on the subject was in progress."

"The opposition had reference not to the mode of collection, but to the conducting of the manufacture so near to the town. But whether or not the plan of collection and removal may have proved successful, so far as the avoidance of nuisance and injury to health are concerned, the process of manufacture seems unfortunately to offer but little prospect of successful utilisation, so far at least as can be judged from the results of an analysis made at Rothamsted, of a sample of the manure obtained direct from the works. It was found to contain only between 1 and 2 per cent. of ammonia. Such a manure, although it might be useful enough when applied in quantities of many tons to the acre, would obviously be not worth more than its carriage beyond the distance of a very few miles. Besides the great dilution of the more valuable manure matters by the admixture with ashes, a little consideration of the habits of the people is sufficient to account for the small quantity of ammonia found in the manure; for it is obvious that little of the urine beyond that passed once a day with the fæces would reach the boxes, and so find its way into a manure thus collected and prepared."

The plan has at length been abandoned, for both of the reasons referred to by Messrs. Lawes and Gilbert.

Goux's System, described in detail in vol. ii., "Minutes of Evidence," part 4, is one of a somewhat similar kind, differing from the Eureka plan mainly in the subsequent treatment of the excrement. This is not dried by heat, but allowed to ferment along with the drying and absorbent material used in its collection. The filth is collected from house to house in tubs lined with a layer of absorbent material, and these tubs are removed at short intervals, as experience declares to be required. Gathered at a depôt, the whole contents, ordure, liquid, and the fibrous lining, are cleared out and turned over, and the vessels are sent back to the privies. Each of the receiving tubs is filled to a certain depth with dust, chaff, house sweepings, ash, or other absorbent stuff. A conical core smaller than the tub is then pressed down upon this layer, and the space between it and the outside vessel is filled in like manner with similar absorbent refuse matters. The core is then removed and the tub is taken to the privy and placed below the seat. Every day one-fifth or thereabouts of the tubs are taken to the works, empty vessels being put in their places. The contents are collected on a floor, sprinkled with a little sulphuric acid, and after a certain amount of fermentation and consequent destruction of the fibrous matter, the whole becomes a homogenous, inoffensive, but feeble manure, which may be very fairly described in the words used by Messrs. Lawes and Gilbert about the Eureka failure. We saw the system in operation to a certain extent at Rochdale; where in August, 1869, according to the Report of the Sanitary Committee of the Town Council who had charge of the experiment, 342 closets were then being treated on this plan.

It must be remembered, as regards all these expedients, not only that it is but a part of the excrementitious matter which is dealt with; but that even as regards that portion of the excrement which they do remove, they so entirely depend upon efficient cleanly superintendence and direction, that wherever they have merely had the average man to work them they have failed. Moreover, this very frequent collection of filth by hand from houses, and its removal sometimes through the cottages themselves, almost necessarily under the eye and nose of the household, whatever may be the importance of the economic object aimed at, is universally condemned by our domestic habits as nasty and offensive. They can never be an entire success, and in competition with the water-closet, a jury of average householders will certainly condemn them for lack of cleanliness and comfort.

The above account of these, which may be termed "preventive processes," will be sufficient to justify the statement we have made of their inefficiency to hinder the pollution of the rivers and streams; they do not of course profess to have any remedial action upon water which has been polluted. *First Report of the Rivers Pollution Commission.*

TO MITIGATE THE DROUGHT.

[A French ordinance calls the attention of agriculturists to the following report, drawn up by Dr. C. Hoffmann, professor of agriculture, and teacher at the Agronomic School of Grignon. We take the extract from the "Journal de l'Agriculture."]

DURING the last few days I have had occasion to traverse many departments of France, and regret being compelled to report most unfavourably as to the effects of the drought.

For 20 years past the advantages attendant on deep cultivation have been constantly expatiated upon, and this year the beneficial effects of the system are strikingly apparent. In those localities in which the subsoil plough has been judiciously and persistently employed for any considerable length of time, the crops are now suffering far less from the drought than in those districts in which farmers have not resorted to it. The winter crops (Rape, winter Barley, winter Vetches, Rye, Wheat, and winter Oats), look, comparatively speaking, much better than the forage ones, although they (the winter crops) have also suffered from the oppressive heat which has prevailed since April.

The extraordinary short supply of green food continues to be a cause of great anxiety to the farmer, and should the drought last much longer it will become a serious question how to keep the stock alive from day to day.

Amongst the measures which may be easily and advantageously resorted to with a view to mitigate the effects of the long protracted dry weather, I would venture to suggest the following, classifying them under the heads, summer keep, autumn keep, spring keep, litter, manures, purifying water.

Summer Keep.—Maize or Indian Corn may be sown as late as the end of July, or even to the beginning of August. Care should be taken, however, to select a quick-growing variety. In order to accelerate the germination of the seed, it is well to steep it for 48 hours in water, and it should then be sown towards evening, three or four grains in a place, about 3 inches deep, and in rows 12 inches apart—seed per acre 4½ bushels. As a surface crop, Hungarian Melica 2¾ lb. per acre, Millet, 3½ lb., and Tartarian Buckwheat, 4½ bushels, will be found a useful mixture, and should be lightly buried by means of the harrow and roller.

Although Buckwheat is but a second-rate forage crop, it has this in its favour, it is able to withstand drought, and serves to shelter other plants during the period of growth.

As regards Maize, although it cannot make rapid progress in a time of drought, it will at least germinate and keep growing. The seed put in during the dry weather will be found considerably in advance of seed which has been kept back to be sown after rain.

In order to secure a succession of green food, it is advisable to sow the above mixture (of Millet, &c.) at intervals of eight days. Thus will be obtained a nutritious and palatable fodder for live stock of all kinds.

The common Nettle is an excellent food for cattle and pigs. After being cut it should be allowed to wither in the sun for half a day, in order that it may lose its pungent properties before being given to the stock.

Cattle should only be driven to pasture in the woods either in the morning or evening; during the heat of the day they would be tormented by insects. Pasturage situated in Red Beech and Horse Chestnut woods is not so good as that under Oaks, Birches, White Beeches, Elms, and Alders.

Autumn Keep.—In Alsace, Auvergne, Limousin, and Anjou, the Turnip is regarded as one of the ordinary farm crops; but whether it can be grown this year without a change in the weather, is very doubtful. In any case, an attempt should be made, and to protect the roots, in some measure, against the dry heat, a surface crop of Tartarian Buckwheat might with advantage be raised. Four to five bushels of Buckwheat seed per acre should be harrowed in first, and then 2½ to 3 lb. of Turnip seed. The Buckwheat will protect the Turnips against the fly, as well as against the sun's rays. Let the Buckwheat be cut with the sickle in September or October—even if the grain is then only half ripe—care being taken not to damage the Turnip leaves. Should the weather be fine, it can be dried and carried. It makes a good winter keep for cattle and sheep. The Turnips may be left till November. Early kinds of Turnips should be sown not later than July 25; late varieties up to August 20. White Mustard is a crop, the value of which has been nowhere properly appreciated. It may be sown broadcast, 11 lb. per acre, from mid-August to mid-September, and will soon appear above ground, and grow rapidly. It should be mown whilst in bloom.

Vine leaves are a somewhat acid, but at the same time nutritious and refreshing green food. In Languedoc, sheep are allowed to eat them off the plants, and the vineyards are not found to sustain any damage in consequence. After harvest, the branches which have been chopped off the Vine can be tied up in sheaves or bundles, and given to sheep and horned stock in racks.

Acorns, Beechnuts, and Chestnuts, are also worth collecting this year, and may be used as food, either fresh or dried. If intended to be given in a dry state, they should previously be crushed and steeped in water. Cattle and swine are very fond of them.

Winter Keep.—Gorse will grow everywhere in France, except on chalk soils. It still covers large areas in Sologne and Brittany, and in the last-named locality the young shoots of the plants are frequently used as fodder for horses and cows. Where the Gorse is cut every year, and grows thickly, the scythe is the implement used to cut it.

In the case of old and detached plants, however, the shoots are best cut off with a sickle—the left hand being armed with a leathern glove or wooden fork. The Whin, before being given to stock, should either be bruised in a trough or cut by a chaff-cutter, and then, after remaining some time in water, be crushed by a wooden pestle in order to destroy the thorns. The green shoots of Gorse thus prepared make a capital fodder.

The Jerusalem Artichoke (Helianthus tuberosus) is extensively grown in many of the central and western departments. The root of the plant, besides being useful as an article of diet for man, forms a wholesome food for neat stock, sheep, and swine, and the leaves, when dried, may also be given to the flock. In the latter case, the stalks should be be cut in autumn, lightly tied together, and placed upright in the field. As soon as dry they may be stored away in an airy shedding or barn, and given to the sheep in racks during winter.

Oat and Wheat straw, though, comparatively speaking, inferior feeding materials, must this year be turned to account. After they have been cut into chaff their feeding value can be greatly increased by steeping them for 24 hours in water sweetened with molasses. One kilo (2 lb. 3 oz.) of Sugar-Beet molasses suffices for 100 litres (22 galls.) of water. If molasses are not obtainable, they may be replaced by rape or cotton cake. Though an animal cannot, of course, be fattened on this food, it may, at least, be kept alive; for straw treated in the above way becomes not only more digestible and nutritious, but also more palatable,

* "Notes on the Composition, Value, and Utilisation of Town Sewage," reprinted from the "Journal of the Chemical Society," March and April, 1869. (Harrison & Sons, St. Martin's Lane.)

and is readily eaten by live stock. A little hay can at each meal be added to the animal's rations.

The leaves of certain trees also contain so much nutriment as to render them valuable substitutes for hay.

Spring Keep.—As the land sown down this year with Clover, Lucerne, and Sainfoin has mostly failed to produce a plant, it will be advisable not to break up the old fields still under those crops. In order to render them as productive as possible in the spring, let them be well harrowed in the autumn and sown with Rye-grass. The latter will not be injured by the frost. Rye-grass or winter Oats may also be added to the Trifolium incarnatum, which is sown in August or September. A mixture of Rape or Turnips and Rye will yield an early supply of green food. It will be ready for cutting by the end of March.

Litter.—There will be no superabundance of straw this year, and in its place sedge, reeds, heath, dry earth, and leaves, can be used as litter, all of which should be brought under cover before winter. They may be allowed to remain down as litter somewhat longer than is usual in the case of straw. When removed to the dung-heap, some slacked lime should be added to them. In the department of Somme, dry turf is used instead of straw.

On most farms dung is not treated in the most rational and economical way. In order to preserve its fertilising properties, it should be covered with 8 to 12 inches of earth, and moistened with liquid manure or water.

It is worthy of mention that many of the farmers in the department du Nord have systematically watered their fields during the late dry weather. In Masny, a 6-horse power engine, with a consumption of 17 bush. of coal, has watered 2½ acres a day (of 12 hours). The pump in use is a portable centrifugal one, and the water is obtained from wells, of which there are a number in those districts where the cattle remain out all the year through.

HOWARD'S HORSE RAKE.

THE annexed illustration gives a better view of the improvements recently made on this machine, and of the mechanism for lifting the rake by a foot lever friction strap, than that which we gave on the 23d ult., p. 1009. The former notice which we gave applies, it will be seen, rather to our present illustration than the former—in other words, to the implement shown at Oxford, than to the illustration given of it. The difference between the two illustrations will readily be seen, on comparing them together, and referring to the foot apparatus for tightening the straps on the drums, very clearly shown on the near wheel of the present engraving (fig. 226), together with the additional apparatus, not formerly shown, for holding up the rakes when desirable. This additional apparatus belongs to that class of improvements usually known technically as "the perfecting of the invention," and is of more importance in the working of the machine than at first sight may be imagined by the casual observer; and in giving it we repeat the former favourable notice of the implement, as the best horse-rake now in the field.

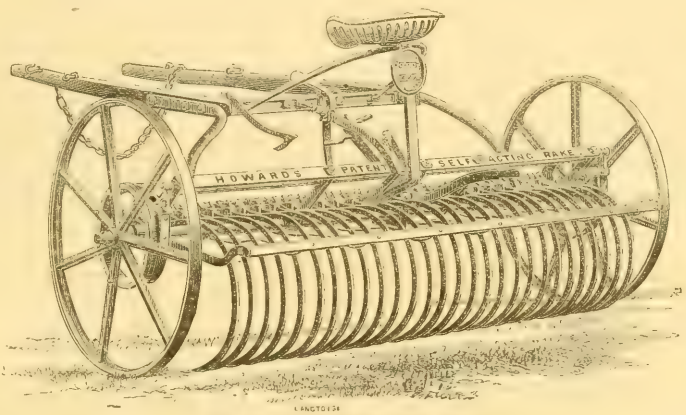

FIG. 226.—PATENT SELF-ACTING RAKE.

Home Correspondence.

Oat Growing in Wales.—What a wonderful man is Mr. Smith! At p. 1041 he published deliberately these words:—"I find that 'G. A. H.' has been carrying out in Wales a reclamation of some unsubdued mountain land, 1000 feet above the level of the sea, on which he has succeeded in growing some straw but not corn, for the Oats will not come to maturity." He writes this apparently after a personal visit to the spot, and as he sets up to be a land valuer, and one who gives advice to others, of course most of your readers would think his remarks and assertions worthy of credit. Well, I send him a sample of last year's Oats, and I refer him to your own judgment of them, and I send him also a sample of this year's growing crop, marked as having been grown from *seed ripened last year on the same farm*, and yet he neither has the manliness to acknowledge his error nor yet to persist in it, but now says that Oats grown 1000 feet above the sea only produce 14½ corns to each head! What a clever farmer is Mr. Smith, and how nicely he jumps to conclusions! He states my sample of this year's Oats was labelled "ten" ripe Oats, and he jumps to the conclusion (although there were, it seems, 146 Oats in the parcel) that it meant ten ripe heads. Unfortunately for Mr. Smith's theory the sample was labelled "unripe," and not "ten ripe." For Mr. Smith's satisfaction let me assure him that my Oats were all cut some time ago, and the whole (except one field) in stack; but for his satisfaction, also, I would inform him I had one field on a dry hill top, so short that I did not think them worth gathering, and so turned my sheep in to eat them, which they are now doing with vast satisfaction to themselves. I am afraid, however, it will not please him when I tell him I have seen worse crops than those I have put my sheep on to gathered in the south of England as though it were something precious, and stowed away into great wooden barns. Mr. Smith's knowledge of farming is illustrated by the judgment he pronounces about the growth of Oats in a hill country. If he knew as much about Oats as I have no doubt he knows about Wheat, he would have known that Oats will grow a great deal better on a light soil in South Wales, even though it be 1000 feet above the sea, than they will grow in the heavy clay around Bletchley. Now then, I ask Mr. Smith to answer this question. He declared Oats would not come to maturity on my farm. Well, I am this year growing Oats from seed grown last year on this same farm (and there is not a spot that is not at least 1000 feet above the sea). Were last year's Oats, then, brought to maturity or not? If they were brought to maturity, then what is the value of Mr. Smith's opinion? Mr. Smith says he picked up in his own neighbourhood three "heads" of Oats, out of which he rubbed 630 Oats. Now, I beg to tell him I believe he has made some mistake. If he had said three plants, it is quite possible; but to get 210 Oats out of one head, I declare to be, in my judgment, impossible. Four harvests ago I had a crop of Oats here (black Tartarian), which a very large farmer in Scotland estimated as being 14 bolls (84 bush.) to the acre. The straw was upwards of 5 feet long, and nearly as thick as a man's little finger. The heads were enormous, but the largest number I could get off one head was 119 Oats. Mr. Smith must have been reading the wonderful history of Baron Munchausen. I hope the gentleman who asked his opinion on clay land cultivation, will read his opinion on Oat-growing in Wales. *G. A. H.*

Crops in Herts.—The soil here is a stiffish clay on a chalky subsoil; it lies well for drainage, and has been drained deeply, and I believe thoroughly. It is cultivated by steam, smashed up, and very rarely turned over. For this very dry season the Wheat is remarkably good. The best piece will yield 5½ qr. per acre, after a capital crop of roots drawn off. The plant looked thin up to the first week in May last, when it began to stool out, and has surprised every one who has seen it. Barley, Oats, and Peas are quite an average crop on this farm; Mangels very fine; Turnips good. Tares and Rape a splendid crop, which is being consumed on the land by the whole of a large flock of sheep. They also get cotton cake and Peas. The land is cultivated immediately after the fold, and is intended for Wheat next season. We have a large herd of Shorthorns here, all the young animals are under cover, living on cut straw, Tares, Cabbage, cotton cake, &c., and are doing well. The meadow grass and Clover was a light crop this season, still we have three large stacks, plenty of good straw, and therefore we hope to be able to get through the ensuing winter with about 200 head of cattle, and be able to make an enormous lot of first-rate manure, without which it is a perfect farce to attempt to farm to advantage. *T., August* 12.

—— The Wheat crop about here will, I think, be over an average. Oats, average; Barley, below average; Beans, very bad; hay, the worst crop since 1844. Mangels are a good plant; Turnips a bad crop. I expect the Wheat upon the heavier class of soils will turn out much better than is generally expected. *J. B. Lawes, Rothamsted, St. Albans, August* 18.

Crops in West Norfolk.—For the season my Wheat is tolerable, quite equal to my neighbours. Of course the light land is very deficient. I have not harvested my thin sown (4 pecks per acre) apart from the other (6½ pecks). Several friends came during the season, and without exception every one fixed on the thin sown as being the best Wheat; some, I think, have quite made up their minds to sow less seed. Some thought during the winter months that my Wheat looked so desperately thin it was impossible to have a crop. I hope when I come to thresh it will prove the contrary: one of my neighbour's threshed yesterday 5¼ coombs per acre; this time four years he had 8½ on the same field. My Barley, I am sorry to say, is a very sorry crop, without exception the worst I have grown in ten years. I am carting a field to-day, and am satisfied it cannot yield more than 9½ coombs per acre. I have grown 16½. I have many acres that will not cover over 4½ coombs, and have grown over 10. The Turnips, on the whole, are doing well; the early-sown Swedes did not come up at first. The Mangels are very fair, rather short in plant; should the dry weather continue another week, I fear they will all go back. Our summer feed this year has been comparatively nothing, I was obliged to sell my lambs about six weeks ago; have not done so since I came for 10 years until this year. My meadows have been shut up ever since, and now have not so much feed as I had when I sold the lambs. I must leave you to form your own opinion of us poor light land farmers. I have only about 16 score sheep on the farm, and 16 head of young stock in the yard, eating straw and cake (not steamed). *C., August* 12.

Sewage upon Sand.—As I think you will be interested in the results which have attended the application of sewage to the sand which was brought from the Maplins, and placed at the Northern Outfall, I forward the following particulars of experiments, in contrast to others upon this farm. Five acres of good strong land, in good heart, but not under sewage, were sown down last fall in Oats. Six acres 3 roods of Italian Rye-grass were ploughed at the same time, and similarly sown. This land, however, is very poor hot land, and is under the control of the sewage. It was intended that no sewage should be applied to it this season, in order to test the value of the manure left by two years of sewage applied to grass, but the extreme dryness of the weather made it necessary, in order to secure a crop at all, to sewage certain parts of it. The yield from the 5-acre plot is 8.3 qr. per acre, with a fair amount of straw. That from the 6¾ acres of hot land is 5.5 qr. of Oats per acre, with a falling off in the straw. One-third of an acre of the sand was put down in Oats this spring, and the crop has been sewaged, as it seemed to require it. The yield of Oats is 7.5 qr. per acre, and the yield of straw is the largest of any. I may add that the price put upon this last sample, when sent to market, has exceeded both the others. The sand has also taken a first place in Potato growing, both in quantity and quality, as the following will show. One-third of an acre of sand under sewage, planted with "Regents," yielded 2 tons of ware, 8 cwt. of middlings, and 2 cwt. of chatts, thus giving a return of more than double the weight per acre which we have this year realised on this farm. *Henry J. Morgan, Lodge Farm, Barking, Essex, August* 16.

Tiptree Hall Farm, and the General Farming Reports.—I am just returned from my annual perambulations through the Eastern Counties—corn-producing districts—and I can in some measure confirm the published reports about them, except that I think the estimation of the yields of the crops on the really corn-producing lands is somewhat too low; and I have proofs of this from the information of a few farmers and their labourers, where some fields of Wheat have been threshed. In my walks through Essex in particular I could not get any farmer to acknowledge that there would be anywhere 5 qr. of Wheat an acre, but on my return, last week, I fell in with some men returning home with some steam threshing machinery; and they

told me that all they had hitherto threshed had averaged near 12 coombs an acre, and as, from my very plain and light dress, the men could not suspect that I was anything more than one of their own class, I have no doubt but what they told me was strictly correct, and may be relied upon by all who have commercially an interest in the anticipated yields of our crops this year. And I have again been in the neighbourhood of Tiptree Hall, the seat of the renowned citizen, J. J. Mechi, Esq., formerly of Leadenhall Street. Referring to Tiptree Hall, it will probably be remembered that, some two or three years back, I caused to be published some important corrections, which I had accidentally obtained, respecting its history, and which I think ought to have been long ago made public, as they have evidently occasioned no little mischief. It has been the persevering custom of Mr. Mechi and his metropolitan admirers to represent Tiptree Hall farm as having formed part of a barren heath until he became its proprietor; but a greater mistake could not have been made or attempted. As I showed in my former letters, and from documentary proofs which I was enabled to examine, Tiptree Hall estate was held in rather superior estimation, and had a residence in the centre of it for the occupation of a respectable family, and it was divided into fields, and planted with forest trees upwards of 200 years back, and from that period, and probably much longer, the estate had been regularly farmed by the owners or tenants of it; and for very many years before Mr. Mechi became the proprietor it had been in the occupation of one of the most respectable farming families in the county of Essex, I believe, for 40 years. It is true there is a heath near it; but as I myself ascertained by walking partly round the farm it is nearly surrounded by the fields and farms of others, bearing as much produce, acre for acre, as does Tiptree Hall farm, though probably at not more than half the cost spent upon them, that is, acre for acre. Such is the case; and I was shown several Essex farms which in the same time had increased in value much more than this farm has, either to rent or to purchase, confining myself within a period of about 30 years; but were I to go back to the same documentary proofs I saw, I could show that some estates have increased in value more than three-fold within the last 60 or 70 years. But to give one out of many examples of this; an elderly gentleman told me that his father rented the estate he was then proprietor of 70 years back at £200 a-year; and that the rent of it was subsequently raised to £320 a-year, and then again raised to £700; and now, he said—and I have no doubt of the truth of it—it would let for £1200 or £1400 a-year, and it has no advantages except for farming purposes, nor is there a railroad within several miles of it. I cannot judge of the value of Tiptree Hall premises, not having been able to examine them, but I should think their situation would not induce any gentleman to become the occupant of them, and they are not fit for a tenant-farmer. Confining myself, therefore, to the value of the land alone, I should say that Tiptree Hall lands are not now of greater value than are the lands immediately surrounding them. In concluding this paper, I am aware that Mr. Mechi will require that I should add my name and address, but I withhold them on this account, that, were I to give them, they would give greater weight to my paper than I wish it to possess. *T. B. S.*

New Zealand Red Bearded Wheat.—The Wheat sent by Mr. Henry Nairn, of Pourerere, Hawk's Bay, New Zealand (*Gardeners' Chronicle*, June 26, 1869, p. 696), having been considered deserving of trial, as having produced 75 bushels per acre, some further remarks on it may be desirable. Grown in the country, it is described as short in straw, and, notwithstanding the season, very prolific. As, however, my plants, growing in unfavourable circumstances, died in the winter, I have had no opportunity of observing its properties as a winter Wheat. I therefore planted some grains early in March, and these ripened the last week in July, growing under the same circumstances as winter Wheat, which ripened at very nearly the same time. From this it would appear that New Zealand alters the constitution of Wheat grown there, because it appears from Mr. Nairn's account that this is a winter Wheat, he having been told that it was only common Rivetts, which it is not likely would have been suggested if it were a spring Wheat. One objection to spring Wheat is, that the grain is apt to be shrivelled more or less. Might not this stout-strawed Wheat prove to be a better sort of spring Wheat? The grains in my plants are large and plump; but as I allowed only a very few ears to grow on the plants, this may be the consequence of over-nutrition. *B. Clarke, F.L.S., Mount Vernon, Hampstead.*

The Foot-and-Mouth Complaint.—Am I right in believing that the proper name for this is fever, which may proceed from natural causes or be transmitted by infection? and am I right in supposing that a high temperature, dry food, and an insufficiency of water are likely to cause such a disease? I ask these questions because my animals never suffer from this complaint. They are never without an ample supply of water, and the cattle are always kept under cover, and not allowed to range the fields. Perhaps some of your correspondents will enlighten me on this matter. There is an absence in the dried-up grass of much of the 75 per cent. of water which green fresh grass contains. When we give cake, meal, dry hay, bran, &c., water is essentially necessary. *J. J. Mechi, August 20.*

Landlords and Land Agents.—In your impression of the 23d ult., in your summing up of the controversy, Smith *v.* "G. A. H." on farm agreements, there occurs in the concluding sentence the following words: "Let us add that land agents do not as a body exist there." This, I imagine, is meant in no disparagement of that excellent, nevertheless ill-used class of men, or that our Belgian neighbours in question are to be considered peculiarly privileged, being free from the jurisdiction (shall I call it?) of such. If we accept the ordinary meaning of land agent as the representative of a landlord, the presumption with some propriety might arise, are there any landlords? Such arrangements of individuals as landlord, land agent, and land tenant in one, are to be found in the backwoods of some countries, but their existence on the Belgian side of the water rather takes our attention as a peculiar occurrence. The development of land in all ages has been worthy the study of master minds, and landowners, be they ever so well acquainted with most land business, cannot, as a rule, do without those whose study has been the more practical part of the subject; and the office is no sinecure. It ranges over a multiplicity of subjects concerned both with what appears on the surface of the land and what is under it, and the acquisition of them; the being conversant with most, if not thoroughly up in all, involves early application, much perseverance, and considerable talent. Landlords, fair and honourable in their dealings, be they guided by prudent agents or not, are a blessing in their localities, but grasping, narrow-minded menials are not to be regarded; their selfish, short-sighted notions possess them with the means of stamping a retrograde policy in the history of the property in their period. The case of the proprietor who may not have given much attention to country matters, and who waives his own judgment in favour of that of his land agent, very materially adds to the responsibilities of the latter. In the boots of the landlord, so to speak, his interest, wheresoever and howsoever it turns, is to be regarded by him in the first instance; his welfare must be a first concern, as much as if it were his own. In the land agency business there are amateurs—military men, for instance—who, by strict military punctuality, think to make up for practical skill; men of the law, dexterous in amassing into agreements phrases partaking of the least allusion to land, and at the least emergency ready to open fire from behind any one of them. Those, and such as those, attempting matters not in the province of their experience, are viewed more by the light of selfish motives than of encouraging a right feeling between man and man. It is refreshing to meet with men of the higher stamp—practical men, who at a glance almost perceive the true reckoning of their case, and by timely well chosen measures, be it in drains, buildings, accommodation, surface improvement, a term of credit, or judicious advance, or by any of the many ways which his long and tried experience recalls, see how to set matters to rights again; but those instances of dry law and no gospel are doubtful means to an end, and are taken as a cripple rectification at best. Let land agents properly so called aspire to the highest standard in their profession; let them seek to cultivate the more advanced views of the period, and urge on the landlord, the true conservator of old notions, the expediency of shaking off opinions that have served their day and generation, instead of dragging them into the existence of more modern times. Above all, let them cherish the *dictum* that the interest of the servant is that of the landlord, and there is much promise of hearing less of the charges preferred against them of perpetuating obsolete phraseology, as contemptible as the way in which they are made. Important as the office of land agent is, how little are their interest, as a body acknowledged. Unlike engineers, surveyors, and almost every other profession, they are unknown by any institution, or such other fitting name, of themselves. "Unity is strength," and it would be well for them to see to their interests in this respect, and so partake of the advantages usually attaching to bodies corporate: there are many ways in which the good offices could be of service. By such a step, encouragement might be preserved for true merit, and a check sustained to the employment of those who reduce the standard of the business—amateurs simply—whom, it may be, Mr. Smith has in his mind's eye when he speaks of them as fostering so tenderly antiquated and unworkable covenants in farm agreements. *A Scot.*

Foreign Correspondence.

SOUTH AMBOY, NEW JERSEY.—*Clover Dodder.*—Would it not be an advantage to the agriculturist to occasionally give a short description of noxious weeds, either native or introduced, if with woodcuts all the better?—for it appears rather behind the time for a reader of the *Agricultural Gazette* not to know the above plant when he finds masses of it as large as a bear's-skin, and feels uncertain if it be not the Clover rooting above ground when it is too dry to root under. This does not show much knowledge of vegetable life. A little instruction in the usual schools on common plants, weeds, and insects, illustrated with specimens collected on the spot, would be both interesting and useful.

There are, unfortunately, few books or periodicals published in England at a price to meet the simple wants of plain farmers and country workmen. Here we have plenty of periodicals giving short articles on all those subjects, with frequent cuts; so that any one finding an insect or plant fresh to them will probably be at once able to name it, and its use or destructive qualities, as the case may be. *James Taplin, South Amboy, N. J., U. S. A., July 23.* [The Cuscuta Trifolii has been frequently described and figured in our columns. We cordially assent to the judgment of our correspondent on the character of the American and Canadian agricultural Journals. They are admirably conducted.]

Societies.

ROYAL DUBLIN.

THE horse show held last week under this Society, as far as the number of entries is concerned, was more successful than any of its predecessors. We append a Table showing the entries of each year since the establishment of the show:—

Year.	Number of Entries.	Year.	Number of Entries.
1864	370	1868	368
1865	None	1869	452
1866	303		
1867	330	1870	413

The 1st prize for the thorough-bred sire in the Stud Book best calculated to improve and perpetuate the breed of sound and stout thorough-bred horses, weight-carrying hunters, and horses for general stud purposes, fell to Earl Spencer, for General Hess, 13 years, by Nabob out of Lady Alice. There were 61 competitors for the Citizens' Challenge Cup, value £100, open to horses four, five, or six years old, the *bonâ fide* property of farmers whose income does not exceed £500 per annum. It was won by Mr. John Morris Johnston, of Dunshaughlin, with a bay gelding four years old. The challenge cup of the Royal Agricultural Society, value £50, for the thorough-bred stallion considered most desirable for improving the breed of draught horses in Ireland, was awarded to Lord Lucan. Captain J. C. Ross's (Scots' Greys) hunter, by Mallet, dam by Navarino, which won the hurdle jumping on the first day, has been sold for £200, to Mr. Darby, of Rugby. The following statement from the tables of the Registrar-General, showing the number and value of horses in Ireland in successive years, may be of interest as showing how far the efforts of the Society have been successful in increasing the supply. The first show was held in 1852:—

Year.	Number.	Value.	Year.	Number.	Value.
1862	606,774	£5,503,074	1867	525,348	£4,879,158
1863	570,078	5,130,000	1868	524,713	4,884,968
1864	561,361	5,261,700	1869	527,248	4,896,808
1865	547,867	5,133,963	1870	529,264	4,912,013
1866	545,749	5,114,164			

The sheep classes numbered 141 entries. Pure Leicesters were not first-rate. In Border Leicesters, Mr. Thomas Robertson, Narraghmore, Kildare, was 1st. The Roscommon sheep, owing its excellence to Leicester crosses, were well represented. Shropshire sheep were exhibited principally by Mr. C. W. Hamilton, who took most of the prizes.

NORTH LANCASHIRE.

Blackpool.—At the meeting and show of this Society, held the other day, Lord DERBY thus referred to the show and to the meeting of the Society:—He could not speculate calmly upon the question of drainage and manure, of long leases and short leases, when the public are watching from day to day, and from hour to hour, the progress of great events in Europe, which may affect not only the history of the present day, but the history of generations yet unborn. But he could tell the gentlemen present, that the society whose annual meeting they had assembled to celebrate had been in existence for upwards of 23 years; that the income was, last year, from receipts at the door and from subscriptions and donations taken together, nearly £800; and, although exposed to the competition of small local associations, all very useful and beneficial in their way, it had contrived not merely to hold its own, but to extend its operations, and increase its funds. In 20 years it had quadrupled it operations. The increase under the head of agricultural implements was most marked. He knew that the improvements in Lancashire during the last 25 years were marvellous. Landlords and tenants had gone to their work with a will. There had been a great change in the agricultural condition of this country. It might not be necessary or even our interest that every inch of the soil should be cultivated to the utmost extent it could bear; but when they heard of so many complaints about the smallness of the country,—and he had often heard it said during the last few months, "Just think what England would be if only the colonies were to separate themselves from us, what an insignificant power we should be reduced to!"—his answer to all that was, Before you complain you hav'nt got space enough, just make as much as you can of the space you have got. A much more

sensible advice than recommending, as has been done recently, wholesale emigration.

VALE OF ALFORD.

August 9 : *Irish Cattle and Pleuro-pneumonia.*—At the meeting here Mr. McCombie, M.P., said :—Every one here will agree with me that to the introduction of Irish cattle three-fourths of our calamities as to pleuro-pneumonia are due. I considered it my duty to make a strong representation to the Government. I told Mr. Forster the unvarnished truth on this subject. I applied to Lord Airlie on the subject, and stated to him, as I had stated to Mr. Forster, that Irish cattle had been the cause of three-fourths of the pleuro-pneumonia in Scotland—that it was a public sale of Irish cattle that first brought the disease into Aberdeenshire, and carried it into ten or twelve different farms ; that the stock of two of my neighbours, namely, the late Mr. Wilson, Whiteside, and the late Mr. Aiken, Meikle Endovie, became infected—the former losing 45 to 50 valuable Shorthorned cattle ; that pleuro-pneumonia was introduced here only the other day by two Irish cattle, and that the whole stock on the farm, with one or two exceptions, had either died or been killed ; that for my part I would not take an Irish beast into my farms, though I got it for nothing. I also pointed out that starved Irish store cattle prowled through the country by night, and often left infection behind them ; that there was little doubt whenever an Irish farmer found pleuro was in his stock, he sent for the jobber, who bought them at a nominal price, brought them over to Scotland, and sold them at Muir of Ord, and elsewhere, to the Scotch jobber, who again sent them over the country as crosses. I stated that I proposed that no Irish store cattle should be allowed to leave Ireland, for Scotland or England, without a clean bill of health for three months, and that from the first seller. Lord Airlie took up the matter warmly, and told me he thought the subject should be brought before the Duke of Richmond. I took the liberty of calling upon his Grace, and I was very much struck with the great ability, the acquaintance with the subject, and the deep interest in our welfare by his Grace. I explained to the Duke at length the state of matters, as I had done to Lord Airlie. In the most courteous manner he said the subject would receive his most serious consideration, and you will have observed that Lord Airlie and the Duke of Richmond advocated our views in the strongest manner in their places in the House of Lords. The tenant-farmers of Scotland are very much indebted to both these noblemen for their efforts, and I have no doubt that the ventilation of the subject, as Lord Airlie says, will do a great deal of good. Lord Airlie's efforts on our behalf did not end here. He had a servant on horseback, at 7 o'clock in the morning, before I was out of bed, with a letter for me, the contents of which were that Lord Spencer, the Lord-Lieutenant of Ireland, wished to see me at half-past 12 o'clock that day. I had another engagement at that hour, but wrote his lordship I would telegraph and put it off, if necessary. He sent his servant back with another letter, stating that Lord Spencer was to leave that afternoon for Ireland. It was too good an opportunity to let slip, and I waited on his lordship at the time appointed. The first words he said to me were, "I sent for you in case you thought I was against the interests of the farmers." I had a long interview with him. I urged strongly our claims for protection from the inroads of Irish store cattle without clean bills of health. He stated that he could not put the Irish farmer in a worse position than the English and the Scotch farmers. I told him that when the Cattle Diseases Bill was in committee last year, I proposed that an owner of stock infected with pleuro-pneumonia should be clear of the disease at least three months before he was allowed to dispose of store cattle, but under certain restrictions fat cattle for immediate slaughter should be allowed to be sold. I stated that for the safety of the country, the Bill of last year should be altered. His lordship listened with great attention to my statements, and said he would not forget them ; but, as Lord-Lieutenant of Ireland, he could not think of putting the Irish farmer in a worse position than the farmers of England and Scotland, but that he would see that the law, as it stood, was most rigorously carried out. But I have detained you too long, gentlemen, over these details, which I hope, however, are not without interest to you.

BLANDFORD.

The following lecture, on "The Science and Practice of Seeding," was lately given by Professor Buckman :—

Origin of Farm Plants.—He believed that all our farm plants were derivatives, that by experimental processes they had been derived from wild ones. They should take care to sow seed sufficiently thin, so that one plant should not obtrude upon another ; thus they would get those plants which would pay them for the different processes which they adopted. He believed that by such care in cultivation plants would improve, and that, *e.g.*, the wild Oat was capable of producing the cultivated Oat. He had cultivated some of the wild Oats, and next year he found that they yielded grain ; by the process of cultivation he obtained in four or five years Oats of 38 lb. to 40 lb. per bushel. On the other hand, when he examined some of the Oats grown under wild circumstances—grown round the Oat ricks—he found that they were not so good as the crop which he had sown. When he went into the market and found Oats 36 lb. and 38 lb. per bushel, he saw that some were thin in the berry, with some hair at the base, showing that they were not the best kind, but Oats that had degenerated into wild Oats. There was every reason to believe that, after all, the wild Oats about our farms had in a great degree degenerated from the cultivated Oat. The inference was that, inasmuch as wild Oats were capable of being, by cultivation, getting the best examples, improved to a cultivated state, so cultivated Oats would degenerate into wild ones. If they sowed Oats of a poor quality on poor land they would find that they would have a poor crop. He deduced, as already stated, this fact : that inasmuch as wild Oats were capable—by care and selection, by being put in prepared, cultivated ground—of advancing, in the course of years, to good cultivated Oats, so good cultivated Oats were capable of degenerating into wild Oats. As the result of an experiment he had taken the seeds of a wild Vetch and cultivated them, when he became aware of this important fact—that under cultivation half the seeds would be very small indeed, while the others would be double the size. Examine any Vetch you like, any sample produced that you liked, and you would find that the seeds varied considerably in size. He went to a farm, and he was shown some small Vetches ; the farmer admitted that they were small, adding, "But then you see you get the measure." Now experience showed him that measure was not enough for him. Giving the result of experiments with the smaller and larger specimens, he showed the advantage of the latter.

As a general rule they would find, he urged, that the best seeds would, under all circumstances, be the best for sowing. It was a folly to suppose that filling up the measure would answer the end in view ; small specimens produced but small results. It was the same with plants as with animals ; if you had not a good sire or dam you would be quite sure to have small results. He wished them to understand with regard to Vetches that the matter of the selection of the seed should be observed ; that cultivated Vetches were but derivatives from the wild Vetch.

He had some specimens of the wild Parsnip, which he put in a new bed ; he selected the seeds, planting them in prepared ground, and instead of having the forked roots (indicating the wild Parsnip), he had the larger esculent, which was at present in cultivation under the name of the Student Parsnip. Any of his friends present could try the experiment ; they could take the wild Parsnip seeds and put them in a drawer till next spring ; then they could put them in a prepared bed. Some, they would find, would be covered with hairs, and wild, dark coloured ; others would be light coloured.

They must select their roots. Selected roots are of the utmost importance. From all the experiments to which he had referred he concluded that all our garden esculents, all our cultivated farm plants, were derivatives ; that they had all been derived by cultivated processes familiar to every farmer, and which he constantly carried out. The farmer had his change of seed ; he got his seed from different localities. These were cultivated processes.

Principles of Cultivation.—His object now was to point out the principles upon which those cultivated processes depended. In the first place, the selection of seed was of the greatest possible importance. They knew very well that when they selected their seed they endeavoured to get seed of a good quality. They wanted occasionally to change the sort of seed. Why was this ? Because if they did not change the sort, if they kept the same place for sowing, they would be neglecting some of the cultivated processes by which the sorts they aimed at had been derived.

Change of Soil and Seed.—They wanted not only to change the description of seed, but also to change the soil ; they must go from one locality to another. Professor Buckman recommended that, when practicable, crops produced by the kind of seeds offered for sale should be examined. He observed that when a new sort was introduced into a district it became fashionable, for the reason that it had never been tried before. It took a new position. Your neighbour got an excellent crop from it, better than before ; so you tried it yourself, and it became fashionable. But by and by another sort was introduced. Change was necessary on the principles which he had already pointed out. From perpetual changes they obtained better crops. The greater the amount of changes the more they were likely to succeed. There was ample evidence afforded that the cultivated processes must be paid attention to. If this were not done, no good results could be expected.

Next he would call their attention to the quality of the seeds. They all knew that the seeds of all their crops varied very considerably, but they were perhaps not aware of the amount of variation. He had experimented largely with reference to this question, and had come to the conclusion that a great number of seeds were sold in the market which ought not to be sold, for they did not germinate. They contained a great quantity of weeds. It was of the highest importance to get the seed free of weeds. He had seen samples containing enough weed to stop all growth. Such samples every right-minded and judicious farmer would repudiate.

Wheat and Barley—importance of testing samples for seed.—With regard to Wheat and Barley, he had tried some experiments. He had seen samples of seed of which 72 per cent. failed to germinate. He had seen Barley of which 24 per cent. failed. Of some samples in his own neighbourhood the failure reached 30 per cent. Persons sowing seed at the present time sowed in some cases a sack per acre. Now, before sowing, they should try to do what he had always himself endeavoured to do—ascertain the germinating power of the seed. He never put into the ground a sample of Wheat or Barley until he had ascertained, if possible, what percentage would come up, how much per cent. would germinate. It was easily done. The plan he adopted was to take a small flower pot and press the soil in it, leaving the seeds even ; he put say a hundred seeds in. If placed in a hothouse the seeds would come up all the quicker. Thus they would see the amount of germinating power. He had done this frequently. He had made three or four experiments with Barley.

Turnip Seed.—He remembered receiving a sample of Turnip seed. It was represented to consist of selected bulbs, and 96 per cent. would, it was said, come up. He tested the germinating power for himself, and found that 26 per cent. would not come up, notwithstanding it was represented that 96 per cent. would be the yield. Therefore it was important that farmers should be careful in these matters, that they understood the principles involved. They should ascertain for themselves as much as possible with regard to the quality and germinating power of the seeds. A respectable seedsman would ascertain this for them ; still, they must look into the matter themselves—make it a matter of business, only to trust worthy men.

Facts about Professor Buckman's Farm and thin-seeding.—He should now like to point out to them some facts—which he hoped they would consider interesting—connected with the quantity of seed to be sown. This was a subject which would occupy them until midnight ; however, he did not intend to keep them very long ; he should merely point out some facts and experiments connected with thin-seeding, which, if they did not care about practising, they would, at all events, he hoped, consider somewhat interesting. Regarding the quantity of seed to be sown, then, it must be regulated by various circumstances—not only by the quality of the seed itself, but by the climate, the soil, the kind of cultivation adopted, the forwardness of the work, and other circumstances which it would be quite idle for him to explain before such a society as that. He would point out to them some experiments which he had made in his own district. They might look upon him, he dared say, as a scientific man ; but he only pretended to be a plain farmer, and if they came to his farm they would, perhaps, find many faults. They knew well enough that a person might have ideas and opinions, but could not get them carried out ; he knew that for his own part he should find a difficulty in getting his men to do all the things he wanted. When he entered upon his new farm his neighbours questioned the expediency of using superphosphates and artificial manures ; they had not experimented with them, and they thought that it was no use for him to try them. He, however, adopted his own course, and the result was that persons were now using some of those appliances which before they could not use because, as they imagined, of their inutility. He did not pretend to be a good farmer ; he was not half so good a farmer as some of those present. He did not think he had farmed to much profit ; he had, however, endeavoured to effect and carry on improvements, to make certain experiments connected with the science of agriculture, and that was as much as should be expected from a young fellow like himself. He had determined to try experiments with regard to seeding. He had a capital man—a superior workman—he must not call him a bailiff because that was a fancy name for a small farmer's son. He found, respecting Barley, that his man was using for seed a sack of Barley per acre. He said to him, "That is too much. Suppose you take a tumbler and put three Potatos in it, you will find them too thick ; or if you take a thimble and sow three or four barley corns in it you will find them too thick." He showed him that with regard to the sack of Barley per acre he was doing pretty much the same thing. He, however, was at that time in a fresh district, and he had always respect for men acquainted with the district. He studied principles particularly, because they could be applied universally. He was told that a sack per acre was not too much, and that his neighbour was sowing a sack and a half, which really proved to be the case. It was remarked, "If you don't put it in, sir, you cannot expect to get it out." But, after all, that was not a scientific argument. If they came to analyse it they would see that there was a fallacy in it, which he should not now stop to point out. In 1864 he tried the experiment of 4 bushels of Barley ; in the following year he tried 3, and he had a good crop—he thought quite as good as that produced by the 4 bushels ; pro-

bably better. In 1866 he again tried 3 bushels with the same satisfactory result. In 1867 he tried 2 bushels, and in 1868 the same quantity, with favourable results. These experiments proved to him the advantages of thin sowing. He sowed in one part of the ground 6 pecks, and in another 4 pecks; they were in the same field, and the other circumstances were the same. As a result he had from the 4 pecks the most magnificent Barley. The result of the whole experiments tended to show that the thinner the sowing the better were the samples produced; and an improvement in the quality of the produce, with a saving in the amount of seed, surely seemed desirable.

Value of Records.—He recommended them to make these observations for themselves—to put down to "log" every event. They should record the germinating power of their various seeds; the dates at which they were sown, the dates at which they came up. Putting all the circumstances together they would be able to say a good deal on the matter which they could not say unless they had some such evidence as that. What he said and wrote became scientific evidence; practical farming was the most scientific work in the world. He believed that the plants to which he had referred were derivatives. He had tried to show them the advantages of thin sowing where circumstances admitted it; if plants were sown thickly you never got anything like the crop you would otherwise have. A specimen of Wheat was on one occasion submitted to him for examination, when he observed that it was "smothered out by weeds," or, in other words, that three or four times as much seed as was necessary had been sown,—the greatest weed in a Wheat field, as was once well observed, being the Wheat itself. The gentleman who showed him this sample belonged to the county, and this conversation took place at a meeting of a board of guardians. They would see that sometimes a little business was done by boards of guardians. The gentleman knew it was a small kind of Wheat, and denied at first that it was smothered out by weeds; it was, he said, "the cream of the flower garden." He, however, ultimately admitted that too much seed had been sown, that they had a little over, and they put it all in. The result was a poor crop. By the use of the black board the Professor illustrated the advantages of thin sowing with respect to Oats. He found, he said, that he could grow Oats on his light soil with a great deal of success, but in order to secure success he must sow half the quantity usually sown, and the best seed he could procure. He did not look at seed that did not weigh 45 lb. to the bushel; he had seen seed 48 lb. to the bushel. If he sowed light samples he had a perfect failure. He had concluded from all the experiments he had performed that, after all, the best seed they could get was the cheaper to buy under any circumstances. No matter about the price; the best, the plumpest seed they could buy, was the best developed, the highest cultivated. They should aim to get as the parent of a crop, so to speak, a high kind of seed, just the same as they did with regard to stock. If they used degenerated sorts, why then, as with regard to their cattle, they were certain to meet with failure. He admitted that they could not do all this at once; they could not adopt the system of thin seeding at once.

He congratulated them on burning their Couch, which could not in that case hurt them. Some put it slyly up in a corner, fancying that it would rot. But he held that decidedly the best policy was to burn their enemies, and to let their ashes become useful.

He alluded to the large number of seeds from the common Dock. He had counted, he said, as many as 80,000 seeds on one plant alone—at least, he set a class of twenty students to do it, giving a branch to each student. To put weeds slyly in a corner did not, it must be confessed, look very well—that was not getting rid of the enemy.

BUCHAN.

High Farming.—Mr. Bruce, of Inverquhomery (the Chairman), said:—The farmers generally were not at one with him on the point of his high farming. They thought he put too much manure on his land. He had, however, drawn up a little Table from the reports of the turnip competitions that had appeared in the *Banffshire Journal*, and he wanted to prove that he was right, and that his farmer friends were wrong. Having plenty of time, he made up the following Table, showing the produce and cost of the Turnips on each of the farms entered for competition, the quantity of the produce in one case not being given, but that did not affect the conclusion:—

Farm where grown.	Produce per Acre.	Cost per Acre.	Cost per Ton.
	tns.cwt.qr.lb.	£ s. d.	s. d.
Millhill	27 11 1 20	5 1 5½	3 8
Yokieshill	26 13 2 14	5 7 3	3 11¾
Oldtown	24 7 0 16	5 6 0	4 4½
Skellymano	.....	5 8 6	4 6¼
Nether Aden.. ..	23 11 1 20	6 5 10	5 4
Average	25 12 0 17½	5 13 11½	4 1½
Inverquhomery..	32 12 3 10	8 19 0	5 5½

The lowest cost incurred by the other competitors against Inverquhomery was—Inverquhomery, 5*s.* 5½*d.*, and Millhill, 3*s.* 8*d.* giving a balance against Inverquhomery of 1*s.* 9¾*d.* per ton. The highest cost incurred by other competitors was—Inverquhomery, 5*s.* 5½*d.*, and Nether Aden, 5*s.* 4*d.*, showing a difference of 1¾*d.* per ton against Inverquhomery. But as Turnips are worth more than 5*s.* 5¾*d.*, the cost per ton to Inverquhomery, the true calculation is got by taking the gross produce in each case at its true value, and also adding the total value of cost, including labour, &c. It will be evident that, as the cost of labour in each case is nearly the same, the proportion will be considerably altered when this item is added to the cost of produce, as will be seen by the following estimates:—

	Inverquhomery.	Average of other competitors.
	£ s. d.	£ s. d.
Manures	8 19 0	5 13 11¼
Rent	1 7 0	1 7 0
Ploughing (autumn)	0 12 0	0 10 0
Cross ploughing and harrowing	0 10 0	0 10 0
Drilling	0 10 0	0 12 0
Cost of labour (manuring) ..	0 5 0	0 5 0
Hoeing and finishing ..	0 10 0	0 12 0
	£12 11 0	£9 5 11¼

While the difference remains the same, the proportion, roughly stated, is as twelve to nine with total cost added, and eight to five on the cost of manures alone. Taking the above as the basis for calculation, the cost per ton will be to Inverquhomery, on 32 tons 12 cwt. 3 qr. 16 lb., 7*s.* 8¼*d.* per ton; to the average of other competitors, 7*s.* 3*d.* per ton. If the value of a ton of Turnips is 10*s.*, according to the above data, the profit per acre to Inverquhomery would be £3 16*s.* 5*d.*; and to the other competitors, £3 10*s.* 0¾*d.*; giving a balance in favour of Inverquhomery of 6*s.* 4½*d.*. If the value is put at 9*s.* per acre, the profit to Inverquhomery would be £2 3*s.* 9¼*d.*; and to the other competitors, £2 2*s.* 2¼*d.*, showing in favour of Inverquhomery, 1*s.* 6¾*d.* per acre. But it may be said that valuation is far too high. Stating the price at a little below 9*s.*, the cost would come to be against Inverquhomery. But I looked at the crop this year, and I took my brother's opinion on it, and asked how much he would expect it to be more than a crop after an ordinary manuring. He said about 2½ quarters, but then the land was old lea, and he allowed a quarter on that account; so that I have 1½ quarter of extra crop, which is valued at 30*s.* per quarter, or 45*s.* in all. Then I calculate the extra manure lying in the close at 8 cubic yards, which is calculated at 31*s.* These items give me £3 16*s.* per acre of extras. If I go back and take the difference of £3 5*s.* 0¾*d.* that I pay more than the others for my manures, these extras cover that cost, and leave me an advantage of 10*s.* 11¼*d.* per acre, besides leaving me with better grass, which will feed a greater number of cattle.

Notices of Books.

The Character and Condition of the Linseed Cake Trade, *considered in Relation to the Manufacturer and the Consumer, &c.* By W. Jarratt, Chairman of the Driffield and East Riding Pure Linseed Cake Company.

This is, of course, an advertisement, and is intended to promote the interests of the company of which its author is chairman. It is, however, undoubtedly very useful, serviceable writing, and is calculated to promote the interests of agricultural readers generally.

"Scientific and experimental testimony alike point to the conclusion, that in combination oilcake is superior in nutritive properties to any other species of food which can be given to the farmer's stock. 'Sheep,' says Dr. Playfair, nearly thirty years ago, 'fed upon oilcake increase in weight faster than on any other kind of food; and if it is used with Oats and Barley, they are firm to the touch and possess plenty of good flesh, and the fat lies equally distributed amongst the muscular fibre.' 'Oilcake,' says Mr. Clare Sewell Read, a distinguished agricultural writer, nearly twenty years later, 'continues to be the predominant feeding stuff with the Norfolk grazier. No matter how dear it may be, he will have it. Of all artificial food it is certainly the most handy in form, the easiest to keep, the most palatable to cattle, and the safest when given in large quantities.' 'There is in fact,' says another able and well-known writer, Mr. J. B. Lawes, F.R.S., 'only one manufactured article of food employed by the farmers with advantage on a large scale, this is oilcake.'"

This is the opening paragraph of the pamphlet, which then goes on to describe the adulteration of cake since 1849, when Professor Way reported:—

"'That there is no reason to believe that linseed cake is adulterated at any time with sand or other earthy matter. Adulteration by other matter being also rendered unlikely by the fact, namely:—That different samples of seed free from admixture of other seeds, or from impurity of any kind, present variations in the proportion of albuminous matter amply sufficient to account for those found in the specimens of cake.'"

The following sentences describe the present condition of the manufacture:—

"Russia is the great Linseed producing country of Europe. The vast tracts of that immense empire are intersected by magnificent navigable rivers, and almost the entire produce of that country is conveyed either to St. Petersburg, Archangel, and other ports in the north, or to the ports on the borders of the Black Sea in the south. The trade at the Black Sea ports is almost entirely in the hands of Greek merchants, whilst an old established colony of English traders hold sway and regulate the business at St. Petersburg.

"Doubtless the mixing of small weed seeds, such as Dodder, Mustard, Millet, and a variety of other injurious matter of indigenous growth, had been practised in some degree both in the north and south of Russia for some time previously; but it required the Russian war to develope to the utmost the practice of mixing Linseed before its shipment to this country. It may be asked what there was left for the crusher to do in the shape of adulteration, when it had become the fact that he got Linseed mixed with 40, 50, 60, and even 70 per cent. of weed seeds. There could not be much room, one would think, for the exercise of his genius, although we shall see by-and-by that even the cake-maker's resources were by no means exhausted. It is quite true that the crushers did not pay for such a doctored commodity the value of Linseed, although the consumer of the manufactured article had that privilege; but even the crushers began to discern that the Greeks were reaping the richest harvest, and that they themselves were paying exhorbitant prices for Mustard, Millet, and Dodder.

"Dr. Voelcker brought the subject of adulteration of Linseed before the members of the Royal Agricultural Society in 1863. The result of an examination of samples obtained from various sources showed, with two or three exceptions, that Russian Linseed imported into Hull was adulterated in various degrees from 12 to 70 per cent. Two samples showed about 12 per cent. admixture—one 20 per cent.—another 35 per cent.—two samples 19 per cent.—one sample 41 per cent.—another 43½—another 49½—another 52—and one 70 per cent., of which last sample the doctor remarks, a large quantity of this seed finds its way to Hull and other ports."

No remedy is possible so long as farmers do not care about the quality of what they buy. But if they were to ask for none but professedly "pure linseed" cake, and employ an analyst to examine what they buy, the remedy would be prompt and efficacious. Of course the pamphleteer recommends the wares of the Driffield company, and we have no doubt they well deserve his praise. We refer, however, to his pages solely for the principle which they defend; any other company or Linseed crusher can carry it out if it be desired to do so.

Emigration to Virginia (East), *or, The Old Dominion State.* Report from Joseph Newton, Esq., F.R.H.S. (74, Oxford Terrace, Hyde Park), of his Second Visit to this State. Messrs. T. Hunter & Co., 1, Gresham Buildings, Basinghall Street, E.C.

Our correspondent, Mr. Joseph Newton, has here given some of the results of land inspection in the United States. He prefers "old Virginia" to any of the Northern or Western States, and his opinion is gladly published by Messrs. Hunter & Co., who are, apparently, agents for the sale of this land.

The following extract describes Norfolk City:—

"Norfolk is 300 miles from New York by sea, 190 from Washington, 180 from Baltimore, and 140 from Richmond, the capital of Virginia. It contains 20,000 inhabitants, and is, after Richmond, the most important city in the State.

"With the Revolutionary War, it may be said, ended the first period in the history of Norfolk, and with the late Civil War has ended its second. It is now entering upon a third state of existence, from which may be entertained every expectation of prosperity; rivers, canals, and railroads are all directing commerce to its fine port; and when, therefore, the productions of this vast tract of country, peopled to a considerable extent, through our agency, as it will be, with energetic English and Scotch settlers, shall have fairly begun to find their way to Norfolk, there will then be no lack of merchandise about that great seaport, or of lines of ocean steamers to convey it to all quarters of the globe. The Far West even demands an outlet here, and this induces us to assert, and that emphatically, that neither Kansas nor the Colorado, meritorious as they may otherwise be, can ever possibly successfully compete with settlers on our lands in Eastern Virginia, which has all the advantage of this fine city and port lying, as it were, within its grasp, while the productions of the two States just named will have to be carried over 1000 miles before they reach our great eastern market. In short, the unrivalled advantages which the home counties enjoy in reference to proximity to London, Eastern Virginia possesses in regard to Norfolk; added to which, her winters are much shorter than those of either Kansas or the Colorado, or anywhere in that latitude. From what has been stated, therefore, it must be at once apparent that Norfolk must rapidly and steadily increase in wealth, population and influence. On that account we have secured lands in its immediate vicinity suitable for purposes of market gardening, and to that class of settlers unusual advantages are now offered in the shape of fine soil at a comparatively cheap rate, a climate in which there is little or no winter, and a sure and increasing demand for all kinds of produce, such as is supplied to Covent Garden Market, and at prices far more remunerative than those obtained at the present day in the great English metropolis.

We add the testimony of Mr. W. Hebditch, an immigrant Englishman resident at Curdsville, Buckingham County, Virginia:—

"My experience of the New England States led me to conclude the whole country was laid out in market gardens and very small farms, yielding all the paraphernalia of garden stuffs. New Jersey struck me as being a sandy desert, fit for goats. New York seemed more highly improved than any, having several herds of very

fine cattle, but no large flocks of sheep; in fact I have not seen a flock of 1000 sheep in America. The Western States have a deep dark soil, producing Maize in profusion. I saw Irish Potatos growing in the western portion of Illinois in large quantities, but I look upon it as a bleak, cold region, the temperature and the people sympathising with each other wonderfully; altogether far from inviting to as tranger. I passed through Indiana, but made no stay. I spent two weeks in Ohio, and found there many intelligent and good farmers, several of them owning 200 to 300 breeding ewes. In Kentucky I was highly pleased, the people full of hospitality and kindness, and the land rich and good; I styled it the Garden of the States; it carried me in thought to the beautiful meadows of England at sight of those herds of Durham cattle pasturing on the luxuriant greensward of the counties of Clark, Bourbon, Fayette, &c. But land at 120 dols. an acre was no place for me, so I retraced my steps at once through the States of Pennsylvania and New Jersey to New York, and spent the remnant of the winter in that city, and on April 1 started for Virginia, and in three weeks I had purchased this place. I felt, as soon as I was in the State, I was nearing home. We (my wife and I) found ourselves in the midst of people, free, hospitable, kind and intelligent—surrounded by thousands of acres of land of different grades, but all capable of producing much heavier crops than they were wont, if tilled to the purpose.

"Like Mr. Loader, another Englishman, I searched for an open, healthy situation, and did not care for your valuable river and mountain land. My farm consists of 400 acres, with a large frame-house, cabins and out-buildings, a large and productive apple-orchard, and all other varieties of fruit peculiar to this State, in abundance. It is situate 15 miles from Farmville, near the Willis Mountains; the Willis River runs through the plantation. The mail carrier passes my door every day. An Episcopal church within 4 miles, and other denominations abound in the vicinity.

"This farm cost me, at per acre, less than one-fifth of the amount of rent of the farm I lived on with my father for 23 years in England, and my good tillage will produce any crop grown there in like abundance. Looking these facts in the face, I see nought to alter the opinion I formed previous to my leaving Mother Land, and to all your readers in England, who feel themselves oppressed by high rents, rates and taxes, I say, come to Virginia, and amongst the millions of acres that meet your gaze, I feel assured you will soon be riding with pride over your own estates, subservient to no landlord."

Farm Memoranda.

Charnwood Forest.—The harvest is general throughout the Ormskirk and Southport district, and a considerable portion of the cereal crops carried. The long drought, which has been more severe on the low-lying lands nearer the coast than amongst the more hilly grounds lying inland, has been very trying to the inhabitants of some districts, and unless rain comes soon it is to be feared that their general health will suffer, as the old marl pits are nearly all dried up, and the supply from wells and springs is deficient. The Wheat crops are very good, and the Oats fair. Very little Barley is grown, and it is feared that the Potato crop, although healthy and good in quality, will be short in quantity. The Mangels, which are generally transplanted after the early Potatos are taken up, are not so good as usual, and there are not many Turnips grown in the district. The hay crop was short, but not so bad as in the Midland Counties.

I have been recently through the Midland and Southern Counties. After passing Derby the ground is much more burnt up, and the signs of drought greater, than in Lancashire and Cheshire, and I feel confident that your account of the crops in last Saturday's leader is correct, and that the whole of our crops, Wheat included, are below the average. I was very much struck by the short straw and deficient appearance of the Barley crop in the South Midland district; but surprised to find some fields of Turnips looking better than might have been expected. I stayed a few days in Leicestershire, and found complaints of smut in the Wheat principally in the neighbourhood of Nottingham; but on the whole the Wheat crops are fair, though short in the straw, and in some places very thin in plant. On a farm in Charnwood Forest, a hilly and rather bleak district on the granite formation, the crops are, upon the whole, better than might have been anticipated. Some of the Wheat is good, and some wretched. On one field of Oats the crop is excellent, long in the straw, and likely to yield well: this field was sown early. On a late sown field the Oats are not more than 8 inches high. The other fields of Oats and Barley, which were all sown early, are very fair. The crops of Mangels and Carrots are capital, and there would have been good crops of Swedes and white Turnips but for the ravages of an abominable and destructive grub, specimens of which I left at the office of your paper the other day. This execrable plunderer is fast reducing the Turnip fields from a healthy green to the resemblance of newly ploughed land. (I may add, that the four grubs were picked from one plant, and are smaller than the generality of their tribe.) There were about 6 acres of Cabbages, looking well; but the "Smother Fly" has got among them, and a white, small grub is busy at their roots, and destroying many plants. The Potato crop is the most promising, there are 26 acres looking magnificent; they were got in early and will prove a paying crop, unless a second growth sets in (as was the case in 1868) after the long wished for rain comes. The sheep stock (Cheviots) on the Forest are very poor for want of grass, and the whole district is in the greatest distress for want of water. Fortunately on this farm an old mill reservoir was repaired in 1868, and is doing good service; but the cost of carting water to the different fields on a farm of 480 acres is excessive. Unless rain comes soon they will have to trench upon their hay and oat-straw, which is their reserve for the winter and spring. This farm may be taken as a fair sample of those in the Forest; there are better cultivated farms and there are worse. One inference may, I think, be drawn from several years' experience, viz., that, as a general rule, early sowing, not only of cereals, but of roots, is in the majority of cases the most successful plan, at all events it is so in Charnwood Forest. There were occasional showers during the summer which started the roots and benefited the other crops, but none of the water reached the springs or drains, all was absorbed by the land and the vegetation. *W. H. B., August* 17.

Ravensdale Park, the Property of Lord Clermont.—The farm is not very large, but is now in very fine order, and it is only those who saw it some 20 years ago who can form any idea of what skill, energy, and perseverance can do in reclaiming hill-sides covered with large sunken rocks and top stones, and wet bottom grounds, which were filled in and levelled, now forming large, level, good grass fields; indeed, the farm, notwithstanding its fine appearance now, was nearly all made out of wild waste lands, which at one time would have frightened a less persevering man than Mr. M'Clelland (his lordship's manager) from beginning to improve it; but any person who wishes to see what can be done in the way of improving such lands will be well repaid by a visit to the park.

The farmyard, which has been also rebuilt to suit the other improvements on the farm, has been very neatly arranged to suit the quality of stock kept on the place, and necessary for his lordship's establishment.

The horned stock consist of a beautiful herd of Ayrshire cows of the best blood of that famed milking stock of cattle; and they are really a beautiful sight, whether seen lying on the pasture with their mottled hides and tapering little horns, or coming into the byre, with their udders full of milk; but I will say nothing on the points of these stock, as I find that I would make a very bad judge of an Ayrshire. Their very best points—looking at them as I would at a Shorthorn—seem to me the worst, and the nearer they come to the shape of a good Shorthorn I find they are the less thought of by a thorough Ayrshire judge; and although I have been trying to get some knowledge of their points from Mr. M'Clelland, who is a first-class judge of them, I find I never could do justice to them as a judge, and whenever Ayrshires are shown it is only doing an injustice to the breeders to put Shorthorn breeders or graziers to judge them.

There are also some West Highland cattle bred on the hills, where no other stock would do or almost live, and it is to be regretted that West Highland cattle are not more generally bred and fed on the mountains throughout the country, instead of many of the hard, ill-bred runts kept on them. The West Highland cow, crossed with the Shorthorn bull, produces a cross superior to any other cross for butcher purposes.

It is almost needless for me to mention the well-known stock of Berkshire pigs kept at the park, as they are well known through the country and even in England; indeed, I seldom met a well bred stock of Berkshires in any sties that I was not told were descended from the Ravensdale and Abbeyfarm stock, which were generally the winning stock at the various shows; they generally shared the prize honours whenever they were exhibited.

After leaving Ravensdale Park, the drive to Newry is through a very poor part of the country; but what Nature took from them in the soil, she has given to the inhabitants in the shape of industry; for the neat and comfortable appearance of their places is very creditable to them; but I always observe that the worse the soil, the more industrious the people, and those born with a silver spoon in their mouth never like to use the iron spade or hoe.

But on the other side of Newry begins true industry, not only amongst the farmers, but amongst the proprietors, who have started, and in some cases encouraged the starting of mills, or bee-hives of industry, seen throughout the north, and which have made it what it is by employing all extra labour that otherwise would have been thrown on the farmer, banished to America, or the poor-house; and what pleasure it is to look across such a country, with its acres of mixed husbandry, filling the towns with business every market day, making Belfast and other towns what they are, instead of what the eye meets in many parts of the south, where miles of undrained, half waste lands are seen, with very few comfortable houses, except that of the owner. And such a state of matters, in connection with the much boasted balance at the bankers, does not say much for the farmers, and far less for the proprietors, who had also Government to assist them with money: and 9 years ago I could gather 100 drainers, as good men as could be desired when working by task, in one small district; now these men are all starved off, and improvements will cost double what they would then; but, no doubt, the northern farmers have a protection in their tenant-right, but what gave it to them? It is an old saying that right is might, and in their case it was so, and Providence helps those who help themselves. They had no law to protect them more than the South, but they went a-head, and the voice of the country was with them, and custom made the right a kind of law; but the right could never be gained by taking from the soil only what Nature would give, in the shape of cattle feeding, and leaving capital idle in the bank, for which they will only get 1½ or 2 per cent.; and it is a very short time in the bank till the enterprising English will have it, to enable them to buy Irish beef with Irish money.

Miscellaneous.

Law of Hypothec and Servants' Wages: *Dunbar* v. *Cumming*.—At the Small Debt Court, Aberdeen, a case of general interest for Scottish farmers was tried, as to whether a domestic servant's wages were preferable to a landlord's hypothec. The pursuer sued the defender for a half-year's wages due to her, as domestic servant to the defender's tenant, whose effects the defender had sold off, in virtue of his hypothec as landlord. The Sheriff said the question for determination was—Whether the wages of a domestic servant were preferable to the landlord's hypothec in an urban subject? The question was important, and, so far as he was aware, there was no direct authority on the subject. In the old case of White *v.* Christie, in 1792, however, the Court had preferred the landlord to a servant. In the case of M'Glashan *v.* Athole, decided in 1816, the Court had preferred farm servants to the landlord, and this, according to the report of that case, upon the ground that the servants, having by their labour contributed to the production of the subject of the hypothec, had a preference on the *ipsa corpora*, and that for reasons of humanity and expediency the landlord should not get the benefit of their services free. The decision was altogether a peculiar one, for the same reasons which were there given for supporting a farm servant's claim applied equally to the case of an artisan, and yet it was well settled that an artisan had no preference. In his view, in M'Glashan's case legal principle was stretched to some extent to admit the servant's claim. That case was certainly inapplicable to the case of a domestic servant, who in no sense produced the subject of the hypothec. For these reasons, and seeing that the landlord's hypothec in urban subjects was a favourite of the case, he must reject the servant's claim here. Judgment of absolvitor accordingly. *Aberdeen Free Press*

Draught of Mowing Machines.—The power required to drive a mowing-machine at work may be resolved into direct draught and side draught. A good mowing-machine should be so balanced between the driving wheels and the cutter bar, by placing the line of draught nearer or further from the heel of the bar, that ordinarily there will be little or no side draught. If so placed, the end of the tongue will sometimes when at work be drawn towards the standing grass and sometimes thrown away from it by the side draught. Practically the side draught is of small account in a good machine. The direct draught depends upon three causes, and may be resolved into three parts:—1. The draught of the machine itself on its own wheels on the ground. 2. The power required to give motion to the gearing and the knife. 3. The resistance offered by the grass or other substance cut. These three several parts, added together, make up the sum total of the resistance, are called the draught of the machine, and for convenience are spoken of as pounds power, which for comparison are sufficiently accurate. Each of these separate causes varies much in different machines at the same time, and in the same machine at different times. The power required to draw the machine on its own wheels depends upon the size of the wheels, the perfection of the axles, and the smoothness of the ground, but, other things being equal, upon the weight of the machine; and in a machine weighing 600 lb. should not, on a smooth firm turf and a level field, be more than 75 to 100 lb. Adding to the weight of the machine would add to the draught just in proportion, whether that added weight be in the machine or in a driver on it. Suppose the machine to weigh 600 lb., and the draught to be 80 lb.; put a driver of 150 lb. on the seat, and you have increased the draught 25 per cent. or to 100 lb., while the power required to drive the knife and to cut the grass remains unchanged, and you have only increased the draught 20 lb. The power required to drive the knife and gearing depends upon the perfection of the gearing, the weight and velocity of the knife. It should, while differing in different machines, remain nearly the same in the same machine at different times, and would do so if they were built upon correct mechanical principles, and kept in proper order. A machine that in proper order may not require more than 10 or 20 lb. of power, may require 10 or 20 times that amount from deficiency of oil, collection of dirt in the gearing, gum on the knife, or loosening of the connections of the pitman by wearing or otherwise. The resistance of the grass to be cut will vary with every change of condition, kind and thickness of grass, and every variation in the condition of the knife and rapidity of stroke. The greater the velocity of a cutting edge after the velocity is once obtained, the less power is required to do a given amount of work. In the great trial of the New York State Agricultural

Society, the first and second causes were measured together under the name of "trial out of grass," and the third by itself called "absolute draught," got by deducting the sum of the first and second from the total amount of power required. In one or two cases machines were used which had an absolute heavier draught out of the grass than when in the grass and at work, a fact which was wondered at by the committee, and accounted for by them, but which we will consider by-and-by. The direct draught of a good machine, working under the most favourable circumstances, as shown by the trial of the State Agricultural Society, is less than 300 lb., but those favourable conditions are not always to be obtained, so that the draught must many times be much heavier. The machine having the lightest draught at a trial may not be the best machine for practical use; it may not have sufficient power to work under less favourable circumstances. The power of a machine to cut, other things being equal, depends upon the hold the wheels have upon the ground. When the second and third causes combined are sufficient to overcome the hold the wheels have, they slide, the knife stops, the machine is clogged. The heavier the machine, the less likely this is to occur; putting a heavy driver on the seat will sometimes carry a machine through, when with a lighter one it would clog. *American Paper.*

The Week's Work.

AUGUST 27: *Harvest in Scotland* is earlier than was at one time expected. A late season was never anticipated in the North; but spring-sown corn, with few exceptions, has made rapid progress to maturity from the day the seed was first put into the ground. Large breadths of Oats shot into ear before the crop covered the ground; dry, open soils indicating premature ripening in many places. The difficulty will not be when to start, and how to use the scythe and reaping machine, but how to time the several operations of cutting, stooking, and stacking to the force of manual labour at the command of the farmer—for Wheat, Barley and Oats are ripe together. Over the greater part of Scotland the command of labour is limited to a regular staff of harvest hands, so that the whole work has to be done by them; and when Oats, which generally are the last, require to be cut first, the task will be short but severe, calling into requisition the assistance of reaping machines by those who have hitherto only used the scythe.

Hemp Harvest generally takes place about this time. The practice is very diversified, and in Britain limited to a few examples, and in these the crop for the most part is pulled, tied up in small sheaves, steeped and grass-retted like flax. In some cases the sheaves are allowed to lie open and dry, and when bound up the crop is stacked like corn, and dew-retted prior to being sent to the mill for breaking and scutching. In the United States of America Hemp is more frequently cut with a hook or short scythe than pulled, and left evenly spread on the ground until fit for tying up and stacking. It is dew-retted just before the winter snows set in. When grown for both seed and fibre, Hemp is seldom water-retted or steeped. The male and female plants both yield fibre, the latter only seed. When the male plant is thus harvested with the female, there is a considerable sacrifice of fibre, and the American mode of drying and stacking involves a further sacrifice of fibre from drying in the sun. To obviate these sacrifices, small farmers who have plenty of spare time on hand first pull the male plants, which they water-rett and grass-rett as Flax, and afterwards pull the female crop for seed and coarser Hemp, but this mode of separation is slow work, and seldom practicable on large farms with hired labourers.

Ploughing in Stubble.—Sow on a clean stubble about 20 lb. of seed to the acre, after rain, and cover with bush or chain harrows.

Autumn fallows attend to as soon as the work can be begun. It has become an established fact that ploughing or smashing up land when dry is more advantageous than ploughing it wet. Steam-power has even superseded the old maxim of ploughing clay lands between the wet and the dry. The drier land is ploughed the better, and therefore the first opportunity after harvest should be embraced to prosecute the work of fallowing, with all the force at command, before the weather breaks, and the earth becomes soaked to its maximum with the rains of autumn.

The Teams in harvest require special attention in food, water, grooming, and rest. Corn crops this year will not be over-burdensome to carry on many farms, but the loads, so long as the work lasts, will be as heavy, if not heavier, than usual, and the pace fully as quick. A greater number of reaping machines is in the field, and we never saw the work of getting in autumn Turnips prosecuted with greater pressure upon the teams. "The work must be done" is the order of the day; and under such an arbitrary rule horses should have an abundance of easily digested food, with plenty of pure, soft, filtered water. Cold hard water to horses in the harvest field is worse than unwholesome, and so is water full of animal and vegetable life. There is little rest for the teams in harvest, and therefore the back of the carthorse should be relieved from the weight of the load when unloading in the stackyard, and at night thorough grooming is essential to recruit the exhaustion of the system that has taken place during the day.

Turnip-hoeing must not be neglected even in harvest. Where there is a sufficiency of moisture in the land, the first sown stubble Turnips grow with great rapidity, so that if neglected for a day or two to be singled the loss will be heavy.

Farrow Sows that bring forth their second litter attend to. Dairy porkers and bacon hogs, as the days become colder, will bear moderate forcing, but the diet should be cooling. *W. B.*

Notices to Correspondents.

AGRICULTURAL GAZETTE, *December* 28, 1867: *J. Foster.* It shall be sent to you, if in print; but you should apply to Mr. Bailey Denton, 22, Whitehall Place, Westminster, for his sheets of cottage plans.

CURING BACON: *A Correspondent from Prestwich* writes: —"Will some of your readers or subscribers kindly say which is the best method of curing bacon? I cannot prevent it turning rancid; surely there must be some plan by which this may be avoided. I know that several others are making the same complaint; and I am sure that if some effectual plan could be devised, it would be a benefit conferred on hundreds besides myself. My fruit trees are suffering from Cotton Bug; will you kindly say what is the most effectual remedy against the pest? Some time ago I had several fruit trees destroyed by them, and I was obliged to root them up; and after exposing the soil to a winter's frost and snow, planted others in their places; and now again they have made their appearance, and if not eradicated immediately, will kill these also."

EXPORTS TO THE WEST INDIES: *Mr. Thornton* informs us that Mr. Tour, of Aylesbury, has sent several pure Leicester rams to Jamaica.

FOOT-AND-MOUTH DISEASE: *A Constant Subscriber.* See leader in the present number.

ERRATUM.—See *Gardeners' Chronicle*, August 6, p. 1067. The extraordinary heat spoken of at Havre, occurred not in 1808, but in 1868, on the Sunday of the Models' Regatta, the second Sunday in August, as the writer believes. The weather was fearfully hot for weeks, as those who visited the unlucky exhibition there will remember.

Markets.

ENGLISH WOOL.

During the past week there has been a fair demand for the lower grades of Downs and other clothing wools, but in general there is little disposition to enter into engagements of any magnitude until something more definite is known as to the prospects of peace; indeed, the present uncertainty is perhaps more prejudicial to some descriptions than the certainty of a long war, as it renders it difficult to know what class of goods to work upon.

CURRENT PRICES OF ENGLISH WOOL.	Per lb.–	*s. d.*	*s. d.*
Fleeces—Southdown hoggets	.. .. ..	1 1 to 1 2	
Half-bred ditto ..	.. ..	1 2 — 1 2½	
Kent Fleeces	.. ..	1 3 — 1 4	
South Down ewes and wethers ..	..	0 ¢3 — 1 1	
Leicester ditto	.. ..	1 2 — 1 3	
Sorts—Clothing	.. ..	0 10 — 1 0	
Combing	.. ..	1 0 — 1 8	

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Aug. 25.

Prime Meadow Hay	120s. to 125s.	Clover, old ..	120s. to 130s.
Inferior do. ..	100 110	Inferior do. ..	110 120
New Hay	100 120	Prime new do. ..	100 120
Inferior do. ..	80 100	Inferior do. ..	80 100
Straw	24 30	COMMERCIAL DOCKS.	

CUMBERLAND MARKET, Thursday, Aug. 25.

Sup. Meadow Hay	120s. to 140s.	Inferior Clover ..	120s. to 130s.
Inferior do. ..	100 110	Prime 2d cut do. ..	— —
New do.	120 130	New do.	110 140
Inferior do. ..	108 115	Straw	32 36
Superfine Clover	140 150	JOSHUA BAKER.	

COALS.—Aug. 24.

Hastings Hartley, 16s. 3d.; Hollywell Main, 17s.; Walls End Hetton, 19s.; Walls End Hetton Lyons, 16s. 3d.; Wallsend Hartlepool, 18s.; Walls End Kelloe, 17s.; Walls End Last Hartlepool, 18s. 6d.; Walls End Original Hartlepool, 18s.—Sloops at market, 24; sold, 20; unsold, 4; at sea, 10.

METROPOLITAN CATTLE MARKET.

MONDAY, Aug. 22.

We have a much larger supply of Beasts than last week; trade is not brisk, but there is not much decline in the price of best qualities. The number of Sheep is about the same as Monday last; trade is active, and prices generally have advanced a little. There is scarcely any trade at all for Lambs; only a few of the choicest find purchasers at our top quotations. Trade is brisk for choice Calves. Our foreign supply consists of 2870 Beasts, 8500 Sheep, 280 Calves, and 80 Pigs; from Scotland there are 120 Beasts; from Ireland, 200; from Norfolk and Suffolk, 60; and 1090 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	5 4to5 8		Best Long wools	5 2to5 6	
Best Shorthorns ..	5 0—5 4		Do. Shorn ..	.. — ..	
2d quality Beasts	3 4—4 0		Ewes & 2d quality	4 6—4 10	
Best Downs and Half-breds ..	5 0—5 8		Do. Shorn ..	.. — ..	
Do. Shorn	— —		Lambs	4 8—5 8	
			Calves	3 0—5 8	
			Pigs	3 4—5 4	

Beasts, 2940; Sheep and Lambs, 22,300; Calves, 225; Pigs, 230.

THURSDAY, Aug. 25.

The number of Beasts is very much smaller than on last Thursday; choice qualities are very scarce, and are readily disposed of at higher rates. There are not quite so many Sheep, and there is a fair demand for them, at fully Monday's quotations. Trade for Lambs is exceedingly bad; only a few choicest qualities can be sold. We have a good supply of Calves; they are all sold at rather lower rates. Our foreign supply consists of 360 Beasts, 3450 Sheep, 455 Calves, and 90 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	5 4to5 8		Best Long-wools ..	5 2to5 6	
Best Shorthorns ..	5 2—5 6		Do. Shorn ..	.. — ..	
2d quality Beasts	3 4—4 0		Ewes & 2d quality	4 6—4 10	
Best Downs and Half-breds	5 6—5 8		Do. Shorn ..	.. — ..	
			Lambs	4 8—5 8	
Do. Shorn ..	.. — ..		Calves	3 4—5 6	
			Pigs	3 0—5 0	

Beasts, 930; Sheep and Lambs, 14,000; Calves, 600; Pigs, 110.

METROPOLITAN MEAT MARKET.—Aug. 25.

Best Fresh Butter	.. .. ..	18s. per dozen lb.	
Second do. do. ..	.. .. ..	16s. ,,	
Small Pork, 5s. 0d. to 5s. 8d.; Large Pork, 4s. 4d. to 4s. 8d. per 8 lb.			

MARK LANE.

MONDAY, Aug. 22.

There was a moderate supply of new English Wheat to this morning's market, which was sold at the prices of this day se'nnight. The market was not well attended, and very little disposition shown to purchase foreign Wheat; in some instances American was sold at somewhat less money; other descriptions were unaltered in value. Malting Barley was fully as dear, grinding and Beans and Peas rather easier. The Oat trade was firm, at an advance of 6*d.* per qr. The top price of Flour was reduced 4*s.* per sack. There were about 1000 qrs. of new white Mustard seed at market, but makers were not disposed to purchase, and we heard of no sales.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk.	White 40—53		Red.....	44—53	
— — fine selected runs do.	50—57		Red.....	47—55	
— — Talavera	52—60				
— — Norfolk	—		Red.....	—	
— — Foreign	42 63				
BARLEY, grinding & distilling 25—33			Chev. 42—48	Malting ..	36—41
— Foreign .. grinding and distilling 25—33				Malting ..	33—43
OATS, Essex and Suffolk	25—27				
— Scotch and Lincolnshire..	Potato 27—29		Feed		—
— Irish	Potato 26—29		Feed		24—27
— Foreign	Poland and Brew 25—27		Feed		20—25
RYE	32—36		Foreign ..		33—36
KIDNEY, Foreign	—				
BEANS, Mazagan	43s. to 47s..	Tick 49—50	Harrow ..		43—50
— Pigeon	51s. to 53s..	Winds —	Longpod ..		—
— Foreign	Small 45—47		Egyptian		42—44
PEAS, White, Essex, and Kent..	Boilers 38—40		Suffolk ..		40—42
— Maple, 44s. to 44s.	Grey 36—40		Foreign ..		36—40
MAIZE	—		Foreign ..		32—34
FLOUR, best marks delivered..	per sack 42—50				
— 2d ditto	ditto 38 47		Country ..		35—47
— Foreign	per barrel 20—32		Per sack..		35—01

WEDNESDAY, Aug. 24.

Supplies of Wheat on sale to-day were somewhat limited, the fresh arrivals of new English being small; there was, however, a fair show of foreign Wheat on the stands. The quality of the new English Wheat exhibited was very variable, but there were some excellent parcels on the stands; trade ruled very dull for all descriptions, but prices were without alteration from those current on Monday last. Barley was dull, and unaltered in value, while there was no inquiry for malt. Oats met a quiet sale, at late rates. Beans and Peas were inactive, at the recent decline in the quotations. Maize sold slowly on former terms. There is still a demand for Flour on French account, and country and foreign sacks and barrels were very firm in value in consequence.

AVERAGES OF THE WEEK.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 57,6	Qrs. 71	Qrs. 2289	Sacks. —
Irish ..	—	—	—	—
Foreign ..	22,220	7477	53,802	{ 17,571 { 3,360 brls.
	22,...	1347	56,771	

LIVERPOOL, Aug. 22.—We had a good attendance at our market to-day, with a fair consumptive demand for Wheat, at about last Friday's rates. Flour steady. Indian Corn firm, and about 6*d.* per qr. dearer than on Friday. Oats inactive. Oatmeal quiet.

AVERAGES.

	Wheat.	Barley.	Oats.
July 16	49s 8d	31s 2d	25s 6d
— 23	49 9	31 2	26 11
— 30	52 10	33 5	26 9
Aug. 6	54 11	31 8	28 3
— 13	54 10	32 11	28 0
— 20	54 7	33 5	25 10
Average ..	52 6	32 3	26 11

SEED MARKET.

Since our last report we have had some copious showers, having not only a most beneficial effect on vegetation, but also, as we anticipated, largely increasing the demand for all kinds of seeds required for present sowing. Trifolium incarnatum, with but little offering, must be noted 2*s.* to 3*s.* per cwt. dearer. Rape and Mustard in more request, at improving rates. Winter Tares in better demand, but the supply for the present rather exceeds the demand, sowing having scarcely commenced. Rye, winter Barley, and Oats in fair demand, at full prices. Clovers and Trefoil unchanged.

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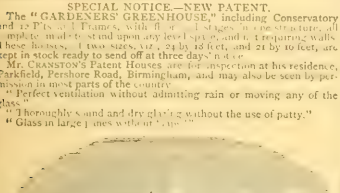

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	2-inch.	3-inch.	4-inch.
HOT-WATER PIPES, Nos 6 and 7—per yard	s. d. 0 11	s. d. 1 5	s. d. 1 11
ELBOWS, No 12 .. .. each	1 0	1 9	2 0
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SYPHONS .. .. ,,	1 4	2 4	3 8
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6 ft. by 8 ft., Double Lights, do. 2 15 0
GREENHOUSES Per ft. super.
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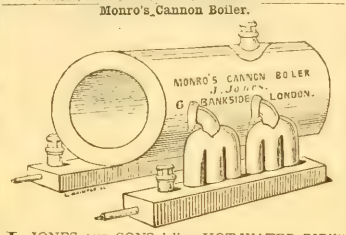

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INDIA RUBBER RINGS for Pipe Joints; Sheets, Cord, or any other packing, and are perfectly water-tight

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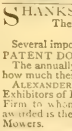

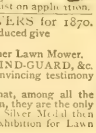

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PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.

The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.

ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

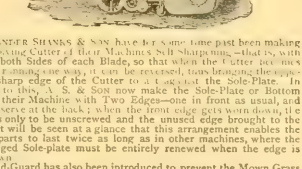

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the keen edge or sharp edge of the Cutter to bear against the Sole-Plate. In addition to this, A. S. & Son now prevent the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single-edged Sole-plate must be entirely renewed when the edge is worn down.

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There is no ribbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.

Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.

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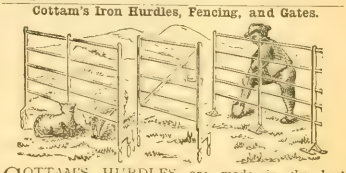

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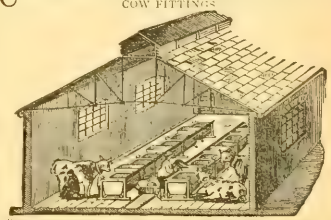

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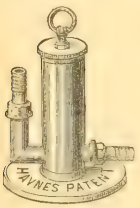

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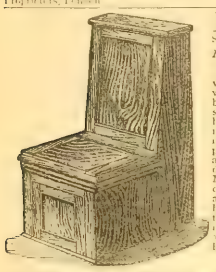

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3 " " ..	0	4½	14 " " ..	2	6	
4 " " ..	0	5½	14 " " ..	2	6	
5 " " ..	0	6½	15 " " ..	3	0	
6 " " ..	0	8	16 " " ..	3	6	
7 " " ..	0	13	17 " " ..	4	6	
8 " " ..	1	0	18 " " ..	5	0	
9 " " ..	1	2	19 " " ..	6	0	
10 " " ..	1	4	20 " " ..	7	0	
11 " " ..	1	6				

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4 inches in diameter ..	0	6½	9 inches in diameter ..	1	8½		
5 " " ..	0	8	10 " " ..	2	0		
6 " " ..	0	10	11 " " ..	2	6		
7 " " ..	1	1	12 " " ..	3	0		
8 " " ..	1	4					

Either flat or conical tops.

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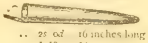

24 inches long ..	2	6½	16 inches long ..	1	4½		
22 " ..	1	10	14 " ..	1	2		
20 " ..	1	8	12 " ..	2	6		
18 " ..	1	6					

HAND GLASSES, WITH OPEN TOPS.

Each.	s.	d.		Each.	s.	d.
12 inches ..	6	6	20 inches ..	10	6	
14 " ..	7	6	22 " ..	11	6	
16 " ..	8	6	24 " ..	12	6	
18 " ..	9	6				

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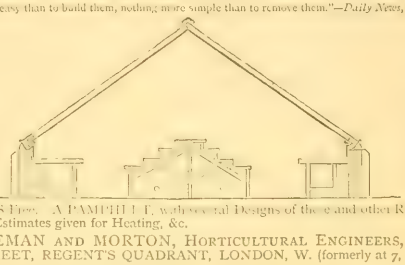

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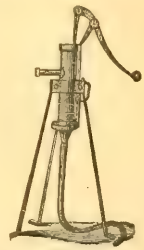

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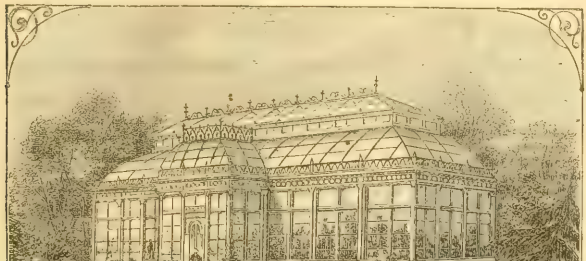

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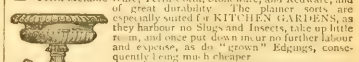

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No. 36.—1870.] SATURDAY, SEPTEMBER 3. {Price Fivepence. / Stamped Edition, 6d.

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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
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BLACK SUFFOLK PIGS.—A Litter, newly weaned, of purest blood. A Single Pig, 35*s*. a Pair, 42*s*
G. GILBERT, Claxton, Norwich.

Strawberries.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C., have great pleasure to announce that by careful attention during the past exceptionally hot summer, they are enabled to offer strong, healthy, pointed runners of approved kinds, in fine cool soil, at very reasonable prices. See pages 45 and 49 of their AUTUMN CATALOGUE, which can be had, post free, on application to

VINES. Strong, well ripened CANES, for fruiting and planting. See AUTUMN CATALOGUE, page 49.

CHRYSANTHEMUMS. Large flowered POMPON and JAPANESE kinds; exquisite plants for Conservatory and Room Decoration, at 9s., 12s., and 18s. per dozen. See AUTUMN CATALOGUE, page 27.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.

CALCEOLARIA, INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes this season at the Royal Horticultural, and other places. Per packet, 2s. 6d.

CALCEOLARIA, finest hybrid. Per packet, 2s. 6d.; smaller packets, 1s. 6d. CALCEOLARIA, finest spotted. Per packet, 2s. 6d.; smaller packets, 1s. 6d. Saved with the greatest care, and from one of the largest collections in the kingdom.

CINERARIA, choicest, mixed.—Saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2s. 6d.; smaller packets, 1s. 6d.

PRIMULA, choicest fringed varieties. The various varieties of Primula will be found grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.

PRIMULA.—Choicest mixed, fringed. Per packet, 2s. 6d.

PRIMULA.—Dark crimson. Per packet, 2s. 6d.

PRIMULA.—New scarlet. Per packet, 2s. 6d.

PRIMULA.—Rose fringed. Per packet, 2s. 6d.

PRIMULA.—Choicest white fringed. Per packet, 2s. 6d.

PRIMULA.—Choice Fern-leaved mixed. Per packet, 2s. 6d.

PRIMULA FIMBRIATA Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2s. 6d.

Forwarded (limited) only on receipt of Post-Office Order.

JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

To the Trade.

JEAN VERSCHAFFELT begs to offer the following plants, of which he possesses a very fine stock, at the undermentioned low prices, viz.:—

CAMELLIAS, 1 to 1½ foot, with buds, all fine sorts, named, selections of 100 in 25 distinct varieties, £6 10s. and £9.

OTAHEITE ORANGES, fine plants, full of fruit, 22s. per dozen.

Extra-sized plants, extraordinary strong, 36s. per dozen.

JASMINUM GRANDIFLORUM, grafted plants, very fine flowering species, 2s. per dozen.

LATANIA BORBONICA, 2-yr. seedlings, in single pots, 40s. per 100.

ARALIA TRIFOLIA, 2-yr. seedlings, strong, 5s. per 100.

For Early orders see Steamers.

Steamers sail weekly from Ghent direct to Goole and London, and from Antwerp to all the principal ports of England. All letters to be directed to

JEAN VERSCHAFFELT, Nurseryman, Ghent, Belgium.

JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, begs to offer—

100 LATANIA BORBONICA, in pots, ready March, 30s. to 40s.
100 HOLLY, striped and green, named, £8, £12, £16.
100 MOSS ROSES, good plants, 25s.
100 RHODODENDRONS, 1 shoot with roots, for grafting, £1.
100 Do. do., 2 and 3 shoots with roots, for grafting, £8, £10, £12.
100 AZALEA INDICA, with flower buds, £1, £5, £6.
100 AZALEA HARDY GHENT, best sorts, with all flower buds, £5.
100 AZALEA MOLLIS, 3,000 kinds, 25s. and 42s.
100 MAGNOLIA LENNI, 1 foot, £12.
100 CEDRUS DEODARA, in small plants, £1.
100 THUYA ELEGANTISSIMA, 1 foot, £12, £15.
100 ABIES NORDMANNIANA, 1½ to 2 feet high, and more through, fine plants, £12 [Three months' credit.]

To the Trade.

F. GEE begs to offer (fine selected stocks) NEW SEEDS for present sowing, as follows, for cash:—

GREEN-TOP YELLOW SCOTCH TURNIP, 2s. per bushel
EARLY STRAP-LEAF TURNIP, 2s. per bushel
EARLY SIX WEEKS or STUBBLE TURNIP, 2s. per bushel
Fine ESSEX RAPE, 12s. per bushel
Fine WHITE MUSTARD, 10s. per bushel
WHITE FIELD PEAS, 6s. per bushel
TRIFOLIUM INCARNATUM, 65s. per cwt.

New 4 Bushel Sacks charged 1s. 3d. Remittances must accompany all orders. Seed Establishment, Biggleswade, Beds.

Substitutes for the Clover Crop.

JAMES CARTER AND CO. can strongly recommend TRIFOLIUM INCARNATUM (Italian Crimson Clover) for the above purpose. The seed may be sown at once upon lands where the Clover crop has failed, and will be certain to produce a valuable sward for consumption in May and June.

Messrs. CARTER also prepare a special mixture of hardy quick-growing Clovers and Grasses, which if sown at once will ensure a most acceptable green crop in early spring.

Too much importance cannot be attached to the quality of the Seeds used, so as to secure a clean after-tilth, and the utmost care is taken by Messrs. CARTER to carry out this object.

Sow 2½ to 2 bushels per acre. Price 18s. to 24s. per acre.

BROMUS SCHRŒDERI, if sown early, will produce a heavy crop of forage in spring and several after cuttings in one season. Sow 50 lb. per acre. 1s. per lb.

MUSTARD, TRIFOLIUM MENAYIUM, CARTER'S SUPERFINE ITALIAN RYE-GRASS, RAPE. } Lowest prices on application.

All goods carriage free.

JAMES CARTER AND CO., Seed Farmers, 237 and 238, High Holborn, London, W.C.

SILVER SAND and PEAT, from Bedfordshire, also SCREENED and HAMPSHIRE PEAT, in any quantity.—This sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depôt.

THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT FLOWER PACKING CASE, and MILLER'S PATENT PORTMANTEAU, FAMILIES, and TOURISTS' SEASIDE COMPANION.

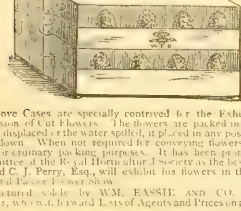

The above Cases are specially contrived for the Exhibition and Transmission of Cut Flowers. The flowers are packed in water, and cannot be displaced or the water spilled, if placed in any position, even if upside down. When not required for conveying flowers, they can be used for ordinary packing purposes. It has been pronounced by the Committee of the Royal Horticultural Society as the best case now in use, and C. J. Perry, Esq., will exhibit his flowers in them at the next Crystal Palace Show, Sept. 3rd.

Manufactured solely by WM. EASSIE AND CO. (LIMITED), Gloucester, who will forward Lists of Agents and Prices on application.

Superb New Bedding Plant,

VIOLA CORNUTA VAR. PERFECTION.

B. S. WILLIAMS has much pleasure in offering a new SEED of the above, and from the manner in which it has been tested, both in dry and exposed situations, as well as moist and shady places, he has no hesitation in asserting its superiority over every other Viola yet offered for bedding purposes. It is of free growth, yet seldom exceeds 6 or 8 inches in height; the leaves are much larger than those of V. cornuta, whilst the flowers, which are borne well above the foliage, still retain the characteristic horns of that species, but are fully three times the size, and of good substance; the colour is shaded blue, the eye orange-yellow, with a dark purple disc surrounding it, from which proceeds radiating lines of still deeper purple; indeed, it resembles a gigantic V. cornuta in habit, and, whilst retaining its profuse blooming qualities, producing flowers which almost rival our florist Pansies for size and substance. Was awarded a First-class Certificate by the Floral Committee when exhibited before them (Sept. 25, 1869) by Mr. Jobson, of Rotherfield Park, its raiser, which no similar Viola has received.

None is genuine unless B. S. W.'s name and address is on each packet. Price 1s. 6d., 2s. 6d., and 5s. 6d. per packet.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

B. S. WILLIAMS

NEW and CHOICE FLOWER SEEDS,

Post Free.

	Per packet—s.	d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and	5 0
CALCEOLARIA, Neill's extra choice strain, 2s. 6d., 3s. 6d., and		5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &		5 0
CARNATION, from Prize flowers		1 0
CYCLAMEN, Wiggans' Prize strain	1s. 6d., 2s. 6d., and	3 6
CENTAUREA CANDIDISSIMA	1s. and	2 6
ECHEVERIA METALLICA, new bedding plant		2 6
HOLLYHOCK, from Chater's finest varieties	1s. and	2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and	3 6
PYRETHRUM (Golden Feather)	1s. and	2 6
PANSY, from Prize Flowers	1s. and	2 6
PANSY, finest Belgian varieties	1s. and	2 6
PANSY, Cliveden Blue, Purple and Yellow	each	1 0
LEPTOSIPHON ALATUS. This is a charming companion to our Hybrid Solanums for Autumn and Winter Decoration, and cannot be too highly recommended. The berries are snowy white, and produced in great abundance	1s. 6d. and	2 6
EAST LOTHIAN STOCKS, per collection of three colours		2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and	1 6
PINK, finest double fringed		1 0
VIOLA CORNUTA ALBA	1s. 6d. and	2 6
WALLFLOWER, New Golden Tom Thumb		1 0
WALLFLOWER, Scholders' fine dark variety		1 0
Hunt's Auricula-eyed SWEET WILLIAM		0 6
FACSONIA VAN VOLXEMII, splendid greenhouse climber		2 6

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Wheelers' Cocoa-nut Cabbage.

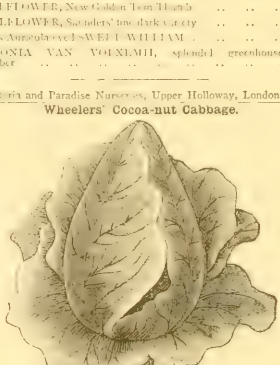

WHEELERS' COCOA-NUT CABBAGE is a new and very early variety, perfectly distinct, and of most excellent flavour. 1s. per packet, post free. Price List on application.

WHEELERS TOM THUMB LETTUCE (true), 1s. per packet; small packet 6d., post free.

J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

Choice New Seeds.

CHARLES TURNER can now supply the following, all of his own sowing, and from his unrivalled Collections:—

	Per packet—s.	d.		Per packet—s.	d.
Auricula, stage	2	6	Pelargonium, bal. orchesses	2	6
alpine	2	6	Primula sinensis fimbriata	2	6
Carnation	2	6	rubra	2	6
Cineraria	2	6	Dutto alba	2	6
Calceolaria	2	6	Perfect	2	6
Cyclamen	1	0	Lobelia speciosa alba	1	0
Pansy	2	6	,, primula grandiflora	1	0

The Royal Nurseries, Slough.

CHOICE SEEDS for PRESENT SOWING, free by post. Per packet.—s. d.

CALCEOLARIA, Wheeler's superb unsurpassed strain 2s. 6d. to 5 0
CINERARIA of the finest strain, in great variety, 1s., 1s. 6d. and 2 6
PRIMULA, of the finest strain, mixed 1s. 6d. to 2 6

The Trade supplied with CALCEOLARIA and CINERARIA, TROPŒOLUM POLYPHYLLUM, a splendid hardy species for the open ground, golden yellow flowers, in long tresses, trailing on the ground. Tubers ready.—DRY TUBERS at 100s. per 100

GEO. WHEELER, Nurseryman, Seedsman and Florist, Warminster, Wilts

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but P. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 23, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, and may be had wholesale and retail of P. PARSONS, Nursery and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint; price 2s. 6d. per packet.

The Agents for the Show will be duly raised shortly.

"NEWTON" NURSERIES, CHESTER.—A These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.

Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES and all particulars on application.

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

Dutch Flower Roots.

DOWNIE, LAIRD, AND LAING, have now received their first importation of FLOWER ROOTS, consisting of—

HYACINTHS, POLYANTHUS NARCISSUS, DOUBLE NARCISSUS, CROCUS, TULIPS, JONQUILS, RANUNCULUS, ANEMONES, SNOWDROPS, &c., &c.,

which have all been carefully selected from the most celebrated Establishments in Holland.

The Bulbs have arrived in splendid condition, being unusually well ripened, very large, and exceedingly heavy.

D., L. & Co. can supply fine Bulbs of the PRIZE HYACINTHS at Kensington, Regent's Park, Crystal Palace, and Royal Caledonian Society's Shows, at 12s., 15s., and 24s. per dozen.

Descriptive CATALOGUES of DUTCH BULBS forwarded post free.

Stanstead Park Nurseries, Forest Hill, S.E.; and Edinburgh, N.B.

Dutch Bulbs and other Flower Roots.

CHARLES TURNER has just received his first importation of BULBS, which are unusually fine, and in the best possible condition for immediate orders. If the selection is left to C. TURNER, they will be supplied at the following low prices, in fine variety:—

HYACINTHS, best kinds for glasses or pot culture, 6s. to 18s. per doz.
,, mixed, for beds or borders, 3s. 6d. per dozen; 25s. per 100.
(In ordering Hyacinths, it should be stated whether Single or Double are preferred.)
TULIPS, Early, 6s. to 15s. p. 100 } Can be supplied by the dozen
,, Double, 6s. to 15s. per 100 } at proportionate prices.
,, Van Thol, 9d. per dozen; 5s. per 100.
NARCISSUS, 1s. 6d. to 3s. 6d. per dozen.
JONQUILS, 2s. 6d. to 3s. 6d. per dozen.
SNOWDROPS, Single, 2s. 6d. per 100; Double, 3s. 6d. per 100.
CROCUS, in large variety, 2s. 6d. to 4s. 6d. per 100.
ANEMONES, and other Bulbs for the season, at equally low prices.
LILIUM AURATUM, extra strong flowering bulbs, 2s. 6d. to 7s. 6d. each.
LILY of the VALLEY, imported clumps, 18s. per dozen
SPIRÆA JAPONICA ,, 15s. and 18s. per dozen

Descriptive CATALOGUE on application.

Also CATALOGUE of Auriculas, Azaleas, Carnations, Chrysanthemums (large), Chrysanthemums (Pompon), Cinerarias, Pelargoniums (show and fancy), Picotees, Tanks, and Roses; as well as a Descriptive CATALOGUE of Strawberries, Fruit Trees, &c.

The Royal Nurseries, Slough.

HOOPER & CO.'S

CATALOGUE OF BULBS, &c., FOR THE COMING SEASON

IS NOW READY: ILLUSTRATED, CORRECT, AND INTERESTING.

Intending purchasers are solicited to send for a Copy.

The advantages of early planting, both for indoors and out, cannot be overrated.

HOOPER AND CO., COVENT GARDEN, LONDON, W.C.

DUTCH FLOWER ROOTS.

BENJAMIN S. WILLIAMS,

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.,

BEGS TO ANNOUNCE THAT HIS

ANNUAL CATALOGUE OF DUTCH FLOWER ROOTS,

Containing all the best varieties of HYACINTHS, TULIPS, CROCUSES, NARCISSUS, CYCLAMENS, LILIUMS, &c., also

A SELECT LIST of FRUIT TREES, ROSES, &c., for AUTUMN PLANTING,

is now ready, Post Free on application.

CARTER'S
SEEDS, BULBS, &c.,
CARRIAGE FREE.

☞ From and after the 1st of September, 1870, JAMES CARTER AND CO. *will pay Carriage on all Garden and Agricultural Seeds, Dutch Flower Roots, and Potatos, without any increase on their published prices,* so that purchasers in England will have these Goods Delivered Free of Cost at the nearest Railway Station, and in Ireland and Scotland Delivered Free at the nearest Port.

CARTER'S
COLLECTIONS OF BULBS
FOR CONSERVATORY AND WINDOW DECORATION,

Price from 10*s.* 6*d.* to 84*s.*, including packing, and carriage free.

CARTER'S No. 4 Collection of Bulbs for Conservatory and Window Decoration, including box and packing, and carriage free, price 21*s.*, contains—

Hyacinths, 12 in 12 extra fine named sorts	Tulips, Tournesol, 6
Polyanthus-Narcissus, 6 in 6 varieties	,, Rex rubrorum, 3
Jonquils, sweet scented, 12	,, La Candeur, 3
Crocus, finest named, 50	,, Royal Standard, 3
Dielytra spectabilis, 1	,, Yellow Prince, 6
Lilium speciosum, 1	,, Rosa Mundi, 1
Scilla sibirica, 6	,, Duc Van Thol, 6
Snowdrops, extra large selected, 24	Amaryllis formosissimus, 1
	Ixias, finest mixed, 6
	Sparaxis, finest mixed, 6
	Triteleia uniflora, 6

CARTER'S
COLLECTIONS OF BULBS
FOR CONSERVATORY AND OUTDOOR PLANTING,

Price from 15*s.* to 84*s.*, including packing, and carriage free.

CARTER'S No. 10 Collection of Bulbs for Conservatory and Outdoor Planting, including box and packing, and carriage free, price 15*s.*, contains—

Hyacinths, 6 in 6 extra fine named sorts for pots or glasses	Scilla Belgica, mixed, 6
,, mixed bedding, 6	Crocus, blue, 50
Narcissus, double, white, 6	,, large yellow, 50
,, Pheasant's-eye or Poeticus, 6	,, white, 50
Tulips, extra fine mixed, 12	Anemones, extra fine mixed, 18
,, Tournesol, 3	Gladiolus Brenchleyensis, 4
,, Rex rubrorum, 3	Iris, extra choice mixed English, 6
,, Royal Standard, 3	,, extra fine mixed Spanish, 6
,, Yellow Prince, 3	Jonquils, Campernelle, 6
Double Daffodils, 6	Ranunculus, extra fine mixed, 18
Star of Bethlehem, 6	Snowdrops, 24

CARTER'S
COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING ONLY,

Price from 10*s.* 6*d.* to 84*s.*, including packing, and carriage free.

CARTER'S No. 15 Collection of Bulbs for Outdoor Planting only, including box and packing, and carriage free, price 10*s.* 6*d.*, contains—

Hyacinths, fine mixed, 9	Crocus, yellow, 25
Narcissus, double white, 6	Snowdrops, 25
,, Pheasant's-eye, 6	Winter Aconites, 12
Double Daffodils, 6	Gladiolus Brenchleyensis, 3
Tulips, extra fine mixed, double, 6	Iris, finest mixed Spanish, 12
,, extra fine mixed, single, 6	Lilium candidum, 2
,, extra fine mixed, late, 6	,, tigrinum, 2
,, Duc Van Thol, 6	Anemones, finest mixed, 12
Crocus, blue, 25	Ranunculus, finest mixed, 12
,, white, 25	Star of Bethlehem, 6

JAMES CARTER & CO.'S
CATALOGUE OF
HYACINTHS, TULIPS, CROCUS & OTHER BULBS, ROSES, FRUIT TREES, &c.,

Containing full particulars of the above Collections, is now Ready, and will be forwarded Gratis and Post Free on application.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

EARLY FEED
FOR SHEEP AND CATTLE

MAY be OBTAINED by SOWING DURING SEPTEMBER,

Suttons' Rapid Growing Grasses and Clovers.

This Mixture consists entirely of the quickest growing varieties, and will produce a crop of green food to feed off in November, and a heavy crop for mowing in the following May or June, after which it may be ploughed up. Sow 2 bushels per acre. Price **12s.** per bushel.

Suttons' Improved Italian Rye-grass,
The best and most productive in cultivation.

September is an excellent month for sowing our Improved Italian Rye-grass. Price **7s. 6d.** per bushel; cheaper by the quarter. Carriage Free. Also

TRIFOLIUM INCARNATUM, | MUSTARD,
BROMUS SCHRÆDERI, | RAPE,
And other Seeds for Autumn Sowing.

SUTTONS'
IMPORTED FLOWER ROOTS.
SUTTON & SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS,
HAVING RECEIVED their FIRST CONSIGNMENT of
CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

Suttons' £2 2s. Collection for Open Ground, Carriage Free, contains—

24 fine mixed Border Hyacinths	12 fine mixed Gladiolus
12 ,, Polyanthus Narcissus	25 Duc Van Thol Tulips
25 Pheasant's-eye Narcissus	12 mixed Single Early Tulips
25 Double White Narcissus	12 fine mixed Double Tulips
50 Double Daffodils	12 ,, Parrot Tulips
12 large Campernelle Jonquils	12 Gesneriana Tulips
100 fine mixed Double Ranunculus	50 fine mixed Tulips
100 Scarlet Turban Ranunculus	12 ,, English Iris
25 fine mixed Double Anemones	12 ,, Spanish Iris
25 ,, Single Anemones	6 Lilies, choice
100 Crocus, in 6 sorts	6 Ferraria Pavonia
100 Snowdrops	12 Dog-tooth Violets
50 Winter Aconites	6 Orange Imperials

Sutton's £1 1s. Collection, Carriage Free, contains—

12 fine mixed Border Hyacinths	6 fine mixed Gladiolus
6 ,, Polyanthus Narcissus	12 Duc Van Thol Tulips
12 Pheasant's-eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 ,, Parrot Tulips
6 large Campernelle Jonquils	6 Gesneriana Tulips
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 Scarlet Turban Ranunculus	6 ,, English Iris
12 fine mixed Double Anemones	6 ,, Spanish Iris
12 ,, Single Anemones	3 Lilies, of sorts
100 Crocus, 3 sorts	3 Ferraria Pavonia
50 Snowdrops	6 Dog-tooth Violets
25 Winter Aconites	3 Crown Imperials

Suttons' 10s. 6d. Collection of Flower Roots
For OPEN GROUND, contains a choice assortment for a Small Garden.

FOR INDOOR CULTIVATION.

Suttons' £2 2s. Collection, Carriage Free, contains—

24 fine Hyacinths, by name	6 Persian Iris
12 fine Miniature Hyacinths, do	6 Peacock Iris
12 Polyanthus Narcissus, do	100 Crocus, by name
6 large Double Jonquils	12 choice Tulips, by name
12 Single Sweet-scented Jonquils	6 choice Sparaxis, by name
12 Scilla præcox	1 Cyclamen persicum
12 Single Duc Van Thol Tulips	1 Tropæolum tricolor
12 Double Tournesol Tulips	2 Lilium candidum, a bulb
50 Early Tulips, 10 sorts	2 ,, ,, rubrum

Sutton's £1 1s. Collection, Carriage Free, contains—

12 fine Hyacinths, by name	3 Peacock Iris
6 Miniature Hyacinths, by name	50 fine Crocus, by name
6 Polyanthus Narcissus, do.	6 choice Ixias
6 Single Sweet Jonquils	3 choice Sparaxis
6 Scilla præcox	3 choice Oxalis
6 Single Duc Van Thol Tulips	1 Tropæolum tricolor
6 Double Tournesol Tulips	1 Lilium lancifolium album
25 Early Tulips, 5 sorts	1 ,, ,, rubrum
3 Persian Iris	

Suttons' 10s. 6d. Collection of Flower Roots
For POTS or GLASSES, contains a choice assortment of most useful and showy kinds.

The best 12 Hyacinths, by Name, for 12s.,
Extra fine Double and Single varieties.

For further particulars, with complete Cultural Instructions, see

SUTTONS'
AUTUMN CATALOGUE FOR 1870,
Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

☞ *Five per cent. allowed for cash payments.*

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

VIOLA LUTEA MAJOR.—A free growing and flowering variety, habit and strength of plant intermediate between Viola cornuta and the Cliveden varieties of Bedding Pansies; flowers brilliant golden-yellow, very large, borne in great profusion, from March to October. Very valuable either for Spring and Summer Bedding. Plants for Pedigree, 1*s.*

First-class Certificate awarded at Royal Horticultural Society's Show, May 4, 1870.

First-class Certificate awarded at Royal Botanic Society's Show, May 25, 1870.

ROBERT PARKER, Exotic Nursery, Tooting, Surrey, S.W.

JAMES' INTERNATIONAL PRIZE CALCEOLARIA.—The Plants of this splendid strain were awarded the 1st prize by the Royal Horticultural Society, at their Spring Show, May 11, and we beg to state, as a Caution to Purchasers, that we hold the Entire Stock of Seed raised by the Grower, and supplied to us direct. Price per packet, 2*s.* 6*d.* and 5*s.* Prices to the Trade on application.

JAMES CARTER AND CO., The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

ROYAL LEAMINGTON SPA.—HORTICULTURAL SHOW, to be held at Leamington, on TUESDAY and WEDNESDAY, September 13 and 14, in connunction with the Warwickshire Agricultural Society.

President—The Right Hon. the EARL of WARWICK.

SPECIAL PRIZES OPEN TO ALL ENGLAND.

Class B, No. 24—12 Ornamental Foliage Plants, 1st Prize, £10; 2d, £5; 3d, £2. Class B, No. 31—For the best Specimen Greenhouse Plants, 1st Prize, £10; 2d, £5; 3d, £2. Class B, No. 37—For the best Collection of Plants, arranged for effect as for a Conservatory, 1st Prize, £5; 2d, £3; 3d, £2. Class B, No. 38—For the best Basket or Stand of Plants arranged for a Drawing-room, 1st Prize, £2; 2d, £1; 3d, 10*s.* Class C, No. 39—For the best 36 Spikes of Gladioli, 1st Prize, £5; 2d, £3; 3d, £2. Class C, No. 43—For the best 48 Roses, single stems, 1st Prize, £5; 2d, £3; 3d, £2. Class D, No. 53—Fruit, 12 varieties, excluding Pines, 1st Prize, £5; 2d, £3; 3d, £2.

Latest date of ENTRY, SEPT 6. Early Entries are particularly requested. Prize-lists, with Forms of Entry, may be had from Mr. J. MEASURES COOKES, Honorary Secretary, Leamington.

BRIGHTON and SUSSEX FLORAL and HORTICULTURAL SOCIETY'S GRAND EXHIBITION of PLANTS, FRUITS, and CUT FLOWERS, will be held at the Royal Pavilion and Eastern Lawn, on WEDNESDAY and THURSDAY, September 14 and 15. Prizes are offered on the same liberal scales as former years. In addition the Railway Company have to guarantee, for the Last Eight Seasons, an average of £100 a day at the Abbury Cup (the Eight Guineas), for the best Ten Dishes of Fruits of the Exhibitor's own growth. Schedules on application to the Secretary, 36, St. James Street, or J. STARY, Superintendent of the Exhibition, Victoria Gardens, Brighton. EDWARD CARPENTER, Sec.

The Gardeners' Chronicle

SATURDAY, SEPTEMBER 3, 1870.

MEETINGS FOR THE ENSUING WEEK.

TUESDAY	Sept. 6	Crystal Palace Flower show.	
WEDNESDAY	Sept. 7	Royal Horticultural Floral Committee, at 25 Kensington Gore	11 A.M.
		Ditto (General Meeting)	3 P.M.

THE subject of ACCLIMATISATION is one which has often been discussed in this Journal. Fierce debates have been held as to the possibility of the occurrence. LINDLEY, *salve magne nomen*, vehemently opposed the notion, and yet was the means of making known in these columns a larger number of instances of the process, whose existence he denied, than probably any one else. As in most similar disputes, the discordance of opinion would cease if once the disputants would agree as to the exact sense in which they employ the word. Every one admits that when a plant of one country is transferred to another, having different climatic conditions, a change in that plant's constitution takes place. The change may be for good or for ill, but a change there is, without doubt. If that change be beneficial, if it be such as to enable the plant to adapt itself to the new conditions and to thrive under them, then we hold that acclimatisation has taken place. It will be seen that we here use the word in a general sense, entirely independently of any advantage which we, as cultivators, may derive from the change. The modifications which enable the plant to sustain itself under novel circumstances, may be, and often are, of such a nature as to destroy the utility of the plant for man's purposes, but this fact, however unpleasant to practical men, must not be taken in evidence against the theory of acclimatisation, quite the reverse.

Some writers, while they admit the possibility of acclimatisation in the case of the "race," deny it to the individual. The original immigrant, say they, remains unchanged, but its offspring may be modified for good or ill, according to circumstances. We fail to perceive the accuracy of this reasoning, because if the constitution of the parent plant were not in some way or another affected it would not have the power of producing new individuals endowed with different temperaments. Every one admits, because the thing is so obvious, that amongst a batch of seedlings some will be much more hardy than others. It is so even with the kidney Bean, a plant supposed to be comparatively little variable. There must be certain circumstances more favourable than others for the production of hardy varieties of this character, and did we but know what they are, we might avail ourselves of this valuable property. In any case it is certain that, by careful "selection," we have it fully as much in

our power to "fix" this quality of hardihood as we have to secure the perpetuation of a flower of any particular form or habit.

Now, if by the process of selection we can seize on a certain variation and perpetuate it, if we can rear a race that will maintain itself under conditions where its progenitors could not—and no one who knows what gardeners have done already will deny the possibility of this,—then acclimatisation is no mere chimæra, but it is a fact. It remains for the cultivator to turn it to good account, or rather, we should say, the experimentalist and the man of science must first show the way, and having done so successfully, the practical man is pretty sure, from very self-interest, to follow the lead. It is in this way that experimental gardens, especially in our colonies, may, when properly directed, do so much good, nay, have done, and are doing, so much service. And this leads us to mention incidentally the proceedings of the Horticultural Society of Victoria, which seems, thanks to the labours of Mr. CLARSON and others, to be doing very useful work. In the report of the Society for 1869, a copy of which lies before us, we find the following passages, which we extract in illustration of what we have above said as to the effect of different climatic conditions in modifying the constitution of plants:—

"In a register provided for that purpose, a record is kept of each tree as it fruits in the garden. In this register is regularly entered the name of the tree, the character of the stock, the wood, foliage, and blossom of the tree, the period of ripening, the qualities of the fruit, its true definition, and every particular which can prove of interest to the grower. Though much of this trouble has little apparent concern for the casual observer, or may appear unimportant, it all has a very important bearing when testing the character and value of a tree; and the record here obtained will prove one of the most valuable works extant.

"The recorded observations of those residing in a climate like that of England are far from reliable, as a guide to growers in this climate, and numerous illustrations might be given of this. Several of the Pears grown in England, and reported upon as merely 'stewing' Pears, are found here to be melting and delicious dessert varieties; while many of the Apples which are characterised by English authorities as of no special merit are so changed by climate as to be among our most valuable varieties.

"Last year the committee reported the reception of a case of fruit tree cuttings from the Royal Horticultural Society's Gardens at Chiswick. These cuttings were grafted last season, and the committee now report that notwithstanding the severe drought of last summer, a large number of the varieties have succeeded, and of these, scions are this year available for further stock. The success of this experiment induced the committee to request a further consignment. The cuttings here alluded to were taken from the trees growing in the Chiswick Gardens in the pruning season of 1867 (October); they were shipped by the 'Anglesey,' in December, and arrived at the Gardens in April, 1868. There being at that season of the year no stocks in a condition for grafting, the cuttings were preserved with but slightly impaired vitality until the following August, when they were grafted.

"It will thus be seen that a period of more than nine months elapsed from the time they were cut from the trees. Nevertheless, 66 Apples, 72 Pears, 24 Figs, 5 Vines, and 8 Plums, have been saved of this consignment.

"The experiment is exceedingly interesting, as it proves conclusively that, in the form of cuttings, all the new varieties of fruit trees may be introduced with the certainty of success. The importance of this result will strike all who have experienced the losses and disappointment attending the importation of the trees. The introduction of new varieties is by this means rendered a very simple and inexpensive matter. A case of 6 cubic feet capacity will contain some thousands of cuttings, the trees of which would require a space equal to many hundreds of tons measurement. Another advantage with the cuttings is, that the case may be hermetically sealed and stowed away like ordinary merchandise; whereas, special instructions as to care (which is seldom exercised) have to be given as to the stowage of the cases containing trees."

The importance of the fact here chronicled is readily appreciable, and we shall look forward with much interest to the future records of the Society to see if any, and what, changes are wrought in the quality of the fruit so obtained, and how far these alterations are dependent on climate—how far on the nature of the stock employed.

An influential meeting was held on Wednesday sennight at NOTTINGHAM, under the presidency of Lord BELPER, the Lord-Lieutenant of the county, for the purpose of taking into consideration the desirability of forwarding a request to the Council of the Royal Horticultural Society to hold its provincial exhibition for the ensuing year in that town. Wolverhampton, the town selected for the meeting of the Royal Agricultural Society, is, if we may judge from a letter in our last issue, likely to institute an independent exhibition. Whether this be so or not, it has been, to our thinking, abundantly proved that the Royal Horticultural Society has gained nothing, but rather the reverse, from its association with the Agricultural Society. It was received with lukewarmness by the officials at Oxford, and our predictions as to the non-success of the exhibition in that town were abundantly verified. In the present instance the case is altogether different. Nottingham is a large town; it teems with operatives, by whom gardening as a hobby is enthusiastically pursued—how enthusiastically is well told in Mr. REYNOLDS HOLE'S amusing book on the Rose. It is surrounded by a fertile and well "gardened" neighbourhood. Gardens of first-rate repute are comparatively plentiful in the vicinity. The "Dukeries" are not far removed, but, more than all, there is a large class of amateurs among the gentry, as among the artisans, who love gardening for gardening's sake, and who are willing to give time, labour, and money in the cause. On these accounts, therefore, we can but look on Nottingham as a very appropriate place for such an exhibition. The Nottingham people have shown that they really desire the Society to visit their town. The Society has not had to ask the town to receive it, but the conditions have been precisely reversed.

We learn that other places have already, or will shortly prefer a similar request, so that there can be little doubt of the continuance and success of these provincial shows. Reverting to the meeting at Nottingham, it has been a matter of satisfaction to us to see that the proposed exhibition has been so warmly taken up by the gentry and amateurs of the neighbourhood. The gardeners are not likely to be behindhand, and the nurserymen may be trusted to look after their own interests.

It must be remembered that the success or failure of such an exhibition depends, to a large extent, on the gentlemen of the neighbourhood. If they forbid their gardeners from exhibiting, the show becomes an advertising medium for the trade, and little else; and the true horticultural spirit, as manifested by the exhibition of plants from the love of gardening and love of plants and cultural skill, becomes degraded into a mere commercial speculation.

It is the more desirable that the country gentleman and the artisan—the amateur, in fact, to whatever social grade he belong—should take a prominent part in such an exhibition, as an uncomfortable impression is abroad that such exhibitions are too much pervaded by the commercial element, and worse, that the moral atmosphere of our flower shows is not so pure as it might be. For our own parts we do not believe in these injurious rumours. There may be a basis of fact in them, but a large superstructure of misapprehension has been built on it. It is alleged that in some cases, at any rate, the exhibiting gardener in his zeal may be led to use means incompatible with strict honesty; that he is tempted to deal with his master's property as if it were his own, and to descend to trickery and questionable practices in order to get together a collection for purposes of exhibition, and that a general demoralisation of gardeners, especially young ones, is likely to result from the undue multiplication of flower shows. In other words, that the evil tendencies and propensities manifest on the racecourse are gradually making their appearance in the flower show. With good opportunities for knowing the true state of the case, we do not hesitate to express our opinion that the rumours we have alluded to are to a large extent unfounded. There may be isolated cases where an exhibitor is a rogue, and uses the exhibition as a field for his roguery; but when that is so, the man would be sure to manifest his evil propensity at some time or another, exhibition or no exhibition, and it is not fair to condemn the system because an occasional scapegrace makes use of it to subserve his own evil purposes. To condemn the system of exhibitions is indeed preposterous, for to them is mainly due the present advanced state of horticulture amongst us—an advance which might have been all the greater had there been more harmony and better feeling between scientific and practical men.

Moreover, if, for argument's sake, it be allowed that the temptation and opportunities for dishonesty at flower shows be great, the probability of speedy detection is also great, and the evildoer is particularly liable to be "hoist with his own petard." There are dishonest gardeners and fraudulent exhibitors, doubtless, and their influence would be most detrimental were it not kept in check by the better feeling and sounder practice of the majority. The judges at flower shows as a rule are quite beyond suspicion, and they would, and do, resolutely set their faces against any evil practices of which they may be cognisant. Still, in view of these injurious allegations we press on the various societies and their staff the urgent necessity of being on the watch for the slightest improper practice on the part of exhibitors or other frequenters of flower shows, and the imperative duty of sternly discountenancing the slightest deviation from strict morality. The stealing of cuttings, of which we had several complaints last season, should, under proper management on the part of the officials, be rendered all but impossible. Flower-show managers also have it in their power to neutralise the injurious impression that is likely to gain ground, that "exhibiting" is the be-all and end-all of gardening, by enlarging the scope of their exhibitions, and not unduly limiting it to certain classes of plants to the exclusion of others. A good display must be secured, but good cultivation and the fostering a taste for new and interesting plants in contradistinction to those which are merely showy or commercially valuable should also be aimed at, else flower shows will become mere bazaars.

By taking a large share of the management of these shows into their own hands amateurs have it in their power to keep their beloved pursuit as free from evil taint as any human institution can be; and it is on this account that we rejoice to see the Nottingham folk so earnest in their desire to co-operate with the Council of the Royal Horticultural Society. We have little doubt that, in its turn, the latter body will reciprocate the good feeling, and, taught by past failures, do its utmost to secure a satisfactory exhibition.

—— As above stated, the Right Hon. Lord BELPER, the Lord-Lieutenant of Nottingham, presided, on Wednesday, the 24th ult., at a meeting held in the Mayor's parlor, NOTTINGHAM, for the purpose of considering the desirability of inviting the ROYAL HORTICULTURAL SOCIETY to hold its annual provincial exhibition in Nottingham in 1871, when the following resolutions were passed unanimously, viz.:—

1, Proposed by Alderman THACKERAY, J.P., and seconded by Mr. J. LEE, J.P.:—

"That the present meeting considers it desirable to invite the Royal Horticultural Society to hold their great provincial flower show in Nottingham in 1871, and that the Lord-Lieutenant (as chairman) be requested to communicate this wish to the President of that Society."

2, Proposed by Mr. BARBER, J.P., and seconded by Mr. T. R. STAREY:—

"That a guarantee and local subscription list be at once commenced, as evidence that Nottingham is prepared to give the Royal Horticultural Society a proper reception."

3, Proposed by Mr. J. W. LEAVERS, and seconded by Mr. F. GOODHALL:—

"That a committee be formed, consisting of the Mayor (chairman), Mr. J. Smith Wright (treasurer), Mr. E. J. Lowe (secretary), Mr. H. Sherbrooke, J.P.; Sir H. Bromley, J.P.; Mr. R. Milward, J.P.; the High Sheriff, Mr. R. Birkin, J.P.; Mr. F. C. Smith, M.P.; Mr. C. Seeley, M.P.; Mr. Davy, J.P.; Rev. S. Reynolds Hole, Mr. H. Akroyd, Mr. W. Newton, Dr. Robertson, Mr. R. Birkin, jun., J.P.; Mr. S. R. P. Shilton, Mr. Knight, Mr. Forman, Capt. H. Farmer, Mr. Windley, J.P.; Mr. J. R. Pearson, Mr. Gadd, Mr. Speed, Mr. Ingram, Mr. Cruickshank, Mr. Evans, Mr. Henderson, Mr. Tillery, Mr. Lamb (with power to add to their number). Also, that the Mayors of Derby, Leicester, Grantham, Retford, and Newark, be invited to form district committees to co-operate with that at Nottingham."

4. Proposed by the MAYOR, and seconded by Mr. R. BIRKIN:—

"That the thanks of this meeting be given to the Right Hon. Lord Belper for his kindness in presiding."

—— The ROYAL ALBERT HALL at South Kensington is rapidly approaching completion, and the numerous workmen who are engaged in its construction, with an instinctive appreciation of its future mission, get up daily concerts amongst themselves during a portion of the dinner-hour. On the anniversary of the late PRINCE CONSORT'S birthday, the usual concert was performed with a little more than ordinary elaboration. An amateur assisted with his violin, and a bugler perched somewhere afar off in the roof tested the acoustic capabilities of the building with a succession of resonant melodies. A boy named BRITTON, says the *Daily News*, with the purest and freshest tenor voice we have heard for some time, sang one or two pretty ballads, and the more mature artisans also contributed songs and choruses. The effect of the whole was to establish, beyond dispute, Colonel SCOTT'S success in erecting a building within which 10,000 persons can sit comfortably, and hear distinctly every note, either vocal or instrumental, that comes from the great

orchestra. The main purpose of the International Hall has, therefore, been effected, for there can be no doubt that it is as a leviathan concert-room it will be mainly used. It must be remembered that the acoustic necessities demanded that the building should take the form of an ellipse, and, having an ellipse to deal with, it cannot be denied that Colonel SCOTT has been successful in procuring favourable architectural results. About the hearing capabilities of the interior there can be no doubt whatever. The works which are to connect the hall with the Industrial Exhibition of 1871, are in a satisfactory state of forwardness. The galleries over the Italian arcades of the Horticultural Society's garden are nearly finished, and these will be connected with the upper circle of the hall. The facilities for promenading will be very great—first, within the new galleries in which the contributions will be exhibited; second, along an external gallery running along the tops of the Italian arcades; and thirdly, in the great conservatory, which communicates with the hall, and which, when lighted up at night, will be a perfect fairy palace. The various foreign nations which have promised their co-operation to next year's exhibition are proceeding vigorously with the construction of their departments, and most conspicuously the French, who have not allowed the terrible war now waging to interrupt or even slacken for a moment their preparations at South Kensington.

—— We learn that the prospects of the forthcoming EXHIBITION of FLORISTS' FLOWERS at the Crystal Palace are satisfactory. The entries for the show give promise of a very extensive exhibition. The following gentlemen have consented to act as judges:—For Dahlias: Mr. Charles Turner, Slough; Mr. Richard Dean, Ealing; and Mr. W. Holmes, Hackney. For Hollyhocks and Gladioli: Mr. J. Standish, Ascot; Mr. J. Fraser, Lea Bridge; and Mr. Kinghorn, Richmond. For Asters, Verbenas, and Roses: the Rev. C. Peach, Appleton-le-Street; Mr. Lidgard, Hammersmith; and Mr. Edmonds, of Chiswick. And for vases of cut flowers: W. Thomson, Esq., Penge.

—— We have not heard of any one in this country who has tried the hardiness of OPUNTIA RAFINESQUIANA. It appears from the statement of M. LOUESSE that the plant survived the last winter at Paris without any protection whatever, even though the temperature fell to as low as —13° Centigrade. The plant is a native of Missouri, Illinois, and Mexico, and produces yellow flowers, which are succeeded by elongated violet-coloured fruits.

—— The ninth volume of M. DECAISNE's excellent work, the "JARDIN FRUITIER DU MUSEUM," contains the completion of the account of the more important Pears in cultivation, of which M. DECAISNE describes and figures no less than 317 varieties. To make the history of the genus as complete as possible, M. DECAISNE now adds, in the 104th part of his magnificent publication, an account of certain species or varieties growing wild, or apparently so, in different countries, and which have been regarded as distinct species by various authors. Great interest attaches to these trees, inasmuch as they, or some of them, are the parents of our domestic varieties. Among the trees so mentioned is the Polwiller Pear (Pyrus Polvilleriana), a hybrid form, thought by BAUHIN to be intermediate between the Apple and the Pear. The Polwiller Pear, says M. DECAISNE, affords a remarkable illustration of the persistence of characters in a hybrid tree, perpetuated for three centuries by grafting, and which affords strong evidence against the opinions of those who maintain that our old varieties of fruit trees degenerate and disappear. The only plants of the Polwiller Pear known are those derived originally from the hybrid form described by BAUHIN. In 1860, out of 150 fruits collected in the garden of the Museum, M. DECAISNE found only 13 seeds well formed, and these seeds, when sown, produced four very different forms. In 1864, 139 of these small Pears furnished 62 seeds; in 1867, 50 seeds which were obtained from the Jardin des Plantes of Dijon all proved sterile. Lastly, in 1865—a very hot and dry summer—it was found necessary to cut open 356 fruits in the Museum garden in order to obtain a single well-formed seed. Among the four forms derived from the seed of the Polwiller Pear, three were remarkable for the small size of their leaves, while their pubescence was like that of the parent tree, or that of Cratægus Aria. The seedlings belonging to the fourth form seemed to M. DECAISNE to belong entirely to the category of cultivated Pears, but were not referable to P. communis, the leaves of which are roundish. On the other hand, the bark of old trees of P. Polvilleriana remains smooth and greyish, like that of Cratægus Aria, instead of cracking and becoming blackish like those of the Pears.

—— The MAXIMUM TEMPERATURE of the AIR during the week ending August 27 in England varied from 77°.4 at Portsmouth to 62° at Newcastle, with a mean of all highest for the several stations of 69°. In Scotland it varied from 70°.5 at Glasgow to 62° at Greenock, with a mean for all stations at 65°.6. The MINIMUM TEMPERATURE in England varied from 49° at Liverpool to 38° at Hull, with a mean of all lowest for the several stations of 43°. In Scotland it varied from 47° at Greenock to 37°.5 at Paisley, with a mean for all stations of 43°.6. The MEAN TEMPERATURE of the AIR in England varied from 57°.3 at the two southern stations, Portsmouth and Blackheath, to 52°.6 at the northern station, Newcastle, with a mean for the several stations of 54°.7. In Scotland it varied from 53°.9, at Glasgow and Perth, to 52°.2 at Paisley, with a mean for all stations of 53°.3. The RAINFALL was very large at several of the stations (see Mr. GLAISHER's Tables in our present issue). At Wolverhampton the fall on Monday, the 22d ult., amounted to 1.05 in. At Bristol, Birmingham, and Bradford, the falls on Tuesday the 23d amounted to 1.20 in., 0.81 in., and 0.63 in. respectively; whilst on Saturday the 27th the falls at Wolverhampton, Liverpool, Manchester, Eccles, and Hull amounted to 0.66 in., 0.79 in., 1 in., 1.12 in., and 0.76 in., respectively. The mean fall for the week, for all stations in England, was 0.87 in., and in Scotland was 0.47 in.

—— Vast flocks and herds for the sustenance of Paris during the siege now arrive every day, and are placed in pens in the BOIS DE BOULOGNE, PARIS. The parks and lawns in the neighbourhood of Passy and La Muette now present, says a correspondent of the *Daily News*, the aspect of old Smithfield market 50 times magnified.

—— We are now enabled to give an illustration (fig. 227) of the AUSTRALIAN NUT, specimens of which were transmitted to the Oxford meeting of the Royal Horticultural Society by Dr. HOOKER. It will be seen that the fruit in question has a leathery rind, like that of a Walnut, within which is a hard woody stone, enclosing the large nut-like seed. The flavour of these nuts is fully equal to that of a Kentish Filbert. For a full account of the plant producing this nut, Macadamia

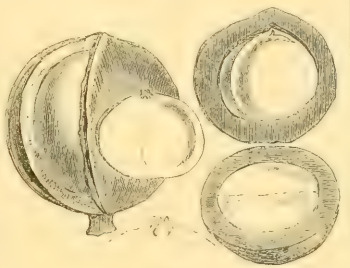

FIG. 227.

ternifolia, we refer to a former number, p. 1231 (1869). The plant was introduced to English gardens by Mr. W. BULL, and has been exhibited by Messrs. E. G. HENDERSON & SON.

—— We gain some notion of what a SIEGE means when we learn from PARIS that the veteran director of the Jardin des Plantes, the well-known chemist, CHEVREUL—aptly called, from his researches into the nature of fatty substances, "the king of the fatty acids,"—has placed himself at the head of a brigade composed of *employés* of the Museum, and betaken himself to the fortifications. M. DELAUNAY, the Observer, and M. MILNE EDWARDS have marched to the scene of action at the head of nearly the whole of the officers and servants of the Academy of Sciences and the Muséum. What should we think here in London if the chief librarian of the British Museum, with Professor OWEN and Mr. BENNETT as his *aides*, took the field with their subordinates and occupied Shooter's Hill, or if the director at Kew, with his staff, took upon themselves the defence of Richmond Hill? And yet this is what it has come to in Paris. When the war shall be over, as we all hope it may soon, one of the most needful reforms in the state of public institutions in France will be that in the Jardin des Plantes. Imperial *régime* has certainly not been favourable to science.

POTATOS IN SOMERSETSHIRE.

SOME of the Somerset and Dorset horticultural shows, and especially those of Shepton Mallet and Sherborne, are remarkable for the fine quality of the vegetables produced at them. By general consent, Sherborne is considered to make the finest display, having a fine rich loam that suits all kinds of vegetables well. At the exhibition of the Shepton Mallet and East Somerset Horticultural Society on the 17th ult., at Shepton Mallet, there was a wonderful display of Potatos, as fine in quality as they were varied in character. To give some idea of the competition in the two classes for half a peck of round, and the same of kidney Potatos respectively, furnished by cottagers, I counted no less than 43 lots, and there was not a bad dish of tubers among them. In the corresponding classes for subscribers to the show, there was to be seen the same extent and quality, and here 42 lots were staged. Three prizes were offered to cottagers for a basket of six varieties, and these were shown in tea-trays, or shallow boxes and baskets with divisions for each variety, about 16 tubers of each. There was a large number of these baskets competing. The leading kidney Potato was a handsome medium-sized smooth variety, named Lady Paget, with scarcely a trace of an eye, so uniformly even was the surface. I endeavoured to get the history of this Potato from some of the cottagers, but beyond the fact that one or the other had grown it for some time past, I could get nothing definite. The leading round variety was the Early Emperor, or Somersetshire Red, very fine, and in form the model of a round Potato. In cultivating the variety the Somersetshire cottagers evince a decided preference for a Potato of high class quality. The kidney varieties were:—Cheddar Dwarf, a very fine and smooth tuber; Doctor Kidy, a large and somewhat coarse-looking tuber, but said to be much esteemed by the cottagers; Fluke Kidney, very fine; Myatt's Ashleaf, a perfect sample in a few instances; Jackson's Imperial, a medium-sized, very smooth kidney, of fine shape; Perfection, a variety much stained about the eyes with red, small, but of fine shape; Taylor's Kidney, fine and handsome; Black Ashleaf, a veritable "nigger" among the fair-skinned kinds around it; Cornish Kidney, large in size, of good shape, but coarse looking; Eardrop Kidney, a medium-sized smooth variety; Morning Star, much in the same way; Walnutleaf, very fine quality; Chagford Kidney, in shape and appearance very inviting; Gloucestershire Kidney, small in size, but good looking; Prince of Wales, large in size, but with a very coarse appearance; Ashtop Fluke, both large and coarse; and Pink-eyed Ashleaf, a good looking Potato. Of round varieties the leading kinds appeared to be a lapstone-shaped Potato named King, of fine quality; Pink-eyed Regent, of good appearance, but rather deep in the eye; Pebble, a deep-eyed Regent; Fortyfold, very smooth skin and good looking, but deep in the eye; Lily-white, a round tuber of excellent appearance; Red Rough, deep-eyed, but a good-looking sort; Pheasant's-eye, having small purple eyes; Arrowsmith's Seedling, a pink-eyed round tuber; Paignton Victoria, apparently the same as Paterson's Victoria; Paterson's Blue, large and good looking; Purple King, a large, dark, but smooth tuber; Wellington, of the Regent type, much stained with red about the eyes; Scammell's Glory, a half-lapstone-shape tuber, much stained with purple; White Fortyfold, very like the common Regent; Breezee's Prolific, one of the new American kinds, appearing of good quality to look at; Chesseter's, a large, coarse-looking, round tuber; Purple Fortyfold, and Snowball, a good-looking handsome tuber. There is no doubt many of these are purely local names, but the number of them, and their general good quality, points to this district as a Potato growing one; and this quality was not confined to the Potatos alone, but extended to most of the vegetables staged on this occasion. The size of some of these (by no means in most instances, at least, divorced from quality,) would have astonished the denizens of districts that had suffered from the drought; but the fields round Shepton Mallet had a rich and luxuriant appearance, green, and vigorous in growth, the happy result of a heavy rain a few days previous to the show, which must indeed have been a rain, as one "native" informed me a single drop which fell on his coat sleeve covered a space of 6 inches square. This rain had materially aided the development of the vegetables, and a fine lot was accordingly produced. In most instances collections of vegetables were shown in oval-shaped clothes-baskets, very nicely arranged, and the quality would have shamed many a large provincial show. One basket shown by a cottager contained capital Globe Onions, a fine young Cabbage, Parsnips of excellent size and quality, young Vegetable Marrows, Scarlet Runners, and British Queen Peas—all in a fine state of fitness for table; and the characteristic of quality was evident throughout the contributions. In most instances the vegetables were arranged in the basket previously to bringing them to the show, and during the journey a clean white cloth was carefully covered over it, to keep the contents fresh and clean.

Any allusion to the Shepton Mallet show would be incomplete without some announcement of the fact that a flower show at Shepton means a general holiday. Every shop, other than those for vending refreshments, is kept closed; triumphal arches, festoons of evergreens and flowers, various types of house decoration—all tended to make the clean little market town as gay as possible. There is to be observed on all hands a general outbreak of spontaneous enthusiasm. A flower show is not a *fête* day merely for the few engaged in horticultural pursuits, but for all the inhabitants; and from the surrounding villages come in hundreds of visitors, in holiday attire, and the showfield during the afternoon is a moving mass of delighted spectators. Surely this Somersetshire town has well earned the title of "plucky little Shepton." *R. D.*

New Garden Plants.

× CYPRIPEDIUM DOMINIANUM, *Rchb. f.*

Pedunculo pluriflore; bracteis spathaceis acuta ovaria pedicellata subdimidio æquantibus; ovario pilosulo; sepalis oblongo-triangulis; petalis caudatis ciliatis, labello saccato, antice juxta ostium retuso; staminodio transverso antice apiculato, basi utrinque rotundato, postice barbato.—*Scientific Dominicanum*, Hort.

It is a very interesting fact that Mr. Dominy has been so fortunate as to raise a mule between C. Pearcei and C. caudatum, which has nearly every organ intermediate between the two. The leaves are broader than in Pearcei, narrower than in caudatum. The spike is like that of Pearcei, showing three flowers at once in

full expansion, not produced one after the other, as in Pearcei. The colours are nearly those of caudatum, whose nice blotches on the inner lip are preserved. It is immediately recognised from C. caudatum by the acute bracts, from C. Pearcei by the transverse (not rhomboid) staminode, and the hairy ovary. We have not the least doubt that the new curiosity will be welcome to amateurs, the more so since it is of the freest growth, as Messrs. Veitch, the possessors, have informed us. We feel highly pleased to name the novelty in honour of Mr. Dominy, to whose skill we are indebted for so many highly curious additions to our knowledge of hybrids. *H. G. Reichb. fil.*

CAMPSIDIUM, *Reiss. et Seem.*

Calyx campanulatus, coriaceus, limbo 5-dentato, æquali. Corolla tubulosa, leviter curvata; limbo 5-lobo, lobis subæqualibus. Stamina 4, didynama, cum rudimento quinto. Antheræ parallelæ, nudæ. Stigma bilobum. Capsula elliptica, compressa, lævis, loculicida. Septum valvis contrarium. Semina alata, pluriseriata. Frutex scirrhosus volubilis, chilensis et chiloensis, glaberrimus; ramis angulatis; foliis oppositis 3—7-jugis cum impari, petiolo alato, foliolis ovato-oblongis vel ellipticis, utrinque obtusis vel acutis, sæpe mucronatis, margine dentatis vel subintegerrimis, supra læte viridibus, subtus pallidioribus; racemis terminalibus simplicibus, 4—9-floris, pedunculis elongatis, bibracteolatis, bracteolis linearibus acutis, petiolis pedunculis calycibusque purpurascentibus, corollâ aurantiaco-rubra vel sanguinea, filamentisque villosis, ovario glabro. Species unica. — *Campsidium chilense*, Reiss. et Seem. MSS. in Herb. Vindob.; Seem. in Bonplandia, vol. x. p. 147, t. 17. *Tecoma Guarume*, Hook in Bot. Mag., t. 4896, in adnot. (non De Cand.). *Tecoma valdiviana*, Phillipi in Linnæa, 1857, p. 14. *Tecoma mucronata*, Hort. Nomen vernaculum Chiloense, "Pilpil Boqui," teste Bridges. — Geographical Distribution: Chiloe (Bridges' W. Lechler' n. 474, King!): island of Huafo, Int. 44° S. (Inglis!) in Herb. Hook.!; Arique, near Valdivia (Lechler! Plant. Chil. n. 1751).

This beautiful Bignoniacea (fig. 228) occurs between latitudes 40° and 44° S., and climbs over trees with a height of 40 to 50 feet. Nevertheless it is not mentioned in Gay's "Flora of Chile." Sir William Hooker thought it identical with Tecoma? Guarume (Bignoniaalata, Pav.), but authentic specimens of Bignonia alata in the Berlin Herbarium prove it to be identical with Tecomaria fulva, Seem. (Tecoma fulva, De Cand.); and the plant to which Sir W. J. Hooker alluded is the type of a genus allied in habit to Campsis, Lour., but differing from it in the shape of the corolla, and with parallel, not divaricate, anthers. Campsidium has, however, no rooting branches, nor is it furnished with tendrils like most climbing species peculiar to America, but seems to be winding like Pandorea. It is a graceful climber, with pinnate leaves, and orange-coloured racemes. For a knowledge of the plant I am indebted to Professor Phillipi, of Santiago de Chile, who was good enough to transmit it to me in a letter. When Dr. Reisseck and myself imposed on the species the name of chilense, we were unaware that Phillipi had already described it under the name of Tecoma valdiviana, and strictly speaking, Campsidium valdiviana is the name it ought to bear. Occurring in high southern latitudes there is every reason to believe that the plant may prove hardy in the southern parts of England. *Berthold Seemann.*

THE ORCHARD HOUSES AT CHISWICK.

THE span-roofed house at Chiswick (see p. 1054) is close to the long, lean-to house, which is described at p. 1087. This form of orchard-house is popular, and deservedly so. It has advantages peculiar to itself, which could not well be secured otherwise; but it is by no means the earliest in production, nor the warmest in the winter months. For these two reasons alone I have always wondered at its adoption in northern or locally cold situations. Nor is it safe along the exposed sea coasts. The large house at Chiswick would not endure for an hour a pressure of 55 lb. per square foot, which the island of Guernsey, with its numerous but well built lean-to vineries, underwent only last September. A mere equinoctial squall would shake this house so thoroughly as to loosen and break half of its glass. Very lately the only large span-roofed house here was nearly uprooted, and had to be subsequently protected by high walls and other precautions. This house is only 60 feet long by 20 wide, and has strong rafters, with solid stone walls forming the sides, with glass above them for ventilation, while this very lofty Chiswick orchard-house is, I think, about 100 feet long by 30 wide, and has only inch-thick boarded sides.

Of course such fearful gales are not frequent, nor is an inland situation so exposed as near the coast; still I cannot help thinking that these quite unnecessarily lofty houses are insecure anywhere. An American writer in this Journal, commenting on my recommendation to stake Maize plants, says "that a wind which was strong enough to uproot Maize, would also uproot trees." Well, both of these are of continual occurrence here. Many of our trees were thus prostrated last September, and all my Maize was levelled; but having been staked, it was not, in many cases, uprooted. In other gardens where staking had been neglected the crop was ruined. Ten years ago one of my orchard-houses, 100 feet long, was blown down before my eyes in about 30 seconds. Everything was destroyed. It fell upon an adjacent house, and broke most of the glass. The splinters then spoiled the flower garden. One end—called the "jib" by the workmen here—was hurled bodily 20 yards off. On another occasion, another house of mine was left, as it were, suspended in the air, in a squall, the earth round it having been torn away by the fall of trees, which were there for shelter! The house was built near a steep place, and the trees fell into the valley beneath.

Remembering these, and many similar accidents elsewhere, I could not admire the lofty proportions of the Chiswick house; nor did the length seem to me at all in harmony with the breadth and height. It had to me the air and look of a glazed barn more than of an orchard-house for real work. For what it has to do the height to the apex of the roof is perfectly unnecessary. As nearly as I could judge it was 16 feet.

The sides were only 6 feet in height, which is far too low, especially here. Half of this was glass, and the rest only wooden planking, 1 inch thick. These wooden sides had a mean appearance in what is really a national garden. In a house of such pretensions 2 or 3 feet of solid brick and 5 feet of glass would have been more suitable, and in better style. But that which to me is most unsuitable is the shortness of this house compared with its breadth and height. It produces a stunted and dwarfed look, as if the whole structure had been reduced while building it.

Mr. Rivers' glass span-roof compares, to its own advantage, with this one, being of the same length, but 6 feet narrower, and 4 feet less in height at the apex, the sides being a few inches lower than at Chiswick. Even these excellent proportions I would venture to alter thus: the house should be at least five times as long as it is broad. The sides should be somewhat higher; but even in this case, the height to the apex of the roof should not be more than 12 feet. In short, for such a style of training as is adopted at Sawbridgeworth and Chiswick in span-roofed houses, of pyramids and bushes in pots, with a few standards in the centre of the borders, the height of 12 feet is by far the best. The reason is obvious; the trees are even then by no means too near to the glass anywhere. In Peach culture, all who look to colour in fruit must bear this in mind.

Entering the Chiswick-house, one is struck with the even and regular appearance of the trees. At the period of my visit (in April) they were in full bloom, and setting rapidly. The air was pure and bright, and the temperature in the house felt like 70°, with a gentle current everywhere. No draught; no stagnation; a warm sun overhead; trees carefully pruned, and mulched, too, with a foot deep of leaves over and around the pots, retaining heat and moisture.

Everything which skill could do was done of course. There were two rows of potted trees along the sides and at the ends, and large central borders. The main walk was in the centre. Two rows of wooden pillars, painted blue and white, supported the roof, the ventilation of which, on the lanthorn principle, I prefer to openings at either end, as being easily worked, and regular in action. Only, however, the alternate windows at the sides could open for ventilation, which, in such a season as the present, might be insufficient. The glass was stout 21 oz., and I estimated the size of the panes at 18 inches by 13. The lowest row of planking was hinged for ventilation, &c. The trees looked very promising and healthy. Cherries and Apricots equally so, and no crowding anywhere.

From this house I went on to the lower one close by. This is in the first style of such houses, and would easily prove what I have here stated, that lofty houses are unsuited to pot culture. For this house, though more crowded than the other, was in excellent condition, and the trees looked quite as well as in the larger house, though so much more economical a structure. The ends are not even of glass, but of mere boards. The sides have only hinged wooden ventilators of a foot or so in width. This house has a central border in which fine old potted trees were plunged in a foot of leaves, a few prolific Fig trees and Vines in pots; bloom abundant, air pure, and circulation free; in short, a very thriving house, bearing more in proportion to its neighbour.

About this period of my visit the superintendent kindly joined me, and we went together over the houses, of the culture in which I could not but speak very highly of course. I only wish I had the designing of a cordon-house to confide to his skilful treatment. We have not yet realised the fact that "the orchard-houses of the future" will not quite resemble the present ones. This is inevitable in horticulture, especially where glass is a chief agent, and when its advantages shall be more appreciated than even now. Of one fact I feel persuaded, and that is, that our successors will give up the pretty but unsound idea of growing a little of everything in their orchard-houses, and of making them receptacles of seething bedding plants and of spring crops in pots. It cannot be sound practice to grow Vines, Peaches, Apricots, Figs, Cherries, and Plums in the same limited space under glass. It would be preferable to subdivide our present huge houses, to lower their roofs, and to increase their length. On the score of appearance a short, broad, and lofty glass building is inferior to a long, low, narrow one. But if this last has the central portion somewhat more raised than the ends (which it is easy to do), then in utility and beauty it will much excel any "barn-like" house.

If I mistake not, Mr. Rivers has his original orchard-house still doing as good work as his latest—only he

has adapted that work to its form. No doubt he could, and does, grow as fine a Peach in that house as can be grown in such a house as the lofty span at Chiswick. Nay, we might carry this principle so far as to assert that a handsomer fruit can be grown under a ground vinery than in a Crystal Palace.

Returning to the large house, I think that groups of spiral cordons—say of seven trees each—would much vary the rather monotous tone of the trees, which are pyramids and bushes, with standards here and there. Three groups of these spiral cordons, ascending round wires of slight iron rods to the lofty apex, would relieve the "flatness of the scenery." Having myself introduced these spiral cordons into orchard-houses, and having a number of them in most luxuriant bearing, I should feel great interest in their trial in this model house. The superintendent seemed to me to enter warmly into my wishes on this matter. So lofty a house is admirably adapted for cordons, either diagonal or spiral, or for both styles together. There are at present in good places, houses, suggested by myself, of immense size, in which diagonal cordons, trained in six parallel rows, fill the whole of the building. Five walks enable the pruner to attend to these splendid trees, the beauty and fertility of which surpass all other styles, and are very much superior to the Chiswick houses, only for this cause that the cordon system of training is here well developed. For such trees I will admit that rather lofty houses are required, but not for potted trees. This is a distinction too often lost sight of. The amateur should resolve, at first starting, on what he intends to cultivate. If potted trees, then I should recommend him to have a smaller and a lower house. If cordon trees, he will then require more height, especially at the sides, and a narrower house altogether, because cordons are flatter and occupy less lateral space.

My own favourite house is a lean-to. It has about 13 feet (clear measure) of training space for the large 12 years old diagonals on the back wall. The rate of production of these is something fabulous. Then come groups of spiral cordons in the borders, twisted round thin wooden pillars, equally good, and five in each group. Between each group are low flat standards in the border, so as to allow the sun to shine on the lowest portions of the diagonals on the back wall. In front is a row of bushes, also in the border, but unsatisfactory as making too much wood. These will be changed to pots again, or into cordons, in some shape or other, but I am sorry to have to sacrifice so many fine trees. Thus we have but three rows of trees in all, a walk near the glass, and another near the back wall. The house is only 15 feet wide inside, but there is no crowding. Vertical cordons in pots at the ends serve for trial trees, &c.

This house would be improved by additional length, for in cordon training it is difficult to know where to stop, all being so regular and continuous; whereas, with pots, the monotonous tone of culture requires a break for effect.

Sixteen years of orchard-house pruning and training have taught me that there is good in everything, but that not to distinguish but rather to confuse is a retrograde step in horticulture. *T. C. Bréhaut, Richmond House, Guernsey.*

HEATHERSIDE RIVAL CUCUMBER.

We have on several occasions during the present season received examples of the above-named Cucumber, and in all the points which, as we take it, go to constitute a good Cucumber, we have found none to equal the Heatherside Rival. However strange it may seem, it is none the less a fact that truly good Cucumbers are but rarely seen; even at our exhibition tables the great mass of Cucumbers exhibited are more than frequently very inferior. They are irregular in shape and size, and possessed of a neck one-third the length, watery, &c. Perhaps the most popular Cucumber of the present day is Telegraph, and of this there are various types—two thoroughly good ones having been sent out respectively by Mr. William Paul and Messrs. Rollisson. Of these we prefer that of Mr. Paul. It is more compact, and with a much shorter neck, which is a great point. The Telegraph is a very prolific variety and forces well; it is, however, just at times a little soft and watery. The Telegraph is evidently a descendant of the old Syon House, a smooth green sort, which again is descended from the Smyrna. Then, again, Mr. Pearson sends us his Long Gun, a good sort, of somewhat similar character; and Mr. Turner his Blue Gown, which is a black-tipped spine, very handsome, and has as yet carried everything before it.

It is a singular thing that, notwithstanding the favour which we as gardeners have for the Syon House breed of Cucumbers, and their undoubtedly handsome appearance, their wonderful freeness of fruiting, &c., they are not general favourites in Covent Garden. The great call is for black-spined Cucumbers. And they say they are of better flavour, and are much firmer in the flesh, &c., and so far they are correct. The great fault of the black spines has been in their being so short and stumpy. In the Heatherside Rival we have undoubtedly the nearest approach to a model Cucumber we have yet seen. It is of fair length, from 15 to 18 inches, about 1½ inch in diameter, perfectly uniform in thickness from the stalk to the very tip: there is no long neck or handle; the surface is smooth, of a dull green colour, with a small setting of black spines; these are small, and distantly situate. The flesh is exceedingly firm, of excellent flavour, and the core or seed part exceeding about one-third the diameter of the fruit. This is a prodigious bearer, and capitally adapted for either summer or winter fruiting. It is a hybrid of Mr. William Dean's, who will, we suppose, soon send it out. *B.*

LILIES.

[The following notes are translated from a paper of M. Duchartre, which has appeared in successive numbers of the Journal of the Imperial and Central Horticultural Society of France. They refer specially to the fine collection of Lilies brought together by M. Max Leichtlin, of Carlsruhe. We subjoin a list of the species and varieties of this genus cultivated by that gentleman, and with which we have been favoured by him. The "!" attached to some of the names is intended to indicate the certain correctness of the name: the "?" on the other hand, implies either a doubt as to the correct name, or indicates that the name given is merely a provisional or garden appellation: the letter "*r*" is attached to those species which are most remarkable for the beauty of their flowers; while the letter "*n*" indicates new species.]

In the third edition of the "Species Plantarum," dated 1762, Linnæus noted nine species only of this genus, which are also enumerated exactly in the same order in the "Systema Vegetabilium" of 1774, edited by J. A. Murray, in conjunction with the great Swedish naturalist. The nine species are:—1, Lilium candidum, from Palestine, Syria, and Cadiz, of which two varieties are mentioned; 2, L. bulbiferum, from Italy, Austria, and Siberia, with seven varieties; 3, L. pomponium, from the Pyrenees and Siberia, with two varieties; 4, L. chalcedonicum, from Persia, and Platina in Carniola, with two varieties; 5, L. superbum, from N. America; 6, L. Martagon, from Hungary, Switzerland, Siberia, and Leipsic; 7, L. canadense, from Canada; 8, L. philadelphicum, from Canada; 9, L. kamschatkense, from Canada and Kamschatka. As to the characters by which Linnæus distinguished these nine species, they suffice to separate the four last mentioned, which have whorled leaves, from the five first in which the leaves are always scattered, that is to say, alternate, or arranged spirally. Of these five two have bell-shaped, erect flowers—L. candidum, and L. bulbiferum. The three others have pendulous flowers, the segments of which are rolled back; these are, L. pomponium, L. chalcedonicum, and L. superbum. L. candidum, the white Lily of gardens, is easily recognised by its flowers, of a colour so white that their purity has become proverbial; their segments are smooth internally. L. bulbiferum has bright orange flowers, the segments of which are studded on their inner surface with numerous small projections. Moreover, as is indicated by its name, it developes in the axils of its upper leaves numerous small bulbels, by means of which the plant may be propagated. Of the three species with pendulous flowers, the American L. superbum is a large and fine plant, the flowers of which are destitute of projections from their inner surface, and are of a reddish orange colour, marked with numerous blackish spots; L. pomponium and L. chalcedonicum have flowers of the same form, varying in colour from bright red to yellow, but L. pomponium has narrow linear leaves, channelled on the upper surface, and having a prismatic or triquetrous form, while L. chalcedonicum has rather broader lanceolate leaves, thickly crowded over the whole length of the stem. Of the four species with whorled leaves, L. Martagon may be distinguished by its pendulous flowers, generally of a purplish colour, but varying much in hue, and always having the segments of the flower rolled back in the form of a turban; hence the name, Turban Lily.

L. philadelphicum is easily recognised by its erect flowers, of a reddish orange colour passing into yellow towards the centre, where it is marked with purplish black spots. The segments of the perianth are narrowed below into a long stalk. L. canadense has slightly pendulous bell-shaped flowers, the segments of which are somewhat rolled back, of an orange-yellow colour, marked internally with a quantity of purplish black spots. L. kamschatkense has rather small erect bell-shaped flowers, of a deep reddish purple colour, passing into yellow towards the base, where they are marked with small black spots. Five of the plants above-named grow naturally in Central or Southern Europe, the remaining four are peculiar to North America. The eastern part of Asia, and particularly Japan, which lately has contributed more than any other country to our knowledge of this genus of bulbous plants, were entirely neglected by the immortal botanist, although in the "Amœnitates Academicæ" (5th fasc. p. 870 to 872), published in 1712, Kæmpfer had noted several Lilies as natives of this part of Asia, and especially those which at a later period received the names of L. cordifolium, L. speciosum, and L. tigrinum, but these Japanese species were soon brought into notice. Thunberg, whose "Flora Japonica" was published in 1784, and whose whole idea was to refer the Japanese forms to European species, soon saw how ill-founded his previous opinion was. In a memoir, entitled "Botanical Observations on the Flora Japonica," published in the second volume of the "Linnean Transactions of London," he established the following species:—1st, L. cordifolium, the Sjire, Sjiroi and Osjiroi of the Japanese and of Kæmpfer, which had previously been called Hemerocallis cordata by Thunberg himself in his "Flora of Japan," p. 143; 2d, L. speciosum, the Kiasbiako, or Konokko Juri, of the Japanese and of Kæmpfer, and which had been called in his earlier work L. superbum; 3, L. longiflorum, called L. candidum in the "Flora Japonica," the Biakko of Kæmpfer; 4th, L. lancifolium, the name of which has been unfortunately transferred by all our horticulturists to L. speciosum, thus causing lamentable confusion. It had been previously indicated in the "Flora Japonica" as L. bulbiferum. It was by mistake that Thunberg applied to L. lancifolium the synonym Kentan, or Oui Juri, of Kæmpfer (Amœn. Acad. p. 871), and which, as it seems to me, must be the same as the species subsequently described by Gawler in the "Botanical Magazine" under the head of L. tigrinum; 5th, L. maculatum, originally confounded with L. canadense in the "Flora Japonica." Thunberg afterwards devoted himself with more care to the same subject, and wrote a paper in the third volume of the "Memoirs of the Imperial Academy of Sciences of St. Petersburgh" (1811), under the title of "Examen Liliorum Japonicorum." In this new memoir, which refers to eight species, he described more completely the five species already enumerated by him in his first memoir, and gave rather indifferent figures of three of them, viz., L. lancifolium, L. longiflorum, and L. maculatum. Moreover, he characterised and figured two new species under the name of L. elegans and L. japonicum. Persisting, nevertheless in his unfortunate tendency to refer Japanese forms to European types, he admits into his memoir, under the name of L. pomponium, the Lily which Siebold and Zuccarini described and figured in 1835 as L. callosum.

The following is the list of Lilies in M. Max Leichtlin's collection before referred to:—

Lilium alchaseum?
,, alternans, Sieb. et Vr. !
,, aurantiacum?
,, auratum, Lindl. !
,, ,, macranthum ! *r.*
,, avenaceum, Fisch. ! *r.*
,, Browni, Brow. !
,, bulbiferum, L. !
,, Buschianum, Lodd. !
,, ,, grandiflorum, *r.*
,, ,, nanum
,, callosum, Hort ! *n. r.*
,, callosum?
,, cantabricense?
,, canadense, L. from Brentwood
,, canadense, L., from New Hampshire
,, canadense, L., from Sheffield
,, candidum superbum
,, candidum, L. !
,, ,, fol. argenteo variegatis !
,, carniolicum, Bernh. !
,, carolinianum, Michx. !
,, ,, from Chester, *r.*
,, Catesbæi, Walt. ?
,, chalcedonicum, L. !
,, ,, flore luteo
,, ,, majus
,, ,, punctatum?
,, columbianum? (Oregon)
,, concolor, Salisb. !
,, cordifolium, Thunb. !
,, Coridion, Sieb. et Vr. !
,, croceum, Fuchs. et Chais !
,, croceum præcox
,, ,, fl. saturato, *n. r.*
,, davuricum, Gawl. !
,, eximium, Court. !
,, formosum, Ch. Lem. !
,, formosissimum?
,, fulgens, var. Leichtlinii?
,, giganteum, Wall.
,, Humboldtii, Roezl. ! *n. r.*
,, japonicum, Thunb. ?
,, Jeffersoni?
,, Leichtlinii, J. D. Hook. ! *r.*
,, ,, splendens?
,, lilacinum?
,, longiflorum, Thunb. !
,, ,, from Liu-kiu !
,, ,, præcox ?
,, ,, Takesima !
,, ,, Wilsoni ! *r.*
,, Martagon, L. !
,, ,, album !
,, ,, Cantani, Vis. ! *n. r.*
,, ,, dalmaticum, Maly
,, ,, maculatum, splendens, Leichtl. ! *n. r.*
,, Martagon superbum
,, ,, tigrinum tardivum
,, ,, 19 garden varieties
,, Maximowiczii, Regel ! *n. r.*
,, monadelphum, Bieb !
,, pardalinum, Kellogg ! *n. r.*
,, parvum, Kellogg ! *n.*
,, Pattersonianum, Lindl. !
,, pennsylvanicum !
,, Philadelphicum, L. !
,, ,, andinum, Hook. ! *r.*
,, ,, of Brentwood
,, ,, of Connecticut
,, ,, of Massachusetts
,, ,, from the Orange Mountains
,, philadelphicum wanscleanum
,, pomponium ?
,, Humboldtianum, Roezl. *n.*
,, pomponium, L. !
,, ,, majus
,, ,, flavum ?
,, ,, pardalinoides ?
,, ,, var. Hort. angl.
,, puniceum, C. Koch. !
,, pseudo-tigrinum, Carr. !
,, puberulum, Torr. ! *n. r.*
,, pubescens, Bernh. !
,, pumilum, Red. !
,, puniceum, Sieb. et Vr. !
,, pyrenaicum ?
,, sanguineum ?
,, Siebaldii ?
,, sinuatum, Lindl. *r.*
,, speciosum, Thunb. !
,, ,, Kæmpferi, Zucc. !
,, ,, punctatum
,, ,, ,, late maculatum, *r.*
,, ,, atropurpureum, *r.*
,, ,, roseum Wilsoni, *r.*
,, ,, rubrum
,, ,, ,, sanguineum Red. *r.*
,, ,, Schrymakersii, *r.*
,, ,, Verschaffelti
,, spectabile, Link, Fisch. !
,, ,, bicolor ?
,, ,, maculatum ?
,, superbum, L. !
,, ,, from Connecticut
,, ,, from S. Carolina, *r.*
,, tenuifolium, Fisch. !
,, testaceum, Lindl. !
,, Thunbergianum, Roem. et Schult. !
,, ,, cupreum
,, ,, atro-sanguineum
,, ,, aurantiacum
,, ,, aureum
,, ,, flore-pleno, *r. n.*
,, ,, marmoratum grandiflorum
,, ,, scalatinum, Lei htl. *n. r.*
,, Thomsonianum, Lindl. !
,, tigrinum, Gawl. !
,, ,, Fortunei !
,, ,, cretinum
,, ,, foliis variegatis, *r.*
,, ,, flore-pleno, *r. n.*
,, ,, splendens, Leichtl. *r.*
,, tricolor ?
,, tabuliforme, Wight. ?
,, umbellatum, Hort. Berol !
,, Wallichianum, Roem. et Schult. !
,, Washingtonianum, Kellogg ! *n. r.*
,, Wilson, Hort ! *n. r.*

Unnamed Lilies:—Nos. 3, 4, 15, 16, 17, 18, 20, 200, 201, 202, from California; Nos. 131, 164, 165, 166, received from Kew; No. 163, from Wisconsin; No. 187, from Berlin; Nos. 23, 132, 134, from St. Petersburgh; Martagon, from Japan, *n. r.*

(*To be Continued.*)

THE KNOWN FORMS OF YUCCA.—V.

Group III.—*Integro-marginatæ.*—Edge of the leaf neither toothed nor splitting off in threads. (*Continued.*)

The following forms are the caulescent members of this group, which are hardy in the South of England:—

32. *Y. flexilis*, Carrière, Rev. Hort. viii. p. 308, t. 89. —Stem short, buds few; leaves bright green, shining as if varnished, faintly glaucous when young, when fully deve-

loped 24—28 inches long, 15—16 lines broad at the middle, narrowed gradually to an acute point, the outer ones gracefully reflexed, the central half flat, the edge entire, distinct, red-brown; perianth pearl-white, 3—3½ inches long, with divisions 15—18 lines broad. This I have not seen to know it, and my notes are taken from Carrière's description. Is it in cultivation in this country?

33. *Y. gloriosa*, Linn. Sp. Plant. p. 456; Bot. Mag. t. 1260; Redouté, Lil. t. 326-7; Haw. Suppl. Pl. Succ. p. 37; Kunth, Enum. iv. 273; Carrière, Rev. Hort. ix. p. 359.—One of the best known and most variable species, to be seen in every collection. Stem reaching a height of 4—6 feet below the rosettes, much branched when luxuriant; leaves 100—120, in a dense rosette, 24—27 inches long, 3 inches broad at the middle, narrowed to 15—18 lines above the base, full green, glaucous only when young, so rigid in texture that the outer ones are not at all recurved, the face concave throughout, and marked with distinct plications upwards, and the point quite pungent, the base 3—4 lines thick, the border marked with a distinct brown edge, usually quite entire, rarely very slightly filiferous. Inflorescence 4—5 feet high, copiously panicled, the flowers bell-shaped, 1½—2 inches deep, the ovate-lanceolate divisions 8—9 lines broad. A native of the Southern United States. The fullest account of the forms of this species is contained in Carrière's paper in the ninth volume of the "Revue Horticole. The principal varieties with which I am acquainted are—1, *glaucescens*, Carrière: like the type, but the foliage permanently glaucous; 2, *superba* (Y. superba, Haworth, Suppl. Pl. Succ. p. 36; Bot. Reg. t. 1690): leaves more rigid and more glaucous than in the type, 18—21 inches long, 2—2½ inches broad at the middle, panicle denser, and hardly more than half as tall; 3, *obliqua* (Y. obliqua, Haworth, Syn. Succ. p. 69; Kunth, Enum. iv. p. 274 et 677): leaves and flowers smaller than in the type, the former more or less twisted to one side; 4, *mollis* (Carrière, Rev. Hort. ix. 360): a large variety, with leaves 30—33 inches long, 2½ inches broad at the middle, not so concave on the face as in the type; and 5, *recurvata* (Baker): leaves 28—30 inches long, 2—2½ inches broad at the middle, the outer ones recurved, the central half nearly flat on the face, and the back but little raised, plication of upper part very slight, point less pungent, colour very glaucous when young, but the bloom deciduous. The last is midway between gloriosa and the next species.

34. *Y. recurvifolia*, Salisb. Parad. t. 31; Kunth, Enum. iv. p. 272; Y. recurva, Haworth, Synop. p. 69, Suppl. p. 35; Y. pendula, Siebold, Carrière, Rev. Hort. viii. p. 488, t. 104.—Stems shorter, but more branched than in the last, rarely a yard high. Leaves 150—180, in a close rosette, varying from 2 - 3 feet long when fully developed, 2—2½ inches broad at the middle, narrowed to an inch above the base; all finally more or less falcately curved, the face nearly flat throughout, the point less pungent than in gloriosa, and texture not so thick, the back only rounded near the tip, and in the lowest quarter; colour bright apple-green, faintly glaucous when young, the edge quite entire, with a narrow, distinct, brown border; panicle 4—5 feet high, the lower branches erecto-patent, 12—18 inches long, the campanulate perianth 2 inches deep, with divisions nearly an inch broad. A native of the Southern United States, long cultivated and widely diffused in English gardens. M. Carrière has lately given it a new name, without warrant, as it already has two in England, long established, and moreover quite appropriate, of which Salisbury's has the priority. According to Carrière it is also grown in France as "recurva," "reflexa," and "japonica." *Y. rufo-cincta*, Haworth, Suppl. Pl. Succ. p. 37; Kunth, Enum. iv. 274, is apparently only a slight variety of the same species. A specimen, from Mr. Ellacombe, has leaves rather more reedy in texture than in the type, with a more distinctly marked red-brown border, reaching 2 feet long, by 2½ inches broad when fully developed, with a caudex below the rosette not more than a foot long.

35. *Y. gigantea*, Lemaire, Rev. Hort. ix. 222.—This, which is the largest form of the series now under consideration, I know only from M. Lemaire's account in the volume of the "Revue Horticole" just cited, which is taken from a plant which flowered in the collection of M. Verschaffelt, at Gand, in October, 1859. Stem 4 feet long below the tuft of leaves; leaves 54—56 inches long, 3 inches broad at the middle, bright shining green, the edge entire, whitish; panicle 2 feet long, copiously branched; perianth cream-coloured, 3½ inches deep, the divisions connivent, ovate-acuminate. Is anything known of the plant in England? *Y. G. Baker.*

GINSENG.

Amongst the most extraordinary medicinal plants which have from time to time been celebrated in different ages and countries, the Ginseng of the Chinese is one of the most curious. This drug is the dried root of Panax Schinseng, Nees, a small plant, frequently with a creeping underground stem or rhizome. It is a native of China, and so highly is it esteemed that it forms a large article of internal commerce, and realises almost fabulous prices. As much as 300 taels of silver, which is equal to about £100 of our money, is about the average price of a single tael (640 grains) of the drug. Though it has been proved by our own chemists to possess no medicinal virtues, other than being mucilaginous, aromatic, slightly bitter, and saccharine, it is nevertheless esteemed as a most invaluable root by the Chinese, who believe it produces the most extraordinary effects upon the human system, invigorating and restoring the fatigued and wearied body to a marvellous degree, and bringing back youth to the aged and strength to the weak. Be this as it may, it has held its position with the Chinese for a very long time, and still continues to be highly prized. In the year 1709 we read that a body of Tartars, numbering some 10,000, were sent by the Emperor of China in quest of the root, with instructions to bring home as much as they could find, 2 lb. of the best of which was to be given by each man to the Emperor, and the remainder they were to sell for the same weight of fine silver. The Chinese name, Jinsang or Ginseng, implies "Wonder of the World," and the generic name Panax is derived from the Greek panakes, or panacea, a cure for all diseases. Both words, therefore, refer to its supposed extraordinary powers. The Ginseng plant grows in the mountainous parts of China, but the best quality, or that which is most esteemed by the Chinese, is obtained from the Corea; Manchuria also produces a good variety. A species of Panax named quinquefolia growing in North America has roots similar to those of the true Chinese Ginseng, with which plant indeed it is often confused. These roots are, however, on comparison more slender than those of P. Schinseng. The Americans at one time exported them to China in large quantities as a substitute for the Chinese drug.

The Commissioner of Customs of Newchang has sent home some very interesting remarks on the trade and cultivation of Ginseng, which remarks will no doubt be worth giving in his own words; he says:—

It is difficult in discussing the trade of the chief port in Manchuria to avoid noticing the strange root in which every native in China, from the Emperor to the humblest coolie, places such implicit faith. Fine Manchurian Ginseng is only found in the upper valley of the Usuri, where ruined towns and forts mark the cradle of the race which seven centuries ago ruled over China from the Yellow River to the Great Wall, which was forced back by the valour and genius of Genghis, and which 400 years afterwards again swept into China to occupy and retain the Imperial throne. But Ginseng loves moisture and the densest of the forests, which cling to the slopes of the hills; it nestles in recesses to which the rays of the sun have never penetrated, and which are as pathless now as in the days when the Golden Tartars were dwelling in and cultivating the plain. The genuine Manchurian Ginseng consists of a stem from which the leaves spring, of a centre root, and of two roots branching off at the same point from each side of the centre root. The stem somewhat resembles the head and neck, and the side roots the shoulders and arms of a man; the main root represents the body, and a fork, which the main root frequently forms, the legs.

The Chinese, with a not ungraceful feeling, believe that a plant which thus expands into the human form amid thickets and jungle, on which the foot of man has never trod, must be intended to alleviate the sufferings of the human race. Its precious qualities are increased and intensified by age, and a plant is of no great value until it has been growing and gathering strength for at least an ordinary lifetime. The age, and consequently the value of a plant, are ascertained by a careful examination of the upper portions of the centre and side roots. These portions should be covered with rings, and the thicker and more numerous the rings the greater the age. The value of Ginseng in no way depends upon its length, thickness, or colour. I myself have seen here a delicate root weighing but 6 mace, which cost 50 taels. The upper portions of the root also possess the greatest healing power; the stem, which appears aboveground, on the other hand, ought not to be eaten. It is supposed to be baneful rather than beneficial.

In former years, the collection of Ginseng was in the hands of some 40 merchants, who, on payment of a heavy fee, obtained the necessary authority from the Tartar General of Kirin. In addition to the fee, each merchant was bound to hand over to Government a certain weight of the object of his search. The search is continued from the end of April to the end of September. In it the merchants employed the outlaws, whom the fear of punishment had driven to take refuge in these wilds, and who were compelled by their position to be faithful servants. These men underwent great hardships, and incurred great dangers. Forced to wander far from the little patches of Millet they had raised for their support, they were even menaced by starvation and by the wolf, the tiger, and the leopard; and not unfrequently the hardships were endured and the dangers were incurred in vain.

In the time of Tankouang Ginseng was becoming yearly more scarce, and plants of any great age were rarely found. Finally, in order to arrest their utter extinction, the collection of the wild root was prohibited by Imperial edict. Steps were taken in Kirin to carry this order into effect, and measures were adopted to prevent the admission of the interdicted plant into China. Nevertheless, a very small quantity is still clandestinely collected—to a considerable extent, however, in Russian territory. The cultivation of Ginseng, though allowed, is not encouraged; it is, in fact, hardly recognised as Ginseng, as the tariffs of the various native custom-houses class it under the general heading of medicine. This course is not altogether unreasonable. The side branches of the cultivated plant are frequently broken off, and its premature growth and the means made use of to expedite its development often efface the resemblance from which it derives its name.

With a view to produce a false appearance of age, hair is tied tightly round the upper portions of the root, but a practised eye can easily detect the deception. Ginseng is cultivated in Manchuria and in the Corea. The average Corean-cultivated Ginseng is superior to the average Manchurian; 84 piculs 27 catties of Manchurian Ginseng were exported in foreign vessels during the past year: the value was not 2 taels a catty. *John R. Jackson.*

YELLOW CALCEOLARIAS FOR BEDDING-OUT.

Two facts are generally acknowledged in regard to these plants. The first is their superlative excellence where they do well, and the second is their persistency in ill-doing in certain places. In this notice I purpose discussing the foundation of success with a view of discovering whether it is not possible to have these superb yellow bedders do their best everywhere in all localities—a high aim it must be admitted, but not higher than the merits, the usefulness, and the capabilities of the plants deserve. In these days of propagation by express, we have need to see to the foundations of our plants—Calceolarias especially, if they are to grow throughout the season, must neither be weakened by heat nor cramped into those popular horticultural thumbscrews, pots. If so, they will be sure sooner or later to resent such treatment. A cool free bottom from first to last is the first condition of success. Excitement by artificial heat, root squeezing by the pressure of pots, is disease or death, sooner or later, to the Calceolaria. This is no novel theory deduced from natural inferences. My pen is now dipped in the black gall of many bitter disappointments. For years I treated Calceolarias like Verbenas or other bedding plants, and for so many years the plants failed more or less. Even at Hardwicke these failures were so provoking that I have pretty well run through all other yellow bedders as substitutes. But I have learned to lay the foundation of the Calceolaria stocks with such firmness and strength, that it is now planted out in flower in May, and continues in blossom till November. The time of propagation with me is not earlier than the last week in October, nor later than the end of November. This gives a good choice of time, and any period between these two is equally good and successful. If earlier, the cuttings are apt to become autumn-proud, which originates winter tenderness, and is too often the parent of summer weakness. If propagation is deferred until December, the chances are that the frost will have made its first meal of what should have formed our next year's plants. Avoiding, however, this risk of danger, the cuttings can hardly be taken too late. Than the manner of propagation nothing can be more simple. Use only young wood, from 3 to 4 inches in height, and take it off with a heel, that is, with the bottom portion that adheres to the old wood. Late in the season the plants abound with such cuttings. They should simply be taken off and inserted without any further dressing or mutilation whatever. The cuttings do best with heel and head left entire, though pieces of young wood will strike without heels and with the heads cut off, but they are not so certain. Old wood is wholly to be shunned. Cuttings of the woody stem strike slowly, if at all; and there is a want of soundness in plants so raised, arising from the hardness of the wood.

The Place of Propagation is a very cold pit, if 2 feet deep so much the better. We use such a pit 6 feet wide and 60 long, the walls, built of flints, 9 inches thick. The bottom is well manured with a layer of old hotbed dung, chiefly rotten leaves; this is dug into a common loamy soil. This surface is then smoothed, trodden firm, and covered with about an inch of common road sand. The cuttings are then inserted in rows, from 4 to 6 inches apart and 3 inches in the rows. The cuttings are put in firmly with a small dibble, taking care to compress the soil firmly round the bottom of the cuttings. The top portion of the soil and the upper part of the cutting are then consolidated, and the entire work finished by a copious watering from a quick-running watering-pot, the quantity of water given being sufficient to run the whole surface down into a uniform state of smoothness. The lights may then be at once put on, or a few hours may elapse before this is done, if the weather is dull and mild. For about a week they may remain almost close shut down, after which air may be given on every mild occasion, and the cuttings treated as if they were already plants. I have stated that the cuttings may be 2 feet below the glass. This depression saves a deal of labour and trouble alike in shading and covering, and is recommended for these objects. The cuttings will do equally well, they could, however, hardly do better, 6 inches from the glass. Then, however, they would require shade during sunshine, protection during frost, and much more water than in the depressed position here recommended. Two feet from the glass they do well, at a minimum risk, and with the smallest possible expenditure of time and labour.

When do they strike?—At their leisure, and at various times from December to the end of March. It seems to make very little difference in the end. They are ventilated and watered as if they were plants after the first week. Deep down in such pits, however, with a cool bottom they require but very little water, and that chiefly along the back of the pit, when the sun hits them. The front portion is often not watered at all until the spring. What is of infinitely more im-

portance than the time of rooting is the fact that the cuttings will all strike; certainly not more than five per cent., often less, will fail. The mid-passage treatment between rooting and final turning out is comprehended in two words, simplicity and hardness. The cuttings simply require to be let alone, and neither petted nor coddled. The same rules apply to the plants—a hard simple regimen; water when they need it, at the lowest possible temperature; abundance of air, drawing the lights completely off when the thermometer is above 45°; and stopping the plants as soon as they have grown 2 inches (repeating the stopping, if needful, up to the middle of March), and keeping the plants free of insects, is all the culture needed. Beyond this period continue the cool exposed treatment, and let the plants grow on without further stopping. Early in April the pit will be filled with such a mass of strong, clean, healthy plants as will delight the eyes of flower-gardeners, and some strong measures must instantly be taken to avoid the wreck and ruin threatened from over-crowding.

These measures are the following:—Another cold pit, if at hand, or, lacking that, a border by the side of a wall—or, if this cannot be had, any piece of ground can be enclosed on each side with mats, boughs, straw hurdles, window-shutters, or any protecting substance; on this a layer of equal portions of thoroughly rotten dung, or half-rotten leaves, and fresh stiffish loam, should be spread from 6 to 8 inches deep. The plants are then carefully taken, with a ball, from the cutting-bed, and planted in this compost 6 or 8 inches, or, if the room could be had, a foot square, and the fresh soil pressed firmly round them. They are then watered thoroughly with water at the temperature of 60°, the object of using warm water this once being to warm the soil, so as to give the roots an instantaneous start in their new feeding ground. They proceed to occupy it at once, and it is astonishing how soon the whole of the compost becomes full of a thickly reticulated mass of roots.

The tops of the plants have generally been sheltered for a few weeks with a screen of new green boughs, left on night and day at first, and gradually removed piecemeal, until they are finally dispensed with about the first week in May. At the latter period the whole of the plants will be showing flowers. Where early bloom is desired these are left to expand, and the plants are removed into their final quarters in full blossom. If the first show is not needed the plants receive a final stopping at the end of April.

In the process of transplanting the cuttings to their intermediate quarters, all the weakest plants are reserved. The cutting-pit is then treated to a dressing of compost, the same as used for the outside, and these weak plants returned to the cutting-pit, where the extra shelter and fostering of the glass enables them speedily to overtake the others; and thus, when planting day arrives, the entire stock, of many thousands, are all of nearly uniform size and strength. Two or three good waterings are generally sufficient for the plants while in their transition quarters, the last being given two days before their final removal, when manure-water should be used, and the soaking should be so thorough as to penetrate right through and saturate the entire root medium.

This brings us to the mode of their final planting, and of the culture. Above we have now a rich waving field of gold, below a network of roots, binding firmly together into one continuous mass a layer of rich manure-saturated soil. The problem before us is how to remove the plants, without injury to either root or tops, to their blooming quarters. Begin at one side or end, and thrust a spade under the level of the loam and dung, and bring out a spadeful of the same with the plants standing upright upon it. There will be one, two, or three plants, according to their distance apart, the size of the spade, &c; take hold of a plant with one hand and tear the soil asunder carefully with the other. In this way each plant will be furnished with a mass of soil filled with its roots, which will be skirting its outer ragged edges in all directions. This riving of the soil by hand will not save every spongiole from mutilation, but it will leave them free in the very best possible position for laying a fresh hold of the soil in their new quarters. These lumps of earth, with their upstanding plants, are instantly conveyed in hand-barrows or carts to the flower garden, and planted at once, to prevent the roots being checked. In planting, the plants are inserted about an inch deeper than they have been in their temporary quarters, and the soil is placed carefully and firmly around the roots, and the whole mass of earth copiously watered, as soon as the planting is finished. As we insert these large plants from a foot to 15 inches apart, and as they are put out in full flower, the result is that the Calceolarias are the first groups to tell, and the last to fade into green leaves only.

A few days after planting a hoe is run over the surface in lieu of mulching, which we cannot practise in the regal manner described by some of your correspondents, and which, consequently, we have given up. Mulchings of short grass are found positively injurious. Our soil is mostly a heavy loam. Where it is light, we use clay with the manure for Calceolarias, with the best effect. This helps to keep their feet cool. This latter object is also very much aided by thick planting. The plants speedily cover the ground, and shut out the fierce summer sun alike from root and stem. We further aid a cool bottom by the use of sewage or clean water; our rule being seldom, perhaps four times during the season, but thoroughly to penetrate through the soil, until the top water reaches that which is ascending from the depths of the earth. In exposed positions we stake with common stakes, or entangle the tops in a maze of twiggy boughs. But the chief part of our stock are not staked, being so sturdy and strong that they can stand alone.

Continuous blooming is secured by incessant picking. As soon as a few seeds ripen at the bottom of the trusses, they are picked off. Those who allow a whole corymb of seed to ripen must expect the plants to revenge themselves by long dreary intermissions of bloomlessness. Profuse inflorescence and a heavy harvest of seed, the freshness of early summer and maturity of full-lapped autumn, cannot well be enjoyed together. There have been seasons of baking drought when Calceolarias have refused to flower always, but in ordinary seasons, only adopting the simple and easy modes of propagating and culture here described, Calceolarias may be expected to flower first and last, and to fill up with beauty the whole space between these two. Neither do I offer the above as a panacea for every possible case of failure. The disease of the Calceolaria, like that of the Cucumber, seems alike inscrutable and incurable in some localities. For instance, my brother, Robert Fish, at Futteridgebury, who I believe has long grown his plants on the above system, was nearly vanquished by the disease for several seasons. I can, however, add that it has proved successful here, while plants propagated in pots and subjected to stimulating processes invariably failed. It is, therefore, worthy of a trial in all places where any difficulty is experienced, while to the large grower it offers the great advantages of cheapness, simplicity, and the most complete success. *D. T. Fish.*

THE RANUNCULUS ORDER.

THERE are some groups of plants which are recognised at a glance by the outsider almost as soon as by the professed botanist. Speaking broadly, every one recognises a Fern, a grass, or a Palm,—there is a certain distinctive appearance about such plants which ensures their ready recognition. To be sure, owing to that mimicry of form which we often meet with in Nature, we may sometimes be led grievously astray; thus almost every one, unless he has a smattering of botanical lore, is liable to mistake a Cycad for a Palm, a sedge for a grass, the finely cut leaves of an Umbellifer for those of a Fern, and so on; but these are, after all, exceptional instances, and the outsider may console himself with the recollection that the most learned may sometimes get deceived in this way. In the case of the Ranunculus family there is no strong family likeness that is apparent to those unversed in botanical distinctions. On the contrary, much surprise is often elicited at the fact that such plants as the climbing Clematis, the floating water Buttercups, the Larkspurs, the Aconites, the Pæonies—plants whose general outward aspect (*facies*, as the Latins would have said) is so diverse—should be associated in one and the same group. What, then, is the bond that ties them all together? In answering this question, it is as well to state that in this, as in all corresponding cases, the connecting threads are manifold. It scarcely ever happens that a single thread is strong enough; the link that is serviceable in one case is useless in another. In linking plant to plant, and group to group, the botanist depends, so to speak, on a network of threads. That network is always complex, seldom complete, generally exhibiting large irregular rents here and there, bridged over, it may be, by solitary threads, but often so incomplete that communication between one side of the rent and the other is only effected by a very circuitous and tortuous route. This circumstance, which undoubtedly militates against the prosecution of the study of plants by some people, yet, on that very account, offers additional attractions to others by acting as an incentive to observation and experiment. Every new fact that is gained, however trifling apparently, is a real gain, it is sure to fit into some portion of the tangled and torn web—to help to fill up its rents, or to extend the network in a new direction. Reverting then to the question—what is the bond that ties the members of the Ranunculus family together in spite of their many very obvious differences?—we may say, in general terms, that the characteristic marks of the family are these: the constant isolation of the sepals, petals (when present), and of the stamens, and the great number of the latter organs. In other words, the pieces of the calyx (sepals), of the corolla (petals), and of the andræcium (stamens) are always "distinct" and uncombined, and the last mentioned organs are too numerous to be readily counted. Take a common Buttercup (Ranunculus), and pull off in succession its sepals, petals, and stamens—a piece of "dissection" that does not require any skill—and you have an illustration of what has been just said as to the characteristic features of the order to which it gives its name. Compare with the Buttercup a flower of Aconite, Larkspur, or Pæony, and you will find, with considerable variations in form and colour, precisely the same arrangement and disposition of parts. Hence then, we may sum up the distinctive features of Ranunculaceæ thus—Calyx polysepalous,* corolla (when present) polypetalous,* andræcium polyandrous,† all free from adhesion one to the other (hypogynous ‡).

There are many other points which are occasionally serviceable in enabling us to ascertain whether or not a plant belongs to this family, but they are less serviceable (because less constant) than those already mentioned, or they are too recondite to be alluded to in a paper like the present. Several genera of the order as thus characterised have well-known and much appreciated representatives in our garden flora. Let us take the genus *Clematis* first. This is easily recognised by its climbing habit and by the opposite arrangement of the leaves. In other genera of the order the leaves are alternate, and none save Clematis are climbers, but then it must not be forgotten that one or two species of Clematis grown in our gardens are erect under-shrubs, with no tendency to climb, *e. g.*, C. erecta, C. tubulosa, C. integrifolia, &c. The flowers of Clematis have a calyx, often coloured, of 4—5 or 6 pieces, white, or some shade of violet or blue, no petals, and numerous distinct stamens and pistils, the latter ripening off into seed vessels, often tipped with a long feathery style. The species of Clematis are, with the exceptions just named, climbing plants, that is to say, they are not twining plants, nor indeed have they true tendrils. They climb by means of their leaves and leaf-stalks, much as a boy would do with his hand. When the leaf-stalks come into contact with a shoot or other object, they gradually twine around it, and having clasped it, they become, after a day or two, thickened into the semblance of little branches. The leaf-stalks, as observed by Darwin, are sensitive to the touch, when lightly rubbed they gradually bend towards the stick with which they are touched, and if they come into contact with it they gradually twine around it, as above said. The degree of sensitiveness varies much in different species, in different parts of the same leaf-stalk, and is only exhibited in the young state. The leaf-stalks manifesting this extraordinary sensibility to touch would have little power of availing themselves of this faculty were it not for the revolving movement which the young shoots exhibit. These move against the course of the sun, and in their revolution enable the sensitive leaf-stalks to come in contact with any support, and to coil themselves around it. How slight is the pressure required to excite the sensibility of the leaf-stalk is shown by Mr. Darwin, who states that continued pressure, even from a loop of soft thread weighing only one-sixteenth of a grain, is sufficient to excite the twining movement.§

The species of Clematis are among the most beautiful of our garden climbers. For scrambling over hedges, or waste places, or old trees, what can be more beautiful than the common Clematis, C. Vitalba, common in chalky districts in Britain. See it, scrambling in wild luxuriance over the hedges as in the undercliff in the Isle of Wight, or draping some old tree with a mantle of beauty as at Cliveden, and acknowledge that even by the side of its more brilliant garden compeers it loses little by the contrast. Clematis Flammula, again, is a fine plant for covering a trellis or bower. Its dark green leaves are always agreeable, while in late autumn the profusion of richly scented white flowers invest it with great attractions. Clematis balearica, a variety of C. cirrhosa, has also richly tinted finely cut foliage, but it is a shy bloomer. All the European and Himalayan and American species, however, are surpassed in beauty by the more recently introduced Chinese and Japanese species, C. florida, C. patens, C. lanuginosa. The hybridist has been busily at work among them, also, and to his efforts we owe such really splendid acquisitions to our gardens as Jackman's Clematis, which really can hardly be overpraised. *Atragene* differs from Clematis mainly in the outer stamens resembling petals. No other Ranunculaceous plants have a climbing habit or opposite leaves.

The species of *Thalictrum* have small whitish flowers, the sepals of which before the flower opens overlap one another at the margins, while in Clematis they either merely touch or are bent inwards towards the centre. The flowers of Thalictrum are very like those of the small-flowered species of Clematis, and their fruits or seed-vessels are very similar to those of those species which have short styles destitute of the feathery hairs which form so great an ornament to some species of the last-named genus. For garden purposes, however, Thalictrums are chiefly valuable for the elegance of their much divided foliage.

Anemones are too well known to need lengthened comment. Botanically they are known by the leafy involucre below the flower, the coloured calyx, and the absence of corolla. Many of them have the feathered style, like that of certain Clematis; others, such as the charming little Hepaticas, so welcome in spring, have

* *i. e.*, of uncombined sepals.

* Of uncombined petals.

† The word Andræcium is applied to the whole of the stamens of any given flower. In the present case there are numerous stamens, distinct one from the other, and free from union with any other organ.

‡ When the stamens or other organs of the flower spring from below the pistil without adhering one to the other, the term hypogynous is employed. When adhesions occur, the organs appear to spring from around (perigynous), or above the pistil (epigynous).

§ The reader will do well to refer to Mr. Darwin's paper on the movements and habits of climbing plants, "Journal of Linnean Society," vol. ix., 1865, p. 26, for a summary of his experiments and observations. Are these the observations which a French Academician calls "mouseux"?!

only a short style, and the involucre is close to the flower. A. nemorosa is the common but very lovely wood Anemone, of which a double-flowered variety is cultivated in gardens. A. apennina, another favourite with lovers of old-fashioned plants, has blue flowers. Taller and finer than those is A. japonica, with clusters of rose or white flowers. The kind known in gardens as "Honorine Jaubert," is an improvement on the original form, and is an indispensable adjunct to the flower border in late summer. The Anemones of the florists are double-flowered varieties of the South European A. coronaria, cultivated in our gardens from time immemorial, and not without reason, for the intensity and variety of their colouring and the beauty of their finely cut foliage amply entitle them to a place in every garden. The duplication of the flowers is due to the replacement of both stamens and pistils by petal-like bodies. Old Parkinson, who is more prosy than a writer could well be now-a-days, confesses his inability to "describe the infinite variety of the colors of the flowers, and to give each his true distinction and denomination . . . . for who can see all the varieties that have sprung from the sowing of the seede in all places, seeing the variety of colors risen from them is according to the variety of ayres and groundes wherein they are sown, skill also helping Nature in ordering them aright. For the seede of one and the same plant sowne in divers ayres and groundes doe produce that variety of colors that is much differing one from another; who then can display all the mixtures of color in them, to set them downe in so small a roome as this book?"

Adonis.—Of this genus the common Pheasant's-eye affords an illustration. Botanically it is very close to Anemone, but has no distinct leafy involucre. On the other hand, it has calyx and corolla, both brightly coloured; the leaves are finely cut. A. æstivalis has deep crimson petals, and is sometimes met with in cornfields. A. vernalis has citron-yellow petals.

Ranunculus.—The species of this genus, sufficiently different in general aspect, may yet readily be recognised by the peculiar little scale or pit at the base of the petals. It is worth while specially noting this pit, because it is the representative of the more highly developed spur of the Columbine. All the species, whether they be the floating, white-flowered, cut-leaved species of our ponds, the Buttercups of our fields and meadows, the glorious "Rookwood Lily" of New Zealand, or the florists' Ranunculus, all alike have this pit on their petals. The Turban Ranunculus of the florists belongs to R. africanus, the common Ranunculus to R. asiaticus. These flowers owe their structural peculiarities to varying degrees of transformation of the stamens and pistils into petals or petal-like segments. Ranunculus is one of the flowers in which the florists' canon of circular outline may be accepted with little hesitation; the flowers naturally are so circular, and the petals of most of the species are so rounded, that it seems in this case only following a natural indication to lay stress on the circular or globose form. The so-called "bulb" of these Ranunculi consists of a mass of adventitious roots, some of which are swollen and filled with starchy matter, thus acting as reservoirs for nutritive substances for the supply of the young buds formed just above the roots. M. Baillon compares the roots of Ranunculi, and with justice, to those of the Dahlia, which are formed on a similar plan.

R. aconitifolius, a very old friend in gardens, under the name of Fair Maid of France, has double white flowers. R. acris, with double yellow flowers, is often grown in cottage gardens under the name of Bachelors' Buttons. We must not forget the common Celandine, so grateful a remembrancer of spring, with its shiny, marbled leaves, nestling in the axils of which are often to be found little swollen fleshy buds or bulbils destined to reproduce the plant, somewhat after the fashion of those of the Tiger Lily (L. tigrinum). A double-flowered variety is in cultivation, but in our opinion it is no improvement on the common single form. Grandest and noblest of all is the R. Lyallii, the Rookwood Lily of New Zealand, with circular leaves like those of a Water Lily, and large panicles of ivory-white chalice-like flowers.

Caltha.—The genus to which the common Marsh Marigold belongs is very like Ranunculus in aspect, but the flowers have no petals, the coloured petal-like segments being in reality sepals. The seed-vessels, unlike those of the genera before mentioned, split open when ripe. A double flowered variety is in cultivation, and whereas the single form is always found in wet places, the double-flowered variety seems indifferent to the nature of the soil in which it grows. We must confess that we think the single plant, so abundant by the Thames, between Kew and Richmond, as far more effective and handsomer than the smaller flowered double variety; but there may be some descendants of the old florists ready to say with Parkinson, "The single kind I leave to the ditch sides and moist groundes about them as the fittest place for it, and only bring the double kind into my garden as fittest, for his goodly proportion and beauty, to be entertained and have place therein."

Trollius.—The Globe Flower is well named; its yellow sepals arching over and completely concealing the linear petals, which have a long gland at their base, like that of Ranunculus. The sepals usually fall off as the fruit ripens.

Helleborus.—The Hellebores differ mainly from Trollius in their persistent sepals and their petals being tubular. Some botanists consider these horn-like tubes to be really modified stamens, and not petals. Linnæus included most of these organs of an intermediate or nondescript character under the head of nectaries. Physiologically, he was right, as in many instances they are veritable honey-makers or honey-storers; they are veritable honey-makers or honey-storers; morphologically it goes against the grain to have to call by one and the same name organs intrinsically of a different nature. Their value as garden plants is well appreciated. Even in London the Christmas Rose thrives well, and its blooms, if protected from the soiling effects of London smoke by a handlight, may be developed to delight the Londoner, little accustomed to see flowers of such purity grown within sound of St. Paul's. H. orientalis is equally well worth cultivating, and even when it does not flower its handsome foliage renders it a desirable inmate of a town garden.

Eranthis.—The charming little Winter Aconite is the type of this genus. How welcome are its yellow cups, surrounded by their bright green frills, in very early spring. Generically it differs mainly from the Hellebores in the perianth consisting of six deciduous, not persistent, pieces. The nectaries are of the same nature as those of the Hellebores. *Coptis* and *Isopyrum* are now rarely seen out of botanic gardens, more's the pity.

Nigella, as a genus, is best distinguished by the union of the carpels for a greater or less distance. Its nectaries, which Baillon considers, as in the case of the Hellebores, to be modified stamens, are placed opposite to the sepals. The best known species in cultivation is the N. damascena, the "Love in a Mist," whose bluish flowers are surrounded by very finely cut bracts, and whose bladder-like capsular fruit presents, when ripe, a double series of cavities in the interior. This appearance is due to the detachment of the inner from the outer portion of the wall of the fruit; the latter continues to grow for a time, and hence, on cutting across the seed-vessel, two sets of cavities are seen, one central, containing the seed, the other external, and empty.

Aquilegia.—To this group belong our old friends the Columbines, with their singular but elegant flowers. Here we have a calyx of five coloured segments, five horn-like petals, and very numerous stamens, arranged in ten rows, five in front or above the sepals, five in a corresponding position as regards the petals. In addition to these fertile stamens there are in the centre of the flower next to the pistil ten barren stamens surrounding the five carpels, which ultimately ripen into as many follicles or pods. Double Columbines, which are not unfrequent in gardens, are of two kinds, one in which the stamens are replaced by a number of horn-like petals, and the other in which the petals are flat, and so arranged as to resemble the rays of a star. The species cultivated most frequently in gardens are A. sibirica and A. vulgaris, of both of which numerous varieties, differing in colour, &c., are grown. A. canadensis has red flowers. A. Skinneri, a Californian species, with its scarlet and yellow flowers, is less seen in gardens than might be expected from the beauty and singularity of its flowers. *The Rambler.*

(To be Continued.)

CEPHALOTUS FOLLICULARIS.

HERE we have one of Nature's most singular vegetable forms. While in the genus Nepenthes the pitchers appear to be extensions of the leaves, and in Sarracenia the leaf itself seems hollowed out into the peculiar horn or pitcher-like form, we find that in this remarkable plant the pitchers are wholly distinct from the leaves. It is of small growth, a well-grown specimen rarely getting more than 8 or 9 inches across, but it is nevertheless a most interesting subject. It is a native of New Holland, and, therefore, cannot be expected to live long in the intense broiling atmosphere, accompanied by insufficient light, to which we often see it subjected. I have seen the Cephalotus grown in a house devoted to the culture of Victoria regia, and to flourish for a time, the plants being covered with a bell-glass, and allowed very little air; but they were standing within 6 inches of the glass roof, and consequently received every ray of light, being merely shaded during bright sunshine by tissue-paper. Under such treatment the plants grow fast, but I have never known them live long. I have also seen it grown within 6 inches of the front lights of a cool greenhouse, with the bell-glass tilted so as to give plenty of air, the pot in this case standing in a pan containing an inch of water, which must keep the material in which the plant grew completely saturated. The plants in this case were quite as large as any I have ever seen, and produced pitchers in quantity almost as black as ebony; altogether the plants had a vigorous appearance, that I never saw in those grown under the very hot system.

The treatment I recommend is intermediate between these two extremes. The plant evidently grows much faster with a brisk day temperature in the growing season. To be placed as near the glass as possible at the end of a house where Muscat Grapes are well done, with a fair amount of heat, are conditions which suit the plant admirably. The bell-glass under which it is grown should be kept a little tilted day and night, and shaded during strong sunshine with tissue-paper, which admits plenty of light,—a most essential conducive to the continued well-doing of the plants. It is propagated by taking off the small shoots it throws out from the side, or by division of the crowns. This should be done in spring, just as the plant is showing signs of growth. The material in which I find it to thrive best is a mixture of three parts rotten Sphagnum, chopped fine, two parts crocks broken quite small, the largest not larger than small peas, and one part fibrous peat, a handful of sand being mixed with the whole. The object is to secure a material that will take any amount of water without becoming sour. Repot every spring, getting away as much of the old soil as can be done without injuring the roots. Use pots from 2 to 6 inches in diameter, according to the size of the plant. Pot high, the crown of the plant being kept well up, and plunge the pots in others two or three sizes larger, the vacancy being filled up with Sphagnum. The whole should be well moistened every other day during the growing season, and once or twice a week when at rest. On no account ever allow the plant to become dry, or it will suffer materially, if not die. Keep a good look-out for green-fly, which gets on the under side of the leaves, and does irreparable mischief, sometimes, before it is discovered. As I have before observed, the plant delights in a brisk temperature whilst growing, say 60° to 70° by night, with a rise of 15° or 20° by day. When at rest, 45° to 50° at night, with 5° or 10° higher by day. Under these conditions, the plant will do well and live for many years, going on increasing by throwing out suckers. *T. Baines, in "Florist and Pomologist."*

Home Correspondence.

The Drooping and Revival of Plants.—I have been much interested by your leader on this subject (p. 1147). It is one of great practical importance, and therefore specially deserving the attention of practical men. Many of our everyday operations proceed on the assumption that the leaves of plants absorb moisture directly from the atmosphere. I have long been of that opinion, and for that reason I venture to question the conclusiveness of the experiments cited by you to prove the contrary. No doubt they have been most carefully made. The names and claims of the experimenters set that at rest. The fact that drooping plants, after being suspended in a saturated atmosphere, weighed no more, but absolutely less, than before, even though their firmness was restored, must be accepted. The balance proves that. But to my mind it does not and cannot prove the inference, that therefore the leaves absorbed no water from the air. I submit that, to make this absolutely certain, the aqueous vapour in the air ought to be measured before and after the experiment. If this had suffered no diminution after the removal of the drooping leaves, it would then be absolutely certain that the leaves had not been filled up from that source; if it had, the reverse would be proved. This would be a nice experiment; but it can hardly be beyond the range of our present advanced science. [This has, we believe, been done, and no diminution in the amount of watery vapour detected.] The reason that I object to the balance as a certain test in such a matter, is that in such nice experiments the changes in the mechanical condition of the branch or leaf might sensibly affect its absolute weight when weighed in the free atmosphere. A flaccid branch occupies less space than a turgid one. Its mechanical condition is also widely different. Might not both of these facts affect its weight? The drooping branch receives no support from the atmosphere during the process of weighing, the branch with every leaf thoroughly stiffened and distended to the utmost limit does. It floats in the air like a boat on the water, with this difference, that the boat is brimful of water. It lies over it as well as under it; still even then the boat has a buoyancy of its own, and so may the leaf. In fact, the analogy is doubtless in favour of the leaf; for a fully distended leaf is filled with air as well as water, and this air helps to bear it up or lighten it during the process of weighing. For these reasons I think it probable that a turgid leaf, even if absolutely heavier, might weigh less in the free air than a flaccid one. Neither does it seem certain that the absorption of water and air by a leaf would add to its dead weight. Air has weight as well as water, and yet it is well known that a full inhalation of air into a man's lungs makes his body lighter, relatively at least to surrounding objects. The body is easier lifted, possesses greater buoyancy. Why should it not be so with a distended leaf. If it be granted that the condition of living bodies affects ever so infinitessimally their gross weight, the inference drawn from the reading of the balance in these experiments cannot be withheld. As to the upper portion of plants drawing supplies of sap from the under portion—this is very far from being always the case. It is no uncommon thing to see a flagged branch revive from the bottom upwards. Of course growing plants mostly do so revive; though, if Nature's provision for the growing extremities was so special as you assume, there seems no reason why the growing plant should not revive from the top downwards, as well as detached branches. If the growing points can empty the branch below them, and revive themselves at the expense of the drooping leaves lower down, there seems no reason why they should not also draw the sap from the roots first with such potency as to leave the lower leaves unfilled until they satisfied themselves; but Nature seems more

impartial in her mode of distribution. If, however, there is a growing point in need of supplies, to this they are forwarded upon the simple principle of first come first served; hence the nearer the drooping leaf to this flowing stream the sooner filled. But the facts you cite of the youngest leaves and growing extremities of flaccid branches being the first to revive, are easily explained on the hypothesis that leaves absorb moisture directly from the air; the younger the tissue the more permeable it is: and thus the young leaves would fill themselves first, and the flaccid branch become turgid from the top downwards. But the upper leaves would not have emptied the lower ones. The phenomena chronicled would only resolve themselves into a matter of time of filling, or a sufficiency of water to fill all the vessels. In a botanical box or vasculum there would be a deficiency of vapour, (?) and hence the lower leaves would remain empty, to the apparent establishment of the conclusion that they had been robbed for the enrichment of the upper leaves. This, however, can hardly be said to be proved by the cases cited. The case of the Potato shrivelling from the bottom upwards does not seem to me to help the argument, but rather to weaken it. Even the fact in this case is questionable. Potatos laid in a dry place, detached from contact with the earth, will shrivel first and most at the furthest extremity from the growing points or terminal shoots, whether such shoots happen to be placed at the top or bottom of the tubers. If it can be established that leaves absorb no moisture from the air, we may soon have an attempt made to prove that the quantity thrown into it by them is not at all dependent upon the amount already existing in the atmosphere, and that all the anxious care that we have hitherto taken to surround our favourites with a moist atmosphere, either to furnish them from this source with water or check its expenditure by evaporation, has been but labour in vain. I presume it will not be contended that there is any structural obstacle or physical obstruction to the passage of water from the outside of the leaves to the in. Vegetable tissues are (subject to certain limitations) permeable to air, gases, and fluids in all directions. Throughout the greater portion of their structure currents may even be reversed without inconvenience. Hence it is probable that as leaves perspire fluids so freely, they may also inspire aqueous vapour from the air when they need it most. If we deny them this power we are almost compelled to endow them with a greater, or to assert that neither do they absorb the air or other gases through their leaves. For if they do, we assign to them a task which seems impossible, that of electing to admit gaseous fluids, and shut out aqueous vapour, which is almost if not altogether as subtle and penetrating. *D. T. Fish.* [The vapour is condensed before it enters the leaf. EDS.]

Dimorphism in Gladiolus.—Is it generally known that there are two distinct forms of flower in Gladiolus gandavensis? In the one all the parts are, as it were, upside-down, the stamens of course are attached to the outer petals: in one they are '.', in the other .'. The lower "labellum" is outside in the one case and inside in the other, but that this structure is not a mere turning upside-down of the parts is proved by these lower segments being ornamentally marked, while the top segments never are. As a rule one form of flower belongs to one set of spikes, and the other form to another set: the two forms are very seldom seen in company on one spike, although at times there appears to be both forms, because the flowers are often a little pushed aside. The ovary and stigmas are also reversed from the beginning. It gives the spikes quite a different aspect from each other when once noticed, but the characters should be sought for in good well-grown specimens—not ill-grown ones. *W. G. Smith.* [See leader at p. 382, in our volume for 1861. EDS.]

Robinia inermis.—Can any of your readers inform me what was the origin of the close-growing Robinia inermis? Did it originate in one of those bunchy growths frequently seen in Birch trees, in the same way that the various dwarf forms of Firs and Pines appear to have done? I believe that it did, and my opinion is founded on the fact that I saw the other day in the village of Weybridge, in Surrey, where large Locust trees abound, a fine specimen which had near the top a tufty mass, exactly of the same character as those of the Birch and Pine above referred to. A few days previously I noticed a similar development on a Scotch Fir in the same district. *M.*

Lawns in Bad Condition.—I fear your correspondent, "B. C.," is not the only one who has a lawn in this state this season, but possibly the symptoms are more alarming than its actual state. I have seen lawns exhibit all the characteristics of that of "B. C.," by simply not mowing them in dry seasons. The strongest and most worthless plants survive, while the finer grasses perish, and hence the patchy growth of coarse grasses—Couch, &c. It is the same with weeds. No drought seems capable of killing these, and thus the weeds and coarse herbage seem to divide the lawn between them; but weekly mowing, while favourable to the growth of finer grasses is death to weeds, and it either kills or fines down the rough grasses into smoothness. If the want of regular cutting has originated the evil complained of, the remedy, which can at once be applied after the recent rains, is frequent cutting. This will at least improve the appearance of the lawn at once, by forming a smooth surface. Care should also be taken not to allow any of the coarse grass or weeds to ripen seeds. The weeds might also be grubbed up by the roots. A slight sprinkling of guano might be scattered over the turf with common grass seeds; scratch both in with a light rake, and roll down firmly. Little more should be done at this season. If these means of renovation are not sufficient, top-dress the surface next January or February with from a quarter of an inch to an inch of light rich soil, and sow a mixture of the choicest lawn seed next April. Roll in and mow the first few times with care, so as not to injure the roots of the grass. This treatment, unless the lawn is radically bad, exhausted, sour, &c., will restore the grass to first-rate condition. When the young seeds vegetate, it is well to allow the grass to reach a length of 2 inches before cutting it, and in this stage weed out every weed and roll it several times before mowing. It may then be cut every week, and rolled like an established lawn. For several months the young grass should be swept as lightly as possible. Frequent mowings, occasional top-dressings, careful weeding, and persistent rollings are the likeliest means of keeping or restoring a grass lawn in or to good condition. *Queries.*

A Literal Translation.—At the horticultural exhibition held at Sevenoaks on the 27th ult., prizes were offered "for the best glass of honey," in competition for which an exhibitor staged a tumblerful (!) of clear-drawn honey from the comb. The exhibition was in every respect a good one. *Opus.*

Geometrical Bedding.—The prettiest illustrations which I have seen this year of the use of very dwarf plants for this purpose, are at Messrs. Veitch's, at Chelsea, where, besides several nicely-grouped raised beds, will be found a large circular vase about 6 feet diameter and 3 feet high, filled with mould which is

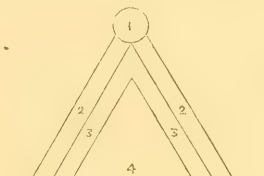

Fig. 229.

slightly inclined up to the centre, at which point there is a plant of Pachyphytum bracteosum. Around the margin there is an edging (5) of Pyrethrum Parthenium aureum or Golden Feather. Inside this is an edging of Alternanthera versicolor (2), and from it six rays of the same plant converge to the centre (1—fig. 229). This division of the circle into six segments affords room for the display of a triangular group of the following plants, one in each segment (4):—Echeveria secunda glauca, Sempervivum californicum, S. tabuliforme, S. globiferum, S. montanum, and Umbilicus chrysanthum; three of which are edged (3) with Antennaria tomentosa, while for the other three the edging is made of Pyrethrum Parthenium aureum. *W. T.*

Fruit Judging.—Turning over my note-book lately I found some memoranda made of a leader which appeared in the *Gardeners' Chronicle* on Dec. 13, 1862, bearing on this subject. I think the judgment had reference more particularly to judging Grapes; but still the principle is the same. The writer's judgment was different to Dr. Hogg's, seeing that the former gives preference to flavour over size and symmetry. My note goes to prove (I have not the entire leader by me, nor can I readily refer to it), that the writer in the *Gardeners' Chronicle* divided his judgment into two general sections, and then subdivided those sections into parts, something in this way:—

1. Flavour: 3 points in all. { 3 points if excellent; 2 points if second rate; 1 point if inferior; 0 if bad.

2. Appearance: 3 points in all. { Size—1 point of each if of high excellence. Colour—½ if inferior, or partial. Condition—0 if bad.

Simplifying it, he says, "Let quality, which means flavour, and appearance be taken as of equal total value. Let, say, six points include perfection—three for flavour and three for appearance; and then subdivide as above." The article in question seems full of wisdom, and we should do well at this time, I think, to consider calmly and deliberately what has been well said by fruitists of a past age, in this present fruit-growing discussion. *N. H. P.*

Preservation of Plants from Frost.—Will any of your readers narrate their experience in preserving plants through the winter without the aid of a glass building and hot-water apparatus? I have a spare room at the top of my dwelling-house which I could devote to the purpose; in it there is a glazed sash window, but no fireplace. Would a lamp burning spirits of wine provide sufficient heat?—and would an iron plate, or a vessel containing water, be a desirable addition, as a diffuser of caloric, if suspended over the flame? I presume that the fumes from cheap mineral oils, such as paraffin, &c., would be injurious to vegetation. *E. S.*

Melon Seed Vegetating in the Fruit.—I have seen this several times, though it is not a common occurrence. Such soft-fleshed varieties as the Persian or Cabul, if slightly over-ripe, used to exhibit this peculiarity. It would be interesting to hear from Mr. Dean if his Melon was at all over-ripe, or if it was kept long, or at all, after it was cut, and in what temperature. I have frequently lost more than half the seeds of choice long Cucumbers through this internal sprouting, which has taken place before the seeds were thoroughly matured; and in decayed Melons such growths are comparatively common. Considering the ease and rapidity with which such seeds germinate, the wonder seems that they sleep so long within the fruit, and not that they occasially grow. *Observer.*

Early Rose Potato.—The following is the produce obtained from this Potato:—March 18, 1870: planted 13 Potatos, weighing 3¼ lb. August 22, 1870: raised Potatos weighing 101½ lb., giving an average return of 31 lb. for every 1 lb. *Vernon Darbishire, Glan-y-coed.*

Botanical Terms.—In an article at p. 1083, you comment, I think perfectly correctly, on the incorrect use of the term "gamopetalous" in modern handbooks, as a substitute for "monopetalous," and say that "we are at present obliged to use a set of terms in a conventional sense, and to disregard the inappropriateness of their application." In the "Journal of Botany" for July I suggested the adoption of the terms synpetalous, apopetalous, synsepalous, aposepalous. Would not this meet the difficulty, as being technically correct, and analogous to syncarpous, apocarpous? *Alfred W. Bennett.* [The difficulty is to find a word which shall express clearly the distinction between imperfect separation and cohesion. EDS.]

Fifty Dollar Potato.—The following is the produce of 1 lb. of the Fifty Dollar Potato:—My employer bought 1 lb. (3 tubers) in April last, and I followed the same method as recommended by your correspondent, E. Bennett, see p. 460. By May 27 I had 88 sets, and I planted the one half of them then, and the remainder on June 4. I lifted them on August 29, and the total weight produced was 133 lb. Twenty of the largest weighed 16 lb. *A. McAndrew, Bromley Palace, Kent.*

Foreign Correspondence.

SYDNEY BOTANIC GARDENS.—Almost surrounded by picturesque park-lands, and in the most retired part of the city, the Botanic Gardens spread over 100 acres, and encircle Farm Cove, one of the many charming indents of the magnificent harbour of Port Jackson. Although favourably situated in so romantic and beautiful a spot, "Nature's picture" has, in no small degree, been enhanced by artistic adornment. All who have watched the progress of these gardens within the past few years, and can appreciate talent and taste in the production of delightful spectacles, must admit this; but there are beings in existence who feel not the sublimity of Nature and Art, and in whom the most noble picture, or even the most gorgeous flower, will fail to excite a sense of admiration.

The origin of the inner garden dates from the year 1818, during the administration of Governor Macquarie. The first appointment as curator fell to the lot of Mr. Fraser, who is supposed to have planted the two splendid specimens of Norfolk Pine (one 106 feet, the other 84 feet in height), which catch the eye on entering the principal gate. He it was who laid out the grounds in beds, intersected by straight walks, which in any other but a nursery would not be tolerated by any landscape gardener. The idea should have been to imitate Nature as much as possible, and this cannot be done by straight lines; yet independent of this acknowledged defect, the inner or original garden, so called, possesses attractions owing to the great variety of plants it contains, and their almost perpetual luxuriance and verdure, which a lover of the beautiful cannot but pause to admire. Fraser was succeeded by Richard Cunningham, who was lost in the Bogan country while on an expedition with the late Sir Thomas Mitchell. Allan Cunningham, his brother, whose name is familiar to all who make the science of botany a study, afterwards became director of the garden. He died in the house which may be seen to the left, the residence of the present curator, Mr. Charles Moore. After passing through an avenue, which is formed of Robinia Pseud-Acacia, Olea europæa, and other plants, which almost meet so as to form an arch some 20 feet overhead, on entering the gate, two magnificent specimens of Latania borbonica, one on either side, clothed to the ground with their graceful fan-like fronds, first arrest attention. Down the straight walk, distant some 30 yards, or midway between this and the entrance to the outer garden—a glimpse of which may be had beneath its spreading branches—the larger of the Norfolk Pines alluded to, a

picture in itself, majestically towers up. Standing beside this fine specimen—which may be seen not only from the walks that radiate from it, but from almost any part of the grounds—the eye rests upon numerous individuals of Jacaranda mimosæfolia, the Rosewood of Brazil (a plant which, for its gorgeous flowers and the delicacy of its foliage, should be termed Prince of Brazilian forests); Erythrina, Wigandia caracasana, Tecoma velutina, Camellia, Astrapæa, Metternichia principis, Gardenia, Allamanda, Azalea, Hibiscus, Sciadophyllum, Poinsettia, Paratropia, Brunsfelsia, Franciscea, Mango, Cinnamon, Coffee, &c., all of them planted with good effect. Among the more conspicuous of the taller trees in the densely crowded squares are such as Brachychiton, Bauhinia, Elæocarpus, Podocarpus, Corynocarpus, Quercus, Castanospermum, &c., their profuse rich foliage contrasting with that of the many rare exotics with which they are surrounded.

At the extremity of the straight walk to the east, the aviary, which contains a valuable collection of birds, has, in the distance, a pleasing effect. Entwining a trellis-work in front are the elegant climbers, Thunbergia laurifolia, Mandevilla suaveolens, Wistaria sinensis, Beaumontia grandiflora, and Bignonias Tweediana and Cherere. A clump of Musa, with its large foliage, growing near, adds a charm to the rest. On either side of the walk, close to the aviary, are two enclosures, a fountain in each, and ponds for aquatic fowl. Facing west along the centre walk, you cross a small stream, upon which are several bridges. From one of these a pretty little view may be had of numerous Tree Ferns, Alsophila, Cyathea, and Dicksonia (one of which, A. excelsa, is 25 feet in height, with a double stem from near the base); these grow along the banks, their massive green fronds bending gracefully over, while tall trees near afford them a deep shade. On the slightly elevated ground beyond this a scene of elegance and beauty presents itself in a collection of Palms and Cycads tastefully placed in angular beds; but it is not only in this spot that they add to the picturesque appearance of the garden; there is a general distribution of them throughout the grounds; and whenever they can be viewed from the hills interspersed with other foliage, their grandeur is almost beyond description. A magnificent specimen of Cocos plumosa, which is at least 40 feet high, is always a pleasing object; and, before ascending this gentle slope, a fine specimen of Corypha australis rears its proud head to nearly the same height. On the opposite side of the walk is a Ficus, remarkable for its immense bunches of berry-like fruit. Among the more noticeable of the Palms are several species of Phœnix, Latania, Seaforthia, Chamærops, Saguerus, Areca, Sabal, Jubæa, Copernicia, Livistonia, Cocos, and the unique Caryota urens. There are many others of rarity and extreme beauty, some of which are new to science. In one of the beds are specimens of Urania speciosa, the Traveller's Tree of Madagascar; Nuytsia floribunda, the Flame Tree of King George's Sound, believed to be the only plant of its kind which has ever been successfully cultivated in any part of the world; Bonapartea juncea, and other plants of interest.

Standing at the western extremity of the walk which divides this group of tropical treasures, one cannot but dwell upon the charming prospect before him. A pinetum of Conifers and Taxads slopes down a lawn to the left, at the termination of which the continuation of the dividing wall or fence is concealed from view by a dense shrubbery. A specimen of Taxodium, with some Abies and Cedrus, are among the nearer objects. Further down, Cupressus macrocarpa, C. lusitanica, C. Lawsoniana, and C. torulosa are visible, and, more distant still, a group of Dammaras, in which the species D. Moorei and D. robusta are conspicuous. Dammara obtusa, D. ovata, and D. australis may also be seen, and among them there is one which is probably Dr. Seemann's D. vitiensis, from Fiji. These, with others of the Pine tribe, grouped well together, but too numerous to mention, form a varied mass of exuberant foliage which is lovely to behold, and which, if taken in the same view with the assemblage of Palms and Cycads, adds variety to the prospect. Our Australian friend the Corypha, first noticed before ascending the slope, now has its tall naked stem hidden; its head of rich green fronds peeps above the neat foliage of a Cyminosma, which spreads over a bridge upon the stream beneath. Adjoining this, near the small oval pond, are many interesting plants, such as Ficus religiosa, the Pepul tree of Ceylon; Artocarpus integrifolia, the Jack Fruit; Abies jezoensis, the Japan Larch, the latter growing most luxuriantly; also some noble specimens of indigenous trees, among which may be noticed the original plants of Flindersia Oxleyi, Grevillea robusta, Araucaria Cunninghamii, Harpulia, Epicarpurus, Tetranthera, &c., collected by Fraser on his first expedition to Moreton Bay. A little to the westward of these is a collection of Rhopalas and other proteaceous plants. A portion of the huge Norfolk Pine in the distance looks proudly above the surrounding mantle of many-hued masses of leafage.

In this garden, in an enclosure to the left of the avenue, are the conservatories, three in number. It is a great pity to see crowded together in these, for want of space, such a vast collection of choice and valuable plants. A good substantial house, at least 100 feet in length by about 50 feet in breadth, is much needed.

On entering the outer or lower garden through its principal gate, which is partly concealed from view by a clump of Bambusa arundinacea, the lover of the picturesque will be fascinated with the manner in which Nature has been imitated. The monotonous and rigid uniformity of square beds and straight lines which offends the eye at almost every step in the inner garden is replaced by a beautifully varied surface, and a tasteful arrangement of exotic trees and shrubs. The slopes, levels, and gentle undulations harmonise with the charming aspect of the bay. Contrast in the general effect, and perspective, too, have been studied. "All Nature is a garden"—hence, to create scenery such as will always resemble and often might be mistaken for that of Nature is an art, but one which few can acquire. Backed up by the foliage of a Ficus, a Eugenia, and other plants that border a lawn to the West, a rockery crowded with Orchids, Crassulas, Æchmeas, Aloes, Bilbergias, and other plants equally interesting, face the gate. A serpentine walk, 16 feet in width, encircles the grounds, and several others branch from it. To the left a thickly planted shrubbery almost hides the dividing wall, which in places is crested with Ivy, Rhus radicans, and various species of Bougainvillea. Strolling along in this direction, occasional glimpses may be had of the bay between the numerous groups of rare exotics studding the fine lawns that slope towards it. Leaving the rockery a little to the left, an undulating surface with a gradual ascent stretches along the eastern side of the cove, presenting a series of delightful nature-like views, so disposed as to cause this part of the grounds to appear far more extensive than it really is. Another rockery with remote background has, in the distance, a delicious effect, being adorned on one side by a Ficus syringifolia, the remarkable richness of whose bluish-green foliage is in itself striking, but rendered still more pleasing by the softer shades that surround it. Single specimens of such trees as Pinus, Olea, Gleditschia, Acacia, Photinia, Pittosporum, with Azaleas, Dracænas, and Bamboos, the latter 60 feet in height, sometimes occur, to embellish and diversify the landscape. At one spot a shrubbery in the foreground hides from view the entrance to the cove, causing the rest to appear like a lake bordered with verdure of the brightest tints, while the vice-regal residence, like a castle embosomed in green, peeps above its richly clothed hilly outline; nothing can exceed the beauty or the interest of this view. From here you can see to advantage the rarities of the inner garden, presenting a rich and varied display. Araucarias, Palms, Plantains, Magnolias, Bamboos, Poplars, Oaks, and Olives, &c. —the plants of Britain, America, Madagascar, China, Japan, Polynesia, and Australia, vieing with each other in their beauty and magnificence, affording a sight as novel as it is glorious. The visitor cannot help picturing to himself the future appearance of this most delightful garden. When that part of the bay now being filled in shall have been added to the already extensive pleasure ground, its beauties will have increased in a tenfold degree, and this is one step only towards the great end Mr. Moore has in view.

The stream that flows through the inner garden, and is crossed by means of bridges, is here converted into a chain of ponds that are subterraneously connected. In a fairy nook facing the bay the first of these may be seen, having a small island in its centre. In the water, close to where it makes its exit into the next pond nearer to the bay, stands a monument to the memory of Allan Cunningham. Upon the islet three or four specimens of Seaforthia elegans and a Corypha, Palms of great and singular beauty, together with some trees of Alsophila excelsa, grow up in a group, curving their feathery fronds over a mass of Platycerium alcicorne that is nestling between their stems; while Arums and Richardias, which luxuriate in the water, prettily hide the bank. Some Weeping Willows growing near, their pendulous branches drooping gracefully overhead, afford in seasons of heat a graceful shade, and give to this lovely spot a solemn but beautiful appearance. Adjacent to this spot, and not far from an Acmena pendula and a Camphor tree, his Royal Highness the Duke of Edinburgh, on the occasion of his first visit, planted a Theophrasta imperialis, which is thriving, and now about 5 feet high. The encircling carpet of verdure, which from the hill is so lovely, is now in a still greater degree interesting; and the cove opening to view, being the anchorage of Her Majesty's ships lying in port, is thus rendered sometimes more attractive. Onward a few paces, you are in the first of a series of small gardens of monocotyledonous or endogenous plants, placed according to the natural classification. This instructive arrangement curves round from a hill, at the base of which there is a rustic octagonal summer-house, with a roof thatched with the leaves of Xanthorrhœa or Grass Tree, and close to which is another interesting arrangement of exogenous plants. From several views which may be had of this kiosk in these miniature gardens, it is suggestive of a South Sea Islander's house; the vegetation above which it peeps, consisting of Palms, Pandanus, and several genera of the Musaceæ and Araceæ, agree with it in character; and the richly clothed hill as the background completes an exquisite and interesting picture. A serpentine embankment running northwards, planted with dwarf flowering shrubs, conceals for a time the waters of the rippling bay; this bank is not only an ornament to the grounds on either side, but serves as a shelter to the arrangement mentioned, which runs parallel with it, and terminates in a rockery, in which there is a walk which brings you suddenly to the brink of a pond, still more enchanting than the first, in which the Papyrus, some Nymphæas, and other aquatics are growing. The banks of the ponds and the grounds around them are matted with Stenotaphrum glabrum, the Buffalo-grass. The extensive and beautiful lawns, too, which I have seen none to surpass, are almost entirely made of it and the Cynodon Dactylon or Doub. These should be extensively cultivated, for there are no grasses more valuable in such a climate as this; they are always green, even in seasons of excessive drought. A rockery at the other extremity, rendered more bold and pleasing by one or two huge Dracænas, some Palms, Tree Ferns, Yuccas, and Aloes, growing in the interstices or near to it, partly conceals the more distant view of extent northwards of this delightful locality.

At the western and eastern entrances are rockworks, that at the latter unequalled in this country. The situation is on an elevated solid block of rock, upon which large mounds of earth were formed of irregular shapes, and so planned as to shut out the view of the garden from the outside. It occupies nearly a quarter of an acre. Upon these mounds masses of waterworn rock and stumps of trees of a rustic character have been distributed in an artistic manner, and planted with a great variety of suitable plants, such as Cactuses, Aloes, Euphorbias, variegated Phormium, Dracænas, Dendrobiums, Platyceriums, and other Ferns.

There is an impressive grandeur in this garden; for, independent of its lovely situation, its almost perpetual luxuriance, and the skilful manner in which Nature has been imitated, it is a treasury of nearly all the natural families of plants. Mr. Moore has spent a quarter of a century in this garden, and all its artistic beauties are his creation. He has reconstructed and embellished the original as far as practicable; and, in the heavy additions made, has left a lasting memorial of his professional taste and judgment. Much yet remains to be done ere his task is finished; may he live to complete it. The great wonder to those who know anything of the matter is, that he has so admirably managed and economised the small funds annually placed at his disposal by the Government, as to produce a garden, the merits of which it would be difficult to overestimate. *W. R. Guilfoyle* (*Sydney Mail*).

St. Helena.—Can any of your readers obtain for me some information about the house-eating white ants? I have been carrying out some experiments here as to the most efficacious and available method of protecting wood, and think I can succeed; but at the same time should be grateful for any hints. The objects are to protect timber in a cheap manner and on the spot. The white ants here eat the town up,—that is, the wood-work; they tunnel, bore, and build in an admirable manner. I have a colony of them in my bedroom. I feed them with wood, to prevent them eating my boots when placed on the floor. *E.*

Notices of Books.

Westward by Rail: the New Route to the East. By W. F. Rae. London: Longmans. Pp. 390.

The opening up of new routes to or from distant countries is a matter of particular interest to horticulturists. How many thousands of plants have perished *en route* from India, China, or elsewhere? How many hundreds of pounds have been fruitlessly lavished by enterprising nurserymen in their endeavour to import the Orchids or Ferns of the Indian Archipelago or South America? What bitter disappointment has been experienced by our colonists in the receipt of packets of dead seeds or cases of what had been valuable trees.

Thanks to improved methods of packing, to such contrivances as Ward's cases, to a better knowledge of plant life in general, and of the habits of certain plants in particular, and thanks, more especially, to the shorter duration of the transit which the skill and enterprise of the engineer and navigator has procured for us, we may soon look forward to the reduction of these losses *in transitu* to a minimum. The Suez Canal and the Pacific Railway will ultimately prove of no little value from this point of view; already we hear of large importations of plants conveyed through the Egyptian canal, and we may look forward to similar importations, as in the case of such seeds which speedily lose their vitality, through the medium of the vast American railway.

The narrative of the journey from New York to San Francisco, though it contains little that has not previously been told, is nevertheless agreeably related in the pages of the volume whose title is above cited. In illustration of the author's style we may extract certain passages relating to matters horticultural. Speaking of Chicago, which now rivals Cincinnati in the number of pigs annually slaughtered, the author says:—

"The abundance, excellent quality, and moderate price of Peaches, Apples, and other fruit sold here in the autumn excites the admiration of the visitor. In some streets the pavement is encumbered with boxes of fresh Peaches. I learned that these are produced in the southern part of the State of Illinois. The soil and climate of that locality render fruit-growing as profitable there as it is in the southern parts of Germany. During

the Strawberry season five cars filled with Strawberries arrive at Chicago daily. When the Peaches are ripe the supply sent to market every morning fills 20 cars, each carrying 500 boxes of Peaches. Egyptian Illinois is the name of this prolific fruit-bearing region. Intersected by railways, the market is within easy reach of the cultivator's door. It is seldom that a crop fails, the climate being equable and temperate. Thousands of acres are still to be had by the settler. When I add that this land may be purchased for less than £2 the acre, I have said enough, I think, to excite the desire of many to possess and cultivate it."

Here is the way in which the new cities, which are constantly growing on the American continent, are planned : —

"Farther west, and on the other side of the line, I saw what appeared to be a nursery garden devoted to the growth of young trees. The young plants were in ordered rows, and disposed with a special view to regularity. A fellow-traveller who knew the country and its customs, told me that my supposition was erroneous. The spot was the chosen site of a future city. It is thus that speculators plan out and prepare the way for the settlement of uninhabited tracts of suitable land. Not only do they plant the trees destined to overshadow the footpaths on which unborn children will play, but they also give names to the streets, and even set apart sites for imaginary buildings. All these things are carefully noted in a map which is shown to the seekers after new abodes. They buy lots where their fancy dictates, and sometimes find on arriving to take possession that they are the first and the only inhabitants. The trick is not a new one. It was played upon Martin Chuzzlewit when he determined to make his home in what he thought was a new and rising city, but which proved to be an old and dismal swamp."

Even the bitterest enemies of Mormonism have expressed their admiration at the endurance and skill which have converted the desolate Salt Lake Valley into a region of fruit trees and cornfields—

"This praise," says our author, "is subject to qualification. It is true that they have planted trees and sown grain where rank herbage seemed the natural product of the soil ; that their Peaches and Apples are well flavoured ; that their corn is excellent in quality. But it is likewise true that the soil and climate of Salt Lake Valley combine to render gardening and farming easy and profitable occupations. Irrigation is the one thing needful, and to irrigate the thirsty land is here the merest child's play. The country is intersected with streams of fresh water descending from their sources among the mountains to fill the lakes in the lower ground. On the borders of these streams a vegetation far more luxuriant than that of the parched plains indicates the course to be adopted by him who would till the soil in the hope of reaping a harvest. Of these hints the first settlers took the advantage, and the result is seen to-day in the Acacias which line the streets of the city, and the orchards which surround the houses. No miracle has been wrought here. They only will marvel at the spectacle who are unaware of the simplicity of the process."

We had marked several other extracts relating to the condition of the Mormons, the climate and products of California, and the Chinese in San Francisco, but it would hardly be fair to the author to do so, even if our space permitted. We must therefore refer the reader to the book itself, merely adding, by way of conclusion, a passage relating to our own colony of British Columbia, and to the honey-bee, concerning which we should be glad to have further evidence before we place it among the category of accepted facts. If true, it is a fact worthy the attention of Mr. Darwin :—

"That the praises I have vented on the Californian climate are not exaggerated may be inferred from this circumstance. It was some time after settlers had flocked here from other parts of the American continent and from Europe before the honey-bee was introduced. This useful little insect soon made itself at home, and filled hives with honey. After a year or two had elapsed the store of honeycomb was diminished to a minimum. The bees found that as flowers were in bloom all the year round there was no necessity for laying up a large supply of honey against a barren and blossomless winter season. Consequently, arrangements had to be made to deal with the bees as with hens, abstracting the honey in small portions in order that the formation of the honeycomb might go on uninterruptedly. Perhaps it may prove interesting to add what I have learned at second-hand, but from unprejudiced sources, that the highest eulogiums passed upon the soil, sky, and climate of California are literally applicable to Vancouver's Island also; and that if Americans are to be congratulated on having such a Garden of Eden as California among the States of the Union, the English people are quite as fortunate in numbering Vancouver's Island among the possessions of Great Britain. My informants were Americans, who did not conceal their desire to substitute in British Columbia the Stars and Stripes for the Union Jack. It is hardly creditable that a possession so valuable should be almost disregarded. Those who are concerned in the organisation of emigration from England might do their fellow-countrymen a service by investigating the advantages of settling in British Columbia."

FOREIGN JOURNALS.

FOLLOWING up from p. 500 our notes on the foreign horticultural publications, we find on our table another part (including Nos. 10, 11, and 12) of the 18th volume of **Flore des Serres,** which contains some most exquisite illustrations. We take them in order, as usual. *Symphytum officinale fol. luteo-marginatis* is an ornamental variety of a well-known hardy herbaceous plant, in which the leaves are evenly and distinctly bordered with creamy yellow ; the present form, which was found in a wild state by M. J. de Beucker, of Antwerp, is a constant and well-marked hardy variegated perennial. *Tydæa Robert le Diable* is a bold-habited and high-coloured variety, raised by M. Van Houtte ; the leaves are ovate, and the flowers nearly 2 inches across, of a deep crimson, freely spotted over the limb with confluent black blotches. *Dendrobium taurinum*, a Philippine Island species, with flowers of singular shape, resembling a bull's head, the sepals pale greenish, the petals purple, elongated, and twisted like a pair of horns, and the lip paler purple. *Pteris cretica albo-lineata*, the white-banded Pteris, beautifully figured. *Pelargonium* (zonal) *Madame Victor Le Febvre*, a zonal variety, with rosy pink flowers. *Campanula Raineri*, a beautiful large-flowered species, of a close dwarf habit, with subsessile ovate remotely-serrated leaves, and short funnel-shaped blue flowers, nearly 1½ inch across ; it is a hardy perennial, from the banks of the Lake of Como. *Strawberry Triomphe de Hollande* (Quatre-Saisons), sent out by M. Copyn, of Utrecht, a large and extremely good-looking form of perpetual Strawberry, the berries ovate, and represented as being an inch across, and of a deep red colour. *Phalænopsis Lowii*, a pretty purple-lipped Moulmein species, now pretty well known. *Thysanotus proliferus*, a curious fringed-flowered Swan River Lilywort, now seldom seen in gardens. *Doryanthes excelsa*, a fine portrait of an old garden favourite. *Achimenes* (*Eucodonia*) *nægelioides diamantina*, a splendid Gesnerad, one of the results of M. Van Houtte's felicitous hybridisations in this class ; it has bold cordate-ovate hairy leaves, and large Gloxinia-like flowers of a beautiful pale rosy purple with a yellow band down the lower side of the tube. *Ptychosperma Alexandræ*, an uncoloured plate of this fine Australian Palm, in its mature condition, showing a tall slender ringed trunk, and a crown of handsome pinnate leaves ; it is indeed a "Palma superba," and grows from 70 or 80 to upwards of 100 feet in height. *Selenipedium* (*Cypripedium*) *Schlimii*, a very pretty and distinct form of Lady's Slipper, with purple lip and white petals. *Gloxinia speciosa Lion de Flandre*, a large-flowered and very showy bluish purple drooping variety, with broad creamy white throat. *Tacsonia quitensis eriantha*, an elegant conservatory creeper, with rosy-tinted flowers. *Vanda Batemanni*, a fine double plate of one of our finest and rarest Orchids. *Primula cortusoides amœna grandiflora*, a fine illustration of the best form of this most charming hardy perennial. *Cytodeira chontalensis*, a charming variegated-leaved Gesnerad, with the centre of the ovate-oblong leaves of a bright green, feathering out towards the margin, which is of a rich coppery hue, the largish fimbriated flowers being white. *Trichopilia crispa marginata*, a remarkably choice and beautiful Orchid, of which an excellent figure is given in the double plate here issued. The superior character of the plates is well maintained in this bulky number, with which the 18th volume closes. The opening parts of the succeeding volume are announced as being in preparation.

L'Horticulteur Francais, of which the numbers to June last have reached us, contains figures of the following subjects :—*Cobæa penduliflora*, an elegant creeper, to which we have before alluded, but one requiring a high stove temperature. *Palava flexuosa*, a pretty Malvaceous annual, described in these columns some years since. *Tacsonia eriantha*, mentioned above. *Coleus Saisonii*, a handsome variety, in which the leaves are marked with white, red, green, and bronze, in an irregular manner, and not evenly margined as in the golden varieties of the Queen Victoria type : it appears to have originated in a sport on C. Veitchii, and to have been obtained by Mr. Lierval. *Weigela Lavallei*, a fine new variety of Weigela, obtained, it is said, between *W. arborea grandiflora* and *W. multiflora*, which latter it most resembles in its large, reddish purple flowers ; it is a very abundant bloomer, and must be an acquisition amongst hardy flowering shrubs. It is one of the announcements of M. Lemoine, of Nancy, and has, we may hope, escaped both the tramp of the war-horse and the concussion of the cannon ball. *Pêche Robert Lavallée :* a Peach, described as being of the largest size, and the first quality ; the fruit being elongated, and terminating in a nipple, and the skin yellowish green, tinted with rose, and more strongly marked with purple on the sunny side ; it was raised at Segrez, and is nearly related to the Chevreuse tardive, and the Reine des Vergers.

La Belgique Horticole (April to July, 1870) contains the following illustrations :—*Tillandsia* (*Wallisia*) *Hamaleana*, a South American species, of dwarf growth, with linear arched leaves, an inch wide, and large violet-coloured flowers, white at the base. The species was exhibited in 1867, by M. Linden, at Paris, where it was much admired. In the text, Professor Morren adopts the genus, Wallisia. "It has a sweet odour, and," the author adds, "it is truly extraordinary that a large number of mauve and violet flowers diffuse a sweet odour—a fact as yet unexplained." The Wallisia figured by Regel in "Gartenflora," under the name of W. Lindeniana, M. Morren regards as intermediate between his W. Lindeni, and the W. Hamaleana noted above. *Verbena tenera varieties :* a group of five pretty forms of the cut-leaved slender species, generally known in England as V. pulchella. A *Wallflower*, with variegated leaves and double purple flowers. *Vriesia psittacina brachystachys :* an elegant Brazilian plant, with oblong ligulate leaves, and short spikes of yellow flowers, red at the base, the lively colours of which are very attractive. *Mimulus luteus calycanthemus :* one of the duplex spotted varieties, introduced a few years ago by Mr. Bull, in which the calyx becomes enlarged and coloured like the corolla. *Rose Edouard Morren :* a reproduction of the plate in the "Floral Magazine."

We must reserve a notice of some other publications for another opportunity.

Florists' Flowers.

I HAVE just been looking at some illustrations of HERBACEOUS CALCEOLARIAS that made considerable stir some 20 years ago, and I was led to institute a comparison between them and what I have this season seen of the best strains in cultivation. "Strains" of the Calceolaria, however, is a term that must be used with a very limited interpretation now-a-days, for there is such a manifest identity of character between "James's International," "Dobson's extra choice dwarf," and the "Dalkeith or Thomson's," that they may, without any fear of unduly lauding the one or detracting from the other, be pronounced the same. In growth, shape, and size of flowers, and in the extent of variation, they are in general characteristics equal. Henceforth let vendors of the seed of each of these meet on the common ground of equality in the value of their strains.

In point of dwarfness of habit, an undoubted and marked advance has been made during the past few years. The plants bloomed this year by Mr. James, gardener to W. F. Watson, Esq., Isleworth, seemed to possess this close, compact, short habit in a remarkable degree. Perhaps the possession of it was in some measure traceable to the dry season, yet Mr. James makes very careful selection of his seed types, and persistently crosses in order to procure certain results. These results he undoubtedly attains—slowly, but surely. [Dwarfness and compactness is a special feature in some of the Continental strains. EDS.] Size of flowers is another marked feature. Even during a very dry spring, when a reduced size of flowers might reasonably have been looked for, they have been seen of very large proportions. Some plants shown by Messrs. Dobson & Son, of Isleworth, at one of the early meetings of the Royal Horticultural Society, were particularly noticeable for the immense size of the individual flowers. But the size has been gained at the expense of a considerable loss of both form and refinement. The majority of these large flowers are singularly grotesque and uncouth in appearance—of indented, flat, and irregular shapes, and with capacious mouths, staring open, as if inviting insects of all kinds to take up their abode within. Now it is requisite that the improver, having developed size to his heart's content, should seek for refinement, and this will no doubt come in its own good time. The peculiarly clustering form of flowering which the Calceolaria has taken in recent years, yielding immense ball-like clusters of blossoms of a clubbed character, is somewhat against the production of form, though not necessarily so. Our raisers plead, with much force, that the Calceolaria is required for decorative purposes chiefly, and that so long as there is an abundance of flowers of large size, partaking of striking showy hues, form is a matter of comparatively secondary importance. Still, the Calceolaria is much used for exhibition purposes, and progressive refinement is a strong need in all exhibition flowers. In Mr. James's flowers there could be seen a decided improvement in point of shape ; probably others could show similar results. So the work is being taken up, and already showing fruit.

In point of variation, I noticed that Mr. James had succeeded in obtaining flowers of great depth of colour, in one case almost black. In another part of a house of seedlings could be seen pure white flowers, obtained from seed taken from a clear pale primrose-coloured flower in 1869. Some were intermediate between the two, and there is reason to believe white Calceolarias will soon be as common as yellow ones. Crimson-coloured flowers have developed into very fine hues of colour, some self-coloured, and some densely spotted on pale grounds. One flower was of enormous size, a veritable floricultural Brobdingnag among Calceolarias ; it had a pale green base, the upper part sulphur, profusely blotched and spotted with lovely crimson : this was one of the varieties having the flowers produced in clusters. Mr. James informed me that there is one peculiarity about these cluster-producing sorts, that the blooms hang much longer than those not so arranged in bunches.

More and more does the shrubby habit appear to develope itself in Mr. James's strain. Probably this is the reason for the compactness of habit before alluded to. Mr. James selects habit as much as shape and colour of flowers for seed purchases ; so the dwarfed habit is readily accounted for.

Cultivators should make a point of having an open porous soil, through which the water will readily percolate ; a soddened mass about the roots of the Calceolaria is hostile to its wellbeing. This season Mr. James used some new loam, which had the appearance of being free and open, but when employed for potting purposes, it became very close and sticky, and he imperilled the lives of many plants in consequence. A

loose, fibry, and thoroughly seasoned loam should be used, and the danger, which came close to Mr. James, will be held at a distance.

The season has proved hostile to the saving of seed. The dry atmosphere shrivelled up the seed-pods, so that they appeared incapable of producing their precious seed. All growers appeared to have suffered more or less, and the same remark applies to the Primula. I saw this season one house of Primulas that had been saved for seeding; the plants were in fine condition, and the pods large and plump; on examining them, the pods were seedless. Where eight ounces of seed might reasonably have been looked for, scarcely half an ounce was gathered. *R. D.*

Garden Memoranda.

Heckfield Place, the Seat of Viscount Eversley.—We have occasionally in these columns heard a little of Heckfield, but it has mostly been in relation to its Vines; good as they are, however, they form by no means its chief feature, for all the departments are done well, and everything in and about the gardens bears continual evidence of the cultivated taste of the owner, and the energetic perseverance of his gardener, Mr. Wildsmith. We had heard of the beauty of the flower garden at Heckfield, and went to see it for ourselves, and came away highly pleased with what we saw. For not only is there a beautiful blending of colour, an entire absence of gaudiness, and a delightful softness that charms the eye, but with it also there is such a degree of finish, even to elaboration, that we are compelled to characterise the entire arrangement as perfect. The undulated lawn of 16 acres is as smooth and as clean as well could be. The pathways are like yellow asphalte, and are a real pleasure to travel over. We are at liberty to mention here that Lord Eversley kindly permits the gardens to be thrown open to the public on Tuesdays; also that gardeners are made welcome on any day, Sundays excepted.

We started on our tour of inspection of the gardens from the entrance to the south terrace, just by the carriage-way, and noted, at the bottom of a flight of steps leading to the pleasure-grounds beyond, a splendid pair of Palms (Chamærops Fortunei), one on either side of the path, each having a height of 7 feet, and in diameter about 9 feet. These are not mere fair-weather trees, that are popped into winter quarters as soon as the melancholy wind begins to blow cold, but they are real out-door plants that stood out all last winter unprotected, and are now in first-rate order. The leaves are not, like too many more of their poor subtropical brethren, "all tattered and torn," but look just as they should do. These Palms were planted out here in the autumn of 1867, and were then about 3 feet in height. Their subsequent growth has been of the most satisfactory kind. Turning now to the flower garden, we find it to consist of two distinct arrangements, the beds on the south terrace being arranged in blocks, while those on the east terrace are in lines; but we may premise that along both fronts of the mansion runs a broad walk, on the outside of which dips a steep sloping bank, the flower beds lying between this and the balustrade beyond. From the walk the whole of the bedding is seen to perfection, and from it very beautiful views of the trees in the park, its fine undulations, the lake, and the fine country beyond, are distinctly seen. The top of the mansion affords a view of the finest scenery of North Hants, and glimpses of other counties.

Now let us look at the beds on the south terrace, which are arranged in three blocks—the two end ones being the same in shape and constitution; whilst the four best, forming the centre block, each of which resembles a square with one corner scolloped out, are all planted alike. In the centre of each block is a large vase filled with flowering and creeping plants, charmingly arranged, and growing luxuriously; and these give a pleasant relief to the more formal character of the bedding, which consists chiefly of foliage plants. The centre block of four beds is planted with an edging of Alternanthera paronychioides, inside of which is a broad line of Lady Plymouth Pelargonium, regularly dotted with neat plants of Coleus Verschaffeltii, then a narrow line of Iresine Lindeni, enclosing gold-edged Pelargonium Reine d'Or, with a centre of P. Flower of Spring, out of which rose a neat, well coloured plant of Abutilon Thompsoni. This arrangement of colours is most pleasing, and the extraordinary pains taken to keep the several lines and dots clear and well defined deserves much praise. The two end blocks each consist of eight small beds radiating from the centre, the pattern of planting being, however, very simple, as the beds paired with each other as well as the blocks. The most effective group here, and certainly a veritable gem, is an edging of Golden Feather Pyrethrum, enclosing a mass of Coleus Verschaffeltii, dotted with three strong plants of Centaurea candidissima. Another grouping is a ground of Pelargonium Flower of Spring dotted with plants of Iresine acuminata, a new variety, which looks like a great improvement upon Iresine Herbstii. A third pair of beds is filled with grounds of Mrs. Pollock, dotted with plants of Coleus Berkeleyi, the other having an edging of Stachys lanata, inside of which is Coleus Berkeleyi, and a centre of Flower of Spring Pelargonium.

In the angle of the terrace, and forming a connecting link between the two arrangements, is an oblong group of beds in two lines, with cross beds at either end, between which were openings admitting to the turf in the centre, on which stood several neat vases filled with plants in flower. The beds on either side of this opening have centres of rose or scarlet Pelargoniums, and from these run out a chain of variegated Honeysuckle; the groundwork on the outside consisting of Pelargonium Manglesii, whilst the centres of the links are filled with, first, rings of Iresine Lindeni, then of Pelargonium Flower of Spring, and centres of Coleus Verschaffeltii. The design in the east garden is unique in its character and extremely effective, consisting of lines of foliage beds along either side, whilst down the middle are large raised stone beds, resembling baskets, all oval in shape, and which are filled with centres of Humea elegans, and a large variety of flowering plants, the outer edgings being well covered with creepers—the rich and unconstrained appearance of these beds contrasting most effectively with the more formal patterns. Separating in equal portions this part of the terrace is a handsome fountain, in front of which are steps leading to the grounds beyond. On each half of the terrace are eight beds, consisting of four rounds, one at each corner, and two oblongs with rounded ends on either side. The one-half of the bedding represented the other half, so that the design here, though elaborate, is not extensive. Taking the round beds first in order, one has for centre a small variegated Aloe, edged with Sempervivum californicum; from this radiate six rays of Alternanthera paronychioides, having in the centre of each ray a fine plant of Echeveria metallica,—the angles left by the rays being filled either with Italia Unita Pelargonium or Pyrethrum Golden Feather. The next round bed is a gem of the first water, presenting a lovely combination, starting with a sloped edge of Echeveria secunda glauca, inside of which is a broad ring of Alternanthera paronychioides and a centre of Golden Feather, with a well-rounded plan of Coleus Verschaffeltii in the middle of it. Running round the ring of Alternanthera are strong plants of Echeveria metallica set in round patches of Pyrethrum Golden Feather. The other two round beds are somewhat similarly planted, and are both extremely effective.

Turning to the long beds, we found two of them that seemed worthy of special attention for the beauty of their arrangements, whilst the others, although really good, are perhaps not quite so striking. One has an edging of Echeveria secunda glauca, then there are three rings, the centre one of Coleus Berkeleyi, the ground between these and the Echeveria being filled with Alma Pelargonium; inside the centre ring is a groundwork of Pelargonium Reine d'Or, having a plant of Iresine acuminata in the middle,—the corresponding rings at either end being formed of Iresine acuminata filled with Flower of Spring and centres of Lady Cullum Pelargonium. The other long bed is edged with Alternanthera paronychioides, inside of which an oval and ring at either end formed of Coleus Verschaffeltii, the oval having a centre ground of Pelargonium Bijou dotted with plants of Iresine Lindeni, and a plant in the middle of Coleus Hendersoni. The end rings are filled with Mrs. Pollock, centred with Echeveria metallica, and the angles outside the rings are filled with Golden Feather, each angle having in its centre a good plant of Echeveria. Readers may fancy that the variety of plants here used would produce anything but a good effect, we can, however, assure them that to gain ideas in bedding arrangement this one bed alone is worth a trip to Heckfield to see and study. The Echeveria is a fine plant for this sort of decoration, and next year other succulents are to be largely used and new designs worked out; but it seems almost impossible to eclipse in beauty the present arrangement.

Gardeners of the old school, whose ideas in bedding have not yet got beyond the stereotyped stuff of the last 12 years, would find in a visit to this place material enough to work in them a revolution in horticultural taste. Heckfield is also famous for its winter gardening, the arrangement for each winter being exactly the same in form as that of the previous summer, but worked out with different stuff, and we hope to have an opportunity to see and chronicle it by-and-by.

We must just mention that at the end of the terrace there is a pretty border of chain bedding, backed up by a mass of Vinca elegantissima, giving the whole a pleasing finish. Then down the flight of steps to the left, to see a pretty fernery under glass, formed out of an old pothouse, and notice a showy ribbon-border planted with gay colours, to give the appearance of a rainbow from the opposite side of the ground. From here we proceed to the lakes that lie in the valley right in front of the mansion, and which are divided by a broad pathway that leads away to the park beyond.

On a level with the lower lake is a recently constructed fernery, of the most delightful kind, from the centre of which a foot bridge leads over to a small island on which a comfortable summer-house stands, having on either side raised beds of rockwork, that are filled with a large and interesting variety of alpine plants. This little island is a most charming and secluded spot, and affords evidence of the genius of the gardener to produce landscape effect. Traversing the outlying grounds we met with many noble Beech trees, one especially that looked like a forest in itself, so full was it of enormous branches. Larch grows here to a great height, having fine stems, and Rhododendrons thrive in wondrous luxuriance. Of more modern trees there were fine specimens of Picea Nordmanniana and nobilis, and a handsome Abies Douglasii. Our attention was also specially drawn to a very fine Pinus, 45 feet high, a variety apparently between nobilis and cephalonica, but which Dr. Lindley some years since declared to be the true nobilis.

We must just have a glance at the kitchen gardens, especially as we find here a display of ribbon bordering that is truly superb. Entering from the carriage-way, we see a broad straight walk running before us, that leads from this point through the kitchen gardens right down to the lakes. The first compartment shows, on the left hand, a large and compact block of glasshouses that are devoted to any and every purpose; and on the right hand are the garden offices, rooms, sheds, &c., and behind these again a range of early vineries. On either side of the path is a ribbon border planted up to a backing of small oblique cordons of Apples and Pears that have been, and are, fruiting capitally. The front row of the border consists of Mrs. Pollock, alternated with Blue Lobelia, next that a line of Golden and Silver-edged Pelargoniums alternated, then a line of Coleus Hendersoni; behind this Christine Pelargonium, then Bijou, the back row consisting of plants of Comte de Morny Pelargoniums, alternated with plants of Iresine Lindeni. This arrangement gets, for the time, plenty of admiration, until we arrive at the archway that opens up the large kitchen garden, for here we see with delight, on either side of the path, a border of such pleasing effect as to fairly eclipse anything of a similar kind that has yet been witnessed. The path is bordered by a neat, well-kept edging of Box, about 6 inches in width, and next this is planted a row of Pelargonium Manglesii, on which is just a thin sprinkling of its pretty pink blossoms; then a very neat and well-defined line of Coleus Verschaffeltii, and behind this a broad carpet of Gnaphalium lanatum, throughout the entire length of which are dotted, 5 feet apart, strong plants of Iresine Lindeni; this is backed by a row of Pelargonium Christine and Purple King Verbena alternated, and lastly, a row of that fine old bedding Scarlet Pelargonium Punch. The borders are cut off from the vegetable ground by hedges of small Cupressus Lawsoniana, that are too recently planted to display their full usefulness.

At the end of this path we come again upon the lawn, and here occurs a notable object in the shape of a huge Yucca gloriosa, having probably some half hundred heads, all springing from one original stem; the group is about 12 feet in diameter. Could the limits of this notice have permitted we would cheerfully have alluded more largely to the fruit crops at Heckfield, both in and out of doors. The vineries especially are full of heavy crops of first-class table bunches of Grapes, and some of the older houses, that were a year or two ago condemned, have, under Mr. Wildsmith's care, become once more fruitful. Stone fruits are in great abundance, and very fine. Only one sort of Melon—Meredith's Hybrid Cashmere, a superb and handsome white-flesh kind, of rich flavour—is grown, and that will produce three or four crops in the season from the same plants. Vegetables look very well, indeed all departments are well done; and there are no dirty corners to be duly avoided. We must leave allusion to Mr. Wildsmith's Grape-room to another time. *A. D.*

Miscellaneous.

The Maple Leaf.—The representative plant and badge of Canada is said to be the Maple leaf, as is told in the national song of that dominion:—

"On merry England's far-famed land
May kind Heaven sweetly smile;
God bless old Scotland evermore,
And Ireland's Emerald Isle;
Then swell the song, both loud and long,
Till rocks and forests quiver—
God save our Queen, and Heaven bless
The Maple leaf for ever!
The Maple leaf, the Maple leaf,
The Maple leaf for ever!
God save our Queen, and Heaven bless
The Maple leaf for ever!"

American Horticulturist.

Pigeons Contraband of War.—The national pastime of Belgium, the great pigeon races from the southern provinces of France, has been abruptly put a stop to by the war. The French authorities have very naturally interdicted the entry of Belgian pigeons into France. When it is borne in mind that there are 10,000 trained pigeons, any one of which could convey intelligence from Paris to the frontier towns of Belgium in which they are located in the space of five or six hours, we cannot be surprised at the French authorities interfering with this pastime. The strategic information conveyed by a single pigeon might lose a battle or an empire. At the same time, we sympathise with the Belgians in the derangement of their favourite amusement. In England we have little idea of the fervour with which this sport is pursued by them. *Concours* from the extreme south of France, in which 1000 or 1500 pigeons take part, and in which the first prize is a service of plate given by his Majesty the King of the

Belgians, are not uncommon; and minor races of from 300 to 400 miles are of every-day occurrence in the season. *The Field.*

WOOD-PAPER.—"Nature" has received a specimen of paper manufactured entirely from wood, which is at least equal in colour and texture to the cheaper kinds of ordinary printing paper. There is no doubt that the pulp from the fibre of the Fir and some other kinds of wood makes excellent material for paper, which can be prepared at a low price, the only practical difficulty being the high temperature, and consequently the high pressure required, to decompose the non-fibrous matter. Another material now actually employed for the manufacture of paper, is the husk and seeds of the Cotton pod, from which the oil has been expressed; the fibrous pulp resulting from this operation is said to be an excellent paper-making material. The larger portion of the cheaper printing-papers used for newspapers, magazines, &c., is now made entirely from the Spanish Esparto grass, a name given to two distinct species, Macrochloa tenacissima, and Lygeum Spartum, both growing abundantly on the shores of the Mediterranean; but the comparatively high price of this material, more than double what it was a few years since, affords a favourable opening for the introduction of other paper-making fibres.

DWARFING TREES.—A foreign correspondent of the "Boston Traveller" relates with how much curiosity he witnessed some remarkably successful specimens of dwarf trees in Japan. I have seen in the gardens, more especially those about Owari, a Maple, a Pine, a Peach, and a Camphor tree, all more than 15 years old, with their limbs, leaves, and trunks as perfect as any in a forest, and all grew from a box not a foot square, and not one was over 2 feet high. The trunks looked like old trees, and the limbs were gnarled and rugged as the mountain tree of the same kind. The owner told me that these trees would grow no larger for 50 years. In one garden there was a complete fruit orchard in a box 4 feet long and 2 feet wide—Pears, Peaches, Plums, Apples, Oranges, Lemons, Olives, Bananas, and Cherries, represented by perfect trees, the tallest of which was not over 3 feet. Whether these ever bear fruit I failed to ascertain; neither could I learn the process by which the tree is kept so small. But I am satisfied that it is done by killing a large tree and keeping a sprig, which starts from the old root, for the dwarf. The climate and soil favour this torturing process, for a root will not die as long as it remains undisturbed in some localities. I saw great trees near the gateway of a temple yard at Sinara, which were bent over, making a large circle, like the curls in the pipe of a bugle. They must have been bent around something 50 years ago. At another place a large Oak tree was bored out from the joint of two limbs near the top to the roots, and a magnolia tree set out down in this hollow, which grew up inside the Oak until it spread out its branches in the top, making of it an "Oak Magnolia." This tree has been spoken of by Japanese writers in native newspapers as an Oak tree with a Magnolia graft upon it. The system of grafting is carried to great perfection, and Yacca said that they successfully graft Orange into Apple, and Pear into Cedar. *American Horticulturist.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE lovely *Eucharis amazonica* may be induced to flower now, if it has been carefully exposed to the ripening influences of the sun, and a liberal treatment be afforded. The plants should be watered with liquid manure, frequently syringed overhead, and if possible, they should be plunged in a nice gentle bottom-heat, just to start the plants into growth. *Lilium auratum* must be watered with very great caution after the flowers have fallen off. This lovely plant is difficult to keep through the winter, even with the best of treatment, hence the need of greater caution at this season. Continue to pinch back the shoots upon *Ageratums*, *Heliotropes*, *Verbenas*, &c., required for winter blooming, and so induce bushy plants to form. *Humeas*, *Cinerarias*, *Chinese Primulas*, and *Calceolarias* (herbaceous), should be pushed along quickly, by shifting them into fresh pots (one size larger). Their roots reach the inner sides of the pots in which they are growing. Sow another batch of *Mignonette* to succeed those which have recently been thinned out. The *Ten-week Stocks*, which I advised should be sown a few weeks since, should now be potted off into small-sized pots in the usual way, to be grown on for early flowering. Those *Bulbs* recently purchased should be sorted out, and the first lot should be potted at once. Place under a moderate covering of sifted cinder ashes or some similar material. The soil should consist of a good fibrous loam, three parts decomposed, and well-rotted farmyard manure. It is always advisable to place either a small layer of leaf-mould, moss, or small charcoal upon one good crock at the bottom of the pot. The bulbs must be fixed firmly in the soil, but not too deeply, finishing the surface off neatly. Allow it to dry somewhat, when a good soaking of water should be given, before covering them over with the necessary material. *Cactuses* of the Epiphyllum type should have as much sun and air as possible, so as to ripen the young growths. Give to all *cool stoves* a slight amount of artificial heat by night, now that the thermometer is likely to fall much too low for them on any night. Keep the young growths upon all *Climbers* well pruned back, in all instances where the wood is not likely to produce blooms, which much that is formed after this date is incapable of doing.

FORCING HOUSES.

With a view of dispensing with fires as long as possible, shut up all houses containing late Grapes which are progressing favourably early in the afternoon of mild days, and so "box up" some of the natural heat as a supply in hand, to aid in carrying a good temperature through the night. It is advisable, however, when this plan is followed, to keep the house somewhat dry and free from moisture. To obviate the injurious effects of any moisture that may form during the night, it will be necessary to give air betimes in the morning; say from 7 to 8 o'clock, or according to the mean outer temperature. In regard to *Pines*, the linings of pits must now have constant attention. A good temperature of from 90° to 95° is indispensable. Where a dozen or so of the strongest successionals have filled their present pots tolerably full of roots, it will be advantageous, where a good successional supply is needed, to give them a moderate shift without delay. They will, perhaps, form fine fruits at a time when they may prove very acceptable.

HARDY FRUIT GARDEN.

It requires a philosophical mind at a time like the present to contemplate the havoc which *insects* make amongst our choicest *wall-fruits*. Though, fortunately, all gardeners are not tormented with hosts of hornets, as we are here in Herts, I doubt not they have enough to do to contend with against the many other pests. The question is asked over and over again, What is to be done to save my *Peaches* and *Nectarines?* Many advise covering with "hexagon" netting. I think it is patent to all who have tried this, that any protection which is capable of keeping away wasps, blue flies, and earwigs, so impedes the circulation of air and light as to cause the fruit to be flavourless. The last plan I have adopted is to hang some old and almost worn-out fish netting in front of each tree, fastened securely at a short distance from the foliage, and to paint the meshes carefully over two or three times a week with gas tar. The odour given off by this exceeds that of the ripening fruit, and consequently neutralises the fragrance emitted from the fruits, and which entices the enemy. Should any wasp approach, the chances are that when entering between the meshes of the nets it will come in contact with the tar, which from its caustic properties will give the insect a hint that it is not likely to want again. Keep the foreshoots which may form upon the above kinds of trees cut back as often as needed, and if symptoms of spider exist, persist in the oft-told water remedy until the trees are safe from further injury. Gather all fruit as soon as it is ripe enough by going over the walls daily. Lay such as are thus gathered, and are not required for immediate use, in a cool fruit room or cellar.

HARDY FLOWER GARDEN.

Cuttings of any kind of "bedding stuff" should now be got in, irrespectively of the blanks which more or less will be made in every bed, so little growth will have been made this season in many places. To wait longer is to risk having a poor supply of stock to begin another year with, and this gives a gardener a very poor chance of making an early and effective display. I often find when cuttings are rather scarce, and have to be taken one here and one there, that it is as well in placing them into the pots, pans, or boxes, to divide them into two sizes, putting the longer ones in the largest pots. Each cutting will thus have a better chance than when little and big are placed in together, and the former become smothered up with the large ones. Loosen the bandages upon those Rose-buds which were lately put in, and if any of the buds are shooting at all stop all other shoots upon the Briars by cutting them back. If the buds are not starting it will be a questionable policy to cause them to do so now, as the time is too limited to enable them to make shoots sufficiently strong to stand through the winter, the earlier months of which are fast approaching; hence it will not be advisable in any way to stop or check the Briar shoots.

KITCHEN GARDEN.

Make a good planting of the forwardest autumn-sown *Endive*, in frames or similar places where slight protection can be afforded against the first early winter frosts. The same remark applies to *Lettuces* at a stage fit for transplanting. This should in no wise interfere with the constant transplanting of batches, once a week or so, of each, on an open piece of ground, such as a south border, which will also come in useful. Young crops of weeds will now form apace, therefore keep the hoe at work. Pull up all *Onions* which are ripening, and let them lie to ripen for a week or so. Thin out *Turnips*, and remove all old exhausted vegetable crops. *W. E.*

TOWN GARDENING.

COMMENCE putting in cuttings of *Calceolarias*. These should be taken from those shoots which grow as near the base of the old plants as possible, and which are not likely to attempt to bloom. The best and easiest plan of striking and wintering them is to make up a bed in the following manner:—Dig out a pit about 15 inches deep, put in 6 inches of brick rubbish at the bottom, and 6 inches of rich sandy loam on the top of that, which will bring the plants up close to the glass. Put in the cuttings about 2 inches apart, and shade them for a few days, after which give them as much air as possible, merely protecting them from heavy rains and frost. Still continue to put in cuttings of *Pelargoniums* and other bedding plants of which stock is required. *Dahlias* will now be coming into full bloom, and should not be allowed to make too much growth at the top, as it impoverishes the flowers, and makes them small. Therefore thin out the crowded shoots, and where the flower-buds are formed two or three together, take them all off but one. *Mignonette* should be sown now in 48-sized pots in rich sandy loam, with a good drainage. Place the pots in a frame, and as soon as the seedlings are up give them plenty of air and gentle waterings, and at all times protect them from wet and frost. Under such circumstances it will do well in towns, and will be found very useful in the spring. The *Pyrethrum Golden Feather*, an invaluable plant for town gardens, should now be sown in a cold frame. When the seedlings are up, and thinning out, give all the air possible in fine weather, protect them from wet and frost, and they will make fine plants for next season. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, AUGUST 31, 1870.

1870 MONTH AND DAY.	At 9 A.M. Readings of Barometer reduced to 32° Fahr.	Dry Thermometer	Wet Thermometer	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years.	Wind. Direction.	Horizontal Movement.	Rain. In Inches.
August	Ins.	Deg.	Deg.	Deg.		Gr.	Deg	Deg	Deg.	Deg	Deg		Miles	
25. Thurs.	29.76	60.8	53.5	49.0	61	3.6	66.8	48.0	21.2	58.1	— 2.4	N W	310	0.00
26. Friday	29.61	57.2	52.0	48.4	74	3.4	60.8	52.0	14.8	56.1	— 4.2	N W	330	0.01
27. Satur.	29.79	57.3	53.0	48.5	77	3.4	59.0	41.3	25.7	50.9	— 3.2	N W, S W, N W	170	0.14
28. Sunday	29.60	66.1	59.1	57.5	88	5.3	72.6	53.2	19.4	62.3	+ 2.1	N W, W N W	550	0.55
29. Monday	29.65	59.3	53.3	47.9	70	3.8	68.8	49.6	19.2	56.1	— 3.6	N W	355	0.00
30. Tues.	29.69	57.3	53.0	48.0	79	3.7	65.1	42.5	22.6	52.3	— 7.1	N W	190	0.00
31. Wednes.	30.12	50.2	52.5	38.5	74	3.9	62.0	50.0	12.0	56.0	— 3.4	S W	305	0.00

August 25 Generally cloudy till night, then cloudless.
— 26 Generally cloudy, but fine.
— 27—Boisterous squally, fine early morning. Cloudy afternoon. Rain commenced falling about 8 P.M., and continued to Daybreak
— 28—Generally cloudy. Rain fell heavily during the early morning.
— 29 Variable, with gleams of cloud prevalent throughout the day. Occasional lightning.
— 30—Cloudy throughout the day. Fine.
— 31—A very fine day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, AUGUST 27, 1870.

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	77.4	43.2	34.2	71.7	49.0	25.7	57.3	0.58
Blackheath ..	71.0	41.1	29.9	68.0	48.2	19.8	57.3	0.70
Bristol ..	69.6	42.4	27.2	66.6	47.3	19.3	55.4	1.21
Birmingham ..	68.9	41.7	27.2	65.4	49.2	16.2	55.7	0.85
Wolverhampton	69.1	42.3	26.8	65.0	49.3	15.7	54.1	1.75
Leicester ..	..	..	..	..	..	..	..	..
Norwich ..	66.9	45.5	21.4	64.0	48.2	15.8	54.5	0.60
Nottingham ..	70.5	39.0	31.5	68.0	44.0	23.1	54.9	0.33
Sheffield ..	69.0	41.0	28.0	66.0	47.0	19.0	55.5	0.77
Liverpool ..	67.0	40.9	18.0	61.8	52.2	11.6	56.4	1.23
Manchester ..	73.0	41.0	32.0	67.3	41.3	23.0	54.1	1.51
Salford	70.0	40.0	30.0	65.3	43.2	21.0	54.2	1.66
Bradford	66.0	45.0	21.0	64.7	43.2	10.5	51.9	0.68
Leeds	67.0	45.0	22.0	64.9	48.9	10.0	55.3	0.44
Hull	67.0	41.0	26.0	64.2	43.2	22.7	53.2	1.04
Newcastle ..	62.0	41.0	18.0	59.5	48.8	10.7	52.0	0.41
Edinburgh ..	64.7	46.0	18.7	..	..	..	52.0	0.60
Glasgow	70.5	42.7	27.8	..	..	..	54.9	0.62
Dundee	64.0	41.0	23.0	..	..	..	51.3	1.00
Aberdeen	64.0	46.2	17.8	..	..	..	52.2	0.16
Paisley	65.0	37.5	27.5	..	..	..	52.2	0.93
Greenock	62.0	47.0	15.0	..	..	..	53.4	0.25
Leith	..	..	..	..	..	..	..	..
Perth	69.0	42.0	27.0	..	..	..	53.9	0.60
Dublin	71.1	39.8	31.3	..	..	..	55.8	1.00

JAMES GLAISHER.

Notices to Correspondents.

ARAUCARIA IMBRICATA: *E. A.* This has frequently produced cones at Kew, Bicton, and elsewhere.

BOTTLE GOURDS: *B. T.* Pray do not eat your Bottle Gourd. It is rank poison. Bottle Gourds, when ripe, are much used for bottles, and other purposes; but they must be well washed with vinegar, which is allowed

to remain for some days before they are used, or fatal consequences may ensue. *M. T. B.*

BUDDING AND GRAFTING HOLLIES: *Subscriber.* The best time to bud Hollies is August or September, just after rain if possible, as the bark will run better then. March is the best month for grafting.

ELM TREE AND WASPS: *C. C.* We do not think that there is any connection between the wasps attacking the tree and the yellow decaying leaves. There is probably a large wasps' nest in the neighbourhood of the tree, perhaps several, and they have recourse to the bark of the tree to get fibre out of which to make their paper combs. The coincidence of the yellow leaves is probably due to the dryness and heat of the season. We have had our attention directed to a similar occurrence in the neighbourhood of London both in Elms and Limes, and the circumstance mentioned by our correspondent of the tree he speaks of being near the carriage-drive points to the same cause, the draining and hardness of a carriage-drive often depriving the roots of their natural supply of moisture.

FLOWER SHOW APPEALS: *R. Draper.* We don't quite make out the purport of your inquiry. Pandanus utilis, which is what you mention, is green-leaved, but there is a white-striped Pandanus in cultivation, and that, of course, is variegated. Maranta zebrina we should consider a variegated plant, but Alocasia metallica not.—*P., Burton-on-Trent.* Croton angustifolium and Croton variegatum are not different species, but varieties of one species, which varies to a remarkable extent; hence, strictly speaking, the judges were correct in disqualifying, though we think it is practically stretching the botanical point too far. Fuchsias only differ in being a lower grade of varieties, and of garden origin, instead of being aborigines.

FRUIT: *Somerset.* Perfect ripeness is the condition in which the flavour of fruit should be at its best. It depends, therefore, on the stage at which it is gathered whether such fruit as Peaches or Strawberries is best shut up for a day or more in a close room after gathering before it is eaten. Your inquiry has been overlooked.

FRUITS, SELECTION: *A Subscriber. Pears:* Louise Bonne of Jersey, Marie Louise, Fondante d'Autômne, Doyenné du Comice, Maréchal à la Cour, Glou Morçeau, Beurré Diel, Beurré Rance, Easter Beurré. *Plums:* Prince of Wales, Prince Englebert, Denyer's Victoria, Jefferson, Early Prolific, Transparent Gage, Autumn Compôte, Belle de Septembre, Coe's Golden Drop. *Cherries:* May Duke, Black Tartarian, Elton, Bigarreau Napoléon, Empress Eugénie, Nouvelle Royale.

HORNETS IN IRELAND: *A. G.* asks if any of our correspondents can say if hornets have been met with in Ireland? Information on this subject will oblige.

INSECTS: *R. S., Hembury.* We found some specimens of the insect, which we first described under the name of Peritymbia Vitisana (since described in France under the name of Phylloxera vastatrix), in the wounds of the roots of the Vines sent. It is the same species described and figured lately in our pages, and which is now doing such great damage in the vineyards of France. The roots of all newly-imported Vines should be most carefully examined before planting. *I. O. W.—B. H.* The whorl of eggs surrounding the stem of the Pear sent are those of the common Lackey Moth, Bombyx castrensis, the gaily-striped caterpillars of which live socially under a common web in the early summer. *I. O. W.*

LILIES: *Fairplay.* L. lancifolium album and L. lancifolium rubrum are distinct varieties of L. lancifolium. The correct name is, however, speciosum, not lancifolium.

MILDEWED GRAPES: *W. B.* We presume you meant to direct our attention to the condition of the berries of your Grapes. Your cultivation seems to have been so far good. The examples sent are well grown, and every part well developed. We observe, however, that the skin of a great portion is partially discoloured—a sort of minute dark granulations. That is the effect of mildew. The Fungus itself seems to be killed, but these are the effects, and it seems to have visited you rather severely. We find very little traces of this on the leaves. Your Grapes are so far injured and cannot be improved. We would, however, advise you to arrest its further progress by applying flowers of sulphur.

NAMES OF FRUITS: *A. B. Plums:* 1, Damas d'Espagne; 2, Orleans. *Apple:* King Pippin.

NAMES OF PLANTS: *E. K.* One of the Planes—apparently P. orientalis—so far as we can tell from such a scrap. *D. F.* Coluteaarborescens. *W. X.* Liriodendron tulipifera. *L. G.* The Red Whortleberry (Vaccinium Vitis-Idæa. *Ignoramus.* Spiræa Fortunei. *—W. T.* Veratrum nigrum.

PEACHES: *A Constant Subscriber.* Without some knowledge of the flowers and leaves of your Peaches, we are unable to tell you their correct name. The simple fruits resemble, and might be referred to, a dozen varieties —Royal George, Bellegarde, Royal Charlotte, &c. Are the flowers large or small? and what sort of glands have they on the leaves, if any?—*T. H.* Your seedling Peach is of fair quality, but, so far as the specimens show, has no particular merit to recommend it to general cultivation.

SHOW GOOSEBERRIES: *W. A., Selby.* Apply to any Lancashire or Scotch nurserymen. We do not undertake to recommend dealers.

VIOLAS: *P. Middleton.* The varieties do not appear to be of much floricultural importance.

WHITE MOSS ROSE: *C. G.* Undoubtedly there has been a White Moss Rose in cultivation, and more than one. The best is that called the White Bath, a beautiful flower, which we suppose may still be had of any of the principal Rose growers.

CATALOGUES RECEIVED:—W. Paul's Bulb Catalogue.—B. S. Williams' General Bulb Catalogue.—L. Van Houtte's Catalogue of Bulbs and other Flower Roots.—E. H. Krelage en Zoon, Tulipa: Catalogue Spécial des Tulipes.—J. Scott's Companion to the Orchardist.—J. Backhouse & Son's Stove, Greenhouse, and Bedding Plants.—J. Carter & Co.'s List of Dutch Bulbs.—P. T. Rodger's Autumn Catalogue.—J. Meredith's Catalogue of Vines.

COMMUNICATIONS RECEIVED:—W. D.—J. S.—G. R.—R. W.—J. W. L.—T. J.—T. H.—F. W. B (Stanhopea and Ficus, next week. Other communications received with thanks.—A. W.—J. B.—W. P. A.—T. P.—W. X.—R. D.—A. Forsyth.

DIED, at Annan, August 30, Mr. JOHN PALMER, senior partner of the firm of John Palmer & Son, Nurserymen, Annan, N.B., aged 70.

Markets.

COVENT GARDEN.—Sept. 3.

We have no alterations to note here; the market continues to be well supplied, and prices are low. Amongst flowers we have Balsams, Pelargoniums single and double, Gladioli, Asters, Dahlia, Liliums, Oleanders, Tritomas, &c.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	1 0 to	2 0	Nectarines, per doz.	4 0 to	8 0
Apricots, per doz ..	2 0 —	4 0	Oranges, per 100 ..	8 0 —	12 0
Figs, per doz.	2 0 —	4 0	Peaches, per doz. ..	6 0 —	12 0
Grapes, per lb. ..	2 0 —	5 0	Pears, per doz. ..	1 6 —	3 0
Lemons, per 100 ..	6 0 —	16 0	Pine-apples, per lb.	3 0 —	6 0
Melons, each ..	1 0 —	4 6	Plums, p. half sieve	2 0 —	3 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Beet, per doz. ..	2 0 to	3 0	Horse Radish, p. bun.	3 0 —	5 0
Cabbages, p. doz...	1 0 —	1 6	Lettuces, p. score ..	1 0 —	3 0
Carrots, p. bunch ..	0 3 —	0 8	Mint, per bunch ..	0 3 —	0 6
Cauliflowers, p. doz.	1 6 —	3 0	Mushrooms, p. pott.	3 0 —	4 0
Cucumbers, each ..	0 6 —	1 0	Onions, per bunch ..	0 4 —	0 9
French Beans, p. sieve	2 0 —	3 0	Parsley, p. bunch ..	0 2 —	0 4
Do., retail, p. lb. ..	0 4 —	0 6	Shallots, per lb. ..	0 8 —	..
Garlic, per lb.	0 0 —	..	Spinach, p. bushel ..	2 0 —	3 0
Gherkins, per 100 ..	2 0 —	..	Tomatoes, per doz. ..	0 0 —	1 0
Herbs, per bunch ..	0 2 —	0 4	Turnips, ynng, p. bun.	0 9 —	1 0

Potatos, York Regents, per ton, 90s. to 105s.; Kidneys, 110s. to 120s. do.,

A NURSERYMAN, in the Provinces, is desirous of meeting with an ACTIVE PARTNER, with moderate capital.—X., Messrs. Protheroe & Morris, Leytonstone, N.E.

AGRICULTURAL PUPIL.—A practical Farmer, occupying about 700 Acres of Land, is desirous of receiving into his Family an intelligent, gentlemanly young Man as PUPIL. He would have a comfortable home, and every facility for becoming acquainted with the business.—Apply by letter, AGRICOLA, *Standard* Office, Cirencester.

MR. WILLIAM BULL is in WANT of a PERSON qualified to take the Management of the Seed Department. None need apply who are not thoroughly competent for the appointment, and who cannot give reference and having filled a similar situation. Salary, £200 per annum.—Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

MESSRS. J. AND C. LEE are in WANT of an OUTDOOR FOREMAN for their Isleworth Nursery. He must understand Fruit Trees and Grapes, and be a good Propagator. Apply by letter, addressed to the Royal Victoria Nursery, Hammersmith, W.

WANTED IMMEDIATELY, an experienced LOAD MAN and PACKER AT OUT; must be an expert hustler and Gutter of Roses, Fruit Trees, Rhododendrons, Hollies, Yews, &c. Wages, to commence, 25s.—R. THORNHILL, Nurseryman, Cheshunt.

WANTED, a HEAD GARDENER (three Men and Boy under him). Must be a first-class Grape Grower, understand Early and Late Forcing, and a good Hand at Kitchen Garden Vegetables, and Pleasure Ground. Some steel rods when Lawn Tennis has Head Gardener. Apply, stating ages, what family, and at what wages he can be had.—Hanchurch, Beccles.

WANTED, for a Nobleman, near London, about November next, a thoroughly experienced MAN, to Manage a large Garden, with a Man under him. Must be a first-class Grape Grower, understand Early and Late Forcing, and a good Hand at Kitchen Garden Vegetables, and Pleasure Ground. Some steel rods when Lawn Tennis has Head Gardener. Apply, stating ages, what family, and at what wages he can be had.—Hanchurch, Beccles.

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WANTED, as GARDENER, in the country, a steady, sober, industrious Man, who understands the profession thoroughly. Will have two Men under him. Must be married, and without family. Wife to attend to Lodge Gate.—Address, by letter only, stating age, wages required, and all particulars, to D., 80, Shoreditch.

WANTED, a skilful NURSERY WORKMAN, who has had many years' practice in Budding, Grafting, Packing, and general Nursery Work; one who has some knowledge of Planting Villa Gardens preferred. A good character from last employer indispensable. Apply, stating wages, by own handwriting, to ISAAC DAVIS, Brook Lane Nursery, Ormskirk.

WANTED, a Middle-aged Married MAN, without family; a good Flower and Kitchen Gardener; and to have the care of Cows. Wages, £40; house rent-free.—Rev. R. SALWEY, Ash Rectory, Sevenoaks.

WANTED, an active, intelligent MAN, who well understands the Propagation of Roses, Conifers, Rhododendrons, and choice Hardy Trees and Shrubs, especially under Glass.—Apply, by letter only, to A. B., 3, Essex Street, Southwark, London.

WANTED, a skilled PACKER.—Preference given to one who has been accustomed to Pack Plants, and who is also a Gardener. Wages, 25s. per week.—BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

To the Seed Trade.

WANTED, an active ASSISTANT, well up in the Vegetable and Flower Seed Department, and of good address. —Apply, stating references and salary, to X., Nutting & Son, 60, Barbican, London, E.C.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

GARDENER (HEAD).—Age 30, married; thoroughly experienced; understands the profession in all its branches. First-class references.—T. K., Church Street, Paignton, Torquay; or LUCOMBE, PINCE, AND CO., Exeter.

GARDENER (HEAD).—Age 28; has served 13 years in the largest establishments, and thoroughly understands all branches connected therewith. A seven years' character, with highest references.—H. SLATER, High Street, Uttoxeter.

GARDENER (HEAD), now or for the term.—A Scotchman, age 39, married, one child; well up in all branches. Wages about £65. High character from all former employers, copies of testimonials from whom, with their addresses, on application.—W. D. S., Messrs. Dickson & Co., 1, Waterloo Place, Edinburgh.

GARDENER (HEAD).—Age 37, married; has a thorough knowledge of Gardening in all its branches, Vines, Melons, Cucumbers, Mushrooms, Greenhouse, Stove and Orchard-houses. Can be well recommended by H. R. SEYMOUR, Esq., Cromwell, Hungerford.

GARDENER (HEAD),—Age 35, married, two children; highly recommended for Forcing Pines, Vines, Peaches, Melons, Cucumbers, also a first-class Flower and Kitchen Garden. One year's unexceptionable character from last place.—A. A., 128, Clarendon Street, Westbourne Square, W.

GARDENER (HEAD).—Age 34, married, no family; understands the Management of Vines, Peaches, Melons, Cucumbers, Stove and Greenhouse Plants, and Flower Gardening. Ten years' good character.—R. B., Combe Wood, Kingston, Surrey.

GARDENER (HEAD), to any Nobleman or Gentleman requiring a First-class Gardener.—Age 36, married; fully competent in every branch of the profession, including Specimen Plant Growing, Early and Late Forcing, Spring, Summer, and Picturesque Gardening. Can be highly recommended, with five years' unexceptionable character.—Mr. BURNHAM, Colwich, Derby.

GARDENER (HEAD, OR SINGLE-HANDED).—Age 32, single; thoroughly understands the profession. Fifteen months' good character.—A. B., 2, Boundary Villas, St. Ann's Road, Notting Hill, W.

GARDENER (HEAD), where two or three or more are kept.—Age 35, married; thoroughly practical, and well experienced in all branches of the profession, including Specimen Plant Growing, Early and Late Forcing, Spring, Summer, and Picturesque Gardening. Can be highly recommended, with five years' unexceptionable character.—Mr. BURNHAM, Colwich, Derby.

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GARDENER, Married, no incumbrance; has a good practical knowledge of the profession in all its branches, including the Forcing of Early and Late Fruits, Vegetables, and the Culture of Stove and Greenhouse Plants; three years' character.—M. R., Mr. Patching's, Stationer, High Street, Putney, S.W.

GARDENER.—A young Man, having left the Vineyard, Garston, is now open to an engagement. Three years previous at the Royal Exotic Nurseries, Chelsea. Practical knowledge of Plant Growing, Cutting, Propagating, &c., and can Grow Grapes and Pot Vines on a plan equal to Meredith's.—T. H. T., 18, Vine Terrace, Garston, Liverpool.

GARDENER (age 40, married).—A Gentleman will be glad to recommend to any Lady or Gentleman requiring a good Gardener, one who has a thorough knowledge of the profession, also a first-class Rose Grower. Has a small Meadow Land and Stock if required. Seven years' good character. Liberal wages expected.—W. P., Mr. Bunn's, Rose Road, Red Hill, Surrey.

GARDENER, where the assistance of one or two Men is allowed.—Age 26, married; can be well recommended by present and previous employers.—P. COCHRANE, Buxted Park Gardens, Uckfield, Sussex.

GARDENER (SECOND, OR SINGLE-HANDED).—Age 21; well understands the Management of Flower and Kitchen Gardens, Vineries, &c. Six and a half years' good character. State wages.—E. B., Mr. Furday, Bookseller, Belvedere, S.E.

GARDENER (SECOND, or otherwise).—Age 23, single; seven years' experience. Good character from previous employers.—J. DEAR, Occupation Road, Victoria Road, Cambridge.

GARDENER (UNDER), in a Nobleman's or Gentleman's Garden.—Has had five years' experience. Good reference.—A. B., Watchman's, Post Office, Wrotham, S.W.

To Nurserymen.

FRUIT TREE GROWER and KNIFESMAN.—Age 32; an energetic Man, who is a skilful Cultivator of Fruit Trees, a proficient Knifesman, and has a thorough knowledge of the Outdoor Department; long experience. First-class testimonials from past employers.—B. M., 23, Princes Row, Reading, Berks.

PROPAGATOR (FOREMAN), in a Nursery.—Has had long experience in Growing and Propagating Stove and Green house Plants, Heaths, Camellias, Azaleas, Rhododendrons, Roses, Conifers, &c. Good references.—*Gardeners' Chronicle* Office, W.C.

PROPAGATOR, or FOREMAN and PROPAGATOR.—A middle-aged Man, who is well experienced in Hard and Soft-wooded Propagating.—S. T., 3, Hewlett Terrace, Pulross Road, Brixton, S.W.

STEWARD and GARDENER, or GENERAL MANAGER, age 44.—A thoroughly practical Farmer, and first-rate Gardener, of energetic habits, seeks a re-engagement; understands all matters in every branch of farming; also Woodlands and Plantations, the Erection of Buildings, &c.; a good Accountant. Wife can manage Dairy and Poultry.—H. A. M., 50, Bevington Road, Notting Hill, W.

BAILIFF, and GARDENER or BAILIFF.—Middle aged, married, no incumbrance; has a thorough knowledge of the Management of a Farm; has had many years' experience in working both Light and Heavy Land, Rearing, Buying, and Selling of Stock; thoroughly understands the Growing of Vines, Pines, and Forcing in every department.—C. M., Post Office, Bramsiow, Middlesex.

To Noblemen or Gentlemen.

BAILIFF or STEWARD.—Age 45, no family. Wife no objection to Dairy and Poultry.—Mr. STEVENSON, Silwood Park, Sunninghill, Berks.

IMPROVER, in a Nobleman's Garden.—Age 21; has served an Apprenticeship. Three years' good character from present employer.—W. B., Abbey Gardens, High Wycombe, Bucks.

To Gardeners.

IMPROVER, in a good Nursery or Gentleman's Garden.—A young Man. Premium given. Good character.—B. A., Post Office, Highbury.

To the Trade.

TRAVELLER, SALESMAN, or PLANT FOREMAN.—A respectable and competent young Man.—HORTICOLA, *Gardeners' Chronicle* Office, W.C.

Seed Trade.

SHOPMAN (HEAD), or WAREHOUSEMAN.—Thomas Kennedy & Co., Nurserymen and Seedsmen, Dumfries, can with confidence recommend a young Man to any house requiring the above.

ASSISTANT, in a Seed Shop.—Six years' experience at Counter and Warehouse Work.—H., 14, Ingles Street, Inverness.

GROOM and GARDENER.—Age 22; can Milk. Is leaving present situation in consequence of the family going abroad. Good character.—J. T., Aughton Cottage, near Ormskirk, Lancashire

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

THE GRANITIC PAINT, the best for the finest painting, and the roughest work. Used in the Crystal Palace, Sydenham, by the Turnpike Trustees, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.
29A, King William Street, London Bridge, London, E.C.

DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.
30A, King William Street, London Bridge, London, E.C.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, CAPTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are disowned both by Sayner and Makers.
S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Paxton Works, Sheffield. Established upwards of 125 years.

E. PAGE HERN'S "FRIGI DOMO."—Patronised and used for Fitmore and Kew Gardens. It is made entirely of prepared wool, and a perfect non-conductor of heat or cold where it is applied
PROTECTION from the SCORCHING RAYS of the SUN.
WOOL NETTING 3 yards wide and 11 dd. per yard
"FRIGI DOMO" CANVAS
Two yards wide . . . . . 12 6d per yard.
Three yards wide . . . . . 18 6d. per yard.
Four yards wide . . . . . 24 6d per yard.
SCRIM CANVAS, 52 inches wide, 70 yards long, 5s. 6d. to 8s. 6d. p. yard.
HESSIAN CANVAS, 36, 40, 54 and 72 inches wide, 6½d and 8½d. per yard.
ELISHA THOMAS ARCHER, Sole Maker, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen.

W. M. DILLISTONE,
HORTICULTURAL AUCTIONEER AND VALUER,
Sible Hedingham, Essex.

To Landowners.
WANTED to RENT, a few ACRES of good LAND, adapted for a NURSERY, near Bristol, or in Surrey, Berks, Gloucestershire, or Devon. Apply by letter to
Y. Z., Post Office, Ambleside.

To Gardeners.—Middlesex (13 miles from London).
TO BE LET, a FOUR-ROOM COTTAGE, STABLING, CART-HOUSE, and FORCING HOUSES, standing within a walled Garden of about an acre, well stocked down, and ready for occupation.
Mr. WOODS, Auctioneer, Hounslow, Middlesex.

Florist Business, Freehold.
TO BE SOLD, or LET on Long Lease, with immediate possession, GOODWILL, GREENHOUSE, SHOP, HOUSE and STOCK-IN-TRADE of a Nurseryman and Florist, in a leading thoroughfare, South-West of London, about six miles out, on pleasantly situated, close to two Stations.—Apply to
JOSEPH MAY, Seedsman and Florist, 35, B ½ gate Street, Strand, W.C.

Good Opportunity for Growers.
A DESIRABLE HOUSE and PLANT, containing 11 good Rooms, Coach House and Stable, nearly an acre of Walled-in Garden, stocked with Fruit Trees and Vegetables; two Large Early Forcing Houses, each 62 feet by 12; Frames, Lights, Fowls and Fowl House, &c. Lease 12 years at £50 per annum. Railway Apply to
Present Occupier, A. B., 5, Exeter Place, Waltham Green, S.W.

To Market Gardeners and Others,
WITHIN A SHORT DISTANCE OF A RAILWAY STATION.
TO BE DISPOSED OF, the valuable LONG LEASE of about FORTY ACRES of MARKET GARDEN LAND, in a Ring Fence. Capital Dwelling-house, Sheds, and Implements, &c., to be taken at a valuation. Immediate possession.
For further particulars and cards to view, apply personally to Mr. J. S. GOODALL, Auctioneer and Land Agent, Valuer, 16, Southampton Street, Covent Garden, W.C.; and Feltham

To Florists, Seedsmen, and Naturalists.
FOR SALE, in consequence of the death of the late Proprietor, the FREEHOLD PREMISES, known as the AVIARY GARDENS, Cheltenham, with the Houses, Buildings, Stock and Goodwill of the extensive above business, which has been carried on for many years as an Exhibition Garden and Depot for the Sale of Live Birds and Poultry, Florist Plants, Seeds, and other articles connected with the Garden, Aviary and Aquariums.
Immediate possession may be had. For particulars apply to
Mr. C. H. JESSOP, Solicitor, Cheltenham.

TO BE SOLD, the desirable LEASE and BUSINESS of an old-established and well-known NURSERY, situate in a leading thoroughfare, a few minutes from Covent Garden Market, in about 2 acre in extent, and nearly all covered with glass; there is also a spacious Seed Shop, with commanding front, Counting-house, Stable, &c. The Show-house, 45ft. by 20ft., fronts the high road, together with Greenhouses, Pits, &c., making about 7000 feet of glass; the whole well supplied with water. Lease about 30 years unexpired. This offers an excellent opportunity to an energetic person with some capital, or to a country Nurseryman extending their business to London. Present owner retiring from the business.
Full particulars may be had of F. W. SEARLE, Agent, 6 Bishopsgate Street Without, E.C.

Jersey Cows.
FOR SALE, the property of a Gentleman, EIGHT splendid YOUNG COWS, of the purest breed, 3 and 4-yr. old, three of them just Calved, the others near upon Calving.
On view at Highbrook Station, London, Brighton and South Coast Railway, on Wednesday, September 7, on application to the Station Master. Price £20 each.

SALES BY AUCTION.

Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, September 3, at half-past 12 o'Clock precisely, an important and choice Importation of NEAPOLITAN ONIONS, TULIPS, CROCUSES, NARCISSUS, SNOWDROPS, and other BULBS, just arrived from well-known farms in Holland.
On view the morning of Sale, and Catalogues had.

Palms, Tree Ferns, Conifers, &c.

IMPORTANT PUBLIC SALE of PLANTS, at Ghent, on SEPTEMBER 8 and 9, at half-past 2 o'Clock, P.M., on the Premises of Mr. Alfred Serdobbel, Nurseryman, Faubourg d'Anvers, under the direction of Messrs. E. VERHULST and JEAN VERSCHAFFELT, Nurserymen:—PALMS, large and middling sizes, and also of rare species; TREE FERNS and others, about 1800 PALM SEEDS, in various fine varieties; CONIFERS, AMARYLLIS DRUIANA, RHODODENDRONS, &c.

Manchester.—Two Days' Sale.

IMPORTANT SALE of the very VALUABLE COLLECTION of ORCHIDS FORMED by JOHN EDWARD TAYLOR, Esq.

CAPES AND DUNN respectfully give notice that they have received instructions from J. E. Taylor, Esq., to SELL by AUCTION, at the Gallery, Clarence Street, Manchester, on WEDNESDAY and THUSDAY, September 14 and 15, at 12 o'Clock, the highly important selection of rare and valuable ORCHIDS, consisting of Cattleyas, Vandas, Aerides, Odontoglossums, Phalenopsis, Dendrobiums, &c.; also many valuable Stove Plants, particularly a fine specimen of Anthurium Scherzerianum.
Catalogues will be ready several days prior to the Sale, and can be had by applying at 8, Clarence Street, Manchester, or they will be forwarded on receipt of one stamp.

The Wilderness, Whiteknights, near Reading.

CLEARANCE SALE of VALUABLE STOVE and GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS are instructed by H. Vyse, Esq. (who is leaving the neighbourhood), to SELL by AUCTION, without reserve, on the Premises, the Wilderness, Whiteknights, near Reading, Berks, on TUESDAY, September 6, at 12 for 1 o'Clock precisely, the whole of the choice STOVE PLANTS, many of which are fine specimens, comprising Ardisias, Begonias, Euchanis, Gardenias, Ixoras, Dracænas, Pandanus, &c.; a quantity of handsome FOLIAGE PLANTS, consisting of Alsasias, Anthuriums, Caladiums, Crotons, Dracænas, Marantas, Pandanus, Panicums, Selaginellas, Tradescantias, and Variegated Vines. Also some choice EXOTIC FERNS, comprising Adiantum, Gymnogramma, &c.; a few ORCHIDS, some Fruiting and Succession PINES, together with a quantity of HARDY FERNS.
On view the day prior to the Sale; Catalogues may be obtained on the premises of Mr. WM. LEES, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

New Hampton, Middlesex.

To GENTLEMEN, NURSERYMEN, MARKET GARDENERS, and OTHERS.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from the Trustees of the Hampton and Hampton Wick School Charities, to LET by PUBLIC AUCTION, on the premises on the first Estate Room, on MONDAY, September 12, at 12 for 1 o'Clock precisely, the RECTORY FARM, New Hampton, Middlesex, near the Hanwell Station, on the Thames Valley line, now in the occupation of Mr. Edward Birch, containing A. R. P. 25 1 0, or thereabouts, of rich and produ tive Land, admirably adapted to Nursery, Market Gardening or Agricultural purposes
May be viewed (Tuesdays excepted) one week prior to the Sale. Particulars may be obtained on the premises; of Howard Paddison, Esq., Solicitor, 57, Lincoln's Inn Fields; and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

Tooting, Surrey.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. R. Parker to SELL by AUCTION, without reserve, on the Premises, Exotic Nursery, Tooting (10 minutes' walk from Tooting Station), on THURSDAY, September 15, at 12 for 1 o'Clock precisely, Thousands of capital Stock for the STOVE and GREENHOUSE PLANTS, the whole of which are very healthy, comprising Ananassa sativa variegata, Ficus elastica, Ardisias, Lastrea cristata, Gardenia, Gardenia intermedia (fine variety), Tacsonias, Coleus, Euphyllum truncatum; Rhododendron Countess of Haddington, javanicum and formosum; Cossignea borbonica, and numerous other Greenhouse and Stove Plants. Also a large quantity of choice ORCHIDS, including Vanda suavis (Veitch's variety), Aerides maculosum, A. Lobbii, Angraecum sesquipedale, Cypripedium superbiens, Thunia Bensoniæ, Lælia praestans (true), and hundreds of EXOTIC FERNS; fine Specimen EPIPHORE and DOVE PALMS; likewise a selected assortment of SUCCULENT PLANTS, consisting of Echeveria secunda glauca, pumila, grandiflora, atropurpurea; Sempervivum rubrinelle, repens, glutinosum; Cotyledon Pumila repens, &c.; Primula cortusoides amœna, Salvia argentea, Schizostylis coccinea, and other Hardy HERBACEOUS PLANTS, &c.
On view the day prior to the Sale. Catalogues may be had on the premises, and of the Auctioneers and Valuers, Leytonstone, E.
N.B. P. & M. respectfully announce that they have received instructions from Mr. R. Parker to SELL by AUCTION, without reserve, on OCTOBER 13 and 14 next, an immense quantity of first class extra NURSERY STOCK. Further particulars will shortly appear

Potter's Bar, N.

PRELIMINARY NOTICE of an IMPORTANT CLEARANCE SALE of CHOICE GREENHOUSE and STOVE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by the Proprietor, who wishes to relinquish the business, to SELL by AUCTION, without reserve, on the Premises, the Nursery, near the Railway Station, Potter's Bar, Middlesex, on MONDAY and TUESDAY, September 19 and 20, at 11 for 12 o'Clock precisely, the whole of the CHOICE STOVE and GREENHOUSE PLANTS. Further particulars will appear

Shropshire Sheep.—The Sutton Maddock Flock,

THE PROPERTY of MR HENRY SMITH

MESSRS. LYTHALL AND CLARKE are instructed to SELL by AUCTION, at the New House, Sutton Maddock, Shiffnal, on MONDAY, September 19, at 12 o'Clock punctually (Luncheon at 11 for 12), TWENTY SHROPSHIRE RAMS, including the noted sires "Latimer," Radford," and "Blackbird;" 120 excellent SHEARLING and STOCK EWES, including the Royal Agricultural Society's Third Prize Pen, and the noted sires "Holmes" and "Radford;" TWENTY promising RAM LAMBS, principally by Mrs Beach's Royal Agricultural Society's Third Prize Sheep at Oxford
The Sutton Maddock Flock remained in reputation second to none among the Shropshires. Its merits have secured it the highest honours at the Royal Agricultural Society of England, the Birmingham, Smithfield, and various local Shows, and its superiority has been acknowledged by the leading Flockmasters, who have frequently selected Sires from it
Conveyances will meet Trains at Coalport and Shiffnal Stations, and can immediately after the Sale be Shiffnal at 2.30, returning after the Sale
For Catalogues apply to the Auctioneers, 10, New Street, Birmingham

Stoney Lane, Bromsgrove, Worcestershire.

IMPORTANT SALE of SHORTHORNS.

MESSRS. LYTHALL AND CLARKE are favoured with instructions from Thomas Bolton, who gives up a considerable portion of his Grass Lands, to SELL by AUCTION, without reserve, on TUESDAY, September 20, his entire HERD of pure bred SHORTHORNS, numbering upwards of 60 Head of highly descended Cows, Heifers, and Bulls
Catalogues, with Pedigrees, will shortly be published, and may be obtained from the Auctioneers, 10, New Street, Birmingham

Sale of Shorthorns.

MESSRS. THORNTON AND KIRKBY are instructed by the Rev. Thos. Stanford to SELL by AUCTION, without reserve, at Storrs Farm, Windermere, on TUESDAY, September 13, the DRAFTS from the HERD of about Fifty Head, including Bulls, Cows, and Heifers, of fashionable blood. Among them are some highly descended cows by "Grand Duke" and "Crompton Brave" tribes; also several of Mr. Booth's noted "Isabella" or "Medora" family, and a few of the "Minstrel" branch of the "Gwynnes," as well as of Mr. Mayson's "Lady Fragrance" and "Certainty" tribes. Much trace from well bred strains that are celebrated for their great milking properties. First-class Bulls of Booth blood have been in use, and the Cow and Heifers are mostly by the Bulls "Earl" Peer of the Realm" (27,057), or Mr. Booth's "High Sheriff" (26,802).
Also will be SOLD, a very fine lot of CUMBERLAND HEIFERS, most of which will be upon Calving to Bulls from the Herd.
Catalogues, with Pedigrees, may be had of JOHN THORNTON, 15, Langham Place, London, W.; of Mr. KIRKBY, Saurey, Windermere; or of Mr. SMITH, Storrs Farm, Windermere

Sale of the Celebrated Nunwick Hall Herd.

MR. JOHN THORNTON will SELL by AUCTION, at Nunwick Hall, Northumberland, on the day after the Penrith Show, the entire and very FIRST-CLASS HERD of SHORTHORNS belonging to Charles R. Saunders, Esq. It numbers between 60 and 70 head of Bulls, Cows, and Heifers, comprising some remarkably fine specimens of the "Waterloo," "Wild Eyes," and "Gwynne" tribes; also many descendants of the famous cows "Fleda," a 155 gs. purchase at the 1866 Fawsley Park Sale, Mr Crofton's "Elvira" (the Emma tribe), and Mr Torr and Colling's "Old Daisy," as well as other highly fashionable sorts. Grand Duke 9th (19,879) was in service at Nunwick, and first-class bulls have since been used; the celebrated prize bull "Edgar" (19,086) reserved as a Sire. Massive size and first at H.S. Dumfries), and Earl of Eglinton (28,832), a son of Grand Duke 10th, the more recent sires, are included in the sale.
Catalogues, with Pedigrees, may be had of Mr. HOWARD KETT, Plumpton Hall, Penrith; at the Farm; or of JOHN THORNTON, 15, Langham Place, London, W

Weston Park, Shipston-on-Stour.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, October 18, at Weston Park, Warwickshire, about FIFTY HEAD of SHORTHORNS, the property of Sir Geo. Philips, Bart., including some of the best and choicest families in the Herd, many of which are of Knightley descent, and by Bulls of that favourite sort, as well as others of Kirklevington blood.
Catalogues, with Pedigrees, will shortly be issued, and further particulars given in future Advertisements
London: 13, Euston Square, N.W.

Agricultural Land Improvements, Drainage,
FARM BUILDINGS, LABOURERS' COTTAGES, &c.
THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.
Incorporated by Act of Parliament in 1849.
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The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent charge of about 6 per cent. in 31 years, or at the option of the Landowners in a shorter term.
No investigation of title necessary, and no legal expenses incurred
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No investigation of title is required.
For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

The Agricultural Gazette.
SATURDAY, SEPTEMBER 3, 1870.

THE cultivation of "SNATCH CROPS" is an attempt to economise time and space by growing in the same season two crops instead of one, at the same time improving the condition of the land. Any system which has for its object an extension of those crops which are eaten on the farm must meet with favour while meat is so dear, especially as forage crops eaten by animals improve the condition of the land, while the other crops sold off the farm and yielding no manure must impair it. Since the "manfold," which in some other countries is an unfailing and indispensable aid to agriculture, is unfortunately neglected in England, we must give even more attention to the economy of the sheepfold and farmyard. And as the supply of good, dry guano is almost exhausted, and artificial manures are necessarily becoming scarcer and dearer, we must attend to crops which save the pocket and leave something behind them.

The following notice of "snatch crops," taken almost *verbatim* from our note-book, is a record of personal experience and observation, and may perhaps be more useful and suggestive, though not so flattering, as a more highly coloured narrative.

The forage crops preferred for lambing flocks on the sheep farms of the Southern and Eastern Counties are Rye, winter Barley, stubble Turnips, and late-sown Rape. Stubble Turnips are the earliest and by far the most valuable crop for ewes and lambs in spring. The store of nutriment in the bulbs enables them to produce their greens on chalks and backward soils, on which Rye would yield but little; and as the "tops" grow at a very low temperature, they are produced by the first mild days in spring, and sometimes as early as the end of February. In cool moist seasons they will last far into May, in ordinary years not later than about the end of April. Sheep are sometimes allowed to pass quickly over a field of young tops to check their "running."

On April 17, 1865, Rape and Turnip-tops, forced by warm growing weather, were running fast, they soon became tough and stalky, and on May 4 were in full blossom.

The "Hertfordshire White" and the "Green Round" are perhaps the hardiest varieties, and the most productive of tops. As small, hard, unforced Turnips stand the winter best, this crop should be manured but slightly, if at all. We have occasionally sown 1½ cwt. of guano per acre in February, but that has been on poor land, and not so much for the benefit of the Turnips as of the next crop.

On clean land this is an inexpensive stubble

crop. It needs no hoeing if sown thinly, nor any expenditure of labour beyond one sound ploughing. The crop should be sown broadcast, or drilled at narrow intervals, as soon after harvest as the stubble can be ploughed, and except on the earliest soils, and in the most favourable autumn, it is of little use to sow later than the third week in August. Turnips for spring feed may also be sown after early Peas, Tares, early Rape, &c.; and these crops will be off in time to clean the land, if necessary, before sowing.

Rye succeeds Turnip-tops, and is invaluable on light sandy soils. It costs only the labour of ploughing and the price of the seed—only one-third as much as Tares. Its chief use is for ewes and lambs, or fatting tegs may be finished off on Rye, with cake and the addition of Mangel, or the latest Swedes hauled to the field. Two bushels per acre should be drilled after ploughing the Wheat stubble twice, if possible. Rye just bridges the gap between Barley sowing on the Swede land and the covering in of Clover and Grass mixtures. It may be begun at the end of March, and it always gives a second bite worth folding. Our memoranda state—

May 4, 1855: Rye in Surrey is as high as the hurdles. It lasts about six weeks, and gets hard and stalky about the above date, when the Surrey farmers drive their Down sheep from the Rye fields to Guildford Fair.—In the extraordinary mild winter of 1868-9 Rye was folded at Christmas, and yielded a second crop in April, and we saw several fields saved for seed, and in ear, that had been folded in the early part of spring.

Italian Rye-grass is adapted for light, warm land. One bushel per acre, with a peck of Trefoil for bottom feed, sown in spring corn, gives a good bite the first week in April, five weeks at least before Trifolium, or Tares.

May 18, 1858: A portion of our Italian Rye-grass was fed hard by pigs folded on it and fed with Beans, from April 20 to 30, and is now, after rain, producing a mass of young blades—while that not fed is producing seed-stalks.

This was on a hard clay, unsuitable for cereal forage crops, which soon run up stalky on such soils in dry, cold, or hot weather, and are peculiarly injurious to the succeeding Wheat crop, unless prevented from stalking by close feeding, and ploughed and fallowed before harvest, so that every scrap of the grass has not merely withered, but disappeared from the ground. We have known the Wheat crop reduced to four or five sacks per acre, even when corn had been fed on the land, and as many quarters might have been expected; and as no seed had been produced by the Rye-grass, this interference with the kindred crop is remarkable. A light coat of manure is practically the best remedy, but in this case the crop of Rye-grass is bought too dear.

April 17, 1865: Italian Rye-grass is ready for folding on good land. May 6: Italian Rye-grass, a stunted crop this year, through drought and late frosts; the ewes are uneasy on it, breaking out of their fold, and doing badly. May 12: The ewes do not thrive, but the lambs, running forward and picking out the Trefoil, do very well—a hint for mixtures.—April 9, 1864: Horses and sheep turned into a field of Trefoil, with a few acres of Italian Rye-grass in one corner, finished the latter before turning to the Trefoil. May 3: The weather having been dry and cold all March and April, feed has been very scarce, and sheep have been cheap. On April 9 we bought 190 tegs in good condition, at 50s. 6d. each; they were fed on Mangel and Rye-grass with 1 quart of Oats each daily, and sold in seven weeks at about 60s., including the wool, 7 lb. each, at 2s. 5d. per lb.

Of Trifolium incarnatum, sow 20 lb. per acre, on a clean stubble, broadshared, as soon as the corn has been carted, or harrow a perfectly clean stubble unploughed; then when the ground is soft, after rain, drill 20 lb. of seed on the solid surface, with the Suffolk drill, and roll across. We sowed in this way on August 23, 1864. On September 10 the plant was coming into leaf. If attacked by slugs it should be limed and rolled. In 1865 it was eight days earlier than usual, and stunted by drought and frost. On May 6 it was coming prematurely into blossom. It is best adapted for light warm soils, coming in before Tares, and producing a bulky crop, costing only from 5s. to 7s. per acre for seed. Trifolium makes rather coarse unmarketable hay. As a fodder crop it is excellent for horses, and on our land is more valuable than Tares for sheep folding. It should be given in cages, as in the case of Tares, and may be followed by Turnips or Rape, or perhaps Swedes, after one ploughing. A field where Trifolium had been saved for seed was ploughed and sown with Rape on September 15, 1865. The self-sown Trifolium and the Rape were about 18 inches high; the latter was readily eaten by the lambs, and the Trifolium was trodden under foot.

Of Tares, for early fodder in May, 3 bushels per acre are sown immediately after harvest. The land should be dry when ploughed. The cost of seed averages 27s. to 30s. per acre. On heavy soils generally that bear red Clover well, Tares without dung are generally a bulky crop, and a valuable one for soiling horses and pigs. On weak light land they require dung. Tares indispose the land for Clover, and therefore should not be grown immediately before it in the rotation. The practice in Essex is to sow about 6 or 8 acres of autumn Tares, at two or three sowings, on a heavy land farm of 200 acres, and 4 or 5 acres of spring Tares; the former come in before the red Clover, and the latter after it and during harvest. They are sown after Clover lea Wheat:—

May 18, 1850: The Tares sown early in October are ready to begin. May 22: The early sorts, on good land, are getting rank and laid; the latter variety is about ten days more backward. A good crop smothers Thistles, Docks, and even Couch-grass. July 3: The early Tares are past feeding, the second early are in full pod.

They remain in season from the time of blossoming till the pods harden. On our clay land Tares are less nutritious and digestible than on the Hampshire, Shropshire, and Gloucestershire sheep farms, where they are excellent food, and are relied on for three months in the year. On July 3, 1858, in dry favourable weather, our sheep getting plenty of Oats, oilcake, and water, were put on Tares, which were cut for them with a chaff-cutter. The bad doers, which looked thinner than the rest on the pastures, got poorer and "lost their bellies," that is, they assumed the greyhound instead of the pig shape, which indicates thriving. Ewes and old store sheep eat Tares on our land without injury, but in the case of young sheep and lambs they tax the powers of digestion severely.

Cost of Tares per Acre.

Rent and taxes	£2	0	0
Ploughing..	0	11	0
3 bush. of seed, at 10s.	1	10	0
Drilling, &c.	0	4	0
	£4	5	0

The cost of the seed makes this a more expensive crop, per ton, than Mangel or Turnips, either of which can be grown at 5s. or 6s. per ton, including the charge for manure. On early land, where another green crop follows Tares, the expenses are divided, and if the land is kept clean, the two crops may give a profit.

Folding before Midsummer is not found to benefit the succeeding crop of corn to anything like the same extent as folding in the autumn quarter of the year, possibly because evaporation is at its height in spring and early summer.

Wheat after Tares on heavy land, whether they were eaten on the land or not, often grows too strong in straw, and is light and mildewed in the ear. Barley also is often too strong, and of inferior quality. When Tares or any other forage crops have been folded on heavy land, small seeds, like those of Turnips and Rape, do not vegetate freely, and the plant is likely to be defective, even when the subsequent cultivation has been well done.

Another forage crop—Mustard—is of little value, except as a good preparation for a sound, yielding crop of Wheat. One peck per acre is sown after Peas or Tares, or on bare fallow before the last ploughing. It may be folded seven or eight weeks after sowing, and affords a useful bite for the ewes, and capital covert for birds.

Let us hope that these notes on forage crops will suggest something worthy of trial. We would urge upon the less experienced reader the necessity of getting the land clean before commencing the growth of snatch crops; for, unless it is made clean, and kept so, they will prove unprofitable. We must also leave him to decide what intermediate crops can be taken on his land without injury to the main crops.

—— The corn trade was again slack on Monday at Mark Lane, and last week's prices could not be maintained. There was a fall of 1s. to 2s. a qr. in Wheat. —— In the cattle market the prices of the best qualities were fully maintained, and generally the trade, though somewhat inactive, was at about last week's rates.

—— The meeting of the Manchester and Liverpool Agricultural Society, next week, at Wigan, promises to be a very good one. There are said to be at least 3000 entries, of which 1848 are of implements. The following prizes have been already awarded:—To the tenant and occupier of not less than 100 acres, and under 150, for draining: Mr. John Warburton, Burtonwood, near Warrington.—To the tenant and occupier of not less than 100 acres, for marling: Mr. William Gore Ashton, of Roby, near Prescot.—For best tank, £3: Mr. William Owen, of Croft, near Warrington.—For eradicating hedges: Tenant and occupier of a farm of not less than 160 acres: Mr. Robert Owen, of Halewood, near Liverpool. Tenant and occupier of a farm of not less than 80 and under 160 acres: Mr. John Warburton, Dallam, Burtonwood; silver medal, Mr. Josh. Hollingshead, Church Hill, Over.—Planting hedges: Tenant and occupier who shall have raised the greatest length of Whitethorn hedge (not less than 880 yards): Mr. Edward Musker, Stand Park Farm, Sefton. Tenant and occupier who shall have raised the greater length (not less than 44 yards): Mr. Samuel Davies, Minshull Vernon, Cheshire. The following premiums were offered to members situate in the low-lying portion of the Society's district, viz. west of the railway from Lancaster to Parkside, south of the railway from Parkside to Manchester, and west of the railway from Manchester to Crewe and Stafford:—Best arable or cultivated farms: To the tenant and occupier of a farm not less than 150 acres: Mr. James Kay, Warburton Park, near Warrington; silver medal to F. G. Byrom, Suiton Grange, Speke.—Tenant and occupier of not less than 100 acres and under 150: Mr. Robert Birch, Orrell, near Liverpool; silver medal, Joseph Gorst, Garston, Liverpool.—Tenant and occupier of not less than 50 acres and under 100 acres: Mr. Richard Mawdsley, Orrell, near Liverpool.—Tenant and occupier of the best managed dairy or grazing farm, of not less than 200 acres: Mr. John Griffiths, of the Rake, Hawarden, near Chester.—Tenant and occupier of not less than 100 acres and under 200 acres: Mr. Joseph Trickett, Moss Lane, near Northwich.—Laying down land to grass: The tenant and occupier who shall lay down in the best manner, for mowing, not less than 15 acres: Mr. Thomas Atherton, Speke, near Liverpool.—Tenant and occupier, who shall lay down in the best manner, for pasturing, not less than 15 acres: Mr. Samuel Lees, Newton, near Preston Brook.—Tenant and occupier of a farm of not less than 100 and under 150 acres of land, capable of arable cultivation, who shall lay down in the best manner, for mowing, not less than 10 acres: Mr. W. Atherton, Speke, near Liverpool.—Tenant and occupier of land capable of arable cultivation, who shall lay down, in the best manner for pasturing, not less than 10 acres, £4: Mr. Beecroft, Upton, Cheshire.—Tenant and occupier of a farm, of not less than 50 acres, and under 100 acres of land, capable of arable cultivation, who shall lay down in the best manner, for mowing, not less than 7 acres, £3: Mr. Samuel Cook, Linacre Village, Bootle.—To the tenant and occupier of a farm, not less than 25 acres, and under 50 acres of land, capable of arable cultivation, who shall lay down in the best manner, for mowing, not less than 3 acres, £2: Miss Elizabeth Williams, Linacre. In the high-lying district the following were awarded for best cultivated farms:—Tenant and occupier of not less than 150 acres, in the best state of cultivation, £10: Mr. W. Hesketh, Atherton Lodge Farm, Leigh.—Tenant and occupier of not less than 50 acres, in the best state of cultivation, £6: Mr. William Bleachley, Myrtle Grove, Prestwich, near Manchester.

—— Our old and valued correspondent, Mr. Patrick Matthews, of Gourdie Hill, by Errol, thus epitomises his recollection of droughts during a period of more than 70 years. In 1799 he was residing on a farm of carse land, a silt deposit of the River Tay. The crop in 1799 at the beginning of harvest was of fair average promise, and the season had been of average character; but about the middle of August, the very morning that the harvest people met to cut the cereal crop, the rain came on, and in four weeks most of the standing corn was sprouted and green in the ear; so much were the sheaves grown together, that by taking hold of one of the hood sheaves, the whole stook might be dragged along. The small lizard (ask) had generated so numerously in the field during the wet season, creeping into the lower end of the sheaves, that when the rick was about 12 feet high, he observed these lizards lying so thickly around the base of the rick, as to colour the ground yellow, having crept out from the ends of the sheaves above, and dropped down. It was then customary, for more rain fell in the harvest than now falls, to put up the stook with great care, and especially to cover it well with two hood sheaves, so as to throw off the rain from the covered-up ears, and men, accustomed every season to this work, could perform this neatly. Now, from an improvement of the harvest weather, it is seldom the practice to hood the stooks. As if all the moisture in the atmosphere had come down the previous autumn, the following season (1800) was the dryest summer in his remembrance. The cereals, excepting the Wheat, too short for being cropped, were all pulled by the hand; even in the deep moist clay soil of the Carse of Gowrie, the bulk of the crop not being one-fourth of the average. At that time Potatos and Turnips were not so extensively cultivated as now, and did not afford an inferior food for man to fall back upon, while, at the same time, owing to the war and restrictive laws of commerce, the foreign supply was defective. In consequence the 8 lb. peck of oatmeal rose towards the summer of 1801 to 3s. 9d., and the wheaten loaf high in proportion. In 1801, up to midsummer market in Perth, the end of

June or beginning of July, the drought continued similar to 1800, causing great alarm from the fear of a third year of famine; but upon that day fine showers commenced, accompanied with balmy weather, so as to recover the parched crop and produce a full average. In a week or two, such was the prospect of a fair crop that the price of oatmeal, at that time the staff of life, fell from 3*s.* 9*d.* per peck to 1*s.* In 1826 there was again a very dry summer, and very light crop, excepting Wheat, and in the following winter not so much rain fell as caused the carse ditches to run. But the scant crop did not seem to affect the health of the population, being in time of peace with plenty of foreign supply. Mr. MATTHEWS adds:—Should we augur of the remainder of 1870, it would be in favour of dryness, with a frosty December.

—— The "Journal of the Society of Arts" extracts from the 4th Report of the Industrial Employment Association the following statement of facts:—

There are [we presume in London] 34,918 families with four persons in each family; 27,519 families with five persons in each family; 19,503 families with six persons in each family; 12,136 families with seven persons in each family; and 6,212 families with eight persons in each family, having only one living-room for each family.

The number of stray or neglected children in London is upwards of 100,000.

The number of paupers in England and Wales is above 1,000,000; 331,235 of these paupers are children under 16 years of age.

Three hundred thousand of these children are so neglected that they have no means of getting a living beyond the chances of a street life, and, as a consequence, these wretched children recruit the armies of crime and villany.

It is estimated that there are about 1,000,000 able-bodied men out of work.

There are 31,861,040 acres of uncultivated land in the United Kingdom.

At least 10,000,000 of these acres are capable of cultivation, and could be made to produce food worth £10 per acre per annum, or an increase of food worth £100,000,000 sterling per annum.

The cultivation of this waste land would afford temporary employment for men out of work, and permanent employment for all the pauper and criminal classes.

It would not then be necessary to expend £44,000,000 sterling per annum on food imported from foreign countries for home consumption.

Neither would it be necessary to expend £18,000,000 sterling annually on account of want and criminality.

The line dividing the enclosed from the unenclosed lands of Great Britain is encroaching on the latter as fast as it pays to keep it moving. The facts, if facts they be, which these figures profess to convey, might be supplemented by another, to be stated thus:—Divide the cultivable waste lands among the paupers and those out of employ, *i. e.*, give them 10 acres a-piece, and they would very soon be all starving together.

—— The following is an additional testimony to the precise value which belongs to the so-called "A. B. C." manure, or native guano. It is Professor CHURCH'S report upon exhibited samples of the manure in question:—

"A sample of 'native guano' has been carefully examined, with the following results as to its richness in the three chief manurial ingredients, nitrogen, phosphates, and potash:—

100 parts of 'native guano' were found to contain—
.44 of nitrogen, equal to .53 of ammonia.
.24 of dry phosphoric acid, equal to .52 of bone-earth.
.18 of potash.

It will thus be seen that the manure prepared by the "A. B. C." process, and sold as native guano, contains less than 8*s.* worth of nitrogen in any form, and, taking all its constituents into consideration, would probably not be cheap at 20*s.* per ton.

OUR LIVE STOCK.

CATTLE.

ON Thursday, the 25th ult., the herd of the Messrs. Mitchell, of Alloa by Stirling, was sold by Mr. Thornton, of London. The sale was exceedingly successful, and there was a good demand from abroad for the best bred individuals of the herd. The cattle were in good condition, and although harvest operations kept many persons from the sale, yet a good business-like company assembled. Shortly after luncheon, over which Lord Dunmore presided, the auction commenced with lot 1, *Cameron Lass* by PRINCE ARTHUR (13,497), which became Mr. A. Bethune's property for 31 gs. No extraordinary price was given until *Blue Bell* by KNIGHT ERRANT (18,154) made her appearance. She is both a well-bred and a very handsome 7-year-old cow, two months gone in calf to ISLAND CHIEF, and after some competition she was sold at 160 gs. to Mr. H. Cochrane, for Canada. *Maid of Lochty*, a lovely, white, and very massive cow, by ARTHUR GWYNNE (19,244), was sold cheap at 40 gs. to Mr. Godsman, of Aberdeen; and *Bella* by the same bull, and also a thick, handsome, white cow, was secured, quite worth the money, at 54 gs., by Mr. R. Mowbray. *Cherry Gwynne* by WARRIOR (23,178), dam *Cherry* by M'TURK (14,872), attracted Mr. E. S. Bolden's eye, and was finally knocked down to him at 160 gs. *Sarah Gwynne* by SIR SAMUEL (15,302), dam by DUKE OF CAMBRIDGE (12,747), and descended from *Cripple Gwynne* by MARMION, and others of this famous tribe, only brought 46 gs., from Mr. H. C. Pole-Gell. *Belle* by RED FRIAR (24,913), and a daughter of Mr. Mowbray's *Bella* (lot 9), went into Sir W. S. Maxwell's hands, at 60 gs.; and *Pride* by BRIGADE MAJOR (21,312), dam by FIRST FRUITS, g.d. by PRINCE ARTHUR, made 80 gs., and became also Sir W. S. Maxwell's property. After this succeeded a less animated period, during which animals changed hands at ordinary prices, until lot 23, *Lucy* by RED FRIAR (24,913), showed herself, as a level, true grown Shorthorn of fine colour, and just over three years old. This excellent heifer, in calf to Mr. Booth's BANNER BEARER, was bought for New Zealand by Mr. Hay, at the high figure of 120 gs. Lot 28, *Sally Gwynne* by ISLESMAN (26,444), and from *Sarah Gwynne*, lot 14, realised 125 gs., becoming Mr. H. C. Pole-Gell's property. Among other prices worthy of especial notice were 100 gs. given by Mr. Cochrane for *Miss Blithe*, and 105 gs. for *Blithe Belle*, daughter of lot 18 and grand-daughter of lot 9, given by Mr. Hay for New Zealand. The general average of the sale was no doubt considerably lowered by the circumstances which prevented the sale of the bulls BARON BOOTH (21,212) and MALVIOLO (24,519), both animals being withheld on account of lameness. Among the calves CHERRY PRINCE by ISLESMAN (26,444), dam Mr. E. S. Bolden's *Cherry Queen*, attracted special attention; and although only five months old he was sold to Mr. J. W. Philips for the high price of 81 gs. The general result of the sale was most satisfactory. The 36 cows brought, on an average, £56 15*s.* 9*d.*; 11 bulls made £36 1*s.* 8*d.* each; and 47 animals realised the very good average of £51 18*s.* 10*d.*

Name of Animal.	When Calved.	Price.	Purchaser.
Cows and Heifers.		Gs.	
Cameron Lass	1866	31	Mr. A. Bethune.
Lady of the Lake	1866	43	Mr. A. Bethune.
Comely 3d	1863	26	Mr. R. Arklay.
Dandelion	1862	4	Mr. G. Wylie.
Lassa	1862	3	Mr. R. Arklay.
Blue Bell	1863	160	Mr. H. Cochrane (Canada).
Sonsie	1864	32	Mr. W. Godsman.
Maid of Lochty	1864	41	Mr. W. Godsman.
Bella	1864	54	Mr. R. Mowbray.
Amazon	1864	34	Mr. J. Gordon.
Cherry Queen	1865	160	Mr. E. S. Bolden.
Gwendlin	1864	20	Mr. J. Young.
Lady of the Isle	1866	32	Mr. J. Bethune.
Sarah Gwynne	1866	46	Mr. H. C. Pole-Gell.
Beatrice	1866	32	Mr. R. Binnie.
Samuel's Farewell ..	1866	50	Mr. T. Jolly.
Lucinda	1866	27	Mr. R. Arklay.
Belle	1866	60	Mr. W. S. Maxwell.
Pride	1866	80	Sir W. S. Maxwell.
Bessie Bell	1867	59	Mr. A. Bethune.
Sonsie 2d	1867	33	Mr. J. M'Queen.
Alice	1867	24	Mr. J. Young.
Lucy	1867	120	Mr. Hay (New Zealand).
Gipsey Girl	April, 1868	29	Mr. H. Scott.
Beauty	July, 1868	35	Mr. Hay (New Zealand).
Comely 5th	Aug., 1868	60	Mr. J. W. Philips.
Soldier's Daughter ..	Aug., 1868	33	Mr. G. Hope.
Sally Gwynne	Nov., 1868	125	Mr. H. C. Pole-Gell.
Lassie	Dec., 1868	36	Mr. T. Jolly.
Miss Blithe	Feb., 1869	100	Mr. Cochrane (Canada).
Maid of the Forth ..	Mar., 1869	60	—
Miss Rose 2d	April, 1869	32	Mr. H. Scott.
Blithe Belle	May, 1869	105	Mr. Hay (New Zealand).
Countess	Nov., 1869	35	Mr. J. Bethune.
Lady Samuel	May, 1870	31	Mr. T. Jolly.
Sonsie 3d	May, 1870	34	Mr. Bethune.
Bulls.			
BARON BOOTH (21,212) ..	1866	..	Not offered.
MALVIOLO (24,519) ..	1866	..	Not offered.
ISLAND CHIEF	1868	36	Mr. D. Forrester, Demerara
RED ROVER	April, 1869	37	Mr. R. Mowbray.
MASTER BLITHE	July, 1869	41	Mr. A. Bethune.
BARON FOURTH	Aug., 1869	36	Mr. J. M'Queen.
LORD KELLIE	Sept., 1869	20	Captain Armstrong.
LORD MAR	Sept., 1869	31	Mr. Cheape.
LORD BURLEIGH	Jan., 1870	42	Mr. R. Binnie.
SAMUEL GWYNNE	Feb., 1870	19	Mr. D. Meldrum.
CHERRY PRINCE	Mar., 1870	81	Mr. J. W. Philips.
WATERMAN	May, 1870	15	Mr. Peat.
WATCHMAN	Aug., 1869	20	Mr. D. M'Clane

36 cows and heifers at £56 15 9 =	£2044	7	0
11 bulls at .. .. 36 1 8 =	396	18	0
47 animals at .. .. £51 18 10 =	£2441	5	0

—— Mr. Staniforth's catalogue, which we mentioned in last week's impression, contains some excellent pedigrees, and we hear that the cattle whose names occur in it are good and in nice condition, that the heifers are heavy with calf, and finally, that the stock is popular in the lake district of Cumberland where it is situated. *Claribel*, No. 1, is by Mr. R. Booth's VALASCO (15,443), out of *Farewell* by ROYAL BUCK (10,750), also of Warlaby extraction, and traces back to PILOT (496) and other good Colling sires. *Frederick's Pride*, a daughter of Colonel Towneley's FREDERICK (11,489), and *Pride*, by the Bates' bull, 4TH DUKE OF YORK (10,167), is the next name. She is descended from good Colling stock. Lot 3 is by Mr. E. S. Bolden's DUKE OF MOSCOW (14,447), and from a cow of the *Medora* by AMBO (1636) tribe. Lot 7, out of this cow, and by COXCOMB (19,527), bred by Mr. Fawkes, of Farnley, is full of good breeding, and is, like most of the cows, in calf to Mr. Carr's PEER OF THE REALM. Lot 8, by JURYMAN, bred at Storrs, is of the "Gwynne" or "Princess" tribe, and lot 9 is one of the "Flora" family, originally bred by Mr. A. L. Maynard. We must also notice the "Rowenas," noted for their milking properties, descended from *Rowena* and DUKE OF MOSCOW (14,447), already spoken of in connection with Springfield. The bulls recently used have been JURYMAN (20,043), and GRENADIER (21,876), both bred by Mr. Staniforth; EVANDER (23,897), purchased of Mr. Dickenson, of Ulverstone; and MASTER POINTS, purchased of Mr. A. L. Maynard. The cows and heifers are in calf to Mr. Carr's PEER OF THE REALM and Mr. Booth's HIGH SHERIFF. The catalogue is published by Mr. Thornton, who will sell the herd on the 13th inst.

SHEEP.

THE second portion of the Strafford flock, so long bred by the late Mr. E. Waters, was sold by Mr. John Waters, auctioneer, of Salisbury, on the 17th ult. The sale was satisfactory, and the bidding spirited, the whole of the 169 lots being disposed of in the unusually short space of three and a half hours. The following are among the prices realised:—Six-teeth ewes, lot 5 (Mr. Brine), £7 per head; lot 10 (Mr. Lunn), £4 12*s.*; lot 15 (Mr. Parker), £4 8*s.*; lot 3 (Mr. Russell), £4; lot 2 (Mr. Russell), £3 13*s.*; lot 7 (Mr. Lunn), £3 13*s.* Four-teeth, lot 5 (Mr. Parker), £5 10*s.* per head; lot 10 (Mr. Barton), £4; lot 15 (Mr. Lunn), £3 6*s.*; lot 2 (Mr. Homer), £3 3*s.*; lot 3 (Mr. Homer), £3 3*s.* Two-teeth, lot 5 (Mr. Parker), £5 10*s.* per head; lot 10 (Mr. Russell), £3 12*s.*; lot 7 (Mr. Barton), £3 3*s.*; lot 20 (Mr. Symonds), £3 3*s.*; lot 25 (Mr. Fooks), £3. Chilver lambs, lot 10 (Mr. Lunn), £2 10*s.*; lot 5 (Mr. Dear), £2 6*s.*; lot 9 (Mr. Dear), £2 4*s.*; lot 6 (Mr. Moore), £2. The 6-teeth ewes averaged 66*s.*; the 4-teeth ditto £2 17*s.* 9*d.*; and the 2-teeth ditto £2 13*s.* 8*d.* per head. The chilver lambs averaged £1 16*s.* 2*d.* The ram lambs, which were much younger generally than those sold on the former occasion, made prices ranging from £3 to £9 9*s.*; averaging £4 14*s.* 3*d.* The sale was a most satisfactory one in all respects. The sale of the remaining young ram lambs, kept back for Wilton fair, according to previous custom, will complete the dispersion of this old established flock.

—— On Friday, the 26th ult., Mr. Rigden's annual sale took place at Hove, near Brighton. The following prices were obtained for pens of five ewes:—One pen of full-mouthed ewes, £4 per head (the Prince of Wales); one pen, £4 16*s.* per head (Duke of Richmond); one pen, £3 per head (Mr. Woods, Leatherhead); one pen, £3 5*s.* (Mr. Woods); one pen, £3 5*s.* per head (Mr. E. Stenning, Godstone); one pen, £3 per head (Mr. Carew Gibson); one pen, £2 15*s.* per head (Mr. E. Cane); one pen, £2 10*s.* (Mr. J. S. Turner). Several pens at from £2 10*s.* to £2 15*s.* per head. Rams for letting brought the following figures:—A 4-year-old, 15 gs. (Colonel Tomline); a 2-year-old, 27 gs. (Colonel Tomline); a year-ling, 15 gs. (Mr. Heasman); do., 15 gs. (Mr. Wodehouse); do., 15 gs. (Mr. C. Gibson); do., 15 gs. (Lord Norbury); do., 10 gs. (Mr. Drummond); do., 12 gs. (Lord Norbury); do., 20 gs. (Mr. Gillespie). Rams for sale were thus disposed of:—A 3-year-old sheep, 10 gs. (Mr. Stevens); a 2-year-old sheep, 10 gs. (Mr. Gibson); a shearling, 10 gs. (Mr Hodson); do., 11 gs. (Mr. Milward); do., 12½ gs. (Mr. Hodson); do., 12 gs. (Mr. Northall Laurie); do., 13½ gs. (Lady Shelley); do., 10 gs. (Mr. S. Beard). These sheep were all exceedingly well bred, and were by "Archbishop," the 1st prize sheep at Canterbury, which was sold to Mr. Webb for 250 gs.; by "Young Elegance," sold at Mr. Webb's last sale for 140 gs.; and by "No. 40," a son of "Reserve," highly commended at Leicester.

—— We have to acknowledge the receipt of the sale catalogues of the Sutton Maddock flock, which will be dispersed by Messrs. Lythall & Clarke, and of Lord Sondes' Southdowns and Norfolk cattle, to be sold by Mr. E. Beck. Both these sales take place on Monday first.

SCIENCE IN AGRICULTURE.

By JUDGE FRENCH.

KNOWLEDGE has been well defined as the power to discern differences, a power which ordinarily comes only through careful and long training. It is true that some kinds of knowledge, as of music, and painting, and sculpture, seem to come to a few favoured mortals almost by direct and special divine bestowal. They have perceptions not common to the race, and form an exceptional class. The rest of us acquire knowledge only by the slow processes of education, not in schools merely, but by self-culture, in the line of our pursuits, whether of business or recreation.

We are told very often that agriculturists, however scientific, never settle anything, and are never certain of anything, and there is a great deal of truth in the statement. It might fairly enough be retorted that we are as well agreed in our conclusions as clergymen and doctors and lawyers are in matters pertaining to their professions, and that when Catholics and Protestants and homœopathists and allopathists will harmonise in their views, the farmers will soon follow their example.

This suggestion, though well enough for defence,

does not do much for the advancement of knowledge, which is the important point.

I am not one of the disconsolate class who believe that everything good is declining, and the world going backward, but in my daily observations I find discouraging evidence that there is occasion for constant labour by the agricultural press, and by the institutions established to promote the interests of agriculture, to keep our farmers up to the step in the march of progress. We need all the aid of farmers' clubs, agricultural schools, and papers, to keep the wits of our farmers bright enough to profit by what daily passes before their eyes.

Commercial Fertilisers.—Everybody almost uses more or less of these articles, and yet there is a general impression that we are cheated in most of them, but we cannot get from the thousands who every year use superphosphates and other fertilisers anything more than a general opinion, usually in the form of a certificate, that they find them of great value on their corn or Potatos. To illustrate how loosely opinions are held and expressed on this subject, let me give a conversation between myself and two very intelligent men, both of them farmers, both of them well educated, and both members of a farmers' club.

Both of them would be amused, no doubt, should they chance to read this in print, at their own slipshod opinions. I remarked that I had just received a quantity of Day's superphosphate, which I intended to use at the rate of 1000 lb. to the acre on my Asparagus.

"Day's superphosphate!" said Mr. A.; "why, I tried that years ago, and it is good for nothing."

"Indeed!" said I; "how did you use it?"

"Oh, I put it on to everything—on to corn and Potatos, and Vines, and it produced no effect whatever; it was good for nothing."

"Where did you obtain it?" I inquired, and added that I knew Mr. Day for an honest man, and was sorry to learn that he had ceased to manufacture.

"I got it," he replied, "through the Ames Plough Company; and they told me this year that it was such a fraud that they had done selling it."

"I think, friend," said I, "that you must be under a great mistake in this matter, because I ordered a ton of this fertiliser of the Ames Plough Company in April, and they commended it very highly, and sent it; and last week I ordered another lot, which I received from them to-day, so that I am sure they continue to sell it."

"Well," he said, "on the whole, I guess I am mistaken in the name. I think it was another kind that I used," and gave the name of another maker of superphosphate, which I will not state.

The other man then took up the discourse, stating that none of these superphosphates were good for anything—that a few years ago he bought a quantity of Gould's, and tried it every way, but it was utterly worthless, and produced no effect whatever. I insisted upon knowing what experiments he tried, and he informed us that he mixed a quantity of it with water and put it on to his squashes and Cucumbers, and it killed every one of them. Upon my suggesting that the result seemed to show it had some strength, he replied that it had not much, for he let half a hogshead of the liquid run out on to a piece of grass, and it did not alter it a shade; you could not see where it went, and he reiterated his opinions that none of these superphosphates were worth a cent. I told him that I thought there had never been any such fertiliser in the market as Gould's superphosphate, and suggested muriate of lime as possibly the article he used. He said, come to think of it, he believed that was the name of it, but still insisted that none of these fertilisers were of any value. These instances show how little reliance can be placed on even the honest opinions of very respectable men, who have no motive or intention to misrepresent. The mere carelessness in observation, memory, and statement, which is very common in all but trained observers, renders the experiments of most men utterly useless to themselves or anybody else.

Green (Indian) Corn Fodder for Cows.—Occasionally the farming community is astonished with a statement, upon high authority, which seems to contravene all the experience of the community. Of this kind is the opinion persistently repeated in public addresses, that corn fodder is the meanest thing that can be offered to milch cows, uttered by a gentleman holding a high position in the agricultural world. Now, if this gentleman should live a hundred years, and make two speeches every day, as he probably might, he would not do good enough to counterbalance the evil which his opinion about corn fodder would do if it was generally accepted as correct. Fortunately, however, only about one person in a thousand agrees with it—not so large a proportion as we have in the community of insane or idiots. In Concord we furnish about 2000 galls. of milk a day for Boston, of quality equal to the best; and our farmers, almost without exception, rely upon green corn for their cows in August and September. My next neighbour says he could not keep half his number without it. I kept eight cows in the yard nearly a month last year, in August and September, and fed them almost wholly on green corn fodder, giving them a little dry hay and no grain, and they gave more milk than when at pasture, and made excellent butter. We reckon sweet corn best, but usually sow the Southern corn, because the seed of the sweet corn is too expensive. I have nearly 2 acres sown this year, part of which I hope to dry and save for winter use. If there is anything settled in my neighbourhood, it is that corn fodder is valuable for milch cows. My own experience of twenty years corresponds with the general opinion. "Error of opinion," says Jefferson, "may safely be tolerated while reason is left free to combat it;" and the wise men of the East, who denounce corn fodder and swamp mud as useless, create but a small ripple on the great ocean of public opinion. *Albany Cultivator.*

THE WHEAT CROP OF 1870.

Although the climate of Great Britain is proverbially changeable, our seasons are seldom characterised by great extremes, either of cold in winter or heat in summer, while the amount and distribution of rainfall are generally suited to a considerable variety of crops. Not more than two or three times in a century do seasons of remarkable winter cold, summer heat, or drought occur. Two years ago (August, 1868), I called attention to the fact that we must go back for about half a century to find a season characterised by dryness and high temperature to the same extent as the one then just past. The present season has been remarkable for extreme dryness, commencing one month earlier and prevailing later than in 1868; while the temperature has also frequently been very high. Throughout the southern and eastern parts of England scarcely any rain fell during April, May, and June. There was rather more, but still very much less than the average, in July, and much of that which did fall was in heavy and more or less partial storms; while August, again, has been up to this time extremely dry. Vegetation has, therefore, been, in a great degree, dependent upon the moisture retained within the soil from the supplies of the winter and early spring; and the amount of this resource must obviously have been very variable, according to the character of the soil and subsoil.

A drought very similar in character occurred in 1844. In that year, as in the present, the produce of grass land was exceedingly small, and the crop was in many cases left uncut, its value being considered insufficient to pay the cost of making into hay. It was, too, in 1844 that the first experimental Wheat crop was taken from the field on this farm, which has been devoted to the growth of Wheat every year from that time to the present; and as the characters of the first and the 27th seasons resemble each other pretty closely, a comparison of the first and 27th crops will be of some interest. In the first season, 1844, the produce of Wheat without manure was 15 bush. per acre. In 1870, the 27th season of Wheat in succession on the same land, the unmanured produce is again exactly 15 bush. In 1844 the highest produce by mineral manures, without ammonia, was scarcely 17 bush., and in 1870 about 18½ bush. In 1844 the addition to the mineral manures of 81 lb. per acre of sulphate of ammonia increased the produce to 24½ bush. In 1870 the addition of salts of ammonia, in quantities of 100, 200, 400, and 600 lb. per acre, gave respectively 26, 30½, 40½, and 45½ bush. When it is considered that between these two periods 25 crops of Wheat have been carried off the land, the identity of the produce without manure in the two cases and the general similarity of effect with different descriptions of artificial manures is very striking.

The following Table shows the amount and quality of the Wheat yielded in 1870, the 27th crop in succession; the results being those obtained from the same plots, and under the same conditions of manuring year after year, as have been selected for illustration in previous years; and for comparison there are given by their side those recorded on former occasions, and also the average results for a period of 18 years:—

Bushels of Dressed Corn per Acre.

Harvests.	Without Manure Plot 1.	Farmyard Manure Plot 2.	Artificial Manure Plot 7.	Plot 8.	Plot 9.	Means of Plots 7, 8, & 9.	Means of Plots 1, 2, and 7, 8, & 9.
1852	17½	44	50	55½	58½	54½	47
1853	16½	40	45½	49½	51	49	43
1856	14½	32½	46½	43½	44	43½	31
1860	12½	35½	39	32½	32½	31½	26½
1867	16	40	52½	50	53½	52	39½
1868	15	41½	57½	56½	57½	57	42½
1869	14½	37½	50½	54	59	54½	39½
1870	15	47½	49½	45½	43½	43½	34½
Average 18 years 1852–1869	14½	35½	35½	38½	36½	36½	29½

Weight per Bushel of Dressed Corn. Pounds.

1852	62·7	63·1	62·5	62·1	62·1	62·3	62·7
1853	60·6	62·1	63·1	61·5	62·6	63·1	62·8
1856	60·6	61·5	61·6	61·4	61·1	61·4	61·2
1860	61·3	61·7	61·3	60·1	60·6	60·6	61·2
1867	58·1	61·4	61·6	60·7	59·9	60·5	59·4
1868	61·0	61·6	61·1	63·0	61·1	61·4	61·3
1869	58·1	59·7	57·4	57·2	57·1	57·2	58·2
1870	61·7	62·4	62·4	61·7	60·7	63·2	62·8
Average 11 years 1860–1870	57·5	59·9	60·2	58·6	58·2	58·7	58·7

Thus, the permanently unmanured plot gives 15, and the farmyard manure plot 36½ bushels per acre, or respectively slightly over the average of the 18 preceding years. The three artificially manured plots give, on the other hand, very much over the average; plot 7 yielding 40½, plot 8, 45½, and plot 9, 45½ bush. per acre; or respectively 4⅜, 6⅜, and 9 bush. over the average of the previous 18 years. It is evident that, so far as Wheat is concerned, the past season has been very favourable for the action of certain artificial manures, but much less so for farmyard manure. A somewhat similar result was obtained in the case of the hay crop also, certain artificial manures having yielded more than 2½ tons, while dung gave not more than half a ton.

The quality of the grain is this year very high, averaging 6 lb. per bush. more than that from the same plots last year, and 4 lb. per bush. more than the average of the preceding 18 years. In fact, this experimental field has not yielded grain of so high a weight per bushel since 1849.

Taking, as in former years, the average of plot 3, plot 2, and plots 7, 8, and 9, taken as one, the average produce this year is 31½ bush., or 2½ bush. more than the average of the last 18 years. But as the average weight per bushel is this year 62½ lb., or 4 lb. more than the average of the 18 years, the 31½ bush. are equivalent to 32⅝ of the standard weight of 61 lb. per bushel, and to nearly 4½ bush. more than the average produce of the preceding 18 years, if the latter be calculated to the same standard weight per bushel.

The following are results obtained this year in fields which are not under experiment, but cultivated according to the ordinary practice of the farm, and for comparison with the new results, those recorded in former years are here repeated:—

Bushels of Dressed Corn per Acre.

Harvests.	Fields. No. 1.	No. 2.	No. 3.	No. 4	No. 5.	Average.
1863	63	..	..	..	..	..
1865	38	45	46	51	..	46½
1866	40	42	40	..	..	40½
1867	32	35	36½	..	..	34½
1868	44½	46½	50½	51	..	48
1869	37	39½	43½	45½	53½	42½
1870	34	44½	39½	44½	..	40

Weight per Bushel of Dressed Corn (Pounds).

1863	63½	..	..	..	..	58½
1865	64	63	58	58	..	60
1866	61½	60½	60½	..	..	60½
1867	57	61½	61½	..	..	59½
1868	64	62½	61½	61½	..	62½
1869	59½	58½	60½	60½	59½	59½
1870	60½	63½	61	60½	..	61·6

It should be mentioned that the yields of 34 and 44½ bush. were both obtained in the same field, the smaller produce being due to loss of plant, so much complained of over large Wheat-growing districts this year.

In another field, the whole of which was uniformly manured, 13 different descriptions of Wheat were sown, and the average results of five lots already threshed is 48⅜ bush. per acre, and more than 65½ lb. per bush., the weight of one description reaching very nearly 67 lb.

The above records afford evidence of a very superior crop of Wheat this year under favourable conditions, and also of considerable falling off under unfavourable conditions. Indeed, in endeavouring to form an estimate of the produce of the country at large, based on the results here given, we must not lose sight of the fact that the plant has this season been unusually deficient, more especially on the lighter soils. So far as Wheat is concerned, there has been a splendid seed forming and maturing season, but acting in many cases upon an insufficient amount of plant, and it is probable that some of the heaviest and some of the lightest crops ever known in England have been grown this year.

Under the circumstances described, it is of course extremely difficult to form a satisfactory estimate of the average yield over the United Kingdom. Considering, however, that the best Wheat lands have suffered the least, that many of them have yielded large crops, and that the quality at any rate is generally considerably over the average, I think the crop of the United Kingdom may be estimated as equivalent to from 30 to 31 bush. per acre, weighing 61 lb. per bush.

Taking, for safety's sake, the lower of these estimates as the basis of further calculations, and assuming, in the absence of the official returns, the area under Wheat to be somewhat less than in 1869, but equal to that in 1868—namely, 3,937,275 acres, the gross product of the United Kingdom will amount to 14⅜ million qr. Deducting from this 2½ bush. per acre for seed, there will remain available for consumption as food 12⅜ million qr.; and taking the average population during the next 12 months at 31 millions, and the requirement per head to be 5½ bush., the total requirement will be 21½ million qr., leaving about 7⅜ million qr. to be supplied from foreign sources. Last year, following a similar method of calculation, I estimated that not less that 9⅜ million qr. of Wheat would be imported during the harvest year ending August 31, 1870. The quantities of Wheat and Wheat flour, reckoned as Wheat, actually imported from September 1, 1869, to August 13, 1870, amounted to about 9⅜ million qr., and assuming the recent rate of import to continue to the end of the

month, the total imports for the harvest year will probably exceed 10 millions. A study of the Tables of imports for past years is, however, sufficient to show that estimates so made are liable to certain special sources of error, which are more liable to lead to under than to over-statement. Thus it is obvious that over and above the quantities of Wheat imported to complete the supply required to meet the average demand for human food, we sometimes receive a considerable surplus, dependent on the amounts which foreign growers have to dispose of. For example, the home crop of 1867 was an extremely bad one, and that of 1868 one of great abundance; and yet the imports for the harvest year following the abundant crop were only three quarters of a million quarters less than those for the year following the preceding very bad one. It is probable that when Wheat is very abundant and the price low, there is both an increased consumption of bread and a considerable quantity of Wheat used as food for stock. I will only add, in conclusion, that, with a great European war proceeding, it seems of little use to hazard any estimate at present as to the probable range of prices up to the next harvest. *J. B. Lawes, Rothamsted, Herts, Aug. 24, in the "Times."*

PURE OILCAKE.

THERE is no doubt whatever that a very large proportion indeed of cake admittedly adulterated by the crusher, and sold by him as such to the dealer, is resold by the dealer as pure linseed cake, and he puts a large profit into his own pocket with little fear of detection. In truth, if discovery of the fact by some mischance should happen—there has simply been a mistake, things are made pleasant, and confidence is quickly restored; or, in the more expressive language of the Committee of the Royal Agricultural Society, "Farmers are unwilling to give up the names of the dealers, resting satisfied with the settlement in the individual cases."

It is quite clear that there is no room for these respectable middle-men and their large commissions in such a trade as the pure linseed cake trade; and if pure cake is to be manufactured there is practically an end of their vocation. The class of merchants and cake dealers engaged in these operations is composed of men of respectability and position, and hence their important influence; but the fact still remains that their interest is opposed to that of the farmer. They can have no motive for pressing inquiry into the doings of the crushers. Their chief aim is to get an article which leaves them a high remuneration. The dealer naturally praises the cake he sells to his customer, as the crusher extols it to him. The whole transaction is one of confidence, and the great bulk of the business throughout England is done without a particle of inquiry on the part of the consumer. The cake is accepted on the character of the dealer without scruple or hesitation.

All the representations of the frauds of cake makers do not affect the character of the respectable merchant, with whom the farmer has probably other pleasant business associations, and thus all suspicion of the quality of the commodity is averted.

There are often quotations in the market of pure linseed cake at prices which, to those who have any accurate knowledge of the subject, carry their own condemnation. For, if the cake be what it is represented, a great loss must inevitably accrue to the manufacturer, inasmuch as the value of the oil and cake would not realise the cost of the linseed, to say nothing of the expense of manufacture.

The farmer from his position can possess little knowledge of these details, although he may have a strong conviction that crushers do not live on losses, and, of consequence, another conclusion is inevitably forced upon him.

Whenever the dealings of the crusher and the consumer are direct there is necessarily more responsibility and much more difficulty in the transaction. The manufacturer and his customer meet face to face, and are on much more equal terms. A gentleman was one day waiting for his train, in the coffee-room of an hotel in Hull, when he became an involuntary listener to a dialogue which illustrates this question. The conversation was between the representative of some Hull crushers and a respectable farmer or stock breeder. "Now, Mr. So-and-So, I must sell you 20 tons of cake. Just look at these samples. This is a magnificent cake—pure, and remarkably cheap, although higher in price than the others; but, still, if you like anything at a little less money, here is a sample of genuine cake of excellent quality." The customer still seemed to hesitate, the cake seller evidently concluding that the difficulty was only one of choice. "Cake," said the farmer, "is very dear just now." "Yes, it is," was the reply; "but if you would be content with something just a little inferior to the other in quality, I have here an excellent brand, which would, perhaps, answer your purpose quite as well." "Still," urged the farmer, tentatively, "it all seems very dear." "Yes: you see oil is flat just now, and cake has gone up in consequence; but to show you how anxious I am to do business, as trade is bad" (here he became confidential, and spoke in subdued tones) "and stocks are large, you shall have 20 tons of this brand"—producing a fourth sample—"at 10s. a ton less than the last sample I showed you. Surely this will answer your purpose," exclaimed the crusher's representative. The stock breeder took the samples produced, and appeared to examine them very carefully. "Let me see," said he; "this you say is 'genuine'—why, that will be the best." "No, no; 'pure,'" replied the seller, "is 'A 1.'" "Oh, yes! Very well, then, what did you say this was made of?" pointing to sample No. 4. The question seemed to be very embarrassing, seeing that no description at all of the composition of the cake had been given. A moment of painful silence followed, which the farmer terminated by rising to go away, observing quaintly, "Why, really you have so many sorts one gets quite puzzled. I think I mustn't trade to-day." Some may consider the desire for reflection was wise! *Extracts from "Character and Condition of Linseed Cake Trade," by W. Jarratt, Chairman of the Driffield and East-Riding Pure Linseed Cake Company.*

TILLAGE AND SEEDING.

AT the end of my letter, at p. 1131, after having given the names of gentlemen who, nearly 60 years back, had seeded acres of land with Wheat, and with 1 peck of seed only per acre; and of others who had seeded their lands with 2 pecks, and of others again who had used 3 pecks, and all with complete success, I added that I had others who seeded their land with half a peck, or—that I may not be misunderstood—with 4 quarts only. And the gentleman I shall here instance was Mr. J. D. Piper, of Calne Engaine, Essex, a few miles from Colchester. Mr. Piper was in the habit of inviting people by advertisements, both to witness his seeding and also the threshing and measuring his crops. I myself witnessed most of the seedings, also the threshings and measurings.

I extract the following from the *Farmers' Journal* of March, 1857; but it was published also in other agricultural journals:—

J. D. PIPER'S BALANCE-SHEET, 1856.—GROWTH OF 1855.
11TH YEAR OF WHEAT AFTER WHEAT.

Expenses per acre.		*Receipts.*	
Rent	£2 0 0	9 coombs of Wheat,	
Tithes	0 7 0	at £17 a load of 10	
Rates	0 3 0	coombs	£15 6 0
Hoeing	1 15 0	Straw, about 2 tons	2 15 0
Sowing	0 7 0	Chaff	0 9 0
Seed	0 1 0		
Threshing	1 4 0		£18 10 0
Reaping	1 2 0	Expenses	8 9 0
Nitrate of soda ..	2 0 0		
	£8 9 0	Clear profit ..	£10 1 0

Averages for the last Seven Years:—

Average quantity, 38 bush. and half a peck: average price per load 10 coombs	£13 10 0
Average profit per acre for seven years	7 8 7
Profit the 5th year £6 6 3	
,, 6th ,, ... 7 3 3	
,, 7th ,, ... 3 5 3	
,, 8th ,, ... 4 11 9	
,, 9th ,, ... 11 13 9	
,, 10th ,, ... 8 19 8	
,, 11th ,, ... 10 1 0	
7)52 0 2	
Average profit for seven years .. £7 8 7	

Mr. Piper concludes this statement thus:—

"But it is said, 'This is a very fine story, Mr. J. D. Piper, but your field is garden.' Very well, I grant it is; and if every large farmer would divide his large fields into small ones—say one or two acres each, and cause 50 timber and other trees to grow between all the divisions, he would have just as good a garden as J. D. Piper."

"Calne Engaine, May, 1856."

I can bear personal evidence to the integrity and veracity of Mr. Piper's report, and of the high esteem in which he himself was held by all who knew him or had any dealings with him.

It was my intention to have given in detail an account of my own proceedings, extending four years backwards beyond the dates referred to by Mr. Piper, and I had drawn up my paper for this purpose, but I find it to be too long to expect room for it; I therefore confine myself to a shorter report. Know, then, my respected readers, I commenced farming operations in my parish early in the spring of 1837, Mr. Piper having commenced his in 1841 or 1842; and I think he was induced to do so from the reports I sent to the newspapers and agricultural journals, and from frequent personal inspection of my doings, and the success of them which he generally witnessed.

And here I must ask to be excused for repeating that I learnt what I know of land cultivation whilst at a school kept by a worthy and learned clergyman in the parish of Hackney, at which I was upwards of nine years. Whilst there I spent most of my leisure time in the nursery and vegetable gardens with which, at that time, the neighbourhood abounded; and it was during that period that I made the trial which I have described, of seeding a measured acre of well-cultivated Wheat land with a measured peck of Wheat only, and which produced 204-fold. And here I will call to the remembrance of the respectable audience who attended my lecture on this subject at the Royal Agricultural College, that an elderly gentleman rose up from among the audience and stated that he could confirm all the lecturer had stated of the peck of Wheat an acre, and that the produce of it stated was correct, for he himself had assisted at the dibbling of it, and also witnessed the threshing and measuring of it. This gentleman added, that so convinced was he of the success and benefits of thin-seeding, that, though he had farmed very extensively, he had never since the time referred to used more than a bushel of seed Wheat an acre, and generally somewhat less. I can add that that gentleman was a highly educated man, and a profound classical scholar, and one of the best read men I ever knew; and further, had I that gentleman's permission to give his name, the whole neighbourhood in which he lived would corroborate all I could say to his honour and praise.

But to return to my subject,—and I wish it to be borne in mind that I commenced my farming in my parish early in the spring of 1837, and I give my practice. My fields, only two in number, were surrounded by high and broad earth embankments called hedges, and in and on these grew a number of old Pollard trees, and bushes and Thorns of all kinds, rough grass, Thistles, &c. These as soon as possible I removed, grubbing up both trees, Thorns, bushes, &c.; at the same time I commenced cultivating the larger of the fields, and ploughed, scarified, and rolled it 11 times, ploughing deeper and deeper every time; and by these operations I got up and together large heaps of Twitch and other weeds, which being placed in convenient places I kept in the heaps as they were, as also the earth round the field from the earth embankments, mixing into the whole lime, chalk, and salt, the last to kill the seeds of the weeds. Early in the autumn I had the land ready for putting in the seed for a crop of Wheat, but in doing this I met with great opposition and, I blush to record it, much personal insult, which proved the low state of the education of the agricultural population in those times. The offence I gave was my being determined to seed my land with not more than a fourth, fifth, or sixth part of the seed that farmers universally sowed; and so violent was the prejudice that I with difficulty got labourers to attempt it, and when they did pretend to commence, they in dibbling dropped four, six or eight, or ten or more seeds in each hole, and the holes were six or eight or more times larger than I was determined they should be, and consequently fully 2½ or even 3 bush. of seed would have been used, instead of 2 pecks, which I was determined should not be exceeded.

I was, therefore, compelled to give up the attempt to dibble in my seed. At length I went to a man who kept a corn-drill, and drilled for his neighbours at a fixed price per acre. "Sir," said I, "will you drill my field with Wheat for me?" "Certainly, sir, I shall be glad to do so," was the reply. "But will your drill put in any small quantity I like?" "Certainly," was again the reply. "But will it put in not more than 2 pecks an acre, and as much below that as I please?" "It will," replied he, "drill as little as 2 pecks." "Then," said I, "bring your drill to my field, and put in 2 pecks an acre." So he came, with a couple of men, and set to work, when I at once saw he was putting in not less than 8 pecks an acre, if not 10, when I interfered, and stopped his drilling; and I shall never forget the sneering and insults I received, especially from his men. But I was determined to persevere, and so I bargained with the owner of the drill to give it up to me and my own man, and I at once commenced altering the drill in this way: I took out every other coulter, so as to make the rows 12 inches wide, instead of 6, and I made a composition with which so to fill the cups with an indention in them that they could take up but one or two seeds at a time, instead of the usual cupful, and I then ordered the horses to be moved on, myself being the drill-man; and thus, when the drilling was finished, something under 2 pecks an acre had been drilled.

Now, my readers, I ask your particular attention: the same farmer who kept the drill had also a horse-power threshing-machine, and I employed him to thresh my crop in the field where it had grown, and this he did; and to his surprise and astonishment, and to that of hundreds more, the yield was 55 bush. an acre? And, my readers, listen a little longer, while I inform you that I grew Wheat after Wheat, in that same field, year after year for 13 years following—14 in the whole, varying my quantity of seed and the kinds of the Wheat, from half a peck per acre to 2 pecks, which I never exceeded, and the result was that the average yield for the 14 years was 44 bush. an acre. There was one more crop equal to the first, and which was in the year 1847; and there were two of the years in which the yields did not exceed 30 bush. each, or 28 and 30, and which brought down the average to the 44 bush., or 5½ qr. I have already stated, and repeat, that my Wheat always sold at the highest market price; and I add further, that I always got as many disinterested witnesses as I could to see my seed drilled and the crops threshed. Disinterested, I write, because, as Mrs. M. C. cleverly shows at p. 1165, little confidence can be placed in the testimony of labourers, for which I give a reason, and conclude this already too long letter. My reason is this:—On its being noised about that I had another very large yield of Wheat, the bailiff of a most worthy and respectable yeoman was determined to beat me, and so he set to and threshed out some Wheat, and afterward reported that the yield per acre was some bushels more than mine. I was pleased to hear it, but at the same time sceptical, as the place was never remarkable for the production of large crops;

but his master seemed, or pretended, to believe him, and so whenever he (the master) saw me he used to say: "You know I beat you in growing Wheat by several bushels an acre." I politely replied that I was sceptical; but he, partly in joke, and partly in earnest, replied again that his bailiff and his men maintained that it was so. Well, time, the tell-tale, went on; the bailiff and some of the men quarrelled, and then they came to me and let out the truth by saying that the bailiff was determined to beat me, and so they threshed and threshed, and winnowed and measured, from a large stack, the produce of two fields, until they got more by a few coombs than I had grown, and then reported that the Wheat had come off just the same quantity of land that mine had, and no more, and was so many bushels an acre more than mine were. I could give some more examples of the same kind, but this one, in my opinion, proves that the testimony of men given to support or please their master is not to be depended upon. *Geo. Wilkins, Wix Vicarage, Aug.* 26.

HOME-GROWN FOOD.

To the Chairman and Members of the Chamber of Agriculture.

GENTLEMEN,—One of your class, I have watched your progress with some satisfaction. Permit me, however, to say that hitherto you have only nibbled at the outskirts, and tried to tinker, without entering into the marrow of the matter. You have an important part to play in the world's game. The United Kingdom of Great Britain and Ireland, and all her dependencies, are dependant for weal or woe upon how you play your part. You will have an annual meeting some of these days. Come and let us have a "crack" together ere you meet. None can be the worse for it. Intelligent inquiry may arise out of it; and many gross delusions as to the nation's prospects of prosperity and permanency, and the way of securing these, may be dispelled. Mark the following figures, check them for yourselves, and deduce from the facts thereby ascertained rational results. Never mind mine, I will be satisfied with your own.

The population of the United Kingdom is 30,000,000. Mankind cannot as yet live without food. In a general way a healthy man consumes 700 lb. of solid dry food in a year, say

200 lb. of butcher meat, at 2*d* per lb.	..	£7 13 0
500 lb. of bread and other stuffs, 2*d* per lb.		4 3 6
700 lb. of solid dry food per annum		
Without port or luxuries	..	£11 16 6
Per 30,000,000 costs		£[illegible]

What food has the nation? The food raised in the United Kingdom last year was—

Cattle, 9,000,000, at say £10	..	£90,000,000
Sheep, 30,000,000, at say 20*s.*	..	36,000,000
Pigs, say 2,000,000, at say 20*s.*	..	2,000,000
Bad but meat	.. .. ..	£[illegible]
Wheat, 12,000,000 qr. at say 44*s.*		£[illegible]
Barley and Oats, 30,000,000 qr. at say 30*s.*		45,000,000
Peas and Beans, 2,500,000 qr. at say 42*s.*		5,460,000
Bread stuffs	.. ..	£[illegible]
Say	.. ..	[illegible]
		£[illegible]
Home grown food	.. .. ..	£[illegible]
Agricultural imports		£12,000,000
Do. exports	.. ..	21,000,000
Say notwithstanding	.. ..	[illegible]
Food raised and brought into nation	.. ..	[illegible]
Shortcoming of a healthy supply in grain		£[illegible]

Or the requisite food for about 9,000,000, out of our 30,000,000 of people.

The requisite food for a healthy man used per annum		£11 11 6
The food reared and brought into action last year could only afford each individual	.. .. ..	8 4 6
Showing	.. ..	£3 7 0

short of a health sustaining supply.

There is thus not food in the country for its population though each had his fair share, which many have not. The weak in nature as in worldly goods are pushed to the wall. Hence the 3,000,000 of paupers, criminals, and vagrants. Their food and housing cost the nation annually about £25,000,000, which is just so much discounted from the industrial produce of the country.

If there be truth in these figures, it follows that the governmental management of the country is wrong if it does not protect and promote the agricultural prosperity of the United Kingdom and of all her dependencies capable of raising food; that the home landowners are wrong in protecting game, withholding land from cultivation, and continuing laws which obstruct or impose burdens on the practical agriculture of the nation; that the nation is wrong in not employing pauperism, criminals, and vagrants in works or land not sufficiently remunerative to induce the capitalist to undertake them, but which are beneficial in themselves, thereby compelling all idlers to some extent to make their own meat, in place of continuing the present system, which is all loss to the country; and the whole body of the people are wrong in storing up capital, or investing it in other pursuits than the promotion of agriculture and the growth of food in Great Britain, necessary to sustain the population in a healthy condition. The penalty of wrong is punishment. If the colonies, neglected by the home government, declare off from this country; if the landowner insanely keeps on for his own amusement, withholding land from the plough and the fold; if pauperism, crime, and vagrancy are continued to be fed, housed, and clad in idleness by the nation, and do nothing towards self-support; then —as living man must have food to sustain life, as the country cannot grow food for the population, and the imports are far short of a necessary allowance—starving man will put forth his hand and take. In taking he will squander. A terrible dearth and reaction must ensue, and the greatest nation the sun has ever shone on must be destroyed—be literally eaten up by the Goths and Vandals reared by her own self, in her own midst. But there is money in the country? So there is: but money is not food. It will, however, buy food? Yes, if in the hands of those who want food, and food is in the country to be bought. Money in the coffers of the millionnaire will not buy food for the million. Money, however abundant in a country, if locked up in the hands of capitalists, will only buy food when the capitalist chooses to put it in circulation. Money in the hands of a starving people will create such a market for food that supplies will be freely imported, so long as the price to be got for the imported article will pay the importer and give him profits. When profits to the importer cease, imports cease. Abundant imports, then, depend upon abundant funds at the disposal of the mouths that consume them. Abundant home growth of human food necessarily reduces the price to all consumers. Abundant imports necessarily imply the original cost—cost of bringing home—and profit in addition, and necessarily require abundant funds in the hands of the people. Everything, then, is in favour of home growth, and without it a shutting of our ports at present would leave a third nearly of the population foodless, were the remainder to consume each his own share. The nation's plight is desperate.

But there is hope for the country. Not, however, in its mercantile enterprise, with agriculture neglected. That has resulted in the past year in 9,000,000 of inhabitants being left without a health-sustaining supply of food. It is just as true that industry is money as that the penalty of idleness is want; but money in the hands of the millionnaire does not buy food for the million. The millions must either have home-grown food at a reasonable price, or money at command to create a market for the importer at a profit. Without money at command of consumer, no market—no market for profit, no importations.

Can we manage a healthful sustenance for all the population without it? The supply short of sustaining a healthful existence to all our people is, as before, £102,500,000.

Facilities given for an improved system of rotation in cropping the arable acreage of the nation (about 50,000,000 of acres) and improving the permanent pasture of the land (about 22,000,000 of acres) would go far to make up the deficit. Observe, however, that crops and cattle are so dependant on each other, that no permanent improvement can be effected on the one without embracing the other. Without manure, no permanent crop improvement; without increased crops, no additional cattle can be reared. By improving both, it has been estimated on reliable data that an increase may be calculated on to the extent of—

11,000,000 additional cattle, at £10	.. .. ..	£[illegible]
50,000,000 additional sheep, at 20*s.*	.. .. ..	50,000,000
11,000,000 additional qr. Wheat at 44*s.*	.. ..	11,000,000
12,000,000 additional qr. Beans at 42*s.*	.. ..	25,200,000
		£[illegible]
Less [illegible] Barley and Oats at 30*s.*		12,000,000
Increase	.. ..	£[illegible]
Surplus after health allowance to population of home reared food	.. ..	£[illegible]

equal to the food of 3,000,000 of population additional to the present number.

The population increases 25 per 100 every 20 years. So there could be food raised at home for all the present population for years to come, though we should not import a quarter of vegetable or animal food.

But without the aid of the state and of the landlords such improvements cannot be effected. They must consent to encroachments upon the 22,000,000 of statute acres of permanent pasture lands, and on the 4,000,000 of waste and uncultivated lands, so far as reclaimable; their amusement must give place to their profit and the food of the people. Unjust burdens must be removed from the land; and all Game Laws and other laws obstructing practical agriculture or destroying the food grown must be abolished. Improving leases must be granted and facilities given to draw the requisite capital to the cultivation of the soil.

That done, a very few years would bring forth the desired surplus of	£[illegible]
These improvements, accompanied by the abolition of deer forests—mutton taking the place of deer —would bring in annually still further	600,000
The abolition of the Game Laws would save the country a loss now entailed on it—some say of £15,000,000 say	10,000,000
The employment of paupers, criminals, and vagrants in preparing for the plough and the fold the waste places which it would not pay the capitalist to undertake would make them self-sustaining to the extent of say half the present cost, now utterly and irretrievably lost to the country, say	20,000,000
Would bring up the surplus to ..	£[illegible]

while the improvements need not stand there.

The idle might be employed in building bulwarks and reclaiming land from the sea—Dutchifying them and extending our arable area. Their attention might then be turned to farming the ocean, saving and protecting spawn, breeding fish, fishing, and adding food to the people. Under free and wholesome emigration of honest industry to the colonies, and judicious home protection and guardianship, the arable area thereof would rapidly extend, and our dependencies would become, even in our own day, well-farmed farms for growing on a great scale food for themselves and their brethren at home. Their prosperity would be increased by our necessities, and by-and-by the promise would be realised, so far as the British rule at least is concerned, that the world would be made glad, and the desert places thereof blossom as the rose. *A Fife Scot in the "Edinburgh Courant."*

THE DORSETSHIRE LABOURER.

[The following is an abridged report of a paper on this subject, read by Mr. H. N. Cox, some time ago, before the Melplash Agricultural Society.]

WHILST there have been improvements in the farms, the homesteads, the machinery, and, I may add, even the cattle on the farm, let us now examine what has been the progress of the agricultural labourer as regards comforts and civilisation. I hesitate not to say that the position of the labourer has not improved throughout our county in anything like the ratio that agriculture itself has progressed. The Hon. Mr. Stanhope has visited this county, and I have read with extreme pain his report. That he has been correctly informed on every subject I most emphatically deny, but that he has mentioned very many startling truths I am bound to confess.

I will first refer to that part of Mr. Stanhope's report where he speaks of the cottage accommodation in Dorset. Now, in no county in England—I will say more, in no county in the whole world—are better cottages to be found than in Dorset; but I can also reverse the picture—there are localites in Dorset in which the cottages are a disgrace to the owner of the land, a great eyesore to the farmer who rents the farm, and a miserable abode for wretched labourers, whose families, being brought up in such misery, furnish our gaols with numerous inmates. But the Hon. E. Stanhope has written fairly with regard to the bad cottages. He has not left us in doubt as to where they are situated, and, whilst the fact of there being such wretched hovels in the county is a disgrace to the landowners, it is no fault whatever to the tenant, to whom they are of the utmost annoyance and great loss. I will just read what Mr. Stanhope says.

"For some years the cottages of Dorset were a by-word and reproach. It is pleasant to look back upon the serious charges then advanced against them, because it places in strong and gratifying contrast their present condition. 'There has been,' says Lord S. G. Osborne, 'in the 27 years that I have known Dorset, the greatest improvement.' Where many have improved it is invidious to mention names. Following the lead of Mr. Sturt, of Crichel, the great majority of landowners have effected great changes on their estates. The improvement in public opinion on this subject is no doubt in a great degree due to the exertion of Lord Sydney Godolphin Osborne, to whose most valuable paper in the appendix it is unnecessary for me to call your particular attention.

"In spite of these changes the cottages of this county are more ruinous and contain worse accommodation than those in any other county I have visited, except Shropshire; and it must be remembered that the system of hiring adopted here would especially seem to require a sufficiency of bed-room accommodation. The estate of Lord Rivers, having been held by life tenants, is notorious for its bad cottages. And such villages as Bere Regis, Fordington, Winfrith, Cranborne, or Charminster (in which there is an average of seven persons to a house), are a disgrace to the owners of the land, and contain many cottages unfit for human habitation. Nor can this condemnation be confined to large open villages. The parish of Batcombe, for instance, with an acreage of 1,109, has within its limits 29 cottages occupied by agricultural labourers, of which 11 have one bedroom only, and in five of these families with three or more children are sleeping. In the 42 parishes comprised within the unions of Cerne and Wimborne, no less than 314 (or 16 per cent.) of the cottages had one bedroom only, and 313 of these contained a family with three and more children. What is called a second bedroom is often, too, a mere apology for it, and is sometimes described as 'a closet not closed' from the bedroom. One special difficulty in the way of improvement in this county should, however, be mentioned. It is the number of cottages let on lease for lives, and until these fall in the landlord has no control and no power of effecting such improvement. It is to be regretted that some are still being let on these terms.

"There is one circumstance connected with these villages which renders them more especially open to reproach, that is, the neglect of the most obvious sanitary precautions. In village after village the answer was, 'There is nothing like one privy to every cottage.' I saw whole rows of cottages with none, and abounding with nuisances of all kinds. Remonstrance is generally disregarded, and the state of filth in which many parishes are left calls aloud for some active interference to relieve the present authorities of a responsibility they have grossly neglected."

Is all this true? I fear we must answer yes. Then what are the increased comforts of the labouring population in these localities? Are they in proportion to the improvements in agriculture itself? I pity the

farmers who rent these farms; but what shall we say for the poor labourers themselves? Herded together as they are, without a single decency provided, can we wonder that people visiting these localities exclaim against Dorset, and hold it up to public view as a national disgrace? Is it to be wondered, then, that as children become conscious that comforts and decencies can be obtained in other localities, that they gladly leave the homes of their early miseries, and seek elsewhere what ought to be found for them where they had been brought up? I believe nowhere in this immediate locality can these squalid dens be found. Let us only hope that gradually they will disappear from our country altogether, and that the brilliant example of Lord Westminster, Lord Portman, Mr. Sturt, and scores of others will speedily be followed, and every dismal hut will be replaced by a neat cottage, which any labourer will feel proud to call his home.

The next question is wages, and on this I cannot agree with Mr. Stanhope. I am happy to find in the parts of Dorset which I have visited that there has been a great improvement in wages within the past 15 years, and, as a class, the labourers do not complain. I must, however, confess that I have not visited many of those places to which Mr. Stanhope alludes. As a specimen, however, of the wages in the county, I inquired of persons who attend Wimborne market, some attending Shaftesbury, some Dorchester, and others Bridport market. At Wimborne the wages are certainly higher than in this locality. For instance, a man (I will name him if you like) worked as carter; he had 11*s.* per week, a house, fuel, and Potato ground. The house was worth at least 2*s.* 6*d.* per week, a very comfortable cottage indeed. His son, aged 16, had 8*s.* 6*d.* per week, and two other boys had respectively 6*s.* 6*d.* and 3*s.* 6*d.* In the neighbourhood of Maiden Newton—I will not mention the name unless wished—a farmer paid his carter 8*s.* per week, with a capital cottage, and a garden of 40 perches. This man's son, aged 18, was shepherd at 9*s.* per week, and two boys earned 10*s.* more, making the joint earnings 27*s.* per week; but there was something more—the man was offered 1*s.* per week extra if he would give up his cider, but neither he nor his son would do without this stimulant. Besides this, the man and son had a quarter of an acre of land between them. I can give many similar instances of wages in the county; and I am very sorry to say that the labouring men in our towns are not paid nearly so well as the men on our farms. I don't believe Mr. Stanhope knew anything about the tools a shepherd requires when he took the trouble to take down the evidence of a shepherd's wife. The shepherd, it appears, has 10*s.* per week, and £3 besides during the year; but he had to find his own tools, even his shears for clipping. Besides his crook and shears, I don't know that he ever uses any other tool excepting the iron bar, which, as a matter of course, every farmer provides. He may want a hook to stop a gap at times, but I expect he would more frequently want it to get a faggot for fuel. I doubt much if the shepherd of any gentleman at this table spends 6*d.* a-year for his tools. What a voluble woman was this shepherd's wife. She had no meat, except a giddy sheep was killed. Perhaps even Mr. Stanhope himself might have eaten a portion of a giddy sheep. I expect every farmer here has partaken of it on many occasions. I know I have myself; and every farmer and butcher knows that as soon as giddiness comes on, the sheep, which is invariably a young one which has never bred, or as you know Dorset people call a hogg, is killed and dressed, and the mutton is perfectly wholesome and nutritious. This tale of giddy mutton is a very old one, which I thought had done its duty when the great "S. G. O." a quarter of a century ago, made such use of it. We may, I think, conclude that the wages of the Dorset farm labourer are higher in the eastern part of the county than in the western, and that they are quite equal to the wages of labourers generally throughout the West of England.

But now comes the question of the comforts of life which these wages allow them to enjoy. Mr. Stanhope says they only get pig meat (I hope they get sufficient of that), and they seldom taste butcher's meat. I very much fear they will never get much butcher's meat in this country. We all know that wages have increased about 20 per cent. within the last twenty-five years; but what has been the result? Meat, butter, and cheese have increased in value in the same proportion; and if you added 20 per cent. more to the wages of your labourers they would not even then get much butcher's meat. Let us, for instance, suppose there are 2,000,000 of our population who are engaged in agriculture, or in business supported by agriculture. Add 1 lb. of mutton per head weekly to each of these, and we should require a weekly supply of 25,000 sheep, or 1,200,000 sheep per annum, taking each sheep at 20 lb. per quarter. We could not at once get such a supply of sheep, or a proportionate quantity of cattle, and the consequence will be that butcher's meat will remain beyond the reach of the farm labourer. It is a sad thing to think of; but I hope the day is not far distant when the abundant stock of sheep in Australia, and the immense herds of cattle in South America, will be preserved so as to come here in sufficient quantities to provide our working men with that which they ought to have in abundance.

I must, however, remember that I have the great question of education still behind, and therefore I must speedily conclude this subject; but I cannot forbear one remark to Mr. Swatridge and the clergyman of Sturminster Marshall. I will just read the remarks in the *Pall Mall Gazette* of November 13, 1869, on this subject:—"The evidence of the farmers enables us to see why the labourers at the county agricultural meetings receive prizes for bringing up large families. A labourer without a family is not deemed an eligible servant by a Dorsetshire farmer. The reason is very clearly stated by the clergyman of Sturminster Marshall; two boys can do as much work as one man, but their combined wages do not amount to so much. Mr. W. Swatridge, miller and corn-dealer, stated the 'custom of the country' in this particular thus: 'The usual mode of hiring a man hereabout is to make a condition with him that his wife or a daughter shall go to work, and his sons as they get old enough to go. One effect of this is the reduction of the father's wages, which is made up by the employment of his family. He, of course, is anxious to push off his son at seven years old, or as soon as he can, to plough, and the farmer is quite ready to get the cheaper labour which he has thus the means of getting. As the boys grow up they go on living at home; but, although they are doing men's work, the employment of the whole family lessens their earnings also, and they do not get man's pay. A farmer does not care to hire a single man.' Another witness says: 'When I hire a family the boys are shown to me, and I see whether they are big enough for my purpose. When we hire a man we look out for a family suitable to the farm, the condition being that all shall go out when required.' What is said about the ignorance and moral degradation that prevail in the Dorsetshire labourer's home it is quite needless to print.

Now, gentlemen, mark the words—a labourer without a family is not deemed an eligible servant by a Dorsetshire farmer. This can only refer to certain localities, and it is those localities where there is not ample cottage accommodation. If a farmer has but one or two cottages, a man with a family is a boon to him; but if only those who have families are eligible servants, what becomes of the good and tried servants who, before they have passed the meridian of life, get their principal sons married off? Can we find any destitute of places? It is precisely the same with a farmer as it is with every tradesman—he must have boys growing up to learn his business. The tradesman takes his apprentice, but the farmer does otherwise. He has not the boy bound to him, but pays him what he earns; and in too many instances it happens that when a boy is got useful he leaves his father, and goes to a neighbouring farmer. There is no stigma to be cast on the farmer, because he takes his apprentices in a different manner from the butcher, the mason, or the carpenter. We never hear of a good farm labourer being out of employ, or that he is paid less money because he has no family. It is the same with the farmer as with the owner of the factory. Each wants children to grow up and learn the business, and each pays them what they earn. One word for another of Mr. Stanhope's witnesses. "This witness said her husband's master was a very good man, but she added, 'farm chaps work so hard that they might as soon be transports.' They don't like being 'drove about as they are at farmwork; they don't know what sort of work they may be put to. It's slavish work, and I've heard many of the people say they would go away if they could. One of my sons is gone to America; and there's our Jim, he says he'd be away too if it wasn't for his bad leg.' They like to be good scholars, because it helps them to go away."

Farm labourers might as well be transports! Alas! what has been the use of all the improvements? They seldom thresh; few of them like to mow. Ask one labourer of the present day if he works half as hard as his father did? And yet they say they are worse than transports. It is very few of them that will say so. I have mingled much with them, and a more happy, contented and robust class I have never met with. I hope the Dorset labourer, however, will improve in his social position. Every farmer wishes his men to be comfortable and contented. He knows well that unless his cattle are well housed and well fed he cannot expect to receive any profit from them. How much more important, then, is it that those men who toil for him should be well fed and well housed, in order that they might be enabled to do a fair day's work for a fair day's pay! I will say no more on this subject, but leave you to say if in comforts and salary the Dorset labourer has kept pace with the advancement of agriculture.

Discussion.

Mr. Parmiter, of Melplaish Court, expressed his conviction that Mr. Stanhope had overdrawn and misrepresented the case with regard to the condition of the Dorset agricultural labourer. The cottage accommodation particularly was, he thought, not so bad as represented. Speaking of his own experience, Mr. Parmiter said that occasionally the wives of his men worked on his farm, but there was no compulsion in the matter—they did it for their own advantage. Regarding butcher's meat, he wished his men to kill two pigs every year, and he believed he had not a man on his farm that did not do so. If they liked to sell the meat they might do so, or they might exchange it for mutton or beef. He considered that several statements in Mr. Stanhope's report were erroneous.

Mr. Cox then proceeded to speak of education. It has been said by Pope, "A little learning is a dangerous thing," but "A farthing rushlight is better than no light at all." I say let every child receive a little light, a sufficient education to enable him to read, write, and keep accounts, and the time is not far distant when every agricultural labourer will feel it his duty to educate his children. The rapid advances which have been made in education within the past few years convince me that without State interference at all the poor people of England, at least the agricultural poor, will be able to write and read, as well as understand accounts. Twenty years ago the schools in our locality were very few in comparison with what they are now. In fact there is scarcely a village around here which has not a good school, under, for the most part, certificated teachers. For my own part, however, I would have no objection to a law which should inflict a penalty on every man who employed a child under nine years of age, or even who employs one at that age who could not write, read, and understand thoroughly the simple rules of arithmetic, unless he provided that he should be given sufficient time to devote 260 hours during a year, exclusive of Sundays, to education. This would give two hours a-day for five days weekly during six months, which could be given without interfering with work. I believe every farmer in England would be delighted to aid in getting the working classes educated, but he would repudiate State interference as another step in the direction of centralisation to which English legislators are gradually drawing.

In speaking of those who are engaged in agriculture I have confined my observation to boys, but I think that the necessity of educating girls is still greater than boys, and this leads me to consider next—What should be the kind of education? A great part of the distress of the labouring class rests with themselves. I have before mentioned the squalid huts in which some live, but the distress of that hovel is increased too often by the ignorance of the wife of any domestic economy. Now it is all very well to talk of instructing girls in reading, writing, and arithmetic, but they want to know something far more important to them than these. Is there a farmer in our land who does not know that many a poor labourer who earns good wages is often in rags and discomfort through a lack of tidiness at home? Some men who earn less wages than these untidy fellows are always tidy, have comforts which the other men cannot obtain, and this through the wife of one having no knowledge of domestic economy and the other having some knowledge. Daughters of agricultural labourers must not be taught a lot of fancy needlework and similar useless follies, but let them know above everything how to make every article of wearing apparel for themselves and the men and boys. Years ago the women knitted stockings for their husbands and children, which were worth half-a-dozen pairs of what we now purchase. But we are advancing in civilisation now, and such things cannot be done. I feel certain, however, you can never begin too young in reason to make girls know every domestic duty. Their education must be industrial, and they should above all be taught that it is to the advantage of labourers to vary their diet, that cheap and nutritious things can be provided by economy which are preferable to a constant use of bread and Potatos. By all means I say let girls read, but let them also know what is good and useful for them in the sphere of life in which they are placed. And one thing I say is essential in the education of both sexes, and that is a religious training. I wish not to confine that training to the simple tenets of one particular creed, but I say that no education can be good in which the duty to God and man is not taught, and no more simple language can be found than in the Ten Commandments and the simple words in our own Church Catechism, which conclude by saying we must do our duty in that state of life to which it shall please God to call us. Again, the education of labourers should be industrial, and it should be continued until they have attained a higher age than ten or even twelve years; but that can be done without for one moment interfering with their work on the farm. From September until March their time is never occupied on the farm, or rather, should never be occupied, after six in the evening—during the months of December and January not after four. Their work during the whole winter months is light, and the time they could devote to an evening school is quite sufficient to give them a fair education indeed. I say no moderate-sized parish ought to be without these schools, and it is a disgrace to our country that for so long a time our labouring poor have been in such intellectual darkness. At the meeting of the Chamber of Agriculture in Hampshire I see that a gentleman recommended that labourers' children should be instructed in reading, writing, arithmetic, and grammar. I see no objection to this course, although I have certainly a vague idea that something of far more importance than grammar can be taught our future shepherds, carters, and machinists. Remember, your farm labourers will now have to be in constant use of the most intricate machinery, requiring great care and skill, and surely a knowledge of mechanics and the component parts of the various machines would be far more important to them than grammar itself. The various parts of a steam-engine would soon be known—the revolutions per minute which the beating cylinder of a threshing-machine could be made to perform with different sized wheels, and so many things in connection with the machinery on a farm could be more easily taught these boys than even the simple grammar of our language. Of course our educators in the village schools are now selected for their knowledge of other subjects than the one I have just named, and I will say from what I have witnessed of the teaching in the parochial schools of West Dorset that a more energetic class of masters can rarely be found, and, although probably they know little of the mechanical subjects I have named, yet with proper diagrams and explanations they would soon become proficient, and prove still more able assistants to the agriculturists in their judicious training of their working boys. Another subject, which particularly shepherds

and carters should understand, is animal physiology, but that is rather too intricate for us to think will be taught labourers' children in our day. I sincerely hope that all classes of the community will, however, see the necessity which exists for education, and will, by at once adopting such means as are within their reach, commence the good work; but let there be no useless bickerings about religion. In merely introducing this subject, I have laid aside voluminous writings on it, and have given my own unvarnished idea of the present condition of the Dorset labourer, and the necessity for increased education. I know the objections too often raised by persons who say—if you make them know too much they will not work on the farm. I believe those persons, but I will ask them—When will they know too much? You cannot educate these persons too highly in their business. Will they be less able hedgers or drainers because they can use a pen? Will the sheepfold be less quickly placed, or the horses cared for less because the shepherd and carter can do a proportion sum? There is one thing, however, about which I have my doubts. Education is to abolish crime, empty our gaols, and materially lessen our poor-rates. I have no doubt that a religious and moral teaching will do something in this direction; but, whilst we find some of the greatest in the land, some of the most highly educated, guilty of some of the most abominable offences, we can hardly expect to arrive at an elysium by educating the masses. There are various causes of crime besides ignorance. Evil examples, drunkenness, laziness, and a host of other things, foster crime; and education may do something to stay its progress, but we shall be deceived if we think to have a very material change. There is one thing which I consider an important part of the education of children—I mean their recreation. And, whilst these young folks are for ever following their monotonous duties at the farm and in school, it is a duty you owe them to see they have proper time for recreation, to strengthen the mind and to refresh and invigorate their bodies. Even to the adult labourer recreation is necessary, and it is a source of much pleasure to me to find that readings and entertainments for the labourers during the long winter evenings are now becoming so prevalent. If you can induce your adult labourers to take an interest in matters of a literary character they will feel less inclined to waste their time at the ale-house, and will be more anxious that their children should become well instructed. Harvest homes, holidays judiciously given, are actually of no loss to the farmer, and afford a real pleasure and benefit to the labourer, and I believe if farmers in Dorset would promise a day's recreation between the hay and corn harvests to all who would not attend the hiring fair at Dorchester, few would ever go there.

ON EXHAUSTION BY OVER-STIMULATION.

[Mr. D. T. Fish sends us the following remarks on a paper relating to this subject lately read before the Cumberland Farmers' Club.]

Mr. Ross treats of a subject of absorbing interest and great practical importance. He touches, as it were, the very mainsprings of life. A common principle is held to run through animal and plant life alike. What over-exertion is to the one, Mr. Ross holds, over-stimulation is to the other; both alike end in weakness and exhaustion.

This identity or resemblance between the two forms of life may, however, be fairly called in question. Neither has Mr. Ross put the matter very plainly in his introduction. The problem is not, "Has Nature set limits to the production of animal and vegetable life?" but has she set bounds in regard to size, and made size, not the gauge of strength but the measure of weakness? Is the vital energy, the reproductive stamina of plants, in the inverse ratio of their mass?

It will be better to leave out all collateral issues, such as the relative feeding value of large cereals or fruit, of large, medium, and small roots, and also their different keeping powers, and confine our attention wholly to this one point of size in its relation to strength. Assuming that weight and bulk are most desirable in themselves, let us inquire what loss, if any, we sustain in fostering such qualities in the shape of debilitated strength or impaired vitality. Can any one prove that a big Turnip has less vital force in it than a little one? or does its mere size cause any vital function to be discharged with decreased energy? The big root dives deeper down, and spreads wider abroad through the earth, than the smaller one. The broad leaf absorbs more light and heat, drinks more water, sifts more air, and transforms more food into Turnip, than a narrow one; and the thick stem pumps up more fluid, and conveys more suitable *pabulum* to the plant, than the puny one. All the collecting, transporting, and transforming forces of plants work with an energy and power proportioned to their size, and therefore it follows that, other conditions being the same, the vital force of plants will be strongest in the largest.

Possibly to this extent Mr. Ross will agree with me. He nowhere directly says that the development of size weakens vital action. But he affirms that it paralyses the reproductive powers. The plant itself may be strong, but its progeny will be weak. Mr. Ross observes in his paper that there is grass and grass, I add here that there is size and size. There is gross fat in vegetable as in animal life, and there is healthy growth. I have nothing to say in favour of fatty degeneration in either kingdom, but I believe in healthy development. The heavier our root crops and cereals can be grown the more men and bullocks they will feed, and the fuller the hungry stomachs of both sorts can be filled the better. Mr. Ross seemed to forget that the major portion of crops are grown for food and not for seed. Hence, if size be inimical to seed-bearing, it might still be wise and profitable to foster it. It matters not to the bullock whether the fine roots that fill its stomach would have produced good seed or not. There seems no reason in the nature of things why it should not also produce good seed; still it would be a waste of good food to devote it to that purpose. However good the seed, the old root would be converted into a mass of rottenness. The same fate, however, awaits small roots devoted to seed-bearing. The young seed is born of the old plant's death; but with small roots there is less waste of food, and more seed can be reaped of a given space. For these reasons it is profitable and prudent to employ small medium sized roots for seed-bearing. Those who understand the matter best mostly proceed thus: They first select the finest samples for stock, they then sow the stock of seed late and thick to procure quantity. These small roots of the second remove yield the best and heaviest return of seed. Seed growing and harvesting is, however, a special business, by no means understood by the majority of farmers. And it is wiser in most cases to buy than to save their own seed. If, as Mr. Ross confessed, the seed from the large roots was gathered in an unripe state, of course much of it would refuse to germinate, and the crop raised therefrom would be blanky, as he describes it at p. 474, 1869. The same thing would have happened to such seed, though the produce of smaller roots. Mr. Ross says, no; the big roots are like a post horse, warranted to do 20 miles a day, but forced to run 60 miles. To save seed from them is like urging the same horse to do 60 more miles the next day. It cannot do it, because two days' strength have been overdrawn on the previous day.

So it is with large roots. Over-stimulation has whipped all their latent stamina down bulbwards, and there is not power enough left to run vigorously and successfully seedwards. Such is a fair statement, I think, of Mr. Ross's argument. Its soundness, however, is open to grave doubts. No analogy, for instance, can be instituted between the repletion of a root by over-stimulation, and the depletion of an animal by excessive exertion. The comparison is bad in other respects. The parallel would lie, not between the over-fed root and the exhausted horse, but between the seed of the former and the foal of the latter. This matter is much more complicated than it seems. And, while admitting that exhaustion or repletion might tell upon strength of progeny in both cases, it would be no easy matter to assess its value in either. A much more apposite analogy could be drawn between over-fed stock and over-stimulated plants. The wise breeder and seed grower shuns extremes, and finds his success and his reward in a medium course. But to the mere producer of corn and beef, weight, bulk, and quality are the primary objects. The problem given to farmers to solve is, how to grow most of these in the shortest time at the least cost. To accomplish this a forcing regimen is needful, and this may be freely employed without fear of endangering health or enfeebling life.

As to the Potato, I am quite sceptical about its general ailments and the special disease being the result of over-forcing. This theory rests upon no sounder basis than the electrical ones, so well disposed of by Mr. Ross. Neither am I disposed to admit that the succession of attacks on the Potato, enumerated by Mr. Ross, viz., the blind eyes, curl, dry and wet rots, exerted a cumulative debilitating effect—preparing the way for the present deluge of disease. Each of these are still to be found in different localities, but seldom or ever associated with the disease specially so called. Potatos are likewise as healthy and strong as they ever were. Nothing can exceed the robust vigour of many of Paterson's splendid varieties, but no robustness and strength of youth can resist the subtle force of the disease; it sets starving or feeding culture alike at defiance—it sweeps through the deepest valley or climbs over the steepest hills with equal ease, and leaves in the one and upon the other the same footprints of rottenness and death. Mr. Ross's experience must be limited indeed, if he has only seen the deluge of disease in the valleys; it is no respecter of places, soils, or treatment. And yet in apparent contradiction to all this, though with equal truth, it may be said that the caprice of this disease is as marvellous as its subtlety. Of two fields on the same soil, with the same treatment, of the same variety, one shall be taken and the other left. I have seen this again and again, and these and other singular facts in reference to the deluge have led me to look upon this terrible scourge at last as an incurable plague and inscrutable mystery that no man can either stay or fathom. It was not caused by over-stimulation, neither can it be cured by semi-starvation. No cultivator has succeeded in producing the disease, neither can any arrest its progress when it comes. The only remedy is to snatch the Potatos from the ground, when the disease makes its first black dot on the leaf, as we would snatch a brand from the fire.

It would unduly extend these remarks to follow Mr. Ross through the cereals. It is, however, a serious matter if our grain has deteriorated in weight from 5 to 6 lb. per bushel. I trust, however, this may be found to be a mistake. Statistics would prove whether the loss of weight, if any, might not be made up by the gain in bulk. If it be so, means must be devised to reach and exceed the old maximum weight. There seems no good reason in the nature of things why strength of straw should result in weakness of ear or smallness of kernel. The probabilities are all the other way. The strength of the entire plant should be concentrated into its most valuable properties. The power of the root crop should be packed up in its roots, of the cereals in the ears and the grain. Doubtless, at times it is otherwise. There is a danger of growing straw apparently at the expense of the ear. Most farmers know how to guard against it. Mr. Ross, however, seems rather to change his ground here. He does not say—no one at the meeting said—that the heavy grain of one year produced a light crop the next. And yet this would be the logical sequence from the twin assertion that the finest roots produced the worst seed, or that such seed refused to germinate or grew a weakly crop. Both roots and cereals have of late years been marvellously improved by selection, but selection has hitherto been exercised on the simple principle of selecting the best. It has been believed that like will produce its like. As a rule this has been verified by experience. Occasionally, however, and exceptionally, like produces its unlike. Mr. Ross seems disposed to exalt the exception into the rule. If it be true that large roots produce worthless seeds, the obverse must likewise be true, that small roots will yield the best. Therefore, if you want monster Mangels or Turnips, save seed from the smallest roots, for if strength cannot generate strength let us try weakness; and if weakness in this case becomes the parent of strength, why not in others? Let us choose small animals as the parents of our prize stock, and demonstrate thus that there is at least one new thing under the sun.

Home Correspondence.

Oat Growing in Wales: Reclamation of Hill Land 1200 Feet above the Sea.—Herewith I send you a sample of Oats grown this year (1870) upon newly reclaimed land in Radnorshire, at an elevation of nearly 1200 feet above the sea. It is of good fair quality, but not quite equal to last year. Little more than two years ago this land was growing nothing but very coarse grass mixed with Heather. It was not very wet, neither was it dry enough to cultivate without drainage, so it was drained with tiles 3 feet deep, and 7 yards apart. The upper surface of the land was peat 3 to 6 inches thick, then from 24 to 30 inches of clay, and below that a very hard subsoil of broken stone bedded into clay as hard and firm as an ordinary Macadamised road. The land after being drained was pared and burnt, and last year it was sown broadcast with Turnips, without any manure except the ashes. Owing, however, to the dry season, and the late period at which the seed was sown, a very poor crop of Turnips came, in some places none and in others a very few, so that the average crop was not than 4 tons to the acre, say one-sixth of an ordinary crop. This year the land got about 3 tons of lime to the acre, and was sown with Oats (Canadian Poland), the seed used having been grown last year on the same farm in the adjoining field, and also upon newly reclaimed land. I had a part of the land accurately measured off when the crop was cut, and the produce kept separate and then threshed. We had no bushel to measure the corn with, as our Oats are usually all consumed on the farm, and when sold are sold by weight. I therefore had to weigh the threshed Oats instead of measuring them, and the produce showed that the acre produced 2010 lb. of clean Oats and 85 lb. of tailings. If we allow 40 lb. to represent a bushel, then the produce was $2010 \div 40 = 50\frac{1}{4}$ bush. of clean Oats and $85 \div 40 = 2\frac{1}{8}$ bush. of tailings, making $74\frac{3}{8}$ bush. altogether from the acre. At page 1041 Mr. Smith, of Woolston, (apparently after a personal visit to the spot), says "'G. A. H.' has been carrying out in Wales a reclamation of some unsubdued mountain land 1000 feet above the level of the sea, on which he has succeeded in growing some straw, but not corn, for the Oats will not come to maturity." It is rather fatal to Mr. Smith's pretensions to be considered a good judge of farming matters that he should, in a letter dated July 16, appearing in your Paper of July 30, have expressed this opinion. If Oats will not come to maturity in South Wales on land 1000 feet above the sea, it is rather singular that I should last year have grown a crop of Oats on newly reclaimed land upwards of 1100 feet above the sea, and that from the seed so raised I should this year have grown another crop of Oats on still higher land (nearly 1200 feet), and should have obtained nearly 75 bush. of Oats from the acre. The seed was grown last year 1100 feet above the sea, and, of course, was "immature," for hath not the Woolston oracle spoken, and did not that celebrated agricultural authority declare that Oats in such a position will not come to maturity? From whence then come my 75 bush. to the acre? If "immature seed" will produce 75 bush. to the acre, how many bushels may we not expect from "mature" Oats grown at Woolston? *G. A. H.*

P.S.—Before the crop was cut, I picked several heads and counted the grains, and there were from 65 to 75 grains in each head, but the crop was very thick on the ground, too thick if the season had been wet. It

is a very old calculation to reckon 1 bush. of corn to the acre for each grain in the head as growing, if the straw be an average thickness on the ground. [We have received as good a sample as any one could wish to see, with, however, occasional greenish grain among it, and fairly described as "of good, fair quality, but not quite equal to last year."]

How to Meet a Critic.—It has been my fate to make certain people angry, by draining the wet lands, removing some miles of useless fences, deepening the cultivation, increasing the manure and the crops, erecting new buildings, and enlarging the demand for labour and increasing the food of the people. All this is provoking enough, but to talk, or write, and tell the public about it is the great source of offence to those who can only suppose that my object was self-laudation, and that I could not possibly have at heart the welfare of agriculture and of my country. I have long since given up all hope of convincing those who are determined not to be convinced, and shall therefore permit numerous and gross mis-statements to find their true level. There are people still living who remember the agricultural condition of this neighbourhood, and this farm, in 1841, when I purchased it at £23 per acre (five-sixths freehold). This price, and their observations, will not substantiate the mis-statements that this farm was a rich and productive one before it came into my hands. I never said or wrote that it was uncultivated when I bought it, with the exception of some 2 or 3 acres of bog now dry, and some waste outside pieces. The "lady" does not seem very grateful for my support of her poultry question. The extent of my purchase of male birds is two at one guinea each, once in two years. I wish I could make everybody happy and unenvious, but it is beyond my powers. There is, however, one comfort—truth will always, in the long run, prevail—as falsehood must fail. A clear conscience is a great blessing, at all events to *J. J. Mechi.*

The Harvest and the Crops: Mr. Sanderson's Report.—Not many farmers see the *Times* newspaper, and it is therefore considerate on the part of the *Agricultural Gazette* to copy such letters as Mr. Sanderson's into these columns—it gives country residents an equal chance of enlightenment with those of the city, while at the same time it takes the game from the wood, and places it fairly in the open, so that captious farming sportsmen may take a "puff" at it if they please. I have said few farmers see the *Times*, and it has been remarked that none write in that paper, because it is not one which represents them, or values their opinions or interests; it is only certain gentlemen, who are "too clever by half" for farmers, or who perhaps profess to be half-farmer and half something else, who favour the readers of that print with a display of their exclusive knowledge on matters rural; and, therefore, as I said before, we are indebted to the Editor of the *Agricultural Gazette* for placing Mr. Sanderson's letter before us. At the same time, it is fair to others to say that his statement as regards the crops is at variance in some important particulars with those of the *Agricultural Gazette's* correspondents, but let that pass for the present. Mr. Sanderson says:—"The grazier has suffered most severely. The light land farmer and grazier will suffer heavy losses. Wheat is under an average crop. Barley is 20 per cent. under an average. I walked through some fields which will not yield 2 qr. per acre. Oats are a very short crop, 15 per cent. under an average. In many parts of the country the Potato crop is inferior. The Bean crop is shocking bad, the stems are not a foot long. Hay has well-nigh been a total failure. In no year since 1818 have pastures yielded so little feed. The year 1870 will prove very disastrous to the grazier." And after this doleful array of losses, present and in prospect, what says Mr. Sanderson? "To the British farmer there is much in the present season that is cheering!"—the "cheering" part of the business consisting principally, he goes on to say, in the circumstance that "beef and mutton command high prices." But why are the prices high? Is it not because the feeder's pastures are burned up, and he cannot keep one animal where in ordinary years he kept three? *P., August* 24.

Crops about Maldon, Essex.—We beg to lay before you our report of the crops in this district. The year 1870 has been an extraordinary one in a meteorological point of view, having been characterised by heat and continued drought, following upon a somewhat prolonged winter, the chief feature of which,—very high winds from N. and E., which being coupled with a low temperature, were most trying to all vegetation. The rainfall in this district for nine months is 50 per cent. below the average. Wheat on good heavy soils: Plant good, straw short; yield very good, but less than 1869; quality and condition fine; weight 62 to 65 lb. per bush. On mixed and loamy soil: Plant fair, straw short; yield nearly an average, quality and condition good; weight 62 to 65 lb. per bush. On light and gravelly soils: Plant poor, having suffered from wireworm, spring wind, frost, and drought; straw very short; yield very poor, 25 per cent. below average; quality various, rather smutty; condition good. Barley on heavy soils: Good plant, straw generally short; yield likely to be below an average, quality good; colour yellow; well harvested. On mixed and loamy soils: Good plant, straw short; yield below an average. On light and gravelly soils: Plant poor, straw very short; yield must be bad, as much never got into ear, quality unfit for malting. Oats: The same remarks apply to this grain. Winter-sown Beans: A bad plant, yield and quality very poor. Spring-sown promise a better yield, but the crop generally is estimated at 25 per cent below an average. Straw very short. Peas: Small breadth, quality and yield good. Roots: Mangel planted well and on good soils, will yield a heavy crop: on lighter land they have suffered from drought. Turnips and Kohl Rabi: It has been impossible to get a plant of these owing to the ravages of fly, and may be said to be an utter failure. Hay: One-fourth of a crop. A good proportion of last year's crop left. We estimate that there is not more than the usual quantity of old Wheat remaining. Farmers have not yet delivered new Wheat freely, as lower prices and the uncertainty of the political future keep both buyers and sellers in suspense. *H. T. Eve & Co., Maldon.*

Oats and Oat Plants.—"G. A. H." tells you that I jumped at conclusions about his ten ripe heads; I tell him plainly that I did not, for I have his handwriting to prove it. I have looked at his writing again; there is the "ten," then a division, then comes "ripe." As to what he meant to write, if he did mean to write "unripe" that is nothing to me. The height of the maturity of his Oats appears to be the height of sheep keep, and that's about all, for he keeps the "bushels," which I asked him about, in the background. "G. A. H." does not believe that I rubbed 630 Oats from three heads. I tell him that I did, and let him ask Mr. Duncan, of Bradwell, who grew the Oats (and who is also a magistrate), and Mr. Bignell, of Loughton, whose land adjoins the newly reclaimed common, whether they dispute my word. *William Smith, Woolston, Bletchley Station, Bucks, Aug.* 27.

Are "Prize Farms" a Good or an Evil?—It would be interesting and profitable to hear what your notable correspondents, Mr. Smith and "G. A. H.," have to say on this point. As it will afford them new ground for disputation, they cannot do better, perhaps, than comply with this suggestion. On the first intelligence of Mr. Mason's promised liberality, my own impression was that the hundred guinea cup might as well be thrown into the Thames, in so far as the then forthcoming competition, in connection with the Oxford show, would serve to promote the interests of agriculture. And, though I did not apprehend that the Royal Agricultural Society of England would vote a second prize of £50 so handsomely as they did, now that we are furnished with an account of the 1st and 2d prize farms, in which the most prominent features in their management are set before us, my first impressions are rather strengthened than removed. It is true that the judges' report has not yet appeared, but, from the information which has been already given us of these farms, it is plain that the competition which has recently taken place will never serve the purpose for which it must surely have been intended. Farming is too intricate a subject to be judged of in comparison as a whole. We may not compare land and its management as we would the composition, finish, and efficiency of ironclad ships or of needle-guns. In the latter case, given the same quantity and quality of material, and with equal skill and provision equal results will be produced. But, while different forms of farm management may be contrasted, the farms themselves may admit of no comparison whatever. The soils may be classed as light and heavy land; but, as the composition of one soil differs from another, similar results, with equally skilful management, can seldom or never be obtained. Mr. Keary and his associates will have done their duty well if they leave the competitors in unanimity with each other, and the report of the "prize farms" will be equally successful if it gives the public a clear understanding of the grounds on which they have arrived at a decision. Meantime, I look for nothing more from this movement; and fail entirely to discover how it is fitted to elicit useful facts, to lead to greater knowledge in general or special branches of farm practice, or to promote the best interests of agriculture in any way whatever. *Anti-Humbug.*

A Correspondence on Harvest Work.—

"1. *To Mr. Mechi.* I have enclosed a paragraph out of the *West Sussex Express*, stating that an acre of Wheat cost you for cutting, binding, stooking, and carting, 9*s.* 6*d.* per 12 pecks, 2 bush. Now, being a grower of 240 acres of corn yearly, I find that the expense of cutting Wheat is from 14*s.* to 16*s.*, and Oats, 12*s.* to 14*s.* per acre, under our present system; and from this I have concluded that your corn must have been machine cut. Will you kindly state the cost of each item, of cutting, binding, stooking, and carting? In comparing the cost per acre, I find yours is done for 9*s.* 6*d.*, and my own is something like £1 per acre, and in some instances much more. I should feel particularly obliged if you would kindly explain the matter, as I have asked many persons who have used the reaper, and never had a proper and practical explanation as to cost yet. ——, *near Bognor, Sussex.*

"2. *To Mr.* ——, *near Bognor.*—The statement you quote is correct. I provided the reaper and the horses, the men had to pay the driver, and also had to bind, stook, cart, and stack, at 7*s.* 6*d.* per acre. The horses and machine I reckon at 2*s.* per acre. Three horses will cut about 7 or 8 acres per day. Such part as was not cut by machine, but by the men, was paid for as follows:—Wheat: mowing, 5*s.* per acre; binding and stooking, 3*s.* per acre; carting and stacking, 3*s.* 6*d.* per acre. A man will mow an acre of strong Wheat per day. Oats: a heavy crop of 10 to 11 qr. per acre; price about the same as the Wheat. Barley: something less, the crop being light. We cut all we can with the machine, as it forwards harvest, and renders unnecessary the employment of strangers. The standing crops of this year were favourable to the use of the reaping machines. We use Hannam's harvest carts, long, broad, and low; one horse, and a boy to drive. The farm is open, and not now encumbered with trees and fences. Some farmers are penny wise and pound foolish in the matter of harvesting. In order to get it done cheaper, or to prolong it over a month is a great mistake. The Barley heads are thus allowed to break off, the Beans to shell out, and other corn to be blown out by the winds. Our harvest was completed, Beans and all, by August 19, and during harvest we threshed and carted to market 140 qr. of Wheat. As soon as corn is fit it should be at once, if possible, secured. A saving of 2*s.* to 3*s.* per acre in labour is as nothing when compared with the risk of loss by bad weather or other causes. A reaping-machine pays the farmer even if he does not use it. It renders him independent of his labourers at a critical and sometimes imposing period. *J. Mechi, Aug.* 26.

Leases and Agreements.—Mr. Scott, of Mark Lane, is a little unreasonable. He says I object to leases, and yet I propose to let my land on lease. I beg to assure him I have never objected to leases in a money point of view. On the contrary, I am satisfied that a lease system, if adopted in England, will raise the rent of land a great deal faster than anything else. If Mr. Scott will refer to p. 777 he will find in an article written by me these words:—"If the farmers of England desire to be thoroughly independent, and to have full security for every penny they expend, let them do what their brethren in Scotland did two generations ago—let them take leases. A lease is the best security a tenant can have, and it is in the end far better for the landlord's pocket and for peace and goodwill." I do not think language could be plainer, and why Mr. Scott should put me down as an opponent of leases I cannot see. Mr. Scott fails to convince me of my having made a mistake in writing about tenant-right. Where did Mr. Scott learn that "lime takes ten years to repay its cost?" My experience of lime upon the land which I have is, that it repays the cost the very first year, and leaves a profit the second, and yet I have to draw my lime 10 miles. If Mr. Scott means that it is 10 years before land forgets the dose of lime I quite agree with him, and I even go further, I do not think it ever fogets it. Mr. Scott finds fault with me for requiring a tenant to bring 120 tons of lime on to a certain farm every year, and asks why a tenant should bind himself to expend £100 a-year in lime during the last eight years of the lease? My answer is, because I want my land left in good heart and good cultivation, and I think it no more unreasonable to ask a tenant to spend £100 a-year in lime during during the last eight years of a lease, than it is unreasonable to ask him to pay me rent during the last eight years of the lease. If I gave my land to a tenant without some stipulation as to manuring, I might get it back at the end of the lease something like a sucked orange. I have a good many tenants at will, and with two exceptions all are under agreement to draw certain quantities of lime and superphosphate. *G. A. H.*

The Rainfall of 1870.—The success of root crops and of spring-sown grain and other crops is materially governed by the amount of rainfall during the four months—April, May, June, and July. Indeed a comparison of the fall during these months is much more important than that of the year's average, which has generally engaged attention, for in some years the annual fall may be considerably under the average, and yet we have had the usual rain during these important months. We may consider 2 inches as about the average fall for the months in question; or, to speak more correctly, 8 inches is the average of these four months during the last 30 years. In the course of these years we have had several wet summers—that of 1860 being considered the wettest—the four months having a fall of 12 inches—whilst in 1843, 1862, and 1867, it somewhat exceeded 10 inches. In contrast with this, during the years 1842, 1847, and 1864, it was somewhat less than 5 inches, and in the year 1844 it was 3.16, and more than one-half of this fell in the month of July. During the present year the rainfall of the four months in the neighbourhood of the writer has scarcely exceeded 2½ inches, being considerably the least during the last 30 years, it being less than one-third the average of the last 30 years. If we limit our observations to three months, excluding July, we find that in the year 1844 there was less rain, and we find also there are two instances, but in separate years, of there being less rain in the months of June and July severally, but there is no instance on record during these years of there being so little rain in these two months, taken together. Such, then, are the peculiarities of this most remarkable season, and amongst its disastrous results none is so striking as the almost total loss of the hay crop and the scarcity of pasturage. This is even more so than in the year 1844, to which I have just referred, and the only way to explain the difference is that in the last-mentioned year the rain during the two preceding months was greater than in the present year. I cannot dismiss the subject without calling attention to the rubbish, for it is little better, that has appeared in several papers

written by the opponents of drainage, and the advocates of wide hedgerows and hedgerow timber, who do not hesitate to advance the monstrous proposition that the doing away with the latter and the introduction of the former are really the causes of the drought. Why, if suitable land is deeply and properly drained the effect is to enable the land to absorb and retain more moisture than before, instead of allowing the winter's rain to run off the surface entirely—to assimilate it indeed to good deep land, the best test for the richness of which is its capability of retaining moisture. Then with regard to the curse of good farming, hedgerows and hedgerow timber, putting aside the weeds, rabbits, and other vermin protected by these, how is it that the crops are always so much worse near hedgerow timber, however highly manured the land may be? but because the trees rob the land of its moisture, and the nourishment it conveys as well as the air of its carbonic acid or aërial food. The shade of trees is very grateful to cattle no doubt, and a fair proportion is no disparagement to pasture land, but if very numerous the pasturage is robbed of its food and its moisture, and is rendered less abundant and less valuable. Trees may attract moisture but they drink up all the moisture they attract; and as to their increasing the rainfall, we must not be oblivious to the fact that the largest amount of rain falls on localities too lofty for trees to vegetate. With regard to the advantage of retaining our bogs and swamps, with all the malaria thereby engendered, in order to assist evaporation in the summer, such arguments are worthy of the times

"When wild in woods the naked savage ran,"

but quite out of place at the present day. The moral taught by the late drought should be, that we should pay more attention to irrigation and the utilisation of our rivers and streams, and the preservation and retention of our winter's rain, but not that we should encourage hedgerow timber and swamps and bogs, for the propagation of toads and frogs, and the gratification of such croakers as have lately appeared in print. *W. C. Spooner.*

Tiptree Farm Progess.—Finished harvest on the 19th, including Beans; fields horse-raked. We threshed, sold and delivered 140 qr. of Wheat. Have still a well filled stackyard, and the great barn full. Twenty-five years ago I was told by some of my practical friends that I should never grow enough to fill my great new barn. Yield of Wheat not so good by 3 sacks per acre as in 1868, when I grew 8 qr. and 7 qr. per acre of white Wheat on some of my heavy land fields. I therefore conclude that the Wheat crop is by no means so superabundant on the heavy land as in 1868, although it may yield an averge. On the light, hot land it is a melancholy failure. On a neighbouring farm, where a field of 10 acres was steam-ploughed, and the field dressed with 3 cwt. of Odams' manure per acre, the whole field of Wheat was offered in a railway carriage for £20, straw and all. It was at once accepted, "unseen." "You will lose £10," said the seller; and so it proved; for there were only 5 qr. of Wheat, of a very inferior quality. I know many other instances where, on well farmed but hot soils, the crop is sadly deficient. My first and best field of white Wheat gave 6 qr. 2 bush. per acre, and sold for 59s. per qr.; the second 5 qr. 6 bush. per acre, at 54s. per qr.; the third (Rivett's, after 6 qr. per acre of white Wheat, in 1869), 5 qr. 1 bush. per acre, sold at 46s. per qr. The Wheat yields well according to the straw, and as there are scarcely any laid crops, and the weather has been so suitable for harvesting, the grain is in first-rate condition, quite fit for the miller. This tells against old Wheat. Our Beans are very well podded, the stems and kernels free from blight; straw very short. Black Oats very fine, quite 10 to 11 qr. per acre, and plenty of straw. The land was cool and in good condition. Our land has been sadly too dry, and I fear our young Clover plants dried up. The rain now falling will do much good for the root crops. *J. J. Mechi, Aug. 22.*

Societies.

SCOTTISH METEOROLOGICAL.

At the late half-yearly geneal meeting of this society, Dr. Keith Johnston reported that the Council have now 91 stations. The Council have requested Mr. Buchan to prepare a report on the monthly temperature of the British Islands, and to state to this meeting a few of the results obtained by him. The subject is one which, it is believed, has not been thoroughly investigated by any other society, or, indeed, by any meteorologist except Professor Dové; and Professor Dové's charts, which are now ten years old, were based on observations not only necessarily scanty, but in several cases unavoidably incorrect. The first chart which this Society prepared of the temperature of the British Isles was published in the Society's Journal in January, 1864, and it has been frequently referred to by meteorologists as the only one existing. That chart was constructed on returns obtained during a period of five years; the new chart which Mr. Buchan is now constructing is founded on observations for thirteen years, ending December, 1869. These charts, besides giving the mean temperature of the year for the whole British Islands, give also the mean temperature of each month. The Council anticipate that when these charts are published, with the tables explanatory of them, they will be found to afford valuable aid in the discussion of many important questions of a practical nature.

A New Thermometer.—A new maximum and minimum thermometer, invented by Mr. W. Macdougall, was exhibited and described by him. This instrument consists in an ordinary minimum thermometer. Resting on the spirit is a small column of mercury, between which and the bulb of the thermometer is inserted a small index for the minimum readings. Above the column of mercury is another index for the maximum readings. As the thermometer rises, it pushes forward the upper or maximum index to the greatest degree of elevation of temperature. As it falls it leaves the maximum index, comes in contact with the minimum index, and presses it down to the lowest degree of temperature, acting in the same manner as the ordinary minimum thermometer. There are two scales, one of which reads to the upper end of the mercury column, and gives the maximum readings; the other reads to the lower end of the mercury column, and gives the minimum readings. This instrument is a slight modification of Sixe's self-registering thermometer.

On the motion of the Chairman, votes of thanks were awarded to Mr. Stevenson and Mr. Macdougall.

Monthly Temperature of the British Isles.—Mr. Buchan, the secretary, said the investigations that had been made into this subject, the result of which was shown by the coloured maps on the walls, were perhaps the most important that this Society had undertaken since its establishment. An early attempt had been made seven or eight years ago to partially solve this problem of the temperature of the British Isles. The observations made at that time, however, had two inherent defects, being based only upon the experience of five years, which was much too small a time to give results that could be thoroughly relied upon. They were also defective in so far as some parts of the country were very badly represented. Now, however, they had completed the investigations from observations made during the last thirteen years, and this, he considered, must be a close approximation indeed to the solution of this problem. The number of stations had in the interval increased by four times. The observations were based upon a mean of thirteen years, and 68 Scottish, 54 English, and 11 Irish stations. The prominent points brought out in the results were briefly these. They would see that the series of small maps were coloured red and blue, while others had a wash of China ink. The red lines included all temperatures that ranged from 55° upwards. It had been proved by the returns of the Registrar-General, and by the observations of their own Society, that when the temperature rose to 55° in the spring and summer months, diseases from bowel complaints began to appear; and as it rose to 60°, the deaths very largely increased, until it became an epidemic. The black lines represented temperatures that fell below 45°. When the temperature fell below 45°, throat and lung complaints, and all complaints connected with breathing, began to increase; and when the temperature fell below 40°, these complaints increased so rapidly that the deaths which took place were even more numerous than what was produced by any epidemic. The blue lines represented an intermediate and the healthiest temperature. Here the mean temperature for the whole year was given, and it was one very flattering to Great Britain, for it was wholly shaded with blue, showing that this country possessed one of the healthiest climates in the world. One very marked point, as brought out in the results, was the effect of the mountain system on the temperature during the winter months. When winds crossed the high mountain ridge that was on the west of the British Isles, they deposited their vapour, radiation took place, and the temperature rapidly fell. In the same way, in Ireland, the lower temperatures were found inside, the higher temperatures outside. Another very marked result was the effect of Ireland upon Britain by increasing the summer temperature and lowering the winter temperature opposite to that island. In regard to the influence of the Irish Sea, Mr. Tennant, a member of Council of the Society, who had for a year or two given a good deal of attention to the direction of winds in different parts of the British Isles, stated that a great deal of wind blowing in the Irish Channel was from south and south-west. It was not so much westerly as it was in Scotland and over Ireland, but it flowed to a great extent through the centre of the Channel. Now, on looking at the charts, it would be seen that the effect of this current in the winter months was to push up the isothermal lines over the Irish Sea. Through the whole of the months, the observations all showed the marked effect which that open space of water had upon the temperature of the British Isles, as clearly as the effect which the Irish land had upon the part of Britain opposite. Questions of temperature had a considerable influence upon agriculture. Many agriculturists believed that if the night temperature fell to 40°, there was no growth for 24 hours. If the night temperature fell to 40°, the mean temperature might be expected to be about 46°. Thus, then, by observing the charts for the various months, and taking note of those parts of Britain whose temperatures were less than 46°, one would ascertain the places where, during certain months, there was little growth—a very important question in discussing the crops of the British Islands. The next important temperature for agriculture was that required to ripen our cereals. It had been proved by observations made by persons competing for prizes offered by the President of the Society, that for the purpose in question, with the ordinary range of temperature in Scotland, there must be an average of 56°. If it fell below that, there was a deficiency in the crop; if it rose, the crop was so much the better, provided there were rain and other necessary conditions. Accordingly, with the charts for the different months, one could point to those parts of the British Islands where there was some hazard in rearing cereal crops—the places, namely, where the necessary temperature was scarcely to be expected, or where it occurred so seldom that the risk was considerable. It was generally supposed that the temperature fell 1° for every 300 feet of elevation, so that supposing at the sea level there was a temperature of 58°, at an elevation of 600 feet the temperature would be 56°, or a temperature sufficient to ripen cereals. In reference to this, however, it was interesting to compare the station of Braemar and Deeside with that at Wanlockhead in the Leadhills, which were about the best equipped stations of the Society. It was well known by experience, that on Deeside, Oats could ripen up to about 1500 feet above the sea; but at Wanlockhead, which was only 1300 feet above the sea, Oats were sown only for the straw. Here, then, were very marked differences in the effects of temperature, as shown in the growing crops. Taking the month of June, he found that, deducting a degree for every 300 feet of elevation, he got a mean temperature at Wanlockhead of 54°.9; while at Braemar, applying the same correction, he got a temperature of 56°.8. The cause of the difference between the two places he was not prepared to hazard an opinion upon; but it had an important bearing on the produce of the country. He thought that if this question was a little inquired into at some other stations, they might get some general law for guidance in reference to such matters.

The Chairman was very glad to find that Mr. Buchan had taken up this subject again, because he believed their Society was the first to publish such a map as that now before the meeting, which had been referred to as the only exposition that existed with regard to the isothermals of the British Islands. An opinion prevailed that the Gulf Stream had really not much influence on the climate of Great Britain; but if they looked at the lines of equal temperature for the month of January, and contrasted them with the lines indicating the summer temperature, they would be at no loss to see the influence which the Gulf Stream had on the temperature of the British Islands in winter. If these islands were indebted to the heat of the sun entirely for their climate, the isothermal lines would be coincident with the parallels of latitude. Accordingly in July these lines were very nearly parallel with the lines of latitude—that was to say, that the sun produced an effect in proportion to the distance places were at from him. In January, however, when, being so far from the sun, these islands were dependent on something else for heat, the isothermal lines did not run like the parallels of latitude, but ran almost north and south, indicating that heat producing them must be at right angles to them—must be, in fact, in the far west. Accordingly he found that the farther west one went, the heat was found to increase, in consequence of the source of heat being in that direction. No other cause was known unless it were the Gulf Stream, which heated the air passing over it; so that the temperature of our climate was in winter almost entirely dependent on the Gulf Stream, and little or nothing upon the sun. This also explained that on the east coast of Great Britain the temperature was lower than on the west coast. There was a difference of a couple of degrees in winter, arising no doubt from the cause he had referred to. Mr. Buchan had referred to the sanitary view of the question. Some time ago there was a very interesting lecture delivered by Professor Tyndal, which had been published under the title of "Dust and Disease." In that lecture it was endeavoured to connect a number of the diseases which appeared from time to time in the country with organic matter floating in the atmosphere. The existence of that organic matter in the atmosphere Professor Tyndal had clearly proved. It had been calculated by Dr. Angus Smith that the air of large cities particularly was full of living organic matter, which was sometimes termed "spores." These spores were of course excessively minute, and one of the curious results recently made out was, that the quantity of air breathed by an ordinary person in 10 hours contained no less than 40 millions of them. Sometimes they were beneficial, sometimes detrimental to health; and he should not be surprised if it were discovered, on further investigation, that these organisms might differ according to the temperature of the air in which they existed—that there might be organisms of a certain character in a hot temperature producing certain diseases, and organisms of a different character in a colder temperature producing other diseases. There had been an interesting meteorological remark founded on Professor Tyndal's lecture which he wished to make known. One of the common prognostics of rain in Scotland was, that distant objects appeared very near, and it was considered a sign of good weather when

there was a haze. What was the explanation? De La Rive pointed out that the dust in the atmosphere in moist weather became translucent, on the same principle that a piece of paper put into water became more translucent than before, so that distant objects became more visible than when the dust was dry.

Farmers' Clubs.

NEWBURY.

Condition of the Labourer.—At the last meeting of this Club, the Rev. C. W. EVERETT, Vicar of Woolhampton, read a paper, from which we make the following extracts :—

The Labourer's Home.—The labourer's cottage is too often only his nominal abode, but scarcely his home. After spending his evening at the public-house, he comes there to sleep off the effects of his intemperance ; and with the early dawn returns only half rested to his daily work. He knows but little of his children : and, from the slight experience they have of a father's fostering care, they derive but small advantage. Sometimes, alas ! the mother's example is no better ; her presence at home is unfrequent, and the hungry children cry themselves to sleep, as the only comfort which their untidy, crowded resting-place affords. This, I am thankful to say, is not always the case ; nor so much the case as it was some years ago ; but it ought never to be the case. It is, however, no overstrained picture of what was once very common, and is now not in some places unusual. The labourers' dwellings within my recollection are vastly improved. I remember some in the early years of my ministry that were really not fit for human beings to dwell in. One bedroom was a maximum provision for a family to sleep in, where persons of all ages, and of either sex, were huddled together, sometimes the bedsteads having not only beds on them, but under them, too. Nor had those who occupied these dormitories always the ties of blood relationship to lessen the evils (if, indeed, this can be said) of such close contiguity. Sometimes a place was found for a lodger, and a flimsy curtain across a portion of the room was rather an excess of decency and refinement. That typhus fever should have been very commonly prevalent at the time, and in the places I speak of, you will not be surprised to hear ; nor that the morals of the labouring classes were at a very low ebb.

Whatever may be said of the improvement still required in labourers' cottages, there can be no doubt but that within the last 30 years a great deal has been done, and a great deal is still doing. The great object now is to improve the feelings and habits of the labourers, that they may appreciate and thankfully avail themselves of what has been done for their good. I need scarcely tell you that all care is thrown away, and a decent home provided in vain, when the only use made of increased accommodation is to let out what are considered as extra and spare rooms to strangers, and where the family are satisfied with their old crowded style of occupying one sleeping room.

Relations of the Master.—The farmers have been held answerable for a great deal of the drunkenness and sensuality that prevails amongst the poor, because they do not, it is said, sufficiently provide for the decent lodging of the young lads they employ, and do not keep them enough under control during those evening hours when their services are not required. Now, I believe that masters may do much to improve the moral training of their servants. But to say that they are the sole cause of their turning out ill is, as a rule, neither true nor fair. I believe that some give themselves a great deal of trouble, often in vain, to reclaim those who come under their charge. There are others, no doubt, who are too careless in this particular. But it must be acknowledged that very many of those who come fresh from their homes have been breathing a morally vitiated atmosphere from early childhood. If religion were excluded from our village schools, you would, in too many many cases, find no high sense of duty, no thorough responsibility to God, to which you could appeal with any prospect of being understood, much less of making an impression ; and what is very sad to reflect upon is this, that the lesson taught to the child at school is too often practically untaught at home. With the not very promising material brought together under your roof, it is not to be wondered at that even with the best intentions you often fail of doing the good you would wish ; that you become disheartened, then callous, and at length suffer the torrent of evil to rush on its way unheeded that you fancy you cannot stem ; and yet, if the lower stratum of society is to be regenerated, it is with these young persons that you must begin. By them is a higher tone of morals to be initiated, and in time, I hope, perfected.

Towards effecting this, mere secular education will do but little, whilst a good Christian example will do much. But example will not do everything, and, indeed, will effect nothing if it is immediately counteracted by the evil influence of companions who are perhaps hardened in vice ; and, therefore, I cannot insist too strongly upon what I have heard advocated in this room—the necessity and the advantage of a farmer always requiring a character when he hires a servant. If this were insisted upon, a young man would know that he must behave himself with propriety, or else be thrown out of employ. I think, too, that much influence for good might be exercised over these carter lads by making them feel that they form a part of a well conducted family ; that they are not external to their master's household, but for the time blended with it ; that if they are lodged in the house they are, in fact, as much a part of the family as the domestic servants are ; and that from them the same amount of decorum is required. I may mention, I hope without offence, that where the habit of family prayers prevails, it would be very desirable that these lads should join before retiring to rest. In those cases where they are not taken into the house, a decent and comfortable lodging should be considered a necessary adjunct to the requisite farm buildings ; it should be required by the tenant, and provided by the landlord, and this should be presided over by a thoroughly steady man and his wife, who should be required to enforce rules, an infringement of which will bring punishment, and eventually dismissal. A common reading-room and a place for healthful recreation in parishes, I have on a former occasion mentioned as most desirable, to establish and to keep a sound mind in a sound body.

Faults Treated as Crimes.—I think that one great mistake in the management of the poor, which law and custom have established, is the treating in them those faults as crimes which in their superiors in education are looked upon as mere pardonable breaches of good manners. Thus, the son of a labourer is sent to prison for that breach of discipline which would bring upon the young man at the University some trifling imposition, or perhaps only a reprimand from the tribunal to which he is amenable. I have taken the two extreme ends of the social scale, to show you that the same remedy which is found effectual in the one case might, I believe, be applied with equal success in the other. I would introduce into our country villages something of the proctorial authority—a court that should take notice of moral delinquencies, and treat them as such. It seems hard to send a young man of the labouring class to prison for an offence which, if committed by his betters, would be termed a lark ; and harder still, that a mark should be affixed to his name, which will stick to him through life, and which may be brought against him to invalidate his testimony, even should he, on some future occasion (perhaps a reformed and respectable character), appear simply as a witness in a court of justice. A prison is, and should be, a place of punishment, but it is not often, I fear, a place that leads to reformation. When a young man is sent there for a trifling offence, he is quite as likely to come out hardened and careless about his future character as he is to come out a better man. I believe that by a somewhat different course there would be more probability of reclaiming him. The tribunal that I would propose, before which I would in the first instance bring breaches of morality and good manners—cases which are an annoyance to the peaceable and disgraceful to the perpetrators of them, but which have nothing strictly criminal in them—might, I think, be composed of the clergymen and churchwardens of the parish. They should have power to admonish, and to fine to a limited amount, proportionate to the nature of the offence ; and if this fails of effect, or the fine is not paid, the case must then go, as at present, to the bench of magistrates. But I believe that in a majority of cases the course that I have ventured to recommend would be effectual. I am aware that the composition of my tribunal may, by many, in these days, be objected to. I answer, let such recommend a better. I may add, that I would have no costs (beyond the fine inflicted), no fees, no counsel employed in these village courts ; the attendance of the offender should be voluntary. If he prefers going to the petty sessions, let him go.

Marriage.—But when I speak of the desire of a young man to settle respectably, we must not forget that, according to the original law of Nature, "it is not good for man to be alone," he will have to seek out a helpmeet for himself ; and that on the training, the discretion, the good sense, and the piety of the partner he may choose will mainly depend whether his cottage becomes his home, or whether he is driven from family comforts to seek for society and excitement at the public-house. If the overcrowding of former days has been detrimental to the character of our male population, how much more has it been so to that of the female. With a greater share of naturally implanted delicacy of feeling, when that delicacy becomes by circumstances blunted, and at length subdued, its recovery is more hopeless and its loss more detrimental to the interests of society. For, after all, the first impressions in good or evil are generally imbibed from the mother. Now, let us consider what is the training of our country girls, and what are the expectations for good that we may form from it? They, generally speaking, get more school education than the boys do, unless it is in the case of the eldest girl remaining at home in a large family, who is often wanted to mind the younger children whilst the mother is at work in the field. They are not, as a rule, required to go to work so early as their brothers are. I cannot here enter at any length into the assumed demoralising effect of field work as compared with other employments for women. I can only say that, with care, this need not be so. I fear that in most cases, whatever may be the after employment, the seed of mischief is sown at home, and that the crowded dwellings are answerable for much of the evil which occurs afterwards. For this reason it certainly seems desirable that young girls should be got out to household service so soon as they are of sufficient age to make themselves useful. But here again it must be remembered that they often enter a respectable family with the mind already tainted to an extent which those who have been brought up apart from the evil influences to which they have been exposed cannot easily imagine.

Household Servants.—A pretty long residence in country places—a knowledge of the blots which our parish registers reveal—does not enable me to give that pre-eminence in virtue to household servants over those who seem to be less advantageously situated that I would wish to do, and in some respects this may be accounted for with a feeling of pity rather than of censure. If we consider the advantages enjoyed by female servants in the present day, we cannot but regret that so little real benefit is derived from them. Look at the wages they receive. These are from 50 to 100 per cent., and in some cases even more, above what the same places were worth some 30 years ago. They might lay by from half to three-fourths of their earnings, and yet be able to dress themselves with the quiet neatness which so became the servants who lived with our fathers till they seemed to become a portion of the family, and who loved Master Tommy as dearly as if they really were their own kin. But what use is made of the larger wages which our female servants now receive? The close imitation of their betters in the frivolities of a luxurious age too plainly declares. And then this finery must be seen and admired. This leads to Sundays out ; to a craving for amusement, to a restless discontent with and neglect of duties, to impatience of reproof, however mild, and to a fondness for perpetual change. We cannot look to these, I fear, to regenerate the class from which they spring, to be the wives of an improving peasantry, the mothers of a socially better race ; and yet the question I would wish to propose is, Cannot we make them so? Are not we, are not the masters and mistresses of England, very much to blame for those errors which in our servants we see and deplore? Are we not too easy and careless, and too little thoughtful of our responsibilities?

Savings Banks, &c.—I will only further add on this subject, that I think a great deal of good might be done, and provident habits established, if it was insisted upon at hiring that a certain sum out of the wages agreed to be given should be put every year into the savings' bank. If this was not at first very readily acquiesced in, I believe that as the bank book showed the small increasing fortune, the advantage would be acknowledged, and the rule become generally acceptable. Gardens or allotments are essential to the well-doing of the labourers, and for these I have always found them thankful. I should put the size of these at from 10 to 40 poles, according to the means of attending to the required work that each individual may possess. I have necessarily touched upon the dark side of the labourer's character in much that I have advanced in this paper ; but I have not lived for nearly a lifetime in country villages without being able to say, with thankfulness, that there is a bright side, and one that will repay the trouble of drawing it out and improving it. Where the character has not been deteriorated by that curse of the labourer, the beer-shop, and the whole temper soured and changed by straitened circumstances, too often caused by his own vice and improvidence, the labourer who has been well brought up possesses qualities which are as genuine and as honourable to him as any which distinguish his betters in rank and education. He becomes much attached to a master who treats him well, and is as careful of his property as if it were his own. He is loyal to his Queen, a lover of his country, and a respecter of order. He has very generally a religious bias, and is more likely to become a fanatic than an infidel. I have hardly ever heard read a letter written by one of this class to his friends at home from some distant colony to which he may have emigrated without finding a distinct recognition of a superintending Providence. With respect to the honesty of the labouring class, when we consider the immense amount of property which is left unprotected, and sometimes very carelessly, at the mercy of our indoor and out-door servants, it is really doing them but justice to say that they are, as a class, particularly honest. Nor should I omit among their distinguishing characteristics their charity to those who are worse off than themselves. Most of their faults may be traced to the brutalising effect of overcrowded dwellings and abounding beershops. Until this last evil is removed, I despair of any decided benefit being effected by any other remedial measure. But whilst denouncing in the strongest terms the low beer-houses, I should be glad to see the day when a jug of wholesome beer was the general accompaniment to the supper table of every labouring man. This last subject to which I have referred, and perhaps a few others, are the only ones on which legislative interference is required in order to introduce a higher state of morality among the poor. On most other points, individual exertion and individual determination to do what is right, combined in one long, strong pull together, will, I believe, effect what we all so much wish to see—an improved tone of

feeling in the labouring classes. We have a higher code of morals to refer to than was ever propounded by the greatest wisdom of a national Parliament or the most paternal Government. The one short and simple rule, to do to others as you would they should do to you, will, if carried out in its true and honest sense, secure all that is required to make us a happy, a united, and a prosperous nation.

Notices of Books.

The Agricultural Labourer, *a Short Summary of his Position, &c.* By T. E. Kebbel, of the Inner Temple, Esq., Barrister-at-Law. Chapman & Hall.

This little volume contains a full discussion of its very important subject. It is the work of a considerate and benevolent man, and gives ample evidence, also, of a careful study and large knowledge of the various circumstances which it describes. The several chapters successively consider the effect of field work on women and children, the food and wages question, cottages and allotments, education, hiring, the publichouse and poaching, benefit societies, co-operation, large and small farms, and peasant proprietors. The work ends satisfactorily on the key-note by which the whole performance is clearly dominated and inspired; and we extract the concluding paragraph in illustration of the impartiality, kindliness, and sound sense which have dictated its pages:—

"I have stated a certain number of conclusions to which a great mass of evidence appears to tend; but I have always done my best to give their full weight to all modifying considerations. As I have hitherto said very little 'out of my own head,' I may perhaps be allowed to say now that I know of no question, if we except religious ones, which requires to be approached with a mind so attuned to impartiality as this one of the agricultural labourer. On the one hand is his life of silent, secluded, uncomplaining toil, always suggestive of the *qui laborat orat:* his undeniable privations, his honesty, his simplicity, his helplessness, so unlike the loud self-assertion and menacing pugnacity of the city artisan; all prepossessing us in his favour, all imbuing us with the idea that a system which does not do more for him must be radically indefensible. On the other hand we see in him but one link in a great social chain which has endured for centuries, the origin of which was noble and generous, and the continuation of which has been secured from age to age by the accumulative force of kindly traditions and immemorial sympathies. If we fail to give its full value to every reflection which is suggested by either side of the shield we are dashed headlong into error; and it is the certainty of this which should make us so cautious of dogmatising. But I am happy in believing that the more the question is studied, the more will it be seen that the highest interests of the landlord, the tenant, and the labourer harmonise with each other; and that in a logical development of, rather than a total departure from, the ancient social system of England, lies our best hope for the future."

Farm Memoranda.

West Gloucestershire: *August* 26.—In walking over the pastures day after day one cannot but wonder how well the cattle and sheep have done upon such short rations, especially where the water supply is plentiful. The drought in 1868 was not so much felt as that of this year. On the 7th of August then the rain came, and for weeks it rained more or less, so that by the end of the month we had plenty of grass keep; but now there is no more prospect of grass than there was two months ago. We had a beautiful rain during the afternoon of the 22d, which went down to the roots of the green crops, but nothing like enough to benefit the pastures. The Mangels were, and are, looking well, and seem to enjoy the sunshine, but the Swedes and Turnips had begun to show signs of distress, and they could not have lived much longer had not the rain come, for the leaves were beginning to droop, and the blue blight was upon them, destroying large patches through the fields. They are now beginning to revive, and we may yet have at least half a crop, which will be of immense value to us this year to mix with straw-chaff, for there is but very little hay for the cattle to feed on; we were never so short before, for we have but 10 tons of English hay made this year, instead of 200. Our bullocks intended for fattening are now in the stalls; we have for some time past been compelled to carry out food to them in the field, and now that the grass is so very short they require to feed twice a-day, so that it saves labour to bring them to the food, and we shall know, at least, that they get plenty. The store cattle, too, must have food carried out to them. The in-calf heifers are now getting an allowance of straw-chaff, grains, and bran, daily, and they seem to enjoy it; but as grains are getting so very dear (6*d.* per bushel), we shall have to find a substitute. We are giving our lambs about a pint of bran and Oats each per day, and change them on to fresh ground often; although the keep is no better, they keep very firm and healthy. The stock ewes are running about the stubbles by day; they do very well, picking up the shed corn; they lie on the pastures at night.

The young seeds do not show much signs of life at present; we have sown Italian Rye and Trifolium over the bare patches.

The Potato crop in this neighbourhood is pretty good, so far as quantity goes, but they are growing out badly. We are busily engaged digging them out; there is no sign of disease at present. Although they are not quite so ripe as we could wish, by letting them lie upon the ground a few hours the skin becomes tough, so that they do not bruise so easily in picking up. They are stored in very narrow pits, and a little soil thrown in amongst them, and thatched as soon as possible.

The harvest in this neighbourhood is now well secured, and the ricks in most cases are thatched. The Wheat came to hand in the best possible condition, and promises to yield well off deep, well-farmed land, but upon some of the thin brash it is not good. Some little has been already threshed, and is favourably spoken of. Early-sown Barley is good both in straw and corn, but the reverse must be said of late-sown. Oats are very good; Peas are also very good, and the straw free from blight, therefore it will make some good fodder. Beans are very various; spring-sown are much better than the winter-sown. Vetches are well podded, but owing to the great scarcity of summer keep the acreage seeded will be under average.

The Oak trees and Chestnuts are again heavily laden this year, and we may very soon expect the Acorns and Chestnuts to fall with a rough wind. We know too well the consequences of neglecting to have them picked up, so as to prevent the cattle from eating too many of them at a time; as they are of such an astringent nature, and the prospect of very succulent grass to counteract them so remote, we may expect much more serious results than happened two years ago. *J. W.*

Hill Farming in the North of England.—I shall not touch the system of breeding three-parts bred lambs, as carried on in the east of Scotland and Northumberland, but confine my remarks to the breeding of lambs of the first cross between the Leicester tup and the Cheviot or black-faced. The half-bred lamb from the Cheviot ewe is perhaps quite as large, but the three-parts bred hogg can be fattened to a greater weight at an early age; and the plan, therefore, specially recommends itself to those who, in low-lying situations, breed and feed their own lambs.

There are two distinct plans followed of breeding half-bred lambs, either by keeping a regular standing stock of ewes, or buying draft ewes at five or six years old, and taking one crop of lambs from them. Where a regular standing stock of all ages is kept, it is generally on the lower unenclosed ranges of hills from 400 to 900 feet above the sea level. The breeding of Leicester-Cheviots has rarely gone above a line about 700 feet high, but crosses from black-faced ewes are bred perhaps 200 feet higher. The success which has attended a few farmers who have tried the black-faced cross on farms hitherto entirely devoted to pure Cheviots is drawing attention to this plan of sheep-breeding, and it is possible we may see it still further extended. Some poorish though not very high-lying farms, which carry only an indifferent Cheviot stock, are found to be more profitably farmed in this way. There are farms, as every sheep breeder knows, which produce a very good lamb, and only an indifferent old sheep, and *vice versâ*.

Where a standing stock of Cheviot ewes, producing half-bred lambs, is kept, the stock is generally maintained by ewe lambs bought in autumn from some breeder of Cheviots. Of course they can only be second lambs, as the best are kept at home, but as they are almost invariably wintered on the low lands, and altogether better kept, they grow as big as the first. It may here be remarked that it is a great advantage to get, if possible, the ewe lambs from the same breeder year after year, as if they are bought miscellaneously the stock gets very irregular in character, and their produce has more or less of the same defect. Nothing adds more to the appearance of a lot of sheep or lambs than having them like each other.

Where there is only a limited portion of low enclosed lands belonging to the farm, the ewes are sold off at six years old, but where there is a sufficient extent of low land the draft ewes are brought down and another crop of lambs taken off them, and they are then either sold as "double milled" ewes, or are kept till they are in fair condition and sold to the butcher.

All along the East of Scotland and Northumberland the tups would be of the Border Leicester breed; and in the Western districts and Cumberland they would be either imported from Yorkshire or be of the same variety bred in the district.

A stock of 500 sheep would consist of 400 ewes and 100 hoggs, as though only a sixth is drafted every year, a fifth of young sheep is required to make up for deaths and casualties. If valued over to an incoming tenant last Whitsuntide, they would probably cost him about 44*s.* the ewes, and 28*s.* for the hoggs. Perhaps eight Leicester tups would be required, which should cost, as shearlings, from £5 to £6.

The ewes have their first lambs at two years old, and on the unenclosed ranges begin to lamb from the 1st to the 10th of April, according to the elevation and exposure. Those having twins are generally removed to the fields, and either kept there all summer or taken back about the beginning of June.

The lambs are castrated and their tails docked about the end of May. From being in lower localities, and perhaps more carefully looked after at this season, the ewes bring more lambs than on most pure Cheviot farms; still we cannot reckon on having more than 380 lambs from the 400 ewes on average farms of this class. Of course when there is a considerable amount of land besides in fields, the ewes there will greatly increase the proportion of lambs; but we are not taking them into account at present.

The lambs, of course, are all to sell, and may be taken at an average price of 16*s.* 6*d.* each. The 500 sheep—young and old—should clip about 80 stones of wool, of 24 lb. to the stone. There will be from 75 to 80 draft ewes to sell, say 78, and two or three culls. To keep up the stock, about 105 ewe lambs will be bought, at a cost for the best second lambs of perhaps 12*s.* each in average years, and some outlay is required to keep up the number of tups. The debtor and creditor account may, therefore, stand something like the following:—

380 lambs, at 16*s.* 6*d.* each	£308	0 0
80 stones of wool, at 28*s.*	112	0 0
78 draft ewes, at 26*s.*	101	0 0
	£521	0 0
Deduct for 105 ewe lambs, at 12*s.*	£62	0 0
Wintering at 8*s.* 6*d.* each	45	0 0
Annual outlay for tups	10	0 0
Also the necessary expenses, as shepherds' wages, dipping, &c.	70	0 0
	187	0
	£334	0 0

It is not quite so plain a matter as in pure Cheviot farms to give the rents generally paid per sheep, as the farms have mostly more or less arable land attached, and frequently a number of cattle are kept amongst the sheep, and there is a greater diversity in their profitableness in all ways.

On arable farms where ewes are kept, they are mostly bought at 5 or 6 years old, one crop of lambs taken, and they are then fattened and sold between November 1 and Christmas to the butcher. The pure Cheviot does not produce so many lambs as half-bred ewes, and 130 lambs to 100 ewes may be taken as a pretty good average.

When a standing stock of black-faced ewes, breeding lambs to Leicester tups, is kept, it is generally on higher lands, or on those of a poorer description than where Leicester-Cheviots are bred.

The young stock is bought either as lambs in the autumn or as hoggs in the spring. There is probably no dearer sheep to the weight than a black-faced ewe hogg, and the high price given for them compared with that realised for the old ewes is a great drawback upon the profits. The tups used should be even more sprightly and rather lighter in the wool than those put to the Cheviot ewes. They will bring more lambs, but the management is in all respects the same as previously described. The debtor and creditor account may be put as follows:—

[illegible] lambs, at 12*s.* each	£360	0 0
Wool [illegible]	60	0 0
Draft ewes, at 16*s.*	64	0 0
	£424	0 0
Deduct—		
[illegible] bought as lambs and wintered	£305	0 0
Expenses — [illegible] wages, &c.	70	0 0
Keeping up tups	10	0 0
	385	0 0
	£39	0 0

This is a less sum per sheep than what is realised from the Leicester-Cheviot breeding stock or from the pure Cheviot, but a greater number of ewes, say in the proportion of 5 to 4, can be kept on the land, and a fair stock can be kept on a quality and exposure which would not breed a Leicester-Cheviot, and only a very indifferent pure Cheviot. *J. H. J. S., in "North of England Farmer."*

Miscellaneous.

War and its Effects on our Grain Supplies.—Altogether our prospects for the supply of bread are by no means unsatisfactory, especially when we learn that the United States, Russia, and other countries have been blessed with an abundant harvest. What we have really to deplore are our prospects as regards Barley and Oats, which are decidedly scarce at home, and are usually imported in large quantities from the North of Europe. But the ports of Russia, Denmark, and Sweden are likely to continue open, and much of the Prussian produce may come to us through those channels. Should then our requirements not prove extravagant, and the supplies continue to flow in from neutral countries almost uninterruptedly, we cannot expect prices to rule very high. Let it not be imagined that war must of necessity have a considerable influence on prices, from the fact that a considerable amount of money is expended in food and other purposes. Money has no such power. *Food Journal.*

The Week's Work.

September 3.—*Scotch Harvest.*—September is still counted harvest month in Scotland, as August is termed harvest month in England, but the old calendar rules of harvest months and harvest moons are fast falling behind the progress of field practice, faster perhaps in the North than in the South; thorough drainage and

improved cultivation, manuring and seeding, having shortened and advanced the period of harvest 14 days in some places, and fully a month in others. The length of the harvest this year will, to present appearance, exceed an average, but much depends upon the coming weather during the remaining weeks of the current month. In some districts of the North, Oats, the principal crop grown, make a stand, as it were, about the close of September, and remain green until the frosts of October, and sometimes November, whiten and render them fit for the stackyard, none of the corn being fit for seed. Even when cut green, Oats do not ripen in the stook towards the close of this month in the North as they do in August in the South when cut in a similar state. The order of succession in ripening is Bere, Barley, Wheat, Oats, Peas, and Beans, but to this there are numerous exceptions—many fields of Oats, for example, have this year ripened or will ripen before Wheat and Barley.

Corn Harvest proceeds promiscuously, so to speak, as stated last week. Very little remains out in the South, and northward every effort is now being made to bring it to a close. Small sheaves loosely bound, when properly set in the stook, are sooner ready for the stackyard, and although they give rise to rather more handling in the stacking, experienced workmen fork two or more at a time, so that we have always found that small sheaves rather expedite than retard the operation of stacking, while they make better work.

Buckwheat harvest before it begins to shed its first ripe seeds. Owing to the manner in which the plant flowers and ripens the whole cannot be secured, and as a rule the first ripe is the best. Part of the plant being thus cut green, the small sheaves or bundles require to be left loose and exposed in the best manner for drying, and also to be turned once or twice; and in cutting and turning very great care is requisite to prevent shedding of the seed. Some thresh out in the field, and store the seed, which makes excellent food for poultry, and also for cattle, when ground into meal; others bind up and stack, as Turnip seed.

Aftermath Meadow and Clover Hay cut before the crops begin to etiolate at the bottom. Like the first cuttings, both are this year exceptional, being in a few places heavy and forward, but in the majority almost *nil*, the meadows and Clover being required as pasture for stock. What little there is will possess the greater value, and therefore should be carefully harvested. Both crops are more liable to injury from wet weather and heavy night dews than the first crops, and therefore mowing should be deferred until settled weather sets in. In others respects, the work is similar to harvesting the first crops.

Grass Seeds, for hay or pasture after a corn crop, sow on a clean stubble, and chain-harrow in, as directed for August. The practice is preferable to sowing the seeds with the corn in spring, as a much closer and healthier bottom of young grass can be obtained before winter.

Hop Picking generally commences this month. When equally ripe, the flowers may be picked as one quality, but this is seldom the case in the best of seasons; and when they ripen unequally, they are divided into three qualities in the picking—the dark or over-ripe, the brown or ripe, and the green. The three qualities are then taken to the oast and kiln-dried separately, and when cool put into sacks, technically termed pockets. Fine weather is essential to the successful harvesting of this crop, as the slightest damp from rain or dew injures the flavour and strength of the bitter principle, thereby reducing the market value of the crop.

Cabbage seed, if not already sown, sow in beds for spring planting. Advanced seedlings remove to a nursery in rows 6 or 9 inches apart. Transplanting them a second time by simply shifting will check over luxuriance of growth, harden and fit them for standing the winter. By thus shifting the young plants will be more uniform in size, stronger in the stem and better rooted, and less liable to run to seed next summer, or to be attacked by insects, than when left in the seed-bed throughout the winter.

Early Potatos.—Large breadths are dug and sent to market during July and August, and about the beginning of September the storing of seed for the ensuing season takes place.

Autumn Fallows.—Continue to plough, dig, or smash up by steam as soon as the crops are removed from the ground, as directed last month. The advantage of breaking up stubble early with a deep trench-furrow has been known from time immemorial, but with horse-power this could seldom be done in the case of heavy clay soils until rain fell to soften the land; and when the weather breaks it frequently happens that clay land becomes too wet for profitable tillage. But with steam power the land may be broken up immediately the harvest is over, and the drier the more effective the operation.

Farm Horses. — Autumn fallowing and stubble Turnips have greatly increased the labour of the teams at this season, rendering an extra allowance of corn necessary along with a cooling diet of green forage, as sewage grass, Clover, Tares, Lucerne, Sainfoin; or, in the absence of such, steamed food should be given. On no account allow farm horses to lose their sleek summer coat in Autumn.

Milch Cows are in too many instances neglected at this season, more especially in our northern counties, what they get in the pastures being insufficient to support them. They should have sewage grass, Clover, Tares, Lucerne, or Sainfoin, and be housed at night whenever the cold weather sets in. In some places an early plot of Globe Turnips is grown for cows. The tops are objectionable, and the bulbs should be steamed along with chaff and bean meal. Old or worn-out cows may be allowed to run dry for fattening. In our southern counties early September is generally favourable for milch cows, the weather being mild, and the grass plentiful; but to this there are many exceptions, the weather either being wet, or the pastures burnt up, or the bite deficient naturally; and of the two, a cold wet bed at night is the most objectionable to an in-calf milch cow timed to calve about the close of the year. Cows should continue to have plenty of soft filtered water to drink.

The Dairy suffered much from the extreme heat of July and August. It is now less disagreeably close and sultry, so that the ventilation and temperature of the milk-room and cheese-room are more easily controlled. Very great improvements are now being made in some dairies for controlling the extremes of temperature during summer and winter, and it is just as necessary to attend to the temperature of the cow during the process of secreting the milk, as it is to the temperature of the dairy in the several processes that take place after the milk is withdrawn from the udder. *W. B.*

Notices to Correspondents.

WEED: *A Regular Subscriber.* It is a Knot-grass, common in sandy fields. Diligent use of the hoe, and well cultivated fallow crops, will destroy it.

WINTER BEANS: *W. P.* After broad-sharing, and, if necessary, burning the stubble—and thereafter ploughing it and cleaning it—cart a dressing of dung and plough it under with a shallow furrow; and after harrowing drill 10 pecks to 3 bushels of the small winter Beans, in rows 2 feet apart. Any time in September will do for seed-time.

Markets.

ENGLISH WOOL.

The transactions during the week have been only to a moderate extent, at unaltered prices. The feeling as to the future varies with the changing prospects of continued war or early peace, but as a rule holders are very firm, and do not seem at all inclined to give way from prices lately ruling.

HOPS.

BOROUGH MARKET, Sept. 1.

Messrs. Pattenden report there is a good demand for fine samples of the new growth, but inferior sorts command little or no attention. Prices as yet are very unsettled, and we must defer quotations until next week.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Sept. 1.

Prime Meadow Hay	120s.	to 130s.	Clover, old ..	140s.	to 150s.
Inferior do. ..	100	110	Inferior do. ..	110	120
New Hay	110	120	Prime new do.	120	130
Inferior do. ..	90	105	Inferior do. ..	100	110
Straw	24	32			

CHARLES JAMES EASTON.

CUMBERLAND MARKET, Thursday, Sept. 1.

Sup. Meadow Hay	130s.	to 140s.	Inferior Clover ..	115s.	to 130s.
Inferior do. ..	110	120	Prime 2d cut do...	—	—
New do.	120	134	New do.	110	138
Inferior do. ..	105	112	Straw	32	36
Superior Clover ..	140	150			

JOSHUA BAKER.

COALS.—Aug. 31.

Hastings Hartley, 16*s.*; Hollywell Main, 17*s.*; Walls End Framwellgate, 16*s. 3d.*; Walls End Haswell, 19*s.*; Walls End Hetton, 19*s.*; Walls End Hetton Lyons, 16*s.*; Walls End Hartlepool, 18*s. 3d.*; Walls End Original Hartlepool, 19*s.*; Walls End Tees, 18*s. 9d.*—Ships at market, 22; sold, 20; unsold, 2; at sea, 5.

METROPOLITAN CATTLE MARKET.

MONDAY, Aug. 29.

We have a shorter supply of Beasts and a good demand, consequently prices have advanced, and a fair clearance is effected. The number of Sheep is small, but trade is not very brisk; however, choicest qualities are dearer; it is still difficult to dispose of Lambs; only a few choice ones are saleable. Calf trade on the average is about the same as last week. Our foreign supply consists of 1975 Beasts, 7550 Sheep, 313 Calves, and 60 Pigs; from Scotland there are 70 Beasts; from Ireland, 400; from Norfolk and Suffolk, 60; and 2070 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Hereford, &c. ..	5 6	10 5	Best Long-wools	5 4	10 5 6
Best Shorthorns ..	5 4	8 5	Do. Shorn ..	.. —	.. —
2d quality Beasts	3 6	4 2	Ewes & 2d quality	4 8	5 0
Best Downs and Half-breds ..	5 8	5 10	Do. Shorn ..	.. —	.. —
Do. Shorn ..	.. —	.. —	Lambs	4 8	5 8
			Calves	3 8	5 8
			Pigs	3 4	5 4

Beasts,4575; Sheep and Lambs, 23,060; Calves, 325; Pigs, 190.

THURSDAY, Sept. 1.

We have nearly twice as many Beasts as on Thursday last, but a large proportion is of inferior quality; all descriptions are rather lower in price, and a clearance cannot be effected. The number of Sheep is not large, yet it exceeds the demand; prices are lower for all kinds. A few choice Lambs are sold at about mutton price; the season for this article may be said to have closed. Calves are selling about the same as on Monday. Our foreign supply consists of 400 Beasts, 2650 Sheep, 275 Calves, and 40 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Hereford, &c. ..	5 4	10 5 6	Best Long-wools	5 2	10 5 4
Best Shorthorns ..	5 2	5 4	Do. Shorn ..	.. —	.. —
2d quality Beasts	3 2	4 0	Ewes & 2d quality	4 4	4 10
Best Downs and Half-breds	5 4	5 8	Do. Shorn ..	.. —	.. —
Do. Shorn ..	.. —	.. —	Lambs	.. —	.. —
			Calves	3 8	5 6
			Pigs	3 4	5 4

Beasts, 1815; Sheep and Lambs, 12,440; Calves, 495; Pigs, 40.

METROPOLITAN MEAT MARKET.—Sept. 1.

Best Fresh Butter .. .. .. 18*s.* per dozen lb.
Second do. do. .. .. 16*s.* ,,
Small Pork, 5*s. 0d.* to 5*s. 8d.*; Large Pork, 4*s. 4d.* to 4*s. 8d.* per 8 lb.

MARK LANE.

MONDAY, Aug. 29.

There was a good supply of Wheat from Essex and Kent to this morning's market, and as millers were not disposed to purchase, excepting at a reduction of 1*s.* to 2*s.* per qr. upon the prices of this day se'nnight, very few sales were made, the bulk of the supply remaining unsold. For foreign the demand was extremely limited, at last week's rates. Malting Barley, Beans, and Peas were unchanged in value; grinding was 6*d.* per qr. cheaper. Oats could only be sold at a decline of 6*d.* per qr. The value of Flour was unaltered. Of new Mustard seed there were between 4000 and 4000 qrs., but the ideas of millers and holders were too wide to admit of business.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	44	51	Red.....	42	51
— — fine selected runs..do.	48	55	Red.....	46	53
— — Talavera	50	53			
— — Norfolk	—		Red.....	—	
— — Foreign	42	63			
BARLEY, grind. & dist., 29*s.* to 33*s.*..Chev.	42	45	Malting ..	36	41
— Foreign .. grinding and distilling	25	33	Malting ..	33	43
OATS, Essex and Suffolk	25	27			
— Scotch and Lincolnshire	27	29	Feed	—	
— Irish .....Potato	26	28	Feed	24	27
— Foreign .....Poland and Brew	25	27	Feed	20	25
RYE	32	36	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan ..... 43*s.* to 47*s.*..Tick	49	50	Harrow ..	41	50
— Pigeon ....51*s.* to 59*s.*..Winds.	—		Longpod..	—	
— Foreign.....Small	45	47	Egyptian ..	42	44
PEAS, White, Essex, and Kent..Boilers	38	40	Suffolk ..	40	42
— Maple, 40*s.* to 44*s.* .....Grey	36	40	Foreign ..	36	40
MAIZE			Foreign ..	32	34
FLOUR, best marks delivered..per sack	42	50			
— 2d ditto .....ditto	35	47	Country ..	35	47
— Foreign.....per barrel	29	31	Per sack..	35	62

WEDNESDAY, Aug. 31.

The grain trade to-day remained in a dull and inactive state. The supplies on offer were not large, but the attendance of millers was limited, and sales could only be effected at the reduced prices of Monday last. Foreign Wheat changed hands to a small retail extent, at late rates. Barley was quiet, but unaltered in value. Malt tended downwards in price. There was a large show of Oats, but the quotations were supported. Beans and Peas were scarce, and commanded late rates. Flour was dull, but nominally unaltered.

ARRIVALS LAST WEEK.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	700	160	—	—
Irish ..	—	—	—	—
Foreign ..	13,340	200	27,190	3120
				— brls.
	14,040	360	27,190	

LIVERPOOL, Aug. 30.—We had an average attendance at to-day's market, but, prejudicially influenced by the report received this morning from Mark Lane, the tone generally was flat. In Wheat, however, there was a fair business, at about 1*d.* per cental decline since Friday. Flour quiet. Indian Corn dull, at a reduction of 6*d.* to 9*d.* per qr. on the week. Oats in limited demand at 1*d.* per 45 lb. decline. Oatmeal dull.

AVERAGES.

	Wheat.	Barley.	Oats.
July 23	49*s.* 9*d.*	31*s.* 2*d.*	26*s.* 11*d.*
,, 30	52 10	33 8	26 9
Aug. 6	54 11	31 8	28 8
,, 13	54 10	32 11	28 0
,, 20	54 7	33 5	25 10
,, 27	51 1	36 8	24 6
Average ..	53 0	33 2	26 9

SEED MARKET.

The brisk demand for Trifolium seed, noted in our last report, has continued throughout the week; and as the stocks are now almost quite exhausted, values have consequently advanced several shillings per cwt. A large quantity of new Mustard seed has appeared in Mark Lane, the whole of which will probably be taken for manufacturing purposes. New sowing Rape seed is in fair demand, at unchanged rates. For winter Tares we have a slow sale, at last week's currencies. There is nothing doing just now in either Clover or Trefoil seed. Italian Rye-grass meets with a free sale, at full prices. Canary seed is now obtainable on very moderate terms. We have a fair trade doing in Rye, winter Oats, and Barley.

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Have now ready for delivery, in fine condition,
CORN MANURE, for Spring Use
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SUPERPHOSPHATES of LIME
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Richard Hunt, Gosselend Alton, Hants.
Robert Leeds, Weston House, Brandon, Norfolk.
George Saville, Ingthorpe, near Stamford
Samuel Jonas, Orchall Grange, Essex
Charles Dorman, 23, Essex Street, Strand, W.C.
Thomas Webb, Hildersham, Cambridgeshire.
Jonas Webb, Melton Ross, Lincolnshire.
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Farmers can will be forwarded on application to the Secretary, or may be had of the local Agents.
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"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
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"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample sent to me contained only 17 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
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"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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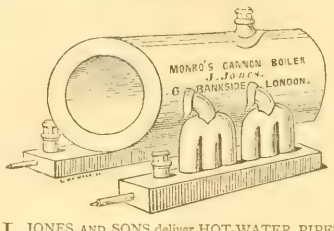

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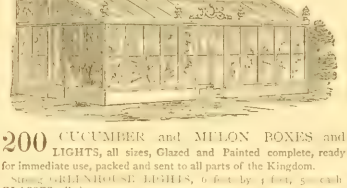

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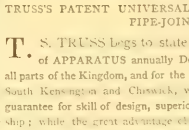

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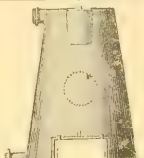

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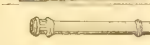

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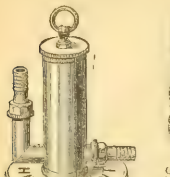

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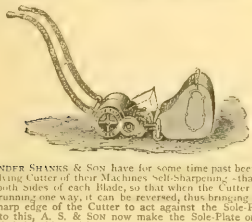

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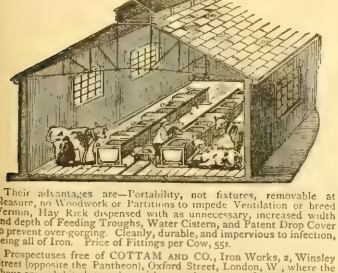

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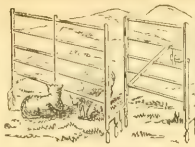

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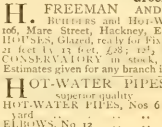

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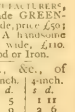

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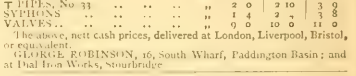

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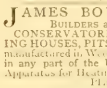

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16 by 13	17 by 13	20 by 12	..	15 0	16 0	18 6
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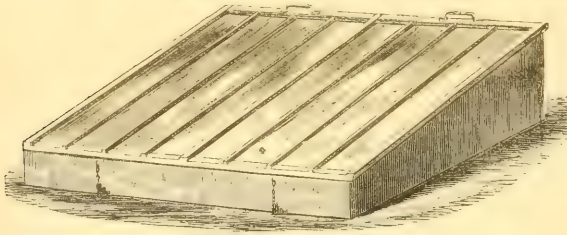

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 37.—1870.] SATURDAY, SEPTEMBER 10. {Price Fivepence. / Stamped Edition, 6d.

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British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British species and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

CROTONS.—A magnificent Pair of Plants, in luxuriant health and foliage—1 specimen, 4 feet high, diameter of tub, 4 feet; 10 diameter, 5 pictum, 6 feet 6 inches high from tub, 4 feet in diameter Also 160 PINES, best varieties, fruiting and succession. For price, apply to
R. P. KER, Nurseryman and Seedsman, 6, Basnett Street, Liverpool.

TO the TRADE.—1-yr. SEEDLING HOLLIES. 1-yr. SEEDLING QUICK.
C WHITEHOUSE, Brereton Nurseries, Rugeley, Staffordshire.

HERBACEOUS and ROCK PLANTS, &c.—An extensive Collection of the above, fine Plants, in large 60 pots, 4s. per dozen, 30s. per 100; POLYANTHUSES, 2s. 6d. per dozen, 16s. per 100; RUTLAND, 3s. per dozen, 20s. per 100; FERNS and LYCOPODS, LILIUMS, TREE CARNATIONS, and all other general Nursery Stock; also Loam, Peat, Silver Sand, Gravel, Turf, Grotto Material, Manure, Peruvian Guano, Tobacco-paper, &c., at
J. FRYER'S, Clarendon Nurseries, Camberwell New Road, S.E.

VIOLA LUTEA MAJOR.—A free growing and flowering variety, habit and strength of plant intermediate between Viola cornuta and the Cliveden varieties of Bedding Pansies; flowers bright golden-yellow, very large, borne in great profusion, from March to October. A valuable addition to Spring and Summer Bedding Plants. Per dozen, 18s.
First-class Certificate awarded at Royal Horticultural Society's Show, May 4, 1870
First-class Certificate awarded at Royal Botanic Society's Show, May 25, 1870
ROBERT PARKER, Exotic Nursery, Tooting, Surrey, S.W.

Improvement of Grass Lands.

SUTTONS' RENOVATING MIXTURE should now be sown 6 to 12 lb. per acre.
SUTTON AND SONS, Seed Growers, Reading.

To Improve Clover Leys.

SUTTONS' RAPID-GROWING GRASSES and CLOVERS, from 1 to 2 bushels per acre, harrowed in and rolled afterwards, will produce an abundant supply of feed in April and May. Price 12s. per bushel, carriage free
SUTTON AND SONS, Seedsmen to the Queen, Reading

To the Trade.

SEAKALE and ASPARAGUS, extra, for Forcing. Wanted Estimates for the supply of above.
CHARLES H. DICKSON, 23, Market Place, Manchester.

WINTER VETCHES, True.—We are prepared to supply these, of fine sample and at lowest market rates. Samples and prices on application
THOMAS MCKENZIE AND SONS, Dublin, Belfast, and Address to Camden Quay, Cork

WINTER TARES, WINTER TARES.—The Subscribers having procured the best possible, are prepared to supply the Trade with any quantities of samples genuine and pure. Prices and samples free on application to
JOHN B. MCKENZIE AND CO., 29, Patrick Street, Cork

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London

NEW, GENUINE, SELECT, AGRICULTURAL and FLOWER SEEDS. Special prices and advantageous offers on application to
JAMES FAIRHEAD, 7, Borough Market, S.E.

JOHN BETHAM, Forwarding Agent, trading under the firm of BETHAM & SON, begs to state, that as the season for DUTCH BULBS is now arriving, he hopes to receive a share of the favours usually accorded to his late Father, who was Senior Partner in the Firm of BETHAM AND BLACKITH.
Office, 6, Lower Thames Street, London, E.C

TO BE DISPOSED OF, in consequence of the Owner leaving the neighbourhood, PINE PLANTS; a splendid lot, in Fruiting condition, and Successions; also some STOVE and GREENHOUSE PLANTS, AZALEAS, &c. For price and particulars, apply to
Messrs. R. LOWE AND CO., Nurserymen, Wolverhampton.

Neapolitan Violets—Crimson Thrift.

CRIMSON THRIFT, hardiest and showiest edging plant extant, strikes freely in open border; 50 cuttings for 2s. 6d.; 2000 in thumbs. NEAPOLITAN VIOLETS, prepared for blooming, 2s. 6d. per dozen. IRESINE LINDENI CUTTINGS, at 2s. per score, for stamps.
HORTUS, *Gardeners' Chronicle* Office, W.C.

Selaginella Californica.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, has much pleasure in offering a few strong plants of the above new and distinct species of SELAGINELLA, from California, which is stated to be hardy. Price 21s. each.
A. V. G. begs to say that his new general CATALOGUE of Plants is just published, and may be had on application from his Agents, Messrs. R. SILBERRAD, 5, Harp Lane, Tower Street, London, E.C.

B. S. WILLIAMS'
NEW and CHOICE FLOWER SEEDS,
Post Free

	Per packet—s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s 6d, 3s 6d, and 5 0
CALCEOLARIA, Neill's extra choice train, 2s 6d, 3s 6d, and 5 0
CINERARIA, Weatherill's extra choice strain, 2s 6d, 3s 6d, & 5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain	1s 6d, 2s 6d, and 3 6
ECHEVERIA METALLICA, new bedding plant	2 6
Williams' New Hybrid SOLANUMS	2s 6d and 3 6
PYRETHRUM (Golden Feather)	1s and 2 6
PANSY, from Prize Flowers	1s and 2 6
PANSY, finest Belgian varieties	1s and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
EAST LOTHIAN STOCKS, per collection of three colours	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s 6d and 2 6
" " var. PERFECTION	1s. 6d., 2s 6d, and 3 6
WALLFLOWER, Saunders' fine dark variety	1 0

Victoria and Paradise Nurseries, Upper Holloway, London, N.

JAMES' INTERNATIONAL PRIZE CALCEOLARIA.—The Plants of this splendid strain were awarded the 1st prize by the Royal Horticultural Society, at their Spring Show, May 4; and we beg to state, as a Caution to Purchasers, that we hold the Entire Stock of Seed saved by the Grower, and supplied to us direct. Price per packet, 2s. 6d and 5s. Prices to the Trade on application.
JAMES CARTER AND CO., The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

SEEDS, from PRIZE FLOWERS, awarded the First Prizes at the Crystal Palace, Royal Horticultural, and Royal Botanic Flower Shows, for some years; and are acknowledged second to none in purity. CALCEOLARIA, CINERARIA, and PRIMULA, in sealed packets, 1s 6d, 2s 6d, 3s 6d, and 5s each.
JOHN DOBSON AND SONS, Woodlands Nursery, Isleworth; and High Street, Hounslow, W.

THE TRADE SUPPLIED with CALCEOLARIA, CINERARIA, PRIMULA, BALSAM, CYCLAMEN, and SCARLET INTERMEDIATE STOCK SEED, in packets. The seed is just harvested in splendid condition, and the quality second to none in the Trade. A liberal allowance. LIST on application.
JOHN DOBSON AND SONS, Seed Merchants, Isleworth and Hounslow, W.

BULBS, just imported, in fine condition. LIST free on application.
JOHN DOBSON AND SONS, Seedsmen, &c., Isleworth and Hounslow, W.

LOUIS VAN HOUTTE begs to announce that his ENGLISH CATALOGUE, No. 135 L., was sent out last week to all his Customers.
DUTCH BULBS, of all sorts; HARDY PERENNIALS, HARDY and INDIAN AZALEAS, the extraordinary JAPAN AZALEA (Azalea mollis, in splendid varieties), CAMELLIAS, RHODODENDRONS, &c.
N.B. Several varieties of the Azalea mollis will shortly appear in the triple first Number of FLORE DES SERRES (four triple Nos. for 30s.), containing, when finished, Coloured Plates.
The FLORE DES SERRES ET DES JARDINS DE L'EUROPE is a Belgian Periodical, the property of the Advertiser. Seventeen Volumes are ready, containing more than 1900 highly Coloured Plates of the most approved Ornamental Plants. Price of the whole Set, £25 7s. Long terms by mutual agreement.
Royal Nursery, Ghent, Belgium.

The most Desirable Plant of the Season.
PARSON'S NEW WHITE MIGNONETTE RESEDA ODORATA INIMA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in colour, habit, and colour—long nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has exhibited a flower of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—
The Royal Botanic Society, Regent's Park, First-class Certificate, March 19, 1870.
The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.
The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.
The Brighton Horticultural Show, First-class Certificate, June 28, 1870.
The above will be sent out in October, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint; price 2s. 6d. per packet.
The Agents for the above will be advertised shortly.

SILVER SAND and PEAT, from Bedfordshire, also KENT and HAMPSHIRE PEAT, in any quantity.—This Sand is acknowledged by Florists to be the best to be obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depot.

HARRIET SCOTT, late STEPHEN SCOTT, Wood Broker to the Crystal Palace Company, Woodside, Croydon, Dealer in all kinds of Garden Materials for garden use, including the following:—SILVER SAND, KENT PEAT, LOAM, GARDEN MOULD, BIRCH and HEATH, BROOMS, WATTLES, HURDLES, GARDEN STICKS, TARRED TWINE, FIREWOOD, &c. RUSTIC LOGS and PEAT, suitable for Terneries, &c.
A Price List sent on application.

Dutch Flower Roots.
CROYDON. A. HENDERSON & SON. SEED WAREHOUSE. ESTABLISHED 1828.
ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers.
DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted.
Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application.
Sion Nursery, Thornton Heath, Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

Dutch Flower Roots.
DOWNIE, LAIRD, AND LAING, have now received their first importation of FLOWER ROOTS, consisting of—
HYACINTHS, POLYANTHUS NARCISSUS, DOUBLE NARCISSUS, CROCUS, TULIPS, JONQUILS, RANUNCULUS, ANEMONES, SNOWDROPS, &c., &c.,
which have all been carefully selected from the most celebrated Establishments in Holland.
The Bulbs have arrived in splendid condition, being unusually well ripened, very large, and exceedingly heavy.
D., L. & Co. can supply fine Bulbs of the PRIZE HYACINTHS at Kensington, Regent's Park, Crystal Palace, and Royal Caledonian Society's Shows, at 12s., 15s., and 24s. per dozen.
Descriptive CATALOGUES of DUTCH BULBS forwarded post free.
Stanstead Park Nurseries, Forest Hill, S.E.; and Edinburgh, N.B.

DUTCH FLOWER ROOTS.

JAMES VEITCH & SONS,
ROYAL EXOTIC NURSERY, CHELSEA, S.W.,
BEG TO ANNOUNCE THAT THEY HAVE RECEIVED THEIR
ANNUAL SUPPLY OF BULBOUS ROOTS FROM HOLLAND,
And are pleased to say that they are in splendid condition.

CATALOGUES are now ready, and will be forwarded Post Free on application.

J. V. AND SONS desire to impress upon those who patronise them, the great advantage of giving them their Orders early, as the successful cultivation of Bulbs depends in a great measure upon their being planted early in the season.

PAUL'S HYACINTHS, TULIPS, &c.
"Mr. W. Paul's Hyacinths . . . with grand solid spikes, such as are rarely seen at any show and in any season."—*Journal of Horticulture.*
"A remarkably fine display of Hyacinths."—*Gardeners' Chronicle.*

WILLIAM PAUL
BEGS TO ANNOUNCE THAT HIS
HYACINTHS, TULIPS, CROCUSES, and other DUTCH FLOWER ROOTS
Have arrived in excellent condition, and he respectfully solicits early Orders for the same.
In proof of the quality of Bulbs imported by him, he begs to refer to his Annual Exhibition in the Royal Horticultural Gardens in March and April, which has been visited by Her Most Gracious Majesty the Queen, Her Royal Highness the Princess of Wales, and several other Members of the Royal Family.
PRICED DESCRIPTIVE CATALOGUE Free by Post.
PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

Now Ready, Gratis and Post Free,
ILLUSTRATED AUTUMN CATALOGUE
OF
DUTCH BULBS,
SEEDS, FRUIT TREES, FERNS,
FERN CASES, and other HORTICULTURAL DECORATIONS,
GARDEN REQUISITES, &c.
TRADE MARK.
DICK RADCLYFFE AND CO., 129, HIGH HOLBORN.
SEED GROUNDS, ERFURT, PRUSSIA.

SEED CORN.
CARTER'S PRIZE "NURSERY" STOCKS.
We can strongly recommend the following stocks of WHEAT, BARLEY, and OATS, as being of very pure quality, and selected from samples that have taken First-class Prizes.
The greatest care has been bestowed upon the crops during growth, by hand-weeding, &c., to ensure the choicest quality; and as we hold but a limited quantity, early orders are necessary to ensure a supply.

WHEAT. Price on application.
Sheriff's Bearded White
Talavera White
Fenton White
Chidham White
Lammas Red
Browick Red
Pedigree Red

BARLEY. Price on application.
Carter's Prize Long-eared
Cape's Excelsior
Brewer's Delight
Chevalier

OATS. Price on application.
Waterloo
Canadian
Tartary
Poland
Normandy
Winter

We shall be pleased to supply any varieties not named above.
Lowest price per bushel or quarter on application.
Every precaution is taken when threshing to keep the stocks pure, but as the Corn must pass through the machine, we cannot undertake any guarantee as to the samples being unmixed.
JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

CARTER'S
SEEDS, BULBS, &c.,
CARRIAGE FREE.

*** Five per cent. discount allowed for cash payments.*

CARTER'S
COLLECTIONS OF BULBS
FOR CONSERVATORY AND WINDOW DECORATION,

Price from 10s. 6d. to 84s., including packing, and carriage free.

CARTER'S No. 4 Collection of Bulbs for Conservatory and Window Decoration, including box and packing, and carriage free, price 21s., contains

Hyacinths, 12 in 12 extra fine named sorts	Tulips, Tournesol, 6
Polyanthus Narcissus, 6 in 6 varieties	,, Rex rubrorum, 3
Jonquils, sweet scented, 12	,, La Candeur, 3
Crocus, finest named, 50	,, Royal Standard, 3
Dutch Iris, splendid, 1	,, Yellow Prince, 6
Lilium speciosum, 1	,, Rosa Mundi, 3
Scilla sibirica, 6	,, Duc Van Thol, 6
Snowdrops, extra large selected, 24	Amaryllis formosissimus, 1
	Jasts, finest mixed, 6
	Sparaxis, finest mixed, 6
	Tritelcia uniflora, 6

CARTER'S
COLLECTIONS OF BULBS
FOR CONSERVATORY AND OUTDOOR PLANTING,

Price from 15s. to 84s., including packing, and carriage free.

CARTER'S No. 10 Collection of Bulbs for Conservatory and Outdoor Planting, including box and packing, and carriage free, price 15s., contains—

Hyacinths, 6 in 6 extra fine named sorts for pot or glasses	Scilla Belgica, mixed, 6
,, mixed bedding, 6	Crocus, blue, 50
Narcissus, double, white, 6	,, large yellow, 50
,, Pheasant's eye or Poeticus, 6	,, white, 50
Tulips, extra fine mixed, 12	Anemones, extra fine mixed, 18
,, Fourneoli, 3	Gladiolus Brenchleyensis, 1
,, Rex rubrorum, 3	Iris, extra choice mixed English, 6
,, Royal Standard, 3	,, extra fine mixed Spanish, 6
,, Yellow Prince, 3	Jonquils, Campernelle, 6
Double Daffodils, 6	Ranunculus, extra fine mixed, 18
Star of Bethlehem, 6	Snowdrops, 24

CARTER'S
COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING ONLY,

Price from 10s. 6d. to 84s., including packing, and carriage free.

CARTER'S No. 15 Collection of Bulbs for Outdoor Planting only, including box and packing, and carriage free, price 10s. 6d., contains—

Hyacinths, fine mixed, 9	Crocus, yellow, 25
Narcissus, double white, 6	snowdrops, 25
,, Pheasant's eye, 6	Winter Aconites, 12
Double Daffodils, 6	Gladiolus Brenchleyensis, 3
Tulips, extra fine mixed, double, 6	Iris, finest mixed Spanish, 12
,, extra fine mixed, single, 6	Lilium candidum, 2
,, extra fine mixed, late, 6	,, tigrinum, 2
,, Duc Van Thol, 6	Anemones, finest mixed, 12
Crocus, blue, 25	Ranunculus, finest mixed, 12
,, white, 25	Star of Bethlehem, 6

JAMES CARTER & CO.'S
CATALOGUE OF
HYACINTHS, TULIPS, CROCUS and OTHER BULBS, ROSES, FRUIT TREES, &c.,

Containing full particulars of the above Collections, is now Ready, and will be forwarded Gratis and Post Free on application.

JAMES CARTER AND CO. can strongly recommend TRIFOLIUM INCARNATUM (Italian Crimson Clover) as a substitute for the Clover crop. The seed may be sown at once upon lands where the Clover crop has failed, and will be certain to produce a valuable sward for consumption in May and June.

Messrs. CARTER also prepare a special mixture of hardy quick growing Clovers and Grasses, which if sown at once will ensure a most acceptable green crop in early spring.

Too much importance cannot be attached to the quality of the Seeds used, so as to secure a clean after-stith, and the utmost care is taken by Messrs CARTER to carry out that object.

Sow 1½ to 2 bushels per acre. Price 18s. to 24s. per acre.

BROMUS SCHRÆDERI, if sown early, will produce a heavy crop of forage in spring and several after cuttings in one season. Sow 50 lb. per acre. 1s. per lb.

MUSTARD, TRIFOLIUM INCARNATUM, CARTER'S SUPERFINE ITALIAN RYE-GRASS, RAPE. } Lowest price on application.

All goods carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

EARLY FEED
FOR SHEEP AND CATTLE

MAY be OBTAINED by SOWING DURING SEPTEMBER,

Suttons' Rapid Growing Grasses and Clovers.

This Mixture consists entirely of the quickest growing varieties, and will produce a heavy crop for mowing in April, May, and June, after which it may be ploughed up. Sow 2 bushels per acre. Price **12s.** per bushel.

Suttons' Improved Italian Rye-grass,
The best and most productive in cultivation.

September is an excellent month for sowing our Improved Italian Rye-grass. Price **7s. 6d.** per bushel; cheaper by the quarter. Carriage Free. Also

TRIFOLIUM INCARNATUM, BROMUS SCHRÆDERI, | MUSTARD, RAPE,
And other Seeds for Autumn Sowing.

SUTTONS'
IMPORTED FLOWER ROOTS.
SUTTON & SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS,

HAVING RECEIVED their FIRST CONSIGNMENT of
CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

Suttons' £2 2s. Collection for Open Ground,
Carriage Free, contains

24 fine mixed Border Hyacinths	25 fine mixed Gladiolus
12 ,, Polyanthus Narcissus	25 Duc Van Thol Tulips
25 Pheasant's eye Narcissus	12 mixed Single Early Tulips
25 Double White Narcissus	12 fine mixed Double Tulips
50 Double Daffodils	12 ,, Parrot Tulips
12 large Campernelle Jonquils	12 Gesneriana Tulips
100 fine mixed Double Ranunculus	50 fine mixed Tulips
100 Scarlet Turban Ranunculus	12 ,, English Iris
25 fine mixed Double Anemones	12 ,, Spanish Iris
25 ,, Single Anemones	6 Lilies, of sorts
100 Crocus, in 6 sorts	6 Ferraria Pavonia
100 Snowdrops	12 Dog's tooth Violets
50 Winter Aconites	6 Crown Imperials

Sutton's £1 1s. Collection, for Open Ground,
Carriage Free, contains—

12 fine mixed Border Hyacinths	6 fine mixed Gladiolus
6 ,, Polyanthus Narcissus	12 Duc Van Thol Tulips
12 Pheasant's eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 ,, Parrot Tulips
6 large Campernelle Jonquils	6 Gesneriana Tulips
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 Scarlet Turban Ranunculus	6 ,, English Iris
12 fine mixed Double Anemones	6 ,, Spanish Iris
12 ,, Single Anemones	3 Lilies, of sorts
100 Crocus, in 6 sorts	3 Ferraria Pavonia
50 Snowdrops	6 Dog's tooth Violets
25 Winter Aconites	3 Crown Imperials

Suttons' 10s. 6d. Collection of Flower Roots
For OPEN GROUND, contains a choice assortment for a Small Garden.

Suttons' £2 2s. Collection, for Indoor Cultivation, Carriage Free, contains—

24 fine Hyacinths, by name	6 Persian Iris
12 fine Miniature Hyacinths, do	6 Peacock Iris
12 Polyanthus Narcissus, do.	100 Crocus, by name
6 large Double Jonquils	12 choice Ixias, by name
12 Single Sweet scented Jonquils	6 choice Sparaxis, by name
12 Scilla præcox	1 Cyclamen persicum
12 Single Duc Van Thol Tulips	1 Tropæolum tricolor
12 Double Tournesol Tulips	2 Lilium lancifolium album
50 Early Tulips, 10 sorts	2 ,, ,, rubrum
3 Persian Iris	

Sutton's £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, by name	3 Peacock Iris
6 Miniature Hyacinths, by name	50 fine Crocus, by name
6 Polyanthus Narcissus, do.	6 choice Ixias
6 Single Sweet Jonquils	3 choice Sparaxis
6 Scilla præcox	3 choice Ovalis
6 Single Duc Van Thol Tulips	1 Tropæolum tricolor
6 Double Tournesol Tulips	1 Lilium lancifolium album
25 Early Tulips, 5 sorts	1 ,, ,, rubrum
3 Persian Iris	

Suttons' 10s. 6d. Collection of Flower Roots
For Indoor Cultivation, contains a choice assortment of most useful and showy kinds.

12 extra fine Hyacinths, by Name, for 12s.,
Extra fine Double and Single varieties.

For further particulars, with complete Cultural Instructions, see

SUTTONS'
AUTUMN CATALOGUE FOR 1870,
Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

Five per cent. allowed for cash payments.

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

Dutch Bulbs and other Flower Roots.

CHARLES TURNER has just received his first importation of BULBS, which are unusually fine, and in the best possible condition for immediate orders. If the selection is left to C. Turner, they will be supplied at the following low prices, in fine variety:—

HYACINTHS, best kinds for glasses or pot culture, 6s. to 18s. per doz
,, mixed, for beds or borders, 3s. 6d. per dozen; 25s. per 100
(In ordering Hyacinths, it should be stated whether Single or Double are preferred.)
TULIPS, Early Single, 6s. to 15s. p. 100 } Can be supplied by the dozen
,, Double, 6s. to 15s. per 100. } at proportionate prices.
,, Van Thol, 9d. per dozen; 5s. per 100.
NARCISSUS, 1s. 6d. to 3s. 6d. per dozen.
JONQUILS, 2s. 6d. to 4s. 6d. per dozen
SNOWDROPS, Single, 2s. 6d. per 100; Double, 3s. 6d. per 100.
CROCUS, in large variety, 2s. 6d. to 4s. 6d. per 100
ANEMONES, and other Bulbs for the season, at equally low prices.
LILIUM AURATUM, extra strong flowering bulbs, 2s. 6d. to 7s. 6d. each.
LILY of the VALLEY, imported clumps, 18s. per dozen
SPIRÆA JAPONICA ,, 15s. and 18s. per dozen.
Descriptive CATALOGUE on application

Also CATALOGUE of Auriculas, Azaleas, Carnations, Chrysanthemums (large), Chrysanthemums (Pompon), Cinerarias, Pelargoniums (in 11 classes), Pœonies, Pinks, and Roses; as well as a Descriptive CATALOGUE of Strawberries, Fruit Trees, &c.
The Royal Nurseries, Slough.

JOSEPH BAUMANN, NURSERYMAN, Ghent, Belgium, begs to offer—

100 LATANIA BORBONICA, in pots since March, 30s. to 40s.
100 WASHINGTONIA, good plants, 30s.
100 RHODODENDRONS, best hardy sorts, 1-yr. grafted, £4.
100 ,, do., good plants, with flower buds, £8, £10, £12.
100 AZALEA INDICA, with flower buds, £4, £5, £6.
100 AZALEA HARDY GHENT, best sorts, without flower buds, £5.
100 AZALEA PONTICA STOCKS, 15s. and 18s.
100 MAGNOLIA LENNI, £10 to £16.
100 CEDRUS DEODARA, in small plots, £1.
100 THUJA ELWANGERIANA, good plants, £2, £4.
100 ABIES NORDMANNIANA, 1½ to 2 feet high, and more through, fine plants, £12. [Three months' credit.]

ROYAL LEAMINGTON SPA.—HORTICULTURAL SHOW, to be held at Leamington, on TUESDAY and WEDNESDAY, September 13 and 14, in conjunction with the Warwickshire Agricultural Society.

President—The Right Hon. the EARL of WARWICK.

SPECIAL PRIZES OPEN TO ALL ENGLAND.

Class B., No. 24.—12 Ornamental Foliage Plants, 1st Prize, £10; 2d, £5; 3d, £2. Class B., No. 26.—12 Stove or Greenhouse Plants, 1st Prize, £10; 2d, £5; 3d, £2. Class B., No. 37.—For the best Collection of Plants, arranged for effect as for a Conservatory, 1st Prize, £5; 2d, £3; 3d, £2. Class E., No. 38.—For the best Basket or Stand of Plants, arranged for a drawing-room, 1st Prize, £2; 2d, £1; 3d, 10s. Class C., No. 39.—For the best 36 Spikes of Gladioli, 1st Prize, £5; 2d, £3; 3d, £2. Class C., No. 43.—For the best 48 Roses, single stems, 1st Prize, £5; 2d, £3; 3d, £2. Class D., No. 53.—Fruit, 12 varieties, exclusive of Vines, 1st Prize, £5; 2d, £3; 3d, £2.

Latest date of ENTRY, SEPT. 9. Early Entries are particularly requested. Particulars, with Forms of Entry, may be had from Mr. J. MEASURES COOKES, Honorary Secretary, Leamington.

The Gardeners' Chronicle
SATURDAY, SEPTEMBER 10, 1870.

VENTILATION, discussed from a theoretica standpoint, is still a vexed question, for though all admit its necessity, few are agreed as to the means by which it should be effected. Hence for the last half century we have had various schemes propounded, many of them of homœopathic application, and many attempts to fill the full bottle, with an expenditure of vast pains for the purpose. One fact should be quite patent, to ventilate an apartment of any kind there must be an outlet as well as an inlet; and for the former to act in the most effective manner, the nearer it is to the highest part of the room the more certain and effective must be its action; hence any scheme based upon introducing fresh air at the lowest level, without providing a corresponding outlet at a higher point, is built upon a supposition which never can be effective. True, if you warm the fresh air as it is introduced, it will so dilute that of the apartment as to do some good; but if it is let in cold, then it will lie at the lowest place, and cold feet must be the consequence. The plan of passing fresh air over hot plates, as is practised in the majority of hot-air stoves, and, horticulturally applied, in the Polmaise system —first scorching the pure fresh air and then saturating it with extraneous moisture—is the wildest scheme that ever was thought of; and all schemes which seek to go the same way are wrong in principle, and, consequently bad in practice.

What is it, then, that we want? Why, if we could get it, we should like our apartments, and the apartments of our plants, flooded with the pure bracing air of the mountain-top, with its oxygen and its ozone in its native state. Must it not then be foolish to pass it over a surface that will drain it of every atom of moisture, send it in its parched state into the apartment, and then call it fresh air? It may be fresh, inasmuch as it is not poisoned by the products of animal combustion and respiration, but it is no more the pure air of the open field which makes the pent-up citizen feel 20 years younger when he breathes it, and sends thousands careering to the sea-side or the mountain, than it is the perfume of "Araby the blest." If pure air is wanted, we must go upon a different principle of admission to that; and if we heat it

all—and we must do so for the greater part of the year—it must be so passed over warmed and moistened surfaces, not a hot-plate and a vapour-bath, that it shall pass to its destination warmed but in its native purity. This may be effected either by passing the air over a large heating surface at a low temperature—the best plan, or we may generate heat at a high temperature upon a small scale, and thus admit it in the necessary quantity in a second chamber to warm the large volume of air that may be requisite for our purpose. Thus the pure air may be in some measure deteriorated, but at the same time be much more pure than if the whole body had passed over the heated surface.

This is looking at ventilation as more immediately applicable to animal subjects, but vegetables require it in the same ratio, especially those tender subjects which are natives of tropical climes, or which we force at a cold and unnatural season. They feel the cold blast just as much as ourselves, and generally suffer more from it.

Now the question might be asked, do plants really require the amount of ventilation which some consider indispensable? KNIGHT and other garden philosophers of 30 to 40 years ago contended that ventilation was not necessary, except for the purpose of cooling the atmosphere of plant houses, and hence the then fashionable curvilinear-roofed houses were constructed almost without any provision for ventilation at all; indeed we recollect a large frame, containing a Vine or Vines, in the garden of the Horticultural Society, which had the lights screwed down so that no air could be admitted. True the plants grew, and so long as there was moisture in the atmosphere looked well; but directly the vapour bath was exchanged for a dry air stove then scorching set in, and the natural consequence, immature wood. Growth, it is certain, may progress, so long as the temperature is not in excess of the natural requirements of the plant without their being very injuriously affected, as witness plants in Wardian cases and other close places; but let us come to the maturation of wood, the inducing of the flowering and fruiting principle, and then how do we stand? Polmaise produced for a few years some large bunches of Grapes—the result, most likely, more of healthy root action than of the system of heating; but they did not colour, nor could they have much flavour, the system of bottom ventilation being entirely useless for that purpose. PENN grew his plants well, but obtained little good fruit except Cucumbers; and there are thousands of houses in the country at the present time in which the fruit is spoiled or spoiling for the want of "the chink of air" in the early morning. But oh! says the "handy man" attendant, "we do not give air until the temperature rises to 70°, and then by that time the fruit is beautifully dewed over," and when that dew disappears the bloom is gone also. Hence the reason why old dilapidated houses frequently produce finer fruit than the modern, improved (?) new ones. Light, and especially sun light, is of immense importance in the maturation of fruit, but there must be reason in its application. Strip your Peaches, Nectarines, or Apricots, as they show signs of ripening, and you get splendid colour and flavour; expose your Black Grapes in the same manner and they will be worthless, deficient in both colour and flavour; yet, strange as it may seem, thin out the leaves of your Muscats and other White Grapes when they begin to lay on the finishing coat of colour, and you secure the rich golden tint you so much covet, and flavour also. The maturation of fruit depends mainly upon the volume of air which can be brought in contact with it, the action depending upon the oxygen of the atmosphere combining with and carrying off the acid of the fruit; and hence where the climate is sufficiently warm for them to ripen thoroughly, Pears, Apples, or Plums, are always richer from standard trees than from a wall, just because there is a free circulation of air around them. Mr. HENDERSON, of Cole-Orton, whom we referred to recently, assures us he did not point so much to the few broken squares in the roof of his vineries as the source of colour in the Grapes, as to the wide, open laps between the small squares of glass, "the chinks," far more numerous than the casual observer would take cognisance of.

Mr. ORMSON, in his new scheme of ventilation, as exhibited at Oxford, has provided us with a few "globule" doses, which are liable to several of the objections which have been already urged. Practical men can only accept his proposition as an instalment, the full settlement of the account being left to be paid in a much more simple and efficient manner. "Fix sufficient heating surface in the front of the house," said one of the foremost living gardeners, after examining Mr. ORMSON'S scheme. "Give me a large continuous opening opposite to it, and a larger continuous opening at the top of the house, with sufficient coarse woollen netting to cover both, and

> 'Let the storm pelt us,
> Or fair weather warm,'

I will ask for no further aid in the way of ventilation."

WE have seen with much satisfaction that the ROYAL COMMISSION, appointed by Government to inquire into the BEST MODE OF PROMOTING SCIENCE, has not been idle during the past session, but has held many meetings in rapid succession, which looks like work. We cannot doubt that some important step in favour of science and scientific men will flow from its labours. It may not be inopportune, therefore, if we draw attention, in a general way, to one or two points which have probably been under the consideration of the Commission, and which at any rate are likely, sooner or later, to be brought under discussion in Parliament in connection with their report.

The better endowment of science and scientific men is one of these subjects. It is notorious that of all the barren and unprofitable trades that a man can turn his wits to in a pecuniary point of view, the most barren and unprofitable is science; and the more abstract the science, and the deeper the thought, and the greater the mental talent required to master it, the less the return. With one or two exceptions the only career open to, and the only prizes accessible to, a man of science, are professorships or similar posts, with salaries varying from £50 to £500 or £600 a year—salaries exactly on a par with those of clerks of different grades in a merchant's office: and the total number of such scientific posts in the kingdom will probably not amount to 100. Notwithstanding the miserable prospect which science thus holds out to her votaries, many whom Providence has endowed with the special talent required for her researches have it so strongly, that, in defiance of poverty and difficulties, they abandon themselves to it, and confer lustre or wealth on their country by their discoveries, while they themselves pass their lives in indigence and distress. Even the barren recompense of honour and distinction is rarely awarded to them—never in due proportion to their deserts.

Ought this to be so? Do we wish to discard everything from our national attributes, but the money-making faculty? We imagine not. Suppose we blotted out from our records all our scientific men and their discoveries, from NEWTON downwards, how should we as a nation look then? Would the most practical among us wish to see such a result? If not, should not some means be taken by the nation to provide moderate support for the forlorn hope who devote themselves, or are devoted by Nature, to this most unremunerative pursuit? The only fund from which an occasional trifling dole reaches this class, is the pension fund of the Civil List. It is pitiable to read of the miserable assistance afforded by it to men of scientific eminence, and their widows and children. Is there not something humiliating to the nation in such inadequate recognition of their work? We could understand its being ignored altogether—we could understand the reply, "We never bade you devote yourself to science; you have worked, but we never ordered your work, and we will not pay for it;" but if we admit that unordered work of which we receive the advantage and the credit, although legally entitled to nothing, ought, from the higher view of the moral sense, to be recognised and recompensed, then we do say that such inadequate recognition and recompense as the Civil Pension List gives is worse than none, and is a discredit to the nation. It was not always so. Science was once amply endowed. The whole of the endowments now held by the clergy were originally as much intended for the support of learning as for that of religion. When these endowments were made, science and religion were united in the same persons, and they were given to the holders as much because they were men of learning or science as well as men of religion. When the two came to be separated, when science found itself another home, the endowments remained with religion; but the original intention of the destination was most certainly originally to both. It was the learning and science of those days which alone made the often debased religion respectable, because they were found nowhere but under the same hood; and had they then existed in separate establishments and under separate titles, can we doubt that the endowments would have been divided between them? Strict moral justice would require restitution and readjustment. That we cannot expect, and we do not know that we would wish it; we would rather not have to consider the question. But whatever may be the case with the general question, we have no doubt as to the course that ought to be taken with every endowment that can be dealt with without encroaching on the rights of persons. In all college and university endowments it is only the merest justice that science should be allowed a fair share of everything intended for learning. Learning in those days was only another word for what is called science in these. Originally learning did not mean Latin and Greek, for these were the native languages of the learned. Neither did it mean mathematics; philology and mathematics are only accessories to natural science. It is a misconstruction effected by the influence of these very endowments that has given Latin and Greek philology an exclusive title to the name of learning. Let science resume her proper place in the front—such a resumption would do something; and let the nation do the rest, to lift up science from the state of destitution into which it has fallen.

Were this once recognised as a duty by the State, we should not only be able to make suitable provision for the scientific servants of the State (let them have ample but not lavish means), but other important aids to the progress of science would become available. Our learned societies might be provided with suitable meeting rooms and assistance towards publishing their transactions. Our museums might be multiplied, enlarged, and utilised, and our entire system of scientific education might be remodelled and placed on a more extended and satisfactory footing. Do we dream when we hope that some or all of these things may result from the Commission lately sitting? We trust not. We do not ask or expect all at once, but whatever be done, every effort should be used to make it something that will be progressive, something that will go on increasing of its own accord without the necessity for continual windings up or fresh applications.

—— THE VINE DISEASE and its cause and remedy continue, as well it may, to occupy the attention of scientific men. According to *Les Mondes*, MM. PLANCHON and LICHTENSTEIN, of Montpellier, have definitely established the specific identity of the leaf-Phylloxera and the root-Phylloxera. (See our columns, 1869, p. 763.) "On July 12," they write, "we shut up some fresh and healthy Vine roots by the side of some leaves loaded with galls, obtained from M. LALIMAN, of Bordeaux. Some hundreds of young Phylloxeras had escaped already from these galls. Not finding a young leaf on which to develope new galls, the insects fixed themselves on the roots, and 12 days after they had formed on these several groups, among which were discovered adult females and young ones of divers ages. The youngest had no apparent tubercles, but those of medium size, as well as the adult females, bore the characteristic tubercles, and all, by their forms, mode of life, dimensions, and the colour of their eggs, proved absolutely identical with the subterranean Phylloxeras which live normally on the roots." It now remains to trace the changes from one form to another, and to ascertain the cycle of transformations by which the winged insect is brought forth. M. MILNE-EDWARDS has ascertained that the opened galls are not always abandoned and empty; and he directs the attention of Vine-growers to this fact, in order that they may gather all affected leaves and burn them. M. LICHTENSTEIN'S observations go to show that the only means of hindering the irruption of the Phylloxera over clean Vines is to stamp out the Phylloxera infested ones. The result of the attacks of the Phylloxera is no longer a matter of doubt. M. DE SERRES, of Orange, has put the insect on healthy Vines, and it has killed them; M. FAUCON, of Graveson, has, on the contrary, cleared some very much infested Vines by prolonged submersion, and has saved them—destroy the Phylloxera and you save the Vines. Practically, however, the only means of stopping the extension of the malady consists in destroying the plants which are attacked, for the insect, once thoroughly established underground, is otherwise indestructible. This done, however, nothing is easier than to hinder its dissemination from infested places, since this dissemination must take place by means of

the winged insects, whose progenitors form on the leaves galls which are very easily recognised, and consequently it is only necessary to organise, from May to August, an active search among the Vines, and to have the branches, whose leaves bear galls of the Phylloxera, taken away and burnt. M. Laliman, of Bordeaux, further points out that the Vitis æstivalis, of America, seems to be free from the attacks of the Phylloxera, at least in the Gironde this has been the experience of the last three years; and he asks the Minister of Agriculture to make further plantations of this kind of Vine, in order to convince those who are sceptical. The French writers seem entirely to ignore the circumstance that the insect was described by Prof. Westwood and Mr. Berkeley in our columns, and that the identity of the insect on the leaf with that on the root was established as long ago as 1867 by Professor Westwood (see *Gardeners' Chronicle*, 1869, p. 109).

—— At the meeting of the American Association at Troy, on August 23, Professor Hill read a curious paper on the Compass Plant, a wild Sunflower of the western prairies, introduced to the notice of the scientific world 30 years since by General Benj. Alvord, U.S.A., and to the civilised world in general by Longfellow in his "Evangeline." Some of the American botanists having denied that the plants pointed to the north, the Rev. Thomas Hill, of Waltham, Mass., measured their bearing on the prairies, and raised seedlings in his own garden. The leaves of the young plants stand upright on long leaf-stalks, and when three or four inches high twist their stalks so as to bring the edges of the leaf north and south. Dr. Hill's measurements showed that five-sevenths of the leaves came very nearly into the meridian. The scientific name of the plant in question is Silphium laciniatum.

—— It is to be regretted, independently of the horrors of the general situation, that the terrific war now raging should put forth its destructive hand to arrest the development of Gardening in Paris, and that some of the fair scenes we have so often alluded to should be so ruthlessly annihilated. Yet so it is. A few days since the daily papers told us that—"The once beautiful Bois de Boulogne is turned into a great farm, dirty and uncared for: 20,000 oxen and 300,000 sheep are grazing there. The green grass has disappeared, the shrubs are stripped of their foliage, the borders of the lakes are trampled into quagmires of filth—in fact, the Bois de Boulogne has ceased to exist, it is closed as a public promenade." We also read in reference to Strasburg, whose Museum, so rich in collections of fossil plants, and Library have been destroyed, and whose noble cathedral has not wholly escaped disaster, that the Botanic Garden has been converted into a cemetery, burials being no longer performed outside the city.

—— We learn that the Dutch Scientific Society of Haarlem has proposed a series of questions to be answered by the 1st of January, 1872, among which the following are the most important:—1. To define, by anatomical and chemical researches, the mode of origin and the function of wax in living plants. 2. To explain, as much as possible by the aid of original researches, the history of the development of certain malformations and excrescences produced in the Oak by different gall-making Hymenoptera. 3. To decide experimentally whether the roots of plants give rise to particular excretions, and in that case to establish the nature of the excreted matters. 4. To study the works of Huyghens, both with reference to the state of knowledge at this time, and with reference to its actual state. 5. The value of the constant of aberration, deduced by Delambre from the eclipse of the first satellite of Jupiter, and that which results from the more recent astronomical measurements, present a difference at present inexplicable. The observations respecting the eclipses of the first satellite of Jupiter are required to be collated, and a new determination of the constant aberration to be deduced. 6. To make a new series of researches on the influence which the different colours of the spectrum exercise on the respiration of the green part of plants. 7. To give a monograph of the flora of the sandhills of Holland. 8. To give a systematic description of the marine Phanerogamia.

—— Good news for collectors of Fungi. In addition to Mr. Worthington Smith's Clavis, alluded to on another page (1221), we learn that the first part of Mr. M. C. Cooke's "Handbook of British Fungi," containing descriptions of above 1000 species, mostly of the larger Fungi, is ready for delivery to subscribers on receipt of the subscription (half-a-guinea), with 6*d.* for postage of the two parts. It is hoped that the second part, concluding the work, will be ready about Christmas. The book may be had on application to Mr. M. C. Cooke, 2, Junction Villas, Upper Holloway.

—— Some time since we announced that a party of American Horticulturists, fitly led by the Hon. Marshall Wilder, had left the Eastern States of the Union to see with their own eyes the glories of the Western State on the Pacific shore. On their arrival in California they were received with great enthusiasm and much speech-making, of a kind that would make us sober folk mute. The welcome was, as it should have been, warm and earnest, and the party have returned delighted and astonished with the wonders and fertility of vegetable life in California. We are promised particulars of what was seen on this memorable progress, from which, no doubt, much that is interesting to European horticulturists may be gleaned.

—— It was formally announced at the meeting of the Royal Horticultural Society on Wednesday last, that the invitation which had been received from Nottingham had been accepted by the Council, and that the next Provincial Show of the Society will be held in that town. The precise date of the exhibition is not yet fixed; but now that the Society has determined to part company from the agriculturists, it will be at liberty to select its own time, and to hold its exhibition at a period more favourable to such displays than was the case on previous occasions.

—— From "Cosmos" we obtain the information that M. Böttger has produced a new test-paper which is highly sensitive towards the alkalies and alkaline earths. The reagent is a magnificent colouring matter, obtained from the leaves of Coleus Verschaffeltii, upon digestion for 24 hours with absolute alcohol, to which a few drops of sulphuric acid have been added. The paper is prepared for use by the usual process. The colour is a splendid red, which passes more or less rapidly into a fine shade of green, by the action of the alkalies or the alkaline earths. It is far more sensitive than turmeric; it is unaffected by carbonic acid, and will indicate the presence of the least traces of the carbonates of the alkaline earths in water. A moistened strip of the paper, when held at the opening of a gas-jet, immediately assumes a green colour, if ammonia be present.

—— The Maximum Temperature of the Air in England during the Week ending September 3, ranged from 76°.2 at Portsmouth to 64° at Newcastle; the mean of all highest for the stations south of Sheffield was 71°.6, and for those to the north of Nottingham was 67°.9. In Scotland it varied from 71° at Paisley to 63°.5 at Greenock, with a mean for all stations of 66°.1. The Minimum Temperature in England varied from 49°.5 at Liverpool to 38° at Manchester and Hull, with a mean for all stations of 42°.3. In Scotland it varied from 46° at Greenock to 38° at Paisley, with a mean for all stations of 42°.4. The Mean Temperature for the eight southern stations of England was 56°.1, for the eight northern was 54°.5, and for the several stations in Scotland was 52°.6. The Rainfall in England varied in amount, from 1.88 inch at Newcastle to 0.20 inch at Wolverhampton, with a mean for all stations of 0.71 inch. In Scotland the amount collected at each of four stations exceeded 1.50 inch, the mean for all stations was 1.15 inch.

—— We omitted to state that the very pretty and probably hardy Bignoniaceous plant, described by Dr. Seemann in our last issue under the name of Campsidium chilense, was introduced to this country by Mr. William Bull, of Kings Road, Chelsea, and that that gentleman is the sole possessor of the stock.

New Garden Plants.

Oncidium splendidum, *A. Rich.*

Pseudobulbis brevibus rotundato-semipyriformibus subcompressis monophyllis; foliis oblongis acutis, racemo grandiflore; sepalis petalisque cuneato-oblongo-ligulatis acutis, labello basi utrinque rotundato auriculato ab unguc latissimo brevissimo flabellato obreniformis, carnis geminis semiglobatis in unguis basi, anteposita carina longiori impari; columnæ brevis alis rotundatis.—*Oncidium splendidum*, A. Rich. MSS.; Duchartre in Journ. Soc. Imp et Centr. d'Hort de Paris, 1862, p. 50. Van Houtte, Flore des Serres, xvii., p. 11, cum tab.

Folia obscura viridia; sepala et petala flavo-viridula brunneo-purpureo-fasciata; labellum profunde aurantiaco-flavum; columnæ flavida auribus albidis.

Yes! there are mimetic plants. Do not trouble living botanists about their sufferings from mimicry, but remember that a Veronica and a Podocarpus, a Lomaria and a Cycad were confounded; that Utricularias have been mentioned in tropical letters as queer "Orchids;" that Croomia, the second genus of Roxburghiaceæ, induced some people to regard it as a Berberid; that Phyllanthus fluitans mimics a Salvinia. After all, such mimicry may be endured—it is just nice fun for celebrating some botanical April Fool's day, and if a botanist be caught, he has the right to laugh with those who discovered the blunder. The most terrible mimetic plants, however, are the nearest allies, the species of the same genus. And such an one is our Oncidium splendidum. You get a single flower—in a tin case, under favourable but rare circumstances, more generally in a broken wooden or pasteboard box,—of course without the least communication about its habitat and growth. You make out the short and broad claw of the lip, the side calli standing wholly between the auricles. But how about the other flowers? Do you not remember that some (Continental) correspondents sent you abnormal flowers in order to get new names? And is not the old Mexican Flor de Muerto just as well entitled to indulge in its own domestic mimicry on its own account as another species would be entitled to take the disguise of the old plant published in 1844? All further epistolary inquiries are wont to be fruitless, some excellent correspondents excepted—*rarissimæ aves!*—and then you may amuse yourself looking at your surprising flowers. Thus we thought that silence was golden, when in 1862, we believe, we obtained bit by bit homœopathical doses of single flowers (even now we have no inflorescence—*avis aux lecteurs!*). The necessary information never came. It was Monsieur Duchartre, of the Institute, who, assisted by Dr. Prillieux, made out that the old Parisian tale of the plant having had a name by Achille Richard (who delighted in giving a new name to nearly every Orchid coming in his reach), was well founded. We have now at hand a typical flower. We have M. Van Houtte's good representation, and we have seen a plant at M. Linden's, at Brussels, so that all scrupulous sorrows are lost. We know now that the very short unguis of the lip, its very broad anterior part, the position of the side keels between the auricles are as perfectly normal, as probably the shortness of the pseudobulbs may be. According to M. Van Houtte, the zealous friend of every interesting plant, the plant came from Guatemala, and was introduced by M. Herment at Caen. He gave specimens to Messrs. Thibaut & Keteleer, of Paris, then these came in the hands of Messrs. Van Houtte and Linden. It would appear that the Mexican Oncidium funereum, Lex. (O. Barkeri, Lindl., O unguiculatum, Lindl., Odontoglossum tigrinum, Lindl., O. unguiculatum, Klotsch) has much longer and flatter pseudobulbs, also lighter leaves. Most probably the plant does not exist in the form of specimens collected at its habitat, in any herbaria. Hence the indication of "Guatemala" must be understood *cum grano salis*. Poor Oncidia are not very much esteemed by rich amateurs, yet those who like O. macranthum, serratum, Marshallianum, may also give a friendly certificate to our species, and to O. funereum; these two, at least, would appear to possess better marks of distinction than certain so called species of Encephalartos. *H. G. Rchb. fil.*

CULTIVATED PASSIONFLOWERS.

The last edition of "Paxton's Dictionary" enumerates more than a hundred kinds of Passionflower, as known in British gardens, and some ten or a dozen species of Tacsonia. If we suppose, as is indeed the case, that many of these names are synonymous—names of hybrids or of slight seedling varieties—and that others are recorded in error, there still remains a considerable number of forms whose identity is vouched for in botanical books, and illustrated in trustworthy collections of plates, and confirmed by native specimens in herbaria. They are or have been in cultivation then. That "have been" is important. From a study of the genus we have become tolerably familiar with the forms described or figured in books, and, thanks to the kindness of many correspondents, we have had good opportunities of ascertaining what kinds are now really in the country. From Kew, from Edinburgh, from numerous nurseries and private sources, flowers have been forwarded to the writer, with that unvarying courtesy which, to judge from its promptitude, must be as agreeable to pay as it has been pleasant to experience; and what is the result? Where are the gorgeous flowers, so many of which are depicted in the "Botanical Magazine," the "Botanical Register," and other less accessible periodicals? We do not think we shall be far wrong in replying that hardly more than a fifth of the entire number of species mentioned in garden records are now to be found in British gardens.

On the other hand, a few new forms have been introduced of late years, while the facilities for hybridisation and cross-breeding are such that hybrid varieties are becoming more and more numerous every season. A botanist has no real right to lament over the increase of hybrid varieties, however justly he may deplore the loss to our collections of so many fine species. The interest attaching to the hybrid varieties and their production is very great indeed, and those who think that a botanist must of necessity disregard or dislike such cross-breeds, forget that a botanist is not merely a registrar or portrait-painter—in words or with brush—but a physiologist also. The life-history of Passionflowers is unusually interesting, and the hybridisers are in many cases unconsciously, but none the less surely, unravelling some of its mysteries.

The loss to our gardens of many fine species is, however, a matter for real regret. On the other hand, some which, from a gardening point of view, might be dispensed with or retained in botanic gardens, nevertheless—weeds that they are—hold their ground. Dispersed as weeds throughout the tropics, their seeds get continually imported with other things, and they thus are found occupying a place in collections to which their beauty hardly entitles them.

Again, carrying out the principle that there are more fish in the sea than ever came out of it, it must be remembered that there are still several gorgeous species perfectly well known to botanists, and which have never yet made their appearance in cultivation. We have reason to hope that M. Wallis' excursions in North Brazil may have resulted in the introduction of some of the fine forms of that region, and drawings of some of which, made by that most successful collector, by the kindness of Prof. Koch, of Berlin, we have had the opportunity of inspecting.

The first species introduced into European gardens was, no doubt, the P. incarnata, a native of Florida and Central America, extending southwards, at least,

if P. edulis he considered as a form of it, as far as South Brazil. The true incarnata is now hardly to be met with in gardens; everywhere it has been elbowed out by P. edulis. At any rate, the P. incarnata is the one in which the semblance of the parts of the flower to the instrument of our Lord's passion was first observed. The cross, the scourge, the hammer, the nails, the crown of thorns, even ten of the Apostles—Judas, who betrayed, and Peter, who denied, being absent—all may be seen by the imaginative in these flowers. Monardes (1593) was the first to call attention to this peculiarity.* Soon afterwards, the plant was in cultivation at Bologna and at Rome. There is some little confusion as to the exact date, but it may safely be said to have been in cultivation in Italy before 1609. Thence it probably was introduced into Belgium, and is known to have been grown in this country in 1629. Parkinson figures it under the name of "Maracoc sive Clematis virginiana—the Virginia Climber." He associates it with Clematis, because, as he says, "unto what other family or kindred I might better conjoin it I know not." Parkinson distinctly mentions it as "grown from seed such as hath been brought to us from Virginia," so that it would seem we were not, as Morren supposes, dependent on Belgium for the introduction of the plant.

Parkinson, who appreciated the flower, calling it the "surpassing delight of all flowers," had very little sympathy with the imaginative description of Monardes, as will be seen from the following extract. Now-a-days we may perceive analogies without being necessarily deemed superstitious. "Some superstitious Jesuite would fain make men beleeve that in the flower of this plant are to be seene all the markes of our Saviour's passion, and therefore call it Flos Passionis, and to that end have caused figures to be drawne and printed, with all the parts proportioned out, as thornes, nailes, speare, whippe, pillar, &c., in it, and all as true as the Sea burnes, which you may well perceive by the true figure, taken to the life of the plant, compared with the figures set forth by the Jesuites, which I have placed here likewise for every one to see: but these bee their advantageous lies (which with them are tolerable, or rather pious and meretorious), wherewith they use to instruct their people; but I dare say God never willed his Priests to instruct his people with lyes, for they come from the Divell the author of them. But you may say I am beside my Text; and I am in no doubt you will thinke I am, in this, besides my selfe, and so nothing to be beleeved herein that I say. For for the most part it is an inherent errour in all of that side to beleeve nothing, be it never so true, that any of our side shall affirme that contrarieth the assertions of any of their Fathers as they call them; but I must refer them to God, and hee knoweth the truth, and will reforme or deforme them in his time. In regard whereof I could not but speake (the occasion being thus offered) against such an erroneous opinion (which even Dr. Aldine, at Rome, disproved and contraried both the said figures and the name, and seek to disprove it as doth (I say not almost, but I am afraid altogether) leade many to adore the very picture of such things, as are but the fictions of superstitious brains; for the flower itselfe is far differing from their figure, as both Aldine in the aforesaid booke, and Robinus, at Paris, in his 'Theatrum Floræ,' doe set forth; the flowers and leaves being drawne to the life, and there exhibited, which I hope may satisfie all men that will not be perpetually obstinate and contentious."

We must do Parkinson the justice to say that, if he be somewhat uncharitable, he gives an excellent figure of P. incarnata, but he seems to have overlooked the fact that "the Jesuites figure of the Maracoc" (Murucuia), as copied by him, does not represent P. incarnata at all, but some other species more nearly resembling Passiflora glandulosa, of which it has the simple leaves and the glandular footstalks. Certainly the flower in this wonderful specimen is a "make up." Supposing the "corona" of threads to represent the crown of thorns, and the stamens the five nails, the Jesuit artist has just reversed their natural position; the five stamens—nails—are at the base of the column, while a terribly material crown of thorns occupies the proper place of the stamens at the top of the column. The three stigmas, too, are certainly unusually like spear-heads, so that there can be no question that Aldinus was quite correct when he stated that with the aid of a little straining of the imagination the emblems of the Passion might be as well found in a great many other flowers. It must also be remembered that no two of the older authors agree, one with the other, as to the precise significance of the several parts. By some the coronet is the type of the crown of thorns, while others see in it the "parted vesture." The ovary is for some the sponge dipped in gall; the stamens represent with some the nails, with others the five wounds, each author giving a slightly different version; and Ferrari compares the "column" to the pillar to which Christ was attached, and not to the cross, because the gentle nature of the flower did not admit of its reproducing the emblem of the gibbet!

Passiflora lutea, a North American species, of little pretensions to beauty, was the next species introduced; but it is doubtful whether it is to be found now in English gardens. P. hirsuta and P. minima, both inconspicuous kinds, are recorded in Belgian gardens as early as 1660, and still retain a position in English gardens, though having little to recommend them from a gardening point of view.

P. cœrulea, a South Brazilian species, was introduced in 1625, and still holds its ground most deservedly. About London, as in Dublin, it is quite hardy, and, whether in foliage, flower, or fruit, is always interesting and beautiful. P. laurifolia is reputed to have been introduced in 1690, but from that time to the middle or end of the 18th century but few species were introduced. In 1763 the Granadilla (P. quadrangularis) was introduced, and was followed some ten years later by its near ally, P. alata. In 1728 Martyn commenced the publication of his "Historia Plantarum Rariorum," in which we find several figures of plants growing in the Chelsea Garden. These were drawn by the famous flower painter, Van Huysum, and included good figures of P. serratifolia, introduced to Chelsea in 1731, but we fear lost in cultivation. P. suprea, grown from seed sent from the Bahamas by Catesby, in 1740, and of P. holosericea and P. vespertilio, sent from Vera Cruz by Houston.

Dillenius figures P. vespertilio in his "Hortus Elthamensis," and Jacquin the elder gives excellent illustrations of several species, most of which, except Passiflora gracilis, were known in gardens previous to his publications.

In 1745 Hallmann, a pupil of Linnæus, gathered together the fragments left by his predecessors, and formed a monograph in which he included 22 species, a knowledge of some of which was obtained from cultivated specimens in the Upsal Garden. Lamarck also and Jussieu availed themselves not only of herbarium specimens, but of living ones in the Jardin des Plantes at Paris; while Cavanilles, in his tenth dissertation, published in 1790, figures several from specimens in the gardens of Paris and Madrid. De Jussieu not only founded our present Passifloreæ nearly as it stands now, but separated the Tacsonias from the Passion-flowers proper—a distinction which some of the moderns ignore, but to which we, for reasons hereafter to be cited, are disposed to give in our adhesion. Tournefort had previously separated Murucuia as a genus distinct from Passiflora—a separation for which there seem less weighty grounds than in the case of the Tacsonias; while at a more recent period Labillardière established his Disemma—better written Distemma—a group the limitations of which appear to us so defective as to render it untenable, though truly in some two or three species the double crown, one filamentous one membranous, furnishes a ready means of discrimination. In a subsequent notice we may take occasion to allude to some of the physiological peculiarities of the genus, and to the distinctive characteristics of those species best suited for cultivation. *M. T. M.*

* Of course, the poets have not been slow to avail themselves of a suggestive a theme. thus Rapin describes the flower:—

"Flos alte maisus crispato margine frondes,
Caule in sublimi vallo prætendit acuto;
Spinarum in morem patet os, et Christe tuorum
Instruptus foliis summa instrumenta Dei rum.
Nam surgens flore e medio quot stamina cernis,
Sursum tolit apex clavos mutatus adunco."

The unknown author of the Portuguese poem, entitled "Paraguassu" (quoted by Southey), is even more precise in his details, though, for in some lines the translation of which we owe to Dr. Wolfwitsch), not content with pointing out the similitudes of the other parts of the flower, he sees in the red spots with which the "column" is marked, the analogue of the Saviour's blood.

GRAPE GROWING AT ELY.

THERE are several vineries in the gardens of E. Harlock, Esq., and ripe Grapes are generally cut from March to January; but as I was anxious to give a vivid photograph of the fruit trees in pots (see p. 1156), I kept them clear of all other fruits; and now I purpose directing attention to only one vinery out of several. It is a span-roofed house, 20 feet wide and 150 long, with a 16 feet rafter on each side. The house is divided into three divisions, of unequal lengths; the largest and latest, if I remember rightly, being 57 feet long. The Vines were planted in 1862 or '63, and the average yield from them has been about 17 cwt. of Grapes. Larger bunches and finer berries may be seen elsewhere, but in the heavy yield of serviceable fruit this house is seldom if ever excelled. The Vines are planted inside the house, near to the wall, and the entire floor forms their border. It is 2 feet deep, and is formed of the following mixture:—Stiff loam, road sweepings, home-made charcoal of a great variety of woods, charred loam charred with the charcoal, horse droppings, and the refuse of bricks and mortar from old buildings. The proportions were somewhat as follows:—Six inches sweepings and loam, 1 inch charcoal, 2 inches charred earth, 4 inches mortar, and 2 or 3 of horse droppings. The whole was well turned over, and formed a light porous mass, which it still continues, unless on the surface, where constantly treading has made it hard and firm. No drainage was given, as there is no water to be found in the soil within 8 feet of the surface; neither was any border made outside the house, though the roots are free to range out if they will, and the ground is left uncropped for 6 feet all round the outside.

The surface of the border is top-dressed most seasons with about 4 inches of pig and horse manure. No manure-water is given. The Vines are watered with river-water, which is, however, so hard that it leaves lime spots on all it touches. The Vines are never syringed after the buds become prominent.

More water than usual has been given to the borders this year, partly on account of the drought I presume, but also with a view of preventing shanking, which manifests itself to some extent in most seasons. "Why, no wonder the Grapes shank," I exclaimed, "you load the Vines barbarously." The answer was puzzling, and I have heard the same answer before many times. "I have never found reducing the crop a remedy for shanking. I have tried it again and again, and those with the lightest load have almost invariably shanked the most." Pressed for an antidote, Mr. Grix added, that he would try more copious waterings before starting the Vines next year. This year there was less shanking, and he had watered more than usual.

I may add, that I have tried the water cure on some Muscats which have shanked persistently for a good many years, and they are worse than ever; so that I fear this will not prove a panacea. But it must not be supposed, because I have adverted to this, that the shanking was serious at Ely. Quite the contrary; cut out all the shanked berries, and the crop remaining was still heavy and good. But there it was, and to be a faithful chronicler here it is noticed. The Vines were planted 42 inches apart, and as the whole of each side of the house was thoroughly furnished, the effect was magnificent. To walk under such a roof, literally burdened with luscious Grapes, was a treat of the highest order. One could realise the force of the Eastern saying, with its pithy epitome of rest and plenty, "dwelling under your own Vine and Fig tree." Another thought was also suggested here, by the mode of treating the young wood, that of perfect shade. If I remember rightly, from the time of flowering, or very shortly afterwards, no laterals, or but very few, are removed. The roof is a dense mass of young wood; these are the root formers and sap drawers; fetching supplies to the front for the Grapes, and providing stores for next year. This was the most peculiar feature of Mr. Grix's treatment of the Grapes. So dense is the forest of leaves on the roof, so numerous the later shoots, that very few of the Grapes can ever receive a direct ray of light. The fruit ripens and colours in a subdued light, and it seems to do both well. Some Grapes I tasted were of good flavour, and the whole crop was laying on colour firmly.

Another point was adverted to, and that was the difficulty of keeping late Grapes. The Grapes did not rot much, but shrivelled fast after the new year. Had they rotted one might have attributed it to the extra amount of shadow, but shrivelling is quite another matter. Possibly the pitch of the roof and the span-roof together is the cause of the shrivelling. I have observed frequently that late Grapes seldom if ever keep so well in span-roofed houses as in lean-tos.

Be that as it may, those who can command a supply of Grapes from the March of one year to the January of the next have not much to complain of. And this they do at Ely in a wholesale way. It is the latter feature that strikes one so forcibly at Ely. Where others grow their tens of bunches they seem to grow their hundreds. And their hundreds excel in quality the tens of many others. Those who have large families to supply, and who purpose growing fruits for market, may learn much from a visit to these gardens, how to cultivate either with certainty or economy. The latter is a special feature. Everything is done in the simplest and cheapest manner. The largest return for the smallest investment has been the rule of building, furnishing, and cultivating. Nothing has been done for show, all for use. The long vinery is as simply and cheaply built and ventilated as the orchard-house, and it answers its purpose equally well.

The early vineries are well heated; I remarked upon what seemed almost an excess of pipe in one of them. Mr. Grix's reply is worth repeating, as it expresses the experience of most of the best practical gardeners. "By far the cheapest in the end. Nothing pays so well as pipe. By dividing the heating surface you may save three-fourths of your coal; and as pipes last a generation, and have to be purchased but once, and coals must be obtained every year, it is obvious that pipes are infinitely cheaper than coals." The loss of money through a lack of pipes in the hothouses of Britain is incalculable. Hot-water apparatuses are strained, boilers cracked, and chimneys made red-hot, to the waste of coal and injury of everything concerned—all for the want of sufficient heating surface. Like most thoughtful horticulturists, Mr. Grix has turned his special attention to this subject, and has not only taken the first step towards small-coal boilers—by providing a sufficiency of pipe—but also the second, by inventing an economical boiler, warranted to heat a large area of pipe by the consumption of a small amount of fuel, to which I may call the attention of your readers on a future occasion. *F.*

THE UNDER-GARDENERS' COTTAGE AT WIMBLEDON HOUSE.

THE cottage, of which the accompanying woodcut (fig. 230) shows the elevation, has been recently erected in the course of some alterations and improvements, designed and carried out by R. Marnock, Esq., at Wimbledon House, a classic locality for horticulturists on account of its association with the name of Marryatt, and now the residence of H. W. Peek, Esq., M.P. for Mid-Surrey. The building in

question is the under-gardeners' cottage, and was designed from suggestions furnished by Mr. Peek. We invite particular attention to it, as a building well-contrived and adapted for its object, which is to provide the young gardeners employed by Mr. Peek with a convenient residence, and one in which health and comfort may go hand in hand. Too often the living rooms—bothies—allotted to under-gardeners are thrust into a corner, a lean-to back shed, roughly fitted up, being thought to afford accommodation sufficiently good for them, health and comfort being kept out of view, and the decencies of life neither studied nor cared for. To all such as these, the cottage here shown stands in admirable contrast; and we trust that other wealthy employers besides Mr. Peek may be induced, on seeing how pretty an object even an under-gardeners' lodge may be made, to give the comfort of their *employés* some little consideration, and, as opportunity may serve, may imitate so good an example.

Fig. 230

The plan (fig. 231) which is appended is so far self-explanatory that we need not enter on any lengthened description. It will be seen that there is a large living room; that each man has a separate bed-room; that there is abundant passage-way for access, and serving also to secure ventilation; that a sick-room with fire-place is provided for such as may need an asylum of this sort; that a separate room is set apart for the use of day labourers; that there is a profusion of cupboard room, a very great convenience; and that a lavatory leaves no excuse for the neglect of cleanliness. If we were to suggest any improvement upon this plan, it is that a quiet reading-room might have been added, for when several men are brought into contact in this way it is not always that they are all disposed to occupy their leisure hours in study, and a separate apartment devoted to this object is, therefore, very greatly conducive to harmony, since in that case no one of them need disturb or annoy either of the others.

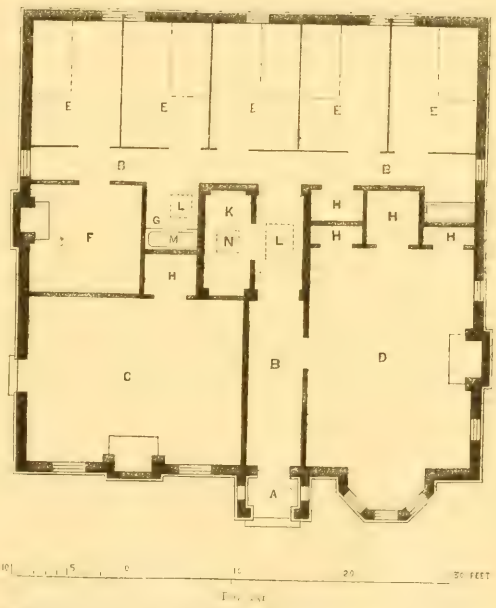

Fig. 231

REFERENCE TO PLAN: A, Porch; B, Passages; C, Day-labourers' room; D, Living room; E, Sleeping rooms; F, Sick room; G, Lavatory; H, Closets; K, Store-room for boxes, &c.; L, Skylights; M, Sinks; N, Trap.

We hope to have an opportunity of taking up this subject at some future time, and also of directing attention to the condition of the residences of head gardeners as well as under-gardeners. We shall be glad if any of our correspondents of this class, who are well housed, will send us plans and sketches for the illustration of our comments. *M.*

HISTORICAL NOTES ON BELGIAN PEARS.

M. Du Mortier, a very distinguished Belgian botanist, who, in the course of his long and brilliant career, has made successful excursions outside the domain of pure science, has recently published a book of great interest, under the title of "Pomone Tournaisienne." The title is justified, because the work contains descriptions of the varieties of Pears which have been produced at Tournay. The author has preceded this portion of his work by two instructive chapters, one of which is entitled Belgian Pomology, whilst the other relates to the culture of the Pear tree. The editorial commission (of the "Annales de la Société Impériale de Paris") has thought that the first of these chapters contained numerous historical facts, of which it would be well to present a statement to the readers of their Journal. Belgium, and Tournay in particular, have rather powerfully contributed to the increase of our pomological riches, so that there may be some interest in knowing what we owe to them in this respect.

M. Du Mortier still ascribes the origin of modern pomology to the Abbé Nicolas Hardenpont. "Before his time," he observes, "we possessed only a small number of melting Pears, which had been met with by chance:—the Besi, which, having been found in a hedge at Chaumontel, has kept this name; the Saint Germain, found in the forest of Saint Germain; the Beurré gris, the Doyenné, and the Colmar, with the Bergamotte. The crisp Pears dominated; those with melting flesh constituted very rare exceptions."

Nicolas Hardenpont was born at Mons, in Hainault, June 14, 1705; he died there, December 31, 1774. After having gone through his studies at the Louvain university, he entered into the priesthood, and became a secular priest in his native town. He possessed, at the foot of Mont Panisel, near to Mons, a garden, in which he carried on with marvellous success his persevering efforts with a view to obtain new varieties of fruits, and endowed his country with several sorts of Pears, which surpassed all that were then known, and which have not since been superseded, viz., Beurré d'Hardenpont, Délices d'Hardenpont, Passe Colmar, Beurré de Rance, and Fondante du Panisel.

From various circumstances, the learned Belgian botanist concludes that the Abbé Nicolas Hardenpont commenced his sowings about the year 1730, and that he awaited their results during a space of 30 years; in fact, an old indication assigns the date of 1758 to the obtaining of the Passe Colmar, of 1759 to that of the Beurré d'Hardenpont, of 1762 to that of the Beurré de Rance. The Délices d'Hardenpont and the Fondante du Panisel were obtained still later.

It would be especially interesting to know by what means Nicolas Hardenpont succeeded in obtaining these fruits of superior quality. Precise information is wanting in this respect; but M. Du Mortier thinks that this fortunate pomologist had recourse to artificial cross fecundation. He rests his opinion on its being at the beginning of the 18th century that the knowledge of the sexes of plants (already, since 1649, plainly indicated by Camerarius) commenced to become almost general, thanks to Sebastian Vaillant, and then, considerably later, to the immortal Linnæus. He does not hesitate to say: "The Beurré d'Hardenpont is, to our eyes, a cross between the Besi de Chaumontel and the Doyenné; it has the tortuous wood, the undulated [*crolée*, Belge] leaves, and the shape of fruit of the former, the delicate melting flesh and the golden skin of the latter. The Passe Colmar appears to be a seedling from the Colmar fertilised by the Rousselet. It has the tall habit, the diffuse stem, the flat leaf of the Colmar, the flower, and the aroma

of the Rousselet. The Beurré de Rance is due evidently to a Bon Chrétien fertilised by a Colmar, having the wood, leaf, flower, form of fruit, and peduncle of the Bon Chrétien, the succulence and flesh of the Colmar. Lastly, the Délice d'Hardenpont is, in our opinion, the produce of a Colmar fertilised by a Beurré gris, having the tall habit, the leaf, form of fruit and caducous habit of the first, the buttery flesh and thin skin of the second."

These acquisitions of Nicolas Hardenpont were long in finding their way beyond the limits of Belgium, and it was only in 1806 that M. L. Noisette, having come to Enghien to purchase plants at Parmentier's, had an opportunity of seeing at the same time, at the castle of the Duc d'Aremberg, the Beurré d'Hardenpont, as well as the Passe Colmar, which were cultivated there. On his return to Paris he brought back some grafts of these two fruits. Unfortunately, though the name of the latter was respected, the former was, for no good reason, changed into that of Beurré d'Aremberg, but which nevertheless has been generally adopted in France. It is essential to add that this same Beurré d'Hardenpont is much oftener called in the environs of Mons, Glout morceau, whence we have made, in France, Goulu morceau. "But," says M. Du Mortier, "the word glout, gloutte, in Walloon, signifies dainty or delicate; glout morceau means, then, dainty bit; goulu, on the contrary, signifies greedy or great eater; so the Beurré d'Hardenpont has become, by a strange alteration of its name, a gluttonous eater, instead of a fruit worthy of being eaten. Even more has been done, and the variety obtained by Hardenpont has been confounded with the Glout morceau de Cambron, a Pear entirely different and of only second rank." [?]

Hardenpont soon had imitators in Belgium. In 1787, Capiaumont, an apothecary at Mons, obtained from seeds of the Calabasse, the Beurré Capiaumont, a remarkably productive variety. About the same period Dorlin got the Poire de Saint Ghislain, the Médaille d'Or was produced at Oignies, and the abbot of the Bardou obtained the Beurré du Bardou, or Beurré Anglaise.

At the commencement of the present century the work begun by Hardenpont was continued at Mons with success. One of the first fruits which appeared there is the Beurré Liart, or Beurré Napoléon, one of the most exquisite Pears we possess, and of which Docteur Jahn said, with reason, "it is so juicy that one might suppose oneself drinking the fruit." It was obtained, in 1808, by Nicolas Liart, a grocer in the Rue des Capucins. The history of this fruit, which is related by Poiteau ("Annales de la Soc. d'Hort. de Paris," xiv. 1834, p. 364), in an inaccurate manner, has been corrected by M. Daras de Naghin, who was an eye-witness of what happened. The production of this excellent fruit made such a sensation that the prefect of the department of Jemmapes, M. de Coninck, sent the raiser a gold medal as a reward. The latter wished the Pear to bear his own name, but the prefect christened it Beurré Napoléon. The fact of the medal having been given to Liart caused the name of Médaille to be given to this variety in Hainault. Shortly after the Abbé Duquesne acquired, in his turn, an excellent novelty in the Pear which he named Marie Louise, a fruit which has been very wrongly attributed to Van Mons. Then, in 1817, Devergnies obtained the Beurré Devergnies, an excellent fruit, and too little distributed, which has also been falsely attributed to Van Mons.

On its side, Enghien counts two precious acquisitions, the Orpheline and the Fortunée. The first was obtained by the Abbé Deschamps, director of the Convent of Orphans of Enghien. Van Mons, ignoring its previous baptism, distributed it in Brabant under the name of Beurré d'Aremberg. The Fortunée is due, not to Parmentier nor to Van Mons, as has been said, but to M. Fortuné, of Raisme. M. Châtillon having removed from Enghien, and settled at Alost, obtained there the Fondante des Bois, or Bosch-peer, one of the most commendable of fruits.

Brabant and imperial Flanders have seen also some precious fruit produced, which date from the end of the last century, the raisers of which remain unknown. Such especially is the Bergamote de Pentecôte or Doyenné d'hiver, which Van Mons informs us was raised in the garden of the Capuchins of Louvain, and which was distributed by those fathers in the towns where they had houses. At the beginning of the present century it was named: at Louvain, Pastorale; at Anvers, Bergamote de Paques; at Gand, Doyenné de printemps; at Termonde, Seigneur d'hiver; at Malines, Poire Anglaise; at Tournay, Beurré d'Austerling, a name which the gardeners have altered into Beurré d'Austerlitz.

It was also at the end of the last century that the Beurré des Trois-Tours was obtained at the ancient castle of the celebrated painter, David Teniers, at Perck, near Vilvorde; this castle has become the farm (manor) of the Trois-Tours of our days. It is from this last name that the name of Beurré des Trois-Tours has come for this fruit, and under which it has been propagated in the environs of Vilvorde. Van Mons having obtained some grafts of this variety, rechristened it, and gave it the name of Beurré Diel, under which he described it in 1819. This last denomination has prevailed; but, in Brabant, it is always called the Beurré des Trois-Tours.

It was likewise at the end of last century, or quite at the commencement of the present one, that the Fondante des Bois and the Beurré blanc d'hiver were obtained. The former, falsely attributed to Van Mons, was found in a wood in the environs of Alost, and named Boschpeer, *i. e.*, Pear of the woods (Poire des bois); its discovery was due to M. Chatillon, a distinguished horticulturist, from whom it received its name. "It is certainly," says Du Mortier, "one of the most precious fruits, and one of those most worthy of being cultivated." As to the Beurré blanc d'hiver, an excellent fruit in January, it was carried from Lierre into Brabant, where there still exists a tree of it from 60 to 80 years old. The raiser of it is unknown.

Malines, again, was an important centre of production for pomology. It is to M. de Nélis, counsellor at the court of this town, that is due the Colmar Nélis, or Bonne de Malines, a very commendable variety. Here also lived the Comte de Coloma, who raised several good Pears, such as the Urbaniste, already very widely distributed in 1818; the Beurré Coloma, and the Bonne Carmélite, a half crisp Pear, of the class of the Calebasses, commendable for its long-keeping qualities. Major Esperen, moreover, belongs to Malines; and to him many good fruits are due, among others the following:—Josephine de Malines, an exquisite Pear, which ripens in February and March; Bergamotte Esperen, an excellent fruit, ripening in March; Seigneur Esperen, productive and excellent; then, of a lower rank, in order of merit:—Soldat Laboureur, a half crisp Pear, Suzette de Bavay, Beurré Bretonneau, &c.

The man who gave the most lively impulse to pomology was Van Mons, to whom is due the activity which has reigned in Belgium since his time. Van Mons founded a vast nursery at Bruxelles, and a seedplot, which was broken up about 1820. He, however, took away the remains to Louvain, and gained therefrom many new fruits, of which a very large number were not even named. His greatest gain was his Nec Plus Ultra, known under the name of Nec Plus Meuris, from which have come Ne Plus Meuris, and N'a Plus Mûri. This odd name is explained in this way: Van Mons wrote only, and by abbreviation, *nec plus*, adding to these two words the name of his gardener, Meuris. That which has especially made the reputation of this great pomologist is, on the one hand, his theory of production by seed, and on the other, the dissemination of the good varieties obtained in Belgium, and which he dispersed over all Europe, but almost always changing their names. His theory was that by continual re-sowing, from Pears newly gained, one might arrive at producing good fruits only, so as not to require to graft the Pear tree any more. This theory has acquired celebrity in Brabant. "Certainly," adds M. Du Mortier, "there is truth in Van Mons' theory, especially as regards the rapidity of the production of fruit and of the disappearance of the objectionable qualities of many seedling Pears; but it also operates in this manner, that if one obtains a larger quantity of eatable fruits, one finishes by only obtaining very small fruits of but moderate quality. This explains how Van Mons, and those who have followed him, after having sown so much, have left so few Pears of real merit, eatable Pears, but wanting in sugar and flavour."

It is especially in the Walloon portion of Brabant that this theory has been adopted. M. Bivort, continuing Van Mons' work, has obtained from his nurseries some good novelties. He has been followed by MM. Bouvier, Berckmans, Grégoire, Beauman, Nélis, and De Jonghe, who, according to our author, have, between them, put into commerce much too large a quantity of seedling Pears.

Lastly, Tournay has enriched the pomological lists. "In Belgium," says M. Du Mortier, "if Gand is the capital of Flora's kingdom, Tournay is the capital of Pomona's. That is due to a clayey and chalky soil, exceptionally favourable to the development of the aroma of fruits, and then again to the religious care which has been taken there only to cultivate the most exquisite and approved varieties. There number is not aimed at but quality, and every Pear of secondary merit is unmercifully sacrificed."

"In the last century some varieties seem to have been obtained at Tournay: the Calebasse, the Mansuète de Tournay, the Poire David, and the Calebasse à la Reine. The Marquise d'Hem had been gained at the castle of Hem, between Tournay and Lille. At the end of the last and the beginning of the present century, MM. Joseph de Gaest de Braffe and François de Hove had commenced to sow; they were soon followed by MM. Norbert Bouzin, dean of Chin, Gabriel Everard, Charles Louis Durondeau, Florimond Castelain, Joseph Dumont, Isidore Dubuisson, Pringalle, Daras de Naghin, &c., to whom excellent productions are due."

The Société Royale d'Horticulture of Tournay encouraged these works briskly, and all the most perfect Pears which have been gained in Belgium during this century figure among those to which it has awarded its medals. "It is there only that fruits are found which rival the productions of the Abbé Hardenpont, the Beurré Dumont, the Beurré Durondeau, the Beurré Dubuisson, the Beurré Saint François, the Beurré Dilly, the Colmar Daras, are fruits of more than usual merit; the Episcopale, planted on a south wall; the Beurré de Naghin, grafted on the Quince; the Délice Everard, Délice Fontaine, Beurré Lix, Délice de Froyennes, Beurré Saint Aubert, Crassane Du Mortier, Beurré de Ghelin, Castelinne, Beurré Pringalle, &c., follow them closely."

To complete his history, M. Du Mortier presents the list of Pear trees obtained in Belgium, classing them according to the raisers to whom they are due:—

1. *Pears obtained by Van Mons.*—Alexandrine Hélie, Arbre Courbé, Arlequin Musqué, Beurré Colmar, Beurré Curtet, Beurré De Coninck, Beurré Du Mortier (its true name, under which M. Du Mortier received it from the raiser, is Verte Du Mortier), Beurré Gens, Beurré Sterckmans, Beurré Napoléon, Charles Durieux, Charles Smet, Charles Van Mons, Colmar d'Aremberg, Colmar de Meester, Colmar Josse Smet, Colorée d'août, Comte de Flandre, Conseiller à la Cour, Corpsheat, Délice de Lovenjoul, Doyen Dillen, Duc de Nemours, Enfant Prodigue, Léon Leclerc, Nec Plus Ultra, Meuris, Nouveau Poiteau, Président Van Mons, Retour de Rome, Surpasse Meuris, Théodore Van Mons, Tout il faut, Verte Du Mortier (see Beurré Du Mortier).

2. *Pears obtained by Esperen.*—Bergamote Esperen, Besi Esperen, Bon Gustave, Charlotte de Brouwer, Des Deux Sœurs, Double Rousselet, Elisa d'Heyst, Grand Soleil, Josephine de Malines, Juive, Passe Colmar Musqué, Passe Tardive, Princesse Charlotte, Princesse Marianne, Seigneur Esperen, Soldat Laboureur, Suzette de Bavay, Vineuse d'Esperen.

3. *Pears obtained by M. Bivort.*—Adèle Lancelot, Alexandre Lambré, Aline Richard, Amand Bivort, Belle Fleurusienne, Bergamote Heinbourg, Beurré Bennert, Beurré Berckmans, Charles Bivort, Comte de Paris, De Lamartine, Docteur Cornelis, Docteur Trousseau, Duc d'Aumale, Duchesse Hélène d'Oriéans, Florimond Parent, Jean Baptiste Bivort, Laurence de Glymes, Léopold Ier., Madame Elisa, Mgr. Affre, Pie IX., Prévost, Prince Albert, Willermoz.

4. *Pears obtained by M. Berckmans.*—Alexandre Bivort, Beurré de Wetteren, Emilie d'Heyst.

5. *Pear obtained by M. Légipont.*—Légipont.

6. *Pears obtained by M. Simon Bouvier.*—Aimée Adam, Amand Adam, Bouvier Bourgmestre, Colmar Navez, Délices de Jodoigne, Docteur Maluce, Emilie Herpin, Emilie Bivort, Henriette Bouvier, Souvenir d'Esperen, Triomphe de Jodoigne.

7. *Pear obtained by M. Beauman.*—Bergamote Hertrick.

8. *Pears obtained by M. De Jonghe.*—Délicat Bronzé d'Enghien, Colmar Marnix, Duc Alfred de Croy, La Grosse Figue, Prince Camille, Robert Treel.

9. *Pears obtained by M. Grégoire.*—Aglaé Grégoire, Anna Nélis, Avocat Allard, Avocat Nélis, Bergamote de Jodoigne, Beurré Delfosse, Colmar Delahaut, Commissaire Delmotte, Docteur Lentier, Docteur Nélis, Emilie Minot, Gérardine, Gilain, J. J., Hélène Grégoire, Henri Grégoire, Henri Ledocte, Iris Grégoire, Incomparable de Beauraing, La Cité Gomand, La Sœur Grégoire, Léon Grégoire, Léontine Van Exem, Louis Grégoire, Madame Grégoire, Mathilde Gomand, Minot Jean Marie, Mgr. Sibour, Nouvelle Aglaé Grégoire, Nouvelle Fulvie, Précoce de Jodoigne, Président Muller, Président Royer, Prince Impérial, Professeur Hennau, Rousselet Vanderveken, Sénateur Mosselman, Soldat Bouvier, Souvenir de Léopold Ier., Souvenir de la Reine des Belges, Souvenir de Simon Bouvier, Thérèse Kumps, Transylvanienne, Vice-Président Delahaye, XXVe. Anniversaire de Léopold Ier., Zéphyrin Grégoire, Zéphyrin Louis.

—*Ann. de la Soc. Imp. de Paris* (*Flore des Serres*).

THE ORCHARD HOUSE AT BLENHEIM.

Orchard-houses *à la* Rivers *et à la* Pearson are now established institutions in our gardens, forming at most seasons, and in late summer especially, one of the principal attractions and most important features we have. There is no garden so large that they can be out of place, and in small gardens they are almost indispensable. What a variety of fruits do they not afford us! what pleasure and gratification do they not bring! Within one small house the variety of a great orchard is at once had, and to a great extent they render us independent of the changes of our variable climate.

At Blenheim, the noble seat of the Duke of Marlborough, decidedly the most important feature, in a gardening point of view, and the best piece of gardening in all that wide wide place, was the orchard-house, *à la* Fountaine, just lately erected there upon the principle advocated by the Rev. John Fountaine in his little pamphlet, entitled "The Improved Method of Growing Fruit upon the Orchard-house Principle." The chief feature or principle in Mr. Fountaine's method is that of cultivating both orchard-house fruit—Peaches, Plums, Cherries, &c.—and Grapes in the same building. In other words, orchard-house fruit have to be grown in a vinery, or with its aid and protection only, thus virtually abolishing the simple orchard-house altogether.

The house at Blenheim, which it is our object to notice here, is a lean-to erected against a south wall, about 15 feet in height, with ventilation at the top of the wall, 18 feet in width and 68 feet in length. This is ultimately intended as a vinery we believe, the back wall is to be planted and covered with Vines, and one Vine at every 8 or 10 feet only on the roof, so as not to create much shade for the Vines on the back wall or the fruit trees underneath. Two double lines of rails, placed 5 feet wide, are laid, as on a railway, the whole length of the building, on the surface of the soil, and continued along the border outside in front of the wall, some 10 or 12 feet further than the length of the building,—the ground actually occupied or acquired being thus fully double the area of the house.

On these rails are placed small flat stages, or trucks on wheels, like railway trucks, on which the trees in pots are placed, which can thus be shunted out or in on the lines of rails at pleasure, one end of the house being made to open for that purpose. In the house at Blenheim there are 12 of these flat trucks or stages in two lines of six, each 10 feet in length. On the back trucks, which were occupied with Peach trees, some 3 to 4 feet in height, in 10-inch pots, in perfect health, and laden with splendid fruits, six of the trees had their pots plunged in sunken metal pans, the others being set on the flat stage, each truck holding about 10 trees. The front trucks were all filled with beautiful little Plum and Cherry trees, each bearing a heavy crop, and, what is of more consequence, of splendid quality.

It was on a hot day in July last that I visited this house; the trucks with their occupants were then inside, somewhat protected by the glass, as Mr. Lee, the able gardener, stated, from the scorching sun's rays and from the drying winds. At night, we were informed, these trees were placed in the open air, there to receive the full benefit of the night air, and the cooling and refreshing dews of heaven. That this practice is sound, although uncommon, few will dare to dispute, the condition of the trees themselves—all in the most rude health, and the flavour of the ripened fruit, testified to that. Never have we seen trees in pots look better than those at Blenheim, and they do Mr. Lee great credit. In the early spring, when the nights are cold, and in cold damp weather, the trees are of course kept more indoors, and herein lies greatly the value of the principle—the facility with which they can be placed in either position. We all admit the value of the cool open air in the flavouring of our Peaches, Plums, &c. On this subject of imparting flavour to our fruits there is much to be said in favour of allowing liberal ventilation, and perhaps a little against it, but on this I shall have more to say at some future time. *B.*

THE KNOWN FORMS OF YUCCA.—VI.

Group III.—*Integro-marginatæ.*—Edge of the leaf neither toothed nor splitting off in threads. (*Concluded from p.* 1184.)

I have now noticed all the known forms of the genus, except a small group of caulescent entire-leaved plants, which are cultivated with us under shelter, but some of which may not improbably prove to be hardy when we have had more experience of them. These are the following:—

36. *Y. Donianna*, Hort.—Stem reaching a foot high below the leaves, 1½–2 inches thick. Leaves 150—200, extending over a space of 15—18 inches, all more or less recurved, purplish green, 12—15 inches long, 3—6 lines broad at the middle, narrowed to three-eighths of an inch above the base, the point not pungent, the edge faintly denticulate towards the base; in the young state, the face flat, except at the point and base, the back but little raised except in the lowest quarter, the middle slightly plicate vertically.

37. *Y. semicylindrica*, Baker.—Stem 3–4 inches long below the rosette of leaves, 2 inches thick. Leaves 45—50 in a dense rosette, 20—21 inches long, 6—10 lines broad at the middle, only the lowest recurved; colour an average very slightly glaucous green, the face concave and the back very convex all through; texture as firm as in gloriosa, point pungent, the margin quite entire, bordered with a brown line.

38. *Y. ensifolia*, Hort.—Stem about a foot high below the rosette of leaves, tuberous at the base. Leaves 35—40, in a dense rosette, 2 feet long, an inch broad at the middle, narrowed to half an inch above the base, none recurved, all rigidly erecto-patent, colour a pale glaucous green, edge horny, quite entire, the point pungent, the face slightly concave even in the middle, not at all vertically plicate.

39. *Y. Boerhaavii*, Hort.—Shortly caulescent. Leaves about 200, spreading over a space of 2 feet, only the lowest slightly recurved, 26—28 inches long, 12—13 lines broad at the middle, very little narrowed downwards, colour bright green, slightly glaucous when young, point not pungent, edge narrowly transparently horny, middle flat both on the back and face, both surfaces being quite smooth.

40. *Y. canaliculata*, Hook. fil., Bot. Mag. t. 5291.—Stem 1—2 feet long below the rosette, 3—4 inches thick. Leaves 40—50, in a dense rosette, 20—24 inches long, 2—2½ inches broad at the middle, very strong, and rigid in texture and pungent and cuspidate at the point, the face so deeply concave that a section taken at the middle is nearly half a circle, the edge slightly toothed near the point, marked all through with a very distinct brown line, colour a slightly glaucous green, back moderately scabrous. Panicle 4—5 feet high, the scape about equalling the leaves; perianth cream white, an inch and a-half deep, the connivent ovate-lanceolate divisions 8—9 lines broad.

This concludes my enumeration of the forms of Yucca. This season has been such an unfavourable one for the flowering of Yuccas that we intend now to wait till another comes and passes over before dealing with them in the "Refugium," and in the meantime I shall be very glad to receive information of any forms not noted here which may be known to readers of the *Gardeners' Chronicle*, or to receive dried specimens of the flowers of any but the very commonest, —in short, of any except gloriosa, filamentosa, flaccida, and recurvifolia. There can be no doubt that the best distinctive characters in the genus are to be found in the fruits and seeds, but there is very little in print already on this point, and no chance of investigating it further in this country in the living plants. *J. G. Baker.*

Home Correspondence.

Parnassia palustris.—Do the anthers of the beautiful Grass of Parnassus open outwardly or inwardly? I ask the question, because Prof. Asa Gray describes them as introrse, while most other writers speak of them as extrorse. To my mind, they are neither the one nor the other, but open laterally. What is the purport of the elegant palmated scales between the petals and the stamens? I send you specimens from *Oban*. [In the specimens forwarded by our correspondent the anthers are in the unopened flower decidedly introrse, that is, they have their face directed towards the centre of the flower, but the chinks through which the pollen escapes are certainly more nearly lateral than either extrorse or introrse. In several of the unopened buds sent by our correspondent, the anthers were already open, and the pollen liberated though the filament was not lengthened, and neither styles nor ovules were fully developed. It is probable, therefore, that the opening in the anthers was an accidental occurrence, as under the circumstances self-fertilisation could scarcely occur. The attachment of the anther to the filament appeared to us to be "innate" that is, the anther was poised on the slender top of the filament as on a pivot, so that a change in its position could very readily occur. The most recent account of the structure of this elegant and singular plant is that of Mr. A. W. Bennett, published in a recent volume of the Journal of the Linnean Society, vol. xi., p. 24, from which it appears that the filaments, at first short, suddenly lengthen one after the other. During the time they are lengthening they adhere firmly to the ovary, but as soon as the pollen is discharged the filament assumes a horizontal position, and the anther falls off. The anther, when the pollen is ripe, is described as placing itself with its back on the very apex of the pistil, so as completely to close the approach to the ovary, but to prevent all chance of self-fertilisation the stigmas are not developed until the whole of the anthers have discharged their pollen. The object then of the scales alluded to in our correspondent's letter is not to convey pollen to the stigma of the same flower, but to retain it, and allow insects to carry it away to other flowers in which the stigmata are already developed. The scales of Parnassia then appear to serve the same purposes as the coronet of Passionflowers. Eds.]

Costmary: Alecoast.—Will some of your readers oblige by stating the origin of these names, that is if they have not forgotten the existence of the plants to which they are applied? By the way, we hear occasionally of mimicry of form, wherein one plant or insect assumes the form of another for strategical purposes, as it were; why should there not be mimicry in other particulars? Costmary to my nose smells almost precisely like Spear Mint, and might, one would think, be used for similar purposes. *Balsamita.* [The older writers speak of the plant under the name of Costus hortorum, from the analogy with the fragrant Costus of India. Costmary, says Parkinson, "is of especiall use in the spring of the yeare, among other such like herbes, to make Sage ale, and thereupon I thinke it tooke the name of Alecoast." The same writer says, "the leaves have an especiall vertue to comfort both the stomach and the heart, and to warme and dry a moist braine!" Costmary would probably signify Mary's Costus, as it would appear from the French names of the plant—Menthe de Sainte Marie, Menthe Notre Dame. The French also know it by the name of Coq, or Herbe au Coq, or Cock's Mint, as if poultry were partial to the plant. Eds.]

Sun-dials.—I observe (p. 1147) that the inscription,

"Horas non numero nisi serenas,"

is not approved of by you. [We thought it characteristic of a large section of the French people, and more than ever appropriate now.] But may we not interpret it to mean that those hours of our lives which are obscured by the storms of passion, are not worthy of account, and that serenity of mind accompanies wisdom and virtue? Under the impression of this feeling, Antoninus Pius, in his last moments, gave "Æquanimitas" as the parole to his prætorian guard. The following old English couplet might not be an inappropriate motto to a dial:—

"True as the dial to the sun,
Although it be not shone upon."

G. S.

Earwigs.—I find, by experiment, that the greased paper cylinders, lately recommended by one of your correspondents, are not so effectual in trapping earwigs as a pot stuffed with dry hay. *G. S.*

Hardy Primulas.—At p. 1152 there is an article on hardy Primulas, in which it is stated that P. sikkimensis is not by "any means a beautiful plant." The writer can only have seen poor specimens, for if the genus possess a queen, this is it. We are also told pot culture is objectionable; to this I cannot assent. I have had plants with stems 3 feet high, with three verticils of flower. It requires a large pot in proportion to its size, and succeeds best in a mixture of rich sandy peat and a large quantity of cocoa-nut fibre. As soon as the plants begin to grow the pots should be placed in pans of water, and remain so till they have done flowering, when they may be gradually deprived of water, and kept comparatively dry during winter; care should be taken to exclude frost from the crowns. I was surprised to see no mention of P. capitata, with its round heads of brilliant blue flowers, or of P. Stuartii, with its magnificent foliage; nor should P. gigantea, P. altaica, or P. stricta be forgotten. As Mr. Duncan informs us that "many of the brightest ornaments of the genus have yet to be imported," he would be conferring a favour by giving their names and habitats. *Ebor.* [Mr. Duncan is, we believe, in America. Eds.]

Mulberries.—In reply to your correspondent, "H. H. E.," p. 1160, I beg to say that I have successfully grown a Mulberry against a boarded outhouse, on a S.W. aspect, by allowing it to form an upright stem for about 8 feet, and from the top training one branch horizontally. The shoots from this horizontal branch are trained perpendicularly downwards, and yield plenty of delicious fruit, such as is not to be had from ordinary standards, and even better than from a potted plant in a warm orchard-house. The fruit is borne of course on small shoots which proceed from the pendent branches, and these must be manipulated from time to time by tying down, shortening, cutting out, &c.,—in fact, by what Mr. Rivers happily calls "gardening common sense." *G. S.*

Opuntia Rafinesquiana.—In answer to an editorial inquiry, I beg to state that a small plant of this Cactus, which I obtained from Ghent in the previous spring, was planted in the open border last autumn. Its position was within 6 inches of the wall of an orchard-house, whence a little warmth may have reached it by convection. It bore the winter, which was of unwonted severity (a thermometer having registered 15° in the same garden), with no indication of suffering, made several new joints in the succeeding spring, which in turn produced four large yellow flowers. The fleshy fruits of these, of somewhat obconic form, remained for some weeks after the rapidly deciduous flowers had dropped, but made no progress towards ripening, and at length withered. *P. H. Gosse, F.R.S., Sandhurst, Torquay.*

—— I planted a specimen of this Cactus in a bank with hardy Semperviva in May, 1869, and it received no injury during last winter. *John E. Daniel*, 6, *The Terrace, Epsom.*

—— With reference to your query as to the Opuntia Rafinesquiana, I beg to say that I bought three plants of it, and have grown one in a south border the last two winters without any protection; it has there made much more progress than those in the greenhouse, but neither has flowered yet. *A Very Old Subscriber.*

——In the month of April, 1869, I planted out a plant of Opuntia Rafinesquiana on a piece of rockwork here. It withstood last winter without any protection, and this season has made a growth of about 6 inches. *A. M'Andrew, Bromley Palace, Kent.*

—— This plant has proved perfectly hardy at Combe Royal, near Kingsbridge, South Devon. Two specimens were planted out in the spring of 1869, one at the foot of an eastern aspect wall, the other on an open bank facing the south, and both are as healthy and vigorous as a third plant, which, for safety, was kept in the greenhouse. *A Devonian.*

—— We have a plant of Opuntia Rafinesquiana that has passed the winter uninjured on a piece of rockwork, in an exposed situation, about 10 feet from the ground, and it is now growing vigorously. *Thos. Cripps & Son, Tunbridge Wells.*

Disa grandiflora at Ferniehurst.—Your correspondent, "Scrutator," did well in drawing attention to these splendid plants, and more especially in giving such excellent cultural details. It was with much pleasure I saw these plants some months ago, and I then noticed them in these pages (see p. 770), and a week or two ago I had the pleasure of again seeing them. This time, however, they displayed their richly coloured blossoms of scarlet and gold. These last, contrasted with the healthy foliage, formed a sight more easy to imagine than describe. It is indeed very rare to meet with this old plant grown well. It comes from South Africa, and people will persist in scorching it to death in a high and frequently dry temperature. If potted in sweet fibrous peat and well drained it is just an impossibility to kill it with too much water. Dr. Harvey, who unfortunately was not spared to complete his comprehensive "Flora Capensis," tells us it comes from the Table Mountain, at the Cape of Good Hope, where it grows on the "steep, boggy, spongy margin of a stream, which has water in it at all seasons, but which in winter must be so swollen as to cover the plant. The margin is completely clothed with the Disa, but immediately beyond is a margin of Restios, which bending over afford considerable shade to the roots and foliage leaving the flower-stalks to peep out at the sun. The summit of the mountain is very frequently enveloped in mist, most especially at the season when the Disa blooms. It is very cold also as the mist comes accompanied by a strong, cold, south-east wind; after this succeeds the scorching sun of latitude 33°." I have seen it

endure several degrees of frost with impunity, and a cool, moist, and shady situation is most essential for its welfare. It may be interesting to know that this plant has been raised from seed. If I mistake not it was under the care of Mr. Eyles, superintendent of the Royal Horticultural Society, South Kensington, some eight or ten years ago. There are many species of Disa known in herbaria which have not as yet made their appearance in our gardens, as also beautiful Eulophias, Habenarias, Lissochilus, Polystachya, and Microstylis, which we hope to see introduced ere long. As a rule, terrestrial Orchids are not so skilfully cultivated as the epiphytal kinds. How seldom we see a good, or even presentable, plant of the grand Orchis foliosa! I remember once seeing a specimen in the collection of A. Turner, Esq., Leicester, bearing many fine cylindrical spikes of a rich purple colour, and 18 inches high; and this plant was blooming in an ordinary conservatory. It is quite a treat to catch a glimpse of a Satyrium in flower, and a group of hardy North American Cypripediums, well bloomed, would attract as much attention at any of our great flower shows as would the finest epiphytes ever grown. Would that we had more of that class of cultivators, of whom the enthusiastic Editor of the "Refugium Botanicum" may be taken as the type. *F. W. B.*

Iris Pavonia and chalcedonica.—May I ask some of your correspondents to inform me as to the culture of Iris Pavonia and Iris chalcedonica? For the last two years I have bought imported bulbs of both, and tried them both in pots and in the open ground, but cannot get them to flower; they both throw up leaves, but show no signs of flower: the I. chalcedonica turns yellow and dies before it has attained its full growth of leaves. I shall be glad to know if there is any particular treatment or soil required for these rather uncommon favourites. *A. Watkins, Feltham.*

Tacsonia Van Volxemi.—I have a large plant of Tacsonia Van Volxemi, planted in a box, and trained under the roof of a greenhouse, all the flowers of which, with but a few exceptions, have this year dropped just before expanding. What is the probable cause, and what the proper treatment? The plant in question is covering some 15 or 16 square yards, and the box in which it is planted is 6 feet long, 8 inches wide, and 15 inches deep. It has grown well, and shown hundreds of blooms through the past summer, and to the best of my knowlege has not been dry at the roots. *W. Dovecote.* [We can only suggest insufficient nourishment. Try top-dressing, and a thorough soaking of tepid water. EDS.]

Globe White Hip Rose.—I have to mention, that since the letters of your two correspondents appeared, expressing a wish to recover White Globe Hip, the family who seem to be nearly the sole possessors of it have made arrangements for placing this beautiful and peculiar old white summer Rose in the hands of Messrs. Ballantyne & Son, Nursery Gardens, Dalkeith, N.B., on condition of their retaining it on sale for the present. The nursery is close to a station, near Edinburgh, on one of the main lines to London, *viâ* Carlisle. I am somewhat horrified to find Mr. Godwin would have been glad to have had the cuttings, which I have only now discovered, owing to his notice having appeared in a different part of the paper. My offer to procure them was made in all sincerity, but I have no doubt he will understand my referring him to Messrs. Ballantyne, under the circumstances. As regards Margined Hip, I cannot assist otherwise, but I would make the following suggestions:—That I consider the family above mentioned deserve some credit for the prompt action they have taken, as sole owners of a favourite so old as to be new again; but that I believe there are many others who would do the same, in like circumstances, but might not have the same favourable means of bringing their plant before the public; and, more likely, not have any idea of its rarity. And, as Margined Hip is most likely to survive in some moderately old-fashioned garden, and in one (or more) not much kept up to the day, nor often altered, I should not be at all sure of any notice in the gardening periodicals reaching their possible owners; but would recommend a letter or advertisement in an ordinary newspaper, as your correspondent appears really to wish for it. *Old Subscriber, August* 29.

Dahlias and Early Frosts.—Herewith I inclose you a Dahlia leaf, to show the effect of the frost which we experienced this morning, August 31. At 5.30 A.M. a thermometer placed on the ground where the leaf lay fell to below 30°. On Sunday and Monday, August 21 and 22, I scraped thin ice off a branch lying on the ground, and on the 22d a thermometer lying on the grass went down to 31°, which surprised me, seeing that high temperatures were registered in your Table last week. *Geo. Rawlings, Romford, Essex, August* 1.

Tagetes for Bedding.—I send a specimen of a Tagetes which is largely used and highly approved of for beds here. It appeared originally, I believe, among plants of Tagetes signata pumila, and was thought to be a double form of that kind, or a hybrid. The foliage is somewhat different to that of the ordinary dwarf Marigold, but it does not appear to possess any positive difference from the yellow pigmy variety, with which it seems to me identical, being only a good selection. As a yellow bedder it is unrivalled, having this advantage over the T. signata pumila, that it does not smother its flowers in young foliage when grown on a rich soil. The plant sent you came off strong soil, and it is an average plant as regards bloom. *Hamilton Hughes, Liverpool.* [This appears to be a good strain of the ordinary Tagetes patula nana, a compact grower, scarcely a foot high, and with deep orange-yellow flowers. We do not observe any difference in foliage or habit such as would be suggestive of its being a hybrid. EDS.]

Lapageria rosea at Banbury.—There is now a grand example of Lapageria rosea growing in one of the houses of Mr. P. J. Perry's nursery at Banbury. In one house, a compound house under one span-roof, the widest portion of which is used for cultivating Dracænas, and such like foliaged plants, and the narrowest part for Adiantums of various kinds, there can be seen growing a plant of Lapageria rosea, which at the present moment covers something like 180 superficial feet of the interior of the roofing. The centre of the house has a brick pit or stage, some 4 feet in height, and a portion of this has been converted into a pit in which the Lapageria is planted. The root is planted close to the wall of the pit by the door of the house. The wood that covers the house is furnished from a number of strong shoots, and at the present moment there cannot be less than 180 fine flowers distributed about over the wood growth. I was told that there have been as many as 200 flowers on it at one time. Flowers and foliage alike are in the highest state of development—larger and more massive flowers I never saw hanging on this magnificent creeper. The house appears to suit it admirably. It is low, cool, and moist, and somewhat shaded, and here this grand plant flourishes with a vigour of growth and a freedom of flower quite inconceivable by those who have only seen the spare, wiry growth, in the plants occasionally met with. The soil in which it grows is occasionally renewed by the addition of some rough peat, mingled with a little loam. Underneath its roots is plenty of drainage, so as to admit of a free passing away of the water given to it. It is a "thirsty soul." During the summer about 30 gallons of water are given to it once or twice a week, according to the state of the weather. The condition of the foliage was both robust and clean. There seemed to be no difficulty about the latter, as with a generous treatment that seems to take care of itself. At the exhibition of the Banbury Horticultural Society, held on August 30, a well-grown and well-flowered specimen in a pot, trained over an oval wire, was exhibited by J. Gillet, Esq., and awarded the 1st prize as the best specimen plant. *R. D.*

Lilium auratum.—Owing to a family bereavement, I was unable at the time to reply to Mr. May's note at p. 1091. I now write to say that my plant this year produced 208 blooms, varying from 1 to 27 blooms on a single stem. The plant was about 8 feet in height from the surface of the pot, and about the same in diameter, furnished with blooms to within 15 inches of the pot. The first flower expanded on July 31, and the last on August 17. The greatest number of blooms expanded in one night was 48, which took place on August 8, and formed then a perfect show. *J. Smith, Gr. to James Bland, Esq., Quarry Bank, Allerton, Liverpool.*

Hydrangea paniculata.—I have forwarded to you a cut bloom of Hydrangea paniculata, which has been in bloom in the open nursery for eight weeks; it opens first of a pure white colour, and changes to red. It is perfectly hardy, and a free grower. It is one of the best autumnal flowering shrubs that we have. I received it from Messrs. Parsons, of New York, who describe it as one of the finest shrubs grown, and it changes to a scarlet in America. *W. H. Babbage, American Nursery, Bagshot.* [Very handsome trusses. EDS.]

Floral Display in Carriage Drives, &c.—This subject has received but little attention of late. Perhaps it is owing to the difficulties which lie in the way, in the various circumstances and situations which surround such places, that no general law can be laid down. A drive which passes a mile of wood, for instance, could not, having regard to its floral accompaniments, be treated in the same way as a quarter of a mile of grassy slope; yet I think more might be done with our hardy flowering plants in both places. Flowering shrubs are certainly plentiful, and much is done by them. Mr. W. Paul is preparing something more in collections of foliaged trees. But where are our native flowers? Step out of a carriage into one of those old carriage drives which abound in this country—one which passes through woods. Dive into the wood, in spring, in summer—what do you see? O what Bluebells! O what Primroses! Look! Here is the wild Anemone. O what a stretch of beautiful Heath! The buestion is, are they to remain there? I say bring them to the front, for they are worthy! Nothing looks more out of place, at the sides of such a drive as that above indicated, than formal beds of flowers, clipped shrubs, fantastic hedges, and the like. These may do close to a building where the architect displays his style in such nicety of finish, but in a drive of any extent, or one verging on a wood, that sort of thing is, in my opinion, a "child's dressing up" of Nature's beauties. No; let us copy from Nature's book, and in return exhibit her to the best advantage. What prettier object does the eye wish to rest upon in spring than an irregular mass of Bluebells, perhaps of an acre in extent, stretching away, among, and under the trees?—or in summer, than masses of our bright Heath? Talk of bedding-out! Here we may have acre beds, which will take care of themselves. Our Snowdrop, Primrose, Narcissi, Jonquil, Anemone, Viola, Forget-me-Not, and Heaths, these are the "bedding stuff." The clearance of scrubby underwood, in length and breadth according to circumstances, at intervals, in woods through which the drives pass, and the selection of suitable banks and corners where no woods exist, to plant such plants by the million, should be the order of the day. Two or three or more of those things may be grown side by side to flower in their respective seasons. Rabbits—if the soil be not disturbed too freely—will not think of mischief, especially when vegetation once covers the soil. Much might be done with these materials in shrubberies or pleasure-grounds. What a pretty picture to alight upon suddenly would be, at this season of the year, a fine old tree covered with the silvery drapery of the wild Clematis (Traveller's Joy indeed!), and spread at its feet a broad carpet of bright Heath! Who will say such common things do not deserve such, to them, uncommon places? *Henry Mills.*

Dendrobium chrysanthum (Wall.), Golden-flowered Dendrobe.—This beautiful and easily cultivated species will now be flowering in most collections. It does well in a moderately cool temperature, and when well grown has pseudobulbs 4—5 feet long, and as thick as the finger. I saw some fine-flowered bulbs the other day at Ferniehurst; upon one at least there were upwards of 70 fine, well-developed, rich golden-yellow flowers, the lip having a bold velvety-crimson blotch on each side the disc. The individual flowers remind one forcibly of the Dendrobium Gibsoni (Paxt.), but they are borne in clusters of 4—6 together, and look more beautiful by being seen in juxtaposition with the healthy bright green foliage. Being of pendulous habit it must be grown on a block or in a basket; the latter, however, is preferable. It requires an abundance of water when growing. *F. W. B.*

Fruiting of the Common Laurel.—The old Laurels here are covered with ripe fruit—fine clusters; at first they are red, then turn quite black, resembling miniature bunches of Grapes. Although I have seen the berry formed and grow to a green state, in quantity, I never saw such quantities in a ripe state. Are they considered poisonous in a degree to harm if eaten? The birds do not care to eat them. *H. Mills, Enys Gardens.* [The pulp of the berries is not poisonous, but the kernels, like the leaves, are dangerous—that is, if many are eaten. EDS.]

Melon Growing.—At p. 1190 your correspondent "A. D." states, in his remarks on the gardens at Heckfield, that only one sort of Melon is grown—Meredith's Hybrid Cashmere, and that it will produce three or four crops in a season from the same plants. Now, such a recommendation might induce others not well informed in Melon culture to try the three or four crop experiment, which would end not only in disappointment, but in a waste of time and space. It is well known that any Melon plant in good sound health will produce fruit upon successive growths or laterals, but after the first succession at the farthest, did he ever see a fruit that was worth either the time, or the space the plants occupied, or was any credit to a gardener when placed on his employer's table? *T. C.*

Weeds on Lawns.—I have a portion of my lawn on which Potatos were planted four years ago, to renew it, the old turf having become mossy. The manure applied was purchased in the neighbourhood, and had much of the roots of Potentilla anserina in it; and this I find has been ever since increasing, though I have used every means to eradicate it, by weeding and hand-picking. Would some of your practical correspondents suggest any crop or crops to effect the complete eradication of this weed, which I consider one of the most, if not the most, difficult of all weeds to exterminate. It propagates in three ways: by stolons, by roots underground, and by seed. The roots being of a dark colour are only seen with difficulty, particularly if cut much by the spade. *J. W. L.* [We can only suggest forking the surface and picking out the roots carefully, or paring and burning the surface, in either case resowing with grass seeds. Probably the paring would be the most effectual plan. EDS.]

Early Rose Potato.—I observe a note in your last, Number (Sept. 3) concerning the produce of Early Rose Potato, being the average of 31 lb. from 1 lb. of sets. My produce far exceeds this, being 54 lb. of excellent Potatos from the 1 lb. of sets; quality could not be exceeded. *James Atkins.*

Dwarf Trees.—Your account of dwarf trees reminds me of one in my possession. About 20 years ago I found a branch of a Gooseberry had drooped to the soil, and the point had taken root. I cut it from the parent and planted it out, and for many years it has produced large crops of fine fruit; last year as many as 40 berries, after throwing off the same number. The kind is Crown Bob, which I now call Topsy. It is

15 inches high and 2 feet through. Of course suckers are attended to as they appear. *A Very Old Subscriber.* [A very interesting case. EDS.]

Melon Seed Vegetating in the Fruit.—I have much pleasure in saying, in reply to "Observer," that there were only two fruits left on the plant, which was growing in an ordinary Melon frame, heated under the bed with hot water. They had only been kept two or three days after cutting, and were fully ripe, but showing no symptoms of decay. Whilst growing they had been kept quite hardy, but were well grown, as the fruits were full sized, and the plants in pretty good health when the fruits were cut. *W. Dean.*

Wireworm.—Is there any destructive powder manufactured for killing the wireworm, and where can I procure it? *John Sutton.* [Spirits of tar dug in at the rate of 1 gallon to 50 square yards, is said to be an effectual remedy; heavy dressings of quicklime, and the refuse lime of gasworks, the latter especially, have also been found efficacious. EDS.]

Yellow Calceolarias.—I have read with much interest Mr. Fish's able article on the above, at p. 1184, but notice that he is silent on one of the principal points. We have, at great length, Mr. Fish's way of cutting, time, manner, and place of propagation, and a long routine of after management, till their final planting out. Mr. Fish's *modus operandi* is very good, and I quite envy him his cold pit. I can boast of no such appliance; and, even if I could, I would prefer to strike and winter the plants in pots, in a cool situation, the after management same as that adopted by Mr. Fish. Whether the plants are struck in pots, or simply pricked into a frame, however, matters little, provided they are not coddled. The point Mr. Fish is silent upon is the depth and composition of his beds, nothing being advanced on this point beyond the brief statement, "Our soil is mostly a heavy loam;" therefore, Mr. Fish must excuse me if I tell him his article is so far incomplete. The heavy loam, however, is highly favourable to the growth of the Calceolaria, an abundant proof of which has been afforded to me this summer, the plants positively refusing to grow in light soil, while those planted in heavy loam are all that can be desired. *Thos. Simpson, Broomfield.*

Asparagus Culture.—At p. 1124 Mr. Maw informs us that he has removed the seed from his Asparagus plants, to ascertain if any benefits will accrue from so doing. Allow me to inform him that I have removed the seed annually since 1868, with satisfactory results. I find the "heads" are much stronger, and also a little earlier. *F. J. P.*

Foreign Correspondence.

ORANGE CULTURE IN ST. MICHAEL'S.—An unusually large crop of summer Oranges this season anticipated the commencement of the annual export business. This untimely fruit is very inferior in quality to the regular crop of the season, so inferior, indeed, that the prices realised by its sale in the English market by no means repaid even the prime cost and freight. The Oranges which ripen in the summer months are not only deficient in sweetness and flavour, but are far more susceptible of damage in transport, and, in many cases, their condition when packed and ready for shipping was such as to make it certain that they could not arrive in England in a marketable state. Indeed, it would have been far more profitable to the exporters to have allowed the fruit to rot upon the ground, for the natural effect of sending damaged and unsaleable Oranges to England was to depreciate the market and injure the reputation of Azorean fruit. The exporters, however, seem to have been persuaded that the taste of the English public was so strong in favour of Oranges of any description that it would be safe to impose upon them any amount of worthless fruit, and they were not deterred by constant low prices, and consequent loss, from continuing the exportation as long as they had Oranges to export. Fortunately for them the regular crop has turned out a remarkably fine one, and the fruit did at first realise excellent prices in the English market. The experiment of transporting it to Great Britain in steamers appears to have been to some extent successful; and although it is asserted, in favour of the sailing ships, that they bring their cargo to its place of destination in a better condition than can be insured by steamers—an assertion which is only partially true—the advantage is said to be counterbalanced by the superior expedition and certainty of arrival which the steamers afford. Whichever way the advantage may really be, shippers at St. Michael's have a decided predilection for the latter, and, although the class of steamers which have hitherto engaged in the trade is hardly that best suited to encounter the winter storms of the Atlantic, being in general very deficient in the engine-power necessary to make head against a heavy sea and a strong wind, the masters of sailing vessels which have for years plied between the Azores and Great Britain, and which have acquired a high reputation for their sailing qualities, are loud in their complaints of the manner in which they are neglected, and forced to delay for weeks in port, waiting for a cargo which they maintain they could bring to market in a more healthy condition than the steamers, which are robbing them of the traffic. The freight charged does not vary much between the steam and sailing vessels, and averages from £6 to £6 10*s.* per ton.

There is a certain amount of inconvenience arising from the employment of both classes of vessels in the trade, namely, that it makes it more difficult to keep the market supplied with regularity, as it often happens that a steamer which may contain a cargo equal to that of three, or even four, schooners, overtakes a detachment of the latter at the port of destination, although despatched many days after them. The market is thus overstocked; indeed, it has recently happened that, the London warehouses being insufficient to receive the large quantities of Oranges arriving at the same time by different modes of conveyance, it was found necessary to retain the cargoes on board ship for three or four days for want of storage-room on shore, to the great detriment of the fruit, and depreciation of the market price,

There is, however, at this moment a more imminent danger to the Azorean Orange trade, one which has already this season seriously affected the business and the profits of the exporters of fruit. The development of the fruit traffic between the South of Europe and Great Britain, consequent upon the increased facilities afforded by railways, and the progress made in the culture of the Orange, especially in Spain, has had the result of continually overstocking the English market, and lowering the price of the produce to an amount not only unremunerative, but ruinously costly to the pockets of the exporters. The enormous exportation from the port of Valentia alone—an exportation which is stated to be annually on the increase—is so alarming to those engaged in the business in these islands, that some of them have already begun to cast about for a new market, and have turned their attention to the possibility of inaugurating a profitable traffic with the United States. As yet, however, hardly anything has been done in that direction, the freight demanded for the conveyance of fruit to an American market being so high as to deter shippers from despatching more than a very few cargoes across the Atlantic. The rate of freight demanded is indeed as high as that from any port in the Mediterranean, or from Sicily (from which island there is a steady exportation of Oranges to the United States), the reason being that steamers despatched to the Azores must come out in ballast, whereas steamers plying to the Mediterranean can always find cargoes, both for their outward and their homeward voyage.

With regard to the other vegetable products of the island of St. Michael's, it is said that about two-thirds of the Potatos raised are consumed in the island; while on the other hand, the annual crop of Lupins has generally to be supplemented from an external source. Of Yams there is annually a large growth, the soil and climate being peculiarly favourable to the vegetation of the crop, of which about two-thirds are generally exported to Portugal, or to the other islands. The Yams grow most luxuriantly in the valley of the Furnas, in those places where the ground is irrigated by the hot springs; indeed they seem to thrive best the nearer they are to the boiling water in which they are literally soaked. Of late years attention has been much turned in St. Michael's to the culture of the Pine-apple. A good deal of this fruit is annually sent to England, where it realises a fair price, and it is not at all improbable that an extensive trade may be developed in this particular article.

The wonderful advantages of soil and climate possessed by this island favour the rapid growth of all sorts of exotic plants and trees. A large extent of mountain side and highland has, in recent years, been planted with different kinds of Pines and Fir trees, which shoot up at a prodigious rate, the wood of which, when at 20 to 30 years' growth, is used for making Orange boxes. In the island of Terceira the culture of Tobacco has been introduced. Great expectations were formed as to the success of the experiment, and many proprietors entered into the cultivation with spirit, but with no very great success. The plant, indeed, comes forward luxuriantly; but, whether it be from the peculiarity of the atmosphere, or from lack of sufficient heat to bring it to perfection at the time of gathering, it has been found impossible to eradicate the flavour of greenness which remains after manipulation. A factory was opened, but soon closed; another opened, and sent for foreign Tobacco to work up with that grown in the island; but, although the cigars were well made, even with the mixture the greenish flavour could be perceived, and this factory is also now closed.

In the islands of Pico and Fayal the Vine was in former years extensively cultivated, more especially in the former island, where a large quantity of an inferior class of wine was annually made. Since the attacks of the Oidium, Vine culture has almost ceased; and this failure, combined with the Potato disease, brought great distress upon the poor inhabitants, with whom this esculent was the principal article of sustenance. Indeed, for several years the islands were in a chronic state of famine; but latterly the successful cultivation of the sweet Potato has furnished the poor with a plentiful supply of nutritious food. Previously to the year 1842 from 20,000 to 30,000 boxes of Oranges were annually exported from Fayal, but owing to the attacks of the insect (Coccus Hesperidum), which destroyed the trees, for several years no Oranges were produced. For the last 15 years the insects have been gradually disappearing, and the exportation of Oranges is augmenting. It is calculated that the crop of 1868 yielded 6,430,000 Oranges.

THE CURRANT CROP IN CEPHALONIA.—Whenever, owing to a severe winter, or the lateness of the rainfall in spring, the Currant crop is backward in ripening, it rarely happens that it is harvested undamaged. During the month of August heavy rainfalls invariably occur, and should the fruit then happen to be on the Vines, and, much more, should it be exposed on the drying areas, it must suffer. A sure protection against untoward accidents of this nature might be found by roofing over the drying areas with glass, in sliding panels—hot-house fashion. The rays of the sun, intensified by passing through the glass, would accelerate the process of drying, and full protection would at the same time be offered against sudden and unfavourable changes of weather. The areas to be covered in are, after all, not very large, and, considering the cheapness of glass, the expedient would not turn out very expensive. In fact, the losses incurred in a few seasons from the present improvident system would more than cover the outlay. But such is the inveterate attachment to old habits and practices among this people, that they prefer risking their property, however valuable, to the certainty of securing it at the expense of adopting unwonted appliances.

Societies.

ROYAL HORTICULTURAL: *Sept. 7.*—W. W. Saunders, Esq., F.R.S., in the chair.—At the termination of the usual preliminary business of the meeting, the Chairman stated that he regretted to mention that the Rev. J. Dix had been taken seriously ill, but he was glad to learn that on the previous evening he was very much better. In pointing out the most interesting of the plants exhibited, Mr. Saunders first called attention to the excellence of several of the specimens of Orchids in Lord Londesborough's collection, after which to the beautiful group of Nerines and Vallotas, sent by Mr. Sigismund Rucker, who had cultivated these plants with great success for many years. The great secret in their culture was to keep the plants in an ordinary greenhouse, and to keep the soil in which they grow at all times damp. There appeared to be two varieties, one the plant originally received from the Cape of Good Hope, and the other, an improved form, with broader petals of a brighter colour. Several other plants then came under review, including the choice assortment of ornamental trees from Messrs. Lee; the Lilium Leichtlinii, from Mr. Wilson, a beautiful species of a genus which had attracted the attention of cultivators for centuries, but which had been treated like many other subjects, grown by one generation of men and neglected by the next; and the fruiting specimens of Stangeria paradoxa, a plant which had been a puzzle to botanists, but when the seeds were botanically examined he expected further light would be thrown on this interesting plant. It was then announced by the Chairman that the Council had determined to accept the invitation to hold the next country meeting at Nottingham instead of going to Wolverhampton. The date had not yet been fixed, but the Council would try to fix it for a date when the greater number of plants were in the greatest perfection. The date would be announced at their next meeting on September 21.

Floral Committee.—Charles Lee, Esq., in the chair.—Owing to the disagreeable condition of the weather for exhibiting purposes, this, though a very interesting meeting, had a very small attendance. Mr. Denning, gr. to Lord Londesborough, again staged a choice group of Orchids, amongst which Burlingtonia venusta, Polycycnis muscifera, Zygopetalum Gautieri, Lælia elegans var. Turneri, Dendrobium chrysanthum, Oncidium incurvum, a fine specimen; Aerides Huttoni, with two nice spikes; and Miltonia candida grandiflora, a beautiful specimen, were very conspicuous. A Special Certificate was awarded. From Messrs. Veitch & Son came a beautiful group of new and interesting plants, amongst which the following were honoured with First-class Certificates:—Daphne elegantissima, a close compact-growing shrub, a variety of indica rubra, with green lanceolate leaves, margined with creamy yellow; Calamus cinnamomea and Livistonia rotundifolia, two very handsome Palms; and Adiantum peruvianum, a new and extremely effective Fern, which was figured and described at p. 457. With the above also came flowering specimens of Cattleya crispa, superba, maxima, Lælia elegans, Vanda Bensoniæ, Cypripedium Veitchii, and a thriving specimen of Begonia Veitchii, which has stood out unprotected for the last three years. A Special Certificate was voted to the collection. Mr. Bull also staged an exceedingly fine group, which received the same award, and in which were several fine pots of Lilium auratum, about 18 inches high, and very showy; several very handsome Palms and Cycads, a nice specimen of Brownea princeps, and Dæmonorops cinnamomea, identical with the Calamus in Messrs. Veitch's collection, which also received a First-class Certificate. From Messrs. E. G. Henderson came a collection of Tricolor Pelargoniums, to which a Special Certificate was given. Mr. Green, gr. to W. W. Saunders, Esq., exhibited male and female specimens of Stangeria paradoxa, the latter bearing ripe fruit, produced for the first time in this country, the two plants being rarely got in flower at the same time. With the above came the beautiful Amaryllis Belladonna pallida, the curious Mappa fastuosa, and Griffinia dryades, a new Brazilian species with flowers of a bright cœrulean blue, with white passing down the middle to the base of the segments. A Second-class Certificate was awarded to the latter, and a Special to the group. Messrs. J. & C. Lee, Hammersmith, had a very

large and interesting collection of hardy ornamental trees and shrubs; also small specimens of Thuja semperaurea, which received a First-class Certificate. Amongst florists' flowers the Dahlia was the best represented. In the class of 24, distinct, the best came from Mr. Walker, Thame, Oxon, Mr. Burfitt, Wandsworth Common, being 2d, both showing very good stands. Mr. R. Hopkins, New Brentford, sent the best 12; Mr. Burfitt coming in 2d, and Mr. T. Adams, gr. to — Wildser, Esq., Wyke Green, Isleworth, 3d. Amongst the new varieties the following were awarded Second-class Certificates:—Flower of Kent, a good yellow self, shown by Mr. G. Harris, Orpington, Kent; and Mrs. Watts, a pale show variety, from Mr. G. Parker, Maiden's Green, Winkfield. Mr. C. J. Perry sent a fine stand of Verbenas; Mr. Eckford also sent some new Verbenas, to one of which, named Miss Charlotte Mildmay, a large pale flesh-coloured flower with rosy crimson eye, a Second-class award was made. Mr. Cannell had specimens of several new Pelargoniums, as also had Messrs. Bell & Thorpe, Stratford-on-Avon, who staged a fine nosegay variety, named David Garrick, an immense trusser, of a fine deep crimson colour, to which a First-class Certificate was given. Mr. Roe, gr. to Mrs. Lewis, The Rookery, Roehampton, sent a good stand of French Asters. Mr. Bull took the 1st prize for 6 distinct Liliums, with neatly-grown specimens of lancifolium album, tigrinum Fortunei, auratum maculatum, lancifolium rubrum, tigrinum splendens, and auratum. Mr. G. F. Wilson also sent a fine spike of L. tigrinum splendens, and a smaller one of L. Leichtlinii, yellow, deeply spotted, and recurved. The latter received a First-class Certificate. Mr. C. Pilcher, gr. to S. Rucker, Esq., Wandsworth, had a splendid group of Nerines and Vallotas in flower, and from Messrs. Osborn & Son came a fine specimen of Grevillea Banksii; to each of which a Special Certificate was awarded.

Fruit Committee.—G. F. Wilson, Esq., in the chair.—At this meeting two prizes were offered by Messrs. Osborn & Son for the best examples of Golden Champion Grapes. Mr. Sage, The Gardens, Ashridge Park, Berkhamsted, sent two remarkably good bunches each of which weighed 3 lb.; both bunch and berry were very fine in size, but they were wanting in colour; the 1st prize was awarded. Mr. J. Douglas, gr. to F. Whitbourn, Esq., Loxford Hall, Ilford, sent a small bunch, with much smaller berries, from a cane grafted on the Trentham Black, which undoubtedly caused the berries to have a blackish tinge. The committee withheld the 2d prize. Mr. T. Bray, gr. to E. A. Sandford, Esq., Nynehead Court, Wellington, Somerset, sent a seedling Nectarine, named Henrietta Mary, which was considered to be worthless. Mr. Cadger, Luton Hoo Park, Beds, sent three specimens of a seedling Cucumber, measuring about 30 inches in length, and 3 inches in diameter, which were too large altogether for approval. Mr. R. Dean, Ealing, exhibited fine specimens of Onions, under the name of Danver's Yellow, grown from Vilmorin's stock of that variety, which the committee considered very fine, but decided that it was distinct from that kind. Messrs. Sutton & Sons, Reading, sent a collection of 50 varieties of Potatos, many of them of good size, but very coarse. A Special Certificate was awarded. Mr. Dancer exhibited fine examples of Pond's Seedling, and other Plums. Mr. Sage also sent a collection of fruit, and good samples of dwarf white Celery. Mr. Catleugh, Hans Street, Chelsea, sent a fine specimen of the Giant Puffball; Mr. Porter, gr. to E. Benham, Esq., Isleworth, also sent fine examples of Pond's Seedling Plum. From Mr. C. Noble, Bagshot, came fruit of a seedling Peach called The Lady, which was not considered to be any improvement upon existing varieties. The Chairman exhibited bunches of the Muscat Frontignan, a White Grape, sent out by Mr. Standish three years ago as new, and valuable for growing in cold orchard-houses. In the houses at Gishurst Cottage it is decidedly earlier, and produces larger bunches than Chasselas Musqué grown alongside. The flavour was all that could be desired, and the variety deserved what it did not get—some recognition from the committee. Messrs. Carter & Co. again exhibited growing examples of their new Chinese Mustard, which was acknowledged as being distinct, but no award was made. From Mr. Eckford, gr. to Earl Radnor, came a seedling Nectarine, which was thought to be like the Pitmaston Orange; and from Mr. Cox, Redleaf, came a dish of a small Apple of excellent flavour, grown by Messrs. T. Bunyard & Son, Maidstone.

Metropolitan Florists' Society: *September 6 to 8.*—This new Society of Florists, which has for its object the encouragement of that class of plants which is popularly designated Florists' Flowers, and which consist of Pinks, Picotees, Carnations, Pansies, Dahlias, Tulips, and Auriculas, and such other subjects as were prized and cultivated by the florists of old, held its first exhibition at the Crystal Palace on Tuesday, Wednesday, and Thursday last, with very successful results. The Society was projected through the Crystal Palace Company having abandoned its autumn shows, which, in a commercial sense, were failures. Nevertheless, the company gave it its warmest support, and became liberal subscribers. It is probable that such a collection of Dahlias, consisting of over 100 stands, has not been witnessed for many years. Thanks to genial weather, the blooms were remarkably fine in size, form, and colour, and called forth unbounded praise from the many admirers of this fine autumn flower. Roses and Asters were in great force, whilst Gladioli and Hollyhocks were very fairly represented.

In the nurserymen's class for 48 cut blooms of Dahlias there were seven competitors, the competition being very strong. The 1st prize was carried off by Mr. J. Keynes, Salisbury; Mr. H. May, Bedale, Yorkshire, being placed 2d. Mr. Keynes' flowers were remarkably large, symmetrical, and fine in colour, the best being Gazelle, Lightning, Toison d'Or, Lilac Queen, Earl Pembroke, King of Primroses, Mrs. Boston, Victory, Hon. Miss Herbert, Mr. Dix, Flora Wyatt, and John Kirby. In the 2d prize collection the following were exceedingly fine:—Leopard, George White, Baron Taunton, Leah, Miss Henshaw, Master of Arts, Eclipse, Criterion, Memorial, John Kirby, and Yellow Boy. The latter blooms were a little smaller than those shown by Mr. Keynes, but were splendidly finished. Mr. J. Harrison, Darlington, was placed 3d, and Mr. G. Edwards, York, 4th, both contributing very meritorious collections. The best 36—a remarkably even and well-finished collection, were staged by Messrs. W. Draycott & Sons, Humberstone, near Leicester. The blooms in this lot were of excellent quality, especially those of Norfolk Hero, Blushing Fifteen, Annie Neville, John Kirby, Miss Henshaw, Princess of Wales, Lord Derby, Mr. Dix, Leah, George Brown, Yellow Perfection, and Mrs. Thornhill. Mr. Keynes, who was 1st for 48, came in for 3d honours here, the second position being secured by Mr. H. May, and the 4th by Mr. J. Harrison. The varieties exhibited comprised mainly those above mentioned, the blooms being uniformly fine. In the class for 24, Mr. J. Walker, Thame, Oxon; Messrs. Kelway & Son, Langport; Mr. H. Clark, Rodley, near Leeds; and Mr. S. W. Pilcher, Horsham, Surrey, were the principal competitors, the prizes being awarded in the order named. In the collections shown by the above the following varieties were the most conspicuous:—Champion, Mrs. Boston, Nelly Buckle, Commander, Golden Gem, Lady Maud Herbert, Volunteer, and Leah. The best 24 fancy varieties, in the nurserymen's class, were exhibited by Mr. Keynes, who staged, amongst others, grand blooms of Leopardess, Viceroy, Chameleon, Sparkler, Flossie Williams, John Sealey, Octoroon, Attraction, and Oliver Twist. Mr. H. May was also placed 2d in this class, contributing in his collection blooms of Pope's Gem, John Salter, Glory, Queen of Sports, Polly Perkins, Prince of Wales, and Leopard, n very fine order. In the amateurs' class for 24, the 1st prize was taken by Mr. C. J. Perry, Castle Bromwich, after a very close competition, with Mr. R. Petfield, gr. to G. Thornhill, Esq., Diddington, who was placed 2d, Mr. J. Burfitt being 3d, similar varieties to the above being shown. For 12 (amateurs), Mr. J. F. Martin, Henfield, Sussex, was 1st, with excellent blooms of Unique, Mrs. Henshaw, Sir G. Smythe, and James Hunter in his group. The next best lot came from Mr. G. H. Fawkes, Mr. H. Glasscock, Bishop Stortford, and Mr. H. Fry also receiving awards. Mr. Perry also staged the best 6 Fancies, which consisted of Grand Sultan, Butterfly, Prospero, Lightning, Fanny Sturt, and Pauline. Mr. R. Petfield came in 2d, Mr. J. Burfitt 3d, and Mr. Fawkes 4th, all very good in quality. Several new flowers were staged, amongst which the following were selected for First-class Certificates:—Annie Hobbs (Hobbs), a fine white self; Flora Wyatt (Keynes), a fancy variety, cinnamon blotched with crimson, large and full; and Richard Dean (Keynes), also a fancy, of immense size, good form, and of a pale brown colour, striped with deep crimson.

Hollyhocks were very well represented, considering the lateness of the season; the blooms, however, were not so fine in colour and shape as those shown three weeks ago at South Kensington. Only three collections of 12 spikes, and these rather poor ones, were staged, Mr. H. Minchin and Mr. W. Chater being respectively 1st and 2d. In the open class for 24 cut blooms, Mr. Chater came in 1st with a very fine collection, amongst which Rose d'Amour, Marion, Countess of Crawford, Carus, Carus Chater, King, Conquest, and Bullion were the best. Mr. H. Minchin had a neat group, and took the 2d prize. Mr. J. Harrison and Messrs. W. Draycott & Sons also came in for prizes in this class. The amateurs' class for 12 was fairly represented, the prizes being awarded to Mr. W. Minchin, Hook Norton, Oxon, Mr. R. Fry, Taunton, and Mr. Rickwood, Ilkley, near Leeds.

Of Gladioli there were about 15 collections contributed, for the most part very fine, especially those shown by Messrs. Kelway & Son, Langport, which took the 1st prize for 36; and by Messrs. Stuart & Mein, Kelso, which occupied the corresponding position in the class for 24. In the latter collection, the spikes of Rosa Bonheur, Bernard de Jussieu, Delicatissima, Maréchal Vaillant, Madame Desportes, Lord Byron, Spectabilis, Robert Fortune, Molière, Meyerbeer, and Charles Dickens were quite first-rate. R. A. Wheeler, Warminster, was the only other exhibitor in the class for 36, taking the 2d prize. Next to Messrs. Stuart & Mein, for 24, came Messrs. Draycott & Sons, Mr. G. Edwards, York, being 3d, and Mr. J. Walker 4th. In the amateurs' class for 6 there were only two competitors—Mr. R. Fry, Taunton, and the Rev. H. H. Dombrain, Westwell Vicarage, who took the 1st and 2d prizes in the order named.

French Asters, owing to the dryness of the season, were not so large or so fine as usual, though they were very largely exhibited. The best 36 came from Mr. G. Wheeler, Warminster, a very neat and evenly grown lot; Mr. W. Sandford, gr. to T. Thomassett, Esq., Walthamstow, coming in 2d, Mr. J. Walker 3d, and Mr. H. Minchin 4th. Mr. G. Mathews, High Street, Shoreditch, was 1st for 12, Mr. R. Petfield coming in for 2d honours. Mr. G. Wheeler also had the best 24 German Asters, which were quite equal in size and finish to those noticed above. Mr. J. Walker, Mr. J. Betteridge, and Mr. W. Sandford also obtained awards in this class, some fine blooms being shown amongst them. The competition in the open class for 24 Verbenas, five trusses, was very numerous. Mr. C. J. Perry came in 1st very easily. Among his collection the following were very attractive:—Magnificus, Mrs. Mole, Edwin Day, Rev. C. P. Peach, Mrs. George Prince, Velocipede, and Shakespere, the latter being a wonderfully brilliant scarlet, of great substance. Mr. H. Minchin had good examples of Géant des Batailles, Nemesis, Reine des Roses, G. R. Tye, and Lady Hastone, &c., and took the 2d prize. Mr. G. H. Fawkes, Birmingham, was 3d, and Mr. J. Burfitt 4th. Cut Roses were shown in excellent condition for the time of year, and considering the peculiarities of the season. Messrs. Paul & Son, Mr. Keynes, and Mr. H. Coppin, Shirley, were the principal competitors in the nurserymen's class for 24; and Mr. H. Exell, gr. to J. Hollingsworth, Esq., Maidstone, and Mr. J. Parnell, Brookfield, Rugby, amongst amateurs for 12. For the three prizes offered for a basket or vase of cut flowers, for the dining-room, there were nine competitors, the 1st prize being won by Miss A. Hassard, Norwood; Mr. W. Soder, gr. to T. Hanbury, Esq., Brentwood, coming in 2d, and the Rev. H. H. Dombrain 3d.

In the ever attractive miscellaneous class were large, varied, and tastefully arranged groups of plants from Messrs. Downie, Laird & Laing, and Messrs. Carter & Co., to which Special Certificates were awarded; a collection of Tricolor and Silver-edged Pelargoniums, from Messrs. E. G. Henderson & Son; cut Roses and Dahlias from Mr. G. J. Woolletts, Caterham; a fine stand of Marigolds from Mr. D. G. M'Kay, Sudbury; and a similar one from Mr. H. Cooper, gr. to Miss A. Hassard; and six remarkably fine dishes of Apples from Mr. Chaff, gr. to A. Smee, Esq., Carshalton. First-class Certificates were awarded to Messrs. Downie, Laird & Laing, for Pelargonium Pink Queen; Cupressus Lawsoniana pendula alba, shown by Messrs. Paul & Son; to Mr. H. Appleby, Dorking, for his new fumigator. Mr. G. Wheeler, Warminster, exhibited 24 beautiful double Zinnias; and Messrs. Dick Radclyffe & Co. examples of their handsome rustic Fern cases and aquariums. Mr. Chapman had several examples of his new flower boxes, including one which contained a stand of Asters, which were exhibited at the Worcestershire Horticultural Society's Show, held at Kidderminster last Monday week, and were shown here comparatively little the worse for their long incarceration, and which called forth much praise from the spectators. He had also neat little game boxes, made to contain two brace of birds, there being four separate compartments, through which the air is allowed to pass, without admitting flies. If any of the birds become tainted, it is a matter of impossibility for the infection to contaminate the others. Truly "no gardener, florist, or gamekeeper should be without them." A First-class Certificate was awarded to them.

At the judges' dinner, on Tuesday, the Rev. H. H. Dombrain presided, the Rev. C. P. Peach being in the vice chair. In addition to the judges, there were present most of the leading florists of the metropolis and from the provinces. Several toasts were given, including "the Crystal Palace Company," coupled with the name of Mr. Wilkinson, proposed by the chairman; and "Success to the Metropolitan Florists' Society," coupled with the name of Mr. Dombrain, given by Mr. Keynes, Salisbury.

Dundee Horticultural: *Sept.* 2.—The annual Floral Fête of this Society was held in Baxter Park, and it is probable that a better display has not been seen in Scotland this year. The chief feature was the competition for stove or greenhouse plants. Only three competitors came forward, the 1st prize being won by Mr. James Heath, gr. to James Cox, Esq., Clement Park; and Mr. A. Kerr, gr. to Joseph Grimond, Esq., Corbet Castle, Broughty Ferry, being 2d. Almost the whole of one of the central stages in the large marquee was occupied by the plants in this competition, and presented quite a show of themselves. In Gladioli the best 24 came from Mr. John M'Pherson, Polmuir, Aberdeen; and the best 6 from Mr. A. Hosie, Claverhouse. The 1st prize in Hollyhocks (spikes) was carried off by Mr. Wm. Shand, Fetteresso Castle. The Dahlias, though not so extensive as in other years, were nevertheless very good. As was to have been expected from the long-continued dryness of the season, the show of herbaceous blooms was a failure. The Phloxes, Stocks, and Antirrhinums were very tall and straggling. The Coxcombs, though not many, were large, full, and very rich in colour. Messrs. John Stewart & Sons, nurserymen, Dundee, contributed, as usual, on a large scale. Their collection of 30 stove and greenhouse plants were particularly worthy of notice. In cut flowers, Messrs. Stewart also retained their forward place as growers of Roses and Hollyhocks, for which they obtained 1st prizes in their respective classes. Messrs. Laird & Sinclair, nurserymen, in addition to their competing stands, also sent a very interesting collection of fine-foliaged plants.

The show of fruit was the finest ever seen in Baxter Park. The 1st prize for collection of fruit,—eight varieties (Pine-apple excluded)—was gained by Mr. William Brow, gr. to Mr. David Baxter, Bart., at Balmain Castle. The noted Glamis Grapes were well represented. The bunch of Black Alicante, the best one for bloom, was truly of Eschol character; and the four bunches shown by Mr. Johnston, the Earl of Strathmore's gardener, afforded a treat worth seeing. Mr. George Paton, American Muirs, had two seedling Gooseberry bushes, heavily loaded with the largest of berries. The Apples, Pears, Currants, Peaches, Apricots, were very good. Mr. John Reid, Ballindean, as usual, carried off the 1st prize for Gourds. His collection of upwards of 100 were a very fine sight.

Amongst the miscellaneous subjects exhibited was a collection from Mr. B. Kirk—2000 queen wasps, more famous in death than in life, for they were much inquired after at the show. He declared on the label, "Had all the queens escaped they would have produced this season a progeny greater in number than the population of Great Britain."

South of Scotland Horticultural: *September* 2.—The exhibition of this Society was held on the above date in the Mechanics' Hall, Dumfries, and proved very successful. The flowers were neatly arranged on tables extending along the hall from end to end, while the fruits were displayed on a table in front of the platform. The exhibition of flowers was exceedingly good, and from their neat arrangement and fresh appearance, presented a beautiful sight. Mr. Milligan, Dumfries; Messrs. Kennedy & Co., Dumfries; Mr. James Service and Mr. Robert Service, Maxwelltown, contributed much to the success of the show by the extensive and varied collections of plants which they sent for exhibition. The various departments of the exhibition were all well represented. Of greenhouse, stove, and fine-foliaged plants, the display was excellent. Pelargoniums were also largely represented. All kinds of fruit were shown well. Vegetables were also well competed, and it may be interesting to note that the Leeks seemed particularly good.

Notices of Books.

Clavis Agaricinorum; *an Analytical Key to the British Agarics, with Characters of the Genera and Subgenera.* By Worthington G. Smith, F.L.S. London: Reeve & Co., 1870. 8vo. Pp. 40, with Six Plates.

This memoir was originally read before the Woolhope Club, Hereford, Feb. 22, 1870, and we are glad that the author, who has done so much to illustrate the Fungi of this country, has thought fit to publish it separately, as it undoubtedly must prove a great help to every student of an extremely difficult tribe. We by no means assert, as some have done, that all difficulties are removed, and that now nothing is easier than to determine any species of Agaric. A line of the old algebraic problem in verse –

"He took it and tried, but it puzzled his prating,"

would undoubtedly be the result if the critic went at once without any previous knowledge to the determination of almost any species of Agaric. No doubt the colour of the spores is a most important element in the distribution of Agarics into subgenera, but even this will sometimes prove a difficulty, as anomalies occur, and the tints are so very different in the Dermium section. Lepiota is confessedly very closely allied to Psalliota; indeed in those species which change their colour, and with the colour of the flesh at the same time that of the spores, it is often impossible, from the inspection of dried specimens only, to say whether we have before us a Lepiota or a Psalliota,—a difficulty which has often puzzled the writer of this notice, in the course of describing a very large exotic collection of debateable species; and though the dried specimens were in almost every case accompanied by exquisite drawings, there was still room for frequent doubt.

In every arrangement there will be anomalies. If we take the free gill as a characteristic of Lepiota, we shall not be long before we have species before us in which the gills are neither remote nor approximate, but decidedly attached to the stem, and this is still more evident in Amanita, where there are few species with really free gills, as in Volvaria and Pluteus. The same difficulty occurs in deciding whether the gills are truly decurrent in several cases, and we are, therefore, sorry that subgenera resting on such very slight characters as Tubaria and Deconica should have been proposed. A. furfuraceus is one of the most variable of Fungi, and almost every form of attachment may be found. After all, such species as A. vulgaris, camptophyllus, &c., are left in Mycena, where the gills are quite as decurrent as in either of the above mentioned subgenera. We have no objection to the separation of Agaricus variabilis with its two close allies, but the slight tint in A. euosmos is not sufficient to separate it subgenerically from A. ostreatus, and it has clearly no affinity with A. variabilis. We cannot assent to the separation of A. cretaceus from Psalliota, though we may approve of the keeping such abnormal species as A. fumoso-purpureus and echinatus distinct, though they seem to connect Lepiota with Psalliota.

If the colour of the spores is to be all in all, we must begin to cut up Hygrophorus and Lactarius, which could scarcely be done with advantage.

These observations may wear a rather conservative appearance, but in truth the reforms requires to be much deeper; the Friesian system, excellent as it is, and far superior, in our judgment, to every other, will undoubtedly some day require considerable modification, though we believe that it will always remain as the groundwork on which any satisfactory arrangement can be built. A. corticola revives after a shower of rain as readily as a Marasmius, and yet no one would think of turning it out of Mycena, and we could point out many other anomalies. The genus Hiatula seems to have escaped Mr. Smith's notice, though possibly that, and one or two other Agaricoid genera, are neglected as being entirely exotic, though on the same ground Pilosace might have been excluded.

Mr. Smith has appended a list of the British species, amounting to 701, which will undoubtedly be considerably increased. We cannot conclude this notice without expressing our admiration of the energy which the author of this little publication is continually exerting in a subject which is of daily increasing importance.

The Book of the Roach. By Greville Fennell (of the *Field*). Pp. 118. London: Longmans.

This little work presents itself at a seasonable period of the year, since September and October are probably more usually devoted by general anglers to roach fishing than any other months. Fly-fishing for trout is then over, and the weeds are too thick in most places for pike-fishing in its most sportsman-like form of spinning, while chub are not so universally distributed, and do not occur in such numbers in the places where they are met with as the roach. The professed object of the author was to give an "exhaustive view of the subject," by "blending" his own experience with those of previous authors, and thus to present to his readers a book "in every respect satisfactory and acceptable." We have a great respect for Mr. Fennell, because of the numerous interesting communications which he has for so long a period been contributing to the *Field* newspaper, and the able service which he has rendered to Thames anglers in helping to improve the fishing of that noble stream. We feel sure that lovers of roach fishing will rejoice to learn that so talented a writer has collected together, and published at a small price, a great amount of information upon this subject—information that is both useful and reliable. To this extent the book is "acceptable."

But we must plainly state our opinion that the book is by no means a "satisfactory" one. It bears evidence of having been got up hastily, and without proper care; since we find a recipe for a certain ground-bait given twice, and a good article on the bite of the roach at p. 55, but no reference, either there or in the index, to some still more interesting information on this point which is given at p. 30 under the heading of "shotting floats." In another place we come upon a paragraph headed "Clearing swim," one quarter of which only is devoted to this subject, while the next quarter describes what are the best swims, and the last half of the paragraph treats of the effectiveness of particular baits, a subject which belongs to another chapter.

Again, the book is unsatisfactory from the fact of its not being, what its author intended it to be, "exhaustive." That cannot be called an exhaustive treatise upon roach fishing which omits allusion to the lightest of all rods, the five-jointed bamboos, which come from Japan; and disposes of the Nottingham reels in the following words:—"We are afraid to attempt to describe the proper manner of using them, they must be seen in the hands of a master to be appreciated."

The information which is contained in this little work merely requires to be re-arranged, and a few omissions supplied, and anglers would then possess as complete a book of reference upon roach fishing as could well be compiled. We look forward to the pleasure of seeing this soon in a second edition.

FOREIGN JOURNALS.

RESUMING our notice of foreign publications, **L'Illustration Horticole** first comes to hand. Of this publication we have already mentioned that a new series commenced with the year, and of this new series four numbers, the contents of one of which have been already noted, have reached us. In those now before us (February to April) we find figures of the following plants:—*Pepinia aphelandræflora*, a plant referred to Pitcairnea by Lemaire, a tufted-growing Bromeliad, with linear-lanceolate, reflexed, bright green leaves, and comparatively large spikes of long, convolutely tubulose, bright orange flowers, which are of a very showy character; it is from Para. *Calathea* (*Maranta*) *chimboracensis*, a small-growing species from Ecuador, with ovate-oblong leaves, green, with an irregular band of dark bottle-green, and a parallel contiguous band of grey running down each side of the leaf, about midway to the margin; though a pretty plant, it bears no comparison with several of the species already known. *Cattleya Eldorado splendens*, a really splendid Orchid, of the quadricolor type, which, together with Trianæ, M. André here refers to C. labiata. In the present plant, from the Rio Negro, the flowers are large, of a delicate rose, with a remarkably richly-coloured lip, the whole centre of which is clear orange, surrounded by a band of white, the margin being of a deep violet-rose and fimbriated. *Pompon Chrysanthemums*, a group of six varieties. *Ceratostema speciosum*, a splendid greenhouse shrub from the neighbourhood of Loxa, in Ecuador, the stem erect, with a tuberculate base, the leaves ovate-lanceolate, with a short twisted petiole, and the flowers in short axillary drooping spikes, cylindraceo-costate, bright orange-red, with a short yellow and slightly spreading limb. *Camellia Teresita Canzio Garibaldi*, an Italian variety, recently obtained by M. Bernardino Lechi, of Brescia, an imbricated flower, of a delicate lilac-rose colour, scarcely coming into the first rank as to merit. *Dieffenbachia Wallisii*, a Rio Negro species, with the stalks and leaves green, the blade marked with a broad feathery central band of grey, and a few patches of the same colour scattered between the midrib and margin. *Houlletia odoratissima antioquiensis*, a Colombian plant, with ovate pseudobulbs, somewhat plicate leaves, and an erect scape of numerous large flowers, which are brown outside, and of a rich blood-purple within, the lip being narrow, elongated, white, with a hastiferous tip and a pair of cirrhiform teeth near the base. *Alloplectus villatus*, a stout-growing Gesnerad, with broad ovate leaves 6 to 9 inches long, of a velvety deep green, with a greyish green band along the outer and principal veins, and terminal fasciculate flowers which have a large crimson calyx, and pale yellow corolla; it comes from Eastern Peru. *Maxillaria grandiflora*, a handsome Lycaste-like plant, from New Grenada and Peru, with large white triangular flowers, and a saccate lip, closely striped with purple at the sides, and having a tongue-shaped deflexed apex bordered with yellow. *Azalea Bernhard Andreæ alba*, a double white variety, raised from seed on the establishment of M. Linden, at Ghent; it may be distinguished from the other double whites, by the more open flowers, showing the style in the centre exactly as in the single-flowered sorts; the centre, moreover, is greenish. *Calathea* (*Maranta*) *smaragdina*, is a moderate sized plant from the Upper Amazon, with a tuft of erect leaf-stalks and horizontal leaves, the blade of which is ovate-oblong, 10 inches long, of bright emerald-green, deeper near the costa; it is quite a second-rate kind.

Gartenflora (December, 1869, to June, 1870) contains the following illustrations, many of which are good examples of chromolithography:—*Homalonema rubescens*, a fleshy-stemmed Arad, bearing a few saggitate-cordate leaves, the under surface of which is stained with red, and the petiole as well as spathe is purplish crimson; it is East Indian. *Calanthe Sieboldii*, a Japanese terrestrial Orchid, in which the leaves are broadly lance-shaped and plicate, and the erect scape bears a lax raceme of neat yellow flowers. *Spathiphyllum Minahassæ*, a pretty stemless Arad from the Sunda Isles, producing ovate-oblong long-stalked leaves, and elliptic oblong leaf-like white spathes, rivalling those of Richardia. *Oncidium dimorphum*, a small yellow brown-spotted Orchid, from Brazil, in which the lip is dimorphic: three-lobed, or subentire. *Begonia boliviensis*, now well known. *Agave heteracantha*, a stemless species, with lanceolate leaves, margined with chestnut-coloured deltoid variously-directed spines, and an erect simple spike-like inflorescence. *Spathiphyllum cannæfolium*, a stemless Arad, with lanceolate oblong leaves, and a leafy spathe which is white inside and green exteriorly. *Aerides nobile*, a fine Orchid, related to A. odoratum. *Lælia coccinea*, a pretty little old-fashioned Polemoniaceous plant, better known here as Hoitzia coccinea. *Musa Eusele*, now so familiar from its use in subtropical gardening. *Zygopetalum maxillare Gautieri*, a variety with flowers larger than in the type, and with a fine violet-tinted lip. *Lonicera Ruprechtiana*, an Amoor Honeysuckle of the Xylosteum group, with elongate elliptic leaves, and small pale yellow flowers. *Lilium tigrinum flore-pleno*, one of the most striking of hardy Lilies, and of which comparatively weak specimens have been exhibited at some of our meetings during the past summer; the flowers are coloured and spotted like those of the common Tiger Lily, but the segments of the perianth are duplicated so as to form a full double flower, and, according to the figure before us, the flowers are borne in a pyramidal panicle as in the type, and also in the splendid single varieties, Fortunei and splendens, which rank amongst the choicest of "hardy bulbs." *Palava flexuosa*, already noticed. *Anthurium aralifolium*, a stemless species, with long-stalked, pedately-lobed leaves, which are cordate-hastate in outline, and of a glaucous-green colour; it is said to be New Caledonian. *Atragene alpina*, an old plant, of which three or four varieties are shown. *Odontoglossum Rossii*, a pretty dwarf Mexican Orchid. *Atragene macropetala*, a blue-flowered Manchurian plant, related to A. alpina, but with a taller climbing stem, and petals equalling the sepals. *Pancratium speciosum*, also called Hymenocallis, an old stove bulb, with elliptic-lanceolate leaves, and umbels of 10 to 15 white flowers. *Abutilon megapotamicum*, the pretty red and yellow-flowered plant sometimes called A. vexillarium, and which, trained on a pot-trellis as suggested by this figure, would probably make a good exhibition plant. *Clethra barbinervis*, a Japanese species, with obovate-oblong serrated leaves, and racemes of small white flowers. These numbers also contain a view of the Hamburgh International Exhibition, and a portrait of Mr. F. J. E. Enke, of Erlangen, publisher of the "Gartenflora," who died on December 9 last.

The Apiary.

WE have given an account of a hive, according to our promise in a recent Number, but in case any erroneous idea regarding the queen bee should have been

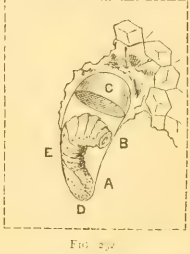

FIG. 258.

A, B, the queen-larva spanning its cocoon. A, the head, with the "spinnerettes" fastening the silk to the sides of the cell, and forming the re-purator at the end shown at D; B, the end of the larva resting against the side of the cell, and by pressing its back against E, the larva is enabled to move its head and neck on all sides of the cell, and gradually working upwards, it is enabled to finish and rest upon its back with its head downward; whilst the white "queen jelly," C, fills about one-fourth of the interior space, and keeps up a moisture for the growth of the larva, and expansion of the abdomen, which nearly touches the jelly.

received by our readers, as "I. O. W." has alluded to a question affecting the queen's impregnation, we

dismiss the subject with only one remark, for the present. He alludes doubtless to that long word "parthenogenesis" in bees, as he states the queen bee "when not impregnated at all (she lays male eggs only) or when not impregnated until after a certain number of days, after she has arrived at the winged state, only deposits eggs which produce males." We believe the matter is met (*Gardeners' Chronicle*, p. 1062 and 1063), but we will not hesitate to repeat, "no unimpregnated queen bee can deposit fertile eggs of either drones or workers." The facts of the imperfectly fed and untimely raised fertile workers, will, we believe, remove much of the mystery of "parthenogenesis," and we will pass on to another fact, which has this season again fallen under our own observation, as the extreme dryness of the air, and the average of the temperature, has brought our queen-raising periods to something like Italian seasons, *i. e.*, queens have appeared within 10 or 11 days, and a few hours over, as compared with our averages of former seasons, namely, 14 or 16 days. We allude of course to our "summer-raised queens," and not those now being bred or any raised in the autumnal months at all. The queen bee spinning her cocoon, and the added woodcut (fig. 232), with the letterpress, will explain the whole process of the cocoon being spun to the required height. Thus, in a normally raised queen-cradle, with a worker egg and larva properly fed, and the queen jelly duly deposited, we were able in our wax model queen cells, which are made to open and shut, to see the queen larva spin its cocoon at all hours. This has never been recorded before, but conjectured, as possible; but we had no idea of the activity of that apparently motionless mass undergoing the process of growth by absorption and suction in its later stages. We have only to add, that queens raised in worker cells, when contracted at first, have not the jelly laid up, as in the acorn-shaped cup of the normal queen's cradles: nor do the spaces in the drones or workers cells ever contain such added jelly; and both the drone and worker larvæ have very contracted spaces to perform their cocoon spinning evolution in, for the very sides of the cell seem to bulge with the internal pressure of the larvæ, at least in those newly made cells of pure wax, which of course become more and more strengthened as each successive batch of brood leave the cells as perfect bees, and give the combs greater stability, and will in the autumn bear the great weight of honey and pollen stored for their winter's consumption.

We will now proceed to redeem our pledge regarding the best form of "bar-frame hive" to be used for the purposes of obtaining honey, and raising stocks of bees,—the "honey trough hive," for that will be the letter title to accept, as contradistinguished from the numerous imitations of the original "bar-and-frame hive," which are merely adaptations of the frames within the long bee-boxes which were used in the place of common straw hives years ago, and which have had all their periods of being arranged as collateral hives, side by side, or storied hives, one above another, or under one another; indeed, the imagination of bee-masters and hive-makers seems now to be exhausted, and we cannot suggest any new mode of making the beehives which are to store honey more abundantly, unless we could persuade the bee-keepers now to turn their filled hive upside down, and place an empty hive on it! when, we promise the happy bee-keeper, he shall have a garden flowing with honey, which he will not be able to gather! This honey-trough and bar-frame hive, having thus been made or purchased, will be represented by a box about 14 inches long, 12 inches wide, and 21 inches deep, to be made to stand on a few bricks to keep it from the soil and damp earth, in any open part of the garden selected for the apiary. This box, if it had its lid taken off (which is merely a plank in the commonly made form), would exhibit seven frames, resting on the two ledges of the box, front and back, by their prolonged bars at the top, formed for that purpose. The half-inch bars, with slips of zinc attached, help to keep the frames apart, whilst they also close in the tops of the frames to prevent the bees from escaping from above. These seven frames have a square bar, 9 inches, fitted within the frame, fixed and waxed on the two lower sides, for the bees to attach their combs to; and being 9 inches only give a shorter and more certain direction for the bees to be guided by; whereas if made to accommodate the older forms of bee-boxes, the bars would be made 14 inches long, and often misguide the bees. This "honey trough," however, is constructed on a better principle, the bar-frames are very perfect; as all the other attempts to introduce a long bar resting in a frame, and not fixed or made in a solid square frame, are failures. The weight of the comb when filled with honey and brood exceeds 6 lb., and will to a certainty fall out when attempted to be worked or examined by unpractised bee-masters; and even those more skilful, in warm weather, when the wax attachments to the sides become soft, will find the whole comb falling down and breaking. These solid frames, with the guide bars all solidly made, are much to be commended and always used, as a guide to the bees for comb building and a security to the bee-master when lifting out the filled combs of honey or examining the bees. The alighting board for the bees is also always dry and sheltered from the side winds, whilst the entrance to the "bar-frames" is direct up the inclined plane, which forms an angle with the alighting board. This inclined board is about 11 or 12 inches deep, running the whole length of the interior of the "honey trough;" when a swarm is to be introduced the slide-board is taken out, and the swarm of bees quietly shot down on the alighting board. When the bees have all ascended and settled themselves in amongst the seven bar-frames, the sliding board is run into its place, and the bees will then be left to go in and out as they please, as the board does not touch the bottom board, but leaves a $\frac{3}{8}$ inch space for the purpose of having an entrance extending the whole length of the alighting board in the interior. Thus the bees have $6\frac{1}{2}$ inches from A to B, in the small plan shown below, to fly through, and alighting near the $\frac{3}{8}$ inch space, crawl up the box sides, from X, to the frames and combs above. At the back of the apiary or honey trough, at C D, a shutter with a sheet of glass, fixed, or made to slide in and out, so as to substitute perforated zinc for ventilation, is desirable.

The plan, fig. 233, is a section of the "honey-trough bar-frame hive," of which some account was given, we believe, in the report of the meeting of the Royal Horticultural Society at Oxford; but we add this as our own impression of what the "bar-frame" should have been, and we believe we have followed the description given in the short notice of this useful hive.

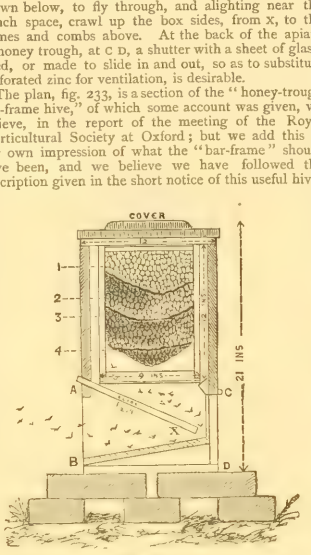

Fig. 233.

This contains seven bar-frames 1 inch wide and $\frac{1}{2}$ inch thick. There are eight $\frac{1}{4}$-inch pieces to fill in between the sides and the frames, which close in the bees at the top. No. 4, shows the centre comb, which is always built in advance of the side combs by the bees. No. 3, the next extended combs, which would be formed on both sides of the centre comb. No. 2, the next shorter pair of combs, on the outside of the last-formed combs. No. 1, the last formed sheets of combs, built on the two outmost bar frames, and thus form a third pair of parallel combs, and seven sheets of combs in gradations from the outsides to the long centre comb. A B is the entrance, contracted at X by the $11\frac{1}{4}$-inch slide, the bottom of the box being the alighting-board, always dry and sheltered from the winds; C D the shutter at the back. The top bar is 12 inches of the bar frame (which is only 9 inches wide as to the frame, and 12 inches deep, and has the guide-bar 9 inches just under the top-bar), leaving the half inch on each side to rest on the outer frame. *M. D.*

Garden Memoranda.

Stoke Park, the Seat of E. J. Coleman, Esq.—I lately spent a few hours in looking over this delightful place, rendered the more interesting by so many recollections which link it to the past. It was here, amidst its peaceful groves and leafy bowers, that the poet Gray, whose monument forms one of its handsome features, used to wander; and the old Manor House, which sheltered Queen Elizabeth beneath its roof, still remains, and is, to all appearance, capable of holding its own against the winter winds for centuries yet to come. My present object, however, is not to speak of the past, but to describe in a few words my impressions as to the state in which I found the gardens under the care of Mr. Richards, whose skill as an Orchid and fruit grower has been so often demonstrated at our metropolitan and other exhibitions, and who has now removed to take charge of the gardens at Gunnersbury Park.

Few amongst us can forget the splendidly finished Grapes exhibited by Mr. Richards at the Crystal Palace a few years ago, or the Orchids sent up from Grimston Park, and exhibited before the Royal Horticultural and other societies. I was therefore quite prepared to find everything in the best possible order, but I certainly was not prepared to find a place so beautiful; its charming undulating scenery, its extensive park, splendid trees, noble mansion, handsome rippling lakes, and leafy glades must be seen to be appreciated.

A pleasant walk from the Slough station, over two and a half miles of well kept road, flanked on either side by rich land, and from which we catch here and there glimpses of Windsor Castle between the large Elm trees which thickly stud the hedgerows, brought me to the entrance to the park, which is directly facing Windsor Castle. The entrance is a handsome one, with a substantially-built lodge on each side. A graceful drive, winding over undulating ground, with here and there long vistas, brings the visitor to the lake, which is spanned by a substantial stone bridge. The lake runs through the park from east to west, the ground on the north and south of the lake opening out into a beautiful panorama of landscape, seldom equalled, and rarely surpassed. Following the drive over the bridge on the northern bank of the lake, we arrive at the north front of the mansion, which is situated nearly in the centre of a park containing 400 acres, beautifully clothed with handsome trees. The park (one of the first enclosed in this country as a deer park) is well stocked with red deer. The mansion is substantially built, and stands on an eminence. It has a raised terrace on the east, west, and south sides, and on these are formed just enough of flower borders and beds to give relief to the stonework. The walks are edged with a stone curb, next to this a band of beautiful green turf, and the flower borders are then raised above the turf by means of closely kept Box hedges, about 9 inches high; and at intervals on each side of the terrace walk are planted handsome specimens of Mr. A. Waterer's beautiful Rhododendrons, having splendid heads, in various sizes, of from 10 to 30 feet in circumference. These are of the very finest varieties, and the effect produced must be grand.

Arriving at the north side of the mansion, on which is the entrance hall, a noble flight of steps leads to the front door, on either side of which is a sort of covered portico, supported by massive stone pillars; and standing between these, in square wooden tubs, were handsome specimens of standard Portugal Laureis in fine health. The opposite, or south side of the mansion, is approached by a flight of steps, similarly constructed to those on the north front, and having a colonnade or portico supported with stone pillars, interspersed with standard Portugal Laurels; but this being the principal front a large half circle is carried out into the park, beyond the ordinary terrace wall, in the centre of which a handsome fountain is placed, with a series of flower-beds surrounding it, the specimen Rhododendrons being also continued at intervals on the grass on the east side of the mansion.

Near the entrance to the terrace from the carriage drive on the north side is a large conservatory, containing handsome specimens of Camellias, Azaleas, and other greenhouse plants; this fine building, formed in a recess of the mansion, is also approached from the terrace by a flight of stone steps. On the opposite or west side of the mansion is a similar recess, covered with a ridge-and-furrow roof, and supported by eight iron pillars, about 30 feet high; this is called the fernery, and is certainly well worth going a long distance to see: it is of an irregular form, having no decided outline, but on entering the door on the west side one is at once struck with the beautiful green pillars which support the roof, covered as they are from floor to roof with masses of Lycopodium denticulatum, jutting out from which are fine large plants of the fine-leaved Begonias, such as B. Rex, or B. Marshallii; and one is struck with astonishment to see that Lycopodiums, Ferns, and other plants can be kept alive, and be made to retain their vigour, at such a distance from the floor, not a single break appearing in any of the pillars. The way this was accomplished was as follows:—The pillars were encased with a good layer of Sphagnum moss and peat soil; this was skilfully bound on to the pillars with strong copper wire, and, at the same time, small pieces of the Lycopodium, Ferns, Begonias, &c., were inserted between the moss. The whole of the walls are covered with thick cork slabs, out of the crevices and fissures of which quantities of Ferns, Ficus repens [stipularis], Mosses, and various other plants grow, and here and there large strips of the Lycopodium denticulatum is forming a living green mass; this also is seen high up on the wall-plate at the spring of the roof. Some of the rooms from the mansion open out into this beautiful fernery, as also into the conservatory before described. Opposite the centre of the fernery a flight of iron steps leads up to one of these rooms (we believe the dining-room), on each side of which a splendid Cyathea medullaris, about 30 feet high, is planted, the graceful fronds of which reach over the walk, and form a beautiful evergreen arch. Arranged around the walls I also noticed handsome specimens of Alsophila Macarthuri, Dicksonia antarctica, D. squarrosa, Alsophila australis, Cyathea dealbata, and various other handsome specimens. Considering that these have only been planted a few months, the progress they have made proves that the position assigned to them is quite in accordance with their wants. Much, however, may still be done to improve this beautiful fernery, and a stroll through those at Manley Hall, described in these columns some months ago, would furnish the artist with the idea to enable him to finish what at present it seems almost impossible to improve.

Leaving this beautiful fernery we retrace our steps to the terrace on the west front of the mansion, and

look towards the west on a scene of indescribable beauty. The ground on the side of the mansion is laid out in croquet lawns, shrubberies, flower gardens, and rosaries, and extends to a considerable distance, the ground gently falling from the mansion. Following a straight walk westwards, we pass through a series of Rhododendron clumps filled with the choicest varieties of this popular plant from Knap Hill, and on each side, as we pass down, frequent glimpses are obtained through leafy glades of miles of distant landscape. A little farther on we pass through a rosary, and beyond this, on our left, a glimpse of Mrs. Coleman's flower garden is seen, surrounded by banks of choice evergreens, relieved here and there by specimens of coniferous trees. The beds are raised a little above the general level of the ground, the turf being sloped gradually up to the edge of the beds. On the north side of this group of flower beds, and directly opposite to them, is a handsome temple.

Continuing westwards we come, at what appears to be the termination of this walk, upon a splendid bronze group of figures, backed up by masses of trees, amongst which a handsome Cupressus macrocarpa stands out in bold relief. A broad walk, still leading westwards, brings us to a steep incline, and from this on to another level plot, in the centre of which stands a fine Araucaria imbricata. Beyond this, two walks strike out into a sort of wild, undulating undergrowth of shrubs, hardy Ferns, &c. Following that to the right, up a gradual ascent, we come to a sort of promontory, on which is built a rustic summer-house, from which is seen one of the finest views that it is possible for the imagination to conceive or for the eye to behold. Through a sort of leafy tunnel, directly opposite this summer-house, is seen Windsor Castle, about three miles distant, the whole of the north-west front of the Castle being visible. The tops of the trees are kept cut in, so as to form what appears to be a perfectly level and even evergreen surface, whilst the sides are treated in a similar manner, and a number of trees for a considerable distance on each side of the tunnel at the end nearest the summer-house form what may be called the roof; these are kept nicely cut in, so that the effect is remarkable in the extreme; it is perhaps the most unique thing of its kind to be met with. This is certainly an idea that might be turned to good advantage in many ways. The effect, even in the winter, must be exceedingly grand, for the brown twigs of the trees would still form the tunnel, and give a different effect from that produced in the summer by the beautiful foliage. When reluctantly leaving this beautiful spot—I had returned to have another look through this verdant telescope—I was somewhat rudely reminded that the summer-house was the abode of what could not be termed the most pleasant companions in the world, for presently a deep-toned buzz caused me to look up, and before I had time to ascertain clearly what it was that had interrupted my reverie many others had joined in the chorus. I had entered the abode of a colony of hornets, who had established their home in the roof of the summer-house, which was composed of heather; and as they were momentarily becoming more numerous I was glad to retreat and resume my journey towards the mansion by a walk nearly parallel with that by which I had left it. This walk is intersected by several others passing through beds of giant Azaleas and various other flowering shrubs, while specimen Conifers are dotted about here and there on the lawn; and in the foreground, on the west front of the house, is a fine old gnarled Oak. Leaving these beautiful grounds and again entering the park, I made my way towards the kitchen garden and forcing department, which must form the subject of another notice. *J. W.*

Miscellaneous.

Rose Hedges.—The first I ever saw was at Shrubland Park, near Ipswich. The late Mr. Beaton was walking round with me, full of his botanical and cultural quips and cranks, and suddenly we came upon a semicircular Rose hedge, forming the back of a simple Verbena garden on grass. It was formed wholly of the Rose Gloire de Rosomène; from top to bottom it glowed with large semi-double Roses, only variegated with the clear, bright, green leaves, and its elegant thin buds, in all stages, from mere narrow lines to bursting flowers. They were set in a frame of cloudless sunlight, and the Rose hedge seemed positively illuminated. It was perfectly dazzling in its brightness. Beaton, who was eagle-eyed to note effects, gave one of his most significant smiles, as he saw my pencil and book instantly at work. Yes, he remarked, "Is it not a glory?" I have never seen this Rose so gloriously bright since, nor anything more striking in the way of hedges. I have tried it as a background in ribbon-gardening, with but indifferent success. But there is no question that an immense deal could be done with Rose hedges, both as ornamental and useful objects. The first is too obvious to need much further remark; but it might be worth while on gentlemen's estates, and especially in regard to inside boundary lines or fences to plantations and shrubberies, to intermix the Noisette, Ayrshire, or Boursault, in such free-growing good roses as the Banksian, Gloire de Dijon, Maréchal Niel, Climbing Devoniensis, Lamarque, Céline Forestier, &c., among White Thorns, Sweet Briers, &c., that are used for hedge plants. Occasionally, round home, wood fences are left wide and rough for game. What cover could be better or safer for the birds than large tangled masses of Roses. The effect from a distance would be magnificent in the extreme, while near at hand their beauty and sweetness would bear the closest inspection. And where gardens, as is often the case, are bounded by woods, why not furnish the debateable ground between the two with tangled irregular groups, or at least wide fences, of Roses? Let the queen of flowers lay its hand upon both garden and woody wilderness, and bind them together with a climbing wreath or tie of Roses. They might graduate in quality and height by degrees as they receded from the garden, until tall and rampant Ayrshires and Sweet Briers clothed the trees of the forest. Such masses of Roses would display an exuberance of floral wealth, and bring in such a revenue of sweetness as has never yet been reaped from fragrant Roses. Roses planted thus would create a new effect in landscape scenery. The greatest want of our decorative art in the present day is breadth; the second, which grows out of the first, is naturalness. *D. T. Fish, in "Florist and Pomologist."*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Heaths and *Epacrises* which have been placed out-of-doors should be carefully attended to from this date. If the balls become too wet, and there are further signs of rain, it will be advisable to remove them at once to some place of shelter. The safest plan is to place some lights over them on loose brick pillars, which is better than placing them within the more confined area of a house or pit. Look well into and throughout each plant, so as to detect any mildew that may be upon it. Should any be found, flowers of sulphur should be lightly dusted over all the affected parts at the earliest possible moment. The past excessive heat must be taken into consideration to determine the length of time it is intended to leave the more render greenhouse plants out-of-doors. The nights are often very cold now, and are likely to cause more check to the plants than might be imagined. Keeping such facts in mind will make all hesitate before leaving their choicest plants outside too long. The pots must be well washed, and the drainage of each plant should be examined before they are housed away for the long winter season. *Cyclamens* will now commence growing, and will require potting in all instances where this has not been done since they flowered last season. They like a compost of nice fibrous loam, with all the smaller portions sifted out, with well-decayed manure and silver sand. Look through all collections of *stove plants*, and if any kind of insect pests are found let the whole have a thorough cleansing before winter. In some instances tan-beds are used in such houses, to afford a little bottom-heat to those plants which may be benefited by it. Therefore let the tan-beds be renovated at once by adding fresh tan, &c., before the advent of colder winter weather. Remove all the late-bloomed *Indian Azaleas*, which have now completed their growth, into the open ground, that the wood may be well ripened by exposure, and that plenty of bloom buds may be formed. Finally, pinch back all soft-wooded winter-blooming stove plants, and also, if necessary, the last shift. Place them on sunny shelves, or other fully-exposed positions, where they will gain as much sun as possible.

FORCING HOUSES.

Well-grown late *Grapes* should now be well coloured, or be quickly bringing this process to a final and successful termination, that is, if they are expected to have good hanging and keeping capabilities. Give air in abundance on all proper occasions, bearing the fact well in mind that the young wood has to be ripened as well as the fruit. Air, pure and free, aided by a nice natural temperature, is the all-powerful agent for this purpose. All Grapes at such a stage as the above should be kept perfectly dry at all times, this state of things being also the most felicitous in regard to the attendant process of wood ripening. In regard to *Pines*, it is most essential that the young growths lately made should be well matured or hardened before the advent of short dull days. For this purpose give plenty of air, with a good amount of heat, when the sun shines freely, and water with comparative moderation in accordance with the wants of each batch, which can only be determined by referring to the quantity of roots which each plant may have. Those Pines which are actively engaged in the first stages of fruiting should be pushed along with all speed, without unduly hurrying them, with a view to get the fruits in such a forward state as not to be too greatly influenced by the dull season now approaching. It is far better to get them forward at this stage than to allow them to get behind now, and so to have to force them at a later date. Make all possible progress with the young *Cucumber plants* for the mid-winter supply. If a good basis and a strong start be not now assured, what chance of success can be looked for hereafter? Do not over-water them at this season, it is a point in practice of greater import than at first sight appears. Sow *French Beans* in pots for early winter production indoors, placing them in a sunny position in front of forcing houses or other similar places.

HARDY FLOWER GARDEN.

Now that the soil and atmosphere are both more saturated with moisture, it will be necessary to bring the final planting out of seedling *Polyanthuses* to a close. Any old stock plants not required of *Picotees* and *Pinks*, &c., should now be planted out into open borders properly prepared. These, and *Carnations* which have been grown from layers, should now be potted up carefully from the open ground into small pots, and be placed into a close cold frame for a week or two. They all delight in a nice, open, sandy, and fibrous soil, having a liberal supply of moderately decayed leaf-mould in admixture. Pot each firmly, and in such a manner that not the least movement can be occasioned to the young plants under any circumstances. Those who follow the practice of rooting their *Pelargonium cuttings* intended for bedding purposes in the open ground, should pot them up as soon as they are sufficiently rooted, placing them into pits or other structures in which it is intended to winter them.

HARDY FRUIT GARDEN.

Stop the last formed laterals upon *Vines* by pinching them back in front of the more matured leaves—this for the last time this season. Pick a dish or two of such second early *Pears* as are likely to come in the earlier in consequence, and so endeavour to fill a gap in a few weeks hence, when they are likely to be useful.

KITCHEN GARDEN.

Continue the necessary transplanting out of autumn-sown *Cabbages* for early spring use. As I have before suggested, no better place to plant these upon than the current season's Onion-bed can be found; and this should be done without in any way digging or forking the bed over, as they delight in a firm soil, within which the roots ramify with a zest. It is always advisable to make plantings of the above at three or more consecutive times, to counteract, as far as possible, the peculiarities or fluctuations of the season, which ever keep all good cultivators on the alert. Prick out young seedling *Cauliflowers*, as before advised, on to sheltered positions, where some kind of protection can be afforded when sharp weather comes, as soon as these are large enough to handle. Thin out the earliest bed of *autumn-sown Spinach* in such a manner that the sun and air can act well upon each plant as it grows; the better to harden it against all eventualities of weather, as when grown too thickly the crop is not nearly so hardy as it should be. Gather all kinds of produce for the purposes of pickling, and should *Capsicums* be at all late in ripening, place them where practicable in a frame to hurry them along. Blanch *Endive* by the usual process; earth-up *Celery* as needed, and, what is of great importance, choose every opportunity to well hoe every bit of ground amongst crops when dry days exist, and so avoid having a crop of strong weeds at a later date, when the trouble to eradicate them will be doubled for want of sun. *W. E.*

TOWN GARDENING.

The season for starting *Bulbs* has commenced, and I would recommend that purchases be made at once, for the best bulbs are generally those that appear in the market first. In selecting the *Hyacinth*, see that the bulbs are firm and of good form, and if the skin be split at the base of the root so much the better, for it indicates that the bulb is well matured. Place a few roots at once in glasses to flower in the winter. The glasses should be filled with soft water, placing the bulb so that the base just comes in contact with the water; then place them away in a dark cupboard, till the roots nearly touch the bottom of the glass, when they should be brought forward in a warm room to flower. Care should be taken at the same time to remove, with a soft sponge, any decayed scales, such as generally accumulate, and at the same time to change the water, observing at all times to keep the water so that it just touches the base of the bulb. To keep up a succession of flowers from Christmas to May, fresh bulbs should be placed in glasses about once a fortnight, and be treated as above. A few may also be planted in pots, in a compost composed of two-thirds of maiden loam and one-third of rotten dung with leaf-mould and sand in equal proportions, well mixed together. With this fill 48-size pots, with broken crocks at the bottom for drainage. Press the bulbs on the surface with a small portion of sand underneath, and on no account cover them. Give them a good watering, and place them out-of-doors on coal ashes to keep down the worms; and in the course of a few days, when the soil has become dry, cover them over with about 4 inches of fine ashes or cocoa-nut fibre; then let them remain till the bulbs have made a growth of from 1 to 2 inches, when they should be cleared of all surface covering, and shut down in a cold frame, or brought into the house for a few days, protecting them from frost. Whenever the weather permits, give plenty of air. I consider about the first week in November the best time for planting out-of-doors, for if planted earlier they are likely to appear aboveground in midwinter, and if deferred later, the roots will be weakened by their natural tendency to vegetate. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON

FOR THE WEEK ENDING WEDNESDAY, SEPTEMBER 7, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree Humidity.	Weight of Vapour in 1 a Cubic Foot of Air.
September	Ins.	Deg	Deg	Deg		Gr.
1. Thurs. .	29.185	63.1	55.5	49.4	61	3.8
2. Friday	29.137	61.3	60.4	59.6	95	5.7
3. Satur. .	29.134	61.5	61.5	59.6	80	5.6
4. Sunday .	29.185	61.5	56.7	52.4	73	4.4
5. Monday	29.58	61.0	59.1	56.2	89	5.0
6. Tues . .	29.10	61.3	58.3	55.6	82	4.9
7. Wednes	29.24	57.2	55.2	53.2	89	4.5

1870 MONTH AND DAY.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range in Day	Mean.	Departure of Mean from Average of 30 Years	WIND. Direction.	Horizontal Movement	RAIN In Inches
September.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
1. Thurs. .	72.6	41.9	27.7	59.4	+ 0.4	{ S.W. S.S.W. }	288	0.00
2. Friday .	71.4	56.5	14.9	60.9	+ 2.2	{ S.S.W. S.W. }	187	0.01
3. Satur. .	64.8	54.2	10.6	58.2	— 0.2	{ S.W. N.W. }	273	0.09
4. Sunday .	70.0	44.7	26.2	56.3	— 1.9	WSW	215	0.00
5. Monday	72.0	55.0	15.0	61.0	+ 3.0	S.W.	200	0.17
6. Tues . .	66.0	53.4	12.6	58.3	+ 0.4	S.W.	200	0.21
7. Wednes	57.0	48.3	9.6	51.7	— 6.1	WSW	215	0.52

Sept. 1.—Nearly cloudless throughout. Very fine

— 2.—Overcast till night, then generally cloudless. Rain fell during the morning.

— 3.—Generally cloudy. A thunder-storm between 11 A.M. and noon. Heavy rain also fell between these times. Cloudless at night. Aurora borealis visible at 10 P.M.

— 4.—A very fine day. Small amounts of cloud prevalent. Lunar halo at night.

— 5.—Overcast throughout. Rain fell during the afternoon and evening.

— 6.—Overcast till night, then variable. Heavy rain fell almost continually from noon till the evening.

— 7.—Cloudy till evening, then generally cloudless. Rain fell heavily throughout the day. Lightning at night.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, SEPTEMBER 3, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Week	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range	Mean	FALL OF RAIN.
	Deg	Deg	Deg	Deg	Deg	Deg	Deg	In.
Portsmouth ..	76.2	32.2	44.0	72.4	40.2	32.0	56.3	0.40
Blackheath ..	72.8	41.1	31.6	68.8	39.1	29.6	53.7	0.64
Bristol	70.0	42.1	27.9	66.7	38.5	28.2	52.1	0.94
Birmingham ..	70.3	45.9	24.4	66.0	40.4	25.6	53.2	0.78
Wolverhampton	70.5	41.7	28.8	65.8	34.9	30.9	50.4	0.20
Leicester ..	..	..	..	..	..	..	..	..
Norwich	69.5	42.5	27.0	66.6	40.1	26.5	53.8	0.78
Nottingham ..	72.0	42.5	31.5	68.0	37.5	30.5	52.8	0.88
Sheffield	69.0	44.0	25.0	61.7	40.6	15.7	55.4	0.87
Liverpool	67.3	49.5	17.8	62.8	51.2	11.6	55.5	0.57
Manchester ..	72.0	46.0	26.0	66.1	42.2	23.9	54.5	0.51
Salford	68.4	48.3	20.1	64.1	44.4	19.7	54.7	0.45
Bradford	66.3	43.0	23.3	64.0	48.3	15.7	54.7	0.98
Leeds	69.0	44.0	25.0	64.4	46.2	18.2	55.3	0.88
Hull	64.0	48.0	31.0	64.7	45.9	18.8	53.9	0.31
Newcastle	64.0	41.0	20.0	61.1	48.2	13.1	53.2	1.88
Edinburgh	61.7	43.0	21.7	..	..	..	52.7	0.90
Glasgow	61.8	39.2	24.6	..	..	..	51.5	1.83
Dundee	64.0	41.0	23.0	..	..	..	51.6	0.09
Aberdeen	69.5	44.3	25.8	..	..	..	52.8	1.14
Paisley	71.0	38.0	33.0	..	..	..	52.4	0.20
Greenock	69.5	39.0	17.5	..	..	..	53.2	1.50
Leith	..	..	..	..	..	..	..	..
Perth	66.0	43.0	23.0	..	..	..	53.9	1.00
Dublin	72.9	40.0	32.9	..	..	..	54.1	1.44

JAMES GLAISHER.

Notices to Correspondents.

BEECHMAST: *W. J.* We should suggest raking up the Beechmast if it is unsightly, and either removing or burning it.

FLY TRAP: *H. M.* Tried and found wanting.

FRUITS TO NAME: *E. W. G.* Yes, if you are moderate in your demands, and will send the fruit carriage paid to our office, addressed to the Editors.

FUCHSIA GLOBOSA.—The Editors will feel obliged to any correspondent, who will furnish them with cuttings of this plant.

NAMES OF PLANTS: *R. G.* 1, Pæonia, we cannot tell which from the scrap sent; 2, Isolepis gracilis; 3, Hibiscus syriacus, the Althæa frutex of gardens.—*H. R. S.* 1, Gymnogrammaphlebium appendiculatum; 2, Davallia pentaphylla; 3, Litobrochia pedata.—*Rob.* Lycium afrum.—*Colonel H.* Both species of Santolina. No. 2, probably S. pectinata; but it is impossible to name specifically the fragments sent.—*F. W. B.* A Ficus, near F. diversifolia, Miq.; Stanhopea next week. —*F. F. S.* Euonymus europæus.—*D.* Balsamita vulgaris, Costmary.

PELARGONIUMS: *J. M.* The show and fancy Pelargoniums have been so gradually evolved out of the various species formerly cultivated, that it is impossible to say exactly from which they have originated. P. cucullatum is, however, generally considered as one of the prominent ancestors of the race now called show varieties. Half the forms figured by Sweet are hybrids or garden varieties and the blood of many of these is apparent in the modern sorts.

ROCKWORK: *A. McA.* Mr. Robinson is, we believe, in America. Letters addressed to the office of the *Field* would probably reach him.

SEEDS TO NAME: *T. Y.* In all probability the seeds of Cassia Thora, a common tropical plant. We do not know if they are used for any purpose or not. *D. O.*

VEGETABLES AT EXHIBITIONS: *E. W. T.* Vegetables should be washed certainly.

VERBENA: *T. Pugh.* There is nothing remarkable in the trusses sent; it is a good scarlet, nothing more. Of its habit we are of course altogether unable to judge from cut blooms.

WILD FLOWERS: *W. J.* To retain the colour of the flowers in drying plants, is very difficult in many, and impossible in some cases. The best plan is to dry quickly, by changing them frequently, using a good thickness of bibulous paper, and drying it thoroughly after each change before again using it. Dried in an oven amongst fine clean sand, the colours may be kept even better than in paper, but the specimens are not so convenient for preservation.

COMMUNICATIONS RECEIVED:—T. C. E.—H. W. N.—J. M. —H. M.—E. A. J.—W. E.—T. S. We must beg you to excuse our accepting your kind offer, for which nevertheless accept our thanks.

Markets.

COVENT GARDEN.—Sept. 10.

A very large quantity of Plums, Peaches, Nectarines, and early sorts of Pears are now offered, and very low prices have to be taken to effect clearances. Hothouse Grapes are also supplied in excess of the demand. Potato trade very heavy, and prices from 5*s.* to 10*s.* per ton lower. Amongst flowers we have Balsams, Pelargoniums (single and double), Asters (French and German), Dahlias, Liliums, Oleanders, Tritomas, &c.

FRUIT.

	s. d.	*s. d.*
Apples, p. ½ sieve ..	1 0 to 2 0	
Figs, per doz. ..	0 6 — 1 0	
Grapes, per lb. ..	1 0 — 3 6	
Lemons, per 100 ..	6 0 — 16 0	
Melons, each ..	1 0 — 3 0	
Nectarines, per doz.	1 0 — 4 0	
Oranges, per 100 ..	8 0 to 12 0	
Peaches, per doz. ..	1 0 — 4 0	
Pears, per doz. ..	1 0 — 7 0	
Pine-apples, per lb.	3 0 — 6 0	
Plums, p. half sieve	2 0 — 3 6	

VEGETABLES.

	s. d.	*s. d.*
Beet, per doz. ..	2 0 to 3 0	
Cabbages, p. doz. ..	1 0 — 1 6	
Carrots, p. bunch ..	0 4 — 0 6	
Cauliflowers, p. doz.	1 6 — 3 0	
Cucumbers, each ..	0 6 — 1 0	
French Beans, p. sieve	2 0 — 3 0	
Do., retail, p. lb. ..	0 4 — 0 6	
Garlic, per lb. ..	0 8 — ..	
Gherkins, per 100 ..	2 0 — ..	
Herbs, per bunch ..	0 2 — 0 4	
Potatos, York Regents, per ton, 90*s.* to 105*s.*; Kidneys, 110*s.* to 120*s.* do.,		
Horse Radish, p. bun.	3 0 to 5 0	
Lettuces, p. score ..	1 6 — 2 0	
Mint, per bunch ..	0 2 — 0 4	
Mushrooms, p. pott.	1 0 — 4 0	
Onions, per bunch ..	0 4 — 0 9	
Parsley, p. bunch ..	0 2 — 0 4	
Shallots, per lb. ..	0 8 — ..	
Spinach, p. bushel .	2 0 — 3 0	
Tomatos, per doz. ..	1 0 — 1 6	
Turnips, yng., p. bun.	0 9 — 1 0	

A NURSERYMAN, in the Provinces, is desirous of meeting with an ACTIVE PARTNER, with moderate capital. —X., Messrs. Protheroe & Morris, Leytonstone, N.E.

AGRICULTURAL PUPIL.—A practical Farmer, occupying about 700 Acres of Land, is desirous of receiving into his Family an intelligent, gentlemanly young Man as PUPIL. He would have a comfortable home, and every facility for becoming acquainted with the business.—Apply by letter, AGRICOLA, *Standard* Office, Cirencester.

WANTED, 10 miles from London, where seven Men are kept, a HEAD GARDENER. He must bring evidence of superior ability in the Management of Men, as well as of Houses, Fruit, Flowers, and Vegetables, and have experience in Ground-work As the position is one of trust, no applicant should reply whose character will not bear strictest investigation. Apply by letter, stating age, recent situation, name of last or present employer, or, if out of place, reasons for leaving.—B. HATHWAYS, Royal Exchange, E.C.

WANTED, as GARDENER, in November, a thorough good practical Man to take charge of small Garden and Greenhouse. Age between 30 and 40, married, and without children preferred. If Wife can do Laundry work, additional salary will be paid. Comfortable cottage provided, and good wages will be paid to a suitable person.—Apply, First, with full particulars, to J. C., 10, Lord Nelson Square, Liverpool.

WANTED, a YOUNG MAN, to work in the Houses under the Foreman. A Premium expected.—W. CLARK, Eshold House, Woodlesford, Leeds.

WANT PLACES.—Letters to be Post Paid.

Gardeners and Under Gardeners.

WM. CUTBUSH AND SON beg to state that they have at all times on their books MEN of various qualifications, whose characters will bear the strictest inquiry. Any Gentleman making application would save time by clearly stating the duties to be undertaken, wages offered, &c., so that suitable Men may be selected.—Highgate Nurseries, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen. Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has open his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Further information required, which may refer to B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

GARDENER (HEAD), to any Nobleman or Gentleman requiring a first-class Gardener.—Age 30, married; fully competent in every branch of the profession, including Specimen Plant Growing, Fruit and Late Forcing, Spring, Summer, and Picturesque Gardening.—Can be highly recommended, with five years' unexceptionable character.—H. BURNHAM, 16 Brook, Derby.

GARDENER (HEAD), middle-aged.—ROBT. BROWN, for the last 15 years Head Gardener to the late Rev. George Chetwode, at Chilton House, Thame, Oxon, where he has had the entire Management of an extensive Garden, with Kitchen Gardens, and Forcing of every description of Fruit, will be disengaged in October, and wishes for a similar situation. Is leaving on account of the death of the Reverend Gentleman. Testimonials of the highest order.—Address as above.

GARDENER (HEAD), age 41, married.—A. CALDER is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener, having lived 18 years as Head Gardener in last situation; well versed in Forcing of all kinds of Flowers, Fruit, and Vegetables; understands the Management of Greenhouses, Stove Plants, and Kitchen and Flower Gardening. No objection to look after Meadow Land. Character will bear the most rigid investigation.—A. CALDER, Thames Ditton, Kingston, S.

GARDENER (HEAD), to any Nobleman, Lady, or Gentleman requiring the services of a first-class Gardener. —Age 36, married. References can be had from late employer.—W. W., General Post Office, Exeter, Devon.

GARDENER (HEAD). Age 30, married; thoroughly experienced; understands the profession in all its branches. First-class references.—T. K., Church Street, Paignton, Torquay; or LUCOMBE, PINCE, AND CO., Exeter.

GARDENER (HEAD).—Age 30, married; has a good practical knowledge of the profession. Can undertake the Management of Land and Stock, if required.—R. C., 3, Kingswood Terrace, Penge, S.E.

GARDENER (HEAD).—Age 27, single; has served 17 years in large establishments, and can be highly recommended as to being up in the Forcing of Fruits, Flowers, and Vegetables.—R. P., Post Office, Leatherhead, Surrey.

GARDENER (HEAD).—Thoroughly understands the Management of Vines, Melons, Cucumbers, and all kinds of Pot Plants, and Kitchen and Flower Gardening. Good character.—G. F., Portico Lodge, Harrow Road, Kensal Green, London, W.

GARDENER (HEAD).—Age 33, married; first-class Grower of Pines, Vines, Stove and Greenhouse Plants; Forcing, &c. Understands the Management of Flower and Kitchen Garden, Land, Stock, &c. Twenty years' practical experience. First-class references.—A. G., Barr & Sugden, King Street, Covent Garden, W.C.

GARDENER (HEAD), to any Nobleman or Gentleman in want of a thorough practical Man.—Age 34, married, no children; good Kitchen and Flower Gardener; a successful exhibitor.—B. C., Mr. Moses, Florist, &c., Royal Hill, Greenwich, Kent.

GARDENER (HEAD), married, no family.—F. HILL will be open to an engagement with any Lady or Gentleman requiring a first-class Gardener, on or before October 5. Can have unexceptionable testimonials from present employer as to ability in all the various branches of Gardening.—F. W. CURRIE, Esq., Coombe Warren, Malden, Kingston-on-Thames, Surrey.

GARDENER (HEAD), married.—S. SPREADBURY, seven years Gardener to H. B. Webster, Esq., Granard Lodge, Roehampton, is desirous to meet with any Lady or Gentleman requiring the services of a Man thoroughly practical in all the various branches of the profession; also the Management of Land and Stock.—Is disengaged through the estate being sold.—S. S., 4, Dare Terrace, Upper Richmond Road, Putney, S.W.

GARDENER (HEAD), or GARDENER and FORESTER.—Has had many years' practical experience in first-class establishments; thoroughly understands the Cultivation of Pines, Vines, Melons, Fruits, Flower and Kitchen Gardening, Management of Land, &c., and can be highly recommended. Upwards of six years in present situation, and satisfactory reasons given for leaving.—A. B., Charles H. Dickson, 23, Market Place, Manchester.

GARDENER (HEAD, or SINGLE-HANDED).—Age 29, married; understands the Culture of Vines, Fruits and Flowers, also Kitchen Garden and Flower Borders.—THE GARDENER, Woodslee, Cottenham Park, Wimbledon, S.W.

GARDENER (HEAD, WORKING).—Age 29, married; understands Vineries, Conservatory, Greenhouses, Cucumbers, Flower and Kitchen Gardening, and Early and Late Forcing. Three and a half years' good character.—H. R., 6, Bradford Road, Wells Road, Sydenham, S.E.

GARDENER (HEAD), where three or four Under-Gardeners are kept.—Age 40, married; great experience in Early and Late Forcing, Stove, Greenhouse, and Kitchen Gardening. Death of the Earl of Kingston cause of leaving. Good character from last place.—J. CLARK, 160, St. Paul's Road, Camden Town, N.W.

GARDENER (FOREMAN), to a Landscape Gardener or otherwise, or UNDER in a Gentleman's Garden.—Age 29, single; understands Greenhouse and Planting. Good character.—W. S., 30, South Street, Isleworth, W.

To Noblemen and Gentlemen.

GARDENER.—Age 35, married, no family; practical in all branches. Good testimonials and good character from present employer.—W. S., Post Office, Laughton, Hawkhurst, Sussex.

GARDENER (SECOND).—Age 23, single; understands Forcing, and Flower and Kitchen Gardening. Good character.—A. B., Post Office, Oxted, Surrey.

GARDENER (SECOND, or otherwise).—Age 23, single; good knowledge of the profession. Seven years' experience. Good character from previous employers.—J. DEAR, Occupation Road, Newton Road, Cambridge.

GARDENER (UNDER).—Age 19; would prefer an Improver's place. No objection to paying a Premium for three years' knowledge. Good character.—T. G., Post Office, Whetstone, N.

GARDENER (UNDER).—Age 20; can Milk if required, or make himself generally useful. Good character.—S. T., Ash Ley Cottage, Town Hall Lane, Walthamstow.

To Nurserymen, &c.

CYCLAMEN and GERANIUM GROWER, or general PLANT FOREMAN in Nurseries, &c.—HORTUS, South Lodge, New Cemetery, Fulham New Town, S.W.

To Nurserymen.

PROPAGATOR of Stove, Greenhouse, and Soft-wooded Plants, also Hardy Outdoor Plants.—Has had long practice in London and Provincial Nurseries. Thoroughly steady and persevering. Can be well recommended.—H. W., 9, Byrome Street, Hale Road, Altrincham, Cheshire.

To Noblemen, Gentlemen, and Agents.

STEWARD or FARM BAILIFF, at Michaelmas next.—Age 40, married. First-class references from his present employer, who is giving up the Farm.—Z., John Thornton's, 15, London Road, Place, Tooley, S.E.

STEWARD or BAILIFF.—Age 40, married, one child; can undertake the Management of a Farm of any extent. Understands Buying and Selling, also Steam Machinery, and the various Works required on an Estate. Has had the best experience in Draining and Laying out Acres. Unexceptionable references.—ALPHA, 100, High Street, Croydon.

To the Trade Generally.

MANAGER or TRAVELLER.—Age 35; thoroughly conversant with every branch of the Nursery and Seed Trade. —B. S., 25, Kinglake Street, Liverpool.

IMPROVER, in a Nobleman's or Gentleman's Garden. —Age 19, well grown. Premium of £5. Two years' good character. —C. W., Swindon Hall, near Cheltenham.

IMPROVER, in a Nobleman's or Gentleman's Garden. —Age 19; has worked in the House Department four years. A Premium given. Good references.—J. DAWE, Charlminster, Dorchester, Dorset.

ASSISTANT, under General Propagator.—Age 21; several years' experience. Can Bud and Graft, and willing to make himself useful at General Nursery Work.—F. S., 88, Albert Cottages, Woodbine Grove, Penge, S.

Seed Trade.

SHOPMAN, CLERK, or BOOK-KEEPER.—Age 30, married; active, of thorough business habits, and well up in the duties of the profession.—A. R., Messrs. Butler & McCulloch, South Row, Covent Garden, W.C.

To the Nursery and Seed Trade.

SHOPMAN (FIRST or SECOND), or to Manage a small Seed and Plant Trade.—Age 28; 12 years' experience. Good Penman and Accountant, thorough business habits, and a fair knowledge of Plants, hardy and exotic. Highest references and testimonials from former employers, and gentlemen in the trade.—Apply, stating salary, to ALPHA BETA, Post Office, Bathford, Somerset.

Seed Trade.

SHOPMAN (or UNDER).—Five years' experience in a Provincial House.—J. T., 25, High Street, Birmingham.

RAYNBIRD, CALDECOTT, BAWTREE, BOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS.
Address, 20, Seed Market, Mark Lane, E.C. ; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass by the steps over Hoole-road Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

New White Mustard Seed.
H. AND F. SHARPE have fine samples of the above, which they can offer to the Trade at low figures. Samples and prices on application.
Seed Growing Establishment, Wisbech

Cabbage Seeds.
H. AND F. SHARPE will be glad to quote special prices to the Trade of all the best sorts of Cabbage Seeds, grown last season from the finest selected stocks. Prices very moderate.
Seed-growing Establishment, Wisbech.

To the Trade.
F. GEE begs to offer (fine selected stocks) NEW SEEDS for present sowing, as follows, for cash —
GREEN-TOP YELLOW GLOBE TURNIP, 2s. per pint, 24s. per bushel.
HARDY STRATTON TURNIP, 22s. per bushel.
EARLY SIX WEEKS or STUBBLE TURNIP, 22s. per bushel.
Fine ESSEX RAPE, 23s. per bushel.
Fine WHITE MUSTARD, 16s. per bushel.
WINTER TARES, 13s. 6d. per bushel.
New 4 Bushel Sacks charged 1s. 4d. Remittances must accompany all orders.
Seed Establishment, Ingelewoode, Brasted.

Suttons' Improved Italian Rye-Grass.

The BEST and MOST PRODUCTIVE in CULTIVATION
SEPTEMBER is an EXCELLENT MONTH to SOW (3 Bushels per acre).
SUTTONS' IMPROVED ITALIAN RYE-GRASS has been used with the greatest success at the Sewage Farms of

Aldershot	Croydon	Tunbridge Wells
Barking	Rugby	Warwick
Banbury	Romford	&c., &c.

Special quotations given for large quantities.
All goods carriage free.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

To Nurserymen and Florists.
TO BE SOLD, or LET on Lease for 85 years, within 10 miles of London, about THREE ACRES of LAND, well stocked with Fruit Trees; also an excellent new EIGHT-ROOMED HOUSE, with that quantity of GLASS & ERECTIONS.
For further particulars, apply by letter or personally to Mr. MAY, Seedsman, 35, Brydges Stree', Covent Garden, London, W.C.

SALES BY AUCTION.

Planting Season.
IMPORTANT to NOBLEMEN, GENTLEMEN, NURSERYMEN, BUILDERS, and others EXTENSIVELY ENGAGED in PLANTING.

PRELIMINARY NOTICE of FORTHCOMING UNRESERVED SALES of NURSERY STOCK.

OCTOBER 3, on the Premises, the NURSERIES, CHRISTCHURCH, HANTS; by order of Mr G Smith, who is relinquishing the Nursery business.
OCTOBER (early in the month), on the Premises, the GROSVENOR PARK NURSERY, CAMBERWELL, S.E.; by order of Mr J. Dawson, the land being immediately required for the erection of a church.
OCTOBER 6 to 12, on the Premises, the WOKING NURSERY, WOKING, SURREY; by order of the Executors of the late Mr. George Jackman.
OCTOBER 13 and 14, on the Premises, EXOTIC NURSERY, TOOTING; by order of Mr. R. Parker, thousands of extra NURSERY STOCK.
OCTOBER 17 to 22, on the Premises, the SUNNINGDALE NURSERY, BAGSHOT; by order of Mr. Charles Noble, a large portion of his BERKSHIRE NURSERY being required for building purposes.
OCTOBER 24 to NOVEMBER 1, on the Premises, ST. JOHN'S NURSERY, WOKING, SURREY; by order of the Executors of the late Mr. William Jackman, Sen.
NOVEMBER 3 and 4, on the Premises, the WHITCHURCH RECTORY, EDGWARE, MIDDLESEX; by order of the Proprietor.
NOVEMBER 7 to 10, on the Premises, the LEIGHHAM COURT RUSH NURSERY (a branch establishment), STREATHAM HILL, SURREY; by order of Mr. George Clarke, the land being required immediately for building purposes.
NOVEMBER 21 to 25, on the Premises, the WANDSWORTH COMMON NURSERY, SURREY; by order of Mr. R Neale, a portion of the land being required for building purposes.
Catalogues, when ready, may be had on the respective Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, E

New Hampton, Middlesex.
TO GENTLEMEN, NURSERYMEN, MARKET GARDENERS, and OTHERS.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from the Trustees of the Hampton and Hampton Wick School Charities, to LET by PUBLIC COMPETITION, on the premises of the Rectory Farm, on MONDAY, September 12, at 12 for 1 o'clock precisely, the RECTORY FARM, New Hampton, Middlesex, near the Fulwell Station, on the Hounslow Railway line, now in the occupation of Mr. Alexander Brice, containing 65 A. 1 R. 25 P., or thereabouts, of rich and productive Land, admirably adapted to Nursery, Market Garden, or Agricultural purposes.
May be viewed any day (Sunday excepted) previous to the Sale. Particulars may be obtained on the premises; of Howard Faddison, Esq., Solicitor, 5, Lincoln's Inn Fields; and of the Auctioneers and Valuers, Leytonstone, Essex, N E

Tooting, Surrey.
MESSRS. PROTHEROE AND MORRIS are instructed by Mr. R. Parker to SELL by AUCTION, without reserve, on the Premises, Exotic Nursery, Tooting (10 minutes' walk from Tooting Station), on THURSDAY & FRIDAY, October 13 & 14, at 11 for 12 o'Clock precisely, thousands of extra Stock of STOVE and GREENHOUSE PLANTS, the whole of which are very healthy, comprising Ananassa sativa variegata, Ficus elastica, Ardisias, Lasiandra macrantha, fine Gardenia intermedia (Over's variety), Tacsonia, Coleus, Epiphyllum truncatum; Rhododendron Countess of Haddington, javanicum, and numerous others; Cossignea barbonica, and numerous other Greenhouse and Stove Plants. Also a large quantity of choice ORCHIDS, including Vanda suavis (Veitch's variety), Aerides maculosum, & fine Angræcum sesquipedale, Cypripedium superbiens, Thunia Bensoniæ, Lælia præstans (true), and hundreds of EXOTIC FERNS; fine GREENHOUSE and STOVE PALMS; likewise a selected assortment of HARDY PLANT PLANTS, consisting of Echeveria secunda glauca, pumila, grandiflora, atropurpurea, Sempervivum rubricaule, repens, glutinosum; Cotyledons, Klemia repens, &c; Primula cortusoides amœna, Salvia argentea, Schizostylis coccinea, and other Hardy HERBACEOUS PLANTS, &c.
On view the day prior to the Sale. Catalogues may be had on the premises, and of the Auctioneers and Valuers, Leytonstone, E
N.B. P. & M. respectfully announce that they have received instructions from Mr R. Parker to SELL by AUCTION, without reserve, on OCTOBER 17 and 18 next, an immense quantity of first-class extra NURSERY STOCK. Further particulars will shortly appear.

Potter's Bar, N.
IMPORTANT CLEARANCE SALE of CHOICE GREENHOUSE and STOVE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by the Proprietor, who wishes to relinquish the business, to SELL by AUCTION, without reserve, on the Premises, the Nursery, near the Railway Station, Potter's Bar, Middlesex, on MONDAY and TUESDAY, September 19 and 20, at 11 for 12 o'Clock precisely each day, the whole of the choice STOVE and GREENHOUSE PLANTS, comprising a quantity of Crotons, Pandanus variegatum, 500 Dracænas of sorts, Araucarias, 400 New Coleus, Bougainvillea longiflora, Hoyas, Poinsettias, Ardisias, Pandanus variegatum, Amaryllis, Anthurium, Perskeas stocks, 5000 choice Exotic Ferns of sorts, a few Orchids, Foliage plants for cutting, Lilium longiflorum, Myrtles, Oleanders, Pelargoniums for cutting, market kinds, Hydrangeas, 200 Double Primulas, 6000 Cinerarias, Cyclamens, Geraniums (scarlet, &c.), 500 Tea and Hybrid Perpetual Roses in pots, 2000 Chrysanthemums, 600 Hardy Ferns, Gardenia, &c.
On view two days prior to the Sale. Catalogues may be had on the Premises; and of the Auctioneers and Valuers, Leytonstone, E.

Bulbs from Holland.
MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, September 19, at half-past 12 o'Clock precisely, the double and single HYACINTHS, TULIPS, CROCUSES, NARCISSUS, IRIS, RANUNCULI, and other Bulbs, just arrived from Holland, and Lotted to suit the Trade and private buyers.
On view the morning of Sale, and Catalogues had.

Orchids from New Grenada.
MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, September 13, at half-past 12 o'Clock precisely, an Importation of ORCHIDS, from a new region in New Grenada, including fine masses of Cattleya Mossiæ, Odontoglossums phalænopsis, Pescatorei, and others; Trichopilias, Anguloas, Epidendrums, &c. All in first-rate health.
On view the morning of Sale, and Catalogues had.

Orchids.
MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, September 20, at half-past 12 o'Clock precisely, a collection of choice Established ORCHIDS, and several small Importations from various localities.
On view the morning of Sale, and Catalogues had

Manchester.—Two Days' Sale.
IMPORTANT SALE of the very VALUABLE COLLECTION of ORCHIDS FORMED by JOHN EDWARD TAYLOR, Esq.

CAPES AND DUNN respectfully give notice that they have received instructions from J. E. Taylor, Esq., to SELL by AUCTION, at the Gallery, Charlotte Street, Manchester, on WEDNESDAY and THUSDAY, September 14 and 15, at 11 o'Clock, the highly important selection of rare and valuable ORCHIDS, consisting of Cattleyas, Lælias, Dendrobiums, Odontoglossum, Phalænopsis, Dendrobiums, &c.; also many valuable Stove Plants, particularly a fine specimen of Anthurium Scherzerianum.
Catalogues will be ready several days prior to the Sale, and can be had by applying at 8, Charlotte Street, Manchester, or they will be forwarded on receipt of one stamp.

Sale of Shorthorns.
MESSRS. THORNTON AND KIRKBY are instructed by the Rev. Thos. Staniforth to SELL by AUCTION, without reserve, at Storrs Hall, Windermere, on TUESDAY, September 13, the DRAFTS from the HERD of about Fifty Head, viz., Bulls, Cows, and Heifers, of fashionable blood. Among them are some highly descended animals of the Mantalini and Barmpton Rose tribes; also several of Mr. Dixon's "Red Shilland" or "Mickley" Bulls, and a few of the "Minstrel" branch of the "Gwynnes," as well as of Mr Maynard's "Thomas," and Mr Wilson's "Cerunnus," others trace to unrelated families, and selected for their great milking properties. Most class Bulls of Booth blood have been in use, and the Cows and Heifers are mostly in calf to Mr. Carr's "Peer of the Realm," grandson of Mr. Booth's "Grand Duke."
Also will be SOLD, a very fine lot of CUMBERLAND HEIFERS, most of which will be down Calving to Bulls from the Herd.
Catalogues, with Pedigrees, may be had of Mr. THOMAS THORNTON, 15, Langham Place, London, W.; of Mr. KIRKBY, Saurcy, Windermere; or of Mr. SMITH, Storrs Farm, Windermere

Sale of the Celebrated Nunwick Hall Herd.
MR. JOHN THORNTON will SELL by AUCTION, without reserve, on FRIDAY, September 23 (the day after the Penrith Show), the first-class HERD of SHORTHORNS, belonging to Charles R. Saunders, Esq. It numbers between 60 and 70 head of Bulls, Cows, and Heifers, and comprises some remarkably fine specimens of the "Waterloo," "Wild Eyes," and "Gwynne" tribes; also many descendants of the famous cow "Fleda, a 155 gs. purchase at the 1856 Fawsley Park Sale, Mr. Crofton's "Elvira" (the Emma tribe), and Mr. Charles Colling's "Old Daisy," as well as other highly fashionable strains. Hengist Jacopin (19,879) was in service at Nunwick, and first-class Bulls have since been used; the celebrated Prize Bull, Edgar (9680) (second at R.A.S.E., Manchester, 1869, and first at Penrith and Carlisle), and Earl of Carlisle (23,812), a son of Grand Duke 10th, the more recent sires, are included in the sale.
Catalogues, with Pedigrees, may be had of Mr. HESKETT, Plumpton Hall, Penrith; at the Farm; or of JOHN THORNTON, 15, Langham Place, London.

NOTICE.—The SALE of SHORTHORNS, advertised to take place at SCALEBY CASTLE, CARLISLE, on WEDNESDAY, September 21, is for the present UNAVOIDABLY POSTPONED.

Shropshire Sheep.
THE ELEVENTH GREAT CENTRAL SALE of RAMS and EWES will be held in RINGLEY HALL, BIRMINGHAM, on THURSDAY NEXT, September 15, at 12 o'clock punctually, and will comprise 150 splendid SHROPSHIRE RAMS, and 600 fine EWES, from the Celebrated Flocks of the Leading Breeders in Shropshire, Staffordshire, and Warwickshire, and including several Prize Animals. LYTHALL AND CLARKE, Auctioneers
Offices, 69, New Street, Birmingham

Stoney Lane, Bromsgrove, Worcestershire.
IMPORTANT SALE of SHORTHORNS.

MESSRS. LYTHALL AND CLARKE are favoured with instructions from Thomas Harris, Esq. (who has given up a considerable portion of his Grass Land), to SELL by AUCTION, without reserve, on TUESDAY, September 20, his entire HERD of pure bred SHORTHORNS, numbering upwards of 60 Head of highly descended young Cows, Heifers, and Bulls.
Catalogues, with Pedigrees, may be obtained from the Auctioneers, 39, New Street, Birmingham.

Churchill Heath, Chipping Norton, Oxon.
IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to offer for SALE by AUCTION, without reserve, on TUESDAY, October 4, at Churchill Heath, about 50 HEAD of very superior young SHORTHORN COWS and HEIFERS, mostly in calf to Mr. Torr's Bull, Grand Duke 3rd, as well as that of his Father, which have been long and carefully bred from the most fashionable blood of the day. The Sale will include a very choice selection from the Herds; amongst them will be found the First Prize Cows at the Royal Agricultural Society's Meeting at Oxford, and the Bath and West of England at Taunton, as well as several other Prize Winners, Second Prizes in the Counties of Gloucester, Oxford, Warwick, and Worcester
Catalogues, with Pedigrees, and other particulars, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. GEO. GARNE, Churchill Heath, Chipping Norton, Oxon

Stand Hall, Whitefield, near Manchester.
MR. STRAFFORD begs to announce that the SALE by AUCTION of SHORTHORNS and POLLED ANGUS CATTLE, the property of Thos. Statter, Esq., of Stand Hall, Whitefield, advertised for WEDNESDAY, September 28, is POSTPONED until further notice.

London: 13, Euston Square, N.W., September 5.

THE LANDS IMPROVEMENT COMPANY.—(Incorporated by Special Acts of Parliament.)
DIRECTORS.
John Clutton, Esq., 9, Whitehall Place, S.W.
Frederick L. Dashwood, Esq., Kirtlington Park, Oxford.
Henry Farquhar, Esq., 16, St. James Street, S.W.
Lord Gardner, M.P., 85, Eaton Square, S.W., and Galloway House, Wartonshire, N.B.
John Horatio Lloyd, Esq., 11, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 22, Primes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.
The Company advance money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.
The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.
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Agricultural Land Improvements, Drainage, FARM BUILDINGS, LABOURERS' COTTAGES, &c.
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J. BAILEY DENTON, Principal Engineer.
Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.
Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.
The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge of about 6 per cent. in 31 years, or at the option of the Landowners in a shorter term.
No investigation of title necessary, and no legal expenses incurred.
Note—The Company will undertake the Erection of Cottages for Agricultural Labourers at a reduced rate of commission and on very favourable terms.
Application to be made to ARTHUR MILMAN, Esq., the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

SMITHFIELD CLUB SHOW, AGRICULTURAL HALL, ISLINGTON, DECEMBER 5 to 9.
IMPLEMENT DEPARTMENT.
THE LAST DAY for receiving APPLICATIONS for SPACE for IMPLEMENTS and MACHINERY, &c., is OCTOBER 1.
Printed Forms of Application, with Rules and Regulations, may be obtained of Mr. DAVID PULLEN, Assistant-Secretary, corner of Half-Moon Street, Piccadilly, London, W. All communications should bear outside the words "Smithfield Club."

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and Four following Days.
Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under:
CATTLE.—Form A For an OX or STEER (in any Class).
" B For a COW or HEIFER (in any Class).
" C For a PAIR of OXEN (in Extra Class).
SHEEP. " D For a Pen of three WETHERS or EWES
" E For a SINGLE WETHER SHEEP in Extra Class.
PIGS. " F For a pen of three PIGS (in any Class)
" G For a SINGLE PIG in Extra Stock.
ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.
Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr. DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Piccadilly, London, W.
N.B. All communications respecting the Show must be addressed to the Assistant-Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.
SATURDAY, SEPTEMBER 10, 1870.

THE drought is over at length. Beginning earlier and lasting longer, it has been in many respects more injurious than that of 1868. The hay crop has been even shorter than that of the preceding dry year; and the Wheat crop is unquestionably below the standard of 1868; though whether it is to turn out below the annual average productiveness of the country, remains yet to be determined by the threshing-machine. The aftermath grass will in all probability be less productive this year than it was two years ago; for although nothing can be more feeding than the warm rains which are now falling on our pastures, yet those of 1868 began a month earlier. The root crop, however, is certainly not so bad this year as it was then. There was a more even "plant" obtained in June; and where the land has been in good order, and the crop has been well managed, even the drought of 1870 has not hindered the growth of very fair crops of Swedes and common Turnips. We have seen 200 acres on a single farm in Oxfordshire during the past week which are covered with a most promising, and, indeed, an already satisfactory crop of both.

Ponds, and wells, and springs, will all soon gradually attain their ordinary condition, and we may hope that with better, because more abundant, water everywhere, the unusual prevalence of fevers everywhere in country places will cease. The water supply question, which is being gradually solved in large towns, with infinite advantage to health, will soon become, so to speak, an almost exclusively agricultural subject. Mr. BAILEY DENTON's frequent warnings and instructions will, we hope, at length be listened to, and the winter's stores be garnered for summer use over those immense districts of light and

porous soil throughout England where they are most easily collected, and most urgently required. There cannot be a doubt that much distress and disease have arisen out of this drought to many a labourer's family all over England. In districts of stiff clay, where there are no springs, as well as in light and porous soils, where there are no ponds, the suffering has this year, as in 1868, been very great. No benevolence can be either more permanent in its results, or more immediately productive of relief, than that which attends to the supply of a necessary of life having so many far-reaching influences. And we cannot doubt that country gentlemen and owners of land and villages will, after so much lamentable experience of late years, feel it their duty during the coming winter to make permanent provision against future drought, so far as their people are concerned.

As to the wants of the land which a drought make manifest, they, paradoxical as it may seem, are best met by deep and thorough drainage. It is deep and early cultivation by which the best water reservoir for plant use is provided, and deep and early cultivation can be effected only on well-drained soils. The effect of deep tillage in maintaining an adequate water supply for plants has been apparent this year wherever plough land and pasture abut on one another; the one, cultivated and deeply stirred, with shortened growth no doubt, but green and growing; while the other was bare and bleached, or even burned. It is a mistake to suppose that land drainage is wasteful—it is, in fact, when combined with deep and thorough tillage, conservative—of the rainfall. It is probable enough—indeed, we may admit it as being certain—that the straightening of outfall ditches, and what may be called the arterial drainage of a country which always more or less accompanies ordinary land drainage, quickens, and therefore both raises and shortens, river floods. But the system of land drainage, as a whole, has not, we believe, been at all injurious to the country as regards the water supply for animals; while it has, unquestionably, been most beneficial to the country as regards the water supply for its plants. It is, indeed, Mr. BAILEY DENTON'S capital point, that it furnishes a ready accessible means of serviceable water supply for villages—the supply, naturally filtered, coming from the main drain of two or three fields, being by itself sufficient, if stored during winter, for the wants of a large village during summer.

THE CABBAGE (Brassica oleracea), a sea-side plant—indigenous, like the Oak, but hardier and even more tenacious of life—the parent of the whole race of Cabbages, Cauliflowers, Broccoli, and Sprouts, and a most useful field crop—may, by proper management, be made to supply green food in almost every month of the year; and that on clay soils and in dry climates unsuited to the common forage crops. It is not suprising, therefore, that the Cabbage is increasing in favour, both among dairy farmers and flock-masters. No other crop is so valuable for cows at the critical period when grass begins to fail in the autumn months. In dairy districts the Drumhead is sown about the middle of August, pricked into sheltered beds in autumn, and planted in April and May for use in October and November. A succession crop, for use up to Christmas, is sown on a warm border early in March, and transplanted in June, 2 feet apart. On sheep farms Cabbages are most useful at lambing time, and in July and August, when grass and the ordinary green crops are apt to be scarce. The "Thousand-headed" is, perhaps, the best variety for summer use, and will become more popular when better known. It is this Cabbage, in a slightly different form, which is so invaluable in the Channel Islands, where it is found growing among the fruit trees in orchards, and in all sorts of unexpected corners, and is indispensable to the tethered Alderneys during five months of the year.

The following notes detail the modes of cultivating the several varieties. They are quoted from a book, which is our chief authority in matters of detail in practical farming, containing as it does a record of personal experience and of observation during many years.

For spring-feeding you sow the Thousand-headed Cabbage in a seed-bed in March; for summer and autumn feeding you should have sown in August. The plants of the spring sowing may be pricked out in showery weather in summer time after Italian Rye-grass, or similar crops, twice ploughed and dunged if possible. The plants, which are of vigorous habit, soon get hold of the ground; on good land the crop will be bulky, and 4840 plants (viz., 1 yard apart) will set an acre, at 1s. per 1000 for cost of labour. The autumn-sown plants should be transplanted before winter into a secure spot, sheltered by a few thatched hurdles, or otherwise protected from cutting winds and from game.

On August 1 and 10, 1865, we sowed Thousand-headed Cabbage in a seed-bed; began to prick out the plants, a few inches apart, on November 2, in a seam opened with a spade, setting the plants thinly, and then making another row 6 inches from the first. The plants should be stout and stocky. If sown too thickly, they are liable to be drawn up and to run to seed, especially after a mild winter, or when sown too early. In 1866 we sowed the seed on August 30. It may however be sown three weeks earlier, provided the plants are pricked out thinly, when they are small, in some well dug corner. The transplanting should take place in March, or as early in spring as weather permits. The land may be dunged and deeply ploughed in winter, scarified in spring, and marked out in rows, or cultivated in any other approved way, as for Mangel or Swedes. The early crop comes in at the end of July, and, if wanted, may be fed earlier. On July 1, 1866, our Thousand-headed were large and leafy, and though not yet full grown far surpassed a good crop of Rape. A month later the crop was in perfection. Plants growing thinly looked like spreading shrubs, and a field of Cabbages more than breast high and interlacing their thousand stems, produced a solid mass of greens into which the flock could only penetrate slowly by dint of hard eating. In this respect the prowess of the old ewes is surprising; like pioneer settlers in the backwoods on the edges of cultivation they steadily clear a way—even our forest of Cabbages went down before them, and they left "not a wrack behind," for the great stalks, still young and tender, were eaten to the ground. No kind of animal knows better how to appreciate 40 tons per acre of succulent green food in August than the veteran ewe who has entered upon that last campaign which must end in the shambles.

For use at another time of year we sowed, on March 24, 1865, in a seed-bed; transplanted July 1, on manured land twice ploughed, after Italian Rye-grass. The weather was showery. On September 5 the Cabbages were a heavy crop, and still growing. At this time of year the stalk is juicy, and is eaten to the ground. There are two ways of turning this Cabbage to account for the suckling flock in the spring. First, by letting the spring-sown crop stand: the large leaves fall during the winter, and in spring the stalks are soon covered with shoots and sprouts breaking out in all directions, which earn for the variety the name of Thousand-headed. Or the early-sown autumn crop may be made to yield a second crop, in spring, by cutting instead of folding it. The stalks should be cut about a foot from the ground, they shoot again immediately. But if this is done later than the beginning of August, the young, sappy shoots will not stand the winter, and the whole plant may be lost.

Another way of folding heavy land in summer is to sow an early variety of Cabbage about July 10, prick it out in a sheltered bed in November, and transplant in the field after Tares, or other early spring crop; it will be hearted in July. The same variety sown in March, or drilled in the field if the land is ready, will be ready for use in autumn. The stalks of all the varieties, except the Drumhead, will produce sprouts in spring.

For the sake of an experiment we sowed these three sorts on March 24, and transplanted them on July 1:—1. Imperial Oxheart; 2. Scotch Drumhead; 3. Cottagers' Kale. On September 5, No. 1 was hearting. It should be planted about 27 inches apart each way, and is excellent for early, quick growth. No. 2 is large and later. It should be planted a yard apart. No. 3 is a hardy variety, and will stand the winter. The same varieties for early use were sown August 1 and 10, pricked out in a seed-bed the second week in November, and transplanted early in April, with the following results:—On August 28, No. 1 was hearted, and ready for folding; No. 2 not yet turned in; No. 3 still growing. The last variety appears to have no particular merit, except for standing severe winters.

We have thus shown how to cultivate the Early York, and other early Cabbages, for use from the middle of July; to be succeeded by the Thousand-headed, until the autumn, and then by the Drumhead for winter use; and the Thousand-headed, Cottagers' Kale, and Sprouts of the autumn early sorts, for use at lambing time in spring. In reference to the times of sowing and other dates, we would remark that ours is a late district.

—— PRICES fell again last Monday in Mark Lane, and trade has been dull in all the corn markets of the country during the past week. —— In the meat market, also, last week's prices have scarcely been maintained. The supply in the metropolitan cattle market has exceeded the demand; and, except the choicest qualities, prices have been lower.

—— The quantity of CORN, CATTLE, FORAGE, and VEGETABLES brought into PARIS is so large that the Imperial Government, just before its fall, announced that all the public warehouses and laystalls were full, and that farmers must now arrange with private proprietors. Picardy, Brie, and Beauce have sent in large quantities of Wheat, the crop being fine this year in the departments of the Seine and Marne, Seine and Oise, Eure and Soir, Loire and Aisne, and Somme; the corn is being threshed and ground, and sent into Paris as fast as possible, and where the means of grinding are insufficient it is sent off in the grain. The Bois de Vincennes, the Bois de Boulogne, the Luxembourg gardens, and the open ground around the fortifications are crowded with cattle and sheep. Yet with all this, the prices of many articles are high; thus pork is dearer, because of the small number of animals sent in to Paris, while the contrary is the case with mutton. Potatos are especially dear, so are butter and eggs, and there is a great outcry against the market people and grocers for asking exorbitant prices, and in one case some soldiers buying provisions for their company were asked eight francs for a sack of Potatos that would not have cost more than half that sum a few days previously; the populace in this instance took the affair into their own hands, put the Potatos into the soldiers' waggon, and threatened to scatter the remainder if the salesman made any complaint. Of course it will not do to allow such acts as these, and it is expected that the Government will take the whole matter into its own hands, and fix the prices of all necessaries as equitably as it can until the siege, or the danger of it, is over. If something of this kind be not done serious riots may be the result. M. J. A. BARRAL, in the *Journal de l'Agriculture*, gives the losses of the farmers in the seven departments invaded by the enemy at more than 160 millions sterling. He calculates that more than 10 millions of acres have been overrun, and that the loss in crops, cattle, &c., cannot be less than about £16 per acre. It is to be hoped that this estimate will prove greater than the actual loss, though that is certainly large.

—— Sir J. C. JERVOISE is anxious to test the opinion that the FOOT-AND-MOUTH DISEASE spreads by contact with persons from infected stock; and the following letters have accordingly been addressed by him to the Secretary of the Bath and West of England and Southern Counties Agricultural Society:—

No. 1.

"Idsworth, Horndean, August 21, 1870.

"I have lately received the Journal of the Bath and West of England Society, 1870. At p. 42 I read that Professor BROWN, the Society's Veterinary Inspector, states that persons coming from infected stocks are perhaps the cause of more outbreaks of foot-and-mouth disease than the actual and direct contact of healthy with diseased animals.

"This is so contrary to my own experience that I am most desirous of bringing the question to demonstration, and with this object I shall be glad to place, for the space of one twelvemonth (from September 1, 1870), 12 out of 13 Irish steers, purchased in June last, to be infected by Professor BROWN or any member of the Veterinary College he may select, in the way and in the manner referred to by Professor BROWN, 'otherwise than by actual and direct contact.' The visits to be paid at intervals not more frequent than 14 days. In case of his success I shall be ready to pay the sum of £100.

"I shall not be bound to the number of 12 cattle against all casualties. I name 12 out of 13 because one of the number has been a good deal shaken by a severe attack after his journey from Ireland.

(Signed) "J. CLARKE JERVOISE."

"P.S.—I request you will be so good as to place my proposal before the Association. The state of affairs in Dorsetshire narrated in the *Times* of August 19, where the highway from Whitchurch Canonicorum to Bridport is stopped with a view to lessening the danger of contagion to animals passing thereon, with the sanction of Mr. ARTHUR HELPS, will, I trust, justify this communication."

No. 2. "August 22, 1870.

"SIR,—Referring to my proposal of yesterday, I beg leave to suggest that 'member of the Royal College of Veterinary Surgeons' should be interpreted as any Veterinary Inspector appointed under the 'Contagious Diseases (Animals) Act;' and that in lieu of fortnightly experiments in infection, no subsequent attempt shall be made till 21 days after the period allowed for the incubation of the disease; and in order to avoid the errors which may arise from accident or coincidence being mistaken for consequence, it shall be necessary for the

whole or the majority of the beasts submitted to the experiment to be infected during the course of the twelvemonth dating from September 1, or, if preferred, October 1, 1870.

"The cattle will, as a matter of course, not be subjected to any exceptional treatment or habit.

"To remove anxiety on the score of public danger, I beg leave to call to mind the experiments in vaccinating sheep instituted by the Privy Council in the year 1862. I do not know in what locality these experiments were conducted, but I believe they were unattended with evil consequences, and I trust that the experiment proposed will be equally harmless.

(Signed) "J. CLARKE JERVOISE."

These letters were read at the last meeting of the Council of the Society, and after an animated discussion it was ultimately resolved, "That the Council thank Sir J. CLARKE JERVOISE, Bart., for the communication he has made, but after giving it the fullest consideration the Council feel themselves unable to undertake the duty suggested in relation to the proposed experiments."

—— The following letter from Lord CLINTON appears in the *North Devon Herald*, upon STRAW as FOOD for CATTLE. His lordship says :—

"My own experience, such as it is, fully bears out the assertion that 'in fattening cattle, hay may be dispensed with altogether,' and it has often been a matter of surprise to me in Devonshire to see hay so freely, not to say extravagantly, used in feeding cattle for the butcher, while straw, a nutritious and comparatively cheap article of food, is scattered wastefully about the yards, and treated only as fit for the dung-heap. In the great meat-supplying districts of Aberdeenshire and Kincardineshire, straw is universally used in fattening cattle; and in my own farm in the latter county, consisting of less than 300 acres, I tie up 28 beasts every winter, and realise good prices for them without using a pound of hay, giving them Turnips, Potatos, and straw, and sometimes, though rarely, artificial food of some kind. Thus, they all lie upon sparred floors raised 5 or 6 inches from the ground, with interstices to allow the moisture to pass through, an arrangement which economises the straw, a very small quantity sufficing for bedding, and contributes very much to the comfort and health of the animals. The expense of these floors is inconsiderable, each spar is separate and movable, and may be taken out at any time to be repaired or renewed, and, if properly taken care of, may last for many seasons. The trying time through which we are passing will have served a good purpose if it turns our thoughts to the cheapest and most profitable method of fattening cattle in this part of the country, and at the same time teaches us the value of economy in the use of all our farm produce, even in seasons of abundance."

—— The following report on the BARKING SEWAGE FARM has been put into circulation on the authority of Mr. BEADEL, the land-agent and auctioneer at Chelmsford :—

"I cannot help expressing my astonishment at the progress which has been made upon the Lodge Farm since my visit upwards of a year ago. I remember the nature of the land before the sewage was applied to it; and I am greatly surprised that so short an experience in its use should have for result the complete system which now appears to prevail, and which produces so much success. The crops of Onions, Carrots, Parsnips, Mangels, and Cabbages, are startling. Engaged professionally, as I am, all over England, I must admit that I have seen nothing approaching to them anywhere in regard to luxuriance of growth. The cereal crops also seem to be very much above an average. Considering the hot season we have had, the effect of the application of sewage to such land is certainly wonderful."

OUR LIVE STOCK.

CATTLE.

AT the sale of Mr. J. G. Dixon's herd, by Mr. Thornton, at Caistor, on the 2d inst., the cattle were brought out in only middling condition. No high prices were given, and the company, although large, was not inclined to bid briskly. The comparatively low condition of the animals, the scarcity of hay and keep of any kind in the surrounding district, and the fact that only four of the cows were in calf, all contributed to lower the value of the stock. *Blush Rose 2d* was bought by Mr. Kirkham for 30 gs.; *Mace 2d* went into Mr. G. Skepworth's hands at 28 gs.; *Perfection 2d* was sold at 30 gs. to Mr. Walker; *Rennet 6th* made 29 gs.; *Mace 4th* became Mr. Pears' at 32 gs., and PARADOX 7TH brought the highest price of the day, 36 gs., becoming the property of Mr. J. W. Dixon. The average for bulls, cows, and calves, was £20 11*s.* 8*d.*

—— Mr. Strafford has issued a catalogue of some choice Shorthorns, the property of Messrs. Garne & Son, of Broadmoor, and Mr. George Garne, of Churchill Heath, which will be sold on the 4th of next month. The foundation of these two herds was laid nearly 40 years ago by Mr. Garne, who was one of the earliest introducers of Shorthorns into the county of Gloucester. They originated from stock then held in high repute, such as that of Messrs. Champion of Blyth, Mason of Chilton, and Whitaker of Burley. First-class bulls have since been used from Farnley, Brandsby, Ley Fields, Tortworth Court, and other famed herds; latterly, sires have been bought and hired at high figures from Col. Towneley and Messrs. Booth and Peel, and on comparing their pedigrees with the Herd Book, will be found to combine alliances with many fashionable families. Among these sires may be mentioned GONDOMAR (17,985), by VALASCO (15,443), dam by 2D GRAND DUKE, and previously descended from *Bliss* by LEONARD (4210); 6TH DUKE OF AIRDRIE, of *Duchess* descent; CYNDRIC (19,542), full of fashionable Bates blood; DUKE OF TOWNELEY (21,615), whose name proclaims his origin; ROYAL BENEDICT (27,348), by PRINCE CHRISTIAN (22,581), and previously bred from highly fashionable Booth blood, such as is represented by CROWN PRINCE (10,087), VANGUARD (10,994), and BUCKINGHAM (3239); and lastly we find the name of BUCCANEER (25,693), by LORD LYONS (26,677), who traces back, like GONDOMAR, to *Blissful* by GRAND DUKE and *Bliss* by LEONARD. Upon further inspection of the catalogue, we find a large number of the descendants of *Pye* by NEWNHAM (2365), including the *Pinks 3d* to *6th*, and other animals which may be named the Messrs. Garne's "P." family. *Fantja 8th*, once the property of Mr. Sartoris, is also present, and other well known names. ROYAL BUTTERFLY 20TH, the 1st prize bull at Taunton, will likewise be sold.

—— Messrs. Lythall & Clarke have issued a catalogue of Mr. T. Harris's Shorthorns, which will be sold at Stoney Lane, near Bromsgrove, in Worcestershire, on the 20th inst. The herd, which numbers 62 individuals, is well-bred, and has been improved by the introduction of first-rate sires. We need only mention the names of Captain Oliver's FESTIVAL (26,147), the Marquis of Exeter's SUPERINTENDENT (25,254), Colonel Kingscote's LORD RED EYES 2D (25,460), and Mr. A. J. Robart's ARCHDUKE (21,185), to indicate the spirit with which the herd has been kept up. These bulls have been allied to cows which are represented by four well-known strains of blood :—(1), "The Lancasters," obtained originally from Mr. Wilkinson, of Lenton; (2), the descendants of *Julia* by BALKAN (14,120), bred by Sir C. Knightley, a grand old cow now in her 17th year, and one of the only two animals retained by Mr. Harris at his sale 14 years ago; (3), the produce of *Bessie* by SILKIE LADDIE (10,947), from Mr. Topham's stock; and (4), "The Lavender's," which may be traced back to stock once in the possession of the late Earl Ducie, Mr. Barnes, and Mr. Stratton.

—— We have to record the recent deaths of two excellent animals. *Queen of Rosalea*, of Branches Park notoriety, the 2d prize cow at Oxford, and the winner of numerous prizes, died from the effects of a ruptured blood-vessel. This cow was by Mr. R. Booth's RAVENSPUR, of the "Medora" tribe, and out of *White Ladye* by the well-known VALASCO (15,443). Mr. Booth, of Warlaby, has also experienced a severe loss in COMMANDER-IN-CHIEF (21,451), who died a few days since from inflammation of the intestines. This bull has been one of the most remarkable of his day as a prize-taker, and his pedigree was unrivalled, he being by VALASCO, and from *Camp-follower*, by CROWN PRINCE (10,087).

—— A valued contemporary contains the following announcement :—Mr. Strafford is to sell, at Weston Park, Warwickshire, October 18, about 50 head of Shorthorns, the property of Sir George R. Phillips, Bart.; and on October 7, some of the Shorthorns of Lady Pigot will be offered for sale, "by unreserved auction," by Messrs. Newson & Stanley, in conjunction with Mr. J. Thornton.

—— On Monday week Mr. Cochrane's purchases of Booth cattle left their native shores on board the "European." In addition to the animals already specified in previous impressions the cargo included the Alloa purchases, namely, *Blue Bell* by KNIGHT ERRANT, and *Miss Blithe* by LORD BLITHE. Also a heifer from Mr. John Booth's herd. Mr. J. S. Thornton, of Whitby, Canada, took out a roan bull and three red and roan in-calving heifers, from Mr. Cruickshank's herd at Sittyton, and one of the heifers of Mr. Currie, of Halkerston. There were also three of the Yorkshire show prize Lincoln rams, late the property, respectively, of Mr. Wallbridge, Mr. Cartwright, and Mr. Marshall; three of Mr. Wiley's Leicester gimmers, and several horses.

—— In giving the results of the Alloa sale last week, we omitted to mention the prices made by three young bulls, offered by the Earl of Dunmore. They were sold very cheap, at from 22 to 28 gs. each. The sale of Border Leicesters was not very satisfactory, principally on account of the season scarcely being far enough advanced.

SHEEP.

LORD SONDES' fifth annual sale of and letting of Southdown sheep, and sale of Norfolk red polled cattle, took place last Monday, under the management of Mr. E. Beck, auctioneer, of Fakenham, at Elmham Hall, Norfolk. The proceedings opened with the sale of 400 ewes and lambs, which realised £740, or 37*s.* each. The pens of five shearling ewes made from 50*s.* to 79*s.* per head; pens of ten ewes made from 38*s.* to 52*s.*; ewe lambs varied from 25*s.* to 37*s.*, and wether lambs sold at from 25*s.* to 30*s.* per head. The demand for rams was small, many remaining unsold. Those which changed hands commanded good prices, and brought from 12 gs. up to £27 6*s.* each. The cattle, which comprised 17 heifers near calving and three bulls, were sold as follows :—the heifers at from £12 12*s.* to £27 6*s.*; the 2-year-old bull brought £25 4*s.*, and the bull calves £4 4*s.* and £9 9*s.*

—— At Mr. Henry Smith's Shropshire ram sale, Sutton Maddock, last Monday, some good prices were realised. The sale was conducted by Messrs. Lythall & Clarke, and commenced with the 4-shear sheep, Latimer, which was secured by Lord Chesham for 34 gs.; "Iron Mask," herd by Mr. Jarvis, of Upton Magna, was sold for 26 gs., to Mr. Robert Smith, of Chew Magna; Mr. W. O. Foster bought a good shearling for 15 gs.; and the Duke of Sutherland took another at 12 gs. Other shearlings were disposed of at prices varying from 10 to 16 gs., until the appearance of lot 19, which became Lord Bradford's property for 32 gs. The average for rams was a little over £11. Ram lambs made from 35*s.* to 65*s.* Ewes sold very well. Captain Oliver bought the first pen of six for 8 gs. each; lot 2, a pen of five, brought £6 per head; and lot 3 made £5 15*s.* per head. After this brilliant commencement, the prices fluctuated between 47*s.* and 115*s.*, giving an average, over 121 ewes sold, of nearly 80*s.* per head.

HORSES.

AT the sale of Count de Lagrange's stud, last Monday, some remarkable prices were given. Gladiateur, after much competition, was purchased by Mr. Blenkiron for the enormous sum of 5800 gs.; the Duke of Hamilton gave 3800 gs. for Général, and Henry by Monarque was sold to Mr. Wright for 1350 gs.; Mortimer, one of the best horses in training, either here or on the Continent, was bought by Mr. Carter, the French trainer, for 3000 gs., and Trocadéro became Mr. Woolcott's property at 1400 gs. At this remarkable sale horses were sold at all prices, from 20 gs. up to the marvellous figures we have just quoted.

POULTRY.

SOME of our readers may be able to help our correspondent, "G. E. O.," who writes as follows :—

"I should be much obliged by any information as to the cause of a disease that has lately attacked some of my chickens. The neck is strained to its full length, is swelled to more than twice the usual size, and the chicken dies in a day or two, or in a few hours. I did not see the first that died; but yesterday a strong chicken about three weeks old was shown me, when it had been ill an hour or two. It could still run about, but was gasping for breath. The swelled neck was so transparent, I thought there was only air in it, and made an opening with a sharp pair of scissors. The enlargement immediately went down, the chicken could eat, and is nearly well this morning.

"Sometimes in the late summer months I have before lost chickens from an enlargement on one side of the neck, from which they died in a day or two. Then, as now, the swelling was attributed to a sting; but I could never see any outward injury, and think that the scissors might have been equally useful in former cases."

STEAM CULTIVATION.

THE following discussion of this subject is reported as having taken place before the Turriff Agricultural Association, at their recent annual meeting :—

Mr. A. STEWARD, the Chairman, directing a steam-plough company in the neighbourhood, wrote to Mr. Greig, of Harveston, as to the cost and management of a steam-plough. He replied, recommending Fowler's No. 2 plan of cultivation, which would, in the absence of stones, plough 15 acres, or cultivate 25 acres in 10 hours, and half that quantity if earthiast stones and boulders were present. The engines, he said, are excellent traction engines, and would pull 40 tons on the level. They will work any kind of land, or any shape at any elevation, three men and a boy forming the working staff. The engines are suitable for threshing, and, with broad wheels, are excellent road rollers for crushing road metal. The Secretary, Mr. Greig, banker, Laurencekirk, then wrote with particulars about the Kincardineshire company, which was started four years ago, with a capital of £1500 in £1 shares. They have wrought three clear seasons and part of a fourth. In 1867 they ploughed and cultivated 666 acres, and earned £309; in 1868 they ploughed 913 acres, or 50 per cent. more, and earned £469; in 1869 they ploughed 966 acres, and earned £500; and in 1870 they ploughed 1163 acres, and earned £600. Every year, you will see, the revenue increased, and the working expenses he states to be on an average £306, or 20 per cent. say on the capital. If they earned £600, and the expenses are £300, that leaves £300 to divide, which would be 20 per cent., unless you occupy about 14 per cent. with renewals or with fresh stock, which go into capital. Instead of increasing their capital by buying new implements, they purchase out of their revenue, and thus decrease their return; but still they reap a clear return of 7 per cent. Although they have this sum to divide, the secretary says they have never done so, but have kept it as a nest-egg, so confident were they that they could do better by applying 7 per cent. to the purchase of fresh gear, than by dividing it.

Mr. Steward further said :—Perhaps I may mention what the charges of the Kincardineshire company are. They dig or plough to a depth not

exceeding 11 inches for 13*s.* 6*d.* per imperial acre, to a depth of 12 inches for 15*s.* 6*d.*, and greater depths at special rates. They plough lea to a depth not exceeding 8 inches for 10*s.* 6*d.*, and they dig for Barley 10 inches at 10*s.* 6*d.* per acre. For cultivating, by a grubbing machine, land that had been dug or ploughed by the company the same season, they charge 7*s.* per acre; they cultivate other land to a depth of 7 inches for 7*s.* 6*d.*, charging a shilling per acre more for each additional inch of depth. The secretary of the Kincardineshire Club, who is somewhat connected with this part of the country, says there are special advantages in the use of steam-ploughing on the clays of Kincardine; but the establishing of a free interchange between soil and subsoil, by the breaking of the pan and stirring without throwing up the subsoil in winter, and the speedy completion of spring operations, are advantages of much more general diffusion, and would, after a few years' experience of steam-power, recommend its use strongly enough in the Turriff district.

As opposed to Fowler's system, there is the extraordinary invention of Mr. Thomson, of Edinburgh—the road-steamer. This road-steamer is a perfect miracle: it does horse-hauling, it turns on its own length, it passes freely out and in at an ordinary field-stile, and works up an incline of one in seven. A trial of the engine was made at the Highland Society's Show at break-ploughing, when the Society were of opinion that it ploughed six furrows most thoroughly and most successfully, and that there was no better work done by any of the steam-engines belonging to the Fowlers or the other firms. It is possible many would be inclined to take Thomson's in preference to Fowler's system, as the one would only cost about a third of the price of the other. The gearing recommended by Mr. Greig would cost £1500 at least; while the road-steamer would not cost over £600, and it could be made to carry their coals, crush road metal, or do any kind of work. One of Thomson's steamers has been at work in Aberdeen for 15 months, by Mr. White, corn merchant, and carries 80 tons a day to and from his flour mills most satisfactorily. I hope the public-spirited farmers of this district will be inclined to take the matter up, and I for one will be glad to take my proportion of the shares with them.

Mr. G. W. MURRAY (Banff Foundry) said:—What has brought me to my feet is the speech of the Chairman on steam-ploughing, and I hope it will not be out of place if I state to you a little of my experience in the matter. I have no doubt the time is not far distant when steam-ploughing will be pretty general in Aberdeen and Banff shires. I have seen most of the systems of steam-ploughing; I am familiar with Fowler's, and I know Thomson's, for, in fact, I was the first person who suggested, and only about this time last year, at the Highland Society's show, the idea of attaching to Thomson's engine two of our own double-furrow ploughs. I was at the time much taken with the idea, thinking that, by these means, steam-ploughing could be had for little money. I wrote Mr. Thomson, suggesting that he should supply a road-steamer, and take half the risk, but he would only take a third of it; I was to keep a third to myself, and I applied to my friend on my left (Mr. Fowler, Armidale), to Mr. Hutchinson, and others to take the other third, and to use the engine and ploughs. When we came to see our way, it turned out that it would be five months before Mr. Thomson could give us a steamer. It was then the month of December, so that, by the time it came, there would be no ploughing left to perform. The matter dropped there, and since that time the steamer has attracted so much attention, and been so much in demand, that I do not believe we could get one on the same advantageous terms as were then offered. But I have since then seen the steamer and four-furrow at work, and had more experience of it. At Oxford, along with some others, engineers of eminence, I watched it very minutely at work, and we found that, in drawing a four-furrow plough, the steamer looked as if doing its work well, but in going three rounds the steam fell from 120 to 80 lb. This satisfied me that the steamer was not yet the thing required for ploughing. One thing yet remains to be proved in order to establish Thomson's steamer, and that is whether the indiarubber tires will stand. They cost about £100 each, and in the opinion of several eminent men they will not stand; but if they do stand, the steamer will undoubtedly be a success, and useful for many operations. Then I saw Fisken's system, which can be wrought by an ordinary engine, or by water-power; it is very much, if I mistake not, on the principle of the patent of our friend, Mr. Leslie; and is the best I have seen for ploughing. The capital required for it would not exceed £600, and the engine could be turned to many uses. The conclusion I came to, however, is, that it would be necessary to exercise a little caution before going in for any one system of steam-ploughing. It is not in general necessary to recommend caution to the Scotch farmer, but I take the liberty of doing so in this case. This year the Messrs. Fowler's patent for their balance steam-plough and gearing expires, and next year is the year when the Royal Society of England turn their attention specially to testing the merits of steam-ploughing. The fact of Fowler's patent being exhausted will, I believe, bring many new systems into the market. Among them will be the steam-plough of my friend, Mr. Leslie, which, I venture to predict, will beat a good many, if not all of the others, and will be obtained for very little money. I think there will be a revolution in steam-ploughing next year, and on that ground I venture to suggest that it would be premature for this association to choose a steam-plough this season.

Mr. LESLIE explained that Fowler's system was wrought wholly by steel ropes; Fisken's system combined the steel and the hemp ropes; and his own system was wrought wholly by hemp ropes. Fisken's cheapest apparatus, without the steam engine, cost about £240, and his own about £70 less.

Mr. LESLIE (Burnside of Delgaty) then proceeded to read some facts and speculations with reference to that department of agriculture to which he had given most attention, the state and prospects of the mechanics of agriculture. He commenced by comparing the cost of physical, animal, and natural forces, and the advantages of the latter in point of economy, though their use was prevented by the complexity and cost of the machinery required. Water-power had yet only been used experimentally for ploughing; but the time would come, he doubted not, when the greater part of Aberdeenshire would be ploughed by water-power. There are two directions in which we may look for improvement in implements and machinery used in agriculture, one by cheapening the machinery or apparatus, and the other by increasing the efficiency of the implements, so that the waste power might be reduced to the lowest possible point. He then proceeded to point out what had been attained, and what he believed to be attainable in these days in the machines used in the operations of the farm. Beginning with the plough, he said a young man left the Turriff district lately, and went to the south of England to manage a farm. He found the ploughs drawn by five horses in line, and altered the arrangement to four horses, in two pairs, one before the other, saving a horse. The plough was described as a primitive-looking implement. Perhaps by adopting a lighter draught, and putting three horses abreast, another horse might be dispensed with. At any rate, the saving of one horse out of five was something considerable, and the neighbours were all going about to see the new invention. He then noticed experiments at Paris in 1859, and at other places, showing that Howard of Bedford's single plough was 25 per cent. lighter in draught than the other ploughs, while Oats sown on the ground ploughed by it produced the heaviest crops both of Oats and straw. He was present last winter at some trials made by Mr. Milne, Mains of Laithers, with a common swing-plough, Howard's two-wheel plough, and a three-wheel plough made by Mr. Reid, Muiresk. The trials showed a decided superiority of the two-wheel plough over the swing-plough, and of the three-wheel plough over the two-wheel. The use of a wheel as a substitute for the sole-plate of a plough, with a view to the reduction of friction, is not new, neither is the combination of two ploughs into a double-furrow plough, which is several centuries old; but as far as he was aware the combination of the two, for which we are indebted to Mr. Pirie, Kinmundy, is a new and valuable invention. How far this combination may be advantageously carried, it is impossible to say. As long ago as 1855, we find a three-furrow plough exhibited by Mr. Williams, a farmer in Wiltshire, which was found to effect a saving in drought of about one-third. It appears likely that on light level land, free of stones, the three-furrow plough would have an advantage over the two-furrow plough. Referring to the comparative cheapness of steam over horse-power, in ploughing, he said the great obstacle was the cost of the apparatus. He had made experiments extending over several years, with a view of reducing the cost, and he believed it was possible to do so to the extent of one-third, in the case of the less expensive apparatus, and of more than a half in the case of the more costly. He had also kept in view the possibility of using fixed engines and water as sources of power, which he believed to be quite practicable, and, especially in the case of water-power, very advantageous. The time would come, he doubted not, when every foot of fall on the Deveron would be utilised, and a great part of the cultivated land ploughed by water, at a cost not exceeding 3*s.* 6*d.* per acre. He referred to the zig-zag iron harrow as capable of doing double the work in the same time as a wooden harrow, and on a neighbour's farm had saved its cost in one year. With reference to sowing-machines the drill and broadcast were pretty equally matched on well-ploughed lea, but in sowing land after a green crop the drill manifested the advantage. He recommended a continuation on different soils of the experiments made by Mr. Milne, Mains of Laithers, as to the distances between the rows and the quantities of seed that would produce the best crop, and suggested to the committee to consider whether something might not be done by members co-operating for the purpose. He then entered upon the history of the reaping-machine. In modern times, the first reaping-machine to be continuously worked was invented 60 years ago by James Smith, of Deanston. It consisted of a wheel 6 feet in diameter, sharp at the outer edge, which was caused to revolve at considerable speed, and a conical drum, by which the corn was supported till delivered at the side in a continuous swathe. This machine had the advantages of simplicity and positive motion, or the motion continuously, in the same direction of all its parts, not possessed by any machines at present in use, and he would not be surprised to see it revived, when farmers had learned to lay their fields flat, and gather off the stones. One of Smith's machines was wrought in the parish of Turriff, in the years 1833 to 1837, by Mr. Mess, who was at the time tenant of the farm of Barnyards of Delgaty, went to America, from which he returned a few years ago, and is still alive. The unevenness of the surface was the principal cause of the failure of that machine. For farms of considerable size, the most convenient reaping-machine was that with side delivery in sheaf; where 100 acres of grain have to be cut down, a machine of that kind would repay its cost in a season. Even where crops are laid and twisted, it would, by a little management, and the partial use of the scythe as an auxiliary, make a much better job than could be made by the scythe alone. He might mention that the substitution of the scythe for the hook in reaping, which took place in that quarter about 60 years ago, was said to have originated in the parish of Auchterless. He then referred to the plan adopted by Mr. Runciman (and described in the Journal) of communicating power from a water-wheel to a mill 130 yards distant. Experiment showed that 120-horse power could be conveyed 12½ miles with a loss of only one-fourth—opening up a wide field for the utilisation of water-power. Referring to machinery for manures, he mentioned that bones were first used as manure in the north of Scotland by the late Mr. Rannie, who was at the time tenant of the cottage farm of Carnousie, in the parish of Forglen. Referring to machinery for irrigation, he pointed to a plan lately patented for distributing water in the form of showers by means of a fixed apparatus, which can be paid by a fixed rent-charge of 25*s.* per acre for 25 years, and, where steam is required, will cost about 3*s.* per acre to work. In occasional seasons like the present there was difficulty in getting a plant of Turnips on account of the dryness. Chandler's liquid manure drill machine, which he had exhibited in the show, was intended to meet the contingency, by enabling the farmer to apply with the seed a quantity of water sufficient to enable it to vegetate. This machine had been in use for 15 years, and experiments had shown that the crop produced by the manure (in that case superphosphate of lime) dissolved in water, and applied by the machine, had been greater than that produced by the manure in a dry state, in the proportion of one-fourth to one-half more, the cost being not more than 1*s.* per acre. He concluded his survey by quoting the remark of Mr. Edwin Chadwick, that the number of improved agricultural implements and machines that might be profitably used, and are not, is greater than the number of those that are used; and he made a strong appeal to the proprietors, who profited most by the introduction of improved machinery, to co-operate with the farmers.

IRRIGATION, SHOWER-WISE.

MR. CHARLES RINTOUL, of Kingston, North Berwick, and of East Craigie, well-known as an early Potato grower on the latter farm, where he took two crops of tubers in the year, thus writes in the columns of the *Farmer*:—

The prime necessity of agriculture at the present day is the storage of water, and its application to the soil. This necessity is specially felt by those who risk vast sums of money in the application of artificial manure; and, as one who has carried this risk further, perhaps, than many, I beg a brief space in your Journal to point out a means by which it seems possible, not merely to lessen, but practically to destroy the risk.

The value of artificial manure applied yearly within the United Kingdom is variously estimated at from £10,000,000 to £12,000,000. In my own district, the south-eastern portion of Scotland, I have good reason to know that the expenditure does not fall short of £750,000. Or, to take my own case, and that only in respect to one article, I have this year upon my two farms 200 acres under Potatos, to which I have applied manure to the extent of £20 per acre, or £4000 in all. Artificial manure will not of itself give a crop; heat will not give a crop; but the combination of manure, heat, and moisture will give results of which we have as yet no conception. The difficulty has been to obtain moisture along with heat; and the experience of the last three seasons has convinced farmers that "something must be done."

The landlords of the country—I speak from experience so far as Scotland is concerned—have done a great deal to make capital available for drainage, and the science of agriculture has been much advanced in consequence. What we farmers now want is, that proprietors should give the same facilities to have capital made available for irrigation purposes in connection with our river system, where it can be shown that irrigation in this form could be made a permanent lands' improvement.

The time has now come when this can be done, not as a process antagonistic to drainage, not merely for land lying low, or level, or naturally moist, but with the greatest benefit on that land which has been already best drained, or where, naturally, no drainage works are required.

From the extent to which manure is used on my farms, I am keenly alive to the risks of a bad year. A month lost through a backward season, means the entire sacrifice of the manure sunk in the ground on

early Potatos, which I cultivate to a large extent. Even a week gained in bringing them to market would nearly double the price I obtain for my first crop. To remove all this risk and uncertainty, I am at present making arrangements for introducing on a farm of 200 acres an invention, which I believe to provide the exact remedy required.

This invention is not one of irrigation in the ordinary sense—namely, the cultivation of land by water alone as the source of fertility, and on land specially prepared by levelling or cutting for the distribution of the water, hence limiting the area of its application. The fault of all systems of irrigation has been the over-saturation of the soil, or the unequal distribution of the water. By this new plan, invented by Mr. Brown, of Edinburgh, and the experiments on which I have watched with great interest, water is applied in the natural form of rain-showers, and only in sufficient quantity to supply the loss by evaporation. It entails none of the labour accompanying the use of the hose and pipe, and the physical conformation of the land does not hinder its application. The apparatus once laid down, as much as 1000 acres of land could be watered by it each night, at a first expense, for engine and pumps, not exceeding £500, and requiring only the work of two men—an engineman, and a person to turn the taps; and, compared with other systems, the quantity of water required to supply 1000 gallons per acre, in the form of fine rain, would be small. The system has been proved for the cultivation of grass and hay, and pasture land, over a period of six seasons. In the driest seasons, it has been shown that, paying interest on capital, rent of land, manure, and labour, grass can be produced at 5*s.* a ton, and hay at £1, the weight produced being 40 tons of grass, or equivalent to about 7 tons of hay. On Mr. Hutchison's farm, near Kirkcaldy, where the system is in use on pasture land, it is seen that an unfailing growth of the best description of pasture can be maintained throughout the driest period; in fact, the drier the weather the better the growth, owing to the moisture being maintained.

It is not my purpose to describe the details of the system. These can be easily ascertained. And I think the agriculturist should now learn that a remedy for the present water famine exists, and is beginning to commend itself to the practical agriculturists of Scotland.

SEMI-FIXED ENGINE—CLAYTON AND SHUTTLEWORTH'S.

At the Leicester and Manchester meetings of the Royal Agricultural Society of England, and at the corresponding Christmas meetings of the Smithfield Club in the Agricultural Hall, we had occasion to report the growing popularity of small vertical engines, so that the competitive trials at Oxford were looked forward to with the deepest interest; and now that the trials are over, and the results before the public, new questions have arisen, whose solution will doubtless end in the extended use of this class of engines in agriculture. Our readers are aware that the Royal Agricultural Society judge of the merits of engines by the fuel they consume in the performance of a given quantity of work. We were told in the yard that the cross-tube and "baffer-plate" of Hancock & Foden's vertical engine reduced the consumption of fuel about one-half, and yet on trial this very engine, to which our special attention was solicited, consumed more than twice the fuel of Clayton & Shuttleworth's engine, the subject of this notice. There may be some truth in what was repeatedly told us in the trial-yard, viz., that small vertical engines are greater consumers of fuel than large ones. But, practically speaking, this is only paying a very high compliment to the three firms who carried off the 1st, 2d, and 3d prizes with horizontal engines, whose consumption of fuel per horse-power per hour, compared with the three commended vertical engines, is as follows, viz.:—*Horizontal engines:* Clayton, Shuttleworth & Co. (1st prize), 3.73 lb.; Brown & May (2d prize), 4.44 lb.; Reading Iron Works Co. (3d prize), 4.65 lb. *Vertical engines:* Marshal, Sons & Co. (highly commended), 5.75 lb.; Robey & Co. (commended), 5.9 lb.; Davey, Paxman & Davey (commended), 6 lb. Such differences in the consumption of fuel speak for themselves.

The annexed illustration (fig. 234), from a right side photograph, with the following description, will give a general outline of its merits and adaptation to agricultural purposes.

The engine, it will be seen, is upon the same general symmetry of plan as the portable engines of this firm which gained the 1st prize at the last trial of engines of the Royal Agricultural Society held at Bury St. Edmund's in 1867, with this difference, that the Oxford engine is placed upon a water-tank pedestal, whereas the Bury engine runs on wheels.

The water-tank pedestal is a capital contrivance, no less for its utility in holding a ready supply of water and for the superior fulcrage it affords to the engine, than for its workmanlike appearance and artistic finish. No artist thinks of making an equestrian statue stand upon the bare ground, so to speak; even the solid rock must be so chiselled out as to show the uniform stability of the base; and why should it be otherwise with the steam-horse? for when the two bearings are placed on the ground, the ground under each bearing forms a fulcrum which yields less or more antagonistically to the other at every stroke of the piston, thereby reducing its effective performance. All who use the common portable engines are familiar with the objection to which we thus refer, however well the fore-wheels and hind-wheels may be blocked; and also how superior is the working of a fixed engine on its unyielding basis as compared with a portable one. There are not two opinions about this, neither can there be two opinions as to the superiority of the fulcrage afforded by the water-tank pedestal as compared with the front and rear bearings resting on the ground.

Two other improvements merit special notice, viz., (1) the plan of fixing the working parts to the boiler, and (2) the feeding of the boiler with hot water.

It will be seen from the engraving that the working parts—including the cylinder, governor, guide for the connecting rod, and the plummer-blocks for the crank shaft and fly-wheel—are all fixed to the boiler by means of a cast-iron saddle bedplate in one casting. By thus rigidly fixing the several centres and bearings in their true position to each other for mutual action, greater accuracy of performance is secured than can be obtained when the several parts are fixed to the boiler separately, subject to vibration and unequal expansion by heat; while the latter, the old plan, also weakens the boiler. Between the two plans, the difference is more

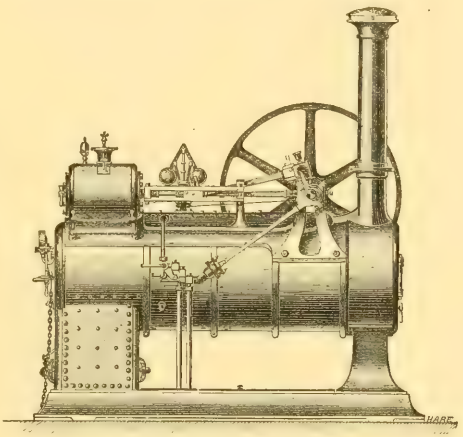

Fig. 234.—Semi-fixed engine.

in favour of the former than is perhaps yet credited. Upon the truthful discharge of the duties of the several working parts towards each other depends the success of every combined machine, and in this respect the movements of the Clayton-Shuttleworth engine stand very high.

The feed-water heater is fed by pumping apparatus, as seen on the side of the boiler. The water is raised from the water-tank pedestal as is commonly done from a pail, but instead of being forced directly into the boiler the water passes through small tubes, surrounded by the exhaust steam from the cylinder, which raises its temperature to nearly the boiling point before it enters the boiler. Along the top of the cast-iron saddle bedplate, between the cylinder and the chimney, the exhaust-steam conduit extends, traversed by the small tubes above mentioned. The bolts which hold down the cover of this steam conduit are shown in the drawing. The water produced by the condensation of the steam flows back into the water-tank by a pipe, and provision is made for feeding the boiler directly from the force pump should circumstances so require. There is under this head an economy of both water and fuel, and also of tear and wear of the boiler in generating steam.

The cylinder, 7 inches in diameter with 12-inch stroke, is steam-jacketted. The boiler, which is similar to those of the portable engines, is lagged down to the fire-box, and with the fire-box beautifully finished at the end with cast-iron mouldings. The fire-box is of Low Moor iron, and the other portions of Best Butterley. The length of the connecting rod is favourably proportioned to the length of the crank, so as to equalise the speed of the stroke throughout the length of the cylinder. The cut-off distributing apparatus is exceedingly simple and easily adjusted, the friction involved being reduced to a minimum by the small eccentrics and the machine finish of the workmanship; the whole of the bright parts being done by machine-tools, commands admiration.

Of the adaptation of horizontal engines in agriculture, as compared with vertical engines, the only question that remains at issue is the amount of house-room required when worked indoors, and the housing of the engine when worked outdoors in quarries, tile-yards, &c.; and the freedom from priming, and consequent greater safety, will turn the balance in favour of the former for indoor work, granting that the consumption of fuel and performance are equal. As for outdoor work the horizontal will be as easily protected from the weather as the vertical, if not more easily in many cases. At all events the difference, if any, in favour of the vertical, will be found immaterial in practice. And, with regard to travelling crane work, hoisting, pumping, &c., the construction of the horizontal is, in our opinion, more favourable than that of the vertical. No doubt under this head the vertical engines have become so popular that a large amount of prejudice will have to be overcome before opinion will become general; but prejudice arising from habitual use, although holding like a "rusty nail," will be withdrawn the moment the horizontal engines are in use, for, practically speaking, nothing can long stand before so great a difference in the economy of fuel and work done.

In a commercial sense the vertical engines, according to the catalogue prices, cost rather less money, generally speaking, than the horizontal; but taking into account the consumption of fuel and work done, the latter are the cheapest engines, apart altogether from quality of material, workmanship, expense of repairs, and permanent durability, upon which their real money value depends. The 1st prize engine under notice was sold, and is on its way to Sydney. It packs into small space, and does not require skilled labour to fix it, so that for export this class of engine is valuable, the freight being small. At home an engine can be conveyed by sea, rail, or road with equal ease, and is as readily shifted from place to place when at work as a vertical engine; and from being machine-finished duplicates can be supplied of a very uniform quality of workmanship, all equal to the beautiful little engine which did its work so well at Oxford, and which will form a copy to more than one maker before the Royal Agricultural Society of England meets at Wolverhampton. *W. F.*

THE IMPROVED KENTUCKY SHEEP.

Mr. Robert W. Scott, to whose skill the "Improved Kentucky Sheep" is due, seeing nothing in the existing sheep of the district to suit his requirements as a grazier, determined upon beginning to graft upon the original stock something that would in time come nearer to his standard. None of the British breeds would suit his purpose—the Cotswold being too delicate when young to bear exposure to the wet season; the Southdown having too short a fleece, and the Merino being too small. Acting on these impressions, the improver informs us that he "has perseveringly endeavoured, for over 30 years, to combine in the same animal the hardiness and prolific quality of the native sheep, the size and weight of fleece of the Cotswold, and the symmetry of form and delicacy of mutton of the Southdown; and also to combine in the same fleeces the weight and length of the Cotswold, with the thickness and softness of the Merino."

Mr. Scott's *modus operandi* was as follows:—In the beginning about 30 ewes were selected from a flock of unimproved native sheep. Amongst these was turned a very large and fine Saxony or Merino ram, the object being to increase in the offspring the thickness of the wool, and to impart fineness to the fibre. This step was thought advisable before uniting the coarse fleeces of the native sheep with the coarse and still more open fleeces of the large imported varieties, and the effect was satisfactory. The ewe lambs of this cross were put, on October 1, after they were one year old, to an imported Bakewell ram, of large, full, round carcase, and a heavy fleece of long wool. The ewe lambs of this latter cross were also, in due time, put to an imported Southdown ram, of large size and high standing, the object now being to infuse into the progeny that active, sprightly, and thrifty disposition, and highly flavoured and beautifully marbled mutton for which the Southdowns are so justly celebrated. This object was also successfully obtained. The wethers of this cross were the delight of the epicure, while the value of the fleece was not diminished; as much being gained by increasing the number of fibres to the square inch as was lost in the length of them.

A very doubtful experiment was next tried, but the operator speaks well of the result. A ram, three-fourths Cotswold and one-fourth Southdown—a large, hardy, active sheep, with a thick and heavy fleece, was put to this progeny. The two next crosses were made by pure-blood Cotswolds; and the next by "a fine, full blood Oxfordshire Down, of remarkable softness

and silkiness of fleece." They were all animals with short neck, round barrels, broad backs, and full briskets. They seem to have added to the flock still more weight of carcase and fleece; while the texture of the latter, and the delicate flavour of the former, were not perceptibly impaired, and therefore in the next fall the flock was divided between two full-blood Cotswolds.

It must have been amusing to have glanced at the flock at this stage, with a view to detect the traces of these crosses. We are informed that they were all perceptible (blended, but still manifest) in the character and habits, as well as in the carcase and in the fleece; but in some a particular cross predominated, which was naturally to be expected, on account of the recentness of the improvement. That the blending might be more entire, a cross with foreign sires was avoided the year following (1854), but sires were selected from the "improved" flock. "In the fall of the year 1855," says Mr. Scott, "*in order to carry out the same design*, I tried chiefly to a mixed ram, whose pedigree showed Cotswold, Oxfordshire, Teeswater, and Southdown blood." The italics here are our own, for it seems improbable that the object alluded to would be obtained by such means; still the breeder was perfectly satisfied with the result. Something further was done in 1856. A fine large Cotswold ram was used, and the year following selected ewes put to him and a ram of mixed blood. This gave a more complete uniformity to the progeny—the ewes crossed with the Cotswold evincing a preponderance of Southdown and Merino, those put to the mixed-blood ram exhibiting a preponderance of Cotswold qualities. The rams used in 1858 and 1859 were from his own flock, with a view of fixing the qualities gained, and more entirely blending the blood. "By this time," says Mr. Scott, "these sheep were as essentially alike and uniform, and maintained their identity and imparted their qualities as surely as sheep of any other breed."

Since 1860, well selected rams of his own breeding, together with those of Leicester and Cotswold blood, have been used in such a manner as to impart some valuable qualities either to the fleece or to the carcase, or to the constitution of the progeny; "pure Cotswolds, superior in form, size, and fleece, being raised in 1865 and 1866."

Now let us touch slightly on the economic results of this preparatory blending. One object was to get an animal which should be adapted to the climate and subsistence of the West and South. Was this done? In a new country the housing of sheep is generally too expensive a process to be practised. Therefore a class of sheep is wanted that will live in the open air, and cull their subsistence under ordinary conditions. Sheep may be so adapted to a bad climate or to a poor soil, as to get the greatest amount of good out of it. Where some would starve they thrive. Thus the sheep required was one that would face the bleakest winters and the hottest and dryest summers without any protection, except that which Nature had given them. The Improved Kentucky apparently have fulfilled these conditions. If it be allowable to twist the meaning of an old proverb, we would say, "like good wine they need no bush." They bear the climate unaffected by disease. They are free from cough, snuffle, foot-rot. In springs, and summers of excessive rains, clothed to the knees and to the ears by a thick, long, and impenetrable fleece, they bid defiance to the wind, rain, and snow, and seem at all times to be comfortable and sprightly. In summer they are changed from pasture to pasture, and they devour almost every green weed; in winter short grass is all that they require, and if that cannot be afforded them they will take the corn fodder or straw with the cattle, and thrive well upon it—though at lambing time, like other sheep, they require a more succulent diet. They get on without grain or hay.

Then as to their thrifty and prolific character, a good deal is to be said. The practice, of course, is to breed only from the most healthy, symmetrical and well-woolled ewes; the rest are fed as usual, and fatten with great rapidity. No ram is ever used which has the slightest taint of disease. By such care in the selection of parents, and by the frequent crossing of animals not even remotely related, and also by crossing with rams of different breeds (which is against the received opinions of the majority of breeding authorities) without making noted crosses (which is a saving clause), "a degree of health and vigour has been infused into this breed which," we are told, "is not surpassed in any other." The native ewes, under favourable circumstances, very frequently produce twins, and rear them well. The improved sheep are quite as prolific. Mr. Scott says—"I have often, when the flock was smaller than at present, raised one-third more lambs than there were ewes, and have rarely failed to raise as many lambs as ewes even under unfavourable circumstances. As thrifty and wool-producing sheep, they are preferred to the Cotswolds in Kentucky, and in the West. Yearling rams will weigh 174 lb.; 9 months old lambs, 104 lb; 2-year-old rams, 224 lb.; same age ewes, 180 lb., fed on grass only."

Then as to the weight and character of fleece, the evidence is conclusive on the point of "improvement." The fleeces of these sheep vary from 8 to 15 lb.—the whole flock of over 100 breeding ewes having averaged over 8 lb. of merchantable wool, free from burrs, tags, &c.; and though not washed on the sheep's back, still clean enough for domestic manufacture. Though the fleeces of these sheep are not perfectly uniform as to length, thickness, and fineness of fibre, still there is a general uniformity, and the diversity is said to be of no practical disadvantage. Their wool is longer than that of any sheep, except that of the Cotswold family, and is equal in length to that of many individuals of that family, while it greatly excels the wool of the Cotswold in fineness and softness of fibre, and in the number of fibres to the square inch. In some individuals it is wavy or curly, but is never harsh or wiry. Except the face and the legs below the knees, the whole body is covered with a close and compact fleece, which, when full grown, leaves no open line on the back, as with the Cotswold; but gives a perfect protection to the sheep, and causes them to present a smooth, handsome, and portly appearance. The wool is lustrous, and dyes, cards, and spins well, and is much approved by manufacturers. The testimony to the merits and value of these sheep appears to be very strong. We do not see any quotation of the value of the wool, but a manufacturer is reported to make the following statement:—"When we take into consideration the fineness of the texture, the length and evenness of the staple, the weight of the fleece, its clearness of gum, we can say that we prefer the wool purchased of you to any other we use; and in consequence have for years recommended our customers to supply themselves with your sheep." A gentleman who used the sheep for years said of them:—"I am not able to supply the demand for ram lambs, £5 per head; I reared from one of the ewes two lambs, which weighed, at five months old, 105 and 111 lb. gross, and clipped 5½ and 6 lb. of wool; they brought me £10. The mother, when I sold the lambs, weighed 175 lb. Another lamb at six months old weighed 122 lb., clipped 6 lb., and brought £5." These and other facts of the same kind, go to prove that Mr. Scott, by judicious selection and cross breeding, has produced a really valuable variety. And there is no slight advantage in seeing how the success has been achieved.

[This story of a sheep breeder is taken from the "Journal of the Agricultural Society of New South Wales," whose Editor describes it as "like the pranks of an American tapster, in the concoction of one of the slang drinks of that country. The effect, however, is well spoken of by Mr. Scott, who says, 'My success in the Improved Kentucky Sheep has been great, and the sale and diffusion of them wide.'"]

VAGRANCY.—ITS CAUSES AND PREVENTION.

[At the recent conference on the subject of the Poor-law held at Leamington, Mr W. W. B. Beach, M.P., in the chair, Mr. F. B. L. Baker (Hardwicke County) read the following paper.]

I AM much honoured by being asked to write, for your consideration, a ten minutes' paper on "Vagrancy: its causes and prevention." But to do so I must be very brief. If, therefore, I give my opinion *quantum valeat*, briefly and decidedly, I trust that my doing so may be imputed, not to want of courtesy, but to want of time. The causes and the character of vagrancy are so differently stated by writers of great experience in different parts of England that I can only come rather unwillingly to the conclusion that we have, not one set of vagrants travelling throughout the whole country, but several distinct species, each keeping to their own district.

In Gloucestershire and the neighbouring counties we find nothing of the highly amusing and poetical vagrants described by Mr. Doyle, in Cheshire, nor of the burglars or organised robbers described by Mr. Dunne, in Cumberland. But, in truth, all our accounts of the class appear sadly liable either to error or misconstruction. Even our statistical returns have been sadly misunderstood. Many readers of the judicial statistics took alarm at the returns there given, and believed that the ratepayers had to maintain an average of 32,000 vagrants, and could not understand the Poor-law Board describing them as only 6000. The return, indeed, of 32,000, which was intended to include tramps and vagrants, has been found on examination so unsatisfactory that it will be omitted for the future. This want of information as to the numbers and character of the class we have to deal with is greatly to be regretted, and I fear we shall not get a satisfactory solution of how to prevent them till we get a more accurate knowledge of their numbers and habits. This, I think, may be acquired by one of the modes of prevention which I propose, if it be ever fairly carried out. The causes of vagrancy in my part of the country, I think, are easily stated. A man falls out of work either from slackness of trade, which causes not only the most idle or the most drunken, but also the oldest and weakest of the gang to be discharged, or even at times of full work an idle, or careless, or stupid man will be occasionally turned off. These usually try, in the first place, to get employment in the same town, but if they fail, and find their money and credit exhausted, they set out to seek it elsewhere. For a time they may seek for it honestly and diligently, but those who fail in getting employment quickly—sleeping in filthy vagrant wards as, alas! most of them are—insufficiently fed—wet through by day and with small means of drying by night—become contaminated in body and mind, and, finding from their companions the advantages of begging, gradually join the ranks of the older mendicants with whom they are obliged to associate.

It has been asserted by some that most of the vagrants are the sons of vagrants born and bred to the trade, but I think this is sufficiently disproved by the fact that in July, 1858, there were only 2069 vagrants in England and Wales, as shown by the Poor-law return, while in 1867 there were 5248. And it is clearly impossible that the odd 3179 could have been born and bred in the time. If I am right in these causes they ought to be some guide to us in finding a system of prevention. It has been commonly said, that if we could prevent the public from indiscriminate almsgiving beggars would cease, but few even pretend to tell us how the public are to be so prevented; yet unless we can at least greatly diminish the almsgiving we shall do no good. I believe, however, that this is quite feasible if we carefully consult the public feeling. We must, in the first place, take the utmost care, and let the public see that great care is taken, that no man, good or bad, shall be allowed to starve—that the workhouse shall give an ample security that every person who comes to it without food or money shall be quite secure of food and shelter. If this be carefully done many will cease to give to those of whom they know nothing, and the number will increase year by year. But if all vagrants are to be lodged and fed, means must be taken to avoid this kindness becoming a temptation to idleness, without at the same time using a degree of harshness which will incline the public to pity and assist them.

I think we may fairly assume that there are some vagrants, probably few in number, who travel entirely for the purpose of going direct to some place where they hope to find work or return to their parish—that these few are anxious to make their way thither at their best speed, and that these generally deserve to be helped on the way. We may also assume that there are others, probably by far the major part, whose object is merely to live idly from day to day, and these, all will agree, ought to be sternly repressed; but neither the charitable public nor the relieving-officers can tell with any certainty whether a vagrant belongs to one class or the other. A system has been suggested of giving to every man a ticket certifying where he slept on the previous night, and to what point he professed to be going. If he then kept to his true line, and walked a fair day's journey in proportion to his strength, he should be relieved from any task-work and fairly treated. If he brought no such evidence he should be compelled after each night to perform a task, the severity of which should be increased till it was found sufficient to deter the idler. This would exactly meet the difficulty, the public would have confidence that the honest traveller would be relieved without hardship, and they would not object to hardship being enforced on the idler. On the other hand, the walking a full steady day's journey day after day would entirely destroy the charm of an easy vagabond life. It would also have the important advantage that it would enable us to know the course of our vagrants. But this system has failed, and has had to be given up for the present, not as I believe from any weakness in itself, but simply from the difficulty of getting it properly carried out. To deal with such an evil as vagrancy it is necessary to have a nearly unanimous action over a large extent of country. It is necessary also to make the labour, where it is inflicted, real and severe; but, after we had got three counties to adopt a far higher degree of uniformity than had previously been arrived at, I found that out of 37 unions 24 gave from 12 to 18 ounces of bread, and 13 gave from 8 to nothing; 8 required four hours of labour, and 9 gave none at all; 6 had baths, and 32 had none. From such a want of uniformity the system naturally failed. I endeavoured to get permission from the Poor-law Board that, where this system was established, and where all honest travellers were altogether relieved from labour, those who could not show that they were travelling straight might be called on for a six hours' task instead of four; but, failing to obtain either uniform action or a power of enforcing labour, the plan had to be abandoned. I cannot but believe, however, that in due time the care of vagrants must be altogether made over to the police, and the expense paid out of the county rate, as was suggested in 1866 by Her Majesty's Poor-law Inspectors, Sir John Walsham and Mr. Corbett, and urged in Parliament by Sir Michael Beach, then secretary to the Poor-law Board. When this is done uniformity of action will be secured; and the ticket system will, I think, work well. But, though we have been unable to get that united action which alone can enable us to cope with such an evil as vagrancy from the different boards of guardians, we and several other counties have obtained some degree of unity of action from the magistrates.

At the Trinity Quarter Sessions, 1869, our magistrates agreed to adopt the system which had been found to work well in Cumberland (described in a Parliamentary paper, "Vagrancy, Cumberland and Westmoreland," printed April 22, 1869), and had been more recently tried with good success in several other counties, viz., that of the magistrates in quarter sessions recommending to their brethren throughout the county that every person proved to have begged of any one should be sent to prison. As soon as this resolution was passed the police exerted themselves

vigorously, a large number of beggars were sent to prison, generally for 10 days each, and the effect has been that the vagrants properly so called (that is to say, those who sleep in the vagrant wards of workhouses) have diminished by about one-fifth. But the far larger number of tramps who used to pass my lodge on the road from Bristol to Birmingham have diminished by more than half, and the nuisance to the poor dwellers by the road-side is greatly abated. This system has been adopted by ten counties entirely, and by six others partially, before last October, and in all with similar good results. This last plan is simple and easily carried out. It is also sound and unobjectionable in principle wherever the rule is carefully maintained of securing the absolute necessaries of life to all who are destitute. So long as this is known by the public to be done, they will more and more support us by withholding their misplaced charity. Yet I believe that we can only hope for a real suppression of vagrancy by the first plan of tickets where the whole care of this class is placed in the hands of the police.

There is a third system, to which I had not intended to revert, because I thought that the scheme of a neighbouring county would have been so well known to you as to have needed no remarks of mine. But, however well-known to you, I must mention the scheme of my friend Captain Amyatt Browne, Chief Constable of Dorset, of providing by private subscription a supplementary assistance to all travellers, which, I understand, has had the effect, which might have been expected, of inducing the public to withhold their alms from people of whom they know nothing. This, again, is a sound principle. It has the slight advantage of depending on voluntary subscription, being, therefore, somewhat less reliable than a rate support, and it is less punitive than I would wish towards the professional tramp; but it is good and independent, and would continue to work well with either or both the others. Forgive my asking your consideration of one other small matter. Many gentlemen, who have not gone closely into the statistics, imagine that the cost of vagrancy is a heavy item in the poor-rates. This is not so, and our object in repressing vagrants is not the cost of the rates, but the rescuing men from a vicious life. If the most liberal allowance of food, fuel, &c., that is given at any union were made universal throughout the country, the cost would then amount to about 1-400th part of the total rate, so that a farmer who would pay £20 of poor-rate while the most liberal allowance was made to vagrants, would pay £19 19*s.* if all aid to vagrants were refused.

During the discussion which ensued, Sir M. H. Beach said: If Mr. Baker's system could be carried out it would be of the greatest importance, as securing relief to any one travelling in a *bonâ fide* way in search of work. In any case he would have sufficient to keep him from starvation, and it would have this important result—that when the public knew that no man need starve they would button up their pockets, and he thought that would be dealing effectually with vagrants. Mr. Goschen had conceived that it would be possible to confine habitual vagrants for 48 hours; but he (the speaker) feared this proposition would be a dangerous one to adopt, for it would do away with the benefit of the public knowing that any man might receive relief when utterly destitute. Although vagrancy was diminishing, the question appeared to him to be one of great importance, and nothing could tend better to a solution of the difficulty than conferences of that character, where they could meet and take counsel.

Mr. B. Baker said the best method of employing vagrants was where there was a well at the bottom of the garden, and a large tank on a rise at the back of the house, to set all vagrants to carry 80 buckets of water in the morning before they left. That was work anybody could perform—it required no skill. Stone-breaking might be done in some places, gardening in others; but there certainly was a difficulty in providing profitable employment.

The Rev. Mr. Pole remarked upon the destruction of clothing by tramps, and inquired as to the best remedy. They did not regard punishment, and he did not think they were sent to prison for more than 21 days.

Mr. Baker, in reply, said that the employment of a police relief officer in Essex had produced an extraordinary effect at first. Since it had been established it brought the number of vagrants down in two or three unions from 32,000 to something like 1200, in the course of a few years. Then it was a new thing, but since that it had been tried all over the country, and had become like a scarecrow, which at first kept birds off, but subsequently did not frighten them. With regard to the question of what they were to do with vagrants who tore up their clothes, he would remark that two years ago he visited one of the workhouses in Gloucestershire (Thornbury), where he stayed all night. During the night a man had torn up his clothes, and next morning he was invited to see the man let out. He was first made to pick oakum, and then a sack was procured. The officers cut a hole in the bottom of the sack, two at the side, and then put him in the sack, with his arms thrust through the two holes at the side, in which condition he was sent out. That was a perfect cure. It made a strong impression, and since that there had never been a case of clothes tearing in the Thornbury Union.

The Chairman then proposed a resolution to the effect that all vagrants should be placed under the superintendence of the police, and that the Chief Constables of various counties should interchange communications for the purpose of acting in concert, so that the destitute might be relieved, the habitual vagrant punished, and that the necessary cost be defrayed by the borough or county rate; which was carried unanimously.

THE CHARLIER HORSE SHOE.

[During the meeting of the Highland and Agricultural Society at Dumfries, Professor Williams read a lecture (says the *Dumfries Courier*), by M. Charlier, as follows:]

Gentlemen,—I come from France, sent by my father, a veterinary surgeon at Paris, a Knight of the Legion of Honour, to exhibit to you a new method of horse-shoeing which he has invented. This shoeing has been practised in our country for the last five years on a great number of horses employed in different services, and obtained, on account of its advantages, the most honoured rewards given by the International Committee of the Exhibition, 1867, and by the Imperial Agricultural Society. Encouraged by the success and the hope given by the noble visitors who saw and persuaded us to this undertaking, I will try to import a thing of public utility into this hospitable land, that kindly receives all new ideas indicating any progress in science or art. With your sanction, in spite of the opposition which always attacks anything destined to change a habit, the new shoeing will obtain victory, and extend to all the countries where the preservation of the horse is an honour. For a long time a good system of shoeing has been sought for; many would even no longer shoe the horse, to avoid the numberless defects of the usual mode. But the shoe is, to this day, the only way of preventing the wear of the foot; we must, therefore, try to reduce the size of the shoe as much as possible in reforming it. Our shoeing answers to this universal want, being more natural, or rather less artificial, than any other, being more simple and rational. Seen in its *ensemble* it is quite different from all other shoes known hitherto, on account of—1st, The whole strength left to the bare foot; its whole form and whole function in never paring the foot, never touching the frog, nor the sole, nor the bars; 2d, The new method of preparing the hoof with new instruments to receive the shoe; 3d, The new fitting of the shoe round the hoof, this alone allowing the pressure of the frog on the ground; 4th, No bevelling; 5th, Its elasticity; 6th, Its narrowness; 7th, Its lightness; 8th, The new manner of forging the shoe, stamping and nailing it; 9th, No longer any calking nor hooks of the shoe to prevent slipping.

1. Frog, sole, and bars preserve all their uses on the ground. The foot is left full, strong, and free. In fact, the frog, when large and strong, supple and elastic, in assisting to support, fills a most useful office. It is the principal organ of elasticity of the foot, which weakens the shock on the tendons and the articulations, and by its pressure on the ground acquires a sufficient consistency to give play to the flexible branches of the crust. Moreover, by its structure it forms in the hinder part of the foot a kind of natural calking or wedge, which strengthens the bearing on the ground, and prevents the horse from slipping. It should be then wrong to suppress the functions of the frog in cutting it away, and in removing it from the ground by the high heels of a thick shoe. The sole, when thick, forms a strong cover that protects all the inner parts from contusions of stones, nails, pricks, or stumps; also fills the office of an arch by its solidity maintaining the crust, and by its yielding under the weight of the body, giving it play. Thus, if we cut the sole, we render it more sensible, drier, and more contracted. The bars also serve for the support and the expansion of the crust. Never rasp the crust. The crust, when thick, as supple as it is strong, resists shocks and is elastic. In rasping it, you render it thin and dry, being susceptible of being broken or split, and contracted.

2. In the natural state the crust is the basis of the foot; when it is solid and resists wear, the whole foot remains entire. On our artificial roads, and with severe work, it breaks, and the foot is ere long worn away. It is necessary to protect the crust while preserving it, as it preserves the whole foot. In our system we don't shoe, we merely place a ferrule or ring round the natural foot to prevent the breaking of the precious wall, as a ferrule is placed round the bottom of a stick to prevent the splintering of the wood. Then let us take away only the lower edge of the crust and replace it by an artificial border, harder, more resisting, but the same as to form, thickness, and length, flexibility, and elasticity; its durability being such that, thanks to a regular wear, by the continual growth of horn, the hoof remains ever in its normal length. The support is as in a natural state. On the lower edge of the crust a groove is formed by a buttoris, with a guide, taking care not to cut so deep as the thickness of the sole, nor so broad as the width of the crust, sloping on the white line that marks the separation of these two portions, just within the track of the old nails. This groove is to receive a shoe which is not placed under the sole of the foot, but rather under the wall, as its continuation, being sometimes even with the sole and the frog in the normal foot. The shoe, being only supported by the crust, does not want bevelling. It cannot injure the sole or heels, and never forms corns, when it is well fitted.

The new shoe is as elastic as the crust itself, which it follows in all its movements of expansion. Thanks to its elasticity, the contracted foot is enlarged, and regains its suppleness and health by regaining the circulation in its interior, and its normal functions. The shoe owes this power to its new shape, being curved as a spring, and to its fitting round the base of the foot, put in the place of the crust itself. The new shoe is very light; it weighs about a third and often even a half less than the ordinary shoe. The horse is freer in gait. The new shoe is of necessity narrow, since it merely rests on the width of the crust, and not quite even on that. But on the lower surface it can be made broad, in order to increase its durability; the external surface follows the natural bend of the hoof. It is higher than wider, without increasing the length of the foot, being buried in a groove. This shoe has over the narrow shoes the important advantage of allowing the support of the frog. The hind shoe is, however, stronger than the fore shoe. The manner of forging this shoe is very simple. A square, or nearly square, little bar of iron is turned cold in a very short time, or hot; a man can, alone, stamp it with two rounded punches. The shape and direction of the nail-holes are particular, necessitated by the unusual thickness and narrowness of the shoe. The exterior opening of the hole is rounded oval; the hole is funnel-shaped; the upper orifice is square. The nail has exactly the same shape—a head of a lengthened cone shape, a neck strong and solid, a square blade. The nail thus stops up the hole hermetically. Thanks to these conditions, the new shoe, of a good quality of iron, is very solid on the foot—an important advantage, especially for hunters. Six, seven, or eight holes have different directions, according to the inclination of the hoof; they are nearly straight towards the heels, more inclined towards the toe. A shoe with well stamped holes can be nailed without danger of injuring the living parts, the hole being a guide to the nail. No longer calkins, nor hooks or toe-pieces. There is no need of calkins; the frog is a natural calkin on the slippery ground, sustaining the tendons instead of straining them. In case of frost, only two movable nail calkins are fixed towards the heels of the shoe; the toe forms a kind of hook by its narrowness and the inner angle of the shoe. These nail calkins can be fixed by any one, not being into the horn, and, owing to the thickness of the shoe, are solid. They are taken off as soon as they have become useless, becoming even hurtful on hard and level ground. In fine, the new shoe is not difficult to use, and no more liable to accidents than the ordinary shoe; it takes less time to be forged, a single man making 80 to 100 shoes per day—no longer time to fit it on the foot; it can be fitten cold as well as warm; it lasts a sufficient time; it is then no more expensive than the common shoe, being made with a small piece of iron requiring less coal to be heated; it is suitable for all shapes of feet; it is an orthopedic and pathological shoe, sufficient frequently alone to cure corns and contracted feet, and other diseases, being susceptible of all modifications, according to the worst feet; and when the instruction of farriers is extended, it will be known and practised easily everywhere. Till that time comes, in case of lost shoe, the foot is left stronger than after the ordinary destructive shoeing, and resists wear much longer on the roads or pavement. Before changing the old shoe, it is necessary to allow the foot sufficient time to grow. To resume with our shoeing, the foot, being sufficiently preserved from wear, acts quite as in the natural state; it is as an unshod foot of a colt. The greatest enemies of it are routine and ignorance: but we, friends of progress, ought to unite and destroy this ignorance for the preservation of such a precious servant as the horse.

Home Correspondence.

Steam Power Culture.—Mr. Sanderson has given his usual report on "The Harvest and the Crops." Let us compare my position, as the advocate of steam-power culture, against his general report, for it is well that the world should know it. Take Wheat first. Here is what he says:—"I estimate the average acre-age yield of Wheat of this year's crop to be 30 bushels, or just an average crop." Further on he says:—"I estimate that the Wheat area this year is under average, and, consequently, that the total produce of Wheat will, from a diminished area, fall short of average." I merely give the last point for the reader to have the whole truth. On my Nos. 2 and 4, heavy clay land, Wheat after Beans, the 15th crop in succession under steam culture, and without a fallow of any kind, I have now harvested the best crop of Wheat that has ever grown upon those fields. The heads are long and well set. The produce must be over 40 bushels per acre of mixed red and white Wheat, Nos. 2 and 3 (heavy land) are Wheat after Wheat, needed to re-arrange them with some land bought a year ago. It is Rivett's, with fine long and strong heads; and, although Wheat after Wheat, it will give a produce of quite 40 bush. per acre. The average produce on these four fields under horse culture was

about 20 bush. per acre on an average of years. The cost of seed-bed for the crops just harvested was 6*s.* 8*d.* an acre. Now let us look to the Wheat crop on No. 4, light land. The cost of seed-bed was 6*s.* 8*d.* an acre. It is by far the best crop that I have seen about here. The produce must be near upon 40 bush. per acre of mixed red and white Wheat. No. 3 (light land) is Rivett's Wheat, after Mangel. On this there must be a produce of 50 bush. per acre, while the seed-bed cost only 2*s.* per acre. That is the sum total about my Wheat crop. Now let us look at Barley. Mr. Sanderson estimates 20 per cent. below average. I have no Barley on my heavy land. No. 6 (light land) is Barley. The cost of seed-bed was 9*s.* 7*d.* an acre. This field was Wheat in 1867, giving a produce of 43 bush. per acre of seed-bed, 10*s.* 6*d.*; Barley in 1868, produce 54 bush. per acre, cost of seed-bed 10*s.* 8*d.* per acre; Barley in 1869, produce 63 bush. per acre, cost of seed-bed 10*s.* 3*d.* Therefore the crop that I have just harvested is the fourth white crop in succession, one of Wheat and three of Barley, and this last crop is the best of the lot. It stood thicker on the ground, and the quality is better than that of last year. Therefore the produce must be over 63 bush. per acre. The 14 acres were cut by machine and tied in sheaves, and therefore stack closely, yet the rick is 24 yards long, 6½ yards in width, well made up. I take it that the land in character is very much like the land in Rutlandshire that Mr. Sanderson tells us "will not yield 2 qr. per acre." This land of mine has had no cart manure for the four white-strawed crops, a little superphosphate for each crop, and that is all. I have by me samples of 1868 and 1869 Barley, and therefore do not trust to memory as to quality. 1869 was better in quantity than 1868, and 1870 is better than 1869. Oats I grow none. Beans, 33 acres. They are grown on my newly-purchased land, which has had only one operation by steam-power. They are short in straw, but they are well corned, and will give a produce of 30 bush. per acre. Mr. Sanderson says, "Of all farm crops, Beans are by far the worst." Peas, 17 acres. They are grown on my newly-purchased land, which has had only one operation by steam power. They were a very fine crop, well corned, and must give a produce of 40 bush. per acre. Mr. Sanderson fixes the general crop at an average. Mangel, 5 acres. Two-thirds of a plant, the seed having been destroyed by insects, the land being in much too light a state when planted. The bulbs are good and are growing fast. The dry weather has never checked them. Mr. Sanderson speaks well of Mangel. Swedes, 7 acres. They are a good plant, and look very growing. Mr. Sanderson estimates the general crop at about an average. This is my position for my 15th crop under steam culture, and I take it that it compares well against horse culture, especially so the corn crop, and when we take into consideration the fact that I have no fallows whatever on my heavy clay land, the evidence is conclusive on the side of steam culture. *W. Smith, Woolston, Bletchley Station, Bucks, August 22.*

Harvest of 1870.—We have passed through one of the finest harvest seasons ever known. The great bulk of the cropping is now, at this early period, safely secured, and it will prove somewhat better than was anticipated. The early threshings of Wheat, in particular, have proved well, and the quality is very superior to last year's crop. The steam-ploughs and cultivators, the digging breast-ploughs, the skeleton-ploughs, scarifiers, grubbers, &c., are all getting into work, and in many places the common plough is at work simply to plough up the land. The better course, however, is to take off the share and attach a digging-breast or skeleton share, armed with a prong or prongs. Any blacksmith can fit one, or our leading plough-makers can readily supply them. They break up the soil into a rough and cloddy state, ready for the subsequent workings, not probably to that depth and in that effective manner which can be achieved by steam cultivation, but still in a very satisfactory state for the destruction of weeds, insects, grubs, &c., and more particularly to prepare the soil for the reception of those invaluable deposits which the atmosphere at this particular season has to bestow in the form of dews and rain. For this purpose as much surface soil as possible should be exposed to these atmospheric influences, hence the value of the rough and cloddy condition, which is far better than the mere ploughing, although good in its way to promote the growth of annuals, *i. e.*, seeds of weeds, &c. The great thing is in the repeated working or cultivating of the soil at this season, and consists of the various operations known as autumn culture. The workings in dry and sunny weather add greatly to the fertility of the soil by aiding in the absorption of those chemical constituents which are so necessary to some of our most important crops. The Wheat crop, for instance, feeds much upon the ammoniacal deposits with which the air and rain charge the soil. The benefits derived by this mode of culture are incalculable, and every available appliance ought to be brought into requisition for the next few weeks, prior to Wheat seeding. The preparation of the Bean and Pea lands for the Wheat crop is almost certain to produce a fine healthy plant through the winter, and the cleansing and laying up lands for early spring crops, either of corn or roots, is of great value. The season is so early and so suitable for this autumn culture, that it ought to be universally adopted, and all other work of the farm should for a short time give way to it. For the amelioration of clay and stiff soils it is of great importance, and light soils might be broken up to advantage; but they should not be repeatedly worked lest they be made lighter. To facilitate this mode of culture all crops should be cut by the reaper or scythe, so that no obstruction of stubbles, &c., mars the workings. It is not desirable to reduce the soil to a fine pulverisation, except where foul and weedy. In such case the best practice is to fully reduce it, get off the twitch and weeds, and burn them. Should the season continue open and dry the "bastard fallowing" will nearly equal a common fallow, which on heavy clay lands is highly to be prized. When steam culture becomes general the breaking up all arable lands not under crop will be universal, and to the farmers and country most advantageous. *O. F.*

The Corn Crops, 1870.—I have found that those who wish to know commercially the state of the crops, in any season, do well to rely on the statements of various correspondents, as given in the *Agricultural Gazette*. "In the multitude of counsellors there is safety," still, as regards the mode of collecting these returns, our system is very defective; for instance, the term "average," is a very undefined one, and may mean 12 bush. an acre in Cardiganshire, or 40 bush. an acre in Essex. What we want is to obtain, through the medium of the correspondents before referred to, an answer to such a question as the following — What is the average produce per acre, on an average of years, in your district? I say district, not county, because the county could afterwards be averaged from the districts. County is too extensive for one man to give an opinion upon in any one year. I know a district in a western county where the Oat crop this year will not average 15 bush. per acre, but 20 miles further north, in the same county, they have 9 qr. per acre. Pray, sir, let us have the average of each county made up from the district averages, and, as the Board of Trade gives us the county average, in say Wheat, we could then easily tell the "tottle o' the hol," as the late Mr. Hume used to say. I have seen Mr. Sanderson's letter in the *Times* newspaper; of course his figures on this subject cannot be much otherwise than guesswork: it is not to be expected that by walking through a few fields of Wheat, in certain localities, a knowledge of the crops over England could be arrived at, but you will arrive at them pretty closely by the way I point out. Mr. Sanderson makes out a black list of the farmers' losses this year, and then says:—"The farmer's position is cheering." It would be a little cheering to the English farmer if Mr. S. would advocate through the *Times* a reduction of rents, to the extent of 30 or 40 per cent.; his own statements supply the grounds on which such reduction should be made. *Wheatsheaf, Liverpool, August 29.*

Crops in Essex.—I have just now pulled one of the finest crops of the finest Beans I ever saw, the seed not having been half so much as a farmer would have used. I cannot thresh them at present, as I want to keep them in the straw until age has made them more digestible. I have also grown Peas in the same way, much thinner also, but thick or thin, according to the kinds; I have never had louse on any,—this from my having deeply cultivated my land and sown my seed widely from row to row. My parish and neighbourhood, east and south, and I may say north, never was fuller of corn than at the present time, nor was the Wheat ever better in quality. I am not able to say so much as to the quality of the Barley, but the yields will be excellent, and the quality may be good. *George Wilkins, Wix, Manningtree.*

Crops near Pontefract.—I have this year abundance of Wheat, Oats, and Barley; not so grass, which is light; my Potatos are abundant, also Turnips. As regards the fly, many farmers "till" with guano: now this, I maintain, and have proved, makes the ground stink for many days after it is put on, and causes all sorts of fly to alight on the surface of the soil, where they remain until the plants make their appearance, when they eat them away. I am confident that all artificial manures cause the land to stink, and all sorts of insects to come and worry the green herbs that are sown. You may depend upon it that there is nothing like good stable manure for tillage for crops of any sort, I don't care what sort you set or sow. Now, if you set a fallow field with Potatos, and till them well with stable manure, next year you can have a good crop of Wheat, and the year following a good crop of Oats or Barley, with the same tillage you tilled your Potatos with; but if you till with guano, you have this to do every year; it is like wind—it flashes for one year, then it is gone, but at the same time it makes the ground stink. Now, if you till with good stable manure, it makes soil, and it then remains in the ground, and it keeps it warm. *A Farmer of Pontefract.*

Tiptree Farm.—Permit me to make a few remarks on "J. B. S.'s" communication in last week's *Gazette*, at the same time to ask him a question or two. Referring to Tiptree Hall Farm, he writes:—"I caused to be published some important corrections, which I had accidentally obtained, respecting its history, and which I think ought to have been long ago made public, as they have evidently occasioned no little mischief." Will he kindly inform me where these important corrections, that have occasioned so much mischief, are to be found? Will he say why he so often ventures on the borders of Tiptree but has not the pluck—so reluctant!—to call and see for himself? The "great weight his name and address" would give to anything he might then write, after a personal inspection, would do more to satisfy the public regarding Mr. Mechi's doings than "the elderly gentleman's" statement, and his own surmises from behind the hedge. A visit from one whose name is of great weight would be adding another eminent name to that register of thousands,—practical farmers, foreign as well as metropolitan, admirers, who have considered a personal visit more satisfactory than the gossip of neighbouring market tables. Will "J. B. S.,"—perhaps he will say he cannot, may be he will not, it will not answer his purpose,—or will Mr. Mechi's neighbours, who must hear of these comparisons,—give us some idea of the agricultural value of land immediately around Mr. Mechi's farm? The gipsies and the players of "Aunt Sally" and such like, I am quite aware, can give us an opinion of it, from their point of view, from the one side, near the entrance gate. Standing at that gate, facing the house, will "J. B. S." say what the lands to the right hand let for—their agricultural value? It may be, as he partly walked round the farm, he strayed over that very spot, and can give us his own estimate of it. Some one remarked in my presence, they could be had for about 16*s.* per acre. "J. B. S.," I know, can tell me, and for the benefit of the public he will no doubt do so; it is hard at times when many are talking to catch the right figures. Now, if Mr. Mechi, the occupier of the neighbouring farms, not necessarily abutting thereto, or even the overseers or parish authorities, would give us their views regarding this locality, they would confer a favour on many of your readers, and set at rest the conflicting opinions given from time to time. *West Indian.*

Curing Bacon.—For the information of your Prestwich correspondent (p. 1172), I beg to state that the plan I pursue is to place the hams and flitches into the salt vats, or, where no such convenience is at command, the usual wide tub that the pig has been scalded in will answer the purpose to cure one in, rubbing the salt well in with the hand to each part individually as they are sent in, with a sprinkling of saltpetre on hams, and on the thick ends of the flitches. The usual time that I allow it to stop in pickle is a month, turning it over after it has been in a fortnight, so that each part may be equally affected. After it has been in the allotted time, I turn it up edgeways for some of the brine to run off, and then it is hung up in a dry airy room or kitchen till dry, when it may be packed in a chest with malt-dust between each part, or it can retain its place, merely covering it with paper, or place it in calico bags to keep the dust off it. I have scarcely ever known bacon to turn rancid after it has been put through this process, as I attribute the rancidity to its being kept in too hot a place. *Ceres.*

Leases and Agreements.—Let your correspondent, "G. A. H.," state more distinctly what he means, when he writes of lime repaying "the cost the very first year." [What was the cost of the number of bushels applied, and of carting it 10 miles?] His answer for "requiring a tenant to burn 120 tons of lime on to a certain farm every year," is, "because I want my land left in good heart and good cultivation;" but he does not inform us in what condition the tenant received the land from his hands—was it like "a sucked orange?" If the preceding tenant was "under agreement to draw certain quantities of lime and superphosphate," and did so, "G. A. H." might be right in expecting the incoming tenant to do so; but why the last eight years, if, as he affirms, "I do not think it (the land) ever forgets it (the lime)?" *Worthing, Sussex.* [The lime *may* be a means of squeezing the orange. Ed.]

Possible Produce of an Ear of Oats.—I have received a bit of evidence to-day from "a looker-on," a stranger, in Scotland, for "G. A. H.," about heads of Oats. The gentleman who sent this writes thus:—"I send you three heads of oats, taken out of a stack this morning, on which, if you count small grains as well as large, you will find considerably more than 630 grains." The oats are here, and I have counted them; here is the sum total—766 large ones, and 127 small ones; together, 893. *William Smith, Woolston, Bletchley Station, Bucks, Sept.* 3. [We are offered an ear with 245 grains.]

Foreign Correspondence.

Paris: *The Crops in France.*—The accounts from the great agricultural centres are excellent, and particularly from Lyons, in the neighbourhood of which an almost magical change has taken place. A month ago everything was parched up, now the fields are brilliant with verdure; all the growing crops exhibit remarkable vigour. It would appear as if the plants

had gained in vitality during the drought, and that the sap was as abundant as in the spring.

The herbaceous crops exhibit the greatest activity; the meadows, lately almost as arid as the desert, are covered with new grass; the Lucerne has shot up 8 to 12 inches in a few days, and will be ready for cutting before the month expires. Maize, Buckwheat—in fact, all the supplementary green crops, are in admirable condition. Food is therefore secured for the cattle until the bad weather comes, and between this and then will have acquired stamina to enable them to support some deprivation during the winter, so that the losses will most probably be infinitely less than were expected. Another favourable circumstance is that the crop of late Potatos looks remarkably well. The amount of fruit in the orchards is also considerable. At the same time that the late crops are good the soil is well moistened, and in capital condition for ploughing for the autumnal sowing. The scarcity of labourers is great, but by pushing on the work actively with those who remain, very little land will be allowed to remain fallow. These accounts are satisfactory, but France will want all the produce she can possibly produce. Great destruction has taken place, and there is no telling what may follow. The German army is approaching Paris, and the cattle and sheep are being brought within the walls from all around,—the meadows of the Bois de Boulogne are covered with them, and the supply of grass there will not last long; but forage as well as all other necessaries for men and cattle are being brought into the city in immense quantities: and it is to be hoped that, should Paris be invested or besieged, famine will not be added to the other horrors of war.

It is impossible to say who are the greatest sufferers by war, but certainly agriculturists are amongst them, and must pray for peace.

The case of the Vine growers is a peculiarly hard one, as the greatest danger seems to be coming upon us at the very period of the vintage. Immense destruction has doubtless been done in Alsace, and thence all the way to Chalons, or nearly so; and now it seems highly probable that a great struggle may take place in the plains of Champagne, where there is the finest crop of Grapes that has been seen for years.

The Government has imported quantities of cereals from the United States, and compressed hay from Holland and other countries.

Societies.

BATH AND WEST OF ENGLAND.

At the usual meeting of the Council of this Society last week, the following was issued as a complete list of the committees and stewards for the ensuing year:—

Publication Committee: Thomas Dyke Acland, M.P. (Chairman), Hon. and Rev. S. Best, F. W. Dymond, Col. Luttrell, G. S. Poole, Lord Portman, Herbert Williams.—Finance and Contracts Committee: H. Williams (Chairman), J. C. Ramsden, Clement Bush, Charles Edwards.—Stock Prize-Sheet Committee: Col. Luttrell (Chairman), Thomas Danger, J. D. Davy, A. F. M. Druce, T. Duckham, M. Farrant, Henry Fookes, C. Gordon, John Gray, James Hole, T. Hussey, J. Webb King, Col. Lennard, H. Middleton, E. F. Mills, W. Rigden, J. S. Turner.—Implement Regulations Committee: J. E. Knollys (Chairman), Col. Deedes, Mark Farrant, W. Froude, John Gray, Jonathan Gray, A. Grenfell, H. P. Jones, Colonel Lennard.—Judges' Selection Committee: Col. Luttrell (Chairman), H. Fookes, John Gray, C. Gordon, Thomas Hussey, Col. Lennard, W. Wippell.—Railway Arrangements Committee: W. Adair Bruce (Chairman), Col. Brent, Sir J. T. B. Duckworth, C. Gordon, Jonathan Gray, Col. Lennard, Sir M. Lopes, Bart., M.P., S. Pitman, J. C. Ramsden, J. R. Spiers. (With power to add to their number.)—Disqualifying Committee: John Gray (Chairman), the Stewards of stock, and the Stewards of horses.—Arts and Manufactures Committee: E. S. Drewe (Chairman), T. D. Acland, M.P. (Vice-Chairman), Hon. and Rev. S. Best, Col. Brent, J. Daw, R. R. M. Daw, Sir. J. T. B. Duckworth, Bart., Jonathan Gray, Rt. Hon. Sir S. H. Northcote, Bart., C.B., M.P.; R. King Meade King, J. E. Knollys, Rev. T. Phillpotts, S. Pitman, W. R. Scott, P. P. Smith, R. J. Spiers, J. W. Walrond, E. W. Williams.—Stewards of No. 1 Section: W. R. Scott, E. W. Williams.—Stewards of No. 2 Section: John Daw, J. C. Ramsden. (With power to add to their number.)—Steward: Implements (Yard): John Gray, W. Froude; Implements (Field): J. E. Knollys, H. P. Jones; Stock: J. S. Turner, H. Fookes, Col. Lennard, J. Hole; Horses: C. Gordon, Col. Luttrell; Poultry: Col. Brent, R. H. Bush; Horticulture: Rev. T. Phillpotts, Hon. and Rev. J. T. Boscawen; Music: Jonathan Gray; Mess: H. St. John Maule; Library: Jonathan Gray, Wm. Thompson; Advertisements: Charles Edwards; Plant: Jonathan Gray (Chairman), John Gray, J. E. Knollys, Herbert Williams; Arrangements: John Gray, Jonathan Gray.—Arts Hon. Secretary: R. R. M. Daw; Treasurers: R. Badcock, F. W. Dymond; Official Superintendent, H. Spackman; Official Accountant, William Smith; Consulting Chemist, Dr. Augustus Voelcker; Veterinary Inspector, G. T. Brown; Secretary and Editor of Journal, Josiah Goodwin.

DEVONSHIRE.

The Agricultural Labourer.—Canon GIRDLESTONE some months ago read a paper on this subject before this Society, to which we have not had an opportunity of directing attention. We now give the following abridged report. He said:—

I stoutly protest against allowing differences of opinion on public matters to interfere with the kindness and courtesies of private life. Thus, in this matter of the agricultural labourer, I am quite sure we all wish the same result, though we may differ as to the means of attaining it. We wish to do the best we can for the labourer, though, perhaps, we are not all quite agreed what is the best; and many differ still more widely as to the ways which lead to it. I, then, having my own opinions on this subject, propose to give you a short description of the agricultural labourer as I think he ought to be, leaving you, in the discussion which will follow, to decide whether my picture is correctly drawn, and how far it is realised here and elsewhere.

First, as regards the home of the labourer. We have most of us more or less some good horses of our own, and we are no doubt anxious that they should do a good day's work, and do it well and cheerfully. In order to do this one of the first things we do is to secure a good stable. A cold, draughty stable, or a stable low, small, badly ventilated, and badly drained, or one in which, without any separation of stalls, all our horses would be huddled together, is there any one of us but, putting all views of humanity out of the question, and merely with reference to our own advantage, would at once say, "With such a stable my horses are more likely to be in the hands of the farrier than of the ploughman, with such a state of things I shall get no work done?" It is exactly the same with the human animal. Laying aside both Christian and moral considerations, a healthy and comfortable home is essential to the efficiency of the working man, and is consequently of as much importance to the employer as to the employed. The following is my idea of the sort of home a labourer ought to have, if he is to be able to do a really good day's work. A house well roofed, drained, and ventilated, and floored, with a fireplace in every room, and every window made to open, with downstairs a good family room, with handy grate, oven, and boiler, and a scullery at the back, with door to the garden, with upstairs never less than three, and if possible four bedrooms, with a good garden round it, a pigstye, and other conveniences so constructed and screened as to be decent in appearance as well as in reality. The labourer's home should be on the farm if possible, or at any rate as near as can be to his work. A long walk to and from his work is most exhausting to the labourer, and very unnecessarily so, and of course at the same time most damaging to the farmer, who wants the whole strength of those who work for him, and to whom it is of great importance that they should be fresh when they come upon the farm. A moderately sized Potato ground, in addition to the garden, is a great advantage to the labourer; whereas if too large it is apt to embarrass and overfatigue him. If to some one or two cottages on each farm there were also added a cowshed, with facility of pasturage for a cow, and these cottages were reserved as prizes for the most skilled, industrious, and thrifty labourers, the employer would reap as much advantage as the labourer himself from the improved character of both workmen and work, to which such sort of emulation, wherever scope has been given for it, has always led, and is sure to lead. This, then, is my idea of an agricultural labourer's home. As far as providing such a home is concerned it is of course almost entirely a landlord's question. But I have no hesitation in saying, nevertheless, that if I were a farmer, laying aside all regard for the labourer and with a view to my own advantage alone, I should no more think of taking a farm without stipulating for proper and healthy labourers' homes upon it, than I should of being content with stables and cowhouses of such a sort as would be sure to make my horses and cattle unhealthy and unprofitable. The farmers have only to be awakened to a sense of this matter in its true light, and to act upon their knowledge, and the landlords must yield. The result will be for the labourers, decent, healthy, comfortable homes; for the farmers, staunch, more skilled, industrious, and contented labourers.

I pass on from the home of the labourer to his work. This ought, as far as possible, to consist of piece-work. I say as far as possible, because I am well aware of the difficulty there is in bringing many agricultural operations under the denomination of piece-work. Nevertheless, many of those difficulties may by perseverance and good management be overcome, and for his own sake, as well as in the interest of those who work for him, it is well worth the farmer's while to overcome them; for until human nature is very much changed from what it is now, labourers will be found, even without reference to age, to differ very widely from each other. Physical strength and power of endurance, skill, industry, a desire to do an honest day's work, and many other particulars, are points in which there is sure to be an immense amount of difference. Yet, unless the amount of a man's earnings depend upon the amount of work done, it is difficult to see how to avoid paying all these various characters of labourers exactly the same amount of wages, and so inflicting on the farmer both a present and a prospective loss, by getting now a less amount of work than he ought for his money, and discouraging improvement in the class for the time to come. It is very important also for all parties, that in every case in which a system of day-work is adopted, the number of hours constituting a day's work should be definitely settled and understood, and that an account of all after-time employment should be accurately kept, and paid for, not by beer or cider or other refreshment, except, perhaps, in time of harvest, but in money, and in the proportion it bears to a day's work. Now that threshing is almost entirely done by machinery, it is very difficult to provide wet-weather work for agricultural labourers. Yet when the immense loss of income, which in the changeable climate of Great Britain, and specially in the western counties, accrues to the labourer from bad weather, unless paid by the week, with no deduction for wet days, and the difficulty in which the loss involves him, are considered, it will be obvious that a farmer who wishes his labourers to have well-nourished powerful bodies and minds, free from anxiety, will do his best to secure them against the possibility of many day's forced idleness in the course of a year—involving, of course, short commons for themselves and families.

Next to work comes wages. In the North of England wages are paid almost entirely in kind, and the result is pronounced by the Women and Children Employment Commissioners to be very good. But then this system is in that locality connected with hiring by the year, the keep of a cow, involving abundance of milk, and many other substantial advantages, which there is no time to mention now, but a full report of which will be found in the report of the Commissioners. Unless the whole system were adopted in full, the same results could not be expected to follow. And in general, considering the many abuses to which a system of payment in kind is open, I am still of opinion, as I always have been, that the safest and best way for all parties concerned is to pay wages wholely and solely in the coin of the realm. The worst of all ways is to pay wages in cider or beer. This is nothing more or less than to whet the appetite for a further supply at the public-house. Liquor does not strengthen, it only stimulates. If taken in excess, it debilitates and destroys. Not cider or beer, but beef, is the best manufacturer of muscle. A Devon Potato and cider-fed man, with six months' Yorkshire beef in his belly, has been found able to do what he never in his native county could do—as good a day's work as a Yorkshireman born and bred. To the use of cider in the place of a solid nutritious food in the West of England, may be attributed in great measure the rheumatic attacks which cripple up so many of our labourers in the prime of life. The weekly allowance of cider to a Devonshire labourer is valued at from 1*s.* 6*d.* to 2*s.* Now it is clear that out of wages of 9*s.*, 10*s.*, or even 12*s.* a-week, this is far too much for a married man with a family to spend in drink for himself alone. If given in money instead of in liquor, it would in nine cases out of ten be spent on beef for himself and family, and be vastly more beneficial to all parties, including the farmer, whose object is of course to have able-bodied labourers, with minds free from the anxieties caused by sick wives and children. It may be objected that the labourers are many of them opposed to such a change. So many of them are opposed to the introduction of machinery or any other rational improvement. Our duty is to teach them better, to do at any rate what we know is our duty to them, and they will soon find out that we are consulting their real interest at the same time. I know one large employer of labour in South Devon, whose men as they go to work all leave an empty can at the house, in size proportioned to the number of their families, and on their return in the evening take it away filled with milk as an addition to their wages. Milk is a most wholesome and nutritious diet for any one, but especially for children, and makes the use of rice, another cheap and nutritious article of diet, possible, because palatable. In the midst of plenty of milk, however, there is in most cases no article of diet more scarce or difficult of attainment to the labourer. In my own neighbourhood, generally speaking, he cannot get it at any price. The farmer who follows the example above described, or if he cannot afford to give the milk to his labourers at least lets them buy as much as they want at cost price, will not only much benefit those who work for him, but will find his own account in a stronger race of men. Wages ought to be paid never less frequently than once a week, and at a stated hour: at an early hour if paid on Saturday, though Friday, as giving the wife a b[etter] opportunity of spending the money thriftily, is [much] better day for payment. Wages, for obvious[ly] should never be paid at a public-house. Tho[ugh], I am afraid it will be difficult to persuade ma[ny] hearers to that effect, yet I feel sure that if, [in] the case of domestic servants, no deduction for ba[d] or sickness were made from the wages of a[gri]labourers except perhaps to the amount receiv[ed] sickness from a benefit society, the farm[er] would save as much in poor rate as he would lose [in] wages. He would also gain as much as almost th[ree] would gain, by the comparative immunity [from] and long-continued sickness, from want [of] nourishment in which large and repeated [de]ductions from wages almost always involve the labo[urer]. As above stated, I advocate a system of piece-w[ork] whenever it is possible. But where this is impossi[ble] which

must often be the case, why should not there be paid, to some more and to others less, wages according to their ability and skill, as is the case in almost every other trade and profession? The paying all—good or bad, skilled and unskilled, industrious and idle—alike, is a plan which must surely have been invented on purpose to keep all agricultural labourers on the same dull dead level, and to deprive them of all encouragement to improve themselves. Almost all of us, no matter what our employment is, need a stimulus, or else we are apt to sink into mediocrity. Now it is not to be expected, of course, that farmers should pay their labourers more than the market price. But if the market prices were raised by an improvement in the character of the labourer, the farmer, though he should pay higher wages, would find a more than corresponding advantage in more work done, by fewer hands.

The character and habits of the labourer must next be considered, and that these should be of the right sort is fully as important for the farmer as for the labourer himself. If labourers are idle, drunken, unthrifty, always on the verge of the Union, and often in it, in debt and difficulty, with bodies debilitated by intemperance and the substitution of stimulating drink for wholesome nutritious food, and minds never free from the anxiety which is the sure accompaniment of an unhappy home and a neglected family—except the poor victims themselves, who suffer more than those who employ them—who, on the other hand, is a greater gainer than the farmer, if having in his employ a lot of labourers the very reverse of those above described? It is clearly to the interest of the farmer, even at a little sacrifice, to do all he can to encourage habits of thrift and industry amongst his labourers. Pronounce decidedly against all sotting at the public house. Never let an act of drunkenness or dishonesty be overlooked. Make it a rule, if possible, that labourers should belong to some friendly society, established on sound principles, in which old-age pay as well as sick pay and funeral expenses are provided for. Make known the rules and advantages of the Post Office Savings Bank, and give every possible encouragement to make use of it. Let farmers' wives and daughters, in conjunction with the clergy and their families, take a personal active interest in clothing and blanket clubs and mothers' meetings, as being all of them more or less instrumentalities which tend to the formation of thrifty habits.

One way in which labourers incur much unnecessary loss is connected with small village shops. It not unfrequently happens—owing, perhaps not to the shopkeepers, but to those who supply them—that the goods sold in these are very much adulterated as well as dear, and that when long credit is given the accounts are not kept as accurately as could be wished; yet the labourer, being in debt, even though he is fully aware of the disadvantage at which he is laying out his small amount of wages, has no alternative but to continue his custom. There is no better antidote to this than a good co-operative store in every village. These in London and all our large provincial towns are found to be of the greatest advantage, not only to the working classes, but even to the middle classes and gentry. Wherever the same system has been tried in small towns and villages, it has been successful. Not only by this means are unadulterated articles at low prices secured, but, ready money being an essential part of the system, habits of debt are discountenanced, and the labourers, as many of them as take shares in the stores, find the advantage of such investment so great, as to discipline them to waste their money in other ways. A co-operative store, in which all the inhabitants of a parish should join together for the purchase of the necessaries of life, would be equally beneficial to all classes; would enable farmers as well as labourers to lay out their money to the best advantage, as well as encourage thrifty habits in all. After all, however, there is nothing which so much tends to degrade and pauperise the labourer as the habit which to such an alarming extent prevails almost everywhere, of dependence on the Poor-law. Had there never been a Poor-law in this country there would have been no paupers. The really poor, and sick, and afflicted, the deserving poor—if I may use the term in contradistinction to the word pauper—those whose condition is owing to no fault of their own but to causes over which they had no control—and the number of such persons is comparatively small, would have been much more amply and cheerfully provided for than now by voluntary benevolence, the genial flow of which would not then, as now, have been checked by the indiscriminate and compulsory maintenance of the undeserving, many in number, as well as the deserving few. The time, it may be hoped, is not far distant, when the growing feeling of the country will be realised by the abolition of the Poor-law. This, which, to an extent which cannot be contemplated without alarm, demoralises the working classes, presses hard upon the employers, and even to a certain extent tends to demoralise them, for it tempts them, often through mistaken kindness, to the expedient—which is fatal alike to the independence and wellbeing of all parties concerned—of keeping wages low, with the relieving officer as the resort in sickness and old age; whereas a better scale of remuneration for work done would be more than repaid to the employer by the absence of all call for poor rates, and the labourer would be roused by the certainty that if he did not out of his increased resources lay by for a time of need, he could have no legal claim to relief.

Who is bold enough to deny that a class of labourers, such as I have above described, would be a gain both to themselves and to their employers? Nothing would render greater assistance to the formation of such a class of labourers than education. I am no advocate for over-education. But to be able to make out and cast up a bill, to write a well expressed, correctly spelt, and legible letter, and above all to read with fluency, ease and pleasure, so as to be disposed and able to acquire all such information as is necessary for the formation of the character and habits above described, as well as becoming a skilled workman, is in the advanced and continually advancing condition of agriculture quite indispensable. Whereas, some fifty years ago, or even less, land was cultivated on nearly the same system as had prevailed for centuries before, and which required from the labourer neither skill nor knowledge, at the present time agriculture has become a science, and a labourer who has some knowledge of the principles on which the science is based, and skill in the handling of the intricate machinery by which human nature is now so largely supplemented, is much more valuable to his employer. Mr. Edwin Chadwick, in his address on the opening of the last session of the National Association for the Promotion of Social Science, goes so far as to say (p. 21):—"There are probably more sound mechanical inventions and labour saving processes unused, than there are used in agriculture, and the barrier to their use is the ignorance of the working classes." The farmer has as much interest in the education of the labourer's children as the labourer himself has.

I say to the farmer, then, determine, even at a small present sacrifice, though I hardly think any sacrifice at all will be involved in doing so, to employ no children except they can bring a certificate from a competent authority that they can at least read fluently, write a good hand, and know enough of arithmetic to make out and cast up a bill. Never tempt them by offers of work to leave school till they have had time to acquire at least the above amount of education. Rather make a condition with those labourers whom you employ, that they must from the earliest age send their children to school. Do not tempt the mothers away to work in the fields, to run on errands, and so force them to keep their children at home to mind the house and the baby. Home is the place for wives and mothers, school for children. Field-work after a given age, and when they can read, write, and keep accounts, is the sphere for boys, domestic service for girls. Not only after such previous teaching will they be more skilled in their several spheres, but, which tends even more perhaps to their value as servants, they will be more likely to be sober, industrious, and trustworthy. This holds still more good as regards religious instruction. Put no obstacle—such, for instance, as work not absolutely necessary—in the way of a labourer and his family keeping the Sabbath and attending his place of worship. Rather give him any encouragement to do this, and to send his children to Sunday school. Where a certain amount of Sunday work, as for instance tending of cattle and sheep, must be done, the farmer, who is alive to the value of having a religious man in his employ, will arrange, as far as possible, that each of his labourers should take his turn, and so none entirely miss the blessing of the Sabbath. In those parishes, which in different parts of the country are not few in number, in which the farmers, their wives, and daughters take a personal interest and part in these matters—teaching in the Sunday school, visiting the day school, noticing the needlework and knitting, and in always, by precept and example and personal interest, by encouraging, with little presents and acts of kindness, the parents and children who are doing their duty in these respects, and so setting a mark upon those who neglect it—it is wonderful what a rapid and steady improvement there is in the character of the agricultural labourer, and, consequently, in the cultivation of the land and the prosperity of the farm. There is nothing better for maintaining and carrying forward the amount of education required at school than good loan libraries of interesting and instructive books. None should be allowed to take the books out except members, and the rate of subscription for membership should, of course, be less for labourers than for others.

I have now as far as time permits, though necessarily very shortly and imperfectly, sketched out to you what, as regards his home, his work, his wages, his moral character, his religious and secular training and education—the six features which appear most prominent in his position—the agricultural labourer ought, in my opinion, to be. We are all agreed, I am sure, as I have hinted before, on the value of a well stabled, fed, groomed, and trained horse, or on the shortsightedness of the policy of those who in any way neglect their horses or other stock. A labourer, such as I have above described, is equally, or even more valuable, both as a more effective servant, as a saving of that which, of all burdens, is the most oppressive to the farmer—the poor rate, and as facilitating the use of machinery, and so making a higher class of cultivation possible with fewer hands, and, consequently, less cost. Moreover, unless the condition of the agricultural labourer be brought up to, and maintained more or less at, the mark above described, with the present facilities for emigration, and the earnest desire of the colonies—as more than once expressed to me by those eminent ex-colonial governors, Sir William Denison and Sir George Grey—to possess themselves of our best agricultural labourers, the backbone of the country is sure to leave it, and nothing remain but what is nearly worn out. Is it likely that a young, healthy, intelligent labourer, who on landing in Australia would be eagerly sought for at three times the wages he gets here, with an active wife who would nearly double his own earnings, will forego all these immediate advantages, with the certainty, moreover, after a few years' service, of a farm of his own, and cling to a few shillings a week wages, a tumble-down cottage, and the Union for his home as soon as he is crippled up with rheumatism or premature age by over-toil and unwholesome food—is it likely that he will sit still simply because a not after all very unpleasant voyage of a few weeks separates him from a land which, when he reaches it, he will find as rich in soil and better in climate than that which he leaves, while constant communication with the old country may be maintained by post and telegraph? Is it wise in landowners and farmers to sit still, instead of doing all in their power to stay this exodus, as long at least as there is room in old England? Would it not be far wiser to endeavour to attach these most valuable servants to home by making home something more like what it would be if they emigrated to Australia? I do not offer any opinion as to how far the labourers in this district come up to the mark sketched by me. This is a matter of which you, my hearers, are the best judges. All I say is, that, as a mere matter of pounds, shillings and pence, it would pay well everywhere to bring them up to this mark.

Farmers' Clubs.

ATHY: *On the Management of Hedge Fences.*—Mr. GEORGE DODDS, forester to his Grace the Duke of Leinster, read the following paper on this subject:—

There is no fence more generally in use in the cultivated districts of Britain than the Thorn hedge; and considering its permanent nature as a fence upon good land, it is certainly the best adapted for all purposes where a neat and clothed appearance is the object. I have heard it said that a straggling, untrimmed hedge betokened a system of thriftless husbandry. I would consider the condition of a hedge in a farmer's eye should be impenetrability, regularity, and occupance of the least possible space; but I find that none of these three points have been paid much attention to in this district. The soil upon which the Thorn as a hedge fence thrives best, and in which it is likely to live to a great age, is a heavy loam upon a dry bottom. In all light soils, such as moss, sand, or gravel, Thorns are very apt to die suddenly, if not attended to in the way of cutting and cleaning once a year at least. In the formation of a hedge fence many recommend the practice of manuring poor, light soils for the reception of Thorn plants; this I by no means approve of, as I have had occasion to observe hedges which were planted with manure grow freely for the first two or three years after planting, but as soon as the manure lost its effect upon the plants, they fell into a bad state of health, and in the course of a few years from the time of planting such a hedge was much inferior to one which received no manure, upon the same soil and situation. The best manure for Thorns in a light soil is a good dressing of clay or heavy loam if it can possibly be got, and if that cannot be had, plant them in the natural soil, and pay particular attention to keeping clean in summer, and cutting in autumn or spring.

In the planting of Thorn hedges two methods are generally practised, according as the soil may be damp or dry. The one method is that of planting the hedge on the brow of an open ditch, made at the same time for the purpose of keeping the roots of the hedge dry; but I need scarcely mention this, as the method has been generally practised in this district; the other method is that of planting the hedge upon the surface of the soil, without any ditch whatever, and either of these methods may be adopted according to circumstances. I am decidedly in favour of the latter method, as being the most neat and least expensive in erecting, as well as taking up much less room in the field; and, where the soil is dry, it thrives equally as well. In the training up of a hedge, when the object is that of having a firm and compact fence capable of resisting the ordinary efforts of cattle, the best mode is that of keeping the ground under the hedge plants clean from all weeds, as this secures the health of the hedge in the under parts, and allows it to spread down to the very ground; otherwise, when weeds are allowed to grow under the hedge, it soon becomes bare and naked of branches, and proves always open and weak there. In the cleaning of hedge fences, it is also an object of great importance to dig the ground, and keep the same clear of weeds at least 1 foot beyond the drip of the hedge on each side, as this secures a free current of air passing through, without which a fence is sure to become bare in the under part. Having said this much as to keeping clean

all hedge fences, I have next to say that, in training up a hedge, when the object is to have a firm compact fence, capable of resisting cattle, the great point is, after that of keeping clean, to cut the fence yearly, according to a given form, and this form must in all cases be regulated by the situation in which the fence grows, by the object in view, and in a great measure by the taste of the proprietor. I have already said that it is necessary to cut hedge fences yearly, and I believe there are very few practical men who have had their attention directed to the rearing of such fences but will agree with me on this point. The difference is seen at once between a hedge cut yearly and one that is not cut. Hedges, from being regularly cut, are kept close in texture from bottom to top, and are generally healthy and long-lived compared with others not regularly cut. In the cutting of hedges they will increase in height and breadth of their own accord, under the best system of cutting, seeing that in the act of cutting the annual shoots there is always a short piece left at the base of every young shoot. A hedge in course of a number of years, however well kept, generally outgrows itself, from the cause I have already stated, and this state of a hedge is easily known by its loose habit, and of an open overgrown appearance.

There is no way of renewing a hedge in this state but that of cutting it in, or what is termed ribbing. This ribbing consists of stripping the hedge of its side branches, and allowing it to make new wood all over. In ribbing the hedge all the lateral branches must be cut upwards, to within 4 inches of the main stems of the hedge, upon each side, and the hedge over all should also be reduced in height to about 3 feet. In this case I am speaking of hedges that have been under a regular system of cutting. It should also be kept in view, in the case of ribbing in a hedge, that the operation should be done at a period when the field is under farm crop, and when there is to be no sheep or other cattle grazing for a year or two in the field where the hedge is, as they are sure to injure it by eating the young shoots as they grow; besides, their wool and grease is injurious to the welfare of a hedge so closely cut in. The ribbing may be done at any time of the year, but I would prefer it being done between the months of November and April. In reference to the great majority of the hedges round about this district, I say that the greater part of them would not be sufficiently renewed by ribbing. In order to renew such hedges the plants would require to be all cut down within about 6 inches of the ground, observing at the same time to make all the cuts upwards. When this is done, and the rubbish removed, the ground should all be well cleaned, and dug to the breadth of about 18 inches on each side of the hedge, and all gaps among the old stumps planted up with new or young plants. In planting up with young plants I would recommend that young Thorns, or Quicks, as they are generally termed, should not be used in such cases, as they never succeed well among old Thorns, but in cases of this kind use Beech plants, as they generally thrive well among old Thorns.

There are four forms of hedge fences generally adopted in Scotland—namely, the wedge-shaped, the full-sided, the square-shaped, and the upright. The wedge-shaped is the best form where snow is apt to prevail, and it is also the form which is by far the simplest to keep in order, in the way of cutting. The full-sided is the most common form in all agricultural districts, for which it is very well adapted; for by its bulging sides it is not easily approached too close, or injured by stock of any kind; but it is very apt to go out of order, and overgrow itself if not under skilful and good management: excellent specimens of this form of hedge are to be seen on his Grace the Duke of Hamilton's estate, in Lanarkshire, Scotland. I consider the square-shaped hedge is only adapted for a gentleman's home or pleasure grounds; but I find when hedges have been paid any attention to in this district, this is the form that has been generally adopted. It is all very well to have a fence of this kind round a garden, where it may be well kept, but as a general fence it is the most liable to become overgrown and useless. The upright hedge is an admirable fence, and is well adapted for pleasure ground scenery, but not at all for a farm or field fence. For my own part, I consider the wedge-shaped and the full-sided forms the best that can be adopted for usefulness, and the other two I consider merely ornamental forms, but well adapted for producing extra shelter upon pleasure grounds.

In the event of any farmer rooting up any of his hedges for the purpose of making two fields into one, as the case may be, and when plants are healthy, I would recommend him to fill up any vacant spaces in any other of his hedges, providing the plants were carefully dealt with, as I have seen several instances of this experiment tried, which were always attended with great success. I shall here give an instance or two that has come more particularly under my own observation:—When acting as assistant forester upon the Marquis of Bute's estate, in the island of Bute, we transplanted several hedges from thirty years' growth and upwards, and after removing one of them a mile and a half from the place where it originally grew, in the following summer it would not have been known that it had been transplanted; also when acting as forester upon the Lee estate, Lanarkshire, the property of Sir Norman M. Lockhart, Bart., we transplanted a mixed Thorn and Beech hedge, over fifty years' growth, nearly half a mile in length, and removed it to a higher and more exposed situation than where it originally grew, and in the following season, after transplanting, we had not fifty dead plants out of the whole line of fence transplanted. So I have no hesitation in recommending the transplanting of Thorn hedges of any age and in any situation. But in all cases of transplanting Thorn hedges the ground should be perfectly dry to secure ultimate success, and the cut made for the reception of the plants should be large in proportion to the size of the ball, say from 1 to 2 feet wider than the ball of the plants. The best time I consider for transplanting Thorn hedges is the months of January or February—any time during fresh weather. In making these few remarks I appeal to the farmers of this district, and more especially to the tenants upon his Grace the Duke of Leinster's estate, to try and make some improvement upon their hedge fences, as the greater part of them are in a very neglected state; and I am sure that any observing person in passing through this district could not fail of being struck with the state of the hedges upon the different farms, considering the high state of cultivation of the land in general. And I am sure that Mr. Hamilton, his Grace's agent, would give the tenants every encouragement in the improvement of their hedge fences.

DISCUSSION.

Mr. LOW: Did I understand you to say that hedges planted without manure are better than those with manure?

Mr. DODDS: A hedge planted with manure will grow very well for a few years, but it will then stand still. If a hedge is planted even on poor land, by paying attention to the trimming it will grow.

Mr. LOW said he considered the Irish system, which prevailed in that neighbourhood, was the best; for the fence was made of a good sloping bank, with the plants growing over it, which thus gave excellent shelter to cattle; and it was by planting the roots in the bank, where they had room to spread, that the hedge grew luxuriantly. A fence planted on the flat never could give that shelter to cattle which the hedges made on the Irish system in the neighbourhood of Athy can give. A good bank was made, and the surface was taken out of the gripe and thrown upon it frequently. The plants on this bank had plenty of room to spread themselves; whereas, if planted on the flat, and the roots get no surface in which to spread, there was a failure. The system adopted there was a most successful one of growing Thorns. They had there a grip on one side, the bank, and the hedge to give shelter in winter. Where there was a sheep walk, and the hedge was planted on the flat, there was no shelter at all, no matter how high it grew; while, by the other way, if a storm came, the stock had the benefit of the grip, the bank, and the hedge, which made the wind break over them far into the field.

Mr. DODDS: If a man pays attention to a hedge on the flat it will grow for him.

Mr. LOW: But the root has not the same hold at all. It will grow twice as well if you give a surface to spread its roots in. Besides, you have to go to such expense with a hedge planted on the flat. You have to put up wire fencing, and have no shelter from it at the best of times. I don't think that would be an advantageous system in this part of the country. The Irish way of planting gives regular shelter to the stock on the farm.

Mr. DORAN: It would take 50 years to have a fence on the flat.

Mr. CONOLLY: Ay, and three fifties. A fence made in the other way would cost more than a stone wall.

Mr. LOW: The system Mr. Dodds has advocated does very well in Scotland, where it is all tillage land. In this country it does not accomplish the good that a bank does, with a grip on one side and the hedge planted in the bank.

Mr. CONOLLY said, where a hedge is not well kept, it looks very bad. The plan spoken of by Mr. Low was the better plan, and he himself could give an illustration of the truth of his words. Whoever had land at Corbally, as he had, would say there were no finer fences in the country. There was not better shelter for cattle within 50 miles round, and they were made exactly as Mr. Low speaks of. Go into any of these fields, and they would see that the cattle could never be at a loss for a warm place. In the severest time of winter they were fully as warm as if in the house, and one would think they were house-fed cattle. In fact, they scarcely ever bring them into a house; still, they look as clean and as fat as if fed in the house.

Mr. DAVIDSON: There is a great deal of that due to the grass, Mr. Conolly (laughter).

Mr. CONOLLY: And to the shelter, too. Any of ourselves would look very queer, if, after a good supper, we had to go into a cold bed; and what is true of ourselves is true also of the brute creation.

Mr. DODDS: If a hedge planted on the flat is let grow five or six feet, then trimmed shortly and regularly, it will become a good hedge.

Mr. DORAN: When will you have it a good hedge, and what would it cost you?

Mr. DODDS: What would those big banks of earth cost you? There would be more expense in putting up those big banks of earth than in planting on the flat.

Notices of Books.

Description of a New Method of Treating the Sewage of Towns. By John Hart. Simpkin, Marshal & Co.

Mr. Hart proposes to "purify" the sewage, *i.e.*, to remove suspended matters from it, by a cleverly devised set of concentric settling tanks. The water thus clarified will, he believes, be tenfold easier than before to deal with upon land by ordinary irrigation, for the abatement of its nuisance. He is probably right in supposing that it will be less difficult to distribute evenly, but he is wrong in supposing that the suspended matters are a valuable manure, and he is wrong in supposing that it is the interest of towns to concentrate the work of deodorisation on the plan he recommends. It is their interest to adopt a system which shall distribute the filth over as much land as possible. We would abandon all the niceties and refinements of management recommended by Mr. Hart and other writers. Having a large water supply and very dilute sewage, we should regard as an advantage rather than otherwise; and ordinary irrigation of such sewage over drained land of fair quality and tolerable porosity will, we doubt not, ultimately be found to convert the drainage of our towns into money at the rate of 5*s.* a head per annum for each of the inhabitants.

The following extract conveys the substance of Mr. Hart's leading argument:—

"The limited use hitherto made of the liquid refuse of towns for agricultural purposes may be considered to arise chiefly from the difficulties attending the processes of its application. Unless tracts of nearly level land have been obtainable, a large outlay has been often incurred in producing the form of surface supposed to be indispensable.

"It has also been insisted on, that under drainage is unnecessary, or even prejudicial to land on which irrigation is to be carried out. However that may be, it is highly conducive to the success of the plan now to be described, as it enables the soil to absorb the virtue from a larger quantity of fluid than it would if no drainage existed; while whatever water is received into the drains themselves becomes so well filtered as to be more thoroughly purified than by any means hitherto employed on a large scale.

"In the neighbourhood of towns there is usually abundance of cultivated ground (possessing thorough drainage, and with a more or less undulating surface), the occupiers of which will gladly avail themselves of sewage, if it can be had in reasonable quantities at short notice, and of any degree of strength.

"To apply liquid in a cheap manner to farms that have not undergone an expensive preparation, it is essential that a large area be available for its occasional use on a part only, when and where experience proves it to be most desirable. If such is not the case, periods will occur at which it is impossible to utilise the supply with the regularity with which it is produced. An understanding between several farmers is therefore likely to facilitate the introduction of such a system in a neighbourhood, the expense of superintendence and regulation being (if properly managed) so trifling that many will gladly avail themselves of a benefit the mention of which is now sufficient to prejudice them against it.

"Supposing such an understanding to exist, it would be necessary to appoint a manager having the control of the supply of liquid, whose duty it would be to see that none should run to waste, and that each farmer should have as much as desired when most suitable to himself and the other associated members.

"One of the obstacles at present attending the disposal of sewage is the tendency of the channels conveying it to become partly silted up by offensive deposit. The remedy usually resorted to is that of giving them a considerable inclination, and using stops or sluices at frequent intervals; but a worse evil then ensues, as their form is rapidly changed by the current, and constant attention becomes necessary to keep them in working order.

"It is possible however to convey sewage as far as is desired, if the heaviest part of the suspended matter is previously removed. This may be effected by one of the circular purifiers already described, but it must be borne in mind that its present object is not to remove all offensive matters, but simply to take out those which would impede its flow. An apparatus of comparatively small size is sufficient for this purpose: for instance, the one shown as large enough for a population of 1000, when little subsequent treatment is used, becomes under this plan suitable for from 5000 to 7000, yet still leaves a great part of the fertilising property in the fluid, to enrich the land to which it is applied."

Farm Memoranda.

HOVERINGHAM, NOTTS.—The question as to how best to apply steam-power to the cultivation of the soil is interesting to all. For many years I have worked hard to find out how to do it, and I have completely succeeded, for at the end of my 15 years' practice I find that I can make a good clean seed-bed for Wheat on my heavy clay land for 6*s.* 8*d.* per acre, and for the next year's crop, Beans, on the same land, the cost of seed-bed is only 7*s.* per acre, or 10*s.*, according to circumstances. How to teach others to do this is the next question, and quite as interesting as the former; to me it is a very heavy task, for, although I have repeatedly told you and the world how I have done it, I am almost daily receiving letters of inquiry upon the subject; occasionally people come and look at Woolston for themselves, and now and then I am pressed into other districts to give my opinion as to how best to apply the power upon these soils. The following instance is one:—

In June last, after a couple of letters of inquiry, Mr. Nall, of Hoveringham, Nottinghamshire, with a practical friend of his, visited Woolston. I took them all round and through some of the fields of corn. The result was an order for a set of Woolston tackle to be delivered this month. Before starting this tackle nothing would do but I must go down and give my opinion, after seeing the land, as to how best to apply

it. So on Monday last I started, giving the whole of yesterday to the inspection of the farm, &c. Now, if you will kindly publish what I have to say, you will help me to explain to many others, as well as to Mr. Nall, how best to apply steam-power to the cultivation of the soil.

Mr. Nall is a retired Manchester man, and rents the farm of Mr. Franklin, of Hoveringham, not only for amusement, but for the improvement of the land. Hoveringham is midway between Nottingham and Lincoln. The farm contains 325 acres, of which 122 acres are in permanent grass, mainly good grass land; 56 acres of arable land are upon a deep, cool gravel, with here and there a patch of dry burning soil; and the rest, 147 acres, are upon the hill, a red clay soil.

The 147 acres of red clay land are divided into 12 fields; therefore average about 12 acres. There is nothing objectionable in the shape of either of them, but the lot of land they cover is very objectionable, and so is the Twitch with which they are overrun, for steam-culture means clean farming; and so long as all this lot of hedges is retained the seeds of Twitch are liable to be blown from them, and so are bits of Twitch liable to be dragged from them in many ways, and thus get planted upon heath land. In some of the hedges there is a lot of trees that spoil the corn on three or four yards on each side of the hedge; and, in addition to this, there are trees standing in one of the ploughed fields, to plague the men when working the steam-power cultivator. Landlords must look to this. That is their part, for they must clear these nuisances out of the way of steam cultivation.

There are three homesteads upon the farm, and they are pretty well situated to the land to allow of a reduction of horses, especially the homestead upon the hill on the clay land. Thirteen horses have been kept to work this farm, but, in anticipation of the introduction of steam-power, three have been sold off, and two others are to be sold off at once. The five will, I am told, make £100. The cost of the set of Smith's tackle (just purchased and delivered yesterday), including a 10-horse power engine, a combined ridger and subsoiler, and a five-tined smasher, is £446; deduct from this the £100 for five horses to be sold off, the extra capital needed is only £346.

The mode of cropping on the gravel land has been roots, Barley, Clover, Wheat, Beans, or Peas, and Wheat or Oats. This cropping will be continued and will work well under steam culture, and as the land is pretty clean there will be no extra operation by steam-power needed to make it quite so. The mode of working will be this, this year:—A ridging of an Oat stubble for roots after it has laid upon the ridge for a couple of months; a careful man will be sent along each ridge to take out every particle of Twitch that grew while the Oats were growing, then a subsoiler will be drawn along each ridge by four horses to split them, and bring out any portion of Twitch there may be covered in the middle of the ridges, which must then be picked up by the careful man. In due time the land may be harrowed and seed drilled in, or it may be put into ridges by horses, or worked in any way the tenant may think fit. The cost of the combined ridging and subsoiling by steam-power and the splitting of ridges by horses will be 10s. per acre. For the next crop, Barley, the tenant may smash it in the spring by steam or work it by horses, just as he pleases. Clover will follow next, and will need no operation. Wheat will come next, and for that the land must be ploughed over by horses with the common plough, after which the land must be ridge-ploughed and subsoiled, then carefully looked over by the careful man, as in the case for roots, and the splitting of the ridges must follow, and so must the second picking of Twitch, as in the case for roots, and the land may be planted with either Beans or Peas in any way the tenant may think fit. The cost of seed-bed will be 10s. per acre. After the Bean or Pea crop is harvested the land must be smashed by steam-power, and cross-cultivated by horses for Wheat. The cost of seed-bed will be 6s. 8d. per acre. The average cost of seed-bed for the six years' cropping will not exceed 7s. 6d. per acre, and the land may always be kept clean. I would, as a rule, advise a small dressing of manure for the roots and Beans, and 3 cwt. of superphosphate for the last crop of Wheat, and if the roots are drawn off, a little superphosphate should go on for the Barley crop.

The cropping on the clay land has been half Wheat and Barley, and on the other half Beans, Peas, Clover, Vetches, and roots, but the latter failed in 1868 and 1869. This year there is a plant, they having been sown early, but they are now mildewed and must be pulled at once. On this land I would, under steam-power, advise the cropping to be thus:—Beans or Peas. If a bit of Vetches is needed the tenant may grow a bit, but I see no good in them. After the Beans or Peas Wheat should follow, and next year Barley should be the crop. For Beans the land should be manured with about 10 or 12 tons of common dung, which in October must be ridged in by the combined ridger and subsoiler by steam-power, and the ridges must be split in December; and the same amount of Twitch picking must be done as is pointed out for roots on the gravel land. The cost of this seed-bed will be 10s. per acre. After the Beans are harvested the land must be smashed by steam-power, and then crossed by horses, after which the Wheat must be drilled in, 10 inches from row to row; 3 cwt. of superphosphate should be given to the Wheat crop per acre. The cost of seed-bed will be 6s. 8d. per acre. When the Wheat comes off, the land should be ridged and subsoiled by steam-power, then hand-picked as for Beans, then split by horses and picked again; after which, and at the proper time in the Spring, it may be harrowed down and the Barley drilled in. Six cwt. of superphosphate should be given to this crop. The cost of seed-bed will be 10s. per acre.

The average cost of seed-bed for the three years' cropping will be only 9s. per acre, and at that cost the land may be worked 10 inches to a foot deep, and kept clean for ever, and the crops will all be good ones. *William Smith, Woolston, Fletchley Station, Bucks, Aug.* 31.

The Week's Work.

SEPTEMBER 10.—*Carnation Clover* (Trifolium incarnatum).—Sow four bushels of the rough seed in the husk, or 20 lb. of clean seed per acre, and bush or chain harrow in on a clean stubble. Some give the land a stroke of the harrows before the seed is sown, purposely to raise a fine mould; others roll or clod-crush, when the soil is crusty; but a very fine mould is not desirable at this season. If the land requires manure, 3 cwt. of Peruvian guano, and 2 cwt. of gypsum, may be applied with a broadcast distributor on the stubble, and harrowed in with common harrows prior to the Clover seed being sown. The cultivation of the crop is exceedingly simple. It follows Wheat, Barley, and Oats, and is sown from August to the close of the current month.

Liming in Autumn, for winter Beans, Vetches, Clover, &c., is preferable to liming the land at the removal of these crops for Wheat or other cereals; pulse crops being greater consumers of lime, and hence profiting more by its application than the succeeding white crops. It should be thoroughly incorporated with the surface soil, purposely to prevent its sinking to the bottom of the staple, which it is very liable to do. From 30 to 300 bushels of shells from the kiln are applied per acre; 100 bushels being a common dose. We have even applied 1000 bushels to a cold tenacious clay soil, by two applications in one season. The quantity depends upon the nature of the land, the quality of the manures used, and the length of time between the limings. Some prefer frequent limings, others give large doses at a time, with long intervals between. Lime is also applied to grass land, either alone, or in the form of lime-compost, and to land being laid down permanently to grass.

Winter Vetches.—Sow for soiling or folding in spring. Some make two sowings this month, for the purpose of successive soiling and folding; one early, and the other late—the last of the season; others prefer the last sowing in October. The crop is partial to a rich clay soil, but will grow on friable land in good condition. If the land is foul, scuffle and clean it. Some manure on the flat—15 to 20 loads of farm dung per acre—ploughing in shallow, and then drilling 3 bushels of Tares, and 1 bushel of Rye per acre. Others smash up and drill in the above quantity of seed, with from 3 to 5 cwt. of guano per acre.

Laying down Land to permanent meadow and pasture.—The old rule, "fill the land with seed and manure," still applies; but modern systems of cultivation differ from those of the olden time. Thorough drainage and deep tillage are primary operations, that must never be neglected; and should the land require lime, chalk, marl, or clay, these should be applied before the manure and the seed. The seeding and management afterwards are similar to what is given above on renovating grass land. The quantity and kind of seed will depend upon the soil and climate. The quantity varies from 30 to 70 lb. per acre, so that 50 lb. is perhaps not far from an average.

Rye.—Sow, on land adapted for it, 2½ to 3 bushels per acre. There are large tracts of poor sandy soil capable of growing Rye, which will not grow anything else, and on such it should be grown. If kept clean such land is very easily cultivated, and being generally dry, there is no obstacle in the way of carting. Where there is a command of clay, 80 loads per acre—*i.e.*, half a load to a pole—will change, and greatly improve the texture of the soil.

Stock Sales.—The great ewe, lamb, and ram fairs of the North take place from the middle of August to the middle of September, but public fairs are giving place to private sales all the year through. Ewes intended to lamb in February should be served this month, and for March lambing the ewes and rams should both be in condition for flocking together next month. Ewes bought in for a single crop of lambs — sometimes termed "crop-ewes" — are generally served with a heavier breed, as the Southdown ewe with a Cotswold ram, and Cheviot or Blackfaced with Leicester, &c. Wether hogs and shearlings are put up in pens to fatten, or are folded on Rape, Vetches, rich aftermath or Turnips; a pint of Peas or pound of oilcake being allowed per head to force them forward by Christmas. All sheep not fit for breeding force forward to the shambles. Breeding ewes also, when they get into a state of obesity, send to the butcher, as they become profitless breeders, more than the half being barren and the remainder bad nurses.

Newly-weaned Calves, in seasons like this, where the grass was burnt up in August, and is still deficient, are liable to be infested with lice on the skin, and worms in the windpipe, &c.; our improved breeds more so than the older races. The former, lice, are easily seen behind the ears, and along the neck and back. Harsh, frequent, dry, husky coughing indicates worms in the air passages—the malady being termed "hoose" or "hack," from the peculiar sound of the cough. "It follows," says one of our best authorities, Spooner, "bare pasture, with a bad supply of water. Cows are sometimes affected." Both lice and worms may be prevented by a liberal diet, with plenty of soft, filtered water to drink, so as to keep the calf growing sleek, and without losing its milk-flesh at the time of weaning. Keep other beasts in equally good heart. As for cure, consult your veterinary surgeon. *W. B.*

Notices to Correspondents.

CAREY'S CATTLE GAUGE: *G. E. W.* We do not know what form of cattle gauge you have, but our one is provided with a slide, and on this is a scale to be used, as indicating the girth in feet or inches. It slides between two other scales, one giving the weight in stones, the other the length of the animal. The index on the slide is brought opposite the place in the scale of the ascertained length (taken between the front of the withers about one-third down the shoulder, and a line square with the tail end of the beast). Having thus placed the slide, you read off the weight opposite that part in it which corresponds to the ascertained girth of the beast (taken immediately behind the shoulder). But the index on the slide should not be a fixed point; or there should be two or three indices on it, and a different one should be chosen for different sorts of beasts and different conditions of fatness. You will get the best form of gauge from Mr. J. Tree, 22, Charlotte Street, Blackfriars Road, London.

THE DRAWINGS OF WHEAT FLIES: *Entomologist.* In the engravings to which you refer (p. 1162), the engraver has luxuriated in tarsi. Having evidently read that the variety in Nature is infinite, he gives one leg tarsi with eight joints, another with six, another with four, and so on; and provides against sameness by impartially taking care that no two shall be alike. This, however, is one of the cases where Nature declines to sport, and insists on all the legs having each five articles to each tarsus.

Markets.

ENGLISH WOOL.

Markets vary in tone from day to day, as peace or war seems in the ascendant, but in either case so far the change is in tone alone, the actual column of business being very limited. Holders generally are firm.

HOPS.

BOROUGH MARKET, Sept. 8.

The fresh arrivals of the new crop have further strengthened the belief that the yield is one of the most favourable secured for many years. The quality of both the Sussex and Kent Hops is good, and the return is most prolific. As there appears to be reason to hope for an early suspension of hostilities, maltsters are curtailing their operations until they can learn whether the foreign trade is likely to be yet resumed. Mid and East Kents, £7 to £12; Weald of Kents, £6 to £8; Sussex, £5 12s. to £6 10s.; Yearlings, £1 5s. to £3 3s. per cwt.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Sept. 8.

Prime Meadow Hay	125s. to	135s.	Clover, old	..	140s. to 150s.
Inferior do. ..	100	120	Inferior do. ..	120	130
New Hay ..	115	120	Prime new do. ..	130	140
Inferior do. ..	100	110	Inferior do. ..	110	120
Straw	30	36	CHARLES JAMES EASTON.		

CUMBERLAND MARKET, Thursday, Sept. 8.

Sup. Meadow Hay	130s. to	140s.	Inferior Clover	..	126s. to 130s.
Inferior do. ..	115	120	Prime 2d cut do. ..	--	—
New do.	120	132	New do. ..	110	140
Inferior do. ..	105	112	Straw	32	38
Superior Clover	140	150	JOSHUA BAKER.		

COALS.—Sept. 7.

Hastings Hartley, 16s.; Walls End Framwellgate, 16s. 6d.; Walls End Hetton, 19s.—Ships at market, 6; sold, 6; at sea, 35.

METROPOLITAN CATTLE MARKET.

MONDAY, Sept. 5.

We have a large increase in the supply of Beasts as to numbers, and the quality is very inferior; the choicest descriptions, consequently, are not much lower than on Thursday, but a clearance of other kinds cannot be effected. The supply of Sheep is short, yet quite equal to the demand; trade is dull, at our quotations. Good Calves are not very plentiful; trade is dull, and late prices are with difficulty maintained. Our foreign supply consists of 2290 Beasts, 8450 Sheep, 310 Calves, and 55 Pigs; from Scotland there are 102 Beasts; from Ireland, 860; from Norfolk and Suffolk, 100; and 1898 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5 2	10 5 4	Best Long-wools	5 2	10 5 4
Best Shorthorns .	5 0	— 5 2	Do. Shorn ..	.. —	— ..
2d quality Beasts	3 0	— 3 8	Ewes & 2d quality	4 4	— 4 10
Best Downs and Half-breds ..	5 4	— 5 8	Do. Shorn ..	.. —	— ..
Do. Shorn ..	.. —	— ..	Lambs ..	.. —	— ..
			Calves ..	3 8	— 5 6
			Pigs ..	3 4	— 5 4

Beasts, 5250; Sheep and Lambs, 22,900: Calves, 335: Pigs, 195.

THURSDAY, Sept. 8.

We have a large supply of Beasts, but more than half are foreign; trade is very dull, except for the few choice qualities that are on offer, and these fully maintain late rates. The number of Sheep is rather smaller than last week, but it exceeds the demand; best descriptions are sold about the same as on Monday; other kinds are unsaleable. There is no alteration in the Calf trade. Our foreign supply consists of 990 Beasts, 5260 Sheep, 417 Calves, and 95 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	2to5 4	Best Long-wools..	5	2to5 4
Best Shorthorns ..	5	0—5 2	Do. Shorn ..	..	——
2d quality Beasts ..	3	0—3 8	Ewes & 2d quality	4	0—4 8
Best Downs and Half-breds ..	5	4—5 8	Do. Shorn ..	..	——
Do. Shorn ..	..	——	Lambs	..	——
			Calves	3	8—5 6
			Pigs	3	2—5 4

Beasts, 1760; Sheep and Lambs, 10,050; Calves, 50c; Pigs, 150.

METROPOLITAN MEAT MARKET.—*Sept.* 8.

Best Fresh Butter .. .. .. 18*s.* per dozen lb.
Second do. do. .. .. .. 16*s.* ,,
Small Pork, 4*s.* 8*d.* to 5*s.* 6*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 8*d.* per 8 lb.

MARK LANE.

MONDAY, Sept. 5.

There was a fair supply of English Wheat to this morning's market, which was sold at about Friday's prices, or 1*s.* to 2*s.* per qr. below the prices of this day se'nnight. For foreign there was little inquiry, and the few sales made were at about 1*s.* per qr. reduction. Malting Barley, Beans, and Peas were steady; grinding Barley 1*s.* per qr. cheaper. Oats sold slowly, at very irregular prices, and were 1*s.* to 2*s.* 6*d.* per qr. lower than this day week. Flour was unchanged in value. White Mustard seed was held for 11*s.* per bushel, but up to a late hour very few sales had been made.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	44	—51	Red.....	41	—51
— — fine selected lots .. do.	48	—55	Red.....	45	—53
— — Talavera	49	—58			
— — Norfolk	—	—	Red.....	—	—
— — Foreign	41	—62			
BARLEY, grind. & dist., 29to 33*s.* Chev.	42	—45	Malting ..	36	—41
— Foreign .. grinding and distilling	25	—33	Malting ..	33	—43
OATS, Essex and Suffolk	24	—36			
— Scotch and Lincolnshire..Potato	26	—28	Feed	—	
— Irish ..... Potato	25	—27	Feed	23	—26
— Foreign .....Poland and Brew	24	—26	Feed	19	—24
RYE	32	—36	Foreign ..	33	—36
RYE-MEAL, Foreign					
BEANS, Mazagan....43*s.* to 47*s.*..Tick	49	—50	Harrow ..	49	—50
— Pigeon ....51*s.* to 59*s.*..Winds.	—		Longpod..	—	
— Foreign ..... Small	45	—47	Egyptian .	42	—44
PEAS, White, Essex, and Kent.. Boilers	38	—40	Suffolk ..	40	—42
— Maple, 40*s.* to 44*s.* .....Grey	36	—40	Foreign ..	36	—40
MAIZE	—		Foreign ..	32	—34
FLOUR, best marks delivered..per sack	42	—50			
— 2d ditto .....ditto	35	—47	Country ..	35	—47
— Foreign ..... per barrel	29	—31	Per sack..	35	—61

WEDNESDAY, Sept. 7.

The supply of new English Wheat at Mark Lane today was very moderate, but quite equal to the demand. The inquiry for both English and foreign samples was limited, but no material change was noted in price. Barley ruled quiet for both grinding and distilling qualities. Malt was dull, at drooping currencies. There was a good show of Oats, which sold slowly on former terms. Beans and Peas met a quiet sale, at late rates. There was very little inquiry for any kind of Flour, but prices were unaltered for both town and country marks.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 490	Qrs. 10	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	21,890	26,300	—	{ 500 { 14,990 brls.
	22,380	26,310	—	

HULL, Sept. 6.—We have had a fair supply of English Wheat, which met with a slow sale, at 2*s.* per qr. decline. Foreign Wheat must also be noted 2*s.* per qr. lower, to effect sales. Barley, for malting, 1*s.* per qr. lower, but grinding sorts unaltered in value, with fair demand. Beans and Peas are each 1*s.* per qr. lower, and so are new Oats; but fine old Oats are scarce, and bring last week's currency.

AVERAGES.

	Wheat.	Barley.	Oats.
July 30	52s 10*d*	33s 5*d*	26s 9*d*
Aug. 6	54 11	31 8	28 8
— 13	54 10	32 11	28 0
— 20	54 7	33 5	25 10
— 27	51 3	36 8	24 6
Sept. 3	49 1	36 2	25 9
Average ..	52 11	34 0	26 7

SEED MARKET.

The recent rains have increased the demand for Trifolium, of which there is now very little left on hand, and prices in consequence continue to rule very high. The large quantity of new Mustard seed, of which we spoke in our last report, has been bought up for manufacturing purposes. Winter Tares are still a slow trade; a few appear to have been saved in most parts of the country, and although the yield has proved to be good, it is nevertheless thought that should a brisk consumptive demand arise, as seems probable, higher values will be reached. Winter Barley, Oats, and Rye move off steadily at late rates. Clover and Trefoil seed attract just now but little attention. Sowing Rapeseed is firm. Our advices from France quote an advance of 3*s.* to 4*s.* per bale in the price of foreign Italian.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

CARTER'S choice strains of CALCEOLARIA, CINERARIA, and PRIMULA.
CALCEOLARIA INTERNATIONAL PRIZE.—The plants of this splendid strain received several 1st Prizes this season at the Royal Horticultural, and other places. Per packet, 2*s.* 6*d.*
CALCEOLARIA, finest hybrid. Per packet, 2*s.* 6*d.*; smaller packets, 1*s.* 6*d.* CALCEOLARIA, finest spotted. Per packet, 2*s.* 6*d.*; smaller packets, 1*s.* 6*d.* Saved with the greatest care, and from one of the largest collections in the Kingdom.
CINERARIA, choicest, mixed.—Saved from a splendid collection of named varieties, and cannot be surpassed. Per packet, 2*s.* 6*d.*; smaller packets, 1*s.* 6*d.*
PRIMULA, choicest fringed varieties.—The various varieties of Primula we offer can be grown with the utmost confidence, as they are saved with the greatest care, and from one of the finest strains in cultivation. The Fern-leaved varieties are splendid, and the Fern-leaved new scarlet is a decided novelty in colour.
PRIMULA.—Choicest, mixed, fringed. Per packet, 2*s.* 6*d.*
PRIMULA.—Dark carmine. Per packet, 2*s.* 6*d.*
PRIMULA.—New scarlet. Per packet, 2*s.* 6*d.*
PRIMULA.—Rose fringed. Per packet, 2*s.* 6*d.*
PRIMULA.—Choicest white fringed. Per packet, 2*s.* 6*d.*
PRIMULA.—Choicest Fern-leaved carmine. Per packet, 2*s.* 6*d.*
PRIMULA.—Choicest Fern-leaved white, 2*s.* 6*d.*
PRIMULA FIMBRIATA.—Fern-leaved new scarlet. This is a decided novelty, the flowers being of a deep scarlet colour. Per packet, 2*s.* 6*d.*
Smaller plts. 1*s.* 6*d.*
Forwarded immediately on receipt of Post-office Order.
JAMES CARTER AND CO., The Royal Seedsmen, 238, High Holborn, London, W.C.

Wheelers' Cocoa-nut Cabbage.

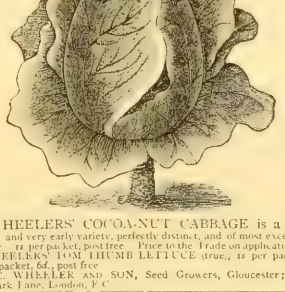

WHEELERS' COCOA-NUT CABBAGE is a new and very early variety, perfectly distinct, and of most excellent flavour. 1*s.* per packet, post free. Price to the Trade on application.
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J. C. WHEELER AND SON, Seed Growers, Gloucester; and 59, Mark Lane, London, E.C.

ROTTED HORSE MANURE.—Above 25 solid yards FOR SALE, also PEAT, SHELLS, GRAVEL, &c.
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Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under engagement with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the result of my careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
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PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.
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WILKIE'S BLIGHT COMPOSITION, referred to in *Gardeners' Chronicle*, pages 802 and 896.
Especially recommended to Rose and Fruit Growers.
For further particulars, see printed handbills, which may be had on application, also previous Advertisements in these columns, page 918.
Sold in pats, containing 1 gallon, 3*s.* 6*d.*; 2 gallons, 6*s.*
One gallon will bear diluting with three of water
Sole Agents: OSBORN AND SONS, Fulham Nursery, London, S.W.

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BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1*s.*, 2*s.* 6*d.*, and 5*s.*
Powder Distributors, 2*s.* 6*d.* and 3*s.* 6*d.* each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY Bedford Warehouse, Sussex Wharf, Wapping, E.

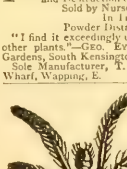

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Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Sea Baskets, with stem and pronging for placing in any position, on the lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Canaries, Pheasantries, &c.
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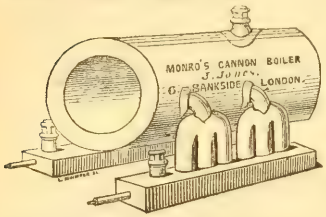

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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom. Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each. GLASSES, all sizes. References to the Nobility, Gentry, and Trade in most of the Counties in England.

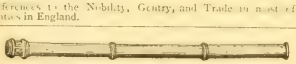

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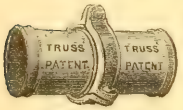

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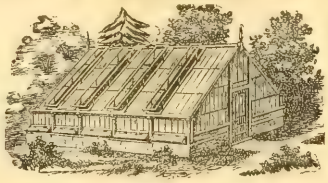

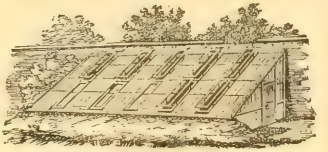

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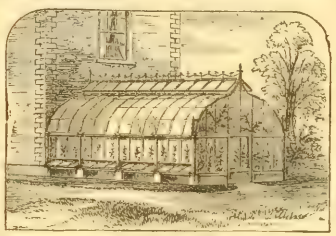

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	2-inch.	3-inch.	4-inch.
HOT-WATER PIPES, Nos. 6 and 7—per yard	s. d. 0 11	s. d. 1 5	s. d. 1 11
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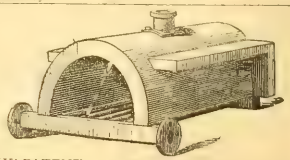

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	Each.
6 ft. by 4 ft. Lights, 2 in thick, unglazed ..	£0 5 0
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Woodwork only Prepared and Fitted	0 0 6
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THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT FLOWER PACKING CASE, and MEMBERS of PARLIAMENT, FAMILIES, and TOURISTS' SEASIDE COMPANION.

The above Cases are specially contrived for the Exhibition and Transmission of Cut Flowers. The flowers are packed in water, and cannot be displaced or the water spilled, it placed in any position, even if upside down. When not required for conveying flowers, they can be used for ordinary packing purposes. It has been pronounced by the Committee of the Royal Horticultural society as the best case now in use, and C. J. Perry, Esq., will exhibit his flowers in them at the next Crystal Palace Flower Show. Manufactured solely by WM. EASSIE AND CO (LIMITED), Gloucester, who will forward Lists of Agents and Prices on application.

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No. 35. CAST-IRON PUMPS.

2½ inches	£1 9 0
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No. 547A. GARDEN ENGINE.

30 Gallons	£5 13 0
24 ,, ...	5 1 0
16 ,, ...	3 16 0
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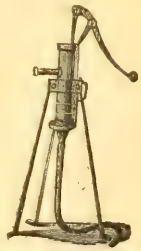

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COLOURED SHELL GRAVEL, for Gardens, Conservatories, and Terraces, presenting a very novel appearance, and of a mottled fawn colour; also the natural SHELL GRAVEL, as used in Horticultural and Botanic Gardens. Sold by

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PATENT WATER BRINGER.

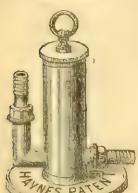

HAYNES AND SONS' PATENT WATER BRINGER, price 24s.

This simple Machine will draw water from a pond or well 10 feet below the level of garden, and 100 feet over the surface, with the Hydronette or any other Garden Engine.

THE HYDRONETTE (ROBIN'S PATENT),

For Gardens, Greenhouses, Conservatories, Hotbeds, Washing Windows, Carriages, &c

Unrivalled ease of action, simplicity, convenience, and force.

The HYDRONETTE is a more useful, easy-working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz:—No 1, with 4 feet of Suction Hose; Strainer, Jet and Rose, 12s. 6d; No 2, 15s 6d; No 3, £1 1s; No 4, £1 5s; No 5, 10s Extra Hose and Union Joints to order To be had of

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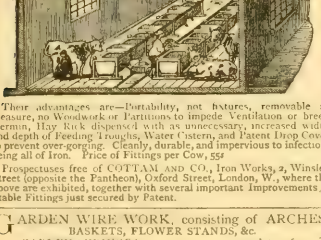

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4 „ „ ..	0	5½	14 „ „ ..	1	2	6
5 „ „ ..	0	6½	15 „ „ ..	1	3	0
6 „ „ ..	0	8	16 „ „ ..	1	3	6
7 „ „ ..	0	10	17 „ „ ..	1	4	0
8 „ „ ..	1	0	18 „ „ ..	1	5	0
9 „ „ ..	1	2	19 „ „ ..	1	6	0
10 „ „ ..	1	4	20 „ „ ..	1	7	0
11 „ „ ..	1	6				

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5 „ „ ..	0	8	10 „ „ ..	1	2	0
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7 „ „ ..	1	1	12 „ „ ..	1	3	0
8 „ „ ..	1	4				

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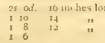

24 inches long ..	2	0d.	16 inches long ..	1	1	4d.
22 „ ..	1	10	14 „ ..	1	1	2
20 „ ..	1	8	12 „ ..	1	2	6
18 „ ..	1	6				

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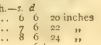

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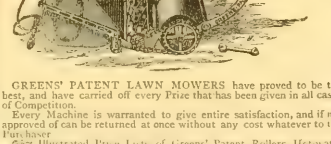

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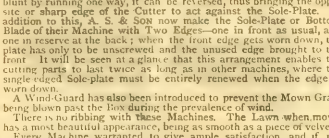

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-Sharpening—that is, with steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single edged Sole-plate must be entirely renewed when the edge is worn down.

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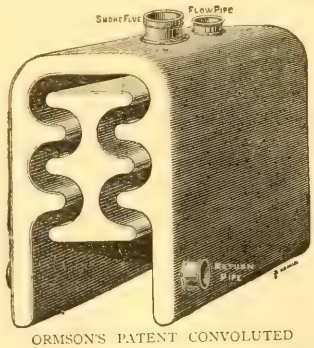

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AND

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No. 38.—1870.] SATURDAY, SEPTEMBER 17. {Price Fivepence. / Stamped Edition, 6d.

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FLOWER SHOW, FRUIT and FLORAL COMMITTEE MEETING, on WEDNESDAY NEXT, September 21, at 11 o'Clock, General Meeting at 3. Band of the Royal Horse Guards at 5.30. Admission 2*s*. 6*d*.

NATIONAL HORTICULTURAL EXHIBITION, 1871.—MAY 27 to JUNE 2.
ONE THOUSAND POUNDS in PRIZES.
To be HELD in the BOTANICAL GARDENS, MANCHESTER.
Botanic Gardens, Manchester. BRUCE FINDLAY.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots. DESCRIPTIVE PRICED LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Roses.

MITCHELL'S renowned ROSES are NOW in FINE BLOOM. The largest stock and the best plants in England. Pilt Down Nurseries, Uckfield, Sussex

Roses.

WM. KNIGHT, of the Floral Nursery, Hailsham, Sussex, begs to announce that his splendid collection of upwards of 20,000 ROSES is NOW in FULL BLOOM. An inspection respectfully solicited.
Also an immense stock of the choicest varieties of ROSES in Pots, for planting out or growing on for pot culture.

Paul's Roses.

WM. PAUL begs to announce that his ROSES are NOW IN BLOOM. All the varieties recently exhibited by him in his "Garden of Roses" at the Crystal Palace, and many other novelties, may be seen.
Inspection respectfully invited. Entrance from the platform, Waltham Station, Great Eastern Railway; half-an-hour's ride from London. PAUL'S Nurseries, Waltham Cross, N.

Paul & Son's Rose Catalogue for 1870 and 1871.

PAUL AND SON'S new ROSE CATALOGUE is now ready. Every care has been taken to insure correct descriptions. Also LISTS of ROSES, on own roots, for present planting. 10,000 disposable.
The "Old" Nurseries, Cheshunt, N.

Dwarf and Standard Roses.

FRANCIS & ARTHUR DICKSON & SONS have an immense Stock of extra strong well grown plants of all the best ROSES in cultivation (including all the new varieties) for Autumn and Spring planting. Also a large stock of strong Trees in pots, which can be be planted out now, at once. Priced Descriptive CATALOGUE sent free by post. Their Roses are unusually fine this season. Inspection respectfully invited. Visitors will please ask for
FRANCIS & ARTHUR DICKSON & SONS, "Upton" Nurseries, Chester, as there is another firm of the same name.

NEW, GENUINE, SELECT, AGRICULTURAL and FLOWER SEEDS. Special prices and advantageous offers on application to
JAMES FAIRHEAD, 7, Borough Market, S.E.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

Improvement of Grass Lands.

SUTTONS' RENOVATING MIXTURE should now be sown. 6 to 12 lb. per acre.
SUTTON AND SONS, Seed Growers, Reading.

To Improve Clover Leys.

SUTTONS' RAPID-GROWING GRASSES and CLOVERS, from 1 to 2 bushels per acre, harrowed in and rolled afterwards, will produce an abundant supply of feed in April and May.
Price 12*s*. per bushel, carriage free.
SUTTON AND SONS, Seedsmen to the Queen, Reading.

SUTTONS' AUTUMN CATALOGUE is now ready, gratis and post free on application.

SUTTONS' FLOWER ROOTS, for Open Ground Cultivation.
Collections .. .. .. 10*s*. 6*d*. | £1 1*s*. | £2 2*s*.
For particulars see page 1244 of this week's *Gardeners' Chronicle*.

SUTTONS' FLOWER ROOTS, for Indoor Cultivation.
Collections .. .. .. 10*s*. 6*d*. | £1 1*s*. | £2 2*s*.
For particulars see page 1244 of this week's *Gardeners' Chronicle*.
SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

Dutch Bulbs.

PAUL AND SON'S Descriptive LIST is now ready. Appended thereto are LISTS of VINES and STRAWBERRIES, both in fine planting condition.
The "Old" Nurseries, Cheshunt, N.

EDWARD TAYLOR, SEED MERCHANT, &c., Malton, Yorkshire, begs to announce the arrival of his first importations of this season's HYACINTH ROOTS, all of first size and quality. CATALOGUES, wholesale and retail, on application.

Dutch Bulbs and Roots, &c.

ANT. ROOZEN'S CATALOGUE of above for 1870 is now ready, and will be sent free on application.
Overveen, near Haarlem, Holland.

Dutch Flower Roots.

THOMAS KENNEDY AND CO.'S CATALOGUE of HYACINTHS, TULIPS, CROCUSES, and other BULBS is now ready, and will be forwarded gratis on application.
Nursery and Seed Establishment, Dumfries, Aug. 31.

Extra Picked Dutch Flower Roots.

J. SCOTT'S Priced Descriptive CATALOGUE of the above, &c., may be had free on application.
J. SCOTT'S WASP DESTROYER.—Certain and immediate destruction. Testimonials on application. See previous Advertisements. Price 12. 6*d*. and 2*s*. 6*d*. per bottle.
J. SCOTT, The Seed Stores, Yeovil, Somerset.

Dutch Flower Roots.

FRANCIS & ARTHUR DICKSON & SONS have received from the most celebrated growers in Holland their first large importation of the above, and have the satisfaction to say that the Bulbs are large, sound, and well ripened. Early orders respectfully solicited. Descriptive CATALOGUE post free on application.
The "Old" Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.
Exotic Nursery, Tooting, Surrey, S.W.

1870.—Bulbous Flower Roots.

JAMES DICKSON AND SONS have a very large and excellent stock of the best and soundest description. Early orders solicited. Priced CATALOGUE on application
(Old Established Nursery and Seed Business), 102, Eastgate Street, and "Newton" Nurseries, Chester.

Hyacinths, Tulips, and other Bulbs.

WM. CUTBUSH AND SON'S importations of the above have just arrived, and have every appearance of being above the average quality, for which they have been noted for many years. CATALOGUES post free.
Highgate Nurseries, London, N.

Gladiolus Brenchleyensis.

JAMES CARTER, DUNNETT AND BEALE beg to announce that they have 150,000 Flowering Bulbs of GLADIOLUS BRENCHLEYENSIS for Sale. Price per 1000 upon application.
JAMES CARTER, DUNNETT AND BEALE, 237 and 238, High Holborn, London, W.C.

For Present Sowing.

HUNT'S SUPERB SWEET WILLIAM, in 25 choice varieties, at 2*s*. 6*d*. per packet, post free.
JAMES HOLDER, Crown Nursery, Reading, Berks.

TULIPS.—700 English Show Tulips, part of the late Mr. Tibbutt's Collection, for SALE cheap. 500 or 300 for £5, at MICHELL'S Nursery, William Street, New North Road, Islington, N.

CENTAUREA RAGUSINA COMPACTA.—The proper time to sow Packets for 1*s*., 2*s*. 6*d*., and 5*s*.
Price to the Trade on application to
C. YOUNG, The Nursery, Balham Hill, S.W.

ORCHIDS.—To be SOLD, a Private Collection of ORCHIDS, belonging to a Gentleman changing his residence. There are about 210 in all, 180 in very good condition, of which about 60 are well grown Specimen Plants, fit for Exhibition.—Dr. INMAN, 12, Rodney Street, Liverpool; or Spital, Cheshire.

TO the TRADE.—SEEDLING HOLLIES. 2-yr. SEEDLING QUICK.
C. WHITEHOUSE, Brereton Nurseries, Rugeley, Staffordshire.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

Transit Agency for Plants, Seeds, &c.

C. J. BLACKITH AND CO., Cox's and Hammond's Quays, Lower Thames Street, London.
Forwarders to all parts of the World.
N.B.—Mr. BLACKITH is sole Survivor of the late Firm of BETHAM AND BLACKITH.

WM. GROOM, Ipswich, is now sending out a set of Seven of his splendid NEW ZONAL PELARGONIUMS. Full particulars, with numerous Illustrations, may be had on application. Price 30*s*. the set. A faithful Illustration, by Andrews, 18 stamps.

WANTED, CUTTINGS of GERANIUMS LUCIUS and MERRIMAC, 250 of each sort. State price to C. BASS, 10, Craven Villas, Ealing, W.

LEWIS WOODTHORPE'S NEW CATALOGUE for AUTUMN, 1870, is now ready, which he will be happy to forward free upon application. It comprises a choice and varied collection of select New Plants of the season, with Lists of Spring-blooming Plants, Roses, Fruit Trees, Seed List, and a general and well grown Nursery Stock.
Munro Nursery, Sible Hedingham, Essex.

EVERY GARDEN REQUISITE KEPT in STOCK at CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London

Vines.

CHARLES TURNER has strong healthy FRUITING CANES of all the leading varieties, new and old, also for planting. LISTS on application.
The Royal Nurseries, Slough.

VINES, VINES, now ready for planting out. DESCRIPTIVE CATALOGUES post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

PEACHES and NECTARINES.—Fine healthy Pyramids, in Pots, each bearing from 12 to 18 good Fruits. Price 7*s*. 6*d*. to 10*s*. 6*d*. each.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

ORCHARD HOUSE TREES.—Just published, a CATALOGUE, with prices, free per post.
THOS. RIVERS AND SON, Nurseries, Sawbridgeworth.

PINE PLANTS.—About thirty good strong healthy Plants to be SOLD. Price on application.
Mr. SMITH, Gardener, Westmill Road, Ware, Herts.

Vines and Strawberries.

FRANCIS R. KINGHORN begs to offer very superior VINES, grown from Eyes, without bottom-heat, comprising all the leading sorts. Fine strong Canes, at 6*d*. to 10*s*. 6*d*. each
STRAWBERRIES, strong, well matured plants, of all the best kinds, in 60-sized pots, or bedded, at 6*d*. to 10*s*. 6*d*. per 100.
Sheen Nursery, Richmond, Surrey.

Strawberries.

G. WALKLING can now supply strong PLANTS of all the leading kinds, at 4*s*. per 1000. Many kinds may be had in 60, 48, and 32 pots, at an additional charge. The Trade supplied.
High Road College Park Nurseries, Lewisham, S.E.

Strawberries.

CHARLES TURNER is now prepared to supply strong plants of all the leading kinds. Many varieties may be had, in small pots, at an additional charge, to insure a crop of fruit next season. Descriptive LIST on application.
The Royal Nurseries, Slough.

Strawberries, &c.

HENRY BAILEY has to offer to the Trade strong and well rooted runners of KEENS' SEEDLING, 15*s*. per 1000. Same variety for forcing, in 48 and 32 sized pots, at 40*s*. per 100. LANCASHIRE LAD, GOOSEBERRY, and RABY CASTLE CURRANT, 40*s*. per 1000.—Royal Nursery, Feltham, W.

Strawberries.

J. HOUSE can with confidence recommend a STRAWBERRY, raised in Scotland, sold under the name of GARIBALDI. It is the earliest and best flavoured, and a prolific cropper, having fruited it three years in the Nursery. It has proved the best for dry seasons and early forcing. Plants 5*s*. per 100; a few in fruiting pots at 10*s*. per dozen.
J. HOUSE, Eastgate Nursery, Peterborough.

WHICH are the BEST SORTS of STRAWBERRY?
The President, first-rate in all points
The Premier, the finest and largest Reds
General Havelock, the finest of all the very earlies.
Plants 1*s*. per dozen, 3*s*. per 100, 20*s*. per 1000. Will be sent to any Station on the Great Eastern Railway, on receipt of cheque or Post Office order on Chadwell Heath Post Office, payable to
ARCHER MOSS, Jun., Chadwell Heath Mills, E.

EDWARD TAYLOR, SEED GROWER and SEED MERCHANT, Malton, Yorkshire, will be glad to quote prices and send samples of CARTER'S PRIZE TURNIP SEEDS, the leading varieties of GARDEN PEAS, and several other sorts of seeds, which he can offer on advantageous terms

New White Mustard Seed.

H. AND F. SHARPE have fine samples of the above, which they can offer to the Trade at low figures. Samples and prices on application.
Seed Growing Establishment, Wisbech

Cabbage Seeds.

H. AND F. SHARPE will be glad to quote special prices to the Trade of all the best sorts of Cabbage Seeds grown last season from the finest selected stocks. Prices very moderate.
Seed-growing Establishment, Wisbech.

For	TRADE MARK.	PEDIGREE	Seed.

GOLDEN DROP RED WHEAT.
Apply to Captain HALLETT, Brighton.

FOR SALE, SEED WHEAT (quite clean), 2108 bushels, the produce of 33 acres, weighing 64 lb. per bushel. A fine selection of prolific Browick Red, grown upon heavy land, thoroughly cultivated by steam power. For nine years artificial manures only have been used. One bushel per acre of this seed, drilled in September, is ample, if the land is in good mechanical condition. Price 6*s*. per bushel, cash.
Mr. JOHN PROUT, Blount's Farm, Sawbridgeworth, Herts.

NEW WINTER TARES.—Samples and lowest quotations on application to
EDWARD TAYLOR, Seed Merchant, Malton, Yorkshire.

NEW WINTER TARES.—Fine samples at low prices, which may be had on application to
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

WINTER TARES, WINTER TARES.—The Subscribers having procured the best possible, are prepared to supply the Trade with any quantity. Samples genuine and pure. Prices and samples free on application to
JOHN B. MCKENZIE AND CO., 29, Patrick Street, Cork.

Sow Now.

TELEGRAPH CUCUMBER.—Packets for 13 or 31 stamps. Price to the Trade on application to
C. YOUNG, The Nursery, Balham Hill, S.W.

DILLISTONE'S EARLY PROLIFIC PEA.—About 19 quarters of this Pea for Sale, by bushel, coomb, or quarter.

BLACK SUFFOLK PIGS.—A Litter, newly weaned, of purest blood. A Single Pig, 25*s*.; Pair, 42*s*.
G. GILBERT, Claxton, Norwich.

JAMES' INTERNATIONAL PRIZE CALCEOLARIA. The Plants of this splendid strain were awarded the 1st prize by the Royal Horticultural Society, at their Spring Show, May 3rd, 1870. Beg to state, as a caution to Purchasers, that we hold the Entire Stock of Seed saved by the Grower, and supplied to us direct. Price per packet, 2s. 6d. and 5s. Prices to the Trade on application.

JAMES CARTER AND CO., The Royal Seedsmen, 237 and 238, High Holborn, London, W.C.

FERNS, carriage free to London or Goole.

1	Adiantum Farleyense	15	Gymnogramma Laucheana gi-
20	,, concinnum	25	,, Tartoni (gantea
25	,, ,, latium	1	,, gigantea, new
20	,, macrophyllum	15	,, peruviana argyrophylla
30	,, scutum	25	,, Wettenhalliana
50	Athyrium Goringianum	50	Pteris argyrea
15	Gymnogramma ochracea	30	,, cretica fol var.
25	,, Laucheana	10	,, tricolor

170 plants for £7 10s

LOUIS VAN HOUTTE, Royal Nursery, Ghent.

ADOLPH STELZNER, NURSERYMAN, Ghent, Belgium, begs to offer the following plants at extra cheap prices :—

ARAUJA SIEBOLDII, extra fine plants, 18s. and 30s. per doz.
,, ,, ARGENTEA, extra fine plants, 30s. per doz.
,, ,, AUREA, extra fine plants, 30s. per doz.
ABIES STICHENSIS, very fine, 2 years' seedlings, 30s. per dozen.
ANTHURIUM SCHERZERIANUM, according to size, 20s., 40s., 80s., 100s. per dozen.
DRACÆNA INDIVISA, var., extra fine plants, 15s. per dozen, 6s. per 100
,, REGINÆ, extra fine plants, £3 and £8 per dozen
,, TERMINALIS, COOPERII, NIGRICANS, STRICTA, &c., 20s. per 100
AZALEA INDICA, fine sorts, fine plants, with flower buds, £1 and £2 per 100
CAMELLIAS, fine sorts, 1 to 1½ foot high, with flower buds, £10 per 100.
,, fine sorts, 2 to 3 feet high, with flower buds, £3 and £8 per doz.
CORYPHA AUSTRALIS, fine 1 and 2 year seedlings, £2 and £4 p. 100.
,, 1 foot high, 30s. per dozen
CHAMÆROPS EXCELSA, fine 2 to 3 year seedlings, £2 per 100
LATANIA BORBONICA, 3 feet and over seedlings, £3 and £5 p. 100
PHŒNIX REVERSA, extra fine plants, 3 feet high, £4 per 100.
SPIRÆA JAPONICA, fine strong, 20s. per 100.

The following FERNS, 5s. per dozen, or £2 per 100 :—Adiantum concinnum, cuneatum, formosum, gracile, hispidulum, A. decorum, A. affine, Cheilanthes hirta, Davallia tenuifolia stricta, Gymnogramma Laucheana, G. Laucheana gigantea, G. Parsoni, G. Wettenhalliana, Doriopteris palmata, Alsophila australis, Pteris serrulata cristata, P. tricolor, P. serrulata variegata, Selaginella involvens, Nephrodium ramosissimum, Lastrea dilatata rubrum, L. erythrosora, Osmunda cinnamomea, Blechnum Lindmanii, Adiantum macrophyllum.

The following FERNS, 4s. per dozen, or 30s. per 100: Pteris cretica fol. var., Pteris nemoralis fol. var., Pteris pedunculosa, new plants, with fine character, Nothochlæna chrysophilla, Osmunda regalis cristata, Nephrodium Filix-mas, N. Goldianum, N. Fortunei, Athyrium Frizelliæ, Lastrea Filix-mas, Lastrea Filix-fœmina, Polystichum cristatum, &c., 4 dozen, Lastrea Filix-fœmina.

ASPIDIUM REVOLVANS, the Yorkshire-wood Fern, very scarce, nice 2-yr. seedlings, £2 per dozen.

ATHYRIUM GOERINGIANUM PICTUM, extra strong, 3-yr plants, 9s. per dozen.
CYATHEA DEALBATA, 24s. per dozen.
BRAUNEA INSIGNIS, 24s. per dozen.
CHEILANTHES PULVERACEA, ADIANTUM CHILENSE, CHEILANTHES DEALBATA, 12s. per dozen.
CIBOTIUM BARINGII, extra extra strong plants, 3 feet and upwards through, 30s. per dozen.

For payment, bills will be drawn after three months date of invoice. References required from unknown correspondents.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, begs to offer the following articles. As will be observed, the prices are extremely moderate :—

DRACÆNA VEITCHII, strong plants, 36s. per dozen.
,, INDIVISA, ditto, 30s. per dozen
,, AUSTRALIS, fine strong plants, 36s. per dozen.
,, DRACO, 18s. per dozen.
,, COOPERII, STRICTA, TERMINALIS, 24s. per doz.
,, ROBUSTA, 30s. per dozen.
PINCENECTITIA CLAUCA, 18s. per dozen.
,, TUBERCULATA, 18s. per dozen.
AGAVE AMERICANA VARIEGATA, 9s. per dozen.
DASYLIRION ACROTRICHE, 18s. per dozen.
,, of sorts, strong plants, 60s. per dozen.
ECHEVERIA, of sorts, 9s. per dozen.
ALOCASIA JENNINGSII, 24s. per dozen.
ANTHURIUM SCHERZERIANUM, nice plants, 60s. per dozen
BEGONIAS, in varieties, 6d. per dozen
CALADIUMS, 12 new varieties, 18s.
CROTONS, in fine named sorts, 24s. per dozen.
GLORIOSA PLANTII, 9s. per dozen
HIBISCUS COOPERII, 9s. per dozen.
MARANTA, in six varieties, 18s. per dozen
PANDANUS UTILIS, 12s. to 18s. per dozen.
PASSIFLORA, in six varieties, 6s. per dozen.
RAVENALA MADAGASCARIENSIS, 24s. per dozen
SIBTHORPIA REGNI, 12s. per dozen
ACHIMENES, 24 varieties, 5s.
GLOXINIA, in fine mixed varieties, 25s. per 100
,, named, 50s. per 100
TYDÆA, 12 new varieties, 9s.
TROPICAL ORCHIDS, 24 distinct sorts, 60s.

FERNS.

DARÆA DIVERSIFOLIA, fine plants, 40s. per 100.
LOMARIA GIBBA, 30s. per 100.
BLECHNUM BRASILIENSIS, 6s. per dozen.
GYMNOGRAMMA PEARCEANA ARGYROPHYLLA, 6s. per doz.
LYGODIUM SCANDENS, strong plants, 18s. per dozen
ADIANTUM CAPILLUS VENERIS, 25s. per 100
SELAGINELLA, fine sorts, 2s. per doz.
ASPLENIUM BELLANGERII, 6s. per dozen.
,, BULBIFERUM, 25s. per 100
,, VIVIPARUM, 9s. per dozen.
CYRTOMIUM FALCATUM, 12s. per dozen.
,, CARYOTIDEUM, 18s. per dozen.
DICTYOGLOSSUM ACUTUM, 30s. per dozen.
GYMNOGRAMMA WETTENHALLIANA, 9s. per dozen.

PALMS.

LATANIA BORBONICA, 30s. per 100; nice plants, 24s. per dozen.
CHAMÆROPS EXCELSA, 100s. per 100.
,, HUMILIS, 6s. to 24s. per dozen.
CORYPHA AUSTRALIS, 45 per 100.
SABAL ADANSONII, 15s. per dozen.
ARECA RUBRA, 18s. per dozen.

INDIAN AZALEAS, with flower buds, £1, £1, £5, to £10 per 100.
CAMELLIAS, with flower buds, £4 to £5 per 100.
,, with flower buds, £6 to £10 per 100.
THEA BOHEA, the Black Tea plant, 12s. per dozen.
SOLANUM CAPSICASTRUM FOLIIS VARIEGATIS, on stems, 12s. per dozen
LIBONIA FLORIBUNDA, 6s. per dozen
EUGENIA UGNI, 9s. per dozen
ILLICIUM RELIGIOSUM, 12s. per dozen.
MAGNOLIA GRANDIFLORA, 9s. to 18s. per dozen.
Hardy RHODODENDRONS, choice named vars., £4 to £10 per 100.
Hardy GHENT AZALEAS, with flower buds, fine named varieties, £5 per 100.
FREE HELIONIES, in 24 choice varieties, 24s. per dozen
Choice and named Herbaceous PÆONIES, 42s. per 100.
12 fine varieties of PHLOX, 6s.
LILIUM LANCIFOLIUM SPECIOSUM, 42s. per 100.
,, AURATUM, 30s. per dozen.
AMPELOPSIS VEITCHII, 9s. per dozen.
AUCUBA, of sorts, 18s. per dozen
CLEMATIS, of sorts, 18s. per dozen.
GYNERIUM ARGENTEUM, strong, 4s. per dozen.
ILEX, of sorts, 12s. to 18s. per dozen
Agents, Messrs. R. SUTHERLAND, 5, Harp Lane, Lower Street, London.

Suttons' Improved Italian Rye-Grass.

The BEST and MOST PRODUCTIVE in CULTIVATION SEPTEMBER is an EXCELLENT MONTH to SOW it; bushels per acre.

SUTTONS' IMPROVED ITALIAN RYE-GRASS has been used with the greatest success at the Sewage Farms of

Aldershot	Croydon	Tunbridge Wells
Barking	Rugby	Warwick
Banbury	Romford	&c., &c.

Special quotations given for large quantities.
All goods carriage free.
SUTTON AND SONS, Seedsmen to the Queen, Reading

LOUIS VAN HOUTTE begs to announce that his ENGLISH CATALOGUE, No. 135 L., was sent out last week to all his Customers.

DUTCH BULBS, of all sorts; HARDY PERENNIALS, HARDY and INDIAN AZALEAS, the extraordinary JAPAN AZALEA (Azalea mollis, in splendid varieties), CAMELLIAS, RHODODENDRONS, &c.

N.B. Several varieties of the Azalea mollis will shortly appear in the triple first Number of FLORE DES SERRES (four triple Nos. for 30s.), containing more than 100 highly Coloured Plates.

The FLORE DES SERRES ET DES JARDINS DE L'EUROPE is a Belgian Periodical, the property of the Advertiser. Eighteen Volumes are ready, containing more than 1900 highly Coloured Plates of the most approved Ornamental Plants. Price of the whole Set, £25 7s. Long terms by mutual agreement.

Royal Nursery, Ghent, Belgium.

Strawberries.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C., have great pleasure to announce that by careful attention during the past exceptionally hot summer, they are enabled to offer strong healthy plants of the most approved kinds, in and out of pots, at reasonable prices. See pages 48 and 49 of their AUTUMN CATALOGUE, which can be had, post free, on application.

VINES.—Strong, well ripened CANES, for fruiting and planting See AUTUMN CATALOGUE, page 50.

CHRYSANTHEMUM.—Large-flowered POMPON and JAPANESE kinds; vigorous plants for Conservatory and Border Decoration, at 6s., 9s., and 12s. per dozen. See AUTUMN CATALOGUE, page 27.

Echeverias.—Special Offer to the Trade.

H. CANNELL has a fine large Stock of the following, viz. :—

ECHEVERIA SECUNDA, 3s. to 5s. per dozen.
,, GLAUCA, 2s. 6d. to 4s. per dozen.
,, PUMILA, 2s. to 3s. 6d. per dozen.
,, ATROPURPUREA, 3s. per dozen.
,, METALLICA, very fine large plants at 2s. 6d. each; smaller ones, 2s. 6d. per dozen; seedlings, 2s. 6d. per dozen.

Alternantheras.—To the Trade.

H. CANNELL has fine Stock Plants, full of cuttings, of the following three varieties, viz. :—AMABILIS, PAPONYCHIOIDES, and MAGNIFICA, 4s. per dozen; smaller, 3s.; single stem plants, 1s. 6d. per dozen; cuttings, 6d. per dozen.

Notice.

H. CANNELL begs to inform all his Friends and Customers that his AUTUMN CATALOGUE is now ready, and will be sent free on application for one stamp. It contains a list of all the new and best older varieties in cultivation, viz., Achyranthemums, Chrysanthemums, Coleus, Fuchsias, Geraniums, Lobelias, Penstemons, Verbenas, Verbenicas, Violas, &c. List of seedlings at the very lowest possible price consistent with quality.

Geranium Cuttings.

H. CANNELL begs to inform all who wish to improve their collection of GERANIUMS, in either of the following classes—ZONALS, for pots; ditto, bedding; also DOUBLE ZONALS and GOLDEN, BRONZE, and SILVER-EDGED VARIETIES—that he has a great quantity of all the best in cultivation.

Also nearly all the BEDDING PLANTS that are now so much admired in the London Parks, either as Stock Plants or Cuttings. A Catalogue, with full particulars, sent free for one stamp.

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich, S.E.

Now Ready, Gratis and Post Free,

ILLUSTRATED AUTUMN CATALOGUE

OF

DUTCH BULBS,

SEEDS, FRUIT TREES, FERNS,

FERN CASES, and other HORTICULTURAL DECORATIONS,

GARDEN REQUISITES, &c.

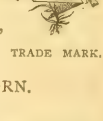

TRADE MARK.

DICK RADCLYFFE AND CO., 129, HIGH HOLBORN.

SEED GROUNDS, ERFURT, PRUSSIA.

PAUL'S HYACINTHS, TULIPS, &c.

"Mr. W. Paul's Hyacinths * * * * with grand solid spikes, such as are rarely seen at any show and in any season."—*Journal of Horticulture.*

"A remarkably fine display of Hyacinths."—*Gardeners' Chronicle.*

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

HYACINTHS, TULIPS, CROCUSES, and other DUTCH FLOWER ROOTS

Have arrived in excellent condition, and he respectfully solicits early Orders for the same.

In proof of the quality of Bulbs imported by him, he begs to refer to his Annual Exhibition in the Royal Horticultural Gardens in March and April, which has been visited by Her Most Gracious Majesty the Queen, Her Royal Highness the Princess of Wales, and several other Members of the Royal Family.

PRICED DESCRIPTIVE CATALOGUE Free by Post.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

SEED CORN.

CARTER'S PRIZE "NURSERY" STOCKS.

We can strongly recommend the following stocks of WHEAT, BARLEY, and OATS, as being of very pure quality, and selected from samples that have taken First-class Prizes.

The greatest care has been bestowed upon the crops during growth, by hand-weeding, &c., to ensure the choicest quality; and as we hold but a limited quantity, early orders are necessary to ensure a supply.

WHEAT.		BARLEY.		OATS.	
Sheriff's Bearded White	Price on application	Carter's Prize Long-eared	Price on application	Waterloo	Price on application.
Talavera White		Carter's Excelsior		Canadian	
Tenton White		Brewer's Delight		Tartary	
Chiltern White		Chevalier		Poland	
Lammas Red				Normandy	
Browick Red				Winter	
Pedigree Red					

We shall be pleased to supply any varieties not named above.

Lowest price per bushel or quarter on application.

Every precaution is taken when threshing to keep the stocks pure, but as the Corn must pass through the machine, we cannot undertake any guarantee as to the samples being unmixed.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

Vines, Extra Strong Fruiting, &c.

FRANCIS & ARTHUR DICKSON & SONS have this season a splendid lot of VINES, grown from eyes, without bottom heat, in extra strong short jointed Fruiting Canes; as also fine Canes for planting. Their Collection includes all the new and leading varieties, and the plants are really first-class. Inspection respectfully invited. If this is inconvenient, specimen plants can be sent.

Priced Descriptive LIST sent free by post.

The "Trade" Nurseries, CHESTER.

To the Trade.

LOMARIA GIBBA, beautiful plants, in 48's and 32's, by the dozen or hundred; FANDANUS UTILIS, from 7s 6d up to 60s each, DRACÆNA AUSTRALIS, from 5s up to 7s 6d each; ADIANTUMS, in varieties, from 6s to 12s per dozen; FERNS SERRULATA, 6s to 9s; GYMNOGRAMMA CHRYSOPHYLLA, 9s per dozen; DRACÆNA COOPERII, STRICTA, NOBILIS, PENDULA, and RUBRA, equally cheap.

E. HAWKINS, 80, Bishop's Road, W.; and Oaklands Nursery, Shepherd's Bush, W.

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass by the Steps[illegible] over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.

Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES and all particulars on application.

JAMES DICKSON and SONS, "Newton" Nurseries, Chester.

To Nurserymen and Gardeners.

THE LOCAL BOARD of HEALTH of KINGSTON-UPON-HULL are desirous to receive TENDERS for about 512 LIME TREES and 140 ORIENTAL PLANE TREES, suitable for an Avenue. The Trees to be clean grown, and from 12 to 15 feet high, and to have been removed within the[illegible] months.

Tenders to state the price per tree, including proper packing and delivery at the Railway Station, Hull, in quantities of not less than 100, also where the Trees may be seen before removal.

Tenders, endorsed "Tender for Trees," are to be addressed to the Chairman of the Town's Improvement Committee, and forwarded under cover to C. S. Todd, Esq., the Law Clerk to the Board, Town Hall, Hull, on or before MONDAY, September 26, 1870.

The Board do not bind themselves to accept the lowest or any Tender.—By order, EDWARD MARR, Surveyor to the Board.

Surveyor's Office, Town Hall, Hull, September 8, 1870.

HARRIET SCOTT, late STEPHEN SCOTT, Wood Broker to the Crystal Palace Company, Woodside, Croydon, Dealer in all kinds of Garden Materials for garden use, including the following:—SILVER SAND, KENT PEAT, LOAM, GARDEN MOULD, BIRCH and HEATH BROOMS, WATTLES, HURDLES, GARDEN STICKS, TARRED TWINE, FIREWOOD, &c RUSTIC LOGS and PEAT, suitable for Ferneries, &c

A Price List sent on application.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent of Soluble Biphosphates, 5 to 7 per cent of Ammonia, and 15 per cent of Alkaline Salts. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.

REES and CO.'S Biphosphated Peruvian Guano Company (Limited), 32, Leven, William Street, Limehouse, E.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.

"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined is remarkably free from moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more general this manure will become known by agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,

Signed) "AUGUSTUS VOELCKER.

"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—

WHEAT MANURE, strongly recommended for Autumn Sowing.

DISSOLVED BONES, Superior Dressing Pasture Lands.

PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.

Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.

116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.

ODAMS'S DISSOLVED BONES.

ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited).

Chief Offices, 109, Fenchurch Street, London, E.C.

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This Company was originally formed by, and is under the direction of, Agriculturists, or country gentlemen, and is managed for their benefit, viz.,

"THE TENANT-FARMERS' MANURE COMPANY."

Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company, and hence the consumer has the best guarantee for the efficacy of the Manures.

Particulars will be forwarded on application to the Secretary, or may be had of the local Agents. C. MACNAY, Secretary.

Chief Offices—109, Fenchurch Street, London, E.C.

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.

Sold by Nurserymen, Seedsmen, and Florists,

In Tins at 1s., 2s 6d., and 5s.

Powder Distributors, 2s 6d and 3s 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—LEO EXLEY, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868

Sole Manufacturer, T. A. POOLEY Bonded Warehouse, Sussex Wharf, Wapping, E.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s 6d; ½ cwt., 21s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.

JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1s. per lb., 8½ per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 10s per gallon.

SILVER SAND, of the finest quality, for Horticultural purposes, at 20s per ton; smaller packages 6d. per cwt.

WM. RUSHFORTH, Seed Merchant and Nurseryman, Leeds.

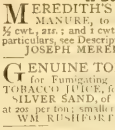

MEDICATED TOBACCO PAPER. The above is vastly superior to the ordinary Tobacco Paper, and much more economical. One fume effectually destroys the whole family of aphides, and two fumes in quick succession will annihilate Thrip. Price 1s 8d. per lb; hampers containing 56 lb delivered carriage free to any railway station in England, Scotland, or Wales, or to any seaport in Ireland.

CAUTION.—A very inferior and totally different article is being offered under the same name

JAMES DICKSON and SONS, "Newton" Nurseries, Chester

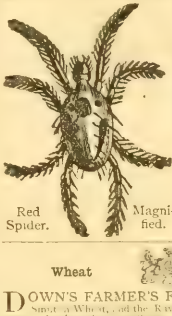

Red Spider. Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.

Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.

Wholesale by

PRICE'S PATENT CANDLE COMPANY (Limited),

Battersea, London, S.W.

Wheat Sowing.

DOWN'S FARMER'S FRIEND, for Preventing the Smut in Wheat, and the Ravages of the Slug, Grub, and Wire worm. A 5d packet is sufficient for 8½ Bushels of Seed Wheat, which can be dressed and fit to sow in a quarter of an hour.

Testimonials from the largest Wheat Growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed in every district.

Full directions for use are given with each packet

Prepared at the Manufactory, Wburn, Beds

CAUTION.—Incorrect and dangerous Imitations, and consequent disappointment, are to be avoided by observing that the signature of HENRY DOWN is on the label

Agents in every Town throughout England, Scotland, and Ireland.

The Noted French Cold Grafting Wax

(MASTIC LHOMME LEFORT),

For Grafting, Budding, Healing, &c., may be obtained of

HOOPER and CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsman and Nurseryman.

Horticultural and Window Glass Warehouses.

JAMES MILES, 6, High Street, and 12 and 13, Blossom Street, Shoreditch, London, E.

CONSERVATORY and ORCHARD-HOUSE GLASS.

Genuine White Lead, Oils, Colours, Brushes, &c.

GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNECTIONS, &c.

Prices upon application

CONSERVATORY BASKETS.

Strained Wire Espalier Tranners for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vine Baskets, with stem and prongs for placing in any position, on the lawn, round garden windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Minton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

R. HOLLIDAY, Horticultural and *Floral* Wire Works, 2a, Portobello Terrace, Notting Hill Gate, London, W.

Illustrated Catalogues of the above on application.

THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT FLOWER PACKING CASE, and MEMORIES of PARLIAMENT, FAMILIES, and TOURISTS' SEASIDE COMPANION.

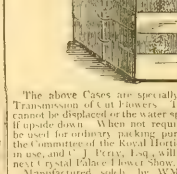

The above Cases are specially contrived for the Exhibition and Transmission of Cut Flowers. The flowers are packed in water, and cannot be displaced or the water spilled, if placed in any position, even if upside down. When not required for conveying flowers, they can be used for ordinary packing purposes. It has been pronounced by the Committee of the Royal Horticultural Society as the best case now in use, and Penny Royal will exhibit his flowers in them at the next Crystal Palace Flower Show.

Manufactured solely by WM. EASSIE and CO. (LIMITED), Gloucester, who will forward Lists of Agents and Prices on application.

COLOURED SHELL GRAVEL, for Gardens, Conservatories, and Terraces, presenting a very novel appearance, and of a mottled roan colour; also the natural SHELL GRAVEL, as used in Horticultural and Botanic Gardens. Sold by

FRANCIS and CO., Surrey foot of Vauxhall Bridge, London, S.E.

THE GRANITIC PAINT, the best for the finest painting, and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.

394, King William Street, London Bridge, London, E.C.

DAMP WALLS PREVENTED by the use of the SILICATE ZOFISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.

30A, King William Street, London Bridge, London, E.C.

PATENT WATER BRINGER

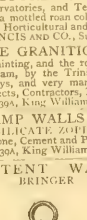

THE HYDRONETTE (ROBIN'S PATENT),

HAYNES and SONS' PATENT WATER BRINGER, PRICE 21s.

This simple Machine will draw water from a pool or well not over 30 feet below the level of garden, and 100 feet over the surface, with the Hydronette or any other Garden Engine.

For Gardens, Greenhouses, Conservatories, Verandahs, Washing Windows, Carriages, &c.

Unrivalled ease of action, simplicity of construction, and force.

THE HYDRONETTE is a more useful, easy-working, reliable, and convenient water-throwing machine than any other in use. It is made in five sizes, viz.:—No 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12s. 6d No. 2, 15s. 6d.; No. 3, £1 1s No. 4, £1 6s.; No. 5, £1 10s. Extra Hose and Union Joints to order. To be had of

HAYNES and SONS, 227, 229, and 231, Edgware Road, W.

CAUTION.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

Caution to Gardeners.—When you ask for SAYNOR and COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe their mark, SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make; all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years

JAMES PHILLIPS and CO. beg to submit their prices as follows:—

GLASS for ORCHID HOUSES,

As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom

Each Box contains 100 feet. The prices only apply to the sizes stated Squares 20 by 12, 20 by 11, 20 by 14, 20 by 15.

	10 oz to the foot.	21 oz.
Fourth quality	15s 0d	10s 6d.
Third quality	16s 0d	22s 6d
Seconds	18s 0d	26s. 0d.
Ringlass	21s 0d	27s. 0d.

The above prices include the boxes, which are not returnable.

HORTICULTURAL GLASS.

Stock sizes, 16-oz., in 100 feet boxes, boxes included.

These prices only apply to the sizes stated.

	ghs.		yrds	2nd
11 by 9	12 by 9	14 by 9	*s. d.*	*s. d*
12 by 10	13 by 10	14 by 10	15 by 10 } 13 6	15 6 17 0
13 by 11	14 by 11			
14 by 12	15 by 11	15 by 11	16 by 11	
15 by 12	19 by 12	16 by 12	17 by 12	
16 by 13	17 by 13	20 by 12	..	
10 by 14	20 by 13	18 by 13	..	15 0 16 0 18 6
	17 by 14	18 by 14	..	16 to 17 0/ to the foot
	20 by 14			

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	6½ by 4½	7 by 5	7½ by 5½ } .. 12s. 6d.
8 by 6	8½ by 6½	9 by 7	9½ by 7½ }
		10 by 8	10½ by 8½ .. 13s. 6d.

Boxes 2s. each, returnable at full price.

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, CROUGHED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

JAS. PHILLIPS and CO., 180, Bishopsgate Street Without, E.C.

Kosher's Garden Edging Tiles.

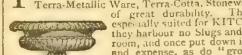

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra Cotta, Stoneware, and Redware, and of great durability. The planer sorts are especially suited for KITCHEN GARDENS, as they harbour no worms, insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

ORNAMENTAL VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F. & G. KOSHER, Manufactured Stone Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection

WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Improved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.

To be obtained of F. & G. KOSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—

1s. 14s per Ton, 2s. 2d. per Bushel; 2s per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained sand 4s. per Ton more. Samples of Sand by post on receipt of Stamp

PEATS and RUSTIC WORK for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates

FLINTS and RUBBLE for Foundations see above

F. & G. KOSHER

N.B. Orders promptly executed by Railway or Vessel.

A liberal discount to the Trade

Spring Flowering Bulbs.

BUTLER, McCULLOCH, AND CO.'S COLLECTION of CHOICE ROOTS for Greenhouse or Flower Garden Decoration, sent carriage paid. Non-barge for packages.

FOR CONSERVATORY

No. 1.	No. 2.	No. 3	No. 4	No. 5	No. 6
105s.	50s.	25s.	21s.	15s.	10s. 6d.

FOR FLOWER GARDEN

No. 7	No. 8	No. 9.	No. 10	No. 11	No. 12
100s.	60s.	30s.	25s.	21s.	10s. 6d.

FOR GREENHOUSE and FLOWER GARDEN.

No. 13	No. 14	No. 15	No. 16	No. 17	No. 18
105s.	52s. 6d.	42s.	21s.	15s.	10s. 6d.

CATALOGUE, containing details, post free.

5 per cent. allowed for cash.

BUTLER, McCULLOCH, AND CO., 27, South Row, Covent Garden, London, W.C. Established upwards of a century.

Dutch Flower Roots.

DOWNIE, LAIRD, AND LAING, have now received their second importation of FLOWER ROOTS, consisting of—

HYACINTHS, POLYANTHUS NARCISSUS, DOUBLE NARCISSUS, CROCUS, TULIPS, IONQUILS, RANUNCULUS, ANEMONES, SNOWFLAKES, &c., &c.,

which have all been carefully selected from the most celebrated Establishments in Holland.

The Bulbs have arrived in splendid condition, being unusually well ripened, very large, and exceedingly heavy.

D. L. & Co. can supply fine Bulbs of the PRIZE HYACINTHS at Kensington, Regent's Park, Crystal Palace, and Royal Caledonian Society's Shows, at 12s., 15s., and 24s. per dozen.

Descriptive CATALOGUES of DUTCH BULBS forwarded post free.

Stanstead Park Nurseries, Forest Hill, S.E.; and Edinburgh, N.B.

Dutch Bulbs and other Flower Roots.

CHARLES TURNER has just received his first importation of BULBS, which are unusually fine, and in the best possible condition for immediate orders. If the selection is left to C. T. entirely, they will be supplied at the following low prices, in fine variety:—

HYACINTHS, best kinds for glasses or pot culture, 6s. to 18s. per doz.
" mixed, for beds or borders, 3s. 6d. per dozen; 25s. per 100.
(In ordering Hyacinths, it should be stated whether Single or Double are preferred.)
TULIPS, Early Single, 6s. to 15s. p. 100. } Can be supplied by the dozen
" Double, 6s. to 15s. per 100. } at proportionate prices.
" Van Thol, 9d. per dozen; 5s. per 100.
NARCISSUS, 1s. 6d. to 3s. 6d. per dozen
JONQUILS, 2s. 6d. to 4s. 6d. per dozen
SNOWDROPS, Single, 2s. 6d. per 100; Double, 3s. 6d. per 100
CROCUS, in large variety, 2s. 6d. to 4s. 6d. per 100
ANEMONES, and other Bulbs for the season, at equally low prices.
LILIUM AURATUM, extra strong flowering bulbs, 2s. 6d. to 7s. 6d. each.
LILY OF THE VALLEY, imported clumps, 18s. per dozen
SPIRÆA JAPONICA, 15s. and 18s. per dozen.
Descriptive CATALOGUE on application.
Also CATALOGUE of Auriculas, Azaleas, Carnations, Chrysanthemums (large), Chrysanthemums (Pompon), Cinerarias, Pelargoniums (in 12 classes), Picotees, Pinks, and Roses; as well as a Descriptive CATALOGUE of Strawberries, Fruit Trees, &c.
The Royal Nurseries, Slough.

Selaginella Californica.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, has much pleasure in offering a few strong plants of the above new and distinct species of SELAGINELLA from California, as it is stated to be hardy. Price 21s. each.

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The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.

The Crystal Palace International Show, Crystal Palace, First-class Certificate, May 21, 1870.

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

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Polyanthus Narcissus, 6 in 6 varieties	" Rex rubrorum, 3
Jonquils, sweet scented, 12	" La Candeur, 3
Crocus, finest named, 50	" Royal Standard, 3
Dielytra spectabilis, 1	" Yellow Prince, 6
Lilium speciosum, 1	" Rose Blanche, 3
Scilla sibirica, 6	" Duc Van Thol, 6
Snowdrops, extra large selected, 24	Amaryllis formosissimus, 1
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Hyacinths, 12 in 12 extra fine named sorts for pots or glasses	Scilla Belgica, mixed, 12
" 12 in 3 colours for bedding	Crocus, blue, 25
Narcissus, double, white, 12	" striped, 75
" Poeticus (Pheasant's eye), 12	" large yellow, 75
Tulips, extra fine mixed, 30	" white, 75
" Tournesol, 6	Anemone, extra fine mixed, 36
" Duc Van Thol, 6	Gladiolus Brenchleyensis, 8
" Royal Standard, 3	Iris, extra choice mixed English, 12
" Rex rubrorum, 3	" extra fine mixed Spanish, 12
Double Daffodils, 12	Jonquils, Campernelle, 12
Star of Bethlehem, 12	Ranunculus, extra fine mixed, 36
	Snowdrops, 50

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COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, comprises—

Hyacinths, 12 in 12 colours	Crocus, blue, 25
Narcissus, double, white, 12	" striped, 50
" Poeticus (Pheasant's eye), 12	" large yellow, 50
Double Daffodils, 12	" white, 50
Tulips, extra fine mixed, double, 12	Anemone, extra fine mixed, 24
" extra fine mixed, single, 12	Gladiolus Brenchleyensis, 6
" extra fine mixed, late, 12	Iris, extra choice mixed English, 12
" Duc Van Thol, 12	" extra fine mixed Spanish, 12
Polyanthus Narcissus, fine named, 6	Lilium candidum, 3
Campernelle Jonquils, 6	" tigrinum, 3
Star of Bethlehem, 12	Ranunculus, extra fine mixed, 24
Triteleia uniflora, 6	Snowdrops, 50
Dog's-tooth Violets, 6	Winter Aconites, 24

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JAMES CARTER AND CO. can strongly recommend TRIFOLIUM INCARNATUM (Italian Crimson Clover) as a substitute for the Clover crop. The seed may be sown at once upon lands where the Clover crop has failed, and will be certain to produce a valuable sward for consumption in May and June.

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And other Seeds for Autumn Sowing.

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SEEDSMEN TO THE QUEEN,
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CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

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24 fine mixed Border Hyacinths	12 fine mixed Gladiolus
12 " Polyanthus Narcissus	25 The Due Van Thol Tulips
25 Pheasant's eye Narcissus	12 mixed Single Early Tulips
25 Double White Narcissus	12 fine mixed Double Tulips
50 Double Daffodils	12 " Parrot Tulips
12 large Campernelle Jonquils	12 Gesneriana Tulips
100 fine mixed Double Ranunculus	50 fine mixed Tulips
100 Superfine Turban Ranunculus	12 " " English Iris
25 fine mixed Double Anemones	12 " " Spanish Iris
25 " Single Anemones	6 Lilies, of sorts
300 Crocus, in 6 sorts	6 Perraria Pavonia
100 Snowdrops	12 Dog's-tooth Violets
50 Winter Aconites	6 Crown Imperials

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6 " Polyanthus Narcissus	12 The Due Van Thol Tulips
12 Pheasant's eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 " Parrot Tulips
6 large Campernelle Jonquils	6 Gesneriana Tulips
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 " Superfine Turban Ranunculus	6 " " English Iris
12 fine mixed Double Anemones	6 " " Spanish Iris
12 " Single Anemones	3 Lilies, of sorts
150 Crocus, 3 sorts	3 Perraria Pavonia
50 Snowdrops	6 Dog's-tooth Violets
25 Winter Aconites	3 Crown Imperials

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24 fine Hyacinths, by name	6 Persian Iris
12 fine Miniature Hyacinths, do.	6 Peacock Iris
12 Polyanthus Narcissus, do.	100 Crocus, by name
6 large Double Jonquils	12 choice Ixias, by name
12 Single sweet-scented Jonquils	6 choice Sparaxis, by name
12 Scilla præcox	1 Cyclamen persicum
12 Single Due Van Thol Tulips	1 Tropæolum tricolor
12 Double Tournesol Tulips	2 Lilium lanceifolium album
50 Early Tulips, 10 sorts	2 " " rubrum

Sutton's £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, by name	3 Persian Iris
6 Miniature Hyacinths, by name	50 fine Crocus, by name
6 Polyanthus Narcissus, do.	6 choice Ixias
6 Single Sweet Jonquils	3 choice Sparaxis
6 Scilla præcox	3 choice Oxalis
6 Single Due Van Thol Tulips	1 Tropæolum tricolor
6 Double Tournesol Tulips	1 Lilium lanceifolium album
25 Early Tulips, 5 sorts	1 " " rubrum
3 Persian Iris	

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For Indoor Cultivation, contains a choice assortment of most useful and showy kinds.

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JOHN CRANSTON obtained during the past season the large number of 21 First and Ten Second Prizes for ROSES, exhibited at the principal Rose Shows throughout the kingdom. It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.

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NEW FORCING GERANIUMS.—We now offer and strongly recommend the two undernamed Geraniums, as distinct and superior to other similar kinds, and have no doubt they will give the same satisfaction that Mrs. Lewis Loyd and Mrs. Bradshaw gave when sent out by us

KINGSTON BEAUTY—French white, with deep violet blotch on each petal; great bloomer. 5s.

MARKSMAN—Rosy lilac, with maroon blotch on each petal; great bloomer, of very dwarf habit. 5s.

T. JACKSON & SON, Nurseries, Kingston-on-Thames.

The Gardeners' Chronicle

SATURDAY, SEPTEMBER 17, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, Sept. 21 { Royal Horticultural Fruit and Floral Committee, at S. Kensington .. 11 A.M. / Ditto (General Meeting) .. .. .. 3 P.M.

IN speaking of the British Museum the other day, we expressed a hope that, before the natural history collections shall have been transferred into the buildings about to be built to receive them, the Government would take the mode of management of the Institution into consideration; and if they find that its government by trustees is not the mode best adapted for the purpose (as there is no doubt they must), that they would bring that system to an end—that they would define the mission and object of the collection, and put the whole on the best footing for carrying these into effect. It may be useful if we try to define its mission ourselves, and to see how far it has been fulfilled in the past, and how it may best be so in the future.

Whatever it may have been in its early days, the mission of the Museum is in ours, undoubtedly, the instruction of the people. Starting, no doubt, as a collection of curiosities, whose practical object was relaxation, *i. e.*, to interest and amuse, with little thought of instruction, it is long since it has reversed the order and placed instruction as the main object, entertainment as the accessory. This is right, both practically and theoretically. Its principal means of instruction are the proper display of its stores to the general public, and the provision of material for study and instruction for scientific men and authors, who digest the information, and by-and-by restore it to the public in their works. A third important means is the communicating and contributing material from its larger stores to other collections throughout the country. How has the Museum fulfilled these duties? How far has it directly contributed to the information of the mass of the people by the display of its costly treasures? It has provided a raree-show of ill-stuffed animals—an indigest crowd of birds, shells, and fossils, without landmark, guidance, or light to tell what the arrangement means, or any information about the objects exhibited, other than their locality, and that their name is something in Latin. The scientific man may (or may not) want no more, but to the non-scientific what is the value of such information? Labels are the keystone of all collections—without labels their value is little more than that of a Chinese puzzle. Even the poor, sentimental gatherer of scraps with associations cannot do without his labels—they are the story that gives the value to his mute records: one bit of granite is as good as another until his label tells you that his bit comes from Pompey's Pillar—one dried Forget-me-not as another, until his label tells you that his is from Waterloo—one bit of rotten wood as another, until we learn from his label that his bit is from Herne's Oak, or "Alloway's haunted kirk." The proper making of labels, level not to say to the capacity but to the degree of previous knowledge of uninstructed people, is the great difficulty in all museums, and requires a great deal of pains and a good lot of brains. Look what absurd pedantic vagaries are played in this way in the well intentioned attempts at instruction in our public parks. By way of making it clear to the mind of the visitors that a plant is an Oak or an Apple, they are told that it is a cupuliferous or a pomaceous tree. The making of labels is a science in itself. It is the compression of the strongest essence (*i. e.*, essentials) of knowledge into the smallest space and in the clearest words; but it is an undeveloped science. We have no professors of labels; nothing has been done in this line in the British Museum, neither has anything been done in the way of illustrative diagrams or drawings of small objects, and yet without these everything that is small, everything that is physiological, everything that is not external, must be abandoned as inexplicable.

The authorities of the South Kensington Museum have for long been alive to the importance of these aids to instruction, and, although plenty of room for improvement still remains even there, good service has been done by their example. For the general public it is manifest that this ought to form a very large and important part of any attempt at instruction.

The next help to the general instruction in natural history which the nation might expect to draw from a great central museum like the British Museum, is the communication and sharing of their specimens with less fortunate towns in the provinces. The South Kensington Museum has circulating art collections, which have been found of the greatest use. Why should not the National Natural History Museum have circulating natural history collections? and why should it not have a store supply of material from which to assist in furnishing properly named specimens to those places—towns, villages, or parishes—which have accommodation and apparatus and means for displaying them? This opens a very wide and novel field, which our space will not allow us to do more than hint at. Nothing whatever has been done, or, so far as we know, thought of, in that direction; but it is plain that it is only following out the impulse which has been given to general education, and we feel sure that it will not be long before something of this sort will be sought for by the most purely abstract educationists as a means of bringing the minds of the difficult-to-teach within the scope of their skill. There is nothing like the works of Nature for awakening an interest, and arousing the dormant faculties of the mind; and this is now well known to our most accomplished teachers, and acted upon in our best and highest schools. With such a system would arise the necessity of helps of another kind, which would react to the advantage of the Museum itself and of natural science. Collections of duplicates would require to be formed—our naval officers and foreign dependencies would be encouraged to supply these, and ships might be sent more frequently to particular stations for material and information, for lack of which men of science cannot complete their investigations or prosecute their researches satisfactorily; and by that means material would be obtained which would enable the Museum to complete its desiderata either directly or by interchange with other similar establishments in other countries.

The last, and most powerful perhaps, although the least direct mode in which a great national natural history collection can contribute to the instruction of the people, is by the facilities which it gives, or should give, to authors and men of science to obtain information from its contents, which they elaborate and return to the nation in the form of works on the subject. To this branch of its duty the Museum has always been alive, and its officers have always performed it with hearty zeal and good-will, and yet this, on which we should hear the fewest, is the very point on which we hear the most numerous complaints. The other points have been neglected, or wholly ignored, and we hear no complaints; but here, where, so far as the work is done at all, it is done well, the complaints are grievous. The explanation is, that where the duty is ignored both the Museum and the public have got into the way of thinking that the duty is not a duty. The Museum thinks that its mission stops at putting a stuffed skin with a Latin name before the public. There is the thing, find it out if you can. It does not yet recognise that it has to try to teach the public anything—to knock anything into its head. Whereas, with the scientific man it has always been recognised as a part of the Museum duty to show specimens and give information when asked. But of course the information to be got is limited to that possessed by the officer. Each man has, most properly, only one department. If you go for information out of their department you can get none; and there are many departments which have no officer that knows the subject. Crustaceans, flies, moths, bugs, &c., all immense subjects, are in this category; and to make matters worse, the trustees have a law—which they seem to suppose useful, for they retain it in spite of remonstrance—that no assistant shall be appointed who is above 25 years of age. Those who have of late years been appointed are rising naturalists, who promise in course of years to attain distinction; but surely at the great national museum it is not too much to demand that the post of consulting naturalist in any department should be filled by a risen naturalist—not a rising one. Neither, we hope, is it an unreasonable demand that there should be at least one officer told off for each department, independent of whatever staff may be necessary to keep the collection at the level of the day.

These things have not been sufficiently thought about; but these things ought to be thought about; and we trust that they will receive a good deal more thought than they have hitherto received from those who are interested in them, and from those of HER MAJESTY'S Government whose duty it is to decide on such matters.

As is well remarked by a correspondent at p. 1186, many of the everyday operations of the gardener depend on the assumption that the LEAVES of plants ABSORB MOISTURE directly from the atmosphere. But this assumption, if it be intended to apply to the absorption of watery vapour, is at variance with the results of most of the experiments that have been made to determine this point. We have recently (p. 1147) alluded to some experiments of M. PRILLIEUX, which go to show that when leaves, flaccid from undue evaporation, are suspended in moist air, they recover their freshness though they do not gain in weight; hence the inference is drawn that the renewed turgescence of the leaves is due, not to the absorption of vapour, but to the transference of fluids from one portion of the branch to another. These experiments of M. PRILLIEUX were suggested by some previous ones made at various times by M. DUCHARTRE, and to which we alluded at the time of their publication, but which it seems desirable again to bring under notice. M. DUCHARTRE'S experiments were made for the most part on Epiphytes—such as Orchids, Bromeliads, and Commelynads—plants having no direct communication with the soil, and which yet, on chemical analysis, are found to contain potash, soda, alumina, and other ingredients, such as plants whose roots grow in the earth derive from that medium. If these plants derive their sustenance from the moist vapour by which they are surrounded, it is difficult to conceive how they could procure the materials we have just alluded to. But if it be admitted that they absorb not aqueous vapour, but water itself, provided by the deposition of dew or the fall of rain, we can at once account for the possession of these inorganic materials. To ascertain how far this conclusion was just, M. DUCHARTRE placed several of these Epiphytes, provided with their aërial roots, in closed vessels filled with moist vapour; the result was in all cases, as in the experiments of M. PRILLIEUX before alluded to, that the plants lost weight. If, however, from any cause the plants came in contact with liquid water, it was absorbed readily, as indicated by the greater weight of the plants and the disappearance of the water.

Pursuing these experiments still further, M. DUCHARTRE took some plants of Tillandsia dianthoidea—a plant which lives for a time unattached to any tree, and which does not produce roots. This plant in the West Indies and in some parts of South America is simply hung from the balconies or the verandahs of the houses, where it grows and produces flowers without producing a root, and without contact with the soil, being literally an "air plant." Now here is a plant which one would think must derive benefit from the aqueous vapour by which it is surrounded. To ascertain whether this be so or not, M. DUCHARTRE took two plants, attached them to pieces of dry cork of the same

weight by means of soft wire, which also served to keep in place a small quantity of dry Sphagnum which was wrapped round the base of the stem. It is not necessary to give the details of these experiments, which may be read in the volume of the Journal of the Imperial and Central Horticultural Society of France, 1868, pp. 546—556. Suffice it to say that the plants, though surrounded by moist vapour, lost weight when not supplied with water in a liquid condition. On the other hand, whenever the base of the stem was placed in water, absorption took place, and the plant rapidly and markedly increased in weight. All the time no water was supplied, the plants lived on their own resources, and doubtless under these circumstances they had the power of regulating the amount of evaporation, and thus of prolonging their vitality longer than would otherwise have been possible.

It will be observed in this case that it is the base of the stem which is stated to be the active agent in absorbing water. It acted as a root would do under like circumstances. Not a word is said as to the influence of the leaves in absorbing water. Indeed, contrary to all anticipation, the direct results of experiments go to show that leaves do not absorb water to any extent, either in a liquid or gaseous form, except they be absolutely plunged in liquid water for some time, when they absorb considerable quantities. The absorption of water, indeed, is prevented by the structure of the epidermis, often so thickly clothed with hairs, or so fully provided with a waxy bloom-like secretion that contact with water becomes difficult. It comes then to this, that a withered plant recovers its freshness, not by any absorption of watery vapour, scarcely by any imbibition of water itself, but chiefly by the transport of water from one part of the plant, where it is not wanted, to another, where it is more serviceable. At the same time it must be remembered that very potent aid is given to the plant in its attempts to recover itself by the circumstance that evaporation from its surface is stopped by the moist air surrounding the plant.

One circumstance has been pointed out to us, which is well worth further investigation. In all the experiments we have alluded to, it is inferred that no absorption has taken place, when a plant was surrounded with air saturated with moisture, because the weight of the plant was not increased under such circumstances; but it does not appear to have been remembered that the density of aqueous vapour is very much less than that of dry air. If the latter be estimated at 1000 that of aqueous vapour is 625 only, a circumstance that ought to be taken into consideration in such experiments as those to which we have been alluding.

—— Referring to the great interest attaching to the town of Liverpool, in which the British Association is now holding its annual meeting, the *Athenæum* of last week has an excellent article devoted to the history of this great mercantile centre, and from which we extract the following:—

"Holt states in his 'Survey' that a farmer who died in 1705 remembered that the first load of nightsoil brought from Liverpool into the country part of the shire was by his father, 'who was paid for carting it the same price that theretofore had been paid for carting away this nuisance and throwing it into the Mersey.' There is a certain sort of propriety in the fact that Lancashire was the first English county in which the Potato was grown; for John Hawkins, the dealer in slaves (the article which, with cotton, subsequently enriched Liverpool beyond all conception), got in 1565 the first Potatos for ship provisions from Santa Fé, in New Spain. He introduced them into Ireland, whence they came into Lancashire, where curious chance promoted the cultivation of other useful and profitable vegetables. In 1756 we brought over from Canada the French neutrals in the war of the period. They resided some years in Liverpool, and, according to the fashion of their *cuisine* and the sanction of their appetites, they required so many vegetables that the prices went up in the markets for such things. This led to increase of production, and Liverpool was long famous for its good supply of fresh vegetables. In enriching the land for such purposes every sort of experiment was resorted to. Even mussels were applied to the forcing of the earth to bring forth fruits more abundantly. But it was found that mussels helped the land only to one crop, and then left it "seedy" and weakened. Accordingly this method of farming was called by agricultural wits dram-husbandry! Liverpool imports, among a host of other things, that now precious, yet once almost useless drug—madder. The value of madder went up marvellously after the discovery of dyeing cotton a Turkey-red. From a mere nominal price it rose to one varying from 50s. to £6 a cwt. As England imports nearly 300,000 cwt. of madder and madder-root, it might be supposed that Turkey-red was our only wear, but madder is applied to more uses than we have space to mention. Liverpool has its intellectual glories as well as its material possessions. With the city the name of William Roscoe will be for ever connected. He was the son of a tavern-keeper, but the gentleman was innate in him, and his tastes could not but lead him to what he became. He laboured amid the turmoil of Liverpool, its pursuits, passions, triumphs and calamities, as calmly as if he had been far away from the distracting din of men and their antagonisms; but there is something melancholy in the fact that, after all his intellectual labours, he made shipwreck of his fortunes by embarking and failing in business as a banker. It is painful to contemplate the author of 'Lorenzo de Medici' and 'Leo the Tenth,' whose wealth as well as learning had been turned to the best purposes, meekly accepting £100 a year from the Royal Literary Fund."

Our contemporary omits to mention that Roscoe was not only an historian, but an acute botanist, and that his splendidly illustrated monograph on the Scitamineæ and allied orders, including some of the most beautiful and interesting of our stove plants, now sadly neglected, gave him high rank among the botanists of his time, though much of what he did is superseded by the fuller and more accurate information now possessed.

—— The University of St. Lawrence has conferred the degree of Master of Arts, *honoris causa*, on Mr. M. C. Cooke, in acknowledgment of the value of his little works on Fungi.

—— It is said that our Government has refused to allow the use of one of Her Majesty's ships for the proposed scientific expedition to Gibraltar and Syracuse, in order to observe the phenomena of the Total Eclipse on December 24 next. Some 60 men of science volunteered their services, their time, their money, if the Government would furnish the means of transport, and this has been refused. We do not know who is responsible for this act of meanness only explicable on the supposition that Government may have an idea of dispensing with volunteer aid, and of despatching its own officials. The Chancellor of the Exchequer is the member for the University of London, the highest representative of science in the kingdom, and its graduates are not the men to uphold such policy as this—a policy that might have denied Franklin a few pence for a string to his kite or denied a few strands of wire to a Wheatstone. Our rulers require to be "Prussianised" ere they can be made to appreciate the claims of science.

—— The Maximum Temperature of the Air in England during the Week ending September 10, varied from 74°.6 at the extreme southern station, Portsmouth, to 66° at the extreme northern station, Newcastle, with a mean of all highest for the several stations of 69°.2. In Scotland it varied from 66° at Perth to 62°.4 at Aberdeen, with a mean for all stations of 63°.9. The Minimum Temperature in England varied from 38°.4 at Portsmouth to 47°.1 at Liverpool, with a mean for all stations of 43°.3. In Scotland it varied from 39° at Aberdeen to 47° at Greenock, with a mean for all stations of 42°.5. The Mean Temperature of the Air for the week varied in England from 57° at Blackheath to 53°.3 at Newcastle, with a mean for the eight southern stations of 56°, and for the eight northern stations of 54°.8. The mean for the several stations in Scotland amounted to 52°.2. The Rainfall during the week was very large in both countries, more particularly in Scotland. In England, at six stations, the falls amounted to 1 inch or more, in some cases to more than 1¼ inch; the largest fall was recorded at Portsmouth, viz., 1.61 inch, and the smallest at Wolverhampton, viz., 0.26 inch. The mean for the different stations was 0.83 inch. In Scotland the falls were very large, the largest being recorded at Greenock, viz., 3.02 inches, and the smallest at Perth, viz., 0.60 inch. The mean fall for the several stations was 1.40 inch. (See Mr. Glaisher's Tables in our present issue.)

—— We observe that the collection of Plants and Farming Stock belonging to F. Pryde, Esq., of Digswell, Welwyn, is shortly to be disposed of by auction, in consequence of the expiration of the lease. The collection of plants, though not extensive, is interesting, and has been under the charge of one of our correspondents, Mr. William Earley, whose weekly Calendar of Operations in our columns has, we believe, given much satisfaction to our practical readers.

—— One objection to Mr. Rendle's Plant Protectors consisted in the difficulty of removing and replacing the glass. This has now been entirely obviated by a slight alteration of the form of the grooved ridge tile at the top. The convenience and utility of these little contrivances in small establishments is very great, while in larger ones they are steadily growing in favour.

—— The *Times* gives the following account of Market Gardening in Cornwall:—

"The average annual despatch of early Potatos from the Penzance railway station for the past four seasons is 2337 tons, and of Broccoli 2627. The largest total of Potatos was in 1863, when 3146 tons were sent off, and of Broccoli in 1868, when the quantity was 3571 tons,—this year 2591 tons of Potatos and 2574 tons of Broccoli. Mr. Bolitho, of Penzance, has announced his intention of offering a prize of £25 for the best essay on the present position and future prospects of market gardening within the district of the Western Society."

New Garden Plants.

Epidendrum microcharis, *Rchb. f.*

Aff. Epid. pulchello, A. Rich et Gal. Folio linear-ligulato, labello trifido, lacinia postica semisagittata, antica bicrurina denticulo interjecto. *Epidendrum microcharis*, Rchb. fil. in litt. ad cl. Saunders.

Radices velatæ filiformes subtilissime inculpte. Vaginæ fultientes emarcidæ. Pseudobulbi oblongo-pyriformes purpureo violacei hinc impressi. Folia gemina. Lamina ogtone articulata, linea callosa transversa albida sub lamina, linear-ligulatæ acutæ, chartaceo pergamineæ infra purpureo-violaceæ, supra violaceo marginatæ. Racemus pauciflorus. Bracteæ triangulo-subulatæ ovario pedicellatis longe breviores. Ovaria pedicellata curvula. Sepala ligulata obtuse acuta. Petala linearia apiculata. Labellum omnino adnatum, trifidum, lacinia laterales semiovatæ retrorsum angulatæ extrorsum hinc lobulatæ, lacinia media bifida, lacinulis divaricatis denticulo medio interjecto, basis levis. Columna omnino labello accreta, apice dilatata, andrœcilinum linearibus emarginatum, dentes semiovatis acutis utrinque. Color ochroleucus albidus maculis ocellis purpureis.

A neat and very lovely little plant, producing masses of small pyriform-fusiform bulbs, according to a neat little sketch which we obtained from W. Wilson Saunders, Esq. The leaves, purplish beneath, are linear-ligulate acute. The small flowers are yellowish, with many purplish dots. It comes from Guatemala, and has flowered lately, under Mr. Green's able management, in the rich collection of W. Wilson Saunders, Esq. *H. G. Rchb. fil.*

LILIES.

(*Continued from p.* 1183.)

Many of the Japanese Lilies which were published by Thunberg are now well known in gardens. No species can be confounded, for instance, with Lilium cordifolium of Thunberg, which has no analogy with any other species except the Nepalese L. giganteum, of Wallich. The two plants just named agree in habit, in their heart-shaped leaves, their long nearly tubular flowers, and their dirty white colour, marked with small purplish lines and spots, especially along the middle line of the petals; but the lesser height of the Japanese species, the smaller number of flowers, and the angular seed vessels, suffice to distinguish it from the Nepalese species.

The L. speciosum of Thunberg is a magnificent plant, of which Siebold introduced bulbs into the Botanic Garden of Ghent, and which, when it first flowered in 1833, created a veritable sensation. Its stiff, glabrous stem bears alternate leaves, which are shortly-stalked, oval-oblong, more or less rounded at the base, and traversed by from 5 -7 longitudinal nerves. The leaves become narrower towards the upper end of the stem, which is often much branched, and bears as many as 20 flowers. These are very large, reflexed, revolute, and the segments of their perianth are studded on their inner surface with numerous projections of a more or less bright rose colour. This magnificent Lily has been the parent of numerous varieties, varying in colour from bright rose to rosy white, and even to pure white. One of these varieties is a malformation, with a flattened fasciated stem, bearing above many flowers of smaller dimensions than those of the other varieties. It is unfortunate that the Belgian gardeners, following in this respect the bad example of Mussche, head gardener of the Botanic Garden, Ghent, should, without the slightest reason, have transferred to this species the name of L. lancifolium, under which it is now better known than by its correct denomination. The true lancifolium (Thunb.) has not yet been introduced into Europe. Thunberg, who at first did not distinguish it from our Lilium bulbiferum, subsequently recognised it as a distinct species. ("Trans. Linn. Soc.," ii., 1794, p. 333). He characterised it by its stem scarcely exceeding a foot in height, angular, bristly, and reddish; by its numerous, alternate, sessile, lanceolate, glabrous leaves, all rather small, and becoming more and more so towards the upper end of the plant, where numerous axillary bulbils are formed. The flower, moreover, is small, solitary, erect, white, almost bell-shaped, while the segments of the perianth are narrowed below into a stalk. Between this Lily, of which Thunberg has only given an inferior figure representing the extremity of the stem terminated by a young flower-bud, and the L. speciosum, there does not exist a single point of resemblance. It is therefore very much to be regretted that the nurserymen should transfer to the one species the name of the other.

Another little known Japanese species, and one which, like the preceding, does not exist in European gardens, is that which Thunberg ("Flora," p. 135) originally considered to be L. canadense, but which he referred to his L. maculatum in 1794. Later still he gave a figure of it in the "Mém. de l'Acad. Impér. des Sciences de St. Petersburg," iii., p. 204, pl. 5, fig. 1. Judging by this figure and the description which accompanies it, the spotted Lily is rather more than a foot high, its glabrous stem is rounded, striated or furrowed, unbranched as far as the inflorescence. It bears numerous leaves of moderate or small dimensions, lanceolate, tapering at the base, but still sessile, with several nerves prominent on the under surface. These leaves form a sort of false verticil at the

base of the inflorescence. This latter consists of from four to six flowers of moderate size, bell-shaped, with the extremity of the segments slightly rolled back. The colour is indicated as blood-red, marked in the interior of the flower with points and spots of deep purple. Dr. Asa Gray ("Diagnostic Characters of New Spec. of Phænog. Plants, collected in Japan by Ch. Wright," "Mem. of the Amer. Acad.," vi., p. 434), cites this plant, with doubt, as a variety of L. superbum (Linnæus), a determination open to criticism. The Japanese Lily, which Thunberg called L. elegans (Mém. de l'Acad. de St. Petersb.," iii., p. 203, pl. 3, fig. 2), and which he at first in his "Flora," p. 135, had called L. philadelphicum, and afterwards, in his memoir of the plants of Japan ("Trans. Linn. Soc.," ii., p. 333), L. bulbiferum, is also not in European gardens. L. elegans is about 18 inches high, with a smooth, simple, rounded stem; its leaves are of moderate size, alternate, and the stem is terminated by a large, flesh-coloured, bell-shaped flower, the oblong segments of which are more or less turned back at the extremities. Thunberg compares this species to Lilium bulbiferum, from which it is distinguished by its simple, smooth stem, neither striated nor divided; by its scattered leaves of a more ovate-oblong form; and lastly, by the pieces of the perianth, which are oval, and not narrowed into a stalk at their base. The figure which he gives is very indifferent.

As to the L. longiflorum ("Trans. Linn. Soc.," ii., p. 333, and "Mém. de l'Acad. de St. Petersburg," iii., p. 203, pl. 4) it is not only well known, but also frequently cultivated in our gardens. It belongs to a group of Japanese Lilies with large white flowers, among which the Swedish botanist had already distinguished another species under the name of L. japonicum ("Mém. de l'Acad. de St. Petersburg," iii., p. 205, pl. 5, fig. 2). It is easy to characterise L. longiflorum. The plant is 18 inches high, the stem is rounded and glabrous, bearing numerous, alternate, thick, lanceolate leaves, rather broad in proportion to their length, acuminate, marked on their lower surface with three prominent nerves, and is terminated by from one to three large beautiful flowers, of a pure white colour within, slightly clouded without, slightly pendulous (*penchées*), having the tube relatively rather short, widening gradually upwards from the base into a broad spreading limb.

It is much less easy to ascertain what is the plant which Thunberg designated in 1783 in his "Flora Japonica," p. 133, under the name of L. japonicum. Thus in the catalogue of his collection, M. Leichtlin indicates by a ? that he is by no means certain of the specific identity of the Lily cultivated by him under this name; in truth the characters by which Thunberg distinguishes his species are deficient in exactness, while the bad figure which he gives certainly does not dissipate the doubts engendered by his description. It is even in some respects in opposition to his text, for it represents the segments of the perianth as oblong-lanceolate, acutely pointed and acuminate, while in the text they are described as elliptic. On the whole, according to this botanist, L. japonicum is a plant about 2 feet high, with a rounded glabrous stem, bearing a small number of alternate rarely opposite leaves, which are very shortly stalked, lanceolate-acuminate, glabrous, pale on the lower surface, which is marked by five prominent nerves. This stem is terminated by a single, whitish, bell-shaped flower, about 3 inches long. This Lily is described as very beautiful by Thunberg, who adds, that while spontaneous at Miaco and elsewhere, it is often cultivated by the Japanese as an ornamental plant. These seven species of Lily described by Thunberg being thus dealt with, there only remains that which he referred erroneously to our L. pomponium, and on which more recently Siebold and Zuccarini established their L. callosum.

While Thunberg was studying and making known the Japanese Lilies at the end of the last century, the French botanist André Michaux was exploring the United States for the purpose of examining its vegetable products. The results of his expedition were given in his "Flora Boreali-Americana," published in 1803. But while in the case of many genera he greatly enlarged the circle of our acquaintance, he left the Lilies pretty much as he found them. Indeed he only mentioned in his work three species, first, L. canadense (Linn.); and secondly, the charming L. Catesbæi (Walt.), a southern plant already figured by Catesby in 1743, and the stem of which is about 18 inches high; terete glabrous, brownish below. The leaves are scattered alternate, nearly green, linear lanceolate, acute, slightly glaucous on their upper surface. The flower is large, solitary, erect, of a blood-red colour, passing into yellow towards the centre, where it is marked with numerous purplish brown spots. The segments of the perianth are revolute, narrow, wavy at the margins, tapering at their summits into a long point, and at their base into a long narrow stalk.

The third species, considered new by Michaux, was the L. carolinianum, which he characterised by its nearly verticillate leaves with obscure venation, and by its flowers, 1—3 in number, reflected, the segments revolute, bright red in colour, passing into orange-yellow towards the centre, which is marked with reddish brown spots. This pretty Lily, however, has no claim to specific rank. It is a mere variety of L. superbum (Linn.), of which it is a diminished form. The same plant subsequently received from Poiret the name of L. Michauxii ("Enc. Meth. Suppl.," iii., p. 457), and from Roemer and Schultes that of L. Michauxianum ("Syst.," vii., p. 404). Thus at the beginning of this century, when Persoon published the first volume of his "Synopsis Plantarum," in 1805, comprising the enumeration of all the flowering plants then known, the genus Lilium was only represented by 17 species, thus arranged :—

1. *Flowers erect, bell-shaped.*—1, L. cordifolium, Thunb.; 2. L. longiflorum, Thunb.; 3, L. candidum, L.; 4, L. japonicum, Thunb.; 5, L. lancifolium, Thunb.; 6, L. bulbiferum, L., and var. *b* croceum, a native of Dauphiny, which had previously, and justly so, been considered as a distinct species by Chaix, under the name L. croceum in Villars' "Histoire des Plantes du Dauphiné," 1786, and even long before by Fuchs.

2. *Flowers with Revolute Segments.*—7. L. Catesbæi, Walt.; 8, L. speciosum, Thunb.; 9, L. pomponium, L.; 10, L. chalcedonicum, L.; 11, L. superbum, L.; 12, L. Martagon, Linn.; 13, L. carolinianum, Mich.; 14, L. canadense, Linn.; 15, L. maculatum, Thunb.; 16, L. kamschatkense, L.; 17, L. philadelphicum, L.

Had Thunberg's L. elegans been at that time distinguished, it would have been added to the list. It is specially after the publication of Persoon's "Synopsis," that is to say during the present century, that the augmentation in the number of species of Lily has become considerable. Scientific voyages have become more common, scientific explorations have become more thorough and complete, the study of plants by the closet naturalists has become more searching. Hence have arisen on the one side numerous discoveries, on the other the establishment of more or less legitimate points of distinction of plants formerly confounded with others. Materials have thus gradually accumulated, but unfortunately they have not of late years been subjected to so complete a monographic revision as to enable the bad to be separated from the good species, the legitimate forms from those which have been established on insufficient grounds.*

(To be Continued.)

* The publication of Spae on the genus Lilium, which appeared in 1847 in the 19th volume of the "Mémoires Couronnés par l'Acad. Roy. de Belgique," is already 23 years old, and while only partially complete at the time of publication is necessarily much less so now. Moreover, this memoir, wherein 44 species of Lily are described, will not stand the test of rigid botanical criticism.

GRAPE GROWING AT WOODSTOCK.

Woodstock—the famous old borough of Woodstock—historically associated with stirring times, and the theatre of memorable occurrences, recorded either in the more trustworthy annals of historic facts, or worked into the plots of novels, touched by the magic wand of romance and imagination; and in later years noteworthy because of the proximity of the noble domain of Blenheim, is a quiet, clean, and pretty well-to-do town, about 6 or 7 miles north-east of the seat of the classic halls of Oxford. Woodstock is a prosperous town, not because a duke is its near neighbour, and in a great measure its owner, but because it has industrial resources of its own, of which glove-making is the chief feature, mainly carried on by enterprising burgesses. They make good gloves, and obtain a ready market for them, and hundreds of persons are employed in their manufacture. Woodstock lays wide of any railway station, and is now comparatively isolated and unhappy in consequence. A great duke wished to keep his property away from the taint of railways, and the borough of Woodstock, which could hardly be expected to be so unseemly as to oppose a duke, said ditto, and lost a valuable market or two in consequence; and were it not for its glove manufactures, it would have dwindled into an agricultural village. The visitor to Woodstock has to ride from the railway station which serves it, along a road almost as white in the summer time as if strewn with flour, from the oolitic nature of the stone employed in mending it. It is a horrible ride on a blazing day, with the sun shining down on it, and the refraction of the rays thereof is quite blinding to the eyes of the traveller. A walk along that road on such a day must be absolute torture.

Woodstock is looking up horticulturally, after a fashion of its own, and because it likes it. Woodstock can now be seen broken out into an eruption of the genus Vitis, as many a dwelling presents a Vine-clad front; there is a cheerful aspect of vinosity, and the Vines flourish as if fully at home in the calcareous soil. The white road leading to the borough creeps and winds about it, through lines of white houses; white-wash and lime-dust bear each other company, as if it was a region of perpetual snow. But, as a set-off, Vines crop up here and there, and amid their leaves could be seen clusters of the crimson berries of the Black Esperione, the amber of the White Muscadine; with here and there the more refined berries of the Black Hamburgh. With a steady, but sure growth, the Vine-clad walls increase in extent each year, and relieve the monotony of the white houses and the whiter roads. From the produce of these Vines hundreds of gallons of rich, luscious wines are manufactured: invigorating, undefiled, and innocuous. For years, Mr. Fenn, who is well known as a wine producer, has been showing his fellow townsmen what he can do with the 16 cwt. of Esperione and Muscadine Grapes he annually takes from the south end of the Rectory house; and at last, after much patient teaching, his lessons have gone home, and other walls swell with fruit, and other cellars are rich with vinous compounds. Wines are manufactured at 6*d.* a bottle that with the uninitiated (and they are many) might pass for the choicest brands of Moet and Chandon. The initiated (and they are few) would be perhaps surprised that so good a quality could be obtained at so small a cost—perhaps drink it with all the less risk of injury.

The residence of Mr. Morris, a respectable tradesman of the borough, furnishes an excellent illustration of Grape growing at Woodstock. The front of the house, which has a south-west aspect, is literally covered with strong-growing and free-fruiting Vines of Black Hamburgh, Esperione, and Royal Muscadine Grapes. The roots are in a border in front of the house, composed, in a great measure, of lime-stone and refuse soil brought there; and on the top is a stone pavement flanking the road. Such Vines as these would convert Mr. Cramb to a belief in the fitness of a calcareous soil to conduce to their well being. The produce of these keeps Mr. Morris's cellar stocked with wines for his table. In the garden at the back of his house, placed against a south wall, is a true amateur's vinery, designed by Mr. Morris, and, when originally built, only a small part of the present size. This house is now about 70 feet in length, by 6 feet in width; 9 feet in height at the back, by 4½ in front; along it runs a stone walk, 27 inches in width, with a 3-foot border between it and the front of the house, and another border, about 20 inches in width, at the back. Strong enough in construction to last many years, the house is light and airy, and appears to suit the Vine well.

An inside border was made in which to plant the Vines, of which there are 24 in number, consisting of Black Hamburgh, Esperione, Royal Muscadine, and a small white, but highly flavoured, Tunisian Grape, some cuttings of which were received from Mr. Rivers, of Sawbridgeworth. Black Hamburgh preponderates. With the exception of a bottom line of wooden shutters near the border in the front of the house, the whole of the surface is constructed of glass. By means of the shutters bottom air can be given; and by means of wooden shutters at the top, each couple of which are opened or shut by means of a thin iron rod, ventilation can be given also. A Vine is planted to each rafter, but some are allowed to carry two main shoots, and the yield is about 20 lb. per rafter. There is no heating apparatus, but the development of the bunches is in every way satisfactory. The Black Hamburgh Grapes are sent to Oxford when ripe, which is just at the termination of the long vacation; here they find a ready sale, and realise good prices.

That there should be no check to the Vines through giving water of a lower temperature than the interior of the house, Mr. Morris has hit on a capital expedient for rendering this practically impossible. A force-pump has been fixed to the wall at the back of the house, and the feed-pipe communicates with a tank in Mr. Morris's dwelling, some 20 or 30 yards distance, filled with water supplied by the borough authorities. By means of this pump the water is forced up into a tub standing on a somewhat elevated position, and fully exposed to the action of the sun. From this tub another pipe runs along the wall against which the house is built, and entering the house, fills a flat tank set against the wall, by means of a ball tap. Farther on is another tank connected with the one just mentioned; and thus an abundance of water is provided for keeping the border moist, and of a temperature akin to that of the atmosphere of the house. The cost of this house, independently of the wall, was about £70.

This house is also used for forcing Strawberries in the spring months. At the back of the house are supports for a shelf 12 inches in width, and near the glass, which contains a great many pots of Strawberries at the proper season. On the border in front of the house is also stood a number, and from these a fine lot of fruit is obtained, which is also sent to the Oxford market. Thus two crops of fruit are taken from the house at different periods of the year.

Mr. Morris is proud to own himself, and glories in being, a pupil of Mr. Fenn. Mr. Fenn has in the Rectory gardens a home-made vinery or two, displaying much ingenuity in economising space and material, which do their work to his entire satisfaction. Here Mr. Morris learnt the first principles of what he has so much improved on hard by. To teacher and pupil alike great credit is due, and both are honoured in the result. Mr. Fenn's arrangements must be noticed later; and, though on a less pretentious scale, equally satisfactory services have been rendered.

Such are a few aspects of Grape growing at Woodstock. The great ducal mansion hard by furnishes in the fine gardens attached to it some excellent and worthy illustrations of the triumphs of horticultural science in these modern times, done by a master mind among professional exemplars of the art—Mr. William Lee, the gardener at Blenheim. In like manner, amateur horticulturists like Messrs. Fenn and Morris show what can be done when the spirit is stirred within them, and a desire to emulate to some appreciable extent warms the nature, and incites it to a line of action. What they have so worthily done is

capable of being compassed by others, and the foregoing remarks are set down to induce some to "go and do likewise." *R. D.*

POLLARD OAKS.

Among the pollard Oaks in Richmond Park (Surrey), there is one which has for some time past attracted my special attention, and which, more especially as it is now rapidly dying, and will soon, if no steps are taken, become a complete wreck, appears to merit description in your columns.

This tree is the first on the left hand side of the public road where one reaches the end of the palings which form the enclosure of Pembroke Lodge, going in the direction of Kingston.

The side on which the aperture (fig. 235, showing the dead or dying trunk on the outside, the living portion within,) through which alone the composite nature of the tree is visible, is the one turned away from the road, and thus it happens that very few people, whether observers or not, have chanced to discover that within the hollow trunk there appears to be another and solid trunk enclosed, so that there is, as it were, a tree within a tree.

The enclosed trunk* measures 2 feet 10½ inches in circumference, at 2 feet from the ground, and the enclosing trunk 14 feet 2 inches at the same height. The height of the external pollarded tree is about

Fig. 235.

50 feet, and its trunk, from the ground to the base of the limbs, 8 feet 3 inches; the enclosed trunk measuring about 7 feet 9 inches.

It should be observed that there is on the right hand side at the top of the enclosed trunk, at the point where it joins the now closed cavity of the pollard tree, a short descending spur, which has unfortunately been mutilated, and no longer presents its natural appearance.

Now the enclosed trunk looks at first sight like part of some quaint Chinese puzzle, or the egg in the bottle of a conjurer, and one asks at once how on earth it got there. I have heard it suggested that it might be the stem of an Oak which was once a seedling within the cavity, an acorn having germinated in the earth and mould at the base of the interior of the pollard Oak; or again that it might have had its origin in a sapling, springing from the butt on the inrolled edge of the bark of the exterior tree. But in the case of either of these hypotheses, it seems to me impossible to believe that the branches and foliage of the growing stem could have been developed within the chimney-like cavity, and finally won their way through the aperture in the crown of the enclosing trunk. I think that we shall have to abandon the idea which first presents itself, according to which the enclosed mass is supposed to be a true stem formed of ascending tissues, and be forced to conclude that it was originally a descending root, and that it has been modified so as to assume the appearance, and to some extent the functions, of a stem.

But this root may have been formed in one of two ways—either as (1) an adventitious root springing from the base of one of the branches of the main tree at the top of the hollow part; or (2) as the root of a tree which was at first an independent seedling sprung from an acorn dropped in the crown of the pollard Oak, and nourished by the decaying tissues of its heart-wood and rotting leaves, but which has at length become so intimately combined with the foster tree, that its stem cannot now be distinguished from the branches of the pollard.

Of these two solutions of the difficulty I am inclined to accept the former, as the production of adventitious roots is of more common occurrence than cases in which a tree can be shown to have attained any large size when growing epiphytically upon another of the same species.

However, it is well to state that my father has discovered a case in Richmond Park, where a seedling Oak, 6 inches high, is rooted in the decaying centre of a pollard Oak; and there is a noble Oak tree between Mr. Sherratt's house and the large pond, in the heart of which a Holly tree of 12 to 18 feet high, or more, is growing vigorously. There is no question that the mould formed within hollow trees affords ample material for the development of seedlings, and in the moist woods of western England and Wales numerous cases of trees having this epiphytic origin might be found.

But here, on the supposition that the enclosed trunk of what we may call the double tree was the root of an independent tree, it is necessary to suppose that the true stem has become so completely incorporated with the wood and bark of the exterior tree as to appear to be one of its branches, for there is now no trace that any such process of fusion has taken place.

Dr. Masters writes to me to say that he has seen numerous cases among pollard Willows, in which there were descending woody structures similar to the one described above, and that most of these were due to the formation of adventitious roots, but that they were in some rare instances the roots of seedling Willows. In some cases Dr. Masters was able to determine the nature of these growths by clearing away the surrounding *débris*, when it was proved that the seedling plants had no more than a superficial connection with the wood of the original trunk, there being no communication between wood and wood.

There are three other pollard Oak trees known to me in Richmond Park, in the interior of which similar root-growths are found, but no one of these approaches the double tree in respect of the size of the enclosed trunk-like root. These cases are more or less directly favourable to the opinion that the enclosed trunk has its origin in an adventitious root.

Fig. 236.

In one of these a small, but much branched bundle of roots descends from the base of one of the limbs into the upper portion of the cavity, which is filled with mould. Here it is impossible that this can be the root of a seedling tree, growing epiphytically upon the pollard, for there is no slender branch to correspond in size with it, all the adjacent limbs being of great thickness, and so large in size that the puny root at their base could not possibly be their root, supposing that either of them had been originally an independent tree.

Again, near Robin Hood Gate, there is another instructive example of the production of adventitious roots, where these growths are much branched, and of various sizes, from the thickness of whipcord up to about 30 inches in circumference. These roots descend

* It is difficult to avoid speaking of the enclosed mass as a "trunk," but this use of the word must not be understood here to imply that it is of the nature of a true stem.

into a bed of dead leaves and mould, with which the lower part of the trunk is filled.

The third tree may be found within 50 yards of the Oak described above, in the centre of which a Holly tree is established. This pollard Oak is now completely hollow, and has the trunk laid open all along one side, thus disclosing a slender stem-like root standing almost free within it, being united at one point only to the crown of the main tree, at a point close to the base of two of its limbs (fig. 236). This portion of the tree, which is somewhat separated from the rest, is dead, and the limbs are decaying, while the remainder supports three stout branches, which are still alive and covered with foliage. In this case also I should incline to refer the inclosed root to an adventitious origin.

If we turn to Dr. Masters' chapter on Heterotaxy ("Teratology," chap. iii. p. 156) we learn that the production of adventitious roots in trees and woody plants has been frequently noted, and that their formation may "be considered as an attempt to obtain fresh supplies through a more vigorous and healthy channel." The Vine, Willow, Laburnum, and Cornish Elm have all more or less frequently afforded instances of this abnormal mode of growth. "The production of roots, which ultimately serve as props to support the branches, or as buttresses to compensate for the increasing weight of branches and foliage, is also a familiar occurrence. The huge gnaurs and burrs met with occasionally on some trees often produce great quantities, not only of adventitious buds, but of roots also." *J. T. Moggridge, Park Villas West, Richmond.*

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE Association meets this year at Liverpool. At the first general meeting, held on Wednesday last, in the Philharmonic Hall, the President, Professor HUXLEY, delivered the customary address, from which the following passages are extracted. At the conclusion of the address the Earl of Derby, in proposing a vote of thanks, observed that it was impossible to discuss controversial questions in a spirit more fair and temperate, and more free from dogmatism or asperity :—

"It has long been the custom of the newly-installed President of the British Association, taking advantage of the elevation of his position, and casting his eyes around the horizon of the scientific world, to report what could be seen from his watch-tower. I shall not presume to attempt a panoramic survey of the world of science, nor even to give a sketch of what is doing in the one great province of biology, but I shall endeavour to put before you the history of the rise and progress of a single biological doctrine (SPONTANEOUS GENERATION); and give some notion of the fruits, both intellectual and practical, which we owe, directly or indirectly, to the working out, by seven generations of laborious investigators, of the thought which arose, more than two centuries ago, in the mind of a sagacious and observant Italian naturalist.

It is a matter of everyday experience that it is difficult to prevent many articles of food from becoming covered with mould; that fruit, sound in appearance, often contains grubs at the core; that meat, left to itself in the air, is apt to putrify and swarm with maggots. The philosophers of antiquity interrogated as to the cause of these phenomena, were provided with a ready and plausible answer. The axiom of ancient science, 'that the corruption of one thing is the birth of another,' had its popular embodiment in the notion that a seed dies before the young plant springs from it; a belief so widespread and so fixed, that St. Paul appeals to it in one of the most splendid outbursts of his fervid eloquence :—'Thou fool, that which thou sowest is not quickened, except it die.' The proposition that life may, and does, proceed from that which has no life was held alike by the philosophers, the poets, and the people of the most enlightened nations 1800 years ago: and it remained the accepted doctrine of learned and unlearned Europe through the middle ages, down even to the 17th century. It is commonly counted among the many merits of our great countryman, Harvey, that he was the first to declare the opposition of fact to venerable authority in this, as in other matters: but I can discover no justification for this notion. The main concern of Harvey's wonderful little treatise is not with generation, in the physiological sense, at all, but with development, and his great object is the establishment of the doctrine of Epigenesis. Redi did not trouble himself much with speculative considerations, but attacked particular cases of what was supposed to be 'spontaneous generation' experimentally. Here are dead animals, or pieces of meat, says he; I expose them to the air in hot weather, and in a few days they swarm with maggots. You tell me that these are generated in the dead flesh; but if I put similar bodies, while quite fresh, into a jar, and tie some fine gauze over the top of the jar, not a maggot makes its appearance, while the dead substances, nevertheless, putrify in just the same way as before. It is obvious, therefore, that the maggots are not generated by the corruption of the meat, and that the cause of their ormation must be a something which is kept away by gauze. But gauze will not keep away aëriform bodies or fluids. This something must, therefore, exist in the form of solid particles too big to get through the gauze. Nor is one long left in doubt what these solid particles are; for the blowflies, attracted by the odour of the meat, swarm round the vessel, and urged by a powerful, but, in this case, misleading instinct, lay eggs out of which maggots are immediately hatched, upon the gauze. The conclusion, therefore, is unavoidable; the maggots are not generated by the meat, but the eggs which give rise to them are brought through the air by the flies. These experiments seem almost childishly simple, and one wonders how it was that no one ever thought of them before. Simple as they are, however, they are worthy of the most careful study, for every piece of experimental work since done, in regard to this subject, has been shaped upon the model furnished by the Italian philosopher. As the results of his experiments were the same, however varied the nature of the materials used, it is not wonderful that there arose in Redi's mind a presumption that in all such cases of the seeming production of life from dead matter the real explanation was the introduction of living germs from without into that dead matter. And thus the hypothesis that living matter always arises by the agency of pre-existing living matter took definite shape, and had thenceforward a right to be considered and a claim to be refuted in each particular case, before the production of living matter in any other way could be admitted by fearful reasoners. It will be necessary for me to refer to this hypothesis so frequently that, to save circumlocution, I shall call it the hypothesis of Biogenesis; and I shall term the contrary doctrine—that living matter may be produced by not living matter—the hypothesis of Abiogenesis. It is interesting to observe that Redi did not escape the customary tax upon a discoverer, of having to defend himself against the charge of impugning the authority of the Scriptures; for his adversaries declared that the generation of bees out of the carcase of a dead lion is affirmed in the book of Judges to have been the origin of the riddle with which Samson perplexed the Philistines—

> 'Out of the eater came forth meat,
> And out of the strong came forth sweetness.'

Against all odds, however, the philosopher did splendid battle in the cause of Biogenesis; but he held the doctrine in a sense which, if he had lived in these times, would have caused him to be classed among the defenders of 'spontaneous generation.' *Omne vivum ex vivo*, aphoristically sums up his doctrine, but he went no further. He had speculatively anticipated the manner in which grubs are deposited in fruits and in the galls of plants, but he admitted that he had not sufficient evidence to bear him out, and he therefore preferred the supposition that they are generated by a modification of the living substance of the plants themselves. Indeed, he regarded these vegetable growths as organs by which a plant gives rise to an animal, and he looked upon this production of animals as the final cause of galls and of some fruits. He proposed, also, to explain in the same way the production of parasites within the animal body. It is of great importance to apprehend Redi's position rightly; for naturalists have ever since been working upon the lines of thought he laid down. Clearly he held Biogenesis as against Abiogenesis, and I shall immediately proceed to inquire how far subsequent investigations have borne him out in so doing. But Redi also thought that there were two modes of Biogenesis. By one, of common occurrence, the living parent gives rise to offspring which passes through the same cycle of changes as itself, and this has been termed Homogenesis. By the other the parent was supposed to give rise to offspring which passed through a different series of states, and did not return into the cycle of the parent. This ought to be called Heterogenesis, the offspring being altogether and permanently unlike the parent. The term, however, has been used in another sense, and M. Milne-Edwards has substituted for it Xenogenesis, which means the generation of something foreign. After discussing Redi's hypothesis of universal Biogenesis, I shall go on to ask how far the growth of science justifies his other hypothesis of Xenogenesis.

"The progress of Biogenesis was triumphant and unchecked for nearly a century. The application of the microscope to anatomy in the hands of Grew, Leuwenhoek, Swammerdam, Lyonet, Vallisneri, Reaumur, and other illustrious investigators of Nature of that day, displayed such a complexity of organisation in the lowest and minutest forms, and everywhere revealed such a prodigality of provision for their multiplication by germs of one sort or another, that the hypothesis of Abiogenesis began to appear not only untrue, but absurd; and in the middle of the 18th century, when Needham and Buffon took up the question, it was almost universally discredited. But the skill of the microscope-makers of the eighteenth century soon reached its limit. A microscope magnifying 400 diameters was a *chef d'œuvre* of the opticians of that day; and, at the same time, by no means, trustworthy. But a magnifying power of 400 diameters, even when definition reaches the exquisite perfection of our modern achromatic lenses, hardly suffices for the mere discernment of the smallest forms of life. A filtered infusion of hay, allowed to stand for two days, will swarm with living things, among which any which reaches the diameter of a human red-blood corpuscle, or about 1-3200th of an inch, is a giant. It is only by bearing these facts in mind that we can deal fairly with the remarkable statements and speculations put forward by Buffon and Needham in the middle of the eighteenth century. Led by various theoretical considerations, Buffon and Needham doubted the applicability of Redi's hypothesis to the infusorial animalcules, and Needham endeavoured to bring the question to an experimental test. He argued that if these creatures were produced from germs, the germs must exist either in the substance infused, or in the water, or in the superjacent air. Now, the vitality of germs is destroyed by heat; and hence, if the infusion were boiled, carefully corked, and the vessels containing it again heated, all germs present would be destroyed. Consequently, on Redi's hypothesis, when the vessels thus prepared were set aside to cool, no animalcules should be developed in them; whereas if animalcules are not dependent upon pre-existing germs, but are generated from the substance infused, they ought in time to make their appearance. Needham found, under the circumstances in which he made his experiments, that animalcules always did arise in the infusions. In much of his work Needham was associated with Buffon, and the results of their experiments fitted with the French naturalist's hypothesis of 'organic molecules,' according to which life is the indefeasible property of certain indestructible molecules of matter which exist in all living things, and have inherent activities by which they are distinguished from not living matter. Each individual living organism is formed by their temporary combination. They stand to it in the relation of the particles of water to a cascade or a whirlpool, or to a mould into which the water is poured. The form of the organism is thus determined by the reaction between external conditions and the inherent activities of the organic molecules of which it is composed; and as the stoppage of a whirlpool destroys nothing but a form, and leaves the molecules of the water with all their inherent activities intact, so what we call the death and putrefaction of an animal or of a plant is merely the breaking up of the form, or manner of association, of its constituent organic molecules, which are then set free as infusorial animalcules. It will be perceived that this doctrine is by no means identical with Abiogenesis, with which it is often confounded. On this hypothesis a piece of beef, or a handful of hay, is dead only in a limited sense. The beef is dead ox, and the hay is dead grass; but the 'organic molecules' of the beef or the hay are not dead, but are ready to manifest their vitality as soon as the bovine or herbaceous shrouds in which they are imprisoned are rent by the macerating action of water. The hypothesis, therefore, must be classified under Xenogenesis rather than under Abiogenesis. Such as it was, I think it will appear, to those who will be just enough to remember that it was propounded before the birth of modern chemistry and of the modern optical arts, to be a most ingenious and suggestive speculation. But the great tragedy of science—the slaying of a beautiful hypothesis by an ugly fact—which is so constantly being enacted under the eyes of philosophers, was played almost immediately for the benefit of Buffon and Needham.

"The Abbé Spallanzani suggested that Needham's experiments had not been conducted with sufficient care; and showed that a more prolonged exposure of the flasks to an elevated temperature, and a more complete method of closing them, entirely prevented the appearance of animalcules. But we all too often forget that it is one thing to refute a proposition, and another to prove the truth of a doctrine that contradicts that proposition; and the advance of science soon showed that though Needham might be quite wrong, it did not follow that Spallanzani was quite right. The discovery of oxygen, and of some of its relations to the phenomena of life, opened a new way to meet the question, and occasioned doubts as to what might have happened to the organic matter of the infusions, or to the oxygen of the air, in Spallanzani's experiments. What security was there that the development of life had not been checked or prevented by chemical changes? It was needful to repeat the experiments under conditions which would make sure that neither the oxygen of the air nor the composition of the organic matter was altered in such a manner as to interfere with the existence of life. Schulze and Schwann devised means of accomplishing this, by causing the only air which reached the infusions to pass through red-hot tubes, or through strong sulphuric acid. They found that an infusion so treated developed no living things, but that if it was afterwards exposed to common air, life appeared abundantly. The accuracy of their experiments has been by turns affirmed and denied, but, in any case, they have proved that the treatment to which the air had been subjected had destroyed something that was essential to the development of life in infusions. This something might be solid, fluid, or gaseous; that it consisted of germs remained only an hypothesis of more or less probability. Contemporaneously with these investigatione came the discovery of Cagniard de la Tour, that common yeast is composed of a vast accumulation of minute plants. Thus fermentation, in so far as it is attended by the development of microscopical organisms in enormous numbers, became assimilated to the decomposition of an ordinary infusion; and it was an obvious suggestion that the organisms were, in some way or other, the causes both of fermentation and of putrefaction. The chemists, headed by Berzelius and Liebig, laughed the notion to scorn; but in 1843 it was shown by the since illustrious Helmholtz that the interposition of a membrane between a putrefying or a fermenting liquid and one that was simply putrescible or fermentible prevented the formation of organisms in the latter. Therefore, the cause of the development of these organisms must be something that cannot pass through membrane; and, when viewed by the light of Graham's subsequent researches upon colloids, Helmholtz's experiments narrowed the issue to this: that which excites fermentation and putrefaction, and at the same time gives rise to living forms in an infusion, is not a gas and is not a diffusible fluid; therefore it is either a colloid, or it is matter divided into very minute solid particles.

"The investigations of Schroeder and Dusch in 1854, and of Schroeder alone in 1859, cleared up this point by showing that the exclusion of air from an infusion by a plug of cotton wool prevented putrefaction, fermentation, and the development of organic forms. It is hard to imagine what the fine sieve formed by cotton wool could have so indeed, excepting minute solid particles, but it was reserved for Professor Tyndall to complete the demonstration; first, by showing that ordinary air does contain such particles, and secondly, that filtration through cotton wool removes them. It has been a common objection to the doctrine of Biogenesis that, if it were true, the air must be thick with germs; and the Abiogenists regard this as the height of absurdity. Professor Tyndall has proved that ordinary air is no better than a strabout of excessively minute solid particles; that these particles are almost wholly destructible by heat; and that they are strained off, and the air rendered optically pure, by passing through a layer of cotton wool. It remains yet in the order of logic, though not of history, to show that among these solid destructible particles there are germs capable of giving rise to living forms. This was done by M. Pasteur, in those beautiful researches which will ever render his name famous, and which, in spite of all attacks upon them, appear to me to be models of accurate experimentation and logical reasoning. He strained air through cotton wool, and found, as Schroeder and Dusch had done, that it contained nothing competent to give

rise to the development of life in fluids highly fitted for that purpose. But the important further links in the chain of evidence added by Pasteur are three. In the first place, he subjected to microscopic examination the cotton wool which had served as strainer, and found that sundry bodies, clearly recognisable as germs, were among the solid particles strained off. Secondly, he proved that these germs were competent to give rise to living forms by simply sowing them in a solution fitted for their development. And, thirdly, he showed that the incapacity of air strained through cotton wool to give rise to life, was not due to any occult change effected in constituents of the air by the wool, by proving that the cotton wool might be dispensed with altogether, and perfectly free access left between the exterior air and that in the experimental flask.

"To sum up the effect of this long chain of evidence, it is demonstrable:—That a fluid eminently fit for the development of the lowest forms of life, but which contains no germs, nor any protein compound, gives rise to living things in great abundance if it is exposed to ordinary air, while there is no such development if the air with which it is in contact is mechanically freed from the solid particles which usually float in it, and which may be made visible by appropriate means; that the great majority of these particles are destructible by heat, and that some of these are germs or living particles capable of giving rise to the same forms of life as those which appear when the fluid is exposed to unpurified air; that inoculation of the experimental fluid with a drop of liquid known to contain living particles gives rise to the same phenomena as exposure to unpurified air; and it is further certain that these living particles are so minute that the assumption of their suspension in ordinary air presents not the slightest difficulty. On the contrary, considering their lightness and the wide diffusion of the organisms which produce them, it is impossible to conceive that they should not be suspended in the atmosphere in myriads. On all these grounds, the evidence, direct and indirect, in favour of Biogenesis for all known forms of life must be admitted to be of great weight. On the other side, the sole assertions worthy of attention are that hermetically-sealed fluids which have been exposed to great and long-continued heat have sometimes exhibited living forms of low organisation when they have been opened. It is probable that there must be some error in these experiments, since others similar to them are performed on an enormous scale in the preservation of various kinds of food in tin cases, and with a totally different result.

"Meat, fruits, vegetables, the very materials of the most fermentable and putrescible infusions, are preserved to the extent, I suppose I may say, of thousands of tons every year, by a method which is a mere application of Spallanzani's experiment. The matters to be preserved are well boiled in a tin case, provided with a small hole, and this hole is soldered up when all the air in the case has been replaced by steam. By this method they may be kept for years, without putrefying, fermenting, or getting mouldy. Now this is not because oxygen is excluded, inasmuch as it is now proved that free oxygen is in no necessary for either fermentation or putrefaction. It is not because the tins are exhausted of air, for Vibriones and Bacteria live, as Pasteur has shown, without air or free oxygen. It is not because the boiled meats or vegetables are not putrescible or fermentible, as those who have had the misfortune to be in a ship supplied with unskilfully-closed tins well know. What is it, therefore, but the exclusion of germs? I think that Abiogenists are bound to answer this question before they ask us to consider new experiments of precisely the same order. And in the next place, if the results of the experiments I refer to are really trustworthy, it by no means follows that Abiogenesis has taken place. The resistance of living matter to heat is known to vary within considerable limits, and to depend to some extent upon the chemical and physical qualities of the surrounding medium. But if, in the present state of science, we are offered the alternative either of believing that germs can stand a greater heat than has been supposed, or that the molecules of dead matter, for no valid or intelligible reason that is assigned, are able to rearrange themselves into living bodies, exactly such as are frequently produced in another way, I cannot understand how our choice can be even for a moment doubtful. In expressing this conviction I must, nevertheless, guard myself against the supposition that I intend to suggest that no such thing as Abiogenesis has occurred in the past or will in the future. I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call 'vital' may not some day be artificially brought together. All I feel justified in affirming is that I see no reason for believing that the feat has been performed yet. And, looking back over the past, and finding no record of the commencement of life, I am devoid of any means of forming a definite conclusion as to the condition of its appearance. Belief, in the scientific sense, is a serious matter, and needs strong foundations. To say that I have any belief as to the mode in which the existing forms of life have originated would be using words in a wrong sense. But expectation is permissible where belief is not; and if it were given to me to look beyond the abyss of geologically recorded time to the still more remote period when the earth was passing through physical and chemical conditions, which it can no more see again than a man can recall his infancy, I should expect to be a witness of the evolution of living protoplasm from not living matter. I should expect to see it appear under forms of great simplicity, endowed, like existing Fungi, with the power of determining the formation of new protoplasm from such matters as ammonium, carbonates, oxalates, and tartrates, alkaline and earthy phosphates, and water, without the aid of light. That is the expectation to which analogical reasoning leads me; but I beg you once more to recollect that I have no right to call my opinion anything but an act of philosophical faith. So much for the history of the progress of Redi's great doctrine of Biogenesis, which appears to me, with the limitations I have expressed, to be victorious along the whole line at the present day.

"As regards the second problem offered to us by Redi, the hypothesis of Xenogenesis, the researches of two centuries have led to a different result. That the grubs found in galls are no product of the plants on which the galls grow, but are the result of the introduction of the eggs of insects into the substance of these plants, was made out by Vallisneri, Reaumur, and others, before the end of the first half of the 18th century. The tapeworms, bladder-worms, and flukes continued to be a stronghold of the advocates of Xenogenesis for a much longer period. Indeed, it is only within the last 30 years that the splendid patience of Von Siebold, Van Beneden, Leuckart, Kuchenmeister, and other helminthologists, has succeeded in tracing every such parasite, often through the strangest wanderings and metamorphoses, to an egg derived from a parent, actually or potentially like itself, and the tendency of inquiries elsewhere has all been in the same direction. A plant may throw off bulbs, but these, sooner or later, give rise to seeds or spores, which develope into the original form. A Polype may give rise to Medusæ, or a Pluteus to an Echinoderm, but the Medusa and the Echinoderm give rise to eggs which produce Polypes or Plutei, and they are therefore only stages in the cycle of life of the species. But if we turn to pathology it offers us some remarkable approximations to true Xenogenesis. As I have already mentioned, it has been known since the time of Vallisneri and of Reaumur, that galls in plants, and tumours of cattle, are caused by insects, which lay their eggs in those parts of the animal or vegetable frame of which these morbid structures are outgrowths. Again, it is a matter of familiar experience to everybody that mere pressure on the skin will give rise to a corn. Now, the gall, the tumour, and the corn are parts of the living body, which have become, to a certain degree, independent and distinct organisms. Under the influence of certain external conditions, elements of the bodies which should have developed in due subordination to the general plan, set up for themselves, and apply the nourishment which they receive to their own purposes.

"From such innocent productions as corns and warts, there are all gradations to more serious tumours, and in the terrible structures known as cancers, the new growth has acquired powers of reproduction and multiplication, and is only distinguishable by form from the parasite worm, the life of which is neither more nor less closely bound up with that of the infested organism. If there were a diseased structure, the elements of which were capable of maintaining a separate and independent existence out of the body, it seems to me that the shadowy boundary between morbid growth and Xenogenesis would be effaced. And I am inclined to think that the progress of discovery has nearly brought us to this point. The Appendix to the Twelfth Report of the Medical Officer of the Privy Council contains an essay 'On the Intimate Pathology of Contagion,' by Dr. Burdon-Sanderson, which is one of the clearest, most comprehensive, and well-reasoned discussions of a great question that has come under my notice for a long time. It contains evidence to show that the active element in vaccine lymph is non-diffusible, and consists of minute particles, not exceeding 1-2000th of an inch in diameter. Two of the most destructive epizootic diseases—sheep-pox and glanders—are also shown to be dependent for their existence and propagation upon extremely small living particles, to which the name of microzymes is applied. An animal suffering from either is a source of infection to others, for the same reason that a tub of fermenting beer is capable of propagating its fermentation to fresh wort. In both cases it is the solid living particles which are efficient, the liquid in which they float and at the expense of which they live being altogether passive. It is a question of immense importance to determine whether these microzymes are the results of Homogenesis or of Xenogenesis, or in other words, whether they are capable, like the Torulæ of yeast, of arising only by the development of pre-existing germs, or of being the results of conditions operating upon the body in which they are found. Are they parasites in the zoological sense, or are they merely what Virchow has called 'heterologous growths?' A parasite may be stamped out by destroying its germ; but a product of disease can only be annihilated by removing the conditions which gave rise to it. It appears to me that this problem must be solved for each zymotic disease separately.

"I have dwelt upon the analogy of pathological modification, as in favour of the Xenogenetic origin of microzymes; and I must now speak of the equally strong analogies in favour of the origin of such pestiferous particles by the ordinary process of the generation of like from like. It is a well-established fact that certain contagious epidemic diseases, both of plants and animals, are caused by the growth of minute organisms. The smut of Wheat is a well-known instance of such a disease, and it cannot be doubted that the Grape disease and the Potato disease fall under the same category. Among animals, insects are wonderfully liable to the ravages of contagious and infectious diseases caused by microscopic Fungi. In autumn, it is not uncommon to see flies, motionless upon the window-pane, with a sort of magic circle, in white, drawn round them. On microscopic examination, the magic circle is found to consist of innumerable spores, which have been thrown off in all directions by a minute Fungus called Empusa muscæ, the spore-forming filaments of which stand out like a pile of velvet from the body of the fly. These spore-forming filaments are connected with others, which fill the interior of the fly's body like so much fine wool, having eaten away and destroyed the creature's viscera. This is the full-grown condition of the Empusa. If traced back to its earlier stages, in flies which are still active, and to all appearance healthy, it is found to exist in the form of minute corpuscles, which float in the blood of the fly. These multiply and lengthen into filaments, at the expense of the fly's substance; and when they have at last killed the patient, they grow out of its body and give off spores. Healthy flies shut up with diseased ones catch this mortal disease and perish like the others. A most competent observer, M. Cohn, who studied the development of the Empusa in the fly very carefully, was utterly unable to discover in what manner the smallest germs of the Empusa got into the fly. The spores could not be made to give rise to such germs by cultivation; nor were such germs discoverable in the air, or in the food of the fly. It looked exceedingly like a case of Abiogenesis, or at any rate, of Xenogenesis; and it is only quite recently that the real course of events has been made out. It has been ascertained that when one of the spores falls upon the body of a fly, it begins to germinate, and sends out a process which bores its way through the fly's skin; this, having reached the interior cavities of its body, gives off the minute floating corpuscles which are the earliest stage of the Empusa. The disease is 'contagious,' because a healthy fly coming in contact with a diseased one, from which the spore-bearing filaments protrude, is pretty sure to carry off a spore or two. It is 'infectious,' because the spores become scattered about all sorts of matter in the neighbourhood of the slain flies. The silkworm has long been known to be subject to a very fatal contagious and infectious disease called the Muscardine. Audouin transmitted it by inoculation. This disease is entirely due to the development of a Fungus, Botrytis Bassiana, in the body of the caterpillar; and its contagiousness and infectiousness are accounted for in the same way as those of the fly disease. But of late years a still more serious epizootic has appeared among the silkworms; and I may mention a few facts which will give you some conception of the gravity of the injury which it has inflicted on France alone. The production of silk has been for centuries an important branch of industry in Southern France, and in the year 1853 it had attained such a magnitude that the annual produce of the French sericulture was estimated to amount to a tenth of that of the whole world, and represented a money value of 117,000,000f., or nearly five millions sterling. What may be the sum which would represent the money value of all the industries connected with the working up of the raw silk thus produced is more than I can pretend to estimate. Suffice it to say that the city of Lyons is built upon French silk as much as Manchester was upon American cotton before the civil war. Silkworms are liable to many diseases; and even before 1853 a peculiar epizootic, frequently accompanied by the appearance of dark spots upon the skin (whence the name of 'Pébrine" which it has received), had been noted for its mortality. But in the years following 1853 this malady broke out with such extreme violence, that in 1856 the silk crop was reduced to a third of the amount which it had reached in 1853; and up till within the last year or two it has never attained half the yield of 1853. This means not only that the great number of people engaged in silk-growing are some 30 millions sterling poorer than they might have been; it means not only that high prices have had to be paid for imported silkworm eggs, and that, after investing his money in them, in paying for Mulberry leaves and for attendance, the cultivator has constantly seen his silkworms perish and himself plunged in ruin; but it means that the looms of Lyons have lacked employment, and that for years enforced idleness and misery have been the portion of a vast population which in former days was industrious and well-to-do. In 1858 the gravity of the situation caused the French Academy of Sciences to appoint commissioners—of whom a distinguished naturalist, M. de Quatrefages, was one—to inquire into the nature of this disease, and, if possible, to devise some means of staying the plague. In reading the report made by M. de Quatrefages in 1859, it is exceedingly interesting to observe that his elaborate study of the Pébrine forced the conviction upon his mind that in its mode of occurrence and propagation the disease of the silkworm is, in every respect, comparable to the cholera among mankind. But it differs from the cholera, and so far, is a more formidable disease, in being hereditary, and in being, under some circumstances, contagious, as well as infectious. The Italian naturalist, Filippi, discovered in the blood of the silkworms affected by this strange disease a multitude of cylindrical corpuscles, each about 1-6000th of an inch long. These have been carefully studied by Lebert, and named by him Panhistophyton; for the reason that, in subjects in which the disease is strongly developed, the corpuscles swarm in every tissue and organ of the body, and even pass into the undeveloped eggs of the female moth. But are these corpuscles causes, or mere concomitants, of the disease? Some naturalists took one view, and some another; and it was not until the French Government, alarmed by the continued ravages of the malady, and the inefficiency of the remedies which had been suggested, despatched M. Pasteur to study it, that the question received its final settlement; at a great sacrifice, it is true, of the time and peace of mind of that eminent philosopher, but, I regret to have to add, of his health. But the sacrifice has not been in vain. It is now certain that this devastating, cholera-like Pébrine is the effect of the growth and multiplication of the Panhistophyton in the silkworm. It is contagious and infectious because the corpuscles of the Panhistophyton pass away from the bodies of the deceased caterpillars, directly or indirectly, to the alimentary canal of healthy silkworms in their neighbourhood; it is hereditary, because the corpuscles enter into the eggs while they are being formed, and consequently are carried within them when they are laid; and for this reason, also, it presents the very singular peculiarity of being inherited only on the mother's side. There is not a single one of all the apparently capricious and unaccountable phenomena presented by the Pébrine, but has received its explanation from the fact that the disease is the result of the presence of the microscopic organism, Panhistophyton.

"Such being the facts with respect to Pébrine, what are the indications as to the method of preventing it? It is obvious that this depends upon the way in which the Panhistophyton is generated. If it may be generated by Abiogenesis, or by Xenogenesis, within the silkworm or its moth, the extirpation of the disease must depend upon the prevention of the occurrence of the conditions under which this generation takes place. But if, on the other hand, the Panhistophyton is an independent organism,

which is no more generated by the silkworm than the Mistleto is generated by the Oak or the Apple tree, on which it grows, though it may need the silkworm for its development in the same way as the Mistleto needs the tree, then the indications are totally different. The sole thing to be done is to get rid of and keep away the germs of the Panhistophyton. As might be imagined, from the course of his previous investigations, M. Pasteur was led to believe that the latter was the right theory; and guided by that theory, he has devised a method of extirpating the disease, which has proved to be completely successful wherever it has been properly carried out. There can be no reason, then, for doubting that, among insects, contagious and infectious diseases, of great malignity, are caused by minute organisms which are produced from pre-existing germs, or by Homogenesis; and there is no reason, that I know of, for believing that what happens in insects may not take place in the highest animals. Indeed, there is already strong evidence that some diseases of an extremely malignant and fatal character to which man is subject, are as much the work of minute organisms as is the Pébrine. I refer for this evidence to the very striking facts adduced by Professor Lister in his various well-known publications on the antiseptic method of treatment. It seems to me impossible to rise from the perusal of these publications without a strong conviction that the lamentable mortality which so frequently clogs the footsteps of the most skilful operator, and those deadly consequences of wounds and injuries which seem to haunt the very walls of great hospitals, and are, even now, destroying more men than die of bullet or bayonet, are due to the importation of minute organisms into wounds, and their increase and multiplication; and that the surgeon who saves most lives will be he who best works out the practical consequences of the hypothesis of Redi.

"I commenced this address by asking you to follow me in an attempt to trace the path which has been followed by a scientific idea, in its long and slow progress from the position of a probable hypothesis to that of an established law of Nature. Our survey has not taken us into very attractive regions; it has lain chiefly in a land flowing with the abominable, and peopled with mere grubs and mouldiness. And it may be imagined with what smiles and shrugs, practical and serious contemporaries of Redi and of Spallanzani may have commented on the waste of their high abilities in toiling at the solution of problems which, though curious enough in themselves, could be of no conceivable utility to mankind. Nevertheless, you will have observed, that before we had travelled very far upon our road there appeared, on the right and on the left, fields laden with a harvest of golden grain, immediately convertible into those things which the most sordidly practical of men will admit to have value—namely, money and life. The direct loss to France inflicted by the Pébrine in 17 years cannot be estimated at less than 50 millions sterling; and if we add to this what Redi's idea, in Pasteur's hands, has done for the wine-grower and for the vinegar-maker, and try to capitalise its value, we shall find that it will go a long way towards repairing the money losses caused by the frightful and calamitous war of this autumn. And as to the equivalent of Redi's thought in life, how can we overestimate the value of that knowledge of the nature of epidemic and epizootic diseases, and consequently of the means of checking or eradicating them, the dawn of which has assuredly commenced? Looking back no further than 10 years, it is possible to select three (1863, 1864, and 1869) in which the total number of deaths from scarlet fever alone amounted to 90,000. That is the return of the killed, the maimed and the disabled being left out of sight. Why, it is to be hoped that the list of killed in the present bloodiest of all wars will not amount to more than this. But the facts which I have placed before you, must leave the least sanguine without a doubt that the nature and the causes of this scourge will, one day, be as well understood as those of the Pébrine are now; and that the long suffered massacre of our innocents will come to an end. And thus mankind will have one more admonition that 'the people perish for lack of knowledge;' and that the alleviation of the miseries and the promotion of the welfare of men must be sought by those who will not lose their pains in that diligent, patient, loving study of all the multitudinous aspects of Nature, the results of which constitute exact knowledge or science. It is the justification and the glory of this great meeting that it is gathered together for no other object than the advancement of the moiety of science which deals with those phenomena of Nature which we call physical. May its endeavours be crowned with a full measure of success."

Home Correspondence.

Drooping and Revival of Plants.—Like your correspondent, Mr. Fish, I have perused with interest your article on the experiments of MM. Prillieux, Unger, and Ducharte on the drooping of plants, and, like him, I have not been convinced of the correctness of both the inferences drawn from them. Unlike him, however, my scepticism has relation not to the inference that leaves do not absorb moisture, but to the inference that the absorption of water through the roots is not the sole cause of the restoration of the flaccid leaves under the circumstances of the experiments, and that the restoration is effected by some hidden and mysterious operation. I believe that the absorption of water through the roots is, if not the sole cause, at least the main cause, of the revival of the leaves, even of a branch severed from the tree; because the sap contained in the branch when it is cut off, and which revives the leaves, is originally derived from the roots. When a tree is growing there is a constant current of sap through the roots, stem, and branches to the leaves; but when a branch is cut off, the current of sap from the roots is, of course, prevented from entering the branch, but the sap which has already entered continues to flow towards the leaves, until it is exhausted. When the sap has reached the leaves its water is rapidly thrown off, if the leaves are exposed to sunlight or dry air, and unless they receive a large and continuous supply of sap they soon droop; but if the air around the leaves is moist, or if they are in darkness, their perspiration is much impeded. Hales estimated the perspiration of plants to be equal in amount to 17 times that of a man. Now in the experiments referred to, the branches before being cut off were full of sap, and rapidly conveying it in full current from the roots to the leaves; immediately after being detached from the tree the supply of sap to the branches ceased, but the sap in the severed branches continued to flow towards the leaves, and the leaves being exposed to the sun and dry air, they perspired greatly, and the supply of sap left in the branches being inadequate to produce a sufficiently full current to restore the waste, the leaves soon became flaccid. But on the branches being placed in a vessel filled with air saturated with moisture, the perspiration was nearly, but not altogether, stopped; and the diminished current of sap then became adequate to supply for a time the waste caused by perspiration, and the leaves consequently regained their turgidity, in which state they continued until the sap in the branches could no longer support their slow perspiration. The cause of the loss of weight in the branches was the perspiration. This explanation of the experiments is in accordance with the other fact stated to have been elicited by them, viz., that the younger and upper portions of a branch in moist air, or darkness as in a vasculum, recover their freshness at the expense of the lower portions. It also agrees with the case mentioned of the Potato—the tuber of which is a branch; and this case shows clearly that a detached branch may contain a large quantity of sap, which may keep the branch alive for a considerable time, if not exposed to light or dry air. These cases also show that the sap in a branch continues its course, after severance, towards the leaves as before. Mr. Fish thinks that the leaves of plants absorb moisture directly from the atmosphere. "Leaves," says Professor Johnson, "spread out their broad surfaces into the air for the same purpose precisely as that for which roots diffuse their fibres through the soil. The only difference is, that while the roots suck in chiefly liquid, the leaves inhale almost solely gaseous food." I have attentively considered Mr. Fish's arguments, and I am sorry that I am obliged to differ from him; for, although they are very ingenious, I have not been convinced by them. The swelling of a flaccid leaf is due to water and not to air. I think, therefore, that a leaf turgid with water—which is heavier than air—would weigh heavier than the same leaf deprived of the water, and in a flaccid state. The cases of the boat on (meaning, I presume, sunk and suspended in) water, and the man's lungs, are, I think, not very apposite. A boat sunk and filled with water becomes buoyant when the density of the water overbalances the weight of the boat. Were the boat weighed in air, like the leaf, it would weigh lighter when filled with air, or collapsed, than when filled with water. In the same manner, the man's lungs would weigh lighter if filled with air, or collapsed like the leaf, than if filled with water. If my explanation is correct, neither growing plants nor detached branches revive from the top downwards, but *vice versâ*, as is, I believe, the fact. *A. Thompson, The Cross, Whitehaven.*

Archangel Mats.—These are both scarce and dear, and I am told it is in consequence of the Russian Government having forbidden the cutting down of the trees for a time, in consequence of the Lime trees in Russia having been so terribly thinned. Some of your correspondents who are acquainted with Russia may perhaps be able to give us some information on this subject, and at the same time I shall be glad to know if the Lime tree can be made available in this country for making mats, and if it be possible to cultivate it on an extensive scale for that purpose? Will any of your correspondents kindly give information on this point, and no doubt gratify others as well as *An Old Mat?*

The Gardeners' Royal Benevolent Institution.—I trust you will, with your usual generosity to correspondents, allow me to call the attention of subscribers to this Institution (and particularly those who are gardeners) to the part enacted by the electors at the recent election, which, according to my views, is anything but right or just. At the election in question, I find that David Brown—who has never subscribed one farthing to the charity—is placed on the funds as a pensioner, at the expense of others who have subscribed to it for several years. This is not an isolated case in the present instance, as there were seven pensioners to be placed on the pay-list—one certainly without being balloted for—owing to his having been a subscriber 15 years and upwards. Of the six who were successful at the ballot-box only two had ever subscribed to the Institution, and one of these for four years only. It seems stange indeed that candidates who never paid anything for the benefit of the Society should receive more votes than those who have been contributing to its funds. If such a course as this be not put a stop to in some way or another, it must prove the ruin of the Institution; for why should a gardener continue to subscribe when he sees that those who give nothing are better off? Then, why should he be paying one guinea per annum to the charity, when he is convinced that those who keep their guineas locked up are made pensioners in preference to him? At the last election, Maria Shuard, the widow of Mr. Shuard, who subscribed £1 1*s.* per annum for 13 years, received 405 votes, whereas D. Brown, who never subscribed at all, got 668 votes. In like manner James Souter, who annually paid £1 1*s.* for 10 years, and John Gibson, a seven years' subscriber, were thrust aside, to make room for strangers who are only known to the Society as drones are to the industrious gatherers of pure honey. I hope the committee will enact some bye-law, the effect of which should be, in the first place, to limit the candidates to those who have been subscribers, and secondly, to secure the pension to those who have subscribed longest, so that there should be no contest, except among those who have subscribed the same number of years. It is my opinion that by this method the Society would flourish better than it does, as I have reason to believe a great many gardeners who now refuse to subscribe would become members, and thereby render it impossible to prefer strangers before men who have subscribed seven, ten, and thirteen years. I appeal to the reasonable men who are members of the Institution, and known to be eminent in their love for fair play and justice, whether their nature does not recoil at such exhibitions of dishonesty and cruel perversion of rights? I have now submitted to the good sense and good feeling of the gardeners who are subscribers to the abovenamed Institution, whether it would not be better for them to join me in insisting that so great an injustice shall be terminated. *John Cole McArdell.*

Wasps.—This year we have an abundance of fruit of all kinds, and although, perhaps, by nature, the wasps have entitled to their share, they destroy so much more than they consume that all gardeners would be glad to get rid of them, which they may easily do by the following simple method, which does not appear to be generally known, viz.:—Take a 4-ounce phial of strong spirits of turpentine, and, at night, when the wasps have retired to their nest, take out the cork from the phial and insert it in the orifice of the nest, pressing it well in with the foot; the following morning you may dig out the whole of the comb with perfect safety, the wasps being all dead. If not a very large nest, 2 ounces of spirits will suffice. For further security, should the nest be very deep in the ground, or with a very intricate entrance, such as at the root of an old tree, where the fumes from the turpentine cannot have their full effect, you may arm yourself with a can of boiling water, which pour into the hole while digging, should any of the wasps show signs of life, but there is seldom or ever any necessity for this precaution. *S. G., Putney Heath.*

Bracken.—What is the proper time to plant the common Brake or Fern, to secure its growth, and what is the best way of doing it? Last winter I double ploughed about 2 acres of sandy soil, and had the Fern roots taken up and planted therein in the spring. They have all failed. I have now had the land steam-cultivated 18 inches deep, and shall be much obliged for any information about planting it again. *T. R. K., Bury St. Edmund's.* [The stems of the Bracken run widely and often deeply. If you can find a spot where they are rather shallow, and dig them up in sods, taking care of the true stems (black horizontal bodies almost as thick as one's little finger), and of their growing points, they should not fail, on being transplanted. EDS.]

Aquilegia Skinneri.—Your correspondent, "A Rambler," see p. 1186, can hardly have seen the true plant of the above name, which he describes as red and yellow. This is certainly a mistake, as a reference to the figure in "Botanical Magazine" will show. It is, in fact, red and green, and is a native of Guatemala. No doubt the so-called A. californica (A. truncata, Fischer and Meyer) is the plant intended, its flowers being red and yellow. *W. T., Ipswich.*

Fruit Bearing Plants the Strongest.—I am not about to discuss the knotty physiological question that you advert to in a leading article at p. 243. Mr. Thomas Meehan may be right in claiming the greater strength for the weaker, that is, the fruit-bearing sex, among plants, though the theory hardly accords with experience. Certainly any evident tendency to fruitfulness has generally been accepted as the effect as well as a cause of weakness. But, practically, this question is of less moment than seems to have occurred to either you or the author of the ingenious theory; for, admitting that the seed-bearing plants are the strongest, does not the maturation of the seed expend their strength? And may not a crop of seed do more than re-establish a balance of power between the two sexes? Is it not likely to leave the female plants weaker than the male? Where, then, would be the practical benefit of planting only seed-bearing trees? You are quite right about the Araucarias at Bicton. There is no difference in vigour between the sexes; and Mr. Barnes assured me on the spot that not even the most practised eye could tell the one sex from the other until they revealed themselves. But Mr. Meehan proceeds to state that we owe variegation to the male principle, and that here we see a

weakened vitality follow the variegation. He proceeds: "Variegated forms cannot endure cold nor the extremes of climate like the green-leaved forms." Upon what foundation the first statement rests, that variegation is a manifestation of the male principle in plants, I am unable to say. It seems singular that it should have passed unchallenged by such botanists as yourselves? Will you be good enough to explain to us, so that we may see upon what it rests; and, as to the weakened vitality of variegated plants, I should be glad to know whereabout the weakness is to be found in such plants as Sanchezia nobilis, Anthuriums, Caladiums, Marantas, Cissus, Crotons, Begonias, or even Cobea scandens variegata. As to their not being able to resist cold, all I can say is that while hundreds of green Hollies were killed to the earth during the winter of 1859-60, not a single variegated one out of a great many had a leaf injured. And as for variegated Boxes, cited by Mr. Meehan, did ever any of your readers see one injured by cold? I never did. While grateful to learn from our good friends over the Atlantic, I don't care to accept of such theories as that we owe variegation to the male principle in plants, and that variegated plants are therefore more tender, or liable to suffer from cold in consequence, without one tittle of evidence. Will you enlighten me on these matters, and oblige a very careful reader and sincere *Enquirer*.

Fly and Wasp Trap.—I have found the following plan for destroying flies and wasps far more effectual than the ordinary bottle system. I use the same composition, but instead of putting it in bottles I take common basins, filled with beer and treacle to within an inch or so of the top; then two pieces of glass are taken, large enough to cover the top of the basin by putting their edges together. In the middle of the length of the edges, which fit together, is made a semicircular hole or notch, which can be made by any one by taking a common door key, and punching off by small bits the said hole with the wards. By placing the two pieces of glass together afterwards the semicircular notches will make one round hole, through which flies and wasps will enter, and most likely will never return alive. By my experience with the above plan for the last four seasons I find that one basin will destroy as many flies in a day or two as a bottle would in a season. If a hole of about ⅜ inch could be cut in the middle of a pane of glass instead of in the edges, of course it would be better. *E. Davies, Gr., Nunhoun Hall.*

Early Rose Potato.—I have had a sample of what I understand is the Early Rose Potato, the stock of which was, I think, purchased of a London firm two years since. It is a rather coarse Fluke-shaped Potato, weighing about 10 to 11 oz., and of a dirty light pink colour. I cooked one, and thought it waxy, and at present not nearly equal to Gloucestershire Kidney, Early Oxford, and some other early sorts. I compared it with the figure in Peter Lawson & Son's almanac, which they say is an exact copy of the figure in Bless & Son's (New York) circular, and this Potato is certainly not like it. I think the Potato I have seen will prove a productive cattle Potato, but it will not come into favour for the table. I understand the yield was upwards of fiftyfold, which is very large. I notice in last week's *Gardeners' Chronicle* that Mr. Atkins describes his as being of excellent quality. It would be very desirable that we should know the exact description of the true Early Rose Potato, and that we also hear from well-known and competent authority what the quality really is. I hope the Rev. Mr. Radclyffe will, after awhile, favour us with his latest notes on the character of different sorts of Potatos grown this year. *H. R. T.*

—— Last March I bought 10 lb. of this Potato. I cooked a dish for trial, and found the flavour to be very good. The remainder I planted in the ordinary way on a dry sandy hill. Last week I took them up, and had 168 lb. of good marketable tubers, which I thought a very good yield, for I had early Shaws growing by their side, which did not give one-half that return. I have no doubt when this Potato becomes better known it will be the poor man's favourite, for I had not one diseased or super-tuberated tuber amongst them. *H. W. Nutt.*

Sunflowers.—Your readers may be interested in the following account of a large Sunflower, which is now growing in the garden of Mr. Sawyer, of this place. The seed from which it grew was taken from a plant which grew in a cottage garden. That plant had only one stem and only a single flower. The plant which I am now describing has reached the height of fully 10 feet. It has as many as 27 branches, with buds and flowers upon each. One branch has 11 buds and flowers. The stem is 8 inches in circumference, and the largest flower, which I have now taken off for seed, is 17 inches in diameter. I have never met with such a specimen before. *Edward Wakerill, Gr., Heywood Lodge, Maidenhead, Berks.*

Cyclamens.—I beg to send you a bulb of Cyclamen for inspection. It was presented to me as a peculiarity, by a gentleman amateur, and I promised him to inquire if such a freak had previously been observed. In potting the bulb in the spring, he placed the bulb upside down. The result, as you will perceive, is that roots are growing where the original crown was, and a new crown with foliage is produced from amongst the old dried roots—there also appears some sign of flower buds. *Thomas Challis, The Gardens, Wilton House.*

Melon Growing at Heckfield.—If your correspondent "T. C." will oblige me with his address, I will forward him a Melon, not of the third, but of the fourth crop, from the same plant; and, if that should prove too good a fruit for him, I will send him one of the fifth crop in a month's time. I have no hesitation in saying that I actually sent Melons of the fourth crop to my employer's table, who tells me (with the remarks of "T. C." in his hands) that better Melons he never wished to eat. *W. Wildsmith.*

Sundials.—No doubt the sundial, in its modest and self-deprecatory autobiography—

"Horas non numero nisi serenas"—

does intend to institute an uncomplimentary parallel between itself and the moondial, man. We know from Sam Butler that the moon "Rules all the sea and half the land," but I do not imagine that the writer ever thought to find so kind a commentator as "G. S." to foist so much "good interpretation" on to his line by what might be almost called a pious fraud. I am inclined to believe that the composer got hold of what he was pleased to think a "good idea," which he tried to get into a hendecasyllabic verse, and failed most signally; for indeed the poor soul is guilty of a shocking false quantity ("nisi") in a verse that otherwise "goes on all fours." Monkish writers, however, are frequently above such petty details as quantities. From seeing this notice, I have been led to look back to the inscriptions referred to by "G. S." in p. 1147. A few of them seem to labour under slight inaccuracies:—1.

"Signat et monet
Stulto longo, sapienti brevis."

Should not this be "longa?" [A misprint certainly, though correctly copied by us.] Somehow it seems to me that the inscription can hardly be complete. I fancy there must be two entire iambic lines; perhaps it was impossible to decipher the beginning. Of course it would be easy to fill them up by conjecture. 2. The punctuation of the "somewhat unintelligible distich," at Mortefontaine, can scarcely be right. Should not the two first commas be removed? [It would seem so, but they are in the original.] Then the translation would be something of this kind:—

Had not Death's death by death done Death to death
The gate above were closed to us beneath.

The iteration in lines like these was anything but unpleasant to monkish ears. Compare, for instance—

"Cur mittis violas? Nempe ut violentius urar.
Quid violas violis me violenta tuis?"

[How should this be rendered?] 3. "Ite reditque viam," &c., must surely be "Itque reditque." The next line, too, should run, I think—

"Umbra fugax homines nec reditura sum,"

omitting the comma and substituting "nec" for "non." "Unam time" I cannot understand. May it not be "Umbram time," or "Urnam time?" [Or, again, "Ultimam time."] 4. The second inscription on the double sundial should be "Dum morior moreris" (not "morieris"). [Yes.] I think the second line ought to run "cum moriere," or "dum moriare." Whether it does or not I cannot say. [No.] *W. F. S., Woolston, Bletchley Station.* [We thank our correspondent for his emendations. We were too faithful plagiarists. EDS.]

—— The sundial on Seaham church has the following inscription:—

"The natural clockwork, by the mighty one
Wound up at first, and ever since hath gone;
No pin drops out, its wheels and springs holds good,
It speaks its Maker's praise, tho' once it stood.
But that was by the order of the workman's power,
And when it stands again it goes no more.

John Robinson, Rector, } A.D. 1773.
N. Duglass, Fecit. }
Thomas Smith, } Church Wardens.
Samuel Stevenson, }

D. M

Seaham in Latitude 54. 51."

I may mention that at this church Lord Byron's marriage certificate is kept. Seaham Hall was the place that he married from. *R. Draper.*

Foreign Correspondence.

A HORTICULTURAL VISIT TO CALIFORNIA.—We have been favoured with the following notes on the Horticulture of California, drawn up by the Hon. Marshall Wilder, in conjunction with Messrs. Downing, Ellwanger, and Barry, after their recent visit. These notes are also published in one of the American horticultural Journals for the present month:—

Fruit Culture.—We begin with this, being the most important. We arrived at San Francisco on June 20. On visiting the markets, the next morning, we found an abundant supply of all the early fruits; of Strawberries, the first crop had passed, the second was just coming in; Apricots, early sorts abundant and beautiful; Cherries, in their prime—large, beautiful and excellent; Currants, plentiful and very large; early Pears, chiefly Doyenné d'Eté and Madeleine; Apples, mostly Red Astrachan; Figs, Gooseberries, and early Plums. From all this we came to the conclusion that the period of our visit was more favourable for the objects we had in view than we had expected, and perhaps as favourable as any period of the year, as we afterwards found it to be. Thus we had the opportunity of witnessing the harvest, at its height, in the great agricultural districts.

We took immediate steps to ascertain in what localities we should find the best examples, in the several departments of culture, and within easy reach of us, and ascertained that the valleys of Santa Clara, Napa, Sonoma, Sacramento, and San Joaquin contained some of the largest and best conducted orchards and vineyards in the State.

Santa Clara Valley.—Here we visited the large orchard of Mr. L. A. Gould. It consists of 3000 Pear trees, 4000 Apple trees, 35 acres of Strawberries, 10 acres of Grapes: in all 73 acres. Grapes are planted among the Pears. The orchard was planted in 1855. The Pear trees are set at 16 feet apart, with a Grape between every two trees, and two rows of Grapes between every two rows of Pear trees, thus covering every foot of the ground. The Strawberries are grown in rows 3½ feet apart by 1½ foot in the row. The plants in one plot were said to be six years old, grown in hills which were full 18 inches across, and were bearing ripe and green fruit and blossoms.

Here the Strawberry bears two main crops in the year, one commencing in April and one in September; but in fact, it bears the whole year when irrigated as it is here. Mr. Gould has three artesian wells on his premises, varying in depth from 320 to 340 feet, and giving a constant flow of water during the dry season. The Strawberries are irrigated by carrying the water along the headlands in wooden flumes about 18 inches square; stoppers are inserted opposite the spaces between the rows, and thus the water is distributed and shut off at pleasure. Mr. Gould had on his grounds a mile and a-half of these flumes. The Longworth's Prolific, here and in many other places, was spoken of as the most profitable, and appeared to us to constitute the bulk of this fruit on the market.

The later Cherries were in perfection, and were extraordinary for size and beauty, surpassing, as we thought, any we had ever seen in any country, Napoléon Bigarreau and Black Tartarian especially; the former of these is much cultivated, and sold under the name of "Royal Ann."

The Pear orchard is composed of many of the leading well-known sorts; the trees remarkable for health, vigour of growth, and productiveness. The oldest are about 12 years, and some of these we estimated at 30 feet in height, and a foot in diameter of trunk at the ground. The crop we regarded as too heavy for the future welfare of the trees, and we suggested the thinning of the fruit; but Mr. G. said the low prices of fruit would not justify the expense. We shall speak of prices hereafter. Doyenné d'Eté and Madeleine were being picked, and compared favourably with those grown at the east. All other varieties seemed to be in advance of ours in the same proportion: All varieties seemed to do well; many were already, though not half grown, highly coloured. Mr. Gould expressed the opinion that the later sorts, such as Winter Nelis (now being extensively planted), Beurré Clairgeau, Doyenné d'Alençon, and Glou Morceau are likely to be the most profitable market sorts in the future.

The Apple orchard is less promising than the Pear, we thought owing to the ground being too wet at a certain period of the year. Newtown Pippin was said to be the most profitable, and next to that Smith's Cider, White Pearmain, and Winesap.

English Walnuts thrive and bear well here, and Mr. Gould has some fine rows or avenues of young bearing trees, and is planting more. We were much pleased with the general good condition and management of this establishment.

We passed from this to the grounds of Mr. B. F. Watkins, adjoining. He has a fruit plantation of 35 acres, every part of which is kept in the best possible order. He has 7 acres of Longworth's Prolific Strawberry, and several acres of Black Hamburgh Grapes, grown for the table. Apples, Pears, Plums, and Peaches are all grown successfully; the Plums, especially, were heavily laden with fruit. No Curculio in California. Here we saw the practice of mulching carried out extensively; and Mr. Watkins, as well as other good cultivators with whom we met, regard it as very beneficial in that dry summer climate.

Our next call was at the elegant grounds of James P. Fierce, Esq. All the fruits are well grown; but the chief feature is a vineyard of 26 acres, composed mainly of Sweetwater, White Muscat of Alexandria, and Rose of Peru, which latter is much cultivated. As the fruit was not ripe, we were unable to identify it with any variety known to us. The fruits here are grown for market, and last year realised, on an average, about 4 cents per lb.

A remarkable feature of these grounds was a Grape arbour three-fourths of a mile in length, 30 feet in width, and 12 feet high, covered with Grapes trained in the most elaborate and artistic manner. Part of this arbour is used as a drive, in which carriages may pass.

San Mateo.—On Wednesday, June 22, through the politeness of W. C. Ralston, Esq., of whose princely hospitality we shall speak hereafter, we were taken to

the residence of F. D. Atherton, Esq., of Fair Oaks, San Mateo Co., about 25 miles from San Francisco.

Mr. Atherton has a charming place. Besides his ornamental grounds, he has an orchard and vineyard of 9 acres, to which he gives great attention, and which he keeps in the most perfect order. The ground among the trees and Vines has been cultivated thoroughly, not a weed was to be seen, and the surface was rolled as smooth as a floor.

The Pear portion of the orchard seemed to have received special attention, and contained a large collection, including the newer sorts. Mr. Atherton's experience with varieties corresponds, in the main, with ours. Josephine de Malines is one of the best Pears, and several trees have been grafted over with it. Grapes looked very well. Muscat of Alexandria showed large, well-formed bunches.

Figs, Olives, and Walnuts were all in bearing, and looked well. Lawton Blackberries heavily laden with fruit just beginning to colour, and elegantly trained to a wire trellis. This was the first fruit garden we visited, and we were all delighted with it. It raised our expectations with regard to the future, and they were fully realised.

In the same neighbourhood we called at the country residence of Hon. J. H. Selby, mayor of San Francisco. The grounds are well planted. In the fruit garden we saw a fine collection of Apples trained as pyramids, with stems about 2 feet in height. Other fruits were all carefully pruned and trained, and the walks were lined with Fig trees. We next visited the elegant grounds of Messrs. Barron & Bell, Manor Park, but night prevented further notes.

San Lorenzo.—June 28, we visited the plantation of Mr. E. D. Lewelling, of San Lorenzo, some miles from San José. Mr. L. has 125 acres in fruits, grown for market, and is one of the earliest, most experienced, and successful fruit growers in California. On our arrival we found him in his extensive and well-arranged fruit-packing house, preparing Apricots, Cherries, early Plums, Pears, and Currants for market. All were remarkably fine of their respective kinds. He had sent Cherries that morning to San Francisco, that measured 3¾ inches in circumference, and weighed 30 to the pound. We thought we never saw such Cherries. He sells, annually, about 65,000 lb. of Cherries, at from 10 cents to 40 cents per lb., though some had reached as high as 75 cents. All fruits are sold, in California, by weight. The Black Tartarian commands the highest price.

He has 40 acres of Cherry Currants, and the sight of this plantation will convince any one that the Cherry Currant is not unproductive; indeed, the bushes were covered with masses of fruit of enormous size. He has sold 140,000 lb. in one year, at from 9 to 11 cents per lb. Both Cherries and Currants are put up in boxes of 10 lb. each, and 12 boxes in a case. Plums are profitably grown, and are packed in 20 lb. boxes.

Of Blackberries he has 8 or 10 acres, all Lawton. The crop is not more than fair. These are packed in 5 lb. boxes. Generally the Blackberry does not succeed so well as at the East, though we met with occasional exceptions, which we will refer to hereafter.

Pears are packed in 50 lb. boxes, and Apples in 60 lb. This orchard was planted 15 years ago. Pears succeed well; and in regard to varieties, we might repeat what we said in speaking of Mr. Gould. Mr. Lewelling has produced the Pound, or Uvedale's St. Germain Pear, weighing 4 lb. 3 oz.

Almonds are successfully grown—the soft shell varieties—Languedoc and Lewelling's Standard, a seedling of his own. We saw one tree, 14 years old, 15 inches in diameter, that has yielded 3 bushels, and were sold at 28 cents per pound. He has 2000 Almond trees planted. The English Walnut is also grown extensively, and some of the trees are already large enough to produce some 2 bushels of nuts each.

Mr. Lewelling prefers the Peach and Apricot for Plum stocks, as they produce no suckers, whilst the Plum is troublesome in that respect. It may be well to state here that the Currants are trained in bush form, on single stems, and the branches are carefully shortened during the growing season, to keep them compact and prevent breaking down. While speaking of Currants, we may as well add that a company has been organised for the purpose of manufacturing beet-sugar, and the same company will manufacture Currant jelly, which is now prepared extensively in San Francisco.

The Sugar-Beet is produced here with great success. It attains fully twice the size and weight that it does with us in one season. We were informed of single ones weighing over 100 lb. An enterprise of this kind, well managed, can scarcely fail of success. We were much pleased with the arrangement and management of this extensive establishment, every part of which is accessible, through broad avenues 32 feet wide, the whole enclosed with fine hedges of Osage Orange and Cerasus ilicifolia, called the Californian Holly. Some objects in the way of ornamental trees worthy of note, we shall refer to hereafter.

A short distance from Mr. Lewelling's, we visited the orchard and vineyard of Mr. E. T. Crane. He has 32 acres, including a large plantation of Cherry Currants in great perfection. The balance of his orchard was made up of Cherries, Pears, Apples, &c., besides a small vineyard. This place is well managed, and was very satisfactory. Mr. Crane's experience with varieties is the same as Mr. Lewelling's. The Newtown Pippin is the most profitable Apple.

San José.—At San José we visited the extensive orchard and nurseries of Mr. B. F. Fox. Unfortunately Mr. Fox was not at home, but his foreman conducted us over a part of his grounds. Mr. Fox is one of the pioneer orchardists of that region, and a large portion of his trees are well advanced in growth. The fruit was generally good. Early Apricots and Pears were going to market. Both Apricot and Nectarine trees were heavily laden with large and beautiful fruit.

Here, too, we made a call at the fine grounds of General Henry M. Naglee, where we found a large and well-managed vineyard, the fruit of which is wholly used in the manufacture of brandy, in which the General is said to excel. We found here many ornamental trees of interest, to be spoken of hereafter. Had our time permitted we should have visited many other orchards and vineyards in this rich and beautiful valley. The valley of Santa Clara, in its agricultural as well as horticultural aspect, is exceedingly interesting; and our visit there will long be remembered by our party as one of the most agreeable and instructive incidents of their travels.

Napa Valley.—On June 29 we visited the orchards of Mr. Simpson Thompson, at Suscol, in the Napa Valley. Mr. Thompson has 100 acres under fruit culture, besides a large farm. Here we found one of the largest and best Apple orchards we had seen. The Early Harvest and Red Astrachan were fit to gather. Williams' Favourite was largely planted, and looked remarkably well. The following sorts were named as the most profitable:—Williams' Favourite, Early Strawberry, Summer Rose, Red Astrachan, Early Harvest, Winesap, Rawle's Janet, Newtown Pippin, White Pearmain, Roxbury Russet, Rhode Island Greening, Yellow Bellflower, and Smith's Cider. Northern Spy and Baldwin failed, and had been grafted over with Yellow Bellflower and other sorts. Newtown Pippin did best of all.

Mr. Thompson was one of the earliest fruit cultivators in the State, since the discovery of gold. He informed us, that when he commenced he planted Peach stones, and in 18 months from the planting gathered fruit from the trees, and sold them in San Francisco at enormous prices. The Duke Cherries are extensively grown here, being found more profitable than the other classes.

From Mr. Thompson's we proceeded to "Oak Knoll," the residence of R. B. Woodward, Esq., some four miles from Napa, in the heart of the beautiful Napa Valley. Mr. Woodward has 125 acres in fruit, all in the finest state of cultivation, the only defect being that the trees stand too close together. The oldest trees are 12 years planted, and many of them are 18 inches to 2 feet in diameter of trunk, and 25 to 30 feet in height; we should think more than twice the size they would attain with us in the same time. Of the 125 acres, 25 are in Grapes, 50 in Apples, and the balance in Pears, Cherries, &c. All the trees are models of health, vigour, and productiveness.

The Pears consist of all the leading sorts. Of Apples, the following were named as the most profitable:—Early Harvest, Red Astrachan, Fall Pippin, Fallawater, Yellow Bellflower, Smith's Cider, White Winter Pearmain.

The vineyard contains some 20 to 30 of the best varieties of foreign Grapes, including the Muscat of Alexandria, Black Hamburgh, &c. The grounds of Mr. Woodward are very extensive, the whole estate containing some 2300 acres. Near the residence is a fine, well-planted lawn. The grain-fields, seen from the lawn, were grand. This establishment itself, and the beauty of the surrounding scenery, gave us great pleasure.

On an adjoining estate, Mr. Woodward took us to see a steam threshing-machine in operation, in the centre of a great Wheat field. The force employed was a 12-horse power engine, 12 men, and five horses. The quantity of grain threshed was 800 to 1000 sacks, of 100 lb. each, per day. Two-horse power forks were employed in feeding the machine.

Sonoma Valley.—On Thursday, June 30, we visited Sonoma, a place famous for its vineyards. We went from Napa by carriage. The ride over the finely-wooded hills, through a rich farming district, was delightful. As we came in view of the valley, with its broad vineyards—more than 1000 acres—and fields of grain, with the richly-wooded hills beyond, the scene was enchanting.

Our chief point of destination was the vineyards of the Buena Vista Vinicultural Company. The President, William Blanding, Esq., had kindly invited us, and agreed to meet us there. In approaching this establishment, we left the main road, and passed through several vineyards.

At that of Mr. Louis Tichnor we made a brief halt, and visited his cellars. He kindly presented samples of his wines—Reisling, from the famous German Reisling Grape; another, from Reisling and Chasselas combined, and a red wine of Burgundy character, made from the Zinfindal; and Muscatel, from the Muscat of Alexandria, which is used in flavouring other wines. Mr. Tichnor's vineyards cover 140 acres, and he makes 40,000 to 50,000 gallons of wine annually. One of his cellars contains 100,000 gallons, and another 150,000. Our party were well pleased with these wines. The cellars and all their appointments were of the most complete character.

The Buena Vista Company's vineyard was commenced some 15 years ago, and contains now, according to the annual report of last year, 441 acres—127 acres in full bearing, 116½ acres in half bearing, 120 acres partly in bearing, 71½ acres planted in 1867-8-9—in all, nearly 300,000 Vines. The product of 1869 was 58,435 gallons, said to be not more than half as much as the year previous, partly owing to the heavy crop of 1868, and partly to unfavourable weather during the ripening of the Grape. The principal wines made are the White and Red Sonoma and Sparkling. The Grape used is chiefly the "Mission," as it is known here. The price of the still wines is 50 cents per gallon, and the sparkling 10¼ dols. per case of a dozen. The cellars are cut out of the solid rock, are very extensive, well arranged, and kept in perfect order.

The Vines are grown in tree form, without stake or trellis; the stems from 2 to 3 feet in height. Some of the oldest are fully 6 inches in diameter. No summer pruning is practised farther than the removal of superfluous shoots early in the season. The bearing canes are allowed to run their full length, spreading over the ground, which is kept clear and well cultivated. They are planted 8 feet apart. The cost of cultivating is estimated at 25 dols. per acre, but others put it higher than this. The average product per Vine is about 10 lb. Twelve to 15 lb. give a gallon of must. The Mission Grape is most productive, and frequently yields 40 to 50 lb. to a Vine; the Reisling not over 4 or 5 lb. The soil and situation of this company's vineyard are both highly favourable for the business.

Mr. Blanding, the president of the Society, is also president of the California Silk Company, at Davisville, in Yolo County. The company has there 350 acres in trees; 100 acres in Mulberry for feeding the silkworm; 10,000 Languedoc soft shell Almond, the fruit of which sells readily at 25 cents per lb., and the balance in Cherries, Figs, Grapes, &c.

A short distance from the Buena Vista Company's grounds we visited the vineyard of S. A. Shaw, Esq., president of the Fruit Growers' Society of Sonoma. His vineyard covers 16 acres, and is composed of Muscat of Alexandria, Black Hamburg, Rose of Peru, and a few other sorts, planted in 1858 and 1859, and grown in the same way as those of the Buena Vista Company. The stems of the oldest Vines are 4 to 6 inches in diameter, set 8 feet apart. The fruit is all sold for the table, and usually averages 10 cents per lb. The vineyard was in fine condition, and was inspected by our party with much pleasure. The proprietor, Mr. Shaw, and his brother, who has a vineyard adjoining, accompanied us very kindly, and gave us much information in regard to the culture of that neighbourhood.

We could have spent another day, or even two, very profitably, in that district; but our engagements, made beforehand, at other places, hurried us along.

VICTORIA, VANCOUVER'S ISLAND, B.C.—Located far away from the glorious old country of my birth, I never cease to take the liveliest interest in all that concerns its welfare, and when the mail brings the *Gardeners' Chronicle*, and I become immersed in its contents, I feel as if I were again treading the old soil, talking to friends, and taking sides with one or other of the controversial writers of its pages. One subject of late, the "Fungus theory," which for some time past has engaged the pens of some of your correspondents, has more than ordinarily interested me.

To attribute the cause of death of various trees to the action of fungoid growth in the living tissues, caused by the presence of decaying roots, sticks, &c., in the soil, is, I think, anything but good philosophy, for whence comes the organic matters found in all the fertile soils which clothe the present surface of the globe, but from decayed vegetable substances. Look at Nature's grand workshops, our primæval forests, and observe how she conducts her operations, and how rapidly organised substances are converted into food for the living plant, and we shall look in vain for positive evidence of the fungoid theory.

Let me invite some of your correspondents to accompany me in a stroll to one of our British Columbian forests for evidence of what I say, and as a good illustration we will explore yonder valley, where the forest appears most dense, and where vegetation is uncommonly luxuriant, and plunge at once into its midst. All around us, and hemmed in on every side, we have one tangled mass of undergrowth; overhead, towering to some 150 to 200 feet or more, and shutting out the sky, we have a dense forest of gigantic Abies Douglasii, Menziesii, canadensis, Picea grandis, Thuja gigantea, &c., all in the most luxuriant health. And now let us turn our attention to the ground. Lying across our path and each other at every step, and stretching their ponderous trunks towards every point of the compass, are former giants of the forest in every imaginable state of decomposition, the products of decay giving life and vigour to innumerable young of the same species, as well as to others composing the mass of vegetation by which we are encircled, and forming that rich soil so much prized by the settlers of this country. If we move the soil in order to secure some new plant which has attracted our attention, we find it one mass of decaying

vegetable substances, among which the roots of the living plants are luxuriating without showing any symptoms of fungoid disease. And this is true of the country generally, one generation of living organisms living on the decayed and decaying remains of former generations, yearly adding fertility to the soil by their leaves and branches, and so on to all time.

Can the presence, then, of decaying sticks, &c.—woody fibre, in fact, be the cause of fungoid decay in living organisms, as some of your correspondents asserts? or is not the presence of the mycelium of Fungus in the living tissues due to some anterior predisposing cause, and which has hitherto escaped the attention of the very respectable advocates of the "Fungus theory?" If we admit the first, we set up, as I conceive, a theory against one of the grand laws of creation; by the latter we admit our own fallibility and the necessity for further and more careful observation.
H. Mitchell, Victoria, Vancouver's Island, B.C., July 27.

Societies.

GLASGOW AND WEST OF SCOTLAND HORTICULTURAL: *Sept.* 7.—This last and greatest exhibition of the season was held in the City Hall. In point of the number of entries it was a great exhibition, though in respect of quality not quite so notable. So far as gardening art is concerned, we had little to complain of. Flora exercises at all times a potent influence, but Pomona has charms that are quite irresistible—Brodingnagian bunches of Grapes, the beautiful Peaches and Plums, and the no less interesting, though more common, contribution of Pears and Apples. To make a show interesting, however, we must have something like artistic skill displayed in grouping and arrangement. Fruit looks inviting at all times, but Mr. Graham's arrangement of it after the *dîner à la Russe* style, was simply entrancing. There were finer dishes of some of the kinds exhibited than Mr. Graham showed, but the combination was wanting. Fruit and flowers artistically disposed upon one table, besides offering a lesson to the gardener, furnish object lessons for all who are desirous of studying at the school of taste. The flowering plants were not so numerous as usual; but the plants of beautiful foliage—whether from a parti-coloured point of view, as for instance the Crotons, or remarkable for beautifully cut outline, as some of the varied Ferns—made up for the seeming deficiency; and then the cut flowers, for brilliancy of colouring, were superb.

The Fuchsias were by far the best grown plants seen in Glasgow for years, particularly those shown by Mr. Duncan, which were model plants; and the Ferns, particularly those from Mr. Connon, were very effective. The table bouquets were simply magnificent, well built, and the flowers of the rarest order. The hand bouquets were equally good, and formed quite a feature in the exhibition, confronting the many good lots of Lilies sent for competition. Fruit was of more than average quality. Mr. Graham, gr. to Sir George Campbell, Garscube, as above noticed, had a charming assortment, set out in Bohemian glass dishes and chinaware, furnished by Lady Campbell herself. Mr. D. Campbell, gr. to G. Alston, Esq., Craighead, sent such a stand of the Tokay as has not been seen at any of our Scotch competitions—the International of last, and a former year not excepted. Mr. Smith, at the Countess of Stair's, Bargany, had by far the best Black Hamburghs. Mr. Bryden, at Sir William Wallace's, Stranraer; Mr. M'Connochie, at Mr. Smollett's; Mr. Crosbie, at Sir James Colquhoun's, Luss; and Mr. Rose, at Sir James Lumsden's, Arden, all had magnificent fruit. A splendid bunch of Royal Vineyard Grapes came from Mr. Alston's vineries at Craighead, much finer than we have previously seen in this country. Excellent Peaches came from Castlemilk, Scone Palace, and Drumpellier; and a capital lot of fruit came from Blythswood. The Apples and Pears were such as to command general attention from their variety and size and colour. The lots from Mr. J. M'Gregor, Barrochan, Paisley, from the Marquis of Bute, and from Sir William Wallace, even eclipsed some of those from the Royal Horticultural Society of London. In the London collection, however, there was an accurate nomenclature. Every variety from the Royal collection was prominently named; in the others this was totally disregarded. Competitors should make a note of this, and act accordingly. Vegetables formed a very large exhibition. Our agricultural friends are likely to be interested in the lots of Potatos shown, particularly the Bovinia.

Notices of Books.

Monographie Historique et Litteraire des Lis. Par F. de Cannart d'Hamale, Sénateur, &c. (Literary History of the Genus Lilium.) Malines. 8vo, pp. 122.

Two features specially characterise the literature of Belgium. We speak more particularly of its scientific literature, as being that with which we are most familiar, but scholars and men of letters tell the same story in reference to the *belles lettres*. Those features are—uncompromising patriotism, and a revelling in historic detail. The two are naturally often combined. If a plant has to be described, its history is probed to the uttermost, and ten chances to one if Dodoens, De Lobel, or some other Belgian or *quasi*-Belgian is not pressed into the service, made to disclose what he may have written on the subject, trotted out for the admiration of all readers, with the reminder that he too was a Belgian. All this is very pleasant and very creditable to the little kingdom now so sorely tried by troubles not of its own making. The treatise, whose title is above quoted, is a very good illustration of the national tendency. It is the work of an elegant scholar, a man of travel and of taste—a lover of plants, an accomplished gentleman, and the President of the Federation of the Horticultural Societies of Belgium to boot. It is no matter for wonder then that the book before us, if not the most profound in a botanical sense, is nevertheless one of the pleasantest and most instructive horticultural monographs that has come under our notice. Starting with the history of the Lily and its kind from the time of Moses, the author leads us pleasantly along, gossiping the while, and citing quotation after quotation from authors Greek, authors Latin, authors French, authors Flemish, till he brings us down to our own times, and discourses of the latest importations from Japan.

It would seem that scarcely an allusion to his favourite genus, in profane or sacred writers, from the most remote times up to the present, has escaped the vigilance of the author, with one prominent exception—English writers are almost entirely ignored.

> "To gild refined gold, to paint the Lily,
> To throw a perfume on the Violet;
> To smooth the ice or add another hue
> Unto the rainbow; or with taper light,
> To seek the beauteous eye of heaven to garnish,
> Is wasteful and ridiculous excess."

Wherefore, seeing how much has been said on the subject, M. de Cannart may have thought it a work of supererogation to add what English poets may have written. Amid so much that is pleasant reading we hardly know what to extract to give our readers an idea of the contents of the volume. Suppose we take the Lilies of France—the Fleurs-de-lys, as having special relation to current events. We are first of all cautioned not to place too much faith in the notion that these well-known heraldic insignia really were intended for Lilies. They may have been, says M. de Cannart, intended for spearheads or for golden bees (the crest of the first kings of France), distorted in the drawing! And then we are told that the word "lys" is a corruption of "Loys," as it was once written "Fleur de Loys," or "Fleur de Louis." That Louis le Jeune in 1150 adopted the Fleur-de-lys as his device—azure, three Fleurs-de-lys or, as the heralds would say; and that this shield had as "supporters" two angels robed in dalmatics, with the motto "Lilia non nent," and the cry—"Montjoie et St. Denis."

Other chroniclers give the history of the regal insignia of France in these terms:—Clovis had married Clothilde, daughter of Chilperic, a princess who retained her Christian faith amid the idolatry of the Franks, and successfully employed the allurements of her beauty, the charm of her language, and the attraction of the ceremonial worship of her Church for the purpose of converting her royal spouse. At the battle of Tolbiac, Clovis saw his soldiers wavering and his fortunes tottering. Throwing himself on his knees, he cried aloud, "Oh, God! whom Clothilde worships, I implore thy aid, make me to triumph and I will believe in thee." His soldiers rushed on the enemy with redoubled courage, and put them to flight. An angel appeared to Clovis, bearing from heaven a branch of Lily, which he forthwith adopted as his armorial bearings and transmitted to his descendants. Clovis and his soldiers abjured idolatry, embraced Christianity, and were received into the Church by the Bishop of Rheims. But this is to assign a very modern origin to the device in question. Another story has it, that one Francus, son of Hector, driven out from Troy, came to found a new empire in Gaul, and bore with him a Fleur-de-lis as an augury of his future greatness.

We have not space to follow the author further in his archæological investigations into the history of the white Lily, though we sympathise with him when he has to make the confession, that after all it is more probable that it was the yellow Iris (Iris Pseud-acorus), and not the white Lily, which was intended as the characteristic flower of France. In the same pleasant strain, full of erudition, but never pedantic, M. de Cannart gives the history of all the species of Lilies cultivated in our gardens up to the discovery in Japan, by the much lamented John Veitch, in 1861, of Lilium auratum and L. Leichtlinii. Even the numerous varieties of L. auratum are not neglected, but allusion is made to several of the varieties introduced into commerce quite recently by Mr. Bull.

Comparatively few botanical details are given in the work before us, in which the author adopts, with slight modification, the classification of Kunth, and adds a fifth section, to include the very distinct L. cordifolium and L. giganteum.

FOREIGN JOURNALS.

FOLLOWING up from our last notice the numbers of the **Revue Horticole** for the present year (Nos. 3 to 15), we find the following coloured figures published:—*Vallota grandiflora*, a fine form of V. purpurea obtained from Belgium, and not unlike the one Mr. Bull calls eximia. The different forms of this fine greenhouse bulb cannot be too strongly recommended to the attention of all lovers of flowers. *Cerise Grosse de Vervières*, a variety of Cherry much cultivated in the neighbourhood of Vervières under the name of La Grosse, and a very handsome and most productive sort, belonging to the section of the Griottes, and producing moderate-sized, round, deep rosy red fruit. *Ageratum Lasseauxii*, a Montevidean species, introduced by way of France, and which, judging both by the figure and a small plant produced at a recent meeting at South Kensington, is of spare and lanky habit, though here described as being "extrèmement ramifiée;" it has lanceolate-elliptic leaves, and flower-heads of a lilac-rose colour, and is said to resemble A. mexicanum in habit. *Pêche Plate*, the Flat Peach of China. *Pentas carnea kermesina*, a garden variety with flowers of a lively carmine-rose. *Poire de Preuilly*, a remarkably large Pear, attaining upwards of 7 inches in length and 12 inches in circumference, with the form of Bon Chrétien, greenish, and speckled like Duchesse d'Angoulême, becoming yellow when ripe, the flesh crisp, coarse, and not very highly flavoured; it was raised at Preuilly, a town in one of the central departments of France. *Æchmea Weilbachiana*, a handsome Bromeliad with coral-coloured inflorescence, also known as Lamprococcus. *Raisin Mormen Noir*, a small black Grape, much grown in the neighbourhood of Lyons. *Poire Président Mas*, a fine-looking sort, obtained from seed of Beurré d'Aremberg, sown in 1852, and named in 1867 after M. A. Mas, president of the Horticultural Society of Bourg. The fruit is large, oblong, with blunt extremities, green passing to bright yellow at maturity, regularly marked with brown specks, the flesh firm and melting, with an abundant sugary and highly perfumed juice; in use from November till January. *Portea kermesina*, a showy Bromeliad, with channelled toothed violet-tinted leaves, and a central oblong inflorescence composed of large compressed rosy bracts, from which the bluish flowers protrude; it was sent from Bahia by M. Porte to the gardens of the Muséum at Paris. *Justicia Lindeni*, a Mexican species, with a head of orange-yellow flowers. *Begonia magnifica*, a very handsome species, introduced from New Grenada by M. Linden, and having unequal-sided ovate leaves, and large rosy crimson flowers with the four divisions oblong-lanceolate and equal. *Pêcher Madeleine à feuilles de Saule* is a narrow-leaved sport from the ordinary Madeleine, observed and put in commerce by M. Arnould jeune, of Nancy; the fruit is of excellent quality, large, subspherical, and of a fine deep red on the exposed side, with a flavour recalling that of Madeleine rouge; it is in season towards the end of August. Among the woodcut illustrations we notice: *Hydrangea Hortensia Madame Mézard*, a sport of the common Hydrangea, obtained by M. Mézard, of Rueil, and differing in having the florets undulately toothed or fimbriate, rose-coloured, with green band, and often producing from the centre a more or less developed second floret; it seems a highly curious monstrosity. *Secateur facile*, a form of pruning scissors, which is made to open and shut with greater ease than usual. *Episcia tesselata*, a Peruvian plant, found by M. Wallis, and introduced by M. Linden; it is a robust herb, with opposite ovate-lanceolate leaves, and numerous subsessile pale yellow flowers, and is principally valuable for its bullate, metallic-tinted leaves. *Anomalous Pear*, a monstrosity, in which a woody branch protrudes from the surface of the fruit, and another from the foot-stalk of the fruit, showing that both fruit and pedicels had become converted into woody branches. *Anomalous Cherry*, showing well developed calycine lobes at the apex of the fruit. *Inciseur en scie*, a pincer-like cutting instrument invented by M. Gagneur, of Beaune, and improved by M. Refroigney, of the same place, in which the cutting blades are toothed like a saw, and which is specially designed for the use of the Vine dressers. *Diospyros costata*, showing the fruit to be 2 inches in diameter and more or less deeply ribbed. *Cupressus Macnabiana*, a Californian species, remarkable for the Apple-like smell it gives out; it is very hardy. The cut branches, when put in water, are said to purify the air of an apartment, and hence M. Carrière suggests that, in a hygienic point of view, they might be advantageously introduced into confined rooms. *Phylloxera vastatrix*, several figures showing the insect in its various stages of growth, as found on the leaves and roots of the Vine. *Cupressus Lambertiana depressa*, a curious variety, with long branches, which grow out so as to form a hollow centre, like a tree wanting a leading stem. *Dolichos bicontortus*, a Japanese vegetable remarkable for the form of the pods, which are from two to four in number, and rolled up circularly on the dorsal nerve, so as to describe about a turn and a half, and disposed in the form of a pair of eye-glasses. *Taxus Roezlii*, a North Californian Conifer, growing some 50 or 60 feet high, introduced by M. Roezl; as seen from a distance it resembles the Deodar so closely as to be mistakable for it; the cones are about 2 inches long. As a species, M. Carrière states that it is allied to T. Hookeriana. *Alloplectus vittatus*, noticed above. *Anomalous Pear*, bearing a leaf from the surface of the fruit; this result occurs on the Pera parda, a variety of Pear cultivated in Spain, and on which sometimes several leaves, constituting a small rosette, are developed. *Soufflet-Injecteur Pillon*, an instrument invented by M. Pillon for the destruction of insects, by means of the distribution of liquid remedies. It consists of a pair of bellows, to the nozzle of which is attached a hollow copper sphere with two openings, one for the introduction of the liquid to be employed, the other communicating with the nozzle, and serving for its distribution, which is effected after the manner of the scent vapouriser; it is made by M. Bodevin, 26, Rue de Réaumur, Paris. *Staphylea colchica*, a very

hardy and vigorous shrub, with opposite leaves, composed of five, more rarely three, oval shining leaflets, and white flowers in terminal panicles, and of an ornamental character, so much so, that it is observed it may be found useful as a market plant. *Chamærops Gruyttbu*, an Indian greenhouse Palm, forming a tall trunk, supporting a head of numerous fan-shaped leaves, on smooth unarmed petioles; it is more slender and graceful than the other species of Chamærops cultivated with it at the Jardin du Museum. *Ananassa monstrosa*, a kind of Pine-apple, producing well-formed regular fruits, except that they are destitute of a crown, and which has been obtained by M. Lafont, a distinguished amateur horticulturist of Bordeaux, from a seed of a Pine-apple from Bahia; its quality is said to have been perfect, and M. Carrière strongly recommends the culture of these crownless Pines, as being, in consequence of this peculiar development, more pulpy than usual at the apex, though somewhat less good-looking. *Thermomètre Piguet*, the ground thermometer, which the Editor figures, not for its novelty, but in order to bring so useful an instrument into more general use.

Miscellaneous.

ORIGIN OF TEA.—At what period the use of tea first became established in China is probably not a well-ascertained fact; but we have strange descriptions of its origin by Chinese writers. One of these, a legend believed in by the religious portion of the community in China, is as follows:—"A pious hermit, who, in his watchings and prayers, had often been overtaken by sleep, so that his eyelids closed, cut them off in holy wrath against the weakness of the flesh, and threw them on the ground; but a god caused a Tea shrub to spring out of them, the leaves of which exhibit the form of an eyelid bordered with lashes, and possess the gift of hindering sleep. When the hermit had tasted and proved the shrub, he taught the use of it to his fellow men." *Food Journal*.

LARGE PEARS.—As an instance of the enormous size to which fruit may be grown in the vicinity of Melbourne, may be mentioned some Brobdingnagian Pears, which were on view the other day at a seedsman's. They numbered half-a-dozen, the total weight being 16 lb. 11 oz. The largest weighed 3 lb. 3¼ oz., and the smallest 2 lb. 10½ oz. *Overland Telegraph*.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Chrysanthemums should not be glutted with manurial waterings at this particular season of their annual growth. The change from the heat of summer with its dry arid temperature to the longer cooler nights of early autumn with its excessive condensation of vapour, bathing all vegetation so thoroughly, will be all that these plants can need, or require, if the roots are kept well watered with clear water. By-and-by, when the flowers have perceptibly formed, resort may again be had to weak manure-waterings, to be increased in strength as the flowers develope themselves. Look carefully after earwigs, as they nibble away at the flower-buds in the embryo stage of growth, and so cause many a shoot to be blind, a circumstance which is only perceived at a later date, and when resort to remedial agencies is of no avail. Those who wish to keep *Fuchsias* and other similar soft-wooded plants in bloom for the longest time possible, should give the pots a slight surfacing with good decomposed manure, having resort to constant manure waterings of moderate strength, shutting up all air-giving apertures in the structures they may be in, at an early hour in the afternoon. Give to all *Coleuses* intended for permanent winter display, their final pinching back for the autumn. Keep them closer, and in such an exposed position that the sun may obtain free access to them. Plants of *Lisianthus Russellianus* should now have the pots they are in tolerably well filled with roots, and should be so treated as to endow them with greater hardihood, the better to withstand the hardships of the incoming winter. They require for a short time a cooler temperature, more air, and less moisture. Afterwards, a dry shelf elevated near to the glass in the cool end of a cool stove will suit them well. Those cultivators who, with commendable caution, may have shifted their New Holland and other similar plants under shelter during the past excessive rains and windstorms, must now use great caution not to keep the plants too warm. Give all the air possible at all times for a few weeks, and so assimilate the present condition with the past that too great a fluctuation may not occur to influence the plants injuriously. Prepare the greenhouse for the reception of plants by performing the customary cleansing, arranging and tying of climbing plants, &c. Finish also the necessary training and tying-out of specimen plants in pots, that all such things may be forwarded to the utmost, ready for the final housing.

FORCING HOUSES.

All good practitioners must now adapt their treatment to the obvious decline of the duration of light, in the case of *Pines*, and all subjects undergoing forced growth. If from any special cause a high temperature must be maintained therefore, let it be qualified by a ree admission of air, so that a rapid growth-formation be not possible. It is needless for me to draw attention to the fact that, with diminished light less and less moisture must be afforded and maintained. The fibre of each plant should be so thoroughly developed that it be not too readily injuriously influenced by a dry artificial heat in the fast approaching midwinter season. Reducing these suggestions to actual figures in regard to temperature, it will be necessary to keep up a mean of 75° by day, with an increase of 9° to 10° with actual sun heat, and about 60° to 63° by night; and this should be maintained, and at the same time air should be given more freely than usual between half-past 8 in the morning and 4 P.M. Maintain a goodly warmth around all frames or pits containing *Cucumbers* or *Melons* having no artificial internal warmth. Keep all decaying leaves clear, and so permit the light and air freely to pervade every part amongst such as are healthy and growing.

HARDY FLOWER GARDEN.

Cuttings or seedlings of all *Hardy Herbaceous Plants* intended to winter out should now be got into their winter quarters with no further delay. Get the beds ready for *Pansy* planting, which should not be delayed beyond the latter part of this present month. Fasten the young growths produced upon lately budded Roses or Brier stocks firmly to a neat stick, that the winds may not snap them off at their base or newly-formed juncture with the stock. It is not advisable to let these plants flower at their apex at this time, as they will sometimes do if not stopped. *Garden walks* must, now that the worms are unusually busy, and the autumnal *débris* of fallen leaves begin to be strewn around, be kept constantly swept, rolled, and, if necessary, weeded. If not well attended to at this season walks get into a very unsightly state by the advent of winter, when clean firm walks add great cheerfulness around a home. Thin out the last sowing of *Mignonette* as soon as the plants give evidence as to which will prove the strongest. Sow a pan of *Nemophila insignis* for potting off to flower at an early date indoors. Pot up such plants of *Schizostylis coccinea* as are needed or intended to be bloomed indoors during the autumn or winter time.

KITCHEN GARDEN.

Choose fine dry days upon which to earth-up *Celery*. Remove now all strong overgrowths from *Tomatos*, as they only tend to create fresh and stronger roots, which in turn collect and send up crude sap, requiring the full powers of the foliage to develope, and act adversely as regards the ripening of the fruits. If the fruit is at all late, remove also many of the leaves if at all gross and luxuriant in their nature. The same remarks apply to *Capsicums*, &c. Look over previous *Cabbage* plantations wherever the "leather-coated grub," so well known to all land culturists, is making havoc. At the base of some of the young plants, two and three of these pests will be found, and must be destroyed before other plants are put in, in lieu of those which are destroyed. If this be not done, the grubs will readily find out others, and so devastate the whole bed. Take up all Potatos showing any symptoms of ripening at the earliest possible moment, or they will be very likely to "grow again." *W. E.*

TOWN GARDENING.

I CANNOT help again reverting at this season to that universal favourite, and most delicious esculent, the *Mushroom*, which is so easy of cultivation in town. It does well in dark cellars and outhouses, and any person who possesses such places can grow it with as much success as in the country. Hence a few practical hints on the cultivation of the Mushroom in such positions will not be out of place. Provide at once some short horse-dung, such as that collected in the streets will answer admirably. This should be placed in a heap and turned over once a week for three weeks, which will allow the rank heat to pass off, and deprive it of its noxious qualities. It can then be put into boxes or baskets, or a bed may be formed on the ground or on shelves. It should be well beaten down until it is about 12 inches in thickness; a stick or two should then be inserted in the dung, to enable the grower to judge of the internal heat. If this trial stick gets too hot for the hand to bear, the heat is too great to receive the spawn, and it should be replaced and left till the bed becomes about milk-warm. Artificial spawn, which can be purchased at any seed shop, should be broken into lumps about the size of Walnuts. These lumps should have a thready appearance, and smell like Mushrooms, and should be placed in the beds about 1 inch apart, in rows 4 inches asunder. The bed should then be gently beaten down again, and if in a few days the trial-stick does not indicate an increase in the temperature, cover the bed over at once with fresh mould about 2 inches thick, and well beat it down, but if by chance the heat should rise, plunge in a thick stick, and leave the hole open for the heat to pass off, and delay soiling for a few days. A covering of hay will be of service in proportion to the heat of the cellar. These beds will generally begin to produce good Mushrooms about six weeks after spawning, and will sometimes continue bearing for several months. If the cultivator has room, and a succession is required, a bed should be made up every three months, or oftener, remembering that beds made at this season are generally the most productive. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON.
FOR THE WEEK ENDING WEDNESDAY, SEPTEMBER 14, 1870.

1870. MONTH AND DAY. September	At 9 A.M. Readings of Barometer reduced to 32° Fahr.	Dry Thermometer	Wet Thermometer	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
8. Thurs.	29.52	56.6	52.1	47.6	78	3.7
9. Friday	29.24	65.4	60.9	57.1	70	5.3
10. Satur.	29.45	58.3	51.9	40.1	65	3.6
11. Sunday	30.02	59.8	55.2	51.1	78	4.2
12. Monday	30.00	60.5	55.6	51.2	77	4.2
13. Tues.	29.89	59.5	57.0	54.7	85	4.8
14. Wednes	29.67	59.1	56.8	54.5	85	4.7

1870. MONTH AND DAY. September	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 30 Years	Wind. Direction.	Horizontal Movement.	Rain. In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
8. Thurs.	64.9	49.4	18.5	54.3	− 3.5	WSW	404	0.13
9. Friday	71.4	51.5	19.9	60.1	+ 2.4	S.W. to WSW	485	0.30
10. Satur.	63.8	50.8	13.0	55.9	− 1.8	WSW to WSW	632	0.00
11. Sunday.	69.8	44.7	22.1	54.4	− 3.2	WSW to S.W.	143	0.00
12. Monday	68.8	45.1	23.7	55.6	− 1.9	WSW to WSW	284	0.00
13. Tues.	60.0	49.8	10.2	53.5	− 3.8	WSW	324	0.21
14. Wednes	65.8	41.8	24.0	52.5	− 4.7	N.W. to N.N.E.	364	0.00

Sept. 8.—Very fine throughout the day; overcast at night, and rain fell heavily from 10.30 P.M. to midnight.
— 9.—Very variable; occasional showers of rain
— 10.—Generally cloudy till the afternoon; fine afterwards. A violent gale prevailed.
— 11.—Light clouds prevailed in the morning and afternoon; cloudless at night.
— 12.—Light clouds were prevalent throughout the day.
— 13.—Generally overcast. Rain fell from 9.30 A.M. to 2.30 P.M., and between 3 and 6 P.M.
— 14.—Small amounts of cloud prevailed till about 6 P.M.; cloudless at night.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, SEPTEMBER 10, 1870.

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest	Mean of all Lowest.	Mean Daily Range	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	74.6	38.4	36.2	71.0	43.7	27.3	55.9	1.61
Blackheath ..	71.4	36.2	35.2	68.1	40.0	28.0	57.0	1.33
Bristol	67.6	40.9	26.7	63.7	51.0	12.7	55.9	1.46
Birmingham ..	69.1	44.2	25.1	65.3	50.1	15.2	56.8	0.41
Wolverhampton	68.1	47.2	20.9	64.9	48.9	16.0	55.3	0.06
Leicester ..	70.5	42.2	28.3	66.4	48.4	18.0	56.0	0.77
Norwich	69.8	43.3	26.5	64.3	49.9	14.4	55.7	0.93
Nottingham ..	70.8	42.9	27.9	67.0	48.7	18.3	56.9	0.52
Sheffield	68.0	42.5	25.5	65.2	48.1	17.1	55.2	0.84
Liverpool	67.6	47.1	20.5	63.4	50.4	13.0	55.5	1.15
Manchester ..	70.2	41.5	28.7	65.1	46.6	18.5	54.7	1.10
Salford	70.9	41.0	28.3	64.0	47.8	16.2	54.5	0.99
Bradford	66.5	40.6	19.9	65.1	40.4	25.7	55.8	0.39
Leeds	69.0	44.0	25.0	65.9	49.0	16.9	56.1	0.39
Hull	69.0	40.0	28.0	61.9	44.9	17.0	53.4	0.71
Newcastle ..	66.0	45.0	21.0	61.1	48.0	13.1	53.3	0.29
Edinburgh ..	64.7	42.0	22.7	..	..	..	52.7	0.99
Glasgow	64.0	44.4	19.6	..	..	..	52.4	1.02
Dundee	63.0	44.0	20.0	..	..	..	51.8	1.05
Aberdeen	62.4	39.0	23.4	..	..	..	51.2	0.61
Paisley	64.5	42.0	22.5	..	..	..	52.1	2.00
Greenock	62.5	47.0	15.5	..	..	..	51.8	3.02
Leith	..	..	..	..	..	..	..	..
Perth	66.0	40.0	26.0	..	..	..	53.4	0.60
Dublin	68.7	41.0	27.7	..	..	..	55.7	0.66

JAMES GLAISHER.

Notices to Correspondents.

BEETLE: *W. S. C.* Bruchus rufimanus, a common pest. By no means use the Beans for seeds. It will almost certainly continue the breed. *A. M.*

BOOKS: *Filix-mas*, Lowe's "Ferns, British and Exotic," and Williams' "Select Ferns," supplemented by Moore's "Index Filicum," if you wish to know how to discriminate them.

DAHLIAS: *J. B.* asks if it is allowable to take the eyes out of Dahlias before putting them up for exhibition? He says:—"I was at a show last week where there was a silver cup competed for; the person who got the 2d prize had several of his blooms without eyes, and he said it was allowable to take them out. Had he been a member of the Society long enough, he would have had the cup." Let Glenny answer:—"If flowers are exhibited which show the disk or a green scale, or have been eaten by vermin, or damaged by carriage, or *have been deprived of stamens or petals*, or dressed, as it is called, or are evidently decayed, the censors should reject them at once." Of course they should.

DISEASED CUCUMBERS: *G. H.* The cause of your Cucumber roots being in their present condition is attributed to a species of Vibrio. There is no remedy, other than to burn the roots and soil, and to grow your next batch of plants in loam obtained from a different place.

ERICAS: *E. M. F.* Altoniana or any of its varieties, gemmifera, Marnockiana, Massoni, Parmentieriana rosea, retorta major, Shannoniana, and some of the later varieties of ventricosa.

EXHIBITION PLANTS: *E. M. F.* Six good stove or greenhouse for August flowering are the following, but they must be treated with a view to the flowering at that season:—Allamanda nobilis, Clerodendron Balfourianum,

Dipladenia amabilis, Ixora Dixiana, Plumbago capensis, Stephanotis floribunda, or either of the following might be substituted :— Bougainvillea glabra, Rondeletia speciosa major, Brugmansia Knightii flore-pleno.

FERNS FOR EXHIBITION : *E. M. F.* Cyathea (sometimes called Cibotium) princeps, Adiantum cardiochlæna (polyphyllum), Lomaria gibba (not Gibbii, as so often written at exhibitions), Gleichenia dicarpa, Adiantum farleyense, Todea superba, Nephrolepis davalloides Gleichenia Speluncæ, Dicksonia antarctica, Dicksonia Youngiæ, Davallia divaricata, Thamnopteris Nidus—any of these.

FLOWER SHOW APPEALS : *J. H.* The Bougainvillea glabra is not strictly speaking a greenhouse plant, but it ought to have been no disqualification in interpreting the meaning of the universally adopted class, "Stove and Greenhouse Plants." The meaning of the class unless otherwise specified is, that either stove plants or greehouse plants are eligible. The wording, "Stove or Greenhouse," would of course be better, because more exact.

FOLIAGE PLANTS FOR EXHIBITION : *E. E. P.* Sphærogyne barbata, Cyanophyllum magnificum, Maranta Veitchii, Croton angustifolium (or any of the new sorts, such as Veitchianum, Hookerianum, &c.), Pandanus Veitchii, Alocasia metallica (or Lowii).

FUNGUS : *Hendon.* Lycoperdon gigantaeum, one of the best of the edible Fungi.

KEEPING PEARS : *T. Jordan.* You do not mention the kind of Pear alluded to. Pears have their seasons of ripening, and do not keep beyond them. If, as we understand, yours is some very late sort, let the fruit hang on the tree as long as it is safe from frost ; then gather, handling carefully, and lay for a week or two in a dry cool fruit room ; afterwards put them, a few together, in small covered boxes to prevent shrivelling, rejecting all bruised fruits ; examine occasionally so as to detect and remove decay. When the season of maturity approaches, it may be accelerated by bringing the fruits, still covered, into a warm room for a week or two.

MARACOC : *W. M., Fly.* "Paradisus in Sole," 1620, p. 394.

NAMES OF FRUIT : *T. H., Tonbridge. Cherry :* Belle Agathe ; *Apple :* like Summer Golden Pippin.—*C. R. T.* We are sorry to say that your Peach had quite decayed before we could examine it. If you can tell us the character of the flowers, and send us another leaf, we may perhaps be able to determine it.—*P. S. Grapes :* 1, White Nice ; 2, Black Prince ; 3, Black Frontignan.

NAMES OF PLANTS : *P. H. G.* Acropera armeniaca (Lindl.).—*F. W. B.* Stanhopea graveoiens.—*A Subscriber.* Hemerocallis fulva foliis variegatis.—*H. P.* 1, Cratægus flava ; 2, C. oxyacantha var. melanocarpa ; 3, C. macrantha ; 4, (?).—*C. H. B.* 1, Aristolochia Sipho ; 2, Escallonia rubra ; 3, Leycesteria formosa ; 4, Rhus Cotinus, the Wig Plant.—*A. McA.* 1, Lycopodium Selago ; 2, L. clavatum. They are difficult to establish under cultivation, and grow on boggy heaths.—*Y. M.* Campanula fragilis.—*A. B.* Myrsiphyllum asparagoides —not at all like Plumbago in the flower.

PELARGONIUMS : *M. B.* The Zonal Pelargoniums should not have been placed lower on the prize list, because of the presence of Saloire de Nanteuil. They should either have been fully admitted or entirely excluded, according to the interpretation put on the word zonal—whether as merely indicating a race of varieties, or actual leaf marking.

PLANTS FOR CHALK CLIFF : *M. C. N.* We should recommend your friend to plant freely such things as Sedums, Sempervivums, Thymes, Lotus corniculatus flore-pleno, Helianthemums ; and if there is space for larger plants, any of the Cistuses, especially the Gum Cistus.

PROLIFEROUS TRUSS OF PELARGONIUM : *A. F.* This phenomenon is not very uncommon ; some varieties throw proliferous trusses almost constantly. It is of course a blemish from a decorative point of view.

COMMUNICATIONS RECEIVED :—E. B.—J. F. H.—B. C.—T. D. Burres (thanks.)—W. H. I.—D. N.—W. B.—C. H. B.—North, York.—Harrison & Sons—W. P. R.—Miss Freeman (with many thanks)—Dinas Mawddwy your fruit shall be named ; but another time, please to pay the carriage.—J. B.—T. B.—A. D.—G. B.—A. F.

Markets.

COVENT GARDEN.—Sept. 17.

We have still very large supplies, and those from the west and south-west parts of the Continent are greatly increased, in consequence of the home consumption being so much diminished. Fine samples of fruit, however, are comparatively scarce, owing to the effect of the late dry season. Potato trade still heavy, and prices from 5*s.* to 10*s.* per ton lower. Cut flowers we have Balsams, Pelargoniums (single and double), Asters (French and German), Dahlias, Liliums, Oleanders, &c.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve ..	1 0	2 0	Oranges, per 100 ..	8 0	12 0
Figs, per doz. ..	0 6	1 0	Peaches, per doz. ..	1 0	4 0
Grapes, per lb. ..	1 0	3 6	Pears, per doz. ..	1 6	3 0
Lemons, per 100 ..	10 0	16 0	Pine apples, per lb.	3 0	6 0
Melons, each ..	1 0	3 0	Plums, p. half sieve	2 0	3 6
Nectarines, per doz.	1 0	4 0			

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Beet, per doz. ..	2 0	3 0	Horse Radish, p bun.	3 0	5 0
Cabbages, p. doz. ..	1 0	1 6	Lettuces, p. score ..	1 6	3 0
Carrots, p. bunch ..	0 4	0 8	Mint, per bunch ..	0 3	0 6
Cauliflowers, p. doz.	1 6	3 0	Mushrooms, p. pott.	3 0	4 0
Cucumbers, each ..	0 6	1 0	Onions, per bunch ..	0 4	0 9
French Beans, p. sieve	2 0	3 0	Parsley, p. bunch ..	0 2	0 4
Do., retail, p. lb. ..	0 4	0 6	Shallots, per lb. ..	0 8	..
Garlic, per lb. ..	0 8	..	Spinach, p. bushel ..	2 0	3 0
Gherkins, per 100 ..	2 0	..	Tomatos, per doz. ..	1 0	1 6
Herbs, per bunch ..	0 2	0 4	Turnips, yng. p. bun	0 3	0 4

Potatos, York Regents, per ton, 90*s.* to 105*s.* ; Kidneys, 110*s.* to 120*s.* do.,

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application ; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4*s.* per 1000, free by rail ; 5*s.* cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society. The largest stock on hand, wholesale of CHARLES J. BLACKITH AND CO., Cox's Quay, Lower Thames Street, London, E.C. Retail of the principal Seedsmen. Prices on application.

A NURSERYMAN, in the Provinces, is desirous of meeting with an ACTIVE PARTNER, with moderate capital. Address, Messrs. Truthree & Morris, Leamington, N.E.

WANTED, an active GARDENER, to PURCHASE a HALF-SHARE in a small Nursery, Florist, and Jobbing Business in Islington. £60 cash.
G. R., 32, Rotherfield Street, Islington, N.

WANTED, in a large Garden, a good FOREMAN, who perfectly understands the Cultivation of Fruit and Vegetables. Flowers not required.—Mr. SEAKLE, Head Gardener, Himley Hall, Dudley.

WANTED, a thorough competent Man, as FOREMAN, to Manage a Market Garden, one who understands Growing Cucumbers, Tomatos, &c., and Supplying the Market. None need apply whose character will not bear the strictest inquiry as to honesty, industry, and sobriety. One used to the business preferred.—C. W. & Co., Market Gardeners, Bromley, Kent, Bromley Station.

WANTED, as GARDENER, in November, a thorough good practical Man to take charge of small Garden and Greenhouse. Age between 30 and 40, married, and without children preferred. If Wife can do Laundry work, additional salary will be paid. Comfortable Cottage provided, and good wages will be paid to a suitable person.—Apply by letter, with full particulars, to J. C., 10, Lord Nelson Square, Liverpool.

WANTED, an experienced BAILIFF, competent to take the Management of a Farm of 450 Acres (one-fourth Arable), within 40 miles of London, and thoroughly acquainted with the Management of Timber, few Acres of which would be also in charge. Salary £100, with house rent free and keep of horse.—Apply by letter, W. B., Rastall & Son, Ebury Street, Eaton Square, S.W.

WANTED, by the Committee of Visitors of the Moulsford Lunatic Asylum, near Wallingford, Berks, a Married Man, as WORKING BAILIFF, and his Wife, to take charge of the Dairy, and Churn if required. Wages, for the two, £28 per week, with a cottage, and an allowance of coals, milk and garden produce. Applications, with testimonials, to be sent to the undersigned by October 1.—T. HOOD, Jun. (Clerk to the Visitors), Abingdon, Berks.

WANTED IMMEDIATELY, at the Home for Little Boys, Horton Kirby, Kent, a WORKING FARM BAILIFF, to Work a Farm of 100 Acres with the Boys, and with his Wife to take charge of one of the Houses, containing Thirty Boys. They must be members of the Established Church, and have children to reside with them.—Application, stating wages required in addition to board and lodging, to be addressed to the SECRETARY, at the Office, 78, Cheapside London, E.C.

WANTED, as IMPROVER, a Man about 20, in a Nobleman's Garden, where a general system of Gardening is carried on. A Premium will be required.—D. JUPP, Hawkstone, Shrewsbury.

WANTED, in the Seed Trade, as SHOPMAN, a Young Man from 20 to 25 years of age.—Apply, in own handwriting, stating amount of experience, where previously employed, and salary expected, to J. CATTELL, Nursery and Seed Establishment, Westerham, Kent.

WANTED, in a Wholesale Seed Warehouse in London, an active young Man as UNDER SHOPMAN.—Apply, stating full particulars, to C. H., *Gardeners' Chronicle* Office.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen, on application (Inquiries given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust
Victoria and Paradise Nurseries, Upper Holloway, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send their ADDRESS, and TESTIMONIALS, to their REGISTRY, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & Co. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

GARDENER (Head), to any Nobleman or Gentleman requiring a first-class Gardener.—Age 45, married ; thoroughly experienced in all branches of the profession. Would take charge of Meadow Land and Stock if required. Ten years' good character. Left last situation through death of employer.—C. W., 5, Mira Place, Enfield, N.

GARDENER (Head), age 48, married.—ROBERT COLE, Gardener to Mrs. Okeden, Tunworth, Dorset, is at liberty to engage with any Nobleman or Gentleman requiring the services of a thorough practical Man. Leaving on account of labour being reduced. Six and a half years' good character.—Mr. LEACH, Fryanston Gardens, Blandford, Dorset.

GARDENER (Head), married, no family.—F. HILL will be open to an engagement with any Lady or Gentleman requiring a first-class Gardener, on or before October 5. Can have highest testimonials from present employer as to ability in all the various branches of the profession.—F. HILL, Esq., Coombe Warren, Malden, Kingston-on-Thames, Surrey.

GARDENER (Head), middle-aged.—ROBT. BROWN, for the last 15 years Head Gardener to the late Rev. George Chetwode, at Chilton House, Thame, Oxon, where he has had the entire Management of Extensive Flower and Kitchen Gardens, and Forcing of every description of Fruit, will be disengaged in October, and wishes for a similar situation. Is leaving on account of the death of the Reverend Gentleman. Testimonials of the highest order.—Address as above.

GARDENER (Head). WILLIAM FARLEY, Digswell Park Gardens, is at liberty to treat with any Nobleman or Gentleman requiring the services of a first-class practical Gardener, who has had great experience in every branch of modern Horticulture, including the Management of Forcing operations, and the Culture of Plants and Vegetables, &c. Thirteen years' excellent character from present employer, whom he is leaving, through the expiration of lease, at Michaelmas. Friends are requested to communicate.—Welwyn, Herts

GARDENER (HEAD).—Thoroughly competent in all the branches of the profession. No single-handed place accepted.—S. L., Post Office, Exeter.

GARDENER (HEAD).—Married, age 36 ; thoroughly understands Early and Late Forcing, Kitchen and Flower Gardening ; is a good Plant grower. Three years in last situation ; good character.—A. M., Mr. J. Christie, Nurseryman, Leatherhead, Surrey.

GARDENER (HEAD).—Married, no children ; well educated. Understands perfectly every department of Modern Gardening. Wife first-class Dairymaid if required. Excellent character, &c.—J. DILLISTONE, Colwick, Notts.

GARDENER (HEAD).—Age 30, married, no family ; experienced. Has lived five years in last situation, and has had the entire Management of a large Garden. Thoroughly practical in all branches of the profession.—A. B., 1, Farnham Royal, Bucks.

GARDENER (HEAD).—Age 28, married, no incumbrance ; thoroughly practical and fully competent in every branch of the profession, including Early and Late Forcing, Picturesque Gardening, &c. Good character.—H. COOK, Gardener, The Grove, Tollington Park, Holloway, N.

GARDENER (HEAD).—Age 34, married, no family ; understands the Management of Vines, Peaches, Melons, Cucumbers, Stove and Greenhouse Plants, and Kitchen and Flower Gardening. Ten years' good character.—R. B., 1, Percy Cottages, Woolwich, Surrey. £60 cash.

GARDENER (HEAD, WORKING).—Age 28, single ; thoroughly practical in all branches of the profession. Good reference from late employers.—A. B., Farnborough Park, Hants.

GARDENER (HEAD, WORKING), age 35, married. —WILLIAM HENDERSON, for the last three years Gardener to Thomas Marrian, Esq., Thurcroft Hall, Maltby, Rotherham, is at liberty to treat with any Lady or Gentleman requiring the services of a thorough practical Gardener ; well understands the Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, the Management of Fruit, Flower and Kitchen Garden. Wife having no family, is qualified to undertake the duties of Laundress, or take Charge of Gentleman's Residence. Characters will bear investigating.

GARDENER (HEAD), where one or two Men are kept.—Age 27, single. Five years' good character.—J. B., Post Office, Cuckfield, Sussex.

GARDENER (HEAD), where one or more are kept.— Age 40, married ; thoroughly understands the Management of Stove and Greenhouse Plants, Vines, Cucumbers, Melons, and Fruit, Flower, and Kitchen Gardening. Good character.—B. W., Mr. Lewis, Baker, Upper Richman Road, Putney, Surrey, S.W.

GARDENER.—Married, no incumbrance ; has a good practical knowledge of the profession in all its branches, including the Forcing of Early and Late Fruits, Vegetables, and the Culture of Stove and Greenhouse Plants. Three years' character.—M. R., 16, Lifford Street, Putney, S.W.

GARDENER and BAILIFF, or GARDENER and STEWARD.—Middle-aged ; great experience. Can produce the highest possible testimonials from present situation, which he has filled many years.—G. R., Mr. William Paul, The Nurseries, Waltham Cross, Herts

GARDENER (SINGLE-HANDED, or otherwise).— Middle-aged, married ; thoroughly experienced in all branches. Three and a-half years' character from the place just left.—3, Wakeley Road, Penge, S.E.

GARDENER (SECOND, or SINGLE-HANDED), in a good Garden.—Age 25, single. Two and a-half years' good character.—C. H., Post Office, Brenchley, Kent

GARDENER (SECOND), where Head Gardener is kept.—Age 26, single ; understands Stove and Greenhouse, and Flower and Kitchen Gardening. Two and a-half years' good character.—E. T., Nursery, Maidenhead.

GARDENER (SECOND), where there is an opportunity of improving in the Forcing line. Near London preferred. Three years with present employer.—J. O., Post Office, Hornchurch, Essex.

GARDENER (UNDER) or IMPROVER, in a good Garden.—Age 21. A Premium given. Unexceptionable character.—S. T., Post Office, Twickenham, S.W.

GARDENER (UNDER).—Age 20, respectable ; wishes to improve himself ; has been in a Plain Flower and Kitchen Garden three and a-half years. Good character. Direction to a Premium.—J. B., Mr. Long, Waxwell, Finner, Middlesex.

GARDENER (UNDER), age 24.—A Lady wishes to recommend a young Man as above, in a Gentleman's family, where a professed Gardener is kept. He has nearly three years' good character.—J. M., Mr. Marchant's, Great Marlow, Bucks

To Nurserymen and Market Growers.

FOREMAN, or PROPAGATOR and FOREMAN,— Has been used to Grow for the London Market. Any Lady or Gentleman Marketing a portion of their things, would find the Advertiser a valuable servant.—S. C., Mr Mackintosh, Nurseryman, Hoppenscroft, Hertford Place, Dundee.

To Nurserymen.

PROPAGATOR, or PROPAGATOR and FOREMAN.—A young Man, well up in Nursery Work ; successful Budder and Grafter. Three and a-half years good character.—PROPAGATOR, Post Office, Newington, Sittingbourne, Kent.

BAILIFF and GARDENER.—Age 44, married, no family. Wife no objection to Dairy or Poultry. Good references. M. A., 67, Westbourne Park Road, Paddington, W.

FARM BAILIFF (to take Management of Farm or to Assist).—Age 40, married, respectable ; 26 years' practical experience. Willing to make himself generally useful. Good reference.—H. MARRIOTT, Langford, Chichester, Sussex.

To Noblemen, Gentlemen, and Agents.

STEWARD or FARM BAILIFF, at Michaelmas next.—Age 40, married. First-class references from his present employer, who is going up the Farm.—Z., John Thornton's, 15, Hanover Street, Hanover Place, London, W.

STEWARD or BAILIFF.—Age 40, married, one child ; can undertake the Management of a Farm of any extent. Understands Buying and Selling, also Steam Machinery, and the various Works required on an Estate. Has had the best experience in Managing 1000 Farms of 1000 and 2000 Acres. Unexceptionable references.—ALPHA, 106, High Street, Croydon.

IMPROVER, in a good Establishment.—A Premium will be given. Three years' good character.—J. D., Mr. Walters, 3, Doric Street, Cambridge.

FURNISHER, FURNISHING FOREMAN, or SALESMAN.—Age 35 ; 16 years' experience in Town Trade. Unexceptionable references.—A. B., 83, Bramley Road, Kensington Park, W.

TO the SEED TRADE.—A Gentleman (age 32) of 17 years experience in one of the best London establishments, will shortly be open to an engagement as a first-rate house (London or Provincial), where an energetic and successful discharge of his duties would be likely to lead to an interest in the business. He has travelled for 13 years, and has a good connection in the country ; would be willing to assist in that department if necessary.—E. A. C., 2, Belgrave Street, Euston Road, N.W.

To the Seed Trade.

MANAGER.—Experience both in Town and Country Houses. First-class references given.—T. W. ROSE, *Gardeners' Chronicle* Office.

To Seedsmen.

SHOPMAN or MANAGER.—Wanted, an immediate engagement.—X. Y. Z., 8, Nicolson Street, Edinburgh

Seed Trade.

SHOPMAN, CLERK, or BOOK-KEEPER.—Age 30, married ; active, of thorough business habits, and well up in the duties of the profession.—A. R., Messrs. Butler & McCulloch, South Row, Covent Garden, W.C.

SALES BY AUCTION.

Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, September 20, at half-past 12 o'Clock precisely, a splendid collection of Choice Established and Imported ORCHIDS, many of them of a new and exceedingly rare description, including

Aerides Huttoni	Goodyera (Anæctochilus) Dawsoniana
,, suavissimum	Lælia Schilleriana splendens
Cattleya Eldorado	Neottia Origiesiana
,, Bowiana	Odontoglossum Insleayi
,, Roezenisis	,, zebrinum
Cypripedium niveum	,, Pescatorei splendens
Dendrobium Falconeri	Oncidium Papilio
,, taurinum	,, superbiens
Dendrobium filiforme	Pescatorea cerina
Epidendrum vitellinum majus	Vanda Denisoniana
Eroptos biloba	,, gigantea

On view the morning of Sale, and Catalogues had.

Bayswater.

MR. J. C. STEVENS has received instructions from the Proprietor to SELL by AUCTION, on the Premises, No. 9, Queen's Road, Bayswater (close to Kensington Gardens, and Bayswater Station of the Metropolitan Railway), on TUESDAY, September 27, at half-past 12 o'Clock precisely, the whole of the stock of PLANTS, BIRD CAGES, FERN STANDS and CASES, MINTONS TILE WORK, GLASS SHADES and FIXTURES, FERNS and PALMS suitable for table decoration; CANARIES and other Birds, in cages; PARROTS, AVIARIES of BIRDS, &c.; and other miscellaneous effects of a Florist retiring from the Trade and GOOD WILL of the BUSINESS, which has been carried on for the last four years by the present proprietor, and previously for 60 years by Auctioneer and Valuer, Mr. Bayswater.

The Stock may be viewed the day prior and morning of Sale; and Catalogues had on the Premises, or of Messrs. H. AND R. POWELL, Estate Agents, No. 1, Queen's Road, Bayswater, W.; of J. C. STEVENS, Auctioneer and Valuer, 38, King Street, Covent Garden, W.C.

Potter's Bar, N.

IMPORTANT CLEARANCE SALE of CHOICE GREENHOUSE and STOVE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by the Proprietor, who wishes to relinquish the business, to SELL by AUCTION, on the Premises, on the Nursery, near the Railway Station, Potter's Bar, Middlesex, N., on MONDAY and TUESDAY, September 19 and 20, at 11 for 12 o'Clock precisely each day, the whole of the PLANTS and GREENHOUSE PLANTS, comprising a quantity of Crotons, Pancum variegatum, 500 Dracænas (of sorts), Eucharis, Gardenias (sorts), 400 New Coleus, Bouvardia longiflora, Hoyas, Poinsettias, Ardisias, Epiphyllum (in variety), Dracæna rubra, Aphelandra, Tecomas, 3000 choice Exotic Ferns (of sorts), a few Orchids and Palms, likewise some large specimen Azalea indica alba, 4 to 6 feet, with a quantity of smaller Plants in variety; large Camellias, Azalea indica alba, 3000 choice Exotic (of sorts), Azalias, Cytisus, 3000 Pelargoniums (in leading market kinds), Hydrangeas, 200 Double Primulas, 8000 Cinerarias, Cyclamens, Geraniums (in sorts), 500 Tea and Hybrid Perpetual Roses in pots, 2000 Chrysanthemums, 500 Hardy Ferns, Succulents, &c.

On view two days prior to the Sale. Catalogues may be had on the Premises; and of the Auctioneers and Valuers, Leytonstone, E.

Christchurch, Hants.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr G. Smith (who is relinquishing the business in order to devote his whole attention to the Seed Trade to SELL by AUCTION, without the slightest reserve, on the Field Nursery, Bridport and Soot's Hill Nurseries, Christchurch, Hants, on MONDAY, October 3, at 12 for 1 o'Clock precisely, the whole of the valuable NURSERY STOCK, comprising a large and varied assortment of Evergreen and Coniferous Shrubs, in capital condition for removal, including 10,000 Laurels, 1 to 4 feet; 400 Irish and English Yews, variegated and green Hollies, Aucubas, Arbutus, Ivies, 3000 choice Exotic Ferns (of sorts), a few Orchids and Palms, likewise some large specimen Azalea indica alba, 4 to 6 feet, with a quantity of smaller Plants in variety; large Camellias, Azalea indica alba, 3000 choice Exotic (of sorts), Azalias, Cytisus, 3000 Pelargoniums (in leading market kinds), Hydrangeas, 200 Double Primulas, 8000 Cinerarias, Cyclamens, Geraniums (in sorts), 500 Tea and Hybrid Perpetual Roses in pots, 2000 Chrysanthemums, 500 Hardy Ferns, Succulents, &c.

On view two days prior to the Sale. Catalogues may be had on the Premises; and of the Auctioneers and Valuers, Leytonstone, E.

Christchurch, Hants.

IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. George Jackman, Senior, to SELL by AUCTION, without reserve, on the Premises, the Woking Nursery, Woking, Surrey (about one mile from the Woking Station), on THURSDAY, October 6, and four following days, at 11 for 12 o'Clock precisely each day, a portion of the very valuable NURSERY STOCK, consisting of upwards of 3000 Specimen Coniferæ and Evergreen Shrubs, of matchless shape and beauty, ranging from 3 to 15 feet, in capital condition for removal, the whole having been carefully prepared, including choice Abies, Pinus, Picea, Taxus, Araucaria, Cupressus, Juniperus, Thujopsis and Thujas, of sorts; Thujopsis borealis, Wellingtonia gigantea variegated and green Hollies, Arbutus, Box, Bays, Phillyreas, &c.; also thousands of smaller Conifers and Evergreen Shrubs, comprising 3500 Picea Nordmanniana, 1 to 5 feet; 600 Thujopsis borealis, 1 to 4 feet; 500 Pinus australis, 4 to 3 feet; 3000 green and variegated Box, 2 to 3 feet; 6000 Portugal Laurels, 2 to 4 feet, 600 English Yews, 4 to 5 feet; 2100 Thuia Warreana and aurea, 3 to 6 feet; 300 Pinus Pinsapo, 2½ to 2½ feet; 500 Irish and Chinese Junipers, 3 to 4 feet; 1000 hybrid and seedling Rhododendrons, 1 to 3 feet, &c.; likewise a fine collection of ornamental Deciduous Trees and Shrubs for Park and Garden Planting; 800 standard and dwarf Acer Negundo variegata, 3500 standard and dwarf Roses, of the best varieties; together with thousands of Deciduous Plants, &c.

May be viewed any day prior to the Sale. Catalogues may be had (6d. each, returnable to purchasers) on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B. M M respectfully invite all persons who contemplate planting during the ensuing season should inspect this Stock, in order to form an adequate conception of its beauty and excellence. P. & M. would direct attention, when inspecting the Stock, to the fact of its extent that the borders on each side of the Centre Main Walk alone measure 1830 feet long, by 20 feet wide, and are furnished with thousands of unrivalled specimen Coniferæ and Evergreen Shrubs, admirably adapted for effective planting.

Bagshot, Surrey.

PRELIMINARY NOTICE of an EXTENSIVE and UNRESERVED SALE of NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. Charles Noble to SELL by AUCTION, on the Premises, the Sunningdale Nursery, Bagshot, on MONDAY, October 17, and five following days, without reserve (about 4 acres of the land being required for building purposes), a portion of the valuable NURSERY STOCK, including an unlimited variety of choice Evergreen, Coniferous, and Deciduous Shrubs, of remarkable growth and symmetrical form and beauty, a large quantity of American Plants, clean grown Fruit Trees, Standard and dwarf Roses, &c.

May be viewed any day prior to the Sale. Catalogues (when ready) may be had on the Premises, and of the Auctioneers and Valuers.

Stoney Lane, Bromsgrove, Worcestershire.

IMPORTANT SALE of SHORTHORNS.

MESSRS. LYTHALL AND CLARKE are favoured with instructions from Thomas Hutton, Esq. (who has given up a considerable portion of his Grass Land), to SELL by AUCTION, without reserve, on TUESDAY, September 20, his entire HERD of pure bred SHORTHORNS, numbering upwards of 60 Head of highly descended young Cows, Heifers, and Bulls.

The Midland Railway Company have kindly consented to allow the Trains leaving Birmingham at 9 A.M. and 12 50 noon, and those leaving Bristol at 6 and 8 A.M., to call at Blackwell on the days of Sale.

Catalogues, with Pedigrees, may be obtained from the Auctioneers, 39, New Street, Birmingham.

Digswell House, Welwyn, Herts.

MR. GEORGE JACKSON, in conjunction with Messrs. JACKSON AND SON, are favoured with instructions from Felix Pryor, Esq. (whose lease expires at Michaelmas next), to SELL by AUCTION, on the Premises, at Digswell, within half a mile of the Welwyn Station on the Great Northern Railway, on WEDNESDAY and THURSDAY, September 21 and 22, at 11 o'Clock, the whole of the valuable LIVE and DEAD FARMING STOCK, comprising six remarkably fine young Grey Cart Horses, a Van Horse, and a Roan Pony; 40 Head of Dairy Stock, including 12 Cows, and 23 1 yr. and 2 year old Steers and Heifers; Shorthorn Pedigree Bull; 100 Pigs, including Sows, Fatting Pigs, and Stores.

The IMPLEMENTS comprise a Loading Cart, with Ladders and Copses, nearly new; a double-shaft Waggon; liquid manure Cart and Pump; Iron Ploughs; Corn Drills, Harrows, Rolls, Horse Drags; "Gardener" Chaff-cutting Machine; Linseaking Machine; Oil-cake Crushing Machine; Dressing Machine; Sheep, Lamb, and Pig Troughs; Feeding Troughs; Shepherd's Hut; Cow Cribs; Cake Breaker; Corn Crusher; Malt Mill; Forks and Rakes; Sacks; two Rick Cloths; a Load Cloth; also a large quantity of Sawn Seasoned OAK, ELM, and ASH TIMBER; Cart and Plough Harness; Saddles and Bridles; Horse Clothing, Stable Fittings and Requisites; Dairy and Brewing Utensils; Fencing Materials, and Sundry Fittings; about 100 LOADS of MEADOW HAY; a quantity of Wheat Straw.

In the GARDENS.—A varied and interesting collection of Hard and Soft-wooded Stove and Greenhouse Plants, including fine large specimen Camellias, 5 feet high, with large heads well set with blooms, double white and red, &c., in the finest possible health; many valuable Orchids, specimen Ferns, Palms, Dracænas, Eucharis, &c.; also a fine specimen Gardenias, Epacris, Amaryllids, Libonias, Azaleas, Anthurium Schillerianum, Begonias, Bougainvilleas, Clerodendrons, Genetas, Solanums, Chrysanthemums, Double Primulas, &c.; also a few Standard Bay Trees, well trained for forcing, in pots; Lilacs, ditto; specimen Echeveria metallica, Pinuses, Iresine Lindeni, &c. Garden seats, 24-inch Mowing-machine, Garden Engine, Iron Rollers, Lawn Labrary, 2000 volumes of Books, including Clutterbuck's "Hertfordshire," David Robert's "Holy Land," bound, large size; Valuable Engravings, Billiard Table; the Study, Entrance Hall, Kitchen, Cooper's and other Utensils connected with the Culinary Cuisine, the requirements of Servants' Hall, Larders and Pantries, China and Cut Glass.

The outdoor effects comprise a well-built Family Break, by Stamper; a double-seated Pleasure Cart, by Holland; Pleasure Saddle Pony, a very large collection of valuable Saddlery and Horse Clothing by Whippy, London, Stable Fittings and Requisites.

May be viewed on Monday and Tuesday preceding the Sale. Catalogues on the Premises; at the Inns at Welwyn, Hatfield, and St. Alban's; of Mr. GEORGE JACKSON, Auctioneer and Appraiser, Hitchin and Baldock; and of Messrs. JACKSON and SON, Land Agents, Hertford, Ware, and Bishop Stortford.

Preliminary Notice—Digswell House, Welwyn, Herts.

MR. GEORGE JACKSON, in conjunction with Messrs. JACKSON AND SON, are favoured with instructions from Felix Pryor, Esq., to SELL by AUCTION, on the Premises, on WEDNESDAY, THURSDAY, and FRIDAY, October 5, 6, and 7, at 11 o'Clock each day, punctually, the whole of the HOUSEHOLD MANSION, comprising the FURNITURE (principally manufactured by Gillow, Morant & Holland), including 21 Bedchambers and Dressing-rooms, the appointments of Dining-room, Drawing-room, Library, 2000 volumes of Books, including Clutterbuck's "Hertfordshire," David Robert's "Holy Land," bound, large size; Valuable Engravings, Billiard Table; the Study, Entrance Hall, Kitchen, Cooper's and other Utensils connected with the Culinary Cuisine, the requirements of Servants' Hall, Larders and Pantries, China and Cut Glass.

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Easthampstead Nursery, near Bracknell, Berks.

IMPORTANT to NOBLEMEN, GENTLEMEN, and OTHERS, PLANTING for IMMEDIATE EFFECT.

MR. W. ABRAHAM has received instructions from the Proprietor of the above Nursery, Mr. R. Saunders, to SELL by AUCTION, on the Premises, on MONDAY, October 3, and four following days, at 11 for 12 o'Clock, punctually each day, a very Choice Collection of CONIFERÆ, EVERGREEN and DECIDUOUS TREES and SHRUBS, comprising 10,000 Laurels, 2 to 5 feet; all healthy, handsome, symmetrical Trees, and having been moved within the last two years are in all respects worthy the attention of intending purchasers; 5000 Portugal Laurels, 2 to 5 feet; 3000 Irish Yews (of sorts), Cedrus Deodara and Libani; Thujopsis, Cupressus, Retinospora, Abies, Picea, Pinus, Taxus, Common and Portugal Laurel, green and variegated Hollies, Arbutus, Box, Bays, Phillyreas, Rhododendrons and fine bushes of the same, 2 to 6 feet; Kalmias, Azaleas, Heaths; 10,000 handsome Spruce Firs, 2 to 5 feet; 30,000 FOREST TREES, including Scotch, Larch, and Austrian Firs; Beech, Hornbeam, Hazel, Alder, Oak, Ash, &c.; 1500 standard Perpetual Roses, 60,000 strong Quick, 400 yards of Box-edging, Pampas Grass, &c.

The Nursery is situated half a mile from the Bracknell Station, South Western Railway (Reading and London); Ascot, 13; Wokingham, 4; Maidenhead, 8; and Windsor, 9 miles. For convenience of purchasers, any lots can remain upon the ground until December 25 following.

The Stock may be viewed, and Catalogues obtained 10 days prior to day of Sale, either at the Nursery, the principal Inns in the neighbourhood, or post free of the Auctioneer, Valuer, &c., Goldworth Nurseries, Woking.

To Nurserymen, Market Gardeners, Builders, and Others.

PADDOCK WOOD, KENT, close to the Railway Station.

MESSRS. DEBENHAM, TEWSON AND FARMER will SELL by AUCTION, on the Premises, on WEDNESDAY, October 5, at 4 o'Clock punctually, the remainder of the above FREEHOLD ESTATE, comprising about 11 Acres of Pasture, Arable, and Hop Land, very valuable for Nursery and Market Gardens, Hop and Fruit Plantations; and the larger portion particularly suitable for Building, Brickmaking, or Speculative purposes, and offered in One Lot, Freehold Title, rendering such Title absolutely safe, and reducing the cost of transfer to an almost nominal amount. The property is distant only 5 miles from Tonbridge, 30 from Maidstone, and 35 from London. Three-fourths of the purchase-money can remain on mortgage at £5 per cent.

Particulars and Plans at the place of Sale; at the Rose and Crown Hotel, Tonbridge; at the Star Hotel, Maidstone; and in London of T. G. BULLEN, Esq., Solicitor, Barge Yard Chambers, Bucklersbury; and of the Auctioneers, 80, Cheapside, E.C., who will forward them by post on application.

FIRST-CLASS SHORTHORN SALES in SEPTEMBER.

FRIDAY, September 23.—The ENTIRE HERD, belonging to Charles R. Saunders, Esq., Nunwick Hall, Penrith; between Sixty and Seventy Head of Shorthorns, Bull and Heifer, comprising many remarkably fine specimens of the "Waterloo," "Fleda," "Emma," "Gwynne," "Wild Eyes," and other fashionable tribes. Also the celebrated prize Bull, "Edgar" (9768), and several fine Young Bulls.

TUESDAY, September 27.—The ENTIRE HERD of Seventy Head, at RAGDALE HALL, Melton Mowbray, the property of Mr. D. Porter, for more than 50 years from good stock, and crossed with first-rate Bulls. The FLOCK of pure-bred LINCOLN SHEEP will be SOLD on the same day.

FRIDAY, September 30.—The very superior HERD of about Forty Head, belonging to Thomas Robinson, Esq., at Burton-on-Trent; including several animals of the "Princess," "Buttercup," "Lady Bates," and "Duchess of Oneida" tribes. Also some very good SOUTHDOWN and SHROPSHIRE RAMS.

Catalogues with Pedigrees of JOHN THORNTON, 15, Langham Place, London, W.

Weston Park, Shipston-on-Stour.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, October 18, at Weston Park, Warwickshire, about FIFTY HEAD of SHORTHORNS, the property of Sir Geo. R. Phillips, Bart., including some of the best and choicest families in the Herd, many of which are of Knightley descent, and by Bulls of that favourite sort, as well as others of Kirklevington blood.

Catalogues, with Pedigrees, will shortly be issued, and may be had of Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. FINLAY DUN, Weston Park, Shipston-on-Stour.

Important Sale of Shorthorns.

MR. STRAFFORD has received instructions to SELL by AUCTION, without reserve, on TUESDAY, October 18, at Weston Park, SIX very superior and well-bred YOUNG BULLS, belonging to R. J. Sheldon, Esq., of Brailes House, that are well worthy the attention of purchasers of first-rate blood.

Catalogues, with Pedigrees, will shortly be issued, and may be had of Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. SHELDON, Brailes House, near Shipton-on-Stour.

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SMITHFIELD CLUB SHOW, AGRICULTURAL HALL, ISLINGTON, DECEMBER 5 to 9.
IMPLEMENT DEPARTMENT.

THE LAST DAY for receiving APPLICATIONS for SPACE for IMPLEMENTS and MACHINERY, &c., is OCTOBER 1.

Printed Forms of Application, with Rules and Regulations, may be obtained of Mr. DAVID PULLEN, Assistant-Secretary, corner of Half-Moon Street, Piccadilly, London, W. All communications should bear outside the words "Smithfield Club."

SMITHFIELD CLUB FAT CATTLE SHOW.—
THE ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and following Days.

Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under.

CATTLE.—Form A. For an OX or STEER (in any Class).
,, B. For a COW or HEIFER (in any Class).
,, C. For a BEAST in Extra Stock.
SHEEP. ,, D. For a Pen of three WETHERS or EWES.
,, E. For a SINGLE WETHER SHEEP in Extra Stock.
PIGS. ,, F. For a pen of three PIGS (in any Class).
,, G. For a SINGLE PIG in Extra Stock.

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.

Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Piccadilly, London, W.

N.B. All communications respecting the Show must be addressed to the Assistant Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.

SATURDAY, SEPTEMBER 17, 1870.

RINDERPEST is once more following in the line of invading armies, and adding its quota of ruin to the dire calamities which war entails. The history of the recent outbreak, or, rather, recent spread of the disease, is simple enough. In the endeavour to supply vast hosts with food, all available sources must be taxed; cattle must be obtained, healthy if possible, but, at any cost, cattle. The inexhaustible cattle population of eastern Europe is, thanks to railway extension, always within comparatively easy reach, and between the two risks—of plague among the animals, and famine among the men—the choice is not difficult.

From Podolia and Hungary cattle were sent to Berlin, and with the cattle travelled the insidious pest, in its stage of incubation doubtless, only to be detected perhaps, if at all, by very careful inspection; but if in time of peace we have no reason to believe that inspection is an infallible safeguard against the introduction of infectious diseases, what can we hope for during the turmoil of war? Cattle plague, we learn, appeared first in Berlin, and quickly found its way to Dresden. Precautions were taken, it is said, to arrest its course; they failed to effect their intended object; the disease travelled on, and in few days appeared at Kaiserlautern on the Bavarian frontier. Simultaneously the wave of

pestilence seems to have rolled northward from Berlin to Stettin, and almost to the shores of the Baltic.

Westward, again, cattle plague appears in the French department of the Moselle, touching Saarbruck in its course. Unchecked by the feeble measures of precaution, which are possible of application now, the cattle plague speeds on its way to Paris. At Bar le Duc, some 70 miles from the capital, it was known to exist several days ago; how much further the disease has extended by this time we do not know, but we can hardly expect that any active means will be taken to arrest its spread. France just now has enough to do, without having to deal with a new enemy.

Obeying no law but the one of universal distribution, the pest next, as we are informed, takes a north-easterly course, and penetrates the Dutch cattle district of Leyden, not far from Rotterdam. Never in the history of the disease has such a rapid progress been recorded, the plague in its course has absolutely kept ahead of precautions. The Dutch Government were on the alert at the first sound of warning which was uttered, but before any effective measures could be taken the disease, according to reports, crossed their frontier, and, when too late, compelled energetic action. The Dutch frontier, we learn, is closed to animals from France and Germany; Bavaria also has prohibited the passage of animals into the country; and Luxembourg has followed the same course. Meanwhile, in this country we have adopted the only precautions which are capable of being carried into effect, short of prohibiting importation of cattle altogether. By the Council Order of Sept 9, France is placed among the scheduled countries. All the other countries from which we obtain supplies of cattle were already included, excepting Spain, which need not be taken into account, as cattle plague is not likely to cross the Pyrenees.

Our actual present position in respect of the importation of foreign cattle may be thus defined. At all the outports foreign cattle can only be landed, in parts of ports defined, for slaughter, and they cannot be taken out of those defined parts alive. These restrictions are the most stringent which can be applied to foreign cattle landed in this country at any part of the coast, and the establishment of a separate market for the sale and slaughter of imported cattle will not affect these arrangements in the least.

In the port of London, however, the new Order has practically no action, as previously to its issue cattle from France were landed only at defined parts of this port, and then, as now, the Order was in force permitting the removal of cattle out of the defined part by rail to the metropolis, in order that they may be sold in the metropolitan market, and be slaughtered in the limits of the metropolis within ten days from the time of landing. Nothing practical is likely to come of poetical aspirations, but we cannot help thinking how far more comfortable we in this city should feel if all the foreign cattle imported into the port of London were, by way of being accommodated in the commodious market of the future, somewhere on the banks of the Thames convenient to Whitechapel and elsewhere, and satisfactory to everybody in every respect. If such a dreamland did now exist, it would be pleasant to think, in the event of an outbreak of rinderpest, that we should know exactly where it commenced, and perhaps even be able to form some idea of where it was likely to end.

It would be idle to attempt to disguise the extent of the risk which we run of the introduction of the cattle plague into this country. No precaution can render us absolutely secure, but we may hope that in view of the danger every means will be adopted to avert it; we shall at any rate gain nothing by underrating the importance of the situation,—indeed, it will be safer to suffer from unreasonable apprehension than to enjoy a false sense of security.

If average crops of Wheat are secured in America and Russia as well as in England, there seems no reason to anticipate more than an average price. That the price of Wheat of fine quality should have been as low as 45*s.* in June, when there was no great accumulation of stocks, showed misplaced confidence in the coming crops of the corn countries. That it should have risen many shillings per quarter by harvest time was natural. A further considerable rise on the outbreak of hostilities, when there was no evidence of serious deficiency anywhere, and our own crops promised an average, was a mere panic, the usual result of vague apprehensions. Buyers seem to have forgotten in June that the average price of Wheat since the repeal of the Corn Laws has been 53*s.* per quarter. Having bought fine Wheat in 1863 and 1864 at 40*s.* per quarter, they forgot that superabundant harvests had then caused an accumulation of stocks, with the usual depression of price. In June, buyers seemed to have expected a continuance of supplies at less than the cost of production, or, at all events, of delivery in London; and in the early part of August the trade suffered from a reaction, after its state of over-confidence. It has, perhaps, settled at length to a more healthy and permanent condition.

Buyers are not usually authorities on the general subject of prices; they act on their experience, and seldom see far a-head. In periods of low prices an opinion soon becomes current that open ports have ensured unbounded supplies at a low rate; high prices must never be expected again! Peace makes us forget war, and almost refuse to believe in its repetition; and plenty makes us forget our dependence on foreign markets and the variation of seasons which have, in all past experience, depressed and raised prices by turns.

The history of agricultural production reveals the striking variation of seasons, and the occurrence of cycles of good and of bad harvests respectively. The past half century has belonged to a cycle of good years, as did the first 65 years of the last century. But the intervening period belongs to a cycle of inclement seasons, of indifferent crops, and of years of scarcity throughout Europe. The history of this period, and of the dearth and distress all over Europe, and of the riots among the people, is carefully traced and compared with that of the corresponding years of plenty, by economists like ADAM SMITH, TOOKE ("History of Prices"), and MALTHUS. According to Mr. TOOKE, a series of a hundred years, at least, is requisite to reduce to a fair average the inequalities of the seasons. Individual experience is, therefore, extremely deceptive. A period of 10 years, exhibiting, as it always does, considerable difference in the harvests, does not enable us to strike an average of annual production. The commonly received standard of 28 bushels of Wheat per acre, as the average yield of England, may have been correct during the last 20 or 30 years, but it may be falsified before the century is out, and we may return to ARTHUR YOUNG'S estimate of 24 bushels. The alleged increase in yield of 1½ bushel per acre since 1850, may be adventitious rather than permanent. Many of the "facts" and figures relating to the trade, and supply, and yield of corn, based as they are on recent experience alone, may turn out to be fallacious; it may, in short, be imprudent to rely, as we do, on importations which have already reached an enormous magnitude, and are rapidly increasing.

We desire to point out, therefore, that when history repeats herself, and a preponderance of unfruitful seasons again afflicts Europe, the country whose wants are greatest will suffer most, and England, France, Belgium, Italy, Holland, and other countries which import Wheat, will each have to supply its individual wants at a dear rate by outbidding the rest. The results of increasing competition among nations with growing populations will seriously menace the productive industry of England.

The collapse, in the hour of trial, of the military strength of France could not have been predicated, but the evils which arise in this country from the neglect of its manure resources and consequent rise in prices and dependence on foreign countries for a large portion of the food supply, are not in any way doubtful, or hidden behind the veil of fortune. They are palpable, and their effects, slowly and insidiously accumulating, can be calculated. Food can only be cheap as well as abundant in England when the products of its consumption are returned to the soil, so as to maintain or even increase, its fertility. No mechanical contrivances, with recourse to artificial manures, can prevent a gradual increase in the cost of producing meat or corn, so long as the human population is a source of waste. Although the land is not by any means fully stocked, meat has almost doubled in price in our own generation, because (among other causes) the increasing cost of producing cattle food continually raises the cost of maintenance. Since English agriculture combines the growth of meat with that of corn, the heavy returns and the enrichment of the soil by manure ought to diminish the cost of growing both. A judicious outlay of capital ought to reduce the cost of production. What signifies £1000 expended on a 500-acre farm for steam-cultivating apparatus, or £500 for a prize bull, where a herd of 50 animals may be improved for many generations? The farmer, however, is deterred from incurring the first outlay in agricultural improvement; he knows that in his march of progress he will be encountered by continually increasing expenses. As he increases his sales of produce he must increase his purchases of manure. The herd must be maintained. Turnips imply not only tillage but guano, and guano is 40 per cent. dearer, and the supply is nearly exhausted. Superphosphate rises. The steam-plough, after all, is only a mechanical means of cultivation, it is not a source of fertility any more than a spade. There is, we are aware, a widow's cruse theory with respect to the soil, but experience teaches that, except in miraculous or rare instances, the land that is heavily cropped must be heavily manured. Live stock, it is true, produce manure, but in the end man is the great consumer, and it is the waste of the products of his consumption, and the increased cost of production, which checks the progress of agricultural improvement. Hence food becomes dear, and the employment of labour, both in agriculture and in all manufacturing pursuits, is restricted; and hence manufacturing industry must of necessity gradually find a field in newer and less burdened states.

If the exigencies of political life and party warfare allowed our legislators to attend to subjects of social importance, or if our leading agricultural society occupied a somewhat wider field of labour, and indulged a little less in the *otium cum dignitate* of wealth and position, we cannot but suppose that the attention of agriculturists and of the public would be earnestly called to the means which may exist of increasing the productive resources of the country, and of rendering it less dependent on importations of corn. There is practical work in this direction which cannot be done by individuals or companies, but only by such combination as might act with effect on public opinion and on the legislative mind.

—— At Mark Lane on Monday Wheat sold at the prices of that day se'nnight; in flour no alteration. Beans were 1*s.* to 2*s.* per qr. cheaper. On Wednesday trade in grain was quiet, at about Monday's rates. —In the Metropolitan Cattle Market on Monday, foreign and home supplies being small, prices advanced for all kinds of stock; and on Thursday, notwithstanding a large foreign supply, choice descriptions brought Monday's prices.

—— The following has been forwarded to the secretary of the Royal Agricultural Society of England from the Austro-Hungarian ambassador, with a request to give it publicity:—

"The Royal Hungarian Ministry for Agriculture, Commerce, and Industry proposes to award two prizes, of 100 ducats and 50 ducats, for the invention of a Hemp mowing or cutting machine, under the following conditions:—

"1. Mowing machines which cut the Hemp as short as possible over the soil may compete, as well as plough-like instruments which cut it under the soil.

"2. No models will be admitted.

"3. The competing machines or instruments will be submitted to a trial on an ordinary Hemp field, at a place and date to be fixed hereafter. The results will be examined and the prizes awarded by a committee composed of agriculturists and engineers.

"4. The first prize can only be awarded to a thoroughly well-working and efficient machine or instrument.

"5. The machines which obtain the prizes remain the property of the competitors.

"6. The applications for the competition are to be made, till June 1, 1871, to the Royal Hungarian Ministry of Agriculture, Industry, and Commerce at Pesth, to which, also, all inquiries relating to the details of the trial are to be addressed.—Pesth, August 13, 1870."

—— As the belief in the EFFICACY of INOCULATION has recently extended in the United Kingdom, and has been lately practised in Ireland, our contemporary, the *North British Agriculturist*, submits, for the consideration of the believers in inoculation, the following facts:—1st, There is no instance of inoculation with the virus obtained from a diseased animal proving a cure or a preventive for the same malady as is the case by vaccinating the human subject with the virus of the cow-pox. The disease known as small-pox in man is prevented, but cow-pox and small-pox are distinct diseases, although they are somewhat analogous. What would be thought of the mental state of the veterinarian who would advocate inoculation with the virus of foot-and-mouth disease as a preventative of that irruptive fever, or the inoculation of healthy cattle with the virus obtained from the lungs of an animal affected with the cattle plague! The truth appears to us to be that inoculation of healthy animals by the virus obtained from the lungs of an animal affected with

pleuro-pneumonia, can only act in the same manner as a seton does, by producing a counter irritation in the system for the time being. Those who practise inoculation by inserting a tape in the tail of an animal which has been steeped in liquid obtained from the lungs of a diseased animal, which has either died of the disease or been slaughtered, when known to have been affected, are guilty of an act of cruelty which should render them liable to prosecution under MARTIN'S Act.

—— It will be seen from the following correspondence that the Central Chamber of Agriculture has not been wanting in urgency and promptitude in connection with the threatening of the cattle plague :—

No. 1.—*To Dr Williams, of the Privy Council Veterinary Department.*

Central Chamber of Agriculture, Salisbury Hotel,
Fleet Street, E.C., September 6, 1870.

Sir,—Great alarm has been created by the intelligence published in the *Times* of yesterday to the effect that cattle plague has broken out near Berlin, also at Dresden, and still nearer to us, at Kaiserlautern. Seeing that the latter place, in Rhenish Bavaria, is situated upon one of the main lines of railway by which the German armies now in France are receiving their supplies, and that, therefore, there is imminent risk, or rather a certainty, of the plague spreading over France, if it really has appeared at Kaiserlautern—may I, therefore, inquire if any confirmation of the news has been received by your department, and whether the danger is yet deemed sufficiently serious to warrant the treatment of all animals imported from France as from an infected place ?

I have the honour to be your obedient servant,

(Signed) JOHN ALGERNON CLARKE, Secretary.

No. 2. *—To Secretary of Central Chamber of Agriculture.*

Privy Council Office, Veterinary Department, Princes Street, Westminster, S.W., September 8, 1870.

Sir,—I have the honour to acknowledge the receipt of your letter of the 6th inst., and in reply to inform you that information has been received at this office of the existence of cattle plague at Kaiserlautern, but that the report of cattle plague existing near Berlin and at Dresden has not yet been confirmed.

I am directed by Mr. Forster to add that he is taking every step to obtain information on this subject, which he is carefully considering every day.

I have the honour to be, Sir,

Your obedient servant,

(Signed) C. EARDLEY WILMOT, for Secretary.

—— We learn from the Melbourne papers that the recently published AGRICULTURAL STATISTICS of that colony show, along with an increase of land under tillage of 16 per cent. over last year, the following results :—The Wheat crop shows a total increase of 1,000,000 bush., or 25 per cent. over the yield of the most prosperous of the last ten years. The total yield of Wheat (5,697,056 bush.) is more than double that of 1860, and is not far short of the totals of 1863, 1864, and 1865 put together. The average produce per acre was nearly 20 bush., of Oats 26 bush., of Potatos 3 tons and a tenth, of hay 1 ton and six-tenths. The produce of wine, representing the vintage of 1869, was 577,287 gals., or 128,740 gals. more than in the preceding year. The yield of Barley, Rye, and Bere, is nearly double what it was in the previous year. The increase in Potatos is about 60 per cent., on Mangel Wurzel 57 per cent., on Beet, Carrots, Parsnips, and Cabbages, 144 per cent., on Onions 196 per cent., and on hay 83 per cent. The only article of produce which shows a decrease is tobacco. On all kinds of grain the average increase is 50 per cent. ; on green crops and hay, about 70 per cent. ; and on wine, 29 per cent. "These are extraordinary results," says our colonial contemporary. "The number of bushels of Wheat per head of the population is usually taken as the test of a good harvest. Last year the harvest gave about 6 bush. per head, while the present year's gives nearly 8 bush. This is very fair for a colony which is only beginning to be self-supporting in the matter of breadstuffs."

—— "A Farmer" writes to us : "An Act of Parliament was granted in the session of 1869, and in force for May 1, 1870 ; why is it that the doctoring process is still going on ? Many tons of old worthless Trifolium incarnatum have been coloured during the past few weeks, and many tons of Clover seed will be operated on very shortly." If "A Farmer" knows this, he should have public spirit enough to inform.

OUR LIVE STOCK.

CATTLE.

THE Scaleby Castle sale is postponed on account of the prevalence of foot-and-mouth disease in the locality.

—— The next few days will witness several important sales of Shorthorns. On Tuesday the Stoney Lane herd, the property of Mr. T. Harris, will be disposed of. Friday will see the dispersion of the Nunwick Hall herd, near Penrith, and the succeeding Tuesday Mr. Thornton will sell Mr. D. P. Walesby's Shorthorns. We trust that cattle breeders, about to sell pedigreed stock, will not be discouraged at the note of alarm sounded by a widely-read contemporary upon the stagnation of our live stock trade. Grumbling at "bad times" seems carried a little too far, so soon after the brilliant sales in the spring, the wonderful prices realised at Oxford, and the most satisfactory sales of stock effected since that time, not only by "Mr. Booth and Major Gunter," but by the less popularly-known breeders—we say grumbling is, after such events, rather out of place. It is no new thing for fashionable blood to sell at incomparably higher prices than good ordinary "Herd Book entries," but worth will generally tell, as was shown at Alloa a few days since, where 47 good animals averaged £51 18*s.* 10*d.* each.

—— The Nunwick Hall herd (Penrith), which will be disposed of by Mr. Thornton on Tuesday next, consists of 62 animals, 46 of which are cows and heifers. There are among these several "Waterloos," a considerable number of the *Furbelow* and *Flourish* (both by LITTLE JOHN—4232) tribe ; some members of the *Elvira* by DUKE (193) family, known also as Mr. Crofton's "Emma" tribe ; several "Gwynnes," and a few of the "Wild Eyes" sort. Among the bulls, EDGAR (19,680), the 2d prize at Oxford in the aged class, will be an object of interest. He is by PRINCE PATERICK (18,633), and of Mr. Crofton's "Emma" tribe.

—— A northern subscriber of the *Irish Farmers' Gazette*, thus advocates the use of well-bred male animals :—"I could at this moment show any one bullocks or heifers two years old, say last March, from 7 cwt. to 8 cwt. each, which were in no ways pampered : their feeding was, after weaning, grass in summer, and plenty of Turnips, chiefly Aberdeens, in winter, with a small quantity of oilcake or bruised Oats when cake was not to be had ; their fodder was chiefly fresh oat-straw, and, the latter end of spring, hay in place of straw." This is the result of using good sires, and avoiding those "mongrel brutes of bulls" which have done so much harm, and are still doing so.

SHEEP.

THE following is the result of the great annual sale of rams at Kelso on the 9th inst. Rings No. 1 to 3 were devoted to Border Leicesters, and Ring 4 was occupied by half-breds. Mr. Donkin and Messrs. Fairbairn & Penny sold the greatest number of the Leicesters, most of the remainder being disposed of by Mr. Oliver. The auctioneers for half-breds were Mr. Davidson and Mr. Atkinson. Some extraordinary prices were given, among which we may mention £100 given for one of Lord Polworth's rams, and £62 for one of the Rev. R. W. Bosanquet's sheep. Mr. Simson, of Blainslie, sold an excellent shearling for £40 ; Mr. Bell, of Linton's, top price was £39, and Mr. Forster, of Ellingham, sold a sheep for £36.

RING No. 1.—Auctioneer : Mr Donkin.

Rams.	Name of Owner.	Highest Price.	Average.
		£ s. d.	£ s. d.
15	Mr. Rea, Mellerton, Wooler ..	7 5 0	5 1 0
30	Messrs. Thos. Black & Sons, Heathery-law ..	10 0 0	5 14 6
21	Mr. Lyon, Meadow Mill	6 15 0	5 7 0
20	Messrs. Dunlop, Nether Ridge ..	12 10 0	5 8 6
17	Mr. Linn, Woodside	15 10 0	7 3 0
25	Mr. Wilson, Woodburn	10 0 0	6 2 0
18	Mr. Kerr, Ellingham	8 0 0	5 15 0
11	Mr. Tait, St. Cuthbert's	5 15 0	4 17 3
12	Mr. Dickinson, Beanley-in-Alnwick	10 5 0	7 11 3
41	Mr. J. C. Eedan, Low Trewitt ..	10 0 0	5 12 6
26	Mr. Davidson, jun., Brandon ..	5 15 0	4 8 10
31	Mr. Parker, Shellacres, Coldstream	8 5 0	6 12 6
22	Mr. Rutherfurd, for the Executors of the Representatives of the late Mr. Angus, Whitefield, Morpeth ..	10 5 0	5 6 0
30	Rev. R. W. Bosanquet, Rock ..	62 0 0	12 4 6
1	Mr. Wood, Thornborough, Hexham .	7 7 0	5 19 0
37	Mr. Forster, Ellingham, Chathill ..	36 0 0	11 0 6
28	Mr. Dinning, Adderston, Belford ..	11 10 0	5 18 3
7	Mr. Chrisp, Hawkhill, Alnwick ..	16 0 0	10 13 0

RING No. 2. Auctioneers : Messrs. Oliver, Brand & Atkinson.

Rams.	Name of Owner.	Highest Price.	Average.
		£ s. d.	£ s. d.
39	Mr. Brunton, Eastfield	15 0 0	5 15 10½
25	Mr. Simson, Trows	11 0 0	6 2 6
24	Mr. Wilson, Haymount	15 0 0	7 9 6
27	Mr. Cunningham, Grahamslaw ..	35 0 0	10 15 8
15	Mr. Crosby, Kirkby Shore	10 0 0	3 4 8
33	Mr. Simson of Blainslie	40 0 0	8 12 8½
23	Mr. Bain, Legars	9 0 0	5 13 7
29	Mr. Calder, Oxenrig	8 0 0	4 16 0
17	Mr. Rea, Middleton	7 5 0	5 13 0
100	Mr. Hardie, Harriefield	25 15 0	6 16 0

RING No. 3.—Auctioneers : Messrs. Fairbairn & Penny.

Rams.	Name of Owner.	Highest Price.	Average.
		£ s. d.	£ s. d.
35	Mr. Calder, Kelloe Mains	11 10 0	6 2 3
26	Mr. Thomson, Rutherford	12 15 0	7 1 0
5	Right Hon. Lord Polwarth, Mertoun	100 0 0	22 14 0
38	Mr. Purves, Linton Burnfoot ..	17 10 0	9 5 10
48	Mr. Hogarth, Eccles, Eccles Toffs ..	26 0 0	10 9 5
6	Mr. Dickinson, Maidenhall	15 0 0	8 10 1
43	Mr. Nisbett, of Lambden	10 10 0	5 18 11½
18	Mr. Fairbairn, Cowlog	10 0 0	6 2 9
32	Mr. Hume, Wormerlaw	12 10 0	7 10 0
40	Mr. Bell, Linton	39 0 0	9 17 3
10	Mr. Oliver, of Lochside	7 10 0	5 9 0
42	Mr. Simson, Courthill	18 10 0	7 9 1
4	Mr. Roberton, Harpertoun	26 0 0	8 10 9
50	Mr. Robeson, Springwells	11 0 0	6 3 7
30	Messrs. J. & G. Laing, Wark ..	16 0 0	6 14 0
35	Mr. Wotherspoon, Spotsmains ..	11 0 0	6 14 0
55	Mr. Torrance, Sisterpath	35 0 0	7 0 0
36	Miss Stark, Mellendean	32 0 0	13 10 10

RING No. 4 HALF-BREED RAMS.—Auctioneers : Messrs. Davidson, Atkinson & Oliver.

Rams.	Name of Owner.	Highest Price.	Average.
		£ s. d.	£ s. d.
13	Mr. Riddell, Hundalee	6 5 0	4 4 0
22	Dr. Marshall, Chatton Park ..	9 0 0	7 0 0
6	Mr. G. S. Douglas, Reddlestonhill ..	9 0 0	6 10 0
19	Mr. Purves, Linton Burnfoot, Belford	8 10 0	5 10 6
2	Mr. George Rea, Alnwick	13 10 0	9 4 6
6	Mr. Joseph Dun, Jundean	3 3 6	2 13 4
11	Mr. Stevenson, Yetholm, (Cheviots)..	2 10 0	1 19 2
16	Mr. Roberton, Harperton	12 5 0	8 1 0
12	Mr. W. I. Blaikie, Hollydean	5 10 0	3 14 7
30	Mr. Elliot, Hindhope, Jedburgh ..	14 5 0	7 10 3
4	Mr. Thos. Adam, Windyknow	7 5 0	6 2 6
10	Mr. J. Bertram, Hartside	9 0 0	4 1 3
8	Mr. Renwick, Weatherston	3 15 0	3 6 8
1	Mr. Rutherfurd, Edgerston	2 10 0	—
5	Mr. Smith, Melkington	4 5 0	3 5 4

—— The following are notes of recent ram sales and lettings :—

HAMPSHIRES.

Mr. Dibben's (Bishopstone—Messrs. Ewer & Winstanley, auctioneers) : Four ram lambs were let at 6½, 13½, 9½, and 8 gs. respectively. Amongst purchasers of lambs or rams were Mr. E. Pinckney, 9½ gs. ; Mr. Cheney, 9 gs. ; Mr. James Rawlence, 9 gs. ; Mr. Carpenter, 13½ gs., and 15 gs. for a 2-teeth ; Mr. Symes, 12½ gs. ; Mr. Andrews, 10½ gs. ; Mr. Jenner, 10 gs. ; Mr. Whitmarsh, 10 gs. The whole lot realised an average of £8 5*s.* 0*d.*

Mr. W. G. Duncan's (Bradwell, near Stoney Stratford—first annual sale) : A 2-shear ram, bred by the late Mr. Humfrey, of Oakash, made £13 15*s.* ; a number of theaves made from £2 12*s.* to £2 16*s.* per head, and ewes fetched from 44*s.* to 50*s.* Wether lambs made from 30*s.* 6*d.* to 34*s.* ; ram lambs sold at from £2 12*s.* 6*d.* to £13 5*s.* each.

OXFORDSHIRES.

Mr. Charles Howard's (Biddenham) : The 35 rams sold realised an average of £9 1*s.* 6*d.* One fine shearling made 19 gs. Twelve animals remained unsold.

SHROPSHIRES.

Lord Chesham's : Mr. Bradshaw secured the highly commended sheep at the late Oxford meeting for 21 gs. for the season, and Mr. E. Smith hired another at 11 gs. Twenty-one shearlings were sold, the prices given ranging from 5 gs. to 15 gs. The average was £7 3*s.* Among the purchasers were Lord Lismore, Mr. A. Copeland, Watford ; Mr. Attenborough, Mr. Jones Loyd, and Mr. J. Boord, &c. 125 stock ewes, in fair condition, were sold at an average of nearly £3 per head.

Earl of Dartmouth's : 34 rams were offered, of which 30 were disposed of at prices varying from 5½ to 13 gs. Store ewes realised 51*s.*, and yearlings 45*s.*

Mr. C. R. Keeling's : At the annual sale of the Yew Tree flock prices ranged from 5½ to 50 gs. The general average for the rams would be about 12 gs.

Mr. R. H. Masfen's (Pendeford) : 59 shearling rams, bred by Mr. Masfen, six stock rams, and 80 shearling and stock ewes were submitted by Mr. W. G. Preece. Only one out of the 59 was unsold. The average was nearly £10 each, while the older rams averaged 13 gs. each.

LINCOLNS.

Mr. H. Dudding's (Panton) : 86 shearling and 2-shear sheep were sold and let last week for no less than £1151, or £13 7*s.* 8*d.* apiece. The highest prices were £51 for a 2-shear and £32 for a shearling.

Mr. T. Kirkham's (Biscathorpe) : 60 shearling rams were let by auction, and averaged £13 7*s.* 6*d.* each. The highest price (£42) was given to Mr. H. Mackinder, of Langton. The 2-shear rams (33 in number) were let at prices ranging from £7 to £40, Mr. Needham, of Huttoft, giving the latter price ; the average of these pens was £11 9*s.* 8*d.* The 3-shear and upwards realised prices varying from £5 10*s.* to £28, producing a nett average of £8 2*s.* 9*d.*

Mr. T. Gunnell's (Milton) : Messrs. Mann & Raven sold a number of shearling rams at very good prices, ranging from £40 downwards. The prices averaged more than £11.

Mr. St. Peter Robinson's (Huttoft) : 55 shearlings, 2-shear, and 3-shear rams, were let at prices varying from £5 to £21. No. 5 was secured by Mr. North, of South Thoresby, for £20. Mr. Bancroft secured No. 6 at £21 ; Mr. Wm. Chatterton gave £20 for lot 42, and Mr. Kirkham hired lot 10 for £17.

Wootton Dale: The rams were sold by Mr. Calthrop on the 2d inst., when 55 sheep realised an average of £11 4*s.* each. Lot 1 was bought for £28 by Mr. R. Wright, of Nocton Heath ; lot 19, £19 (Mr. R. Walker), and lot 20, £23 (Mr. J. Beaulah). No sheep sold for less than £7.

The late Mr. John Davy's (Owersby) : Shearlings brought £15 10*s.* 9*d.* each ; 2-shear sheep £12 19*s.* 7*d.* ; 3-shear and upwards, £12 5*s.* 6½*d.* The general average was £14 0*s.* 4½*d.*

LEICESTERS.

Rudstone House: On Wednesday, the 17th ult. upwards of 70 pure bred Leicester rams were submitted to competition by Messrs. Allison & Wentworth. The highest shearling was bought by Mr. J. H. Medforth, of Gransmoor, for £30 ; the following prices

were also given :—£20 (Mr. J. Staveley, of Dotterill Park), £16 10s. (Mr. J. H. Medforth), £16 5s. (Mr. Simpson Staveley, of Tibthorpe). The average of 1-shearlings was £10 5s. Out of 32 shearlings offered, 22 were taken. Of the 2-year shearlings eight were at an average of 8 gs. ; and of the 3-shear four were let at an average of £8 10s. ; of 4-shear three were let, averaging £8 17s., the highest of which Mr. Jordan, of Emswell, took at £14. Thirty-three were let for £341 14s., being a shade under £10 9s. each, in the lot.

Great Givendale: The best shearling was let to Mr. Jordan, of Emswell, for £20. The second best shearling of last year (£35 10s.), after a strong contest with Mr. Foljambe's agent, was secured by Mr. Mede, an Irish breeder, of Ballynarth, Ballinhassig, county of Cork, for £33 10s. Among some of the leading buyers were Mr. Wright, of Oglethorpe Hall ; Mr. Staveley, of Hayton ; Mr. Phillips, of Beadlam Grange'; Mr. Brown, Holme on Spalding Moor ; Mr. Stamper, Highfield House, Nunnington, and several others.

Mr. C. Bradfield's (Babingley) : The first ten rams sold at an average of £5 4s. 6d. ; second ten made £7 4s. ; third ten, £6 2s. 6d. ; fourth ten, £5 8s. ; fifth ten, £5 ; sixth ten, £4 14s. ; seventh ten, £4 17s. 6d. ; and eighth ten, £4 9s. 6d. ; the average being £5 7s. 6d. per head.

Messrs. Russell & Son (Hereford Farm) : Here were recently offered 25 rams from Mr. Downing's, Holm Lacy, and for these the lowest figure was 5 gs. and the highest £8 5s. The following lots were also put up :—10 rams from Mr. Taylor's, Showle Court, prices from £6 to £8 10s. ; 15 Oxfordshire Down rams, belonging to Mr. Bryan, Southleigh, prices from 5 to 6½ gs. ; four rams from Stretton Court (Mr. Yeoman's), 5½ gs. They also sold a number of Oxfordshire Down rams, belonging to Mr. Gillett, the prices being 6, 6½, and 7 gs.

Messrs. Spurling's (at Melton fair) : Mr. Lewin's first seven score of black-faced wether lambs averaged about 45s. 3d. each, and the ewe lambs 18s. and 15s. Mr. Waller's wether lambs about 20s. 6d. ; the crones about 22s. 3d. ; two shearling tups fetched 42s. each, one 45s., one 44s., and another 52s. Mr. H. Orford's fat sheep fetched 36s. 6d., and the crones 27s. 6d. ; his tups averaged about 45s. Mr. Smith's wether lambs 15s. 6d., and the ewes 20s. Mr. Bond had 1760 lambs and sheep for sale. The principal consignors of lambs were the executors of Mr. Thomas Crisp, of Gedgrave Hall, and Mr. A. Crisp, of Chillesford ; their wether lambs averaged about 14s. 6d. the best, and inferior about 12s. ; some half-bred lambs of better quality averaged 17s. 3d., as did the Down crones ; the black-faced shearling ewes averaged 45s. ; one lot sold for 42s. Mr. W. Toller's (Gedgrave) lambs averaged 20s. 6d. Lord Rendlesham's black-faced ewe lambs 23s., and the ram lambs 21s. each ; 14 ewes sold for 34s. Mr. Crisp's (Chillesford) fat sheep averaged about 39s. Mr. Ling's (Otley) half-bred lambs, one score sold for 15s., others for less.

LESSONS OF THE DROUGHT.

THANK God ! a nice rain at last, was the joyful exclamation of a parched-up farmer on Friday last, when he had seen a plentiful 10-hours' rain soak into his fields. There had not been such a downfall since the end of February, the only rain being a good thunderstorm soon after midsummer, and a slight shower or two, just sufficient to lay the dust, a fortnight ago. As his arable land consists entirely of 100 acres of dry gravelly soil, it may be useful to recapitulate how he has got through this trying summer, and how he hopes to survive the coming winter. And if we must believe the adage that "Drought never brought dearth into England," we shall see reason to think it has brought great anxiety at least to the light land farmers of the country, and will require some considerable care and foresight yet to counteract its deficiencies. Yet perhaps we may be able to console our suffering neighbours with the thought that our worst trials are passed ; that our distresses, though now under the figure of a dark cloud, have a silver lining ; and that Hope, though unaccompanied by her rainbow, may yet revisit us. But to begin at the beginning. By Lady-day all our work was well forward. We had burnt all the Couch we could find ; we had dunged and double ploughed to a depth of 13 inches over Mangel ground ; we had sown our Barley "in the dust," right up to the sheep ; and the Wheat, where drilled early with 1 bush. to the acre, was looking well ; where got in late, with 2 bush. of seed, was thin and uneven. However, we hand-hoed the whole, and trusted to the first shower to set all right. But alas ! the April showers came not. The May flowers were equally conspicuous from their absence ; as the days lengthened everything was burnt up. In June we run the mowing-machine over 100 acres of meadow grass, and got up two ricks in the place of six. Our prospects now began to look very serious, especially for the stock. We had, luckily, fatted and sold our lambs before the Trifolium quite failed. The cows, nearly 30, were eking out their scanty pasture with a plentiful supply of water, which never fails, and a little pollard or grains, when we had the good fortune to buy the crop off 40 acres of marsh land, which is usually under water half the year and worthless, but has now given me a good rick of coarse hay and kept the cows until this time. It has also enabled me to pen 300 ewes on my own meadows, which, being bought at the cheapest time, will pay well for their corn and wonderfully enrich the pasture.

To return to the corn crops. Just as the Wheat and Barley were coming into ear, a welcome thunderstorm, with about an inch of rain, fell in time to save the main crop, excepting on a few gravelly patches, which never recovered. The yield of Wheat will, I believe, eventually prove about 4 qr. to the acre, instead of 5 qr. ; of Barley about 3 qr.,—in both instances the straw very short, and some of the grain thin. I must confess to feeling considerable qualms as every morning the dry east wind and uninterrupted sunshine kept pouring in at my windows, and the grass keep, in spite of an occasional shower, got less and less. I have said we had a plentiful supply of water. I found by damming up the ditches I could raise the level above the mouths of the tile drains, and by this means kept the subsoil cool, though I could hardly irrigate the surface. This had a very beneficial effect, and is worth remembering in future dry times.

Had it not been for this expedient I think we must have sold our stock. As it is, I hope we have now keep enough. We have 15 acres of Mangels as good as any in the country, and still growing fast. Of Swedes, a sprinkling with Turnips coming on between them, and hoed out. We have also 8 acres of stubble Turnips after Wheat, just fit for the hoe. By cutting straw along with the hay into chaff, I hope to save a hay rick for sale, which, at £6 a ton, will pay well. We have also been lucky with pigs, having kept a large herd fatting through the summer on grains, weeds, and butchers' offal. I find by bedding them up with dry ashes every time they are cleaned out they require but little straw, and retain the full value of the dung. With plenty of this latter ingredient, with the land very clean and healthy, I can now look forward to the future with thankfulness and hope.

Having so frequently advocated in these columns the necessity of keeping a much larger stock than usual as the only method of growing corn or paying rent, I have been anxious to show how far the system will stand the test of this unusually trying season. In my own case I have succeeded in keeping 100 sheep more than usual up to the present time, and have every prospect of being able to keep on or fat off the whole ; but I had plenty of water. I fear, however, that many farmers on the South Downs and other dry countries have not had the same advantage, and without water stock-keeping must be a miserable failure ; and I should hope the lesson inculcated by the last few years will not be lost on them. I understand the sheep ponds made on the tops of the hills have not failed ; likewise the catchwater ponds in the valleys where the whole winter's rains and summer storms are securely kept. I believe it is an established fact that the annual rainfall on a house is sufficient to supply the inhabitants of that house ; and there can be no doubt that, by proper precautions, such as shooting, and cemented tanks. or ponds in convenient places, a sufficiency might be secured for any amount of stock that a farm will keep, and with a conveniency of water, it is wonderful on how short a bite dry cattle will thrive. Let every one then who in the coming winter sees the rain washing down his yards and running to waste, remember how he has suffered for the last four months, and exert himself to retain as large a share of it as possible for future use, and this year's dear-bought experience will not be thrown away. *F. B. M.*

HOW TO GROW A POOR CROP OF WHEAT.

THERE are few practices in American farming in which there is more loss than in the careless, imperfect manner of putting in Wheat. It is very probable that more than half of the land sown in the United States produces crops that range from 10 bush. per acre down to nothing, where only good management and good culture were needed to average from 20 to 30 bush. per acre.

In growing winter Wheat, some of the main causes of, and reasons for, these light yields, are sowing on badly prepared land, either after spring crops, or on an old grass sod, and on land too much run to produce good crops of Wheat—land that in some cases is too much exhausted to grow good Wheat with good cultivation, but that more generally fails to grow paying crops for want of good cultivation and good management. I believe that few of our good Wheat lands are so badly run, that a suitable rotation of crops, frequent seeding to Clover, and a well-worked summer fallow, will not produce heavy crops of Wheat ; while, as a general rule, good land that has had this kind of management for some years will grow very fair Wheat after well-managed spring crops.

That so much land fails to grow paying crops of Wheat, when sown after spring crops where but little attention is given to the rotation, and the Wheat is sown late on badly prepared land, is not surprising. It is true, rich new lands have grown good Wheat in this way, but it would not be expected to see them continue to do so after they have been a long time in cultivation. But in sections where Wheat appears to be gradually failing under bad cultivation, good farming and fine cultivation may still grow good crops. A large part of Wheat farming is on soils of this character and condition, and a large share of the failures and light crops are owing to sowing such lands after spring crops, where the land is not well managed, suitably prepared, or properly manured.

A far too common practice is to break up an old sod, plant to (Indian) Corn, Potatos, and Beans two or three years, sow to Oats, Barley, or some other spring crop, a year or two more ; and after the land is thus pretty well run out with spring crops, sow to Wheat and seed down. Now, this is a very bad system, or rather, way of farming, for there is no system about it. To thus reduce the soil with spring crops, and then expect to grow good Wheat with the scant preparation usually given in such cases is taxing the soil severely. In the first place, an old and, in a sense, exhausted June grass and Timothy sod, with most likely a good sprinkling of Wire-grass, is not a good, genial condition of the land to start with—it is far inferior to a good, clean Clover sod. This old sod, with the scant cultivation, and very little, often no hoeing given to crops now-a-days, will seldom be well subdued, but the Wire-grass (Poa compressa) roots, like those of the Canada Thistle and Quack-grass, will grow as well one end up as the other, and other seeds will largely work in. So the spring crops are none too clean at first, and gradually get worse, as the land is kept under the same general management, until the last crops are quite foul and poor. A good summer fallow is needed to subdue such land, as it will be much more difficult than when the sod was first broken up ; and no one should expect to grow good Wheat by the usual practice of merely turning under the stubble, smoothing down with the harrow, and sowing and harrowing in. This course is still worse from being usually done rather late. Such farmers are not generally any too well along with their work ; while it is a very common practice to sow the summer fallows, or rather well prepared fields first, and leave until the last such fields as are least prepared to grow Wheat with such treatment.

Another bad practice is to plough up an old sod, harrow down the furrow, and sow Wheat immediately. Timothy and June grass being also cereals of a similar nature to Wheat, exhausts the soil in much the same manner, thus leaving it in a rather bad condition for Wheat. Besides the Wheat plant is a delicate feeder, that, unlike corn and Peas, which do well on a fresh sod, must have the manure, sod, or other plant food, well rotted and prepared to be fairly available, while an old, dry sod, ploughed under in dry weather, is a long time in rotting. So an old sod, freshly ploughed under, makes a bad preparation for Wheat.

A good Clover sod is a good deal better, as that, instead of exhausting the soil, furnishes additional supplies of the very elements most needed by Wheat. A clean Clover sod also rots much sooner than the old grass sod above described, and much sooner brings the soil into condition to give the Wheat a good start. But even with Clover it is much better to break up three or four weeks before seeding, as it is better to have any sod pretty well rotted when the Wheat is sown.

It is true that very good Wheat is in many cases grown after spring crops. On rich, clean land, a Clover sod may be planted to corn, the next spring sown to Barley or Peas, and be put into Wheat the same fall. If a good Clover stubble is turned under, and a light dressing of manure is given before sowing the Wheat, good crops should be grown in this course. But a better way is to grow a crop of Clover between the Barley and Wheat. Clover takes well with Barley, and can thus be grown between two exhausting grain crops to the very best advantage. But there is a good deal of Barley and other stubble that is not seeded, and that if the land is clean and well prepared, has a light dressing of manure, and is sown in good season, will grow good Wheat, and good Clover if seeded with the Wheat. Of course, it will be best to sow such land to Wheat this fall. But where the most of these important requisites of good farming are wanting, where the land is not well subdued, reasonably sure of a good crop of Wheat, and of good crops of Clover if seeded with the Wheat, it will in most cases be best to leave it and make a thorough summer fallow the next season. For where land is to grow Wheat and two or three crops of grass from one preparation, it pays to do it well, as a small deficiency three or four times repeated, in as many crops, will much more than offset the cost of the extra cultivation needed.

In preparing land for Wheat, it should be made fine and mellow, not light and huffy, but rather well worked down together. It cannot be too well and finely cultivated and comminuted, but may be too loose and open. The latter is sometimes the case with stubbles, that have been very dry and have then gone through a softening process that farmers call slaking, leaving the soil very light and open when ploughed. When a heavy stubble is ploughed under on land in this condition, it makes it still worse, so that, unless there is considerable rain, it is quite difficult to work the soil down and make a good seed-bed for Wheat. Cross-ploughing a furrow, where the sod is not thoroughly rotted, will sometimes make the land quite loose. In such cases it is often best to omit the ploughing, and make a good seed-bed with the harrow and cultivator or gang-plough. Where stubble or

other land is too loose, it should be well worked down with the harrow and roller. The plough, gang-plough, and cultivator all have a tendency to make the land more loose; but a good harrow and roller make it fine and mellow, and work it well together. Land in the latter condition is much less likely to heave with frost than when it is very light and huffy. *Albany Cultivator.*

AGRICULTURAL STATISTICS, IRELAND, 1870.

THE collection of the statistics commenced on June 1, and occupied on the whole nearly two months. The enumerators, who were selected from the Royal Irish Constabulary and Metropolitan Police, discharged their duties with their usual efficiency. About 600,000 separate holdings were visited by them, and the names of the parties from whom they received the particulars of tillage and stock for each separate holding are stated in the returns.

The abstracts have been compiled from summaries made by the enumerators for their respective districts, and will probably differ in some degree from the revised figures which will be hereafter published; but I do not apprehend that any change of importance will be necessary in the numbers now given:—

	Acres.
The total acreage under all crops this year was	5,642,556
The total acreage under all crops in 1869 (revised numbers)	5,577,780
Showing an increase in the extent under crops in 1870 of	64,776

The crops which increased in extent this year are—

	Increase.	
Cereals—	Acres	Acres.
Barley	19,242	20,583
Bere and Rye	581	
Beans and Peas	760	
Green Crops—		
Potatoes	1886	
Turnips	16,987	29,455
Mangel and Beetroot	4184	
Cabbage	2565	
Carrots, Parsnips and other green crops	1177	
Vetches and Rape	2056	
Meadow and Clover		105,119
Total increase on the foregoing crops		155,157

The crops which decreased in acreage in 1870 are—

	Decrease.	
Cereals—	Acres	Acres.
Wheat	19,546	56,022
Oats	36,476	
Flax		34,359
Total decrease on the foregoing crops		90,381
Making a nett increase in the area under all crops of		64,776

It appears from the foregoing summaries that, compared with 1869, Wheat shows a decrease of 19,546 acres, and Oats of 36,476 acres. In Barley there is an increase of 19,242, in Bere and Rye of 581, and in Beans and Peas of 760 acres. Green crops show an increase of 29,455 acres, the largest amount being in the extent under Turnips, which increased this year by 16,987 acres. There is an increase in the extent under meadow and Clover of 105,119 acres, and a decrease in Flax of 34,359 acres.

ABSTRACT OF CEREAL CROPS.

	1869.	1870.	Increase in 1870	Decrease in 1870.
	Acres	Acres.	Acres.	Acres.
Wheat	280,460	260,914	..	19,546
Oats	1,685,240	1,648,764	..	36,476
Barley	221,710	240,952	19,242	..
Bere and Rye	11,183	11,764	581	..
Beans and Peas	9,955	10,715	760	..
Total	2,208,548	2,173,109	..	35,439

Decrease in cereal crops in 1870, 35,434 acres.

ABSTRACT OF GREEN CROPS.

	1869.	1870.	Increase in 1870.	Decrease in 1870.
	Acres.	Acres.	Acres.	Acres.
Potatos	1,041,602	1,043,788	1,886	..
Turnips	322,072	339,059	16,987	..
Mangel Wurzel and Beetroot	21,129	25,313	4,184	..
Cabbage	32,265	34,830	2,565	..
Carrots, Parsnips, and other green crops	26,501	27,678	1,177	..
Vetches and Rape	25,395	28,051	2,656	..
Total	1,469,264	1,498,719	29,455	..

Increase in green crops in 1870, 29,455.

GENERAL SUMMARY OF CEREAL AND GREEN CROPS, &c.

	Acres.	Acres.
Decrease in cereal crops in 1870	35,439	69,793
Decrease in Flax in 1870	34,359	
Increase in green crops in 1870	29,455	134,574
Increase in meadow and Clover	105,119	
Total increase in the extent of land under crops in 1870		64,776

THE EXTENT UNDER CROPS, GRASS, FALLOW, WOODS AND PLANTATIONS, AND BOG AND WASTE UNOCCUPIED, IN 1869 AND 1870, IS GIVEN BY PROVINCES IN THE FOLLOWING TABLE:—

Provinces.		Extent under Crops.	Grass.	Fallow.	Woods and Plantations.	Bog and Waste Unoccupied	Total.
		Acres.	Acres.	Acres.	Acres	Acres.	Acres.
Leinster	1869	1,595,818	2,427,749	9,752	102,960	643,197	4,837,676
	1870	1,591,523	2,490,105	7,724	102,178	638,146	
Munster	1869	1,348,087	3,301,907	2,683	107,977	1,174,127	5,934,787
	1870	1,338,923	3,322,462	3,543	107,768	1,142,021	
Ulster	1869	1,889,595	2,190,458	6,504	58,832	1,168,878	5,314,267
	1870	1,923,137	2,115,197	5,453	61,037	1,209,441	
Connaught	1869	744,280	2,061,276	1,739	50,692	1,375,207	4,233,194
	1870	760,903	2,063,204	2,334	50,574	1,356,179	
Total	1869	5,577,780	10,041,390	20,684	320,461	4,359,609	20,319,924*
	1870	5,642,556	9,990,968	19,054	321,557	4,345,789	

* Exclusive of the larger rivers, lakes, and tideways.

The acreage under the head of "bog and waste unoccupied," had not any live stock on it at the period of the enumeration.

THE AREA UNDER THE SEVERAL CROPS IN EACH YEAR FROM 1866 TO 1870, INCLUSIVE, WAS AS UNDER:—

Crops.	1866.	1867.	1868.	1869.	1870.
	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	299,190	261,034	285,150	280,460	260,914
Oats	1,699,645	1,660,511	1,701,645	1,685,240	1,648,764
Barley	150,293	171,001	186,318	221,710	240,952
Bere and Rye	10,021	9,662	9,966	11,183	11,764
Beans and Peas	14,554	13,552	9,969	9,955	10,715
Potatos	1,050,353	1,021,781	1,034,681	1,041,902	1,043,788
Turnips	317,198	336,728	320,094	322,072	339,059
Mangel and Beetroot	20,162	18,797	19,109	21,129	25,313
Cabbage	36,511	34,018	32,875	32,265	34,830
Carrots, Parsnips, and other green crops	26,538	25,506	26,622	26,501	27,678
Vetches and Rape	30,623	26,580	22,033	25,395	28,051
Flax	263,597	253,257	206,483	229,252	194,893
Meadow and Clover	1,601,423	1,658,335	1,692,135	1,670,716	1,775,835

RETURNS OF LIVE STOCK.

It appears from the following Table that the returns of live stock for 1870 when compared with 1869 show an increase in the number of horses of 3105; of cattle 62,705; and of pigs 377,108. Sheep exhibit a decrease of 317,211.

THE FOLLOWING ARE THE NUMBERS OF LIVE STOCK FOR EACH YEAR FROM 1855 TO 1870, INCLUSIVE:—

Years.	Number of Horses.	Number of Cattle	Number of Sheep.	Number of Pigs.
1855	556,267	3,564,400	3,602,342	1,177,605
1856	573,408	3,687,888	3,694,294	918,525
1857	599,782	3,620,954	3,452,252	1,255,186
1858	611,321	3,667,304	3,494,993	1,409,883
1859	629,075	3,815,598	3,592,804	1,265,751
1860	619,811	3,606,374	3,542,080	1,271,072
1861	614,212	3,471,688	3,556,050	1,102,042
1862	602,894	3,254,800	3,436,132	1,154,324
1863	579,978	3,144,231	3,308,204	1,067,458
1864	562,158	3,262,294	3,366,941	1,058,480
1865	548,339	3,497,548	3,694,350	1,305,953
1866	535,799	3,740,157	4,274,282	1,497,274
1867	514,189	3,797,861	4,835,519	1,735,194
1868	524,703	3,646,796	4,901,496	869,578
1869	528,201	3,733,675	4,651,195	1,082,224
1870	531,306	3,796,380	4,333,984	1,459,332

Difference in Numbers between 1869 and 1870.

Increase.	Increase.	Decrease.	Increase.
3,105	62,705	317,211	377,108

The total estimated value of horses, cattle, sheep, and pigs this year, is £35,518,465 being an increase of £554,875 when compared with 1869, as appears by the following Table:—

ESTIMATED VALUE OF LIVE STOCK IN IRELAND IN EACH YEAR FROM 1855 TO 1870, calculated according to the rates assumed by the Census Commissioners of 1841, viz.:—For horses, £8 each; cattle, £6 ror.; sheep, 22s.; and pigs, 25s. each. [These rates have been retained since 1841, in order to facilitate a comparison of the value—one year with another. A percentage may be added by anyone at pleasure on account of the increased value of live stock since that period.]

Years.	Horses.	Cattle.	Sheep.	Pigs.	Total Value.
	£	£	£	£	£
1855	4,450,296	23,168,600	3,962,576	1,472,006	33,053,478
1856	4,587,264	24,321,077	4,063,723	1,148,150	33,120,220
1857	4,798,256	23,536,201	3,797,477	1,568,982	33,700,916
1858	4,890,568	23,837,476	3,844,492	1,762,354	34,334,890
1859	5,032,600	24,801,387	3,952,084	1,582,188	35,368,259
1860	4,958,488	23,441,431	3,896,288	1,588,840	33,885,047
1861	4,911,850	22,565,972	3,911,655	1,377,552	32,769,015
1862	4,823,152	21,156,785	3,801,745	1,442,905	31,224,587
1863	4,639,824	20,437,501	3,639,024	1,334,322	30,050,671
1864	4,497,264	21,204,911	3,703,635	1,323,100	30,728,910
1865	4,386,712	22,734,062	4,063,785	1,632,441	32,817,007
1866	4,282,392	24,350,020	4,701,710	1,871,593	35,209,715
1867	4,191,440	24,100,719	5,319,071	1,543,989	35,157,219
1868	4,197,624	23,704,174	5,391,646	1,086,972	34,380,416
1869	4,225,608	24,268,888	5,116,314	1,352,780	34,963,590
1870	4,250,448	24,676,470	4,767,382	1,824,165	35,518,465

Difference in Value between 1869 and 1870.

Increase.	Increase.	Decrease.	Increase.	Increase.
£24,840	£407,582	£348,932	£471,385	£554,875

Scutching Mills.—The number of mills for scutching Flax in each province in 1869 was, in Ulster, 1392; Leinster, 46; Munster, 41; Connaught, 32; making in all 1511.

Emigration.—In the first seven months of 1869 the returns of emigrants from the several ports of Ireland show that 45,246 persons left this country. In 1870, the number for the same period was 53,854, being an increase of 8608 persons in this year.

Weeds.—On several occasions I have called attention to the great injury arising from the unchecked growth of weeds which is, unhappily, so apparent throughout every part of the country. On this subject that distinguished agriculturist the late Sir John Sinclair has given the following experiments, which prove the almost incredible advantage of carefully weeding cereal crops:—

"1. Seven acres of light gravelly land were fallowed, and sown broadcast with Wheat; one acre was measured off, and not a weed was pulled out of it; the other six were carefully weeded. The unweeded acre produced 18 bush.; the six weeded acres 135 bush., or 22½ per acre, which is 4½ bush., or 1 qr. more produce in favour of weeding. 2. A 6-acre field was sown with Barley, in fine tilth, and well manured. The weeding, owing to a great abundance of Charlock, cost 12s. per acre. The produce of an unweeded acre was only 13 bush.; of the weeded, 28. Difference in favour of weeding, 15 bush. per acre, besides the land being so much cleaner for succeeding crops. 3. Six acres sown with Oats; one acre ploughed but once, and unmanured, produced only 17 bush. Another six acres ploughed three times, manured, and weeded, produced 37 bush. This experiment proves that Oats require good management, and will pay for it as well as other crops. Ten bushels of the increased produce may be fairly attributed to the weeding, and the other ten to the manure."

Labourer's Dwellings.—It is scarcely possible, both on social and sanitary grounds, to exaggerate the importance of improving the dwellings of the labouring classes; the Legislature has enabled the Treasury to grant loans for this most desirable object through the medium of the Board of Public Works. According to the census of 1861, the number of fourth-class houses in Ireland, each of which had but one room for the entire family of every age and sex, was 89,374—and in these were living nearly half a million of persons.

I have the pleasure of stating that in all Ireland, with only two exceptions, and they were not important, the particulars given in the abstracts have been readily afforded to the enumerators, and I beg to repeat my respectful acknowledgments to the landed proprietors, tenant-farmers, the clergy of all denominations, and to the public press, for a continuance of the valuable assistance which I have now for so many years experienced in connection with these statistics. *William Donnelly, Registrar-General, General Register Office, Dublin, August* 30, 1870.

THE PAST HARVEST.

THE English harvest season being now closed, and the produce in many districts proved by threshing out, an approximate estimate may be formed of the general yield of the cereal and pulse crops. The disastrous effect inevitable to the summer's drought on most crops over extensive and widespread areas cannot be ignored, but it is equally noteworthy that Wheat is almost everywhere in excess of an average crop, and that Barley and Oats are yielding beyond appearances and expectation. In the case of Wheat, the main causes of this success were the cold retarding spring, insuring short and stiff straw, and the favourable blooming time, having every embryo kernel to set. I have many heads of Wheat from various districts averaging 50 grains, usually only 40; and in one case of six-rowed Red Chaff "fluft" 88 grains, in lieu of 70. I

yesterday threshed out my own crop on Knap Hill Farm, Surrey -naturally extra poor soil- estimated at 38 bush. per acre, and it turns out 44. Had the plants been as thick on the ground as they would have been in the country generally but for the early ravages of the wireworm and slug and the absence of rain until the tillering season had gone by, we should this year have had a Wheat crop at least equal to that of 1868, and consequently in excess of any other we have had during this century. My Barley crop is equally good in the head, though thin on the ground, running from 33 to 37 grains each, and it is not so ricey as I anticipated in my letter in your columns on June 7. This is generally the case throughout England, to which I confine my remarks, not having this year been in either Scotland or Ireland. I hear, however, from good authority, that Barley in Scotland is the crop of the season.

But bearing in mind that the total cultivated area of all Scotland is not much more in extent than half that under corn crops alone in England—namely, as 4,400,000 is to 7,200,000 acres—the slight national importance of this circumstance is apparent.

My prediction as to the Oat crop must also be modified, as a recent personal inspection of the crops in 20 counties—just half those of England—has satisfied me that it will be within 10 per cent. of an average. The Bean crop realises my anticipations, that, taking winter and spring Beans together, it is not half a crop. Peas extremely short in the straw, but well podded, and nearly an average. Harvest has been early, as I anticipated, and the cost of securing it unprecedentedly low. On July 7 I saw Rye and Peas reaped and housed, and on the 19th Wheat, and the land ploughed. On August 19 I had cleared my Wheat, Barley, and Oat stubbles, ploughed the land, sown stubble Turnips, Trifolium, Tares, Rye, and renewing Grass and Clover seeds where the spring sowings had failed, a practical proof of the unusual earliness of the season. On the 26th I saw on a farm of 1200 acres—that of Mr. Robert Leeds, of Castle Acre, a matchless type of Norfolk farming—the harvest completed, the work of a fortnight, the poor ingatherers paid off, and looking wistfully forward to a long winter. Here, too, I witnessed the unprecedented sight of fat cattle under cover being finished on this year's Turnips, a large field of which I inspected, and then estimated the crop at 20 tons an acre.

This is mainly the result of steam cultivation in autumn on ordinary soil, and confirms me in the belief that the science of Norfolk agriculture beats the natural fertility of the land in Lincolnshire.

The adjoining farm is the well-known scene of the enterprising operations of the late Mr. Hudson, still occupied by his respected widow. The Mangel, Swede, and Turnip crops are as heavy and clean as could be insured by garden cultivation, and yet their extent is too great for the eye to embrace at one view. Here, too, the harvest was finished at probably half the ordinary cost. But this is not the main advantage to a tenant-farmer, but the saving from vexation and mental tear and wear which are incident generally at harvest time to every one farming on a large scale in our uncertain climate.

The limited expenditure in labour this season, and the early termination of field-work suggest very grave considerations as to the rural labourer's means of subsistence during the coming winter. Comparatively no haymaking, no hand-hoeing of green crops, no harvesting, and no extraneous employment. Assuredly, if ever the recruiting sergeant had a field to cultivate among agricultural labourers he will have it this winter in the southern, western, and eastern provinces. It will be well for the future if territorial proprietors, whose rural population is not redundant, cut out some extraneous employment for labour, and improve their estates while they have the chance of doing so advantageously to themselves and the country at large; otherwise, the economy of the summer's labour will be more than counterbalanced by the excess of the winter's poor-rates. Let them remember that the employment of labour has a double advantage—it pays directly by the work performed, and indirectly by keeping down local rates and engendering increased consumption of our produce.

On the Holkham estate Lord Leicester has taken time by the forelock, and is extensively employing labour especially in the reclamation of 800 acres of land embanked from the sea; and during two days' inspection of his estates, extending over many miles, I neither met a beggar nor a tramp, now the pest of the country. Probably the education we have now in prospect may do something to enable English agricultural labourers to earn higher wages, engender provident habits, and lessen pauperism. At present they weigh heavy on the springs of industry, are behind Continental labourers in many respects, and will, if not improved and elevated, ultimately break the back of real property in England.

The storage of water presents itself as one of the most prominent objects for an expenditure of capital in labour. The constantly recurring droughts we are now having have raised water to a premium, and yet the quantity hourly, daily, and yearly running to waste is incalculable. Not alone for the extraneous purposes of surface and sub-irrigation is it desirable to preserve it, but for the imperative wants of our live stock in such a season as this. A neighbour of mine in Surrey has had three horses the whole summer employed in carting water, and at the Norfolk farm of Mr. Leeds they are at present carting water for the stock from a distance of three miles.

In 80 days of the summer of 1868 we had only 5.15 inches of rain, and this year in a similar period we have only had 2.27 inches, showing a deficiency over even that dry year of nearly 3 inches, or 300 tons an acre. If any one wishes to see a successful storage of water I would recommend them to inspect an intercepting reservoir at Ockley Court, near Dorking, Surrey, where a stock of 20,000 tons is secured for the supply of cattle in fields and houses, cottages, gardens, mansion, by a simple bank across a valley. In the case of the Oxford Prize Farm—Mrs. Millington's, near Bicester—I found water carefully preserved, and all the blankless green crops sown by the water-drill. Except in this, I believe no extraneous aids were employed to insure the best illustration I have this year witnessed of rent-paying power—*i. e.*, every crop a success without the expenditure of a single shilling in show. Steam cultivation has been extensively employed, but this I was assured had resulted in economy as well as good crops. I cannot too highly commend the judges for giving this farm the first position in the county, because its management is so much more beneficial as an example to those who have to live by their occupation than trimmed show farms, developing, perhaps, enormous aggregate produce, but regardless of cost. I have had the opportunity of witnessing an equally apt lesson for a rent-paying farmer, namely, the management of the Britannia and other farms of Mr. James Howard, M.P., where on over 1000 acres of highly-farmed land not 5*s.* an acre has been expended on extraneous manures, and yet unrivalled crops, especially of Wheat and Barley, have been produced by dint of labour and steam cultivation alone. All the root crops on these farms were wonders of success, but it is noteworthy that the Kohl Rabi, a root of limited cultivation, but here extending over many acres, was the triumph of the season.

The peculiarities of one season so seldom recur in another until after a long cycle of years, that the lessons they teach are generally forgotten before they again become applicable. The three past seasons are, however, in many features exceptions to this, and had we anticipated the recurrence of 1868 in 1870 we would have done many things we have not done, and left undone many things we have done. We would have sown a greater area of Wheat, and cleared our lands of stock in early autumn, and we would not have consumed our abundant stock of hay. It may be, therefore, useful to review the past year. In ordinary seasons an ordinary person may form a fairly correct estimate of the produce of the crops if his opportunities of observation are extensive enough; but this year it is most difficult to steer into a safe conclusion. And yet any one who has a correct knowledge of surface geology and local rainfall may sit at his fireside and make a sound approximate estimate of the produce of respective districts.

I have, however, personally inspected the crops in 20 of the southern, eastern, western, and midland counties, and these, then, are the conclusions I have come to:—For weeks up to June 18, it was daily expected that cereal and pulse crops generally would succumb to the drought, and lead to a famine; but grass alone, especially as a hay crop, did so; then we had three days' welcome rain, and all Wheat has turned out over an average crop of say 32 bush. an acre on real Wheat soils, and very little under on lighter land. There is no rust, blight, or disease of any kind, and not a laid straw in all England. The importance of the feature will be confirmed by referring to my report on the crops of England and Ireland in the *Times* of this date, in 1862, where it is stated that I have seen thousands of acres of Wheat, from its luxuriance, laid or lodged in the month of April, and that the crop of that year turned out about 1 qr., or 8 bush., an acre below an average. Pasture and Potatos that year were extra crops. In 1864 we had a full average Wheat crop, while grass land was a scene of desolation from Cornwall to Carlisle. In 1867 we had a great hay and a bad Wheat crop, In 1867 the reverse. In 1869 these crops were again reversed, and this year they have also changed places. If, then, our 3,800,000 acres of Wheat land produces an average of over 30 bushels an acre we will have 14½ millions of quarters, or within 7 millions of our home consumption, and at least 2 millions more than from last year's crop. The fact that when Wheat is abundant grass is a failure is a great botanical mystery, seeing that they are the same species, which explains why the one never succeeds immediately after the other. Barley, from its extraordinary fine heads, making up for its want of straw, will be an average crop, and Oats nearly so. Beans are an exceedingly poor crop, but there is no loss this year from early autumn frosts, as is frequently the case. Peas I have already mentioned as a fair crop, but it is really not of much importance. Hops are more so, because their success or failure materially affects many important rentpayers and employers of labour. I have been much in Kent during the season, and can say they are an undoubted success on all soil congenial to their growth, which is that resting on the greensand formation. Wheat and Trefoil Clover are also extremely good on the same formation. Mangel Wurzel is almost everywhere an average crop, and, from the rapidly increasing extent of its cultivation, may now be considered, like Turnips, of national importance. As it generally gets a good dose of salt at sowing time, the land is kept moist until the plant has got a start, and then it can stand any amount of heat and sunshine. Swedes, much the most important root crop, are not equally easy of cultivation, and while at least one-half on the area sown this year have entirely failed, the successful crops, from having been sown early, are already mildewed, and will have to be taken up before they they are fully matured. I again commend the use of the water-drill for this crop, and would repeat that the earliest and healthiest crop I have seen this season was that sown by it on Mrs. Millington's farm, Oxfordshire, and must have gone a great way in securing her the distinction of beating all the men in the county in farm management. I find all roots on the flat the best this year, and shall in future abandon the practice of ridging up in the South of England. Nor shall I in future apply manure direct to roots or any other crops, except grass, if I can help it. Grubs have been most destructive to root crops this season by cutting the leading tap-root in two about 6 inches below the surface, and thus killing the plant. I have suffered much in my Mangel crop, and intend turning the affected land up and liming it, whenever the crop is removed. On a field of 10 acres in Hants, belonging to Mr. W. Shearer, a crop of Swedes, after having been carefully singled, horse and hand hoed, and finished, and the roots almost as large as goose eggs, was entirely destroyed by this grub about a month ago. Potatos, except on black, loamy, and peaty soils, are the most deceptive crop of the season, everywhere looking luxuriant, and everywhere yielding only half a crop, and this injured by a second growth, as in 1868. I am endeavouring to check this ruinous process by cutting the renewed green and luxuriant haulm, which I find an acceptable fodder to my milch cows and young stock. The loss to grass farmers this year must be very serious, and dairy produce must inevitably be dear. In Middlesex the occupiers cannot possibly have realised enough to pay their rates and taxes. Sheep farmers must have been equally punished; but in many cases they have Sainfoin, Lucerne, and other forage plants to fall back upon, and they have a good clip of wool, and no lameness or diseases among their sheep. This cannot be said of the owners of cattle, as they are limping in almost every county, and no remedy seems to be anywhere applied, although you opened your columns some months ago to suggestions from those who had had previous experience of the foot-and-mouth disease.

The drawbacks that have occurred to farming profits this year, although local, have been sufficiently extensive to affect the letting value of land, and the competition for farms over considerable districts is by no means so keen as in recent years.

Wheat is selling at fair prices, and hay is as dear per pound as Oats, but there are many who have little of either to sell, and no one now expects to get war prices even in war times, as our wants seem no longer to regulate our supply, but the surplus which foreign countries have to spare all over the world. *Thos. C. Sotl. 10, Kirby Lane Yard, E.C., Sept. 3, in the "Times," Sept. 8.*

OUTDOOR RELIEF.

[At the recent Congress at Birmingham Mr. W. W. Beach, M.P., made a short Mr. Wason read the following paper.]

HAVING been requested to place before the meeting some remarks on outdoor relief—a subject which will, I hope, provoke a useful discussion to-day—I venture to request your patience whilst saying a few words on pauperism generally, and on the direction in which we must look if we desire to find a remedy for it. The changes which occurred in the use and holding of land chiefly during the reigns of Henry VII. and Henry VIII. converted the peasantry from cultivators into labourers. Under that great change England might still have remained free from pauperism but for later errors. Judging from the history of Holland and England, the present painful and disgraceful state of pauperism in which we find ourselves was the result of extravagant expenditure on foreign war, and consequent debt, which led to the substitution of indirect taxation on the necessaries of life for direct taxation upon land, then almost synonymous with property. Thus the source of pauperism was the shifting of taxation from the land of the rich to the labour of the poor—from the shoulders of those who had property to the backs of those who had none. We all know that want and distress are inevitable, but it is otherwise with pauperism, which is a disease of man's creation, and, once called into being by a bad system of laws and taxes, it spread gradually and continually like an infectious disease. Although the current belief amongst us is that Poor-laws, like ours, lessen poverty and prevent starvation, they probably multiply both. The poverty and misery permanently existing in our great cities is without example in any prosperous country, and the inefficiency of the Poor-laws in time of severe pressure, as for instance during the cotton famine in Lancashire, or during the last winter in London, is indisputable. In fact, the resource which should be reserved for an extreme case, viz., the paying of public money for the support of the poor, now only avails under ordinary circumstances, and we have to

return to the natural remedy, namely, private charity, in any great crisis.

There is reason to believe that more people die of want and its consequences in London with a Poor-law and 3,000,000 of inhabitants than in Italy with 20,000,000 and no Poor-law. It is remarkable that those who live where there is a legal and compulsory rate for the support of the poor cannot believe that any well-governed country can get on without such a system, whilst those who live where there is no such provision are at a loss to understand how it can be necessary. In Scotland, where a law for compulsory assessment has long existed, although as late as 1815 it appears to have been enforced only in some exceptional parishes in which the voluntary system had been allowed to fail, the English system is now thoroughly established; but yet cases of death from want are as likely to occur as under the old state of things, when a dole of meal was given only to the poorest out of the money collected in the kirk. The consequences of the compulsory system are so fatal to private charity that the mere proposal to adopt it caused the weekly collections for the poor to fall off considerably; and, as the Poor-laws had come to be regarded as the proof of civilisation, even the success of Dr. Chalmers in Edinburgh failed to convince the Scotch of the value and efficiency of their ancient habit of supporting the poor by local collections and unpaid administrations. One difference between a country with Poor-laws and another without is, that in the former there are paid relieving officers in a district, whereas in the latter every man and every woman is an unpaid and self-appointed relieving officer.

Of late years many taxes have been taken off the necessaries of life, and the peasant is no longer bound down to the limits of his parish. These changes, combined with the enormous expansion of commerce brought about by the gold discoveries, and the immense amount of labour which has been employed in making our railways, have caused the evils of pauperism to be less apparent, and to grow upon us less quickly; but communism, now rampant in Russia, powerful in France, and growing in Germany, will come upon us, either by gradual steps or by sudden revolution, unless we give up palliatives, and seek in earnest to rid ourselves of the disease of pauperism. To effect this we have to understand its causes, and to investigate the condition of countries where it does not exist. We may then be induced to revise our land laws and the system of government and taxation which have prevailed since the Great Revolution.

Having said thus much on a somewhat distasteful and unpopular subject, I turn to the question—Can we prevent the present law of out-relief from increasing the distress which it was designed to prevent? I fear not. It is impossible to affirm that the present law, aided as it has been by circumstances alluded to before, viz., the discovery of gold and the formation of railways, and also by improved schools, allotments of land, and an increased number of benefit societies, has raised the agricultural labourer to a condition of wholesome independence and manly self trust. The legislation of 1834 swept away many abuses, and saved the owners and occupiers of land from ruin; but, in spite of it and many subsequent acts, and all the orders, counter-orders, and exceptions of the Poor-law Board, the peasant is as ready as ever to draw what he still calls "parish pay," and often objects to join a benefit club on the ground that "it would only save the parish." At the same time, an increasing number of artisans, of small tradesmen, and of other persons who have friends able to maintain them, are constantly trying to obtain out-relief. Many who are above the condition of those who depend on their daily labour for their daily bread have no shame in asking for out-relief, even when it is not a necessity, and no thought that the rates are extracted from people as poor, and often poorer, than themselves.

All will admit that much of the money spent in out-relief really acts as a rate in aid of wages, and keeps down the latter to its lowest point, thus deeply injuring the agricultural labourers, particularly the good and prudent, and indirectly injuring those who employ them, for the men work short hours in Hampshire, and, except when at task work, give inferior labour for inferior wages. Artisans, who are better able to take care of themselves, have not suffered in the same proportion. They have succeeded, by trades combinations and emigration, in keeping their wages at a high figure, although they are at the present moment suffering seriously from want of employment—a want which would be partially removed if they would accept lower earnings. A vast number of them provide for illness and old age by saving or by benefit clubs; but many of them trust to the Poor-law, and come for out-relief in case of sickness, either immediately or after a few weeks. The evil of out-relief in destroying the self-reliance of the pauperised classes, and of undermining that of the class just above them, was to have been averted by the workhouse test. This test, however, has failed, and is almost in abeyance, as the exceptions allowed by the Poor-law Board are acted upon and the general order is not. Boards of guardians are naturally reluctant, where the option is left to them, to take a step which may force people into the union house against their will, and break up the home of a family. They also shrink from the greater cost of keeping a family in the union house. I am sorry to say that the amount of money raised by benefit clubs in agricultural districts, although much increased, is still insignificant as compared with the sum spent in out-relief. As it may be useful to compare the out-relief given in different unions, I subjoin a Table of that given at Alresford:—

1. A sick man with a family receives about the ordinary amount of wages, chiefly in money and partly in bread.
2. An able-bodied widow with children receives for each child 1s. and a gallon of bread weekly.
3. An old couple receive 5s. 6d.
4. An old person receives 3s.
5. A lying-in woman whose husband is at work, if there are five or more children, receives 2s. 6d. or 3s. a week for four weeks.
6. The sick have a nurse found them when necessary, and meat, wine, porter, &c., when recommended by doctor.
7. The funeral of a grown person costs the parish from 23s. to 27s.; that of a child less.
8. An order for medical attendance is given when applied for, except in the case of persons earning more than ordinary wages.

The earnings of the agricultural labourer average about 14s. a week, but, with the exception of carters and shepherds, who are supposed to be better off, we take their earnings at the ordinary rate of day pay, says 10s., in considering their means of supporting a sick wife or child. If a man belongs to a benefit club, we treat him as if he had half his club allowance, considering the other half as a means of supplying him with sick comforts, and so more quickly restoring him to health. The cases with which we have the most difficulty are those of:—

1. Men partially disabled who apply for out-relief, and for permission at the same time to earn what they can.
2. Children of able-bodied men in full work for whom meat, milk, &c., is recommended by the doctor.
3. Artizans and others temporarily ill, whose ordinary earnings are from 18s. to 30s. a week.
4. Widows with children occupying a house rented at £8 or £10 a year, and carrying on some business which they say does not enable them to support their children.
5. Persons unable to work, but having friends able or legally bound to support them.

If the responsibility of supporting the last class could be made to fall in the first instance on the relatives, and on the union only when these have proved their inability, a large amount of out-relief would be struck off the books. At present the relatives frequently escape their liability. Another improvement in the law would be to make relief to persons not living in the union illegal, except in the cases of schools and public institutions. The idea of charity still clings to out-relief, which in all the above cases is often given where it would be better systematically to refuse it. If the labourer could be taught to depend upon himself, and not on the rates, he would receive better wages, out of which he would be able to put by for sickness and old age, as he now puts by for fuel, rent, and clothing. It is quite clear that distress is by no means in proportion to the largeness or smallness of the earnings, but rather to the want of care and thrift on the part of the receiver. Whilst the families of the armourers of Sutton Coldfield, who earn £1 a day, form a very distressed population, as the men work about three days a week, and often leave a wife and family to be relieved by charity, or by a loan from a neighbour, most of those who are present know of highly creditable instances amongst the agricultural labourers, where, notwithstanding a heavy family and small earnings, the home is kept neat, and the club money regularly paid up. In considering the question of out-relief I commend the following figures, taken from the Poor-law Reports for 1868-69 and 1869-70, to the attention of the meeting:—

			Indoor Relief.		Outdoor Relief.
Walsingham (Norfolk)	..	1868	.. £775	..	£2962
..	..	1869	.. 922	..	2958
Atcham (Shropshire)	..	1868	.. 1515	..	677
..	..	1869	.. 1512	..	659

Having been in the habit of considering that under ordinary circumstances a union was, in so far, fairly well managed where the out-relief amounted to three times as much as the indoor, I am quite at a loss to understand these figures. In the Walsingham Union the out-relief is nearly 12 times as much as the indoor, and at Atcham it comes to little more than one-third. This contrast must be owing to exceptional circumstances or to exceptional management, and in either case it ought to throw some light on Poor-law administration. I will conclude by asking for suggestions from those present in respect to the administration of out-relief, and by placing before the meeting two questions:—

1. Is it desirable that, after a fixed date, out-relief should be given in goods only?
2. Is it desirable that, after a fixed date, out-relief should be abolished, except in cases of urgent and immediate necessity?

TRADE IN DEAD MEAT.

In considering the best means of securing more humane treatment for animals in transit, we have not lost sight of a question closely connected with the subject referred to us—viz., the supply of dead meat, whether of home or foreign production, to the British consumer. It is obvious that, supposing the supply of both animals and dead meat to be only equal to the demand, the greater the number of the animals slaughtered before removal, either from foreign ports, or from the places of their growth, to the markets in this country, the fewer will be the cases of suffering or ill-usage of live animals during transit. The question therefore arises—Would it be wise, or would it be possible, for the Government so to interfere with the special arrangements of the trade at present existing, as to discourage the transit of live animals in favour of the transit of dead meat?

It has not been very easy to make an accurate comparison of the charges at present made by the railway companies for the carriage of dead meat and live animals respectively.

1. Because in the former case the charge is per ton per mile, and in the latter, per head or per truck.

2. Because the charge varies in each case, according to the length of the journey; being, as a general rule, for short journeys, up to the maximum rate fixed by Parliament, and for long journeys, somewhat below it.

We do not propose, in this report, to enter into what would necessarily be a long discussion upon the incidence and effect of these relative charges, or to state the arguments for and against the substitution of a dead meat trade for the trade in live animals. That question was fully argued before the Parliamentary Committee on the "Trade in Animals," in 1866, and again before the Committee on the "Metropolitan Foreign Cattle Market Bill," in 1868, and we entirely agree in the conclusion arrived at by the former committee, that "it is not possible to dispense with a live meat market in the metropolis and other great towns."

We may mention, however, as to the railway charge, that we are satisfied, both from the documentary and oral evidence presented to us on this subject—

That no undue preference is shown, or advantage held out, to one trade over the other by the railway companies.

That, though the charge for live animals is undoubtedly, in most instances, lower than that for dead meat, this is necessarily the case, owing to the far greater amount of labour, trouble, and uncertainty as to both weather and markets, thrown by the carriage of the latter upon railway companies.

In many cases, indeed, the dealers in dead meat willingly pay extra rates beyond those alluded to above, to ensure the expeditious and certain delivery of the meat, and the question of compensation for delay and loss enters much more largely into the calculations of those concerned in the dead meat trade than in that of live animals.

We have not been able to obtain from the companies any satisfactory statistics of the quantities of dead meat carried by them. Indeed, the only return we can refer to is an imperfect one, which gives the quantity brought into the metropolis alone by the different lines of railway in 11 months of the year 1867. This amounted to 64,924 tons only. The officers of all the companies who gave evidence before us agree in saying that the trade is increasing, but at the same time they absolutely repudiate the idea that it could ever be made to supersede the trade in live animals. Indeed, several witnesses declared that it had extended itself at present almost as far as could safely be done without certainty of loss; and they instanced the great losses incurred by the dealers in dead meat at the time when, during the prevalence of the cattle plague, the carriage of live animals by railway was prohibited.

Upon the whole, we could by no means recommend the Government to attempt, by any special enactment, to interfere with the free course of the traffic in both these articles; or to deprive the trade of the option they at present enjoy of selecting whichever mode of supplying food to the general consumer they consider most to their advantage.

As to the conveyance of dead meat by sea, from foreign countries into the United Kingdom, it is unnecessary to say much.

We are as yet unable to procure the return of the quantities imported in 1869; but in the three preceding years they exhibit a gradual decline, the quantities being—1866, 592,368 cwt.; 1867, 510,507 cwt.; 1868, 454,943 cwt.

In this return the import of salt meat is included as well as of fresh; and the total quantities, it will be seen, formed, even in the year when the largest importation was made, but a small contribution to the vast consumption of this country. No legislation would, in our opinion, overcome the difficulties attending the transmission of dead meat by sea; and it is certain that any measure calculated to discourage the transmission of live animals, or interfere with the eager competition now existing for their carriage by sea, would soon drive the foreign breeder to seek a market elsewhere, a large field being always open to him in the great cities of the Continent.

That this would certainly be the case, is abundantly proved by the experience, during the last four years, of the effect produced upon the importation of foreign animals by the restrictive measures adopted in this country for the suppression of the cattle plague.

In 1865, the total number of animals imported amounted to 1,330,334. In 1866, the number declined to 1,102,492; and this decrease became still more marked in the two succeeding years, the return for which is as follows:—Live stock imported into the United Kingdom in 1867, 765,743; in 1868, 511,564.

Indeed, we are strongly of opinion, that any measure

tending to place the foreigner in the smallest degree at a disadvantage in our markets, as compared with the home producer, would be attended by a gradual, but certain, diminution of our supply of animals from abroad. *Report of Transit of Animals' Committee.*

HOW TO MAKE BUTTER.

We milk 16 cows—15 new milkers, and one farrow. They are a mixture. The native predominates; but there is an infusion of Ayrshire, Durham, and Devon blood. Feeding in fair New England pastures, we shall average for the next four months about 12 pails of milk a day. We generally get them out of the yard in the morning, a little before six, and into the yard at night, a little before seven. In the morning the utmost care is taken to clean the bag, before milking, from all filth and dust that might mingle with the milk while in the act of drawing it. This is mostly done with the bare hand, but sometimes with a wet cloth, and is of the first importance. Any mixture of impurities with the milk taints the cream, and takes from the sweetness of the butter. Besides having the milk perfectly pure, we milk the cows perfectly clean. The last quart is worth double the first for butter; besides, nothing has such a tendency to lessen the flow of the lacteal fluid as leaving a portion of it in the cow's udder. We milk the cow as rapidly as possible. A man or woman who can milk a cow in three minutes will get an eighth more in quantity and in value than one who struggles through double that time. There is a sort of relaxation of the cow's nerves that a quick, strong milker always impels, which gives completeness to the flow.

Our milk-room is about 20 feet long by 8 wide, with windows opening towards the west, and our milk-rack, with its five tiers, together with a few shelves, will hold something near 150 pans. At one end of the room is a table whereon pans sufficient to hold a pailful of milk can be placed, and into which the milk is strained through a 60 copper wire-cloth, placed in the spout of a tin pail exclusively used for this purpose. Our pans are about 4 inches deep, of common tin, with a wired edge; although a much better and more desirable article is a heavy block zinc, which we are substituting for the old tin as fast as new ones are required. The milk is set in these pans about 2 inches deep. It never should be set deeper; and if you had the pans and the space, 1 inch is better than 2 inches. It does not make as much difference in the cool days of early summer and autumn, when the milk will keep fresh and sweet for some time; but when the hot days come, and the milk will sour in a dozen hours, the thinner it is set the better. Our milk is always skimmed as soon as it begins to sour, or immediately after it has come to a solid curd. Between these two points, the trouble of taking off the cream is very much greater than it is at either; besides, the particles of soft curds that inevitably mix with the cream diminish its value. As soon as it is taken off it is churned, or what is skimmed at, say, five o'clock in the afternoon, added to that taken off the succeeding morning, makes the churning that is placed in the churn as soon as possible after breakfast, if not before, and immediately converted into butter. It takes longer to churn sweet cream than sour, but the product of the process, if not greater, is better.

When the butter comes, the buttermilk is drained out, and then the mass is thoroughly washed in two or three waters, before it is taken from the churn. It is then placed in a large wooden bowl, preparatory to being worked with the paddle and salted. By this time most of the buttermilk is out, and it requires only such manipulation as is needful to evenly distribute the salt. It is then set in a cool place till the next morning, when with the paddles again it is made into balls, or moulded and stamped, in a 1 or 2 lb. wooden mould, preparatory to being sent to the market.

But the most important thing is yet to be told—the pails and the pans must be kept perfectly sweet, and this is the way it is done: First, all are washed in cold water, till they are perfectly freed from all particles of milk; then in hot soap suds; then scalded in boiling water, and finally placed in the sun for several hours. If the sun does not shine, exposure to the outside air has always a purifying influence. It greatly facilitates the operation of scalding the pans to have a large-topped kettle full of boiling water, into which each may be dipped as soon as it is washed in the soap-suds, and, without being wiped may be immediately carried out-of-doors. The butter needs to be completely freed from buttermilk and water. The sooner this is done the better; but, after it is done, any further handling, either with the hands or paddles, is an injury. When the butter is made, it must be kept in a clean and sweet place till sold. If it is put in boxes on a cellar-bottom, that cellar should be innocent of the smell of rotten Potatos or growing Turnips. Nothing so easily becomes impregnated with unseemly odours as either cream or butter; and as in the making, so in the keeping, absolute cleanliness is of the first importance. In all this, care and work are inevitable; but the reward comes in a good price for the product, and the consciousness of excellence—the latter being worth more than the first. *American Paper.*

We add the following, also from an American paper:—

No man need expect to succeed in the dairy business, unless well provided with good shelter for his cows, as well as the proper grasses and water, and accommodations for milking, feeding, and whatever else appertains to the conveniences and labour connected with it. It may be well to enumerate a few of these items, which are here offered for consideration.

1. Permanent grass and Clover pastures on dry, elevated soil, or their equivalent in other grasses or herbage, enabling the cows to give abundance of rich, good flavoured milk. Common prairie and lowland grasses will not answer.

2. Abundance of pure water supplied by living springs, running brooks, or permanent rills. Ponds or stagnant water are not healthy for dairy cows, and will not aid in making a high flavoured cheese or butter.

3. Barn stables or sheds into which the cows may be driven in excessive heats or cold storms for shelter, as all excessive temperatures, whether of heat or cold, of drought or moisture, affect the milk both in quality as well as quantity, and influence, more or less, the quality as well as quantity of the dairy products.

4. Quietude of the cows, continually, whether at pastures, in their yards, or stables, together with gentleness in their treatment, and a continuous loveable care for them, so that they repose entire confidence in those who go among, care for, or handle them.

5. Plenty of salt once a week to keep their bowels open, and their appetites good.

6. Steady milkers; the same milkers to the same cows, continuously as may be possible, so that the cows get accustomed to those who draw their milk; and let the milking be done silently, without talking, as all unnecessary noises disturb the cow, and more or less affect the equable and steady flow of her milk. The milk cow is a very sensitive animal.

7. Perfect cleanliness in the pails and vessels which receive the milk, and clean hands to the milker. For these purposes a bucket of water, washbowls, and a soft linen or cotton cloth to wipe off the udders, should always be in attendance.

8. In addition to these requisites, when a prolonged drought dries the pastures, green crops of grass, the small grains, or Indian Corn should be sown in the spring, to help out the pasture grasses, and keep up the flow of milk. For the want of these, oftentimes half the dairy products of the season are lost. Their food should be daily cut, and fed to the cows in clean mangers.

The enthusiastic dairyman, just beginning the business, may say, "If I have to encounter all these difficulties, I may as well throw up the business at once, for I have neither the capital to expend in so multifarious a preparation, nor have I the convenience on my farm to supply all requirements, even if I had the moneyed means to provide them." The answer to this is: No man should attempt dairying unless he goes into it as a permanent business; and every kind of permanent occupation requires a certain amount of preparation to prosecute it to its most successful results. He may have his cheese-house, his kettles, cauldrons and presses in ever so good order, and which can be suited in one place about as well as another; but the material of which his cheese or butter is to be made must be of good quality and perfectly arranged, or his work will prove a failure.

Home Correspondence.

Oat Growing in Wales. — Your correspondent, "G. A. H.," in p. 1167, believes that Mr. Smith has made a mistake in stating that "he had picked up in his own neighbourhood three 'heads' of Oats out of which he rubbed 630 Oats," and further states that "to be, in my judgment, impossible." What the possibility in the neighbourhood of Mr. Smith is I know not, but I know that I picked up one straw of Tartarian Black Oats, grown in Wales this year, on which I found 336 perfect grains of Oats. Besides the number of Oats on this one straw, there was another peculiarity which I should be very glad to get the opinion of some of your scientific readers upon it. From the upper knot of this straw there were four what I may term branches, the strongest being about 3-16ths of an inch in diameter and 20 inches in length from the knot to the first branch of the head, which was very large; the second branch was about 2-16ths of an inch in diameter, 16¼ inches in length, with a moderate-sized head; the third branch, a small one, 5 inches long, containing about 20 grains; the fourth branch, smaller, contained about four grains. I did not observe whether this straw was the only one that had grown on the same root or not. The size of this straw 6 inches below the upper knot is 5-16ths of an inch in diameter: the whole length might be about 4 feet. Is it a peculiarity of the Tartarian, for I have not seen it in any other Oat? or is it what we generally term "a freak of Nature?" *W. D.*

Thame Ploughing Match, Sept. 8.—The managers wisely laid out the lots so as to fully test the abilities of the men, and make them as equal as possible in every class. The majority of the lots were ploughed in first-rate style, doing great credit to the enterprising and spirited farmers of this highly cultivated district. One of Messrs. Howards' patent double-furrow ploughs was at work in the same field, and did its work equal to the best single furrow ploughs, the three horses abreast being easier worked ploughing two furrows than the two horses were ploughing one furrow, showing a saving of one-fourth in horse, and one-half in manual labour. This is an advantage of immense importance to the agricultural interest directly, and the country at large indirectly. The prizes went: Special Champion prize to work done by a Howard plough; the Local Champion prize to work done by a Ransome plough; the three-horse teams, 1st and 2d prizes to Ransome ploughs; in two classes of 2-horse teams, 1st and 2d prizes to Howard ploughs. *L. P.*

Oats and Oat Plants.—At p. 1167 "G. A. H." is found writing thus:—"Mr. Smith says he picked up in his own neighbourhood three 'heads' of Oats, out of which he rubbed 630 Oats. Now, I beg to tell him I believe he has made some mistake. If he had said three plants, it is quite possible; but, to get 210 Oats out of one ear, I declare to be, in my judgment, impossible." A too hasty confidence in the judgment of "G. A. H." is likely to be disturbed. If he is really serious in what he asserts, I will produce for his astonishment, if need be, an Oat stalk from which he may rub not less than 245 grains! Mr. Smith may be a little dogmatic at times, but he is a sound and sensible farmer, and his knowledge of farming is not to be gauged by the criticisms of "G. A. H." What shall I say of his literary opponent, who is in the constant habit of pouring out ridicule on everything Mr. Smith dares to say or do? *W. N.*

Spring and Summer Keep for Cattle.—The question, "What are we to do for keep next spring?" is not asked without occasion, as the prospects for spring keep are worse than they have been for several years past. The parched condition of the stubble sown with Clover in the spring, pastures deficient of grass, a hay crop fully one-fourth less than previous years, the advancing prices of all kinds of feeding stuffs, may well cause fear among the hundreds of agriculturists who are dependent on spring food for the existence of their stock. However, the long-desired rain has come; and although in most cases the young Clover plants have gone too far to be benefited much by it, and the fly has made too clean a sweep of the Turnip plants for them to do much good, yet by exercising promptness much may be done during the next fortnight to make up the deficiencies caused. Italian Rye-grass is a most valuable plant. Its remarkably quick growth and powers of reproduction recommend it at once to notice. If sown alone, 2 bush. per acre are sufficient. It is useful sown with Trifolium incarnatum (Italian Crimson Clover) at the rate of 1 bush. and 10 lb. per acre. Trifolium incarnatum is also excellent when sown to improve the Clover leas; 20 lb. per acre harrowed in will very much improve the crop of Clover hay. On a clean fallow it succeeds well; and a later variety, Trifolium incarnatum tardif, is excellent as a succession, coming in about a fortnight later. Brome-grass may also be sown on a clean stubble, in drills 9 inches apart. This is also very valuable, of strictly a perennial nature, and would produce an excellent pasture with the help of liquid manure. Vetches, Rye, and winter Oats may also be sown at once. Turnips it is generally too late for; there are, however, two kinds—the White Stone and Grey Stone—which, if sown by September 14, will produce plenty of top and a bulb as large as an orange by April, if not wanted before. I venture to offer these remarks, thinking they may prove of service to some of your readers, whose prospects are, as in this county, very bad for feed next spring. *Observer, Berkshire.*

Oats on a Single Ear: Woolston.—Mr. Smith has got another "Looker-on" to help him. When I count grains in an ear of Oats, or any other corn, I reckon them as I see them, and that, I think, is the usual way. In many of the hulls of the Oats, as seen hanging in a head or ear, there will be two grains, a large and a small one; the small one growing out of the large one, as it were; but the number of double Oats varies very much with the year. You have been offered a head of Oats with 245 grains in it. Suppose you ask your correspondent to send it, and then count the hulls as they hang! For my part I never saw a head of Oats with any such number, and I am not inclined to believe it. I am still waiting to hear from Mr. Smith about my Oats, of which I sent you sample both last year and this. I have grown Oats this year on land nearly 1200 feet above the sea, yielding 75 bushels to the acre, besides plenty of straw; and the seed they grew from was grown in the adjoining field last year, and quite 1100 feet above the sea. Have the Oats, then, of crop 1869, which have grown a crop in 1870, come to maturity or not? I am waiting a reply. *G. A. H.*

Societies.

DEVONSHIRE.

The Agricultural Labourer.—After Canon Girdlestone's paper on this subject, reported last week, the points referred to in the discussion which ensued were the following:—

Mr. Wade, the Chairman, said some people appeared to argue as though everything had to be done for the working man, and not by the working man. That was a mistake. What was wanted to be done for him was to

raise him in the social scale, to make him a more truly independant man, a better labourer, more frugal, a less frequenter of the cider shop, and more constantly home after his day's labour, with his wife and family. He entirely agreed with Canon Girdlestone, that something should be done for the labourer, with the view of providing him with a better house, and he sincerely wished that every working man had at least two good bed-rooms. Just now they were hearing a great deal about education, and he asked if they considered a child's education finished when he left school at 13; what prospect was there of a boy learning farming practically, or of becoming a good labourer, or of learning other duties he would be called upon to perform in after life? The fact was, there was no system at present laid down. A farmer at the present moment was less independent of manual labour than ever he was, because he no sooner would correct a boy of 14 or 15 years of age than the lad would say, "I will leave you on Saturday night," and perhaps would go into the town. Legislation was required to deal with this and other difficulties, as arising out of the conduct of boys between the ages of 13 and 18. He suggested the boys working on farms should live with and be under the control of their parents, and that they should be paid a graduated scale for their services, similar to that adopted under the Workshop and Factories Act. It was high time some change was effected with regard to the agricultural labourer, for now not more than one labourer in a parish could be found to make faggots, whilst if a farmer wanted a rick to be thatched he had to hire a professional man to do it. This afforded ample proof of the great necessity for adopting some kind of system to ensure the raising of the abilities of the labourer to a higher point.

Mr. Watson thought that some were disposed to think the tenant-farmer a great deal more independent than he really was. The tenant-farmer, as a rule, was seldom in the habit of acting of his own accord; he had, in fact, a kind of dread of his betters, and hence it was he seldom took any decisive action of his own. He had carefully considered the subject since the meeting, and he could come to no other conclusion than that the best way to improve the agricultural labourer would be by improving his wages. He would give the labourer the option of having the cider or not. The withdrawal of cider from the men was an attempt, he thought, to make them teetotallers. Teetolalism might be very good in its way, but he had a great objection to its being compulsory.

Mr. Knowles thought the great obstacle to the increase of manual labour resulted from the fact of so many thousand acres remaining uncultivated. Many of the large landowners cultivated their land in the outset, but finding it did not pay, let it off. He would ask what was the reason it did not pay? Because it was so overrun with rabbits and hares. He maintained that the owners of coppices and preserves ought to pay much heavier taxes than they did at present. The worthy Canon had commenced firing at little birds, with a view, he supposed, of frightening the big ones, but he trusted that for the future he would direct his attention to higher game.

Mr. Sowton considered that agricultural labourers had much deteriorated since the abolition of parish apprenticeships, and suggested that the Legislature should adopt some means to remedy existing evils.

Mr. Stooke moved: "That the Chamber desires to express its approval of the generous efforts of the Rev. Canon Girdlestone to improve the condition of the agricultural labourer; but, at the same time, considers that, whilst wages are properly an employer's question, the condition of the homestead or dwelling of the labourer, as stated by the Rev. Canon, is mainly an owner's question; and this Chamber is also of opinion that the Rev. Canon might, with equal propriety and effect, extend the area of his observations to labourers in general." He did not approve of too much money being paid for the comforts of the labourer, to the entire exclusion of those of the tenant-farmer. However, if something was not done, it was evident the labourer would emigrate.

Mr. Ford seconded the resolution. He contended that the comforts of the agricultural labourer were equal, if not superior, to those of the towns. He referred the worthy Canon to the deplorable condition of labourers, as regards house accommodation, in the fashionable places of Torquay, and Newton, and other towns.

The Rev. Canon Girdlestone said they had differed on matters of detail rather than on principle. They were all agreed that the condition of the agricultural labourer required improvement. He agreed with the Chairman's remarks, with the supplementary remarks as to the carrying out of the practical education of the labourer after leaving school. As to the cider question, he did not object to labourers having cider, but he did object to its being kept back out of their wages. He did not believe in helping the labourer so much as teaching him the way to help himself. When he was last here he attended the Newton Board of Guardians, and he was extremely interested in the manner in which the business was transacted, and it was evident from what he saw that the Poor-law was administered with remarkable skill and judgment. This led him, when he returned home, to examine the statistics, comparing those of the Newton Union with those or the Tiverton, and he must say that the comparison was considerably in favour of the former. This arose from the fact that at Tiverton the guardians were pretty well of one calling, whilst at Newton they were various, and, as a result, a greater amount of experience was brought to bear on the administration generally. It would also be seen that the indoor relief was more rigidly enforced at Newton, and which he regarded as one of the greatest tests for keeping down pauperism. The motion was then agreed to.

HEXHAM.

Local Rates.—Not having been able to give a report of Mr. Grey's excellent paper on this subject at the time it was read before the Hexham Farmers' Club, we have postponed it till now. He said:—

Local rates being levied chiefly on the occupiers of land and houses, the subject is one which is naturally interesting to farmers, but when we consider that such rates have during a few years been doubled, and in many cases trebled, it is not surprising that increasing attention should be given to it. When these grievances, which we have every day complained of, have become oppressive, it is not to be expected that those complaints should be confined to the farmer's fireside or the market ordinary, but that they should take the practical form of discussion at Farmers' Clubs and other gatherings; firstly, to consider the nature of those grievances, and the best means of removing them; and, secondly, to use the only means by which the ears of our legislators can now be reached, viz., agitation.

The first part of the subject, and doubtless the most important, is the source from which the several local rates, collected with the poor rates, should be raised. At present the assessments to these rates comprise few subjects besides the occupation of land and houses. Very decided opinions have recently been expressed that all sources of income should contribute not only to the relief of the poor but to the maintenance of highways and police, and to the county expenditure for criminals and lunatics. There is much to be said in favour of this proposition. In the infancy of Poor-laws it was directed that every man should contribute to the relief of the poor "according to his ability." In the days of Queen Elizabeth the ability of a man to contribute to the relief of the poor in his own parish would be measured chiefly by the value of his occupation of land, but in our times neither the ability to relieve the poor nor the responsibility for creating pauperism can be measured by the value of the occupation. It is said with truth that a manufacturer or trader, whose hereditament may be equally assessed with that of a farmer, may derive ten or twenty times the income and cause tenfold the pauperism that the farmer does, and yet he pays the same amount towards the poor rate. He also requires the services of the police to a greater extent, and probably also causes greater expense in the prosecution and care of criminals, and yet he pays no more to the county rates. The natural inference to be drawn from this and many other arguments which have been so frequently used that I need not repeat them is, that local rates should be derived from all sources of income. I may mention here that in 1867 the amount of property assessed to Income-tax was over £300,000,000, and yet about £15,000,000 of local rates were levied on an assessment of about £100,000,000 for purposes in which all the community had an equal interest. That there are many difficulties in the way of carrying out such a system is no argument against its justice, for difficulties may be overcome, but objections to the principle should be fully considered and weighed. If this system were adopted it would resolve itself pretty nearly into an Income-tax, and as it would be almost impossible to localise the sources of income, for instance, the funds, railway shares, &c., it would follow that the poor and other rates would become national instead of local. If even this obstacle could be surmounted we have this principle stopping the way, that local representatives should not be entrusted with the administration of national funds, and that the ratepayer should have, through his representative, the control of the expenditure of the rates.

Let me for a moment point out how far this is the case at present. Under the Union Chargeability Act the ratepayer is represented by the guardians in the expenditure of the poor rate. In the disposal of the county and police rate the ratepayer has no voice; and in the highway rate I may say he has but little control, for while he is rated for the highways in his township, the expenditure of that township is in the hands of a large body of waywardens of other townships. That we are threatened with other rates, such as those for compulsory education, is only a reason for our being more determined to have those burdens fairly distributed. It appears to me, however, that as long as we wish to preserve our national system of local governments, which has been considered to be so valuable in the formation of our national character, we must have our rates levied chiefly by localities. If this be so, I do not see clearly how the subjects to be assessed for rates can be otherwise than heritable property. I would, however, include with houses, lands, railways, &c., which are now rateable, woodlands, mines of all kinds, factories, game, fisheries, &c. I think, however, that the payer of local rates is clearly entitled to some relief from those whose incomes are not now rateable, and perhaps the fairest way in which this could be done would be to charge a third of the poor and county rates, if not of the highway rates, on the Consolidated Fund. This would leave two-thirds to be raised in the locality, which would be a sufficient security to the nation for the proper administration of the funds. This principle is admitted in the contributions towards the salaries of medical officers, in this country at least, and that it was not extended to Ireland appears to me a greater injustice than many out of which so much political capital is made. This Club is aware that I have already advocated the equal division of rates between landlord and tenant; that the tenant should pay them in the first instance and be empowered to deduct half the amount from his rent. We have a precedent for this in the payment of poor-rates in Ireland and other local rates in Scotland, where the plan works successfully. In support of the justice of this proposition numberless instances could be brought forward in this country where the rates on a farm during the present leases have risen from £10 to £50, and some from £20 to £120, very much from causes over which the ratepayer had no control, such as county rates, contributions to turnpikes, &c. I think, therefore, that landowners should freely share in the fluctuations of local rates, as they are equally interested in the prosperity and peace of the district, and in the condition of its highways. In this way the rates would be paid in three equal parts by the Consolidated Fund, the owner and the occupier of heritable property. I shall not discuss the merits of that notorious character the "compound householder," further than to mention the plan which works satisfactorily in Ireland, which is that on all tenements valued under £4 a-year the landlord and not the occupier is rated; nor shall I enter into the details of the mode in which mines and other subjects should be assessed. The principle that they should be rated having been admitted, this must be arrived at after careful consideration. It might be said that where game is fed like poultry on ground already fully assessed it should not be rated any more than poultry, and there is justice in this; but when land is let at a less rent than it would otherwise be on account of the game on it, clearly either the game should be assessed at its letting value or the land at the full value it would let for if there were no game on it.

Having considered the sources from which rates are to be obtained, and the persons who should pay them, I shall next consider how a uniform system of assessment is to be arrived at all over the kingdom; for if any contribution, however small, is to be made by the Exchequer, it is absolutely necessary that the system of assessment should be uniform, not over a county only, but over the whole of the United Kingdom. This result can never be attained under our present system of assessment committees. It might be done by county assessment boards if they were under the guidance of some central office which would enforce a uniform system on all such boards, or if they had some mode of acting in unison through inspectors or paid officers who should be in communication with one another. I am not an advocate for increasing Government offices, but it is clear to me that all our local governing bodies require some centre from which uniformity of action can emanate, take, for instance, the Tithe Commissioners, the Enclosure and Poor-law Commissioners, and the Local Government Act Office. By some such means county assessment boards might be made to act uniformly. These boards should consist of representatives from the union assessment committees; they should have an officer to act as valuer in cases where they might order valuations, and probably the same officer could act as clerk to the board. It is open to discussion whether a county board would be necessary if national uniformity were to be enforced by inspectors who might attend assessment committees, and be empowered to hear appeals from them. I am also inclined to think that the continual revising of the valuation lists by our assessment committees is confusing and unnecessary, and that a revision of the valuation lists once in five years or so would be sufficient, the only changes in the meantime being the names of occupiers as they may occur. I think the constant watchfulness of the committees for every outlay in order to increase the valuation is irritating, and a discouragement to improvements. The assessment being arrived at, it is a debatable question whether the rates should be levied on the gross valuation or on rateable value, after deduction for waste, repairs, insurance, &c. To enter fully into this part of the subject would occupy too much of your time, but I am inclined to think that rating on the gross valuation would give rise to less inequality and complaint than the present system.

A matter which is at present very unsatisfactory to my mind is the area over which rates are made. The poor rate is now equal over the whole union, and I think no one will now advocate a change of the law in this respect; nor would it be desirable to have the county rate made equal over a less area than the county; but the highway rate, being made different for each township, is an unmitigated evil, unjust in its incidence, and mischievous in its results. The Club has already discussed this question, and it will probably be introduced again in the discussion on road management next January, by Mr. Wallis; I shall therefore only say that, till the highway rate is made equal over the highway district, I have no hope of seeing good roads or economical management. It is wrong in principle. The rate should be equal over an area co-extensive with the management. It would be more convenient in many ways if the highway districts were the same as the Poor-law union. As to the collection of rates, I think paid collectors, who should collect all the local rates at the same time, would be much more satisfactory than the present system. In fact, in all populous townships paid collectors are now employed. I have before, at this Club, advocated the abolition of the offices of overseer and parish constable. The duties of these offices are a great tax on the ratepayer who has to perform them, and the annual change of officers is very inconvenient. They have to attend before justices, revising barristers, auditors, and assessment committees, and their want of experience in these offices is a cause of much trouble, not only to themselves, but to those before whom they have to attend. I have already laid down the principle that the expen-

diture of the rates should be governed either by the ratepayers or persons chosen to represent them. This is carried out, as I have before stated, in the case of the poor rate. It is imperfectly carried out in the case of the highway rates, because a large board has the power to enforce the levying and expenditure of rates on one township which is represented by only one waywarden, and the system will not be complete till the rates are equal over the highway district. In the compulsory contribution to turnpike rates, which are often unequal and oppressive, the ratepayer has no redress, and he has no voice in the expenditure. In any legislation about turnpikes this point should be attended to, and I would suggest that, in the case of great main lines of road, half the cost of repairs should be paid out of the county rate, as it is in Scotland and Ireland, instead of the whole from the local rate.

In the case of the county rate, the ratepayer has no control whatever. To obviate this grievance, County Financial Boards have been suggested; and, though I do not anticipate from them all the reforms and economy which it is the fashion to expect, I think it is only just that the ratepayers should be fully represented on the county finance committees. If county rates were paid equally by landlord and tenant, perhaps the tenant ratepayers would have more confidence in their administration by the justices, who are generally landlords. I have not attempted fully to enter into the details of the reforms which I think are required in local taxation, nor, indeed, would it have been possible to do so in the time allowed by this Club; but I trust I have touched sufficiently on the principal points to show that the injustice and inequalities of the present system are so great, that the subject should be taken up without loss of time by Parliament. When bills on the subject are brought into the House, we shall be prepared to discuss their provisions. In the meantime, I would suggest that a small committee of the Club be appointed to lay before the candidates for the representation of this division of the county of Northumberland the views of this Club on the subject of local rates.

At a subsequent meeting, when the Club met for the discussion—

Mr. J. M. Ridley said the Scotch system acted uncommonly well; the landlord paid half the rates, and the tenant the remaining half. Would the board be exclusively of landlords, or, by the Chairman's plan, would the control of the rates be left to an amalgamated board?

The Chairman said he was not quite prepared to recommend one thing; if the rates were levied as they were now he should wish to have county boards established; but if, as suggested, the tenant should pay the rates, and deduct one-half from the landlord's rent, then in that case they should have assessment committees under some central supervision.

Mr. Ridley did not think that the county rating board would be of any avail, though he agreed in principle that those who paid money should have the control over it. He thought if county boards were established, they would be badly attended and not work efficiently, and the work would soon fall into the hands of three or four men. His opinion therefore was that, however just in principle, the establishing of rating boards would not act, and that the Scotch system was superior to the county board.

Mr. Lee (Dilston) said all would agree with him that the Chairman had broached an important subject; the paper was very comprehensive, and it contained much valuable matter in little space. He had to move a resolution, which was, "that the support of the poor and lunatics was a national object and a national duty, and therefore a portion of the cost should be paid out of the Consolidated Fund." It was one of the most important subjects to be discussed that day. It would with difficulty be obtained, but if farmers said it must be done there would be a chance of its being done; while if they only wished it to be done it never would be done. He therefore urged them all to make an effort and see if they could not get an alteration effected in the law.

Mr. Thomas Trotter expressed himself in favour of having all kinds of property rated to the poor; a great many things did not at present pay—mines, woodlands, &c. It had been suggested by many Chambers of Agriculture that the rating to the poor be based on the Income-tax, which would reduce the rates to 4*d*. in the pound. In this, they had calculated the Income-tax of the United Kingdom and the East and West Indian possessions, which latter could not be rated to the poor in England. Each person in the parish ought to be rated; but they could not base the rating on the Income-tax, or they would cease at £100, and many men who had £40 and £50 a-year should be rated to the poor.

Mr. Smith said the law of rating should be very materially altered; farmers formerly had great protection, but now they had no protection. There was an open market and free trade, and he thought that every source from which an income was derived should be assessed to the maintenance of the poor in the United Kingdom.

Mr. T. Drydon was of opinion that the basis of taxation should be considerably widened, but all descriptions of property should not be rated. It would be hard upon professional men, and it would be extremely difficult to localise every source of income. He agreed with Mr. Lee that one-third of the poor rates should come from the Consolidated Fund, and two-thirds from unions in which the ratepayers reside. This would lead to national rating, to which he had no objection, and he believed it was one of the questions looming in the future, though he was afraid it would destroy local government, which was what they should seek to cherish. Mr. Drydon expressed his concurrence with the Chairman's remarks in reference to game and the revision of valuation lists. He thought the valuation lists should be revised once in 10 years. The rates should be paid by both landlord and tenant, and county financial boards should be formed.

Mr. Dods said he thought there could be no two opinions as to the question what subjects ought to be rated. He thought that the question of rating naturally arose first, and that, at that meeting at any rate, whatever might be the feeling out-of-doors, there could not be two opinions on rating—that all heritable subjects—lands, houses, mines, railways, electric telegraphs, and everything else that was really fixed to the soil should be rated. With regard to rating personal property he might state that the thing was tried in Scotland. In 1845 the new Poor-law Act was passed in Scotland, by which there were three means of raising the poor rates left to the different parishes, and each parish to adopt one of those means. One way was to raise the rates entirely from heritable property, another was by voluntary assessment upon property, and the third was to raise one half of the rates upon heritable property, and the other half upon "means and substance," or income. A few of the parishes adopted the middle course for some time; but he did not think there were any rates raised by the third method, including the rating on income, or "means and substance," as it was called in the Act, it being found utterly unworkable; and anything that was to be contributed to the poor rates from any other source than heritable property must come direct from the Consolidated Fund. If they could get one-third of the poor rates from the Consolidated Fund, he saw no objection, except that their Board of Guardians had petitioned against the continuance of the Poor-law Board; but if they got this one-third they would have to submit to a closer scrutiny than they did now, as they could not expect Government to give one-third of the cost of the maintenance of the poor without having some control over it. That appeared to him to be one objection, though he did not see but that, so long as they maintained local government in their hands to the extent of two-thirds, there need be any objection whatever to the Government of the country being represented in some way in that expenditure of the one-third. Having agreed upon what subjects should be rated, the next matter was how there should be a uniform basis attained for the levying of these rates. They should have a county assessment committee of magistrates appointed by the Quarter Sessions, and guardians appointed by each Board of Guardians in the county to meet once or twice a year, to go over the valuation lists of the Assessment Committees, and get them all upon the same basis. If this board was established they might dispense with the appeals upon rating at the Quarter Sessions, and a great deal of money was spent in appeals which might be saved by the appeals being settled by a County Assessment Board with the help of a county valuator. It would not, in his opinion, be fairly and equitably settled until they had county assessors, as is the case on the other side of the Tweed, and in Ireland too. If they got uniformity of rating they should have no deductions from the gross estimated rental. They had a much stronger claim for uniformity of rating in counties than for uniformity over the country. When they get one-third of the poor rates from the Consolidated Fund, then steps would be taken to make it uniform; but until he saw a clear way to getting that one-third he did not advocate national rating. Having done with this point, he should ask who were the parties to pay the rates? On coming to reside in this county he was astonished on finding that occupiers had to pay the rates. The occupiers certainly paid them in Scotland, but at the rent-day the occupier deducted one-half of the rates from the landlord's rent. If this was the case in England they would have a better guarantee that the rates were not improperly spent. He admitted that the rates ultimately came out of the land, but they knew as well as himself that if they took the money out of their own pockets, they would be more careful in the spending of it than when it came out of the pockets of other people. He thought that if they, as a Farmers' Club, went in for any petition on this matter, to bring it before their members of Parliament, they should go in for having a law by which one-half of the rates would be paid by the proprietors and the other half by the occupiers, of course taking care that existing bargains were respected. Next came the question of the area over which rates should be equal. In the national expenditure the taxes were equal over the whole kingdom, in their Poor-law unions they were now equally rated over the whole union; and the county rate was an equal rate over the whole county. When this principle was once admitted it should be acted upon in every case, and the highway rate ought to be equal over the highway district. Districts should be made of a workable size, and an equal highway rate made for the district. In fact this principle should be carried out in every case. The last point to which he should refer was by whom should these rates be expended, when they had succeeded in having equal rating over the district. The nation had control over the poor rates, and the same was the case with the highway rates. But the county rates and the police rates, so far as he was aware, were the only rates in Britain over the expenditure of which those who were taxed had no control. They paid the county rate but they knew nothing what came of it; and it was only right they should have some control over the expenditure of the rates they paid. All they heard of the county rate was that the county accounts were laid upon the table of the grand jury, and he should like to know who looked at them? Along with this question they should ask that that duty laid upon the police of acting as gamekeepers should be taken off their shoulders. Sir Baldwin Leighton's Act should at once be repealed.

Mr. J. M. Ridley said he agreed with much that the preceding speaker had stated. As to the administration of the rates, he could not agree to a county financial board as advocated in many places; he preferred such a board as would have been formed under Mr. Ward Hunt's Bill to meet all the requirements. Mr. Dods was wrong in supposing that Sir Baldwin Leighton's Act was simply to take cognisance of this offence, and to get the police to protect the game; it was to take cognisance of more graver matter than this Act was passed. Thirty-seven out of the 40 chief constables in the country reported to the Home Secretary that they could no longer hope to limit the amount of crime in their districts, unless the class of persons who lived by poaching could be suppressed, and the only way to suppress them was to carry out the provisions of that Act. The criminal class were the cause of great expense to the country, and the poaching class were a set of depredators who, when prevented from any longer earning a livelihood by poaching, at another time would be robbing the farmer's hen roost or stealing his mutton. He wished to remove the impression that these constables were supported as game preservers.

Mr. Dods said that he did not say that the police were supported for that purpose alone; they had police before Sir Baldwin Leighton's Act was passed. This new duty was laid upon policemen, and, of course, the number of policemen was increased.

After some further discussion it was resolved—

"1. That the support of the poor and lunatics is a national object and a national duty, and therefore a portion of the cost should be paid out of the Consolidated Fund."

"2. To petition Parliament that every species of heritable property be rated for the poor, including game, fisheries, &c.; that means be enacted for providing uniform county rating, and that no deductions be made for rating from the gross estimated rental; that the rates be levied in equal portions upon owners and occupiers; that the area of rating in all cases be co-extensive with the area of paying; that the offices of constable and overseer be abolished, and the rates made and collected by paid officers, and also that county financial boards be formed."

KELSO.

Cabbage Culture.—At the usual monthly meeting of this Club the subject for discussion was—"The Propriety of planting Cabbages, early or common variety, in the spring for the use of winter stock, or as money value."

Mr. Penny, Bartlehill, said he had had no practical experience in the matter, but he was aware that for some years back the breeders of Leicester sheep had been cultivating the common variety of Cabbages to a considerable extent. He found that some of the owners of stock believed Cabbage to be a great benefit in the feeding of sheep, while others thought they had a tendency to scour, and not only that, but in some instances they were injurious to the health of sheep. His own opinion was, that by giving this plant in a judicious manner it was of great advantage. He found that some people laid the Cabbages down in the field and gave the sheep as many of them as they could eat, and when that was done he believed they might cause scour, but if given judiciously they were neither apt to scour nor to injure the health of the animals. He thought it would be well to look out for something to supply the place of grass when their pastures failed, as they had seen them do lately. He must say that Tares would be always a precarious crop, and again, spring Tares had so many enemies that they were in danger. He did not mean to say that Cabbage would be free from ravages, as many of them were destroyed by the wireworm; still he thought they were not so liable to disease, and wireworm was not so very strong in the field. He had been able to glean a little practical experience from a tenant-farmer who was in the habit of growing Cabbage, and that gentleman said that he considered 1 acre of good Cabbage worth any 2 acres of good Tares that ever he tried. This year he had given Cabbages to his hoggs once per day, and they had weaned up to his very best expectation. From what the gentleman said, he fancied there would be five or six thousand Cabbages to the acre, and that according to that calculation, 1 acre would serve 100 hoggs, at a Cabbage per day, for eight weeks. He did not think any acre of Tares would serve 100 hoggs for the same length of time, and his opinion, from what he had learned, was that it would be well to use Cabbage for feeding of sheep. He believed the farmer to whom he had referred planted four different varieties of Cabbage, the Early York, the Late York, the American Early, and the common Drumhead Cabbage; and as to the treatment of the land, he put them on really good friable soil, and manured well. He planted them from the middle of March to April 1.

Mr. Usher said he had had a little experience in the growing of Cabbage. He had tried them twice. He had planted them about the end of April, and the first year he had a very large crop of the common Cabbage. He wanted them for ewes and early lambs in the spring, and he pulled them in the autumn. The outside blades were very useful for winter cattle, and after stripping them off he placed the Cabbage upside down, and covered them up with earth, and they kept remarkably well all the winter in that way, and came out very flush in the spring. They were uncommonly useful for ewes and lambs. The next year he had a very good crop. He gave them to winter cattle up to February 1, and they did very well on a few stocks a day. They never got enough to rush them. He believed that if given in moderation, nothing healthier could be given to stock, and so far as he had tried them he thought that they were a good auxiliary, and they could be brought in in the spring of the year where Turnips failed. He could not speak much about the number of Cabbages per acre; but Mr. Gibson, of Woolmet, who grows Cabbages to a considerable extent, told him he could usually, in a fairly good average year, grow from 60 to 70 tons per Scotch acre of Drumhead Cabbage. Of course they manure

the land very strongly, but they might depend upon it if a man could do that on a farm, Cabbage must be a crop of great value.

Mr. MEIN, seedsman, Kelso, thought that Cabbage, as a feeding plant, had not secured the attention it deserved. Ram breeders, he found, used Cabbage, and the demand for the plant was becoming great, which showed that it was beginning to be appreciated as an auxiliary in the feeding of stock. He dared say some of those present would have been at Birmingham Show, and would have seen the enormous specimens of Cabbage shown by Mr. Robinson, Derby. He had some business transactions with that gentleman the other day, and he thought he would ask him his best mode of cultivating Cabbage, and in his reply he said :—"The south country stockmen say now that sheep scour less and grow much better with Cabbages in the early winter months than they do with either Swedes or Mangels. I generally sow from the beginning of August to the 18th ; but, in a season like the present, you may continue to do so later. The plants with me are transplanted out as soon as they are large enough, at the rate of about 60 in a square yard. They stand in that form until March or the beginning of April, when they are replanted to grow for the crop, and continue planting until the latter end of July for sheep in lambing season. Please recollect that spring-sown plants will never produce anything like the same quantity of produce as the autumn-sown ones. As a rule strong land will grow them finer than light soil. I manure my land in winter with horse-dung, or any other strong manure, and give it a dressing of guano and soot before planting, always taking care to have it well mixed with soil to prevent the fibres of the young roots being damaged in the early stage of growth. If I want them for farm cultivation I plant them 3 feet apart ; if for exhibition, 4 feet ; and for competition, 4 feet by 5 feet."

The CHAIRMAN said it was quite soon enough, even at this season of the year, to sow either early or late Cabbages. He had tried nearly all the varieties of the early tribe, and he had come to the conclusion that the Enfield was the best for early use. Late Cabbage required an immense quantity of manure, and without that it was no use to try them. He found the expense of manure to be rather too heavy to carry on planting them to any great extent. They were splendid feeding either for cattle or sheep, and they came at a season of the year when Tares were not so valuable. They should be sown about the present time, and in about six weeks after the plant should be cut, when new fibres would spring, and then they should be planted out in March or April.

Notices of Books.

The Impossibility Overcome; *or the Inoffensive, Safe, and Economical Disposal of Town and Village Sewage.* By the Rev. Henry Moule, M.A., Vicar of Fordington.

The waste of fertilising matter which ought to be derived from the consumption of food by the 20,000,000 of our English population, is a scandal and a shame to English agriculture. The great nuisance and injury which these valuable waste materials create wherever the population is gathered into towns, makes that which really is most valuable worse than valueless to its owners. They therefore want to get rid of it as quickly and completely as possible. There are two ways open to them, one of which involves a good deal of detailed and personal dealing with very filthy stuff, and which moreover is inevitably imperfect even under the best circumstances, and the other of which is prompt, self-acting, and complete. In the one case every householder has to collect his own house waste, and bury it under imported earth ; in the other the town water supply does everything for him. The former is much the best plan, as regards the fertilisation of a garden with its detached house ; though here, too, the imperfect cleanliness and difficulty of management will, with an average household servant to depend on, often prove, we fear, fatal to its adoption. The latter is unquestionably much the better plan, in the ease of any collection of houses provided with adequate house and street drainage.

Hitherto, however, town drainage has carried all sewage to the rivers, and the rivers of Lancashire and Yorkshire have been accordingly converted virtually into sewers. This, as a direct injury to those who drink of river water, will no doubt very soon be forbidden, and the filth now laden upon water must be taken to the land. Chemistry being unable to extract this filth from the extremely dilute solution of it which ordinary sewage presents, the only available alternative is to let the water distribute itself over land laid out for that purpose on which plants are growing which it is capable of feeding. This method is effectual for the abatement of the nuisance, and it is effectual also for the conversion of the now wasted manure into useful food for man. As the Rivers Pollution Commissioners say :—"All the ingredients are thus taken to the land, and three-fourths of them in winter, four-fifths or five-sixths of them in summer, are left there for the use of growing plants, the remainder being rendered harmless. These manure materials are thus carried, distributed, buried, and without the costly labour of the dung-cart, manure distributor, or plough. They are brought to the very roots they are to feed, and the fertility they accordingly produce is unexampled otherwise in English agricultural experience." The advocates of the earth-closet system nevertheless believe that the difficulties connected with this subject are to be overcome very easily by the earth-closet system as distinguished from the water-closet system ; and Mr. Moule, to whom belongs the credit of having urged the earth-closet upon the attention of this generation, here vigorously and ably discusses the question with Mr. Denton, as regards its applicability to the small town of Hitchin. It is well that the most confident and sanguine advocate of the system should have the utmost publication of his views ; and notwithstanding that we believe them to be untenable, as regards town populations, we make the following extract therefore from his pages :—

"I would now place these two systems in contrast and show that in the Dry Earth system is to be found a complete correction of the hateful evils of cesspools, privy vaults, and middens, together with an entire prevention of those evils which the water sewerage system, in its attempts to effect this, has so largely generated. I will show that under the former of these each house and property may be cleansed without injury to a neighbour or to the public by the creation of another and perhaps greater nuisance. By it also the utilisation of the sewage may be so complete to the town itself as to produce a permanent income instead of a permanent burden.

"Take the population of Hitchin to be like that of Dorchester, about 7000 souls. At the rate of 36 gallons of water per head of the population per diem, 250,000 gallons will be required daily. (For Dorchester 300,000 gallons are pumped.) This would weigh 1120 tons ; of which nine-tenths are required for the water-closets and for the flushing of the sewers—that is, for this purpose alone about 1000 tons daily : I say nothing of the inadequate effect of this mass of water, I merely observe that no deodorisation is effected by it. Foul and deleterious gases, generated by putrefaction in the drains and sewers, escape into the houses and into the atmosphere through traps and gully-holes and ventilators. The river, it seems, is so polluted that at some distance from the town the cattle may not drink from it. The cost of the works was £14,000 ; and the principal and interest of this, together with the working expenses, have been or are being paid off, I suppose, from the Board of Health rate.

"Now, for the closets of such a population, dry sifted earth or clay at the rate of 20 tons or loads per diem, would do thoroughly and effectually what 1000 tons of water fail to do. Let the small given quantity of dry earth be applied at once and in detail, and all offensive exhalation is checked ; no putrefaction can take place ; and either the same day, or after weeks and months, the mixed mass may be removed without the slightest offence to either the party removing it or to any others As the removal need not be daily nor weekly, so the supply of earth might depend upon the means of storage.

"The capability which the dry earth possesses of repeated use in the closet presents several advantages. First, supposing it to be used four times in the year, the whole quantity requisite for the town is one-fourth of what would be required if used only once. Secondly, it secures the fair price of the manure when offered for sale. Water sewage, since it must be got rid of, will never, therefore, fetch its just price. But, if the demand for earth manure be small and the price low, it may be kept and used until the demand and the price rise.

"And what price will it fetch? For the last three years I have sold, from my parish school and my own premises at £3 per ton dry. My schoolmaster gets the price of the first 2 tons sold, for his care of the sanitary arrangements of the school. And at present I have an order for 10 tons at the above-named price. I hope by this means to put a new floor to my schoolroom.

"But let us pursue our contrast—1000 tons of water a day worse than wasted ; 20 tons of earth a day, allowed to lie in a vault for three months, and used four times, will at the end of the year be worth at the very least £5470. Deduct £2000, if you please, for expenses and for the principal and interest of the cost of plant and of the little water conduit of which Mr. Bailey Denton speaks, and there is an income left of £3000 from this source alone. We have, however, to add to this, not to my mind the difficulty, but rather the profits of the sink water and slops, in which, after many years' experience, I find almost as great value as in the manure from the closets.

"Let us separate them, and first deal with the sink water of the back kitchen. For this we have only to improve a little on the present system of removing the coal ashes and dust of the house, in which, it should be observed, water forms no part. Instead of the old broken box, or coal-scuttle, or slop bucket, which now disfigures the streets of a town drained and sewered after the most approved fashion (if, indeed, the filth of the house do not fester in the nasty fixed dust-bin), we have only to substitute a water-tight vessel capable of containing the dust and ashes of the house, and the greasy and other dirty water of the kitchen and back kitchen for two days. If the quantity of the liquid be large, so that the vessel when filled would be too heavy for two men to lift, then let there be a drain at the bottom, and let the vessel stand over a sink connected with a pipe or drain, of which more presently. Through this all the liquid not absorbed by the ashes would pass off, leaving the greasy and soapy matter behind. Let such vessel be removed, as under any system the ashes ought commonly to be removed, once in two days, and no foul smell or injurious gas will be emitted, and a valuable manure will be formed.

"Then take the bath water and other liquid from the bedrooms ; and, for this, instead of the foul and expensive sewer as a general receptacle, there might be for each house a catch-pit with its cover forming part of the pavement—its area according to the requirements of the house, and its depth about 12 or 18 inches. This catch-pit might be filled with solid matter, as dry as can be procured. Then, between it and each floor of the house to which it is attached, there might be communication by means of a lead or earthenware pipe, carefully guarded at the top in order to prevent any solid matter entering it. Through this pipe let all the bath-water, &c., pass into the pit. Into it also any drainage from the ash-receptacle might be conveyed. There might be at the bottom of this a small well-protected drain, allowing of the escape of the liquid into a small conduit immediately beneath. If this conduit, if all such in a town should empty themselves into a river with the contents, under the simple condition that the solid matter placed in these catch-pits should be frequently emptied, would be perfectly innocuous. But, if otherwise, how feasible would be the application of so small a quantity of liquid by irrigation or sub-irrigation to the land.

"With what a cost of labour, however, will this be attended if to all these catch-pits earth is to be supplied ! No. We have only to avail ourselves of another kind of refuse with which the water system cannot deal—we have only to throw the sweepings of the pavements and of the streets into these catch-pits, and, with a very little dry earth in addition to this, the filtration and deodorisation of this part of the liquid refuse of the houses of towns, and its removal and disposal, will be complete.

"And, let it be carefully noticed, that in thus utilising coal ashes, dust, and street sweepings, scarcely any addition will be made to the present cost of scavenging. More labour might be required, but the additional carriage, if any, would be small indeed ; while the refuse in both cases, as well as in the case of the closets, is thus made a source of income.

"This, as I have stated it, is the system in a very rough form, but perfectly feasible and effective. Engineers, if they can get rid of their prejudices, may work out a modification and improvements which, without any increase of traffic in the streets, shall, with God's blessing, be nearly perfect as to sanitary results. The truth, indeed, will soon appear, that under the Dry Earth system town refuse may be removed beneath the surface of our streets quite as easily, and, I believe, at as little cost, but far more thoroughly than it is now removed under the water sewerage system."

Record Map of the War. H. Allnutt, Agricultural Library, 200, Fleet Street.

We may name this map to our readers, if only because of its issue from the Agricultural Library. It is a large skeleton map, offering the means of recording on the spots of their occurrence the various events transpiring during this war, so that at its close the sheet, about 4 feet square (on a scale of 12 miles to the inch), shall contain a detailed history of the past months or weeks which shall have elapsed since the declaration. The reader may, if he please, merely put index letters, or figures (*a*, *b*, *c*, 1, 2, 3, &c.), upon the spots where events have occurred, keeping in a little memoranda book the corresponding record of events, and leaving till the close of this most astounding list of contemporary history the work of gumming to the several spots printed labels, which Mr. Allnutt will supply, of the kind of those given below :—

"First life lost."—The first death has rapidly succeeded the first shot of the campaign. On the exposed strip of territory south of Saarlouis a German sentinel was fired at on the morning of July 28, by a French vedette. Having passed the frontier, stopped back and reloaded, but before he could discharge his second shot, the Prussian ball had put a stop to his further participation in the campaign.—*Times*, July 29.

"Sarbruck bombarded by the French, Aug. 2, but retaken by the Germans after a victory over General Frossard at Spicheren, near Sarbruck, Aug. 6.

"Weissemburg stormed by the Crown Prince of Prussia, Aug. 4.

"Battle of Woerth won by the Crown Prince of Prussia over MacMahon, Aug. 6.

"Forbach occupied by the Germans, Aug. 6.

"Saverne occupied by the Germans, Aug. 7.

"St Avold occupied by the Germans, Aug. 9.

"Strasburg invested, Aug. 10.

"Battle at Pange, over the French by the Germans, on Sunday, Aug. 4.

"Nancy occupied by the Germans.

"Victory over the French at Mars-la-Tour, or Vionville, forcing the French back on Metz, Aug. 16.

"Another great battle on the same ground, but called Gravelotte and Rezonville by the Germans, again compelling the French to retreat to Metz, Aug. 18. The King of Prussia being present.

"Battle of Carignan, near the Belgian frontier, over the French under MacMahon, Aug. 30.

"MacMahon's army, 80,000, surrendered, with the Emperor, to the Germans, Sept. 2."

The following is a more particular description of Mr. Allnutt's idea, which is very well carried out :—

"Its peculiarity is the absence of a multitude of names of places which are not necessary, if our only object is that of showing the course of events in the mighty struggle now going forward between France and Prussia. The map is also on so large a scale, that there is ample space to put in all operations.

"It is divided into squares of 40 miles each side, which not only enables a very correct estimate to be made of the distance between any two places, without the trouble of applying the scale, but this arrangement will be found of especial use for reference : the letters on each side of the map, with the figures on the top and bottom, give great facility in fixing a certain locality.

"As events may occur too numerous to enter, it is recommended to adopt figures referring to a journal, thus : 'No. 1 K, in 6, refers to the first life that was lost in the war ; see the *Times*, July 29.' 'No. 2 is the taking of Saarbruck by the French ; but this action was of too small a character to denote with a blue flag.'

"After a victory has been authenticated, it will be necessary to find out the nearest town in some other map, and by means of the scale in that map, together with the scale of miles we give, it will not be difficult to insert the spot in the Record Map sufficiently accurate for all practical purposes ; then mark it with a flag, French blue, Prussian red, as the case may be ; to do this, make a short down stroke on the spot with pen and ink, to repre-

sent the pole of the flag; then damp the back of the small piece of blue or red paper (a supply of which will accompany every map), and it can be fixed with one side on the stroke made by the pen as shown on the map.

"Should it be found that a mistake has been made, or that the news is false, the flag can be taken off in a few moments by damping it; it will be well, however, not to be in too much haste to note an event of this kind, for time should be allowed for confirmation of the news."

Farm Memoranda.

THE LANDES OF GASCONY.—The Landes are losing their old weird, desolate appearance; young Pine trees are springing up by thousands where nothing but Ferns were to be found a few years since, and soon the old characteristics of the Landes will have utterly disappeared. The causes of the former condition of these wastes have always been hidden, and they still have great interest from a scientific point of view. M. Faye was engaged to level a portion of the Landes between the lakes on the coast and the basin of Arcachon, and has made use of the opportunity to study the peculiarities of the soil, and has communicated his observations to the Academie des Sciences.

At about 3 feet below the surface of the Landes, there lies everywhere an impermeable stratum, called *alios*, a stony substance of a brown colour, variable in thickness, which is nowhere great, and covering an indefinite bed of sand, identical with that which lies above it. This invisible waterproof stratum has always had a great influence on the health of the inhabitants of the country. Retaining the products of vegetable decomposition from the upper soil, where there was scarcely any slope, the *alios* has for centuries fixed intermittent fever in and around the Landes; but reclamation has driven away the fever, and the *alios* seems now to have no other effect than that of forcing the roots of the marine Pines to grow horizontally instead of vertically. The sand of the Landes is white, intermixed with a few black grains, containing peroxide of iron and oxide of manganese. Washed, first by the water of the ocean, and afterwards by rain for centuries, it holds no soluble matter, and the *alios*, which is of a dark reddish brown colour, sufficiently compact to require a pickaxe to break it up, is a stratum of the same sand cemented together by some organic and slightly ferruginous substance. In the summer a hole made in the soil down to the *alios* fills gradually by lateral infiltration with yellowish water not fit for drinking; but if the *alios* is pierced an abundant supply of perfectly limpid water is obtained.

The question is how this *alios* is formed? It is evident that it was produced *in situ*, and the presence of the organic matter already mentioned leads to the supposition that the latter plays some part in the formation of this peculiar stratum.

The *alios* is found everywhere in the Landes except in the marshes, on the banks of ponds, and in the downs, even when the latter, protected by old forests, have never been swept by the winds for centuries. Soundings, and the knowledge of these exceptions, led M. Faye to the discovery of the mode in which the *alios* was formed. In winter and early spring the nearly level surface of the Landes is covered with rain-water, but during summer the level of this water descends by evaporation to the depth of one or two mètres, a level which also corresponds with that of the ponds which border the chain of downs. If now we take into consideration the decomposition of vegetable matter which takes place in the water, and the deposit which must be produced at the lower level, it is easy to see why an agglomeration of sand and organic matter should take place at the depth already mentioned. This operation being repeated annually during many centuries, an increasing stratum of *alios* is naturally formed, which doubtless continues to grow at the present moment.

It is not surprising, then, that no *alios* is to be found in the marshes which are always under water, nor in the downs which are not inundated, like the Landes, by a periodical sheet of water carried off regularly by evaporation, the rain as it falls being carried away by the slopes to the sea.

But whence come the traces of ferruginous matter which aid in the agglomeration of the *alios* and in giving it its red tint? It was shown long ago that the decomposition of roots and other vegetable matter brings the peroxide of iron contained in the soil into a state of inferior oxidation, and renders it liable to be attacked by the weak acids resulting from vegetable decay; more recently M. Daubrée attributed the formation of the limonitic iron of the Swedish lakes to this chemical action, showing that iron thus rendered soluble over great areas is collected together by springs and rivulets, reassumes its primitive oxidation when the waters come in contact with the air, and is then deposited in the form of slime, and forms mineral strata of great richness. The same effect, but produced on the spot, would account for the small quantity of iron found in the *alios*. Vegetable decay has, in fact, produced in places the identical effect on the blackish portions of the sand of the Landes: where a fall in the level has caused a great accumulation of water there has been a concentration of iron, and in past times a certain number of furnaces worked up the iron, which is now exhausted.

M. Faye, having explained the origin of *alios*, showed what effect an impermeable subsoil has on the salubrity of a district; the escape of the water is stopped, the subsoil becomes a centre of putrefaction and infection, and endemic malaria devastates the country. In the Landes, the evil has been remedied by cutting rather deep drains to carry off the water, and the roots of Fern and other plants, which partly perish every year, have been replaced by those of the maritime Pine. Thus the contamination of the air by the subsoil has been stopped, and with it the intermittent fevers which had given to the inhabitants a peculiar character of debility. M. Faye, after much observation, arrives at what he believes to be a principle, namely, that wherever an impermeable subsoil is found at a depth of 2 or 3 feet from the surface there will always be intermittent fever if the soil be contaminated by vegetable putridity, and fevers of a typhoidal character if animal decomposition be present. As to the remedy, it consists evidently either in draining, as adopted in the Landes, or in the removal of the vegetable or animal decomposition.

The young forests of the Landes, as well as many others in France, are frequently on fire, and the loss occasioned by such accidents is enormous; but it has been observed that in no case has the fire crossed the railway. In many places M. Faye found immense burnt spaces, extending as far as the eye could see towards the east; while in the opposite direction the young Pines were untouched and flourishing: he therefore proposes that at certain distances the Pine plantations shall be separated by roads or strips of land, on which nothing need be done beyond eradicating the Ferns and Rushes which, in dry seasons, take fire easily: such an arrangement would limit the ravages of fire, especially if the reserved strips were perpendicular to the direction of the prevalent winds. The proprietors would certainly lose the produce of these unplanted portions of the soil, but they would no longer be exposed to ruin by conflagration, and they would obtain a reduction in the heavy rates which they pay for insurance.

It has been the custom always of the sheep-farmers of the Landes to burn the Fern at the end of the summer, with the view to get a little more herbage the following year from the meagre soil. Arago says, in a meteorological paper, that when the English possessed Guyenne, the Vine growers of Medoc petitioned the Government on the subject; they said that the black smoke of the Ferns injured the Vines, and had an effect on the wine itself. The practice of burning the undergrowth has diminished since the Landes were planted, but it has not entirely disappeared; and the fires which are so frequent in the forests of France in the summer are believed to have been often caused by the burning of the dry Fern.

In very dry weather it is not surprising that forests are burnt, but rather that they should escape: not only are dry plants inflammable, but some green ones also. We remember a case, recorded by Mr. Howitt, if we mistake not, of a green Furze-bush taking fire instantly from a lighted match being thrown into it. The forest of Fontainebleau has frequently suffered by fire; this year, one of the picturesque spots, known as the *Hauteurs de la roche brûlée*, was reduced to a mass of blackened rocks. The causes of conflagrations in this forest are not far to seek: the villages around swarm with artists, who spend all their daylight hours in the forest—and all French artists smoke; and there are innumerable caves and nooks, where pleasure-parties, in defiance of all forest laws, make roaring fires, by which the rocks are almost calcined.

M. Faye's mode of limiting the terrible fires in the forests of the Landes, as well as his explanation of the formation of the peculiar stratum called *alios*, and the effects of such an impermeable subsoil, met with the support of his colleague of the Academy, M. Elie de Beaumont—a fact which certainly adds to the value of this curious communication. *Athenæum.*

The Week's Work.

SEPTEMBER 17.—*Rye-grass* and *Clover leas* intended for Wheat should now be ready for the seed. Some rib or rafter plough the lighter class of soils with the view of rotting the sward, and at the same time getting a proper seed-bed with the desired clod. If this was done shortly after the removal of the hay crop, the land, after lying a month, is coup-ribbed, or cross-ploughed, or scarified, as circumstances may direct; and when ploughed for the seed furrow an inch of fresh soil is brought to the surface, which forms an excellent seed-bed. In this way the grassy sward is broken and incorporated with the soil, thereby insuring its decomposition, with the destruction of insect life, more successfully than when ploughed with a single furrow. Others turn the green sward, by means of a skim-coulter, into the bottom of the furrow, to rot under the furrow slice, the land being thus left at one operation ready for the seed-drill. When Rye-grass and Clover lea lies one or two years in pasture the sward is thicker and more liable to be infested with wireworm. Insects seldom deposit their eggs in healthy pastures, but the presence of much effete matter is always to be suspected, and to rot such sufficiently for the safety of the Wheat a top-dressing of lime compost, artificial manure, or (far better) liquid manure is applied before ploughing on either of the above plans, so as to set up the rotting process, effectually decomposing the green sward under the furrow-slice, thereby depriving the young insects of food in the spring-time when they first make their appearance in the grub form, and *per contra* supplying food for the Wheat plant. Another plan is to plough early, and to compress the furrow-slice with a heavy presser, and then by harrowing and rolling, at intervals of a fortnight or three weeks, the green sward is effectually rotted, and a sufficiently solid seed-bed secured for the Wheat plant to stand and ripen without becoming "root-fallen." But this plan requires the land to be in tolerably good heart, otherwise compression will not rot the effete sward of a poor soil without some top-dressing.

Bean and Pea Stubble Fallows for Wheat sowing, if not finished last month, should be so early in the present. Heavy clay lands, if clean, as they always are under good management, may be smashed up to the weather by steam. If ploughed it should be narrow and deep, assuming that the land has hitherto been deeply cultivated, otherwise plough the depth hitherto gone, and subsoil so as to get the land cultivated to the proper depth. By such means a suitable seed-bed for Wheat will be obtained without crossing or running the risk of poaching the land in the event of being overtaken by rain before the work is finished. Light land, full of Couch and annual weeds, is not well adapted for Wheat; but if to be sown with Wheat along with from 3 to 5 cwt. of guano, scuffle or broadshare, and gather off the weeds, and then harrow once or twice to braird the seeds of weeds shaken out by the harrows and scuffler, before it is ploughed for the seed-furrow. Some burn the weeds in small heaps on the land, but the more advisable plan is to cart off, and convert them into compost by lime, guano, or liquid manure, &c., as it effects more successfully the destruction of the seeds of weeds, and secures at the same time manure to the land.

Wheat Seed-time, owing to the greater breadth of root crops now grown on Wheat soils, extends over a greater length of autumn than it did under the old bare fallow system. But a very large proportion of the Wheat crop is still sown during the latter half of September and the first half of October.

Newly-threshed Seed is to be preferred to the old-threshed, the quality in other respects being equal. The best Wheat on the farm should be selected during harvest for seed—crisp, plump corn, grown on clean, flinty straw; and if such cannot be had at home, it should be obtained from some other place. Some soils and climates are defective one way or another in the growth of Wheat, so that annually it loses less or more constitutional vigour, according to the season, consequently a change of seed is desirable every year. Some, however, only change every second or third year; but, unless under exceptionally fine seasons, the practice involves a much greater sacrifice than is generally imagined. It is easily known in harvest if seed Wheat can be selected at home up to the maximum standard, and if not, the more advisable course is to change the whole of the seed for the ensuing crop.

Pickling Wheat is a very diversified practice, partly owing to opinion, and partly perhaps to the peculiar kind of Wheat sown, and Fungi with which it is infected. Thus the smooth thin-skinned varieties of Wheat, and also samples of any variety that have fine bran, are more easily washed and acted upon chemically than the thick hairy-skinned varieties and coarse bran samples; and with regard to Fungi, the spores of bunt adhere more closely than do those of smut. Some use ½ lb. of blue vitriol (sulphate of copper) dissolved in two gallons of warm water to a sack of Wheat, so as to wet the surface of the grains equally; others use half a pound; others a whole pound, and sow as soon as the grain has absorbed the moisture. Others wash the Wheat in water and skim off the light grains that float before they use the above pickles; and as the pickle is applied whilst the Wheat is wet with some 4 to 6 gallons of water, the stronger pickles may be used with safety, and so on. Another and very common mode of pickling is to wash the Wheat in brine sufficiently strong to float a Potato. Stir and skim off so long as anything rises to the surface, and then dry by sifting hot lime over the washed Wheat spread thinly on the floor, mixing rapidly until the surface of the grain is wholly coated over. Whichever of these plans is adopted, no more Wheat should be pickled at a time than can be sown.

Kind of Seed is determined by climate, soil, and cultivation. The different varieties take their names from various sources, as (1) the person who selected them, as Hunter's, Shirreff's, and Hallett's Wheats; (2) the place where first grown, as Essex Wheat; (3) the colour, red Wheat and white Wheat; (4) the period at which they are sown, as winter and spring Wheat, and so on. Some are more hardy than others, and better adapted for this or that soil, climate, and management, so that trials on a limited scale should be made to ascertain whether new varieties can be grown with more profit than the old ones.

Thick and Thin Seeding is a question of experiment which every Wheat grower should solve. From 6 to 10 pecks per acre are sown in September, and from 2 bush. to 3 bush. in November.

Wheat Manures are now made by all our manure

manufacturers, but Peruvian guano, 2 to 5 cwt., is still considered the best by many farmers.

Wheat Sowing is generally done by seed and manure drills, less or more manure being now applied along with the seed. The coulters are placed from 8 to 12 inches asunder, each being kept down by a weighted lever to the proper depth.

Renovating Grass Land is sometimes more profitably done about this time than in August, in very dry seasons. The carting, harrowing, and rolling are more easily done than in spring, and do infinitely less harm to the land. Anthills, Tussack-grass, and weeds should be dug out and carted off. Some throw the anthills, as it is technically termed, thus spreading the ants abroad as in winter, but we prefer getting rid of the ants on the former plan, for in mild autumns they are apt to establish themselves in safety before the killing frosts of winter come. If necessary the surface should be well harrowed before the compost is applied, and after it is spread it should be well harrowed into the roots of the old grass. The grass seeds should then be sown with a broadcast machine, and lightly covered with a bush or chain harrow. If the supply of compost is limited, it is preferable to do a part well than half do the whole, top-dressing the remainder next year. Grazing stock should be kept off, as they not only do harm with their feet before the compost is washed in and consolidated with rain, but also pull up the young grass with their mouths. Should mild weather set in, so as to force up a too luxuriant growth, it is better to top in time with the scythe or mowing-machine, as in flagging Wheat, than to turn in stock. Instances have occurred of a light crop of hay having been harvested. But it is better to consume the grass green for soiling, leaving a good long stubble, and carrying the rake high. *W. B.*

Notices to Correspondents.

THISTLES: *Many* asks why the common Thistles, which abound in our pasture fields and lanes, should not be crushed or bruised in the same manner as Gorse? and whether they would not be useful and wholesome as food for horses and cows? [Thistles crushed when green would probably be wholesome food. But they will not grow well except on good land, and good land ought to grow plants still more productive and nutritious!]

Markets.

ENGLISH WOOL.

We have no change to note in the market this week, but holders are very firm, and for the limited business done full rates have been insisted upon. Should peace be arranged, we might expect a sharp advance.

HOPS.

BOROUGH MARKET, Sept. 14.

The market continues animated for the new growth, which is coming to hand freely. Prices of all descriptions are firm, with a slight tendency to improved figures, while old of all kinds are neglected. Weald of Kent, £3 5s. to £4 14s.; Mid and East Kents, £4 to £7; Sussex, £3 to £3 15s.; Farnham and country, £4 10s. to £6 6s.; old, £1 to £2 10s. per cwt.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Sept. 15.

Prime Meadow Hay	126s. to 135s.	Clover, old ..	..135s. to 142s.
Inferior do. ..	..110 100	Inferior do. ..	..115 127
New Hay ..	..115 125	New 2d cut do.	..120 132
Inferior do. ..	..100 110	Inferior do ..	..110 115
Straw	.. 30 34	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, Sept. 15.

Sup. Meadow Hay	130s. to 140s.	Inferior Clover	..120s. to 130s.
Inferior do. ..	..115 124	Prime 2d cut do.	..120 130
New do.	..120 132	New do. ..	..115 140
Inferior do. ..	..106 115	Straw	.. 34 38
Superior Clover	..140 150	JOSHUA BAKER.	

WHITECHAPEL, Thursday, Sept 15.

Fine Meadow Hay	112s. to 120s.	Prime old Clover	..135s. to 147s.
Inferior do. ..	..100 110	Inferior do. do.	..105 115
Prime New Hay ..	90 100	Prime 2d cut do.	..130 140
Inferior do. ..	.. 80 85	New Clover ..	..115 120
Straw	.. 28 31	Inferior do. ..	.. 90 105

METROPOLITAN CATTLE MARKET.

MONDAY, Sept. 12.

Owing to the stormy weather during the past week, several cargoes of foreign stock have not arrived; consequently we have a short supply both of Beasts and Sheep. The English consignments are also smaller than of late. Prices have advanced for all kinds of stock, and a clearance is nearly effected. The trade ruled heavy towards the close of the market, in consequence some lots remain unsold. Our foreign supply consists of 1076 Beasts, 4200 Sheep, and 34 Calves; from Scotland there are 93 Beasts; from Ireland, 460; from Norfolk and Suffolk, 60; and 1326 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	8to6 0	Best Long-wools	5	6to6 0
Best Shorthorns ..	5	4–5 8	Do. Shorn	—	— ..
2d quality Beasts	4	0–4 8	Ewes & 2d quality	4	8–5 2
Best Downs and Half-breds ..	5	10–6 4	Do. Shorn	—	— ..
Do. Shorn	—	— ..	Lambs	—	— ..
			Calves	4	0–6 0
			Pigs	3	8–5 4

Beasts, 3015; Sheep and Lambs, 13,770; Calves, 64; Pigs, 60.

THURSDAY, Sept. 15.

The number of Beasts is large, but chiefly consists of foreign and middling qualities. Choicest descriptions are quite as dear as on Monday, and a fair clearance is effected. Choice English Sheep are scarce, and the whole supply is smaller than of late: the demand is, however, very limited, as is usual on Thursdays at this time of year, and a clearance cannot be effected. There is no alteration in prices for business done. Calves are rather dearer. Our foreign supply consists of 1300 Beasts, 3700 Sheep, 310 Calves, and 160 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	8to6 0	Best Long-wools ..	5	6to6 0
Best Shorthorns ..	5	4–5 8	Do. Shorn	—	— ..
2d quality Beasts	4	0–4 8	Ewes & 2d quality	4	8–5 2
Best Downs and Half-breds ..	5	10–6 4	Do. Shorn	—	— ..
Do. Shorn	—	— ..	Lambs	—	— ..
			Calves	4	0–6 0
			Pigs	3	8–5 4

Beasts, 2030; Sheep and Lambs, 9050; Calves, 440; Pigs, 180.

METROPOLITAN MEAT MARKET.—Sept. 15.

Best Fresh Butter .. .. .. 10*s.* per dozen lb.
Second do. do. .. .. .. 1*6s.* ..
Small Pork, 5*s.* 4*d.* to 6*s.* 0*d.*; Large Pork, 4*s.* 4*d.* to 4*s.* 10*d.* per 8 lb.

MARK LANE.

MONDAY, Sept. 12.

There was a moderate supply of Wheat from Essex and Kent to this morning's market, which sold slowly at the prices of this day week. The attendance was fair, but the demand for foreign was confined to retail purchases; we do not alter our quotations. Barley and Peas were unchanged in value. Beans were 1*s.* to 2*s.* per qr. cheaper. Oats were steady at last week's rates. There was no change in Flour.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	44–51		Red.....	41–51	
— — fine selected runs..do.	48–55		Red.....	45	53
— — Talavera	49–58				
— — Norfolk	—		Red.....	—	
— — Foreign	41–62				
BARLEY, grind. & dist. 29s. to 33s.. Chev.	42–45		Malting ..	36–41	
— Foreign .. grinding and distilling	25–33		Malting ..	33–43	
OATS, Essex and Suffolk	24	26			
— Scotch and Lincolnshire.. Potato	26–28		Feed	—	
— Irish ..... Potato	25–27		Feed	23–26	
— Foreign .....Poland and Brew	24–26		Feed	19–24	
RYE	32–36		Foreign ..	33–36	
RYE-MEAL, Foreign					
BEANS, Mazagan....43*s.* to 45*s.*	Duck	49–50	Harrow ..	49–50	
— Pigeon ....51*s.* to 59*s.*..Winds.	—		Longpod..	—	
— Foreign .....Small	45–47		Egyptian .	42 –44	
PEAS, White, Essex, and Kent..Boilers	38–40		Suffolk ..	40–42	
— Maple, 40*s.* to 44*s.* .....Grey	36–40		Foreign ..	36–40	
MAIZE	—		Foreign ..	32–34	
FLOUR, best marks delivered..per sack	42–50				
— 2d ditto .....ditto	35 –47		Country ..	35–47	
— Foreign .....per barrel	24–27		Per sack..	35–61	

WEDNESDAY, Sept. 14.

The grain trade to-day ruled quiet, nevertheless no quotable alteration took place in prices. The supply of new English Wheat was moderate, and of foreign it was tolerably good; the demand for all qualities was inactive, at about the rates current on Monday last. Barley was in fair supply and request, at previous currencies. Malt was dull and drooping in value. Oats, the supply of which was large, experienced a quiet sale, at late rates. Beans and Peas were purchased slowly, on former terms. Flour was in limited demand, but prices were unchanged.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 930	Qrs. 420	Qrs. —	—
Irish ..	—	—	—	—
Foreign ..	32,080	790	39,330	Sacks. 400 / 5740 brls.
	33,010	1210	39,330	

LIVERPOOL, Sept. 13.—We had a good average attendance at our market to-day, with a consumptive demand for Wheat at about Friday's prices. Flour neglected, at a reduction of 9*d.* per sack and barrel. Indian Corn in good request, at an advance of 6*d.* to 9*d.* per qr. Oats slow, and 1*d.* lower. Oatmeal dull and drooping.

AVERAGES.

	Wheat.	Barley.	Oats.
Aug. 6	54s. 11d	31s 8d	28s 8d
— 13	54 10	32 11	28 0
— 20	54 7	33 6	25 10
— 27	51 3	36 8	24 6
Sept. 3	49 1	36 2	25 9
— 10	48 1	35 8	23 10
Average ..	52 2	34 5	26 1

SEED MARKET.

Trifolium seed, as was to be expected, is now in diminished request; some quantity will, however, be still required, and it appears likely that the supply will prove unequal to the demand. Winter Tares are coming forward more freely, and the trade being dull prices have declined 6*d.* to 9*d.* per bushel. White Mustard seed is also a little cheaper. Sowing Rapeseed continues very firm. A few samples of new home-grown Clover seed have been exhibited at Mark Lane, but values are not yet fixed. We have a moderate demand for winter Barley, Oats, and Rye.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—Sept. 14.

Hastings Hartley, 16*s.* 9*d.*; Hollywell Main, 17*s.* 3*d.*; Eden Main, 16*s.* 9*d.*; Wall's End Braddyll's Hetton, 17*s.* 9*d.*; Walls End Haswell, 19*s.*; Walls End Hetton, 19*s.*; Walls End Hartlepool, 18*s.*; Walls End Heugh Hall, 18*s.*; Walls End Kelloe, 17*s.*; Walls End Original Hartlepool, 19*s.*; Walls End South Kelloe, 18*s.*—Ships at market, 31; sold, 31; at sea, 40.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

Cottam's Iron Hurdles, Fencing, and Gates.

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

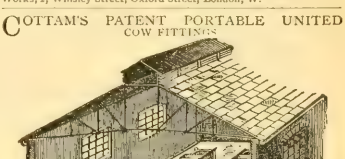

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55*s.*

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

SHANKS'S PATENT LAWN MOWERS for 1870.
The Patent Improvements recently introduced give SHANKS'S MACHINE
Several important advantages possessed by no other Lawn Mower.
PATENT DOUBLE-EDGED SOLE-PLATE, WIND-GUARD, &c.
The annually increasing Sale forms the most convincing testimony how much these advantages have been appreciated.
ALEXANDER SHANKS & SON beg to intimate that, among all the Exhibitors of Lawn Mowers at the Paris Exhibition, they are the only Firm to whom the Jury awarded a Medal. The Silver Medal then awarded is the highest Prize ever given at any Exhibition for Lawn Mowers.

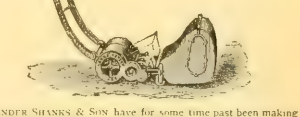

ALEXANDER SHANKS & SON have for some time past been making the Revolving Cutter of their Machines Self-sharpening—that is, with Steel on both Sides of each Blade, so that when the Cutter becomes blunt by running one way, it can be reversed, thus bringing the opposite or sharp edge of the Cutter to act against the Sole-Plate. In addition to this, A. S. & SON now make the Sole-Plate or Bottom Blade of their Machine with Two Edges—one in front as usual, and one in reserve at the back; when the front edge gets worn down, the plate has only to be unscrewed and the unused edge brought to the front. It will be seen at a glance that this arrangement enables the cutting parts to last twice as long as in other machines, where the single edged Sole-plate must be entirely renewed when the edge is worn down.
A Wind-Guard has also been introduced to prevent the Mown Grass being blown past the Box during the prevalence of wind.
There is no jibbing with these Machines. The Lawn when mown has a most beautiful appearance, being as smooth as a piece of velvet.
Every Machine warranted to give ample satisfaction, and if not approved of can be at once returned.
Illustrated Circulars, with full particulars, sent free on application.
A. SHANKS AND SONS, Dens Iron Works, Arbroath; and 27, Leadenhall Street, London, E.C.
☞ A Stock of all sizes of Lawn Mowers always kept at 27, Leadenhall Street.

GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.
GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.
HAND MACHINE.

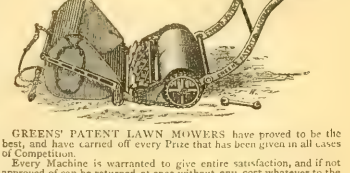

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.
Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.
☞ Illustrated Price Lists of Greens' Patent Rollers, Hot-water Boilers, Galvanised Wire Netting, Garden Seats and Chairs, Fountains, Vases, &c., free on application
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; 54 and 55, Blackfriars Road, London, S.E.

Monro's Cannon Boiler.

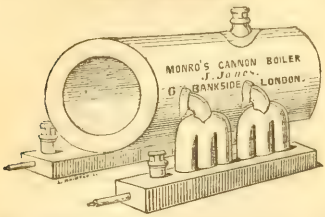

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at their wharf in London. Lists on application.

J. JONES AND SONS, Iron Merchants, 6, Bankside, Southwark, London, S.E.

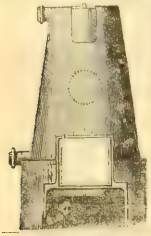

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PUBLIC and PRIVATE BUILDINGS, MANUFACTORIES, CONSERVATORIES, &c., heated on the new improved system, combined with perfect ventilation.

These BOILERS are adapted for setting in Brickwork, or as shewn in sketch they require no Brickwork.

POLLARD, JEFFISON, AND CO. (Successors to John R. Pelly),

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Which are in general use, and which Boilers have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.

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HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c.

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CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 10s. each.

Portable Boiler. Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.

INDIA-RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly watertight.

Elliptic Boiler.

Goods, of the very best manufacture, delivered at Railway or Wharf in London.

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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.

Strong GREENHOUSE LIGHTS, 6 feet by 4 feet, 5s. each GLASSES, all sizes.

References to the Nobility, Gentry, and Trade in most of the Counties in England.

Midland Horticultural and Hot-Water Engineering Works, Loughborough.

T. G. MESSENGER will be happy to prepare Plans and Estimates from instructions sent him, or, if preferred, will wait personally on any Ladies or Gentlemen at their residences.

T. G. M. does not advertise himself to be a Patent Upon Construction, but will carry out the designs of Architects according to their details, or he will apply his principles of construction to their designs. The satisfactory completion of work undertaken is guaranteed.

T. G. M. sells as Perfection what he CALLS HIS PATENTED BOILER, which is exceedingly powerful and economical in fuel. His Patented Valve gives complete satisfaction in every case. Many thousands are now in use. Prices on application. A richly Illustrated Catalogue forwarded post free for 33 postage stamps.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

	Each.
6 ft. by 4 ft. Lights, 2 in. thick, unglazed..	£0 5 0
" " Primed and Glazed with 10 oz. Sheet ..	0 11 0
" " with stout portable Box, not Painted	1 3 0
" " Painted four coats, and Handles on	1 8 0
" " Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do	2 15 0

GREENHOUSES Per ft. super.

Woodwork only Prepared and Fitted	0 0 6
" Primed and Glazed with 16 oz. Sheet	0 0 9
" Delivered, and Fixed with Ironwork	0 1 0
" Painted four coats, two sides, ready for use	0 1 3

Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

Portable and Fixed Hot-water Apparatus

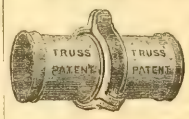

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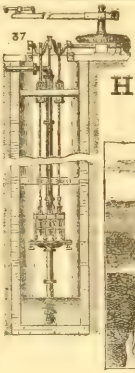

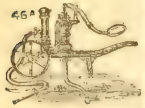

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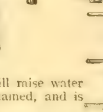

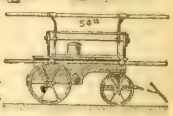

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STOVES.—TERRA-COTTA, for Greenhouses, give continuous healthy heat 24 hours for 1d., without attention; fuel ordinary Coal. Practical Gardeners admit they are the best, safest, and cheapest Stoves for small Greenhouses that ever were used. JOHN ROBERTS, Patentee, Upnor, Kent.

HOT-WATER PIPES, BOILERS, &c., &c., of superior quality. 2 inch. 3 inch. 4 inch.

	s. d.	s. d.	s. d.
HOT-WATER PIPES, Nos 6 and 7—per yard	0 11	1 5	1 11
ELBOWS, No 12 .. .. .. each	1 10	1 9	2 0
T PIPES, No 33	2 0	2 10	3 0
SYPHONS	1 7	2 4	3 0
VALVES	0 0	10 0	11 0

The above, nett cash prices, delivered at London, Liverpool, Bristol, or equivalent.
GEORGE ROBINSON, 16, South Wharf, Paddington Basin; and at Dial Iron Works, Stourbridge

BEARD'S PATENT NON-CONDUCTING and VENTILATING METALLIC GLASS HOUSES will prove cheaper than wood

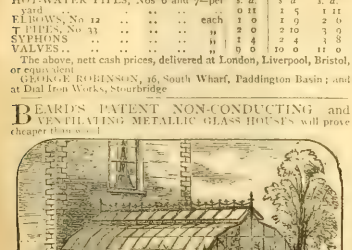

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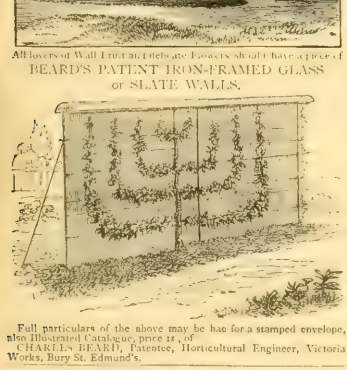

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MOULE'S PATENT EARTH SYSTEM.

From Mr W. GILBERT, *Diamond Street, Keighley.*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth to be no obstacle; as, by having by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees a couple of spoonfuls put into a bucketful of water, and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

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RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application
—JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

Archangel and Petersburg Mats.

ARCHANGEL MATS, under present value; PETERSBURG MATS at old prices. Samples and prices at J. BLACKBURN AND SONS, Russia Mat and Sack Warehouse, 4 and 5, Wormwood Street, London, E.C.

E. T. ARCHER'S "FRIGI DOMO."—Patronised and used for Fragrant and Kew Gardens. It is made entirely of prepared wood and a perfect non-conductor of heat or cold where it is applied

PROTECTION from the SCORCHING RAYS of the SUN.

WOOL NETTING, 7 yards wide and 1 yard long, 6d. per yard.
"FRIGI DOMO" CANVAS

Two yards wide	1s. 9d. per yard.
Three yards wide	2s. 8d. per yard.
Four yards wide	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 5l. 5s. or 1½d. per yard.
HESSIAN CANVAS, do., do., 54 and 72 inches wide, 63d. and 84d. per yard.
ELISHA THOMAS ARCHER, Sole Maker, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen.

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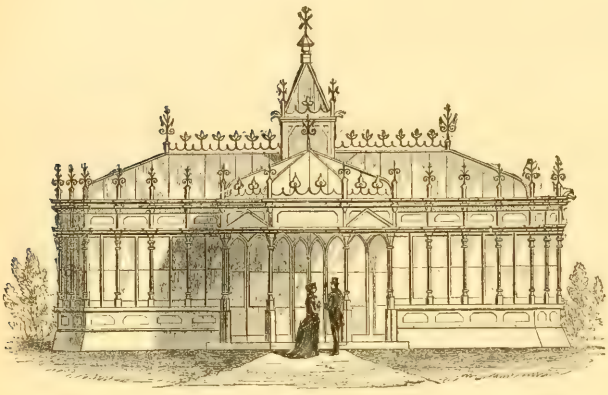

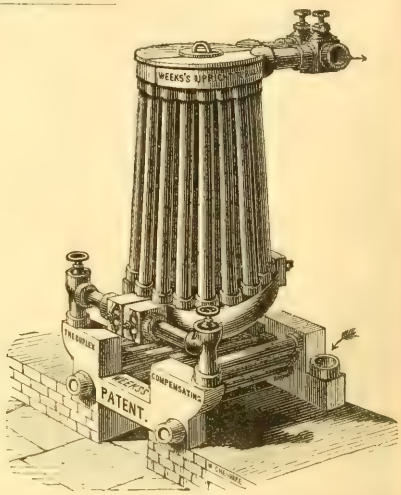

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Fruit Trees, Roses, &c.

B. S. WILLIAMS can supply all the best kinds, true to name and in good condition; fine fruit-bearing trees, on French Paradise Stock, trained as Cordons. FOREST and ORNAMENTAL TREES of every description. Priced LIST on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

CYTISUS RACEMOSA, HYDRANGEA HORTENSIS, fine strong plants, in 48's, by the dozen, hundred, or thousand Price on application.
HENRY B. MAY, The Nursery, Edmonston, N.

TO the TRADE.—1-yr. SEEDLING HOLLIES. 1-yr. SEEDLING QUICK.
C. WHITEHOUSE, Brereton Nurseries, Rugeley, Staffordshire.

ACORNS.—For SALE, the true SCARLET OAK (QUERCUS COCCINEA) SEED, in most splendid condition this year. Apply to
Mr. HASTIER, 6, Water Street, Blackfriars, London, S.E.

ORCHIDS.—To be SOLD, a Private Collection of ORCHIDS, belonging to a Gentleman changing his residence. There are about 210 in all, 180 in very good condition, of which about 60 are well grown Specimen Plants, fit for Exhibition.—Dr. INMAN, 12, Rodney Street, Liverpool; or Spital, Cheshire.

FOR SALE, the most Perfect Collection of SHOW AZALEAS in England, consisting of 55 varieties, all best kinds, and most beautifully trained specimens. Also about the same number of CAMELLIAS.
Rev. FRED. FITZPATRICK, Cloon Rectory, Mohill, Ireland.

TO PERSONS ABOUT to PLANT.—A Gentleman having a great number of surplus TREES and SHRUBS (all recently planted), including some remarkably handsome specimens of Cedrus Deodara, Abies Douglasii, Thujas, Araucarias, Wellingtonias, &c., wishes to DISPOSE of them at a moderate price, or in EXCHANGE for RHODODENDRONS, HOLLIES, BERBERIES, or other shrubs.—For terms or particulars apply to
Mr. BAYMAN, Holmbury, Ewhurst, Guildford.

Dried Natural Flowers.

MESSRS. BOETTNER, BROTHERS, Greussen, near Erfurt, Prussia, beg to announce that their Priced LIST of BOUQUETS, FLOWER BASKETS, WREATHS, &c., &c., of DRIED NATURAL FLOWERS, is now ready, and may be had on application to their Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

LEWIS WOODTHORPE'S NEW CATALOGUE for AUTUMN 1870, is now ready, and he will be happy to forward free upon application. It comprises a choice and varied collection of select New Plants of the season, with Lists of Spring-blooming Plants, Roses, Fruit Trees, Seed List, and a general and well grown Nursery Stock.
Munro Nursery, Sible Hedingham, Essex.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND AGRICULTURAL MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

For	TRADE PEDIGREE MARK.	Seed.

GOLDEN DROP RED WHEAT.
Apply to Captain HALLETT, Brighton.

NEW WINTER TARES.—Fine samples at low prices, which may be had on application to
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

New White Mustard Seed.

H. AND F. SHARPE have fine samples of the above, which they can offer to the Trade at low figures. Samples and prices on application
Seed Growing Establishment, Wisbech

Cabbage Seeds.

H. AND F. SHARPE will be glad to quote special prices to the Trade for all the best sorts of Cabbage Seeds grown last season from the finest selected stocks. Prices very moderate.
Seed-growing Establishment, Wisbech.

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5*s.* per 1000; also Drumhead or Cattle Cabbage Plants at 3*s.* 6*d.* per 1000, can now be supplied by
W. VIRGO AND SON, Wonersh Nursery, near Guildford.

CUCUMBER and STRAWBERRY PLANTS, wholesale and retail, of all the leading kinds.
G. WALKLING, Nurseryman, High Road and College Park, Lewisham, S.E.

Improvement of Grass Lands.

SUTTONS' RENOVATING MIXTURE should now be sown at 2 to 3 cwt. per acre.
SUTTON AND SONS, Seed Growers, Reading.

To Improve Clover Leys.

SUTTONS' RAPID-GROWING GRASSES and CLOVERS, from 1 to 2 bushels per acre, harrowed in and rolled afterwards, will produce an abundant supply of feed in April and May. Price 12*s.* per bushel, carriage free
SUTTON AND SONS, Seedsmen to the Queen, Reading

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

Established 1785.

KING'S ACRE NURSERIES, NEAR HEREFORD,

JOHN CRANSTON, Proprietor.

The following Descriptive Priced CATALOGUES are now ready, and will be forwarded on application:—

The NEW ROSE CATALOGUE for 1870.
The CONIFER, SHRUB, and FRUIT TREE CATALOGUE.
The FOREST TREE CATALOGUE, including Plants for Coverts, Underwood, &c.

Twenty-one First and Ten Second Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and Ten Second Prizes for ROSES, exhibited at the principal Rose Shows throughout the kingdom. It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.

The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.

Nurseries, King's Acre, near Hereford.

Dwarf & Standard Roses.

FRANCIS & ARTHUR DICKSON & SONS have an immense Stock of extra strong well grown plants of all the best ROSES in cultivation (including all the new varieties) for Autumn and Spring planting. Also a large stock of strong Plants in pots, which can be be planted out now, at once. Priced Descriptive CATALOGUE sent free by post. Their Roses are unusually fine this season. Inspection respectfully invited. Visitors will please ask for

FRANCIS & ARTHUR DICKSON & SONS, "Upton" Nurseries, Chester.

Vines, Extra Strong Fruiting, &c.

FRANCIS & ARTHUR DICKSON & SONS have this season a splendid lot of VINES, grown from eyes, without bottom-heat, in extra strong short-jointed Fruiting Canes; also fine Canes for planting. Their Collection includes all the New and leading varieties, and the plants are really First-class. Inspection respectfully invited. If this is inconvenient, specimen plants can be sent.

Priced Descriptive LIST sent free by post.

The "Upton" Nurseries, Chester.

SEEDS, from PRIZE FLOWERS, awarded the First Prizes at the Crystal Palace, Royal Horticultural, and Royal Botanic Flower Shows, for some years; and are acknowledged second to none in quality. CALCEOLARIA, CINERARIA, and PRIMULA, in sealed packets, 1s 6d, 2s 6d, 5s 6d, and 6s each

JOHN DOBSON AND SONS, Woodlands Nursery, Isleworth; and High Street, Hounslow, W.

THE TRADE SUPPLIED with CALCEOLARIA, CINERARIA, PRIMULA, BALSAM, CYCLAMEN, and SCARLET INTERMEDIATE STOCK SEED, in packets. The seed is just harvested in splendid condition, and the quality second to none in the Trade. A liberal allowance. LIST on application

JOHN DOBSON AND SONS, Seed Merchants, Isleworth and Hounslow, W.

BULBS, just imported, in fine condition. LIST free on application

JOHN DOBSON AND SONS, Seedsmen, &c., Isleworth and Hounslow, W.

Planting Season.

WM. KNIGHT, Floral Nursery, Hailsham, Sussex, begs to call the attention of the Nobility and Gentry and Trade in general to his extensive and matchless stock, consisting of an immense quantity of Standard and Dwarf and Pyramidal Trained APRICOTS, PEACHES, NECTARINES, CHERRIES, PEARS, PLUMS, and APPLES, also Standard, Dwarf, and Pot ROSES, CONIFERÆ, RHODODENDRONS, EVERGREENS, ORNAMENTAL and FOREST TREES, &c., and respectfully solicits inspection of all intending Planters. Descriptive Priced CATALOGUE free.

The Nurseries are within five minutes' walk of the Hailsham Station, Brighton and South-Coast Railway.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hampshire Gate Nurseries, Keymer, Hurstpierpoint; price 2s 6d per packet

The Agents for the above will be advertised shortly.

Now Ready, Gratis and Post Free,

ILLUSTRATED AUTUMN CATALOGUE

OF

DUTCH BULBS,

SEEDS, FRUIT TREES, FERNS,

FERN CASES, and other HORTICULTURAL DECORATIONS,

GARDEN REQUISITES, &c.

TRADE MARK.

DICK RADCLYFFE AND CO., 129, HIGH HOLBORN.

SEED GROUNDS, ERFURT, PRUSSIA.

DUTCH FLOWER ROOTS.

JAMES VEITCH & SONS,

ROYAL EXOTIC NURSERY, CHELSEA, S.W.,

BEG TO ANNOUNCE THAT THEY HAVE RECEIVED THEIR

ANNUAL SUPPLY OF BULBOUS ROOTS FROM HOLLAND,

And are pleased to say that they are in splendid condition.

CATALOGUES are now ready, and will be forwarded Post Free on application.

J. V. AND SONS desire to impress upon those who patronise them, the great advantage of giving them their Orders early, as the successful cultivation of Bulbs depends in a great measure upon their being planted early in the season.

SEED CORN.

CARTER'S PRIZE "NURSERY" STOCKS.

We can strongly recommend the following stocks of WHEAT, BARLEY, and OATS, as being of very pure quality, and selected from samples that have taken First-class Prizes.

The greatest care has been bestowed upon the crops during growth, by hand-weeding, &c., to ensure the choicest quality; and as we hold but a limited quantity, early orders are necessary to ensure a supply.

WHEAT.		BARLEY.		OATS.	
Sheriff's Bearded White Talavera White Fenton White Tidham White Lammas Red Browick Red Pedigree Red	*Price on application.*	Carter's Prize Long-eared Carter's Excelsior Brewer's Delight Chevalier	*Price on application*	Waterloo Canadian Tartary Poland Normandy Winter	*Price on application.*

We shall be pleased to supply any varieties not named above.

Lowest price per bushel or quarter on application.

Every precaution is taken when threshing to keep the stocks pure, but as the Corn must pass through the machine, we cannot undertake any guarantee as to the samples being unmixed.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

NEW DOUBLE GERANIUMS,

CROWN PRINCE AND KING OF THE DOUBLES

(ENGLISH RAISED VARIETIES).

MADAME AND MARIE LEMOINE WILL NOW CEASE TO BE GROWN.

H. CANNELL,

In consequence of so many inquiries, and having a large stock, has determined to let these two Doubles out after October 1, and he is glad to have the honour of drawing the attention of Growers to these fine Geraniums, which are unquestionably the most striking advance and greatest acquisitions since Doubles were introduced.

The following is the report given by the *Gardeners' Chronicle*, of Crown Prince, at the Floral Committee of the Royal Horticultural Society, August 17, 1870:—

"Mr. CANNELL, of Woolwich, exhibited neatly grown plants of Crown Prince, a double flowered free-blooming variety, of great merit. In colour the flowers are of a deeper shade of Peach than in any other variety, and in habit it appears to be very vigorous, without the grossness of the older kinds. A First-class Certificate was awarded."

The "Gardeners' Magazine" reports at the same time thus:—"CROWN PRINCE: A very dwarf free-flowering double Zonal, most distinct in character and colour from all existing varieties. The flowers, which are large, full, and of good form, are of a deep rich rose-carmine colour. First-class Certificate."

Shirley Hibberd, Esq., in the "Gardeners' Magazine" of September 3, speaks of Crown Prince thus:—"The colour is delightful; in my opinion it surpasses in this respect every known variety, single or double. I shall speculate on Crown Prince probably, with a view to dry the flowers for winter bouquets, as well as to enjoy richness of colour all the summer."

Trade prices:—10s. each; Three for 25s.; Six for 40s.; Thirteen for 80s.

KING OF THE DOUBLES.

This is the largest and best shaped pip of all the doubles, including the new ones of the present year. Colour is a beautiful bright cerise, and very free; a noble variety.

5s. each; Three for 13s.; Six for 24s.; and Thirteen for 40s. *Orders executed in rotation as received.*

H. CANNELL, NEW FLORIST FLOWER and FLORIST FLOWER SEED MERCHANT, WOOLWICH.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.

Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

NEW FORCING GERANIUMS.—We now offer and strongly recommend the two undernamed Geraniums, as distinct and superior to other similar kinds, and have no doubt they will give the same satisfaction that Mrs. Lewis Loyd and Mrs. Bradshaw gave when sent out by us.

KINGSTON BEAUTY.—French white, with deep violet blotch on each petal; great bloomer. 5s.

MARKSMAN.—Rosy lilac, with maroon blotch on each petal; great bloomer, of very dwarf habit. 5s.

T. JACKSON & SON, Nurseries, Kingston-on-Thames.

DOUBLE GERANIUMS, FERNS, and DRACÆNAS, &c.—Marie Lemoine, 6s. and 9s. per dozen; Madame Lemoine, 4s. per dozen; Andrew Henderson, 4s. per dozen, 21s. per 100; Victor, 5s. per dozen; Triomphe, 3s. per dozen; Delight, 1s. each; Nosegays Masterpiece and Lizzie, 6s. per dozen.

GREENHOUSE FERNS, a good assortment in 60's and 48's, 18s. per dozen.

DRACÆNA TERMINALIS, 6s. and 9s. per dozen; a few extra size, 2s. 6d. a pair.

PERESKIA STOCKS, 4s. per dozen.

EVERGREEN OAKS, two years in drills extra, 20s. per 1000.

LAURUSTINUS, nice bushy plants, mostly with flower buds, 4s. per dozen, 25s. per 100.

STRAWBERRY PLANTS, Sir Charles Napier and President, 2s. 6d. per 100.

The above prices are for cash only

EDWIN HILLIER, Nurseryman, Winchester.

A. VAN GEERT, Nurseryman, Ghent, Belgium, begs to offer the following articles. As will be observed, the prices are extremely moderate:—

DRACÆNA VEITCHII, strong plants, 36s. per dozen.
" INDIVISA, ditto, 30s. per dozen
" AUSTRALIS, fine strong plants, 36s. per dozen.
" DRACO, 18s. per dozen
" COOPERII, or STRICTA, TERMINALIS, 24s. per doz.
" ROBUSTA, 30s. per dozen
PINCENECTITIA GLAUCA, 18s. per dozen.
" TUBERCULATA, 18s. per dozen.
AGAVE AMERICANA VARIEGATA, 9s. per dozen.
DASYLIRION ACROSTRICHE, 18s. per dozen.
" of sorts, strong plants, 60s. per dozen.
ECHEVERIA, of sorts, 9s. per dozen.
ALOCASIA JENNINGSII, 24s. per dozen.
ANTHURIUM SCHERTZERIANUM, nice plants, 60s. per dozen.
BEGONIA, in varieties, 24s. per dozen.
CALADIUMS, 12 new varieties, 18s.
CROTONS, in four varieties, 18s. per dozen.
GLORIOSA PLANTII, 9s. per dozen.
HIBISCUS COOPERII, 9s. per dozen
MARANTAS, in six varieties, 18s. per dozen
PANDANUS UTILIS, 12s. to 18s. per dozen.
PASSIFLORA, in six varieties, 9s. per dozen
RAVENALA MADAGASCARIENSIS, 36s. per dozen
STRELITZIA REGINÆ, 60s. per dozen
ACHIMENES, 24 varieties, 5s.
GLOXINIA, in fine mixed varieties, 25s. per 100.
named, 50s. per 100.
TYDÆA, 12 new varieties, 9s.
TROPICAL ORCHIDS, 24 different sorts, 60s.

FERNS.

DARÆA DIVERSIFOLIA, fine plants, 40s. per 100.
LOMARIA GIBBA, 30s. per 100.
BLECHNUM BRASILIENSE, 6s. per dozen.
GYMNOGRAMMA PERUVIANA ARGYROPHYLLA, 6s. p. doz.
LYGODIUM SCANDENS, strong plants, 18s. per dozen.
ADIANTUM CAPILLUS-VENERIS, 25s. per 100.
SELAGINELLA, of sorts, 9s. per dozen.
ASPLENIUM BELLANGERII, 9s. per dozen.
" BULBIFERUM, 40s. per 100.
" VIVIPARUM, 9s. per dozen.
CYRTOMIUM FALCATUM, 12s. per dozen.
" CARYOTIDEUM, 18s. per dozen.
DICTYOGLOSSUM CRINITUM, 30s. per dozen.
GYMNOGRAMMA WETTENHALLIANA, 9s. per dozen.

PALMS.

LATANIA BORRONICA, 30s. per 100; nice plants, 24s. per dozen.
CHAMÆROPS FURFURACEA, 30s. per 100.
" HUMILIS, 12s. to 24s. per dozen.
CORYPHA AUSTRALIS, 18s. per dozen.
SABAL ADANSONII, 24s. per dozen.
ARECA RUBRA, 18s. per dozen.

INDIAN AZALEAS, with flower buds, £3, £4, £5, to £10 per 100.
CAMELLIAS, without flower buds, £4 to £5 per 100.
" with flower buds, £6 to £10 per 100.
THEA BOHEA, the Black Tea plant, 12s. per dozen.
SOLANUM CAPSICASTRUM FOLIIS VARIEGATIS, on stems, 12s. per dozen.
LIBONIA FLORIBUNDA, 6s. per dozen.
EUGENIA UGNI, 9s. per dozen.
ILLICIUM RELIGIOSUM, 12s. per dozen.
MAGNOLIA GRANDIFLORA, 9s. to 18s. per dozen.
Hardy RHODODENDRONS, choice named vars., £4 to £10 per 100.
Hardy GHENT AZALEAS, with flower buds, fine named varieties, £5 per 100.
TREE PÆONIES, in 24 choice varieties, 24s. per dozen.
Choice and named Herbaceous PÆONIES, 42s. per 100.
12 fine varieties of PHLOX, 6s.
LILIUM LANCIFOLIUM SPECIOSUM, 42s. per 100.
" AURATUM, 30s. per dozen.
AMPELOPSIS VEITCHII, 9s. per dozen.
AUCUBA, of sorts, 18s. per dozen.
CLEMATIS, of sorts, 18s. per dozen.
GYNERIUM ARGENTEUM, strong, 42s. per dozen.
ILEX, of sorts, 12s to 18s. per dozen.

Agents, Messrs. R. SILBERRAD, 5, Harp Lane, Tower Street, London, E.C.

Succulents—Surplus Stock.

THOMAS S. WARE begs to offer as follows. Prices, low, on application.

Echeveria atropurpurea.	Cacalia repens.
" metallica, specimen.	Sempervivum barbatum.
" gibbiflora	" bracteosum.
" pumila or gracilis.	" Haworthii.
" secunda	" repens
" " glauca.	Sedum tortuosum.
" " intermedia (a fine form, larger than the above)	" atroedum fol. var

T. S. W. has also a large Collection of COTYLEDONS, CRASSULAS, ECHEVERIAS, SEMPERVIVUMS, CACALIAS, PACHYPHYTUMS, SEDUMS, ALOES, AGAVES, HAWORTHII, &c

Hale Farm Nurseries, Tottenham, Middlesex

FERNS, carriage free to London or Goole.

1	Adiantum farleyense	15	Gymnogramma Laucheana gi-
20	" concinnum	25	" Parsoni [gantea
25	" latum	4	" " gigantea, new
30	" macrophyllum	15	" peruviana argyrophylla
30	" scutum	25	" Wettenhaliana
30	Athyrium Goringianum	30	Pteris argyrea
15	Gymnogramma hybrida	30	" cretica fol. var.
25	" Laucheana	30	" tricolor

370 plants for £7 10s

LOUIS VAN HOUTTE, Royal Nursery, Ghent

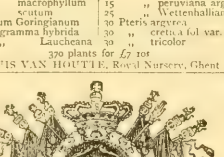

LOUIS VAN HOUTTE begs to announce that his ENGLISH CATALOGUE, No. 135 L., has been sent out to all his Customers.

DUTCH BULBS, of all sorts; HARDY PERENNIALS, HARDY and INDIAN AZALEAS, the extraordinary JAPAN AZALEA (Azalea mollis, in splendid varieties), CAMELLIAS, RHODODENDRONS, &c.

N.B. Several varieties of the Azalea mollis will shortly appear in the triple first Number of FLORE DES SERRES (four triple Nos. for 30s.), containing more than 100 splendidly Coloured Plates.

THE FLORE DES SERRES ET DES JARDINS DE L'EUROPE is a Belgian Periodical, the property of the Advertiser. Eighteen Volumes are ready, containing more than 1900 highly Coloured Plates of the most approved Ornamental Plants. Price of the whole Set, £25 7s. Long terms by mutual agreement.

Royal Nursery, Ghent, Belgium.

ADOLPH STELZNER, Nurseryman, Ghent, Belgium, begs to offer the following plants at extra cheap prices:—

ARALIA SIEBOLDII, extra strong fine plants, 18s. and 30s. per dozen.
" " ARGENTEA, extra fine plants, 30s. per doz.
" " AUREA, extra fine plants, 30s. per dozen.
ARUM SITCHENSIS (new), fine 3-yr seedlings, 20s. per dozen.
ANTHURIUM SCHERZERIANUM, according to size, 20s., 40s., 80s., 160s. per dozen.
DRACÆNA INDIVISA, var., extra fine plants, 15s. per dozen, £5 per 100
" REGINÆ, extra fine plants, £3 and £8 per dozen.
" TERMINALIS, COOPERII, NIGRICANS, STRICTA, &c., 9s. per dozen.
AZALEA INDICA, fine sorts, fine plants, with flower buds, £3 and £5 per 100
CAMELLIAS, fine sorts, 1 to 1½ foot high, with flower buds, £6 p. 100.
" fine sorts, 2½ to 5 feet high, with flower buds, £3 and £8 per doz
CORYPHA AUSTRALIS, fine 1 and 2-yr. seedlings, £2 and £4 p. 100
" " fine plants, 3 to 5 feet high, 30s. per dozen.
CHAMÆROPS EXCELSA, fine 2-yr. seedlings, £2 per 100.
LATANIA BORRONICA, fine 1 and 2-yr. seedlings, £1 and £2 p. 100.
PANDANUS UTILIS, extra fine, 1 foot high, £4 per 100.
SPIRÆA JAPONICA, for forcing, 30s. per 100.

The following FERNS, 5s. per dozen, or £2 per 100:—Adiantum concinnum latum, A. cuneatum extra strong), A. decorum, A. affine, Cheilanthes hirta, Davallia tenuifolia stricta, Gymnogramma Laucheana, G. Laucheana gigantea, G. Parsoni, G. Wettenhaliana, Doronopteris ornata, Nephrolepis australis, Pteris serrulata cristata, P. tricolor, P. serrulata variegata, Selaginella involvens, Nephrodium ramosissimum, Lastrea dilatata ramosa, L. erythrosora, Osmunda cinnamomea, Blechnum Lindsæana, B. nigrum, B. occidentale.

The following FERNS, 4s. per dozen, or 30s. per 100:—Pteris cretica fol. var., Pteris nemoralis fol. var., Pteris polydactylon 13-yr plants, with fine characteristic fronds, Polybotrya chrysophilla, Osmunda regalis cristata, Cystopteris obtusa, Cyrtomium atratum, C. Fortunei, Athyrium Frizelliæ, Lastrea F.-m. cristata, Lastrea F.-m. furcans, Polystichum Braunii, P. grandiceps, Lastrea opaca, &c.

ASPIDIUM FRAGRANS, the Violet-smelling hardy Fern, very scarce, nice 2-yr seedlings, £2 per dozen.

ATHYRIUM GORINGIANUM PICTUM, extra strong, 3-yr. plants, 9s. per dozen.

CYATHEA DEALBATA, 24s. per dozen.

BRAINEA INSIGNIS, 15s. per dozen

CHEILANTHES PULVERACEA, ADIANTUM CHILENSE, CHEILANTHES DELICATULA, 12s. per dozen.

CIBOTIUM PRINCEPS, extra strong plants, 3 feet and upwards through, 30s. per dozen

For payment, bills will be drawn after three months date of invoice. References, required from unknown correspondents.

HARRIET SCOTT, late STEPHEN SCOTT, Wood Broker to the Crystal Palace Company, Woodside, Croydon, Dealer in all kinds of Garden Materials for garden use, including the following:—SILVER SAND, KENT PEAT, LOAM, GARDEN MOULD, BIRCH and HEATH, BROOMS, WATTLES, HURDLES, GARDEN STICKS, TARRED TWINE, FIREWOOD, &c. RUSTIC LOGS and PEAT, suitable for Ferneries, &c.

A Price List sent on application.

Echeverias.—Special Offer to the Trade.

H. CANNELL has a fine large Stock of the following, viz:—

ECHEVERIA SECUNDA, at 10 to 15s per dozen
" GLAUCA, at 6d. to 1s 4s. per dozen.
" PUMILA, at 2s to 3s. 6d. per dozen.
" ATROPURPUREA, at 2s per dozen
" METALLICA, very fine large plants at 2s. 6d. each; smaller ones, 2s. 6d. per dozen; seedlings, at 9d. per dozen.

Alternantheras.—To the Trade.

H. CANNELL has fine Stock Plants, full of cuttings, of the following three varieties, viz.:—AMABILIS, PARONYCHIOIDES, and MAGNIFICA, at 1s per dozen; smaller, 3s. 6d. single stem plants, 1s. 6d. per dozen; cuttings, 6d. per dozen.

Notice.

H. CANNELL begs to inform all his Friends and Customers that his AUTUMN CATALOGUE is now ready, and will be sent free on application for one stamp. It contains a List of all the new and best older varieties in cultivation, viz., Anturhiums, Chrysanthemums, Coleus, Fuchsias, Geraniums, Iceplants, Pentstemons, Verbenas, Veronicas, Vuccas, &c. List of seedlings at the very lowest possible price consistent with quality.

Geranium Cuttings.

H. CANNELL begs to inform all who wish to improve their collections of GERANIUMS, in either of the following classes—ZONALS, for pots; ditto, bedding; also DOUBLE ZONALS and GOLDEN, BRONZE, and SILVER EDGED VARIETIES—that he has a great quantity of all the best in cultivation

Also nearly all the BEDDING PLANTS that are now so much admired in the London Parks, either as Stock Plants or Cuttings. A Catalogue, with full particulars, sent free for one stamp.

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich, S.E.

Winter Flowering Plants.

FREDERICK PERKINS has a fine healthy Stock of the undermentioned Plants, especially prepared for winter decorations, which he begs to offer at the undermentioned prices:—

AZALEAS, all the best varieties, with buds, 18s. to 30s. per dozen.
BOUVARDIAS, in 48-pots, full of buds, 18s. to 24s. per dozen.
CAMELLIAS, best varieties, with 10 to 20 buds, 60s. per dozen
CYCLAMEN PERSICUM, mixed varieties, flowering bulbs, 6s. to 12s. per dozen
CARNATION, TREE, with buds, 24s. per dozen.
DRACÆNA TERMINALIS, STRICTA, and COOPERII, from 30s. per dozen.
DEUTZIA GRACILIS, 12s. per dozen.
ERICAS, in six winter-flowering sorts, 18s to 24s per dozen.
EPACRIS, best varieties, 18s to 24s per dozen
EUCHARIS AMAZONICA, 3s 6d each; 30s. per dozen
EUPHORBIA JACQUINIÆFLORA, very scarce, 21s. each
EPIPHYLLUM TRUNCATUM, in variety, 9-inch stems, 24s to 30s per dozen
FERNS, good mixed Stove and Greenhouse varieties, 12s to 18s per dozen
GENISTA CANARIENSIS, 12s per dozen
GERANIUM LASIANDRA MACRANTHA, very large purple flowers, 2s. 6d. each.
LILY OF THE VALLEY, imported clumps, 18s. per dozen.
POINTSETTIA PULCHERRIMA, 15s. per dozen.
" ALBA, 6d. each.
PICOTÉE PRINCE OF ORANGE, beautiful yellow, lake edge, flowering plants, 5s to 10s 6d each
PRIMULA SINENSIS FIMBRIATA, in 6 varieties, 9s. per dozen.
" " FLORE PLENO ALBA, 18s per dozen
" " " RUBRA, 18s. per dozen.
" " " DELICATA, 12s per doz
PRUNUS SINENSIS FLORE PLENO, one of the best forcing plants, 18s per dozen
ROGERIA GRATISSIMA, 24s. per dozen.
ROSES, best varieties for hybrid Perpetuals, 15s. per dozen.
" MARECHAL NIEL, 18s. per dozen.
SPIRÆA JAPONICA, imported clumps, 18s. per dozen.
" PALMATA, flowering stems, beautiful magenta, 3s. 6d. each

The above are all well grown plants, mostly in 48-sized pots, and have been especially grown for winter flowering. Single plants, or any quantity, may be had of each variety, at the above prices, to suit amateurs or small Growers.

F. P.'s Priced CATALOGUE of Hyacinths, Crocus, Tulips, and other Dutch Roots, Spring Bedding Plants, and Winter-Flowering Plants, is now ready, and may be had free on application. The usual Trade discount.

FRED. PERKINS, Seed Warehouse, 51, Regent Street, Leamington.

GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1s. per lb., 84s. per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 10s. per gallon

SILVER SAND, of the finest quality, for Horticultural purposes, at 20s. per ton; smaller lots at 2s. per cwt

WM. RUSHFORTH, Seed Merchant and Nurseryman, Leeds

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

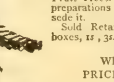

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.

Sold by Nurserymen, Seedsmen, and Florists,

In Tins at 1s., 2s. 6d., and 5s.

Powder Distributors, 2s. 6d. and 3s. 6d. each.

"I find it exceedingly useful for destroying the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

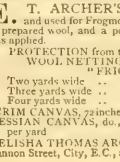

Red Spider.

Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. His outlived many preparations intended to supersede it.

Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.

Wholesale by PRICE'S PATENT CANDLE COMPANY (Limited), Battersea, London, S.W.

E. T. ARCHER'S "FRIGI DOMO."—Patronised and used for Frogmore and Kew Gardens. It is made entirely of prepared wool, and a perfect non-conductor of heat or cold where it is applied.

PROTECTION from the SCORCHING RAYS of the SUN.

WOOL NETTING, 2 yards wide and 11 d. per yard.

"FRIGI DOMO" CANVAS

Two yards wide	11 d. per yard.
Three yards wide	2s. 8d. per yard.
Four yards wide	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 5¾d to 8½d. p. yard.

HESSIAN CANVAS, do., do., 54 and 72 inches wide, 6½d. and 8¾d. per yard

ELISHA THOMAS ARCHER, Sole Maker, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen.

TO THE SEED TRADE.

W. DRUMMOND & SONS

Can this year spare to the Trade a few hundred bushels of the following TURNIP SEEDS, all of their own growth. Prices on application.

GREEN-TOP ABERDEEN YELLOW IMPROVED.

A large, handsome, solid bulb—very nutritious, and an excellent keeper; and is, as now improved, decidedly the best Yellow for winter and spring use in cultivation.

DRUMMOND'S IMPROVED EARLY FIELD YELLOW.

This is altogether a most desirable Turnip, having a large, handsome-shaped bulb—a deep yellow with bright green crown, and small tap-root and "shaw." Being very sweet it is greatly relished by cattle, and if stored before severe frost sets in it will keep sound and juicy till spring. From its quickness of growth it is invaluable for late sowing, and unless wanted for early autumn use it should not be sown till towards the end of June, and sowing may be continued up to the middle of July, with the certainty of having a full crop.

WILLIAM DRUMMOND AND SONS, SEEDSMEN, STIRLING, N.B.

Dutch Flower Roots.

DOWNIE, LAIRD, AND LAING, have now received their second importation of FLOWER ROOTS, consisting of—

HYACINTHS,	JONQUILS,
POLYANTHUS NARCISSUS,	RANUNCULUS,
DOUBLE NARCISSUS,	ANEMONES,
CROCUS,	SNOWDROPS,
TULIPS,	&c, &c,

which have all been carefully selected from the most celebrated Establishments in Holland.

The Bulbs have arrived in splendid condition, being unusually well ripened, very large, and exceedingly heavy.

D., L. & Co. can supply fine Bulbs of the PRIZE HYACINTHS at Kensington, Regent's Park, Crystal Palace, and Royal Caledonian Society's Shows, at 12s., 15s., and 24s. per dozen

Descriptive CATALOGUES of DUTCH BULBS forwarded post free

Stanstead Park Nurseries, Forest Hill, S.E.; and Edinburgh, N.B.

Dutch Bulbs and other Flower Roots.

CHARLES TURNER has just received his first importation of BULBS, which are unusually fine, and in the best possible condition for immediate orders. If the selection is left to C. TURNER, they will be supplied at the following low prices, in fine variety :—

HYACINTHS, best kinds for glasses or pot culture, 6s. to 18s. per doz.
" mixed, for beds or borders, 3s. 6d. per dozen; 25s. per 100.
(In ordering Hyacinths, it should be stated whether Single or Double are preferred.)

TULIPS, Early Single, 6s to 15s per 100 } Can be supplied by the dozen
" Double, 6s. to 15s. per dozen } at proportionate prices.
" Van Thol, 9d. per dozen; 5s per 100

NARCISSUS, 1s 6d to 3s 6d per dozen

JONQUILS, 2s. 6d. to 5s. 6d. per dozen.

SNOWDROPS, Single, 2s. 6d. per 100; Double, 3s. 6d per 100.

CROCUS, in large variety, 2s 6d to 4s 6d per 100

ANEMONES, and other Bulbs that the season, all equally low prices.

LILIUM AURATUM, extra strong flowering bulbs, 2s 6d. to 7s 6d. each.

LILY of the VALLEY, imported clumps, 18s. per dozen.

SPIRÆA JAPONICA " 15s. and 18s. per dozen.

Descriptive CATALOGUE on application.

Also CATALOGUE of Auriculas, Azaleas, Carnations, Chrysanthemums (large), Chrysanthemums (Pompon), Cinerarias, Pelargoniums (in 11 classes), Picotees, Pinks, and Roses; as well as a Descriptive CATALOGUE of Strawberries, Fruit Trees, &c.

The Royal Nurseries, Slough.

Dutch Flower Roots.

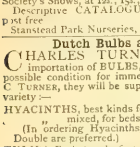

ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers

DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted.

Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application.

Sion Nursery, Thornton Heath, Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

Spring Flowering Bulbs.

BUTLER, McCULLOCH, AND CO.'S COLLECTION of CHOICE SORTS for Greenhouse or Flower Garden Decoration, sent carriage paid. No charge for packages.

FOR CONSERVATORY.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6.
105s.	50s	25s.	21s	15s.	10s 6d

FOR FLOWER GARDEN

No 7	No 8	No 9.	No 10	No 11	No 12
100s	60s	40s	25s	21s	10s 6d

FOR GREENHOUSE and FLOWER GARDEN

No 13	No 14	No 15	No 16	No 17	No 18
105s	52s 6d	42s	21s	15s	10s 6d

CATALOGUE, containing details, post free

5 per cent allowed for cash

BUTLER, McCULLOCH, AND CO., 27, South Row, Covent Garden, London, W.C. Established upwards of a century

B. S. WILLIAMS'

NEW and CHOICE FLOWER SEEDS,

Post Free

	Per packet —s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain	2s. 6d., 3s. 6d., and 3 6
ECHEVERIA METALLICA, new bedding plant	2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 3 6
PYRETHRUM (Golden Feather)	1s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
EAST LOTHIAN STOCKS, per collection of three colours	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
" " var. PERFECTION	1s. 6d., 2s. 6d., and 3 6
WALLFLOWER, Saunders' fine dark variety	1 0

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following, —

LAURUS PINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 7 ft | COMMON LAURELS, 6 to 9 ft
Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, thickly set with buds.

The above have recently been transplanted, are very bushy handsome plants, and quite safe. Price per dozen or hundred on application.

Floral Nursery, Hailsham, Sussex.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at very moderate prices, in order to clear the land for building purposes

Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved varieties, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.

To Gentlemen wishing to make New and to improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.

Nursery and Seed Stores—Walton-on-the-Hill,
Seed Warehouse—15, Queen Square.
Liverpool, September, 1870.

CARTER'S
SEEDS, BULBS, &c.,
CARRIAGE FREE.

*** *Five per cent. discount allowed for cash payments.*

JAMES CARTER AND CO. can strongly recommend the following assortments of FLOWER ROOTS for Spring decoration. *The Bulbs are all very choice, and having been most carefully selected from the Stocks of the chief Continental Growers,* the possibility of failure can scarcely be entertained,

BULBS for INDOOR PLANTING.

COLLECTION No. 1, complete, price 84s.
COLLECTION No. 2, reduced quantities, price 63s.
COLLECTION No. 3, reduced quantities, price 42s.
COLLECTION No. 4, comprises—

Hyacinths, 12 in 12 extra fine named sorts
Polyanthus Narcissus, 6 in 6 varieties
Jonquils, sweet scented, 12
Crocus, finest named, 50
Dielytra spectabilis, 1
Lilium speciosum, 1
Scilla sibirica, 6
Snowdrops, extra large selected, 24
Tulips, Tournesol, 6
" Rex rubrorum, 3
" La Candeur, 3
" Royal Standard, 3
" Yellow Prince, 6
" Rosa Mundi, 3
" Duc Van Thol, 6
Amaryllis formosissimus, 1
Ixias, finest mixed, 6
Sparaxis, finest mixed, 6
Triteleia uniflora, 6

Price 21s.

COLLECTION No. 5, reduced quantities, price 10s. 6d. Packing and carriage free.

BULBS for INDOOR and OUTDOOR PLANTING.

COLLECTION No. 6, complete, price 84s.
COLLECTION No. 7, reduced quantities, price 63s.
COLLECTION No. 8, reduced quantities, price 42s.
COLLECTION No. 9, comprises—

Hyacinths, 12 in 12 extra fine named sorts for pots or glasses
" 12 in 3 colours for bedding
Narcissus, double, white, 12
" Poeticus or Pheasant's-eye, 12
Tulips, extra fine mixed, 30
" Fortuné, 6
" Duc Van Thol, 6
" Royal Standard, 3
" La Candeur, 3
" Yellow Prince, 3
" Rex rubrorum, 3
Double Daffodils, 12
Star of Bethlehem, 12
Scilla Belgica, mixed, 12
Crocus, blue, 75
" striped, 75
" large yellow, 75
" white, 75
Anemones, extra fine mixed, 36
Gladiolus Brenchleyensis, 8
Iris, extra choice mixed English, 12
" extra fine mixed Spanish, 12
Jonquils, Campernelle, 12
Ranunculus, extra fine mixed, 24
Snowdrops, 50

Price 30s.

COLLECTION No. 10, reduced quantities, price 15s. Packing and carriage free.

BULBS for OUTDOOR PLANTING.

COLLECTION No. 11, complete, price 84s.
COLLECTION No. 12, reduced quantities, price 63s.
COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, comprises—

Hyacinths, 12 in 3 colours
Narcissus, double white, 12
" Poeticus or Pheasant's-eye, 12
Double Daffodils, 12
Tulips, extra fine mixed, double, 12
" extra fine mixed, single, 12
" extra fine mixed, late, 12
" Duc Van Thol, 12
Polyanthus Narcissus, fine mixed, 6
Campernelle Jonquils, 6
Star of Bethlehem, 12
Triteleia uniflora, 6
Dog's-tooth Violets, 6
Crocus, blue, 25
" striped, 50
" large yellow, 50
" white, 25
Anemones, extra fine mixed, 24
Gladiolus Bren. hleyensis, 4
Iris, extra choice mixed English, 12
" extra fine mixed Spanish, 12
Lilium candidum, 3
" tigrinum, 3
Ranunculus, extra fine mixed, 24
Snowdrops, 50
Winter Aconites, 24

Price 21s.

COLLECTION No. 15, reduced quantities, price 10s. 6d. Packing and carriage free.

JAMES CARTER & CO.'S
CATALOGUE OF
HYACINTHS, TULIPS, CROCUS and OTHER BULBS, ROSES, FRUIT TREES, &c.,

Containing full particulars of the above Collections will be forwarded Gratis and Post Free on application.

SUBSTITUTES for the CLOVER CROP.

Messrs. CARTER prepare a special mixture of hardy quick-growing Clovers and Grasses, which if sown at once will ensure a most acceptable green crop in early spring

Too much importance cannot be attached to the quality of the Seeds used, so as to secure a clean after-tilth, and the utmost care is taken by Messrs. CARTER to carry out that object.

Sow 1½ to 2 bushels per acre Price 18s to 24s per acre

BROMUS SCHRÆDERI, if sown now, will produce a heavy crop of forage in spring and several after cuttings in one season Sow 50 lb. per acre. 1s. per lb.

MUSTARD,
TRIFOLIUM INCARNATUM,
CARTER'S SUPERFINE ITALIAN RYE-GRASS,
RAPE,
} Lowest price on application.

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

SUTTONS'
IMPORTED FLOWER ROOTS.

SUTTON & SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS,

HAVING RECEIVED their FIRST CONSIGNMENT of

CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

SUTTONS' SUPERB DUTCH HYACINTHS

For CULTIVATION in POTS or GLASSES.

The best 12 Hyacinths for 12s.

Messrs. SUTTONS' Collection of Hyacinths consists of more than 200 varieties, a Priced and Descriptive LIST of which may be had on application.

Suttons' Collections of Named Hyacinths.

100 HYACINTHS in 100 very choice sorts	£4 4 0
100 " 50 very choice sorts	3 10 0
50 " 50 very choice sorts	2 2 0
50 " 25 very choice sorts	1 15 0
25 " 25 very choice sorts	1 1 0
12 " 12 extra fine sorts	0 12 0
12 " 12 choice sorts	0 9 0
12 " 12 good sorts	0 6 0

The order should specify whether they are intended to be grown in water or earth, as all kinds are not equally suited to both purposes. It should also be stated whether single or double blossomed kinds are preferred; otherwise we usually supply about two-thirds double, and one-third single. The single varieties generally thrive best in water, but their merits are never apparent until the flowers are fully expanded.

SUTTONS' MIXED HYACINTHS, for Beds or Open Borders —Double, Single, and various colours, 2s. 6d. per dozen, 18s per 100

SUTTONS' HYACINTHS, in distinct colours for Massing, Bedding, Ribbon Gardening, &c —Double and Single, various shades, separate, 4s. per dozen, 30s. per 100.

Suttons' £2 2s. Collection for Open Ground,

Carriage Free, contains—

24 fine mixed Border Hyacinths	12 fine mixed Gladiolus
12 " Polyanthus Narcissus	25 Duc Van Thol Tulips
25 Pheasant's-eye Narcissus	12 mixed Single Early Tulips
25 Double White Narcissus	12 fine mixed Double Tulips
50 Double Daffodils	12 " Parrot Tulips
12 large Campernelle Jonquils	12 Gesneriana Tulips
50 fine mixed Double Ranunculus	50 fine mixed Tulips
100 Scarlet Turban Ranunculus	12 " English Iris
25 fine mixed Double Anemones	12 " Spanish Iris
25 " Single Anemones	6 Lilies, of sorts
300 Crocus, in 6 sorts	6 Ferraria Pavonia
150 Snowdrops	12 Dog's-tooth Violets
50 Winter Aconites	6 Crown Imperials

Suttons' £1 1s. Collection, for Open Ground,

Carriage Free, contains—

12 fine mixed Border Hyacinths	6 fine mixed Gladiolus
6 " Polyanthus Narcissus	12 Duc Van Thol Tulips
12 Pheasant's-eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 " Parrot Tulips
6 large Campernelle Jonquils	6 Gesneriana Tulips
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 Scarlet Turban Ranunculus	6 " English Iris
12 fine mixed Double Anemones	6 " Spanish Iris
12 " Single Anemones	3 Lilies, of sorts
150 Crocus, 3 sorts	3 Ferraria Pavonia
50 Snowdrops	6 Dog's-tooth Violets
25 Winter Aconites	3 Crown Imperials

Suttons' 10s. 6d. Collection of Flower Roots

For OPEN GROUND, contains a choice assortment for a Small Garden.

Suttons' £2 2s. Collection, for Indoor Cultivation, Carriage Free, contains—

24 fine Hyacinths, by name	6 Persian Iris
12 fine Miniature Hyacinths, do.	6 Peacock Iris
12 Polyanthus Narcissus, do	100 Crocus, by name
6 large Double Jonquils,	12 choice Ixias, by name
12 Single Sweet-scented Jonquils	6 choice Sparaxis, by name
12 Scilla præcox	1 Cyclamen persicum
12 Single Duc Van Thol Tulips	1 Tropæolum tricolor
12 Double Tournesol Tulips	2 Lilium lancifolium album
50 Early Tulips, 10 sorts	2 " " rubrum

Suttons' £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, by name	3 Peacock Iris
6 Miniature Hyacinths, by name	50 fine Crocus, by name
6 Polyanthus Narcissus, do.	6 choice Ixias
6 Single Sweet Jonquils	3 choice Sparaxis
6 Scilla præcox	3 choice Cyclamen
6 Single Duc Van Thol Tulips	1 Tropæolum tricolor
6 Double Tournesol Tulips	1 Lilium lancifolium album
25 Early Tulips, 5 sorts	1 " " rubrum
3 Persian Iris	

Suttons' 10s. 6d. Collection of Flower Roots

For Indoor Cultivation, contains a choice assortment of most useful and showy kinds.

For further particulars, with complete Cultural Instructions, see

SUTTONS'
AUTUMN CATALOGUE FOR 1870,

Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

☞ *Five per cent. allowed for cash payments.*

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

Strawberries.

CHARLES TURNER'S Descriptive LIST can be had on application The following are particularly recommended:

BONNE BOUCHE	FROGMORE LATE PINE	PRESIDENT
DR. HOGG	MR. RADCLYFFE	SIR C. NAPIER
ECLIPSE		SIR J. PAXTON

Strong plants from the ground, or in small pots, at an extra charge, to insure a crop of fruit next season

The Royal Nurseries, Slough.

CHEAP STRAWBERRY PLANTS.—The Advertiser, having a large acreage under this fruit, will supply strong plants at following low prices:—Keens' Seedling, Sir Charles Napier, and Prince Imperial, at 12. 1*s.* ; Sir Joseph Paxton, John Powell, President and Frogmore Pine, at 12. 6*d.* ; Carolina superba, British Queen, and Dr. Hogg, at 2*l.* per 100. Orders, unless from well-known firms, to be accompanied with postage stamps or order on New Ferry.

JAMES SHIELD, Strawberry Farm, Thornton Hough, Neston, Cheshire.

Strawberries.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C., have great pleasure to announce that by careful attention during the past exceptionally hot summer, they are enabled to offer strong healthy plants of the most approved kinds, in and out of pots, at reasonable prices. See pages 38 and 40 of their AUTUMN CATALOGUE, which can be had, post free, on application.

VINES.—Strong, well-ripened CANES, for fruiting and planting. See AUTUMN CATALOGUE, page 50.

CHRYSANTHEMUM.—Large-flowered POMPON and JAPANESE kinds; vigorous plants for Conservatory and Border Decoration, at 6*s.*, 9*s.*, and 12*s.* per dozen. See AUTUMN CATALOGUE, page 27.

Vines and Strawberries.

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The Gardeners' Chronicle

SATURDAY, SEPTEMBER 24, 1870.

THE POTATO GRAFTING question received fresh illustrations from the specimens exhibited by Mr. FENN at the Royal Horticultural Society on Wednesday last. It will be remembered, from what has been stated in our columns on previous occasions, that strong evidence has been given to show, first, that when an eye of one Potato is grafted into the tuber of another, adhesion takes place; and secondly, that a change is produced in the new tubers formed on the graft. Both these points have been, and still are, contested. It has been denied that any adhesion takes place, and that the potion of any grafting process having taken place is therefore erroneous; and it has been, moreover, alleged that if any change take place in the new product, such change is due to the natural tendency of the Potato to sport, and is not in any way due to any commingling of sap that might take place did adhesion really occur.

For our own parts, judging from the evidence before us, we have never doubted the fact that adhesion does occasionally take place, at least as firmly as in the case of any other graft. We can hardly be mistaken on this point. We have seen and tested the adhesion, and moreover we have seen how the stock, if we may so term it, has become exhausted, all its nutrient matter removed and itself reduced to an empty skin, when successful grafting has taken place. It will be remembered that all the "eyes" on the stock are removed, so that the shrivelled condition of the tuber must be due to its having yielded up its supplies to the eye parasitically implanted upon it. If this be so, it is not unnatural to infer that the new growths may be influenced by the nature of the stock, and present more or less of a mixed character. Those who, like Mr. FENN, have had much greater practical experience in this matter than ourselves, say that this is no mere inference, but that it is a demonstrated fact; and we confess that we incline to the belief that this is so. We cannot shut our eyes to the circumstance that considerable changes in the nature of the haulm and of the tubers do take place; that the appearances produced are of a character intermediate between the two Potatos made use of as scion and stock. On the other hand, Potatos have been so often crossed and recrossed by pollinic fertilisation that we think still further evidence is required before we can absolutely, and without reserve, give assent to the theory of graft hybridisation. To us, however, it seems certain that certain changes are produced, that those changes are of a remarkable character, that they occur with so much constancy in these so-called grafted Potatos as to justify the expression of a strong probability that they are due to the intermingling of the sap of the two Potatos used for the experiments. These changes occur year after year—they are as marked this year as they were last; and, to our thinking, there is a degree of regularity about their production which justifies the inference that they are the result of the grafting process—that they are not only *post* but *propter*. We admit, of course, that these changes may be mere "sports," but if so they occur with unusual constancy; and if they be really sports, then our Potato grafters have found out the art of producing these "accidents" almost at will. In any case, then, the physiological interest in these productions is great, if they do not directly owe their origin to graft hybridisation, at least indirectly they are the result of that process: and if this be admitted, as we think it must be, then vegetable physiology has gained an important fact, and one which can probably be turned to good account.

From a practical point of view it must be admitted that the results are anything but encouraging. Last year the verdict was unfavourable; this year it is equally so. The grafted Potatos are, for practical purposes, Potatos spoiled. This circumstance, however unfortunate, does but lend support to our opinion, that a change does take place; moreover, if this be true, we do not see why, with proper care in the selection of varieties, good results may not be arrived at as well as bad ones. We append to these remarks a communication from Mr. FENN in reference to his Potatos, and we may add that the Fruit Committee expressed the same opinions from the cooked and uncooked samples before them—an opinion arrived at before they had seen the descriptive catalogue of Mr. FENN'S exhibition, and which we now lay before our readers:—

"I exhibit to-day graft hybrid Potatos, three years from the graft, as being the result of my latest experiments in this curious physiological question. The examples are of single roots as dug from the soil—namely, a root of Wheeler's Milky White, grafted in Thomas Almond's Yorkshire Hero. The haulm during growth supported itself perfectly upright, which the true Milky White does not; and on cooking the hybrid it proved drier to eat than its Milky White parent, and inferior to either parent. I show specimens of Wheeler's Milky White alongside, to allow ocular demonstration of the amalgamated characters in the hybrid products. I also show a root of Thomas Almond's graft hybrid, the Yorkshire Hero, raised by grafting Haigh's Cobbler's Lapstone Kidney into the Lancashire Flounder. It is a feature of Hero to eat drier and harsher, so to speak, than the Lapstone; and this I invariably find to be the case with every hybrid of my raising, when compared with the parents; and I would ask whether Mr. Taylor's Yorkshire hybrid does not exhibit the same distinction from its graft parent, the old Ashleaf Kidney, which he grafted into the Haigh Cobbler's Lapstone? A marked ugliness of feature also accrues to Mr. Taylor's hybrid. It would be well to gain the results of other Potato grafters' delvings anent these features; for if they hold to be constant and true, a livery and bad, though productive sort, could easily be rectified into very good eating. But to return: a root of Milky White grafted into the old original Fluke, yields tubers drier and harsher to eat than Milky White, and with the flesh whiter than the Fluke, but in flavour not so good as either parent. A root of Fenn's Onwards, grafted into Yorkshire Hero, is drier to eat than the Onwards, and not so good flavoured as either parent, nevertheless, it is the best result I have yet achieved by the grafting process; with a root of the old original Fluke, and a root of Fenn's Onwards' seedling. A root of Yorkshire Hero grafted into Fluke, which eats dry even to grittiness, and is quite worthless, and as ugly a producer as well can be. A root of Yorkshire Hero grafted into Fenn's Onwards, ugly in produce, very dry, harsh eating; not at all satisfactory. And a root of Fenn's Irrepressible Nigger seedling grafted into Fenn's New Purple Kidney seedling."

THE history of the VETERAN VINES is not yet recorded, for still another has cropped up, which has not only reached the ripe old age of "threescore years and ten," but which in this present year of 1870 has been a "prizeman" at Oxford, and in a competition open to all comers has registered Two Firsts. In a recent comment upon the Grapes shown there we stated that, with the exception of the produce of the veteran Vines at Chatsworth, and "Mr. COLEMAN'S fine young Vines at Eastnor Castle," there was little that called for special remark. At that time, guided in some measure by the rather loose character of the bunches, and the fact that we had been informed that Mr. COLEMAN had been planting fresh Vines at Eastnor, we were led to conclude that the Grapes were the produce of young Vines. Corrected, through a friend of Mr. COLEMAN'S, it affords us great pleasure to record that the Grapes which obtained the 1st prize for the best basket, and the 1st prize for the best dish, were not the produce of young Vines, but were all cut from an old stager, which at the time carried a crop of 400 lb. of equally good Grapes, and has done the same annually for some years past.

The following history, from Mr. COLEMAN'S own pen, has been obligingly forwarded to us. He says:—"When I came to Eastnor ten years ago I found the fine old tree in a bad state, owing to the drains in the garden having become choked with sediment and vegetable matter washed from the surface. I had a new series of drains put in two feet deeper than the old ones, and then removed the surface soil from the border, laying as many as I could of the old roots bare. Good turfy loam, with charcoal and bones, was laid over them and partially up the stems of the Vine. The following year I saw a great improvement both in the wood and fruit, and by the end of the second year the Vine had become so vigorous, the roots having found their way into the old drains as well as the new turf soil, as to justify me in asking for and obtaining permission to build a new house over it. The old house, a span-roof one, running north and south, was 42 feet by 17 feet; the new one is 72 feet by 20 feet, and 10 feet high. The Vine is planted at the south end, travels horizontally under the ridge, and throws out lateral branches right and left, 4 feet apart, which run down under the rafters until they reach the wall-plate.

"The first year after the new house was built, the leader reached the north end, a distance of 30 feet. This, at the proper time, was shortened back, and two pairs of lateral branches, on the true extension principle, were taken down, and this system has been followed every year since until the present time. The house is now quite full of young wood, but after the winter pruning it will take another year to fill it with bearing wood, when I have no doubt this rejuvenised veteran will produce 500 lb. of fine fruit every year."

Who, then, shall count the age of a well planted and well cared-for Vine? The life of a man appears but a period of infancy, scarcely the hey-day of existence, in the life of the Vine. We hear of its girth of stem being measured by feet, and its years by hundreds, in more favoured climes than our own; and really Mr. COLEMAN'S noble old Vine, rising into second life, seems to say, "Treat me fairly, kindly, do not cripple me by undue pinching of either roots or branches, and I will produce you 'beautiful' Grapes for hundreds of years, if not 'for ever.'"

We congratulate Mr. COLEMAN most heartily upon his marked and well-deserved success. Not only has he brought the Vine into health, but he has fortified his position by winning six 1st prizes with the produce of the veteran this year, besides helping him to four 1st prizes for collections of fruit. Mr. COLEMAN concludes:—"So much pleased am I with the extension principle, that I have worked my early and Muscat house upon the same plan. One Bowood, seven years old, has five rods, and carries 25 bunches upwards of 3 lb. each. One thing I have remarked on the old Vine—though the bunches are heavier than formerly, I think the berries, if anything, are a little smaller, and not quite so much hammered. Our natural soil is strong loam, resting on clay or limestone. The soil I use for my Vine borders is turf from the igneous rock."

THE ravages of the VINE DISEASE are now too well known, both in this country and abroad. The insects, which are the cause of the malady, infest both root and leaf, and though easily discerned and battled with in the latter position, are not to be dislodged by any summary process when they attack the roots. Hitherto, very little information of an encouraging nature has been elicited in respect to a remedy. The stamping-out process has been suggested, as that most to be relied upon; but this is a very extreme measure, and one which, in most cases, would not be had recourse to except as a last resort.

We are glad, however, to be able at last to record an instance of complete success in dealing with this devastating disease. The Vines at Powerscourt were attacked, as many others have since been, some two or three years ago, and suffered so much, that it was necessary to have recourse to active measures to arrest the progress of the evil. The course adopted was, we learn, as follows:—The Vines were taken up, and their roots washed clean and even scrubbed, so as to remove all trace of the insects. The soil was cleared out, and the Vines were replanted in entirely new soil, every precaution being taken to remove all traces of the pest, and avoid all

risk of contagion. These Vines, as we learn from an eye-witness, are now growing away with the utmost vigour. The remedy is complete.

Mr. DUNN, the gardener at Powerscourt, may be congratulated on having thus conquered an enemy which itself seemed to threaten to overrun and bear down everything in the shape of a healthy Vine with which it came in contact. Others who may, unfortunately, be similarly circumstanced may now therefore, with some degree of confidence, adopt the same remedial course.

—— WE are requested to state that W. MARSHALL, Esq., of Enfield, who has now in flower a fine male inflorescence of NEPENTHES RAFFLESIANA, will willingly furnish pollen to any one who may have the female plant in bloom, and be desirous of fertilising it. The plant will be in bloom for the next week or two.

—— We extract the following from "Hints to Colonists upon the CULTIVATION OF SILKWORMS" ("Silk Supply Journal," July 15, 1870, Vol. I., No. 7):—

"Some years ago the writer, then in Ceylon, was discredited for a time by hazarding the statement to a learned botanist, that he could, by simply changing its conditions, produce leaves from the Mulberry tree before them which the botanist would class as of another description. A cutting was taken and planted in a sheltered warm nook, in a rich free loam, where the refuse of an adjoining stable was frequently thrown upon it. Two years after the parent tree, then five years old, or in its prime, in a poor dry soil and exposed situation, produced a rough, small, dark brownish leaf, full of woody fibre, about 4 inches extreme length; while its progeny, the cutting, at two years of age, yielded a large, light, bright green-coloured, smooth leaf, measuring 17 inches in length by 12 inches in width, and in no instance corresponding to the leaf of the original tree. Our botanical friend pronounced it to be Morus alba, while its progenitor was known to be Morus nigra. The moral of this anecdote may be thus summed up. Don't bother your heads about species, nor wait to get white Mulberries while you have any other; take what you can obtain on the spot, and trust to a genial climate, good soil, and proper cultivation to do the rest. After all, the results of feeding are the true tests, and worth more than all the opinions about different descriptions."

—— We learn from the *Builder* that an effort is being made by Mr. FRANCIS FULLER, of Whitehall Gardens, and his friends, to organise a company to purchase the ALEXANDRA PALACE, with the view of opening it for the people of North London. It is proposed to form a company for this purpose on the Tontine principle, with a capital of £650,000, in fully paid-up shares of 20*s.* each, with power to issue debentures bearing interest at 5 per cent. per annum, to the amount of £150,000 if necessary. The shareholders first registered, up to the amount of £500,000, will be those alone entitled to the ownership of the park, palace, and contents, which it is estimated will be worth, at the close of the Tontine in 1880, about one million and a half sterling. It is a pity that so fine a building as the Alexandra Palace, occupying a most picturesque suburban position, should be allowed to remain idle, when it might be profitably utilised for the purposes of public recreation.

—— Dr. SCHOMBURGK, the energetic director of the Adelaide Botanic Garden, states, in his annual report on the condition of that garden, that the only GRASS which will resist the DROUGHT and scorching HEAT of the summer season in South Australia is the Cynodon Dactylon. By frequent close mowing a tolerable lawn may be ensured, but one open to the objection that in winter time the grass in question loses its verdant appearance.

—— We have been requested to publish the following letter, concerning the METROPOLITAN FLORAL SOCIETY:—

"Will you permit me, through your columns, to thank all those kind friends who so earnestly worked to render our show at the Crystal Palace so great a success, demonstrating, as it clearly did, that the florists are still able to maintain their position, and the value of the flowers they especially cultivate? We are already considering our plans for the ensuing season, and have made a proposal to the Royal Horticultural Society to offer prizes for Auriculas and Carnations and Picotees at their exhibitions in April and July; and the manner of offering prizes for the other flowers mentioned in their prospectus will probably be something of the same kind. We believe that we shall fill a useful gap, and in our way render some service to horticulture. *D., Deal.*"

—— The prospectus of the PEOPLE'S GARDEN COMPANY has just been issued. Its patrons, says the *Builder*, are stated to be Lord LYTTELTON, Sir HARCOURT JOHNSTONE, M.P., Mr. T. HUGHES, M.P., Mr. E. BEALES, M.A., Dr. HODGSON, Mr. W. B. CARPENTER, M.D., F.R.S., and Mr. HENRY SOLLY. The company has been formed, it is remarked, "with the object of securing for its shareholders and members and to be laid out as gardens and recreation grounds, in order to afford to the toiling multitudes, irrespective of class or country, healthy, rational, and elevating enjoyment, so necessary now that the extent of building has covered the former vacant spaces of the metropolis, and rendered the dwellings of the people generally so crowded and their surroundings so insalubrious." The prospectus goes on to state that the great object which the company has in view is, that its shareholders and members with their families may enjoy the exhilarating country air, fine music, and such recreation as will tend to the healthful development of body and mind. The company has secured a plot of 50 acres of land, beautifully situated, and being the larger portion of Old Oak Common, near Willesden Junction.

—— In the last part of the "Journal of the Linnean Society," Mr. J. G. BAKER contributes a very valuable revision of a portion of the LILY FAMILY, including those species with capsular fruits, and flowers with partially united petals, thus including the Funkias, Blandfordias, Kniphofias, Agapanthus, Muscari, Hyacinthus, and other genera of garden interest. Mr. BAKER has laid us under a heavy obligation to him, and we hope he will soon increase it by extending his revision to the whole family. The task of preparing an accurate revision of this kind is one involving not only great labour, but is tiresome and wearisome to the last degree. The "Enumeratio" of KUNTH is now somewhat out of date, and was at all times an unsatisfactory work, inasmuch as it was a matter of considerable difficulty to determine any plant by its use, owing to the want of analytical tables and other reference guides. These are furnished by Mr. BAKER, and if, as no doubt is the case, they are as well drawn up as those of the genus Narcissus, &c., they will prove of very great value. Mr. BAKER has had the advantage of consulting not only the herbaria at Kew, but also the living plants in the Royal gardens, and in the rich collection of Mr. SAUNDERS. Such work as Mr. BAKER is doing is hardly likely to be fully appreciated out of the botanical circle, on which account it is the more incumbent on us to point out that horticulturists also owe him a debt of gratitude.

—— A leading article in the *British Medical Journal* for Sept. 10 is very severe on the insufficiency of the EDUCATION at present given to our MEDICAL STUDENTS, and the consequent inferiority, comparatively speaking, of the medical profession in this country:—

"The miserable inferiority in scientific research; the dearth of original work, the want of exactness, the poverty of physiological investigation, the ignorant impatience of practical detail which we all have to deplore so much in the mass of professional work at this day, are due to the inadequate preliminary cultivation of our students; to their defective training in scientific method; the small base on which the pyramid of medical lore is made to stand. The solemn deprecation of excessive devotion to microscopical research; the empty sneer at chemical physic; the idle and mischievous disregard of instruments of precision—the sphygmograph, the thermometer, the laryngoscope, the ophthalmoscope—are all the expressions of a Philistine ignorance . . . The inferiority of English to German medicine is due to this inferiority of preliminary training."

It is not in medicine alone, but in almost every department of knowledge or industry, that this defective scientific training is found. Our gardeners, as a rule, are lamentably deficient in the very elements of science.

—— The MAXIMUM TEMPERATURE of the AIR during the WEEK ending September 17, in England, varied from 70°.6 at Portsmouth to 62° at Newcastle, with a mean for all stations of 65°.6. In Scotland it varied from 68° at Leith and Perth, to 60° at Paisley, with a mean for the several stations of 64°.2. The MINIMUM TEMPERATURE in England varied from 31° at Hull to 42°.4 at Bristol, with a mean for all stations of 37°.5. In Scotland it varied from 33°.5 at Paisley to 41° at Greenock, with a mean for the several stations of 37°.1. The highest MEAN TEMPERATURE of the week in England was recorded at Bristol, viz., 54°.9, and the lowest at Hull, 49°.3; whilst the mean of the eight southern stations was 53°.4, and of the eight northern was 52°.3. In Scotland the highest recorded was at Leith, viz., 52°.2, and the lowest at Paisley, viz., 49°.9, with a mean for all stations of 51°.2. The RAINFALL was greatest at the northern stations of England and the several stations in Scotland; the largest fall at any station in England was 1.17 inch, at Liverpool, whilst at Portsmouth no rain fell during the week: the mean fall for the eight southern stations was 0.26 inch, and for the eight northern was 0.71 inch. In Scotland the largest fall was registered at Perth, viz., 1.07 inch, whilst the mean for all stations was 0.69 inch. (See Mr. GLAISHER'S Tables in our present issue.)

—— A correspondent of the *English Mechanic* recommends the leaves of the WILD RASPBERRY "as the finest tea I ever tasted." The garden variety, it is said, will do, but is not so good for the purpose indicated. It is not the first time we have heard of rasping tea.

—— We find in the address of the President to the Pharmaceutical Conference at Liverpool, the following illustrations, among others, of the application of SPECTRUM ANALYSIS to the elucidation of the chemical composition of plants:—

"Lithium has been noticed in the root of Dandelion, rhubarb, in Gentiana lutea, Atropa Belladonna, Nicotiana Tabacum, Triticum vulgare, commercial pearlash, raisins, and carrageen. Strontium exists in many specimens of Dandelion. Rubidium has been detected in syrup made from loaf sugar, which most probably had been manufactured from Austrian Beetroot, also in Oak bark, from trees growing on beds of lias in the neighbourhood of Bristol, and in tea, coffee, and cream of tartar. By some authors it has been denied that plants absorb from the earth such metals as are not absolutely essential to their nutrition. Experiments, however, afford strong evidence to the contrary. Mr. R. Warington ("Journ. Chem. Soc." 1865) found in the ashes of the Beech and Birch .193 per cent. of manganese. In a case of cattle poisoning at Wells Assizes, the animals were proved to have been killed by eating plants containing lead derived from the soil on which they grew. Analysis showed that grass, weeds, Fungi, Thistles and shrubs contained a poisonous quantity of lead, although totally unaffected in their growth. The triassic marls of Cotham, near Bristol, are celebrated for an abundance of celestine, or sulphate of strontium. An examination of the ashes of plants and shrubs growing on these strata nearly always shows the presence of strontium in small quantity. I have detected this metal in Taraxacum, Arabis, Senecio, Capsella, Poa, Senebiera and Scoparium."

HEATHER AND ITS APPLICATIONS.

"He spoke of plants divine and strange
That every hour their blossoms change,
The Cypress and her spire
Of flowers, that with one scarlet gleam
Cover a hundred leagues, and seem
To set the hills on fire;
And all the while, said he, to know
That we were in a world of woe,
On such an earth as this."

Wordsworth's "Ruth."

THE youth who has been reared on level ground, where the cattle grow to be large and fat on the long green grass of carse and fen, may be forgiven if he does not see beauties in the untilled steep sides of a lofty mountain, where the native Heather (Calluna vulgaris) really is at home; but one can hardly pass over in silence the "faint praise" bestowed by Sir Walter Scott upon this beautiful native shrub when, master of description as he was, he could say—

"Land of brown heath and shaggy wood."

The blooming Heather is now before me in all its loveliness, and I look at the bright green twigs and rosy pink unopened blossoms. I have seen the common Squill (Scilla præcox), not far from Sheffield, acres of blue flame; and in Scotland the Gorse (Ulex europæa) for miles a sheet of gold; but there is a warmth of colour about the Heather Bell which neither the cold blue of the Squill nor the gaudy yellow of the Gorse can yield: it is literally what Wordsworth has said of American plants—as if it set the hills on fire. There is scarcely any plant more easily got in bulk than Heather, and if planted in winter and kept moist it will bear the transplanting well, and make a great show with little cost in a new garden. I laid out a garden for a gentleman a few years ago, and as the site was an immense gravel pit, there were neither trees nor shrubs to clothe the ground, so that all the new work had to be either planted or turfed; but as we were near a common where native peat earth shrubs abounded, we were able to get from the common cartloads of Heaths and other dwarf shrubs, and with these the banks were clothed, giving the new work a look of age and finish highly desirable. Moreover, these undershrubs, being of low stature, did not interfere in the least with the Hollies and Yews of the permanent plantations, and were preferable to turf, as they needed no mowing or other care, and had the effect of looking like dressed ground. We gained also one effect which is too often lost sight of, namely, the double cropping—that of having a plantation of undershrubs, interesting in themselves, and acting as a foil to set off the taller specimens and more conspicuous groups of flowering shrubs and trees.

Many years ago I was at pains to point out how Rhododendrons might be raised from seed by thousands on the peat mould or leaf mould in plantations, and I have derived great pleasure from seeing the subject taken up by others, and carried out successfully. The seed was simply scattered on bald places. Such places, where not naturally existing, were easily made. The idea was taken from Nature clothing the waste with Heather, and other peat earth plants.

In planting trees and shrubs, no item of information respecting future effect should be thought unimportant. Now the inclination of the plantation to the eye of the observer should be studied, as Fir trees, Rhododendrons, and Heaths will all require to be looked up to; a deep cutting or apparent cutting that will give gentle slopes or high banks may be made very effective when skilfully planted, and an artificial hollow requiring a dry bridge to span it will often give a glimpse of certain plants that look best when viewed overhead. The mockery of any kind of rockwork in miniature is to be shunned as a temptation of the Evil One. I have often seen a handsome house and garden made odious by having stones stuck up everywhere, as if they had been put out to dry for grinding. A rock that a stonemason's labourer can carry in his arms or on his back, should never be set up single-handed as a rock, but should be called what it really is, a large stone. Rockwork to be tolerated should show itself too great for removal, and more or less connected with its headquarters underground. Heather may be seen growing on a peat bog, still it is not at home there; but see it on a gentle slope—on what is called in the North a brae, which means land sloping

at an angle of 30° —wrapping round a block of granite as if the ancient rock were holding the earth and all thereon in its place! In planting clumps of hardy Heaths I always found it useful to put plenty of stones around the plants and through the soil, after the pattern which Nature has set us. In the natural disposition of Heather on our hills we find Erica Tetralix and Erica cinerea abound in large patches, frequently of an acre or more in a place; hence we have no difficulty in getting a large clump of either of these. I am not speaking here of planting a Heath garden, such as that at Woburn Abbey and elsewhere, but of undergrowth such as would be so desirable in a pinetum.

I once went from garden to garden with a foreigner who wished to see English gardening, and in one place we had to wade through a piece of ground planted with Potatos to get at some rare Coniferæ; such useful arboretums are fortunately rare. I need scarcely remark, that when Heather once gets possession of the ground planted as a pinetum or arboretum, there is no further cultivation needed; and in this it is preferable to grass, which requires constant mowing. The fewer edge tools that are used in situations where fine trees are the better.

As the season for planting and transplanting bulbs and other hardy plants has set in, we cannot do better than take account of the state of our affairs, and report either the progress we have made or the shortcomings. If we look at a circular bed of Scarlet Pelargoniums on level ground in a flower garden, we see its beauty as a bright spot, and the eye takes in at once its boundary line. There is no mystery about it. Now let us take the example of what a sailor would call a bluff or piece of ground swollen or jutting out, and suppose it planted with trees overhead, and with an immense bed of Snowdrops by way of carpet, and you see its beauty but not its boundary line; and this mystery hanging over it gives it a fresh charm. There is a plantation of this kind bounded by a stream of water and a footpath near the Bersham Paper Mills, Wrexham. Long before the leaves have budded forth upon the trees overhead, the woodland Squill and tiny Snowdrop will be at their best. It is not these only that come in so opportunely for the dull season, but cheap herbaceous plants, such as the Periwinkles and the Wallflowers, the hardiest of all hardy plants,—and they too delight in bluffs, and blaze in early spring their ruddy gold and sky blue.

Dressed ground admits of more rule and order in its construction than most people are aware of. If we look at the plan of a fortification, with its "fosse o'erflowed" to keep intruders at bay, and its wall behind that with "bastion tower and vantage coign," we shall have an excellent ground-plan for imitation, the ornamental water taking the place of that for warfare, and the bluffs the places of tower and bastion; and when these are planted some part of the clump of flowers will always lie at the proper angle of observation and in a good light. The picture will be charming, for the salient points will be there, but rounded to the art of peace; and these will give scope for rock-work as it ought to be. Where the soil is not suitable for Rhododendrons and Heaths as underwood—the double Gorse and the Ayrshire Rose will do well in the clay land; and the beautiful Berberis Aquifolium, fruiting as it does so freely, and game and poultry being so fond of the berries, will do wonders as underwood.

Another tooth of the wheel of time has come round, and the coming short days have this advantage, that when the sun is low you can arrange all your hardy plants, and the wintry rain pelting pitilessly will do the watering most effectually if you will only begin in time. The Squill and Snowdrop are frequently transplanted when in flower, because at that time they are easily found; but common as they are, they have their time to rest, as well as their time to shake their bells in the wind, and there is now no time to be lost in getting such plants settled where they are to flower.

Let no one imagine that I am excluding rare plants from this undergrowth. I am only speaking of such plants as can be got in thousands, because in small lots they would be only patches, which would in no way connect the tree plantation with that of the dressed ground.

Since writing the above, I am glad to see that other gardeners hold the same views, as may be seen in a letter from Mr. H. Mills, at p. 1218; and that of Mr. D. T. Fish, at p. 1223. Where the planter has copied from Nature the effect will be pleasing, because the plants will seem at ease, and so well suited to the place as if they had never known another home. *Alex. Forsyth, 9, Islington Square, Salford.* [Nothing can be finer for winter bedding than some of the varieties of hardy Heaths, which are far too much neglected. Eds.]

ENGLISH LOCAL FLORAS.—II.

In "Ray's Letters," published by Derham in 1718, is a list of plants by Mr. Thomas Lawson, one of Ray's most valued correspondents, dated 1688, which, though scarcely coming under our designation of a local Flora, may be mentioned here. It contains 149 species, with localities, chiefly from Westmoreland, Cumberland, Yorkshire, and Lancashire, with a few from more southern counties; some provincial names and brief observations are also added.

The next author who has given us a local Flora is John Blackstone, who published, in 1737, his "Fasciculus Plantarum circa Harefield sponte Nascentium." In this small 8vo of 118 pages we have an enumeration of 524 plants growing in the neighbourhood of Harefield, a Middlesex village, separated by the Colne from Denham, in Buckinghamshire, and bounded on the north by part of Hertfordshire. As very few Mosses or Fungi are included, this number is considerable, and many additions are made to it in his later work, "Specimen Botanicum." The plants are arranged alphabetically, the names of Gerard and Bauhin being given; among the more interesting of the species mentioned is the Fritillary (Fritillaria Meleagris), which had not previously been recorded as British. This he found "in Maud Fields, near Rislip Common, observed above 40 years by Mr. Ashby, of Breakspears. The country people," he adds, "call them Snakes' Heads." In this locality they are still found, and known by the same name. The Coralwort (Dentaria bulbifera) is another rarity which he was first to observe in its now well-known locality in the Old Park Wood, Harefield; but this had previously been recorded by Parkinson from Sussex, in 1640. No descriptions of the plants are given, and few synonyms except those already referred to; the habitats and (of the rarer species) localities are added, as well as the time of flowering, which is very accurately stated. Although probably of no great botanical learning, our author offers a good example of a careful local botanist; and in the "Flora of Middlesex" a high tribute is paid to his accuracy. From this work we learn that, "in all, Blackstone was the first to put on record no less than 232 species as Middlesex inhabitants;" and he stands as the sole authority, according to the Middlesex Flora, for the occurrence of Orchis fusca, O. ustulata, and O. militaris, in that county. In a subsequent note, however, published in the "Journal of Botany," for the present year (p. 87), Dr. Trimen states that he has found in the Banksian herbarium specimens of O. militaris, collected by Sir Joseph Banks in another locality, near Harefield. Besides these, three other Orchids, O. pyramidalis, O. conopsea, and Ophrys apifera, also recorded by Blackstone, have been met with but once since, by Michael Collinson, in 1790. Perhaps this disappearance of Orchids may be attributed to "one Miles, a parson of Uxbridge, who," according to a note of Peter Collinson's, in 1757, "is Orchis mad, and takes all up, leaves none to seed, so extirpates all wherever he comes; which is cruel, and deserves chastisement."

In 1746 Blackstone published a second volume, of about the same size, called "Specimen Botanicum," in which are given localities of rare plants from various parts of the country, with many additions to the Harefield list. This is of interest, as being, according to Pulteney, "the last book published in England, on indigenous botany, before the system of Linnæus had gained the ascendancy over that of Ray." Our author died in 1753, and was commemorated by Hudson in the genus Blackstonia, a name which he gave to the Yellow-wort, first separated by Blackstone from the Gentians. This name Linnæus at first adopted, but subsequently abandoned it for Chlora, an older name, by which it is still known. The catalogue of Harefield plants was reprinted, but with modern nomenclature, in the "Phytologist" for May, 1862 (vol. vi., pp. 149—151, new series). A larger number of species is given for Buckinghamshire by Blackstone than by any previous or subsequent writer; among them Jasione montana, which has been found in that county but once since his time, and that in the very "lane leading from Denham to Iver Heath," in which he discovered it.

In 1738, the year following the publication of the "Fasciculus," Dr. Charles Deering, "a native of Saxony," says Pulteney, "who came first to England in the train of a foreign ambassador," published a "Catalogus Stirpium, or Catalogue of Plants, naturally growing and commonly cultivated in divers parts of England, more especially about Nottingham." Considering that he published his book after a residence of only two years at Nottingham, it may be considered as fairly complete, containing, as it does, about 850 plants, nearly 200 of which are among the lower cryptogams. It is the earliest work upon British botany exclusively in which the "virtues" of the various plants are set forth in English; the notes, habitats, &c., are also all given in the same language. Deering seems to have been a great admirer, as well as a diligent follower, of Ray, and acknowledges much assistance from Dillenius; his names are taken from the "Synopsis," ed. iii., with synonyms from older writers; and, as an appendix, he gives a "general distribution of plants" according to that work, which was then the standard one upon the subject. The preface sets forth in a very amusing manner the advantages of a study of botany to gentlemen, ladies, and tradesmen: to the first he commends it as an "agreeable interposition between the bottle and books;" to the second as affording, among other things, "choice of beautiful patterns for their curious needlework;" while the tradesmen are told that, were their thoughts on their walks "agreeably taken up with this innocent and useful diversion, [they] would not lean towards publick houses"! Botany, it would seem from this, is a study which should be strongly advocated by the Total Abstinence Society.

One or two of the plants described by Deering are worthy of note. Those afflicted with the "phyllomania," which is now so prevalent, would do well to look out for the "Arum aureis venis pulcherrimis obsitum," or "Wake Robin with Gold-coloured Veins," which we do not remember to have noticed in any collection of foliage plants. It was "first found by Miss Stanhope, of Bingham, plentifully growing in a close called Fell-dike, between Bingham and Carcoulston, who transplanted it into their gardens, where it continues without degenerating." Can any Nottinghamshire correspondent inform us whether it still lingers in old-fashioned gardens? Deering was the first to report Crocus vernus from its now well-known locality of Nottingham Meadows; and his account of its discovery is interesting. "No mention is made of this in the 'Synopsis.' I found it, in company with Mr. Tutin, a little above Fox Lane, in the clay field; it grows also in Nottingham Meadows in several places on the right hand side of the road going to the King's Meadows. It seemed to me at first that probably some roots might have been carried to that place among the dung from some garden, but when I considered they were very numerous and spread very much, and the above-mentioned friend assured me he had for near 10 years observed them there, I began to doubt whether they might not be of spontaneous growth." This evidence is in favour of the nativity, or at least the complete naturalisation, of this species; and Deering seems also to have met with the other Nottingham Crocus, C. nudiflorus, as this is probably the plant he refers to under the erroneous name of Colchicum commune. He records Datura Stramonium from the same neighbourhood, but "dares not affirm it to be indigenous;" and gives an account of a case of poisoning by the seeds of that plant. He also states that he found the Mistleto upon Oaks in Thorney Wood. A few of his records may be set down as probably erroneous, such as that of his finding the Lizard Orchis in two localities near Nottingham; but on the whole the work seems sufficiently accurate. His remarks on the medical properties of the plants are very copious, and sometimes amusing; but space will not allow us to cite examples. He died in 1749.

In "Plantæ Woodfordienses," published by Richard Warner, an Essex gentleman, in 1771, we find the first traces, as far as local Floras are concerned, of that adoption of the Linnean system which so soon became general in England. Although the alphabetical arrangement is still maintained, the Linnean specific name is given to each species, and its place in the artificial system is added. The names from Ray's "Synopsis" and Hudson's "Flora Anglica" are quoted, the latter being originally taken from the "Species Plantarum," and, as customary in ante-Linnean names, embodying a short description of the plant referred to. The volume contains 518 species, all of the higher phanerogams, grasses, and cryptogams being excluded; of the former, habitats, localities, and times of flowering are given. There is nothing in the work beyond its general accuracy, to demand especial comment; unless we except his note of the occurrence of the Mistleto "on an Oak between Woodford Row and the 'Bald-faced Stag,' near the Ten Mile Stone, and on several trees, many of them Oaks, between Loughton and Mr. Conyers', Copped Hall." Taken in connection with Dr. Bull's recent valuable researches in the matter of Oak-grown Mistleto, these references of the older writers are of some interest; as, unless we suppose them to have fallen into some error—which is scarcely probable with so well-known a plant—its occurrence must formerly have been more frequent than it is at present. *James Britten, F.L.S.*

VENTILATION.

As this is a subject to which I have devoted considerable attention, I wish to offer a few remarks upon your leader at p. 1211. A good deal of interest was excited about ventilation by some papers of mine, some years ago, on this subject. Some objected to them as too high, others as too deep, but I am not aware that the theory of ventilation as set forth in them has ever been seriously impugned. From various causes, the practical part of the subject was left unfinished. I remember well that the purport of one of the papers, which I believe never appeared, was to show the best places for the admission of air; and the easiest means of heating it before it was admitted to the house. An air drain was carried along outside of the house, from which pipes were led, that discharged the fresh air immediately beneath the heating apparatus. The latter, again, it was suggested, were to be furnished with evaporating tins, to charge the fresh air with the extra complement of moisture it could carry in virtue of its superior temperature. By such arrangements fresh air admitted could be both warmed and watered before coming in contact with the plants. It would thus reach them freighted with food, and without levying a water-rate upon succulent stems, tender leaves, dewed flowers, or well-filled fruits. I confess I considered Mr. Ormson's invention an improvement upon my air-drains, &c., rough sketches of which are probably yet in the *Gardeners' Chronicle* office. Were the air channels in Mr. Ormson's pipes to be furnished with a few evaporating pans for water, to be emptied or filled at pleasure, I think his mode of making the fresh air pass through his tube for the heat-

ing of the house one of the best ventilating expedients that has yet been invented. It is easy to write about the bracing mountain air, with its stimulating influence on animal life; but let any one try a rush of it through a forcing-house in March, and note how the plants would welcome it. The fact is, air ought to be warmed before it is sent careering among tender plants freighted with the perfume of "Araby the blest" or any other. You object to the air being warmed by a hot plate, or watered with a vapour bath; but it is difficult to see how else it is to be genialised. At all events this is Nature's method, and no one has yet discovered a better. Neither am I aware that the idea, that seems to pervade a good portion of your leader, that heating the air destroys its quality, can be sustained, either by experiment or experience. No one thinks of roasting air designed for the use of either plants or animals; but such a moderate heating as air would receive in passing through Mr. Ormson's hot-water tube would neither lessen its percentage of ozone, disintegrate its constituent parts, nor deteriorate its quality. The heat would dry it, or, rather, the addition of caloric would cause it to carry more water. But I have already shown how this may be provided, and with such provision the air so charged with heat and moisture seems admirably adapted to sustain the strength and promote the health of growing plants. While the application of moderate heat to the air of hothouses could hardly vitiate, it might do very much to purify, the air. It is impossible to state how many of those living germs of vegetable or animal life, with which Professor Huxley and others assure us the air abounds, might be destroyed by their passage through such tubes as Mr. Ormson has provided for ventilation.

Neither am I ashamed in this age of progress to give a verdict in favour of some of the principles illustrated in the much-praised, much-blamed Polmaise. When Lindley had lauded it to the skies, and the practicals were furious, I made the pilgrimage to Polmaise, and judged for myself. Most certainly the Grapes lacked neither colour nor flavour, nor the air geniality. But Polmaise was a system of heating rather than of ventilation, though it combined the latter with the former. The primary ideas were a renewal and circulation of the internal atmosphere, and the moving air the distributor of its own caloric, thus dispensing with hot-water pipes, flues, &c. The Grapes were well coloured, and, as far as I can remember, by the admission of air in the ordinary way; and had it been otherwise the Polmaise vinery was by no means destitute of those chinks in the roof so much eulogised of late in your columns. After all, you take your coarse woollen netting from the Polmaise wet blanket, and little can be said against your bottom and top openings opposite each other so protected, unless it be that it is a very old and very extravagant mode of ventilation. As to the first, the older the better if the plan cannot yet be superseded by a superior one. The second objection is fatal; nothing is easier than to sweep out one atmosphere and admit another if we are prodigal of heat and indifferent to draughts. The highest art in the ventilation of plant-houses is the effecting of sufficient change of air with the least loss of caloric; and to do both without suddenness or violence, that cause draught, the change of atmosphere should be slow and thorough, not rapid and partial. The analogies of mountain and sea breezes are wholly out of place when applied to the ventilation of plant structures. Within these we should rather imitate the motion of the air on a still summer's day. It is here, again, that I think Mr. Ormson's perforated rafter the right thing in the right place. By providing so many outlets, draughts—cold, cutting, killing—are rendered impossible; the whole atmosphere moves, in "globule doses" if you will, but their countless numbers will make a ventilating pill as efficient as the foremost living gardener's continuous openings opposite to each other at top and bottom. As much or more air will be discharged from the house by Mr. Ormson's method, while the action will be so much milder, that the plant patients will have all their effete air discharged, and the fresh brought within the reach of all, without their feeling the change.

For the purpose of agitating the entire atmosphere I am also of opinion that the lower the fresh air can be admitted into the house the better. In this respect also I approve of Mr. Ormson's arrangements. As a whole, they seem well adapted for effecting a thorough change of atmosphere without exposing the plants to draughts of cold or incursions of dry air. They seem well adapted for admitting as much air into the house, and as little heat out of it as possible, and distributing the fresh air impartially through every portion of the atmosphere. Were the air admitted and discharged through inverted tubes at front and back, much of the dust and many of the germs might be excluded.

The terms outlets and inlets for air are, however, rather misleading. Each are both to a much greater extent than most of us are aware of. This is especially true of ventilating spaces on the tops of houses. An outward and inward current takes place in most or all of these—there are currents in hothouses, no less than mysteries in heaven and earth, that have not been dreamt of by our philosophy. But the following may be accepted as waking realities:—That in every upper ventilating space cold air rushes in as well as hot air out. That such air falls to the lowest part of the house like a stone in water; that as it accumulates there it rolls over or on towards the source of heat; that the heat gives it wings to rise, like a frightened bird, towards the glass,—dashing against its cold surface it either flutters towards the top ventilator, and escapes, or, if winged too severely by the cold glass, it drops to the ground, and again rolls over, or on to, the source of heat. Throughout the whole area of glasshouses innumerable vertical currents from roof to floor and back, are constantly running up or down. These are crossed by horizontal ones at right angles, and at every possible angle; so that the air of our hothouses, apparently so still, is in perpetual motion. All these atmospheric movements, backwards and forwards, and up and down, constitute an important part of the ventilation of plant-houses. Many limit the term to the disharge of one atmosphere from a given place, and the admission of another and a different one, without having any definite idea of how this is done, or why.

All space being filled with air, its mere transposition from one place to another is not so easy as is generally supposed. The necessity, again, of its removal is not always obvious. The primary idea of ventilation was simply the letting of hot air out and cold in to regulate temperature. So far nothing can be more simple, but beyond this and the recognition of the mechanical effects of air in motion upon the growth of plants, the necessity for ventilation, or rather the reasons of that necessity, are somewhat obscure. The reason you advance at p. 1212, that the maturation of fruit depends upon the volume of air that can be brought in contact with it, is certainly not very clear. All fruits are ripened in a volume of air in contact with them, and the cases you cite illustrate the supreme importance of light rather than air as a maturing agent. Colour, again, is not ripeness. In most fruits it precedes it, in many it is altogether absent, and it is still an open question whether the conditions most favourable to the laying on of colour are those best calculated for ripening, that is, the development of the highest quality in fruit.

The highest coloured fruits are by no means the best flavoured, and the rage for colour and size, which found such unexpected advocacy in high places at Oxford, is a popular error, if not an absolute degeneracy from cultivated and refined taste. Mere magnitude and gaudy or heavy colouring may please the young and command the admiration of the uninstructed, but the diamond is none the less prized by the intelligent, though it be small and colourless. *D. T. Fish.*

BRITISH ASSOCIATION.

THE following, among other papers, likely to be interesting to our readers, were read at the recent meeting of the British Association:—

Section B. Chemical Science.

Mr. A. E. FLETCHER, F.C.S., read a paper entitled "Air Pollution from Chemical Works." He remarked that during the progress of many manufacturing processes gases or vapours were given off, which, passing into the surrounding air, polluted it, and rendered it more or less unfit for animal or vegetable life. If all noxious vapours were to be suppressed by the summary stoppage of the manufacturing processes causing them, we must dispense with the use of a variety of useful substances; indeed, it might be said that every manufacture was accompanied at its birth by some offensive smell or smoke. Still, the public were right in requiring that noxious vapours should be reduced to a minimum. Those who were not acquainted with manufactures would be surprised at the large amount of noxious vapours discharged from works. He then referred to the direction which he thought future legislation should take, his opinion being, he said, guided by the observations of Dr. Angus Smith, in his reports. In places where complaints were made against manufacturers by farmers, as to damage to their crops by corrosive smoke, let the district be called "a manufacturing district," upon the requisition of a certain number of inhabitants. To such district an inspector should then be appointed, who should have power at any time to ascertain the nature and amount of the gases escaping from the various works. At the end of each month, or a longer period, the inspector should publish a list of all the works in his district, with a number indicating the average amount of acid vapour he had found upon his visits. There the inspector's duties should terminate, as he should be neither prosecutor nor judge, but merely publish the facts he ascertained, which the farmer himself could never have gathered. He contended that such a plan would be beneficial in its operation. It would be universal in its application; it would embrace every description of manufacturing works. Hitherto legislation had been partial. There was at present an Alkali Act, but it regulated the alkali manufacture only.

Some discussion followed upon Mr. Fletcher's paper.

The CHAIRMAN said there was no doubt that legislation on this subject was much required; and while on the one hand we should endeavour to do justice to the farmer, we must on the other hand be careful not to make legislation too easy, otherwise the manufacturers would be involved in constant litigation.

Mr. GOSSAGE said he quite anticipated that, ere a few years have elapsed, chemical nuisances would be unknown.

Dr. ANGUS SMITH did not doubt that by careful attention to the mode of investigation pursued by Mr. Fletcher it would be possible to know exactly the proportion of sulphuric acid or muriatic acid, and probably of other gases, which proceeded from a particular place. The whole question was one, however, requiring great consideration, and it was only by examination that a proper mode of calculation could be arrived at; but there were some results already ascertained which could be employed in sanitary inquiries. At the same time he was of opinion that the people of this country would not endure the amount of pressure which would be involved in the plan of constituting certain neighbourhoods manufacturing districts.

Dr. VOELCKER pointed out that the farmer might at present suffer considerably before he would engage in an expensive lawsuit. At the same time, he thought that care should be taken that only substances positively injurious were prohibited.

In the course of the discussion it was strongly urged that over-legislation on this question should be avoided; and that at present the crops did not suffer to the extent which was sometimes imagined. It was stated that the Alkali Act had so far been beneficial as to call the attention of manufacturers to the subject, thus inducing them to employ improved apparatus at their works.

Section D. Biology (Zoology and Botany).

This department, which met in the reading room, was presided over by Professor ROLLESTON, who, in his inaugural address, drew attention to the importance, in the interests of science, of trained students observing natural history, and he especially urged the necessity of local observations. He expressed a wish that there was in every district a Gilbert White to write its natural history as White wrote that of Selborne. He urged the desirableness of establishing field clubs, and expressed an opinion that it was to the development of provincial museums that we must look in the future for the extension of intellectual pursuits throughout the land. From these museums, while the chief object of them should be to obtain collections from the districts in which they were placed, he would not exclude foreign specimens, but he insisted upon the proper classifying and cataloguing all specimens. While not depreciating scientific instruction as a means of training the mind, he cautioned scientific students against the neglect of literary pursuits. Proceeding to review the subjects which would be considered in the section, Professor Rolleston said that one of the most important of these subjects, that of spontaneous generation, touched upon certain susceptibilities lying outside the realm of science. He, however, reminded his audience that in the sectional discussions they had only to do with the scientific arguments bearing upon the question; and he hoped that the committee would be supported by the members in excluding all extraneous considerations. Truth being one, all roads leading to it would assuredly converge sooner or later. Their business was to see that the road with which they were particularly concerned was properly laid out. In this view he was glad to be able to fortify himself by the dictum of Archbishop Whateley,—"The possessor of real faith will be fully convinced that whatever suppressed physical fact appears to militate against his religion will be proved to be natural or else be reconcileable with his religion." The Archbishop further said that if he were to found a Church he would make it one of his articles that it should not be lawful to bring forward scripture or religious considerations to disprove scientific theory, which only should be applied in the region of morals. He wished, indeed, that Archbishop Whateley had founded such a Church. This and other testimonies which he quoted were most important; but he could not forbear to point out what might seem to be a want even in the *dicta* of such men. They had allotted the privilege of error of teaching to the utterances of only one of the parties concerned; they had forgotten the woe which religious men and theologians had brought upon the world because of the offences which they, with ill-considered zeal, had created. They had left something unsaid which might be summed up in the homely caution, that there may be faults on both sides. He trusted that discussion upon the scientific aspects of these great questions would not be restrained, it being kept in mind that mutual forbearance might slacken progress as well as excite mutual jealousies. In conclusion, he expressed a hope that the Association would adopt some means to carry out the suggestions he had made in the opening of his address. He said he would be more than satisfied, and all his objects would be fully accomplished, if only as much money could be obtained for these purposes as was lost to the people every year through suffering and death, occasioned directly by ignorance of scientific facts and principles relating to sanitary arrangements alone.

Section F.—Economics and Statistics.

Mr. GEORGE CAMPBELL, D.C.L., read an important paper on "Agriculture in India." He said that he fully recognised that it was the duty of the Government in India, and of the collectors and other officers, to promote the productions of the soil in India by every means in their power. The great point to be aimed at was not so much an increase in the area of production as in the productive powers of a given area. In India the Government was the great head landlord, and the collectors were the agents of the great state landlord, and ought to perform a landlord's duties. They had created native landlord's but to suppose that they would perform the duties of a landlord was one of the anachronisms which we English were apt to cling to in the face of fact. The farmers—the ryots—were, in truth, very good farmers, but they were all on a very small and humble scale, and they had not the education or information to enable them to adopt scientific improvements. He believed it to be wholly and absolutely incorrect to represent them as too conservative to improve. Show them the means of raising better crops and they would readily adopt them. It was, in his opinion, the duty of the collector of a district to promote agricultural improvements in every way in his power. All that Government had been able to do was to facilitate traffic. The secret of improving our Indian Cotton cultivation had not been discovered. It required a method of its own. Government had sent out practical Scotch gardeners, but he doubted if they would have any brilliant success. Now, as to what should be done, in his opinion Government made a great mistake in ceasing to maintain a special college for the education of the Indian civil ser-

vants. The present examinations were a mistake; the young men were crammed as for a special examination, and had very little practical knowledge. He especially referred to their ignorance of arithmetic. India, too, was too much overriden by the legal system. It was not enough to administer India by a rigid system of law The Indian civil servants should be more trained for executive government, with a knowledge of agriculture. His view was, that the Indian civil service should be made a much broader and wider service than it was, and that it should supply men for various executive departments, according to their special aptitudes. He even hinted at a department of agriculture in India. He would also advocate improved security of tenure in India, especially in the new settled districts, many of which were best for agriculture, and which would lead to their development. As to the management of the natives, they were much more easily led than driven.

Home Correspondence.

Lilium auratum.—A plant of this fine Lilium, which has been grown in the open air in my garden here for the last three years, is now in full bloom. The bulb has never been removed nor interfered with since first planted in November, 1867. The stem is 7 feet 6 inches high, and 3¾ inches in circumference at a foot from the ground. On it there are 70 beautifully expanded blooms, which form a perfect cone, extending 2 feet 6 inches down from the top, and measure 4 feet 6 inches in circumference. The flowers are so thickly and uniformly set on the stem, that at a distance the plant looks like a colossal Hyacinth, and impregnates the air with its fragrance for at least 30 yards around it. This grand Lilium in its present state may be said to form a perfect galaxy of floral splendour. It was well said that "Solomon in all his glory was not arrayed like one of these." *James Neilson, Rose Hall, Falkirk, September* 19.

—— I have a bulb of Lilium auratum which grew last year in a 9-inch pot. It produced a stem 9 feet in height, with 20 of its fine flowers on the top. In the autumn the ball was slightly reduced, and transferred to a pot 11 inches in diameter. This year it has produced two stems 9 feet above the rim of the pot; the one bearing 18 of its fine flowers in the ordinary way, but the other, for about 4 feet of the upper portion, became flattened (fasciated) in the stem, cockscomb-like, gradually widening towards the top, where it measures 4 inches in width, and is divided into two parts about 5 inches downwards from the top. This flattened stem has produced 103 flowers, and the whole of them have been perfectly developed. They were produced from both sides, and also from the edges of the stem. The consequence was that the whole of the upper portion, extending some 18 inches downwards, was one mass of bloom, crowded together so closely that it was impossible to see the stem at all, or to distinguish one flower from the other. It has been a grand sight. Have any of your correspondents ever seen 103 blooms upon one stem of this glorious Lilium? *Thos. Jones, Duxbury.*

Echeveria secunda glauca.—This plant is likely to prove a great acquisition for the flower garden, not only in its sub-alpine character, or for edgings as it is used at Battersea Park and other places, but as a flowering plant. It blooms long and profusely, and supplies a colour we have long needed, viz., a deep orange, that contrasts beautifully with Lobelia and other blues. We have a double row of it here this season 400 feet long, planted in front of a row of Lobelias, and the effect of the deep orange-coloured bloom and fine glaucous foliage against the deep blue of the Lobelia is at once rich and striking, and unlike anything I have seen in the way of bedding. I need not speak of the adaptability of this plant in other respects, especially as an edging around beds of E. metallica and other succulents of the larger kind, but as a flowering plant I have not yet seen it tried to any extent. Those who want a stock of it should begin now, by sowing seed in a temperature of 60°. Grow them on all winter in a mild greenhouse temperature, and they will be nice plants next spring for planting out. This is the way to get a stock of it. *J. Simpson, Wortley.*

American and English Potatos.—As "H. R. T." (p. 1252) wishes me to express an opinion of, and describe, the true "Early Rose" Potato, I have no objection to do so. The usual shape of the "Early Rose," as sent here by Mr. Bliss, of New York, is something like the fluke, and of a light dull red, and with many small mole-eyes in a nucleus on little elevations. It is a good cropper, but nothing like so early as the Royal Ashleaf here. The Early Rose was not of good quality or flavour from my ground. It, and also the other American Potatos sent with it, were not waxy, but soft and unmealy. A Potato, in my judgment, should be "white in flesh, dry, nutty, and yet mealy." The American Potatos sent here were all very white in flesh, and the leaves were broad and very handsome. The white Potatos were dingy in colour. I should think they would be acquisitions to cottagers on chalky or sandy soils. They were all excellent croppers, and the form of all were very good; and the eyes were, in the round Potatos, tolerably level. This is all I can conscientiously say. A Potato may be indifferent, or even very bad, in one soil or season, and be altogether good in other soils and seasons. I have not had a bad Potato for two years. I got rid of all deep-eyed Potatos, which ripen later than level sorts. My sorts are: round Potatos—Napoleon and Gryffe Castle Seedling, both excellent and early ripeners, but not late keepers; and kidney Potatos—Royal Ashleaf, Yorkshire Hero, Taylor's Yorkshire Hybrid, Pebble White, and Cobbler's Lapstone, which is the type of a first-class Potato. I dug all the above Potatos ripe by August 6, and I have a capital crop of Turnips in their places. It is curious that, when dug perfectly ripe, their skins adhering firmly, the haulm was as green as in May. I did not find one diseased tuber, very few were grown out. I planted on January 24, and not one single set was frosted, but I lost some in store. Some people around here lost sacks in store. I planted with a stick, which causes free drainage. Almost all my sorts were much nibbled by the worms, owing to the drought. The Royal Ashleaf, or Myatt's Prolific—an excellent sort, not here—and either Hero or Taylor's Hybrid, will take you through a season from June 4 to the same period. Why, then, will you grow deep-eyed croppers which grow out or get diseased long before they are ripe? By so doing you destroy your own comfort, and also much national wealth. All the sorts named by me are good croppers, of good quality, handsome appearance, and "early ripeners." The only novelties here, of merit, are Lord Portman's Bryanstone Kidney, and a seedling kidney, not named, sent from the Dorset Nurseries by Mr. Blandford. The former is white, and does Mr. Leach great credit, and the latter Potato, blotched at the eye, is good: both are good croppers. One word about the Lapstone. I landed this—the best of all Potatos—safe this year; but it usually grows out, even the smallest tuber, before any other sort. Taylor's Hybrid, Hero, and Pebble White are all of Lapstone blood; and hence their excellence. Mind my words, "Plant early ripeners that keep late." You cannot have two better for this purpose than Hero and Taylor's Hybrid. I dug Royal Ashleaf June 4, and left off with Taylor's Hybrid, still excellent. The following may interest the reader:—If you want to test 20 sorts of Potatos, more or less, take them of one size, and whichever weighs heaviest will be the best when cooked; a light Potato never yet was good. If you want to test cooked Potatos without tasting them, break them in half and apply a microscope, and whichever looks in its granules most like white sugar will be the best. If the granules look dark or muddy the tuber will not be good! If you buy Potatos by measure you will get 20 lb. more weight by buying big and little together than you will get by buying all big ones! Finally, Potatos that have grown out in store, and are chimped, cannot be so good for seed as ones that have not grown out. The scion draws matter in a ring from the centre of the Potato, like a ripple in a pond. As soon after Christmas as the ground will work I plant my grown-out Potatos, and do not break off the scion. They keep better and grow out less in the cold ground than in a warm stove or clamp. Lastly, all new seedling Potatos should be cooked before they are certificated. *W. F. Radclyffe, Sept.* 19.

Walnut Preserving.—There is an abundant crop of Walnuts in this neighbourhood this season, and as the time is drawing near when they should be gathered, I have no doubt many of my brother gardeners would feel truly thankful if some of your correspondents would give us, through the medium of your pages, the benefit of their experience, as to the best mode of preserving them. I must confess that, after trying various methods, I have failed to keep them in that clean, plump condition in which we generally get imported ones. *Thos. Foote, Gr., Haldon House, near Exeter.*

Melon Growing at Heckfield.—Your correspondent, Mr. Wildsmith, is perfectly right in all that he writes about Melon growing. I have myself for many years past taken three crops, and this season, if I had not wanted the house for Cucumbers, I might have had good Melons until Christmas. *R. Gilbert, Burghley, Stamford.*

—— I am obliged to W. Wildsmith for his offer, but I have got an abundance of really good Melons, sufficient for my own supply, besides other plantations for succession; yet will be glad if he will honestly and without reservation answer me the following:—When did he first gather fruit from the plants now bearing the supposed fifth crop? Also how many of these crops were apparent and showing at the same time on the same plants? Further, can he reasonably suppose that any practical gardener, possessed of common sense, will be induced to believe that after a Melon plant has been in bearing for say six months, it will then be capable of perfecting fruit equal to its first or any former produce? *T. C.*

Larch.—The Larch has been extensively planted in the woodlands in this neighbourhood, and I am very sorry to see so many of them without foliage at this season, as that appears to me an ominous sign of the tree being in a decaying state. About this time last season I observed many of the Larch trees losing their foliage; in fact some had lost it weeks before, and of course were perfectly dead. Some were cut down, and a few remained, but did not show the least signs of life in the last spring, but are quite dead; and I believe those similarly affected this year will suffer the same fate as those of last year. I shall feel obliged if some of your numerous correspondents will inform me if the Larch timber be similarly affected in any other parts of the country, and in what locality. *L., Worksop.*

Beehives.—I keep bees for experimental purposes, and am therefore rather particular to have my hives properly constructed. I don't care about the cost, as it occurs only once in a lifetime. There appears to be no end to the wear and tear of a beehive, if properly constructed, with good workmanship and well-seasoned wood, for I am no friend to straw hives; in short, I consider the cost of a good hive quite of a secondary consideration. I am much taken with fig. 233 at p. 1222, and should esteem it a favour if "M. D." will inform me through your columns where I can get this honey-trough hive properly constructed, as it appears to be just the kind of hive required for experimental purposes. I have read over and over again "M. D.'s" communications, and hope for the benefit of myself and others he will continue them for some time to come. We in this country have no publication devoted entirely to bees, as there is in Germany, America, and France, where all bee-keepers can have their say; and I have to thank you, Mr. Editor, for giving place to the valuable contributions of "M. D." in the *Gardeners' Chronicle. J. F. H.* [We can only say that the honey-trough hive, as exhibited at the Royal Horticultural Show at Oxford, can be constructed by any village carpenter, provided the directions be followed which we gave in our former number, and the woodcut, fig. 233, p. 1222, but care must be taken about the "bar-frame." We should therefore advise "J. F. H." to apply to Mr. Pettitt, Snargate Street, Dover, who exhibited the hive alluded to. We hope to keep the discussion alive through the winter with regard to bees. We find even the "American Bee-Journal," with such a wide field as that country affords to bee-keepers, is becoming all "buzz." *M. D.*]

Cherry Laurel and Benthamia in Fruit.—One of your correspondents speaks of having the Cherry Laurel in fine fruit. Will you allow me to say, through your columns, that if he or any one else will kindly save me two or three nice sprays, rather under-ripe than over-ripe, and with a few leaves attached, I shall be sincerely obliged, and will gladly refund the postage. If placed in a little box stout enough to bear some hard usage they could come by pattern-post. I am very wishful also for a spray of the fruit of Benthamia fragifera, if any one can kindly oblige me with one on the same terms. *Leo H. Grindon,* 71, *Rumford Street, Manchester.*

Roses for Exhibition.—Would Mr. Radclyffe give a list of 24 of the best Roses for show in different colours? *M. A. B.* [In reply, Mr. Radclyffe kindly sends us the following list and comments:—1. Maréchal Niel, golden yellow; 2. Charles Lefebvre, rich darkish crimson; 3. Sénateur Vaisse, dark red; 4. Marguerite de St. Amand, pink; 5. Pierre Notting, dark purple-crimson; 6. Gloire de Dijon, orange-yellow; 7. W. Griffiths, salmon-rose; 8. Prince Camille de Rohan, maroon; 9. La Ville de St. Denis, pure rose; 10. Madame la Baronne de Rothschild, creamy pale rose; 11. Dr. Andry, deep red; 12. Souvenir de la Malmaison, blush; 13. Madame Victor Verdier, deep red; 14. Alfred Colomb, fiery red; 15. Maurice Bernardin, vermilion; 16. Comtesse Cecile Chabrillant, pink; 17. Léopold Premier, dark red; 18. John Hopper, rose, crimson centre; 19. Triomphe de Rennes, yellow; 20. Devoniensis (Tea), creamy yellow; 21. Mademoiselle Marie Rady, fine red; 22. Louise Peyronny, silvery rose, with rose margin; 23. Jules Margottin, bright cerise; 24. Madame Willermoz, white. As 20 and 24 are Tea Roses, and may be objected to, supply their places with Princess Mary of Cambridge, pale rose, and Felix Genero, rose with silvery lilaceous reverse of the petals. These are also noble show Roses,—Madame Boll, rose; Maréchal Vaillant, brilliant crimson; Madame Boutin, cherry-crimson; and Marie Baumann, fine carmine. I should have liked to have put among the 24 Roses Madame Masson, deep claret, and Mesdames Vidot and Rivers; but they are not very good growers, or hardy. The 24 named above are good growers, and hardy for their families. Observe, finally, the largest Roses should be placed in the top line, the next largest in the second line, and the smallest in the third line. As far as may be, the colours up and down the lines should be contrasted. The new Tea Rose, Marie Sisley, is blooming here now, and is extra fine. I saw the Tea Rose, Madame Trifle, at Blandford to-day; it is very good. *W. F. Radclyffe.*]

Root Blight.—In the *Gardeners' Chronicle* appeared recently a note, as if I was totally in error as regards the systematic position of the Fungus, which, according to the extensive observations of my friend, the Rev. Dr. Muecke, causes the root blight or root decay of the Wheat and some other cereals in Australia. This Fungus is, however, closely allied to Willkomm's Xenodochus ligniperda, which causes the red decay (Roth faule) in Oaks, Pines, &c. That particular Fungus was placed by Rabenhorst into Schlechtendal's genus Xenodochus, and its peculiar

ravages are altogether similar to the attacks of our Xenodochus on the roots of grasses. The temporary name which I gave might be changed into X. graminiperda. It is quite possible that Xenodochus must be altogether eliminated out of the series of genera. But as the metamorphosis of so many of the lower Fungi is as yet imperfectly understood, we must leave the whole Xenodochus question as yet an open one; and in placing the cereal Fungus with the wood Fungus I did not wish to do more than indicate the affinity, both structural and physiological, of both. The Fungus of the Takeall was considered by some observers a Fusidium, to which genus it certainly belongs not. *F. Mueller, Government Botanist, Melbourne.* [Without a sight of the Fungus referred to—Xenodochus—it is impossible to speak with any confidence. We should not, however, expect to find a Fungus closely allied to X. carbonarius, which occurs on the leaves of the Great Burnet, or the roots of Wheat, much less on Oat. The Fungus which causes red-oak in England is Xylostroma corium, and we therefore thought there might be some confusion between Xenodochus and Xylostroma. If Dr. Mueller will favour us with a specimen of the Fungus in question, we will give it our best attention, and at the same time we should be glad to have a reference to the publication in which Rabenhorst referred Willkomm's Fungus to Xenodochus. Schlechtendal's genus is not likely to be eliminated as far as X. carbonarius goes, which is a most remarkable Fungus. EDS.]

Flower Show Appeals seem to be the order of the day; every garden newspaper editor is constantly called upon for his decision in certain matters relating to flower show disqualifications, &c. Now this undoubtedly occurs in a great measure through the schedules not being properly and distinctly worded, and on the other hand, through exhibitors not complying with the wording of the schedule, which, if acted up to, whether properly worded or otherwise, certainly would prevent to a great extent these constant appeals. During the past week one exhibitor complains of being disqualified through having more than one Lilium in a pot, the said pot being exhibited in a collection of greenhouse plants; surely if a pot of Liliums was admissible at all it should not have been disqualified through having more than one bulb in a pot. A second exhibitor complains of being disqualified through extracting the eye from a Dahlia,—very properly, too; a third through showing Bougainvillea glabra as a greenhouse plant, in a collection where the schedule distinctly states for the best six stove and greenhouse plants in flower: the five were all stove plants, the exhibitor admitted, and there can be no question about the Bougainvillea, for it is certainly not a greenhouse plant; therefore, there being no greenhouse plant in the collection it was very properly disqualified, and by two of the best plantsmen in the North. The society where this last disqualification took place formerly used to give separate prizes for collections of stove and greenhouse plants, but the latter always cut such a poor figure so late in the season that it was determined to class them both together, and award the prize for the best stove and greenhouse plants, hence the proper disqualification. *Edward Bennett, Enville Gardens.*

How to Destroy Ants.—My vineries, Peach-houses, and greenhouses are all infested with a small ant, introduced by some plants (Tree Ferns, I believe) bought by my head gardener at a sale. Besides being an eyesore they are very severe upon the ripe fruit. We have tried to poison them with strychnine, arsenic, and poisoned paper, but all to no effect. Can any of your correspondents suggest any means by which we can get quit of the destructive pests? *Arch. Orr, Ewins.* [There are many remedies recommended, but none that we have tried are effectual. Will any of our correspondents, who have an effectual recipe, kindly give us the particulars. EDS.]

Sunflower.—I have a fine Sunflower now growing in my garden, with a simple stem and terminal flower, which, within 2 inches, reaches the size of the Sunflower referred to by Mr. Wakerill. This flower is 15 inches in diameter, the disc of florets measures 8 inches in diameter, the leaves, large in proportion, 17 inches across. *W. G. Smith.*

Potatos Grown from Transplanted Shoots.—I have this year tried an experiment which may interest some of your readers. In the spring I planted some American Early Rose Potatos, and as soon as the shoots were fairly above the ground, from half an inch to 1 inch high, I set to work to remove all the shoots, except one, from each Potato; this I had been informed would ensure the growth of large Potatos. My informant was Mr. Carmichael, of Sandringham, gr. to H.R.H. the Prince of Wales; he, however, has kindly commended my experiment, which, he says, he believes to be new. The experiment was as follows:—When I pulled the shoots gently and carefully, I found that they came out entire, with a compact little tuft of rootlets and without a particle of old Potato, and their perfect appearance led me to think that they might maintain an independent existence, so I made little holes, about a foot apart, in rows 18 inches wide, and therein planted my handful of shoots. I was delighted to see that they grew and flourished, and not less so when I took them up, and found a fair crop of Potatos. The united length of the three or four rows which I had planted was 18 yards, and from this I took up 3½ stones of Potatos, of which 33 weighed 17 lb., seven weighed 5 lb., and one about ¾ lb. When planting them I gave away six shoots, which remained after I had put in all the best, and they were planted after being some hours out of the ground, but although one shoot died, the remaining five produced 8 lb. of Potatos. I cannot hear of any one who has tried the plan which I have described, but if it should have been done, perhaps some of your correspondents will be kind enough to say what results have been obtained. Perhaps I ought to add that my ground was not well manured, and that the yield from the transplanted shoots was as great as, if not slightly in excess of, that from the whole Potato. *A. E. Barrett, Grimston, Lynn, Norfolk, Sept. 20.*

Grindelia hirsutula.—The plant referred to by Mr. Harper Crewe, at p. 1054, the name of which is printed Gundelia (probably a printer's error) is Grindelia hirsutula. Gundelia is a Syrian plant, totally different, though both are Composites. *W.*

Passiflora quadrangularis as a Conservatory Climber.—I believe this plant is generally considered to be too delicate in constitution to succeed in an ordinary conservatory. I am led to this belief by seeing it classed amongst stove plants in most nurserymen's catalogues, and also from the fact that several practical men in my own neighbourhood have expressed their astonishment at seeing it thriving in the conservatory. It will be seen, however, from what I shall say, that the plant does not require that amount of coddling to which it is generally subjected. In August, 1868, my employer had a plant of this Passiflora presented to her, and having no room to spare in the stove, we decided to give it a trial in the conservatory, with the intention of removing it to the stove should it not do well. A place was accordingly prepared for it by removing from one of the pillars a plant of Smith's Defiance Pelargonium. The soil was taken out and replaced with a suitable compost, into which it was immediately planted. The leading shoot was trained round the pillar up to the roof, a part of which it was required to cover. The plant then started into vigorous growth, but did not flower that season. The following March I pruned it back rather hard, and by April it was again growing very freely, breaking almost at every eye, and I found it necessary to thin out much of the young growth as the season advanced. By August, 1869, it had covered the portion of the roof allotted to it, which measured 18 feet by 6 feet. It began to flower early in September, and continued producing from 6 to 14 of its beautiful fragrant blooms daily till the end of October. At that time the house was filled with the Chrysanthemums, and with a view to prolonging their bloom as long as possible an abundance of air was kept on, and no fire used except on one or two occasions; indeed, the house was kept comparatively cool all the winter. About the second week in February an increase in temperature was allowed for such things as Primulas, Cinerarias, &c., onward through the spring months. The pruning was done in March this year, and the plant was generally treated as before mentioned until the middle of August, when the conservatory was painted inside and out, and it became necessary to take down all the climbers from the roof, pillars, and walls. The Passiflora was laid on a sort of trellis, covered over with a mat, and thus kept for three weeks. In again training it to the roof I was obliged to cut off a considerable portion of the lateral growths, notwithstanding which, and having the doors and sashes open during the time of painting, as well as having an abundance of air on day and night since, the plant is now full of flower, from 5 to 15 opening every day. *N., Blandford.*

Bougainvillea spectabilis.—This plant for many years baffled the efforts of gardeners to bloom it, and is the least attractive of any of the species, on account of its natural season of blooming with us, which is in our very shortest days. Can any of your readers say what is its season of blooming in Malta, where it is said to do well, as compared with the other sorts? It is not worth cultivation in England. *J. S.*

Grapes from Old Vines.—I send you a bunch of Grapes from a very old Vine, also some of the soil in which they grow. I cannot tell you the exact age of them. The most information I can get is this:—An old workman who had been on the place all his life, and died two years ago, at the age of 70, frequently told me that when a boy he remembered them spoken of as the old Vines. A new roof had been put on the house in his time, and you know that roofs were roofs formerly, and not like those of our days, when the builder may expect to outlive his work. This evidence naturally led me to inquire if they had been planted by Pitt, the statesman, but I doubt if they were. If such is the case, they are not more than 100 years old, and yet from the evidence of my informant they must have been planted by Pitt. Six years ago they had got into such a bad state of shanking that scarcely any were fit for table. It was decided to renew the border, and a son of my old informant tells me that he could have put all the roots in his coat pocket. There were some as thick as a walking-stick stretching about 10 or 12 feet from the house. The soil they now grow in, though the best that could be obtained, is not what one would wish to have, still I am happy to say that they have for the past four years improved 50 per cent., so that you may imagine what they were then, for they are not much now. I believe that two Vines were only planted, the others being layered from them. It appears that they have been cut back close to the bottom at times, for the rods are only as thick as some of six or eight years' growth. There is a quantity of Fungus in the border, similar to the few threads on the portion sent to you. It was not in last year. *Wm. P. Roberts, Holwood.* [A very nice sample. EDS.]

Double Pansy.—I inclose specimens of a double Pansy, and should be glad to know if it is rare. I have never met with it in England or Scotland. It has flowered very freely here for the last three summers without any artificial watering whatever, and as the flowers are very double and stand well above the foliage, it is very showy, as well as most useful for bouquets and cut flowers for vases. *Joseph Dinsmore, Glenvill, Fermoy, Ireland.* [This appears to be distinct from the double Pansy sometimes met with in this country. It has more white in the centre of the flower, and, in fact, appears to be one of the ordinary purple and white Pansies, duplicated so as to form a full double button-like flower of a very ornamental character. It must be a good border flower. EDS.]

Foreign Correspondence.

THE SCREW PINE OF NEW ZEALAND. In a recent visit to the Bay of Islands and the Canadian settlement, Dr. Stratford found this plant, the Freycinetia Banksii, or the Kiekie of the natives, growing in splendid luxuriance, and showing a great abundance of very fine fruit. The doctor has long since had a conviction that if the plant was introduced into England and properly cultivated, it would make an addition to the horticultural productions which would be highly prized, consequently he procured some of the ripe fruit, made a drawing of it, washed out the minute seeds, and sent them to a well-known tropical horticulturist to bring the plant into public notice. It is astonishing how little is known of the Screw Pine by the European inhabitants of New Zealand; although it has long been recognised, and highly approved of, by many of the settlers, still it has never been offered for sale in any of the fruit shops, or any attempt made to render it of economic value.

The Freycinetia Banksii is found growing very plentifully in the forest of the North Island, and is known to be remarkably abundant and luxuriant north of Lake Taupo, and at the northern extremity of the island, particularly about Hokianga and the Bay of Islands. It is a lofty climbing plant—rooting as it ascends the highest trees—of long, straggling habit, and known by the tufts of its long grassy leaves, with serrated edges. Its leaves are often 3 feet long, minutely toothed, with long extended tips. Its flowers are on separate plants, and are seldom produced more than once in two years. The male flowers are in cylindrical spikes, 3 or 4 inches long, surrounded by white fleshy bracts, or, as some would call them, petals, while the fruit is an oblong, green spadix, consisting of a multitude of laterally compressed carpels, or compound ovaries, each about the third of an inch long, the lower part soft and hollow, the walls of its cavity diversely covered with minute pendulous seeds, the upper part thickened, very hard and solid, with trunculated top. The whole fruit, when perfectly ripe, is of a rich brown hue, and of a very tempting aspect. Each fruit is 6 or 8 inches long, and often 6 or 8 inches in circumference, and there is generally three or four in a bunch. It has long been known to the natives, and is vastly prized by them: while many of the European settlers speak highly of its qualities.

There is a remarkable peculiarity in this plant, insomuch that the bracts or petals are eaten as well as the fruit itself. The flower bracts are fit to eat in the spring—that is, in the months of October and November. They become fleshy and tender in the male flowers, when the pollen is matured, and in a corresponding degree when the female flowers are fully developed. The edible bracts are more numerous and fleshy in the male than in the female flowers. They are much sought for by the natives for their sweet and luscious taste, while by the settlers they are said to have been made into a jelly, having a flavour resembling Strawberry jam. The fruit ripens late in the autumn, in the months of May and June. The hard grains, or crenated tips on the outside, are stripped off and rejected, and the sweet mucilaginous pulp containing the minute seeds is eaten. The flavour of the fruit is somewhat peculiar, and, as is often the case with foreign fruits, the taste for it has to be acquired before it can be fully appreciated. Under any circumstances, it is far from unpleasant; it sometimes appears to gain a flavour from the tree on which it is growing. Upon the whole, it is a most luscious fruit, nor is it an insignificant bearer. Under cultivation it will, in all probability, become a general favourite, and rank in close proximity to the Pine-apple.

The leaves of the plant are used by the natives for making small baskets, mats to sleep upon, and belts. For these purposes the leaves are split into strips about the eighth of an inch wide. They are also used, after being steeped in water for some time, so as partly to

macerate them, to make a kind of shaggy cloak to keep off the rain, which they do most effectually. The leaves of the Kiekie are inserted in a sort of framework, made of New Zealand Flax, so that the mat or cloak somewhat resembles in appearance the thatch of a roof. In some cases it is said that the seeds of the Kiekie are carried by birds, who are very fond of the fruit, and dropped on the branches of some of the neighbouring trees, or deposited in the tufts of ancient parasites which live upon them; here they grow, and soon send down numerous aërial roots to the ground; these are often long and tough, sometimes divide before they reach the earth, and are covered with numerous spongioles which seek nourishment from every available source. These roots are used for making baskets to catch the lamprey, for when the bark is taken off they are found to be very tough and almost indestructible.

After having spoken of this fine fruit, we may say a few words of the locality in which it was so abundantly found—the Canadian settlement of the Bay of Islands. Upon arriving at it, the mind of the traveller naturally reverts to the settlers' home in the backwoods of Canada—the substantial log-house and the old snake fences, hewn out of the dense forests, bearing evidence of the untiring industry of the people, and giving promise of plenty and prosperity. There is no doubt but that the Canadian settlement is a great fact, and forms a wonderful contrast to the slovenly method of farming generally adopted in this country. Although but a short time since they arrived, one of the settlers has made himself a hand fanning or winnowing-machine, that he could not have obtained in Auckland for £40, and is now making himself a stationary threshing-machine, to be worked by two yoke of oxen, and, when finished, it is expected that he will be able to thresh out his stack of Wheat (standing close by), at the rate of some 100 bushels a day. This is a positive proof that good Wheat may be profitably raised in this country, as well as any other part of the temperate latitudes, provided the simple labour-saving machines of our American cousins are employed. A fanning-machine, such as above mentioned, could be purchased in Canada for £5, and is in the possession of the poorest farmer, enabling him perfectly to clean his grain for market; while the stationary threshing-maching under cover, turned by horse or oxen-power, by means of an endless chain, permits him to thresh his own grain with great facility, and to do the work when he could do nothing else.

We think that the country is to be congratulated on the settlement of these industrious people in this fertile neighbourhood, and we are pleased to hear that they soon expect to have a great accession to their number, and that the Colonial Government and Superintendent of the Province of Auckland have been petitioned to reserve an adjoining lot of land for the location of the expected immigrants. *New Zealand Herald, Auckland.*

Societies.

ROYAL HORTICULTURAL: *Sept.* 21.—Major Trevor Clarke in the chair. The general business of the meeting, including that of announcing the awards of the Fruit and Floral Committees, being completed, the Rev. M. J. Berkeley proceeded to address the meeting, first calling attention to the flowering specimen of Dendrobium chrysotis, a plant which was introduced from Assam, and was bought amongst a batch of Dendrobes at one of Mr. Stevens' sales. It closely resembled D. fimbriatum, but on examination the marking of the lip and the size of the petals were found to be different, moreover, the latter plant came from Nepal; still, although it had been described by Professor Reichenbach as a distinct species, it was probable that it was only one of the forms of a large group. A flowering specimen of Gloxinia insignis, from the gardens of W. W. Saunders, Esq., was then alluded to as having been formerly known under the name of G. maculata. The stem was beautifully spotted, and though the plant was scarce, it was deserving of a more extended recognition. Fuchsia coccinea, flowering specimens of which were shown by the Chairman, was next commented upon. This plant was introduced into this country so far back as 1788, but it seems to have been generally lost sight of until it was re-discovered in a greenhouse in the Botanic Gardens at Oxford in 1867, the much hardier F. magellanica, which was introduced from Tierra del Fuego, soon after it, having usurped its name, and got distributed throughout the country, whilst the true plant lingered only in Botanic Gardens, finally surviving in the Oxford Botanic Gardens, thanks to the great care of the Baxters, father and son. Mr. Berkeley then read Dr. Hooker's description of the plant, as given in the "Botanical Magazine," tab. 5740, vol. xxiv. of the third series. When in Scotland a few days ago (said Mr. Berkeley), I was much struck with the beauty of some fruiting plants of the scarlet-berried Elder, Sambucus racemosa, of which there were some 40 or 50 specimens, about 8 feet in height, growing in Aberdeenshire, and loaded with their lovely racemes of scarlet fruit, a quantity of which I had gathered and sent to Chiswick, to be raised for distribution. The subject of the new Vine disease, which in some establishments has done damage to the extent of some hundreds of pounds, was then adverted on, Mr. Berkeley remarking that he was first enabled to examine the insect which gives rise to it in 1867 at Powerscourt, in Ireland, where it was pointed out to him by the gardener there, Mr. Dunn, who until that time was not aware that it attacked the roots. From the fact that the eggs found on the roots were larger than those seen on the leaves, he at first thought the insects to be distinct, but an examination under the microscope had determined them to be identical. Many remedies had been tried to get rid of the pest, though unfortunately they have all proved ineffectual, until a method was hit upon and successfully tried by Mr. Dunn, and which was communicated by him to Mr. Barron, the Society's superintendent of the Chiswick Gardens, when on a visit to Powerscourt a few days ago. The Vines in question had got into a very bad state, and Mr. Dunn had the roots taken out of the ground, and all the soil removed; he then cleaned the canes, and washed the roots three times with clean water, after which they were planted in a new border, and from the testimony of Mr. Barron, he (Mr. Berkeley) was enabled to state that the Vines were in as good a condition as could be wished for (see p. 1277). It was then mentioned that M. Planchon had stated that he had found winged specimens of the male insect, which, so far had not been reported in this country, and if any one was unfortunate enough to be troubled with the pest, and found winged specimens, they would confer a benefit on the Society by forwarding the same to Mr. Andrew Murray, to be placed in the Society's entomological collection. The subject of Potato grafting then came under notice, some particulars of which will be found at p. 1277; after which it was stated that a good Tomato salad was made by cutting some Tomatos into slices, and mixing them with water Cresses, and Garlic or Shallots, and with plenty of salad oil, and a little vinegar.

Mr. Marshall, Clay Hill, Enfield, announced that he had at present some male flowers of Nepenthes, and if any one had female flowers, and wished to fertilise them, the pollen was at their service.

It was then announced that the next meeting would be held on October 5, when prizes would be offered for collections of edible and poisonous Fungi, and it was hoped that some attention would be paid to have them correctly named and neatly arranged.

Floral Committee.—Mr. J. Fraser in the chair. This was a very successful autumn meeting, the subjects being both numerous and interesting; and the meeting was well attended. From Messrs. Veitch & Son came a large collection of plants, including several fine specimens of Nepenthes hybrida, hybrida maculata, Hookerii, Rafflesiana, Dominiana, rubra, and ampullacea; and of Orchids, such as Vanda Bensonii, Masdevallia Veitchii, with six finely developed flowers; Cypripedium concolor, Catasetum fasciatum pliciferum, curious in form, and of a deep bronze and pale green colour; also Odontoglossums, Cattleyas, &c. A Special Certificate was awarded, and was well merited, the specimens of Nepenthes especially being in remarkably fine condition. Mr. B. S. Williams had several well-flowered specimens of Odontoglossum grande, together with flowering examples of Phalænopsis amabilis, Cypripedium Stonei, Oncidium incurvum, Miltonia Morelliana var. atrorubens, &c., which also received a similar award. Messrs. J. & C. Lee, Hammersmith, staged a fine group of flowering and fine-foliaged plants, including a magnificent specimen of Dendrobium calceolare, bright orange-yellow; and Livistonia altissima, a very neat Palm. A First-class Certificate was voted to the latter, and a Special to the collection, which contained many choice and interesting Palms, including Geonoma Verschaffeltii, a dwarf stocky habited species, with broad bilobèd leaves, and very distinct in character. From Messrs. E. G. Henderson & Son came a collection of Tree Carnations, and another of variegated Pelargoniums, to which special awards were made; also specimens of Thymus citriodorus aurea, a dwarf compact-growing form of Golden Thyme, a useful little plant for rockwork or carpet bedding; and Alternanthera magnifica, both of which were deemed worthy of first-class awards, a distinction which was also conferred on a new bedding white woolly-headed Cineraria, named argentifolia, from the same firm. Messrs. Ivery & Son, Dorking, exhibited a fine collection of hardy British Ferns, which received a special award; and also a group of new forms, to the following of which First-class Certificates were awarded:—Polystichum angulare congestum, Scolopendrium vulgare Iveryanum, and S. vulgare lacerato-cristatum, the two latter being dense crispy ornamental forms, well adapted for general decoration. To Mr. A. Parsons, gr. to W. J. Blake, Esq., a First-class Certificate was given for Athyrium Filix-fœmina Blakei, a very handsome crested plumose form raised at Danesbury; and to Messrs. J. & C. Lee a similar award was made for a robust bronze-foliaged Pelargonium, named Mrs. John Lee. First-class Certificates were also voted to a new seedling Gladiolus named John Standish, large pale blush, with purple-lake feathers, a flower of remarkable smoothness and substance, and possessing all the properties of a first-rate florist; it was shown by Mr. J. Douglas, gr. to F. Whitbourn, Esq., Loxford Hall. Also to the following Dahlias—Annie Hobbs, a white self; Gem of the Season, deep rose, golden-tipped, very pretty, shown by Mr. G. Harris, Orpington; and Mary Keynes, a fine tipped flower, of a creamy white colour, deeply tipped with rose, from Mr. Keynes. The latter also exhibited Victory, deep purple self; Flossy Williams, very large fancy; and James Cocker, a large, flat, broad petaled flower, deep crimson; Mr. Thomas Hobbs, Bristol, sent Robert Lambert, a large purple self; and Mr. G. Rawlings, Romford, had George Peabody, of a lighter shade of colour: to all of which Certificates of the 2d class were given. Mr. Eckford showed a stand of new Verbenas, to one of which, named Peter Williams, intense scarlet, with bold white eye, a First-class Certificate was awarded. Mr. J. Walker, Thame, Oxon, had the best stand of 24 cut Asters; Mr. J. George, gr. to Miss Nicholson, Putney Heath, being 2d. The best 12 also came from Mr. Walker, Mr. George being again placed 2d, and Mr. B. Porter, gr. to E. Benham, Esq., Isleworth, 3d. The Asters, as might have been expected from the lateness of the season, were of very poor quality. In the class for 12 double Zinnias, six colours, the best came from Mr. Walker, and the next from Mr. Porter. Mr. William Paul had a large collection of cut Roses, and also of cut blooms of Pelargoniums, to which a Special Certificate was awarded. Mr. Green, gr. to W. W. Saunders, Esq., had a flowering specimen of Gloxinia insignis, and a cut spike of a fine variety of Acineta Barkeri; also several forms of Agave, including A. Besseriana candida, which received a first-class award. A First-class Certificate was awarded to Messrs. J. Brooke & Co., Fairfield Nursery, Manchester, for a splendid example of the new golden-flowered Dendrobium chrysotis, which will shortly be described in our columns; and Special Certificates to Messrs. Standish & Co., for a collection of hardy shrubs; and to Mr. A. Waterer, of Knaphill, for a group including specimens of different sizes of his beautiful Cupressus Lawsoniana erecta viridis, and of the pendent-habited C. Lawsoniana gracilis, together with a dwarf narrow-leaved Rhododendron called Cheiranthifolium, suitable for winter bedding.

Fruit Committee.—G. F. Wilson, Esq., F.R.S., in the chair. A very good meeting with above the average number of exhibits, and made very attractive by the excellence of a large collection of Potatos shown by Mr. Fenn, The Rectory, Woodstock. These were divided into four sections, comprising (1) Fenn's Minimusians, a very dwarf class of Potatos, raised expressly for small suburban, villa, or children's gardens. In this group, Father's Favourite, a second early white kidney, a good keeper; Yellow Girl, first early, white round; Mother's Pet and Curly Poll, both fine early kidneys, and said to be good for pot culture, seemed well adapted for the purpose in view. (2) Seedlings for the frame. The most noteworthy amongst these were, of rounds, James Morris, early yellow; Eliza Fenn, early white; and Lizzie Polly, first early white, remarkably smooth and even; and of kidneys, Mary Bowers, first early, a good forcer; and Woodstock Kidney, a fine smooth second early variety. (3) For the garden. These were principally round kinds, including Goldfinder, fine second early, a good keeper; Cricket Ball, large smooth red, second early, for winter use; Rector of Woodstock, white, second early, and a good keeper; English Rose, second early, smooth red; and Betsy's desire, second early, and a good keeper, a good variety for cottage gardens; and (4) new seedlings for field culture. In this group there were four varieties staged:—Hope in the Future, a kidney of excellent promise, which Mr. Fenn has crossed again with the Woodstock Kidney to gain a finer form; Bountiful, second early red kidney, an immense cropper; Ruddy as a Cherry, round red, late, and a long keeper; and Live in Hope, large white, flattish oval-shaped, of good quality, which has also been crossed again to obtain roundness in shape and shallowness in eye. With the above came a collection showing the effects of grafting, with Mr. Fenn's remarks on the different breeds. These mainly consisted of Yorkshire Hero grafted into Fenn's Onwards, showing produce ugly in form, and dry and harsh in eating; Yorkshire Hero grafted into the Fluke, the produce of which eats dry even to grittiness—quite worthless; Fenn's Onwards grafted into Yorkshire Hero, produce not so good in flavour as either of the parents; Wheeler's Milky White grafted into Fluke, produce finer and harsher, and not so good in flavour; Irrepressible Nigger grafted into Fenn's Purple Kidney, produce of a comical and most fantastic form. The conclusion which Mr. Fenn has drawn, after three years' experiments, is that the grafting of one variety on another materially influences the character of the offspring, though in most instances for the worse. A Special Certificate was awarded for the interesting display. He also again exhibited specimens of Apples, to show the influence of the stock upon the scion; also a pie to show the excellence of the variety for culinary purposes, but the latter had been sweetened too much to be of any service. Prizes were offered for the best dishes of early dessert Apples and Pears, and for a collection of Tomatos. In the class for the best dish of dessert Pears, Mr. J. Smith, gr. to the Earl of Gainsborough, Exton Park, took the 1st prize with Beurré d'Amanlis of very fine quality; Mr. Craddock, The Gardens, Compton Verney, being 2d with very fine Louise Bonne of Jersey. Mr. Douglas had fine specimens of Louise Bonne of Jersey, as also had Mr. Gilbert. Mr. S. Wells sent Beurré Hardy, and Mr. W. Gardiner, Gansel's Bergamot. Mr. Douglas was 1st for the best dish of dessert Apples, with Cox's Orange Pippin, Mr. Craddock coming in 2d with very fine Ribston Pippin. Good specimens of Downton Pippin, Cox's Pomona, King of the Pippins, and Fearn's Pippin, were also staged. Mr. Paul received a Special Certificate for a fine collection of cooking Apples. Messrs. Wheeler & Son, Gloucester, exhibited a new Pear, named Brockworth Park Seedling, a large, handsome, and good flavoured variety, bearing considerable resemblance to Louise Bonne of Jersey; to this the Committee gave a First-class Certificate. Messrs. Wheeler also exhibited specimens of an excellent Lettuce, under the name of Highnam Court, which was considered identical with the variety known as the Princess Royal. From Messrs. Lane & Son, Great Berkhampstead, came a fine collection of 15 well-grown varieties of Grapes, which received a special award; and from Mr. W. Paul came a large collection of new seedling varieties, some of which were highly appoved of by the Committee. Mr. Clarke, gr. to J. Brown, Esq., Holmbush, Horsham, sent three grand bunches of Black Alicante, fine in bunch, berry, and colour, but acid in flavour. Mr. M. Rochford, market gardener, Page Green, Tottenham, had a specimen of the Charlotte de Rothschild Pine, which when cut weighed 9 lb. It was grown in an 11-inch pot in less than 15 months, in a compost mixed with sewage prepared by the "A. B. C." process. Mr. Gilbert, gr. to the Marquis of Burghley, sent specimens of a large green-fleshed Melon named General Von Moltke, weighing 9 lb., and of very fair flavour; also an example of Melon Princess Louise, a scarlet-fleshed kind, weighing 15½ lb. They were both considered too large for general cultivation. Mr. Calcot, Reading, had good examples of Black Hamburgh Grapes grown in the open air; and Mr. Tillery fine specimens of Williams' Bon Chrétien Pear, grown on a wire trellis. Mr. Goldsmith, gr. to G. D. Tycer, Esq., Hollenden Park, sent remarkably well coloured fruit of a Peach named Coup d'Hebe, which was not known to the Committee. Mr. Smith, gr. to the Earl

of Gainsborough, sent Prince of Wales Nectarine, to show its fine late-keeping qualities. From Messrs. Carter & Co. came a large collection of Tomatos, to which the 1st prize was awarded, M. Verhulpen, Brussels, exhibited Bouckard's fruit-gatherer, a new Continental invention, certainly the simplest and best form yet sent out, and exceedingly well adapted for gathering choice fruit, more useful to amateurs than to practical men, as such contrivances generally are. A First-class Certificate was awarded to it.

Royal Botanic, Belfast. *Sept. 8 and 9.*—This was the first of an intended annual series of shows, upon a somewhat extensive scale, organised under the auspices of the directors of the Royal Botanic Gardens. Unlike most of the shows held in Belfast, this was an exhibition *en règle*. Flowers and flowering plants, to be seen to advantage, must have some other groundwork than what is to be found under tents as we have been accustomed to see them. The Regent's Park show-ground, and the Great International of 1866, gave the cue to all managers of shows, and we have had a leaf taken from that book in some of our provincial towns since. The curator, Mr. Johnston, laid out the groundwork admirably; and although first-class specimens of plants did not predominate, what was present was set off to the best advantage. The undulating grassy banks were in the highest order of freshness, notwithstanding their recent formation, and if we have anything to take exception to, it was in the gravel of the properly-designed walks not being bright enough. The opening day was one of the most brilliant of autumn, and the attendance of rank, beauty, and fashion, was such as even to command more than the ordinary comment of the regular great show visitor.

The principal feature of the exhibition was the large quantity of beautifully grown plants, furnished chiefly by H. Hawkins, Esq., Kin-Edar; T. Sinclair, Esq., Hopefield; D. Taylor, Esq., Bertha House; A. J. Macrory, Esq., Duncairn; and Professor Yonge, &c. Some of them were remarkable for their fine foliage and general luxuriance. Mr. Hawkins took a high position with the green and gold Sanchezia nobilis, the noble ovate acuminate leaved Cyanophyllum magnificum, which at once struck every observer, and the curious Beaucarnea recurvata, with a stem like a Spanish Onion, but so indurated as to be quite woody, and bearing handsome Yucca-like light green foliage. These, with the Crotons and the Lapageria, were really grand. The Ferns and Palms, the kings of exotic vegetation, were represented towering above their lesser fellows, but were not contributed in so great numbers as might be expected from the many rich collections which exist in this district. In these classes Mr. Hawkins carried off many prizes with plants which would have done credit to the shows of the metropolis. The amaryllidaceous Vallota purpurea, with its scarlet trumpet-like flowers, exhibited by Mr. Sinclair, was a fine specimen, but we cannot particularise. The display of Fuchsias was magnificent. Scarlet Pelargoniums were also grandly shown, and lightened up the *tout ensemble*, which Ferns and plants only remarkable for foliage bring out in the distance. The New Zealand Filmy-Ferns displayed by Messrs. Fowler & Co., Glasgow, were also very fine. The Ferns of other countries than our own are much sought after; but our own island is prolific of beauties which, for diversity of outline and general gracefulness, can scarcely be eclipsed, and which were well shown. The Dahlias, especially the 1st and 2d prize collections, of both nurserymen and gardeners, were superb, —surpassing those sent across the Channel. The Roses, although past their best, were still good. The bouquets from Mr. J. B. Houston and Captain Nicholson were beautiful — the white Rose surrounded with white Stephanotis, and garnished with Maidenhair Fern and other choice tit-bits of Flora, made up quite a model bouquet. The Gladioli were a fine exhibition, so showy were they, and the Coleus so soft and beautiful. Mr. H. Dickson, Belmont, as usual, excelled in Roses; and Messrs. A. Dickson, Newtonards, in Dahlias and Gladioli. The fruit, as is always the case, was a great object of attraction, and well might this be the case in this instance. There were contributions from the vineyard at Garston, furnished by Mr. Meredith, which were really magnificent. The wonderful bunch of White Nice, shown by Mr. Fowler, gr. to the Earl of Stair, Castle Kennedy, weighing a trifle over 15 lb., was of itself worth an outing to see, but the judges evidently passed it over as being only an object conspicuous for size. Add to this the competitors from the Earl of Strathmore's garden, Glamis Castle, Scotland,—a sample of Hamburgh which, by the way, was much wanting in respect of finish; from Colonel Taylor, M.P., who showed the best collection; from Colonel Leslie, M.P.; and from Messrs. J. Ho. Houston, John Thomson, A. J. Macrory, and others, and the Grape show alone became a tempting one. Besides all these, there were excellent Figs, Peaches, Nectarines, Apricots—some of them indeed of the finest quality. Apples were splendid from Messrs. Barkley and Waring. Colonel Leslie had 30 dishes of fine kinds. The Pears were also good. In vegetables, and farm produce, the principal exhibitors were W. G. Andrews, Esq., W. Valentine, Esq., W. Robertson, Esq., John Cleland, Esq., and Hill Hamilton, Esq. The Parsnips were remarkably fine, as were also the Celery and Yellow Turnips.

The second day was a boisterous one, telling against the receipts; but notwithstanding this, there was a surplus after meeting all expenses. The Council recommended an honorarium to be given to Mr. Johnston for his successful management, and determined upon continuing a great show annually. September seems the most fitting time, as both flowers and fruit can be shown in plenty together.

One remark is due to the interests of the judges, and of horticulture itself. An excellent *déjeûner* was served up for the gentlemen who officiated, and not one single member of the Council was present! In England much the same sort of thing exists, although not quite so glaring. In Scotland it is quite different; and neither is the show, nor the wealthy gentlemen who lend the weight of their influence to support it, a bit the worse for it. Hospitality is shorn of much of its gilding when the parties that dispense it keep behind the screen.

Brighton Autumn Flower and Fruit Show: *Sept. 15 and 16.*—The annual autumn exhibition of flowers and fruits, for prizes offered by the Brighton and Sussex Horticultural Society, took place on Wednesday and Thursday in the rooms and grounds of the Royal Pavilion. Owing to the singularly dry season, the display both of fruit and flowers was the finest that has been held since the formation of the Society. The specimens exhibited were not only unsurpassed in quality, but every class abounded with competitors, rendering the duties of the judges most difficult and trying.

In the banqueting room, the first to be visited, the centre was filled with fruit of all kinds; the north, west, and south parts of the apartment being filled in with plants of large proportions, and the eastern portion devoted to Roses, where Mr. Mitchell, of Piltdown, made a fine display, beating Messrs. Paul & Son, of Cheshunt. Mr. J. Woollard, of Cooksbridge, exhibited some fine specimens in the same class—namely, three trusses of 48 varieties. In the next class, 24 varieties, the Rev. Mr. Hales, of Henfield, carried off the 1st prize, beating Mr. Knight, of Hailsham, and Messrs. Virgo & Son, of Guildford. The collection of Roses was very fine, especially the flowers of Mr. Mitchell, who exhibited several new varieties. The most remarkable trusses, and which contributed in the main to secure him the prize, were Gloire de Santenay, Charles Lefebvre, Horace Vernet, Alfred Colomb, Madame Pulliat, Sénateur Vaisse, Xavier Olibo, Anna de Diesbach, Madame la Baronne de Rothschild, La France, Queen Victoria, Souvenir de la Reine d'Angleterre, Princess Mary, Victor Verdier, Pierre Notting, Mons. Woolfield, Prince Humbert, Maréchal Vaillant, Mdlle. Marie Rady, and Madame Victor Verdier, all of which were of beautiful form and colour.

In stove and greenhouse plants, Mr. F. Parsons, of Brighton, came out particularly strong, carrying off the £10 cup given by the Railway Company for the best eight. Although open to all England, the three prizes in this class were secured to Sussex; Mr. Gilbert, of Hastings, and Mr. G. Hudson, gr. to F. Barchard, Esq., Horsted, taking 2d and 3d prizes.

In the south drawing room, along the eastern front, another magnificent display of fruit was arranged, consisting chiefly of Pines, Melons, Grapes, &c. The great attraction of this room, however, was the competition in Dahlias; and Mr. Keynes, of Salisbury, forwarded some specimens which were alone worth a visit to the show. He carried off the 1st prize, beating Mr. Walker, of Thame, Oxon, and Mr. H. Seale, of Sevenoaks, who came in 2d and 3d. The prizes for this favourite flower were, consequently, widely distributed, showing a keen competition. In this room there was also a good display of Asters, Verbenas, &c.

The saloon was principally devoted to a display of wax and paper flowers, illuminations, bronzed and wicker flower-stands, &c. The wax and paper flowers were modelled by Mrs. Snelling and Miss Gurr, of the Chain Pier Bazaar; Miss Friend, of Patcham; and Miss Weekes, of West Hill Street. The fancy flower-stands were the productions of the inmates of the Blind Asylum and of Mr. Martin, Henfield; and great taste and ingenuity were shown in their design and workmanship. Miss Inglis, of Grand Parade, contributed the illuminations, as well as some modelled flowers, which were greatly admired. By the side of these artistic displays there was a fine show of Orchids, Asters, and Verbenas; but the Hollyhocks were not of average merit. The other flowers mentioned were unusually good, especially the Orchids.

The music room was the apartment in which fruit was exhibited in greatest variety; and the competition for Mr. Ashbury's cup, value 8 gs., offered for the best collection of ten dishes, was very keen. This prize was won by Mr. Jones, gr. to Lady Mill, Montisfont Abbey, Romsey; Mr. Bannerman, gr. to Lord Bagot, of Rugeley, Stafford, and Mr. Pragnell, gr. to G. D. W. Digby, Esq., Sherborne Castle, Dorset, taking 2d and 3d prizes. These facts show that the exhibition had more than a local interest; and as a proof that the competition in this class was very keen, an extra prize was given to Mr. Young, gr. to W. H. Stone, Esq., M.P., Leigh Park, Havant. The fruit displayed was something extraordinary; and the bunches of Grapes which were shown by Mr. Bannerman were of huge proportions. The best Providence Pine was shown by Mr. H. Clarke, gr. to Earl Cowper, and Mr. G. Young had the best Queen; Mr. Ward, gr. to T. N. Miller, Esq., Bishop Stortford, being first in the class for any other variety. The other dishes of fruit, Plums, Peaches, Nectarines, Apples, Pears, Figs, &c., were first-rate; and at the west end of the room there was a complete show of Apples, principally for culinary purposes.

The lawn, notwithstanding the temptations of the room, was well patronised. The show of Pelargoniums was one of the finest that ever took place in Brighton, the trusses of blossom on some of the gigantic plants being of very large dimensions. The Ferns, Petunias, Calliums, Fuchsias, &c., were also very fine; and combined with this display of the ornamental was one comprising the useful, for at one end of the tent were three or four collections of vegetables, to which the Committee awarded extra prizes. Here were also displayed two devices—stars—composed of Asters, Pelargoniums, Roses, Calceolarias, &c., which had a very pretty effect, being hung up at the entrances to the tent. Outside the tent there was a very interesting show of garden implements and ornaments.

Royal Horticultural Society of Aberdeen.—The autumn show of this Society was held in the Music Hall Buildings, Aberdeen, on Friday and Saturday, Sept. 9 and 10. The show was one of the best autumn shows that has been seen in Aberdeen for a number of years. The show of plants in pots was rather meagre, as was to have been expected, from the fact that very few prizes were offered in this department. The staple of the show consisted in cut flowers, fruit, and vegetables, and in each of these departments the display was good. The Hollyhocks shown were not numerous, but they were in excellent condition, well filled, and distinctly coloured. In Gladioli, Mr. Shand, Fetteresso, and Mr. McPherson, Polmuir, Aberdeen, stood pre-eminent. Mr. Shand carried off the challenge cup for 30 spikes, presented by Mr. McPherson, who was thus precluded from entering the lists against his old rival; and Mr. McPherson gained the challenge cup for 24 spikes. He has done the same now for three years in succession, and the cup is permanently his own. These two gentlemen never showed finer specimens of Gladiolus than on the present occasion. They have given great attention to its cultivation, and well deserve their success. The Dahlias were admirable blooms, well coloured, and generally well shaped. Here again Mr. McPherson was 1st, but only by a short distance; for another successful grower, Mr. James Cocker, Froghall, Aberdeen, was very close upon him. The Asters and Marigolds, though not attracting so much attention as the Gladioli and Dahlias, made a remarkably good show. It is unfortunate for the Aberdeen growers that their season is generally a month or three weeks later than that of the South of England; otherwise, we have no doubt they would make a very creditable appearance—in cut flowers at least—at the meetings of the Royal Horticultural of England; at all events, they would make a fair trial. There was an extensive and fine display of fruit, and some of the baskets were of first-rate quality. The collections sent in by Mr. Webster, Gordon Castle, and Mr. Moir, Ury House, were remarkably fine when compared with what is usually seen at Aberdeen. Vegetables always form an important item in an Aberdeen show, but we do not remember ever having seen at any previous show either so keen a competition or so great and uniform excellence. In spite of the great drought of the season (less than an inch of rain fell between July 16 and September 1), the vegetables were uniformly large, well grown, and juicy. Some of the collections shown were of remarkable excellence, such as those sent in by Mr. Farquhar, Fyvie Castle, and Mr. Patrick Cocker, Froghall. We have never seen so great a number of huge, compact Cabbages, collected together as on this occasion. A silver medal offered for six named varieties of Potatos called forth extraordinary competition, and most of the collections sent in were remarkable for the excellence and size of the Potatos. Some good seedlings were shown in various classes, and several of these got First-class Certificates; for instance, Mr. Webster, Gordon Castle, had one for a seedling Plum, and two for seedling Apples. Some seedling Potatos also got Certificates of Merit. A considerable number of prizes also was given to the working classes specially. In vegetables the working men did remarkably well, but in cut flowers they were scarcely up to the mark.

Garden Memoranda.

The Aston Lower Grounds, Aston, Birmingham.—The plan which accompanies this paper represents the walled-in garden of the Lower Grounds, Aston, Birmingham, a comparatively new but very popular place of public resort in one of the near suburbs of the iron metropolis, and lying close by Aston Hall. It is some five or six years since the present proprietor, Mr. H. G. Quilter—for some time actively connected with the management of the Aston Park estate—took the Lower Grounds, and commenced to form them after the present pattern. In their general characteristics of attraction these grounds bear a great resemblance to those of the Crystal Palace at Sydenham, only there is no palace of glass, though there is every accommodation for high-class concerts, amateur theatricals, and many of those things belonging to the internal arrangements of the Sydenham Palace. The grounds are 36 acres in extent, and comprises two large lakes, one of which is kept solely as an ornamental water, the other for boating and fishing. There is also an extensive cricket ground, as well as grounds for archery, bowls, croquet, &c., with every incidental accommodation of a high-class character. To these grounds come, during the year, thousands of visitors. During the summer months large excursion parties come in from the Black Country, and it has been observed that to these, in a pre-eminent degree, the various flower gardens present the chief feature of attraction. The flower gardens, but especially the one given in the accompanying plan (fig. 237), certainly furnish features of excellence of a very high order. In catering for the public, Mr. Quilter is not unmindful that high-class gardening is as attractive to the horticulturally untutored as that which represents lower levels of excellence; and the result of his observation and experience goes to prove that just in proportion as he rises up to the application of the highest and best features of modern gardening, so does the attractive force augment in a corresponding ratio. It was while manager of the Aston Park estate that Mr. Quilter became alive to the importance of flower gardening as an attractive feature in a place of public resort, and year by year he has enlarged the sphere of his operations, and introduced entirely new features into his final arrangements. It should here be stated that Mr. Quilter is not a professional horticulturist, and what he has attained to has been reached by close observation and persistent application; that which he saw to be attractive elsewhere was instantly seized on and applied in his own grounds. Cliveden, Battersea Park, and other places furnished many features that were at once reproduced in the Aston Gardens, in designs by no means destitute of originality, and with unvarying success. To Cliveden he undoubtedly owes his splendid spring display, though with new and entirely original features; from Battersea Park came the idea

of subtropical gardening, so successfully carried out at Birmingham; while from all the best places about the country has he drawn ideas relative to his summer bedding, and in no case has he slavishly followed any one artist's own design.

The general outline of the grounds may be said to represent a huge Pear of irregular shape; the hotel represents the stem of the fruit, and the large boating lake its apex. With the exception of some few spaces all the upper part of the grounds comprise flower gardens, the recreation grounds proper being beyond these. On emerging from the hotel, a large piece of ornamental water, some 200 yards in length, and 3½ acres in extent, occupies the right-hand side, flanked on the farthermost side by a pleasant walk under over-hanging trees, and this is again bounded by what two

Fig. 237.

years ago was a broad dry ditch, hidden from view by Laurels, but is now a sunken garden, some 250 yards in length, specially designed for subtropical plants. Here can be seen beds and borders of many of the choicer kinds of plants Mr. Gibson uses at Battersea Park, and a sloping bank, falling away from the walk under the trees to the level of the subtropical garden, has been planted with a choice selection of ornamental and pictorial trees, such as the best kinds of Hibiscus, Ailantus glandulosa, Salisburia adiantifolia, Yuccas, Cotoneaster Simmonsii, Kerria japonica variegata, Rubus laciniatus, Acer Negundo variegata, &c. In the subtropical garden can be seen Palms, Cannas, a fine Pandanus utilis, Maranta zebrina, Arundo Donax, Aralia spinosa, Bambusa Fortunei, Cordyline australis, Gunnera scabra, and similar plants, with masses and edgings of Echeverias, Sempervivums, Sedums, &c.

On the left-hand side, the boundary next Aston Hall grounds is formed of a broad belt of Limes, Poplars, &c., and evergreen and deciduous shrubs, with a wide flower-border in the foreground. In front of this, and

running parallel with it, is a strip of turf having a line of flower-beds; then comes a broad gravel walk by its side, leading to the walled-in garden at the extremity of the ornamental water; and between the water and this gravel walk is a broad piece of grass plat, filling up the intervening space, as on the left-hand side of the main walk. So, on the right-hand side, is there a line of beds reaching the length of the walk. At the extremity of the grass plat are other beds, one of them in the form of a series of raised baskets one above the other, and with this a general descriptive outline of the upper division of the gardens terminates. The walled-in garden, of 4 acres in extent, occupies the right-hand side of the grounds at the broadest part, the cricket-ground being on the left. A broad belt of trees starts from the right-hand side of the grounds, and running along between the upper part of the grounds and the walled-in garden, passes lengthwise between it again and the cricket-ground. The open spaces at the foot of these trees gives the site of the second subtropical garden. Beyond the walled-in garden is a spacious promenade, where the band peforms daily, as well as large refreshment houses for the accommodation of excursion parties and others; and beyond these is the boundary of the grounds in the form of a boating lake, about 6 acres in extent, with bands of Rhododendrons on its banks, and shaded by tall trees on two sides, a broad gravel walk running all round it. To ensure safety from accidents when boating in summer and skating in winter, this lake is to be reduced to a depth of 4 feet in summer, and 1 foot in winter.

In a place so extensive as this, which requires half a million plants to fill the whole of the beds about it, it is impossible to give full details of all the bedding arrangements at any one season of the year. It must suffice that the most salient points in the spring, as well as the summer display, be touched upon, and that by no means exhaustively. Reverting, then, to the upper garden, it may be said that the broad border on the left-hand side of the main walk, which is 300 yards in length, was a most conspicuous feature in the spring arrangement when seen in the month of April last. It may be said to have been carpeted with alternate lines of Viola cornuta and Cerastium tomentosum, planted on what is termed the Greek key pattern, and above this was a mass of early single and double flowering Tulips, including such fine kinds as Duchesse de Parma, Couleur Ponceau, Royal Standard, Golden Prince, Yellow Pottebakker, Thomas Moore, Scarlet Van Thol, &c. Seen from the elevated ground at the entrance by the hotel, the border had a fine effect. About 12,000 were required to plant this. A line of Viola cornuta forms a margin to this border. The removal of the Viola and the substitution of yellow Calceolarias gives the summer arrangement, still adhering to the Greek pattern. The Cerastium does excellent service, as it blooms with the spring flowering plants, and remains to aid the summer display after the decaying flowers have been removed by the use of the shears. The beds on either side of the walk are alternately oblong and circular in shape, and in most of the circular beds is planted a specimen Conifer. The majority of the oblong beds are filled with low evergreens, shrubs and trees, such as Rhododendrons, Aucubas, Portugal Laurels, &c.; and, both during the spring and summer, the others are filled with bulbs and gay-flowering plants. The series of raised baskets at the lower end of the ground was a grand floral feature in the spring months. The base of this series of beds is formed of a raised turf pedestal, about 12 inches from the ground, and which gave a 6 feet wide circular border between it and the first basket rising from it. This 6 feet border had in the spring a ground-work of sharp angular lines of Cerastium tomentosum,

forming a circular line of acute angles, and these were planted alternately with Cliveden Yellow Pansy and Viola cornuta. The summer arrangement gives alternate angles of unicoloured flowering and foliaged plants; and the two upper baskets, which had dark Wallflowers and brilliant Tulips in the spring, are now gay with bright coloured Pelargoniums, &c. Round this basket bed is a circle of other beds, each 5 feet in width, four of them oblong in shape, the four others circular, each containing a fine specimen Wellingtonia, some 6 feet in height. By a somewhat large but judicious use of evergreen shrubs, &c., the masses of brilliant colours are considerably relieved; and it is only at certain points where the relief exists that these huge circles and zones of colour are set down. The baskets are formed of slabs of the bark of the Spruce Fir, held together by strong cables, each basket being about 18 inches in depth. The planting of these baskets alone requires one thousand plants. The belt of trees between this part of the grounds and the walled-in garden, with a grassy carpet beneath them, afford an excellent shelter to visitors; and here seats have been provided in abundance, and from this point, when the visitor is looking south-east, a charming view is opened up, and one of the best glimpses of Aston Hall is obtained. The second strip of subtropical gardening, which starts from this point at a right angle, and runs eastward between the walled-in garden and the cricket-ground, reminds one of a piece of Mr. Gibson's handiwork at Battersea Park, set down here for the delectation of the country folk. By every means in his power Mr. Quilter protects his choice plants from harm; beds of Rhododendrons, clumps of shrubs, &c., afford this shelter, and the result here, as in the case of the subtropical garden above, is the production of something only second to that seen at Battersea Park.

But we are only on the threshold of something much more beautiful and attractive—something holding the same relation to what has been already mentioned as Mr. Gibson's subtropical garden at Battersea Park does to what surrounds it. As the walled-in garden is approached from the east, the visitor, through the doorway which gives an entrance to it, gets a peep at the superb floral picture lying beyond. An immense embossed garden, so to speak, lies before him, through the midst of which he can wander by means of broad gravel walks. Right along the centre of this garden, from east to west, and transversely from north to south, the way lies between two lines of raised borders, forming slightly sloping banks covered with flowers; and these banks slope again towards the reverse side. A garden so extensive as this (covering 4 acres) would have been a very flat and confused affair were it not for the series of raised sloping borders. It is these that lend such a charm to the scene when viewed as a whole. The apex of the raised beds, which is a flat some 2 feet in breadth, represents a height of some 2½ feet, and along the whole length of the four divisions, as seen in the plan, runs an elegant galvanised wire fence in the form of festoons, some 8 feet in width, about 5 feet in height at the spring of the swing, and some 2½ feet at its lowest bend. The line in the plan running from A to B gives a diagonal sectional line; the line from C to D a section of the raised border. It will be seen that each arm of the cross-shaped ground plan shows a kind of enclosed oval bed, which most agreeably varies what would be otherwise monotonous straight walks. The irregular angles, outside the arms of the cross, represent grass plots, about which are studded specimen trees and some beds. A high brick wall, against which are trained wall-fruit trees forms the exterior line of the garden, and in front of these, but leaving space for a narrow path by the side of the trees, is a hedge of dwarf Roses. There are three doorways leading to the garden, on the east, south, and west sides; on the north side, in place of the doorway is a pleasant alcove, formed of Limes and Hollies, and having space for a large garden-seat. At the four corners are banks of Rhododendrons, with specimen Cedrus Deodara at the back, mingled with Hollies and other plants. A chain of diamond-shaped bed runs all round this border, which is about 8 feet in width. These beds are formed of dwarf Scotch Fir, about 12 inches in height, which is kept clipped each autumn. The groundwork outside the diamond beds gives a line of triangles back and front. These angles are constantly kept filled with Cerastium tomentosum, which serves alike for the spring and summer display; and here, also, it is allowed to bloom in the spring, and then clipped back for summer service. In the spring arrangement the diamonds on the north side were filled alternately with Silene pendula and Pyrethrum Golden Feather—on the east side Silene and Myosotis sylvatica alternately, with Tulips rising above them. The south side was a repetition of the planting in the north, as was the west of that on the east. Each square that contained Tulips (and there were some 150 of them) required about 50 bulbs. At a later period these diamonds are gay with pink, white, scarlet, and salmon-coloured Nosegay and Zonal Pelargoniums, yellow Calceolarias, &c., relieved here and there with beds of Coleus, Centaureas, Golden Feather Pyrethrum, &c., sufficient to tone down the otherwise oppressive masses of colouring. Behind these, and forming a pleasant background, are the dwarf Roses, bearing their manifold clusters of flowers.

Turning now to the method of planting the insides of the four arms of the cross, it may be stated that the outlines of the plan in which the beds are planted are formed in the first instance by a band of Cerastium tomentosum, about 12 inches in width. This, as will be observed in the plan, gives a diamond alternately with the small circular, and the semicircular panels of a larger diameter. When planted in the spring, the east and west arms of the cross had the following arrangement on the inside of the wire fence:—The upper and lower semicircles were planted alternately with white and crimson double Daisies, each circle contained a mass of Aubrietia purpurea, while each diamond was filled alternately with blue and yellow Cliveden Pansies. In summer the arrangement consists of Purple King Verbena in the circles, and instead of Cerastium tomentosum forming the outlines, Mrs. Pollock Pelargonium takes its place; pink and scarlet Pelargoniums are now masses of colour where the softer hues of the Daisies prevailed in the spring, while the diamonds have masses of colouring adapted for contrast, and of leaf foliage for relief. In the case of the north and south arms, the difference in the spring arrangement consisted in that yellow and purple Pansies were used instead of yellow and blue; the other agents being similar. The oval beds, in the spring masses of dark Wallflowers intermingled with Tulips, have now centres of some decided colours, with vandyked edgings of blue, yellow, and white.

The central flower garden, with the scolloped border outside the gravel walk, differed in the ground-plan and method of planting. By referring to the plan it will be seen that the ground-plan of the outer circle is two lines of scollops, the upper larger than the lower; with a kind of long angular border down next the turf edging. In the spring, the lines defining the scollops were formed of Aubrietia purpurea, the upper tier were filled alternately with blue, yellow, and purple Pansies, a bed of yellow coming between each of the dark colours; the smaller scollops were filled alternately with white Pansies, and pink and white double Daisies, the pink Daisy coming between each of the white flowers, while the space next the turf was filled all through with crimson double Daisies. At the back came a line of dark Wallflowers. On two sides of the circle, the quarter divisions had the ground lines formed of Aubrietia, as above stated; on two others it was Arabis mollis variegata. Notwithstanding that a severe winter, the rigours of which were felt North and South alike, had somewhat marred the effect of this arrangement, yet no one could doubt but that Daisies and Pansies of different colours are among the best things to use in the spring garden, where refinement and an early bloom are desired in unison. Now, as representing the summer planting, the upper line of scollops is planted alternately with Centaurea candidissima and golden-leaved Pelargoniums, the smaller line with Purple King Verbena, and the remainder with alternate patches of pink and scarlet Pelargoniums.

The central circular scroll bed is one on which Mr. Quilter lavishes the richest treasures of his floral wealth; perhaps for the beauty and refinement of the designs marked out there in the spring months, it was scarcely surpassed by anything else in the kingdom. This scroll bed is on a level with the circular walk round it, and, with a sunken garden in the middle, and the fountain, which is the central figure, may be said to be inlaid in turf. Next the scroll bed, in the inside, is a sharp fall of some 5 feet, in the form of a steep turfy bank; then come four circular beds, alternate with four others of the shape of the segments of a circular line; and these enclose a fountain formed of "teag," the local term for the bluish-tinted glass-like refuse from the glassworks, and encircled by a stone basin, which latter is fringed with Ferns and similar plants, and a narrow border runs round it. The spring arrangement of this scroll bed was altogether unique and highly effective. This bed is over 90 yards in length by 5 feet in width, and in planting, a series of circles alternate with shield-like panels was formed. The centre of each series of circles was formed of a disc of Golden Feather Pyrethrum, round this white double Daisies, then a circle of Aubrietia purpurea, then one of crimson double Daisies; with an outer circle formed of the Aubrietia also. The centre of each shield had a disc of Veronica incana, on one side a panel of Arabis mollis variegata; on the other pink double Daisy. Very effective indeed is the mode in which this scroll bed is now planted. Each series of circles now forms a kind of circular pyramid, formed of pink, white, and scarlet Pelargoniums, and yellow Calceolarias, so arranged that the tallest is in the middle, and the dwarfest outside; the lines of the shields are formed of Pyrethrum Golden Feather, filled in with Lobelia Paxtoniana. Descending now to the circular line of beds round the fountain, that in the spring were filled with crimson, white, yellow, and striped Tulips, have each a central disc, with a circular line round it, and a panel on either formed of lines in squares, all of which are Golden Feather Pyrethrum, the groundwork filled in with Alternanthera paronychioides, and A. spathulata. On each circular bed stands a pedestal of slag supporting a stone vase, and these are filled with vari-coloured flowering plants, with Ivy-leaved Pelargoniums and suchlike trailing plants hanging down from these as a fringe.

The effect of the central garden is very much heightened from the fact, that all round it, following the line of circles in the plan, runs a tall, ornamental wire fence, with archways spreading over the paths, and over and about which are trained various kinds of rapid-growing creepers, &c. It may be said to represent the outer walls of a temple, no longer covered with a dome. From the archways over each path are suspended handsome wire baskets, tastefully filled with appropriate plants.

The reverse side of these raised borders, looking towards the grass sward planted with specimen trees, &c., are now extremely gay with ribbon lines of various colours, judiciously arranged. About the irregular angles of grass plats are several raised beds, charmingly planned in mosaic patterns with Echeverias, Sempervivums, Sedums, and suchlike, that are much admired by visitors.

Going away from this garden there can be seen many nooks and corners where a bed of some fine-foliaged or flowering plants has been set down; no spot is disregarded, but there is an unity about the method in which the decorative features are wrought out. A dirty, neglected, unkept corner is scarcely to be detected, so uniformly well are the grounds looked after. Similarly the cricket, archery, croquet, and bowling grounds are kept in the highest state of perfection, the most watchful care being expended on their condition.

To provide the abundance of bedding plants necessary, there is on the north-west side of the walled-in garden, but so screened by tall trees as to be almost hidden from view, quite a nursery of glass, of great extent, where the propagation, &c., is carried on. It is marvellous to note, when looking through these glass structures in the month of April, the multitudes of plants in course of being raised from seed or propagated by cuttings. There can be seen here also, at that time of the year, securely housed from the effects of cold, such a collection of tender fine-foliaged plants, such as Palms, Dracænas, Tree Ferns, Yuccas, &c., as would strike one with astonishment, unless aware of the extent to which subtropical gardening is here carried out.

How this aspect of modern gardening is appreciated by the folks in the Birmingham district, let the admiring throngs who crowd it testify. And away on the other side, also screened from observation, is that most indispensable adjunct to such a place, a reserve garden, which also serves as a trial ground, in which Mr. Quilter tests the value of rare bedding plants as they are announced, and thus never risks making an effective bed with a plant with the decorative value of which he is unacquainted. Here, too, can be seen immense beds of Tulips, of Daisies, Pansies, Arabis, and similar plants, forming stock for the spring display next year. It was too early at the time of my visit to pass a judgment on the newer bedding plants being tested this summer, but an opportunity may be offered to do that ere the season is quite over.

Year by year, since these gardens were first opened to the public in 1864, the number of visitors annually have risen with a marked progression, and in 1869, 262,000 persons visited the grounds. On Easter Monday last over 18,000 persons were admitted, and during the Easter week the turntables denoted an aggregate of 38,000 visitors. Precisely at dusk the grounds are closed, no after-dark attractions of any character are permitted therein; fireworks and such displays are on no account allowed, an outrage is a thing that has scarcely occurred, rarely even is a flower plucked. Mr. Quilter confides generously in the people of Birmingham; on the most crowded occasions his own staff of men suffices to maintain order; and this confidence is respected and reciprocated. *R. D.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Pelargoniums of the Cape or fancy sections, which are being grown on for the earliest flowering, will now require a slight supervision in regard to the pinching back of any gross shoots which may form. Where the shoots grow uniformly of one size this will not be necessary. Keep the house containing them cool, airy, and as clean as possible, so that a strong, sturdy habit may be assured to the young growths. Much good may also be done by thinning those which are growing too densely together, and by removing such weaker ill-placed ones as are likely to interfere with the free growth of the others. Where, through negligence, any of the forward plants have not yet been placed into their blooming pots, it will scarcely be judicious to do so now, unless, indeed, the pots containing them are well filled with roots, when it will be best to pot them without delay; placing them into the smallest possible sized pots. At this period, when the warmth of night is considerably on the decrease, some care should be taken not to allow the temperature to fall below 48° or 50°. Do not permit the mean temperature of stoves proper to exceed 76° to 78°, with a decrease of 8° or 10° by night, affording as much air as possible on all proper occasions; and be careful not to excite into growth such hard-wooded plants as should be at rest. In order to be

upon the safe side, it would be well to house all greenhouse plants quickly after this date. Already some of the hills on the northern side of the Tweed have received their first coating of snow, and frost sufficient to cut off Scarlet Runners has been experienced within 20 miles of London, so that a fair warning has been afforded, and it should be acted on at once. Those who require an early autumnal display of *Chrysanthemums* should now get their most forward plants under cover. Those cuttings of bedding plants which are not yet housed should be sheltered quickly. Abundance of air should be given, even when the plants are placed under cover.

FORCING HOUSES.

Use great caution not to allow too high a temperature to pervade any structures containing Pines during cloudy, dull, sunless weather. These plants, if in a forward fruiting stage, and consisting mainly, say, of Montserrats, or what is perhaps more correctly Black Jamaicas, will at this time form large unsightly crowns if too high a temperature be maintained, and a sufficiency of air be not given. It may be that these do not only decrease the actual size which the fruit would or might have attained, but, what is of some little importance in regard to table display, the large crowns somewhat mar the size of the fruits to the eye, so that they are made to look less than they really are.

HARDY FRUIT GARDEN.

Go over *Peach* and *Nectarine trees*, and fasten any shoots which may, through fruit gathering, or otherwise, have become loosened or unsightly. Proceed rapidly with the gathering of all kinds of fruits which are ready. All choice kinds which will keep, especially *Pears*, should be very carefully gathered—each fruit separately, and should be laid upon the shelves without the slightest bruise being inflicted, as this, if permitted, will cause the fruits to decay before the ripening process is properly consummated. As all fruits of this kind whenever gathered invariably undergo more or less "sweating," it is advisable to permit air freely to pervade the structure containing them, and, if possible, not to lay the commoner coarser sorts too thickly in heaps at the first, in fact, not until this process is past.

HARDY FLOWER GARDEN.

Those who contemplate transplanting *Evergreens*, such as Hollies, for example, may now do so safely, with much hope of success. Continue transplanting, as before suggested, such perennials as *Foxgloves*, *Sweet Williams*, *Canterbury Bells*, *Hollyhocks*, *Wall-flowers*, *Pansies*, *Double Rockets*, &c. Protect potgrown *Auriculas* from excessive rains or sharp frosts, which are ushered in too abruptly. See that perfect drainage exists to each. Attend to the necessary preparation of all kinds of plants for spring garden display, having such bulbs as are intended for the same ready for planting in their separate colours immediately the present occupants of the beds are taken away. Those kinds of spring-flowering plants intended for use as above, which are getting too strong, should be transplanted as I have previously suggested; this with a view not only to retard their growth, but also to harden them off better. Bring all planting-out of *Carnations* and their allies to a conclusion without delay.

KITCHEN GARDEN.

Prepare the border upon which to plant out *Cauliflowers* for spring use, to be sheltered through the winter under hand-lights, by giving a thorough dressing of good manure, and well digging it in, preparatory to planting them out at an early date. Make another planting of the late-sown *Celery* for late spring use when it is wanted to the latest date practicable. Get in all *Onions* as quickly as possible, and arrange them in their quarters for winter keeping. Give *Cardoons* a good earthing-up as required. Hoe well between the crops of *Spinach*. Continue to blanch *Endive*, tying up *Lettuce* for a like purpose as often as may be needed during dry weather. Transplant the necessary quantities of both into cold frames as quickly as the latter become at liberty. Hoe or thin-out the later-sown *Turnips*. Give *Leeks* good manure-water copiously, and make sowings of *Mustard* and *Cress* in some kind of sheltered position. Remove under cover all *Dwarf French Beans* which are being grown on in pots. *W. E.*

ORCHARD HOUSE MANAGEMENT.

Now that the fruit is pretty well over in these structures the one chief object should be to secure the maturation of the wood for next season's supply of fruit. It is a very frequent practice after the fruit is gathered, the trees having so far done their duty for the season, to utterly neglect them. Nothing can be more injurious, as upon the attention given to the ripening of the wood and the formation of the buds depends the condition of next season's crop. It is well to go over the trees now and to prune out all superfluous wood, leaving only that which is required for next year's fruiting. All pruning should be done now, leaving only for winter the mere shortening and trimming in of the ends of the shoots. When summer pinching has been rigidly performed there is of course little to do, but what little there is to be done do now. By thinning out the superfluous wood, light and air are admitted to that which is left, which consequently has a better chance of ripening and developing its buds. Maintain a rather dry atmosphere in the house, and give all the ventilation possible continuously, night and day. For trees planted out no watering will now be required. For trees in pots sufficient water must always be given to prevent the leaves from flagging, but nothing more. The watering should also be done in the morning, allowing the plants to be rather drier at night. Trees in pots, which can be readily removed, had better be placed in the open air entirely, in a warm yet exposed situation, there to be fully exposed to the weather and the sun's influence. This open-air exposure gives a deep colouring to the shoots, and makes it as hard as ebony; and this is looked upon as the perfection of wood in Peaches. Shoots, however, which are sometimes nearly green, are frequently as well ripened. *Potting.*—Now is the time also to see about potting the trees which may require it, and also top-dressing. If potted now, they will make considerable progress in root making before winter, and have full hold of the new soil by spring. Every tree should be separately examined—if well rooted and in a small pot, repot it at once into a pot of a size or two larger. It is well to give plenty of pot-room to young healthy trees. We do not recommend the use of pots larger than from 15 to 18 inches in diameter. Plants in pots of this large size should, if the soil appear at all sour, be turned out, the ball reduced two-thirds, and repotted into the same sized pot; those which seem in a healthy condition should have a great portion of the top soil removed, roots and all, halfway down the pot, and then filled up with fresh soil. In repotting trim the roots pretty smartly, and give plenty of good drainage. Press the soil as firmly as it is possible to make it, by ramming it round the ball with a piece of wood. If no compost has been previously prepared, as it should have been, select now the best fresh yellow loam that can be found, as fibry as possible, to this add about one-third well-rotted manure or decayed malt-dust, or some old nightsoil and some burned or charred earth or lime-rubbish, to keep it free. This, well incorporated together, forms an excellent compost for all sorts of orchard-house trees. After potting give a good watering, to settle the soil about the roots, and attend to them as previously directed. *B.*

TOWN GARDENING.

THE large-flowering *Chrysanthemum* will require special attention at this season. Liquid manure should be given two or three times a week, according to the strength of the plants. This should be made in the following manner:—Get a tub holding about 50 gallons, into which put 1 peck of soot, 1 bushel of horse-droppings, and 4 bucketfuls of stale soapsuds. Fill the tub to the brim with soft water, have the whole well stirred up, and allow it to settle some time before using it. About one-half of this to one-half of soft water will be sufficient. See that all the side buds are removed, leaving only the centre one on each shoot; at the same time remove all lateral shoots, and securely tie the plants. Clear the beds and borders of annuals that have done flowering, and fill their places with Chrysanthemums and Pompons, which will not miss their moving, and will flower freely if shifted after the following manner:—Drive down the spade about 6 inches from the plant all round, at the same time giving it a good soaking, and on the following day remove it to its flowering position. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, SEPTEMBER 21, 1870.

1870. Month and Day.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
September.	Barometer reduced to 32° Fahr	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg		Gr.
15. Thurs.	30·14	53·9	50·3	40·7	76	3·6
16. Friday	30·37	54·9	52·2	49·5	82	4·0
17. Satur.	30·70	57·2	54·4	50·9	82	4·3
18. Sunday	30·18	60·3	55·6	50·1	69	5·1
19. Monday	30·09	57·4	51·9	45·6	64	4·1
20. Tues.	30·17	55·9	51·3	47·7	76	4·5
21. Wednes	30·17	55·9	53·7	51·7	87	4·1

1870. Month and Day.	Temperature of the Air.					Wind.		Rain.
September.	Highest.	Lowest.	Range in Day	Mean.	Departure of Mean from Average of 30 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg	Deg	Deg	Deg	Deg		Miles	
15. Thurs.	63·1	47·5	25·6	50·5	— 6·6	W. NW.	110	0·00
16. Friday	64·8	38·8	26·0	57·1	— 4·8	variable	85	0·00
17. Satur.	64·5	47·5	17·0	56·2	— 0·5	SW. NW.	190	0·00
18. Sunday	65·3	54·0	11·3	58·4	+ 1·9	variable	180	0·00
19. Monday	63·4	44·8	18·6	52·8	— 3·4	E. NE.	120	0·00
20. Tues.	68·0	39·6	29·3	53·0	— 3·0	variable	85	0·00
21. Wednes	66·3	42·2	24·1	53·1	— 2·7	variable	90	0·00

Sept. 15.—Generally cloudless. Fine. Aurora at night.
— 16.—A fine day.
— 17.—Overcast throughout. Fog.
— 18.—Generally cloudy. Great gloom prevailed during the morning.
— 19.—Cloudy during the day. Cloudless at night.
— 20.—Cloudless. Very fine.
— 21.—Generally cloudless. Very fine.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, SEPTEMBER 17, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	70·0	38·2	31·8	67·7	44·0	23·7	55·8	0·00
Blackheath ..	68·3	37·5	31·1	63·5	44·6	18·9	54·0	0·21
Bristol	63·7	42·4	23·3	61·2	40·7	20·5	54·0	0·12
Birmingham ..	68·5	34·0	30·0	64·4	37·1	27·3	54·0	0·23
Wolverhampton	66·1	39·7	26·4	61·6	45·0	16·6	53·5	0·20
Leicester ..	68·2	35·5	32·7	63·0	43·3	19·6	53·3	0·56
Norwich	65·0	40·0	25·0	61·3	45·1	16·2	52·2	0·17
Nottingham ..	66·0	34·8	31·2	62·0	43·6	18·4	52·8	0·39
Sheffield	65·0	36·5	28·5	61·0	40·0	15·4	52·0	0·53
Liverpool	62·3	41·5	20·8	60·0	50·4	10·6	54·4	1·17
Manchester ..	66·8	35·0	31·8	63·0	44·5	18·5	53·4	0·66
Salford	65·5	37·0	28·5	62·5	44·9	17·6	52·4	0·92
Bradford	63·7	39·8	23·9	61·1	47·9	13·2	53·1	0·52
Leeds	63·0	41·4	21·6	59·7	46·2	13·5	52·9	0·35
Hull	65·0	31·0	34·0	60·9	39·3	21·6	49·3	0·58
Newcastle ..	62·0	42·0	20·0	57·5	47·2	10·3	51·0	0·06
Edinburgh ..	65·7	36·0	29·7	..	..	..	51·8	0·20
Glasgow	62·0	34·5	28·1	..	..	..	50·5	0·66
Dundee	65·0	39·0	26·0	..	..	..	51·7	0·75
Aberdeen	61·5	40·7	22·8	..	..	..	50·9	0·88
Paisley	60·0	34·5	26·5	..	..	..	49·0	0·60
Greenock	61·0	41·0	20·0	..	..	..	51·3	0·70
Leith	68·0	37·8	30·2	..	..	..	52·9	1·7
Perth	68·0	34·0	34·0	..	..	..	51·8	1.07
Dublin	68·4	44·0	24·4	..	..	..	56·4	0.49

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *J. R.* Rivers' "Miniature Fruit Garden," or, if further information be wanted, Thomson's "Gardener's Assistant.

CEPHALOTAXUS FORTUNEI FŒMINA: *C. F. P.* We have had our attention drawn to a similar fact before, which was noted at the time (see p. 1166, 1868). All the Cephalotaxi are understood to be dioecious, but the occurrence of these two sexes of its fruiting apparently without means of fertilisation may suggest doubts as to their being so. It is certainly more likely that a dioecious plant should, under certain circumstances, become monoecious, than that a tree should bear fruit without fertilisation. *A. M.*

FUNGUS: *W. M., Ely.* Agaricus subpulverulentus, P.

GARDENERS' GRIEVANCES: *North York* complains that his mistress makes a practice of going through the houses from time to time, and digging up the soil in the pots as deeply as she can—Heaths and other hard-wooded plants coming in for their share of this treatment. She also waters, pots, and removes to other quarters, plants put aside to rest. We can only say that such an employer does not appear to want a gardener; and that it is unfair to any gardener thus to interfere with his proceedings. An employer has of course the right to have anything done which he or she pleases, but then, if it is against a gardener's advice, he or she must take the risk, if the gardener is exempt from blame for the consequences. It is better that employers, when they wish anything done, should give instructions to have their wishes carried out, and not to meddle in and muddle the gardener's work.

HINKS' PETROLEUM STOVES: *F. T.* We have no experience with these, but they are said to be safe and efficient.

INSECTS: *Subscriber.* The insects, found by thousands in a Turnip field at Bedale, are the larvæ of the common lady-bird (Coccinella septem-punctata). Doubtless your Turnips have swarmed with Aphides, upon which these lady-bird larvæ have been feeding (hence they should be protected as much as possible), and by-and-by we shall have accounts in the newspapers of wonderful swarms of lady-birds, supposed to have migrated from abroad. *W.*

KEEPING GOLDEN DROP PLUMS: *A. B.* asks if any of our readers can tell him how to keep Golden Drop Plums after being gathered.

NAMES OF FRUITS: *B. C. Pears:* 1, Easter Beurré; 2, Beurré Rance; 3, Beurré Diel; 4, Glou Morceau; 5, Passe Colmar; 6, Williams' Bon Chrétien; 7, Beurré d'Aremberg; 8, not known; 9, Marie Louise; 10, Marie Louise; 11, Fondante d'Automne; 12, Beurré Bosc; 13, Van Mons Léon le Clerc; 14, Uvedale's St. Germain. *Apples:* 2, Yellow Ingestre; 3, Old Nonpareil; 4, Manks Codlin; 5, Kerry Pippin; 6, White Easter; 7, Court Pendu Plat; 9, 11, Cellini; 12, Manchester Pippin; 13, Wyken Pippin; 15, Non such; 16, Baxter's Pearmain; 18, Ronald's Royal Pearmain; others could not be recognised. *Fig:* Brown Turkey. *Plums:* 1, Reine Claude de Bavay; others quite rotten.—*Dinas Mawddwy. Apples:* 2, Sturmer Pippin; 3, small Norfolk Beaufin or Black Crab; 5, Yorkshire Greening; 7, Kentish Codlin; 8, White Easter. *Pears:* 2, Black Achan; 5, Beurré Rance; 7, 10, Easter Beurré; 8, Winter Crassane; 9, Ne Plus Meuris; 11, 14, Beurré d'Amanlis; 13, Beurré Bretoneau; 15, Winter Nelis; 18, Louise Bonne of Jersey; others unknown.—*Inquirer. Apple:* Caroline Pippin.

NAMES OF PLANTS: *Subscriber.* We cannot undertake to name "ten varieties" from fragments of twigs.—*Query.* 1, Stapelia bufonia; 2, Echeveria retusa; 3, Agathæa cœlestis; 4, Asplenium viviparum; 5, Polypodium pectinatum; 6, Adiantum hispidulum; 7, Polystichum capense; 8, Anemia Phyllitidis; 9, Phymatodes vulgaris; 10, Cereus strigosus; 11, C. flagelliformis; 12, Saxifraga sarmentosa. Some of your Ferns not in fruit, and therefore difficult to determine.—*Caroline.* Veronica incana.—*F. R.* We cannot undertake to name florists' flowers. No. 3 is probably a Robinia (commonly, but erroneously, called "Acacia"); but we cannot name a plant from a fragment of a leaf.—*J. Scott.* Polygonum cuspidatum.—*G. Donaldson.* 1, Gymnogramma speciosa of gardens, a form of

Chlomelanos; 2, G. pulchella, a sulphur-coloured variety. *H.* 1, 2, 5, forms of Cystopteris fragilis; , Davallia bullata; 4, Doodia media; 6, Asplenium fontanum. *—F. H. N.* Habrothamnus roseus.

NECTARINES REMAINING ACID, &c.: *W. E. M.* We cannot account for this, they having, as you say, received the same treatment as the Peaches, excepting it be from over-cropping. We can ascribe it to no other cause.

PELARGONIUMS: *J. C.* The flowers had all fallen to pieces, and were not recognisable. The gold and bronze leaf, John Fraser, is bright and good now; its merit depends on its habit and constancy as compared with other kinds. We hesitate to say it is distinct—there is such a manifest sameness throughout the whole class.

POMOLOGY: *V. R.* Decaisne's "Jardin Fruitier du Muséum" and Leroy's "Dictionnaire de Pomologie" are good recent works. The "Pomological Magazine," a few volumes of which were published some years since, is also a standard work. The "Florist and Pomologist" is the only periodical we have which meets your inquiry. The first two are published in Paris, the Magazine is occasionally to be had at second-hand bookshops, the last is published at 172, Fleet Street.

SOLANUM CAPSICASTRUM: *Caution.* You would do well to act up to your name.

STEPHANOTIS: *Gardener.* The fruit of the Stephanotis is NOT eatable—don't try it even.

STRAWBERRIES: *St. Aubyn.* The runners of Strawberries should be kept cleared away—from the old stools as soon as any required stock has been secured, from young plants as fast as they commence to shoot forth.

UNDER GARDENERS' COTTAGE: *C. E. F.* has entirely mistaken the arrangement, as he will see if he looks carefully at the plan. It is a room for the day-labourers who also not live on the premises; D is a general living room for the young men who do live on the premises, and who have separate sleeping rooms at E. We do not know what the arrangements are for cooking in this instance. In some places there is a garden woman employed, who attends to this among other matters: sometimes the men have to cook for themselves, one being told off in rotation for the purpose.—*T. S.*, another correspondent, hints at "rules and restrictions," in the case referred to, as being "a great drawback to the comforts of the under gardeners;" but we can scarcely imagine that any unjust rules would be continued if their action was shown to be oppressive, while a proper code of rules is most essential to the order and respectability of any establishment.

VEGETABLE REFUSE: *F. T.* The very best way of economising vegetable refuse is to collect it in a heap and then "smother burn" or char it. The harder portions, such as Cabbage stumps, prunings, &c., should be charred with the rest. Of course the heap should be kept as far from the house, and as much out of sight, as possible.

VINES: *J. J.* You cannot do better than as you propose, to renew as much of the border as you can without disturbing the roots to any great extent. It will do them no harm to pull off a great portion of the surface fibry roots, as they will soon get renewed in the fresh soil. You will further improve your Vines by cutting away one-third the number of the old rods, and encouraging the growth of more young wood. This will do quite as much for you as the renewal of the soil.

CATALOGUES RECEIVED:—E. G. Henderson & Son's Autumn Catalogue of Bulbs, &c.—Hooper & Co.'s General Catalogue for 1870.—R. Dean's Catalogue of Hyacinths, &c.—R. Parker's Catalogue of Hyacinths, &c.—Wood & Co.'s Dutch Flowering Bulbs.—E. P. Francis and Co., Descriptive Catalogue of Roses.—J. House, Select List of Hyacinths, &c.—J. Veitch & Sons' Catalogue of Hyacinths, &c.—Butler, McCulloch & Co., Dutch and Cape Bulbs.

COMMUNICATIONS RECEIVED:—Rev. H. T. (with many thanks)—I. C.—R. A.—E. M.—H. R.—C.—I. H. A. Gardener.—R. I. (the Irrepressible Nigger—he'll be choked up in a twinkle to be let go).—Buz.—J. K.—J. C.—I. C. N.—H. B. D.—H. G. R.—W. P. A.

DIED, on the 21st inst., aged 70, Mr. WILLIAM HIGGINS MOUNTFORD, late Head Gardener to H. R. Hughes, Esq., Kinniel Park, St. George.

Markets.

COVENT GARDEN.—Sept. 24.

The trade generally rules very heavy, and both wholesale and retail prices are somewhat lower, there being a large supply, which is considerably augmented from the effects of the late high winds. Amongst flowers we have Pelargoniums (single and double), Asters, Dahlias, and Lilliums.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0 to 2 0		Oranges, per 100	10 0 to 16 0	
Figs, per doz.	0 6 to 1 0		Peaches, per doz.	1 0 to 4 0	
Grapes, per lb.	1 0 to 3 6		Pears, per doz.	1 0 to 3 0	
Lemons, per 100	10 0 to 16 0		Pine-apples, per lb.	3 0 to 6 0	
Melons, each	1 0 to 3 0		Plums, p. half sieve	2 0 to 3 0	
Nectarines, per doz	1 0 to 4 0				

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Beet, per doz.	2 0 to 3 0		Herbs, Radish, p. bun.	3 0 to 5 0	
Cabbages, p. doz.	1 0 to 1 6		Lettuces, p. score	1 0 to 3 0	
Carrots, p. bunch	0 4 to 0 8		Mint, per bunch	0 3 to 0 6	
Cauliflowers, p. doz.	1 6 to 3 0		Mushrooms, p. pott.	1 0 to 4 0	
Cucumbers, each	0 6 to 1 0		Onions, per bunch	0 4 to 0 9	
French Beans, p. sieve	2 0 to 3 0		Parsley, p. bunch	0 2 to 0 4	
Do., retail, p. lb.	0 4 to 0 6		Shallots, per lb.	0 8 to ...	
Garlic, per lb.	0 8 to ...		Spinach, p. bushel	2 0 to 3 0	
Gherkins, per 100	1 0 to 2 0		Tomatos, per doz.	1 0 to 1 6	
Herbs, per bunch	0 2 to 0 4		Turnips, p. bunch	0 9 to 1 0	

Potatos, York Regents, per ton, 90s. to 105s.; Kidneys, 110s. to 120s. do.,

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Friar Gardens, New Park Street, Southwark, London, S.E.

HOT-WATER PIPES, BOILERS, &c., &c., of superior quality.

	2-inch.	3 inch	4 inch
HOT-WATER PIPES, Nos 6 and 7—per yard	s. d.	s. d.	s. d.
	0 11	1 5	1 11
ELBOWS, No. 12	each 1 0	1 9	2 6
T-PIPES, No. 33	,, 2 0	2 10	3 9
SYPHONS	,, 1 4	2 4	3 8
VALVES	,, 8 0	10 0	12 0

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WANTED, a FOREMAN, to take the Management of a Market Garden and Orchard. None need apply who do not thoroughly understand their business. Apply to Messrs. G. H. Pearce, Sons, & Co., Sydenham.

WANTED, by the Committee of Visitors of the Metropolitan Pauper Asylum, near Wallingford, Berks, a Married Man, as WORKING BAILIFF, and his Wife, to take charge of the Dairy, and board 12 Paupers. Wages, if the Wife is to be employed, 20s. per week; if not, 18s. per week. Board and Lodging for Man and Wife. Further particulars, with testimonials, to be sent to the Clerk signed by Oct. 1. H. MAUD, Clerk to the Visitors, Wimbledon, Surrey.

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WANTED, as GARDENER, a married Man, who has had considerable experience in Conservatory Work, and also understands Outdoor and Kitchen Gardening. Stable-age, wages, and full particulars to Apply, Sulgrave, Northampton. None need be likely to possess a character who cannot fulfil the above requirements.

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Victoria and Paradise Nurseries, Upper Holloway, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. F. G. HENDERSON AND SONS, Wellington Nursery, St. John's Wood, London, N.W.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

GARDENER (HEAD).—Age 30, married; thoroughly practical in all branches. Has got lessons. Good character.—T. S., 20, Queen's Road, Upper Holloway, N.

GARDENER (HEAD).—Age 33, married, no family; thoroughly understands Early and Late Forcing of Fruit, and Kitchen and Flower Gardening. Nearly ten years in last situation. Good character.—J. W., East Farleigh, Kent.

GARDENER (HEAD).—Age 29, married; thoroughly understands the profession in all its branches. Two and a half years' good character.—T. S., Compton, Swan Agent, Widow Hill, Upper Norwood, S.E.

GARDENER (HEAD).—Married; thoroughly understands Forcing Fruits, Flowers, Vegetables, and good Kitchen and Flower Gardener. Eight years' good character. Can be well recommended.—J. W. M., West Park, Salisbury.

GARDENER (HEAD), to any Lady or Gentleman requiring a thorough practical working Gardener.—Married, three children; has a superior knowledge of the profession in every branch. State wages given, &c.—X. Y. Z., Post Office, Wood Green, Tottenham, N.E.

GARDENER (HEAD).—Age 37, single; thoroughly experienced in every branch of the profession; Early and Late Forcing, Flower and Kitchen Gardening, the Management of Land, Stock, &c. Good character from present employer.—I. P., 2, Wandle Terrace, South Street, Wandsworth, S.W.

GARDENER (HEAD).—A Gentleman wishes to recommend a thoroughly steady, industrious Man as above; competent to undertake the Charge of Land and Cattle, if required. Wife accustomed to Dairy and care of Poultry. Both can be highly recommended.—S. H., Post Office, Epsom, Surrey.

GARDENER (HEAD), age 48, married.—ROBERT COTT, Gardener to Mrs. Okeden, Farnworth, Dorset, is desirous to engage with any Noblemen or Gentleman requiring the services of a thoroughly practical Man. Leaving on account of Labour being reduced. Six and a half years' good character.—Mr. LEACH, Bryanston Gardens, Blandford, Dorset.

GARDENER (HEAD), married. S. SPREADBURY, Conservatory Gardener to H. B. Webster, Esq., Grimond Lodge, Richmond, is desirous to meet with any Lady or Gentleman requiring the services of a Man thoroughly practical in all the various branches of the profession; also the Management of Land and Stock. Disengaged through leaving family sold.—No. 7, 4, Park Terrace, Upper Richmond Road, Putney, S.W.

GARDENER (HEAD), or GARDENER and BAILIFF.—Married, without family; steady; has a thorough practical knowledge of Gardening; also the Management of Arable and Meadow Land, and Buying and Selling all kinds of Stock, &c. Wife understands Dairy and Poultry. Three years' good character.—A. B., Messrs. Lane & Son, Berkhamsted, Herts.

GARDENER (HEAD, WORKING).—Aged 40, married, no encumbrance; has had great experience in Renovating old Gardens, making new ones; Growing Vines, Peaches, Melons, Pines, Cucumbers, Kitchen Garden, Conservatory, &c. Twenty-two years experience in Growing Roses as an especial favourite. Five and a half years' good character.—G. C., 3, Backhouse & Son, Nurserymen, York.

GARDENER (HEAD, WORKING), age 35, married.—WILLIAM HENDERSON, for the last three years Gardener to Thomas Marrian, Esq., Thurcroft Hall, Maltby, Rotherham, is at liberty to treat with any Lady or Gentleman requiring the services of a thoroughly practical Man. Well understands the Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, the Management of Fruit, Flower, and Kitchen Gardens. Wife, having no family, is qualified to make Butter. Good character. Lambeth Lake, Charlwood, Horley. Strictest character will bear investigating.

GARDENER (HEAD, or otherwise).—Married; has a good practical knowledge of the profession in all its branches. Good references for abilities, &c.—A. P., G. Thomson, Esq., Dartmouth Park Lodge, near Highgate.

GARDENER (age 35, married, no family).—A Gentleman wishes to recommend his Gardener, as above. Has a practical knowledge of Vine Growing. Desirous of family shifting their residence. Excellent character.—E. D., Post Office, Wrayshall, Staines, Middlesex.

GARDENER (SINGLE-HANDED). Age 25, to take Charge of Greenhouses, and Flower and Kitchen Gardens. No objection to one Horse. Four and a-half years' good character.—S. W., Lobb, Bedales.

GARDENER (UNDER), where two or more Gardeners are kept.—Age 34, steady. Good character. No objection to a Premium.—I. A., Dringhoe's, Hotel-st., Maidenhead, S.W.

FOREMAN, in a Private Establishment.—Nine years' practical experience; active and intelligent. First-class character in every respect.—W. F., Tatenhill, Burton-on-Trent.

FOREMAN, in a Nobleman's or Gentleman's Garden. Age 24; two years' good character.—J. F., Mr. Clapham's, Rumbridge, Wantage, Berks.

To Gentlemen, Contractors, and Others.

NEW GROUND WORKER. Thoroughly understands Laying out of New Grounds, and Alterations and Improvements. G. L., 14, Belgrave Street South, Belgrave Square.

TRICOLOR GERANIUM GROWER and RAISER, is well-seasoned PROPAGATOR. Ten years' Reader in one Establishment.—J. B., 91, St. John's Terrace, Regent's Park, London, N.W.

To Nurserymen.

PROPAGATOR of Stove, Greenhouse, and Soft-wooded Plants, also Hardy Outdoor Plants. Has had long practice in Large and Provincial Nurseries. Thoroughly steady and punctual. Can be highly recommended.—H. W., 9, Pye-st., Stockwell, Surrey, Nursery-n, Chesham.

INSTALLATION AGENCY, with or without the Management of a Home Farm. Wanted by a Gentleman of considerable experience in every description of Agriculture as practised in Scotland and the North of England. The Advertiser is a thorough man of business. Highest references and good security.—BETA, Post Office, Aylesbury.

IMPROVER, in a Nobleman's or Gentleman's Garden.—Age 20. Good references. £5 Premium given.—J. I. FERRET, Elton, Oundle, Northamptonshire.

To the Seed Trade.

CLERK and TRAVELLER.—Wanted, an Immediate Engagement by Advertiser, who is accustomed to Counting House duties and the Road. Eight years' reference from present employer.—J. H., care of Mr. Rowell, 47, Grange Walk, Bermondsey, S.E.

SHOPMAN.—Single; 15 years' experience in the Seed trade, and a good knowledge of the Florist business. Good reference.—C. C., Mr. Pestridge, Seedsman, Greenway, Uxbridge.

Seed Trade.

SHOPMAN, or WAREHOUSEMAN.—Age 29, single; 11 years' experience in first-class Provincial Houses. Good reference.—W. B., *Gardeners' Chronicle* Office, 171, Strand, W.C.

DAIRY and POULTRY MAN.—Age 36; no incumbrance; has practice to a small Garden. Wife good Dairy woman. Good reference from late and previous employers.—H. I., Post Office, Millbrook, Southampton, Hants

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, VALUER, &c., Golworth Nurseries late R. Dean's, Woking, Surrey.
SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER (of the late Firm of Lee and Fraser), Horticultural Auctioneer, Valuer, and Land Agent, 4, Maylands, Romford, Essex, E.
SALES by AUCTION, &c.

Landscape Gardening, Groundwork, the Making of New Roads, Planting Gardens, Parks and Pleasure Grounds, &c.

WM. WOOD and SON are prepared to undertake the above Works, and to execute them in the most efficient, either by contract or otherwise. Estimates, Plans, and specifications supplied on the shortest notice.
Park Fencing undertaken to any extent.
N.B. Plans and Designs for Horticultural Buildings, &c., &c.
Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WANTED to PURCHASE, a small NURSERY and SEEDSMEN'S BUSINESS, within thirty miles, T. S., Mr. C. Throp, Queen's Road Nurseries, Halifax, Yorkshire.

Upper Norwood, near the Palace.—To Nurserymen.

TO BE LET, on LEASE, or otherwise, a piece of GARDEN GROUND, in an open but sheltered position on the slope of Westow Hill. Part of it well adapted for the erection of a Vinery or other houses, with good private entrance from the main road.
Apply at 1, Belgrave Place, on the Premises; or to Mr. C. E. NORTON, Church Road, Upper Norwood, S.

SALES BY AUCTION.

Planting Season.

IMPORTANT to NOBLEMEN, GENTLEMEN, NURSERY MEN, and OTHERS ENGAGED IN EXTENSIVE PLANTING.

PRELIMINARY NOTICE of FORTHCOMING SALES of NURSERY STOCK.

OCTOBER 17, on the Premises, 1 ROWN NURSERY, READING, by order of Mr. Brown, the whole of the quantity of useful NURSERY STOCK, ORNAMENTAL VASES, &c.

OCTOBER (after end of the month), on the Premises, the CAMDEN NURSERY, near HAMPTON STREET, CAMBERWELL, by order of Mr. Wm. Paine, who is relinquishing NURSERY STOCK, &c.

OCTOBER, on the Premises, the NURSERY, PHILIP LANE, TOTTENHAM, MIDDLESEX, by order of Mr. Alex. Jeffrey, who is relinquishing NURSERY STOCK, &c.

OCTOBER 24 and NOVEMBER 1, on the Premises, ST. JOHN'S NURSERY, WOKING, SURREY; by order of the Executors of the late Mr. William Jackman, Sen.

NOVEMBER 3 and 4, on the Premises, the WHITCHURCH BILTORY, HOUNSLOW, MIDDLESEX; by order of the Proprietor.

NOVEMBER 9 to 19, on the Premises, the LEIGHAM COURT ROAD NURSERY (a branch establishment), STREATHAM HILL, SURREY; by order of Mr. George Clarke, the land being required immediately for building purposes.

NOVEMBER, by order of the WANDSWORTH COMMON NURSERIES, SURREY, S.; by order of Mr. R. Neale, who is relinquishing the land being required for building purposes.

Catalogues, when ready, may be had on the respective Premises, and of MESSRS. PROTHEROE and MORRIS, Auctioneers and Valuers, Leytonstone, Essex, E.

Christchurch, Hants.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. G. Smith (who is relinquishing the business in order to devote his whole attention to his seed trade) to SELL by AUCTION, without reserve, on the Premises, the Park Place, Belbin's and Scot's Hill Nurseries, Christchurch, Hants, on MONDAY, October 31, at 12 for 1 o'Clock precisely, the whole of the valuable NURSERY STOCK, comprising a large and varied assortment of Evergreen and Coniferous Shrubs, in capital condition for removal, including about 1,000 Laurels, 1,000 Portugal Laurels, 1,000 English Yews, variegated and green Hollies, Euonymus and Box, Bays, Aucubas, &c.; Pinus, Thujas, and Abies, in choice kinds; Cedrus Deodara, Thujopsis, large quantities of Spruce, Retinospora, and Lawson Firs; also forest and ornamental Trees: fine standard, pyramidal, and trained Fruit Trees: a choice collection of standard and dwarf Roses, hardy Ornamental Plants, Strawberry Quick, Privet, Pampas Grass, and a quantity of other useful Stock.

On view two days prior to the Sale. Catalogues may be had on the premises, and of the Auctioneers and Valuers, Leytonstone, Essex.

N.B. The entire contents of the Nursery will be sold, and no trade made with Mr. G. Smith to allow the lots to remain on the ground one month from the date of Sale, the purchase-money being paid by Thursday, October 6.

Woking, Surrey.

HIGHLY IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. George Jackman, Senior, to SELL by AUCTION, without reserve, on the Premises, the Woking Nurseries, Woking, Surrey (about one mile from the Railway Station), on THURSDAY, October 6, and four following days, at 11 for 12 o'Clock precisely each day, a portion of the very valuable NURSERY STOCK, consisting of upwards of 3000 Specimen Coniferæ, and Evergreen Shrubs, of matchless shape and beauty, ranging from 3 to 15 feet, in capital condition for removal, the whole having been carefully prepared, including choice Abies, Pinus, Piceas, Taxus, Araucarias, Cupressus, Junipers, Retinosporas and Thujas, of sorts; Thujopsis borealis, Wellingtonia gigantea, variegated and green Hollies, Arbutus, Box, Bays, Phillyreas, &c.; also thousands of Ornamental Conifers, from 2 feet upwards; 3500 Standard and Dwarf Roses, 3 to 4 feet; 600 Thujopsis borealis, 5 to 6 feet; 500 Pinus austriaca, 3 to 4 feet; 3000 green and variegated Box, 2 to 3 feet; 4000 Evergreen Privet, 2 to 3 feet; 600 English Yews, 4 to 5 feet; 1000 Thuja Wareana and lobbii, 4 to 5 feet; 1000 Cupressus Lawsoniana, 4 to 5 feet; 500 Irish and Chinese Junipers, 4 to 5 feet; 1000 hybrid and seedling Rhododendrons, 2 to 3 feet, &c.; likewise a fine collection of Ornamental Deciduous Trees, 8 to 12 feet, for Park and Garden Planting; 800 standard and dwarf Acer Negundo variegata; 2500 standard and dwarf Roses, of the best varieties; together with thousands of Deciduous Shrubs.

The whole can be seen prior to the Sale. Catalogues may be had (6d. each, returnable to purchasers) on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex.

N.B.—P. & M. respectfully urge that all persons who contemplate planting during the ensuing season should inspect this Stock, in order to form an adequate conception of its extent, beauty, and excellence. P. & M. would further mention, with a view of conveying an idea of its extent, that the borders on each side of the Centre Main Walk alone measure 1486 feet long, by 20 feet wide, and are furnished with thousands of unrivalled specimen Coniferæ and Evergreen Shrubs, admirably adapted for effective planting.

Camberwell, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, GREENHOUSE PLANTS, GREENHOUSES, PITS, HOT-WATER PIPING, BOILERS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. John Dawson to SELL by AUCTION, on the Premises, The Nursery, Grosvenor Park, Camberwell, S., on TUESDAY, WEDNESDAY, October 18 and 19, at 11 for 12 o'Clock precisely each day, without reserve (the land being required immediately for the erection of a Church), the whole of the valuable NURSERY STOCK, consisting of a capital assortment of choice Evergreen and Coniferous Shrubs, Ornamental Shrubs, admirably adapted for the neighbourhood of London, fine Standard and Dwarf Roses, Fruit Trees, Fruiting Vines in pots, 3000 choice Greenhouse Plants, including 400 Camellias and Azalea indica, &c.; 1500 Hardy Climbers, likewise several Greenhouses and Pits, Light-boxes, Hot-water Piping, Boilers, &c.

Now on view; Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, E.

Tooting, S.W.

IMPORTANT SALE of YOUNG and THRIVING EXTRA NURSERY STOCK.

MESSRS. PROTHEROE and MORRIS are instructed by Mr. R. Parker to SELL by AUCTION, without reserve, on the Premises, the Tooting Nurseries, Tooting, S.W., on THURSDAY, FRIDAY, October 13 and 14, at 11 for 12 o'Clock precisely each day, Thousands of Valuable Extra NURSERY STOCK, remarkably well-grown and in excellent condition for removal; comprising 6000 choice Evergreen Shrubs and Coniferæ in specimen borders, including Picea Nordmannana, P. Pinsapo, and P. nobilis, Thujopsis borealis, Thujas of sorts, Pinuses of sorts, Wellingtonias, Cupressus Lawsoniana, Portugal Laurels, &c.; thousands of Common and Colchic Laurels; 1000 Green Hollies, 18 inches to 2 feet; Arbutus, 500 English Yews, 500 Box, silver-tree of sorts, fine Rhododendrons full of bloom buds, bushy Box, Cotoneaster Simmonsii, Berberis of sorts; about 3000 Spiræa Thunbergii, 3 feet, beautifully formed; Acer Negundo variegata, &c.; a large quantity of Ornamental and Forest Trees, consisting of Black Italian and Lombardy Poplars, Acer Negundo variegata, Acacia inermis, &c.; Choice Standard and Dwarf Roses of the best varieties; a large quantity of Boursaults, inermis and Amadis, Manetti, and Seedling Stocks; fine healthy Privet, Portugal Laurels in bearing condition; together with 50 lots of Choice ORCHIDS, fine Azalea indica, Gynerium argenteum, Yuccas of sorts, &c.; Choice Hardy Herbaceous Plants, Bulbs, &c.

May be viewed two days prior to the Sale; Catalogues may be had on the Premises; and of the Auctioneers and Valuers, American Nurseries, Leytonstone, Essex.

Bagshot, Surrey.

HIGHLY IMPORTANT and EXTENSIVE UNRESERVED SALE of NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Charles Noble to SELL by AUCTION, on the Premises, Nurseries, Bagshot, Surrey, five minutes' walk from Sunningdale station, South-Western Railway, on MONDAY, October 17, and five following days, at 11 for 12 o'Clock precisely each day, the whole of the valuable NURSERY STOCK, including an unlimited variety of choice Evergreen, Conifers, and Deciduous Shrubs, of remarkable growth and symmetrical form, and in splendid condition for removal; 20,000 Portugal Laurels, 12 to 18 feet; 2000 Retinospora ericoides, 1 to 2 feet; 2000 Cupressus Lawsoniana, 3 to 10 feet; 2000 Retinospora squarrosa, obtusa, and pisifera, 1 to 5 feet; 1000 Thujopsis borealis, 400 Taxodium distichum, 3000 fine Picea nordmanniana, 2 to 6 feet; 1000 Thuja Lobbii and gigantea, 12 to 18 feet; Araucarias, Wellingtonias, 4 to 15 feet; a quantity of handsome specimen Standard, 5 to 12 feet; also 5000 Pinus crenata, 2 to 3 feet; 5000 Berberis Aquifolium and Berberis Darwinii, Andromeda floribunda, 25,000 Rhododendrons, comprising 15,000 hybrid seedlings and 10,000 pontica, 1 to 4 feet; 5000 choice named varieties, full of bloom buds; 2000 Kalmia latifolia, 1000 Azalea indica, 2000 Irish and 500 Tritomas, clean-grown Fruit Trees, Standard and Dwarf Roses of the best varieties, and thousands of other Trees and Shrubs too numerous to particularize.

May be viewed two days prior to the Sale. Catalogues of each, returnable to purchasers, may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B. Any portion of the trees of the ground being required for building purposes. The whole of the specimens bear evidence of very careful production, and were all prepared for removal during the late unfavourable winter, 1869-70.

Bayswater.

MR. J. C. STEVENS has received instructions from the Proprietor to SELL by AUCTION, on the Premises, No. 9, Queen's Road, Bayswater (close to Kensington Gardens, and Bayswater Station), on TUESDAY, October 11, and following day, TUESDAY, September 27, at half-past 12 o'Clock precisely, the whole of the stock of PLANTS, BIRDS, CAGES, &c., the STAGING and GLASS, MINTON'S ENCAUSTIC TILES, WIRE BOXES and FIXTURES, FERNS and PALMS suitable for table decoration; CANARIES and other Birds, in cages; PARROTS, AVIARIES of BIRDS, &c.; and other miscellaneous effects, including the valuable and well-known GOODWILL of the BUSINESS, which has been carried on for the last four years by the present proprietor, and previously for 60 years by Auctioneer and other members of his family.

The Stock may be viewed the day prior and morning of Sale; and Catalogues had on the Premises, or of Messrs. H. AND R. POWELL, Estate Agents, No. 1, Queen's Road; and of Mr. J. C. STEVENS, Auctioneer and Valuer, 38, King Street, Covent Garden, W.C.

Nurseries, Reddish, near Stockport,

IMPORTANT ANNUAL SALE of NURSERY STOCK.—To NOBLEMEN, GENTLEMEN, and NURSERYMEN.

MR. KERRON has been favoured with instructions from Mr. B. Whitham, to SELL by AUCTION, without reserve, at the above Nurseries, on WEDNESDAY and THURSDAY, October 5 and 6, a portion of his most valuable NURSERY STOCK, consisting of a splendid stock of Rhododendrons, including hardy Azaleas, well set with bud; also a very extensive and valuable collection of Forest and Ornamental Trees, Evergreen and Deciduous Shrubs, in too great variety to enumerate in an advertisement. Sale [illegible] commence each day at 11 o'Clock.

[illegible] obtained of Mr. B. WHITHAM, The Nurseries, Reddish, near Stockport, and of the Auctioneer, at Romford Street, Ashton-under-Lyne.

[illegible] Sale Catalogue.

Easthampstead Nursery, near Bracknell, Berks.

IMPORTANT to NOBLEMEN, GENTLEMEN, and OTHERS, PLANTING for IMMEDIATE EFFECT.

MR. W. ABRAHAM has received instructions from the Proprietor of the above Nursery, Mr. R. Saunders, to SELL by AUCTION, on the Premises, on MONDAY, October 3, and four following days, at 11 for 12 o'Clock, punctually each day, a very Choice Collection of CONIFERÆ, EVERGREEN and DECIDUOUS TREES and SHRUBS, ranging in height from 4 to 16 feet, all healthy, handsome, symmetrical Trees, and having been moved within the last two years and in fine order for removal, and worthy the attention of purchasers. They consist of Araucarias, Junipers, Arbor-vitæ of sorts, Cedrus Deodara and Libani; Thujopsis, Cupressus, Retinospora, Abies, Picea, Pinus, Taxus, Cotoneaster frigida, Portugal Laurels, green and variegated Hollly, Arbutus: STANDARD RHODODENDRONS and fine bushes of the same, 2 to 6 feet; Kalmias, Azaleas, Heaths; 10,000 handsome Spruce Firs, 2 to 5 feet; 30,000 FOREST TREES, including Scotch, Silch, and Nonway Firs, Birch, Beech, [illegible] Hornbeam, &c., &c.

[illegible] Nursery is [illegible] adjoining the Railway Station.

The Nursery is [illegible] miles from Ascot, 3¾ from Sunningdale Station, South Western Railway (*viâ* Reading and London); Ascot, 3¾; Wokingham, 4; Maidenhead, 8; and Windsor, 9 miles. For convenience of packing, the trees can remain upon the ground until December 10, following the Sale.

The Stock may be viewed, and Catalogues obtained 10 days prior to day of Sale, at the Nursery; the principal Inns in the neighbourhood, or (post free) of the Auctioneer, Valuer, &c., Goldworth Nurseries, Woking, Surrey.

Paddock Wood, Kent, close to the Railway Station.

The remainder of this FREEHOLD ESTATE, comprising about 63¾ Acres of Pasture, Arable, and Hop Land, very valuable for Nursery and Market Gardens, Hop and Fruit Plantations; and the largest portion of which is suitable for Building, Brickmaking; and Accommodation Purposes, lying, as it does, nearly adjoining this important Junction Station, on the main South-Eastern Railway, and possessing extensive Frontages to the highroad from Brenchley to Maidstone, having also a Registered Parliamentary [illegible] Road, [illegible] Station, [illegible] Paddock Wood Station, [illegible] Brenchley, [illegible] Maidstone, [illegible] Tonbridge, [illegible] Tunbridge Wells, [illegible] Hastings, [illegible] London. Three-fourths of the purchase-money can remain on mortgage at £5 per cent.

MESSRS. DEBENHAM, TEWSON, AND FARMER will SELL the above (in 20 Lots, varying from half an Acre to 10 Acres, and one of 35 Acres), at the Maidstone Road Inn, close to the Paddock Wood Station, on WEDNESDAY, October 5, at 4 o'Clock punctually.

Particulars may shortly be had at the Bar of the [illegible] Hotel, Tonbridge; at the Star Hotel, Maidstone; and in London of [illegible] Land Surveyors, Estate Agents, and Auctioneers, 80, Cheapside, E.C., who would forward them by post on application.

Entire Stock of a Greenhouse Builder.

Comprising a CONSERVATORY, GREENHOUSES, PITS, various sizes, GLASS, PUTTY, LIGHTS, and LIGHT-BOXES, HOT-WATER APPARATUS, MORTAR, MACHINE, CARRIAGE, CHESTNUT PALINGS, PHAETON, and VALUABLE LEASE of SHOP and PREMISES.

MR. JAMES H. GREEN is instructed to SELL by AUCTION, on the Premises, 205, King Street, Hammersmith, on TUESDAY NEXT, Sept. 27, at 1 for 2 o'Clock, the ENTIRE STOCK of a GREENHOUSE BUILDER, and LEASE of PREMISES.

May be viewed [illegible] of the Sale, and Catalogues had on the Premises, 77, King Street, Hammersmith.

Staffordshire.—brereton Nurseries, near Rugeley.

IMPORTANT to NOBLEMEN, GENTLEMEN, and PARTIES PLANTING.—SALE by AUCTION of VALUABLE NURSERY STOCK.

MR. C. GILLARD begs to announce that he has been instructed by Mr. Whitehouse to Advertise for SALE by AUCTION, on the Premises, on TUESDAY and WEDNESDAY, October 4 and 5, the large quantity of truly VALUABLE STOCK of makers of Forest Stuff, which there is no occasion to describe in these columns.

The SPECIMENS for Sale will comprise several hundreds of the best Gold, Silver, and Green Hollies, from 18 inches to 6 and 7 feet, including about 100 perfect specimens of the best Golden Queen Hollies, 6 feet; Yews, transplanted Spring of 1870; fine specimens of Cupressus Lawsoniana, Thuja gigantea, Thujopsis borealis, Wellingtonias, Picea Nordmanniana, Picea Pinsapo, Picea Pichta, Abies Morinda, Cedrus Deodara, Cedrus Libani, Abies Webbiana, Cunninghamia lanceolata, Pinus Peuce, Pinus Benthamiana, Araucaria imbricata, and other ornamental flowering shrubs and evergreens; fine Oak, Larch, and other Forest Trees; strong and Seedling Quick, Fruit Trees, &c.

Particulars with [illegible] catalogues, which will be published in due time, to be obtained from the Auctioneer and at the place of Sale.

FIRST-CLASS SALES of SHORTHORNS, SHEEP, PIGS, &c.

TUESDAY, September 27.—The ENTIRE HERD of SEVENTY HEAD, at RANBY, WRAGBY, LINCOLNSHIRE, bred by the late Mr. [illegible] Wrawby, [illegible] 20 years, from good stock, and crossed with first-rate bulls. The FLOCK of pure-bred LINCOLN SHEEP [illegible] on the same day.

FRIDAY, September 30.—The very superior HERD of about FORTY HEAD, belonging to Thomas Robinson, Esq., at BURTON-ON-TRENT, including several animals of the Certainty, Buttercup, Lady Bates, and Duchess of Oxford tribes. Also some very superior SHEEP, Young Stock, and Implements.

WEDNESDAY, October 5.—Mr. W. Bates's ENTIRE HERD of SHORTHORNS, at BADMINTON, CHIPPENHAM, of about SEVENTY HEAD, including some of the very best Darlingtons, Minnies, Lavenders, and other Duke families, crossed with bulls of pure Bates blood for several years.

THURSDAY, October 6.—The Late Mr. W. Hewer's HERD of about EIGHTY HEAD, at the Manor Farm, CRAWTON, HIGHWORTH, from good sorts, and crossed with bulls of Spencer and Booth blood. Also his very famous stock of pure BERKSHIRE PIGS.

FRIDAY, October 7.—About FORTY very choice and highly-bred PRIZE ANIMALS, from the celebrated herd belonging to Lady Pigot, Brandon Park, Newmarket. Also the HERD of SHROPSHIRE SHEEP, pure-bred white PIGS, HORSES, IMPLEMENTS, &c., from two farms whose leases have expired.

Catalogues, with Pedigrees and full particulars of JOHN THORNTON, 15, Langham Place, London, W.

Churchill Heath, Chipping Norton, Oxon.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD begs to announce that he has received instructions to offer for SALE by AUCTION, without reserve, on TUESDAY, October 4, at the Churchill Heath Farm, a HERD of very superior SHORTHORN COWS and HEIFERS, [illegible] from Mr. George Grove's Herd, as well as that of his Father, which have been long and carefully bred from the most fashionable blood of the day. The Sale will include a very [illegible] Heifers [illegible] will be found the First Prize Cows at the Royal Agricultural Society's Meeting at the Bath and West of England Show, and at Gloucester, as well as several others that have obtained Prizes in the Counties of Gloucester, Oxford, Warwick, and Worcester.

Catalogues, with Pedigrees and other particulars, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. GEO. GARNE, Churchill Heath, Chipping Norton, Oxon.

Bodicote House, Banbury.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is instructed to announce for SALE by AUCTION, on WEDNESDAY, October 12, at Bodicote House, Banbury, the ENTIRE HERD of SHORTHORNS belonging to W. Caless, Esq., consisting of about 30 Head of Bulls, Cows, and Heifers, which have been selected and bred with care, chiefly from the famed Herds of J. C. Adkins, of Milcote; H. Combe, of Cobham Park; W. Smith, of West Rasen; and J. Webb, of Babraham; with the introduction of Mr. Mason's fine young Short-horn Bull Champion (21,963), winner of a Prize at the Royal Agricultural Society's Meeting at Leicester in 1868.

Full Pedigrees may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. CALESS, Bodicote House, Banbury.

SMITHFIELD CLUB SHOW, AGRICULTURAL HALL, ISLINGTON, DECEMBER 5 to 9.
IMPLEMENTS and MACHINERY.

The LAST DAY for receiving APPLICATIONS for SPACE for IMPLEMENTS and MACHINERY, &c., is OCTOBER 1.

Printed Forms of Application, with Rules and Regulations, may be obtained of Mr. DAVID PULLEN, Assistant-Secretary, corner of Half-Moon Street, Piccadilly, London, W., to whom all communications should bear outside the words "Smithfield Club."

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY and TUESDAY, December 5 and 6, and Four following Days.

Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under.

CATTLE.—Form A. For an OX or STEER (in any Class).
" B. For a PAIR OF HORNED OXEN.
" C. For a BEAST in Extra Stock.
SHEEP. " D. For a Pen of three SHEARLING EWES.
" E. For a SINGLE WETHER SHEEP in Extra Stock.
PIGS " F. For a Pen of three PIGS in any Class.
" G. For a SINGLE PIG in Extra Stock.

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.

Printed Forms of Application, with Rules and Regulations, may be obtained on application to Mr. DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Piccadilly, London, W.

N.B. All communications respecting the Show must be addressed to the Assistant-Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.
SATURDAY, SEPTEMBER 24, 1870.

CATTLE PLAGUE continues to spread in Prussia, and it still clings to the rear of the Prussian army, keeping ahead of all repressive measures. There is nothing remarkable in this unchecked advance of the disease; indeed, it would be wonderful if the ordinary means of prevention retained their usual potency under the new

conditions. Contractors for the army are bound to continue their supplies, and they have not many places to choose from. According to the latest reports the Swiss frontier has been closed, in consequence of the proximity of the plague. France undoubtedly suffers, but the information from that country is not very precise as to the locality of the disease; we may, however, be tolerably certain that it has not yet reached the immediate neighbourhood of Paris.

Holland remains free; the report to which we referred last week turns out to be false—fortunately for the Netherlands, and, perhaps we may add, luckily for us also.

From Berlin and Dresden the cattle plague appears to have spread in all directions, and it is not too much to assert that the present generation has not seen the disease so widely prevalent in Central and Western Europe as it is at present.

Before the outbreak occurred in Prussia, the cattle plague existed in Hungary, Poland, Transylvania, and Gallicia, in several well known districts; it existed eastward of those places to an unknown extent, in Russian provinces up to the shores of the Caspian Sea. From how remote a point it may yet be necessary for the Prussian army contractors to draw supplies none but an army contractor can surmise; all we know is, that the daily consumption and waste of animal food must be enormous, when 300,000 men have to be sustained; and if to the culinary consumption be added the ravages of cattle plague among animals closely congregated together and badly tended, the daily destruction of animal life must be absolutely terrific, and the daily demand for fresh materials sufficient to try to the utmost all the available resources. Meanwhile the important question arises, on what are we relying for security? We are receiving cattle and sheep from Holland, Schleswig Holstein, France, and Spain, principally. Denmark and Sweden supply us with a few cattle, but at present we have nothing to fear from them. All the dangerous countries, as we may for the sake of distinction term them, are now placed in the schedule in respect of cattle, while sheep and goats are subject to still more stringent regulations.

Germany, Belgium, and the Netherlands have occupied the position of infected countries from the passing of the Contagious Diseases (Animals) Act, and by the Order of Council of September 9 France was included in the list. Therefore all the foreign cattle landed in this country, except those from Sweden, Denmark, Spain, and Portugal, must be slaughtered at the landing-places at the outports; but in London, pending the construction of a separate foreign market for sale and slaughter of cattle from scheduled countries, they must be slaughtered in the metropolitan area. Further restrictions are imposed on French and German animals by the last Order of Council, dated September 20, and which comes into operation on September 23.

Under the exceptional conditions which obtain in France and Germany, it has been deemed necessary to adopt exceptionally severe measures of precaution, and in the terms of the last Order, sheep and goats imported from any port in the states of the North German Confederation or France shall be slaughtered within the defined part of the port at which they are landed. Cattle from those countries are already under the same restrictions at all the outports, and in reference to the port of London there is a clause to the effect that cattle, sheep, and goats, "shall be landed only at places approved by HER MAJESTY'S Customs, and set apart for the purpose; and, notwithstanding any Order of Council to the contrary, no animal shall be moved alive out of any places so set apart." This regulation is tantamount to the complete isolation of all animals imported from Germany and France. To Dutch and Belgian cattle the provision of the fourth schedule, enjoining slaughter within the defined parts of ports apply, but no special regulations have been made respecting sheep sent from Holland or Belgium, and it may be fairly presumed that they are not necessary. At present these countries are free from cattle plague, and in order to protect themselves from invasion have interdicted the importation of animals from the infected countries. It is possible that in spite of absolute prohibition of imports of live stock, the cattle plague may enter some of the neighbouring states from France or Germany, as it did enter Ireland in 1866 in spite of similar precautions; but the measures which have been adopted give reasonable promise of safety.

It is obvious that the chief care in this country has been to guard against the introduction of infected cattle, and it cannot be questioned that bovine animals represent the principal risk. Sheep, we know, are liable to take the plague, but only in a minor degree, and they can also convey it to cattle, but the probability of such an event happening from the introduction of foreign sheep is not great. No one questions for a moment the position that total prohibition of imports of foreign stock would confer the highest attainable degree of security against the introduction of foreign disease; but with a deficient supply of home stock, want of fodder, and meat at famine prices, the most furious monopolist would scarcely suggest such a measure. The safety-market compromise is not yet in the way of being realised; and until the fact is accomplished, we must be content with such measures of precaution as are practicable of application. The last Order of Council, we apprehend, will be universally pronounced sufficiently stringent.

THE following brief narrative, in continuation of our last week's remarks on PRICES, showing the effect of the variation of the seasons, may perhaps interest those whose fortunes as agriculturists are so much under the influence of season. Commencing with the remarkable years that closed the 17th century, a contemporary writer notes in his diary that in the latter part of the reign of JAMES and the beginning of that of WILLIAM, "the seasons were kindly to the fruits of the earth." From 20*s.* to 25*s.* per quarter was not an uncommon price for Wheat. An adverse change began in 1693, which was the first of the seasons known traditionally as the "seven ill years." Exportation was prohibited in 1699. The price of Wheat had more than doubled, although money was scarce and dear, owing to the "crying down" of clipped money in 1696 and the issue of new coin. Two or three indifferent years in the beginning of the century were followed by a very low comparative range of prices until 1765, during which there were only five years of marked deficiency—1727, 1728, 1740, 1756, and 1757. The evidence of low prices and large exports during this lengthened period shows the favourable character of the seasons. Years of plenty frequently came in groups, as they do now. In 1748, 1749, and 1750 the average yearly exports of corn of English growth were 1,300,000 qr. and the average price of Wheat was from 29*s.* to 33*s.* per qr. It was 32*s.* 1*d.* for the 66 years ending 1766.

This long period of abundance was attended by great improvement in agriculture and in the condition of the people. Labourers were never in more comfortable circumstances than in the reign of GEORGE II., which has been described by Mr. HALLAM as "the most prosperous period that England had ever experienced." The increase in the population caused an extension of cultivation, and the series of plentiful years reduced the cost of production.

The great change which occurred in the production and trade in corn in 1765—a change, in England, from regular exportations to habitual importations, and in Europe generally from cheapness to dearth—has been attributed to various causes; to a fall in the value of silver, owing to the great increase in the American mines, which took place in 1770, to the extension of industry and population, and the introduction of improved machinery into the cotton manufactures after the Peace of Paris in 1763. Various writers have referred the phenomena of prices principally to differences of demand or consumption, treating as subordinate any variations of supply. But their theories do not account for the sudden rise in price, and for the transition from a large export to a large import, which occurred between 1765 and 1775.

In fact, there is no reason to suppose that the consumption increased suddenly; probably at the period in question it diminished, since wages did not precede, but followed, very inadequately, the rise in price. The defective harvest in England and abroad was the real reason why the quartern loaf was as high as 1*s.* 6*d.* in London at one time, in 1766, when there was general distress throughout the kingdom, an early meeting of Parliament, and a Speech from the Throne on the subject of the high price of Wheat. The following harvest was still more deficient, and the five years from 1770 to 1774, inclusive, were all unproductive, and gave rise to a dearth and great distress and suffering among the people, with riots throughout the country.

In 1773 a contemporary writer, Mr. ARBUTHNOT, remarks:—"We have had five successive bad crops all over Europe, therefore till there was a plentiful year corn could not be cheap." 1774 was equally unproductive. The average price for the ten years ending that year was 51*s.* per qr., compared with 29*s.* 2*d.* for the ten years ending 1751. In the last-named period we had five years of war, with good harvests; in the less prosperous period, peace and bad crops. In the one case our balance of exports of Wheat was 4,700,000 qr., and of all kinds of grain 8,869,000 qr., and in the other the balance of imports was 1,363,000 qr. of Wheat, and of all kinds of grain 3,782,000 qr. The population had increased, but the increased breadth of land gained by inclosures, to say nothing of improvements in cultivation, had kept pace with it. Throughout Europe there was a similar recurrence of years of scarcity, owing to the prevalence of unusually inclement weather, cold, wet summers with some extremely severe winters and bad harvests. We read in the "Annual Register" that in 1767—

"The irregularity and inclemency of the seasons for some years past in different parts of Europe has occasioned great deficiency of the crops in several countries. Some parts of Italy have been severely affected by this calamity. England, which usually supplied its neighbours with such immense quantities of grain, and allowed a considerable bounty on the exportation of it, has been a sufferer from the same cause."

"1768. The badness of the late harvest in France has occasioned provisions of all sorts to bear an immoderate price, and corn in particular was not only very dear, but, in general, very bad, and the bread consequently disagreeable and unwholesome. The distresses of the people were excessive, and their complaints and murmurings became universal."

"1770. A scarcity of provisions prevailed in France. It is said 4000 persons perished by famine in Limousin and the Marche only; and in Normandy, the most fruitful province of France, Barley bread sold at above 2*d.* a pound. This misery produced numberless riots and insurrections in different parts, in which much mischief was done, and many lives lost."

"Berlin, April 13, 1771. It still continues to freeze every night, as in the middle of winter. The want of provisions is very great; both at Frankfort and in the circle of Swabia, our magistrates distribute bread to the poor gratis, and those of Nuremburg do the same. In Bavaria bread is at an excessive high price."

"1773. The dearth which has so long afflicted different parts of Europe has this year been grievously felt in different countries. Germany, Bohemia, and Sweden have presented scenes of the greatest calamity, and multitudes have perished in that miserable extremity of wanting the plainest and most common necessaries of life. France has been a sharer in this misfortune. Nor has the taking off of the bounty on exportation in England, with all the other measures that have been adopted to answer the same purpose, been sufficient to remedy the evils proceeding from inclement skies and unusual seasons."

"1775. In several places in France bread could not be obtained for money. The distress was the more irremediable, as other nations were not abundantly supplied. The scarcity of corn in England not only cut off that resource, but diverted a still greater by the immense quantities which it drew from the American colonies."

After describing the distresses of the people in France and the alarming riots, the account concludes with this very suggestive statement:—"At length it pleased Providence that a most plentiful harvest removed the distresses of the people, both in France and most other parts of Europe."

A plentiful harvest in most parts of Europe in 1775 relieved these distresses. In England the price fell from 59*s.* 1½*d.* at Lady Day to 43*s.* 7*d.* at Michaelmas, and continued at about that price for two years; 200,000 qr. of Wheat were exported in 1776. Up to 1792 the seasons were irregular, but not so bad as they had been; 1779 was a great year, and prices fell to 36*s.* 3*d.* During the three last years of the American War, from 1780 to 1784, when trade was declining, and the industry of the country was much depressed, Wheat was above 50*s.* a qr. The three next years, ending 1787, were marked by great commercial reaction and prosperity, and by a fall in the price of Wheat of 10*s.* per qr. Contemporary records show that the variations in price were due to the characters of the seasons. In 1789 a bad crop here and abroad produced an Order in Council, prohibiting export, and admitting foreign corn, duty free. Our price rested at about 57*s.*; at the great foreign corn marts it ranged between 60*s.* and 70*s.* 1790 was wet; the relative prices enabled us to import corn; the next crop was abundant, and large supplies had the effect of reducing prices to 40*s.* 11*d.*, of closing our ports, and of producing a corn bill.

To sum up the character of the seasons and their influence on price, it appears that from 1741 to 1751 the yearly mean rainfall in England

was 18½ inches, and these were years of plentiful corn crops, as is usual in dry seasons; in the 18 years ending 1748 there was only one deficient year; during the 18 years ending 1793 there were six years of decided deficiency; during the first 65 years of the 18th century the seasons were remarkably favourable compared to those of the last 35 years. It is to that circumstance, far more than to the increase of the population, or the depreciation in the value of silver, that we must attribute the rise in the price of Wheat from £1 12s. 1d. per qr. in the former period to £2 10s. 6d. in the latter period. The average for the century was £1 18s. 7d. The average for the first 65 years shows a fall of 16 per cent. compared with that of the whole of the former century, which was £1 18s. 2d. per qr.

During the great war in the beginning of this century the area of Wheat was probably as great as it is now, and in good years the growth would have sufficed for the consumption of the country. The fullest evidence shows that the high prices which ruled were owing, firstly and mainly to bad seasons, secondly to the war, thirdly to the paper currency and suspension of cash payments. The fall in the price of Wheat of from 30 to 40 per cent. after the conclusion of the war was slightly affected by the resumption of cash payments by the Act of 1819 ("PEEL'S Bill"), but its occurrence was mainly due to better harvests.

The general character of the seasons in Europe during the last 50 years has corresponded to that of the larger and earlier portion of the last century, and prices have ruled comparatively low. Even the repeal of the Corn-laws in England, which became necessary owing to the doubling of the population, was perhaps retarded several years by the five abundant Wheat crops in 1853-57.

—— At Mark Lane English Wheat has advanced in some instances 1s. per qr.; in flour some Americans advanced 6d. to 1s. per barrel, whilst town-made fell 3s. per sack.——At the Metropolitan Cattle Market a large number of inferior beasts were offered; choice descriptions met with a ready sale at fully late rates. The supply of sheep improved, not so the quality; hence quotations were but slightly altered.

—— We learn that a meeting of the Norfolk Chamber of Agriculture will be held on October 1, to receive the report of the Committee appointed to take action in the matter of the new regulations made by Fire Insurance Offices for insuring farming stock.

—— The Statistical Department of the Board of Trade have just issued the following preliminary statement of the Agricultural Statistics of Great Britain for the current year:—

Extent of Land in Great Britain under

	Wheat.	Barley.	Oats.	Potatos.	Hops.
	Acres.	Acres.	Acres.	Acres.	Acres.
1869.	3,652,125	2,151,324	2,752,653	541,543	64,488
1870.	3,668,257	2,281,480	2,7[illegible],700	[illegible],441	61,702
1870.	3,463,131	2,067,600	2,704,[illegible]7	517,304	60,138
	Increase (+) or Decrease (−).				
1870. over 1869.	− 105,226 or 1·2 per cent.	+ 117,146 or 5·2 per cent.	− 21,013 or 0·8 per cent.	+ 7,693 or 0·4 per cent.	− 1,614 or 2·7 per cent.
1870. over 1868.	+ 218,994 or 4·4 per cent.	+ 217,302 or 10·1 per cent.	+ 4,654 or 0·2 per cent.	+ 45,761 or 8·4 per cent.	− 4,350 or 6·8 per cent.

Total Number of Live Stock in Great Britain upon June 25.

	Cattle.	Sheep.	Pigs.
1868	5,423,651	30,711,196	2,308,539
1869	5,313,473	29,538,141	1,939,452
1870.	5,394,756	26,150,417	2,[illegible],857
	Increase (+) or Decrease (−).		
1870 over 1869.	+ 81,283 or 1·5 per cent.	− 1,187,724 or 4·0 per cent.	+ 247,935 or 12·3 per cent.
1870 over 1868.	− 29,225 or 0·5 per cent.	− 2,[illegible]9,779 or 7·7 per cent.	− 140,152 or 6·1 per cent.

—— It has been decided that there shall be no game season this year in any part of France, all the powder and arms and all the men who are capable of using them being required for the defence of the country. There is but one kind of game to be shot at present, says a journalist. There is no doubt that the decision is just and politic, but it is to be feared that the poachers will benefit largely by the fact; should they, however, be deterred by patriotism, the birds will hold jubilee, and the stock of game, miserably short, will gain considerably.

—— The Directors of the Manchester and Liverpool Agricultural Society awarded Mrs. WILLIAM PATERSON, 38, Union Street, Dundee, their extra prize silver medal for a fine bold sample of 13 varieties of her late husband's far-famed seedling Potatos, exhibited by her at their show at Wigan on the 7th and 8th inst. PATERSON'S seedlings are said to be the heaviest cropping Potatos in the kingdom.

—— In the course of the Poor-law discussion at Basingstoke, on July 28, following the paper on Outdoor Relief, read by Mr. MARX, Chairman of the Alresford Board of Guardians, and reported in our Journal the other day, the name of Sir BALDWIN LEIGHTON was prominently brought forward, and the Poor-law administration in the Atcham Union, of which he is the Chairman, was spoken of as exceptionally good. We are glad, therefore, to be able to place before our readers the following interesting letters from Sir BALDWIN, in which he describes the system pursued by his Board of Guardians. In the Union of Atcham, in Shropshire, with a population chiefly agricultural, of 19,314, and where wages are not very much higher than in Hampshire, the amount of indoor and outdoor relief is only £2171, whilst in the small agricultural unions in Hampshire, with a population of from 6000 to 8000, it amounts to from £3000 to £4000 a-year. In the latter unions the out-relief is four or five times as much as the indoor, whilst at Atcham the outdoor relief is only rather more than one-third of the indoor.

From the Chairman of the Alresford Board of Guardians to the Chairman of the Atcham Union.

Arlebury, Alresford, July 16, 1870.

Sir,—I hope you will excuse my troubling you, as the matter on which I write is one of public interest. We are to have a meeting of Chairmen and Vice-chairmen of Boards of Guardians for Hants and Berks on the 28th of this month, and I want to draw attention to the small amount of out-relief given in the Atcham Union.

May I ask you to explain whether this small proportion arises from the circumstances of the population, or from the system pursued by the Board of Guardians in their administration of Poor-law relief.

I am, &c.,

FRANCIS MARX.

From the Chairman of the Atcham Board of Guardians to the Chairman of the Alresford Union.

Loton Park, Shrewsbury, August 2, 1870.

Dear Sir,—I am very sorry that, owing to the neglect of our clerk, I have not been able to reply sooner to your letter of the 16th, which was only put into my hands yesterday at our Board meeting.

There is nothing very peculiar in our population, except that we have no town in the union—the inhabitants are agricultural, with the exception of a few coal and lead miners.

The chief reason, therefore, for the small amount of outdoor relief is to be found in the administration of it by the Board. I may mention, we have had less change in our officials, probably, than any Board in the kingdom. This union was formed 33 years since, and we have had during that time—

1 Chairman.
5 Vice-chairmen (we have two at the same time).
2 Clerks: the father died about six years since, and his son succeeded.
7 Relieving officers (we have two). Of these, one was promoted to be rate collector, one resigned through old age, one married a wife with money, and two were dismissed.
2 Masters: son-in-law succeeded father-in-law.
4 Matrons: one resigned, one died, one (a daughter) retired on her father's marriage.
4 Schoolmasters: three resigned.
1 Industrial trainer, female.

Many of the working guardians have also attended the Board from 10 to 15 years, so that by this means we have been able to act on a uniform system.

I may explain that, as Chairman, I endeavour to encourage thrift, and in my own neighbourhood I am able to persuade a large number of labourers to save. At present I have about 30 savings bank books in my keeping, the sums entered varying from 10s. up to £80; and, besides this, I am aware of many of my neighbours who keep their own books.

As a Board, we always endeavour to make children support their parents, and I am happy to say there are very few cases where they fail to do so when the alternative is the workhouse. At the present time we have only one married couple in the workhouse, and they were brought in, owing to the wife being bed-ridden, and the cottage in a dirty state. We have also an old married man, whose wife is taken care of by a daughter, and a deserted Cornish wife. This shows that our rule does not bring many of this class into the workhouse. We have about nine couples only in our permanent out-relief list.

You may have observed how few children we have on out-relief. This shows the small number of young persons with young families who apply, and in almost all these cases the destitution is occasioned by sickness, and the relief is not permanent. When this class apply, and also widows with families, we offer to take some of their children into the workhouse, and then, if ill, we grant out-relief. At the present time we have 13 children of widows, who are not receiving other relief, and two of a man to whom just at this time we are giving to the amount of 8s. a week.

I observe in Alresford there are a large number of children in the workhouse, 5 per 1000. We have 3 per 1000. While on out-relief Alresford has 20 per 1000, Atcham has only 4. I cannot account for this great difference, as you appear to make great use of the workhouse test for this class.

I ought to mention that we have a very good school. Our boys and girls are taught reading, &c., by a master, together. They play in the same playground, a gravel path separating the two sexes; the playground is enclosed by a low hedge only. The girls have their own kitchen, where the officers' dinner is cooked by them under the industrial trainer, and they have a laundry adjoining, where they wash their own clothes, and, when there is sufficient strength, the industrial trainer's linen. Although in the same house, they are quite isolated from the adults, except at meal times. Every endeavour is used to make them handy, and to draw out their intellect. Among other things the advantage of the savings bank is strongly impressed, and I have found several in consequence have put by money before they have left us three years.

As we have a regular system, our rules become known, and we have but few applications, only from 40 to 50 during the half-year. We meet twice a month, thus this is not an average of four per meeting, and perhaps twice or thrice per annum we have a blank book with no applications.

We give no permanent relief out of the workhouse—

1. To any who rent more than half an acre of land.
2. To orphan children, *i. e.*, without both parents.
3. To deserted wives or deserted children.
4. To applicants residing out of the union.

In cases of funerals we do everything or nothing, *i. e.*, we will not give the coffin and allow the relatives to do the rest.

If a cottage is very dirty, we endeavour to get it made clean under the threat of refusing out-relief.

If rent is £4 10s. or even £4, we only grant relief for a short time until the pauper can obtain a cheaper place.

We never grant out-relief on the plea of no work.

We do not give clothing, except to children going to service.

These rules do not apply to occasional relief caused by sickness.

While on the one hand we act in what some may call a very stringent manner, the Board endeavour by various plans to raise the condition of our poor. Two applicants came before the Board who were paying £5 each for their cottages, under a nobleman who was non-resident. The Board wrote to point out to him that that rent was higher than was asked by any other gentleman in the union. He wrote a very civil reply. The agent was very angry, but our letter has, I believe, done good. The rent of cottages, with gardens, under gentlemen, varies from £2 10s. to £3 10s., and is rarely £4.

The Board lately wrote to a Baronet, who is also non-resident, pointing out that a house where a pauper died was not fit to live in—he promised to pull it down.

The Board also writes to landlords, requiring them to sewer and to make privies, also pointing out the bad and dirty state of their cottages.

Some years since, when work was scarce, the Board took the initiative in endeavouring to procure work, and were thus enabled to send applicants to places in the union where they could procure it. By this means we kept the applicants from becoming pauperised.

In all these cases my personal influence, no doubt, does something, still no landlord likes being found fault with (if he is to blame) by a public body, and thus we are able to do a good deal in this way without having recourse to law. Indeed we have only once had occasion to summon a party for a nuisance, the others, by dint of writing and perseverance on our part, carrying out what we required.

We are very particular about vaccination. If a parent applies for relief, one of the questions asked is—"Have your children been vaccinated?" and if there is any doubt it is the duty of the relieving officer to examine the arm. If it is a fit case for relief it is granted only for a fortnight, and in the meantime the child must be vaccinated or a certificate of unfitness given.

Our vaccinations are up to 95 per cent. on our births.

I may add our wages are low. Day labourers, 10s. to 12s. a week, piecework a little more; women, 1s. a day, but few work in the fields; labourers, with food, 4s. 6d. to 6s. a week; waggoners, £10 to £14 per annum, with food and lodging; servant girls above 18, £6 to £10; above 12 up to 18, £2 to £6. Our cottages, with good gardens—and almost every cottage has a garden—are let at from 50s. to £5, and we have many who have land sufficient for a cow attached to their holding. On this property, out of nearly 70 cottages, 30 have cow land, and on another small estate I had there were 21 cottages and eight kept cows. Coal also is cheap, 10s. to 13s. at the pit, and many labourers get their master's team to haul it for them without payment.

I shall be happy to give you any other information, but fear I have written already too long an epistle.

Yours truly,

BALDWIN LEIGHTON.

From the same to the same.—(Extract.)

Loton Park, August 11, 1870.

Dear Sir,—I have been very much interested in reading the account of the proceedings at your meeting at Basingstoke respecting the administration of the Poor-laws. I am sorry I was prevented from attending it owing to our assizes taking place at the same time. The interchange of ideas among those interested in Poor-law work no doubt will lead to good when carried on, as your meeting seems to have been, in a friendly spirit. There is an error, into which I think several speakers fell, of supposing if a Board decline to grant out-relief the applicant must of necessity come into the house.

I frequently go over the list of applicants with our relieving officers, and the master, with a view of ascertaining how many have come in to whom we have refused outdoor relief, and it is astonishing how few will accept our offer. Our Board refuse outdoor relief, even in our limited number of applications, to nearly half of those who apply. Practically I find that most of these are supported by their children or other relatives when outdoor relief is refused. I examined the lists with the view of ascertaining how far we were right in our order.

In this union we never allow want of work to be an excuse for applying for relief; and, consequently, we have but few applicants of this class. Should we have, however, great slackness of work, and should it become evident that there were a large number out of employment, I should apply to the waywardens to undertake an improvement of their roads; and I have no doubt that, partly by subscriptions, and partly by rates, we should be able to offer employment to all who were really willing to

work, and unable to procure it. . . . I may add that, though as a guardian I refuse outdoor relief to an able-bodied applicant, yet out of the Board-room, if the man is of fair character, I always try to procure him the offer of work, and during the winter I generally take on extra hands on my own property. By this means, in my own neighbourhood, no labourer able and willing to work need complain that he is unable to procure it.

Yours faithfully,

BALDWIN LEIGHTON.

OUR LIVE STOCK.

CATTLE.

WE can give a favourable report of the Rev. T. Staniforth's sale on Tuesday, the 13th inst. In 1869 21 animals were selected from this herd, and realised an average of £32 12s. On the latter occasion a draft of 25 cattle from the same herd made the very satisfactory average of £42 6s. 8d. Among the animals disposed of some were of Booth and others of Bates origin, and representatives of both sections of our great Shorthorn breeders were to be seen around the sale ring. The day was awfully wet, but in spite of this drawback a large company assembled, and a good competition evidenced the high reputation of the stock. Mr. Thornton commenced at 2 o'clock with *Claribel*, by VALASCO (15,443), dam *Farewell*, by ROYAL BUCK, and previously thoroughly well bred: she was sold at 29 gs. to Colonel Towneley, and is cheap, should she prove a safe breeder; *Frederick's Pride*, lot 2, by FREDERICK (11,489), dam by 4TH DUKE OF YORK (10,167), went cheap into the same hands at 62 gs. *Graceful* by DUKE OF MOSCOW (14,447), and of the "Medora" tribe, a plain cow, but a great milker and breeder, was knocked down to Mr. J. Meadows at 39 gs.; *Nipple*, a very thick and good 8-year-old cow by MASTER POINTS (18,360), was secured by Mr. W. Townshend for 47 gs.; *Rosina* by JURYMAN (20,043) was cheap at 46 gs., and was purchased by Mr. J. Gaitskell. *Ringlet*, by JURYMAN, is a very good heifer, of fine colour, and brought 65 gs. from Mr. C. Swarbieck, and *Music*, by the same bull, was purchased for the Duke of Devonshire at 70 gs. Mr. Swarbieck again became a purchaser, and secured *Gaity* by EVANDER (23,897), for 53 gs.; and Colonel Towneley took *Puff*, by EVANDER, at 51 gs. We subjoin a complete list:—

Name of Animal.	When Calved.	Price.	Purchaser
Cows and Heifers.		Gs.	
Claribel	1861	29	Colonel Towneley
Frederick's Pride	1869	62	Colonel Towneley
Graceful	1866	39	Mr J. Meadows
Nipple	1866	47	Mr W. Townshend
Rosina	1866	46	Mr J. Gaitskell
Ringlet	1867	65	Mr. C. Swarbieck.
Lady Grace	1866	56	Mr. C. Swarbieck.
Music	1866	70	Duke of Devonshire
Lewen	1867	31	Mr J. Waddelouse
Swiss	1867	40	Mr. R. Jefferson.
Rivette	1868	42	Mr G. Atkinson
Gaiety	1868	53	Mr. C. Swarbieck.
Nell	1868	29	Mr. R. Parker.
Puff	1868	51	Colonel Towneley
Sprightly	1868	38	Rev. C. Gillow.
Lavinia	1868	35	Captain Gandy.
Garnet	May, 1869	31	Captain Gandy.
Scarlet	June, 1869	25	Captain Gandy.
Mossrul	June, 1869	47	Mr G. Ashburner
Sappho	July, 1869	26	Mr W. Dent
Nelly	July, 1870	5	Mr J. T. Banks.
Bulls.			
DUKE OF EDINBURGH	May, 1869	33	Mr J. Bell
SUNSHINE	Aug., 1869	40	Rev. C. Gillow.
MOSSGATE	Nov., 1869	29	Mr. J. Hunt.
GONDOLIER	May, 1870	32	Mr. Ralph.

21 cows and heifers at £43 14 0 = £917 14 0
4 bulls at . . 35 3 6 = 140 14 0
25 animals at . . £42 6 8 = £1058 8 0

—— The sale of Mr. Harris's Shorthorns, at Stoney Lane, took place on Tuesday, 20th inst. We gave some account of this herd in our impression of the 10th inst. Messrs. Lythall & Clarke, of Birmingham, were the auctioneers, and commenced to sell at 1 o'clock. The first four lots went at from 27 to 28 gs. each. Lot 5, *Favourite*, was purchased by the Earl of Beauchamp for 51 gs. *Peeress* (lot 7), of the "Lavender" tribe, was bought by Mr. Beckwith, at 44 gs. *Butterwort* became Sir G. Jenkinson's, at 55 gs. All these cows were by Lord Faversham's CASTLEREAGH (19,409). *Gertrude* was bought by Mr. Vernon for 45 gs.; *Agnes* became Lord Beauchamp's property, at 42 gs.; *Lady Wilkinson*, of the "Lancaster" family, was knocked down to Sir George Jenkinson, at 41 gs.; and *Lavinia* (lot 24) was sold to the Earl of Beauchamp for 40 gs. These four cows are all Lord Faversham's DIPLOMATIST's. Next followed two or three lower prices, until *Lady Lavender* by SUPERINTENDENT (25,254) appeared, and was sold to Mr. F. Lythall for 41 gs. *Lady Sarah* and *Lady Elizabeth*, both by DIPLOMATIST, made respectively 42 and 41 gs., and became the property of Mr. W. Price, M.P., and Mr. Z. Walker. The heifer calves sold at from 13 to 30 gs. each. The bulls, as usual, made considerably less, MONARCH by SUPERINTENDENT being sold for 28 gs. to Mr. Owen. SATELLITE by Captain Oliver's FESTIVAL brought 30 gs., and was bought by Mr. Webb. The general result of the sale was as follows:—43 cows and heifers over 12 months old brought £31 4s. 6d. each; 17 calves under 12 months' old brought £21 0s. 9d. each; and one bull over one year old made £29 8s. The general average over 61 animals disposed of was £28 17s. 4d.

SHEEP.

ON the 15th inst. Messrs. Lythall and Clarke sold a large number of Shropshire rams and ewes at Bingley Hall, Birmingham. Mr. Lythall, of Radford Hall, showed 16 rams, which realised from 13 gs. to 8 gs. each; Mr. Yates, of Grindle, showed 16 rams, which brought from 2 gs. to 5½ gs. each; Mr. Nock's (Sutton Maddock) rams made from 10 gs. to 6½ gs. each; Lord Willoughby de Broke's averaged 6 gs.; Mrs. Beach's 13 rams made from 22 gs. to 9 gs. each; Mr. H. J. Sheldon's 9 rams made from 6 gs. to 5½ gs. each; Lord Sudeley's 8 rams made from 10 gs. to 6 gs. each; Mr. Z. Walker's 2 rams made 5 gs. each; Mr. E. Tongue's made 4 gs. each; Mr. C. Stubb's 3 rams brought respectively 24, 16, and 12 gs.; and Mr. Chilwell's 6 rams brought from £3 10 to £3 2s. 6d. After this, 10 Oxfordshire rams, the property of Mr. A. F. M. Druce were disposed of at from 9 gs. to 6 gs. each. Next followed a large number of Shropshire ewes, which realised as follows:—

Pens	Name of Owner.	Price per Sheep. Highest	Lowest
		£ s. d.	£ s. d.
40	Mr Yates	2 9 0	2 7 0
35	Mr Nock	3 8 0	3 0 0
10	Mrs. Beach	4 0 0	3 1 0
40	Mr Lyt. (the Cotteridge) . .	3 10 0	2 1 0
110	Lord Willoughby de Broke	2 6 0	.
20	Mr. E. Tongue	2 8 0	2 6 0
80	Mr. E. Glover	2 4 0	2 0 0
50	Sir Robert Peel	2 6 0	.
50	Mr Lyth	4 1 0	2 15 0
50	Mr. Tolfree	2 8 0	2 4 0

—— The following awards at the late annual meeting of the Kingscote Agricultural Society to shepherds, are of interest to sheep breeders, as showing the number of lambs produced by a certain number of ewes in Cotswold flocks, and the risk of death among ewes during pregnancy and parturition. The conditions for competition in the shepherds' classes were stated as follows:—"To the shepherd, who from a flock of 50, or any greater number of ewes, shall rear the largest number of lambs and save the greatest number of ewes in proportion to the number put to the ram, the lambs and ewes being alive on June 1, or *bonâ fide* sold fat previous to that time." The following valuable statistics were elicited by the offer of this most useful prize:—1st, £1, Henry Holborow, servant to Mr. T. Bolton, Knockdown, 50 ewes turned out, 50 ewes alive, 70 lambs; 2d, 10s., Frederic Clarke, servant to Mr. Clarke, Nymphsfield, 64 ewes turned out, 62 alive, 93 lambs. To the shepherd from a flock of 100 and upwards, as above:—1st, £2, Wm. Wakefield, servant to Mr. Playne, Minchinhampton, 102 ewes turned out, 99 alive, 139 lambs; 2d, £1, servant to Mr. E. Drew, of Leighterton, 134 ewes turned out, 129 alive, 148 lambs. To the shepherd from a flock of 200 and upwards, as above:—1st, £3, John Busby, servant to Mr. D. Holborow, of Bagpath, 240 ewes turned out, 238 alive, 278 lambs; 2d, £2 10s., Edward Smart, servant to Mr. John Fowler, Cranmer, 281 ewes turned out, 276 alive, 323 lambs; 3d, £2, Richard Day, servant to Mr. E. Drew, Calcot, 240 ewes turned out, 235 alive, 270 lambs; 4th, £1, Thomas Morse, servant to Mr. Blackwell, Hazlecote, 283 ewes turned out, 277 alive, 284 lambs. To the shepherd from a flock of 300 and upwards, as before mentioned:—1st, £3, Jesse Hunt, servant to Mr. Butler, Badminton, 454 ewes turned out, 438 alive, 525 lambs; 2d, £2, George Turner, servant to Mr. Ford, Wood Leaze, 300 turned out, 295 alive, 314 lambs.

POULTRY.

Poultry Keeping.—At the Metropolitan Hotel, New York, Mr. Warren Leland recently related his system and experience at a meeting of the New York Farmers' Club. He said:—I have found that for every 100 fowls you must give up at least an acre. But rough land is as good as any. Hens naturally love the bush, and I lop young trees, but leave a shred by which they live a year or more. These form hiding-places and retreats for them. In such places they prefer to lay. I have great success, and it depends on three or four rules, by observing which, I believe, one can make a good living by hens and turkeys. 1. I give my fowls great range. 18 acres belong to them exclusively. Then the broods have the range of another big lot, and the turkeys go half a mile or more from the house. The 18 acres of poultry yard is rough land, of little use for tillage. It has a pond in it and many rocks and bushes, and weeds, and sand places, and ash heaps, and lime and bones and grass, and a place which I plough up to give them worms. 2. When a hen has set I take her box, throw out the straw and earth, let it be out in the sun and rain a few days, and give it a good coat of whitewash on both sides. In winter, when it is very cold, I have an odd stove in the house, and keep the warmth above freezing. There is also an open fire-place, where I build a fire in cool wet days. They dry themselves, and when the fire goes out there is a bed of ashes for them to wallow in. Summer and winter my hens have all the lime, ashes, and sand they want. 3. Another reason why I have such luck is because my poultry yards receive all the scraps from the hotel. Egg-making is no easy work, and hens will not do much of it without high food. They need just what a man who works requires—Wheat, bread, and meat. As to breeds, I prefer the Bramahs, light and dark. I change the cock birds every spring, and a man on the farm has no other duty than to take care of my poultry. I have often 3000 spring chickens.

ON FARM ORCHARDS.

WHEN we look at a field of Apple trees in full bloom we cannot help admiring such a beautiful exhibition of early spring flowers, and we might well be excused if we grew this fruit tree only for the sake of its flowers. Hundreds of acres of the best land are devoted to the culture of Apples in many parishes in the southern and western counties of England. In Hereford, Worcester, and Devon the Apple crop is preserved in the form of cider, and is thereby made available for many years. In the home counties and elsewhere there is an immense trade in growing kitchen and dessert Apples, to supply the markets of London and other large towns with the raw materials for Apple dumplings, pies, and puddings, all thoroughly English dishes, whose merits are duly appreciated. Dessert Apples are a luxury at all times, and only require to be ripe when they are ready for the table. There is no recipe wanted in the affair of eating dessert Apples; their savoury flesh is delicious from the skin even to the core. An Apple tree laden with its rosy fruit is a great temptation to young persons and others to break through and steal; indeed, such is the inherent love for Apple orchards, that every man seems anxious to possess one. They are our native vineyards, and as such may well be coveted, as Naboth's was of old. After a lapse of more than 40 years I have still a bright recollection of an orchard attached to an old mansion in Aberdeenshire. The house had gone to decay, and the forest trees had grown high in the grounds outside the garden, and that shelter which the orchard had always needed was thus in the end effectually supplied; and thus about 2 or 3 acres of land that had once been a garden was then in grass, and every old Apple tree laden with fruit. My father bought the crop, and I thought that the most meritorious act of his life, for we had Cherries and Apples to gather, to eat, and to carry home; and years afterward, when I had a family of boys, I rented a small orchard in the parish where we lived in Devonshire, that they might not covet or learn to steal Apples from other orchards abounding in the neighbourhood; and they still look back with pleasure to the time when they climbed the Apple trees.

The Apple crop has always been a precarious one in Britain, and is likely to continue so. In the North of Scotland it is necessary to plant Apple trees against walls, and they seldom do much good as standards unless, as above stated, they get the shelter of evergreen trees of the Pine and Fir tribe. In the midland and northern counties of England the Apple never seems to have had a fair trial; it is not wanted for cider, and the low state of the art of cookery is not likely to require Apple pies, or, indeed, any other kind of pastry; and where fruit tarts are made, the Plum generally gets the preference over the Apple. As all kinds of fruit are sure to obtain a ready sale in London, we find Apple culture in the home counties carried to the highest perfection, and in the cider districts the Apple becomes almost a necessary of life, for a farm without an orchard would yield little comfort either to the tenant or to his labourers. As I have lived several years in the best Apple districts, and have made myself acquainted with the best methods practised there, I shall endeavour to state here some of the leading points of farm orchard culture.

The success of Apple growing depends upon watchfulness of a great number of small matters. In some localities the mealy-bug makes sad havoc with Apple trees, infesting every chink of the bark. Insects prey upon the leaves, and eat into the fruit, and in the shape of canker whole limbs will dry up, and the tree die piecemeal. Where game is preserved, it is very difficult to keep hares and rabbits from barking Apple trees, and it is sometimes useful to bribe them by cutting down branches from other trees for them to bark, and thus create a diversion in the farmer's favour, thereby lessening the risk of losing valuable fruit trees. Where there is great danger it is best to envelope the bole or stem of the tree in a strong Thorn faggot, tied with wire, and, as the farm orchard can seldom be protected from thieves, they too need watching.

This is no treatise on the choice of Apples to be grown, but I shall try to convince cultivators that Apple trees are not like certain Aloes, requiring 100 years to grow before they flower and fruit, but that a handsome return may now be got from an Apple orchard in seven years from the time of planting; and I can assure them that I have seen fine Apples grown on trees only one year transplanted. About the beginning of the era of orchard-houses, which happened in my time, a complete change came over the culture and management of Apple trees; before that time they were pruned, ringed, and the like, but all the operations

were always above the collar, performed on the trunk and branches of the tree; after that time the pruning was underground, and the roots, or rather rootlets, were reduced in size, but increased in number, and the result has been extreme fruitfulness in very young and very small trees. The farmer's short lease, or other uncertainties of tenure, will only admit of short-lived crops, hence the tenant for the most part grows only annuals and herbaceous plants. The far-seeing landlord plants an Oak wood, and it is a valuable investment of capital to be returned with profit, but not for many years; but if a tenant plants an orchard it is an investment in like manner, but one to be returned with profit after a period counted by days,—for the age of Apple trees, their bulk too and their profits, will steal upon the farmer like grey hairs, and count in the end like good deeds done that could not then by any possibility be repeated, and though often disappointed of a crop, even after very fair promises, yet in the throws of the dice he will have some consolation to know that in a good Apple year the orchard profits alone on some farms have paid the whole of the rent. Certain valleys on the banks of rivers and at the foot of steep hilly slopes shut in by the crooks and bends of the high ground, are frequently found to have fine healthy soil to a great depth; these are the natural situations for orchards, lying under the wind, and having a good store of food for the 50 years that the orchard may need such a supply. But this style of thing and such favoured spots must not mislead people who wish to prepare ordinary land for an artificial orchard, where some or all of these natural advantages are wanting. Ordinary soil will have to be trenched from 1 to 2 feet deep, and enriched by compost of some kind—manure, marl, peat, or sand, as the case may be,—for Apples are not created out of nothing, but made out of certain ingredients, which, like the spokes of a wheel, must all be there before it turns. Some of the finest Apples I ever saw were grown in soil enriched by dead cattle cut up and mixed with earth till the flesh had disappeared and a great part of the bones.

It is easy enough to root-prune and to stop useless growths upon Apple trees, but there is nothing to be done where the tree has not vigour enough to perfect flowers and fruit, and in the early stages attention must be paid to extend the tree, and then there comes the time for the production of flowers and fruit. I would lay particular stress upon the healthy development of the flowers, without which fine fruit is impossible. The stormy weather that often prevails during the early flowering of the Apple tree, necessitates a certain amount of shelter, natural or artificial. Houses, trees, hedges, rocks, hills, and the like, have all been made available for shelter. An old stone quarry, with its high rocky banks, makes an excellent site for an orchard when plenty of good soil can be got; indeed a crop of Apples can seldom be secured where the trees are exposed to the full force of the wind, for if the blossoms should escape without injury, the fruit will often suffer by being blown down. When a dry season like the present (1870) sets in, after young trees have been planted, the intensity of the dryness may be lessened by tying straw round the stem of each tree, and mulching round the roots; but at the time of planting, if the trees could be dipped in puddle made of clay and manure, not only to coat the roots but also the stem two or three times, the process would be found of very great service in giving the trees a start,—for if we look at the thick, hard, dry bark of most trees, it is certainly of great service as a non-conductor when the sap is rising. When W. Forsyth, of fruit-tree notoriety, operated upon Apple trees, he cut all the wounds of the roots afresh with a clean cut, and scraped out all holes and chinks in the bark, and then he plastered them all over as carefully as a surgeon would bind up wounds, so that under this adhesive plaister the tree was never fully exposed to the weather. Whether his invention was worth the Government grant which he got for it or not, we need not trouble ourselves to inquire, for in the grafting process the clay daubing has been acknowledged essential to success, and this before W. Forsyth was born; and now, a lifetime after his death, it is in full play in every nursery of any note. From my own experience I can state that plants, delicate or otherwise, can be successfully transplanted by the aid of puddled compost of the consistency of cream or thick paint, that could not be so well done by any amount of watering after planting in dry earth; and all practical gardeners and propagators are aware that, in the affair of striking cuttings, germination of seeds, and all other methods of rooting, the air should be excluded and moisture maintained, hence the constant use of the bell-glass in all botanical establishments.

The after-management of Apple trees may be summed up in few words, for when the leading shoots have been shortened to prevent the trees growing too high or too straggling, the pruning as regards the branches should cease. Cutting limbs or large branches off Apple trees by way of improving them is sheer madness, but as this tree is a progressive subject, extending yearly over a larger space, the distance apart for the trees at planting time has often been warmly debated. I was told of a farmer's managing man who planted his master's Apple trees at six long strides apart, and as the trees, though tall, were only spare in bulk, the distance looked ample, but the farmer's age and experience had taught him better, and he condemned the six long strides, and said ten or twelve strides was none too much. "Well," said the manager, "hang me upon the first tree that touches its neighbour!" But before seven years had gone by, the farmer hinted that it was hanging time, for the Apple trees were switching each other. If an acre of orchard contain 48 full grown trees it will be well stocked, but I should plant three or four times that number of trees at first, and carefully distinguish between those for permanent service and the temporary kinds to be cut away when their room was wanted. As the orchard is often near the homestead, much might be done for it with manure-water, and such a "refresher" annually will soon tell upon size and quality of fruit. The orchard should not be mowed, neither should it be grazed with cattle, but eaten by sheep, for obvious reasons.

It is an old saying that "good wine needs no bush," and not only do good Apples recommend themselves, but good cider, once tasted, creates for itself a relish. Being the juice of ripe fruit its manufacture is simple and easy, for it is not half so artificial as the making of malt and the brewing of beer; and as long as the farmer has to find nourishing drink for his workpeople as well as food, it is for him merely a choice between malting Barley or home-grown Apples. Every autumn we get a supply of dried Apples from Normandy, and they are retailed from the Italian warehouses and first-class grocers' shops at 9*d.* per lb. In the olden time dried Apples were not uncommon in England, for the church of that day by law established enjoined the keeping of Lenten and other fasts, not only in religious but in every house,—for such things were not singular in those days; and the dried Apples called Norfolk Beaufins attest to the present day that the people of the Eastern Counties availed themselves of their fine climate to grow Apples, and they were shrewd enough to know, also, how to preserve them. The beautiful sample of Normandy dried Apples now before me attest that good Apples certainly can be dried and nicely preserved still. The heat has to be strong enough to set the saccharine juice and evaporate the water; but it is only a certain class of Apples that have firm flesh and rich juice that will keep and be worth the trouble. The well-known Norfolk Beaufin and the Yorkshire Greening dry nicely, but it must be borne in mind that, when dried, they must be tough, and not roasted so as to be tender. When cooked for the table cider should be added, or failing that, plain syrup (sugar and water). On referring to my notes, dated Syon, 1836, I find the following account of the Norfolk Beaufin. I had made an accurate section of the fruit to show the depth of the eye, the length of the foot-stalk, and the contour of the Apple, and this I had coloured like the fruit at the time. The stem is only half an inch long, and the eye deeply set, the fruit is rather flat in shape, its greatest diameter being $2\frac{3}{4}$ inches, and its greatest depth only $2\frac{1}{2}$ inches, the colour of the side next the sun dull red, the rest a dark green. This was a fruit of medium size, grown in Middlesex. We seem to have lost all knowledge of dried Apples now in this country, so that if I were to offer such a thing to any one to cook they would no doubt think that such tough leathery-looking materials would make but a sorry confection; but such is certainly not the case, for dried Apples rightly cooked are quite a luxury: but in an article of this nature for the columns of a periodical I cannot go into details, neither would the parties to whom this is addressed have patience to read long letters. *A. Forsyth*, 9, *Islington Square, Salford.*

AFTER THE HARVEST.

A SOMEWHAT extended circuit taken through several rural districts, formerly well known but not recently visited by the writer, has afforded the means of estimating the position and prospects in several differing localities. Starting from the midland counties (just before the rains of September), we found all the grass lands of Warwickshire, Northamptonshire, and Buckinghamshire completely parched, the hayricks very small, water nearly dried up, and the cattle plainly showing the ill effects of the past summer's drought. But in spite of all there were numerous pieces of Swedes, and more particularly of Mangel, which, under the autumn rains, will supply much stock provender.

About Leighton some appearance of green on the grass lands was disclosed, and the chalk soils around Dunstable had evidently borne fair crops of Wheat. Barley and Oats, however, were deficient. In Hertfordshire, where a good deal of the land is thin and gravelly, complaints of deficiency of crops were very general, and the corn-stacks (of all sorts) were certainly much smaller than usual. There were, however, larger growths of artificial grasses—Clover, Sainfoin, &c.—than we expected to see; and assuredly we have seen much worse crops of Turnips and Mangel in this district in seasons apparently more favourable to root growing. Hay, however, is dearer than it has been known for many years, and the condition of sheep (the staple stock) is anything but first-rate. Afterwards, passing from London to the New Forest, we observe the sandy lands of Surrey and the chalk soils of Hampshire to offer very similar appearances to those we noticed in Bedfordshire and Herts. Around Winchester a wide expanse of water meadows—on some of which grass had just been cut for hay—was most refreshing to the eye, and afforded abundant food to both cows and sheep. The value of the irrigated meadows in the chalk valleys must be enormous in dry seasons, and it is surprising that irrigation to grass land has not been extensively adopted. No doubt the cost of farming a water meadow is in the first instance considerable, and such as the owners of encumbered or entailed estates are unwilling to incur. Were estates smaller, it is certain that improvements now scarcely thought of would soon be effected.

In the New Forest, and the sandy heaths and Fir plantations about Bournemouth and Christchurch, no one looks for husbandry. The New Forest wants enclosing, when some splendid sites for residences and fine tracts of farming land would be the result. The sandy heaths also, when planted, afford some charming residences, to which purpose indeed they are being applied with wonderful rapidity.

Again, proceeding from Christchurch to Wimborne, along the valley of the Stour, we see as fine a tract of land, both grass and arable, as any in England; and upon the whole it seems to be well managed and cultivated. Here the grass lands, being chiefly within the influence of the river, were less parched than any (not being water meadows) we have seen elsewhere, while the corn-stacks seemed to be of somewhat larger proportions. From Wimborne to Salisbury we pass, first through some sandy tracts, of little natural fertility, but on which some vigorous efforts to cultivate are visible, and afterwards fair light-land farming on chalk subsoil is to be noted. Here, as in other districts, the root crops exceeded our expectations. Around the little town of Downton, the tract of water meadow is worthy a journey to inspect. Favoured by an unusually broad expanse of level land between the chalk hills, and the confluence of two or more streams, a breadth of irrigated grass land strikes the visitor with admiration. Here also much grass was being cut for hay, while cows of the kind and proportions seen in the best dairy districts had evidently fared sumptuously throughout the dry summer. Starting by the railway through Wylye, Codford, and Warminster to Devizes, we pass over that wide tract of country known as Salisbury Plain, and subsequently through lands similar in character, though deeper and of greater general fertility. This district, well known to us 35 years ago, was extremely interesting from the general and great advances made since that period in the general condition of its husbandry. Great tracts of Down land—once merely sheepwalk—have been broken up, and the whole of the large farms, being held by men of capital, and, being without covers, free from the curse of game, are obviously cultivated in the highest and most intelligent manner. The dressings of manure we saw being carried upon some of the fields of very large extent were quite extraordinary. The roots were also very good. From Devizes through Pewsey Vale to Marlborough land of a heavier character, but generally well cultivated and productive, was passed. The grass lands—(dairy chiefly)—about Trowbridge and Melksham were, however, as bare as those of the Midlands, and the cows seem to have suffered greatly from the drought. From Marlborough to Swindon the road passed over first a chalk and then a green-sand district, where the large farms and high manuring we previously noticed were continued. Several of these farms are owned by the occupiers, and the state of the residences and the condition of the farms alike proved the social and economical benefits that would accrue from a more general concurrence of those circumstances. On some of these farms there have been extraordinary yields of Wheat this season, while the other grain crops and roots sufficiently indicate what capital, security, and intelligence can accomplish in farming, even in a difficult season.

Approaching Swindon the land consists of dairy farms, which continue nearly to Gloucester, and here again the drought has proved its mastery. From Gloucester, *viâ* Cheltenham and Worcester, to Birmingham, various and varying conditions of soil and culture are seen, but all telling of the evils and benefits of a dry summer in parched pastures, small corn-stacks, and most abundant crops of fruit. Everywhere, however, there are better roots than might have been expected.

The abundant rain which has fallen since the commencement of September promises to bring forward roots and revive the grass lands, so that with a moderately mild autumn and early winter we may suffer less than has been feared. It is certain, however, that everywhere vast numbers of half-fat cattle and sheep have been sold to the butcher, so that we must look for dear meat for the current year. *Economist.*

"ON EXHAUSTION BY OVER-STIMULATION."

FROM a reference made by Mr. Fish to a page, Mr. Ross's paper on the above subject must have appeared in the *Agricultural Gazette*. [See p. 1074, 1869]. Judging from Mr. Fish's comments, the position which Mr. Ross sought to maintain was, that when vegetable productions, those more particularly under the cultivation of the farm, attained perfection in any one year, if you tried the next year to make their reproductions more perfect than the parent, you failed; and instead of the advance or improvements you expected,

your forcing system revolted and begot degeneracy and want of vigour (otherwise exhaustion) in the plants forming the crop, whatever that might be. This surmise may be all wrong, however, because Mr. Fish's references are necessarily somewhat obscure to a person who had not read the original article, and doubtless Mr. Fish took for granted that all his readers in the *Gazette* had read it, and had a knowledge of the exhaustion theory at their finger's ends, otherwise he would have taken care to quote some of the objectionable passages to show that his animadversions thereon were pertinent, and that if Mr. Ross's wicket was not down it ought to be. If I am right in my conjecture as to the meaning of the phrase "exhaustion by overstimulation," then, in my opinion, the doctrine is true, but not new; it was propounded many years ago, by a correspondent of the "British Farmer's Quarterly Magazine," and was published in that work about the year 1833; it afterwards appeared in the "Farmer's (Monthly) Magazine," and other papers and periodicals of the day; and out of one of these I cut the following, which was the opening passage:—

"There appears to be a limit set by climate, cultivation, situation, and local circumstances, to the quality of the produce of the soil. All cultivated vegetables have a tendency to degenerate, but this tendency is more than counteracted by the cultivation bestowed, until they arrive at a degree of perfection beyond which it does not appear possible by any cultivation to push them; and if this is attempted, a recoil is induced, and a degree of degeneracy and inferiority in the produce appears to be inevitable. This is perhaps particularly the case in annual and biennial plants. Suppose a very prime sample of Wheat is presented to us, such as might induce a farmer or corn factor to pronounce it one of the best he had ever seen: the presumption is, that this fine grain grew on land of the best quality, which was prepared in the best possible manner for it; that the circumstances attending its growth, ripening, harvesting, &c., had been particularly favourable; and that it had, in fact, arrived at the utmost perfection which it was capable of attaining. Now, if this fine grain be used as seed, what will be the result? of what quality will be the produce? Will it not be found to have degenerated—to be much inferior to the seed used? Improve it cannot; that it will remain stationary is just possible, but that it will go back is almost certain. When grain is used which has reached the maximum—Wheat weighing, say 66 lb. per bushel, Barley weighing 58 lb. per bushel, Oats weighing 48 lb. per bushel—is the produce reaped equal in quality to the seed sown, or is it not always a few pounds, and often a considerable number of pounds, lighter? The plants appear to be constitutionally incapable of producing an equal to that grain from which they sprung, because it had attained that degree of perfection beyond which it could not possibly go, and therefore retrograde it must for a season; but having now room it will advance again the following season, if climate, soil, and circumstances are favourable; should these be unfavourable it will continue to retrograde.

"If this doctrine is correct, it follows, that to raise a first-rate article as produce, we must use an article of lower quality as seed.

"Public opinion has hitherto been opposed to using any but the finest samples of grain for seed, judging that the finer the seed is, the better is the produce likely to be: that, as vegetables incline to degenerate, the best plan, it is said, is to sow the best seed of them which can be got; avoiding degeneracy, and aiming at perfection. This would be all very well if the principle were a correct one, which it evidently is not; if it were, we should by this time have had Wheat as large as Beans. Grain of the weights I have mentioned, or approaching them, is about the limit fixed by our climate for their attainment; and if we sow them with a view of raising a better, or even so good, we shall find to our mortification that, instead of going forward, we have been going backward. Change of soil and situation have no doubt an invigorating influence on plants subjected to them; but no change of soil or situation can add improvement to a production which has already attained perfection.

"Agricultural societies offer premiums for the best samples of 'seed Wheat.' Many competitors come forward with splendid samples; bright, heavy, plump, and beautiful. The superlative best—if I may so speak—are selected for the prizes. The superiority in point of quality being thus settled, it is resolved, before awarding the premiums, to test the productiveness of the selected sorts; and for this purpose several agriculturists receive a portion of the seed, to sow on their respective farms. It is sown, harvested, and threshed; and by-and-by, out comes the judges' report, in something like the terms following:—'We find the quantity and quality so inferior that we cannot recommend the Wheats for the Society's premiums'—just what was to have been expected.'

Mr. Fish argues the case analogically; he gives no facts, the result of his own experience, on the subject; he gives the following sentence, however, from his own experience, and it is as valuable as true:—"The wise breeder and seed grower shuns extremes, and finds his success and his reward in a medium course." This is the gist of the whole matter, and the secret of all successful cattle breeding, and corn or root growing, to avoid extremes and adopt a medium course. Then why depart from this salutary rule? If a medium course is the right one, over-stimulation must be the wrong one. Mr. Ross is charged with saying that the finest roots produced the worst seed; worst in what respect? "In growing a weakly crop," and a very likely result certainly. Mr. Fish says, "If it be true that large roots produce worthless seeds, the obverse must likewise be true, that small roots will yield the best;" by the best, Mr. F. means the best to sow for a crop, because he afterwards says, "If you want monster Mangel or Turnip, save seeds from the smallest roots." He says this jeeringly, of course, and as a thing not likely, in his opinion, to be realised; but has Mr. F. ever tried? Has he ever put the matter to the test in in own practice? Had he done so, he might have found that he could grow the largest roots from the smallest root seed, but not the largest roots from the largest root seed. Then as to corn growing, I can grow Oats, weighing 48 lb. per bushel, but not from seed of that weight sown; if I sow seed weighing 48 lb., then I shall probably reap a crop weighing 45 lb. To attain a weight of 48 lb. reaped, I must avoid extremes, which 48 lb. would be, used as seed, and I must adopt a medium course, and sow corn weighing 44 or 45 lb.

Then as to cattle breeding, it would extend this paper to an inconvenient length to go into that subject at present, or refer to what has been said, written, and practised thereon by various authorities. To be successful, it will be found that one principle governs all—avoid extremes and practise a middle course. I believe this law of inferiority, following and consequent on perfection, "extends through all extent," and is applicable, not only to over-cultivated vegetables and breeding animals, but, intellectually considered, to man himself. All past history and recent experience prove that when the father has been a great man, intellectually, a certain taint of dulness and incapacity attaches to his offspring. In the words of one of the correspondents before referred to:—"How many names illustrious for extraordinary talent in their various professions could be mentioned, but whose inspiring mantles have not fallen upon their sons!" *P., Sept.* 9.

GERMAN POTASH SALTS.

Now that autumn is approaching, I would recommend such farmers as intend to apply potash manure to their fields, to prepare to do so before winter. The application of potash salts is by no means general in this country, and where it is resorted to at all, it is mostly put off until spring. Now, though concentrated salts may be applied in spring as well as in autumn, it is very material that the inferior qualities (and it is these that are chiefly used) should be brought to the field before winter, if they are to be of use to the first crops; and where people are so saving as to use the cheapest and least valuable quality, crude kainite this early application is quite indispensable. Few field experiments have as yet been made with potash salts, and if the direct effect, the increase of the first crop, is considered, some of them have led to very doubtful results. In most such cases the fault has been with the late application.

I have had occasion to watch the manuring with potash salts in their native land, Germany, I may say nearly from its first beginning. I have, as a practical agriculturist, for some time settled in that country, first experimentalised with the new manure, and later, made it a regular item of my annual farm expenses, buying considerable quantities; I have, therefore, more experience respecting its use than most farmers in this country. It is on the strength of this practical experience that I venture to offer some suggestions.

My chief task in this paper will be to consider the practical questions: What salts should be used, and how should they be applied? But I hope to be pardoned for bestowing a few words on the larger question, as to what is the object of manuring with potash salts.

My reason for doing so is that very few practical farmers seem to be aware of the character of the manure. Our colleagues over the German Ocean have been just as slow to master the question; but by this time the more intelligent of them have at length mastered it, after much experimentalising, and the great and annually increasing application proves how established is the usefulness of the salts.

It is all-important that farmers should, from the very beginning, regard the potash manure from the right point of view, for it differs in many respects from most other artificial manures. It must be borne in mind that it is neither a general fertiliser, nor even universally applicable; it does not profess to be so. I have no space to enter into the question of the necessity of potash to the growth of plants; I must accept this as granted; if readers have any doubts about it, I must refer them to the writings of our great agricultural chemists, among others to Dr. Voelcker, and chiefly to Baron Liebig, who has investigated the matter in the most exhaustive manner.

At present I must be allowed to assume potash to be indispensable to the vegetable system of all our farm crops, chiefly of Clover, pulse crops, Flax, Beetroot, Potatos, and Hops. The following Table will show what proportions of potash are contained in these and some other plants:—

In round Potash.

Hay of mixed grasses	17 lb	Wheat straw	4 lb.
,, red Clover	19 ,,	Barley	4·8 ,,
,, white Clover	10 ,,	,, straw	9·3 ,,
,, Tares	30·0 ,,	Oats	4·2 ,,
Potatos	5·6 ,,	,, straw	9·7 ,,
,, and their leaves	2·1 ,,	Beans	12·0 ,,
Mangel	4·3 ,,	,, straw	25·2 ,,
,, and their leaves	4·3 ,,	Peas	6·8 ,,
Sugar-Beet	4·0 ,,	,, straw	10·7 ,,
,, and their leaves	4·0 ,,	Hops	13·4 ,,
Turnips	3·0 ,,	Linseed	10·4 ,,
,, and their leaves	4·2 ,,	Flax	11·3 ,,
Wheat	5·5 ,,		

Baron Liebig, in his "Principles of Agricultural Chemistry," lays down as a rule, that "The different substances necessary to the growth of a plant, or the different articles of its food, are all of equal value; that is to say, if one out of the whole number be absent, the plant will not thrive." But they are only of value as far as they are required for the composition of the plants cultivated. In guano we supply, more or less, all that is required for the growth of plants, supposing the soil to contain some available universal constituent; guano may, therefore, on the whole, be considered a general fertiliser, the application of which will, under ordinary circumstances, everywhere produce an increase of vegetable growth. It is different with potash salts; they supply, we may say, only one constituent of the vegetable system; a very important one, it is true, but one that stands third in the list of fertilising agents; nitrogen being the first, and phosphoric acid the second. It can, therefore, only produce a direct beneficial result where there is plenty of other manuring matter, nitrogenous and phosphatic, present in the soil (the salts should, therefore, never be used by themselves, but always in addition to some other manure); where this is not the case, to expect an increased growth from the application of potash alone, is mere folly. Moreover, potash salts can only produce a visible result where there is a scarcity of available potash in the soil. They may act beneficially, they may even be necessary without such a result being at once visible; for we know that potash need not be in solution to be available for plants, and as long as sufficient available potash for one or for a few crops is present, the crops will assimilate it. Thus our fields may be, I may say, on the brink of infertility, because the original potash is almost used up, and we may still not see any increase of the crop worth mentioning to result from the application of potash salts. Productiveness and fertility are two distinct properties; by dissolving and stimulating manures we may produce abundant crops, while we are, in truth, impoverishing our lands.

Our object in applying potash salts is, therefore, either to keep up the proper properties of potash in the soil, or else to supply that element for the immediate use of the next one or more crops. We should, under these circumstances, apply it only where either the natural composition of the soil shows a deficiency in potash, or where, by high farming, we in our crops use up more of that element than the soil contains, or can supply. Herein lies the difference between the salts and other manures. Other manures, guano, superphosphate, and whatever they may be, contain manuring substances that every soil stands in need of, potash salts such as only some certain soils want. To apply them where there is no additional potash required is waste, and to expect results in such cases is folly. It is, therefore, to be regretted that most of the experiments hitherto instituted have been made without regard to this primary condition, without considering the nature of the land indiscriminately on all soils. And it is most unfair to stigmatise the salts as useless, because on soils rich in potash, or poor in other fertilising matter, they have produced no result. Let not the reader imagine that because the use of the salts is limited there is only a narrow field to be found for it. There is, on the contrary, a very wide one; for we are, in general, robbing our land most unfairly of its potash, and if accurate researches were made farmers would be astonished at the rate in which they are reducing the stock of it in their fields. But, to estimate justly the use of the manure, it is necessary that we should consider fairly the end it is meant to answer, and we must exclude from it all such soil as either contains, or else is otherwise supplied with potash sufficient for the growth of the crops raised on it. In the former case (if the soil contains an abundance of potash) it will be merely a question of time, for no soil can supply of itself (by the disintegration and decomposition of rocks) as much of the element annually as our modern heavy crops consume; and I would advise farmers not to put off the replacement too long, or they may be sufferers by this false economy.

In the latter case, of course, there is no occasion for applying the manure, for it is perfectly indifferent whether the potash is restored to the soil in the shape of salts, or in that of animal manure produced of oil-cake. There are comparatively few, but on the whole a good many farms where by feeding large quantities of cake, the potash consumed is replaced, and sometimes more than replaced. The use of potash salts should, therefore, be limited to such soil where more potash is consumed than is annually restored. Farmers may easily draw an account with regard to this proportion. They know approximately what weight of each kind of produce they reap (they should not in this calculation omit reckoning the grass), and they know what manure they apply; there are analyses both of plants and of manures, and thus the difference may easily be ascertained. They may also have their soil analysed, but then they should not be content with analysing the surface soil only, but should extend the inquiry to the subsoil as well, which in well-manured fields is often poor in potash, while the surface soil is rich in it. It has frequently been observed that in Clover-sick fields the Clover looks flourishing and healthy so long as it is young and the roots do not penetrate the surface soil, containing plenty of potash; but on extending them to the subsoil, containing insufficient potash, it pined and withered.

Where the object of the salts is immediately to supply particular crops requiring a great amount of potash with that element, they will often be found useful (for Hops, flour, Potatos, Clover, &c.), even where the composition of the soil would not appear to justify its use by any poverty of the alkali. In that case the potash of the soil is, somehow or other, not perfectly available for the plants.

The Germans are the most scientific farmers of the two nations, and thus it happened that they had turned their minds to the potash question long before the salts were discovered. Baron Liebig openly expressed the fear that a general impoverishment of our fields would take place, because we had no means of restoring this one element: all the others we were able to replace. And Dr. Stecker, who has solved the problem of farming without keeping any beasts, using only artificial manure, and has solved it, financially, with perfect success, expressed great apprehension that, though he had made a good business, he would, in the end, exhaust his land, merely because he could not restore the potash. Under these circumstances the discovery even of the very inferior "skim salts" was hailed with unconcealed delight by the German agriculturists, and numberless were the field experiments instituted with them. Many of these were unsuccessful; but farmers, makers, and chemists working together, studying, experimentalising, and improving, they have, at length, produced a far more valuable manure; and though the potash question is not finally settled, still a basis has been arrived at, whereon to found new experiments, and numbers of farmers derive great profit from the use of the salts.

I made my first experiments in 1865, with skim salts, on light gravelly, and black boggy soil, the latter very deficient in mineral constituents; but I have watched experiments made by others even before that time. My rotation being based on raising as many Potatos as possible for a Potato distillery attached to my property, I grew Potatos twice in six years, on some fields twice running. In the latter case I used farmyard manure and lime the first year, and potash salts and guano prepared with sulphuric acid (containing 10 per cent. ammonia and 10 per cent. soluble phosphoric acid) the second. In the former case I applied farmyard manure both times, once with lime (my soil was very deficient in lime), and the other time with potash salts. I have grown excellent Potatos, both as regards quantity and quality.

Having considered the object of manuring with potash salts, the further questions are these: What kind of salts should we employ? and, How should we apply them? Answering the first question first, I must remind my readers that we live at a great distance from the mines, that therefore the better qualities will best bear the additional cost of freight, carriage, &c. The salts are not pure; they contain admixtures, some of which may be considered useful, such as sulphate of magnesia and common salt. German farmers ought to, and do, attach some value to these admixtures, but I do not think we can do so at this distance; having them, we should turn them to as good account as we can, but in my opinion we are not justified in considering them to influence the price,—we should calculate that only by the proportion of potash. Besides the useful or harmless admixtures, some of the salts contain a most injurious one, viz., chloride of magnesium. The crude salts contain a very considerable proportion of this noxious substance; I cannot, therefore, recommend their use, setting aside completely that, though they are apparently the cheapest (the ton costing least), they are not so in reality, for the unit of potash will be found to be dearer in these crude salts (on account of the greater freight in their bulky shape, and the recent enormous rise in their price), than in more concentrated kinds. If farmers wish to use kainite, they should use the calcined stuff, which has a higher proportion of potash (18 against 13; 30 of sulphate against 23), and has lost a portion of the injurious chloride of magnesium. Besides this, it keeps better, as it is not hygroscopic, which the crude salts are to a very considerable degree. If my opinion, based on practical experience, is not thought sufficient on this point, I may quote Dr. Voelcker's distinct words:—"The calcined kainite is decidedly superior."

The potash salts contain their potash in two different shapes, either as muriate or as sulphate. Many Germans consider the latter the preferable kind, and it is what I have used. Still I am of opinion, that in England the muriate would answer better. For one, the unit of potash is generally cheaper in this shape. Moreover, chloride of sodium (common salt) has been found to answer far better as manure in England than it has in Germany. The cause is probably to be found in the climate. On this account, I believe that chloride of potassium (which is muriate of potash) would probably answer better here, too, than it is supposed to do in Germany. The only case in which muriate has really been found to affect injuriously the produce is with Tobacco, which does not burn so easily and completely if manured with muriate. The reason why some of the Germans prefer the sulphate is the false supposition that muriate escapes, being dissolved by the water, and thus removed from the soil. This is perfectly erroneous, for the researches of chemists, principally of Baron Liebig, prove that potash salts of every kind, muriate as well as others, are completely absorbed by the soil. Professor Way's and other chemists' analyses of drainage water prove the same thing, as only traces of potash were found in water taken from many different fields. The greater solubility of muriate must, far from being a disadvantage, be rather considered a great advantage, as it facilitates the application of the manure where it is most needed, viz., to the subsoil. Though—before sufficient field experiments have been made to establish the fact beyond doubt (hitherto very few valuable experiments have been made at all)—I will not therefore pronounce absolutely in favour of muriate, I still venture so far as to give it as my decided opinion, that in our climate muriate will be found preferable.

The difference in the price should decide which ought to be bought. Now, I consider there is only a choice between two kinds, for I except crude kainite altogether, as of very doubtful advantage, by its admixture of chloride of magnesium, its hygroscopic nature, and its poverty of the most important ingredient—potash. Thus the choice lies between the calcined kainite, containing its potash as sulphate, and the concentrated muriate; and of the latter only the best quality, containing 80 to 85 per cent. of muriate, or 50 to 52 per cent. of pure potash, ought to be used, (unless the other is proportionately cheaper), as the carriage and freight enhances comparatively more the price of the lower qualities. The prepared sulphates are too dear for agricultural use. Calcined kainite contains generally 30 per cent., sometimes a little less, sulphate, or 18 per cent. pure potash. Dr. Anderson gives the manuring value of pure potash at from £20 to £30 per ton, or 4*s.* to 6*s.* per cent. in the ton; taking as the mean of these 5*s.*, calcined kainite, with 18 per cent. of potash, should be worth 5 multiplied by 18, equal 90*s.* per ton; and muriate, with 50 per cent., 5 multiplied by 50, equal to 250*s.* per ton. The former sells (I believe) at about £4 at present, the latter at £10, but generally at less, a few shillings above £9. Taking the value of potash at 4*s.* per cent., calcined kainite would be worth 72*s.*, and muriate 200*s.*, so the latter appears to be the cheaper of the two. This is in London or any other seaport town (cheaper in the North, dearer in the West); but the carriage to the inland places being added to this price, leaves the balance still more in favour of the concentrated, less bulky muriate.

It is all-important, indeed imperative, if farmers do not want to waste their money, that they should have the salts analysed and the proportion guaranteed. Besides this, it is necessary that they should buy from good and reliable sources. I am happy to say I have had the opportunity of being instrumental in securing a proper supply by reliable makers, and I can therefore recommend the Agricultural Co-operative Association, 29, Parliament Street, Westminster, to all farmers who desire to buy salts of either kind. I have availed myself of my acquaintance with some of the best makers, to bring about a connection between them and the Association, considering this to be of advantage to English farmers. The Association buys of reliable men only, has all the salts it buys analysed, and is, as I understand, making arrangements to keep a stock in four or five seaport towns on the English and Scotch coast. Thus it would appear to offer all advantages to farmers.

The last subject that it remains for me to treat in this paper is the best mode of application of the salt. Now, this will depend entirely on the variety employed. If kainite, crude or calcined, is used, I would, by all means, recommend its application before winter. With muriate it does not matter how and when it is applied, another circumstance in its favour. Crude kainite should, under all circumstances, be brought to the field in autumn, because only thus will the injurious chloride of magnesium be removed before the seed reaches the ground. I have used calcined kainite, or a salt very similar in composition, but containing more sulphate of magnesia. When I applied the manure in conjunction with farmyard manure I have mixed it with the latter, strewing daily a certain proportion over the heap. This has a double advantage; firstly, it saves much trouble and secures a better and more even distribution; secondly, the sulphate of magnesia contained in the salt, fixes the ammonia of the animal manure, and combines with it and the phosphoric acid to a double salt, very soluble and most valuable. For these reasons I recommend the prescribed method wherever it is applicable, as decidedly the best. Where I applied the potash salts in conjunction with artificial manure, I brought it to the field by itself, in autumn or winter, harrowing it in or not, as it happened; the other manure was of course applied in spring. Potash salts should never be used by themselves; either guano or, far better, superphosphate, ought to be added by all means; Dr. Voelcker's experiments prove in how beneficial a manner both manures supplement each other, the mixture producing a better crop than any other dressing, even where superphosphate or potash salts alone failed to act. Where kainite is used I should certainly recommend one of the ways adopted by myself to be followed; they have been arrived at after much experimentalising. Finally, I recommend farmers to try, and try repeatedly, the salts, which have been found in Germany not only a most useful manure, but in many cases a sure remedy against grass disease, Potato disease, and Clover sickness, the latter above all being generally attributable to the impoverishment of the soil, and principally the subsoil, in available potash. *Henry W. Wolff*, 6, *Woronzow Road, St. John's Wood.*

Home Correspondence.

A Few Words in Reply to a "Farmer of Pontefract."—I have not a word to say in disparagement of farmyard manure, the question is, how is the stock to be kept up, much more increased? I am quite sure that if the corn and fat stock are sold off a farm, and no cake used or other manure bought, the manure heap will grow beautifully less; and as the tendency of a "Pontefract Farmer's" remarks are to make us suppose that he only uses what manure he makes, I think it is not out of place to ask him if this is the case? I have been a farmer for nearly seven years, and I find I have to expend more than my rent in hand tillage and cattle food; and I find my manure-heap does not increase faster than I have a place for it, as soon as it is fit to put on the land. Let us look at the Potato crop. I find it requires full 20 tons of good manure made from beasts eating cake, and about £3 of hand tillage per acre; and I have noticed that the crop has often been lost where the manure-heap was. Then look at the Turnip and Mangel crop; the latter requires as much manure as Potatos. I think it will be clearly seen that it is quite impossible to keep up the fertility of land except by supplementing the manure-heap in several ways. The "Pontefract Farmer" lays great stress on guano making the land stink. Well, so does pig manure, and manure containing cake smells much more than merely decayed straw; so does nightsoil, town manure, &c. I do not wish to say much for guano, which is not equal to what it used to be; it does not smell so strong, and is not so dear. But I do happen to know a farmer about 70 years of age, who was not possessed of £50 when he married, and has 10 children, and is now believed to be worth £10,000, which he considers he has made mainly by the use of guano; and there are few who do not know that the increased fertility of England is greatly owing to the extended use of foreign fertilisers. If our friend's nasal organs are very sensitive I would recommend his quickly covering over with earth any manure he may put on to his land that is not pleasant, and he will soon cease to be annoyed by the smell; and if he covers his farmyard with a shed he will have a less smelling manure than he has in open yards, particularly in a wet time. There was a time when the smell of a manure heap was very pleasant to a farmer's nose, just as the smell of Violets is said to be disagreeable to a huntsman, as he fancies it destroys the scent of the "varmint." I have occasionally seen a great many flies on a manure heap,—I do not say the Turnip fly, which always infests the Turnip plant in certain states and seasons, no matter what manure may be used; and I think the best way to protect the plant is to push it out of harm's way, which can, I think, best be done by using some stimulating manure in addition to the "muck heap." *H. R. T., a Small Farmer.*

The Cattle Plague.—In the *Times* of this day I read:—"September 15, 4.30 P.M.: The cattle plague is fast spreading in Brandenburg, Hesse, Nassau, and Saxony." It will spread into France, where it will scarcely be more desolating than the war which is now scourging that unhappy country. In the year 1866, when the then French Minister of Agriculture, M. Behic, stopped the importation of cattle into France, ridicule was thrown on him in a leading article of the *Times*; nevertheless he persevered, and by so doing saved France from a loss that very few Englishmen can appreciate. *An Old Subscriber, Sept.* 16.

Lime as Manure.—Your correspondent, "Worthing, Sussex," wants a more distinct statement about lime repaying its cost the first year, and to know the cost, quantity, &c. My lime costs me 10*s.* per ton, and I cart it 10 miles at a cost of 8*s.* per ton; if I hire carters to haul for me, using my own horses, the cost is a little less, say 7*s.* I apply 2 tons an acre, or if I can manage it 3 tons per acre, the first year, and another 1½ or 2 tons per acre the second year. Lime near Worthing would be used to "suck the orange," but lime with me is used to make the orange "ripe." I have a deal of peat overlying clay, and unless lime is applied to it, the crop to be got is very poor indeed. But if I apply lime, I get plenty of good Oats and plenty of straw, from 4 to 6 feet long; and if I take good care that none of my straw is sold, but that all of it goes back into the land, and that when roots are grown they, too, all go back on to the land, I am not the least afraid of my orange being "squeezed," notwithstanding the fact of the Editor of the *Agricultural Gazette* hazarding an opinion that possibly such may be the result. Land in my part of the country never forgets lime, provided it be dry land. Let a spot of land in the middle of a wild sheep pasture be inclosed and limed and broken up, and then "loosed out" again, and you will know that spot for generations after. I have an outlying farm, the tenant of which is about 60 years of age, and he has often pointed me out in his sheepwalk a place which he well remembers when he was a boy his father broke up and limed and then "loosed out" again, and

there is no mistake about it being worth double the money of the adjoining land, and he himself from time to time has followed in his father's footsteps. He is one of those with whom I do not think it necessary to stipulate he shall draw a certain quantity of lime. "Worthing" asks me questions which common sense should have prevented. Although land in my opinion never forgets lime, yet the effect of the lime gets less and less every year, and after some years a fresh dose of lime sets it moving again. Does "Worthing" think that land which got a thorough good manuring with farmyard dung (say 30 tons to the acre) would ever become like a piece of land adjoining that had never got a single ton of manure? Nevertheless, the effect of the 30 tons of dung gets less year by year, and in a few years it will need a fresh dunging to keep up its fertility. No doubt the Editor of the *Agricultural Gazette* will tell me that lime is not dung. Nevertheless, I beg to remind him that when a farm is "breeding" sheep and cattle, those sheep and cattle carry off in their bones a great deal of lime; and I would like him to tell me where that lime comes from? I would also like him to tell me whether it is "squeezing the orange" to put back lime into the land to replace the lime which those young animals (bred and reared upon the land) have carried off in their bones? *G. A. H.*

Ploughing Match at Wellingborough on Sept. 15.—The land was in a most unfavourable state, as the failure of the Clover crop obliged a corn stubble to be used to operate upon, and the soil being neither wet nor dry enough to clear the plough, made it very difficult to make nice work; considering this drawback, the ploughing in all the classes must be declared excellent.

Class 1. Members' sons or pupils: three competitors (2 Ball's, and 1 Ransome's plough).—Mr. Sydney Rippin, of Wilby, ploughed his lot in very good style, and took 1st prize. Mr. W. H. Bearn, of Findon Hill, ploughed in fine style, but, the plough not packing his work, he had to be satisfied with the 2d prize.

Class 2. Members' sons or pupils under 21 years of age: five competitors (2 with Ball's, 1 Cook's, 1 Ransome's, and 1 Howard's plough).—Mr. George Hockney, of Whittering, ploughed his lot very neatly, and with considerable judgment, gaining the 1st prize with a Cook's plough. Mr. Stephen Blunt, of Paulspury, made a grand piece of bold, strong work with a Howard's plough, but by a mistake in finishing, had to be satisfied with the 2d prize.

Class 3. For all former winners of the united societies of Northamptonshire: eight competitors (6 with Ball's, 1 Ransome's, and 1 Cook's plough).—John Clark ploughman to Sir W. de Capel Brook, Bart., Geddington, did his work in a masterly way considering the very loose state of the land, winning the 1st prize with a Ball's plough. Samuel Willis, ploughman to Sir Chas. Isham, Bart., of Lamport, ploughed his lot so well as to get placed 2d, also with a Ball's plough. Mr. W. E. Jones' (of Wellingborough) ploughman, Charles Smith, ploughed in very decent style, and took 3d prize with Ransome's plough.

Class 4. For all ploughmen in the employ of members of the Wellingborough Society only: twenty-two competitors (13 with Ball's, 5 with Ransome's, 3 with Adams', 1 with Cook's, and 1 with Howard's plough).—This class had a decided advantage in having the best land, which enabled his Grace the Duke of Buccleuch's ploughman, by his extraordinary artistic powers, to make a splendid piece of work, winning the 1st prize with a Ball's plough. Mr. Thos. Williams' (of Wootons) ploughman, Thomas Cockerill, made exceedingly even, bold, compact, square work, but slight defects in his ridge and last furrow threw him into the 2d prize, with a Howard's plough. Mr. T. Chambers' (of Higham Ferrers) ploughman, James Lawford, took the 3d prize with a piece of respectable work, with a Ball's plough.

All England Champion Class—The Society's Medal: four competitors.—Messrs. Mobbs, Snow & Wood's nominee, Stephen Blunt, ploughed his lot in grand style, with ridges straight, bold, and low—clean, even, straight, square ploughing, well packed, but a little defective in the finishing, and carried off this important prize with one of Howard's ploughs. Messrs. Ransome & Co.'s far-famed champion ploughman, James Barker, did a piece of very beautiful, straight, even work, but the ridge being rugged, the work loose, and the finishing defective, he took only the 2d place, with Ransome's plough. Mr. Corbet's (of Shrewsbury) nominee, Samuel Hoare, did not show any merit in the implement, although he proved himself a very good ploughman. Messrs. Ball & Son's (of Rothwell) nominee, John Hopkinson, made a very creditable piece of work with one of their ploughs.

Messrs. Ransome & Co. showed one of their double-furrow ploughs at work with three horses, doing some sound even work. Messrs. J. & F. Howard also showed one of their double-furrow ploughs at work in the same field, drawn by two horses, making beautiful work. *L. P. B.*

Forking-out Twitch or Couch-grass.—The curse of agriculture in many districts, especially in undrained and heavy lands, is Twitch. It defies the hoe and the plough—the more you cut it into pieces and harrow, the wider and more thickly you spread it and plant it. The only cure is to fork it out and carry it off the land, be the cost what it may. I have seen fields with the appearance of pastures from Twitch alone, and I remember a farmer saying—"What should I have as food on my stubbles after harvest without this grass?" If we are to multiply and extend our grain crops it becomes imperative to fork out this pest. Now is the time, after harvest and before scarifying the stubbles. We are now removing it from a recently planted field of Cabbage after Tares, so that none shall remain. In very dry summers it may be killed by frequent ploughings, but that is uncertain, for the least moisture in a clod preserves its vitality. A good corn crop is almost impossible with Twitch companionship, and yet how abundant and general is its existence. I remember many years ago getting into "hot water" because I ventured to suggest that it was a mistake to hold the prize show in a field almost a bed of Twitch. This was not 100 miles from Watford. In Lincolnshire I once saw great stacks of it, intended for paper making. The weediness of British agriculture costs the country millions annually—1s. per acre on 45,000,000 amounts to £2,250,000. This is but a small part of the loss; for how seldom are our pastures and Clovers cleared of obnoxious weeds. *J. J. Mechi, Sept.* 6. P.S. Boys are spudding out young Docks from the Clover leas,—I presume they came to us in the seed: this is also a paying operation.

Science in Agriculture.—At pp. 1195-6 a remark in an article copied from an American paper speaks slightingly of Gould's superphosphate. As this might be read in this country for a misprint for Goulding, of Cork, I beg to state that, having witnessed the whole of their process of manufacture, and used their manures with success, it is only fair that any possible misapprehension should be avoided. The extension of Messrs. Goulding's works at "The Glen," Cork, is a proof of their success. *William Rayson, Doneraile, County Cork.*

Woolston Farming.—"W. N." thinks that Mr. Smith "is a sound and sensible farmer," and speaks of my "pouring out ridicule on everything Mr. Smith dares to say or do." Let us see what I have ridiculed. Mr. Smith stated he had made a seed-bed for Wheat with his steam-smasher for 6*s.* 8*d.* per acre. I took his own figures, and proved that he had never done anything of the sort. Mr. Smith began to dogmatise about farmyard manure and straw, declaring straw to be of no value for feeding purposes, and that if any animal were given straw the whole of it would pass through it and come out as straw still. I think most of your readers would give their verdict that I proved Mr. Smith to be most ridiculously in the wrong. He next said that 1 ton of straw would absorb 3 tons of water, and produce 4 tons of manure, and when I told him I had tried the experiment with straw chaff, and that it would not absorb any such quantity of water, he pointed to a Turnip, and asked, in the most triumphant manner, how, then, could 1 lb. of vegetable matter there hold 9 lb. of water—an answer which I certainly turned into ridicule, as it richly deserved. Then Mr. Smith began to teach us our duties as landlords, and said the only agreement requisite between landlord and tenant was, "Pay your rent and keep your land clean." Your readers can judge whether or not the unsparing ridicule I heaped upon this saying was deserved or not. Mr. Smith's next move was to declare that Oats would not come to maturity in Wales at an elevation of 1000 ft. above the sea, and I proved that I had this year grown good Oats at an elevation of nearly 1200 ft., from seed ripened last year in the adjoining field, at an elevation of 1100 ft. above the sea. Mr. Smith no doubt is, after all this, as "W. N." tells us, "a sound and sensible farmer," and not to be gauged by the criticisms of *G. A. H.*

Societies.

ROYAL AND CENTRAL BUCKS

AT the annual meeting of this Agricultural Association, at Aylesbury, on Wednesday last, Mr. DISRAELI spoke as follows on agricultural topics:—I hope, although this has been a very trying year to my constituents and the agricultural world generally, I may venture to state that the termination of your labours has not been altogether so unsatisfactory as it once promised or rather menaced to be. I believe we shall all agree that while the harvest is a good harvest, and even in the light lands in which I live the Wheat harvest is one of which I am not ashamed, Barley is not so plenteous as it might be, but it is of excellent quality. It is of that brightness which our maltsters love, and I think we shall be able to place it in the market with confidence in those with whom we deal. No doubt we have all suffered terribly in the expectations which we entertained respecting the root crops, but the late rains have been most beneficial, and although I cannot flatter myself so far as to suppose that the bulbs will expand at this late season of the year, still there is no doubt there will be a large quantity of green stuff which will be valuable food for the winter. And on this point, looking to the unexpected drought which has prevailed this year, I would advert to one point, and one point only, to which I wish to call your anxious attention, and that is to make provision for a better supply of water for the cultivation of the soil. Where I have lived I have never built a cottage without making tanks, and I have introduced tanks among all the old cottages as far as I could manage to do so, and during the trying times you have lately experienced it is difficult to express what a mitigation of suffering of the population generally, especially on the table lands on the top of the Chiltern Hills, has been produced by these tanks. I think it is well for the agricultural world to consider whether that principle should not be pursued still further, and for my own part I cannot see why every farm, especially in those districts where there is want of water, should not be furnished with a reservoir. I hardly know anything more striking than the great waste of surface water, and when I remember the intense suffering, not only of the peasantry, but of the cultivators of the soil, this year from the want of water, I think the time has come when we ought to consider whether greater use might not be made of that surface-water which now is entirely wasted. It seems to me that if the habit were introduced of establishing reservoirs, very great advantage might be obtained, and under the difficult circumstances of years of drought like the present, very great benefit might accrue. I hardly like to sit down without making some reference to those topics which so much occupy the attention of the country and of Europe at the present moment. We have all witnessed great and strange events of late, and it is more than possible—it is probable, that we shall all of us witness, and even perhaps soon, greater and stranger events. There seems a likelihood that there will be in Europe a very trying time. I think it may be some consolation to us that the last 40 years of this country have not been wasted. Though there may be differences of opinion upon a variety of questions which have been discussed, and which have led to legislation, I think that all impartial persons must admit that, on the whole, the progress of this country during the last 40 years has been decided and considerable. The moral and physical condition of the people may not have improved to the extent which the younger portion of those who are sitting in this room I trust will witness; but the principles upon which the moral and physical condition of the population of this country can be established and insured are no longer merely the subject of philosophy, but have been recognised in legislation, and we have acted upon those principles. It is impossible to deny that our finance and our commerce are flourishing; and although we have heard from those whom we greatly esteem that our means of national defence are by no means perfect, still the public mind of the country has for a long time been drawn to the subject; and I must say that I think the elements exist in this country of securing ample and complete means of national defence. Now, there was only one subject, and it was the most difficult one, which for a long period appeared as one which could not be drawn to any satisfactory conclusion, and that was the distribution of political power in the state. All felt that so long as there was a great controversy in the nation upon that question, circumstances might occur, unforeseen and unprecedented, as we experience at the present moment, which might convulse this nation, and which might be the cause of great peril to our political institutions and our social happiness. I think, therefore, it is a matter of great congratulation at this moment, when empires vanish and republics suddenly arise, and the greatest possible changes occur or are threatened in every part of Europe, that three years ago, with, if not the entire yet with the very general concurrence of opinion among sensible men of all parties, and without any disruption of political parties, which I, for one, look upon as one of the greatest misfortunes which could happen to England, we did settle the question of the distribution of political power in this country on principles which, I believe, are firm, and which at this moment allow every man to feel secure and confident in the political establishments of his country. I have always felt myself that if England was true to herself there was no fear. I believe that England now is true to herself, and therefore I think, great, vast, and startling as are the changes that even hourly occur, we as Englishmen need not be appalled. (Loud and repeated cheers.)

Farmers' Clubs.

ATHY.

The Exhaustion of the Soil.—Mr. Lawes, of Rothamsted, gave a lecture on this subject here last week; it had already been discussed by him before the London Farmers' Club. We gave on that occasion an imperfect report, owing to the pressure upon our space at that time by advertisements. We are now able to give a fuller report, and the following is the substance of the Paper before the Athy Farmers' Club:

Mr. LAWES said the subject of the present lecture was one on which he had addressed the London Farmers' Club in the spring of the present year. That lecture had been published, and he did not, therefore, intend reading it to the meeting; but he hoped by means of Tables of results which he had prepared, and which were hung on the walls so that all might see them, to make his remarks interesting and instructive. The first point he would call attention to was the question of the fertility of the soil, and he would direct their attention to the following questions:—

1. Whether, in order to preserve the soil from exhaustion, it is necessary to enforce a fixed rotation of crops?

2. What are the best or most generally applicable means at our disposal for the estimation of the value of unexhausted manures?

In considering the characters of soil with the view of arriving at some answer to these questions, it will

suffice, he said, to confine attention mainly to the definition and illustration of those qualities which are commonly known under the term "condition," and to pointing out the distinction between these and those which are due to what may be called the normal or natural fertility of the land. There are other points of great practical and scientific interest in connection with the state of fertility of our soils which must be left out of view on this occasion; as, for instance, the influence of the various crops we cultivate, the special effects of ordinary and of various artificial manures, the loss of fertilising matters by drainage, and allied subjects.

The word "condition" is in very common use amongst agriculturists. It is said that a farm is "in condition," or "out of condition," or in "high condition," or in "low condition." These terms are well understood to imply certain states of fertility which it is not easy to define more accurately in a few words. As I understand it, the word "condition" refers to those elements of fertility in a soil which, whether they have been accumulated by natural processes or by the art of the farmer, are capable of being turned to account in the growth of crops within a limited period of time, and which by such growth are soon exhausted. "Condition" is, therefore, something that is altogether distinct from the natural or standard fertility of the soil. A soil may be naturally very fertile, but at the same time very much out of condition; or it may be naturally very poor, but in very high condition.

In one case the element of fertility is easily removed, and in the other case that element is contained in what I call standard fertility. The first Table to which I will call your attention contains the results of growing dressed corn, per acre, on certain plots of a field which has now grown Wheat, year after year, for more than a quarter of a century. Up to the autumn of 1843 it was under the ordinary system of cultivation of the farm. In 1839 it was dunged, and grew Turnips; in the next four years it was unmanured, growing Barley in 1840, Peas in 1841, Wheat in 1842, and Oats in 1843. In the autumn of 1843 the first experimental Wheat crop was sown, and the twenty-seventh is now growing. Portions of the field have received no manure whatever during the whole period of the experiments. Another part has received 22 tons of farmyard manure per Irish acre. Another part has received various artificial manures. The remainder, divided into numerous plots, has been manured with different descriptions of manures (artificial), the same description having as a rule been applied to the same plot, year after year, for the last 18 years, and in some cases for longer still. Whatever variance there was, was caused by the seasons, and not by the manner of cultivation. The Table shows the following results:—

Table 1. Illustrations of Condition.

Wheat grown year after year on the same land.

Years	Plot 2. 14 tons Dung, every year; 26 years, 1844-69.	Plot 16. Mixed Mineral Manure, and 800 lb. Ammonia Salts, 1852-64 years, 1865-69.	Plot 5. Mixed Mineral Manure alone; 18 years, 1852-69.	Plot 17	Plot 18*
	Bush.*	Bush.*	Bush.*	Bush.*	Bush.
1844 ..	20¾	19⅝	15¼	12⅝	20⅝
1845 ..	32	32⅛	24⅝	32¼	33
1846 ..	27½	27	25	32	26⅝
1847 ..	29⅝	32	30⅝	34⅝	30⅜
1848 ..	25⅝	30⅛	30⅝	25⅞	29⅝
1849 ..	31	31⅜	28⅝	33⅝	32⅝
1850 ..	28¼	31⅝	30¼	30⅜	29½
1851 ..	29⅜	30⅞	37	31⅛	31
Average, 8 years, 1844-51	..	30½	29⅜	30¼	28⅞
1852 ..	27⅝	28¼	†16⅝	‡24⅝	‡14⅜
1853 ..	19⅛	25⅛	†10⅛	‡ 8⅜	‡10⅛
1854 ..	41⅛	49⅛	†24⅜	‡44⅛	‡24⅝
1855 ..	34⅜	32⅛	†18⅞	†18	‡31⅛
1856 ..	36⅛	37⅝	†19⅝	‡31	‡32⅝
1857 ..	41¼	40⅜	†23½	†26¼	‡40⅜
1858 ..	38⅜	41⅝	†18⅝	‡33½	‡21⅞
1859 ..	36⅛	34⅜	†20⅜	†20½	‡32⅜
1860 ..	32⅛	32⅜	†15⅝	‡25¼	‡18⅝
1861 ..	34⅜	37	†15⅜	‡18⅝	‡32⅝
1862 ..	38⅜	36¼	†17⅜	†27⅜	‡32⅝
1863 ..	44	55¼	†19⅜	†21⅛	‡40½
1864 ..	40	51⅜	†16⅝	‡36⅜	‡17⅜
1865 ..	37⅜	32⅝	†14⅛	†17	‡32⅝
1866 ..	32⅝	17⅜	†13⅛	‡26½	‡12⅜
1867	27½	14⅝	† 9¼	†10⅜	‡23⅝
1868	41⅜	22⅜	†17⅜	‡37⅜	‡18⅝
1869 ..	38¼	16⅜	†15⅜	†16⅜	‡22⅝
	Averages.				
26 years, 1844-69	33⅜	..	..	..	..
21 years, 1844-64	..	36⅛	..	..	..
13 years, 1852-64	..	39½	..	..	..
5 years, 1865-69	..	20⅝	..	..	..
18 years, 1852-69	..	..	..	§24⅝	§24⅝
18 years, 1852-69	..	..	†17⅛	‡17⅞	‡31⅝

* Of dressed corn per acre † Mineral manure. ‡ Ammonia salts. § Mineral manure and ammonia salts.

Table No. 2 contains the results of similar experiments in Barley, which have been continued for 18 years. The treatment is exactly the same. One plot was manured with farmyard manure, and the other two with artificial manures.

Table 2. Illustrations of Condition.

Barley grown year after year on the same land.

Years.	Plot 7. 14 tons Dung every year, 18 years, 1852-1869.	Plot 2A. Superphosphate, and 200 lb. Ammonia Salts, every year; 18 years, 1852-1869.	Plot 2AA. Superphosphate, and 400 lb. Ammonia Salts, 6 years; 200 lb. Ammonia Salts, 10 years; 275 lb. Nitrate, 2 years. Total, 18 years, 1852-1869.
	Bush.*	Bush.*	Bush.*
1852 ..	33	36⅜	43½
1853 ..	36¼	49⅜	42½
1854 ..	56⅜	60⅜	64½
1855 ..	39⅜	47½	56⅜
1856 ..	30⅛	26⅜	33½
1857 ..	51¼	50⅜	60½
1858 ..	55	41⅜	54½
1859 ..	40	34⅜	35⅜
1860 ..	41⅜	43⅜	43½
1861 ..	54⅜	55	55¼
1862 ..	40¼	46¼	51
1863 ..	51⅜	61⅜	60½
1864 ..	62	58⅜	56⅜
1865 ..	52½	40⅜	47½
1866 ..	53¾	50½	50⅜
1867 ..	45⅜	44	41½
1868 ..	43⅜	37⅜	44
1869 ..	40⅜	48	48¼
	Averages		
18 years, 1852-69	48	47½	..
6 years, 1852-57	..	45½	49⅜

* Of dressed corn per acre.

In Table No. 3, instead of a single crop, we took a common rotation crop. The Swedish Turnips were artificially manured, the manures consisting of minerals and ammonia. The whole of the crop was then removed, and the rotation was taken off without further manure.

This has been for 22 years under experiment, and we have only given the land four rotations.

Table 3.—Artificially Manured Four-course Rotation, conducted through 5½ courses. 22 years. 1848-1869.

Average produce of the 2d, 3d, 4th, and 5th courses (16 years), 1852-1867.

Years.	Description of Crop.	Mixed Mineral Manure, Ammonia Salts and Rape-cake, for Turnips only, of each course, 1852, 1856, 1860, 1864. Turnips carted off.
		Per Irish Acre.
1852, 1856, 1860, 1864	Swedish Turnips (roots and tops)	11 tons 3¾ cwt.
1853, 1857, 1861, 1865	Barley	48⅝ barrels
1854, 1858, 1862, 1866	Beans	21½ ,,
1855, 1859, 1863, 1867	Wheat	36½ ,,

These are all the Tables I have brought to show you the condition of the land. If you look through them you will see that, whether we use artificial manures or dung, the condition has been kept up.

Table 4. Illustrations of Condition.

Experiments with Manures on Permanent Meadow Land.

Years	Plot 2. 14 tons Dung, 8 years, 1856-63; Unmanured, 6 years, 1864-69. Total, 14 years, 1856-1869.	Plot 9. Mixed Mineral Manure, and 400 lb. Ammonia Salts, every year; 14 years, 1856-1869.
	Hay per Acre. Cwt.	Hay per Acre. Cwt.
1856	36	50¾
1857	47½	57¼
1858	37¼	64
1859	49¾	55¼
1860	46¼	59¾
1861	45¼	56¾
1862	43¼	57¼
1863	44¾	53¾
1864	48¼	50½
1865	25¾	34½
1866	43	44¼
1867	51	48
1868	36½	60¾
1869	55¼	62¾
	Averages.	
8 years, 1856-63 ..	42¼	..
6 years, 1864-69 ..	43¼	..
14 years, 1856-69 ..	43	54
1870	21	..

That Table relates to permanent pasture. The condition of the land has been kept up throughout these experiments, whether with farmyard or artificial manures. In the Wheat experiments, the average of 26 successive crops grown by farmyard dung was 11 barrels of Wheat on the average per acre. With artificial manures, where we used a moderate amount of ammonia, the average was 12 barrels per acre; and where we used a larger amount, 13 barrels. With Barley the farmyard manure gives on the average 19 barrels, and the artificial manure gives about the same. On the rotation experiments we have 21 tons of Turnips per Irish acre, 19 barrels of Barley, and 12 barrels of Beans. On the permanent pasture we have, by the use of 23 tons of dung per Irish acre, 3 tons 9 cwt. of hay, and with the artificial manure, 4 tons 6 cwt. It is obvious, therefore, that land can be kept in "condition," whether continually under grain crops, under rotation, or growing natural grasses, equally by farmyard dung or artificial manures.

Now, while I am on the subject of condition I will draw attention to the manner in which land is put out of condition. I will first refer to the experiments in Wheat, the results of which we give in Table 1. During the first eight years, from 1844 to 1851 inclusive, plot 16 on my farm was variously manured with mineral manure and ammonia salts, and gave an annual average produce of 12 barrels per Irish acre. With a large increase of ammonia we got an average produce of 13 barrels. From that time all further manuring ceased, and then you will see that the first crop was very much reduced, it being 11 barrels. It then fell rapidly to 6, and then to 4¾. You will thus see that the manures were not entirely exhausted, though much reduced, and the "condition" of the land due to the unexhausted residue of the manures applied during the 21 previous years was sufficient to yield a fair crop in the first year after the manuring was stopped, but that the produce then rapidly declined. It should be stated, however, that the quantity of ammonia applied in this experiment was very excessive, amounting, in the 21 years, to as much as would be supplied in 10 tons of Peruvian guano. Deducting the amount of nitrogen in the increase of crop in the 21 years from the amount supplied in the manure during the same period, it appeared that nitrogen equal to more than a ton of ammonia, and to more than would be supplied in 6½ tons of Peruvian guano, remained unrecovered in the increase of crop. An analysis of the soil to the depth of 27 inches from the surface showed that about one-third of this excess still remained in the soil within that depth, at that period; leaving, however, the remaining two-thirds still unaccounted for. Even the one-third retained within a depth of 27 inches from the surface would appear, from the small produce yielded by it, to be so diffused, and locked up in such states of combination in the soil, as to be available in very small quantities annually. Of the remaining two-thirds, doubtless a part is still retained in the soil below a depth of 27 inches: but probably the largest proportion of it has passed off, in the form of nitric acid, in the drainage water. In the other experiments on Wheat, the results of which are given in the Table, the amounts of ammonia applied were by no means so excessive, only half as much being annually applied, where they were used at all, as during the 13 years of excessive application on plot 16. During the first eight years of the 26—that is, from 1844 to 1851 inclusive—plots 5, 17, and 18 were manured with various, but, upon the whole, somewhat similar mixtures of mineral manure, ammonia salts, and sometimes rape cake, and gave nearly equal average amounts of produce over the eight years, namely—29¼, 30¼, and 28⅞ bush. respectively. From that date, 1852, to the present time, a period of 18 years, plot 5 has been manured every year with a mixed mineral manure containing salts of potass, soda, and magnesia, and superphosphate of lime, and every year during the same period plots 17 and 18 have been manured with the same mineral manure or ammonia salts alternately. For example, in 1852 plot 17 received ammonia salts and plot 18 the mineral manure. In 1853 plot 17 received the mineral manure and plot 18 the ammonia salts, and so on alternately for the 18 years; thus, plots 17 and 18 have each been manured nine times with ammonia salts and nine times with the mineral manure during the 18 years, the difference being that when one received ammonia salts the other received mineral manure, and *vice versâ*; and accordingly we have had each year one plot manured with mineral manure, following a residue of ammonia salts, and one plot manured with ammonia salts, following a residue of mineral manure. Over the 18 years the average produce of plots 17 and 18 was exactly the same, namely, 24⅜ bush. in each case; but if we take the average of the 18 crops grown by mineral alone, whether upon plot 17 or 18, we find it to be only 17¾ bush.; whilst the average of the 18 crops grown upon either plot by ammonia salts is 31⅛ bush., or nearly 14 bush. per acre per annum more.

At the time of the commencement of this set of experiments the utility of supplying ammonia as manure for grain crops was vehemently disputed, it being asserted that if only a sufficiency of available mineral constituents were provided within the soil, the plant would obtain all the necessary ammonia from the atmosphere. It would hardly be possible to select or arrange a set of experiments more entirely conclusive against such a view. The mineral manures, though always succeeding upon a residue of ammonia salts, gave only a small crop, whilst the ammonia salts suc-

ceeding upon a residue of mineral manure, which had been useless without them, gave a large crop. Plot 5, manured every year with the mineral manure alone, gave an average over the 18 years of 17½ bush., whilst the same mineral manures applied on either plots 17 or 18, and always after a residue of ammonia salts, gave only 17¾ bush., or less than ¾ bush. per acre per annum of increase due to the unexhausted residue of the previously applied ammonia salts, these being employed in comparatively moderate quantity. From these results it is clear that the soil may be kept in "condition" to yield a fair crop of Wheat every year by the application of ammonia salts and certain mineral manures; but that if the ammonia salts be only applied in moderate quantity, the unexhausted residue will very little affect the produce of succeeding crops.

I will now refer to Table 2, which gives some results of experiments on the growth of Barley for 18 years in succession on the same land. Plot 2A has been manured every year with superphosphate of lime and ammonia salts; and plot 2AA has received the same amount of superphosphate every year, and twice as much ammonia during the first six years, but only the same amount as plot 2A each year since. Taking the six years of the double application of ammonia on plot 2AA, the result is an average of 49⅜ bush., against only 45½ on plot 2A, with the smaller amount of ammonia salts, thus showing an average increase of 4 bush. per acre per annum due to the extra amount of ammonia salts applied. In 1858, the first year in which the amount of ammonia applied on plot 2AA was reduced to the same as that on plot 2A, it still gave 5 bush. more than the latter; in the next year it gave only 1½ bush. more; and in the third year the produce was practically equal on the two plots. Here again, then, the unexhausted residue from the ammonia salts previously applied has appreciably increased the succeeding crop; but it should be stated that the amount of ammonia salts—400 lb. per acre per annum—applied during the previous six years was, for Barley, very large, indeed excessive.

Table 3 gives the average produce over four consecutive four-course rotations, in which the Turnips were liberally manured with mineral manure, ammonia salts, and rape cake, and the whole crop (roots and tops) carted from the land. On the average, about 13¼ tons of Turnips were removed; yet it will be seen that the unexhausted residue from the manures applied for the Turnip crop was such that an average produce over the four courses of 48⅜ bushels of Barley, 21½ bushels of Beans, and 36¾ bushels of Wheat was obtained. In the experiments on permanent meadow land, the results of which are given in Table 4, plot 2 was manured with 14 tons of farmyard dung per acre per annum for the first eight years, and has since (that is, for six years) been left entirely unmanured. It will be seen that during the eight years of the application of dung the average annual produce of hay was a little under 43 cwt., and that during the six following years it amounted, without any further application of manure, to a little over 43 cwt. of hay, thus showing a very marked effect from the unexhausted residue of the previous heavy dressings of farmyard dung.

From the above results, relating to Wheat, Barley, rotation, and permanent meadow, the following conclusions may be drawn:—1. That condition of land may be maintained, either by farmyard manure or by artificial manures. 2. That when active nitrogenous manures, such as Peruvian guano, ammonia salts, or nitrate of soda, are applied in only moderate quantities usually employed in practical agriculture, the unexhausted residue left in the soil after the removal of a corn crop has but little effect on succeeding crops. 3. That when rape cake, bones, and other purchased organic manures, which yield up their fertilising elements comparatively slowly, are employed, the unexhausted residue left after the removal of the first crop may yield an appreciable amount of increase throughout a rotation. 4. That when farmyard dung is employed, the effects may be apparent for a still longer period. 5. That when mineral manures, such as phosphates, salts of potass, &c., are used, the effects of any unexhausted residue are too slow and gradual to admit of any determination of their value. [We shall next week continue the publication of Mr. Lawes' lecture.]

E.V.E.

Harvest Homes have been held this year, as on several previous occasions, in Eye Park and elsewhere, the festivities concluding on Thursday in last week at Oakley Park. Two years ago Sir. E. Kerrison assembled at Oakley the greater part of the labourers employed on his Suffolk estate to celebrate together their harvest home; but last and this year a different course was pursued, the parishes immediately surrounding Oakley Park sending their harvest men with their wives to one principal festival which received the special attention of Sir Edward and Lady Caroline Kerrison, whilst parochial harvest homes were held in the parishes at a greater distance. The farmers pay, in the case of the Oakley Park harvest home to Sir Edward, and in the parochial gatherings to a committee of management, the sum they were formerly accustomed to give their men as largess, and by means of the fund thus raised a good dinner is provided for the labourers and their wives, followed by sports and amusements of various kinds. This fund, however, is quite inadequate to provide or a gathering of the scale of that of Thursday, and Sir Edward largely supplemented it, the result being a rural *fête* complete in every respect. The parishes included on this occasion were five—Hoxne, Denham, Brome, Oakley, and Stuston. Where convenient, the day's proceedings commenced with service at the parish church. Shortly before 2 o'clock a stream of men and boys who had been employed in the harvest work, with the wives of the former, numbering altogethering some 750, began to enter the park, accompanied by their employers and their families, and to proceed across the sward to a temporary bridge thrown over the miniature fosse, which separates the park from the gardens. Ample provision for that most important part of the proceedings—the dinner—was made under three spacious marquees, opening one into the other, and forming a canvass apartment some 160 feet in length. Here were long tables spread with a substantial meal of meat, Potatos, plum-puddings, and the necessary accompaniments, and decorated with flowers and other simple ornaments, while when the company was once seated, a liberal supply of beer was distributed. The employers carved for their people, whilst their wives and daughters, as well as some of the invited guests, were active in their endeavours that the wants of all should be promptly supplied. During the dinner, Sir Edward and Lady Caroline moved among their visitors, speaking a kind word to one and another as they passed and attended to their wants.

Sir E. Kerrison, after proposing "The Health of the Queen and the rest of the Royal Family," said the only other toast he had to propose was "Success to the united Harvest Home of Hoxne, Denham, Brome, Oakley, and Stuston." There had already been held the harvest homes of Eye and Braiseworth, Yaxley, and Thrandeston, making nine harvest homes this year. Last year there were 11, but whether it was from the organisation not being forthcoming or from some other reason, in two parishes in which there were harvest homes last year there had been none this. He was sorry he could not always entertain them all at Oakley, and his only reason for wishing that these gatherings, in which all, occupiers and labourers, aided, should be united to form one, was the chance that the day might be rainy, when all would be spoilt, whereas by having several, if one day was rainy the others might not be, and so all did not suffer. These festivals not only promoted goodwill and good fellowship amongst them, but were in reality almost the only way in which the great agricultural population could show its thankfulness for a good harvest. If the present had not been a good harvest throughout England, yet it had been a good one among those whom he was now addressing. The toils and labours of the harvest were those which employers and labourers shared together, and surely when they were brought to a successful conclusion it was their first duty to meet together in their parish churches, or any other places of worship which they might attend, and thank God that the harvest had been gathered in; and then they were right to come together, as they did that day, to celebrate it with joyful festivity. There were many questions of special interest to the few parishes whose inhabitants he saw around him. One in particular he always alluded to, and that was the presence among them of a trained nurse, who, he hoped, had been of a use and a comfort to those who had been unfortunate enough to need to have recourse to her assistance. She required their sympathy because her labours were not the lightest in the world, and he thought they had been of some benefit to them. Another matter of some importance to the district was the establishment of an industrial school for girls. Last year when he addressed them the school was about to be established. Now it was an accomplished fact, and five or six girls had been sent out to service, and had given satisfaction. There were more to follow, and he thought the school would be of advantage to the district. Whilst they were celebrating the end of a successful harvest they could not forget the horrors of the war which was decimating our neighbours on the other side of the Channel. After alluding to the incidents of the war, Sir Edward continued—He hoped peace would now soon follow. He gave them "Success to the harvest home," and if they enjoyed themselves that day he hoped they would do so with the moderation he had always observed when large numbers of his countrymen were assembled together. When people objected to large gatherings and said that rioting and vice were induced by them, he denied it, and said, on the contrary, and they would bear witness to it, that it far more often happened that vice and immorality sprang from people going to holes and corners, pot-houses and ale-houses, to drink away the money earned by the sweat of their brow, than when they met their fellows as they did that day.

Pipes and tobacco, with tickets for two pints of strong ale, having been distributed to the men, the whole company were quickly in the open air, and engaged in the sports and pastimes arranged for them. There were races for men, boys, women carrying eggs in spoons, blindfolded races, races for men carrying jockeys 10 stones in weight, hurdle races, three-legged races, wheelbarrow races, putting the weight, jumping, balancing in a basket, climbing and walking the greasy pole, and many other contests for prizes consisting of useful articles of all sorts. Cricket was provided, and the band of the 10th Suffolk (Eye) Rifles played, and the amusements were brought to a conclusion with a display of fireworks. On Friday the usual children's *fête* was held.

Notices of Books.

Principles of Agriculture. By Albert D. Thaer. Translated by W. Shaw and Cuthbert Johnson. Ridgway, Piccadilly. (See p. 1075.)

During the time of the Romans, the triennial rotation of crops, as it in all probability existed and was practised in every part of Europe, except in Italy itself, where it does not seem to have been introduced until the 14th century, consisted in—1, A naked fallow, with repeated ploughings, during summer; 2, crop of autumn corn; 3, crop of spring corn. The fallow ought always to be manured, and this invariably used to be the case when the proportion of meadow and pasture ground was much greater than it is at present. At the present day, however, the fallows are only regularly manured in a very few fertile countries, or in districts where there is a great deal of rich meadow land, or where stall feeding is practised. In order to turn all the hay and straw into manure, there ought to be as many large cattle as there are acres of land to be annually manured. And it is necessary to assign from 3 to 5 acres of open pasture land, according to the quality, and from 10 to 15 acres of forest pasture to each beast.

Thaer mentions the great services of Schubert, but does not approve of his revival of the old dispute about fallows; he thinks them desirable, and, in support of his opinion, advances many scientific and economical reasons, which, however, are not applicable to the circumstances of modern agriculture. Careful tillage may, he admits, enable us to dispense with bare fallow; and he quotes a singular practice of the Belgians, who arrange their fields in narrow strips, and after having well pulverised the land with plough, harrow, and roller, sow the tops of the ridges only, and leave the sides exposed to the influence of the atmosphere.

"It is not so necessary to repeat the operation of fallowing every third year, as was formerly supposed; the land may often be maintained in better condition by being employed in the cultivation of vegetables destined for the feeding of cattle, which will be the means of producing a greater quantity of manure than if it were fallowed every third year. But this mode of proceeding requires very great care and attention, more extensive power and facilities at command for working the land, and a period of time of sufficient length between the harvest and seed time to allow a very careful tillage being bestowed on the soil. Fallow crops are certainly more efficacious than naked fallows, when, as in the case in some districts, these latter are not commenced until after the middle of the summer. Hence the late Barley, which frequently is not sown until the middle of June, is to be recommended for such rotation, notwithstanding the uncertainty of success. If land which is to be completely fallowed is very carefully ploughed at least four times during warm and dry weather, it ought to continue clean and fertile, and free from weeds, and the farmer has a right to expect crops of Clover, leguminous plants, or other fallow crops, on the next fallowing, if not on the two succeeding fallowings."

In Thaer's time, observant and intelligent agriculturists seldom adhered strictly to the triennial rotation:—

"They either sow their land with Clover, or reserve it for leguminous crops, or suffer it to lie fallow, according to the state of it at the time the Barley is sown, or according as it is more or less light or free from weeds. They choose the clearest part of the land for Clover and Peas, and do not restrict themselves to a systematic course of crops, but are guided by circumstances, making a rule to sow Clover in the same place only once in nine years, experience having proved that it does not succeed if repeated oftener. When it happens, after having sown leguminous plants, either from unfavourable weather or from their having overrated the fertility of the soil, they do not obtain a sufficiently abundant crop to cover the ground with its leaves, they either have it eaten off the ground, while in a green state, by cattle, or bury it with the plough, and lay down the land for a naked fallow.

"Where the soil is very strong, it is scarcely considered safe to sow Wheat upon manured fallowed ground, from fear of the crop falling down. It is, therefore, more usual to sow Barley, which, according to the general opinion in these parts, is less exposed to this accident than Wheat. But against all these reasons the triennial system still maintains its ground, and has its supporters."

Thaer refers with approval to the English "quadrennial rotation," viz.:—1, Weeded crops; 2, Barley; 3, Clover, 4, Autumnal grain. This system, which afterwards became famous as the Norfolk, or 4-course, rotation, was introduced, he says, on the estate of Frederick the Great, under the superintendence of an Englishman, named Brown, and of other experienced agriculturists who had been sent to study in England. The king endeavoured to introduce the system into his dominions by encouraging landed proprietors and farmers to adopt it.

"Change of crops also prevents very materially the increase of the predatory grubs and insects which prey upon the farmer's crops.

"The testimony of a great many aged persons goes to prove that a wide extent of land, which had been wholly exhausted by the triennial rotation, has become so much ameliorated by this system of cultivation in the course of one generation, that it is now capable of producing a considerable surplus of corn for exportation, besides affording an abundant pasturage to three times as many cattle as were formerly fed upon it."

Even at the present day there is much still discovered on the subject of the nutrition of plants. Thaer had adopted the theory now universally accepted, that instead of each plant requiring peculiar elements of nutrition, they all remove from the soil, in various degrees, the same elements. This fact destroys an old and plausible theory of a rotation of crops. The true explanation may, perhaps, be found, not in chemistry so much as in vegetable physiology—not so much in the relative amount of the food constituents contained in the soil, as in the relative power of different plants to assimilate them under different conditions.

"It is possible," he says, "that the roots or suckers of all kinds of plants may possess a sensibility and a power of choice, which enables them to imbibe and appropriate to themselves the exact proportion of each of those substances which Nature leads them to require for their support."

We learn that the constant repetition of grain crops under the triennial system was attended, then as now, by great variation in the amount of produce, and, consequently, by occasional periods of over-production followed by periods of scarcity. The common yield is, as might be expected, small, but, in very favourable seasons, all adverse influences of soil and its comparative poverty are apparently overcome by the vigour imparted to the plant. In the southern half of France, and wherever the triennial system is still followed, this is known to be the case. It accounts for the sudden variations in the price of corn to which we are still liable. In the great corn-producing tracts of America, and wherever cattle are not reared in large numbers for exportation or consumption, the average yield of grain tends to diminish. As fast as new tracts are reclaimed, the mischief sweeps onwards with devastating force. The cost of production abroad may probably increase, and future years should therefore find us less dependent on foreign sources for our supplies of agricultural produce.

Crops sown in rows wide apart, and the intervals cultivated during the summer, take the place of fallow :—

"Thus in Kent, where so great a quantity of Wheat is cultivated, Beans sown in rows are considered as the best preparation which the ground can receive. Many vegetables which yield advantageous produce, and particularly Cabbages, if transplanted or sown in rows, may be substituted, if a sufficient quantity of manure can be procured, and if there is a superabundance of fodder.

"In the present day, many persons are so blinded by prejudice that they cannot see the most palpable objects, or rather that they obstinately shut their eyes to everything which appears to be in contradiction to their preconceived opinions.

"For my own part, accident and necessity, and not the perusal of any publication on English agriculture, or any reflection on the subject, led me to adopt this alternate system of cultivation. As I have been honoured with the title of the father of this system in Germany, I trust I may here be permitted to relate the circumstances which induced me to adopt it. I was an ardent disciple of Schubert's system of Clover and stall feeding, and consequently wished to introduce that plant into my rotation, and to cultivate it during the third year instead of fallowing the ground. But it did not succeed; the field became infested with weeds; the autumnal corn which I sowed, after a single ploughing, completely failed, although I manured the land after ploughing the Clover, and it had been already manured in the previous winter. With the assistance of a tolerable field of Lucerne and green Oats, I obtained sufficient food to keep my cattle during the summer, but in the winter I felt the want of the fodder I had expected to derive from my field of Clover; all that I had to give them was some Potatos and Turnips, grown on the Lucerne field after it was broken up, and a small quantity of natural hay. Filled with gratitude to these two vegetables for the valuable assistance they afforded me, I had a portion of that land on which the Clover had failed broken up and planted with Potatos. The crop yielded by these roots was abundant, but late; and as the weather proved wet and unpropitious, I was not able to sow Rye on this ground, as had originally been my intention. I therefore sowed Barley on it the following spring; and, as I was fully determined to have a supply of Clover, I sowed the seeds of it thickly with the Barley. The following year I had some good Clover for the first time; while another field which had been manured during the winter, and on which the Clover had been sown after a second crop of grain, produced very little besides Sorrel. After yielding a miserable cutting, this last-mentioned field was ploughed three times previous to being sown with Rye; while the former was ploughed only once, after having yielded a second cutting of Clover, and yet it produced a decidedly finer crop of Rye than the other, and these circumstances had the effect of determining my choice of a rotation.

"Nevertheless, I was far from attaching any value to it, beyond that of peculiar adaptation to my own circumstances and situation. On the contrary, I felt some degree of shame at the idea of becoming a mere grower of Potatos, and an imitator of all the petty gardeners in my neighbourhood who cultivated their acre of ground, and all, as nearly as possible, in the same manner. However, when I came to consult and converse with them, I found that their experience coincided entirely with my own. I made only one difference, namely, the introduction of a hoe from Mecklenburg, for the purpose of bringing the mould round the roots of my Potatos, and which is now come into general use throughout Germany.

"It was not until sometime afterwards that chance threw in my way the works of some of those English authors who regarded this rotation, or a similar one, as the only basis of good cultivation; who advise that the fallow should be replaced by crops planted in rows, and carefully tilled; and consider Clover to be only an ameliorating crop when, sown with the first crop of grain, it finds the soil thoroughly loosed and cleaned by the fallow crops, and, consequently, vegetates so thickly and luxuriantly as to cover the whole surface of the ground with a shade; and who, when this is the case, regard the cultivation of this plan as an excellent preparation for Wheat. I thought it my duty to make this system known to the German public, and also some English experiments, which I learned were made about the same time, and which seemed to coincide with my own views. I accordingly published it, first in the 'Hanoverian Magazine,' and subsequently in my 'Introduction to a Knowledge of English Agriculture.'

"It is not therefore entirely without reason that this rotation has been designated the English system, although it is not in general use even there, but is only practised in some particular counties, and on the estates of some few enlightened agriculturists, whence it will doubtless become every year more and more diffused.

"Many persons fear that the spring cereal plants will be laid if they are sown on a rich soil; but experience ought to reassure them that such will never be the case, if they will only take care not to sow the seed too thick—a practice which is at once superfluous and highly injurious. Deep ploughing will always prevent the corn from being laid.

Many remarks, in accord with modern experience, are made on such subjects as "double crop," ploughing in green crops, &c. An absolute preliminary to improved husbandry and to agricultural enterprise is "that the farmer shall be sole and absolute master of all his land, free to act, unfettered by trammels, and exempt from all restrictions."

On the question, now so much mooted, of the exhaustion of soils, he says, rather drily :—

"I have never yet had an opportunity of examining or analysing any of those inexhaustible soils which are capable of bringing the crops to full maturity every year without being manured, and in which no diminution of fertility is observable so long as the requisite degree of cultivation is bestowed on them. It is asserted that such land is to be found in the Ukraine, in Hungary, and several other places, and that some few circumscribed portions of it are to be found even in Germany. Several soils which I have analysed were once considered to be inexhaustible;" one of which, "taken from the right bank of the Elbe, some few miles from its mouth, was made to bear the richest crops, as Cabbages, Wheat, autumnal corn, Beans, &c.; but every sixth year it was necessary to manure it thoroughly, and to give it a fallow."

The chapter on the "Theory of the Soil" is particularly instructive, containing a description and analysis of every variety of soils that can be conceived, with suggestions as to special management, the crops suitable for them, the weeds infesting them, their relative desirability to the farmer, and a great variety of general and particular information on the subject.

Of manure, he says :—

"It acts upon the soil in two ways :—First, by communicating to it those juices which are calculated for the nutrition of plants and vegetables. Secondly, by the chemical action which it exercises on those substances contained in the soil, decomposing them, and recombining them under new forms, and thus facilitating their introduction into the suckers of plants; and, perhaps also, by communicating that degree of energy and activity to vegetation which enables it to take up and appropriate the suitable nutritive juices.

"Some kinds of manure appear to produce only one of these effects, or at least to produce one in a far greater decree than the other; while others, on the contrary, seem to produce both."

Some manures merely fertilise the soil by stimulating it, others add to its constituents. The first merely render the wealth of the soil available, and enable the farmer to trade upon it. This system of farming may be compared to an over issue of paper currency, which sooner or later becomes depreciated, and is no longer convertible into real wealth. Modern farmers, with all the advantages of modern discoveries in chemistry and analysis, are far from understanding truths which Thaer clearly expressed 60 years ago. How long the period that elapses before truths, recognised in theory, and taught to every schoolboy, become concrete in our daily practice! Half instructed minds present an almost insurmountable barrier to the progress of truths that invade our habits and prejudices. It is partly on this account that agriculture has gained nothing, compared with other arts, from the application of the "kindred sciences." And in this respect the future will depend, not alone on the progress of scientific discovery, but on the diffusion of a superior education among agriculturists, which will enable them to comprehend the teaching of science.

The reader who refers to the "Principles of Agriculture" will find in the chapter on manures everything of practical importance that can be said even now on the subject of applying manures—liquid and solid—to the land, of preserving them from waste previously, and of their distribution throughout the rotation. The old practice of marling, once so common in England, as well as on the Continent, is also described, and its merits discussed.

Farm Memoranda.

NORMANDY.—"Were I asked to name the most favoured portion of France, without doubt I should point to Normandy:" thus says M. de Lavergne in his work upon rural economy. The highly finished appearance of the country, the mansions scattered about, the neatness of the villages, the well trimmed fences and carefully dug ditches that line the roads, the freshness of the verdure in the meadows, the healthy and vigorous race of cattle—all these remind the traveller more especially of England. From times long past agriculture has flourished, either from the nature of the soil, the humidity of the climate, or the careful attention of the farmer, or more probably from its proximity and easy access of transit to the capital. Paris has been a great devourer of the fisheries furnished by the coast, of the fat oxen, butter, fowls, cider, the principal market for horses, and all that could be gathered from the soil. Since the alteration in our treaty relations, and the opening of our ports, there has of late years arisen another outlet scarcely less important. Any one who needs to be confirmed in these facts can visit the markets in different localities—such as Caen for corn, Charenton and Isigny for butter, Pont l'Evêque for butter and cheese, Le Mans, La Hecke, and Alençon, with many others; or if he takes his station at the windows of the Hôtel Cheval Blanc at Honfleur, or stand upon the quays, he can watch the lading of the steamers of the Brighton and South-Western Companies, and their arrival and departure at the flow of the tide. At first the line of steamers of the Brighton Company plied weekly between Honfleur and Littlehampton, but now there is a daily service of these and the opposition vessels of the South-Western Company. During the month of May in 1868—by no means the most prolific month of the year—there was shipped altogether at this port 12,000 cases of eggs, weighing 800 tons; 15,000 packages of butter, weighing 450 tons; besides fruits, as Cherries, Strawberries, and early Plums, weighing 300 tons. In the autumn the exports are much larger, the shipments of poultry, Pears, Walnuts, and seed being very considerable.

The province itself includes the departments of Eure, Orne, La Manche, of the Seine Inferieure, which corresponds to what was called Upper, and the Calvados to Lower Normandy. The Seine traverses a portion, and, with the thriving ports of Havre and and Honfleur, exercises an important influence upon the description of the products. The Calvados may be taken as a fair sample of the other portions, and therefore we have selected this for our purpose from the reports accompanying the proceedings of the *enquête agricole*. From this source we learn that the Calvados consists of six districts, the names of which are well known in English history, and here the Commission held their sittings—Caen, Bayeux, Falaise, Lisieux, Pont l'Evêque, and Vire; these again are subdivided into 37 cantons, in all 765 communes. It appears the soil is affected by three distinct geological actions, one part resulting in the greater abundance of the cereals, another in pasturage, and a portion, although small, in woods and copses. The rivers are numerous and abundantly sufficient to supply the needful amount of moisture. The ports are seven in number, and are all situated on the coast with the exception of Caen, which is connected with the sea by a canal traversed in about an hour by steamers which ply daily with passengers and goods backwards and forwards to Havre. It is the capital town of the department, and is remarkable also for the quaint architecture of its streets, and the number and beauty of its churches, one of which has been appropriated for the purposes of a corn market. The town is the resort of the farmers, who are generally an exceedingly well-to-do class, of which there is every sign in the appearance of the country around.

Since the beginning of this century, agriculture, as stated in the report, has made immense progress, and that we can readily believe. Up to that time the property was in the hands of the Church and a few "grand seigniors," the roads were desperately bad, and there was no easy outlet for the produce; but at the Revolution the change seems to have been marvellous, the law compelled the sale of many estates, the subdivision of all, the communications were improved, education penetrated the dense ignorance of the people in the villages, and the husbandman and farmers have caught the infection and give fresh skill and intelligence to their occupation. The population continued to increase until within the last 30 years, and since then it has somewhat declined, owing, it is said, to the superior attractions offered by the large cities for the labouring classes. From this and other causes wages too have risen considerably, in the proportion of 1*f.* to 1*f.* 50*c.*, and those of farm servants have doubled.

The whole superficies of the department covers 552,072 hectares, or 1,380,180 acres; of this arable lands occupy more than one-half. The farms are not generally large, those above 50 hectares requiring a capital of 10,000 francs being rare; and it is seldom they exceed more than half that number, the *petites cultures* do not exceeed 20 hectares. Owing to the

construction of the railways, the better management of the roads, and the consequent openings for produce, rents have risen one-tenth; the large occupations let for 100 francs per hectare, the moderate for 110, and the small for 130. The *métayage* system, common in other parts of France, is here unknown. The cultivation of the cereals constitutes the chief wealth of the plains; that of Colza, attempted at the beginning of this century, has taken a great development, and has led to the adoption of a system of alternate courses. The fallows have been replaced by artificial grasses, which prepare the soil for Wheat; the tillage, executed formerly by oxen, is now universally managed by horses, and the farmers of the plains around Caen rear a goodly number of colts for the markets in Paris and elsewhere.

At one time Rye was extensively cultivated, but now it has diminished greatly; whereas Barley has increased, especially in the lighter soils around Caen and Falaise; Flax and Hemp have also diminished, and Sainfoin, Lucerne, and Trefoil have increased. The rotation of crops are—for the first year, Colza; second, corn; third, Sainfoin and other grasses, Rye and Oats, and in some spots Beetroot and Potatos are cultivated. The custom of reaping and leaving a length of straw for the cattle has disappeared, and the harvest is now reaped with the scythe. The only machinery in common use are the threshing-machines; their effect upon wages has not been perceptible, and they necessitate the employment of an additional number of persons. The different kinds of manure used are the natural refuse of the stables and farmyards, oilcake from the Colza, guano, the vrac and star-fish found on the sea coast.

The breeding and rearing of horses furnishes the chief occupation of the farmers in the district of Caen, and the sheep farming is most general in the neighbourhood of Falaise; there a farm of 100 hectares generally possesses a flock of 100 to 150 sheep. By the present system of cultivation certain changes have taken place. The Colza, which in 1852 occupied 29,985 hectares, has been extended over 40,000 to 50,000 hectares, which bring in not less than 30 to 40 millions of francs. The fallows have completely disappeared. In 1852 it was ascertained that 121,113 hectares were in grass or natural meadow, 317,294 in arable land, and 115,175 devoted to forest, heath, &c. There are now probably 150,000 hectares in grass, since meat, butter, and cheese being articles in great request, all the soil that could be turned to that purpose has been converted into natural meadows. Throughout the department milk, butter, and cheese constitute a considerable agricultural industry. The making of the butter, which is now perfectly understood, and of which the Bessin is the principal centre, does not bring in less than 20 millions of francs to the Calvados; that of cheese produces from 2 to 3 millions. In the district of Pont l'Evêque, and more especially of Lisievo, there is made an excellent cheese called Camembert, which owes its name to a village in the district of Vimontiers, where it was first produced. The cheeses of Pont l'Evêque, of Livarot, and Mignot have long been celebrated in Paris and all the markets of France. In some cantons the rearing of poultry, and more especially the commerce in eggs, forms an important source of occupation. The *gélinotte* of Caumont in the district of Bayeux, the *chapon* and *poulard* of Crèvecour in the district of Lisieux, merit an especial mention. The ports along the coast furnish a valuable assistance to the development of this trade; we find it stated that during seven years and a-half there were exported in all 340,006,402 kilogs., giving an annual average of 4,534,187 kilogs. Since a kilog. is the weight of 16 ordinary-sized eggs, it follows that there were exported annually by the ports of Calvados 72,546,992 eggs, or more than six million dozen. The farms of Calvados do not, however, alone supply this quantity, since the departments of the Orne and Mayenne bring their contingent. On the other hand, from Carentan in La Manche the exports are said to be still more considerable, and towards this the districts of Bayeux and Vire contribute their share.

Attention to horticulture has become general, and the growth and sale of fruits of all sorts, fresh and preserved, furnishes a considerable revenue to the inhabitants, particularly around Honfleur. The cultivation of the cider Apple has increased much in all the districts, except Caen, where it is quite unimportant. It is reckoned that in average years the whole of the Calvados produces in cider two million hectolitres, and in years of abundance upwards of four millions. In valuing the hectolitre at 3f., this would give the produce of the soil at from 6 to 12 million francs. It is not unusual in some of the cantons for the farmer to pay the whole of his rent from the crop of Apples in his orchard. The produce exported from Havre is generally sent to England, and often even to Russia; but Paris, London, and the United States are the chief consumers of the abundant supplies of animals, butter, eggs, poultry, &c.; and this commerce has been greatly facilitated by the line of railway from Paris to Cherbourg, with branches to Honfleur, Le Trouville, Le Mans, and Saint Lo. Well may M. de Lavergne—an excellent authority upon all that concerns the agriculture of France—speak in terms of exultation of Normandy as the most favoured portion of his native country! When occasion requires and opportunity arises we shall gladly revisit it.

Miscellaneous.

RATIONAL AGRICULTURE.—First on the list of things that would tend to promote rational agriculture, I would venture to mention Farmers' Clubs, or, as they might be called, farmers' schools for grown up pupils, "Where each by turn is teacher and is taught." They are the most readily available and practicable means of agricultural education that we have at hand. These clubs and the national shows of the Royal and Highland Societies have done more to advance British agriculture to its present position of high excellence than anything else. They have taught the British farmer to think, and to express his thoughts. I can assure you, although you may not think it, I read with far more interest and profit the papers and discussions of some of those Farmers' Clubs in the old country than I do even the parliamentary debates in our own. Through these clubs, and the agency of the press in diffusing the knowledge gleaned at their meetings, and by that strength which such union gives, the British farmer is fast becoming a power in the state. Instead of being considered a mere cipher, and told how he was to vote at elections, he will ere long dictate to his landlords how they must vote in Parliament on such questions as the Game Laws and Tenant Right. Now, if Farmers' Clubs can effect such revolutions as they have done in the practice, in the social and intellectual position, and in the political influence of the farmer at home, why should they not produce the same results in this country? Here we are quietly, for the want of some such union, allowing one of the curses of England, the Game Laws, to be fastened upon us, and never bestowing a thought upon Tenant Right. Farmers' Clubs are a far greater necessity as a means of collecting and diffusing information in a new country like this than in an old one. Here we have a climate so widely different from that of the old country, that we have as it were to begin afresh, and elaborate a practice in accordance with climatic and local requirements. Nothing can aid us more in doing this, and in devising some course of rational cultivation, than periodical meetings of farmers, to "reason together" on questions affecting their interests and the progress of their art. By such means many valuable facts derived from practical experience, and that otherwise would be lost, will be collected and recorded. It is from Farmers' Clubs that some scheme for the education of young farmers should emanate, and the neglect of their education, as I have already pointed out, may be attended with injurious consequences to the state. The formation of these clubs should be a simple matter; all that is requisite is fixed times for meeting, a sensible chairman, active secretary, and the apostle Paul's definition of charity, slightly modified, as rules for the guidance of members. I hope soon to see them flourishing in every district in the colony, and I feel sure their establishment will be attended by good results to farmers themselves, and to the community at large. *Mr. J. Mitchell, of the Victoria Agricultural Society.*

FOOD PRESERVING.—In the last report of the Committee, mention is made of a mode invented by Mons. Shauer, and adopted by Baron Fabrice, which, it was hoped, might enable meat to be kept exposed to the air for an indefinite period; but the specimens examined, and repeated experiments made by the Committee, have not satisfied them as to the success of the method pursued. Several tins of preserved meat from Melbourne were forwarded to the Committee by Sir Francis Sandford, by direction of Earl Granville, for examination and report. The Committee notified to Sir F. Sandford that the specimens sent were equal, both in flavour and nutritive value, to other samples from Australia which had been before carefully examined and tested by the Committee; but the Committee having, at the same time, the opportunity of comparing them with meat preserved at Her Majesty's victualling yard at Deptford, were unanimously of opinion that this latter was much superior in flavour, as well as in every quality which makes up food value. The Committee also suggested to Her Majesty's Government that a full detail of the methods adopted at Deptford should be forwarded to the Meat Preserving Company in Australia. M. Thibierge's process, which consists in dipping the meat for a short time—a few minutes only—in very dilute sulphuric acid, has been under consideration; but, so far as the Committee have had opportunities of examination, they have not arrived at a favourable opinion as to its ultimate success. Mr. Collett forwarded to the Committee specimens of meat and other articles of food preserved in Canada by means of bisulphite of lime, employed in accordance with the process of Bailey and Medlock. The result was not successful, owing perhaps to adventitious circumstances. Manning's method of keeping raw meat in tins—one of the varieties of preserving processes by means of sulphuric acid gas—has also been examined, but not found satisfactory. Comparisons have been instituted, to test the value of American beef purchased by Her Majesty's Government for the use of the Royal Navy, as against meat cured at Deptford. Notwithstanding the excellent quality of the Deptford meat, the Committee considered the American specimens so specially good as even to exceed in value the British samples. Further experiment has shown the value of the desiccated meat prepared at Queensland, and its great keeping qualities over a long period of time, and the Committee believe that this will become a very valuable article of commerce, and a cheap addition to our food resources. Several trials have been made of Mr. Tallerman's Australian meat, and the Committee have had the advantage of the scientific aid of Dr. Thudichum, who has specially examined into and reported on its value. From these trials and report the Committee have arrived at the conclusion that the meat is highly impregnated with the salts used in its preservation, notably with chloride of sodium; that it has lost a considerable proportion of its nutritive qualities, and cannot be depended on without the addition of fresh meat and vegetables, to make it thoroughly life-sustaining. To these Dr. Thudichum suggests the further addition of "Extractum carnis" (Liebig), in order to supply elements of value lost in the processes of preservation adopted. The last results of Professor Gamgee's and Dr. Estor's plans appeared to the Committee more favourable than the previous specimens submitted to them for examination. The Committee are still of opinion that these researches, if not as yet leading to any great and startling discovery, by which our food resources are likely to be largely and permanently increased, have still been of considerable value, not only in directing public attention to this most important subject, but also in guiding experiment, and encouraging those who have worked earnestly in endeavouring to accomplish the object the Society has in view—the general benefit of the community. *Report of the Society of Arts' Food Committee.*

The Week's Work.

SEPTEMBER 24: *Seed Clover* is harvested about the close of the month. Choose fine weather, as the crop should be secured dry.

Winter Beans are grown either in ridges or on the flat, and in lighter land than what is generally termed Bean soil. The cultivation and seeding is very diversified. They are now mostly grown in rows from 18 to 27 inches apart for horse-hoeing, but we have sown broadcast on an Oat stubble both with and without manure, and ploughed them in with a light furrow; or the Beans are sown broadcast on the Wheat or Oat stubble in the same way, with or without manure, but generally a slight manuring and the land ridged up with a double-furrow plough, or a bout of a common plough, which gathers the manure and Beans into a row in the centre. When grown this way the rows are sometimes 30 inches apart, with 15 to 18 inches clear for horse-hoeing when the Beans come up in narrow beds 12 to 15 inches broad. If a light soil is set up deep, the drills will require rolling to let out the Beans equally, and on strong clays a light harrow may be needed to cover the seed. In the above examples the seed may be sown with a Bean-barrow at the back of the furrow in ridging, and in the bottom of every second furrow, where the crop is grown on the flat on lands liable to drift in winter. Another plan is to smash up the stubble, manure and drill, or manure on the stubble, smash up and drill at one operation by steam, and either dibble or drill in the seed by machine. But where the weather and season will permit, the more advisable course is to give the land a more thorough autumn fallow than above, in August if possible, or as early in this month as the work can be done, ridging and manuring as for Potatos and Carrots, and then either dibbling or drilling in the seed with a machine, or the seed may be sown with a Bean-barrow over the manure, 2 bushels per acre.

Winter Peas are grown in the same way as winter Beans, but on light calcareous soils, to which the crop is partial.

Potatos.—Harvesting the main crop usually commences about the close of the month, South and North. When dug with a three-pronged fork, a man will keep two women or boys gathering with baskets. When the Potatos are turned up by a common or double-mouldboard plough, or potato-plough with skeleton mouldboard, a man will shake out to six or eight gatherers. The Potato digger turns up and shakes out the Potatos, thus dispensing with manual labour both in digging and shaking out. A cart goes alongside the gatherers, into which the Potato-baskets are emptied, the duty of the carman being to empty the baskets so as to keep the gatherers going, and when the cart is full an empty one is ready to take its place. Potatos are stored either in barns or pits, the latter about the breadth of the cartwheels outside, so that the loaded carts can readily be backed into them. The pits are first covered with straw and an inch or so of earth, not quite up to the ridge, and when the "sweating" is over it is covered with from a foot to 15 inches of earth, with straw vents at intervals along the ridge for ventilation. Those who market immediately sort their Potatos in the gathering into three qualities; the first for sale, the second for seed, and the third for pigs. The more common practice is to pit the whole sound crop, and when sold to sort them by means of Potato-riddles, the width of the mesh being a matter of agreement. If there is any part of the field more promising than another for seed, the crop on that part should be pitted by itself, and in gathering the two extremes of unshapely large, and premature small, so to speak, may be separated for pigs.

Manuring for Potatos, Carrots, Mangel Wurzel, and

spring Beans and Peas, and the prior fallowing of the land, should be proceeded with without delay; and also the autumn fallowing of land for manuring for Swedes and Turnips at the time of sowing. In all such cases the land should get a thorough deep tillage, not less than 15 inches. Where it has been previously ploughed to this depth we prefer turning up the bottom to the weather by the plough, but where it has only been ploughed some 6 or 8 inches deep, smashing, subsoiling, or digging by steam is preferable, the subsoil in very few cases being perfectly sound. In late districts, where the harvesting of the Oat crop is only just concluded, the fallowing should be done at one operation, by steam in preference to horses, and if the weather will permit of manure being applied the manuring should keep close to the ploughing or smashing of the stubbles, so that when overtaken by heavy rain the work may stop until the weather breaks up, when the manuring of the newly ploughed or smashed land may be resumed; when otherwise, had the manuring of the newly ploughed land been allowed to fall behind, the carting after the rain could not be done so well, if at all. The stubbles may now be smashed and ridged for manure by steam at one operation, so that the manure-carts can go alongside the implement, the small heaps being left upon the stubbles and spread on the newly opened drills while the implement in returning is covering the manure in the last two or three drills.

The Dairy.—In our southern counties September is a good dairy month, the temperature being favourable for the operations of making either butter or cheese; but towards its close that great enemy, a damp atmosphere, begins to be felt, more especially on the west coast; hence the prudent maxim is to light the stove in time, not only to keep things dry and free from mustiness, but also to ventilate the milk-room and cheese-room when the windows are closed.

Swine attend to as in August, by keeping the piggeries clean and giving a cooling diet, *i. e.*, plenty of sour food. Towards the close of the month bacon hogs may be forced forward as the weather grows cool. *W. F.*

Markets.

METROPOLITAN CATTLE MARKET.

MONDAY, Sept. 19.

The number of Beasts is considerably larger than last Monday, but the average quality is very inferior, consequently choice descriptions are readily disposed of, at fully late rates. There is also a considerable increase in the number of Sheep, but no improvement in quality; trade is hardly so brisk as last week, but there is very little alteration in quotations. Choice Calves are scarce and dear. Our foreign supply consists of 1860 Beasts, 7750 Sheep, 214 Calves, and 140 Pigs; from Scotland there are 78 Beasts; from Ireland, 450; from Norfolk and Suffolk, 30; and 1302 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools	5 6	05 10
fords, &c. ..	5 8	06 0	Do. Shorn ..	.. —	.. —
Best Shorthorns..	5 4	5 8	Ewes & 2d quality	4 8	—5 0
2d quality Beasts	4 0	—4 8	Do. Shorn ..	.. —	.. —
Best Downs and			Lambs	.. —	.. —
Half-breds ..	5 10	—6 2	Calves	4 0	—6 0
Do. Shorn ..	.. —	.. —	Pigs	3 8	—5 8

Beasts, 3720; Sheep and Lambs, 20,300; Calves, 220; Pigs, 190.

THURSDAY, Sept. 22.

We have again a large number of inferior Beasts on offer; choicest qualities being scarce, are readily disposed of at Monday's rates; trade is dull for other kinds, yet they are for the most part disposed of, at a small reduction. There is a fair supply of Sheep; trade is dull for them at lower rates, and a clearance cannot be effected. Choice Calves are in demand, at high prices. Our foreign supply consists of 1300 Beasts, 9080 Sheep, 448 Calves, and 220 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scbts, Here-			Best Long-wools..	5 4	05 8
fords, &c. ..	5 8	06 0	Do. Shorn ..	.. —	.. —
Best Shorthorns ..	5 4	5 8	Ewes & 2d quality	4 6	—5 0
2d quality Beasts	4 0	—4 8	Do. Shorn ..	.. —	.. —
Best Downs and			Lambs	.. —	.. —
Half-breds ..	5 8	—6 0	Calves	4 0	6 0
Do. Shorn ..	.. —	.. —	Pigs	5 8	—5 8

Beasts, 2300; Sheep and Lambs, 9080; Calves, 448; Pigs, 220.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Sept. 22.

Prime Meadow Hay	126s. to 135s.	Clover, old ..	..130s. to 142s.
Inferior do. ..	..110 120	Inferior do. ..	..115 125
New Hay ..	..115 125	New 2d cut do.	..120 130
Inferior do. ..	..100 110	Inferior do. ..	..110 115
Straw	.. 30 34	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, Sept. 22.

Sup. Meadow Hay	130s. to 147s.	Inferior Clover	..120s. to 130s.
Inferior do. ..	..110 120	Prime 2d cut do.	..126 136
New do.	..118 140	New do.	..110 140
Inferior do. ..	..100 110	Straw	36 40
Superior Clover	..140 150	JOSHUA BAKER.	

ENGLISH WOOL.

During the past week there has been a more cheerful feeling, and although the amount of business has not been very large, yet special qualities are inquired for, and holders are much less inclined to make concession, in order to induce business.

METROPOLITAN MEAT MARKET.—Sept. 22.

Best Fresh Butter .. .. .. 19s. per dozen lb.
Second do. do. .. .. 17s.
Small Pork, 5s. *od.* to 5s. 4d.; Large Pork, 4s. 4d. to 4s. 8d. per 8 lb.

MARK LANE.

MONDAY, Sept. 19.

There was a fair attendance of millers at the corn market to-day, and rather more animation was noticeable in the grain trade; notwithstanding no enhancement took place in prices, with the exception of English, which occasionally realised more money. The supply of new English Wheat was somewhat large, the condition of which was good; the demand ruled steady, and in some instances an advance of 1s. per qr. was obtained. The arrivals of foreign Wheat were large, and a similar inquiry was experienced, but prices were not quotably higher. The show of Barley was moderate. The demand for choice samples of malting and grinding was steady, but for inferior descriptions it was rather slow, at about late rates. Malt continued dull and drooping in value. Oats, the supply of which was moderate, met with a more active demand, at the rates current on Friday. Beans and Beas were in fair supply and request, but unaltered in value. There was a better inquiry for Flour, American barrels selling at an advance of from 6*d.* to 1s. on the best brands. The top price of town-made was reduced 3s. per sack.

	s.	s.		s.	s.
PRICE PER IMPERIAL QUARTER.					
WHEAT, Essex, Kent, Suffolk. White	44	—51	Red.....	41	—51
— — fine selected runs..do.	48	— 55	Red.....	45	—53
— — Talavera	49	—58			
— — Norfolk			Red.....	—	
— — Foreign	41	—62			
BARLEY, grind. & dist., 29s to 33s. Chev.	42	—45	Malting ..	36	—41
— Foreign .. grinding and distilling	25	—33	Malting ..	33	—43
OATS, Essex and Suffolk	24	—26			
— Scotch and Lincolnshire.. Potato	26	—28	Feed	—	
— Irish ..... Potato	25	—27	Feed	23	—26
— Foreign .....Poland and Brew	24	—26	Feed	19	—24
RYE	32	—36	Foreign ..	33	—36
RYE-MEAL, Foreign	.....				
BEANS, Mazagan.... 43s. to 47s. Tick	49	—50	Harrow ..	49	—50
— Pigeon .... 51s. to 59s. ..Winds.			Longpod..	—	
— Foreign ..... Small	45	—47	Egyptian .	42	—44
PEAS, White, Essex, and Kent.. Boilers	38	—40	Suffolk ..	40	—42
— Maple, 40s. to 44s. .....Grey	36	—40	Foreign ..	36	—40
MAIZE	—		Foreign ..	32	—34
FLOUR, best marks delivered.. per sack	39	—27			
— 2d ditto ..... ditto	32	—44	Country ..	32	—44
— Foreign ..... per barrel	24	—27	Per sack..	35	—61

WEDNESDAY, Sept. 21.

There were good supplies of new English Wheat on sale here to day, the quality of which was good. The demand for both red and white qualities ruled steady, and the full prices of Monday last were readily paid in all sales conducted. Foreign Wheat changed hands to a fair extent, on former terms. There was a good show of Oats, and sound corn sold freely at Monday's currencies. Maize was unaltered in value. Barrel Flour was firm, at late rates, and town marks were unchanged from Mondays reduction of 3s. per sack.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	1040	100	—	—
Irish ..	—	—	—	—
Foreign ..	26,810	2120	35,050	1090 (9000 brls.
	29,150	2220	36,050	

LIVERPOOL, Sept. 20.—We have had an average attendance at our market to-day, with a good demand for Wheat at about 2*d.* per cental advance. Flour in good request, at about previous rates. Indian Corn in good request at about 3d. per qr. decline. Oats quiet. Peas firmer.

AVERAGES.

	Wheat.	Barley.	Oats.
Aug. 13	54s 10*d*	32s 11*d*	28s *od*
— 20	54 7	33 5	25 10
— 27	51 3	36 8	24 6
Sept. 3	49 1	36 2	25 9
— 10	48 1	35 8	23 10
— 17	46 6	36 4	23 9
Average ..	50 9	35 2	25 3

HOPS.

BOROUGH MARKET, Sept. 21.

The trade in new Hops is now very active, and good Hops, whether Kent or Sussex, are bought up directly, at slightly advancing prices. During the past few days a rise of 10s. per cwt. has been established, in consequence of the growth proving to be much inferior in quality and colour to what was expected when the market started.

SEED MARKET.

In the absence of any great consumptive demand the seed trade now rules very quiet. Winter Tares are offering very freely, and are obtainable on easier terms. Sowing Rapeseed continues firm. For white Mustard seed we have but little inquiry. A few samples of new English white and red Clover seed have been sold on our market at high prices. New home-grown Trefoils move off slowly, at moderate currencies. Windsor and Long-pod Beans are now offering. Linseed is in good request. We have a fair demand for winter Barley, Oats, and Rye. Hemp seed is still exceedingly scarce. Canary seed continues cheap.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—Sept. 21.

Eden Main, 16s. *od.*; Walls End Haswell, 19s.; Walls End Kelloe, 17s.; Wall's End East Hartlepool, 18s. 6*d.*—Ships at market, 10; sold, 10; at sea, 35.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s *6d*; ½ cwt., 21s; and 1 cwt., 42s, with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery
All other MANURES and CAKES as per Price List, supplied on the lowest terms
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LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition
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DISSOLVED BONES, for Dressing Pasture Lands
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.
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Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
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"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything to the encomiastics of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates when I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed "AUGUSTUS VOELCKER.
"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.
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200 CUCUMBER and MELON BOXES and LIGHTS, all sizes, Glazed and Painted complete, ready for immediate use, packed and sent to all parts of the Kingdom.

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"Glass in large panes with no lap."

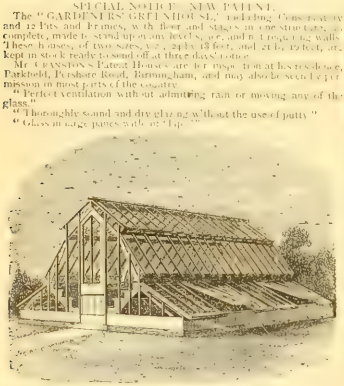

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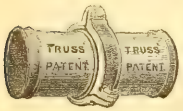

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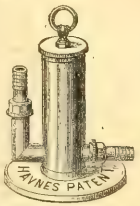

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This simple Machine will draw water from a pond or well to feet below the level of garden, and 100 feet over the surface, with the Hydronette or any other Garden Engine. To be had of HAYNES AND SONS, 227, 229, and 231, Edgware Road, W. CAUTION.—None are genuine unless labelled "HAYNES & SONS, Proprietors, London."

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The HYDRONETTE is more useful, easy-working, reliable, and convenient water throwing machine than any other in use. It is made in five sizes, viz.:—No. 1, with 4 feet of Suction Hose, Strainer, Jet and Rose, 12s. 6d.; No. 2, 15s. 6d.; No. 3, £1 1s.; No. 4, £1 5s.; No. 5, £1 10s. Extra Hose and Union Joints to order. To be had of

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PORTABLE ENGINES, from 4 to 30-Horse Power.

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With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

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These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use. CLAYTONS are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

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JONES'S PATENT DOUBLE L SADDLE BOILER.

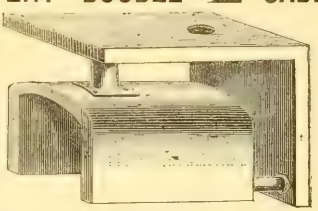

These Boilers possess all the advantages of the old Saddle Boiler, with the following improvements, viz.:—The water-space at back and over top of Saddle increases the heating surface to such an extent that a Patent Double L Saddle Boiler will do about twice the amount of work with the same quantity of fuel; the cost of setting is also considerably reduced, and likewise the space occupied; at the same time these Boilers are simple in construction, and being made of wrought-iron are not liable to crack.

They are made of the following Sizes:—

SIZES.			TO HEAT (of 4-inch Pipe).	PRICES.		
High	Wide	Long	Feet.	£	s.	d.
20 inches	18 inches	18 inches	300	5	0	0
20 ,,	18 ,,	24 ,,	450	6	0	0
20 ,,	18 ,,	30 ,,	600	7	0	0
24 ,,	24 ,,	24 ,,	700	8	0	0
24 ,,	24 ,,	30 ,,	850	10	0	0
24 ,,	24 ,,	36 ,,	1,000	12	0	0
24 ,,	24 ,,	48 ,,	1,400	15	0	0
28 ,,	28 ,,	60 ,,	1,800	20	0	0
30 ,,	30 ,,	72 ,,	2,600	30	0	0
30 ,,	36 ,,	96 ,,	4,500	50	0	0
48 ,,	48 ,,	108 ,,	7,000	75	0	0
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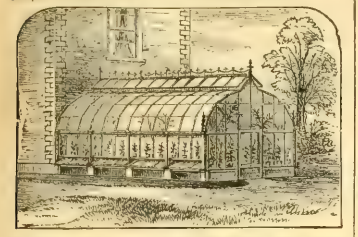

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GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.

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THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT FLOWER PACKING CASE, and MEMBERS of PARLIAMENT, FAMILIES, and TOURISTS' SEA-SIDE COMPANION.

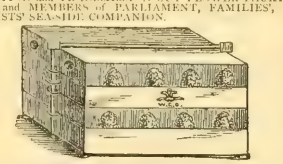

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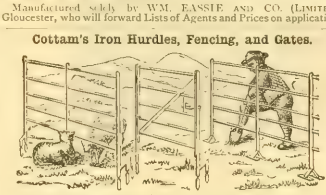

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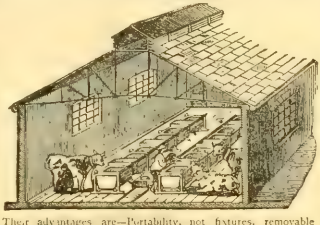

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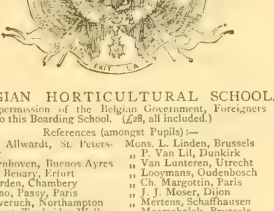

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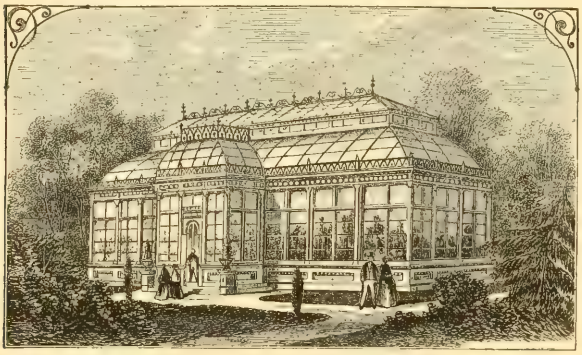

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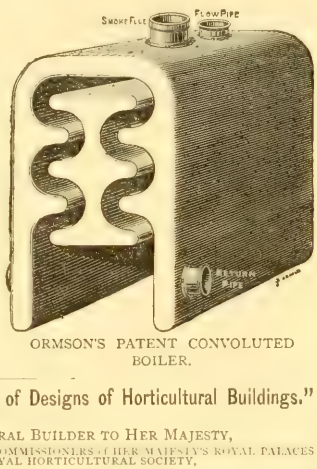

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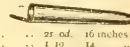

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AND
AGRICULTURAL GAZETTE.

No. 40.—1870. SATURDAY, OCTOBER 1. { Registered at the General Post Office as a Newspaper. } Price Fivepence.

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SUTTONS' RAPID-GROWING GRASSES and CLOVERS, from 1 to 2 bushels per acre, harrowed in and rolled afterwards, will produce an abundant supply of feed in April and May.
Price 15s. per bushel, carriage free
SUTTON AND SONS, Seedsmen to the Queen, Reading.

CUCUMBER and STRAWBERRY PLANTS, of whole sale and retail, of all the leading kinds
G. WALKLING, Nurseryman, High Road and College Park, Lewisham, S.E.

DICKSONS' IMPROVED MUSHROOM SPAWN. —New Spawn, of finest quality, now ready. CIRCULAR, with price and testimonials, on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5s. per 1000; also Drumhead or Cattle Cabbage Plants at 3s. 6d. per 1000, can now be supplied by
WYRLEY AND SON, Wombrish Nursery, near Tunbridge.

Cabbage Seeds.

H. AND F. SHARPE will be glad to quote special prices to the Trade of 40 of the best sorts of Cabbage Seeds grown last season from the finest selected stocks. Prices very moderate
Seed-growing Establishment, Wisbech.

New White Mustard Seed.

H. AND F. SHARPE have fine samples of the above, which they can offer to the Trade at low figures. Samples and prices on application.
Seed Growing Establishment, Wisbech.

NEW WINTER TARES. Fine samples at low prices, which may be had on application to
FREDK. GEE, Seed Merchant and Grower, Biggleswade, Beds.

For	TRADE PEDIGREE MARK.	Seed.

GOLDEN DROP RED WHEAT. Apply to CUTBUSH & HATFIELD, Brighton.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouses, 237 & 238, High Holborn, London.

Adiantum Farleyense.

R. T. VEITCH, The Nurseries, Exeter, having some of the finest, if not the best plants in cultivation, is now prepared to offer fine and strong healthy plants at 5s. 6d. per dozen.

Fruit Trees, Roses, &c.

B. S. WILLIAMS can supply all the best kinds, true to name and in good condition; fine fruit-bearing Trees, on French Paradise Stock, trained as cordons, POTATOES and ORNAMENTAL TREES of every description. Priced LIST on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots. Descriptive Priced LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

ORCHARD HOUSE TREES.—Just published, a CATALOGUE, with prices, free per post
THOS. RIVERS AND SON, Nurseries, Sawbridgeworth

VINES, VINES, now ready for planting out. Descriptive Priced CATALOGUES post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

Vines.

B. S. WILLIAMS has this season a splendid STOCK of all the best and newest kinds. Priced LIST on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

Vines, Vines.

T. THORNTON has much pleasure in offering all of the leading varieties of well-grown VINES, from eyes, grown and ripened without fire-heat.
Heatherside Nurseries, Bagshot, Surrey.

VINES, from Eyes, Fruiting next season, 7s. 6d. each; strong planting, 5s.; ditto, 3s. 6d., of the following varieties:—Black Hamburgh, Buckland Sweetwater, Lady Downe's, and White Lady Downe's, Black Alicante, West's St. Peters, Mrs. Pince, Golden Champion, and Muscat of Alexandria.
J. PEED, Fox Nursery, Brixton, London.

Madresfield Court Black Muscat Vine.—£5 Prize.

MESSRS. JAMES CYPHER have determined that they have offered a PRIZE of FIVE POUNDS for the best THREE BUNCHES of the above GRAPE, to be awarded (if deserving) by the Fruit Committee of the Royal Horticultural Society, on November 2 next.
Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

Vines and Strawberries.

FRANCIS R. KINGHORN begs to offer very superior VINES, grown from Eyes, without bottom heat, comprising all the leading sorts. Fine strong canes, 5s. 6d. to 10s. 6d. each
STRAWBERRIES, strong, well rooted plants, of all the best kinds, in 60-sized pots, or bedded, 3s. 6d. to 10s. 6d. per 100.
Sheen Nursery, Richmond, Surrey.

Fruit Trees.

PURCHASERS of FRUIT TREES are respectfully invited to inspect the Stock in the Waltham Cross Nurseries, adjoining Waltham Station, Great Eastern Railway, which the Proprietor believes to be unequalled in quality. Prices moderate. CATALOGUE free by post.
WILLIAM PAUL, Paul's Nurseries, Waltham Cross, London, N.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that the above Apple will be SENT OUT in NOVEMBER next, in the same rotation as the orders are received. An illustration of it, and a description by Dr Hogg, is given in the "Florist and Pomologist" for March, 1870, in which he says that it is "destined and worthy to take its place among the worthiest of its kind."
DWARF MAIDEN TREES, 7s. 6d. each; DWARF TRAINED, 10s. 6d. A remittance or reference from unknown correspondence.
Nurseries: Shipston-on-Stour, 20th September, 1870.

The Nurseries, Ghent, Belgium.—Autumn, 1870.

JEAN VERSCHAFFELT begs to intimate that he does not intend to issue a new Catalogue this season; and would therefore refer to his last Catalogues (No. 14, 1869–1870) for all goods described in that list. Prices for New Plants shall be reduced upon possible; all the novelties of the season may be had at the same prices as those of other respectable Firms.

JEAN VERSCHAFFELT begs to offer the following new and interesting plants in the most splendid specimens:—

AZALEA LINEARIFOLIA (Hooker), from Japan; figured and fully described in the *Botanical Magazine*, for May, 1860, Vol. XX., No. 2913, plate, 6s. 5,000 now offered for the first time at 15s. each, or more plants, 21s. each.

ILEX LAWSONIANA, fol. var., 3s. each.

" CRENATA, fol. var., 2s. 6d. each.

" SERRATA, fol. var., 2s. 6d. each.

EUPHORBIA MONTEIRI, 10s. each.

NIDULARIUM MEYINDORFII, one of the finest Bromeliaceous plants, 6s. each.

ECHEVERIA AGAVEOIDES, good fine plants, now reduced to 10s. each; 50s. per dozen.

ALTERNANTHERA AMABILIS LATIFOLIA, the finest of the tribe, 2s. each.

TILLANDSIA ARGENTEA, young plants, 21s. each.

FICUS BONNELIANA, (another subtropical gardenia), 10s. each.

ARALIA PENTAPHYLLA, fol. var., 15s.

YUCCA SPECIOSA CALIFORNIA (hardy), 8s.

LONGIA CYCADIFOLIA, fine young imported stems, thoroughly established, 15 to 20 inches high, very strong, 40s. to 60s. each

LOMARIA GIBBA CRISPA, good plants, 15s.

BALANTIUM SELLOWIANUM, New, imported stems of this very rare species; fine strong stems, 4 to 8 inches high, 40s. each

12 CATTLEYA MOSSIÆ; last spring imported plants, thoroughly established, £4 10s.; 25 do., £8; 100 do., £20

12 SELAGINELLA DENTICULATA, fol. var., 4s.

12 " MARTENSII, fol. var., 8s.

100 LATANIA BORBONICA, 30s.; single pots, 2-yr. seedlings, two to three leaves, 40s.; 500 do., £8

12 CHAMÆROPS ARBOREA, 24s.

CHAMÆROPS EXCELSA, 1-yr. seedlings, in store pots, containing 80 to 100 plants per pot, 20s.

12 COCOS MAXIMILIANA; about 12 ins. high; three eaves, 30s.

PILOGYNE'S SELLOWIANA, three years imported plants, perfectly established, from 10s. to 15s. each

12 SANCHEZIA NOBILIS VARIEGATA, 10s.

" ADHELANDRA ROEZLIANA, 25 each

12 INDIVISUS UTILIS, 15 inches high, 20s.

100 PANDANUS UTILIS, in store pots, 30s.

" DRACÆNA INDIVISA (Cordyline superbiens), Veitchi.—A good stock of extra fine strong plants of this very elegant ornamental species, with numerous leaves, now at hand: 12 fine strong plants, 30 inches high, 50s.; 12 ditto, 30 to 40 inches high, 80s.; 100 per 1000 in proportion.

12 DRACÆNA LINEATA, 20s.

12 AGAVE ELIBERA, 30s.

12 " VILMORINIANA, 30s.

12 AGAVES, various kinds, 30s.

12 FICUS ELASTICA, fine plants, 18 to 20 inches high, 24s.; 100 do., £8.

12 JASMINUM GRANDIFLORUM, flowering throughout the winter months, 24s.

12 TREE CARNATION ATIM; flowering all through the winter, strong plants, 30s.

100 AZALEA INDICA; best leading sorts, for winter flowering, fine plants, 15s., 20s., and 25s.

100 AZALEA INDICA, SOUVENIR DE PRINCE ALBERT, £6.

100 CAMELLIAS, without buds, bushy, £5.

100 LILIUM LANCIFOLIUM ALBUM; very large roots, £1.

100 " " RUBRUM; ditto, ditto, £1.

100 " " PUNCTATUM; very rare; ditto large, £6 10s.

100 RHODODENDRONS, hardy hybrid varieties, named; and

25 at 50s., 25 at 80s., 25 at £5, 25 at £8.

All orders to be sent direct to JEAN VERSCHAFFELT, Nursery, man, 131, Faubourg St. Pierre, Ghent, Belgium.

Agents in London: Messrs. ROBERT AND BERRADD AND SON, 5, Harp Lane, Great Tower street, London, E.C.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, begs to offer the following articles. As will be observed, the prices are extremely moderate.

DRACÆNA VEITCHII, strong plants, 36s. per dozen.

" INDIVISA, ditto, 30s. per dozen.

" AUSTRALIS, fine young plants, 30s. per dozen

" DRACO, 18s. per dozen.

" COOPERII, STRICTA, TERMINALIS, 24s. per doz.

" ROBUSTA, 9s. per dozen.

PINCENECTITIA GLAUCA, 18s. per dozen.

" TUBERCULATA, 18s. per dozen.

AGAVE AMERICANA, STRIATA, 6s. per dozen.

DASYLIRION ACROSTRICHE, 18s. per dozen.

" other sorts, strong plants, 60s. per dozen

ECHEVERIA, of sorts, 6s. per dozen.

ALOCASIA JENNINGSII, 24s. per dozen.

ANTHURIUM SCHERZERIANUM, nice plants, 60s. per dozen.

BEGONIAS, in varieties, 6s. per dozen.

CALADIUMS, 12 new varieties, 18s.

CROTONS, in fine varieties, 18s. per dozen.

GLORIOSA PLANTAGINEA, 9s. per dozen.

HIBISCUS COOPERII, 9s. per dozen.

MARANTAS, in six varieties, 18s. per dozen.

PANDANUS UTILIS, 12s. to 18s. per dozen.

PASSIFLORA, in six sorts, 24s. per dozen.

RAVENALA MADAGASCARIENSIS, 30s. per dozen

STRELITZIA REGINÆ, 60s. per dozen

ACHIMENES, 24 sorts, 4s.

GLOXINIA, in fine mixed varieties, 25s. per 100.

" named, 50s. per 100.

TYDÆA, 12 new varieties, 9s.

TROPICAL ORCHIDS, 24 different sorts, 60s:

FERNS.

DAREA DIVERSIFOLIA, fine plants, 40s. per 100.

LOMARIA GIBBA, 30s. per 100.

BLECHUM BRASILIENSE, 6s. per dozen

GYMNOGRAMMA PEKUVIANA ARGYROPHYLLA, 6s. p. doz.

LYGODIUM SCANDENS, strong plants, 18s. per dozen

ADIANTUM CAPILLUS VENERIS, 25s. per 100.

SELAGINELLA, of sorts, 9s. per dozen.

ASPLENIUM BELLANGERII, 9s. per dozen.

" RUTIFERUM, 15s. per 100.

" VIVIPARUM, 9s. per dozen.

CYRTOMIUM FALCATUM, 12s. per dozen.

" CAUDATUM, 18s. per dozen.

DICTYOGLOSSUM CRINITUM, 12s. per dozen.

GYMNOGRAMMA WETTENHALLIANA, 9s. per dozen.

PALMS.

LATANIA BORBONICA, 30s. per 100; nice plants, 24s. per dozen

CHAMÆROPS FORTUNEI, 60s. per 100.

" HUMILIS, 12s. to 24s. per dozen.

CORYPHA AUSTRALIS, 12s. to 24s. per dozen.

SABAL ADANSONII, 18s. per dozen.

ARECA RUBRA, 18s. per dozen

INDIAN AZALEAS, in three sorts, 7s., 12s., 15s., 18s. per doz.

CAMELLIAS, with and without buds, 4s. to 15s. per doz. with flower buds, 1s. to 3s. per 100

THEA BOHEA, fine Plants for potting, 12s. per dozen

SOLANUM CAPSICASTRUM FOLIIS VARIEGATIS, on stems, 12s. per dozen

LIBONIA FLORIBUNDA, 6s. per dozen.

EUGENIA PANICULATA, 9s. per dozen.

ILLICIUM RELIGIOSUM, 12s. per dozen.

MAGNOLIA GRANDIFLORA, 9s. to 18s. per dozen

Hardy RHODODENDRONS, choice named varts., 4s. to £10 per 100.

Hardy GHENT AZALEAS, with flower buds, fine named varieties, 15s. per 100.

TREE PEONIES, in 24 choice varieties, 24s. per dozen.

Choice and named Herbaceous PEONIES, 42s. per 100.

12 fine varieties of PHLOX, 6s.

LILIUM LANCIFOLIUM SPECIOSUM, 42s. per 100.

" AURATUM, 30s. per dozen

AMPELOPSIS VEITCHII, 6s. per dozen.

AUCUBA, of sorts, 18s. per dozen.

CLEMATIS, of sorts, 18s. per dozen.

GYNERIUM ARGENTEUM, strong, 4s. per dozen.

ILEX, of sorts, 12s. to 18s. per dozen.

Agents, Messrs. R. SILBERRAD, 5, Harp Lane, Tower Street, London, E.C.

Spring Flowering Bulbs.

BUTLER, MCCULLOCH, AND CO.'S COLLECTION of CHOICE ROOTS for Greenhouse or Flower Garden Decoration, sent carriage paid. No charge for packages.

FOR CONSERVATORY.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
105s.	50s.	25s.	21s.	15s.	10s. 6d.

FOR FLOWER GARDEN.

No. 7	No. 8	No. 9.	No. 10	No. 11.	No. 12
100s.	60s.	40s.	25s.	21s.	10s. 6d.

FOR GREENHOUSE and FLOWER GARDEN.

No. 13	No. 14	No. 15	No. 16	No. 17	No. 18
105s.	52s. 6d.	42s.	21s.	15s.	10s. 6d.

CATALOGUE, containing details, post free.

5 per cent. allowed for cash

BUTLER, MCCULLOCH, AND CO., 27, South Row, Covent Garden, London, W.C. Established upwards of a century

Dutch Flower Roots.

DOWNIE, LAIRD, AND LAING, have now received their second importation of FLOWER ROOTS, consisting of—

HYACINTHS,	IONQUILS,
POLYANTHUS NARCISSUS,	RANUNCULUS,
DOUBLE NARCISSUS,	ANEMONES,
CROCUS,	SNOWDROPS,
TULIPS,	&c., &c.,

which have all been carefully selected from the most celebrated Establishments in Holland.

The Bulbs have arrived in splendid condition, being unusually well ripened, very large, and exceedingly heavy.

D., L. & Co. can supply fine Bulbs of the PRIZE HYACINTHS at Kensington, Regent's Park, Crystal Palace, and Royal Caledonian Society's Shows, at 12s., 15s., and 18s. per dozen.

Descriptive CATALOGUES of DUTCH BULBS forwarded post free.

Stanstead Park Nurseries, Forest Hill, S.E.; and Edinburgh, N.B.

Dutch Flowering Bulbs and Autumn Seeds.

WILLIAM SKIRVING announces the arrival of his Annual Stock of DUTCH FLOWERING BULBS, comprising Hyacinths, Tulips, Crocus, Anemones, Ranunculus, Narcissus, &c., all carefully selected, CATALOGUES of which can be had free on application.

AGRICULTURAL SEEDS for PRESENT SOWING.

Best sorts of WHEAT, grown on his own Farms; WINTER VETCHES, RYE, and a general assortment of GRASS SEEDS for Laying Down Permanent Pasture, or for One or Two Years' Mowing for Green Food.

Early orders are respectfully solicited, and can be executed either at the Seed Warehouse, Queen Square; or at his Nursery and Seed Establishment, Waverley Mills.

Queen Square, Lane-passage, 1870.

DUTCH BULBS, of all sorts; HARDY PERENNIALS, HARDY and INDIAN AZALEAS, the extraordinary JAPAN AZALEA (Azalea mollis, in splendid varieties), flowers very large, as those of Rhododendrons; CAMELLIAS, RHODODENDRONS, &c.

Volumes are ready, containing more than 1900 highly Coloured Plates of the most approved Ornamental Plants. Price of the whole Set, £25 7s. Long terms by mutual agreement.

LOUIS VAN HOUTTE, Royal Nursery, Ghent, Belgium.

N.B. Several varieties of the Azalea mollis will shortly appear in the triple first Number of FLORE DES SERRES (four triple Nos. for 30s.), containing more than 100 highly Coloured Plates.

The FLORE DES SERRES ET DES JARDINS DE L'EUROPE is the Belgian Periodical, the property of the Advertiser. Eighteen Volumes are ready, containing more than 1900 highly Coloured Plates of the most approved Ornamental Plants. Price of the whole Set, £25 7s. Long terms by mutual agreement.

LOUIS VAN HOUTTE, Royal Nursery, Ghent, Belgium.

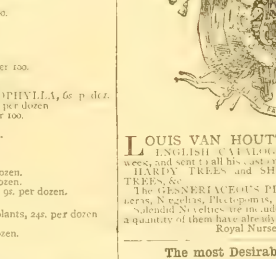

LOUIS VAN HOUTTE begs to announce that his ENGLISH CATALOGUE, No. 1870, will be ready next week, and sent to all his customers.

HARDY TREES and SHRUBS, ROSES (first-rate), FRUIT TREES, &c.

The GESNERIACEOUS PLANTS—Achimenes, Gloxinias, Gesneras, Tydæas, Phlox-drummondi, Fuchsias, Begonias, Hybrids, &c.

Splendid New Orchids are included in this CATALOGUE, No. 1870; a quantity of them have already appeared in the FLORE.

Royal Nursery, Ghent, Belgium.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogized, and sent out to the Public as something very superior, when they are no better than existing varieties: but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been the first favourite of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870

The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870

The Brighton Horticultural Show, First-class Certificate, June 28, 1870

The above will be sent out in October, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hounslow Gate Nurseries, Keymer, Hurstpierpoint; price 2s. 6d. per packet

The Agents for the above will be advertised shortly.

LUCOMBE, PINCE, AND CO., Exeter Nursery, Exeter.

All kinds of ORNAMENTAL and USEFUL PLANTS.

FOREST TREES of every description.

Fine specimen plants of CONIFERÆ, all the choice kinds.

VINES, in pots.—Large stock of well ripened Canes of all leading varieties.

ROSES, in pots.—All the new sorts just out, and a careful selection from those of former years.

PEACHES, in pots; NECTARINES, APRICOTS, FIGS, and other FRUITS, selected for the Orchard-house.

STRAWBERRIES.—All the best sorts.

Priced LISTS on application.

VARIEGATED and other GERANIUMS.

TRICOLOR GERANIUMS, 3s. to 6s. per dozen.

GOLD and BRONZE, 2s. to 4s. per dozen.

DOUBLES, 2s. 6d. to 9s. per dozen

ZONAL and NOSEGAY, 2s. to 4s. per dozen.

NEW ZONALS of 1870, 12s. per dozen.

All strong plants, in 3-inch pots, package free.

A Priced LIST of the new and leading sorts of the present season post free on application.

WM. POTTEN, Florist, Sissinghurst, Staplehurst, Kent

VARIEGATED PELARGONIUMS.

Sir Robert Napier	Mabel Morris	Dragon
Sunbeam	Mrs. John Clutton	St. John's Wood Star
Florence	Italian Beauty	Prima Donna
Mrs. Pix	Prince Silverwings	Yellow Christine

The 12, in strong plants, for 21s., package included. Remittances requested from unknown Correspondents

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

New Golden Bicolors.

H. CANNELL can now offer the following at a great reduction, in fine strong established Plants, viz.:—

	Each.— s. d.	Per doz. s. d.
SOUTHERN BELLE	0 6	7 6
MISS PRICE	0 6	7 6
PRIMA DONNA	0 9	7 6
BLACK KNIGHT	0 9	7 6
CLEOPATRA (Carter's)	0 9	7 6
MRS. ALAN LOUNDES	0 6	7 6
CRITERION	0 6	7 6
NONPAREIL BEAUTY	0 9	7 6
GOLDEN RULE	0 9	7 6
PRINCESS LOUISE VICTORIA	0 6	5 0
FAIRY POLLY	0 6	5 0
SILVER PHEASANT	0 6	5 0
BEAUTY of the PARKS	0 6	5 0
CRIMSON CROWNED CANARY	0 6	5 0
GOLDEN MODEL	0 6	5 0
BRONZE PERFECTION	0 6	5 0
GOLDEN ECLIPSE	0 6	5 0
GOLDEN MODEL	0 6	5 0
SAFRANO	0 6	5 0
CLEOPATRA (Smith's)	0 6	5 0
COMPACTA	0 6	5 0
BEAUTY of CLAPHAM	1 0	10 0
MRS. POOL	0 0	7
YELLOW BOY, the best plain yellow-leaf variety	1 0	

H. C. can supply all the best Older Varieties equally cheap.

The usual allowance to the Trade.

New Zonals, 1870.

H. CANNELL begs to announce to all who wish to improve their collection of the above that he can now supply the following. The first five varieties are H. C.'s own sending out, and are far in advance of all existing kinds.

The three first are correctly and beautifully illustrated by Andrews, sent free for 1s. 6d. each.

BEAUTY of LEE, the brightest best pink, in the way of Maid of Kent, 2s. each; 18s. per dozen.

KING of the ROSES, the best and largest blooms, in the way of Criterion, a grand kind for pots, 2s. each; 18s. per dozen.

MRS. KELLER, a striking advance on Mrs. Paul, &c., 2s. each; 18s. per dozen.

GEANT DES BATAILLES, certainly a dwarf and most abundant bloomer, in the way of Bayard, Vesta, &c., 2s. each; 18s. per doz.

MELTON GEM, decidedly an improvement on Lucius, 2s. each; 18s. per dozen.

JEAN SISLEY, certainly the best and brightest scarlet ever sent out, 2s. 6d. each; 25s. per dozen.

VICTOR LE LYON, nearly pure purple, the most distinct coloured Double Geranium since Madame Lemoine, 3s. 6d. each; 40s. per dozen.

CRIMSON BANNER (Hibberd's), yellow foliage with pure magenta flower, 1s. 6d. each; 15s. per dozen.

WHITE WONDER (Hibberd's), white-flowered variety, 1s. 6d. each; 15s. per dozen.

THE BRIDE (Turner's), certainly the best shaped bloom in all the whites, 2s. each; 20s. per dozen.

COLESHILL.—This is a splendid improvement on the good old Lord of the Isles. 2s. each; 20s. per dozen.

ADVANCER, self-coloured bright pink, fine improvement on the old Christine, 1s. each; 8s. per dozen.

The first and three last have received First-class Certificates from the Royal Horticultural Society. The set for £1.

H. CANNELL has now a fine lot of PRIMULA SINENSIS at 3s. 4d. per dozen; CINERARIAS, 2s. 6d. per dozen; and HYACINTHS, 6s. per dozen, in small pots, just in for shifting into large pots. The two first-mentioned are warranted to be first-class in quality of flowers. Seedlings picked out of the same at half the above price.

H. CANNELL, F.R.H.S., New Florist Flower and Florist Flower Seed Merchant, Woolwich.

ADOLPH STELZNER, NURSERYMAN, Ghent, Belgium, begs to offer the following plants at extra cheap prices:—

ARALIA SIEBOLDI, extra extra fine plants, 18s. and 30s. per dozen.

" " ARGENTEA, extra fine plants, 30s. per doz.

" " AUREA, extra fine plants, 30s. per dozen.

ABIÈS SITCHENSIS (new), fine 3-yr. seedlings, 20s. per dozen.

ANTHURIUM SCHERZERIANUM, according to size, 20s., 40s. and 60s. per dozen.

DRACÆNA INDIVISA, var., extra fine plants, 15s. per dozen, £5 per 100

" REGINÆ, extra fine plants, £3 and £8 per dozen

" TERMINALIS, COOPERII, NIGRICANS, STRICTA, &c., 6s. per dozen.

AZALEA INDICA, fine sorts, fine plants, with flower buds, £3 and £4 per 100

CAMELLIAS, fine sorts, 1 to 1½ foot high, with flower buds, £6 p. 100

" fine sorts, 2½ to 3 feet high, with flower buds, £3 and £8 per doz.

CORYPHA AUSTRALIS, fine 1 and 2-yr. seedlings, £2 and £4 p. 100.

" fine, 1 foot high, 30s. per dozen.

CHAMÆROPS EXCELSA, fine 2-yr. seedlings, £4 per 100.

LATANIA BORBONICA, fine 2 and 3-yr. seedlings, £1 and £2 p. 100.

PANDANUS UTILIS, extra fine plants, 1 foot high, £1 per 100.

SPIRÆA JAPONICA, for forcing, 30s. per 100.

The following FERNS, 5s. per dozen, or £2 per 100:—Adiantum concinnum latum, A. cuneatum (extra strong), A. decorum, A. affine, A. Capillus Veneris, Davallia pentaphylla, Lastrea Filix mas, Lastrea cristata, G. Laucheana, G. Laucheana gigantea, G. Parsoni, G. Wettenhalliana, Doodyea pinnata, Aspohla australis, Pteris serrulata cristata, Doodyea pinnata, Aspidium falcatum, Selaginella involvens, Nephrodium ramosissimum, Lastrea dilatata ramosa, L. erythrosora, Osmunda cinnamomea, Blechnum latifolium, Acantum macrophyllum

The following FERNS, 4s. per dozen, or 30s. per 100:—Pteris cretica fol. var., Pteris nemoralis fol. var., Pteris polydactylon (very plants, with fine character), Nothochlæna chrysophilla, Osmundæ regalis cristata, Cystopteris fragilis bulbifera, Cyrtomium falcatum, C. Fortunei, Adiantum Fritellii, Lastrea F.-m. cristata, Lastrea F.-m. furcans, Polystichum cristatum, P. grandidens, Lastrea opaca, &c.

ASPIDIUM FRAGRANS, the true sweet-smelling hardy Fern, very scarce, nice 2-yr. seedlings, £2 per dozen.

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CIBOTIUM PRINCEPS, extra extra strong plants, 3 feet and upwards through, 30s. per dozen

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References required from unknown correspondents.

B. S. WILLIAMS'
NEW and CHOICE FLOWER SEEDS,
Post Free

	Per packet.—s. d
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and	5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggens' Prize strain .. 1s. 6d., 2s. 6d., and	3 6
ECHEVERIA METALLICA, new bedding plant	2 6
Williams' New Hybrid SOLANUMS .. .. .. 2s. 6d. and	3 6
PYRETHRUM (Golden Feather) .. .. .. 1s. and	2 6
PANSY, from Prize Flowers .. .. 1s. and	2 6
PANSY, finest Belgian varieties .. .. 1s. and	2 6
PANSY, Cliveden Blue, Purple and Yellow .. .. .. each	1 0
EAST LOTHIAN STOCKS, per collection of three colours ..	2 6
POLYANTHUS, Wiggins' Prize Strain .. .. 1s. and	1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA .. .. 1s. 6d. and	2 6
" " var PERFECTION 1s. 6d., 2s. 6d., and	3 6
WALLFLOWER, Saunders' fine dark variety	1 0

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Winter Flowering Plants.

FREDERICK PERKINS has a fine healthy Stock of the undermentioned Plants, especially prepared for winter decorations, which he begs to offer at the undermentioned prices —
AZALEAS, all the best varieties, with buds, 18s. to 30s. per dozen
HOLYHOCKS, in 48 pots, full of buds, 18s. to 30s. per dozen
CAMELLIAS, best varieties, with 10 to 20 buds, 60s. per dozen
CYCLAMEN PERSICUM, mixed varieties, flowering bulbs, 6s. to 12s. per dozen
CARNATION, TREE, with buds, 24s. per dozen.
DRACAENA TERMINALIS, STRICTA, and COOPERII, from 30s. per dozen
DEUTZIA GRACILLIS, 12s. per dozen
ERICAS, in six winter-flowering varieties, 18s. to 24s. per dozen.
EPACRIS, best varieties, 18s. to 24s. per dozen
EUCHARIS AMAZONICA, 3s. 6d. each; 30s. per dozen.
ECHEVERIA AGAVEOIDES, very scarce, 21s. each.
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FERNS, good mixed Stove and Greenhouse varieties, 12s. to 18s. per dozen
GENISTA CANARIENSIS, 12s. per dozen.
GERANIUMS, Double, in 72 varieties, 18s. per dozen.
LASIANDRA MACRANTHA, very large purple flowers, 2s. 6d. each.
LILY OF THE VALLEY, imported clumps, 18s. per dozen.
POINSETTIA PULCHERIMA, 24s. per dozen.
" ALBA, 2s. 6d. each.
PICOTÉE PRINCE OF ORANGE, beautiful yellow, lake edge, flowering plants, 5s. to 10s. 6d. each.
PRIMULA SINENSIS FIMBRIATA, in 9 varieties, 9s. per dozen.
" " FLORE PLENO ALBA, 15s. per dozen
" " " RUBRA, 18s. per dozen
" " " DELICATA, 30s. per dozen
PRUNUS SINENSIS FLORE-PLENO, one of the best forcing plants, 18s. per dozen
ROGIERA GRATISSIMA, 24s. per dozen
ROSES, best varieties of Hybrid Perpetuals, 15s. per dozen
" MARECHAL NIEL, 18s. per dozen.
SPIRÆA JAPONICA, imported clumps, 18s. per dozen.
" PALMATA, flowering crown, beautiful magenta, 3s. 6d. each
The above are all well grown plants, mostly in 48 sized pots, and have been especially grown for winter flowering. Single plants, or any quantity, may be had of each variety, at the above prices, to suit Amateurs and small Growers.
F. P.'s Priced CATALOGUE of Hyacinths, Crocus, Tulips, and other Dutch Roots, Spring Bedding Plants, and Winter-Flowering Plants, is now ready, and may be had free on application. The usual Trade discount.
FRED. PERKINS, Seed Warehouse, 51, Regent Street, Leamington.

Succulents—Surplus Stock.

THOMAS S. WARE begs to offer as follows. Prices, low, on application to him

Echeveria atropurpurea	Cacalia repens.
" lactellina, spec. unicum	" Scaposa cum barbatum
" gemelliflora	" bracteosum.
" pumila or gracilis	" Haworthii.
" Secunda.	" repens
" " var. minima (a fine form, larger than the above)	Sedum tortuosum.
	" azoreum fol. var.

T. S. W. has also a fine Collection of BOTYLEDONS, CRASSULAS, ECHEVERIAS, SEMPERVIVUMS, CACALIAS, PACHYPHYTUMS, SEDUMS, ALOES, AGAVES, HAWORTHII, &c.
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RAYNBIRD, CALDECOTT, BAWTREE, & HOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
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Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

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These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain
CATALOGUES free and all particulars on application
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

To Nurserymen and Others.

ST. MARY'S BURIAL BOARD, DOVER, invite TENDERS for the Supply of HARDY TREES, SHRUBS, &c., of the best kinds for planting at their new Burial Ground at Dover, where they are to be delivered, at the Contractor's cost, during the months of October and November next, at such times and in the quantities directed by the Board. About 1350 Trees and Shrubs will be required, to include Sycamore, Elm, Lime, Evergreen, Alder, Ash, Oak, Laburnums, Pines, Firs, Larch, Lilacs, small Shrubs, and ornamental Evergreens of various kinds; besides about 2200 Privets, and 5000 Quicksets.
The Board reserve the right of rejecting any plants they may consider of inferior quality, and are not bound to accept the lowest Tender. Tenders to state the size and age of the plants, and prices per dozen or per 100 of each kind separately; and to be delivered on or before October 11 next, at the Office of Mr. G. FIELDING, Snargate Street, Dover, the Clerk to the Board.—Dover, September 27.

HARRY SCOTT, late STEPHEN SCOTT, Wood BROKER to the Crystal Palace Company, Woodside, Croydon, Dealer in all kinds of Garden Materials for garden use, including the following:—SILVER SAND, KENT PEAT, LOAM, GARDEN MOSS, BIRCH and HEATH, BROOMS, WATTLES, HURDLES, GARDEN STICKS, TARRED TWINE, FIREWOOD, &c. RUSTIC LOGS and PEAT, suitable for Ferneries, &c.
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SILVER SAND, in bushel bags.—Price at Mines, 1s. 11d. Also DERBYSHIRE SPARS, for Walks or Rockeries.
J. NUNN, Lloyd Street, Manchester.

HONEY for SALE.—A Gentleman, who has a surplus stock of Bees in Straw Hives, wishes to dispose of the Honey, in Comb, of 12 Hives, which could be delivered in London
The GARDENERS' Twin Arms, Palmer Street, Bath.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 21s.; and 1 cwt., 42s.; with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application
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All other MANURES and CAKES as per Price List, supplied on the lowest terms

Apply for prices, &c., to JOHN BENNET LAWES, 59, Mark Lane, London, E.C., Dublin, Shrewsbury, and Cardiff.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition,—
WHEAT MANURE, strongly recommended for Autumn sowing.
DISSOLVED BONES, for Dressing Pasture Lands
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and Dealer in Waste Articles
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REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure ever produced. Its base is Peruvian Government Guano; it contains 27 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports read Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Hyde, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seal is not broken.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need not add that I shall avoid anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent of moisture, and fully the per centages of valuable constituents which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure becomes known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours truly, (Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Autumn Sowing.

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ODAMS'S DISSOLVED BONES
ODAMS'S SUPER-PHOSPHATE of LIME

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Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
Particulars will be forwarded on application to the Secretary, or may be had of the Local Agents.
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GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1s. per lb., 8s. per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 10s. per gallon
SILVER SAND, of the finest quality, for Horticultural purposes, at 20s. per ton, smaller lots 2s. 6d. per cwt.
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The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
By HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
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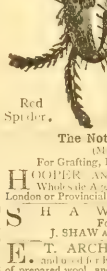
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Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
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The Noted French Cold Grafting Wax
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For Grafting, Budding, Healing, &c., may be obtained of
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For Samples and Prices apply to
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E. T. ARCHER'S "FRIGI DOMO."—Patronised and used by the Prince Consort and Kew Gardens. It is made entirely of prepared wool, and a perfect non-conductor of heat or cold where it is applied.
PROTECTION from the SCORCHING RAYS of the SUN.
WOOL NETTING, 2 yards wide and 30 yd. per yard
"FRIGI DOMO" CANVAS
Two yards wide .. .. 1s. 6d. per yard.
Three yards wide .. .. 2s. 8d. per yard.
Four yards wide .. .. 3s. 6d. per yard.
SCRIM CANVAS, 72 inches wide, 70 yards long, at 1s. 6d. per yard.
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TO THE SEED TRADE.

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Can this year spare to the Trade a few hundred bushels of the following TURNIP SEEDS, all of their own growth. Prices on application.

GREEN-TOP ABERDEEN YELLOW IMPROVED.

A large, handsome, solid bulb—very nutritious, and an excellent keeper; and is, as now improved, decidedly the best Yellow for winter and spring use in cultivation.

DRUMMOND'S IMPROVED EARLY FIELD YELLOW.

This is altogether a most desirable Turnip, having a large, handsome-shaped bulb—a deep yellow with bright green crown, and small tap-root and "shaw." Being very sweet it is greatly relished by cattle, and if stored before severe frost sets in it will keep sound and juicy till spring. From its quickness of growth it is invaluable for late sowing, and unless wanted for early autumn use it should not be sown till towards the end of June, and sowing may be continued up to the middle of July, with the certainty of having a full crop.

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CARTER'S PRIZE "NURSERY" STOCKS.

We can strongly recommend the following stocks of WHEAT, BARLEY, and OATS, as being of very pure quality, and selected from samples that have taken First-class Prizes.
The greatest care has been bestowed upon the crops during growth, by hand-weeding, &c., to ensure the choicest quality; and as we hold but a limited quantity, early orders are necessary to ensure a supply.

WHEAT.		BARLEY.		OATS.	
Sheriff's Bearded White Talavera White Fenton White Chidham White Lammas Red Browick Red Pedigree Red	*Price on application.*	Cartter's Prize Long-eared Carter's Excelsior Brewer's Delight Chevalier	*Price on application*	Waterloo Canadian Tartary Poland Normandy Winter	*Price on application*

We shall be pleased to supply any varieties not named above.

Lowest price per bushel or quarter on application.

Every precaution is taken when threshing to keep the stocks pure, but as the Corn must pass through the machine, we cannot undertake any guarantee as to the samples being unmixed.

JAMES CARTER AND CO., THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

Strawberries.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C., have great pleasure to announce that for a small amount of manure for potting over a hot summer, they are enabled to offer strong, healthy plants of the finest approved kinds, in and out of pots, at reasonable prices. See pages 48 and 49 of their AUTUMN CATALOGUE, which can be had, post free, on application.

VINES.—Strong, well ripened CANES, for fruiting and planting. See AUTUMN CATALOGUE, page 50.

CHRYSANTHEMUM.—Large flowered POMPON and JAPANESE kinds, vigorous plants for Conservatory and Border Decoration, at 6s., 9s., and 12s. per dozen. See AUTUMN CATALOGUE, page 27.

Strawberries.

CHARLES TURNER'S Descriptive LIST can be had on application. The following are particularly recommended:

BONNE BOUCHE	FROGMORE LATE	PRESIDENT
DR. HOGG	PINE	SIR C. NAPIER
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Strong plants from the ground, or in small pots, at an extra charge, to insure a crop of fruit next season.

Royal Nurseries, Slough.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:

LAURUSTINUS, 4 to 6 feet | PHILLYREAS, 6 to 8 feet
VARIEGATED LAUREUS, 5 to 9 ft | COMMON LAUREUS, 4 to 9 ft
Variegated HOLLIES, 4 to 7 ft.
RHODODENDRONS, 3 to 5 feet, thickly set with buds.

The above have recently been transplanted, are very bushy, handsome plants, and quite safe. Price per dozen or hundred on application.

Floral Nursery, Hailsham, Sussex.

Planting Season.

WM. KNIGHT, Floral Nursery, Hailsham, Sussex, begs to call the attention of the Nobility and Gentry and Trade in general to his extensive and well-grown Stocks, consisting of an immense quantity of Standard and Dwarf and Pyramidal Pear and APRICOTS, PEACHES, NECTARINES, CHERRIES, PEARS, PLUMS, and APPLES, also Standard, Dwarf, and Pot ROSES, CONIFERÆ, RHODODENDRONS, EVERGREENS, ORNAMENTAL and FOREST TREES, &c., and respectfully solicits inspection to his Grounds, which are within five minutes' walk of the Hailsham Station, Brighton and South Coast Railway.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at very moderate prices, to make room for the best for building purposes.

Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees and Shrubs cultivated in Britain, many of which are of unique and rare kinds, and of the finest possible specimens for immediate effect.

Intending purchasers will find the Stock of Old Plants in the Grounds (by the new entrance) a rare opportunity, for such investment, and well-grown Stocks of Trees and Shrubs is seldom to be met with.

Seed Warehouse and Seed Stores—Walton-on-the-Hill.

Seed Warehouse, 15, Church-street, Liverpool.

Liverpool, September, 1870.

Violets and other Spring-flowering Plants.

LEWIS WOODTHORPE offers the following, now being the best time to plant, to insure a good show in the spring:

VIOLA ODORATA PENDULA, the new Weeping Violet of New York.—The largest Violet in cultivation, flowers of enormous size, very double, beautiful shade of blue, with large white centre, very sweetly scented, and free flowering, 1s. 6d. each; 12s. per doz.

VIOLETS.—The King, the Queen, the Double Red, Double White, Comptesse de Chambord, 6s. per dozen.

The Double White Tree and Double Blue Tree Violet, 1s. each.

HEPATICAS.—The Double Red and Single Blue, 3s. per dozen.

AURICULAS, ALPINES.—An exceedingly fine bloom, 3s. and 6s. per dozen.

PRIMULA CORTUSOIDES.—A pretty pink, and free flowering, 4s. per dozen.

DAISY, AUCUBÆFOLIA.—The golden blotched, very pretty, 3s. per dozen.

DAISIES, 36 choice named varieties, per order, 5s.

POLYANTHUS.—The best strain that can be had, 6s. per dozen.

HELIANTHEMUM, the Dwarf Rock Cistus, in 20 fine varieties, 4s. per dozen.

100 choice named HERBACEOUS, ROCK, and ALPINE PLANTS, in 100 sorts, in pots, 20s. per 100.

A CATALOGUE of New and Choice Hardy Spring-flowering Plants, Roses, Fruit Trees, with a general and well-grown Nursery Stock, sent free upon application.

Munro Nursery, Sible Hedingham, Essex.

Now Ready, Gratis and Post Free,

ILLUSTRATED AUTUMN CATALOGUE

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SEEDS, FRUIT TREES, FERNS,

FERN CASES, and other HORTICULTURAL DECORATIONS,

GARDEN REQUISITES, &c.

TRADE MARK.

DICK RADCLYFFE AND CO., 129, HIGH HOLBORN.

SEED GROUNDS, ERFURT, PRUSSIA.

NEW PLANTS.

E. G. HENDERSON & SON

RESPECTFULLY ANNOUNCE

THE FOLLOWING NEW PLANTS,

Of first class merit and award. To be sent out in the ensuing month of October.

Pleroma macrantha floribunda (true).

E. G. HENDERSON & SON have great pleasure in calling the attention of cultivators and Exhibitors to this exceedingly beautiful species, of which has as a warm greenhouse plant the most low offered us a remarkably free flowering variety, producing its large and magnificent silver-shaded blossoms freely from the terminal and axillary growth of each branch. The flowers are from 4 to 5 inches in diameter, of a compact and circular outline, well expanded, and of a most intensely rich violet-purple colour. A plant grown in the Wellington Nursery, 18 inches high and as much through, produced over 100 flowers and buds. Such is its prolific tendency to bloom, that plants in 60-sized pots readily produce flower-bud, and from those in 48's from 9 to 18 flower-buds are produced in succession. The growth is free, compact, and compact, with rich green ornamental elegantly wrinkled leaves. There being a much inferior and shy-flowering variety of this plant in circulation, E. G. HENDERSON & SON commend the present introduction as a valuable addition to any collection.

For exhibition purposes and conservatory decoration it is by far the finest plant in its group, altogether unequalled in the uniform freeness of its growth, the neatness of its habit, and the ornate character of its bloom. As a summer and autumn flowering species of strictly shrubby growth, it succeeds admirably in a warm greenhouse or Mexican department with the Monochætum and Pleroma elegans, or with similarly allied plants. If otherwise treated as a stove plant, it should be accommodated in the coolest part, and returned to a lower temperature during the warm summer months.

21s. each.

New Spring-flowering Pelargonium, "Prince of Pelargoniums."

This most beautiful variety resembles in its style of flower the well known Dr. Andre by its elegantly fringed margin and equally large flower, but greatly exceeds it in effect in being a brilliant vermilion-scarlet ground colour, finely relieved by a birch white centre with violet veins, and flushed with rich crimson on the upper flower lobes. The truss and individual flowers are alike large and compact, with well rounded petals, and being produced in great profusion upon a remarkably compact yet vigorous and dwarf habit, forms one of the most attractive and beautiful plants for decoration yet offered in its tribe. It is admirably adapted for all general purposes of early spring and summer decoration, in the drawing-room, conservatory, and basket groups. Being one of the most free-flowering varieties in its tribe, it is found invaluable for furnishing a succession of cut bloom from February until Midsummer, during the entire season when first-class table and ball-room bouquets are required, and also for the most select groups in artistic holder or vase. For market purposes it will be one of the finest ever sent out.

7s. 6d. each, 6 plants 30s.

Thymus citriodorus aurea.

A beautiful rich golden-leaved variety of the sweet-scented Thyme, forming a fine relief contrast to the green, prostrate growth of Silene, Saxifraga, and other plants of similar habit, and the only companion plant to Antennaria tomentosa, so extensively and beautifully applied at Battersea Park, for surface or groundwork effect in miniature Swiss scenery. In its remarkably dwarf and compact growth, it is admirably adapted for imparting a diversified and picturesque feature to miniature slopes and broad marginal ground masses of Antennaria, Echeveria, or Sedum, and imparts a brilliant effect when seen in broad features of contrast with the emerald green and silvery hues of surrounding plants.

3s. 6d. each.

THE NEW AUTUMN CATALOGUE,

Including Bulbs and all kinds of Flower Roots, is in circulation, and ready for posting on application.

WELLINGTON NURSERY, ST. JOHN'S WOOD, LONDON, N.W.

NEW DOUBLE GERANIUMS,

CROWN PRINCE AND KING OF THE DOUBLES

(ENGLISH RAISED VARIETIES).

MADAME AND MARIE LEMOINE WILL NOW CEASE TO BE GROWN.

H. CANNELL,

In consequence of so many inquiries, and having a large stock, has determined to let these two Doubles out after October 1, and he is glad to have the honour of drawing the attention of Growers to these fine Geraniums, which are unquestionably the most striking advance and greatest acquisitions since Doubles were introduced.

The following is the report given by the *Gardeners' Chronicle*, of Crown Prince, at the Floral Committee of the Royal Horticultural Society, August 17, 1870:—

"Mr. CANNELL, of Woolwich, exhibited neatly grown plants of Crown Prince, a double flowered free-blooming variety, of great merit. In colour the flowers are of a deeper shade of Peach than in any other variety, and in habit it appears to be very vigorous, without the grossness of the older kinds. A First-class Certificate was awarded."

The "Gardeners' Magazine" reports at the same time thus:—"CROWN PRINCE: A very dwarf free-flowering double Zonal, most distinct in character and colour from all existing varieties. The flowers, which are large, full, and of good form, are of a deep rich rose-carmine colour. First-class Certificate."

Shirley Hibberd, Esq., in the "Gardeners' Magazine" of September 3, speaks of Crown Prince thus:—"The colour is delightful; in my opinion it surpasses in this respect every known variety, single or double. I shall speculate on Crown Prince probably, with a view to dry the flowers for winter bouquets, as well as to enjoy richness of colour all the summer."

Trade prices:—10s. each; Three for 25s.; Six for 40s.; Thirteen for 80s.

KING OF THE DOUBLES.

This is the largest and best shaped pip of all the doubles, including the new ones of the present year. Colour is a beautiful bright cerise, and very free; a noble variety.

5s. each; Three for 13s.; Six for 24s.; and Thirteen for 40s. *Orders executed in rotation as received.*

H. CANNELL, NEW FLORIST FLOWER AND FLORIST FLOWER SEED MERCHANT, WOOLWICH.

"The Royal Seedsmen."

CARTER'S
SEEDS, BULBS, &c., CARRIAGE FREE.

*** *Five per cent. discount allowed for cash payments.*

COLLECTIONS OF BULBS
FOR INDOOR PLANTING.

COLLECTION No. 1, complete, price 84s.
COLLECTION No. 2, reduced quantities, price 63s.
COLLECTION No. 3, reduced quantities, price 42s.
COLLECTION No. 4, price 21s., comprises—

Hyacinths, 12 in 12 extra fine named sorts
Polyanthus Narcissus, 6 in 6 varieties
Jonquils, sweet scented, 12
Crocus, finest named, 50
Hybrid spec Gabilla, 12
Lilium speciosum, 1
Scilla sibirica, 6
Snowdrops, extra large selected, 24
Tulips, Tournesol, 6
" Rex rubrorum, 3
" La Candeur, 3
" Royal Standard, 3
" Yellow Prince, 6
" Rosa Mundi, 3
" Duc Van Thol, 6
Amaryllis formosissimus, 1
Ixias, finest mixed, 6
Spatiphyllum, finest mixed, 6
Triteleia uniflora, 6

COLLECTION No. 5, reduced quantities, price 10s. 6d.
Packing and carriage free.

COLLECTIONS OF BULBS
FOR INDOOR AND OUTDOOR PLANTING.

COLLECTION No. 6, complete, price 84s.
COLLECTION No. 7, reduced quantities, price 63s.
COLLECTION No. 8, reduced quantities, price 42s.
COLLECTION No. 9, price 30s., comprises—

Hyacinths, 12 in 12 extra fine named sorts for pots or glasses
" 12 in 3 colours for bedding
Narcissus, double, white, 12
" Poeticus Pheasant's eye, 12
Tulips, extra fine named, 39
" Tournesol, 6
" Duc Thol, 6
" Royal Standard, 3
" La Candeur, 3
" Yellow Prince, 3
" Rex rubrorum, 3
Double Daffodils, 12
Star of Bethlehem, 12
Scilla Bifolia, mixed, 12
Crocus, blue, 75
" striped, 75
" large yellow, 75
" white, 75
Anemones, extra fine mixed, 36
Gladiolus Brenchleyensis, 8
Iris, extra choice named English, 12
" extra fine mixed Spanish, 12
Jonquils, Campernelle, 12
Ranunculus, extra fine mixed, 36
Snowdrops, 50

COLLECTION No. 10, reduced quantities, price 15s.
Packing and carriage free.

COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING ONLY.

COLLECTION No. 11, complete, price 84s.
COLLECTION No. 12, reduced quantities, price 63s.
COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, price 21s., comprises—

Hyacinths, 12 in 3 colours
Narcissus, double white, 12
" Poeticus Pheasant's eye, 12
Double Daffodils, 12
Tulips, extra fine mixed, double, 12
" extra fine mixed, single, 12
" extra fine mixed, late, 12
" Duc Van Thol, 12
Polyanthus Narcissus, fine mixed, 6
Camperelli Jonquils, 6
Star of Bethlehem, 12
Triteleia uniflora, 6
Dog's-tooth Violets, 6
Crocus, blue, 25
" striped, 25
" large yellow, 50
" white, 25
Gladiolus Brenchleyensis, 6
Iris, extra choice mixed English, 12
" extra fine mixed Spanish, 12
Lilium candidum, 3
" tigrinum, 3
Ranunculus, extra fine mixed, 24
Snowdrops, 50
Winter Aconites, 24

COLLECTION No. 15, reduced quantities, price 10s. 6d.
Packing and carriage free.

JAMES CARTER & CO.'S CATALOGUE
OF HYACINTHS, TULIPS, CROCUS and OTHER BULBS, ROSES, FRUIT TREES, &c.,

Containing full particulars of the above Collections will be forwarded Gratis and Post Free on application.

CARTER'S COLLECTIONS of HYACINTHS.

For the convenience of those Customers who do not wish the trouble of selecting for themselves, is offered the undermentioned Collections of Hyacinths, *the selection of which being left to their judgment and experience*, will be found perfectly adapted for the purposes stated.

A.	12 good varieties	Double Hyacinths, for pots, 7s. 6d.
B	12 "	Single Hyacinths, for pots, 7s. 6d.
C	12 "	Double Hyacinths, for glasses, 8s. 6d.
D.	12 "	Single Hyacinths, for glasses, 8s. 6d.
E.	12 very fine varieties	Double Hyacinths, for pots, 9s. 6d.
F	12 "	Single Hyacinths, for pots, 9s. 6d.
G	12 "	Double Hyacinths, for glasses, 10s. 6d.
H.	12 "	Single Hyacinths, for glasses, 10s. 6d.
I	12 best varieties	Double Hyacinths, for pots, 12s.
K	12 "	Single Hyacinths, for pots, 12s.
L	12 "	Double Hyacinths, for glasses, 12s.
M	12 "	Single Hyacinths, for glasses, 12s.
N	100 Hyacinths, in 100 best varieties,	£6 6s.
O	100 Hyacinths, in 50 best varieties,	£4 4s.
P	50 Hyacinths, in 50 very fine varieties,	£2 10s.
Q	50 Hyacinths, in 25 very fine varieties,	£1 17s. 6d.

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

SUTTONS'
IMPORTED FLOWER ROOTS,
SUTTON & SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS,

HAVING RECEIVED their FIRST CONSIGNMENT of

CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

SUTTONS' SUPERB DUTCH HYACINTHS
For CULTIVATION in POTS or GLASSES.
The best 12 Hyacinths for 12s.

Messrs. SUTTONS' Collection of Hyacinths consists of more than 200 varieties, a Priced and Descriptive LIST of which may be had on application.

Suttons' Collections of Named Hyacinths.

100 HYACINTHS in 100 very choice sorts		£4	4 0
100 "	50 very choice sorts	3	10 0
50 "	50 very choice sorts	2	2 0
50 "	25 very choice sorts	1	15 0
25 "	25 very choice sorts	1	1 0
12 "	12 extra fine sorts	0	12 0
12 "	12 choice sorts	0	9 0
12 "	12 good sorts	0	6 0

The order should specify whether they are intended to be grown in water or earth, as all kinds are not equally suited to both purposes. It should also be stated whether single or double blossomed kinds are preferred; otherwise we usually supply about two-thirds double, and one-third single. The single varieties generally thrive best in water, but their merits are never apparent until the flowers are fully expanded.

SUTTONS' MIXED HYACINTHS, for Beds or Open Borders.—Double, Single, and various colours, 2s. 6d. per dozen, 12s. per 100.

SUTTONS' HYACINTHS, in distinct colours for Massing, Bedding, Ribbon Gardening, &c.—Double and Single, various shades, separate, 4s. per dozen, 30s. per 100.

Suttons' £2 2s. Collection for Open Ground,
Carriage Free, contains

50 fine mixed Border Hyacinths	12 fine mixed Gladiolus
12 " Polyanthus Narcissus	25 Duc Van Thol Tulips
25 Pheasant's eye Narcissus	12 mixed Single Early Tulips
25 Double White Narcissus	12 fine mixed Double Tulips
50 Double Daffodils	12 " Parrot Tulips
12 large Campernelle Jonquils	12 Generianna Lilies
100 fine mixed Double Ranunculus	50 fine mixed Tulips
100 Scarlet Turban Ranunculus	12 " English Iris
25 fine mixed Double Anemones	12 " Spanish Iris
25 " Single Anemones	6 Tubes, of sorts
300 Crocus, in 6 sorts	6 Ferraria Pavonia
100 Snowdrops	12 Double Scarlet Wallflowers
50 Winter Aconites	6 Crown Imperials

Suttons' £1 1s. Collection, for Open Ground,
Carriage Free, contains—

12 fine mixed Border Hyacinths	6 fine mixed Gladiolus
6 " Polyanthus Narcissus	12 Duc Van Thol Tulips
12 Pheasant's eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 " Parrot Tulips
6 large Campernelle Jonquils	6 Generianna Lilies
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 Scarlet Turban Ranunculus	6 " English Iris
12 fine mixed Double Anemones	6 " Spanish Iris
12 " Single Anemones	3 Tubes, of sorts
150 Crocus, 3 sorts	3 Ferraria Pavonia
50 Snowdrops	6 Double Yellow Wallflowers
25 Winter Aconites	3 Crown Imperials

Suttons' £1 10s. Collection of Flower Roots
For OPEN GROUND, contains a choice assortment for a Small Garden.

Suttons' £2 2s. Collection, for Indoor Cultivation, Carriage Free, contains—

24 fine Hyacinths, by name	6 Persian Iris
12 fine Miniature Hyacinths, do	6 Peacock Iris
12 Polyanthus Narcissus, do	100 Crocus, by name
6 large Double Jonquils	12 choice Tulips, by name
12 Single Sweet-scented Jonquils	6 choice Spatiphyllums, by name
12 Scilla peruvica	6 Double Duc Van Thol Tulips
12 Single Duc Van Thol Tulips	1 Tropæolum tricolor
12 Double Tournesol Tulips	2 Lilium lancifolium album
50 Early Tulips, 10 sorts	2 " " rubrum

Suttons' £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, by name	3 Peacock Iris
6 Miniature Hyacinths, by name	50 fine Crocus, by name
6 Polyanthus Narcissus, do	6 choice Tulips
6 Single Sweet Jonquils	3 choice Spatiphyllums
6 Scilla peruvica	3 choice Oxalis
6 Single Duc Van Thol Tulips	1 Tropæolum tricolor
6 Double Tournesol Tulips	1 Lilium lancifolium album
25 Early Tulips, 5 sorts	1 " " rubrum
3 Persian Iris	

Suttons' 10s. 6d. Collection of Flower Roots
For Indoor Cultivation, contains a choice assortment of most useful and showy kinds.

For further particulars, with complete Cultural Instructions, see

SUTTONS'
AUTUMN CATALOGUE FOR 1870,
Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

*** *Five per cent. allowed for cash payments.*

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

Vines, Extra Strong Fruiting, &c.

FRANCIS & ARTHUR DICKSON & SONS have this season replanted the PAVINEs grown from eyes, without bottom heat, in order to grow Short jointed Fruiting Canes, true to Grape character. These Canes are now ripening, and will be found perfectly free from disease. Inspection respectfully invited. If this is not convincing, specimen plants can be sent.
Priced Descriptive LIST sent free by post.
The "Upton" Nurseries, Chester.

Dwarf & Standard Roses.

FRANCIS & ARTHUR DICKSON & SONS have an immense Stock of extra strong well grown plants of all the best ROSES in cultivation (including all the new varieties) for Autumn and Spring planting. Also a large stock of strong Plants in pots, which can be had potted out best, if more Forced Descriptive CATALOGUE sent free by post. Their Roses are unusually fine this season. Trade and Export liberally invited. Visitors will please ask for
FRANCIS & ARTHUR DICKSON & SONS, "Upton" Nurseries, Chester.

Standard and Dwarf Roses.

LEWIS WOODTHORPE begs respectfully to call the particular attention of those about to plant to his fine stock of ROSES, which, from their vigorous growth, both in quality and varieties, cannot fail to give every satisfaction.
STANDARDS, very superior, selected, 18s. per dozen; £6 per 100.
Very fine, 12s. per dozen; 45s. per 100.
HALF-STANDARDS, very superior, 12s. per doz.; £4 10s. per 100.
DWARFS, on Manetti stocks, fine plants, 6s. per dozen; £2 per 100.
" in pots, very superior, 8s. per dozen; £2 10s. per 100.
Descriptive CATALOGUE of New and Choice Plants, Roses, Fruit Trees, &c., free upon application.
Special prices for large quantities and to the Trade.
Manor Nursery, Sible Hedingham, Essex.

Established 1785.

KING'S ACRE NURSERIES, NEAR HEREFORD,
JOHN CRANSTON, Proprietor.
The following Descriptive Priced CATALOGUES are now ready, and will be forwarded on application:—
The NEW ROSE CATALOGUE for 1870
The CONIFER, SHRUB, and FRUIT TREE CATALOGUE
The FOREST TREE CATALOGUE, including Plants for Covers, Underwood, &c.

Twenty-one First and Ten Second Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and Ten Second Prizes for ROSES, exhibited at the principal Rose Shows throughout the kingdom. It is therefore proved that his Nurseries stand unrivalled for the cultivation of the Rose.
The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.
Nurseries, King's Acre, near Hereford.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, containing Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Hardy Trees, &c., Dracænas, Agaves, Yuccas, Bouvardias, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Hollland Plants, and Amaryllis, &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, when at all times a well-ripened assortment of Fruits is furnished, and Choice Plants supplied for Balls or Dinner Table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

The Gardeners' Chronicle

SATURDAY, OCTOBER 1, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, Oct. 5 { Royal Horticultural and Floral Committees, at S. Kensington .. 11 A.M. / (Day) (General Meeting) .. .. 3 .. }

THE decision of the question of SPONTANEOUS GENERATION is one of the utmost moment, even from a practical point of view. It is no mere philosopher's problem, the solution of which would have but little influence on the well-being of our race; on the contrary, it is a matter most intimately concerning our own physical health—and in some cases our very existence,—while it is no less important as regards the animal or vegetable productions on which we depend for food or clothing. Unhappily it is a problem, the satisfactory solution of which seems as far off as ever. In each succeeding generation men arise who prove to their own satisfaction, at least, that spontaneous generation does occur. Their experiments are made with all the ingenuity that science can devise, with all the care that an honest love of truth, and an earnest desire to find it, will allow of. In some cases the evidence they bring forward seems conclusive; but only for a time. Sooner or later a flaw is detected in the mode of experimenting, in the instrument employed, or in the chain of reasoning, and once again the old paths have to be trod under new and different conditions. If we had had to select among our foremost naturalists one who more than any other might have been expected to uphold the doctrine of spontaneous generation, that one would have been Professor HUXLEY. But, like a doughty man of science that he is, he will not be led astray by personal predilections, but boldly and unhesitatingly draws inferences from the evidence before him—inferences wholly unfavourable to a doctrine which, from what he has said on former occasions, we assume he would gladly support did he feel himself at liberty to do so. The point in dispute, we need hardly say, is as to whether what we call living matter is, under all circumstances, as it certainly is under most, the direct product of pre-existing living matter, or whether it may not occasionally be generated

de novo, from a combination of elements under conditions as yet unknown to us. Happily, we can at the present day discuss these matters without fear of pains and penalties, and without uncharitable assumptions or aspersions. In whatever mode the new life appear, the miracle of its production remains the same—the attributes of Divinity are wholly unshaken.

So far as we can discern, all parties are agreed that in the majority of instances the new growth is the direct offspring of the old, and therefore if we can by any means destroy the vitality of the parent, check its multiplication or prevent the access of new germs, we can "stamp out" any particular growth as effectually as we can rid ourselves of cattle plague or small-pox. Observers tell us that we are surrounded by infinite myriads of germs of inconceivable minuteness, invisible even under our best microscopes, and only rendered apparent by optical experiments such as those of Dr. TYNDALL; and that these germs, under favourable conditions, progress and multiply, it may be, to our sore discomfort. These germs are, on the generally received theory, supposed to be the product of pre-existing organisms. How, then, were these organisms formed in the beginning, if not by the combination of certain proportions of oxygen, carbon, hydrogen, and nitrogen, as it is asserted similar organisms may be still formed? Why limit Creative power to one primordial fiat, and deny the continuous and constant operation of the same GREAT CAUSE? But while the general belief will be much strengthened by the recent utterances of Prof. HUXLEY, there is now, as there always has been, a small class of observers who are led to conclude that in certain instances new growths or germs may be and are developed under circumstances precluding the existence of parental organisms of the same description. They take most elaborate precautions to prevent the access of germs from without; they expose fluids to a degree of temperature known, or at any rate supposed, to be destructive to all forms of life; and yet at the expiration of a short time they find evidences of vitality, and they are led to infer that that life has been formed in their experimental flasks, and has not been introduced from without. Some of the more recent experiments in this direction have been particularly suggestive. The chemical elements found in all living creatures have been supplied in certain definite proportions, and life has appeared, while in other cases, where the proportions have been differently combined, or the elements have been of a different character, not a speck of vitality has been observed.

Now, if these experiments be free from flaw, we shall only have to study the conditions under which living specks are produced to be able to regulate their production almost at will; and we shall be as well able to "stamp out" any objectionable manifestions as we can be under the opposite hypothesis of successional formation. As mere matter of practice, then, if we had to deal with a murrain or a blight, it would be of little import how that murrain originated—whether by "biogenesis," or parental development, if we may so call it, or by "abiogenesis," or spontaneous generation. If we only knew all the conditions under which development took place, we should be able to contend successfully against these plagues, or at least we should in most instances be able to avoid exposing ourselves, our herds, or our crops to conditions favourable to their production; and this is why the settlement of the question of spontaneous generation, as it is somewhat erroneously termed, is so all-important to practical men.

As we have seen, the decision of Prof. HUXLEY on the present state of the question is, that the notion of spontaneous generation is fallacious, and both he and Prof. TYNDALL seem to be of opinion that there is some flaw in Dr. BASTIAN'S experiments; and in so far as the production of those wonderful spiral coils, which the latter gentleman finds under certain circumstances, it would seem most probable that, in spite of all his precautions, the access of foreign material has not been effectually prevented. Professor TYNDALL points to one weak place in Dr. BASTIAN'S experiments when he declares that, in spite of the removal of the air from the experimental flasks by means of the air-pump, it is perfectly impossible to remove all the germs with which the air had been charged. But if this be the case, then these germs have a faculty of retaining their vitality under a temperature greatly exceeding that which has hitherto been deemed sufficient utterly to destroy vitality.

When it is stated that the living things supposed to arise out of non-living materials, and gradually to emerge from the region of the invisible into that of the visible, are no larger in the latter stage than $\frac{1}{100000}$ of an inch in diameter, it will be seen that, while it would be difficult indeed to suppose any place from which they could be perfectly prevented from obtaining access, it would be equally difficult to suppose that such infinitesimal specks could resist such an elevation of temperature as that to which they were subjected by Dr. BASTIAN.

THE VISIT of the ROYAL HORTICULTURAL SOCIETY to NOTTINGHAM next year being decided on, there yet remain several important questions, at some of which we propose to glance. Not the least urgent of them is the site. The *Nottingham Guardian* argues strongly in favour of the Arboretum, as being a position close at home, and one to which the population would flock every evening; and urges that, in choosing Wollaton, the Council and the Committee have made a false step. The point of facility of access is certainly one which should by no means be overlooked; but, if we are rightly informed, there is a fatal objection to the use of the Arboretum in this case, namely, that, being public property, the authorities have no power to exclude the public from any portion of it. Our country contemporary, indeed, says, "the Arboretum is ample in space, admirable in contour, inexpensive in preparation, convenient to the rail, suitable to the town, and with a reputation in the district which cannot be surpassed; therefore success is certain, and that much cannot be said of any other place,"—all which may be very true, so far as it goes, but then if every one may claim free admission, and there is no power to override this claim, it is quite evident that the Society could not have made arrangements to hold its show there.

What the principal recommendations of Wollaton Park, which appears to be the selected site, may be, we know not, but we think it must not be charged with any great difficulty of access. It is not further out of Nottingham, we believe, than the Botanic Garden, near which the 1869 meeting was held, was out of Manchester, and there is a fine well-kept main road leading to it; it is very little further from the town than the ground used in 1868 at Leicester; and we believe that the Midland Railway Company will be prepared to issue return tickets at almost nominal fares (1½*d.* has been mentioned) from Nottingham to their Lenton station, which is within 10 minutes' walk of the ground. It, therefore, does not appear that Wollaton is so very objectionable on this score.

Another important question is the style of the exhibition, and we hope, now that the Society has ventured to leave the overshadowing companionship of the agriculturists, and to appear in a leading character as the representative and foster parent of Horticulture, it will put in an appearance worthy of its position. It may fairly be expected of it, with its means and its prestige, that its show should, year by year, be looked back upon by its country friends and supporters as one far superior to what they have hitherto witnessed in their respective localities, but no impression of this sort can be made by merely adding tent to tent, each one being but a repetition of what is seen at every country exhibition. No; what is wanted is something more—something entirely different; and if the Society has but the courage to strike out in this direction, its annual visits to the country will become red-letter days in its history. Visitors are not drawn in shoals, on such occasions, by a mere duplication of the ordinary features of an every-day show; they must have something novel and to some extent sensational; and no better investment, as we believe, could be made by the Society than to provide the means of making its provincial show bear some resemblance to the International of 1866. That is the direction in which to work. Let the ground be picturesquely laid out, as was done on that occasion, and let the whole be brought under one roof, when something like a pictorial effect may be produced, and there may then be some reasonable prospect that the visitors will be attracted and the coffers filled.

There is one more point of importance, and that is to advertise—to advertise early, and to advertise thoroughly. It need not, after all, be so very costly a process, for one principal channel of announcements, the railway stations, will be certainly well worked by the railway companies for their own advantage; the chief outlay in this direction would be the cost of a bundle of posters supplied to each company. And then the neighbourhood and the surrounding country should be inundated with announcements in such form as to excite interest amongst the country people. This is the only way to obtain the influx of numbers which is necessary to realise a grand success worthy of the Society and its mission; and it is for want of this—for want of their being made sufficiently known among the masses—that so many great projects fail.

—— WE are requested to call the attention of our readers to the EXHIBITION of FUNGI, to be held at the Royal Horticultural Society on Wednesday, October 5. The following prizes are offered on the occasion: — Collection of Edible Fungi (open), £2, £1. Collection of Edible and Poisonous Fungi, arranged separately (prize offered by W. WILSON SAUNDERS, Esq., F.R.S.), £5. Prizes are also offered for competition for collections of Black and White Grapes; for single bunches of either; and for a dish of Grapes, consisting of 6 bunches of any variety, grown in the open air against the wall, without any protection whatever.

—— The subjoined letters relating to the proceedings of a self-styled GARDENERS' AGENT will tell their own tale. We have repeatedly had occasion to call attention to this manœuvre, and have in our possession a great number of letters in the same handwriting, couched nearly in the same form, but almost always signed by a different signature, and dated from a different address. If those who are favoured with this gentleman's missives would adopt the course followed by our correspondent, "the agent" would probably experience a decline in his trade:—

"Knowing that you are always willing to chronicle anything for the benefit of gardeners, I take the liberty to send the enclosed letter, which I received last week in answer to an advertisement. As soon as I read it, I had my doubts about it, and wrote off at once to a friend in London to call at 161, Sloane Street, to see the said Mr. DREW. I had a letter back, stating that 161, Sloane Street, was a post-office, and nothing was known of Mr. DREW, except that he called there for letters occasionally. Immediately on the receipt of this news, I wrote to Mr. DREW, saying that if he could give me proofs that he was an agent in such matters, and could help me into a situation, I was willing to pay him double what he asked. My reason for writing to him was to see what sort of excuse he would make, but I need scarcely say that I have not had any answer. *W. S.*"

"SIR,—I can give you the first offer of a 'Gardener's' situation to a gentleman residing near Windsor, 25 miles from London. In writing to me to engage a person, he says, it will be requisite to have a fair practical experience in the fruit, flower, and kitchen gardens, hothouse and vinery, which, from your advertisement, I conclude you would be quite competent to undertake. Board and residence at the Hall, with offices, and 18*s.* per week, he offers to begin with, and prospects of an early advance to one that suits, and is obliging. My fees will be 5*s.* for introduction (including registration), and 20*s.* bonus, payable at end of second month after engagement. If you would like to take the place please write by an early post, inclosing introduction fee, 5*s.* in stamps, when I will at once place you in treaty with the gentleman to insure the situation. I am in constant correspondence with most of the leading firms in the trade, Messrs. Warren, Woolster, Tippitts, &c., and will keep your address before me for a week or two in case you decline this.—I am, sir, yours respectfully,

"J. B. DREW, Gardeners' and Horticultural Agent.

"161, Sloane Street, London, S.W."

"P.S. If you agree to the above terms and offer, I shall be glad to hear by return post, if possible; but if you do not, you need not write, as, my instructions being 'to engage an efficient person without delay,' I shall be obliged to offer to another after the fourth day by post.

"Arrangements can be made to live out of the house if you prefer it."

—— As many gentlemen have expressed a wish to be present at the annual FUNGUS EXCURSION and DINNER at HEREFORD this year, it will be well if all such gentlemen will communicate with Mr. ARTHUR THOMPSON, St. Nicholas Street, Hereford, on or before Monday, Oct. 3, so that definite arrangements may be made for conveyances, &c. The excursion will be made on Thursday, Oct. 6, in carriages to Hagley Park, where a dome of the upper Ludlow rocks just reaches the surface, and by Trap dyke to Bartestree, to Dormington, when the ascent to "Adam's Rocks," on the Aymestry ridge of the Woolhope Valley, will be made. Here a brief description of the geology of the surrounding district will be given, and a short paper on the "Geological Drifts of the Neighbourhood," by the Rev. F. MEREWETHER, M.A., will be read. Descending by Old Sutton, the carriages will be regained, and the return made to the Green Dragon Hotel, by 3 o'clock P.M. The dinner will take place at 4 o'clock P.M., when some edible Funguses will be served, cooked from the club recipes. Tickets, 4*s.* each. After dinner the following papers will be read:

"On some Curious Algæ, only Apparent in Times of Drought, with Notices of those that occur and Colour Water at Seasons of High Temperature," by EDWIN LEES, Esq., F.L.S., &c.; "The Fungi which affect our Forest Trees," by WORTHINGTON G. SMITH, Esq., F.L.S.; "Notes on Fairy Rings," by JAMES BUCKMAN, Esq., F.L.S.; and "Illustrations of the Edible Funguses of Herefordshire," by Dr. BULL. An exhibition of Fungi will be held at the Green Dragon Hotel at 9.30, on Thursday morning, and gentlemen who attend this meeting are requested to look out a day or two before, and bring with them, in the morning, a collection of Funguses from their own districts. Besides Dr. BULL, of Hereford, we believe Mr. C. E. BROOME, of Batheaston; Dr. TRIMEN, British Museum; the Rev. W. HOUGHTON, Mr. M. C. COOKE, Mr. W. G. SMITH, and others, will be present. A party of gentlemen intend leaving Paddington for Hereford by the 4.50 P.M. train on Wednesday.

—— Mr. CLARKE, the officiating Superintendent of the Calcutta Botanic Garden, describes the Bengal species of the order COMMELYNACEÆ in the last number of the "Journal of the Linnean Society." The distinctions are drawn from the number of the cells, and the manner of dehiscence of the capsules, as well as from the characters presented by the seed. As the relative position of the male and female flowers on monœcious or spuriously hermaphrodite plants is now attracting attention, it may be well to cite what Mr. CLARKE says on the distribution of the sexes in the Bengal species of Commelyna:—

"The innermost flower of the peduncle expands first, and the tendency of each successively expanding flower to become male is greater than in its predecessor. Also the tendency to become male is far greater in the first expanding, long-peduncled lower raceme than in the upper one. The innermost flower on the upper raceme is always perfect, and generally the next to it, sometimes more, but on the lower raceme the innermost flower even is generally male, and this lower raceme is often rudimentary, sometimes obsolete; and these three cases all occur in one species."

—— As an incitement to the careful CULTURE of OLD VINES we hear that Mr. AYRES, who has taken much interest in the extension system of Vine cultivation, with the proprietor of the *Notts Guardian*, and some of their friends, intend, at the forthcoming show of the Royal Horticultural Society at Nottingham next summer, to offer a series of prizes for Grapes from Vines of not less than 25 years' growth. The number of bunches to be shown is not yet decided upon, but already sufficient money is in hand to give three prizes of £7, £5, and £3, for which we should think not less than six bunches would be required. The Grapes may be of one variety or several varieties, and may be cut from one Vine or several Vines, trustworthy evidence being given that the Vines are of the age required. We mention these prizes thus early that those who intend to compete may improve their bunches in size by pruning upon the "cut to the best bud system." For these prizes we anticipate a most interesting and important exhibition, an exhibition that will do much to settle the question of the wearing out of young Vines, and at the same time give force to the theory of Extension *v.* Restriction. Relative to these prizes Mr. AYRES will be glad to receive any suggestions, especially from those who intend to compete, which may be addressed to him at "Nottingham." Will no one do as much for young Vines, so that a fair comparison may be arrived at?

—— What are those beautiful black Plums which are now beginning to make their appearance in Covent Garden Market—Damsons? No; they are far larger and finer, and more beautiful than Damsons. Though of the same beautiful bluish black colour, they are quite twice the size if not more. They have a little of the same peculiar taste, and a little of that of the Sloe also, but are not so pleasant to the palate as a Coe's Golden Drop, yet, nevertheless, they are very passable, and especially at this late season, when Plums are Plums. The Plum in question is called SANDALL'S PLUM. This fruit has been exceedingly plentiful this season, and we have become almost surfeited with them, but they are now over in most cases. There may be a few choice Golden Drops, or Impératrices, or Late Reds, or Autumn Compotes, &c., carefully protected in certain places, but nothing in quantity; even the Damsons are over, leaving us nothing but the "wee" Bullaces for our tarts, pies, and puddings; yet in Covent Garden Plums are still in season, for Sandalls are just coming in. From whence come they, then? Not from France, which has the credit of supplying everything remarkable in Covent Garden, but from the market gardens round London. It was only on Tuesday last that we saw in one celebrated fruit garden more than 100 trees of this Plum in one group; trees, too, of no ordinary size, being from 20 to 40 feet high, with large spreading heads, all densely laden with most beautiful black fruit, every little twig, even, being as thickly set as the berries on a bunch of Grapes: many bushels might be seen on a single tree; truly they were a grand sight. Sandall's Plum has many recommendations; it is indeed singular it should be so little known. It is one of the few Plum trees which produce timber. The tree has a twiggy sort of growth, of the Sloe type, and attains a large size, forming a clean trunk of considerable length, and we have measured some stems 3 feet in circumference. It is very hardy, and a certain bearer. It is one of the very latest, and, from its beautiful appearance, fetches a high price in the market. It has further the great merit of hanging on to the trees up to the very last, and even when quite ripe there are seldom any blown down by the wind. It is very little liable to cracking in wet weather,—a failing which is the destruction of so many Plums. It will hang on the tree, and be fit for use during the course of two months—September and October. What a valuable tree, then, would not this be in a private garden,—just one to supply Plums for cooking, &c., when wanted, until November! The fruit is of medium size, roundish, of a beautiful jet-black colour, with a thick bloom; flesh reddish, clinging slightly to the stone, moderately juicy, with a smack of the Sloe flavour; an excellent fruit for tarts, &c., and valuable for its lateness. We know little of the true history of this fruit. It originated, we believe, in some of the market gardens of Fulham, where it is grown, and with Mr. DANCER, of Chiswick. It is known simply as Sandall's Plum.

—— The readers of our advertising columns will have observed that several NURSERY SALES in the Woking and Bagshot district are to be looked for among the coming events of the present and succeeding months. They take place just at the right period for transplantation, so that an excellent opportunity will be afforded to persons having considerable ground alterations to make, or extensive tracts of land to furnish, to supply at least some portion of their *desiderata*. After the fine rains we have recently had, all properly transplanted trees and shrubs will move well. The series of sales is to commence on Thursday next, the 6th inst., at Mr. GEORGE JACKMAN'S Woking Nursery, when a considerable choice of very handsome and carefully prepared specimens of the choicer Coniferous and other ornamental trees will be offered, besides a variety of other smaller stock. We also notice amongst the announcements several varieties of the dwarf, cushion-like Firs, which are so admirably adapted for furnishing geometrical gardens, and which we are surprised to see so rarely planted. Mr. NOBLE will clear off some of his Berkshire ground, shortly after.

—— According to the *Preston Herald*, the quantity of FRUIT shown in the Preston market on Saturday last was the greatest on record. Carts commenced entering the town, from the Fylde district in particular, at about three o'clock in the morning, and continued in one stream until about ten o'clock. The greatest show of fruit previously remembered occurred in the year 1858 (the comet year). The immense show of fruit consisted chiefly of Damsons; and for this fruit the prices ranged from 1*s.* 1*d.* to 1*s.* 6*d.* per dozen quarts. Round Plums were sold at from 10*d.* to 1*s.* 3*d.* per dozen quarts; Pears from 10*d.* to 1*s.* per score pounds; Apples, table fruit, 2*s.* per score; Manx Codlins, 8*d.* per score; bakers, 8*d.* to 1*s.* per score. The line of baskets extended upwards of a mile, which made it difficult to fix a uniform price—showing how much the Preston folk stand in need of a covered market.

—— The following are methods of utilising TOMATOS, extracted from the "American Agriculturist." We have no personal experience of the qualities of TOMATO PIE, but if any of our readers are disposed to try the experiment, here is the *modus operandi*:—

"Take two large ripe Feejee or other Tomatos of the same size, drop them into boiling water to remove the skin, then, with a sharp knife, cut them into thin slices, put the crust in an ordinary pie pan as for berry pie; cover the bottom with a layer of Tomatos, then a layer of sugar and butter, then of Tomatos, then of sugar and butter as before; flavour with either lemon, orange peel, or nutmeg, to the taste; cover with the top crust, bake, and bring to the table hot (cold Tomato pie is not good). Two very large Tomatos, two tablespoonfuls of sugar, and one of butter, are enough for one pie baked in a pan 10 inches across. If there are too much Tomato, sugar, and butter put into one pie, there will be too much juice. A little practice in making will make all right."

Raw Tomatos, also, are not much relished in this country; as in many other cases, the taste must be acquired. Thus, says a correspondent of our American contemporary,—

"Tomatos, to be eaten raw, are much nicer if peeled without scalding. If properly ripened that can be accomplished with very little trouble. As an accompaniment for bread and butter nothing can be nicer than Tomatos, served like Strawberries with white sugar and sweet cream, without pepper, salt, or vinegar. Have the Tomatos fresh and cool, and nicely peeled and sliced."

While dealing with culinary matters we may make further extract from the above-named excellent publication, as to the proper method of cooking TABLE MAIZE, a feat we have never yet satisfactorily accomplished:—

"Cut the green corn (the seeds) from the cob, and boil in so little water as to be dry when done; add a cupful of sweet cream and a lump of butter."

—— The MAXIMUM TEMPERATURE of the air in England during the WEEK ending September 24 varied from 72°.5 at Eccles to 64° at Newcastle, with a mean of all highest for the several stations of 69°.7. In Scotland it varied from 70°.2 at Leith to 63° at Dundee, with a mean for all stations of 66°.7. The MINIMUM TEMPERATURE, in England, varied from 34° at Hull to 49° at Newcastle, with a mean for all stations of 41°.9. In Scotland it varied from 38°.5 at Glasgow to 46°.7 at Aberdeen, with a mean for all stations of 42°.3. The MEAN TEMPERATURE of the air for the week varied from 57°.9 at Manchester to 51°.5 at Hall, with a mean for all stations of 55°.5. The mean for the several stations in Scotland amounted to 55°.3. The RAINFALL during the week was very small in both countries, especially in Scotland. The greatest rainfall in England was 0.05 inch at Liverpool, and at five other places only were any falls recorded exceeding 0.01 inch. In Scotland the only rainfall recorded was 0.01 inch at Aberdeen.

—— A communication from Dr. DICKIE to the last Number of the "Journal of the Linnean Society" is interesting as suggestive of the manner of TRANSPORT of SEEDS and PLANTS from one country to another, and as illustrating the geographical distribution of plants. It appears that the Commander of an Aberdeen ship trading to Australia met with a quantity of green seaweed floating on the surface in the North Atlantic ocean. For a space of 14 miles the sea was covered with this vegetation. The position of the ship at noon, on the day of the discovery, November 24, 1867, was lat. 12° 0′ N. long., 21° 40′ W. Captain MITCHELL says:

"Considering our position, I concluded that the substance must have come from some part of the American continent or the West Indies within the influence of the Gulf Stream. It had probably been washed from some river or estuary by a flood, and subsequently carried by the southern branch of the Gulf Stream south of the Canary Islands, and then further southwards by the African current to the place where it was found—probably passing between the Cape de Verds and the main land. I came to this conclusion, from the fact that currents along the west coast of Africa continually sweep round in the direction of the coast line, at 300 miles from the mouth of any river on that coast; even in the event of a flood, the drifts could not have been so far eastward. It may be worthy of notice, in reference to this, that the destructive hurricane in the West Indies occurred about the end of October."

Dr. DICKIE thus reports on the substance collected by Captain MITCHELL:—

"Besides three Algæ, it contained numerous fragments, more or less decayed, of wood, both exogenous and endogenous; seedling plants, several inches long, all with a pair of cotyledons, root and terminal bud, quite fresh; small fruits partially decayed, evidently 2-seeded legumes. Intermixed were various macroscopical Crustaceæ, and a common oceanic insect, one of the Hydrodromidæ genus Halobates. On some of the pieces of drift wood were numerous elliptical ova of a deep orange colour."

One of the three Algæ above mentioned Dr. DICKIE refers to a new genus, allied to Enteromorpha, and called Kallonema; the second to Spermosira, and the third to Schizosiphon.

New Garden Plants.

DENDROBIUM CHRYSOTIS, *n. sp.*

Affi Dendrobio fimbriato, Wall. Petalis ligulatis obtuse acutis, labello unguiculato oblongo rhombeo, alte bilobato, insulis duobus approximatis utrinque in medio basi, callo transverso per medium, tota superficie lœve hirsutulis; antico in lasi columnæ ligulato, margine superiori ciliato in fissuram exeunte.

Since 1863 we have known of this Dendrobium, which has several times been sent to us. We believe it comes from Assam. The last flowers were obtained from T. Moore, Esq. It is, indeed, near D. fimbriatum, and, being blotched, should be compared with the so-called D. fimbriatum oculatum (Paxtoni Hort.), most probably the wild type of that species. That has a single blotch in the disc of the lip, not two, as are to be seen in our plant. The lip of the old species is circular and nearly hastate at the base, while in D. chrysotis it is rhomboid. The little beard from papillæ on the disc of the lip is much longer in our plant, which boasts very long fringes. The hollow at the base of the column is very long, not short, as in D. fimbriatum (see Bot. Mag. 4160). The petals are long and narrow in our plant, broad and short in D. fimbriatum. Upon these considerations we have at length published a plant we had for a long time kept apart. Without our valued correspondent's interference we should have certainly followed the "nonum prematur in annum." We candidly confess that the plant represented in tab. 71 of Paxton's "Flower Garden" gave us the impression of being intermediate, on account of its long narrow petals, yet it wants the characteristic lip. We could, however, not find a similar specimen among the herd of inflorescences in our collection, and it is well known, alas! with what negligence many representations are made. If the type is not preserved one cannot rely on these things. It may be that we shall some day write some remarks on our own experiences in this marvellous field, where the paying public becomes the dupe of negligent authors and careless artists. *H. G. Rchb. fil.*

We add, by request of Prof. Reichenbach, a few further notes on this very showy plant, which was sent us by Messrs. Brooke & Co., of Manchester. It was purchased at one of Stevens' sales, and comes from Assam. The stems are slender and rod-like, 3 feet to 4 feet long. The leaves are thin, oblong acute, sessile,

situated at intervals of about an inch. The flower-spikes are very slender, 8 or 9 inches long, and bear about six large deep yellow flowers; they issue from the stem opposite a leaf, with which they are synchronous, and they are borne freely up the stem. The flowers measure about 2½ inches across, the two lateral sepals spreading almost at a right angle with the axis of the flower. It was awarded a First-class Certificate by the Floral Committee, at its meeting on the 21st ult. *T. M.*

ON THE GROWTH OF TIMBER TREES.

THE following account of the comparative growth or increase in height and circumference of stem of some of the various Coniferous plants which have been introduced into this country within the last half-century may be found interesting at the present time, when the question of the adaptability of such trees to cultivation on a large scale with a view to profit, as timber, is occasionally cropping up. In the dimensions given, the circumference of the bole or stem has been invariably taken at a height of three feet from the ground level, and the height by measurement.

1. *Cedrus Deodara.*—Planted in 1832; height in 1837, 6 feet; in 1850, 32 feet 10 inches; in 1870, 60 feet; circumference of bole, 7 feet. This is evidently a cutting plant, and not a seedling, and has very much the character of the Cedar of Lebanon.

2. *Abies Morinda.*—Near the above, and planted at the same time; height in 1837, 7 feet; in 1850, 27 feet; in 1870, 57 feet; circumference, 7 feet 6 inches. It is a very handsome plant when in good foliage, and well feathered to the ground.

3. *Pinus ponderosa.*—Planted in 1832; this has a very fine bole, which carries its thickness well upwards; it is 65 feet high, and the circumference of the stem is 8 feet. I calculate that there are now quite 17 feet of timber in it. This appears to me to be one of the most likely Conifers to make a valuable timber tree, in situations similar to those in which the Scotch Fir flourishes, and no doubt the quality of the timber will be quite equal to, if not superior to, that of the Scotch Fir, if the accounts given of it are correct.

4. *Abies Douglasii.*—Planted in 1832; height in 1837, 15 feet 3 inches; in 1850, 48 feet: in the frost of 1860-61, 8 feet or 10 feet of the leader was cut off, but it has now recovered, and is 65 feet high; circumference of bole, 7 feet 6 inches. It carries its thickness up well, and appears likely to be equal, if not superior, to the Spruce.

5. *Pinus insignis.*—planted in 1842; 2 feet 4 inches in height; in 1850, 25 feet 6 inches; and now 60 feet, with a circumference of the bole at one yard of 8 feet 4 inches. This is a very noble plant, and is the only one out of many which was not injured in the frost of 1867; the branches, which are proportionately very large, radiate from the stem in a peculiar manner, extending to a great length—nearly 30 feet—and from their weight of foliage they gradually bend down to a horizontal position. Should this tree be spared to become aged, I have no doubt whatever that it will be one of the most striking and picturesque of the whole tribe; but I should almost fear that its very rapid growth would militate against its intrinsic value as a timber tree until very old.

6. *Abies cephalonica.*—Near to, and probably planted at the same time as, No. 5; it is a very handsome specimen, nearly 50 feet high; circumference, 6 feet.

7. *Taxodium sempervirens, or Sequoia gigantea.*—From a cutting struck in 1848, planted in 1850; is 35 feet high, and 6 feet in circumference of bole. A Douglas Fir planted near this on the same day is 35 feet high, and 3 feet 6 inches in circumference; and a Cedrus Deodara 30 feet high, and 2 feet 4 inches in circumference.

8. *Wellingtonia gigantea.*—Planted in March, 1855; pulled up by a boy with an eye to the beautiful in May; discovered in a bed-room window, brought back and replanted minus its splendid roots. It is now 35 feet high; the circumference of the stem at 3 feet is 6 feet; and round the base 9 feet. I am sorry to add that the foliage, both of this specimen and of most of the Coniferous plants about the place, has suffered very much indeed from the piercing east winds, accompanied with severe frost, which occurred on February 12 of the present year; but I hope they will recover in due time. Such a combination of wind and frost is by far the most severe that has occurred during my experience; and I shall be very agreeably surprised if we do not find, as the season advances, that more injury than we expect has been done.

9. *Cryptomeria japonica.*—Planted in 1847; is 40 feet high, and has a circumference of 3 feet 4 inches. The timber of this tree is said to be very valuable, and certainly the slow rate at which the stem increases, in comparison with others of the same age, might lead to the inference that its timber would be closer-grained and stronger, as a Larch which is grown slowly in an exposed situation is of better quality than one grown much faster in a low and sheltered place.

By way of comparison, the following authentic facts with regard to the present size of older trees may be useful as a guide. A Scotch Fir, planted in 1808, is now 65 feet high, with a circumference of stem of 8 feet at a yard from the ground. A Silver Fir, planted at the same time, is 80 feet high, with a circumference of 9 feet 6 inches. Three Cedars of Lebanon, also planted in 1808, have each a full circumference of 9 feet, and an average height of 65 feet. The timber of this tree is valueless where strength is required, being very brittle, and incapable of bearing any strain; it has a powerful and very agreeable odour, and pieces of it placed among the clothes in a wardrobe help to keep the moths in check. A Turkey Oak (Quercus Cerris), planted in 1808, is 60 feet high, with a circumference of 8 feet. A Cork tree (Quercus Suber), planted in 1808, is nearly 70 feet high, and has a circumference of 7 feet 9 inches. A Birch, planted at the same time as the last, is 60 feet in height, and has a circumference of 6 feet 6 inches. Lastly, a common Oak, the acorn of which was sown in the place where the tree now stands in November, 1807, is about 60 feet high, and the bole is 6 feet 2 inches in circumference at a yard from the ground.—*John Cox, Redleaf, in "Florist and Pomologist."*

BALANIFORM OAK GALLS AND CYNIPS CURTISII.

IN the *Gardeners' Chronicle* for 1855, p. 116, there will be found an article on several Oak-galls occurring in the East, written by the late Mr. John Curtis, and illustrated by Captain George Elliott, R.N., whilst in the Crimea. One of these productions (No. 3) was called by Mr. Curtis the Balaniform Gall, and we here reproduce its figure (fig. 238) and the text referring to it.

We read that "this is another remarkable variety of galls from Captain Elliott, and being exceedingly like the clusters of barnacles (Balanus) attached to oyster shells and rocks below high-water mark, we would call it balaniformis. Similar groups of galls have been found in England by a lady, and also by Dr. Badham, but the individuals composing the bundles are much smaller than those from the East. They are all found on the bark. It must be observed that the flies, which are the authors of these excrescences, have not yet been discovered; but it may be fairly assumed from those we do know, that they are related to the Cynips Quercus ramuli of Linnæus and its congeners."

So far Mr. Curtis' remarks, which we supplement by presenting below a figure (fig. 239) of the smaller galls

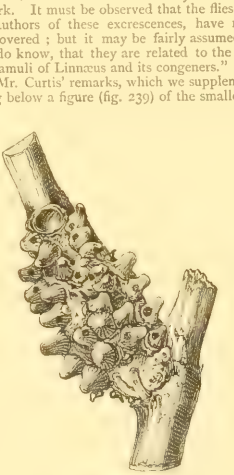

this author refers to, occurring in this country and in Germany on Quercus Robur, and which are supposed to be the work of Cynips corticalis of Hartig. But leaving this doubtful point in suspense, we are enabled to differentiate these two galls through the kindness of Mr. Frederic Moore, who has placed in our hands a series of the same balaniform gall, which Mr. Curtis has figured, and the Cynips bred from them. Mr. Moore's specimens come from Koordistan,* but they are exact fac-similes of the gall from the Crimea, thus affording indirect evidence that probably the very same species of Oak occurs in both countries. Botanists may perhaps tell us if such is the case, and if it is Quercus pubescens, which also occurs in Southern Austria, as from this country Kollar has described a cone-shaped thick-walled capsule gall, covered with a grey felt, and the inner cell of which is said to be as hard as bone, and of the size of a pea. This gall is found on Q. pubescens and pedunculata, and the insect's name is Cynips conifica.

Professor Hartig, in his monograph of the Cynipidæ, after describing Kollar's cone-shaped gall just referred to, mentions that the same naturalist sent to him galls from Hungary on Quercus pedunculata, which he describes as being larger than all other solitary galls (known to him), ball-shaped, 1½ inch in diameter, their whole circumference beset with conical bosses ¼ to ⅝ lines in height, which are irregularly distributed. The thin-shelled inner gall is of the size of a Pea, and is situated in a hollow formed by the loose cellulose matter of the gall, which substance is of somewhat closer grain than that of the gall of Cynips folii. The small inner gall is connected with the cellulose substance by a thin bundle of vesicular fibres. From this gall Professor Hartig bred Cynips hungarica.

Our galls from Koordistan, which are identical in size and shape with those of Captain Elliott, are of a pale brick-colour, and covered by a very close, short, and whitish pubescence, in all parts not easily accessible to friction. Notwithstanding their being outwardly composed of an agglomerate of cones, they possess in the centre only one oval cell of the size of a pea. The walls of this inner cell are thinner than those of a Cherry stone; they are as hard as Boxwood, of the same tinge outwardly, granulate, and firmly imbedded in a softer, mealy, but close yellowish substance, resembling that of the interior of the common marble gall (Cynips lignicola), after the insect has escaped from it, but showing polish on a surface cut with the knife. The interior of the cell is coated with a whitish powder, the residue of the vegetable juice, on which the larva fed. The hardness of the mealy substance, of which the whole gall is made up, increases gradually towards the centre, but the texture of the inner cell shows by far the hardest grain. It will be seen that there is an outward resemblance between this and the gall from Hungary, and future investigations will have to show if they are identical or not.

But when we compare the Koordistan gall (which is of the same kind as that from the Crimea) with the smaller conical galls on the British Quercus Robur (fig. 239), it will be seen at a glance that they are quite distinct; the former cell is granulate, and surrounded by an outer coating of cellulose matter; the latter cell is striate and quite unprotected, except by its own thickness—and each gall, that is each cone, possesses one cell, whilst the Eastern production is composed of an accumulation of cones, none of which are hollow, and forming mere excrescences of one gall with a single chamber in the centre.

Recapitulating the results of our inquiries, we have:—

1. Curtis' balaniform gall on a Quercus from the Crimea; 1A. Balaniform gall on a Quercus from Koordistan (Cynips Curtisii, new species); 1B. Balaniform gall on Q. pedunculata, from Hungary (Cynips hungarica, Hartig.).
2. Kollar's conical gall on Quercus pubescens and pedunculata, from Southern Austria (Cynips conifica, Kollar).
3. Balaniform gall on Quercus Robur, from Britain and Germany (Cynips corticalis, Hartig?).

For the insect from 1A, the balaniform gall from Koordistan, we propose the name of Cynips Curtisii, and for those concerned we append a diagnosis:—

C. Curtisii, sp. nova.—Fusco-nigra, thorace villoso; abdomine nigro, nitido, apice griseo-sericeo, nervis alarum plus minus fusco-nigris; pedibus antennisque nigris; ano genitalibusque rufis. Long. corp. 2 lin.; exp. alar. 4 lin. ♀ (fig. 240).

The insect figured is a female. It is black, with a hairy thorax, a black and shining abdomen; its apex sericeous, and red genital segments. The length of its body is 2 lines; the expanse of its wings, 4 lines. Its ovipositor is represented too straight in the figure; it is in reality curved and sabre-shaped. It belongs to the first section of the genus Cynips, as arranged by Hartig.

FIG. 240.

We may take this opportunity of inviting contributions in foreign and

* For commercial purposes it may be well to call attention to a report received in 1867 by the Foreign Office from H. M. Consul Tayler, in Koordistan, in which this gentleman says of the mountains of the Kuzzilbash: "Hemmed in by stupendous arid rocks, it encloses a lower range of thickly wooded hills . . . producing gall nuts, and other productions equally uncared for and unknown."

exotic galls, accompanied, if possible, by their insects, and any observations concerning them. Any materials entrusted to us shall be duly acknowledged, and in cases of novelty the results of our studies shall be published. *Albert Muller, Eaton Cottage, South Norwood.*

HARICOT BEANS AS ESCULENTS.

THE Potato, on its introduction to England and Ireland, appears to have been so suddenly welcomed, that its spread into the gardens of rich and poor was most rapid. If we attempt to account for this, we shall find that it became a general favourite with the rich and the poor upon two entirely opposite principles. The rich man found it to be an agreeable diluent to his meat and nitrogenous food; the poor man, on the other hand, finds it filling at the price; and so, his hunger satisfied, he deems himself not only fed but nourished, and if not strengthened upon this vegetable diet, he betakes himself to beer or cider, and so substitutes stimulation—"pot valiancy"—for strength. Hence, then, though we consider the Potato as a real blessing to all classes, we cannot help thinking that it is the duty of all country gentlemen, and whoever comes in contact with the poor man in his cottage home and cottage garden, to point out to him such other plants as he might profitably grow, not only to vary the eternal Potato food, but to increase the muscle-making, strengthening, and health-giving nature of his diet.

With this view then we would direct especial attention to a vegetable in common use in France, Germany, and other Continental countries, and all over the American continent, by high and low, rich and poor, and yet we have no English name for it; and though its French name may be known to our gentry, yet we doubt if one poor man in five thousand has ever heard of it. The vegetable to which we refer is the Haricot Bean, of which Miss Acton says in her "Modern Cookery:"—"The Haricot blanc is the seed of a particular kind of French Bean, of which we find some difficulty in ascertaining the English name; for, though we have tried several which resembled it in appearance, we have found their flavour, after they were dressed, very different and far from agreeable. The large white Dutch Runner is, we believe, the proper variety for cooking; at least we have obtained a small quantity under that name which approached much more nearly than any others we had tried to those we had eaten abroad."

The Haricot blanc is the white-seeded variety of the Phaseolus vulgaris, of which Don says:—It is a very variable plant, either twining or dwarf, with white or lilac flowers, and the seeds are very variable both in colour and shape. These variations may be gathered from the fact, that in a row of white Haricots grown this summer a few of the plants had a twining habit, and of these some had seeds of a lavender tint, blotched with bands of indigo. The white sort is that recommended for the table, and is the one principally used in Paris on account of its delicate appearance; but in the States we have partaken of many different sorts; and there in early summer, before the new Potato has come in, Beans are served at every dinner table. In this country different dwarf sorts of Kidney Beans are grown for the green legumes, which, indeed, afford a vegetable of excellent quality, but as the ripe seeds are so nutritious we particularly advocate their growth as a boon to the poor.

Mrs. Beeton says:—"It ripens readily in dry summers in most parts of Britain, but its culture has hitherto been confined to gardens in England, but in Germany and Switzerland it is grown in fields. From 3.840 parts of Kidney Bean Einhoff obtained 1.805 parts of matter analogous to starch, 351 of vegetable animal matter, and 799 parts of mucilage."*

The visitor to the food department of the South Kensington Museum will find a "Table of the equivalents of food containing the same supply of flesh-formers," in which it is stated that, as 5 oz. of flesh-formers are required to restore the daily waste of the body, it takes to supply this—

	lb.	oz.		s.	d.
Of Wheat flour	2	1	Average cost	0	4½
Barley meal	2	6	,,	0	4½
Maize	2	9	,,	0	7½
Rice	4	13	,,	1	2
Peas, dry	1	5	,,	0	2½
Beans, dry	1	5	,,	0	2¼
Potatos	20	0	,,	0	7

We see, then, the larger proportional of feeding matter in Peas and Beans, and yet the cost is cheaper; and though here perhaps the Bean analysed was the dried harvest or Mazagan Bean, we are assured that the Haricot Bean is much of the same composition.

Peas, it is well known, have always been used where cheap feeding is an object, but we have found that their constant employment as food for the poor is not relished. The union pea-soup is undeniably good, with its quantity of meat and vegetables, but a haricot of beef or mutton would cost no more, and afford what the rest of the world beyond our own country esteem a highly nutritious delicacy. Haricot Beans, too, have the merit of being easily cooked, though it is strange that when we speak of a haricot of mutton we mean a stew with the haricot left out; and in no English cookery book that we have consulted is the Bean introduced, but its place is supplied with Carrots and Turnips, vegetables of quite a low feeding character. Francatelli gives the following directions for cooking Haricots, bearing in mind that they should usually be put to soak over night, though from two to four hours' soaking will be sufficient:—"Put a large stewpan, half filled with water, on a stove fire to boil; then throw on the Beans, with a pat of butter and a little salt, and allow them to boil until they are become quite tender; drain them in a colander, then put them in a stewpan, with a little fresh butter, pepper, and salt, some chopped Parsley, and Lemon juice; toss the whole well together over a fire until well mixed." Now, as Lemons are not often found in the cottage, we can say from experience that a dash of vinegar is most acceptable. But we recommend the French sauce as still better, namely, chopped Sorrel leaves instead of Parsley. In Paris these were served to us in neat little basins with our bit of chop or steak, as the custom is, and the addition of the Beans really made for us as hearty a breakfast or dinner as the usual slab of beef or chops to follow of the English hotel, for which one has to pay a couple of shillings. The poor man, then, may have these with his bit of meat at a much cheaper rate than his mess of Potatos.

But the cottager may say, I can grow Potatos, and cannot grow the Beans. We shall therefore proceed to show how he can grow the Beans, and what a prolific crop it is. We have grown ripe Haricot Beans in the cold district of the Cotswolds, and on forest marble clays, with constant success; but our crop of this year, grown in the south (Dorset), will afford the most recent evidence on that score. Our crop of this year, just harvested, may be shortly described as an increase of more than a hundred-fold. We have by us three roots, with 62, 50, and 45 pods, each on an average containing 5 beans, this will give nearly 200 per one increase. They are all of them much more thickly podded than our best Peas, and we calculate might yield as much as 12 sacks an acre. These were grown in sandy loam in the garden, but we think that they would be as profitable for field culture with us as they are on the Continent, where they are a common field crop, with reference to which and other matters connected with Haricots, we will conclude this article with the following quotation from George Don's "General System of Gardening and Botany," vol. ii., p. 353:—

"*Field Culture of the Kidney Bean.*—In this country the culture of the Kidney Bean has been confined to gardens, but it might be grown equally well in dry, warm, rich, and sheltered soils—being grown in the fields in Germany, Switzerland, and similar climates. The sort generally used for this purpose is the small Dwarf White. The ground is prepared by several turnings, and the seed is dibbled in rows 18 inches or 2 feet asunder, in the beginning of May. The ground is hoed and weeded during the summer, and the crop is ripe in August. It is usually harvested by pulling up the plants, which, being dried, are stacked or threshed. The haulm is of little bulk or use, but the grain is used in making the esteemed French dish called haricot, which it were desirable that the cottagers of this country were acquainted with. There is perhaps no dish so easily cooked, and at the same time so agreeable and nourishing."

Here, then, is a good authority to back our assertions, which scarcely needs what follows:—"Haricots and Lentils are much used in all Catholic countries during Lent and *maigre* days, as they, from their peculiar constituents, form so excellent a substitute for animal food. Boiled Peas in his shoes is no great mortification to the pilgrim, nor is the soul greatly afflicted in fasting from meat when Beans are allowed and duly appreciated." *J. B.*

* Book of Household Management.

BRITISH ASSOCIATION.

WE continue our record of papers read at the Liverpool meeting of the British Association. We have extracted some of them from the Liverpool papers, but these are so meagre that we shall find it necessary to supplement them from more trustworthy sources.

Section C.—Geology.

Dr. MOFFAT read a paper on "Geological Systems and Endemic Diseases," showing that the soil has an influence on the composition of the cereal plants grown upon it, and on the diseases to which the inhabitants are subject. The district in which he practises consists geologically of the carboniferous and new red sandstone or Cheshire sandstone systems. The inhabitants of the first are engaged in mining and agricultural occupations, those of the latter in agriculture. Anæmia, with goitre, is a very prevalent disease amongst those living on the carboniferous system, whilst it is almost unknown among those living on the new red sandstone system, and consumption is also more prevalent amongst the inhabitants of the former. As anæmia is a condition in which there is a deficiency of the oxide of iron which the blood naturally contains, Dr. Moffat was led to make an examination of the relative composition of the Wheat grown on the soil of Cheshire sandstone, carboniferous limestone, millstone grit, and a transition soil between Cheshire sandstone and the grit. The result of the analysis shows that the Wheat grown on the soil of the Cheshire sandstone contains the largest quantity of ash, and that there is a larger quantity of phosphoric acid in it than in the soils of the carboniferous and millstone grit systems; also a much larger quantity of oxide of iron than in either of them. He has calculated that each inhabitant on the Cheshire sandstone, if he consumes a pound of Wheat daily, takes in nearly five grains per day of the sesqui-oxide of iron more than the inhabitant of the carboniferous system, and who seems therefore to be subject to this great liability to anæmia in consequence of the deficiency of iron and phosphoric acid in the food he consumes. It is not only in the Wheat grown upon the carboniferous system that there is a deficiency in the quantity of oxide of iron, and the phosphates, says Dr. Moffat, but also in the blood of the animals reared upon it; so that the inhabitants upon that system take in a minimum quantity of these constituents of the blood, compared with that taken in by the inhabitants of the Cheshire sandstone. He stated that sheep were liable to anæmia—a fact which he attributed to sheep walks being upon trap and limestone hills, in the soil of which there is but little, if any, iron.

Dr. TURNBULL, of Liverpool, said that the paper was a valuable and important communication, opening up a comparatively new subject which had scarcely yet been touched upon, and he wished there had been a large medical audience. It showed that there was a connection between the geological conditions of soils and the health and diseases of the inhabitants living on the soils. It showed too, that this influence might be indirect through the food grown on the soils, and it showed how the particular disease, anæmia with goitre, might be produced by deficiency of the oxide of iron and the phosphates in the Wheat grown on a certain soil. Such facts were interesting, in reference both to vegetable and animal physiology, and practically to the agriculturist as well as the physician. There was another statement in the paper particularly interesting to him—that consumption was less common in the inhabitants living on the Cheshire red sandstone than in those living on the soils of the carboniferous system. He had himself, in a work on this disease, directed attention to the inequalities in the distribution of this, the commonest of all diseases, and urged the importance of investigating the causes of these inequalities, with a view to their prevention. He had also pointed out that in this town of Liverpool, which had been the most unhealthy, but which initiated sanitary improvements, the statistics furnished by the late Dr. Duncan showed that these improvements reduced, in a remarkable manner, the mortality from phthisis. An inquiry into the results of sanitary measures in 25 of the large towns of England, which had been made under the direction of the health officer of the Privy Council, has since proved that drying of the soil by main sewers produced its first and greatest improvement in the mortality of large towns by reducing that form of this disease. This had led to the first inquiry which had yet been made into the effects of geological conditions of the soil on the health of the inhabitants. The three south-eastern counties of Surrey, Kent, and Sussex were carefully examined by Dr. Buchanan, under the direction of Mr. Simon; and this inquiry had, he observed, brought to light the important fact that dampness of soil is a powerful cause of consumption. This might be considered the first fact brought to light in relation to the influence of geological conditions on endemic disease; and Dr. Moffat had in this communication, which tended to bring science to the prevention of disease, brought another fact to light, and had proved that conditions of the soil might indirectly influence the inhabitants through the food grown on the soil.

Mr. A. R. WALLACE read a paper on the "Earth's Eccentricity and the Precession of the Equinoxes," illustrating their relation to geological climates and the rate of organic change. The paper was illustrated by a diagram constructed by means of the tables published by Mr. Croll in the "Philosophical Magazine," of August, 1868. The diagram covered a period of 3,000,000 years before A.D. 1800, and 1,000,000 years after that date. The paper at the outset stated that with the existing amount of eccentricity the earth was nearer the sun in winter than in summer in about the proportion of 90 to 93, and received, therefore, about 1-17th more heat in December than in June, but the difference was neutralised by the peculiar distribution of land and sea. When the eccentricity of the earth was great it would cause an enormous difference in the climates, causing the winter to be lengthened, and the summer to be correspondingly shortened; but on the other hand, during the periods of low eccentricity, the climate would change but little during periods stated in the diagram. The conclusions drawn from this paper in regard to the glacial epochs was that it was evident that, if these causes had had any importing share in producing them, then the indications that geologists had found of intercalated warm periods represented not an unusual or abnormal event, to be speculated on as something extraordinary and difficult to account for, but the normal state of things; and that a consequent migration of species, of which evidence was also found, must have occurred, not once only, but over and over again during the whole continuance of the glacial period. A full appreciation of this would, perhaps, assist in the interpretation of many well-known anomalies of distribution. A still more important consequence was to be drawn from the almost endless succession of migration of animals and plants that must have been caused by these often repeated changes of climate—migrations that would take place whenever the change of climate was considerable, even though no glacial epoch appeared. This migration being interrupted in various directions by seas, mountains, or other obstacles, would inevitably lead to the crowding together of animals and plants before separated, and thus lead to a complex and often renewed struggle for existence, and give wide scope for new and favourable variations to establish themselves. One of Mr. Darwin's great principles was that "the relation of organism to organism was the most important of all relations," and, "that though a change of climate may produce a considerable direct effect in modifying species, it induces far greater indirect effect by favouring the increase or diminution of enemies and competitors of the species." He also assured Mr. Wallace that there was no cause so powerful in inducing specific changes as mutations of climate through the consequent migrations. He also found from the diagram that we live, and have done for the last 60,000 years, in a period of small eccentricity. During the past 4,000,000 years there were only nine

occasions when the eccentricity was so little or less than it is now, while the average is nearly twice as great; for considerable periods it was three times as great. It fell, therefore, that for the last 60,000 years there had been but little mutuation of climate each 10,000 years—the periods into which he divided the 4,000,000—and therefore, in Mr. Darwin's own words, "the most powerful cause in inducing specific changes" had been in abeyance. Any estimate we might form of the rate of specific change from the stability of species during that period would therefore be fallacious. The period of about 10,000 years of alternate changes of climate would seem to be one well adapted to favour rapid changes of species, as the change would be sufficiently gradual to allow of any possible amount of migration. There would be sufficient time for the appearance of abundant variation, and for the increase to any extent of those adapted to the changed conditions, whilst there would also be time for the new and complete relations into which species would be thrown to become adjusted and balanced. If they were adequately impressed with the highly complex relations which subsist between each organism and all around it—which Mr. Darwin has done so much to elucidate—and if they further accepted his views that all changes in these relations, however brought about, necessarily caused the modification of some forms and the extinction of others, it seemed hardly possible to conceive a state of things better adapted to promote the increasing growth and change of the organic world than that which had beeen presented to them.

Some discussion followed the reading of Mr. Wallace's paper, more or less favourable, in which Mr. Boyd Dawkins took occasion to object to the attempt to correlate geological periods with historical times.

Section D. Biology (Anthropology).

A paper was read by Dr. B. W. RICHARDSON, entitled "New Physiological Researches on the Effects of Carbonic Acid." In the course of an interesting communication he explained that the observations he had made were new, in that they related to the direct action of carbonic acid on animal and vegetable fluids, and they were interesting equally to the zoologist and botanist as to the anatomist. The author first demonstrated, from a specimen, the result of subjecting a vegetable alkaline infusion to the action of carbonic acid under pressure. The result was a thick fluid substance, which resembled the fluid which exudes as gum from some trees. When this fluid was gently dried it became a semi-solid substance, which yielded elastic fibres, and somewhat resembled caoutchouc. This observation had led the author to study the effect of carbonic acid on albumen, serum of blood, blood itself, bronchial secretion, and other organic fluids. When the serum of blood was thus treated with the carbonic acid under pressure and gentle warmth, the colloidal part was separated; but when the blood, with the fibrine removed from it, was treated, there was no direct separation, the blood corpuscles seeming for a time to engage the gas by condensation of it. But blood containing fibrine, and holding fluids by tribasic phosphate of soda, was at once coagulated by the acid. The bronchial secretion was thickened by carbonic acid, and a tenacious fluid was obtained, resembling the secretion which occurred in asthma and bronchitis, while secretions on serous surfaces were thickened and rendered adhesive. After detailing many other facts, Dr. Richardson concluded by showing what bearing this had of a practical kind. In the first place, the research had relation to the question of elasticity of organic substances; and secondly, on the direct action of carbonic acid on the production of vegetable juices. But the greatest interest concentrated on the relation of the research to some of the diseases of the animal body. Thus, in instances where the temperature of the body was raised, and the production of carbonic acid was excessive, the blood on the right side of the heart had its fibrine often precipitated, and in many other cases fibrinous or albuminous exuded fluids were solidified, as was the case in croup. The author, in the course of his paper, explained how rapidly blood charged with carbonic acid absorbed oxygen when exposed to that gas; and he held that carbonic acid in the venous blood was as essential to the process of respiration as was the oxygen in the pulmonary organs.

Home Correspondence.

Potato Grafting.—I read with great interest the leading article at p. 1277 on Potato grafting. I should like to ask whether experiments have been made in Potato grafting, where the eye inserted and the recipient tuber were of the same race? If I understand rightly, the aim of the experiments hitherto made has been to attempt, by means of grafting, to unite the qualities and characters of two distinct races of Potato, and that this endeavour has apparently met with partial success. The sceptical, however, may still look upon the results obtained as the mere effects of the act of grafting, and not of any quasi-hybrid influence. The question, then, is this, does the mere act of grafting induce variation among Potatoes? that is to say, would the produce of an eye taken from one tuber of a Fenn's Onwards, for example, and grafted into another tuber of the same kind, be more variable than that obtained in the ordinary way without grafting? The presumption was that the produce of Potato-grafts would be subject to much the same laws as ordinary tree-grafts, where the product usually corresponds most closely with the characters of the tree whence the graft was obtained; but here we have evidence that this is not the case when two distinct races are employed, and I wish to ask whether it is so when graft and stock are of the same race? *J. Dalrymple Maconochie, Park Villas West, Richmond.*

Preserving Walnuts.—In the course of last winter a few dishes of Walnuts were accidentally preserved in such excellent order till the middle of February, that perhaps some of your correspondents might think the plan worth trying in a more regular manner. The Walnuts had been placed, after gathering, on the boarded floor of an Apple-loft, where they usually keep in tolerable order for a few weeks and then shrivel; last year, however, they chanced to be placed next to a quantity of seed Potatos, and room being needed the Walnuts were, I presume, somewhat carelessly moved to the end of a rough plank Apple shelf, and there left amongst the straw with a number of the seed Potatos which had been accidentally gathered up with them, and when the Walnuts were required for dessert they were found to be plump and fresh, and quite excellent. The shelf being of rough planks admitted a deal of air, whilst the straw protected them from the too rapid evaporation of the slight dampness in the Potatos; at least, I suppose this would be the explanation of their superior condition. Our Walnuts have never before kept so well, although we have tried many of the plans usually recommended. *E. O.*

The Royal Horticultural Society at Nottingham.—Upon this subject there appears already to be a hitch, for I read in the *Nottingham Daily Guardian* that a deputation from the Council has fixed on a site for the exhibition upon the circumference of the town, when a much better one, the public Arboretum, could be had in the centre. A correspondent of the *Guardian*, who appears to have spent some days in Nottingham, says:—

"As a London nurseryman, who has visited almost every exhibition the Society has had, from the palmy days of Chiswick down to the present time, I say without the slightest reservation, the Society has never had so fine a site for an exhibition as the Arboretum presents, nor one where, with ordinary prudence in the management, profit is so sure to come in. Within easy distance from the railway, in the best part of the town, splendidly fenced, with broad, handsome walks, and capacious and well-kept lawns and flower gardens, and, above all, refreshment saloons capable of seating at one time little short of a thousand people, a better site could not be had. All this is ready without a shilling of expense to the Society, a fact pregnant with very serious consideration for the executive of the gathering. If table-land be the difficulty, I would undertake to find more tent room than the Society ever yet needed, and have acres to spare; and if consecutive tents must be had, why not run them over the broad central walk of the garden, where a stretch of more than 1000 feet may be got with the greatest ease, not level, certainly, but rising so gently as to make it most desirable?"

What more than this can the Council desire? Surely if a town proposes to meet the Society handsomely, it has a right to expect some consideration in return. Wollaton, it appears, is situated three miles from Nottingham upon the Mansfield branch of the Midland Railway, Lenton being the nearest station. On the contrary, the Arboretum is an easy ten minutes' walk from either the Northern or Midland stations, and it appears to be replete with every accommodation. Some letters which have appeared in the *Guardian* are temperate and well-reasoned, and, it is fair to presume, would not be inserted without just cause. In these provincial visits the convenience of guarantors, and those who find the special prizes, should be considered. No town can be expected to subscribe its money without a fair chance of some return; and therefore, to make these visits agreeable to all parties, and at the same time profitable, it is quite as necessary that the Council should endeavour to fit themselves to circumstances as to expect that in all cases circumstances can be made to fit them. To object to ground in a public garden because it is not as level as a billiard-table is, to say the least of it, childish. *A. W.* [See some remarks at p. 1310. EDS.]

Coreopsis aristosa.—I have Coreopsis aristosa, showing abundance of flower-buds. It has really a large showy flower, reminding one of a Helianthus. *T.*

How to Destroy Ants.—We have here destroyed ants with soft-soap, with a few days' care (after uselessly trying many other remedies), in the greenhouse and garden, by well stirring together 2 lb. of soft-soap with about 6 or 8 gallons of water, and pouring this mixture frequently on the tracks of the ants, so as to keep them moist. We have also got rid of them in some of the offices of the house, by making the soft-soap into a paste with a little water, and carefully filling up the ants' holes between flags or boards with this paste, renewing this stopping wherever displaced by the ants. *S. M. O.*

—— I used to find that a little sulphur mixed with the top mould of a pot cleared that pot of ants effectually; but it is a much more difficult matter to extirpate them. A very numerous colony once fixed themselves in the woodwork of the house in which I lived. I tried all sorts of means to drive them away, but in vain; they were all day long, from May to September, passing in a continuous stream from a Poplar tree near the house into a chink of the woodwork, where they disappeared; but a second continuous stream issued from another chink, and passed back by another column to the tree—as soon as the chink was stopped with putty or paint they found out some other place of entrance or exit. It may be doubted whether their real abode was in the living or the dead timber; but I imagine they hibernated in some crevice of my dwelling-house—they never, however, appeared inside. I was beaten, and left off annoying them. But after some years I pulled down the tree, and after that they entirely disappeared. I consider they found their sustenance in the tree, which always abounded in aphides, and when this was gone they decamped. Moral: Stop the supplies. *H. J. S.*

Heather.—Mr. Forsyth's communication in your last issue (p. 1278) is likely to be of service in calling attention to the use of these hardy little shrubs for decorative purposes. For many years I have grown them largely with other American plants in sandy loam without a particle of peat, and employed them successfully in landscape gardening operations, so that a few hints as to the kinds most likely to be serviceable may not be out of place. All the numerous varieties of Calluna vulgaris group well—C. alba and C. coccinea make an excellent bed. The varieties of C. vulgaris, with silver and golden foliage, form an excellent group. C. vulgaris flore-pleno is a perfect gem, and is as hardy as the common one; it is of bright pink colour, and this, with an edging of C. pygmæa, is always of interest. C. v. tomentosa is a bold-growing sort, that mixes well with C. v. Alportii. All these are varieties of our common Heather, or Ling, as it is sometimes called. There are many others, interesting as curiosities, which should be grown by collectors. Erica carnea and herbacea are beautiful spring-flowering pink and flesh-coloured kinds, and if any variety is wanted to accompany them, the dwarf Irish form of E. mediterranea, which is whitish, will associate well with them. The E. arborea, E. mediterranea, and E. stricta, with whitish and pink flowers, make a beautiful tall group. E. vagans and E. alba, white and pale pink, with E. multiflora, perhaps a variety of vagans, being of similar growth, and of a deep rose colour, ought to be largely encouraged. Erica cinerea, blue-purple, when mixed with E. Tetralix, which has pink flowers, is very attractive; and here Nature and Art meet, for miles of these two are to be met with both in Holland and this country. There are pretty varieties of E. cinerea, as alba, coccinea, and pallida, but they are not met with in nurseries so plentifully as the other sorts above enumerated. These are the chief kinds of Heath adapted for groups on lawns or shrubberies, but what is called Irish Heath or Menziesia must not be omitted, for the flowers are bold and effective, of a pure white or purplish colour, and they have the advantage of blooming from June often till Christmas. Occasionally the long wiry stems, if not prevented, grow out to great length, and I have seen them seek support from the stems of bushes, and surprise the beholder with bunches of their flowers 5 or 6 feet high. Such was the case at the late Archdeacon Croft's, at Saltwood, near Hythe, some few years ago. The best time to plant Heaths is when the autumnal rains have well set in. They may be kept within bounds by the use of the knife or shears. In some cases the year after pruning the removal of the plants will be found advisable, which will much tend to keep them within limits adapted to their situation. *William Masters, Exotic Nursery, Canterbury.*

Melon Growing at Heckfield.—Under the above heading I quote the following from R. Gilbert:—"Mr. Wildsmith is perfectly right in all that he writes about Melon growing." Now on what grounds does he speak with so much authority on another's behalf? Simply, it appears, because he has himself been in the habit of taking three crops; but is that a reason why the system should be advocated as a good one? Suppose Mr. Gilbert to be placed in a similar situation to the one I fill, where a good Melon is prized above all other dessert fruits, and where the employer and other members of his family not only know but expect to be well supplied with first-class fruit, both as to size and quality combined; can he still say he would be able to give satisfaction with the produce of either the third or fourth crop? If he really thinks he could, allow me to tell him, candidly, that in my opinion it is beyond the skill of any man to do it. Where there is only sufficient convenience for one plantation in a season, then the system might be adopted to prolong the supply—for out of inadequate means an employer cannot look for extraordinary returns; but where means and facilities are provided to keep up a succession of young fruiting plants, both system and practice alike are bad and unsatisfactory. *T. C.*

—— I quite endorse Mr. A. Wildsmith's views on this matter. All that is needed to cut a second, or even a third good crop of any ordinary variety of Melon, is to keep the leaves free of thrip and spider, and the roots healthy. My second crops have often been better, and generally heavier than the first, and there is no difficulty in cutting a third. But a second was my constant practice for years. And more fruit can be cut from a given space, by successional crops on the same plants, than by renewing the plants. If the old plants are healthy and strong, they show and swell directly the growth is made, the roots in full activity, and the fruit swell at an extraordinary rate. "T. C." has made a mistake. The practice of the successional cropping of the same Melon plants is common, and generally successful. *Quercus.*

Preserving Golden Drop Plums.—I beg to inform your correspondent, "A. B.," as to how Coe's Golden Drop Plum may be kept for two or three

months. Gather them carefully when dry and sound, and hang them up by the stalk in a dry, cool and airy room. A line stretched across the room and the fruit tied to it, answers the purpose very well. The fruit should be gathered before it begins to shrivel. *A. S. Kemp, Haught u. Sicknall.*

The Transplantation of Bracken.—I observe a neighbour asks about this. Permit me to supplement your answer as follows:—It may be done in your way, but all difficulty vanishes by the following method: Go with a horse and cart and a sharp spade into a thicket of Bracken; proceed to cut out a cart load in large spadefuls, say a foot square and as much deep; cart it to the place you wish it to grow in, empty it out, and spread it about as if the pieces were large clods of earth, turning any of the largest inverted pieces the right way up, and spreading the new material about 6 inches thick, without any particular care of root or stem, and next year you will have a crop of Bracken that will speedily become a thicket. Singular though it seems, this rough mode has been far more successful with me than the most careful digging up and replanting of the roots and stems. If "T. R. K." can spread the roots and soil a foot thick in their new home, the ground will be covered the sooner; but 6 inches will insure a crop, which spreads with great rapidity in its own earth. The latter advantage constitutes the merit and the success of this rough and ready method of transplanting Bracken. *D. T. F.*

Muscari armeniacum, &c.—Can any of your readers tell me where I can procure bulbs of Muscari armeniacum and ambrosiacum, two most beautiful things, which some nurserymen used to keep, and which no nurseryman ought to have lost? No garden should be without them, but, alas! no one seems to know where they can be had. Can any one put me in the way of getting again the Double Primrose which used to go by the name of the Double Scotch—a deep brownish purple variety edged with yellow? This hot summer has killed my last surviving plant, and I do not like to be without it—it is so beautiful. *H. Harpur-Crewe, Rectory, Drayton-Beauchamp, Tring.*

Fruit in Yorkshire.—Some of your correspondents will be surprised to hear of the large quantities of fruit, and the prices realised, sold at Thirsk, a small market town in North Yorkshire. It is chiefly grown by small farmers and cottagers, who convey it to market in all kinds of conveyances, hampers, boxes, trunks, tubs, &c. It was computed that there were sent into Thirsk last Monday week upwards of 30 tons of Plums, which were sold at the following prices—I give you the highest in all cases—(fruit is sold at 18 lb. per stone):—Damsons, *8d.* per stone; Green Gages, *1s.*; Kirk's Plum, *1s.*; Orleans, *6d.*; Pond's Seedling and Victorias (Denyer's), a great favourite in this neighbourhood, *8d.* a score. Pond's Seedling is sold for Victorias, the country people not knowing the difference. Winesours, one of the very best preserving Plums, are sold for *8d.* per stone, the Wheat Plum fetched *1d.* and 1½*d.* per stone, and the Chermes Pears *2d.* per stone. I believe there are hundreds of stones of Plums that will never be gathered, but lie on the ground to rot, from the price being so low. *J. C. Nicholson, Mount St. John, Thirsk.*

The Gardeners' Benevolent Institution.—Mr. McArdell calls attention to what seems a hardship and an evil—namely, that in the election of pensioners subscribers have no advantage over non-subscribers; they have, however, this undoubted privilege, that after subscribing for 14 years they are placed upon the funds, should they unfortunately need the pension, without an election at all. This is certainly a great advantage. Whether it is a sufficient inducement to gardeners to subscribe, is a different question, but it certainly ought to be. Fourteen guineas, and then a pension of £20 per annum for life, if deserving of it and qualified to receive it—this is not a bad investment. The other matter of giving a greater preference to subscribers in the ordinary elections, rests with the members. I confess hitherto the mere fact of an applicant being a subscriber for a few years has not gone for much with me. Perhaps he subscribed with the express object of becoming a pensioner. Were the Society more popular, it would be needful to be particular in choosing the members, or it might soon become bankrupt from an excess of pensioners. The man who may have subscribed with the express object of getting his guinea back over and over again, may not be such a fit object of charity as another who may never have had the opportunity of subscribing, and yet has been overtaken by sudden affliction or loss. I have generally been guided in voting by the apparent need of the object of charity, and occasionally by the importunity of the applicant or his friends. I am thankful to say that hitherto none of the applicants have been known to me, so that my votes have been quite impartial. It is, perhaps, well that Mr. McArdell has called attention to the subject, although I do not see how the evil (?) he complains of is to be remedied, unless each year's subscription is to be counted as so many votes. It would hardly be worth while for them to count one; but if the members thought proper to allow each year's subscription to count four, then the men who had subscribed say 12 years would start with nearly 50 votes ahead of those who had not subscribed at all, and so on in proportion. This might be an inducement to some to become subscribers, and could hardly be thought unjust to any. Still, my hope and wish for all the members is, that we may never have to take back our guineas; while every one who has one that can possibly be spared for this charity ought to hasten to give it, and thus enjoy the greater blessedness of giving than receiving. I have only one regret as the urgent cases come before me, that I have been able to do so little for the Institution. Every applicant seems deserving of election, and had all gardeners supported this benevolent institution as they ought to have done, none of the needful ought to be turned heart-breaking-away. Why, if our guinea can but comfort one suffering brother of the spade, or cheer the struggling widow of one true gardener, we can have no richer reward. While taking care to be just to subscribers, let us be also, so far as is in our power, be very pitiful to non-subscribers, and help all who are overwhelmed in common misfortune to the utmost of our ability. We must take care that our charity is not strained by our selfishness or our prudence, but rather let it fall, like the gentle dew from heaven, an unexpected and it may be undeserved blessing upon the earth beneath. *A Subscriber.*

—— In your paper of the 17th inst. there appeared a letter from Mr. J. C. McArdell, which I think ought not to pass unnoticed. In the first place it is well to remind him and your readers generally that the committee have no power to make such bye-laws as he suggests, even if they desired to do so. As long as the present rules are in existence the committee can only do their duty in the way they have done. Every one who has received a voting paper, however, must have noted how carefully, in large type, is printed the number of years a candidate has subscribed to the funds; there has been manifest care taken that no one's claim on that score should escape notice. What more can be done? The votes of those who give their money must determine how the money shall be distributed, and I doubt if any one subscriber is justified in rebuking others for the way in which they give their votes. Such strong language as "an exhibition of dishonesty and cruel perversion of rights" is sadly out of place. If every one has not a right to exercise his own judgment in the matter, it is a farce to issue polling papers at all. Had your correspondent simply said, "The candidate who has shown a wish to help others is best entitled to sympathy," I should not have disputed the correctness of his remarks. Supposing the other claims were equal, no doubt the subscriber is entitled to preference; but that any wrong is done, because a candidate who has subscribed £10 or £12 does not get £16 a-year for life on the first application for assistance, I must deny. Admitting what I have said in his favour, there may be other circumstances which must always influence the voter—the past career and character of the applicant (we all know there are gardeners and "gardeners"); and I for one confess that I voted for one who I knew thirty years ago struggling with ill-health, and never in a position to give, yet a man whom I hold to be a real gardener, and a credit to his profession. Old friendships are sure to influence in these matters: "if he has not been able to subscribe, I have, and I think I have a right to give him my votes." Then, again, the peculiar circumstances of each case, and the age, influence many. I notice the two names your correspondent gives, and I see the successful candidate, who had 600 votes, was 78 years of age. Mrs. Shuard, whose case is no doubt a very good one, and who I trust will be safe next time, is only 65. Some have the advantage of very energetic friends, who solicit for them; but, on the whole, I do not think the friends of subscribing candidates have much to complain of. All over 15 years have got on the list easily, and a glance at the list before last election shows only two names of non-subscribers put on since 1857. Now there are four more, aged 84, 78, 75, and 71. Had we 100 more yearly subscribers (and there are more than 100 men I know who ought to give but do not), all who asked help might have had it at last election. Past success makes us hopeful for the future. When I joined there were 13 pensioners, now there are nearly 60. We have about £8000 invested, and as doubtless for the future outsiders will not have the excuse of being old men before they heard of the Institution, I think it is bad policy for any gardener to withhold his help. If he never needs aid, so much the better; it will be a pleasant thing to remember that in his prosperity he did not forget the weaker brethren. *W. A.*

Depth of Soil for Bedding Calceolarias.—I have much pleasure in answering Mr. Simpson's question. The depth of our soil is about 2 feet. The deeper, for such plants as these, that need a cool and damp bottom, the better. There is no storing tank equal to a deep tilth for holding water. The water supply of this country might be doubled by deepening the tilth one-half. The best manure, if one could get it, for Calceolarias, is half rotten cowdung; 4 inches of this, mixed with a strong loam, will carry these splendidly through most seasons. Last season burned several of our Pelargoniums, killed thousands of Viola cornuta outright, and likewise stunted into flowerlessness a good many of our Calceolarias. But this was an exceptional occurrence; generally they go on wearing their bright golden crowns throughout the summer. Nay, there is nothing to equal them. I find that, even with the addition of manure, ground gets Calceolaria sick. The exigencies of colouring in a large geometrical flower-garden compel us to have the same colour in the same spot, at times, for several years running. I observe a great difference after the second crop of Calceolarias on the same ground. They are not so strong, as they seem in danger of losing the art—so useful as to be well nigh indispensable, espe- in geometrical designs or ribbon borders,—that of continuous blooming. If it can be avoided, never let Calceolarias follow Calceolarias. If it must be so, manure well and deeply; or, better still, transfer the earth to another bed, and give the Calceolaria the Pelargonium or Ageratum soil close by, adding, if needful, a little burnt earth or clay to it with the manure. Where the same plants have to succeed each other for several seasons, it is well thus to transfer the earth in the autumn or during the winter; each plant may thus appear in the old place, and yet the roots be provided with fresh food. By such simple expedients we reap all the benefits of a rotation of crops, while the surface hues of beauty are repeated from year to year. This is an object with those who love repose in gardens, and have reached through years of patient labour, and many failures possibly, to a high state of grouping perfection, and therefore delight in repeating it season after season. Those who prefer a change each year will rotate their crops of flowers in the usual manner, without the exchanging of the soil between beds. But soils deep and moderately rich, and certainly moist, are indispensable for the successful growth of Calceolarias throughout the parching climate of East Anglia. *D. T. Fish.*

The Outdoor Cultivation of Palms.—Some months ago I suggested in your Journal the advisability of allowing some of the smaller hardy Palms at Kew to remain in the gardens during the summer months. In making this suggestion I was guided by what I see every winter on the south coast of France, at Hyères, Cannes, Nice, and Mentone, as also on the western and eastern Rivieras. In these localities the Palms in question, planted and growing in the open air, remain exposed all winter to a temperature which every year, once or ottener, falls to the freezing point, sometimes to two or three degrees below. For weeks at a time, also, the night temperature does not rise above 45° or 46°. Since then I have tried the experiment in my own garden at Weybridge, Surrey, with entire success. On June 12 I planted out 32 young Palms, received from Algiers the previous summer in their pots. The latter were plunged to the rim in the sandy soil, but under each pot I placed a large saucer. Recollecting that Palms, whilst growing, cannot have too much water, I wished by this means to secure a plentiful supply of moisture to their roots. They were watered every second day in sunny weather. The locality was a border exposed in full to the south, and protected from the north by a dense Portugal Laurel hedge, 10 feet high. In this sunny, rather sheltered situation, the Palms have done admirably, and have made a very healthy and vigorous growth. I left them in the border until September 12, when I thought it time to take them in, as the thermometer had gone down repeatedly to 36° at night, and once to 32°. Although I knew that they would stand such a temperature for a few nights, I was not sure that its long-continued repetition might not injure them. I found every leaf in good order, and the roots were coming out of the apertures of the pots, healthy and vigorous. Some I repotted, and found the roots in perfect order. Always finding the roots of Palms that require repotting curled up at the bottom of the pot, like those of a Hyacinth, and having seen at Mentone, on taking down a terrace wall, 5 feet high, the roots of young Palms (four years old), down 5 feet deep, I have come to the conclusion that the pots and tubs usually employed are not deep enough for the natural root action of Palms. I have therefore had pots made by Messrs. Bousey, Brox Potteries, Chertsey—12's, 26 inches deep. In these pots the Palms will be able to strike downwards, as is no doubt their habit in the sandy soils they affect. In such regions the white, ivory roots, no doubt, go down in search of moisture. The Palms look very well in these rather quaint pots—rather like flower-pots placed on columns. One advantage is, that they take less than one half the room that an ordinary pot containing the same quantity of earth would take. Thus they can be stowed away in less than half the space. When thus stowed away in winter, during their dormant state, I have no doubt that they would not be in the least injured by having all their leaves tied together by a string, which would still further help their being stowed in a limited state. I presume as much from what takes place at Bordighera, between Mentone and St. Remo, where there are groves of Date Palms. They are cultivated to supply Italy with Palm branches for Palm Sunday. These Palm branches are quite white, and are thus blanched by being tied together, swathed, during the winter months, so as to entirely exclude light from their tissues. This process does not injure the leaves in the least, although it does the appearance of the Palm tree. When unswathed, if left on the tree, the branches soon recover their natural colour; if loosely tied up in a conservatory, when at rest in winter,

in order to occupy less space, the interference with their natural functions would not by any means be so great. The Palms thus treated have been Latania borbonica, Corypha australis, Raphis flabelliformis, Phœnix dactylifera, P. tomentosa, Chamærops humilis, C. excelsa, and Curculigo recurvata. [The latter an Amaryllid, not a Palm. Eds.] These Palms have been, during the summer, a very ornamental feature in my garden, and will be more so when they become larger. They are now consigned to a cool house, from which we only purpose to keep out the frost, as we did last winter. My impression, from what I see every winter in the South, and from experience during this last year, is, that the more hardy Palms may be grown with ease, and without anything more than protection from frost, for outdoor decoration; indeed, with as little trouble and expense as Pelargoniums or Fuchsias. *Henry Bennet, M.D., Grosvenor Street, Sept.* 24.

Acacia Riceana.—I send you with this a sprig of this graceful Acacia as it is at this season of the year. Unlike the rest of the family, it is useful at nearly all seasons. In mixing with flowers, whether for vase or hand, it is equally effective. It will last for more than a week in any arrangement. For ladies' hair it has been used effectively. It remains in its present state till the month of April; it then opens its flowers, and soon fades away, as all Acacias do; but from the month of August till April it remains in this state. Some of the finest shoots on our tree are 6 feet long, covered with its embryo straw-coloured flowers. *H. K., Floors, Sept.* 26. [A very elegant plant, that should be more grown. Eds.]

A Plague of Flies.—During the past ten days we have been visited with a fearful plague of small flies; indeed, so numerous have they become, that the ground in places is literally covered with them, and the air appears to be full. At times, especially when the sun is bright, it is almost impossible to walk or drive for them without a slight screen over the face. The havoc they are committing is terrible; healthy young Peach trees are so infested with them that the weight actually breaks off the leaves; trees that were healthy and clean a few days since are now covered with green-fly, and are in a dreadful state; the green crops are also suffering badly from their ravages; and if rain does not shortly come, things will be very serious indeed. The Turnip fields adjoining my two kitchen gardens are in a most wretched condition. Has this plague of flies been general? If so, I fear we shall hear some very sad accounts. I remember a similar occurrence some few years since, when at Osberton, but the plague only lasted a few hours. *Edward Bennett, Enville Hall Gardens, Stourbridge.*

Picea Nordmanniana.—There is growing here a fine healthy specimen of Picea Nordmanniana, which has been planted about 20 years, but has never borne a cone till this season. It is a very handsome tree, and the soil here—a heavy loam—seems to suit it remarkably well, it having made an average growth of from 15 to 18 inches every year. The branches are very dense, and regularly disposed from the top to the ground. There are several plants of this Pine planted in the woods here, and, from its healthy constitution and quick growth, it bids fair in time to quite outdo the common Silver Fir. It well deserves to be much more extensively planted than it is. I should be glad to know if it is common for this variety to bear cones in these islands? [No.] *Robert Moulton, Steward and Gr. to the Lord Athlumney, Somerville, Navan.*

Fruit Gathering.—A monthly horticultural periodical has lately put forward two opinions, the fact or fallacy of which is of such serious import to all fruit gardeners, that I am most anxious to have the question settled in your next impression. The one is, that it is not essential to gather fruit (Apples and Pears) dry. [We should say that it is.] The other, that the process of rubbing after the sweating of the fruit (this, of course, as applied to Apples, as Pears do not sweat to speak of) is unnecessary, and, indeed, objectionable. [Quite right.] In addition to the above queries, which are of essential consequence to all gardeners, may I add another? Should stone fruit be gathered at any particular time of the day? [At any time when dry.] Is it injurious to take it when warm from the sun? [We have never heard so.] *A Constant Reader, Cardigan.* [We should like to have the opinions, *pro* and *con*, of correspondents on these subjects. Eds.]

Potatos Grown from Transplanted Shoots.—I beg to inform your correspondent "A. E. Barrett" (p. 1282), that his method of growing Potatos from transplanted shoots is not a new idea. The same thing was practised by me as far back as 1854, also by the late Mr. Gould, nurseryman, of Redditch, who grew a very large crop of Alstones the year after he witnessed my crop at Perdiswell Hall. I have always practised the one-stem system, and have recommended it several times in this Journal. The method of propagating by shoots was also recommended by me, early in the spring of this year, in these pages, in my comments on the Fifty Dollar Potato. By the above method I made 132 sets from four tubers of the American Rose. This spring I adopted rather a novel, if not original, plan of increasing Potatos by shoots. The Countess of Stamford and Warrington had some half-dozen Potatos sent her, which were forgotten at planting time, and were not thought of until the beginning of June; the shoots were then drawn up a foot or more in length, and quite bleached. These I exposed a few days to harden, and then cut them in lengths about an inch long, or sufficient to just obtain one eye. These I planted in pans just as I would the eyes of a Vine; in a few days nearly the whole of them started into growth, and within a fortnight from the time the Potato shoots or eyes were planted, I called the attention of the Earl of Stamford to the method I had employed to increase the half-dozen tubers entrusted to my care. The shoots were all planted in the open ground, and, notwithstanding the late season for planting, and the hot, dry summer, they have yielded above my expectations. We are told there is nothing new under the sun, therefore I cannot claim the method I adopted as original. *Edward Bennett, Enville Hall Gardens, Stourbridge.*

Echeveria secunda glauca.—Mr. Simpson has called timely attention to this singular and most useful bedding plant. I am indebted to him for a pinch of seed, which I sowed about a year ago, and I am now the fortunate possessor of 400 of this very desirable succulent. At present they form the groundwork of a square, in which are dotted over the surface a dozen fine plants of Echeveria metallica, edged with the Sempervivum californicum, and though only yearlings, they are covered with its uncommon-coloured flowers, and which, no doubt, as Mr. Simpson says, would look well mixed with blue Lobelia, although I prefer all these singular-looking plants in a bed or border by themselves—anyway it is a plant that commands attention from all visitors to the gardens, and hence it deserves to be encouraged by gardeners. *H. Knight, Floors.*

Foreign Correspondence.

Crops in South Australia.—His Excellency the Governor of South Australia directs the publication of the following paper, read by Dr. Schomburgk before the Chamber of Manufactures, for general information:—

The efforts of our agriculturists have now to a considerable extent to be directed to other objects than that of Wheat growing, which has reached its utmost limits—a contingency that cannot surprise, and that no one has ever doubted must sooner or later arrive. To Wheat, which has hitherto engrossed almost exclusive attention, other paying products must be added from which our agriculturists may derive an income; the time having passed when Wheat growing alone was the safest and most profitable occupation. The fertility of large tracts of our soil has been already exhausted for want of attention to the warnings of science. Warnings such as these, constantly repeated, were less heeded than they ought to have been. The vital question with us is, What shall we do—which are the plants practical and useful to add to the ordinary occupation of our agriculturists? I am sorry to say they are not so very numerous. The peculiarity of our climate, especially the continuous droughts, are not favourable to many useful commercial plants; they are decidedly averse to tropical and subtropical agriculture. But for such we have now an extensive, fertile, and promising field at Port Darwin, of which I will speak hereafter. The task of introducing any new industrial plant is not an easy one. We may know all about the structure of such a plant, its life, its distribution, its culture, its use—we do not know it completely, because for our particular purpose we must know also its natural enemies. Another question—and I think a very important one—Will the new industrial plant pay, when we have to compete with other countries where wages range lower? and how long will it be before we can derive a profit from its culture? Many will shrink back from the experiment, rather than wait for years to elapse before a profit can be returned. We are too much used to cereal growing, which no doubt gives the quickest return, and which till now has retarded the introduction of such plants as require the lapse of years before such can be obtained. But we must not blame the South Australian agriculturists for such alone. No; such an antipathy for new industry plants is evinced over the whole civilised world, until a successful pioneer has found its paying qualities. I will mention only one instance. The introduction of the Potato in Prussia met with great impediments. The Government distributed a certain number of Potatos in every district; many of these were tasted raw by the people and thrown away, until they were forced by law to plant and account for them. The question has been very often brought before the public, Are there are no localities in the colony where we could grow sugar, Coffee, Tea, and Cotton? Such an attempt would only lead to a total failure, the plants above-mentioned belonging exclusively to tropical agriculture, for which our southern climate is not at all adapted. I may say there is no doubt that Sugar-cane will grow in several localities in the colony, but if with profit is the problem.

Our southern climate is not adapted for sugar cultivation by the cane. The cultivation of Coffee also is not worth the thought. I think there is not a more delicate plant, especially when in bloom, than the Coffee. In British Guiana, where I resided five years, which is situated under 7° latitude, the Coffee plantations are sheltered by large trees to protect the plants, especially during the flowering season, against cold winds. What would become of them here with our cold southern wind? In some favourable places in our gullies Tea might grow. Generally where the Camellias are growing the Tea plant will; but if with profit is another very doubtful question. Cotton growing was several times attempted, and always a failure, as the crop depends entirely on favourable wet summers, with which we are not often blessed. It is no criterion if we see or hear of a few plants growing luxuriantly, and producing a few fine pods under extraordinary circumstances. That Cotton could be cultivated extensively as a staple with profit in South Australia is a chimera. It is my firm belief that tropical agriculture in South Australia would be a total failure—capital and time would only be lost. Why venture such, while we have the most promising and unfailing field for such at Port Darwin?

Sericulture.—The importance of introducing sericulture into South Australia is undeniable, as we have clear evidence of the adaptability of our climate to the production of an excellent quality of silk, for which the demand is now unlimited, in consequence of the disease amongst the silkworms prevailing in the silk-producing countries in Europe, and unknown here. Considering how the silk manufacture increased for centuries, and still continues to do so, the demand can never fail. To facilitate the scheme, I made inquiries in Europe as to what kind of Mulberry was now considered the best for feeding the silkworm, and introduced the seeds, and offered for distribution the young plants of the most approved kinds; but I am sorry to say the demand for these was very limited, and I hailed with delight the judicious act of the Government to provide the means for laying out the first Mulberry plantation in South Australia at the Magill Orphanage, where my surplus stock could be used. There is no doubt that the production of silk will become one of our future and most important industries, which will at the same time be a practical and useful aid to the ordinary occupation of our farmers. As the silk manufacturers now prefer the cocoons to the reeled silk, this will save a good deal of tedious work of sericulture. In regard to the growth of the Mulberry throughout the colony, we may say they grow everywhere. We find the trees growing at Glenelg and Brighton close to the beach in sand, so luxuriant, even as in the hills or elsewhere. In Italy, as I understand, sericulture is divided into three different branches, namely, the growing and selling of the Mulberry leaves, the rearing of the cocoons, and the reeling of the silk; and in comparison with the work spent, one pays as well as the other. I will also not go into the dry details of figures as to the enormous amount of money which is spent in producing silk; but will only call your attention to the extraordinary fact that the sum paid for silkworm eggs from China and Japan is yearly about £100,000. I am expecting by every mail a quantity of Mulberry seeds, and probably next season will be prepared to distribute a number of Mulberry plants. This I find is a good plan to lay the basis of new industries. There are many people who shrink back from the trouble to procure seed and raise the plants, but if they can get trees they will plant them. I may also mention here, that after many trials of different kinds of Mulberries for the food of the silkworm in the silk-producing countries have been made, the white Mulberry (Morus alba) is considered now the best; but a variety (Morus multicaulis) is used for the young worms, beginning to leaf four weeks earlier than Morus alba, and this kind should not be omitted in any Mulberry plantation. Before closing the chapter on sericulture, I cannot omit to mention the names of Mrs. S. Davenport and Mr. G. Francis. Both have been indefatigable in promoting sericulture.

Flax and Hemp.—We may say, and with gratification, that the energetic and enterprising farmers in the South have laid the basis of a new and probably remunerative industry—that of Flax growing. Many years elapsed before an attempt was made, and the country has to thank the Rev. T. J. Smyth, of Kapunda, who in an able and persevering way recommended the culture of the Flax in this colony, for the result. If we consider the unfavourable season the Flax-growers had to contend with, the first result is in every way most encouraging, and I hope for the well-doing of the colony that other districts will follow the example, as there is no doubt that Flax will grow in most of our districts, and yield a fair return. I would also call the attention of the farmers to the growth of the Hemp plant, another saleable article, much sought after in the home markets both for its fibre and its seed; the latter is noted in the last price current at 44s. to 48s. per cwt., and, considering the heaviness of the seed, it yields a remunerative price. The Hemp plant will grow in any kind of soil, and could probably be grown throughout the colony with profit; and to show what an important plant Hemp is, which produces one of the best cordages, that the last three quarters 1050 tons of cordage and ropes have been imported.

Beetroot.—I come now to another industry, of which it is pleasing to notice the basis will be also laid this season by the same enterprising men in the South. I cannot speak from experience, but I am confirmed that the soil and climate, especially in the neighbourhood of Mount Gambier, is most admirably adapted for the growth of the Beetroot, for the manufacture of

sugar and other purposes. According to the latest statistical news from home, there are at present 1184 beet-sugar works on the Continent in Europe, and the total produce of these is about 4½ million cwt. of sugar annually; upon an average about 4000 lb. is obtained from 500 cwt. of Beet, and this quantity is the yield of about 2½ acres. The refuse after the sugar is extracted forms an excellent article of food for cattle, and is even considered better than any specially cultivated for the purpose; a good quality of paper is also made from it. The molasses is also used up for fodder, not being fit for sweetening on account of the mineral salts it contains. As before mentioned, there is no doubt that the Beet will grow in many districts of the colony, and if we can produce the beet-sugar for the same price as imported cane-sugar, it will become a flourishing industry; and then we must consider the fact that with a beet-sugar manufactory the fattening of cattle must be connected, which also will produce a fair return. But this is not all: the farmers, by Beet growing, will have the advantage of a rotation crop, as the want of such is severely felt in South Australia. In Prussia, where beet-sugar manufactories are established, no cereal fields are observable for miles around—the eye only meets Beet fields, such paying the farmer far better than cereals.

Hops.—Of this very important plant we have already proof of successful growth in the samples of Hops shown by Mr. T. Kleinschmidt, of Lobethal, and Mr. Bell, in Encounter Bay. It is true we have not many favourable districts in the colony for the profitable growth of this so valuable plant, but there is no doubt that in other districts besides the above-named suitable spots will be found. I am sorry to mention that I tried several years to introduce the male Hop plant, such being considered in a Hop plantation valuable for the production of seed, which, it is said, improves the flavour of the Hop materially.

Tobacco.—There is no doubt that many districts of the colony are well adapted to the culture of Tobacco. Much attention was given to its cultivation in the early days of the colony, and superior Tobacco was made, but its culture became entirely neglected when the high prices of Wheat which have since ruled made that culture more remunerative than that of Tobacco. I remember in the year 1850 seeing at Lyndoch Valley a Tobacco field which attracted not only my attention, but created my surprise and admiration, having scarcely seen better plants during my travels on the Orinoco. I will not maintain that the South Australian Tobacco would, or ever will, surpass the South American or West Indian in flavour, but no doubt we may produce a fair sample, just as good as is produced on the Continent.

Zante Currants, Sultana and other Raisins.—Our first sample of Zante Currants sent to Melbourne are considered by our neighbours as of excellent quality, superior, cleaner, and of better quality than that of the imported ones, and we in South Australia till now have thought little of them. If we consider that the annual import of dried fruits into the Australian colonies is generally more than £120,000, and as we know that our climate is in every way favourable to these productions, is it not surprising that no more attention has been paid to these sources of profit? I would strongly recommend all the vignerons, especially the smaller ones, having from 1 to 3 acres of vineyard, to graft all the worthless kinds of Grapes, which abound in our vineyards, and from which they never will derive a great benefit by selling such Grapes at 30*s.* to £2 a ton, with Zante Currants, Sultana and other Raisin Grapes, which will be found more profitable than the unpalatable wine hitherto for the most part produced. It is gratifying to me to have added something to this extensive branch of industry by the introduction of the Sultana Grape, which is regarded by the vignerons with extreme satisfaction. I may say that, from information received, probably more than two-thirds of the 1100 grafts I distributed last year have grown, and this valuable Raisin, which commands the highest prices in the European markets, may be considered as established in the colony. Very little attention has also been paid to the drying of Apples, Apricots, Plums, Figs, and some other fruits, from which some profit could be derived, but which, unfortunately, are frequently left to rot on the ground.

To be Continued.

Societies.

Bury Horticultural.—The autumn show of this Society was held on Friday, September 16, in the Corn Exchange, and although it had not the advantage of the attractions offered at the summer show, the display of fruit brought together a large number of visitors. The show exhibited no falling off, and although flowers were quite subordinate to fruit, the former were well worthy of inspection. In the classes for stove and greenhouse plants Mr. Fish, gr. to Lady Cullum, and Mr. Squibb, gr. to the Marquis of Bristol, again had to fight a friendly battle, and both were successful, one taking the prize for a stove or greenhouse plant in bloom, and the other the prize for four distinct varieties. For Fuchsias Mr. Fulcher came first, with four very fair plants. Mr. Snelling also exhibited some nice small specimens. The Zonal Pelargoniums were very good, especially the six shown by Mr. Fish; Mr. Barrett had the double Pelargonium class all to himself. There was a large and very good show of Coleus, and being ranged down one side of the Corn Exchange, their dark and beautifully variegated foliage formed an effective background to the flowers and fruit. Mr. Squibb showed four very good Ferns, taking the 1st prize, and Mr. Fish also took 1st prizes for hardy Ferns and Lycopodiums. The single Petunias were good, but the double ones were not equal to those of former years. The Dahlias were perfect, and the show of this flower was a very large and good one. Mr. Southgate, gr. to R. J. Pettie Ward, Esq., Finborough Hall, carried off the 1st prize in three of the classes, Mr. Raynham, gr. to Rev. T. Anderson, Felsham, being 1st for the best six fancy varieties. E. Greene, Esq., M.P., offered three prizes for the best 36 Dahlias, distinct, and Mr. Raynham took the 1st prize, beating Mr. Pettitt, of the Botanic Gardens, who run him close. Of Asters also there was a splendid display, one that has never been surpassed at this show; and here again Mr. Southgate was first in the field. The Hollyhocks were good, as also were the Marigolds, Mr. Clarke, of Bury, taking the 1st prize.

Of the fruit show we may say that it was one of the finest to be found out of London, several of the classes deserving especial attention. Mr. S. Barrett sent some fine large kitchen Apples, and the dessert kinds were also very good. Among the Pears there were no fewer than seven dishes of Williams' Bon Chrétien, proving that the celebrity this variety has obtained is well deserved. The Currants were well preserved, and so were the Cherries. There was a large and very excellent show of Filberts and Nuts, Mr. Grieve, gr. to Rev. E. R. Benyon, sending a dish of Cob Nuts, and another of Filberts, which called forth the admiration of every one. Amongst the Plums Coe's Golden Drop was predominant, and there were some nice dishes of Magnum Bonum. The Nectarines and Peaches were also excellent. The black Grapes shown by Mr. Squibb were very good. Mr. Fish and Mr. Squibb sent baskets of fruit, most tastefully arranged, and apparently pretty nearly equal in point of merit, but Mr. Fish was adjudged 1st. Greengages were not so good as usual, the season being late for them. For Mr. Clay's prize for the best six dishes of dessert fruit there was a good competition, the dishes being tastefully arranged at the bottom of the table. Mr. Squibb took the prize, but Mr. Powell had a very fine dish of Victoria Plums, and also some good Grapes.

The Ladies' 20-guinea Cup, not competed for at the Royal Show at Bury, was offered as a challenge prize, three years ago, to the exhibitor who could take the greatest number of 1st prizes for three years in succession. For the first and second seasons it was taken by Mr. Fish by a large majority. This year, owing to the alterations in the schedule, an increase in the number of exhibitors, the abolition of the May show, and other causes, Mr. Fish's majority has not been so large. He, however, again carried off the cup by a majority of eight above all other competitors, and it now becomes his own property.

Florists' Flowers.

Chiswick has looked up this season, notwithstanding the boding cloud of promised desolation that hung over it at the early part of the year. It was not to be expected that it would tamely yield up all of that heritage of kindly attraction bequeathed to it by its glorious past, and though something akin to an appearance of general abandonment came down on that particular spot where the two files of small circular beds used to be filled with Pelargoniums—to the delight of the eyes of some, to the bewilderment of those hapless cultivators who used to go there to make a selection, and found how much alike many of the reputed varieties were, and to the general mystification of everybody else not affected with the then prevailing floricultural epidemic, the Pelargonium fever, now somewhat subsiding—yet brightness broke out smiling elsewhere; and, among other things, a batch of Pentstemons were not only very attractive, but highly interesting. Scarcely has any flower shown such a marked advance in the way of improvement as this during the past few years. Mr. Barron, who seems determined to have something worth looking at, at Chiswick, let what will come, had not only a nice plantation of Pentstemons, but one of herbaceous Phloxes also, though it is only of the former that this paper will treat.

With the march of improvement two things appear to have gone hand in hand, viz., increased size and finish in the flower, and so much of variation in point of colour as to admit of there being classes in various groups according to the prevailing hue. In noting the collection of Pentstemons growing at Chiswick an attempt was made to group them, and the start was made with those flowers having the tubes of the deepest hue of colour. These may be included under the head of claret-crimson, having this shading predominant. The group gave Black Prince, dark claret-crimson, with pencillings of the same in the white throat, the darkest of all; Castor and Pollux, not quite so dark, white throat slightly stained with violet; Mulberry Superb, deep purplish crimson, the throat marked with the same; Stanstead Surprise, purplish crimson, with a few faint lines on the throat—a very fine flower; and De St. Paul, bright reddish claret, white throat, with heavy purple pencillings—a very fine and showy flower. Those showing on the tube a prevailing hue of purple were represented by—Purple Perfection, clear violet purple, with white throat marked with purple lines; Regalia, deep purple, marked on the interior of the tube in the same way; Georges Sand, deep violet, white throat, slightly pencilled with violet; and Miss Carnegie, pale purple, white throat much covered with thin lines of purple. Violet-coloured flowers were seen in Marie Held, deep violet, with white throat slightly stained with violet, very dwarf and compact in growth, yet freely branching, and wonderfully prolific of flowers; Mons. Albert Robert, violet, the inside of the tube stained with dark maroon; this and the foregoing were very fine and distinct. Lovely, pale violet, pure white throat, distinct, and very fine; and John McPherson, pale violet, tinted with blue, white throat, pencilled with violet lines; very distinct and good. Regarding these violet-coloured flowers, it may be stated that they are very charming indeed, and among the most beautiful and distinct of the improved varieties. Paler in colour, but very pretty, and highly necessary in a collection, were the lilac-tinted flowers. Of these there were Mrs. McHardy, lilac tube, the white throat pencilled with pale violet; and Richard Lenoir, pale purplish-lilac, pure white throat, dwarf and compact in habit, and very beautiful. Crimson-coloured flowers were represented by Albert Tardieu, rich deep crimson, white throat pencilled with the same, very fine; Grande Conde, rich crimson, not quite so deep in hue as the foregoing, the throat not so heavily pencilled; both these are of very fine quality. Le Conquérant, crimson, tinged with claret, throat slightly pencilled with dark red; and James Rothschild, deep reddish-crimson, the white throat slightly marked with fine lines of the same. Of red or scarlet tubed flowers, there were Alfred Pillen, deep red, the throat stained with dark maroon, very fine and showy; Bon Villageois, bright red, white throat slightly pencilled with the same, a very fine and striking variety; Colin Bell, shaded red, the throat pencilled with dark purple; and Apollon, with slight lines of purple on the throat.

The presence of certain dwarf-growing varieties, which have been obtained from France, will be welcomed by those who cultivate in pots for exhibition purposes. Such flowers as Marie Held and Richard Lenoir represent a type admirably adapted for the purpose. Conjoined with a free branching, yet compact growth, is a singular wealth of flowers, and that is the very kind of thing required for pot work.

Notwithstanding the dry season, and the fact that Mr. Barron had not been able to give them much attention, the Pentstemons at Chiswick bloomed remarkably well, and served to indicate what they might have done had they been favoured with more moisture at the roots, or some mulching. If not required for beds or border purposes, a plantation of them should be grown in every place requiring a constant supply of cut flowers. As soon as the leading shoot is removed, numbers of side branches appear, and the main of these carry a spike of flowers also. They are most valuable as decorative agents, planted in two or three lines in the middle of large beds; in mixed borders they are so useful that the best manner in which to sing their praises is to state that such a border ought not to be without some of the fine varieties now in cultivation.

K. D.

Garden Memoranda.

Wimbledon House, Surrey, the Seat of H. W. Peek, Esq., M.P.—This establishment, so historically interesting to horticulturists, is situated about 10 miles from London, at the south-east extremity of Wimbledon Common, and about one mile from the Wimbledon Station on the South-Western Railway. The grounds consist of about 85 acres, and once belonged to Bond Hopkins, Esq., for whom it was laid out about the middle of the last century. The place is, however, better known from having been the home of Mrs. Marryatt, and of her son, Captain Marryatt, the great novelist. In the palmy days of Chiswick, the names of Mrs. Marryatt, and her gardener, Mr. Redding, were household words in all places where horticulture was cherished. She was an enthusiastic admirer of flowers, and especially of the hardier kinds of herbaceous plants with which she used to adorn her flower garden in the good old days when the "colour" mania was undreamt of. The flower garden at that time was said by Loudon to be perhaps unrivalled in the neighbourhood of London for the number of species and varieties of herbaceous plants which it contained. In addition to these, the collections of stove and greenhouse plants were probably second to none; and the botanical works of 30 or 40 years ago prove that not a few of those classes, as well as of more hardy plants, were flowered in the gardens at Wimbledon House for the first time in this country. Since the estate passed into the hands of its present owner, the member for Mid-Surrey, the gardens have been greatly altered and improved from designs furnished and carried out by R. Marnock, Esq., the late highly respected superintendent of the Royal Botanic Society's Garden, Regent's Park. Those who remember the place under the old *régime*, will be better able to form an idea of the extent and style of the improvements made than we can tell them, our duty being to point out a few of the principal features and characteristics of the place as we had the pleasure of seeing it a few weeks since.

After being in the grounds a short time the completeness of the estate as a suburban residence is remarked, the whole lying compactly within a ring fence. On the left-hand side of the mansion—a commodious and substantially built edifice—stands a large and elegant span-roofed conservatory, which is in connection with the household apartments. The roof of this structure is

partly supported on iron pillars, to which are trained such climbers as Mandevilla suaveolens, Lapageria rosea, Passifloras, Tacsonias, Bignonias, Edwardsias, &c. The walls are well covered with Acacias, Wistarias, Pelargoniums, and other subjects, and the body of the house is filled with fine-foliaged and flowering plants, such as Coleus, Cannas, Fuchsias, Pelargoniums, some remarkably well-grown specimens of Vinca rosea. Humea elegans, Balsams, and Lilium auratum, whilst a small collection of hardy and exotic Ferns forms no mean portion of the display. Leaving the conservatory we passed to the eastern front of the mansion, noticing on the way two handsome tripod vases, made in iron, filled with bedding stuff, and which admirably suited the positions they occupied. Most noticeable at this spot were some fine clumps of vigorous growing Rhododendrons, beautiful specimens of the deciduous Cypress, Taxodium distichum—a most effective tree for planting singly on lawns where the pleasure-grounds are extensive—and as handsome a specimen of the Maidenhair tree, Salisburia adiantifolia, as can be seen anywhere. It is very free in growth, and is well furnished with foliage of a bright green tint. To keep the tree in health and beauty through the remarkably dry period from which we have now happily emerged, its roots had to be continually supplied with moisture, which had the desired effect, and amply repaid the labour expended. In front of the mansion a new terrace has been made of considerable length, which slopes to the flower garden, some 3 or 4 feet below. From this "coign of vantage" a beautiful view of the distant country is obtained, through the natural falling of the grounds in a gradual manner, the picture being moreover heightened in beauty by several fine pieces of water. Running along the terrace is a chain of flower beds, very neatly planted, whilst in the garden below a series of small beds are so arranged as to form in outline a large square, in the centre of which stands a noble vase. Here, as on the terrace above, the planting and arrangement of the colours used had been very successfully accomplished. Amongst the plants used were two which deserve a word of commendation—Ageratum Prince of Wales, a dwarf, compact growing variety, studded with its bright blue flowers; and the common Houseleek, which had been planted round alternate beds. They flowered very freely, and gave great satisfaction. On the lawn are some excellent standard specimens of Portugal Laurels in tubs; also a fine pair of variegated Aloes, several beautifully grown Wellingtonias, with specimens of Cedrus atlantica and Picea Pinsapo to match; whilst forming the belt of trees on the right are handsome Hollies, both green and variegated, Araucarias, the Mulberry tree, and remarkably handsome evergreen Oaks; indeed of the latter there is here a fine collection, which is much prized by its owner. Two large and remarkably fine specimens of Quercus Fordii had recently been transplanted with great success. On the opposite side is a large old-fashioned orangery, and near it is an old Cedar of Lebanon, bearing a crop of young cones on its topmost branches, and a little further on is a large specimen of the Snowdrop tree, Halesia tetraptera, covered with its Beech-nut like fruit. This is usually seen in the form of a bush, but here it has grown to the dimensions of a good-sized tree.

From hence we proceed to the flower garden, the entrance to which is through a fine piece of rustic arch work, at the bottom of a beautiful avenue of Elms. At either end of this avenue are pairs of statues, which represent prominent characters in the works of Sir Walter Scott. The first pair is the "Knight of Buccleuch" and "Louis XI." the leading characters in "Quentin Durward;" and the second, "Captain Dugald Dalgety," who will be recognised by all who have read the "Legend of Montrose," faced by the celebrated Covenanter, "Balfour of Burley," celebrated in Scott's "Old Mortality."

On the right of the avenue the eye is caught by a fine expanse of water of about 7 acres, of an irregular outline, and margined with trees and low-growing shrubs, whilst on the left is the mill field containing some noble Elms, and a fair portion of an old mill, which is now tenanted by a pair of large Australian Emus (Dromaius Novæ Hollandiæ). Formerly the road into the flower garden ran straight through the rustic work before-mentioned, but a new road has been made on the left, and the farther end of the archway is now filled up with a choice collection of British Ferns. The new path runs parallel to the outer boundary, from which it is divided by a border of moderate width filled with Rhododendrons and the usual description of border plants, and the paths in this direction are all edged with very large shells, such as cottager's are wont to prize for the decoration of their mantelshelves. From the boundary the ground naturally slopes gently to the centre, where there are two fountains which are nearly always kept playing. On the east side it is bounded by a magnificent range of glass, erected some two or three years ago by Mr. Gray, of Chelsea, and of which a fine view is obtained at nearly all points. There is something so natural and yet charming in the composition of this garden, as to rivet the attention of the visitor in a very marked manner. To describe it would require the pencil of an artist, but when we say that the choicest of shrubs and trees are planted judiciously, and yet with studied ease, over its surface; that there is no particular typical form of bed employed, that there are no two of these planted alike, and that the balance between foliage and colour is so evenly kept and regularly fixed as to be in perfect unison one with the other, then the reader will gather some idea of the quiet but charming beauty of the place. Amongst the shrubs and trees employed the most noticeable are Irish Yews, Rhododendrons, Magnolias conspicua and glauca, Cryptomeria elegans, Salix babylonica crispa, Cupressus Lawsoniana, Taxodium distichum, Pyrus japonica, Andromeda floribunda and A. speciosa, Almonds, Hollies, and Wellingtonias, of which latter the place is rich in handsome specimens. Roses are also extensively used, and there is a very attractive rustic Rose garden. The greatest novelty amongst the bedding plants was a dwarf-growing, white-flowered Chrysanthemum, which continues in bloom all through the season, and is largely used for bedding-out and pot-culture for the conservatory, for which latter purpose it is extremely useful at this season of the year, when such structures are generally less gay with flowers than at any other time.

The noble range of glass alluded to above stands on a terrace overlooking the flower garden, and is about 220 feet in length, divided off into several compartments, having a small lobby at either end and a large dome in the centre. Entering the range at the southern end we commence with lobby No. 1, which contains a small collection of Ferns and other plants, with Cobæa scandens growing away vigorously up the roof. The next division contains a miscellaneous collection of greenhouse plants, Ferns, Begonias, and a neat group of Cotyledons and Crassulas, with Cobæas and Passifloras on the roof. After this comes an intermediate house, with a portion divided off, so that such operations as potting can be carried on in the same temperature as the houses, without subjecting the plants to a chill by carrying them through the open air to a distant potting-shed. Then comes a collection of choice stove plants and Orchids, the latter nearly all recently imported plants, which are establishing themselves in their new home in a very satisfactory manner. The collection of Orchids is not at present a large one, but it is the intention of Mr. Peek to increase it at convenience to a considerable extent. The division in this house which corresponds with the potting place in the former is constructed internally as a fernery, and fitted up in a very tasteful manner. We next enter a spacious and delightfully cool corridor, the walls around being covered with such ornamental and useful climbers as Heliotropes, Passifloras, Abutilons, and Clianthus magnificus, &c. Then comes the central division, which is crowned with a noble dome, and has a fine specimen of Seaforthia elegans in the centre, whilst around the sides are a collection of large specimen plants, most notable amongst which was a grand bush of Tabernæmontana coronaria, producing a profusion of its beautiful white flowers. Passing through another corridor corresponding with the former we enter the aquarium-house, in the centre of which is a large tank, heated with hot-water pipes, containing a collection of the choicer and more interesting examples of tropical aquatics, as well as Palms, Musas, and Pitcher-plants, &c. Stove and greenhouse plants occupy the next compartment, and the last contains a neat group of Azaleas.

Behind this range stands another of fruit houses, also newly erected, on modern principles. No. 1 is the late vinery, and is planted with such kinds as Gros Guillaume, Trebbiano, Lady Downe's, Alicante, &c.; these Vines are now three years old, and are making good progress. No. 2 is filled with Muscats, and No. 3 contains Black Hamburghs, which are forced for the first crop. No. 4 is the fruiting Pine-stove, containing the second batch, principally of Queens, which has been ripened this season. The plants, which are grown in pots and plunged in cocoa-nut fibre, presented a very clean and vigorous appearance, and were showing well for fruit. No 5 is the early Peach-house; the next is also filled with the same, but a little later. The trees were healthy and robust, and carried a good crop of fine fruit. No. 7 is a vinery, containing old Vines, which have been transplanted here from one of the old houses, which has been levelled by the march of improvement. These old Vines are favourites of Mr. Peek, who spared their lives, and they appear to appreciate their respite, if we may judge from the progress they have since made. They cannot, however, talk; but have finished off a very good crop of fruit, which, in their case, is a better qualification. During the winter and early spring months this house is converted into an orchard-house, as it is filled with a collection of fruit trees in pots, which remain here until they can be removed with safety from frost into the open air. The borders are made inside and out of the whole of this range, the outside portion of which is not yet completed, a little being added to it every year, instead of following the orthodox manner of making the whole at once. The whole are confined within the limits of a brick wall, and are well drained, to carry off any excess of moisture. The heating of the whole of the houses above noticed is accomplished with one of Gray's large upright tubular boilers, which does its work well; though another one of the same size is fixed in close proximity, which can either be used conjointly, or remain as a reserve in case of accidents.

The kitchen garden, a large walled-in enclosure, lies to the left-hand side of the grounds, at the back of the flower garden, and on the corresponding portion on the right hand stands a block of model farm buildings, complete in every detail. In the kitchen garden, the whole of the large old standard trees have been removed, to let light and air on to the vegetable quarters, which latter are well stocked with good examples of Celery, French Beans, and such things as are usually classed as "winter stuff." We also noticed a row of the Chinese Yam, Dioscorea Batatas, which are annually grown for their roots. The tubers are set in the open ground as soon as the spring frosts are over, and stakes are inserted amongst them for the tops to cling to instead of lying on the ground. When they have completed their growth in the autumn the roots are taken up and stored away for winter use, like Carrots, Parsnips, &c. New Strawberry plantations are made every year, the plants which are forced in the spring being planted out to produce the next season's supply. The varieties most largely grown are Dr. Hogg, Eclipse, Oscar, Marguerite, Empress Eugénie, Keens' Seedling, and Vicomtesse Hericart de Thury for dessert, and Grove End Scarlet for preserving. Asparagus and Cardoons are largely and very successfully grown, a row of the latter showing wonderful health and vigour, notwithstanding the great want of moisture experienced during the summer. We were also pleased to see a very neat border of herbs, well grown and neatly labelled, a practice which might be adopted with advantage in other establishments. The walls are planted with Peaches, Nectarines, Pears, Plums, &c., and amongst other things a well-trained Mulberry tree, which is grown and trained in a similar manner to the Moorpark Apricot, the young spurs being retained for fruiting. The training seems to have altered the character of the leaves, as they are much more deeply lobed than when grown in the tree form. Passing from the kitchen garden we enter another enclosure, containing a row of Melon pits of some 24 lights, and several successional Pine-stoves and forcing-houses. Most of the hard-wooded greenhouse plants are placed out here in the summer, and along with them was a large quantity of Chrysanthemums, Cinerarias, &c.

From here we proceeded, through an open yard, past the young mens' rooms, of which we gave a figure at p. 1215, to another kitchen garden, which has recently been made, and in the left-hand corner of which stands the gardener's cottage, a new, substantial, and very convenient structure, in the Gothic style of architecture, and quite a palace in comparison to the ordinary residences at the service of head-gardeners. The principal path, and, indeed, most of the others, are edged with curved tiles, and next to them is a row of cordons some three or four years' old, and then a row of Strawberries, with a line of beautifully-trained pyramidal Pears, about 12 inches in diameter of the branches at the bottom, and well furnished all the way up, and bearing a nice crop of fruit. Between these are fruit-bearing plants of the autumn bearing Raspberry, carrying a good crop of fine fruit. The cross walks are lined with pyramidal Cherries and Plums, and dwarf, bushy Apple trees. A path leads out of this garden through shrubberies and glens, and past rockeries, ferneries, and plantations of choice Coniferæ all round the estate, and the scenery is very pleasingly varied with glimpses of the surrounding country, and of the different sheets of water, whilst in remote corners the interest is relieved with shell grottoes, rustic summer-houses, &c. The whole of the gardens and grounds are under the skilful management of Mr. Henderson, a practical and enthusiastic gardener of the modern school of practitioners.

Miscellaneous.

LONDON GARDENERS IN THE OLDEN TIME.—The following may be interesting, as illustrative of the manners of the gardeners in the olden time. In 1345 (19 Edw. III.) "the gardeners of the earls, barons, and bishops, and of the citizens of the City of London," petitioned the Mayor, John Hammond, that they might "stand in peace in the same place where they had been wont in times of old, in front of the church of St. Austin, at the site of the gate of St. Paul's Churchyard, there to sell the garden produce of their said masters, and make their profit." But the Mayor, finding that "the scurrility, clamour, and nuisance of the gardeners and their servants there selling pods, Cherries, vegetables, and other wares to their trade pertaining daily, disturbed" the priests in the church of St. Austin, as well the reputable inhabitants, ordered that henceforth the gardeners "should have as their place the space between the south gate of the churchyard of the said church and the garden wall of the Friars Preachers (Black Friars) at Baynard's Castle." *City Press.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Now that the decrease of light is so perceptible, and natural influences have so little that is conducive to the growth of plants that require more warmth than is naturally found in our climate, it becomes important that we should make the most possible use

of what sunshine we are favoured with, especially in regard to *Hard-wooded Plants*, the young growths of which it is necessary should be well ripened for the production of fine flowers, and plenty of them. For this purpose a good maximum temperature, so far as is practicable, should be maintained, by means of the sun's warmth, on every possible occasion. This, however, let it be well understood, should be used in conjunction with a free admission of air, and a moderately dry atmosphere, and without a too plentiful supply of root moisture. Keep all *Ericas* as cool as possible during warm periods at this time, so that they may not be forced into a weak and imperfect growth. Expose the rarer kinds to all the influences of sunlight and air by setting them up prominently in such structures as they are grown in, and be particularly cautious as regards the watering, so that the roots may receive no check through being over-glutted with moisture at this time, and that the soil in which they are growing does not become sour. There is a possibility that a frost of some few degrees may occur during any night from this date; hence it will be necessary to act with caution, so as not to expose the plants too greatly by leaving too much air on during bright nights, such as are at all likely to precede a frost. I may also suggest that a gentle but certain decrease of both warmth and moisture must be discontinued in regard to *Orchideous plants;* this in order not only to gently check their growth, but also the better to harden off such as is already made. Let no kind of greenhouse plant remain exposed out-of-doors after this date; indeed it is possible that before these remarks are read a sharp frost may have been experienced, acting as an additional reminder to what I suggested a week or two ago.

FORCING HOUSES.

Lose no more time in pruning such *Vines* as are intended for early forcing, in all instances where the operation has been delayed. It may be almost needless to add that some progress in the matter of preliminary preparations may be made by giving the structures containing them the necessary thorough cleansing, painting, white-washing, &c. These remarks apply equally to such *Peach* and *Nectarine houses* as are intended to be forced early. It is a very judicious procedure to apply Thompson's Styptic to all those wounds made in pruning very strong branches, for whilst this preparation stops the wounds from bleeding, it is but reasonable to suppose that it also prevents the too free ingress of air into the vessels of the wood,—the admission of which, it is needless to remark, is opposed to the natural order of things. Some kind of protection might be given to the earliest vinery if heavy rains should fall, or it is surmised that too much moisture has been, or is likely to be, afforded. In regard to *Pines*, which are being fruited in pits, it will be necessary to lower the mean temperature as the light decreases, the more so during dull weather, for this reason—an excess of heat caused by fermentation is generally accompanied by excessive atmospheric humidity, the two acting together being conducive to too great activity in the subjects referred to.

HARDY FRUIT AND FLOWER GARDEN.

Under this combined heading I may state in general terms, that with the advent of October the planting season may be said to have fairly commenced in regard to both deciduous *Fruit-bearing and Flowering trees*, and, indeed, I may add *Evergreen trees* as well. For whilst the natural elements around have less power to excite growth, we help to ripen the wood made more quickly and better by checking the upward supply from the roots. The injurious tendency of this is neutralised by the fact, that the condensation of aqueous vapour is so great at night as to absolutely envelope every part of the trees in moisture. The temperature of the air becomes gradually colder and colder, whilst the soil below—the subsoil which the roots approach more particularly — retains a genial latent warmth conducive to fresh root formation when replanted, and as a consequence fresh rootlets are formed before the sharper frosts set in. Thus the trees will have taken a hold of the fresh soil preliminary to a return to activity in the spring. This will also be found a good time in which to plant out *Crown Imperials*, *Lilies*, *Irises*, and other kindred subjects that have been taken up and somewhat dried. Others which remain constantly in the borders may also be divided. Immediately the summer bedding-plants in borders cease to be interesting, let them be removed, and the borders prepared by a good coating of manure, and the necessary digging over for such bulbs for spring blooming as *Hyacinths*, *Crocuses*, *Tulips*, &c., as well as for the usual annuals or perennials, which should now be transplanted into permanent blooming quarters for a like purpose. Keep the birch-broom constantly at work, and the roller frequently going upon walks and grass plots during fine days, between intervals of moist rainy weather; for as attention is given to these matters, so in like manner will beauty and convenience be enhanced during the ensuing spring and summer months. Give to *Picotee* and *Carnation pipings*, which are being potted up, all the air possible after the first week or so, when they should be shut up in a close frame. Do not, however, endanger the young leaves during this period by keeping the atmosphere of such cold frames too damp, or by allowing actual moisture to rest upon the leaves or in the hearts of the plants. The beds should now be prepared during bright fine weather for the future planting out of *Ranunculuses*. Immediately the foliage of *Dahlias* is so severely cut with frost as to become unsightly, let the tops be cut off at about a foot or so above the ground line. Give to all *Lawns* their final mowing for the season about this time, choosing a fine period for the operation, and so allow time for a slight growth to form that the plant may withstand the winter with the least possible injury.

KITCHEN GARDEN.

Give to all *Herb beds* a good dressing with a friable kind of manure, not only as a protection against severe weather but as an aid, in a fertilising point of view, to a robust spring growth. Continue to transplant *Lettuces* and *Endives* upon a sunny southern aspect, and so thin out the seedlings which are now up, that *cloches* (which now must be brought into full use) or others of the many kinds of protection useful for these and similar purposes may be placed over them at the approach of frosts, which injure or retard a useful and kindly growth. Sow Lamb's *Lettuce* and other Lettuce seeds. Take up some of the stronger Lettuce and Endive plants, to store away in frames for immediate use following the first severe weather, and give all the air possible to seedlings of either which are transplanted in frames (being now small), for the purpose of affording a successional supply in the early spring months. Make good all blanks that occur in autumn plantings of *Cabbages* or *Cauliflowers* intended for the spring supply; give the latter all the air possible. Earth-up and so secure all *Celery* crops against the advent of frost, and have some kind of material in readiness to protect such early Walcheren or Snow's *Broccoli* as are now forming flower for an early supply. *W. E.*

TOWN GARDENING.

If it is intended to preserve any of the *Pelargoniums* and *Calceolarias* that have flowered out in the borders during the summer, they should be at once taken up, and have the long straggling roots and the rank top shoots taken off. Then pot them into 48-sized pots, well water them, and shut them close down in a frame for some days till they begin to recover, when they should be placed in the greenhouse or window to winter. All those young plants that have been struck in the borders should be potted into 60-sized pots, so that they can be moved into their winter quarters. Calceolarias are easy to keep through the winter, and they do well in town. Cuttings should now be put in; those young shoots nearest the bottom that have no tendency to flower make the best plants, and to economise space put them in pots or pans about an inch apart in a mixture of leaf-mould and sand, when they can be removed to any place for protection during frosty weather. *Grass plots* and verges should be well rolled preparatory to the last mowing, the edgings should also be trimmed with the edging iron, the walks well rolled, and the borders well hoed and raked to give a neat appearance during the autumn. The beds should now be cleared where it is intended to plant *Hyacinths* and early *Tulips*, and a good dressing of leaf-mould and sand should be dug in and left rough to sweeten till the latter end of the month, when they should be levelled down, and the bulbs planted. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, SEPTEMBER 28, 1870.

1870 Month and Day	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
September.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
22. Thurs.	30.16	58.4	56.5	54.3	86	4.7
23. Friday	30.19	55.9	53.3	51.2	82	4.2
24. Satur.	30.17	55.5	52.2	48.9	80	3.9
25. Sunday	30.19	48.3	48.3	48.3	100	3.8
26. Monday	30.28	51.3	51.3	51.3	100	4.2
27. Tues.	30.09	51.4	51.4	51.4	100	4.7
28. Wednes	30.16	56.8	56.8	56.8	100	5.0

1870 Month and Day	Temperature of the Air.					Wind.		Rain.
September.	Highest	Lowest	Range in Day.	Mean.	Departure of Mean from Average of 50 Years.	Direction.	Horizontal Movement.	In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
22. Thurs.	67.0	47.1	19.6	55.0	− 0.4	E. : E.S.E.	115	0.00
23. Friday	64.2	43.5	20.7	54.2	− 1.0	E.	225	0.00
24. Satur.	65.8	42.0	23.8	53.4	− 1.6	E. : E.S.E.	110	0.00
25. Sunday	69.1	37.1	31.7	52.0	− 2.8	NE. : E.	115	0.00
26. Monday	70.0	43.6	27.1	56.1	+ 1.5	NE.	125	0.00
27. Tues.	68.2	45.2	23.8	56.4	+ 2.0	I.	105	0.00
28. Wednes	71.0	48.3	23.6	58.9	+ 4.7	NE.	111	0.00

Sept. 22.—Cloudy till the afternoon, then cloudless. A fine day
" 23.—Cloudless. Very fine
" 24.—Cloudless. Very fine. Brilliant Aurora Borealis at night; magnetic storm
" 25.—Cloudless. Aurora Borealis. Continued magnetic perturbations
" 26.—Generally cloudless. Faint Aurora borealis at night
" 27.—Cloudless throughout. Very fine
" 28.—Generally cloudless. Very hot

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SEPTEMBER 21, 1870.

Names of Stations.	Temperature of the Air: Highest.	Lowest.	Range of Temperature.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	70.0	38.7	31.3	67.3	44.1	23.2	55.7	0.00
Blackheath ..	69.1	37.6	31.5	68.0	41.5	26.5	54.8	0.00
Isle of Wight ..	..	..	..	..	..	..	..	..
Tunbridge ..	70.5	33.5	37.0	67.3	33.5	33.8	50.4	0.00
Wolverhampton ..	68.2	31.2	37.0	66.0	37.9	28.1	52.0	0.00
Leicester	67.2	30.1	37.1	64.6	34.2	30.4	49.4	0.03
Nottingham ..	70.3	30.0	40.3	69.1	33.1	36.0	51.1	0.00
Mansfield	71.0	27.0	44.0	69.1	30.2	38.9	49.7	0.00
Sheffield	70.5	30.0	40.5	66.3	34.4	31.9	50.3	0.03
Liverpool	70.2	35.1	35.1	66.1	38.2	27.9	52.2	0.05
Manchester	71.8	33.5	38.3	65.0	39.7	25.3	52.3	0.05
Salford	72.8	34.4	38.4	66.7	40.3	26.4	53.5	0.02
Bradford	69.9	34.5	35.4	66.2	36.2	30.0	51.2	0.01
Leeds	68.0	34.0	34.0	66.0	36.3	29.7	51.1	0.02
Hull	67.0	31.0	36.0	63.7	41.7	22.0	51.5	0.00
Newcastle	64.0	40.0	15.0	63.0	51.3	11.6	55.9	0.00
Edinburgh ..	60.7	43.0	26.7	..	..	..	51.1	0.00
Glasgow	61.0	38.5	30.5	..	..	..	51.7	0.03
Dundee	63.0	41.0	22.0	..	..	..	51.7	0.00
Aberdeen	64.3	40.7	17.6	..	..	..	53.3	0.01
Paisley	68.0	39.0	29.0	..	..	..	54.1	0.03
Greenock	63.5	45.0	18.5	..	..	..	55.1	0.00
Leith	70.1	42.0	28.2	..	..	..	56.2	0.00
Perth	66.0	40.0	26.0	..	..	..	54.0	0.00
Dublin	76.1	39.5	36.6	..	..	..	59.1	0.00

JAMES GLAISHER.

Notices to Correspondents.

AQUILEGIA GLANDULOSA: *W. H. L.* asks where seeds of this fine Columbine are to be obtained, true. Those who have it should advertise.

BOOKS: *Novice.* "The Treasures of the Kitchen Garden," a little work, published several years ago by Messrs. A. Henderson & Co., Pine-apple Place, will probably suit you well.

FUNGUS: *W. D.* Celery is often attacked by the Fungus of which you have sent specimens. Lime, soot, or sulphur would be useless. Your only chance of escape is to grow your crop in an entirely different spot of ground. No remedy is known for this and many similar plagues. *M. J. B.*—*James Kerr.* The same answer also applies to your query. *M. J. B.*—*G. F. M.* In all probability trees are partially injured by Fungus growing on the roots of trees which have been felled, but old trees send out their roots in every direction, and only a portion may be injured, and the growth of the others may be so vigorous as to prevent any serious mischief. Young trees most probably are more liable to injury than older ones. It is some time before transplanted trees get well established, and are therefore more liable to mischief. It was the opinion of the late Earl Fitzwilliam, who had observed forest trees closely, that special roots nourished particular parts of the tree, and that injury might be confined to that portion. When the tap-root is affected, the heart of the tree decays. *M. J. B.*—*A. Green.* Russula *vitellina* is *not* so named because it is good for "victuals." If you eat it you will be poisoned to a certainty. — *W. M., Ely.* 1, Lepiota, viz.,—Agaricus naucuius, Fr.; 2, same, young condition; 3, one of the ephemeral Coprini, it had deliquesced before it reached us,—probably Coprinus fimetarius; 4, not Agaricus semi-orbicularis, but A. arvalis, Letellier—near to, or the same as, A. pediades, Er.

HARDY LILIES: *W. H. L.* may take the list published at p. 1183, with very little limitation, since the tenderest would probably live in a nicely prepared border, in a sheltered position, especially if covered up so as to keep frost out of the ground in winter. Those most needing protection would probably be Thomsonianum, speciosum, eximium, longiflorum, Brownii, with their varieties.

HEATHER: ROSES: *J. L.* You will find most of your questions answered in another column. The burning you speak of applies only to large tracts of moorland. When the Heath becomes scrubby it is burnt, which causes the plants to spring up with fresh vigour. Standard Roses may be removed in October, and even as late as March; but after such a summer as we have lately passed through those planted early in autumn are likely to succeed best.

INSECTS: *A. E. H. G.* The grubs which have destroyed your Endive and other plants are the caterpillars of the moth named Agrotis segetum, now nearly full-grown. The earth round the crowns of the plants should be carefully removed, when the grubs will be found at a small distance below the surface. In a few days they will go deeper to become chrysalids. If searched for with a lantern after dark they would be found out of their retreats. *W.*—*G. E.* The small flies, of which clouds have been seen in many places during the present hot, dry weather, are winged aphides from Cabbage or Turnip fields. *W.*—*E. H. M.* The enlargements on the Willow twigs are galls formed by a saw-fly (Nematis salicis?), the blackish larvæ of which are now feeding within the gall. Can you send a supply of the galls in damp Moss to Professor Westwood, Oxford? *W.*

NAMES OF FRUITS: *H. B. D.* 1, Beurré d'Amanlis; 2, Urbaniste; 3, Old Colmar; 4, Easter Beurré; 5, Winter Nelis; 6, Duchesse d'Angoulême; 7, Beurré Gris; 8, Beurré Diel; 9, Knight's Monarch; 10, Flemish Beauty; 11, Beurré Rance; 12, Vicar of Winkfield—*H. M. Pears:* 1, Old Colmar; 2, Passe Colmar; 3, Josephine de Malines, we believe. *Apples:* 1, Fearn's Pippin; 2, King of the Pippins; 4, Golden Nonpareil; 5, Franklin's Golden Pippin; 6, Downton Nonpareil; 7, Blütapfel.—*J. B. F. Apple:* Trumpington. *Captain H. Dennis. Apple:* We believe it to be De Boutigny.—*Erratum last week: Inquirer. Apple:* Caroline Pippin should be Carolina—a very different Apple.

NAMES OF PLANTS: *C. F.* Your plant, raised from seeds received from New Zealand (?) is really nothing but the Globe Artichoke, Cynara Scolymus.—*Correspondent.* The Oncids were O. obryzatum (the yellower one), and O. aurosum—usually considered a form of O. excavatum.

OAK SPANGLES: *J. D. & S., Chester.* Your Oak leaves are covered with Oak spangles, as shown in the following cut. These spangles or galls, which are extremely common, are attached to the underside of the Oak leaves by a short pedicle, as represented in No. 5, and the same is shown in the centre of No. 4, which is the underside of one of the globular spangles magnified, No. 3 being the upper side. The galls are formed by a

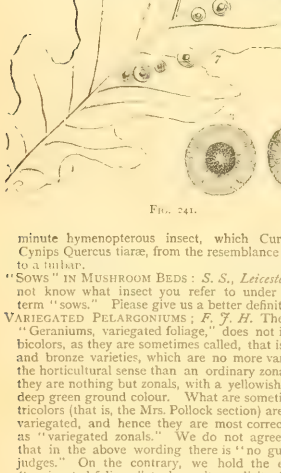

FIG. 241.

minute hymenopterous insect, which Curtis named Cynips Quercus tiaræ, from the resemblance of the gall to a tiara.

"SOWS" IN MUSHROOM BEDS: *S. S., Leicester.* We do not know what insect you refer to under the vague term "sows." Please give us a better definition.

VARIEGATED PELARGONIUMS; *F. J. H.* The wording, "Geraniums, variegated foliage," does not include the bicolors, as they are sometimes called, that is, the gold and bronze varieties, which are no more variegated in the horticultural sense than an ordinary zonal; indeed they are nothing but zonals, with a yellowish instead of deep green ground colour. What are sometimes called tricors (that is, the Mrs. Pollock section) are decidedly variegated, and hence they are most correctly classed as "variegated zonals." We do not agree with you that in the above wording there is "no guide for the judges." On the contrary, we hold the expression, "variegated foliage," to be quite explicit; but it does not bear the interpretation which, from your remarks, appears to have been put upon it. The class would fairly have included the groups respectively represented by Mrs. Pollock, Italia Unita, Bijou, Golden Chain, and L'Elegante.

VINES NOT FRUITING: *A Subscriber.* Your first and present duty is to get the wood properly ripened; for this end keep a dry atmosphere in the house, with abundance of air, and keep the borders dry until Christmas, when you may then water them well. Prune your Vines then, and treat them subsequently as will be directed in our weekly Calendar of Operations. Indeed, if you follow carefully the advice there given, you cannot fail to have fruit. If you require more elaborate instructions, procure "Thomson's Treatise on the Vine." A mulching of good stable manure might be applied after the berries are set.

COMMUNICATIONS RECEIVED.—H. Bennett, Stapleford received with many thanks.—F. M. O. (Fuchsia, with many thanks.—J. —Joe.—H. Y.—R. G.—J. C. S.—J. McC.—I. S. H.—W. S. D.—C. B. M.—Sir W. J.

Markets.

COVENT GARDEN.—Sept. 30.

The supply has considerably outstripped the demand during the past week, and a large quantity of goods, both home grown and foreign, remains on hand, auction goods especially. Pears now comprise, among leading varieties, Marie Louise, Bonne Louise, Gansel's Bergamot, and Duchesse d'Angoulême. Among Apples may be mentioned Ribston Pippin, Cox's Orange Pippin, Blenheim, and Kerry Pippin. Amongst flowers we have Pelargoniums, Asters, Fuchsias, Bouvardias, Pompon Chrysanthemums, Mignonette, and a few good Heaths.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	to 2 0	Oranges, per 100	3 0	to 12 0
Figs, per doz.	0 6	1 0	Peaches, per doz.	1 0	4 0
Grapes, per lb.	1 0	3 6	Pears, per doz.	1 6	3 0
Lemons, per 100	10 0	16 0	Pine apples, per lb.	3 0	6 0
Melons, each	1 0	3 0	Plums, p. half sieve	1 0	1 6
Nectarines, per doz.	1 0	4 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jer., each	1 0	to 1 0	Garlic, per lb.	0 8	—
— round, per lb.	0 2	0 4	Herbs, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Horse-Radish, p. bun.	3 0	5 0
Brus Sprouts, ½ sieve	3 0	3 6	Lettuces, p. score	1 0	1 6
Cabbages, p. doz.	1 0	1 6	Mint, per bunch	0 3	0 6
Carrots, p. bunch	0 4	0 8	Mushrooms, p. pott.	1 0	1 6
Cauliflowers, p. doz.	1 6	3 0	Onions, per bunch	0 4	0 6
Celery, red, p. bun.	1 6	2 0	Parsley, p. bunch	0 2	0 4
— white, do.	1 0	1 0	Shallots, per lb.	0 8	—
Cucumbers, each	0 6	1 0	Spinach, p. bushel	2 0	3 0
French Beans, p. sieve	2 0	3 0	Tomatos, per doz.	1 0	1 6
Do., retail, p. lb.	0 4	0 6	Turnips, yng., p. bun.	0 4	0 6
Potatos, Regents, 60s. to 80s.			Kidneys, 30s. to 100s. per ton.		

A NURSERYMAN, in the Provinces, is desirous of meeting with an ACTIVE PARTNER, with moderate capital.—X., Messrs. Pitcher & Manda, Leytonstone, N.E.

Botanical Collector.

MESSRS. VEITCH AND SONS are desirous of meeting with an energetic, well-informed Young Man, who wishes to go Abroad as a COLLECTOR of NEW PLANTS and other objects of Natural History. Application, stating age, education, and references, must be made by personal attendance in writing.—Royal Exotic Nurseries, King's Road, Chelsea, S.W.

WANTED, in a very extensive private Establishment, a thoroughly competent young Man as FOREMAN, to take charge of the Plant Department, comprising a fine collection of specimen Indoor, Greenhouse, and Stove Plants, and all kinds of Plants grown for decorative purposes. Wages, 28s. per week, with lodging, &c. A separate Foreman is kept for the Fruit.—Apply, by letter only, to R. JAMES VEITCH AND SONS, Royal Exotic Nurseries, Chelsea, S.W.

WANTED, a HEAD WORKING GARDENER.—Must thoroughly understand the Forcing of Grapes, Melons, Cucumbers, Mushrooms, &c., and have a good knowledge of Flowers. Wages 24s. a week, with a good cottage. Married Man preferred.—J. B., Post Office, Eastcott, Middlesex.

WANTED, as good WORKING GARDENER, a Man not above 30 years of age, and his Wife for a small Laundry. Good character indispensible.—*L*, Messrs. Gilbert, Stationers, Cothall Chambers, London, E.C.

WANTED, a married GARDENER, who understands the Management of Vines, and Kitchen and Flower Gardening. Wages, £65 per annum.—Apply to Mr. Cox, Ashley, Walton-on-Thames.

WANTED, as GARDENER, a steady, sober, industrious Man, who understands the profession thoroughly. Must be married, without family, to live in the house. Wife as Cook. Address, stating age, wages required, and all particulars, to W. J., Mr. Wilson's, 30, Cheapside, London, E.C.

WANTED IMMEDIATELY, an active MAN, who knows something of Fruit Trees and has worked in a Market Garden.—Letters only, to Mr. MORLEY, Beckworth Gardens, Surrey, S.W.

WANTED, by the Committee of Visitors of the Moulsford Lunatic Asylum, near Wallingford, Berks, a Married Man, as WORKING BAILIFF, and his Wife, to take charge of the Dairy, and Churn if required. Wages, for the two, 21s. per week, with a cottage, and an allowance of coals, milk and garden produce. Applications, with testimonials, to be sent to the undersigned by October 7.—J. T. MORLAND (Clerk to the Visitors), Abingdon, Berks.

To Gardeners.

WANTED, a LAD, not over 20 years of age, to take entire Charge of a small Garden and Conservatory, to clean Boots and Windows, and to live in the house.—Apply, by letter only, to J. M., 33, Argyle Road, Ealing, W.

WANTED, a first-rate LAUNDRESS (married), to undertake the Washing of a Family in the Country. A comfortable cottage, with laundry, &c., is provided. If the Husband is a good Farm Servant, employment would be found for him.—Miss E. CURRIE, Minley Manor, Farnborough Station.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. F. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send their NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.—JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his REGISTERS at PRESENT many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

GARDENER (HEAD).—Single; has a good practical knowledge of the profession in its several branches, including Forcing of Early Fruits, Plants, Flowers, &c.; is well up in the Culture of Stove and Greenhouse Plants. Can be highly recommended. Five years' excellent character.—W. H., Post Office, Reading.

GARDENER (HEAD), to any Nobleman or Gentleman requiring a first-class Gardener.—Age 35, married, no family. Thoroughly understands the profession. Unexceptionable testimonials as to his best order, and good character from present employer.—J. O., Post Office, Laughton, Hawkhurst, Sussex.

GARDENER (HEAD), to any Lady, Nobleman, or Gentleman requiring a first-class Gardener. Testimonials may be had by applying to Mr. Bessent, 10, Everton Park, Liverpool, and from two last situations.—C. W. COOK, The Gardens, Croxteth Park, Liverpool.

GARDENER (HEAD).—Age 33; thoroughly understands the profession in all its branches, including Pine Growing, Early and Late Forcing, Plant Growing, &c. Seven years excellent character. Liberal wages expected.—H. T., 13, Garden Cottages, East Street, Epsom, Surrey.

GARDENER (HEAD), to any Lady or Gentleman requiring a thorough practical Man.—Understands the Management of Fruit, Flowers, and Kitchen Garden, Conservatory, and Orchard House, Early and Late Forcing of Grapes, Melons, Cucumbers, Mushrooms, and French Beans, &c. Can draw Plans, and Lay Out Grounds. Highest references if required.—C. H. S., Packenham Street, Great Clap Road, London, W.C.

GARDENER (HEAD).—Married, without family; has lived for the last seven years in very good establishments, and can produce excellent testimonials as to character and general knowledge of Gardening to the Masters at whose service he may be made. Persons requiring a trustworthy Servant would find this an opportunity worthy of their notice.—A., 69, Thurston Terrace, Wellington Road, Forest Gate, Essex.

GARDENER (HEAD), married, no family.—F. HILL is open to engagement with any Lady or Gentleman requiring the services of a first-class Gardener; has had good experience in the Cultivation of Orchids, Stove and Greenhouse Plants, Forcing, and every other branch of Plant Growing, &c. Can give the highest testimonials from present employer.—F. W. HILL, Esq., The Hill, The Gardens, Combe Warren, Malden, Kingston-on-Thames, Surrey.

GARDENER (HEAD), age 41, married.—A. CALDER is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener. Having lived 18 years as Head Gardener in last situation, well versed in the Forcing of all kinds of Flowers, Fruit, and Vegetables; understands the Management of Greenhouses, Stove and Orchid Houses, and Flower Gardening. No objection to look after Meadow Land. Good character can be had from the last two situations.—A. CALDER, Thames Ditton, Kingston, S.

GARDENER (HEAD.)—WILLIAM EARLEY, Digswell Park Gardens, is at liberty to treat with any Nobleman or Gentleman requiring the services of a first-class practical Gardener, who has had great experience in every branch of modern Horticulture. Thirteen years' excellent character from present employer, whom he is leaving, through the expiration of lease, at Michaelmas. Reference is kindly permitted to F. Pryor, Esq., 8, Cleveland Row, St. James's; Bailey Denton, Esq., and to the leading Horticulturists. Friends are requested to communicate.—Welwyn, Herts.

GARDENER (HEAD).—Age 28, no incumbrance; understands the profession thoroughly. Twelve years' experience.—H. S., 7 Randall's Seed Establishment, Exeter.

GARDENER (HEAD). Middle-aged; thoroughly competent in all the branches of Horticulture. First-class references. No single-handed place accepted.—S. L., Post Office, Exeter.

GARDENER (HEAD). Age 28; thorough knowledge of the profession in all its branches. First-class reference.—J. B., Mr. Poynter's, County Seed Establishment, Taunton.

GARDENER (HEAD).—Age 40, married; well acquainted with Late and Early Forcing, Plants, Flower, Fruit, and Kitchen Gardening, &c. Good character.—SCOREY, Royal Nursery, Slough.

GARDENER (HEAD), in a Nobleman's or Gentleman's Family.—Age 24, single; has a thorough practical knowledge of the profession in all its branches. Six years' good character.—J. L. W., M. Walker's, Stationer, Leyton, N.E.

GARDENER (HEAD).—Age 37, single; thoroughly understands the profession in all its branches. Upwards of three years' good character.—G. O., Mr. Hatton, Harrow Gate, Dorking, Surrey.

GARDENER (HEAD).—Age 34, married; thoroughly understands Forcing, Fruits, Flowers, Vegetables, good Kitchen and Flower Gardener. Eight years' good character. Can be well recommended.—J. W. M., West Park, Salisbury.

GARDENER (HEAD).—Thoroughly understands all kinds of Early and Late Forcing, Stove and Greenhouse Plants; also Flower and Kitchen Gardening. Good references.—B. C., Orton Hall Gardens, near Peterborough, Hunts.

GARDENER (HEAD), age 32. — WILLIAM RATCHELOUS, Head Gardener during the last five years to the Hon. Colonel Duncombe, M.P., will shortly be at liberty to engage with any Nobleman or Gentleman requiring the services of a thorough practical Gardener.—Waresley Park, St. Neots, Hunts.

GARDENER (HEAD, or good SINGLE-HANDED), married.—A Gentleman wishes to recommend a thoroughly steady industrious Man as above. Satisfactory reasons given for leaving.—GARDENER, Ivyhurst, Edge Hill, Wimbledon, Surrey.

GARDENER (HEAD, or SINGLE-HANDED).—Thoroughly understands the profession; Wife can undertake a small Laundry. Can be very highly recommended.—GARDENER, Post Office, Sunbury, Middlesex.

GARDENER, in a Gentleman's Garden, where there are several Gardeners, or as FOREMAN in a smaller Garden.—Age 25; been two or three years in Nurseries.—C. C., Hamilton Grove, Hamilton Road, Lower Norwood, S.E.

GARDENER and ORCHID GROWER.—F. NEWMAN begs respectfully to offer his services to any Nobleman or Gentleman, as above. Thoroughly practical; can be highly recommended by the Messrs. J. Veitch & Sons, whose extensive collection of Orchids has been entirely under his charge for the last three years. Highest references from Mr. James Anderson, Gr. to J. Dawson, Esq., Meadowbank, Uddingston, N.B.; also from Mr. J. K. Petch, Gr. to Sam Mendel, Esq., Manley Hall, Manchester, having been Foreman under each, respectively, for upwards of two years.—Royal Exotic Nursery, King's Road, Chelsea, S.W.

GARDENER (UNDER), in a Gentleman's Garden, where he will have a chance of improving himself.—Age 18. Good character.—Mr. BOLLAND, Palmerston House, Buckhurst Hill, Essex.

To Gardeners.

GARDENER (UNDER), in a good Garden, where he could learn a good knowledge of Flowers.—Address, stating wages, to J. H., 3, Cecil Villas, Lower Road, Isle of Dogs, London, E. Age 22. Respectable; would like a place of about two or three years.—F. W. DURRANT, Keswick Hall, Coltishall, Norfolk.

To the Trade.

NURSERY FOREMAN or MANAGER.—Middle-aged; unexceptionable character; many years' experience in all branches of the Nursery and Seed Trade, both in London and the Country.—M. L., 28, St. Ann's Road, Notting Hill, W.

FOREMAN, in a Nobleman's or Gentleman's Garden.—Has a practical knowledge of Vines, Pines, Fruit, &c., and Early and Late Forcing. Good reference.—A. B., Mr. Webb, Stationer, York Town, Frimley, Surrey.

To the Trade.

FOREMAN (INDOOR), or GENERAL PROPAGATOR.—London and provincial experience. Good references.—N. Y., Mr. J. Parsons, 12, Lata Place, Stock Bridge, Edinburgh.

PROPAGATOR (FOREMAN), in a Nursery.—Has had long experience in Growing and Propagating Stove and Greenhouse Plants, Bedding Plants, Roses, Evergreen Shrubberies, Roses, Conifers, &c. Good references.—G., *Gardeners' Chronicle* Office, W.C.

PROPAGATOR, or PROPAGATOR and FOREMAN.—Middle-aged; thoroughly experienced in Soft and Hardwood Propagating and Grafting. Good references.—C. A., 13, Chancellor Road, West Hill, Sydenham, S.E.

To Landed Proprietors.

LAND STEWARD.—The Advertiser desires an engagement in the above capacity. He has a thorough practical knowledge of Agriculture, the Valuation and Management of Timber, and all Estate matters. Satisfactory references.—J. M., Messrs. Gilbert & Co., Hallsford House, Upper Tooting, Surrey.

STEWARD or BAILIFF.—Age 30, married, one child; can undertake the Management of a Farm of any extent. Understands Buying and Selling, also Steam Machinery, and the same as Works required on an Estate. Has had the best experience as Bailiff upon Farms of 1000 and 2000 Acres. Unexceptionable references.—ALPHA, 106, High Street, Croydon.

A GENTLEMAN, who has had the Management of a Retail Business, and has occupied a most confidential position for some years, is seeking a re-engagement where his services and ability would be appreciated. Age 30. Bookkeeper and Correspondent. Testimonials of the highest character.—A., *Gardeners' Chronicle* Office, W.C.

Wholesale Seed Trade.

MANAGER, or TRAVELLER and CORRESPONDENT.—The Advertiser is open for an immediate engagement as above; has had considerable experience in the best Provincial and Provincial Highest references.—BETA, 38, Lordship Road, Stoke Newington, N.

SHOPMAN (HEAD), MANAGER, or TRAVELLER; age 35, married.—The Advertiser will be shortly open to treat for a situation as above; thoroughly acquainted with the Seed Trade, both Wholesale and Retail; also the Nursery Business. Ten years with present employer.—W. B. C., Messrs. Carter & Co., High Holborn, London, W.C.

Seed Trade.

SHOPMAN, or WAREHOUSEMAN.—Age 29 single; 11 years' experience in first-class Provincial Houses. Good references.—W. B., *Gardeners' Chronicle* Office, W.C.

IMPROVER, under Glass, in a first-class Garden.—A young Man, practically acquainted with the general work of the Fruit, Kitchen, and Flower Gardens. References and personal character.—J. E. C. Drury Fortnum, Esq., Stanmore Hill, Middlesex.

To Nurserymen and Market Gardeners.

IMPROVER.—A respectable Man, age 28; has had five years' experience in the business with a view to Partnership. Good references from former employers.—F. E., 9, Castle Place, Worcester.

To Noblemen and Gentlemen.

HOUSE and ESTATE CARPENTER, or to undertake the Management of any Erections that may be required.—Wanted, by a practical Man of many years' experience in all kinds of Building operations, a situation as above. Has had good practice in Agricultural and Horticultural works. Good testimonials.—J. H., 4, Winstanley Road, Clapham Junction, London, S.

SALES BY AUCTION.

Planting Season.

IMPORTANT to NOBLEMEN, GENTLEMEN, NURSERYMEN, BUILDERS, and OTHERS ENGAGED EXTENSIVELY in PLANTING.

PRELIMINARY NOTICE of FORTHCOMING SALES of NURSERY STOCK.

OCTOBER 24 to 29, by the Trustees, in the PLANTATION ROAD NURSERIES, CHESTER; by order of the Executors of the late Mr. Chivas, without reserve, the FIRST PORTION of the very extensive NURSERY STOCK.

OCTOBER (latter end of the month), on the Premises, the CAMDEN NURSERY, SOUTHAMPTON STREET, CAMBERWELL, S.; by order of the Executors of the late Mr. Wm. Barnes, the whole of the thriving NURSERY STOCK, also the several GREENHOUSES, PITS, FRAMES, and UTENSILS in TRADE.

NOVEMBER 3 and 4, on the Premises, the WHITCHURCH RECTORY, EDGWARE, MIDDLESEX; by order of the Proprietor, a large quantity of valuable NURSERY STOCK.

NOVEMBER 8, 9, and 10, on the Premises, PHILLIP LANE, TOTTENHAM, N.; by order of Mr. Alex. Johnstone, a quantity of useful NURSERY STOCK.

NOVEMBER 17 to 19, on the Premises, the LEIGHAM COURT ROAD NURSERY (a branch establishment), STREATHAM HILL, SURREY; by order of Mr. George Clarke, the land being required for building purposes.

NOVEMBER 21 to 26, on the Premises, the WANDSWORTH COMMON NURSERIES, SURREY, S.; by order of Mr. R. Neale, a portion of the land being required for building purposes.

Catalogues, when ready, may be had on the Premises, respective Farms, and of Messrs. PROTHEROE and MORRIS, Auctioneers and Valuers, Leytonstone, Essex, E.

Christchurch, Hants.

SHORT NOTICE of an IMPORTANT CLEARANCE SALE of NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. G. Smith, to SELL by AUCTION, on the Premises, Park Place, Belbin's and Scot's Hill Nurseries, Christchurch, Hants, on MONDAY NEXT, at 1 for 1 o'Clock precisely, the whole of the valuable NURSERY STOCK, comprising a large, varied, and choice assortment of Evergreen, Deciduous, and Coniferæ Shrubs; Ornamental and Forest Trees, Fruit Trees, standard and dwarf Roses, American Plants, NURSERY STOCK.

Now in view, and Catalogues had.

N.B. For the convenience of Purchasers, arrangements can be made with Mr. Smith to allow the lots to remain on the ground one month from the date of Sale.

Woking, Surrey.

HIGHLY IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. George Jackman, deceased, to SELL by AUCTION, without reserve, on the Premises, Park Place, Belbin's and Scot's Hill Nurseries, Christchurch, Hants, on MONDAY NEXT, at 1 for 1 o'Clock precisely, the whole of the valuable NURSERY STOCK, comprising a large, varied, and choice assortment of Evergreen, Deciduous, and Coniferæ Shrubs; Ornamental and Forest Trees, Fruit Trees, standard and dwarf Roses, American Plants, NURSERY STOCK.

Now in view, and Catalogues had.

N.B. For the convenience of Purchasers, arrangements can be made with Mr. Smith to allow the lots to remain on the ground one month from the date of Sale.

Woking, Surrey.

HIGHLY IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. George Jackman, deceased, to SELL by AUCTION, without reserve, on the Premises, the Woking Nursery, Woking, Surrey (about one mile from the Railway Station), on THURSDAY, October 6, and four following days, at 11 for 12 o'Clock precisely each day, without the removal, the whole having been carefully prepared, including choice Abies, Pinus, Picea, Taxus, Araucaria, Cupressus, Juniperus, Retinosporas and Thujas, of sorts; Thujopsis borealis, Wellingtonia gigantea, variegated and green Hollies, Arbutus, Bays, Privets, Cupressus Lawsoniana, hundreds of smaller Conifera and Evergreen Shrubs, comprising 3500 Picea Nordmanniana, 1 to 5 feet; 600 Thujopsis borealis, 1 to 4 feet; 500 Pinus austriaca, 1 to 5 feet; 2000 Bays and Privets, 1 to 4 feet; 2000 2 to 4 feet; 6000 Portugal Laurels, 2 to 4 feet; 600 English Yews, 4 to 5 feet; 1200 Thuja Warreana and americana, 3 to 6 feet; 300 Picea Pinsapo, 3½ to 6½ feet; 200 Irish and Chinese Junipers, 4 to 6 feet; 5000 hybrid and seedling Rhododendrons, 1 to 3 feet, &c.; likewise a fine collection of Ornamental Deciduous Trees, 8 to 15 feet, for Park and Garden planting; 800 standard and dwarf Roses, 1000 variegated, 3500 standard and dwarf Roses, of the best varieties; together with the stands of Deciduous Shrubs, &c.

May be viewed any day prior to the Sale. Catalogues may be had 6d. each, returnable to purchasers) on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B.—Mr. R. respectfully urge that all persons who contemplate planting during the ensuing season should apply to him, as they can order to form an adequate conception of its beauty and excellence. P. & M. would further mention, with a view of conveying an idea of its extent, that the borders on each side of the Walks in the Nursery measure 1886 feet long, to 20 feet wide, and are furnished with thousands of unrivalled specimen Conifera and Evergreen shrubs, admirably adapted for effective planting.

Camberwell, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, GREENHOUSE PLANTS, GREENHOUSES, HOT-WATER PIPING, BRICKWORK, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, The Nursery, Grosvenor Park, Camberwell, S., on TUESDAY and WEDNESDAY, October 11 and 12, at 11 for 12 o'Clock precisely each day, without reserve, by order of Mr. Barnes, who is leaving the land being required by October 17 for the erection of a Church), the whole of the valuable NURSERY STOCK, admirably adapted for the London Suburbs, including 5000 Green and Variegated Hollies, 2000 Portugal Laurels, 2000 Laurustinus, 500 Green and Variegated Hollies, 200 Common Laurels, &c., 200 choice Conifers, of sorts; 400 Chinese Arbor-vitæ, 800 Junipers, of sorts; 2000 Ornamental and Forest Trees, including 1000 Limes, &c.; 400 Standard and Half-Standard Roses, 500 Currants, 250 Fruiting Vines, in pots; 3000 choice Greenhouse Plants, including 400 choice Camellias and Azalea indica, &c., 1400 Hardy Climbers, of sorts; 300 Standard and Dwarf Fuchsias, several Greenhouses and Pits, Twelve 1 and 2 Light boxes, Handlights, Hot-water Piping, Tank, Brickwork, &c.

May be viewed 3 days prior to the Sale. Catalogues may be had of Mr. Dawson, 170, Camberwell Road, S.; and of the Auctioneers, Leytonstone, E.

Crown Nursery, Reading.

SALE of CHOICE NURSERY STOCK, &c.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. James Holder to SELL by AUCTION, on the Premises, Crown Nursery, Reading, near the Cemetery, on WEDNESDAY, October 12, at 11 for 12 o'Clock precisely, without reserve, a large quantity of choice Evergreen and Deciduous Trees and Shrubs of the usual kinds, fine Standard and Dwarf Roses, Rhododendrons by name; a selected assortment of fine Fruit Trees, consisting of Apples, Pears, Plums, and Cherries, &c., fine Vines in pots, a quantity of ornamental Vases, and Figures, Fancy flowerpots, &c.

May be viewed the day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Tooting, S.W.

IMPORTANT SALE of YOUNG and THRIVING EXTRA NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. R. Parker to SELL by AUCTION, without reserve, on the Premises, Exotic Nursery, Tooting, S.W., on THURSDAY and FRIDAY, October 13 and 14, at 11 for 12 o'Clock precisely each day, Thousands of Valuable Extra NURSERY STOCK, remarkably well-grown and in excellent condition for removal; comprising Evergreen Shrubs and Coniferæ in specimen borders, including Picea Nordmanniana, P. Pinsapo, and P. nobilis, Thujopsis borealis, Thujas of sorts, Pinuses, Wellingtonias, Cupressus Lawsoniana, Portugal Laurels, &c.; thousands of Common and Colchic Laurels; 1000 Green Hollies, 18 inches to 2 feet; Arbutus, 500 English Yews, 500 Arbor-vitæ of sorts, fine Rhododendrons in full of bloom buds, bushy Box, Cotoneaster Simmonsii, Berberis of sorts; about 2000 spruce Firs, 2 to 4 feet, beautifully furnished; 2000 Ligustrum ovalifolium, &c.; a large quantity of Ornamental and Forest Trees, consisting of Black Italian and Lombardy Poplars, Acer Negundo variegatum, Acacia inermis, &c.; Choice Standard and Dwarf Roses of the best varieties; a large quantity of Bouvardias, Inermis and Amadis, Manetti, and other kinds; fine Standard and Pyramidal Fruit Trees, in bearing condition; together with 50 lots of Choice ORCHIDS, fine Azalea indica, Gynerium argenteum, Yuccas of sorts, &c.; Choice Hardy Herbaceous Plants, Bulbs, &c.

May be viewed two days prior to the Sale; Catalogues may be had on the Premises; and of the Auctioneers and Valuers, American Nurseries, Leytonstone, Essex.

Bagshot, Surrey.

HIGHLY IMPORTANT and EXTENSIVE UNRESERVED SALE of NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Charles Noble to SELL by AUCTION, without reserve, on the Premises, Sunningdale Nursery, Bagshot, five minutes' walk from Sunningdale Station, South-Western Railway, on MONDAY, October 17, and five following days, at 11 for 12 o'Clock precisely each day, the very valuable NURSERY STOCK, including an unlimited variety of choice Evergreen, Coniferous, and Deciduous Shrubs, of remarkably growth and symmetrical form and beauty, viz., 15,000 common Colchic and Portugal Laurels, 1 to 5 feet; 3000 Retinospora ericoides, 1½ to 2½ feet; 2000 Cupressus Lawsoniana, 1 to 10 feet; 2000 Retinospora squarrosa, obtusa, and pendula, 2 to 5 feet; 1000 Thujopsis borealis, 2 to 4 feet; 1000 Bays, 3000 fine Picea Nordmanniana, 2 to 6 feet; 1000 Thuja Lobbii and gigantea, 3 to 8 feet; Araucarias, Wellingtonias, 4 to 7 feet; a quantity of handsome specimen Conifers, 5 to 12 feet; also 2000 Deutzia crenata pl., 1 to 5 feet; 5000 Spiræas, 2 to 5 feet; 3000 Berberis, Andromeda floribunda, 25,000 Rhododendrons, comprising 15,000 hybrid seedlings and 10,000 ponticas, 1 to 4 feet; 6000 choice named varieties, full of fine trusses of bloom, of sorts; 1 mile Arbutus, Privets, &c., 500 Tritomas, clean grown Fruit Trees, Standard and Dwarf Roses of the best varieties, and thousands of other Trees and Shrubs too numerous to mention.

May be viewed any day prior to the Sale. Catalogues 6d. each, returnable to purchasers) may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B. The Sale is imperative, about 4 acres of the ground being required for building purposes. The whole of the specimens bear evidence of careful planting, and were all prepared for removal during the autumn and spring of 1869-70.

St. John's Nursery, Woking, Surrey.

PRELIMINARY NOTICE of a HIGHLY IMPORTANT and VERY EXTENSIVE CLEARANCE SALE of FIRST CLASS NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. William Jackman, deceased, to SELL by AUCTION without reserve, on the Premises, St. John's Nursery, Woking, Surrey, on TUESDAY, October 24, and seven following days, at 11 for 12 o'Clock precisely each day, the whole of the thriving NURSERY STOCK, consisting of a varied and choice assortment of handsome Evergreen and Deciduous Shrubs, comprising numerous magnificent specimens; also 40,000 clean grown Fruit Trees, particularly worthy the attention of Market Gardeners and others extensively engaged in planting; Grafted Roses, Dwarf Roses and Pinmetree Stock; Grass planted Forest Trees, Vines in pots, &c.

May be viewed any day prior to the Sale. Full particulars will appear in future advertisements.

Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY and MONDAY, October 1 and 3, at half-past 12 o'Clock precisely each day, 1200 Lots of first-class HYACINTHS, TULIPS, CROCUSES, IRIS, and other BULBS, just arrived from well known farms in Holland.

On view the mornings of Sale, and Catalogues had.

Easthampstead Nursery, near Bracknell, Berks.

IMPORTANT to NOBLEMEN, GENTLEMEN, and OTHERS, PLANTING EXTENSIVELY THIS AUTUMN.

MR. W. ABRAHAM has received instructions from the Proprietor of the above Nursery, Mr. R. Saunders, to SELL by AUCTION, on the Premises, on MONDAY, October 3, and four following days, at 11 for 12 o'Clock, punctually each day, a very large collection of the CHOICEST and BEST EVERGREEN and DECIDUOUS TREES and SHRUBS, ranging in height from 4 to 16 feet, all healthy, handsome, symmetrical Trees, and having been moved within the last two years, and carefully prepared for removal, for the convenience of purchasers. They consist of Araucarias, Junipers, Arbor vitæ of sorts, Cedrus Deodara and Libani; Thujopsis, Cupressus, Retinospora, Abies, Picea, Pinus, Yews, Variegated and Green Hollies, Arbutus, and variegated Holly, Arbutus: STANDARD RHODODENDRONS and fine bushes of the same, 2 to 6 feet, Kalmias, Andromeda, Azaleas, Berberis, Cotoneasters, and other choice EVERGREEN TREES, including Scotch, Larch, and Austrian Fir; Birch, Beech, Hazel, Alder, Oak, Hornbeam, &c.; 1500 standard Perpetual Roses, 60,000 strong, transplanted seedlings, Quicks for hedging, Cuttings for do.

The Nursery is within half a mile from the Bracknell Station, South Western Railway, from Reading and London; About 18, Wokingham, 4, Maidenhead, 8; and Windsor, 9 miles. For conveyance of Purchases, the Nursery can remain upon the ground until December 30, following the Sale.

The Stock may be viewed, and Catalogues obtained 10 days prior to days of Sale, at the Nursery; and of the principal Inns in the neighbourhood, or (post free) of the Auctioneer, Valuer, &c., Goldworth Nurseries, Woking, Surrey.

Paddock Wood, Kent, close to the Railway Station.

TO NURSERYMEN, MARKET GARDENERS, BUILDERS, and OTHERS.

The remainder of the FREEHOLD ESTATE, comprising about 60½ Acres of Pasture, Arable, and Hop Land, very valuable for Nursery and Market Gardens, Building and Brickmaking, and the larger portion especially suitable for Building, Brickmaking, and Accommodation Purposes, lying, as it does, nearly adjoining this important Junction Station, on the main South-Eastern Railway, and having a frontage to the Maidstone Road, between Brenchley to Maidstone, having also a Registered Parliamentary Title, rendering such Title absolutely safe, and reducing the cost of transfer to a comparatively small amount. The property lies only 5 miles from Tunbridge, 10 from Maidstone, and 35 from London. Three fourths of the purchase money can remain on mortgage at 5 per cent.

MESSRS. DEBENHAM, TEWSON, AND FARMER will SELL the above in 20 Lots, varying from half an Acre to 10 Acres, and one of 35 Acres), at the Maidstone Road Inn, close to Paddock Wood Station, on WEDNESDAY NEXT, October 5, at 2 o'Clock precisely.

Particulars with Plans at the place of Sale; at the Rose and Crown Hotel, Tunbridge; at the Star Hotel, Maidstone; and in London of T. G. BUDD, Esq., Solicitor, 3, Serjeants' Inn, Fleet Street, Bucklersbury; and of the Auctioneers, 80, Cheapside, E.C., who will forward them by post on application.

Nurseries, Reddish, near Stockport,

IMPORTANT SALE of VALUABLE NURSERY STOCK.—To NOBLEMEN, GENTLEMEN, and NURSERYMEN.

MR. KERRISON has been favoured with instructions from Mr. B. Whitham to SELL by AUCTION, without reserve, at the above Nurseries, on WEDNESDAY and THURSDAY, October 12 and 13, a portion of his most valuable NURSERY STOCK, comprising many thousands of Hybrid Rhododendrons and hardy Azaleas, well set with bud; also a very extensive and valuable collection of Deciduous and Evergreen Trees, Evergreen and Deciduous Shrubs, in 100 great variety to enumerate in an advertisement. Sale to commence each day at 12 o'Clock at noon punctually.

Catalogues may be had (post free), and any further information obtained of Mr. B. WHITHAM, The Nurseries, Reddish, near Stockport; and of the Auctioneer, 290, Stamford Street, Ashton-under-Lyne.

The Nurserymen and Gentlemen who have attended numerously during the Sale can be supplied by Private Contract with Trees, Shrubs, or Plants not offered in the Sale Catalogue

Staffordshire.—Brereton Nurseries, near Rugeley.

IMPORTANT to NOBLEMEN, GENTLEMEN, and PARTIES PLANTING.—SALE by AUCTION of VALUABLE NURSERY STOCK.

MR. C. GILLARD begs to announce that he has been instructed by Mr. Whitehouse to Advertise for SALE by AUCTION at the Nursery Grounds, on TUESDAY and WEDNESDAY, October 11 and 12, a large quantity of truly VALUABLE STOCK, to make room for Forest Stuff, for which there is an increasing demand, and Fresh Ground required.

The SHRUBS for Sale will comprise several hundreds of the best Gold, Silver, and Green Hollies, from 18 inches to 6 and 7 feet, including a large quantity of Pyramidal and Fine Specimen Hollies, up to 4½ feet, transplanted in the Autumn of 1869 and spring of 1870; fine specimens of Cupressus Lawsoniana, Thuja gigantea, Thujopsis borealis, Wellingtonia gigantea, Araucaria, Cedrus Deodara, Cedrus Libani, Cedrus Atlantica, Retinospora postera, Picea nobilis, Picea Pinsapo, Picea Nordmanniana; Abies, sorts; Picea excelsa or Lowii, Pinus Cembra, very fine; Rhododendrons, and other ornamental Trees and Shrubs; Common and Variegated Oak, Larch, and other Forest Trees; strong and Seedling Quick, Fruit Trees, &c.

Particulars will appear in Catalogues, which will be published in due time, to be obtained from the Auctioneer and at the place of Sale.

Hanover Nursery, Rye Lane, Peckham.

PRELIMINARY NOTICE of SALE.—In consequence of the expiration of the Lease, the whole of the Valuable and well grown STOCK of the above celebrated NURSERY will be offered for SALE, particulars of which will be given in due course. Also for immediate Sale a large and superior Stock of AZALEAS, well set for bloom. Prices may be had on application to Mr. IVERY, Hanover Nursery, Rye Lane, Peckham.

N.B. A superior Stock of MUSHROOM SPAWN, which can be offered at a low price.

Sale of Leicester Sheep, at Stanwick Park House, near Darlington.

MR. THOMAS WETHERELL (commissioned by J. Wood, Esq.), will SELL by AUCTION, on THURSDAY, October 13, the following Pure-bred LEICESTER SHEEP, consisting of 145 Ewes and Gimmers, and a few Tups and Tup Lambs, which have been bred with the greatest care and judgment by Mr. Wood and his late father for over 55 years. The original of the Flock commenced from Collings, Mason, Wiley, Smith, and early breeders, since when has been introduced the blood of the famous blood of Buckley, Sunday, and Brandsburton, which stands at the present day equal with any other. Mr. T. WETHERELL, having jointly with Mr. Wood divided the different lots, confidently solicits the attendance of Breeders to this important Sale, which affords an opportunity to procure a class of sheep which, for renowned blood, uniformity of symmetry, and character, as well as fine quality of Wool and Mutton, is not surpassed by any other Leicester Flock.

Catalogues to be had of Mr. WOOD; or of Mr. T. WETHERELL, 32, Claypath, Durham.

Commissions faithfully executed by the Auctioneer.

Durham, September 26.

Weston Park, Shipston-on-Stour.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is favoured with instructions to announce for SALE by AUCTION, without reserve, on TUESDAY, October 18, at Weston Park, Warwickshire, about THIRTY HEAD of SHORTHORNS, the property of Sir Geo. R. Phillips, Bart., including some of the best and choicest families in the Herd, many of which are of Knightley descent, and by Bulls of that famous blood, as well as others of Kirklington descent.

Catalogues, with Pedigrees, may be had on application to Mr. STRAFFORD, 18, Euston Square, London, N.W.; or of Mr. FINLAY DUN, Weston Park, Shipston-on-Stour.

Important Sale of Shorthorns.

MR. STRAFFORD has received instructions to SELL by AUCTION, without reserve, on TUESDAY, October 18, at Weston Park, SIX very Superior and well-bred YOUNG BULLS, belonging to H. J. Sheldon, Esq., of Brailes House, that are well worthy the attention of purchasers of first-rate blood.

Catalogues, with Pedigrees, may be had of Mr. STRAFFORD, 18, Euston Square, London, N.W.; or of Mr. SHELDON, Brailes House, near Shipston-on-Stour.

FIRST-CLASS SALES of SHORTHORNS, SHEEP, PIGS, &c.

WEDNESDAY, October 5.—Mr. Butler's ENTIRE HERD of SHORTHORNS, at BADMINTON CHIPPENHAM, of about SEVENTY HEAD, including some of the very best Darlingtons, Minnies, Lavenders, and other choice families, crossed with bulls of pure Bates blood of first-class excellence.

THURSDAY, October 6.—The late Mr. W. Hewer's HERD of about EIGHTY HEAD, bred for years at SEVENHAMPTON, HIGHWORTH, WILTS, principally crossed with bulls of Spencer and Booth blood. Also his very famous stock of pure BERKSHIRE PIGS.

FRIDAY, October 7.—About FORTY very choice and highly-bred PRIZE ANIMALS, from the celebrated herd belonging to Lady Pigott, Branches Park, Newmarket. Also the FLOCK of SHROPSHIRE SHEEP, pure-bred white faces, HORSES, IMPLEMENTS, &c., from farms whose leases have expired.

Catalogues, with Pedigrees and full particulars, of JOHN THORNTON, 15, Langham Place, Regent Street, London, W.

THORNTON'S SHORTHORN CIRCULAR.—The Tenth Number of this publication is now in hand. Particulars for insertion up to the end of September to be sent during the week to JOHN THORNTON, 15, Langham Place, London, W.

SMITHFIELD CLUB SHOW. AGRICULTURAL HALL, ISLINGTON, DECEMBER 8 to 9.

IMPLEMENT DEPARTMENT.

THE LAST DAY for receiving APPLICATIONS for SPACE for IMPLEMENTS and MACHINERY, &c., is OCTOBER 1.

Printed Forms of Application, with Rules and Regulations, may be obtained of Mr. DAVID PULLEN, Assistant Secretary, corner of Half-Moon Street, Piccadilly, London, W. All communications should bear outside the words "Smithfield Club."

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and following days.

Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under.

CATTLE.—Form A for an OX or STEER (in any Class).
" B. For a COW or HEIFER (in any Class).
" C. For a BEAST in Extra Stock.
SHEEP. " D. For a Pen of three WETHERS.
" DD. For a SINGLE WETHER [Stock.
" E. For a SINGLE WETHER SHEEP in Extra
PIGS " F. For a pen of three PIGS in any Class.
" FF. For a SINGLE PIG in Extra Stock.

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.

Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr. DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Piccadilly, London, W.

N.B. All communications respecting the Show must be addressed to the Assistant Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.

SATURDAY, OCTOBER 1, 1870.

It is impossible to obtain precise information respecting the PREVALENCE OF INFECTIOUS DISEASES AMONG ANIMALS on the CONTINENT. The accounts which reach us probably fall short of the reality, although they contain sufficient to indicate the very serious aspect of affairs. In Eastern Europe cattle plague is rife. In Galicia, Transylvania, Podolia, and Polish Russia the malady is still progressing. On the Asiatic shores of the Black Sea the plague is also reported to be spreading rapidly.

From Berlin, along the main lines of cattle transit up to the Baltic coast, the disease has now extended, and we hear that Saxony has prohibited the imports of cattle and other ruminants, as well as of substances belonging to them, from Berlin and Stralsund. Saxony is still suffer-

ing from the ravages of the plague, but is naturally desirous of avoiding any fresh introduction of infected stock.

Cattle plague has broken out in Alsace and in Mannheim, and in respect of Germany it can only be said that the spread of the disease is almost unprecedented in rapidity. It is admitted by the authorities that the unusually successful measure of the military cordon cannot now be, to any sufficient extent, adopted, in consequence of the necessity which compels the attendance of troops upon other, and, for the moment, more urgent duties.

We may gather from all the reports that have reached this country during the last few days, the rinderpest is doing its work without let or hindrance; and we know from experience how effectually that work will be done. Some epizootic and epidemic diseases seem to exhaust themselves by the violence of their action. It is common to hear it said of a malignant fever that it is dying out. Cattle plague dies out only from one cause—pure inanition,—the sheer want of material on which to feed. So long as animals are within the sphere of its deadly influence its energy remains unimpaired; and in the last attack upon the last ox of the herd, the disease is not less virulent than it was in its mid-career.

While the war lasts, it is idle to expect any diminution in the number of attacks, except what must necessarily be due to the thinning of the herds by disease and slaughter; but it may be questioned if we should not run more risk of infection after peace is restored than we do now. At present there is something like a concentration of the herds and flocks, in the immediate vicinity of the centres of the contagion, for the supply of the troops; and the operations of the contractors, who literally scour the country in search of animals for exportation to England, are limited by the circumstance of war. When the causes which lead to the massing of animals together no longer exist, distribution will be the order of the day, and enterprising dealers will enjoy unrestricted freedom of selection. Animals of all sorts and sizes will be in the market, and the previous scarcity, resulting from restrictions upon the importation of cattle, will give a new impetus to the trade.

Until the precautions which will be gradually carried into effect upon the cessation of the war have been effectual in arresting the spread of the disease, it is not likely that any of the preventive measures which have been enjoined by the recent Acts of the Legislature will be relaxed. It might perhaps occur to many well meaning but uninformed people, that no one would wish, for mere personal considerations, to disturb, in the slightest degree, any of the arrangements which are absolutely necessary for the protection of home stock; but it is unfortunately the case that the commercial spirit is not patriotic in its character, and rarely exhibits the spectacle of self-sacrifice. Importers of foreign stock have assured us, over and over again, that they are quite as anxious as the Government or the English farmer can be, to keep disease out of the country; and by way of proving the sincerity of their constant protestations, after the last Order was passed, they used all the means at command to get as large a number as possible of German animals into the metropolitan market last Monday, by shipping them at North German ports in time to land them in London in the eve of the day on which the Order prohibiting the movement of such animals from the landing-place set apart for them came into operation.

The Order to which we referred last week was passed on September 20, and the first clause provided that "This Order shall take effect from and immediately after the 23d day of September." Under ordinary circumstances the majority of the animals landed at the London wharves come in on Saturday and Sunday, the last day being, as a rule, the busiest day in the week. Last week, however, the day was changed to Friday, which was the last day of grace allowed by the Order, and a considerable number of German animals were landed in time to be sent to the metropolitan market. The animals which were in the market on Monday were in good health and condition; most of them were North German beasts, which had been shipped at Tonning, where at present there is no disease, but no one can say with any good reason that the place will remain free another week; it is, therefore, satisfactory to know that no more stock will be brought from Tonning, or any other part of Germany, to the metropolitan market for some time to come.

QUOTING from our note-book, we propose to bring before the reader a few points on the subject of root crops; and first, on early Turnips as a means of folding heavy land early in autumn. We sowed the early white Pomeranians on May 8 and 18; on July 10 they covered the ground and did very well, in spite of the drought, which ended July 1. They were folded off in August and September. On May 13 and 16, 1865, we sowed Pomeranians on 8 acres, and on 17 acres of heavy land, and had a very great crop, which proved exceedingly valuable. The cost of the respective fields per acre was:—

No. 1.—Eight Acres.

	£	s.	d.
Rent and taxes	2	0	0
One autumn ploughing with three horses, three men, a day	0	14	3
15 loads of dung at 3s.	2	5	0
Spreading ditto	0	1	4
Guano	0	15	0
One ploughing with three horses in spring	0	11	0
Two ditto with two horses	0	16	0
Ploughing out furrows, 1s.; harrowing, 1s. 6d.; rolling, 1s.; drilling, 1s.; seed, 1s. 6d.	0	6	0
Hoeing	0	11	0
	£		0

No. 2.—Seventeen Acres.

	£	s.	d.
Rent and taxes	3	0	0
Guano	2	0	0
Steam-smashing in autumn	0	15	0
Twice broadsharing in spring	0	6	0
Harowing, rolling, and seed	0	5	0
Hoeing	0	11	0
	£3	17	0

The land was poor, and was greatly improved by the fold. The Turnips maintained 300 lambs (on corn) per acre, per week; which, at 4*d.* per head, gives £5 an acre. By growing white Turnips and Cabbages, the heavy-land farmer can begin feeding, in earnest, in July, and he has the advantage of being early on the market to buy his stock, and of getting his land manured in good time.

Rape delights in fen land, or soft rich soils; it also grows freely on chalks and light soils generally, in years of average moisture, and is a favourite crop on account of its inexpensive cultivation and its value for sheep. On hard clays it often becomes stunted and mildewed, both in dry or in very wet seasons. The only chance for Rape on such lands is to sow it with a deep, well pulverised tilth; it won't grow in clods. The land must be cultivated thoroughly and deeply. In the dry season of 1865 we had to deal with a poor heavy farm that needed both cleaning and feeding. Bare fallow is starvation on such land. As an alterative we tried three fields of Rape. The first was a Wheat stubble well folded in winter, by fatting sheep fed on roots and corn, ploughed once in spring, cultivated and drilled without manure on June 6. The crop was much mildewed, and only maintained 62 fatting ewes per acre per week. Another field, cultivated as for Turnips, did much better; and a 25-acre field, deeply ploughed in winter, and well moved by the steam cultivator in spring without further ploughing, produced a crop higher than the hurdles. Both of these fields had 3 cwt. of guano per acre.

Rape is usually ready to fold eight weeks after sowing it. On June 12, 1865, the Rape having been drilled on May 13, 4 quarts per acre, 12 inches apart, with 3 cwt. of guano per acre, had just been hoed, and looked promising. The rows would have closed up after the first shower, but on July 10 the drought had punished the crop. July 29, the Rape was stunted and had grown less. This was partly owing to thick seeding. Two quarts of seed would have been sufficient, and 18 inches from row to row would have been better than 12 inches. A thick crop runs to stalks, which become stunted and tough, and instead of being eaten are trampled under foot, making litter enough to drive a timid man into bare fellow for the rest of his days. Our best crop (4 quarts per acre, sown broadcast, on July 12, 15, and 17, and the seed not all covered) did much better, but was much too thick. It grew fast, and was eaten while young; but the stalks, though succulent, were drawn up, long, and weak. To avoid waste, by treading under foot, we gave the sheep a small fold twice a day, mowed part of the crop, and gave it in cages. On heavy land Rape should be sown early, and in small quantities for succession, and folded when young. On warm, fast land, the early fold is sometimes ploughed, and resown with Rape or Turnips.

The *Swedish Turnip* does not need a prominent place in these notes. In the southern and eastern counties it is esteemed in the autumn months before Mangel has arrived at perfection. It yields considerably less weight to the acre, on clays especially. The weight of the Mangel crop diminishes, however, while that of Swedes increases in the districts further north. Swedes are invaluable on all land that bears folding in winter. They are more liable to mildew when sown early than white Turnips, especially in warm climates on early soils. The season for sowing is from the middle of May to the middle, or even the end, of June. Early-fed Swedes are generally "waxy" and inferior; they are not in proper season till October. They stand a moderate amount of frost without injury, but are much deteriorated by successive frosts and thaws, therefore they should be heaped and protected when intended to remain in the field after the middle of November.

Kohl Rabi is comparatively little known, and has special merits which require notice. It is even hardier than the Swede, and is better able to stand dry weather. In 1864, a year of extreme drought, we were much struck with its appearance on very light land in Cambridgeshire, where it proved superior to the other root crops. The late Mr. FRERE (Editor of the "Journal of the Royal Agricultural Society"), who grew it very successfully, gave us the following account:—

"An early sowing of Kohl Rabi took place on April 8; they were transplanted, and gave 21 tons 2 cwt. 0 stones per acre. The main crop is drilled at the same time and in the same way as Swedes, those drilled the third week in June do not arrive at full maturity, and therefore stand the severest frost. They do not produce sprouts, but the leaves are retained. For transplanting after Tares, about July 10 to 17, the seed is sown about May 12, and the quantity of food produced is more and better than the general crop of white Turnips, and double that produced by sowing white Turnips after Tares with the same treatment. With the same cultivation as Swedes, they yield on our light land one and a-half times as much food. They are wholesome food for sheep; milch cows do well on them, and no flavour is imparted to the butter."

—— AT Mark Lane, on Monday, a small supply of English Wheat sold readily at the extreme prices of the previous Monday. At Wednesday's market, though the supply continued limited, there was no advance on Monday's rates.——At the Metropolitan Cattle Market the effects of the recent restrictive Order were palpable. At Monday's market choice qualities were scarce, and advanced in price; the average rates for sheep were lower. Wednesday's trade was dull, at lower rates.

—— Mr. MECHI has addressed another letter to the *Times* on THE USES OF LONDON SEWAGE, in which there is at least one statement which may mislead. The assertion that "the average annual produce of each of the 107 acres under sewage at the Lodge Farm, near Barking, is from £30 to £70," is, we imagine, intended to convey only the fact that there are many acres under sewage management there of which this is true. Strawberries have been grown on the farm, yielding more than the largest of these sums per acre, and this year it is announced that upwards of £50 an acre has been realised for Onions; but, as Mr. MECHI says:—

"As the farm is so liberally thrown open to public inspection, all doubt can be very speedily removed. The crops consist of Cabbages (ordinary and pickling), Carrots, Parsnips, Potatos, Beetroot, Mangel Wurzel, Onions, Kohl Rabi, Broccoli, Turnips, Strawberries, with some Italian Rye-grass, and Clover, Oats, and Wheat. Crops are grown in rapid succession. Their appearance is one of succulent luxuriance, contrasting most favourably with those of the surrounding market gardens, although the latter receive as much as 50 tons per acre of London solid manure for each crop, at an enormous cost. Little live stock is kept on the farm to make manure. The farm depends entirely on London sewage. In fact, the crops go to London, and come back in a few days in the form of sewage. The crop of Onions was sold for £53 per acre, the purchaser to gather and remove it. The Cabbage crop would probably realise more than that. Two crops per annum are taken on most of the land. The land is of a porous, gravelly nature, the sewage flowing on to it by gravitation, and, after passing through, it comes away like pure water. The rent of the land was 45*s.* per acre, but it has been taken at 55*s.* per acre by the present occupiers. The total annual quantity used is estimated at 1-365th of the London sewage, or about one day's for the London sewage. Several floodings or dressings are given to each crop. I estimated much of the Mangel crop at fully 40 tons per acre. The sewage is pumped from the great reservoir at Barking by a 25-horse power engine, consuming about 20*s.* worth of fuel per day, to which must be added the engine-driver's wages of 4*s.* 6*d.* per day. Making all allowances for expenses, the crops must, and I believe do, prove unmistakably remunerative."

—— Mr. WILLOUGHBY WOOD thus refers to the original purity of the Shropshire breed of sheep, in the columns of *Bell's Weekly Messenger*:—

"At the end of the catalogue of Mr. Robinson's Shorthorns, to be sold by Mr. Thornton, I find the following paragraph prefixed to the list of Southdown and half-bred

Shropshire and Southdown rams, which are to be offered on that occasion :

"'Mr. Robinson has for the last 29 years bred Southdowns from the flocks of Mr. John Ellman, Mr. Jonas Webb, and other eminent breeders, and lately from the celebrated flock of Lord Walsingham, at Merton. During this period he has sold many of his rams to cross Shropshire sheep, and their descendants have been most successfully exhibited at the Royal and local shows.'

"Some two or three years ago a paper, signed by the best known breeders of Shropshires, denying an allegation that they were in the habit of using Southdown rams, was brought to me, and received my signature. As it is important that the facts of this case should be properly known, will Mr. Robinson specify the breeders of Shropshires to whom he has sold Southdown rams?"

—— The French agricultural societies have put off all their meetings, as the whole force of the country is required for its defence. The Paris Society of Carpenters has decided that the sum of 1000f., destined for its annual *fête*, shall be applied in aid of the families of agricultural labourers of the neighbourhood serving in the army. It is the same all over the country. The vintage has commenced in the South of France.

OUR LIVE STOCK.

THE brilliant result of the Nunwick Hall sale, on Friday, the 23d ult., ranks among the most remarkable events in the recent history of Shorthorns. Last May we were electrified by Mr. Murton Tracey's wonderful average of £86 2*s.* 6*d.* over 44 animals, the highest that had been obtained since the Siddington sale in 1869, when 39 animals made an average of £72 3*s.* Mr. Saunders has, however, far excelled either of his south country brethren ; 61 animals have been sold at an average of £96, while 45 females realised the almost unprecedented sum of £106 10*s.* 4*d.* each. The first 11 lots were comparatively old. Mr. Thorn gave 84 gs. for *Clara Gwynne*, and 55 gs. were given for *Waterloo Duchess* by 9TH GRAND DUKE. *Wild Eyes Duchess*, also by 9TH GRAND DUKE, was put up at 100 gs., and finally knocked down at the sum of 250 gs. to Mr. Cochrane, after a severe competition, in which Lords Dunmore, Skelmersdale, and Kenlis, took part. *Fleda's Farewell* was sold to Lord Dunmore for 150 gs., and *Farrell's White Rose* was purchased by Lord Skelmersdale for 100 gs. A great sensation was caused when, after a sharp contest with Captain Oliver and Mr. Cochrane, Lord Kenlis secured *Waterloo 36th* for the enormous price of 475 gs. *Waterloo 37th* exceeded this figure, becoming Mr. Cochrane's at 500 gs. Mr. Cochrane also secured *Waterloo 38th* for 300 gs., and *Waterloo 39th* became Lord Skelmersdale's property at 150 gs. *Waterloo 40th* was bought for 300 gs. by the Rev. Peter Graham, of Turnscroft, Lancashire, and *Wild Eyes Duchess* was secured by Lord Dunmore for 120 gs. Among the bulls, EDGAR, the Oxford winner, brought 110 gs. from Mr. Thompson, of Maiden Hill, and LORD NUNWICK, a son of the bull just named, was purchased by Mr. Wilson, of Woodhorn, for 205 gs. We must defer our complete list of prices until next week.

—— Mr. Strafford has issued a sale catalogue of the Weston Park herd, the property of Sir George Phillips, Bart. The list comprises 40 females and 9 bulls. Although the whole herd will not be offered, great judgment has been shown in selecting three entire families for sale, namely, the "Knightleys," the "Welcomes," and the "Gwyneths." In glancing at the origin and breeding of these families, we find the "Knightleys" deserve their name, eight being descended from *Rosy* by ROB ROY (557). The immediate progenitors of this section of a well-known tribe are still in the herd, and will be sold at the forthcoming sale, namely, *Polytint* by EARL OF DUBLIN (10,178), and *Lactea* by SARAWAK (15,238), both being out of the famous old cow *Cornbind* by JANIZARY (8175). There are also two cows and a 2-year-old bull of the well-known "Sweetheart" tribe, namely, *Sweetheart 2d*, now 19 years old, by EARL OF DUBLIN, and *Sorceress* by MOCASSIN (18,406). The pedigree of the first-named animal is very perfect, as may be shown by the following Table :—

Cow by HOTSPUR (1117) — SIR WALTER (2037).
Sylph — CAITHNESS 1774.
Graceful — LITTLE JOHN 4252.
Charmer — ACCOMPLISHED (?).
Sweetheart — EARL OF DUBLIN (10,178).
Sweetheart 2d.

Lastly, among the descendants of Fawsley stock may be named two descendants of Sir Charles Knighley's *Fillet* by FAWSLEY (6004), the first by EARL OF DUBLIN, and the second by 3D DUKE OF THORNDALE (17,749). Nine cows and heifers and two young bulls are descended from *Welcome* by THE SQUIRE (12,217), purchased at the Messrs. Dudding's sale in 1860. The "Gwyneths" came from Sarsden, where they were much thought of by the late Mr. Langston, and are seven in number. Besides these, there are a few animals of shorter, although good, pedigree, descended from BLOOMSBURY (3171) and WESTON (5635). Most of the young stock are by the *Cherry Duchess* bull, 3D DUKE OF GENOA, the sire now in service. Some of the younger heifers have been put to the DUKE OF KENT, a handsome roan bull, bred by the Messrs. Leney & Son, of Wateringbury, by LORD OXFORD 2D (20,215), and of the Milcote "Charmer" family. On the same day six first-class Shorthorn bulls, bred by and belonging to Mr. H. J. Sheldon, of Brailes, will be sold. Three of these animals are of Fawsley origin ; one is a *Darlington* by 3D DUKE OF WHARFDALE (21,619), one is a "Foggathorpe," and one is a well bred descendant of *Blanche* by BELVEDERE (1706). The sale is advertised to take place on Tuesday, the 18th inst.

—— On Wednesday, the 12th inst., Mr. Strafford is instructed to sell the entire herd of Shorthorns, belonging to Mr. Caless, of Bodicote House, Banbury. There are in all 49 head, 33 of which are cows and heifers. The greater part of them are excellently bred, 12 being directly descended from Mr. Coates' *Celia* by 3D DUKE OF NORTHUMBERLAND (3047), and *No. 6 Chilton Sale*, by DR. SYNTAX (220). There are also a few descendants of *Portia* by CATO (119), a favourite strain with Mr. Mason, of Chilton. Six of the lots trace from *Amelia*, bred by Mr. Adkins, of Milcote ; whilst nine spring from *Bracelet*, bred by Mr. Harvey Combe, of Cobham Park ; the remainder will be found to combine some good old sorts. HUNTSMAN (21,963), a Royal winner, is the sire of most of the young stock ; he was from *Annie* (bred by Mr. W. Smith, of West Rasen), the dam of WHIPPER-IN (19,130), a 1st prize bull at Battersea in 1862 : *Lady Franklin* was also from West Rasen, and by the sire of *Annie* CAPTAIN SHAFTOE, a Royal prize bull.

—— Great activity at present prevails in the Shorthorn world. The next two weeks will witness many important sales, among which, in addition to what have already been noticed, we may mention Mr. Thornton's three impending Gloucestershire engagements. Mr. Garne's sale is fixed for next Tuesday, at Chipping Norton, but having previously drawn attention to this stock, we pass on to briefly notice two other important auctions. Mr. W. Butler's herd will be sold at Badminton on Wednesday, October 5, and on the following day the late Mr. Hewer's herd comes to the hammer at Sevenhampton. "We had last week," says an excellent authority, "an opportunity of inspecting both stocks. At Badminton we found a number of cows in excellent condition and in calf, grazing on the short bite that has been freshened by the late rains. Old *Darlington 1st*, bred by Mr. Sainsbury at Corsham, is a grand specimen of bovine creation ; fresh looking at 14 years old, with a docile expression of countenance, rich quality of flesh, and abundant hair, she is the type of a fattening beast, as the cushions on her rumps testify. Her descendants are all of one character, with long straight backs and quarters, wide loins, and round ribs, and the same docile but rather masculine-looking heads. *Darlington 17th*, a yearling, was a picture, with a coat of long hair, beautifully variegated white and roan. The 'Minnies' seemed to be the next best lot, all of the same roan colour, and full of heavy flesh. Some of the 'Lavenders' looked rather small in comparison with the rest. The calves were nearly all of the same hue and very fat, being reared on skim-milk made warm with water in which Linseed had been boiled. COUNT BICKERSTAFFE 2D, the bull, was level and true made, with short legs, a broad head, and fine muzzle ; the bull calves had not thriven so well, but were of much promise."

—— The Sevenhampton sale will afford an excellent opportunity to any person who wishes to lay in a good breeding stock of Berkshire pigs. We mean no disrespect to the cattle in thus giving precedence to their porcine companions. On the contrary, we consider that the 88 head of very superior cattle well deserve a good sale and good prices. The cows are large and massive, and when dry feed rapidly. The herd was originally started from well-selected cows with great milking properties, upon which bulls from Earl Ducie's and Mr. Garne's stocks were used ; cows of good pedigree and fine quality were afterwards introduced into the stock, among which were some of Earl Spencer's celebrated "No. 25" family, which will be found in the catalogue under the name of the "Epitaphs ;" also several cows bred from Mr. Smith's old stock of Drax Abbey, York, and others tracing directly back to Mr. Charles Colling's WINDSOR, and also to DENTON, a son of the 1000 gs. COMET. Bulls inheriting largely Mr. Booth's prize blood have for the last 20 years been employed. BORROWBY LAD (12,486) and LORD LENNOX (29,189) were sons of the Warlaby sires, MONK and SIR JAMES. VISCOUNT KILLERBY (19,081), of the "Mantalini" tribe, was purchased of Mr. Carr, and the cows and heifers are now principally in calf to Mr. Torr's BOTHWELL (25,661), a son of LORD BLITHE, and from the "Anna" tribe.

REFLECTIONS ON BRITISH AGRICULTURE.

WHAT changes are coming slowly, but surely, over the agricultural mind. The man who 20 years ago chaffed Mechi for recommending straw as food for cattle, is now found chaffing his own straw for his own cattle ; so that we have, in reality, a great increase of agricultural chaff. While the steam-engine hum of our threshing-machine was in full play to-day, into the pulper went Cabbages, Mangel, with their tops, Kohl Rabi, ditto ; said I to my cattle feeder, "George, hand-power wouldn't do for this." "No," said he, "nor horse-power neither." So that we came to the conclusion that every arable farm of 150 to 200 acres should have a fixed steam-engine, with its accompaniment of pulpers, crushers, chaff-cutters, pumps, sack-elevators, millstones, threshing-machine, cake-breaker and grindstone—a circular saw would be of no use to us, as our timber departed some 25 years ago. How can agriculture progress without steam-power? and yet its use is partial and very limited.

By-the-by, has your engine-driver, during the slack time, taken to pieces the various machines, cleaned their parts, oiled them, sharpened the teeth of your pulper, examined and levelled the brasses, cleaned the engine, flues, mud from boiler, &c.? I have seen so much neglect of these important matters that I wonder whether farmers care for profit or prefer loss. Machinery is like a watch : when I carried my watch-key in my waistcoat pocket, dust worked into it, and as I wound up the watch the dust found its way into the works, and it never kept time, and often the chain or spring broke ; but now that I keep the watch-key in a clean piece of wash leather, and enclose the watch at night in a wash leather bag to keep it warm, it keeps excellent time, although I have worn it constantly since 1826, when it was presented to me with a testimonial engraved on it by my first and only employer. My engine has been driven for 22 years by one of my agricultural labourers, who has gradually become blacksmith, carpenter, or anything else required ; this is the sort of man that should be bred and broke in on every farm. The youngsters who group around the engine-fire in wet and cold weather, at their meal times, get inoculated with a conviction that steam-power is a farm necessity ; and I hope and believe that the rising generation of farmers will grow up with a similar sentiment, and not, like their fathers, look upon it doubtfully as an experiment.

It is not desirable to quarrel with your labourers ; several of mine have been with me for more than 27 years. We almost bred them on the estate. And this reminds me that a certain estate owner from a backward and neglected district visited a greatly improved property in the eastern counties, where he was struck with the intelligent and prosperous condition of the tenantry. When they assembled at the festive board the visitor, in his after-dinner speech, expressed his surprise, and wondered how the landowner found such a superior class of tenantry. One of the tenants present shouted, "Why, his lordship breeds them on the estate, to be sure." No doubt this is true enough, and that, both as regards tenants and landowners, the initiative by means, mind, and progress must have an immense influence on the welfare and progression of agriculture.

Amongst many such instances may be mentioned the late Mr. Coke, of Norfolk, as a striking example. An applicant for a farm too large for his available means would be told, "No, this farm is too big for your capital ; I will find you one more suitable." And no doubt he knew quite well that capital was only one item towards success, and that brains were a necessary and indispensable accessory. In choice of tenants, as in other matters, it is not easy to find the right man for the right place ; and happy is the landowner who, by himself or his steward, is a sound judge of human nature, and takes trouble in rearing such on his estate by example and encouragement.

When I began farming here 27 years ago, guano was unknown, steam was a myth, iron sheep hurdles were condemned as an extravagance, and even to this day nine farmers out of ten do not deepen their cultivation by following the first plough by another drawn in the same track.

Deep draining in strong non-calcareous soils is the exception and not the rule, the argument being that there is a good surface fall for the water to pass away ; of course, they do not reflect that water will not run off the surface until the soil is super-saturated, and they would condemn such a practice as folly in the case of their flower-pots, having a plug in them to stop the drainage.

Altogether, Britain is not half manured or half farmed, and our landowners and farmers conjointly must accept this as a true proposition, and conclude that there is an immense field open and awaiting the joint action of increased intelligence and capital to produce more abundantly and more profitably food for the British people.

I know that I have in my time shocked many prejudices and excited much anger, but has not every man done so who attacks antiquated customs, and advocates changes and improvements? The supporters of the old spinning-wheel, distaff and flail destroyed the newly invented cotton machinery and threshing-machines. It was natural, though a mistake ; the conservative sentiment in favour of old institutions is an honest and not undesirable one up to a certain point, but it is the fight for progress and improvement which introduces us to a new state of things more suitable to our welfare.

I like a good honest stand-up fight, all in good humour, and for a good cause ; and I readily forgive my opponents of the old school when they let their temper get the better of their judgment. *J. J. Mechi, Sept.*, 1870.

WHEAT RUST AND BERBERRY RUST.

[The following article is taken from the columns of our contemporary, "Nature," to which we have also to acknowledge, with thanks, our indebtedness for the blocks by which it is illustrated.]

THE theory has long been prevalent among practical agriculturists, that the proximity of Berberry trees produces rust in Wheat. Men of science, unable to trace herein the sequence of cause and effect, long derided the idea, and placed it among the prejudices of the agricultural mind. The facts of the farmer have, however, been too strong for the science of the botanist, and experience has won the day over theory. Let us trace for a moment the history of the inquiry. The first reference to the injurious influence of the Berberry on corn, appears in Krunitz's "Encyclopædia," published in 1774. Marshall, in 1781, speaks of the Berberry having been extirpated in Norfolk for this reason, and Schopf, in 1788, mentions the same idea as prevalent in New England. Other writers of the same period give similar testimony; and, in 1806, Sir Joseph Banks writes thus in the "Annals of Botany:"—

"It has long been admitted by farmers, though scarcely credited by botanists, that Wheat in the neighbourhood of a Berberry bush seldom escapes the blight. The village of Rollesby, in Norfolk, where Berberries abound, and Wheat seldom succeeds, is called by the opprobrious appellation of 'Mildew-Rollesby.' Some observing men have lately attributed this very perplexing effect to the farina (pollen) of the flowers of the Berberry, which is, in truth, yellow, resembling, in some degree, the appearance of the rust, or what is presumed to be the blight in its early state. It is, however, notorious to all botanical observers that the leaves of the Berberry are very subject to the attacks of a yellow parasitic Fungus, larger, but otherwise much resembling the rust in corn. It is not more than possible that the parasitic Fungus of the Berberry and that of Wheat are of the same species, and that the seed is transferred from the Berberry to the corn."

The acute suggestion thrown out by Sir Joseph Banks, at a time when so little was accurately known of the structure of Fungi, was not followed out for half a century; it was reserved for the German fungologist, De Bary, within the last few years, to establish the truth of his theory, and to prove the existence of the phenomenon of Alteration of Generation among Fungi. The researches of Steenstrup and others have made us familiar with this remarkable phenomenon among the lower forms of animal life, but had hardly prepared us to meet with it in the vegetable kingdom. It appears probable, however, that the phenomenon is by no means uncommon here also—affording another instance of the law that it is in their lowest forms that the animal and vegetable kingdoms approach one another most nearly—and that whole tribes of Fungi hitherto considered distinct are but different phases of one another. This remark applies especially to the two genera of minute parasitic Fungi, Æcidium and Puccinia, to which the rusts in question belong, both belonging to the family Uredineæ. The well-known orange-red spots so common on the leaves of the Berberry are produced by the Æcidium berberidis, while the rust of Wheat and other cereal crops, but found equally on some other species of grass, as the common Couch-grass or Triticum repens, is the Puccinia graminis. In the volume for 1865 of the "Monatsberichte der kon. preuss. Akademie der Wissenschaften zu Berlin," is a paper by Dr. De Bary, giving an elaborate account of his experiments on the propagation of these two Fungi, in which, if his experiments are reliable, he clearly proves the correctness of Sir Joseph Bank's suggestion, that they are one and the same species. The experiment was tried, with due precautions, of inoculating the leaves of the Berberry with the spores of the Puccinia, the result being the production, not of the same Fungus, but of the Æcidium, while the sowing of the spores of this latter Fungus on the leaves of Couch or Wheat, produced conversely the Puccinia. By sowing the spores of either Fungus on the plant on which it was itself parasitic, he failed altogether to reproduce the same plant; and this alternation of generation may serve to account for the fact, which has often been noticed, that rust is apt to appear, not in successive, but in alternate years on the same crop.

It is unfortunate to find that in a work bearing a considerable amount of scientific authority among agriculturists, and published in the same year, 1865—Professor Buckman's "Science and Practice of Farm Cultivation,"—the theory which thus appears to have been proved on the Continent was scouted in the following terms:—"Æcidium berberidis is here referred to, from an opinion prevailing that it is the cause of rust or mildew in Wheat. We can no more believe that the Berberry rust would produce rust in Wheat, than the rust of any other plant would do so. Still, that Wheat growing under a Berberry hedge may be more blighted than the rest of the field is quite true, and so it is with Wheat growing under any kind of hedge." Mr. Buckman fails entirely to grasp the argument, which is, not that Wheat "growing under a Berberry hedge" is attacked by rust, but when growing in the proximity of a Berberry tree, say at the distance of a field's breadth. Nothing is more certain to weaken the hold of science over practical men, than when men of science, in order to support their own theories, set themselves systematically to deny well-known facts. We therefore greatly regret the decision at which it is understood the Council of our Royal Agricultural Society has arrived, to refuse a thorough investigation of the subject which has been urged upon them, calling in the assistance of experienced men and the most able fungologists of the day. This is not the way to command the confidence of practical farmers.

We commend to the consideration of the Royal Agricultural Society the conduct of a railway company in the south of France, described in the *Bulletin de la Société Botanique de France* for January of this year, to which we have already alluded (see "Nature," vol. i., p. 516). In the commune of Genlis, Department of Côte d'Or, a Berberry hedge was not long since planted on one of the railway embankments; when immediately the crops of Wheat, Rye, and Barley in the neighbourhood became infested with rust. The complaints of the farmers caused the appointment, by the company, of a commission to investigate the subject, who reported, after a full inquiry, that wherever the Berberry was planted, the cereals were more or less attacked by rust: where they were absent, the crops were free from disease; and that the planting of a single Berberry bush was sufficient to produce the rust where it had never appeared before. The railway company's own commission held that compensation was due from the company to the farmers.

Our illustration of the Æcidium berberidis is taken (in part) from Grevill's "Scotch Crytogamic Flora;" that of the Puccinia graminis from Corda's "Icones Fungorum."

Alfred W. Bennett.

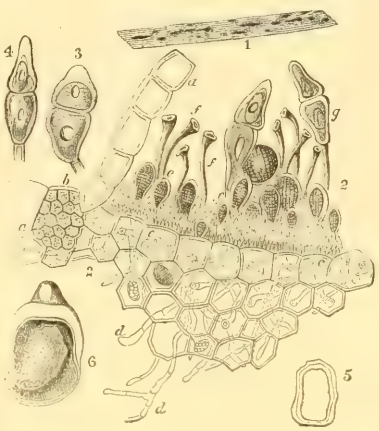

FIG. 242.

Puccinia graminis, Pers. 1. Leaf of grass, with mildew, natural size. 2. Section of the leaf, with a patch of mildew and rust: *a*, epidermis of the leaf; *b*, bast-cell-nerves; *c*, *c*, outer layer of cells of the leaf, on which the parasite rests; *d*, *d*, mycelium; *e*, *e*, young and old spores of Caoma lineare; *f*, *f*, stalks from which the spores have fallen off; *g*, spores of the Puccinia. 3, 4. Spores. 5. Section of the wall of the lower spore-cell. 6. Longitudinal section of the upper spore-cell with the spore-nucleus. (2—6 magnified.)

In considering the question of the influence of the Berberry on the production of rust in Wheat, assuming that De Bary's observations are perfectly correct, it is necessary to consider the nature of what is commonly called rust in cereals. Presuming that his views are strongly confirmed by the analogous connection of Roestelia cancellata, the Pear blight, with the gelatinous parasite of Juniperus sabina, it is well to attend to the following facts:—Professor Henslow, in an article on the diseases of Wheat, in the "Journal of the Royal Agricultural Society," proved distinctly that what is commonly called rust is merely a condition of the common mildew, and this, at a time when comparatively little was known about these parasites, and when many were inclined to accept the views of Unger that they were mere abnormal developments of tissue or spontaneous growths. The observations of Tulasne and others confirmed to a certain extent Professor Henslow's view, but threw further light upon the matter, by showing that many so-called Uredos were merely a subsidiary form of so many species of Puccinia. Meanwhile, though Uredo rubigo vera was the subsidiary form of Puccinia graminis, it was recognised that Uredo linearis is nothing more than the early stage of the Puccinia. Though there is some resemblance between the Uredinoid form of the Puccinia and the rust of the Berberry, there is none between the perfect condition of the parasite. Our readers will have noticed, that at the meeting of the French Academy on August 1, M. Roze contributed some further illustrations of this interesting subject.

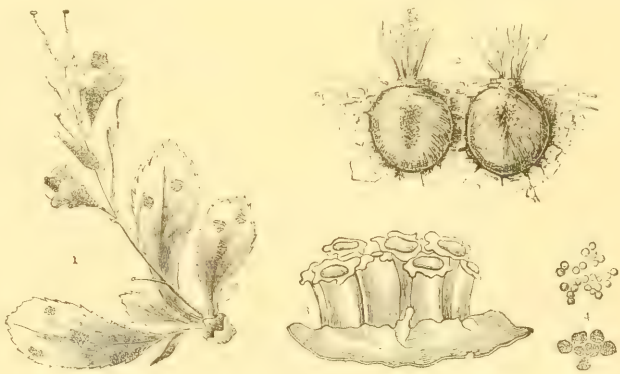

Æcidium berberidis, Gmel. 1. Branch of Berberry with spots of rust, natural size. 2. Spermagonia. 3. A group of Peridia with their orifices dentated. 4. Spermatia. (2, 3, and 4, magnified.)

The great difficulty has always been that mildew is most prevalent in countries where not a Berberry bush is to be found; and the same remark applies to the Pear rust, which abounds where not a single plant of Savine is to be seen, the parasite of the Savine being comparatively of rare occurrence. I think, always assuming the fact of the connection between two parasites, that it may be easily accounted for. It may be true that the Berberry plant produces mildew; but how is this? Not probably from the spores of the present year, but from those which fell to the ground the previous season. There is no doubt that these parasites penetrate into the tissues of the young germinating plants, by means, not of the original spores, but of minute secondary spores which are produced on them, a circumstance which is fully proved in the case of Bunt. This, then, will account for the cereal being mildewed in the neighbourhood of the Berberry. But another consideration is necessary to explain the prevalence of mildew where the Berberry does not exist, or where it is confined to gardens. The subsidiary spores have, no doubt, equally with the Puccinia itself, the property of reproducing the mildew, and there are

always enough of these blown about, either from previous crops or from the neighbouring grasses, especially in the fens, where every ditch is filled with reeds affected more or less with mildew; and thus the parasite may be propagated, season after season, without the Æcidioid form intervening, a circumstance which is not without analogy in other branches of the vegetable kingdom. I may be allowed, perhaps, to recall attention to an article on the development of Bunt in the second volume of the "Journal of the Horticultural Society of London," which seems entirely to have escaped notice on the Continent, where it is stated, in a paper communicated by me on January 18, 1847, with reference to the phenomena described, that "it is quite possible that in plants, as well as in the lower animals, there may be an alteration of generations." *M. J. Berkeley.*

CONVEYANCE OF STOCK BY RAILWAY.

[The subjoined remarks on the transit of fat animals are extracted from the Report of the Chief Inspector of Stock in the Colony of New South Wales, Mr. Alexander Bruce, V.S.]

It is a well ascertained fact that at home a fat beast crawling along a good road at a snail's pace, and rested, and well fed day and night, loses 8 lb. a-day during the journey; and surely here, with bad mountainous roads, little or no feed, and that little exceedingly inferior, and the cattle comparatively wild, we are justified in putting the loss at the same amount in the summer and one-half more in the winter. It may be that stall-fed cattle when taken on the road would fall off very much, but they cannot possibly do so to the same extent as our cattle on the last 120 or 140 miles of their journey to Sydney by either of the principal droving roads.

If then our stock travelled by the road waste even to the extent that they do at home—and I believe stock-owners themselves, when they consider how the cattle die on the station and in Sydney, will allow that I am rather under than over the mark—there cannot be a doubt but it would pay the owner much better to send his stock by railway from any distance over 80 miles than by the road. The question stands thus on cattle from Goulburn :—

By Rail.	
Railway charge	£0 8 6
Loss of weight, say 1 day's waste, at 8 lb., at 2½*d.* per lb.	0 1 8
	£0 10 2
By Road.	
Droving	£0 3 6
Waste of condition, say 10 days, at 8 lb. per day,=80 lb. at 2½*d.*	0 16 8
General deterioration of quality of meat, say 6*d.* per lb. on 650 lb.	0 6 9
	£1 6 11

That is a clear gain of 16*s.* 9*d.* per head, exclusive of the advantage of a far quicker return (a matter of very material importance to all, but especially to the dealer), and also that of far less risk of damage or loss than if the flock are sent by the road. The price put on the quantity deficient is not too high, considering that it is the best of the fat that is wasted, and the rate fixed for the general deterioration is considerably under than over the mark.

I believe a good many sheep are now sent by rail to Sydney, and there can be little doubt but all ought to be so when the distance is over 30 to 40 miles. It is comparatively little trouble to put them on and off the trucks, even with the present convenience, which might be increased; and they waste as much as cattle on the road in fine weather, and a great deal more in bad. I have it on the very best authority that sheep sent by rail from Goulburn in ordinary weathers are worth at least 1*s.* 6*d.* a head more than those travelled by the road. This would bring the saving to be effected by sending cattle by rail to about the same amount as that already estimated.

I am aware that the comparative wildness of our cattle stock, and the difficulty of trucking them will be brought forward as objections to sending them by rail; but the fact that cattle are now frequently sent from Sutton Forest to Sydney by train is a sufficient answer to these objections. The arrangements for trucking cattle could, however, be improved, and I will now endeavour to point out how this might be effected.

The present close covers, which frighten the cattle and stop them from going into the trucks, should be removed. The cattle are of course wholly unaccustomed to anything of the sort, and the covers have to account for a great deal of the punishment and bruising to which the cattle sent by rail are now subjected. As they will almost always be carried at night they require no shade from the sun, and they are too closely packed to suffer from cold or wet even in winter. Should, however, exceptional hot or cold weather occur, iron stays could be thrown across the trucks, and tarpaulins tied over the stays. Besides the side-doors in the truck (which would be required for loading goods for the up-country trip), there should be one at each end, the whole width of it, but divided into two halves, so that when they opened and swung back on the sides they would fill up the gap between the trucks caused by the buffers.

The yards and line should be constructed as to place the trucks when loading on the yards. The proper number of trucks, according to the size of the mob of cattle to be dispatched, could then be drawn up to the yards in a continuous line and firmly chained up to each other, while a piece of flooring, made for the purpose, could be placed between each truck over the buffers, and so secured by bolts or otherwise to the two carriages and to the buffers as to carry the cattle steadily over them. On this being done, the half-doors could be thrown back at each side and fastened by strong chains or iron bolts on the side to secure them against the pressure of the cattle. The trucks would thus form an unbroken line from end to end; and if the engine were kept at a distance, and the wheels of the truck as much as possible out of sight, there is no doubt but, with a few quiet workers or milkers to lead them on, the cattle would take the trucks nearly as readily as they would a line in a stock-yard, and more readily than they crossed some of the bridges on their road to the station, for at the station the forcing yard would of course assist in making the cattle go into the truck. As the cattle went on the trucks they could be kept from going either backward or forward by putting round rails through here and there, where required, between the rails of the trucks or through openings made in the sides for the purpose, till each of the trucks could be filled with the proper complement of cattle, and the doors closed and fastened.

In this way I think it will be seen that the whole number of trucks would be more easily loaded than one would now be with the cover on it, and by the small door in the side; and the cattle need not be knocked about or bruised more than they would be in putting them into a drafting-yard or lane. The sides of the trucks should be closely and smoothly boarded all round, from the height of, say, 4½ or 5 feet down to a level with the animal's knees, to prevent bruising through the one beast crushing the other, and the inside of the fore and hind doors should be padded to save the cattle from the effects of the jolting occasioned by the train stopping and starting.

With these precautions, well-planned forcing yards, and quiet, careful management in putting on and taking off the cattle, they ought to have fewer bruises upon them than if they had come through some of the double lines of fences between which they would have had to travel if they came by the road; and the saving in condition by the rail has been already pointed out.

RELATION OF LANDLORD AND TENANT.

The Laws of Hypothec, Entail, and Primogeniture.

With your permission I purpose to direct your attention to some of the effects of the noxious land laws —Entail, Primogeniture, and Hypothec—as seen by me in practice. I do not think it will be difficult to show that these three laws are monstrously unjust to the general body of farmers, most hurtful to the landlords and aristocracy, and inimical to the public weal. The subject has many points of view; and there are certain dark corners as hideously deformed as the front or first face is. I shall, therefore, first treat of the law with reference to the public interest.

Apart from the inherent right of the public to interfere with any system that threatens limitation of the necessaries of life, they have an undoubted right to be on even terms with the landlord in the making of their contracts. They are not so at present. The law of hypothec, by the preference which it gives to landlords over other creditors, renders him independent of the general solvency of the tenant. He is thus rendered safe in accepting offers from adventurers which he could not otherwise have got or taken. The *bonâ fide* solvent farmer is obliged to offer the same terms or consent to be driven out of the field. The same pressure obliges him to submit to any terms the landlord chooses to dictate as to game preserving and the like. Free competition, or freedom of contract, in such circumstances, is impossible. Indeed, if there is to be a preference, it should be given to those general creditors who probably never would have come in contact with the tenants, had these tenants not been planted in their respective farms by the proprietor, and who certainly never would otherwise have been led to trust them to the same extent. There should be no preferences to any. Every individual member of the public, I hold, is entitled to demand, as even-handed justice, the same open field of competition in taking a farm, and the same right of recovery from his debtor's estate, as a landlord has, whether his claim arises from services, without the return for which he cannot live, or from furnishings to the farm, which are as necessary to the raising of the crop as is the land itself. The accounts for manure furnishings are now very often equal to the rent, and is it justice that a landlord should be preferred for his rent before a creditor for those furnishings? In the one case, the landlord only loses his yearly profit; in the other, the creditor losses both subject and profit.

The due proper cultivation of land is essential to our existence, and the extent of land is, in this country, in proportion to the population, supposed to be limited. The general public must look to the means of subsistence being provided, and so they are, at least, entitled to have all laws that limit such means of subsistence abrogated. But nothing can be more prejudicial to the proper cultivation of the soil than a law which prevents the landlord from having any interest in the selection of his tenant. Come what may, he can, with the assistance of his law agent, easily secure a preference for two years' rent. Let anyone take a plain, common-sense view of this question, and apply this law to his own business, and see what would be the effect of the absence of a direct interest in selection; and land being of limited quantity, there is, as a matter of course, a natural over-competition for it, which aggravates the evil. Well, as there is no interest on the part of the landlord to select, and little room on the part of an intending offerer for choice, what must be the result, but that, in many cases, the worst, or, at least, the most unscrupulous, men become the tenants; and that better men must give the same terms or want? What is the ultimate effect of this? The result is, that good cultivation is restrained; building, enclosing, draining, and manuring, are all put under difficulties; that the land does not produce what it might; and that the tenant, in many cases demoralised, embarrassed, and pauperised, leaves perhaps just enough of crop and stock as may be sufficient to pay the rent—and no more. The landlords get paid, while the general creditors get, in too many cases, not a sixpence. Nor is this all, for by the time the tenant gives up, the land is so exhausted from neglect, that several years of the very highest cultivation will not do more than restore it to order. There is yet another evil. Just look at the moral degradation of those connected with the tilling of the soil. Our illegitimate returns are sad in the extreme, but these afford but little index of the unchastity, and even abandonment, that exists. It is not difficult to see that much of this is due to the want of the surveillance and active sympathy of their superiors.

Nor is this all. We have a pauperism that threatens to devour us. It is every day getting more alarming, and I have no difficulty in tracing it to the baneful influence of those restrictive laws which limit labour. That limitation prevents a demand beyond the best of our labourers. For example, in this small and comparatively well cultivated county, there could be profitably employed for years twenty times our surplus agricultural population, while at the same time no investment can be got for money lying in hundreds of thousands in our banks. This would absorb all our present supply of able-bodied labour, and more, even as regards persons at present receiving parochial relief, on the ground that they are not able-bodied. I recently made a full inquiry into the state and capabilities of the poor on our Elgin rates, and I found that at least 50 per cent. of them could be utilised. I am convinced that if our proprietors made a provision, by the erection of suitable houses, there is not a farmer of more than 100 acres of land but would gladly aliment a pauper who has simply the ability to see that the cattle were comfortable, and of attending to any little odds and ends, such as replacing a broken paling-bar, which are constantly occurring about a farm. Besides this, if labour were more plentiful, the roll would be relieved of a considerable percentage by the disposal of the able members of the family. Nor would the effect stop there, for it would permeate every interest, from the meanest subject to the Queen.

Just let us look at the other side. Suppose that laws which are even, just, and fair, take the place of these odious and barbarous enactments. It is not too much to assume that the same spirit which pervades the mercantile community would animate the agriculturist. What would be the effect of that in our country? Contrast the clay bogs on undrained lands of the neighbouring estate of Westfield 30 years ago with the present finished fields. Nay, we need not go so far back. You, who only a few years ago beheld the sour pasture, the spindly corn, and the *dun nowt*, on that property, will now see carpets of Clover, boulders of Turnips, and mountains of fat. Do you remember the old steading? What do you now see? Majesty might dine in any of the brute beasts' stalls. And why all this? Why, because the spirited owner is also occupier, and is beyond the influence of these enervating laws.

If those connected with the soil were animated with but a tithe of the spirit displayed in the instance to which we have just referred, and if we had a system that would bring in capital, the change might not, indeed, equal Westfield, but it would astonish the most sanguine.

As to improvements, besides the acknowledged advantages of draining, and additional manuring, there is not a field in our county that might not be stone-fenced. There is plenty of material. Look at that hill of free-stone in Quarrywood, almost bursting from its bed, and, as were, imploring to be taken and used up. Yet, for dyking or fencing purposes it lies almost untouched. It is calculated that good dyke fencing enhances the value of land from 2*s.* 6*d.* to 5*s.* an acre. This alone would add to our rental more than 20 per cent.; but that return would be only one of the many good things.

In regard to the tenants, I think I have shown that these laws are most unjust, and that the tenant is not in a position to protect himself. No ship can sail well without an evenly-balanced keel. She may do in good weather, but sooner or later she will come to grief. I never was ashamed of my countrymen until the present stir in the Game Laws began. Think of a Scotsman

asking Parliament to give him the very worst of protection, and openly pleading that he can't take care of himself. It is not a whit more ludicrous than the boast of the bully schoolboy, "Hold me, or I'll fight!" What a state of degradation must our farmers have been reduced to when they make this miserable appeal! It is easy to see that if these fundamental laws of entail, primogeniture, and hypothec are removed, this excrescence of game will speedily disappear. Put the tenants on an even position with the landlords, and they will be able to take care of themselves; and in regard to game, make it property. If, then, a tenant chose to rear so many head of game for his landlord, why should he not be permitted to do so in the same way as he now, by agreement, grows so many quarters of corn, or feeds so many head of cattle for him? Put them on an equal footing, and so long as they don't seriously interfere with the public wants, let them arrange their own affairs.

I shall now show that these laws have a most pernicious effect upon the interests and prestige of the landlords; and first, as to their interests. At the outset there would necessarily be in new occupancies less rent under fair laws than under the present protective system; but in process of time the landlord would be far more than recompensed. Assume that a man of intelligence and capital (they generally go together) goes into one farm, having been attracted to it by the impression that he can invest his money profitably, and that another of ordinary or inferior intelligence and limited capital (they also are generally found in company) gets possession of another farm, having got it from being the highest offerer, and from there being no interest in the landlord to make a seclection, what will be the ultimate result? The first man will reclaim, and drain, and fence, and generally will not only put the farm in good order, but will permanently improve the soil, and at the end of his lease the land will yield such a rent as will give far more than compensation for the previous loss of rent. The other man will make none of these improvements. At the end of his lease there will be the same "tumble-down" houses, open ditches, and bogs; while the land itself is so thoroughly scourged, that it is worth even less rent than it was at the beginning of the lease. Now a landlord must look at the produce of the soil for his rent; and the more it produces, the more rent he will ultimately get. Let us take a case for illustration, and see the difference in value between good farming and bad farming on a 100 acre farm, conducted under the five-course shift:—

[illegible]

However short-sighted a landlord may be, he must see, from the figures, if the present system did not tend to divorce him from contact with business men and with proper business affairs, what is ultimately for his benefit.

It is notorious that a considerable percentage of our farmers are insolvent at this moment, and are in a much worse state than they were when they entered their farms. What must be the ultimate fate of these men? If they have, without misfortune, reduced themselves from solvency to insolvency, is there any chance, by pursuing the same course of conduct, of their redeeming their position? These men, who are probably two or three years in arrear, struggle on till they fall from exhaustion, and the landlords and the lawyers consume the carcase; while other good farmers, who, from sympathy, had lent a helping hand in propping up their falling fortunes by a cash credit bond, or some other similar obligation, get themselves crippled in the pecuniary catastrophe. The effect of this cannot but be disastrous. It reminds me of what a great brewer once told me—"When a barley corn does not malt, it moulds, and infects its neighbours, and taints the ale." All these evil effects ultimately fall on the landlords. In the meantime the landlord is appealed to for delay in the payment of his rent, and, having the security of hypothec, he can scarcely refuse; but if he had no such security, he would probably never be asked for delay, and the tenant would give in before the matter assumed such grave proportions as to involve the safety of others, and itself become a total wreck.

It is said that this law of hypothec enables landlords to raise up deserving tenants, but this must have been said as a joke. A deserving tenant cannot raise himself, and if he cannot, let him remain where he is, as he is more useful as a servant than he would be as a "hard up" farmer. Besides, why foster more farmers, when we have already a too plentiful crop? If, however, notwithstanding of this, landlords wish to raise up servants, let them do so at their own risk, and not at the expense of the public. If they want to get credit for generosity, let them deserve it. It is more than absurd for a landlord to take credit for this, when the effect is to raise a still more undue competition for land, while he sits secure for his rent. The public will have no objection to run an equal risk with landlords, but they will decline taking all the risk and foregoing all the profit.

Then, let us look at the prestige of the landlords. At this moment, the tenants do not feel a healthy respect for the landlords, and when vote by ballot comes, the landlord will find that out. It is almost impossible to conceive two interests which should naturally be more in unison than those of landlord and tenant. There is no enactment of any kind affecting the one that does not almost equally affect the other. If the landlords were only wise enough to trust to the proper operation of the laws of political economy, instead of to unjust and odious privileges, they might have a moral power ten times stronger than the power, the reverse of moral or just, which these privileges at present enable them to wield. If landlords would not be eternally thinking of their political power and their dignity, and would direct their attention to the material, and social, and moral advancement of those whose destinies are in their hands, they would command a power worthy of the highest ambition; they would ennoble nobility; they would preserve a respected aristocracy, without which a country is never safe; and they would be reverenced, and allowed and welcomed by the general public to take their fair share in the government of our country, which they have hitherto too much abused for the undue and near-sighted benefit of their own order.

I have already been so lengthy that I can't ask you for more space, but you will perhaps allow me to state, in regard to the law of entail, that it is no reason for its existence that a comparatively few families wish their descendants to be "great folks;" but it is a good reason for its non-existence that it retards agricultural progress, and demoralises the very class that it is meant to perpetuate. It is a sufficient argument for the extinction of this privilege, that its possessors have little or no interest, but the reverse, in improving the land. In nine cases out of ten, an entail proprietor can't reap what he sows, and it would be a waste of time to argue about the result.

It may, also, be remarked that this is the most unconservative law in our Statute Book. What can have a greater tendency to revolution than that 999 out of every 1000 of our people are, by an Act of Parliament, insultingly excluded from becoming owners of what every man so much desires to possess. Does the safety of a land lie in land being in few hands? Is there anything that inspires patriotism more than the possession of a piece of land? I have great faith in institutions which further the material interests of the majority. I do not believe in the institutions which have a contrary effect.

As to primogeniture, its existence seems doomed, and it is high time. I know nothing that has a more destructive influence than this law, particularly among the humbler classes. In my practice, cases are of common occurrence where the effects must last for generations. Take the case of many of our fishermen, who rarely make settlements. An industrious man, with the assistance of maybe seven of a family, builds or acquires heritable property say of the value of £700, being all his means (and they have all an ambition to be proprietors), and dies intestate. What is the consequence? The eldest son succeeds to the whole, and never will work afterwards; for few will work, if they can help it; while the other sons have to start in the world without a sixpence. If, instead of this, we had a law that, in the absence of a settlement, provided for an equal division, we should have £100 given to each member, and probably a new fleet of seven boats launched upon the waters. The same results are seen in different ways in other vocations.

If there is to be a preference, it should be to the youngest child, who gets the least nurture from its parents; but I cannot see a reason why the State should encourage fathers in giving an undue preference to the eldest son, at the expense of the younger children; and this law has that undue influence, for at this moment it is a general belief in this country, that a father can't will past the eldest son property to which he has acceded.

I believe that the abolition of primogeniture would have a tendency more accumulative than dispersive, as, in the majority of successions the property would be sold and bought up by capitalists; but this is the only evil that could spring from it.

I am not advocating a compulsory division of property. I only go Mr. Bright's length, that, in the absence of settlements, the natural accumulative and dispersive laws should have full and free force. I must here specially guard myself from being understood as having any personal reference to the landlords of this county. It is the system that I direct my remarks against. Our large landlords here are, notwithstanding the evil influence of these obnoxious laws, individually most fair and liberal. I have never heard of one of them doing an unkind action; while I have witnessed deeds of beneficence that will never lose their influence. What, besides, is of great importance to the public as well as to the tenants is, that they are careful in the selections of factors, whose conduct and judgment will vie with any of their class. In spite of those mischievous laws, our large proprietors and their factors in this county have generally displayed personal worth of character, which, while but a coincidence, has gone far to blind the eyes of the public to the abstract bearing and tendency of laws whose natural malignancy is thus accidentally modified. As Blackstone says, liberty should be a matter not merely of "gracious behaviour," but of settled law. *David Forsyth (somewhat shortened from the "Elgin Courant").*

ECONOMY OF WATER.

We have experienced a dry and hot summer, almost beyond precedent, and often have I grieved at the suffering of poor sheep and cattle from want of water, so much so that I cannot resist writing a line to you upon the subject, in the hope of inducing landowners and farmers to husband for those hot months the rainfall of the preceding half-year, so as to ensure an adequate supply all the year round. Heaven gives us water enough, which I am sorry to say we do not economise, but waste and abuse.

If water be the first necessary of life, the want of it must be a very serious and deplorable circumstance. It is well known that water is a large constituent of organic bodies, whether vegetable or animal. For instance, beef strongly pressed yields nearly four-fifths of its weight of water; and a man weighing, say 160 lb., if squeezed under an hydraulic press, would give 120 lb. of water, and only 40 lb. of dry residue. Potatos contain 75 per cent. of water by weight, and Turnips no less than 90 per cent. Thus, the living organism may be regarded as a mass diffused in water.

It is generally believed that sheep drink but little, and that pasturage, however arid, will suffice for them. This is altogether a fallacy. A sheep on dry food will consume at least a gallon of water per day, if freely within its reach. Moreover, experiments recently made in France have proved that a sheep cannot live beyond 14 days without water, that a horse may live for 25 days without solid food, merely drinking water, and that he can live only five days when consuming solid food without drinking. After using solid aliment for 10 days, with an insufficient quantity of water, the stomach becomes absolutely worn out. A horse which had been deprived of water for three days has been known to have drunk 11 gallons in three minutes. Such facts show, I think, the importance of water in the sustenance of animals. I must, however, proceed to say a word or two on the economy of this precious fluid.

I am often laughed at when I assert that drainage prevents drought. It may seem startling, yet it is true. The better drained the land, the more loose and friable it becomes, and the more moisture it will hold. It has been proved over and over again that more water is held by a pulverised and open soil than by a compact and close one. Therefore, the increased capacity of the soil to contain moisture is the greatest security against the withering effects of drought. Watery vapour is constantly rising from the surface of the earth in dry weather, and Sir Humphrey Davy found by experience that 1000 lb. of soil, perfectly dried, upon exposure, gained by absorption from the atmosphere in a single hour from 3 to 18 lb. of water, the best soil gaining the most and the worst the least. It is, I may add, most essential for agriculturists, in the frugal management of water, that they lay out a system of drainage that shall fall in with Nature and not oppose her. In many cases water is not far to seek if a little mechanical skill were used. If care were taken when draining farms to have a drinking place in every enclosure supplied from the main channels, connected, where practicable, with perennial springs, there would be an abundance of water at all times of the year for every description of stock. How lamentable, therefore, that so little attention is paid to what is so necessary to the health and comfort of the animals of the farm. I have often seen the poor creatures compelled to drink out of abominable puddles when the outlay of a very insignificant sum would place within their reach a constant supply of pure running water.

In Scotland numerous small lakes and dams are kept up for the use of cattle in time of drought, and reservoirs for detaining and storing water are common on most farms. It were surely well that the agriculturists of England followed the good example of their more northern neighbours and at once set about constructing dams, tanks, and reservoirs for a like purpose. The clouds shower down abundance. It certainly, therefore, is the fault of man that there is any scarcity of water at any season of the year for any purpose of husbandry. Farmers and others have to blame themselves, therefore, for the deficiency.

Owing to the persistent drought this year, the earth became so parched, bronzed, and fissured, that nine out of ten of the common constructed ponds became literally dry, to the great consternation and discomfort of herds and flocks. Now, the chief cause of this is the absence of shade. I have often noticed that while there was abundance of water in one pond, there was none in the other, although the soil was alike. The reason is simple—one was shaded, and the other not; consequently the latter was soon evaporated to dryness.

Probably it may be unnecessary to remark that in constructing ponds it is of great moment to make them sufficiently deep, and to line them substantially and carefully with clay puddle. Whatever be the surface area there should at least be a minimum depth of 8 feet or so at the shaded side. Moreover, a much larger quantity of water is economically stored up by every

foot of additional depth. Depth, too, has the great advantage over width or surface extent, of losing less in proportion by evaporation, and the water also keeps sweeter and more palatable and wholesome.

The loss by evaporation in hot seasons is quite astonishing. A calculation was made a short time ago, which showed that, in 40 days, the evaporation of an unprotected pond, containing about 14,000 gallons of water, was 9000 gallons; and as much, in fact, as would have supplied a flock of hundreds of sheep for the time. This remarkable result is, I regret to say, discredited by many practical and scientific men who ought to know better; and pained, indeed, have I been to see farmers and others cutting away every branch, twig, and tree on the banks of ponds, thus causing great misery to the poor sheep and cattle during periods of excessive aridity.

I would suggest to agiculturists and graziers to have the mouth or entrance to the pond, where practicable, on the north side, and protected from the sun on the south by Fir trees, evergreen shrubs, or other equally effective shelter; and where water is scarce, to use any contrivance in their power for raising it to the surface for conservation in time to meet the requirements of next year, and so spare poor dumb animals of the field the horrors of extreme thirst. *Mr. D. Macdonald in the "Times."*

THE UTILISATION OF SEWAGE.

[The following is the report, from the Liverpool *Daily Post*, of the discussion on this subject, which took place before the Chemical Section of the British Association at Liverpool.]

A REPORT of a committee, appointed at the last meeting at Exeter, to inquire into the treatment and utilisation of sewage throughout the kingdom, was read. The committee originated from the Mechanical, Statistical, and Chemical Sections, and the report had been previously read in the former Section. An appendix was added by Mr. Hope, giving an interesting account of the irrigating processes on the Brittain's Farm, near Rumford, the ultimate success of which the results already arrived at would seem to indicate. Although the works have only been in operation about a twelvemonth, a comparison between the crops grown on the irrigated ground and those grown on adjoining ground not irrigated shows results highly favourable to the former. Professor Corfield then gave a synopsis of a publication he had prepared, and which is to be published shortly by order of the Association, giving a digest of the present state of knowledge on sewage matters. In this digest he stated that he had given a sort of natural history of the methods taking in the treatment of refuse matter from human habitations. One of the methods treated of was that of precipitation, and he had come to the conclusion that it was impossible to solve the difficulty by that method, for the simple reason that the matter which they wanted to remove *par excellence*—ammonia—could not be precipitated. There was then the system of the treatment of the sewage by filtration and irrigation, and a chapter was devoted to the public health question of irrigation. It was, he said, perfectly well shown that sewage farms could be made a nuisance, but it was also very clearly shown that no nuisance need exist, especially if the sewage was filtrated. With regard to its effect on public health, it was found that, where sewage farming had been carried on, where the ground was really a water meadow, intermittent fever was caused; but it was also shown that intermittent fever was caused in the vicinity of farms where the water did not contain any sewage. This was the case in Milan and other places, but in this country there was no evidence whatever that intermittent fever had been produced, even where the ground was covered with water like a marsh; and the conclusion he came to was that sewage farms, if they were not actually marshes or badly farmed, had no chance of producing intermittent fever. With regard to cholera, the evidence from Milan was that on several occasions, whilst there had been cholera in Milan itself, there had not been a single case on the sewage farms; and, as to typhoid fever, it was perfectly well known that sewage farms had not the smallest influence with the spread of that class of disease. He then read the report of an analysis, made by Dr. Russell, of sewer gases as bearing upon the public health. The experiments upon which the report was based found the quantity of oxygen very little diminished, whilst the carbonic acid was not increased to any extraordinary extent, there being plenty of rooms the air of which contained much more than was found in the samples of gas exhibited. The report concluded by stating that the experiments, as a whole, must be taken to indicate purer air than might have been anticipated, notwithstanding the samples were taken during the hottest part of the summer.

A report as to the probability of entozoic diseases being propagated by sewage irrigation was next read by Professor Corfield. The report stated that, with the view of carrying out the experiments which it was thought desirable should be instituted, three families of Guinea pigs, of four members each, were purchased. One member of each family was examined, but no sign of any entozoic disease was found either in the viscera or the muscles. The three survivors of one family were now being fed on sewaged produce only, and those of the other two families on unsewaged produce only. It was proposed, however, to feed the last with an occasional meal containing the larva or ova found on the sewage vegetables, or, failing that, taken from the sewage itself. The animals would be killed and examined, and it was hoped that some result might be obtained even from preliminary experiments upon so small a scale. They intended, however, instituting experiments on a much larger scale.

Mr. GRANTHAM said these experiments were being made to allay any apprehension that might arise of any danger from the products of the sewage farms. In addition to what Professor Corfield had told them, he should mention that the roots and grasses grown on the farm were also submitted to microscopical observation, and nothing was found which was at all injurious.

The PRESIDENT said he might congratulate the Association, and the Section in particular, on receiving these reports. They had had, he believed for the first time, a committee formed of engineers and chemists to work out the subject really scientifically, and he thought the results they had in a few months obtained were most interesting. They might look forward next year to some further enumeration of these most important results.

Dr. PAUL (London) said he wished to make a personal statement. He understood the report which had been placed before them purported to be a report of the British Association Committee appointed at Exeter. That committee consisted of six members, but of these three, or at least two, had taken no part in its production. For his own part he desired to disclaim any participation or responsibility, and in doing so he believed he represented the opinions and feelings of one-half of the committee. He complained of the action of the committee in asking from sources outside of the Association for money to enable them to carry out the inquiry, as tending to deprive the action of the committee of that independent and authoritative air which should exist in an inquiry of this nature, which interested so many people throughout the country. He entirely disapproved of the course taken by the committee, because he considered it inconsistent with the engagement and pledges into which they voluntarily entered.

The PRESIDENT read the names of the committee, but no discussion arose on Dr. Paul's objection, and the business of the Section was proceeded with.

Mr. DAVID FORBES, F.R.S. (London), being then called upon to read his paper on "The Utilisation of Sewage," with special reference to the phosphate process, he said that since the adoption in this country of water as a means for carrying off the excreta in towns, the difficulties of dealing with the sewage question had increased. As all the water, except what was carried off by evaporation, must by its own gravitation find its way ultimately to the sea or sink into the ground to pollute the wells and springs around, and since there was no likelihood of the employment of water being discontinued, there remained no remedy but to look the difficulty in the face and attempt to overcome it by devising some methods—for he had confidence that no one system would be found applicable to all local circumstances—by which the sewage might be prevented from being, as it was at present, not only a nuisance, but a source of danger to the inhabitants around. It was, he thought, generally acknowledged that the required purification of the effluent water could not be effected by a purely mechanical system; and sewage irrigation, which was classed as one of the mechanical systems, left nothing to be desired, provided only that the local circumstances were favourable. It had, however, its drawbacks; and there were numerous places where it did not appear either to be applicable or advantageous. Sewage water could not but taint the surrounding air, especially with a stiff soil, the smell in some cases being so offensive that the inhabitants in the neighbourhood would not submit to it. It was also stated that sewage irrigation was not suitable for all crops; and, as far as experience went, to continue the sewage over the same land ultimately tended to produce a weakened vegetation, and proved that the limit was soon reached beyond which the application might be even positively injurious. Then the expense of machinery and land was enormous, and for the sewage of London alone no less than 60,000 acres of land would be required. They would agree with him therefore as to the importance of finding out a process which would at once deodorise and purify the sewage to such an extent that the liquid might run into the rivers without danger to health and animal life, and this without the necessity of erecting costly works for the transmission of the sewage to localities miles distant, where it was likely to taint the surrounding atmosphere on being distributed. There were several processes by which this was attempted, but these were admitted failures, chemically and commercially; and he wished to call attention to the entirely novel process in which phosphoric acid and lime water caused the solid parts to precipitate rapidly and leave a perfectly transparent water with so little perceptible taste that any persons might drink it provided they could banish from their minds the filthy source from which it came. Mr. Forbes then proceeded to show the action of the phosphate on a quantity of sewage, and said that in this process it was only attempted to take so much of the solid matter from the sewage as to leave the water in a condition sufficiently pure to be innoxious to health. This, he submitted, was the case under his proposed system of purification; and he believed it would eventually prove most valuable in such localities as were found unsuitable for sewage irrigation.

Mr. HOPE (Brittain's Farm) rose to defend the application of liquid manure. He said the misfortune had been from the earliest times that the engineers had disregarded the chemical side of the question, and the chemists that of the engineers, and it was only by keeping both in view that any satisfactory results could be obtained. Mr. Forbes' idea about smell had no foundation in fact, and if a nuisance arose from irrigation in this respect it was owing to mismanagement.

Professor VOELCKER said his opinion was, that the land was the only proper medium which would effectually complete the deodorisation of sewage; but the land, he added, should be in a condition fit to receive the sewage. Unfortunately, there were comparatively few soils in a condition to absorb the liquid. In some places great inconvenience was felt in consequence of the stiffness of the soil; and so great was this sometimes felt, that he believed means would have to be adopted before the sewage was put on the land, to remove, at any rate, the suspended matters, which were the great source of inconvenience, and which caused disagreeable smells and bad gases.

Professor GILBERT said he quite agreed with what Dr. Williamson said the other day, that no process was known to chemists which would enable them to remove the useful matters by precipitation, and give them a material commensurate with the cost of its production. He had heard that morning that the process of precipitation had been abandoned in the two towns where it had been in operation—Leamington and Hastings; and the result of ten years' close experience on the subject led him more and more to the conclusion that where they had large populations water was the only mode of cleansing. If they had water, irrigation was the only mode of deodorising and purification.

Dr. HOLLAND denied that irrigation had proved a nuisance, or polluted springs any more than solid manure. If it turned out a nuisance in any particular place, that was owing to bad management. He also denied the allegation that entozoic diseases were spread by means of its influence. The manure, he said, went to the roots of the crops, and not to that part above the ground; and he pointed to Scotland, where the process in some places was carried on, as a proof that these diseases were not propagated by irrigation, as it was not likely that the Scotch, known as "canny" people, would continue the process if it was found to injure the cattle that fed upon the sewage products.

Professor HUXLEY, who entered the room during the discussion, was requested by the President to afford to the section an expression of his opinion on the subject. He said he had flattered himself that he could make sure of having nothing to do but listen, but the interesting discussion that had been going on had drifted very oddly into a province of which it was his business to know something; and, without wishing for a moment to deny the accuracy of what the last speaker said, he ventured to suggest the necessity of a little caution about one's conclusions upon the matter. Nothing could seem more entirely plausible than the arguments put before them so well, for it would certainly be a very remarkable circumstance if eggs of any sort could creep from the roots of plants to their foliage; but he thought the speaker did not reckon upon that wonderful series of changes of form which those animals living in cattle and causing their destruction were capable of undergoing. They must recollect that the alternative they had to deal with here was not the egg of a parasitical worm, but a greater or less number of intermediate conditions in which the animal was capable of living, totally different from those in which the parasite existed. Dr. Holland would be perfectly familiar with one of the most fatal entozoic diseases among cattle—the staggers in sheep. These were caused by the presence of a large entozoic which was developed in the brain of the sheep. If they took the brain of the sheep which had died of this disease, and fed a dog with it the bladder-worm which caused the apoplexy in the sheep suddenly became metamorphosed into a kind of tapeworm, which developed with great rapidity in the interior of the dog. This eventually passed through the dog upon the pasture upon which the sheep were feeding; and if there be one of these infinitesimally small ova raised by the dust and carried upon the leaves, certain it was that by one or other of these channels the ova got back into the sheep, and gave rise to the staggers. Therefore, although no doubt many of the arguments used by Dr. Holland were largely applicable, they must look at the history of each of these cattle parasites with the same care and knowledge as they now had of the staggers worm before they could be so sure as he seemed to be that parasites could not be transmitted in this way. He merely put forward this as a caution.

Some further discussion followed, in the course of which several speakers advocated the ash-pit system in preference to the water-closet system of removing the refuse, Mr. Alderman Rumney expressing the opinion that the committee had in their researches been biased to the wet system. There had not, he said, been the slightest reference made to Manchester or Hull, where the dry system had been carried out most beneficially. an Hull the death-rate had decreased from 32 to 23, and this was attributed to the dry system.

ALLEGED DECLINE IN NORFOLK HUSBANDRY.

If we may accept the statements made at a recent agricultural dinner at Harleston, a serious check to, if not a decline in, the husbandry of Norfolk has occurred, and is likely to continue and increase. The causes alleged are such as our readers will find to be the old old story. Game preserving, insecurity of tenures, defective management of the estates by landowners; in short, all those obstacles to advancement in husbandry and to success in farming business which justify the common saying amongst farmers, "that the great encumbrance on land is the landlord." And this by no means implies any desire to avoid payment of rent; on the contrary, farmers are only too ready (impelled by competition for farms) to give more rent than farms are really worth. But the obstacles complained of arise from mismanagement of landed property, from the prejudices, the passion for game, or the relative poverty of the owners.

The *Mark Lane Express* says "that some 15,000 acres in one certain district" (of Norfolk) threaten to become unoccupied. "On the lighter soils, ranging away from Brandon to Walton, many of the tenants find it quite impossible to go on any longer." That the occupiers of such light soils have experienced at least two out of the last three years of much disaster from want of moisture is certain. Yet that does not account for the evils which have come upon so many of the Norfolk farmers. Mr. Charles Howard, speaking at Harlestone, said:—"I never in my life was in a county where I saw so much useless timber. I am quite certain of one thing—that the farmers of Norfolk do all they can to meet the exigencies of the times; it now rests with the landlords to help them. The first thing they should do would be to allow them the privilege of cutting down this beastly rubbish—pieces of timber which, if they stand 50 years, will never be worth a sovereign; to cut down many of the hedgerows; and to destroy the great pest of the farmers—the tenants of these wild hedgerows—the rabbits." Mr. Overman said:—"They were living in critical times, and unless the landlords went ahead as fast as the tenants, good-bye to their having any tenants at all." And he said, in reference to game, that "if the landlords persisted in over-preservation of game they would have to farm the land themselves. The misery of this might first of all fall on the tenants, but it would afterwards come upon the landlords, and perhaps many of them would be able to find neither the capital nor the ability."

Want of fair play from the owners of farms is the main complaint of the occupiers of farms in Norfolk. And no small part of this game evil is the result of fashion, founded to a great extent upon bad examples from high persons and great proprietors, who ought to do better and to act very differently. Thus complaint is made that since the Prince of Wales has bought land and preserved game in Norfolk there is double the game-preserving in Norfolk to that which previously existed. The desire of inviting the Prince to a day's battue shooting among the squirearchy is said to be the immediate cause of the extension of game-preserving in Norfolk. This is, for many reasons, greatly to be lamented. The following passage from a paper lately read at the Monmouthshire Chamber of Agriculture strongly illustrates the views expressed in Norfolk:—"There is no denying the fact that agriculture prospers in proportion to the desire and power of those possessing land to perform improvements. There are extensive estates but partially developed by reason of the want of funds to open them out, and on these very estates reside tenants willing to undertake the cost and responsibility of works of improvement, whose efforts are drowned by the powerless position of the tenant for life; he cannot charge the property with an outlay for improvement by himself, and the occupier's lease is not long enough to allow him to commence the work with his own capital. It is a matter of regret that proprietors do not avail themselves more generally of the Act of Parliament which permits the employment of capital, from whatever source, towards benefitting the freehold, securing the outlay by the ordinary mode of rent-charge. Tracts of poverty-stricken land might be redeemed by granting leases; tenants would be forthcoming who would pay the interest on the money expended, in addition to the old rent; but these are matters hardly connected with our subject."

Game-preserving and want of means or will to make the requisite improvements by landowners constitute the cold shadows under which English husbandry is now carried on. If the farmers as a body will insist upon the county members pledging themselves to repeal the Game Laws, the stone of the arch of wrong will have dropped out, and English agriculture will soon make a new spring forward. *The Economist.*

Home Correspondence.

Tiptree Hall and its Neighbourhood.—In replying to the West Indian gentleman, who has crossed the Atlantic to defend Mr. Mechi, and teach Englishmen how to farm their lands and grow miraculous crops, I in the first place inform him that I will intrust the Editor of the *Agricultural Gazette* with the names of three of the gentlemen from whom I received the accounts about the ancient Tiptree Hall and the farm attached to it, which I have sent to the Press; and the Editor will see that each of the three possesses a considerable amount of landed property, and each of two of them cultivates a larger farm than is Tiptree Hall farm. I write this in no disparagement of Mr. Mechi nor his estate, but merely to show that the information I have given may be relied upon; indeed, two of the gentlemen are well known agriculturists, and the other has the opportunity of knowing as much about Tiptree as any man in Essex; I myself, therefore, implicitly rely upon his testimony, as I do upon that of the others. Now, as I am writing for the information of the general public, rather than for that of the West Indian, I admit that the methods I have adopted for the four last years of satisfying myself about Mr. Mechi's crops, and his farming in general, is not in ordinary cases what I should adopt, or approve of; but this is not an ordinary case, but an extraordinary one. Mr. Mechi, whenever doubts are expressed on the correctness of his publications about his enormous crops, appeals always for a confirmation of his statements, not to men in respectable positions, or to his brother farmers, but to his own labourers. Such being the case, I think no gentleman will accuse me of dishonourable conduct in my having in a quiet way obtained a correct history of Tiptree Hall, and the estate attached to it, and which proves that it was not a portion of a barren heath when Mr. Mechi became the proprietor of it; but that it was one of the first enclosed estates in all that part of the county of Essex. All this I obtained from oral and documentary evidence of the best kind. With reference to Mr. Mechi's farming, I would say there are some things to praise, but much, I think, to be censured. Mr. Mechi has doubtless increased the productiveness of his farm, but not in proportion to the enormous outlay lavished upon it; nor has he performed a single operation that I should recommend a tenant to copy from; nor do I think that any person who attended any of his annual and expensive gatherings saw a single thing that he considered an improvement. Each of the persons in the crowds that wandered about the farm, saw crops about as good sometimes as he himself had at home on his own farm. Then, having ended their wanderings, all retired to an enormous tent on the Hall lawn, and feasted on the most expensive viands and drank the most expensive wines, of which a considerable portion of the crowds neither knew the names, nor could distinguish one kind of wine from another. The motley company then heard a profusion of congratulatory speeches in praise of the generous host, and of all that was seen; and then, all being ended, all took their departure, some to one part of the world and some to another, but not one to carry into practice any suggestion that had been made, nor even to make a trial of anything seen. I myself, from a kind invitation, attended one of those enormous meetings, and during the whole time I spent at it, and even afterwards, I thought I had never spent a less profitable day; and such is my opinion even now. I learned nothing that I could turn to account, and I forgot nothing that I wished to forget; and hence the day I spent in wandering about Tiptree Hall farm, and feasting in the tent, and listening to speeches, was a blank, and nothing but a blank, to me. But to return to the West Indian, who wishes me "to give him some idea of the agricultural value of lands immediately around Mr. Mechi's farm." In reply to this, I inform him that I am not in the habit of valuing land for agricultural or other purposes gratuitously, and then not unless each field is pointed out to me; and even then I should want to know whether the lands were to be mapped or not; and again, to learn to whom I was to look for the payment of my account. But as the West Indian adds, that "the gipsies and players of Aunt Sally, and suchlike can, he is sure, give an opinion of it," and as they probably would do so gratuitously, I am rather surprised that he does not employ them, and not come to me. But if the West Indian is anxious to make a purchase of an estate, "in immediate proximity to Mr. Mechi's," and if he will take my advice for once, I should say to him, be not deterred from doing so on account of its being near to a common, or a heath, for some of the most productive lands I know there have between them and a heath or common, similar to that alluded to, nothing but quickset hedges. But I further add—more, however, for general information than for the West Indian's—that the first time I made my survey on the other sides of Mr. Mechi's farm, I saw both Wheat and Bean crops equal to any I saw on the Hall farm, though I wish not to disparage what I have seen there. Perhaps I have seen crops of Wheat on the Hall farm amounting to nearly 6 qr. an acre, but of a red and coarse quality. But as for crops of white Wheat of 8 qr. an acre, or even 7, which Mr. Mechi writes he had grown, I hope it is not a sin to say that I never saw such crops at Tiptree Hall, and my belief is that no one else ever did,—neither Mr. Mechi nor his labourers *T. B. S.*

Exhaustion by Stimulation.—An agricultural newspaper is not the proper place to discuss questions in metaphysical science, and, therefore, I shall ask to be allowed to make but one remark, in reference to the quotation which forms the concluding portion of the article headed "Exhaustion by Stimulation." When the Almighty ruler of the universe sees that a great work is required to be done in the world, He invariably raises up a great man—one of giant intellect, to do it, who passes away when his mission is ended. His son does not emerge, intellectually, from the mediocrity of the general mass of mankind around him; he does not become the great man No, 2, because, as such, he is not wanted. *Cler, Sept.* 24.

Number of Oats in an Ear.—I was shown the other day a stalk of Oats on which there was a very great number of grains. Being in a hurry I had no time to count them, but I have no doubt there were considerably over 200, as seen in the head, and if all the small corns were reckoned there would have been over 300. I therefore freely admit (what I have never seen before) this large number on one head. Whether this was a picked head or an average I know not, but if an acre of land were covered with such heads as thickly as Oats grow in my part of the country, I am satisfied the produce would be from 20 to 25 qr. to the acre. Whether such a produce is possible or not I do not pretend to say. This head was, however, in three divisions, having main or top head, and two branches below; but the branches were so close it was fairly called a single head. I have often seen three heads striking from one stem, but then they branched off very much lower down, and formed three distinct heads. *G. A. H.*

The Farringdon Agricultural Society's Ploughing Match took place last week, on the farm of Mr. Peacock, in the parish of Hinton, about six miles from Farringdon. There were only 19 teams in the field, but quality truly made up for quantity. Mr. H. Newman's ploughman, John Neil, had twice won the champion prize against James Barker, of Ipswich, and had ploughed himself out of the Society for two successive periods of three years, on the conclusion of which he again appeared among the selected first-class ploughmen of the district; but his beautifully straight and even work with a Ransome's plough was superseded by the more firmly packed and better work of William Cornley, ploughman to Mr. N. Hobbs, of Pewsey, with a Howard's plough. The 3d prize was awarded to Thos. Grinaway, ploughman to Lord Radnor. The 2d class of ploughmen fell far short of the rest of the field, and the 1st prize was not awarded. The ploughboys under 16 years of age (3d class) did their work exceedingly well, and there was an extremely close run betwixt the two best. Both Messrs. Ransomes and J. & F. Howard exhibited their new double-furrow ploughs at work in the same field, ploughing an acre of Clover stubble land with their horses in the same time that the competing two and three-horse teams did half an acre. Both ploughs finished their work as quickly, and in quite as good style, as the single ploughs, some interest being stirred up by the secretary, who, with the stewards, had one of Howard's single-furrow ploughs tested against Howard's double-furrow plough, with the dynamometer working at the same—viz., 5 inches in depth, and 8¼ inches in width; the single-furrow drew a little less than 4 cwt., and the double-furrow less than 6 cwt., showing that the three horses in the latter were not harder drawn than the two in the former, whilst a horse and a man were saved in the ploughing of two acres of land. *L. P. B.*

Societies.

CHESHIRE.

At the recent annual meeting of this Society, Lord De Tabley, in giving "Success to the Cheshire Agricultural Society," said their meeting had been a most harmonious and creditable one, they had been favoured with a bright sun and a good assemblage of Cheshire farmers and their wives and dairymaids. It was out of his power to discuss eloquently and learnedly the merits of the show, but he might say that the horses appeared to him exceedingly good, and the exhibition of cheese, which was perhaps the most important to this county, seemed excellent. He could not sit down without alluding to two or three facts which Mr. Tollemache would have more ably brought under their notice had he been present. It was only right that Cheshire farmers should know the exact position in which they stood, in order not to discourage them but to stimulate their exertions. Mr. Tollemache had sent him a statement of the importation of American cheese, which showed that from 1865 to 1869 there had been an increase in the importation of nearly a 100,000 cwt. of cheese. In 1865 the total foreign cheese imported was 853,277 cwt. and last year it was 979,189 cwt. Still he thought there was no cause for discouragement: for with a large increase of population in this country there were additional ways of disposing of farm produce; while as to quality, he did not think foreign cheese would ever beat a good Cheshire. Poor cheese might find a difficulty of sale, but good Cheshire would never be beaten. Improve the make of your cheese, then, he would say, and beat the foreign out of the field.

Mr. R. Dutton, in replying said—Taking into account the area, the subscription list of the Manchester and Liverpool was not larger than theirs, and therefore what he strongly urged upon them was to offer prizes, open to the competition of the whole of the kingdom,

Let them have the best bull, whether it be Lady Pigot's, Mr. Brierley's, or any other; let their Cheshire farmers see them, and see if they could not take a leaf out of the books of others. Not only so, but he would have a champion prize for cheese, open to the whole of the kingdom, so that they could get makers to send from Somerset and Scotland, amd let them try to find out how the cheese was made there, with a view to adopting the methods. There were other points, too, which required a little ventilation. He would have premiums, as now, limited to the sphere of the Society's operations, but, in addition to all-comers' prizes, he would make a distinction between those who made a living by agriculture and those who did not. He did not like to see Lord Crewe competing with dairy farmers, and though his lordship was fairly beaten, and it was his (Mr. Dutton's) honest opinion that a better pair of cows was in the possession of a dairy farmer than those belonging to the Right Hon. Lord Crewe, still he thought a large landowner like his lordship should not compete with tenant-farmers. However, such was the case, and he thought that the parties competing for a specific purpose in this direction should be those making a living mainly by farming. Then he would press it upon their judges that in giving the prizes for the best dairy cow or best pair of dairy cows, they should not give them to those with a tendency to lay on fat. It did not follow that the cow in the best condition was the best dairy cow. It might produce excellent stock, and yet not be a good milker. Therefore he would instruct their judges to give their attention to the qualities the cow possessed for the dairy, and if they liked to give prizes to the best cow irrespective of that, they could do so. The other day a cow, which was unquestionably the best animal, was shown against other dairy cows; but after considerable hesitation the judges, he being one, decided that they could not give the prize to that cow, and made a note in their book that though they considered it the best in the yard, not being the best dairy cow they did not consider it was entitled to the premium. There was one more question which everybody seemed inclined to shirk, but upon which he had spoken out more than once, this was in regard to the stallions and brood mares. He considered that, whatever their merits in other respects, if they were not perfectly sound they should not be allowed to take prizes. They would laugh at a judge who gave a prize to an unsound cow or an unsound bull. And he must say that to give a premium to an entire horse which was unsound—he did not say this with any specific reference to what had been done—was to do a positive injury, and to hold out an encouragement to the horse to travel throughout the length and breadth of the country, propagating unsound horses. As to mares, he knew the common notion was that when a mare was unfit for sale the best thing to do with her was to make a breeder of her; but he held that no man, be he farmer or gentleman, would act wisely in putting an unsound brood mare to the horse when the probability was that in five cases out of seven she would propagate her own unsoundness; and therefore he thought there should be a foot note inserted under the premium of horses, requesting the judges to withhold premiums from entire brood horses which, in their opinion, were unsound. Proceeding to comment upon the farm premiums, Mr. Dutton told them candidly that sometimes when money was expended upon a farm it was not taken into consideration whether that money would be wisely and profitably expended. He did not think it was good policy to expend 20*s.* in one direction with a prospect of getting no more than 18*s.* back. Many a man spent money on unnecessary improvements, for unless money expended gave a return of five per cent. a man was not a good farmer, although his land might be clean, free from Thistles, and nothing wrong in the fences. There was a saying that a man who caused two blades of grass to grow where only one grew before was a benefactor to his race; but a man ought not to expend capital without a fair and reasonable prospect of getting interest for it.

Mr. James Daplin responded for the judges. The last of their shows which he attended was held at Congleton, and he was sorry to say that they had gone backward rather than improved since then; but it might be, as he had been in Yorkshire recently, he fancied he had seen better stock there. The horses he had inspected that day were generally sound, clean in appearance, and well shod—a point which they ought still to look to, for he believed there were more horses lamed through bad shoeing than hard work. He mentioned that, because there were two brood mares which were lame in the feet, but of good constitution and room in them for breeding good horses. He did not believe in breeding from old mares, but would rather breed from young ones. In breeding, many farmers lost time. They were all well aware that from three to four years horses were very unsaleable, owing to casting their teeth, being bad in their coats and out of condition. Therefore this was the time he would put a young sound mare to the horse. The fourth year it would have a colt, and at the back end of the year they would have a colt worth from £10 to £12, and the mare better in appearance by £10 or £15. This plan would not preclude the young mare with a colt at her foot doing the work of an old horse. If they put old mares to the horse they need not be astonished to see colts with lop-ears, bad necks, bad hocks, their tails turned, with ring bones, side bones, and one foot over the other. But if they would take the line he had directed they would see the advantages of it. As to the stallions exhibited he was sorry there was not another class or two, as there was only one class for entire horses, which included some waggon horses as fine as could be seen in England.

Farmers' Clubs.

ATHY.

The Exhaustion of the Soil.—We continue the publication of Mr. Lawes' lecture from p. 1298:—

So far, I have endeavoured by means of some actual experimental results to illustrate "condition" of soil; and it is obvious that when it results from the expenditure of capital in the purchase of cattle food or direct manures, it should be reckoned as the property of the tenant. I now propose to consider certain other characters of soil which are not included under the term "condition"—standard fertility, for instance, and the character of soil. When a tenant takes a farm, what is it he agrees to pay rent for? Partly for the use of a residence and farm buildings; but the greater portion of the rent is paid for permission to grow crops on the land. The course of cropping is either expressly stipulated in the lease or agreement, or the tenant is bound by the "custom of the country." As he is subject to penalties if he deviate from the course so prescribed, it must be assumed that that course is the very best he could follow for his own interest and profit, or that by following any other, with a view to increase profit to himself, the interest of the owner would be sacrificed, by a reduction of the natural or standard fertility, or rent value, of the land. Admitting that the recognised rotation of any district may be, upon the whole, the most suitable to follow in it, it nevertheless will not be denied that the farmer of intelligence and capital would, if he were permitted to do so, occasionally deviate from it, with profit to himself at any rate. It will be well, therefore, to direct attention to some results illustrative of the extent and limit of the productive capability of a soil of a certain class or character, with a view of forming some judgment of the probability of injury to the land by a deviation from the ordinary course of cropping. I have, in the course of my various experiments, sought to gauge the capability of my soil to yield crops for many years in succession without manure, and even under more exhausting conditions still, and some of the results obtained are recorded in Table 5. It should be stated, however, that in no case has any attempt been made to increase the productiveness by either subsoiling or deeper ploughing than usual, though great care has been taken to keep the land as free from weeds as possible, without injury to the crop by treading.

Table 5. Illustrations of Natural Fertility.
Experiments with Wheat, Barley, and Meadow Hay.

Years.	Wheat: Plot 3. Unmanured each year, 26 years, 1844-1869	Wheat: Plot 10A. Ammonia Salts alone, 25 years, 1845-1869.	Barley: Plot 1B. Unmanured every year, 25 years, 1852-1876	Meadow Hay: Plot 3. Unmanured every year, 14 years, 1856-1869
	Bushels	Bushels	Bushels	Cwt.
1844 ..	14	18	..	..
1845 ..	23¼	13	..	.
1846 ..	17	22⅝	..	..
1847 ..	16	25¾	..	..
1848 ..	14½	13¼	.	.
1849 ..	11	3⅜	.	.
1850 ..	15¾	20⅛	..	.
1851 ..	13	20	.	.
1852 ..	14	21⅝	27¼	.
1853 ..	5¾	6⅝	20⅜	..
1854 ..	22½	34⅜	35	..
1855 ..	17	14⅝	11	..
1856 ..	14½	24⅜	14⅝	24½
1857 ..	13⅝	20⅛	26¼	25¾
1858 ..	15	20⅝	18	22½
1859 ..	13⅝	18⅝	14¼	24⅜
1860 ..	12¼	14⅝	14¼	24⅜
1861 ..	11¾	12⅝	17¼	25¾
1862 ..	16	23	16½	27¼
1863 ..	17½	30¼	22⅜	29⅝
1864 ..	16¼	32	24	24⅜
1865 ..	13⅝	26¼	18	14⅝
1866 ..	13⅝	30¼	15⅝	23⅝
1867 ..	13	21	15⅝	17⅜
1868 ..	11	24⅛	11⅝	17⅜
1869 ..	11⅛	21⅝	16¼	14
Averages.				
First period	16¼	26⅝	23	24½
Second ,,	15	21⅝	17⅜	23⅛
Total ,,	15½	24¼	20⅛	23⅝
Average Nitrate formed in soil.				
First period	13·5	26·	17·	.
Second ,,	11·	21·	11·	..
Total ,,	14	24	14·5	..

The first column of the Table shows the produce of Wheat obtained for 26 years in succession, from 1844 to 1869, inclusive, on a portion of the experimental Wheat field which has received no manure whatever since 1839. The average produce per acre per annum, over the 26 years, has been over 15½ bush. of dressed corn, about 14 cwt. of straw, and 22⅞ cwt. of total produce (corn and straw together). The average over the second half of the period is 14 bush. of corn and 2⅜ cwt. of straw less than over the first half; showing perhaps a slight, but at anyrate no very marked, tendency to decline in annual yield. The rent of similar land in the neighbourhood (25*s.* to 30*s.* per acre, tithe free), or the condition of the farmers of the district as to wealth, does not indicate any great fertility of the soil. On plot 10A the productive capabilities of this same soil have been still further put to the test, and the results enabled us not only to gauge the past, but to form some idea of its prospective productiveness. For the crop of 1844, the first of the experimental series, this plot received a dressing of superphosphate of lime and silicate of potass; but not any, either potass, soda, lime, magnesia, phosphoric acid, or silica, has been applied since that date. For the crop of 1845, and for each crop since—that is, for 25 years in succession—it has been manured with ammonia salts alone. During that period it has given an average annual produce of 24⅜ bush. of dressed corn and 24 cwt. of straw per acre per annum, being an average annual increase over the unmanured produce of 8⅜ bush. of corn and 9½ cwt. of straw, and a total increase over the 25 years of nearly 220 bush. of corn and 239½ cwt. (nearly 12 tons) of straw. It is obvious from these results that the soil of this plot 10A has yielded up annually, for this long period, considerably more mineral matter from its own resources than the unmanured plot. There is, however, an average annual produce of 14⅝ bush. of corn and 34⅝ cwt. of straw less over the last 13 than over the previous 12 years of the period. Assuming this to be due to exhaustion, and not to difference of seasons only—and there is the evidence of analysis that it is, at least in a great measure, due to exhaustion—it is still obvious that it would take many more years yet to bring down the annual yield of this plot to that of the unmanured one.

The next column in the Table shows the amounts of produce of Barley obtained for 18 years in succession on the same land, without any manure, in an immediately adjoining field. The average produce over the whole period is 20⅛ bush. of corn and 12¼ cwt. of straw per acre per annum. There is, however, a considerable reduction of produce in the later years; the average of the first 9 years being 23 bush. of corn and 13⅜ cwt. of straw, and of the second 9 years only 17⅜ bush. of corn and 10⅝ cwt. of straw, or a reduction of 5⅛ bush. of corn and 3 cwt. of straw per acre per annum over the second half of the period as compared with the first. This more rapid reduction in the case of Barley than of Wheat is doubtless due to the much more limited range of the roots of Barley, so that in its case an actually less bulk of soil has contributed to the crop, and the exhaustion, though telling more upon the crop, is, therefore, more superficial than in the case of Wheat.

The permanent meadow land gave, over 14 years, an average of 23⅞ cwt. of hay per acre per annum without manure, and, as the figures show, an average of only ⅜ cwt. less over the second than over the first half of the period.

Table 6. Illustrations of Natural Fertility.
Unmanured Four-course Rotation, conducted through 5½ courses. (22 Years), 1848-1869.
Average produce of the 2d, 3d, 4th, and 5th courses 16 years, 1852-1867.

Years.	Description of Crop.	Unmanured, every year; 16 years, 1852-1867. Turnips carted off.
		Per acre.
1852, 1856, 1860, 1864 ..	.. Swedish Turnips roots and tops)	18¾ cwts.
1853, 1857, 1861, 1865 ..	.. Barley	40⅛ bush.
1854, 1858, 1862, 1866 ..	.. Beans	12⅝ ,,
1855, 1859, 1863, 1867 ..	.. Wheat	34⅛ ,,

Lastly, as Table 6 shows, the 2d, 3d, 4th, and 5th courses of five consecutive entirely unmanured four-course rotations gave scarcely any Turnips at all; but the average of the four crops of Barley was 40⅛ bush.; of the four crops of Beans, 12⅝ bush.; and of the four crops of Wheat, 34⅛ bush. To sum up the chief points of these illustrations of the extent or limit of the fertility of a somewhat heavy loam, of by no means extraordinary quality, it has yielded an average annual produce, without any manure at all, of 15⅝ bush. of Wheat for 26 years; of 20⅛ bush. of Barley for 18 years; of 23⅞ cwt. of hay for 14 years; and, under rotation for 20 years, an average over the last four courses, or 16 years, of 40⅛ bush. of Barley, 12⅝ bush. of Beans, and 34⅛ bush. of Wheat. I confess that my view of the productive capability of heavy, or even moderately heavy, soils has undergone considerable change since I commenced the various experiments to which I have referred. Formerly I supposed that a very few years of consecutive corn growing would suffice to reduce the corn-growing capabilities of any ordinary soil to practically nothing. Such, however, is not the case; and a very little reflection will show how essential it is for the well-being, if not, indeed, for the

existence of man that the elements of fertility should be so locked up and distributed throughout the soil as to be capable of being taken up by crops extremely gradually, and so to last for an immense period of time. If needy landlords or indigent tenants could have drawn upon the locked-up elements upon which the maintenance of the natural or standard fertility of the soil depends, how little fertile soil would still remain in England. It has sometimes been argued that the soil is to be looked upon as little else than a support for plants, to which the cultivator must add all the constituents necessary for the growth of the crops he removes; just as the manufacturer who hires a mill has to supply the cotton or other material for the manufacture. I think, however, it would be difficult to account for the difference of rent paid for land, except on the assumption that it yields, from its own resources, a greater or less surplus, in the forms of corn and meat, beyond the amounts required to pay the cost of cultivation, to return interest on capital employed, and to afford a profit to the tenant. I think further observation will show that, excepting in the case of the lighter soils under modern management, the rent value of different descriptions of land has generally borne a closer proportion to their relative natural fertility than to any other circumstance. Let us suppose, for example, three descriptions of soil—one that would yield 5, another 15, and another 25 bush. of Wheat per acre from their own unaided resources; that is, without the use of any purchased cattle food or manure. A soil which would yield only 5 bush. of Wheat would probably bear no rent at all, the whole value of the produce being required to meet the costs of cultivation. The soil yielding 15 bush. would doubtless pay a rent, and the one yielding 25 bush. a considerably higher rent. But now let us assume that all three cultivators were able to go into the market and purchase cattle food and manure; the three soils would be very differently affected by this importation of elements of fertility from without. An amount of money expended in food and manure that would raise the produce on the poorest soil from 5 bush. to 25 would not raise that on the medium soil from 15 to 35 bush., and still less would it increase the yield on the best soil from 25 to 45 bush. of Wheat. It is obvious, therefore, that the surplus available for rent, dependent on such a use of elements of fertility from without, would be proportionally the greatest on the poorest soil, and the least upon the naturally most productive soil. It is chiefly in the fact here illustrated that is to be found an explanation of the rapid rise in the rent of light soils of late years. Compared with heavy land, they are cultivated at a less cost, they are much better adapted to carry stock, and with the aid of purchased food and manures, they can now rival in productiveness the natural fertility of clays and loams. So long as the farmer depended almost exclusively upon the natural fertility of the soil, the surplus to pay rent was much less on those light soils which could supply from their own resources but little of the constituents required for the growth of crops; but since he has been able to go into the market and purchase, in the form of cattle food and direct manures, those elements of which his soil was deficient, the increase of productiveness which has followed has, as a matter of fact, been found to be proportionally much the greater in the case of the lighter and naturally less fertile, than in that of the heavier and more fertile soils. Thus the productiveness of light soils is in a greater degree dependent on the amount of capital expended on food and manure than is that of the heavier soils. Moreover, the increased fertility and the increased rent of the lighter soils of late years are partly due to the accumulations from the past expenditure of the tenant. This increased productiveness is, however, of the character of improved "condition;" and hence it is that the productiveness of such soils may be comparatively easily and rapidly reduced. That excepting in the case of light soils under the conditions above referred to, the amount of rent paid is, in practice, chiefly dependent on the natural fertility of the soil, and not on the amount of capital employed by the tenant, is evident from the fact that there are, on many estates, highly cultivated farms with abundance of capital invested, adjoining others in a very opposite condition; the poor farmer being able to set apart from the produce of the land as large a surplus in the form of rent as his higher farming neighbour; whilst any demand for an increase of rent on account of increased capital employed would be met with the remonstrance that the benefits arising from the increased expenditure of capital by the tenant should justly accrue to himself.

From the facts and arguments which have been adduced in regard to the natural fertility of the heavier soils, and to the essential conditions of productiveness of the lighter soils, the question naturally suggest itself—Whether, or under what circumstances, the more frequent growth of corn than accords with the recognised rotation of a district might be permitted without risk of deteriorating the property of the landlord? Although any such repetition of corn crops is strongly objected to, as tending to exhaust the soil, it is remarkable that many operations which affect the soil in an exactly similar way are not only allowed, but approved. A fallow, for example, is an economical means of obtaining the produce of two seasons in one year; certain costs of cultivation, seed, and harvesting, are saved; but so far as the removal of constituents from the soil is concerned, it is immaterial whether two crops of Wheat of 16 bush. or one of 32 bush. be taken from the land. By liming, again, certain constituents which are locked up in the soil are set free and rendered available much more rapidly, and so are removed in larger quantity within a limited period of time than they otherwise would be. The same result—namely, the export from the farm of larger crops within a limited period of time—follows in like manner from the use of the subsoil-plough, the steam-smasher, and a great variety of implements of modern application. In fact, all these processes, which are regarded with favour rather than otherwise, have the one object and result of causing the soil to yield up its elements of fertility more rapidly. I believe that whilst a greater freedom from the adoption of a fixed rotation would often be beneficial to the tenant, it would not, if accompanied with proper conditions, result in any injury to the landlord. In saying this I trust it will not for a moment be supposed that I would recommend the abandonment of a rotation of crops, and the continuous growth of corn. To be more specific, what I do think is, that where fallow, or liming, or subsoiling, or steam-smashing, and allied processes, are admissible and advantageous, or where root crops cannot be consumed on the land during wet weather without injury to the succeeding crops—that is to say, on the heavier and deeper soils—Barley may often be grown both in larger quantity and better in quality after Wheat than after a root crop. Again, where Mangels are manured, as they often are, with 20 or even 30 tons of dung per acre, I see no objection, either from a scientific or practical point of view, in taking out of the land the large quantity of mineral constituents still remaining available after the removal of the Mangels, by growing two or even three corn crops in succession, with the application of artificial manure for each extra crop. Very generally, indeed, two corn crops might be taken in succession from medium and heavy land, provided it be kept free from weeds, and artificial manures be applied for the second crop. Nor do I think that real injury would be done by the occasional growth of Peas, or even an extra corn crop, on light soils, when the seeds have failed, as occurred after the dry summer of 1868; indeed, as much of some fertilising matters might be washed out of the soil by drainage as would be exported from the land in the extra crop.

So far, then, I have endeavoured to illustrate what is called "condition," and to point out the distinction between it and what may be called the natural fertility of a soil. I have maintained that "condition" is a quality dependent on the expenditure of the tenant, and that it should be considered as a part of his capital. I have also shown that "condition" may be withdrawn, or reduced, by cropping, within a very limited period of time. "Natural fertility," on the other hand, is the property of the landlord; and although it is not absolutely inexhaustible it is very little liable to injury from any system of agriculture which, so far as present appearances enable us to judge, has any prospect of prevailing in this country. It remains to offer some suggestions of a practical kind, with a view to the protection of the landlord, or succeeding tenant, from injury, in case of any considerable modification, or the entire removal, of the usual restrictions in regard to cropping; and also as to the best, or simplest, method of estimating the value of the unexhausted capital of the outgoing tenant, with a view to compensation from the landlord or the incoming tenant. It will be admitted on all hands that if the tenant were unconditionally free as to his course of cropping, and he were to leave his farm wholly under corn, the landlord would not so readily obtain a tenant for the farm. I would propose, therefore: 1. That all land should be given up with a fixed proportion under fallow, root crops, seeds, and corn crops; the proportions to be settled according to the custom of the locality; and that the outgoing tenant should pay a compensation, to be assessed by competent valuers, for any excess of land under corn over the so fixed amount. 2. That, excepting under special arrangement, and with the purchase of stable dung or similar town manures, no straw or root crops shall be sold off the farm. 3. That the tenant should be required to keep the land free from weeds; and, in default, to pay compensation to the landlord or incoming tenant for the cost of cleaning; such cost to be assessed by competent persons.

The cost of cleaning foul land which is in high condition is much greater than that of putting land which is poor in condition, but free from weeds, into good condition. Moreover, the state of the land as to weeds should be one important element in deciding whether an extra corn crop should or should not be taken. If, therefore, the tenant be allowed greater latitude in regard to cropping, more stringent clauses should be inserted in agreements against foul land. However highly a tenant may farm during the early or middle years of his occupation, he, as a rule, endeavours as far as possible to withdraw his capital out of the land, by reducing its condition, towards the end of this term, lest neither the landlord nor the incoming tenant should adequately compensate him for his unexhausted manures. It must be admitted that there is great difficulty in laying down any rules which shall be generally applicable for the estimation of the productive, and consequently the money, value of the residue of manures which have previously been applied to the soil, and have already yielded a crop. It has been shown by reference to direct results that some important constituents of manure either leave little or no unexhausted residue in the land, or leave it so combined within the soil, or so distributed throughout it, that it produces little or no appreciable effect on succeeding crops. Some manures, on the other hand, have been shown to produce marked effects for several years after their application. It is obvious, therefore, that it would require a very complicated sliding scale to enable us to estimate the value of unexhausted manures under the many varying conditions that would arise—as to the description and amount employed, the soil, the season, and the crop grown—were it attempted to take as a basis the valuation of constituents already underground. In Lincolnshire and adjoining counties half-inch bones are valued to the incoming tenant the second year after application, and in some instances guano is valued after it has grown a crop. It would, I think, be much more satisfactory that all valuation should, if possible, relate only to what is aboveground. Nor do I see any difficulty in doing full justice to the outgoing tenant without taking into account the value of the unexhausted residue of manures which have already yielded a crop. The three items upon which I would rely as the basis of a valuation in favour of the outgoing tenant are—the farmyard manure made during the last year of the occupancy; the manure from purchased food which has not grown a crop; and the straw of the corn crops of the last harvest.

TABLE 7.

Estimated Value of the Manure obtained by the Consumption of 1 ton (cwt., or lb.) of Food, each supposed to be of good average quality.

	Description of Food.	Money Value of the Manure from one Ton of each Food.		
		£	s.	d.
1.	Cotton-seed cake, decorticated ..	6	10	0
2.	Rape-cake	4	15	0
3.	Linseed-cake	4	12	6
4.	Cotton-seed cake undecorticated	3	18	6
5.	Beans	1	17	0
6.	Beans	1	14	0
7.	Tares	1	13	6
8.	Linseed	1	13	0
9.	Peas	1	12	6
10.	Indian meal	1	11	0
11.	Linseed-cake	1	2	6
12.	Malt-dust	1	2	6
13.	Peas	1	1	0
14.	Cotton-cake, pulped	1	0	0
15.	Oil-cake, Pulped	1	0	0
16.	Oats	1	15	0
17.	Wheat	1	13	0
18.	Malt	1	11	6
19.	Barley	1	10	0
1.	Clover-hay	2	5	0
2.	Meadow-hay	1	10	0
3.	Bean-straw	1	0	0
4.	Pea-straw	0	18	0
5.	Oat-straw	0	15	0
6.	Wheat-straw	0	12	0
7.	Barley-straw	0	10	0
1.	Potatos	0	7	0
2.	Rutabaga	0	5	0
29.	Mangel Wurzel		4	3
30.	Swedish Turnips	0	4	3
31.	Common Turnips	0	4	0
32.	Carrots	0	4	0

The quantity of straw grown is a pretty sure indication of the condition of the land in regard to recent manuring. To take an extreme case by way of illustration: the continuously unmanured Wheat plot, which has been already referred to, gave an average of only about 14 cwt. of straw per acre, whilst plot 16 gave, over the 13 years of heavy manuring, 46½ cwt., or 3¼ times as much. Now, if I had entered upon a farm with the straw of the corn crops given over to me not exceeding 14 cwt. per acre, and left it with straw averaging 3¼ times as much, I might surely in justice claim, of the landlord or my successor, compensation for such an increase in the quantity of straw, indicating as it would the increased condition of the land. In reference to this point, it may further be remarked, in passing, that not more than about 5 per cent. of the weight of the straw is derived from the constituents of the soil itself, by far the greater part being derived from the atmosphere, through the agency of the manures applied, and directly due, therefore, to the expenditure of the tenant's capital. I propose, then, as a part of the compensation to the improving outgoing tenant, that he shall be paid the consuming value of the straw which he leaves in excess of that which he entered upon. The next point to consider is, the valuation of the manure which has been obtained by the consumption of purchased cattle food within 12 months from the termination of the occupation, and which has not yet yielded a crop. Some years ago I published a Table showing the calculated value of the manure resulting from the consumption of 1 ton of each of the chief standard articles of cattle food. Those estimates were, at the time, considered by some to be somewhat too high. They have lately been carefully reconsidered; and, taking into account the higher money value of some of the chief constituents at the present

time, it has been decided to make but little further alteration than to add a few articles to the list that were not previously included in it. The results are given in Table 7, on the previous page.

It will be observed how very widely different is the estimated money value of the manure obtained by the consumption of 1 ton of different articles of cattle food in common use. It is obvious, therefore, that, in settling the amount of compensation to be paid to the outgoing tenant for the value of the manure produced by the consumption of purchased food, it would not suffice to take a fixed proportion of the purchased food bill, but the value of the manure constituents of the particular description of food actually employed must be estimated. It would no more be fair to make the valuation irrespectively of the value of the constituents obtained from the different descriptions of food than it would be to charge the same price for the inferior descriptions of guano as for the best Peruvian. As the value of the constituents obtained as manure from 1 ton of the various foods has been estimated at their market price, if sold in a concentrated, dry, and easily portable state, some reduction from the amounts given in the Table should be made in the valuation supposed, on account of the risk of loss by decomposition and drainage, and for the extra cost of carriage and application to the field, all of which will be greater in the case of the cattle manure than in that of the dry purchased manure. For these reasons I would propose that one-third or one-fourth less than the amount shown in the Table should be allowed for all purchased cattle food used within 12 months of the termination of the occupation, provided the manure obtained from it has not yet grown a crop. It is, I believe, the custom in Norfolk, and in some other counties, for the tenant going out at Michaelmas to apply the dung made during the previous winter to the root crop, the incoming tenant taking the crop at a valuation. The objections to this plan are, that the root crop is a very uncertain one, and may, in a bad season, be very much less than the amount of manure should produce, and that if the outgoing tenant has fed his stock upon purchased food, the value of the manure cannot be recovered in the root crop alone, even if the season be favourable. For example, in one of the courses of experimental rotation to which I have referred, after a liberal manuring of rape-cake, salts of ammonia, and mineral manure, less than 4½ tons of roots were removed; and the result was, that the succeeding crops amounted, without any further manure, to 60½ bush. of Barley, 43½ bush. of Beans, and 46 bush. of Wheat. It is obvious that, under the system referred to, these heavy crops of Barley, Beans, and Wheat would become the property of the incoming tenant, whilst he would only have to pay for the manure which had largely contributed to produce them the small value of 4½ tons of roots. I would submit that it would be a much fairer arrangement to value the manure made during the winter by the load, or ton, and that the incoming tenant should also pay two-thirds or three-fourths the estimated money value of the manure from the purchased food consumed in its production. If, in addition to this, the outgoing tenant were paid the consuming value of the straw of the corn crops of the last harvest, he would receive fair compensation for the capital which he had invested in "condition," whilst the incoming tenant would only have to pay for that which possessed an actual money value.

The conclusions arrived at in the course of the foregoing discussion may be briefly summarised as follows:—

1. "Condition" is a quality quite distinct from natural fertility of soil; it is mainly dependent on the amount of capital expended by the tenant in the purchase of cattle food or manure, and is, therefore, his property; it may be easily and rapidly reduced.

2. The natural fertility of a soil, whether high or low in degree, is, comparatively speaking, a permanent quality; it can only be injuriously affected by the continuance of an exhaustive system of cropping for a long period of time; it is the property of the landlord; and, excepting in the case of very light soils, it is the chief element in determining the rent-value of the land.

3. In the case at any rate of the heavier soils, it would generally be beneficial to the tenant of capital and intelligence if he were allowed much more freedom as to cropping than present customs permit.

4. No injury is likely to result to the landlord from granting the tenant permission to crop as he pleases, provided he is bound to keep the land free from weeds, and leave a fixed proportion under fallow and green crops at the termination of his occupation.

5. No simple rules, applicable to various descriptions of soil, season, crop, and manure can be laid down for the valuation of the unexhausted residue of previously applied manures which have already yielded a crop.

6. By the valuation of so much of the farmyard manure, and of so much of the manure constituents derived from purchased cattle food as have not yet yielded a crop, and also of the straw of the last harvest, fair compensation may be made to the outgoing tenant, whilst the incoming tenant will only be required to pay for that which has a fixed and easily ascertainable money value.

Notices of Books.

Hand-book of Small Farm Management. By Thomas Baldwin, Superintendent of the Agricultural Department of National Education, Dublin. Browne & Nolan, Nassau Street.

Mr. Baldwin's little books, adapted especially for the small farmers of Ireland, but containing in every page information agriculturally serviceable everywhere, are happily achieving an immense circulation.

In the present volume, including successive sections on soils and manures, on farm implements, on crops, on live stock, and on permanent imptovements of the land, the whole field of agriculture is surveyed. Woodcuts are introduced, illustrative of farm machines, plants, and live stock; and the book concludes with an account of the Glasnevin model farm, which is used as a laboratory for the agricultural school there, from which we shall hereafter make an extract. The little book is to be had for very little money, and may be heartily commended as a well packed storeroom of agricultural facts.

Farm Memoranda.

TILLYFOUR.—In no other county of Scotland is the breeding and fattening of cattle so successfully carried out as in Aberdeenshire. Without cattle the present rents could not be paid, as the return obtained for fat cattle is the main source of agricultural wealth. The county at large is therefore deeply interested in stock management. What applies to the county of Aberdeen applies within certain limits to nearly every county of the United Kingdom.

Our attention has been frequently called within the last two or three months to the difficulties which the owners of stock have experienced to keep their cattle in a progressing state. The difficulties of the present season are not, however, exceptional, as farmers have often had to contend with the perplexing problem, how to keep cattle which are being prepared for the fat market in a progressing state from the end of July to the beginning of October. Having this summer frequently seen the scarcity of food in pastures, and the almost entire absence of forage crops which could be used as a substitute for, and an auxiliary to, the scanty and withered herbage in the pasture fields, we resolved to visit Aberdeenshire, in the expectation that we would see instances of how the problem has been satisfactorily solved—viz., the autumn keeping of cattle which were being prepared for the fat market; and knowing the practical skill and energy displayed at Tillyfour in the management of cattle by Mr. William M'Combie, M.P., we visited him last week.

Taking train from Edinburgh, and proceeding by Stirling and Perth to Aberdeen, we observed almost everywhere that the pastures were bare, affording little keep for cattle beyond the withered stalks of the grasses which had formed seed. Between Perth and Aberdeen were seen well-stocked pastures, with cattle in a condition from lean to half fat, but in no instance did the herbage appear to be so abundant or so succulent as to advance condition. In many instances it appeared to us that the cattle must be getting older without advancing in condition—or, speaking more correctly, they are losing condition acquired in the beginning of the grass season. It was after we had reached the station of Whitehouse, in the Vale of Alford, that we observed that, although the herbage was comparatively browned by the summer drought, there was sufficient for the animals to eat, but the grass was not of a description calculated to fatten them.

It was only after we inspected the stock on the three farms occupied by Mr. M'Combie—viz., Tillyfour, Bridgend, and Dorsel, amounting to between 1100 and 1200 acres arable—that we found the problem satisfactorily solved, how feeding cattle could be kept with a profit during the latter part of summer and the greater part of autumn without reducing their numbers until the Turnip crop was matured. At Tillyfour we found 41 polled cattle, aged from three to four years, comfortably housed, 20 being in strawyards, and 21 tied up in byres. The cattle in the sheds are fed three times a day on a mixture of Oats, Peas, and Tares. The forage is nearly ripe, and the cattle receive as much as they can eat without waste. In addition to the forage (Oats, Barley, and Tares), they have a feed of good Clover hay, that is, four feeds a day of forage. The cattle tied up also receive forage three times a day along with Turnips, but get no cake at the present time. Water is introduced into all the sheds. The cattle in the sheds receive from 2 to 3 lb. of the best linseed cake a day. The cattle confined in byres are allowed as many Turnips, with the shaws attached, as they can eat; the variety is the Aberdeen Yellow: the bulbs are already well grown, and promise to be a very full crop by October. The seed was sown in the latter part of May. The cattle in the sheds are expected to be ready for the London market in a month or six weeks from the present date, while the largest sized cattle confined in the byres are not to be despatched for London until the Christmas market. They will be allowed cake about the end of October until the time they leave for London, "to give them the last dip."

In a somewhat high and exposed field were grazing about 30 cattle, purchased in spring at from £20 to £24 per head. The pasture, second crop Clover, was very good, but the cattle seemed as if they would have been the better of shelter. There is a shed in the field. On inquiry we learned that these animals will be removed in ten days to the feeding stalls. In another field, consisting of upwards of 100 acres of old pasture, a large number of cattle were grazing. The field had been at one time under the plough, but at a distant date. Observing some draining operations proceeding, we inferred that the field is to be broken up and put through a course of cropping. Judging from the herbage, we assumed that the land was superior, but the altitude is high, being between 700 and 800 feet above the level of the sea. The cattle in this field were neither so uniform nor so good as those we had previously seen. A few of the cattle had been worked in the plough, but all were about three-parts fat, *i.e.*, testing them by the Tillyfour standard of fatness. We also observed two or three coloured cattle in this lot.

Adjoining this field were 36 acres of Swedish Turnips: the field was without a blank, and so luxuriant were the leaves that the rows could not be distinguished. Surprised at the appearance of the field, we learned that it had been for a long period in grass. Broken up in 1867, it had produced two extraordinary crops of Oats. The land received about eight cartloads of farmyard dung, and from 5 to 7 cwt. of dissolved bones per acre, previous to sowing the Swede seed. We have seldom seen in any season such a promising crop, and nowhere this autumn have we observed a field at all approaching this one on the farm of Tillyfour, the result mainly, we believe, of the number of years the field has been grazed.

In a field near the house, where a part of the breeding stock was kept, we found about 30 cows in milk, generally with calves at their feet. The cows are large, handsome, and generally in very high condition. Among them was the 1st prize cow at the Great International Exhibition at Paris in 1856. She is now 18 years old, and although fat she shows the effects of advancing years. We learn that this year she lost her calf, but, with this exception, she has bred regularly since she was two years old. This cow, when in bloom, was one of the most perfect specimens of the Polled Angus that ever was exhibited, and has never been beaten in any competition, except by her daughter, "The Pride of Aberdeen," who was in the same field with a splendid heifer calf at her foot. Several other 1st prize cows of the Highland Society were also in the field.

In one of byres was a 3-year-old bull of the Polled Angus. In open sheds were three yearling bulls; one of these is a remarkable animal for his size, and shows prominently the characteristics of the breed.

On the farm of Dorsel we learned from the farm manager that he had 100 cattle on the farm—part under cover, and part in the field. A number of these cattle, however, were grazing on the adjoining farm of Astown. Of the 46 cattle under cover, 24 were in open sheds, and the remainder tied up in byres. The cattle which are in open courts are expected to be despatched to London within the next six weeks. We learned they were purchased in spring at £22 10*s.*, and that the price expected in London is from £30 to £35. The cattle tied up are not so finished, but are of larger sizes, and are intended for the Christmas market. They are not all pure Polled Angus; some of the best have a strain of the Shorthorn. The feeding at Dorsel is the same as at Tillyfour. In a well-sheltered grass field below the steading we found nearly 30 very good cattle, which, under ordinary circumstances, would have been considered fit enough for the market; but we learned that they are to be tied up within the next ten days to be thoroughly finished for London. In a field adjoining were a number of heifer calves, and in a high-lying field were about from 15 to 20 yearling heifers, which Mr. M'Combie had bred.

The Turnips—yellow and Swedish—on this farm are very superior to anything in the district. The extent under Turnips is from 65 to 70 acres.

On the farm of Bridgend we were shown a number of cattle, some of which were superior to anything we had seen housed at Tillyfour or Dorsel. The first lot we examined, numbering about 20, had been eight weeks in the house; they were prime fat, although they had only been receiving from 2 lb. to 3 lb. of cake daily for the last six or seven weeks; but they were also receiving forage, a mixture of Tares, Oats, and Peas, all of which were nearly ripe. These cattle were purchased in April at £22 15*s.* per head, and should now be worth about £33 in the market. In a byre we examined a number of animals; the aged cattle were of large sizes, and in great condition, but they will not be shown in London until the season is farther advanced. In the byre there are three black steers, aged two years, bred at Tillyfour, and should they continue to improve as they have done they may be entered for competition for the great prizes offered for fat stock when they are matured. Standing next to these were four Shorthorned Angus cross-breds; two of these are already in a condition suitable for competition, yet we learned that they have not received any cake or corn. In another part of the byre were two cows and one heifer, victims to the pernicious

system of over-feeding for the showyard, and this over-feeding had been perpetrated to gain prizes offered for breeding animals. The two cows, aged four and five years, competed successfully at the Highland Society's Show at Aberdeen in 1868. The heifer was first at the show of the Great Northern Agricultural Society the same year, and the first in Edinburgh at the Highland Society's Show (1869) as a 2-year-old. These animals having been rendered unproductive, are being trained for competition for prizes offered for fat animals. We were also shown an ox and a heifer, intended for exhibition at the forthcoming shows of fat stock at Birmingham and London. The heifer obtained the 1st prize at the Highland Society's Show in Aberdeen in 1868 (in the class for 2-year-old heifers). Since then she has not been exhibited, and having proved unfruitful, she is now being prepared for the fat shows. After many years Mr. M'Combie appears to have at last discovered that the training of animals of his favourite breed—the Polled Angus—is ultimately productive of disappointment, and this year he has not been an exhibitor.

In the adjoining field to this farm were about 40 or 50 cattle grazing, which in a few days are to be under cover, to be prepared for the Islington market, where they will probably be shown in the month of December.

On the farm of Bridgend the Turnips are splendid, and there appears to be a good prospect on all the farms that there will be no want of Turnips, whatever there may be of fodder, to prepare the cattle for the fat market.

Mr. M'Combie expects that in the course of the next seven or eight months he will despatch to the London market between 300 to 400 fat cattle. The last two years the average price obtained has been from £35 to £36 a head.

It will be apparent to the reader that Mr. M'Combie has successfully solved the problem how cattle for the fat market can be successfully kept on until the Turnip crop is ready to be used for fattening. It is apparent that great care, founded on experience, is required to carry out the system followed on the farms occupied by Mr. M'Combie. As regards the general management, we may state that the cattle are turned out to graze on goung grass from the 10th to the 15th of May, and a portion of that young grass is cleared of stock, by the 10th to the 15th of June, to be reserved for cutting. When the Clover plants are abundant a very succulent cutting is available for feeding stock kept under cover. This second crop of Clover, with the forage crop of Tares, Oats, and Peas, and a few acres of yellow early-sown Turnips, with a small allowance of cake, solves the problem how cattle are to be kept during summer and autumn in any year. During Mr. M'Combie's long experience as a feeder of cattle, the present year has been, he stated, one of the most difficult to carry on his stock during the trying period from the month of July to the time when the Turnips will be available. We may state further that Mr. M'Combie believes that profitable feeding depends in a great measure upon the proper selection of the animals to be fattened, and that cattle should not be parted with until they are fully matured for the shambles; and to secure this, early housing, with proper feeding and proper care taken, is essential to secure that ripeness which obtains the highest prices in the Islington market. Mr. M'Combie does not believe in an indiscriminate use of cake or meal. He has found by experience that cake supplied beyond six or eight weeks will seldom pay the feeder of cattle in Aberdeenshire.

We may add further that the period of grazing cattle is being gradually shortened in Aberdeenshire, and that house-feeding is becoming more popular every day; that at the present time, on Mr. M'Combie's farms, house-feeding extends to nearly nine months of the year. We believe that the time is not distant when house-feeding will be much more generally practised, and that grazing on arable farms will be greatly curtailed.

Those desirous of information on the management of stock will find much useful information in "Cattle and Cattle Breeders," written by W. M'Combie, M.P. *North British Agriculturist.*

Miscellaneous.

EXTRAORDINARY CROP OF BARLEY.—One of the most extraordinary specimens of the productive powers of the cereal crops that has been grown in East Lothian, or perhaps anywhere else, this season, has been produced on the farm of Auldhame, occupied by Mr. Dale. The specimen consisted of 23 stalks, averaging about 5 feet 4 inches in length, and several of them nearly an inch in circumference, all growing from a single root. Several of the heads had as many as 38 pickles, and others 36, making the enormous number of nearly 900 pickles from the single seed. The field on which the Barley grew had been first sown with Wheat, but as the Wheat crop was thin and somewhat indifferent looking, the Barley was afterwards put in. In such a dry season as the present has been, it says not a little for the system of high farming practised at Auldhame, that the enterprising tenant has succeeded in making his cereal crop produce nine hundred fold. *Haddingtonshire Courier.* [The above might have been the case as regards a single root under very favourable circumstances; but the important question is, What was the produce per acre? Were 900 bushels reaped for 1 bushel sown?]

The Week's Work.

OCTOBER 1: *Corn Harvest* is seldom finished in late districts of the North, and in elevated and late districts of Wales, before the beginning of the month, and in late seasons much corn is often abroad towards its close. The current season has been favourable to most late backlying places, so that corn harvest is now concluded with very few exceptions.

Michaelmas Entries.—Changes of tenants are not frequent in England, but when they do take place entries to farms at this season is favourable for carrying out improvements of a permanent character, as drainage, breaking up poor pasture land to aëration, and such like. And even when no change takes place, but where the yearly tenancy runs from Michaelmas to Michaelmas, it is a favourable period for giving up old plans of farmering and entering upon new. The farmer's year, too, very generally begins with October, which involves the settling of accounts and the balance of the books. Where old-fashioned tenants give up, it is not so easy selling the dead and live stock to the incoming tenant, as it was in the olden time, the interest of the latter being to avoid purchasing what is out of date unless at a price sufficiently low as to enable him to sell without loss. It may, therefore, be advisable for the outgoing tenant to sell by auction, but in many cases, if not the majority, the old plan of "creeping in at little money" is still the rule, the incoming tenant taking the stock of his predecessor at a lump sum. There are, however, more objections to this plan than formerly, for tenants who enter with limited capital have it in their power in most places to hire contractors to do both field and barn work, and to let their Turnips and strawyards to graziers. On the contrary, nothing is more expensive than teams and implements out of date, or more profitless than stock that will not pay for their keep. It is seldom advisable, however, to start with the most expensive live stock and implements, such being in too many instances the reverse of profitable. When changes are determined on, it requires the exercise of the highest skill to purchase what will prove most profitable under the peculiar management of the purchaser. Much depends upon the state the land is in.

Farm Servants in England very frequently change places at this term, and those who do not change renew their terms. Much has recently been said relative to the management of this class, more perhaps than is consistent with the liberties they enjoy and exercise. There is not a worse plan than to treat servants with a morbid philanthropy, as if they were continually at the mercy of their employers, for the first duty of the latter is to teach the former to stand upon their own feet, which all good servants never fail to do. That there are bad masters and bad servants is a totally different affair, and for either most philanthropic remedies are about the worst that can be prescribed; and yet the man who has neither head nor hands must live, but certainly not on the same terms as the others; and the farther we progress in improvement the more difficult will it be to reconcile the two extremes to the satisfaction of political economists. Our own plan has always been to have nothing to do with bad servants, employing only good hands, who can take care of themselves and families. They cost more wages, it is true, but they are cheaper in the end, more ways than one.

Wheat Sowing continue as root crops are removed and the land got ready. Pickle and drill as directed last month, using rather more seed. October was once counted Wheat seed time, but thorough drainage, and the growth of root crops, Beans, and Peas on land that used to be bare fallowed, is extending the sowing over a greater length of time. Thus far the season has been favourable for getting Clover, Bean, and Pea stubble ready for early seeding, but it may be otherwise in many places with the harvesting of root crops in the South, should the weather continue favourable and growing; but the threatening approach of an early winter may induce the early harvesting of root crops also. The season has been exceptional in many respects, so that the prudent course is to watch the weather, and store the Potatos, Carrots, Mangels, Kohl Rabi, and Swedes in time, no less for their safety than for the getting of the land ploughed and the Wheat sown with a favourable season. Avoid working in wet weather, as poaching land after roots does immense harm. In fine weather the best plan is to keep the harrows and seed-drill close up to the plough. In Ireland, where a great breadth of Potatos is grown in lazy-beds, the tops are pulled by the hand and removed, when the Wheat is sown broadcast, and covered by the operation of digging the Potatos. A good braird is generally obtained, but at the expense of a considerable sacrifice of seed, *i. e.*, the land requires to be thickly seeded, as much of it is buried too deep. The more economical plan would be to harrow the land after digging the Potatos, and then either dibble or drill in the seed.

Live Stock.—A very serious loss attends the keeping of stock too long at grass, more especially our improved breeds. Even in fine seasons in the South cattle of every kind should have a dry bed in a hovel to go to when the pastures become wet, for when caught lying on a wet bed by a frosty night or morning, the consequences, in the form of inflammatory attacks, black leg, braxy, and so on, are often fatal. Even the hardy Kylo looks out for shelter in his native glen, with a dry bed of long heath; but our lowland herds have no such choice. Sheep folding on Rape, Coleseed or Turnips, attend to; if the green tops of the latter are consumed more chaff and ground corn will be required than when the roots only are eaten in troughs. In Sussex, Hants, Dorset, and Devon this is early lambing season, and if Italian Rye-grass and Clover seeds are insufficient for ewes, as will be the case in too many instances this year, Belgian Carrot is preferable to Turnips. Put the rams to breeding ewes for lambing the latter week in February or beginning of March. In our highland sheepwalks flocks begin moving down towards their winter quarters in the lowlands. *W. B.*

Notices to Correspondents.

*** We regret to say that a parcel of letters and manuscripts, forwarded to the Editor last Saturday, has miscarried.

GAS-LIME: *William H.* It is a mixture of caustic lime and carbonate of lime, with lime containing combined with it sulphuretted hydrogen, &c., which has been taken by it out of the coal gas which is passed over it for purification. In so far as it is combined with this sulphuretted hydrogen, it will, by exposure to air, become gypsum. A waggon load, or as much sometimes as two waggon loads per acre, is used. It is generally made into a compost with earth, and turned over several times, before putting it over the land. It is more commonly applied to clay land than light soil. Coal ashes may be useful to put on coarse grass land where there is no Clover.

GERMAN SALTS. Mr. Wolff desires to correct a few inaccuracies (not of our creation, however) in last week's Paper, on this subject:—"In p. 1294, col. 3, line 10, for 'universal' read 'mineral.' In line 42, for 'properties' read 'proportion.' In p. 1295, col. 1, line 4, for 'flour' read 'flax.' In col. 2, line 10, for 'valuable' read 'reliable.' And in the same column, last line but one, for 'Grape disease' read 'grass disease.'"

GUANO: *R. H. T.* It is rarely adulterated except with things which add to its weight. A bushel of good guano, filled in without pressure, should not exceed 73 lb. in weight: it may vary from 69 to 73 lb., and the lighter the better, provided, on throwing it into water, none of it floats, for that would show an admixture of sawdust. If heavier than 73 lb. per bushel, it has been adulterated with earth.

Markets.

MARK LANE.

MONDAY, Sept. 26.

There was only a small supply of Wheat from Essex and Kent to this morning's market, which sold readily at the extreme prices of this day se'nnight. The attendance was fair, but only a retail business was done in foreign, at our previous quotations. Barley, Beans, and Peas were without change in value. Oats, owing to large receipts of foreign, were 6*d.* per qr. lower. In Flour no alteration.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	44	52	Red	41	51
— — fine selected runs do.	46	55	Red	45	53
— — Talavera	42	45			
— — Norfolk	—		Red		—
— — Foreign	41	62			
BARLEY, grind. & dist. 28 to 32	Chev	42	45	Malting	36	41
Foreign grinding and distilling	26	33	Malting	33	43
OATS, Essex and Suffolk	24	26			
— Scotch and Lincolnshire	Potato	26	28	Feed		—
— Irish	Potato	25	27	Feed	23	26
— Foreign	Poland and Brew	24	26	Feed	19	24
RYE		32	36	Foreign	33	36
RYE-MEAL, Foreign						
BEANS, Mazagan	43s. to 47s.	Tick	43	50	Harrow	40	50
— Pigeon	51s. to 59s.	Winds.	—		Longpod.	—	
— Foreign		Small	45	47	Egyptian	42	44
PEAS, White, Essex, and Kent.	Boilers	38	40	Suffolk	40	42
— Maple, 40s. to 44s.	Grey	36	40	Foreign	36	40
MAIZE			—	Foreign	32	34
FLOUR, best marks delivered	per sack	39	47			
— 2d ditto	ditto	32	44	Country	32	44
— Foreign	per barrel	24	27	Per sack	35	61

WEDNESDAY, Sept. 28.

At the opening of the corn market this morning the grain trade exhibited a steady feeling, but later in the day it entirely lost its recovery, notwithstanding no quotable alteration took place in prices. Although the supply of new English Wheat was limited, and that of foreign far from being extensive, yet sales in all descriptions were effected cautiously, at the rates current on Monday. Barley was in fair supply and demand for both malting and grinding qualities, at previous values. Malt ruled quiet, but unchanged in prices. Oats, the supply of which was large, experienced a limited demand, at about late rates. Beans and Peas met with a moderate inquiry, at the extreme prices of Monday. The Flour trade ruled quiet, but without any change in price.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch	670	170	—	—
Irish	—	—	—	—
Foreign	8010	4700	39,090	600 brls.
	8680	4870	39,090	

LIVERPOOL, Sept. 27.—We have had a fair attendance at our market to-day, but with only a moderate consumptive demand for Wheat, prices in some cases receding 1*d.* to 2*d.* per central from Tuesday's rates. Flour met a limited request, at a decline of about 6*d.* since Tuesday. Corn in good request, at an advance of 6*d.* to 9*d.* per qr. Peas very firm, and dearer. Others quiet and unchanged.

AVERAGES.

	Wheat.	Barley.	Oats.
Aug. 20	54s 7*d*	33s 5*d*	25s 10*d*
— 27	51 3	36 8	24 6
Sept. 3	49 1	36 2	25 9
— 10	48 1	35 8	23 10
— 17	46 6	36 4	23 9
— 24	45 4	36 2	20 7
Average ..	49 2	35 8	24 0

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Sept. 29.

Prime Meadow Hay	120s. to 135s.	Clover, old ..	..130s. to 140s.
Inferior do. ..	..110 120	Inferior do. ..	..115 125
New Hay ..	..115 125	New 2d cut do.	..120 130
Inferior do. ..	..100 110	Inferior do. ..	..110 115
Straw	.. 30 34	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, Sept. 29.

Sup. Meadow Hay	130s. to 140s.	Inferior Clover	..126s. to 132s.
Inferior do. ..	..118 126	Prime 2d cut do. ..	.. ..
New do. ..	..126 134	New do. ..	..110 115
Inferior do. ..	..110 116	Straw	.. 32 42
Superior Clover	..140 150	JOSHUA BAKER.	

METROPOLITAN CATTLE MARKET.

MONDAY, Sept. 26.

The number of Beasts is rather larger than last week; choice qualities are, however, scarce, and consequently still dearer; the trade for other kinds is worse, there being a large supply of foreign cattle landed at Deptford and other places that are not allowed to come here, but must be sold and slaughtered at the place of landing. We have not quite so many Sheep as last week, yet trade is very dull, and on the average prices are lower. Good Calves are scarce and dear. Our foreign supply consists of 1750 Beasts, 6800 Sheep, and 150 Calves; from Scotland there are 84 Beasts; from Ireland, 360; and 50 from Norfolk and Suffolk.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-fords, &c. ..	5	8to6 0	Best Long-wools	5	4to5 8
Best Shorthorns ..	5	4—5 8	Do. Shorn ..	..	—..
2d quality Beasts	5	10—4 6	Ewes & 2d quality	4	4—5 0
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn ..	..	—..
Do. Shorn ..	..	—..	Lambs	..	—..
			Calves	4	0—6 2
			Pigs	3	8—5 0

Beasts, 3860; Sheep and Lambs, 19,350; Calves, 162; Pigs, 190.

THURSDAY, Sept. 29.

The number of Beasts on offer here to-day is not nearly as large as on Thursday last, but we must take into account that importations from certain districts must be sold at place of landing; trade is excessively dull, the small amount of business transacted is at lower rates, and a large proportion remains unsold. The supply of Sheep considerably exceeds the demand: indeed, there is scarcely any business doing, and our quotations are almost nominal. Calves are lower, yet they are disposed of. Our foreign supply consists of 600 Beasts, 4450 Sheep, 300 Calves, and 220 Figs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-fords, &c. ..	5	6to5 10	Best Long-wools ..	5	2to5 6
Best Shorthorns ..	5	4—5 8	Do. Shorn ..	..	—..
2d quality Beasts	3	8—4 4	Ewes & 2d quality	4	0—4 6
Best Downs and Half-breds ..	5	6—5 10	Do. Shorn ..	..	—..
Do. Shorn ..	..	—..	Lambs	..	—..
			Calves	3	8—5 10
			Pigs	3	8—5 8

Beasts, 1340; Sheep and Lambs, 8880; Calves, 335; Pigs, 235.

METROPOLITAN MEAT MARKET.—Sept. 29.

Best Fresh Butter .. .. .. 19*s.* per dozen lb.
Second do. do. .. .. .. 17*s.*
Small Pork, 5*s. 2d.* to 5*s. 6d.*; Large Pork, 4*s. 6d.* to 5*s. 0d.* per 8 lb.

HOPS.

BOROUGH MARKET, Sept. 28.

A somewhat less active inquiry for the new growth has been noticed in our market, the arrivals being too extensive to allow sales to be effected quickly. Olds have continued neglected. The quotations are:—Weald of Kent, £3 5*s.* to £4 10*s.*; Mid and East Kents, £4 to £7; Sussex, £3 to £3 15*s.*; Farnham and country, £4 10*s.* to £6 6*s.*; olds, £1 to £2 10*s.* per cwt.

SEED MARKET.

The seed trade continues in the quiet state noted in our last. For Trifolium seed there is now scarcely any demand. Winter Tares are in fair request, at declining values. White Mustard seed is also easier. New Dutch Hemp seed is now offering. There is but little English Canary seed on offer. In Clovers and Trefoils there is scarcely anything passing. Linseed is steady. Foreign Italian is without change. We have a fair trade for Windsor and Longpod Beans. Winter Barley, Oats, and Rye are in moderate request.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—Sept. 28.

Holywell Main, 17*s. 3d.*; Walls End Thrislington, 18*s.*; Walls End Haswell, 19*s.*; Walls End Hartlepool, 18*s. 6d.*; Walls End Heugh Hall, 18*s. 6d.*; Walls End South Kelloe, 18*s. 6d.*—Ships at market, 14; sold, 13; unsold, 1; at sea, 40.

Cottam's Iron Hurdles, Fencing, and Gates.

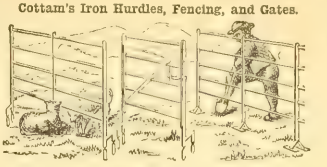

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.

Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

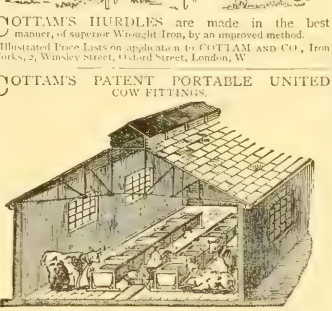

Their advantages are—Economy, not Rafters, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-eating. Comfy, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55*s.*

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, and COLLECTING MACHINES for 1870.

GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other

HAND MACHINE

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.

☞ Illustrated Price Lists of Greens' Patent Rollers, Hot-water Boilers, Galvanised Wire Netting, Garden Seats and Chairs, Fountains, Vases, &c., free on application.

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; 54 and 55, Blackfriars Road, London, S.E.

CONSERVATORY BASKETS.

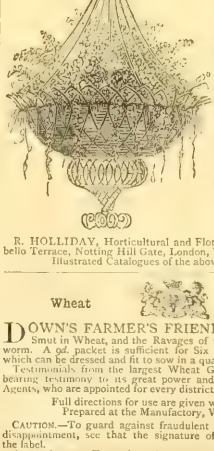

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and pedestal for placing in any position, on the Lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Avenues for Conservatories, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Minton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

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Illustrated Catalogues of the above on application.

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DOWN'S FARMER'S FRIEND, for Preventing the Smut in Wheat, and the Ravages of the Slug, Grub, and Wireworm. A 5*d.* packet is sufficient for Six Bushels of Seed Wheat, which can be dressed and fit to sow in a quarter of an hour.

Testimonials from the largest Wheat Growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed for every district.

Full directions for use are given with each packet.
Prepared at the Manufactory, Woburn, Beds.

CAUTION.—To guard against fraudulent imitation and consequent disappointment, see that the signature of HENRY DOWN is on the label.

Agents in every Town throughout England, Scotland, and Ireland.

THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT-FLOWER PACKING CASE, and MEMBERS of PARLIAMENT, FAMILIES, and TOURISTS' SEASIDE COMPANION.

The above Cases are specially contrived for the Exhibition and Transmission of cut flowers. The flowers are packed in water, and cannot be displaced if the water spilled, if placed in any position, even if upside down. When not required for conveying flowers, they can be used for ordinary packing purposes. It has been pronounced by the Committee of the Royal Horticultural Society as the best case now in use, and C. J. Perry, Esq., will exhibit his flowers in them at the next Crystal Palace Flower Show.

Manufactured solely by W. EASSIE AND CO. (LIMITED), Gloucester, who will forward Lists of Agents and Prices on application.

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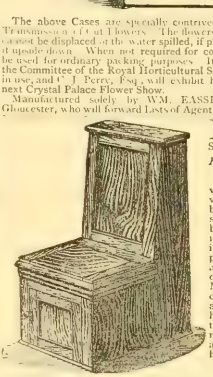

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Lawford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty the supply of Dried Earth to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees a couple of spadesful put into a bucketful of water), and must say I had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

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HOT-WATER PIPES, BOILERS, &c., &c., of superior quality.

			2-inch.	3 inch.	4-inch.
HOT-WATER PIPES, Nos 6 and 7 - per yard	..	..	*s. d.* 0 11	*s. d.* 1 5	*s. d.* 1 11
ELBOWS, No 12	..	.. each	1 0	1 9	2 6
T-PIPES, No. 33	..	.. „	2 0	2 10	3 9
SYPHONS	..	.. „	1 6	2 4	3 3
VALVES ..	..	.. „	9 0	10 0	11 0

The above, nett cash prices, delivered at London, Liverpool, Bristol, or equivalent

GEORGE ROBINSON, 16, South Wharf, Paddington Basin; and at Dial Iron Works, Stourbridge.

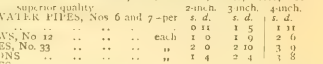

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c.

Improved Conical. *Tubular Boiler.*

HOT-WATER PIPES at whole-sale prices; Elbows, T-Pieces, Syphons, and every other size then kept in stock.

WROUGHT and CAST-IRON CONICAL MIDDLE, also IMPROVED CONICAL, also Elliptic, Boilers, from 24s. each.

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars to Fire-bars.

Portable Boiler. CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60s. each.

Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.

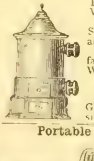

INDIA-RUBBER RINGS for Pipe Joints: Sockets require no other packing, and are perfectly water-tight. *Elliptic Boiler.*

Goods, of the very best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground-street, London, S.E. (Surrey side Blackfriars Bridge). Price List on application.

Portable and Fixed Hot-water Apparatus

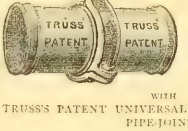

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,

WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extent sions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

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Genuine White Lead, Oils, Colours, Brushes, &c.

GARDEN ENGINES, PUMPS, SYRINGES, INDIA RUBBER HOSE, TAPS, CONNECTIONS, &c.
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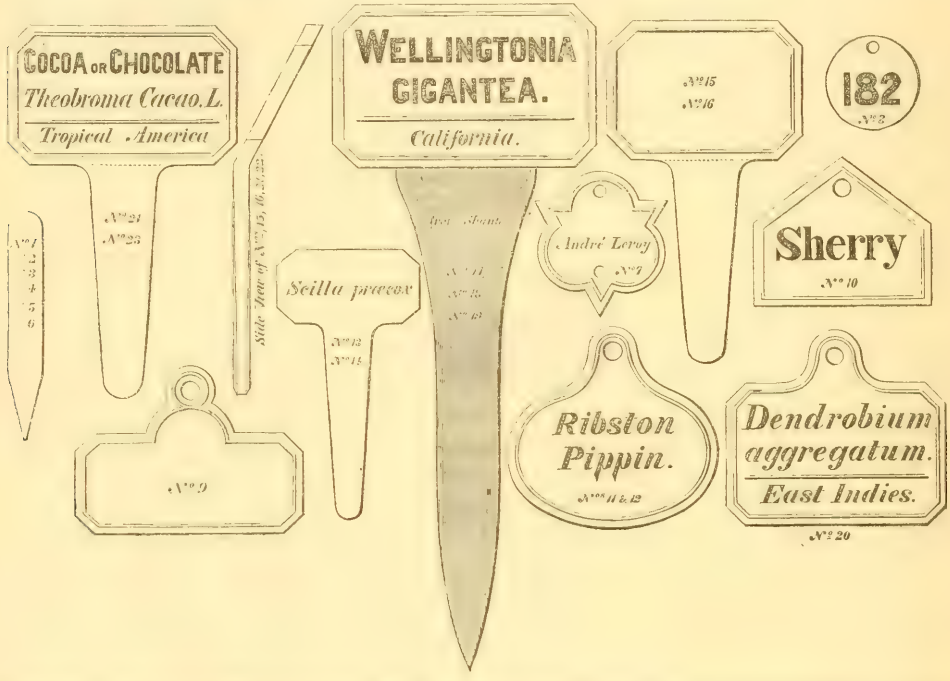

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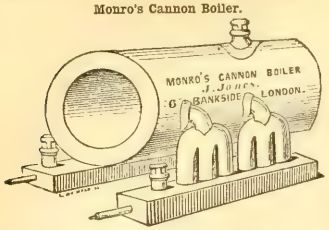

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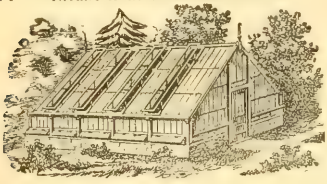

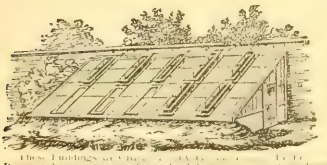

These Buildings are unrivalled, whether the object of the house has complete protection from rain, wind, or other severe weather.
Illustrated Price Lists, containing prices of 240 different sized Houses, free on application to the Makers, enclosing 2 stamps for postage. Also the improved PORTABLE HOTHOUSES for the PEOPLE, cheapest ever offered. Guaranteed sound and good quality. Apply to
W. RICHARDSON AND CO., Horticultural Builders, Darlington.

JAMES BOYD AND SONS, HORTICULTURAL BUILDERS and HEATING ENGINEERS, Paisley, N.B. CONSERVATORIES, GREENHOUSES, VINERIES, FORCING HOUSES, PITS, and every description of Horticultural Building, manufactured in Wood or Iron by Steam power Machinery, and erected in any part of the United Kingdom. Manufacturers of Hot-water Apparatus for Heating Churches, Mansions, Warehouses, &c. Plans and estimates on application.

By Royal Letters Patent.

SHREWSBURY'S GAS CONSERVATORY BOILER, Registered Gas Oven, now in use. IMPROVED REGISTERED GAS BATH, £10. Testimonials on application. Enclose stamp.
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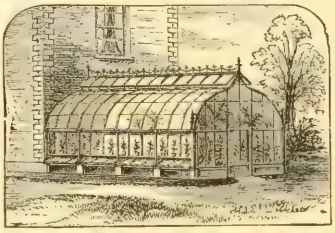

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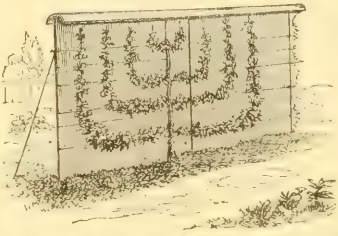

Full particulars of the above, and of Beard's patent roofing, also illustrated price list, post free. Apply to
CHARLES BEARD, Patentee, Horticultural Engineer, Victoria Works, Bury St. Edmunds.

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6 ft. by 4 ft. Lights, 2 in. thick, unglazed	£0 5 0
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GREENHOUSES	Per ft. super.
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T. G. MESSENGER will be happy to prepare Plans and Estimates from instructions sent him; or, if preferred, will wait personally on any Ladies or Gentlemen at their residences.
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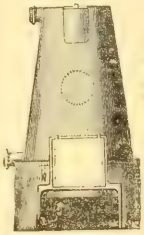

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These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require NO BRICKWORK.

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Sole Manufacturers of the Improved CONICAL BOILERS,
Which are in general use, and which herein refer for their durability and economy, attained a celebrity far surpassing any other Boilers ever invented.

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AS LEAN-TO ROOFS FOR COVERING PEACH WALLS OR FOR EARLY VINERIES, AND AS SPAN-ROOFS FOR ORCHARD-HOUSES, VINERIES, GREENHOUSES, FORCING PITS, &c.

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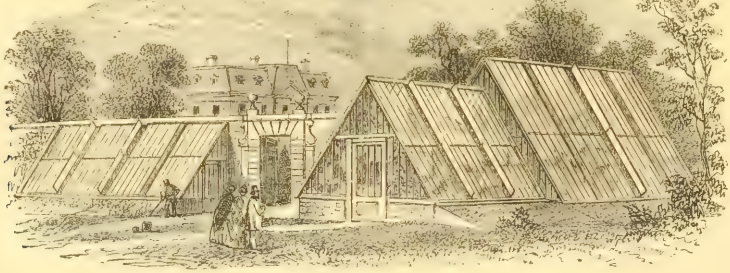

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Editorial Communications should be addressed to "The Editor;" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.
Printed by WILLIAM RICHARDS, at the Office of Messrs. BRADBURY, EVANS, & Co., Lombard Street, Precinct of Whitefriars, City of London, in the Co. of Middlesex, and Published by the said WILLIAM RICHARDS, at the Office, No. 41, Wellington Street Parish of St. Paul's, Covent Garden, in the said County.—SATURDAY, October 1, 1870.

THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 41.—1870.] SATURDAY, OCTOBER 8. { Registered at the General Post Office as a Newspaper. } Price Fivepence.

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NOTICE to SUBSCRIBERS.—On and after this date the SUBSCRIPTION to the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE will be £1 3s. 10d. for 12 months, including postage, instead of £1 4s. as heretofore.
May be had of all Booksellers.

Published by W. RICHARDS, 41, Wellington Street, Strand, W.C. October 1, 1870.

THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—Notice is hereby given, that an ADDITION to the LIST of PENSIONERS will be made in JANUARY NEXT. All Persons desirous of becoming Candidates are required to send in their applications, with their Certificates and Testimonials, to the Committee, on or before November 7, after which time they will not be received. Preference will be given to those applicants who have been subscribers for 15 years and upwards. Printed Forms may be had upon application By Order, F. R. CUTLER, Secretary.
14, Tavistock Row, W.C., October 6, 1870.

Veitch Memorial.

A GENERAL MEETING of SUBSCRIBERS to the VEITCH MEMORIAL will take place on FRIDAY, October 21, in the Council Room of the Royal Horticultural Society, South Kensington. The Chair will be taken at 3 P.M.
THOMAS MOORE, Hon. Secretary.

Fruit Trees.

PURCHASERS of FRUIT TREES are respectfully invited to inspect the Stock in the Waltham Cross Nurseries, adjoining Waltham Station, Great Eastern Railway, which the Proprietor believes to be unequalled in quality. Prices moderate. CATALOGUE free by post.
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Madresfield Court Black Muscat Vine.—£5 Prize.

MESSRS. J. AND C. LEE beg to remind their Friends that they have offered a PRIZE of FIVE POUNDS for the best THREE BUNCHES of the above GRAPE, to be awarded (if deserving) by the Fruit Committee of the Royal Horticultural Society, on November 2 next.
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SUTTONS' FLOWER ROOTS, for Open Ground Cultivation, carriage free.
Collections ... 10s. 6d. | £1 1s. | £2 2s.
For particulars see page 1340 of this week's *Gardeners' Chronicle*

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For particulars see page 1341 of this week's *Gardeners' Chronicle*
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CARTER'S BULBS and SEEDS, carriage free. See page 1340 of this week's *Gardeners' Chronicle*

CARTER'S COLLECTIONS of BULBS, for indoor and outdoor planting, 10s. 6d., 21s., 42s., 63s., and 84s., carriage and packing free. See page 1340 of this week's *Gardeners' Chronicle*.

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FRANCIS & ARTHUR DICKSON & SONS have received from the most celebrated growers in Holland their first large importation of the above, and have the satisfaction to say that the Bulbs are large, sound, and well ripened. Early orders respectfully solicited. Descriptive Priced CATALOGUE post free on application.
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ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL LIST of GARDEN and AGRICULTURAL SEEDS for the present season is now ready, and can be had upon application. Samples and stocks are very fine, and prices very low.

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SUTTON AND SONS, Reading Nurseries.

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MITCHELL'S renowned ROSES are NOW in FINE BLOOM. The largest stock and the best plants in England. Pitt Down Nurseries, Uckfield, Sussex.

Roses.

THOMAS S. WARE is offering extra fine Standard, Half-Standard, and Dwarf ROSES, by the hundred or thousand. Price on application.
Hale Farm Nursery, Tottenham, Middlesex, N.

ONE HUNDRED THOUSAND STANDARD and DWARF ROSES, superb plants. Descriptive CATALOGUES on application.
JOHN CRANSTON, Nurseries, King's Acre, Hereford.

Roses.

ONE HUNDRED THOUSAND STANDARD ROSES.
200,000 DWARF HYBRID PERPETUAL ROSES.
50,000 TEA-SCENTED ROSES.
A magnificent stock to select from. CATALOGUES on application.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Paul's Rose Catalogue.

"A very complete and able Catalogue."—*Floral World.*
CATALOGUE of ROSES is now ready, and will be forwarded post free on application. The stock of plants is large and excellent.
PAUL'S Nurseries, Waltham Cross, London, N.

Established 1785.

KING'S ACRE NURSERIES, NEAR HEREFORD.

JOHN CRANSTON, Proprietor.
The following Descriptive Priced CATALOGUES are now ready, and will be forwarded on application :—
The NEW ROSE CATALOGUE for 1870
The CONIFER, SHRUB, and FRUIT TREE CATALOGUE
The FOREST TREE CATALOGUE, including Plants for Coverts, Underwood, &c.

Twenty-one First and Ten Second Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and Ten Second Prizes for ROSES, exhibited at the principal Rose Shows throughout the kingdom. It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.
The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.
Nurseries, King's Acre, near Hereford.

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STANDARDS, very superior, selected, 18s. per dozen : £5 per 100
HALF STANDARDS, very superior, 12s. per doz. ; £4 10s. per 100.
DWARFS, on Manetti, strong, 8s. per dozen ; £2 10s. per 100
" " extra, very superior, selected, 12s. per doz. ; £4 per 100
Descriptive CATALOGUE of New and Choice Plants, Fruit Trees, &c., free upon application
Special prices for large quantities and to the Trade
Manor Nursery, Hall Lane, Bingham's, Essex.

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FRANCIS & ARTHUR DICKSON & SONS have an immense Stock of extra strong well grown plants of all the best ROSES in cultivation (including all the new varieties) for Autumn and spring planting. Also a large stock of strong Plants on poles, which can be planted out in autumn. Priced Descriptive CATALOGUE sent free by post. Their Roses are unusually fine this season. Inspection respectfully invited. Visitors will please ask for
FRANCIS & ARTHUR DICKSON & SONS, Upton Nurseries, Chester

Vines, Extra Strong Fruiting, &c.

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The "Upton" Nurseries, Chester.

Vines and Strawberries.

FRANCIS R. KINGHORN begs to offer very superior VINES, grown from Eyes, without bottom-heat, comprising all the leading sorts. Price 18s. per dozen, or £7 per 100.
STRAWBERRIES, strong, well matured plants, of all the best kinds, in crescent pots, rebedded, 5s. 6d. to 6s. per 100.
Sheen Nursery, Richmond, Surrey.

Strawberries.

CHARLES TURNER'S Descriptive LIST can be had on application. The following are particularly recommended :

BONNE ROUGE	FROGMORE LATE
DR HOGG	PINE
ECLIPSE	SIR J. RADCLYFFE
PRESIDENT	SIR C. HASTLER
SIR J. PAXTON	

Strong plants from the ground, or in small pots, at an extra charge, to insure a crop of fruit next season.
The Royal Nurseries, Slough.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that the above Apple will be SENT OUT in NOVEMBER next, in the same rotation as the orders are received. An illustration of it, and a description by Dr Hogg, is given in the "Florist and Pomologist" for October, 1870. The Doctor states it is "destined and worthy to take its place with the foremost fruits."
DWARF MAIDEN TREES, 7 feet high, TWARI TRAINED, 10s. 6d. A few extra fine specimens, 21s. each, carriage free.
Nurseries, Shipstone Street, Stourbridge, September, 1870.

LUCOMBE, PINCE, AND CO., Exeter Nursery, Exeter.
All kinds of ORNAMENTAL and USEFUL PLANTS.
FOREST TREES of every description.
Fine specimen plants of CONIFERÆ, all the choice kinds.
VINES, in pots.—Large stock of well ripened Canes of all leading varieties.
ROSES, in pots.—All the new sorts just out, and a careful selection from those of former years.
PEACHES, in pots; NECTARINES, APRICOTS, FIGS, and other FRUITS, selected for the Orchard-house.
STRAWBERRIES.—All the best sorts.
Priced LISTS on application.

Fruit Trees.

MAGNIFICENT Espaliered PEACHES, NECTARINES, APRICOTS, PLUMS, APPLES, PEARS, and CHERRIES
Standard-trained PLUMS, Fruiting Trees.
Dwarf-trained ESPALIER TREES—APPLES, PEARS, & PLUMS
Pyramidal PEARS, PLUMS, and CHERRIES

WM. WOOD AND SON'S Nurseries have long been celebrated for the growth and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application.
Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Winter Flowering Plants.

FREDERICK PERKINS has a fine healthy Stock of the undermentioned Plants, especially prepared for winter decorations, which he begs to offer at the undermentioned prices :—
AZALEAS, all the best varieties, with buds, 18s. to 24s. per dozen.
BOUVARDIAS, in 48-pots, full of buds, 18s. to 24s. per dozen.
CAMELLIAS, best varieties, with 10 to 20 buds, 60s. per dozen.
CYCLAMEN PERSICUM, mixed varieties, flowering bulbs, 6s. to 12s. per dozen.
CARNATIONS, TREE, with buds, 24s. per dozen.
DRACÆNA HERMINALIS, STRICTA, and COOPERII, from 30s. per dozen.
DEUTZIA GRACILIS, 12s. per dozen.
ERICAS, in six winter-flowering varieties, 18s. to 24s. per dozen.
ERICAS, best winter-flowering, 36s. per dozen
EUCHARIS AMAZONICA, 3s. 6d. each ; 30s. per dozen.
FUCHSIA AVALANCHE, 6s. per dozen each.
EPIPHYLLUM TRUNCATUM, in variety, 9-inch stems, 24s. to 30s. per dozen.
FERNS, good mixed Stove and Greenhouse varieties, 12s. to 18s. per dozen
GENISTA CANARIENSIS, 12s. per dozen.
GERANIUMS, Double, in 72 varieties, 18s. per dozen.
LANTANA MAWAI, Novelty, 2s. 6d. each ; 24s. per dozen.
LILY OF THE VALLEY, imported clumps, 18s. per dozen.
POINSETTIA PULCHERRIMA, 15s. per dozen.
PICOTEE PRINCE OF ORANGE, instead of yellow, like edge, flowering plants, 5s. to 10s. 6d. each.
PRIMULA SINENSIS in FIMBRIATA, 30s. per dozen.
" " " FLORE PLENO, 30s. per dozen.
" " " ROSEA, 30s. per dozen.
" " " ALBA, 30s. per dozen.
PRUNUS SINENSIS FLORE PLENO, one of the best winter plants, 18s. per dozen.
ROCHEA GRATISSIMA, 9s. per dozen.
ROSES, in 48-pots, full of buds, 18s. per dozen.
MARECHAL NIEL, 18s. per dozen.
SPIREA JAPONICA, imp. mixed clumps, 15s. per dozen
" PUMILA, Novelty, 2s. 6d. each ; 24s. per dozen.
All the above are well grown plants, ready for present sales, and have been specially grown for winter flowering. Small plants, in quantity, can be had of each variety, at the above prices, to suit Amateurs and small Growers.
F. P.'s Priced CATALOGUE of Hyacinths, Crocus, Tulips, and other Dutch Roots, Spring Bedding Plants, and Winter Flowering Plants, is now ready, and may be had free on application. Liberal Trade discount.
FRED PERKINS, Seed Warehouse, 51, Regent Street, Leamington

Araucaria imbricata.—Perfect Specimens,

WELL GROWN and very HANDSOME.
WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX.

WM. WOOD AND SON have a large Stock of the above. Price, per plant :—

2 feet	.. ..	£0 5 0	8 feet	.. ..	£2 2 0
5 feet	.. ..	1 1 0	10 feet	.. ..	3 3 0
6 feet	.. ..	1 11 6	Larger, up to 30 feet.		

Price on application.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following :—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 7 ft. | COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, thickly set with buds.

The above have recently been transplanted, are very bushy handsome plants, and quite safe. Price per dozen or hundred on application
Floral Nursery, Hailsham, Sussex.

Planting Season.

WM. KNIGHT, Floral Nursery, Hailsham, Sussex, begs to call the attention of the Nobility and Gentry and Trade in general to his extensive and matchless stock, consisting of an immense quantity of Standard and Dwarf and Pyramidal Trained APRICOTS, PEACHES, NECTARINES, CHERRIES, PEARS, PLUMS, and APPLES, also Standard, Dwarf, and Pot ROSES, CONIFERÆ, RHODODENDRONS, EVERGREENS, ORNAMENTAL and FOREST TREES, and respectfully solicits inspection of all intending Planters. Descriptive Priced CATALOGUES free.
The Nurseries are within five minutes' walk of the Hailsham Station, Brighton and South-Coast Railway.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite ; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety ; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties ; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded.
The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.
The Royal Horticultural Society, Kensington, First-class Certificate, May 24, 1870.
The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.
The Brighton Horticultural Show, First-class Certificate, June 28, 1870.
The above will be sent out in October, at 2s. 6d. per packet, and may be had also from the retail trade of JAMES DICKSON, Nurserymen and Seedsmen to Her Majesty, at 9 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint ; and of the following Agents :—

ENGLAND.
Messrs. James Carter & Co., 237 and 238, High Holborn.
" Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
Mr. George Tredgett, Cambridge.
Messrs. Wood & Ingram, Huntingdon
Mr. L. S. Woodthorpe, Side Hedingham, Essex.
Messrs. J. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
Mr. G. Heasman, Fareham.
" Bradley, Ripon, Yorkshire
Messrs. A. Henderson & Son, London.
" Sutton & Son, Reading.
" Jas. Veitch & Sons, Kings Road, Chelsea.
Mr. W. Knight, Hailsham, Sussex
" Lunaby, Brighton, Seaford Eastern Railway Station.
" A. Peed, Lewes.
" E. Holmes, Whittington Nursery, near Lichfield.
Messrs. S. Nairn & Sons, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
Mr. W. Bull, King's Road, Chelsea.
Messrs. Butler, McCulloch & Co., Covent Garden, London.
Mr. E. Taylor, Malton, Yorkshire.
Messrs. Cuthbush & Co., Barnet, Hertfordshire.
Mr. B. S. Williams, Upper Holloway, London
" T. Cowing, Derby.
" James Wood, Newport, Isle of Wight
Messrs. F. Lawson & Son, 24, Bridge Row, London
" Rutley & Silverlock, London.

SCOTLAND.
Messrs. Downie, Laird & Laing, Aberdeen.
" P. Lawson & Son, Edinburgh.
" Dickson & Sons, Leith.
" W. Drummond & Sons, Stirling.

IRELAND.
Messrs. W. Drummond & Sons, 68, Dawson Street, Dublin

BELGIUM.
Mons. Louis Van Houtte, Ghent.

PRUSSIA.
Messrs. Platz & Son, Erfurt.

AMERICA.
Messrs. B. K. Bliss & Sons, New York.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE, for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c. ; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c. ; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.
Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

To the Trade.

ADIANTUM CUNEATUM, ASPLENIUM LUCIFERUM, ASPLENIUM VIRIDISSIMUM, a dwarf form of bulbiferum, of neat and compact habit, very suitable for Wardian cases. BLECHNUM LLEMITIS, a rare and interesting Bromeliaceous plant with serrated leaves.
DRAYMOND BROTHERS, Seedsmen, Nurserymen, and Florists, 52, George Street, Edinburgh.

Magnificent Trees for Avenue Planting.

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX.
WM. WOOD AND SON have to offer a splendid stock of the following remarkably well-grown Trees :—
ROBINIA PSEUD-ACACIA, 6 and 8 feet.
ASH, WEEPING, extra fine, 7 to 6 feet stems.
CYCLAMEN SYRINGÆFOLIA, 8 to 10 feet.
ULMUS GLANDULOSA, 6 feet.
ELMS, extra fine, consisting of American, English, Cornish, and other varieties, 6 to 8 feet, 8 to 10 feet, and 10 to 12 feet.
LARCH, 6 to 8 feet.
HORSE CHESTNUTS, Common and Scarlet, extra fine plants, 7 to 8 feet, 8 to 10 feet, 10 to 12 feet, very fine specimens.
AMERICAN WEEPING WILLOWS, 7 to 8 feet.
CATALOGUES gratis on application

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at very moderate prices, in order to clear the land for building purposes.
Among the Evergreens are many thousands of fine specimens of variegated and bronzed-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees generally cultivated in Britain, many of which are of large size, well adapted for giving immediate effect
To gentlemen wishing to make New and to improve Old Pleasure Grounds, this is an opportunity not often offered, such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.
Nursery and Seed Stores—Walton on the-Hill.
Seed Warehouse—15, Queen Square.
Liverpool, September, 1870

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The Public are cordially invited to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are cordially invited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON and SONS, "Newton" Nurseries, Chester.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870.

THE ROYAL BERKSHIRE ROOT SHOW, to open in all Root-growers in the United Kingdom, will be held on SATURDAY, November 26, when SILVER CUPS and other PRIZES to the Value of FIFTY POUNDS will be awarded for the best specimens of MANGEL, SWEDES, TURNIPS, KOHL RABI, &c. Full particulars apply to
SUTTON AND SONS, Seed Growers, Reading, Berks.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano ; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"8 January, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES AND CO'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

NEW BEDDING VIOLET.

E. G. HENDERSON & SON

RESPECTFULLY OFFER

VIOLA "IMPERIAL BLUE PERFECTION."

Of the various kinds tried in groups and beds during the present trying season, the "IMPERIAL BLUE PERFECTION" has proved itself the most vigorous and the most prolific in bloom, retaining its fine glossy verdure, free from spider, and keeping a dwarf and compact healthy growth throughout the most sultry weather. It forms an invaluable bed throughout the spring, early summer, and late autumn months. In colour and effect it far surpasses the V. cornuta Perfection—a companion bed of this last-named variety having proved a complete failure. The intense upper Tyrian purple and rich cœrulean-blue under-petals are much finer for effective contrasts with the white and golden yellow of the same group than any of the slate or mauve-blue in other varieties yet offered. As a centre group, the "IMPERIAL BLUE PERFECTION" is in admirable keeping and effect when surrounded with a well-proportioned belt of the elegant pearl-white tint of Achyrocline Sandersoni or the pure silvery sheen of Gnaphalium tomentosum. This fine variety is adapted to all ordinary garden soils ; its continuous growth yielding a succession of bloom until the latest season of display in the flower garden.

9s. dozen ; 50 Plants, 28s. ; 100 Plants, 50s.

☞ For Notices of the New Plants, PLEROMA MACRANTHA FLORIBUNDA, brilliant spring-flowering PRINCE of PELARGONIUMS, and THYMUS CITRIODORUS AUREA (the Golden Thyme), see *Gardeners' Chronicle*, October 1, p. 1308.

THE NEW AUTUMN BULB CATALOGUE,

In circulation, will be forwarded free on application. It includes an extensive Herbaceous and Alpine Plant List of between 2000 and 3000 species, also selections of tuberous and bulbous rooted species, including the finest Gesneria, Achimenes, Gloxinias, Caladiums, Cyclamens, Delphiniums, Aquatic and Marsh Plants, Shrubs for Rockwork, Spring-flowering Bedding Plants, Hardy Climbers, Roses, &c., &c.

WELLINGTON NURSERY, ST. JOHN'S WOOD, LONDON, N.W.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s 6d; ½ cwt., 21s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, for Dressing Pasture Lands
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, etc Dock or Warehouse
116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.

All other MANURES and CAKES as per Price List, supplied on the lowest terms.

Apply for prices, &c., to JOHN BENNET LAWES, 59, Mark Lane, London, E.C., Dublin, Shrewsbury, and Cardiff.

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited)
Chief Offices—109, Fenchurch Street, London, E.C.
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Chairman—John Clayden, Littlebury, Essex.
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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz.:
"THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 50,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
Price-Lists will be forwarded on application to the Secretary, or may be had of the local Agents.
C. T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

Red Spider. Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 2s., and 10s. 6d.

Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea, London, S.W.

GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1s. per lb.; 8½ per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 1os. per gallon
SILVER SAND, of the finest quality, for Horticultural purposes, at 20s. per ton; small casks, 2s. 6d. per cwt.
WM. RUSHWORTH, Seed Merchant and Nurseryman, Leeds.

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 5s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

MOULE'S PATENT EARTH SYSTEM.

From Mr W. GILBERT,
Leonford Street, Rugby.

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by leaving by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees on a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT
"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

CONSERVATORY BASKETS.

Strained Wire Espalier Frames for all Kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rockeries, Aviaries, Summer Houses, &c.; Wire Work Vase Baskets, with Stem and Prongs, for placing in any position, on the lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Minton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

R. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Portobello Terrace, Notting Hill Gate, London, W.
Illustrated Catalogues of the above on application.

GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN-MOWING, ROLLING, and COLLECTING MACHINES, 1869.

GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when too coarse to become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any unexperienced person, owing to the peculiar adaptation of the Machines, which no possessor has ever failed

HAND MACHINE.

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition

Each Machine is warranted to give entire satisfaction, and if not approved can be returned at once with all any cost whatever to the Purchaser.

Illustrated Price Lists of Greens' Patent Rollers, Hot-water Boilers, Galvanised Wire Netting, Garden seats and Chairs, Fountains, Vases, &c., free on application

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; 63 and 65, Blackfriars Road, London, S.E.

Horticultural and Window Glass Warehouses.

JAMES MILES, 6, High Street, and 12 and 13, Dawson Street, Shoreditch, London, E.
CONSERVATORY and other HARDWOOD GLASS.
Genuine White Lead, Oils, Colours, Brushes, &c.
GARDEN ENGINES, PUMPS, SYRINGES, INDIA RUBBER HOSE, TAPS, CONNECTIONS, &c.
Prices upon application.

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

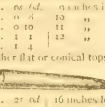

Each	s.	d.		Each	s.	d.
2 inches in diameter	.. 0	3½	12 inches in diameter	..	1	0
3 ,, ,,	.. 0	4½	13 ,, ,,	..	1	6
4 ,, ,,	.. 0	5½	14 ,, ,,	..	2	6
5 ,, ,,	.. 0	6½	15 ,, ,,	..	3	0
6 ,, ,,	.. 0	8½	16 ,, ,,	..	3	6
7 ,, ,,	.. 0	10½	17 ,, ,,	..	4	0
8 ,, ,,	.. 1	0	18 ,, ,,	..	5	0
9 ,, ,,	.. 1	2	19 ,, ,,	..	6	0
10 ,, ,,	.. 1	5	20 ,, ,,	..	7	0
11 ,, ,,	.. 1	6				

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter	..	0s.	6d.	9 inches in diameter	..	1s.	8d.
5 ,, ,,	..	0	8	10 ,, ,,	..	2	0
6 ,, ,,	..	0	10	11 ,, ,,	..	2	6
7 ,, ,,	..	1	1	12 ,, ,,	..	3	0
8 ,, ,,	..	1	4				

Table flat or conical tops.

CUCUMBER GLASSES.

24 inches long	..	..	2s. 6d.	16 inches long	..	..	1s. 4d.
22 ,,	..	..	1 10	14 ,,	..	..	1 2
20 ,,	..	..	1 8	12 ,,	..	..	2 0
18 ,,	..	..	1 0				

HAND GLASSES, WITH OPEN TOPS.

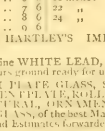

Each	s.	d.		Each	s.	d.
12 inches	..	..	6 6	20 inches	..	..	10 6
14 ,,	..	..	7 6	22 ,,	..	..	11 6
16 ,,	..	..	8 6	24 ,,	..	..	12 6
18 ,,	..	..	9 6				

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use

SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH and FOREIGN, PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to

JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

Kosher's Garden Edging Tiles

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down require no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F. & G. KOSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection

WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability. Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. KOSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—Sifted, 15s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of Stamp.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. KOSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

JONES'S PATENT DOUBLE L SADDLE BOILER.

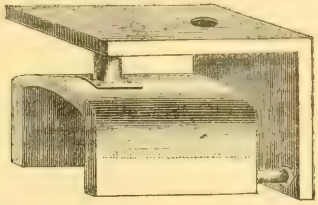

These Boilers possess all the advantages of the old Saddle Boiler, with the following improvements, viz.:—The water-space at back and over top of Saddle increases the heating surface to such an extent that a Patent Double L Saddle Boiler will do about twice the amount of work with the same quantity of fuel; the cost of setting is also considerably reduced, and likewise the space occupied; at the same time these Boilers are simple in construction, and being made of wrought-iron are not liable to crack.

They are made of the following Sizes:—

Sizes.			To Heat (of 4-inch Pipe).	Prices.		
High.	Wide	Long	Feet.	£	s.	d.
20 inches	18 inches	18 inches	300	5	0	0
20 ,,	18 ,,	24 ,,	450	6	0	0
20 ,,	18 ,,	30 ,,	600	7	0	0
24 ,,	24 ,,	24 ,,	700	8	0	0
24 ,,	24 ,,	30 ,,	850	10	0	0
24 ,,	24 ,,	30 ,,	1,000	12	0	0
24 ,,	24 ,,	48 ,,	1,400	15	0	0
28 ,,	28 ,,	60 ,,	1,900	20	0	0
30 ,,	30 ,,	72 ,,	2,600	30	0	0
36 ,,	30 ,,	96 ,,	3,500	50	0	0
48 ,,	48 ,,	108 ,,	7,000	75	0	0
48 ,,	48 ,,	144 ,,	10,000	100	0	0

And are kept in Stock, and Sold only by the Inventors and Patentees,

J. JONES AND SONS, IRON MERCHANTS, 6, BANKSIDE, SOUTHWARK, LONDON.

Dutch Flower Roots.

DOWNIE, LAIRD, AND LAING, have now received their second importation of FLOWER ROOTS, consisting of—

HYACINTHS,	IONQUILS,
POLYANTHUS NARCISSUS,	RANUNCULUS,
DOUBLE NARCISSUS,	ANEMONES,
CROCUS,	SNOWDROPS,
TULIPS,	&c.,

who have all been carefully selected from the most celebrated Establishments in Holland.

The Bulbs have arrived in splendid condition, being unusually well ripened, very large, and exceedingly heavy.

D., L. & Co. can supply fine Bulbs of the PRIZE HYACINTHS at Kensington, Regent's Park, Crystal Palace, and Royal Caledonian Society's Shows on 12s., 18s., and 24s. per dozen.

Descriptive CATALOGUES of DUTCH BULBS forwarded post free

Stansfield Park Nurseries, Forest Hill, S.E.; and Edinburgh, N.B.

Dutch Flower Roots.

CROYDON. A. HENDERSON. EAST SURREY SEED WAREHOUSE. ESTABLISHED 1820.

ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers.

DESCRIPTIVE and PRICED CATALOGUES are now ready, containing pra tical directions for their successful cultivation on all the various systems now adopted.

Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application

Sion Nursery, Thornton Heath Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

Spring Flowering Bulbs.

BUTLER, McCULLOCH, AND CO.'S COLLECTION of CHOICE ROOTS for Greenhouse or Flower Garden Decoration, sent carriage paid. No charge for packages

FOR CONSERVATORY

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
105s.	52s.	25s.	21s.	15s.	10s. 6d.

FOR FLOWER GARDEN

No. 7	No. 8	No. 9	No. 10	No. 11	No. 12
100s.	60s.	40s.	25s.	21s.	10s. 6d.

FOR GREENHOUSE and FLOWER GARDEN

No. 13	No. 14	No. 15	No. 16	No. 17	No. 18
105s.	52s. 6d.	42s.	21s.	15s.	10s. 6d.

CATALOGUE, containing details, post free

5 per cent. allowed for cash.

BUTLER, McCULLOCH, AND CO., 25, South Row, Covent Garden, London, W.C. Established upwards of a century.

Dutch Flowering Bulbs and Autumn Seeds.

WILLIAM SKIRVING announces the arrival of his Annual Importation of FLOWERING BULBS, comprising Hyacinths, Tulips, Crocus, Anemones, Ranunculus, Narcissus, &c., all carefully selected, CATALOGUES of which have been had free on application.

AGRICULTURAL SEEDS for PRESENT SOWING.

Best sorts of WHEAT, grown on his own farms; WINTER VETCHES, RYE, and all descriptions of GRASS SEEDS for Laying Down Permanent Pasture, or for One or Two Years' Mowing for Green Food.

Early orders are respectfully solicited, and can be executed either at the Seed Warehouse, Queen Square; or at his Nursery and Seed Establishme nt, Wide-o'-the-Hill.

Queen Square, Liverpool, Sept. 1870.

Succulents—Surplus Stock.

THOMAS S. WARE begs to offer as follows. Prices, low, on application

Echeveria atropurpurea	Cotyledon repens
" metallica, specimen.	Sempervivum barbatum.
" glauca	" leucoconum
" pumila or gracilis.	" Haworthii
" secunda	" glaucum
" " glauca	" " variegatum
" " intermedia (true	Sedum Telephium

form, larger than the above)

T. S. W. has also large collections of CRASSULA CONS, CRASSULA LYCOPODIOIDES, CRASSULA PERFOLIATA, ECHEVERIA SETOSA, PACHYPHYTUMS, SEDUMS, ALOES, AGAVES, HAWORTHIA, &c.

Hale Farm Nurseries, Tottenham, Middlesex

B. S. WILLIAMS'

NEW and CHOICE FLOWER SEEDS,

Post Free

	Per packet —s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggens' Prize strain	1s. 6d., 2s. 6d., and 3 6
ECHEVERIA METALLICA, new bedding plant	2 6
Williams' New Hybrid SOLANUMS	2s. 6d. and 3 6
PYRETHRUM (Golden Feather)	1s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian Varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
EAST LOTHIAN STOCKS, per collection of three colours	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
" VAR. PERFECTION	1s. 6d., 2s. 6d., and 3 6
WALLFLOWER, Saunders' fine dark variety	1 0

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Violets and other Spring-flowering Plants.

LEWIS WOODTHORPE offers the following, now being the best time to plant, to insure a good show in the spring:

VIOLA ODORATA PENDULA, the true Weeping Violet of New York.—The largest Violet in cultivation, flowers of enormous size, very double, beautiful pale mauve-blue, with large white centre, very sweetly scented, and free flowering, 1s. 6d. each; 12s. per doz.

VIOLETS.—The King, the Queen, the Double Red, Double White, Compacta, the Czar (the largest Single), 4s. per dozen.

The Double White Tree and Double Blue Tree VIOLET, 2s. each.

HEPATICAS.—The Double Red and Single Blue, 4s. per dozen.

AURICULAS, ALPINES.—An exceedingly fine strain, 4s. and 6s. per dozen.

PRIMULA CORTUSOIDES.—A pretty pink, and free flowering, 4s. per dozen.

DAISY AUCUBÆFOLIA.—The golden blotched, very pretty, 4s. per dozen.

DAISIES, in 6 choice named varieties, 4s. per dozen

POLYANTHUS.—The best strain that can be had, 2s. 6d. per dozen.

HELIANTHEMUM, the Dwarf Rock Cistus, in 20 named varieties, 4s. per dozen.

100 choice named HERBACEOUS, ROCK, and ALPINE PLANTS, two of a sort, in pots, 20s. per 100.

A CATALOGUE of New and Choice Plants, Spring-flowering Plants, Roses, Fruit Trees, with a general and well-grown Nursery Stock, sent free upon application

Munro Nursery, Sible Hedingham, Essex.

"The Royal Seedsmen."

CARTER'S

SEEDS, BULBS, &c., CARRIAGE FREE.

*** *Five per cent. discount allowed for cash payments.*

COLLECTIONS OF BULBS

FOR INDOOR PLANTING.

COLLECTION No. 1, complete, price 84s.

COLLECTION No. 2, reduced quantities, price 63s.

COLLECTION No. 3, reduced quantities, price 42s.

COLLECTION No. 4, price 21s., comprises—

Hyacinths, 12 in 12 extra fine named sorts	Tulips, Tournesol, 6
Polyanthus Narcissus, 6 in 6 varieties	" Rex rubrorum, 3
Jonquils, sweet scented, 12	" La Candeur, 3
Crocus, finest named, 50	" Royal Standard, 3
Dutch Iris, splendid, 12	" Yellow Prince, 6
Lilium speciosum, 1	" Rosa Mundi, 3
Scilla sibirica, 6	" Duc Van Thol, 6
Snowdrops, extra large selected, 24	Amaryllis formosissimus, 1
	Ixias, finest mixed, 6
	Sparaxis, finest mixed, 6
	Tritelcia uniflora, 6

COLLECTION No. 5, reduced quantities, price 10s. 6d. Packing and carriage free.

COLLECTIONS OF BULBS

FOR INDOOR AND OUTDOOR PLANTING.

COLLECTION No. 6, complete, price 84s.

COLLECTION No. 7, reduced quantities, price 63s.

COLLECTION No. 8, reduced quantities, price 42s.

COLLECTION No. 9, price 30s., comprises—

Hyacinths, 12 in 12 extra fine named sorts for pots or glasses	Scilla Belgica, mixed, 12
" 12 in 12 do. do. for bedding	Crocus, blue, 75
Narcissus, double, white, 12	" striped, 75
" Poet's or Pheasant's eye, 12	" large yellow, 25
Tulips, extra fine mixed, 36	" white, 25
" Tournesol, 6	Anemones, extra fine mixed, 36
" Duc Van Thol, 6	Gladiolus Brenchleyensis, 6
" Royal Standard, 3	Iris, extra choice mixed English, 12
" La Candeur, 3	" extra fine mixed Spanish, 12
" Yellow Princes, 3	Jonquils, Campernelle, 12
" Rex rubrorum, 3	Ranunculus, extra fine mixed, 36
Double Daffodils, 12	Snowdrops, 50
Star of Bethlehem, 12	

COLLECTION No. 10, reduced quantities, price 15s. Packing and carriage free.

COLLECTIONS OF BULBS

FOR OUTDOOR PLANTING ONLY.

COLLECTION No. 11, complete, price 84s.

COLLECTION No. 12, reduced quantities, price 63s.

COLLECTION No. 13, reduced quantities, price 42s.

COLLECTION No. 14, price 21s., comprises—

Hyacinths, 12 in 12 fine colours	Crocus, blue, 25
Narcissus, double white, 12	" striped, 50
" Poet's or Pheasant's eye, 12	" large yellow, 50
Double Daffodils, 12	" white, 25
Tulips, extra fine mixed, double, 12	Anemone, extra fine mixed, 24
" extra fine mixed, single, 12	Gladiolus Brenchleyensis, 6
" extra fine mixed, late, 12	Iris, extra choice mixed English, 12
" Duc Van Thol, 12	" extra fine mixed Spanish, 12
Polyanthus Narcissus, fine mixed, 6	Lilium candidum, 3
Jonquils, 6	Ranunculus, extra fine mixed, 24
Campernelle Jonquils, 6	Snowdrops, 50
Star of Bethlehem, 12	Winter Aconites, 24
Triteleia uniflora, 6	
Tulips, tooth Violets, 6	

COLLECTION No. 15, reduced quantities, price 10s. 6d. Packing and carriage free.

JAMES CARTER & CO.'S CATALOGUE

OF HYACINTHS, TULIPS, CROCUS AND OTHER BULBS, ROSES, FRUIT TREES, &c.,

Containing full particulars of the above Collections will be forwarded Gratis and Post Free on application.

CARTER'S COLLECTIONS of HYACINTHS.

For the convenience of those Customers who do not wish the trouble of selecting for themselves, is offered the undermentioned Collections of Hyacinths, *the selection of which being left to their judgment and experience,* will be found perfectly adapted for those purposes.

A	12 good varieties Double Hyacinths, for pots, 7s. 6d.	
B	12 " "	Single Hyacinths, for pots, 7s. 6d.
C	12 " "	Double Hyacinths, for glasses, 7s. 6d.
D	12 " "	Single Hyacinths, for glasses, 8s. 6d.
E	12 very fine varieties Double Hyacinths, for pots, 10s. 6d.	
F	12 " "	Single Hyacinths, for pots, 10s. 6d.
G	12 " "	Double Hyacinths, for glasses, 10s. 6d.
H	12 " "	Single Hyacinths, for glasses, 10s. 6d.
I.	12 best varieties Double Hyacinths, for pots, 12s	
K	12 " "	Single Hyacinths, for pots, 12s
L	12 " "	Double Hyacinths, for glasses, 12s.
M.	12 " "	Single Hyacinths, for glasses, 12s
N.	100 Hyacinths, in 100 best varieties, £6 6s.	
O.	100 Hyacinths, in 50 best varieties, £4 4s.	
P	50 Hyacinths, in 50 very fine varieties, £2 10s.	
Q.	50 Hyacinths, in 25 very fine varieties, £1 17s. 6d.	

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

DUTCH FLOWER ROOTS

CARRIAGE FREE.

SUTTONS'

IMPORTED FLOWER ROOTS.

SUTTON & SONS,

SEEDSMEN TO THE QUEEN,

READING, BERKS,

HAVING RECEIVED their FIRST CONSIGNMENT of

CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

SUTTONS' SUPERB DUTCH HYACINTHS

For CULTIVATION in POTS or GLASSES.

The best 12 Hyacinths for 12s.

Messrs. SUTTONS' Collection of Hyacinths consists of more than 200 varieties, a Priced and Descriptive LIST of which may be had on application.

Suttons' Collections of Named Hyacinths.

100 HYACINTHS in 100 very choice sorts	..	£4 4 0
100 " 50 very choice sorts	..	3 10 0
50 " 50 very choice sorts	..	2 2 0
50 " 25 very choice sorts	..	1 15 0
25 " 25 very choice sorts	..	1 1 0
12 " 12 very fine sorts	..	0 12 0
12 " 12 choice sorts	..	0 9 0
12 " 12 good sorts	..	0 6 0

The order should specify whether they are intended to be grown in water or earth, as all kinds are not equally suited to both purposes. It should also be stated whether single or double blossomed kinds are preferred; otherwise we usually supply about two-thirds double, and one-third single. The single varieties generally thrive best in water, but their merits are never apparent until the flowers are fully expanded.

SUTTONS' MIXED HYACINTHS, for Beds or Open Borders.—Double, Single, and various colours, 2s. 6d. per dozen, 18s. per 100

SUTTONS' HYACINTHS, in distinct colours for Massing, Bedding, Ribbon Gardening, &c.—Double and Single, various shades, separate, 4s. per dozen, 30s. per 100.

SUTTONS'

COLLECTIONS of FLOWER ROOTS.

Suttons' £1 1s. Collection, for Open Ground, Carriage Free, contains—

12 fine mixed Border Hyacinths	6 fine mixed Gladiolus
6 " Polyanthus Narcissus	12 Duc Van Thol Tulips
12 Pheasant's-eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 " Parrot Tulips
6 large Campernelle Jonquils	100 Gesneriana Tulips
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 Scarlet Turban Ranunculus	6 " English Iris
12 fine mixed Double Anemones	6 " Spanish Iris
12 " Single Anemones	3 Lilies, of sorts
150 Crocus, 3 sorts	3 Petraria Pavonia
50 Snowdrops	6 Dogstooth Violets
25 Winter Aconites	3 Crown Imperials

Suttons' £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, by name	3 Peacock Iris
6 Miniature Hyacinths, by name	50 fine Crocus, by name
6 Polyanthus Narcissus, do.	6 choice Ixias,
6 Single Sweet Jonquils	3 choice Sparaxis
6 Scilla peruviana	3 choice Tritelia
6 Single Duc Van Thol Tulips	1 Tropæolum tricolor
6 Double Tournesol Tulips	1 Lilium lancifolium album
25 Early Tulips, 5 sorts	1 " " rubrum
3 Persian Iris	

SUTTONS' COLLECTIONS of TULIPS.

Early Varieties	s. d.	Large Double Tulips.	s. d.
100 in 10 choice varieties	5 0	100 in 10 choice sorts	17 6
50 " 5 "	3 0	50 " 10 "	10 0
25 " 5 "	2 0	25 " 5 "	5 0
12 " 4 "	1 0	12 " 4 "	2 6

For Descriptive List of 100 choice kinds, see Suttons' Autumn Catalogue.

SUTTONS' COLLECTIONS of CROCUS.

For Open Ground.	s. d.	New Crocus, for Pots.	s. d.
1000 in 10 varieties	18 6		
500 " "	10 0	1000 in 25 named sorts	35 0
250 " 5 "	5 0	500 " 25 " "	18 0
100 " 5 "	2 3	250 " 25 " "	9 0
100 large blue	1 9	100 " 25 " "	4 0
100 " purple	3 0	50 " 25 " "	2 0
100 " white	3 0	25 " 5 " "	1 0
100 " yellow	1 9	12 " 3 " "	0

For further particulars, with complete Cultural Instructions, see

SUTTONS'

AUTUMN CATALOGUE FOR 1870,

Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

☞ *Five per cent. allowed for cash payments.*

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

VARIEGATED PELARGONIUMS.

Sir Robert Napier	Mabel Morris	Dragon
Sunbeam	Mrs. John Clutton	St. John's Wood Star
Florence	Italian Beauty	Prima Donna
Mrs. Dix	Prince Silverwings	Yellow Christine

The 12, in strong plants, for 21s., package included. Remittances requested from unknown Correspondents.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

VARIEGATED and other GERANIUMS.
TRICOLOR GERANIUMS, 3s to 6s per dozen
GOLD and BRONZE, 2s. 6d to 5s. per dozen.
BEDDERS, 2s. 6d to 4s. per dozen.
ZONAL and NOSEGAY, 2s. to 4s. per dozen.
NEW ZONALS of 1870, 12s. per dozen.
All strong plants, in 3-inch pots, package free.
A Priced LIST of the new and leading sorts of the present season post free on application to
WM. POTTEN, Florist, Sissinghurst, Staplehurst, Kent.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash:—
GOLDEN TRICOLORS.—Lady Cullum, 3s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s. 6d. SILVER TRICOLORS.—Caroline Longsdell, 6s.; Italia Unita, 2s. 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; E. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Painted Lady, 5s.; Princess of Teck, 4s.; Shrubland Beauty, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeaux, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of other varieties post free on application.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

NEW AND CHOICE TRICOLOR PELARGONIUMS.—Terms Cash

	Each—s. d.		Each—s. d.
Mrs. Headley	7 6	Cannell (Smith's)	7 6
Sir R. Napier	7 6	Flamingo (Smith's)	7 6
Victoria Regina	2 6	Countess of Ashburnham	5 0
Achievement (Turner's)	7 6	Mrs. Dunnett (Turner's)	7 6
.. (Smith's) ..	5 0	Mrs. Burbidge (Smith's)	5 0

New ZONAL PELARGONIUMS of 1870, including Coleshill, Stanstead Rival, Sedd, Harry George, Claudus, Sunshine, Lady Hawley, &c., 1s. 6d. each, 12s. per dozen.
New Tricolor, Gem of the Season, 2s. 6d.; Lady Edith, 1s. 6d.; Alice Lee, 1s. 6d.; Wallsu, 1s. each.
J. ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants.

GOLD and BRONZE PELARGONIUM (1870), "MRS. JOHN LEE."—This beautiful bedding Pelargonium has fine circular leaves, smooth, and of great substance; rich golden ground with broad crimson bronze zone; the colours are bright and durable. A plant lifted from the open ground was awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society, on September 21. Plants now ready, price 7s. 6d. each. The usual discount to the Trade, and 4 sent for 3 ordered
JOHN AND CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

The Gardeners' Chronicle

SATURDAY, OCTOBER 8, 1870.

THE promoters and well-wishers of the FUNGUS SHOW at the Royal Horticultural Society on Wednesday last must have been well pleased at the large attendance and great interest manifested in the display. The Fungi exhibited were not so numerous as on former occasions, a circumstance that may in part be accounted for by the circumstance that the dry season we have lately experienced has not been favourable to the development of these plants, though the common Mushroom near London has been very abundant; and in part to the circumstance that the Fungus foray and feast was held on the day following at Hereford. Of this meeting we hope to give some account in our next issue.

Some details relating to the exhibition at Kensington will be found in another column, but here we may advert to the abominably slovenly way in which these curious plants are shown. Mr. ENGLISH'S collection formed a marked exception, and was set up with much taste. Mr. SMITH'S collection was enlivened by the facetious labels by which species of botanical, culinary, or poisonous interest were designated. No attempt was made on this occasion, as was done last year, to put any of the edible species to a practical test, probably owing to the absence of a *chef* qualified to do justice to the savory morsels. One of the best of the edible species, and the safest of all because the most readily recognised, the Giant Puff Ball, Lycoperdon giganteum, which has a particularly delicate flavour, was not shown. Several of the most approved kinds, however, were exhibited, as will be seen from our report. Mycologists tell us, and we implicitly believe them, that tons of valuable Fungi waste their nutritious qualities in the untrodden woods from want of sufficient knowledge on the part of those to whom a substantial meal of any kind would be a boon. No doubt this is much to be lamented, but we must own ourselves sceptical as to any alteration in this state of things being effected till gardeners have found out what to cultivate and how to grow them. We appreciate the delicacy of the Giant Puff Ball, we relish the Vegetable Beefsteak, we delight in Champignons, Morels (when we can get them), Truffles, and some others; but we have no faith in their ever being anything but casual delicacies, very good on emergencies, but useless, so far as food is concerned, till they can be brought as much under the dominion of the gardener's art as the common Mushroom is. Another circumstance, which in our opinion must tend to render the really good species unappreciated, is the extravagant terms in which the enthusiasts speak of their pets. *Patés de foie gras*, Ortolans, the choicest *crus* of Burgundy or Bordeaux, or the most luscious Peaches are not described by *connoisseurs* in more glowing terms than are certain of the edible Fungi. Now this, to our thinking, is mistaken zeal, calculated to hinder rather than promote the cause. Other circumstances that tell against the adoption of these plants as articles of diet are the capriciousness and uncertainty of their production, the fact that species wonderfully like each other, at least to unlearned eyes—and cooks are not likely to be over discriminative in such matters—are, some poisonous, others edible, nay, even the same species is considered poisonous by some while it is freely partaken of by others without ill-effects. Some illustrations of this occurred at Kensington: Agaricus melleus was placed in the edible section by some of the exhibitors, in the poisonous series by others. In such a case we should adopt Mr. BERKELEY'S ruling, and keep clear of acquaintances of such uncertain tempers. Boletus luridus, too, was shown among the poisonous kinds, yet we are assured by a valued correspondent that he eats it as freely as he would the very closely allied B. edulis; and Mr. BERKELEY alluded to the case of a gentleman, well-known in geological circles, who partook of Boleti of all and any kind he could get, without ill consequences. We think the inference to be drawn from all this is, not to eat any kind of whose properties we are ignorant, and not to experiment, except in the most tentative manner, on unknown species. First catch your hare; next be sure it is a hare; then eat it, if you are further sure it won't disagree with you. In any case such exhibitions as those at Kensington and Hereford cannot fail to be of much service; and now that the authorities of the Royal Horticultural Society have practical proof of the great interest shown in the subject by the public, we hope they will, in their own interest as well as that of their visitors, take pains in future to secure a more satisfactory display of the objects brought for exhibition, and specially encourage experiments, with a view to bringing these guerilla food-stuffs under the orderly management of the food-producers, the gardeners.

THE following communication, from our esteemed correspondent, I. O. W., will be read with interest at this juncture:—

SMOTHER FLIES, CHOLERA FLIES, WINGED APHIDES.—The swarms of flies with which we are now tormented—flying into our mouths, flying and settling upon every thing,—are the last autumnal and winged brood of the aphides, chiefly of the Cabbage and Turnip crops. The suddenness of their appearance in the winged state is no new phenomenon. Several weeks ago complaints were made to us of black grubs which were found by thousands at the bottom of the stems of vegetables, which proved to be larvæ of lady-birds or Coccinellæ which had been feeding upon the plant lice which had already attacked the plants in vast quantities. The wonder at the present time is the immense number of the winged flies, but this is easily explained, first by the long-continued dry and hot weather, and secondly by the prevailing east wind, which although not of itself producing the flight of flies, has evidently a peculiar atmospheric effect in promoting their extra-development. The singular but well-known history of the aphides is sufficient to account for even a more extensive visitation of these creatures. The males are only produced in the autumn. They are winged, as is also the case with the brood of females simultaneously produced. After a single pairing the female commences to lay eggs, and in the following spring to bring forth living young. These wingless young, without further impregnation, also bring forth wingless progeny; and this state of things goes on through the spring, summer, and early autumn months, until males are again produced, to repeat the cycle of existence. Now it has been ascertained that there are as many as from twelve to twenty generations in a single year, and, according to KYBER, a female aphis has been known to continue breeding for four years under very peculiar circumstances. We may, therefore, place full confidence in REAUMUR'S statement, that a single female aphis may be the progenitor of 5,904,900,000 descendants during the year of its ordinary life! Correspondents who complain of the state of the Turnip crop should put their shoulders to the wheel. If children were employed to pick off the under leaves of the Turnips covered with aphides, to put them in baskets and burn them without delay, much good would result. Any fluid application for the destruction of the insects seems hopeless, as they invariably fix themselves on the underside of the leaves. *I. O. W.*

—— WE learn from an official document, signed by the Secretary to the Government of India, that that Government, after communication with various agricultural and horticultural societies in India, and with persons interested in the subject, have arrived at the conclusion that the only real obstacle to the development of an extensive trade in the fibre of RHEEA or CHINA GRASS is the want of suitable machinery for separating the fibre and bark from the stem and the fibre from the bark, the cost of effecting such separation by manual labour being great. The demand for the fibre is already large, and no doubt might be extended with reduced prices, and there is a practically unlimited extent of country in India where the plant could be grown. The requirements of the case appear to be some machinery or process capable of producing, with the aid of animal, water, or steam-power, a ton of fibre of a quality which shall average in value not less than £50 per ton in the English market, at a total cost, all processes of manufacture and allowance for wear and tear included, of not more than £15 per ton. The said processes are to be understood to include all the operations performed, after the cutting and transport of the plant to the place of manufacture, to the completion of the manufacture of fibre of the quality above described. The machinery must be simple, strong, durable, and cheap; and should be suited for erection at or near the plantations, as the refuse is very useful as manure for continued cultivation. To stimulate the invention or adaptation of such machinery or process, the Government of India hereby offer a prize of £5000 for the machine and process that best fulfils all the requirements named above. Rewards of moderate amount will be given for really meritorious inventions, even though failing to meet entirely all the conditions named. Arrangements will be made by the Government of India for the supply of carefully dried stems, and specimens of fibre separated from the bark, but subject to no other process, to mechanical firms and others desirous of competing, on application to the Secretary to the Government of India in the home department. All machinery, &c., must be brought by the competitors at their own charge to a locality which will be notified hereafter, probably in the North-West Provinces or the Punjab, and there worked under the supervision of their own representatives for a sufficient time to enable the judges appointed by Government to determine whether all the conditions named have been complied with. The prize machine is to be transferred, if required, to Government, at 5 per cent. above cost price; the patent right in any such machine to be also transferred, if required, to Government, on the latter securing to the patentee a royalty of 5 per cent. on the cost price of all machines manufactured under the patent during its currency. One year from the date of this notice will be allowed for the preparation of the machines, and their transport to the locality named for the competition; and the trials will then be made and the decision of the judges announced. If no invention of sufficient merit is received in the abovenamed period to obtain the prize offered, the Government will continue to allow machines to be tendered for trial till the end of two years from the same date, after which, or on the award of the prize, the offers herein made will be withdrawn.

—— Two more parts of Mr. SAUNDERS' useful REFUGIUM BOTANICUM are before us. They contain a large number of illustrations, with descriptions of bulbous plants, Scillas, Drimias, Ledebourias, and the like, and of some of which Mr. BAKER furnishes a monographic enumeration. As these plants are preserved with difficulty, it is the more desirable that good figures of the cultivated species should be published. It is remarkable, also, how many of the species now described are absolutely new, and unmentioned in botanical books. We shall have occasion to refer to these plates at another time, but we may now specially call attention to the Kniphofia præcox, a form of the "Red-hot-poker" plant, which flowers as early as May. Hydrocotyle asiatica is an interesting plant, from the great virtues assigned to it in cases of leprosy, &c., and on botanical grounds, from the æstivation of the petals, which is sufficiently different, in Dr. SEEMANN'S opinion, from that of Umbelliferæ, to warrant the exclusion of this genus from that order, and to necessitate its transference to Hederaceæ. Neither of these points, however, are alluded to in the text. We have only to repeat our frequently expressed gratitude to Mr. SAUNDERS and his coadjutor for the valuable services they are rendering to horticulture and botany.

—— We have been favoured by Messrs. OTTOLANDER & SON, of Boskoop, with samples of a few HARDY TREES and SHRUBS which are deserving of special notice for their highly ornamental qualities. One of them is named *Dimorphanthus mandchuricus*. This is a noble Araliaceous plant, with something of the aspect of Aralia canescens (the falsely-called A. japonica of gardens), and, like it, having very large bipinnate leaves, but instead of the nearly smooth leaves of the Aralia, which produce interpetiolar prickles at the

base of the leaflets, and only here and there small ones on the rachis, in the Dimorphanthus both the primary and secondary rachides bear strongly developed spines, and the veins of the leaflets bristle with smaller spines on both surfaces. The leaves are said to be 5 feet in length and as much in breadth, and are of a bright green above and glaucous beneath. It will form a noble erect-growing woody plant, of Palm-like habit, for the ornamentation of lawns and shrubberies. Some cultivators, it appears, have stated that this is the same as Aralia canescens, but it is certainly quite distinct. Another fine thing, described as "a noble tree and perfectly hardy," is the *Idesia polygama*, a Flacourtiaceous plant, which bears the name of Polycarpa Maximowiczii in the French gardens. It forms a large deciduous tree, with alternate cordiform-acuminate serrated leaves, of a shining green colour, with red veins above, and glaucous beneath, the petioles red, 8 inches to a foot long, and the blade 8 inches to 12 inches across. The flowers come in very long and compound racemes, at the tips and in the upper leaf axils, and are succeeded by very numerous orange-coloured berries, which are reported to be edible. Being, as is said, perfectly hardy, it must form a magnificent tree, on account of its large size and the breadth of its foliage. In *Juglans ailantifolia* we have a grand pinnate-leaved tree, producing many pairs of oblong elliptic leaflets on a downy rachis. The leaves are nearly 2 feet long, and the tree must be a very effective one if perfectly hardy, on which point our information is deficient. Finally, Messrs. Ottolander send us a *Quercus nobilis*, a seedling Oak, "coming from Quercus Robur nigra, crossed with the Quercus americana. The growth is much like that of Quercus alba, but it is more robust, and very hardy, the leaves larger, and the young ones of a fine deep red." It is certainly a very fine Oak, with large, coriaceous, glossy leaves, 9 inches long and 5 inches broad, wider towards the blunt apex, where they are slightly and bluntly sinuate-lobate.

—— We learn that a fine show of Vegetable Marrows may be seen at the Chippenham Hotel, Harrow Road, Paddington. There are, we are told, 17 specimens of different sorts, consisting of the Long-striped Green-ribbed, one weighing 20 lb., and measuring 2 feet 6 inches long; the Gold-ribbed, one weighing 18½ lb.; the White-ribbed, weighing 17½ lb.; the Turk's Head, and a very curious specimen called the Dial-faced, equally fine; besides two large Pumpkins, one weighing 14 lb. The whole of these were grown within 200 yards of the Chippenham Hotel by the workmen engaged upon the various buildings, and upon the waste grounds about to be built upon.

—— The following is an extract from a letter of Messrs. Calvert & Co., of Manchester, to the Agri-Horticultural Society of Madras, as to the mode of applying Carbolic Acid to Coffee Trees, to prevent the attacks of the Borer. The plan recommended is very simple, and if the carbolised limewash be applied at the time when the beetles are on the wing, and the females depositing eggs, there can be no doubt that it will prove a most effectual preventive. Of course if the eggs have hatched and the larva commenced to burrow, it can be of little or no use:—

"The stems of the plants to be washed, and the soil round them to be sprinkled with a whitewash of ordinary consistence (made with quicklime) in every 3 gallons of which 1 oz. of carbolic acid has been well mixed.

"If this strength be found not quite sufficient to destroy the insects, an experiment can readily be made with larger proportions of carbolic acid in the lime, till it is ascertained what strength the Coffee plant can actually bear without being injured."

—— The most notable facts in connection with the Meteorology of the Week ending October 1, are the high day temperatures and the nearly total absence of rain throughout the British Isles. (See Mr. Glaisher's Tables in our present issue.) The Maximum Temperatures of the air in England ranged from 75°.1 at Portsmouth (the extreme South station) to 64° at Newcastle (the most northern station), with a mean for all stations of 71°.3. In Scotland it varied from 69°.8 at Leith to 62° at Dundee, with a mean for all stations of 66°.3. The Minimum Temperatures in England ranged from 33° at Hull to 44°.8 at Liverpool, with a mean for all stations of 38°.9. In Scotland it varied from 38°.5 at Glasgow to 47° at Greenock, with a mean for all stations of 42°.9. The Mean Temperature of the week in England varied from 56°.6 at Norwich to 49°.4 at Hull, with a mean for all stations of 54°.5. In Scotland it varied from 54°.8 at Edinburgh to 52°.4 at Dundee, with a mean for all stations of 53°.4. The Rainfall was very small, the only stations at which any fall was recorded being at Wolverhampton, in England; and at Dundee, Aberdeen, and Leith, in Scotland.

—— Mr. Robinson contributes, to the last number of the *Field*, the first of a series of articles on Transatlantic Horticulture, with which he does not seem to be much impressed, barring the Blackberries.

—— Dr. David Moore has lately published, in "Transactions of the Royal Irish Academy," a paper on the Morphology of Sexes in some Dicecious Plants, in which, after alluding to cases of hermaphroditism in usually unisexual flowers, such as the Papaw, he describes a similar instance in Nepenthes distillatoria, in which male and female flowers were produced together on the same raceme. The plant was raised from seeds in the Glasnevin Gardens, and flowered for the first time last year:—

"I had been observing," says Dr. Moore, "the inflorescence closely, hoping the plant would be female, and was glad to find my expectation realised on the opening of the first flower, which had a well-developed ovary; but at the base of the ovary a number of abortive stamens were produced, which gave to the flower the appearance of being hermaphrodite. The succeeding flowers continued to expand centripetally from the base towards the apex of the raceme, in a regular manner, each of which had an ovary surrounded by abortive stamens. The valves of the capsule did not adhere firmly together, as they usually do until the seeds are nearly ripe; they were partly free, similarly as they appear after dehiscence.

"They were imperfect; but on examining them with the microscope, the young seeds were well formed, adhering in great numbers to the placentas of the separate valves of the capsule, and had the appearance of being perfect. I tried to impregnate the pistils with pollen from stameniferous flowers, and also with the imperfect stamens which were in the pseudo-hermaphrodite flowers; but in neither case did perfect seeds follow.

"The pistilliferous flowers continued to be developed until fully one-third up the raceme was reached, after which all the remaining flowers to the apex were male or stameniferous. This well-authenticated case favours the theory that vigour in the plant is productive of the female line of vital force. Here we have a young and healthy specimen flowering for the first time from seed, and only the earliest expanded flowers were pistilliferous. A converse case to this is stated by Dr. Masters in his work on 'Vegetable Teratology,' where the male force predominated, and the female succumbed, perfect stamens with anthers being produced in the ovaries of a Myrtaceous plant, Bæckea diosmæfolia, instead of ovules.

"The morphological change which has so curiously taken place in our Nepenthes appears to be of a very simple nature. The axes of the pseudo-hermaphrodite flowers, in place of terminating in normal stameniferous bodies, have become lengthened beyond their usual boundaries, and formed themselves into four-valved ovaries."

—— Among the little discomforts of life is one which is pretty [illegible] to those who cannot leave London during August and September, and particularly the unfortunate bachelors who are obliged to make their daily meal in an eating-house or restaurant. It is the nuisance of Flies, to which some people are so sensitive, that to dine becomes a positive trial instead of a pleasure. In Belgium the butchers use Laurel oil on their doorposts and window frames, to such good effect that the flies will not enter the shops. The *Food Journal* asks, Is not the hint really worth taking? But what is Laurel oil?

New Garden Plants.

Odontoglossum blandum, *n. sp.*

[illegible]

Quite in the way of Odontoglossum nævium, perhaps even handsomer, since the ovate-acuminate blade of the lip is much more expanded. We have to thank Mr. Stuart Low for a dried flower he obtained long since, and recently we have received flowers from Mr. Ortgies, of Zurich, collected by M. Roezl. Whether Mr. Low's plants live we do not know, those from M. Roezl are all dead. A third collector has done his best to destroy the Orchids of the district of Ocaña, by sending thousand of dead Masdevallias and thousands of putrid Odontoglossums. Except some Epidendrum atropurpureum (macrochilum), and a most wonderful Peristeriaceous plant, we know of nothing which arrived in this consignment in a living state. There was a time when niggers used to be packed like herrings to be sent from Africa to America, now Orchids are wasted in the same manner to be sent from America to Europe. The worst is that the modern collectors have so little confidence in their own talent for investigation that they all fall down, as wandering locusts, to waste the one place, Ocaña, without even trying to discover new areas of Orchids. In lieu of making experiments how plants may be best sent alive, of collecting in favourable seasons, and at the latest time before there is an opportunity to send them to Europe, they work like the late Warscewicz, only intent on accumulating masses, and sending in a careless manner, even in the rainy period, the unhappy plants which are unfortunate enough to fall into their destructive hands. In former times more care was exercised, and it was believed that a nice bargain could be made with 30 to 50 healthy specimens of a good species. We remember a most wonderful collection made by our friend Wagener in New Grenada for Mr. Linden, and which arrived, nearly every specimen, in a good state,—it was *une bonne affaire*. If Wagener had overfilled his cases with thousands, the plants would have perished; if Wagener had collected in the rainy season, his plants would have perished too; and if Wagener had amused himself in lieu of himself taking care to see his boxes on board ship in due time, there would have been no result. Let us add that Wagener, when collecting, not only prepared a most curious and useful herbarium, but also the nicest and truest and most elegant drawings. Wagener collected moderate quantities, thinking, as a man of good sense and of honesty, that it was well to leave a portion of the plants in their place, since it was a sin to destroy the lovely creatures, and since others would like to gather the same things at a later date. Some modern collectors, however, appear to think "*après nous le déluge.*" They collect by thousands all they find, and thus the plants will be destroyed in their native habitats and we none the better. We hear that the gorgeous Masdevallia elephanticeps is nearly destroyed at Ocaña, and we should wonder if there are ten specimens alive in Europe, we having seen but one. And if the thousand had arrived alive, we believe that 50 good healthy plants would have given the same gain if not a greater than a thousand. Where are the (we believe) 500 specimens of Cattleya superba, which were to be had for 1*s.* or 6*d.*, at Mr. Stevens'? Gone! If a small lot in good condition had been sold, the plants would now be doing well. Cultivators would have taken much more care of the precious plants, which would have arrived healthy, not with death in their shoots. If we had the acquaintance of some magistrates in Ocaña we would induce them to adopt the Yorkshire system, where the peasants are told to prevent the extirpation of Cypripedium Calceolus in a not very civil, but very successful manner. If such steps are not taken, and if the nigger system of collecting thousands is kept up, then we have no doubt that the neighbourhood of Ocaña, once an Orchidaceous paradise, will lose its Orchidaceous glory, and those expeditions to Ocaña, prepared by some of our highly valued correspondents, will have the effect of making very painful blanks in their *[illegible]*. *H. G. Reichenbach fil.*

DO PLANTS ABSORB WATER THROUGH THEIR LEAVES?

This is a subject of such great practical importance that I feel extremely grateful to you for returning to it, and to Mr. A. Thompson for his interesting letter (p. 1251). His explanation is an amplification of your first leader, that the upper portion of branches are refurnished at the expense of the under, and that the sap flows upward in the detached branches in accordance with the same law that made it ascend before they were severed from the roots. The chief objection to this theory seems to be the limited amount of sap husbanded in a detached branch, and the considerable quantity of fluid needed to fill flaccid leaves.

If we cut asunder a growing shoot at an early period of its growth, we observe, with astonishment, the volume of the ascending sap, and the rapidity with which it flows. Estimated by these criteria the leaves require a large quantity of fluid to fill them and to keep them full. But sever a branch of a Vine, for instance, from its root, let its large leaves fade and flag, and place them in a saturated atmosphere, and they are not only filled, but kept full for days or weeks, probably. Now, if all this sap flows from the growing stem, one must believe that it was wonderfully well filled to start with. Of course I am well aware that the amount of sap sent to the front is largely dependent upon the quantity utilised and expended there, and that the activity of evaporation may control the ratio of absorption and regulate the rate of circulation; but even giving due weight to these facts, so well put by Mr. Thompson, and in your second leader, I hesitate to accept the theory that the flaccid leaves regain their turgidity wholly and alone by the aid of the sap from below.

A false canon in ethics was long promulgated in this form: "Of two evils choose the least." In the absence of direct proof, it may perhaps be admitted within the domain of science thus: "Of two difficulties choose the least." It certainly seems more difficult to account for all the facts upon what may be called the robbing Peter to pay Paul theory, than on the commonly received one, that leaves possess and exercise the power of absorbing aqueous vapour or water from the atmosphere. As the whole matter turns upon the loss of weight of plants, or portions of plants that have passed from a flaccid to a turgid state, and as Mr. Thompson seems to have misunderstood my remarks in illustration of the mode of weighing, I again refer to it.

The analogy to the boat in water was to this effect—that it would weigh lighter in the water than out of it, and lighter, again, as a boat, than as timber huddled together in a lump and thrown into the water. The distended surface of the boat would buoy it up in the water and reduce its gross weight. May it not also be so with a flaccid leaf, whose cells are huddled together? It could not lay any hold on the air in the process of weighing, but would fall down in a lump, a dead weight instead of a living one. But this view of the matter is further strengthened thus. Supposing it possible and I do not suppose any naturalist will deny that it is so—that the turgid leaf is partially distended with air; would not this still further reduce its gross weight by giving it greater buoyancy, the air partly carrying the solid matter during the process of weighing? Further still, if the leaf during the process of filling absorbs any fluid, such as aqueous vapour, weighing little more than half as much as air, this would likewise still further

lessen its weight, and make the turgid leaf or branch seem much lighter than the flaccid one.

Here, then, are three valid reasons for the facts so carefully noted by so many scientific men. Turgid leaves may weigh lighter than flaccid ones, because of the mechanical change they have undergone, because they contain more air, and they may have absorbed aqueous vapour from the atmosphere, which is much lighter than air. I offer them in all humility for what they are worth, but I think they all will require explanation before practical men generally will receive the hard dogma of science, that leaves cannot absorb moist vapour directly from the atmosphere.

To my practical mind the philosophers have begun their experiments in this matter at the wrong end, and at best they have only half done their work. The test of the balance alone is not sufficient, neither does your theory of a transference of sap from one portion of the flaccid branch to another meet the case; for, however this may have been, the whole branch would weigh the same as before,—any displacement of matter from one part to another could not affect the gross weight of the whole. If the branches and leaves lose weight during their transition from flaccidity to turgidity the vital question remains, what has become of this loss? Under the conditions specified it seems quite possible for the plants to have absorbed water and yet to have lost weight by the activity of oxygen in a limited and stationary atmosphere. I have already put the question, whether the aqueous vapour in the air was carefully measured before and after these experiments. You answered, "you believed this had been done, and it had suffered no diminution." It would be well, however, to be furnished with particulars of such measurements. These experiments on flaccid leaves and branches are by no means new, and it is no reflection on scientific men to assert that it is only quite recently that instruments of sufficient accuracy for such nice experiments on aqueous vapour have been placed at their service. Could not the amount of aqueous vapour before and after the revival of the drooping leaves be measured by Professor Tyndall? His verdict would be at once accepted by all scientific and practical men. If more aqueous vapour was present after the leaves became turgid, then Mr. Thompson's statement would be confirmed, "that the cause of the loss of weight in the branches was the perspiration;" though it does seem crediting the branch with enormous store of fluid to assume, as he does, that it contains enough to fill up all the flaccid leaves, and to throw off waste into the bargain. Still, if exact scientific instruments revealed an increase of aqueous vapour, the fact must and would be accepted. It will hardly, however, be believed upon doubtful or no evidence. But the air would require testing for gases as well as water. It is likewise important to know under what conditions as to light and heat the experiments on the flaccid leaves were made. If in the semi-darkness of a study or a common living room, nothing would be more likely than that the oxygen of the atmosphere would prey upon the carbon of the leaves, and a loss of substance, and consequently of weight, would inevitably follow. If it be granted that the air is one of the chief sources of the food of plants, it follows, from the small percentage of that food in the atmosphere, that it must be kept moving in order to bring the food within reach. Isolate and fix a portion of the air, as in the case of these experiments, and the carbonic acid gas and ammonia would speedily disappear, while the oxygen would probably work with increased energy as an extractor of carbon. The leaves would thus be starved and robbed simultaneously, and a loss of weight become inevitable.

As to the mechanical inability of plants to absorb water in a state of aqueous vapour, it is not so easy to see how either hairs or bloom can hinder such a subtle fluid from entering. That these should be able to roll off such agglomerated masses of water as dew or raindrops is intelligible, but the barrier must be fine and close indeed that aqueous vapour cannot penetrate.

But if it be admitted that leaves absorb water when in contact with them as water, this is the point of most practical importance. Until you added your note to my first letter I was under the impression that this power was questioned or denied, and even now it is by no means clear why the greater bulk and grossness of the water should facilitate its absorption. You advert to the presence of minerals in Epiphytes, in proof that they cannot be supported by aqueous vapour, but by rain and dew. But were not the latter raised from the earth in the form of aqueous vapour? The condensation of the latter into their grosser form of common water, represented by dew or rain, can hardly have added potash, soda, alumina, lime, silica, &c. And unless what I contended for at the Oxford Congress, that such matters are collected from the dust of the world, be admitted, it seems as if they must be lifted in infinitesimal doses into the air on the light and all but invisible wings of aqueous vapour. The twin questions of how minerals get into Epiphytes, and from whence the minerals come, has not yet received a very satisfactory answer. To tell us, as we were told at Oxford, that they exist in rain water, only suggests the further question of how do they get into it? If their dusty origin is ignored—and in this phrase I would include the products of combustion, respiration, and decomposition—and their aqueous elevation is denied, it seems difficult to account for their presence in the atmosphere. In the case of the rootless Tillandsia you refer to, the difficulty of the absorption of such matters is almost equally great whether it takes place through the leaves or through the stem, for I presume the latter is covered with a cuticle, and its natural position is not immersed in water but suspended in the air.

If the power of leaves to absorb moist vapour from the atmosphere is denied, I do not see how the theory that a moist atmosphere checks perspiration is to be upheld. The amount of sap forwarded to the front, that is, sent into the leaves, is not wholly or primarily dependent upon the state of the atmosphere, but upon the vital force and growing energy of the plant; a moist, genial air strengthens the one and quickens the other to little purpose if it arrests the throwing off of water, which seems essential to the deposition of the solid matter that it holds in solution. It will be admitted that the rate of growth, the addition of new parts, the enlargement and consolidation of structure, is largely dependent upon the amount of sap elaborated in and thrown off by the leaves. Experience likewise demonstrates beyond all controversy that plants grow faster in a moist climate. This seems incomprehensible, on the theory that such a climate checks perspiration merely and only. The nett results of the twin assertions that plants neither give up water to, nor take moisture in from, a moist atmosphere is that they would almost cease to grow. Universal experience proclaims the contrary, and on this broad basis of fact I am to rest my faith that plants not only give out of their abundance to replenish the air with moisture, but drink their purest draughts of the finest distilled water from out of its vasty depths. The air is not simply a storehouse filled with suitable plant food, but a cistern of living water from which they may drink for evermore without draining it dry. Upon this hypothesis, a moist atmosphere would check perspiration by establishing a counter current. The leaves thus filled from the sources would be fuller than before from the two currents, the one flowing from the roots the other from the leaves; more moisture might be perspired, and consequently more growth made. For neither of the supplies would be water only. From both sources the chief constituents of plants would be poured in. It would be like filling a vessel from the two opposite extremities at once. With two inlets and one outlet it would soon be filled to repletion. It is so, I believe, with plants growing in a moist atmosphere. They absorb both food and drink at top and bottom, and their rapid growth is the natural product of this double supply. The loss of weight in a confined atmosphere may arise from one of the feeders, the root, and its representative, the stem, being wholly cut off. From the absence of plant food in the enclosed space, from the change of mechanical condition in the leaves or branch, the exceptional mode of filling wholly from the air, the abnormal activity of oxygen, and the extraordinary stimulus to elongation, caused by the saturated atmosphere, while light and moving air, those primary requisites to a consolidated healthy growth, were either wholly wanting, or but partially present.

While so many other explanations are possible, I hope I shall be excused for adhering to the old theory. Of course I hold it subject to that great tragedy of science, so eloquently adverted to by Professor Huxley the other day at Liverpool,—the slaying of a beautiful hypothesis by an ugly fact. But we have a right to demand, in the interest of science and practice alike, that the fact is a fact and not a fallacy under a false name, and further, that it is strong enough to slay the theory. Now in this case I deny no fact, I accept the record of the balance. But I venture to doubt the inference, that is, the theory built upon it. I accept your transposition of fluids theory, but there ought to be no loss of weight, which there was in all cases. I believe in the power of moist air to arrest perspiration, but Mr. Thompson's explanation that the loss of weight is so caused cannot be accepted. I advise practical men to hold on to the old theory, and the successful practice based upon it, until the new one is buttressed with stronger facts and more irrefragable evidence than has yet appeared in its support. *D. T. Fish.* [The two physiologists who have of late years taken up this question are, we fear, but little able to follow up their interesting experiments. Both M. Duchartre and M. Prillieux are Parisians. May they soon be enabled to pursue their peaceful researches without let or hindrance. Eds.]

LILIES.

(*Continued from p. 1246.*)

To give an idea of the additions made to the list of newly-discovered Lilies since the beginning of the century, it will be convenient to group the species according to the country from which they have been derived.

Europe.—This continent has but few native Lilies, and those which are indigenous to it were early recognised. It was therefore unlikely that modern botanists would materially augment the number of species; nevertheless the exploration of the remoter, less frequented countries, has resulted in the discovery of some few species. Grisebach found in Albania a yellow-flowered Lily, the anthers of which are also yellow. The segments of the perianth are revolute, and the whole flower is much like that of L. pyrenaicum. To this Grisebach applied the name L. albanicum ("Spicileg Flor. Rumel," ii., p. 385, 1844). This species grows in the higher mountains of that country, but is rare, and, moreover, has not hitherto been introduced into gardens. Bernhardi raised to the rank of a species, under the name of L. carniolicum (Mert. et Koch, "Deutschl. Flor." ii. 536), a Lily which he discovered growing in the subalpine districts of Carniola and Istria. The flower is pendulous, its segments revolute, of a rich minium-red or fauve colour, and marked near the base with numerous projecting brownish purple lines. This species, according to Koch, is more nearly allied to L. pomponium than to L. chalcedonicum. Lastly, Ebel observed on the mountains of Montenegro a plant about 18 inches high, or rather more, of very slender habit, and which accordingly he named L. gracile, but of which he only saw fruiting specimens. This species was described and figured in Ebel's "Zwælf Tage auf Montenegro" (1842), p. 8—9, fol. i., fig. 1, *a*, *b*, *c*, *d*. This plant has not been detected by any other botanist. These are, if I mistake not, the only discoveries of European Lilies since the time of Persoon; but I have already mentioned that Chaix has made a distinct species of the Orange Lily (L. croceum, Chaix, in "Vill. Dauph." i., p. 322), which Persoon considered to be merely a variety of L. bulbiferum. The reasons for the separation are, that the Orange Lily does not produce bulbils in the axils of its leaves, that its large and beautiful erect bell-shaped flowers—solitary in the wild plant, more or less numerous in garden specimens—are of a rich orange colour, studded over with small blackish spots, and that moreover it produces a capsule with six prominent angles that might be called wings, and which is umbilicate at its extremity; while the L. bulbiferum has its fruit marked with six obtuse angles, which do not extend into wing-like projections. On the other hand, Gouan, in his "Illustrations," p. 25, as far back as 1773, distinguished the L. pyrenaicum Gouani, as a separate species. This had been regarded by some, as by Lamarck ("Encycl." iii. 536), Persoon ("Enchir." i. 359), Gawler ("Bot. Mag." 789), as a variety of L. pomponium; by others, especially by Gmelin ("Syst." 544) as a variety of L. chalcedonicum. It is certain that the plant has marked analogies with the two species just named, and specially with the first. Nevertheless, it differs from them in its robust habit, its very numerous ciliated lanceolate leaves, which sometimes become broader, especially towards the base of the stem; its reflexed perianth, of a greenish yellow, marked internally with reddish black spots, exhaling a goat-like odour as strong as it is unpleasant; its style scarcely so long as the ovary, thick throughout its length; and in the circumstance that the segments of the perianth are invested with down at their extremities. It may, moreover, be added that the flowers, three or four in number, in the wild state, and borne in clusters, are each separately supported on a long stalk, which is curved at its upper end into the form of a semicircle, so as to render the flowers pendulous, or even slightly bent inwards; this stalk springs from the axil of a bract relatively broader than the upper leaves.

M. Max Leichtlin has in his collection two Lilies which he received from Montenegro, and which constitute two varieties of the Martagon Lily, as distinct as they are curious in their flowers, of very thick substance, of so deep a purple colour as to appear almost black. These are the plants called, in M. Max Leichtlin's list, L. Martagon dalmaticum, and L. M. Catanii, Vis.

Perhaps the L. peregrinum of Miller, which Linnæus considered merely as a variety of the white Lily, should be added to the list of European species. It is especially distinguished from the white Lily, L. candidum, in the circumstance that the segments of the perianth are markedly narrow at the base, but some authors say the plant was originally derived from Constantinople; others say it came from the East, that is to say, from Western Asia; or, again, that it originated in gardens, like the L. pubescens, Bernh., which has reddish orange-coloured flowers, and which is a seedling of L. bulbiferum, specially characterised by its flower-stalks and flower-buds being covered with down.

Asiatic Russia.—The immense possessions of Russia in Asia have been explored during the last 50 years by numerous botanists, who have discovered many species of Lily described in works relating to the flora of that empire,—Fischer has made us acquainted with four:—

1. L. avenaceum (Fisch.), a native of Kamtschatka, Mantchuria, the Kurile islands, Sachalin, and Japan, and which has flowers of medium size, of a scarlet (*rouge-ponceau*) sometimes orange colour, studded with dark spots, and whose segments are revolute. The stem bears only a solitary verticil of lanceolate dark leaves. This species was named but not described by Fischer. Maximowicz described and figured it in the "Gartenflora," 1865 (p. 290—292, pl. 485).

2. L. pulchellum, Fisch. ("Hort. Berol." 1834, et "Animady. Botan." Decemb. 1839, p. 14), a charming little Siberian plant with (in the wild state) a solitary flower of a fine minium-red colour, beset with dark spots on the inner surface, and remarkable, moreover, for the shortness of the style.

3. L. tenuifolium, Fisch. ("Ind. Pl. Hort. Gorenk.," 1812, p. 8), a fine species, distributed throughout almost the whole of southern Siberia, in the basin of the river Amoor, and which owes its name to its linear leaves pressed up against the centre of the stem. It bears numerous recurved flowers of a fine red colour without spots. M. Leichtlin considers, and I think with justice, that a Lily introduced from Japan by

Siebold under the name of L. puniceum, Sieb. et Vr., is only a variety of this species with a more robust and more floriferous habit.

4. L. Szovitzianum, Fisch. et Avé Lallem. ("Animadv. Bot.," Decemb. 1839, p. 16). This plant is indigenous to the Caucasus. Its stem, 3 feet high and upwards, is terminated by a cluster of recurved pendulous flowers of a fine yellow colour, studded with red spots in the interior, and nearly as large as those of the white Lily. It is also known under the name of L. colchicum, Steven. M. Karl Koch affirms ("Wochenschr." 1866, p. 100) that this is only a simple form of L. monadelphum, Bieb., owing its peculiarities to diversities of age and soil, and that the plant with smaller revolute flowers, of a colour at first greenish and afterwards ochre-coloured, described and figured under the same name of Szovitzianum in 1864 by Regel, in the "Gartenflora" (xii., p. 161—162, pl. 436), is only L. ponticum.

L. monadelphum, Marsch. Bieb. ("Centur. Plant. Rar. Ross. Merid.," pars 1, tab. 4, 1810) is a beautiful Caucasian plant, which attains a height of 3 feet and upwards. The leaves are numerous, lanceolate, and covered with stiff hairs on the under surface along the nerves. The flowers are in clusters of 5—6, nodding or pendulous, of a fine yellow colour, and studded, especially towards the base, with red points; these flowers have the form and dimensions of those of the white Lily. Their stamens are united together at the base. The perianth before fertilisation is but slightly revolute, but afterwards it becomes very much so, and then constitutes what Schultes, father and son, called L. Loddigesianum (Roem. et Schult. "Syst." vii., p. 416, in adnot.) In proximity to these yellow-flowered Lilies must be placed L. ponticum, C. Koch, in "Linnæa," xxii., 1849, p. 234, which Prof. Koch discovered in 1843 in the mountains of Transcaucasia in the pachalik of Trebisonde, and which, with a habit analogous to that of the L. monadelphum, is distinguished from that plant by its lesser dimensions, its smaller flowers of a less clear yellow, greenish at first, and finally ochreous, their segments much more markedly revolute, and hence shorter; by its stamens entirely free, and separate one from the other. This species seems limited to the western portions of the Transcaucasian regions, and to the north of Asia Minor.

In Redouté's splendid work on the Liliaceæ, a plant is figured under the name of L. pumilum, with small reflexed flowers, with perianth-segments slightly revolute, of a fine scarlet colour, rivalling that of L. tenuifolium, Fisch., and which is so nearly allied to that species that M. Koch affirms their identity ("Wochenschr." 1866, p. 61). Nevertheless, M. Regel ("Gartenflora," 1865, p. 65—66, pl. 463, f. 1) keeps it up as a distinct species, the difference consisting in the leaves being broader and stiffer than those of L. tenuifolium, its flowers smaller and the perianth segments destitute of nectariferous furrow. Redouté cites Dahuria as the native country of this Lily, which has been confirmed by M. R. Mack, who found the plant on the confines of Dahuria, in the Amoor valley.

Link has described, under the name L. spectabile ("Enum. Hort. Berol." i. 321), a very beautiful species dispersed throughout Southern Siberia, and which produces solitary flowers in the wild state, but is many-flowered under cultivation. These flowers are large and beautiful, erect, nearly bell-shaped, of a fine minium-red colour, and woolly externally. It is evidently the same plant as that named in the "Botanical Magazine," t. 1210, L. davuricum, though Reichenbach ("Icon. Botan. Exot." i., cent. i., p. 68) has questioned this determination. The same species has been distributed by M. Van Houtte as L. umbellatum, a name belonging really to a plant of the United States. MM. Asa Gray, Miquel, and others consider L. spectabile as a variety of L. bulbiferum; but M. Glehn ("Suppl. ad Ind. Sem. anni 1868, H. Petrop.," p. 19, 1870) denies the accuracy of this determination, especially calling attention to the different characters of the fruits of the two plants, as noted by Fischer, Meyer, and Lallemant. Lastly, Loddige has figured in his "Botanical Cabinet," n. 1628, under the name L. Buschianum, a Siberian Lily which he received from Jos. Busch, of St. Petersburgh, the stem of which, about 2 feet in height, bears at its extremity one or more erect perfumed flowers, the segments of which are not revolute, and are of a fine scarlet colour, beset internally with blackish purple spots. M. Karl Koch considers this species ("Wochensc." 1868, p. 149) as allied to L. pulchellum. In a one-flowered specimen which I received from M. Leichtlin in June, 1870, the three sepals were strongly recurved, while the three petals were straight; both were remarkable for their median nerve, prominent on the outer surface, and covered with long white hairs.

(To be Continued.

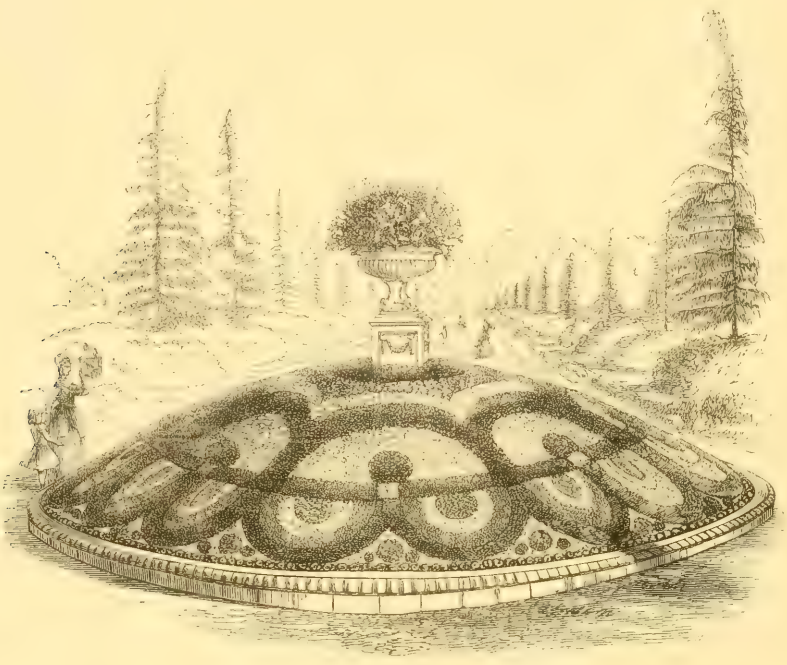

Fig. 244.

BEDDING OUT AT KEW.

In the time of our forefathers, Yew trees clipped into the shape of dragons or of dumb-waiters, according to the skill or patience of the practitioners, were considered as the height of good taste, so far as the gardener's art was concerned. A few such maimed and tortured shrubs may yet be seen even in the vicinity of London, and excite our curiosity more than our pity. Another vagary of fashion was the planting belts of glaring colour side by side in the so-called ribbon borders. Here and there an artist revealed himself by the skilful way in which he combined his colours, or by the judiciousness of his arrangements in toning down the offensive outburst of crude colour; but such instances were few and far between, and it is probably more to the increased number and variety of the subjects at his disposal than to any amelioration in taste that the present relatively improved state of our flower-beds is due. Spring gardening, too, has had its share in producing a better state of things. The softer tints, the exquisite blending of colours, that we meet with in good examples of spring bedding must have had some influence in refining the utter vulgarity of the general run of summer bedding as practised only a short time since. Lately another style of bedding has sprung into existence, and one which bids fair to take the public taste. It has its advantages in that it permits of a greater variety of interesting plants being made use of, and in the hands of a master of the art it is unquestionable that exceedingly good effects may be produced. Even under ordinary circumstances a striking effect may readily be obtained, even though it be not such as to satisfy the severe canons of cultivated taste. This system of carpet bedding seems likely, from the amount of public favour it receives, to assume large proportions, and it is therefore more than probable that in the future we shall see more satisfactory examples than we do at present. Most of the instances met with now are too much frittered, boldness and breadth of effect are sacrificed to pettiness of detail, while formalism is rampant to an extreme degree. Instead of taking the material for what it is, and making the best of it, the idea seems to be, or rather the result is, to make the plants look as little like plants as possible. The beds might as well be made in coloured paper, or cut from Turnips or Beetroot. It is much easier to criticise than to suggest improvement—we merely throw out these hints in the hope of preventing the majority, who are not likely to be successful, from attempting to follow in the track of the few who do succeed in this—the latest system of bedding-out.

Our illustration (fig. 244) shows the large round bed at the end of the broad walk in the Royal Gardens, Kew. The engraving by no means does justice to the bed in question or to its surroundings, it is not wholly accurate, and, indeed, merely serves to give a general idea of the mode of planting. The general effect, especially as seen from a little distance, is excellent, but the bed is not wholly free from some of the defects we have mentioned, and errs especially in being too elaborate—a simpler design would have been even more effective. Some of the plants are, indeed, wholly ineffective from being completely overshadowed by their more vigorous neighbours. The annexed plan (fig. 245) will illustrate the mode of planting. The central vase (1), of much more elegant design than would appear from the figure, is filled with Pelargoniums; it had an over-tall Humea elegans in the centre, which is now, fortunately, removed. Around the base of the vase is a circle of Perilla (2); this is enclosed within an

octagonal-shaped mass of Pelargonium Waltham Seedling (3), the facets of the octagon being vandyked and bounded by a double belt of Centaurea candida inside (4), and of Coleus Verschaffeltii outside (5). The concave sides of the octagon are filled with semicircular beds (6) of Mrs. Pollock Pelargonium, encircling a small patch of Iresine Lindeni (7); a circle of blue Lobelia (8) comes next, and runs round the whole bed—broken, opposite to the centre of the semicircles, by plants of Sempervivum canariense and S. arboreum atropurpureum (9), which are too large for their position. Outside this circular belt (8) are a series of concentric semicircles, with their convexities directed outward; the centre of those semicircles (10) consists of Echeveria metallica, and an undergrowth—quite ineffective—of Alternanthera amabilis and Sempervivum urbicum. This is surrounded by a belt of Golden Feather Pyrethrum (11), which in its turn is encircled by a belt of Echeveria secunda glauca (12), next to which comes a brilliant and effective zone of Alternanthera paronychioides (13). The sides of the triangular recesses (14, 15) left between the contiguous semicircles are composed of Golden Feather Pyrethrum, while the base of the triangle is formed by the edging (16) of Echeveria secunda glauca, which runs round the entire bed inside the moulding. In the centre of the triangles so formed are plants of Echeveria metallica, Sempervivum californicum, Senecio pyramidalis, Sempervivum arachnoideum, Alternanthera versicolor. In alternate beds Pachyphytum roseum is substituted for the Senecio. These triangular spaces lose in effect from the multiplicity of their contents; one or a triad of plants in each would suffice.

40 *Feet.*

FIG. 245.

BRITISH ASSOCIATION.

WE borrow from the pages of "Nature" some further extracts from the address of Professor ROLLESTON to Section D., one of the most noteworthy addresses of the kind it has ever been our fortune to read. EDS.

I have been speaking of the microscope as an instrument of education, and I wish before leaving the subject to utter one caution as to its use when this particular object of education is in view. If a subject is to act educationally, it must be understood thoroughly; and if a subject is to be understood thoroughly, it must form one segment or stretch in a continuous chain of known facts. Ἀρκτέον ἀπὸ τῶν γνωρίμων, said one of the greatest of educators; you must start from some previously existing basis of knowledge, and keep your communications with it uninterrupted if your knowledge is not to be unreal. And my concrete application of these generalities is contained in the advice that no sudden jump be made from observations carried on with the naked eye to observations carried on with the highest powers of the microscope. I am speaking of the course to be pursued by beginners, and beginners we all were once, and if our places are to be filled, and filled they will be, by better men as we hope than ourselves, they will have to be filled, we also hope, by men who have yet to become beginners. It is in their interest I have been speaking, and I say that a beginner does not ordinarily get an intelligent conception of the revelations of the microscope except in Bacon's words, *Ascendendo continenter et gradatim*, by progressing gradually from observations with the naked eye through observations dependent upon dissecting lenses, doublets and triplets, and the lower powers of the compound microscope, up to observations to be made with the higher and highest magnifying powers.

Unless he ascend by gradations from organs and systems, structures and tissues and cells, his wonder and admiration at the results of the ultimate microscopic analysis, of what he had but a moment before knowledge of only in the concrete and by the naked eye, is likely to be but unintelligent.

There are three other agencies which can be set into activity with nearly as little trouble and difficulty as the simple apparatus of which I have just been speaking, and which will, like it, secure as a necessary preliminary discipline "*propædeutik*" for their rational comprehension of Biology. These are local museums, local field clubs, and local natural histories. Local authorities, persons of local influence, should engage and interest themselves in the starting into life of the two former of these agencies, and if some such person as Gilbert White could be found in each county to write the natural history of its Selborne, I know not at what cost it could not be well to retain his services. As the world is governed upon each particular area of its surface, there is to be found a certain percentage of the population occupying it who have special calls for particular lines of study. It is the interest of each county to have such means and such institutions in being as will render it possible to detect the existence of persons gifted with such special vocations, to give the talent thus entrusted to them fair scope for development, and to render smaller the risk of their dying mute and inglorious. A young man who is possessed of a talent for natural science and physical inquiry generally, may have the knowledge of this predisposition made known to himself and to others, for the first time, by his introduction to a well-arranged local museum. In such an institution, either all at once, or gradually, the conviction may spring up within him that this investigation of physical emblems is the line of investigations to which he should be content to devote himself, relinquishing the pursuit of other things; and then, if the museum in question is really a well-arranged one, a recruit may be thereby won for the first and growing army of physical investigators, and one more man saved from the misery of finding, when he has been taken into some other career, that he has somehow or other mistaken his profession, and made of his career one life-long mistake. Here comes the question. What is a well-arranged museum? The answer is, a well-arranged museum for the particular purpose of which we are speaking, is one in which the natural objects which belong to the locality, and which have already struck upon the eye of such a person as the one contemplated, are clearly explained in a well-arranged catalogue. The curiosity which is the mother of science is not awakened for the first time in the museum, but out-of-doors, in the wood, by the side of the brook, on the hillside, by scarped cliff and quarried stone; it is the function of the museum, by rendering possible the intellectual pleasure, which grows out of the surprise with which a novice first notes the working of his faculty of inspiration, to prevent this curiosity from degenerating into the mere woodman's craft of gamekeeper, or the rough empiricism of the farmer. The first step to be taken in a course of natural instruction, is the providing of means whereby the faculties of observation and of verification may be called into activity; and the first exercise the student should be set down to is that of recognising in the actual thing itself, the various properties and peculiarities which some good book, or some good catalogue, tells him are observable in it. This is the first step, and, as in some other matters, *ce n'est que le premier pas qui coûte.* And it need not cost much. There is a name familiar to Section D., and, indeed, not likely for a long while to be forgotten by members of the British Association generally, extrinsic means as well as the intrinsic merits of the well-loved man conspiring to keep his memory fresh among us, and the bearer of that name, Edward Forbes, has left it as his opinion that "It is to the development of the provincial museums that, I believe, we must look in future for the extension of intellectual pursuits throughout the land." (Lecture "On the Educational Uses of Museums," delivered at the Museum of Practical Geology, and published in 1853. Cited by Toynbee, "Hints on the Formation of Local Museums," 1863, p. 46.) With the words of Edward Forbes I might do well to end what I have to say, but I should like to say a word as to the policy of confining the contents of a local museum to the natural history specimens of the particular locality. No doubt the first thing to be done is the collection of the local specimens, and this alike in the history of the potential Cuviers and Hugh Millers, who may be born in the district, and in the interest of the man of science who may visit the place when on his travels. But so long as a specimen from the antipodes or from whatever corner of our world be really valuable, and be duly catalogued before it is admitted into the museum, so that the lesson it has to teach may be learnable, I do not see my way towards advising that foreign specimens be excluded. It is to my mind more important that all specimens should be catalogued as soon as received, than that any should be rejected when offered.

I must not occupy your time further with this portion of my address. Let me first say that a person who wishes to know what a field club can do for its members, and not for them only, but for the world at large, will do well to purchase one, or any number more than one, of the "Transactions of the Tyneside Naturalist's Field Club;" and that if there be any person who thinks that White's "Selborne" relates to a time and place so far off that there can be no truth in the book, and who yet would like to try upon himself the working of the fourth disciplinary agencies of which I have spoken—that, namely, of studying some local natural history on the spot of which it treats, and comparing it with the things themselves *in situ*,—let him repair to Weymouth, and work and walk up and down its cliffs and valleys with Mr. Darwin's book in his hands.

I shall not be suspected in this place and upon this occasion, nor, as I hope, upon any other, of a wish to depreciate the value of scientific instruction as an engine for training the mind. But neither, on the other hand, should I wish to depreciate the value of literary culture, my view of the relations of these two gymnastics of the mind being the very simple, obvious, and natural one that they should be harmoniously combined—

Alterius sic
Altera sic poscit opem vis, et conjuvat amice.

I know it may be said that there are difficulties in the way, and especially practical difficulties, but I have always observed that people who are good at finding out difficulties, and especially practical difficulties, are like people who are good at finding out excuses,—good at finding out very little else. The various ways of getting over these difficulties are obvious enough, and have been hinted at, or fully expressed by several writers of greater or less authority on many occasions. It is, however, of some consequence that I should here say what I believe has not been said before, viz., that a purely and exclusively literary education, imperfect and one-sided as it is, is still a better thing than a system of scientific instruction (to abuse the use of the word for a moment) in which there should be no courses of practical familiarising with natural objects, verification, and experimentation. A purely literary training, say in dialectics, or what we are pleased to call logic, to take a flagrant and glaring

instance first, does confer certain lower advantages upon the person who goes through it, without any discipline in the practical investigation of actual problems. By going through such a training attentively, a man with a good memory, and a little freedom from over-scrupulousness, can convert his mind into an arsenal of quips, quirks, retorts, and epigrams, out of which he can, at his own pleasure, discharge a mitrailleuse of chopped straw and chaff-like arguments, against which no man of ordinary fairness of mind can, for the moment, make head. It is true that such sophists gain this dexterity at the cost of losing, in every case, the power of fairly and fully appreciating or investigating truth; of losing, in many cases, the faculty of sustaining and maintaining serious attention to any subject; and of losing, in some cases, even the power of writing. A well-known character in an age happily, though only recently, gone by, who may be taken as a Cæsar worthy of such Antonies, used to speak of a pen as his torpedo. Still, they have their reward, they succeed now and then in convincing juries, and they are formidable at dinner-tables. It would not be fair, however, not to say that a purely literary training can do much better things than this. By a purely classical education a man, from being forced into seeing and feeling that other men could look upon the world, moral, social and physical, with other (even if not with larger) eyes than ours, attains a certain flexibility of mind which enables him to enter into the thoughts of other and living men, and this is a very desirable attainment. And, finally, though I should be sorry to hold with a French writer, that the style makes the man, the benefit of being early familiarised with writings which the peculiar social condition of the classical times, so well pointed out by De Tocqueville (*De la Démocratie en Amérique*), conspired and contributed not a little to make models of style, is not to be despised. Such a familiarity may not confer the power of imitating or rivalling such compositions, but it may confer the power of appreciating their excellences, the one power appearing to us to be analogous to the power of the experimenter, and the other to that of the pure observer in natural science; and we should undervalue neither.

Masters of science, it must be confessed, are not always masters of style; let not the single instance of last night tempt you to generalise, it was but a single instance. The writings of the man whom we in this section are most of us likely to look upon as our master in science have been spoken of by our President in his recently published volume as "intellectual pemmican;" and if scientific reading and teaching is to be divorced from scientific observation of natural objects and processes, it is better that a man, young or old, should have in his memory something which is perfect of its kind, entire and unmutilated, such as the opening of sentences of the Brutus of Cicero, which Tacitus, I think, must have had in his memory when he wrote his obituary of Julius Agricola, or as the opening sentences of the Republic of Plato, or the conclusion of the Ajax or Sophocles, than that he should have his memory laden with a consignment of scientific phrases which *ex hypothesi* have for him no virtual reality. I have already said that I am strongly of opinion that literary should always be combined with scientific instruction in a perfect educational course; these somewhat lengthy remarks refer therefore only to systems in which it is proposed that we should have not only a bifurcation, but a radical separation of studies and students, and the moral of this may be summed up by saying that a purely scientific education must be a thoroughly practical one, familiarising the student with actual things as well as with words and symbols. It was upon the solid ground that Antæus learnt the art of wrestling; it was only when he allowed himself to be lifted from it that he was strangled by Hercules.

Coming now to the second part of my address, I beg to say that the word Biology is at present used in two senses, one wider, the other more restricted. In this latter sense the word becomes equivalent to the older, and till recently more currently used word, Physiology; it is in the wider sense that the word is used when we speak of this as being the section of Biology; and this wider sense is a very wide one, for it comprehends animal and vegetable Physiology and Anatomy, firstly; Ethnology and Anthropology, secondly; and thirdly, Scientific Zoology and Classificatory Botany, inclusively of the Distribution of Species. It may have been possible in former times for a single individual of great powers of assimilation to keep himself abreast of, and on a level with, the advance of knowledge along all these various lines of investigation; but in those times knowledge was not, and could not, owing to difficulties of intercommunication, the dearness of books, the costliness or the non-existence of institutions, have been increased at the rate at which it is now being, year by year, increased; and the entire mass of actually existing and acquired knowledge was of course much smaller, though man's power of mastering it was no smaller than at present. It would now be an indication of very great ignorance in anybody who should pretend that his own stock of information could furnish him with something in each one of the several departments of knowledge I have just mentioned, which should be worthy of being laid before such an assembly as this. As will have been expected, I shall not presume to do more than glance at the vegetable kingdom, large as is the space in the landscape of life which it makes. What I propose to do is merely to draw your attention to a very few of the topics of leading interest, which are at the present moment being, or rather will shortly begin to be, discussed by experts in the Department of Physiology and Anatomy; in the Department of Ethnology and Anthropology; and, thirdly, in the Department of Scientific Zoology.

Under the head, and in the Department of Physiology Proper and Anatomy, our list of papers and, I am happy to add, the circle of faces around us, suggests to us the following subjects as being the topics of main interest for the present year: the question of spontaneous generation; that of the influence of organised particles in the production of disease; that of the influence of particular nervous and chemical agencies upon functions; that of the localisation of the cerebral functions; that of the production, and indeed of the entire *rôle* in the economy of creation of such substances as fat and albumen; and finally, that of the cost at which the work of the animal machine is carried on.

Professor Rolleston then alluded to the question of spontaneous generation, in a passage already quoted by us (see p. 1280), and then proceeded as follows:—

To come now to the kind of considerations which are the proper business of Section D., let me say that for the discussion of the question of spontaneous generation very refined means of observation, and besides these, very refined means of experimentation, are necessary. And I shall act in the spirit of the advice I have already alluded to as given to the world by one of her greatest teachers, if I put before you a simple but a yet undecided question, for the solution of which analogous means of a far less delicate character would appear to be, but as yet have not proved themselves to be, sufficient. Thus shall we come to see very plainly some of the bearings, and a few of the difficulties, of the more difficult of the two questions. What an uneducated person might acquiesce in hearing spoken of as spontaneous generation, takes place very constantly under our very eyes, when a plot of ground which has for many years, or even generations, been devoted to carrying some particular vegetable growth, whether grass or trees, has that particular growth removed from it. When such a clearing is effected, we often see a rich or even a rank vegetation of a kind previously not growing on the spot spring up upon it. The like phenomenon is often to be noted on other surfaces newly exposed, as in railway cuttings and other escarpments, and along the beds of canals or streams, which are laid bare by the turning of the water out of its channel. Fumitory, Rocket, Knot-grass, Cow-grass, Polygonum aviculare, and other such weeds, must often have been noted by every one of us here in England as coming into and occupying such recently disturbed territories in force; whilst in America the destruction of a forest of one kind of wood, such as the Oak or the Chestnut, has often been observed to be followed by an upgrowth of young forest trees of quite another kind, such as the White Pine, albeit no such tree had been seen for generations growing near enough to the spot to make the transport of its seeds to the spot seem a likely thing. In one case referred to by Mr. Marsh, the Hickory, Carya porcina, a kind of Walnut, was remarked as succeeding a displaced and destroyed plantation of the White Pine. Now the advocates of spontaneous generation must not suspect me of hinting that there is any question, except in the minds of the grossly ignorant, of the operation of any such agency as spontaneous generation here; no one would suggest that the seeds of the Polygonum aviculare, to say nothing of those of the Hickory, were produced spontaneously; but what I do say is, that the question of how those seeds came there is just the very analogue of the one which they and their opponents have to deal with. And it is not definitely settled at this very moment. Let us glance at the instructive historical parallel it offers. For the very gross and palpable facts of which I have just spoken there are two explanations offered in works of considerable authority. The one which has, perhaps, the greatest currency, and commands the largest amount of acceptance, is the one which, in the words of De Candolle, regards *la couche de terre vegetale d'un pays comme un magazin de graines*, and supposes that in hot summers and autumns, such as the present, the fissures in the ground, which have proved so fatal this year to the young partridges, swallow up a multitude of seeds, which are restored again to life when the deep strata into which they are thus introduced, and in which they are sealed up as the chasms close up, come in any way to be laid open to the unimpeded action of the sun and moisture. Squirrels, again, and some birds resembling herein the rodent mammalia, bury seeds and forget to dig them up again; and it is supposed that they may bury them so deep as to be protected from the two physical agencies just mentioned. Now germination cannot take place in the absence of oxygen, and I would add that well-sinkers know to their cost how often the superficial strata of the earth are surcharged with carbonic acid. The rival explanation, and the less popular—I do not say the less scientific—looks to the agency of transportation as occurring constantly, and sufficing to explain the facts. By accepting this explanation, we save ourselves from running counter to certain experiments, some of which were carried out, if I mistake not, under the auspices of this Section (see British Assoc. Reports), and which appear to curtail considerably the time during which seeds retain their vitality, and to multiply considerably the number of conditions which must be in force to allow of such retention for periods far shorter than those which have to be accounted for. A better instance of the expediency of checking the interpretations based merely upon observations however accurately made by putting into action experiments, cannot be furnished than by recording the fact put on record by Mr. Bentham, when discussing this question in his last year's address to the Linnæan Society.

"Hitherto direct observation has, as far as I am aware, only produced negative results, of which a strong instance has been communicated to me by Dr. Hooker. In deepening the lake in Kew Gardens, they uncovered the bed of an old piece of water, upon which there came up a plentiful crop of Typha, a plant not observed in the immediate vicinity; and it was therefore concluded that the seed must have been in the soil. To try the question, Dr. Hooker had six of Ward's cases filled with some of the soil remaining uncovered close to that which had produced the Typha, and carefully watched; but not a single Typha came up in any one of them." (Note in President's address, May 24, 1869, p. 72 of Linnæan Society's Proceedings.)

To this I would add that experiments with a positive result, and that positive result in favour of the second hypothesis, if hypothesis it can be called, are being constantly tried in our colonies for us, and on a large scale. I had taken and written here of the Polygonum aviculare, the Knot or Cow-grass—having learnt on the authority of Dr. Hooker and Mr. Travers (see "Natural History Review," January, 1864, p. 124; October 1864, p. 619), that it abounds in New Zealand, along the roadside, just as it does in England—as a glaring instance, and one which would illustrate the real value of the second explanation even to an unscientific man and to an unassisted eye. But on Saturday last I received by post one of those evidences which make an Englishman proud in thinking that whithersoever ships can float, thither shall the English language, English manners, and English science be carried, in the shape of the second volume of the "Transactions of the New Zealand Institute," full like the first, from the beginning to the last page, with thoroughly good matter. In that volume, having looked at its table of contents, I turned to a paper by Mr. T. Kirk, on "The Naturalised Plants of New Zealand," and in this, at p. 142, I find that Mr. T. Kirk prefers to regard the Polygonum aviculare of New Zealand as indigenous in New Zealand. Hence that illustration, which would have been a good one, falls from my hands. And I must in fairness add, that because one agency is proved to be a *vera causa*, it is not thereby proved that no other can by any possibility be competent simultaneously to produce the same effect, whatever the schoolmen, with the law of parsimony ringing in their ears, may have said to the contrary. I have dwelt upon this subject at this length with the purpose of showing how much difficulty may beset the settlement of even a comparatively simple question which involves only the use of the unassisted eye, or at most of a simple lens. The *à fortiori* argument I leave you to draw for yourselves, with the simple remark, that the question of spontaneous generation is now at least one to be decided by the microscope, and by the employment of its highest powers in alliance with other apparatus of all but equal complexity.

We come, in the second place, to say a word as to the extent of the influence which organic and living particles of microscopic minuteness, but solid for all that, have been supposed, and in some instances at least have been proved, to exercise upon the genesis and genesiology of disease, and so upon the fortunes of our race, and our means for bettering our condition, and that of our fellows. I need not refer to Dr. Sanderson's valuable report (just published in the "Privy Council's Medical Officer's Blue Book," Twelfth Report, 1870, p. 229) upon those contagion particles which he proposes to call by the convenient name, slightly modified from one invented by Professor Béchamp, of microzymes; for Dr. Sanderson is here to refer to the matter for himself and for us; and when this meeting is over, we shall all do well to lay to heart what he may tell us here and now, and besides this, to study his already printed views upon the matter. It may be perhaps my business to remind you that these views, so far as they are identical with Professor Hallier's as to the importance of those many minute living organisms, the micrococcus of his nomenclature, the microzymes of Mr. Simon's "Blue Book," were passed in review as to their botanical correctness by a predecessor of mine in this honourable office—namely, by the Rev. M. J. Berkeley, at the meeting held two years ago at Norwich; and that some of the bearings of the theory and of the facts, howsoever interpreted, upon the theory of evolution, were touched upon by Dr. Child in his interesting volume of "Physiological Essays," p. 148, published last year. . . .

There exists, as is well known, a tendency to involve all physiological into physico-chemical phenomena; undoubtedly many have been, and some more may still remain to be, so ordered, but the public may rest assured that in the kingdom of biology no desire for a rectification of frontiers will ever be called out by any such attempts at, or successes in the way of, encroachment; and that where physics and chemistry can show that physico-chemical agencies are sufficient to account for the phenomena, there their claim upon the territory will be acceded to, as in the cases we have been glancing at; and where such claims cannot be established, and fail to come up to the quantitative requirements of strict science, as in the cases of continuous and discontinuous development or self-multiplication of a contagious germ, and in some others, they will be disallowed.

(*To be Continued.*)

Home Correspondence.

The Teachings of Galls.—The reading of Professor Huxley's presidential address to the British Association for the Advancement of Science, delivered at Liverpool, has brought to my recollection a remarkable instance of the development of active organs foreign to the normal plant, and springing from a growth of pathological origin, viz., a gall produced by the ovipositor of a Cynips. In Germar's "Zeitschrift fur die Entomologie," 1843, vol. iv., p. 405, Professor Hartig describes the gall of Cynips lucida, Kollar, at the apex of young shoots of Q. pubescens as follows:—"The gall, like those of Teras terminalis, Rhodites Rosæ, and Cynips radicis, consists of an agglomerated cellulose mass, in which from three to thirty and more larval cells are imbedded. This many-chambered gall is in its whole circumference closely beset with thin stalks, each about 2 or 3 lines in length. Each stalk ends in a club-shaped open vesicle or gland (Druese) in which a sticky sap is secreted, which probably serves for nothing else than a protection from parasitic hymenoptera." Professor Hartig then proceeds:—"Here organs are produced by the sting of an insect; functions appear in the organs thus formed, although the latter are quite foreign to the Oak itself! It is a foreign organism which causes these formations! The rich indications this insect gives us concerning the degree of mastery on the plant are perhaps reserved for coming centuries to interpret, when we shall possess a more intimate acquaintance with the nature of the vegetable organism and

of the forces influencing it." I have but little to add to these significant words; the practical importance of this observation for the gardener is evident. The pricking of Figs and other fruits is not only done by natural caprification, but also by impatient man; his hand supersedes the insect in fertilisation; his knife grafts the choice variety on the wild stock; his influence on shape, colour, habit, and quality of vegetable growths is yearly becoming more extensive; and who will deny that a class of pathological forms, which has given us writing and dyeing fluids, various oils, the Elm-balm and Elm-water, and even eatable galls of different kinds, will not some day reveal yet greater benefits? It is much easier to disregard ancient medical lore, as for instance that of the Bedeguar, than to disprove it altogether; and worthless as they may be now, it is nevertheless true that the qualifications attributed to sundry galls by the older pharmaceutic chemists first directed attention to a field of inquiry, in which our present observers gather a gradually increasing and daily more valuable crop of practical results. *Albert Müller.*

Standard Apricots.—When a boy, visiting a relative a few miles north of London, seeing a standard Apricot in fruit, I determined that if the chance presented, I would try whether the climate of the county of Durham would ripen the Apricot upon a standard tree. After 20 years' lapse my tree (the Breda) was planted, and now, with 19 years' growth, I have my first good crop, the size of a large Walnut, thoroughly ripe a really pretty sight, and yielding say 5 or 6 pecks of very useful fruit. The tree has considerable shelter from a wall, and forest trees beyond. I shall be much interested in hearing the experience of other gardeners in the North of England as to the growth of the Apricot as a standard. *A Constant Reader, Darlington, October* 1.

Haricot Beans as Esculents. At p. 1313 I find a long article by "J. B.," on the Haricot Bean as an esculent. Every one has heard of the English baronet who wished to benefit his country by introducing the grinder's barrow—an ingenious contrivance, which, he thought, no one in his native land had ever seen because he had not. I am afraid that the Haricot speculation would turn out much after the same fashion. The word Bean is unfortunate, and should not have been used, as it is applied in "J. B.'s" letter to two very different plants, for the garden Bean and the field Bean belong to the genus Faba; but the Haricot, French Bean or Kidney Bean, belongs to Phaseolus; and the writer confounds the two when he says that the Bean analysed was perhaps the Mazagan Bean, a well known garden variety, but adds that we are assured the Haricot Bean is of much the same composition. The following plain statement of facts may be of some service to those who, like "J. B.," contemplate giving Haricot rations to poor people. An eminent English nurseryman once related to me his experience in this little matter as follows:—His father was a seafaring man, and late in life settled down at the water's edge to deal in provender. He had a corn-mill on the Severn, turned by the tide of that river. His avocations in early life called him to the ports of France and Germany, and being a shrewd practical man he turned his knowledge of the language and of the produce of those countries to account; and when he saw that Haricots were cheap there, he conceived the idea of benefiting his countrymen as well as himself, by introducing them, in rather a humble way at first, simply as food for pigs. Accordingly he bought a ship-load of them, and in due time ground them into fine meal, and gave the mess of Haricot porridge to the pigs; but judge of his disappointment, vexation, and loss when he found that the pigs turned up their noses at the mixture—the very swine would not eat it! This was, indeed, dearly bought experience of Haricot Beans as esculents. The fleshy roots of the Scarlet Runner are decidedly poisonous, as is well known; and although the unripe pods or green husks of the French Bean are eaten as a vegetable after being boiled, that has nothing to do with the nature and properties of the dried seeds. If I were asked for examples of this kind, I could point to the wholesome Poppy seed as a luxury, and to its poisonous capsule, containing the deadly opium in dangerous abundance. The Potato itself is a familiar example of food at one end of the plant underground, and nauseous, not to say poisonous, fruit at the other, in the form of the Potato-apple. When the late Mr. Dickens praised the pods of the Sugar-Pea, which he ate on the Continent as a boiled vegetable, he thought any kind of garden Pea would yield the same quality of pods, and hinted that English matrons should boil their Pea husks and eat them; on which the late Dr. Lindley raised his voice in favour of the pig, and said that we ought certainly to eat, as Mr. Dickens had done, the green pods of sugar Peas, but that we ought not to rob the pig of his perquisites. The husks of Peas had been given to swine from time immemorial, and they are so still, but the celebrated novelist had not been "posted up" in plant lore sufficiently to distinguish the Sugar Pea from the Marrowfats, &c., of garden notoriety. The German diet for the troops in the face of the enemy at the present crisis, as related by good authority, is little better than Pea porridge; and there are, moreover, other German dishes, as saur-kraut, that would hardly pay for the trouble of getting them introduced. "J. B." confounds fasting with abstinence; but if he will note passing events, the Germans with their Pea porridge will give him an excellent idea of an army abstaining, and Pea porridge is a splendid example of the French *soup maigre*, which, translated into the vernacular of my native country, would be bare-foot broth—vegetables *ad lib.*, boiled in salt and water. But be it what it may, if the Uhlan fills his belly with it his abstinence may be compulsory, but he has no right to say that he is fasting. Fasting at the present day consists of only one full meal a-day, and that not before mid-day, with collations consisting of about 2 oz. of bread for breakfast, and the same for supper. "J. B." thinks that there is no great mortification in fasting, and that the soul is not greatly afflicted in fasting from meat where Haricot Beans are allowed and duly appreciated. If "J. B." will give fasting a fair trial,—and the injunction is just as binding upon him as it is now, or ever has been, upon any other man,—he will no doubt find the 40 days of Lent no slight mortification; and whether his soul be afflicted by it or not, I warrant his body will look forward with anxiety for Easter. I fear this flight of fancy about fasting is treading on dangerous ground, for when "J. B." casts it up in derision of his fellow Christians professing different religious doctrines from his own, he may find, with very little research in the sacred Scriptures, that he is casting the aspersion right in the face of the Saviour himself, who not only fasted 40 days, and felt the pangs of hunger, but gave instructions to his followers how they were to fast, and has therefore left every man not only his precept, but his blessed example as well. *Alex. Forsyth.*

Fruit Harvesting.—During some years' experience in fruit growing, gathering, and harvesting, I have from time to time dotted down certain rules for my guidance, and with respect to gathering I find Rule No. 1 to be: "Avoid gathering in wet weather." Rule 2: "Never gather until the dew is off." And these rules I strictly adhere to. Many reasons might be given to show the soundness of them if it were necessary, and I very much doubt if one good reason can be given for gathering fruit wet. *B. S. R. Adam, The Manor House, Staines.*

How to Destroy Ants.—Happening to hear the other day in conversation that Guinea fowls were very fond of ants, it struck me that perhaps with using some precautions a few of them may be introduced into the Peach-houses of your correspondents, or perhaps, as they are not very commonly kept, some other kinds of poultry may have the same liking for ants. *H. G., Hereford.*

—— The best way to get rid of ants is, I believe, to allow them the company of three or four good toads. These creatures have a particular liking to the little busybodies, and will clear off a large number in a short time. *Ben. Matthews.*

—— Allow me to state, that if your correspondent, Arch. Orr, Ewing (p. 1282), will have a few dinner plates smeared over with syrup made from common sugar, and placed in his houses, they will soon be covered with the ants, which may afterwards be killed with boiling water. In a Peach-house here, where ants literally swarmed, I used the above plan, and in a few days scarcely one could be seen. *James Bell, The Gardens, Strathfieldsaye.*

The Plague of Black Flies is general. My Peach, Nectarine, Plum, and Cherry trees have been blackened by them. Whilst my servant was syringing the trees, the Rev. Mr. Miles, who lives near Dorchester, called to see the gardens, and he said his trees were also blackened with them. I observe on the leaves of the above trees a great number of small, green insects, and also some with a red tinge. Has Mr. Bennett observed any on the leaves of his trees. If he has observed them, can he inform me what they are? *W. F. Radclyffe.*

—— The extraordinary plague of small flies first visited here about three weeks since, but not thick enough to cause any alarm. They have now increased to a fearful extent, so much so, that the atmosphere is thoroughly charged with them, and vegetation is suffering terribly; indeed some of my Peach trees, which have been remarkably clear and healthy all the summer, and promised to carry their foliage late in the autumn, have been so attacked by this formidable enemy, that their leaves are now prematurely falling. The Cabbage tribes are also literally infected with them. I fear the plague is general in this district, as I hear great complaints of the Swede crop being nearly destroyed by them in places. They have also committed sad havoc upon the Hops in this neighbourhood where late in picking. *Thomas Young, Standford Court Gardens, Worcester.*

—— I have sent for your inspection some leaves of Broccoli and Savoy, on which you will find a numerous colony of aphides, which at this time are committing sad havoc on all the cultivated varieties of the Brassica family. I think I may safely say that hundreds of acres of Swedes and other Turnips are going down before it in this county. The foliage curls up, turns yellow, and falls off. In many places where a month ago fine green fields of Turnips were to be seen, they now have a very brown or patchy appearance. In kitchen gardens matters are no better. Stalks of Brussels Sprouts, 2 feet high, are losing all their foliage and dropping down; and Savoys, Cabbages, &c., are sharing the same fate. To the market gardeners the loss must be very great, as I have seen large Drumhead Cabbages and Savoys rotting off before the insect, as though we had intense frost. At present I have not seen or heard of any remedy. Quicklime, soot, tobacco-water, and soft soap and quassia liquor, have been tried, but do not seem to have any effect in clearing the plants of the pests. Perhaps some of your correspondents might know of an effectual remedy, which I should be glad to have. *R. Maber, Sunderland.* [See "I. O. W.'s" remarks at p. 1341. Eds.]

Single Petunias for Bedding.—I am pleased to observe that a little stir is being made in other quarters in favour of these fine old, but now rather neglected bedding plants. Some years ago they were very popular for that purpose, but since the ungainly double kinds came into the field (these, however, proving utterly unfitted for bedding) the single ones have come into disrepute. I should much like to see gardeners reverting to their old love again, and although they would find it clothed in a somewhat different garb, yet it would be found none the less beautiful or acceptable for bedding purposes. The striped, ribbed, and blotched single Petunias rank amongst the prettiest and most effectual bedding plants that we have. They are most persistent bloomers, grow and flower freely alike in drought and moisture, but especially under the former are they to be commended. I have been astonished this past summer to note how determinedly a large bed of them grew, and continuously flowered, in spite of having been planted out in soil that was literally as dry as ashes, and getting no water after being first put out. For large beds, and especially in public parks and gardens, they would prove at once cheap and effective. As pot plants they deserve to be more largely grown, and would as neat bush plants, about 24 inches over, prove objects of great attraction at our flower shows. They are very easily cultivated, needing but to be started early, and receive plenty of pinching, to make capital specimens, with flowers that command the admiration of all beholders. *A. D.* [There are few more attractive bedding plants than the old Petunia phœnicea, one of the original types, from which the garden varieties have sprung. Its freely branched habit, slender growth, funnel-shaped not flabby flowers, and fine bright amaranth rosy colour, make it a model bedding plant. Eds.]

Harvesting Walnuts and Filberts.—I have for many years adopted the following plan, and with great success:—I procure an old beer barrel, knock in one end, and then sink the barrel in some dry and convenient place in the garden, leaving nothing but the mouth visible; into this I put my Walnuts, first having them shucked. I then cover the barrel with boards or any other material which will prevent the earth falling in, and cover the whole with about 3 or 4 inches of mould. The Walnuts are taken out as they are wanted, and the barrel covered in as before. I adopt the same plan with Filberts, only that I put them in husk and all, as gathered from the tree. In this way I have both Walnuts and Filberts in excellent condition until the following spring is far advanced. *B. S. R. Adam, The Manor House, Staines.*

Sandall's Plum.—This Plum was raised some 60 or 70 years since by the late Mr. Sandall, a market gardener, then living at Crabtree, Fulham. The original tree is now dead. I can vouch for the above, having lived in the neighbourhood for the last 40 years, and I have seen the old tree scores of times. It is, as you say, a good late Plum, but it is not a sure bearer, being surpassed in this respect by Prince of Wales, Victoria, and Mitchelson's (the last especially); and another thing against it (in these fast times), it is at least eight or nine years before it begins to bear. After that time it is a prodigious cropper, about once in three years. Any one having half-a-dozen sorts or so cannot do wrong in adding Sandall's, but for a small garden, where there is only room for one Plum, I would say, plant Mitchelson's. *Market Gardener.*

Is Bougainvillea glabra a Greenhouse Plant?—At p. 1282, Mr. Bennett, of Enville Gardens, states that this is not a greenhouse plant. I must differ in this instance from that gentleman, as for several years past I have seen it not only growing but flowering profusely after it had been planted out in the ordinary way of climbers. Only a few weeks since I saw it growing in this manner in the conservatory at Tyntsfield Hall, near Bristol, the residence of W. Gibb, Esq. It had already reached the height of 10 or 12 feet, and was a perfect mass of flower. The decision I came to then was that the plant is certainly the finest greenhouse climber we have, and may be fairly termed a greenhouse plant for exhibition or other purpose. Should any one require further information, I have no doubt Mr. Harrison, the gardener at Tyntsfield, will answer any questions with pleasure. *William Burton, Victoria and Paradise Nursery, Upper Holloway.*

Successional Cropping of Melon Plants.—Allow me to say a few words in reply to "Quercus." He says, "I quite endorse Mr. Wildsmith's views on this matter. . . . A second crop was my constant practice for years." But if he is in the habit of reading the *Gardeners' Chronicle*, he will remember the discussion first commenced with a fourth and fifth crop. Again, he tells us his second crops have often been

better and heavier than the first; perhaps the first did not deserve the name of a crop, as is often the case under mismanagement, while the plants are in bloom and at the same time in full vigour. Further, he asserts, "'T. C.' has made a mistake." In what? If in my not being aware that the system was in practice, I again refer him to the *Gardeners' Chronicle* of September 10, p. 1218. *T. C.*

—— As "T. C." still seems to have some lingering doubts as to the possibility of obtaining more than one crop of good Melons from the same plant, will he permit me to assure him that I have had the pleasure, in company with other horticulturists, of both seeing and tasting fruit of the third and fourth crops of Meredith's Hybrid Cashmere, as grown by Mr. Wildsmith at Heckfield; and, as far as our judgment went, both were pronounced to be in size, handsomeness, and flavour first-rate. Mr. Wildsmith has recently informed me that he has a fifth crop, also of fine fruit, and would have been pleased to have afforded "T. C." ocular demonstration of their quality, as he proposed. *Alex. Dean.*

Garden Peg.—I herewith submit to your notice a specimen of a new garden pin for pegging down Verbenas, &c., and more especially for layering Carnations, Picotees, &c. They are well japanned, and will not rust or corrode, and they are as cheap as any other pin used. The great advantage is the bow at the top, which enables one to draw the pin without disturbing the plant,—a matter of much importance in taking off layers. I have used them, and find they answer capitally. They are of my own design, and I purpose offering them to the trade and others. *Henry Yowell*, 95, *Ladywood Road, Birmingham.* [A capital peg for the purpose. The wire is bent so as to form a little loop at the top, above the hook, and this serves as a handle. Eds.]

Foreign Correspondence.

Crops in South Australia.—(*Continued from p.* 1317.)—Of *Almonds* till now very little has been thought, and in consequence these trees have been utterly neglected, because, as the phrase goes, "they won't pay;" but I am of a different opinion, since I have seen that the Almonds will form a profitable export. In the last London Prices Current the Jordan Almonds are quoted at 85*s.* to 240*s.* per cwt., and in their shells, 60*s.* to 70*s.* Is this not an encouragement to pay more attention to this, till now, neglected tree? which will grow in every locality—a tree which is satisfied with every soil, and will produce every year a bountiful return. We see hundreds, I may say thousands, of Almond trees scattered over the colony; we see trees nearly in every garden; but their fruits are worthless. I think two-thirds of the trees grown here are only seedling plants; naturally such never will produce a marketable fruit. The grafting knife should be used, and I would recommend the Jordan and Brandis varieties, which are much sought by the trade. I hope horticulturists as well as agriculturists will take this into their consideration, and it must be plain to them that Almonds will pay for export for the little trouble bestowed on them. There may be many nooks and corners on their property where almost nothing will grow. I can assure them the Almond tree will be satisfied with such spots; only they must not neglect trenching the ground first.

Ricinus or Castor-Oil Plant.—This tree, considered as worthless as the Almond, we see thrive in every locality, in every soil, poor or rich. We see it grow close to the coast in almost pure sand, covered with seed, and generally regarded as a nuisance. But the hundredweight of seed of this nuisance is noted, according to the last prices current, as being worth 10*s.* to 12*s.* The Ricinus, as I remarked, will grow where scarcely any other vegetation will grow, and such spots are generally found on farms. Why not plant them with Ricinus? After planting there is little or no trouble except gathering of the seeds, which can be accomplished by children; and if a tree brings only 3*s.* to 4*s.* a year, it is worth the little attention bestowed on it.

Mustard furnishes, I may say, a very important, and, I believe, a paying article of commerce, and I am satisfied it would thrive with us in all our districts, if it was not for the pest of the colony—the aphis. The Mustard plant belongs to the same natural order as the Cabbage plant, the Cruciferæ, whose representatives are, without exception, so unmercifully attacked by this scourge, and I fear the Mustard plant would not escape its ravages; but as Australia is the land of anomalies, my fear may be premature, and the aphis may, after all, not do so much harm to the plant as I fear. The northern plains would probably be well adapted for the growth of the Mustard, as the plants, in too rich a soil, would grow too luxuriant in their stalks and leaves. If we consider the great quantity of Mustard imported into this colony, there is no doubt the cultivation of the plant would pay.

Rape.—If I did not fear the ravages of the aphis, as this plant belongs to the same natural order as the Mustard, I would strongly recommend the culture of this most valuable oil-producing plant, as its oil maintains high prices in the European markets, in consequence of the crops on the Continent not being with surety depended on, as they are often destroyed by frost or snow, which calamity we have not to fear in South Australia.

Sunflower.—The extensive culture of the Sunflower, especially in Russia and Germany, is a fact. The most profit from this plant is gained from the seed, which contains 40 per cent. of a sweet oil, only second in value to olive oil. It is now more than 200 years since this valuable plant, a native of Peru and Mexico, was introduced to Europe, and, strange to say, until now its valuable qualities were never brought to account. The Russian husbandmen were the first who bestowed their attention on the useful oil which the seeds contain. They commenced the cultivation of the Sunflower first on a small scale, planting the seeds in nooks and corners, on the sides of walks, &c. The value of the oil soon became known, and was more and more appreciated, so that at the present time the cultivation of the Sunflower in Russia is carried on to such an extent that already, in the year 1866, more than 100,000 cwt. of Sunflower oil was manufactured, the value of which was one and a-half million roubles. The third part of this oil was exported to the Prussian port of Stettin, where it was rapidly sold with rising prices. This export from Russia, and the steady increase of the culture of the Sunflower there, opened the eyes of the German farmers, and they began the cultivation of the Sunflower with the same profitable result. The oil, as I already mentioned, is only second to the Olive oil, and is not only used in housekeeping as the former, but mostly as a lubricator for the delicate machinery of textile fabrics which increase throughout Europe, and which in consequence have increased the demand for the expensive Olive oil. From the stalks of the plant the Russians manufacture a valuable potash, the residuum is used as oilcake for fattening cattle, and the leaves of the plant for manure. Should not this profitable culture of the Sunflower in Russia and Germany also be an inducement to our farmers to introduce this paying branch of industry to our colony? Climatic difficulties to the growth of the Sunflower do not exist in South Australia. We see the Sunflower, with its smiling face, in our gardens, thrive most luxuriantly in every kind of soil; the only fault that could be found with it is, that it exhausts the soil; yet this could be remedied by manure. Would it not be desirable that experimental trials should be made this season? Let us begin, like the Russians, and plant the seeds first in nooks and corners; and should it succeed, cultivate it more extensively. It may become in the future as profitable to South Australia as it is at the present time to Russia and Germany, and it is to be hoped that the farmers will give their earnest attention to this so important branch of industry.

Olives.—I think there is scarcely any country where the Olive thrives better than in South Australia; also in regard to the quality of the oil produced. Very little care has been hitherto taken in regard to the manufacture of the oil, because it was considered that it would not pay. I hope better days will dawn for our Olives. Considering the great number in the colony, they should be turned to a better account, as a profit would be obtainable from them.

Canary Seed.—This is another plant whose culture till now has been entirely overlooked by our farmers, and which I am sure will thrive all over the colony. It is a fact which is to be wondered at, if we consider the enormous prices often paid for it in the colony, and which not seldom have risen to 2*s.* and 2*s.* 6*d.* per lb. I think the generally ruling price—3*d.* to 4*d.* per lb.—would leave the grower a fair margin for the little trouble in cultivating it, and it is a plant which would be satisfied with any soil and situation.

Gram, Vetches, Yellow Lupin, and Maize.—With the exception of Oats and Barley very little attempt has been made by our farmers to grow other grain for cattle. I am most sanguine of the profitable growth of grain in this colony; and we have to thank his Excellency, who takes so great an interest in our agricultural pursuits, for the introduction of this important plant. "Gram (says the *Inglewood Advertiser*) bids fair to be ranked among our profitable products ere long. Its value as horse feed has long been acknowledged, and the possibility of growing it is now beyond a doubt. Some time ago Mr. J. Roberts, who cultivates one of those little patches of ground that dot the clearings made from the scrub here and there, planted a few rows of the valuable East India Pea, and now he has a capital crop nearly ripe. The plants look strong and healthy, the drought notwithstanding, and are covered with filled pods. On one plant, covering not over 4 inches of ground, no less than 139 full-grown pods were counted. The successful cultivation of this plant would be a great good, and the attention of farmers can be very fairly directed towards it. The yellow Lupin has some years gained on the Continent a high fame with the farmers; in fact, it has supplanted the Oats, Vetches, and other horse feed, as a plentiful and wholesome fodder, in its green state as well as the seeds. The cultivation of Maize is also overlooked, which I am sure will thrive in the South profitably."

Lentils.—This is a plant, I believe, very little known as food in England, but thought much of on the Continent, where it is cultivated to a great extent as one of the most profitable crops, as it thrives well even on stony and barren soils, and may be admirably adapted for certain districts in our colony. The Lentil has a traditional history, not alone on the Continent, but also in Arabia, where it is grown still more extensively, being considerably used in the preparation of the dish for which Esau sold his birthright to Jacob, as stated in the 25th chapter of Genesis.

Capers.—There is no doubt we could produce this so-much-sought-after luxury equally well as in the southern part of Europe. In the neighbourhood of Toulon it is cultivated in orchards in the intervals between Figs and Olive trees. As a pickle the flower-buds of the Caper are in great esteem, and form a great article of commerce throughout Europe. In the Mediterranean the flower-buds of the Caper are gathered just before they begin to expand, which forms a daily occupation for children during six months, when the plants are in a flowering state. As the buds are gathered they are thrown into a cask, among as much salt and vinegar as is sufficient to cover them, and, as the supply of Capers is increased, more vinegar is added. When the Caper season closes the casks are emptied, and the buds sorted according to their size and colour, the smallest and greenest being reckoned the best, and put in smaller casks of fresh vinegar for commerce, and in this state they will keep for five or six years. Considering the little work the growing of this important commercial article involves, it would be worth while for our horticulturists, especially in the gullies, where this plant will grow most luxuriantly, to make the attempt to cultivate the true Caper (Capparis spinosa).

Cochineal.—I am sure every one of us is acquainted with the cochineal insect, which produces the splendid, valuable, and much-used dye called "carmine," and of which Mexico and the West India Islands export large quantities every year. The trade is likewise supplied with the same article from Brazil and East India, but Mexico furnishes the largest quantity, and at the same time the finest quality. Till the year 1725 the breeding of the cochineal insect was entirely confined to Mexico; and the Government, with the strictest care, kept it a secret; and till then it was generally believed in Europe that the cochineal was not an insect, but a kind of seed. In the year 1785 Theirre de Menonville, a Frenchman, with the greatest danger of his life, brought a few living insects to French Domingo, where they soon were acclimatised. During 1827 the insect was, by Bertholet, introduced to the Canary Islands, and lately with the best results into Corsica and Spain. If the insect thrives well in Spain and Corsica, why should it not do the same in Australia? Both kinds of the cochineal plant, Opuntia Tuna and Opuntia cochinillifera, which I introduced by raising from seed, grow luxuriantly in the borders at the Garden, without having the slightest care bestowed upon them; this gives the fact that the plant will thrive in South Australia. The second and most important question is how to introduce the insect. This could be done only on living plants, in so-called Wardian cases. I understood that Sir George Grey, when Governor in New Zealand, introduced the cochineal insect there, but what became of them I have no information. I was also informed that his Excellency sent some insects to the Melbourne Botanic Garden, but they were lost. This is not the place to give a description of the treatment of the cochineal insect and the preparation of the carmine; but to give you only one instance of the greatness of the cochineal trade, I will only mention that the export of cochineal alone from the Mexican province of Oaxaca amounts to three-fourths of a million dollars annually. Now, assuming that 1 lb. of cochineal is worth 10 dols., and that 70,000 insects make a pound, they must rear an immense quantity of insects. Not that I am sanguine of its success in this colony, but we should try it. It is true the discovery of the splendid aniline colours has done the carmine trade some harm; notwithstanding, it is still a most flourishing trade.

(*To be Continued.*)

Societies.

Royal Horticultural: *Oct.* 5.—W. W. Saunders, Esq., F.R.S., in the chair. The usual preliminary business of the meeting being concluded, the Chairman called upon the Rev. M. J. Berkeley to address the meeting (a very crowded and somewhat noisy one), first stating that, with respect to the Fungi, such exhibitions were of great importance, because the eye must be educated to distinguish the edible from the poisonous species, and it was further necessary to state that the names given to the specimens exhibited were correct; but the eye must be made well acquainted with the forms and characters of the different species before it could be hoped that they would come more generally into public use.

Mr. Berkeley, before noticing the Fungi, called attention to Lord Londesborough's beautiful new variety of Dendrobium chrysotis, a plant which attracted considerable notice at the last meeting, and stated that it was undoubtedly a distinct variety, and totally different from D. fimbriatum, with which the plant first shown was at one time thought to be identical. Several diminutive but very pretty Orchids, shown by the Chairman, were next commented upon, especially Trichoceras parviflorus, the flowers of which were so much like an insect as to be a good model for making artificial flies, and he (Mr. Berkeley) had no doubt they would be "very killing." The beautiful group of Retinosporas, shown by Messrs. Standish & Co., were then referred to as being most valuable Conifers, from their being nearly, if not quite hardy. A polished specimen of "Cocacula" wood, a new product from Panama, was then shown to the meeting as being very handsome for cabinet

work, but though the wood was highly coloured it afforded no dye. Mr. Berkeley then, referring to the Fungi, remarked that a specimen of the rare Hydnum coralloides was shown, as well as a fine specimen of the dry-rot Fungus (Merulius lacrymans) which was by far too common, and should be immediately burnt when found. As a remedy against this Fungus, it was mentioned that an application of a saturated solution of corrosive sublimate would prevent its appearance for a number of years, but that creosote was found to be far more efficient. After alluding to several other rare or doubtful species, the speaker said that it was absolutely necessary that every one should have some knowledge of them before eating them, though the same remark applied equally well to such plants as Watercress and Horse Radish, for which Cicuta and Aconite had been mistaken. Some coloured diagrams of edible and poisonous species, made by Mr. W. G. Smith, who has done much to increase the knowledge of these plants, were then shown. They are published by Mr. Hardwicke, of Piccadilly, and were recommended to be used in schools, as they could be obtained at a reasonable cost. Mr. Berkeley then concluded by adverting to some points in the address of Professor Huxley at the meeting of the British Association at Liverpool.

The Chairman, having proposed a vote of thanks to Mr. Berkeley, which was carried unanimously, called on Mr. William Paul for some remarks on the Roses exhibited by him.

Mr. Paul said: The Roses now before you are part of a collection which is intended to bloom from the present time to Christmas. They are all Tea-scented Roses, and this is the third time this year that they have been covered with flowers—first in May, again in July, and now in October. The flowers now out are but the beginning of the third series; the later buds on the plants will continue to unfold for a period of two or three months. The plants have been kept constantly under glass, although I do not hold this to be an indispensable condition of success. I have flowered Tea-scented Roses equally well out-of-doors up to this period, but from October onwards it is best to place them under glass, or the frost and rain may mar the beauty of the flowers, if they do not destroy them. Of all Roses, the Tea-scented varieties flower the most continuously and abundantly in the autumn and winter. The plants now exhibited were kept in a cold greenhouse during last winter, the frost barely excluded. They were pruned in January; and after the first flowering, which took place in May, was over, the flower-spikes were cut off, and the plants were rested by withholding water. A new growth shortly followed, producing the second flowering in July. The flower-spikes were again cut off, and the plants again rested by the agency of drought. The third growth took place in August, and the commencement of the third flowering is now before you. These flowers are not so large as those previously produced, but they are valuable, and will become more so as the flowers out-of-doors grow fewer and ultimately disappear. In future a little heat will be employed occasionally to mitigate the effect of the superabundant moisture of autumn and winter.

Floral Committee.—Mr. J. Fraser in the chair. This was another very successful autumn meeting, beautiful from the fact that Mr. William Paul, Waltham Cross, exhibited a fine group of Tea Roses, which are now blooming with him for the third time this season, and interesting on account of the varied objects shown by other exhibitors. In the group of Roses shown by Mr. Paul, the following varieties especially were in fine condition:—Monsieur Plaisir, Madame Maurin, Maréchal Niel, Monsieur Furtado, Madame Falcot, Madame Villermoz, Souvenir d'un Ami, Alba rosea, and Madame Margottin; with these came a collection of cut blooms, to both of which Special Certificates were awarded. From Messrs. Veitch & Sons came a miscellaneous group of plants, including the beautiful Veitchey, C. Dominiana lutea, C. devoniensis, and Rodriguesia secunda, and the following, to which First-class Certificates were awarded:—Platycerium alcicorne majus, a large bold-foliaged and free-growing form of the Stag's-horn Fern; Adiantum Capillus-Veneris maximum, a very fine seedling form; and Corypha Martiana, a handsome Palm, with large, erect-growing foliage. A Special Certificate was also awarded to the collection, as well as to a group of the handsome, close-growing, golden Retinospora obtusa aurea nana, from the same firm, and which the late Mr. John Veitch always noted as the best of all the varieties he had seen in Japan. Mr. Green, gr. to W. W. Saunders, Esq., had a small group of pretty little Orchids, comprising the whitish, purple-flowered Paphinia cristata, Macradenia triandra, small, white and green; Restrepia antennifera, Trichoceras parviflorus, with flowers wonderfully like a large hairy fly; Spiranthes margaritifera, with one spike of spirally arranged pinkish flowers; Epidendrum nocturnum, white; and an exceedingly fine form of Miltonia spectabilis Moreliana, with flowers measuring 5 inches by 4 inches. A special award was voted to the latter plant, and also to the collection. From Messrs. Backhouse & Son, York, came a dwarf silvery-leaved Pyrenean Senecio named argenteus, with deeply lacerated leaves, which was deemed worthy of a First-class Certificate; whilst to a dwarfish round-headed densely-flowered species of the Michaelmas Daisy, Aster longifolius var., pinky lilac, a fine border plant, sent by the same firm, a Certificate of the second class was awarded. Mr. W. Moore, gr. to C. Leach, Esq., Clapham Park, had a Special Certificate for a beautiful collection of Nerines, comprising N. Fothergillii, N. Fothergillii major; N. flexuosa, N. coruscans, N. coruscans major, and N. rosea, with several fine seedlings, raised between the above, all well-grown and extremely handsome as autumn decorative plants. Messrs. Standish & Co. were also awarded a Special Certificate for a collection of 24 species and varieties of Retinospora, all more or less beautiful subjects for planting in pleasure grounds, and, moreover, considered to be perfectly hardy. Messrs. Cripps & Son, Tunbridge Wells, exhibited a golden form of Cupressus Lawsoniana named lutea, taken as a sport in 1867; and a collection of cut flowers of a new race of late-blooming Clematises. To Mr. Denning, gr. to Lord Londesborough, a Special Certificate was given for a very fine broad-petaled variety of the new Dendrobium chrysotis, exhibited at the last meeting. In the flowers on the present plant the petals are not only broader but thinner in texture, which latter may be due to age; and the colour, a bright orange-yellow, is more evenly distributed; while the plant is totally different in habit from D. fimbriatum, of which the plant first shown was supposed to be a form. It had eight well-grown spikes, and was certainly a most beautiful object. Messrs. E. G. Henderson had a First-class Certificate for Wigandia imperialis, a large deep green foliage plant for subtropical gardening, and for a new, very pretty, richly coloured tricolor Pelargonium, named Miss Goring. With the above came a group of Nerine sarniensis, a collection of winter-flowering Carnations; Sedum Fabarium purpureum, a purplish-flowered variety of S. spectabile; Aster amelloides (Bess.), a very attractive border plant; and Pleroma macrantha floribunda, very fine deep purple, and a free bloomer, to which a special award was voted. Mr. J. Parker, Victoria Nursery, Rugby, had a Second-class Certificate for the golden-edged Ivy-leaved Pelargonium, named Golden Queen; and to Mr. C. J. Perry a similar award was made for Dahlia Prince Imperial, dull orange, with rosy centre; and Certificates of the first class were voted to Mr. Rawlings, Romford, for Dahlia Monarch, a fine large flower, of a rich deep velvety maroon colour; and to Mr. G. Parker, Maiden's Green, Winkfield, to Dahlia Yellow Standard, a large flower, but coarse, and not well finished.

Fruit Committee.—G. F. Wilson, Esq., F.R.S., in the chair. At this meeting, which was probably the best of the year, prizes were offered by the Society for collections and single dishes of Black and White Grapes; and by the Rev. George Kemp, a member of the committee, for a dish of Grapes, consisting of 6 bunches of any variety, grown in the open air against a wall without any protection whatever; and the result was a better display of Grapes, and consequently a stronger competition, than has been called forth for some time. Especially was this the case in regard to the open air Grapes, no less than 15 dishes being shown, a number greatly in excess of former years; and the thanks of the Society, as well as of all interested in horticulture, are due to the rev. gentleman for his liberal encouragement of this branch of Vine culture. Several varieties of Black Grapes were shown, for the most part well grown and clean, but not nearly so good in flavour as the White Sweetwater and Royal Muscadine; indeed, in all cases the White Grapes were decidedly the best—a hint well worthy the attention of intending cultivators. The 1st prize was taken by Mr. Hepper, gr. to C. P. Millard, Esq., The Elms, Acton, with small, neat bunches, but well ripened, of White Sweetwater; and Mr. J. Morris, Francis Court, Broad Clyst, Devon, who had good bunches of Royal Muscadine, came in 2d. The best collection of Black Grapes came from Mr. Bannerman, gr. to Lord Bagot, Blithfield, who exhibited fine examples of Barbarossa, Mrs. Pince's Black Muscat, Lady Downe's Seedling, and Blithfield Seedling, a variety with immense round berries, resembling Plums, and moreover possessing an excellent flavour of the Hamburgh character. This appears to be a very promising novelty. Messrs. Lane & Son came in 2d, Mr. Douglas, gr. to F. Whitbourne, Esq., and Mr. Laytham, gr. to Messrs. Bertram & Roberts, Rockhills, Sydenham, also competing. For the collection of White Grapes, Messrs. Lane & Son and Mr. Douglas were adjudged equal 2d awards. Mr. Wattam, gr. to C. Longman, Esq., Shendish, Hemel Hempstead, had the best bunch of Black Grapes, a very fine one of Black Alicante, weighing 4¾ lb.; and Mr. Laytham was 2d with a good example of the same variety. A remarkably well finished bunch of Muscat of Alexandria, shown by Mr. Turner, was placed 1st in the class for White Grapes. Mr. Wattam coming in 2d with a bunch of the same variety weighing over 5 lb., but not so well ripened. Mr. Paul again contributed specimens of several varieties of seedling Grapes, and Mr. Wells, Southend, had several dishes of Black Hamburgh and Muscat Hamburgh, grown in "Well's Patent Ground Vineries," to which latter a Special Certificate was given. A similar award was also made to Messrs. Rivers & Son for a collection of small Apple trees on the Nonesuch Paradise stock; to Mr. A. Colbourn, gr. to J. Blyth, Esq., Woolhampton, for a dish of exceedingly fine Salway Peaches, from a tree planted in an ordinary house in 1858, which this season has produced over 700 fruit nearly as fine as those shown; to Mr. Scott, Merriott Nurseries, Crewkerne, for a collection of 140 varieties of Pears, nearly all new; to Mr. R. C. Halse, Addison Road, Kensington, for two dishes of Apples; to Mr. Cornford, gr. to H. Streatfield, Esq., Chudingstone, for a dish of fine Walburton Admirable Peaches, and a collection of Apples; and to Messrs. Carter & Co., for a large collection of Beet, Mangels, Potatos, and Carrots, &c. Mr. J. Garland, gr. to Sir T. D. Acland, Bart., Killerton, Devon, showed a specimen of Doyenné du Comice Pear, one of the very best winter dessert kinds, which weighed 1 lb. 4 oz.

The display of edible and poisonous Fungi exhibited in competition for the prizes offered by W. W. Saunders, Esq., was not so extensive as on former occasions, which may perhaps be accounted for by the circumstance that the Fungus foray at Hereford took place on the following day, and some of the exhibitors no doubt reserved their forces for that occasion. The arrangement of the specimens exhibited was as bad as bad could be, with the exception of those staged by Mr. English, which were not only fine, well-selected examples, but were set up with considerable taste, the brilliant colouring of some, and the quaint forms of others, being set off by Moss and other garniture, which not only lent the charm of beauty, but imparted an appearance of reality and naturalness to the group highly to be commended. Among Mr. English's specimens of edible varieties were Agaricus (Psalliota) arvensis, the Horse Mushroom; Marasmius oreades, the Champignon, Agaricus (Lepiota) rachodes and procerus, Boletus scaber, Hydnum repandum, and others. Of poisonous kinds Mr. English exhibited Boletus luridus, Cantharellus aurantiacus, Lentinus cochleatus, a curious species, with a fluted stalk, and a spirally twisted pileus or cap, resembling a snail's shell, and having a powerful smell of aniseed; the gorgeous but very poisonous Amanita muscarius, and others. Mr. W. G. Smith's collection was illustrated by some grimly humorous labels, indicative of the untoward results likely to accrue from the partaking of those labelled "poisonous." The edible kinds, in like manner, were symbolised by a legend, the letters of which were made to resemble sirloin of beef, knives, forks, and other appurtenances of the dinner-table. Among Mr. Smith's collection were Peziza aurantiaca, Agaricus rutilans; and among the poisonous species Agaricus melleus, A. squarrosus, Russula rubra, A. (Amanita) muscarius, Lactarius vellereus, L. controversus, A. fascicularis, A. phalloides, Russula rubra, &c. Mr. Smith's edible kinds included Ag. procerus, the Parasol Agaric, Lactarius deliciosus, Ag. erubescens, Boletus scaber and edulis; the Beefsteak Fungus, Fistulina hepatica, Agaricus pantherinus, A. prunulus, A. grammopodius, &c. Messrs. Hoyle and Austen, of Reading, showed among edible kinds, A. nebularis, Russula heterophylla, Agaricus arvensis, A. melleus (shown in other collections among the poisonous kinds), Cantharellus aurantiacus, Helvella esculenta, Morchella esculenta, Lactarius deliciosus, and others. His collection of other species of botanical interest was very extensive. Messrs. Cripps, of Tunbridge Wells, sent a large specimen of the dry-rot Fungus, Merulius lacrymans, in fruit; and Mr. Orchard, gr. to T. Harris, Esq., The Priory, Wimbledon, a beautiful specimen of Hydnum coralloides. Mr. English and Mr. Worthington G. Smith were awarded equal 1st prizes, and Messrs. Hoyle and Austen were placed 2d.

Florists' Flowers.

It is a very unusual sight, indeed, to see Verbenas done well in pots. Occasionally they turn up at flower shows, and when seen, are generally among the worst grown things there. Some such an impression as this was left on the minds of those who saw the Verbenas in pots at the Great Show of the Royal Horticultural Society at Oxford. It was not for want of size in the pots that the plants did not look better, as they were of a type introduced by Mr. Albert Deane, of Colchester, some 12 years ago, and in appearance resembled a hybrid between a wash-hand-basin and a flower-pot. This pot has a wide saucer-like mouth, furnishing a large surface of soil, and the design originated in a desire to afford space for pegging down the plants to the soil, as if grown in a bed. It was also thought that the width of the pot at the top would enable the plant to exhibit, to a greater degree than it could do in an ordinary flower-pot, its natural habit; and further, the inventor thought, that as the plant was made so much smaller below, this arrangement would considerably lessen the weight, and by thus curtailing the amount of soil, prevent the plant from making too great a top.

The plants exhibited in these pots at Oxford did not appear in a condition to lead one to suppose the ends sought to be so gained were actually secured; and while the pots had a very ungainly, awkward, and even ugly appearance, the plants looked particularly unhappy. It seemed that the effect of the wide basin-like mouth was to furnish a large mass of soddened soil about the stalk of the plants to their manifest discomfort. Thus at Oxford was there illustrated one method of cultivating the Verbena in pots.

Six weeks later, the exhibition of the Banbury Horticultural Society furnished another illustration of the Oxfordshire mode of growing the Verbena in pots, and one so satisfactory that it well deserves a record, because of its suggestive value. The exhibitor was Mr. William Finlay, gr. to Colonel North, Wroxton Abbey, near Banbury. These showed what the Verbena could be made to become as an exhibition plant when well grown. The pots were 8 inches in diameter; the foliage clean (a rare occurrence with Verbenas on the exhibition table), robust, and plenty of it, and the flowers plentiful and fine. The varieties were Wroxtonii, a seedling raised at Wroxton Abbey Gardens by Mr. Finlay; Blondin, Blue King, White Lady, Caroline Smith, and Princess of Wales, all good, sturdy, close growing kinds, and well adapted for culture in pots. The plant of Wroxtonii had 64 trusses of bloom; Blue King, 60; Blondin, 55; White Lady and Caroline Smith, each, 47; and Princess of Wales, 30.

The mode of culture adopted by Mr. Finlay is a very simple one. Yearly the plants are raised from cuttings put in in the month of March, and when rooted, potted into 4-inch pots. These make sufficient growth, both of root and branches, to be potted into the blooming (8-inch) pots about May 1; and as soon as the roots get a good hold on the soil, they are placed in a frame having a slight bottom heat, till thoroughly rooted in the soil. They are then placed in a cold frame, air is given, and the plants are protected from the sun when the flowers are open. After the plants are well established in the blooming pots, a little weak manure is given them. The compost used by Mr. Finlay is made up of loam and leaf-mould, with which is mixed as much sand as will make it sharp. As a matter of course, there is a certain amount of pinching and tying-out proceedings, in regard to the performance of which definite rules can scarcely be laid down. *R. D.*

The Apiary.

Having brought our summary of bee life to an end, and given our readers an account of a hive which we know is constructed on right principles, besides having the commendation of the advanced bee-masters in America, Germany, and France, we must proceed to caution the novice not to make or purchase hives which are built longer than deep, because the combs may be constructed by the bees out of the line of each frame when made 13 inches long at the top. Besides, these frames are apt to allow the combs to fall out, when loaded with honey and brood, and they are not completely filled up with the sheets of comb. This the bees seldom can do in the first year of their swarming and taking possession of a bar hive, with nine or ten frames, but the shorter frames, having only the 9 inches within the bars, generally have the combs built by the bees immediately, in a direct line, on the waxed bar above, and within the frames, the combs being always attached to the sides. Thus three sides of the combs are fastened and secured, and the new wax will bear the weight when handled, as the combs must be, if raised daily for examination. But I must mention that, if old combs be fixed between the frames in which brood has been raised, of course the cocoons within the cells have made the wax sides stronger, so as to endure some amount of moving even in the long frames. The bees will build down to the very bottom bar in the second season in each frame, when each comb will be thus shown as set in a frame, 9 by 12 inches deep, the top rows of cells being elongated for honey-cells, the secondary or transition cells for pollen, or the kept-open cells for daily food, and all the true hexagonal cells for breeding purposes are built in the centre of each comb, the two outermost last combs generally having the drone cells. These breeding cells are always at one constant distance apart, and therefore draw out upwards very well, as the top deep combs are first out,—the one great distinctive mark of the bar-frame hive being, that no necessity exists for separating the sides of the combs from the sides of the hives, to which the bees invariably attach the combs for security, and which, in the Grecian bar alone, must be cut with a knife before each examination of a comb, and lifting out from the box or hive; whereas the bar-frame, with the combs within the frame, is never attached to the sides of the outer box or hive, as there is an inch space all round the bar-frames, and the combs are fixed within their respective frames. We have been thus explicit to prevent the novice being misled by the recommendation of new inventions or improvements, as the American bee-world seems to have gone mad with patents and diamond hives, &c.; but let bee-keepers rest assured none but those hives that approach nearest to the natural habitat of the honey-bee will give results satisfactory to the naturalist and bee-keeper, whilst each comb must be made to swing like the prophet Mahomet's coffin—separate, and in the air; whilst the bees can follow their natural instincts, and touch each comb's sides, without the power of sealing down the frame to the outer box or case. This outer case always being strong and weather-proof, gives at once an apiary in each bar-frame hive, requiring neither bee-house nor shed, but a few bricks to stand the box off the ground free from dirt and damp, with an open space in front.

We must conclude with the mode of filling this hive with bees this autumn. Now is the best time to operate upon the cottager's bees, and to transfer them to the bar-frames. The novice should guard himself with a veil, and a pair of worsted gloves drawn over an old pair of dog-skin gloves. Thus equipped, and having two empty straw hives, and an old cloth, long enough to wrap around the bottoms of the hives, gently raise the cottager's filled hive, containing the combs and bees, reverse it on an old tea chest or box (without a lid), and fix one of the empty hives over it, binding around the cloth, so that the bees cannot escape: then place the other hive on the stand from whence the stock was removed; into this all the stray bees will crawl; tap the chest or box with a stick, or rather drum upon the sides of the hives, but with care, in case you should detach the new combs from the sides of the hive: in about three minutes a grand rush of bees into the empty hive above the cottager's will be heard. When the bulk of the bees have thus escaped from the combs upwards, remove the hive on to the stand (where the first empty hive had been placed to receive the returning stragglers), and place this over where the bees had been driven from; close again and drum a short time, and if necessary give the bees some puffs of burnt rag or brown paper: this smoke will alarm them, and many more will ascend from the filled hive. After about three minutes reverse the hives in the box, and at once, removing the filled hive with the combs, insert a knife and cut the edges of the combs one by one, and, lifting them out—beginning at one of the short pieces—brush off with a duck's wing the bees into the reversed hive, and put away the combs in dishes. Some of the unsealed cells will let out the honey, which may besmear the bees to their injury, therefore have some water to wash the wing in from time to time. When all the combs have been cut out and removed indoors—for the attacks of the neigbouring stocks of bees will be immediate, and the removal of honey very great if not quickly done,—the discomforted and swept-off bees should be added to those already in the hive on the stand. To do this, merely spread the cloth removed from the hives, so as to reach the mouth of the hive on the stand; and then shake the bees out of the hive on to the spread part of the cloth, when they will all gradually ascend into the hive containing their companions. Thus half-a-dozen stocks may be operated upon, as not more than 20 minutes need be consumed in this work upon each. The hives may then be left until next day, when after mid-day, they can have a coarse cloth put under, and be tied around the sides—first having shaken three stocks into one hive, thus making two families of the six driven out of their full hives the day before. These may be transported to be put into the bar-frames, wherever the apiary may be arranged to become their permanent home. The combs which had been cut out having been carefully examined, the pure honeycombs should be separated from the pollen and brood cells, if any be found in the combs; and if so, these combs should be fixed at once with great care within the bar-frames, which operation we will explain in our next article. *M. D.*

Garden Memoranda.

Stoke Park, Slough (*continued from p.* 1223).—In the kitchen garden I had only time to take a hasty glance over the vegetable and out-of-door fruit departments, but I saw enough to satisfy me that there was abundance of everything, and that a proper rotation system of cropping had been carried out; and the gardens and walks were everywhere scrupulously clean and free from weeds.

Entering the glass department from the road on the north-east side of the mansion, I came upon a very compact group of glass structures, consisting of three ranges of pits, two span-roof fruit and plant houses, and behind these a lean-to Pine stove. The pits are about 100 feet long by 7 feet wide, and are principally used for bedding plants, forcing early vegetables, Cucumbers, Melons, &c. The two span-roof houses are about the same length as these pits, and 14 or 15 feet wide. The first of these, a Peach-house, has a walk through the centre, and a border on each side, about 2½ feet wide and perhaps 3 feet deep; and this is all the trees had to grow in. It was evident there had been fine crops gathered from them, and I never saw trees in better condition. This shows that a wide border is by no means necessary for large Peach and Nectarine trees, especially where they are forced early, the great advantage of inside borders being that the roots are perfectly under control, and can be fed with stimulants freely without causing the soil in the borders to become soddened or sour. The trees were trained on a neat half circular wire trellis overhead, from the surface of the border on each side. The hot-water pipes were also very judiciously placed just below the wall-plate of the house. Every part of each tree could be easily reached. These are undoubtedly the best constructed Peach-houses for early forcing I have ever seen. Two other divisions in this range are used for forcing early Cucumbers, Melons, Strawberries, &c.

The next range of houses is of about the same size as that just noticed, and parallel with it, and the pits in front. It is filled with a general collection of stove plants, Orchids, &c. The Pine stove is about 210 by 20 feet, and is one of the best Pine stoves in the country, filled from end to end with a clean stock of fine plants in various stages of development. Any man may well be proud of having had charge of such a lot of plants. They fully confirm the opinion so often expressed, that Mr. Richards is one of our best Pine growers. The range is in three divisions, and there is a good broad walk, both back and front, so that one may pass comfortably round the pit either to inspect or work amongst the plants. The first division is filled with fruiting plants, on some of which I noticed noble fruit in various stages of growth—Queens, smooth-leaved Cayennes, Charlotte Rothschilds—many of which will weigh, when ripe, from 5 to 9 lb.; all were in pots, about 10 inches in diameter. The back wall of this division was covered with a large plant of Bougainvillea glabra, which had been completely covered with its beautiful bright flowers. The second division contained a very fine stock of succession plants, put in last March. The third division contained a fine lot of healthy suckers just put in. In the fruiting house I noticed a fruit of Charlotte Rothschild coming up, which I should think will weigh not less than 10 lb. when ripe; the stem a little below the base of the fruit was nearly as thick as a man's wrist. I observed the same stoutness in the fruit-stalk in many other instances—a sure indication that the fruit will be large if properly finished. On leaving this fine range of pineries, Mr. Richards expressed his regret (and well he might) at leaving them to the care of other hands, after having brought them to such a high state of perfection; not that he feared they would fall into less skilful hands, but because he would be deprived of personally seeing his own expectations realised.

Near the north end of the Pine stoves is another large walled-in garden, in which are the vineries, late Peach-houses, plant-houses, potting-sheds, Mushroom-houses, &c. Most conspicuous amongst this group of houses is a span-roofed one, lately built, of large dimensions, called the Azalea-house. In this building are to be seen one of the best lots of Azaleas in this country. This being a plant Mr. Coleman is particularly fond of, he has spared no expense in procuring all the best varieties that could be had, and Mr. Richards has used his utmost skill in cultivating these handsome plants, for not a single specimen (and there were a large quantity of various sizes) could be seen but was perfectly healthy, and in the best possible condition. These fine plants when in bloom are taken up to the mansion, and must undoubtedly produce a magnificent effect in the large conservatory. This fine house is about 90 by 24 feet, and some 15 or 18 feet high in the centre.

The vineries, which are about 170 by 16 feet, the end house facing the west, contain a fine crop of Muscats, the bunches and berries good, and the crop regular. In an adjoining house was the remainder of what had been an excellent crop of Black Hamburghs, which could not be surpassed for finish. Passing through two more vineries, from which the fruit had been cut, I came to the large Peach-house, which has a double set of trees, on which was a large crop of fine fruit; the trees, though old, were in very good condition; this house is about 145 feet long and 18 wide. We next pass through a fine span-roofed plant-house, which contained a good collection of soft-wooded plants, and beyond this, a little further up the garden, is a conservatory containing Camellias, hybrid Rhododendrons, and various other plants. This brings me to the end of my notes on this most beautiful place, which I found replete with evidences of horticultural skill and in perfect order.—At p. 1223, for "Giant Azaleas" read "Ghent Azaleas." *T. W.*

Miscellaneous.

Town Gardening.—In the centre of London, amongst smoke and dirt, occupying the upper part of a house, with a broad staircase lighted from above, I have, at about 10 feet from the skylight, arranged around the walls the undermentioned plants, which live and flourish luxuriantly:—Scarlet Runner Bean, Heliotropium peruvianum, Scolopendrium vulgare (Hart's-tongue Fern), Blechnum Spicant (Hard Fern), Athyrium Filix-fœmina (Lady Fern), Osmunda regalis (Flowering Fern), Eccremocarpus scaber, Nasturtium (varieties), Mimulus moschatus, Cobæa scandens, Pelargoniums selected for foliage rather than flower, Fuchsias various, Isolepis gracilis, Convolvulus major, Lysimachia nummularia (Moneywort), Saxifraga sarmentosa (Mother of Thousands), Vinca major (Periwinkle), Tradescantia zebrina, Lycopodium formosum, L. apodum, and L. denticulatum, under bell-glasses. These plants cost in the streets and markets from 1*d.* to 1*s.* each. The compost I use is vegetable mould mixed with one-fourth part of fine white sand, pots well drained by potsherds and bits of charcoal. They are well supplied with water, in which every fourth day is dissolved ½ oz. of sulphate of ammonia to each gallon. The pots stand in porous red stands, from which the surplus water is drawn off by a siphon. When any dirt appears on the leaves the plants are carefully sponged. Such a utilization of a staircase might perhaps afford to others the same pleasure it gives to *An Attic Worker, in "English Mechanic and Mirror of Science."*

The Hanging Gardens of Babylon.—These have always been a mystery to all unacquainted with classical literature. It is generally supposed that these hanging gardens were either large floating islands, full of verdure and bloom, or else some specimens of elevated gardening on the top of public buildings in some special quarter of the great city. The real facts are these:—The great Babylonian king, Nebuchadnezzar, among other works to signalise his reign and promote peace, made hanging gardens. This work was undertaken to gratify his wife, Amyitis, a Median princess. Having passed her younger days in a mountainous region, she disliked the uniform level of the country about Babylon, and pined for the woods and hills of Media. The lofty rocks and various trees of this wonderful paradise were an attempt to imitate Median scenery. These gardens were high enough to overlook the walls of the city, and occupied a square 400 feet on a side. It has been a question how these gardens were supported at this great height, as it was, until lately, taken for granted that the Babylonians did not understand the principle of the arch. But it is now known that very perfect arches were built in Egypt, in Assyria, and in Babylonia centuries before Nebuchadnezzar's time, and so the question is simplified. The ancient Romans, when they had to carry a stone aqueduct across a deep ravine, sometimes built three or four tiers of arches, one above another, till the required level to which the water was to be carried was reached. In the same manner, only on a larger scale, were the hanging gardens raised. They built one storey of arches, covering the required space; on this was placed a second storey: and thus was storey after storey raised. A great mass of earth covered the top, and water was supplied from the Euphrates through pipes. Not only flowers and shrubs grew there, but trees of the largest size; some of them so large that their trunks, according to Quintus Curtius, were 12 feet (?) in diameter. The ascent to the gardens was by

steps, and on the way up, among the arches, were stately apartments, whose pleasant coolness the heat of the climate could little affect. *American Horticulturist.*

FAILURE OF THE PEACH AND APRICOT IN AUSTRALIA.—It has been noticed that, of late years, the Peach and the Apricot have become almost a failure, in contradistinction to former times of superabundance; the scarcity is to be traced to the want of rain, and so dry has been the cycle just closed—and we hope for a long time—that the wells, even in the hilly districts, have failed. During the last week heavy rains have fallen, and swamps and floods are the order of the day; creeks are "bank high," roads impassable, drains broken up. *Overland Telegraph.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

CULTIVATORS of tender plants should use great caution in regulating the mean temperature of their warmer houses, according to the decrease of natural light, so as not to permit a frost of more than ordinary severity to reduce the temperature so much as to risk checking the growth of any plants in such a manner as to injure them. As an illustration of what I allude to, I may refer to the tender *Phalænopsids*, on which are sometimes to be seen leaves varying materially in their dimensions the one from the other; the smaller ones, it is needless to remark, being the result of infelicitous treatment. Now, what is readily observed upon the face of the more tender exotic may have equal influence upon plants of much hardier constitution, even though these may not exhibit the proof so readily to the eye; therefore every growing plant which at this season requires artificial aid should have such an amount of direct and immediate attention as will enable these last leaf-growths of the season to become as perfect examples of their kind as possible—and this, it must be borne in mind, without in any way exciting any other plant undergoing its season of rest to make fresh shoots or leaves. Heat, however bright the sun may be, if an equivalent of air be afforded, will in no wise influence these requirements. It is injudicious air-giving, and keeping too close an atmosphere, that deranges the natural order of things. *Mignonette* sown a month or six weeks ago, and which has been properly thinned out, will now, if growing freely, need some slight support by being tied to small, neat sticks—not exactly to keep the young plants from breaking, but to prevent them from being blown about by the wind or otherwise loosened near the ground line, a matter of more importance than is generally supposed in connection with its successful pot culture. Reseda odorata eximia should be grown by every one who wishes to excel in pot culture; too much cannot be said in its favour for such a purpose, so very far is it in advance of the favourite old variety. Finish pruning all pot-grown *Roses* intended for early forcing, selecting good, robust eyes, but do not use the knife too severely. Give the final cutting-back or pruning-in to all stove or greenhouse *Climbing Plants* in all instances where light is an important consideration on behalf of the other more lowly inmates. This operation must, however, be performed very judiciously, as some subjects, such as *Kennedyas*, bloom in the ensuing spring upon such wood as is already formed, and should not therefore be cut-back more than is absolutely necessary. Have all kinds of protecting materials prepared so as to afford shelter to *Chrysanthemums*, which are now advancing to the blooming period.

FORCING HOUSES.

Now that we are fairly into the month of October, it may not be amiss to give a detailed account of the average mean temperature which should be kept up. The highest maximum during bright sunshine, aided by its direct heat, should not exceed from 80° to 81°, with a decrease of 7° to 8° during dull days, and when the heating medium has to be called more directly into requisition. The night temperature should not at any time average more than 61° or 62°. Use every possible precaution not to allow the bottom-heat in *Pine stoves* to exceed a safe mean. This will be all the more necessary at this time in proportion as new tan has been added lately, and this, with the accustomed turning over, will not fail to create a fresh warmth. It may be well to add here that fruiting plants which have just finished swelling their fruits or are ripening may safely enjoy a temperature higher than the above by some 5° or 6°.

HARDY FLOWER GARDEN.

The arrangements should now be complete in regard to the winter housing of every kind of half-hardy plant. To leave things to further risk will be very injudicious, however mild and open the weather may continue. Make the necessary preparation of a cold frame for *Shrubby Calceolarias.* This can be protected from the severest weather by placing in it a moderate thickness of good yellow loam and well sifted leaf-mould. The plants should be dibbled into rows 2 or 3 inches apart as soon as convenient after this date. All that is really needed, if they are to form robust plants, is so to plant them at this time as to ensure their rooting readily at or about the advent of the new year, which will be far better than inducing an earlier root formation, which only tends to induce autumnal growth at the expense of a free robust growth in the early spring. Such things as *Carnations, Auriculas, Pansies,* &c., grown in pots, and which have hitherto remained in an exposed position, should be placed permanently into cold pits, or other similar structures, there to be wintered. Give them air with the utmost freedom on all proper occasions. The earliest batch of *Roman Hyacinths* may be removed from under the cinder-ashes or other material, and receive a good soaking of strong manure-water, keeping them subsequently in a cool pit or so for a few weeks.

HARDY FRUIT GARDEN.

Those kinds of pot-grown *Strawberries* which have been properly prepared for very early forcing should now be removed under the cover of a cold frame, or similar structure, the more readily to ripen off their crowns. Do not withhold the necessary supply of root moisture, and afford an abundance of air. Most kinds of both *Apples* and *Pears* may now be gathered with perfect immunity from anything like shrivelling, so beneficial has the past fine weather been to them. If there are instances where more caution is required, it is to be met with amongst such varieties as Beurré Rance, Court-pendu Plat, &c. I have very recently adverted to the fact that fruit trees may now be transplanted with impunity. Choice should, therefore, be made without delay, and the necessary planting be done before a less propitious season arrives.

KITCHEN GARDEN.

I can add little to my former suggestions in this department. Following the past more than usually bright drying autumnal weather, much progress should have been made with the eradication of autumn weeds. When the wind is in the right quarter let rubbish-heaps be collected and burnt, for generally the combined aggregate of a summer's tidying finds expression in large heaps of refuse at this time. Cut away the old growth upon *Asparagus* plants at the ground line, clearing it away and well hoeing the ground subsequently. *W. E.*

TOWN GARDENING.

ONE of the very best bedding plants for town gardens is the *Pyrethrum Golden Feather*, and plants of this which have been growing out in the borders should be taken up, and be potted or planted in a cold frame; though they are tolerably hardy they still require a little protection during sharp weather. These make excellent plants to propagate from in the spring, and will be far in advance of seedlings. The *Echeveria secunda* and *secunda glauca*—the best kinds for town—should now be taken up and potted in sandy soil, at the same time taking off all the offsetts and planting them round the edge of small pots, to be wintered in a cold frame. Place more *Hyacinths* in glasses, as directed last month, to follow up in succession. *Chrysanthemums* should now be placed in their blooming position, so that they can be easily protected from frost, for if the buds are once touched with it they never swell after. They should, however, have all the air possible, and be supplied with liquid manure twice a week. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, OCTOBER 5, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
Sept. and October	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
29. Thurs.	30.23	55.4	55.2	55.0	99	4.9
30. Friday	30.29	55.3	53.2	51.1	87	4.2
1. Satur.	30.40	57.0	55.8	54.7	88	4.7
2. Sunday.	30.37	61.0	58.0	55.0	82	4.9
3. Monday	30.32	56.2	55.4	54.7	95	4.8
4. Tues.	30.35	54.8	51.8	51.2	100	4.2
5. Wednes	30.21	53.5	52.7	51.9	94	4.4

1870. MONTH AND DAY.	Temperature of the Air.					Wind.		Rain.
Sept. and October	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Mean of 30 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
29. Thurs.	70.8	46.2	24.6	57.6	+ 3.5	N.E.; E.N.E.	160	0.00
30. Friday	64.0	46.6	17.4	54.2	+ 0.2	E.N.E.	229	0.00
1. Satur.	60.8	41.5	19.3	51.7	+ 0.8	E.N.E.; E.	265	0.00
2. Sunday.	68.3	44.9	23.4	55.5	+ 1.7	E.	205	0.00
3. Monday	68.6	47.1	21.5	59.7	+ 3.9	N.E.; E.	155	0.00
4. Tues.	58.7	46.7	12.0	51.6	— 1.9	N.E.; Calm.	100	0.00
5. Wednes	58.1	46.4	12.0	51.3	— 2.0	N.E.; N.N.E.	95	0.00

Sept. 29 Generally cloudless till night. Very fine
" 30 —Variable amounts of cloud prevailed during the day. Fine.
Oct. 1.—Cloudless throughout. Fog in morning. Fine
— 2.—Generally cloudless. Very fine.
— 3.—A little cloud was prevalent during the morning. Cloudless in the afternoon and evening.
— 4—Cloudy till night, then cloudless. Fog and misty rain during the morning.
— 5.—Generally overcast throughout the day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, OCTOBER 1, 1870.

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean Fall of Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	75.1	33.5	41.6	73.0	39.1	33.9	54.8	0.00
Blackheath ..	71.0	37.1	34.5	69.1	41.1	25.9	55.7	0.00
Bristol								
Birmingham ..	71.6	37.0	36.6	69.7	13.0	28.8	55.6	0.00
Wolverhampton	71.2	40.2	31.0	67.1	41.2	25.9	54.5	0.01
Leicester ..	71.2	39.2	32.0	66.1	43.3	23.0	54.0	0.03
Norwich ..	71.7	41.2	30.5	67.9	43.6	24.3	56.0	0.00
Nottingham ..	73.7	37.0	36.7	68.7	41.6	24.1	55.5	0.00
Sheffield ..	71.0	37.0	34.0	66.4	42.2	24.1	53.0	0.00
Liverpool ..	70.1	41.8	28.3	66.1	47.2	19.0	55.9	0.00
Manchester ..	73.5	37.0	36.5	71.0	40.1	30.9	54.4	0.00
Salford	75.0	38.0	36.1	72.0	42.3	29.7	55.9	0.00
Bradford	68.8	41.0	27.8	65.7	47.3	18.4	55.3	0.00
Leeds	70.0	42.0	28.0	65.7	45.7	20.0	54.5	0.03
Hull	67.0	33.0	34.0	63.6	40.6	23.0	49.4	0.00
Newcastle ..	64.0	43.6	21.0	60.2	49.2	14.0	52.0	0.00
Edinburgh ..	68.7	42.0	26.7	..	..	..	54.8	0.00
Glasgow	66.8	38.5	28.3	..	..	..	52.7	0.00
Dundee	62.0	44.0	18.0	..	..	..	53.0	0.05
Aberdeen	67.0	45.7	21.3	..	..	..	53.8	0.01
Paisley	68.0	42.0	26.0	..	..	..	53.5	0.00
Greenock	69.5	47.0	22.5	..	..	..	55.8	0.00
Leith	69.8	41.8	28.0	..	..	..	53.0	0.02
Perth	66.0	42.0	24.0	..	..	..	53.2	0.00
Dublin	71.9	38.8	33.1	..	..	..	55.3	0.00

JAMES GLAISHER.

Notices to Correspondents.

*** Some of our correspondents have been much annoyed by applications having been made to them to purchase fruit, &c. It is understood that communications in the body of the paper are not advertisements, and the privacy of the writers of such communications should not be intruded on.

BOOKS: *Subscriber, Coventry.* "Thompson on the Vine," "The Culture of the Pine Apple," by D. Thompson, and Rivers' "Miniature Fruit Garden," the two former published by Blackwood, and the latter by the author, will suit you.

CAMELLIA BUDS DROPPING OFF: *A Subscriber.* Want of vigour appears to be the cause of your buds falling off, which we suspect is partly due to your not having supplied them with sufficient water during the growing season. If the soil is exhausted, and is not sour, give water liberally, with occasional applications of weak liquid manure; let the trees have plenty of light and air, and all may yet go well. See, pp. 52 and 1332 in our last year's volume.

CANNAS: *J. S. H.* The following are 12 of the best sorts of Cannas:—Green-leaved—C. Annæi, peruviana, Prémices de Nice, limbata, picturata fastuosa, involventia. Dark-leaved—C. metallicoides, nigricans, Bihorelli, Van Houttei, discolor floribunda, Rendateri. Any plant nurseryman should be able to supply them.

FUNGUS: *W. J.* Your specimens are a form of Leaf Manna, which is sometimes abundant in conservatories. *M. J. B.—W. B.* We are not aware that green butcher's meat is the effect of a Fungus. We believe that it is due to some chemical change. The change is sometimes extremely rapid, and quite different from that incipient stage of decomposition which is known in some counties under the name of sapiness (a word closely of Greek origin), which is accompanied by a Fungus. *M. J. B.*

GRAPES: *Subscriber.* The berries were considerably damaged in coming through the post. We can discern no traces of any worm. The berries are decaying and moulding fast, but that is owing to damp—a damp atmosphere in the house, and possibly a damp border. Keep them drier.

HEATING SMALL GREENHOUSES: *J. I.* would be glad to hear whether there are any stoves like "Hayes' Patent" suitable for a greenhouse 12 feet by 12 feet, which burn coke or coal, and consume their own smoke? Have any of our correspondents experience of such? Winter is coming on, he observes, and many like himself will be in want of such a stove. We know of nothing better than Trotman's Hotwater Gas-stove for small houses.

INSECTS: *C.* The Leopard Moth (Zeuzera Æsculi).

KEEPING FRUIT: *C. J.* Bran is not a bad material in which to pack Apples, so far as mere preservation goes. It is, however, somewhat liable to get damp, and apt to impart a little flavour to the fruit, of a musty character. We have used corkdust for the same purpose, and found it answer admirably. It is of such a dry nature that every particle of moisture is absorbed. There is no system of packing away fruits so good, however, as having them laid in thin layers on wooden shelves in some cool airy place. When massed in heaps together they get heated, and decay soon begins.

NAMES OF FRUITS: *H. S. D. Apples:* 1, Fearn's Pippin, splendid example; 2, King of the Pippins; 3, Thorburn's; 4, Brownlee's Russet. *Pear:* Duchesse Hélène d'Orléans.—*T. Jenkins. Apples:* 1, Ribston Pippin; 2, like Hollandbury—not quite sure; bad specimen; 3, Aunt Hannah; 4, Emperor Alexander. *Pears:* 6, Josephine de Malines.—*J. Y. W. Pears:* 1, Winter Nelis; 2, Beurré Superfin; 3, Easter Beurré; 5, Passe Colmar; 6, Forelle; 7, Beurré de Capiaumont; 9, Easter Beurré; 10, Doyenné d'Ete; 12, Althorp Crasanne; 14, Henri Capron; 16, Marie Louise; 17, Fondante d'Automne. *Apples:* 1, King of Pippins; 3, Fearn's Pippin; 4, Landsberger Reinette; 5 and 6, Scarlet Nonpareil; 7, Sturmer Pippin; 10, Old Nonpareil.

NAMES OF PLANTS: *J. M.* 1, Selaginella caulescens; 2, S. erythropus.—*B. M.* Tropæolum speciosum, S. and Z.—*P. H. G.* Maxillaria rufescens, Lindl.—*Subscriber.* Calycanthus occidentalis, Hook. and Arn.—

P. C. Amaryllis lutea, L., the "Autumne or Winter Daffodill" of Parkinson. "The Dutch florists export it under the title of Yellow Colchicum:" Bot. Mag., p. 290. As you say, it "is to be prized," and deserves to be more generally known *J. T.* The Wig plant, Rhus Cotinus.—*Joe.* 1. Litobrochia (Doryopteris) sagittata; 2, Pteris umbrosa; 3, Athyrium Filix-femina; 4. Polystichum angulare; 5, Lastrea spinulosa; 6, Blechnum Spicant; 7, Asplenium Trichomanes.—*T. C.* Quamoclit vulgaris.

ROSE-PINK BEDDING PELARGONIUMS. *Neph.* It is quite an indeterminate point which is the best. Some growers still hold to the old Christine for bedding purposes, and there is much allowance to be made for differences of soil and climate. Perhaps some of our readers, who may have formed conclusions on this subject, will give our querist the benefit of their observations.

SANDALL PLUM: *Mary, and others.* Apply to your nurseryman, who will procure it for you.

STRAWBERRIES: *J. H., Old Heath.* One of the most useful of all Strawberries is Vicomtesse Hericart de Thury. Sir C. Napier is recommendable as a large cropper and of large size. We would also recommend Dr. Hogg, President, La Constante, Sir Harry, the Rev. W. F. Radclyffe, Lucas, and Elton Pine.

WINTER-BLOOMING STOVE CLIMBERS: *D. B.* Bignonia venusta, Combretum purpureum, Ipomœa Horsfalliæ, Passiflora Lemicheziana.

WOODLICE: *S. S., Leicester.* Various remedies have been recommended for getting rid of these. A slight sprinkling of gas-lime will expel them from their haunts. You may also get rid of them by pressing the soil down round your beds, and pouring boiling-water on the pressed soil. A good trap is made by placing two boards, kept one-eighth of an inch apart, near the beds.

COMMUNICATIONS RECEIVED: S. L. M., Thanet yes- L. W. —I. M.—E. W. B.—P. C.

Markets.

COVENT GARDEN.—Oct. 7.

Trade continues exceedingly dull, with scarcely any variation in prices. Peaches and Nectarines have much fallen off in supply, some good late sorts being the only ones now offered. Pears now comprise, among leading varieties, Marie Louise, Bonne Louise, Gansel's Bergamot, and Duchesse d'Angoulême. Among Apples may be mentioned Ribston Pippin, Cox's Orange Pippin, Blenheim, and Kerry Pippin. Amongst flowers we have Asters, Fuchsias, Bouvardias, Pompon Chrysanthemums, Mignonette, Valota purpurea, and a few good Heaths.

Fruit.			
	s. d.		*s. d.*
Apples, p. ½ sieve ..	1 0 to 2 0	Oranges, per 100 ..	8 0 to 12 0
Figs, per doz. ..	0 6 — 1 0	Peaches, per doz. ..	4 0 — 8 0
Grapes, per lb. ..	1 0 — 3 6	Pears, per doz. ..	1 0 — 3 0
Lemons, per 100 ..	10 0 — 16 0	Pine-apples, per lb.	3 0 — 6 0
Melons, each ..	1 0 — 2 0	Plums, p. half sieve	2 0 — 3 6
Nectarines, per doz.	3 0 — 6 0		

Vegetables.			
	s. d. *s. d.*		*s. d.* *s. d.*
Artichokes, green, each	1 0 to 1 0	Herbs, per bunch ..	0 2 — 0 4
— Jerusalem, p. lb.	0 2 — 0 4	Horse Radish, p. bun.	3 0 to 5 0
Beet, per doz. ..	1 0 — 2 0	Lettuces, p. score ..	1 6 — 3 0
Brussels Sprouts, ½ sieve	3 0 — 3 6	Mint, per bunch ..	0 3 — 0 6
Cabbages, p. doz. ..	1 0 — 1 6	Mushrooms, p. pott.	1 0 — 1 6
Carrots, p. bunch ..	0 4 — 0 8	Onions, per bunch ..	0 4 — 0 9
Cauliflowers, p. doz.	1 6 — 3 0	Parsley, p. bunch ..	0 2 — 0 4
Celery, red, p. bun.	1 6 — 2 0	Salsafy, per bundle,	1 6
— white, do. ..	1 0 — 1 6	Shallots, per lb. ..	0 8 — 1 0
Cucumbers, each ..	0 6 — 1 0	Spinach, p. bushel..	2 0 — 3 0
French Beans, p. sieve	2 0 — 3 0	Tomatos, per doz. ..	1 0 — 1 6
Herbs, per bunch ..	0 2 — 0 4	Turnips, yng., p. bun.	0 4 — 0 6
		Veg. Marrows, p. doz.	2 0 — 3 0
Garlic, per lb. ..	0 4 — 0 6		

Potatos, Regents, 6*or.* to 8*or.*; Kidneys, 8*or.* to 12*or.* per ton.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
J. JONES AND SONS, 35, King Street, Cheapside, London, E.C.
Manufactory, 6, Bankside, Southwark, S.E.

Simplicity and Cheapness.

PLUMB'S HEATING APPARATUS.—The only effectual invention for Heating Nurseries, Conservatories, Offices, Greenhouses, &c. No fumes or smell. Particulars to be had of C. PLUMB, 21, Commercial Road, Lambeth.

A WEEKS' UPRIGHT TUBULAR BOILER for SALE, with Tubular Bars, &c., largest size, to heat 10,000 feet of pipe. Was only in use one month, house being pull. down. Price £25; put free from makers. Apply at 37, Marlborough Hill, St. John's Wood, London, N.W.

A NURSERYMAN, in the Provinces, is desirous of meeting with an ACTIVE PARTNER, with moderate capital. X., Messrs. Protheroe & Morris, Leytonstone, N.E.

To Gardeners.

NURSERY, &c.—A Gentleman, having a quantity of Glass and large Garden in the Seaside, well adapted for a Nurseryman, &c., is desirous of meeting with a Gardener who will work the same and pay himself.—For further particulars apply to Mr. RICHARDSON, Office, 204, Broad Road, Camden Town.

WANTED, a GARDENER, for the vicinity of Caterham, where the Lawn, Orchard, and Kitchen Garden comprise an Acre.—He must thoroughly understand his business, and possess a good character for industry, sobriety, and capability.—Address, stating last employer, age, and wages expected, J. N., Messrs. Dawson & Sons, Cannon Street, London, E.C.

WANTED IMMEDIATELY, an efficient BUDDER and GRAFTER, competent for Rhododendrons, Roses, Fruits, &c., on a large scale. Young Man preferred. State particulars and wages expected, &c., to ALEXANDER BROWN, Millport Nurseries, near Glasgow.

WANTED IMMEDIATELY, TWO ACTIVE YOUNG MEN, in a large Forcing Establishment, near London, where all the choicest of Fruits, Plants, and Flowers are extensively grown for the London Market. Wages, first year, 10*s.* per week, to be advanced annually, with Fire and lodging on the premises free. Fitchmen required. £20.—For particulars apply to Mr. DICKSON, Fiber St, Centre Avenue, Covent Garden, W.

WANTED, a WORKING BAILIFF, BAILIFF and GARDENER, or BAILIFF and CARPENTER, to superintend the general Management of a Country Place, Building Repairs, &c.—C. W., care of Miss Prince, Post Office, Bridport

WANTED, a single Man as GARDEN LABOURER. Thorough knowledge of the work necessary.—Reference to a Head Gardener. Wages 16*s* 6*d.* per week; 1*s.* allowed for Sunday Work.—W. P. ROBERTS, Holwood Park, Keston, Beckenham, Kent

WANTED, an experienced MAN, who thoroughly understands the Management and Rearing of Shorthorns, also preparing them for Shows. Wages £1 a week, and a cottage.—W. A., Mr. W. Ridgway, 169, Piccadilly, W

WANTED, an ASSISTANT CLERK.—Must have a good knowledge of the Names of Plants, and be qualified to Correspond.—Apply, in own handwriting, stating wages required, last occupation, and other particulars, THOS. S. WARE, Hale Farm Nurseries, Tottenham, Middlesex, N

Seed Trade.

WANTED, in a London House, a SHOPMAN, experienced in Counter-work, active, and of steady habits.—Apply, by letter only, to B., *Gardeners' Chronicle* Office, W.C.

Seed Trade.

WANTED, an ASSISTANT SHOPMAN, of good Address. One who has had some experience in the Flower Trade preferred.—DRUMMOND BROTHERS, 52, George Street, Edinburgh.

WANT PLACES.—Letters to be Post Paid.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen requiring Further particulars given on application to Messrs. R. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

FISHER, HOLMES, AND CO. can with confidence RECOMMEND to notice several experienced GARDENERS, of undoubted habits, varying in qualifications and wages. Engagements satisfactorily answered upon inquiry.—Handsworth Nursery, Sheffield

TO WHOLESALE SEED MERCHANTS.—A Gentleman, having a good connection in Cornwall among Seedsmen, wishes to add to his other business a COMMISSION for the SALE of SEEDS to the TRADE. Can give the highest references and security.—W. P. M., Hingan, Post Office, Redruth, Cornwall

GARDENER (HEAD).—Married, no incumbrance; thorough practical knowledge of the profession in all its branches. Good character.—A. D., Chesham's, 14, Grove Road, Holloway, N

GARDENER (HEAD).—Age 36, no family; has a thorough practical knowledge of the Cultivation of Vines, Pines, Peaches, Melons, and Greenhouse Plants, and the routine of the kitchen and Flower Garden. Can be well recommended.—M., Post Office, Potters' Bar, N.

GARDENER (HEAD).—Age 32, married, no family; thoroughly understands all kinds of Early and Late Forcing, Stove and Greenhouse Plants, also Flower and Kitchen Gardening. Good references.—A. H., 8, Rosedale Cottages, Albion Road, Hammersmith, W.

GARDENER (HEAD). Married, no family; has a good practical knowledge of the profession in all its branches, including Fruit, Flowers, Plants and Forcing. Early and Late Fruit, Vegetables, and the Culture of Stove and Greenhouse Plants. Three years' character.—A. B., 5, Randall's Buildings, Maytock Road, Clapham Junction

GARDENER (HEAD).—Age 33; thoroughly understands the profession in all its branches, including Pine Growing, Early and Late Forcing, Plant Culture, Flower and Kitchen Gardening. Good references.—A. H., 8, Rosedale Cottages, Albion Road, Hammersmith, W.

GARDENER (HEAD).—Age 43; has a thorough practical knowledge of the profession in all its branches. Has lived in first-class establishments in Perthshire and Scotland. Will be open for an engagement early in November. Satisfactory references can be given as to character and ability.—THOMAS MCDONALD, Gardener, Dinmore, Girvan, Ayrshire, N.B

GARDENER (HEAD).—JOHN WHITE, late Gardener (for 28 years) to Thomas Brand, Esq., Hillman Court, near Stockbridge, Hants, to Thomas Baring, Esq., M.P., and his predecessor, the late C. B. Wall, Esq., M.P., is desirous of obtaining a Respectable and Early Gentleman to engage Servants. Mr. White has had large experience in Pine Growing, Early and Late Forcing, Plant Culture, Flower and Kitchen Garden Management, and can recommend a most trustworthy and steady Man.—J. WHITE, Messrs. Thomas Rivers & Son, Nurserymen, &c., Church Street, Romsey

GARDENER (HEAD), to any Lady or Gentleman requiring a thorough practical Man.—Understands the Management of the Flower and Kitchen Garden, Greenhouse, Conservatory, and Orchard House, Early and Late Forcing of Grapes, Melons, Cucumbers, Mushrooms, and French Beans, &c. Can draw Plans and Lay Out and Manage Stock and Woods, if required.—C. H. S., 5, Packenham Street, Gray's Inn Road, Londonderry, W.C.

GARDENER (HEAD).—Age 33, married, no family; has held a situation at a Nobleman's summer residence, and taken entire charge of House, &c., when vacated: a similar situation, or otherwise, in a Nobleman's or Gentleman's family is desired. Has a practical knowledge of the profession in training of Fruit and Fine Fruits, Flowers, &c., including Flower and Kitchen Gardening. Five years in last situation. Both characters will bear strictest inquiry. J. W., 21, Bell Street, Maidstone

GARDENER (HEAD, WORKING).—A respectable Couple would be thankful to meet with a place by the 23d inst.; the Man as above, with 28 years' good practice. An offer preferred where first-class Early and Late Forcing and display are desired. The Wife could undertake the charge of Poultry or Laundry. A good previous character, with nine years' one from present place.—JOHN ALVEY, Gedling House, Notts.

GARDENER (HEAD), where two or three or more are employed.—Age 35, married; thoroughly practical in all branches of the profession. Seventeen years' experience. Good character.—H. C., Mr. Norris, Rose Cottage, Sarisbury Green, Southampton.

GARDENER (HEAD), where two or more are kept.—Age 35, married, no incumbrance; thoroughly understands Early and Late Forcing, including Vines, Strawberries, French Beans, Flowers, and Stove and Greenhouse Plants.—G. S., Wembly Park Gardens, Sudbury, near Harrow.

GARDENER (HEAD), or GARDENER and FORESTER.—Mr. PRICE can confidently recommend the above to any Nobleman or Gentleman desirous to engage a Steady, Industrious Gardener, a first-class practical Man. He has had 20 years experience in first-class places.—W. S., Mr. Price, Nursery, Exeter

GARDENER (HEAD), or GARDENER and FORESTER.—Has had many years practical experience in first-class establishments; thoroughly understands the Cultivation of Pines, Vines, Melons, Fruits, Flower and Kitchen Gardening, Management of Woods, and other duties of Agricultural Operations. Has years in present situation, and satisfactory reasons given for leaving.—D. CHARLES, H. Dickson, 21, Market Place, Manchester

GARDENER.—A Gentleman, making alterations in his establishment, wishes to recommend his Gardener as a thorough practical Man; can take the Management of Land and Stock, if required. Has lived in his present situation three years.—G. B., Neville Lodge, Friern Park, Whetstone, N.

GARDENER.—Age 35, married; thoroughly practical in the Cultivation of Vines, Pines, Peaches, Stove and Greenhouse Plants and Flower and Kitchen Gardening. High testimonials for character and ability.—A. A., 130, Clarendon Street, Westbourne Square, London, W.

GARDENER, married, two children.—A Clergyman, leaving his home, wishes most highly to recommend his Gardener. Thoroughly understands his work. Character quite unexceptionable.—Rev. R. CAMPBELL COLQUHOUN, Crockham Vicarage, Edenbridge, Kent, Surrey, S.E.

TO NOBLEMEN and GENTLEMEN.—WILLIAM HARRISON, Gardener (Head) for the last four years to the Hon. Admiral Dundas, now offers his services to any one requiring a thoroughly experienced practical GARDENER, well up in Plant, Fruit, and Vegetable Culture, for which he has taken about Seventy Prizes at York and Pocklington. Age 33, married. Can be highly recommended by several Gentlemen, and by his present employer.—WM. HARRISON, Radmere Wood, Abbots Bromley, Rugeley, Staffordshire.

GARDENER and ORCHID GROWER, age 30, married.—F. NEWMAN begs to offer his services to any Nobleman or Gentleman, as above. Thoroughly practical; can be highly recommended by the Messrs. J. Veitch & Sons, who have extensive collection of Orchids has been entirely under his charge for the last three years. Highest references from Mr. James Anderson, Gr. to F. Dawson, Esq., Meadowbank, Effingham, N.E.; also from Mr. J. R. Petch, Gr. to Sam. Mendel, Esq., Manley Hall, Manchester, having been Foreman under each, respectively, for upwards of two years.—Royal Exotic Nursery, King's Road, Chelsea, S.W.

GARDENER and BAILIFF, or GARDENER and STEWARD.—A Middle-aged Man of great experience can produce the highest possible testimonial from present situation, which he has filled many years.—G. R., Mr. William Paul, The Nurseries, Waltham Cross, Herts

GARDENER (UNDER), in a First-class Establishment.—Age 20, married; will bring a small Premium.—E. C., 15, Draycott Terrace, Sloane Street, Chelsea, S.W.

GARDENER (UNDER), to work in the Houses under the Foreman, in a good establishment. Age 18. Good character.—GARDENER, Colney House, St. Alban's, Herts.

FOREMAN, in a Nobleman's or Gentleman's Garden.—Has a practical knowledge of Vines, Pines, Fruits, &c., Early and Late Forcing. Good reference.—A. B., Mr. Weeb's, York Town, Frimley, Surrey

FOREMAN.—A steady, active young Man; understands Forcing in its various branches, Flower Gardening, &c., and a first-class Propagator. Good reference.—W. H. B., 171, Malden Road, Haverstock Hill, N.W.

To Nurserymen.

GROUND FOREMAN and SALESMAN.—Thoroughly experienced, with a good practical knowledge of Nursery Stock; successful Budder and Grafter. First-class reference.—A. B., Mr. John Stevens, The Nurseries, Coventry.

Nursery and Seed Trade.

FOREMAN, SALESMAN, or to take the entire Management of small concern.—Age 31, married.—B. A., *Gardeners' Chronicle* Office, W.C.

PROPAGATOR (FOREMAN), in a Nursery. Has had long experience in Growing and Propagating Stove and Greenhouse Plants, Heaths, Camellias, Azaleas, Rhododendrons, Roses, Conifers, &c. Good references.—G., *Gardeners' Chronicle* Office, W.C.

TO NURSERYMEN, &c.—A sober, industrious, trustworthy Man (married, no family), wants immediate employment as Respectable Journeyman, Shopman, Packer, careful Packer, and thoroughly practical in every department. Terms moderate.—NURSERYMAN, Jones's Family Hotel, Freshfield, Formby, near Liverpool.

PACKER.—Thoroughly understands Seed and Nursery Packing. Twelve years' experience. The highest testimonials as to character and ability.—A. B., 2, Elm Cottages, High Street, Lower Norwood, S.E.

SEED TRADE. A young Man, having a considerable experience in the Seed Business, will shortly be disengaged. Could undertake the Management of a Seed Shop or Warehouse, has also a knowledge of the Grain and Manure Trade. Would not object to Travel. Highest recommendation from present as well as former employers.—J. D., James Gray, Seedsman, Stirling.

IMPROVER, in a Nobleman's or Gentleman's Establishment, for two years; would give a Premium of £10 to £20. Age 21, unexceptionable character.—M., Post Office, Richmond, Surrey.

To Nurserymen and Market Gardeners.

IMPROVER, with a view to Partnership.—Age 28 respectable; has had five years' experience in the business. Good references from former employers.—T. E., 6, Castle Place, Worcester.

IMPROVER, in the Nursery Business; age 18, willing to make himself generally useful. Has had two years' experience under a good gardener, and excellent character.—W. C., Mr. Scott's, Seed Stores, Yeovil, Somerset

To Head Gardeners

IMPROVER.—Wanted to place an active intelligent Youth under a first-class Gardener, where he would have every facility for acquiring a knowledge of the business. An adequate Premium will be paid.—Address, with particulars, E. HOBDAY, Gardener, Ramsey Abbey, Huntingdonshire.

FARM BAILIFF.—Middle-aged; well acquainted with all kinds of Agriculture, also Rearing and Breeding of Stock. First-class reference.—R. H. ADAMS, Cwmbwrla Post Office, Swansea, Wales.

FARM BAILIFF; age 22.—A Gentleman is desirous of a situation as above. He is willing to pay 10*s.* a week towards his board for three months. Remuneration no object. Had three years' experience. Never been out before.—T. B. C., Victoria Lodge, Millbrook, Southampton.

ESTATE AGENCY, with or without the Management of a Home Farm, Wanted by a Gentleman of great experience in every description of Agriculture as practised in Scotland and the North of England. The Advertiser is a good Accountant and a thorough man of business. He has some knowledge of the Management of Woods and Plantations. Highest references and first-rate security.—B. F. A., Post Office, Appleby, Westmoreland

To the Wholesale Seed Trade.

MANAGER, or CLERK and TRAVELLER. Age 32.—A Gentleman wishes to obtain a Situation as above. Upwards sixteen years' experience. Good connection at 11, Crooswell Grange, St. Giles' Road, Norwich

To the Retail Seed Trade.

CLERK or BOOK-KEEPER.—Five years' experience in a first-class business house. Highest references.—J. T., 15, St. Mary's Butts, Reading.

Seed Trade.

ASSISTANT.—Mr. SCOTT can with great pleasure recommend a young Man, age 21.—Apply either to Mr SCOTT, The Seed Stores, Yeovil; or to G., 28, Richmond Road, Dalston, London, E.

SHOPMAN.—THOMAS B. THOMSON, Seedsman, Birmingham, has a young Man who can highly recommend as above, who has been in his employ for nearly five years. He is strictly honest, and has a good knowledge of the business.—For further particulars, address as above.

To the Seed Trade.

SHOPMAN or ASSISTANT.—Good references from *first-class* London and Provincial Houses.—P. Q. R., *Gardeners' Chronicle* Office, W.C.

Seed Trade.

SHOPMAN, or ASSISTANT.—A young Man; has had eight years' experience in the Seed Trade. Can be well recommended.—Messrs. WM. DRUMMOND AND SONS, Stirling.

GROOM, could take charge of a small Kitchen Garden, age 20. Can be well recommended.—WALTER DUMPER, Stroudwood, Upham, Bishop Waltham; or THOMAS HARDISTY, Castle Gardens, Bishop Auckland, Durham.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.

Park Fencing undertaken to any extent.

N.B. Plans and Designs for Horticultural Buildings, &c., &c.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, Valuer, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.

SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Maylands, Romford, Essex, E

MR. CHANDLER, HORTICULTURAL AGENT and VALUER, Underhill Road, Dulwich, S. (late of Forest Hill)

N.B. A small NURSERY to LET, in a good situation, about three miles from London

WANTED to RENT, a few ACRES of good LAND, adapted for a Nursery.

Y. Z., Strontian Lodge, Cotham, Bristol.

TO BE LET, at St. John's Wood, a FORCING HOUSE and GREENHOUSE, 35 feet long, 17 feet wide, and 16 feet high, newly erected on best principles, with Hot-water Pipes complete and outside Pits and Frames. Excellently adapted for the Cut Flower Trade. Rent £40 a year, on certain conditions.

Apply at 37, Marlborough Hill, St. John's Wood, London, N.W.

Sewage Farm to Let.

THE ASHBY-DE-LA-ZOUCH LOCAL BOARD OF HEALTH are prepared to receive TENDERS for the OCCUPATION of 27½ ACRES of LAND, upon which the Sewage of the Town, with a population of upwards of 4000, has been brought. A portion of the land has been under-drained, and the remaining portion will be drained before Lady-day next.

There is a good Residence, together with Garden and Outbuildings, well situated on the land, and the whole is within one mile distance of a station on the Leicester and Burton Railway.

The Board will grant a Lease for a period of 16 years from March 25 next, and the Tender will be for the whole of this period. The Sewage will be required to be all consumed.

Tenders to be sent by SATURDAY, October 29, directed to the Clerk to the Board, marked "Tender for Sewage Farm." The Board reserve to themselves the power to reject all or any of the Tenders, at their discretion.

All further information may be obtained upon application to Mr. JOHN SALISBURY, Surveyor, Ashby-de-la-Zouch, or to the undersigned.

W. P. DEWES, Clerk to the Board.

Board Office, Ashby-de-la-Zouch.—October, 1870

SALES BY AUCTION.

Warminster, Wilts.

HIGHLY IMPORTANT to NOBLEMEN, GENTLEMEN, and others PLANTING.

MR. W. ABRAHAM has received instructions from the Proprietor of these extensive and old-established Nurseries (Mr. George Wheeler), to SELL by AUCTION, on TUESDAY, November 1, and two following days, a splendid collection of specimen Conifers, and other Trees and Shrubs, of remarkable symmetry and beauty, all in excellent health and condition for immediate removal; they consist of Picea, Abies, Cedrus, Thuja, Cupressus, Juniperus, Pinus, Weeping Beech, ditto and other Hollies, Æsculus, some fine Rhododendrons, Standard Roses, and thousands of other Trees and Shrubs, which will be minutely described in the catalogues.

The stock may be viewed, and Catalogues obtained, 10 days prior to the Sale, on application at the Nursery, or of the Auctioneer and Valuer, Goldworth Nurseries, Woking, Surrey.

Planting Season.

IMPORTANT to NOBLEMEN, GENTLEMEN, NURSERYMEN, BUILDERS, and OTHERS ENGAGED EXTENSIVELY in PLANTING.

PRELIMINARY NOTICE of FORTHCOMING SALES of NURSERY STOCK.

END of OCTOBER.—On the Premises, the WHITTINGTON NURSERY, HIGHGATE HILL; by order of Messrs. McGregor & Middlemiss

NOVEMBER 3 and 4, on the Premises, the WHITCHURCH RECTORY, EDGWARE, MIDDLESEX; by order of the Proprietor.

NOVEMBER 5.—On the Premises, the NURSERY, PHILIP LANE, TOTTENHAM, N.; by order of Mr. Alex. Johnstone.

NOVEMBER 7 to 10, on the Premises, the LEIGHAM COURT ROAD NURSERY, STREATHAM, adjoining STREATHAM HILL, SURREY; by order of Mr. George Clarke, the land being required for building purposes.

NOVEMBER (Second Week).—On the Premises, the KIRKDALE NURSERY, SYDENHAM; by order of Mr. George Selley.

NOVEMBER 21 to 25, on the Premises, the WANDSWORTH COMMON NURSERIES, SURREY; by order of Mr. Robert Neale, a portion of the land being required for building purposes.

Catalogues, when ready, may be had on the respective Premises, and of Messrs. PROTHEROE AND MORRIS, Auctioneers and Valuers, Leytonstone, Essex, E.

Woking, Surrey.

MESSRS. PROTHEROE AND MORRIS respectfully inform Noblemen, Gentlemen, Nurserymen, and others, that the important SALE of VALUABLE NURSERY STOCK, now taking place on the Premises, the Nurseries, Woking, Surrey, will continue on MONDAY and TUESDAY NEXT, by order of the Executors of the late Mr. George Jackman, without reserve.

Now on view, and Catalogues had.

Camberwell, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, GREENHOUSE PLANTS, GREENHOUSES, HOT-WATER PIPING, BRICKWORK, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, The Nursery, Grosvenor Park, Camberwell, S., on TUESDAY and WEDNESDAY, October 11 and 12, at 11 for 12 o'Clock precisely each day, without reserve, by order of Mr. Lansdell, the land being required by October 17 for the erection of a Church), the whole of the valuable NURSERY STOCK, admirably adapted for the London Suburbs, including 5000 Green Box, 3000 Variegated ditto, 6000 Aucubas, 2000 Laurustinus, 300 Green and Variegated Hollies, 200 Common Yews, 200 Cupressus, 200 Chinese Arbor-vitæ, 800 Junipers, of sorts; also 2000 Ornamental and Forest Trees, including 1000 Limes, &c., 400 Standard and Half-Standard Roses, 500 Currants, 250 Fruiting Vines, in pots; 3000 choice Greenhouse Plants, including 400 choice Camellias and Azalea indica, &c., 1400 Hardy Climbers, of sorts; 300 Yuccas, of sorts; likewise several Greenhouses and Pits, Twelve 1 and 2-Light boxes, Handlights, Hot-water Piping, Tank, Brickwork, &c.

May be viewed any day prior to the Sale. Catalogues may be had of Mr. Dawson, 170, Camberwell Road, S.; and of the Auctioneers, Leytonstone, E

Crown Nursery, Reading.

SALE of CHOICE NURSERY STOCK, &c.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. James Holder to SELL by AUCTION, on the Premises, Crown Nursery, Reading, near the Cemetery, on WEDNESDAY, October 12, at 11 for 12 o'Clock precisely, without reserve, a large quantity of choice Evergreen and Deciduous Trees and Shrubs of the usual kinds, fine Standard and Dwarf Roses, choice Rhododendrons by name; a selected assortment of fine fruit Trees, consisting of Apples, Pears, Plums, and Cherries, &c., fine Vines in pots, a quantity of ornamental Vases, and Figures, Fancy Flowerpots, &c.

May be viewed the day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Tooting, S.W.

IMPORTANT SALE of YOUNG and THRIVING EXTRA NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. R. Parker to SELL by AUCTION, without reserve, on the Premises, Exotic Nursery, Tooting, S.W., on THURSDAY and FRIDAY, October 13 and 14, at 11 for 12 o'Clock precisely each day, Thousands of Valuable EXTRA NURSERY STOCK, remarkably well-grown and in excellent condition for removal; comprising 6000 choice Evergreen Shrubs and Conifers in specimen borders, including Picea Nordmanniana, Picea Pinsapo, and Picea excelsa, Thujopses Lobbii, Thujas of sorts, Pinuses of sorts, Wellingtonias, Cupressus Lawsoniana, Portugal Laurels, &c.; thousands of Common and Colchian Laurels; 2000 Green Hollies, 1000 Variegated ditto; 500 English Yews, 500 Arbor-vitæ of sorts, fine Rhododendrons full of bloom buds, bushy Box, Cotoneaster Simmondsii, Berberis of sorts; about 1000 Spruce Firs, 5 to 7 feet, beautifully branched; 2000 Ligustrum ovalifolium, &c.; a large quantity of Ornamental and Forest Trees, consisting of Black Italian and Lombardy Poplars, Acer Negundo variegata, Acacia Robinia, &c.; Evergreen Shrubs and Dwarf Roses of the best varieties; a large quantity of Boursaults, inermis and Amadis, Manetti, and other kinds; fine Standard and Pyramidal Fruit Trees, in bearing condition; together with a select Choice of ORCHIDS, fine Azalea indica, Cyrtoma argenteum, Yuccas of sorts, &c.; Choice Hardy Herbaceous Plants, Bulbs, &c.

May be viewed two days prior to the Sale; Catalogues may be had on the Premises and of the Auctioneers and Valuers, American Nurseries, Leytonstone, Essex.

Bagshot, Surrey.

HIGHLY IMPORTANT and EXTENSIVE UNRESERVED SALE of NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Charles Noble to SELL by AUCTION, without reserve, on the Premises, Sunningdale Nursery, Bagshot, five minutes' walk from Sunningdale Station, South-Western Railway, on MONDAY, TUESDAY, and WEDNESDAY, October 17, 18, and 19, at 11 for 12 o'Clock precisely each day, a portion of the valuable NURSERY STOCK, including an unlimited variety of choice Evergreen, Coniferous, and deciduous Trees, handsome and well-grown and symmetrical forms and beauty, viz., 15,000 common Colchic and Portugal Laurels, 1 to 5 feet; 3000 Retinospora ericoides, 1½ to 2½ feet; 2000 Cupressus Lawsoniana, 3 to 10 feet; 2000 Retinospora squarrosa, 2½ to 3½ feet; 1000 Picea Pinsapo, 3 to 5 feet; 500 T. dolabrata, 300 fine Picea Nordmanniana, 2 to 6 feet; 1000 Thuja Lobbii and gigantea, 3 to 8 feet; Araucarias, Wellingtonias, 4 to 7 feet; a quantity of handsome Specimen Plants in the border, and a large stock of Retinospora crenata fl.-pl., 1 to 5 feet; 5000 Spireas, 2 to 5 feet; 3000 Berberis, Andromeda floribunda, 25,000 Rhododendrons, comprising 15,000 hybrid seedlings, and the best varieties in cultivation; 5000 Dutch Laurels, full of flower buds; Poplars, of sorts; Crimean Ash, Gyneriums, 500 Tritomas, clean grown Fruit Trees, Standard and Dwarf Roses of the best varieties, and thousands of other Trees and Shrubs too numerous to mention.

May be viewed any day prior to the Sale. Catalogues (6d each, returnable to purchasers) may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B. The Sale is imperative, about 4 acres of the ground being required for building purposes. The whole of the specimens bear evidence of very skilful pruning, and were all prepared for removal during the autumn and spring of 1869-70.

St. John's Nursery, Woking, Surrey.

HIGHLY IMPORTANT and VERY EXTENSIVE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. Wm. Jackman, to SELL by AUCTION, without reserve, on the Premises, St. John's Nursery, Woking, Surrey (about one mile from the Woking Station, South-Western Railway), on MONDAY, October 24, and seven following days, at 11 for 12 o'Clock precisely each day, the whole of the valuable NURSERY STOCK, which extends over 60 acres, is in excellent condition for removal, and comprises 80,000 fine Evergreens, viz.:—20,000 Common Laurels, 1 to 3 ft.; 10,000 Rhododendrons, 1 to 2 ft., 5,500 do., hybrid, scarlet, and white varieties, 1 to 2 ft.; 5,000 Kalmia latifolia, 1 to 2 ft., well set with bloom-buds; 13,000 Green Hollies, 1 to 4 ft.; 5,000 Green and Variegated ditto, 1 to 6 ft.; 2000 Ornamental Conifers, of sorts; 1000 Aucuba japonica, 1 to 2 ft., and thousands of others; 10,000 choice Conifers, including 1,000 English Yews, 1½ to 5 ft.; 1,000 Junipers, of sorts, 1 to 5 ft.; 1,000 Cupressus Lawsoniana, 1 to 6 ft., &c.; large quantities of Wellingtonias, Thujopsis, Thujas of sorts, Red Cedars, Pinsapo, &c.; also about 40,000 Fruit Trees of clean growth, consisting of 30,000 Standard, Pyramid, and Dwarf trained Apples, Pears, Plums, and Damsons; 2,000 Standard-trained Peaches, Nectarines, Apricots, Cherries, Plums, and Apples; 2,000 Cherries, 2-yr. feathered; 5,000 Standard and Dwarf Roses, consisting of the best varieties in cultivation; also thousands of transplanted Forest Trees, viz., 40,000 Spanish Chestnuts, 1½ to 2½ ft.; 20,000 Ash, 1½ to 3 ft.; 18,000 Birch, 1 to 3 ft.; 10,000 Spruce Firs, 1 to 3 ft.; 50,000 Larch, 1½ to 2 ft.; 15,000 Scotch Firs, 1½ to 2½ ft., and 10,000 Sycamore, Oaks, Beech, Hazel, &c.; likewise a large quantity of handsome Specimen Plants in the border, and a large stock of Deciduous and Ornamental Trees and Shrubs, in pots, &c., &c.

May be viewed any day prior to the Sale. Catalogues (6d each, returnable to purchasers) may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Chester.

VERY EXTENSIVE CLEARANCE SALE of FIRST-CLASS NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by the Executors of the late Mr. George Chivas, to SELL by AUCTION, on the Premises, the Eaton Road Nurseries, Chester, on MONDAY, October 24, and five following days, at 11 for 12 o'Clock precisely each day, without reserve, the first portion of the valuable NURSERY STOCK, extending over 100 Acres, and in the highest state of cultivation, including many handsome specimens; the whole in grand condition, and remarkably free from pests, viz., 20,000 Common Laurels, 11,000 fine Green Hollies, 5000 bushy Portugal Laurels, 15,000 Privet, 1800 Variegated and worked Hollies, 8000 Berberis Aquifolium, Standard Roses, Pinsapo, Nordmanniana, Cupressus Lawsoniana, specimen Conifers Deodara, Araucarias, Piceas, Pinus, 12,000 bushy Rhododendron Ponts, 500 named Rhododendrons, and many thousands of Forest Trees, comprising 650,000 Larch, 1½ to 2½ feet; 100,000 Scotch Firs, 750,000 White Thorn (Quick), 300,000 English Oaks, 80,000 Ash, 50,000 Beech, 30,000 Spanish and Horse Chestnuts, 30,000 Sycamore, 1000 Limes, and thousands of others, various; likewise a large quantity of clean-grown Fruit Trees, a large assortment of Ornamental Trees and Shrubs, including 6500 fine Purple Beech, 4 yrs. to 6 feet; 2000 Limes, &c.; and a rich collection of Border Plants, &c.

May be viewed any day prior to the Sale. Catalogues may be had (6d. each, returnable to purchasers) on the Premises; and of the Auctioneers and Valuers, Leytonstone, E.

N.B.—P. & M. having visited these extensive Nurseries, especially urge the Trade and all large consumers to inspect them, as it rarely occurs that so valuable a stock is offered unreservedly in such large quantities and in such excellent condition.

Camberwell, Surrey, S.E.

MESSRS. PROTHEROE AND MORRIS are instructed by the Executors of the late Mr. Wm. Barnes, to SELL by AUCTION, without reserve, on the Premises, Denmark Nursery, Southampton Street, Camberwell, S.E., on WEDNESDAY, November 2, and following days, at 11 for 12 o'Clock precisely each day (unless previously disposed of by private contract), the whole of the valuable NURSERY STOCK, including a choice assortment of Evergreen and Coniferæ Shrubs, a large quantity of clean grown Fruit Trees, together with 29 Greenhouses and Pits, 2000 feet of Hot-water Pipes, two powerful Boilers, about 60,000 Bricks, and numerous other effects.

May be viewed any day prior to the Sale. Catalogues when ready may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

MR. GEORGE NICHOLS has received instructions from Messrs James Garraway & Co., of the Durdham-Down Nurseries, Bristol, to SELL by AUCTION, on the Premises, without reserve, on WEDNESDAY, October 19, and following days, in consequence of the land being required for the Port and Pier Railway Extension, the STOCK of about TWELVE ACRES of NURSERY LAND, consisting of Standard, Pyramid, and Dwarf trained FRUIT TREES, Ornamental SHRUBS, FOREST TREES, &c.

Catalogues will be ready one week prior to the Sale, and may be obtained either of the Auctioneer, or at the Durdham-Down Nurseries, Broad Street, Bristol, October 8.

Bulbs from Holland.

MR. J. C. STEVENS will SELL, by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY and MONDAY, October 8 and 10, at half-past 12 o'clock precisely each day, several large important sets of HYACINTHS, BULBS, CROCUSES, LILIUMS, GLADIOLI, IRIS, NARCISSUS, and other BULBS, just arrived from Holland

On view the mornings of Sale, and Catalogues had

Hanover Nursery, Rye Lane, Peckham.

PRELIMINARY NOTICE of SALE.—In consequence of the expiration of the lease, the whole of the Valuable and well grown STOCK of the above celebrated NURSERY will be offered for SALE, particulars of which will be given in the course of next month. Also for Sale a large and splendid Stock of AZALEAS, well set for bloom. Prices may be had on application to

Mrs. IVERY, Hanover Nursery, Rye Lane, Peckham

N.B. A superior Stock of MUSHROOM SPAWN, which can be offered at a low price

Staffordshire.—Brereton Nurseries, near Rugeley.

IMPORTANT to NOBLEMEN, GENTLEMEN, and PARTIES PLANTING.—SALE by AUCTION of VALUABLE NURSERY STOCK.

MR. C. GILLARD begs to announce that he has been instructed by Mr. Whitehouse to Advertise for SALE by AUCTION, at the above Nursery Grounds, on TUESDAY and WEDNESDAY, October 11 and 12, a large quantity of truly VALUABLE STOCK, to make room for Forest Stuff, for which there is an ever-growing demand in the neighbourhood.

The SHRUBS for Sale will comprise several hundreds of the best Gold, Silver, and Green Hollies, from 18 inches to 6 and 7 feet, Laurels, about 100 perfect specimens of the best kinds, Quick Hollies, upto 4½ feet, transplanted in the Autumn of 1869 and spring of 1870; fine specimens of Cupressus Lawsoniana, Thuja gigantea, Thujopsis borealis, Wellingtonias, Abies Douglasii, Cedrus Deodara, Cedrus Libani, Cedrus Atlantica, Retinospora pisifera, Picea nobilis, Picea Pinsapo, Picea Nordmanniana; Abies, sorts; Picea excelsa of Town, Pinus of sorts, very fine Rhododendrons, and other ornamental flowering shrubs and evergreens; fine Oak, Larch, and other Forest Trees; sandy and Seedling Quick, Fruit Trees, &c.

Particulars will appear in Catalogues, which will be published in due time, to be obtained from the Auctioneer and at the place of Sale.

Bodicote House, Banbury.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD is instructed to announce for SALE by AUCTION, without reserve, on WEDNESDAY, October 12, at Bodicote House, Banbury, the ENTIRE HERD of SHORTHORNS belonging to Thomas Sales, Esq., consisting of about 50 head of Bulls, Cows, and Heifers, which have been selected and bred with care, chiefly from the famed Herds of J. C. Adkins, of Thame; H. Combe, of Cobham Park; W. Smith, of West Rasen; and J. Webb, of Babraham; and the introduction of other good blood. Most of the young Stock are by Huntsman (21,969), winner of a Prize at the Royal Agricultural Society's Meeting at Leicester in 1868.

Catalogues with Pedigrees may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. CALESS, Bodicote House, Banbury

Stroxton, near Grantham.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has received instructions from Mr. John Lynn, to SELL by AUCTION, without reserve, on THURSDAY, October 27, at Stroxton, about FORTY HEAD of very superior well bred SHORTHORNS, being the chief portion of his Herd, that has long maintained a high position at the Northern County, and Local Shows. Also will be sold THREE BOARS and SIX GILTS of the far famed Stroxton breed of WHITE PIGS

Catalogues, with Pedigrees and other particulars, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. LYNN, Stroxton, near Grantham

First Poultry Sale of the Season,

(LUCAS'S REPOSITORY, LIVERPOOL), by

MESSRS. LUCAS AND CO., on FRIDAY, October 21, at 11 o'Clock prompt, at their Repository, Liverpool, 490 lots of choice POMPEY, DORKING, and HIGHFLY, and BIRMINGHAM Fowls for Pigeons. Poultry, 11 per pen. ENTRANCE CLOSES MONDAY, October 17. No more than 300 Lots offered. All Birds to be at the Repository Thursday Evening, or before 9 o'Clock on Friday. N.B.—Three Birds in each pen, except of great merit. Pigeons in pairs.

First Berkshire Pigs.

GEO. GRIGGS, Winner of the First Prize in the Class for Boars of any age, at the Royal Agricultural Show, Oxford, 1870, has a few YOUNG BOARS and SOWS FOR SALE.

See *Agricultural Gazette*, July 23, 1870.—"A most extraordinary Pig." Oaklands, near Romford, Essex.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, DOMESTIC POULTRY, GOOD, ROOTS, and IMPLEMENTS will be held in RINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.

Prize Lists, Certificates of Entry, and every information may be obtained from the Secretary.

The ENTRIES CLOSE on TUESDAY, November 1.

JOHN B. LYTHALL, Secretary.

Offices—39, New Street, Birmingham

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and Four following Days

Intending Exhibitors are requested to apply for Certificate Forms by the referees letters as under:

CATTLE.—Form A. For an OX or STEER (in any Class).
" B. For a COW or HEIFER (in any Class).
" C. For a BEAST in Class XXX.
SHEEP. " D. For a PEN of three WETHERS. [Stock.
" DD. For a Pen of three EWES
" E. For a SINGLE WETHER SHEEP in Extra
PIGS. " F. For a pen of PIGS (in any Class).
" G. For a SINGLE PIG in Extra Stock

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.

Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr. DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Picadilly, London, W

N.B. All communications respecting the Show must be addressed to the Office, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.
SATURDAY, OCTOBER 8, 1870.

THE effect of the last Order of Council in reference to the importation of animals from German and French ports has certainly not been deterrent; on the contrary, in the port of London, it has been found impossible to make arrangements with sufficient promptness to meet the demand for lairage and slaughter-house accommodation, although at Plaistow Wharf, which has been selected for the landing and slaughter of French and German cattle and sheep, every

effort has been put forth to render the lairs and slaughter-houses as complete as possible. Beside the premises which were already in working condition, and capable of hanging a considerable number of carcases, five new slaughter-houses have been erected, each of them large enough to hang about 40 or 50 bullocks. It is calculated that, with the present available means, nearly 500 beasts may be slaughtered every day, and this without interfering with the slaughter of sheep, which will be carried on almost without intermission. New lairs have been rapidly extemporised out of sheds which were previously used for storing petroleum, and these places, added to those which were arranged for lairs, afford accommodation for about 1300 oxen under cover.

Notwithstanding the energy which has been displayed in the endeavour to keep pace with the increased rate of importation, the inspectors still complain of insufficient space; and under the exceptional circumstances of the case it was scarcely to be expected that the precise extent of the demand upon the resources of the selected landing place should have been by anticipation known and provided for. Very little time was given for calculation, for almost as soon as the Order of September 20 come into operation, animals were crowded into London and Southampton, and naturally enough some difficulty was experienced in disposing of them.

Since the 24th of last month nearly 2000 cattle and above 2000 sheep have been landed in London from Schleswig alone, France has sent upwards of a thousand beasts, and it is said that there are no less than 5000 more ready to be shipped from France as soon as arrangements can be made for conveying them across.

The owners of stock in France are determined to keep as many of their animals as they can from falling into the hands of the enemy; obviously the most satisfactory method of disposing of cattle so precariously situated is to send them out of the country to the most convenient market, but if the reports which we have received are correct, the intention to deprive the Prussians of the chance of capturing the cattle overrules all economical considerations, and even prompts the owner of stock to drive the animals into the sea, if no other means of getting them out of the way present themselves.

It is easy to understand that foreign breeders and feeders of stock, both in France and Germany, will be disposed to convert the living animal, now menaced by two dangers, war and pestilence, into the more portable and less destructible coin of the realm, with as little delay as possible.

Over a large area in Prussia, Bavaria, Saxony, and France, the rinderpest is destroying the cattle. Adjoining countries are doing their best to protect their stock against the infection, but the means which have been employed in the infected countries to arrest the spread of the disease have hitherto proved singularly ineffectual, and owners of stock in the vicinity of the many centres of contagion must be painfully aware of the risk which they run, and may therefore be expected to reduce the risk as much as they can by lessening the number of their animals. For some distance around the infected districts, the ordinary cattle trade is paralysed, in consequence either of the presence of an invading army or of legal prohibition on account of the spreading of the plague. Great Britain is the only country which has an unlimited capacity for absorbing all sorts of foreign productions, and to our shores all the animals which can be shipped will be sent. Our position is a dangerous one, and the excessive precautions which have been adopted at the ports on our coasts are evidence that the danger is known, and its extent appreciated. English stockowners will, it may be presumed, take all the means within their reach to protect themselves. The precautions which have been taken by the Legislature are all based on the assumption that imported animals, such at least as are sent to us from scheduled countries, are intended for immediate consumption; in respect of the countries which are now infected with the disease, further steps have been taken to insure that all the cattle and sheep landed in England shall be slaughtered; but sheep imported from scheduled countries in which cattle plague does not exist, are to a certain extent free. We do not apprehend that in the dearth of keep from which most stock feeders have suffered, there is any great probability of sheep from Belgium or the Netherlands being bought for stores; but no harm will be done by the utterance of a caution to all who might perchance feel disposed to take advantage of a favourable opportunity. In the present sanitary or unsanitary condition of foreign stock, no foreign animal should, on any pretence, be introduced to the farm; and the farmer who is wise will for some time to come leave even the home markets, where foreign and English animals are exhibited together, as much as possible to the butcher.

We continue extracts from our Note Book:—In these days of dear mutton, cheap corn, and costly labour, even the heavy-land farmer is glad to lighten his labour bill, and to rest and manure his land by means of artificial grasses. Grazing mixtures are no doubt best adapted for light land and for "tender" friable clays. On hard cold soils the grasses are less productive, and even less nutritious, and the period during which they can be grazed is shorter by a month in spring and six weeks in autumn. On heavy land the crop starts late in spring, and an early bite is injurious to the subsequent crop; and as the following crop of Wheat or Beans should be got in by times on heavy land, early ploughing in autumn is necessary. There remains only a brief period for grazing, and only a short interval between the first and the second bite; consequently it sometimes happens that the second growth proves tainted and unwholesome for stock, especially for young lambs.

An objection to Trefoil and allied plants is that they indispose the land for red Clover, which is a desirable crop for a heavy-land farmer to cultivate. And the grasses interfere in the same manner with Wheat, so that the grazing mixtures on clays are frequently not worth the cost of seed and cultivation, and it is safer to farm such soils for red Clover, which, with the after crop, is valuable for hay and for soiling, and is a good step towards a good crop of Wheat.

In suitable localities no green crop can compare in value with the *Mangel*, which may be used nine months in the year, and may to some extent supplant forage crops in spring and early summer. On clays and in a dry climate we have found Mangel cheaper, weight for weight, and better food than any of them, except in the case of young lambs and cows which require succulent greens of some kind.

The following notes show the order of succession of several of the "artificial grasses:"—

"1864. Italian Rye-grass gave a good bite the first week in May. Trefoil was ready the second week in May. Lucerne the first week, and Tares the third week in May; red Clover for horses the first week in June, on good, early land, and 10 days later elsewhere. Trefoil followed Italian Rye-grass, and preceded Tares and Trifolium.

"May 25, 1858. The Sainfoin may now be mown for horses; red Clover will follow in a week.

"July 10, 1861. Red Clover grazed until June 1, and then laid up for seed, is in full blossom. That which was laid up later is coming on. White Clover and Alsike are losing their latest blossom, and the heads are getting hard with seed.

"July 11, 1861. The sheep at Hinxton (fine light feeding land) are on white Clover, sown with Trefoil. This is the second time of feeding. The great fields of the Cambridgeshire sheep farms are divided into four folds of 10, 20, or 30 acres each, for the purpose of changing the pasture. The fatting sheep and lambs go first, the stores and ewes follow."

The usual mixture of seed on suitable soils is a peck of Trefoil, and a peck of white Clover per acre. The Trefoil comes for early feeding, and the white Clover follows during the summer. On light weak soils this mixture can hardly be depended on, and perennial Rye-grass is introduced.

"May 1, 1865. We are cutting Lucerne a foot high. It is luxuriant, though no rain has fallen for five weeks, and the hot, dry weather has brought the Tares to a standstill, at 3 or 4 inches high.

"June 10. We are cutting the second crop, which is equally good, though the pastures are scorched by continued dry weather.

"July 29. There has been plenty of rain, with hot weather. The third crop of Lucerne is equal to the last. We finished cutting the third crop for horses on Aug. 22, and are getting a fourth crop from the land that was cleared first."

Sainfoin is a valuable forage plant for chalks and poor marly clays. The common sort produces a crop of hay and a heavy aftermath, which is excellent food for sheep, at the end of summer, before the early Turnips are ready. It stands seven years on clean land. Three bushels of rough seed are drilled in spring corn, 9 inches apart.

The Giant Sainfoin is frequently laid down, instead of Clover mixtures, for one year only, and it seldom stands more than four years. The hay is not so good as that of common Sainfoin. After the first cut a crop of seed may be taken as an after crop.

The Anthyllis vulneraria, or Kidney Vetch, is an inferior forage plant, grown on chalks and light calcareous sands. It is a native chalk plant, thickly sown over the Kentish hills and elsewhere in the chalk districts; and, like the wild Vetches found in the same localities, is not succulent. It is, however, wholesome sheep feed, and useful on poor soils.

—— At Mark Lane, though trade ruled quiet, previous rates have been maintained. —— At the Metropolitan Cattle Market, both on Monday and Wednesday, choice sorts were scarce, at previous high rates—other kinds lower. The supply was small.

—— From Paris we have, at intervals, scraps of information concerning the provisioning of the beleaguered city, and the prices of necessaries. Last week we were informed that the supply of milk had almost ceased; this week we learn from a contemporary that the price of necessaries was beginning to tell upon the means of an immense population, which finds itself unable to earn wages. Eggs were selling at 10*d.* each, and butter at 2*s.* 6*d.* per lb., while *café au lait* had become impossible. Forage for cattle was getting scarce, and horses—under the difficulty of feeding them—sold at prices ranging from 10*s.* to 25*s.* each. As regards the supply of meat, the Minister of Agriculture has appointed 500 oxen and 5000 sheep to be slaughtered every day for the supply of public wants; and it appears that a rigid account is to be rendered, from every source of supply within the city, of all provisions in store, as probably they would have to be "centralised" for public use.

—— It was but scant civility that was dealt out to Mr. Mechi at the annual meeting of the Great Braxted Labourers' Friend Society the other day, but his genial and imperturbable good humour carried him victoriously through the evening; and most people will, we think, admit that the better argument, as well as the better temper, was on his side. We quite agree with our contemporary, the *Essex Herald*, in thinking that the remarks of his many opponents should be printed alongside of his own; and in the following abridged report, accordingly, the attitude of both sides of the controversy is fairly represented:—

Mr. Mechi, in returning thanks for the toast of his health, spoke of the benefits to labourers resulting from benefit societies. He then came to the important question, how could they increase their profits by farming. (Laughter.) The interests of landlord and tenant were concomitant and concurrent (hear, hear), and it was to their advantage to abolish open farmyards, as being a source of loss, and to substitute covered and enclosed yards for their cattle, which would increase their profits.

Mr. W. Fairhead.—Certainly not; I don't agree with you.

Mr. Mechi did not expect his friend Fairhead would agree with him. (Laughter.) He maintained, nevertheless, that covered yards increased their profits, by preserving the manure with all its virtues, and that it also preserved the health of their cattle.

Mr. Wakeling.—Enclose them and it will give them disease.

Mr. Mechi wished to know how it was that while there was always so much cry about disease among cattle, it never affected his cattle fed under covered yards. There had been no disease in his covered yard for the last 20 years, and the same could be said of many other farms where the same plan was adopted. He had reason to believe that many of the diseases that were prevalent proceeded from the variation in the temperature, from the insects and various things found in the grass, and from the various conditions in which the food in the open field was eaten. Nobody objected to folding sheep on the land—every one approved of it because the land then got the benefit of all that resulted from the food, but it was not so in the open farmyard, where the virtue of the manure was wasted. If they wanted to increase their profits by obtaining larger crops at a diminished cost, let them have covered yards for their cattle. (Dissent.) This was a lesson which Essex had yet to learn, but he was certain she would learn it. Another point in which he thought Essex was rather deficient was in the unfortunate belief that those strong clay soils called loam were not fit lands to be drained.

Mr. Gwynne.—You have gone into that drainage question so often, Mr. Mechi, I think we shall be better without it to-night. (Hear, hear—Go on!)

Mr. Mechi could only say that the belief that drainage was of no use to such soils was a very fatal deduction from the profits of the farmer.

Mr. Wakeling.—We can't listen any longer; we have heard enough of your gab already.

The Chairman hoped they would give Mr. Mechi a fair hearing. (Hear, hear.)

Mr. Mechi then further urged the importance of draining, and said that one of his strongest opponents on this question had been converted to his way of thinking, and was now only sorry he had not commenced the system years before.

Mr. Wakeling.—I should like to see it in his own writing.

Mr. Mechi said they were here to speak the truth, and ought not to meet facts by prejudices. He suggested that the farmers should form small committees, and experimentalise on a few acres of land.

Mr. Gwynne.—That has been done; we have plenty of fields in this neighbourhood.

Mr. MECHI said let farmers try a piece, and not on mere supposition or prejudice condemn that which they really know nothing about. Amidst occasional interruptions, which he treated in his usual genial manner, Mr. Mechi advocated deep cultivation, and then concluded by once more thanking them for having drunk his health. (Applause.)

Mr. GWYNNE said he could bring forward two neighbours of Mr. MECHI who had drained parts of their land, and were prepared to state an opposite opinion as to its influence upon their corn growing qualities.

We should like to hear any of our Essex or Kentish readers on the underdrainage of the stiff, London clay soils of those counties. Meanwhile we venture the opinion, that both covered yards, of the kind to which, we presume, Mr. MECHI refers, and clay land subsoil drainage, are means, as he expresses it, of increasing the profits of the farmer; and, we add, in reference to Mr. WAKELING'S rough remark, that a man who has so pleasantly the gift of "the gab," as Mr. MECHI has it, will certainly continue welcome at agricultural meetings in spite of the "dissent" and "interruption" with which his speeches are sometimes received.

—— The second part of the annual volume of the Royal English Agricultural Society's Journal has just appeared, containing the official account of the Oxfordshire Prize Farm Competition. An extract from Mr. KEARY's report of the several competing farms is given in another page. Mrs. MILLINGTON's management of Ashgrove Farm, which received the principal honours of the competition, is there described.

—— Potatos that have been dug up too early, or show doubtful symptoms as to keeping, are preserved in France by sprinkling them plentifully with charcoal dust or wood, or charcoal ashes from the baker's or limeburner's; they should be moved from time to time, to change, as is said, the direction of the sap, and thus retard the germination! Another mode is to bury them in earth mixed with a large proportion of plaster, lime, wood ashes, or even coal dust, taking the precaution to bury them as soon as possible, to cover them well up to the depth of 20 inches at the very least, and, lastly, to stamp the earth well down upon them. The slightest amount of light is considered highly prejudicial to them. For seed, on the contrary, those which have turned green in the daylight are considered better than any others.

OUR LIVE STOCK.

CATTLE.

THE result of the sale of the late Mr. D. P. Walesby's Shorthorns, at Ranby, was an average of £25 8*s.* 2*d.* over 70 head of cattle. There was a large company, and although the stock had suffered from the droughty season, they were in nice condition, very well haired, and fleshy, although a trifle coarse and large boned. The last three bad seasons have also told upon farmers' pockets, and no doubt partly accounted for a lower range of prices than might otherwise have been looked for. The calves, of which there were a large number, sold well; thus, while *Miss Easy* by THE BEAU (12,182) made 20 gs., her calf by DUKE OF MORNY (23,714), only eight months old, made the same sum. *Flower Premium* by THE BEAU made 32, and her six months' calf made 18½ gs. *Rose June* by INKERMAN (20,008) was sold for 20 gs., and her roan calf, five months old, brought 22 gs.; *Young Millicent* by WILFORD (23,196) was disposed of at 24 gs., and her yearling bull by COCK OF THE WALK (15,782) for 28 gs. Among the highest prices may be mentioned *Grey June* by COCK OF THE WALK, sold to Mr. R. Wyles for 40 gs.; Mr. R. H. Wrightson bought *Young Rose June* for a similar sum; *Sunshine* by WELFORD, also the sire of the preceding cow, became Mr. Kilham's property for 35 gs.: *Young Snowdrop* by the same bull was sold to Mr. J. R. King for 40 gs., as was also *Primula* (lot 47), by YOUNG COCK OF THE WALK; and *Sophia* by RAVENSHOPE (22,681), a yearling, was purchased by Mr. P. Brown for 35 gs. In the bull sale Mr. R. Wyles gave 28 gs. for YOUNG COCK OF THE WALK by WELFORD. Mr. Chatterton secured WOODMAN by RAVENSHOPE (22,681) for 44 gs., and Mr. M'Vicar became the owner of PRINCE ROYAL by WELFORD at 40 gs.

—— The following quotation from the "Practical Farmer," U.S., which reappeared in the columns of the "Cultivator and Country Gentleman," U.S., of September 28, is a fair specimen of appropriated credit, and may serve to amuse those of our readers interested in the Bates Duchesses:—

"Mr. Sheldon is the present owner of this famous family of Shorthorns. Mr. Samuel Thorn, of Dutchess County, New York, was the originator and breeder of this celebrated Dutchess stock; the bulls he called Duke and Duke of Geneva, &c., and the cows he named Dutchess 1st, 2d, 3d, 4th, and so on, until they have a noted name among stock breeders as the Dutchess strain, that adds notoriety to the great Dutchess County of New York, so celebrated before for its fine stock of every sort, dairy cheeses, butter, and other things."

As everyone in this country knows, Mr. Sheldon's DUKES OF GENEVA and "*Dutchesses*," all but the "1," were imported from this country, and are descended from *Duchess 71st* by DUKE OF GLOSTER, and possibly other Bates Duchesses. Mr. Thorne's DUKES OF THORNDALE and *Duchesses of Thorndale* also trace back to the same source. However the American "Practical Farmer" could fall into so gross an error, it is difficult to imagine; but we, on the other hand, may ask if the English Duchess family of Shorthorns have actually had an American county named after them?

—— The following is a complete list of the prices and purchasers at the recent Nunwick Hall sale of Shorthorns, which was reported on last week:—

Name of Animal.	When Calved.	Price.	Purchaser.
Cows and Heifers.		Gs.	
Waterloo 15th	1858	34	Mr. J. Lamb.
Ellen	1855	52	Mr. A. Metcalfe.
Victoria Peeress	1853	42	Mr. J. Lamb.
Young Emma	1860		Not offered.
Lady Emma Oxford	1862	45	Mr. W. Parker.
Princess Alexandra	1863	81	Mr. J. Fawcett.
Lady Flora	1863	84	Earl of Dunmore.
Flower	1864	54	Mr. J. J. Gaitskill.
Clara Gwynne	1864	71	Mr. J. Thom.
Waterloo Duchess	1864	55	Rev. P. Graham.
Duchess Emma	1864	51	Mr. H. Sayer.
Wild Eyes Duchess	1865	1275	Mr. M. H. Cochrane.
Fleda's Farewell	1865	146	Earl of Dunmore.
Lady Diamond	1866	50	Mr. T. H. Parker.
Lady Lancaster Oxford	1866	50	Mr. W. Thompson.
Pearl Bracelet	1867	50	Mr. Dixon.
Fair Fanny	1867	55	Mr. J. Morton.
Waterloo 22nd	1867	71	Mr. Dixon.
Lady Livingston	1867	67	Mr. G. H. Head.
Waterloo 24th	1867	52	Mr. B. Baxter.
Judy in Spring	1867	36	Colonel Rigg.
Farewell's White Rose	1868	100	Lord Skelmersdale.
Princess Beatrice	1868	34	Mr. R. B. Hethering-ton.
Pretty Fanny	1866	53	Mr. R. Jefferson.
Lady Eglinton	1868	70	Mr. G. M. Tracey.
Waterloo 35th	1868	81	Sir W. Lawson.
Waterloo 36th	1868	47	Lord Kenlis.
Waterloo 37th	1868	50	Mr. R. E. Oliver.
Pearl Duchess	Mar., 1867	47	Colonel Saunderson.
Lady Eleanora	Mar., 1869	60	Mr. J. White.
Waterloo 38th	Mar., 1869	80	Mr. M. H. Cochrane.
Waterloo 39th	Mar., 1869	130	Lord Skelmersdale.
Amy Gwynne	Mar., 1869	80	Mr. J. Fawcett.
Belle Fanny	Mar., 1869	140	Mr. J. P. Forster.
Ellen Duchess	April, 1870	53	Mr. T. Dalrell.
Ellen Duchess	Oct., 1869	61	Mr. T. O. Hay (New Zealand).
Waterloo 40th	Sept., 1869	90	Rev. P. Graham.
Maid Gwynne	Feb., 1870	50	Mr. T. O. Hay.
Lady Emma	Mar., 1870	45	Earl of Dunmore.
Fille d'Edgar	Mar., 1870	80	Mr. J. P. Foster.
Wild Eyes Duchess 2d.	Mar., 1870	120	Earl of Dunmore.
Emma's First.	Mar., 1870	0	Mr. Hetherington.
Lady of Nunwick	Mar., 1870	45	Mr. W. Thompson.
Princess Victoria	Mar., 1870	53	Mr. J. Fawcett.
Tufty Deans	April, 1870	80	Mr. C. W. Wilson.
Duchess Emma 2d	April, 1870	41	Mr. W. Thompson.
Bulls.			
EDGAR (19,680)	1865	110	Mr. H. Thompson.
FAIR FOREST (20,148)	1867	61	Mr. R. Brockbank.
WILD BOY (18,147	1866	50	Mr. M. Lambert.
LORD OF NEWSICK (26,702)	1867	205	Mr. J. Wilson.
GENERAL WILLIAMS (24,658)	1868	35	Mr. J. Collins.
WALTER (26,676)	1868	30	Sir H. Vane.
GENERAL SALKELD	Mar., 1869	50	Rev. O. James.
EASTWELL EGLINTON	Mar., 1869	55	Capt. Thompson.
PRINCE JAMES	Mar., 1869	40	Mr. J. Nicholson.
SALKELD DYKES	Mar., 1869	130	Mr. J. White (Australia).
EASTHALL	Oct., 1869	35	Mr. Parker
EDEN LACEY	Mar., 1870	21	Mr. J. Lancaster.
GAME LORD	April, 1870	31	Mr. T. C. Bowstead.
LITTLEDALE	Mar., 1870	51	Mr. G. H. Head.
PEARL SEEKER	Mar., 1870	25	Mr. Dixon.
WATERLOO COMMANDER	Mar., 1870	35	Mr. A. Graham.

—— Mr. Butler's sale last Wednesday was very successful. The average, over the 74 head sold, was £38 7*s.* 4*d.*; for the 62 females, £39 4*s.* 7*d.* The best prices were given for the Darlingtons, long known in association with Mr. Sainsbury, of Corsham. *Darlington 10th* (No. 1) was bought by Mr. Burnett, of Kingscote, for 65 gs., for Mr. D. R. Davies, and the same purchaser became the owner of *Darlington 15th* at 100 gs., *Darlington 17th* at 155 gs., and *Darlington 19th* at 85 gs. Mr. Pierce purchased *Darlington 13th* for 105 gs., and *Darlington 18th* at 125 gs.; and Mr. Thompson, of Badminton, bought *Darlington 16th* at 85 gs. *Oxford Bride* was sold to the Marquis of Lansdown for 43 gs.; *Ursula 16th*, sold at Didmarton for 50 gs., exchanged hands for a second time at 45 gs., and her calf at 17 gs., both becoming the property of Lord Fitzhardinge; *Oxford Rose* made 53 gs., and was bought by Mr. Pierce, of California; *Ursula 20th* made 50 gs., and was purchased by Lord Fitzhardinge; and *Oxford Gem* was bought by Mr. Pybus for 54 gs. In the bull section LORD COLLINGHAM was sold to the Earl of Aylesford at 115 gs.; and DUKE OF DARLINGTON made 51 gs., and became Mr. Melsome's property.

SHEEP.

WE beg to draw the attention of our readers to the dispersion of Mr. J. Wood's (of Stanwick Park, Darlington) sheep stock, on the 13th inst. This stock has been long bred by Mr. Wood, and his father before him, and is derived from the best blood of Mr. Sanday's, Mr. Buckley's, and Mr. Dixon's flocks of Leicesters.

—— Messrs. Lythall & Clarke held a second sale of Shropshire rams and ewes in the Smithfield, Shrewsbury, on Tuesday last. With few exceptions the prices for rams ruled low, 10 gs. being the highest figure given, in two instances for rams of Mr. J. M. Baker's (of Grendon) blood. "Mainstay," bred by Mr. R. H. Masfen, made £3 15*s.* only, to a gentleman from Wolverhampton. The feature of the sale was Mr. Nock's prize pen of ewes, thought by several competent judges to be the best in England, which, after strong competition between Mr. Wilson and Mr. Firmstone, fell to the lot of the latter gentleman at the unprecedentedly high figure of 14 gs. each. Other ewes sold well, those of Mr. Williams, sen., of Astley, averaging 59*s.*; those of Mr. Williams, jun., of Albrighton, 56*s.*; Mr. Yates', 47*s.*; Mr. Humphrey's, 53*s.*; Mr. Roberts', 87*s.* 6*d.*; Mr. Williams', Berriew, 77*s.* 6*d.* *Midland Counties Herald.*

POULTRY.

THE late Mr. F. R. Horner, of Hull, investigated the "tapping-like" sound which emanates from eggs during the 48 hours before the chick emerges. He came to the conclusion that this sound is not caused by the stroke, nor by any other mode of contact of the chick's bill with the shell. Mr. Horner thus described the means he adopted in order to arrive at a correct notion as to the cause of this familiar sound:—"I broke a small hole in the round end of the egg where the tapping was distinctly audible. By this means I saw the bill *in situ*, and plainly perceived that though the sound continued, the bill itself did not come in contact with the shell, nay, in some early instances, the sound was heard before the bill was visible. Another example was watched till a small fracture in the shell had been made by the chick. This breach was then enlarged considerably, breaking away the shell so as to bring the bill of the chick into open view—to isolate, indeed, and to prevent the possibility of its coming in contact with the shell. Still the same tapping sound continued as before, and, as I now clearly saw, was produced solely by the breathing of the chick."

A GALLON OF WATER.

[The following letter has been lately published by Professor A. H. Church, of the Royal Agricultural College.]

SOME of your readers may like to have a few notes on pure and impure waters from the pen of an analytical chemist who has devoted much labour and study to the subject during the last ten years. Excuse me, then, if I try to give, as it were, a history of a gallon of water, from the time that it falls in rain till the time when drawn from our pump it, shall I say refreshes? or—poisons us.

Rain water falling in the open country and caught in clean vessels is not perfectly pure water. But it only contains mere traces of foreign matters, and, so far as we can prove, nothing at all injurious. One gallon of it, that is 70,000 grains, will never contain more than two or three hundredths of a grain of nitrogenous matters, which, as we shall presently see, are characteristically abundant in impure and dangerous well waters. Of dust and common salt and the gaseous products escaping from manufactories and furnaces it may contain, at some places and on some occasions, varying though small proportions. But even in manufacturing towns the injurious matters which are washed out of the air by a shower are hurtful to vegetation only, and they are kept within narrow limits by the vigilance of our inspectors under the Alkali Act of 1863.

But supposing a gallon of country rain to have been collected and analysed, and about one grain of extraneous substances in the gallon, or even as much as two grains to have been found in it, whence does it derive those further quantities of foreign matters which it contains when drawn up from our wells? It must be remembered that rain water contains two gases dissolved in it, namely, carbonic acid and oxygen, both of which have a solvent action on many of the materials of rocks, and by the agency of which the formation of soils from rock has been in great part accomplished. Thus, rain water falling on rocks, or percolating through soils, dissolves several of their constituents, notably and commonly the carbonate of lime. Thus rain water may become hard water. But rocks and soils often contain matters which are soluble in pure water free from oxygen and carbonic acid, such as sulphate of magnesia, sulphate of lime, and alkaline salts; these substances will, therefore, readily dissolve, and thus the mineral ingredients of the water be further increased. Let us turn now to the so-called organic impurities of waters and their sources.

Suppose one gallon of rain water to have become charged with 20 or 30 grains per gallon of atmospheric and earthy ingredients, and to be resting upon an impervious layer of clay, a water-bearing stratum. Suppose over this layer of clay another layer of porous and pervious gravel. Suppose, further, a cesspool in this gravel. What will be the result? I quote the answer from some words of mine published elsewhere. "When a well and a cesspool are close together, both in a gravelly soil, both fluctuating contemporaneously in level, and both resting on the same stratum of impervious clay, it is not unlikely that the chemist finds much similarity in the contents of both receptacles." The solid matters are strained off, the offensive odour and colour are nearly or quite completely removed, but the careful analyst finds that the remarkable purifying powers of earth and gravel have been unable to efface all the traces of sewage contamination which the water has suffered. He finds the water to have acquired new ingredients. The common salt taken with human food finds its way to the cesspools and thence to the wells: the phosphates of animal matters and animal ejecta find their way to the wells: the

organic matters rich in nitrogen and containing some sulphur, altered more or less completely, are to be found in the wells. None of these intruders may be actually dangerous, but their presence indicates danger. What if the purification so generally effected by a soil or a gravel were to fail? What if, by long use, the natural filter were to become hopelessly polluted? Some trace of active putrescent matter, some germ, it may be, of typhoid or choleraic disease, escapes oxidation and destruction, and then some desolating or subtle scourge appears. Can we chemists fix upon a certain substance in a deadly water and say, "that is the typhoid fever poison?" No, but we can find out whether a water is suspicious or not. We can ascertain whether a water has been affected by an inflow of sewage or not, and therefore we can affirm a water to be secure or otherwise, from the only source of danger yet known to exist. A word or two as to how this opinion may be arrived at.

If we take a gallon of rain water and dry it up, or evaporate it, a very trifling residue remains, usually not one grain in weight. If we take a gallon of the best well water Cirencester can produce we shall find nearly 22 grains left. This residue should be chiefly compounds of lime, especially carbonate of lime. But this residue often contains matters which can only have had an animal origin, and it often amounts to twice or thrice the number of grains I have mentioned. It is of little importance that this increase of the dissolved matters in a water causes it to be much harder, to require the use of more soap in washing, and to prevent tea from drawing well. It is of great importance, on the other hand, that this extra dissolved matter means so much animal substance turned into nitrates, nitrites, ammonia, and other similar compounds, together, perhaps, with some deadly nitrogenous ferment; that it means so much bone, so much putrescence—to be plain, so much excrement, added to a liquid naturally pure but artificially corrupted. We test, then, the quality of a water by seeing how much more dissolved matter it has than it naturally, in our district, ought to have; how much salt from human excreta it has taken up, how much nitrate and nitrite it has got from decaying muscle, how much phosphate from decaying bone, how much organic matter from putrescent flesh. To come to really trustworthy conclusions on any of these points, and on many others nearly as important, demands the most precise and critical processes, the most careful manipulation, and the most perfect apparatus. The experienced chemist recognises in the dried residue of a portion of water certain appearances which he has learned to interpret; he observes the changes which ensue when this residue is heated more and more strongly, such as blackening, deflagration, and sublimates. He estimates with scrupulous precision those ingredients of a water which are only suspicious when the quantities present exceed a certain natural and normal amount. Nor does he omit a microscopic study of the water and to note its colour, as seen through a depth of 2 feet against a surface of white enamel, nor the taste and odour of the water at various temperatures. It is a mistake to suppose that a single test applied to a water can lead to a satisfactory result. A popular but very untrustworthy test of this kind is known as the permanganate test: the substance called permanganate of potash is contained in an impure state in Condy's purple fluid. With reference to this test, I have stated in my chapter on Water Analysis, in the new edition of my "Laboratory Guide" (1870), that its indications as to the presence of organic matter are not safe, adding, "whether this organic matter is likely to be injurious to health or not is a problem which can only be answered with tolerable certainty when a large number of the indications afforded by analysis are favourable or the reverse. The decolourisation of permanganate solution by a water may arise from the presence not only of oxidisable organic matter, but of ferrous carbonate and several other substances." No chemists now depend upon the permanganate test. Frankland and Armstrong, Wanklyn and Chapman, and water-analysts, unite in condemning it. In the hands of a professional analytical chemist it may be of some service, but if it be employed alone, and by some of those persons whom country people persist in calling chemists, it will lead to erroneous results. When will Englishmen learn that dealers in drugs are not chemists, and that medical men are not chemists and analysts? Do chemists, I mean real chemists, pretend to be medical men?

I must defer what else I have to say to another occasion. Next week, if my time and your space permit, I will send you details concerning the waters of Cirencester and its neighbourhood, and then a few words as to the purification of sewage and of drinking water.
A. H. Church, Royal Agricultural College, Cirencester.

CONSULAR REPORTS.

AGRICULTURAL GLEANINGS.

Havre, France.—The average size of farms about here may be taken as from 10 to 20 hectares (25 to 50 acres). A few run as high as 50 hectares, and there is one in the neighbourhood of Honfleur of 750 acres. These farms are generally one-third grass (planted with Apple trees), and two-thirds arable land. About two-thirds of the land is held by large proprietors, and let to tenants on leases of six and nine years. The remaining third is in the hands of small owners, who farm it themselves. Good grass land will fetch as high as £90, and arable land £50 an acre. Ploughmen are paid £16 to £20, ordinary labourers from £10 to £12 (women the same) per annum, and are found in food, lodging, and washing. The farm hands have the same food, and eat together with their masters—the small tenants or proprietors. Those hired by the year live, the women in the farm houses, the men in the stables. The population are an orderly, contented class, of fair morality. Education is pretty well attended to, and schools for girls and boys are established and supported by Government in every commune. Those parents who have the means, pay about 1 f. 50 c. (1*s.* 3*d.*) a month, while the very poor receive instruction gratis. The rate of wages, and the material prosperity of both the farmers and their labourers, have greatly increased since the treaty of commerce with England, which has given tenfold activity to a very large trade in every description of agricultural produce. The average yield of the land may be taken as—Wheat, 19 bush.; Oats, 24 bush.; Rye, 18 bush.; Barley, 17 bush.; Rape, 30 bush.; Clover, 4½ tons; ordinary hay, 5 tons per acre.

St. Michael's, Azores.—The higher mountain ranges are covered with luxuriant turf, the verdancy of which is due to the constant humidity of the atmosphere, and these slopes afford excellent pasturage for sheep and cattle. The science of farming is at a low standing, all agricultural implements and operations are of the most primitive nature, and the few wealthy proprietors who have endeavoured to introduce modern inventions and improvements have met with no encouragement from the rest of the rural population. The strict entails which existed until very recently did, no doubt, cramp and retard agricultural progress, and it is to be hoped that the abolition of the law, in releasing the land from certain burdens, and increasing the number of farmers, may induce more energy and develope more skill in this direction. It appears, however, that much of the backwardness in agriculture is attributable to the gregarious habits of the people, who herd and crowd themselves together in the villages and towns, so that isolated houses and cottages are nowhere to be seen; consequently the peasants are, in most cases, compelled to sleep at long distances from the scene of their daily labour: they cannot be said to live a rural life, nor to take an adequate interest in the soil they cultivate. The same cause operates to deprive the land of the effectual supervision of resident proprietors. Moreover, although many of the latter are men of considerable wealth, by far the larger number have no capital to devote to the improvement of the land; they are compelled to borrow money, and this, as there are no banks, they must do from private capitalists at a ruinous rate of interest. With respect to cereal productions, the greater part of the arable land of the island is devoted to the cultivation of the "Milho," or Indian Corn, upon which the labouring classes chiefly depend for sustenance. The greater portion of the grain raised is consumed in the island, there being comparatively a small margin for exportation. During the past year an undue amount was exported, leaving an insufficient quantity for home consumption. The market price rose considerably in the summer months, and scarcity caused much suffering and discontent. The civil governor was compelled to take measures for the relief of the poor by obtaining supplies of grain from abroad, and amongst other places from Great Britain. A good deal of the grain produced in the island of Terciera is annually exported to Portugal, but the Terciera Wheat, which was formerly the highest priced and most sought after in the market, has fallen off in credit of late years, and is said to be excelled by that exported from the neighbouring island of Graciosa.

Berdiansk, Russia.—The cost at which Wheat can be produced in this part of the Empire, and the price at which it can be brought to the sea-board from the interior under the present primitive methods of cultivation and transport, make it impossible for merchants to compete with any hope of success with America, when even prices in England fall below £2 6*s.* per quarter. The science of farming seems to be quite unknown to the Russians, or, if it be at all understood, is not practised. The soil undergoes a certain amount of scratching up at a certain time of the year, and that is all the preparation made for the reception of seed, which, when sown, is left quite to chance. Rotation of crops is never practised. Land is not fattened with manure. Indeed, the only use to which manure, when not thrown away, is put, is to make crossings over the mud of the streets in the towns and villages. Weeding is never thought of. The plough in use is a roughly made instrument, which just breaks through the surface crust. Threshing is performed as in olden times, on a hardened floor in the open air, by means of horses or oxen, which, while treading out the grain, drag a small stone roller, which likewise assists the operation, and winnowing is effected by throwing up the grain with shovels,—the current of air carries away the chaff, and thus separates it from the grain.

Attempts have been made by an Englishman to introduce improved farming implements and machinery, but with signal ill-success. The farmers would not adopt them, and whatever he brought out remained on his hands.

It would be natural to suppose that the introduction of the German element into the country would have brought with it a better system of farming, and this seems to have been one of the objects aimed at by the Government when immigration from Prussia was invited and encouraged; and no doubt this would have been effected had the allotment of land to immigrants not been weighted with conditions which check improvement, and keep farmers stationary. Each farmer coming to this country receives from the Government a certain quantity of land, which is amply sufficient for him to begin with, and often even too extensive; but as his means increase, he cannot enlarge his possessions by purchase. His neighbours, who may be disposed to sell, are precluded by the law from doing so; the land was given to cultivate, not to sell, and if they wish to get rid of any, it relapses to the state. Thus the thrifty, diligent farmer can only increase his operations by hiring Government lands, which are let out for terms of five and six years. On such a short lease, no farmer will lay out capital in improvements; and, consequently, those who hire these lands, just try to get out of them as much as they can at the lowest possible cost, and thus large tracts of country are annually scratched up and rapidly impoverished. This system did well enough so long as labour was cheap and prices were proportionately light; but now that manual labour has become expensive, and America exports so largely, a change must be made, or this country will be beaten out of the corn trade. The short lease system must be altered if it is desired that the productiveness of this country be fully developed, and the state lands given on longer terms, so that farmers may have an interest in laying out capital and improving the soil, and making it yield largely. At present the average yield per acre on good land is only 8½ bush. The general opinion seems to be that the leases should be extended to at least 12 years, instead of the present five years. Holders could then afford to enter into outlays, with a certain hope of getting a fair return.

Anatolian Provinces, Turkey.—Every form of vegetation known in Lombardy and Central Italy flourishes here—cereals, vegetables, fruit trees, and timber; but the forests are, to all economic purposes, unprotected. The fruit trees are never pruned, the fields are either insufficiently manned or not at all; the ploughs, harrows, and other agricultural implements are rude and wooden; hence the actual produce of the land cannot be justly taken as a measure of its productiveness, but rather as an indication of what, under better care, their productiveness might be. Horticultural science in particular cannot properly be said to exist, the dead wood is never removed from the fruit trees, or the soil turned up and aired about its trunk.

Cattle breeding is left to chance, though better pasture lands than the gigantic mountain ranges, from 5000 to 9000 feet, afford, would be hard to find. Stabling is at its rudest and worst; the science of crossing is unknown. Hence all selection is natural, though that, too, is thwarted by the reckless stupidity of the drovers, who more often slaughter a fine specimen for the sake of the meat and the hide, or kill it by over-work, than reserve it for breeding. Cattle plague of a typhoid character has latterly become in a manner endemic. Preventive regulations have indeed been issued, but these regulations are, and, as matters stand, will long remain, merely illusive.

THE SEWAGE QUESTION.

[In the Health Department of the Social Science Association at Newcastle, Robert Rawlinson, Esq., C.B., C.E., President, in the chair, Mr. James T. Blackburn, of Aldershot, read the following paper on the special question, "What is the best method of disposing of sewage and excreta?"]

In considering the best method of disposing of sewage and excreta, I will not detain you by dwelling on the old ashpit system of collection, which necessitated the removal of the same by horse and cart. This plan has been condemned long since on sanitary grounds, and has been found practically to involve a great waste of manure. There are, however, a few plans based on the dry system of collection, of which Moule's earth-closet has attracted the most attention; that also known as Goux's is similar in principle, inasmuch as both use a dry material for absorbing the refuse which is afterwards used as manure; but these do not deal with other waste liquid matters, for which a system of sewers would have to be provided, and their contents treated some way or other at the outfall. I think it may be presumed that water has long been decided on by sanitarians as providing the best means of bearing away all the refuse of our towns, which will have to be taken on to the land in some form or other. Filtration, chemical treatment, and irrigation have been tried with a view of accomplishing this. By filtration the solid and suspended matters are easily separated; the same is done more perfectly by chemical treatment, lime or alum forming the chief ingredients by which precipitation of the suspended matters is brought about. That known as the lime process has been used at Leicester, Tottenham, Aldershot Camp, &c., but has been abandoned. Compounds containing alum have been tried at Northampton

Stroud, and other places, also by the "A. B. C." Company at Leamington and Hastings; but it has been found, on careful investigation by the Rivers Commission, that they fail in removing the matters in solution, while the dry manure is of very inferior quality. Irrigation, which implies taking the sewage straight from the outfall to the land, holds out great hopes of success, both as regards utilising the manure and preventing the pollution of our rivers; to do this with the least waste and offensiveness, the sewage should be delivered on to, and absorbed by, the soil in a fresh state before decomposition has commenced. The waste of this manure has been enormous, and must have correspondingly lessened the food-producing power of the country, and it really appears, if we could have gone on for ever pouring everything into our rivers with impunity, we should have done so, but this evil may now be said to be gradually working its own cure. There is only one outlet for the world's refuse, and that is vegetable production. No filter, nor chemical or mechanical contrivance can compete with the soil as a medium for purification; it abstracts not only the suspended matters, but also those in solution, then retaining them until appropriated by the plant, and this cleansing power is ever being renewed by the plants, which are constantly withdrawing the deposited impurities and rebuilding them into vegetable structures.

Water, besides having a value of its own, is an economical carrier, and efficient distributor of manure which in sewage is in a very fine state of division; it insures such a complete admixture with the soil as cannot be arrived at by any other means, and the efficacy of all manure depends to a great extent on its uniform diffusion. The water supply of towns varies from 50 to 15 gallons per head per day, and in many instances the sewers receive a large addition of subsoil drainage; this is a serious drawback on heavy soils, and also in those cases where pumping has to be resorted to. My agricultural experience in the use of sewage leads me to prefer a supply of 25 gallons a head as the best measure of dilution, bearing in mind that it has to be applied through all seasons of the year; the less storm water that finds its way into the sewers the better, as the matters it may bring down are comparatively worthless.

The amount of sewage that can be advantageously used on land depends a good deal on how near it approaches in texture to a sand or a clay, the former through the season requiring more than the latter, but taking an average medium soil, from 60 to 70 head of population per acre per annum may be necessary, so that a farm of from 100 to 120 acres will profitably consume the sewage of a town of 6000 or 7000 inhabitants, amounting to 700 or 800 tons a-day; but in sewage farming more even than in ordinary agriculture a maximum return from a given area is what should be aimed at, as the great means of reducing the heavy fixed charges, many of which remain constant, irrespective of the produce. The land, unless resting on a porous strata, will have to be deeply drained, and all irregularities in the surface, which may interfere with the conducting of the sewage, removed. Deep ploughing and subsoiling are then necessary, moving and aerating the ground to a depth of from 18 to 12 inches. The better the quality of the land the less sewage it will require. The difference between good and bad land is never adequately represented by the difference in rent, especially in the case of sewage farming, where the quality of the soil tells not only on one crop in the year, but on four or five in the same time. The sewage at the delivery on the farm must be rid of its solid matter, and as much of that in suspension as possible, as the clearer it can be applied, especially to grass, the better. The solid matter thus separated I have found to be a very poor manure. In this state it can be conveyed over the farm by open or covered main carriers, and further distributed on the land from small open channels, which, according to the configuration of the ground, will either be arranged on the catchwater system, or, when very flat, an artificial slope must be obtained by ploughing into ridge and furrow. The cost of levelling and laying out the land will vary from £10 to £20 an acre. Italian Rye-grass and green crops of all descriptions are the most successful to cultivate; the former is first-rate food for cows, and also for horses, at a later period of its growth when cut and consumed in the house. From 50 to 70 tons may be raised per acre through the season. Rhubarb, Onions, French Beans, and Lettuces thrive luxuriantly under proper treatment. In winter the deeply ploughed land and the grass will take the sewage and retain its manurial matter until the season of growth commences. I think the addition of one or two mineral manures for certain crops will be found economical and productive of good results. Sewage cannot be used advantageously on old grass land, or for growing corn, and the scarcity of green crops in this country renders their cultivation the most remunerative, either as food for man or for conversion into milk, butter, or meat. On a farm of 100 or 120 acres, there would be 60 acres under Italian Rye-grass, which, with a small amount of extraneous food, will keep 300 cows during the growing season, but in many places it is found profitable to sell the grass on the ground.

As to the money value of sewage, chemists have estimated it at 8s. 4d. per head per annum, but in practice we have not yet approached this; the gross return has not been more than from 4s. to 5s. a head, but it must be remembered the whole system is completely in its infancy, and further experience will bring with it considerable amendment.

As examples of what is being done in England, I may mention the farms at Barking, Croydon, Norwood, Bedford, as furnishing instances, out of some twenty or thirty, of what is being done; also Mr. Hope's farm, near Rumford, which from present appearances promises to be a most important example. My own farm on the Government land at Aldershot is an instance of reclaiming land by sewage, and which is about the most barren soil in Great Britain; fair crops of grass, Potatos, and Cabbages are grown on part of it, but its natural poverty makes extraordinary demands on the sewage. Looking at these farms as means of purification, they may be considered a success, as shown in the analysis of the effluent waters made by the Rivers Commission; their inquiry as to the effect of these farms on the health of a neighbourhood was equally satisfactory. The economic use of sewage is really a national question, bearing very materially on the food-producing power of the country, not merely from the utilising of the sewage itself, but also indirectly by manure produced from the consumption of so large an addition of green food, where its application to the land becomes general. Milk and butter will be produced at one-third less than their present price, and it will be found that when effectually fulfilling the agricultural conditions, it will of necessity accomplish the sanitary object also. Instead of compulsion being needed for its adoption, we shall have active competition.

Discussion.

Mr. Goodwin thought Mr. Blackburn's communication was an excessively valuable contribution, more especially so as it was not from hearsay that his conclusions were derived, but from his own practical experience. He was afraid that in stating that 20*l.* per head of the population was obtainable for the sewage was a fallacious argument, but was at the same time a side of the question which excited too much attention. The people should rather be content to get rid of the sewage at the smallest possible cost, and most certainly if it could be managed at the smallest possible profit, and not to consider the question of percentage, because it would simply create disappointment and inconvenience, and would most probably prevent a most satisfactory result being arrived at. He thought that it must be admitted that at all those places where irrigation had been tried it had been successful to a certain extent. It was, however, so serious a matter that every part of the question must be discussed and calmly reviewed.

Mr. Arthur Trevelyan said he heard nine papers read at the British Association meeting on this subject of sewage. A discussion followed at some length, and the ultimate result seemed to be that the wet sewage system was a failure as a general rule.

Mr. Rawlinson, the President, stated, in reply to Mr. Bevan, that the Government in 1848 passed the Public Health Act; in 1858 it passed the Local Government Act; and in 1858 or 1859 it appointed a Royal Commission to inquire into the best means of utilising sewage. This latter Commission consisted of a member of the House of Lords, a member of the House of Commons, engineers, chemists, and medical men; and the inquiry then instituted extended over a great length of time, and the result was embodied in three different reports, which were obtainable. Upon the water supply there had been a Commission sitting in London, but the report was not yet concluded. Then, with regard to the pollution of rivers, the Government also appointed a Royal Commission, and that inquiry had been concluded with respect to the Thames, the Lee, the Ayre, and the Calder. He quite agreed with Mr. Godwin, the previous speaker, who stated that money should in this matter be considered as a secondary question, the first question being as to how they could promote the public health.

Dr. Fairgus said he had studied this question most closely, and had come to the conclusion that the system of carrying excreta by water was a great mistake. The refuse was carried away and poured into the rivers, and, taking the Thames as an example, the result was utter pollution. Four and a half millions had been spent on a scheme of sewage, and the river just named had been almost choked up, the depth being reduced from 20 feet to 10 feet, while at the same time the people were literally poisoned.

Mr. Rawlinson, interrupting Dr. Fairgus, stated that he was appointed upon this very subject some little time ago, and took evidence on the question. He could therefore state that, as to the pollution of the river, it was quite true, but the statement as to the decrease in depth and the injury to health was quite erroneous.

Dr. Fairgus reiterated his statement that disease had been created by the pollution, and he would also suggest that the best plan was to keep the excreta out of the sewers altogether. It only decomposed in them, and made them a gigantic storehouse for the most noxious gases. Taking Croydon as a good specimen of the places where irrigation was carried on, he maintained that the result was a failure.

Mr. Hirst said that great advances had been made at Bedford in the disposition of sewage by irrigation, the experiments there having been crowned by perfect success. He regretted, however, that the system had not been in operation sufficiently long to enable him to give statistical proof of that success. The produce of the land under sewage irrigation was abundant in quantity and excellent in quality. The Rye-grass produced on sewaged soil amounted to something like £21 per acre. The Cabbages had surpassed anything he had ever seen; their size led to their being sold in quarters; and he had partaken of a Lettuce from the sewage ground weighing 5 lb., and excellent in taste. As regards the smell, he considered it as insignificant, and not at all detrimental to health; and the fluid, after draining through the land, became clear and fit to drink. The dry-earth system would answer very well in the case of small communities and isolated houses, but would be found impracticable on a large scale. One form of it was tried at Leicester some years ago, but great difficulty was found in disposing of the soil; the farmers would not buy it, and are only anxious to get it for nothing. Of course, the farmers were deceiving themselves as to the value of the manure, but still the fact was so.

Dr. Stevenson Macadam contended that unquestionably every project yet advanced for the utilisation of sewage was more or less unsatisfactory, and that the perfect solution of the problem was still in the future. The filtration method did not really attain the ends in view. The chemical method was of no practical value, because no available chemical had been discovered to precipitate the fertilising ingredients, and free the liquid from impurity; and the irrigation process had not, as far as he was aware, been tried with success in any large town. In the often-quoted case of Edinburgh, just so much sewage was taken up as the piece of land under sewage irrigation needed, and no more; the rest of the sewage ran waste to the sea. The experiments made by Dr. Elliot, at Carlisle, were designed only for the benefit of a small piece of land; they were not conceived with a view to the disposal of the whole of the city's sewage. His opinion was that the chief aim of a town should be to get rid of the sewage in the most expeditious way. If the town were near the sea, let it run into the sea by all means, for sewage could not be regarded as an article saleable with profit. Its variable character was against its sale. The fertilising properties of Edinburgh sewage, for instance, varied every hour; at one time it gave him 188 grains of organic matter to the gallon; at another period, earlier in the morning, half-past one, it yielded only 27 grains; at half-past three it yielded but 23 grains; and at half-past five it yielded only 8 or 9. His experiments with the earth-closet system supported this view also. An experimental dry earth-closet was set up in a Scotch town, and used by 40 or 50 people during twelve months. The earth was prepared so that it might be very fine, and during the year it was passed through the closet four times. The cost of the experiment, including interest upon the cost of the building, and the preparation of the earth, £62, and the wages of an attendant, estimated at 3s. per week, amounted to £21, and the value of the manure produced did not exceed £6, or £1 per ton on the spot. He had inspected in Liverpool, in the lower part of the town, a novel system of water-closet, suitable for poor districts. The closet was half filled with water, and each morning the scavenger, by opening a little door, sends the excrement into the drain, swabs down the closet, and again half fills it with water. This worked well and overcame the difficulty attending all systems in their adaptation to poor classes; they were perfectly healthy, and the daily visits of the scavenger prevented their becoming a nuisance.

Dr. Farr did not think the water system by any means free from faults. Unquestionably a nuisance was created by employing sewage to carry off the excrement, and he could not agree that the sewage did not smell when cast upon the land. Sometimes gentlemen had noses and did not smell, just as some had eyes and did not see. No doubt good management would reduce the smell to insignificance, and prevent injury to health, but as managed in Edinburgh the system was deleterious to health. He was inclined to think that further investigation would prove that no uniform system could be adopted for the whole country, but they had attained one thing by discussion so far, and that was an acknowledgment of the fact that if the sewage were not returned to the earth the country would gradually become impoverished.

Mr. Michael reminded the section that sewage comprised not only feculent matter, but house slops, and generally a quantity of liquid which could not be got rid of by drying. The process sought for must therefore be a process for carrying this fluid; and after 12 years of laborious investigation, the highest scientific and engineering authorities, appointed by Parliament because of their eminence and impartiality, uniformly reported in favour of utilisation of sewage by irrigation of land. In the course of his dealing with the question professionally, he had been concerned in three investigations of the utmost importance; the case of Blackburn, when it was proposed to use a thousand acres of land in the experiment; the case of Reading, where the same number of acres would be experimented on, and the case of Merthyr Tydvil, where they proposed to take 600 acres. The evidence given by the witnesses in these cases was diametrically opposite upon the same set of facts. Some doctors said irrigation in a certain case produced fever, and others said irrigation had nothing to do with it. The Commissioners had uniformly reported that, beginning with Edinburgh and going throughout the land, they were absolutely without evidence of a single case of disease produced by the irrigation of land from sewage; and it came out in cross-examination that one of the strongest alleged cases of fever having been produced by utilisation of sewage arose from the milkman having adulterated the milk he supplied to the orphanage, where the fever broke out, with impure water, and a tadpole was found in the milk, proving the adulteration. In another case opponents of sewage irrigation visited Mr. Blackwood's farm, and declaimed against the drainings from the sewage as black and stinking, but it was found they had sampled the sewage itself before it was applied to the land. Weighing the system by the evidence, it was found to be the very best possible system, but it must be carried out under three conditions to be harmless; the storm water must be kept out of the drains; the sewage must be delivered fresh; and it must be filtered, that the solid portions may not be passed on to the land. Under these conditions

the system will be innocuous and health secure. The public seemed to think that a sewage farm was a stinking quagmire; but as a matter of fact the land was put under sewage only eight times a year, and the effect was decernible only in the character of the crops. The Commissioners had decided against the "A. B. C." and the lime methods, and Parliament now seemed willing to grant compulsory powers to local authorities to get rid of their sewage by land irrigation,—the only method which fulfilled the conditions of Nature without deleterious effect.

Mr. HOLLAND pointed out that if sewage was taken to the land in a dry state it must be wetted before it could be appropriated by the land, and argued from this that the land might as well have it wet at first as at last; sewage in that case would do naturally what farmers now do artificially at great expense. As regards the smell, he had gone about with a good nose deliberately to see whether the air bore any taint from the sewage cast on a field, and could discover no taint whatever; the land absorbed it utterly.

Mr. IKIN, of Leeds, remarked that in the West Riding they were placed in very peculiar circumstances. Parliament had forbidden them to pollute the rivers with the refuse; and the creation of cesspools was the only course at present left open to them, the "A. B. C." method having proved a dead failure. He therefore asked the practical philosophers of the Social Science Congress to tell him what the people of Leeds must do to overcome their difficulty—to be content with cesspools, or to take their conduits 30 or 40 miles into the country.

Mr. ALLENDALE condemned the water system as a gigantic mistake. It was an accepted principle that 3 lb. of foul matter covered by 20 gallons of water would increase the nuisance, and the conclusion was irresistible that excrement should be removed in as solid a form as possible.

Mr. HEADLAM, M.P., very much sympathised with Mr. Ikin in his description of the difficulties of manufacturers when threatened with injunctions on the one hand and Acts of Parliament on the other. But members of Parliament were often very similarly situated by the conflicting evidence brought before them. But whatever was the best system in the abstract, it would be necessary, under the circumstances, to deal with the subject very much as it was found. It would, for instance, be absurd to attempt to upset the water-closet system of London or Manchester. The simplest plan was to get the sewage on the land as soon as possible. He had not the very highest opinion of the value of the sewage. The first thing was to get quit of it, and if farmers would pay for it, so much the better. But, although alive to the necessity of dealing with the sewage in towns where the water system was established, he would strongly advise the compulsory establishment of the dry-earth system in new villages.

On the motion of Mr. MICHAEL, seconded by Dr. FARR, it was unanimously resolved to recommend the Council to consider the desirability of appointing a committee to investigate the question, "What is the best method of disposing of fluid excreta?"

STEAM CULTIVATION AND RECLAMATION.

SOME of the landowners of Northumberland have done a great and patriotic act in giving a good start to the system of steam cultivation. Among these we may mention Lord Vernon, who bought the set of trial engines and tackle in Newcastle during the Royal Society's show in 1864, and his Grace the Duke of Northumberland, who has purchased a pair of engines and a complete set of apparatus. It is to the work of the latter that we have now to give special attention. We may incidentally remark, however, that nearly all the shares of the Northumberland Steam Cultivation Company were taken up, we believe, by noblemen and gentlemen in the county without a single prospectus being issued. The capital of this company has been recently doubled, and now amounts to the good round sum of £40,000, while, during the five months or so of its existence, 14 double sets of engines and tackle have been applied for, and "placed" or set to work in adapted districts. Nearly double this number of sets are now wanted by this company, but the impetus which has been thus given to this system has so overtaxed Messrs. Fowler & Company that, notwithstanding the enormous resources at their command, they have long been behindhand in the execution of the orders on their books.

The starting point of this great and valuable undertaking consisted in his Grace the Duke of Northumberland purchasing a pair of 12-horse engines and a complete set of tackle and implements with a two-fold object, (1) for giving his tenantry in and around Acklington the opportunity of testing the advantages of steam cultivation, as compared with horse-power for the same purpose, and (2) for trying experiments in reclaiming some moor land, which was of the nominal value of 2*s*. to 2*s*. 6*d*. per acre as a sheep run. The first part of this practice is carried out by his Grace's commissioner, Mr. Snowball, upon a plan which just allows the ordinary interest on capital invested in real property to accrue. The charges are—for ploughing 10*s*., and for cultivating only 5*s*. per acre. But it is the second part of his Grace's object that we have now more particularly to relate, viz., the experiments which have been begun on Chevley Moor, near the Acklington Station of the North-Eastern Railway. These we shall describe from the beginning of the reclamation to the gathering of the present surprisingly fine crop of Oats.

In the spring of last year 40 acres of this moor were enclosed, and the Whin, or Gorse, and Heather were burned off, while, simultaneously, open ditches were filled in and drains cut. The cost of this was—for the burning and levelling, £1 15*s*. per acre; and for the draining, which was done 10 yards apart, and 3 feet deep, £5 5*s*. per acre. The next process was the one in which the steam-power became an important agent in the work to be done. The plough was put to work so as to go just the depth required to cut or tear up the larger roots of the Whin, raise the stumps where they existed, and the turf of the clearer places. The depth this had to be done at was 5 or 6 inches. The next process was to work the turf and roots to the top by the means of the cultivator, which had to be used with three tines only, as the roots were so numerous at places and the turf so spongy, that more tines would have caused the implement to choke and drive the surface into heaps. This done, the harrows and clod-crusher (Crosskill's) were brought into use, and when the roots were well separated and brought to the surface, they, and as much turf as would help to burn them, were heaped in small lots and set fire to, the ashes being subsequently spread over the surface. Other similar workings were then gone through with, but more tines could be used the second time, and the remaining roots and more turf were heaped, burned, and the ashes spread as before. The later cultivatings were done at from 12 to 15 inches in depth, whereby a good deep seed-bed was formed, and a judicious quantity of the subsoil brought to the surface for aeration and mixing with the remaining sods and turf.

Lime was next applied, at the rate of a little over 7¾ tons to the acre. This was obtained of Mr. Barkas, of Little Mill, and delivered at the Acklington Station at 9*s*. 6*d*. per ton. The method of applying it was as follows:—A ton was divided into 25 small heaps, which were placed 5 yards apart, the rows being the same distance. Thus a ton extended 125 lineal yards, and of the 7¾ tons there were on an average 194 heaps to the acre. These were covered up immediately on being dropped from the carts, that the full benefit of the causticity of the lime might be exerted on the crude soil and turf to which it was applied. Thus a double advantage was gained by the care displayed in this regularity of application, for (1) enough of the crude humus and roots were converted into a soluble state, or a condition of assimilatable plant food, as the lime slaked by absorbing moisture from the atmosphere or from rain falling; and (2) this compost, so deposited and developed, was spread with ease and exact uniformity, by which means no patches of irregular growth resulted in the after crop. When this spreading was done, after a few days, the surface was again well harrowed and rolled, whereby any lime which had not had its causticity neutralised by combination with carbonaceous roots or vegetable acids while it was heaped, was finely divided and placed in immediate contact with the crude substances which were scattered over the whole surfaces of the "break." This being done, the soil was again lightly ploughed, and the surface left as rough as possible for the action of the frosts and atmospheric changes of the autumn and winter.

The above costs we may tabulate as follows:—

[illegible]						
[illegible]						
Ploughing twice at 10*s*. per acre	..	..	..	40	0	0
Cultivating [illegible]			..			
Rolling and [illegible]			..			
Lime [illegible]	..	..	..			
[illegible]	..	..	..			
Cultivating [illegible]	..	..	..			
Seed [illegible]	..	..	..			

Thus, it is perceived, the cost for everything will be an average of £15 18*s*. per acre.

Having worked up to this point, all we need further do is to describe the first crop, which, as we have said, was Oats. This has certainly been an object of wonder to the agricultural travellers on this part of the North-Eastern Railway. We have expressed our astonishment and satisfaction on several occasions during the spring and summer, and when the crops on old cultivated land of a similar quality are compared with the Oats on these 40 acres, the difference is marvellous. The manner in which these Oats stood the long and severe drought was almost unaccountable. Theoretically one would scarcely have concluded that a difference between 12 to 15 inches and 6 inches of stirred soil would have given such a marked result. But if the crust of light soil be broken, and the passages which have been made by generations of worms and insects be disturbed, the soil becomes more compact, and therefore the evaporation less rapid. If, for example, a hole be dug for a post, and a fair sized butt-end be inserted, there will not be enough soil to fill the hole again if a slight compression be exercised on the moulds. If, too, a piece of lump-sugar be cut the size of a cup or other utensil, and it be then crushed to powder, it will not fill the cup. These data illustrate the effect of deep cultivation on this kind of soil. There is no fear of an excess of water in the clay subsoil after the drains have been inserted. But the point to be gained is to retain enough moisture during an ordinary season. This ensues under this treatment, for that which would fly off by evaporation, if only shallow cultivation is done, is retained to sustain the growing crop, the main loss of water arising from the organic circulation through the living plants while they feed, grow, elaborate juices, and mature the seed of reproduction.

But we must return to the present crop. From off these 40 acres there are 18 stacks of 10 1-horse cart-loads each, or 4½ loads to the acre. The yield was estimated off-hand at about 44 bush. to the acre; but on close inspection during the process of maturing and the work of cutting, 4 bush. more were added to the first estimate. We have no doubt the latter reckoning is nearer the mark. This is a great crop for the soil and the season. The Oats were sown broadcast by hand on April 4, and the quantity of seed used was 3½ bush. per acre. Here another noteworthy feature presents itself; although the sowing was not early, the crop was ready for cutting and carrying before some neighbouring crops that were put in sooner by some days.

In conclusion, we may say this experiment is to be continued, and the area extended at the rate of about 40 acres per annum. The next plot of 40 acres is in a far advanced stage of preparation. There are some excellent points of management to be seen from the railway, to which it lies close up. Indeed, the process of preparing this soil for cropping is worth a considerable journey to make such an inspection as we did, and we commend it to the study of other landlords who may be equally interested in increasing the value of poor soils. *North of England Farmer.*

GRINDING HAY AND STRAW FOR FEED.

THIS matter is beginning to be seriously debated in the system of advanced agriculture. Like other new things, it makes but slow progress in the agricultural mind at first, but the advance of the age in using steam-power on farms, points out the possibility, and indeed likelihood, of as great an advance in this as in any other direction.

Advocates of the system of grinding hay and straw for feed naturally argue in this way:—The nourishment in the fibre of hay and straw is only attainable by the breaking down of the fibre of the material, and thus opening to the action of the stomach of the animal the cells of the plant, which contain the starch, the sugar, and the oily particles which have been carried into the stem of the dried plant by its natural growth. These broken cells are then acted on by the juices and liquids of the mouth and stomach, are dissolved and assimilated into the system of the animal. Hence, the more perfect the crushing and comminution of the stem, the more easily do the animal's digestive organs take hold of the nourishment which the stem of hay and straw contains, and therefore, the more the fibres are so crushed and divided, the more nourishment is obtained from them. Then, again, in proof of this theory, they show that grass (which is only undried hay) is much more congenial to the animal than hay, that he lives better on it, and fattens quicker, and that therefore the consumption of grass is more profitable than that of hay. This, they affirm, is because the grass, being softer and more easily crushed, is more thoroughly broken down by the mastication of the animal than can be the case with the dried vegetable, and being altogether in a softer state, nearly, if not quite the whole of the nourishment it contains is at once available, which is not the case with hay.

To prove this, examine the excrement from a grass-feeding animal. Wash it in a fine sieve, until all the colouring matter and the animal additions which it has received in the stomach of the beast are removed, and you will find it to have been ground infinitely finer and more completely than excrement from a hay or straw-eating animal treated in a similar manner. The fibre from the grass-fed animal is nearly as fine as the stuff from which they manufacture brown and coarse paper, while the fibre from the hay-eating animal is quite as coarse as the material which the paper-makers use to make what is called straw-board. These are facts demonstrable any day by every farmer who chooses to try them, and they consequently cannot be denied.

Admitting, therefore, for argument's sake, that the finer the particles to which hay and straw can be reduced before it is placed in the stomach of the animal, the more nourishment is derived from it, and consequently, the more profitable it becomes, we come to the consideration of the question: Can this be more easily attained by the natural grinding and mastication of the animal, or by artificial means?

Many will argue that mastication of cattle food is most natural, and therefore best. In reply to this, the answer is: True in many cases, but not in the fattening of cattle. In this operation we want to avail ourselves of every particle of fattening matter in the food in the shortest possible time. Animals can assimilate more than they do in a natural state, and the farmer's object is to make them do so. He wants to reduce his operations to certainty, not leaving them in any way to chance. Young animals grind their food quicker and more perfectly than old ones. Some animals, from greediness of disposition or other natural causes, swallow their food before it is thoroughly masticated; and although in the case of ruminants it is all brought to the mouth a second time, and even oftener, and re-masticated, after having been softened in the stomach

or paunch, yet it is of necessity only masticated in sufficiently fine particles to pass to the second stomach and other digestive organs, and it by no means follows that even the ruminants grind the food as fine as the profits of the farmer require. His object is to make all feed alike. He pays as much for a beast which does not grind his food well, as for one which does—for the lazy chewer as for the more active and industrious one. He wants all the beasts in his byre finished off at one time, and that each and all shall have taken from the hay the last attainable particle of fattening matter. And to make this certain, he applies the help of science in the construction of a machine, to break down and comminute the fibre of the dried plant, having recourse to steam for the power necessary to effect that object.

If this is the case with hay, how much more must it be with straw, whose fibre is harder and more intractable, and whose fattening matters are more sparse and difficult to get at? And if it be true with respect to ruminants, it is of ten times more force with horses, the object in feeding which is to spare the animal all the labour possible, and give him the greatest amount of time in which to rest and recruit his faculties, and where before anything it is necessary that he should be furnished with the least cumbersome and the most easily digested food which is attainable.

It is a well-known fact that hay cut too short in the chaff-cutter gives horses indigestion, and therefore nowadays inch and half-inch chaff is preferred; but as the chaff-cutter, though cutting the substances, does not abrade and tear them, it cannot act in the setting free of the hidden nourishment which the hay and straw contain.

Having arrived at the point that grinding hay and straw may be advisable, the next thing to be seen is how it is to be done, and here we must call in the assistance of the farm machine maker. The operation ought to be effected at one movement—that is, the material should be reduced at once to the necessary fineness. It should be taken from the stack and fed without change to the machine, as a straw-cutter is fed. It ought not to be necessary first to cut it and then to grind it.

The value of boiling hay and straw has been long known: but besides the labour of this course, there is an objection to the constant feeding of animals with hot slops of any kind, for if you begin you must go on to the end of the beast's term of fattening, or he will go back instead of improving.

Steamed straw is now a staple upon old-country farms, and when beasts are purchased for fattening they are at once fed with steamed straw, and are found to do infinitely better than they will do on straw that is given either dry and whole, or chaffed. The steam-engines now used on all farms of any consequence in Britain afford by their waste steam the means of steaming straw without extra expense, except the carrying it to the steaming trough and the removal of it from thence to the cattle-byre. *Victus, in the "Canada Farmer."*

Home Correspondence.

The Abingdon Annual Ploughing Match took place on the 27th ult., on the farm of Mr. Graham, near to the town of Abingdon, where 63 ploughs came in competition out of the 70 which had been entered. Great interest was taken in the three champion classes, both as to the ability displayed by the ploughmen and the manner in which the ploughs of the different makers did their work. Perhaps the prejudice existing against the double-furrow ploughs helped to raise the excitement. In the single-furrow class Mr. W. Graham's man, Thomas James, carried off the prize, with one of Howard's ploughs, from a number of other makers. The performance in this class was exceedingly good, demonstrating both the abilities of the men and the excellency of the ploughs. In the double-furrow plough All England Champion Class, Ransome's, Murray's, of Banff; Fowler's, and Howard's all competed. The men using Fowler's and Murray's ploughs had no chance against those which happened to be using Ransome's and Howard's ploughs, between which the competition was close and exciting; in fact, their work was but little inferior to that of the other champion single-plough class—indeed, the finishing up was quite as good. The question of weight is really after all the great point in connection with these ploughs, for except there is a great saving of both manual and horse labour double-furrow ploughs are a delusion; therefore we would urge upon the stewards of all societies to take prompt measures to test the draught of these ploughs against the single-furrow plough at the same depth and width,—then it would soon be found in what localities they can economise labour. William Broden, ploughman to J. W. Kimber, Esq., of Tubney Warren, Berks, carried off the prize, with Howard's new double-furrow plough, from all comers, although he had only two hours' practice with it the day before. In the Members' Champion Class there were only three competitors. Colonel Loyd-Lindsay's man, William Welsh, carried off the prize, with a Howard's plough, with a fine piece of work, considering the state of the soil.

Class 1. Members' men, with two horses.—1st prize to J. Miles, ploughman to Colonel Loyd-Lindsay, with a Ransome's plough; 2d prize, to W. Radburne, ploughman to Mr. Graham, of Abingdon, with a Howard's plough.

Class 2. Members' men, with three horses.—1st prize, to W. Newport, ploughman to Mr. Bullock, with a Ransome's plough; 2d prize, to Jas. Stimson, ploughman to T. W. Dewe, of Atterwick, with a Howard's plough.

The ploughing in all these classes was well done, considering the hard dry state of the soil. The ploughing in the two boys' classes was very inferior, they evidently not having strength to hold against the hard dry ground. Much credit is due to the officers of this Society for their harmoniously systematic arrangements, which brought everything to a satisfactory issue. *L. P. B.*

Corn Averages: Michaelmas Rents.—I beg to send, for the information of your readers, and especially those who may have adopted the system of corn rents, a statement of the average prices of British corn, founded on the returns published weekly in the *London Gazette*, for the year ending Michaelmas, 1870:—Wheat, 45*s.* 11*d.* per imperial qr.; Barley, 34*s.* 11¼*d.*; Oats, 22*s.* 11¾*d.* The fluctuations in price during the same time are as follows:—

	Highest Price.		Lowest Price.		Difference.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*
Wheat, Aug. 6, 1870	48	11	Feb. 26, 1870	40	7	14 4
Barley, Nov. 13, 1869	39	9	July 9, 1870	30	5	8 6
Oats, Aug. 6, 1870	28	8	Feb. 12, 1870, & Jan. 1, 1870	19	10	8 10

The nett imports during the year (the exports having been subtracted) have been:—Wheat, 8,678, 414 qr.; Wheat flour, 5,277,846 cwt. The nett imports for the year ending Michaelmas, 1869, were—Wheat, 6,976,427 qr., Wheat flour, 4,277,183 cwt. *Montague Marriott, Editor of "Willich's Tithe Commutation Tables," 26, Montpelier Square, S.W., Sept. 27, 1870.*

Leases and Agreements.—You kindly permitted me to ask your correspondent "G. A. H.," one or two questions on this subject, and he gave me the information required as to the quantity and cost of lime. Of the other questions I put he writes: "'Worthing' asks me questions common sense should have prevented." True, I may be deficient in "common sense," at the same time I shall be glad to hear from him "in what condition the tenant received the land from his hands—was it like a sucked Orange? and why "the last eight years" are chosen for the application of lime? *Worthing, Sussex.*

Thin Sowing.—I continued my experiment this year by drilling, last October, 1 peck of Wheat on half an acre, and my usual quantity of 1 bush. per acre on the rest of the field. The two half acres were carefully kept separate, and the produce of the thinner sown was at the rate of 49 bush. per acre, while that of the thicker sown was at the rate of 52 bush. per acre; showing an advantage of 3 bush. per acre in favour of the thicker sown. About the same result took place last year, proving that the 1 bush. per acre drilled is the right quantity for my heavy land. During two years 1 peck dibbled beat all the Wheat on the farm, producing 7 qr. 2 bush., and 7 qr. 1 bush. per acre. But a good deal depends upon season, and nature and condition of the soil. This season has been particularly favourable to the thick sower, for the Wheat did very little branching or tillering in the spring. Consequently, owing to this and the dry season, which prevented the formation of heavy flag and much straw, the crops were generally standing and unlaid. It is because they were standing and the sap fully elaborated that we hear of very heavy yields—say 7 to 8 qr. of Wheat per acre on heavy and rich land. Last year, under different circumstances, the thick-sown crops were laid prematurely, and produced wretched results. The conclusion we must draw is, that seasons influence results as regards thick or thin sowing, but, as a rule, great mischief arises from sowing too much seed. The previous crops of the field on which my experiments were tried had been, in 1867, a heavy crop of Wheat, followed, in 1869, by more than 6 qr. per acre of winter Beans. With covered yards, unwashed cake manure, and deep and clean cultivation, we can grow plenty of Wheat on poor heavy land. In fact, on such land I always, after Clover, take first a white Wheat crop, followed by a crop of bearded Rivett Wheat (Barley does not answer so well on such stiff soils); and then, following the two crops of Wheat, 30 to 40 tons of Mangel; and then again Wheat, Beans, and Wheat. On this plan I grew on one field 8 qr. of white Wheat per acre in 1868, 7¼ qr. of Rivetts in 1869, and now (in 1870) I have a very heavy crop of fine Mangel. The rotation stands thus:—1st year, red Clover; 2d, white Wheat; 3d, Rivett Wheat; 4th, Mangels; 5th, red Wheat; 6th, Beans; 7th, Wheat; 8th, half Beans, half winter Tares—the winter Tares followed in the same year by Cabbage planted in July; 9th, Wheat after the Beans, Oats after the Tares and Cabbage: so that out of the nine years we take four and a-half crops of Wheat, one Clover, one and a-half Beans, one Mangel, half Oats, half Tares followed by Cabbage. The Clover is mowed for hay, then manured, and afterwards folded by sheep, consuming cake, maltcombs, bran, &c. First crop of Wheat after Clover not manured. Second crop of Wheat (Rivett) manured with 2 cwt. of Peruvian guano and 1 cwt. of salt. Mangel crop heavily manured with 20 tons of rich shed manure, deeply trench-ploughed before winter, and 3 cwt. of guano and salt scarified in in the spring. Wheat after Mangel, 2 cwt. of guano and salt ploughed in in October. Beans after Wheat, manured with 12 loads of shed manure. Wheat after Beans, manured with 2 cwt. of Peruvian guano and some salt. Winter Tares after Wheat (not manured), folded, or made into hay; the ground manured with 24 loads of shed manure, and deeply trench-ploughed for the Cabbage planted after Tares in July. *J. J. Mechi, Sept., 1870.*

The Best Grain for Seed.—On reading your remarks at p. 1294, on using the primest sample of seed Wheat, a circumstance was brought to mind which occurred a few years ago. A garden labourer, whom I occasionally employed, made the following observation to me:—"Master, shall I tell you sum'at?" "Yes, Joe, what is it?" "Why, do you remember telling me to take that Parsley seed home to dry it and take care for you? Well, yo' see, I thought I'd beg a bit a noist for mysen, so cut big top seed off and sown it, and there isn't a bit o' cu'led Parsley i' t' lot, an' yores is fust-rate." *A Fact!*

"G. A. H." and Smith's Tackle.—"G. A. H.," at p. 1296, writes, "Let us see what I have ridiculed. Mr. Smith stated he had made a seed-bed for Wheat, with his steam-smasher, for 6*s.* 8*d.* per acre. I took his own figures and proved he had done nothing of the sort." Let your readers refer back to pp. 542 and 748, and they will find the relative cost of the two systems, Smith *v.* Fisken ("G. A. H." throws Fowler's, or any other double tackle, out of court on the score of expense). He told us at p. 288, that "the round-about and the flying-rope system would give pretty nearly the same result," yet at the same time, at p. 780, he places Smith's, or the roundabout, to disadvantage, by allowing 8 acres for Smith's, but 13 acres to Fiskin's. As the matter rests on the amount of work each set can get through in one day, "G. A. H." was asked, at p. 810, "where Fisken's system, using a 10-horse engine, can be found (maybe the owners of such tackle will inform us) averaging 13 acres per day?" He does not reply to this inquiry; but at p. 842 denies that a set of Fowler's roundabout can be set to work for £525. At p. 906 the cost of Fowler's, also Howard's roundabout tackle was given, and at p. 1236 we find a Smith's 10-horse engine tackle costing £446. The cost of tackle of 10-horse power stands thus, viz.:—Fowler, £480, complete; Howard, £520, complete; Smith, £446, complete; Fisken, £600, complete—p. 288. Will "G. A. H." inform your readers where tackle of any maker of 10-horse power, can be found that will get through 13 acres per day? *West Indian.*

Societies.

WARWICKSHIRE.

AT the annual meeting of this Society, at Leamington, the other day, Mr. T. HORLEY said:—We must feel that we are exceedingly fortunate in having for Lord-Lieutenant of the county such a nobleman as Lord Leigh. He is always foremost in every charitable movement which is started, and he has always shown himself ready and willing to alleviate the sufferings and better the condition of the working classes. As a landlord he is a noble example. Since the last meeting of the Society his lordship has given his tenants the privilege of killing ground game on his estate. I am quite certain that neither his lordship nor his friends will ever find legitimate sport interfered with by reason of the concession he has made. But Lord Leigh has done yet more for his tenants: he has promised compensation for unexhausted improvements carried out on his estate; and if that act should lead to the establishment of a good practical system of tenant-right in the county, it will be a great thing for Warwickshire. I must also speak of the liberality of another landed proprietor of the county—Mr. Mark Philips—who has intimated his intention to return to his tenants the whole of the rent of land upon which they had grown Wheat, which would amount to about 25 per cent. of the aggregate payment. That is a noble and generous act, and one showing that Mr. Philips takes a deep interest in the welfare of his tenantry. It has been mentioned in connection with the prize offered by the High Sheriff of Oxfordshire for the best cultivated farm at the last meeting of the Royal Society, that in Lincolnshire they have a tenant-right which was attended with the best effects. It has tended to create enterprise among farmers, and if the same thing were adopted throughout the country, then the whole country would participate in the good which has unmistakably resulted in Lincolnshire. It will be a red-letter day for Warwickshire when we have a practical tenant-right in vogue. Referring to the condition of the agricultural labourers, I must say I believe no system of education will do good unless the labouring classes have good dwellings to live in. Nothing will do more good to the farmers or their servants than providing on the farms suitable dwellings for the latter class, with good gardens, and all near to their work. I also hold that the landlords should not carry on the practice of having large preserves of game. It would be productive of much good if they would remove a large quantity of the hedgerow timber from their fields. If a few of these things were brought about, we should

no longer hear of the farms in Lincolnshire and Northumberland being in a better state than those in Warwickshire and other counties, but there would be a better state of things throughout the whole country.

Mr. C. N. NEWDEGATE, M.P. : I was glad that Mr. Horley congratulated the meeting upon the decision of the Lord-Lieutenant that he would upon his estate allow compensation for unexhausted improvements. I am a half-bred Lincolnshire man, and for more than 15 years, in all my agreements with my tenants, there has been a clause that binds my estate to give them compensation. That system of agreement has been the foundation of the success of agriculture in Lincolnshire which now surprises even Scotland itself. I will not touch on all the observations that have been made with respect to agriculture; but when Mr. Horley says "Fell more of the hedgerow timber," I must call to his attention the admitted fact that in the counties where there is the least hedgerow timber they have suffered most from the drought, and that it is an ascertained fact that in Egypt there were no showers about Cairo till they planted rows of Poplars. As we have experienced a period of unexampled drought, I doubt the policy of felling the hedgerow timber round grass land. I have in this drought watched the state of things in the park at Arbury, and I have found that where there have been trees and shelter there has been more natural pasture this season than I have seen anywhere else. I think, therefore, that what Mr. Horley recommended should be restricted to the felling of hedgerow timber where it stands between arable fields; and this even may require further qualification, for I am convinced a great mistake has been made in Leicestershire, where the hedgerow timber in the fences which separate pasture land has been cut down. I think the recommendation of Mr. Horley needs the qualification I have mentioned. I am an old member for the county, but I am a young farmer; yet this year I have tried an experiment I would like to mention. I was the first to propose and give a prize for draining, as a member of the Rugby Agricultural Society, and I do not repent it; but, happening this year to have a level meadow with a spring in it, I stopped up my drain, and I think I had more pasture there than all my neighbours. I admit that that is an experiment to be tried with caution, but if it done wisely where there are springs you will be able to withstand the drought of such a season as this.

Mr. C. M. CALDECOTT: If I had the fortune of our noble Lord-Lieutenant, and possessed the quantity of land which he possesses, I think I should also be inclined to give my tenants the privilege of shooting hares and rabbits on the farms they occupy. I have a small farm at home, with about 300 acres, occupied by one tenant, and on that farm I have shot 11 hares in three years. I have been out three days this year, and saw one hare on the farm. I do not take particular credit to myself for not being a strong preserver of hares against my tenants. As to Mr. Mark Philips, a better man never lived; and if I, like him, had £30,000 a year, and saw my tenants in difficulties, should I not help them? Mr. Horley has lifted up these two landowners as if there were no others like them in the county. I object to this, and I will not have it. I quite agree with him that a landlord ought to think of his tenants, and what is best for them in the way of helping himself by helping them, and by giving good houses to the labourers, and all that; but it is not to be a one-sided arrangement, it must be worked all through; everybody must have the same feeling—the inferior towards the superior, and the equal towards the equal. There must not be one man set on high, and people say "There's none like him!"

Mr. SMITH, of Bibury, Oxon, said hedgerow timber was a source of great injury to tenants. At a time like the present, when such great demands were made on the land, the soil should be made the most of. One of the greatest drawbacks to the tenant was the over-preservation of ground game. In whatever district he lived, if the farmer was much over-run by ground game, he could not make the best of his land. He hoped to see the day when, like Lord Leigh, landlords would give up ground game to their tenants. Landlords would then have as good sport as at present, and that without the expense of so many gamekeepers. Every tenant-farmer would be a keeper of his landlord. If, on the contrary, they had no share of the sport, when they saw men lurking about their fields they might be inclined to look another way, saying, "They are not going to rob me, but to take the robbers off my land." While, on the other hand, if they had a share in the sport, they might seek assistance and arrest the suspected characters. Rabbits were the worst of vermin, and their over-preservation was unnatural. He had had an interview with Sir Michael Beach, who asked him, "What do you require us to do?" He replied, "All we wish you to do is to set a good example. We wish you to legislate as you please, but we are now come to ask you to allow your tenants to destroy rabbits and course hares." He had given that permission for the last two years. It was said that every pheasant cost a guinea, while its market value was only 3*s.* 6*d.*

Lord WARWICK, the President, said: I hope you will excuse me for saying one or two words with respect to the discussions which have been held during the speeches this evening. I do so in good part, and with the best feeling. It is my earnest wish to hear from all practical men their practical opinions on farming, on stock, and on what may advance the interests of agriculture. I think, as President of this Association, it becomes me to say that we have a little too much wandered into points which are likely to create differences of opinion and discussions which are hardly fitting for a meeting like the present ("Hear, hear," from Lord Leigh). If there were no other places where they could be discussed, I should say let us discuss them with all that good feeling evinced by my friend Mr. Caldecott. But you must remember that there is a Chamber of Agriculture, to which these matters more especially belong. I hope you will nearly all agree with me that if we introduce these matters, which are somewhat personal, and which almost require a reply, or if we get into the discussion of such questions there may be certain disagreements which we should wish to avoid, and which no one who looked forward for a moment would wish to encourage.

Lord LEIGH: I may be permitted to say a few words in reference to the matters alluded to by the noble President. I must say that I most entirely and completely agree with what has fallen from my noble friend. I regret that my name has been more than once mentioned by my friend Mr. Horley and others in reference to the game question. I must say that I perfectly agree with my noble friend the Earl of Warwick, that it is far better to avoid the introduction of such questions as the excessive preservation of ground game, referring them to the Chamber of Agriculture, which is the medium for their consideration. My private feelings led me to see that it would be better for me to give up ground game to my tenants, and I did so for that reason. But I never expected it would pass beyond my own tenantry. It got into the newspapers, and it has been to me a source of annoyance, as it appeared as if I wished to dictate to my neighbours. I am satisfied that the good feeling of every landlord in Warwickshire would, if he could, induce him not to have an excess of game. I am equally convinced that if my noble friend the President thought game was doing any injury to his tenants, he would use his discretion as to the manner in which it should be remedied. It is a question between landlord and tenant, and one which should not be introduced at these assemblies. If the tenant has anything of which to complain, let him state his grievances to his landlord; but do not let him come here and quote Mr. A. or Mr. B. as examples of giving up their ground game. It has been to me a source of great annoyance to hear my name frequently mentioned in connection with this subject. I hope tenants will speak out to their landlords, and not introduce such discussions at festive gatherings like the present.

Farmers' Clubs.

IXWORTH.

Modification of the Four-course System.—At the first meeting of this Club for the season, Mr. MATHEW opened a discussion on the "Growth of Beetroot and Sainfoin in connection with the Four-course System of Farming." He observed that, after the dry summer which they had had, and their consequent experience thereupon, it would be well for them to consider what was best to be done to meet their wants in such seasons as they had experienced, and to try and hit on some plan to render them less dependent in future upon their artificial grasses, Clovers, &c., and to secure a good crop of Beetroot, as upon these two crops for spring and summer feed those who farmed light land were now very dependent. He continued:—Another reason I might give is, I think, we as farmers require a system that will render our farms more self-supporting, or in other words lessen some of those heavy items of expenditure for cake, artificial manure, labour, &c.; more particularly as the sources from which we draw these supplies are beginning to fail; for instance, guano is £5 per ton more than it was at one time; cake from £2 to £3 per ton more than we used to get it at, and the quality of neither any the better for the extra price. Another reason I could give is that we should do well to ask ourselves—Is there no plan by which we can increase the quantity of our stock upon our farms, and this without materially diminishing the quantity of corn? I will divide my subject into three heads:—

1. *How to Meet a Drought.*—The first difficulty we had to encounter in the spring of 1868 was the difficulty of obtaining a plant of Beetroot, the months of April, May, and June, being so hot and dry that none of us could get a plant but those who were fortunate to have their land cultivated in the autumn, and the seed drilled by the middle of April. The next difficulty of that year was what we were to give our stock, and how to fill our stackyards; from the want of rain the crop of Clover was very short, also the mixed grasses. The only fields that did well were those planted with Sainfoin. Then the season ended by our discovering immediately after harvest that all our young layers were dead, and that we must either go without sheep the next summer, or be at the expense of drilling them over again. I will now describe what I tried myself, and the results. Uponone field of 40 acres, I drilled 2 pecks per acre of common Rye-grass, 2 pecks per acre of Italian Rye-grass, ¼ peck of Trefoil, ½ peck of white Clover, and ½ peck of Rib-grass. The result of this was, it came up well just after the first shower, but the drought and sun again set in. The Trefoil and Suckling all died off, but the Rye-grass and Rib-grass kept alive, and although it produced but little feed in the early part of the following spring, it made good feed in the summer, and my sheep and lambs settled upon it better than on any other field. I also tried a mixture of Italian grass, Rib-grass, and Tares—1 bush. of winter Tares per acre, 3 pecks of Italian grass per acre, and a quarter of a peck of Rib-grass. This mixture did well, and produced a capital piece of early feed with the Tares and Grass, and the Rib-grass and Rye-grass made some after feed, and produced a good flag for the succeeding crop of Wheat. I cannot say I prefer Rye-grass as a preparation for Wheat, but upon our light lands it is better than nothing at all. Upon this field I had not sufficient Rye-grass to finish the field by 3 acres, and I therefore drilled it with the Tares without the Rye-grass, and the Wheat crop was this year at least 1 coomb per acre more where the Rye-grass was than where there was nothing at all. On another field I sowed 1 peck per acre of Trifolium; this I mowed for hay, had a fair crop, and my horses were very fond of the stover, but the Wheat this year was very light after it. The best crop, again, on my farm was the Sainfoin, indeed the only crop that did not suffer from the drought. Looking back to the year 1869, the plant of Clover and young seeds after harvest was so good that we all thought this summer there would be no lack of feed, but what has been the case? the drought and sun were again too severe for our layers of one year's growth, and keep for stock has not been so abundant as it was last year, with only the half plant of layers that was left us. Tares also were a partial crop, and we have again had the same difficulty in obtaining a plant of Beetroot, and only on those fields that had the autumn tillage is there a plant. But the Sainfoins of two and three years old have again done well, therefore proving that plant able to stand the severest drought; and now we have again lost our young layers, all but the Sainfoin. I have again drilled over 60 acres as follows:—Half bushel of Schrœder's Brome-grass per acre, ½ bush. of Italian grass per acre, ¼ peck of Rib-grass per acre, 3 lb. of red Suckling. I have not used any Trefoil or white Clover, my previous experience being that it was useless. I also intend drilling this week one field with Tares, 1 bush. per acre, ¾ bush. Italian grass; and as I have now 70 acres of Sainfoin of a very good plant, I feel less dependent upon the success of this late seeding than I should otherwise have done.

And I will now ask you to follow me as I describe my system of growing Beetroot and Sainfoin upon my farm, and I hope you will give me your opinion of its merits, and offer such remarks as may strike you as to its general adaptation to this neighbourhood. I will suppose, then, in the first place, I have 500 acres of arable land in my occupation, and I think it right to grow 20 acres of Beetroot in each year. The plan I pursue is:—I take Beetroot after Barley, *i. e.*, not laying down 20 acres of the Barley shift with small seeds. As soon as Wheat sowing is completed I plough in the Barley stubble, a good deep earth, say 9 inches; then as soon as the land has been acted upon by the weather, I harrow and ridge up, about the new year, or earlier if I can; then in March or April, as the weather permits, I manure with, say, 14 loads per acre of farmyard muck, a quarter of a ton per acre of rape cake, and 2 cwt. of salt, drilling the seed not later than the middle of April. This Beetroot will be followed by Wheat; in the succeeding spring I drill in the Wheat Sainfoin, rather over 1 coomb per acre. This Sainfoin I intend to lay three years, to be succeeded by Wheat in course with the remainder of that shift, thus making the Beetroot and Sainfoin fit in with the four-course system. Perhaps some will say I am losing sight of one of the heads of my subject in making use of such a heavy dressing of manure for Beetroot, but I would go further, if rape cake could be bought at £5 per ton, and would use half a ton per acre; and taking into consideration this field is to have no more manure for four years, I think you will say the dressing is not excessive. The course would be:—1st, Beetroot after Barley instead of layer; 2d, Wheat after Beetroot, in course; 3d, Sainfoin after Wheat, instead of Turnips; 4th, Sainfoin instead of Barley; 5th, Sainfoin instead of Clover, &c.; 6th, Wheat after Sainfoin, in course. I should, therefore, have 20 acres in each year to lay down with Sainfoin, and 20 acres of 3-year-old Sainfoin to come up for Wheat in each year, and if I succeeded in getting a plant of Sainfoin I should always have 60 acres of it of three different ages growing on my farm. Again, taking Beetroot after Barley, you save the autumn tillage of the land; the land after Barley is in a very different state, and does not require so much labour to bring it into a good tilth as after Wheat, the preparation for Wheat being to get the land together as much as you can, the preparation for Barley being to leave the land as light as you can. Again, taking Beetroot after Barley enables you to clean the land well before laying it down with Sainfoin, which is to lay three years, and upon this will your success mainly depend; and as practice is better than

theory I have succeeded in obtaining a full plant of Beetroot during the last three years, grown in this way. I have heard some say "a penny saved is as good as a penny earned," but I am inclined to think the penny saved is better, inasmuch as the saving a penny incurs no risk, while the earning a penny must; and when the labour and seed question is tested in connection with this plan of growing Beetroot and Sainfoin with the ordinary four-course, you will find a great saving will be effected. What will then be the value of these crops upon this 120 acres of land so treated, against 120 acres under the four-course?

2. *Our Various Manures.*—1st comes the manure from stock; 2d, rest is equivalent to manure; 3d, shade is ditto; 4th, tillage to heavy land is ditto; 5th, succession of crops is ditto. We all of us know that stock can be kept upon our farms without limit if we put our hands in our pockets for purchased food, but will it pay? Yes, half way, or one-half from the pocket and one-half from the green crops of the farm; therefore if we want to increase our manure supply from this source, we must increase our green crops to make it profitable. Rest to land is equivalent to manure when land is laid down to herbage, the future vegetation which it produces tending, by its decomposition, to renovate the productive powers of the soil. Land in this state is said to be in rest. Therefore will not the three years Sainfoin be a source of manure? Shade is also equivalent to manure; we are all of us aware that a crop of Clover mown for hay is a better preparation for Wheat than if the land is fed by sheep bare during the summer months, more particularly upon light land; also upon heavy land a stout crop of Beans is considered a better preparation for Wheat than a poor crop of Beans; also a good thick plant of Mustard is better than a light one as a preparatory crop; also upon our lands when we feed our Clovers with sheep, we find it better as a rule to apply the dressing of farmyard manure that we intend for the Wheat crop before harvest: does not this prove that the land shaded from the sun is better than if exposed to its influence. Therefore may we not safely infer that shade is equivalent to manure. Tillage to heavy land is equivalent to manure. We all know that a well cultivated field of heavy land, without manure, would produce a better crop than a field of ill cultivated land, with manure. Succession of crops is also a source of manure. All plants grown and carried off the ground must necessarily tend to exhaust the soil, but plants which are grown and suffered to decay, or consumed by animals upon the land, do not exhaust the soil; some crops prepare the land for crops of a different kind, taking out the soil certain properties and leaving certain deposits behind, thereby rendering the field more kind for a succeeding crop of some other species: for instance, we all of us know in practice that a crop of Clover without manure is a better preparation for Wheat, than a Pea stubble with any fair amount of manure. The purchase of artificial manure to restore the fertility of our soil is a very easy way of getting over the difficulty; but it is not very desirable that we should ask ourselves whether we have not some undeveloped sources of manure at home, that it would be worth our while to look up and bring out; and would it not well repay us to give this question of succession of crops our best attention?

3. *The Keeping more Stock.*—To keep in view profit, as I before mentioned, we must find one-half of the keep from the green crops of the farm, and will not the having 60 acres of Sainfoin increase my food for stock, whether it is cut for hay, cut for soiling during the summer in the yards, or fed upon the land by sheep? I have found Sainfoin for horses and cattle in the yards during the summer months surpass any other green food, and for chaff during the winter for horses, cattle, and sheep, there is nothing equal to it—it is both food and physic. Will not having the Sainfoin from 60 acres of land, all taken off this 60 acres, and consumed upon the rest of the farm, enable me to keep more stock, and adding the other half of cake or corn, make the rest of the land grow more corn? Will not the 60 acres of land requiring no manure for the time it is in Sainfoin enable me to manure more heavily the other arable land of the farm? Will not these 20-acre pieces of land that have been treated in this way, when they come to be laid down with Clover, be more kind for a plant, cut more hay, or carry more stock, and therefore, grow more Wheat? Will not growing the Beetroot in the way I have mentioned enable us to cultivate better the fallow-shift? I have mostly found this portion of the fallow the worst cultivated of any part of the arable land. Will it not also enable us to grow more Swedes upon our light lands, increasing the quantity of food for grazing stock? Will not the putting these things fairly together compensate for the loss of 20 acres of Barley? and will not the having this 60 acres in Sainfoin of three different ages be the best means of providing against such dry summers as we have been having, and also prove no loss in a season when we have plenty of rain? To arrive at a proper conclusion as to the value of Sainfoin, I will name what a field of 16 acres produced these last three consecutive years:—1868. 1st crop of hay, 33 waggon-loads; 2d crop, fed by lambs. 1869. 1st crop of hay, 35 waggon-loads; 2d crop, 80 sacks of seed. 1870. 1st crop of hay, 33 waggon-loads; 2d crop of seed, estimated at 56 coombs; and here I may add I have now the option of taking it up for Wheat or letting it lay another year, which I intend to do, in consequence of my young seeds having failed. I have not attempted to show how to make farming a paying occupation or a profitable investment for money, as that will depend entirely upon the businesslike habits and judgment of the man; but I trust I have introduced such a subject for this evening's discussion as will bring out your practical suggestions, and such will, I fear not, prove of mutual benefit to us all.

Discussion.

Mr. Peto said as to growing Sainfoin on heavy land, he visited a farm in Sussex some time ago, and on a very tenacious clay there with a chalk subsoil he found as nice a plant of Sainfoin as he should wish to see on his own farm. He thought it was no use trying to grow it on heavy land unless there were a chalk subsoil. Mr. Mathew's land was in his opinion just the soil fitted for the growth of Sainfoin. It was of the greatest use in affording feed for their sheep. He broke up a piece of Sainfoin two years old last year, and he got a very good crop of Wheat after it. He had since regretted ploughing the Sainfoin up very much, but the appearance of the layers last year deceived him very much. In 1868 he broke up his layers, and put in Coleworts and Mustard, and then put on manure for Wheat. He met with a tolerable success, but not such as he would have had if he had had a good layer to plough in. To produce a good crop of Wheat, it was thoroughly important to plough in as good a layer as they could get.

The Chairman said a friend of his tried Sainfoin on some very heavy land with a clay subsoil, not like they had round there with chalk stones in it, and last year he had a fair crop, and this year better. Sainfoin would not grow on heavy land, however, in his opinion, unless there were chalk in it. In Essex he was told that they had grown Sainfoin very well indeed on heavy land, but there was some amount of chalk there. But there was one thing which Mr. Mathew had mentioned—the four-course system, and if growing a green crop in succession three years were the system, it must be a new version of it, and one which he was not aware of before.

Mr. Sturgeon said in growing Beet he always cultivated by steam. By doing this a twelvemonth ago he had a very good crop, which many others had not, and he intended to follow the same plan again. In another place, where he used no steam tillage, he did not get half a plant. He used about ¼ ton of Prentice's Mangel manure and about 10 loads of farmyard manure. Some land, however, would not grow Beet any season, nor would it grow Sainfoin. In answer to a question, Mr. Sturgeon said he always did his steam ploughing twice, breaking the land up and then across, and he paid 25*s.* an acre for it, for both ploughings, the people finding everything.

Mr. Driscoll tried farmyard manure against artificial. He put seven loads of hog manure on one part of a field, and on the other 3 cwt. of Barber's manure, and he could see the difference between the two. The artificial was the best.

Mr. Gates said Mr. Mathew's system seemed to be the best way, and growing Wheat at 22*s.* per coomb was not so profitable as Sainfoin. He preferred Sainfoin on light land to a Wheat crop. For his Beet he skimmed the land in the autumn, and then put on from 12 to 16 loads of farm manure. He then put in the Beet seed. He did not ridge his land, but planted on the flat. He did not belive that Sainfoin would answer on heavy land. He had a very good piece of land, and put some Sainfoin on it. He got a good plant, but this year he only got eight small loads off 10 acres, and therefore did not think it a paying crop.

Mr. Peto thought when a man had the capital the wisest thing he could do was to break his land up to 12 inches deep. He believed autumn cultivation with steam power was right for all kinds of land, but he did not think it was right to apply any kind of manure on very light land before Christmas, as if it were wet a great deal of the value of the manure ran away. It was his experience, too, that they got very little benefit from putting their sheep on the light lands early in the autumn. On a good mixed soil, however, they might put their manure on when they pleased.

Mr. Goldsmith said when he began business he took to growing Sainfoin, and was very successful. He got so far as to ask his landlord to let him farm 100 acres on the five-course system, and it took him five years to get into shift, but he was glad to get back again, for the land got so foul. He then went back to his old system of growing Sainfoin and Clover, but every year his crops decreased. He used to grow three loads per acre, but he did not now grow much more than half. He got the best white Wheats, however, after his Sainfoin that he ever grew. He thought, however, if he had grown Sainfoin with Beet he would have done better than growing it after Barley. He was afraid Mr. Mathew's land would not be clean after three years' Sainfoin. Sainfoin, however, was the best preparation for Wheat that they could have. For Beet he thought autumn cultivation was the best. He always got the best crop that way.

The Chairman said it should be their aim to grow as many roots as possible on the smallest quantity of ground, as it was a very exhaustive and expensive crop. As to Sainfoin he thought it cost too much to have only one crop of. He should put roots, followed by Barley, then Sainfoin two years, then Wheat and Barley. As to Ryegrass he did not know how it was on light land, but on heavy land it would be the last he should ever try. He thought they were very much obliged to Mr. Mathew for his excellent paper, and he would call upon him to reply.

Mr. Mathew said if they took Beetroot after Barley instead of layer or Beans, they would have a better crop of Beet and also of Wheat, and yet would be able to keep their land perfectly clean and free from Twitch. As to Beet, he did not muck the crop to get Beet, but for the Sainfoin that followed; for the better crops they got the first years the better would be the crop afterwards.

LAVENHAM.

How to Draw the Largest Value from the Land at the Least Expense.—Mr. Vince opened the discussion on this subject at a recent meeting of this Club. He said there is no class who rely more on their own skill than the farmer, and we must admit there are many of us who have not acquired a thorough knowledge of our business. We must always be acquiring fresh knowledge, for it cannot be said that the cultivation of our soils has yet been brought to that degree of perfection which it is capable of reaching. In a business point of view, the intention is to obtain the greatest possible amount of produce from the soil, and the farmer's object is to raise it at the least cost, in order to afford him the greatest profit. In this a tenant may be assisted materially by his landlord allowing useless pollard trees and fences to be removed, and suitable buildings and yards arranged for all grazing purposes. Half the rent of a farm may be lost for the want of proper accommodation. Good farmyard manure, well prepared, is the farmer's best friend, and I am fully convinced, whatever may be said to the contrary, that really good farming cannot be maintained without good grazing. Our forefathers' chief wealth consisted in cattle, and our dependence must be in a great measure upon cattle also. How can we enrich the soil better than with good substantial manure, and this cannot be procured without cattle; the manure manufacturers and their agents may dispute this, but sound practical farmers will not, I am convinced. The more cattle we can keep, the better it will be for us, directly or indirectly; of course discretion and judgment in buying and selling at the proper time is required. The English nation are a large meat consuming community. For some years past, in spite of all the imports of foreign cattle, meat has realised a fair remunerative price. I am not one of those who would say sheep pay best or beasts pay best. I would say keep all you can fairly of each; keep them well, and should they, at the year's end, not show so favourably upon your balance-sheet as you could wish, you will have the consolation of hoping for some better results from the manure heaps they have manufactured. I have not recommended a small expenditure per acre as the best way to produce the largest amount of value from the soil. Farming, under the most economical principle possible, is expensive, and requires close application and good management. I think steam-power has in some measure cheapened our labour, and also relieved the labourer from some of his most laborious work. Steam-ploughing, I am convinced, will become more general, and with much better results than were by many anticipated. Reaping and mowing machines, too, with their improvements, are more in favour, and have this year more than realised the anticipations of those who employed them, and I believe they will ultimately become as necessary an implement on a farm as the corn-drill. I was very pleased this harvest in seeing one of Burgess & Key's two-horse reapers with one man only to drive it, laying a whole field in even sheaves in workmanlike manner ready for tying. When we can reconcile ourselves to the general use of these appliances, I believe they will cheapen labour, and assist to increase the value of our produce. You have already heard able papers from some of our most intelligent and practical members, upon the waste of force in farming operations, economy in the keep of farm horses, deep and fleet draining, &c. I shall not enter upon these matters, the chief object of my paper being to enforce the necessity of breeding stock and good grazing in connection with our modern cultivation. As far as my own experience goes, it has been satisfactory, and I think there are many of our members who expend a large sum for stock and feeding stuff, who will admit they have received a fair return for their outlay. We have heard £10 per acre mentioned as a fair outlay upon our occupations, and many no doubt think they manage very well with that sum. I would not go so far as our friend Mechi, and say £20 would be much better, but I would urge upon our young members the necessity of breeding stock and grazing as a means of increasing their profits and improving the land, always bearing in mind that the producing man is the man for his country, and the man who will ultimately receive the best return upon his capital.

The Chairman said Mr. Vince had briefly alluded to steam-ploughing, and for the good of those who believed that deep cultivation was of great benefit, he had brought some roots, grown by Mr. Campbell, of Buscot Park, Berkshire. Two were taken from the lower part of a field, where the land was richer, but the two smaller ones from another part of the field were grown in the most hungry clay. He had also brought some of the clay that they might see what it was like; and it was only through deep cultivation that the gentleman he had mentioned was able to grow such splendid roots. On this farm there were two 30-horse power engines, which tore up the soil to the depth of 2 feet, and he could assure them that there was no gammon about this, for he saw it himself. The same mode of cultivation was not employed as they had seen used in that neighbourhood, the cultivator being simply a strong knife, which cut into the ground and tore it up. The object of the gentleman he had mentioned was not to

grow corn or sugar, but to grow spirit, everything on the farm being sacrificed to the distillery. As to keeping cattle, last week when he (Mr. Hitchcock) visited it, there were 1540 bullocks and 5000 sheep on it. Fifty fat bullocks, and from 400 to 500 sheep, were sold every three weeks by auction. He thought the result they might draw from looking at those roots was that deep cultivation was the principal thing.

NORFOLK.

Meeting at Wayland.—Mr. MAYHEW said: Besides the difficulties of feeding his stock, the farmer had had other difficulties to contend with, and he was afraid there were yet more in store for him. During the last few years they had experienced very adverse seasons. There was a time when the light-land farmer by well and judiciously applying his money could meet with some encouragement; but now, however much skill and energy be brought to bear in the farming of light soils, the result was not that which he might reasonably expect. Possibly these adverse circumstances in the long run might be attended with benefit. It might, perhaps, put them on a sounder basis. In the first place no doubt it had a strong tendency to do away, in the successful cropping of the soil, with ground game, or, more properly speaking, vermin. He was sure they would all agree with him in thanking the noble President for having taken the initiative in destroying these pests to the farmer. It was true that in the course of time Parliament might enforce the suppression of them, but their noble President had anticipated this, and had acted wisely in taking the initiative. He thought they would also concur with him that the rents of the light lands were not exactly genuine. They had been put up to an extreme degree by what he might term outside men, men who were not brought up in practical farming, and who imagined that if they could get hold of a light land farm it would be nice to gallop a horse across the farm, so that they had been induced to come and give more for that land than it was absolutely worth. This put a practical man in a very difficult position, especially when the seasons favoured that description of land, but he believed the last few seasons had shown that the practical men who were willing to give a fair rent, and to give no more, were the men in whom alone they could trust.

Lord WALSINGHAM: With respect to ground game, that was always a difficult and moot question, and he had never heard it discussed without its being qualified by the statement that it was very wrong, and people ought not to be allowed to have too much ground game. But who was to decide between too much and too little? A man when he took his farm inquired and ascertained from his neighbours what amount of ground game the landlord was in the habit of keeping, and if he was dissatisfied, he need not take up the lease, and had better go to where there was no game. It was a question which rested entirely with the landlord and the tenant, and one with which the law could not deal. As to theoretical men paying more rent than practical men, the landlord tried to get as practical tenants as possible, and if men turned out not to be practical, it was no fault of the landlord. There might be non-practical men get hold of farms; but, as a rule, he believed the farmers of Norfolk were practical men, and knew the value of land just as much as the landlord, and would never give more than it was worth, unless, indeed, he happened to be a man not of strong mind and unable to judge for himself. If they had a horse to sell, they tried to make as much of him as they could; and if they asked a price they could not obtain, it was proof positive that the value put upon the horse was more than it was worth. It was a matter of agreement between landlord and tenant, between buyer and seller. Referring again to the question of ground game, the noble lord said that the tenant would have a right to complain of his landlord if he kept up more game than he had been in the habit of keeping up before he let the farm; but if the conditions and circumstances under which he took it remained the same, he could not see on what ground any complaint could be made.

LINCOLNSHIRE

Meeting at Holton.—Mr. HEANLEY, in responding for "Success to Farming and Grazing," said it took a clever man to farm at a profit, much more to graze at a profit. Under the present *régime*, with a European war, they were not to have Wheat above 47*s.* per qr., and cake was costing £13 per ton. As a practical man his advice was "farm as well as you can." He recommended the use of artificial manures, the necessity of having sheep on a farm; and with a European war, Wheat instead of being at 4 guineas had come down below 50*s.*, which they must try to make up for by growing a greater quantity. The next thing he could recommend was consideration for the labourer, and that he should be paid in proportion to his labour.

Mr. THOS. DIXON (Claxby) thought that to ensure prosperity it needed the united efforts of the owner, occupier, and labourer. There was a great deal to do which it would require those three interested to carry out to the greatest advantage, but when he looked back he admitted there had been a very great deal of prosperity in the country. Not only farms, but whole parishes now grew more than double the quantity of every description of crop that they did 40 years ago; yet, whilst there had been that prosperity in agriculture, the farmers may not have made much by it. There were three things that had been very valuable to occupiers—namely, steam threshing-machines, reaping-machines, and artificial manures. All these had been productive of great benefits. Artificial manures produced great Turnip crops. If it had not been for the use of reaping-machines they would almost have been beaten, but with them they got in the harvest just when they ought to do. A reaping-machine, in fact, was one of the best things a farmer could have. There was another thing or two that had also tended to the prosperity of agriculture. Landowners or their representatives had not only been considerate for their tenants by building them warm sheds, &c., but had built good cottages for the labourers in the neighbourhood of their work, and copied the best specimens of dwelling that could be found; but he could not see the use of allowing a tree to grow on a space worth say 2*s.* a year, which at the end of a century produced 30*s.* He thought there might be a great advantage gained by improving fences and grubbing up trees. There were also a great many other things he could name that would be a benefit to agriculture. They should have sheep from the best flocks, and cattle from the best herds, and get the most they could out of the soil by endeavouring to grow more than their neighbours. Another thing was, that on these occasions of ram shows, he should be glad if the breeder could vouch that there were no sheep amongst them fed on anything but green food for the last six months. If kept on grass food they would be leaner, fewer sheep would fall lame when they got them at work, and there would be more work in them. Mr. Vessey's sheep were this year in better condition for work than he had ever seen them. They were fat enough, but not too fat, and those who had hired them would be better satisfied than if they were so very fat.

Notices of Books.

The Science of Manure as the Food of Plants. By the Rev. Henry Moule, A.M., Vicar of Fordington. Cassell, Petter & Galpin.

This is not the whole of the title of this pamphlet: the words, "Twelve quarters of Barley may be grown per acre," appear as an integral part of it upon the title-page. The author's view of the science of manure, not by any means a new one, is that the feeding of a plant is effected pretty much as the feeding of an animal, only the processes of mastication and digestion are in the former case done outside—the soil being in fact the stomach of the plant. And he argues further that if manures were properly reduced, and, so to speak, digested before their application to the soil, the effect would be very much the same as that which the stock-feeder realises from the processes of chaff-cutting, grinding, cooking, &c., to which he subjects his food before administering it to the animal. But the process of reductive mastication, cooking of manure, can be nohow done so well as by the soil itself, and the step from this is a very short one which leads the urgent advocate of the earth-closet system to point out the great advantage, agriculturally as well as economically and sanitarily, of the use of earth for dealing with excrementitious matter, whether from the human or any other animal. The following extract illustrates his position here:—

"I once convinced a farmer, who out of 300 acres manured 100 each year with 10 waggon-loads of stable manure per acre (three loads of which he received from cavalry barracks in return for every load of straw supplied to those barracks for litter), that, taking the money value of each load of straw at 30*s.*, and reckoning nothing for wages nor for wear and tear of horses and waggons, this manure cost him £3 per acre, or £300 per annum. More than this, he opened his eyes to the fact that, from his fields being widely scattered, and from the barracks being situated a mile from his stables, his horses with those heavy loads travelled during the year more than 2000 miles! This, although perhaps an extreme case, will serve to prepare the minds of many to perceive that, if the processes which I have likened to those of mastication, swallowing, digestion, and assimilation can be greatly quickened, still more, if they can be completed previous to the application of the manure to the soil, and if, instead of an uncertain and perhaps a too late application to each plant in a field, we can render that application certain, and at the right time, then (to say the least) there will be a great diminution both of cost and carriage. But beyond this there will be a very strong probability of more certain and more abundant crops.

"Well, this may now be done, and by several modes, though all grounded on the same principle or principles. The problem to be solved is this: 'Since the actually nutritive portion of any manure must be very small indeed, how is this to be introduced into a medium of the narrowest compass and yet be in a tangible or manageable form?' The compass must be so narrow, that, as a vehicle of transmission, it shall, in proportion to the matter conveyed, be small; and yet it must be sufficiently large to render the application of the nutriment to all portions of the crop certain and uniform.'

"Now it is no rash assertion of an enthusiast, that the dry-earth system of dealing with excrementitious matter and other offensive refuse of our houses and premises, will, in the full and fair working out of its principles, exactly accomplish this. Let it be observed that the deodorising power of dry and sifted earth and clay is only one of those principles. Besides this, there is, when after use it is dried, the capability of repeated action. Then the matter to be deodorised must be dealt with at once, and before putrefaction sets in. It must also, so far as is practicable, be taken in detail. So much dry sifted earth must in each detailed application be employed as will deodorise and absorb the whole of that to which it is applied—and no more. No other liquid than that for which such quantity of earth is calculated, must be admitted into the chamber or receptacle, into which both excrement and earth are received. Such receptacle, therefore, must be waterproof. Either in it, or in a dry shed to which its contents are removed, those contents should lie, until, whether by time or by some mechanical means, a thorough interpenetration of the solid substances is effected, and until the whole, whether by natural or artificial heat, is thoroughly dried. After which it may be either used again for deodorising purposes, or (which relates more immediately to my present subject) it may with confidence be applied to the soil as manure. The nutritive particles will have been brought into that state and condition in which the roots of the plants, on their being brought into contact, can take hold of them and take them up into the sap vessels."

We now come to the second part of the title-page—"Twelve quarters of Barley may be grown per acre;" but as this is really too good to be true, we must be satisfied with the following statement, which is given as the proof:—

"In proof of the advantage of applying manure in the right place and in the right time, that is, in the place and time which will allow of the roots of the plant acting upon it throughout its growth, I will give two experiments. The first I made some eight or nine years ago with liquid manure—the sink-water and slops of the house, mentioned above in connection with a tank. These were freely diluted also with the surplus rainfall of my house. Beneath two square yards of ground at a depth of 10 inches, I placed a horizontal 2½-inch drain pipe, leaving the joints open. With this pipe there was communication at each end through an upright pipe of the same bore. Through these two upright pipes, after the plants began to grow, I poured, twice a week, about 4 gallons of the liquid sewage. In the month of December I found by the roadside a very fine plant of the Tartarian Oat. It was so fine that I divided it into four parts, and planted these in my bed of 2 square yards. One was killed by frost, the remaining three grew so luxuriantly, that when in blossom the stalks measured 1½ inch in circumference; the leaves were 1 inch broad; and many of the ears measured 26 inches in length. In this stage of their growth they were seen by Professor Owen and Lord Inniskillen.

"Out of one ear I rubbed 800 grains; and the produce of this single plant, so divided, was ¾ lb. of very good seed. At the suggestion of an eminent agriculturist, to whom I showed this seed, I sowed 12 grains in the same ground, treated them in the same manner, excepting that there was no division of the plants, and no transplanting. And from those 12 grains I, in the following July, gathered 1¾ lb. of equally good seed. Had I sown 18 instead of 12 grains I doubt not that the produce would have been at least 2 lb., or 1 lb. the square yard, which would give a yield of 20 sacks of 12 score each, or 30 sacks of 8 score to the acre.

"Such a mode of cultivation, with liquid manure, so applied, must to any large extent be impracticable. If, however, dry and solid manure, compressed in the way above described, can only be conveyed, if not in the same quantity, yet to the same close proximity to the roots of the plant, then the mode is practicable to any extent for which the requisite labour can be provided. In proof of this I give the following experiment.

"At the commencement of 1869, just as I had fully satisfied myself of the digestive capability of dry earth, I received by post, I believe from Captain Hallett's office, 57 grains of his Pedigree Barley. These grains I sowed (January 6) in a pot of common earth standing in my garden; and (February 13) I transplanted the 57 plants, produced by them, into a patch of ground rather less than one-fifth of a rod or perch. Into each hole (10 inches deep) I poured 1 ounce of the earth, which had passed through the closet four times, the strength of which I consider not more than equal to that which may be formed in an ordinary vault or chamber during three months. Of the 57 plants the sparrows destroyed 15. But by the subsequent division of some of the stronger plants I raised the whole number on this one-fifth of a rod or perch to 50 plants. The smallest of these produced 15 stalks; and the larger had each from 40 to 45 stalks, with ears measuring 6 inches and some 7 inches in length; and in some of them there were counted 40 or even 44 grains. The produce from those 50 plants on one-fifth of a perch of ground is ½ peck of grain. Now this gives a yield of no less then 25 sacks per acre! And as the ½ peck weighed 5¾ lb. this would make the weight of each sack 8½ score.

"The inquiry of almost every one of the many farmers and others who saw these beautiful plants in their growth was 'Can this be done on a large scale?' And my reply was, 'Yes, on any scale for which you can find, and are willing and able to employ, labour;' and by it the door is opened to a remunerative employment of a larger amount of labour during all the open weather of winter."

Yes! no doubt this was Mr. Moule's reply, but it is clearly a mere assertion, without the necessary demonstration. The "rule of three," on which this assertion apparently is based, does not apply at all. The things compared in it must be of "the same denomination;" whereas it is clear that the plants grown in a garden one by one are of a very different "denomination" from plants grown broadcast in 10-acre fields. Meanwhile, we may commend to our correspondent, "G. A. H." the assertion that 800 grains have been grown upon a single ear of Oats.

Farm Memoranda.

Ash Grove Farm, near Bicester: *The Oxford First Prize Farm.*—[We take the following extract from the official report in the number just issued of the "Royal Agricultural Society's Journal."]

Before entering upon a description of the several farms which will form the subject of this report, it may be well to give a short account of the origin of the competition. Mr. Mason, of Eynsham Hall, near Witney, late High Sheriff of Oxfordshire, with a most laudable desire to promote the improvement of agriculture, and also, if possible, to obtain from judges appointed by the Royal Agricultural Society a definition of that which constitutes good farming, offered a most handsome prize, of a hundred-guinea cup, for the best-managed farm comprised within a district, the boundary line of which runs through the towns of Reading, Wantage, Lechlade, Stow-on-the-Wold, Banbury, Buckingham, Aylesbury, Great Marlow, and back to Reading. Having communicated his wishes and intentions to the Council of the Royal Agricultural Society, they at once undertook to nominate the judges and to settle the conditions of competition, and also agreed to offer a second prize of £50 for the second best managed farm among those which should compete. These preliminaries having been arranged, my colleagues, Mr. W. Torr, of Aylesby Manor, near Great Grimsby, Lincolnshire, and Mr. T. Gibbons, of Burnfoot-on-Esk, Longtown, Cumberland, and myself were requested by the Council to undertake the inspection of the 21 competing farms, and to award the prizes under the following conditions: 1, general management with a view to profit; 2, productiveness of crops; 3, goodness and suitability of live stock; 4, management of grass land; 5, state of gates, fences, roads, and general neatness. We commenced our first inspection on May 9, and concluded our second survey on July 14. The spring of 1870 has been a peculiarly trying one—cold, dry, and ungenial throughout April and May—followed by extreme drought and heat in June and July; and this has had much influence upon many of the farms in the interval between our two visits. The reports from the North of England, and from some parts of the eastern counties, speak of abundant rain during the month of June, and, although this occurred too late in many cases to produce a good hay crop, it has immensely improved all the late-sown Barley, and all but secured a full plant of Swedes and Turnips. Within the district, however, in which the competing farms are situated, little or no rain fell for many weeks, and it was quite lamentable to see on many of the farms how crops, which promised well in May, were completely burnt up and almost ruined for want of moisture in July. I feel it necessary to lay some stress upon this peculiarity of the season, inasmuch as it will be seen from the description of some of the farms noticed below, that high farming and high condition have told this year in a remarkable degree. I have observed in almost every instance in which high farming has prevailed for a series of years, and thus good condition of the land been obtained, that the effect of adverse seasons has been to a great extent counteracted.

I will now proceed to describe the First Prize Farm, occupied by Mrs. Mary Elizabeth Millington, and to which the judges awarded Mr. Mason's prize. It is known as the Ash Grove Farm, and is situated at Ardley, about 5 miles south-east of Bicester, and about 14 miles north of Oxford. Its extent is 890 acres, of which there are about 820 acres of arable land and 70 acres of pasture. The farm is held under a 21 years' lease from the Duke of Marlborough, six years of which are unexpired. The arable land is chiefly a light thin brown loam resting on the stone or corn brash; and the depth of the surface soil, all of which is of poor quality, sometimes does not exceed 6 inches. The pasture land consists of a narrow strip of meadow nearly in the centre of the farm, on a peaty soil of the worst description. A glance at the map which accompanies this report will show the surface-geology of the district, it is therefore unnecessary to trouble our readers with a geological description. The highroad from Oxford to Brackley runs through the farm, but does not divide it quite equally. The house and premises are situated near the road, and on the north-west side of it. The arable land is well laid out in good square fields, and is farmed strictly upon the four-course rotation, although the only covenant in the lease as to cropping provides that the land shall be farmed under a four-course shift during the last four years, leaving it entirely to the discretion of the tenant how to farm it during the first seventeen.

Buildings.—The house and buildings are of stone and slate, very substantially built, and in good repair. The buildings, however, are somewhat old-fashioned, and do not contain such good arrangements for the accommodation of cattle as they should do. The yards are insufficiently provided with shelter-sheds, and altogether behind the age; but these defects are clearly not the fault of the tenant.

Roots.—The 200 acres of Wheat and Barley stubble land, intended for roots, are ploughed up as deeply as the thin stony land will allow early in the autumn, and steam-cultivated in the following spring. The land is afterwards worked with Coleman's cultivator, and the roots are all drilled on the flat 24 inches apart. About 20 acres of Mangel Wurzel are usually sown, and are manured with 5 cwt. of superphosphate, applied by the water-drill. The plants are horse-hoed three or four times as occasion may require, and hand-hoed, picked, and finished off for 7*s.* per acre. The roots are taken up when ripe towards the end of October, and stored in the usual way. Swedes are sown between the middle of May and the 10th of June, and then the 80 acres of green and white Turnips usually grown, the whole of Turnip sowing being generally completed by the longest day. Swedes are drilled on the flat, 24 in. apart, 4 cwt. of superphosphate being applied by the water-drill. The Turnips are also sown at the same distance, with, however, only 3 cwt. of superphosphate. These are all horse-hoed as often as necessary (never less than three times), and then hand-hoed, picked, and finished—the Swedes for 6*s.* 6*d.*, and the green and white Turnips for 6*s.* per acre. Nearly all the white Turnips, and generally about three-fourths of the Swedes are fed off. In addition to the above large quantity of roots, 50 acres of the seeds are broken up about Midsummer, and sown with white Mustard, which is fed off by the ewes when they are put to the ram, from the middle of September to the end of October. About 2 cwt. of superphosphate is applied by the water-drill for the Mustard. When the land is clear it is sown with Wheat in the usual course.

Barley.—Barley follows the whole of the root crop; and as only about 120 acres of Wheat are sown annually, 80 acres of the seeds are also sown with Barley, the rule being only to sow Wheat on so much of the seed-shift as has been manured with well-made farmyard dung, at the rate of 10 or 12 loads per acre. Chevalier is the sort usually grown, and sowing commences early in March; about 10 pecks of seeds are drilled per acre; early sowing is held to be of great importance, and nearly all the Barley is sown by the end of March. Barley is cut by reapers, and is all sheafed and shocked at 4*s.* per acre.

Seeds.—Small seeds are sown in the Barley in the usual way, being rolled down by a Cambridge roll immediately after sowing. Red Clover is sown only once in eight years; Trefoil and white Dutch, with a little Italian Rye-grass for early sheep-fed, being sown in the alternate four-course. About one-half of the seeds are usually mown for hay, and the remainder are fed off by the ewes and lambs, which are liberally supplied with cake or corn. As soon as the lambs are weaned they are divided into lots, and placed upon the Clover eddishes, and after harvest upon young seeds and stubbles until they go to Turnips. When the lambs have left the grazed seeds, the dung-cart is immediately set to work, and the whole of the farmyard manure is spread over the fields intended for Wheat. This operation goes on at intervals (regulated by the amount of time during which the horses can be spared from their other work) until all the manure is spread on the land.

Wheat.—The treatment of the seed-shift, already described, is the first preparation for the Wheat crop. The Clover ley is ploughed up as soon as the weather permits, then rolled with the Cambridge roll; and about 10 pecks of seed are drilled in during the month of October. The usual varieties sown are the Scotch White Chaff Red and the Improved Lincolnshire White. In the spring the Wheat is hoed where it is thought necessary, but not otherwise. Somewhat later, Thistles, Docks, and weeds of all sorts are carefully taken out. No kind of top-dressing is applied to the Wheat crop, but I venture to give an opinion that small dressings of nitrate of soda mixed with salt, judiciously applied several times in the spring, would yield a good return for the outlay. The effect would be to bring up all the small ears, and to produce a more even, and therefore a more productive crop. Wheat is cut with a reaper, and is tied and shocked by men and women at 4*s.* 6*d.* per acre. Two reapers are employed, and two pairs of horses are allotted to each, with frequent changes; by this means 36 acres are usually cut in the day. The pitching and unloading are done by the acre, usually at a price of from 1*s.* 10*d.* to 2*s.* The stacking is performed by the foreman-labourer, assisted by carters and boys. Thatching costs 4*d.* per square of 100 feet. No beer is given, and the whole cost of the Wheat and Barley harvest amounts to about 11*s.* per acre.

Cattle.—No cattle are bred, and only a few young steers are kept in the summer: about 70 head of cattle are wintered in the strawyards. They have a very small allowance of roots, but a liberal allowance of linseed cake. They are sold in the spring, and are never fattened out. If they pay the cost of the cake consumed, it is all that is expected of them. Paradoxical as this may appear to the uninitiated, the practical farmer will understand that, on light, poor land, the more Turnips that can be fed on the land by sheep, the better; and therefore to attempt to fatten oxen to any extent would necessitate more Turnip carting—increased expense with little or no extra profit; the only object of keeping cattle on a light land arable farm being the conversion of the straw into good manure.

Sheep.—A flock of 400 Lincoln ewes is kept, and the produce does not generally exceed a lamb to a ewe. After weaning, the ewes are kept on seeds and stubbles until the white Mustard is ready, towards the middle of September, when they are put to Lincoln rams, which remain with them five or six weeks. During the remainder of the autumn and winter they are moved about the farm, and, for a month or two before lambing, are allowed ½ lb. of cotton cake per day. This allowance is increased, some linseed cake is added as soon as the lambs begin to drop, and continued until weaning takes place; 150 theaves are annually introduced into the flock, and the draft ewes are all made off as fat sheep. The lambs are weaned upon Clover eddishes, run lightly over the young seeds and stubbles, and then go to white Turnips early in the autumn. They become accustomed to the cake-troughs before weaning, and are supplied with the best linseed cake afterwards, the quantity being carefully and gradually increased during the autumn and winter. The hoggets are all clipped and sent fat to market when 12 or 13 months old. In good Turnip seasons about 200 sheep are bought, and are added to those bred on the farm; thus, 1000 sheep are wintered annually upon Turnips and cake. The ewes are good of their kind, but it is questionable whether the Oxford Down sheep is not better suited to the district.

Pigs.—From 80 to 100 pigs of different ages are generally kept, all being bred on the farm. A small number are fattened annually on the refuse corn, &c., but they do not receive much attention, and do not form any great feature in the management of the farm.

Fences.—Eighteen horses are kept, and are always worked in pairs. They are fed highly on corn all the year round, having Vetches in the yard in summer, and Clover hay in the stable during winter. They are strong useful animals, but do not deserve any special notice.

Fences.—The fences are for the most part of thriving Hawthorn; weeds are not allowed to grow upon the banks or in the hedgerows, and there is not the least waste of land, for the fences are closely trimmed, so that the corn grows almost on to the banks.

Grass Land.—The pastures are very inferior; they have been drained but not otherwise improved; and they ought certainly in future to share in the same liberal treatment which has been so judiciously practised in regard to the arable land.

Labourers.—The labourers at Ardley are well looked after, and well paid; at the time of our last visit the able-bodied men were earning nearly 18*s.* per week at task work. All the work that can be done by the piece is put out at Ardley, and the men are made to work as much as possible by themselves, and not in gangs. No beer is given, and everything is reduced to a money value.

General Remarks. — The foregoing description of Mrs. Millington's system of farming may, perhaps, disappoint those who expected to hear of something new, or of some departure from the old four-course routine, the propriety of which has of late years been much questioned, not only in West Norfolk, where it first originated, or at all events is very generally adopted, but also in many other parts of the kingdom. I by no means think it desirable that the system of farming, or the exact rotation of crops, should be set forth in the lease or agreement; and I am decidedly of opinion that every farmer who has capital and brains, should be allowed to make use of both in any way that will give him the highest return for his money, provided that he fulfils the one important condition, which must never be disregarded, of good crops and perfectly clean cultivation. The advocates of the four-course rotation will find at Ardley that system carried out strictly, and in the best manner. The results speak for themselves. In a peculiar season, which has tried to the utmost the thin dry and arid soils upon the stone-brash formation, this farm shows us, on the whole, better crops of corn and roots, according to the land, than any of the competing farms. It is worthy of note that, although the lease of the Ardley Farm allows the utmost license as regards cropping during the first 17 years of the term, no departure has been hitherto made from the four-course rotation, the tenant believing it to be the best adapted for the soil and district. Mrs. Millington's crops clearly prove the fact to which I have previously alluded, viz., that land in high condition is more capable of resisting the effect of bad seasons than when it is impoverished by over-cropping, or out of condition for want of that fertilising system which can alone restore the elements of productiveness. This state, however, cannot be attained by sudden or spasmodic efforts; and nothing but a series of years of high farming can produce such crops as those which Mrs. Millington's farm this year exhibits. Mr. Mason's prize has not been obtained by hasty preparation, but the well-deserved honour which has been awarded to the tenant of the Ash Grove Farm has been won by years of clean cultivation and high feeding. The annual amount of Mrs. Millington's cake bill, £1200, is the great secret of her success. I believe high feeding of the stock to be the best and safest expenditure that a farmer can make at all times, and in all seasons. The animals are benefited, the land is enriched, and good crops are secured. The judges were asked to point out a farm which most nearly fulfils the condition of one that is managed in the best possible manner—in short, to define good farming. This they can do, and they point to Mrs. Millington's as an extremely good example of a well-managed farm under the four-course system: but they

cannot say more. It may be, and probably is, the best system which could be adopted for the land to which it is applied; but to say that the four-course system is the one that ought to be generally adopted would be the height of folly. First say where you are to farm before you can say how you are to farm; for although the four-course rotation succeeds remarkably well at Ardley, different soils and different circumstances may require an essentially different system.

GRAYSTONE, NEAR ALFORD.—The farm of Graystone is situated within a mile of the Alford Railway Station. Besides Graystone, another farm in the parish of Tullynessle, one of the best in the Vale of Alford, is in the occupation of Mr. Reid. We were desirous of examining the animals he has in training for the forthcoming fat stock exhibitions. In a distant pendicle of the farm of Graystone, we first examined a pure Polled heifer, rising four years old. She is a very large size, handsome, and will not bring discredit to the exhibitor. We next examined a 3-year-old cross-bred heifer—a wonderful specimen of the Shorn-Aberdeen. We were then shown a West Highland heifer, and afterwards a polled 4-year-old Angus or Aberdeen ox, besides other animals. The West Highland heifer is very handsome and in good showing condition. We learned that this heifer occupied a high position in last year's competitions. The Polled Aberdeen bullock is most perfect in all his points, and good judges believe that no other ox to be exhibited this year will bring a higher price per stone. We were also shown a considerable number of other first-class Shorthorn, Angus, and cross-bred animals, which we expect will be afterwards heard of when brought forward in competition for prizes probably in 1871 and 1872.

The pastures were good, particularly the second crop Clover on a field from which a hay crop had been removed.

The system of stock management followed by Mr. Reid is nearly in accordance with that adopted at Tillyfour. In the growing of a mixture of Oats, Tares, and Peas, for the autumn feeding of stock, Mr. Reid prefers the grey Pea, while Mr. M'Combie prefers a white Pea. Mr. Reid does not allow cake to cattle while grazing. When cake is given it is to animals under cover, or in an open shed. Mr. Reid, like Mr. M'Combie, does not consider it advisable to give cake for any lengthened period to other than cattle intended for exhibition. We had much pleasure in inspecting Mr. Reid's stock, the more so, as he has pure Shorthorns, pure Polled, Angus, and animals first crosses of these breeds.

Mr. Reid's practice closely coincides with that adopted by Mr. M'Combie. Both are most successful feeders, obtaining the highest prices in the London market for fat cattle, and, at the same time, securing a good return for the food grown for stock on their respective farms. Neither give oleaginous cakes to what they term "commercial cattle" for a period exceeding six to ten weeks. The cattle intended for the London markets are generally confined early in the season in covered courts or byres; they are fed regularly, but not too frequently, so as to admit of the animals lying and ruminating during the greater part of the day. Mr. Reid agrees with Mr. M'Combie that the fattening of cattle is becoming more and more a question of house-feeding, the time for this having gradually increased until it is now close upon eight or nine months of the year. Cake is not given to cattle when grazing, from the belief that it does not pay the feeder.

An objection has been raised to the growing of a mixture of Oats, Tares, and Peas as a forage crop for the feeding of cattle. The objector states that it is an expensive method of fattening. This objection should, however, vanish upon a little reflection. The mixed crop is not more expensive to grow than Oats, and when consumed by feeding stock will usually give a higher acreable return than when the Oats are sold. The cattle kept upon the mixed forage will not eat more than 100 lb. daily of the green forage, and when the ears of the Oats and the pods of the Tares and Peas are full, the daily consumption of an average-sized ox or steer will be so materially reduced that he will rarely eat 50 lb. of the mixed forage, while the progress made by the animal will be greater than one kept on the best pasture. An average crop of the mixed forage generally weighs from 12 to 15 tons per acre, and in favourable seasons will sometimes exceed these weights; consequently an acre will maintain a considerable number of cattle for several days.

The rapid fattening of cattle is only one of the benefits resulting from the growing of forage crops for the autumn feeding of cattle. The cattle can be kept during the latter part of July and the whole of August and September in an improving state, when cattle grazing are seldom progressing much, particularly when the season is dry and the herbage is short and arid, as it was in the season just passed through. By means of autumn feeding upon green forage, the cattle, when placed on Turnips and straw in October, improve more rapidly than cattle removed from pasture fields at the same time to be fattened on Turnips. Autumn feeding under cover has besides a very decided influence on the maintaining of the manurial condition of a farm, as by it the amount of farmyard manure produced is considerably increased. What is found to be so beneficial in practice in the fattening of cattle by the skilful farmers in Aberdeenshire, should prove not less so in those districts where the fattening of stock is considered the sheet anchor of profitable occupancy of arable farms.

BRAYDON MANOR, CHARLHAMS, AND CASTLE HILL.—We had a beautiful autumn day, and our first start was to see the Braydon Manor Farm, consisting of about 300 acres of one of the most stubborn soils we have met with. This farm is described by Messrs. Voelcker and Coleman, in the second volume of the second series of the Royal Agricultural Society's Journal, showing the vast improvement that had then taken place, but from the description there given we must conclude the improvement to be continuous, and to any gentleman interested in the improvement of poor clay land, we would recommend a personal inspection of this farm.

We were wonderfully struck with the vast improvement taking place both in the grass and tillage, the former by contrasting this land in its improved state with the adjoining lands, and also the samples of hay, the present produce being a capital sample of good hay, in strange contrast to that of the original produce called by the same name. The tillage was in a beautiful state, and the contrast more striking still with the original, and this is principally due to steam cultivation, which was going on in force, on Fowler's system. Of the 300 acres, rather more than 150 acres are under steam cultivation for Wheat crops, which Mr. Ruck believes the land capable of producing in good quality and quantity continuously, the crops after Clover, Beet, or Beans, not having been so good as Wheat after Wheat. At the time of our visit, Messrs. Slatter & Porter's 10-horse double engine was at work on the land, having been there 18 days, during which time it had ploughed the 150 acres nearly twice over, doing its work in a capital manner, and much to the satisfaction of both Mr. Ruck and his friends.

It was interesting to witness the contrast between Mr. Ruck's farms and the lands adjoining, which are under the old-fashioned treatment; the visitors endorsing Mr. Ruck's opinion that all the poor land now lying in Braydon Forest, and let at from 7*s.* 6*d.* per acre, may, by means of the steam cultivator, and capital combined with skill, be made in a few years worth £2 or £3 per acre, and that some of the finest crops may be grown there.

Both Mr. Edmund Ruck and his brother Henry repeatedly expressed their conviction, based on their experience at Braydon, which used to be a by-word for bad farming as well as bad land—(it was a local proverb that "nothing good came out of Braydon")—that all such similarly situated tracts of land, of which there are many in the country, could be improved so that 100 per cent. may be made on the outlay. This would not only prove a paying speculation, but it would be doing a great service to the country at large, for as Messrs. Ruck observed, we could almost, if not quite, grow sufficient corn for our population, without being under the necessity of buying of the foreigner.

By his mode of cultivation, Mr. Ruck is enabled to grow 40 bush. per acre, besides growing wheat-straw in equally increased proportion. We were also pleased with his system of management in his buildings, and even to poultry and bees, the former having a well-arranged house, which is taken from place to place about the fields, where threshing and other operations are going on, and there is food for them. We also noticed several pairs of neat and comfortable cottages, which had been erected by Mr. Ruck on the estate, at a cost of £101 5*s.* per pair, and which contrasted most favourably with the cottages of the olden time. A small but pretty church had also recently been built near to the farm, at which Mr. Ruck's brother-in-law, the Rev. D. O. Cotes, of Purton, officiates, no other church being within many miles of it in either direction.

When Mr. Ruck took this farm in hand in 1862, the rent was £165 per annum for the 300 acres (11*s.* per acre); and he bought it for £4000, or £13 6*s.* 9*d.* an acre. He sold off £600 worth of timber, got rid of the rough Gorse and wide-spreading hedges, levelled the ditches, and properly drained the land; and he has lately been offered £600 per annum, or £2 per acre, so that these figures by themselves will give a very good idea of the improvements that have been taking place.

After visiting the Wheat ricks, &c., and examining the corn produced upon the land this harvest, the company were then invited to luncheon at the homestead, where a very interesting conversation on the merits of the different systems of steam cultivation took place, Mr. Ruck and Mr. Smith agreeing as to steam cultivation being infinitely superior to any other, but differing as to whether Fowler's or Smith's is the best. Mr. Ruck, as being the first to introduce Fowler's steam-plough on the Cotswold Hills, 16 or 17 years ago, when a large party met at Down Ampney on Mr. Bryan's farming, and having had practical experience of Fowler's system ever since, was of course enthusiastic in its praise; while Mr. Smith, as may naturally be expected, was no less eloquent in favour of the system with which his name has been for so many years honourably associated.

After a short walk on the pasture portion of the farm, the gentlemen again entered the break, and were driven through about a dozen miles of beautiful country to Mr. Ruck's farm at Charlhams, a light land farm, but with the impression that even the worst land, by the application of energy and management, may be brought to a state approaching perfection. We passed through a very variable country, agriculturally speaking, diversified with pleasant jokes of our host, and on our arrival our doubts as to his assertion of farming a light land farm and keeping it up to perfection without using any of the straw (the latter being continually sold off for paper making and other purposes), were at once dispersed to the winds.

This farm consists of about 300 acres of very light land, but originally very wet. The water level was lowered by sinking and straightening the brook, so that by this means the gravelly subsoil was drained at little expense. Steam cultivation is here principally used to stir the soil to a depth, while it is more especially worked by horses.

The system generally followed in cropping is to plant Wheat, then Oats, followed by half Mangel and half Rape. The Wheat is drilled on the alternate drill system, being 12 inches and then 4 inches apart, to admit of hoeing—cultivation being the great idea Mr. Ruck carries out; the Oats and Wheat being hoed six times, and the crops obtained are astonishing. The Mangels are also planted in rows 6 inches apart, and the next two rows 26, and so on alternately, and these are kept continually horse-hoed, and his intention is to consume them on the land with sheep, running a double-furrow plough between the wide drills just against winter, to protect them from the frost until they are required for use, and so save the expense of earthing in heaps. The only manure he uses is 3 cwt. of dissolved Spanish stone coprolite and 40 lb. of guano to the acre, and the crops he raises by this means on a farm not of even medium quality naturally (as may be judged by the rent, viz., 21*s.* 6*d.* per acre), are wonderful. We should also add that he uses 3 cwt. of salt every year on every acre for both corn and roots.

Another innovation on antiquated ideas of farming we were here much pleased with, viz., Pirie's double-furrow plough. Two of these ploughs were at work with a pair of horses to each, and they had done 100 acres in 18 days, or the four horses had ploughed on an average 5½ acres per day.

As we had still Castle Hill to inspect, we were reluctantly compelled to be on the move, without being able to go through a field of Rape, which we could see over the tops of the hurdles, showing that Rape also appreciated Mr. Ruck's system of farming. Having a drive of some two miles to Castle Hill, we passed through Down Ampney, one of the seats of the Earl of St. Germans, and were particularly pleased with the neat and well-arranged cottages erected on the estate. On our arrival at Castle Hill, which consists of 700 acres, 600 being arable and 100 grass (300 of the former being very heavy land), we proceeded to inspect the Sugar-Beet. Our astonishment was great to see immense fields, comprising upwards of 100 acres, all well covered with a capital crop, rivalling Mangels for size. These are also planted on the alternate-drill system, 26 inches and 6 inches, and are intended for the manufacture of sugar. They will be taken by the new wire tramway system to the canal, and thence to the distillery at Buscot Park, and will yield a great profit on their growth. No farmyard manure is applied, or, in fact, anything besides the 3 cwt. of Spanish stone coprolite dissolved, and 40 lb. of guano per acre, if perhaps we except that great desideratum of all good farmers, but the especial hobby of Mr. Ruck, continual cultivation; and his intention is to plant the same land again with Beet. He grew 240 acres of Wheat, and the straw will be sold off; in fact, our friend does not believe in meat (if perhaps we except at dinner), and in our various discussions contended it did not pay to produce it.

We next went to see his steam cultivators at work, and on our way came across a kind of "fossil" field, which, on inquiry, proved to be a field left on purpose in its natural state, nothing being taken off it, and at the same time it received nothing in the way of improvement, and we would recommend any of our friends, who doubt the benefits of steam cultivation, to go and see the contrast. The steam cultivators consist of two of Fowler's 14-horse power traction engines, one on each headland, driving a cultivator backwards and forwards between them, 12 feet wide, and smashing the stiff clay up in a magnificent manner. We shall never forget the ecstacy of our friend, Mr. Smith, of Woolston, to see the system he so advocated at Chelmsford in 1856, and which was then condemned, here in full operation, and no doubt he may well be pleased when he considers that he has even converted Messrs. Fowler.

Had any doubt as to the benefit of steam cultivation existed in our minds, we must here have been converted, for the simplicity of the working, combined with the beautiful work, astonished even ourselves. The one engine was driven by the father, and the other by a lad, his son; another lad drove or rather guided the cultivator, which although being such an immense width he seemed to have perfectly under command, and to guide wherever he wished. These were all the hands required, if we except another boy to haul water, and they had that morning done 20 acres, and had 9

more to finish by night, which they would easily do. Powerful as these engines are, the extent of land under culture by Mr. Ruck at Charlhams and Castle Hill leaves no time for their employment elsewhere; hence the land at Braydon is being cultivated this year by Messrs. Porter & Slatter's tackle.

The farm buildings and other points of interest having been visited, not forgetting a magnificent hunter, "Steam Plough," which was greatly admired, the party were then most hospitably and sumptuously entertained at dinner by Mr. Ruck, at Castle Hill, when they were joined by Mr. John Plumbe and other gentlemen.

A most pleasant evening was spent in discussing the merits of Mr. Ruck's ideas, one or two of which we cannot forbear to mention. The first we had the promise of during the day, viz., for the farmer to make a farm pay 100 per cent. on the capital employed, and enjoy himself nine months in the year at Brighton or elsewhere. We admit we were very sceptical as to this, but he, not content with theory, showed us facts and figures not only to prove that it could be done, but that it had been done on a large scale. As there is some probability of his taking out a patent for the idea, we must refer our readers to him personally as to the method to be adopted, and only fear he will have no time for anything else, so numerous will be the inquiries. We can only state that it is a practicable idea. Another of Mr. Ruck's views is that a farmer cannot rob the land. All you have to do is to just put on with the crop sufficient mineral phosphate for that crop, and you can go on growing whatever crops you like to the end of the chapter, of course supplemented with abundant cultivation. *Wilts and Gloucester Standard.*

Miscellaneous.

The Preservation of Grain.—The following is a translation from the *Echo Agricole.* It is taken from a volume on the "Preservation of Cereals," prepared by Dr. Louvel, at the instigation of the Society of French Agriculturiststs:—"The preservation of Wheat in pits, still practised in the present day, goes back to a very high antiquity; and Dr. Louvel has written at great length on the process. He has brought forward a work of Doyère, who, it is well known, has suggested a rational system of pitting grain; and, after having done full justice to all his predecessors, he compels his readers to acknowledge the insufficiency of these processes, and the necessity of doing better than they. Thanks to the application of the vacuum, he has solved this problem in the most satisfactory manner, and he may say with Archimedes, 'I have found it!' A sheet-iron cistern, occupying little space, and which will contain 100 hectolitres (upwards of 275 bushels), an air-pump that may be worked either by hand or steam, and a manometer (pressure guage), to indicate the degree of vacuum, comprise the whole apparatus of preservation of Dr. Louvel, and of which he has made proofs. Our chief Editor, M. Victor Borie, has already, some years since, given an account of some very curious and conclusive experiments which had been made at Vincennes, and at which he was present as a Member of the Committee of Examination, in company with Messrs. Boussingault, of the Institute; Senard, physician-in-chief of the marine; Tisserand, chief of the division of the crown establishments; Doisneau, former syndic of the Paris bakery; and Lecouteaux, member of the Imperial and Central Agricultural Society, and now chief Editor of the *Journal of Practical Agriculture.* After a detention of seven months, the Wheat, the flour, and the biscuit enclosed in the apparatus of M. Louvel were withdrawn in a state of perfect preservation. Bread has been made of that flour, and, having eaten of it, we can affirm that it was excellent; the cost price per year and per bushel, including interest on the apparatus and hand labour, was less than 4*d.*; and it is certain that it will be still lower when the system is fully developed, and the manufacturer can purchase his materials at a better market. The question is therefore settled. The following is the opinion of a competent judge amongst us, M. Touaillon, who thus expresses himself in the book that he has published after the Exhibition of 1857:—'Dr. Louvel has invented a means of preservation (of grain) which completes that of M. Doyere, and has none of the inconveniences that I have pointed out. His apparatus consists of a sheet-iron cylinder, supported by a tripod, either wrought or cast-iron, or wood, painted or tarred. When the cylinder has received its charge (of Wheat, flour, &c.), the vacuum is made, not complete, which would be useless, but by a rarefaction of the air to a sufficient decree, indicated by the manometer fixed to the air-pump. Thus, the cylinders of M. Louvel are also as impermeable as the pits of M. Doyère, require no masonry, can be placed anywhere; the Wheat, &c., is safe from fermentation, insects, and cryptogamic vegetations. One very important effect, and which results from the numerous and continuous experiments made, as well by the honourable inventor as by a committee appointed by the minister of the Emperor's house, is, that the vacuum not only kills the parasitic insects and prevents fermentation, but it dries the grain at the same time. The hermetic apparatus of M. Louvel is calculated to render great services to agriculture, to commerce, domestic and foreign, to the departments of civil and military depôts of provisions, to all consumers, in short, since they allow of laying in a stock at any time, and of establishing, at little expense, store room in the open air to any extent, and without the erection of any building. M. Louvel has proved the price of preservation by his system will cost only from 3½*d.* to 4*d.* per bushel per year, according to the capacity of the cylinder,—a very trifling cost compared with that of an ordinary granary-room, which costs, independent of the shovelling, turning over, sacks, &c., more than two francs per hectolitre per year. I shall not again enter upon the question of large reserves, and general depôts with warrants, which would only be possible upon Dr. Louvel's system; but I am convinced that the farmers ought to adopt it, if they wish to preserve their crops from the numerous causes of damage and destruction, and thus have a security which would allow them to borrow on their reserves.' *Journal of the Society of Arts.*

Necessity for a Minister of Agriculture.—In England, it would have hurt no agricultural show or farmers' club, if we had had a Minister of Agriculture, who could have urged on his colleagues and the legislature the removal of any injurious impediment and obstruction—who could have favoured exhibitions, colleges, professorships and experiments, by legislative measures, or by a small and judicious expenditure. Had there been such a Minister, even to reward and encourage the deserving, progress could not have been impeded, but might have been much stimulated. *Food Journal.*

The Week's Work.

October 8: *Potato Harvesting* continue as directed last month, until the whole crop, North and South, is secured. Where the haulm or tops remain green the tubers should be examined, as this peculiar season has been very liable to produce premature ripening, so to speak, followed by a second growth. Numerous instances of this have been reported, and whenever such occurs in one place the operation of the same cause may reasonably be suspected in another. The Potato, too, is a plant which has evidently degenerated. Whether this has arisen from an improper mode of cultivation, or from the plant never having been properly acclimatised, we shall not say—the former is the more probable cause of degeneracy, and therefore in harvesting the crop the greatest attention requires to be paid to the selection of sound, well-matured tubers for seed Potatos next year, in order to avoid further degeneracy. And apart altogether from the peculiarity of the past summer, and the question whether degeneracy is due to cultivation or acclimatisation, the selection of proper seed at the time of harvesting is no secondary question.

Carrots can sometimes be pulled by the hand in deep, soft, friable soils; but they generally require a spade, and if the spade is properly put in two or three roots may be raised at a time. If the roots are very long it may be necessary to lay hold of the tops with one hand, while the spade handle is being pressed down with the other. The spade should not touch the Carrot, and in the soils where the crop is generally grown an active man will dig and loosen as fast as a woman or boy can top the roots into a basket, the tops being left on the land. The baskets are emptied into a cart, and the Carrots stored in pits or barns as Potatos. They keep best in fine cool sand, and when there is a command of such they should be stored in it.

Chicory, when grown as a substitute for coffee, is harvested in the same way as Potatos. Some manufacturers prefer buying the roots fresh from the field, as there is considerable art in cleaning and kiln-drying, so as to retain the aromatic and bitter principles unimpaired; and this is generally the best plan for the grower, as it enables him to turn the crop at once into cash. Chicory, when grown as a forage plant, yields, under good management, four or five cuttings for soiling, the last about this time. It is better adapted for mixing with other forage crops, as sewage grass, Globe Turnips, Vetches, than to be given alone. For this purpose it is peculiarly well adapted for all kinds of stock at this season, to prevent that low state of health generally experienced.

Steam Culture should be prosecuted this month without interruption, weather permitting. Those who have engines and tackle of their own, experience no difficulty in keeping close up to the season, field after field, as fast as corn and root crops are harvested; but those who have to hire must wait their turn, and therefore should contract in time. The drier the land is ploughed or smashed up by steam, the more beneficial the result, so that a week's delay in getting the work done may tell heavily against the farmer. So long as cattle are out at grass on farms where there is no natural meadow or pasture, such grass land cannot be ploughed until the cattle are housed for the winter; but the moment the cattle are removed the steam-plough should enter, unless in exceptional wet weather.

Sewage Farming continues in full force throughout the month, but as the weather gets colder the growth of Italian Rye-grass is slower. A fresh break of Italian Rye-grass may yet be laid down in our southern counties, and the old worn-out break broken up. The land from which corn and root crops has been removed may be ploughed and sewaged, Cabbages planted, and so on.

Water Meadows should now be ready, as the first floods are the richest.

Sundries.—Harvest and other implements as they are done with for the season should, if out of order, be repaired and painted before they are put past in the tool-house. Rake the stackyard once a week, and otherwise keep it clean and neat. Finish cutting and plashing fences; farm roads repair; clean ditches, and as the leaves fall from trees collect for manure. Brew "October ale" from the best malt only. Catch moles, and destroy vermin of every kind.

Newly housed Live Stock require special attention during the change from summer to winter food, as many of the maladies experienced by lambs, calves, and older stock at this season are chiefly due to an oversight of their natural requirements. It should always be borne in mind that as agriculture advances in improvement the more artificial the condition of live stock becomes, consequently if stock management is allowed to fall behind cattle must suffer seriously at this season of the year, when their health and physical energies are naturally in a low state. Steam culture, where properly carried out, is relieving the teams of much heavy field work, but the reduction in the number of horses that is taking place is increasing the weight of carting; and no greater mistake can be made than to let farm-horses lose flesh in October. Stable economy is very diversified. The old rule to keep the bowels right is not more than sufficiently well understood, for a laxative diet to a hard-working horse at this season too often makes "a soft horse softer:" more than a lax diet is needed. *W. B.*

Notices to Correspondents.

Ant Hills: *A Correspondent* asks:—Will any reader kindly inform me, in your next number, the best plan to pursue to get rid of the ant-hills on my grass land? [The ordinary method of cutting ant-hills open and spreading them abroad before winter is generally effectual.]

Sow: *James R.* The destruction of her young, which the sow will sometimes eat, is a phenomenon connected with temper rather than with food. She has been excited or disturbed; it is not owing to any deficiency of food.

Markets.

ENGLISH WOOL.

During the last week we have had a somewhat quiet market, any prospect of immediate peace having vanished. The exception is in skin wools, especially of the lower grades, which are eagerly sought after, and have risen ½*d.* to ¼*d.* per lb.

HAY.—per Load of 36 Trusses.

Smithfield, Thursday, Oct. 6.

Prime Meadow Hay	126s. to 135s.	Clover, old	130s. to 140s.
Inferior do.	110 120	Inferior do.	115 125
New Hay	115 125	New 2d cut do.	120 130
Inferior do.	100 110	Inferior do.	110 115
Straw	30 34		

Charles James Easton.

Cumberland Market, Thursday, Oct. 6.

Sup. Meadow Hay	132s. to 138s.	Inferior Clover	120s. to 132s.
Inferior do.	110 126	Prime 2d cut do.	— —
New do.	— —	New do.	— —
Inferior do.	— —	Straw	34 40
Superior Clover	140 147		

Joshua Baker.

METROPOLITAN CATTLE MARKET.

Monday, Oct. 3.

The number of Beasts is smaller than on Monday last, but trade is very dull. Choicest descriptions are very scarce, and they consequently are not cheaper, but other kinds are lower. The supply of Swiss is good; we have a fair demand for them, and there is very little alteration in prices. We have a larger supply of Calves, and prices on the average are lower. Our foreign supply consists of 1210 Beasts, 6620 Sheep, 280 Calves, and 100 Pigs; from Scotland there are 120 Beasts; from Ireland, 370; from Norfolk and Suffolk, 30; and 1645 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5	8to6 0	Best Long-wools	5	4to5 8
Best Shorthorns	5	4 -5 8	Do. Shorn	—	— —
2d quality Beasts	3	6—4 6	Ewes & 2d quality	4	0—4 8
Best Downs and Half-breds	5	8—6 0	Do. Shorn	—	— —
Do Shorn	—	— —	Lambs	—	— —
			Calves	3	8—5 8
			Pigs	3	8—5 8

Beasts, 1375; Sheep and Lambs, 19,130; Calves, 345; Pigs, 200.

Thursday, Oct. 6.

The supply of Beasts is small, especially of choice qualities; purchasers are readily found for the best descriptions, at fully Monday's quotations. The number of Sheep is also small, but quite equal to the demand. Thursday's markets, as usual at this time of year, are not now well supplied either with stock or buyers. Monday's prices are pretty generally realised in all departments. Our foreign supply consists of 510 Beasts, 650 Sheep, and 256 Calves.

	s. d.	s. d.		s. d	s. d.
Best Scots, Herefords, &c.	5	8to6 0	Best Long-wools	5	4to5 8
Best Shorthorns	5	4—5 8	Do. Shorn	—	— —
2d quality Beasts	3	6—4 0	Ewes & 2d quality	4	0—4 8
Best Downs and Half-breds	5	8—6 0	Do. Shorn	—	— —
Do. Shorn	—	— —	Lambs	—	— —
			Calves	3	8—5 8
			Pigs	3	8—5 8

Beasts, 1270; Sheep and Lambs, 4750; Calves, 350; Pigs, 80.

METROPOLITAN MEAT MARKET.—*Oct. 6.*

Best Fresh Butter .. .. .. 10*s.* per dozen lb.
Second do. do. .. .. 13*s.* ,,
Small Pork, 5*s.* 4*d.* to 5*s.* 8*d.*; Large Pork, 4*s.* 0*d.* to 4*s.* 4*d.* per 8 lb.

MARK LANE.

MONDAY, Oct. 3.

The supply of Wheat from Essex and Kent to this morning's market was moderate, but sales proceeded with difficulty at last Monday's quotations. There was a poor attendance, and the inquiry for foreign very limited, the turn in prices being against sellers. Barley, Beans, and Peas were unaltered. Oats were in better demand, and 6*d.* per qr. dearer. Flour was unchanged.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	44	51	Red.....	41	51
— — fine selected runs..do.	48	53	Red.....	45	53
— — Talavera	49	52			
— — Norfolk	—	—	Red.....	—	
— — Foreign	41	62			
BARLEY, grind. & dist ,20*s* to 33*s*..Chev.	42	45	Malting ..	36	41
— Foreign .. grinding and distilling	25	33	Malting ..	33	43
OATS, Essex and Suffolk	24	26			
— Scotch and Lincolnshire..Potato	26	28	Feed	—	
— Irish .....Potato	25	27	Feed	23	26
— Foreign .....Poland and Brew	24	26	Feed	19	24
RYE	32	36	Foreign ..	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan.....43*s*. to 47*s*..Tick	49	50	Harrow ..	49	50
— Pigeon .....51*s*. to 59*s*..Winds.	—		Longpod ..	—	
— Foreign ..... Small	45	47	Egyptian .	42	44
PEAS, White, Essex, and Kent..Boilers	38	40	Suffolk ..	42	42
— Maple, 40*s*. to 44*s*. .....Grey	36	40	Foreign ..	36	40
MAIZE	—		Foreign ..	32	34
FLOUR, best marks delivered..per sack	39	47			
— 2d ditto .....ditto	32	44	Country ..	32	44
— Foreign .....per barrel	24	27	Per sack ..	3*s*.	6*d*

WEDNESDAY, Oct. 5.

There were moderate supplies of both English and foreign Wheat on sale here to-day, while the attendance of millers was a fair average for a Wednesday's market. Trade ruled quiet for all descriptions, but there was considerable firmness in prices, which were fully equal to those current on Monday last. Barley was steady; new malting changed hands freely, while full rates were paid for both grinding and distilling sorts. Malt was quiet, and unchanged in value. Good sound Oats were in fair request, on former terms. Beans and Peas were quite as dear as on last market day. Maize was unchanged in value. The Flour trade was inactive, the chief feature being the continued demand for choice American barrels. All qualities remained without alteration in price.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 270	Qrs. 480	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	10,370	960	960	1 [illegible] brls.
	10,640	1440	960	

HULL, Oct. 3.—At our market to-day there was a fair supply of English Wheat, which was taken off readily at fully last week's prices, and in some instances choice samples fetched an advance of 1*s.* per qr. In foreign Wheat no business done. English white made 50*s.* to 53*s.* per qr.; red, 46*s.* to 48*s.*; Dantzic and Konigsberg white, 51*s.* to 53*s.*; mixed, 47*s.* to 49*s.*; Baltic red, Danish, and Hamburgh, each, 45*s.* to 47*s.* Of Barley there was not much offering; grinding quality easier to buy, but malting fully as dear. In Beans and Peas very little was doing, and the former were quoted 1*s.* per qr. lower. Of fine Oats very few were offering, and these were fully as dear.

AVERAGES.

	Wheat.	Barley.	Oats.
Aug. 27	51*s* 2*d*	36*s* 2*d*	24*s* 6*d*
Sept. 3	49 1	36 2	23 9
— 10	48 1	35 8	23 10
— 17	46 6	36 4	23 9
— 24	45 4	36 2	23 7
Oct. 1	48 1	35 7	22 8
Average ..	47 9	36 3	23 6

HOPS.

BOROUGH MARKET, Oct. 5.

The demand for new Hops continues active, nevertheless the supply of medium qualities of Kents and Sussex is so large that prices have declined. Only exceptionally fine and choice samples maintain their value.

SEED MARKET.

New English Clover seed comes forward very slowly, and for the few parcels offering extreme prices are asked; foreign samples are now coming to hand. Winter Tares are in fair demand, at unchanged rates. New Dutch Hemp seed has advanced 1*s.* to 2*s.* per qr. White Mustard seed continues to decline in value. Soving Rape seed is firm. We have an inquiry for garden Beans. Feeding Linseed is in fair request. For Trifolium the demand has now quite ceased. Canary seed is without alteration.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

COALS.—*Oct. 5.*

Holywell Main, 17*s.* 3*d.*; Wall's End Braddyll's Hetton, 17*s.* 9*d.*; Walls End Hetton, 19*s.*; Walls End Hetton Lyons, 16*s.* 6*d.*; Walls End Hawthorn, 16*s.* 3*d.*; Walls End Easington, 17*s.*; Walls End Hartlepool, 18*s.* 6*d.*; Walls End Kelloe, 18*s.*—Ships at market, 19; sold, 19; at sea, 45.

By Royal Letters Patent.

SHREWSBURY'S GAS CONSERVATORY BOILER, Recommended from Owners, not any Interested. IMPROVED REGISTERED VAPOUR BATH, £10. Testimonials on application. Enclose stamp. G. SHREWSBURY, Tower Street, S.E.

HOT-WATER PIPES, BOILERS, &c., &c., of every description.

	2-inch	3-inch	4-inch
HOT-WATER PIPES, Nos 6 and 7—per yard	*s. d.* 0 11	*s. d.* 1 5	*s. d.* 1 11
ELBOWS, No 12 .. .. .. each	1 0	1 9	2 6
T PIPES, No 13 .. .. .. ,,	2 0	3 0	4 0
SYPHONS .. .. ,,	1 4	2 4	3 8
VALVES .. .. ,,	0 0	11 0	11 0

The above, nett cash prices, delivered at London, Liverpool, Bristol, or equivalent.
GEORGE ROBINSON, 16, South Wharf, Paddington Basin; and at Dial Iron Works, Stourbridge.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS. Each.

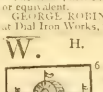

		£ s. d.
6 ft. by 4 ft. Lights, 2 in. thick, unglazed..		0 5 0
,, ,,	Primed and Glazed with 10 oz. Sheet	0 11 0
,, ,,	with stout portable Box, not Painted	1 3 0
,, ,,	Painted four coats, and Handles on	1 8 0
,, ,,	Packed and Delivered Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do.	.. ..	2 15 0

GREENHOUSES Per ft. Super.
Woodwork only Prepared and Fitted 0 0 6
,, Primed and Glazed with 10 oz. Sheet 0 0 9
,, Painted, and Glazed with 16 oz. 0 1 0
,, Painted four coats, two sides, ready for use .. 0 1 3
Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

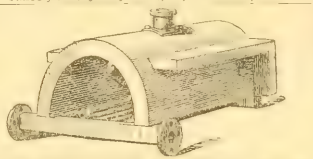

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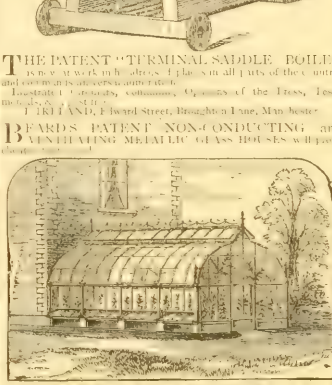

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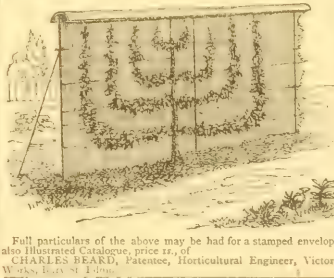

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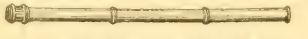

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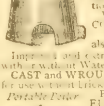

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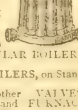

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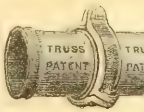

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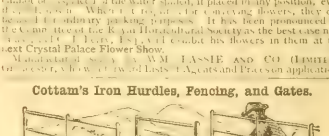

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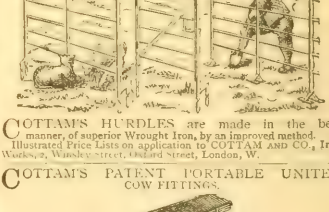

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ROYAL SCHOOL of MINES, Jermyn Street.—Dr. FRANKLAND, F.R.S., will COMMENCE a COURSE of FORTY LECTURES on INORGANIC CHEMISTRY, on MONDAY NEXT, October 10, at 9 o'clock A.M., to be continued on each succeeding Tuesday, Wednesday, Thursday, and Monday at the same hour. Fee for the Course, £4. These Lectures will be delivered at the Royal School of Chemistry, Oxford Street.

Professor HUXLEY, LL.D., F.R.S., will COMMENCE a COURSE of EIGHTY LECTURES on NATURAL HISTORY on MONDAY NEXT, October 10, at 2 o'clock, to be continued on every succeeding week-day but Saturday, at the same hour. Fee for the Course, £4. TRENHAM REEKS, Registrar.

LECTURES on MINERALOGY, applied to GEOLOGY and the ARTS, are given by Professor TENNANT, F.G.S., at King's College, London, on WEDNESDAY and FRIDAY MORNINGS, from 9 to 10 o'clock, and on THURSDAY EVENINGS, from 8 to 9, from October 7 to Christmas, to which the Public are admitted on paying the College Fees, namely, £2 2s. to the Morning Course, and £1 1s. to the Evening.

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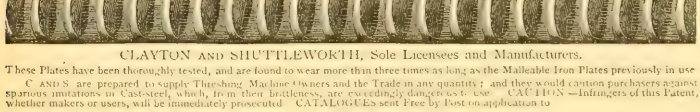

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AND
AGRICULTURAL GAZETTE.

No. 42.—1870.] SATURDAY, OCTOBER 15. { Registered at the General Post Office as a Newspaper. } Price 5d. Post Free, 5½d.

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FRANCIS R. KINGHORN begs to offer very superior VINES, grown from Eyes, without bottom-heat, comprising all the leading sorts. Fine strong Canes, 9s. 6d. to 10s. 6d. each
STRAWBERRIES, strong, well-matted plants, of all the best kinds, in 60-sized pots, or bed-ed, 4s. 6d. to 5s. 6d. per 100.
Shirley Nursery, Richmond, Surrey.

Strawberries.
CHARLES TURNER can still supply strong Plants from the ground, and in small pots, to insure a crop of fruit next season, of the leading kinds
The Royal Nurseries, Slough

To the Trade.
STRAWBERRIES.—Sixty best kinds, in strong plants, 10s. per 100, such as Dr. Hogg, Mr. Radclyffe, Vicomtesse Hericart de Thury, &c. All true to name.
W. LAUKSON, Blakedown Nursery, Kidderminster

One Hundred Succession Pines.
TO BE SOLD, cheap, the above lot of the True RIPLEY QUEEN, warranted clean, excellent stuff; a few Fruiting ditto. The reason required, cause of disposal.
J. HEPPER, Esq., The Elms, Acton, W.

Fruit Trees.
PURCHASERS of FRUIT TREES are respectfully invited to inspect the Stock in the Waltham Cross Nurseries, adjoining Waltham Station, Great Eastern Railway, which the Proprietors have to be unequalled in quality. Prices moderate. CATALOGUE free by post
WILLIAM PAUL, Paul's Nurseries, Waltham Cross, London, N.

Fruit Trees, Roses, &c.
B. S. WILLIAMS can supply all the best kinds, true to name and in good condition; fine fruit-bearing Trees, on French Paradise Stock, Pyramids, Cordons FOREST and ORNAMENTAL TREES of every description Priced LIST on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, and Figs.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots Descriptive Priced LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Roses.
CHARLES TURNER'S Descriptive and Priced CATALOGUE of ROSES is now ready.
It also contains full LISTS of FRUIT TREES, SHRUBS, CONIFERÆ, &c., and may be had post free on application.
The Royal Nurseries, Slough.

Francis & Co.'s Catalogue of Roses.
E. P. FRANCIS AND CO.'S New Edition of the above is published, and will be sent gratis on application. Their stock, both of STANDARDS and DWARFS, is very superior.
The Nurseries, Hertford, Herts.

Roses.
THOMAS S. WARE is offering extra fine Standard, Half-standard, and Dwarf ROSES, by the hundred or thousand. Price on application
Hale Farm Nursery, Tottenham, Middlesex, N.

Roses.
ONE HUNDRED THOUSAND STANDARD ROSES.
200,000 DWARF HYBRID PERPETUAL ROSES.
50,000 TEA-SCENTED ROSES.
A magnificent stock to select from. CATALOGUES on application.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Paul's Rose Catalogue.
"A very complete and able Catalogue."—*Floral World.*
WM. PAUL begs to announce that his NEW CATALOGUE of ROSES is now ready, and will be forwarded post free on application. A few plants is large and excellent.
PAUL'S Nurseries, Waltham Cross, London, N.

To the Trade.
STANDARD ROSES, £3 10s. per 100; DWARFS, £2 per 100 Best plants and kinds. CARNATIONS and PICOTEES, of best sorts, £2 per 100 pairs.
W. JACKSON, Blakedown Nursery, Kidderminster.

TWENTY THOUSAND STANDARD ROSES.—The finest plants in the Trade Also pot VINES, strong, in the leading kinds. Special offers to the Trade. CATALOGUES on application
J. C. PADMAN, Nurseryman, Boston Spa, Yorkshire.

New Roses, Gladioli, &c.
EUGENE VERDIER Fils Aîné, HORTICULTEUR, 3, Rue Dunois, Gare d'Ivry, Paris, begs to state that his CATALOGUE of the above can be had on application to his Agents, C. J. BLACKITH AND CO., Cox's Quay, Lower Thames Street, London, S.E.
N.B. Orders will be received conditionally, to be executed and forwarded as soon as the state of affairs in France will permit.

OSIERS for SALE, chiefly of the Black Holland kind, about 5 Acres, now growing; and also the produce of last year, on the same ground
Apply to CHARLES BARNARD, Bury Farm, Harlow, Essex.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE. RESEDA ODORATA EXIMEA. — This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, which it obtained the highest honours that could be awarded, viz. :—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 11, 1870.

The Grand International Show, Crystal Palace, First-class Certificate, May 25, 1870.

The Brighton Horticultural Show, First class Certificate, June 28, 1870.

The above will be sent out in October, at 10s. 6d. per packet, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint; and of the following Agents :—

ENGLAND

Messrs. James Carter & Co., 237 & 1238, High Holborn.
" Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
Mr. George Tredgett, Cambridge.
Messrs. Wood & Ingram, Huntingdon.
Mr. J. S. Woodthorpe, Sible Hedingham, Essex.
Messrs. J. & C. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
Mr. G. Hinsman, Fareham
" F. Beasher, Halifax, Yorkshire.
Messrs. A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, Lang's Road, Chelsea,
Mr. W. Knight, Hailsham, Sussex.
" Timothy Brigden, South-Eastern Railway station.
" W. Paul, London.
" E. Hoines, Whitnington Nursery, near Lichfield.
Messrs. S. Nairn & Sons, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
Mr. W. Bull, King's Road, Chelsea.
Messrs. Butler, McCulloch & Co., Covent Garden, London.
Mr. E. Taylor, Malton, Yorkshire.
Messrs. G. Gibbs & Co., Garrett Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London.
" Downie, Laird & Laing, London and Edinburgh.
Mr. B. S. Williams, Upper Holloway, London.
" F. Cooling, Derby
" Tume, W., Cowes, Isle of Wight
Messrs. P. Lawson & Son, 20, Budge Row, London.
" Rutley & Silverlock, London.

SCOTLAND.

Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow.
" P. Lawson & Son, Edinburgh.
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling.

IRELAND.

Messrs. W. Drummond & Sons, 56, Dawson Street, Dublin.

BELGIUM.

Mons. Louis Van Houtte, Ghent.

PRUSSIA

Messrs. Platz & Son, Erfurt.

AMERICA

Messrs. B. K. Bliss & Sons, New York.

The Nurseries, Ghent, Belgium.—Autumn, 1870.

JEAN VERSCHAFFELT begs to intimate that he does not intend to issue a new Catalogue this season; and would therefore refer to his last Catalogue (Oct. 11, 1869), for all goods described in that list. Prices for New Plants will be reduced when possible; all the novelties of the season may be had at the same prices as those of other respectable Firms.

JEAN VERSCHAFFELT begs to offer the following new and interesting plants at the annexed low prices, viz. :—

AZALEA LINEARIFOLIA (Hooker), from Japan; figured and fully described in the "Botanical Magazine," for May, 1869, Vol. XXV., No. 203, plate, No. 5970, a few offered for the first time at 10s. each, six finer plants, 21s. each.
ILEX LAWSONIANA, fol. var., 5s. each.
" CRENATA, fol. var., 2s. 6d. each.
" SERRATA, fol. eleg. marg., 4s.
EUPHORBIA MONTI, 10s. each.
NIDULARIUM MEYENDORFFII, one of the finest Bromeliaceous plants, 6s. each.
ECHEVERIA AGAVOIDES, a fine plant, now reduced to 10s. each; 8os. per dozen.
ALTERNANTHERA AMABILIS LATIFOLIA, the finest of the tribe, 2s. each.
TILLANDSIA ARGENTEA, young plants, 21s. each.
FICUS BONNETII (a fine plant for table decoration), 10s. each.
ARALIA PENTAPHYLLA, 5s. each; 45s.
YUCCA ELEPHANTIPES (Guatemala), 8s.
LOMARIA CYCADIFOLIA, fine spring imported stools, the finest and highly established, 15 to 20 in. high, very strong, 30s. to 60s. each.
LOMARIA GIBBA CRISTATA, second plants, 15s.
BALANTIUM SELLOWIANUM.—Newly imported stems of this very rare species: fine strong stems, 4 to 5 inches high, per each 10s.

12 CATTLEYA MOSSIAE: first spring imported plants, the most highly established, 21s. to 25s.; extra, 100s., £20
12 SELENIPEDILUM CAUDATUM, 24s. to 42s.
12 " MARTENSII, fol. var., 8s.
100 LATANIA BORBONICA, in single pots, 25s. each; 45s. two to three leaves, 5s.; each 8s.
12 CHAMELEDOREA ELEGANS, 24s.
CHAMELEDOREA LINDENIANA, fine seedlings, 1 to 2 ft., containing from 6 to 12 plants in a pot, 40s.
12 COCOS MAXIMILIANA: about 12 ins. high; three leaves, 30s.
PHOENIX REDUCTA SENEGALENSIS.—Last two years imported plants, per 100, £18; each 3s. 6d.
12 SANCHEZIA NOBILIS VARIEGATA, 10s.
APHELANDRA ROEZLIANA, 2s. each
12 " ATTENUATA, 10s.
100 PANDANUS UTILIS, 10 inches high, 25s.
DRACENA INDIVISA (Lindleyana superbens), Veitchii.—A good stock of extra fine strong plants of this very elegant ornamental species, well coloured, 60s. each; 12 for £30; strong plants, 10 to 15 inches high, 5s. ; 12 for 50s.; 100 for £18.
Proper size for table decoration.
12 DRACENA LINEARIFOLIA, 30s.
12 AGAVE FILIFERA, 40s.
12 " ATTENUATA, 30s.
12 AGAVES, various kinds, 30s.
12 FICUS ELASTICA, fine plant, 18 to 20 inches high, 24s. ; 10 to 15 do., 18s.
12 JASMINUM GRANDIFLORUM, flowering throughout the winter months, 24s.
12 TREE CARNATION ALIM; flowering all through the winter, strong plants, 30s.
100 AZALEA INDICA: best leading sorts, for winter flowering, fine plants, £5, £6, and £8.
100 AZALEA INDICA, SOUVENIR DE PRINCE ALBERT, £20.
100 CAMELLIAS, without buds, fresh, £15.
100 LILIUM LANCIFOLIUM ALBUM; very large roots, £4.
100 " " RUBRUM, extra large roots, £3.
100 " " PUNCTATUM, very rare, extra large, £6 10s.
100 RHODODENDRONS, hardy hybrid varieties, named, 1 and 2-yr. grafts, £35 300 do., for £20.

All orders to be sent direct to JEAN VERSCHAFFELT, Nurseryman, 134, Faubourg de Brabant, Ghent, Belgium.

Agents in London: Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

Planting Season.

WM. KNIGHT, Floral Nursery, Hailsham, Sussex, begs to call the attention of the Nobility and Gentry and Trade in general to his extensive and matchless Stock, consisting of an immense quantity of Standard and Dwarf and Pyramidal Trained APRICOTS, PEACHES, NECTARINES, CHERRIES, PEARS, PLUMS, and APPLES, also Standard, Dwarf, and Pot ROSES, CONIFERÆ, RHODODENDRONS, EVERGREENS, ORNAMENTAL and FOREST TREES, &c., and respectfully solicits inspection of all intending Planters. Descriptive Priced CATALOGUES free.

The Nurseries are within five minutes' walk of the Hailsham Station, Brighton and South-Coast Railway.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at very moderate prices, in order to clear the land for building purposes.

Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Gorse, Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees, generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.

To Gentlemen wishing to make a New or improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.

Nursery and Seed Stores—Walton-on-the-Hill.
Seed Warehouse—15, Queen Square.
Liverpool, September, 1870.

B. S. WILLIAMS'

NEW and CHOICE FLOWER SEEDS,
Post Free.

	Per packet —s. d.
Williams' Superb Strain of PRIMULA, Red, White, or Mixed..	2s. 6d., 3s. 6d., and 5 0
CALCEOLARIA, Neill's extra choice train, 2s. 6d., 3s. 6d., and	5 0
CINERARIA, Weatherill's extra choice strain, 2s. 6d., 3s. 6d., &	5 0
CARNATION, from Prize flowers	1 0
CYCLAMEN, Wiggins' Prize strain ..	1s. 6d , 2s. 6d., and 3 6
ECHEVERIA METALLICA, new bedding plant	2 6
Williams' New Hybrid SOLANUMS	2s. 6d and 3 6
PYRETHRUM (Golden Feather)	1s. and 2 6
PANSY, from Prize Flowers	1s. and 2 6
PANSY, finest Belgian varieties	1s. and 2 6
PANSY, Cliveden Blue, Purple and Yellow	each 1 0
EAST LOTHIAN STOCKS, per collection of three colours ..	2 6
POLYANTHUS, Wiggins' Prize Strain	1s. and 1 6
PINK, finest double fringed	1 0
VIOLA CORNUTA ALBA	1s. 6d. and 2 6
" " var. PERFECTION ..	1s. 6d., 2s. 6d., and 3 6
WALLFLOWER, Saunders' fine dark variety	1 0

Victoria and Paradise Nurseries, Upper Holloway, London, N.

VARIEGATED PELARGONIUMS.

Sir Robert Napier	Mabel Morris	Dragon
Sunbeam	Mrs. John Clutton	St. John's Wood Star
Florence	Indian Beauty	Prima Donna
Mrs. Pollock	Princess Iverwings	Yellow Christine

The 12, in strong plants, for 21s.; package included. Remittances requested from unknown Correspondents

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash :—

GOLDEN TRICOLORS.—Lady Cullum, 3s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s. 6d. SILVER TRICOLORS.—Caroline Longfield, 2s.; Italia Unita, 2s. 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; E. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Painted Lady, 6s. 6d.; Princess of Wales, 4s.; Stanstead Beauty, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeaux, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of 100 varieties post free.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

GOLD and BRONZE PELARGONIUM (1870), "MRS. JOHN LEE."—This beautiful bedding Pelargonium has fine circular leaves, smooth, and of great substance; rich golden ground with broad crimson bronze zone; the colours are bright and durable. A plant lifted from the open ground was awarded a First-class Certificate by the Floral Committee of the Royal Horticultural Society, on September 21. Plants now ready, price 7s. 6d. each. The usual discount to the Trade, and 4 sent for 3 ordered.

JOHN and CHARLES LEE, Royal Vineyard Nursery and Seed Establishment, Hammersmith, London, W.

GEO. LIGHTBODY, Falkirk, being unable, from infirmity, to continue the cultivation of TULIPS, will dispose of his stock at the following low price :—

100 varieties, fine show sorts, with names .. .. 50s.
200 varieties, ditto, ditto, with names .. .. 75s.

Best bed of 81 rows, comprising many valuable varieties, and several new and fine seedlings, £30.

CATALOGUES of the stock may be had on application.

AURICULA CATALOGUES are now ready.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that the above Apple will be SENT OUT in NOVEMBER next, in the same rotation as the orders are received. An illustration of it was given by Dr. Hogg, in a recent No. of "Florist and Pomologist" for March, 1870, in which he says that it is "to stand and worthy to take its place among the worthiest of its kind."

DWARF MAIDEN TREES, 7s. 6d. each; DWARF TRAINED, 10s. 6d. A remittance or reference from unknown correspondence.

Nurseries : Shipston-on-Stour, September, 1870.

Magnificent Trees for Avenue Planting.

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX.

WM. WOOD & SON have to offer a splendid stock of the following remarkably well-grown Trees :—

ROBINIA PSEUD-ACACIA, 6 and 8 feet.
ASH, WEEPING, extra fine, 7 to 9 feet stems.
CATALPA SYRINGÆFOLIA, 8 to 10 feet.
AILANTUS GLANDULOSA, 6 feet.
LABURNUM, 6 to 8 feet.
HORSE CHESTNUTS, Common and Scarlet, extra fine plants, 7 to 8 feet, 8 to 10 feet, 10 to 12 feet, very fine specimens
AMERICAN WEEPING WILLOWS, 7 to 8 feet.
CATALOGUES gratis on application.

PAUL'S HYACINTHS, TULIPS, &c.

"Mr. W. Paul's Hyacinths * * * * with grand solid spikes, such as are rarely seen at any show and in any season."—*Journal of Horticulture.*

"A remarkably fine display of Hyacinths."—*Gardeners' Chronicle.*

WILLIAM PAUL

BEGS TO ANNOUNCE THAT HIS

HYACINTHS, TULIPS, CROCUSES, and other DUTCH FLOWER ROOTS

Have arrived in excellent condition, and he respectfully solicits early Orders for the same.

In proof of the quality of Bulbs imported by him, he begs to refer to his Annual Exhibition in the Royal Horticultural Gardens in March and April, which has been visited by Her Most Gracious Majesty the Queen, Her Royal Highness the Princess of Wales, and several other Members of the Royal Family.

PRICED DESCRIPTIVE CATALOGUE Free by Post.

PAUL'S NURSERIES and SEED WAREHOUSE, WALTHAM CROSS, LONDON, N.

ROSES, FRUIT TREES, AND HARDY ORNAMENTAL TREES

FOR PRESENT PLANTING SEASON.

PAUL & SON,

THE "OLD" NURSERIES, CHESHUNT, N.,

Beg respectfully to invite attention to the following special stocks, which, holding as they do in quantity, they feel are well worth the inspection of intending purchasers or planters. The Nurseries are one mile from the Cheshunt Station of the Great Eastern Railway. CATALOGUES or Special Prices will be sent free on application.

ROSES.

For these our House-holds, as hereto fore, an unrivalled place during the past year. Forty-six Prizes at the leading Shows have been taken by these Roses. The stock has never, in our long experience, been equal to it or so full this season. Orders will be executed from 12,000 individually carefully Budded plants.

STANDARDS, from 18s. to 24s. per dozen, £6 10s. to £10 per 100.
DWARFS, good, 10s. to 18s. per dozen, 75s. to £6 per 100.
NEW ROSES of 1870, strong, very fine dwarfs, 30s. per dozen.
SPECIMEN POT ROSES, as exhibited at the various exhibitions, 42s. to £10 10s. per dozen.

FRUIT TREES.

FORTY THOUSAND STANDARD TREES,
For Orchards, our special trade stock, all straight, healthy, and vigorous.
Prices for Market Garden or Orchard Planting, £6 to £9 per 100, 18s. to 24s. per dozen.
Dwarf-trained APPLES and PEARS, carefully trained as Palmetts, 2 to 3 tiers of branches, 42s. per dozen.
Fan-trained PLUMS and CHERRIES, clean, well cut trees, 42s. doz.
Fan-trained PEACHES, NECTARINES, and APRICOTS, 60s. doz.
Ryder-trained STANDARDS of above, 5s. to 10s. 6d. each.
PYRAMIDS, 3 to 5-yr. pruned trees, 18s. to 42s. per dozen.
CORDONS, 18s. per dozen. Maiden for Cordons, 12s. per dozen.
All the SMALL FRUITS, fine and well grown, at ordinary prices.
VINES, unsurpassed in the Trade, 3s. 6d. to 10s. 6d. each.

ORNAMENTAL TREES

OF DIVERSE AND VARIEGATED FOLIAGE.

The "Gardener," the leading monthly periodical, speaking of our stock of the 24th ult., says :—"This useful class of trees, with variegated and ornamental foliage, is largely looked after, and almost complete collections have been gathered together."

For description and varieties see Catalogues.

Selections of VARIEGATED TREES, or of ORNAMENTAL-LEAVED TREES and SHRUBS, or these together, 9s. to 31s. per dozen, 75s. to 150s. per 100.

EVERGREENS, CONIFERS, AMERICAN PLANTS.

Now largely grown here and at our High Beech Nurseries. Special Price Lists of these are now ready. All plants in these series are moved here every other season, or if necessary each year.

Collections of 100 CONIFERS, as lists, given on application, £10.
Collections of 100 EVERGREENS, including Hollies, varieties, £5 to £10.
Collections of choice named RHODODENDRONS, from £10 to £15 per 100, according to size.
RHODODENDRON PONTICUM, COMMON LAUREL, SPRUCE FIR, and other EVERGREENS for Wood Planting, cheap and in quantity.

All Goods Carriage Paid to London.

"The Royal Seedsmen."

CARTER'S
SEEDS, BULBS, &c., CARRIAGE FREE.

*** *Five per cent. discount allowed for cash payments.*

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR PLANTING.

COLLECTION No. 1, complete, price 84*s*.
COLLECTION No. 2, reduced quantities, price 63*s*.
COLLECTION No. 3, reduced quantities, price 42*s*.
COLLECTION No. 4, price 21*s*., comprises—

12 Hyacinths, in 12 extra fine named sorts	6 Tulips, Tournesol
6 Polyanthus Narcissus, in 6 varieties	3 „ Rex rubrorum
12 Jonquils, sweet scented	3 „ La Candeur
50 Crocus, finest named	3 „ Royal Standard
1 Dielytra spectabilis	6 „ Yellow Prince
1 Lilium speciosum	3 „ Rex Mundi
6 Scilla sibirica	6 „ Duc Van Thol
24 Snowdrops, extra large selected	1 Amaryllis formosissimus
	1 Texas, fine mixed
	6 Sparaxis, finest mixed
	6 Fritelaria umbrosa

COLLECTION No. 5, reduced quantities, price 10*s*. 6*d*.
Packing and carriage free.

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR AND OUTDOOR PLANTING.

COLLECTION No. 6, complete, price 84*s*.
COLLECTION No. 7, reduced quantities, price 63*s*.
COLLECTION No. 8, reduced quantities, price 42*s*.
COLLECTION No. 9, price 30*s*., comprises—

12 Hyacinths, in 12 extra fine named sorts for pots or glasses	12 Scilla Bifolia, mixed
12 „ in 6 choicest for bedding	75 Crocus, blue
12 Narcissus, double, white	75 „ striped
12 „ Poeticus or Pheasant's-eye	75 „ large yellow
36 Tulips, extra fine mixed	75 „ white
6 „ Tournesol	36 Anemones, extra fine mixed
6 „ Duc Van Thol	8 Gladiolus Brenchleyensis
3 „ Royal Standard	12 Iris, extra choice mixed Eng.
3 „ La Candeur	lish
3 „ Yellow Prince	12 Iris, extra fine mixed Spanish
3 „ Rex rubrorum	12 Jonquils, Campernelle,
12 Double Daffodils	36 Ranunculus, extra fine, mixed
12 Star of Bethlehem	50 Snowdrops

COLLECTION No. 10, reduced quantities, price 15*s*.
Packing and carriage free.

CARTER'S COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING ONLY.

COLLECTION No. 11, complete, price 84*s*.
COLLECTION No. 12, reduced quantities, price 63*s*.
COLLECTION No. 13, reduced quantities, price 42*s*.
COLLECTION No. 14, price 21*s*., comprises—

12 Hyacinths, in 3 colours	25 Crocus, blue
12 Narcissus, double, white	50 „ striped
12 „ Poeticus or Pheasant's-eye	50 „ large yellow
12 Double Daffodils	25 „ white
12 Tulips, extra fine mixed, double	24 Anemones, extra fine mixed
12 „ extra fine mixed, single	6 Gladiolus Brenchleyensis,
12 „ extra fine mixed, late	12 Iris, extra choice mixed English
12 „ Duc Van Thol	12 Iris, extra fine mixed Spanish
6 Polyanthus Narcissus, fine mixed	3 Lilium candidum
6 Campernelle Jonquils	3 „ tigrinum
12 Star of Bethlehem	24 Ranunculus, extra fine mixed
6 Tritelea uniflora	50 Snowdrops
6 Dog's-tooth Violets	24 Winter Aconites

COLLECTION No. 15, reduced quantities, price 10*s*. 6*d*.
Packing and carriage free.

JAMES CARTER & CO.'S CATALOGUE
Of HYACINTHS, TULIPS, CROCUS and OTHER BULBS, ROSES, FRUIT TREES, &c.,

Containing full particulars of the above Collections will be forwarded Gratis and Post Free on application.

CARTER'S COLLECTIONS of HYACINTHS.
For the convenience of those Customers who do not wish the trouble of selecting for themselves, is offered the undermentioned Collections of Hyacinths, *the selection of which being left to their judgment and experience*, will be found perfectly adapted for the purposes stated.

A.	12 good varieties	Double Hyacinths, for pots, 7*s*. 6*d*.	
E.	12 „	Single Hyacinths, for pots, 7*s*. 6*d*.	
C.	12 „	Double Hyacinths, for glasses, 8*s*. 6*d*.	
D.	12 „	Single Hyacinths, for glasses, 8*s*. 6*d*.	
E.	12 very fine varieties	Double Hyacinths, for pots, 9*s*. 6*d*.	
F.	12 „	Single Hyacinths, for pots, 9*s*. 6*d*.	
G.	12 „	Double Hyacinths, for glasses, 10*s*. 6*d*.	
H.	12 „	Single Hyacinths, for glasses, 10*s*. 6*d*.	
I.	12 best varieties	Double Hyacinths, for pots, 12*s*.	
K.	12 „	Single Hyacinths, for pots, 12*s*.	
L.	12 „	Double Hyacinths, for glasses, 12*s*.	
M.	12 „	Single Hyacinths, for glasses, 12*s*	
N.	100 Hyacinths, in 100 best varieties, £6 6*s*.		
O.	100 Hyacinths, in 50 best varieties, £4 4*s*.		
P.	50 Hyacinths, in 50 very fine varieties, £2 10*s*.		
Q.	50 Hyacinths, in 25 very fine varieties, £1 17*s*. 6*d*.		

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

DUTCH FLOWER ROOTS
CARRIAGE FREE.

SUTTONS'

IMPORTED

FLOWER ROOTS.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks, having received their first consignment of

CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

SUTTONS'
COLLECTIONS of FLOWER ROOTS.

Suttons' £1 1s. Collection, for Open Ground, Carriage Free, contains—

12 fine mixed Border Hyacinths	6 fine mixed Gladiolus
6 „ Polyanthus Narcissus	12 Duc Van Thol Tulips
12 Pheasant's-eye Narcissus	6 mixed Single Early Tulips
12 Double White Narcissus	6 fine mixed Double Tulips
25 Double Daffodils	6 „ Parrot Tulips
6 Large Campernelle Jonquils	6 Gesneriana Tulips
50 fine mixed Double Ranunculus	25 fine mixed Tulips
50 Superb Turban Ranunculus	6 „ English Iris
12 fine mixed Double Anemones	6 „ Spanish Iris
12 „ Single Anemones	3 Fine sorts of Scilla
150 Crocus, 3 sorts	3 Fine sorts Lapeirousia
50 Snowdrops	6 Dog's-tooth Violets
25 Winter Aconites	3 Crown Imperials

Suttons' £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, to name	3 Lapeirousia Iris
6 Miniature Hyacinths, to name	50 fine Crocus, to name
6 Polyanthus Narcissus, do.	6 choice Liliums
6 Single Sweet Jonquils	3 choice Sparaxis
6 Scilla praecox	3 choice Ixias
6 Single Duc Van Thol Tulips	1 Lilium candidum bulbs
6 Double Tournesol Tulips	1 Lilium lancifolium album
25 Early Tulips, 5 sorts	1 „ „ rubrum
3 Persian Iris	

SUTTONS' SUPERB DUTCH HYACINTHS

For CULTIVATION in POTS or GLASSES.

The best 12 Hyacinths for 12s.

Messrs. SUTTONS' Collection of Hyacinths consists of more than 200 varieties, Priced and Descriptive LIST of which may be had on application.

Suttons' Collections of Named Hyacinths.

100 HYACINTHS in 100 very choice sorts	£4	1 0
100 „ 50 very choice sorts	3	10 0
50 „ 50 very choice sorts	2	2 0
50 „ 25 very choice sorts	1	15 0
25 „ 25 very choice sorts	1	1 0
12 „ 12 extra fine sorts	0	12 0
12 „ 12 choice sorts	0	9 0
12 „ 12 good sorts	0	6 0

The order should specify whether the roots are intended to be grown in water or earth, as all kinds are not equally suited to both purposes. It should also be stated whether single or double blossomed kinds are preferred; otherwise we usually supply about two-thirds double, and one-third single. The single varieties generally thrive best in water, but their merits are never apparent until the flowers are fully expanded.

SUTTONS' MIXED HYACINTHS, for Beds or Open Borders.—Double, Single, and various colours, 2*s*. 6*d*. per dozen, 18*s*. per 100.

SUTTONS' HYACINTHS, in distinct colours for Massing, Bedding, Ribbon Gardening, &c.—Double and Single, various shades, separate, 4*s*. per dozen, 30*s*. per 100.

For further particulars, with complete Cultural Instructions, see

SUTTONS'
AUTUMN CATALOGUE FOR 1870,
Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

☞ *Five per cent. allowed for cash payments.*

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

Spring Flowering Bulbs.

BUTLER, McCULLOCH, AND CO.'S COLLECTION of CHOICE ROOTS for Greenhouse or Flower-garden Decoration, sent carriage paid. Sent out in packages.

FOR CONSERVATORY.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
105*s*.	63*s*.	25*s*.	21*s*.	15*s*.	10*s*. 6*d*.

FOR FLOWER GARDEN.

No. 7.	No. 8	No. 9	No. 10	No. 11	No. 12
100*s*	60*s*	30*s*.	25*s*.	21*s*.	10*s*. 6*d*.

FOR GREENHOUSE and FLOWER GARDEN.

No. 13	No. 14	No. 15	No. 16	No. 17	No. 18
105*s*.	52*s*. 6*d*.	42*s*.	21*s*.	15*s*.	10*s*. 6*d*.

CATALOGUE, containing detail, post free.
5 per cent. allowed for cash.
BUTLER, McCULLOCH, AND CO., 7, South Row, Covent Garden, London, W.C. Established upwards of a century.

Dutch Flowering Bulbs and Autumn Seeds.

WILLIAM SKIRVING announces the arrival of his Annual Stock of DUTCH FLOWERING BULBS, comprising Hyacinths, Tulips, Crocus, Anemones, Ranunculus, Narcissus, &c., all carefully selected, CATALOGUES of which can be had free on application.

AGRICULTURAL SEEDS for PRESENT SOWING. Best sorts of WHEAT, grown on his own Farms; WINTER VETCHES, RYE, and a general assortment of GRASS SEEDS for Laying Down Permanent Pasture, or for One or Two Years' Mowing for Green Food.

Early orders are respectfully solicited, and can be executed either at the Seed Warehouse, Queen Square; or at his Nursery and Seed Establishment, Walton-on-the-Hill.

Queen Square, Liverpool.—Sept., 1870.

GRAPES FIRST YEAR.—Rods 10 feet long and upwards, will carry from 12 to 18 bunches, from 5*s*. to 10*s*. 6*d*. each, prepared without heat, and acknowledged to be the finest Canes in the kingdom.

RANSLEY TANTON, F.R.H.S., The Nurseries, Epsom.

ALOCASIA LOWII.—An importation of this grand plant having been received in fine condition, can be offered very cheap. Sizes and prices upon application.

The Nurseries, Epsom, Surrey.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their Collection of new and rare plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES.

The Ascot Nursery, Bagshot, Surrey.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit. Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

The Gardeners' Chronicle

SATURDAY, OCTOBER 15, 1870.

WHAT has become of the SILK SUPPLY ASSOCIATION? It has suddenly dropped out of public view, after a brief but rather prominent existence, and we began to fear that it had not received adequate support, and had come to a standstill for want of funds. When we last heard of it, it was rather urgently appealing to those interested for more support. For the last two months its "Journal" has ceased to appear; we learn nothing of the experiments or improvements in reeling which were promised to be shown—an inquiry as to the "Journal," which we addressed to the Secretary, has produced no response, and generally the Association has ceased *virum volitare per ora*.*

When the Association was started we gave it our good word, but we did so discriminatively, and events have justified our discrimination. It started with three objects. One of them we could not speak of with any anticipation of success. The other two, which aimed at increasing and improving the supply from abroad, and improving the processes of manufacture, seemed to us not only deserving of support, but to be attended with fair prospects of success. The one which we could not endorse was the idea of establishing silk culture as a new industry in Britain. Mulberry trees were to be planted in quantity, and a new and profitable source of employment was to be conjured up. We knew that it was a dream, and said so in as gentle terms as we could. The uncertainty of our climate rendered it mere gambling, with almost certainty of loss, unless in regularly heated apartments constructed for the purpose. We pointed out, too, that it had been found, by one of the most successful of former experimenters, that the home-grown cocoons were greatly inferior in weight of silk to those of Italy and the South of France, and that with these disadvantages, added to higher wages, we could never compete with the culture in more favoured climates. The Association, however, would only be taught by experience. They resolved to confute the wiseacres who shook their heads, and to show

* We are happy to hear that this is not the case. The "Journal" is to appear quarterly instead of monthly, and we trust its career will be long and prosperous.

the world how easy it was to make a fortune out of silk; and that their light might not be hid under a bushel, but flame like a beacon over all the land, they obtained from the authorities of the Science and Art Department a suitable apartment at South Kensington Museum, where all the world might see them at the work, so that no doubts or fears might taint the fair condition of their hour of triumph; and that all who chose might follow in their footsteps.

Although an old story, the experiment was by no means as tedious as a thrice told tale. They wore their Mulberry leaves with a difference. Everything was done in first-rate style. The best eggs, and eggs of the best kinds of silkworms were obtained. The most approved trays, fittings, and other apparatus for conducting the experiment were provided after a fashion that would have thrown Count DANDOLO into ecstacies. Every one who had a Mulberry tree within ten miles of London was laid under contribution to provide food for the worms. A staff was set to work to clip the leaves into shreds, to clean and shift them, and generally to take charge of the experiment. At first all went *à merveille*. As usually happens in this country, the young caterpillars would have been out before the Mulberry leaves, and the experiment rendered abortive, unless the hatching of the eggs were artificially retarded by keeping them in a low temperature. This was successfully done, and the worms and the Mulberries started fair. They grew and prospered, and the *magnanerie* became a most interesting sight. The difference between some of the breeds was very striking. As most of our readers know, the ordinary silkworm-caterpillar is of a strange, unnatural-looking white colour, as if it had fallen into a dish of milk, or into a pot of whitewash or white paint; but among those tried by the Association were some (the Ka-hing breed) of a velvety texture, and grey colour, beautifully striped, and with fine ocular markings. We had the pleasure of seeing these, and we proposed to ourselves to employ our pencil in making coloured drawings of the different kinds. We thought they would be in perfection a week later, but when we returned their place knew them no more. The Association was clearing out, bag and baggage. A serious mortality had set in, in the beginning of July, and in a couple of days brought the experiment to an untimely close. A cold night or two then occurred, not that they could properly be termed cold, for the temperature had never fallen below 58° Fahr., but it was enough. It was 8° lower than they could bear, and 15° lower than what they liked. During rearing the temperature should never be allowed to fall below from 70° to 80°; they became paralysed, ceased eating, and died before they could form their cocoons.

In the next number of the "Journal" the calamity was frankly announced, and a full report was promised in the following number—as well as an exhibition of the process of reeling, but neither "Journal" nor exhibition has appeared. As there must be much in the process of the experiment with so many different breeds that it would be interesting to know, we look for the report with interest. Even the record of the sources of supply of Mulberry leaves would be interesting, and as some of the worms had spun up before this mortality set in we should be able to get fresh information on the important point of the weight of the cocoons, as compared with those from warmer climates.

Although, as we predicted, this experiment has not been successful, the labours of the Association in other respects have been so satisfactory that any interruption of their labours will be very much to be regretted. The "Journal" has been a success—well conducted and interesting—and from time to time has contained valuable information. Chiefly owing to their intervention, the Khedive of Egypt has undertaken to try silk culture in Egypt; and other new localities for its culture, abroad or in the colonies, are about to be tried on their recommendation.

The attempts made by the Association, with the best intentions, to introduce some improvements in the home trade, have not been so prosperous. The managers were not looked upon with favour by that very powerful body of individuals, the silk brokers. No man likes to have all his arrangements and mode of conducting business gratuitously altered. It might possibly put him to a great deal of trouble, and though it might benefit the nation in the end it would not profit him one penny; therefore the reply of one of them, which we find quoted in the "Journal," —"we do not want the present system interfered with"—was quite natural, and being natural will not easily be got the better of.

Events are taking place, however, which may release them from much of the difficulties they have experienced in this respect, without any effort or interference of their own. The present calamitous position of France renders it but too probable that the supply of silk from that country next year will be almost as seriously interfered with as the supply of cotton from the Southern States was by the American war. To supplement that the needs of the manufacturers may compel the brokers to encourage the import of cocoons for reeling. In any view the appearance of the Association has been singularly well timed, and if its usefulness was felt and acknowledged before the breaking out of this most unchristian warfare, it now must be felt by the trade to be ten times more necessary and deserving of encouragement.

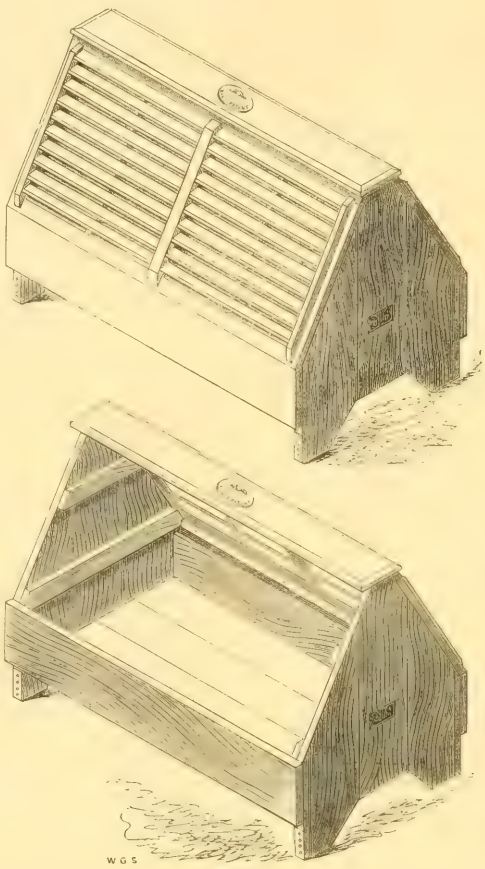

Fig. 246.

IN these days, when so many valuable plants are sent across the seas, either in the form of new introductions or in meeting the ordinary demands of trade, any improvements which it may be possible to effect in the cases in which they are packed for their journey become matters of public interest and importance. When the rough and clumsy contrivances of former times were put aside by the happy idea which occurred to our late friend Mr. WARD, and which led to the construction of the WARDIAN CASE for SEA-GOING PURPOSES, a great step in advance was made, and for many years these Wardian cases have been the means of bearing to our shores such novelties as have been introduced, and of again distributing these and other choice plants to the various quarters of the globe.

WARD's cases were not, however, perfect, and these importations and transmissions were not effected without many losses and drawbacks, cases full of plants made up with every possible care not unfrequently arriving at their destination with few or none of their contents alive. Such losses, often to be computed, in the case of very choice novelties, at many hundreds of pounds, naturally put those who were principally interested in the matter on the track of investigation, and one result is Mr. W. BULL's "Improved Case for the Conveyance of Plants," which he has patented, and of which we now give two figures, showing the external and internal arrangements.

What the causes were which chiefly conduced to bring about the losses referred to, and what the remedies applied, may be gleaned from the following passages of Mr. BULL's specification:—

"It is well known that when plants have to be transported for long distances, and have, consequently, to remain packed up for a considerable length of time, they require to be packed in cases with glass covers, so that the requisite amount of light may be enabled to reach them. They also require to be more or less moist, to withstand a journey of three or four months (more or less) in a closed case; and it is, moreover, necessary to protect them from the action of sea air and salt water during transit. Heretofore great loss has been sustained in the transmission of valuable plants, owing to the direct action of the rays of the sun upon the glass covers of the cases containing the plants, the result of which has been the creation of what may be termed a 'steaming' heat within the case, so that the plants have been literally boiled. Great danger results also from the breaking of the glass on board vessels, which at present frequently happens, thus exposing the plants to the action of the sea air.

"Various devices have been resorted to for the purpose of obviating these serious evils, such as the nailing across the case strips of wood, Bamboo canes, canvas, and other plans; but all the means hitherto used, so far as I know, have more or less failed to accomplish the object in view, as they either make the interior of the case too dark, or do not prevent the sun's rays from penetrating directly into the case.

"Now, in order to remedy the evils above referred to, and also to protect the plants from injury by the dripping on to them of the condensed vapour from the glass, I cover the glass with a frame or frames formed with louvre pieces, so arranged as to permit the necessary light to enter the case, but to protect the glass from the direct rays of the sun, and from breakage; and in order to protect the plants from the dripping of condensed vapour, I arrange the glass covers and interior of the case so that the condensed vapour shall pass down the surface of the glass into small channels or chambers provided within the case to receive it, which chambers are filled with Sphagnum Moss to absorb the moisture. I furthermore guard the plants against injury from sea water entering the case during the washing of the decks, by constructing the case with projecting parts or legs in such manner that its bottom shall be raised some distance from the surface of the deck, thus allowing water to flow underneath without soaking it up."

In this form BULL's Patent Case, the registra-

tion of which dates from June last, seems to be a real and substantial improvement upon those in ordinary use; but as the proof of its merits lies in the use, it may be added that the most satisfactory reports have been received respecting the performances of cases made according to this plan. Thus the President of the Agri-Horticultural Society, Bombay, writes:—"The plants have all arrived in good order, having been carefully packed. I cannot tell you what satisfaction everything has given me. I think your new cases admirable. So much do I think of them, that I am going to send one or two to Australia for plants." The Hon. Sec. of the Mysore Agri-Horticultural Society writes:—"Your grand case of plants arrived here ten days ago in excellent order." The Hon. Sec. of the Victoria Botanic Gardens, India, writes:—"I am glad to say that the three cases forwarded by you arrived here in sound condition, and that the contents were found very satisfactory." The "Chargé d'Affaires de Guatemala," writes:—"Your admirable packing has been much appreciated, and very successful."

These statements are in the highest degree satisfactory. We believe Mr. BULL proposes to delegate the right of manufacture to any persons who may be desirous of using the Improved Case, on payment of a moderate royalty.

—— We are requested to mention that Friday, the 21st inst., has been fixed for holding a general meeting of subscribers to the VEITCH MEMORIAL, in the meeting room of the Royal Horticultural Society, the chair to be taken at 3 P.M. An admirable full-length portrait of the late Mr. VEITCH has been most liberally presented to the Committee by ROBERT CRAWSHAY, Esq., and is now suspended in the room in question, and this, we presume, will leave the Committee free to propose that the whole of the subscriptions should be devoted to the VEITCH PRIZES—the portrait and prizes being the special forms which the former meeting determined the Memorial should assume.

—— The JAPANESE HYDRANGEAS have long been familiar in gardens as ornamental shrubs, the old-fashioned H. Hortensia being one of the most popular of decorative plants. H. japonica, too, is a handsome species, but the comparative paucity of its neuter flowers renders it less ornamental than H. Hortensia. We had before us a few weeks since specimens of two others of recent introduction, which are subjects of great beauty, namely, *Hydrangea Otaksa* and *Hydrangea paniculata grandiflora*. The former is admirably figured in SIEBOLD and ZUCCARINI'S *Icones et Descriptiones Hydrangearum*, forming a portion of the *Floræ Japonicæ*. It is a bold shrub, with obovate serrated leaves, cuneate at the base and shortly cuspidate at the apex, and bears great globose cymes of pale or sky-blue flowers, which are all, or nearly all, radiant with five (or sometimes four) roundish, obovate, entire sepals. In the work just noted the cymes are said to measure 8 to 12 inches across, and in the sample referred to—the ramified termination of a natural shoot—the compound flower-head measured just 42 inches in circumference. It is a grand ornamental plant, very nearly related to H. Hortensia, and, like it, having the whole head composed of radiant or neuter flowers. The flowers themselves are somewhat smaller than those of the common Hydrangea, being about 1¼ inch in diameter, but they are more numerous, and of a more elegant form, and more pleasing colour, the fine pale blue, which, moreover, pervades all the ramifications of the panicle, being, it would seem, natural to them, since they are so described by SIEBOLD, and the specimens sent us entirely confirm his statement. Otaksa is the native Japanese name. It is a plant of great beauty, and will prove to be one of marked utility, about equalling the other Japanese Hydrangeas in respect to hardiness. The *Hydrangea paniculata grandiflora* is another remarkably ornamental plant, but of a totally different character, approaching in its inflorescence nearer to the H. quercifolia of North America. H. paniculata itself is a branching shrub, with ovate, or ovate-oblong acute leaves, and the flowers in small cymes, disposed so as to form a pyramidal panicle, but mostly fertile and inconspicuous, with a few large, white, sterile, or radiant flowers on the outer part of the panicle. H. paniculata grandiflora differs in having a much larger proportion of radiant flowers, the whole of the small, colourless, fertile flowers of the type becoming enlarged and converted into white petaloid blossoms, so that instead of bearing a sparse inflorescence, each branch produces a dense panicle of white flowers of about a foot in depth and 2 feet in circumference. As a hardy, deciduous flowering shrub, blooming in August, it has few equals, while it entirely supplants the old H. paniculata. For the opportunity of noticing these choice novelties we are indebted to Mr. ANTHONY WATERER, of the Knap Hill Nurseries.

—— Since the Fungus show last week we have received from Miss SUSAN BROADWOOD a magnificent specimen of SPARASSIS CRISPA, which arrived in such excellent order, that we put to the test Professor FRIES' dictum that it is most delicious. Care was taken that only the best parts should be used, and nothing could exceed the excellence of the preparation. Opinions, however, were rather divided as to its quality, but making allowance for the prejudices against it, which were considerable, the verdict was certainly in its favour. The specimen came from Lyne, in Hampshire, and was of considerable size, though not perhaps quite so large as that which was figured after a drawing by Mrs. BERKELEY, in HOGG and JOHNSON'S selection of Eatable Funguses of Great Britain. The stem was much more developed, being many inches in length, and the lobes very large. The following is the description in the above-mentioned work:—"The laminæ are rounded and leaf-like, though curled and folded and variously lobed and laciniate with a crestlike margin, thick rooting stem, the greater part of which is sunk in the soil. The hymenium is more or less uneven, and rather wrinkled, or rough with wartlike elevations. In decay the margin becomes soft, acquiring first a yellow then a brownish tinge, and finally the whole plant becomes a loathsome mass. Like all other esculent Fungi those specimens only are fit for use in which there is not the slightest tendency to decay." It throws down an immense number of white spores. *M. J. B.*

—— Another sale of SPECIMEN CONIFERS commences on Monday next at the Sunningdale Nursery. It would appear from our advertising columns that some choice examples will be offered.

—— We have had our attention drawn by Mr. THOMSON, of the Penge Nursery, to the great value of MESEMBRYANTHEMUMS as late autumn and early winter flowering plants. They flower most profusely even in 60 pots, and the brilliant colours of most, and the odd leaf-forms of others, make them exceedingly attractive plants, though now so seldom seen. They require full sunshine to expand their flowers fully, but even when unexpanded their buds are brilliant in colour. One species, M. inclaudens, opens its flowers and keeps them open, even in dull ungenial weather. M. conspicuum produces abundance of charming pink flowers; M. aurantiacum, flowers of brilliant orange; M. curviflorum has pure white flowers. They are so beautiful and so easy to grow, to say nothing of the interest attaching to them, that we should be pleased to see them come once more into fashion. Some of them will even bear a few degrees of frost with impunity. For rockeries or balconies with a southern aspect, with slight protection from frost, they are admirably suited. A fine collection of these plants may now be seen at Kew, and, thanks to the excellent plan adopted in that establishment of grouping plants as far as may be according to the countries from which they come, or to their botanical affinities, a very fair idea of the peculiarities of the South African flora may be obtained. The Oxford Botanic Garden has also a choice collection of these favourites of our fathers, but now too much neglected plants.

—— We are requested to state that the next meeting of the Royal Horticultural Society's FLORAL and FRUIT COMMITTEES, will be held on November 2, and December 7—not on November 16 and December 21, as announced in some early issues of the Society's Schedule and Almanac.

—— The painters and decorators are completing their work in the Fine Art Galleries for the INTERNATIONAL EXHIBITION of 1871. We understand that it is the intention of Her MAJESTY'S Commissioners to invite artists and exhibitors of all Fine Art works to inspect these galleries shortly.

—— In the last number of our Journal, attention was called to the absence of RAIN throughout the British Isles during the week ending October 1. This drought continued until the Friday of the following week (ending October 8), when a change took place, and rain commenced falling over the different districts of England, but principally between the parallels of 52° and 55° North latitude. The following are some of the notes recorded by the observers at the different stations:—At Leicester, the observer remarks, on Friday, "a rainy night." At Manchester, on the 7th and 8th, "excessively heavy rain." At Bradford, on the 7th, the note is "raining nearly all day;" and on the 8th, "barometer reading 1.304 inch lower than on the 5th, at 9h. A.M." At Leeds, the observer records—"The rain commenced on Friday at noon, and it is still falling (9h. A.M., Sunday), the total rainfall up to the present hour being 3.13 inches." At Hull over 1½ inch of rain fell on each of the two days, and at Sheffield the fall on the 8th amounted to 1.90 inch. The mean fall for the eight southern stations was 0.72 inch, and for the eight northern was nearly 2 inches (1.93 inch). In Scotland but little rainfall took place, the mean for the different stations being 0.15 inch. The MAXIMUM TEMPERATURE of the AIR in England ranged from 76°.2 at Portsmouth (the extreme south station) to 60° at Newcastle (the most northern station), with a mean for all stations of 67°.2. In Scotland it varied from 67°.5 (?) at Paisley to 55° at Dundee, with a mean for all stations of 57°.3, or nearly 10° below the mean for the English places. The MINIMUM TEMPERATURES in England ranged from 32° at Hull to 43°.8 at Bradford, with a mean for all stations of 39°.8. In Scotland it ranged from 34°.6 at Glasgow to 44° at Greenock, with a mean for all stations of 38°.9. The MEAN TEMPERATURE of the week in England varied from 54°.3 at Nottingham to 47°.8 at Newcastle, with a mean for the eight southern stations of 53°.3, and of the eight northern of 50°.6. In Scotland the mean for all stations was 47°.2.

New Garden Plants.

× CYPRIPEDIUM VEXILLARIUM, *n. hyb.*

C. Fairrieano-barbatum: foliis ligulatis acutis apice bidentato, pallidis parce ac hieroglyphico-tesselatis; pedunculo vel altiore unifloro; sepalo dorsali latissimo ovali acuto tantum extus glandulifi, utrinque septem-nervi; sepalo inferiori ovato-acuto utrinque septem-nervi; petalis oblongo-ligulatis undulatis reflexis, non arcuatis, limbi ciliati, circa limbum superiorem parce verrucosi, sacci ungue implicato, sacco ipso antice ostio retuso, utrinque juxta bicarinato-lacunata; staminodio transverso antice retuso medio apiculato, utroque limbo introrsum semiforcipato, disco retoso.

The pallid leaves look nearly like those of Cypripedium Fairrieanum, with few and thin dark hieroglyphic reticulations. The leaf comes very near that of the mysterious Hamburghian, "Cypripedium javanicum, the never-flowering variety," a plant that has, indeed, this undesirable quality. The peduncle and bract are like those of old Cypripedium Fairrieanum. The flower is as large as a very large flower of the same species. The upper sepal is whitish with portwine coloured nerves, washed with purple, a little green on its base, with some transverse ascending nervules; outer surface beset with glandular hairs, inner surface naked, shining; the scape is broad, ovate acute; the inferior sepal is much shorter, narrower, of the same colour only on the outside, more pallid inside; the petals deflexed, ligulate, bluntly acute, undulate at the superior limb, with hairs around the limb and with some warts; the inner veins green, the outer veins purplish; the lip nearly as in Cypripedium Fairrieanum, with a broad, hollowed claw, and with the little acute side laciniæ on both sides of the anterior retuse mouth; the transverse staminodium has reticulate nervules, and both anterior sides are bent in like the mandibles of an insect, enclosing on the retuse middle part a single projected tooth. The flower is intermediate between the two. The staminode would be that of Fairrieanum if it were not much broader and shorter, just like that of barbatum. The upper sepal is as in barbatum, wanting the undulation, and the hairs of the inner surface of that of Fairrieanum. The petals would be those of Fairrieanum, except that they have fewer undulations, and if they were not bent down in lieu of being arcuately ascending. They have also some of the fleshy callous warts of barbatum, which are not found in Fairrieanum. The leaf would come extremely near that of Fairrieanum if there were not green reticulations.

This is one of the surprises which Mr. Dominy prepares for the Messrs. Veitch, who kindly favoured the writer with specimens of the highly interesting novelty. *H. G. Rchb. fil.*

STELIS ENDRESII, *n. sp.*

Æquiflora: dense cæspitosa, majuscula, caulibus secundariis elongatis; foliis cuneato-oblongo-ligulatis obtusis, apice emarginatis cum apiculo, crassis; racemo disticho; ovariis pedicellatis medio gemiflexis, bracteis vaginatis acuminatis ovariis pedicellatis bene brevioribus; sepalis ima basi coalitis, omnibus intus papulis filiformibus barbellatis, sepalo dorsali ovali acuto trinervi; sepalis lateralibus ovatis apiculatis paulo minoribus; petalis transverse oblongis apice inflexo cucullatis cum apiculo; limbo erecto ciliatulo, trinervis; labello carnoso transverso subrhombeo excavato; columna gracili; androclinio postice cucullato; rostello ligulato erecto, limbo sub fovea bicruri, cruribus ovatis cum apiculo.

Near Stelis leucopogon, but with 3-nerved sepals. The whitish or greenish leaves are very curious on account of the short villosity of the inside of the sepals. An amateur of Stelids would regard it a beauty. It was discovered in Costa Rica by M. Endres, and flowered in the Hamburgh Botanic Garden in December, 1869, and July, 1870. *H. G. Rchb. fil.*

STELIS GLOSSULA, *n. sp.*

Bilabiata, dense cæspitosa; caulibus secundariis brevissimis; foliis cuneato-oblongo-ligulatis apice minute bilobis cum denticulo; racemo longe disticho floribus; bracteis triangulis ovaria longa non æquantibus; sepalo dorsali oblongo obtuse acuto quinquenervi elongato; sepalis lateralibus oblongo ovatis apiculatis apicem versus connatis subtrinervibus multo minoribus; petalis obtuse rhombeis uninerviis; labello carnoso papuliformi supradorsum bilamellato columna subæquali.

A cæspitose little Stelis, with spatulato-ligulate leaves, and a very curious inflorescence. The brownish flowers stand in two transverse rows, the upper sepal having a much longer extent than the whole of the other organs of the flower together.

This little species was imported by Messrs. Veitch from Costa Rica. *H. G. Rchb. fil.*

CATTLEYA VELUTINA, *Rchb. fil.*

Gardeners' Chronicle, supra, 1870, p. 140.

Till recently we had seen only one flower of this plant, from the collection of J. Broome, Esq. The plant has just appeared in the stoves of the late Consul Schiller, in a much finer variety. It is a magnificent thing. The grand flower is very crisp and wavy, in the way of that of a Miltonia cuneata or some Schomburgkia. The sepals and petals are light orange, with many purplish spots and streaks. The lip has an orange base and a very wide white blade with violet veins, these covered with velvet. The smell is most powerful. The plant itself is in appearance quite like Cattleya bicolor, so that if a mule it may be descended from that, and from such a one as Schilleriana or Gardneriana. We would advise all the possessors of

Cattleya bicolor, and especially of recently introduced plants, not to dispose of their specimens before they flower, since it would be very tantalising to ascertain at a later period that a plant supposed to be one of that old species had proved to belong to such a first-rate beauty as the present. *H. G. Rchb. fil.*

LILIUM THUNBERGIANUM FLORE-PLENO.

This is a remarkably ornamental hardy bulb, which has been obtained along with many other forms of the same species from Japan. Our sketch (fig. 247) was taken from a plant which bloomed in June last in Mr. W. Bull's collection, but the same form, or one closely resembling it, had been flowered so long since as 1862 by Mr. Standish, from bulbs sent from Japan by Mr. Fortune.

The plant grows, in the specimen we have seen, to about a foot or somewhat more in height. The stem was furnished with lance-shaped leaves 3 or 4 inches long, and was surmounted by two flowers, which latter have the perianth segments recurved and spread out, so as to measure 6 inches across. In place of the usual six stamens, there are six erect, obovate, spathulate, petaloid filaments, which are deeply bifid, with the anther seated in the cleft. The colour of the flower is a deep fiery red, partially dotted with black. The petaloid filaments have a stain of crimson, and are paler at the edge, and slightly dotted.

This Lily is quite different in structure from the double-flowered L. tigrinum exhibited last summer by G. F. Wilson, Esq., and in which the perianth segments were duplicated so as to form several overlying layers, all of the same shape and colour. *T. M.*

THE RANUNCULUS ORDER.

(*Concluded from p. 1356*

Delphinium.—A genus sufficiently characterised by the spur-like projection from the calyx, which is the origin of the common name Larkspur, or Lark's-heel, as it used to be called. The form and number of the petals differ in the different species, but they never present the singular form of those of the Aconite. The stamens are arranged as in Nigella, and the carpels as those of Aquilegia. Many of the species and garden varieties rank among the most beautiful of our garden plants. They may be grouped into two main divisions, according as they are annual or perennial. Under the first heading come the very numerous varieties of D. Ajacis, with tall stems and dwarf stems, single or double flowers of all hues, but always with the same finely-cut foliage. The petals in the wild flower, and in many of the cultivated varieties, are marked with peculiar spots, in which imaginative people of old saw, or feigned to see, the letters A I, the mark by which the ancients recognised some plant which they called Hyacinth, but which no modern scholar has been able satisfactorily to identify. D. Consolida, a plant found in cornfields on the Continent, and occasionally in similar situations in this country, is also the parent of numerous garden varieties, for the most part of taller stature than those belonging to the former species. D. cardiopetalum is also an annual species, while D. cardinale and nudicaule are peculiar in having bright scarlet flowers; both the latter are short-lived perennials.

Among the other perennial kinds are some magnificent sorts for filling up the rear of a mixed border, or for planting in the front of a shrubbery. Such is D. formosum, a supposed native of the Caucasus, the flowers of which are large, and of an intense blue colour. As the plant seems to succeed in any soil, and in any aspect, no garden should be without it. D. elatum, grandiflorum, &c., are also grand species, of which numerous varieties, differing in the colour and duplicature of the flowers, exist.

Aconitum.—The singular hooded sepal, which gives the common name "Monkshood," is in general sufficient to enable one to recognise this genus, though the hood is apt to taper off into a spur sometimes, as in A. Lycoctonum, when it is difficult to distinguish the genus at first sight from the Larkspurs. The curious petals concealed within the hood, which look like hammers, are, however, excellent marks whereby to distinguish between the two. More imaginative folk have compared these hammer-like petals to a pair of turtle doves! harnessed to a chariot—the latter represented by the concave sepal—hence the Aconites have been called by the name of Venus' Car. So far as the stamens, pistils, and seed-vessels are concerned, there is nothing to distinguish Aconites from Larkspurs. The acrid, poisonous principle which, in greater or smaller quantity, pervades the whole order exists in its maximum degree in certain species of Aconite, such as A. Napellus, A. Störckianum, A. ferox, &c. Aconitin, as the poisonous principle is named, is perhaps the most powerful vegetable poison known. But it is much more abundant in some species than in others, and its amount depends in all cases on locality and season. The most frightful accidents have occurred from the mistaking the roots of Aconite for Horse Radish,—a mistake which, had it not occurred repeatedly and with fatal results, would be deemed incredible. The finest species for garden purposes are A. Napellus, dark blue; A. paniculatum, very similar, but larger, with more branched flower-stalks and brighter coloured flowers; A. variegatum, an exceedingly pretty species, the flowers being clear blue variegated with white; A. sinense, a fine late-flowering sort. A. Lycoctonum, "the Wolf Killer," is a common plant in mid Europe; it has the palmately cut leaves of the other Aconites, but its flowers are yellow, and in shape more like those of the Larkspur. A. Anthora, a species rarely seen in gardens, is like the preceding, but of shorter stature; it is said to be destitute of poisonous properties. All the Aconites are well suited for the herbaceous border, but should be sedulously kept out of the way of the cook.

Actæa.—In how very few gardens not professedly botanic is this very pretty plant to be found. We say plant because the genus is represented by two species only, one of which alone is known to us in gardens. It is an herbaceous plant, about 18 inches high, with elegantly triply-cut leaves (pinnatisect), the ultimate segments of which are more or less ovate and toothed at the margin. The individual flowers are small, white, and grouped into close spikes. There are four or five sepals, as many petals, stamens so numerous that they constitute the most attractive part of the flower, and only a single carpel, which as it ripens becomes a succulent berry-like fruit, and thus furnishes a characteristic mark to distinguish the genus from its neighbours. The flowers are very like those of Thalictrum, but are distinguishable by the seed-vessel or fruit, and by the presence of many, not a solitary seed. *Cimicifuga*, on botanical grounds, seems hardly worth separating from Actæa, the only difference consisting in the seed-vessel, which is here follicular, like that of the Aconites or Larkspurs.

Xanthorhiza.—If any cruel examiner wanted to puzzle an unfortunate candidate at an examination, here is a plant for him. The only representative of the genus is a low growing North American shrub, as different in outward aspect from the rest of the Ranunculus family as it is possible to conceive. Its shrubby habit is unlike any other of the group, unless it be the Clematis, which is known by its climbing habit. Roots and wood are alike of a deep yellow colour, whence the name of the plant. The leaves are much more Ranunculaceous-looking; they are alternate, with stalks sheathing at the base, and blades deeply pinnately cut. The flowers are small, purplish, grouped in long slender clusters; the sepals and petals are regular in form, and the remaining organs of the flower adhere pretty strictly to their family type.

Pæonia.—The Pæonies really offer a greater divergence from the Ranunculus type of structure than does the yellow root just alluded to, and yet their general aspect is quite Ranunculaceous. The divergence consists in this, that the floral receptacle or thalamus—that part from which the several parts of the flower spring—instead of being convex, as it is in the Buttercup, or lengthened, as in the Pheasant's-eye (Adonis), or flattish, as in the Aconites, &c., is in the Pæonies concave; the consequence of which is, that the stamens which, in all other Ranunculaceæ spring obviously from beneath the pistil (hypogynous), here come off from the receptacle not below the level of the pistil, but at a little higher elevation. They emerge from around the pistils; technically speaking, they are perigynous. The sepals, gorgeously-coloured petals, the stamens (except in so far as their emergence is concerned), and the pistil, are all in conformity with the usual Ranunculaceous structures, but in P. Moutan there is an additional organ, also serviceable as a puzzle for distressed candidates. This consists in a fleshy tube, which encircles more or less completely the pistil in some cases, merely leaving an aperture at the top, through which the styles protrude. This is called the disc, what its exact purport may be, nobody seems to know. It does not appear in the very early stages of the flower, but is developed subsequently to the formation of the other organs; on which account some people are disposed to think it an organ of little consequence or importance to the economy of the flower. We don't quite see the validity of this mode of reasoning; and though we cannot say what function it now serves, if any, or whether it be a vestige of an organ which in former times was serviceable to pre-Adamite Pæonies, but which has now dropped out of use, we yet venture to think it was not made for nothing. Possibly it may serve as a real nectary; that is to say, it may act as a factory or store for honey.

The ripe fruit—follicles—of Pæonies, with their shining black and scarlet seeds, are almost as handsome as the flowers. Every one knows the general appearance of Pæonies, so that any further description of them is uncalled for. There are numerous species and varieties in cultivation, all with gorgeous flowers, the single ones almost as handsome as the double varieties. P. tenuifolia has its leaves very finely cut, almost as much so as those of Fennel. P. Wittmanniana has yellow flowers. The so-called Chinese Pæonies constitute a distinct race, the flowers of which are generally white shaded with rose, but infinitely varied by cultivation, and have all a rose-like perfume. The Tree Pæonies, P. Moutan, belong to a distinct section, characterised by their shrubby habit, and by the great development of the disc already referred to. Their beauty needs no comment. If they were but as high priced as Phalænopsids or Vandas, and as difficult to grow, how much they would be prized.

A word, in conclusion, as to the root-stocks of Ranunculaceæ. Differing considerably in different species in outward form, in essential characters they remain alike—that is to say, in the perennial species or in those plants which are generally classed under the name of herbaceous perennials. Such plants throw up a leafy stem, terminated by a group of flowers. At the end of the season this stem dies down, leaving at its base in the ground a thickened root-stock of varied form in different genera. This root-stock serves as a store-house of nourishment for the secondary buds which are developed from it, and are destined to form new flowering stems in following seasons. In this way the base of the stem and its branches become store-houses. In the garden Ranunculus, a number of adventitious roots answer the same purpose. In the common Buttercup, R. bulbosus, the so-called bulbs, though acrid, are filled with starchy matters, and have been greedily eaten by sheep during the past summer. *The Rambler.*

ONION GROWING AT BANBURY.

PERHAPS a better exhibition of Onions cannot be witnessed anywhere than that seen at Banbury at the end of the month of August. It is a show *par excellence*, and it goes to prove two things—1st, that the Onion can be grown to an enormous size without any sacrifice of those qualities so necessary to this esculent; 2d, that this extraordinary growth can be reached in a comparatively short space of time. Those who exhibit Onions at Banbury are as proud of them as the successful cultivator of the best stand of 24 Dahlias ever raised. They pet them as many an enthusiastic florist does his Auriculas, Pansies, Car-

nations, &c.; and the finer the development, the greater is the zest with which they are staged on the exhibition table. Banbury, which does a great many things horticultural exceedingly well, does Onions particularly so, and some of the townspeople raise a fund annually in the form of a sweepstakes, and give something like 14 prizes for the best dish or tray of 12 Onions; and as there are generally 18 to 24 competitors, all of whom can grow Onions amazingly well, the task of judging them is almost as irksome as being mayor of the borough. The judges generally consume from half to three-quarters of an hour in giving their decisions; and in discharging this function they deserve, and receive, sincere pity. Size, shape, solidity, smoothness, size of the neck—all have to be regarded in the discharge of the censorship; and, it must be recorded to the credit of Banbury, that the decisions of the judges appear to be quietly concurred in on all occasions of this annual competition. Ropes of Onions at Banbury are another feature. Some of these are three and four yards in length; and, as the largest Onions are used, these ropes are somewhat prodigious in character, and rather unwieldy. Still, they are ropes of Onions.

It was said that the show of Onions this year at Banbury was much inferior as compared with the last and preceding years; and yet the best 12 exhibited by Mr. William Finlay, gr. to Col. North, M.P., Wroxton Abbey, weighed just 12 lb. 15 oz., two of the bulbs averaging 20 oz. each, the two smallest 14 oz. each. These enormous Onions are the produce of spring sown seed, and the result goes to show how the weight of vegetables taken from a given piece of ground can be augmented, when some extra care is bestowed on their cultivation.

Mr. Finlay is a very good representative man among the Onion cultivators about Banbury; and the seed of his fine Onions were sown on February 26, and the roots lifted on August 24. About Banbury there appears to be a fine deep rich yellow loam, in some places much darker than in others; and when this is well enriched, as it must be to produce fine Onions, their development into size is only a question of time. The work of preparation commences in the previous autumn; then the spots on which the bulbs are to grow being selected—and this is generally one of the most open spaces in the garden—it is what is termed "double-dug," and trenched as roughly as possible. It is not considered at all necessary to change the ground annually; one successful cultivator stated that he had grown his Onions on the same spot for five years in succession. The advantages of the open spaces are these—that plenty of air and sun is necessary, not only to secure the finest development of the bulbs, but also for their absolute well-being, as the plant is very susceptible of blight, mildew, &c., at particular periods of the season. In trenching the ground all the rough stones are removed, as they are apt to come in the way of the swelling of the bulbs, and interfere with their symmetry and proportions. In some instances the ground is trenched about Christmas time, or a little later, to the depth of 2 feet: 6 inches of strong manure are put at the bottom of the trench, and some 3 or 4 inches placed on the surface of the ground; it is then well dug in, and the ground levelled preparatory to sowing the seed. One grower always trenches in the autumn, and at Christmas, when a moderate amount of frost sets in, begins to manure the ground with the following proportions of manure laid in a heap and well rotted: three-sixths pig, one-sixth cow, one-sixth horse manure, and one-sixth road dirt, adding to the whole about 20 lb. of common salt; they are mixed well together, and spread 5 or 6 inches thick over the ground. On cold, stiff soil, the road dirt is dispensed with, and the same quantity of horse-manure is used instead. This is allowed to lie to the end of January, at which time the ground is well dug again, and any stones that may come uppermost cleared away.

From the middle of January to the middle of February is the usual time for sowing the seed, this being regulated by the state of the weather; and a somewhat drying day is considered essential. Mr. Finlay levels the ground, and sows the seed in rows, 1 foot apart, and at every sixth row there is an alley. Ultimately the Onions are thinned out in the rows to 1 foot apart, and in dry weather the bulbs are well watered, occasional doses of liquid manure being given. One grower, who produces Onions of very fine symmetry and quality, informed me that, in finally preparing the ground for seed, he places on it a thin layer of a mixture formed of burnt garden ashes, a quantity of guano, and some dry rotten manure, the whole of which is passed through a sieve. The seed is then sown in drill lines about three quarters of an inch deep, and covered in with the back of a rake, and in a few days the surface is trodden hard, and beaten with the back of a spade. Then come the various details of thinning out, hand-weeding, watering, top-dressing with a mixture similar in character to that used at the time of sowing the seed, with occasional refreshment in the form of manure-water; and thus are formed the fine Onions seen at the Banbury shows. A continuous pinching-in of the neck, just above the bulbs, imparts that fineness of appearance so much prized by exhibitors of the Onion.

From South Wales I received some time since 12 of the most perfect specimens of Onions I ever saw. They were grown in the neighbourhood of Cardiff, and were taken from ground that has borne Onions for six years in succession. In this instance the ground was heavily manured in the autumn, the seed sown the last week in February, and the after treatment similar to that employed at Banbury. These Onions, sent to me as Danver's Yellow, were exhibited as such before the Fruit Committee of the Royal Horticultural Society, and declared by the Committee to be incorrectly named. Subsequently I was informed by the grower they were not Danver's Yellow, but Nuneham Park, grown from seed as supplied by Messrs. W. Cutbush & Son. Singular to state, the Onion authority in the Fruit Committee, who declared they were not Danver's Yellow, was also of opinion they were not Nuneham Park; and since then I have been endeavouring to discover what variety these Onions really represent, but no one cares to take upon himself the responsibility of identifying them, excepting Mr. James Cutbush, who thinks them excellent examples of Nuneham Park. For myself, with some 12 years' experience at my back, I think them capital illustrations of that fine keeping Onion answering to the type of Danver's Yellow. *R. D.*

AUTUMN CULTIVATION.

Amid the many subjects which require the gardener's particular attention, one stands specially prominent, *i.e.*, the thorough mechanical and manurial condition of soils for the production of superior vegetables. In gardens even in the same district, the nature of the different soils is so various, that what in one garden would be a necessary outlay would perhaps in the adjoining one be labour thrown away. I have in mind those gardens in which sand abounds, and where at very short intervals after rain the ground can be easily worked; and although in this case the soil may naturally be termed hungry, yet it has the advantage, in earliness at least, over the stiffer cold ground, containing a large proportion of clay. There are also gardens in which the soil, although slow in recovering from the abuse of over-cropping or bad tillage, still retains its powers of production for a length of time proportionate to that expended for its reclamation and improvement, always provided that the means adopted are consistent with sound practice. It is however to the latter description of soils that I wish more particularly to allude, because they are the most generally found, and for ordinary purposes are of the greatest service. It cannot be denied that in many instances the ground is insufficiently worked, and even what is done is of the meanest description. Those only who succeed in reclaiming such soils can fully realise the great amount of labour and patience which is requisite to bring the once exhausted and badly tilled ground into a state of thoroughly good working order, a condition which is at once a pleasure to the worker and a substantial recompense to the master.

The best time to take such land in hand, with a view to improving it, is in the autumn, as soon as the summer crops have been removed. Too often the ground is merely cleaned over and left in its compressed state until the period arrives for cropping it again, perhaps because time could not be found in the autumn for properly cultivating it then; but this is a sad loss of time, as well as of atmospheric agency—a grand helper in the cause of soil improvements. Simple manuring is not the only requisite, the mechanical condition must also be in good order to bring about the end in view, and for the latter purpose the atmosphere must play an important part. Ground which has been cropped during the summer becomes compressed through treading about while gathering the crops, and more in wet weather than in dry, and if it is left in this state throughout the autumn months and far into winter, when frost only seems capable of penetrating its surface, it cannot but fail in its productiveness in comparison to that cultivated in the autumn, and which allows the rains to pass freely through, and gives the air free ingress to promote a healthy decay of the vegetable and mineral substances, and to convert them into wholesome food for plants. Even the operation of trenching is in my opinion often but rudely accomplished, for the top spit of the soil, still compressed, is thrown headlong into the trench; though the subsoil by being thrown uppermost certainly gets well pulverized, and in spring gives a good tilth for cropping; but what of the compressed top spits below? Why, these are situated just where the roots will shortly be in action, and it must be apparent to everyone that those hard lumps are very detrimental to the free and early action of the roots of tender vegetables. For root crops in particular, I contend that every opportunity should be taken to aërate the soil. The surface, before trenching or even digging, should be split up, without turning it, and be left in same position, but shattered, so as to allow of the free action of the air. The pressure of one season's traffic will seldom be found to have penetrated beyond 3 or 4 inches, and this depth can easily be reached with the Canterbury hoe, which is the best tool for the purpose. When this surface is found to be thoroughly aërated, the ground may be dug with the spade, and be so left until it, in its turn, is benefited by the united action of air and frost. Then the operation of double-digging or trenching may be proceeded with—the sooner the better, and if the subsoil is good it may remain ridged until it is forked down in the spring for cropping; but if in an unfavourable condition, it is well, when frosted so that a sharp spade can just cut through it, that the whole surface should be turned over, allowing the clods to remain, as they will split up. These masses of earth, being exposed on all sides to the frost, will become frozen through: and when the frost disappears, they crumple down into that generous tilth so necessary for healthy seeding in spring.

The manurial condition of the soil usually obtains more consideration from the cultivator than the mechanical, though there are but very few instances where the gardener is well satisfied with the supply of manure at his command, and for this reason the most economical means of using it should be adopted. We are accustomed to see the great loss of the best chemical qualities of manure which many farmers experience, owing to the slovenly carelessness in which it is treated. Gardeners are also not altogether devoid of blame in this respect; for do we not often see, when looking at their manure heaps, the litter from the stables left just as it was tipped from the stable barrow, some heaps dry, others wet and fermenting, and often after rains the best constituents of the manure running away to the drains or into some ditch, notwithstanding that it is from this same store that they draw their material for replenishing the soil? The gardener takes pains with the litter for his hotbeds; and I would ask, does not the soil require that he should take the same care with his manure for the garden? The best way to use the dung is (where possible) to lay it at once over the ground to be manured, thoroughly shaking and incorporating the whole bulk, and moistening with liquid manure those parts which are dry. When the whole bulk is found thoroughly moistened, spread it over the surface, there letting it remain awhile for the rains to wash the fertilising materials into the ground. The litter, when presenting a bleached appearance, may be double-dug or trenched in. The best time to spread the manure is when the soil, having been rough-dug, is thoroughly pulverized, and in spreading it planks should be laid on the ground, and the manure be tipped right and left of them. This will occasion a little additional labour in shifting the planks, but will amply repay the extra care taken. Ground manured and trenched or double-dug in the autumn, is greatly superior to that done in spring, when the cropping follows quickly after the manipulation of the soil. The thorough absorption of the manure by the soil during the winter months makes the ground ready at once for the delicate roots of the plants, and gives such an impetus to the crops that they are established, and retain their position better than those planted directly after trenching in spring. The fact cannot be too strongly impressed upon cultivators, that to obtain sterling crops, the manipulation of the ground must be thoroughly executed during the autumn and winter months. *J. C. Sage.*

NEW ZEALAND VEGETATION.

The country between the Waikawa and Kawaeranga Creeks consists, for the most part, of steep hills and narrow gullies, and presents but few variations in those features which influence the character of its vegetation. From the Kawaeranga northward to Kurunui, a gradually-narrowing strip of alluvial land, much of which is now occupied by Shortland and Grahamstown, still exhibits dense thickets of Olearia Solandri, Hook. f.; Plagianthus divaricatus, Forst.; Muhlenbeckia adpressa, Lab.; M. compressa, Mein.; Coprosma sps., Dodonæa viscosa, Forst., with a close undergrowth of sedges and other uliginal plants, the most conspicuous of which is Cladium junceum, Br., often found covering large spaces, to the exclusion of other plants. The mud-flats and margins of the creeks are occupied by the Mangrove, Avicennia officinalis, L., which is here abundant and attains a large size; Chenopodium ambiguum, Br.; Leptocarpus simplex, A. Rich; Selliera radicans, Cav.; Samolus repens, Pers.; Scirpus maritimus, L.; and rarely S. triqueter, L.

At various points along the coast small patches of sand admit of a sparse growth of arenarian plants, the most common being Convolvulus Soldanella, L., and Carex pumila, Thunb.; the Pingao (Desmochœnus spiralis, Hook.), a plant which, in the north, at least, is common on shifting sand, usually within the influence of the sea-spray, is here found only in small quantity and apparently confined to a single locality. Occasionally, as in the neighbourhood of the Tararu, the Waionau, and other creeks, alluvial flats of sufficient extent to have been used as cultivations by the Maoris, are now more or less clothed with a dense growth of Tauhinu (Pomaderris phylicifolia, Lodd.), Manuka (Leptospermum scoparium, Forst.), Koromiko (Veronica salicifolia, Forst.), and Fern (Pteris esculenta, Forst.), with an abundance of naturalised plants, waifs of cultivation, grasses, and other stragglers, which are again mixed with a few coarse-growing native plants of herbaceous habit.

In the neighbourhood of Shortland and Grahamstown the hills are usually much broken and precipitous, and attain their greatest height, 2300 feet, near the head of the Kawaeranga Creek: the beds of the different creeks are frequently mere ravines, the sides of which are thickly clothed with Mosses, various species

of Gottschea and Plagiochila: P. Stephensoniana, Mitten, attaining unusual luxuriance; in less moist places a rare Moss, Mielichoferia tenuiseta, Mitten, covers the surface and forms a suitable medium for the growth of various species of Corysanthes, especially C. rivularis, Hook. f., and rocks and trees alike are clothed with a rich covering of various Ferns, more especially Hymenophyllum dilatatum, Swartz.; H. scabrum, A. Rich.; H. æruginosum, Carm.; and Trichomanes reniforme, Menz. The slopes of the hills are usually covered with a dense forest of timber trees and undergrowth, the forms being chiefly the Hinau (Elæocarpus dentatus, Hook.), Toro (Persoonia Toro, A. Cunn.), Tawa (Nesodaphne Tawa, Hook. f.), Beech, or Black Birch (Fagus fusca, Hook. f.), Kauri (Dammara australis, Lamb.), Miro (Podocarpus ferruginea, Don.), Totara (Podocarpus Totara, A. Cunn.), Rimu (Dacrydium cupressinum, Soland.), &c., with Alseuosmia macrophylla, A. Cunn.; Schefflera digitata, Forst.; Coprosma grandifolia, Hook. f.; Senecio glastifolius, Hook. f., and immense tussocks of an undescribed Astelia, and cutting grasses (Gahnia lacera, Steud.; G. arenaria, Hook. f.): the Supplejack (Rhipogonum scandens, Forst.), and Mange-Mange (Lygodium articulatum, Swartz.), are so mixed with the undergrowth as to render all progress tedious and laborious in the extreme.

A remarkable feature, in some parts of the district, is the social character of the arborescent Ferns, more especially of the Mamaku (Cyathea medullaris, Swartz.), and the Weki (Dicksonia squarrosa, Swartz.), which occasionally form groves of small extent; the Ponga Flat, a comparatively level piece of land at an altitude of about 1650 feet, owes its name to the large grove of black Tree Ferns with which it was formerly covered. A few specimens have been spared, and are carefully protected by the miners.

North of the Tararu Creek, the hills next the sea are of lower elevation and more rounded in outline, their slopes being chiefly covered with a varying growth of Pteris esculenta, Forst.; Leptospermum scoparium, Forst.; Pomaderris phylicifolia, Lodd.; Dracophyllum squarrosum, Hook. f.; Coriaria ruscifolia, L.; Epacris pauciflora, A. Rich.; and a few straggling grasses, varied by occasional patches of forest. The tributary streams are choked with a close growth of Typha, Schœnus, Cladium, Carex, and other marsh-loving plants. But a few miles inland these ericetal and uliginal plants disappear, the streams become narrowed and impetuous, the hills steeper and higher, clothed everywhere with a dense bush, often nearly impassable from the abundance of Mange-Mange, which binds trees and undergrowth together in an almost impenetrable mass. The highest peaks of Mount Wynyard, 2690 feet, are approached by connecting wall-like ridges, often not sufficiently wide to admit of two persons walking abreast, and covered with tussocks of Astelia, Gahnia, and various shrubs.*

About the height of 1800 feet a change is usually observable in the character of the vegetation; in broken rocky places there is a profusion of Mosses and Lichens, chiefly belonging to genera Racomitrium, Dicranum, and Cladonia, with a varying shrubby growth of Weinmannia, Leptospermum, Pittosporum, Coprosma, Phebalium, Quintinia, and many Ferns. On more even ground Weinmannia silvicola, Banks and Sol., and Metrosideros lucida, attain a large size, associated with Ixerba brexioides, A. Cunn., and Phyllocladus glauca, both of which attain their maximum of growth at about 2000 feet, although found in abundance at a greater elevation; in fact they occur on the highest peaks, together with Dracophyllum Traversii, Hook. f.; Archeria racemosa, Hook. f.; Griselinia littoralis, Raoul.; Dacrydium Colensoi, Hook. f.; Panax Colensoi, Hook. f.; and many others of greater vertical range. Although from the steep character and ridge-like form of these ranges, water cannot, in some places, be obtained at an altitude of more than 1200 feet, yet the abundance and luxuriance of the Mosses and Hepaticæ, which clothe the summits, attest an atmosphere continually charged with moisture.

The trees and shrubs that have been utilised either as timber for house or ship-building, or for fencing, are the Kauri, Rimu, Totara, Miro, Beech or Black Birch, Manuka, Rawiri, Puriri, Pohutukawa, Rata (Metrosideros robusta, A. Cunn.), Tawa, and, more rarely, the Tanekaha, Tawari (Ixerba brexioides, A. Cunn.), and Toro. The utilisation of the Beech affords a marked extension of the economical range of the genus to which it belongs, as, although largely used in the South, its timber is usually neglected in this part of the colony, although its bark is occasionally sent to the tanyards. It is now being largely used in the construction of the Moanataiari tramway, which will afford a good opportunity of testing its durability.

While on this subject, I may remark, the waste of timber on some parts of the field has been excessive, and will be severely felt by the miners at no distant period. The Kauri has been preserved to a great extent, as the sum of 25*s.* is required for each tree cut down. The Pohutukawa, which, from its value to the ship-builder, has contributed largely to the progress of this part of the colony, is without the benefit of protection, and has been in some cases recklessly cut down for firewood, a proceeding which is said to have been commented upon by the Maoris. Although confessedly difficult, it would seen not impracticable to prevent this wanton destruction of valuable timber by legislative enactment; it is certainly desirable, in the interest of the miners themselves, no less than in that of the colony at large.

Naturalised plants are to be found in great abundance in all situations, except on the highest ranges. The most common forms are identical with those found to the north of the Waitemata, and occur in nearly the same proportion, as will be seen from the following list, which is arranged in the order of their relative abundance over the entire district:—Erigeron canadensis, L.; Hypochæris radicata, L.; Anagallis arvensis, L.; Medicago denticulata, Willd.; Lolium perenne, L.; Euphorbia Peplus, L.; Rumex obtusifolius, L.; Plantago major, L.; Helminthia echioides, Gaert.; Briza minor, L.

The most notable exception in the above list is the Milk-weed (Euphorbia Peplus, L.), which in many northern districts would rank second or third on the list, instead of sixth; the position of one or two species in the list might possibly be altered by an examination of the district in December, instead of April. The former extent of native cultivations is attested by the common occurrence of the Tara (Colocasia esculenta, Schott), and several of the cultivated fruits of Europe, the Peach, Cherry, Fig, Vine, Raspberry, Strawberry, all of which are propagating themselves without the assistance of man, and are probably deteriorating in quality even more rapidly than they are increasing in number. A close analysis of the indigenous species found in the district, shows that fully four-fifths of the entire number are common to both the North and South Islands, the remaining fifth being peculiar to the North. *Transactions of New Zealand Institute.*

* One of these ridges is completely blocked by an immense Rata, Metrosideros robusta, A. Cunn., the trunk of which overhangs both edges of the mural precipice, and can only be passed by the aid of the friendly climbers, and the tussocks of Astelia which partially cover its base.

THE TUBEROSE AS GROWN IN AMERICA.

I OBSERVE, by an article in the "Florist" for January last, and also from inquiries and remarks on culture in other gardening periodicals, that the Tuberose is beginning to attract attention in England; and I have been led to conclude that in a few years' time it will probably be grown in about one garden in 100, if those who have grown it, and those who have not, favour us with a series of articles on the way to do it. Had it been the case of a seedling Variegated Zonal Pelargonium, to be sent out for the first time at a guinea or upwards per plant, warranted small, the florist would have gone mad to obtain it; but as it is only one of the sweetest, purest of white flowers grown—obtainable, too, in flower all the year, and only costing 5 cents, comparatively few persons in England think it worth troubling themselves about.

I never heard of any great success attending the efforts of the few growers of the Tuberose in England. This may, in a great measure, be owing to the miserable roots usually offered for sale; but I have no doubt that if there was a demand for good roots, the supply would be forthcoming, if not from Europe, at least from this country. Peter Henderson states that there are a million of roots grown in the New York neighbourhood, and as that is about the northern limit of successful cultivation, except for the flowers, we can imagine that there is also a large quantity grown further south.

As regards the flowers, they are used at all seasons for making up wedding bouquets and funeral wreaths, as well as for decorating churches and perfuming restaurants. They may be obtained from a single flower in a scented Geranium leaf or a sprig of Lycopod for the button-hole, to a dish, 2 feet in diameter, filled with the blossoms set in sand, and can be purchased from the flower-girls in Broadway, New York, all the year round. No one expects to grow the roots as a trade speculation in England, the summers are not hot enough; but it would be easy to have abundance of Tuberose flowers, say from September 1 to Christmas, in gardens of any pretension. What would give to most ladies more pleasure in the way of flowers, than an abundant supply of Tuberose blossoms during the shooting season, when, as a rule, if flowers are abundant, there is little variety? Mr. Gibson, of Battersea Park, has shown the public how to grow stove plants successfully in the open ground. The same preparation of ground, to husband heat, would also grow Tuberoses, and a light rich south border would suit admirably, though they should not be planted close to the wall, on account of the troublesome red spider.

The details of treatment are as follows:—Pot the bulbs early in May, in 4-inch pots, in rich soil; bury but a small part of the base, not so much to avoid the danger of rotting as to prevent having all the roots at the bottom of the pot; place them in a warm house, give but little water until they are well rooted, and then abundance; harden off, and plant out when the ground has become thoroughly warmed, placing the top of the bulb at least 3 inches below the surface. Nothing more is required but keeping the border thinned and clean. If they are good roots, and the position is sheltered, the flower-stems should not want tying. They should commence to flower early in September. When the nights get cold, take up and pot all those from which the flowers have not been cut. If taken up with care, potted in 9-inch or 10-inch pots, without breaking their roots or earth-balls, and duly watered and shaded, they should open every flower. Those which do not then show flower-stems will come up after, so as to keep up a succession of flowers until Christmas, and probably later, if they are kept in a temperature of from 60° to 70°. A bottom-heat, some 5° to 10° higher than this, is of service. One caution—they take lots of water, and if the roots get dry, the buds shrivel up without opening. A better and less troublesome plan even than potting, is to plant them in a stove or Melon bed, in rich soil, and treat them, as to heat, &c., like winter Cucumbers.

I saw during the last winter a house, 300 feet long, filled with Tuberoses planted out. We have had 47 flowers on a stem, and one of our customers informed me that he had as many as 69 on one. It would not interest your readers to hear how we grow them by tens of thousands for the trade, but if they should cross the Atlantic they might see for themselves. I may add that the bulbs, when dry, should be kept warm—the temperature not less than 50°—or the flower germs decay. A place where Caladiums keep well is first-rate for Tuberose bulbs. *James Taplin, South Amboy, New Jersey, U.S.A., in "Florist and Pomologist."*

BRITISH ASSOCIATION.

WE resume, from p. 1346, our extracts from Prof. Rolleston's address to Section D:—

The antiquary is a little prone, if he will allow me to say so, when left alone, to make himself but a connoisseur; the historian, whilst striving to avoid the Scylla of judicial dulness, slides into the Charybdis of political partizanship; and the biologist not rarely shows himself a little cold to matters of moral and social interest, whilst absorbed in the enthusiasm of speciality. The combination of minds varying in bent is found efficacious in correcting these aberrations, and by this combination we obtain that white and dry light which is so comforting to the eye of the truth-loving student, to say nothing as to its being so much stronger than the coloured rays which the work of one isolated student has sometimes cast upon it from the work of another. It would be invidious to speculate, and I have forborne from suggesting whether the literary contingent in the conquering though composite army has learnt more from observation of the methods and evolutions of the scientific contingent, or the scientific man from the observation of the literary; it is, however, neither invidious nor superfluous to congratulate the general public upon the necessity which these, like other allies, have been reduced to, of adopting one common code of signals, and discarding the exclusive use of their several and distinctive technicalities. Subjects of an universal interest have thus come to be treated, and that by persons now amongst us, in a language universally understanded of the people. I have been careful to include the palæontologist amongst the scientific specialists, whose peculiar researches have cast a helpful and indeed an indispensable light upon the history of the fates and fortunes of our species. But it is not organic science only which anthropology impresses into its service, and it would be the sheerest ingratitude to forget the help which the mineralogist gives us in assigning the source whence the jade celt has come, or could come, or to omit an acknowledgment of the toil of the analytical chemist, who has given the percentage of the tin in the bronze celt, or in the so-called "leaden" and therefore Roman coffin....

I must not trespass into the province of the botanist, but I should be glad to say that no easier method of learning how the natural history sciences can be made to bear upon the history of man, as a whole, can be devised than that furnished by the perusal of such memoirs as those of Unger's upon the plants used for food by man. The very heading and title of the paper I am specially referring to appears to me to have an ambiguity about it which, in itself, is not a little instructive. In that title, "Botanische Streifzige auf dem Gebiete der Cultur-Geschichte," the latter word may be taken, I imagine, etymologically at least, to refer either to culture proper or to agriculture. At any rate, the paper itself may be read in the Sitzungsberichte of the Vienna Academy for 1857; it has, I suppose, superseded the interesting chapters in Link's "Urwelt und Alterthum," of date 1821; and it is not unlikely, I apprehend, to be itself, in its turn, superseded also.

Coming, in the third place, to zoology, I suppose I shall be justified in saying that the largest issue which has been raised in the current year, an issue for the examination of the data for deciding which the two months of July and August which are just past may have furnished persons now present with opportunities, is the question of the kinship of the Ascidians to the Vertebrata. There is or was nothing better established till the appearance of Kowalewsky's paper, now about four years ago, than the existence of a wide gulph between the two great divisions of the animal kingdom, the Vertebrata and the Invertebrata; nothing could be more revolutionary than the views which would obviously rise out of his facts, and within the present year these facts have been abundantly confirmed by Prof. Kupfer, whose very clearly written and beautifully illustrated paper has just appeared in the current number of Schultze's "Archiv fur Microscopische Anatomie." Kupfer's researches have been carried on upon Ascidia canina, but they more than confirm the accuracy of what Kowalewsky had stated to take place in Ascidia mammilatta, and which may be summed up briefly thus: In the larval Ascidian we have in its caudal appendages an axis skeleton clearly analogous, if not essentially homologous, to the chorda dorsalis of the vertebrate embryo, as consisting like it of rows of internally-placed cells, and giving insertion by its sheath to muscles. We have further the nervous system and the digestive taking up in such embryos much the

same positions relatively to each other, and to this molluscan chorda dorsalis, that are taken up by the confessedly homologous system in the Vertebrata; we have the nervous system originating in the same fashion, and closing up like the vertebrate myelen cephalon out of the early form of a lamellar furrow into that of a closed tube; we have finally the respiratory and digestive inlets holding the vertebrate relationship of continuity with, instead of the invertebrate of dislocation and separation from, each other. Such are the facts; but I am not convinced that they will bear the interpretation that has been put upon them; though I must say the possession of this chorda dorsalis by the active locomotor larva of the Ascidian which one day settles down into such immobility, lends not a little probability to Mr. Herbert Spencer's view of the genesis of the segmented vertebral column in animals undoubtedly vertebrate. But on this view I should not be inconsistent with myself, inasmuch as, to waive other considerations, the chorda dorsalis in each case would be considered as an adaptive or teleological modification, not a sign of morphological kinship. Much perplexity may or must arise here, and whilst entertaining these views, I felt myself bound to examine myself strictly to find whether in not taking them up, I might not be giving way to that reactionary reluctance to accept new ideas which advancing years so frequently bring with them; but a recent paper, by Lacaze Duthiers, published in the "Comptes Rendus" for May 30, 1870, and translated in the "Annals and Magazine of Natural History" for July, 1870, would justify me, I think, in calling that reluctance by another name. For in that paper the renowned malacologist just mentioned has brought to light the fact that there is another sessile and solitary Ascidian, the Molgula tubulosa, which goes through no such tadpole-like stage, as had been supposed to be gone through by all Ascidians except the Salpæ, which is never active, and never puts out the activity which is so remarkable in the other Ascidians, but settles down and remains sedentary immediately after it is set free from the egg capsule, neither enjoying a Wanderjahr nor possessing a chorda dorsalis. We are not surprised after this that M. Lacaze Duthiers observes that, "although embryology may and must furnish valuable information by itself, it may also, in some cases, lead us into the gravest errors." Mr. Hancock, of Newcastle-upon-Tyne, has sent us a paper upon this subject, which will be ready duly, and duly noted by us.

The subject of the geographical distribution of the various forms of vegetable and animal life over the surface of the globe, and in the various air, earth, water, fresh and salt, whether deep or shallow, has always been, and will always remain, one of the most interesting subsections of biology. It was the contemplation of a simple case of geographical distribution in the Galapagos Archipelago which brought the author of the "Origin of Species" face to face with the problem which the title of his work embodies; and it is impossible that sets of analogous and of more complicated facts,—many of which, be it recollected, such as the combination now being effected between our own fauna and flora and those of Australia and New Zealand, are patent to the observations of the least observing,—should not, since the appearance of that book, force the serious consideration of the explanation it offers upon the thoughts of all who think at all. The wonders of the deep sea dredge I apprehend, form one, the commensalism of Professor Van Beneden another, subject of discussion, and furnish an opportunity for receiving instruction to all of us. The one set of observations is a striking exemplification of the way in which organisms have become suited to inorganic environments, the other is an all but equally striking exemplification of the way in which organisms can fit and adapt themselves to each other. The current journals have,* as was their duty, made us acquainted with what has been done in both of these directions, and I am happy to say that in the case of the deep sea explorations as in that of parthenogenesis and spontaneous generation, a new work, giving a connected and general view of the entire subject, is announced for publication.

One instance of the large proportions of the questions which the facts of geographical distribution bear upon, is furnished to us in the address recently delivered before the Geological Society by its president, who is also our president, and who may have forgotten to refer to his own work (see "Nature," No. 24, 1870). Another may be found in the demonstration which Dr. Günther, contrary to our ordinarily taught doctrines, has given us ("Zool. Soc. Trans." vol. vi., part 7, 1868, p. 307) of the partial identity of the fish-faunas of the Atlantic and Pacific coasts of Central America; a third is furnished to us by Mr. Wallace's works, *passim*.

It would be superfluous, after introducing even thus hurriedly to your notice so large a series of interesting and important subjects as being subjects with which we shall forthwith begin to deal in this section, to say anything at length as to the advantages to be expected reasonably from the study of biology. I may put its claims before you in a rough way by saying that I should be rejoiced indeed if when money comes to be granted by the Association for the following up the various lines of biological research upon which certain of its members are engaged, we could hope to obtain a one-hundredth, or I might say a thousandth part of the amount of money which has in the past year been lost to the State and to individuals through ignorance or disregard of biological laws now well established. I need say nothing of the suffering or death which anti-sanitary conditions entail, as surely as, though less palpably and rapidly than, a fire or a battle; and I might, if there were time for it, take my stand simply upon what is measurable by money. This I will not do, as it is less pleasant to speak of what has been lost than of that which has been or may be gained. . .

I pass on now to say a word on the working of natural science studies upon the faculty of attention, the faculty which has very often and very truly been spoken of as forming the connecting link between the intellectual and the moral elements of our immaterial nature. I am able to illustrate their beneficial working in producing carefulness and in enforcing perseverance, by a strong turning upon the use of, or rather upon the need for, a word. Von Baer, now the Nestor of biologists, after a long argumentation ("Mem. Acad. Imp. Sc.," St. Petersburg, 1859, p. 340) of the value which characterises his argumentations as to the affinities of certain Oceanic races, proceeds to consider how it is that certain of his predecessors in that sphere, or rather, in that hemisphere, as Mr. Wallace has taught us Oceania is very nearly, had so lamentably failed in attaining or coming anywhere near to the truth. This failure is ascribed to something which he calls "Ungenirtheit," a word which you will not find in a German dictionary, the thing itself not being, Von Baer says, German either. I am happy not to be able to find an exact equivalent for this word in any single English vocable, the opposite quality shows itself in facing conscientiously "the drudgery of details, without which drudgery," Dr. Temple tells us ("Nine Schools Commission Report," vol. ii., p. 311), "nothing worth doing was ever yet done." Mr. Mill, I would add, speaks to the same effect, and even more appositely, as far as our purpose and our vocations are concerned, in his wise Inaugural Address at St. Andrews, p. 50. For the utter incompatibility of an ἀταλαίπωρος ξήτησις,—those two words give a Thucydidean rendering of "Ungenirtheit,"—with the successful investigation of natural problems, I would refer any man of thought, even though he be not a biologist, to a consideration of the way in which problems, as simple at first sight as the question of the feeding or non-feeding of the salmon in fresh water (see Dr. McIntosh, "Linn. Soc. Proc." vii., p. 148), or that of the agencies whereby certain molluscs and annelids bore their way into wood, clay, or rocks, must be investigated. It is easy to gather from such a consideration how severe are the requirements made by natural science investigations upon the liveliness and continuousness of our faculty of attention.

I shall speak of but one of the many purely moral benefits which may be reasonably regarded either as the fruit of a devotion to, or as a preliminary to, success in natural science. Of this I will speak in the words of Helmholtz, taking those words from a report of them as spoken at the meeting of the German Association for the Advancement of Science, which was held last year at Innsbruck. There Professor Helmholtz, in speaking of those distinctive characteristics of German scientific men, and of their truthfulness in particular, is reported to have used words to the effect that the characteristics in question are in reality to be ascribed to the severe simplicity of manners and to the absence of a spirit of self-seeking, which form the guiding and inspiring principles of their men of science, and prevent them from giving themselves up to the pursuit of mere worldly advantages, and from paying undue homage to the prejudices of society. I think *Sittenstrenge* may be considered as more or less adequately rendered by the words severe simplicity of manners; at any rate, as things are known by their opposites, let me say that it is the exact contradictory of that "profound idleness and luxuriousness" which, we are told by an excellent authority (the Rev. Mark Pattison, "Suggestions on Academic Organisation," p. 241),—for whose accuracy I would vouch in this matter were there any need so to do,—"have corrupted the nature" of a large class of young men amongst ourselves, whilst the absence of a spirit of self-seeking is, in turn, the contradictory of a certain character which Mr. Mill (*l. c.* p. 90), has said to be one of the commonest amongst us adults, and to which Mr. Matthew Arnold has assigned the very convenient epithet of "Philistine." Investigation as to whether these undesirable tendencies are really becoming more rife amongst us, might be carried on with advantage in a place such as this, in the way of inquiries addressed to colonists returning home after a successful sojourn abroad. Such persons are able to note differences without prejudice, and, *ex hypothesi*, with unjaundiced eyes, which we are apt to overlook, as they may have grown up gradually and slowly. But, perhaps, researches of this kind are not quite precisely the particular kind of investigation with which we should busy ourselves; neither would the leaders of fashion, the persons with whom all the responsibility for this illimitable mischief rests, be very likely to listen to any statistics of ours, their ears being filled with very different sounds from any that, as I hope, will ever come from Section D. Whether men of science in England are more or less amenable to blame in this matter than the rest of their countrymen, it does not become us to say; but it does become and concern us to recollect that we have particular and special reasons, and those not far to seek, nor dependent on authority alone, for believing and acting upon the belief that real success in our course of life is incompatible with a spirit of self-seeking and with habits of even refined self-indulgence.

Mr. J. W. Cooper read a paper on "The Use of Solutions of Soluble Chlorides for Laying Dust in Thoroughfares."

He stated that in Liverpool, in 1869, Bold Street, Church Street, and Lord Street were watered with salts during the month of July; the report of the results was very favourable, and the experiments had been continued this year. It is difficult to prove the economy resulting from the use of chloride over a limited area; and the Westminster Board of Works, after observing the effect produced at Whitehall and Knightsbridge, resolved to extend the experiment throughout their entire district, comprising an area of 250,000 square yards. As soon as the area was extended, the economy in labour and water was at once made evident. An effective method of remedying the evils arising from organic matter deposited on public thoroughfares is becoming daily a serious matter for consideration with sanitary authorities, as much sickness is believed to arise from the malaria emanating from this source. The deliquescent chloride of aluminum, recently introduced to public notice by Professor Gamgee, seems to meet all the requirements needed in the antiseptic of the future. It is non-poisonous and free from any odour; it prevents decomposition, and arrests it when commenced. It absorbs obnoxious gases resulting from putrefaction, and destroys parasites and germs. It is also not to be surpassed as a precipitant and deodoriser of sewage, and is only one-third the cost of carbolic acid. Mr. Cooper proposes to use this chloride for street watering, and thereby afford a means of thoroughly and effectually purifying public thoroughfares without additional cost to the ratepayers, the value of the water and labour saved being more than sufficent to pay for the necessary quantity of the chlorides.

Home Correspondence.

Late Plums.—Your notice of Sandall's Plum has brought to my mind its lack of history, and that of its congener the Late Black Orleans; the latter is mentioned in the Horticultural Society's Catalogue of Fruits for 1831, but no description is given of it, neither do I remember the origin of either that or Sandall's Plum being given. The Late Black Orleans, now ripe, is much like Sandall's in shape, colour, and size; it is, however, I think, superior in flavour. This may be described as a garden Plum, as it bears well when quite young on pyramids, and submits to summer pruning very well. Sandall's is an orchard Plum, and forms itself into large vigorous trees, not submitting to garden culture like the Late Black Orleans; they are both culinary Plums, and I apprehend were raised from seed in the Fulham fruit gardens. Sandall's is a shy bearer till the trees are aged. I saw in 1868 large trees of this sort in Mr. Varden's fruit garden near Pershore, with five or six Plums on trees capable by their size and vigour of bearing as many bushels. For late dessert Plums we have none to compare with Coe's Golden Drop, particularly from this season, and ripening after this we have the Blue Impératrice and the Ickworth Impératrice, both requiring a wall, and both excellent, supplying the table through the month of October. A rather new dessert Plum, quite hardy, and in season during October, is Bonnet d'Evêque, an oval, medium-sized purple Plum, with a dense bloom; this is quite hardy, and bears freely on young pyramids. The Mirabelle Tardive is also a nice yellowish Plum, which bears abundantly, and is in season all this month. We may safely add to late culinary Plums the Wyedale Plum, which is oval, purple, and larger than our largest Damsons. This sort I received from Yorkshire; it is most hardy and prolific, trees only 18 inches high and two years old being loaded with fruit, which would be in use during the whole of this month. Coe's Late Red is also a very late culinary Plum, good even in November, and from trees on a south wall it is not at all inferior for the dessert. Tardive de Chalons, the latest of all the Plums, is round, below medium size, and of a pale red. This is a November Plum, but is, like our Bullace, harsh and rough in flavour. In the above notice of late Plums, I find that I have forgotten the sorts which here are in use from the middle to the end of September, not very late, but very good. One of these is Reine Claude de Bavay, a very hardy, free-bearing late Green Gage. It is some 20 years since that, when on a visit to the late M. De Bavay, of Vilvorde, near Brussels, I found this grand Plum. I at once ordered 100 trees, which have now formed fine pyramids, and generally bear well. Last year the crop was most abundant, and the fruit fine. They made in Covent Garden 20*s.* per bushel; this year the frost of May 3 nearly destroyed the crop, or it is just possible that the trees were fatigued with the large quantity of fruit they bore in 1869, and were not able to resist the frost. It is very large, covered with a whitish bloom, and when ripe is equal to the old Green Gage in flavour. Young pyramidal trees, only 3 feet high, growing in a dry, exposed part of our nurseries, exposed to all the "winds of heaven," bore a most abundant crop this season. The other kind referred to is the Belle de Septembre, a culinary Plum of great excellence. Its colour is bright red, and its fruit so large that on the trees they look like Sops-in-Wine Apples. It has a most agreeable acidity, and preserves well. The habit of the tree is so compact, that pyramids under summer pinching may be grown for many years 3 and 4 feet apart, quite Cypress-like in character. *Thos. Rivers.*

Seaside Planting.—I am informed that Pinus austriaca is a good subject for planting near the coast, for the purpose of affording shelter. Can any of your readers give any confirmation of this statement from their own experience, or recommend anything better? I should also be glad to learn what ornamental trees there are suitable for decorative planting in such localities. *D.*

Is Bougainvillea glabra a Greenhouse Plant?—Since reading Mr. Burton's remarks at p. 1347, I have looked through no less than 16 plant catalogues and, with the exception of one, all (including Mr. Williams') describe it as a stove climber. I have always grown it as such, and I believe Mr. Burton has done the same, at least I have seen it so treated at the Paradise Nurseries, and in other plant-growing establishments. I do not dispute that it cannot be well grown in a conservatory, for as a rule such places are kept during the winter months much warmer than a greenhouse, but because the plant may succeed very well in

* See "Nature," No. 39, for July 28, 1870, and "Royal Society's Proceedings," August, 1870, for Deep Sea Explorations, and "Academy," September 10, 1870, for Commensalism.

a lower temperature than an ordinary stove I cannot recognise it as a greenhouse plant, and I believe many who have tried it as such have had to mourn over the loss of their plants. We do at times meet with plants and other things doing remarkably well in seemingly very unsuitable places and temperatures—for instance, I once had a large Stephanotis out-of-doors from the end of July until the middle of November, and it withstood some very severe frosts. The plant in question was infested with the mealy-bug, and I cared but little whether it lived or died. The plant was eventually removed into the back of the Azalea-house, and there remained all the winter. The foliage all dropped off, but this was the only injury it received, for in the spring it began to break very strongly. I then removed it into the stove, and it flowered with remarkable freedom. Now although this plant lived and grew in a greenhouse, and would no doubt have flowered well there, I could not recognise it as a greenhouse plant, for quite possibly it would not have survived a second winter in a greenhouse temperature. At times we meet with almost hardy plants, growing in a stove temperature and doing well, but they are not to be recognised as stove plants because we perchance meet with them growing in a high temperature, for without a doubt, if subjected to the same kind of treatment for any length of time, death would be the result. I feel convinced that Bougainvillea glabra can be more successfully grown in a stove than a greenhouse, although it may succeed well in a warm conservatory, yet it cannot be, strictly speaking, a greenhouse plant. I once heard a gardener declare that the Rondeletia was a greenhouse plant, and that he had grown it as such, but I fear many of us would not succeed very well with its culture in such a place. *Edward Bennett, Enville Hall Gardens, Stourbridge.*

—— Your correspondent, Mr. Burton, must have been ruminating in the neighbourhood of Tyntesfield for a new idea, when he concluded the Bougainvillea glabra to be a greenhouse plant, merely because he saw it flowering in a greenhouse a few weeks ago under such solar light and heat as is analogous to its own country, and such as is seldom experienced in this northern clime. What we have seen in the way of acclimatisation this season is no guarantee whatever of the permanent habit of many plants. The country from whence the above plant was introduced certainly entitles it to rank in the stove division, whether in nurserymen's lists or in the cultivator's care. The excessively dry, arid temperature of the past season has been favourable to many strictly tropical forms displaying in the open air their foliaceous beauty and floriferous splendours to an extent that we cannot reasonably expect to see again for years; and your correspondent must not confound the habitat of a plant upon the strength of seeing it under such favourable climatic influences as pervaded Tyntesfield at the time he soliloquised upon the transmutative powers of plants. *Robert Fortune, The Nurseries, Isleworth.*

How to Destroy Ants.—Most of us at times have been prepared to give a certain answer to these queries. In all places where the remedy can be safely used boiling water is an effective cure for the pest of ants. But among roots of plants they seem at times to set all our so-called specifics at defiance. At one time and in several places I found guano-paste a sure means of making their quarters intolerable to them; but that has failed. Strong soapsuds have done the same. I have not tried "S. M. O.'s" prescription of soap-paste. Water, clean and foul, persistently applied until the home of the ants is converted into a quagmire, combined with a few toads to eat up the ants, I have found the best remedies for this most provoking pest. As to the ants eating green-fly, I don't believe it. Or if they do, they produce a dozen for every one they eat. I have carefully observed them; they carry the flies to new quarters, and seem to assist them in the doing of greater mischief. One thing I have invariably noticed,—the more ants the more fly. And I never knew of any case of fly cured by the ministry of ants. Their presence among plants is evil and only evil, and that continually. And the best remedy is to destroy the first drove seen, and the second, and never allow a colony to be established. *Lynn Lyc.*

—— Last spring the ants were very numerous in a house where Vines are planted inside, without any external border. I squeezed a large Lemon in a jug with a pint of water, and left the peel in it for two days. I then poured a little of the lemonade on the ants' run two or three times, and they disappeared. In August a larger nest of ants formed under a paving stone laid on the Vine border. I lifted the stone, dusted them well with ground tobacco, put down the tone, and the next day poured lemonade on the few remaining, and I have not seen them since. Syringing with strong Gishurst Compound water will kill those it wets. Butter and preserves are kept free from ants at Sierra Leone by putting the vessel containing them in another vessel with water in it, with a few drops of lime-juice squeezed into the water; and I have seen ants try to cross the lemonade and die in the attempt. Water without lemon-juice will not save edibles from their attacks. *Henry Rogers, Hartley, Plymouth.*

Passiflora quadrangularis as a Conservatory Climber.—Will Mr. Blandford kindly state the average winter temperature and the lowest temperature observed in his conservatory, in which this plant thrives and flowers? The term conservatory admits of a wide range of temperature; many such houses average 45° or 50°, while others sink as low as 35° or 40°. Does your correspondent think this Passion-flower would endure the latter degree of cold? As to the former, I have no doubt about it, though it is mostly treated, and flowers and fruits splendidly, too, as a stove plant. In a cool stove, at 55° to 60° in winter and 65° to 90° in summer, I have cut hundreds of blossoms for dinner-table decoration, &c. It is a noble plant, and if it will live and blossom in an ordinary conservatory it will be a rich addition, alike of beauty and perfume, to that department. It would be well also to state if the conservatory is span-roofed, and if formed of wood or iron, where the air is admitted, and the aspect of the house. All such points are needful, to ascertain whether the plant is likely to do well in the general run of conservatories, or whether there is anything exceptional in the form, management, or temperature of the house in this particular case. *Enquirer.*

The Plague of Black Flies appears, indeed, to have been almost universal during the prevalence of the dry weather and east winds we have lately experienced. Your correspondent, the Rev. Mr. Radclyffe (who has enlightened us through your columns upon so many interesting subjects), asks a question which I am enabled to answer positively. There were some questions connected with this subject I could by no means satisfactorily clear up, and with a hope of throwing some light upon it I examined those flies closely upon their arrival. They had not been long upon the leaves before they were surrounded with a number of green lice (as described by Mr. Radclyffe): upon watching carefully it was evident that these lice were produced (and as I thought alive) by the black flies—a further examination with a strong glass confirmed this supposition unmistakably; not only did the young travel about as soon as deposited, but were alive and kicking during the process of parturition, which occupied some minutes. To confirm this fact still further, I held some of the black flies between the finger and thumb of the left hand, and squeezed them gently whilst watching with the glass held in the right hand. The result was, first the green aphis quite alive; secondly, ditto in an imperfect state; and thirdly, a lump of green matter in the embryo state. I do not think each fly brought forth above a dozen young ones, but of this I will not speak positively. After they had, however, completed their quantity, they appeared to shrivel up and die. Last spring I began to congratulate myself that we should be free from green-fly, which is generally a great pest with us, but was rather premature in my exultation; for when the blossoms began to expand many lacked a petal, or were wrinkled or otherwise defective. The trees were in such perfect health that I was at a loss to account for this, till I found in every case where it occurred (and they were very many) that the blossoms were full of very small green aphides, which (as soon as it expanded) crawled on to the leaves and curled them up as usual; but not, however, till they had first spoiled the blossoms, for in every instance those affected with green-fly dropped without setting. As further examination found these small lice in the interior of the blossom long before expansion, I was led to the supposition that they must by some means have been inserted as eggs in the autumn. This hypothesis not being forgotten caused an immediate attack to be made upon the black invaders with a syringe charged with quassia water and soft soap, which soon routed the enemy, and as fresh hordes poured down they were similarly attacked, with similar results. But there is a truck of Plum trees on which some fruit is still remaining, not fit, therefore, to be syringed just yet; this offers an opportunity for further observation. After the death of the parent black flies their green offspring appear to move slowly about the leaf for some days, to gather size and strength, after which they extend their travels to the stalk, and there deposit all round the buds what appear to be little sacks of eggs of an oval shape, some green, but most of them nearly black; indeed, I thought they got darker by exposure to the air. When brought under the glass, with the sun shining upon them, they look as if covered with minute crystals; they are laid at the bottom of the crack, between the bud and the branch. Though I tried a good many of the lice with the point of a needle, I only succeeded in pressing an egg-sack decidedly out of one of them, but they were so much smaller than the flies as to render the operation difficult. That one was dark though, not red, as mentioned by your correspondent. There were, however, red ones amongst them, but they did not seem to turn to that colour until exposed to the weather, to which (perhaps wrongly) I attribute the change. Query: are the blue aphides on the Plum identical with the green-fly on the Peach, only varying in appearance on account of the different food? I could discover no difference in the black fly which produced the lice upon the Plum and upon the Peach. The young, too, were green and similar at first, only afterwards assuming the powdered appearance peculiar to the Plum aphis. I ought to state that I did not discover any egg-bags on the Peaches, though the insects clustered round the buds in the same way, but it is possible the early syringing and subsequent very heavy rain interfered with them before they were ripe for reproduction. *John Fountaine, Southacre Rectory, Brandon.*

—— The plague of flies, described by Mr. Bennett, as seen about Stourbridge, is, I should suppose, equally troublesome here at Gordon Castle, and throughout Morayshire. For the last 10 days or more the temperature has ranged in the shade from 65° to 70°, which has proved favourable for the increase of these small insects. They are not uncommon here in dry autumns, although by no means to the same numerical extent as they are at present. They are commonly known in this quarter by the name of the harvest midge. The Peach seems a favourite tree for reproducing the species. In a few days after settling upon the leaves an increased number of brown aphides will be seen, especially along the main rib of the leaf, which very soon exhausts its strength in its ripening stage, and causes it to droop while it is yet quite green, much corresponding to the effects of Physalia Pyrea, which we have more or less every season upon some of the wall Pear trees. I think if Mr. Bennett will examine those leaves of his which have dropped prematurely off, he will find them in the same condition, and that he will agree with me in his verdict, that the weight of the flies on the leaf was not the only cause of premature falling. A number of years ago I sent a leaf to Dr. Lindley, on which were specimens of the fly and its young progeny, and got for a reply: "Aphis persica: easily destroyed by tobacco juice." Ever since I have been on the look-out for it in dry autumns, and as soon as any are observed on the Peach leaves they are syringed over with Gishurst Compound, at 2 oz. to the gallon, which helps to taint the leaves, and prevents these pests from having a resting place. Several of the trees, having fruit upon them this season when the fly was first seen, could not be so easily washed over, and have in consequence lost a large portion of their leaves; but all those which were taken in time have suffered but little. I deem it of the utmost importance to keep the leaves on until they drop by natural ripeneness, which will generally ensure a strong healthy blossom in spring. *J. Webster.*

Hot-water Pipes, in order to convey heat to the air of plant-houses in a satisfactory manner, must possess a large external radiating or conducting surface. Upon this sound principle Mr. Grix advocates plenty of piping. This is, of course, good advice if the present form of pipes is adhered to. A large surface may be obtained from narrow breadths by increasing the length in proportion. I would venture to suggest, notwithstanding the sanction given by long use to the present form of hot-water pipes, that as distributors of heat they are very faulty; and I therefore invite attention to the question, whether forms of piping presenting a far greater surface should not be adopted. My objection to the round pipe is, that it contains the largest possible quantity of fluid within the least possible amount of surface boundary, in other words, it contains the largest store of heat with the smallest means of distributing it. One inch in length of a pipe, the interior diameter of which is 4 inches, will hold about 12 cubic inches of water with about 12 square inches of heat distributing surface. Now a channel 1 inch deep must be 12 inches wide, in order that it may hold the same quantity of water, and if only half an inch deep it must be 24 inches wide. In the former case it would possess more than twice, and in the latter more than four times, the heat distributing surface of the round pipe. Mr. Ormson's ventilating hot-water pipe, being double, presents a very large heating surface, which must be a very great merit in a heat conductor. The space between an 8-inch exterior and 7-inch interior pipe would hold the same quantity of water as the 4-inch round pipe, but it would present a surface of 42 inches to the action of the air instead of 12 inches. A pipe with deep curved corrugations or flutings might prove very suitable as a heat distributor. Stout galvanised corrugated iron is cheap, easily procurable, light of carriage, and admirable for experiment. My objections to the common round pipe will appear more plainly from the following considerations. If I wanted to pass a quantity of hot fluid through a room to a more distant chamber by means of a pipe, and with the object of retaining the heat as much as possible through that intervening space, what sort of a pipe should I choose? Surely that which would convey the largest quantity of the hot fluid with the smallest heat dispersing surface. In other words I should choose a round pipe. On the contrary, if I desired to disperse the heat of the hot water as much as possible during its passage, I should avoid the round pipe as the least advantageous for the purpose. Let the reader also bear in mind that in conveying the heat of the fire to the water, the engineer exhausts ingenuity in contriving to interpose the most extended surfaces. Why, then, does he depart from this principle in his provision for conveying the heat of the water to the air of the house? The water should return to the boiler cold. The circulating channels, then, should be contrived as though they were intended to act as refrigerators of the water. I presume that in a short time pipes or channels on the more correct principle could be made as cheaply in proportion as the common forms, and thus that the more direct and simple means of distributing the heat would also become the more economical. There would

be far fewer cases of failure in heating plant-houses were the form of the piping so correct that a moderate length would be sufficient to disperse the heat. Where the seller advocates plenty of piping (as pipes are now made), his advice, though good, does not seem reasonable to a half-informed purchaser. He is disposed to economise in a point where economy means failure. This could not happen were the means of distributing the heat of the water as perfect as those for producing it. *G. M. Taylor, Seer Green Parsonage.*

Fruits of the Earth in Due Season.—I have at this time a crop of Grapes perfectly ripened on stakes in the open ground. The sort is the Claret Grape, and when ripe the juice is of a brilliant claret colour, the only sort I ever saw where the juice is coloured without the aid of the expressed skin or of some adventitious aid. The leaves of this variety are most brilliantly tinted, dying off of a rich orange-crimson and deep claret colour. This has been an extraordinary Fig year. I have fruited 14 sorts out of 16 on bushes in the open ground. I had two kinds that, place them where I might, would never produce fruit worth eating. One sort I rooted out years ago, the other, as it proved fruitless after all the bright and continuous sunshine we have had, must experience the same fate [Name]. Anent the fruiting of Figs I have proved in my experience that such trees as have very hard ground to grow in are more productive than the same sorts planted in looser earth. When the trees or bushes become stricken in years, their roots often penetrate so deeply that they are not affected by the severest frosts; but we must not be misled by that circumstance, as the trunks and branches will all perish if not protected from such weather, though the roots are unhurt. I see many of your correspondents notice the large crops of Apricots obtained from standards this summer, and even were the fruits not edible they would deserve a place in any garden for their beauty. I have had in my nursery this year two large trees—a Peach and a Nectarine—like good-sized Apple trees. The Peach was so overladen with fruit that they could not obtain their usual size, and we were compelled to prop up the branches with stakes. The flavour was no so piquant as when the crop is less abundant. The Peach ripened so perfectly that one might suck the juice and flesh through a quill; not so the Nectarine, for that was a clingstone, and it produced a smaller quantity of fruit, of large size and exquisite flavour. An American gentleman who saw them, said it reminded him of his orchard at home. *William Masters, Exotic Nursery, Canterbury.*

Grape Growing at Wortley Hall.—Accompanying this I send you a sample bunch, weighing a little over 2 lb., of a crop of Black Hamburghs here; also a sample of the soil, with roots in it, in which the Vines are growing. The vinery in question is ridge-roofed, and the training surface for the Vines is 26 feet by 9 feet. The number of bunches on that space was 95, of which between 70 and 80 are hanging now. I believe I estimate within bounds when I say the crop before we commenced cutting would weigh, in the aggregate, 150 lb. The Vines were planted 14 or 15 years ago, and I have had charge of them for six years. I am informed that no particular pains were taken in forming the original border, which was very narrow, and out of which the roots of the Vines have long since rambled, and are now growing in a deep, stiff loam, which becomes almost a clay 2 or 3 feet down, terminating at a depth of from 4 to 5 feet in a yellowish loose gritstone. The best part of the roots are under what was until last winter an asphalte walk, the crust of which was then removed without disturbing the soil, which was completely permeated with Vine roots, and as hard as a board. A drain was also cut at the same time round the border, to keep back the roots from the vegetable quarter beyond, and this is all the drainage the border has. We also put about a spade's depth of common garden soil and manure on the space that had been occupied by the walk, that we might crop the border its whole breadth with vegetables (as we had regularly done before) without disturbing the Vine roots. Further than this, and manuring annually for the crop of early Potatos, succeeded by French Beans or Cauliflowers, with which the border has always been planted, we have done nothing, preferring to let well alone. For the last six years, however, we have been careful to train no more wood and foliage than could be fully exposed to a good light. Formerly there were about ten Vines in the house, all of which we have been getting rid of but two, which have been gradually extended to occupy the place of the others. The house adjoining this is the same in every respect, but is started a month earlier, and generally bears a heavier crop of fruit. From this house came the three bunches which I exhibited in my collections of fruit at Oxford for the prize offered by the proprietors of the *Gardeners' Chronicle*, though the bunches were not quite ripe, and had not the colour which the crop afterwards attained. I am induced to pen these remarks in consequence of what has been written about Vine borders of late. I am certainly not one who despises proper precautions in forming a Vine border, but here are Vines growing under what would be considered the most unfavourable conditions as regards a border, and which have borne a crop every year for the last five years, which for weight and finish I have rarely seen equalled, and which promise all that can be desired for the future. *J. Simpson, Wortley Hall.* [A very good sample. EDS.]

The Pine Beetle.—A belt of Scotch Fir, which reaches for a considerable distance along the Sunningdale Nursery at Bagshot, shows at the present moment how severely the Pine beetle is attacking the trees. At the present time they look as if a severe frost had blighted the young growth of the summer and completely killed it. I captured one of the marauders, and found it to be a small shining-black insect, well adapted to pierce through to the centre of the young shoots, and when there it tunnels or bores along the centre towards the point, apparently consuming the pith as it advances. Mr. Noble stated that these destructive insects settle on the trees in shoals about once in every two or three years, and effectually destroy the young growth. He finds that it attacks all the true Pines, such as P. austriaca, P. sylvestris, the Weymouth Pine, &c., but not Picea, Abies, or Wellingtonia. It was noticeable that only certain spots on the band of trees were affected; in some places the trees bore a scorched appearance, in others they were scarcely touched. I placed one of the beetles, which I found devouring the pith of a young shoot, in a quill for security, but the ruling passion was not quenched, as in two days it had pushed its way through about half-an-inch at one end of it, thongh it did not succeed in escaping. *R. D.*

Wistaria sinensis bearing Seed.—When at Mr. Charles Noble's, Sunningdale Nursery, a few days ago, Mr. Noble called my attention to the pods of seed hanging on a Wistaria trained across one of the walks of the nursery. In appearance they much resembled the pods of a Scarlet Runner, except that they had a contracted appearance between the seeds. One pod contained three seeds, the other two, and they had sprung from the same raceme of flowers. The plant on which they were hanging was itself a seedling plant, and was the product of one of five seeds brought home by Mr. Robert Fortune on his return from his second journey to China. This plant had produced a pod of seed once before. Near it, and trained against the walls of a cottage hard by, was a plant of the white variety, which had bloomed very freely this season. This was one of the original imported plants, as brought home by Mr. Fortune, and it would appear that a dry season is conducive to the production of flowers. *R. D.*

Melon Growing at Heckfield.—I had intended, after the offer I made your correspondent, "T. C.," to have allowed his remarks (p. 1281) to pass unnoticed, but after reading his reply to Mr. Gilbert (p. 1314) I feel constrained to have another say, and again assert that for the last two seasons I have taken three crops of fruit from my Melons, all of which have been equal to my first crop; and this, the third season, I have already taken a fourth, and have at present 14 Melons hanging as a fifth, nor do I yet despair of having a sixth. Several brother gardeners have suggested to me the desirability of giving my mode of treatment, so here it is—simple in the extreme. They are grown in the best stiff loam we can procure, and allowed but little of it, viz., 14 inches depth and 18 inches width. A bottom-heat of 65° (hot-water tank) suits them well. The vines are allowed to reach the top of the trellis before being stopped, after which they at once throw out laterals and show fruit; then they receive a soaking of water, which will serve them a week or ten days, according to the weather. No water whatever, other than as vapour, is given them for at least a fortnight previous to ripening, but the syringe is used very freely all the growing season, which I find the best preventive for red-spider and thrips, for if these pests get the mastery it will be at the expense of flavour in the fruit. After the whole of the fruit is cut, the vines receive a slight pruning, regulating, &c., then a good watering, when they again soon show for fruit; and thus the process goes on, and will continue, if the plants are kept clean, to the very end of November. Thus much from my own experience. *W. Wildsmith, Heckfield.*

—— As Mr. Alex. Dean has again taken up this subject, on Mr. Wildsmith's behalf, allow me to impress upon him that an assertion is one thing and proof another. Now, as I cannot possibly see for myself these extraordinary plants (for such they must be), will he, also, on Mr. Wildsmith's behalf, answer the questions I proposed to that gentleman, in the *Gardeners' Chronicle* of September 24, p. 1281? *T. C.*

Early Rose Potatos.—On April 7, last, I planted 1 lb. of this Potato in land newly trenched—part of a green pasture field which had lain for 20 or 25 years—the soil being boulder clay, or, as it is commonly termed in this district, "cold till." The pick had to be used in breaking it up 6 inches beneath the surface—the only manure used was stable and cow dung, with lime. I cut the pound of Potatos into 20 sets, and planted them 15 inches apart in the row, and 3 feet from any other crop. I lifted them about 10 days ago, and found the produce to be 72 lb. good of Potatos, several weighing 1 lb. and upwards, all free from disease, and of good quality. I prepared the ground by digging the trench fully 12 inches deep, and stirring the subsoil 3 or 4 inches deep with the pick. I put in a good quantity of dung in the bottom, and turned the green turf on the subsoil in squares of 4 inches; then came 3 inches of soil—then another spreading of dung, with about 6 inches of till on the top. Before planting a good quantity of quicklime was spread on, mixing it thoroughly into the soil, and at the same time taking out the larger stones; after which I opened a row with the spade 4 inches deep, putting in a dusting of hot lime—I planted the sets and covered them level, drawing the earth round the stems as they grew into a good high ridge. The past was an extremely dry and hot season here, and most crops suffered from that cause, yet though the situation was high, with a north-east exposure, none of the crops on any of the ground similarly prepared seemed in the least to flag during the hottest time, although they got no water from the hand at any time; the reason being, I believe, that the roots found their way through the turf into the subsoil, as in digging down I found a network of fibre round the large stones. *S. M'Clellan, Gr. to J. Moffat, Esq., Castle Douglas, N.B.*

Fruit Gathering.—All fruit ought to be gathered dry. Fruit should not be sweated; therefore, no rubbing afterwards, to dry them, can be indulged in. All such rubbings are most injurious. The less fruit is handled after it is gathered, or in the gathering, the better. An even temperature in fruit-rooms is the best antidote to fruit sweating. Sweating by design and on purpose is one of the barbarities that has passed away. In answer to the question, should stone fruit be gathered at any particular time of the day? I should answer—yes; in the cool of the evening or morning. Is it injurious to gather it when warm with the sun? I think that this is the very worst condition in which to gather fruit. It seems softer, and, if so, would be easier bruised; and, as it ought never to be eaten warm, there is no good, and may be much harm, in gathering stone fruit warm. So important do I consider it to have stone fruit perfectly cool before it is eaten, that my practice is to keep Peaches, Plums, Apricots, and Nectarines, on a slate—marble would be still better—for a day or two in hot weather, before they are eaten. Grapes for the night's dessert should likewise be cut in the cool of the morning, and Melons a day or two before. Perfect coolness seems to bring out the peculiar aroma of fruit; if eaten warm, we seem to be eating a sort of stirabout of fruit juice and stale sunbeams. *Quercus.*

Foreign Correspondence.

CROPS IN SOUTH AUSTRALIA.—(*Concluded from p.* 1348.)—Since the introduction of *Chicory* into the colony it has become in some places so prolific as to be considered a nuisance, and of this we import yearly great quantities, as shown in our import returns, viz.:—Total for the last three quarters, 54,960 lb., say, at 23*s.* 4*d.* per cwt., £629 15*s.* The manufacture of Chicory is so simple and inexpensive, that we might easily produce sufficient not alone for our home consumption, but also that of the neighbouring colonies.

Osier.—Not alone because this very useful shrub keeps the embankments of rivers from falling in, but would give also a profit to the grower, having the advantage of giving employment to the basketmakers. I need only mention the great number of baskets and various other Osierwork yearly imported into this colony from Europe and America. As for favourable places for the cultivation of the Osier, I mention only the banks of the Onkaparinga, the Murray Flats, and Inman Valley, but many other localities undoubtedly would be found.

Opium.—South Australia, as far as climate and soil are concerned, offers no difficulty to the cultivation of the Poppy, as we see it thriving in any part of the colony, and probably we could produce a good sample of the drug. Mr. G. Francis exhibited, not long since, at the agricultural show, opium prepared by him, which was considered as fair a sample as could be derived from the first experiment. If we consider the enormous sum which is yearly expended in opium, and as the cultivation and manufacture can be undertaken by young people, this renders it highly desirable that an attempt should be made for the cultivation of the Poppy.

Perfumes.—An abler pen than mine has already drawn the attention of the public to this, I may say, one of the great industries. Mr. S. Davenport, in his able pamphlet on this subject, has spoken already of the great benefit to be derived from this source; and I have much pleasure in commending its perusal to you all. If we consider that British India and Europe consume about 150,000 gals. of handkerchief perfume yearly, and that the English revenue from eau de cologne alone is about £8000 a year, and that the total revenue from imported perfumes is estimated at about £40,000, and that one great perfume distillery at Cannes, in France, uses yearly about 140,000 lb. of Orange blossoms, 20,000 lb. of Acacia flowers (Acacia Farnesiana), 140,000 lb. of Rose flower leaves, 32,000 lb. of Jasmin blossoms, 20,000 lb. of Tuberoses, together with a great many other sweet herbs, we may judge of the immense quantity of material used for perfumes. Most of the flowers which provide the material for perfumes grow luxuriantly with us, namely, Mignonette, Verbena, Jasmin, Rose, Lavender, Acacia Farnesiana, Heliotrope, Rosemary, Pepper Mint, Violets, Wallflowers, Laurel, and Oranges, from which alone three different scents are produced. I may say these plants thrive probably in greater perfection here than in any part of the world. No doubt South Australia should be a

perfume-producing country. We see flourishing here some of the most valuable scent plants. We have the Wattle, Myall-wood, and other native plants, yielding valuable scents. But two things are needed to encourage the enterprise. First—freedom of the still, so as to license distilling in vessels of less than 25 gals. capacity; and, 2dly, the *bonâ fide* advertisement of a capitalist manufacturer, that he will buy any quantity of specified flowers, leaves, roots, or plants at a marketable price. Then some farmers might be tempted to plant a few acres of Lavender or Mint, another Geraniums or Rosemary, another Aniseed, whilst plantations in hedgerows or otherwise of Roses, Cassia, together with contribution of gardens, would lay the foundation for an export trade. Then it must be also noted that whatever the value which the plants yield in flower, fruit, leaves, and stems, it is increased threefold under manufacture, and this manufacture again consumes other local produce, called into existence by it, such as Olive and other oils, fats, alkalies, wheaten flour, colouring matter, pottery, and glassware, which combine to make the farmers and the manufacturers contribute largely to the maintenance of population and the wealth of the perfume countries. To advance this highly remunerative industry, as I have already mentioned, a modification in the law of licensing stills should be made to *bonâ fide* perfume distillers, as the present law restricts stills to a range of capacity between 25 and 50 gallons. Perfume stills for the finer perfumes are best at about 8 to 10 gailons. It is, therefore, hoped that our legislators would take this into their earnest consideration. To encourage the development of new industries every facility, with respect to distillation for perfumes, should be given, even at the sacrifice of a small amount of revenue. To show you the value of perfumes to the countries adapted for their production, the following Table, compiled from the publications of Piesse and Brande and the "Cornhill Magazine," October, 1864, may show why it is so:—

1 acre of Jasmin plants, 80,000, will produce 5000 lb. of flowers, value 1[illegible]	£[illegible]
1 acre of Rose trees, 1 [illegible] will produce [illegible] lb. of flowers, value of [illegible]	75
1 acre of Orange trees, 100, at 12 years old [illegible] 30 lb. of flowers, value 6*d.*	30
1 acre of Violets, [illegible] lb. of flowers, value [illegible]	100
1 acre of Cassia trees, 3 to 4 [illegible] 12 years, [illegible] lb. of flowers, value [illegible]	96
1 acre of Geranium plants, [illegible] 140, will [illegible] leaves, producing [illegible] of distilled attar per cent., at 5s. per oz.	200
1 acre of Lavender, 3,[illegible] giving flowers for distillation, value	30

Further, without knowing the produce per acre, I add the attar per cwt. which the following plants are said to yield:—Rosemary, per cwt., will yield 24 oz. of attar oil; Aniseed, 35 oz.; Caraways, from 3 lb. to 4 lb. 12 oz.; Fennel seed, 2 lb.; Patchouli, 28 oz.

Societies.

[We owe to the kindness of Mr. G. Worthington Smith the following reports on the exhibition of Fungi at Kensington and Hereford respectively. They are the more valuable as being from the pen of one so competent as a mycologist and mycophagist. Science and gastronomy alike owe a debt of gratitude to Mr. Smith.]

THE FUNGUS EXHIBITION AT SOUTH KENSINGTON (see p. 1349).—About two years ago there arose in London a staunch supporter of Donkeyophagy: this gentleman not only advised his friends to eat their donkeys, but he actually slew his own "quadruped," and ate it up. He declared in public that the flesh of the donkey was better than goose, and many proselytes gathered around the new prophet. Great things were expected of the donkeyophagists, and the donkeys of London trembled in their trucks. Suddenly, however, it was announced that the prophet had succumbed,—in fact, that he was dead, and had died suddenly—whether of a surfeit of donkey no one ever knew. Some said it served him right, for flying in the face of Nature; others that horse eating was bad enough, and that any one who could eat a donkey must needs ere long "give up." Since then, donkeyophagists have been in the descendant, and we may safely say that the science has never taken root in London.

It is altogether different with the Fungus eaters, who go on and prosper; year after year their numbers increase, they have an annual exhibition in the rooms of the Royal Horticultural Society, and they have an annual carnival at Hereford. Their ranks are recruited from all classes of society.

Such bad weather for the production of Fungi as that experienced for many weeks previous to the exhibition had not been known for years. The sun had continually shone with depressing brightness and warmth, the air had been free from delightful and exhilarating fogs, there had been no drenching rains, no slush, no mud, no nothing. Spores were down, and mycelium paralysed. The enemies of Fungus-eating prophesied a failure, they said "vegetable beefsteaks" would be as rare at South Kensington as bowine steaks at Strasburg, and it would be no good seeking for Hydnums. But the prophets were altogether off the scent; Fungi in the woods and fields were certainly scarce enough, but the various species shown at South Kensington were many and good. Fungologists scented the game afar off, for besides the exhibitors and the Rev. M. J. Berkeley, Mr. Currey, Mr. W. W. Saunders, and the Rev. G. H. Sawyer were early in the field,—old soldiers and young recruits were all there. The exhibition was advertised as one of Grapes and Fungi, or, as I read it, of Grape (shot) and Ball (Puff), and the latter had the day.

Most of the edible species were displayed at the show, a good number of the poisonous, and a few of considerable interest and rarity. Amongst the latter may be especially mentioned my groups of Agaricus porrigens, sent from the grounds of his Grace the Duke of Argyll at Inverary, and Agaricus circinatus; Polyporus intybaceus and P. frondosus, sent by Dr. Bull, of Hereford, the latter clearly different from each other, and P. giganteus, Agaricus corticatus, Lactarius controversus, recent additions to the British flora; and Polyporus Schweinitzii and Hydnum coralloides, plants of rare occurrence in Britain.

Animadversions on the "abominably slovenly way" in which the Fungi have been exhibited, have been made from time to time in these columns; but it must be borne in mind that Fungi and flowers are very different things. A Rose stuck in a pot, tied and pinned to shape, and "set off by Moss and other garniture," may be pleasing to some and understood by all, but a Fungus in the same predicament is worthless, and can be understood by none. Nearly every essential character of an Agaric resides in its under surface, the colour of the gills and their attachment to the stem being the principal things. Next to this is the stem itself, which, if hidden or absent, would often prevent the recognition of an Agaric. My specimens have not been exhibited "properly staged" because I was incapable of setting them up with pins and sticks, and stuffing Moss round them, and because I knew they would be utterly worthless to students in such a condition. Several of my specimens were shown cut down longitudinally, but this was not because my knife slipped clumsily in gathering the Agarics, but because I wished to show the specific characters of the plants. Towards the end of the exhibition I know my Fungi got a little broken, but this is owing (I am glad to say) to gentlemen, book in hand, comparing my specimens with the plates in Berkeley's "Outlines," Badham's "Esculent Fungi," or my own "Mushrooms and Toadstools." These gentlemen take the plants up and examine them all over, pileus, gills, and stem; no Fungus can stand such treatment long, but this makes all the difference between real work and mere show. As an instance in point, I asked Mr. English, in the presence of Mr. Currey, to show me one of his specimens of Agaricus sulfureus, of which uncommon species he exhibited several specimens (so named); on receiving one from him I immediately saw that instead of the white-spored A. sulfureus, he had got a batch of the utterly different and worthless purple-spored A. sublateritus, which had passed muster with others, owing to his "garniture" of Moss, &c. *Worthington G. Smith.*

THE FUNGUS EXHIBITION AND FORAY AT HEREFORD.—This meeting was, as heretofore, a great success. No less than 60 gentlemen met at Hereford to take part in the day's proceedings, which consisted of a Fungus exhibition, a Fungus "foray" or excursion, and a Fungus feast.

The exhibition of Fungi was all that could be desired, and was perhaps better than that held on the previous day in the rooms of the Royal Horticultural Society. Several species of Fungi of great rarity were exhibited. Amongst the foremost was Polyporus frondosus, brought by more than one of the members, and which attracted considerable attention on account of its recent discovery as a member of our flora, and on account of its clearing up the dubious points of identity between itself and P. intybaceus and P. giganteus. The Rev. W. Houghton brought a beautiful specimen of the edible Sparassis crispa, as large as a small Cauliflower. This is one of the most beautiful of all Fungi, and as delicious to the palate as lovely to the sight. It has an exquisite and somewhat aromatic odour, not unlike that of some sweet confection. There were two noble specimens of Agaricus corticatus, a welcome addition to our flora, several specimens of the gorgeous Cortinarius fulgens, and the equally fine coloured and edible Russula lepida. Lactarius controversus was of course well represented, as was Boletus badius, and many other species of great botanical interest. A remarkable group of bright sulphur-coloured Agarics was brought by Mr. Houghton from a stump in the Wrekin, regarding which no definite conclusion was at the time arrived at; it will probably either prove to be the rare Agaricus (Flammula) inopus, figured by Bolton, or the nearly allied A. hybridus; Mr. Houghton also exhibited Peziza badia. There was a specimen of Polyporus applanatus shown, of enormous size, and an equally gigantic mass of P. hispidus, sent by Dr. M'Cullough, of Abergavenny; this is a most uncouth-looking Fungus, fleshy, covered with rough hairs, and abounding in moisture. One of the members declared, to the amazement of the others, that he had been eating it in mistake for the "vegetable beefsteak"—Fistulina hepatica. Other Woolhopians had tested Gomphidius glutinosus and Paxillus involutus, but though eatable they were not highly approved.

The members and visitors mustered in force when the carriages drove up to the door—Dr. Bull, of course, was to the fore, seconded by C. Edmund Broome, Esq., of Batheaston; Dr. Trimen, of the British Museum; the Rev. J. D. La Touche, the Rev. Wm. Houghton, the Rev. E. D. Carr, the Rev. H. Sandford, the Rev. James Davies, Dr. A. Chapman, of Hereford; W. J. Neville, Esq., F.G.S., F.Z.S., of London; Edwin Lees, Esq., of Worcester; and many others. It was a delightful morning, the air a little moist and foggy, so that the members drove off in high spirits to Hagley Park. An abundance of Fungi was not expected, owing to the many weeks of unfortunately fine, sunny weather preceding the "foray;" the excursion was therefore partly made a "geological" one, and the first stoppage took place in Hagley Park, where the silurian rocks crop to the surface. Dr. Bull here briefly addressed the meeting, and many of the members dispersed to search for Fungi. Agaricus gallinaceus, A. pudicus, and a few common species rewarded the ordinary members, but Dr. Bull, always first and most fortunate, luckily lighted on a fine batch of Scleroderma geaster, a species new to Britain. Undoubtedly this was the best find of the day: this Fungus grew in a Barley-stubble field under the drip of an "Oak." Close by, two of the finest Poplars it is possible to imagine greatly enlisted the admiration of the members: at 5 feet from the ground one measured 14 feet 11 inches, the other 12 feet 10 inches in circumference; the highest was 130 feet by shadow measure. A truly noble Elm was next visited, and which gave ample proof of the goodness of the soil, elevated as it is. At 5 feet from the ground the tree measured 22 feet 10 inches in circumference, and at the ground level 31 feet, full and fair, that is, not increased by any of those excrescences to which the Elm is so liable. It is more or less hollow, and has evidently seen its best days; some of its branches are gone, and its top is broken off about 60 feet from the ground. The air in places was full of aphides, and here half a fine Turnip field was seen destroyed by this pest, the field stinking horribly as the members passed.

The Trap Dyke at Barlestree and Dormington were next visited, and an ascent was made of "Adam's Rocks;" this was a terrible pull, but when the heights were once gained the prospect over the Woolhope Valley was magnificent. Here the Rev. P. B. Brodie delivered a highly interesting address on the geology of the district, and the Rev. F. Merewether read an address on the "Drifts" of the neighbourhood. A descent of the hills was then made to Old Sutton, where the carriages were in waiting for the return. Hydnum auriscalpium, H. udum, a quantity of common Fungi, and a few of botanical interest were found, but none worth printing after the grand find made by Dr. Bull. Soon after 3 o'clock the carriages arrived at the Green Dragon Hotel, when the Fungi were examined till 4, the hour appointed for dinner.

More than 50 gentlemen sat down to this dinner. The edible Fungi consumed were Fistulina hepatica, Lactarius deliciosus, Agaricus rubescens, and Agaricus procerus. The Fungi were cooked according to the recipes printed in the "Transactions of the Woolhope Club," and as reproduced in Mr. Robinson's book on "Mushroom Culture." It is needless to state that the dinner was thoroughly enjoyed by all; the Fungi soon disappeared from the dishes, and though more were called for, it was found impossible, owing to the previous untoward dry weather, to supply the wants of the fungophagists.

The members of the Woolhope Club not only know how to dine and play, they know how to work too, and work well. When the cloth was removed, Dr. Bull at once read a letter, recently received from Professor Fries, of Upsala. This letter was a critical review of the "Clavis Agaricinorum," published in the last volume of the "Woolhope Transactions," and as it gives Fries' own views respecting the modification of the arrangement of the Agaricini as proposed in the "Clavis" we intend to print it in our next number, with some remarks by the author of the "Clavis."—Mr. Lees then followed with a paper on Algæ only apparent in times of drought, followed by a few brief but excellent remarks from Dr. Trimen of the British Museum. The introductory part of a paper was next read on the Fungi which affect forest trees, to which we shall shortly revert. Some notes on Fairy Rings were read by Dr. Bull from the MS. of Mr. James Buckman, and the meeting was brought to a conclusion by Dr. Bull offering a few excellent remarks regarding Boletus edulis, Lycoperdon giganteum, and some other edible Fungi.

With this dinner the Fungus meeting was virtually brought to a close, but Dr. Bull, ever solicitous for the enjoyment of his guests, had provided a delightful excursion for eight gentlemen the next day to Hampton Court Estate, the seat of Mr. Arkwright. At the Castle a sumptuous luncheon was hospitably provided, to which the visitors, after an invigorating walk, did ample justice. In front of the Castle there is a magnificent stretch of level lawn covering several square miles, and said to be the finest lawn in Great Britain. Here is a truly grand Cedar, measuring 17 feet in circumference about 6 inches from the ground, when the trunk immediately becomes divided; after giving off five large branches, it still measures 14 feet 8 inches in circumference. Another Cedar, which was in the perfection of vigour, measures 15 feet 3 inches in circumference at 3 feet from the ground; two Walnut trees measured 15 feet 11 inches and 14 feet 10 inches respectively; and a Horse Chestnut tree 15 feet 7 inches. There was besides the foregoing a Tulip tree of very large size, and peculiarly graceful growth; and two very large specimens of the Oriental Plane.

The party now made for the petrifying springs on the adjoining hills. Meantime the sky had become overcast and lead-coloured, and the rain, so dear to fungologists, began to fall pretty smartly on the party. Two mycologists took refuge in the cave of the petrifying spring, but soon again left the refuge, probably in fear of the nature of the lime-charged droppings: a petrified fungologist would be too awful! As it was, a decided change had come over them both; whether it was the effects of the spring, or the incessant and pitiless downpour of the rain, the rest of the party did not know, but their manner was cold and stony all the rest of the day. After picking up a few Fungi, the band of brothers prepared for the return journey. The precipitous hillside had to be descended, umbrellas were of no use now, and the rain came down in one continuous drenching downpour. How the party got down, slipping, jumping, tumbling, and grasping wet branches of trees and bushes, may be imagined but not described. Suffice it to say that, under the able leadership of Dr. Bull, the party at last emerged from the raking thicket, and alighted in safety in the road not far from the station. This was a small village railway station, where gas was unknown, and the party of fungologists took refuge in a waiting-room (?), where the darkness was made visible by two porters' bull's-eye lanterns and a candle in the ticket-office; here the wet but happy botanists whiled away three-quarters of an hour in recounting their former exploits, and examining their Fungi by the light of a bull's-eye lantern. However, at last the train arrived, a consumptive and puny little oil lamp was lighted outside, and the party gaily stepped into a carriage, and were off to Hereford in a twinkling.

No one was the worse for the wetting, and next day one went north, another south, a third east, a forth west, and the Hereford Fungus foray was over for the year.

All who took part in it will retain a lively remembrance of the geniality and kindness, the hospitality and *bonhomie* of Dr. Bull, of Hereford. *Worthington G. Smith.*

EDINBURGH BOTANICAL: *July* 14.—Sir Walter Elliot, President, in the chair. Donations to the library, herbarium, and museum were laid on the table. Professor Balfour noticed the death of Professor Syme, who joined the Society in 1858. The following communications were read:—

I. *On Kashmir Morels.* By Mr. M. C. Cooke, India Museum, London. The author remarked, that it has long been known that Truffles and Morels are found in N.W. India and Kashmir, but no attempt has hitherto been made to determine the species. Some years ago, application was made to the Agricultural and Horticultural Society of the Punjab, and to other sources, for specimens, but without any result. He had, however, lately received, through Dr. J. L. Stewart, a string of dried Morels, said to be the Morels of Kashmir, and sent by Mr. Baden Powell of Lahore. This string contains two distinct species, both of them small, and neither of them the Morchella esculenta of European markets. The author gave some account of the history of Morels as far as known, and concluded by giving scientific descriptions of the supposed two new species from Kashmir.

II. *On the characters of the Flowers of Silene maritima and Silene inflata, as regards their Stamens and Pistils.* By Dr. F. Buchanan White.——III. *Notes of a Botanical Excursion to the Neighbourhood of Perth.* By Mr. John Sadler.

IV. *Results obtained from the Cutting and Transplanting of a Plaited Hornbeam Hedge.* By Mr. M'Nab. A Hornbeam hedge, planted many years ago, had been plaited, and the stems became naturally grafted to each other. The hedge having to be removed, Mr. M'Nab had it cut into flakes, which were planted in various parts of the Botanic Garden, and are now in a thriving condition, and presenting some curious forms. Mr. M'Nab's remarks were illustrated by a series of drawings and specimens of the hedge.

V. *On the Guachamacan, a Poisonous Plant growing in the Llanos (plains) of Venezuela.* By M. A. Ernst, Caracas. Before entering on a botanical description of the Guachamacan, I beg leave to quote the following statements from a Venezuelan author,* which will be, I trust, a sufficient reason for drawing the attention of the Botanical Society to this remarkable plant:—

"It belongs to the extensive family of Apocyneæ or Dogbanes, whose poisonous qualities are known all over the world. So virulent is this poison, that meat roasted on spits made from the Guachamacan, absorbs sufficient poison to destroy all who partake of it. The lazy Indians make use of it to kill, without trouble, the cranes and herons on the borders of lagoons. For this they procure a number of sardines, besmear them with the juice of the plant, and spread them along the places frequented by those birds. The moment one of them seizes the fish, and before it is fairly swallowed, the bird drops dead; then the indolent hunter, issuing from his hiding place, cuts off the parts affected by the poison, usually the head and neck, and feels no scruple in eating the remainder. A dreadful case of poisoning, by means of this plant, occurred once at Nustrias (a small town in the Venezuelan state of Zamora, formerly province of Barinas), which created for a time great excitement, even amidst that scattered population. A woman, who lived with a man in the vicinity of that town, became jealous of the attentions he bestowed upon a charming neighbour of theirs, and determined to avenge herself, but in some manner that would not excite suspicions. In those remote regions, where coroners and chemists are unknown, it is impossible to detect murder except where marks of external violence are visible. Accordingly, she prepared for her lover a bowl of mosato, a favourite beverage of the country, made of Indian Corn boiled, mashed in water, and fermented; in this she soaked chips of the poisonous plant, and offered it to him with smiling grace. Delighted at the sight of the tempting bowl, the unsuspecting lover invited several of his neighbours—among them his hated rival—to share it with him. The woman, not intending to destroy any but her perfidious lover, during his absence prepared another bowl, omitting this time the poison. Llanero politeness, however, obliged the host to mix this portion with the other, which having done, he invited the company to dip their calabash cups into the bowl. Out of eleven persons there assembled, among them several children, not one escaped except the wicked perpetrator of this wholesale murder; not even the donkeys and fowl of the household, as the attentive master had thrown them the remains of the deadly mixture. Such is the dread in which the Llaneros (inhabitants of the plains) hold this plant, that I was not even permitted to preserve the specimens of fruit and flowers I had collected, with the object of ascertaining their botanical characters of the species. They almost threatened to desert if I insisted upon carrying them among the baggage. The propagation of this plant throughout the Apure, appears to be of recent origin, none of the oldest inhabitants recollecting to have met with it until within comparatively a short period."

Thus far Senor Ramon Paez. Many other cases of poisoning by Guachamacan are reported, which prove beyond any doubt that it must be an exceedingly poisonous, and, for the same reason, highly interesting plant. It is, however, not yet fully known to botanists, and not even mentioned in botanical works. Humboldt does not speak of it. He mentions the name Guaricamo, which is said to be a synonym of Guachamacan, but refers it to Patrisia affinis ("Nova gen. et spec. Plant." v. 357), a plant now placed among Bixineæ, among which no poisonous properties are known. In his "Personal Narrative" (Bohn's Engl. edit. ii. 224), the Guaricamo is called Ryania coccinea (not Hyanai coccidea, as printed in the quoted place), and a poisonous root is ascribed to it. This plant, however, did not attract the attention of the great traveller in such a degree as the true Guachamacan would undoubtedly have done; and it is also altogether impossible that the Guachamacan should belong to Ryania, as it has opposite leaves. If Ramon Paez should be right in saying that the plant was formerly unknown in the Apure, Humboldt's silence with respect to it would be sufficiently explained. The plant contains no milky juice. It appears, nevertheless to belong to Apocyneæ, and there is apparently some affinity to Rauwolfia. Grossourdy mentioning a hypogynous disk. But his description of the floral parts is very deficient; he says nothing about the æstivation of the corolla, nor about the internal structure of the ovarium. I notice in the specimen before me, at the base of the leaf-stalks, some small fragments of a dilacerated membrane, which perhaps united the two opposite petioles. The thick rhizoma, and the numerous rather slender stems, are perhaps no character of the species. In those regions the grass is every year set on fire, and the flames destroy nearly all the over-ground vegetation. The root remains fresh and alive, and new stems spring up from it. I may add, that the vulgar name of the plant has produced even a new verb—"guachamacar," *i.e.*, to poison by Guachamacan. I shall be glad to forward specimens of this interesting plant as soon as I shall be fortunate enough to obtain any.

VI. *Miscellaneous Communications.*—1. Mandragora vernalis and Doremа sp. Professor Balfour stated that the juice of Mandragora vernalis, grown in the Botanic Garden, had been proved to produce marked dilatation of the pupil similar to that caused by Belladona. He also noticed a species of Dorema at present flowering in the Botanic Garden. The plant is large and showy, somewhat resembling the true Asafœtida plant, and was sent by Mr. Loftus from Persia.

* Ramon Paez's "Wild Scenes in South America; or, Life in the Llanos of Venezuela," pp. 208. New York, 1862.

Notices of Books.

Les Promenades de Paris, &c. Par A. Alphand. Imperial folio. Paris: J. Rothschild, 43, Rue Saint André-des-Arts. (Present London address: 11, Portland Terrace, St. John's Wood.)

Some months since (see 1869, 716) we noticed with general commendation the earlier portions of this magnificent publication. Since then it has continued to make its appearance regularly, so that the publisher is now able to announce as complete those portions relating to the Bois de Boulogne and the Bois de Vincennes—spots which, recently pleasant gardens, are now, alas! dismantled and trodden under foot. These portions of the book thus claim a melancholy historical interest as representing features which existed under the splendid *régime* of the Second Empire, but which may never be seen again—at least for many many years, since trees cut down and rooted out are not to be replaced without lapse of time, even by the French gardeners, who have done so much in this direction to enhance the beauty of their fair city, now lying under the ban of war.

In regard to the later portions of the work, we find no falling off in quality, but rather the reverse. The typography, the fine woodcuts representing now scenery, now plants, now buildings, now apparatus, and the plates representing plans of parks, squares, boulevards, &c., or details of the buildings erected on the various sites, are all carried out in the very first style of art. The whole, when completed, will form a truly grand book, addressing itself to professional men, as architects, engineers, landscape gardeners, and practical gardeners, all of whom are furnished with minute information on the subjects which respectively fall under their cognisance; and also commending itself to country residents and the owners of estates, as being full of suggestions, from some one or other of which they can scarcely fail to derive benefit in carrying out their own improvements. Estimates of the cost at which the different works described were carried out, form a very useful feature of the publication. Some idea of its scope, and the manner in which the subject is treated, may be gathered from the fact that the account of the Bois de Vincennes occupies 40 pages of this folio letterpress, and is illustrated by 94 woodcuts by the first French artists.

We understand that some 15 parts remain to be published to finish the work, the cost of which complete will be about £12—rather a high price, but certainly not an extravagant one when the number and nature of the illustrations and the general style of the work is taken into account. The book is especially full of interest at the present moment, when all eyes are turned to see the result of the disastrous war which has imprinted 1870 on the annals of time in figures of blood; and when the general desire is that the city of cities may be spared from devastation. In it at least will be preserved a faithful record of the glories of the promenades and parks of Paris, and on this account, if for this only, it should find a place in every public and garden library, as well as in the libraries of country gentlemen and professional men.

Florists' Flowers.

I FRANKLY confess not only to a belief in the adaptability of the Tropæolum as a bedding plant, but to a great liking for it also, and therefore I grow it. At the present time, and, in fact, all through the summer months, the pleasantest and the brightest thing in my garden has been some plants of the new dwarf Tropæolum, Beauty of Malvern. The frost of the morning of October 10 just scathed it, but that of the following morning effectually destroyed the plants; still, it was the best and most attractive bedding plant I have had this season. It belongs to the compactum breed, and while it is close and compact in growth, blooms not only most profusely, but every flower (unlike those of King of Tom Thumbs, and others of the ordinary Tom Thumb section) is thrown well above the foliage. Not the least of its attractions is its continuity of bloom (again unlike the varieties of the ordinary Tom Thumb section); and if I were to suggest an arrangement of a flower-bed that would, I believe, give universal satisfaction, it would be Tropæolum Beauty of Malvern, edged with the best of all the dwarf blue bedding Lobelias, Blue Tom Thumb. At the Promenade Gardens, Great Malvern, Mr. R. H. Vertegans has had it in glorious perfection during the summer; at the Bangholm Nurseries of Messrs. Peter Lawson & Sons, at Edinburgh, a line of dwarf Lobelia, nearly 100 yards in length, has been a line of beautiful clear blue all the summer through, and at this late period of the year shows no signs of giving out.

Mr. Vertegans claims Beauty of Malvern as a seedling. As compared with Advancer, Scarlet Perfection, and others of the same type, it gains much in vigour of habit, and it also comes true from seed, though it seeds but sparely. For bedding purposes it should be propagated by cuttings; and the plants should be in fair-sized pots, so that at bedding-out time they will have made some growth, and possess an abundance of fibrous roots. There is nothing like getting Tropæolums planted out early, in a nice light soil, not rich; if they can begin to make some growth ere dry weather sets in, the branches cover the ground about the roots sufficiently to keep them cool, and a check is then of rare occurrence. Unfortunately for the Tropæolum, in some places during the recent very dry summer, the Turnip fly (I suppose for want of its usual food) fell on them, and riddled the leaves with small holes, and devoured the flowers as if each was a nice morsel. Such a visitation as that, however, does not often come to flower gardeners.

But as progress in matters horticultural seems to be unbounded and illimitable, it is not surprising that the Tropæolum forms an exception to this universal rule. I have recently seen some Tropæolums that have since passed into the hands of Mr. Thomas Thornton, of Heatherside, Farnborough, for distribution, that appear to me to possess unusually good and striking features of excellence. They came from a batch of seedlings, of which some of the compactum varieties were the parents on the one hand, and on the other hand the trailing forms among them appear to have come from Mr. Treadwell, as something akin to that in colour and habit. Tropæolums that will bloom as abundantly at the end of September as they do in June and July, appear to me to be model bedding plants, and the very things wanted in the flower garden. Altogether there were five varieties; the following three belong to the compactum type:—Lustrous, having bright rosy crimson flowers thrown up well above a dark foliage, like King of Tom Thumbs; very compact habit, and a free and continuous bloomer. This should drive King of Tom Thumbs from the field, having the same character of foliage, with something of the flowers also, but very much superior to it in every respect. Coccineum major, having rich orange-scarlet flowers, very bright, and of unusually large size, compact habit, very free, and always in bloom. In this instance there is conjoined to the dwarf compactum habit, the size of flowers found on the well-known T. Lobbianum Brilliant. The last of the trio is Yellow Dwarf, a yellow flowering variety, that is also a dense and continuous bloomer—something like T. compactum luteum improved in character, without the spots.

The two trailing varieties are Etna, which in habit of growth may be termed a half-trailer, and appearing to be a true cross between the compactum and Lobbianum sections, as it certainly resulted from seed fertilised in this way. It is one of those trailing kinds that push their shoots along close to the ground, and has a compact tufty style of growth, produces extremely showy vivid crimson flowers, and is also a free and continuous bloomer. The other has been named Vesuvius, and is brighter in hue, bearing rich bright orange-crimson flowers, that are thrown up well above the dark foliage of the plants. For bedding purposes this is a great and decided improvement on Mrs. Treadwell, and while that will scarcely flower in the open ground, Vesuvius is singularly fertile of bloom, and constant in its effective floral service. Mr. Porter, of Isleworth, has demonstrated how useful the Lobbianum sect on can be made during the winter months by placing them in pots, and training them up to the rafters of a low span-roof. In this way an abundance of cut flowers can be obtained. Similarly, the use of the compactum kinds need not be abandoned at the termination of the season's work in the flower garden. By taking cuttings in August, growing them on in store pots, and finally potting them singly in 60-pots, nice little blooming bushes can be obtained for flowering during the winter; and those who have to provide cut flowers at the dull season of the year can appreciate how thoroughly useful they are for the purpose. During the dull autumn days, and amid the changing vicissitudes of frost, snow, and rain, with their alternations of sunshine, we want bright, cheery, sparkling

blossoms for our little domestic decorations, and what can be more welcome than the gay coloured flowers of the free-blooming dwarf Tropæolums. *R. D.*

Garden Memoranda.

THE GRAPE ROOM AT HECKFIELD.—The mode of preserving cut bunches of Grapes now in operation at Heckfield is not of Mr. Wildsmith's own originating, as he acknowledges that for the idea he is indebted to Mr. Robinson's valuable exposition of French horticulture. Mr. Wildsmith has endeavoured to improve upon it, and believes that he has been most successful.

His first experiment was tried in the autumn of last year, when some of the shelves of his apple-room had fixed to their front edges deal boards, about 6 inches in depth, and which had in the upper edge of each a number of scollops, cut out just large enough to take the neck of a bottle, the mouth of which projected slightly over. A lot of champagne bottles were nearly filled with water, and into each was also put two or three small pieces of charcoal. The bottles were then put into position, and on October 26 an entire house of Black Hamburgh Grapes was cut, each bunch having about 6 inches of wood below the stem, and an inch above it. The long portion of the wood was inserted into the bottle, and the bunches consequently hung in their respective positions with ease and safety. These Black Hamburghs were consumed by the end of February, 1870, and during that time none had shrivelled, and but few bad berries had to be taken out. To utilise the vacant bottles, part of a house of Lady Downe's Seedling was cut on January 12, and these bunches kept perfectly plump until exhausted on May 5, when the Vines from which they were cut were again in bloom. Lord Eversley, writing from London just then, expressed his gratification at the rich flavour and quality which the old Grapes possessed. Some Muscats cut on November 10 kept pretty well until March, when the berries began to drop off, but did not shrivel. The cause of this Mr. Wildsmith believes to be the lack of a little heat to warm and dry the air in the room.

It must also be mentioned as another drawback, that there was a considerable quantity of Apples in the room during most of the winter, and that these necessarily helped to produce a moistened atmosphere. A small room that was formerly Mr. Wildsmith's office has recently been converted into a Grape-room. I am unable to give its dimensions, but when I looked in upon it on August 25 I found it fitted up with three tiers of shelves, constructed as previously described, and which ran round three sides of the room. On these shelves were 150 bottles, and hanging from each a good bunch of Black Hamburgh Grapes, excepting just a few that had fine bunches of the White Grape Marchioness of Hastings. These had been cut on August 12, and all of them were in fine condition. One reason why these Grapes were cut thus early was, that the produce of the house from which they were taken developes the undesirable peculiarity of going back to red after having once gained their proper colour; another reason was, that spider had shown itself, and this pest could not be eradicated whilst the Grapes were hanging. The new room has a small stove, with flue in the centre, to maintain an equable temperature in winter if necessary; it is also ventilated through the ceiling, and on warm days the door is left open, but the doorway is covered by fine netting, to exclude insects.

After all, the real uses of the Grape-room will be most severely tested after Christmas, as from that period of the year until new Grapes are ready for cutting the most critical time is presented through which to safely and effectively keep a cut crop of Grapes. If Mr. Wildsmith is enabled, with the resources he has now at command, to successfully solve that problem (supposing it to be one), he will have done Grape growers some useful service and certainly relieve late Vines of a considerable incubus. It is a kind of horticultural pudding, the proof of which lies in the eating; and as the judgment of practical men upon its qualities is to be desired, I trust Mr. Wildsmith will by-and-by send the Editors a slice, otherwise a bunch, that we may hear their opinion. *A. D.*

Miscellaneous.

JOHN CUCUMBER.

THERE came four cooks out of the West,
Four cooks both strong and high,
And they have sworn, though prone to rise,
John Cucumber should lie.

They took a frame and caged him down
Upon the forcing-bed,
Wherein, by artificial growth,
John Cucumber they bred.

When cheerful spring brought salmon in,
At price per pound no small,
John Cucumber rash people then
Consumed their fish withal.

The ripening suns of summer came,
And he grew large and long,
And some did then express their fears
That he had done them wrong.

At sober autumn's entrance mild,
Distempers did prevail,
Of such a sort that now they said
They knew he made them ail.

Abounding daily more and more,
Those cases did so rage,
Those four cooks tried their cleverest plan
His crudeness to assuage.

They took a weapon thin and sharp,
And sliced him, sore to see,
Then dressed him with their highest art
And skill in cookerie.

They seasoned him with salt, no lack,
They peppered him all o'er,
They vinegared his mangled form,
And oil thereon did pour.

They steeped him, on a china plate,
In liquor to the brim;
The way they served John Cucumber
Drew down big tears from him.

They stirred and tossed him o'er and o'er,
Regardless of the woe
From his much weeping which appeared:
They turned him to and fro.

John Cucumber was a rebel bold;
For all their enterprise
To render him quiescent food,
They saw he still would rise.

Him, therefore, not to work men woe,
Though losing pains thereby,
They lastly, as a worthless thing,
Did out of window shy.

So much for cold John Cucumber,
Whom few insides can stand,
Of all Cucurbitaceæ
The worst in merrie England. *Punch.*

STONY GROUND PLANTS.—Under this heading I would call attention to a highly interesting class of plants which I have successfully cultivated, and my experience with which may be of some service to younger men when they have to clothe with beauty banks high and dry, where the little pinch of fine soil, like the mortar in a building, bears but a small proportion indeed to the bulk of shapeless stones, great and small, that give the land its appropriate name of stony ground. It is always instructive when the cultivator can come at a plant in its native habitat, before man has tampered with its top in the way of pruning, &c., or meddled with its root in the way of changing its locality by transplanting; for as long as a native plant is to be seen *in situ*, you can make notes of what "hath set it up," and may see in some measure where its affections lie, for truly it may be said of plants as of man, that "some affect the sun, and some the shade." The Cistus, or Rock Rose, the Helianthemum, or Sun Rose, and the whole of the Stonecrop family, are preeminently the furniture for the stony places; but in the whole circle of cultivated plants we shall not find one better calculated for this kind of service than the double-flowered Gorse, for it exposes no spread of foliage to the stormy winds, and, moreover, carries itself so close to the ground as seldom to rise higher than the radius of its base, thus forming half a globe of the most glorious golden flowers that ever adorned a garden, the little that is seen of green enhancing the brightness of the gold, like the artistic dots that shade some famous picture. I would therefore direct attention to this plant in the first instance, and I may as well inform the reader that I was rather peculiarly situated when I had to grow this plant on the top of a stone wall, and hundreds could testify that it was there grown to perfection. The grounds were intersected by the main turnpike road, and in order to secure privacy both sides were bounded by a stone wall about the height of a man, and the double-flowering Gorse formed the coping, and overhung the top of the wall, so as not to give stragglers any encouragement to climb over. I need scarcely remark that ordinary planting would not have answered my purpose in this case, neither will it answer generally with stony ground, where plants have to establish themselves against steep slopes, or on hillocks, whether natural or artificial. The plant must be put in with a quantity of rich food, sufficient for it to feed upon until it can forage among the stones; and this food, for various reasons, must be supplied in the first instance in the form of mud, and with such an amount of clay and manure in its composition as shall make it cling to the bed, and so thoroughly enclose the roots of the plant and the ball of earth that no air can get at the feeders; while besides the mud, as many stones as can conveniently be got to cover it should be laid on, not only to shade and weight the soil, but to act as a cooler and moistener to the ball; for we always find the under side of a stone moist and cool, even in the sunshine, when it is partially imbedded in the earth, and when we are dealing with land where stones predominate we must accommodate our views to suit circumstances which it is above our power to alter. If I recollect aright we got plants of the double-flowered Gorse in pots at 40*s.* per 100, or at something under 6*d.* per plant; and when we consider the area that this plant will cover in three years, forming a bush 6 feet in diameter, I do not recollect any instance where so much real ornament can be got for so small an outlay from a ligneous perennial. When the plant is not in flower it is no straggler, but always looks trim and neat, for it "buries its dead;" and it is not until the plant is finally chopped to pieces that you see the dead leaves and twigs that did its work before it attained the adult state. Although this plant will grow very well on level ground, it is preferable to plant a specimen on an artificial knoll or hillock, so that the centre of the plant may thereby stand high, and the branches droop gracefully down the sides of the slope. The great fault of the plant is its dwarf habit, and this method of planting just brings it up to the level of the eye. It falls to the lot of very few to have it, as in my case above referred to, where it formed an avenue, and stood 9 feet high, so that a lady on horseback could enjoy the fragrance and the beauty of its flowers. How many dull slopes and shapeless mounds of earth throughout the country might be made gay with this plant at little cost!—ay, even the "cairns" (heaps) of stone, with the help of a little rich mud, might thus be made to "blossom like the Rose." *Alex. Forsyth, Salford, in "Florist and Pomologist."*

COLOSSAL ASPARAGUS.—Mr. Peter Henderson, an American citizen of New Jersey, claims to having at last found a distinct variety of Asparagus. Previously he had repeatedly contended that all the so-called varieties were merely differences produced by culture, soil, and climate. The new variety was grown with the ordinary kind, both having been planted in the spring of 1868, each being then one year from the seed, and both grown to a large extent in a market garden in Long Island. The soil was examined, and found to be as nearly the same as it could well be, yet the two beds of Asparagus showed a difference that left no longer a shadow of a doubt of their being entirely distinct varieties. In the old variety he found no shoot thicker than one inch in diameter, and averaging 20 shoots to a hill, while in the colossal many shoots were found 1¼ inch in diameter, and averaging 35 shoots to a hill—an enormous growth when it is remembered that the plant was only three years from the seed. The mode of cultivation is very like the French one—the rows being 6 feet apart, and the plants 4 feet apart in the row. The average clear profit annually on the old sort is estimated to be over £56 per acre, and over £87 per acre on the new; but some growers in the same region estimate their profits on Asparagus at nearly double these rates; and it is expected that it will soon prove a very valuable crop to be raised in the Southern States for the early supply of the northern markets. *Press.*

GINGILIE OIL.—The Gingilie (Sesamum indicum) is said to be an African plant, and is supposed to have been introduced to the West Indies by the negros. It is now pretty generally distributed, and in this country it thrives admirably in the Newera Kalawyia district. The plant is cultivated for the seed, which yields a fixed oil. The method adopted in Ceylon of expressing the oil is rather primitive, and consequently it possesses an unpleasant flavour, and a brown, muddy colour. If properly prepared, the oil would form a very good substitute for sweet oil. The best method of preparing the oil is as follows:—First, steep the seeds repeatedly in cold water, or boil them for a short time, till they are divested of the reddish brown colouring matter contained in the epidermis of the seeds; then, when the seeds have become perfectly white, dry them in the sun, and express the oil in the ordinary way. The seed yields from 40 to 44 per cent. of a pale, straw-coloured oil. When thus prepared, the oil is perfectly devoid of smell, and may be used for extracting the perfume of the Jasmin, Tuberose, Camomile, and Yellow Rose. To effect this, one weight of the flowers should be added to three weights of the oil in a bottle, which should be corked and left in the sun for 40 days, when the oil will be impregnated with the perfume of the flowers. The Gingilie oil is soluble in alcohol, saponifies with alkalies, solidifies by nitric acid, and combines with the oxide of lead. The Gingilie oil is highly esteemed by Egyptian belles for its properties of cleansing the skin, and of imparting to it a bloom and lustre, and also of preserving the beauty and gloss of the hair. In Ceylon, it is used for similar purposes. The negros also use the seeds for making a sort of beverage something like coffee, by roasting the seeds and infusing them in water. The commercial value of the oil, in England, is £40 per ton. *Jaffna News.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

GREENHOUSES and conservatories will now require daily supervision, in the matter of removing decaying leaves and dead flowers, &c. From this time water must be given with great caution, not only because the plants are better without too much of it, but also to prevent the air from becoming too moist—a state of things anything but favourable at this season of the year. *Ericas* and *Epacrises* should now be neatly arranged for the winter. Great care should be taken not to overcrowd them, and with attention to air giving they may safely be carried through the winter. If the pots containing them are of moderate size and stand upon smooth slate benches, see that the base of the pot does not stand so evenly as to impede the free circulation of water, which if permitted would irre-

trievably damage the roots. If any of the pots have become so unclean as to show an unwholesome amount of greenness, let them be immediately washed. The moisture given to each ball quickly finds its way through the sides of clean pots, a beneficial procedure which prevents the accumulation of latent or stagnant moisture, and so affords a wholesome impetus to a healthy root formation. Though these simple facts seem to possess but little importance, they amount to a great deal in the sum total of successful plant culture. Place the earliest bulbs for forcing into strong heat, so that they may be induced to flower at the dullest season, when there are few other plants in flower. Give specimen plants of *Salvias* grown on in pots for early flowering good soakings of liquid manure alternately with clear water, for the next few months. These will come in well to afford an early display, and will enliven with their scarlet flowers the ordinarily duller blooms of the Chrysanthemums. Cutting-pots of bedding Pelargoniums and similar other plants should be occasionally turned round, so that all sides alike may enjoy the light, and to prevent them from becoming drawn.

FORCING HOUSES.

If the lateral growths upon *Vines* carrying late crops are at all thick, or densely clothed with foliage in such a manner as to shade the bunches too much, let them be somewhat thinned out by the removal of the oldest leaves, which are now ripening off. Be careful to protect outdoor Vine borders from too heavy falls of rain, especially such as are intended for early forcing, as it is more than probable that we shall experience a very heavy rainfall during the next few months. Outdoor borders connected with Vines carrying ripened or late ripening crops should be scrupulously screened from heavy rainfalls. Keep a nice latent warmth in the heating *media* in the structures containing such crops; not, however, to such an extent as greatly to influence the internal warmth, but to keep the air as dry and buoyant as possible, so that there may be no possibility of any amount of internal condensation taking place. Look through all the bunches of fruit occasionally, and carefully remove any berries which are decaying, and are likely to prove injurious to the others. If any dead leaves fall, or have ceased to perform their functions upon any such Vines, let them be instantly removed, so that there may be no impediment to the freest possible circulation of both air and light. Be particular not to unduly excite the growing capabilities of successional *Pine plants*, by means of excessive heat, either top or bottom. Indeed, bottom-heat whether applied by means of hot-water chambers or fermenting materials, will require more than ordinary attention just now, as it becomes so readily influenced on the maximum side after having been so recently renovated, turned over, and otherwise prepared for the winter season.

HARDY FRUIT GARDEN.

It seems premature to speak of aiding the leaves in their natural effort to free themselves from such trees as *Peaches*, *Nectarines*, and *Apricots*, so securely do they seem to hold on. As soon as they will loosen freely, they should be assisted by just brushing the trees upwards with a new birch-broom in a light easy manner, so as not to injure the branches. By so doing the wood will be induced to ripen off more freely by being better exposed. I have already referred to the advisability of planting *Fruit Trees* early in the season, where practicable. Let me now add, that in planting such trees thoroughly good drainage is of the utmost importance in all instances where a good natural drainage does not exist. Could I not procure better drainage, through limited space, or from any other cause, I would resort to the readiest method of furnishing a dry base, *i. e.*, by throwing two or three wheelbarrow loads of brick rubbish, or similar other materials, upon which to place upside down fresh turves from a maiden loam pasturage. If any progress is being made in planting, always place great importance on giving each tree a good root-soaking as soon as possible after the operation has been performed; this, not only to insure the best natural conditions for the roots to reinstate themselves, but in order that the soil may settle down around them more firmly for a like purpose, and to prevent the too free access of the outer air to the roots.

KITCHEN GARDEN.

Take up and clamp in the open ground or store for more immediate uses the main crop of *Carrots*. I have always advised that *Parsnips* should be left in the ground until wanted for use, which very greatly enhances their flavour and good cooking properties, and does away with the dryness and stringy or fibrous properties which they become possessed of when taken up and stored away. Where *Garlic* and *Shallots* are in great demand it may be judicious to plant a few out now. Further transplantings of *Salad plants* should be made, as the autumn keeps so remarkably open. Do not delay to forward to the necessary extent the earthing up of *Cardoons*, *Celery*, &c., and otherwise make preparation for frosts, which may be here soon, in spite of the fact that things look so flourishingly to-day. *W. E.*

TOWN GARDENING.

BEDDING plants by this time will require clearing off, which will make the garden appear rather desolate; and if bulbs are not to be planted in their place, the beds should be filled with Evergreens, which will produce a very cheerful appearance during the winter months. Plants of the following kinds can be purchased from 9 inches to 6 feet high, in various colours, at a trifling expense; and they can be so arranged as to form various designs. The following will be found well adapted for this purpose:—*Aucuba japonica*, *Berberis Aquifolium*, the American, China, and golden *Arbor-vitæ*, and the Dutch *Box*. These can all be removed again to the country in the spring, when they will soon recover their natural colour. They are likewise grown in pots for the decoration of halls, balconies, &c. For this purpose they should have been grown in the pots since last spring, as thus they will have a better constitution to bear confinement. In planting them in the beds they should have the mould let in well amongst the roots, be trodden firmly round, and afterwards have 2 or 3 inches of rotten dung placed over the roots. *Carnations*, *Stocks*, *Pyrethrums*, and *Double Rockets* that were potted off to stand the winter should now be placed in their winter quarters—a cold frame, or any other place, where they can be readily protected from frost, and get plenty of air in fine weather. Always be particular to place them on cinder-ashes or other materials, to prevent the worms from entering the pots. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON, FOR THE WEEK ENDING WEDNESDAY, OCTOBER 12, 1870.

1870 MONTH AND DAY.	At 9 A.M. Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
October.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
6. Thurs.	29.01	58.8	56.6	51.6	86	3.1
7 Friday	29.07	57.3	55.2	51.3	86	4.5
8. Satur..	29.03	61.5	58.3	55.4	81	4.9
9 Sunday	29.28	57.3	51.8	44.6	77	4.0
10. Monday	29.18	48.4	49.6	37.2	89	2.6
11. Tues ..	29.73	49.2	49.2	37.3	82	2.6
12. Wednes	29.16	52.5	47.3	42.1	68	3.0

1870 MONTH AND DAY.	TEMPERATURE OF THE AIR.					WIND.		RAIN
October	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Mean of 63 Years.	Direction.	Horizontal Movement.	In Inches
	Deg	Deg	Deg	Deg	Deg		Miles	
6. Thurs.	59.1	46.8	12.3	47.8	— 3.4	NNE., N.W.	160	0.00
7 Friday	62.8	41.6	22.2	52.7	+ 1.2	S.W.	115	1.00
8. Satur..	67.1	52.1	15.0	58.8	+ 6.3	WSW	425	0.20
9 Sunday	58.7	39.2	19.5	47.0	— 3.9	WSW, NNW	140	0.01
10 Monday	52.8	31.2	18.6	42.4	— 9.2	W.; N.	200	0.01
11. Tues. ..	55.4	32.4	23.0	42.9	— 8.5	W. by S.	205	0.0
12. Wednes	62.8	34.2	28.6	47.5	— 3.7	S.S.E.; WSW	515	0.01

Oct. 6—Generally cloudy. Dog. Lunar corona
— 7 Generally overcast. Slight fog
— 8—Variable and mostly cloudy and very mild. Rain fell heavily during the early morning, and again in the afternoon
— 9—Generally cloudy. Rainbow at night
— 10—Very foggy but mild. Overcast at night. A heavy shower of rain fell at noon.
— 11—Generally cloudy. Very fine. Slight fog. Hail shower
— 12—Very variable. Occasional rain. Heavy gales

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, OCTOBER 8, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	70.2	43.4	26.8	67.3	38.3	29.0	51.7	0.45
Blackheath ..	68.6	43.6	25.0	63.3	46.8	16.5	54.1	0.20
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	69.4	43.4	26.0	62.9	46.7	16.2	53.7	1.12
Wolverhampton	67.7	41.8	25.9	61.5	46.0	15.5	52.7	1.21
Leicester ..	69.0	41.0	28.0	62.0	46.6	15.4	52.3	0.25
Norwich	65.5	43.2	22.3	61.8	47.0	14.8	53.3	0.15
Nottingham ..	70.1	41.6	28.5	63.2	47.6	15.6	54.3	0.85
Sheffield	66.9	40.8	26.1	57.4	45.9	11.5	50.6	1.56
Liverpool	63.8	38.8	26.0	58.1	45.1	13.3	50.7	0.62
Manchester ..	68.0	45.0	33.0	60.1	42.2	17.9	50.9	2.09
Salford	70.6	40.8	31.5	60.2	43.5	17.4	51.1	2.49
Bradford	67.8	43.8	24.0	60.8	46.8	14.0	52.7	1.60
Leeds	67.0	40.0	27.0	60.3	46.7	13.6	52.3	1.43
Hull	63.0	32.0	31.0	57.4	42.2	15.2	49.8	2.56
Newcastle ..	66.0	41.0	25.0	61.0	43.8	16.2	47.8	1.60
Edinburgh ..	58.7	41.0	17.7	..	..	..	46.9	0.20
Glasgow	59.2	34.6	24.6	..	..	..	45.7	0.15
Dundee	55.0	30.0	16.0	..	..	..	48.4	0.00
Aberdeen	57.0	39.2	17.8	..	..	..	47.6	0.01
Paisley	60.8	34.0	33.5	..	..	..	47.2	0.50
Greenock	56.5	31.0	12.5	..	..	..	47.7	0.15
Leith	58.0	40.2	17.8	..	..	..	47.4	0.16
Perth	57.0	41.0	15.0	..	..	..	49.9	0.04
Dublin	65.7	39.8	25.9	..	..	..	52.8	1.73

JAMES GLAISHER

Notices to Correspondents.

ANTIRRHINUMS: *R. Dean.* A very fine strain, especially as regards the numerous and varied striped and mottled forms, and those having white tubes and rich crimson lips. We have not hitherto seen so much variety among the former.

BEAN: *A Constant Reader.* Your packet arrived empty.

CHERRY LAUREL FRITTING: *C. J., Dorrington.* Not unusual in the South in hot summers.

FRUIT TO NAME: *A Young Gardener.* If you will send, carriage paid, a few samples, not exceeding six Pears and six Apples, to our office, we will name them for you.

FUNGUS: *T. S. P.* Scleroderma vulgare; probably poisonous.—*W. M.* 1, Agaricus cretaceus; 2, A. squarrosus; 3, A. cerodes var. major; 4, A new and very interesting species, which will be described in the "Annals of Natural History," allied to A. coronillus. The specimens were dreadfully crushed. In future we hope that they will be sent in a tin box. Boxes may be made of thin tin to weigh very little. We should be glad to have Nos. 3 and 4 again, to make herbarium specimens, which would be impossible with those before us. *M. J. B.*—*A. W. F.* The substance is not dry rot, the spores of which are very different. It contains bodies closely resembling the cells of which the peridium Æcidium laceratum is composed. It is inconceivable that anything of that kind could be sent down from the beam. It is more probable that they are the eggs of some insect. The resemblance above-mentioned is very curious. *M. J. B.*

GAILLARDIAS: *R. Dean.* Very pretty, and, we believe, novel in character. The two best are that with narrow but even margin of yellow, and that with a moderate but well-defined zone of crimson around the disk. The one almost entirely yellow will also be useful as a contrast.

NAMES OF FRUITS: *Harrison & Sons. Apples:* 2, Fearn's Pippin; 3, Golden Mundi, of Liverpool; 4, Martin Nonpareil; 6, Flower of Kent. *Pears:* 1, Beurré Rance; 2, Beurré d'Aremberg; 3, Winter Crassane; 4, Duchesse d'Angoulême; 6, like Susette de Bavay; 7, Glou Morceau; 8, Beurré Brettoneau. The others we are not sure of.—*E. W. B. Apples:* 1, Royal Codlin; 2, Striped Beaufin; 3, Gravenstein; 4, resembling Court of Wick, but not certain, as the stalk, which is a characteristic feature of this variety, was wanting; 6, Fearn's Pippin, but subject to the same remark; 7, Nonesuch; 8, Barcelona Pearmain; 9, Sturmer Pippin. *Pears:* 10, Beurré Rance; 11, malformed Beurré Rance; 13, Vicar of Winkfield; 14, Winter Crassane; 15, Ne Plus Meuris.—*J. W.* We believe Beachamwell.—*Market Gardener.* We do not know either of your Apples at present. No. 2 is not Jacques Lebel, which is a large flat Apple.—*J. M. T. Apples:* 1, is a Codlin of some sort, but we do not recognise it; 2, true Court of Wick; 3, Golden Nonpareil; 4, true Golden Reinette; 5, true Cox's Orange Pippin; 6, true Scarlet Nonpareil. *Pears:* 7, Winter Crassane, not Glou Morceau; 8, Uvedale's St. Germain, not Knight's Monarch.—*H. W. C. Apples:* 1, Mère de Ménage; 4, Golden Reinette; 5, Bess Pool; 6, Court of Wick; 8, Scarlet Nonpareil; 10, Alfriston; 11, Brabant Bellefleur; 12, Hick's Fancy. *L. H.* Trumpington.—*J. F. S.* Fearn's Pippin.—*Alexander Cramb.* 3, King of the Pippins; 4, Alfriston, probably, but not quite sure; 5, Rymer; the other not known. *Small Apples (over-abundant address):* 9, Court of Wick; 11, Golden Reinette; the others so small that it is utterly impossible to name them.—*W. H.* 1, Van Mons Léon le Clerc; 2, Flemish Beauty; 3, Rondelet; 4, Bezi Vaet; 5, Gansel's Late Bergamot; 6, quite rotten; 7, Rymer; 8 and 9 we do not recognise, not Reinette du Canada, —*F.* 1, Beurré Bosc; 2, Beurré Clairgeau; 8 and 36, Glou Morceau; 15, Comte de Lamy; 14, Winter Nelis; 38, Ne Plus Meuris; 18 and 23, Marie Louise; 32, Vicar of Winkfield. We cannot undertake to name more than six in one collection.

NAMES OF PLANTS: *Collector.* 1, Cystopteris fragilis; 2, Athyrium Filix-fœmina.—*H.* 1, Doodya caudata; 2, Polystichum vestitum venustum.—*C. J.* 1, Lastrea patens; 2, L. decurrens; 3, L. glabella; 4, Cyrtomium caryotideum; 5, Lastrea dilatata collina; 6, Asplenium obliquum; 7, Adiantum hispidulum; 8, Pteris semipinnata.

PEACH LEAVES SCALDED: *Inquiry without name or address.* The spots on the leaves of the Peaches are caused by the sun's rays scalding them through the glass, whilst perhaps a little moisture remains on them after syringing.

PETUNIA: *R. Dean.* The variety, Jessie Dean, is a very pretty one, of good form, with irregular white margin and rich deep magenta blotches; a desirable flower if constant. Good strains of Petunia, however, yield many choice flowers, and among them some in this way.

POTATOS: *S. H.* A very curious case of "sporting." There appear to have been two tubers formed originally on the same haulm—one a white-skinned round, the other a mottled round; both have superturberated, so that there are on the same haulm two clusters of Potatos of different colours. Can you tell us the name of the variety?

REPORTING HORTICULTURAL SHOWS: *A Member of the Committee.* You do not say to what show you allude. Possibly the notice in question was condensed from the report in a local Journal.

RETINOSPORA LYCOPODIOIDES: *Young Gardener.* It is described as becoming a fine evergreen tree, resembling obtusa. It will grow in any good soil.

SEEDSMAN: *Birmingham.* We have seen nothing of late of the Journal so called.

CATALOGUES RECEIVED:—A. Stelzner, Catalogue des Plantes Nouvelles, rares, et recommendables. — W. Knight, General Catalogue of Nursery Stock.—J. Tremble & Sons, List of Dutch Bulbs.—Haage & Schmidt, Verzeichniss über Blumenzwiebeln Knollengewächse für die Saison 1870-1.—W. Wood & Son, Hardy Ornamental Trees and Shrubs; also Catalogue of Roses, Fruit Catalogue, and Select List of Dutch Flower Roots.—J. Standish & Co., Catalogue of New Plants, &c.—J. Warner, Catalogue of Fruit Trees—L. S.

Woodthorpe, Catalogue of Greenhouse Plants, &c.—J. Whitehead, Catalogue of Carnations, &c.

COMMUNICATIONS RECEIVED:—J. I.—W. W.—W. P. A.—Harden.—A. Y.—J. A. P.—J. A.—P. L.—M. D.—J. S.—Tyro.—G. F. W.—W. S. G.—T. S. M.—H. C.—A. W.

Markets.

COVENT GARDEN.—Oct. 7.

Trade continues exceedingly dull, with scarcely any variation in prices. Pears now comprise, among leading varieties, Marie Louise, Bonne Louise, Grisel's Bergamot, and Duchesse d'Angoulême. Among Apples may be mentioned Ribston Pippin, Cox's Orange Pippin, Blenheim, and Kerry Pippin. Hamburgh Grapes are arriving in large quantities; quality unusually fine, and low prices being realised. Oranges (new) have just shown themselves. Kent Cob Nuts and Filberts are almost a failure in crop; they are realising from 16*s.* to 12*s.* per 100 lb. New Chestnuts have commenced: an unusually fine season for them. Amongst flowers we have Asters, Fuchsias, Bouvardias, Pompon Chrysanthemums, Mignonette, Vallota purpurea, and a few good Heaths.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve	1 0	to 2 0	Oranges, per 100	..	to ..
Figs, per doz.	..	.. 1 0	Pears, per doz.	4 0	to 9 0
Grapes, per lb.	1 0	— 3 6	Pears, per doz.	1 6	— 3 0
Lemons, per 100	9 0	— 14 0	Pine-apples, per lb.	6 0	— 8 0
Melons, each	1 0	— 3 0	Plums, p. half sieve	2 0	— 4 0
Nectarines, per doz.	3 0	— 6 0			

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Artichokes, green, each	1 0	to 1 0	Herbs, per bunch	0 2	— 0 4
Asparagus, per bundle	1 0	— 2 0	Horse Radish, p. bun.	3 0	to 5 0
Beans, Kidney, p. sieve	3 0	— 5 0	Lettuces, p. score	1 6	— 3 0
Beet, per doz.	2 0	— 3 0	Mint, per bunch	0 3	— 0 6
Brussels sprouts, ½ sieve	3 0	— 5 0	Mushrooms, p. pott.	1 0	— 1 6
Cabbages, p. doz.	2 0	— 3 6	Onions, per bunch	0 4	— 0 9
Carrots, p. bunch	0 4	— 0 8	Parsley, p. bunch	0 2	— 0 4
Cauliflowers, p. doz.	1 6	— 3 0	Salsafy, per bundle	1 3	— 1 6
Celery, red, p. bun.	1 6	— 2 0	Shallots, per lb.	0 8	— ..
,, white, do.	1 0	— 1 6	Spinach, p. bushel	2 0	— 3 0
Cucumbers, each	0 3	— 1 0	Tomatoes, per doz.	1 0	— 2 0
French Beans, p. sieve	2 0	— 3 0	Turnips, yng., p. bun.	0 4	— 0 6
Do., retail, p. lb.	0 4	— 0 6	Veg. Marrows, p. doz.	2 0	— 3 0
Garlic, per lb.	0 8	— ..			

Potatos, Regents, 60*s.* to 80*s.*; Kidneys, 45*s.* to 120*s.* per ton.

Standard and Dwarf Roses.

LEWIS WOODTHORPE begs respectfully to call the attention of Amateurs to his extensive and well-grown stock of ROSES, which for the number, superiority, both in quality and varieties, can hardly be excelled in the kingdom.

STANDARDS, very superior, selected, 12*s.* per dozen; £5 per 100

HALF STANDARDS, very superior, 12*s.* per dozen; £4 per 100

DWARFS, each Monthly, strong, 8*s.* per dozen, 55 per 100

,, ,, ,, superior, 9*s.* per dozen, £2 per 100

Descriptive CATALOGUE of New and Choice Plants, Roses, Fruit Trees, &c., free on application.

Special prices for large quantities and to the Trade.

Mount Nursery, Stoke Hornsham, Essex.

Dwarf & Standard Roses.

FRANCIS & ARTHUR DICKSON & SONS have an immense Stock of fine, well-grown Plants, and have planted all the best ROSES in cultivation including all the new varieties. For Autumn and spring planting. Also a large Stock of strong Plants on the seedling Brier, budded or grafted, which they can recommend. CATALOGUE sent free by post. Their Roses are unusually fine this season. Inspection respectfully invited. Visitors will please take notice that

FRANCIS & ARTHUR DICKSON & SONS, The Royal Nurseries, Chester.

Vines, Extra Strong Fruiting, &c.

FRANCIS & ARTHUR DICKSON & SONS have this season a splendid lot of VINES as fruiting canes, with well-matured, clean, extra strong short-jointed Fruiting Canes; also fine Planting Canes, Eyes, &c. Their Vines are unusually fine this season. Inspection respectfully invited. Visitors will please take notice that

FRANCIS & ARTHUR DICKSON & SONS, The Royal Nurseries, Chester.

Fruit Trees.

MAGNIFICENT Dwarf-trained PEACHES, NECTARINES, APRICOTS, PEARS, PLUMS, APPLES, and CHERRIES.

Standard-trained PLUMS, Pyramidal PEARS, and CHERRIES.

Dwarf-trained FRUITING TREES of APPLES, PEARS, & PLUMS.

Pyramidal APPLES, PEARS, and CHERRIES.

WM. WOOD AND SON'S Nurseries have long been celebrated for the growth and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Araucaria imbricata.—Perfect Specimens,

WILLIAM GROOM and VERY HANDSOME

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX

WM. WOOD AND SON have a large Stock of the above. Price, per plant—

2 to 3 feet	..	..	£0 5 0	3 feet	.. .. £1 2 6
3 to 4 feet	..	..	0 10 6	4 feet	.. .. 1 10
6 feet	..	..	1 11 6	Larger, up to 30 feet	

Free on application.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 6 to 9 ft. | COMMON LAURELS, 6 to 9 ft.
Warranted well furnished.
RHODODENDRONS, 3 to 5 feet, thick, fair set with buds.

The above have recently been transplanted, are very bushy handsome plants, and quite safe. Price per dozen or hundred on application

The Floral Nursery, Hailsham, Sussex.

IMPORTANT NOTICE.—To secure a good Crop of MANGEL WURZEL Intends for 1871 the best should be prepared between now and Christmas, and the Seed secured from KING'S unrivalled PRIZE STOCKS, harvested in fine condition, at very moderate prices. Carriage Paid. Packed and sent to be delivered next spring. None but Seed from the best selected Roots kept. Carriage paid to all Stations in London direct.

JOHN K. KING, Seed Grower, Coggeshall, Essex.

Established 1845.

PETER LAWSON AND SON have just received from Australia a few Tons of BROMUS SCHRADERI. This Seed is perfectly hardy, and thrives well during the winter in almost all situations.

On wet lands, where it is sometimes difficult to get good crops of Grass, Bromus Schraderi flourishes, and can be repeatedly mowed for consumption; while it is invaluable on dry soils for grazing during winter, when there is a scarcity of Rye-grasses.

It should be drilled say from 40 to 50 lb per acre, if sown alone. Price of above on application.

P. L. & S. have also on hand a superior stock of PERENNIAL and ITALIAN RYE-GRASSES, NATURAL GRASSES, SEED WHEATS, WHITE and RED OATS, BARLEY, &c.—samples and prices of which they will be most happy to forward on application.

20, Budge Row, Cannon Street, London, E.C.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited), COPN, SEED, MANURE, AND OILCAKE MERCHANTS.

Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.

Samples and prices post free on application. Prize Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

For TRADE PEDIGREE MARK. Seed.

WHEAT, BARLEY, and OATS. Apply to Captain HALLETT, Brighton

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on both Companies' routes time from the Chester Railway Station. The new short route is to pass thy the steps over Hookersbrook Bridge, entering JAMES DICKSON & SONS' new road, lost by the "Eddowes' Inn."

Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES forwarded on receipt of applications.

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

The Noted French Cold Grafting Wax

(MASTIC LHOMME LEFORT),

For Grafting, Budding, Healing, &c., may be obtained of

HOOPER AND CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsmen and Nurserymen.

Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST illustrated of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

MINTON AND CO. Beg to inform the Public that they keep a Stock of their ENAMELLED and MAJOLICA TILES At the China and Earthenware Manufactory, MINTON, 28, Walbrook, Mansion House, London.

They have no connection with any other House of the same name Please to note the address.

A NURSERYMAN, in the Provinces, is desirous of meeting with an ACTIVE PARTNER, with moderate capital. X., Messrs. Protheroe & Morris, Leytonstone, N.E.

WANTED, an active GARDENER, to PURCHASE HALF SHARE in a small Nursery, Florist, and Jobbing Business in Islington. Long Lease. £50 cash.—G. R., 32, Rotherfield Street, Islington, N.

TO PARENTS and GUARDIANS.—Two Partners in an old-established Manufacturing Business desire to meet with a young Man to come in as JUNIOR PARTNER, and to take an active part in the management, so fast as he acquires knowledge of the details. Share of profits in proportion to amount of Capital brought (£5000 to £7000 required), preferential salary may be arranged, with moderate percentage on capital before Partnership is entered upon, during which period the Partners will be glad to receive him as a guest at the business. The Works are in a country village in a Midland County, and every opportunity afforded for ascertaining both the social and moral attributes of the Partners. Any unmarried Man preferred who would reside with one of the Partners.—Apply to Messrs. SNOW AND ATKINS, Solicitors, Birmingham.

TO TRAVELLERS in the NURSERY and SEED TRADE.—The Advertiser wishes to communicate with some one who can TAKE a COMMISSION.—W. P., *Gardeners' Chronicle* Office, W.C.

WANTED, a HEAD GARDENER, where two others are kept.—A respectable Man, who thoroughly understands the business. His Wife would be no incumbrance, and attend to the Poultry and Dairy. The residence is near Dorchester.—P., 38, Wigmore Street, W.

WANTED, a WORKING BAILIFF, BAILIFF and GARDENER, or BAILIFF and CARPENTER, to superintend the general Management of a Country Place, building, repairs, &c.—Apply, stating age and salary required, to Messrs. Paul & Son, Post Office, Ipswich.

WANTED, an energetic, trustworthy YOUNG MAN, in a Suburban seed Shop. Must be a good Salesman, have a knowledge of Plants, and quick at Bouquet making. Also WANTED, a GENERAL YOUNG MAN. Wages, 15*s.* per week.—Apply to 1, Acton Terrace, near London. Unexceptionable references will be required.—Apply in own handwriting, to N. S., Messrs. Ponsford & Son, Nurserymen, Bath, Somerset.

WANTED, in a Provincial Town in the South of Ireland, a YOUNG MAN for the Seed Trade. One with a knowledge of Book-keeping preferred.—Apply, stating age and salary required, to B. B., Messrs. W. H. Smith & Son, 85, Mid Abbey Street, Dublin

WANTED, a young Man, as UNDER WAREHOUSEMAN, in the Seed Trade.—Some knowledge of the Seed Trade and specialties—Address, stating Salary, &c., to Box 63, Post Office, Bristol.

Seed Trade.

WANTED, a SHOPMAN.—Apply, stating age and experience, with references and salary required, to JAMES DICKSON AND SONS, 32, Hanover Street, Edinburgh.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send to them at once. Those requiring GARDENERS or BAILIFFS may rely upon JAMES CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

TO WHOLESALE SEED MERCHANTS.—A Gentleman, having a good connection in Cornwall among Seedsmen, wishes to add to his other business a COMMISSION for the SALE of SEEDS to the TRADE. Can give the highest references and security.—W. P. H., Polgan, Post Office, Redruth, Cornwall.

GARDENER (HEAD).—Age 38, single; well acquainted with all kinds of Early Forcing, and can take charge of Land and Stock if required. Good reference from the gentleman he has just left.—A. B., 7, Chumleigh, Rye Lane, Peckham, S.E.

GARDENER (HEAD), to any Lady or Gentleman requiring a thorough practical Man.—Understands the Management of the Flower and Kitchen Garden, Stove, Greenhouse, Conservatory, and Orchard House, Early and Late Forcing of Grapes, Melons, Cucumbers, Mushrooms, and French Beans, &c. Can draw Plans and Lay Out and Manage Walks and Woods, if required.—C. H. S., 5, Packenham Street, Gray's Inn Road, London, W.C.

GARDENER (HEAD).—Age 38, married; well versed in the profession. Eight years' good character from present employer.—S. T., Messrs. Wood & Co., Nurserymen, Worcester.

GARDENER (HEAD).—Age 31, married, one child; has a good practical knowledge of the profession in all its branches. Good character and ability, sobriety, and industry.—X. Y. Z., Mr. Metcalfe, East Retford, Notts.

GARDENER (HEAD).—Married; thoroughly understands the Management of Pines, Vines, Early and Late Forcing, Stove and Greenhouse Plants, Flower and Kitchen Gardening, &c. Good character.—T. S., 9, Vorley Road, Upper Holloway, London, N.

GARDENER (HEAD).—Age 31, married, no incumbrance; understands Fruit, Flower, and Kitchen Gardening, Vines, Melons, Cucumbers, and Stove and Greenhouse Plants. Two and a half years' good character.—GARDENER, Hermand, West Calder, N.B.

GARDENER (HEAD).—Age 30, married, one child; thorough practical knowledge of the profession, also a good Plantsman. Can be highly recommended by present and previous employer for honesty, sobriety, industry, and ability. State wages given and duties to be undertaken.—W. H., Mr. Jones, Brook Street Post Office, Upper Clapton, London, E.

GARDENER (HEAD), age 40, married, no family.—J. C. PADMAN, Nurseryman, Boston Spa, Yorkshire, can highly recommend a Man who has a thorough practical knowledge in all its branches. Upwards of twenty years' first-class testimonials from previous situations; leaving his present one on account of the estate changing hands

GARDENER (HEAD).—JOHN WHITE, late Gardener (for 28 years) at Norman Court, near Stockbridge, Hants (to Thomas Baring, Esq., M.P., and his father, the late C. B. Wall, Esq., M.P.), is desirous of engaging himself to any Lady or Gentleman requiring the services of a Gardener, &c., of long and large experience. J. W. is married, without family or any incumbrance.—JOHN WHITE, Messrs. Broome & Son, Nurserymen, &c., Clinton Street, Romsey.

GARDENER (HEAD).—A Gentleman wishes to recommend his Gardener, a married man, with one child, who has been in his service for several years. He is a very able and intelligent man, and has a first-class knowledge of Fruit, Flower & Kitchen Gardening, as well as of general Plant Culture. Irreproachable testimonials can be given by the Gentleman and Lady he is now serving.—P. P., 2, Alfred Place, Roman Road, Barnsbury Park, N.

GARDENER (HEAD WORKING, or good SINGLE-HANDED).—Age 35, married; successful with Vines and Exotics. Highest moral character. Total abstainer. Male employer inserts this. Mrs. W. G., Kingscote, Wotton-under-Edge.

GARDENER (HEAD WORKING), age 35, married.—WILLIAM HENDERSON, for the last three years Gardener to Thos. Marrian, Esq., Thurcroft Hall, Maltby, Rotherham, is at liberty to meet with any Lady or Gentleman requiring the services of a thorough practical Gardener; well understands the Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, and the Management of Fruit, Flower, and Kitchen Gardens. Wife, having no family, is qualified to undertake the duties of Laundress, or take charge of gentleman's residence. Characters will bear investigating. WM. HENDERSON, Comston Cold, Bell Busk, Leeds

GARDENER.—Middle-aged, married, no incumbrance; understands the profession in all its branches. Good character.—A. B., Mr. Sale's, Hadley Nurseries, Barnet, Herts, Great Northern Railway.

GARDENER.—Married, steady, respectable; understands the profession. Good recommendation from present and previous employer.—GARDENER, Ivyhurst, Edge Hill, Wimbledon, Surrey, S.W.

GARDENER (FOREMAN, or SECOND), in a Nobleman's or Gentleman's Establishment.—Age 24, single; has had good experience in various Establishments and London Nurseries. First-class references.—A. B., Messrs. Rollisson, The Nurseries, Lower Tooting, Surrey.

GARDENER (SINGLE-HANDED).—Age 27, married, no child; has a good knowledge of Gardening, in all its branches. Would have no objection to make himself useful. Good references.—W. L. H., 4, Bridge Row, Cross Roads, Croydon, Surrey.

GARDENER (where assistance is given).—Age 32, married, two children; 16 years' experience in the Culture of Stove and Greenhouse Plants, Vines, all kinds of Forcing, and Flower, Fruit, and Kitchen Gardening. A total abstainer.—J. B. G., Holt, near Worcester

GARDENER (SECOND), in any Nobleman or Gentleman's Garden, where three or more are kept.—Age 22. Two years' character.—W. W., Kennel Ride, Ascot, Berks.

GARDENER (UNDER), in a Gentleman's Garden.—Age 23, a Foreigner; has been in England two years. A place near London preferred.—NEUMAN, Royal Nursery, Slough.

GARDENER (UNDER, and IMPROVER).—Age 18; has some knowledge of Gardening, having been for three years in the profession. The Lady who inserts this Advertisement can thoroughly recommend him.—F. J., 2, Chiswell Street, Picton Street, Cambridge Green, S.E.

To Nurserymen.

GROUND FOREMAN and SALESMAN.—Thoroughly experienced, with good practical knowledge of the value of Nursery Stock; successful Budder and Grafter. First-class references.—A. B., Mr. Johnstewen, The Nurseries, Coventry.

To Nurserymen.

GENERAL GROUND FOREMAN, PROPAGATOR, and SALESMAN.—Mr. LOCKE, who has completed his engagement with Messrs. Veitch, as above, is prepared to treat either with a London or Provincial Firm. Having acquired the general routine of Propagation from Buds, Grafts, Layers, Hatching, Cuttings, Seeds, and Divisions, is a certain Cultivator of Fruit and Ornamental Trees, Deciduous Flowering Shrubs, Evergreens, Roses, and Conifers, especially variegated Hollies, Magnolias, Purple and Weeping Beech, Weeping Ash, Elms, Salisburias and American Weeping Willow, Variegated Oaks, and Acer polymorphum atropurpureum. From extensive practice he has surmounted the difficulty of procuring in quantity Hardy Variegated Plants, and can supply Plants and Cuttings of the above by the hundred or thousand. Is thoroughly conversant with Work men, the Management and Cropping of Land, the Value of Nursery Stock, and quick in the Execution of Orders. Will bear this former employers; with Messrs. Wheeler & Son, Gloucester; and the late Mr. James Veitch, as General Ground Foreman, Propagator, &c. Many of these will bear the strictest investigation.—12, Hurlingham Grove, Fulham, S.W.

ESTATE AGENCY, with or without the Management of a Home Farm, Wanted by a Gentleman of great experience in every description of Agriculture as practised in Scotland and the North of England. The Advertiser is a good Accountant and a thorough man of business; and also has some knowledge of the Management of Woods and Plantations. Highest references and first-rate security.—BETA, Post Office, Appleby, Westmoreland.

BAILIFF and GARDENER.—Great experience in the Cultivation of the Vine and Pine, and the Management of Woods, the Buying and Selling of Stock, &c., and has held first-class situations as above.—A. B., 48, Cattle Road, Manda Hill, London, W.

To Nurserymen and Market Gardeners.

IMPROVER, with a view to PARTNERSHIP.—Age 28, respectable; has had five years' experience in the business. Good references from former employers.—T. E., 6, Castle Place, Worcester

To the Seed Trade.

SHOPMAN.—A Young Man, who has had five years' experience in the Retail Seed Trade.—JON. S., Post Office, Brechin, N.B.

SHOPMAN (ASSISTANT), also will make himself generally useful in the Warehouse.—A young Man; has had seven years' experience in Wholesale and Retail Agricultural and Garden Seed Trade. Good references.—R. H., Union Street, Leicester.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, Valuer, &c, Goldworth Nurseries (late R. Donald's), Woking, Surrey.

SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER (of the late Firm of T. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description; SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E.

MR. CHANDLER, HORTICULTURAL AGENT and VALUER, Underhill Road, Dulwich, S (late of Forest Hill).

N.B. A small NURSERY to LET, in a good situation, about three miles from London.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS, and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.

Park Fencing undertaken to any extent.

N.B. Plans and Designs for Horticultural Buildings, &c., &c.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

TO BE SOLD, the desirable LEASE and BUSINESS of an old established and well-known NURSERY, situate in a leading thoroughfare, 4 miles from Covent Garden Market; is about 1 acre in extent, and nearly all covered with glass; there is also a spacious Seed Shop, with commanding front, Counting-house, Stable, &c. Lease about 30 years unexpired. This offers an excellent opportunity to an energetic person with some capital, or to a company firm desirous of extending their business to London. Present owner retiring from the business.

Full particulars may be had of F. W. SEARLE, Agent, 6, Bishopgate Street Without, E.C.

SALES BY AUCTION.

Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY and WEDNESDAY, October 17 and 19, at half-past 12 o'Clock precisely each day, choice Double and Single HYACINTHUS, TULIPS, CROCUSES, NARCISSUS, LILIUMS, IRIS, GLADIOLI, and other BULBS, just arrived from Holland, and Lotted to suit the Trade and Private Buyers.

On view the mornings of Sale, and Catalogues had.

Plants from Ghent, and Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, October 22, at half-past 12 precisely, choice CAMELLIAS, AZALEAS, hardy RHODODENDRONS, FERNS, DRACÆNAS, and other plants, from one of the oldest established nurseries in Ghent. Also a fine, fresh collection of HYACINTHS, TULIPS, CROCUSES, NARCISSUS, IRIS, GLADIOLI, and other Bulbs, just arrived from Holland.

On view the morning of Sale, and Catalogues had.

Highgate Hill, N.

IMPORTANT SALE of CHOICE EVERGREENS and other NURSERY STOCK.

MR. JAMES FRASER has received instructions from Messrs. McGrigor & Middlemiss, to SELL by AUCTION, without reserve, on the Premises, the NURSERY, Highgate Hill, N, on WEDNESDAY, October 19, and following day, at 11 for 12 o'Clock precisely, the valuable NURSERY STOCK, comprising about 2000 Euonymus, 5000 Laurel, 2000 Yew, 2000 Portugal Laurel, 800 Box, 1000 Common Laurel, 1000 Aucuba, 800 Laurustinus, 1000 Chinese Arborvitæ, a quantity of Portugal Laurel, Arbutus, Cedrus Deodara, Cupressus Lawsoniana, Wellingtonia gigantea, Araucaria, &c.; Standard and Dwarf Roses, Fruit Trees, Ornamental Trees, including about 200 Black Italian Poplars, Scarlet Chestnuts, Sycamores, Laburnums, Atlantus, &c.; also Hardy Climbers, Irish Ivies (in pots), Virginia Creepers, Yellow Jessamines, Jamesia, &c.

May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneer and Valuer, Maylands Farm, Romford, Essex, E.

Notice.—Postponement of Sale.

To NOBLEMEN, GENTLEMEN, NURSERYMEN, and Others.

MR. H. NASH begs to announce that the SALE of the very valuable and choice NURSERY STOCK, advertised to be SOLD by AUCTION, on the Premises, Worthing, Sussex, on the 4th and following days, is POSTPONED until MONDAY, October 24, and following days, at 12 o'Clock precisely each day, when the whole, as per Catalogue previously advertised, will be most positively SOLD, without the slightest reserve whatever, in order to meet a Deed of Composition.

N.B.—Every reasonable accommodation will be allowed to purchasers for clearing their Lots.

The Lots may be viewed any day prior to the Sale. Catalogues to be obtained at the place of Sale, or of the Auctioneer, Cambridge House, Worthing.

Planting Season.

IMPORTANT to NOBLEMEN, GENTLEMEN, NURSERYMEN, BUILDERS, and OTHERS ENGAGED EXTENSIVELY in PLANTING.

PRELIMINARY NOTICE of FORTHCOMING SALES of NURSERY STOCK.

NOVEMBER 5.—On the Premises, the NURSERY, PHILIP LANE, TOTTENHAM, N.; by order of Mr. Alex. Johnstone.

NOVEMBER 11 and 12.—On the Premises, the KIRKDALE NURSERY, SYDENHAM, S.E.; by order of Mr. George Selby.

NOVEMBER 21 to 26.—On the Premises, the WANDSWORTH COMMON NURSERIES, SURREY; by order of Mr. Robert Neal; a portion of the Stock being reserved for building purposes.

Catalogues, when ready, may be had on the respective Premises, and of Messrs. PROTHEROE AND MORRIS, Auctioneers and Valuers, Leytonstone, Essex, E.

Bagshot, Surrey.

HIGHLY IMPORTANT and EXTENSIVE UNRESERVED SALE of NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Charles Noble to SELL by AUCTION, without reserve, on the Premises, Sunningdale Nursery, Bagshot, five minutes' walk from Sunningdale Station, South-Western Railway, on MONDAY, October 17, and five following days, at 11 for 12 o'Clock precisely each day, a portion of the valuable NURSERY STOCK, including an unlimited variety of choice Evergreen, Coniferous, and Deciduous Shrubs, of remarkable growth and symmetrical form and beauty, viz., 15,000 Common and Colchic and Portugal Laurels, 1 to 5 feet; 8000 Retinospora ericoides, 1½ to 2½ feet; 2000 Cupressus Lawsoniana, 3 to 10 feet; 2000 Retinospora squarrosa, obtusa, and pisifera, 1 to 5 feet; 1000 Thujopsis borealis, 400 T. dolabrata, 3,000 fine Irish Yews, Scandinavians, 3 to 8 feet; 1000 Thuja Lobbi and gigantea, 1 to 8 feet; Araucarias, Wellingtonias, 4 to 7 feet; a quantity of handsome specimen Conifers, 5 to 12 feet; also 5000 Deutzia crenata. The Sale is imperative, about 4 to 5 feet; 3000 Berberis, Andromeda floribunda, 25,000 Rhododendrons, comprising 15,000 hybrid seedlings and 10,000 ponticа, 1 to 4 feet; 5000 choice named varieties, full of fine blooms; Portugal, Common, and Colchic Laurels, Cupressus, 500 Tritomas, clean-grown Fruit Trees, Standard and Dwarf Roses of the best varieties, and thousands of other Trees and Shrubs too numerous to mention.

May be viewed any day prior to the Sale. Catalogues (6d. each, returnable to purchasers) may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

N.B.—The Sale is imperative, about 4 acres of the ground being required for building purposes. The whole of the specimens bear evidence of very skilful pruning, and were all prepared for removal during the autumn and spring of 1869-70.

St. John's Nursery, Woking, Surrey.

HIGHLY IMPORTANT and VERY EXTENSIVE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. Wm. Jackman, to SELL by AUCTION, without reserve, on the Premises, St. John's Nursery, Woking, Surrey (about one mile from the Woking Station, South-Western Railway), on MONDAY, October 24, and seven following days, at 11 for 12 o'Clock precisely each day, the whole of the valuable NURSERY STOCK, which extends over 25 acres, in the present condition for removal, and comprises 80,000 fine Evergreens, viz.:—20,000 Common Laurels, 1 to 3 ft.; 7,000 Rhododendron Ponticа, 9 in to 3 ft.; 3,500 do., hybrid, scarlet, and white Seedlings, 1 to 3 ft.; 3,000 Portugal Laurels, 1 to 3 ft., many set with bloom-buds; 13,000 Green Hollies, 1 to 5 ft.; 5,000 Green and Variegated Box, 1 to 3 ft.; 3,000 Variegated Hollies, 1 to 4 ft.; 2,000 Aucuba japonica, 1 to 2½ ft., with thousands of others; 10,000 Choice Coniferæ, including 1,000 English Yews, 1½ to 5 ft.; 1,000 Junipers, 1 to 4 ft.; 1,000 Cupressus Lawsoniana, 1 to 6 ft., &c. Large quantities of Wellingtonias, Thujas of sorts, Red Cedars, Piceas, &c.; also about 40,000 Fruit Trees of clean growth, consisting of 30,000 Standard, Pyramid, and Feathered Apples, Pears, Plums, and Damsons; 2,000 Wall-trained Nectarines, Apricots, Peaches, Cherries, Plums, and Apples; 2,000 Cherries, 2-yr. feathered; 5,000 Standard and Dwarf Roses, consisting of the best varieties in cultivation; also thousands of transplanted Forest Trees, viz., 40,000 Spanish Chestnuts, 2 to 5 ft.; 20,000 Beech, 1 to 3 ft.; 10,000 Birch, 1 to 4 ft.; 10,000 Spruce Firs, 1 to 4 ft.; 50,000 Larch, 1½ to 2 ft.; 15,000 Scotch Firs, 1 to 3 ft.; 18,000 Pinus austriaca; English Oaks, Ash, Elm, &c. The Stock includes 2,000 Standard Ornamental Trees, Pinetis in the border, and a large stock of Deciduous and Ornamental Trees and Shrubs, Vines in pots, &c., &c.

May be viewed three days prior to the Sale. Catalogues (6d. each, returnable to purchasers) may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Chester.

VERY EXTENSIVE CLEARANCE SALE of FIRST-CLASS NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by the Executors of the late Mr. George Chivas, to SELL by AUCTION, on the Premises, the Eaton Road Nurseries, Chester, on MONDAY, October 24, and five following days, at 11 for 12 o'Clock precisely each day, the whole of the valuable NURSERY STOCK, extending over 100 Acres, and in the highest state of cultivation, including many handsome specimens; the whole in excellent condition for removal. The Stock includes 25,000 Common Laurels, 11,000 fine Green Hollies, 5000 bushy Portugal Laurels, 15,000 Privet, 1800 Variegated and worked Hollies, 8000 Berberis, 1500 Box, 4000 Irish Yews, 2000 Cupressus Lawsoniana, specimen Cedrus Deodara, Araucarias, Piceas, Pinus, 12,000 bushy Rhododendron Ponticа, 500 named Rhododendrons, and many thousands of Evergreens and Forest Trees, also an immense quantity of transplanted Forest Trees, comprising 600,000 Larch, 14 to 24 feet; 100,000 Scotch Firs, 750,000 White Thorn (Quick), 300,000 English Oaks, 80,000 Ash, 50,000 Beech, 20,000 Spanish and Horse Chestnuts, 10,000 Austrian Pines, 25,000 Elm, and thousands of other various; likewise a large quantity of clean-grown Fruit Trees, a large assortment of Ornamental Trees and Shrubs, including 6000 fine Purple Beech, 4 to 10 feet; 3000 Limes, &c.; and a rich collection of Border Plants, &c.

May be viewed any day prior to the Sale. Catalogues may be had (6d. each, returnable to purchasers) on the Premises; and of the Auctioneers and Valuers, Leytonstone, E.

N.B.—F. & M. having visited these extensive Nurseries, especially urge the trade and all large consumers, to inspect them, as it surely occurs that valuable stock is offered unreservedly in such large quantities and in such excellent condition.

Camberwell, Surrey, S.E.

MESSRS. PROTHEROE AND MORRIS are instructed by the Executrix of the late Mr. Wm. Barnes, to SELL by AUCTION, without reserve, on the Premises, the Garden Nursery, Southampton Street, Camberwell, S.E., on WEDNESDAY, November 2, and following days, at 11 for 12 o'Clock precisely each day (unless previously disposed of by private contract), the whole of the valuable NURSERY STOCK, including a choice assortment of Evergreen and Coniferæ Shrubs, a large quantity of clean grown Fruit Trees, together with Standard and Dwarf Roses, a quantity of Herbaceous Perennials, two powerful Boilers, about 10,000 Bricks, and numerous other effects.

May be viewed any day prior to the Sale. Catalogues when ready may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Edgware, N.W.

IMPORTANT SALE of VALUABLE NURSERY STOCK and CHOICE GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Whitchurch Rectory, Edgware, 10 minutes' walk from Edgware Station, Great Northern Branch Line, on THURSDAY and FRIDAY, November 3 and 4, at 11 for 12 o'Clock each day, the valuable NURSERY STOCK, without reserve, a portion of the valuable NURSERY STOCK, consisting of choice specimen Coniferæ and Evergreen Shrubs, Ornamental and Forest Trees, Standard and Dwarf Roses, and Dwarf Roses, together with some choice Greenhouse Plants, &c.

May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Streatham Hill, S.W.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. George Clarke to SELL by AUCTION, on the Premises, the Leigham Court Road Nursery (a branch Establishment), Streatham Hill, S., on MONDAY, October 31, and three following days, at 11 for 12 o'Clock precisely each day, without reserve, the lease having expired and the land being required for building purposes, the whole of the valuable NURSERY STOCK, comprising a large quantity of unusually effective specimen and other Coniferæ and Evergreen Shrubs in great variety, the whole of which have been carefully prepared for removal; also fine Standard Roses, selected Fruit Trees, and a quantity of Greenhouse Plants indoor.

May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Warminster, Wilts.

HIGHLY IMPORTANT to NOBLEMEN, GENTLEMEN, and others PLANTING.

MR. W. ABRAHAM has received instructions from the Proprietor of these extensive and old-established Nurseries (Mr. George Wheeler), to SELL by AUCTION, on TUESDAY, November 15, and following days, the whole of the fine specimen Coniferæ, and other Trees and Shrubs, of remarkable symmetry and beauty, all in excellent health and condition for immediate removal; they consist of Cupressus Lawsoniana, Deodara, Araucaria, Pinus, Weeping Beech, ditto and other Hollies, Yews, also some fine Rhododendrons, Standard Roses, and thousands of other Trees and Shrubs, which will be enumerated in future advertisements.

The Stock may be viewed, and Catalogues obtained, 10 days prior to the Sale, on application at the Nursery, or of the Auctioneer and Valuer, Goldworth Nurseries, Woking, Surrey.

Buscot Park, near Faringdon, Berks.

IMPORTANT SALE to NOBLEMEN, GENTLEMEN, and the TRADE, of an EXTENSIVE and UNRESERVED SALE of NURSERY STOCK.

MR. W. ABRAHAM has received instructions from the Executors of the late A. Campbell, Esq., to SELL by AUCTION, on the Premises, at the Home Nursery, one mile from the Faringdon Station (viâ Uffington and Farringdon branch on the Great Western Railway, on TUESDAY, WEDNESDAY and THURSDAY, November 15, 16, and 17, each day punctually to begin), large quantities of healthy, well-rooted CONIFERÆ, EVERGREEN, DECIDUOUS, and FOREST TREES and SHRUBS, these not being required to plant upon the estate this season. Also 1000 Standard Roses, 1 to 4 feet; 2000 Common and Colchic Laurel, 1 to 2½ feet; 30,000 strong Quick; 30,000 two-years seedling Oak; 5000 Berberis aquifolia; 12,000 Spanish Chestnut; 10,000 Horse Chestnut; 100,000 seedling Quick; 15,000 Spruce; 1000 Thujopsis; 800 Retinospora; 300 Thuja Lobbi; 10,000 Chinese Arbor-vitæ; 3000 Scotch Fir; 15,000 Austrian Pine; 2000 Laurustinus; 2000 Box; 100 Wellingtonia, 3 to 5 feet; 500 Cedrus Deodara, 2 feet; 500 standard Roses; 2000 Pinus insignis, 1 to 4 in pots; Spiræas, Cupressus; 1500 Fuchsias, of sorts, in pots; Aucuba, &c.; also 4 acres of Asparagus, Nos. 1 and 2 Peas.

Full particulars in Catalogues, to be obtained 10 days prior to the Sale, on application at the Nursery, or of the Auctioneer and Valuer, Goldworth Nurseries, Woking, Surrey.

To Noblemen, Gentlemen, Nurserymen, and Others Engaged in Planting.

Extensive SALE of really VALUABLE NURSERY STOCK, now Growing at the STAVELEFORD NURSERIES, NEAT ENNSHAM.

MESSRS. POTT AND NEALE are favoured with instructions from Mr. John Frettingham, to SELL by AUCTION, without the slightest reserve, on WEDNESDAY, October 26, and following days, precisely at 11 for 12 o'Clock, at Stapledon Nurseries, near Sandhurst station, Fresnash Valley Line. The STOCK consists chiefly of the fine single specimen GOLDEN QUEEN, SILVER QUEEN, and purple and GOLD HOLLIES, averaging in height from 3 to 6 ft. to feet; over 1000 STANDARD APPLES, PEARS, PLUMS, &c., from five to six years old, in bearing condition; also a splendid lot of GREEN HOLLIES, PURPLE BEECH, THUJA LOBBII, PORTUGAL LAUREL, WALNUTS, &c.

For buyers to the amount of £10 and upwards may have Three Months' Credit if required.

Catalogues may be obtained on application, by post or otherwise, from 18, Corn Market, Derby; or of the Auctioneers, Wheeler Gate, Nottingham; and 20, Cockspur Street, London, W.C.

Periodical Sale.—Pure-bred Hereford Cattle.

MR. DUCKHAM has been favoured with instructions to SELL by AUCTION, at his next PERIODICAL SALE, to be held in the Showyard, at Hereford, on WEDNESDAY, October 19, at 12 o'Clock precisely, being the Second Day of the Show of the Herefordshire Agricultural Society and great October Fair, about ONE HUNDRED HEAD of useful BULLS, COWS, HEIFERS, and Choice SHOW STEERS, from the Herds of great celebrity.

Catalogues now ready.—50, Broad Street, Hereford.

Weston Park, Shipston-on-Stour.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has received instructions to SELL by AUCTION, without reserve, on TUESDAY, October 18, at Weston Park, immediately after the sale of the choice Herd of Shorthorns belonging to the Right Hon. Lord Bateman, a SUPERIOR and WELL BRED YOUNG BULL, the property of H. J. Sheldon, Esq., of Brailes House, that are well worthy the attention of purchasers of first-rate blood, descended as they are from the favourite Knightley and Kirklevington strains.

Catalogues, with Pedigrees, may be had of Mr. STRAFFORD, 13, Hatton Square, London, W.; or of Mr. SHELDON, Brailes House, near Shipston-on-Stour.

Important Sale of Shorthorns, at Scaleby Castle,

NEAR CARLISLE

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on THURSDAY, October 20, at Scaleby Castle, Carlisle, a valuable selection of pure-bred SHORTHORNS from the first-class Herd belonging to James Fawcett, Esq. This stock has been bred from the Princess blood for fully half a century, and the greatest attention has been given to the milking qualities. Of late years some very fine and high-priced animals have been added to the Herd from the best and most fashionable stocks in the kingdom. The sires in use during the last five years have been 14th Duke of Oxford (24,605) from Holker Hall, and Royal Cambridge Rose, *alias* Royal Cambridge Hand (27,358), by Grand Duke 4th, from the celebrated Cow Moss Rose.

Catalogues, with Pedigrees, may be had at Scaleby Castle, Carlisle; or of JOHN THORNTON, 15, Langham Place, London, W.

HIGHLAND and AGRICULTURAL SOCIETY.—CERTIFICATES in FORESTRY.

The EXAMINATION of CANDIDATES for the SOCIETY'S CERTIFICATES in FORESTRY will take place in the HALL, No. 3, GEORGE IV. BRIDGE, Edinburgh, on THURSDAY and FRIDAY, November 3 and 4.

Candidates must lodge intimation on or before 31st current, with the Secretary, from whom further information may be obtained.

3, George IV. Bridge, Edinburgh, October 11, 1870. DAVID MILNE, Secretary.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870.

THE ROYAL BERKSHIRE ROOT SHOW, Open to all Root Growers in the United Kingdom, will be held on SATURDAY, the 5th November next, when SILVER CUPS and other PRIZES to the Value of FIFTY POUNDS will be awarded for the best specimens of MANGEL, SWEDES, TURNIPS, KOHL RABI, &c.—For full particulars apply to

SUTTON AND SONS, Seed Growers, Reading, Berks.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, DOMESTIC POULTRY, CORN, ROOTS, and IMPLEMENTS will be held in BINGLEY HALL, on TUESDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.

Prize Lists, Certificates of Entry, and every information may be obtained from the Secretary.

The ENTRIES CLOSE on TUESDAY, November 1.

JOHN B. LYTHALL, Secretary.

Offices—39, New Street, Birmingham

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and Four following Days.

Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under

CATTLE—Form A For an OX or STEER (in any Class).
" B For a COW or HEIFER (in any Class).
" C For a BEAST in Extra Stock.
SHEEP. " D For a Pen of three WETHERS
" DD For a Pen of three LAMBS [Stock.
" E For a SINGLE WETHER SHEEP in Extra
PIGS. " F For a pen of three PIGS (in any Class).
" G For a SINGLE PIG in Extra Stock.

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.

Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr. DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Piccadilly, London, W.

N.B. All communications respecting the Show must be addressed to the Assistant Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.

SATURDAY, OCTOBER 15, 1870.

NOT one of the English Agricultural Society's Journals of late years has had so good a chance of being read as the very excellent number which has just been issued by its accomplished Editor, Mr. H. M. JENKINS. The opening pages contain the report by which the Oxfordshire prize farm award is justified; and a competition of such general interest, with a result in many respects so startling, will ensure a wider agricultural publication for this essay, by Mr. HALL KEARY, the reporter, than anything of a strictly professional character addressed to English

farmers has probably ever hitherto received. A volume of which the first 25 pages are filled with so interesting a statement, will probably be read throughout; and its other contents are so various, so useful, and so good, that we doubt not the Editor has thus secured a large permanent addition to the body of regular readers of his periodical.

Mr. KEARY'S report gives a simple and practical, but rather scanty account of the three prize farms, and shorter notices of those which have been commended. In this way six out of the 21 competitors are referred to. Of the others, 13 are unnoticed; Mr. LATHAM is named as especially praiseworthy for the summer management of his flock, and one other is signalised by an elaborate description and condemnation of the system which he has followed. Of course the force of the lesson taught us by the bepraised success is strengthened by the contrast offered in the case condemned; and Mr. HALL KEARY, who is dispassionate throughout, has not hesitated to express the opinion that the "patient continuance in well doing" under the old-fashioned rules of alternate husbandry, of which the 1st prize farm at Ash Grove has been for many years the scene, has stood the test of a difficult season better than the smarter style, harder cropping, and generally more artificial methods of what may be called, by way of contrast, "modern farming." He says:—

"I doubt whether upon light thin soils the alternation of green and white crops can profitably be departed from. The inspection of the 21 competing farms has impressed me strongly with the opinion that it cannot. For not at Kirtlington alone, but on several other occupations where the history of light and inferior corn crops could be traced, it was invariably found that an exhausting system had previously been pursued. On more than one farm which we examined, deep and excellent steam-cultivation had been relied upon to grow repeated crops without manure, and, although on good strong soils this may answer for a time, I believe that in the long run the true system is to endeavour to keep as much stock as possible, and not to grow corn upon too many acres. Stock must and will pay in this meat-consuming country, and the more stock a farmer keeps, the more he will have of that fertilising matter wherewith to produce his cereal crops in the greatest perfection."

We are not by any means certain that the test of an extremely difficult season is so safe as the test of an average season, by which to determine with certainty the relative merits in the long run of different styles of farm management. No doubt, however, it is instructive to observe how varying modes of managing light and shallow soils answer in a drought; and a fuller statement than Mr. KEARY has been able to give us of this year's results at Ashgrove and at Kirtlington respectively would be most instructive. It is perhaps too much to assume, from the official report, that these two farms stand respectively the first and last in the opinion of the judges upon the scale of merit covered by the several competitors; but the latter is the only one, the guiding principle of whose management is distinctly condemned by the reporter; and, having lately walked over both the Kirtlington and the Ashgrove farms, we may do some service by comparing them in some of those particulars on which the justification of the award regarding them must depend, and by which the character of farm management generally is determined.

Ashgrove and Kirtlington farms are within a few miles of each other. Situated under the same sky, and resting on very much the same subsoil, consisting of very similar soil as regards both depth and quality, extending over very nearly the same number of acres, and held on very similar terms from their respective landowners,—they are especially adapted for comparison. Most of the land is in both cases held under a 21 years' lease, of which in each case six years are unexpired; and in both cases perfect freedom of cultivation is permitted up till within four years of the end of the lease, after which time the four-field course of cropping is directed. In the one case the tenant has used this liberty, in the other he has farmed throughout upon the four-course system; and this is the point to which our remarks must to-day be confined.

A detailed report of each will be given hereafter, meanwhile just consider what the two farms do to feed the country—the one holding on confidently and with great success to the old-fashioned style, the other regardless of rotation and using whatever means seem best adapted for a profitable 21 years' holding.

At Kirtlington, out of 923 acres, no fewer than 660 acres are in grain crops, only 116 acres in Clover and Sainfoin, and 147 in roots. At Ashgrove, out of 820 acres of arable land, about 400 acres are in Wheat and Barley, 200 are in roots, and 200 are in seeds. In both cases the land is clean and the crops are good. At Kirtlington we saw 40 acres of magnificent Mangel Wurzel crop, 80 acres of a very even plant of Swedes, some already ripe and some still growing, everywhere a fair crop. The grain was all in rick; 178 acres of a satisfactory Wheat crop had been taken after Clover, Rape, and Peas; 330 acres of Barley had been taken, half after roots and half after Wheat or Oats; 80 acres of Oats were after Mangels, Swedes, and Wheat; 30 acres of Beans after Barley, 42 acres of Peas after Sainfoin and Barley.

At Ashgrove there was a noble row of ricks, containing what had been a capital crop of Wheat and a fair crop of Barley. There were 200 acres of Swedes and Turnips, well covered with what was everywhere a clean and satisfactory, and in most fields a still growing, crop; there were a few acres of good Mangel Wurzel; and the seeds were being manured and ploughed up for Wheat.

In order to maintain the crops at Kirtlington, upwards of £2000 worth of cake and other food for stock is every year consumed upon the farm, and £800 worth of artificial manures is applied. The consequences are, (1), that fair crops for the soil (3½ qr. Wheat, 8 qr. Oats, and 5 qr. Barley per acre) are commonly obtained; (2), that from 20 to 30 tons of bacon are made every year upon the farm; 90 beasts bought in at £14 a-piece are sold out fat at prices between £24 and £30 a head, and upwards of 600 fat sheep are sold off every year; and (3), that a sum, upwards of £2000, is paid annually as wages. This is all done on 1000 acres of the comparatively poor, shallow soil of the Oxfordshire Oolit, on farms admirably equipped in respect of buildings and cottages, and roads and fences; and the judges state that on their first visit they were much struck with the general appearance of the land, its large fields, its clean cultivation, its straight drilling, and the business-like system of management which pervaded the whole concern.

Nevertheless, this is the farm whose management is condemned. "We were not prepared," says Mr. KEARY, "to see so many acres of very light and inferior corn in the month of July." Refusing the explanation afforded by the exceptional drought—putting the whole down to an alleged exhaustion of the land owing to its severe cropping, and in spite of its liberal feeding, the judges hold up Kirtlington for condemnation. We are inclined to believe, nevertheless, that its system of farming which involves so large an expenditure on cattle food and manures, combined with a large proportionate area of corn cropping, and the liberal cultivation of a comparatively small extent of root crops, will survive the blow thus given to it; and that agricultural improvement will follow the line of Kirtlington rather than that of Ashgrove.

Let us not, however, be supposed to cast a slight on the excellent farming of which Ashgrove is so good an example. The 800 or 900 acres here in hand have this year yielded 120 acres of good Wheat, 280 acres of Barley, 185 acres of capital Swedes and Turnips, 16 acres of good Mangels, 200 acres of seeds—mixed grass and Clover—and 80 acres of old grass land. For the meat produced you have the produce of 400 ewes, with occasionally a purchased winter flock—some 400 fat sheep being sold every year, yielding £800 worth of mutton we were told. There is also the produce of 15 breeding sows sold as stores, and some 25 beasts bred up upon the farm are also sold every year in store condition. There is every year a purchase of £1000 to £1200 worth of cake and corn, and about 40 tons of superphosphate. The labour bill is £1200 a-year, or 30*s.* an acre. The farm buildings, like the farm throughout in good order, are yet incomplete and ill designed—the accommodation for labourers is in neighbouring villages.

We do not care to consider or decide, between the tenants of these farms, who may have the greater claim for praise on the score of clean, industrious, business-like, or money-making management; but there can be no doubt whatever that it is cultivation on the former of these plans that alone has any chance of providing sufficient food for England. And we very much regret that, while an award has been made by which a very good and profitable style of farming has been singled out for commendation, Kirtlington, which in almost every particular represents far more accurately than Ash Grove, not only the direction in which agricultural progress is certainly advancing, but the advances which it has actually achieved, should alone, of all the competing farms, have been named by Mr. KEARY as deserving condemnation.

THE appearance of smallpox among sheep landed at Plaistow Wharf from Hamburgh last week, is evidence of the facility with which infectious diseases of animals may extend from those centres of infection which exist in various parts of the Continent. The present circumstances render the carrying out the necessary precautions almost impossible.

In reference to sheep-pox, it may be remarked that vague reports have been current for some time past, respecting the existence of the disease among sheep in Friesland, and the terms in which the statements have been made have been generally calculated to convey the impression that the disease was widely prevalent in the district. It appears, however, that sheep-pox has only one centre in Friesland,—in fact, so far as the information extends, the disease would seem to be confined to one flock; there is no report of its having extended beyond the place of its origin, and as the usual means have been employed to prevent the propagation of the malady, it will probably remain confined to that locality.

Nothing has been ascertained respecting the cause of the outbreak; but the sudden appearance of the disease in a place where it has not been known to exist for years, justifies a suspicion at least that the owner of the flock may have been induced to adopt the system of inoculation which is practised in Saxony. Be this as it may, it is not to Friesland sheep that we owe the last introduction of Variola ovina. The infected cargo was shipped at Hamburgh, and consisted of a mixed lot of 248 German sheep, which had doubtless been collected from various parts of the country. To what extent sheep-pox prevails among the flocks which are following the Prussian army it is quite impossible to say; most probably the disease excites but little attention. It is not, like cattle plague, a deadly malady which arouses apprehension on account of its ravages; sheep-pox among foreign sheep is often very mild in its attack, and animals which are covered from head to foot with papular eruption may be seen grazing with apparent unconcern, while the disease passes through its several stages. English sheep, when brought in contact with foreign animals affected with the mild form of smallpox, do not experience the disease in a mitigated form; on the contrary it has been remarked that the most virulent attacks are sometimes due to transmission of infection from animals which have only suffered slightly from the disease. Sheep-pox has been known to prevail for some time past in the neighbourhood of Stettin, and lately it has manifested a tendency to spread. It is not, therefore, difficult to account for the presence of infected animals as far west of the centre of infection as Hamburgh, nor would it be a matter for astonishment if the disease should reach Holland and Belgium. At present, however, those countries are free.

Cattle plague prevails extensively in various parts of Germany. In Hanover, at Schwerin, and the surrounding districts, the disease has spread to an extraordinary extent. Pomerania, especially the districts of Stettin and Stralsund, has experienced the disease in its utmost virulence. Dresden is reported to be nearly free, at least it may be allowed that the disease has considerably decreased, but in many districts around the town it continues to commit serious havoc among the herds.

All the measures of sanitary police which can be applied, with the present command of means, appear to have been adopted, but our own early experience of the cattle plague was sufficient to prove the utter uselessness of partial restrictions. Slaughtering the diseased cattle, and leaving the infected, although it may be apparently healthy animals alone, is at best an unsatisfactory method of dealing with the affection and a very imperfect form of the stamping-out process, yet under the present circumstances it is scarcely possible to carry out more energetic measures; so long as cattle are capable of following the course of the marching armies, it is not likely that they will be destroyed merely on sanitary grounds. In Thursday's *Times* a telegram from Saarbruck announced that cattle were then dying of the plague faster than they could be buried.

The great success which Prussia has always had in stamping out the disease whenever it has crossed her eastern frontier was mainly due to the establishment of the military cordon. Now that this precaution cannot be adopted for obvious reasons, there is practically no effectual remedy against the extension of the disease.

Importation of German and French animals into the port of London has not yet received any check, in fact the importers seem determined to test the arrangements which have been made at Plaistow Wharf by every means in their power. There are many complaints of want of accommodation, but we have not heard that any suggestion for improving the lairs and slaughter-houses has been made by those who are concerned. If the object of the importers is to obtain a relaxation of the restrictions, which are doubtless productive of some inconvenience, they are taking a great deal of trouble to little purpose; with cattle plague more extensively spread on the Continent than has been known in this generation, no reasonable case can be made out for the removal of prohibitions on which alone we now depend for our own security against another invasion of the pest.

—— There was a short supply of Wheat on Monday in Mark Lane, and it sold readily at the full prices of the previous week. On Wednesday there was no alteration of prices.——In the Metropolitan Cattle Market, on Monday, there was a ready sale for all descriptions of stock, at rather higher rates. On Thursday, also, notwithstanding an abundant supply of cattle, an early clearance was effected at fully Monday's prices for beef. In the sheep market the demand hardly sufficed. Prices were somewhat lower, and a considerable stock was left unsold.——In the seed market inactivity characterises the agricultural trade, the consumptive demand having ended.—— Concerning English Wool, it is reported that "during the week the market was well sustained for good wools; inferior grades, and most descriptions of skin wool, much sought after; medium grades in limited request."

—— In reference to a paragraph in this place last week on the second growth of the Potato crop, Mr. Thomas Scott, of Knaphill, Surrey, has sent us samples in which young Potatos have clustered close around the tuber, of this year's growth—poor themselves, and impoverishing those from which they have sprouted. They are Scotch Regents, planted in April, and are now being harvested, yielding 8 tons per acre. Dalmahoy Regents planted so late as May are not nearly so bad with second growths as those planted a month earlier, and they are yielding 9 tons an acre.

—— The Uses of Agricultural Societies were well illustrated by the Earl of Derby at a late meeting of the Royal North Lancashire Agricultural Society:—

"As long as there are two ways of doing anything, a right way and a wrong way; as long as weeds and Rushes grow in English fields—and as I looked out of the windows of the railway carriage I saw a good few of them, even in Lancashire; as long as the earth which we want to have properly dug into and ploughed, and the wholesome light and air let into it, is in some places—and I have myself seen such places—just scratched on the surface, as if the people who had to do with it were afraid of hurting it; as long as all the dirt and refuse of the towns, which even the Chinese know how to put back upon the soil, is turned into our rivers to poison them, and then allowed to drift out to sea in order to show the very fish what fools we are; as long as we have waste land growing nothing but Gorse and Thistles, and waste labour, or what might be and ought to be labour, waste—hands that ought to be labourers' hands running into idleness, and through idleness into mischief; as long as all these things last, and they will last our time—because bad ways take a deal of mending—so long, I say, there will be a need for, and a use in, shows and gatherings, and meetings and exhibitions of this kind. I don't speak of the pleasure they give in a social way, because that we can all realise; but we can very well understand that if a man does not go from his home more than once in six weeks or a couple of months, except to church or to market, he is apt to think—all people do it who have not the opportunity of comparing themselves with their neighbours—that there are no cows like his cows, and no crops like his crops, and no pigs like his pigs, and that his farm is a model farm generally, and that all his geese are swans. It is no use to tell a man when he is in that way that other people do a great deal better than he does: in the first place he don't like it; and in the second place he don't believe you. But seeing is believing; and a man of the kind I have been mentioning goes home from a show of this sort with some of the conceit knocked out of him; and instead of that, some of those uncomfortable but useful things—new ideas, inserted into his brain. What an exhibition of this kind is meant for, what it has got to say to all or any of us who have anything to do with farming, is just this:—'My good friend, you think you are doing very well with that bit of a holding of yours, and perhaps you are; but just look here, and here, and here; just look at that pig, and that cow, and that labour-saving machine, and that bunch of Turnips, and that lot of Potatos, and you will see that, clever as you think yourself, you might manage a great deal better.' Well, that is the plain English of it."

—— The Rev. C. F. Watkins, of Brixworth, thus writes to the *Times* on the use of Acorns and Horse Chestnuts for feeding cattle:—

"They are equally valuable for pigs and sheep. The scarcity of grass and hay and the mildew among the Turnips render the abundant crop of Acorns a valuable substitute in part in the present scarcity of their more accustomed food. The Horse Chestnut, though little known as such, is a most agreeable food for cattle, and increases the milk in cows; they greedily devour them."

To this we append a memorandum on the experience of 1868 on Acorn feeding, extracted from the "Journal of the English Agricultural Society:"—

"Acorns, crushed or ground, and given with other food, have helped to eke out the more costly supplies of meal in mixturns with roots and fodder. Mr. J. J. Rowley, referring to the practice of Mr. John Woods, the Duke of Portland's agent, says, that after being passed through a close linseed cake mill, they were given to sheep with advantage, at the rate of a quarter of a pound a-piece daily, along with cut hay and chaff, and other dry food. And 'A Suffolk Farmer,' writing to the *Times*, in October last, said that he was then giving 42 score of sheep one pint of Acorns a-piece daily, with half a pound of cake, chaff, and a few Turnips; and, paying women and children 6*d*. per bushel for collecting them, he expected them to collect more than 200 sacks, besides sending 25 score of ewes round the outside of the farm to help themselves. These were folded at night on a field of Beet-tops, and were doing well. He considered one pint of Acorns equal to a quarter of a pound of cake. On the other hand, whether from Acorns or Horse Chestnuts—almost certainly from one or other—there was last autumn a great deal of fatal illness among cattle grazing in the fields, especially in the county of Kent, but also in the Hertfordshire, Warkwickshire, and other wooded districts. And this the veterinary authorities attributed to the consumption of excessive quantities of so indigestible a food."

OUR LIVE STOCK.

CATTLE.

The Churchill Heath sale on the 4th inst. was not rendered remarkable by high bidding, although the fair average of £36 3*s*. 5*d*. was realised over 58 head of cattle. This was a draft sale, and no very young animals were offered. After lunch Mr. Strafford commenced his duties by offering *Ruby* by Duke Valorous (15,951), and in calf to Royal Butterfly 20th, which was sold for 27 gs. to Mr. Parker, of Banbury. *Panacea* (lot 2) was sold for 25 gs., and lot 3 for 27 gs. *Pink* by Royal Oak (16,870), a fine, deep, well-ribbed cow, was sold for 37 gs. to Mr. Majoribanks. *Rose of Spring* by Lord Elgin (18,230), was bought by Mr. Cutler for the same sum. *Precedent* by Cynric (19,542) became Mr. Mace's property at 46 gs., and the same purchaser secured *Paradox* by Cynric, and of the "Pye by Newnham" family, for 39 gs.; and *Pandora*, similarly bred, for 38 gs. These moderate but respectable figures were not excelled until *Pride of the Heath* by Cynric, the 1st prize at Taunton, and the reserve number at the recent Oxford meeting, made her appearance; she is a deep, massive, broad-loined cow, with good shoulders and a nice head, just in her prime, and six months gone in calf to Royal Butterfly 20th; Mr. Savidge became her owner for 77 gs. *Garland*, by Duke of Towneley (21,615), was bought by Colonel Lindsay for 50 gs. *Bessy* was knocked down to Mr. Curtler for 44 gs., although on the eve of calving to the Butterfly bull before-named. Next came *Duchess of Towneley*, by [the Duke of the same name, and from *Donna Inez* by Gondomar (17,985), a nice-headed and very good cow, which succeeded in making the highest price of the day, namely, 85 gs., given by Mr. B. Baxter. The sale of two more young cows at 35 gs. each, made room for *Lady Lavinia* by Duke of Towneley, the 1st prize cow at the Royal meeting at Oxford. Mr. Savage purchased her for 75 gs. Among other good prices may be named 50 gs. for *Rosa Niblett*, from Mr. Curtler; *Lady Godiva* brought 40 gs. from Mr. Edwards; *Genevieve*, 50 gs. (Mr. Majoribanks); *Bertha*, 40 gs. (Mr. Curtler); and *Pattern*, 40 gs. (Mr. Majoribanks). Royal Butterfly 20th was reserved at 150 gs., and Ringleader by Duke of Towneley's Aide-de-Camp (23,797) was sold to Mr. R. Garne for 50 gs. The animals were selected from the well-known herds of Messrs. Garne & Son, of Broadmoor, and Mr. George Garne, of Churchill Heath.

—— Last week was remarkable in the Shorthorn annals of Gloucestershire—Tuesday, Wednesday, and Thursday each being occupied with the sale of some favourite and widely-known herd. It yet remains for us to notice the dispersion of the Sevenhampton cattle and pigs, so long associated with the late Mr. Wm. Hewer's name. The sale, which was conducted by Mr. Thornton, of London, commenced with the pigs, a famous and old-established race, the parent stock of some well-known herds of the purest Berkshire sort. The pigs were indeed the great attraction of the day, and drew long prices both from home and colonial breeders. The young sows were especially admired, as is shown by the following account of prices. Four hilts, farrowed January 2, made on an average 13 gs., the highest price being 15 gs., given by Mr. Beattie, of Canada. Three sow pigs, farrowed March 18, averaged nearly 13 gs., the highest figure, 15½ gs., being given by Mr. Leney, of Kent. Seven hilts, farrowed May 18, realised 12½ gs. each, Mr. Watts giving 15 gs. for one of them; and four hilts, farrowed July 15, made 7 gs. each. Mr. Clarke, of Maidenhead, bought an excellent 9 months old boar for 21 gs., and Mr. R. Chaloner secured another of the same litter at 18½ gs. Mr. Looker bought a six months' old boar for 16 gs., and Mr. Beattie secured another for 12 gs. "Sennington Lad 5th," the sire of much of the highest priced young stock, was sold for 9 gs. to Mr. Burbidge. Next followed the lunch, after which the company assembled around the cattle ring. No remarkable prices were elicited, and in the first seven lots only one brought 25 gs.; 31 gs. for *Nell* by Viscount Killerby (19,081), brought by Mr. G. Hewer, continued to head the list of prices until *Nanny* (lot 21), by Lord Lennox, was sold at one guinea more, and this was the highest price given for females. In the bull sale 71 gs. was given for Bothwell (25,661), bred by Mr. Torr, by Lord Blithe, and from *Blink Bonny* by Booth Royal (15,673). He became the property of Mr. Beattie, who purchased him for Canada; 36 gs. was a good price for Jupiter by Examiner (26,114), as a seven months' old calf, as was also 32 gs. for Jeweller, by the same bull, and out of *Jewel* (lot 12) by Viscount Killerby. No other noteworthy prices were given for bulls. The 70 cows and heifers disposed of made an average of £21 7*s*. 6*d*., and a total of £1496 5*s*., and 17 bulls averaged £24 15*s*. 4*d*. each. The entire proceeds of the cattle sale were £1917 6*s*., and the general average per head £22 0*s*. 9*d*.

—— On Friday of last week a very large company assembled at Branches Park, near Newmarket, to witness the sale, by Mr. John Thornton, of a portion of Lady Pigot's celebrated herd of Shorthorns. In all, 21 females and 9 males of all ages were thus disposed of, owing to the diminished extent of the land in Lady Pigot's occupation. The following is a summary of the prices realised:—

		Average.		Total.
21 cows at	£40 12 0 =		£378 12 0
9 bulls at	21 14 0 =		193 6 0
30 head of cattle at ..	£9 2 7 =		£1173 18 0

Among the principal prices given were £105 for *La Belle Hélène*, and £168 for Mantalini 2d, both of them now the property of W. J. N. Angerstein, Esq.

—— An error unfortunately crept into our report of the Badminton sale last week. It is there wrongly stated that the four members of the "Darlington" tribe were purchased at high prices for Mr. D. R. Davies. They were purchased for Mr. R. P. Davies.

SHEEP.

In reference to a notice of the sale of Shropshire sheep at Shrewsbury the other day, we quote the following paragraph from the *Midland Counties Herald:*—"As a misapprehension might arise as to the value of the ram 'Mainstay,' quoted from the *Herald* of September 30 to have been sold at a low figure at Shrewsbury on the 27th ult., we append a short statement of his career. Bred by Mr. Masfen, at Pendeford, in 1864, he was let in 1865 to the late Mr. H. Osborn, at 10 gs; in 1866 to Captain Berkeley, at 16 gs.; in 1867 he went at 30 gs. to W. O. Foster, Esq., M.P., at Kinver Hill, where he remained till the spring of 1870, when Mr. Nock, of Sutton Maddock, became the possessor of him. We are informed that 'Mainstay' has now been slaughtered."

HOWARD'S TURNOVER PLOUGH, 1870.

The Bedford one-way plough, which gained the 1st prize at the Peterborough Agricultural Society's trial last week, is a great improvement upon the original, both as to field performance and principle of construction. In the field it makes equally good work in comparison with their common ploughs, which have gained prizes at the Leicester and Newcastle trials of the Royal Agricultural Society of England in 1868 and 1864; the work of the old plough was, on the contrary, inferior. The new principle of fixing each body rigidly to the beam and the mode of turning the right-hand body and left-hand body at the land's end, are free from the shortcomings of the old plans of fixing the bodies and turning from right to left.

The annexed illustration, fig. 248, shows a furrow side view of the new plough, and the improvements made involve two new principles of mechanism and action, viz. (1), the fixing of the two bodies and two coulters to opposite sides of a double rotating beam, with two centres, one in the fork of the handles and the other in the framing of the wheel carriage; and (2), the changing from right to left and left to right at the headlands by the pull of the team in turning will readily be understood. The fixing of the bodies and coulters are so plainly shown in the engraving as to require no explanation, and the same may be said of the adjustment of the wheel-carriage and wheels for different depths and for right and left hand work. The change at the lands' end is effected by the ploughman pulling back the handle, by which a rod, seen on the furrow side, relieves a catch immediately behind the wheel carriage, when the onward movement of the horses in turning right or left, as the case may be, turns over the beam, thus bringing into working position

the opposite body and coulter. This is effected by the point to which the team is attached by the short chain, shown hanging in front, this point being below the two centres of rotation, the distance below forming sufficient leverage for this purpose.

In the old plough, first shown for steam-ploughing in 1856, the opposite bodies rotated on a fixed beam, and at the headlands it was difficult to change from right to left, and *vice versâ*, without the assistance of a second person; whilst in the field, whether hauled by steam or horses, the implement never approached equality of work with the common Howard prize ploughs even when new from the manufactory, and with the tear and wear in the centres of rotation the work of course got worse and worse.

It is thus as easy to account for the defects of the old plough in mechanism and performance as it is to show the improvements effected, now that we see the new implement successful in the trial field. Thus the horses haul at an angle with the sole of the plough, so to speak; the breast forms another angle laterally, this being necessary to turn the furrow-slice. There are, therefore, three forces involved,—the tractive force of the horses in hauling, and the two resistant forces of raising and turning the furrow-slice. Now as these three forces meet where the body is fixed to the beam, the improvements effected by having the body rigidly fixed at the point where the three forces meet will readily be understood, as will also the shortcomings of the plan of rotation at this point. In other words, the body must be rigidly fixed to the beam to meet the adverse forces of ploughing; and with regard to the change at the land's end, the new plough, instead of requiring somebody to assist the ploughman, may, practically speaking, be said to be self-acting, as the back pull of the ploughman is chiefly effected by stopping an inch or so before his team; the manual labour required being thus *nil* or next to *nil*.

We confine our remarks chiefly to the above two principles, the minor details of mechanism in working them out being subject to various modifications, as soil and circumstance may require. The engraving (fig. 248) is from a photograph of the prize plough, which appears to suit the land about Peterborough, and which may be seen any day successfully at work. It is, however, made with different forms of breasts, &c., so that those who wish to become practically interested in one-way ploughing have only to ask the manufacturers for an ocular demonstration, so to speak, of what best suits them, just as with other ploughs.

With regard to one-way ploughing, much may be said in its favour. We have often heard farmers in Kent express much surprise at questions being raised to the contrary, and the fact that the clumsy turnwrist plough remains in the field to this day, is not the least potent argument in its favour. That much of the turnwrist ploughing in Kent is out of date, although a common argument, is beside the question, for such may be balanced by an unequal if not greater amount of bad work done by more than old-fashioned farmers with the common right-hand furrow-plough. And the argument of a kindred character to the above may here be likewise disposed of, viz., "that the numerous one-way ploughs recently made prove a growing opinion in favour of one-way ploughing." On the other hand, the advantage of a level surface for mowing and reaping machines is almost a too common-place argument to admit of more than a passing observation. The progress of the movement in favour of one-way ploughing has a deeper foundation than this—for open furrows are attended with shallow, and often unmoved crowns of ridges, and the deeper we plough the more objectionable both become. Both, too, involve extra labour to man and beast; and as thorough drainage and the use of artificial manure, with deep tillage and economy of labour, are found necessary to make the most of the land, it is easy to understand the stimulus which such facts are giving to one-way ploughing.

The importance of the subject, some no doubt may say, demands a closer examination of both practices than is given above. There is much truth in this. Let us take the old first. The open furrows and shallow ploughings at the crown of the ridges, from unequal exposure to the weather and depth of staple, generally produce corn and straw of different quality, consequently when broken down by heavy storms of wind and rain the crop is laid in different directions, which is tenfold more against the reaping-machine in harvest than the crossing of the furrows. And when the loss sustained in harvesting is added to the deterioration in the quality of the corn and straw and the reduction of quantity, the sum total amounts to far more than many imagine. To reduce the number of open furrows and shallow ploughed crowns, the breadth of the ridge is increased, but this mode of reducing one objection increases another, viz., the empty travelling and trampling of teams, sledging of the ploughs, and waste of time on the headland; and besides this extra trampling on the headlands there is much trampling of the ploughed land in ridge-and-furrow practice.

Compared with ridge-and-furrow work the advantages of one-way ploughing may be told in few words. The furrows are all ploughed to a uniform depth and breadth. There is no empty travelling or sledging of the plough on the headland, comparatively speaking, and no trampling on the ploughed land whatever. Should the season or circumstances so require, the seeding of the ploughed land may be kept close up to the ploughs, and the manuring in advance of them. The growth of straw is uniform in quality on land of uniform staple, yielding a greater produce of corn of a finer sample. The crop is stronger and less liable to be broken down in bad weather, and when laid it is generally in one direction, when equally exposed to the weather in large open fields, and consequently more easily cut in harvest. And more than all this, for the straw stands up better in the stook, is sooner ready for the stackyard, and is more easily threshed, whilst the stubbles are in a better condition for autumn fallowing. Such advantages, when summed up, are greatly in favour of one-way ploughing.

This conclusion in favour of one-way ploughing, with its *per contra* of ridge-and-furrow shortcomings, naturally brings us back to the Peterborough Society's trials, and the propriety of extending them to other counties. If we visit Kent, where one-way ploughing is appreciated at its practical value, the dynamometer will indicate a saving of some 50 per cent. of horse-power in favour of the implement illustrated in competition with the old turnwrist ploughs in use. The Bedford plough is also more easily adjusted at the land's end, and makes far better work; so that when such odds are summed up, the total gain is something considerable. *W. B.*

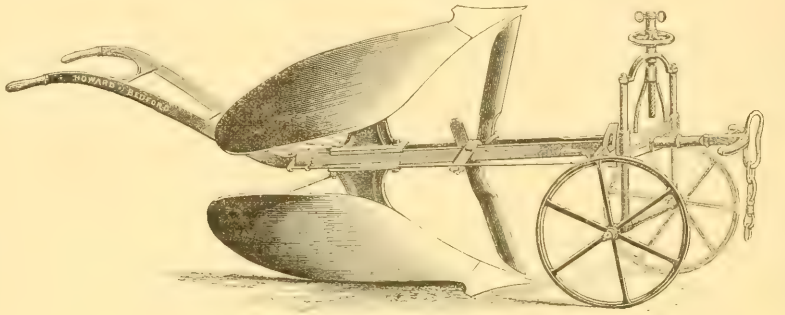

FIG. 248.—HOWARD'S TURNWRIST PLOUGH.

EXHAUSTION BY OVER STIMULATION.

I CANNOT agree with your correspondent "Cler," p. 1328, that this is a metaphysical subject, unfit for discussion in the pages of an agricultural journal. On the contrary, it is a subject of the highest practical importance, and affects the practice and influences the returns of the farmer at all points. Probably, indeed, "Cler" only referred to one illustration of your correspondent "P.," viz., that great men had often degenerate sons; and it was this point, the assumed inability of great men to transmit their mental pre-eminence to their offspring, that he thinks unfit for your pages.

Be that as it may, I am grateful to "P." for challenging my opinions, for I can conceive of no subject more likely to be more useful to your readers than one that advises them how to grow the weightiest grain and roots, and breed the best stock. Such mighty issues are involved in the question—whether or not over-stimulation, as Mr. Ross puts it, leads to exhaustion.

An apology is also due to "P.," Mr. Ross, and your readers, for the time that elapsed between the reading of his paper and my commenting upon it. My remarks were written directly it appeared, and when the subject was fresh to your readers. I invite, however, those who are interested in the subject to re-read Mr. Ross's excellent paper, and the discussion thereon, at the West Cumberland Farmers' Club, as given at pp. 1074, 1075 (1869).

Those who have not the number by them, may safely accept "P.'s" version of the matter. There were many points of interest in Mr. Ross's paper. The points I took exception to were such as this—that our "root crops and cereals are cultivated beyond their natural powers of production" (p. 1074, col. *b*, 1869). On sowing seeds from those over-stimulated roots, the next year's produce are blanky—finger-and-toed, with some tiny worms along with them (p. 1074, col. *c*). Mr. Ross then proceeded to ask, whence this degeneracy? The answer is decisive. "How or why," it is asked (p. 1074, col. *c*, 1869), "have we got so soon from a crop of giants to one of dwarfs?" "The first crop is the result of forcing the plant beyond its natural limits, and the second is the result of the waste of that force by so much as was overdrawn by the first." From these statements, the inference I draw at p. 1200 seems irresistible—that size is held by Mr. Ross to paralyse the reproductive powers. The plant itself may be strong, but its progeny will be weak (p. 1200—see my first letter). "P." has, therefore, carefully interpreted and pithily expressed what I took to be the plain meaning of Mr. Ross—viz., that when vegetable productions attained perfection in any one year, if you tried the next year to make them more perfect than the parent you failed; and instead of the advance or improvement you expected, your forcing system revolted and begot degeneracy and want of vigour, otherwise exhaustion, in the plants forming the crop, whatever that might be ("P." p. 1294, col. *a*). This is the doctrine which "P." upholds as true, though not new, and he cites some very pertinent remarks from the "British Farmers' Magazine" of 1833, in support of his view.

The purport of the extracts is that a limit is set by climate, cultivation, and situation to the quality of the produce of the soil; that our best samples have reached that limit, and have arrived at the utmost perfection which they are capable of attaining; that if any attempt is made to push them further a recoil is induced, and a degree of degeneracy and inferiority in the produce appears to be unavoidable; and that, in a word, all cultivated vegetables have a tendency to degenerate" (p. 1294, col. *a*). The writer proceeds:—"If this (rather these) doctrines be true, it follows that to raise a first-rate article as produce, we must use an article of lower quality as seed." Exactly so. But are the so-called doctrines true? Let us see. Even the first postulate is doubtful. It cannot be certainly affirmed whether an absolute limit is set to the weight or quality of any plant we cultivate. Marking the improvements of late years in nearly all farm produce, he would be a bold man that would affirm that limit was set to the size of a Turnip, a Mangel, or a Potato. The second statement, that our best samples have reached perfection, cannot be sustained for a moment. When or where have Peas, Beans, Potatos, Cabbages, cereals reached the utmost bounds of perfection? Is not each plant being improved year by year? We see its progress on the express in our root crops; our grain advances by parliamentary train, and stops long at every station along the whole line of civilisation. The probability is, however, that men at first ate Wheat but little larger than grass seed; and it is certain that the Wheat found in the lake habitations of Switzerland, which was possibly planted with flint spades, was a peculiar kind, with remarkably small ears and grains. It was the same with Barley. The ears were small, and the grains smaller, shorter, and closer to each other. (See Darwin's "Plants and Animals under Domestication," vol. i., ch. ix., p. 319.) Taking the cereals at long ranges of time, great changes and improvements are seen in their weight and quality. What should we now think had the denizens of the age of stone assured us that their grain and root crops had reached perfection, and that to push them further would have caused degeneracy? And yet they had as good grounds for making the assertion as we have. Nay, they had better; for within the range of their observation all such things had continued of the same size and quality from the beginning. Now improvement is more rapid. We can see it in actual progress, and experience and observation alike upset the theory that any of our plants have reached the utmost limits of their possible size or quality. Denying this premiss, the conclusion with its recoil towards degeneracy perishes with it. It is simply the "baseless fabric of a vision." It has no foundation in the history of the past, no place amid the daily improvements of the present. Cultivators have no need to adopt the truly Hibernian method of going backwards in order to

advance forwards. At every summit gained real progress has been made; they do not need to lie back again in order to reach higher. The improvement of plants is not like the flow of the tide with its necessary obverse, the ebbing back again; rather is it symbolised by the dawn of a day which knows no night,—slowly but surely the light gathers and grows in volume and brilliancy, till the deepest, darkest valleys are filled with its glory. So in a measure has it been with the improvement of plants: unless with the ebbs and flows of civilisation, their progress has known no interruption nor decline. It is altogether a mistake to assert that cultivated plants have a tendency to degenerate. Certainly not while the culture continues. Leave them to Nature, and the law of the mastery to the strongest will have free course. But under cultivation the tendency is wholly in the direction of improvement; the testimony of history is complete upon this point. The plants now grown on our farms and in our gardens are not worse but better than they used to be, and the law of improvement all along has been the selection of the best.

"P." takes us back nearly 40 years for a different rule, that of growing the largest from the smallest or medium-sized plants. The ancients were wiser in their generation. Virgil recommends the yearly culling the largest seed, and Celsus advises to pick out the best ears of corn, and of them lay up our seed separately by itself. In China, imperial edicts order the choice of seed of remarkable size, and it is reported that the Imperial Rice, long noted as one of the finest varieties, was selected and grown by one of the emperors in his garden. Rushing down the stream of time and coming nearer home, we find Sir John Hanmer writing in 1660 that in choosing seed the best seed is the most weighty, and is had from the lustiest and most vigorous stems; and Sir John goes on to give instructions for saving such fine seeds, so good and wise that they are not superseded by the lapse of two centuries, viz., to leave only a few flowers on the plants left for seed, so as to concentrate the force of the whole plant into the few seeds left. Sir John evidently had no fear of a loss of force by over-stimulation before his eyes.

But why quote from such ancient authorities while the modern history of horticulture and agriculture, with all its brilliant achievements in the improvements of plants and animals, is but a record of seeding from the heaviest and the best? "P." appeals to my experience. The answer is emphatic. If you want weight, seed from the heaviest plants. It is thus that our Pears have been rendered so sweet and juicy. Cauliflowers have sprung up from no one hardly knows what or where. Swinish ditch Celery has become white as crystal, brittle as flax, and sweet as a nut; and flowers have been so enlarged in size, improved in form, and changed in colour, that one could hardly know their most recent progenitors. And yet all this glorious gallery of portraits, the living representatives of a school of artists whose creative genius equals that of poets or painters, is to be ignored because a writer 30 years ago wrote down these words:—"Agricultural societies offer premiums for the best samples of Wheat. Many competitors come forward with splendid samples, bright, heavy, plump, and beautiful. The superlative best, if I may so speak, are selected for the prizes. It is however resolved, before awarding the prizes, to test the productiveness of the selected sorts; and for this purpose several agriculturists receive a portion of the seed to sow on their respective farms. It is sown, harvested, and threshed, and by-and-by out comes the judges' report in something like the terms following:—'We find the quantity and quality so inferior that we cannot recommend the Wheats for the Society's premium.'" Just what was to have been expected, sagely adds the writer in the "Farmers' Magazine."

A very pretty illustration of supposing a supposition and finding it, as supposed, in harmony with a foregone conclusion. Had such results ever happened on actual trial, of which the writer gives no proof, they would by no means have sustained such a sweeping inference. The quality of the seed is but one factor, albeit a most important one, in determining the yield; changed conditions, amount of food, depth and quality of the soil, character of seasons, and the skill of the cultivator, all operate with powerful effect in the making or marring of harvests.

Even the finest seed saved from the best samples is not alike; our selected stocks need selection. This, too, was well understood by the ancients. Virgil says:—

"I've seen the largest seeds, though reserved with care,
Degenerate, unless the industrious hand
Did yearly cull the largest."

The modern practice of reeing has the same object in view—the rejection of all but the best. Not only do different ears of the same varieties vary, but different grains on the same ears. Such facts have been carefully noted and acted upon by Le Couteur, Professor Henslow, and others. Mr. Sherriff, again, by noting ears or single grains of extraordinary size or quality, has introduced six or eight improved varieties to our farms. In all these cases there has been no hieing back to seeds of lesser weight, for fear of degeneracy from over-stimulation. From good to better, from better to best, is the law of cultivated plants under skilful cultivation.

The same rule holds good in the breeding of stock. From the earliest ages men have selected the points of excellence they wished to develope, until now, by care and skill, meat, bone, milk, muscle, form, size, almost come at their bidding. What are pedigree books but truthful commentaries on the great law of Nature, that under like circumstances like produces like, and that further, in the multiplication of likenesses, improvements on the originals are possible. It is doubtful whether in any direction these improvements have reached their limits. Though some contend that we are never likely to put more sugar into Beet, less bone in our mutton, greater strength into our teams, or swiftness into our racehorses, the probability is that all these may yet be done. But in some of these cases this question is more complicated than with regard to plants. The bones of the sheep, for instance, must have sufficient strength to carry the load of mutton with its covering of wool. But there is no such check to development of size or quality among plants. The entire plant advances in a more or less proportionate ratio. The heavy ear produces a strong stem and furnishes a large root, and so with root crops. These statements, however, must be slightly modified, but scarcely sufficiently so to affect my argument, thus—that the tendency of improvement is most strikingly manifested in the direction of vitality. The ears of corn, the bulbs of Mangels, the tubers of Potatos have received more attention than their stems and leaves.

As to the law of inferiority, following and consequent on perfection extending through all extent up to and including man himself, as "P." affirms (p. 1294, col. *a*), neither history nor experience reveal any such law. Intellectual power is not conveyed to us by ordinary generation, and hence "P.'s" appeal to the taunt of dulness attaching to the sons of great men—admitting it to be generally true, which I do not—is neither apposite nor conclusive. The children of wise men will prove fools unless they strive after knowledge as their fathers did before them, instead of indolently gazing up into heaven for a ready-made mantle of wisdom that will never fall; or, worse still, meanly attempting to strut about in the borrowed robes of their father's fame. From such worthless seedings what can be expected but a reaping time of dulness and incapacity? *D. T. Fish.*

STEAM CULTIVATION IN GLOUCESTERSHIRE.

A MONTH ago Mr. E. Ruck, of Cricklade, Wilts, having read two of my last letters on steam cultivation, wrote and asked me to visit him and inspect his steam cultivating doings. As he was an old hand at it, having started in 1859, his occupation then being 1500 acres, and he was working two sets of Fowler's tackle in 1862, I accepted the invitation, and went, arriving at Minety station on Friday, September 23, where Mr. E. Ruck, with the following friends of his, met me:—Mr. H. Ruck, a considerable farmer of Cricklade, working mainly by horse culture; Mr. Peacey, Chedglow, near Tetbury, Gloucestershire, who occupies 650 acres of land, 420 acres of it arable, and who has worked a set of Howard's tackle for some years; Mr. Porter, a farmer, who occupies 600 acres of land, nearly all arable, who, with Mr. Slatter, a neighbour of his, occupies 700 acres, 600 of which are arable. The two together possess two sets of double engine tackle, and do their own work as well as the work of their neighbours by contract. Mr. Dowdeswell, who in 1861 occupied Oxlease Farm, in Lechlade, and who then started and worked a set of Smith's tackle, occupied this farm for some years, and fetched it into condition by the aid of steam-power, and then shifted to the farm he now occupies at Castle Eaton, consisting of 100 acres in grass and 300 acres of ploughed land. This last farm he is now fetching into condition with this same set of tackle. Mr. Cadle, a land agent of Gloucester; Mr. Wheeler, a well-known seedsman from Gloucester; and Mr. Peacey, of Chelworth, who occupies 400 acres under the plough and 200 acres of grass land, and who works by horse-power, yet spoke in the highest terms of steam-power upon heavy lands. With this staff of practical and other aid at my elbow we proceeded at once on my trip of inspection, going about five miles on to Mr. E. Ruck's farm at Braydon, Purton. Here I found 150 acres of grass land and 150 acres of arable land, all clay, and what farmers generally would call poor clay; and by way of proof this very farm years ago let at only 14*s.* per acre, tithe and all included, yet the tenant failed to make it pay him for his labour and interest of money. Upon that rent Mr. Ruck bought this farm and set to work by steam-power to improve it—that is, 150 acres of it which is now under the cultivator (not the plough). This 150 acres under horse culture was divided into 10 or 12 fields, but now the hedges are all cleared away a heavy clay mark may be seen along the line of every one of them. A hard road has been made through the centre of this land, to give an easy and substantial communication to the whole of it. The whole of this land in 1869 was cropped with Wheat, and the long rick of threshed straw standing at the roadside proves that it must have been a good one. This year's cropping stood thus:—Clover, 34 acres; Beet, 18 acres; Beans, 11 acres; fallow, 7 acres; and Wheat, 80 acres. The crop of Wheat this year is estimated at 30 bush. per acre. The rest of the cropping was not so good as the Wheat was.

The whole of the 150 acres is now being prepared for Wheat next year. Mr. Ruck has hired Mr. Porter's set of double 10-horse power engine to work it. The two engines were at work pulling to and fro an 11-tined cultivator, clearing a width of 8 feet, and had nearly completed the whole a second time over. The cultivator is not of the balance principle, but turns at land's end, and therefore is in reality a thoroughbred "Smith," upon the very principle that Smith showed his at Chelmsford in 1856, when working the land over the first time; it had narrow shares upon it, grooving the land 4 or 5 inches deep. The second time over it had wide shares on, clearing the whole to a depth of about 5 inches. The whole will need a cross cultivating by horses to make a good seed-bed of it for Wheat; therefore the cost will stand thus.

Neither Mr. Ruck nor Mr. Porter would tell me what hiring cost per acre, therefore I must supply the *data*. Contracting men generally would charge £1 per acre for such work done twice over, but to make matters show as lightly as I can for Mr. Ruck I will fix it at 15*s.* per acre for the twice over; to this must be added coal and water at 4*s.* per acre, the once over with hores at 2*s.* per acre; this brings the total up to 21*s.* per acre. The 150 acres twice over gave 18 days emplayment to the engine. Mr. Ruck sells all his straw off, and will use 3 cwt. of superphosphate and 40 lb. of nitrate of soda per acre for his Wheat. This experiment will be worth watching, for it is meant to prove that we can grow extensively on heavy clay Wheat after Wheat with the aid of artificial manures.

Some grass land on this farm had been vastly improved by the aid of artificial manure. I saw unimproved land and improved land side by side, the former worth three times the latter. I was shown some hay cut from the improved land last year, and some cut from it before the improvement. The former looked worthless, whereas the latter showed excellent in quality, and its strength proved that the quantity must have been more than doubled.

From Purton we drove 11 miles on to Charlhams, Ampney, where Mr. E. Ruck occupies another farm, 300 acres of good land, fen land in character, nearly all arable. His cropping here is one-third roots and Rape, one-third Oats, and one-third Wheat. He sells all his straw off here, and uses artificial manure, the same as at Purton, and his mode of culture is thus:—Take his Wheat stubble for roots first. This he skims or ploughs to a depth of not over 3 inches with horses, a pair of horses doing 2½ acres per day, therefore the cost per acre will be 3*s.* This turning over or skimming is to be done again and again this autumn, therefore these two additional operations will bring the cost up to 9*s.* per acre. In the spring this land is worked by steam-power a foot deep, at a cost of about 15*s.* per acre; this brings the total cost of seed-bed up to 24*s.* per acre. After the roots are either fed on or carted off, the land is worked by horses for either Wheat or Oats, at a cost of about 6*s.* per acre, and the land after the Oats are worked three times by a skim or plough to a depth of 3 inches, at a cost of 9*s.* per acre, for the next crop, after which roots follow again. The average cost of seed-bed for the three years is about 13*s.* per acre.

From Ampney we drove three or four miles on to Castle Hill Farm, Cricklade, where Mr. Ruck resides. Here we found 600 acres arable and 100 acres of grass land. Here there are two kinds of arable land—viz., 300 acres of very good land, deep and cool, resting upon gravel, and 300 acres of heavy clay.

On all this farm there is no regular system of cropping. For instance, 100 acres of Sugar-Beet is to be grown on the same land year after year, using artificial manure only for their growth. On the heavy land last year there were 100 acres of Beans. This 100 acres has been smashed and crossed by steam-power, and is now being crossed again by steam-power, and Mr. Ruck intends dragging it again either by steam or horse-power; therefore the cost of seed-bed for Wheat will stand thus, but before giving it I must tell you that a 14-horse power double engine set of Mr. Ruck's is worked here that has done this year 500 acres of the Wheat stubbles with the Bean stubbles. He contracts with his men at 8*d.* per acre, including water. To this must be added coal, at 1*s.* 6*d.* per acre, and as the tackle, costing £1400, is exclusively for cultivating purposes, I must fix the interest of money, repairs, &c., at 4*s.* per acre. Now for the cost of seed-bed:—

	s.	*d.*
One smashing and two crossings, at 8*d.* each time	2	0
Coal, at 1*s.* 6*d.* each time	4	6
Interest, &c., each time, at 4*s.*	12	0
Oil, at 2*d.* each time	0	6
One dragging	2	0
Per acre	21	0

The implement that I saw working here was, like the one at Purton, a thoroughbred "Smith," turning at land's end, clearing a width of 12 feet.

The land on all the three farms appeared in a cleanly state. To keep it so under horse culture no end of additional horses would be needed; therefore steam-power must have effected a vast saving in Mr. Ruck's case, as well as a great gain in the shape of increased produce. But I must call Mr. Ruck's attention to the fact that his seed-beds by steam-power are not made at the lowest possible cost. I shall very soon have done

my year's work for next year's cropping, and with your permission I will publish in detail all the operations and costs.

One thing more I will notice, and I have done. On my road by rail from Didcot, two miles from that place, I saw another set of tackle at work. It was a two-engine set, working a thoroughbred "Smith" cultivator. Therefore the evidence is dead against the Royal Agricultural Society's judgment at Chelmsford and Chester. At the former place I was the only cultivating man there, and at Chester the Society would have the old balance-plough. At Chelmsford and Chester I turned all my implements at land's end. The Society patronised the balance implements at Chester if it would not at Chelmsford. Now Fowler, and everybody else, can and do sell the cultivator, if it turns at land's end. The balance one is set down as worthless. *William Smith, Woolston, Bletchley Station, Bucks, Sept.* 26.

THE CULTIVATION OF CABBAGE.

I PERCEIVE by your publication of the 17th ult., that Mr. Penny, Bartlehill, has been reading a paper before the members of the Border Union Agricultural Society, on the "Cultivation of Cabbage as Food for Sheep." Judging, however, from Mr. Penny's remarks, it does not appear as if he was very well posted in the knowledge of how to grow this excellent crop. As a grower of Cabbage for years, perhaps you will allow me to detail my experience upon the subject.

I may premise by saying that from my observations, carried over several seasons, I have come to the conclusion that the most stimulating of all vegetable food for sheep or lambs is Rape; that next to it comes Cabbage; then follow Tares, next in order are Swedes, and, lastly, come the yellows and other soft varieties of Turnips.

In providing Rape, Cabbage, and Tares for young sheep, perhaps the right way is to set aside a field specially for the purpose, the size of course to be in proportion to the amount of stock for which feeding is required. This field should be divided equally into three parts, and the rotation followed of Cabbage, Rape, and, third, Tares.

The way in which I follow out the system is this:—Cabbage plants have first to be provided, and with this end in view I have a piece of headland lightly ploughed, harrowed, and rolled firm, about from the 1st to the 15th of August. Before harrowing, either a fair share of Peruvian guano or superphosphate of lime, or a mixture of both, is sown. After rolling, divisions like Onion beds are marked off, the seed sown, raked, rolled, and finally covered over with light bushes to prevent the ravages of birds. Several varieties of Cabbage seed of course can be thus sown, but I have only cultivated two sorts, namely, what are called Drumhead and Flat Dutch. In spring a portion of the land for the crop is drilled, and manured with about half as much more farmyard manure as is usually allotted to Potatos or Turnips. Before covering this is supplemented with a good dressing of guano and superphosphate of lime. The drills are then covered in and rolled. The first plants may be put down about the middle or end of April. The drills may be from 27 to 30 inches apart, varying with the allowance of manures given, and the high or low condition of the soil. In like manner the plants may be put in from 18 to 24 inches apart in the drill. The best way is to put the plants in by spade. In effecting this a man and boy, or woman and boy, may be employed to each drill. The spade is inserted in the centre of the drill with rather of a slope, it is then raised so as to make a free opening for the insertion of the root of the plant. The boy inserts and holds the plant in this position by hand until the spade is withdrawn, and then he finishes by trampling the plant down firmly with the foot. The planting process is followed by what is known as threading the portion of land planted with white cotton thread extended on twigs of trees stuck all over the ground, to prevent crows from pulling out the plants before they have commenced to grow. The after cultivation merely consists in keeping the land free from weeds, and moulding the Cabbage up once or twice to force their growth. Successive plantings may be made up to the middle of June, and Cabbages so planted will, as a rule, be ready for use from September onwards, and will be eaten with relish, and the most favourable results, by every kind of stock, comprising sheep, pigs, cattle, and horses. The crop has the very reverse tendency of purging when given to any kind of stock. For lambs especially it is a safe and highly nutritive food, and by liberal manuring, careful cultivation, and, above all things, sowing the right kinds of seed, a much larger weight per acre than Turnips usually are can be given.

The above is the first part of the rotation. The Cabbages all removed, the land should be lightly ploughed, and as near to the middle of April as the weather will permit, Rape seed and Italian Rye-grass seed should be sown. The usual quantity of Rye-grass seed may be given, and from 12 to 16 lb. broad-leaved Dutch Rape seed sown per statute acre. These may be sown mixed, and after a preparation of the soil similar to that usually made for the depositing of grass seeds and Clover. After seeding the land with Rye-grass and Rape, it should be lightly harrowed and rolled. It should be ready for lambs about July 1—about weaning time—and will, if there has been a good hit of Rape, and the land is in good manurial condition, keep from 12 to 16 lambs per statute acre for a goodly part of the remainder of the season. If the Rape is luxuriant some care and watchfulness are necessary in the commencement, for fear of the lambs swelling, especially if they are rather thin in condition, but after 24 hours generally the danger has passed, and from thenceforth the stock will fatten, grow, and thrive beyond all previous conception. They will be in prime condition, in short, for going on to Cabbage in September and October, which in turn will make them strong and put them into the best possible condition for going on to Turnips in December.

The next part of the rotation is Tares. These would be, for the most part, the winter variety. So soon as the stock is removed from the Rape and Italian Rye-grass, towards the end of September or beginning of October (but in September if at all possible) the land should be ploughed up, a good dressing of guano or superphosphate, or both given, and winter Tares either sown broadcast or drilled in. In England, where Tare growing and folding has extended of late years, two or three sowings are made in autumn, but in my practice I have always sown what I intended growing at once, and in spring supplemented this with a sowing of the spring variety. Winter-sown Vetches should be ready for folding from the middle to the end of May, and, generally speaking, in this country, stand more eating than those sown in spring. Immediately a sufficient extent of Tare ground is cleared, it may be lightly ploughed, harrowed, and rolled, and from 12 to 15 lb. Rape seed sown per statute acre. This will come in for use in April following, and serve until the Tare crop is ready to feed with. The portion of the land thus sown with Rape seed for spring use, will be cleared quite in time for the planting of the later Cabbages.

By the above system, there will be a constant supply of green vegetable food for sheep throughout the year, always, of course, supposing that on another part of the farm Turnips are grown for use during the months of January, February, March, and to the middle of April. There is no doubt some trouble involved in the cultivation of these successive green crops, but against this must be put the consideration, that by such management a great deal of young stock can be kept in the best condition for producing health and early maturity. Add to this that the system is one of high farming, and there is besides the very material circumstance to be kept in view, that much less corn and cake will be required to be given to young sheep thus furnished with a regular succession of green food stimulating and fattening as are Rape, Cabbage, and Tares. I have only to say further that it will well repay the grower of these crops, if in addition to folding them, or eating them, with stock on the land where they had been grown, he practises the giving to each crop a liberal allowance of best artificial manure. *Thomas Robertson, Narrangiowen, Ayton.*

P.S. Mr. Penny, in his remarks, talks of there being 5000 or 6000 Cabbages to the acre, but on the supposition that the drills are 28 inches apart, a distance I have always found quite sufficient, and each plant put down at 18 inches apart in the drill, the number per statute acre would be something over 12,000, and if planted 21 inches apart in the drill the number of Cabbages in that case would be over 10,000. *T. R.*

MEMORANDUM ON SEWAGE.

MY house at this place is provided with very perfect sewers of the best masonry; the main sewer 6 feet high, egg-shaped; the subsidiary sewers the same, but 3 feet high. They receive everything from the water-closets and from the scullery of the kitchen, and a large quantity of water which falls on the roof of the house, which washes them out; and there has recently been added all the liquid from the stables and a large quantity of soapsuds from the washhouse. All this is conveyed by the main sewer to a tank about 150 yards from the house, at a point about 60 feet lower than the house, the tank overflowing into a ditch, and the surplus sewage finding its way into the river, polluting the air more or less on its way. This objectionable state of things had often attracted my attention, and the remedy was somewhat difficult; but when about to make a new kitchen garden a few years ago I conceived a scheme which should remedy the evil to a certain extent, and at the same time make a good use of the sewage.

The level of the new garden was about 80 feet higher than the level of the tank in which the sewage accumulates. I put up a small steam engine (said to be 1-horse power) close to the tank, to drive a forcing-pump by which the sewage might be sent up to the new garden in a 2-inch iron pipe, at a distance of about 400 yards, the iron pipe being continued along an upper terrace in the garden, the greater part of the garden sloping down on one side. At moderate distances in the garden hydrants were placed in the pipe, at each of which a hose could be attached and sewage could be given off, under pressure of the pumping, and thus distributed at any part of the garden. Thus I was enabled to distribute sewage at any time by pumping over any part of the garden, so as to enrich the soil more or less as might be desired, the garden having been good ordinary pasture land, and perfectly dry.

I was much pleased with the success of the arrangement so far, but when the first summer came and the ground was covered with crops, I began to see (what I ought to have thought of sooner) that while such surface application of sewage was an excellent thing, it could only be used during a portion of the year—say four or five months—when there were no crops on the land, and consequently that the use of the sewage was stopped during half of the year at least, and the evils of accumulation in the tank had no abatement.

I bethought myself of a scheme by which the sewage might be applied at all seasons of the year, and at the time when crops most require nourishment.

This was a plan of underground irrigation, by a system of earthen pipes. This I proceeded to execute, laying along the upper terrace of the garden a 4-inch earthen pipe, divided into sections, so that each section should lie on a perfect level, the 4-inch pipe having an upright connection and aperture on the surface in each section, to receive the sewage from the hose, and on the side, at regular distances of 6 feet, a nipple formed on the pipe, to which should be fitted a 2-inch bell-shaped drain pipe, the 2-inch pipes being prolonged in parallel lines, and at a depth of 18 inches under the surface of the soil, down the slope as far as it was desirable to convey the irrigation. I decided that 18 inches was the proper depth at which to lay the pipes and to distribute the irrigation, as it was a good depth for spade culture, and because I considered it to be the depth of the upper and active soil and the top of the subsoil, and at each joint of the pipe I reasoned that a portion of the sewage would issue into the soil, downwards and laterally—and that upwards there would be a capillary attraction of the liquid, and a gaseous emanation of the very vapours which constitute the nuisance of the sewage to the senses above ground, and the nourishment of plants underground.

At the extreme ends of the pipes they were securely stopped, and I calculated that when the supply of sewage was rapid and abundant the pipes would fill upwards and distribute under pressure. In laying a part of the pipes I made an experiment in reference to their action, by letting on the sewage before the earth was filled in over the pipes, and found that the liquid issued from the joints of the pipes all along the line, very much as I expected, and I do not doubt that when they were covered in the issue would be even more regular under the pressure of the incumbent earth.

This system has been in action for the last two years when it has been convenient to pump, and it can be said that in no instance of pumping the sewage into the 4-inch pipe has it failed to disappear, and never to be more heard of—which is a proof that it must have been absorbed under ground more or less regularly, and have gone where it was wanted more or less rapidly, and where it was intended that it should go.

At a depth of 18 inches, it cannot be expected that the action of the sewage, as a manure, should be very rapid, and visible, and marked; all that can be expected is, that it shall gradually enrich the soil, and feed existing plants from that increasing richness.

The great mass of garden plants are annual, and carried away at the end of the season, having received nutriment which has gone into them. On one crop of a permanent character, I think a marked effect has been perceptible—viz., Asparagus, which strikes its roots deep into the soil. I am satisfied that numerous pumpings which have been given to the soil under the Asparagus has produced a much more vigorous growth, which is especially manifested in the autumn, thus leading to a stronger growth in the subsequent season of cutting, six or seven months after.

This proposition it is difficult to prove in words, but from inspection I can come to no other conclusion. The Asparagus plants were cut over unsparingly in the season, and have at the 1st of August grown in a remarkable manner—many of them 8 feet high, the beds quite a forest. Strawberry plants seem to show a similar action of the liquid underneath; green Peas and Carrots some effect, but they are temporary occupants of the soil, and are not there to show effect in a second year.

Thus far I speak of a kitchen garden, and each succeeding year will show how far I am justified in what I have said in favour of underground irrigation. I propose to discontinue the use of all solid manure in the garden, as already it is proved that sewage on the surface—when there are no underground pipes—applied in the winter and early spring, raises admirable crops; and I do not doubt that for years a garden may go on without solid manure, using perhaps, at intervals, a small dressing of lime, and perhaps some common salt. It has been stated to me by a competent judge that if there were no sewage, and solid manure alone had to be used for the area to which sewage has been applied, the cost of manure and cartage would be £30 per annum, so that even if the cost of the steam-engine and other expenditure were charged against the garden alone, and nothing for the abatement of nuisance, £30 per annum saved would be an ample return for an outlay of £100.

But I have been tempted to think of the application of the system to the more extended purposes of agriculture; and one must always recollect that surface irrigation, at all events of impure water, can be applied only when crops are not upon the ground; and if so, what is to become of sewage during the largest portion

of the year, when it cannot be applied to the surface? This consideration first suggested to me the idea of underground irrigation as an alternative disposal of sewage.

I have fancied that it might be applied to meadow lands, and that, even although expensive in the constructive arrangements for its application, the good results might be so considerable as amply to repay the cost. If on permanent meadow land, where grass was to be annually made into hay, the value of underground irrigation were only to be as much as the cost of a topdressing of guano and nitrate of soda, or of farmyard manure, the problem of cost would be solved, inasmuch as the annual application of solid substances is an annual expense, while the cost of the sewage would be little, and the only real cost the charge for its application, as against the capital expended for the means of distribution. If the produce of an acre in its normal state were only 1½ ton of hay, and if underground irrigation were to add only £5 to its value per acre, the capital expended on mechanical arrangements would speedily be repaid. I estimate the cost of such an arrangement at £20 per acre, so that £5 per acre would at once be 25 per cent. on that outlay. My impression is, that if pipes were laid at 14, 12, or even 10 inches only under the surface, and the parallel lines of pipes only 6 feet apart, each pipe would send out the sewage 3 feet on each side; and by keeping up the supply of sewage, the quantity given to the roots of the grasses would be very large. The process would be a very clean process, and could be carried on at all seasons of the year, to whatever extent practice might prove it to be beneficial. The soil and subsoil of a meadow might in this way be brought into an extraordinary state of fertility, and if it was once done it would take less to sustain that fertility; but it must be borne in mind that the subject of sewage implies that one great object is to dispose of it. Of course a period of dryness should be allowed in each year, but during that time the gaseous emanations from the sewage underground would have the best effects, and while empty the pipes would act as conductors of air with the best effect, and as drains, if at all wanted, and the rain from heaven would keep the roots and stalks of the grass, so far as above ground, in a state of perfect purity.

Another view has occurred to me, in addition to the production of vast crops of perpetual hay. I have a strong impression that on this system good grass land well stocked with good grass seeds might be made to yield permanently and annually a very large produce, cut green for the feeding of cattle, and that establishments might be made for the rearing and feeding of cattle to great advantage, and on a very small area of land compared to the results attained. The grass would be of the finest quality, pure and succulent, a great contrast to the soft and spongy produce of the Lochend and Craigentinny meadows. The manures would be admitted to the roots of the plants—12 inches under the surface, the roots going down in search of nutritious food, and the manure ascending through the soil (by capillary attraction), which would purify it as it went—very different from the grass flooded with an excess of filthy liquid which it cannot absorb.

My belief is that, on a very cautious estimate of produce, there might be three cuttings of grass 18 inches high, ready for cutting say on May 20, July 20, and September 20—the first and second crops say only of the value of £6 per acre each, the third say only £3 per acre—in all £15; and this on land worth £3 per acre for ordinary purposes, or perhaps of a much lower value. Thus an annual value of £12 per acre would be created in the land as a return for an expenditure of £20 per acre in making the mechanical arrangements, which would be self-acting, in the same sense as surface irrigation. Such grass, with a suitable supply of bruised Oats or bean meal or linseed cake, would rear or fatten cattle during the summer to the utmost perfection, and at the same time manufacture an immense supply of the finest manure.

I have long had an idea that sewage ought to travel by rail, that it ought to go out of town by railway, having thereby all the facilities of embankments, tunnels, and bridges of railways, an iron pipe being laid in the bed of the railway and a "tap" established at any number of places along the line of railway, at each stage required, by attaching a branch pipe to the main line of pipes, where a disposition might arise or exist to take a quantity of sewage for local agriculture. At such places reservoirs, covered or uncovered, might be placed. Near railway stations, at all towns, a covered reservoir might be constructed, and a stand-pipe erected, 50, 80, or 100 feet high, with a pumping engine, the action of which would be to raise a column of water 50, 80, or 100 feet, as the case might be, in a pipe, say, of 16 inches diameter. As soon as the sewage was raised to the top of the stand-pipe, the action of the steam-power would cease, and the action of gravity would commence in the second limb of the stand-pipe downwards, the force of gravity propelling the sewage in the horizontal pipe laid in the railway, carrying it to any point on the line, where it might be taken off for use.

No doubt such a system would necessitate arrangements on the land where the sewage was to be applied, a receiving reservoir to be made, into which it should be delivered by the branch pipe from the main pipe, and probably a steam engine to effect its distribution; or in some cases, perhaps, the sewage itself might be converted into a water-power of some kind for the distribution of a portion of the quantity, it being borne in mind that the sewage would travel under great pressure coming from the top of a lofty stand-pipe. These ideas are merely stated in the hope that they may be worked out by more skilful persons.

In thinking over the subject, my mind has been forcibly called to the recollection of the meadows around London, the meadows of the greater part of Middlesex, and the miserable and unprofitable management to which they have been subjected during the longer period than 60 years of my recollection—constantly cut in hay, most of them undrained and poorly manured, by no means regularly, rarely with anything but the dung carried by the return carts from London; never by the substances now so well known to be beneficial to grass lands, in alternation with farmyard manure; never with sewage, which would have such marvellous effects, because it has never been applied. Take the undulating surface of Middlesex and Hertfordshire. Think of the quantities of sewage created within these areas, and the quantities which might be sent out of the towns within them by pipes laid in the beds of the railways which pass them, and so from other towns on other railways all over the country.

I cannot but dream of such possibilites and such facilities contrasted with the filthy, although profitable, system near Edinburgh, which, after all, is very limited in extent, and which I cannot say I should like to see generally introduced and spread over the country.

To revert to my own small operations, I may state that I have recently carried the overflow of the tank into an adjacent meadow, down a gentle slope, in an air-tight pipe, and that when it enters the meadow it goes into a line of earthen drain pipes (the same as in the garden). By this arrangement two objects are attained—1st, an abatement of a nuisance by the disposal of surplus sewage, when the tank is full, which it will not contain; 2d, the whole of the surplus is let into a single and double line of pipes, from which it escapes into the soil of the meadow, so that it will gradually be seen what the actual effect is of this mode of the application of sewage to the roots of the grasses. The extent of the line of pipes, part single and a part double, is limited, and it is probable that it may be desirable to extend them; but, in the meantime, care must be taken that the supply of sewage shall be sufficient, and therefore not to extend the pipes beyond the power of supply, and to remember that the whole is a very small affair, connected with one residence only in the country.

But I do look on this as a very interesting experiment in reference to the speculative ideas which I have ventured to state in this paper. My expectation is, that in due time a dark green ribbon of grass will be visible in the meadow, along the line of pipes, in the early winter, still more in the spring, and in the summer a very luxuriant crop of grass or heavy crop of hay. These effects ought to go on increasing from one year to another—a succession of years and continued supply of sewage raising the amount of produce to a very high rate.

I am so sanguine as to entertain the belief that grass lands managed upon this system, the supply of sewage being abundant, might be raised to the value of £20 per acre—perhaps a larger sum—so that an expenditure of £20 or even £30 per acre might be amply repaid. The disposal of sewage is the great domestic question of the day, and if all that comes out of the land can be returned to it, it is difficult to predict how much might be added to the produce and wealth of the country, to say nothing of the degree to which health might be promoted and disease avoided.

Home Correspondence.

Manners.—When a man's parents grudge the extra penny a-week which is the modest charge for which manners are usually taught at the class of schools at which a recent correspondent of yours must have been educated, I certainly think that the victim of the parsimony has a most legitimate cause of complaint against the parental economist. He gives an account in a recent impression of a most hospitable "feast," consisting of the "most expensive viands," and comprising wines of every variety, the names of most of which were new and unknown to the guests. The generous host who invited him to this feast also showed him over his farm, and supplied him *gratis* with all the food for the mind that he was able to furnish; and whatever may have been the quality of the latter, and whatever its intrinsic value, it had at least cost the owner much labour and thought, and no small amount of money. This was good old-fashioned English hospitality, and, according to old-fashioned "manners," should have been met with civility. Mr. Mechi states that he grows certain quantities of Wheat to the acre, and he publishes accounts of the disposal of the produce to prove it. Can any one say that these are, as your correspondent insinuates, systematically falsified by Mr. Mechi? Dare "T. B. S." look in his broad, honest face, and say so? Clearly not; as if so, he would have signed his name in full. Mr. Mechi may deceive himself in some of his figures, but he cannot deceive himself as to his produce; and I for one am not prepared to believe an anonymous assertion, unsubstantiated by one single bit of proof. *W. H.*

The Probabilities of the Corn Market.—The "Chamber of Agriculture" Journal recently summed up the "really painful intelligence received from all parts of the kingdom" with respect to the corn harvest, in these words, "Corn markets must rise." I have scarcely come to the same conclusion as your contemporary as to the general character of the crops, but admitting the difficulty of sifting the evidence in such a season as this, and of striking a probable average when reports are unusually conflicting; and assuming that your contemporary's judgment is correct, it seems to me that if merchants and importers make a note of his opinion, they may possibly increase their orders abroad—in the Black Sea, on the American seaboard, and at Trieste and St. Petersburg,—and the result may be a glut on our markets; and then corn markets will not rise but fall. Anticipated dearness seldom arrives. Some of your readers may remember what happened in 1847. An extremely dry, cold, and backward spring alarmed the country; late in May the Wheat did not even hide a pair of partridges. When was it to show an ear? It became very dear, and merchants swept the interior provinces of South Russia, the banks of the Volga, and other far off corners of the earth, for supplies which were to arrive before the backward harvest could be reaped. We expected to be pinched, but not to be starved after all. But I think it was on the third Thursday in May that genial weather set in; the sun shone and the rain fell—and Wheat fell too, for we had an early harvest after all, instead of a late one. It came on without a check, rushing on amidst sunbeams and showers, as it does in that fastest of countries (and climates), the United States, where both Wheat and Maize are sometimes sown and reaped within 90 days. Mark Lane has not yet forgotten the ruin that fell on her forestalling merchants. Your contemporary's prediction of dearer markets, therefore, tends to defeat itself, and would certainly do so if it were widely believed. I think, however, he has wrongly estimated the value of the advices which may seem to justify his alarming announcement as to the corn crops. I have seen much poor corn on light land, and in some cases the crops are the worst that are remembered; but the complaints are not universal, even on light land; and Wheat is yielding well on well-farmed, sound light lands, in many instances within my knowledge As to the heavier soils, which form by far the larger portion of our arable farming, there seems no reason to doubt, on the whole, that the usual result will follow a dry, hot season, viz., a good Wheat crop. I have seen much heavy Wheat on such soils, and I have received letters from those who have threshed, confirming my observation. And this refers, in some cases, even to poor clay soils. By the way, I have not met with any instances of the devastations of those "yellow maggots," which your contemporary makes so prominent, nor have I been alarmed by the prevalence of smut! Let me add, that if this meets the eye of merchants who buy Wheat abroad, I would, on the whole, advise them to be cautious in their operations, for their own sake, if not for that of *An English Wheat Grower*.

Pneumatic Sewage Cart.—In none of the recent discussions on the sewage question have I observed any mention of the pneumatic system, which I have heard is in successful operation at the Hague and Vienna. If any of your correspondents who have lately been on the Continent could say how the system is found to work, it would interest your readers, and it might throw further light on the subject that would be of great utility. *R. Binns, Cleveston.*

"West Indian" and Smith's Tackle.—At p. 1359 "West Indian's" closing sentence, and one before it, require an answer: "Will 'G. A. H.' inform your readers where tackle of any maker can be found that will get through 13 acres per day?" and again, "where Fisken's system, using a 10-horse engine, can be found averaging 13 acres a day?" One answer will settle both questions. At the Royal Agricultural Society's Manchester show, 1869, Fisken exhibited his system at work; the engine was a 10-horse Fowler, the plough an 8-furrow Fowler balance-plough, which turns over 6 feet width of furrow as it passes along the field. At p. 802 of the *Agricultural Gazette* for July 24, 1869, "West Indian" will find the following words:—"It (a 10-horse engine) hauled during the trials an 8-furrow balance-plough, going from 7 to 8 inches deep at a speed of 3 miles per hour." Now 3 miles are 5280 yards, and as the 8-furrow plough cuts up 2 yards wide as it passes along, it was, according to the above account, ploughing 5280 × 2 = 10,560 square yards per hour. If we reckon the day's work at 12 hours, and allow 1½ hour for breakfast and dinner, during which the plough would stand still, it would leave 10½ hours of actual work; and if we allow 1½ hour for turning at the headlands and for stoppages, it would leave nine hours, during which the plough would be actually running at the rate of three miles per hour, and turning over 10,560 square yards, 7 to 8 inches deep,—therefore 10,560 × 9 = 95,040 square yards, is a day's work. But an acre is 4840 square yards, therefore 95,040 ÷ 4840 = 19.61 acres. So that, on the authority of the *Agricultural Gazette*, Fiskin's system was actually working at Manchester at

nearly 20 acres per day. If "West Indian" wants to buy a set, I have no doubt Fowler & Co., of Leeds, will supply him, or Mr. Fiskin, also of Leeds, will do the same, I have little doubt; and I have also as little doubt that either of them will guarantee to plough 13 acres in a working day of 12 hours, allowing 1½ hour for meals. Let "West Indian" offer them an order on these terms, and see if they will refuse it. *G. A. H.*

Science of Manure.—I thank you for your notice of "The Science of Manure," &c. Perhaps you will allow me to remark that in my statement of the analogy between the manuring of a vegetable and the feeding of an animal there is indeed, as you say, "nothing by any means new." My only claim to originality is in the advantage which I have taken of that analogy. And my "science" amounts to very little if it does not show that not only "the process of reductive mastication, cooking of manure," but those also of digestion and assimilation, are effected by the proper application of the principles of the dry-earth system; that this is done more effectively and more speedily than it can be done by "the soil itself" in any ordinary mode of manuring; and that, whether by transplanting on a small scale or drilling deep on a large scale, there is almost a certainty of the nutritive portion of the manure being at the right place at the proper time. In your observation on my reply to the inquiry—"Can this be done on a large scale?" you have laid too great stress on my affirmative "Yes," and too little on the conditions on which it was given. I had no idea that this mode of applying manure could ever be adopted on plants sown broadcast over a "10-acre field." The reference to labour implied that, whether on a large or a small farm, transplant must be very limited. Whenever the question was put to me, it invariably brought up the idea that such a practice, adopted partially, and to a very limited extent on many farms, would originate a source of relief of the sufferings and privations which the class of occasional labourers—a class too much overlooked—endure through want of work in the winter. I hope to send you shortly two other of my pamphlets, and addressed to the cottage gardeners of England—"Manure for the Million," and "Land for the Million to Rent, addressed to the Working Men of England." Have you seen Dr. Buchanan's report on the "Dry-earth System of dealing with Sewage and Excreta," contained in the appendix to the 12th report of Public Health? *Henry Moule, Fordington Vicarage, Dorchester.*

The Coccinella septempunctata, or Lady-bird, is the well-known enemy of aphides. Its services to Hop growers have long been recognised, and during the present season it has been observed in large numbers upon the exhaustless feeding grounds provided by our aphis-stricken Turnip fields. A walk over such a field on the College Farm revealed the existence of Coccinella in its perfect form, in its larval condition in all stages of growth, as well as the pupa adhering head downwards to the numerous stones which in this brashy district cover the ground. The following observations upon the metamorphoses of this insect this autumn may be of interest to readers at the present time. The larva, before passing into the pupa form, attaches itself by its tail to a fragment of stone, and there hangs in a torpid condition for, in two cases which were watched, from 40 to 50 hours. Towards the completion of this period, the suspended larva becomes exceedingly energetic. Using its tail, now firmly attached to the rocky fragment, as a fulcrum, the rest of the body is in turn elevated and depressed with varying rapidity, trembling meanwhile as though stricken with palsy. This jerking action is kept up until the skin splits along the dorsal line of the thorax, and as the vigorous movements of the creature are continued, the rent enlarges towards the head, which finally emerges, and by repeated efforts the old skin is gradually pushed down to the posterior extremity, and forms a closely adherent ring around the tail and upon the stony fragment before mentioned. The operation of casting the skin does not occupy many minutes. The newly emerged pupa is of a bright lemon-yellow, but in the course of two hours has gradually darkened in colour, until it may be described as slate-blue, inclined to black, with three yellow bands, one on the centre of the back and two on the sides. The activity now ceases, the larval condition has been passed and the pupal state entered upon. This stage occupies seven days. Two cases supplied the following data:—Larva on September 23, passed into pupæ at about 2 P.M. September 24; one emerged between 9 and 12 A.M. October 1, and the other between 2 and 3 P.M. of the same day. I was not fortunate enough to witness the emergence of the perfect insect. Having, however, on several occasions seen it immediately after its struggle to break the pupa case, when its wings were not yet dry, and the insect still lingered close to its former prison, I am able to affirm that on its first appearance the wing cases are of a pure and beautiful lemon-yellow, without a vestige of the spots which afterwards decorate them. After a very short period, however, say one hour after "birth," faint dusky marks are visible, indicating the future spots, and further, about three hours after birth, the insect has assumed its characteristic rich colour and seven black spots. The dehiscence of the pupa case is different from that of the larval skin when the animal passes into the pupal form. In the final transformation the pupa case splits down the centre of the "face," and two gill-like openings appear on either side between the thorax and abdomen. These join on the ventral side of the thorax, and this split is continued until it joins the opening at the face just mentioned. The larval skin, therefore, splits dorsally, but the pupa case splits ventrally. During these observations I kept a considerable number of these creatures in confinement, feeding them with aphides upon fragments of Turnip leaves, and both larva and imago are equally voracious in appetite for their prey. A hungry young Coccinella, after drying and hardening his soft gummy wings and wing cases in the sun, will turn his attention with much zest to the soft green little insects that afforded him so much profitable enjoyment at an earlier period of his career. He seizes the aphides as a cat would a mouse, draws it towards him with two of his six legs, and devours it with enjoyable "munching" movements, eating the whole, skin and all, but in the case of the winged flies, leaving those membranous and uninviting portions of the body neatly clipped off. The voracity of both larvæ and beetles was very remarkable, and a supply of crowding aphides upon the underside of a Turnip leaf soon disappeared under a well sustained attack. *John Wrightson, Royal Agricultural College, Cirencester, October* 10.

Maximum Crops.—It is not well to disbelieve the possibility of growing great crops, because our general average of Wheat is under 30 bush. per acre, and other cereals and crops in proportion, exhibiting a melancholy shortcoming in agricultural production. I am quite inclined to believe in the Rev. Mr. Moule's statement, that he produced Barley at the rate of 12 qr. per acre,* because I know that 10 qr. per acre have been grown on a whole field by a practical farmer in Essex—a friend of mine. Of course seasons and other circumstances affect production. For instance, a field in Norfolk produced 11 qr. of Wheat per acre in the ordinary 4-course rotation, and without any extraordinary preparation. Four years afterwards I saw this field, and in that year it produced only 4½ qr. per acre under the same treatment. I think that the circumstance was noted and verified in the Royal Agricultural Society's Journal. Nine quarters of Wheat per acre are often grown in parts of Lincolnshire and other well farmed districts. I have grown 8 qr. of white Wheat per acre at Tiptree on poor stiff clay, well manured and deeply cultivated. No doubt, as a rule, such crops cannot be grown by thick sowing, except in peculiar seasons, such as the last, which, owing to drought and heat, was particularly favourable to the thick sowers. Whenever a farmer has a new and costly sample of Wheat, he places one kernel in a hole, at wide intervals in his garden, or on a rich piece of ground, and gets an enormous increase. Of course he allows no weeds to interfere with it. Let him pursue a like practice with his general crop, and we should cease to be surprised at a greatly increased average of production. We should never forget Baron Liebig's truthful warning, that the greatest enemy to a Wheat plant is another Wheat plant, for they both require the same meal, and if the guests are too numerous for the repast some must come away hungry and out of condition. Every one knows that two trees of the same species planted too close to each other suffer much from the competition, not only of terrestrial but celestial food, for they turn their backs to, and make few or no branches towards, each other. The absurdly small increase numerically of our grain is a practical proof of our maltreatment of the plant; about nine for one is the average of this kingdom (according to Mr. Caird), abroad it is only five for one. Compare this with the production of from 400 to 2000 from a single kernel, what a wide gap to try to fill up with any intermediate number! When we garden our land (and we shall come to that by-and-by, when our population is 100,000,000, and land three times its present price) our yield of cereals, and other agricultural produce, will contrast strangely and most favourably with our present minimum and insufficient produce. I am a believer in the Rev. Mr. Moule, in sewage wet or dry, in friend Wilkins, in the Rev. and lamented Mr. Smith of Loisweedon, and in Mr. Chadwick, our great social reformer. A Wheat or cereal plant is like a bullock; give him plenty of fresh air, a dry, clean, comfortable bed, plenty of the right sort of food, no hungry competitors, and plenty of time to grow, and you will make him good in quality, ample in quantity, and agreeable to the eye and palate of Mr. John Bull. The next generation will adopt these hints, and work out practical and profitable results. At present we certainly do not, as a nation, half farm our land. A neighbour of mine once grew 10 qr. of Rivett Wheat per acre over the whole field. *J. J. Mechi, Tiptree, October* 8.

* Mr Mechi here entirely misses the point of our criticism. Mr Moule says he produced Barley at the rate of 12 qr. an acre, and we entirely *believe* him. But our contention was that the actual "12 qr. an acre" on the title page of his pamphlet and "the rate of" 12 qr. per acre in the garden are two entirely different things. ED.

"One Hundred per Cent."—On taking up your valuable paper on Saturday evening last, after the labours of the day, I came across an article on "Our own Resources," calling the reader's attention to the account given in another part of the paper of a visit to Mr. Ruck's farm at Castle Hill, &c. With a certain amount of curiosity I turned to it, and read it carefully through. It would be impossible to analyse my feelings while so doing, but when I came to the part where Mr. Ruck states that farming can be made to pay cent. per cent. per annum, I could contain my feelings no longer, and, with a loud hurrah for Mr. Ruck and his 100 per cent. farming, I rushed forward, to the no small astonishment of my good lady, to embrace her and the little ones, at the good fortune that had overtaken the farmers at last. But my wife, instead of entering into my enthusiasm for Mr. Ruck and his farming, put this question—How was it, if farming was so profitable, I should make such a fuss when money was wanted to buy the little ones shoes,—and why I could not go and do likewise? Now this was a home thrust, as I had prided myself on being a good farmer, and leaving a mark to be seen. This called me from the dreams I was indulging in, of what I should do with my 100 per cent. profit, to hard facts. What profit, if any, had I made the two last years? I find they are *nil*, and that this year in many cases there must be a great loss to farmers. Not that I mean to say that this year's Wheat does not yield well according to the straw, but how few farmers, in this neighbourhood at least, are there who have not sustained a considerable loss of plant, therefore a corresponding loss of yield? Sir, I have nothing to say against steam-ploughing, on the contrary I consider it very requisite at times; but when it is advocated as the cheapest, and I suppose the only way of making the profit described, and that the ploughing can be done at a mere nominal sum, I ask how it is that those parties who let out the tackle tell us they cannot afford to plough under 14*s.* per acre and upwards. As regards Mr. Ruck not believing in meat, and that it did not pay to grow it, I would ask my brother farmers what would have become of us at rent-day had it not been for the said meat? Supposing Mr. Ruck's theory to be right (it certainly cannot be practice), would it be either social or political economy to grow all Wheat and no meat? How about the labourers and their families; while the farmers were away from home would they participate in the general advantages offered, and join their masters at the seaside? I should like to know what Wheats are best to plant continuously. I have been given to understand that Mr. Ruck plants principally Rivett's Cone, and that on Monday last a local corn-dealer bid him the extraordinary remunerative price (making, I suppose, the cent. per cent. profit) of 4*s.* 6*d.* per bushel. I think the steam-plough and manure merchants ought to present Mr. Ruck with a handsome testimonial, for by such statements as the present he must be the best means of advertising at command. From Mr. Ruck's well-known liberality and hospitality, I thought your reporter must have described the proceedings through a spiritualistic medium, but when he goes on to say, "We admit we were very sceptical as to this, but he (Mr. Ruck), not content with theory, showed us facts and figures not only to prove that it could be done, but that it had been done on a large scale, and that there is some probability of his taking out a patent for the idea," I was bound to believe that it must be a true statement. It is to be hoped that, not only for the good of the tenant-farmers, but for that of the whole country, Mr. Ruck's statements of profits are not ideas but facts. I for one doubt it, and challenge Mr. Ruck to prove it. I hope I may be allowed to express my opinion that it was a great pity such a statement should have appeared, more particularly at a time when the present profits of farming are well known to be at a discount. Statements when put forward should by their moderation and justness command the respect of the public. *A Cotswold Farmer in "Wilts Standard," Oct.* 5, 1870. P.S. If Mr. Ruck would not think me presuming, I would advise him after taking out the said patent to give up farming, and take one of the most noble and commanding offices in the City of London, and I dare guarantee him such custom as would make him the greatest millionnaire England ever possessed, and the greatest benefactor.

Societies.

PETERBOROUGH.

THIS spirited little Society organised for their meeting this year a public contest of two-furrow ploughs, in addition to the usually large number of implements for working with two horses. Within the last two years two-furrow ploughs have become very fashionable, and this Society has therefore done a great service in bringing all the principal makers together for public trial and exhibition. The revival of these implements was began at Leicester during the Royal Agricultural Society's meeting there, when Mr. Pirie appeared with an extraordinary-looking machine, which was carried on three diagonal wheels. From some cause this plough did not create a favourable impression at Leicester, but Messrs. Fowler & Co., of Leeds, were elsewhere impressed with its mechanical merits, and they took up the manufacture of these ploughs with the energy which they usually display. During the latter part of 1868 and last year, a good many of these ploughs were sold, and the manual labour that could be saved by using them induced many farmers to give them a trial, and

the result has been so far favourable that a great demand for them has arisen. Hence the leading agricultural implement makers have turned their attention to their manufacture, and hence also the public trials at Peterborough on Tuesday and Wednesday of last week.

The work done was certainly of a most excellent character, and the draught for three ordinary horses did not appear to be excessive at 6 inches deep. Some tests were made with the dynamometer, but owing to the variation in the quality of the ground, and some derangement of the instrument, these tests were not conclusive. The exhibitors who sent ploughs were, Messrs. Murray & Co., Banff; Messrs. Underhill & Co., Newport, Salop; Messrs. Cooke & Co., Lincoln; Messrs. Vickers, Snowden & Morris, Doncaster; Messrs. Fowler & Co., Leeds; Messrs. Howard, Bedford; Mr. T. Corbett, Shrewsbury; and Messrs. Ransome, Sims & Head, Ipswich. The chief interest lay in the implements and work of the makers from Banff, Leeds, Ipswich, Bedford, and Lincoln.

Messrs. Murray & Co. worked two ploughs, but one was more adapted for small thin furrows than for the work that was required of it in this match. The full-sized plough, however, did some most excellent work. The man and horses were from a farmer in the neighbourhood, and they had not long been used to this work; but, with the exception of a little want of straightness in the first part of the work done on the first day, the furrows were admirably laid. These ploughs were both carried on three diagonal wheels, somewhat after the manner of Pirie's, and with the small attention they require they are more of a ploughing machine than a hand plough.

Messrs. Fowler's plough, as we have intimated, was one of Pirie's, as improved by themselves, and with a great additional improvement, that has been made by Mr. Perkins, of Hitchin. This consists in a leverage which acts on the two foremost wheels, whereby the shares are raised completely off the ground, as required when turning at the ends or travelling. Another improvement has been made by Mr. Perkins, which consists in the manner in which the stems of the front wheel and hind wheel are connected by a crossed chain, with a view to increase the power of steerage; thus a double steerage is obtained, for while one wheel works to the right the other goes to the left, or *vice versâ*, and the implement can thereby be made to turn in its own length. With these improvements—the lever for raising the machine and the improved steerage—this implement did some most efficient work, the headlands being perfectly clean, and the taking out and setting in as true and short as they could be made by a single-furrow plough.

Messrs. Ransome, Sims & Head had a plough which is most efficiently raised from the ground by a wheel that is carried when the implement is at work, and let down when the ends are reached, or it is required to be removed to another place. This wheel is in the centre of the plough when it is down, so that the plough itself is easily balanced, and made to travel conveniently. This plough was fitted with a long convex mouldboard, and the work done with it by George Barker was certainly not inferior to any we ever saw. It was straight, cleanly cut, and firmly packed, while all the Clover roots were well covered; indeed, scarcely a patch of green could be seen on the whole piece immediately after it was done. This plough was drawn by two of the fine dark chestnut horses belonging to this firm, but it was very hard work at the depth of 6 inches, both on the Clover lea and on the Oat stubble, where the ploughing was done on the second day.

Messrs. Howard sent a plough similar to Messrs. Ransomes', so far as the two bodies were carried on parallel iron beams. In the details, however, there was much difference, for Messrs. Howard raise their plough up and down by a leverage which takes its bearing on the landside front wheel, while the two foremost wheels are acted upon simultaneously by the steerage. This gives the double advantage of having a wheel on the land and a wheel in the furrow to take the action of the steerage. The work done by this plough was good, although the packing and covering of the Clover and grass was not perfection. This, however, arose from matters of detail, and had no detrimental effect as regards the principle of the plough.

Messrs. Cooke & Co. did some most excellent work with a plough which carried two bodies on one beam. This beam was made after the patent of this firm, which consists in a layer of angle iron on the top and left side of a wood beam. We have never seen better work done than this plough turned off.

Some subsoiling and ploughing combined was done on each day by Messrs. Murray & Co. The chief merit of this implement consists in its adaptability for effectually stirring the subsoil at the same time that a furrow is turned, and in this being done in a way which allows a firm footing for the furrow horses, without the soil which has been stirred being again trodden upon. This is accomplished by the subsoiler tine and share being placed on the beam of the plough in front of the plough body, whereby the subsoil that is stirred is instantly covered with a furrow, and a clean, firm footing is left behind for the horses to take during the next drag. With four horses yoked to this implement some excellent work was done, a 6-inch furrow being placed on the top of 5 or 6 inches of broken subsoil. For the purpose of aëration and the percolation of water during the winter months, or for a seed-bed, where an increased depth of mould is wanted, and the raising of crude earth to the surface would be objectionable, this operation was as fine an example of efficient work as could be desired.

In the general ploughing field there were several classes, and the work was most admirably done. One remarkable feature of this work was the fact that Mr. Neal, a farmer's son, again won the plough given by the Messrs. Ball & Son, of Rothwell, for the best work in the whole field. This may account for the excellent ploughing which is generally done in this part of the country.

In the draining field there was a small entry, but the work done was of the usual extraordinary character, the 1st prize winner cutting 3½ feet deep with a width of only 5 inches.

The following is the prize list :—

JUDGES.—J. Helmsley, Esq., Shelton, Newark, Notts; Major Grantham, East Keal Hall, Spilsby; Joseph Martin, Esq., Littleport, Ely, Consulting Engineer; C. E. Amos, Esq., London.

CLASS 1. For the double plough which shall produce the best and most highly finished work, due regard being had to lightness of draught, strength, and simplicity of construction.—£6, Ransome, Sims & Head, Ipswich, double-furrow plough, with patent centre wheel, lifting apparatus, hind friction wheel, and adjustable beams to plough from 7 inches to 12 inches in width; £3, J. & F. Howard, Bedford, double-furrow plough, with three wheels and steel breast.

CLASS 2. For the best general purpose double plough; due regard being had to lightness of draught, ease, and economy of management, strength and simplicity of construction.—£6, J. & F. Howard, Bedford, double-furrow plough with three wheels, expanding beams, leverage, and steerage; £3, John Fowler & Co., Leeds, double-furrow plough with Perkin's improvement; £2, Messrs. Ransome, Sims & Head.

CLASS 3. The sum of £5 was also placed at the disposal of the judges for the class of turnwrist ploughs.—£3, Messrs. J. & F. Howard, Bedford, turnwrist plough with steel plate; £2, Messrs. Ransome, Sims & Head, Ipswich, turnwrist plough with steel plate.

DERBYSHIRE.

AT a recent meeting of this Society, Lord E. CAVENDISH, the Chairman, said :—We have just passed through one of the finest summers ever known in this country, but it has been accompanied by a drought of such unusual length that, pleasant as it has been to many of us, it cannot be regarded as having been a favourable season for agriculture. Should a very severe winter follow, I fear that the shortness of the hay crop and the failure of the Turnip crop will make the winter a very trying one. Very dry summers, like that of this year, are amongst the greatest difficulties farmers have to contend with. In the case of very wet summers, we can take what precautions are in our power; but very dry summers come at such rare intervals that we are not prepared to meet them. It seems to me well worthy the consideration of a Society like this, whether it would not be practicable to store some of the superfluous water of one part of the year for use at those times when only a small quantity of rain falls. I cannot but think that that would be a most useful thing, and that it might be done without a very great outlay. There is one other subject on which, with your permission, I should like to say a few words. I refer to the manufacturing of cheese. You will remember that this time last year Mr. Crompton communicated the results of numerous and careful inquiries which he had made on the subject of the manufacture of American cheese. It occurred to him that a similar system might be adopted in Derbyshire, and he brought two facts prominently under your notice; one was, that the make of cheese was diminishing in this country to a considerable extent, and the other was—and it was a still more lamentable fact—that the Americans were competing with us in our own markets. The object which we ought to have in view in reference to this subject appears to me a very plain and simple one. If it is found, after a fair trial, that the general average of cheese throughout the district can be improved by the factory system, that the improvement can be effected at a diminished and not at an increased cost, and that a better price than formerly can be obtained, then Mr. Coke and Mr. Crompton might safely advocate the adoption of the system. With reference to these points I have made some inquiries, and although my remarks will not have the weight which they might have, if communicated by some one personally and practically familiar with the subject, I may tell you that Mr. Coleman, who has always taken a deep interest in this subject, has kindly placed some facts before me which I think will interest you. I infer from what he says of the results of the concentration of labour, so far as those results are at present known, that the cost of production is very considerably reduced. Mr. Coleman estimates that, taking the yield of 500 cows, a saving of £400 a-year is effected by turning their milk into cheese on the factory system as compared with the old farmhouse system. With regard to the quality of the cheese made on the factory system, so far as I can learn the tests applied have been sound ones, and the result has been satisfactory, namely, that the price obtained for the factory cheese is better than that hitherto obtained for the produce of almost any dairy in the county. It may be replied to all this that there are some very considerable objections to the factory system. I mention these alleged disadvantages with some hesitation, because I have no practical knowledge on the subject, but it is said that if you take away the manufacture of cheese from the dairies you will take away the occupation of the wives and daughters of the farmers. I do not know whether that will be considered a disadvantage or not; but for my own part I have never been in the habit of looking upon the wives and daughters of farmers in other parts of England, where cheese is not manufactured, as an idle and unoccupied class. There is plenty of useful work in the house for them to do. The comfort of the house depends, of course, very greatly upon them, and I cannot help thinking that both wives and daughters would be a great deal happier if they were relieved from the drudgery of making cheese. I do not give you my own opinion on this subject, but I have no doubt this view will have its influence with farmers in determining whether or not they shall support the factory system. There is another objection to that system which is put in this form. The farmers say they have done very well up to the present time, and they would rather things remained as they were. That may be all very well at the present time; but I must say from my personal knowledge of many Americans that they are a stirring and active people, and if they find they can compete successfully with us they will not rest until they have driven us out of the market. It will not do for us to stand still, but we must push on and do the best that can be done.

Mr. NUTTALL said, referring to the cheese factory, that the price given for the milk was equivalent to 77*s.* 6*d.* per cwt., which he thought in an average season was a very fair price, and if they could get above the average price the first season he thought they might infer that they could do still better another season. There had been a considerable amount of prejudice against the cheese, and the complaint against it was that it was not old enough. They certainly could not make old cheese, but there was no doubt that every day it was kept would improve its taste. He, however, thought that the general favour with which the cheese had been received augured well for the ultimate success of the Derby Cheese Factory, and the statement which would at a future time be laid before them would be both satisfactory to the gurantors and to the public.

Mr. HENRY CORBET (for the judges) said : Only last week he had acted in a similar capacity in an adjoining county, where one of the management who proposed "The Judges" did so in a very feeling and almost affecting manner. That gentleman said the judges had very onerous duties to perform, but he was sorry to add from his own experience, that these duties were frequently followed by some very unkind and unpleasant criticism, which he strongly deprecated. Now, he (Mr. Corbet) could not altogether agree with this. Honest, straightforward criticism did a deal of good in many ways, and he could not help thinking that the progress of these societies had done something to improve the breed of judges as well as the breeds of stock. Besides, the great fun of the fair after all was judging the judges; and he could imagine nothing more insipid than that when the visitor took his entrance-ticket he should be bound down, as it were, by a sort of moral obligation not to whisper a syllable against the correctness of the awards. Such a course would not only threaten to become insipid, but impolitic and unwholesome. "To err was human," although he had once heard a clerical-looking gentleman, who had been acting as a judge of poultry, declare that he had never made a mistake in his life, and never before or since had he (the speaker) looked with so much reverence at any man in a white neckcloth. But putting poultry out of the question—those elegant Cochin Chinas, those beautiful Bramah Pootras, or those still more wonderful varieties, the aim with some of which seemed to be to breed them without any tails, and with others all heads and chignons—and admitting that a parson must, from some inscrutable cause, be an infallible judge of cocks and hens, there were other judges, from the highest downwards, who were merely mortal. Brougham was said to be a bundle of crotchets, and Eldon full of prejudice and port wine; and he really believed half the judges of stock were like those judges on the bench. One hated Bates, and the other did not quite fancy Booth; but they were none the worse for a little prejudice or port either. Still, whatever the public said about the awards, the less the judges themselves said the better. He did not know, when the work was over, but that an active steward should caution each of them, just as a policeman was bound to do any other unfortunate man who had got himself into trouble : "Now look here, any thing you say will be used against you, so perhaps you had better hold your tongue until some of your friends have been to see you." Were he discreet he (Mr. Corbet) might stop here, but he should like to say a little about his own business on the ground. He could remember, and not so many years since, when the riding horse classes were almost the laughing stock of these meetings—such failures indeed, that the Royal Agricultural Society had occasionally struck the premiums out of the list. Since then "the nags" had become far away the most popular feature of these occasions. There was no mistake about it, although there was one element in such a popularity with which he could not quite go. No doubt the jumping business "drew" in the way of shillings and half-crowns, but it was no test as to the actual merit of a hunter, as many of the best or best-looking horses he found declined to take part in these exhibitions, and he should prefer to judge the hunters as they did the other horses, and

then let the public judge the jumping and the judges. It was difficult at these times to touch any topic that could not be brought to bear on the war, and he saw that a friend of his had been writing to the papers on the way in which our cavalry is mounted. The light troops were the most useful for modern warfare, but the men were not so well horsed as they might be, and it was proposed to remedy this in the usual way—that was by starting a company. Let them call it the Light Dragoon Horse Company (Limited), for breeding troopers, to be sold to the Government, at three or four years old, at regulation prices. Would anybody in the room like to take any shares? Or, if that would not do, the letter went on to recommend the establishment of Government studs for the purpose. But by the time they had secured an efficient manager, a staff, farm, mares, and so forth, he feared the cost of growing a troop horse would open the eyes of political economists when they came to pass the accounts. Of course he had a notion of his own on the subject, and one that would tend, he thought, to make these societies still more useful, as a little countenance from Royalty or Government would not be out of place. Some three or four thousand a year was given in Queen's Plates, which had outlived their use, as they did little good now either in providing sport or improving the breed of horses. He was not going so far as to say these should be done away with; but if we could afford to spend so much in one direction, we might surely offer a few Royal Prizes at the leading agricultural shows for the best thoroughbred horses; and by such patronage or encouragement at a small outlay some benefit might follow in increasing the supply of well bred stock.

Dr. HITCHMAN said the pursuits of agriculture can never be satisfactorily and successfully carried on on a mere cold, calculating, commercial basis, on the broad principle of an abstract political economy; for they differ from ordinary trade in many essential particulars, and mainly in this, that one man is working upon another man's property, and every day of his life he is either exhausting or improving that property; and this exhaustion or improvement is such that cannot be accurately measured by a foot rule, and here moral sentiments and feelings are necessarily brought into play. Again, the nature of the farmer's pursuits is such that he cannot make the supply to be always commensurate with the demand he cannot obtain more than one crop of Wheat in an entire year, and therefore the cardinal principle of energetic trade cannot be realised of "Small profits and quick returns," for, however small the "profits," the "returns" cannot be quick; and every practised farmer will bear me out in this, that there are circumstances which happen to the highest skill and the most abundant capital, and that seasons influence the result of crops to a greater extent than either or both combined; and superadded to these special peculiarities is the terrible one, developed by the importation of foreign cattle, of contagious diseases by which hundreds, nay, thousands of cows are destroyed, the labours of years of breeding skill annihilated, and capital to an incredible amount, ay, to an amount exceeding the vast sums lost by the cotton famine, sacrificed and gone; and therefore, if the pursuit of agriculture as a livelihood, removed wholly from the sympathy of the public, be brought in its social relations to the simple condition of an ordinary trade, and be carried on between landlord and tenant with none of the chivalrous feelings of the olden time, but solely, absolutely, and exclusively as a pound, shillings, and pence spirit, the days of English agriculture are numbered. Vast factories would crowd all our hills and all our valleys. We should become the manufacturers, the colliers, the carriers for the world! One vast canopy of cloud and smoke would hang like a bird of darkness over the land. Brightness and beauty would be gone. Flowers and grass, trees and waving corn, the sunlit landscape, and the gorgeous clouds would pass away. The bright eye, the rosy cheek, the jocund laugh of ruddy health, would be displaced by sallowness and grime, and the beautiful England of our forefathers would be no more! Happily it is not so; the public honour the pursuit, and the innate love of the English for well-formed animals, and for the cultivated products of the field, will, I trust, cause them to continue to honour it for evermore. They now honour it in a manner that they honour no other, as our presence here at this moment testifies, and as other facts testify. Tens of thousands of persons from our crowded cities crowd to see the mere fat stock of the Smithfield Cattle Show; hundreds of thousands throng the showyards of the Royal Agricultural Society; and even in this our provincial show, we have been gladdened and honoured by the visits of many thousands. It surpasses all other pursuits in its importance to mankind, and therefore I earnestly hope it may continue to receive the sympathy and respect of the public, and that English agriculture may for ever hold the first rank among the cultivators of the earth. I would say something on the game question. It is far, very far from faultless, is the Game Law, but it is not so debased or debasing as some of the men who have denounced it for their own sinister ends. Few large landlords at the present day withhold from their tenants the right of destroying rabbits—those foes to all profitable agriculture,—and I hope the day is not distant when none will do so; and I am glad to say there are few indeed in this county who preserve an undue quantity of ground game. But in addition to this good quality I hope yet to see the landlords ignoring all mere petty politics, and aiding their tenants in the great work of regulating the local taxation of this kingdom, which is annually increasing in variety and amount, and widening the area from which it is gathered, and pressing equally equitable on all classes the burden of providing for such national purposes as vaccination, registration, the police forces and the maintenance of the paupers and lunatics of this great country.

CUMBERLAND.

AT Brampton, Mr. W. TORR, of Aylesby, said:—"The piping times of peace" had not lately been very prosperous ones to farmers; they had suffered somewhat during the last three years: and no one perhaps could speak more feelingly on that point than himself, for he believed he had lost as much money as, if not more than, most farmers in England. And he was not himself responsible for that. He had done his best, rising up early and late taking rest; he had not exactly, perhaps, "eaten the bread of carefulness," but he had made no money, and he had lost a lot of money. He believed this, that the farming of the present day was a very slow way of getting rich. He did not know of any farmer of his acquaintance who had managed his farm so that another man could farm after him, and paid a good rent, who had saved a great deal at it. But a farmer took a great deal of breaking. They might trespass on him a good long while before he would break, and he thought that in paying 20s. in the pound he was more honest than his neighbours. However, be that as it might, they must now rouse themselves, and keep their heads wide awake, and maintain that improved position which the farmers of England had, to his certain knowledge, attained within the last quarter of a century. They must take advantage of science and everything they could, but they must mind not to spend thirteenpence for a shilling's worth of labour, but rather to spend a shilling for thirteenpence worth. He believed that in steam cultivation they had an opportunity now of doing work which their forefathers never had, but he looked upon it rather as an addition to good cultivation than a cheapening of ordinary cultivation. It was simply that they could do by steam that which they never could do by horses. But they would never find that steam would do away with horses. If they adopted steam cultivation, he ventured to say they would not save one pair of horses in ten; they would do the work much better and more effectually by steam, but they would always have a thoroughly good lot of cart horses (as they had in Cumberland) to cultivate their land. He had lately had a long journey with his friend Mr. Gibbons—than whom he found there were few men more respected in Cumberland — through the counties of Bucks and Oxfordshire, to find a finely cultivated farm for a prize of 100 gs. It was a compliment to Cumberland and Lincolnshire that the task was left in the hands of men belonging to those counties, and, putting them together, he thought they would take a good deal of beating. At all events they found a farm answering the necessary requirements, and as there were some ladies present he would willingly tell them it was a farm belonging to a widow. He ventured to think that a Cumberland farmer if he went down to Oxfordshire would find something to learn in the management of sheep. Travelling from home always learned people something. As Shakespeare said, "Home-keeping youths have ever homely wits," and this was as true as anything he could tell them. With regard to steam cultivation he held a little crotchet of his own. He thought if they introduced it into the county on a broad scale of hiring, they were more likely to do good to their county than if they spent a lot of their own money in purchasing machines. If the system obtained, a small farmer would hire for a 20-acre field, when he would not employ steam if he had to buy his own implements. He hired very largely himself, and the more he hired the better he liked it. An engine was all the better for being worked, and the man who attended to it constantly was more likely to work it well than a casual hand.

Notices of Books.

Report on the Cultivation, by Means of Sewage Irrigation, of the Lodge Farm, Barking, *for the Year ending August 31, 1870.*

We have not seen the Sewage Farm, near Barking, for many months; and during that time a great change has, we understand, been effected in the mode which had been adopted for distributing the sewage over the land:—

"The large earthen main carriers have given place to wooden troughs, which, at a moderate cost, efficiently serve the purpose; and all ditches of communication between the plots, which had previously been used for the purpose of conveying water which escaped from one set of the irrigated beds for redistribution over land at a lower level, were filled in for the purpose of isolating each division, and restricting the amount of sewage applied to that which the land could absorb."

Mr. Morgan, the energetic secretary of the Metropolis Sewage Company, under whose directions all these alterations have been made, here reports to the company the result of his year's proceedings.

"The valuation of the crops saved or in the ground has been very carefully gone over, and although some of them will not be taken off the land for two or three months, the value set down against them is that which has been already offered for them as they now stand.

"The result is that from 184a. or. 23p. in cultivation a return of £5,423 9s. 9d. has been obtained, and, in an exceptional year of drought, upon hot, porous soil, 500,871 tons of sewage have been applied to 112a. 3r. 23p."

These totals, representing so large an average produce per acre, include a number of very various experiences. The Italian Rye-grass has, during the past dry summer, been comparatively a failure; and whereas in ordinary summers 100 tons of sewage will produce 1 ton of grass, this year in many plots 290, 343, and even 450 tons of sewage have been expended in the production of that quantity. On the other hand many succulent and some seed crops have done remarkably well. Thus on plot C, containing 13a. 3r. and 12p.—

"There has been grown this year perhaps a finer piece of Onions than the most propitious season has ever produced by ordinary cultivation, conclusively establishing the great value of sewage for this crop. The success also was enhanced by the partial failure of Onions throughout the neighbourhood, owing to the great drought. The difficulty experienced on previous occasions to produce by means of the sewage alone the growth of the Onion plant, made us decide upon using a small amount of dung over a portion of the land, and the result proves that we were justified in so doing. Of 8½ acres sown in Onions, a small part was treated with dung only, in the ordinary manner, about 20 tons an acre having been applied. This was done in order to contrast the result with the other beds under sewage, which were partially dressed with farmyard manure or left without any such top-dressing. From the first, the strength of the plant was evidently the greatest where the dung extended, the crop in the other part of the land appearing as comparatively weak. Even up to the last the influence of the dung made itself apparent, although a fine strong vigorous plant covered all the beds; that one to which no sewage was applied being the sole exception. I regret very much that owing to the very great amount of work which, at the end of July and the beginning of August, was thrown upon our horses by the necessity of speedily preparing the stubble and Potato fields for the reception of sewage, we were not able to market these Onions ourselves, and I am thus unable to give a true return of their value. I sold them on the ground on July 28 at what was then thought to be a very long price, viz., about £43 per acre; but from their having continued to grow through the month of August quite as much as they did during the two preceding months, they have become worth a very much larger sum.

"Upon this plot we have a small bit of Kohl Rabi, which promises to be a good crop, and in this, as in most other crops under sewage, the top is much more luxuriant than is elsewhere to be seen."

Again, on plot A (9a. 2r. 11p.) the grass being very indifferent—

"The beds were ploughed as the succeeding crops required to be sown. Mangel was dibbled in in April, and the remainder, after being laid out for sewage, was planted with Collards in June. Mangel seed was also put in between the rows of Cabbage on the adjoining beds, and Sugar-Beet occupied three-quarters of an acre close by. Although the first sown Mangel is a very heavy crop, likely to average over 40 tons an acre, and the Sugar-Beet also is equally strong and regular, the Collards planted in June take the first place in this plot, for when only eight or nine weeks old £30 an acre was bid for them on the ground."*

On plot H in Wheat (12a. 3r. 36p.)—

"Wheat has now been grown for the fourth time in succession, and notwithstanding the unfavourable description of the land, we have, with the aid of sewage, obtained a better result this year than had been hitherto reached. As the Wheat has not been threshed out I am unable to give accurately the yield per acre, but I believe it will be quite safe to estimate it at 5 qr., with from 2½ to 3 loads of straw. The description of Wheat is that known as 'long straw,' and 7 pecks per acre were sown. The crop was sewaged three times over all, and a fourth dressing was given to a part of it. Had rain come on in any quantity at one period of its growth, a great portion of it would probably have been laid. The dates of the dressings of sewage are — March 8 and 9, 1870; April 1 and 4; April 25 to 27, and a partial dressing was given June 7 and 8.

"A small plot of Clover, adjoining the Wheat, grew in a marvellous manner. From 0a. 1r. 28p. of an acre, 4 tons 5 cwt. of Clover were cut at the first cutting, and carted to be made into hay. When dry the hay weighed 1 ton 2 cwt. A second good cutting though not of equal weight followed, and at the present moment there is a nice show of blossom and a promise of a good third crop. On the removal of the Wheat the land was sown in Turnips, which will come off in time to enable the whole of this division to be sown down in Wheat."

These extracts represent the kind of information which Mr. Morgan furnishes. The management and crop of each plot are described in succession; and the pamphlet concludes with reference to the quantity of sewage which in the several instances has been employed to produce the several money results. Thus 23,000 tons of sewage produced £258 worth of Cabbages—30,000 tons of sewage produced only £90 worth of grass, 20,000 tons of sewage produced £118 worth of Mangel Wurzel, 580 tons of sewage produced £20 worth of Sugar-Beet, and so on.

Elaborate Tables are appended to the pamphlet, and

* Since the above was written, less than a moiety of this crop, upon 3a. 0r. 30p., has been marketed — 27¼ dozen of these Cabbages, weighing upwards of 53 tons, have produced a gross return of £154 12s

from these the reader can learn the extent, weight, and value of the several crops, and the quantity and date of the several dressings with sewage, and a balance-sheet of the year's proceedings completes the work. We add that it would have been more perfectly satisfactory if a map had been added, enabling the reader to understand the arrangement of the several plots and crops, among which at present he feels somewhat mystified. Mr. Morgan's plan of isolating each plot, so that each result can be confidently attributed to the use of a definite quantity of sewage, will give the annual reports of Lodge Farm still greater value hereafter as the source (the only source hitherto) of exact information on the agricultural value of town drainage. It is obvious, from the plain and dispassionate style of the present report, that the statements of fact which it contains may be relied on; and the thanks both of country men and towns men are due to Mr. Morgan for his additions to our knowledge of a subject so interesting to both.

Farm Memoranda.

Banffshire (Boyne District).—A short and excellent harvest is now all finished up and the plough at work again. On many farms the crop has filled the stackyard better than was expected at one period of the season,—the crop after lea being in most cases deficient, while after Turnips it was good; and the Barley crop was mostly good everywhere, and is threshing out well, of great weight, and fine quality, some of it weighing as high as 59 lb. per bushel. A great quantity of it has been threshed out within the last week. The steam threshing-machine is in more favour here for the Barley than Oats, but very few have water for their own mills. The rains we had in the beginning of the month did an immense good to the pastures and Turnips, but the waters and burns are as low as they were in July. Swedes promise to be an excellent crop in most places, and the late yellows, but the early yellows are gumming fast, and are in great want of more rain. The pastures are greener by far than they were in July, though short, but the cattle intended for feeding are mostly housed now and getting Turnips, and only store beasts are on the fields. Cattle in this district have been all very healthy, and where an abundance of water was within their reach have thriven better than could have been expected, considering the dryness of the season.

Top-dressing leas intended for cropping and preparing for sowing Wheat, is the principal work on most farms at present. Potato lifting has now begun, but we can as yet say little about the crop; what we have used as yet is of excellent quality, and no appearance of disease, but some second growth here and there: there is not a great breadth of them planted in this district. Work for labourers is plentiful; a great deal of drainage is being executed in this quarter, a great many new leases being granted lately. So with a fair crop, and good prices for cattle and fair prices for grain, the farmer ought to be thankful; and while the labouring class can get plenty of work at fair wages with provisions at a reasonable figure, there ought to be contentment in our land. *W. J.*

Upper Winchenden, Aylesbury.—The following is Mr. Hall Keary's account of the Second Prize Farm:

I will next describe the farm of Mr. Treadwell, of Upper Winchenden, near Aylesbury, Bucks, to which the judges awarded the second prize of £50, given by the Royal Agricultural Society. This farm contains 420 acres, 180 of which are arable land and 240 pasture. The map which accompanies this report shows that Kimmeridge clay, with a thin band of alluvium running through it, extends from Aylesbury to Thame, and thus embraces the whole district in which Upper Winchenden is situated. The road from Thame to Aylesbury runs in a north-easterly direction through the farm, leaving the greater portion, with the homestead, on the east side of it. The farm is undulating, almost hilly, and the whole of the arable land is on the high ground, intersected by the road, or on the slopes which run down to the meadows and pastures of the valley. The soil of the arable portion may be described as rather a strong clay loam of good quality, but varying very much in depth, being very thin on some of the brows of the hills. The pasture land is of that kind known as good dairy land, but not strong enough to fatten cattle. The farm is held under a yearly agreement from the Duke of Marlborough, and there are compensating clauses for manures on leaving. Mr. Treadwell has only occupied it for five years from Michaelmas last. The house and buildings are nearly new, and are substantially built of brick and slate. Besides the home buildings there are some detached old premises, which are very useful for young cattle and sheep. The arable land is farmed upon a six-course rotation as follows:—

1. Roots.—12 acres: Mangel Wurzel, heavily manured. 4 acres: Rye, eaten off, manured, and sown with Mangels. 8 acres: Winter Tares, eaten off, manured, and sown with Swedes. 6 acres: Spring Tares, fed off, manured, and sown with Turnips. Total, 30 acres.

2. Barley or Oats, half sown with Italian Rye-grass or Dutch Clover, the other half, with the exception of 4 acres, sown with broad Clover.

3. Seeds.—The Italian Rye-grass is fed off by sheep, and is mown over once in the summer to sweeten it.

The broad Clover is mown off or fed as it is wanted. Four acres are heavily manured and planted with Cabbages.

4. Oats or Barley after the Italian Rye-grass. Wheat after Clover or Cabbages.

5. Winter Beans, spring Beans, Peas, and about 5 acres of Mangel Wurzel and Swedes, to draw off for the beasts. Yellow Tankard Turnips are drilled between the rows of Beans and Peas.

6. Wheat, where Turnips are eaten off soon enough, otherwise Barley.

The above six-course system may be almost described as a four-course rotation extended. Although the roots and seeds are diminished, and Pulse substituted, still the land only produces white corn every other year, and as Turnips are sown between the rows of Beans and Peas after the last horse-hoeing, which in favourable seasons produce a large amount of sheep-feed, the system appears to be very profitable without being exhausting. The amount of sheep-feed raised is considerable, and as the green crops, as well as the roots, are all fed off by cake-eating sheep, high condition of the soil cannot fail to be produced. Mr. Treadwell does not adopt steam cultivation, but he ploughs all the land intended for roots very deeply, and frequently subsoils it also. The Mangel Wurzel appeared to be drilled rather close in the rows, 18 inches apart, on the flat; but Mr. Treadwell always uses Gibbs' Selected Golden Globe, which grows a very small top, and which he thinks admits of being grown in closer drills than other varieties. The crop we saw was very perfect in plant, and in spite of the extreme drought of the season, looked healthy and vigorous. The crops of Wheat, Barley, and Oats, except a very few patches upon the thinnest soil, were remarkably clean, heavy, and good; plenty of straw, and large well-filled ears. The Wheats usually grown are Red Browick and Rivett; none is sown till the beginning of November, when 2 bush. 1 gall. per acre are drilled, and the quantity of seed is increased as the season advances to 2 bush. 3 gall. It is all hand-hoed twice in the spring, at a cost of 3*s.* 6*d.* per acre each time. It is cut with a fagging-hook, at an average cost of 11*s.* 6*d.* to 12*s.* per acre, which includes tying and shocking. Chevalier Barley is always grown, and 3 bushels of seed per acre are sown as early in spring as the land will work well.

Cattle.—A dairy of 50 cows is generally kept. The milk is made into butter, which is sent to the metropolitan market. In summer the cows are kept on the pastures, in winter they are tied up in stalls, and fed well with roots, hay, and straw-chaff and cake. Twenty calves are reared annually, and 12 heifers are annually added to the dairy. The draft cows are fatted off, as also are all steer-calves and heifers (not required for the dairy) at three years old. This gives an average stock of 110 cattle both in summer and winter. All the young stock are supplied with cake and chaff in the winter as well as with roots. The cows are all Shorthorns, of a very useful description, and appeared to be in excellent condition. The young stock, according to their different ages, were grazing in the pasture fields, and were in that healthy and satisfactory state in which young animals ought to be kept,—that is, neither too lean nor too fat.

Sheep.—A flock of 220 Oxford Down ewes is kept, and they generally produce about 270 lambs. About 50 theaves are put into the flock every year, and 50 or 60 yearling rams are sold annually in the month of August. All the draft ewes are fatted before they are sold, as also are all the hoggets not kept as rams or put into the flock. About 80 sheep are bought in the autumn in addition to those bred, so that there is generally a winter stock of nearly 600 sheep. In summer, as well as in winter, all the green crops are hurdled off. No sheep run at large except on the pastures. In early spring the ewes and lambs take the Rye, having Mangels thrown to them with chaff and cake. The lambs run forward and take the fresh feed, and soon learn to share the cake with their dams. Vetches succeed Rye, which are hurdled and fed off in exactly the same way. As Mr. Treadwell's sheep arrangements are carried out in a very superior way, I think I cannot do better than give a detailed description of it in his own words:—"On the 1st of September, or a little earlier, according to circumstances, I draft my ewes into small lots in different pastures, using about five rams; of course the ewes are drawn to suit the different rams; about the middle of October the ewes are put all together again with two rams (probably different sheep, to catch those that turn again), and brought on to the seed, and to clear up any food we can spare on the arable land, such as Mangel-tops, &c. The rams are taken away in the middle of November, and the ewes drafted out all over the pastures, where they are kept until we can spare some Turnips, or Rye, or Vetches, or seeds for them in the spring. The ewes, after lambing, get on the pastures about 1½ pint of Oats each, and later on a few Mangels. When on the Rye or Vetches, the lambs run forward and learn to eat a little cake and corn, the ewes getting 1 lb. of cotton cake. The lambs are weaned soon after shear-day, about the middle of June, and are put on the pastures and seeds. The tup-lambs get ¼ pint of corn and cake, and some Cabbage as soon as we can spare them any, until the rams are sold—the first Wednesday in August. The ewes, as soon as the lambs are weaned, have rather a hard time of it until September; they are run thick in a pasture, or they clean up seeds after the other sheep, or run anywhere where we can keep them cheapest. The rams, as you are aware, during the summer are kept on Vetches, and have Cabbage taken to them, always having a plentiful supply of water by them, and movable shades to protect them from the sun, getting about a pint of split peas, and a little linseed and cotton cake."

Pigs.—Seven breeding sows of the Berkshire sort are kept, and all the produce is fatted off at about 10 score weight. The sows are remarkably good specimens of the Berkshire breed, and the feeding pigs combine great aptitude to fatten with sufficient size.

Horses.—Mr. Treadwell keeps nine working horses, which are strong useful animals, but not specially deserving of notice. They are yoked at length, three in a plough, for deep winter ploughing, and they work abreast for the lighter operations of spring cultivation.

Grass Land.—The pastures are a very important feature in Mr. Treadwell's farm. A very small proportion of them are mown for hay, and none are mown two years in succession without an application of good, well-made, farmyard manure, at the rate of nine or ten loads per acre. The fields are divided into convenient enclosures, and are nearly all well watered. Although depastured almost entirely by dairy cattle and young animals, they do not show any symptoms of deterioration; and although breeding animals must eventually, under ordinary management, impoverish the pastures they graze upon, Mr. Treadwell's high farming and liberal use of linseed cake and corn no doubt correct as much as possible a system of stock farming which, in too many instances, has impoverished much of the grass land of the kingdom. Mr. Treadwell buys annually £600 worth of linseed and cotton cake, £200 worth of corn, and besides this generally consumes Beans and Peas grown upon the farm to the value of £600.

Fences.—The fences are, generally speaking, not good, and are evidently suffering from many years' neglect of former tenants. In many cases they are past repair, and can only be improved by grubbing up the old ones and planting new ones, where practicable, on a fresh site. A work of this sort can only be managed by the joint efforts of landlord and tenant, and in this case it is very desirable that some equitable arrangement should be made for the improvement of the fences. *English Agricultural Society's Journal.*

The Week's Work.

October 15.—*Threshing* and *Dressing Seed* for autumn sowing, including Wheat, Barley, Oats, Rye, Vetches, Beans, Peas, and grass seeds, is a question which has this year been easily solved, owing to the fine harvest. Newly threshed corn out of the stook is an old rule which requires to be observed in late, wet seasons, as more or less injury is sustained when the sheaves are stacked damp. But this year we have heard of very little heating in the stackyard. There has been, however, much smut and premature ripening in some places, so that seed will require to be thoroughly dressed to as uniform a sample as possible. It may also be advisable not only to wash and pickle Wheat, but the other kinds of seed corn, for the two-fold purpose of removing light prematurely ripened grain and destroying smut and the like. In other words, lay more stress upon dressing and washing than usual. There is not half that attention paid to the selection and cleansing of seed which the importance of the subject requires; and for this neglect of duty there is now no excuse, as dressing machines and washing apparatus are at the command of every farmer. On the other hand, very fine samples of seed may be obtained from other places, more especially of Wheat and winter Beans, so that the season is unusually favourable for a change by districts subject naturally to degeneracy.

New Varieties of Seed.—Much has evidently been done to introduce new varieties of Wheat, Barley, and Oats, by hybridisation and otherwise, and the season now drawing to a close has afforded a singular opportunity of judging how far they have stood the climatic test of 1870, unusually diversified in different counties. Fickleness, for example, is the familiar characteristic of an English climate; but this hardly applied to some English counties last summer, during which the drought and forcing heat were remarkably uniform throughout. How has this affected the normal acclimatisation of new varieties of Wheat, &c.? Has the quality improved or degenerated, and how do these counties differ from others where the weather has been different? And so on. As threshing now progresses, both for seed and market, such questions merit a practical solution, for the twofold purpose of determining progress made and further improvement needed.

Winter Beans.—If not sown, get in without delay, as directed at the close of last month. The plant is a large consumer of lime. Where lime is naturally deficient, the land should be limed previously to sowing. From 50 to 100 bush. of unslacked lime from the kiln is a common dose for applying to a clean Wheat or Oat stubble per acre. When slacked and spread it should be well harrowed into the surface with a heavy

harrow, before manure is applied. Wood ashes, or specific artificial manures, supply potash, of which the plant is also a large consumer. But a good specific manure for Beans, suitable for being drilled in along with the seed, is much better; one unless the land is in good heart, and the crop forced forward in the early stage of growth to maturity, it seldom comes to much, *i. e.*, pods well; and specific manures are favourable to early maturity of seed.

Bean Harvest of spring-sown crops is seldom over in the North before the middle of the month; and when the crop is followed by Wheat, as is generally the case, it is common to remove the sheaves and stook them on pasture, or Wheat, or Oat stubble adjoining, in order to get the land ploughed and the Wheat sown. The value of steam is incalculable in such cases, as the land can be ploughed and sown with Wheat as fast as the Bean crop is removed. If the land has been saturated with rain to the maximum, it is sometimes difficult to get a proper seed-bed, while the horses' feet do immense harm in drilling and harrowing. To avoid this latter, the seed is sown broadcast by hand, and the horses walk in the out-casting furrows, hauling the harrows between them, by means of a long pole or draught-bar the breadth of the ridge, the work of sowing keeping close up to the ploughing.

The Autumn Top-dressing of meadows finish, in order to get the dressing well washed in with the rains of this and the ensuing month, and a good start sown before the frost sets in. Rich composts are made by saturating peat-earth, scourings of ditches, vegetable mould of any kind, with the liquid from the homestead, or town sewage; or the earth hills may be mixed with farmyard manure, with lime, if the land requires it, with the refuse of fisheries or gasworks: or a rich compost may be made by mixing 12 or 15 bush. of ashes with 5 or 6 cwt. of artificial manure. Such composts, if properly made, may be applied by a manure distributor, and well harrowed in by a chain-harrow.

Live Stock as last week. The familiar old rules, "Only fatten animals that are ripe for the shambles," and "Get rid of an ill-doer at any price," are still in force, as they were prior to the modern theory of early maturity. Much of the complaint now so general, that fattening stock do not pay for their keep, arises from the want of due attention being paid to the drafting out of animals that have not attained the ripe age for fattening, for, when the whole herd of the same age is tied up promiscuously, the ripe ones pay but the green ones do not. The latter are generally sent to the fat stock market in spring only half fat, where numbers of the more promising are bought by graziers for fattening out on the grass, which they pay well for. No doubt an extra allowance of cake and corn will do much to force forward unripe beasts prematurely, as it were, to the shambles; but even in such cases the inferior quality of the carcase, which seldom fetches more than two-thirds, and generally only half, the price of the primest ripe animals, does not repay the extra corn and cake. To the low dead meat value of animals thus prematurely forced forward must be added their greater liability to disease and loss thereby. Much also of the so-called early maturity is due to an obese type, the dead meat of which sells at a very low price. *W. B.*

Markets.

MARK LANE.

MONDAY, Oct. 10.

There was a short supply of Wheat from Essex and Kent to this morning's market, which sold readily at the full prices of Monday last. The attendance was moderate, and only a limited business done in foreign, at that day's rates. Barley, Beans, and Peas were unaltered. Oats must be quoted 1*s.* per qr. higher than on this day week. Flour in fair demand, without change.

	s.	*s.*		*s.*	*s.*
PRICE PER IMPERIAL QUARTER.					
WHEAT, Essex, Kent, Suffolk. White	44	51	Red	41	51
— — fine selected rans. do.	48	50	Red	45	53
— — Talavera	49	53			
— — Norfolk	—		Red		—
— — Foreign	49	62			
BARLEY, grind. & dist., 29/8 to 33/-. Chev.	42	45	Malting	36	41
— Foreign .. grinding and distilling	25	33	Malting	33	40
OATS, Essex and Suffolk	24	36			
— Scotch and Lincolnshire.. Potato	26	28	Feed		—
— Irish Potato	25	27	Feed	23	26
— Foreign Poland and Brew	24	26	Feed	19	24
RYE		32	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan.... 43*s.* to 47*s.*.. Tick	49	50	Harrow	49	50
— Pigeon ....51*s.* to 59*s.*.. Winds.			Longpod		—
— Foreign Small	45	47	Egyptian	42	44
PEAS, White, Essex, and Kent.. Boilers	38	40	Suffolk	40	42
— Maple, 40*s.* to 44*s.* Grey	36	40	Foreign	36	40
MAIZE			Foreign	33	36
FLOUR, best marks delivered.. per sack	37				
— 2d ditto ditto	32	34	Country	33	34
— Foreign per barrel	24	27	Per sack	58	61

WEDNESDAY, Oct. 12.

The grain trade at Mark Lane to-day ruled quiet, owing to the extensiveness of the arrivals from abroad and although no positive reduction in prices took place, yet in some exceptional instances less money was accepted. The supply of English Wheat on offer was limited; the demand was not quite so animated, on former terms. Foreign Wheat, being in abundant supply, met with slow sale, at Monday's quotations. Malt was in more active request, at late rates. The market was largely supplied with Oats, consequently the trade was restricted, and on some occasions it was rather easier to effect purchases. Beans and Peas experienced a moderate demand, at about late rates. Sales in Flour were effected quietly, at Monday's currencies. Barley was in good supply; the inquiry for malting descriptions was fairly active, but grinding qualities were purchased cautiously, at Monday's quotations.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	350	310	—	—
Irish ..	—	—	—	—
Foreign ..	33,560	14,750	45,930	1640 / 17,360 brls.
	33,910	15,060	45,930	

HULL, Oct. 11.—At our market to-day there was a fair show of English Wheat, which was sold freely at last week's prices; in some instances an advance of 1*s.* per qr. was paid. In foreign Wheat nothing was done. English white realised 50*s.* to 53*s.* per qr.; red, 46*s.* to 48*s.*; Dantzic and Konigsberg white, 50*s.* to 52*s.*; mixed, 46*s.* to 48*s.*; Baltic red, Danish, and Hamburgh, each, 45*s.* to 47*s.* Barley, both for malting and grinding, was held firmly. In Beans, Peas, and Oats there was but little business doing, and no alteration in price. The trade in Linseed was exceedingly quiet, crushers being well supplied. Cakes of all descriptions were in good request.

AVERAGES.

	Wheat.	Barley.	Oats.
Sept. 3	40*s.* 1*d.*	36*s.* 2*d.*	25*s.* 9*d.*
— 10	45 1	35 8	23 10
— 17	46 6	36 4	23 9
— 24	45 4	36 2	20 7
Oct. 1	46 1	36 7	22 8
— 8	46 5	36 11	21 11
Average ..	46 11	36 3	23 1

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Oct. 13

Prime Meadow Hay	126*s.* to 132*s.*	Clover, old ..	..130*s.* to 142*s.*
Inferior do. ..	..110 120	Inferior do. ..	..115 125
New Hay ..	..115 125	New 2d cut do.	..120 130
Inferior do. ..	..100 110	Inferior do. ..	..110 115
Straw	30 34	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, Oct 13.

Sup. Meadow Hay	135*s.* to 145*s.*	Inferior Clover ..	126*s.* to 135*s.*
Inferior do. ..	..100 120	Prime 2d cut do. ..	—
New do.	— —	New do.	— —
Inferior do. ..	— —	Straw	35 40
Superior Clover ..	136 150	JOSHUA BAKER.	

METROPOLITAN CATTLE MARKET.

MONDAY, Oct. 10.

We have a very short supply of Beasts and a fair demand, consequently for choicest qualities prices are higher, and there is a clearance of all descriptions. The number of Sheep is also smaller, and the prices of last week are rather exceeded on the average; trade, however, is not brisk. Choice Calves are dearer. Our foreign supply consists of 810 Beasts, 5000 Sheep, 203 Calves, and 230 Pigs; from Scotland there are 130 Beasts; from Ireland, 400; from Norfolk and Suffolk, 20; and 1115 from the Midland and Home Counties.

	s.	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*
Best Scots, Herefords, &c. ..	5	2 to 6	4		Best Long-wools	5	6 to 5	10	
Best Shorthorns ..	5	8—6	0		Do. Shorn ..	..	— —		
2d quality Beasts	3	8—4	6		Ewes & 2d quality	4	8—5	2	
Best Downs and					Do. Shorn ..	..	— —		
Half-breds ..	6	0—6	4		Lambs	..	— —		
Do. Shorn ..	..	— —			Calves	4	0—6	0	
					Pigs	4	0—6	0	

Beasts, 2475; Sheep and Lambs, 16,500; Calves, 240; Pigs, 330.

THURSDAY, Oct. 13.

We have a few more Beasts than last week, and the demand is good; an early clearance is effected, at fully Monday's quotations. Sheep are more plentiful, and there is very little trade for them; prices are lower, and a clearance cannot be made. Choice Calves are scarce, and rather dearer. Our foreign supply consists of 430 Beasts, 3310 Sheep, 260 Calves, and 140 Pigs.

	s.	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*
Best Scots, Herefords, &c. ..	5	10 to 6	4		Best Long-wools	5	6 to 5	8	
Best Shorthorns ..	5	8—6	0		Do. Shorn ..	..	— —		
2d quality Beasts	3	8—4	6		Ewes & 2d quality	4	6—5		
Best Downs and					Do. Shorn ..	..	— —		
Half-breds ..	5	10—6	2		Lambs	..	— —	0	
Do. Shorn ..	..	— —			Calves	4	4—6	4	
					Pigs	4	0—6	0	

Beasts, 1130; Sheep and Lambs, 9,011; Calves, 128; Pigs, 150.

METROPOLITAN MEAT MARKET.—Oct. 13.

Best Fresh Butter .. .. .. 20*s.* per dozen lb.
Second do. do. .. .. .. 18*s.* ,,
Small Pork, 5*s.* 4*d.* to 6*s.* 8*d.*; Large Pork, 4*s.* 6*d.* to 4*s.* 8*d.* per 8 lb.

COALS.—Oct. 12.

Holywell Main, 17*s.* 3*d.*; West Hartley, 16*s.* 6*d.*; Eden Main, 17*s.*; Wall's End Braddyll's Hetton, 17*s.* 9*d.*; Walls End Haswell, 19*s.*; Walls End Hetton, 19*s.*; Walls End Tunstall 16*s.* 6*d.*; Walls End Halepool, 18*s.* 3*d.*; Walls End East Hartlepool, 18*s.* 6*d.*; Walls End Original Hartlepool, 19*s.*; Walls End Auckland Park, 15*s.* 9*d.*—Ships at market, 55; sold, 47; unsold, 8; at sea, 25.

SEED MARKET.

Inactivity continues to characterise the agricultural seed trade; the consumptive demand is now at an end, and no speculation has yet sprung up. A few samples of new red Clover seed have arrived from the United States, but prices are scarcely yet fixed. For new White long values are demanded. Trefoil seed meets with a dull sale. Foreign Italian and Rye-grass are firm. The crop of white Mustard seed has proved unprecedentedly large, and quotations are, in consequence, lower than they have ever been before. Rapeseed has advanced 1*s.* to 2*s.* per qr. New Dutch Hempseed is dearer. Canary seed is without alteration. For winter Tares we have a fair demand, at recent currencies. Windsor and Longpod Beans are in good request. Large blue Peas meet with a ready sale.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

Notices to Correspondents.

AGRICULTURAL IMPORTS FOR EIGHT MONTHS: *R.*

Articles.	Quantities Imported. 1869.	1870.
Animals, living — Oxen, Bulls, and Cows .. .. No.	134,284	92,794
Calves	26,741	22,459
Sheep	530,498	443,168
Lambs	17,942	16,713
Swine and Hogs..	40,487	59,553
Bark, for Tanners' or Dyers' use cwt	338,865	348,006
Bones (burnt or not, or as Animal Charcoal) .. .. .. tons	54,652	51,749
Corn — Wheat — From Russia .. cwt.	4,217,091	6,090,703
Denmark	204,674	263,825
Prussia	3,471,194	2,265,191
Schleswig, Holstein, and Lauenburg	37,290	21,536
Mecklenburg	422,591	435,311
Hanse Towns	456,136	272,160
Italy	231,077	20,708
Illyria, Croatia, and Dalmatia ..	75,014	42,127
Turkey and Wallachia and Moldavia	1,636,839	267,397
Egypt	651,143	99,050
United States	6,515,807	8,083,365
Chili	462,496	355,827
British North America	910,393	1,392,874
Other countries	350,322	168,569
Barley	5,275,516	5,007,142
Oats	3,696,081	7,237,513
Peas	519,632	1,451,440
Beans	1,219,150	1,708,159
Indian Corn, or Maize	10,056,074	10,007,702
Wheat meal and Flour — From Hanse Towns	351,503	540,461
France	948,769	609,916
United States	782,062	1,397,766
British North America	159,469	137,193
Other countries	742,176	499,467
Indian Corn Meal	3,632	3,535
Flax and Tow or Codilla of Flax — Russia	505,468	947,037
Holland	88,244	137,147
Belgium	111,781	134,812
Other countries	1,174,89	274,085
Guano — West Coast of Africa .. tons	2,147	1,880
United States	360	20
Peru	7,344	152,963
Bolivia	1,012	953
British West India Islands	1,101	..
Other countries	2,274	21,905
Hemp and Tow or Codilla of Hemp — Russia .. .. cwt	246,797	220,914
Venetia	176,021	137,678
Illyria, Croatia, and Dalmatia ..	38,102	9,638
British India	13,821	12,848
Philippine Islands	66,315	74,237
Other countries	58,391	52,345
China Grass	11	951
Jute and substances of the nature of Hemp	1,745,159	1,884,285
Hides, untanned — Dry — From British India	145,404	249,747
Other countries	44,776	66,025
Wet — From Argentine Confederation and Uruguay	94,705	138,325
Brazil	62,711	82,845
Australia	22,946	42,203
Other countries	93,720	97,154
Hides, tanned, tawed, curried, or dressed (except Russia Hides) lb.	5,728,822	6,883,429
Hops .. .. cwt.	169,046	69,673
Oil Seed Cakes .. .. .. tons	103,322	94,013
Potatoes .. .. cwt.	1,379,489	685,018
Provisions — Butter	744,812	691,168
Cheese	407,308	511,869
Eggs .. .. No.	131,206,240	127,158,520
Fish, cured or salted .. .. cwt.	303,009	384,769
Lard	265,736	289,486
Meat, fresh or slightly salted — Beef..	7,474	6,994
Pork	12,565	18,121
Meat, salted — Bacon and Hams ..	500,348	432,090
Beef, salted	175,930	119,470
Pork	114,931	133,082
Meat, not otherwise described ..	40,730	57,054
Saltpetre	165,907	172,719
Cubic Nitre	553,791	715,146
Seeds — Cotton .. .. .. tons	83,604	94,543
Clover .. .. cwt	271,056	122,855
Flaxseed and Linseed .. .. qr.	649,09	586,816
Rape	74,080	187,950
Tallow, from Russia .. .. cwt.	64,657	13,577
Australia	139,473	317,943
South America	160,503	69,014,873
Other countries	120,411	183,270
Wool, Sheep and Lambs' — From Europe .. .. lb.	13,674,252	10,501,879
British Possessions in South Africa ..	19,900,942	17,663,102
British India	10,503,161	6,014,473
Australia	134,77,110	156,802,102
Other countries	11,013,465	10,860,556
Alpaca and the Llama tribe	1,671,817	2,066,343
Yeast, dried.. .. .. .. cwt.	75,889	82,103

DADDY LONG-LEGS: *Cor.* The larvæ are likely to be destroyed by frequent stirrings of the soil, exposure to frost, and the attacks of birds. It is difficult to destroy them in turf without killing the plants amid which they are lying.

POND MUD: *G. F. M.* You will be disappointed with it. Nothing that has lain long under the solvent influence of an excess of water is of much value as a manure. Whether it be the mere mud of a pond, or the sediment of sewage, it is worthless, or nearly so, as a top-dressing.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 21s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, for Dressing Pasture Lands.
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE known to the trade.
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse
116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.

All other MANURES and CAKES as per Price List, supplied on the lowest terms.

Apply for prices, &c., to JOHN BENNET LAWES, 59, Mark Lane, London, E.C., Dublin, Shrewsbury, and Cardiff.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore only add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only to per cent of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited).
Chief Offices—109, Fenchurch Street, London, E.C.
Western Counties Branch—Queen Street, Exeter.
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Deputy Chairman—John Collins, 255, Camden Road.
Edward Bell, 48, Marine Parade, Brighton
Richard Hunt, Stanstead Abbots, Herts.
Robert Leeds, Wicken House, Brandon, Norfolk.
George Saville, Ingthorpe, near Stamford.
Samuel Jonas, Crishall Grange, Essex.
Charles Dorman, 213, Essex Street, Strand, W.C.
Thomas Webb, Hilderstham, Cambridgeshire.
Jonas Webb, Melton Ross, Lincolnshire.
C. J. Lacy, 60, West Smithfield, E.C.
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Auditor—J. Carter Jonas, Cambridge.

This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz.,
"THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
Particulars will be forwarded on application to the Secretary, or may be had of the local Agents.
C. T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

T. STANDING, AGRICULTURAL IMPLEMENT MERCHANT, Preston, Lancashire, is OPEN to NEW ENGAGEMENT with any respectable Manufacturer of SUPERIOR and GENUINE ARTIFICIAL MANURES. Connection large amongst the most influential Farmers in Lancashire. None but a really substantial article will be entertained.

GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1s per lb., 8d per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 10s per gallon.
SILVER SAND, of the finest quality, for Horticultural purposes, at 20s per ton; smaller lots at 2s 6d per cwt.
WM. RUSHFORTH, Seed Merchant and Nurseryman, Leeds

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s, 2s 6d., and 5s.
Powder Distributors, 2s. 6d. and 3s. 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

Red Spider.

GISHURST COMPOUND.
Used by many of the leading Gardeners as a sure, safe, and speedy remedy against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
Wholesale by
PRICE'S PATENT
CANDLE COMPANY
(Limited),
Battersea, London, S.W.
Magnified.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of inferior quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Saynor and Myers.
S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market
Paxton Works, Sheffield Established upwards of 125 years.

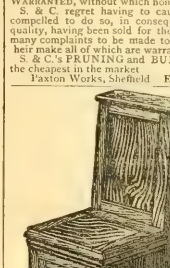

MOULE'S PATENT EARTH SYSTEM.
From Mr W. GILBERT,
Lawford Street, Rugby.
"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
(Signed) W. GILBERT.
"January, 1870."
Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

Cottam's Iron Hurdles, Fencing, and Gates.

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW STUFFING

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Trough, Water Fountain, and Patent Hay Cover to prevent over-gorging. Cheap, durable, and impervious to infection, being all of Iron Price of Fittings per Cow, 55s
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent

Rosher's Garden Edging Tiles

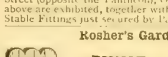

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra Cotta, Stoneware, and Redware, and of great durability. The planer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c, in Artificial Stone, of great durability and superior finish, and in much variety of design.
F & G ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Tiles, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—
14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

Wheat **Sowing.**

DOWN'S FARMER'S FRIEND, for Preventing the Smut in Wheat, and the Ravages of the Slug, Grub, and Wireworm. A 9d. packet is sufficient for Six Bushels of Seed Wheat, which can be dressed and fit to sow in a quarter of an hour.
Testimonials from the largest Wheat Growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed for every district.
Full directions for use are given with each packet.
Prepared at the Manufactory, Woburn, Beds.
CAUTION.—To guard against fraudulent imitation and consequent disappointment, see that the signature of HENRY DOWN is on the label.
Agents in every Town throughout England, Scotland, and Ireland.

THE GRANITIC PAINT, the best for the finest painting and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Churches, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders
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DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA and COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay
394, King William Street, London Bridge, London, E.C.

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating
Improved Conical. *Tubular Boiler.*

GREENHOUSES,
HOTHOUSES,
CONSERVATORIES,
CHURCHES,
PUBLIC BUILDINGS, &c.
HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.
WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED CONICAL, also Elliptic, Boilers, from 23s each

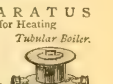

Improved and extra strong, CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 52s. 6d. each.
CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60s. each.
Portable Boiler. Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.
INDIA RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water-tight
Goods, of the very best manufacture, delivered at Railway or Wharf in London.

Elliptic Boiler.

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground Street, London, S.E. (Surrey side Blackfriars Bridge) Price List on application.

THE MULTUM IN PARVO PATENT EXHIBITION and TRANSMISSION CUT FLOWER PACKING CASE, and MEMBERS of PARLIAMENT, FAMILIES, and TOURISTS' SEASIDE COMPANION

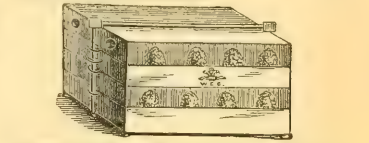

The above Cases are specially contrived for the Exhibition and Transmission of Cut Flowers. The flowers are packed in water, and cannot be displaced or the water spilled, if placed in any position, even if upside down. When not required for carrying flowers, they can be used for ordinary packing purposes. It has been pronounced by the Committee of the Royal Horticultural Society as the best case now in use, and C. J. Perry, Esq., will exhibit his flowers in them at the next Crystal Palace Flower Show.
Manufactured solely by WM EASSIE AND CO. (LIMITED), Gloucester, who will forward Lists of Agents and Prices on application.

CONSERVATORY BASKETS.

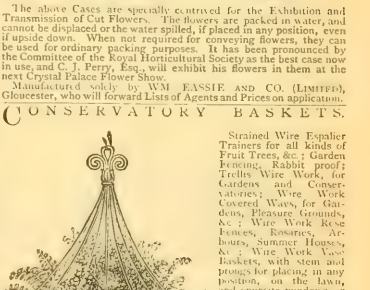

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing; Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Domes, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, over opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.
Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.
Minton's Ornamental Tile Flower Boxes.
All kinds of Wire Work made to order.
R. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Portobello Terrace, Notting Hill Gate, London, W.
Illustrated Catalogues of the above on application

GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, ROLLING, and COLLECTING MACHINES, 1870.
GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.
HAND MACHINE.

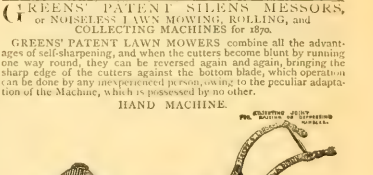

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.
Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.
☞ Illustrated Price Lists of Greens' Patent Rollers, Hot-water Boilers, Galvanised Wire Netting, Garden Seats and Chairs, Fountains, Vases, &c., free on application.
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; 54 and 55, Blackfriars Road, London, S.E.

By Royal Letters Patent.

SHREWSBURY'S GAS CONSERVATORY BOILER, Registered Gas Oven, no gas inside. IMPROVED REGISTERED GAS BATH, £10. Testimonial on application. Enclose stamp. G. SHREWSBURY, Lower Norwood, S.E.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

	Each.
6 ft. by 4 ft. Lights, 2 in thick, unglazed	£0 5 0
" " Primed and Glazed with 10 oz. Sheet	0 11 0
" " with stout portable Box, not Painted	1 3 0
" " Painted four coats, and Handles on	1 8 0
" " Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do	2 15 0

GREENHOUSES Per ft. super.

Woodwork only Prepared and Fitted	0 0 6
" Primed and Glazed with 16 oz. Sheet	0 0 9
" Delivered, and Fixed with Ironwork	0 1 0
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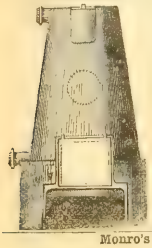

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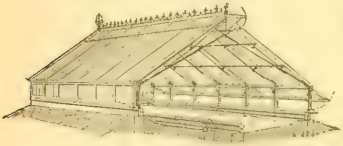

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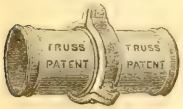

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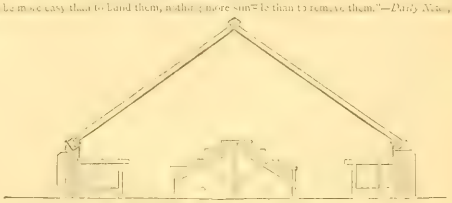

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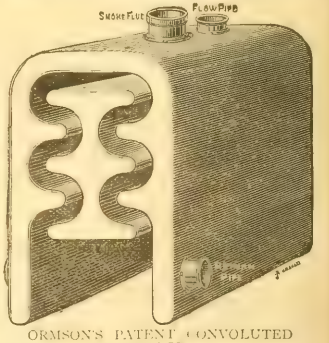

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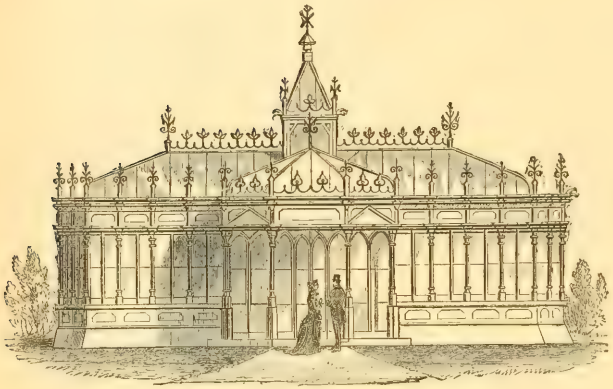

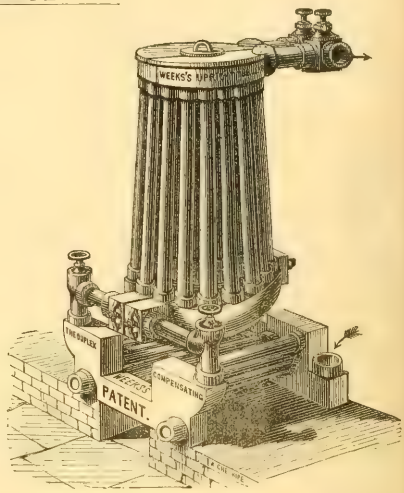

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 43.—1870.] SATURDAY, OCTOBER 22. { Registered at the General Post Office as a Newspaper. } Price 5d. POST FREE, 5½d.

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" W. Knight, Hailsham, Sussex.
" Timothy Brigden, South-Eastern Railway Station, W. Tuil, London.
" E. Holmes, Whittington Nursery, near Lichfield.
" W. Bull, King's Road, Chelsea.
" E. Ingol, Malton, Yorkshire.
" E. S. Williams, Upper Holloway, London.
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2 feet	£0 2 6	5 feet	£1 1 0	8 feet	£3 3 0
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LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
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Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, thickly set with buds

The above have recently been transplanted, are very bushy hand some plants, and quite safe. Price per dozen or hundred on application.

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STANDARDS, and PLANTS for planting out, in fine specimens

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MESSRS. LITTLE AND BALLANTYNE, Nurserymen and Seedsmen, Carlisle, beg leave to request the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c.; and Gentlemen intending to Plant this Autumn are respectfully invited to inspect the Plants on their Nurseries, which they will find well grown and very suitable for exposed situations.

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Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

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Strong roots, 2s. each; usual discount to the Trade.

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WHEAT MANURE, strongly recommended for Autumn Sowing.
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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
London, January 15, 1870

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,

Signed "AUGUSTUS VOELCKER.

The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Autumn Sowing.

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ODAMS'S DISSOLVED BONES.
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Sold by Nurserymen, Seedsmen, and Florists,
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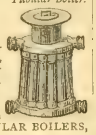

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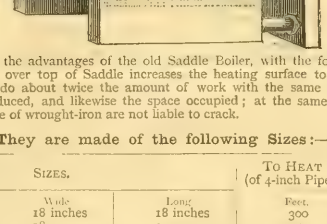

These Boilers possess all the advantages of the old Saddle Boiler, with the following improvements, viz.:—The water-space at back and over top of Saddle increases the heating surface to such an extent that a Patent Double L Saddle Boiler will do about twice the amount of work with the same quantity of fuel; the cost of setting is also considerably reduced, and likewise the space occupied; at the same time these Boilers are simple in construction, and being made of wrought-iron are not liable to crack.

They are made of the following Sizes:—

Sizes.			To Heat (of 4-inch Pipe).	Prices.		
High.	Wide	Long	Feet.	£	s.	d.
20 inches	18 inches	18 inches	300	5	0	0
20 ,,	18 ,,	24 ,,	450	6	0	0
20 ,,	18 ,,	30 ,,	600	7	0	0
24 ,,	24 ,,	24 ,,	700	8	0	0
24 ,,	24 ,,	30 ,,	850	10	0	0
24 ,,	24 ,,	36 ,,	1,000	12	0	0
24 ,,	24 ,,	48 ,,	1,400	15	0	0
28 ,,	28 ,,	60 ,,	1,800	20	0	0
30 ,,	30 ,,	72 ,,	2,600	30	0	0
36 ,,	36 ,,	96 ,,	4,500	50	0	0
48 ,,	48 ,,	108 ,,	7,000	75	0	0
48 ,,	48 ,,	144 ,,	10,000	100	0	0

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AGRICULTURAL SEEDS for PRESENT SOWING
Best sorts of WHEAT, grown on his own Farms; WINTER VETCHES, RYE, and a general assortment of GRASS SEEDS for Laying Down Permanent Pasture, or for One or Two Years' Mowing for Green Food.
Early orders are respectfully solicited, and can be executed either at the Seed Warehouse, Queen Square; or at his Nursery and Seed Establishment, Walton-on-the-Hill
Queen Square, Liverpool.—Sept., 1870

Dutch Flower Roots.

CROYDON. A. HENDERSON. EAST SURREY SEED WAREHOUSE. ESTABLISHED 1828.

ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers
DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation, and all the various systems now adopted.
Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application
Seed Nursery, Thornton Heath Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

Spring Flowering Bulbs.

BUTLER, McCULLOCH, AND CO.'S COLLECTION of CHOICE ROOTS for Greenhouse or Flower Garden Decoration, sent carriage paid. No charge for packages.

FOR CONSERVATORY.

No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
105s.	50s.	25s.	21s.	15s.	10s. 6d.

FOR FLOWER GARDEN

No. 7	No. 8	No. 9	No. 10	No. 11	No. 12
100s.	60s.	40s.	25s.	21s.	10s. 6d.

FOR GREENHOUSE and FLOWER GARDEN

No. 13	No. 14	No. 15	No. 16	No. 17	No. 18
105s.	52s. 6d.	42s.	21s.	15s.	10s. 6d.

CATALOGUE, containing details, post free.
5 per cent. allowed for cash.
BUTLER, McCULLOCH, and CO., 27, South Row, Covent Garden, London, W.C. Established upwards of a century.

NEW LILIES.—Thunbergianum bicolor, T. flore-pleno, T. marmoratum, T. punctatum, Tigrinum flore-pleno, T. splendens, Leichtlinii. The above, with others, are described and priced in Mr. WILLIAM BULL'S BULB CATALOGUE.
LILIUM AURATUM (English grown roots) can be supplied by the dozen, hundred, or thousand.
Establishment for New and Rare Plants, King's Road, Chelsea, S.W.

GEO. LIGHTBODY, Falkirk, being unable, from infirmity, to continue the cultivation of TULIPS, will dispose of his stock at the following low price :—

100 varieties, fine show sorts, with names	50s.
100 varieties, ditto, with names	25s.

Best bedding sorts, comprising many valuable varieties, and several new and fine seedlings, 4s. 100.
CATALOGUES of the stock may be had on application
AURICULA CATALOGUES are now ready.

Standard and Dwarf Roses.

LEWIS WOODTHORPE begs respectfully to call the particular attention of those about to plant to his immense stock of ROSES, which, from their great superiority, both in quality and varieties, cannot fail to give every satisfaction.
STANDARDS, very fine, selected, 15s. per dozen; £5 per 100.
HALF STANDARDS, very superior, 12s. per doz.; £4 10s. per 100.
DWARFS, on Manetti, strong, 8s. per dozen; £2 10s. per 100.
" in pots, very superior, 8s. per dozen.
Descriptive CATALOGUE of New and Choice Plants, Roses, Fruit Trees, &c., free upon application
Special prices for large quantities and to the Trade
Munro Nursery, Stble Heddingham, Essex.

Dwarf & Standard Roses.

FRANCIS & ARTHUR DICKSON & SONS have an immense Stock of well grown plants of all the best ROSES in cultivation (including all the new varieties) for Autumn and Spring planting. Also a large stock of strong Plants in pots, which can be be planted out now, at once. Priced Descriptive CATALOGUE sent free by post. Their Roses are unusually fine this season. Inspection respectfully invited. Visitors will please ask for
FRANCIS & ARTHUR DICKSON & SONS, "Upton" Nurseries, Chester.

Vines, Extra Strong Fruiting, &c.

FRANCIS & ARTHUR DICKSON & SONS have this season a splendid lot of Vines, well grown from eyes, without bottom-heat, in extra strong short-jointed Fruiting Canes; also fine Canes for planting. Their Collection includes all the New and leading varieties, and the plants are really First-class. Inspection respectfully invited. If this is inconvenient, specimen plants can be sent.
Priced Descriptive LIST sent free by post.
The "Upton" Nurseries, Chester

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that this [illegible] will be SENT OUT in NOVEMBER next, in the same rotation as the orders are received. An illustration of it, and a description by Dr. Hogg, is given in the "Fruit and Potato Guide." Many [illegible] "It is destined and worthy to take its place among the worthiest of its kind."
DWARF MAIDEN TREES, 7s. 6d. each; DWARF TRAINED, 10s. 6d. A remittance or reference from unknown correspondence.
Nurseries, Shipton-on-Stour, September, 1870.

Fruit Trees.

MAGNIFICENT Dwarf-trained PEACHES, NECTARINES APRICOTS, PEARS, PLUMS, APPLES, and CHERRIES.
Standard-trained PLUMS, Fruiting Trees.
Dwarf-trained FRUITING TREES of APPLES, PEARS, & PLUMS.
Pyramidal APPLES, PEARS, and CHERRIES.

WM. WOOD AND SON'S Nurseries have long been celebrated for the [illegible] and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application
Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WINTER AND SPRING FLOWERS.

CARTER'S
COLLECTIONS OF
HYACINTHS, TULIPS,
CROCUS, &c.,

Include only the best kinds, and being made up in a most liberal manner, these Collections offer the most desirable medium to ensure an effective display in the Drawing Room or Garden.

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR CULTURE.
Packing and carriage free.

COLLECTION No. 1, complete, price 84s.
COLLECTION No. 2, reduced quantities, price 63s.
COLLECTION No. 3, reduced quantities, price 42s.
COLLECTION No. 4, price 21s., comprises—

12 Hyacinths, in 12 extra fine named sorts
6 Polyanthus Narcissus, in 6 varieties
12 Jonquils, sweet scented
50 Crocus, finest named
1 Dielytra spectabilis
1 Lilium speciosum
6 Scilla sibirica
24 Snowdrops, extra large selected
6 Tulips, Tournesol
3 " Rex rubrorum
3 " La Candeur
3 " Royal Standard
6 " Yellow Prince
3 " Rosa Mundi
3 " Duc Van Thol
1 Amaryllis formosissimus
6 Ixias, finest mixed
6 Sparaxis, finest mixed
6 Triteleia uniflora

COLLECTION No. 5, reduced quantities, price 10s. 6d.

EVIDENCE OF QUALITY.

From C. H. HAWKINS, Esq., *Colchester, November* 15, 1869
"The bulbs arrived quite safely, and I have the pleasure to send you a cheque for them. I sent a like order to another house at the same time, and I think it only right to say that while theirs were more numerous, yours were the finer, firmer, and heavier."

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR AND OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 6, complete, price 84s.
COLLECTION No. 7, reduced quantities, price 63s.
COLLECTION No. 8, reduced quantities, price 42s.
COLLECTION No. 9, price 30s., comprises—

12 Hyacinths, in 12 extra fine named sorts for pots or glasses
12 " in 3 colours for bedding
12 Narcissus, double, white
12 " Poeticus or Pheasant's eye
36 Tulips, extra fine mixed
6 " Tournesol
6 " Duc Van Thol
3 " Royal Standard
3 " La Candeur
3 " Yellow Prince
3 " Rex rubrorum
12 Double Daffodils
12 Star of Bethlehem
12 Scilla Belgica, mixed
75 Crocus, blue
75 " striped
75 " large yellow
75 " white
50 Anemones, extra fine mixed
8 Gladiolus Brenchleyensis
12 Iris, extra choice mixed English
12 " extra fine mixed Spanish
12 Jonquils, Campernelle
36 Ranunculus, extra fine, mixed
50 Snowdrops

COLLECTION No. 10, reduced quantities, price 15s.

EVIDENCE OF QUALITY.

From W. E. MARTIN, Esq., *Hereford, June* 6, 1870.
"The bulbs supplied by you last autumn, made a glorious show all through the spring. They were a splendid collection of 500 plants, and were admired by everybody who saw them."

CARTER'S COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 11, complete, price 84s.
COLLECTION No. 12, reduced quantities, price 63s.
COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, price 21s., comprises—

12 Hyacinths, in 3 colours
12 Narcissus, double white
12 " Poeticus or Pheasant's eye
12 Double Daffodils
12 Tulips, extra fine mixed, double
12 " extra fine mixed, single
12 " extra fine mixed, late
12 " Duc Van Thol
6 Polyanthus Narcissus, fine mixed
6 Campernelle Jonquils
12 Star of Bethlehem
6 Triteleia uniflora
6 Dog's-tooth Violets
25 Crocus, blue
50 " striped
50 " large yellow
25 " white
24 Anemones, extra fine mixed
6 Gladiolus Brenchleyensis
12 Iris, extra choice mixed English
12 " extra fine mixed Spanish
3 Lilium candidum
3 " auratum
24 Ranunculus, extra fine mixed
50 Snowdrops
24 Winter Aconites

COLLECTION No. 15, reduced quantities, price 10s. 6d.

EVIDENCE OF QUALITY.

From D. MATHER, Esq., *Chipping Norton, July* 11, 1870
"I was much pleased with the whole collection of bulbs, they have been a great success."

JAMES CARTER AND CO.'S CATALOGUE of Hyacinths, Tulips, Crocus, and other Bulbs, Roses, Fruit Trees, &c., containing full particulars of the above Collections, will be forwarded Gratis and Post Free on application.

CARTER'S COLLECTIONS of HYACINTHS.

For the convenience of those Customers who do not wish the trouble of selecting for themselves, is offered the undermentioned Collections of Hyacinths, *the selection of which being left to their judgment and experience*, will be found perfectly adapted for the purposes stated.

A	12 good varieties	Double Hyacinths, for pots, 7s. 6d.	
B	12 "	Single Hyacinths, for pots, 7s. 6d.	
C	12 "	Double Hyacinths, for glasses, 6d.	
D	12 "	Single Hyacinths, for glasses, 6d.	
E	12 very fine varieties	Double Hyacinths, for pots, 9s. 6d.	
F	12 "	Single Hyacinths, for pots, 9s. 6d.	
G	12 "	Double Hyacinths, for glasses, 10s. 6d.	
H	12 "	Single Hyacinths, for glasses, 10s. 6d.	
I	12 best varieties	Double Hyacinths, for pots, 12s.	
K	12 "	Single Hyacinths, for pots, 12s.	
L	12 "	Double Hyacinths, for glasses, 12s.	
M	12 "	Single Hyacinths, for glasses, 12s.	
N	100 Hyacinths, in 100 best varieties, 50 bulbs each		
O	100 Hyacinths, in 50 best varieties, £4 4s.		
P.	50 Hyacinths, in 50 very fine varieties, £2 10s.		
Q.	50 Hyacinths, in 25 very fine varieties, £1 17s. 6d.		

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

DUTCH FLOWER ROOTS
CARRIAGE FREE.

SUTTONS'
IMPORTED
FLOWER ROOTS.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks, having received their first consignment of

CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

SUTTONS'
COLLECTIONS of FLOWER ROOTS.

Suttons' £1 1s. Collection, for Open Ground
Carriage Free, contains—

12 fine mixed Border Hyacinths
6 " Polyanthus Narcissus
12 Pheasant's-eye Narcissus
12 Double White Narcissus
25 Double Daffodils
6 large Campernelle Jonquils
50 fine mixed Double Ranunculus
50 Scarlet Turban Ranunculus
12 fine mixed Double Anemones
12 " Single Anemones
150 Crocus, 3 sorts
50 Snowdrops
25 Winter Aconites
6 fine mixed Gladiolus
12 Due Van Thol Tulips
6 mixed Single Early Tulips
6 fine mixed Double Tulips
6 " Parrot Tulips
6 Gesneriana Tulips
25 fine mixed Tulips
6 " English Iris
6 " Spanish Iris
3 Lilies, of sorts
1 Ferraria Pavonia
6 Dog's-tooth Violets
3 Crown Imperials

Suttons' £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12 fine Hyacinths, by name
6 Miniature Hyacinths, by name
6 Polyanthus Narcissus, do
6 single Sweet Jonquils
6 Scilla præcox
6 Single Due Van Thol Tulips
6 Double Tournesol Tulips
25 Early Tulips, 5 sorts
3 Persian Iris
3 Peacock Iris
50 fine Crocus, by name
6 choice Ixias
3 choice Sparaxis
1 choice Oxalis
1 Tropæolum tricolor
1 Lilium lancifolium album
1 " " rubrum

SUTTONS' SUPERB DUTCH HYACINTHS

For CULTIVATION in POTS or GLASSES.

The best 12 Hyacinths for 12s.

Messrs. SUTTONS' Collection of Hyacinths consists of more than 200 varieties, a Priced and Descriptive LIST of which may be had on application.

Suttons' Collections of Named Hyacinths.

100 HYACINTHS in 100 very choice sorts	..	£4	4 0
100 " 50 very choice sorts	..	3	10 0
50 " 50 very choice sorts	..	2	2 0
50 " 25 very choice sorts	..	1	15 0
25 " 25 very choice sorts	..	1	1 0
12 " 12 extra fine sorts	..	0	12 0
12 " 12 choice sorts	..	0	9 0
12 " 12 good sorts	..	0	6 0

The order should specify whether they are intended to be grown in water or earth, as all kinds are not equally suited to both purposes. It should also be stated whether single or double Hyacinths are preferred; otherwise we usually supply about two-thirds double, and one-third single. The single varieties generally thrive best in water, but their merits are never apparent until the flowers are fully expanded.

SUTTONS' MIXED HYACINTHS for Pots or Open Borders.—Double, Single, and various colours, 2s. 6d. per dozen, 18s. per 100.

SUTTONS' HYACINTHS, in distinct colours for Massing, including leaden flowering sorts, in red, blue, and white, various shades, separate, 4s. per dozen, 30s. per 100.

For further particulars, with complete Cultural Instructions, see

SUTTONS'
AUTUMN CATALOGUE FOR 1870,
Gratis and Post Free on application.
FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.
Five per cent. allowed for cash payments.
SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the year they first fruited in, the raiser, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches in winter; and in this short advice lies all the art of growing healthy and fruitful trees, such as J. S. offers.

CAMELLIA BLOOMS and CUT FLOWERS, orders for which can now be executed.
Fine Specimen Standard PORTUGAL LAURELS and IRISH YEWS, in or out of tubs.
FRUIT TREES, in pots, for Orchard Houses.
VINES, a fine stock.
PINE PLANTS, RHODODENDRONS, AUCUBAS, well set with berries.
SEAKALE, and ASPARAGUS, for forcing.
CONIFERS in great variety, and of all sizes.
LUCOMBE, PINCE, AND CO., Exeter Nursery, Exeter.

The Gardeners' Chronicle

SATURDAY, OCTOBER 22, 1870.

THE Report on the COTTON DEPARTMENT of INDIA for 1868-9, drawn up by the Cotton Commissioner for the Central Provinces and the Berars, Mr. HARRY RIVETT CARNAC, contains much matter of interest to the horticulturist, and, indeed, to any one interested in the material progress of our own great industry, and in the welfare and prosperity of India. A few extracts, condensed from the somewhat diffuse publication above-mentioned, may serve to show the magnitude of the interests involved. Thus we learn that in the year 1868 the actual consumption of Cotton in the principal manufacturing centres of the world amounted to over six millions of bales, of 400 lb. to the bale. Great Britain alone took nearly two and a half millions of bales, and could well have taken another half million could she have procured them at remunerative prices.

Owing to the superiority of the staple, the cheaper transit, and other causes, British manufacturers have given the preference to American Cotton over that derived from other sources, and the fearful results of the Cotton famine in our manufacturing districts are too fresh in our memories to make it necessary to dilate upon the immensity of the trade between this country and the United States. But the very extent of the traffic is apt to induce forgetfulness of the circumstance that, after all, England only takes some 40 per cent. of the raw Cotton available in the markets of the world, and if of that amount, the bulk is of American origin, yet that in other markets India has a fair chance of supplying the greater portion of the remaining 60 per cent. The Continental manufacturers, to whom the low price is an inducement, and whose machinery is not unsuited to the short staple, are likely to purchase largely of Indian-grown Cotton; and even China finds the quantities she raises at home insufficient, and seeks to make up the deficiency by purchases in the Indian market. In 1849, we are told, 84 per cent. of the Cotton imported into England was of American origin, a quantity reduced in 1862, 1863, and 1864, to 7, 9, and 10 per cent. respectively; a diminution so great as to appear almost incredible. India, which had been furnishing some 12 per cent. only, was suddenly called on to supply 71 per cent., and though the reopening of the American markets has reduced this amount, she still, according to the figures before us, supplies an amount equal to that transmitted from America, that is to say, about 41 per cent. No other Cotton producing country comes anywhere near India in the amount of staple exported. The sudden rise in the demand for Indian Cotton, and the consequent enhanced prices, had their intoxicating effect on the native cultivator, just as the discovery of gold in Australia, or of diamonds at the Cape, has had.

"All sorts of absurdities," says the author of the Cotton report, "were committed. Silver ploughshares and tires of solid silver for cartwheels made their appearance here and there. Fancy prices were paid for bullocks of a favourite colour, or possessing some peculiarity of tail. * * * Still, after having looked at the worst side of the picture, a very large balance of substantial benefit remains. The cultivators who, rendered enthusiastic by rich harvests, thought to gratify the bountiful Mother Earth by scratching her back with a plough of silver were the exception, and many had the good sense to feel that the cooling shade of Mango groves and other trees planted in hundreds throughout the country, and newly-dug wells with a plentiful supply of water to refresh the soil during the hot months, would be more highly appreciated by the parched and overworked earth than any arrangement which gratitude for plentiful harvests and high prices could suggest. Thus the number of trees planted greatly increased, the irrigated area was extended, and much land lying waste was brought under cultivation. The people indulged in better food and richer clothes, and the demand for the rich 'dhotees' and 'sarees' of Nagpore (the loin cloths and plaids, the chief costume of the men and women respectively) increased; and, as an old conservative Deshpandia, when dilating to me on the objectionable turn matters had taken, expressed it, every coolie or labourer took to dressing himself like a Brahmin. Earthen vessels disappeared before pots and pans of brass and copper, or of even richer metal; sturdy plough cattle were imported in considerable quantities from all parts of India; the dwelling-houses of the people were improved, and, in many cases, mud and thatch gave way before substantial buildings of brick and stone."

But while much money was thus put in circulation, a large quantity was also hoarded and concealed. In other cases large purchases of gold were made. Rupees were exchanged for bar-gold, which was shaped into bangles and welded on the arm of the proprietor.

"The number and thickness of these bracelets varied with the circumstances of the season. A good crop and continued high prices would be represented by a second bangle; the death of a plough bullock or so from disease or by a tiger would necessitate one of the bangles going to the melting pot, or a piece would be cut off from one end of the bracelet * * * and the once massive bangle is hammered out into a lighter circlet."

The marriage festivities observed by the several castes, with their attendant ceremonies and observances, all regulated by precedent and etiquette, also underwent a change in consequence of the influx of wealth. In connection with this part of his subject the writer of the report tells an amusing tale to the effect that one of the castes, the Chumars, very low in the scale of social precedence, according to Indian notions, but enriched by the high price of Cotton, came to the "Mallees," a caste the members of which are famous as gardeners, and begged them to supply chaplets and garlands for a marriage festivity. But the aforesaid Chumars are held in such low esteem that social custom forbade them from using real flowers at marriage festivals, and compelled them to employ paper chaplets, as substitutes. Great, then, was the indignation of the orthodox gardeners at being required to supply real flowers to so low a caste. There was no lack of money, the Chumars offered to pay almost any price, but the Mallees indignantly refused to part with a single flower. It was not the price, it was the principle that would be involved in thus encouraging outcasts. So the Chumars went away discomfited. But they awaited their opportunity, and when the gardeners required repairs to their shoes, or to the leathern buckets used for purposes of irrigation, the Chumars in their turn refused, unless the gardeners furnished them with the requisite flowers. After a struggle of some duration the Mallee gardeners had to pocket their dignity, the Chumar bride was decked with real, not paper flowers, and the gardeners got their buckets mended.

Enough has been said to show the importance of the Cotton crop of India, and the urgent necessity there is, if India is to hold her own, of cultivating the best varieties in the best manner. In the report which furnishes us with our text, one section is devoted to the measures adopted to improve the cultivation of Cotton. These are ranged under three heads:—1, the selection of indigenous seed; 2, the introduction of exotic seed; 3, improved methods of cultivation. But little is said about insect enemies or Fungus pests, and the way to obviate their ill-effects. Judging from the evidence before us, and bearing in mind the peculiar climatal conditions and the state of the labour market, we should be disposed to lay greater stress upon systematic selection and careful breeding from approved Indian varieties than upon the introduction of American varieties less suited to the climate. Experimental gardens, on a small scale, should first be instituted and managed by competent persons, and then trials on a larger scale, based on the experience so obtained, might be carried out. Mr. CARNAC indeed seems to have succeeded in inducing the Government to establish seed farms in the Cotton district with this special object, but it seems to us questionable whether in the preliminary stage it would not have been better to have tried the experiment on a smaller scale, with more precision and with a greater amount of scientific accuracy and scrutiny than is possible in farms of 100 acres or so.

The model farms might more appropriately be made to follow the restricted trials in the garden. The necessary experiments in selection, and specially in hybridising, can be better carried out in a small establishment under the care of a scientific superintendent than in a larger one where the manager is likely to be too overweighted by the general duties of superintendence to be able to give the necessary attention to the experiments. In perusing the report we find, as is most just, full credit paid to Major TREVOR CLARKE, and we are strengthened in our advocacy of careful selection by reading the remark of this zealous hybridist. "I have a strong conviction," writes Major CLARKE, "of the great improvability of the Asiatic plants, and to an extent not dreamed of by those who have not been initiated in select seed-growing, done well." The Americans themselves, since the War, have devoted infinitely more care than before, both to the selection of the seed and the cultivation of the plant.

We close our remarks on this subject by endorsing to the full Mr. CARNAC'S remarks on the necessity of securing the assistance of trained gardeners who have made the selection of seed and other agricultural operations a study, and in so doing, we feel once again our sense of the importance of instituting in this country a thorough training school for gardeners and foresters,—a school in which the pupils shall not be forced, as now, to pick up information anyhow, but in which they shall be systematically trained and put into a position to do good service to the State, not only in our own gardens and woods, but in the Cinchona or the Tea plantations, in the Cotton fields and in the Indian forests. It is almost impossible to over-estimate the importance of this matter, but year after year passes, and nothing is done. By-and-by, when the steed has run away or been stolen, we may think of the stable door.

WE give insertion to the following announcement of a proposal to place a portrait of the veteran Pomologist and Rose grower of Sawbridgeworth, THOMAS RIVERS, in the Lindley Library, with the more satisfaction in that few have laboured more earnestly to advance horticultural science in this country, and to contribute to the profit and pleasure of his fellow creatures, than he who bears the honoured name above mentioned. In these days of testimonials people have justly become tired and, in some instances, disgusted at the proportions the system has assumed. Again, there is a feeling abroad that it is somewhat of a farce to honour in this way a merchant who finds the reward he seeks in the success of his business. But there are many things which outweigh such considerations as these in the case of men who, while doubtless looking after their own interests, do not forget the interests of their fellows, but freely communicate of their experience in order to promote the general good. No one has done more to advance the knowledge of physiology in its practical aspect than Mr. RIVERS, and no one has done more to increase the pleasure and add to the profits of amateur horticulturists, whether rosarians, pomologists, or amateurs of trees, than he who, from his labours as a rosarian, has been dubbed by Mr. REYNOLDS HOLE as Field-Marshal RIVERS.

It will be seen that the proposal is to place a portrait of Mr. RIVERS in the Lindley library, by the side of that of the late Dr. LINDLEY and of Mr. VEITCH; and that no special or direct application is to be made to any one to subscribe to the fund. Gardeners, and others, without the means or the will to contribute, will thus in no way feel themselves obliged by any consideration of self-interest, or a desire to curry favour with the powers that be, to act otherwise than as best suits their inclinations. The compliment must be as spontaneous as it is hearty. To allow any feeling to have weight except one of independent respect and gratitude to the man who has done so much for horticulture, would be to cast insult rather than to pay a debt of acknowledgment:—

"Some friends of Mr. RIVERS, of Sawbridgeworth, being desirous of expressing their appreciation of the valuable services he has rendered during a long life to the cause of horticulture by his numerous writings and discoveries, have united in a subscription to procure a portrait as a suitable memorial of one who has contributed so much to the pleasure and enjoyment of his fellows. The portrait has already been commissioned, and it is intended when completed to offer it to the Trustees of the Lindley Library, to be hung at South Kensington.

"As Mr. RIVERS' consent to the memorial has been obtained on the express understanding that no special application will be made to the general public, but that it shall be a spontaneous movement on the part of those

contributing, no application of any kind will be issued asking anyone to assist; but all who have that feeling of regard and admiration for Mr. RIVERS, by which the promoters of the movement are actuated, are invited to forward their subscriptions to Dr. HOGG, 99, St. George's Road, London, S.W.

"As an illustration of the feeling of many amateur horticulturists, who have derived so much healthful recreation and unalloyed pleasure from the pursuit of horticulture, as it has been popularised by Mr. RIVERS, we give the following extract from a letter received by Dr. HOGG, from one of the early promoters of this memorial:—

"'I am decidedly opposed to testimonials after a man is dead. The dead must depend on their own works for their fame, but the living are capable of receiving pleasure from finding that their exertions for the public good have been gratefully received. If ever there was a man who has diffused pleasure to mankind, or, to use VIRGIL'S expression, *'quo sit memores alios fecisse merendo,'* it is Mr. RIVERS. We now associate Mr. RIVERS so entirely with orchard-houses, that we are apt to forget his earlier but not less useful services in the introduction and cultivation of Roses and Pears, and, above all, root-pruning [and double grafting]. He has managed to blend in a most unusual manner commercial advantages to himself with liberality and instruction to the public."

"The following have already intimated their desire to unite in the movement, and have forwarded their subscriptions:—

Journal of Horticulture, Proprietors of	..	£5	0 0
Speed, Mr. Thos., Chatsworth Gardens	..	1	1 0
Pearson, Mr. John, Chilwell ..	..	1	1 0
Hole, Rev. S. R., Caunton Manor ..	..	5	0 0
Kingsley, Rev. W., South Kilvington	..	2	2 0
Robin, Dr., Kidderminster ..	..	2	2 0
Paul, Mr. William, Waltham Cross ..	..	1	1 0
Radclyffe, Rev. W. F., Okeford Fitzpaine	..		
Wilson, G. F., Esq., F.R.S. ..	..		
Sparkes, George, Esq., Bromley ..	..	1	1 0
Masters, Maxwell T., M.D., F.R.S. ..	..	1	1 0
Moore, Thos., Esq., F.L.S. ..	..	1	1 0

"Whatever amount of money may be received in excess of the price of the portrait will be appropriated to some horticultural object of which Mr. RIVERS may approve; but Mr. RIVERS will regret any proposition that may assume the form of a testimonial being presented to him."

—— We have a letter from Mr. ENGLISH with respect to Mr. WORTHINGTON G. SMITH'S observations on the species he had marked AGARICUS SUFFULTUS (see p. 1380). Mr. SMITH referred the species to A. sublateritius, but it appears from specimens just received that it is not that species, but A. CONISSANS, of which we have an excellent drawing from FRIES, while the decidedly fœtiginous spores set the matter beyond doubt. The whole group is so difficult, that Mr. SMITH may well be pardoned for a mistake which he could not have corrected without handling the specimens. One of the most interesting Fungi in the exhibition was Lycoperdon echinatus, Pers., in Mr. HOYLE'S collection. The spores are of a beautiful lilac, very different from anything in L. gemmatum, to which it is referred by FRIES. We have since heard that Mr. SAWYER brought several specimens with him, which were not, however, placed on the table. A. porrigens, exhibited by Mr. SMITH, exactly accords with a drawing in our possession of Swedish specimens. Polyporus Schweinitzii, though not exactly a novelty, ought also to be noticed. We had never seen young fresh specimens before. *M. J. B.*

—— With reference to the INTERNATIONAL EXHIBITION of next year we are informed that the exhibition buildings are making rapid and satisfactory progress. The painters and decorators are already at work; indeed, in the fine art galleries they are completing their labours, and it is contemplated by the Commission to invite artists and proposed exhibitors of fine art works to pay a visit of inspection to this portion of the building, in which they are more immediately interested. The exhibition of machinery in 1871 promises to be an exceedingly fine one, especially in such as are employed in the manufacture of woollen and worsted goods; with the brick and tile-making machines, these will all be in motion, so that their most interesting features will be freely shown. The Commissioners, by a recent circular, have given notice that, being desirous of affording the manufacturers of steam-engines an opportunity of bringing their latest improvements before the notice of the public, they are prepared to receive applications from those manufacturers whose steam-engines possess features of novelty, and who are willing to allow the gratuitous use of them in supplying the motive power required for the purposes of the exhibition. Any manufacturer being disposed to exhibit on these conditions, should send a short description of the engine they propose to exhibit to Lieut.-Colonel Scott, R.E. Only a limited number of engines will, of course, be required. The French supplementary gallery, notwithstanding the war, is being rapidly proceeded with by the French Commission. These supplementary galleries are to be erected solely with the object of giving additional space to the exhibitors selected for admission into the Annual International Exhibitions, and are only to be used for the display of objects corresponding with those prescribed for each particular year. The Commissioners request that manufacturers of brick and tile-making machines intended to be shown in motion at the ensuing Exhibition of 1871, will, in forwarding their applications for admission, specify the weight, dimensions, and requisite horse-power of each machine to be exhibited. The authorities of schools, &c., desirous of taking part in the first exhibition of the series, which will be held in 1871, are requested to fill up a form of preliminary application, and to forward it without delay to Lieut.-Colonel SCOTT, R.E., secretary, offices of Her Majesty's Commissioners, 5, Upper Kensington Gore, London, W. The information required is the name and address of the applicant and of the institution which he represents; the number of scholars attending the school; the nature of the specimens proposed to be submitted, distinguishing the sub-sections to which they belong. The following are the sub-sections:—

(*a.*) Writing, plain and ornamental. Examination papers and other works showing the results of general, scientific, and artistic instruction.
(*b.*) Drawing and design.
(*c.*) Modelling in clay, plaster, cement, wax, and for terra-cotta, carving in wood, &c.
(*d.*) Models of machinery, building construction, &c.
(*e.*) Needlework, plain and ornamental, lace, knitting, plaiting, &c.
(*f.*) Miscellaneous work by pupils in schools for the blind, reformatories, &c.

—— We learn that Mrs. F. A. DICKSON, wife of the Mayor of Chester, a prominent nurseryman and seedsman of that city, has been presented with a silver cradle, she having given birth to a boy during the mayoralty of her husband. It was subscribed for by the citizens, and it was presented to Mrs. DICKSON, on behalf of the donors, by the Marquis of WESTMINSTER, at a large public meeting held in the Town Hall on Thursday week. The testimonial consisted of a silver centrepiece, with two side stands, on a plateau of silver-gilt. The cost of the plate was £250. The cradle, which is no larger than a Walnut, is suspended from the centrepiece, and is after the fashion of a nautilus-shell.

—— At a meeting of the Fruit Committee of the Royal Horticultural Society, held on August 17, 1869, Mr. MCLAREN exhibited a seedling RASPBERRY, under the name of MCLAREN'S PROLIFIC, for the following representation of which (fig. 249) we are indebted to Messrs. CARTER & Co., who hold the stock of this fine Raspberry. The berries are of immense size, and in colour red; the plant is of vigorous growth, and a prolific bearer. It was awarded a First-class Certificate, as a good autumn-bearing sort, and the expectations then formed of it have this season been fully realised.

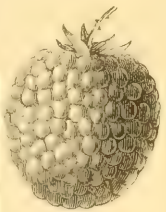

Fig. 249

—— Among forthcoming AUCTION SALES of importance, from the magnitude and value of the stock to be disposed of, we note the announcement of the sale, by Messrs. PROTHEROE & MORRIS, of the extensive stock of Messrs. CHIVAS & WEAVER, of Chester, on Monday next, and the five following days. Also by the same firm, at the same date, of the stock of the late Mr. WILLIAM JACKMAN, of St. John's Nursery, Woking. Both these sales take place in consequence of the death of the proprietors of the stock.

—— In a recent number of the *Illustrated London News*, amid other forcible reminders of the horrors of war, is one which appeals with unusual force to the sympathies of gardeners:—

"The BOTANIC GARDEN OF STRASBURG," says our contemporary, "used during the siege as a place of burial, is the subject of one of our artist's sketches, concerning which he writes:—'As the cemeteries of Strasburg seem to have been all without the fortifications, the only place within that could be used was the Botanic Gardens. At first, judging from the crosses erected, regular graves were formed, and a single cross of unpainted wood, with the name of the person, indicates that one body was placed in one grave. But as the siege went on, more than one had to be put into the same hole, till at last the large pit became an extended trench, which was lengthened at the one end as it was filled up at the other. My sketch will show one of these trenches as it is left at the end of the siege. The coffins are placed three or four deep, and seem like wooden steps leading down to the bottom of the trench. To the left of this trench, extending under the trees, there had been a similar place of burial before this one was opened. Friends have placed crosses along each side, over the spot where their relative or comrade was interred; and the number of interments is shown by these crosses being two, three, and even four deep in the row. In some cases there is only a small square board, with the name of the person; in others this bit of wood is heart-shaped; but the general rule is to erect a cross, with two pieces of wood forming a gate-formed covering over it; many have flowers and immortelles, placed by friends, upon them. There are many small black boards, with white Hebrew letters on them, telling that Jew and Gentile have alike suffered. In fact, 'Equality and Fraternity' is wonderfully exemplified in this sad spot—officer and private, Frenchman and German, as indicated by the names, Hebrew and Protestant and Roman Catholic, rich and poor, old and young, here find rest and safety. The mortality which took place among the old and young during the siege is noticeable in the ages painted on the crosses. I could not help remarking how the labels bearing the botanic names of the plants were placed on one side to make way for the new arrivals in the garden. The burial place of Joseph of Arimathea was in a garden, so the place is not inappropriate.'"

It will be remembered that Strasburg is, or, sad to say, was, famous for the excellence of its natural history museum, enriched by numerous specimens forwarded by BUCKLAND and others of our geologists. Amongst botanists connected with Strasburg there is the veteran FÉE, learned in Ferns; SCHIMPER, cunning in Mosses, and in fossil botany; KIRSCHLEGER, known from his researches in Teratology, and from his "Flora of Alsace."

—— From an article in a recent number of *Land and Water*, we learn that Mr. FRANK BUCKLAND has been very successful in taking a cast of the monster SEVENTY-POUND SALMON captured in the month of June last in the Tay, by Mr. SPEEDIE, tacksman, of Perth. This cast has been subsequently painted by Mr. ROLFE, and the success of the two artists has been such that it must be admitted that the art of casting and painting fish to life has now been brought almost to perfection. It is intended, as time goes on, to paint to life the cast of every native fish of Great Britain. It is also intended that when the 70 lb. salmon is put in its glass case, at the Museum of Economic Fish-Culture at South Kensington, to place a single salmon egg with it, in order to show that an insignificant and fragile globule of albumen not larger than one of its own scales, an ordinary sweet Pea, or the pupil of a human eye, can, if cared for, develope itself into a monster fish, the value of more than two fat sheep, and this without costing anybody a single farthing.

—— We cordially endorse the following remarks, extracted from the *Field*, on the new arrangements regarding the PATTERN POST:—

"With the present month the public have come into the enjoyment of certain additional postal facilities—newspapers are transmitted more cheaply than before, book packets of 2 oz. are carried for a halfpenny, and for the same modest sum a post-card is sold, which dispenses alike with paper, envelope, stamp, and secrecy. But, while the chiefs of the Post Office thus give with one hand, they take with another. For some time past the privilege of sending little parcels by means of the 'pattern and sample post' has been allowed, although the articles may not have actually been patterns or samples. For instance, an angler in a remote part of Scotland, Ireland, or Wales could write to London or elsewhere for lines or baits, and, in the course of a post or two, receive a little packet costing only a few pence for postage; whereas the charge would have been prohibitory as a letter, and conveyance by any other means would be out of the question. But all such things are now to be stopped; the new postal regulation declares that henceforth 'the pattern and sample post is restricted to *bonâ fide* trade patterns or samples of merchandise. Goods sent for sale, or in the execution of an order (however small the quantity may be), or any articles sent by one private individual to another, which may not actually be patterns or samples, are not admissible.' But we really cannot understand why one man who wants to sow 100 acres of land should have 4 oz. of seed sent to him for a 1*d.* stamp, while another who wishes to purchase 1*s.* worth of vegetable seeds for his garden can only have it forwarded at the rate of 2*d.* an ounce, or eight times as much as the other. Nor can we see why two gardeners, living far apart, should be precluded from making a gift or interchange of seeds without being mulcted to the same extent. And similar circumstances arise in other trades, where a manufacturer can send a specimen to obtain an order of £50 or £500, but a retail dealer may not send the same article in exchange for a dozen postage stamps, nor a parent send it as a present to a child at school. Moreover, we fail to see, when a seedsman sends out a number of packets, how the Post Office authorities are to know which are *bonâ fide* samples, and which are sent in execution of small orders. It seems to us that the new regulation offers a premium to dishonesty, and that if it could be carried out strictly it would not only place a very undesirable check on intercommunication between widely-separated districts, but would have a tendency adverse to the revenues of the Post Office. All these packets require the despatch of one letter; very frequently a reply is necessary; and often there is further correspondence—all of which would be cut off with the stoppage of the cause for writing. The alteration we think a mistake, and the sooner it is rescinded the better."

—— Here is a curious fact for those who speculate on the possible origin of species. We take it second-hand from the "Popular Science Review":—"The MOLE IS BLIND. Not so the fœtal mole * * * which at the time of birth is endowed with organs of vision of considerable perfection, while in mature age it is deprived of the means of sight in consequence of certain changes which take place in the base of the skull, terminating in the destruction of the most important structures on which the enjoyment of the sense of sight depends." Coupling this with the statements of the German anatomist alluded to by Prof. ROLLESTON (p. 1377), that in the embryonic condition the ascidian polyps have an axis skeleton corresponding to that of the vertebrate animals, we have facts more startling even than the hypothetical case of the bear and the whale.

—— Heavy falls of RAIN were prevalent at the different districts of the British Isles, during the week ending October 15 (see Mr. GLAISHER'S Tables in our present issue)—that part of the country situated between 53° and 55° North latitude being the most favoured. In England the amounts ranged from 2.49 inches at Bradford to 0.14 inch at Blackheath, with

a mean for all stations of 1.27 inch. In Scotland the maximum fall was 1.80 inch at Dundee, and the minimum 0.47 inch at Leith, with a mean for all stations of 1.03 inch. The MAXIMUM TEMPERATURE of the air in England ranged from 65° at Portsmouth to 52° at Newcastle, with a mean for all stations of 59°; and in Scotland from 55°.9 at Leith to 51° at Aberdeen, with a mean for all stations of 54°.1. The MINIMUM TEMPERATURES in England ranged from 28°.4 at Portsmouth to 36°.2 at Liverpool, with a mean for all stations of 32°.8; and in Scotland from 30° at Perth to 39° at Greenock, with a mean for all stations of 33°.7. The MEAN TEMPERATURE of the week in England ranged from 48°.7 at Portsmouth to 42°.7 at Newcastle, with a mean for the eight southern stations of 46°.4, and for the eight northern of 44°.9. The mean for the several stations in Scotland was 43°.2.

—— A recent number of the "Pharmaceutical Journal" contains the following REPORT ON OPIUM PRODUCTION IN WURTEMBERG for the present year:—

"Though large quantities of Poppies were sown last spring, the crop rarely did well, in consequence of the continued dry weather. This alone put an end to any prospect of considerable development in opium cultivation for the present year, and the scarcity of labourers at the time of gathering was for a time a further hindrance. Subsequently, when the influence of the war had driven many to this work, the best time for collection was past, and the Poppies ripened too quickly, owing to the great heat. On the contrary, the price of the new Asiatic opium admitted of the best Wurtemberg opium fetching as much as 34s. per pound. At this price the earnings of a labourer would amount to 2s. 6d. a day, which is good, considering that old men, women and children could be employed for the purpose. The opium of this year is much superior to that previously grown. The amount of morphia it contains is 12 per cent., even in samples that are somewhat moist.

—— We extract from the columns of the *Builder* the following directions for laying TAR PAVEMENTS, which have been found completely successful:—

"*For Carriage-way.*—A layer of good dry brick rubbish, 8 inches thick, well rammed (if a gravel foundation this need not be used), Kentish ragstone, or the chippings from granite, are the best material. For the tar pavement the stone for the lower bed should be broken to pass through a sieve of a 3-inch mesh, to be well coated with hot Stockholm tar, to be laid 6 inches thick, and well rolled. The next bed is to be broken to pass a 1½ inch mesh, to be laid 2½ inches thick, and well rolled. When nearly dry broken gypsum to be scattered over it, and well rolled: this gives a bright look to the pavement. *For Foot-ways.*—Brick rubbish, 5 inches thick; lower bed, 4 inches thick; next bed, 2 inches thick; and gypsum as before. This pavement may be seen at the Royal Arsenal, Woolwich."

—— Among RECENTLY ISSUED PUBLICATIONS, to some of which we shall have further occasion to refer, are the *Bulletin du Congrès International de Botanique et d'Horticulture de St. Pétersbourg*, containing the papers read at the Botanical Congress at St. Petersburg in May last.—*Les Bonnes Fraises*, par FERDINAND GLOEDE, 2d edition (WILLIAMS & NORGATE).—*The Food, Use, and Beauty of British Birds*, by C. O. GROOM NAPIER, 2d edition (GROOMBRIDGE).—*Transactions of the Scottish Arboricultural Society.*—*Notes sur les Quinquinas*, par H. A. WEDDELL, containing, *inter alia*, a complete list of the species and varieties of the genus Cinchona.—*Catalogue of Plants cultivated in the Royal Botanic Gardens, Trinidad*, by HENRY PRESTOE, Government Botanist—a list which, in more ways than one, reflects credit on its compiler.—*The Forces of the Universe*, by GEORGE BERWICK, M.D. (LONGMANS, 1870).

New Garden Plants.

CYRTOPERA FLAVA, *Lindl., Wall. Cat.* 7364; *Gen. Sp. Orch.* 189; *Royle, Illustr.* 88.—CYRTOPERA CULLENI, *Wight, Icon.* 1754.

Flos bene obliquus; sepala cuneata oblonga acuta, per nervos medios obtuse carinata; petala obovata obtusa acuta; labellum extra-sepalum in pede columnæ angulatum sacatum, antice trifidum, laciniæ laterales obtusangulæ, lacinia media a lata, basi dilatata subreniformi antica medio emarginata, lineæ tres papularum acutarum per discum; columna trigona utrinque sub apice angulata; anthera depressa semirotunda antice ligula retusa producta, vertice papula semiteretı obtusa; pollinia depresso-sphærica postice fissa; caudiculu ligulata; glandulæ transversissimæ utrinque curvæ semifalcato-lineari, medio antice obtusata.—Sepala et petala intense citrina; labellum pallidius maculis brunneis parvulis in sacco baseos.

Terrestrial Orchids are now becoming looked for by amateurs, with the view of making a selection of the most useful. We had long since received some dried wild flowers of this plant sent by Messrs. Henderson, of St. John's Wood, who wished for its name. Such dried specimens being unsatisfactory without indication of habitat and collector, we asked for these, but had to learn, however, that the original possessor, another nurseryman, wanted to guard the grand secret as if it had been the locality of the unicorn. Now it is well known that this showy Orchid grows abundantly in the valleys of the Himalaya, *e. g.*, Surbunda, Mussooree, Shalma, near Morang, as well as at Travancore. The late Dr. Lindley had no doubt good reasons to write to us on one occasion, that it was a very common Indian Orchid. After all, it is a splendid thing, bearing peduncles 2 or 3 feet long, with numerous flowers as large as those of Bifrenaria inodora, both sepals and petals of as deep a lemon colour as that of the flowers of Cattleya citrina. The lip, nearly quite emerging out of the sepals, is pallid yellow, except the darker anterior part, and there are some beautiful brown dots on the interior of the basilar pouch. The anther has an erect ligulate retuse or emarginate plate on its apex. Though amateurs' taste is as difficult to judge of beforehand as Coptic inscriptions, yet we believe the plant will be well regarded. Only think of a great basket bearing six to eight of these magnificent peduncles! It would be something new. We obtained excellent fresh flowers from Messrs. Veitch, who wrote that their spikes were about 2 feet long. *H. G. Rchb. fil.*

ENGLISH LOCAL FLORAS.—III.

WE have already referred to Thomas Martyn's "Plantæ Cantabrigienses," published in 1763, and mention it again in order to notice the county lists which it contains. These lists are chiefly compilations from Ray and Blackstone, with such additions as the author was able to make from his own observations; and include the counties of Cornwall (from Borlase's "History of Cornwall," 1754), Derbyshire, Essex, Hants, Kent, Lancashire, Leicestershire (from Pulteney), Lincolnshire, Middlesex (from Blackstone), Norfolk, Northamptonshire (from Morton's "Natural History of Northamptonshire," 1712), Northumberland, Notts (from Deering), Oxon, Somerset, Suffolk, Surrey, Sussex, Westmoreland, and Yorkshire. A few Welsh plants are added; but none are given for Scotland or Ireland, the author's collections being "too small to be worth inserting." In these lists the Linnean names are used throughout.

In 1774 William Curtis published anonymously "A Catalogue of Plants growing Wild in the Environs of London." Of this we have not seen a copy, but from the "Flora of Middlesex" we learn that it contained 632 Phanerogams and 211 Cryptogams; and that "no localities, not even the county," are given, "nor any indication of whether or not Curtis had himself observed all of" the plants enumerated.

In 1776 appeared the first edition, in two volumes, of Dr. Withering's "Botanical Arrangement of British Plants." Although not partaking of the nature of a local flora, we may fitly refer to it as a work which gave a great stimulus to British botany, and was extensively used for a large number of years; this is evident from the fact that, of the work in its entirety, seven editions have appeared, three of which were published during the lifetime of the author; and a modified form of it, edited by Macgillivray, and terminating with the Ferns, is still in use by those who yet follow the Linnean system. Copies of the first and second editions are, we believe, rare; the third, which is more frequently to be met with, is in four volumes, and, according to the author, "may be rather regarded as a new work than as a re-publication of an old one." Localities for the rarer species are given, especially in the seventh edition (1830), in which those from the "Botanist's Guide," and other then recent works, were added to those which had previously appeared.

In 1777, Edward Jacob published "Plantæ Faversham[ie]nses," on the plan of the "Plantæ Woodfordienses," "without the aid of which it would never have been undertaken." There is nothing which calls for especial notice, unless it be the author's account of his reasons for publication. "The principal Inducement for the Publication was to rectify the account given in Mr. Blackston's 'Specimen Botanicum,' taken from Mr. Bateman's M.S. Catalogue of near Two Hundred Plants growing about this town, because many of the rare ones at this time are not be found in the Places therein referred to, which have of late been often diligently searched in hope of retrieving them, as they would have added much to this work, but in vain." "The industrious hand of improving husbandry" is considered by Jacob as mainly responsible for these losses. The Cyperaceæ, Juncaceæ, and Gramineæ, are omitted from the catalogue, which contains 528 species. The only works cited are Ray's "Synopsis," ed. iii., and the "Flora Anglica;" Ray's name stands first in the body of the work, but the index is of the Linnean names. There is a figure of a double-flowered variety of Orchis Morio, found "in a meadow near Cades in Ospringe;" and a portrait of the author.

Curtis' "Flora Londinensis" (the first volume of which appeared in 1777), having been originally "intended to include only the plants found within ten miles of London," may fairly be considered as coming within the scope of the present notice. The following brief summary of its contents we extract from the "Flora of Middlesex," which contains much information on our older botanical authors:—"This excellent book, of which Sir J. E. Smith remarks that it 'ranks next to Ray's Synopsis in original merit and authority upon English plants,' was published in numbers, each of which contained six plates, with descriptions in folio, the price, 2s. 6d. uncoloured, and 5s. coloured. Twelve numbers formed a fasciculus, of which six (= 72) numbers were issued, each with an index. The book is generally bound in two volumes and the whole number of plates is 435." Three hundred copies of each number were printed. No pains were spared in its production; the figures are life-size, full-coloured, and almost always very accurate. The descriptions show a critical acquaintance with plants, and many species were first well defined and separated from their congeners in these pages. The same author in 1782 published a catalogue of Settle plants, which was reprinted in the "Phytologist" for 1855, pp. 36, 84, 108, &c.

Cambridgeshire plants again come before us in Richard Relhan's "Flora Cantabrigiensis." "The first edition of this book appeared in 1785, and was quickly followed by three supplements, published in 1786, 1788, and 1793 respectively. The second edition of the 'Flora' issued from the press in 1802, and the third and last in 1820" ("Flora of Cambridgeshire"). There are good figures of Thesium linophyllum, Cineraria campestris, Anemone Pulsatilla, and Seseli Libanotis; and a valuable account of the Mosses, Algæ, and Fungi is added. The example of Cambridge seems to have aroused in the sister University a kindred desire to publish some record of the flora of its county; and in 1794 we have the "Flora Oxoniensis," by Dr. John Sibthorp, Professor of Botany in the University, and author of the "Flora Græca." Localities, however, are given only for the rarer plants, and those chiefly in the immediate neighbourhood of Oxford: there are no plates. Of flowering plants, 729 species are enumerated, and of Cryptogams 471. This is the first English work in which any of the forms of Ranunculus aquatilis are raised to the rank of species. Dr. Sibthorp gives R. heterophyllus, R. aquatilis (in a restricted sense), R. fluviatilis, and R. circinatus; the three first names being taken from a work by Wiggers, published in 1780, and the last, by which the plant is still known, being bestowed by himself. The four forms had been distinguished in the "Synopsis" as varieties of R. aquatilis.

The last local flora of the 18th century is the Rev. Charles Abbot's "Flora Bedfordiensis," which appeared in 1798. In this the arrangement was much that of the foregoing: 719 flowering plants are recorded for the county, and by the addition of Ferns and lower Cryptogams the total number of species is made up to 1225. There are good figures of Alchemilla vulgaris (which the author says is "the most elegant plant of all our natives"), Convallaria majalis, and Viola palustris, with one or two Fungi. A reference to some published figure of each species is given, as well as a brief technical description; and original observations are added to some, which show the author to have been a man of careful observation, even if not a profound botanist. In his preface he tells us that he has cultivated many of the plants in his garden; and also that his "amiable and interesting partner" has prepared "an herbarium, the admiration of all who have knowledge and judgment to discern its superior beauty and excellence." The assistance of Professor T. Martyn is also acknowledged. He gives two Water Crowfoots, R. heterophyllus and R. fluviatilis; but says he is "obliged to relinquish the other two varieties, which the late celebrated Dr. Sibthorp has called aquatilis and circinatus," because he has "not yet determined them by cultivation."

In 1805 appeared the "Botanist's Guide through England and Wales," by Dawson Turner and Lewis Weston Dillwyn; a work of about 800 pages, which was published in two volumes. This may be looked upon as a development of the appendix to Martyn's "Plantæ Cantabrigienses," which we have already noticed. The idea of the work, we are told in the preface, originated with Dillwyn, "who, like many other botanists, accustoming himself as often as he left home to select the places of growth of those plants which were likely to occur to his notice, was induced to extract whatever referred to the most uncommon species from Ray, Withering, &c., and reduced it to the following arrangement." The counties are arranged in alphabetical order, and a list of the rarer plants of each is given; the localities being selected from published works, and a large number contributed by the authors, as well as by other British botanists, such as the Rev. Hugh Davies, Mr. Joseph Woods, Messrs. E. and T. F. Forster, Mr. Borrer, &c. In spite of many deficiencies and some errors (especially in the placing of localities under their respective counties), the work is a very valuable one, as containing a summary of the knowledge of the period of the distribution of British plants. Critical notes upon a few of the plants, chiefly by Turner, are added; and the origin of some introductions, such as Sisymbrium polyceratium at Bury, is stated; while errors of previous writers (such as Ray's locality, near Whitchaven, for Lathyrus latifolius, L. sylvestris being the species which grows there) are corrected. It must be admitted, however, that certain plants are inserted—such as Epimedium alpinum, Corydalis solida, Asplenium fontanum, Gentiana acaulis, and others—which subsequent investigation has shown to have been undeserving of a place in our lists. A few works are cited which we have not noticed in these papers, either because we had no opportunity of referring to them, or because they were not of sufficient importance to demand especial notice; these are principally the lists which different botanists had contributed to county histories and similar works. The arrangement of the work is that of Dr. (afterwards Sir) J. E. Smith's "Flora Britannica," then lately published; Mosses, Lichens, Algæ, and Fungi are included.

We have now arrived at a period when the study of botany became in a measure both popular and fashionable; and when, as a consequence, botanical works, both of local and general interest, became more

abundant. As the aim of these papers is to show the various changes which have taken place in the plan and arrangement of our local floras, we shall not pause to refer to all that have appeared, but shall select for special notice only such as bear upon these points. *James Britten, F.L.S.*

THE SPECIFIC CHARACTERS OF AGARICS.

[We are indebted to Mr. Worthington G. Smith for the following translation of the interesting letter received from Professor Fries, of Upsala, referred to at p. 1380, as having been read by Dr. Bull at the meeting of the Woolhope Club, at Hereford, on October 6, with some remarks thereon by Mr. Smith.]

"I HAVE received with singular pleasure the 'Clavis Agaricinorum,' and on account of this present I give my most sincere thanks. I am much pleased with the list of British species, in comparison with those of Sweden. I cannot doubt, however, that many species still lie hid in Britain, chiefly in the Pine woods of Scotland; but many of the very handsome species peculiar to our woods, as Lactarius scrobiculatus and the larger Cortinarii, appear to be almost absent from Britain. In addition, there are various species omitted by my friend Berkeley which are certainly members of the British Flora, as Agaricus clavipes (to which, without doubt, belongs the Agaricus mollis of Bolton), and Agaricus compressus, Sow., altogether distinct from Agaricus butyraceus and Hygrophorus ovinus, but very near to Agaricus metrachrous, &c.

"Here it is lawful to add some observations respecting plate 6 of the work. The vacant space of the series Leucospori, between 2 and 3, analogous with Pluteus and Pilosace, is very well filled by the subgenus Hiatula, described by me in 'Nov. Sym. Myc.,' of which there are numerous tropical species, and two with us borne on the stems of Orchids. They were collected in a similar situation at Amsterdam. The resupinate species in subgenus 6 (Pleurotus) should be excluded. Agaricus xanthogrammus is chiefly remarkable to me, as I know of no species with a partial veil amongst the Hyporhodii.

"I am not able to refer Agaricus echinatus to the Hyporhodii, as the spores are not rosy, but subfuscous, and more like those of Agaricus cretaceus and campestris; also A. hæmatospermus (has its spores) subfuscous not rosy. This species has been recently found in Sweden, and I suspect A. montanum var. cervarium, Alb. and Schw., and A. Hookeri, Kl., to belong to it, for the ring easily disappears. Agaricus aureus occupies the space between Lepiota and Psalliota in the series Dermini, and it will stand for the type of a subgenus (Togaria), but I am unwilling to found a subgenus on a single species. Hypholoma answers in part to Entoloma, but in part (section 'Fasciculares') to Flammula. Flammula and the 'Fasciculares' group of Hypholoma are often confused. The Panæoli should not be in the second group, but the third, as I consider them as analogues of Naucoria and Psilocybe, for the stem is sub-cartilaginous, and the veil is present in some and absent in others. Agaricus fœnisecii and A. papilionaceus are most manifest analogues.

"I know not whether my new work, 'Icones Hymenomycetum,' is known to you. I have communicated to my dearest friend Berkeley many figures of new species. Farewell, &c. * * * E. Fries, Upsala, Aug. 10, 1870. What Nylander and Hoffmann call a trama, to me is not a trama but the base of the hymenium. In my opinion the trama is the substance of the pileus entering between the gills."

As the author of the work in question, perhaps I may be permitted to offer a few observations on Professor Fries' letter. I will do so in connection with the review which lately appeared in your columns, which, it is no secret, came from the pen of a botanist only second in his knowledge of Fungi to Fries himself. (See p. 1221, ante.)

I make no claim to originality in the work, for the scheme is more or less foreshadowed in Fries' works. The genera, subgenera, and species of the Agaricini may be compared with the pieces of a huge and intricate puzzle; of these pieces half are lost or unknown, the rest are almost inextricably disarranged and mixed up together. Now the problem is, how to set up these confused and imperfect pieces in such order as to show one continuous and perfect design. Fries has done this with some success, and all I claim is, to have made out one or two missing pieces, and to have arranged, with some trifling modifications, one or two others. These modifications, I consider, make the pattern clearer than heretofore, and it will be observed that neither Prof. Fries nor your reviewer dissent from my general idea.

I will now briefly remark on the observations of Prof. Fries, and on those printed in your columns in detail. First, as to the new subgenus Hiatula. The publication of this I overlooked, but I foresaw its position, and the only blank space on plate 1, to quote Fries' own words, "is well filled by it." Moreover, at p. 5 of my work there is a note respecting an Agaric which exactly fills this position. It is remarkable to me that this subgenus, its analogue Pilosace and Chamæota, are all foreign. It is my conviction, when foreign countries have been well searched, that every position of my scheme will be filled in. As it is, Fries suggests the filling of three additional positions.

Fries next says that the resupinate species should be excluded from Pleurotus. As he has invariably included them himself, he can only be understood to suggest the formation of a new subgenus for their reception. To this I can see no objection, neither does it affect my arrangement in the slightest degree. Your reviewer says, under Pleurotus, that A. euosmus has no affinity with A. variabilis; this I grant, but neither has it any affinity with A. mitis or A. acerosus amongst the Leucospori, where it was formerly placed. A. popinalis is associated with the Hyporhodii, but its spores are whiter than those of A. euosmus.

Fries says he is not able to refer A. echinatus to the Hyporhodii; your reviewer says he approves of keeping it distinct, as it connects Lepiota with Psalliota; this latter was my reason for removing it, *i. e.*, not so much on account of the spores not being purple-brown, but because the plant was exactly intermediate in position between Lepiota and Psalliota. It is true that the spores in Lepiota change colour in the dried plant, as stated by your reviewer, but this is only because the spores become tinged with the juices of the plant, and not because they change in themselves. I have spores of most of the Lepiotæ preserved (and yet exposed to the air), that have retained their perfectly white colour for 10 years or more.

The subgenus Togaria, mentioned by Fries, fills up another blank space on plate 3 of my "Clavis;" it occupies the middle position of the top three spaces. It is again curious that the typical plant should not be British.

Fries next refers to Hypholoma and its analogy with Entoloma and Flammula, and says that the "Fasciculares" group of Entoloma is analogous with Flammula; this is undoubtedly true; but Flammula is at present badly constituted, and some of the plants have no affinity with each other. It follows, therefore, that the following British species, viz., A. sublateritius, A. capnoides, A. epixanthus, A. fascicularis, and A. dispersus, instead of being placed at the head of Hypholoma, as heretofore, by Fries, Berkeley, and others, must come in at the end, and fill the blank position on plate 4, which is analogous with Flammula on plate 3.

Before leaving the Dermini and Pratellæ, I will briefly touch upon your reviewer's remarks on my subgenera, Tubaria and Deconica; they are not, as he states, founded upon the slight characters of decurrent gills, but decurrent gills accompanied by other characters, as the depressed pileus and the nature of the margin. The difficulty respecting such species as A. vulgaris, quoted by him as being still left in Mycena and not removed to Omphalia, I have referred to at p. 14, under the "Mycenariæ" of Omphalia; the reference to A. camptophyllus being left in Mycena, and not removed to Omphalia, is especially unfortunate, as I have placed it in Omphalia, and not in Mycena.

The Panæoli are mentioned in conclusion by Fries as more analogous with Naucoria and Psilocybe than with Hypholoma. The hollow stem and appendiculate veil, however, of A. fimiputris and its allies appears to me to bear a manifest analogy with the "Appendiculati" group of Hypholoma. The subgenus Panæolus will on proper study probably bear subdivision. I am of opinion that the colour of the spores is by no means a character of the first importance amongst Agarics, and at page 3 of my work I clearly say that the alliance of the species would be closer if the points of structure were followed. Therefore I certainly do not consider the colour of the spores to be "all in all." As to the genus Hygrophorus that could not be cut up, as all the species have white spores. I imagine Fries would not have founded the different subgenera of Agaricus on such a character as spore colour, if he had had such salient points of distinction as we find in Lactarius and Russula under "Piperates," "Dapetes," "Limacini," "Rigidæ," "Fragiles," &c. As to the "trama" in the gills of Agarics, and its value as a character, the subject still wants working up. Fries, however, is clearly right in asserting its absence in Paxillus involutus, and Nylander and Hoffmann are mistaken.

The accompanying plate (fig. 250) shows at a glance my modification of the arrangement of Agarics with white spores. Those with coloured spores are analogous. It differs from that of Fries in the removal of Pleurotus from the bottom right-hand corner position to the one above it; and in the transposition of Omphalia and Mycena (see "Monographia Hymenomycetum," pp. 177, 195); of course I suggest a similar transposition of those subgenera of Agarics which have coloured spores.

The position of Fries' new subgenus, Hiatula (which was unknown to me when my pamphlet was printed), but which I had provided a space for, is shown by the blank position at the top right-hand corner. *Worthington G. Smith, North Grove West, Mildmay Park.*

SERIES I. LEUCOSPORI.—SPORES WHITE.

* Hymenophorum distinct from the fleshy Stem.

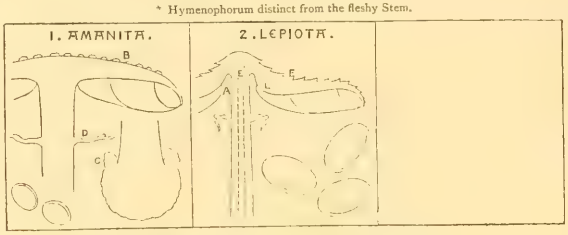

** Hymenophorum confluent and homogeneous with the fleshy Stem.

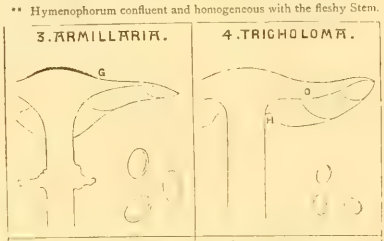

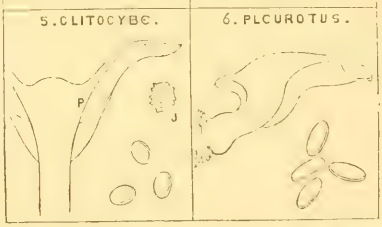

*** Hymenophorum confluent with, but heterogeneous from the cartilaginous Stem.

SUBGENERA OF AGARICUS.

FIG. 250.

VANDA CATHCARTI.

It will interest all cultivators of Orchids to learn that this rarity (fig. 251) has lately flowered in the collection of C. Stead, Esq., Baildon, near Leeds. The plant itself—a fine specimen nearly 6 feet high—very much resembles in habit Renanthera coccinea, but is more robust. The flowers are large and of great substance, 3—5 being borne on a drooping spike. Sepals and petals oblong, pale reddish green behind, and of a chocolate-red, barred with yellow within. Lip three-lobed, lateral lobes wedge-shaped, central lobe cordate, with a peculiar thick, crenelled margin of a clear yellow colour. Crest two-lobed, pale yellow streaked with lake. The unguis of the lip is comparatively slender, and the lip itself has an oscillatory motion, similar to that of some Sarcopodiums, on the plant being touched or shaken—this movement being in all probability due to the weight of the fleshy lip being more than the unguis can support firmly in its place. At first sight the lip would appear to have two holes punched through it, one on either side the two-lobed crest, but on closer examination this appearance is found to be caused by the lobes lying over each other, as in the figure. I should like to hear whether this species has bloomed before in this country in any other collection, as it is not at all commonly met with in collections. Last year this plant produced several spikes, which I am informed were much finer than those produced this year. *F. W. B.*

THE PASSION-FLOWER.

At p. 1214 of the *Gardeners' Chronicle* for September 10, we read that the "Passiflora incarnata is the one in which the semblance of the parts of the flower to the instruments of our Lord's passion was first observed. The cross, the scourge, the hammer, the nails, the crown of thorns, even ten of the Apostles—Judas who betrayed, and Peter who denied, being absent—all may be seen by the imaginative in these flowers. Monardes (1593) was the first to call attention to this peculiarity." All Christendom seems to have endorsed the views of Monardes, and it is the flower of the Passion to this day, and likely to remain so until the end of time, notwithstanding Parkinson's invective "contrarying" it, which occupies about half a column of the *Gardeners' Chronicle*, with as genuine a sample of Billingsate as could be found. I was indeed surprised to see it in our valuable paper, not only sowing discord, but manuring it. I need only quote what "M. T. M" politely calls his "somewhat uncharitableness," where he calls his opponent liar, superstitious, *cum multis aliis*.

In the preface to Lindley's "Introduction to Botany," the Doctor states that, about 300 years ago the knowledge of plants was very limited, and he mentions the issue of an "Introduction to Botany," by Fuchs, of four pages, as an example of the literature of the time in that line. A little over 300 years ago the monasteries had been suppressed, and the inmates, who had cultivated literature and a knowledge of plants, were dispersed, and with the violent spirit of persecution still raging between the new proprietors who had come in for the Church lands, and the properties of the monastic establishments, colleges, and hospitals, and those who had been driven out, and were fortunate enough, according to Cobbett, to get "licenses to beg," there existed just such a state of feeling as we occasionally see displayed in the closing of the gates of Derry, or during a "free fight" and "ruction" at Belfast, where they wreck the residences of the religious body opposed to their interest—for it is interest and ascendancy that is the bone of contention. Religion, ever humble and holy, if true, never had any share in the quarrels on either side.

Parkinson bears me out in all that I have said about the violence and intolerance of the time, for we see him in high dudgeon holding forth in a tirade against the Church, but ostensibly on the Passion-flower, throwing dust in the eyes of his readers who in those days would never be able to see a living Passion-flower to judge for themselves, and all the while, according to "M. T. M.," his opponent had figured one species of Passion-flower and he another; but Parkinson was too angry to be able to see that he was bearing false witness against his neighbour. The statistics of the case, however, are now altered, and we have the first instalment of a botanist's labours, calmly and dispassionately collating materials to illustrate faithfully the character of Passion-flowers; we have, moreover, now a host of witnesses who have all seen many distinct species and varieties of Passion-flowers alive, with all their rays of glory unshorn. Whilst I write this letter four species of this charming climber are before me,

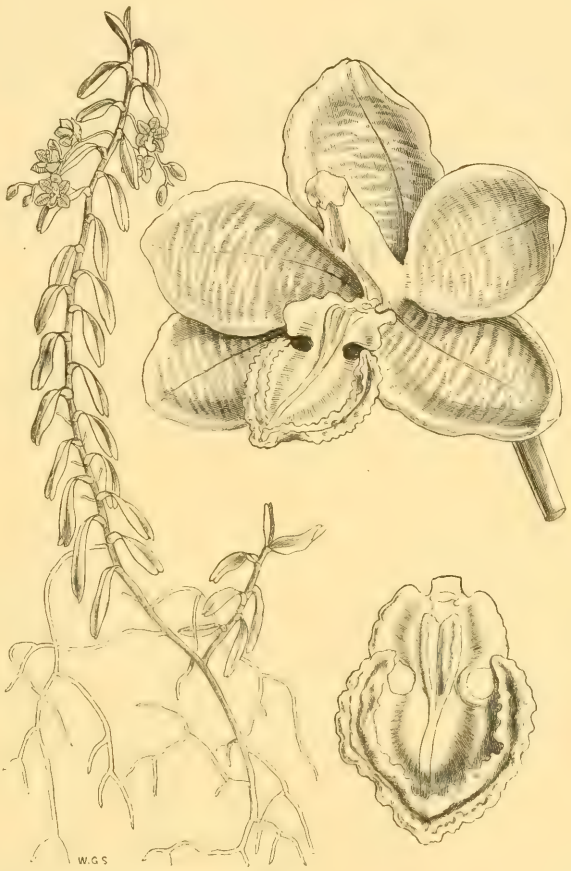

Fig. 251.

with all their reputed emblems thick upon them. I became acquainted with Passion-flowers about 1826, and at that time read with awe that Papists made a great handle of this flower. Parkinson hints that they adore it, and labours—good man that he is—to give them better knowledge, hints that God will judge, and relies upon the devil to do his duty.

When painters delineate the figures of the Holy Family they put a radiance round the head; thus we have the rays of glory round the head of St. John; and in the plant, St. John's Wort (Hypericum, which means the glory on the figure), we have the same idea. There is no fault to be found with Cypripedium Calceolus for representing Our Lady's Slipper—not Lady's Slipper—nor with Oncidium Papilio representing a butterfly, nor with Peristeria in the form of a dove—the Holy Ghost plant. In what the poet calls the God-like face of man we have an image of the highest order, the heir of heaven, the child of immortality; but wonder not if a celebrated traveller introduces to your notice a brute, a perfect brute, yet bearing such an intimate resemblance to man in stature and anatomy as to make some doubt if he had not been the "origin of our species." However, as the most gentlemanly of apes do not possess reason, the gulf is great enough between them and us. But let us go one step further, and you will see in the small box which I have enclosed a Nut [of Anacardium] a perfect model of a monkey's head—eyes, mouth, and expression all accurately put in by Nature; this third round of the ladder has landed us in the vegetable kingdom with a veritable image of a monkey's head, ugly enough, but with the slack skin of the face as in the monkey, puckered together as if tied with a thong, the sunken eyes, flat nose, and cow mouth, so that no one could fail to find the resemblance.

When Dryden spoke of martyrs he said they were "Heroes make half human half divine." The halo round the head of our Saviour has but one signification to the Christian, and that is divine; it is therefore from the standpoint of the glory on the figure that we can best appreciate the Passion-flower. The instruments of the Passion are numerous, and might well puzzle an observer to see them all in a single flower of only a hand's breadth; but as the Passion-flowers hang upon the plant they generally face the observer, like the face of a clock, and in this position the three stigmas at the top of the column form three arms of the cross, and the supporting column, when seen under the centre one, certainly gives the cross. The rays of glory in this plant have nothing like them in the world of flowers with which we are acquanted. I counted the filaments of a purple Passion-flower, and it had more than a hundred spear points, and each filament was parti-coloured of at least three different hues; these filaments from all appearance form no part of the sexual or working part of the flower, but seem gratuitous embellishments: there are moreover other parts superadded, such as a low inner crown with an elegant fringe of coloured dots round the base of the column, just such as the loops of a worsted knitted frock would be. There are three bracteal leaves at the base of the flower on the footstalk. The ovary is certainly a part of the ball and cross, and from its unit springs the three stigmas, and as the Passion-flower indoors opens and remains so for three days only, and then closes for ever, parties will draw their own conclusions from such premises. The five stamens have a conspicuous place in the flower, and as there are said to have been only four nails and five wounds, the stamens would stand for the wounds and not for the nails. In one of the Passion-flowers now before me, the column, stamens, and stigmas, are all spotted with irregular red blotches, those at the base of the column being on a white ground are most conspicuous. There are only five petals to the corolla, and only five segments to the calyx, so that the number 10, so deftly put in by an enemy to make the ten Apostles, is nowhere to be seen: [5 × 2 = 10] but well did Scott say—

> "O! many a shaft, at random sent,
> Finds mark the archer little meant;"

and I was amused to see the version of the ten Apostles, with Judas and Peter absent. Judas's presence is put beyond doubt, he certainly was there, and St. Peter's sword was not only drawn in defence of his divine Master, but drew blood; but whoever was the author of these views his opinions are clearly seen, for on one side of this religious question St. Peter would be an old offender, and it was better to leave out the "Prince of the Apostles," as Parkinson has said, "the occasion being thus offered." It is no wonder if observers differ in the details in this matter, when we find that eye-witnesses of the Passion itself give us different versions of that momentous event, and were two orators of "different schools of thought" to take up the subject now, who would expect them to give us the same ideas? Suppose Mr. Spurgeon were one, he would no doubt astonish us with the new light he would be able to

throw upon this grand picture, whilst some of the old school, Bourdalone, for example, would borrow fire from heaven and burn the event as with a brand into the very bones of his hearers, never to be forgotten—but the two pictures would certainly not be alike. *Alex. Forsyth.*

Home Correspondence.

The Royal Horticultural Society's Country Mission.—Whether this is to be a matter of success or disappointment depends entirely upon how it is carried out. As the first to moot the visit to Nottingham a year ago, I must, now that it has been decided upon, say I feel annoyed and grievously disappointed, inasmuch as in the site selected I feel convinced—and I do not speak as a theorist in such matters—the Council has made the first step towards a failure. When I wrote and named several sites here as being suitable for the exhibition I never named Wollaton, from the simple fact that I knew that all the attempts made in the same direction at High Fields had resulted in failure; and I doubt whether all the prestige of the Royal Horticultural Society will be able to preserve this attempt from a similar result; at least of this I am quite certain, where it may make a profit of £10 at Wollaton, it would make £100 in the Arboretum, as well as conduce to the comfort of every person who may attend the show. But you say the Arboretum cannot be had. I have reason to believe to the contrary, and say it can be had, not legally—at present—certainly, but just as legally as under the same Act of Parliament hundreds of pounds are taken from the public annually for entrance to the race-course and the "betting ring," and for other purposes. So strongly do the people of Nottingham feel the injustice that is being done them in taking the show from their midst, that had I the leisure I would in a week get a requisition signed by 20,000 people for the exhibition to be held in the Arboretum, and the foremost among the signatures should be those of the practical men upon the local committee. A fact like this should be worth something, and it is worth something—for instead of raising a special prize fund of £500 in a few days, which we might have done had the exhibition been held in the town, I doubt if near that sum will be raised by the domiciliary solicitations which are now being inaugurated by the committee. The half-guineas, guineas, five guineas, and smaller sums which had been promised me to the amount of £50, and which, with a little exertion, I could have raised into £100, will now result in small change which I shall not trouble to collect. Indeed, to put the question plainly, why should tradespeople and working men subscribe funds to an exhibition which is to be made as inaccessible to them as possible, and which will bring no profit to the town? This is the wet blanket upon the whole affair. As foreshadowed in my former articles, from the central position of our tilting-ground (the Arboretum), I looked forward to the meeting as a genuine holiday, splendid spectacle, intellectual treat, and social reunion, because every one would be near to places of entertainment where the necessaries of life, and the luxuries too, could be procured at a reasonable rate. Now visitors will be driven into the Robin Hood country, where they must either depend upon pot-house accommodation, or submit to the extortion of itinerant refreshment contractors. I had thought of day trains at reasonable rates, by which the gardens of the Dukeries, Chatsworth, Belvoir, Newstead, &c., could be visited; I had thought of obtaining the permission of our leading merchants and manufacturers, by which their warehouses and manufactories should be seen; but this is gone,—the Society has taken away our centre, and compelled us to be wanderers on an inhospitable circumference of the town. The Arboretum is within a 20 minutes' walk, upon paved streets, of every part of the town, and you are at home. The railway station is a 20 to 30 minutes' walk from the best parts of the town; you have then to ride to Lenton, and to walk a mile over loose gravel afterwards. Can this be an element of success? It is all very well to speak of Leicester and Manchester. The former narrowly escaped being a failure, and I know the walk of two miles was most irksome; as for Manchester, its splendid system of cheap omnibuses puts it out of comparison with ordinary places, and yet for all that I have more than once paid a 5*s.* cab fare to get back to the town from the Botanic Garden. As a mere pecuniary speculation I have no doubt Mr. Findley would not be sorry if the Botanic Garden for the Whitsun week could be shifted two or three miles nearer the centre of population. What was it that caused the abandonment of the Chiswick shows but the distance from town? And what was it that gave the Royal Botanic exhibitions the lead but the facility of access? Yet with this dearly bought experience before them, the Council of the Royal Horticultural Society insist upon carrying the mountain to the exhibition rather than place it in the centre of the mountain, lend their aid to fatten a railway company rather than accommodate the working classes and put a large profit into their own coffers. Walking through our Arboretum only yesterday with a London exhibitor intimately connected with the metropolitan exhibitions of the last 20 years, he stopped at one of the principal points of observation, and exclaimed "What can the Society want? Here is a splendid garden, equal to Chiswick in its best days, which seems to say, 'Here is a home for you; come and take shelter upon my spacious lawns, and the place will swarm with visitors. But practically the Society says, 'No; we have no connection with gardening or dressed scenery, and therefore we go to the open field.'" At our artisans' annual Rose show in July last the receipts were £126 some few shillings; of that amount all but £30 was taken in threepences after 6 P.M. Four years ago, at the floral *fête* in connection with the meeting of the British Association, the two first days at an admission of 5*s.* and 2*s.* 6*d.* respectively, resulted in a loss of £90; the third day, at 6*d.*, with little more than 24 hours' notice, cleared the debt, paid the exhibitors for their extra day, and left a handsome profit. The evidence of the exhibitors in the manufacturing districts goes to show that, the lower the price of admission the greater the amount of money to be taken; and as that money must come from the million, the nearer you place your exhibition to your visitors the more certain your success must become. The selection of site was, to say the best of it, premature, ill-judged, and sadly wanting in the element of courtesy. If a provincial town undertakes to guarantee a Society against loss, and provides special prizes, and if the *élite* of the district, with the Mayor at their head, form themselves into a committee, and undertake the local business of the gathering, surely the least the Council of the Society could do would be to confer with the committee before making final arrangements. Had the Council done so they would have found the evidence of success against their selection, and distasteful to an immense majority of their supporters. Some, of course—those who keep their carriages—may say, "I would as soon drive to Wollaton as to the Arboretum;" but where a merchant or manufacturer would spend 10*s.* or a sovereign on the first day of the show, their workpeople would spend £10 to £20 every night during the exhibition. In a word, it is the "nimble 6*d.*" which pays; and until the Council of the Royal Horticultural Society learns to appreciate and act upon that fact, they will never make profit by their provincial exhibitions. I agree with every word which you have said relative to the want of a radical change in the arrangement of these exhibitions, but that is a matter which I cannot enter into to-day. I am sick of the dreary waste of long tents and formal tables, they look as if the Society had but one idea, and that bound up in a parallelogram, to be used for all time. *W. P. Ayres, Nottingham.* [The fact remains, that the local authorities—so we are told—say they have no power, without an Act of Parliament, to exclude any one from the Arboretum, which practically means that the site is not available. Till that difficulty is removed—and that must be by the Nottingham folk—we do not see how the Society can go there. The Council and the local committee are, we believe, agreed on this point. Eds.]

Late Peaches.—I have at the present time a Peach tree loaded with fine fruit, which are quite hard and firm, and likely to hang some time yet before they are ripe, if protected from frost. The tree in question is situate on a wall with a south aspect, in an enclosed garden, which inclines very much towards the south, consequently getting the full action of the sun's rays. Under such circumstances, and in such a season as the past, I am inclined to think that this Peach is rarely to be met with. Such varieties as Walburton Admirable, Late Admirable, and the Salway, we must admit are amongst our latest; but when trees of these sorts are planted side by side, and in exactly the same situation with the one in question, and ripen their fruit so much earlier, I think it worthy of calling the attention of your correspondents to the fact, which appears more obvious under the conditions stated above. The tree was planted in 1863 by my predecessor, for the Royal George. *E. Morgan, The Butts, Harrow-on-the-Hill.* [Please send us a fruit, when they are ripe, with some of the leaves. Eds.]

Bougainvillea glabra.—Your correspondents need have no fear in treating the above as a greenhouse plant, as it will live in any place where frost is excluded, if kept dry at the roots. It may safely be stowed away with the Fuchsias to winter, and requires much the same treatment in the spring and summer to bloom it successfully, except that it should have less shade than is necessary for Fuchsias. All our pot plants of the Bougainvillea have for several years past been wintered in our Fig-house, where the frost has at times been barely excluded. Treated in this way they lose every leaf, but start vigorously into growth when we commence forcing in the spring. Planted out in a cool house it is most valuable, as it affords an abundant supply of its lovely mauve-coloured leaves for cutting till quite late in the autumn. Our plant here has been literally loaded with bloom; so much so, that we are frequently compelled to sacrifice a quantity to give light to the Ferns beneath. I would strongly advise all who have a greenhouse, and require creepers, to plant Bougainvillea glabra and Tacsonia Van Volxemi. *J. Sheppard, Woolverstone Park.*

—— I have a plant of the above, which is growing in a 15-inch pot, and has not been shifted for the last two years and a-half. For the above period it has been growing in a glass potting-shed, trained under the roof, the door of which has been constantly open by day throughout the summer. I should mention that a flow and return pipe runs through the shed, which excludes frost; still, under the above treatment, Bougainvillea glabra has been all the summer, and is now, one mass of blossom. I may add that a rich top-dressing and a good supply of manure-water have been afforded. I have also a second plant, which was for two years grown in a stove, trained on a trellis, but finding that it flowered sparingly, I removed it to a greenhouse, where it has grown and flowered most profusely; which leads me to believe that Bougainvillea glabra would thrive quite as satisfactorily in a warm greenhouse as in a stove. *T. Lockie, Court Gardens, Great Marlow, Bucks.*

Clematis Jackmani and Acer Negundo variegatum.—As a fervent lover of hardy plants, I think of all the floral decorations with which a garden can be adorned, there is no more beautiful plant than that of Clematis Jackmani, especially when grown on parasol-shaped trainers 5 feet high, and planted alternately with standard plants of Acer Negundo variegatum of the same height, and in line, at a distance of their own height from each other, in front of an Ivy wall. What with the never-ending thousands of blue-mauve flowers of Clematis Jackmani, and the leafy splendour of Acer Negundo variegatum, associated with the Ivy background, a combination is formed of flower and leaf the beauty of which no writing can convey, but has been witnessed here this season by several of the leading horticulturists in England and Scotland with great admiration. *James Neilson, Rose Hall, Falkirk.*

Iris susiana.—Your correspondent, A. Watkins, inquires, at p. 1218, as to the management of the above and Iris Pavonia. I was in hopes some one of experience would have replied to him. Of the first-named, my small experience teaches me that it requires to be left alone at least a year after planting; that is, suppose he procures his tubers this autumn, let him plant them in an open situation, and where it will not be too dry in summer. The crown should be placed about 2 inches below the surface, and there let it remain until the following June twelvemonth, when most likely he will be rewarded with one of the grandest flowers, either ancient or modern. Like many other Iridaceous and Liliaceous plants, it begins to form its new roots before the sap has disappeared from the leaves. I find the "grass" of these plants often dies down in hot dry summers like the last, but they are now making vigorous growth. With respect to Vieusseuxia glaucopis, I cannot speak so positively, but I should recommend the same treatment as for Ixia—loam, peat, leaf-mould, and silver sand—place and keep them in a cold frame, and always re-pot early. *John E. Daniel, The Terrace, Epsom.*

Cooking Potatos.—I recently read in a gardening contemporary a recommendation that Potatos should be at all times boiled in their skins. This is decidedly wrong, and the advice so given is improper. If it were simply a question of saving, perhaps to follow it would be right, but we usually judge of the goodness of a Potato by its flavour and presentability at table, and nothing tends so much to destroy both as cooking it in its skin. The coating of the Potato is not only indigestible, but also contains properties that are exceedingly obnoxious to the palate, and when not previously removed, it invariably imparts to the tuber a taste of bitterness that is to those who are accustomed to the eating of peeled Potatos exceedingly objectionable; besides which there is at all times an absence of that white floury appearance externally when dished up that is such a strong recommendation for all good Potatos. I am sure were two dishes of cooked Potatos of the sort, one peeled before boiling and the other after, to be submitted to the opinion of impartial judges, their judgment would unanimously be in favour of the former mode of preparation. Potatos to be cooked well should be boiled quickly. When I wish to test the quality of my respective trial sorts I have them thinly peeled and put into a small saucepan, in which there is barely sufficient water to cover them—the softer the water the better,—a small knob of salt is added, and the pan is then placed over a quick fire; by the time the tubers are ready for straining, nearly one-half of the water will have evaporated. If after a good drying off the Potatos are not sweet, well-flavoured, and mealy, it will be the fault of the sort, and not of the cooking. *Alex. Dean.*

Melon Growing at Heckfield—Perhaps there is no county in which more Melons are grown than this (Lancashire), and this has been without exception the best season I remember for the last 20 years. I never saw so many good, strong, clean, healthy, fruitful, plants as have been produced this season, which may account in some measure for the fine crop at Heckfield. It is all very well for Mr. Wildsmith, assisted by his friends, to tell us about the wonders of a fourth and fifth crop; but we know too well that, after the second crop, the fruit is impaired in flavour, and it is better to plant again, to keep up a succession of good flavoured fruit. What we want to know is, when did Mr. Wildsmith begin to cut his first crop how many fruit each crop contained, the average weight of fruit which each plant produced, as well as

the number of square feet allowed for each plant, also the kind of pit used to grow them in. It is no uncommon occurrence for the first crop to consist of one or two fruits, which I consider no crop at all; therefore nothing but a plain statement will satisfy us Lancashire lads. The best flavoured Melon I ever met with was the old Green-fleshed Egyptian; but I am sorry to say I do not know where it is now to be found true. For my early crop I grow a hybrid Persian variety which I have grown for many years, and have found nothing equal to the Duke of Cornwall, my first fruit of which is now fit for the table, and the plant will, I expect, give me a supply till the middle of January. Very early Melons are not worth the trouble and expense of growing. *T. H.*

Protecting Alpine Plants in Winter.—What is the best way of keeping alpine and other plants in pots in cold frames during the winter? I have always considered it best to plunge the pot entirely in coal ashes, even covering the surface with ashes where possible. But I have lately been taught by a very good authority that in winter it is better simply to stand the pots on the ashes, without sinking them, and that this plan more effectually preserves them from damping. In summer there is no doubt the pots should be sunk to keep them cool and moist. I should be glad if some of your readers would communicate their experiences on this matter. I have hitherto been very fairly successful with plunging, but I have not tried the other plan. *Henry N. Ellacombe, Bitton Vicarage.*

Passiflora incarnata and edulis.—You say, at p. 1213, "P. incarnata, a native of Florida and Central America, extending southwards, at least if P. edulis be considered a form of it, as far as S. Brazil. The true incarnata is now hardly to be met with in gardens." You make no mention of the leading habitat of Linnæus, Virginia, which is confirmed by all American authorities; or of Kentucky, Gray, Man., p. 186, which is equally far north and more interior. I have no evidence of its passing the limits of the United States. I have it now in cultivation here; it should be perfectly hardy with you, for it stands the winter of Philadelphia, although our seedlings left out in our garden have perished. But older plants with deep roots may probably survive. Linnæus evidently confounded P. edulis with incarnata, but the species is founded on the North American plant, as witness "Herb. Linn.," the reference to Gronovius, and the remark in the "Amœn. Acad." i. p. 265;—"Caulis quotannis (etiam in hybernaculo) perit." This would not be true of P. edulis. But the plant of "Hort. Cliffort.," the earliest reference of all, may have been P. edulis—must have been, if the "Crescit in Brasilia" is to be trusted. The "Herb. Hort. Cliff." at British Museum might settle that. Finally, it is not likely, nor indeed credible, without much evidence, that the tropical and tender P. edulis, with its large woody stems and perfectly glabrous [not always] bright green and shining leaves, is the same as P. incarnata, with herbaceous stems and dull somewhat pubescent foliage, the leaves also more deeply cleft and serratures finer. At least the two plants look very differently, and I suppose inhabit widely separated regions of very different climate. *A. Gray, Cambridge, Mass., U. S. A.*
[We shall have more to say on this anon. Eds.]

Orchid Cultivation.—When I wrote you upon October 23 last year, in reply to Mr. Gammie, I said that it was our intention during this year to try on a more extended scale the advantage of sunlight upon the growth of our Dendrobiums. I now propose to give you the result of that trial, which has fully satisfied us as to the soundness of the conclusions Mr. Gammie had arrived at, based upon his experience in the Himalayas. Since then we have also had Lieut.-Col. Benson's very graphic description of the climate of Moulmein, which perhaps during the growing season is nearer to the treatment my Dendrobiums have experienced than what Mr. Gammie advised; yet I cannot say that we have taken great pains to follow any, but what we thought was a true tropical treatment for our Pines. In my first letter I said that this was my key to Orchid growing made easy—to grow them in my Pine-stove; therefore all the change we had to make was to dispense with what thin shading we had previously indulged in. As most, if not all our Orchids come from tropical latitudes, I think, to grow them well, we should first ascertain what is a tropical climate, and then to consider what changes altiude produces upon those conditions. With this view, I will give a few extracts from "The Naturalist on the Amazon," by Henry Walter Bates—I like to give authorities whenever it is possible. At p. 30 he says:—

"The reader who has visited Kew may form some notion by conceiving a vegetation like that in the great Palm-house, spread over a large tract of swampy ground; but he must fancy it mingled with large exogenous trees covered with creepers and parasites, and figure to himself the ground encumbered with fallen and rotting trunks, branches, and leaves, the whole illuminated by a glowing vertical sun, and reeking with moisture." Again (p. 33):—"We used to rise at early dawn, at that early period of the day the sky was invariably cloudless (the thermometer marking 72° or 73° Fahr.); the heavy dew, or the previous night's rain, which lay on the moist foliage, becoming quickly dissipated by the glowing sun, which, rising straight out of the east, mounted rapidly towards the zenith. The heat increased towards 2 o'clock (92° to 93° Fahr.). The leaves, which were so moist and fresh in early morning, now become lax and drooping; the flowers shed their petals; towards evening life revives again. The days are more or less like this throughout the year in this country. A little difference exists between the wet and the dry season; but generally the dry season, which lasts from June to December, is varied with showers, and the wet, from January to June, with sunny days: the result is there is no hybernation, plants do not flower or shed their leaves, nor do birds moult, pair, or breed simultaneously—in the equatorial forest day and night are always of equal length—budding, flowering, fruiting, and leaf-shedding, are always going on in one species or another."

At p. 68 he speaks of the "Moju, a stream little inferior to the Thames in size, having a temperature of 77° Fahr." We cannot in our Pine-stoves give the equal light, any more than the equal length of days, nor would it be wise that we should continue in our short, dark days as high a range of temperature as during summer; but we may all recognise in this account of ceaseless hybernation the reason why our Pines can rest for a season as easily as the Eucharis amazonica, even when we, in our vain imagination, are forcing them all we can. Is there any other reason why our Cattleyas choose their own season of flowering, regardless of the temperature they grow in, than that here given?—that they are like the plants and flowers of their native clime, which have no one time or season for their budding, flowering, leaf-shedding, and fruiting? These are the reasons that dictate our Pine-stove climate, and the Dendrobiums being the visitors, and not the residents, have no claim to set up why a change should be made for them. No single plant that we have tried has failed, and we have as a result, better, riper, larger bulbs than we were able to grow in any previous year: they have stood the full blaze of the sun, our only care being that they had ventilation in proportion to the power of the sun. I may be an easy convert, as I never did believe in the cool treatment doctrine, applied either to animal or vegetable tropical life; and I think it is a fatal mistake to think Orchids found in high altitudes in tropical latitudes can stand cool treatment with us. The old treatment was too hot for the moisture and food contained in the atmosphere; now we get the moisture without the heat, and tender Cattleyas, like Dowiana, damp off. Good Pines can only be grown on liberal principles as regards their comforts'; with them time is money, the longer it takes to grow a fruit the more it costs; and this is true, also, of Dendrobiums, for there is no making up for lost time if a growth unfortunately gets checked. We have grown in this manner so many of the Dendrobiums that for the future there are few we shall care to shade; but, to be exact, I had better give the names of those that have done the best:—albo-sanguineum, aggregatum, Bensoni, chrysanthum, crystallinum, Dalhousianum, densiflorum, Farmeri, fimbriatum, heterocarpum, moniliforme, nobile, Parishii, Pierardi, tortile rosea, and transparens. With Cattleyas I can hardly say we have an experience; but I regret very much so many should have no more exact locality put down to them than Brazil, for I find at p. 290, while contrasting the climates of the Amazon, Mr. Bates says:—

"With such a soil and climate, the luxuriance of vegetation, and the abundance and beauty of animal forms, which are already so great in the region near the Atlantic, increase on the upper river. The fruits, both wild and cultivated, common to the two sections of the country, reach a progressively large size in advancing westward, and some trees which blossom only once a year at Pará and Santarem, yield flower and fruit all the year round at Ega. The climate is healthy, although one lives here as in a permanent vapour bath."

From this we should certainly expect two growths a-year from some of our Cattleyas. I have thought a great deal about the dry season as described by Lieut.-Col. Benson, and from it I do not gather that Dendrobiums require cold to rest them; and as it would be a great point for us to induce some of them to flower in the late summer and autumn months, I have had a number mossed up again, and put into the fruiting Pine-houses, where they are now commencing a fresh growth; these we must do our best to rest in the hot sun, *à la* Moulmein. "Dendrobes during the hot season are leafless, standing like dried sticks on the trees. Their cylindrical form offers but a small surface to the rays of the sun in comparison to Saccolabium giganteum" (p. 311, March 5). Can you tell me where I can find a good account of the climate where our Odontoglossums come from—the Andes of Ecuador and Granada? I am giving you such a long letter this time that I begin to think I must find an extra excuse; what will you say if I find it after this manner? You do not often get a letter upon Orchid cultivation; is it that as a class they are, of all plants cultivated, of the least importance? for it cannot be that the cultivators love them the least. Has the science culminated, or can it? I cannot even hint such a thing. *C. H.* [We will endeavour to answer some of your questions shortly; in the meantime accept our thanks for your communication. Eds.]

The Fruit Crop.—Having just finished storing our fruits here, I thought a few observations on the crops we have had this season would not be out of place. Apples of all kinds are in great abundance; the cider orchards are literally teeming with fine, well-ripened fruit, and the price is very low—1*s.* per 120 lb. Our local Bag Pears are in great abundance, and fine in flavour, but less in size, excepting on the Quince stocks, which seem to improve, both in size and quality, in dry, warm seasons. Doyenné du Comice, from the Quince, has been this season magnificent, as have many others, especially new Duchesse d'Angoulême, and the old Duchesse, too. General Todtleben has been, and is, superb, one of the finest Pears we have. Duchesse de Brabant, also an A 1, deserves general cultivation. Many others of the new sorts have proved of high excellence, especially two fine early kinds, Hebe and Beurré de l'Assomption—good, large, and handsome; in fact, the finest of large early kinds. I do not think much of British Queen this season; it has proved here watery and insipid. Maréchal de la Cour, from the Quince, has been all that can be desired; from the Pear stock watery and insipid. Maréchal Dillon has been fine, as has also Maréchal Vaillant—two splendid fruits, the first raised by Van Mons about 1818, the other by M. Boisbunel, of Rouen, in 1864. There is another Pear under the same name, raised some years before M. Boisbunel's. It is mentioned in the "Journal of the Horticultural Society of Paris," and must be guarded against as being quite distinct from the above. Our collection now in the fruit-room consists of about 600 sorts; it has been a fine year for verifying the kinds. Cherries were a heavy crop, and all the sorts (about 120) bore fruit, and the trees have made wonderful growth, as it has been a season entirely devoid of insect pests—at least here. Plums are, or have been, so abundant that they have been selling at 2*s.* per bushel; Pears the same price. The early Plums are, however, now all gone, and we have only left the late sorts, which are become valuable, as extending the Plum-pie season. The sorts now in use, and still upon the trees, are Belle de Septembre, a fine, large, first-class preserving sort, with high-coloured syrup; Bonnet d'Evêque, a good new French sort that forms a nice sweetmeat when left to shrivel on the tree; Bricette, a pretty little yellow sort with a brisk vinous juice, very like Mirabelle Grosse; Coe's Golden Drop, the finest of all late Plums; Coe's Late Red, just now rather sour, but when kept till November it is better than Tardive de Chalons, our very latest sort; Dunmore, a fine, richly flavoured Plum, just passing away; Frost's Gage, a small but great bearer, and finely flavoured fruit at this season; Impérial de Milan, a beautiful late preserving sort, with a fine delicious flavour; Late Green Gage, rich and sugary, but nearly past; Nelson's Victory, same as Late Orleans, a middling sort, but nearly past its best; Norbert, a beautiful little very late hanging Plum, when it shrivels it is delicious; Nouvelle de Dorelle, a fine new rich and juicy sort; Roe's Autumn Gage, a fine yellow dessert sort, with rich juicy flesh; St. Martin Quetche, a fine late kind when well ripened, not much inferior to Coe's Golden Drop, which it is very like; Snipe, a good late dark sort, with rich flesh and flavour; Tardive de Chalons—to those who like a little acidity this is a gem for that. Gooseberries and Currants were heavy crops. Strawberries, *ut. J. Scott, Crewkerne.*

Picea Nordmanniana and P. Webbiana coned here abundantly last year, but there are none upon either this year. *H. R. S., Hafodunos, near Llanrwst.*

The Dog's-tooth Violet.—I have not seen this early spring favourite growing in any quantity since I lived with the late Mr. Gaines, at Battersea, who used to grow it extensively for Covent Garden Market; and a more useful and pretty thing when nicely bunched up, is very difficult to meet with at the early season of the year when this little gem comes into flower. The foliage is beautifully marbled, spotted or variegated with brown, black, or purple, all over the surface, which adds greatly to its value for spring bedding. The root is fleshy and white, and tooth-shaped. From this tooth-shaped root arise two leaves; in some varieties they are oval, in others narrow and spear-shaped, which enclose the flower; at first they embrace each other, and afterwards fall opposite on the ground. The flower-stalk rises with the leaves, or at times before them; it is naked, round, tender, and will grow to about 4 or 5 inches high; the flower is placed similar to that of a Cyclamen, at the top of the stalk, in a drooping manner, and it is one of those interesting little plants that will stand a close inspection, for the more closely you inspect it the greater favourite will it become. This little plant is not met with so often in gardens, or so extensively cultivated, as it deserves to be. No doubt this is owing in a great measure to its not making offsets freely, which is the method employed of increasing the different varieties, which may be done any time in summer after the leaves die down. To cultivate the Erythronium successfully, the bulbs should be planted in patches in light loamy soil in a shady situation, and should be very seldom disturbed. They may also be propagated by seeds sown in August in a warm shady border, covering the seeds slightly with leaf-mould and sand. In the following spring the plants will appear, when all the care that will be required is careful weeding, watering, and protection from slugs, until the leaves die down, when a little fine earth should be sifted over the bed. In the spring following, when the plants appear, follow up the same instructions; and this must be done year

by year until they flower, when the best colours should be selected, and planted as previously recommended. This is a little plant I would strongly recommend to all lovers of spring flowers. *Edward Bennett, Enville Hall Gardens, Stourbridge.*

Tomatos in Pots.—These are well worthy of a more extended cultivation than they at present obtain; for if the open crops are entirely relied upon, the cultivator often experiences a disappointment and sometimes a total failure, when a cheerless autumn retards the ripening of the fruit. The safer plan is to pot a batch of sturdy plants in spring in 12-inch pots, potting them firmly in strong loam, giving them an airy place in a frame, or on the front stage of an orchard-house, or greenhouse. There is generally some such place at liberty where the sun can play full upon them, when the bedding plants are outside. When they bloom the point of each shoot should be nipped out two leaves beyond the flowers, and when the fruit is set they should be thinned out to about nine on each plant; all young growths should be closely stopped, so as to throw the whole strength of the plant into the fruit. They should then have a top-dressing of cow-dung and charcoal-dust, and be watered with liquid manure in abundance, giving them a good syringing in the afternoons of very hot days. These will ripen to a certainty, and coming in before those grown out-of-doors gives a much longer season of gathering, which is very desirous where Tomatos are in request. *T. C. Sage.*

On the Kidney Bean for Winter Use.—It is pretty well known that in our climate a variety of vegetables for winter use can hardly be kept in a growing state: thus, though Broccoli and Cabbage will stand the winter, they seldom grow, and certainly do not come to that heart which renders them welcome at table; while Beans of various sorts, and especially Kidney Beans, have their herbage killed at the first approach of frost. Hence it is sometimes extremely difficult to get beyond roots, some of which can fortunately be stored. This, however, has been a want in all northern climates, but nowhere has less attempt been made to preserve green vegetables for winter use than in England, whilst on the Continent Peas, Cabbage, and especially Kidney Beans, are well preserved in various ways, and form no unimportant addition to the frugal meal of the poor man, as well as of his more fortunate neighbour. Now, as I have often partaken of Kidney Beans in German families, I was anxious to ascertain how they were preserved, under which circumstances I applied to my kind friend, Professor Voelcker, for information upon the subject, and it is to him that I are indebted for the substance of the following description of a German Bean-feast, which I recommend for general perusal, as I can assure my readers that, if they should try the system, and its results are as good as those which have come before me, they will find that preserved Kidney Beans for winter use are not at all to be despised; and it will be found that if these esculents are gathered for this purpose just before an apprehension of frost, a great deal of useful food may be spared from destruction:—

"The Beans are sliced just as they are for the table, and then salted and pressed into either a small wooden barrel or large stone jar. In every family of any extent in Germany we preserve large quantities of Kidney Beans in this way. In our household we were about 14 or 15 people, and every summer we preserved for winter use some 5 or 6 cwt. of Kidney Beans. When they are abundant and cheap, the lady of the house buys them wholesale, and invites her lady friends, young and old, to help her to slice the Beans; and towards evening the young men coming from business join the party, resharpen the knives, make themselves generally useful, and, after a good deal of flirtation, the day terminates with a dance. I remember with much pleasure the pleasant Kidney Bean parties. The work is all done in one afternoon, by sometimes as many as 18 or 24 young ladies, and directly a lot is ready, the cook is busy in salting the sliced Beans, and she proceeds as follows:—In the first place she puts a thin layer of salt on the bottom of the barrel or stone jar, and upon this a layer of about 4 inches of sliced Kidney Beans; upon this she sprinkles salt, presses down the Beans as much as she can, then places a fresh layer of Beans and some more salt; and in this way the barrel or jar is filled. In salting down the Beans a heavy stone or weight—say a 2 stones weight, or 1 cwt. — is beneficially placed upon two or three layers of sliced Beans and salt for a little time, say a quarter of an hour, before some more Beans are packed into the barrel or jar. Proceeding in this way, a large quantity of Beans will go into a comparatively small space, and the tighter the sliced Beans are packed the better they will keep. When all the Beans have been sliced, and served in this manner, a clean linen cloth, on a piece of board, is put upon them, and kept pressed down by a heavy stone or iron weight. The Beans and salt in the course of a day or two draw water, so that the whole becomes covered with brine. The jar or barrel should be kept in a cellar or cold pantry. When the Beans are wanted for the table, the surface layer, which generally gets a little mouldy after several months' keeping, is wiped with a clean towel, and the Beans soaked in cold water to remove the excess of salt, and they are finally cooked like fresh Kidney Beans. The only care necessary to be taken with the Beans is to keep always a good weight upon them in the barrel or jar in which they are preserved, so that always a little brine—say a quarter of an inch in depth, or more—stands upon them, to the total exclusion of the air. We have in this way kept Beans for more than a year. This is essentially the same plan as that for making saur-kraut, the only difference being that in preserving sliced Cabbages, and making it into saur-kraut, less salt than for Kidney Beans is used; in consequence of which more lactic acid is produced in the case of sliced Cabbages than in that of sliced Beans."

It only remains to notice that the Beans used for the purpose are the varieties of Scarlet Runner, Phaseolus multiflorus, though the dwarf Beans, and especially the green pods of the Haricot Bean, answer very well for the purpose. *T. B.*

The Grape-room at Heckfield.—I should feel greatly obliged if Mr. Dean would supplement his remarks at p. 1382, on the method of keeping Grapes at Heckfield, by stating at what date the "entire house of Black Hamburgh Grapes, which was cut and bottled on October 26," was ripe. Was it an early or a late house? *Thos. Simpson, Broomfield, Chelmsford.*

Foreign Correspondence.

GARDENERS IN AMERICA. — No doubt many among the least fortunate gardeners in England look over here with curious eyes, and may perhaps be interested in a few remarks on the prospects of gardeners in this country. Of course I cannot pretend to know as much about their chances here as persons who have been much longer in the country, but I have perhaps seen as much of the gardening of the country since coming here as many who have been for years rooted in the spot. Of the capacities of the country for gardening I have no manner of doubt, notwithstanding the complaints of many who have to do with it. To find a country or climate without drawbacks is not given to gardening men. In England we often complain of our cloudy skies, but here a brighter climate brings a murderous host of insects, and the gardener finds a new source of grief and grumbling. But when I reflect that in this country most things can be grown that we grow in England, and that, on the other hand, not a few important products that with us require a high artificial heat (Melons, for example) may be grown to perfection by merely sowing them in the open air like common annuals, I have no hesitation in saying that eventually this country will be found much more favourable for gardening than our own. But to the professional gardener other things are of vital importance. Of what avail to him are fertile soils and fine and varied climates if employers are not to be had? Now, in America there is a very large class who make money freely—make it sometimes so rapidly as to astonish even Manchester—but it is a fact that a very small proportion of these take anything like the interest in gardens that corresponding classes do in England. Sundry reasons might be given for this. Perhaps a good many of the new-rich are not sufficiently refined; perhaps all the money which they can devote to æsthetic purposes goes for the absurdly large rings which decorate the fingers of themselves and their wives; perhaps the amount of Nicotiana virginiana smoked and chewed may remove the necessity for any other joys which the vegetable kingdom can afford—but there is little need to inquire. There are in America numbers of persons of highly-refined taste, who delight in country and suburban life, and among these some have good gardens, and are most agreeable masters; but let it not be supposed that even with these the life of a gardener is anything like what it is in England. There is probably not a place in the country where a gardener has the same standing or the same comforts which fall to the lot of the first-class gardener in England. Labour is so very expensive that no man can afford to keep a bevy of workmen; so manual labour from the head gardener is indispensable. Thus places for what are called first-class gardeners in England may be said not to exist? I have met young men who had been foremen in good places in England, and who had got as good places as could be obtained here, who considered they had made a mistake in leaving the old country. The rule here is, a small place with one man or two to help, and the master is usually master of the situation in the garden as well as in other departments, which we know is not always the case in England. Here he generally orders his own seeds and plants, which will at once suggest a difference. Then, again, the pay, even in the best places, does not leave a gardener better, if so well off as he would be in England. But healthy, hardy young gardeners ought to be able to adapt themselves to the wants of a new country, and, if so, they will find sundry openings not obtainable in the old country. There is not by any means so great an improvement in the pay of the gardener as of the labourer. Men satisfied with second or third-class places, or single-handed ones, may find their expectations answered—others not. If, however, there is less high gardening here there are more chances in other ways. The nursery business is fairly profitable, and in nurseries young men may find good places from time to time; and the cut-flower business—that is to say, the growing of plants for the flowers they yield in winter—is still more so. The best course of all for a young gardener is, after he has succeeded in saving a few hundred dollars, to try and secure some ground of his own—not difficult in this country—and establish himself as a nurseryman, grower of cut flowers, or market gardener. The two first may be, and often are, combined. The difficulty is, of course, to get the means to start with, but the well-to-do florists round the large cities came without a dozen dollars, and the coming men can win with the same weight. But all should understand that success must be preceded by years of patient labour. Therefore it should be attempted by no man who is not young. Unless engaged for good situations previously, it is folly for gardeners past their youthful prime to come here. Botanic gardens can hardly be said to exist in this country, so there are but few chances for the budding curator. The finest gardens in the country are the great public parks, such as the Central Park, at New York, and Fairmount Park, at Philadelphia, vast and beautifully diversified pieces of ground, happily not yet overdone with flower-beds. But parks of this kind are of necessity so few that they are scarcely worth alluding to in this connection. In distant parts of this country, as most people know, grants of land are to be had for the asking, or for a very low price; but it need hardly be added that to commence life on such, some little capital is required, but not more than could be accumulated after a few years' work here. But the hardships, loneliness, and inconvenience of out-settlement life are not such as should be willingly encountered by any but the hardy, vigorous, and young. Life in the back-woods or back prairies may seem very nice in books, but it means hard work and scant reward for a good many years. It is the second generation that reap the benefit of it. Yet with all its difficulties numbers of young men from the long settled and populous New England States go out west and say they like their lot there very well. Sometimes, too, town-bred men go forth to break the virgin sod, and the young gardeners of England and Scotland ought to be able to compete with any of these. The one charm among all the difficulties encountered here is that they lead to independence at last; but that life may not be thrown away in the attempt, it is necessary to begin young. Briefly, then, the advice to gardeners thinking of coming here should be—If you have a good or even a middling place at home, or even a good prospect, be content, and make the most of things as you find them around you. But if you are young and strong and poor and friendless, come and fear not, for, no matter what you turn your hand to here, you are almost certain to arrive at a better end than the many poor gardeners at home, who are as dependent for their precarious living at the end of a long life of hard work as at its commencement. *W. Robinson, in "Nottingham Guardian."*

Societies.

PHILOSOPHICAL OF ADELAIDE.—At the meeting of this Society, held on August 9, his Excellency the Governor presiding, the following interesting paper on "The Influence of Forests upon Climate," was read by Dr. Schomburgk. The President observed that the subject to come before them was one of the greatest importance, and one, he believed, which had been too much neglected. The population of new countries was too apt to think that the timber would last for ever, and not follow the wholesome principle which was incumbent upon heirs of entail, that where one tree was cut down another should be planted. They found that through shortsightedness the country was being denuded of its timber, and he was afraid in many places they would be soon punished by the want of wood for fuel, to say nothing of other results.—Dr. Schomburgk then read the following paper:—

Whether or not forests are of importance to climate is a question pretty freely ventilated of late by science; but how important they are in the household of Nature, and how closely connected with them in civilization, I shall endeavour to prove. Several of my remarks were gathered out of a work of Professor Schacht, a German botanist, who, having distinguished himself by his works on botany, died in the prime of manhood, and too soon for science, which lost in him one of its talented disciples.

Wherever we look we find the produce of the forest; wherever we go we come in contact with it. Our dwellings, furniture, ships, railroads, tools, &c., could not exist without it, nor could we protect ouselves from the cold of the winter, could not prepare our food, could not use the power of steam to fly across land and sea, if there were not or had not been forests. The climate, sheltered situation, humidity, and fertility of soil depend on them. In Nature we behold a constant circulation of matter. The plants and trees absorb the carbonic acid generated by breathing or liberated by decomposition, and exhale instead oxygen, and this oxygen is necessary to the breathing of the living creation. The green leaves and young branches of trees derive a great deal from the atmosphere by binding the carbon of the carbonic acid for the purpose of producing woody substance, starch, fibre, &c. Likewise the soil gets the benefit by the dropping of the leaves, which, decomposing, return to it partially the materials taken out of the ground by the roots. But, what is equally important, the leaves also cover the surface when decaying with a rich layer of humus, the shadows of the trees keep the ground moist, and so a constant decomposition takes place.

Now, we know that water is necessary for the existence of plants, for without water there is no diffusion; without diffusion, no vitality. If on one side the forests absorb a great deal of water out of the atmosphere, they also, on the other side, exhale humidity on a large scale. As a rule, humidity surrounds them, rain falls, and dew also. In the same manner as the lightning conductor attracts the electric fluid, the forests attract and draw down the rain clouds, which benefit themselves, and likewise the neighbouring agricultural land. We find, therefore, as a consequence, always good agricultural land near forests.

Without doubt you are all acquainted with the fact that plants are not alone nourished by their roots, but also

nourished by their leaves, which are the lungs, and by their inhaling and exhaling purify the air in a great measure. It is perfectly well understood that dew is nothing else than a deposit of mist or vapour on the surface of the earth, which only can be generated by having been exhaled or evaporated from that surface; but the dry sand and naked rock cannot exhale any humidity, therefore dew very seldom falls on them, and only in consequence of attraction by a neighbouring forest. The forest itself, presenting a very large surface for evaporation, retards the loss of the soil in the shape of a refreshing dew, which falls on it in abundance. If we find that very little dew falls on the soil of a very dense forest, the reason is, the rays of the sun cannot penetrate deep enough and convey heat thither, consequently very little evaporation can take place and produce radiation of heat.

It is perfectly well known that most of the rivers spring from wooded mountains. The forests conserve the water of a country, and thus nourish the rivers and springs. In a desert the rivers generally dry up. All those magnificent and powerful rivers of North America spring from primitive mountainous forests; but I doubt if they will continue to discharge the same quantities of water into the sea in the future when their mother forests are gone. Already we hear that the Mississippi is perceptibly getting lower since the last decennium. We know also that when, during the winter, snow and ice are melting, great bodies of water suddenly gather in the mountains, and come rushing down with disastrous effects. But even here we perceive a great difference in the manner the waters are drained off. For instance, if such a stream springs from a dense forest, a great deal of ice, snow, and water are retained by the layer of humus acting like a sponge, and consequently the water is drained off gently and with much less danger. But when once the forests of a country are gone there is nothing to check the wild impulse of the waters, and very destructive inundations take place. With reference to this, I wish to point out as one instance only, the fearful inundations caused every year by the Rhone in France.

A mountain range, a wall, a forest protects us against the winds, and we have no business to undervalue this protecting power of the forests; for it favours the growing up of young plantations, keeps the neighbouring agriculture in good condition, stops the progress of gales, keeps swamp fevers and ague away, and counteracts the drying effects of some winds, besides affording cooling shade. We note the astonishing fertility of tropical forests. Looking at this, I fancy nobody could reasonably doubt the beneficial influence of forests. We have good reasons for presuming that a great many mountains, at present naked and denuded of trees, were formerly closely timbered. But when they were cut down the layer of humus left behind was protected no longer, the springs dried up, every violent rain washed some of the good land away, the soil became poor, and the vegetation died away.

A Government, or public body assuming the direction of a newly-established colony, ought always to make the preservation of forests a first consideration, and to establish protective laws, whereby the forests could be preserved and be made to yield a handsome revenue to the State at the same time.

Some countries no doubt at the present time, bearing the character of a hopeless desert, were always so—for instance, the Sahara; but other countries now in a similar plight were formerly in a different condition. All those vast and almost endless savannahs or plains, and prairies of South Asia, were once heavily timbered. Diodorus of Sicily at least mentions the existence of immense forests destroyed by fire. According to Cæsar and other Latin authors Germany was covered with immense forests, and according to Herodotus and Thucydides the same was the case with Greece, Italy, Spain, France, and England. If we believe in the testimony of Diodorus, the forests of Spain were devastated to a large extent. We know that this country when subjugated by the Romans was covered with large forests, especially in southern provinces. But, at the present time only her coasts retain their forests, and the interior presents the aspect of a vast plain covered with Heath, Lavender, and Rosemary. The forests of the Peloponnesus were burnt down by Ali Pasha, and in consequence there came famine and drought. Likewise a Russian General in modern time rendered his name infamous for ever by burning and destroying wholesale the forests of the Caucasus for the purpose of routing out and starving the brave Tscherkessians. The name of this man is Dibitsh Balkansky. Since the destruction of these forests the climate has changed entirely, the country has become barren, droughts and famine set in, and, in consequence, thousands of these brave people emigrated to seek a new home in Turkey. From Denmark, Sweden, and Russia, Germany, North America—in fact, from almost every direction—we hear accounts how forests disappear, how fuel becomes dearer every year, and the re-establishment of forests becomes a question of a very grave aspect, and immediately connected with the welfare of a country.

A gentleman and scholar knowing his Homer and Horace by heart, and travelling through modern Greece, could never find out the meaning of the famous wine of Moræstis, for its vineyards a long time ago ceased to exist. He nowhere could behold the sacred Pine grove of Poseidon. Where are now the pastures around the sacred castle of Dardanos, on which 3000 mares used to browse? Let us hope that the times are past for ever when the progress of civilization was equal to wasting and desolating the surrounding nature. One thing is certain—a broad strip of waste land follows in the wake of culture, and noxious weeds like Henbane, Solanum, Thistles, Nettles, &c., serve to mark the footsteps of men. Before him Nature in all her beauty, behind him desolation and hopeless waste. Looking at this picture, we have no cause at all to be proud of being called the Lords of Creation; but let us hope that the future generations will be wiser than those of the past.

If any one still feels inclined to doubt the influence of forests on the climate of a country, I beg to give several instances in modern times. Egypt, well known for its dry climate after the destruction of its forests, Olive and other plantations, had about six rainy days every year on an average; but since so many millions of useful trees have again been planted, there are now about 24 rainy days per year recorded. There is one man who deserves the greatest esteem from all civilized nations. Napoleon III., with all his faults, has given the world an example, which at least in France will render his name for ever immortal. [This was written before the outbreak of the present war. Eds.] Convinced of the great benefit the barren and swampy districts of France would derive if planted with trees, by his command many millions of trees have been planted in such districts of his empire. By his command thousands of acres of the desert in Algiers have been transformed into forests, with trees suitable to the climate, and with surprising results. The Government of Victoria provided him alone for this purpose with ½ cwt. of seeds of the Acacia mollissima, 2 cwt. of Acacia lophantha, 20 lb. of Gum, and 20 lb. of Sheaoak seed, and Messrs. Law and Somner, seedsmen in Melbourne, with about 2 cwt. more of the above seeds. By the last accounts, these plantations, especially of Australian species, have already reached the height of 9 to 12 feet, and with their rapid growth a great change of the climate is observable, and twice more rain and dew has fallen in the neighbourhood of these young forests than before. By his command, more than 16 geographical square miles of the swampy and unhealthy country along the coast of the Bay of Biscay, in the departments of Landes, where swamp fever was prevailing, have been planted with millions of trees, especially the cork Oak and swamp Pine (Pinus maritima), with a surprising beneficial result. Not only have that these trees drained the land, but they have changed it into a healthy country and fine forests.

I think there is not a more stanch advocate for the liberty of nations than I am; but I am also convinced that despotism is, in such respects, highly conducive to the welfare of a nation. In Japan a law exists that whoever cuts down a tree is obliged to plant another instead. In Biscay every proprietor plants two for one which he cuts down, and the law compelling them is severely executed. Now, if I had the power, I would even go further, and would compel them to plant three instead of one or two. By an ancient law of some nations, he forfeited his hand who cut down a tree without permission of the owner. The motion of one of our legislators—I think Mr. Wentzel—to lay out in every new hundred reserves for tree plantations, and to take steps to protect them, is entitled to the support of the community, and I hope this motion will receive such support from the House as it deserves.

Our neighbours in Victoria, convinced of the necessity of such a measure for the well being of the country, have already begun to carry out this scheme; and in order to promote it in regard to forests, have not only called to life a Board of Forests, but have also appointed an Inspector of Forests, and under his direction the preservation of forests and young plantations will be secured.

Truly the desolation, the waste, and destruction of our forests have been so general that it now renders it imperatively necessary to do some effectual remedy against the repetition. It is more than probable that very little timber will be left, and the rising generation will feel this calamity, and it cannot but occasion some uneasiness in the mind of those who wish well for their country. It is a fact that very few persons have turned their attention to the planting of forest trees on their land. Nothing is more neglected in husbandry than this branch, notwithstanding that on every property will be found some vacant and useless land for other agricultural purposes. Why not plant such spots with forest trees? Most people will shrink back because they will not enjoy the fruits of their labour; but they forget that their children will.

I cannot omit to mention here an anecdote which I read the other day in an old book on the same subject:—"When Ulysses, after a ten years' absence, was returning from Troy, on arriving home he found his aged father in the field planting trees. He asked him why, being now so far advanced in years, he would put himself to the fatigue and labour of planting that of which he was never likely to enjoy the fruits. The good old man taking his son for a stranger, gently replied, 'I plant for my son, Ulysses, when he comes home.'"

Mr. Hare, in an able paper read before the Philosophical Society the other day, advocated the planting of trees. A gentleman in the *Register*, under the name of "Buffalo Row," published a very sensible letter on this subject (I am astonished that this gentleman did not come before the public with his real name). The Editor of the *Comet* pleaded for the same cause. And I have commented on the same subject in all my annual reports—the advisability of planting trees on the vacant land beside our railways and public roads. In the early days of the colony a great oversight was made by the Government in not laying out in every hundred reserves containing, say about one or two square miles, for the purpose of forest plantation. The omission of this, I consider one of the greatest mistakes made.

I am sure some of you who have visited France and Germany must have been struck by the pleasing effect in seeing the railroads and public roads lined with ornamental and useful trees. It would be unreasonable to expect that in our young colony this should already have been carried out; but I may say the time has arrived when our earnest attention should be directed to the planting of trees in all suitable public places. I fear we have let slip a very favourable opportunity this season to begin this scheme, and I can only regret that half of the unemployed at the New Lunatic Asylum and Orphanage at Magill, have not been set to work, say at the Port line, to trench the vacant land, and plant it with useful timber trees—such a belt of trees may be utilised in the future as sleepers for the railways.

I am sorry to say our peculiar climate, especially that of the plains, is not very favourable for the growth of the noble forest trees of Europe and North America; but I am convinced there are a good many kinds of Pines, especially the Californian ones, which would grow most luxuriantly with us. There are a good many kinds of Gum trees from Western Australia, as the famous Jarrah or Mahogany (Eucalyptus marginata) and the splendid red Gum (Eucalyptus calophyna), whose luxuriant growth with us is undeniable, and their timber is the most valuable in Australia. As a proof also of the beauty of those trees, I call the attention of the visitors to the Botanic Garden to such a one. It is about seven years old, and stands in untrenched ground. I was so fortunate as to raise thousands of such noble trees from seeds, and shall be able to give numbers away for the above laudable purpose. But not alone these; but also the red Cedar of New South Wales, whose valuable timber we import in large quantities, could be raised for the purpose. Naturally the present generation would not derive a benefit from such a scheme. We should only have the pleasure of watching their growth, and the pleasing sight of the green belts traversing our plains, denuded at present of all trees; but I am sure the next generation would bless us for such an important undertaking.

Mr. C. S. Hare, in proposing a cordial vote of thanks for this paper, said this was one of those practical subjects which he loved the Society to go into. As one of the pioneers, he wished to give the result of some experiments. Some time ago the Government were paying £800 a year as compensation for land a chain wide on each side of the Port line of railway for the prevention of fire. He proposed to buy that land and plant it; but the Government looked at it, turned it over, and pooh-poohed it. He stated that ten years would not elapse before they had some sleepers and some firewood from the trees. Soon afterwards he fenced a piece of land and planted some Gums himself, and last year when he cut them down the majority of them would have yielded two sleepers. At the same time he planted two or three Willows, which had already reached 2 feet in diameter. That was in ten years. If a private individual could do that, what could the nation do? What he recommended to plant were the blue Gum of Van Dieman's Land and the Cypress alternately. If that was done extensively he felt sure the character of the climate would change, and that we should have abundance of rain, and not be cursed with the barrenness which had prevailed.—Mr. T. Magarey, in seconding, said he should be glad to see two or three square miles in each hundred preserved for forests, and some check put upon the very rapid destruction which was going on. In the South-East, especially around Narracoorte, there was very little forest. The Eucalyptus tree was so scarce in that part of the colony, and they were dying so rapidly, that unless the Government took the matter into consideration they would soon be banished, as the Sheaoak had been. If the Government would take into consideration such matters as those, it would be much better for the permanent interests of the colony than even the rapid extension of the telegraph. One might have an immediate effect, but the other would tend to increase the welfare of the people for ages to come. He knew from experience on the Adelaide Plains that already the country was becoming so dry that it was necessary to plant year after year before trees could be got to grow. The Peppermint and native Pine were most easily grown, and though not the most useful, acted as pioneers for others. They would grow upon limestone ridges, where other trees would not. He trusted Dr. Schomburgk would not cease in his endeavours to press this important subject upon the Government and the people.—Mr. B. H. Babbage mentioned that in the Apennines the monks, under the Grand Duke of Tuscany, were compelled, for every mile of forest they cut down, to plant a mile of fresh trees. He planted about 1000 trees every year, and found about 900 of them live. The blue Gum of Tasmania grew well, and large numbers of them could readily be had from Melbourne. He noticed in the South-East the squatters were systematically burning the scrub from year to year, in order to obtain increased pasturage for their sheep. If did them good, but the country would suffer injury, and the Government would do well to require their lessee, if he cleared away the scrub, to plant a certain proportion of trees, so as to give a permanent amount of foliage.—Mr. G. Hamilton drew attention to the circumstance that a whole forest of Gum trees between Port MacDonnell and Mount Gambier had died during the last ten years, and that the whole country was becoming barren through the overgrowth of Fern.—Mr. R. Ingleby quite agreed with Dr. Schomburgk as as to the effect of trees upon the moisture in the immediate neighbourhood, but wished to guard against the idea that they could alter the climate of the country as a whole. With regard to the dead forest in the South-East, he was told when there some years ago that the result was occasioned by some coleopterous insect, which had eaten all the leaves away. There was another matter germane to the paper which he should like to mention—that was as to the amount of rain. He observed that this winter nearly all the rain had come from an unusual quarter—the North—though the condensation was frequently caused by an upper current of air from the South. They had had little or no rain from the South-West. He remarked that, from the gardening papers which he read, he found that for some years the whole of Europe had suffered from a deficiency of rain, and if his observation did not fail him it would be found that was generally the the case. It was a mistake to calculate upon the rainfalls of the whole year. It was that which fell in the winter season that did the benefit. Any rain that fell after September, except as to some few crops, was of very little use. He thought it would be found we had had, reckoning upon that basis, a series of about eight dry seasons, and if his reasoning was correct we should now be commencing a wet cycle. The aggregate quantity of rain over Australia would not be increased by planting, but the rain would be condensed where the trees were.—Mr. Hare was afraid the observations of Mr. Ingleby would prevent planting. In the Southern Ocean there were 106 inches, and in the Bay of Bengal 600 inches in a year. They wanted some of that moisture to come to South Australia, and that could be brought about by planting.

Dr. Schomburgk did not mean to say that planting would have any influence on the rainfall of the whole country, but only in the neighbourhood of the forests,

He mentioned that the Gum trees planted in Government domain were all dying, as the roots came upon the limestone, though trees could not have been more healthy than they were when young.

Notices of Books.

The Greenhouse as a Winter Garden: *a Manual for the Amateur.* By F. E. Field. With a Preface by W. C. Bryant. New York: Putnam & Jones. London: S. Low, Son & Co.

This little book of 92 pages is addressed principally to amateurs managing their own greenhouses; and though published in New York, is the result of experience gained in this country, where the author had a little greenhouse, which he tended, so says Mr. Bryant, with great ingenuity and success. By a greenhouse the author understands a house devoted to the culture of flowering plants which require the smallest degree of artificial heat; and his subject is limited to the greenhouse as a winter garden. As to form, Mr. Field prefers a house with front lights, and a short slope at the back, and if to this is added a projecting frame in front, he thinks the most efficient working house is obtained. The hints on soils, potting, watering, &c., though brief, are eminently practical. Thus, as to watering: "It will be asked when does a plant require water? I answer, when the ball is dry; and it should on no account be left dry till the plant droops." Again, "Plants in peat, or even in a large proportion of fibrous vegetable soil, will, if they have become thoroughly dry, at first reject the water like a dry sponge; this state is indicated by the water running through almost as soon as it is given at top—none, in fact, being absorbed; in such case, either plunge the pot in a bucket of water, or let it stand with a pan-ful of water under it 24 hours. I believe this little difficulty to be the reason why it is commonly thought that Heaths, Epacris, and such plants, are difficult to cultivate: but this being mastered, I consider no class of plants more desirable for the amateur's winter house." Finally, the amateur with limited appliances is warned against being tempted to cultivate for exhibition.

The materials for furnishing this winter garden are, first, the Chrysanthemum, then the Primula, Cineraria, Epacris, Cytisus, Azalea, Camellia, and others (for which cultural hints are given), which suffice to keep up a succession till June. The plants noted, and we give them as a selection for winter culture, are:—Acacia—armata, Cunninghamii, prostrata; Azalea indica—Gledstanesii, Danielsiana, variegata, alba lutescens, and the old alba for its scent; Cactus—speciosissimus, Akermani, crenatus; Calceolaria; Camellia—double white and red, Lady Hume's, cœlestina, Eclipse; Chorozema—varium, ilicifolium, rhombeum, nanum; Chrysanthemum; Cineraria; Diosma—umbellata, fragrans, ericoides; Epacris—Wilmoreana, variabilis, impressa, miniata, grandiflora, campanulata rubra; Geraniums; Heath—hiemalis, gracilis, flammea, Wilmoreana, and others; Jasmine—grandiflorum, hirsutum; Kennedya—inophylla, monophylla, eximia; Magnolia—fuscata, conspicua, Soulangeana; Mignonette; Myrtle—single, double, narrow-leaved, broad-leaved; Orange; Otaheite Orange; Pimelea—intermedia, linifolia, rosea, spectabilis; Polygala—oppositifolia, grandiflora, gracilis; Primula—sinensis, cortusoides, nivalis, verticillata, farinosa, &c.; Rose; Sollya—heterophylla, angustifolia; Veronica—Andersoni, speciosa, odora, salicifolia; Amaryllis—formosissima, amabilis, ignescens, spectabilis; Cyclamen—persicum; Oxalis—tricolor, Bowiei, speciosa; Hyacinth, Tulip, Lily of the Valley.

The author, it will be seen, has commenced his work with a settled purpose, that of instructing the amateur of small means, and it appears to us that he has carried it out in a very satisfactory manner. The whole range of practical cultivation is gone through, briefly, but with sufficient clearness to keep the amateur, for whose use alone the book is written, from going far astray in his attempts to cultivate the class of plants above alluded to.

Florists' Flowers.

Perhaps no bedding Pelargonium ever stood its ground against all comers, friends or enemies, as Kinghorn's Christine has done. Some will regret, and many would be glad to see this variety totally beaten out of the garden, but, like Purple King Verbena, and Calceolaria aurea floribunda, this old bedding favourite has for many years bravely bid the world defiance. I think, however, there can be no doubt it must now give way to its superiors. Christine has two very bad qualities—its long, ugly seed-vessels are too freely produced, and its colour is washy. I have paid much attention to the raising of improved forms of this greatly needed colour for the flower-garden, and found it necessary to collect and thoroughly prove as to their bedding qualities all the existing varieties in this colour; the following, which is the result of my experience, is at the service of your correspondent, "Napb." (p. 1352):—Magenta Christine (Henderson) is a miniature form of the old Christine in foliage and growth, with bright pink-magenta blooms, and exceedingly free habit; it requires good soil, and in dry seasons a liberal watering, and for small beds, or a front row, it is a fine addition in its class—indeed, the best amongst those of moderate growth. Advancer (Bull) is a stronger grower, almost as much so as Christine, but much thicker and denser in habit, producing an abundance of small trusses just above the foliage; its blooms are almost self-coloured, that is, without any white in the centre; it produces but little seed, and is a promising kind for all situations. Beauty of Lee (Keeler) is a stronger growing variety, a decided improvement on Maid of Kent, Madame Barre, &c. For large beds, or the centres of small ones, this is a fine variety, as it produces very large round trusses, each of which continues a long time in perfection. It has the strongest footstalk of any variety that I know, and its colour is the brightest pink of any; its petals are short and very stout, so that it stands the weather better than any other amongst those that I have bedded this season. Moreover, it seeds but little, and never drops its petals, like most of the varieties of this colour. The two last-mentioned were awarded First-class Certificates last year by the Floral Committee, when bedded out at Chiswick side by side with all the best in cultivation. Mrs. C. Custans (Lee) is also an improvement on the old favourite, Christine, and when a bed of each is seen from a short distance, shows the advantages of being freer in bloom, standing the weather better, and having a slightly higher tinge of pink; its footstalks are rather longer, but it does not shed its petals half so much, and seeds but little, in fact the least of any in this class. Its growth is not quite so close, but it deserves a trial in all situations. Blue Bell (W. Paul) has a tinge of purple mingled in the pink, which makes it distinct; and although it has not so good a habit as some, being rather taller both in plant and footstalk, it has the broadest petal and best shaped bloom in this colour, which gives it a telling effect as a bedder. Its peculiar purple-tinged pink has a striking effect on a summer evening, more so than at any other time. Queen Victoria is the variety that generally looks so well at Kew Gardens, but nevers appears to have got into commerce; at least, I have made inquiries about it, but could not find it beyond the limit of those gardens. It is of the same colour as Christine, a rather freer bloomer, and about 2 or 3 inches dwarfer; it is evidently a favourite at Kew. Surpass Christine (Chater) is the very counterpart of the old Christine in colour and appearance of the plant, but it has much larger blossoms, and is rather stronger in growth, so that for large designs in bedding it is certainly more showy than the old variety. I believe Mr. Chater was so greatly disappointed at its not gaining a certificate at Chiswick two years ago, that he has never let it out. There are several other varieties in this class, but the above are the best as yet in commerce that I am acquainted with. There are, however, two varieties that have been exhibited before the Floral Committee during the present season, which certainly threaten to drive all the above from the bedding garden. I have had the following sorts bedded out this season, namely, Countess of Rosslyn, Rose Stella, Lilacinum, Emmeline, Surpasse Beauté de Suresnes (beautiful as a pot plant), M. Eugène Buenzod, Alexander, Forget-me-Not (the best zone with a pink flower), Rose Rendatler, Mrs. Keeler (the best shaped flower in this colour), and Mrs. W. Paul. All these are good as pot plants, but of little value as bedders. *H. Cannell, Woolwich.*

Garden Memoranda.

The Merriott Nurseries, Crewkerne, which have been in existence for more than 150 years, are situate near to the little village of Merriott, and about three miles from Crewkerne, in a rich, fertile vale watered by the rivers Parrett and Axe. The town of Crewkerne lies near the south border of the county of Somerset, and is chiefly remarkable for its manufactories of sail-cloth and stockings, and for the splendid scenery which the district affords. The Merriott Nurseries originally belonged to the Whitby family, and passed into the hands of their present proprietor, Mr. John Scott, many years ago. Mr. Scott is a thorough enthusiast in all matters relating to hardy fruits, more especially Pears, and has contributed in his time a vast amount of useful information to our knowledge of hardy fruit tree culture, and to the simplification of descriptive details, an assertion which our own columns amply bear out. He is, moreover, the author of "The Orchardist," a most useful cultural and descriptive catalogue of fruit trees, in which over 2500 sorts of fruits are systematically arranged. In it will be found the result of many years' careful study on the rearing, training, planting, and general management of fruit trees, from Apples to Walnuts, including plain descriptive details of all the best varieties of each kind.

For the greater part of last winter Mr. Scott was confined to his house through illness, to relieve the monotony of which he set to work to produce a companion to "The Orchardist," in the shape of "A Selected List of all the best Pears," which is now before us. The varieties selected for a place in this work are all those "designated as 'first quality' by most pomologists," and are arranged by him in three classes—good, better, and best, all Pears of a secondary quality being ignored. They are also arranged in the order of ripening, from July to May, and where practicable the names of the raisers and the country in which they were produced is given, as well as the date of the year when they first fruited—information of a valuable character which we should like to see supplied in other works, and especially with new varieties.

Before reaching the nursery quarters the visitor has to pass through the flower-garden surrounding Mr. Scott's house. Here we noticed several plants, sufficiently interesting to claim a passing word. The first is a Tricolor Pelargonium, named Mrs. Scott, a good bedder, much resembling Louisa Smith, but more vigorous in growth, and propagating more freely; next comes Lantana delicatissima, a variety much appreciated here for its admirable quality of withstanding drought, and consequently a useful plant for growing under trees and in very dry places; then comes a capital subject for subtropical gardening, Onopordon arabicum, a spinous herbaceous plant, with fine silvery leaves and purple flowers, with a bearing as stately as the Scotch Thistle, but much more picturesque. Near the above were some handsome examples of Arundo conspicua; and probably the finest specimen of Thuja pendula to be seen in this country. The quarters devoted to Coniferæ, of which a large quantity are grown, are next entered. The greater portion of these were transplanted very successfully in May and June; they are nearly all grouped in their various classes, and presented a robust and vigorous appearance. The most remarkable amongst them was a large handsome specimen of Thuja japonica, from which a quantity of seedlings have been raised; these have nearly all come like Thuja aurea, which was a seedling sent out by Mr. Waterer from Knaphill, and which probably originated in a similar manner. Forest trees also occupy a considerable space, notably Pinus austriaca, of which an enormous quantity is produced here, as well as in other large establishments for planting near the sea coast, for which purpose no other tree of a similar character is equal to it, for it defies alike the south-westerly gales of the Devonshire and Cornish coast, and the bitterly cold winters experienced on the hills round Holyhead. Another plant largely cultivated for a special purpose is Box, which makes fine cover on the chalk hills of the neighbourhood. Roses, of course, Mr. Scott cultivates largely and well, which is as much as need be said of that branch.

The department of hardy fruits is that which has gained such a notoriety for the Merriott Nurseries. The soil is a moderately rich sandy loam, and naturally fertile; of a good depth, and moderately moist, and with the exception of rain, there is no other water supply than that which is derived from the chalk hills overlooking the Dorsetshire pastures. Of the Pear, upwards of a million plants are planted out in various stages of growth, from the one-year-old maidens to the pyramidal trees 6 feet high, and planted 6 feet apart, the latter well furnished, very healthy, and bearing heavy crops of fruit. Even the little two-year-old trees worked on the Quince were carrying a fine crop of good fruit. Most varieties of Pears thrive well on this stock in a moist soil, but it should never be planted in a position where the ground is dry, and should be placed low in the ground when it is used. Such kinds as Marie Louise and Louise Bonne of Jersey thrive well here on the Thorn, but not nearly so well on the Quince. Huyshe's Prince Consort and Victoria are much finer double worked, they grow much more freely and bear well treated in this manner; whilst that fine autumn Pear, Beurré Superfin, does well on either the Pear or Quince, but here it is better on the former than the latter. Amongst the many kinds in fruit (over 600), we noticed particularly Conseiller à la Cour, very fine on the Quince, partly due to the deep moist loam, as on dry gravelly soil it is scarcely eatable; new Duchesse d'Angouléme worked on Zéphérine Grégoire; Colmar de Johne, a beautiful medium-sized pyriform Pear of excellent quality; and Brown Stroud, a small midwinter Pear of good flavour, having much the appearance of Jean de Witte, and which we believe was sent out by Messrs. Wheeler & Son, Gloucester. Apricots, Cherries, and Peaches form by no means a small contingent, whilst Apples are grown almost as largely as Pears, and for the most part were carrying an immense crop of fruit. A remarkable feature in the whole of the trees grown here is the total absence of the American blight, which Mr. Scott informed us was very rarely seen in the nursery, and he attributed this to the action of the soft saline vapours from the sea, which is only 14 miles distant.

Any notice, however meagre, of the Merriott Nurseries would not be complete without some reference to Mr. Scott's Pommier de Paradis stock, which that gentleman considers one of the best, if not the best, of its kind. He grows a large quantity, and from its remarkably hardy and vigorous constitution, and the easy manner in which it can be propagated, there is no doubt but that it is distinct from the variety generally imported into this country from France under the same name. It was raised in this nursery as a seedling, and the original bush or tree may be seen there now. Of other stocks, that known as Nain Vert is much used for working on the Quince, Pears in their turn being grafted on that,—a process which increases their fertility. The Portugal Quince is recommended by Mr. Scott as being the finest; but the Angiers variety is not so much regarded at Merriott, not being such a free grower, nor so easy of propagation.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

EARLY in the dull month of November, now so rapidly approaching, we anticipate that the bloom-buds upon *Chrysanthemums* will be swelling rapidly, preliminary to an early display, so that it becomes necessary to assist them at this season as much as we can. Those who habitually thin out the bloom-buds should commence at once with the earlier varieties. The operation should be done in such a manner that no shortening of their period of flowering may take place; hence, the first and latest blooms should be left to the extent required. When, however, it is desirable that each shoot should bear one large bloom, of course the most promising one should be selected. I advised a few weeks since the discontinuance of the practice of constantly giving them liquid manure, and suggested the desirability of leaving the plants during the cool, damp nights, to establish a strong and permanent growth upon a natural basis, without the aid of artificial stimulants, for the simple reason that, with such a growth established, more assistance can be afforded with such stimulants when the flower-buds are formed, the roots being healthy and not over-glutted with rich food. As soon, therefore, as the bloom-buds are singled out, commence supplying them with highly stimulating materials; this without any consideration as to the wellbeing of the plants after flowering. Those suckers which emanate from around the base of the current season's shoots should be entirely removed, and, if convenient, it will be as well to give the plants a rich mulching, pressing it firmly on to the old ball. Allow the temperature of stoves and intermediate houses steadily to decline, particularly during dull weather, and afford as much air as possible when the weather is favourable. Look over all kinds of summer bedding plants which have been potted up, removing all decaying or unsightly leaves, and keep all around them as fresh and as sweet as possible. In regard to all such subjects as these, should a dull, damp period ensue, do not hesitate to afford more buoyancy to the air by giving a little artificial warmth. Where a good stock of the showy winter-blooming *Epiphyllum truncatum* exists, it is possible to extend their flowering period by placing a part of the stock in a warmer position than is necessary for the remainder. Give to *Cape Pelargoniums* an abundance of air at proper times, and water them more sparingly than heretofore, so as not to excite them into growth more than is necessary.

FORCING HOUSES.

Immediately the crop of *Grapes* is removed from any *Vinery*, give air freely and abundantly. It is taken for granted that the wood is sufficiently ripened, hence no injury will accrue even if the temperature falls to a moderate degree. Air, the all-powerful perfecter of wood and of fruitful buds, should be admitted as an essential finishing agent which cannot bring its subtle properties to act unless it be allowed free and direct access to the wood. Where any delay has occurred in regard to placing a good thick layer of dry material on the surface of outside *Vine borders*, the Vines from which are intended for forcing, this covering should be immediately put on. This is to be done, not so much to afford protection thus early, as to retain the warmth acquired during the past summer. Do not delay for one day the finishing of all pruning operations in regard to those Vines which are intended to be forced early. The subject of early pruning deserves our utmost consideration and attention in more ways than one, especially so in regard to Vines which are undergoing the necessary preparation for hard forcing. In instances where *Pines* grow under Vines carrying late crops, it will be necessary to aim at keeping up an intermediate temperature, somewhat in keeping with the requirements of both, and this in conjunction with the admission of a little air at the back at all times if possible. The temperature in such instances should not exceed 58° by night, with an increase by day, if obtained by artificial heat only, of about 5°. Continue to collect materials for successional *Mushroom beds*, placing all under cover in a dry open shed, and where the steam arising therefrom can have free egress, so as to dry the materials as quickly as possible.

HARDY FRUIT GARDEN.

This will be found a good time to take up and root-prune all kinds of dwarf, pyramidal, and suchlike *Fruit Trees*. Though the main roots which have sought sustenance low down in the subsoil may be cut back somewhat severely, it will be necessary to use great caution, so as not to injure the smaller or more fibrous ones. With the root-pruning it is also wise to shorten all the grosser shoots formed during the past summer. Help such fruit trees as *Peaches*, *Nectarines*, and *Figs* to shed their old leaves by occasionally brushing them lightly upwards with a new light birch-broom, until they are all removed.

HARDY FLOWER GARDEN.

In consequence of the recent frosts, which have injured *Dahlias* and other summer bedding plants, it has become advisable to remove all such unsightly objects at the earliest possible moment. When the tops are cut away from the former at about 1 foot from the base, the tuberous roots may be immediately taken up and placed in a position where they will dry readily and become ripened off by the influence of the air. When it is intended to remove and transplant *Crocuses* or other similar bulbs, which have been permitted to remain in the ground, no further delay should occur in so doing, as these already grow apace. If any growers have hitherto neglected to pot up their *Carnations* or *Picotee* layers, they should see to the matter without an hour's delay. Collect Fern or Bracken during dry days, for use in severe weather to protect things from frost. See that drip is not too prevalent under old lights which shelter *Auriculas* or rare *Polyanthuses* during wet weather, such as may now be frequently experienced.

KITCHEN GARDEN.

It will now be advisable to make a sowing of *Broad Beans*. The Early Mazagan is a good sort for this purpose, where it can be obtained true; otherwise any of the ordinary long-podded varieties will do. These like a firm ground, and are likely to do better so planted than in soil that has been only recently dug up. The time is also at hand to have to resort to the customary way of securing vegetables from too severe onslaughts of frost. This is done by forming a trench across the piece east and west, and so bringing the heads of Broccoli down that they lie in an almost horizontal position towards the north. When pressed down into position (it should be understood that it is better to press them down without uprooting them entirely) soil should be thrown upon the stalks along their whole length, as an additional protection. Hand-weed autumn-sown *Onions*, continue to fill up vacancies in *Cabbage beds* as they occur, and, even amidst the many calls on your time, turn up all vacant ground, whether into ridge-and-furrow, or roughly, in process of digging, that the air may act to its utmost capability. This should be done in all instances where trenching is not in contemplation. *W. E.*

TOWN GARDENING.

ALL the superfluous shoots of *Ivies* and *Virginian Creepers* should now be cut back; those selected to remain being carefully nailed, or tied in, as the case may be. Be particular to see that the tops of the shoots are securely fastened, to prevent the snow and wind from breaking them down. This is a good time for planting *Ivy*, the best variety for town gardening being that known as the Irish Ivy, Hedera canariensis, which is very hardy and a free grower, and the best of all the varieties for covering walls, forming baskets, hedges, pyramids, and various other designs in wire-work, besides being well adapted for making bold, broad, flat edgings. To insure it starting well, plant it in fresh soil, 12 inches deep, mixed with a little rotten manure; after it has taken hold of this it will grow in brick rubbish freely. As soon as *Dahlias*, and the *Marvel of Peru*, are injured by frost, they should be cut down to within about 6 inches of the ground, and in a few days after the roots may be dug up, placed in the sun to dry, and afterwards stored away in a cellar, or any other place that is secure from frost. If the *Grass Lawns* require another mowing, do it at once, so that the grass may recover before sharp weather sets in. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, OCTOBER 19, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
October.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
13. Thurs.	29.16	51.6	49.2	44.8	72	3.4
14. Friday	29.81	50.7	48.4	45.0	84	3.6
15. Satur.	29.83	42.9	42.8	42.7	100	3.2
16. Sunday	29.27	55.2	55.2	55.2	100	4.0
17. Monday	29.20	50.1	48.6	43.3	78	3.2
18. Tues	29.78	50.7	47.0	41.3	76	3.2
19. Wednes	29.41	51.1	51.2	49.3	87	3.9

1870 MONTH AND DAY.	Temperature of the Air.					Wind.		Rain.
October.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 39 Years	Direction.	Horizontal Movement	In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
13. Thurs.	56.8	40.4	17.4	52.3	+ 1.4	W.; N.W.	600	0.08
14. Friday	59.7	37.0	22.7	47.7	— 2.9	N.E.; S.S.W.	150	0.00
15. Satur.	53.0	33.0	20.0	45.5	— 4.8	Variable	105	0.00
16. Sunday	58.8	42.7	16.1	49.8	— 0.2	S.W.	485	0.60
17. Monday	54.8	42.0	12.8	47.4	— 2.4	W.; W.S.W.	425	0.02
18. Tues	50.0	39.8	10.2	43.4	+ 0.2	S.W.	205	0.03
19. Wednes	59.3	44.0	15.3	50.6	+ 1.3	S.W.	505	0.23

Oct. 13.—Overcast. A heavy gale prevailed throughout the day.
— 14.—Variable till night, then cloudless. Aurora at night.
— 15.—Very foggy during the early morning. Small amounts of cloud during the day. Generally fine.
— 16.—Overcast till night, then variable. Violent gusts of wind and rain prevailed during the day.
— 17.—Variable till evening, then cloudless. Occasional showers of rain.
— 18.—Small amounts of cloud prevalent during the morning. Cloudy afterwards. Rain fell heavily at night.
— 19.—Generally cloudy till night, then variable. Frequent heavy showers of rain.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, OCTOBER 15, 1870.

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	65.0	28.4	36.6	62.1	37.4	24.7	48.7	0.16
Blackheath ..	63.1	32.1	30.7	57.9	37.1	20.8	47.4	0.13
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	61.3	38.1	26.2	56.0	39.6	16.4	46.8	1.30
Wolverhampton	60.1	32.1	27.7	53.8	38.5	15.3	45.1	0.11
Leicester ..	60.0	31.0	29.0	54.7	37.1	17.6	44.1	0.14
Norwich	58.0	31.6	24.2	53.5	40.5	15.0	47.0	0.35
Nottingham ..	60.5	30.8	29.7	55.3	36.0	19.2	45.7	0.52
Sheffield ..	58.0	35.0	23.0	53.1	39.0	15.3	45.6	1.53
Liverpool ..	60.7	30.2	31.5	54.0	42.8	11.8	47.7	1.84
Manchester ..	59.5	31.0	28.5	54.3	37.6	16.7	44.9	1.01
Salford	59.7	31.2	28.5	54.2	37.6	16.6	44.9	1.57
Bradford	55.4	35.2	20.2	51.1	34.0	15.1	42.6	2.46
Leeds	57.0	35.0	22.0	51.7	39.1	12.3	44.0	2.42
Hull	55.0	29.0	26.0	52.4	35.7	16.7	43.1	1.08
Newcastle ..	52.0	36.0	16.0	49.7	37.3	11.0	42.7	0.94
Edinburgh ..	53.7	31.0	20.7	..	..	..	41.9	0.99
Glasgow ..	55.7	32.1	23.6	..	..	..	43.1	1.35
Dundee ..	54.0	33.0	21.0	..	..	..	43.1	1.80
Aberdeen ..	51.0	33.2	17.8	..	..	..	42.1	0.72
Perth	55.0	32.5	22.5	..	..	..	42.8	..
Greenock ..	52.5	33.5	19.0	..	..	..	44.6	1.25
Leith	55.9	34.1	21.8	..	..	..	44.4	0.47
Perth	55.0	30.0	25.0	..	..	..	42.7	1.71
Dublin	61.9	30.2	31.7	..	..	..	46.8	1.45

JAMES GLAISHER.

Notices to Correspondents.

*** We have received from several correspondents advices relating to parcels sent by sample post, which, probably through having been badly packed, have been detained by the Post Office authorities; and it may be well to state that it is contrary to law to forward through the Post Office anything likely to injure the officers of the department, or the contents of the mail bags, as will be seen by a reference to the "British Postal Guide," p. 50, rule 120. Such tender things as flowers, &c., should be packed in tix boxes with a little Moss, and in all cases be post-paid.

CASTOR OIL: *H. B.* The oil is procured by pressing the seeds, and filtering the oil so obtained. This is *cold* drawn castor oil. In America the seeds are heated before they are pressed. You will find a full account of the process in Pereira's "Materia Medica."

CIDER-MAKING: *W. M.* wishes to know the best work on this subject. Can any of our readers inform him?

ECHEVERIA SECUNDA GLAUCA: *N., Newark-on-Trent.* Mr. Cannell, Fuchsia Nursery, Woolwich, has advertised it in our columns.

FERNS: *Cotteswold.* We should not advise you to put much decayed manure. Rather remove it and introduce among the rockwork a mixture of turfy peat and loam, to which a little of the thoroughly-decayed manure and plenty of coarse grit might be advantageously added.

FUNGI: *H. M.* Agaricus subpulverulentus (small specimens; Agaricus (Lepiota) excoriatus. A. arvalis, of Letellier, is not A. arvalis of Fries. Good specimens of the true species, with its rooting base, are published in Madame Libert's collection of dried Cryptogams. *M. J. B.*

FUNGUS: *J. S.* The only production we have ever seen on old coffins is a barren state of some Coprinus, which also occurs occasionally in drains. We have not seen the specimens, and therefore cannot say positively what your plant is. *M. J. B.*

GRAPES: *Tyro.* The berry of the Muscat sent had become quite discoloured, as well as shrivelled, when it reached us, so that we can scarcely form a correct estimate of their condition. Are they sweet and ripe? It seems to us to be a case of want of sustenance—too dry at the roots; hence red-spider, which has, we presume, destroyed the foliage, and so, having no feeders, the berries shrivel up. The Lady Downe's is a more robust growing Grape, and will stand more rough usage than the Muscat.

GYMNOGRAMMA: *A. B.* Your Fern is apparently G. Calomelanos—not Martensii, which is a golden one. The curling of the young fronds is perhaps due to insufficient heat, or to drought, either at the root or in the atmosphere.

IRIS: *W. W.* By Iris chalcedonica we presume you mean I. susiana, the Chalcedonian Iris. It should be potted in well-drained soil, and kept in a cool frame, free from frost, or if planted out it should be placed in a warm situation and on a dry protected border. Iris Pavonia, now called Vieusseuxia glaucopis, should be potted in soil of a light sandy or peaty character, and grown on a greenhouse shelf. See under "Home Correspondence."

MEMORANDUM. If the gentleman who wrote to Mr. C. Plumb, from Rosehill, Dorking, will forward his name, the things required will be sent immediately.

NAMES OF FRUITS: *P. L. Apples:* 2, Cockle Pippin; 4, Reinette de Laak; 6, Emperor Alexander; 9, Old Nonpareil. *Pears:* 1, Passe Colmar; 2, Beurré d'Aremberg; 4, Easter Beurré.—*Harden, Rosedale.* 1, Passe Colmar; 2, Beurré Diel; 3, Beurré Bosc; 4, Hacon's Incomparable; 5, Beurré Rance; 6, Passe Colmar; 7, Duchesse d'Angoulême; 8, Dutch Mignonne; 9, Courtependa Plat. *Large Red Apples (without number):* Scarlet Nonpareil. *Small Streaked Do.:* King of the Pippins.—*Z. Z. Pear:* 1, Beurré Bosc. *Apples:* 1, Rymer; 2, Reinette du Canada; 3, Minshull Crab; 4, Golden Russet; 6, Court of Wick; 8, Pigeon; 9, like French Codlin.—*T. S. M.* 2, Gloria Mundi; 3, Winter Pearmain; 4, probably King Pippin; 5, Doyenné Blanc, we think, but we are not quite sure.—*An Old Subscriber in Devonshire.* 1, Thompson's; 2, Glou

Morceau; 3, Passe Colmar; 4, Vicar of Winkfield; 5, Hacon's Incomparable; 7, Beurré Diel; 8, Beurré Hardy.—*W. S. G.* 1, Beurré Clairgeau; 2, a scrubby Uvedale's St. Germain; 3, smashed; 4, we cannot call to recollection, although familiar to us; 5, Beurré de Wetteren.

NAMES OF PLANTS: *H. T. M.* We cannot waste time in examining specimens, each of which is sent rolled up like a wisp of hay, and fagoted with a band of wire. Send better specimens, and *send them flat*, and we will try to name them for you. 6 is Sedum japonicum; 7, Fittonia argentea; 8, F. Verschaffeltii.—*Fred.* 1, Adiantum Cunninghami; 2, Nephrodium molle; 3, Polypodium Dryopteris; 4, Asplenium Trichomanes; 5, Lastrea dilatata; 6, Polypodium vulgare.—*J. D.* 1, 2, 3, all forms of Selaginella Martensii; 4, Selaginella caulescens. The unnumbered specimens are Enonymus japonicus aureo-variegatus, and a Calceolaria, apparently angustifolia.—*W. W.* Juniperus prostrata. *A. M.*

NEW HARDY TREES: *C. F. P.* Messrs. Ottolander & Son are well-known nurserymen of Boskoop, in Holland—a district rather famous for tree culture. We can vouch for the descriptions published at p. 1341, since they were our own, drawn up with the specimens before us. The latter came to us through the agency of Mr. A. Waterer, of Knaphill, who may perhaps be able to tell you more about some or all of the plants.

PINE LEAVES FALLING OFF: *J. Smith.* From the description you give of your Pines, we should say that you are giving them too much bottom-heat. Such symptoms are readily produced by the destruction of their roots by bottom-heat in excess, which paralyses the plants. If you will strip off a few of the bottom leaves, top-dress with some fresh loam, and regulate the bottom-heat at 85°, all other things being equal, your Pines should recover to a certain extent, but you must not expect your fruit to be so fine as if nothing wrong had occurred.

PROMENADES OF PARIS. We are requested to state, in reference to M. Alphand's magnificent book, which was noticed in our last number, that amateurs, landscape-gardeners, architects, engineers, and others, who may wish to see the portions already published, should address themselves to Mr. J. Rothschild, at 12, Warwick Lane, Paternoster Row. A prospectus, with extracts from the list of subscribers—already including some 1200 names—will be forwarded gratis.

SCALE: *A. Y.* Turpentine is not a safe remedy for killing scale; it may, indeed, kill the scale, but the chances are it will kill the plants. Spirits of wine is better. Paraffin oil is said to be effectual, and not to injure the plants. Syringing with water as hot as it can possibly be used will also free a plant from scale, and will not harm the woody parts, nor, indeed, the leaves of many subjects if they are in a mature state, Soft hairy leaves suffer most.

SELECTION OF FRUITS: *J. L.* For your district we would recommend the following. *Apples:* Early Harvest, Irish Peach, Kerry Pippin, Whorle Pippin, Lord Suffield, Wormsley Pippin, Cellini, Small's Admirable, Bess Pool, Northern Greening. *Pears:* Doyenné d'Eté, Williams' Bon Chrétien, Beurré d'Amanlis, Jersey Gratioli, Suffolk Thorn, Beurré Bosc, Hacon's Incomparable, Flemish Beauty, Knight's Monarch, Ne Plus Meuris. 2. *Strawberries:* Vicomtesse Hericart de Thury, President, Elton Pine. 3. Gas is certainly injurious to plants in sitting-rooms, by making the atmosphere too dry, to say nothing of sulphureous vapours.

VEGETABLE MARROW: *H. M.* There is a whole race of Cucurbita Pepo, called Bush Squash (*non courant* of the French), which accords with your description. The internodes were peculiarly short this year, though the plants, in spite of the dry weather, were unusually luxuriant, with a superfluity of male flowers. Our Gourds never did so badly as this year. They ran almost entirely to leaf. *M. J. B.*

WHITE-FRUITED EGG PLANT: *H. C.* Undoubtedly the white-fruited Egg-plant is as wholesome as the Brinjal. English grown specimens are seldom sufficiently ripened to be good. *M. J. B.*

COMMUNICATIONS RECEIVED:—R. D.—T. S. (former letter also received.)—Hendon—G. J. W. (fruit not yet come to hand.)—J. J.—J. T.—A. Z. (not received).—J. F.—J. Y.—J. M.—G. N.—A. T.—J. N.—A. B.—H. C.—A. F.

Markets.

COVENT GARDEN.—Oct. 21.

Large arrivals are to hand, both of foreign and home-grown produce, but prices have not materially altered. New Oranges from Lisbon are among the latest arrivals. Amongst flowers we have Fuchsias, Bouvardias, Pompon Chrysanthemums, Mignonette, and a few good Heaths.

FRUIT.

	s. d.	s. d.
Apples, p. ½ sieve	1 0	2 0
Figs, per doz.	0 6	1 0
Grapes, per lb.	1 0	3 6
Lemons, per 100	9 0	14 0
Melons, each	1 0	3 0
Oranges, per 100	10 0	020 0
Peaches, per doz.	6 0	12 0
Pears, per doz.	1 6	3 0
Pine-apples, per lb.	6 0	8 0
Plums, p. half sieve	2 0	3 6

VEGETABLES.

	s. d.	s. d.
Artichokes, green, each	10 to 1	0
— Jerusalem, p. lb.	0 2	0 4
Beet, per doz.	2 0	3 0
Brus. Sprouts, ½ sieve	3 0	3 6
Cabbages, p. doz.	1 0	1 6
Carrots, p. bunch	0 4	0 8
Cauliflowers, p. doz.	2 0	3 0
Celery, red, p. bun.	1 6	2 0
— white, do.	1 0	1 6
Cucumbers, each	0 6	1 0
French Beans, p. sieve	2 0	3 0
Do., retail, p. lb.	0 4	0 6
Garlic, per lb.	0 8	—
Herbs, per bunch	0 2	to 0 4
Horse Radish, p. bun.	3 0	— 5 0
Lettuces, p. score	1 6	— 3 0
Mint, per bunch	0 3	— 0 6
Mushrooms, p. pott.	1 0	— 1 6
Onions, per bunch	0 4	— 0 9
Parsley, p. bunch	0 2	— 0 4
Salsafy, per bundle, 1	3	— 1 6
Shallots, per lb.	0 8	— 1 0
Spinach, p. bushel	2 0	— 3 0
Tomatos, per doz.	1 0	— 1 6
Turnips, ring'd, p. bun.	0 4	— 0 6
Veg Marrows, p. doz	2 0	— 3 0

Potatos, Regents, per ton, 60s. to 80s.; Kidneys, 80s. to 120s.; Rocks, 50s. to 60s.

WANTED, a PARTNER, to take the Landscape Gardening Branch in a Provincial Nursery Business of many years' standing, and very profitable. Must be able to command at least £500, and furnish good references.—W. H., Post Office, Tottenham, N.

TO PARENTS and GUARDIANS.—Two Partners in an old-established Manufacturing Business, desire to meet with a young Man to come in as JUNIOR PARTNER, and to take an active part in the Management as fast as he acquires knowledge of the details. He must have £1000 to pay down, to be invested in Capital brought (£2000 to £4000); or if preferred a year's salary may be arranged, with definite percentage on capital before Partnership is entered upon, during which year (or more) every facility will be given for learning the business. The Mills are in a country village in a Midland County, and every opportunity afforded for ascertaining both the social and mercantile standing of the Partners. A young unmarried Man preferred, who would reside with one of the Partners.—Apply to Messrs. SNOW and ATKINS, Solicitors, Birmingham.

MESSRS. JAMES VEITCH and SONS, The Royal Exotic Nursery, King's Road, Chelsea, S.W., are in WANT of a DEPARTMENTAL FOREMAN, to take charge of their Collection of Hothouse Foliage Plants, Palms, Nepenthes, &c. Application, stating age, references, and wages required, to be made by letter as above.

Landscape Gardener.

WANTED, for a Nursery in the Country, an energetic, trustworthy MAN, who can furnish Plans (not necessarily fine drawings), and carry them out both in Ground-work and Planting; he will also be required to take charge of Jobbing Department, and to superintend the men employed. A good opening for a Man of energy and encouragement will be given.—C., *Gardeners' Chronicle* Office, W.C.

WANTED, a GARDENER, who thoroughly understands the Cultivation of Vegetables and Fruit, and the Management of Fruit Plantations. No one need apply whose knowledge of the business, and character for industry and morality will not bear the strictest investigation.—Applications to be sent to A. B., at Rice's, Stationer, Charles Street, St. James's, S.W.

WANTED, an energetic, sober, trustworthy YOUNG MAN, in a small Grower's Establishment. A good Impetor Man preferred, with a good knowledge of Plants and Growing of the same. Unexceptionable references will be required.—Apply, in own handwriting, stating age and wages expected, to Mr. EDWARD THOMAS, Nurseryman, &c., Sittingbourne, Kent.

WANTED, a MANAGER, to take charge of a Farm of 600 Acres, in Essex, from January next. Salary £123 per annum, board, &c. Apply by letter, stating age and all particulars. Copies of testimonials (but not the originals) to be forwarded to X. Z., Post Office, Lancaster Street, Hyde Park, W.

TO TRAVELLERS in the NURSERY and SEED TRADE.—The Advertiser wishes to communicate with some one who can TAKE a COMMISSION.—W. F., *Gardeners' Chronicle* Office, W.C.

A MANURE and FEEDING STUFFS MERCHANT, in a Country district, WANTS an ASSISTANT for Markets and Office. Salary, £60 to £100, according to experience. It is essential that he be a Member of a Christian Church. A Teetotaler preferred, if otherwise suitable. To save correspondence, Candidates will favour by writing only on an application form, to be obtained free from Messrs. CURTIS and BEAMISH, Printers, Coventry.

Seed Trade.

WANTED, a young Man as an IMPROVER.—Apply, in own handwriting, stating terms and experience, to CHARLES H. DICKSON, 25, Market Place, Manchester.

WANT PLACES.—Letters to be Post Paid.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon JAMES CARTER AND CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON and SON, Wellington Nursery, St. John's Wood, London, N.W.

To Noblemen and Gentlemen.

GARDENER (HEAD).—Age 39, married; 23 years' experience; 8½ years in last place. Highest references.—T. M., 1, Lewis Terrace, Chapel Road, Stamford Hill, N.

GARDENER (HEAD).—Age 36, married; thoroughly understands Gardening in all its branches. Two years and three months' character. Wife can manage Laundry if required.—A. B., Post Office, Farnborough Road, Aldershot, Hants.

GARDENER (HEAD), where the Employer takes an interest in the Garden.—Age 27; 9 years' practice in Noblemen's and Gentlemen's Establishments. Good references.—T. R., The Gardens, Pymmes Park, Edmonton, N.

GARDENER (HEAD).—Age 33, married; 20 years' first-class practical experience in every branch of the profession. Can follow Plantsman, also understands Land, Stock, &c. Six years in last place. Highest references.—A. B., Post Office, Winchfield, Hants.

GARDENER (HEAD).—Single; has a good practical knowledge of the profession in its several branches, including Forcing of Early Fruits, Flowers, and Vegetables; is well up in the Culture of Stove and Greenhouse Plants. Can be highly recommended. Five years' excellent character.—W. H. B., Post Office, Reading.

GARDENER (HEAD).—Age 25, married, no children; first-rate testimonials from present and previous employer. Thoroughly understands Stove and Greenhouse Management, also Early and Late Forcing, and Fruit, Vegetable, and Flower Gardening.—Apply, stating wages, &c., in first instance, to Mr. T. H. LEY, Nursery, Croydon.

GARDENER (HEAD).—Married; thoroughly practical in the Cultivation of Vines, Vines, Peaches, Melons, Cucumbers, Mushrooms, Stove and Greenhouse Plants, also Flower and Kitchen Gardening. Highest testimonials to character and ability.—K., Head Gardener, Beechwood Gardens, Tatton, Southampton.

GARDENER (HEAD), age 40, married, one child, aged 16 years.—James May, Head Gardener for seven years to W. F. Butt, Esq., Arle Court, Cheltenham, and since then fifteen months in charge of Messrs. Veitch & Son's collection of Hard-wooded Plants, is open to engage with any Nobleman or Gentleman requiring the services of a thorough practical Gardener. Good experience in Forcing, the Cultivation of Stove and Greenhouse Plants, also the general routine of Kitchen Gardening. Unexceptionable references can be given.—Address, care of Messrs. Veitch & Son, Royal Exotic Nursery, Chelsea, S.W.

GARDENER (HEAD).—Age 36, married; well understands the profession in all its branches. Highly recommended, with excellent character and testimonials.—A. B. C., Mr. Lowe, Nurseryman, &c., Queen Square, Wolverhampton.

GARDENER (HEAD).—Age 30, married, one child; a thorough practical knowledge of the profession, also a good Plantsman, can be highly recommended by present and previous employer for honesty, sobriety, industry, and ability. State wages given and duties to be undertaken.—W. H., Mr. Jones, Brook Street Post Office, Upper Clapton, London, E.

GARDENER (HEAD WORKING), age 35, married.—WILLIAM HENDERSON, for the last three years Gardener to Thos. Marrian, Esq., Thurcroft Hall, Maltby, Rotherham, is at liberty to treat with any Lady or Gentleman requiring the services of a thoroughly practical Gardener; well acquainted with the Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, and the Management of Fruit, Flower, and Kitchen Gardens. Wife, having no family, is qualified to undertake the duties of Laundress, or take charge of gentleman's residence. Characters will bear investigating.—WM. HENDERSON, Conisten Cold, Bell Busk, Leeds.

GARDENER.—Age 20, respectable; to take charge of Horse and Trap and Small Garden. Good reference.—A. MACQUEEN, Compton Beauchamp, Faringdon, Berks.

GARDENER, in a small family.—Middle-aged, no children; thoroughly understands the profession. Willing to make himself generally useful if necessary. Wife a good Laundress, or willing to assist in the House if required. Good character.—G. GRACE, Knox Field, Tunbridge, Kent.

GARDENER and BAILIFF, or GARDENER and STEWARD.—Middle-aged; great experience in Management of Woodland. Highest testimonials from present situation, which he has filled many years.—G. R., Mr. W. Paul's, The Nurseries, Waltham Cross, Herts.

GARDENER and STEWARD, or GARDENER.—A thoroughly competent, practical, and respectable Man, who has had unusually favourable opportunity of forming an extensive acquaintance with the most approved methods of Gardening, the most select varieties of Fruit, Flowers, and Vegetables; Ornamental Planting, &c., and the cheapest and best Markets to purchase from. Credentials unexceptionable.—I. X. L., 39, Stamford Road, King's Road, S.W.

GARDENER (UNDER).—Age 20; has had experience in House Work. Two years' good character.—J. H., Loseley Park, Guildford, Surrey.

GARDENER (UNDER).—Age 19; understands Flower and Kitchen Gardening, &c. Could Manage a small place. Good character.—W. P., Longparish, near Whitchurch, Hants.

GARDENING.—A respectable well-educated Youth wishes to engage himself to thoroughly learn the business of a Gardener, at a Nobleman's or Gentleman's Establishment. Address, stating terms, JOHN BERT, Derwen Fawr, Llandilo, South Wales.

GARDENER (IMPROVER) in a good Garden. Age 18; served three years in a Nobleman's Garden. Good recommendation. Small Premium not objected to.—C. B., Mr Paynter, Kintbury, Berks.

GARDENER, or GROOM and GARDENER.—Has a good knowledge of the Management of Poultry. Good character.—J. COX, Holmer Green, Penn Street, near Amersham, Bucks.

PROPAGATOR (FOREMAN), in a Nursery.—Has had long experience in Growing and Propagating Stove and Greenhouse Plants, Hardy Ornamentals, Azaleas, Rhododendrons, Roses, Conifers, &c. Good references.—G., *Gardeners' Chronicle* Office, W.C.

To Nurserymen.

PROPAGATOR, or FOREMAN and PROPAGATOR.—Understands the Cultivation of Hard and Soft Stuff, also a good Budder and Grafter. Good references.—T. S., 7, Thicket Grove, Anerley Road, Norwood, S.E.

IMPROVER, in a Nobleman's or Gentleman's Establishment, for two years.—Age 21; would pay a Premium of £10. Good character.—A. R., Post Office, Richmond Road, Twickenham.

To Nurserymen and Market Gardeners.

IMPROVER (with a view to Partnership).—Age 28, respectable; five years' experience in the business. Good references from former employers.—T. E., 6, Castle Place, Worcester.

To Gardeners.

IMPROVER, where he could obtain an insight into general Gardening.—Age 17; strong.—State terms, &c., to N. FULLER, Bretton Gardens, Wakefield.

FARM BAILIFF.—Middle-aged, respectable; thoroughly understands the Farming business in all its branches, Draining, Breeding, Rearing, Buying, and Selling Stock. Wife understands Poultry, and could undertake the Management of Dairy. Highest references from present employer as to ability, trustworthiness, &c.—H. G., Race Farm, Panteg, Monmouthshire.

ESTATE AGENCY, with or without the Management of a Home Farm. Wanted by a Gentleman of great experience in every description of Agriculture as practised in Scotland and the North of England. The Advertiser is a good accountant, and a thorough man of business; and also has some knowledge of the Management of Woods and Plantations. Highest references and first-rate security.—BETA, Post Office, Appleby, Westmoreland.

To the Wholesale or Retail Seed Trade.

MANAGER, CLERK, or CORRESPONDENT.—The Advertiser, who has had 18 years' active experience in leading London and Provincial Houses, and, until lately, held a superior position in a leading Dublin House, is open for an immediate engagement.—BETA, 38, Lordship Road, Stoke Newington, N.

Seed Trade.

MANAGER, or HEAD SHOPMAN.—Age 35; thoroughly acquainted with the Trade, both Wholesale and Retail. Reference good; 10 years with last employer.—A. Z., care of Messrs. Hurst & Son, Leadenhall Street, E.C.

CLERK, SHOPMAN, or TRAVELLER.—Many years in the Trade. Good references.—A. M. Z., Post Office, Chorley, Lancashire.

To Seedsmen.

SHOPMAN.—Wanted an immediate engagement as above; first class references from former employers.—A. B. C., 8, Nicolson Street, Edinburgh.

To the Seed Trade.

SHOPMAN.—Age 25; nine years' experience in a London Wholesale House. Unexceptionable references.—P. B., Post Office, Eastcheap, E.C.

SHOPMAN.—Ten years' experience in first-class London and Provincial Houses; good practical knowledge of the business in all its branches. Well conversant in Plants, &c.—W. T. G., 4, Walnut Street, Donegal Pass, Belfast.

To Seedsmen.

SHOPMAN (ASSISTANT), or Otherwise.—Age 21; four years' reference from a first-class retail warehouse.—T. F., Mr. George Winfield, Gloucestershire Seed Warehouse, Gloucester.

To the Seed Trade.

SHOPMAN (UNDER), or in a WAREHOUSE.—A young Man, respectable, steady; writes a good hand, with experience of the Seed Trade. Moderate wages.—J. W., 3, Essex Street, Southwark, London, S.E.

To the Seed Trade.

JUNIOR ASSISTANT.—A respectable young Man, with 12 months' good character. Satisfactory reasons given for leaving. Town preferred.—Y. Z., 13, Palmerston Place, Southsea.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.
Park Fencing undertaken to any extent.
N B Plans and Designs for Horticultural Buildings, &c., &c.
Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, VALUER, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.
SALES and VALUATIONS carefully and promptly conducted.

To Florists.

TO BE LET, a convenient RESIDENCE, with large GREENHOUSES, on the main Road
Dovecote Farm, Green Lanes, Wood Green, near Alexandra Park.

To Market Gardeners and Nurserymen.

TO BE LET or SOLD, about TEN ACRES of ARABLE LAND, near Sunbury Railway Station
Apply to Mr. HENRY MEYERS, Brentford, Middlesex.

TO BE SOLD, the desirable LEASE and BUSINESS of an old-established and well-known NURSERY, situate in a leading thoroughfare, 4 miles from Covent Garden Market; is about 1 acre in extent, and nearly all covered with glass; there is also a spacious Seed Shop, with commanding front, Counting-house, Stable, &c Lease about 30 years unexpired. This offers an excellent opportunity to an energetic person with some capital, or to a country firm desirous of extending their business to London. Present owner retiring from the business.
Full particulars may be had of F. W. SEARLE, Agent, 6, Bishopgate Street Without, E C.

NURSERY and SEED BUSINESS for SALE, in the North of England.—The Grounds comprise about 12 Acres of Land, well filled with general Nursery Stock, and containing several Houses, heated with hot-water, adapted for the growth of various sorts of Plants in demand, also cold Pits, &c; and situated close to an important Market Town and North Eastern Railway Station. The Seed Shop and Premises are in a commanding position in the centre of the town, fitted up expressly for the trade, and where a very large business has been done for several years. Immediate possession can be had, or at a period to be agreed upon; and any portion of the purchase money can remain on satisfactory security at a moderate rate of interest.
N B The Nursery can be had separate from the Seed Business if desired
NURSERYMAN, *Gardeners' Chronicle* Office, London, W.C.

SALES BY AUCTION.

Plants from Ghent, and Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, October 22, half-past 12 o'Clock precisely, choice CAMELLIAS, AZALEAS, hardy RHODODENDRONS, FERNS, DRACÆNAS, and other plants, from one of the oldest established nurseries in Ghent. Also a first-class Collection of HYACINTHS, TULIPS, CROCUSES, NARCISSUS, IRIS, GLADIOLI, and other Bulbs, just arrived from Holland.
On view the morning of Sale, and Catalogues had

Cattleya Dowiana.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, October 25, at half-past 12 o'Clock precisely, an importation of CATTLEYA DOWIANA, and TRICHOPILIAS, from Costa Rica; also Established ORCHIDS, including the new white-flowered Cypripedium niveum, &c.
On view the morning of Sale, and Catalogues had.

Notice.—Postponement of Sale.

To NOBLEMEN, GENTLEMEN, NURSERYMEN, and Others.

MR. H. NASH begs to announce that the SALE of the very valuable and choice NURSERY STOCK, advertised to be SOLD by AUCTION, at the Salvington Nurseries, near Worthing, Sussex, on the 4th and following days, is POSTPONED until MONDAY, October 24, and following days, at 12 o'Clock precisely each day, when the whole, as per Catalogue previously advertised, must most positively be SOLD, without the slightest reserve whatever, in order to meet a Deed of Composition.
N.B.—Every reasonable accommodation will be allowed to purchasers for clearing their Lots.
The Lots may be viewed any day prior to the Sale. Catalogues to be obtained at the place of Sale, or of the Auctioneer, Cambridge House, Worthing.

To Noblemen, Gentlemen, Nurserymen, and Others ENGAGED in PLANTING.

EXTENSIVE SALE of really valuable NURSERY STOCK, now growing at the STAPLEFORD NURSERY, near Nottingham, consisting chiefly of fine single specimen GOLDEN QUEEN, SILVER QUEEN, and UPRIGHT SILVER HOLLIES, varying in height from 3 to 6 to 10 feet; over 1000 strong Standard APPLES, PEARS, PLUMS, &c, with 5 to 6 feet straight stems, clean, good heads, in bearing condition, being from 5 to 6 years old; also a splendid lot of GREEN HOLLIES, PURPLE BEECH, THUJA LOBBII, PORTUGAL LAUREL, WALNUTS, &c.

MESSRS. POTT AND NEALE are favoured with instructions from Mr. John Frettingham, to OFFER by AUCTION, without the slightest reserve, the above really valuable COLLECTION of TREES and SHRUBS, on WEDNESDAY, October 26, at the Stapleford Nursery, at 1 o'Clock precisely (refreshments will be provided on the grounds at 12 o'Clock)
The specimen Hollies are all fine plants, with splendid balls of earth, and were recently transplanted. The Fruit Trees are all clean and true to name, and of best possible kinds.
Trains leave Nottingham and Derby for Sandiacre Station, which is 10 minutes' walk from the Nursery, as follows:—Derby, 6.50 A.M., 9 A.M., 12 35 P.M.; Nottingham, 7 5 A.M., 9.40 A.M., 12 50 P.M. A Conveyance will meet each of the above Trains.
Catalogues may be obtained by Post or otherwise, from 18, Corn Market, Derby; the Auctioneers, Wheeler Gate, Nottingham; and 20, Cockspur Street, London, W.

Westminster.

To MARKET GARDENERS, FLORISTS, FURNITURE DEALERS, PACKERS, and OTHERS.

MR. HENRY A. COX has been favoured with instructions to SELL by AUCTION, without reserve, at Messrs. Schofield's Auction Room, Vincent Square, Westminster, on THURSDAY, October 27, at 1 o'Clock precisely, about 12,000 RUSSIAN MATS.
May be viewed one day previous and morning of Sale. Catalogues had on the Premises, and of the Auctioneer, 10, Parker's Row, Bermondsey, S.E.

Warminster, Wilts.

HIGHLY IMPORTANT to NOBLEMEN, GENTLEMEN, and Others PLANTING.

MR. W. ABRAHAM has received instructions from the Proprietor of these extensive and old-established Nurseries (Mr George Wheeler), to SELL by AUCTION, without reserve, on TUESDAY, November 1, and three following days, a fine collection of Coniferæ, and other Trees and Shrubs, in good condition for immediate removal; they consist of Piceas, Abies, Taxus, Thujas, Cupressus, Biota, Pinus, &c; very fine Weeping Trees, viz., Beech, of two kinds; Elm, Lime, Ash, Thorn, Holly, &c.
Extra fine Pavia and Chestnut in variety, Ford's and Purple Elm; Beech, Purple, Cutleaved, Macrophylla, &c.; Maple, fine American sorts; Azaleas, Rhododendrons, Hollies, Box, Laurels, Sweet Bays, &c; Standard Pears in a bearing state, and a large quantity of other Trees and Shrubs, enumerated in the Catalogue.
The stock may be viewed, and Catalogues obtained, 10 days prior to the Sale, on application at the Nursery, or of the Auctioneer and Valuer, Goldworth Nursery, Woking, Surrey.

Planting Season.

PRELIMINARY NOTICE of FORTHCOMING SALES of NURSERY STOCK.

NOVEMBER 11.—On the Premises, the KIRKDALE NURSERY, SYDENHAM; by order of Mr. George Selley, without reserve, the Term having expired

NOVEMBER 14 and following days.—On the Premises, the HANOVER NURSERY, RYE LANE, PECKHAM; by order of Mrs. Ivery, without reserve, the Lease having expired.

NOVEMBER 21 to 26.—On the Premises, the WANDSWORTH COMMON NURSERIES, SURREY; by order of Mr. Robert Neal, a portion of the land being required for building purposes.

Catalogues, when ready, may be had on the respective Premises, and of Messrs. PROTHEROE AND MORRIS, Auctioneers and Valuers, Leytonstone, Essex, E.

SALE THIS DAY AT HALF-PAST TWELVE O'CLOCK.

Sale of First-Class Dutch Bulbs, Standard Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, on SATURDAY, October 22, at half-past 12 o'Clock precisely, a first-class COLLECTION of HYACINTHS, TULIPS, CROCUS, NARCISSUS, &c; a choice assortment of 300 Standard and Dwarf ROSES, of the best varieties, Hardy RHODODENDRONS, and other American Plants, &c.
On view the morning of Sale Catalogues may be had at the Rooms as above, and of the Auctioneer.

Chivas & Weaver's Nurseries, Chester.

VERY EXTENSIVE CLEARANCE SALE of FIRST-CLASS NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are favoured with instructions from the Executors of the late Mr. George Chivas, to SELL by AUCTION, without reserve, on the Premises, the Eaton Road Nurseries, Chester, on MONDAY NEXT, and five following days, at 11 for 12 o'Clock precisely each day, the first portion of the valuable NURSERY STOCK, extending over 100 Acres, in the highest state of cultivation, including many handsome specimens; the whole in excellent condition for removal. The stock includes 23,000 Common Laurels, 1½ to 3½ ft.; 11,000 fine Green Hollies, 2½ to 7 feet, a great portion of which are beautifully furnished plants, 4½ to 7 feet; 1800 variegated and worked Hollies, 1½ to 7 feet; 5000 bushy Portugal Laurels, 2 to 3½ feet; 1000 Standard do.; 15,000 Privet; 10,000 thriving English Yews, 1½ to 3½ feet; 2000 Irish do., 3 to 6 feet; 4000 Cupressus Lawsoniana, 1500 Aucubas, a large quantity of unrivalled specimen Araucaria, 5 to 10 feet; fine specimen Cedrus Deodara and others; Pinus and Piceas, of sorts; Wellingtonias, Thujas; 12,000 Rhododendron pontica, very bushy, well set with bloom buds; 500 choice named and hybrid kinds, and many thousands of other Evergreens and Coniferæ. Also the largest and cleanest stock probably ever offered of transplanted Forest Trees, comprising 650,000 Larch, 1½ to 2½ feet, particularly good; 100,000 Scotch Firs; 750,000 White Thorn (Quick), strong and healthy, 2½ to 4 feet; 300,000 English Oaks, 80,000 Ash, 50,000 Beech, 20,000 Spanish and Horse Chestnuts, 13,000 Austrian Pine, 23,000 Alder, and thousands of others. A large quantity of Fruit Trees, including 13,000 Standard Apples; a capital assortment of Ornamental Trees and Shrubs, including 6700 cleangrown Purple Beech, 4 to 10 feet; 3000 Limes, and others; together with a quantity of Deciduous Shrubs, and a rich assortment of Border Shrubs, &c.
Now on view, and Catalogues had.
N.B.—P. & M. having visited these extensive Nurseries, especially urge the Trade and all large consumers to inspect them, as it rarely occurs that so valuable a stock is offered unreservedly in such large quantities and in such excellent condition.

St. John's Nursery, Woking, Surrey.

HIGHLY IMPORTANT and VERY EXTENSIVE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. Wm. Jackman, to SELL by AUCTION, without reserve, on the Premises, St. John's Nursery, Woking, Surrey (about one mile from the Woking Station, South-Western Railway), on MONDAY, October 24, and seven following days, at 11 for 12 o'Clock precisely each day, the whole of the thriving NURSERY STOCK, which extends over 60 acres, is in excellent condition for removal, and comprises 80,000 fine Evergreens, viz.—20,000 Common Laurels, 1 to 3 ft; 7,000 Rhododendron Pontica, 9 in to 3 ft; 3,500 do, hybrid, scarlet, and white varieties, 1 to 2 ft.; 5,000 Kalmia latifolia, 1 to 2 ft., well set with bloom-buds; 13,000 Green Hollies, 1 to 4 ft.; 5,000 Green and Variegated Box, 1 to 3 ft.; 3,000 Variegated Hollies, 1 to 3 ft.; 2,000 Aucuba japonica, 1 to 2 ft., and thousands of others; 10,000 choice Coniferæ, including 1,000 English Yews, 1½ to 5 ft.; 1,000 Junipers, 1 to 2½ ft; 1,000 Cupressus Lawsoniana, 1 to 6 ft, &c; large quantities of Wellingtonias, Thujopsis, Thujas of sorts, Red Cedars, Piceas, &c; also about 40,000 Fruit Trees of clean growth, consisting of 30,000 Standard, Pyramid, and Feathered Apples, Pears, Plums, and Damsons; 2,000 Dwarf-trained Peaches, Nectarines, Apricots, Cherries, Plums, and Apples; 2,000 Cherries, 2-yr. feathered; 5,000 Standard and Dwarf Roses, consisting of the best varieties in cultivation; also thousands of transplanted Forest Trees, viz, 40,000 Spanish Chestnuts, 1½ to 2½ ft; 20,000 Ash, 1½ to 3 ft; 18,000 Birch, 1 to 3 ft; 10,000 Spruce Firs, 1 to 4 ft; 50,000 Larch, 1½ to 2 ft; 15,000 Scotch Firs, 1 to 2 ft; 18,000 Pinus austriaca; English Oaks, Beech, Hazel, &c; likewise a large quantity of handsome Specimen Plants in the border, and a large stock of Deciduous and Ornamental Trees and Shrubs, Vines in pots, &c, &c
May be viewed any day prior to the Sale. Catalogues (6d. each, returnable to purchasers) may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Camberwell, Surrey, S.E.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK, TWENTY GREENHOUSES and PITS, HOT-WATER PIPING, BOILERS, BRICKS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by the Executrix of the late Mr. Wm. Barnes, to SELL by AUCTION, without reserve, on the Premises, the Camden Nursery, Southampton Street, Camberwell, S.E., on WEDNESDAY, November 2, and two following days, at 11 for 12 o'Clock precisely each day (unless previously disposed of by private contract), the whole of the valuable NURSERY STOCK, including a choice assortment of Evergreen and Coniferæ Shrubs, comprising many handsome specimens adapted for immediate effect, viz., Wellingtonias, Araucarias, Cedrus Deodara, Irish Yews, Cupressus Lawsoniana, Thujopsis borealis, Thujas of sorts, Cedrus Libani, &c.; choice hardy American Plants, including 1000 choice Rhododendrons by name, &c.; a large quantity of fine Fruit Trees, comprising 1000 Standard Apples, Pears, Plums, and Cherries; 1500 fine Standard and Dwarf-trained Peaches, Nectarines, and Apricots; Dwarf-trained Apples, Pears, Plums, and Cherries; also 4000 Gooseberries and Currants, 500 Ornamental and Forest Trees, Deciduous Shrubs, Hardy Climbers of sorts, choice Standard and Dwarf Roses, Greenhouse Plants, Vines in pots, a large quantity of Garden Edging Tiles, Box Edging, &c.; together with 20 Greenhouses and Pits in capital condition, 57,000 Bricks, 2000 feet of Hot-water Piping, two powerful Boilers, York Paving, Slate and Wood Shelving, Garden Pots, and numerous other effects.
May be viewed any day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers, Leytonstone, E.

Edgware, N.W.

IMPORTANT SALE of VALUABLE NURSERY STOCK and CHOICE GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Whitchurch Rectory, Edgware, 10 minutes' walk from Edgware Station, Great Northern Branch Line, on THURSDAY and FRIDAY, November 3 and 4, at 11 for 12 o'Clock precisely each day, by order of the Proprietor, a portion of the valuable NURSERY STOCK, consisting largely of choice Coniferæ, including 500 Thujopsis borealis, 500 Thuja Lobbii, 2000 Cupressus Lawsoniana stricta, 3 to 4 feet; quantities of Araucarias, Cedrus Deodara, Retinospora of sorts, handsome specimen Abies in choice variety, &c.; also 5000 Standard and Dwarf Roses of the best varieties, Standard Rhododendrons, 4 to 6 feet; and Dwarf do. by name; 2000 Portugal Laurels, 3 feet; a large quantity of Golden Queen and other Hollies, Acer Negundo variegata, Purple Beech, &c.; about 1000 clean grown Fruit Trees, Standard and Pyramidal, in bearing condition; likewise a quantity of well-grown specimen Greenhouse Plants, comprising Azalea indica, double Camellias, choice Tree Ferns, 1500 Cyclamen persicum, &c., &c.
May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E

Tottenham, N.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. Alexander Johnstone to SELL by AUCTION, on the Premises, The Nursery, Philip Lane, Tottenham, Middlesex, 10 minutes' walk from Park Station, Great Eastern Railway, on SATURDAY, November 5, at 11 for 12 o'Clock precisely, without reserve (the term having expired, and the land being required for building purposes), the whole of the valuable NURSERY STOCK, consisting of a varied and choice assortment of 12,000 Evergreens, ranging all sizes, and including many fine specimens, admirably adapted for effective planting The stock comprises fine [illegible] and other Arbor-vitæ, Wellingtonias, Cupressus, English Yews, Araucarias, Euonymus, variegated and green Hollies, Portugal and Common Laurels, Aucubas, Rhododendrons, fine standard Roses, clean grown Fruit Trees, &c
May be viewed two days prior to the Sale. Catalogues may be had of Mr A JOHNSTONE, Nurseryman, Tanner's End, Edmonton, and of the Auctioneers, Leytonstone, E

Streatham Hill, S.W.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. George Clarke to SELL by AUCTION, on the Premises, the Leigham Court Road Nursery (a branch Establishment), Streatham Hill, Surrey, on MONDAY, November 7, and three following days, at 11 for 12 o'Clock precisely each day, without reserve, the lease having expired and the land being required for building purposes, the whole of the valuable NURSERY STOCK, comprising a large quantity of unusually effective specimen and other Coniferæ and Evergreen Shrubs in great variety, the whole of which have been carefully prepared for removal; also fine Standard Roses, selected Fruit Trees, together with 2000 fine specimen Azalea indica, &c.
May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.
Full particulars will appear in future Advertisements

Stroxton, near Grantham.

IMPORTANT SALE of SHORTHORNS.

MR. STRAFFORD has received instructions from Mr. John Lynn, to SELL by AUCTION, without reserve, on THURSDAY, October 27, at Stroxton, about FORTY HEAD of very superior and well-bred SHORTHORNS, being the chief portion of his Herd, that has long maintained a high position at the National, County, and Local Shows. Great care has been taken in rearing the same to combine size, substance and quality, along with good dairy properties; they are in a fine, healthy and regular breeding state of condition. Bulls of first-class character have been used, latterly Cambridge Duke 4th (25,706), who is the Sire of most of the Young Stock; and his produce will be found, on inspection, to do justice to this unrivalled blood. The Cows and Heifers are served by this very superior animal.
Also will be SOLD, THREE BOARS and SIX GILTS of the far-famed Stroxton breed of WHITE PIGS.
Catalogues, with Pedigrees and other particulars, may be had on application to Mr. STRAFFORD, 13, Euston Square, London, N.W.; or of Mr. LYNN, Stroxton, near Grantham

NOTICE.—The SALE of the ENTIRE HERD of pure-bred SHORTHORNS, belonging to W. Cox, Esq., is fixed to take place on WEDNESDAY, November 9, at BRAILSFORD HALL, DERBY.
JOHN THORNTON, 15, Langham Place, London, Auctioneer.

GLOUCESTERSHIRE ROOT, FRUIT, and GRAIN SOCIETY'S SHOW will be held in Gloucester on NOVEMBER 9, when PRIZES in SILVER CUPS and MONEY will be awarded to the amount of £131 4s. 6d.
ENTRIES CLOSE on OCTOBER 29.
Schedules of Prizes and all particulars may be had on application.
A. C. WHEELER, Hon. Sec.
Gloucester, Oct. 23. PETER DREW, Assist. Sec.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870.

THE ROYAL BERKSHIRE ROOT SHOW, Open to all Root Growers in the United Kingdom, will be held on SATURDAY, November 26, when SILVER CUPS and other PRIZES to the Value of FIFTY POUNDS will be awarded for the best specimens of MANGEL, SWEDES, TURNIPS, KOHL RABI, &c.—For full particulars apply to
SUTTON AND SONS, Seed Growers, Reading, Berks.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, DOMESTIC POULTRY, CORN, ROOTS, and IMPLEMENTS will be held in BINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.
Prize Lists, Certificates of Entry, and every information may be obtained from the Secretary.
The ENTRIES CLOSE on TUESDAY, November 1.
JOHN B. LYTHALL, Secretary.
Offices—39, New Street, Birmingham.

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and Four following Days.
Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under.

CATTLE.—Form A. For an OX or STEER (in any Class).
„ B. For a COW or HEIFER (in any Class).
„ C. For a BEAST in Extra Stock.
SHEEP. „ D. For a Pen of three WETHERS.
„ DD. For a Pen of three EWES.
„ E. For a SINGLE WETHER SHEEP in Extra [Stock.
PIGS. „ F. For a pen of three PIGS (in any Class).
„ G. For a SINGLE PIG in Extra Stock.

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.
Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr. DAVID PULLEN, Assistant-Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Picadilly, London, W.
N.B. All communications respecting the Show must be addressed to the Assistant-Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.

SATURDAY, OCTOBER 22, 1870.

IT is a matter for surprise as well as for congratulation that, notwithstanding the extraordinary extent of prevalence of CATTLE PLAGUE in Germany and France, no animals affected with the disease have yet been landed at the parts of ports which have been selected for the reception and slaughter of stock from those countries. At Plaistow Wharf, which has already been dignified by the title of the New Foreign Market, large numbers of cattle and sheep from Germany and France have been landed, and with very few exceptions they have been found on inspection to be in sound health, or in official phrase, "free from contagious or infectious diseases." This is

so far satisfactory, but with the knowledge before us, that rinderpest is still extending, almost without a check, in Prussia and France, we have a right to speculate on the probability of diseased animals being landed on some parts of our coasts, and to inquire what amount of danger of the spread of the affection to our own herds is involved in the probability.

There is, however, no exact precedent to guide us, for we can now count upon the efficacy of a separate foreign cattle market as a protection against the extension of infectious diseases of animals. The security thus obtained will not indeed be complete, but in the absence of evidence to the contrary, it may be allowed that the risk of infection will be reduced to a minimum. The present arrangements for the landing and slaughter of animals from Germany and France in the port of London are more protective than the proposed foreign market will be, because they are associated with the maintenance of the *cordon* round the metropolis, which, on the completion of the market, will be removed. If, therefore, it should happen that diseased animals be landed at Plaistow, we do not apprehend that, with proper care, which would doubtless be taken, the plague would extend beyond the limits of the defined part of the landing place.

Cattle plague on the Continent is absolutely rioting in unlimited licence. The measures which are so successful in times of peace in stamping out the disease are no longer possible, because the troops, which should be occupied in the peaceful duty of guarding the boundaries of infected districts against the incursions of infectious diseases, have been withdrawn to aid in spreading desolation of another kind. We hear of cattle lying dead on all sides, and no provision being made to bury or otherwise get rid of the carcases. In many districts, which a short time ago seemed to have passed through their share of the infliction, the plague has reappeared. Sheep are becoming victims to the malady, as might be expected from constant exposure to the infection; and although these animals are not so susceptible as cattle are to the influence of the virus, they nevertheless are capable of infecting cattle, and under favourable conditions the plague spreads among the members of a flock with terrible effect.

Cattle plague has not abated in the Duchy of Mecklenburg, and in consequence of the presence of the disease, fairs and markets have been prohibited. Hamburgh has refused to allow animals to cross the frontier unless accompanied with a certificate of health. In Saxony the disease is still rife, and also in the Grand Duchy of Baden. The plague also exists at Cologne, at Potsdam in several districts, at Coblentz it has appeared in many places, and it has also extended along the banks of the Moselle to Treves. Recent reports refer to the existence of plague in the departments of Seine and Marne near Provins, and in other countries which are occupied by the Prussians. Eastern Europe has not experienced any abatement of the prevalence of cattle plague. In the governments of Lublin and Warsaw the disease also prevails, and in Gallicia and Transylvania.

Rinderpest is even said to have broken out in countries bordering on the River Plate. The truth of this last report, however, may be reasonably questioned; for any fatal disease among cattle is in danger of being called the plague. The report, however, is important enough to justify the adoption of stringent precautions in the event of another cargo of cattle from the Pampas being landed in this country; an event which is possible, but scarcely probable after the total failure, in a commercial point of view, of the previous importations.

Infectious and contagious diseases among animals are rife in this country. Foot-and-mouth disease is spreading widely among cattle, sheep, and pigs, and many fatal cases have been reported. Pleuro-pneumonia is also common, and numerous outbreaks of this disease, and likewise of foot-and-mouth complaint, have been traced to the importation of animals from Ireland. No restriction of any kind is imposed upon the importation of infected stock from that country, there is no inspection at Irish ports, and none at English ports except Liverpool, where the animals are landed. Scab in sheep is very prevalent, and is likely to remain so while diseased animals are turned into common pastures, and sent to fairs and markets in utter contempt of law and reason.

To complete the list, the fatal affection known as splenic apoplexy is on the increase in many grazing districts. The malady is not infectious or contagious, at least not in the same way that foot-and-mouth disease is, but we have, nevertheless, met with instances where it has extended to all the animals on the farm. In fine, the farther we look the more reason we find to be dissatisfied with the results of all the efforts that have been made of late years to ward off the attacks of disease upon our flocks and herds.

HAVING recently laid before our readers certain facts relating to various FORAGE and ROOT CROPS, we now propose to give from our note-book a few practical details in regard to their value.

An experienced farmer can estimate pretty accurately the weight of a particular crop by its appearance on the ground. His eye tells him that he may expect so much hay, Turnips, grass, &c.; and by practice, and perhaps occasional measurement, he learns how long they will maintain his flock. With regard to some of the forage crops our notes do not supply precise data, and we can only estimate their value, by comparison, in the manner described:—

"One acre of sound white Turnips in full leaf, the bulbs of which weighed 16 tons, maintained 300 large half-bred lambs one week, in September. The roots were uncut. Later in the season, when the Turnips were 'pithy,' and the leaf had fallen, the lambs got over the ground much faster. On September 4, 1865, we put 180 large lambs, and 220 fatting Hampshire ewes on early white Turnips. The crop measured 960 bush. of 50 lb. per acre, or about 21 tons. The Turnips were drilled at wide intervals, 30 inches apart, for the sake of cleaning the land, and they grew too large—smaller bulbs would have been sounder, and would have kept better.

"At the end of September the leaf was off; the bulbs were then pithy, and only weighed 47 lb. per bush. The ewes with 1 lb. of cake a-day, and the lambs with ½ lb., ate 34 lb., and 21 lb. of Turnips a-day apiece. An acre maintained 298 lambs, or 188 ewes, a week.

"On December 29, 1865, 300 large lambs, in a warm yard, ate 12 lb. of Mangels a-day, with ½ lb. of straw-chaff and ½ lb. of meal. On January 30, 1866, a flock of 297 tegs, folded on old Clover ley, were eating 13 lb. of mixed Swedes and Mangels daily, with ¾ lb. of cake and ¾ lb. of straw-chaff. At this rate an acre, or 16 tons of Swedes, would have maintained 317 tegs a week, but under ordinary circumstances of folding in the field during the winter, the Swedes would hardly go so far, as there would be some waste and extra consumption in severe weather.

"Four acres of Kohl Rabi, rather exceeding 21 tons per acre, maintained 118 wether lambs, and 119 ewe lambs, without corn, from September 19 till November 4; they were large, growing, black-faced Norfolk lambs; the weight of vegetable eaten was 12 lb. per head daily. The 317 lambs, therefore, ate five-eighths of an acre a-week. This is an example of a maximum crop.

"An acre of mixed Trefoil and Rye-grass maintained 150 fatting tegs a week in May; 150 ewes with their lambs (without corn), in the same month, required 4 acres of the same food. On poor, hard clay, which does not produce much of this sort of forage, the same flock of 'couples' ate an acre a-day, and the after crop was slight. On such lands these crops are hardly worth the seed. One hundred tegs folded on pasture ate an acre a-week in May. Two and a-half acres of Lucerne kept 11 horses seven and a-half weeks. The value of the crop at 4*s.* a-week for each horse was £6 12*s.* per acre. This was on well-drained clay of medium quality. On rich, warm, dry loams, Lucerne is twice as productive. It should be dunged every winter, and kept perfectly clean by forking between the rows in spring.

"An acre of good Beans maintained 200 fatting tegs a week. We had our fatting ewes on Beans in a hot season from July 3, when they were in pod, until July 29, 1865, when they were no longer relished. A man and boy did all the work of the fold, cutting the Beans with a chaff-cutter. The cost of attendance, 18*s.* a week, was less than the cost of harvesting, threshing, and marketing, leaving a margin for the wear and tear of hurdles. The value of the fold was more than equal to the 'fodder' value of the haulm. Two hundred sheep, at 6*d.* a-week each, amounts to £5 per acre, from which, if we deduct 18*s.* for attendance, 20*s.* for seed and hoeing, 12*s.* for ploughing, &c., and 40*s.* for rent, rates, and taxes, there is a profit of 10*s.* an acre, and the land is left in good heart, and can be ploughed early for Wheat. This is better than bare fallow.

"One acre of a very heavy crop of Rape, higher than the hurdles, maintained for a week in September 225 fatting tegs, getting ¾ lb. of cake a-day. If the corn costs 5¾*d.* a-week (1*d.* a lb.), and the tegs improve at the rate of 7*d.* per week, the gross value of the Rape is 32*s.* 9½*d.*, a result which the practical farmer, who knows the value of manure, will be able to appreciate. But so heavy a crop, costing usually 40*s.* an acre for manure, may be eaten by ewes or sheep without corn, which will perhaps pay 3*d.* or 4*d.* a-week each for their food, bringing the gross value of the Rape to £2 16*s.* 3*d.* or £3 15*s.* an acre. Fancy estimates, however, are of no value except to throw light on the general economy of feeding. We began to fold 160 breeding ewes on a light crop of Rape, 18 inches high, on July 10, 1865. They had ¾ lb. of rape cake a-day, and only half rations of Rape, and were maintained in store order on 1 acre a-week. In the next fold 95 fatting ewes, getting 1 lb. of linseed cake, and full rations of Rape, ate an acre a-week. A field of Rape, much mildewed on heavy land, was entered by the fatting ewes on August 15, and only maintained 62 a week.

"A ewe in store condition eats half as much again as a teg; and a three-parts fat sheep eats rather more than a fatting teg.

These notes may perhaps assist our readers to make a mental valuation of their forage and root crops when completing the purchase of stock. The best practical advice we can add is, to buy nothing but well-bred stock, take care not to overstock, and feed liberally. Satisfactory crops are obtained on ordinary land, at such a heavy cost of manure, and artificial manures are now so dear, that it is more than ever desirable to lay out our money on cake and corn rather than on light manures, so as to have something to place on the *per contra* side of the account. Some successful farmers on heavy land, and of the old school, tell us that by the time roots get to market in the shape of beef and mutton, all the profit is "sifted out" of them. Circumstances change, however, with the rising price of meat, and we believe that the most thriving farmers are those who best understand the management of live stock. It is the most difficult as well as the most important branch of farming, requiring the most unremitting personal attention. We might almost add that if the farmer looks well after his live stock, his crops will take care of themselves! At all events manure has not inappropriately been called "the soul of agriculture."

But although the value of the manure is an important item in the profit and loss account of forage crops, it is a safe plan in making out the account for one's information not to place too high a value on it, and to look to the stock for a return of the costs of cultivation. It is quite possible "to pay too much for your whistle" in the matter of growing forage crops, and to keep the balance on the right side requires great skill and tact, both in the cultivation of the crops on various soils and in turning them to the best account.

—— WHEAT on Monday advanced 1*s.* to 2*s.* a quarter in Mark Lane on the prices of last week, and the advance was maintained on Wednesday.——In the Metropolitan Cattle Market, both on Monday and Thursday, trade was dull, and prices on the average fell below those of the previous week.

—— Our readers should bear in mind that November 1 is the latest day for making entries of live stock for the ensuing show of the Smithfield Club. All communications on the business of the show should be addressed:—"Smithfield Club"—Mr. DAVID PULLEN, Assistant Secretary, corner of Half Moon Street, Piccadilly, W.

—— We have received from Mr. H. M. JENKINS, the Secretary of the Royal Agricultural Society of England, the following copy of a letter received from the Veterinary Department of the Privy Council:—

"To the Secretary of the Royal Agricultural Society of England.

"Privy Council Office, Veterinary Deparment, Princes Street, Westminster, S.W., Oct. 19.

"SIR,—I have the honour to acknowledge the receipt of your letter of yesterday's date, inquiring on behalf of the President of your Society as to the progress of cattle plague on the Continent, and as to what steps are being taken to prevent the introduction of rinderpest into Great Britain by cattle or sheep which are themselves diseased, or which may have been in contact with either diseased or infected animals.

"In reply, I have the honour to state that information has been received at this office that cattle plague is raging in many parts of Germany and France, and that, in consequence of the war on the Continent, all efforts to check it in the various provinces of Germany appear to have failed, whilst in France it is reported to have accompanied the German army from the vicinity of Metz to Paris itself.

"The Orders of Council, copies of which I have the honour to enclose, have been in consequence issued by the Lords of the Council, adding France to the list of suspected countries, and subjecting sheep and goats from Germany and France to the same restrictions as cattle coming from those countries; and further directing that all such cattle, sheep, and goats coming to the port of London shall not be allowed, as hitherto, to be brought to the Metropolitan Market, but shall be slaughtered at the place of landing. It has also been ascertained, on inquiry of the Governments of Belgium and the Netherlands, that their frontiers and seaboard are strictly guarded against the introduction of animals from Germany and France.

"I have the honour to be, sir, your obedient servant,

"E. EARDLEY WILMOT, for Secretary."

—— Our readers will find in another column the report of a visit paid last Saturday to Mr. HOPE'S sewage farm, below Romford. Mr. HOPE has here become the tenant of a farm of 120 acres, which had been purchased by the Romford Local Board, on which the sewage of that town is delivered—paying for it, and for the sewage pumped upon it, a rent of £900 a-year. It has been in his hands only during the past summer, and the crops which have been, so to speak,

achieved under the circumstances, are extremely creditable to his management. No one, however, in this country probably has studied the sewage subject more thoroughly—believed in its importance more confidently—or done more to awaken public opinion to the value of the interests it involves, than Mr. HOPE. And we need not, therefore, be surprised at finding Briton's Farm becoming in his hands one of the leading examples in this country of the possibilities of sewage irrigation. The produce derived from market gardening is well known to be enormous under favourable circumstances. And there can be no doubt that the ordinary experience of garden returns will be far exceeded under a system which will ensure favourable circumstances even during a dry season, which is the great difficulty of market garden cultivation. There are already proofs, both on Briton's Farm and on Lodge Farm, that this is so in the case of both Cabbages and Onions. Meanwhile the Romford people may be congratulated on the entire abatement of their sewage nuisance, with a profitable result to themselves.

—— The Hereford Agricultural Society's show on Tuesday and Wednesday was held on the site of the "once great" October fair. Neither show nor fair has been a great success this year. The classes in the showyard were not well filled, and the number of beasts and sheep in the fair was much less than usual.

—— HOW TO FEED FOR SHOW! Here is an amusing correspondence :—

1. *A Northumberland Farmer to Mr. Mechi :* "I have some Border Leicester shearling rams that I am feeding for showing purposes. At present I am giving them cut Cabbages, green Tares, and Rape. They get also ground white Peas and Linseed, three of the former to one of the latter, and as much of the mixture as they will eat. They have a shed to go into from the sun, and they get, from a bottle, about three pints of strong ale per day. Can you suggest any mode likely to feed them faster than the above? If you could, I would take it as a favour if you would kindly inform me."

2. *Mr. Mechi to Northumberland Farmer :* "I know of an instance where a very fat sheep intended for exhibition could not be carried on any further. At last they tried new milk, which she drank profusely, and made herself up in grand style. Perhaps this hint may be useful to you ; but how about milk and beer agreeing?"

OUR LIVE STOCK.

CATTLE.

MR. WILLOUGHBY WOOD, in noticing a bull bred by Mr. Bell, of Brockton House, and a winner at the recent Staffordshire show, says :—"His dam being an excellent milker, I trust his progeny will bear out the truth of your remarks with regard to the milking powers of pure-bred Shorthorns. I am more and more firmly convinced well-bred cows are, as you assert, equally capable of yielding milk as mongrels ; and that whenever they fail in so doing the fault is to be ascribed to early over feeding, as well as to want of proper care in breeding from a milking strain." This is an interesting point, both to the farmer and naturalist, and we should be glad of the opinions of our practical readers as to relative milking properties of pure-bred and half, not to say mongrel, bred animals. In connection with the doctrine, that crossing is a cause of reversion to an original and more natural type, it has been stated that cross-bred cows are inferior as milkers to those more thoroughly or purely bred. Thus, according to Mr. Darwin, "there is some reason to believe that cross-bred animals between two kinds, both of which are good milkers, such as Alderneys and Shorthorns, often turn out worthless in this respect."

—— Next Thursday is fixed for the Stroxton sale, when Mr. Strafford will dispose of 40 Shorthorn cattle and some well-bred pigs of the small white breed, so long carefully bred by Mr. Lynn. In briefly noticing the contents of the catalogue, we may mention that *Clematis* by SIR JOHN (12,084) heads the list ; and, as the ancestress of four females and a bull now in the herd, her origin is important. She is a grand-daughter of Mr. R. Booth's *Farewell*, the dam of *Fame* and *Faith*, which last cow became the g.g.-dam, of the celebrated bull CROWN PRINCE (10,087). *Fame* bred *Fanchette*, the dam of Mr. Sanday's *Faith*, *Fairy*, and others, which were sold in 1861 for an average of £133 17*s.* 6*d.* Next follow *Ama*, by MARQUIS OF EXETER (14,906), a well-known prize winner, and *Pompons* by GREAT COMET (16,192), also a prize taker at many important local meetings, comes third. This last cow is a descendant of *Priscilla* by BELVOIR (1708), purchased in 1844 from Earl Brownlow, and tracing back to the stock of Mr. Wilkinson, of Linton. She is the first of a group of 12 females and two bulls, all descendants of the same well-bred cow. No. 4 is *Cheerful* by MYSTIC (20,391), and of the celebrated "Charmer" branch of the Milcote *Sylph* by SIR WALTER (2637) sort. Her daughter, *Cheerful Rose* by CAMBRIDGE DUKE 4TH (25,706), will be likely to attract attention on the sale day. *May Dew* by CLAXTON (21,432), and her daughter, *Wiseton Rose*, a six months' old calf, are of the familiar "*Telluria* by ORONTES" (4623), and "*Zinc* by GUARDIAN" tribe. There are also two "Seraphinas :" *Blanchette 2d* by COSTA (21,487), from *Brilliant* by MAY DUKE (13,320) the highest priced cow at the Littlebury sale in 1868 ; and *Gipsey Gwynne*, whose name is almost sufficient guarantee of purity of breeding, but which we may add is from *Goody Gwynne* by 5TH GRAND DUKE. After this brief but satisfactory glance at the pedigrees of the cows, it only remains for us to notice the bulls recently used. These are GARIBALDI (17,919) by 3D GRAND DUKE (16,182), and of the "Cambridge Rose" tribe ; WAVERLEY 4TH (21,084) by SIR JAMES (16,980), and of the "*Water Witch* by MARMADUKE" family ; PRIZEMAN by WAVERLEY 4TH, and of the "Priscilla" sort ; and lastly, THORNDALE GRAND DUKE (25,310) by 4TH DUKE OF THORNDALE, and from *Queen of Hearts* by MAY DUKE (25,310). Most of the young stock are by CAMBRIDGE DUKE 4TH (25,706), a son of 4TH DUKE OF THORNDALE.

—— The progeny of a 500 gs. bull has an interest surrounding it which scarcely pertains to that of ordinary cattle. Shorthorn breeders will be interested to learn that 2D DUKE OF TREGUNTER, purchased for the above-named sum by Mr. Bowly from Major Gunter above two years ago, has become a sire. The calf, which is from *Gayell 11th*, arrived on Wednesday, 5th inst., and is, says Mr. Bowly, "a Duchess all over, with fine quality, beautifully mossy coat, grand back and loins, fine springing ribs, and a head distinguished by aristocratic character." Bravo 2D DUKE OF TREGUNTER !

SHEEP.

MESSRS. SWAN & SON, of Edinburgh, have forwarded a priced catalogue of Shropshire rams, recently sold for the Earl of Strathmore. It is always interesting to trace the extension of a new breed of any of our domestic animals, and a better case than that supplied by the Shropshire sheep it would be difficult to meet with. It is only 11 years since they were recognised as a distinct breed, worthy of a separate class, by the Royal Agricultural Society, and although they were carefully cultivated by many flockmasters for years previously, yet they were not brought under general public notice until the Shrewsbury meeting of the Royal Agricultural Society (1845). "The breed sprang from the Morfe Common sheep," described as a native breed, with black or brown or spotted face, and horned ; the wethers weighing about 11 to 14 lb. per quarter, and the ewes from 9 to 11 lb. per quarter, after being fed with Clover and Turnips, and clipping nearly 2 lb. per fleece, exclusive of the breeding, which may be taken at one-seventh or one-eighth of the whole. These sheep were subsequently crossed with other breeds, but more particularly with the Long-woolled Leicesters and Cotswolds, or the Short-woolled Southdowns. The admixture of such different blood has produced a corresponding variation in the characters of the present breed of Shropshire Downs, and has tended materially to sustain the hesitation which still exists to allow them a place as a distinct breed." So wrote Professor Wilson in 1855, and so far as the origin of the breed is concerned, he substantially agrees with Tanner and W. C. Spooner, both of whom have written upon the subject. The want of fixity of character, although still to some extent observable, is quickly disappearing, and the Shropshire is rising quickly and steadily in public estimation. Ground which Cotswolds, Leicesters, or Down sheep have occupied is being invaded by the substantial forms, combing wool, and mutton of the Shropshire. His extension was given to us as one reason of the flatness of the Cotswold ram sales of the present year, and there is abundant evidence in his presence from Cornwall to North Britain that the "tenant-farmer's sheep," as he has been termed, is making his way. The sale of Lord Strathmore's sheep to flockmasters north of the Tweed has given rise to these remarks. The sheep offered to the Scotch farmers were bred by the Messrs. Crane, of Shrawardine, and Mr. Mansell, of Adcott Hall. The highest price, 15 gs., was given for one of Mr. Mansell's sheep, and the remainder, 21 in all, were disposed of for from 6 to 8 gs. per head.

—— Mr. Wood's sale at Stanwick Park was, on the whole, satisfactory, in spite of a wet morning. The sheep, although in good condition, were not fully made up. The principal purchaser was Mr. Tate, agent to Rowland Burdon, Esq., of Castle Eden, Durham, a gentleman who has lately retired from the duties of Chairman of Quarter Sessions for that county, and is now devoting his time to the breeding of Shorthorns and Leicester sheep. The next largest purchaser was Mr. Johnson, of Stillington, in the county of Durham. The two next, of 15 each, were Mr. Monkhouse, agent to — Hutchinson, Esq., of Egglestone, near Barnard Castle ; and Mr. Robinson, agent to John York, Esq., Bewdley Hall, Pately Bridge, Yorkshire. Mr. Pollard, of Trafford Hill, Darlington, took two very good pens. Mr. Edward Gerard, of Pecknell, near Hardcastle, purchased a pen of very good ewes, and Mr. Stables, of Kirkbank, a pen of gimmers ; Mr. Tweedy, of the Forest Farm, Kipling, Darlington, taking the highest priced gimmers to try them against the Border Leicesters. One of the rams goes into Cumberland, and two (No. 528) to Mr. Burdon, the remainder being bought by local purchasers. Had the weather been more favourable, it is probable the sheep would have made a trifle higher average. The highest prices given were as follows :—For ewes : No. 1 pen of five, £3 10*s.* each (Monkhouse) ; No. 2, £3 6*s.* (Tate) ; No. 3, £3 16*s.* (York) ; No. 6, £5 1*s.* (Monkhouse) ; No. 13, £4 6*s.* (Tate). No ewes were sold lower than £2 14*s.* each, and by far the greater number made above £3. Gimmers sold very uniformly at from £2 10*s.* to £2 18*s.* each, and one pen was secured by Mr. Tweedy at £3 6*s.* Rams brought from £3 10*s.* to £4 15*s.*, and ram lambs from £2 to £2 10*s.* each.

THE PETERBOROUGH PLOUGH TRIALS.

[The following report has been addressed to the President, Vice-Presidents, and Committee of the Peterborough Agricultural Society, by Mr. C. E. Amos, C.E., who superintended the dynamometrical trials at Peterborough the other day.]

GENTLEMEN,—I beg to lay before you a report on the dynamometrical testing of the ploughs at the Thorney meeting, on the 4th and 5th inst., and to give you the results with the information gained by the tests.

Your judges commenced their duties on Mr. Whitting's farm on the 4th inst., and after having seen the work performed by several ploughs, they selected some and handed them over for the dynamometrical experiments which were afterwards made by Major Grantham, Mr. Edward Mawer, and myself. The first experiments were made upon two "turnwrest ploughs," and the result is shown in Table No. 1. The trial of "double-furrow ploughs" then followed, and extended to the following morning, but were carried out on the same "piece of work ;" the results are recorded in Table No. 2. The land upon which the dynamometrical experiments were made was a strong fen land, with clay subsoil, which clay the ploughs frequently entered and brought up to the surface, and this caused some of the weaker ploughs to enter more deeply, and increased their draught.

We then removed to Mr. Goodman's farm, and commenced in a field of loamy soil, tending rather more to a sandy than a clayey nature, which at 6 inches, the depth we ploughed, might be considered a fair work for two horses, when working an ordinary plough ; this soil was not nearly so strong as on Mr. Whitting's farm, where we made experiments on the preceding day. We commenced our operations with the double-plough in class 2 ; the results are recorded in Table 3. Having now ascertained the draught or force required to work the said double-ploughs, it was suggested that we should ascertain the draught required to work a single-furrow plough in the same "piece of work," when cutting a furrow at the same width and depth as had been cut by the double ploughs ; for that purpose Mr. Goodman lent us a new plough (R.N.F.) made by Ransome & Co. of the ordinary construction, the experiment was made and the result recorded in Table 4. All these experiments were made with a dynamometer lent to the Society by Messrs. Howard, and although some amount of difficulty was caused through the loss of a small but important part of its machinery, yet an expedient was resorted to, to repair the loss, and patience and perseverance enabled us to record the results we obtained with correctness.

Experiments were then made on two "turnwrest ploughs," which performed very well, and the results are shown in Table 5. These last experiments were made and recorded by a dynamometer belonging to Messrs. Ransome & Co., but, although the results obtained were fair as between the two ploughs, yet I fear the springs were rather too weak, which may account for the lightness of the draught recorded.

An inspection of these Tables [see next page] will show the degree of excellence of each implement so far as draught is concerned, but the judges have many other points to take into consideration, and it does not necessarily follow that the implement which works the lightest is at all times the most entitled to the prize. The column 4 in the Tables shows the number on the counter of the dynamometer, taken at the end of each experiment ; from the contents of column 4 the columns 5 and 6 are calculated, and column 6 divided by column 7 (the number of horses required to work the plough), gives column 8, the constant draught or force in pounds each horse has to exert during the whole time the plough is moving. An analysis of the columns 8 in Tables 3 and 4 will give us the comparison between the single and double-furrow ploughs, for if the five numbers in that column in Table 3 be added together, the sum then divided by five, the average will be 177,59 lb. for the draught of each horse, as against 178,48 lb., the draught for each horse in Table 4. This shows the horse's work is rather lighter with the double than the single plough. Again, add together the counter numbers in column 4, Table 3, then divide their sum by 5 (their number), the quotient, 702,5 equals the average number the counter would record for the two furrows cut by the "double plough." Then if we refer to Table 4, in column 4 of that Table we find that the "counter number" is 470 for cutting one furrow, therefore for two furrows that number must be multiplied by 2, which equals 940, the number the counter would record for cutting two furrows by the single plough.

The cost of power for working the ploughs would stand thus, the work done being equal in quantity :—single plough, 940 ; double ditto, 702,5 ; which numbers may represent anything one pleases, in value

either in weight or in money, and the least number shows the higher degree of excellence.

The percentage of saving may be found thus :—As 940 : 702,5 :: 100 : 74,73 ; and 100 — 74,73 = 25,27 per cent. the saving in power by using the double-furrow plough.

two little farms down to now has been six horses out of 11, and you all know what their keeping would come to.

Since harvest I have smashed by steam-power Nos. 4 and 3, heavy land, Bean and Pea stubbles, containing together 53 acres, in six and three-quarters days,

Table No. 1.—Turnwrest Ploughs.

1 Exhibitors.	2 Depth of Furrow.	3 Width of Furrow.	4 Number on Counter of Dynamometer.	5 Total Draught.	6 Total Draught	7 Number of Horses.	8 Draught for each Horse.
	inches.	inches.		cwt. qr. lb.	lb.		lb.
Howard & Co.	6	9½	457	3 0 11.13-100	347 13	2	173 36
Ransome & Co.	6	9½	5,2	3 2 12.1-10	404.1	2	202 05

Table No. 2.—Double-furrow Ploughs.

Ransome & Co.	6½	9 by 2	923.5	7 2 7.42-100	791 49	3	263 83
Murray	6½	9 by 2	907	6 0 16.95-100	688 95	3	229 31
Cook	6½	9 by 2	1,073	7 1 6.84 100	818 84	3	272 61
Snowdon & Co.	6½	9 by 2	1,044	7 0 9.07-100	793 02	3	264 34
Fowler	6½	9 by 2	1,06·9	7 0 25.73-100	809.73	3	269.91
Howard	6½	9 by 2	957	6 1 20.23-100	726 93	3	242 31

Table No. 3.—Double-furrow Ploughs, Class 2.

Murray	6	9 by 2	742	5 0 3.6-10	563.62	3	187.87
Howard & Co.	6	9 by 2	654	4 2 15.5	519 56	3	173.15
Ransome & Co.	6	9 by 2	6.7	4 1 2.1	497 03	3	165.64
Fowler	6	9 by 2	683	4 2 14.8 10	527 8	3	175.93
Hunt & Pickering	6	9 by 2	743	5 0 5.9-10	565.9	3	188.63

Table No. 4.—Single-furrow Ploughs.

Mr. Goodman's Plough, by Ransome & Co.	6	9	479	3 0 21	357.01	2	178 48

Table No. 5.—Turnwrest Ploughs *

Ransome & Co.	6	9	..	2 0 22	246	2	123
Howard	6	9	..	2 1 8	269	2	134

* Experiments made by Ransome & Co.'s dynamometer.

As the saving in power is 25 per cent., and in ploughmen 50 per cent., the double plough has great pre-eminence, but care must be taken that it is only used on such work as could be fairly and easily done by two horses when working a common plough ; if more is attempted it will be very destructive to the horses.

C. E. Amos, Clapham, October 11.

SAVING HORSES BY STEAM POWER.

Mr. W. Torr tells us from Cumberland that "he believed that in steam cultivation they had an opportunity now of doing work which their forefathers never had, but he looked upon it rather as an addition to good cultivation than a cheapening of the ordinary cultivation. It was simply that they could do by steam that which they never could by horses ; but they would never find that steam would do away with horses. If they adopted steam cultivation, he ventured to say they would not save one pair of horses in ten." So says Mr. Torr, who is a very great gun on the Royal Agricultural Society's staff, therefore quite worth a shot from William Smith, of Woolston, Bletchley Station, Bucks.

Mr. Torr has had some practice in steam cultivation upon the contract plan, having had a lot done upon the hiring system. Therefore, upon his evidence, we may infer that he has saved nothing in the shape of horse keeping, and gained nothing except it be that his land may be a trifle cleaner, which we have a right to look at as the "addition to good culture." What "addition" "good culture" needs I cannot understand, for "good culture" must be clean, therefore does not need Mr. Torr's "addition" upon that point. Deep culture would be an "addition," but as a rule the contract plan does not give that, for the contracting men generally go upon the scratching plan, to scratch over a large number of acres twice, and in some cases thrice over, just for the fun of the thing ; for this very year I have seen work done thrice over that did not give one atom better seed-bed for Wheat than my own done only once over. Why Mr. Torr should look at this "addition" to "good culture" as worth having I cannot understand, for according to my notion it must be money thrown completely away, for little or no horses or horse-keeping are to be saved ; his land may be a little cleaner and that is all, therefore implies that his "good culture" needed that "addition."

Now I will prove that we may sell horses off, and thus save horse-keeping, if we apply steam-power properly. Here is my own position, for Mr. Torr and all the world to look at.

Down to 1855 I had only 112 acres of arable land that needed six good horses to work them, to keep them about as clean as horse-culture generally does. From 1855, when I adopted steam-power, I reduced my horses to three, and kept only that number down to Michaelmas, 1869, when I bought 130 acres more land —60 arable and 70 grass—adjoining my farm, that needed under horse-culture five horses to work it. As I had a lot of landlord's work to do, in the shape of draining, &c., I started off with two additional horses in 1869, and thus brought my number up to five ; that number has done me for all purposes for landlord and tenant well down to now, and I will soon show that I may now sell another off : therefore the saving on these at an average cost of 4*s.* 8½*d.* an acre—men, coal, oil, and wear and tear, &c., included. It has been harrowed over with 4-horse harrow once, at a cost of 1*s.* 3*d.* per acre, bringing the cost of seed-bed up to 5*s.* 11½*d.* per acre, and that is all, for more than a half of it has been drilled, and the remaining portion will be completed about the middle of next week.

Nos. 2 and 1, heavy land after Wheat, containing together 39 acres, have been dunged for Beans next year. The steam-engine has worked the ridger and subsoiler over them 10 inches deep, putting the land into ridges a yard in width, covering in the manure and subsoiling the land, as well as ridging it at one operation, at a cost, including men, &c., of 6*s.* 3*d.* an acre as the total cost of seed-bed for Beans, and the land is clean, "good culture," without any "addition," although it is for the sixteenth time under steam-power culture, without any fallow of any kind under steam-culture, although under horse-culture it needed, and had, a dead fallow every fourth year.

No. 6, light land after Barley, 14 acres, for Barley next year, which will be the fifth white-strawed crop in succession, has been ridged and subsoiled a foot deep, by steam-power, at a cost of 6*s.* 3*d.* an acre, as the total cost of seed-bed for next year's crop, for it will only need harrowing down and drilling in the spring. The land is clean, "good culture," without any "addition," although it is for the fifth white crop in succession. Mr. Torr may look at it, and so may all the Royal Agricultural Society's judges if they like.

No. 5, light land, 12 acres, after Beans, has been cultivated over once by horses at a cost of 2*s.* per acre, as the total cost of seed-bed for next year for Wheat. The ridging and subsoiling that it had last year by steam-power for Beans put this land in such beautiful condition that it needed only a cultivating over once with horses this year to make a good seed-bed for Wheat. The Wheat is in and up to be looked at. "Good culture" may be seen here without any "addition."

No. 4, light land, 12 acres, after Wheat, has been cart dunged for roots next year. The steam-engine has worked the ridger and subsoiler over it 10 inches deep, ridging and subsoiling the land as well as covering in the dung at one operation, at a cost of 6*s.* 3*d.* an acre as the cost of seed-bed for next year's crop, for harrowing and planting is all that will be needed next spring. "Good culture" may be seen here without any "addition."

No. 3, light land, 11 acres, is in seeds, therefore will need nothing for next year's crop.

No. 2, light land, 13 acres, after Clover, mown twice (once for hay and the second time for seed). Nearly half of it has been ploughed over with horses, and the horses will finish turning it over, and that is all it will get as a seed-bed for Wheat.

No 1, light land, 12 acres, is in roots, and will be worked by horses in the spring for Barley.

This gives the particulars of my 166 acres of arable land for my next year's crop, and Mr. Torr may see that by the middle of next week 65 acres of my Wheat will have been planted, and that about 7 acres of ploughing and 13 acres of drilling will complete my 78 acres for Wheat next year ; that my land is all dunged and ridged as well as subsoiled for Beans ; that my Barley land on my light land for the fifth white-strawed crop in succession has been ridged and subsoiled a foot deep ; that No. 5, light land, has been worked entirely by horses at a cost of 2*s.* per acre for Wheat next year ; that No. 3, light land, is in seeds, needing no operation for next year's crop ; that No. 3, light land, will need a little horsework to complete its seed-bed for next year's crop ; and that No. 1, light land, will need working by horses in the spring for Barley, and that is all they will have to do then, excepting the harrowing and drilling of No. 6 for Barley and No. 4 for roots. Then upon this evidence I may sell another horse off now, for "good culture," without any "addition," may be seen all over my farm, and deep work, which is a substantial "addition," I have got. Then what is the good of Mr. Torr telling the Cumberland men and the world that by the adoption of steam-power we cannot reduce the number of horses needed under "good culture," as he calls it. I can tell him plainly that he will never know what cheap farming by steam-power is until he knows how to farm his land clean, and thus get "good culture," as well as how to reduce the number of horses needed to keep land in "good culture," by making, according to his view, a fallow of some kind every few years to keep it clean. The scratching plan by steam-power upon the contract plan, that he and all the Royal Agricultural Society are driving at, will never help him, and his evidence is dead against them.

William Smith, Woolston, Bletchley Station, Bucks, October 15.

SEWAGE UTILIZATION.

By J. Bailey Denton, M. Inst. C.E., F.G.S.

[The following are remarks on the extent to which existing works and practice militate against the profitable utilization of sewage, read before the British Association at Liverpool.]

The inability of chemists to extract from the liquid sewage of towns an appreciable proportion of its dissolved obnoxious and fertilising elements, and of manure manufacturers to convert the solid suspended matter into a compost that can be sold at a price profitable to the maker and the consumer, is bringing all persons interested in the removal and treatment of sewage to the conclusion that the refuse of towns must be transported direct to the land by the agency of water or earth, whereby all interim detention and manipulation may be avoided. With the astonishing rapidity with which chemical science has advanced within the last century, it may appear precipitate to act upon any present conclusion ; but it must be remembered that, not only in England, but throughout Europe, a large amount of attention has for the last 25 years at least been given by chemists and other scientific men to the question of sewage purification and utilisation, without discovering any chemical process of effecting the objects ; and that, as recently as last year (1869), the present Royal Commissioners appointed to inquire into the best means of preventing the pollution of rivers enunciated the following opinion : —"There is but little difficulty in extracting suspended matters by filtration, but as these do not contain quite one-seventh of the total valuable constituents, the process, though simple, has never been remunerative. The operations of the chemist have, therefore, been directed chiefly to the soluble constituents of sewage, and have had for their object either the precipitation in a solid form of the valuable but offensive ingredients, so as to convert them into portable manure, or, secondly, the rendering them inoffensive by the action of disinfectants. Although these operations have not been altogether unsuccessful, they have hitherto entirely failed in purifying average sewage to such an extent as to render it admissible into running water." [See the report on the Mersey and Ribble rivers by the Rivers Pollution Commission, p. 52.] The same Commission, in their second report of this year (1870), on the chemical process known as the "A. B. C." process, add these words to their conclusions :—"It would obviously be rash to set any bounds to the possibilities of chemistry. Substances may, perhaps, be hereafter discovered, capable of combining with and rendering insoluble the filthy constituents of our town drainage ; but we are compelled to admit that the present resources of this science hold out no hope that the foul matters dissolved in sewage will be precipitated and got rid of by the application of chemicals to the offensive liquid. The chemical affinities of these foul matters are so feeble, and the matters themselves are dissolved in such enormous volumes of water, that their precipitation is a problem of extreme difficulty."

If we are justified in acting upon these views, there is no consideration more opportune, now that we are compelled to desist from polluting our rivers and defiling our shores, than that which necessarily arises on the question of how far existing works and practice favour or militate against the adoption of either the wet or dry methods of direct removal ; and nothing will better prepare the mind for the consideration than the general admission that wherever people are congregated, and a number of dwellings exist together, it is not possible to provide for the largely increasing use of water, by a population doubling itself within the the period of 50 years, without underground conduits for the discharge of liquid sewage. That this is already practically and generally admitted is proved by the fact that in nearly all our cities and large towns systematic sewerage already exists, and that there are fewer exceptions in the northern towns, where water-closets

are very few, and middens nearly universal, than in the midland and southern towns, where water-closets are comparatively numerous, though privies with cesspools still predominate. At Manchester, Wigan, Blackburn, and Crewe, for instance, where the night-soil from the middens is removed by paid contractors, or by the sewer authorities, at considerable cost to the ratepayers, the liquid sewage is discharged by underground conduits systematically devised; while at Stafford, Ipswich, Stamford, and Winchester, where the ordinary privies and cesspools are emptied by their owners, no systematic sewerage whatever exists.

To appreciate the difficulties which stand in the way of a profitable utilisation of sewage in towns already sewered, it should be remembered that the first, if not the only object aimed at when the sewers were made, was to get rid of the liquid refuse in the readiest possible way, irrespective of any effect the sewers might have on the soil through which they passed, or the sewage might have upon the river or shore receiving it. Very little thought was given to the best provision for storm waters, or to the influx of subsoil water; and the difficulties consequent upon sudden or constant dilutions, or on the possibility of polluting the soil in which the sewers were laid by the leakage of the sewage out of them, were in a like manner disregarded. Though the sewers were not designedly made leaky, they were not constructed of a material and in a manner to secure their being water-tight, while in many cases the subsoil water was intentionally admitted. By general consent it has been ruled that, although towns may take their water supply out of rivers, they shall not discharge their foul refuse into them, and it therefore becomes a matter of very great importance to consider how far the works designed for one purpose can continue to be used without modification for another; how far, in point of fact, the sewage originally destined for the sea can be conveyed to the land in a profitable condition by sewerage works, designed without regard to the application of the sewage, and consisting of channels which lose what they should retain and admit what is not only not wanted but what adds to the cost of utilisation. It should be here stated that the original "General Board of Health" recommended that all sewers should be water-tight, and that there should be a separate system of pervious channels for the removal of subsoil water which, of course, could be readily made to discharge their contents into the sewers when required for flushing or dilution. The consideration of these very important points may be of little avail in those numerous towns where a complete system of sewerage works have been carried out, as the difficulty and expense of altering them would negative any such proposition; but it will be of great value in influencing the character of works yet to be performed in small towns where no systematic provision exists, and in places where an alteration of existing sewers is practicable at a moderate cost.

To show to what extent existing leaky sewers, admitting subsoil water, will allow of the passage of sewage out of them into the surrounding soil is most difficult; but the fact must commend itself to the minds of all persons that, under certain conditions, a fluid existing inside a sewer may pass as rapidly out of it into the surrounding ground as the subsoil water may pass from that ground into the sewer. This effect will be conceded when the height and pressure of the one exceeds the height and pressure of the other. Though the difficulty of ascertaining the quantity of sewage which escapes is great, and the facts will only become apparent when disease becomes localised in the neighbourhood of leaky sewers, there exists no difficulty in determining the extent to which the influx of subsoil water takes place. Very many instances exist in which the quantity admitted has been already approximately ascertained. The greatest increase from the infiltration of subsoil water with which I am acquainted is at Tring and Hertford. In the first case, although the sewers are only connected with 30 houses, and the whole influx of sewage does not amount to 1000 gall. per diem, the dry weather discharge from the main sewer amounts to upwards of 1,000,000 gall. per diem. The effect of this abstraction of water from the subsoil has been to lower all the springs in the neighbourhood, and to lay nearly dry the head of the silk mill in the town, from whence the Grand Junction Canal Company obtained a supply of water at a summit level. In the case of Hertford, the discharge from the sewers is more than nine times the water supply. But I will take, as a better illustration of the points I desire to raise, certain typical towns where the sewage is retained in the sewers for certain periods of the day. It will then be made manifest that the evils of infiltration and escape must each occur, for when the sewers are full the sewage will pass out of them with the same freedom as the subsoil water will have passed into them, when the sewage was reduced within them to its minimum flow. At Blackpool, for instance, with a standing population of 7000, the water supply is about a quarter of a million gallons daily, and the discharge from the sewers about 1,000,000 gall. There is, therefore, an infiltration of water from some source of three-quarters of a million gallons, and no effort is made to keep the sewage on the flow when the tides rise above the sewers. In the town of Dover, with a standing population of about 25,000, where the water supply is upwards of 1,000,000 gall. daily, the ordinary dry weather discharge from the sewers amounts to nearly 3,500,000. Here, in order to keep the sewage "on the flow," pumping is resorted to for two hours before and two hours after each high tide, and it is possible that by such means the escape of sewage is in some measure reduced by avoiding the extreme pressure of maximum accumulation. Under any circumstances it will be observed that the expense of pumping is increased by the influx of subterranean water in the proportion of 1 to 3½, and, as a natural consequence, that £350 is spent when about £100 would suffice if the sewage alone was dealt with. If the returns of mortality in these places could be brought to bear, it would doubtless be found that certain epidemics are localised in the low parts of the town, while other diseases prevail in the higher parts, caused by the pent-up gases generated by detention finding their way upwards. But this periodical condition of surcharged sewers is not confined to seaboard towns. In cases where the sewage is lifted, the sewer authorities may allow the sewage to accumulate in the sewers in order to avoid the expense of pumping at night, when precisely the same effect is produced as in seaboard towns under tidal influence. For instance, at the recently-sewered town of Bedford, with a population of 16,000, and a water supply of 250,000 gall. a-day, the ordinary dry-weather flow of the sewage has been variously stated to be from 500,000 to 800,000 gall. per diem, although at the present moment the quantity pumped on to the sewage farm during 12 out of the 24 hours barely exceeds the water supply, showing that the addition due to subsoil water is counterbalanced by an escape from the sewers during the period of rest. That there is a considerable influx of water to dilute the sewage, nevertheless, is shown by analyses made of the sewage taken at different times of the day. Thus Bedford, with its sanitary works, well devised in most respects, illustrates very aptly, by its expedients to avoid some of the expense of lifting, one phase of the evil arising from the infiltration of subsoil water, though the quantity to be lifted is trifling compared with that discharged from other towns. In many of the Lancashire towns, such as Bolton, Liverpool, Oldham, and Warrington, the aggregate daily excess due to subsoil water in these four towns alone reaches, I have reason to believe, something between 20 and 25 millions of gallons, which, if lifted 100 feet, would cost, at 20*s.* per million gallons, upwards of £8000 a-year. At Cardiff, in South Wales, the increase is 1,500,000, without any advantage in the way of flushing and cleansing—which it has been stated alway accompanies the influx of water—for there the inflowing subsoil water brings in with it a share of the sand, which deposits itself in the sewers, and is likely to become an increasing source of impediment and difficulty. In many instances of both seaboard and inland towns the sewage has been more than doubled; and wherever it becomes necessary, on the ground of health and economy, to lift the sewage by mechanical power—as we may safely assume will be the case in all towns, without exception, where the sewers have not a free flow—the difficulty and cost of dealing with such an increased quantity will become proportionately greater. It will not be in the cost of lifting only that the disadvantage of excess will be felt; it will be extended to all the incidents of distribution when sewage is applied either by way of irrigation or by natural filtration to land. The arrangements must provide for the increased quantity to be dealt with, rendered, in the case of irrigation, more difficult still by the circumstance that the temperature of the liquid is lowered in proportion to the amount of dilution, a point of much importance in times of frost, and during certain stages of vegetable growth. These observations are made with a full recognition of the difficulty, almost amounting to an impossibility, of making ordinary sewers completely water-tight, and of the truth that water finding its way into sewers sometimes acts beneficially in flushing them, and that at certain seasons the dilution of sewage applied to irrigation is advantageous. It is to the evil of indiscriminately admitting a largely disproportionate quantity of water, without any power to regulate the time and extent of dilution, to which attention should be called with a view to determine future proceedings.

Turning from sewage works to the utilisation of sewage by irrigation, which the Rivers Pollution Commissioners have recommended as the only plan of dealing with the sewage difficulty at present known, a very strong opinion has prevailed, and has been acted upon up to the present time, that it is only necessary to run the sewage over a surface of land covered with growing vegetation to extract from it all that is fertilising, and to render the effluent liquid perfectly harmless. It has not been considered necessary that sewage should pass through, as well as over, the soil. In fact, in some cases pains have been taken to stop existing drains, and, by raising the water in the soil, oblige the sewage to flow over the saturated ground; and it was not until the issue of the first report of the present Rivers Pollution Commissioners on the Mersey and Ribble Basins that public attention was generally directed to filtration as a means of purification. The Commissioners themselves appear to have considered filtration, both downward and upward, separately from irrigation, and to have reported upon each as distinct operations, for, after advising a trial of intermittent downard filtration on a large scale, they add that in all practicable cases they would strongly recommend "the adoption of irrigation in preference to filtration," evidently considering that irrigation can be properly adopted without filtration."* It is to this very important recommendation, as one likely to mislead if not at once set right, that I would call attention, for by those who have made agriculture a study, and have traced the effects of irrigation in England, Lombardy, and elsewhere, it is considered that no irrigation is perfect unless it be accompanied by filtration, and that if purification of the sewage is to accompany its profitable application to land, it is absolutely necessary that no liquid whatever should pass off the surface, but that the whole should go through the soil as well as over it.

To accomplish this, and at the same time to effect all the advantages the Commissioners would secure by downward filtration solely, it is only necessary to form the surface of the land with slopes so graduated in relation to its porosity that the whole of each slope shall receive and eventually absorb its proportion of sewage; and that, in all instances where a natural drainage does not exist, a system of under drainage should be so arranged as to secure the discharge of the sewage after it has passed through the drained soil and been completely filtered. Where the sewage has not been purified by passing through the soil between the surface and drains, it has been owing to the drains being too shallow, or to the work being so imperfectly done that the sewage has found its way into the drains without any filtration at all, or with only partial effect. In no case where the sewage has uniformly filtered through a sufficient depth of soil has failure occurred. In one case (Walton Convalescent Hospital) within my own practice the effluent water from a small area of land receiving the sewage of upwards of 300 people, having been subjected last year to a properly devised mode of natural filtration, in conjunction with irrigation, was analysed by Dr. Odling, and declared to be "unexceptionable potable water."† In this case the soil is free and porous, though it was excessively wet before it was drained. The sewage having satisfied the growing vegetation is absorbed by the soil, and passing downwards by filtration (naturally incident to under-drainage) is mixed with a constant and copious flow of subsoil water, the level of which is maintained by the under drains. At Briton's Farm, near Romford, Mr. William Hope, V.C., has dealt with a somewhat different description of land, though of similar porosity. He has had the whole drained at a minimum depth of 5 feet, and the effluent water from the under drains, though not equal in purity to that just referred to, shows very distinctly the superiority of irrigation in connection with filtration over irrigation simply. At Briton's (as at Walton) not a drop of water passes off the land. Taking the average daily quantity of sewage distributed over the land in the months of June, July, and August, as rather better than 330,000 gall., it has been ascertained that about one-third, *i.e.*, nearly 110,000 gall., is discharged by the under drains, only a small portion being subsoil water. The quantity of ammonia contained in the sewage as it is applied to the land is 3.194 parts in 100,000, while the proportion in the effluent water is .065 in 100,000 parts. The difference between these two cases is doubtless owing to the fact that at Walton there is a much greater dilution by subsoil water than at Briton's. At Walton the drains were designed and so laid as to avoid being directly under any land that is sewaged, while at Briton's the drains were somewhat more numerous for a given space, and, being laid out at equal distances, necessarily passed under the sewaged land. The work was doubtless carefully done, but the sewage may therefore reach the drains in a less filtered condition than at Walton.

Though the instances are few in which irrigation and natural filtration have been associated in executed works of sewage utilisation, they are sufficient to support the conclusion that no irrigation should be adopted in which filtration does not form a part of the system. At Penrith, Carlisle, and Bedford, the whole

* This interpretation of their views is based on the following words from the general summary to their first report already quoted (see page 128.):—"The drainage of more than 100 people can be purified sufficiently by application to one acre of land, but it is certain that much valuable though non-polluting matter is still left in the sewage when it leaves the land, and that such effluent sewage might be applied again to crops in a similar manner with very great advantage, and with additional benefit to the water itself." But it is possible that the Commissioners in this remark had reference to the water of under-drainage from sewage irrigated lands, and not to the effluent sewage running off them, as at page 60 of their report they say that "it is precisely in those cases in which the sewage is absorbed and disappears in porous land that we have observed, in the effluent water from drains, the most complete purifying effect."

† Dr. Odling's analyses of the effluent waters before the sewage was put on the land (col. A), during its application (col. B), and five hours after the application (col. C), were as follows:—

	Grains per gallon.		
	A.	B.	C.
Total solid matter	7.72	7.78	7.61
Loss on ignition	1.064*	1.00*	1.17*
Chlorine	1.48	1.48	1.42
Nitrogen as free ammonia	0.0016	0.0016	0.0016
Nitrogen as organic matter	0.0016	0.0016	0.0016
Total hardness	2.1°	2.3°	2.2°
Permanent hardness	2.0°	2.1°	1.9°

* Not combustible matter.

of the sewage is absorbed at the surface and discharged in different ways from the subsoil, and the amount of nitrogen and ammonia existing in the effluent water is stated in the report of the Rivers Pollution Commission to be as follows :—

	In Parts of 100,000. Organic nitrogen.	Ammonia.
Penrith	.108	.001
Carlisle	.2004	.005
Bedford	.034	.095

In the two first cases there appears to be no nitrogen as nitrates and nitrites, but in the last they are represented as .505. If these figures, with those relating to Walton and Briton's, are compared with the analysis of effluent water from irrigation only, as practised at Croydon, Rugby, Barking, Norwood, Worthing, Aldershot, Banbury, Warwick, and Edinburgh, the superiority of the combined treatment will be fully confirmed, and there is no limit to the land which may be devoted to it; for drainage, properly devised and executed, and attended by deep surface cultivation, will render the stiffest clays as suitable as free soils. With complete pulverisation of soil sewage farms may be established with security in any part of the country, inasmuch as natural downward filtration, which is only another term for subsoil drainage, is not only a sure means of purifying liquid sewage, as shown by the Rivers Pollution Commissioners, but it is equally sure to free the atmosphere of those noxious gases which several high medical authorities have feared may be evolved from the surfaces irrigated with sewage matter. With a sewage farm naturally or artificially drained, and the surface sloped and prepared by deep cultivation so as to make the absorption and filtration of sewage certain, intermittent filtration may be practised by itself at any time when it is desirable to resort to it independently of irrigation. Thus the principle of "downward filtration" would be carried out in the most practical form, for at seasons when the sewage may be applied profitably to vegetation of course the two processes will proceed together.

It is not too much to say that it will only be by operations admitting alike of this combined or separate action that purification and profit may be secured free from all chance of malaria, and with the prospect of applying the sewage of towns extensively to land by way of irrigation, it is most desirable that the proper preparation of land to receive it should be indisputably understood and acted upon.

INFLUENCE OF MOON ON RAINFALL.

That the moon is very influential in, or at least closely connected with, all changes of the weather, is a belief at once widely spread and deeply rooted. Our satellite can neither be full, nor new, nor "fill her horns," without, as is popularly believed, causing or indicating some alteration in the state of the weather. If she is caught "lying on her back," or, in other words, if, when she is less than a semicircle, her cusps are pointed upwards, so that the straight line joining them is more or less approximately parallel to the horizontal plane, the fact is supposed to be an indication if not the cause of rain. If she submits to be "towed by one star and chased by another," that is, if she is between and near two conspicuous stars, so that the three bodies are at least nearly in a straight line, the fishermen expect a storm.

Though meteorologists show no favour to these and many similar beliefs, some of them admit that it is neither unphilosophical nor contrary to fact to regard the moon as a meteorological agent. Thus, Sir John Herschel, from his own observations, regards it as a meteorological fact that the clouds have a tendency to disappear under the full moon, and adds that a slight preponderance in respect of quantity of rain near the new moon over that which falls near the full, would be a natural and necessary consequence of a preponderance of a cloudless sky about the full.* M. Arago, who concurs in this opinion, states that the expression "the moon eats the clouds," is common in France among country people, and especially among sailors.† The latter philosopher adds that the results obtained from meteorological observations in Germany and in Paris, were that the maximum number of rainy days occurred between the first quarter and full moon, and the minimum between the last quarter and new moon; the ratios being 100 : 121.4 in Germany, and 100 : 126 in Paris; but that in the south of France the minimum number of rainy days occurred between the full moon and the last quarter. He concludes with the remark that "the question requires to be examined afresh."‡

Having by me an unbroken series of carefully-made rainfall observations from the beginning of 1864 to the present time, I have tabulated the results below, so as to show the amount of rain, the number of wet days, and the wet-day rate of rain in each of the four quarters of the 74 complete lunations, beginning with the new moon on January 9, 1864, and ending with January 1, 1870—a period of 2185 days.

The word "quarter," as used here, may be defined thus :—The first quarter begins with the day of the new moon, and ends with the day immediately preceding that on which, according to the almanac, the moon reaches the first quarter, and so on for the others :—

	Quarters. 1st.	2d.	3d.	4th.	Totals.
Actual rainfall in inches ..	56.66	58 87	57.30	55 90	228.73
Relative rainfall	2477	2547	2505	2444	10000
Number of times rainfall was more than 25 per cent.	33	30*	34	30	..
Number of times rainfall was less than 25 per cent.	41	43*	40	44	..
Number of dry days ..	274	301	241	266	1082
Number of wet days ..	274	248	307	274	1103
Relative number of dry days	253	278	223	246	1000
Relative number of wet days	248	225	278	248	1000
Mean wet-day rate of rain in inches	.2141	.2374	.1866	.2043	.2073
Relative mean wet-day rate of rain	103	115	90	98	100

From the foregoing Table, it is obvious that with regard to the three pluvial elements, in South Devon, during the six years ending with January 1, 1870, the four quarters of the 74 moons may be arranged, in descending order, as below :—

Rainfall.	Number of Wet Days.	Wet-day Rate of Rain.
Second (greatest)	Third (greatest)	Second (greatest)
Third	Second (	First
First	Fourth)	Fourth
Fourth (least)	First (least)	Third (least)

This tabular summary shows :—

1st. That the quarters arrange themselves in an entirely different order under the different heads, with the single exception of the second being the quarter of greatest average rainfall and also of greatest average wet-day rate of rain.

2d. That the least average rainfall was in the quarter immediately preceding the new moon, instead of being, as Sir J. Herschel supposes, about the full moon.

3d. That the maximum number of wet days was in the third quarter, and the minimum in the first; thus differing in every particular from the results stated by M. Arago to have been obtained in Germany and Paris, on the one hand, and in the south of France on the other, which, as we have seen, differed from one another.

This discussion may be appropriately closed, perhaps, by echoing Arago's remark, that "the question requires to be examined afresh." *W. Pengelly, F.R.S., in "Quarterly Journal of Science."*

AUTUMN SOWING OF WHEAT.

[The following paper on this subject was lately read before the Whitchaven Farmers' Club, by Mr. John Williamson, of Low Walton.]

1. *Preparation of the Land.*—It is the general, if not the invariable, practice in this locality to sow Wheat after root crops, and in some cases after Beans; and during the period of their growth we expect that the land will be well tilled and cleaned by means of the grubber, the harrow, and the hoe; so that after this crop is removed the land requires but little preparation for the Wheat, the simple process of ploughing and harrowing sufficing. However, it sometimes happens, even with the greatest vigilance, that a little Couch-grass will be found after the green crop is taken off; and in this case, as the plants are but few, it is an excellent plan to fork it out by hand labour. After the land is sown down, it is some time before such another opportunity comes of eradicating weeds; and during the growth of subsequent crops these few plants, that were perhaps looked upon as insignificant, are spreading their lateral suckers and ramifying over the whole field. In our eastern and midland counties the Wheat crop in the rotation takes the place of our Oat crop—that is, it is sown after Clover. It is considered, I believe, that Clover root forms suitable food for the Wheat. The land is rolled with a roller so constructed that it presses upon the furrow seams without rolling the whole surface, thus making a regular and firm seed-bed. With respect to ploughing, where the land has been previously deeply tilled, I like to have a good strong furrow for Wheat. The plants are then able to strike their roots deep in the earth, and are less liable to be thrown out by spring frosts. All that I have to say of naked fallows for Wheat is, that on light land the practice is out of date, and mostly on heavy land. I do not know that it is unprofitable to pursue the practice on land of a stiff tenacious nature.

2. *Manuring.*—Although a great admirer of Jethro Tull, yet I don't believe in trying to grow Wheat without manure on strong clay, or deep loamy soils—what we commonly denominate good Wheat soils. Where a heavy covering of farmyard dung has been applied to the preceding green crop, a crop of Wheat may be grown without any further application of manure, but on sharp light soils, in my opinion, a better practice is either to grow the green crop with artificial manure alone, and apply a full dressing, say from 10 to 15 tons of farmyard dung per acre, in the autumn; or, otherwise, to give for the green crop what we would call half a manuring of farmyard dung, and then, again, in the autumn, give another dressing for the Wheat. In the case of strong soils the properties of the manure can be retained, whereas porous soils require manuring at shorter intervals. A practice obtains, and one of which I quite approve, of leaving the Turnip-tops on the land on which they are grown, and ploughing them in for the benefit of the succeeding crop. There is no doubt they afford a rich supply of carbonaceous food for the Wheat crop. It is better to cart them away if the tops are blighted, or infested with caterpillars and such like. I think a good crop of spring Wheat may be grown with light manure. 5 cwt. of bones, 2 cwt. of Peruvian guano, and 1 of nitrate of soda, per acre, have yielded me a fair crop when both roots and tops were carted off.

3. *Time of Sowing.*—Our rotation is such that we cannot sow very early. To any farmer holding heavy land, which no donbt is a disadvantage in a wet climate, I would say :—Embrace a fitting opportunity; sow when you can without puddling the surface. The light-land farmer may sow almost when he likes. Early sowing is advantageous; less seed is required, and, other circumstances being the same, the crop will ripen sooner. I have found it to answer very well to sow any time between Martinmas and Christmas. In fact, I have seen it do better sometimes than when sown in October; and we never feel apprehensive of wet, although the horses may be sinking to the fetlocks. This would not answer on stiff land; the treading would poach the surface, so that the water could not permeate.

4. *Selection of Seed.*—There is perhaps no part of this subject that is of more importance to us than the selection of good seed. A change is also desirable sometimes from a different climate and soil. The seed should possess the true characteristic qualities of the variety, and be free from seeds. There can be no doubt that the sowing of dirty samples is oftentimes a fruitful source of disseminating weeds. As in the animal kingdom the ailments of the sire are frequently transmitted to the offsprings, so in the vegetable. If we sow sound seed we may expect good produce; but if a poor thin sample be sown, perhaps already contaminated with disease, we cannot reasonably look for a good clean produce. With respect to the sorts of Wheat, it would be difficult to say which is the best. There are a great variety of kinds in cultivation, both red and white, bearded and beardless. I will name a few :—Chiddam : this is an old and much esteemed variety. Hunter's Wheat : this is considered by some to be one of the best white Wheats in cultivation. Then there are Hopetoun and Chevalier, &c.; and amongst red kinds there are Spalding, Prolific, and Pipers, and Lammas, Blood-red. As a rule the red kinds are hardier and less liable to mildew. Quantity and quality and suitability to climate considered, let each grow that kind which he finds to pay him the best.

5. *Quantity of Seed.*—In all cases the nature and condition of the soil, the climate, and the season of the year materially affect the quantity of seed to be sown. I know there are those who cling pertinaciously to the usages of their ancestors, and who are unwilling to leave the beaten track in this matter of seeding. I feel extremely loth to disregard their advice or reject their practice, but I do think that in many cases there is more seed sown than is desirable. Although I don't believe in lavishly and indiscriminately sowing the seed, I would yet carefully abstain from following the advice of theorists who talk about sowing and reaping a crop from an imperial peck to the acre. It will not do to sow less broadcast than from 8 to 10 pecks imperial per acre on light land.

6. *Method of Sowing.*—There are three modes of sowing, namely—by means of the drill, the dibbler, and broadcast sowing. With respect to sowing with the drill, I have not tried it; therefore, I cannot speak from experience; but my opinion is that eventually it will, in a great measure, supersede other methods, and for this reason, that it deposits the seed at a uniform depth, and as a corollary, we look for it to come up and also to ripen uniformly. There is also a saving of seed. Another advantage that this system has over broadcast sowing is this—that the land can be more effectually cleaned in the spring. Although I do not use the drill, I may say that the system is successfully adopted in our own neighbourhood. Mr. John Carter, of St. Bees, adopts this method, and fully approves of it. With respect to dibbling, there is no doubt it is a true and perfect method of depositing the seed. I have used a hand dibbler, which answers very well for a small plot of ground; but the method is so slow and tedious that it is quite impracticable to use it on a large scale. Whichever method is followed, the seed should not be put in more than about an inch in depth. I used to think, till experience taught me better, that by burying the seed pretty deep it would prevent the frost from throwing it out; but I have found that a better plan is to cultivate deep and sow shallow. To whatever country the Wheat plant may be indigenous, it is extremely hardy. We often see it left in the earth for weeks together, and during that time—perhaps just

* "Outlines of Astronomy," par. 432, and note, p. 285. 5th edit. 1850.

† "Popular Astronomy," Smyth's Translation, vol. ii., ch. xxiii., pp. 311, 312. 1858.

‡ "Popular Astronomy," Smyth's Translation, vol. ii., ch. xxxv., pp. 317, 318.

* The rainfall of one "second quarter" was exactly 25 per cent. of that of the lunation.

after the tender germ has burst—subjected alternately to keen frosts and drenching rains without apparently suffering any injury, and unlike many other plants it seems to grow and thrive equally well in hot climates as in cold. This peculiar adaptation leads us to conclude that it was intended by an All-wise Providence to form the staple food of man.

7. *Black Ball and Wire-worm.*—The Wheat plant, like all others, is subject to the attacks of many enemies. Perhaps the worst of all is, amongst vegetable parasites, what is commonly called black ball, and amongst insects the most destructive is wire-worm. With respect to the former of these, a very old and common practice obtains, as a preventative, of steeping the seed in chamber ley, and afterwards of dusting it over with caustic lime. I have tried the plan for some years, and I must confess that I have no great faith in its efficacy. Some recommend a solution of sulphate of copper as being efficacious, but a friend told me the other day that he has tried this solution, and he is now having recourse to the old practice as being the better of the two. With respect to wire-worm, the grub of the May beetle, I believe the best application that can be made to check its ravages is about 4 cwt. of salt to the acre. In conclusion I will just refer to some experiments that were made a few years back by Professor Buckman, taken from the Royal Agricultural Society's Journal. They are instructive. He says—"I planted four plots of Wheat in the following order. 1, much diseased Wheat without pickle; 2, much diseased, treated with sulphate of copper; 3, perfect picked seed without pickle; 4, perfect picked seed, with sulphate of copper. The results were as follows:—Plot 1, much of the seed germinated, but the crop was much blighted both in straw and grain, in fact scarcely a perfect ear of the latter; plot 2, a very small quantity of the seed germinated, the few resulting ears were free from blight; plot 3, germinated, with a good and clean crop; plot 4, the same result as plot 3." From this it appears that the produce of the perfect picked seed without pickle was equal to the produce of the perfect picked seed which was pickled. At the same time the result shows the efficacy of sulphate of copper in destroying the germs of the disease, for in plot 2, which was diseased seed pickled, the few resulting ears were free from blight.

CIRENCESTER WATER.

[Professor Church, of the Royal Agricultural College, here applies some of the truths conveyed in his letter "On a Gallon of Water" to the circumstances of the neighbouring town.]

In continuation of last week's letter I now proceed to give a condensed account of the results of the analysis, chemical and microscopical, of some of our town waters. That my meaning may be quite clear, such details as are not necessary for the present purpose will be omitted, but at the same time I must introduce for comparison a few analyses of the waters of our immediate neighbourhood.

In order that my remarks may illustrate the present condition of our wells, I collected samples, last Wednesday week, September 28, from three of our chief sources of water. One of these, from the steam pump at Thames Head, was obtained to serve as a standard of comparison, the other two were from the town pump in Cirencester Market-place, and Bowly's pump in Watermoor Road, respectively. From previous analyses, as well as from observations at the locality, I consider that the Thames Head water is free from objectionable contamination: it is moreover a type of the deep-well waters of the district in their natural condition. The temperature of the air when the town waters were collected was 64° Fahrenheit, when the Thames Head sample was obtained, 62°. The temperature of the Thames Head water itself was 59°, that of both the town waters 55°. All the waters were perfectly clear, free from suspended matter or microscopic organisms, and when viewed through a depth of 2 feet undistinguishable in colour from the pale bluish tint of pure distilled water. But on the more exact examination which chemistry suggests, differences in the three samples came out. We now proceed to compare the waters in a few particulars:—

	1. Thames Head.	2. Market Pump.	3. Bowly's Pump.
I.—Total solid residue in grains per imperial gallon ..	20.30	22.68	38.36
II.—Loss on further heating of this residue	1.54	2.52	1.68
III.—Chloride of sodium or common salt	1.64	2.27	4.80
IV.—Nitrates ..	traces	marked traces	considerable quantity
V.—Ammonia salts ..	none	traces	traces
VI.—Organic matter ..	traces	traces	marked traces

The above data are sufficient to show us that, while the two first, if not all three, water supplies may be safely assumed to have a common origin, the water of the market pump is slightly contaminated, and that of Bowly's pump considerably contaminated with products derived from animal refuse. Taking the analytical facts here published, and numerous others, into consideration, we may, I think, regard the market pump as a fairly good water, not wholly free indeed from contamination, but not revealing on its examination conspicuous evidence of danger in its use as a drinking water. The case is otherwise with Bowly's pump. Here the suspicions caused by the nearness of a graveyard are confirmed by the marked increase in nearly every item in the above analysis, indicating distinct pollution. It is unnecessary to go over these items in detail; last week we stated how chemists interpret these indications, we now content ourselves with pointing out that any wide departure from the standard of water No. 1, especially so far as regards the items marked iii., iv., and v., involves something more than a suspicion of impurity.

Before we turn to the consideration of some of the other water supplies of Cirencester, let us examine a few wells in the neighbourhood. Here are, first of all, some waters which are entirely or nearly free from organic contamination; the solid residue in grains per gallon (of 70,000 grains) is given together with the loss suffered by this residue on being strongly heated, and, in two cases, the amount of common salt.

	Dagling-worth.	Seven Springs.	Stroud.	Boxwell Springs.
Solid Residue	16.71	18.33	23.50	26.30
Loss on further heating ..	.95	.83	1.34	1.28
Common salt	..	..	1.35	1.40

With these materials for comparison before us we may profitably study a few of the other waters of Cirencester. If we find a water exhibiting more than 30 grains per gallon of total solid dissolved contents, more than 2 grains of common salt, and more than 2 grains of matters volatile at a red heat, we are compelled to regard it as suspicious. If further it contains ammonia salts in abundance, as well as several grains per gallon of salts of nitrous and nitric acids we have further cause for anxiety. When in addition we find a brown or yellow colour, suspended matters, or a milky turbidity, microscopic organisms both animal and vegetable, bad odour and taste, and last of all phosphoric acid, then the water is most probably injurious, at all events is unsafe, and may be deadly. Of waters of this class the following are examples:—

	Pumps in		Private Wells in Dyer Street		Well west of Railway Station.
	Sheep Street.	Gloster Street.	a	b.	
Solid residue ..	76.41	52.76	69.72	101.71	69.90
Loss on heating this ..	9.02	4.40	5.46	12.32	6.72
Common salt ..	10.14	8.45	8.56	8.55	6.36

It is scarcely necessary to give further details concerning these and many other similar waters in different parts of the town, but it may be briefly stated that many of them unite the largest number of disagreeable indications possible. We might, for instance, have spoken of the various nitrogen compounds which are present in these waters, and ought not to be; some containing complex decomposing nitrogenous matters in abundance, some large proportions of nitrites and nitrates. The average amount of these ingredients fluctuates considerably, depending closely upon the varying condition of the cesspools. But that they afford valuable indications of the quality of a water, and the causes of its contamination, will be evident from the following example. The waters of three neighbouring wells in Lewis Lane were sent for analysis without any memorandum as to their relative position. When the examinations were concluded, it became evident from the relative proportions of nitrogenous organic matter, ammonia salts, nitrites, and nitrates, in the three samples respectively, that one of them must be very near a cesspool, another a little further off, and the third at a still greater distance. When the locality was subsequently examined, the anticipations resulting from the analyses were exactly realised, and the cesspool was found in the position indicated. The nitrates, into which all the nitrogenous matters often pass, amount here as a rule to about 5 grains of nitrate of lime per gallon; sometimes however in the worst wells they reach the large quantity of 11 grains, while it is common to find as much as 8 grains. These numbers compare very unfavourably even with the inferior waters supplied to some of our large towns. One wretched sample of a local water actually gave a residue which on heating deflagrated like so much tinder, its nitrates burning up its organic matters! Of such waters as these not one is fit to drink. The pump in the railway station yard gave a water similar to that from the neighbouring pump in Sheep Street; both were remarkable for containing much phosphoric acid. The latter water is just now greatly improved. The well behind a dwelling in Dyer Street furnished a yellowish-brown fluid, which was full of various animal and vegetable organisms, and was positively putrid. Some of the other wells in Cirencester have been partially improved. But it is not sufficient to repair pumps and keep out obvious inflows of impure matters, such as the globules of rancid kitchen grease, which were found in one Cirencester well. The very sites of these wells are too often polluted, and polluted so hopelessly that the great majority of them should be at once and permanently closed. It is dangerous to keep them open with the intention of using their waters only for washing purposes, for which moreover their excessive hardness renders them unsuitable.

It is a relief to be able to refer to a singularly pure water existing, not indeed in the centre of the town, but still some distance to the east of Cecily Hill. It is in a private garden, and when analysed in March of the present year proved to be quite up to the standard of a pure water for this immediate district:—

Solid residue ..	..	21.70	grains per gallon.
Loss on heating this ..	..	1.40	" " "
Common salt ..	..	1.47	" " "

Here we must stop for the present. Were we to give all the data and all the results obtained in studying the waters of Cirencester, we should have to ask for a much larger number of your columns than you could give up to this subject. But in leaving off here we commend the whole question of our water supply to our teetotal friends, who are always urging us to drink nothing but a liquid which they are pleased to call water, but which in too many cases is a deadly beverage,—a liquid clear and bright it may be, but still sewage only partially purified.

A. H. Church, Royal Agricultural College, in the "Wilts Standard."

ON COOKING.

To make Lean Meat Fat and Tough Meat Tender.

Whoever has visited a sugar refinery must have observed the manner in which the syrup is boiled *in vacuo:* the water rises in vapour at a temperature much below that of boiling water in the open air, and consequently the syrup does not behave as it would if boiled in the open air.

The boiling point of water in the open air is about 212° Fahrenheit, and if we take the boiling point of the fatty oils at from 600° to 700° it will be clear that if a piece of beef could be immersed in melted suet it might be easily subjected to a temperature of some 300° or 400° above that of boiling water, without being either burnt or scorched by the process, and with all its native juices retained, whereas, if a joint of meat is boiled in water, the stock or broth will be enriched, and the meat impoverished. I may remark in passing that cooking in oil or melted suet is dangerous, from the liability of the oil to take fire if carelessly handled, but it has other good properties as a set-off against this risk; and one is, that the cooking does not waste the oil as it would waste water, for as the oil will not need to be heated to the point at which it would rise in vapour it may be used time after time for the same purpose. Mr. Farrel, my kind friend and fellow servant, was chief cook at Alton Towers, and had been educated in the kitchen of Louis Philippe, of France, and was, moreover, the son of an eminent cook and confectioner in London, and it is to his kindness that I owe the information I am about to communicate. I got for experiment, by Mr. Farrel's orders, a long piece of very inferior beef, it might be about 24 to 30 inches long, and only about 6 inches wide, and from 1 to 1½ inch thick. Now had this leathery joint been boiled in water it is clear that all the goodness must have boiled out of it before it could have been eaten, on account of its inherent toughness. Not so, however, when the joint was put into the hands of one who had studied the subject; he rolled the ungainly piece quite tight, tied it firmly in a cylinder-shaped lump, and had it cooked in melted suet in a pan only a little larger than itself, so as not to use more oil than was necessary, and instead of any of its own goodness leaving it, it certainly improved by the suet, herbs, and spices in which it was cooked, and when done proved to be as tender as a chicken, having been subjected to a fearful heat. Here, then, is a case where the skill of the cook converted into good food for man an article but one degree removed from what might be given to the dogs. In the higher branches of cookery recourse is constantly had to larding any article that is deficient in fat, and the lean piece is made to bristle with the quill-sized pieces of fat bacon inserted by means of a needle, thus showing the need that some joints have of fatty substances added to bring them up to the standard. We read of the martyrs suffering a refinement of cruelty by being thrown into a cauldron of boiling oil, and this, too, shows beyond all doubt that the fiends who planned this torture knew the intense heat that oil would bear before it would rise in vapour. I mention this to show that although syrup may be boiled *in vacuo* in a sugar refinery, in a kettle half an inch thick, of copper, at such a heat that I might touch it with my finger, and although water in the open air will only heat to 212°, these cases of boiling bear no relation to that of oil; but if we take the case of lead, and when we see it melted in a lead-ladle or iron pot, it will be evident that the iron is at a dull red heat before the lead will melt, and the melting point of lead is about 600°. So that a very good idea may be got of the intense heat of oil when applied to flesh, by the dull red-heat of the iron that melted the lead; thus bringing forward the chemist to confirm the practice of the cook.

The Grecian heroes were wont to praise the "tough bull hide," of which their war shields were made, but our concern now-a-days is with the flesh of both bull and cow, tough, indeed; for the cow, with all her motherly associations of happy homes, &c., must come to the shambles at last; and woe betide the hapless wight who hopes to make a good Sunday dinner from any joint of her carcase. And the same may be said of the tough ewe mutton, where the venerable mother ewe has been got into marketable condition on soft food. The offspring of the said cow and ewe are the high-class beef and mutton for which John Bull is famed, but as the breeding stock must sooner or later leave the farm for the shambles, disguised it may be as fat beasts, but still by no means tender, it will be well if the resources of the scientific cook can be made available to make lean meat fat at the last moment, and tought meat tender.

The art of cookery seems to lag behind other branches of domestic economy; the very washerwoman has her wringing and washing-machines, which not only does the work better now than formerly, but has quite altered the nature of the work, so that washing is not now the drudgery it used to be. Hogarth has immortalised the table cookery of his time, by sketching the struggles with a tough bird to get it carved and eaten, and things do not seem to have improved much since he caricatured them; indeed, the difficulty must annually be repeated, for if we take the case of an old pheasant cock brought to the spit in the first week of September, we have no means, short of roasting to a cinder, to bring the flesh of such a bird to a state fit to be eaten; whereas, by the process of cooking in fatty oil, in an oval pan little larger than the bird, I have seen the old cock made tender enough to satisfy the epicure. The toughness of the flesh of domestic poultry is notorious, and the number of cases under that head is not to be calculated; even the fair flesh of the delicious Turkey has a drawback in the hard brown legs, that require to be "devilled" before they are made tender.

No subject is likely to give greater offence than this in the very quarter where it is most needed; I will therefore conclude by clearing myself of all blame in the affair. I have given the author's name, and can only be blamed for "telling the tale as it was told to me." *Alex. Forsyth*, 9, *Islington Square, Salford.*

CATTLE LITTER.

THE scarcity of hay forces us upon the use of straw, and the increased value of the latter article leads one to ask, where is the bedding to come from? and in the absence of the bedding, we may say—what about the manure? In time of scarcity like this, it is certain every ounce of straw ought to pass through the stomach of the animals, and in agreements where it is covenanted that straw shall be consumed upon the premises, it is a question whether that rule might not be relaxed upon condition that if straw were sold an equivalent in artificial manure should be brought upon the premises. Scores of corn land farmers have more than they can consume in the manner proposed, and possibly they may neither have the capital, convenience, nor inclination to buy in stock and artificial food so as to consume the straw. Profitable feeding requires careful housing, and cattle-sheds cannot be extemporised by a tenant-farmer for one season's use, nor would they be profitable if they could. Of substitutes for bedding, or rather for straw, we have in some parts of the country Fern, and tree leaves as soon as they being to fall. The former is excellent so long as the cattle do not eat too much of it, as if so they are liable to become lousy; and as to leaves, they are quite unexceptional, as they form the finest manure that can be had. Then a friend who has resided in Italy for many years points out Twitch as a capital substitute for straw, either as food or litter, and he assures us that, washed and dried, it forms a food that animals are especially partial to. For years past we have used Twitch tea as a diuretic, and we know that an infusion of it simmered for an hour or two in water, is scarcely less soothing or grateful than barley-water. We have, therefore, good reason to believe that clean Twitch would be found a grateful article, if dried, to most herbiferous animals, and from the saccharine matter which it contains we believe that chopped or steamed, or boiled, it would form a steep for coarser food that most animals would gloat over. In these remarks, we are, of course, speaking of the roots of Twitch, not of the grass or hay made from it. So confident was our informant, an experienced horticulturist, upon the use of Twitch for feeding purposes, that passing some fields where the crop was unusually abundant, he expressed it as his conviction that it would pay to take up, clean, and house for the purposes we have mentioned. An experiment upon a small scale would not be difficult, and if anyone will take a handful and make it into tea the truth of our remarks will soon be made manifest. Kiln-dried, or malted, Twitch is sold by most druggists, and used as a remedy for lumbago and other urinal ailments. As bedding there can be no objection to Twitch, as the fermentation on the dungheap will quickly destroy its vegetative power. As we have mentioned many times before in these columns, Mr. Harold Littledale, of Liskeard Hall, who keeps a dairy of about 100 cows for the supply of the Liverpool milk market, never uses any bedding, nor do the animals even leave the stall. They lie upon a paved floor, which is washed perfectly clean every morning, and then sprinkled with sawdust. No cows can be more clean and healthy than those are. Mr. Mechi keeps all his stock upon sparred floors, using little or no bedding at all, and the same practice is followed by many of the Aberdeenshire farmers.

Another article in which we have great faith at all times, but especially in those of scarcity, may be mentioned, and that is Gorse. Chopped and bruised, the cattle eat it most greedily. At one time we had a cart-mare who was so found of Gorse, especially in the winter season, that she would take it in preference to her corn, grinding up pieces of woody matter as thick as a finger with the greatest avidity, the blood running from her mouth all the time. Taken when not of more than two seasons' growth, chopped, crushed, and mixed with other food, we believe Gorse to be as good a food as can be given to animals, and especially healthy for them in the spring season. For many years we used it chopped with Vetches, Clover, and Lucerne, with the most satisfactory results. *Northamptonshire Guardian.* [See also Lord Clinton's letter at p. 1227.]

Home Correspondence.

"Worthing" and Agreements. — Who told "Worthing" I confined the lime to the last eight years of the lease? If he had learnt his lesson before he began to ask questions, he would have known that the farm he refers to had, during the three years previous to its proposed letting, received several thousand pounds' worth of lime and other artificial manure. If "Worthing" wants to discuss the question, suppose he turns back to p. 903 of your paper for July 2, 1870, and after reading my remarks there on farm agreements, let him put on the gloves, and ask me any questions he pleases. When a man begins to argue and ask questions about an article he has never read, he only injures his own reputation in the minds of his readers, leading them to suppose him a man of no understanding, when he may very probably be a man of sense, education, and intellect. *G. A. H.*

Utilisation of Sewage.—Permit me to record in your columns, for the information of towns and cities which have not yet utilised their sewage, the most successful and perfect instance I have hitherto seen. The farm of Mr. W. Hope, at Hornchurch, about 3½ miles from Romford, in Essex, receives the whole of the available sewage of that town, containing about 8000 inhabitants, which is conveyed to the farm by an iron underground pipe 18 inches in diameter, and is there raised 20 feet high, 700 gallons per minute, by a centrifugal pump worked by an 8-horse power engine, having two boilers and consuming 15 cwt. of coal per day. The town of Romford pays the cost of pumping. Mr. Hope pays to the town £3 per acre rent for the land and, in addition, 2*s.* per head for each of the inhabitants using the sewer, which adds £6 per acre to the rent. The farm is of 121 acres of light and poor gravelly soil, which had previously ruined several tenants. Last year 600 trees and an immense length of great fences were removed, ditches and nine ponds were filled up, the land thoroughly under-drained, at a cost of £4 per acre, each drain at an interval of 150 feet; the land levelled and formed, by aid of theodolite, into rectilinear beds of uniform width, each bed or stetch 30 feet wide, slightly inclining from its centre, along which the sewage is applied, and the supplying troughs so regulated by scientific levelling that, while the flow of sewage is sufficiently supplied, there shall be no scouring, but an easy and gradual distribution over every portion of the land. Roads are so arranged that free access may be had by horse and cart, or by steam plough, to every bed and crop. The whole arrangements appear to me to be most perfect, uniform, and business-like. Steam cultivation is contemplated. All the sewage is absorbed by the soil, and passes through it to the drains, issuing from them as clear as any pump water. I tasted some, and found it pleasant and drinkable. In summer and dry weather the drainage water is allowed to pass into the pump well, to dilute the sewage, and is again spread on the land. The sewage passes to the pumps through half-inch gratings, and flows inoffensively along the open troughings, having the same appearance as London sewage. It makes one wonder what all the hubbub has been about as to the dread of town sewage, for it is infinitely less offensive than the ordinary farmyard or town manure, which is abundantly used on the adjoining lands worked as market-gardens. Some idea of the fears of Parliament on this subject is given by the fact that the Metropolitan Sewage Company were forbidden to put any sewage on the land within two miles of the river Lea, while its very banks might be covered with an unlimited quantity of London dung, or any number of sheep or cattle. It is only when town sewage is allowed to stagnate for a long period in tanks that it becomes so offensive. In this case it only remains in the tank during night, or from Saturday night until Monday morning. But let us compare the condition of this farm now and formerly. Then three men and two boys were employed; now from 35 to 40 persons are regularly employed, with 16 horses. The crops are enormous and frequent. Each crop receives from five to seven floodings of sewage. The minimum value of each crop is £20 per acre, and, as many are perfected in from two to three months, the total value is very considerable. While the surrounding farms and market gardens have proved disastrous, owing to the excessive drought, here the crops have been and are now most abundant and luxuriant, consisting of Cauliflowers, Cabbages, Potatos, Onions, Parsnips, Carrots, red and Silesian Beet, Long Red and Globe Mangel, and other vegetables. A crop of Barley sown in July after Lettuce is in full ear; Italian Rye-grass already cut five and six times; but the most remarkable is a crop of Maize or Indian Corn 8 feet high, as thick in the stem as a mop-stick, with gigantic ears formed and about piercing the sheath. Mr. Hope expects to ripen them, but this I doubt. In the meantime as cattle food the crop is worth £20 per acre, for horses and cattle are greedily fond of it. It seems difficult to realise the fact that great crops of various kinds should be gathered within 10 to 12 weeks after sowing or planting, while those in the neighbourhood are languishing or perishing for want of moisture. With sewage, sowing and transplanting become a certainty in result. Mangels transplanted in July were a fine crop. I weighed Cabbage 20 lb. each, and Mangel would considerably exceed that. It is a remarkable fact that not a single Mangel in many acres had run to seed. Specimens of these crops will be exhibited by Mr. Hope at the Smithfield Show. On these sewage farms the weeds grow three times as fast and as large as on the unsewaged. The moment a crop is removed, the land is scarified, the weeds removed, the land double or trench ploughed, flooded with sewage, and immediately planted with a new crop. We thus see within 12 months a wretchedly poor farm converted into a most luxuriant garden, its fertility ever increasing, multiplying food and the employment of labour concurrently, and extracting a money value from that which is now, in too many cases, poisoning our streams. I could not avoid being struck by the healthy appearance of the engine-driver, who may be said to live 10 hours daily in a sewage atmosphere; so it was with the engine-driver at the outfall works which I recently visited. The laying-out and general arrangements of this sewage farm must afford a most profitable example for those who have not had experience in such matters, and the public are indebted to Mr. Hope for the liberal permission to inspect this farm (after proper application to him), thus giving the benefit of his great experience in this sewage question. I send you a specimen of the Indian Corn. *F. J. Mechi, Tiptree Hall, near Kelvedon, Essex, Oct.* 7.

Drought and Trees.—I observe that at the annual meeting of the Society at Leamington, Mr. C. N. Newdegate, M.P., amongst other remarks made the following statement:—"But when Mr. Horley says, 'Fell more of the hedgerow timber,' I must call to his attention the admitted fact that in the counties where there is the least hedgerow timber they have suffered most from the drought, and that it is an ascertained fact that in Egypt there were no showers about Cairo till they planted rows of Poplars." Some six weeks past I received a letter from a friend in the neighbourhood of Windsor, complaining of the excessive drought, and I think he stated the deer in the forest were being fed on boughs of trees, &c., and owing to the drought the hay crops were a failure; everything, in fact, suffering from rain. Having lived in that neighbourhood for some years, from personal knowledge I believe few places can boast of such an extent of wood and hedgerow timber. Small fields are, or were, the rule from Windsor to Wokingham. It would appear that wooded parts of the country have suffered equally with the open fields. *Taunton.*

Thin Seedings of Wheat.—We have so many disciples of the advocates of thin seeding in these days of agricultural inquiry, as to make it desirable, if not necessary, to put our farming friends upon their guard. Thin seeding can only be "permissible" upon lands under the highest order of culture and good farming, or under some especial order of management, free from insects and vermin. To adopt universally the thin seeding of some of our farming empirics would entail very heavy losses upon the farming community and the country. To profess to seed many of our poorer soils and lands subject to loss of plant, at the rate of 1 peck of Wheat per acre, is to me a gross absurdity—an unreasonable fallacy. Farmers, good common-sense farmers, will not be thus led away; but still the idea will suggest itself—"If others can obtain surprising crops from 1 peck of seed per acre, it is unnecessary for me to sow my usual quantity:" hence the necessity of caution; "Let well alone" is a trite and applicable proverb here. It is, however, a subject worthy of the gravest consideration. "Thick seeding" is seldom requisite—close observation, good judgment, and matured experience are the best guides. Very much depends upon the state and condition of the soil, its site, its climate, and the mode of its preparation for the Wheat crop; good mild loams, if properly ploughed, require very little further preparation than the requisite harrowings. The seeding on these lands need not be excessive; from 6 to 9 pecks per acre is amply suffi-

cient. Heavy loams and clays require more working; they should be broken up immediately after harvest, and a succession of scarifyings and harrowings should be given, not only to aid in fertilising, but in the destruction of the slug and the insect and grub tribes, which infest these soils after the spring cropping, particularly of Beans and Peas. It is customary in many districts to proceed with the drilling after these scarifyings and other workings, but this is doubtful economy; ploughing is, in the majority of cases, to be preferred, —by it the land is all rendered more agreeable for the reception of the seed, and many seeds of weeds are effectually buried, besides, on many lands, the trampling of horses must be prevented in a wet season, which is done by ploughing into "lands" to fit the drill at a round, the horses walking in the furrows both in the harrowing and drilling. The harrowings are regulated by being attached to a pole across the "land." There is a very important point to be taken into consideration in the seeding of Wheat, *i. e.*, the variety to be sown. If the variety to be sown is of very free tillering properties, then certainly a thin seeding might suffice. The Golden Drop Wheat, for instance, is remarkable for the many tillers it will throw off in the spring. The Velvet Chaffed White will throw out many tillers. As a rule, the slow-growing varieties are the most prolific in tillers. Another important point is the size of the grain. Of course, the smaller the grain the more seeds in a peck; hence such varieties may be more thinly sown as to measure than the larger grained varieties. After all, the farmer's judgment must decide. If the land works kindly, and the season is suitable, put in the smaller seeding; if difficulties occur in the working, and the season is untoward, by all means give a thicker seeding. *O. F.*

Paterson's Bovinia Potato.—I received 10 lb. of these Potatos last spring, and planted them in the usual way on a piece of ground 22 feet by 6 feet. I took up and weighed the produce the other day—178 lb.; some of the tubers were very fine, weighing from 3 lb. each downwards. If the result of 10 lb. producing 178 lb. is anything out of the common way pray publish it. *John Marshall, Gr. to A. Worthington, Esq., The Mount Gardens, Whitechurch, Salop, October 13.*

Good Butter.—Good butter greatly depends upon being washed in several waters till all the butter-milk is taken out of it. The other necessity is salt. I have eaten butter, thus made, sweet and good ten days, or more, after it has been made. I have eaten as good butter from cows fed in winter on Swede Turnips as from grass-fed cows. The recipe to remove the Turnip taste is a spoonful of nitre to a pint of hot water, which is to be added to every gallon of milk at milking time. A little oilcake should be given to cows in milk in winter time. *W. F. Radclyffe.* [It is better to remove the milk by patient hand kneading with a cloth than by washing. Turnip or other aroma is best removed by heating the cream before churning. Let it float in a tin vessel for half-an-hour in a boiler of hot water, stirring it frequently.]

Societies.

CIRENCESTER.

The Cultivation of Sugar-Beet.—At the last meeting of this Chamber, Professor CHURCH, of the Royal Agricultural College, introduced this subject, saying:—

In 1869 there were 300,000 tons of beet-sugar manufactured in France, at £25 per ton. This represented in that country alone about 7½ millions sterling. Then it must be remembered that in the manufacture of beet-sugar we have a certain amount of molasses—of sugar which cannot be got into a crystalline state, but remains as a rough kind of treacle, which may be made into spirit by fermentation. This molasses may also be made use of for feeding cattle, a plan already adopted where distilleries have not been established. These molasses, although not very pleasant to the human palate, are acceptable to the palates of many animals, and produce remarkable results in fattening. The value of molasses, which would correspond with the 300,000 tons of beet-sugar produced last year in France, would be about half a million sterling, as it would be about 100,000 tons, valued at about £5 per ton. Beet-sugar is now grown from the Caspian to the Atlantic, and from Austria to Sweden, but there is an objection urged against it. Economists urge that its cultivation would interfere with the amount of land devoted to grain and grass. The production of sugar is considered by many persons to have injured the people of Jamaica, where it is largely cultivated. It is found there are drawbacks where the sugar is turned into spirit, and not crystallised. In England there would be a counterbalancing advantage, namely, that some portions of our rural population, who are not regularly occupied during the whole year, will have a means of steady employment during the winter months, during which at present they often lack work. It will also favour the development of many ingenious contrivances, facilitate enterprise, advance science, and offer, in fact, a new field for industry and capital. The increase abroad has been enormous. In France in 1827 there were 29 factories, in 1860 there were 336, and I cannot say how many there are now, but it is stated that there are more than 600. It is well known there are 500 distilleries of beet-sugar. The produce of 1869 was more than 611,000 tons of sugar. To show that beet-sugar has arrived in England as an ordinary commercial article, I may state that in 1867 it cost this country £1,600,000. We import what we could make better ourselves, and so displace less favourable crops, both as regards the capital and labour now employed. Distilleries in England have been established, but I have only heard of seven, four being in the neighbourhood of London, one at Mr. Campbell's, at Buscot, and two others. I am speaking now of distilleries.

The next point I wish to draw your attention to is the different sorts of Beet. Without going into the botany of the subject, I may say that there are a great many varieties even of the kind known as Sugar-Beet. These varieties go under various names, and many are slightly distinguished one from another. There is a kind called Silesian, and that is one of the earliest places where it was cultivated, but of that there are a great many sub-varieties. Then we have the Imperial Beet, which was a great favourite in France, and I suppose it will now be called the Republican; besides several other sorts. However, it is necessary, before we settle on any kind, to try a few experiments with the various sorts of Beet—to make comparative experiments for several years.

The question of the soil is one of which I shall speak presently, but there is no doubt but that it must be in a fine state of division. It must be free from stones. Mr. Church here produced an illustration of the effect of a stone found in the upper layer of the soil, which, by being under the root, had considerably diverted its growth, and said that the presence of such small stones exercised a most prejudicial effect on the amount of sugar in the root. The shape of the root is another point of some importance. The root should not be necky, neither should it be forked; and although the forked root exhibited contained a fair amount of sugar, the forks would be in the way, and you would lose a certain amount of sugar by bleeding in such a root; therefore it was important that the root should be a shapely one, and have no such branches. Another thing is the proportion of leaf to the root. The smaller the leaf in comparison to the root the greater the proportion of sugar, that is supposing your root attains a fair size. The proportion of root to leaf in some he had tried was 100 to 180, 190, and 202—say on an average 100 of root to 200 of leaf. The root produced was very small in proportion to its leaves, and it only contained 8½ per cent. of sugar, while another, in which the proportion of leaf was not so great, contained 12. The mode in which the leaves are wrinkled is also to be noticed, as when producing sugar the leaves seem stunted in their growth. The flat green part is developed, but not the stems and midribs. If in the centre, instead of the leaves being thrown up they are in a compact mass, and if they are found to be rumpled, I believe those who watch the Sugar-Beet will agree with me in considering that there is a good quantity of sugar present, of course supposing other circumstances to be favourable. Another thing is as to the weight of the root which contains most sugar, and is also most profitable to work. Two pounds is a fair weight, but 5-lb. Beets have been grown which have produced a good amount of sugar. You can grow as small a weight as 1 to 1½ lb., but it is usual to have them from 2 to 2½ lb. as an average, and some consider even higher weights than that suitable for an average. These roots should sink in water. Many other roots do not sink wholly in water, but the specific gravity of these roots is very high. In Austria the average is only 10 tons per acre; in Prussia, 14; in France, 12; but in 1805 it was only 8. Chaptal succeeded in growing 8 tons per acre, Dubrunfaut grew 10 tons, while Dr. Sace grew 16 tons, and he gives it as his opinion that 16 was about the average in his time; while last year in the department of the Seine, an agriculturist succeeded in getting 38 tons as an average, and that also was the average of the several farms in the commune in which his farm was situated. Another succeeded in obtaining 38 tons in Germany, where the methods of cultivation he advocated were carried out. In the experiment reported on by Sir R. Kane, in Ireland, the quantity was from 16 to 40 tons. It was also found that the amount of sugar was in many cases about 16 per cent., whereas that of the Sugar-cane amounts to only about 17. It is said, however, that it costs 22*s.* more per acre to grow Beet than to grow Wheat.

We have next to turn to the facts about its cultivation in England, or rather to the points which we ought to consider in speaking of its cultivation in this country. As to the suitability of the climate, it may be said that nearly the whole of Ireland is capable of growing Beet, only the season of sowing and harvesting must be carefully adapted according to temperature and the other conditions of the place; you should know what time to put it in, what sort to sow, and all other things, such as manuring and the manner of cultivation; and if you take special pains there is hardly a doubt but that Beetroot may be profitably grown. A moist climate and a moderate amount of sun, both of which conditions our English climate usually fulfils, although in two or three seasons we have had a very high temperature and a serious deficiency of rain—such a climate, in fact, as we possess is very suitable for the growth of Beet. An amount of sun, too, not very continuous and powerful, will suit better than a brilliant powerful sun and hot air. It must not, either, be submitted to severe cold or serious drought. Still it has been grown nearly at the Arctic Circle—from the Atlantic to the Caspian Sea, so the range of this root is considerable. It does not rot if submitted to freezing point for a short time, but if allowed to remain for a considerable time at a temperature below freezing, it will, on thawing, become rotten. England is a better Beet climate than the greater part of Belgium, and I know that part of the difference may be due to the fact that the agriculture of Belgium is not of that thorough character which is becoming general in England.

There can be no doubt that the higher kind of agriculture required for Beet will tend to raise agriculture generally. The necessity for a fine tilth of soil will have an ameliorating kind of effect, and force farmers to do more than they have hitherto done. There is another point I want to speak upon, and it is, not the variety of root, but how you can tell if the root is going on well. Roots must not appear above the soil; they must not be exposed to the air and light. It depends in great part on the variety you grow, but if the Beetroot experiences great resistance, if it cannot be developed regularly, it is raised out of the soil, and if you get a root parched and disfigured the less sugar you get. If you cut off the top layer of a root exposed to the air, you find only 5 per cent. of sugar; the next inch will contain 6½ per cent., and so go on perhaps up to 18 per cent., the average of which will be only 10. With reference to the soil, pure chalk does not answer; nor chalk mixed with a little marl, clay, or sand. It must not be poor or sandy. A mixed soil, not too easily dried, answers best; and a heavy soil which is finely worked is better than one which has too much gravelly matter in it. It is also essential that there should not be a large quantity of alkaline matter in the soil. This is found in marine localities, so such are not fit for the growth of them, for in extracting the sugar you get a bad quality; but if only for manufacturing spirit the presence of a little salt is not important. It is found that on many soils, liming, marling, or the application of burnt lime confer great benefit, and cause a larger quantity of sugar to be obtained. I may say that deep ploughing is considered a *sine qud non* in most soils, and that the manure, if you intend to cultivate for sugar, should not be put upon the land immediately before the land be sown. If you intend to get spirit we need not consider this difficulty. All, however, must be ready by about the middle of April. The French directions are to plough in before winter about 16 or 20 tons of farmyard manure, and in the spring use 16 cwt. of rape cake. If the tops are used as manure, as they should be—used as food and then returned to the land—they will be worth about 33*s.* per acre. A 20-ton crop of roots will have about 15 tons of leaves; it may only be 9, but anyhow I think we may say 12. The following figures show what most important mineral matters 20 tons of Sugar-Beet roots remove from an acre:—Potash, 180 lb.; phosphoric acid, 50 lb.; magnesia, 32 lb.; lime, 22 lb.; sulphuric acid, 18 lb.; and of nitrogen, 67 lb. Fifteen tons of Sugar-Beet leaves remove from an acre 840 lb. of mineral matters; while 20 tons of their roots remove 368 lb. Now these constituents, with the exception of the nitrogen, are solid mineral earthy matters, which the plants get from the soil. They could not be got from water nor from the atmosphere. Now a Wheat crop of 35 bush., at 62 lb. per bush., will take away from the land, not 180 lb. of potash, but only 12 lb., and only 18 lb. of phosphoric acid, so that altogether a Wheat crop of 35 bush. only takes from the field 39 lb. of mineral matter, if the straw, &c., be returned. Beetroot has been cultivated four or more years in succession, and the result is that the price of potash has gone up. If you take 180 lb. of it every year, you will of course want to put something more in the soil, consequently the effect is that the sulphate of potash is dearer; and it is found that without some kainite the desired crops cannot be obtained, therefore there must be a great loss some day if the potash is not restored. If you make sugar from Sugar-Beet, you get bone black for purifying the sugar. This contains lots of phosphates, and after a time it will not purify the sugar, and you are obliged to put it on the land. The worn out sacks, also, which become thoroughly rotten after a time, may, by suitable treatment, be converted into a brown powder, and this is applied to the land, being rich in nitrogen. Then there are the ashes from the furnace, and the scrapings of the roots, which are returned, and the distilled liquor waste, which contains three-fourths of the 180 lb. of potash, so that you get back nearly all the potash you have taken from the land. There is again the manure from the animals which have been fed upon the leaves and pulp; return that, and you return all. Therefore, you may send out any quantity of sugar or spirit, for so long as you return the mineral matters through the bodies of your farm animals, you have your potash and phosphoric acid returned. The sugar and the spirit are made from atmospheric food alone, though by the agency of the soil; and if you send out these alone, you do not send away the richness of your land. Saline matters and many other

manures are bad only if you want to make sugar and not spirits. During the last six months 8 lb. of salt have come on every acre in the Cotswold from the Bristol Channel; we find from the rain-water which falls 8 lb. per acre of common salt. During the winter we shall possibly find we have 70 or 80 lb. per acre more.

With reference to the seed, I may say that we should have a good strain, and a large number of moderate-sized plants. Seed may be sown from April 1 to early in May, being soaked in water, previous to sowing, for 24 hours, and then rolled in fine bone black; and 1 acre should have 21,500 Beets at least. Some recommend 12 inches between the drills, and 12 between the rows, others from 12 to 18 inches; but according to the seed, climate, purpose and soil, the distances between the roots must be regulated, as enormous differences do arise from the contiguity of plants one to the other. Plants, 12 inches apart in the rows and 9 between them, would probably yield about 30 tons. The soil of the College experimental plots is not very deep, and has not been manured for four years, and has grown roots which as to size are not to be despised. The following calculation may be interesting, as it shows what 100 lb. of Beetroot (crop of 1870) contained of sugar at successive periods:—August 10, 8.70 lb.; August 24, 9.20 lb.; September 7, 9.77 lb.; September 21, 1048 lb.; October 5, 12 lb. And we shall doubtless have at the lapse of another fortnight 13 or 14 lb. of sugar from the same quantity. After the frost has been, I intend to see what change has taken place in the roots. In France and abroad generally there have been beautiful instruments made for the special purposes of Beetroot raising, one of which is attached to a horse-hoe, and enables one to earth up the roots if there is any sign of their being exposed to the deteriorating influence of the air.

To show the importance of selecting good seed, I need only say that the sugar yield in various roots ranges from 3.6 to 13.5 in 100 parts. In the year 1869 I did not get the same strain of seed, and did not in consequence obtain such a large amount of sugar. There is some difficulty in knowing how the plants progress when growing, but as the leaves ripen we may consider the sugar is formed. If they throw out new shoots and become very vigorous, there is a quantity of sugar appropriated to this use, but it is difficult to know what changes are going on in the root. The easiest method is to take up a few roots and test by rasping them and taking the specific gravity of the juice thus obtained after straining, which ranges generally from 1.07 to 1.078. An unripe root blackens when a knife has passed through it. A mature root, however, under such circumstances becomes slightly pink, and does not blacken. On August 15 I selected a root of white Sugar-Beet at Buscot Park which had not bolted, and it contained 7.9 per cent. of sugar, while one growing by its side which had bolted contained only 6.68 of sugar. Some red Beets were also taken, one of which weighed 2 lb. and another 1¼ lb., the one in this case which did not bolt contained 8 per cent., and the other which had bolted contained only 5.6 per cent. of sugar, thus 2 per cent. was used in throwing up the stem. Sometimes it is the practice to cut off the stems. The preservation of roots is a matter of considerable difficulty. They should be placed in well-aired and well-drained trenches, or fermentation will set in. Avoid injury to the roots, and allow all exceptional moisture to escape, also see that the roots are not injured or scraped in any way. There are many rotations adapted to Beet cultivation, and sometimes two or three Beet crops have been taken in succession, but in such cases all refuse from the manufacture as well as deep culture are required for keeping up the fertility of the soil. The pulp of the Beet has very valuable qualities, and when mixed with other substances forms an admirable food. It is used for dairy cows with great success, and when kept for some time it seems to be easily digested, the rather rough flovour of it when new disappearing. It is recommended to use 50 lb. of pulp, 12 lb. of hay, and 3 lb. of oilcake as food for fatting oxen in France; 1 ton of pulp is equal to from 1½ to 1¾ ton of the roots from which it is made, and this is in consequence of the removal of a considerable portion of water preventing the value of the root from being diminished. Dr. Voelcker agreed with this statement, which has also been made by many Continental authorities. In whatever way the manufacture is conducted we shall have waste liquor, containing much potash, phosphoric acid, and nitrogen, and this must be returned to the land. The tops must be returned as well as the pulp. The sugar and spirit being entirely derived from the air may be sold off the farm without any loss; and the potash and salts are by this treatment returned to the soil.

Discussion.

Mr. Little, jun., said that he could give them a few observations of facts which came under his notice in France. One ton of Beet roots would cost 20 fr., and would produce about 165 lb. of sugar, which would sell at 6*d.* per lb., making in the French market £4 2*s.* 6*d.* The labour for working a ton of roots came to 6*s.* 3*d.*, the duty to £1 6*s.* 3*d.*, or at the rate of about 2*d.* per lb., and allowing 5*s.* for wear and tear, the whole amounted to £2 2*s.* 8*d.* The pulp which came from the ton was valued at 3*s.*, and 5 per cent. of molasses, which went to the distiller's and realised about 6*s.*; which, added to the £4 2*s.* 6*d.*, made £4 11*s.* 6*d.* Allowing the cost of the roots, together with the other sums spent in the manufacture, to amount to £3, they had then a balance of £1 11*s.* 6*d.* on every ton of Beet used. He also visited a distillery, but it was being worked on a different system to that of Buscot. They produced from 1 ton of Beet about 14½ gall. of spirit, which realised at their market from 2*s.* 6*d.* to 2*s.* 9*d.* per gallon. They also had a larger quantity of pulp, which was in a different state to that of the sugar manufactory, as it was not pressed so dry, and was, of course, more valuable on account of its feeding properties. He could say that it was a very profitable investment in France, and they made about £70 worth of sugar from an acre of Beets.

Mr. Edmund Ruck said they were all indebted to Professor Church for his lecture, and as he had had a little experience he could endorse a great deal that Mr. Church had said. In the last week in March, 1869, a letter was published in the *Times* newspaper pointing out the great advantages to be gained by growing Beet in England, and in consequence he went to Lavenham, in Suffolk, in the first week in April, to see some works erected by Mr. Duncan for the purpose of manufacturing beet-sugar. He found there a very expensive and extensive set of buildings and machinery. Mr. Duncan had been giving the farmers in that district £1 per ton for Beet delivered to the manufactory, and the farmers took back the pulp at 15*s.* per ton. The crops raised ran from 16 to 24 tons per acre. In the third week in April he went to France with the object of examining their mode of manufacturing and inquiring as to the profits derived from it. He found that a ton of Beet would yield 20 gallons of spirit, and that the pulp would pay for the manufacture and the interest of the money employed. This spirit would sell in England at 12*s.* per gallon, and the duty here being 10*s.* per gallon there is a margin of 2*s.* per gallon, or £2 per ton. In most establishments on a large scale in France they make both sugar and spirit, and Douai is the great sugar market of France. He was surprised to find that good land was sold generally at £100 per acre in France, but if within 5 miles of a manufactory then the price rose to from £135 to £140 per acre. It was not unusual to cart Beet 7 miles to a manufactory, and if sent by boat on canals it was sometimes taken not less than 30 miles. He found that Beet had in some cases been grown for 15 years in succession, and a yield of 30 tons per acre would give, at £1 per ton, £30 per acre to the farmer and an equal amount to the manufacturer. The Chamber must bear in mind that the pulp will pay all expenses, as well as interest on the capital employed in manufacturing. There are two kinds of Beet principally planted, the Colet Rose, a red Beet, but not the one usually planted in gardens for salad, and the White Silesian, the last-named yielding the greatest percentage of sugar but only about two-thirds the weight per acre of the former. Great attention was required not to allow their Beet to grow coarse, and the only safe way to prevent this is to have the plants very thick on the ground, say in drills 16 inches wide with the plants cut out 8 inches apart. The three principal systems of manufacture are the Champonois, Le Plé, and the Collette. The last much resembles cider-making here on a very large scale, and in the Le Plé system you take out the saccharine matter by applications of hot water. The extraction of the sugar and spirit from the syrup was too elaborate a process for him to enter into. The value of the pulp per ton varies very little in the two systems, but that from the Collette will keep any number of years if properly stored, and the pulp, or cossetts, as they are called, from the Le Plé system, will keep for a year or two. The cost of a sugar manufactory with spirit manufactory combined, and machinery complete, would amount to about £20,000, which would enable them to work up 10,000 tons of Beet per annum. But a distillery, on Le Plé's system, to manufacture 3000 tons into spirit, can be erected, with machinery, for £1600. There is one point in particular to which he would draw their attention: in England we pay our Government a duty of 10*s.* per gallon, so that if you grow 20 tons per acre, and make 20 gallons of spirit per ton, which is equal to 400 gallons per acre, you will pay a tax of £200 per acre. In conclusion, Mr. Ruck observed, it had been proved to his satisfaction from the analysis of Beet grown abroad, and those grown in England, that no country had a better soil or climate than we have for growing them profitably. The idea that a succession of crops of Beet being taken off the land is injurious to it was, in his opinion, a complete delusion.

Mr. Snowsell thought if they received £1 per ton and bought back the refuse at 13*s.* that it could not pay them.

Mr. Smith said they had been told their country was the best for the cultivation of the Beetroot, and superior to France; but be that as it may, it appeared to him that it had been previously tried in England, and was now being tried at Mr. Campbell's, and he believed that the latter experiment would also fail like the rest of them, if they only waited a little while.

Professor Wrightson said they should not go on mere opinions such as had been expressed by the last speaker in discussing this question. They should only consider facts, and base their judgment upon them alone. The relative character of soil and climate in France and England was not the point at issue. The question (which he thought had already been answered by the figures put before them in the lecture) was, can we grow good crops of Sugar Beet? and secondly, Is the quality of the produce good? It appeared to him that both questions might be answered affirmatively, and he therefore deprecated expressions of mere opinion unsupported by facts as to the ultimate success of sugar manufacture in England, or yet of the success or failure of any private enterprise.

Mr. Constable said that, with regard to the value of the pulp, he thought it would clear the minds of many if the Professor stated whether it answered in France for the farmers to purchase back their pulp, and whether the pulp did not return to the soil the mineral food of the plant in its most available condition.

Professor Church said that the value of the pulp must be taken into account both as a food and also as a manure for future crops, and it was generally allowed that it paid the growers of Beetroot to give 12*s.* per ton for the pulp derived from the roots they had sold, not at 20*s.* but at 16*s.* per ton. Numerous opinions had been gathered together, but he could only say that one of their best authorities, Dr. Voelcker, gave it as his opinion that pulp was a cheap and valuable food, and a good substitute for roots. At that price, and even at a higher figure, he (the speaker) had no doubt that the refuse of the manufactories would command a ready sale in England. As to other points, he was convinced that all former failures had been owing to financial mistakes, or to mistakes in the processes adopted, and not to defects of climate or soil. He was certain that they had as good soil and climate as any other part of Europe. He had not in his remarks entered upon the monetary aspects of the case, and his chief reason for not doing so was because the farmers could answer for themselves; for if they can grow 20 to 30 tons on an acre, and sell them at 16*s.* per ton, and buy back five or six tons of pulp at 12*s.* for feeding purposes, they secured not only food for their cattle, but manure for the soil, and a fair profit as well. The greater part of the potash, too, was in the farmer's own hands, if they returned the waste products of the sugar or spirit manufacture. The whole subject, being new, demanded great consideration, and he had left unnoticed many matters connected with it, for had he even attempted to discuss them he would have occupied the Chamber six or seven hours instead of one.

DEVON CENTRAL CHAMBER OF AGRICULTURE.

Small v. *Large Farms.*—At a recent meeting of this Chamber, the Rev. W. H. Thornton, of North Bovey, read a paper on this subject. He said:—

He had had many opportunities of observing the practical working of different systems of agriculture, and had farmed upon a small scale upwards of 14 years, but acknowledged that many present were probably his masters in the art. The point he proposed to discuss was—"Looking to the interests of the general English community, is it more desirable that holdings should be large or small?" The questions must be kept separate from that of the "peasant proprictor," or spade husbandry, productive in certain small areas—apparently unfitted for large ones. There were localities which must be cultivated by these poor people, after this fashion. He referred to the system called "la petite culture" which prevails very extensively in Belgium, where the land is very poor, consisting actually of about 997-1000ths of mere sand; and where a farm of 20 acres was accounted a large one. Dr. Voelcker says that this land lets for from 48*s.* to 60*s.* the English acre. In the neighbouring district of Campain, where the soil is very similar, the rent is from 20*s.* to 30*s.*, the farms being larger. The general condition of the small Belgian farmer was not so good as that of a well-to-do agricultural labourer in the better paid districts of England. One great evil of this small farming was that it reduced the women of the community to a very low level, making them almost beasts of burden. The poor labourers were very badly paid, about 7*s.* a week on the average, the whole system tending to reduce man, woman, and children to a condition of the hardest drudgery. Such was the testimony from Belgium, and he appealed to the meeting with reference to the wretched condition of the English—to our country farmer, who he described as the poorest man in the parish. This applied to the country farmer, and not those living in the neighbourhood of large towns, where the small farmer might do very well. Coming to the main question, he alluded to a gentleman in America in the occupation of 45,000 acres of land, a great part arable, and to a farm let in Northumberland some time ago, at a yearly rental of £2000. Practically they could not consider these extreme cases, and he was sure, on the other hand, they did not desire to see the 20-acre farm. To narrow the subject he would assume that an ordinary farm ought not to be less than 100 acres or more than 1500. Which, he would ask, of these sizes is the most desirable? This was a difficult question to answer, and depended upon many circumstances. They must of necessity strike an average, which would vary very much in different countries at different periods. In England, at the present day, the average would undoubtedly be high. It was not difficult in this country to find an energetic man, with an education and knoweldge, coupled with plenty of capital, willing to farm a large estate and farm it well. Was it good for the people of England that he should be allowed to swallow up two or three smaller men, who in years gone by reared their families and raised their crops upon the same area which he henceforth would alone occupy? Fully aware that there was much to be said on the other side, he (the speaker) answered in the affirmative, and thought it was well, as the large farmer could farm cheaper, more economically, and therefore more profitably, than the small one, and turn out a greater quantity of food, both cereal and animal, per acre, besides being able to buy much more advantageously, and use machinery of every kind. The tendency, too, will be with the large farmer to increase the size of the fields, and thus to throw more land into cultivation, by getting rid of great hedges and banks. It followed that as the wealth and education of the farming classes increased the size of the holdings will

increase in like ratio also. But there were exceptions to this general rule, and in many instances in central Devon he doubted whether small men were not better than large, and in every county nurseries were wanted for young beginners, as a young man could not always be put into as large a farm as that occupied by his father. The overplus of small farmers must, if they would still be farmers, make up their minds to gather together their capital, and seek a fresh home in some English-speaking country beyond the seas, where they would be welcomed as the most acceptable of immigrants, and rapidly expand into substantial men. He would say, with the growth of education and of wealth, large farmers would, and, in the public interest, ought, gradually to absorb many smaller ones; but these would be preserved in certain particular and definite districts, and in the immediate neighbourhood of large towns, where dairy and garden produce commands a high price, and the great rent of land and nearness of manure give special stimulus to the practice of spade husbandry.

MUTFORD AND LOTHINGLAND.

At the late annual meeting of this Agricultural Association, Mr. T. B. Cowell read an able paper on the Game Laws in regard to the true interests of agriculture. The Game Laws, he contended, had signally failed to secure the object for which they had been established, viz., the greater security of property in game and the prevention of poaching. This was shown by the increase in game convictions from 2424 in 1839 to 4529 in 1843, and 10,345 last year. The essayist contended that those who argued that it was a question entirely between landlord and tenant, argued very wide of the truth. To the landlord it might be a small matter whether his farm be let or farmed by himself, but to the tenant a year's dispossession might be of no light consequence. The essayist held that there were obstructions to a tenant making his own terms with regard to game. The matter as regards the right of property and the proper cultivation of land was then discussed, as were the arguments that the damage done by game was far less than the worth of the game, which was therefore valuable property which ought to be preserved; and that the preservation of game benefited the trade of the district. All these arguments, he contended, were insufficient. He supported this contention by examining the effect of game preservation on the system of cultivation of land which, by competition and the increased wealth of the country, was let at rentals which left but the smallest modicum of profit. It was, he held, admitted to be injurious to production, and it was so also by the interference through the gamekeeper with the self-adjusting balance of Nature. The most mischief, however, was the effect the interference and moving of his crops had on the farmer himself—mentally and morally. The effect of the Game Laws on the peasantry he held to be demoralising. The essayist then discussed the mode of administering the Game Laws, and its effect on the offenders and on the rural population generally; the influence of the Game Laws on the taxation of the country. He examined the several modes that had been suggested to remedy the mischief complained of, and urged on the members to obtain an unequivocal pledge to support a measure by which hares and rabbits should be struck out of the game list, declaring them vermin, and making their preservation illegal; and by which, if the shooting were preserved, the landlord should be required twice every year, through the medium of the stamp distributor of the district, to invite the tenant, if he considered special damage had been done to his crops, to name a valuer, who, in conjunction with one named by the landlord, should fix the damages. The essayist concluded by asserting as a certainty that the total abolition of the Game Laws would be determined on ultimately, but in the meantime the farmers should endeavour to secure a remedy by instalments.

Mr. James Colman, without wishing to hurt anybody's feelings, would say he thought the pledge that Mr. Cowell intimated should be required of parliamentary candidates in future, was not the right kind of pledge. In his opinion they ought to be pledged to endeavour to pass a law that no man should take up the business of a farmer until he had had a fit and proper education.

Mr. T. R. Woods hoped the day was not far distant when hares and rabbits would be struck out of the game list, and treated as vermin.

Mr. P. Cowell disclaimed on the part of himself and his brother that the paper read had been written or dictated by any party spirit. He wished also to say that they had nothing to complain of on the part of Sir Francis Crossley. If every landlord was like Sir Francis no farmer would have any complaint to make concerning the Game Laws.

Notices of Books.

The Quarterly Journal of Science. Conducted by J. Samuelson, of the Middle Temple, Barrister-at-law. October, 1870. Longmans, Green & Co.

This number, closing the seventh annual volume, is the last of the first series of the work. Mr. W. Crookes, F.R.S., is hereafter to edit it, the journal having, we understand, passed wholly into his hands. Mr. Samuelson may be congratulated on having, during a week of past years, established a character for the periodical for interest and utility which will, we doubt not, continue to grow and bear serviceable fruit—for agriculturists as well as those of other occupations and professions. We have not ceased to urge the work on the attention of educated men engaged as agriculturists; for, besides the many facts and discussions of direct agricultural interest which its pages continually present, there is the indirect advantage it confers of opening to the reader's mind the fresh and growing character of extending knowledge everywhere; and this is a consideration of wholesome influence, especially on those whose lives are so secluded and so sedentary as those of tenant-farmers generally. The current number contains papers on the late and coming Sun Eclipses—on the Rainfall in England—on Spontaneous Generation—Surveys in India and elsewhere—the Devonshire Association for the Advancement of Science—with notices of books, and chronicles of various branches of science. The following is an extract from the quarterly paragraph on agriculture:—

"Among the leading agricultural events of the past quarter are the great annual meetings of the Royal Agricultural Societies of the three kingdoms. The English Agricultural Society at Oxford and the Highland Society at Dumfries have had capital meetings. The Irish Agricultural Society was less successful. One of the most interesting circumstances of the Oxford meeting was the award of a valuable prize to the best-managed farm of the district. It has been somewhat of a surprise and perhaps a disappointment to the agricultural optimists of the day, that the very competent jury appointed by the Society to examine the competing farms should have placed highest upon the list one which owes but little to the improved stock and implements whose use and introduction the Society has fostered. It is a somewhat old-fashioned style of management which has been thus decorated. The four-course rotation of Wheat, Turnips, Barley, and Clover in succession, is the cropping of the farm; the live stock is inferior, and comparatively few modern implements are in use. The visitor who in the morning left the showyard of the Society full of the best specimens of the finest breeds of all kinds of farm stock and every new agricultural machine, saw nothing of either on the 'best-managed farm' which he walked over in the afternoon. He saw, however, magnificent crops of grain, and roots, and grass, obtained without their aid, and he might conclude that what was wanted for the improvement of English agriculture was not a Society stimulating the production of the best machines and live stock, but an agency for making farmers more energetic and laborious in the use of the common means already everywhere at their command.

"This agency, it is plain, exists in an improved relationship between the landlord and the tenant. The nature of the best farm agreement has been the subject latterly of frequent discussion in the agricultural journals. The lease for a term of years, with freedom to cultivate the land as the tenant choses up till within a few years of the close of the term, is certainly the system which gives freest scope to the intelligence and energy of the tenant, and most likely therefore to result in industrious and successful cultivation.

"An interesting paper 'On Wheat Flies' appears in the *Agricultural Gazette*, from which we learn that Cecidomyia tritici, to which Professor Henslow drew attention 30 years ago as the most destructive Wheat midge of his time, is no longer prevalent; and that the complaints now common of injury from the Wheat midge are due to Lasiopteryx obfuscata. The former is a yellow fly, the latter black. The insect is not easily bred, neither Mr. Kirby, Mr. Curtis, nor Professor Henslow having succeeded. The successors of Miss Eleanor Ormerod, of Sedbury Park, Chepstow, which are recorded in the *Agricultural Gazette*, seem to have been wholesale, notwithstanding her failures in detail. She placed on earth in different flower-pots, grubs and pupæ, with the ears and stalks to which they respectively adhered, as well from Wheat as Barley, protecting each with a covering of gauze or muslin. These were kept in the most natural conditions, and carefully watched and tended all through the winter and spring, without producing anything; but a small heap of Wheat rubbish, which had been ascertained to be well supplied with grubs and pupæ, was left in an out-of-the-way corner by itself, and early in June was found to be swarming with a cloud of these small Cecidomyia-looking midges, viz., Lasiopteryx. 'Numbers of these,' says the writer whom we are quoting, 'were also obtained, and sent to us from the Wheat fields at different dates, but not a single specimen of the Cecidomyia tritici reached us. Now, is this abundance of Lasiopteryx, and scarcity of Cecidomyia, confined to the neighbourhood of Chepstow, or is it general over the whole country? If so, another question, which, however, we can scarcely hope to fathom, is—when Cecidomyia ceased to be prevalent, and Lasiopteryx took its place. It may even be a question whether Cecidomyia ever was generally prevalent—it may have been so only in Kirby's time and the London district.'

"The Rivers Pollution Commissioners have issued a report upon the so-called 'A. B. C.' process for defecating sewage. They pronounce it a failure. The sewage treated on this plan is not defecated, and the manure produced is extremely poor. The only advantage derived from its adoption is a somewhat quickened subsidence of the suspended matters which town sewage carries with it, but as every 10 cwt. of these are rattled through the sewers of a town, borne along in the case of a town with ordinary water supply in a thousand tons of water, it is not likely that these suspended matters can retain much that is soluble or valuable on their exit from the sewer system of a town. And in point of fact the solid matters of town sewage are of very little agricultural value indeed. It is the liquid portion that contains the elements of the food of plants; and it is this, therefore, in which these substances are present in too dilute a form to be precipitated, that must be carried to the land, if either a nuisance is to be abated or a valuable property to be turned to good account. The Commissioners pronounce sewage irrigation to be the only method known to them by which both these results can be attained.

"There has been an unusual prevalence of cattle disease during the past quarter. During the severely restrictive system under which alone cattle traffic was permitted during the prevalence of the cattle plague, the more common diseases, the foot-and-mouth affection and pleuro-pneumonia, almost disappeared. They have resumed their frequency and virulence with the relaxation of the rules affecting cattle markets."

Manure for the Million. By the Rev. Henry Moule. Cassell, Petter & Galpin.

This "Manure for the million" is to be derived directly from the million. And why not? It is nothing less than a monstrous agricultural scandal that the 20 millions of the best bred animals in the country should be virtually good for nothing as farm stock. Mr. Moule would correct this, in the case of all cottagers, to whom this little pamphlet is addressed, by making every one take care of the fertility of his own garden. And we entirely agree with him in the adaptability of his dry-earth closet to this purpose in the case of cottages with gardens, whether isolated in country places or gathered together in country villages. Mr. Moule is the energetic and praiseworthy clergyman of a Dorsetshire parish, and knowing intimately, by long experience, the direct connection between the material circumstances of a labouring population and their capability of benefiting by his more directly professional ministrations among them, he has laboured long and earnestly in both directions for their good. His tract concludes as follows:—

"My heart's desire and prayer to God, for my fellow countrymen, is, the salvation of their souls. But next to that, my earnest desire is to see a real improvement in the temporal condition—so closely connected as it is with the spiritual condition—of you of the working classes. Thankful, therefore, shall I be, if this little tract shall give any help towards such improvement."

The following are the opening paragraphs:—

"You want manure for your gardens. If you could get it, they would produce four or five fold more than they produce now. I have found out a way by which, with little trouble, and hardly any expense, you can have as much manure as almost any of you can want. And by this same slight trouble and expense, you will prevent many bad smells and much sickness.

"Observe,—this is not just a fancy of mine: I have practised it more or less for several years, and very many, who have seen what I have done by it, are now doing the same.

"In God's providence there is no waste. And it was never meant that even the privy-soil, or the sink-water, or the water of the slop-bucket, should be wasted. Still less was it meant that they should poison fresh air, and pollute wells and streams, and produce sickness and death. And yet they are now almost entirely wasted, and the privy does poison the air, and pollute the water, and the little hole dug near the house, or the ditch close by, is the cause of many a sickness.

"Now my discovery is this:—The earth of your garden, if dried—or dried and powdered clay—will suck up the liquid part of the privy-soil; and, if applied at once after each use, and carefully mixed, will destroy all bad smell and all nasty appearance in the solid part, and will keep all the value of the manure. Three half pints of earth, or even one pint, will be enough for each time. And earth thus mixed, even once, is very good manure. But if, after mixing, or after it has lain some time, you throw it into a shed and dry it, you may use it again and again; and the oftener you use it, the stronger the manure will be. I have used some seven, and even eight times, others have used it 20 times; and yet, even after being so often mixed, there is no bad smell with the substance; and no one, if not told, would know what it is."

Farm Memoranda.

Briton's Farm, Hornchurch, near Romford.—*The Utilisation of Sewage.*—A party, including several men of eminence in the world of science, such as Mr. Rawlinson, C.E., Dr. Voelcker, the Chemist of the Royal Agricultural Society, Mr. James Caird, C.B., Mr. E. Chadwick, as well as several members of the Romford Local Board, and several neighbouring farmers, had been invited to meet a deputation from the Metropolitan Board of Works, who paid a visit to the farm on Saturday last, and inspected the arrangements of the farm, under the guidance of Mr. Hope and his principal assistants, who afforded to the visitors every information as to the methods, and, so far as they have at present been ascertained, the results of the cultivation adopted.

Briton's Farm consists of 121 acres of light and poor gravelly soil, and it now receives the whole available sewage of the town of Romford—that is, of about 7000 persons. This is conveyed to the land by an iron pipe of 18 inches in diameter, which is laid underground, and discharges its contents into an open tank. From this tank the sewage is pumped to a height of 20 feet, and is then distributed over the land by iron or concrete troughs, or "carriers," fitted with sluices and taps, so that the amount of sewage applied to any given portion of the field can be regulated with the greatest facility and nicety. To ensure the regular and even flow of the sewage when discharged from the carriers it was necessary to lay out the land with accu-

racy, and it has been levelled and formed by the aid of the theodolite into rectilinear beds of an uniform width of 30 feet, slightly inclining from the centre, along which the sewage is applied. The carriers, or open troughs, by which the sewage is conveyed, run along the top of each series of these beds or strikes, and at the bottom there is in every case a good road, by means of which free access is provided for a horse and cart, or for the steam-plough—the use of which is in contemplation—to every bed and crop. These arrangements, the carrying out of which involved the removal of 600 trees and a great length of heavy fences, the filling up of a number of ditches and no less than nine ponds, as well as the complete under-draining of the whole farm, were mainly carried out last year; but it was not until the middle of April, 1870, that Mr. Hope received any of the sewage from the town of Romford, and not until the following month that he obtained both the day and night supply. Satisfactory, therefore, as have been the results of the present season's operations, they have been obtained under disadvantageous circumstances, and cannot be regarded as affording complete evidence of the benefits which may be derived from the application of sewage to even a poor and thin soil, which had already ruined more than one of those who had attempted to cultivate it.

To mention only one drawback which arose from the lateness of the period at which the sewage was first received, Mr. Hope had not the advantage of being able to apply it to his seed-beds; and thus many, if not all his plants, were not ready for setting out as early as they will be in a future year, and some of the crops have suffered in consequence—that is to say, have suffered in a comparative sense. Speaking positively, they have in all instances been much larger, not only than any that could have been grown upon the same land without the use of sewage, but than any which have been raised from much superior land in the immediate neighbourhood. The crops which have been, or are being raised on different parts of the farm, are of diverse character, but with all the method of cultivation adopted has been attended with almost equal success. Italian Rye-grass, Beans, Peas, Mangels, Carrots, Broccoli, Cabbages, Savoys, Beetroot, Batavia Yams, Jersey Cabbages, and Indian Corn, have all grown with wonderful rapidity, and yielded abundant harvests under the stimulating and nourishing influence of the Romford sewage. The visitors of Saturday last, as they tramped over the farm under the guidance of its energetic proprietor, had an opportunity of witnessing the abundance and excellence of many of these crops. Even where the Mangels, from being planted late, had not attained any extraordinary size, it was noticeable that the plants were especially vigorous, and that there was not a vacant space in any of the rows. All the plants which had been placed in the ground had thriven, and would give a good return. Where this crop had been specially treated with a view to forthcoming shows, the roots had attained an enormous size, and, like some of the Cabbages, had assumed almost gigantic proportions. The Carrots were very fine and well-grown, and the heads of the Walcheren Broccoli were as white, and firm, and crisp as the finest Cauliflowers; while the Savoys, of unusual size and weight, were as round and hard as cannon balls, and some of the Drumhead Cabbages, although equally distinguished for closeness and firmness, were large enough in the heart to hold a good-sized child, and might, as was suggested upon the gronnd, very well be introduced into some pantomimic scene representing the kingdom of Brobdingnag. The Indian corn had reached the respectable height of some 8 feet, and with few exceptions each stalk carried a good-sized and well-filled cob or ear. These, unless we should have another spell of exceptionally hot weather, will not ripen; but in their green state they are readily eaten by horses and cattle, and prove excellent fodder.

In the course of their peregrinations Mr. Hope's guests of course paid a visit to the tank in which the sewage is received before it is pumped on to the land. We need hardly say that the appearance of this miniature lake of nastiness was anything but agreeable; but its odour was by no means overpowering, or, indeed, very offensive. The rill of bright clear water which flowed in at one corner, and some of which was handed about in tumblers, looking as pure as the limpid stream which flows from the most effective filters that are to be seen in the windows of London dealers, had only a short time before flowed out of this hideous reservoir in a very different state. We had met it in the "carriers" flowing along in a dark inky stream, not smelling much, but covered with an ugly grey froth which reminded one of some of the most disagreeable details in the manufacture of sugar and rum, or suggested the idea that it had been used for a very foul wash indeed. With these reminiscences fresh in one's memory, it required some courage to comply with the pressing invitations to taste this "effluent water." There were, however, many of the party who braved the attempt, and by all who tasted it the water was pronounced to be destitute of any except a slightly mineral flavour. In dry weather this effluent water, which has passed through the land and been collected by the drains, after mixing with the sewage, is again pumped over the fields; in wet weather it can be turned into the brook which is dignified with the name of the River Rom. When the inspection of the farm had been completed to the satisfaction of all concerned, Mr. Hope entertained his visitors at luncheon in a fine old barn, but the severe virtue of the members of the Metropolitan Board prevented their accepting the cold fowls and sherry which had been provided for them as for others. After lunch the health of Mr. Hope, which was proposed by Mr. Chadwick in highly eulogistic terms, was cordially drunk by the visitors, and was followed by one or two other toasts. We have omitted to mention that the rent paid by Mr. Hope is £3 yer acre, and the cost of the sewage at 2s. per head £6 more. *Daily News.*

Herkimer County, New York: *Summer Management of Dairy Cows.*—In one of the best dairy districts in this country a dairy farmer, who kept 25 cows for the manufacture of cheese, making in one year nearly 700 lb. per cow, states his mode of feeding as follows:—"When the ground is settled, and grass is grown so that the cows can get their fill without too much toil, they are allowed to graze an hour only, the first day; the second day a little longer; and so on, till they get accustomed to the change of feed, before they are allowed to have full range of pasture. Shift of pasture is frequently made to keep feed fresh and give a good bite. About one acre per cow affords plenty of feed till August 1. If enough land was turned to pasture to feed the cows through the season, it would get a start of them about this time, and be hard and dry the remainder of the season. To avoid turning on my meadows in the fall, I take 1 acre to every 10 cows, plough and prepare it the fore part of June for sowing. I commence sowing corn broadcast, about half-an-acre at a time (for 25 cows) so that it may grow 80 or 90 days before it is cut and fed. I have found, by experiment, that it then contains the most saccharine juice, and will produce the most milk. If the ground is strong, I sow 2 bushels per acre—more if the ground is not manured. The common yield is from 15 to 20 tons of green food per acre. About August 1, when heat and flies are too oppressive for cows to feed quietly in the daytime, I commence feeding them with what corn they will eat in the morning, daily, which is cut up with a grass scythe, and drawn on a sled or waggon to the milk-barn, and fed to them in the stalls, which is one hour's work for a man at each feeding. When thus plentifully fed, my cows have their 'knitting-work' on hand for the day, which they can do up by lying quietly under artificial shades, erected in such places as need manuring most, and are most airy, by setting posts and putting poles and bushes on top, the sides being left open. These shades may be made and removed annually, to enrich other portions of soil, if desired, at the small expense 1 dol. for each 10 cows. At evening, my cows are fed on whey only, because they can feed more quietly, with less rambling, and will give more milk by feeding most when the dew is on the grass. The capacity of cows for giving milk is varied much by habit. In fall, after the season of feeding is past, I give 4 quarts of wheat-bran or shorts made into slop with whey, or a peck of roots to each cow, till milking seasons closes, about December 1. When confined in stables and fed on hay and milked, they are given each one pailful of thin slop at morning before foddering, and also at evening, to render their food more succulent, and they will not drink so much cold water when let out in the middle of the day. In cold weather cows are kept well attended to in warm stables. No foddering is done on the ground. Thus a supply of milk is kept up, and the cows get in good flesh, while their blood and bags are left in a healthy condition when dried off. This flesh they hold till milk season in spring, without other feed than good hay. They will not get fleshy bags, but come into milk at once. About April 1 they are carded daily, till they are turned to grass. Wheat-bran in milk or whey, slops, or roots are daily feed, as they are found best adapted to the nature of different cows, and most likely to establish a regular flow of milk till grass comes." *American Stock Journal.*

Miscellaneous.

The War and Our Food Supplies.—We have not far to seek the nature of changes in the cattle traffic which must accompany Continental wars. We now have France needing all the animal food that can be spared for her, reduced by the failure of the grass crops, which has compelled her farmers to slaughter lean and immature cattle, as well as to refuse any longer to feed the horses *en reserve*, billeted on them by the War Department from motives of economy, and to be in readiness for the urgent demand of any moment. On the other hand, Prussia, with Poland and the Russian steppes in her rear, only fears the cattle plague as a drawback to the thronging of cattle droves on its railways and highroads. The lean and foot-sore herds of Muscovite merchants and Polish Jews will be welcomed; and, in the heat of battle, none will care for the stray oxen dead by the roadside, and none will think of the devastating plague which steals right and left, springing from the fœtid effluvia of pestilent droves, and ramifying wherever the sleek cow or steer of the thrifty Prussian proves susceptible to the disease. It is not our intention at so serious a crisis to favour the exaggerated theories of alarmists, or to run any danger of error on the side of those who consider that for roast beef England still reigns supreme. We seek the truth; and whilst we assert ourselves, as rational men, out-and-out free traders, we believe that the experience of the next few months—only weeks, let us hope—of suffering and suspense will demonstrate that free trade in live stock is by no means synonymous with free trade in meat. Taking the British Isles as a whole, the supply of foreign stock for consumption does not amount to more than 4 per cent. The metropolis, it is true, receives over 20 per cent. of its total meat supply from abroad; but a fifth of the consumption of London amounts to only 2¾ per cent. of the consumption of the United Kingdom; and trustworthy cattle disease statistics indicate a certain means whereby we could at least rely on a speedy addition to our home supplies of 2 or 3 per cent.; indeed, of quite as much as the Continent has given us during the years of our largest importations. We do not believe that we shall starve; and, if the Continental imports are restricted to the steers which we derive from Spain, the complete prevention of the foot-and-mouth disease will rather tend to give us an advantage over days of a thriving and open traffic, *viâ* Hamburg, Holland, and Belgium. We may secure some cattle from Jutland; but all depends on the nature of alliances, offensive and defensive, and on the duration of the war. It would clearly suggest itself that our Canadian provinces might reap the benefit by exporting to us their surplus stock. We shall receive some salt beef in tierces, but the desideratum would undoubtedly be a steady supply of fresh beef. The Canadian steer and sheep are well suited to the English markets. The first is a Shorthorn cross, and the second a long-woolled half-breed, with Lincolnshire, Leicester, and Cotswold blood in varying proportions. The only objection to the sheep is their excessive fatness. We have seen at Christmas time Canadian wethers in quantities averaging nearly 200 lb. dressed, and exceptional ones far exceeding this weight. Canada can, therefore, help us out of a difficulty, if we are compelled to seek for animal food in the New World. The approaching curing season promises to be an active one. Stocks are low in the States and in Liverpool; and, on the declaration of war, prices advanced 10 per cent. They will go higher, and should the war last to the end of the year, the supply of salt provisions cannot equal the demand. *Abridged from the "Food Journal."*

Churn more Milk or Skim Deeper.—From observation, I believe too many butter makers do not skim as deep, or churn so much milk, as they ought. I hear them say often that they don't like to get so much milk, or sour cream, in with the cream. It is a common practice for most butter makers to have a skimmer that is perforated with holes, that the milk may pass through into the pan from which the milk is being taken. If any one has a better reason for not skimming deeper, I shall be pleased to hear it, and herewith give my reason why I think we ought to skim deeper and churn more milk with the cream. First, there are but few dairy houses so far removed from the odours of the kitchen, swill-pail or barrels, or some decaying vegetable matter, as to keep the cream from absorbing odours that injure the flavour of the butter; and the cream must first receive, or have these odours pass through it, before they can reach the milk, as it is most exposed. The milk must therefore be most pure, and, if churned with the cream, will aid in taking up the odours from the butter. By churning only the cream, the dash of the churn must, as we think, injure the butter globules, and make the butter salvy, as the friction is more directly applied to them than would be the case if milk was mixed with the cream. There are times when the milk sours before all the cream is up; yet the milk must be nearly, if not quite as good, from the same cow that is being fed the same feed, in a warm morning as it is in a cool morning. But we often get twice the amount of cream in the cool days that we do in warm days, and the quality is better. Take, for instance, the 24th of August, a hot, sultry day, the cream hardly paid for the labour. Now, take the 26th of the same month, 1869, a good cool day, that gave a nice yield of cream. Is it to be supposed that there is that difference in the milk produced from the same cows on those days, when the cows were fed in the same pasture, that there was in the amount of butter made from their milk by skimming the cream only? I have thought that when the milk is brought in in a heated condition, and placed in a warm room, that perhaps many of the butter globules were exploded by the heat, and that they mingle with the milk, like alcohol with water, but to churn all the milk would be to get more butter. I have been using Dr. A. F. Jennings' Patent Milk Pans this season, and find them an excellent thing for cooling milk and saving labour. *C. L. Smith, Chatauque Co., N. Y.*

Rules to Keep a Farmer Poor.—1. Not taking a good agricultural paper. 2. Keeping no account of home operations. Paying no attention to the maxim, "A stitch in time saves nine," in regard to the sowing of grain and planting of seed at the proper season. 3. Leaving the reapers, ploughs, cultivators, &c., uncovered from the rain and heat of the sun. More money is lost in this way than most people are willing to believe. 4. Permitting broken implements to be scattered over the farm until they are irreparable.

One of the seven wise men of Greece said only this to prove his sense :—"The time to mend the plough is when the plough breaks." 5. Attending auction sales and purchasing all kinds of trumpery, because, in the words of the vendor, the articles are "very cheap." 6. Allowing fences to remain unrepaired until strange cattle are found grazing in your fields, and bruising the fruit trees. 7. Planting fruit trees with the expectation of having fruit, without giving the tree half the attention required to make them produce. *Colman's Rural World.*"

The Week's Work.

OCTOBER 22.—*Mangel Wurzel* is generally harvested about this time, but if the weather is fine and open, and the bulbs growing, the work may be deferred to November. The crop, more practically speaking, should be secured before frost sets in, otherwise it is liable to rot in the pits, or barn, or yard in which it is stored. In tailing, only the small rootlets and earth should be removed, including the branch rootlets of the tap-root, but the tap-root itself should not be cut, as the bleeding or exudation of sap is liable to produce rot, mouldiness, and infusorial action. For a similar reason the tops should not be cut so close as to bleed the bulb. To avoid this some twist off the leaves, but the process is too dilatory for the requirements of practice, and if hurriedly and rudely done, twisting is worse than the knife. The bulbs are stored in pits and barns like Potatos and Carrots, but in some cases in narrow lines between hurdles stuffed with straw. The bulbs in the bins above the hurdles are raised in the form of a roof, and thickly thatched with straw, and the bins are placed alongside each other in a yard, sufficiently close to keep out frost, but not so close as to prevent the escape of steam from the bulbs. Dry settled weather should be selected for the work of harvesting.

Autumn Fallowing and Manuring for spring crops should now be finished with as little delay as possible.

Manuring for Spring Beans is done either on the flat or in narrow ridges, as for winter Beans, but the land may be left more cloddy, open, and exposed to the winter frost. In dry seasons farmyard manure may be carted on to the land without doing comparatively any harm, and even in wet seasons the harm done is greatly rectified by the winter frost, especially when the ploughing, smashing, and ridging is done by steam. Whether the land is thus manured on the flat or in drills, it is in a better and more forward state to receive the seed in early spring, the fine winter-made mould forming a fine seed-bed either for dibbling or drilling, and staple for the after operations of horse and hand hoeing. The reverse of all this is the case when the work of manuring is deferred to spring, while the work itself is much more heavy to the horses as compared with autumn. True, under the old practice, the manure in January and February was carted out in frosty weather, but this was only relieving the teams at the expense of the manure and land.

Parsnips are partial to a dry but rich friable sandy loam, deeply cultivated, and in a high state of fertility. Farmyard manure should be applied at this season, as it requires to be thoroughly incorporated with the land before the seed is sown, and the seed should be sown in a fine seed-bed. Nothing is more injurious to this crop than rank manure and working the land in a bad season at the time of sowing. The land, therefore, should be deeply fallowed 18 to 20 inches. For drilling on the flat the manure should be ploughed in 4 to 6 inches deep, and for drilling in ridges it should be finely broken in the open furrows, and in covering the drills should be well ridged up against the winter frost.

Carrots.—The land requires to be fallowed and manured at this season for Belgian and common field Carrots as for Parsnips. The Belgian varieties are grown on a greater diversity of soil than the common sorts, and is proving a more valuable crop, both as to weight per acre and feeding properties. It is, therefore, fast superseding the other; but the common Carrot is still largely grown on sandy soils.

Potato land is fallowed and manured at this season in the same way as land for Parsnips and Carrots. True, opinion is somewhat divided on the manuring of the main crop,—some saying that the more economical plan is to manure at the time of planting, doctoring farmyard manure with artificial fertilisers, so as to insure its immediate incorporation with the land, as by this plan it yields a more abundant supply of food for young plants; much may be said in favour of both plans for late spring planting. Autumn manuring with farmyard dung does not do away with the economy of artificial fertilisers at the time of planting. For early Potatos the balance is wholly in favour of autumn manuring; and the fact that autumn manuring obviates much of the waste farm dung sustains in the strawyard, while it renders the farmer independent of wet and bad weather in spring, is also in favour of autumn manuring.

Mangel Wurzel, Kohl Rabi, and Swede.—The practice is becoming more common of applying farmyard dung at this season to land intended for the growth of these crops next year, artificial manures being used at the time of sowing by means of seed and manure drills. One thing is greatly in its favour, viz., the relief which it affords to spring cultivation.

Steam Culture.—In all the above examples of autumn fallowing and manuring, the ploughing, smashing, ridging, and covering of the manure is best done by steam; and where land requires subsoiling, it may be done at the same time. Thus in opening the drills for the manure, the ground or open furrows into which the manure is spread is subsoiled in opening, and in covering the manure by splitting the drills the open furrows left are subsoiled in the same way by a pendent subsoiler under the double-mouldboard plough, thereby leaving the land under the manure, and in the open furrows between the drills, in the best possible state for successful winter drainage.

Brood Mares now require a twofold attention, one for themselves and the other for their foetal offspring, so to speak, which now begin to draw heavily upon their physical resources. Foals also require special care, otherwise their growth will be checked, and their symmetry, beauty, health, and future usefulness impaired. What they gather in the pastures is no longer fit to support them, and although outdoor exercise is needed, the essentials of the dietary must now be supplied indoors. *W. B.*

Notices to Correspondents.

ALDERNEY COW: *F. S.* Your best plan is to advertise your cow in the local paper, and employ a local salesman.

BOVINIA POTATO: *Mc Blaine & Co.* We have not had any opportunity of forming an opinion. A correspondent in another column gives a good account of it.

KIANITE: *F. Mackey & Co.* Potash salts are more likely to be serviceable for root crops and Potatos than for grain crops and Wheat.

MILK FEVER: *Edgebaston.* Parturient apoplexy, miscalled milk fever, is much more prevalent among cows in some districts than it is in others; a great deal depends upon how the system of feeding which is pursued, and also upon the head of cattle kept in this district. Shorthorn and Channel Island cows appear to be more liable than other herds to the disease.

SORGHUM: *J. P. & C.* Sorghum is a good food for all sorts of farm stock. We are not aware of any experiment by which its value has been tested in comparison with Indian Corn. We should suppose it would prove inferior to Maize.

Markets.

MARK LANE.

MONDAY, Oct. 17.

There was a fair supply of Wheat from Essex and Kent to this morning's market, which met a good demand at an advance of 1*s.* to 2*s.* per qr. from this day se'nnight. The attendance was good, but only a moderate business was transacted in foreign, at previous prices. Barley, Beans, and Peas were unaltered. Oats sold slowly, at a decline of 1*s.* to 1*s. 6d.* per qr. on the week. Flour in steady demand, without change in value.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk.	White	45—52	Red	42	52
— — fine selected runs	do.	49 - 56	Red	46	54
— — Talavera		50—59			
— — Norfolk		—	Red		—
— — Foreign		40—62			
BARLEY, grind. & dist.	29 to 32	Chev.	42—45	Malting	36	41
— Foreign grinding and distilling		25—33	Malting	33	40
OATS, Essex and Suffolk		24—26			
— Scotch and Lincolnshire	Potato	26—28	Feed		—
— Irish	Potato	25—27	Feed	23	26
— Foreign	Poland and Brew	23—25	Feed	18	23
RYE		32—36	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan	43*s.* to 47*s.*	Tick	49—50	Harrow	49	50
— Pigeon	51*s.* to 59*s.*	Winds.	—	Longpod	—	
— Foreign		Small	43—47	Egyptian	42	44
PEAS, White, Essex, and Kent	Boilers		38—40	Suffolk	40	42
— Maple, 40*s.* to 44*s.*		Grey	36—40	Foreign	36	40
MAIZE			—	Foreign	23	30
FLOUR, best marks delivered	per sack		39—47			
— 2d duto		duto	32—44	Country	32	44
— Foreign	per barrel		24—27	Per sack	35	61

WEDNESDAY, Oct. 19.

There was a fair attendance of millers here to-day, and trade ruled moderately active. The show of new English Wheat was good, while the arrivals of foreign have been fully up to the average. In all kinds sales progressed freely, at the full quotations current on Monday last. Barley was steady in value, though the transactions were not extensive. Malt was dull, at nominal currencies. There was a large supply of Oats, and sound corn changed hands at the late reductions. Maize brought recent values, with a steady inquiry. Beans and Peas were scarce, and commanded late rates. The Flour trade was quiet, but no alteration took place in the value of any description.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch	210	220	—	—
Irish	—	—	—	—
Foreign	12,440	2140	19,740	700 9370 brls.
	12,650	2360	19,740	

LIVERPOOL, Oct. 18.—At to-day's market there was a full attendance, a strong tone for Wheat, and a large business was done, at an advance on the week of generally 4*d.* per cental. Flour in more general request, at advanced prices. Corn dull, and rather easier. Peas steady. Oats and Oatmeal dull. Others unchanged.

AVERAGES.

	Wheat.	Barley.	Oats.
Sept. 10	48*s.* 1*d.*	35*s.* 8*d.*	23*s.* 10*d.*
— 17	46 6	36 4	23 9
— 24	45 4	36 2	20 7
Oct. 1	46 1	36 7	22 8
— 8	46 5	36 11	21 11
— 15 .. .	47 0	36 7	22 5
Average ..	46 7	36 4	22 6

HAY.—per Load of 36 *Trusses.*

SMITHFIELD, Thursday, Oct. 20.

Prime Meadow Hay	127*s.* to 135*s.*	Clover, old	130*s.* to 140*s.*
Inferior do.	110 120	Inferior do.	115 125
New Hay	115 125	New 2d cut do. ..	120 130
Inferior do.	100 110	Inferior do.	110 115
Straw	30 34	CHARLES JAMES EASTON.	

CUMBERLAND MARKET, Thursday, Oct. 20.

Sup. Meadow Hay	130*s.* to 140*s.*	Inferior Clover ..	110*s.* to 126*s.*
Inferior do.	110 120	Prime 2d cut do. ..	— —
New do.	— —	New do.	— —
Inferior do.	— —	Straw	34 38
Superior Clover ..	135 147	JOSHUA BAKER.	

METROPOLITAN CATTLE MARKET.

MONDAY, Oct. 17.

The supply of Beasts is considerably larger than on last Monday, consequently trade is not so brisk, and prices on the average are lower; choicest descriptions are still not very plentiful, and are sold dear. There are a few more Sheep, and trade is dull; prices are rather lower, but a fair clearance is effected. Choice Calves are very scarce and dear. Our foreign supply consists of 1070 Beasts, 6000 Sheep, 250 Calves, and 180 Pigs; from Scotland there are 133 Beasts; from Ireland, 600; from Norfolk and Suffolk, 27; and 1800 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	5 8	to 6 0	Best Long-wools	5 6	to 5 8
Best Shorthorns ..	5 6	— 5 8	Do. Shorn	— —	..
2d quality Beasts	3 4	— 4 4	Ewes & 2d quality	4 6	— 5 0
Best Downs and Half-breds ..	5 10	— 6 0	Do. Shorn	— —	..
Do. Shorn	— —	..	Lambs	— —	..
			Calves	4 4	— 6 4
			Pigs	4 0	— 6 0

Beasts, 3630; Sheep and Lambs, 18,550; Calves, 256; Pigs, 220.

THURSDAY, Oct. 20.

The number of Beasts is about the same as last week, but there are very few choice qualities; trade on the average is dull, and Monday's quotations are only realised for choicest descriptions. The supply of fresh English Sheep is very small, but quite equal to the demand; prices are very little altered. Choice Calves are still scarce and dear. Our foreign supply consists of 480 Beasts, 4500 Sheep, 220 Calves, and 180 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	5 8	to 6 0	Best Long-wools ..	5 4	to 5 8
Best Shorthorns ..	5 4	— 5 6	Do. Shorn	— —	..
2d quality Beasts	3 0	— 4 0	Ewes & 2d quality	4 4	— 4 10
Best Downs and Half-breds ..	5 8	— 6 0	Do. Shorn	— —	..
Do. Shorn	— —	..	Lambs	— —	..
			Calves	4 4	— 6 4
			Pigs	4 0	— 6 0

Beasts, 1150; Sheep and Lambs, 7980; Calves, 255; Pigs, 190.

METROPOLITAN MEAT MARKET.—Oct. 20.

Best Fresh Butter .. .. .. 20*s.* per dozen lb.
Second do. do. .. .. 18*s.* ,,
Small Pork, 5*s. 0d.* to 5*s. 4d.*; Large Pork, 4*s. 0d.* to 4*s. 4d.* per 8 lb.

COALS.—Oct. 19.

Hastings Hartley, 16*s. 9d.*; Holywell Main, 17*s. 3d.*; Walls End Hetton, 19*s.*; Walls End Hetton Lyons, 16*s. 9d.*; Walls End Tees, 18*s. 9d.*—Ships at market, 14; sold, 14; at sea, 60.

SEED MARKET.

In the absence of a consumptive demand the agricultural seed trade now rules very quiet. Fine new English Red Clover seed continues scarce and dear; as yet there is but little offering. A small quantity of new American Red has reached this country, the quality of which is about the average. Super samples of new white Clover seed are held for long values. Alsike is firm. New Trefoil seed excites at present but little attention. For winter Tares we have a fair demand, at fully recent prices; fine parcels are in short supply. Canary and Hemp seed are without change. We have a good inquiry for Blue Peas and Haricot Beans. Mustard seed is firm at the recent advance of, say, 9*d.* to 1*s.* per bushel. Sowing Rape seed must be quoted 2*s.* per qr. dearer.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

ENGLISH WOOL.

During the past week there has been an active demand for English brokes and noils, and all descriptions of skin wool, especially the inferior descriptions suitable for army goods. Other descriptions are firmly held, but the demand for them is not very brisk.

HOPS.

BOROUGH MARKET, Oct. 19.

The trade continues active, and some long growths of Mid and East Kent Hops were placed during the week. Low coloured useful sorts of Hops were pressed for one or two days, and gave way in price, but they have now been cleared off. At Weyhill Fair, Farnham and country Farnham Hops sold pretty freely, at full prices, and London merchants who attended succeeded in doing more business than usual in Kents and Sussex.

Cottam's Iron Hurdles, Fencing, and Gates.

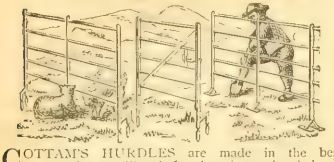

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

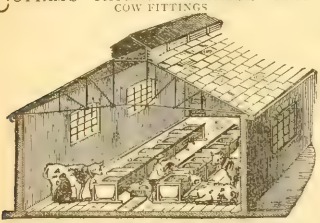

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cisterns, and Patent Flap Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, £5.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Panthe'on), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

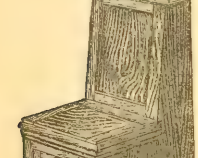

MOULE'S PATENT EARTH SYSTEM.

From Mr W. GILBERT, *Lawford Street, Rugby*

"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest flowers this summer I ever had in my life. They have been admired by every one who has seen them.

"W. GILBERT.

"January, 1870."

Prospectuses and full information may be obtained at 29, Bedford Street, Covent Garden, W.C.

By Royal Letters Patent.

SHREWSBURY'S GAS CONSERVATORY BOILER, Registered Gas Oven, no gas inside IMPROVED REGISTERED GAS BATH, £10. Testimonials on application. Stamp. G. SHREWSBURY, Lower Norwood, S.E.

POLLARD, JEPHSON, AND CO.'S CONICAL BOILERS for HEATING, by HOT-WATER, Fineries, Greenhouses, Conservatories, Mansions, Churches, Chapels, Halls, Warehouses, &c. Fixed at seats of Duke of Newcastle, Lord Belper, &c. At Vivo (mid-Sydney's replaced, after being 20 years in constant use. Apply at Iron Garden, New Park Street, Southwark, London, S.E.

Greenhouses.

H. FREEMAN AND SONS, HORTICULTURAL BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 106, Mare Street, Hackney, E. Good substantially-made GREENHOUSES, Glazed, ready for Fixing, 42 feet long by 13 wide, price £50; 21 feet by 11 feet, £38; 12½ feet by 10 feet, £25. A handsome CONSERVATORY in stock, 20 feet long by 15 feet wide, £110. Estimates given for any Erection in the above line, in Wood or Iron.

Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c., WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY. The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to T. S. TRUSS, C.E., Sole Manufacturer, Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder, Friar Street, Southwark Bridge Road, London, S.E.

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England

For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds

CONSERVATORY BASKETS.

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing; Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Minton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

R. HOLLIDAY, Horticultural and Floral Wire Works, 23, Portobello Terrace, Notting Hill Gate, London, W.

Illustrated Catalogues of the above on application.

GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870.

GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, keeping the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

HAND MACHINE.

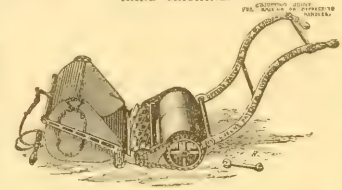

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.

Illustrated Price Lists of Greens' Patent Rollers, Hot-water Boilers, Galvanised Wire Netting, Garden Seats and Chairs, Fountains, Vases, &c., free on application.

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; 54 and 55, Blackfriars Road, London, S.E.

Horticultural and Window Glass Warehouses.

JAMES MILES, 6, High Street, and 12 and 13, Blomfield Street, Shoreditch, London, E.

CONSERVATORY and ORCHARD-HOUSE GLASS.

Genuine White Lead, Oils, Colours, Brushes, &c.

GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNECTIONS, &c.

Prices on application.

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

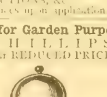

Each—	s	d		Each—	s	d
2 inches in diameter ..	0	3½	12 inches in diameter ..	1	0	
3 " " ..	0	5	13 " " ..	2	0	
4 " " ..	0	5½	14 " " ..	2	6	
5 " " ..	0	6½	15 " " ..	3	0	
6 " " ..	0	8	16 " " ..	3	6	
7 " " ..	0	13	17 " " ..	4	0	
8 " " ..	1	0	18 " " ..	5	0	
9 " " ..	1	2	19 " " ..	6	0	
10 " " ..	1	8	20 " " ..	7	0	
11 " " ..	1	16				

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter ..	0s.	6d	9 inches in diameter ..	1s.	8d.
5 " " ..	0	8	10 " " ..	2	0
6 " " ..	0	13	11 " " ..	2	6
7 " " ..	1	1	12 " " ..	3	0
8 " " ..	1	4			

Either flat or conical tops.

CUCUMBER GLASSES.

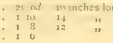

	s	d		s	d
21 inches long	21	0d	30 inches long	1s.	4d.
22 "	1	10	24 "	1	2
20 "	1	8	12 "	2	6
18 "	1	6			

HAND GLASSES, WITH OPEN TOPS.

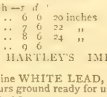

Each—	s	d		Each—	s	d
12 inches	6	0	20 inches	10	6	
14 "	7	6	22 "	11	6	
16 "	8	6	24 "	12	6	
18 "	9	6				

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS. PAINTS of various colours ground ready for use.

SHEET and ROUGH PLATE GLASS. SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to JAS. PHILLIPS AND CO., 180, Bishopsgate Street Without, E.C.

MR. CHANDLER, HORTICULTURAL AGENT and VALUER, Underhill Road, Dulwich, S. (late of Forest Hill).

N.B. A small NURSERY to LET, in a good situation, about three miles from London.

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 19,000 for 35s., cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

PLANT CASE, BULL'S PATENT.—Illustrated and described in last week's *Gardeners' Chronicle*, title p. 1147. Proceedings at Law will be taken against any one infringing this Patent.

Mr. BULL will delegate the Right of Making Patent Cases on payment of a small royalty.

Establishment for New and Rare Plants, King's Road, Chelsea, S.W.

Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (illustrated) of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

New Leaf Rake.

ASHBY, JEFFERY, AND LUKE, of Stamford, have just Introduced a new WHEEL HAND RAKE for RAKING LEAVES; it is fitted with movable steel teeth placed very close together, which adapt themselves to the inequalities of the ground, and gather up seven times as much as the ordinary Rake. They discharge their load by a slight movement of the hand, and can be easily worked by a woman or a boy. Price £3.

MINTON AND CO.

Beg to inform the Trade that they keep a Stock of their ENAMELLED and MAJOLICA WARE

At the China and Earthenware Manufactory,

Stoke-upon-Trent, and at

28, Walbrook, Budge Row, London.

They have no connection with any other House of the same name. Please to note the address

SHAW'S TIFFANY.

For Samples and Prices apply to

J. SHAW AND CO., 29, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—NEWTON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.

JAS T. ANDERSON, 7, Commercial Street, Shoreditch, London.

Archangel and Petersburg Mats.

ARCHANGEL MATS, under present value; PETERSBURG MATS at old prices. Samples and prices at THEAKSTON'S and SONS', Russia Mat and Sack Warehouse, 4 and 5, Wormwood Street, London, E.C.

E. T. ARCHER'S "FRIGI DOMO."—Patronised and used for Frogmore and Kew Gardens. It is made entirely of prepared wool, and a perfect non-conductor of heat or cold where it is applied

PROTECTION from the SCORCHING RAYS of the SUN.

WOOL NETTING, 2 yards wide and 11. 6d. per yard.

"FRIGI DOMO" CANVAS

Two yards wide	1s. 9d. per yard.
Three yards wide	2s. 8d. per yard.
Four yards wide	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 2 yards long, 5¾d. to 8¾d. p. yard.

HESSIAN CANVAS, do., do., 54 and 72 inches wide, 6¼d. and 8¾d. per yard.

ELISHA THOMAS ARCHER, Sole Maker, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen

THE GRANITIC PAINT, the best for the finest painting and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Builders, and Bricklayers

39A, King William Street, London Bridge, London, E.C.

DAMP WALLS PREVENTED by the use of the SILICATE ZOFISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.

39A, King William Street, London Bridge, London, E.C.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers.

S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

Kosher's Garden Edging Tiles.

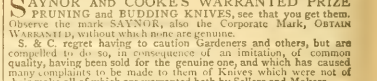

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The planer sorts are especially suited for KITCHEN GARDENS, as they harbour no slugs or Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently are much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish and beauty of design.

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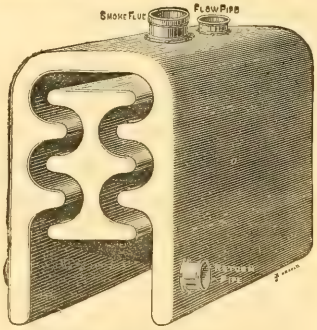

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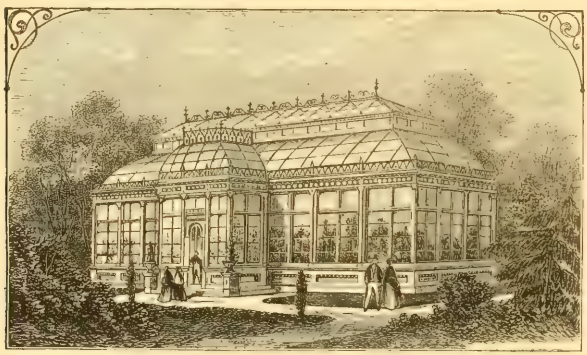

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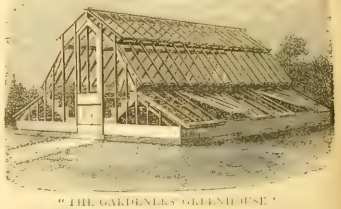

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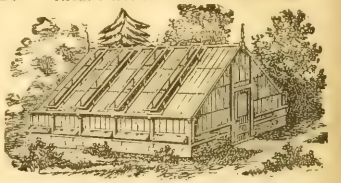

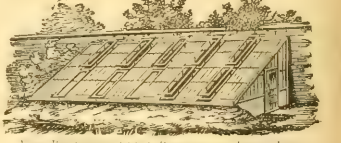

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Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE.—FULL PRICE will be given at the Office for Clean Copies of No. 5, January 29, 1870.
Office, 41, Wellington Street, Strand, W C.

NOTICE to SUBSCRIBERS.—On and after this date the SUBSCRIPTION to the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE will be £1 3s. 10d. for 12 months, including postage, instead of £1 6s., as heretofore.
May be had of all Booksellers.
Published by W. RICHARDS, 41, Wellington Street, Strand, W.C.
October 1, 1870.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
NOTICE—FLOWER SHOW MEETING of FRUIT and FLORAL COMMITTEE, on WEDNESDAY NEXT, November 2, at 11 o'Clock. GENERAL MEETING at 3. Band of the Royal Horse Guards at 2. Admission 2s 6d.

SCOTTISH ARBORICULTURAL SOCIETY.—The SEVENTEENTH ANNUAL GENERAL MEETING of the SCOTTISH ARBORICULTURAL SOCIETY will be held in the CRAIGIE HALL, St. Andrew Square, EDINBURGH, on WEDNESDAY, November 2, at 1 o'Clock P.M. ROBERT HUTCHISON, Esq., of Carlowrie, F.R.S.E., President, in the Chair.
JOHN SADLER, Secretary.

Carnations, Picotees, and Pinks.

J. BOOTH, FLORIST, Pole Lane, Failsworth, near Manchester, is now offering the above, in all the best named show varieties. Trade supplied. CATALOGUES now ready.

Carnations, Picotees, and Pinks.

CHARLES TURNER can supply from his extensive Collection, strong plants of all the classes of the above. CATALOGUES on application.
The Royal Nurseries, Slough.

JOHN J. HASLAM, Son-in-law of the late JOHN HOLLANDS, offers strong well-rooted CARNATIONS and PICOTEES from his unsurpassed stock, also PINKS, PANSIES, Lancashire Prize GOOSEBERRY (true), APPLES, &c. CATALOGUES now ready.
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WOOD AND INGRAM beg to offer SHOW PINKS, in 12 fine varieties, named, extra fine plants. One pair of each for 10s., package included.
The Nurseries, Huntingdon.

JOHN FRASER, of the Lea Bridge Road Nurseries, E., begs to announce that he can now offer unusually fine healthy Plants of TREE CARNATIONS, and many varieties of Winter-flowering HEATHS, in large quantities. It may be remarked that Heaths are well adapted for the decoration of the dinner-table.
Prices on application.

CALCEOLARIAS, Herbaceous, of very choice strain; nice healthy plants, pricked over out of pans, free by post, 25 for 4s., 50 for 7s. 6d., 100 for 14s. Trade price on application per 100 or 1000.
H AND R STIRZAKER, Skerton Nurseries, Lancaster.

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct sorts, for 10s.; 50 plants for 7s.; or 25 plants, distinct sorts, for 5s., hamper and package included.
Crown Nursery, Reading.

New Rhododendron, the Crown Prince.

JOHN WATERER AND SONS have great pleasure in introducing this really magnificent variety. In colour it is a very clear bright rose, having an immense yellow blotch, of great substance, immense flower, and of most excellent habit. Good plants 21s. each. The American Nursery, Bagshot, Surrey.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

PAUL AND SON'S ROSE CATALOGUE for 1870-1, contains Notes on New Roses of 1870, and re-written descriptions of the novelties of previous years. All Amateurs should apply for it. Post free. The Old Nurseries, Cheshunt, N.

Roses.

CHARLES TURNER'S Descriptive and Priced CATALOGUE of ROSES is now ready.
It also contains full LISTS of FRUIT TREES, SHRUBS, CONIFERÆ, &c.; and may be had post free on application.
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TWENTY THOUSAND STANDARD ROSES.—The finest plants in the Trade. Also pot VINES, strong, in the leading kinds. Special offers to the Trade. CATALOGUES on application.
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Francis & Co.'s Catalogue of Roses.

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RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

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B. S. WILLIAMS has this season a splendid STOCK of all the best and newest kinds. Priced LIST on application.
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Vines, Vines.

T. THORNTON has much pleasure in offering all the leading varieties of well-grown VINES, from eyes, grown and ripened without fire-heat.
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VINES, from Eyes, Fruiting next season, 7s. 6d. each; strong planting, 5s.; ditto, 3s. 6d., of the following varieties:—Black Hamburgh, Buckland Sweetwater, Lady Downe's, and White Lady Downe's, Black Alicante, West's St. Peters, Mrs. Pince, Golden Champion, and Muscat Alexandra.
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LOUIS VAN HOUTTE begs to direct attention to this new sort, of which he has a few for sale, at 2s. 6d. each. The WEEPING FILBERT, according to size, from 2s. 6d. to 6s. 6d. each; &c.
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SUTTONS' GUINEA COLLECTION of FLOWER ROOTS, for Indoor and Outdoor Cultivation, forwarded carriage free by rail. In ordering, please say whether for indoors or outdoors.
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The Successful Cultivation of Hyacinths.—See

SUTTONS' AUTUMN CATALOGUE for 1870, which may be had gratis and post free on application.
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Suttons' Fresh Imported Flower Roots, Carriage Free.

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FINE HYACINTHS, first-rate named varieties and mixed sorts; Early and Late TULIPS, and all the best kinds of LILIES, are to be had now from
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The CATALOGUE, No. 136 M, can be had from
Messrs. R. SILBERRAD & SON, 5, Harp Lane, London, E.C.

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E. H. KRELAGE AND SON, Haarlem, Holland, beg to announce that their special CATALOGUE of TULIPS (8vo, pp. 36), containing 1752 varieties, is now ready, and will be sent on application. Discount to the Trade

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W. JACKSON, Blakedown Nursery, Kidderminster.

THE GENUS HYDRANGEA.—The leading varieties mentioned at p. 1373 of the *Gardeners' Chronicle*, Oct. 15, and especially large quantities of the extra fine HYDRANGEA OTAKSA. See FLORE, xviii., p. 35 (in double plate), and CATALOGUE, No. 136 M.
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VAN HOUTTE'S CATALOGUE.—Nos. 1321, 1351, 1364 to 1369, are to be had in London of Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

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To the Trade.

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Best sorts of WHEAT, grown on his own Farms; WINTER VETCHES, RYE, and a general assortment of GRASS SEEDS for Laying Down Permanent Pasture, or for One or Two Years' Mowing, for Green Food.

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Queen Square, Liverpool.—Sept., 1870

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STANDARDS, very superior, selected, 15s. per dozen ; £5 per 100

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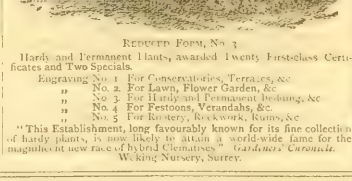

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BOQUET, the best Scarlet bedder, 3s. 6d. each.

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The finest and most extensive collection in Europe, 1s. each and upwards.

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The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently transplanted specimens

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APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES, FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

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MESSRS. JAS. S. EASTES & CO.

TAKE LEAVE TO ANNOUNCE

THAT THEY ARE IN A POSITION TO OFFER THE ABOVE IMPORTANT PEA TO THE PUBLIC.

The "KENTISH INVICTA PEA" was raised by a well-known Kentish raiser of new Peas, in the year 1867, and passed into Messrs. EASTES' hands in the spring of 1868 ; and knowing the importance of thoroughly testing the properties of a new Pea before submitting it to the public, they have carefully grown it each year in their trial grounds, and have also had it tested in the trial grounds of some of the leading Seed Merchants, and the result in every instance has been the same, proving the "KENTISH INVICTA" to be the quickest and earliest *Blue* Pea ever introduced.

EASTES' KENTISH INVICTA PEA is a round Blue Pea, about "two feet" in height, with straight, handsome, well filled pods ; is earlier than the best stocks of Daniel O'Rourke, and Dicksons' First and Best, whilst the fact of its being a "Blue" Pea proclaims it to be infinitely superior in flavour to any White Pea in cultivation.

ASHFORD, KENT.—Oct. 29, 1870.

PETER LAWSON & SON

HAVE JUST RECEIVED FROM AUSTRALIA A FEW TONS OF

BROMUS SCHRÆDERI.

This Seed is perfectly hardy, and thrives well during the winter in almost all situations.

On wet lands, where it is sometimes difficult to get good Crops of Grass, Bromus Schraederi flourishes, and can be repeatedly mowed for consumption ; while it is invaluable on dry soils for grazing during winter, when there is a scarcity of Rye-grasses. It should be drilled say from 40 to 50 lb. per acre, if sown alone. Price of above on application.

P. L. & S. have also on hand a superior Stock of

PERENNIAL AND ITALIAN RYE-GRASSES, NATURAL GRASSES, SEED WHEATS, WHITE AND RED OATS, BARLEY, ETC.,

Samples and prices of which they will be most happy to forward on application.

20, BUDGE ROW, CANNON STREET, LONDON, E.C. ; and EDINBURGH.

New Soft-Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready. It contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest price consistent with quality and correctness. See List, and request quotations.

New Florist's Flower and Florist's Flower Seed Nurseries, Woolwich.

Notice.

H. LANE AND SON'S Descriptive CATALOGUE can be had free by post on application. It contains a List of 500 varieties of ROSES (including the new ones, all at the same price), a choice collection of RHODODENDRONS, all the new and popular FRUITS, a fine collection of CONIFERS, HARDY ORNAMENTAL TREES and SHRUBS, AZALEAS, &c.

The Nurseries, Great Berkhamsted, Herts.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.

Exotic Nursery, Tooting, Surrey, S.W.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Ferns, Stove Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Bedding Plants, and other Novelties.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repays a visit.

Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE for the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved Cool Fruits, with heights and prices, as well as the leading EVERGREENS and ROSES.

The American Nursery, Bagshot, Surrey.

GEO. LIGHTBODY, Falkirk, being unable, from infirmity, to continue the cultivation of TULIPS, will dispose of his stock at the following low prices:—

100 varieties, fine show sorts, with names .. .. 50s.
100 varieties, offsets, with names .. .. .. 25s.

Best bed of 81 rows, comprising many valuable varieties, and several new and fine seedlings, £30.

CATALOGUES of the stock may be had on application.

AURICULA CATALOGUES are now ready.

EDWARD TAYLOR, FLORIST, Malton, Yorkshire, offers, per dozen,

TRITOMA UVARIA, strong, 12s. 6d. per 100.

GRANDIFLORA, 12s. 6d. per 100

GLADIOLUS BRENCHLEYENSIS, 4s. per 100; 35s. per 1000.

SCILLA SIBIRICA, 7s. 6d. per 100; 65s. per 1000.

YUCCA FILAMENTOSA, strong, 6s. per dozen; 35s. per 100.

PHLOX DRUMMONDII, in pots, strong, 4s. per dozen; 25s. per 100.

ARUNDO CONSPICUA, 4s. per dozen; 25s. per 100.

PAMPAS GRASS, 4s. to 6s. per dozen; 25s. to 35s. per 100

CATALOGUES gratis on application.

GLADIOLUS GANDAVENSIS.—Selection of the finest varieties, must be had from November to April. CATALOGUE, containing detailed descriptions, will be published at the end of November next.

AMARYLLIS (Hardy Hybrids).—The culture of the Amaryllis has been for the past four years, and still continues to be, one of the leading features of this Establishment. From year to year no efforts have been spared to bring to greater perfection this beautiful tribe of plants. To effect this, the choicest varieties have been selected from all existing collections, so that, by careful and judicious hybridisation, a very superior class of well-formed flowers has been obtained. I am now offering these bulbs of my own raising, which, for general excellence, are not to be surpassed, if equalled.

At the International Exhibition of 1868, held in Ghent, the First Prizes were awarded to this Collection, and to none other in the English list.

The author of the excellent "Traité Théorique et Pratique de la Culture des Plantes de Serre Froide," M. P. E. De Puydt, in the April Number, p. 300, of the Belgian periodical "Revue Horticole," published in Brussels, speaks as follows with reference to the Collections shown on this occasion:—

"One genus of plants, by the splendour and infinite variety of its flowers, struck all comers with astonishment. The Amaryllis, far from being of recent introduction, has, however, become under the clever hands of Mr. Van Houtte completely transformed, and carried to such a degree of perfection as to be unrecognisable. In one of the saloons of the Exhibition we observed some hundreds of these fine plants, with large flowers, striped, flaked, and edged with every shade of colour, from the purest white to the most crimson. A new variety which had been crowned approached even violet. Mr. Van Houtte's selection was at once irreproachable, and surpassed all expectation."

At the International Exhibition, held at Brussels in the month of April last year, Five First Prizes, including Two Gold Medals, were awarded to my Collections.

Collections of Amaryllis have been made up for convenience, and commonly those sorts producing finely-formed flowers of the richest colours, all of which were specially selected during the past blooming season.

FINE DISTINCT VARIETIES.

Collection		s. d.	Collection		s. d.
A	6 fine varieties for ..	8 0	I	12 fine varieties for ..	48 0
B	6 " " ..	16 0	J	12 " " ..	60 0
C	6 " " ..	32 0	K	12 " " ..	80 0
D	6 " " ..	40 0	L	25 " " ..	32 0
E	12 " " ..	16 0	M	25 " " ..	60 0
F	12 " " ..	24 0	N	25 " " ..	80 0
G	12 " " ..	32 0	O	25 " " ..	160 0
H	12 " " ..	40 0			

LOUIS VAN HOUTTE, Royal Nursery, Ghent, Belgium.

British Orders.

LOUIS VAN HOUTTE, having made advantageous arrangements with the various steamboat Companies for the transmission of goods, matted Baskets or Hampers of an ordinary size can now be sent direct from Ghent to any of the following Ports for the sum appended, which sum will be charged in Invoice at Goole, Harwich, London, and Middlesbro'-on-Tees, for 5s. each; Newcastle-on-Tyne and Liverpool, for 7s. 6d. each; and to Belfast, Cork, Dublin, Glasgow and Leith, for 10s. 6d. each.

SPECIAL RATE FOR FREIGHT TO LONDON ONLY:—

1 package weighing	1 to 4 lb.	.. .. ..	2s. 0d.	
1 "	"	5 to 10 lb.	.. .. ..	2 0
1 "	"	11 to 25 lb.	.. .. ..	3 0
1 "	"	26 to 30 lb.	.. .. ..	3 6
1 "	"	31 to 50 lb.	.. .. ..	4 0
1 "	"	51 to 100 lb.	.. .. ..	5 0
Matted Baskets, each			.. .. ..	5 0

It must be distinctly understood that the above rates do not include the cost of the materials used in packing; these are, however, in all cases, charged as low as possible.

From the above rates, owing to the final destinations the re-expedition is made by special agents, at the cheapest rate and by the shortest route.

It was formerly customary to charge the uniform rate of 5s. per package to London; this method proved naturally unsatisfactory, as small packages were thereby overcharged.

The advantage of the present system for the Buyer will readily be perceived. For example, a party ordering 50 Hyacinths, weighing nearly 10 lb., can now receive these Bulbs, free in London, for 2s. 6d.; 100 Hyacinths, weighing 20 lb., for 3s.; 200 Hyacinths, weighing 40 lb., for 4s., and so on. Another example:—A basket containing 50 Camellias, with buds, or the same number of Indian Azaleas, of the usual size, will be delivered free in London, or any of the first four ports enumerated above, for 5s.

U. S. A. Payments on LOUIS VAN HOUTTE'S account may be made to Messrs. AUSTIN, BALDWIN AND CO., 72, Broadway, New York, to whom also all Orders from customers residing in the United States, with whom L. V. H. has had no previous transactions, must be sent.

Royal Nursery, Ghent, Belgium.—October, 1870.

STRONG Standard APPLES, PEARS, and WALNUTS; fine Standard and Dwarf-trained APRICOTS, PEACHES, and NECTARINES; bushy LAURUSTINUS and PORTUGAL LAURELS; a select collection of Standard and Dwarf Perpetual ROSES of the leading sorts; strong Deciduous flowering SHRUBS; ASH, 3 to 5 feet; LARCH, SPRUCE, SCOTCH and AUSTRIAN FIRS, and all KINDS of FOREST TREES. All the above have been regularly transplanted and are well rooted. Prices on application to

CHARLES BURGESS, The Nurseries, London Road, Cheltenham.

Strawberries.

E. H. KRELAGE AND SON, Haarlem, Holland, are preparing a new ILLUSTRATED CATALOGUE of their unrivalled collection of STRAWBERRIES, in which all the novelties of the last years will be found, and besides, 18 new Russian sorts, obtained by Professor Regel, St. Petersburg, and now offered for the first time. The Catalogue is sent on application. A Discount is allowed to the Trade.

Fruit Trees.

MAGNIFICENT Dwarf-trained PEACHES, NECTARINES APRICOTS, PEARS, PLUMS, APPLES, and CHERRIES.
Standard-trained PLUMS, Fruiting Trees.
Dwarf-trained HEDGE TREES of APPLES, PEARS, & PLUMS.
Pyramidal APPLES, PEARS, and CHERRIES.

WM. WOOD AND SON'S Nurseries have long been celebrated for the growth and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

The Belgian and Other First-rate Fruit Trees.

LOUIS VAN HOUTTE begs to announce that the English issue of his CATALOGUE, No. 1763 M., has been sent to his Customers. It contains the CONIFERS, the ORNAMENTAL TREES and SHRUBS, ROSES of all kinds, and GESNERIACEOUS PLANTS, to be had at a very cheap rate, in dry roots, prepaid by post in small tin boxes. The unforeseen unexpected Novelties therein advertised are of such an important value that they will in all manners attract the attention of those who intend to plant something for autumn, so as to have an enjoyable view of this novel tribe of plants, flowering from March until late in the autumn

Royal Nursery, Ghent, Belgium.—October 29.

Ornamental Trees and Shrubs.

LOUIS VAN HOUTTE begs to announce that his CATALOGUE, No. 1756 M., contains a large quantity of the finest TREES and SHRUBS in cultivation. He directs especial attention to the finest and the grandest of all the LILAC TRIBE, the DR. LINDLEY, which is standard.

Royal Nursery, Ghent, Belgium.

WM. MAULE and SONS beg to inform their Friends who usually require RHODODENDRONS and other AMERICAN PLANTS for Winter and Spring forcing, that their stock is beautifully set with flower buds this season, and early orders will oblige.

Choice sorts, by name, for potting, 30s. to 42s. per dozen
POINTED and other Rhododendron kinds, with AZALEAS and KALMIAS, 18s. to 24s. per dozen
STANDARDS, and PLANTS for planting out, in fine specimens

Nursery, Bagshot.

Araucaria imbricata.—Perfect Specimens,

WELL GROWN and very HANDSOME

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX

WM. WOOD AND SON have a large Stock of the above. Price, per plant:—

2 feet	.. ..	.. £0 5 0	8 feet	.. .. .. £2 2 0
4 feet	.. ..	.. 1 1 0	10 feet	.. .. .. 3 3 0
6 feet	.. ..	.. 1 11 6	Larger, up to 30 feet.	

Price on application.

Roses, Fruiting and Ornamental Trees, Araucarias, and Other Coniferæ.

SPECIAL STOCKS for PRESENT SEASON.

PAUL AND SON, The Old Nurseries, Cheshunt, N., recently drew attention to their special Stocks of the above, of which they invited an inspection. The following SPECIAL STOCKS are especially worth the attention of intending planters.

CATALOGUES or SPECIAL PRICES post free on application.

ROSES, 120,000 individually carefully cultivated Standards and Dwarfs.

New Hardy Fruiting Ornamental Tree—The IMPERIAL CRAB (LANG).—A supposed hybrid between the Red Astrachan and Siberian Crab. Strong 5 to 6 feet stems, 2s. 6d.; dwarfs, 3s. 6d

ACER NEGUNDO VARIEGATA and CERASUS MAHALEB VARIEGATA, the two finest white-edged leaved trees; stand ards, 24s. per dozen, dwarfs, 15s. per dozen.

MAPLES, ASH, ELMS, 8 to 10 varieties of each, variegated, purple, and cut-leaved, 1s. 6d. to 2s. 6d. each.

We would specially call attention to the completeness of our collection of this our specialty—"HARDY ORNAMENTAL TREES."

New Hardy Conifer—CUPRESSUS LAWSONIANA ALBA PENDULA (Paul & Son): First-class Certificates, Royal Horticultural Society, Crystal Palace, Birmingham, Enfield, &c. Orders booked for execution in rotation in May next. 10s 6d. to 42s. each.

ARAUCARIA IMBRICATA, grown at our High Beech Nurseries, uninjured by the frosts of past years, and moved June last. We offer perfect specimens of annexed sizes and prices:—2 to 3 feet, 3s. 6d.; 3 to 4 feet, 5s.; 3½ to 4 feet, 7s. 6d.; 4 feet, 10s. 6d.; 4½ to 5 feet, 15s. to 21s. each.

MEXICAN PINUS, as DEVONIANA, MACROPHYLLA, HARTWEGII, &c., fine unpotted plants, 3 to 4 feet, 3s. 6d. to 5s. each, very rare. Collection of 100 varieties, as lists, given on application.

EVERGREENS—HOLLIES, in 20 to 30 green, gold, and silver leaved bright coloured plants, with leads, 2s. 6d. to 7s. 6d. each. 30s. to 60s. per dozen.

RHODODENDRON PONTICUM, AUCUBA, COMMON LAUREL, SPRUCE FIR, and other EVERGREENS for Wood Planting, cheap and in quantity

All goods carriage paid to London.

New and Interesting Lilium.

E. H. KRELAGE AND SON, NURSERYMEN, SEEDSMEN, AND FLORISTS, Haarlem, Holland, have a fine stock to offer of the following extra fine sorts of LILIUM:—

LILIUM TIGRINUM, flore-pleno, splendid novelty (figured in Belfast, Cork, Dublin, Glasgow and Leith, for 10s. 6d. each.

Regel's "Gartenflora," April, 1870), fine bulbs, £1 each; small bulbs, 10s. each.

LILIUM THUNBERGIANUM, flore-pleno, very fine (see *Gardeners Chronicle*, 1st Jan., 1870), fine bulbs, 2s. 6d. each.

LILIUM HUMBOLDTII, from California, 5 feet high, golden flowers spotted with purple, £1 each.

LILIUM PARDALINUM, from California, large, lilac-white, sweet-scented flowers, £1 each.

LILIUM PUBERULUM, flowers yellow, with purple and black spots, from California, 7s. 6d. each.

LILIUM SPECIOSUM (lancifolium) CANDIDISSIMUM, new introduction from Japan, with pure white flowers, and a dwarf habit, £1 each.

LILIUM SPECIOSUM (lancifolium) RUBRUM MULTIFLORUM, splendid variety, one of the best in cultivation, 8s. per dozen; £3 per 100

LILIUM SPECIOSUM (lancifolium) PUNCTATUM, 10s. per dozen; £1 per 100

LILIUM SPECIOSUM (lancifolium) ALBUM, 7s. per dozen; £1 per 100.

LILIUM SPECIOSUM (lancifolium) RUBRUM, 4s. per dozen; £1 5s. per 100.

LILIUM SPECIOSUM (lancifolium) RUBRUM EXTRA, the darkest of all rubrums, £1 8s. per dozen; £8 per 100.

LILIUM BROWNII, 6s. each; £3 10s. per dozen

LILIUM SZOVITZIANUM (Colchicum) 5s. and 7s. 6d. each, according to size.

Every other sort of Lilium in the trade, as well as the greatest variety of Dutch Bulbs, Bulbous and Tuberculous Plants. All Liliums are supplied in fine flowering bulbs. Prices to the Trade on application. All orders or letters to be sent direct to

E. H. KRELAGE AND SON, Haarlem, Holland.

INTENDING PLANTERS are respectfully invited to inspect the extensive stock of FOREST TREES and SHRUBS grown in these Nurseries, all of which are in fine condition, and can be highly recommended

THOS. THORNTON, The Nurseries, Bagshot, Surrey.

T. T. would be happy to receive Visitors from intending Visitors, as he would be in a position to offer every facility for their doing so.

FOREST PLANTING.—We beg to offer an extensive and well-grown stock for above purpose. Our LARCH, FIR, HIGHLAND PINE, &c., is of unusually fine quality, Prices and every information.

JOSEPH TREMBLE AND SONS, Nurserymen, &c., Penrith.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet	PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 7 ft.	COMMON LAURELS, 9 to 9 ft.
Variegated HOLLIES, 4 to 7 feet	
RHODODENDRONS, 3 feet, thickly set with buds.	

The above have recently been transplanted, are very bushy hand some plants, and quite safe. Price per dozen or hundred on application.

Floral Nursery, Hailsham, Sussex.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, suitable for planting at very moderate prices, in order to clear the land for building purposes.

Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.

Gentlemen wishing to Plant a New or improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.

Nursery and Seed Warehouse, Broad-Hill.

Seed Warehouse—15, Queen Square.

Liverpool, September, 1870

Northampton Nurseries.

JOHN PERKINS, SEN., begs to call the attention of Gentlemen, Gentlemen, and others intending to be planting in his extensive stock of the following, the whole of which will be offered at unusual low prices —

Whitethorn or Quick, extra fine, 3 years transplanted	Hornbeam, 1½ to 2 feet.
Spruce Fir, 2½ to 4 feet.	Evergreen Privet, 1½ to 2 feet
Scotch Fir, 1½ to 2 feet.	Berberis aquifolia, 1 to 1½ foot.
Larch Fir, 1½ to 2 feet, and 2½ to 3 feet.	Green Box, 1½ to 2 feet, and 2 to 3 feet
Pinus austriaca, 1½ to 2 feet.	Portugal Laurel, 1½ to 2 feet, and 2 to 3 feet.
Birch, 2 to 4 feet.	Common Laurel, 2 to 3 feet.
Beech, 2 to 3 feet, and 3 to 4 feet.	Black Italian Poplar, 4 to 6 feet.
Hazel, 2 to 3 feet.	Blackthorn, 1½ to 2 feet

I PUS stock of all kinds of ROSES, FRUIT, FOREST, and ORNAMENTAL TREES, &c., are transplanted and in the best possible condition for removal, having been frequently transplanted.

Descriptive Priced CATALOGUES, free by post, or on application to 52, Market Square, opposite the Corn Exchange, Northampton.

The most Desirable Plant of the Season.

PARSONS'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to any other variety: the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been cultivated at the Principal Shows this year, for which it obtained the highest honours that could be awarded, viz.:—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, at 2s. 6d. per packet, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty the Queen, 28, Western Road, Brighton, and at Hawkes' Gate Nurseries, Keymer, Hurstpierpoint; and of the following Agents:—

ENGLAND.

Messrs Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenall Street, London.
" Wood & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
" A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, King's Road, Chelsea.
" S. Nairn & Sons, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
" Butler, McCulloch & Co., Covent Garden, London.
" G. Gibbs & Co., Down Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Son, Fulham Nursery, London.
" Downie, Laird & Laing, London and Edinburgh.
" P. Lawson & Son, 29, Budge Row, London.
" Butley & Silverlock, London.
" Dick Radclyffe & Co., 129, High Holborn, London, W.C.
" Fisher, Holmes & Co., Handsworth Nurseries, Sheffield.
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
Mr. George Tredgett, Cambridge.
" L. S. Woodthorpe, Sible Hedingham, Essex.
" G. Hinxman, Fareham.
" B. Bracher, Halifax, Yorkshire.
" W. Knight, Hailsham, Sussex.
" Timothy Brigden, South-Eastern Railway Station,
" W. Paul, London.
" E. Holmes, Whittington Nursery, near Lichfield.
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire.
" B. S. Williams, Upper Holloway, London.
" E. Cooling, Derby.
" James Wood, Newport, Isle of Wight.

SCOTLAND.

Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow.
" P. Lawson & Son, Edinburgh.
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling.
" J. & R. Thyne, 60, Buchanan Street, Glasgow.

IRELAND.

Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin.

BELGIUM.

Mons. Louis Van Houtte, Ghent.

PRUSSIA.

Messrs. Platz & Son, Erfurt.
" Ferdinand Juhlke's Successors, Erfurt.

AMERICA.

B. K. Bliss & Messrs. Sons, New York.

To Landscape Gardeners.

THE EPSOM BURIAL BOARD are desirous to have submitted to them PLANS for LAYING OUT and PLANTING 80 ACRES of LAND for the purpose of a CEMETERY. The block plan, showing the sites of two chapels and a lodge, can be seen at my Office. Each design is to be accompanied by a short specification of the number and quality of Trees and Shrubs to be planted, and an Estimate of the total expense to be incurred. They will pay a Premium of Five Guineas to the author of the design which they may consider the best and most appropriate, reserving to themselves the right to withhold the Premium should they be of opinion that no design of sufficient merit has been sent in, and also the right to reject any plan or estimate. The Designs, Specifications, and Estimates are to be delivered at my Office, sealed covers, and marked "Cemetery Designs," on or before THURSDAY, November 10

GEORGE WHITE, Epsom, Clerk to the Board

MYOSOTIS DISSITIFLORA.

B. S. WILLIAMS

Has much pleasure in offering good Seedling Plants, in quantity, of the above superb New Spring Bedder. It blossoms three weeks earlier than M. sylvatica, far more profusely, of a bright azure-blue colour, and is quite as hardy.

Extracts from *Gardeners' Chronicle.*

"For beauty M. dissitiflora carries all before it, captive at its sweet will, and reigns supreme without a rival over all the Forget-me-Nots." "For earliness, compactness, and general effect, it is far in advance of M. sylvatica, and the individual blooms are nearly twice as large. We say, emphatically, that no arrangement of Spring Decorative Gardening can be complete that excludes Myosotis dissitiflora."

Price—per dozen, 6s.; per 100, 40s.

B. S. WILLIAMS, VICTORIA and PARADISE NURSERY, UPPER HOLLOWAY, N.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the present Nursery is reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 30s. per doz., or £10 p. 100.
" Good named kinds, £5 to £7 10s. per 100
" Common mixed colours, £2 10s. per 100
" Van Houtte's splendid, strong bushy flowering plants, 1½ to 3 feet, 42s. to 120s. per dozen and upwards. This is one of the most beautiful of the Double Azaleas.

Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower-buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens

ANDROMEDA FLORIBUNDA.—Good plants, 18s. to 30s. per doz.

RHODODENDRONS.—We invite the special attention of Rhododendron buyers to this part of our stock. We have miles of borders in which the plants vary from 2 to 8 feet high. Every plant a specimen, and comprises all sorts resembling the common Ponticum

Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent on application

Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Green Row were never fully all of them supplied from Knap Hill. As no description on paper can give an adequate idea of these plants, we have had a fair example photographed, which is given in our Catalogue, just published

RHODODENDRON PONTICUM, for Cover, £7 10s. to £15 per 1000
" " varieties, named, from layers, 10 varieties, 6s. to 10os. per 100
" Dwarf varieties, the best kinds, nice plants, £5 to £7 10s. p. 100

Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s. to 100s. per 100

" Larger and very bushy plants, £10 to £20 per 100

☞ We have grown for some years past a large number of Rhododendrons from layers, and we now have a stock of more than 100,000 plants of named varieties, which we believe are quite unequalled, being without exception the best plants we have ever seen. We supply them, all layers, at from 10s. to 200s. per 100. A sample, the only guide, will be sent on application

HARDY HEATHS. The most distinct and beautiful winter and spring varieties, by name, including Menziesias, every plant a specimen; 30 per dozen, 2s. per 100

" The free growing varieties of VULGARIS, &c., 30s. per 100, £10 per 1000.

" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, 45s. per 100.

KALMIA LATIFOLIA, from 50s. to 100s. per 100.
" Nice blooming plants, £5 to £10 per 100
" Larger, 20s. to 60s. per dozen and upwards.
" MYRTIFOLIA, 42s. to 60s. per dozen.

All other American Plants are grown to a large extent.

HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.

COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100; 3 to 3½ feet, £5 to £7 10s. per 100; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.

Thousands of beautifully grown Pyramidal plants.

We have a number of very large Green Hollies, 12 and 15 feet high.

WATERER'S HOLLY.] We have these in large numbers and of

GOLDEN QUEEN. } all sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.

PERRY'S WEEPING HOLLY STANDARDS.—A large number.

NEW GOLDEN WEEPING HOLLY.—Nice Standards.

THE COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, magnificent plants.

VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high

YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 12 feet. These are invaluable as blinds.

IRISH YEWS, of all sizes, up to 10 feet.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN. } Handsome Pyramidal plants, 5, 6, 7, and
" VARIEGATED } 18 feet high. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.

AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high

LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.

LAURUSTINUS and BAYS.—Fine Standards, in tubs.
Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted:—

ABIES ALBERTUS, 5 to 6 feet, 42s. per dozen; 7 to 8 feet, 60s
These are beautiful plants, transplanted 1870

ABIES or CONIFERA, 4 to 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. and upwards.

PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.

PINUS EXCELSA, 2 to 2½ feet, 30s. to 42s. per dozen; 3½ to 4 feet, 7s. 6d. to 10s. 6d. each; larger, 5 to 6 feet, 21s. each and upwards.

PINUS NOBILIS, 1½ foot, very stout, 18s. per dozen; £5 per 100; 2 to 3 feet, 60s. per dozen; 4, 5, 6, 7, 10 to 15 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards.

PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s. per dozen; 2½ to 3 feet, 5s. to 7s. 6d. each; larger specimens, 4, 5, 6, 8, and 10 feet.

PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.

PICEA LASIOCARPA, 3 feet, handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, and 8 feet high, 21s. each and upwards; and all have been transplanted within 12 months.

CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; 5 to 7 feet, 60s. to 84s. per dozen; 10, 12, and 15 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, 4, and 5 feet high.

CUPRESSUS LAWSONIANA GLAUCULIS } 3 to 4 feet, 42s. to
" ARGENTEA } 84s. per dozen.

JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.

THUJA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.

THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 42s. per dozen.

THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.

WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are stout, handsome, well balanced trees, with stout stems and finely rooted:—

ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET FLOWERING HORSE CHESTNUTS, 8 and 10 feet high.
ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet.
The stout and compact Horse Chestnuts have fine heads and stout stems, girthing 5 to 6 inches 4 feet from the ground.
BEECH, PURPLE, 6 to 8 feet; 10 to 12 feet, fine trees.
BEECH, COMMON, 8 to 10 feet.
BIRCH, WEEPING, 8 to 10 feet.
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet.
LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.
MAPLES, NORWAY, 8 to 14 feet.
OAKS, ENGLISH, 8 to 10 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high.
The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBARDY, 10 to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
AILANTUS, 8 to 10 feet.
CATALPAS, 6 to 8 feet.
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years.

Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

WINTER AND SPRING FLOWERS.

CARTER'S

COLLECTIONS OF

HYACINTHS, TULIPS, CROCUS, &c.,

Include only the best kinds, and being made up in a most liberal manner, these Collections offer the most desirable medium to ensure an effective display in the Drawing Room or Garden.

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR CULTURE.
Packing and carriage free.

COLLECTION No. 1, complete, price 84s.
COLLECTION No. 2, reduced quantities, price 63s.
COLLECTION No. 3, reduced quantities, price 42s.
COLLECTION No. 4, price 21s., comprises—

12	Hyacinths, in 12 extra fine named sorts	6	Tulips, Tournesol
		3	" Rex rubrorum
6	Polyanthus Narcissus, in 6 varieties	3	" La Candeur
		3	" Royal Standard
12	Jonquils, sweet scented	6	" Yellow Prince
50	Crocus, finest named	3	" Rosa Mundi
1	Dielytra spectabilis	6	" Due Van Thol
1	Lilium speciosum	1	Amaryllis formosissimus
6	Scilla sibirica	6	Ixias, finest mixed
24	Snowdrops, extra large selected	6	Sparaxis, finest mixed
		6	Triteleia uniflora

COLLECTION No. 5, reduced quantities, price 10s. 6d.

EVIDENCE OF QUALITY.

From C. H. HAWKINS, Esq., *Colchester, November* 15, 1869
"The bulbs arrived quite safely, and I have the pleasure to send you a cheque for them. I sent a like order to another house at the same time, and I think it only right to say that while theirs were more numerous, yours were the finer, firmer, and heavier."

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR AND OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 6, complete, price 84s.
COLLECTION No. 7, reduced quantities, price 63s.
COLLECTION No. 8, reduced quantities, price 42s.
COLLECTION No. 9, price 30s., comprises—

12	Hyacinths, in 12 extra fine named sorts for pots or glasses	12	Scilla Belgica, mixed
		75	Crocus, blue
12	" in 6 distinct sorts for bedding	75	" striped
12	Narcissus, double, white	75	" large yellow
12	" Poeticus or Pheasant's-eye	75	" white
36	Tulips, extra fine mixed	30	Anemones, extra fine mixed
6	" Tournesol	8	Gladiolus Brenchleyensis
6	" Due Van Thol	12	Iris, extra choice mixed English
3	" Royal Standard		
3	" La Candeur	12	" extra fine mixed Spanish
3	" Yellow Prince	12	Jonquils, Campernelle
3	" Rex rubrorum	30	Ranunculus, extra fine, mixed
12	Double Daffodils		
12	Star of Bethlehem	50	Snowdrops

COLLECTION No. 10, reduced quantities, price 15s.

EVIDENCE OF QUALITY.

From W. F. MARTIN, Esq., *Hereford, June* 6, 1870.
"The bulbs supplied by you last autumn, made a glorious show all through the spring. They were a splendid collection of 500 plants, and were admired by everybody who saw them."

CARTER'S COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 11, complete, price 84s.
COLLECTION No. 12, reduced quantities, price 63s.
COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, price 21s., comprises—

12	Hyacinths, in 3 colours	25	Crocus, blue
12	Narcissus, double white	50	" striped
12	" Poeticus or Pheasant's-eye	50	" large yellow
12	Double Daffodils	25	" white
24	Tulips, extra fine mixed, double	24	Anemones, extra fine mixed
12	" extra fine mixed, single	6	Gladiolus Brenchleyensis
12	" extra fine mixed, late	12	Iris, extra choice mixed English
12	" Due Van Thol		
6	Polyanthus Narcissus, fine mixed	12	" extra fine mixed Spanish
		3	Lilium candidum
6	Campernelle Jonquils	3	" tigrinum
12	Star of Bethlehem	24	Ranunculus, extra fine mixed
6	Triteleia uniflora	50	Snowdrops
6	Dog's-tooth Violets	24	Winter Aconites

COLLECTION No. 15, reduced quantities, price 10s. 6d.

EVIDENCE OF QUALITY.

From D. MATHER, Esq., *Chipping Norton, July* 11, 1870.
"I was much pleased with the whole collection of bulbs, they have been a great success."

JAMES CARTER AND CO.'S CATALOGUE of Hyacinths, Tulips, Crocus, and other Bulbs, Roses, Fruit Trees, &c., containing full particulars of the above Collections, will be forwarded Gratis and Post Free on application.

CARTER'S COLLECTIONS of HYACINTHS.

For the convenience of those Customers who do not wish the trouble of selecting for themselves, is offered the undermentioned Collections of Hyacinths, *the selection of which being left to their judgment and experience*, will be found perfectly adapted for the purposes stated.

A.	12	good varieties	Double Hyacinths, for pots, 7s. 6d.
B.	12	"	Single Hyacinths, for pots, 7s. 6d.
C.	12	"	Double Hyacinths, for glasses, 8s. 6d.
D.	12	"	Single Hyacinths, for glasses, 8s. 6d.
E.	12	very fine varieties	Double Hyacinths, for pots, 9s. 6d.
F.	12	"	Single Hyacinths, for pots, 9s. 6d.
G.	12	"	Double Hyacinths, for glasses, 10s. 6d.
H.	12	"	Single Hyacinths, for glasses, 10s. 6d.
I.	12	best varieties	Double Hyacinths, for pots, 12s.
K.	12	"	Single Hyacinths, for pots, 12s.
L.	12	"	Double Hyacinths, for glasses, 12s.
M.	12	"	Single Hyacinths, for glasses, 12s.
N.	100	Hyacinths, in 100 best varieties, £6 6s.	
O.	100	Hyacinths, in 50 best varieties, £4 4s.	
P.	50	Hyacinths, in 50 very fine varieties, £2 10s.	
Q.	50	Hyacinths, in 25 very fine varieties, £1 17s. 6d.	

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

DUTCH FLOWER ROOTS

CARRIAGE FREE.

SUTTONS'

IMPORTED

FLOWER ROOTS.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks, having received their first consignment of

CHOICEST DUTCH FLOWER ROOTS,

Selected by themselves from the leading Growers in Holland, are now prepared to receive Orders for their COMPLETE COLLECTIONS for WINTER and SPRING BLOOMING, either for open ground or indoor cultivation.

SUTTONS'

COLLECTIONS of FLOWER ROOTS.

Suttons' £1 1s. Collection, for Open Ground

Carriage Free, contains—

12	fine mixed Border Hyacinths	6	fine mixed Gladiolus
6	,, Polyanthus Narcissus	12	Due Van Thol Tulips
12	Pheasant's-eye Narcissus	6	mixed Single Early Tulips
12	Double White Narcissus	6	fine mixed Double Tulips
25	Double Daffodils	6	,, Parrot Tulips
6	large Campernelle Jonquils	6	Gesneriana Tulips
50	fine mixed Double Ranunculus	25	fine mixed Tulips
50	Scarlet Turban Ranunculus	6	,, English Iris
12	fine mixed Double Anemones	6	,, Spanish Iris
12	,, Single Anemones	3	Lilies, of sorts
150	Crocus, 3 sorts	3	Due Van Pavonia
50	Snowdrops	6	Dog's-tooth Violets
25	Winter Aconites	3	Crown Imperials

Suttons' £1 1s. Collection, for Indoor Cultivation, Carriage Free, contains—

12	fine Hyacinths, by name	3	Peacock Iris
6	Miniature Hyacinths, by name	50	fine Crocus, by name
6	Polyanthus Narcissus, do.	6	choice Ixias
6	Single Sweet Jonquils	3	choice Sparaxis
6	Scilla peruvca	3	choice Oxalis
6	Single Due Van Thol Tulips	1	Tropæolum tricolor
6	Double Tournesol Tulips	1	Lilium lancifolium album
25	Early Tulips, 5 sorts	1	,, ,, rubrum
3	Persian Iris		

SUTTONS' SUPERB DUTCH HYACINTHS

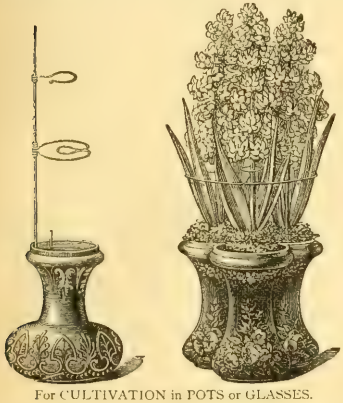

For CULTIVATION in POTS or GLASSES.

The best 12 Hyacinths for 12s.

Messrs. SUTTONS' Collection of Hyacinths consists of more than 200 varieties, a Priced and Descriptive LIST of which may be had on application.

Suttons' Collections of Named Hyacinths.

100	HYACINTHS in 100 very choice sorts	£4	4 0
100	,, 50 very choice sorts	3	10 0
50	,, 50 very choice sorts	2	2 0
50	,, 25 very choice sorts	1	15 0
25	,, 25 very choice sorts	1	1 0
12	,, 12 extra fine sorts	0	12 0
12	,, 12 choice sorts	0	9 0
12	,, 12 good sorts	0	7 0

The order should specify whether they are intended to be grown in water or earth, as all kinds are not equally suited to both purposes. It should also be stated whether single or double blossomed kinds are preferred; otherwise we usually supply about two-thirds double, and one-third single. The single varieties generally thrive best in water, but their merits are never apparent until the flowers are fully expanded.

SUTTONS' MIXED HYACINTHS, for Beds or Open Borders.—Double, Single, and various colours, 2s. 6d. per dozen, 18s per 100

SUTTONS' HYACINTHS, in distinct colours for Massing, Bedding, Ribbon Gardening, &c.—Double and Single, various shades, separate, 4s. per dozen, 30s per 100.

For further particulars, with complete Cultural Instructions, see

SUTTONS'

AUTUMN CATALOGUE FOR 1870,

Gratis and Post Free on application.

FLOWER ROOTS and SEEDS CARRIAGE FREE, except very small parcels.

☞ *Five per cent. allowed for cash payments.*

SUTTON AND SONS,
ROYAL BERKS SEED ESTABLISHMENT,
READING.

Mr. Laxton's New Roses.

H.P. PRINCESS LOUISE and PRINCE of WALES.

PAUL AND SON have the pleasure to announce that the above have passed into their hands, and they hope to have them ready for distribution in course of ensuing summer.

Prince of Wales received First-class Certificate at Birmingham. Princess Louise First-class Certificate at Crystal Palace Show.

Old Nurseries, Cheshunt, N

To the Trade.

STANDARD ROSES, £3 10s. per 100; Dwarf, on Manetti, £2 per 100.

STRAWBERRIES, 50 best sorts, true to name. Strong plants, 10s. per 1000.

W. JACKSON, Blakedown Nursery, Kidderminster.

Hardy Herbaceous Plants.

LOUIS VAN HOUTTE begs to announce that his CATALOGUE, No 138 L., contains a great choice of the best HERBACEOUS HARDY PLANTS, and amongst them the Variegated-leaved POLEMONIUM, DODECATHEON JEFFREYI, the best DELPHINIUM, SPIRÆA JAPONICA, &c.

Royal Nursery, Ghent, Belgium.

ORCHARD-HOUSE TREES.—Bearing Trees, in pots, of PEACHES, NECTARINES, APRICOTS, APPLES, PEARS, PLUMS, CHERRIES, FIGS, MULBERRIES, ALMONDS, VINES, and DESSERT ORANGES. A Priced CATALOGUE of the above sent free on application.

THOS. RIVERS AND SON, Nurseries, Sawbridgeworth.

The Gardeners' Chronicle

SATURDAY, OCTOBER 29, 1870.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY, Nov. 2	Royal Horticultural (Fruit and Floral Committees), at S. Kensington	..	11 A.M.
	Ditto (Scientific Committee)	..	1.30 P.M.
	Ditto (General Meeting)	..	3 P.M.
THURSDAY, — 3	—Linnean	..	8 P.M.

AMONG the many mysteries of plant life yet to be solved, is that relating to the OPENING and CLOSING of FLOWERS. Why should some have a fixed hour for awakening, and an equally definite period for going to sleep, while others—so far as any closing process is concerned—seem never to sleep? and what is the immediate inducing cause of the movements in question? Is it light, or heat, or electricity, or are the motions in question due to the alternate turgescence and emptying of certain cells? We fear that no definite answer can yet be given to these questions. Such evidence as we have seems rather to tend to the inference that the inducing causes are different in different cases; thus, if the Shepherd's Weather-glass or Pimpernel be obviously affected by light, opening its flowers in sunny weather, and closing them when the sky is overcast, the night-blooming Cereus cannot be affected in the same way. In the latter case it can hardly be light that induces the expansion of the flowers. Take the case of the Crocus—a sunny spring day will make these flowers ope their golden eyes to their very widest; but here it seems to be heat rather than light which produces the phenomenon. Put some Crocuses on the chimney-piece of a living-room, in which there is a fire, covering the flowers with a shade so as to exclude the light, and in a short time the flowers will expand. This again points to the agency of heat rather than of light. That these movements have also some connection with the fertilisation of the flowers seems highly probable, and this inference is strengthened by the case of Mesembryanthemum inclaudens, a very pretty autumn-flowering species, for the opportunity of examining which we are indebted to Mr. THOMPSON, of the Penge Nurseries.

In the plants just referred to the fertile stamens are very short and wholly concealed by a series of petals or petal-like stamens, which occupy the throat of the flower-tube. In most other species of Mesembryanthemum the stamens are long and exposed, and the petals of thinner substance than those of M. inclaudens. Are these circumstances mere coincidences, or do they stand to one another in the relation of cause and effect? It would almost seem as if M. inclaudens were self-fertilised, though cross fertilisation is certainly not impossible.

We do not know whether, in other species of Mesembryanthemum in which the flowers remain open, the stamens have the same short stature; perhaps Mr. THOMPSON, Mr. CROUCHER, of Kew, or some other grower may be able to enlighten us on this point.

The genus Mesembryanthemum affords several instances illustrative of the different "habits" of closely allied species: for instance, there is a whole group which open at night, such as M. dolabriforme, M. noctiflorum, and others. M. caninum, a species not known to us, is said by HAWORTH to open in the afternoon. The same observer also says of M. versicolor, "rubicund in the morning, pale silvery in the meridian sun, and rubicund again in the evening." This brings to mind the curious little Selaginella mutabilis, in which the leaves are pale milky white in the evening or in cloudy weather, bright green in the sunshine. The cause of this change may readily be seen under a comparatively low power of the microscope to be due to the contraction of the green contents of the cells into a ball, and to their subsequent diffusion under other conditions. We believe that either Dr. HOOKER, or our most valued correspondent, "M. J. B.," was the first to explain the cause of the change of colour in the Selaginella; but it is clear that the change of colour in the Mesembryanthemum must be due to some other cause.

While writing of Mesembryanthemums, so quaint and so beautiful, we may remind those of our readers interested in the doctrines of vegetable morphology, that Mesembryanthemum barbatum was one of the plants selected by LINNÆUS to show the identity between calyx-leaves and the ordinary leaves. Moreover, the sepals of some of the species, like those of the Roses, show the quincuncial mode of formation exceedingly well. The five sepals in the embryo bud appear one after the other, while the petals appear simultaneously. In most flowers in the adult stage all trace of the primitive inequality of the sepals is lost; but in the Mesembryanthemum, especially in M. conspicuum, this mode of formation is well seen even in the adult state! Again, it is easy to see that in the sepals of Mesembryanthemum it is the sheath rather than the blade of the leaf that is represented.

WHEN the subject of POTATO GRAFTING was first mooted, the changes alleged to have taken place after that operation were by many absolutely denied. This denial came from those who had probably never tried the operation themselves nor seen the results obtained by others. Then, as the evidence became stronger, it was objected that such changes as have now repeatedly been witnessed after the performance of the operation in question, were not necessarily brought about by the grafting process, and that they were not the direct consequence of any commingling of the qualities and properties of the scion and of the stock respectively.

The Potato is notoriously variable; it has been crossed and recrossed *ad infinitum*, and hence "sports" or reversions are common enough. An occasional disentanglement of the mingled elements takes place, and produces changes as great or greater than any that have been observed after the grafting process has been effected. This criticism is perfectly fair as far as it goes, it is based upon facts that are beyond dispute, and any one who leans to the opinion that grafting may and does produce changes must be prepared to weigh these objections and meet them as best he may. An instance is now before us which affords an excellent illustration of the tendency of the Potato to sport. On the same haulm were developed, at a little distance one from the other, two tubers, both of a rounded form, with smooth skins and depressed eyes. The one Potato is perfectly self-coloured, the other is pretty regularly blotched with purple blotches. Moreover, each tuber has grown out—supertuberated, as the phrase is, so that it is now the centre of a mass of small Potatos, which are veritable chips of the old block, in that they reproduce the characters of the parents from which they immediately spring. Here, then, we have a case strictly parallel to the formation of Peaches and Nectarines on the same bough of which this season has furnished us with sundry examples, or of black and white Grapes on the same rod. Here, too, we have a case, of which those who dispute the alleged tendency of grafting to produce variation in Potatos would be sure to avail themselves. They would say, "See here; changes have taken place as great, or greater, than any alleged to be the result of grafting, and yet no grafting has been performed." Nevertheless, it does not follow that, because variation occurs where no grafting has taken place, that therefore the changes witnessed after grafting are not in any way the result of that operation. It may be so, or it may not. Such an illustration as that now before us, does not in reality confirm or confute the Potato grafting theory. It is simply an evidence of that "dimorphism" which the Potato, like all highly cultivated plants, manifests at times, we know not why nor wherefore. It may be, as Mr. MOGGRIDGE in a recent communication (p. 1314) suggested, that the grafting process, the mere surgical operation, is the inducing cause of the changes seen, that the injury inflicted on the tuber has brought about that separation of previously mixed qualities manifested in what

gardeners term sports, and botanists cite as illustrations of dimorphism. From this point of view, the misshapen tubers obtained by Mr. FENN would be the result of an attempt to get back to an ancestral form, and would not be the consequence of the intermingling of the properties of two varieties. The difference between these two explanations is great, and we do not think we are yet in a position to say dogmatically which is the correct one. Nevertheless, we lean rather to the opinion that the variations observed by Mr. FENN, and other experimenters, are really instances of hybridisation, and we arrive at this conclusion mainly from the mixed character of the produce, which, as it seems to us, exhibits evidence of a commingling of properties of the two varieties used in the experiment, rather than of a divergence of characters.

If, however, Mr. MOGGRIDGE's suggestion turn out to be the true one, it will be an important fact gained, as the explanation of the production of sports, at present so mysterious, would then be materially facilitated.

THE subscribers to the VEITCH MEMORIAL, in public meeting assembled, have decided, as we think very wisely, that a PORTRAIT of the late Mr. VEITCH having been secured through the liberality of ROBERT CRAWSHAY, Esq., the fund which has been raised shall be devoted to VEITCH MEMORIAL PRIZES.

We repeat that we think the meeting acted wisely in so doing, and we say this without seeking in the least degree to detract from the importance of certain other propositions which from time to time have been made by individual subscribers, and which included such memorials as a VEITCH Almshouse, a VEITCH Pensioner, a VEITCH Plantation, a VEITCH Fund for Disabled Collectors, &c. Next to the Prize scheme, which was decidedly preferred at the first public meeting, and definitely adopted at the last, the scheme of adding a VEITCH Pensioner to the Royal Gardeners' Benevolent Institution was, as far as we are able to judge, that most in favour, but without a much larger sum at command, both objects could not have been worked out with sufficient completeness; and hence we conclude, as those who were present seem also to have done, that it was better to carry out well the one object indicated by the former meeting, and which it was known had the entire approval of Mr. VEITCH'S family, than to split up the available funds in order to give a more feeble support to a variety of propositions.

As between making the Prize scheme and the Pension scheme the Memorial of Mr. VEITCH, we have, on our own part, no hesitation in giving a decided preference to the former. We were to honour the memory of our deceased friend, by keeping it prominently before the gardening world as an incentive to the same energetic persevering efforts for the advancement of horticulture which we had so often witnessed and so much admired in him; and if we now regard the Memorial as inclusive, and intended to perpetuate the memory of both father and son, —the zealous horticulturist, and the successful traveller,—the same sentiments will equally apply. Surely this will be more effectually secured by spurring on the active man in the full possession of his powers, and in the full practice of his profession, than by pensioning the effete though worthy man whose day of action is past, and who must, in the ordinary course of things, soon pass away from the scene. There can be no question about it; it must be so. The stimulus to action must be more effectual than the sop to repose, in keeping up the memory of a horticultural leader, and we hence conclude that the right thing has been done. It now only remains that these good intentions should be honestly and honourably carried out, which we can have no doubt they will be.

—— WE have received a chromolith of the very pretty WELLINGTONIA GIGANTEA AUREO-VARIEGATA, noticed in our volume for 1868 (p. 948), from its possessor, Mr. HARTLAND, of Cork, accompanied by twigs of the parent plant, showing how well it retains its variegation. The parent tree is now 16 feet high, and with its golden-blotched spray, the variegation showing here in large bunches, there in smaller twigs, must be a very handsome object. Mr. HARTLAND states that "the variegated character is so thoroughly confirmed that thousands of green tops which had been grafted have, without exception, broken out into a richly marked variegation."

—— IF we are to judge from the curious specimen of a GOURD or CUCUMBER plant (more probably the former) lately forwarded to us from Frome by the kindness of Mr. MOGGRIDGE, we are in a fair way of seeing some strange monstrosities this autumn. The specimen in question, of which we give a woodcut showing the external appearance (fig. 252), and the disposition of its component parts in a section (fig. 253), was unfortunately somewhat injured in its transmission by post, but it was in a sufficiently perfect state to enable us to secure a tolerably satisfactory drawing. The case is one just analogous to what occurs not unfrequently in Zonal Pelargoniums, and of which an illustration appeared in this Journal some years since (p. 725, 1855). In that case, however, only a portion of the plant assumed the contracted form, but here the whole plant is reduced to an almost amorphous mass, showing here and there traces

I

of foliage, the disc of the leaves as well as the other portions studded with fleshy warts. We have observed this season, in plants of the Bush Squash—which though they have not received a drop of water since they were

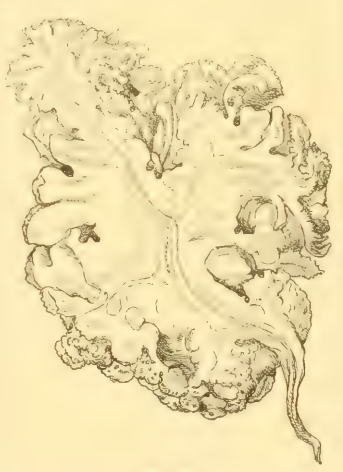

II

planted, are peculiarly luxuriant—that the laterals, instead of developing perfect flowers as they ought, are inclined to send out an enormous quantity of flower-buds, so crowded that they cannot come to perfection. The cause of such malformations is very obscure; they seem to depend rather on an excitement of the cellular tissue, which deranges the normal polarity of the cells, than on any check to vegetation, which rather induces stunted and shortlived individuals. *M. J. B.*

—— WE learn from *Nature* that Dr. SCHIMPER, historian of the Mosses of Europe, and distinguished for his researches in fossil botany, escaped from Strasburg the day before the final closing of the gates at the commencement of the siege. Fears are entertained as to the safety of his fine collection.

—— WE understand that the fine collection of TULIPS, grown by Mr. G. LIGHTBODY, of Falkirk, is to be disposed of, in consequence of the bodily infirmity of the proprietor, which entirely prevents him from engaging in their cultivation. The collection contains many fine seedlings. Here is a rare opportunity for a beginner to make up a good bed or two of these gaudy flowers.

—— Subjoined is the result of GARDENERS' EXAMINATIONS, held under the auspices of the Royal Horticultural Society, July 12, 1870:—

Name.	Fruit and Vegetable Culture.		Floriculture.	
	Cert.	Marks.	Cert.	Marks.
1. G. Haskins, R.H.S., Chiswick	3	700	2	830
2. C. Burley, ditto	3	570	2	770
3. W. Mitchill, ditto	..	..	2	640

The examiner in fruit and vegetable culture remarks that "these were very unsatisfactory papers." The examiner in floriculture remarks, that "the best answers were those of No. 2, but fewer of the questions were replied to."

—— The exhibition buildings for the ANNUAL INTERNATIONAL EXHIBITIONS are making rapid progress towards completion. The painters and decorators have finished their work in the fine arts gallery, and Messrs. MINTON, TAYLOR, & Co. have commenced laying the encaustic tiling on the floors. The walls of the galleries are painted in distemper, a pale green, relieved by a broad band of chocolate under the cornice and by the skirting, which is also chocolate. The ceiling is ordinary distemper. The effect of the whole has been pronounced by those who have seen it to be exceedingly pleasing. In the lower part of the building, which has just been taken possession of by the painters, the same colours will be employed, and, with some exceptions, the same style of decoration will be employed. A "dado," 5 feet high, of chocolate colour, will run round the entire court, and the girders which support the fine arts galleries above will be panelled in the same colours. The colour of the tiles for the flooring is dark red. The French supplementary gallery, or annexe, forms three sides of a square, and has direct communication with the exhibition buildings. The courtyard, or interior of the square, is to be laid out as a garden, and used for refreshment purposes. It is proposed to open up to the view of persons in this courtyard the gardens of the Horticultural Society. American artists, residing in the United Kingdom, who purpose exhibiting works of painting and sculpture, are requested to communicate their names and addresses as soon as possible to the secretary. The days named for the reception of the different classes of objects are as follows:—Machinery, February 1, 2, 3, and 4; scientific inventions, Feb. 6 and 7; educational works and appliances, Feb. 8 and 9; pottery and raw materials, Feb. 10 and 11; woollen and worsted fabrics and raw materials, Feb. 13 and 14; sculpture not applied to works of utility, Feb. 15 and 16; paintings applied to works of utility, Feb. 17; sculpture applied to works of utility, Feb. 18 and 20; engraving, lithography, photography, &c., Feb. 21; architectural designs, drawings, and models, Feb. 22; tapestries, carpets, embroideries, &c., Feb. 23; designs for all kinds of decorative manufactures, Feb. 24; copies of pictures, mosaics, enamels, &c., Feb. 25; paintings not applied to works of utility, Feb. 27 and 28.

—— The following subscriptions to the RIVERS PORTRAIT FUND have been received. We repeat that the whole of these subscriptions are forwarded voluntarily; and we trust that all who appreciate Mr. RIVERS for the useful work he has done will not postpone sending their subscriptions in the expectation that direct application will be made to them, as no such mode of solicitation will be resorted to:—

"Journal of Horticulture," Proprietors of ..	£5 0 0
Fitzgerald, Mrs., Shalstone, Buckingham ..	1 1 0
Hole, Rev. S. Reynolds, Caunton Manor ..	5 0 0
Hooker, Dr. J. Dalton, C.B., F.R.S., Kew ..	2 2 0
Kingsley, Rev. W., South Kilvington ..	2 2 0
Morris, Mr. John, Wethersfield	1 1 0
Newington, Dr., Ticehurst	3 3 0
Paul, Mr. William, Waltham Cross	1 1 0
Pearson, Mr. John, Chilwell	1 1 0
Radclyffe, Rev. W. F., Okeford Fitzpaine ..	5 0 0
Roden, Dr., Kidderminster	2 2 0
Sparkes, George, Esq., Bromley	1 1 0
Speed, Mr. Thos., Chatsworth Gardens ..	1 1 0
Taylor, Mr. T. (Webber & Co.), Covent Garden ..	1 1 0
Wilson, Edward, Esq., Hayes, Bromley ..	2 2 0
Wilson, G. F., Esq., F.R.S., Heatherbank ..	2 2 0
Blackmore, R. D., Esq., Teddington	1 1 0
Masters, M. T., M.D., F.R.S.	1 1 0
Moore, T., Esq., F.L.S.	1 1 0

Subscriptions addressed to Dr. HOGG, 99, St. George's Road, London, S.W., will be promptly acknowledged.

—— Our readers will remember that the ALLIGATOR PEAR, or AVOCADO, Persea gratissima, was exhibited last year for the first time in England, from the collection of tropical fruits grown by R. HINDS, Esq., of Byfleet (see p. 1114, 1869). The plant, which is about 25 feet high, is in a very thriving condition, and when we saw it a short time since had on it another crop of 15 fruits in various stages of development. Another plant, of a different variety, growing in the same house, is also bearing fruit.

—— We have again to record heavy RAINFALL throughout the British isles. The heaviest falls recorded during the week ending October 22 were 3.20 inches at Greenock, 2.69 inches at Paisley, 2.61 inches at

Manchester, 2.50 inches at Salford, and 2.25 inches at Perth. The mean fall for the different stations in England was 1.58 inch, and for the several stations in Scotland was 1.72 inch. The MAXIMUM TEMPERATURE of the AIR in England ranged from 62°.8 at Portsmouth to 53° at Newcastle, with a mean for all stations of 59°.5. In Scotland the highest recorded was 59°.7, at Edinburgh, and the lowest, 54°, at Dundee, with a mean for the different stations of 57°. The MINIMUM TEMPERATURE in England ranged from 31°.3 at Portsmouth, to 41° at Liverpool and Leeds, with a mean for all stations of 37°.3; and in Scotland from 36°, at Glasgow and Paisley, to 42° at Greenock, with a mean for the several stations of 37°.9. The MEAN TEMPERATURE of the week in England varied from 49°.7 at Blackheath to 46°.2 at Newcastle, with a mean for all stations of 47°.9. The mean for the different stations in Scotland was 47°. (See Mr. GLAISHER's Tables in our present issue.) On Monday, October 24, there was a magnificent display of the Northern lights, which was also continued on Tuesday.

—— We have received from Messrs. HURST & SON a sample of the new Pea, "Laxton's Alpha," grown from new seed sown this year. The grower procured the seed in the spring, which he ripened, sowed again, and is now able to pick a good crop. Considering the circumstances, which are certainly noteworthy, the sample was very good.

—— The following letter, extracted from *Land and Water*, and relating to the AMERICAN WATER-WEED (Anacharis canadensis, *alias* A. Alsinastrum of BABINGTON, *alias* Babingtonia damnosa of FRANK BUCKLAND), will be read with interest by those who are plagued with this pest :—

"In reply to the inquiry, if any use can be made as a manure of the Babingtonia damnosa, or River Weed, I can inform him that, for three years past, Mr. RAMSAY, the head gardener to Viscount RANELAGH, at his seat, Mulgrave House, Fulham, has used nothing else but the weed as a manure for Peas, and finds his crops have been the earliest and finest in the vicinity of London; and in flavour I don't ever remember eating any so good. So good, large, and early have they proved, that people who have purchased their seed Peas from the same bag, and from the same nurseryman, have complained that they have been supplied with a different kind, and even now cannot believe that the old method of culture can be so effete when compared with that with the weed used as manure. The way of cultivating these Peas is as follows :—A trench of 2 feet wide and 15 inches deep is dug, without moving any ground between the rows; into this 7 inches of the weed is put, and covered with 6 inches of earth, and is left to decay (now is just the time of year to do it), and in the spring the earth above the weed is loosened without moving it, and filled up to within 3 inches of the surface; on this bed of earth the Peas are sown, and the trench filled lightly with earth to the surrounding level, the result being such as before stated. Having watched this plan for three years past, I can safely, from my own knowledge, give the above as correct. The weed is obtained from a lake in the grounds, which is filled by the tide from the Thames, and retained by sluice gates. The growth of this noxious plant is so rapid in the summer, that about three weeks after the lake of 6 feet in depth has been run out and cleared of every vestige of vegetation, the mass of weed is so great that I can hardly get my cane through it. The soil in which the Peas are grown is very poor, mixed with gravel; for, though in the valley of the Thames, it is decidedly not good alluvium. Several experiments are now being tried with this weed as a manure, by Lord RANELAGH'S direction, the result of which I shall at some future time send you, as I am watching anxiously what other plants may like this new manure. *Lambton Young.*"

LILIES.

(*Continued from p.* 1343.)

China.—In spite of its great extent, China has not contributed many species of Lily; indeed, excepting some Siberian species, which extend into its northern provinces, and some others which belong to it in common with Japan, there are, so far as I know, only the following species peculiar to the Chinese Empire. Salisbury gave the name of L. concolor to a species said to have been imported from China into England by Greville in 1806. It is still very rare in gardens, although it should be grown more extensively on account of its large flowers, which are about 3 inches across, and grouped in threes or fours in a terminal umbel. At the base of the inflorescence is a verticil of three or four floral leaves, which are erect, not revolute, and coloured of a fine minium-red colour. The plant is about 18 inches in height, its slender rounded stem is glabrous. In a fine cultivated specimen which I have in my herbarium, the stem bears 10 alternate leaves uniformly distributed throughout its length. These leaves are of an oblong-lanceolate acute form, narrowed at the base, 5 to 7 centimètres long (2—2½ inches), glabrous, slightly ciliated, paler beneath; the upper leaves rather wider than the lower ones. The pistil is shorter than the stamens, and the style is of the same length as the ovary. There is a variety with a solitary flower, which Link ("Enum." i. 321) considered as the type of the species.

In 1824 a charming little Lily was introduced from China to the garden of the Horticultural Society of London. The stem of this plant did not exceed 25 to 30 centimètres (8—10 inches) in height, and was terminated by two or three flowers of medium size of a fine scarlet colour. Lindley called this plant Lilium sinicum, and gave a woodcut of it ("Flow. Gard." ii., 1851-1852; "Misc.," p. 115, c. ic., xylog. 193). The plant flowered the same year it was introduced, but it seems to have been soon lost, and it is to Mr. Fortune that we owe its re-introduction. It has, nevertheless, remained very rare in gardens up to this time. The stem of this Lily is downy, almost cottony: its leaves are alternate linear-oblong, covered with a slight down, and the three upper ones are gathered together in a whorl at the base of the inflorescence. The segments of the perianth are revolute, smooth on the inner surface, and slightly downy along their median furrow. As in the preceding species, the stamens are shorter than the perianth, and longer than the pistil. The obovate ovary is at most as long as the style. In 1857 a description and coloured plate of the same Lily were given in the "Flore des Serres" (second series, vol. ii., p. 19, pl. 1206), but, as M. Planchon, the author of the description just cited, remarks, there were some slight differences between the specimen there figured and the type characterised by Lindley.

A magnificent Lily is frequently found in gardens under the name of Lilium Brownii, the origin of which is very obscure. Its specific name presents certain difficulties, for it is not easy to determine who was the author of it. Spae, in his memoir on the Lilies presented to the Academy of Sciences at Brussels (July 5, 1845), attributes it to F. E. Brown, nurseryman, of Slough, near Windsor, in whose catalogue it was inserted about 1838 or 1839. According to Spae, the name was reproduced by Miellez in the catalogue of the exhibition held by the Horticultural Society of Lille, in June, 1841, and in the catalogue of the Royal Agricultural and Botanical Society of Ghent in June, 1843. The same author gave a description and a coloured figure of it in the first volume of the "Annales de la Soc. Roy. d'Agric. et de Botan. de Gand" (i., 1845, p. 437—438, pl. 41). Priority then belongs to the name Lilium Brownii, of Brown; although in the same year (1845) M. Charles Lemaire also described this plant in the "Flore des Serres" (i., 1845, p. 110), and illustrated it by an unnumbered coloured plate.

As to the native country of this fine species, M. Lemaire says in his article, "origin and specific name doubtful," and Spae writes, "country unknown." Siebold thinks it a native of Nepaul, and also of China and Japan. M. Max Leichtlin wrote to me recently, stating that the plant was of Chinese origin, and on his authority I have admitted this Lily as a native of China —very probably also of Japan, but not of India. Whatever be its origin, Lilium Brownii is a magnificent plant, which has often been considered to be the problematical Lilium japonicum very badly characterised by Thunberg. Siebold's catalogue for 1870-71, p. 51, mentions it under the name of L. japonicum, Thunb., var. Brownii; nevertheless, as I have had several specimens derived from different sources, and which have all presented the same characteristics, I am disposed to think that it should be admitted as a distinct and well-marked species. Its stem is between 2 and 3 feet high, thick, rounded, and glabrous. It is brown at the base in consequence of the great number of small reddish brown lines scattered over its green surface, its upper portion is unspotted. The numerous leaves are alternate, and scattered equally over the stem, linear-lanceolate in outline, acute at the point, narrowed at the base, with 5 or 7 nerves prominent on the lower surface, slightly channeled above; they spread widely, and offer at their extreme base a transverse callosity. They are very small at the base of the stem, where they soon dry up, and gradually increase in size upwards; the three or four uppermost form a kind of false verticil at the base of the flower-stalk: these attain a length of 20 centimètres (about 8 inches). The flower is solitary, and very large and beautiful. It is of pure white in the interior, and even on the exterior of the three petals, which have only their prominent median nerve coloured of a purplish brown colour. This same tint is spread over the outer face of the sepals, which are margined with white. I have always found an agreeable and rather strong perfume in the flower, though according to M. Lemaire it is completely scentless, and in the opinion of M. Planchon nearly so. The flower is tubular, bell-shaped, with a spreading revolute limb; the petals are much wider than the sepals, the stamens are bent downwards and have greenish awl-shaped filaments, supporting large brown anthers filled with reddish brown pollen. The stamens are as long as the tube of the flower, and are greatly exceeded in length by the style, which is much bent downwards and terminated by a deeply 3-lobed orange-yellow stigma.

The small number of species, which may with more or less probability be regarded as of Chinese extraction, is increased, at least according to the information which I possess, by a very beautiful plant which M. Carrière described and figured in 1867, under the name of Lilium pseudo-tigrinum ("Rev. Hort." November 1, 1867, p. 411—412, with coloured plate). In his article on this new species, M. Carrière states that it was sent from China to the Jardin des Plantes. M. Carrière's statement on this subject is so precise that there seems no reason to doubt the Chinese origin of this Lily. I may, however, remark that M. Max Leichtlin, in one of his letters stated, I know not on what authority, that it was a native of the Liu-Kiu Islands, which are to the south of Japan, between 24° and 28° of North latitude. Lilium pseudo-tigrinum attains a height of more than 3 feet. It resembles in general aspect, and in many of its characters L. tigrinum, a fine species common in Japan, and of which I shall have to speak further on.

L. pseudo-tigrinum differs from L. tigrinum in several particulars; its rounded stem is clothed, especially in the young state, with white appressed hairs; the leaves are numerous, alternate, crowded, linear, 10 to 12 centimètres (4 inches) long, 6 millimètres to 12 centimètres (¼ inch to over 4 inches) wide, narrowed to a point almost immediately above the base, channeled on the upper surface, which is glossy, and with the midrib very prominent on the glabrous lower surface. Its flowers, at first obliquely ascending, become afterwards horizontal, somewhat distant one from the other; they are of a fine red colour, marked internally with deep brown points and spots, and in the centre are provided with rather prominent tubercles. The segments of the perianth are widely spreading and revolute. The style is red, and greatly exceeds the stamens in length, and is terminated by a thick stigma with three unequal lobes. M. Carrière says this species may be easily distinguished from the nearly allied L. tigrinum by its rounded stem, which is not brown but green, and slightly mottled. It produces no bulbils in the axils of its leaves, and these latter have only a single rib, while each leaf of the Tiger Lily has five to seven. The plant is very hardy; it is still but little known, and is not mentioned by M. de Cannart d'Hamale in his monograph of the Lilies, recently alluded to in these pages.

(*To be Continued.*)

THE VEITCH MEMORIAL.

THE meeting of subscribers to the Veitch Memorial took place on the 21st inst., as advertised, in the Royal Horticultural Society's meeting room, at South Kensington, James Bateman, Esq., F.R.S., in the chair. Amongst those present were Messrs. G. F. Wilson, Gibson, Hogg, Moore, Wooster, J. Fraser, Rust, Lamb, J. Wilson, Goad, Richards, Rutland, Budd, Monro, &c. After the Chairman had briefly explained the object of the meeting, the hon. secretary, Mr. Thomas Moore, read the report of the central committee to the general meeting as follows :—

REPORT TO GENERAL MEETING.

It is with much satisfaction that the central committee are able to report that the subscriptions to the Veitch Memorial Fund have reached the sum of £1012 12*s.* 9*d.* This total has to be reduced by £121 14*s.* 5*d.*, expended in the necessary postages, advertising, and printing, leaving a nett amount of £890 18*s.* 4*d.* to be expended on the special object for which the fund was raised.

Various proposals as to the form which the memorial should take were discussed at the preliminary meeting, on which occasion, subject to the amount raised, a decided preference was expressed for that of securing a well-executed portrait of the late Mr. Veitch, combined with the establishment of an annual prize or prizes bearing his name. Some further suggestions have subsequently been made to the committee, but none which they feel warranted in recommending for adoption in preference to those which received the sanction of the former meeting, and on the faith of which the money has been collected. One of the suggestions referred to embodied an emigration scheme for gardeners in conjunction with the establishment of a joint-stock nursery in Canada or the United States; a second suggested the building of almshouses; while a third proposed to obtain an acre of land in one of the parks, and to plant on a raised mound therein the finest of the choice Japanese trees which Mr. Veitch was the means of introducing—all of which objects the committee feel to be sufficiently praiseworthy in themselves, but less manageable, and otherwise presenting no special advantages over the proposals which have already been approved.

The committee would therefore recommend to this meeting of subscribers, duly convened by public advertisement, that the proposals to obtain a portrait of Mr. Veitch, and to establish certain Veitch Prizes, which have the concurrence of Mr. Veitch's family, should be definitely adopted.

In respect to the portrait, the committee report with much pleasure that a very excellent likeness now hanging in this meeting room, and painted expressly to meet the object of the present movement, has been offered to them by Robert Crawshay, Esq., of Cyfarthfa Castle, and they propose that this most liberal offer be accepted, and that the best thanks of the subscribers be conveyed to Mr. Crawshay for his liberal gift. Mr. Crawshay's wish is that the portrait, while remaining the property of the trustees to be appointed for the prize fund, should, with the permission of the Council, find a resting place on the walls of the Royal Horticultural Society's meeting room.

The portrait thus being provided, the committee recommend that the whole amount of the subscriptions, which, as before stated, after payment of expenses, reaches the sum of £890 18*s.* 4*d.*, should be invested in the names of trustees, to be appointed by the present meeting, and the annual interest thereof devoted to prizes for the advancement of horticulture, to be offered at such exhibitions of the leading metropolitan horticultural societies in the three kingdoms as the trustees may judge most conducive to this object, the culture of both flowers and fruits being considered. The details of working out this arrangement must be left to the discretion of

the trustees, as, from change of circumstances, the same arrangements may not be always desirable, but it is suggested that for the guidance of the trustees it be an instruction to them that the prizes are to be of considerable value, so as to be worthy of the object they are intended to commemorate; that they may be varied in number and amount each year according to the funds to be disposed of; and that, as being most useful to the recipients, a considerable proportion of their value be given in money, the money prize being however accompanied by an inexpensive commemorative medal bearing the name or a portrait of the late Mr. Veitch. In order to obtain a die for the latter purpose without lessening the capital amount, it is further suggested that the trustees be authorised to devote the interest first accruing to them to this object.

The committee recommend to the meeting to select the following gentlemen as trustees of the Veitch Memorial, namely, the treasurer and the secretary to the fund, Mr. George F. Wilson and Mr. Thomas Moore, with the addition of five others representing the amateur and practical gardeners of the United Kingdom, namely, Mr. Harry James Veitch, Dr. Robert Hogg, and Mr. Zadok Stevens, representing England; Mr. William Thomson representing Scotland; and Dr. David Moore representing Ireland.

The committee desire to offer their hearty thanks to the Council of the Royal Horticultural Society for having afforded every facility for holding their meetings; to the proprietors of the "Irish Farmers' Gazette," and those of the "Gardeners' Record," for inserting the advertisements of the Irish committee free of charge; and to the members of the general committee for having so effectually worked with them in bringing the proposed memorial to a successful issue.

It was then moved by Mr. John Fraser, seconded by Mr. D. Wooster, and agreed to *nemine dissentiente*—

"That the report of the central committee be adopted, and that the said committee be hereby empowered to carry out the recommendations of the said report."

It was further proposed by Dr. Hogg, and seconded by Mr. J. Gibson, and also adopted unanimously—

"That the thanks of this meeting be conveyed to Robert Crawshay, Esq., for his gift of a portrait of the late Mr. James Veitch, in furtherance of the Veitch Memorial."

Mr. J. Monro proposed that a *carte de visite* portrait of Mr. Veitch should be sent to every subscriber, but the feeling being general that this would be a misappropriation of the funds, the proposal was withdrawn. On the motion of G. F. Wilson, Esq., seconded by Mr. Lamb, it was then agreed that a cordial vote of thanks be given to the Chairman for his kindness in presiding on the occasion.

The annexed balance-sheet of receipts and expenditure, was laid upon the table :—

1870.	Dr. *To Subscriptions.*		
Oct 21.	Paid to Treasurer	£317	3 3
	Paid to Secretary	1	11 6
Aug 5	From Lord Mayor of Dublin ("Irish Farmers' Gazette" advertising account)	2	6 0
„ 8	From Thomas Edmondson "Gardeners' Record" advertising account) ..	0	13 6
„ 8.	From Charles McDonald Edmondson's printing account	0	13 6
		£322	9 9

Cr	*By Expenditure.*		
Advertising :–			
"Gardeners' Chronicle"	£26	7	6
"Gardeners' Magazine"	17	0	6
"Journal of Horticulture"	20	3	6
"Irish Farmers' Gazette"	2	6	0
"Gardeners' Record"	0	13	6
	£66	11	0
Printing :–			
Martin & Hood	£1	10	6
Aird	12	18	3
Bradbury & Co	2	5	6
Edmondson, *per* C. McDonald ..	0	13	6
	17	7	3
Collectors' expenses :–			
Treasurer's list	£10	10	4
Secretary's list	1	15	8
	12	6	0
Secretary's expenses :—			
Envelopes, postage and receipt stamps, &c. ..	16	15	5
Treasurer's expenses :—			
Postage and receipt stamps	1	16	11
Carriage of portrait per railway	6	17	10
Balance	890	18	4
	£1012	12	9

IRISH GARDENING.

AMONG all our public parks the Phœnix Park, Dublin, is the grandest. Covering an area of over 1700 acres, it offers unusual facilities for all kinds of enjoyment. In fact, so far as I can judge, it is too big for purposes of metropolitan recreation, even although we deduct the 350 acres enclosed in respective detachments, and occupied by the Lord Lieutenant, the chief and under Secretaries for the time being. Even then, Hyde Park or the Bois de Boulogne are little else than large cricket grounds by comparison. True, it is tenanted by 1200 head of deer, and no end of cattle browse upon its surface, but these are only so many helps in the ranger or bailiff's department to keep the surface in good order; and the principal army are invited guests, and are, therefore, entitled to the free run of the larder. In a locality swarming with military of course it presents an admirable parade ground, its space adapted for field evolutions, and for great gala displays being all that the most ambitious could desire.

Its vastness of size, however, exposes certain weaknesses of detail which cannot be overlooked. As a park it is not only far from being complete, but it is really ill-furnished. Speaking of Scotch parishes and Scotch livings, a worthy D.D., whose contributions have adorned these pages, remarked, that some were too large for comprehension, and some too small; and so it is evidently with the Phœnix Park. First enclosed as a deer park by the Duke of Ormonde, and later on gifted as a royal park, its dimensions were beyond the "comprehension" or the will of those that have the responsibility of doling out the funds; and hence much that goes not only to adorn but to characterise a park, as a park, has remained unprovided for. There are the wood, the water, the roads, the scope of grass, and the deer, but there is far too little of the two former elements of beauty and furnishing, while some expensive operations that stare one in the face are conspicuous by their defects.

The "Dublin gate," that separates the park from the city, is certainly not of the Louis Quatorze style, nor is it necessary that it should be, looking to the backdoor-like surroundings citywards. Once admitted, you may traverse a magnificent drive straight ahead nearly 3 miles in length, and of breadth in proportion.

On one side of the drive may be seen in passing what looks somewhat like a forlorn cemetery decorated with flowers. This celebrated enclosure I afterwards learned is called the people's garden. It has been laid out at considerable expense, and is nearly the ugliest thing in modern gardening I ever saw. The first objects that meet the eye are quantities of dirty-white blocks of sandstone set up on end at considerable pains upon unnatural beds, and which look like so many rude tombstones, more suggestive without inscriptions than with them. To be sure they are within sight of a milestone-like monument, erected in memory of the "Iron Duke," and are not the only objects of derision to every tourist. That is certainly an imitation of rock as it ought not to be, and as if to aggravate its hideousness, it is placed on high table-land in formally cut out beds decorated with foliage and flowers; and yet in the same people's garden winds a running brook, widening out into a lake, from which beautiful undulations and slopes recede, and where rockwork in its greatness ought to be. I may be severe in my criticism, but it is absolutely necessary to dissociate ourselves from absurdities, if we are not to make the art of gardening embellishment a laughing-stock.

It is with a certain relief that I pass on to look at the arboricultural features of the park, and there, although baldness prevails to a marked degree, there is one very fine feature of ancient planting that must command admiration. It is a very prominent avenue of the old English Elm (Ulmus campestris). Now this is not planted in rows after the formal style of some of our best English avenues in parks—Windsor notably, for instance—but in groups of from three to five plants. Moreover while the avenue feature is retained in the Phœnix, it is retained without that characteristic formality which affects the eye of a lover of Nature much in the same way as those everlasting lines of yellow and scarlet, conspicuously formal from the leaf upwards, that so much predominate in summer bedding-out. There are appropriate little groups of trees planted avenue-like, and yet coming out so well upon the park landscape as to please both painter and gardener. Then the groups are not in pairs like statuary and vases, but are placed alternately. That avenue was planted 120 years ago, and is a sample of what Burke calls "the best taste differing from the worst," showing the rare faculty of foreknowing effects, and laying a suitable groundwork for time to operate upon.

Another style of planting was introduced, I believe by Decimus Burton, about 1811. It consists in the introduction of a variety of trees in acre plots with a basin of earth thrown up, to form a sort of circular entrenchment. The taste of this is very questionable. The less formality in an acre group anywhere so much the better, for trees in general—round-headed trees not excepted. Far better to have an undulating outline, increase the acreage, and lessen the groups. As now seen I prefer the indiscriminate dotting of indigenous Hawthorns, that one would say, but for the beauty and fragrance of the "May" in spring and the profusion of glossy red berries in autumn, were almost a pest upon the face of the park. But the acre groups have another fault, they offer no seclusion. The promenader from any point can see through them as easily as through an open balustrade fence, and while the latter serves some purpose the former is quite objectless. It is an aping at extent to no purpose. It does not even compel the curious and investigating eye to a moment's cursory examination. It must therefore not be in very good taste, unless it had the redeeming point of forming a screen for some choice central specimen which was eventually to form a prominent object in the park decoration. But it is not doing duty in that way at all. It is simply an indiscriminate mixture of Elms, Beech, Chestnut, and Lime, without a single evergreen to stop the eye in its line of observation. Some improvement both in outline and in extent, together with some evergreen auxiliaries, is undoubtedly wanted in this direction. Clothing of that kind costs only one tithe of what has been misspent in what might be called the modernising decorations of the park. All might be done in a way with proper genius at the helm, and although genius cannot work without means, yet we are disposed to think it can make an adequate use of them—

> "Ce noble emploi demande un artiste qui pense,
> Prodigue de génie, mais non pas de dépense."

Yet another sample of planting has been introduced quite recently. Along either side of the principal drive are little circular groups of Limes. They are planted at regular distances and opposite one another, quite as formal as partners in a dance. Now this is a reversion to what has been considered by modern planters as not a good system. All the characters of an avenue can be preserved without resorting to the mathematical rule of absolute precision. Standing at one end you can have the same vista, the same idea of an avenue by irregular planting as to distances, as if the trees or groups were planted to an inch in the matter of intervening space. And then what an advantage it is in all large parks to have openings of irregular extent, to give scope to the eye in resting upon delightful undulations in the more immediate foreground, or sweeping in the distance the grand mountainous scenery, which here particularly is everywhere to be seen from salient spots. The Lime is not a first-rate park tree; Elms, or Oaks, or Spanish Chestnuts are evidently the trees to plant in the Phœnix Park for future effect. Oaks are only limited in number throughout the park, but there can be no question of their adaptability, for in the enclosed grounds of the Vice-Regal Lodge they are giants in rudeness of health, and Elms and Chestnuts rival them in luxuriance, and only require a fair start to go along to be objects of beauty for posterity to look upon.

Hawthorns, as we noticed above, are growing indigenous to the spot, and in great quantity, so that in spring they must fill the whole atmosphere for miles with fragrance. But why, we would ask, are these groves and expanses covered with the British species, C. Oxyacantha, alone, with so many other beautiful hardy sorts to pick and choose from? Is it because the climate or the soil is unsuited to them? This cannot be; for at Glasnevin the Persian four-leaved variety (C. flabellata, the North American Cockspur Thorn, C. Crus-galli, and the scarlet-fruited species, C. coccinea, with its long-spined variety, and the Mexican species, with fruit like a Medlar, and many other species form splendid tree-like bushes, which would heighten the effect, and offer a variety of food for observation and comment.

There is a decided want of trees and underwood to clump in upon the boundary lines—the formal separation wall shining out much too often as you promenade along the drives. One emerges from a survey of this kind with a feeling of relief to see the silvery stream in its winding undulations deep down in the dell as a natural boundary, and the irregular knolls quite as irregularly covered with Furze and Brambles growing lovingly together, and forming a sort of impenetrable cover. Thanks to Nature, this is a bit of grand scenery, checquered only by the serpentine paths, which the foot of man has lined out, and offers the landscape planter a lesson as to form and feature and congruity which many in their zeal for some of their own conjured-up creations quite lose sight of.

As a whole, the character of the Phœnix Park trees have, in time past, been too much overrated. Blots, evidently, have been glossed over which are quite transparent to any disinterested observer and chronicler of facts. In extent, it quite justifies the character of being the "finest national playground in Europe." Its arboricultural features outside of the official domains are not what they ought to be. It is inferior in that respect to any of our London parks, and in the matter of tree planting, tree protection, and tree culture we were, before this lamentable siege, which threatens to undo the work of half a century, considerably behind our Parisian compeers. The present bailiff, Mr. C. McDonald, has the rare opportunity of winning himself a name and fame, if he brings energy and genius to bear upon the duties of his office. *A.*

NEW ZEALAND VEGETATION.

VEGETATION OF CHRISTCHURCH, NEW ZEALAND.—The vegetation of the province of Canterbury, as formerly constituted, may be divided into five main groups or zones, which again can be formed into many sub-divisions. The five main zones are :—

1. The Littoral zone, in which grow, generally, only plants which are peculiar to the sea shore, from high-water mark to 25 feet above it.

2. Lowland zone. This comprises the lower portion of the Canterbury Plains, of Banks' Peninsula, and of Westland. I propose for this group the name of Pine zone. Altitude above sea level, 25 to 800 feet; on Banks' Peninsula, to 1200 feet.

3. Mountain zone, formed by the vegetation, mostly Beech or Fagus, which uniformly covers, where still existing, the sides of the mountains bordering the Canterbury Plains, and the foot of the central ranges, both on the east and west sides. It may appropriately be called the Beech zone. Altitude from 800 to 4000 feet. In the interior of the Alps, it rises only to 2500 feet.

4. Subalpine zone, formed by a great variety of shrubs, and a few stunted trees. It ranges from 2500 to 4500 feet, and includes the lower portion of the interior of the province, and the highest summits of Banks' Peninsula. I propose to call it the Dracophyllum zone, as this genus, belonging to the Ericeæ

or Heaths, is always well represented, and most conspicuous in the regions referred to.

5. Alpine zone, on the summits of the mountains bordering the Canterbury Plains, and on the sides of the alpine ranges, growing to the line of perpetual snow, from 4000 to 7000 feet. It consists of herbaceous plants, often growing in dense, carpet-like swards. I venture to call it the Raoulia zone, from that genus assuming such conspicuous forms in those regions.

There are, of course, many gradations from the one into the other, as all depends upon the aspect, orographical features, mean altitude, and many other secondary causes.

Banks' Peninsula has, in many respects, a peculiar botanical character, as some of the zones are here, as it were, blended with each other in a very striking manner. Moreover, several species of plants growing here are not to be met with elsewhere.

The sand hills near Christchurch are very good examples of the first, or Littoral zone, which consists mostly of creeping succulent plants, fond of saline matter, and of sedges, grasses, and a few small shrubs.

The second, or Pine zone, is well represented in our neighbourhood by the Riccarton Bush, and still better by the forests on Banks' Peninsula. It contains, from its low position, the most luxuriant portion of the New Zealand vegetation, high, straight trees, growing closely together, interwoven by numerous Lianas, their stems covered with Mosses and Ferns, and with a dense undergrowth of shrubs and Fern trees. This second, or Pine zone, is very rich in species, whilst the third, or Beech zone, is remarkably uniform, except on the edges of the forest, or along the watercourses, where shrubs and some smaller trees are mixed with it. But once fairly entered into the Fagus (or Beech) forests, we find very little undergrowth, and the stems of the trees are remarkably clean.

The Riccarton Bush, as the following list will show, is remarkably rich in species. In fact we have there a small remnant of the large forest formerly, without doubt, covering the Canterbury Plains, giving us an insight into the luxuriant forest vegetation which, in a bygone age, flourished here.

The principal portion of the forest consists of the noble coniferous trees, Podocarpus Totara, P. ferruginea (Black Pine), P. spicata, and P. dacrydioides (White Pine); Elæocarpus dentatus (Hinau), 50 feet high, with pendulous racemes of white flowers (the bark of this tree yields a permanent dye, used by the Maoris for colouring mats and baskets); E. Hookerianus, similar to dentatus, but smaller; Plagianthus betulinus (Ribbon Wood), the wood of which is worthless; Pittosporum eugenioides, a small, beautiful tree, with yellow, sweet-scented flowers, bark resinous, wood white, useful for cabinet work; Carpodetus serratus, flowers white, profusely produced, the wood tough, useful for axe handles; Panax crassifolium, the Ivy tree, &c.

Shrubs, &c.—Drimys axillaris, a large evergreen shrub, aromatic and pungent, used by the Maoris for various diseases, the "Winter's bark" of New Zealand, Pepper tree of the settlers; wood used for veneers. Melicytus ramiflorus, a large shrub, with soft white wood, useful for cabinet work; leaves eaten by cattle. Pittosporum tenuifolium, a large evergreen pyramidal shrub, with purple flowers; wood hard, yellowish, useful for cabinet work. P. Colensoi, similar to the last, but larger; wood useless. Hoheria populnea, a large shrub, with abundantly-produced white flowers; the bark affords a demulcent drink, and is also used for cordage. Aristotelia racemosa, a very handsome shrub, with large racemes of reddish, nodding flowers; wood very light, said to be good for veneers. Pennantia corymbosa, a large, very beautiful shrub, covered profusely with very fragrant white flowers; the wood was formerly used by the Maoris for kindling fires, by friction. Coriaria ruscifolia, a small shrub, foliage poisonous to cattle, &c.; the seeds are said to produce delirium and death; a beverage, like Elderberry wine, is made from the juice. Urtica ferox, the Stinging Nettle, stings most violently; the pain lasts three or four days. Rhipogonum scandens, Supplejack; the long underground stems have been used as sarsaparilla by the settlers; the stems as cordage, by the Maoris. Phormium tenax, New Zealand Flax, the fibres of which are very strong; its roots, also, have been used as a substitute for sarsaparilla.

Another interesting locality, in the neighbourhood of this city, and visible from our streets, is the so-called Dry Bush, which, from numerous fires having passed through it, has a scorched appearance. Although there are some large coniferous trees in this small forest, it has more the characteristics of that portion of our bush vegetation which invariably edges our larger forests, of which the Mount Pleasant bush is a still more characteristic representative.

The only conifers are Podocarpus Totara, and P. ferruginea. The other principal forest trees are Alectryon excelsum (Titoki), a beautiful tree, with large panicles of reddish flowers; the oil of the seeds was formerly used by the Maoris for anointing the person; wood hard and durable. Sophora tetraptera, var. grandiflora, a beautiful tree, with large pendulous yellow flowers; wood red, valuable for fencing and cabinet work. Fuchsia excorticata, wood white, soft, probably worthless.

There are in this small bush about 28 species of shrubs, some of them are very beautiful and worthy of cultivation, while others may prove useful for their medicinal properties. The most remarkable among these are Carmichælia australis and C. juncea, with beautiful Pea-like flowers. Discaria Toumatou, the spines of which were used in tattooing. Myrtus obcordata, Piper excelsum (Kava Kava), the New Zealand Pepper tree: a beverage, called kava, was formerly made from the roots and leaves by the Maoris; an infusion of the leaves is used to cure toothache. Clematis, n. sp., a curious leafless climber, with verticillate, yellow, sweet-scented flowers."

The Sand Hills.—It is evident from the shifting nature of the ground in the Littoral zone, that no large or continuous vegetation can occur; at the same time, from its diversified appearance, it is peculiarly interesting to the botanist. There we meet with a few shrubs, such as Cassinia, Carmichælia, Discaria, Pimelea arenaria, with its peculiar baccate fruit; and a considerable variety of herbaceous plants, principally consisting of coarse grasses, Carex, Clematis, Ranunculus, Scleranthus, superior to the Kew-grass for lawns, verges, &c., Tetragoni, Pratia, six species of Orchideæ; among Ferns, Pteris aquilina, Botrychium virginicum, Ophioglossum vulgatum; and Drosera. As new plants are discovered every year, we are forced to the conclusion, that the flora of this neighbourhood is imperfectly known.

The flora of the district contains about 290 species, including 230 flowering plants. As the total number in New Zealand is under 900 species, we may conclude that the collection is tolerably complete. The number of Ferns is 38 species; I believe there is no probability of future additions being made to this number. Of Mosses, Lichens, &c., only 26 species have been collected, but in this class there still remains an ample field for future discovery. Although I consider that the greater part of the flowering plants in the district have now been collected, much remains to be done in tracing the distribution of species; for, although the area is small, it contains several assemblages of species. There are five plants in the district which have not been found elsewhere: they are Clematis (new species), Carmichælia (new species), Aquilaria Novæ Zelandiæ (new species), Senecio saxifragoides, and Fuchsia Colensoi.

Riccarton Bush contains—Forest trees 13 species, shrubs 27, climbers 10, herbaceous 34, Ferns 14, Mosses and Lichens 20. Total, 118.

Dry Bush.—Forest trees 15, shrubs 32, parasites 3, climbers 11, herbs 24, Ferns 13, Mosses 17. Total, 115.

Mount Pleasant.—Forest trees 8, shrubs 20, climbers 11, herbaceous 18, parasites 2, Ferns 27, Mosses, &c., 14. Total, 100.

Port Hills.—Shrubs 18, herbaceous 88, Ferns 15, Mosses 10. Total, 131.

Sand Hills.—Shrubs 11, herbaceous 59, Ferns 4, Mosses 2. Total, 76.

Swamps.—Shrubs 14, herbaceous 86, Ferns, &c., 9, Mosses, &c., 7. Total, 116.

[Extracted from the second volume of the "Transactions of the New Zealand Institute," a publication in all ways creditable to the colony. EDS.]

Home Correspondence.

Plant Cases.—In a letter from an Englishman in a foreign land, he expresses himself as follows:—"It is four and a-half years since I left Britain; during that time I have never seen an English catalogue or horticultural periodical till three days ago, and my joy knew no bounds." No doubt all such information as that you have given respecting Mr. Bull's plant cases would be of great value to such persons fond of gardening, and who are obliged to reside beyond the seas, as it will give those in distant countries an idea how easily, and with what perfect safety they can transmit plants to almost any part of the globe; but I was somewhat surprised to see from your remarks on Mr. Bull's plant cases, that they were considered new in design, as, with the exception of my own improvements, they are identical in shape with those I have long used successfully. I have been using similar cases to those of Mr. Bull since 1866, the year of our great International Horticultural Show, and so well have they answered their purpose that Captain Shepherd, of the ship "George Thompson" (which is by this nearly at its destination), has got four cases filled with the most delicate plants of the soft-wooded type, and I have no doubt that even Verbenas, which are most difficult to travel (since only Foxhunter has ever yet been imported), will arrive safely. If Mr. Bull will add the following improvements to his case, he will find them of great service. First, one of the glass sides should be made movable by means of thumb-screws, so that all the plants may be readily examined. The caps should also be fastened down by the same means; but I have a stout, flat bit of india-rubber nailed tightly at each end, and fastened to the case; this keeps it in its place when the screws are loosened, and thus, by the simple means of a wooden wedge suspended in the centre of the box, ventilation can be readily given in fine weather. In fact, this case is worked like our Cucumber-frames, with a thermometer fastened inside, and the required temperature stated outside, so that any interested passengers (and there are always plenty such) may do a bit of gardening if they are allowed, and plain directions are given to keep the temperature at a certain height. There seems to be no difficulty in getting the captains of vessels to take a pride in these interesting cases. I find a short sharp iron peg fastened in the centre of each foot of the case enters the wood on which it stands, and prevents it from moving when the ship rolls. Again, I find iron handles very objectionable. A strong rope handle, extending just above the cap, so that a round ash pole 2 feet longer than the case may be used, is much more convenient for shipping and unshipping. Two persons can then walk off with the case, in the same way as the brewer's draymen with their barrels. The following are the directions I give to the captains, and if they are of any practical use let them be printed for the world's benefit:—"Please to give air, that is to say, take the side off in all favourable weather, and give as much light as possible. Should the plants become dry and look flagging, please water them, with half a gallon to each box, which I think will be sufficient, but this depends on whether the weather is hot or cold,—if the latter, they will not require much, particularly the Geraniums, which will do better for being kept rather dry, but the Verbenas will require more if the weather is hot and dry. Should they, or even any of them, make much growth, so that they crowd and smother each other, please pinch off several of the leaves and leaders, so that each one may have an equal share of light and air: that is one of the main things. Towards the end of the journey they want to be attended to, and one who is an inexperienced person would hardly dare to think of doing it, but if they grow much pray attend to this, as the smaller plants are often of the most value. The next thing to guard against is damp or mouldiness. Should they show any signs of this (the Verbenas are most likely to do so), please unscrew the movable sides on each, and expose them to a moderate amount of sun and air at all favourable opportunities. Very likely some of the Verbenas may show signs of a kind of white blotch, called mildew; if so please dust them all over with the sulphur, in the dredger attached to one of the boxes. It is possible they might become infested with green-fly, although with the means I have taken to kill every one it would seem doubtful; but if they do appear, please fill the boxes full of tobacco smoke, by putting the tube-end of the pipe through one of the holes. If this is not easy and convenient, dredge them all over, in the same way as with the sulphur, with the tobacco powder, which you will also find attached, like the sulphur." *H. Cannell, Florist, Woolwich.*

—— The great enterprise manifested at the present time by private and public horticultural establishments in obtaining new plants renders every improved means for their safe transmission to and from foreign climes to our gardens a matter of special interest, and the knowledge of such improvements will doubtlessly be appreciated by all lovers of plants as one certain means tending to a quicker dissemination of them wherever the means of their cultivation exists. Having read the remarks accompanying the sections of a Wardian case as given at p. 1372, and there represented as an improved one, we were surprised to find that the modifications therein delineated, so far as shown, should be considered worth a patent, since what is shown as different from other cases is not really so important, nor of such an improved character as that which has been adopted in our own cases for a considerable time, and in the construction of which is found the greatest desideratum required in plant cases, namely, an efficient mode of conveying away the excessive vapour from the glass, to which, until recently, plant cases were liable during long voyages. That all plants subject to close treatment in cases require a modified degree of moisture for their sustenance, is well known to all cultivators acquainted with the conditions of plant life; but as plants sent on long voyages are, in ordinary cases, subject to an excessive amount of condensed moisture, some simple yet efficient self-operating means is required to prevent the condensed vapour from injuring, and to effect this we attach a zinc gutter along the inner front edge of the case, communicating with a tube at the end, through which the water is conveyed to the under strata or drainage. By this expedient, the injury done to the front row of plants, as the one most exposed to the saturated soil, is effectually prevented. In referring to this means of preventing the greatest injury to which plants in Wardian cases are subject, we further beg to remark—and this is important—that, as it is admitted that the best method of ensuring the vitality of plants in close cases during a voyage is to have them previously well established in pots and then plunged, we are of opinion that, when the case is properly drained, and the bulk of soil is duly prepared to that consistence and mean degree of moisture which will not give out excessive evaporation when the case is closed, plants will not materially suffer from the average amount of exhalation during the usual periods of travel. We do not, therefore, perceive any real advantage in confining the residuum moisture in chambers or gutters filled with Sphagnum, after it has been efficiently conveyed from the glass and prevented from saturating any portion of the surface soil. Mr. Bull also names a second-hand feature as an improvement, namely, that of the case resting upon front and back feet, so as to prevent level

* See List of Plants of Otago, by J. Buchanan, p. 38, "Trans. N. Z. Inst.," vol. i.

covered with water on deck, and to admit of its ready escape in case of flooding on board; this simple contrivance has been adopted for many years, and is one which no mechanic of common sense, knowing the object of his work, would omit, nor any intelligent nurseryman or director of botanic gardens disallow. In referring to what we deem objectionable features in the majority of plant cases—and from which we observe Mr. Bull's pattern is not free, much less can we recognise them as improvements—we may remark that our experience is unfavourable to cases with a front and back glass roof, which, while it does not give a proportionately greater space inwardly, not only adds a very important item to the expense, but involves a risk of double breakage, and moreover gives fully twice the extent of surface for accumulation of condensed vapour, thus doubly aggravating the evil sought to be removed, without giving the relative advantage of inner space. One other disadvantage attending such a case is the greater inconvenience for stowing on board, with attendant risk in allowing one front for exposure on which to place other goods as convenience may require. Our case simply represents a miniature lean-to portable house, with a firm wooden back and glazed front, having a flat top protecting board of 9 inches in width; the ends are formed of two boards each (the two-sided case having three), which are firmly clinched by the strong screwed wooden block handles. The front glazed sash or light is butted under the top protecting board, and also over the front upright; the bars are wholly upright, glazed with single sheet glass squares to match (no lapping). The external screen over the glass, for protection and partial shade, is formed of wooden strips placed on a bevelled outline, each equal to the sash in length, of a medium breadth, for admitting a due admission of light. We object to wire or similar material, for reasons well known. Iron handles also appear to be equally objectionable, and inferior to firm wooden block ones, with cords, which, beside bracing the case ends outwardly, admit of greater power with proportionately less risk in lifting from the ship's deck by machinery, or by hand. The simple front case now described appears to be most advantageously adapted for its object, and admits of an equal or greater packing room, with considerably less surface exposure; is of plainer build, economises expense, and occupies less space under all the attendant risks of travel by sea or land. We seek no patent, nor claim any originality in thus offering our meed of information to cultivators of plants, to whom it may prove suggestive and useful. [*Messrs. Henderson and Son's Building Nursery.*] [This matter is so important, that we trust Mr. Bull, Messrs. Henderson, and others, will publicly exhibit samples of their cases, that horticulturists may have an opportunity of comparing them, and forming an opinion as to their relative merits. We believe, indeed, that some of these cases will be exhibited at the meeting of the Floral Committee on Wednesday next. EDS.]

Lindley Library.—I notice in the last *Gardeners Chronicle* that it is proposed to place a portrait of Mr. Rivers in the Lindley Library. Can you give any information about this library, in what condition it now is, and when and in what way its treasures are to be made available? It is now nearly two years since a catalogue was made of the books purchased with the surplus funds of the International Horticultural Exhibition or otherwise obtained, and a list of some important desiderata circulated, by way of a reminder to the generous-minded. Since that time it appears to have retreated altogether into obscurity. *An old Pupil of Professor Lindley.* [Rome was not built in a day, nor the new Coliseum either. When the latter edifice is finished, we believe arrangements will be made for the housing of the library in that establishment. The sooner the better, say we. EDS.]

Bedding-out at Kew.—I have read with great interest the article with the above heading, as I had made some notes on the spot, and had intended to call your attention to the subject. The bedding-out, in what I may call Mr. W. A. Nesfield's garden there, appeared neatly got up, with the stereotyped plants fitted for the occasion, and like "Yarrow Unvisited," "there are an hundred such elsewhere as worthy of your wonder." I needed not to have gone to the expense of a journey to London to see high-class bedding, for the Lancashire gardens abounded with excellent examples of what could be done in this way, with quite an exotic summer to second their endeavours; but I could not resist the temptation of looking in at Kew, and the centre of attraction at the end of the broad walk was the bed in question. Every curve in the bed was true to its centre, and it was a remarkable feature in the bed that every line was struck off by a single stroke of the compasses, so that a person with with two pointed sticks and a string could strike off every line of its eight hearts, thus securing the accuracy of all the crooks and bends. It will be readily granted that there ought to be a dominant or ruling idea in a work of this kind, and a certain congruity of all the parts composing it, but Pelargoniums, Pyrethrums and Lobelias belong to a class of plants that ill assort with such succulents as Echeverias and Sempervivum. The outer edging of Echeveria secunda glauca was quite a gem, and any one taking the trouble to examine the splendid collection of succulent plants in Kew Gardens would soon be able to select such a bed of rare exotics as would set all ordinary gardeners at defiance. I have bedded-out in Devon Mesembryanthemums that during sunshine would have made the best flower-bed in Kew Gardens look pale, and I was amazed to see only two or three succulents represented out of such a rich collection. It is folly to talk of propagating such plants for bedding purposes when single leaves will root and make plants, with no more attention than laying them rather dry on a pan of silver sand in heat; but nobody seems to know of such floral treasures, and it is only when you can refer a man to such collections as those Kew Gardens, that he will believe in the existence of such beauty and variety as the succulent greenhouse plants can show. Here and there a nurseryman advertises Mesembryanthemums, and speaks of their beauty to encourage folks to buy; but it is beating up against the wind, and some crotchety collector gets together a house full of succulents, and young gardeners go miles to feast their eyes on such. I can recollect going many weary miles to get to Claremont to see such a collection, and to see the enthusiastic collector and guardian of the whole, but there is no need of such self denial now, for if one gets to London, a few pence will whirl him underground, and over the water of the Thames. There is now a special Kew Gardens Station, where we are set down only a couple of furlongs from the garden gates; and when the visitor has got thoroughly versed in the collection of succulents there to be seen, he will no doubt feel, as I did, that there could be no need for the dull Nettle-leaved Coleus to have any place where Sempervivum arachnoideum was a partner in the concern. It is the total want of congruity that I complain of. The same fault was conspicuous in Nesfield's beds in the Horticultural Society's Gardens, where the pattern was filled in with coloured glass broken fine. The painter might be pleased when the colour was right, but not so the gardener, whose garden was for plants, and not for ground glass. Had all the succulents been left out in the Kew bed their places could have been filled with flowers of all hues from the greenhouse stages. I cannot help entering my humble protest against the blackish foliage of Coleus, Beet, and Kale being used as a foil in flower-gardens to set off the adjoining bright colours; they are always the black sheep of the flock. It is very difficult to get a good place for a dead white flower in a garden, or a dark brown leaf; the one reminds you of the coffin black, and the other of the white rosette on the shroud. The green leaf, composed of blue and yellow, will always harmonise with its blue and yellow originals, and the rainbow dyes give all the parts of white without its glare, and sweetly shade the picture by painting it on the darkish face of the summer cloud. The style of planting of the Kew bed is taken from the mosaic style of an inlaid table. Tunbridge ware, Torquay marble ware, and Matlock ware all abound in excellent examples of this kind of design; and should the public taste turn in this direction we shall have no need to go from home for models. *Alex. Forsyth.*

Potatos for Keeping.—Please give me the names of three best Potatos for winter use, and for keeping. *T. E. H.* [We sent your question to the Rev. Mr. Radclyffe, who kindly replies as follows:—"The three best Potatos for winter use and for keeping are the Lapstone, the Yorkshire Hero, and Taylor's Yorkshire Hybrid. The two last ripen early, August 7, and keep till June 4, or later; they are of Lapstone origin, and may be had of Mr. Thomas Almond, of Little Fencote, Bedale, Yorkshire. They are admirable, and have never gone astray for eight years. Hero has short haulm and white blossom; Taylor's Hybrid has blue flowers and longer haulm. They are both good croppers. As the Lapstone is apt to grow out early I name a fourth—Pebble White, a first-class Potato, and good keeper; it ripens earlier than the Lapstone, which is a great point. The above four kinds are my finishers. I have not had a bad dish of Potatos for eight years. I add, the best to begin with are the Royal Ashleaf (June 4), or Myatt's Prolific. Royal Ashleaf, and either Hero or Taylor's Hybrid will supply 'J. E. H.' through a whole season with a dish of first-class Potatos. All my Potatos this year were planted January 24, and dug up ripe August 6." EDS.]

A Plea for Vegetables.—I am a well wisher to the Royal Horticultural Society, and I believe the Council of the Society are exerting themselves in the right direction to make their forthcoming exhibition at Nottingham a complete success, and I think that we, as gardeners, would only be doing our duty to horticulture, if we resolved to put our shoulders to the wheel, and assist them as much as possible in their great undertaking. As tending to operate in that direction, I may be allowed to suggest that we should raise the sum of £20 amongst us, to be called "The Gardeners' Prize." This ought to be forthcoming without any difficulty, as 80 subscibers at 5*s.* each would furnish the required amount. Then as to the manner of dealing with it: I would suggest that three prizes be given for the best collections of vegetables, including salads, to be competed for by gardeners only; or, if desirable, the competition may be limited to those only who subscribe to the fund. The 1st prize should be a gold watch of the value of £10; and for the 2d and 3d prizes, silver watches of the value of £6 and £4 respectively. I name these articles as being more suitable to a gardener's requirements, as, however beautiful a cup may be as a work of art, it is not so useful to the winner, who could wear his watch, with honour to himself, and find in it a very useful companion. Your readers will perhaps say, why vegetables? My answer is, simply, that I never yet saw vegetables shown as they ought to be. Single dishes of, say, Potatos, Onions, or anything else, look rough and untidy; but picture to yourselves a neat shallow box, well filled with a good collection of vegetables, artistically arranged, on a garniture of green Moss, or, better still, good curled Parsley; and you will see that the cook's favourites will occupy their place amongst Flora and Pomona's offerings with distinction. If gardeners are made of the stuff I take them to be, they will take up these suggestions in the spirit which I am sure they deserve; at all events, I should be glad to have the opinion of some of your numerous correspondents upon the subject. *R. Gilbert, Burghley.* [A capital notion. EDS.].

Do Plants Absorb Water through their Leaves?—Allow me to make a few further observations on this question, suggested by Mr. Fish's article (p. 1342). I am glad that he has been interested by my letter (p. 1251). The right solution of this question is, as Mr. Fish remarks, of great practical importance. The generally received theory is, I believe, that plants in their normal growing condition receive their food through the stomata of their leaves in a gaseous state, and through the spongioles of their roots in the liquid form of sap, which is the product of the digestion which has taken place in the soil, which supplies the place of a stomach. This sap, which is incapable in the crude state in which it enters the roots of nourishing plants, is carried forward up the stem and branches, as is supposed, by the powerful action which by Dutrochet (its discoverer) was named endosmose, and by the still more powerful action of vitality. It mounts upwards chiefly by the vessels near the central parts of the wood surrounding the pith. When it has reached the leaves (the lungs of plants) it combines, by the stimulus of light, heat, and vitality, with the gases absorbed by them, and is decomposed, throwing off into the atmosphere its superfluous water, which is in such abundance that the leaves have no need to absorb any water from the atmosphere in order to enable them to perform their proper functions. Were water to be so absorbed it would be hurtful, and not beneficial to the plants. When the sap has been duly elaborated, it has undergone a great change, having been converted into cambium, or the "proper juice" peculiar to the plant in which it may be found; and in its descent along the alburnum down the branches and stem, it adds substance to the plant. If the theory thus concisely stated is correct, it follows that plants in their normal growing state do not absorb water through their leaves; and that where plants do so, it can only be under abnormal conditions. The practical deduction from the above, is that the natural mode of watering plants is through their roots, and not their leaves. It would be as unnatural to give food to a man through his lungs, as to a plant through its leaves. It is necessary, however, to keep the leaves of plants clean by washing, so as to preserve their pores open for the admission of their aerial food; of which kind of food a man also requires a regular supply to his lungs, which must, therefore, also be kept in good order. When a drooping plant is watered at the roots, it is surprising how quickly it revives, and its flaccid leaves become turgid and healthy looking, which shows how powerful and quick in operation is that action, whatever it may be, which propels or draws up the sap from the roots to the leaves. To apply water to leaves to nourish a plant would be to reverse Nature's process, and to obstruct the natural current of sap. This mode of feeding could not long be persevered in with impunity. That Nature abhors such a mode is shown by the care which she takes to prevent water from entering externally the pores of the leaves of plants; for she defends the upper surface of the leaves with smooth coatings of varnish over which the drops of rain and dew run like quicksilver, in the same manner as they do over the back of a duck; and at the under surface, the pores of which are more open than the upper, Nature provides for many plants a downy or hairy respirator. The chilling and destructive influence of moisture, resting upon the leaves of plants and checking their respiration, gardeners have too frequently to deplore. Nature more especially provides Evergreens, which have to repel the cold rains and snows of winter, with smooth and glossy leaves. The deprivation of the roots of plants of water, so as to empty the sap vessels of the leaves, would probably cause them to absorb water placed in close contact with them; but this would be diseased action, partaking more of the nature of physical than vital action. Another outward manifestation of a plant's dislike to drink water through its lungs, is that the mouths of the stomata of its leaves contract in moist weather, and expand only in sunshine and dry weather, when it takes in more abundantly its gaseous food. I believe that plants grow quicker in sunshine if their roots have sufficient water than in moist weather. The stimulus of sunshine causes the elaboration of sap in their leaves to proceed with greater activity, whereas moisture tends to cause this elaboration to be carried on more sluggishly. Moist weather may cause plants to grow quicker than dry weather, by supplying to their roots, through the

interstices of the soil, the moisture that is deficient in dry weather, and without which they cannot grow in sunshine. There are supposed to be some plants that are exceptions to the above stated theory of growth, such as Epiphytes, Cacti, and the like. But if so, as there are exceptional cases, I need not further refer to them than to apply to them the axiom of De Candolle, that when a particular function is not sufficiently carried into effect by the organ ordinarily appropriated to it, it is performed wholly or in part by another. May not some of these supposed exceptional plants, when they have the opportunity, drink through the usual organ, like camels of the desert, a large supply of water at one time, and store it for future use in their succulent leaves or stems, as the camels do in their capacious stomachs? Referring again to the experiments of the French physiologists, as Mr. Fish still doubts the accuracy of these experiments, I shall again briefly allude to them. Mr. Fish suggests that "portions of a plant that have passed from a flaccid to a turgid state" may weigh lighter in the turgid than in the flaccid state, and further explains his former illustrations. He is correct in stating that a boat would rest lighter on the water than the timber of which the boat was constructed would do in a lump. But this, I think, does not bear any analogy to a leaf crumpled up into a lump, and suspended in the air, because the leaf is surrounded by only one medium, and that homogeneous, whereas the boat upon the water is resting between two different media of unequal density. A piece of iron in the form of a solid cube would weigh in the air exactly the same as if it were hammered out into a thin plate, because the pressure of the atmosphere would bear equally on every side, and because the force of gravitation depends, not upon form, but mass. But suppose this cube of iron to be laid upon the surface of the water, it would sink, and suppose the plate of iron to be laid upon the surface of the water, or constructed into a boat, it would swim; because in the case of the plate the density of the water would resist the pressure of the atmosphere and the attraction of the earth, as the plate would rest on a more extensive surface of water than the cube, but in the case of the cube it would not resist these forces, as it would rest on too limited a surface. Now, the case of the leaf would be analogous to that of the iron in the air, and not to that of the iron laid upon the water. Upon the same principle, a leaf in its flaccid state, with "its cells huddled together," would weigh exactly the same in the air as it would do when turgid with air. But suppose this leaf to be "partially distended with air," and partially with water, or aqueous vapour of the same temperature as the external air, it would weigh heavier than the flaccid leaf, or the leaf distended with air only, inasmuch as water is heavier than air; but were the aqueous vapour with which the leaf was distended of a higher temperature than the external air in which the leaf was weighed, it would in some measure buoy it up and render it lighter; the case then bearing some analogy to the boat on the water, there being two different media, the interior one tending to bear up the leaf and the external one to depress it. But in the experiments, I apprehend, the rarity of the aqueous vapour would very slightly affect the result of the weighing. Mr. Fish further suggests that the plants may have lost weight by the activity of the oxygen in a limited and stationary atmosphere. I conceive that so long as the vital principle retained the mastery over the chemical (which would, doubtless, be longer than the time occupied by the experiments), the oxygen would be kept in subordination, and no loss would occur from this cause; but rather, the plants would add to their substance and weight by the action of the gases; for the leaves by their vitality would decompose the carbonic acid they would absorb, retain the carbon, and transpire the surplus oxygen. And this action would go on even in "semi-darkness," although more slowly. I do not believe that plants, when in good health, exhale carbonic acid, either by night or day; for they know better how to retain their chief food when in possession of it. Mr. Pepys was unable to find that any carbonic acid was produced so long as the plants remained in health. Mr. Fish doubts that a detached branch would contain sufficient sap to restore the turgidity of the leaves after their being allowed to become flaccid. This restoration would of course depend upon the length of time that the leaves remained flaccid; if only for a short time, there seems no difficulty to believe that when the transpiration was stopped, or nearly so, there would be sufficient sap remaining in the branch to restore the leaves by flowing up to them and being retained there; but if for a longer time, it may be easily believed that the upper leaves would be restored. Mr. Fish also doubts if aqueous vapour can be prevented from entering the pores of the leaves. Possibly this cannot be entirely prevented; but probably, if in small quantity, it does no more harm or good to a plant than to an animal that inhales it. But if this aqueous vapour is applied to the skin of an animal, or to the surface of the leaves of a plant, it obstructs perspiration, and if too long continued may bring on disease in both cases. *A. Thompson, The Cross, Whitchaven.*

Habits of Cuckoos. — Among the interesting accounts of the habits of cuckoos there seems to be no notice of their ever feeding their young. Lately, however, a friend told me that he had repeatedly seen two cuckoos feeding a young one, which was bred in a pied wagtail's nest, among some planks close to his workshop. After the young one left the nest the old ones fed it for several days, and used during that time to utter their well-known notes; but after that left them off. I doubt the correctness of his story, though confirmed, as he alleged, by a repetition of the same occurrence in the following season. I likewise disbelieve what some writers have said respecting cuckoos being found in nests of hedge-sparrows, because their food is not suitable for cuckoos. Besides, the hedge-sparrow is one of the earliest birds to lay eggs, even before the arrival of the cuckoo, while the wagtail is one of the latest to make its nest. During this season I found a cuckoo in a pied wagtail's nest at the end of August, when one seldom hears the cuckoo's welcome notes. Like most boys, I was always fond of "bird-nesting," but I never found a cuckoo in any other nest than a wagtail's, nor observed any other kinds of birds being made a "gowk" by feeding a cuckoo on the wing. I am well aware of what has been said respecting other kinds of birds fostering cuckoos, some of which feed their young with food more suitable for cuckoos than that of the hedge-sparrow. If I were asked why writers generally mention that harmless bird as bringing up cuckoos, I can only suppose the assertion to have been copied from some writers at first without due consideration. *T. Wighton, Cossey Park.* [We should be glad to receive further evidence on the points raised in this letter. EDS.]

The Grape-room at Heckfield.—I have much pleasure in informing Mr. Simpson (p. 1412) that the house of Grapes in question was a late house, and was quite ripe about the middle of September. They were cut and bottled because the house was required for bedding stuff. This year one half of the same house has again been cut, and the whole would have been but for the limited accommodation afforded in the Grape-room. *Alex. Dunn, Old Shirley, Southampton.*

Tomatos in Pots and in the Borders.—Having grown quantities of Tomatos in pots this year, I find the dwarf Orangefield variety one of the best for that purpose. It is likewise the earliest in setting its fruit, and with a little forcing may be got ripe when grown in pots early in July. This year I had about four dozen plants of it transplanted out on a south border, and they ripened a good crop in September. Of course, in this exceptionally warm and dry summer, Tomatos had a good chance of ripening in the open air, but I am convinced that the Orangefield variety may be depended upon for ripening its fruit in ordinary summers on a warm south border. If sown early in heat, and kept growing in pots of a good size, and then transplanted out of them in the middle of May on a warm south border, this variety will be sure to fruit and ripen well. When planted out at first, should there be any appearance of the slight frosts that sometimes occur even till the end of May, a few Fir or other evergreen branches placed round the plants will protect them efficiently. The Orangefield is a sturdy dwarf-growing sort, and requires little support when planted out if pinched in above every cluster of fruit. There is a growing taste in this country for using the Tomato for making sauces and for other purposes, and any mode to make their cultivation more extended will be a boon to many growers, especially to those who have no south walls to grow them on. Owing to our climate, Tomatos will never be so plentiful nor so generally used as they are in America, where they furnish a special and wholesome food for the Yankees, who eat them ripe and unripe, as well as in sauces and salads. *William Tillery.*

—— I fully appreciate Mr. Sage's remarks on this subject at p. 1412, for until this year the thought of the cultivation of pot Tomatos never struck me forcibly enough to give them a trial; but so satisfactory has been the result with me that I shall in future endeavour to ensure a good supply. Although the present year has proved an exception towards the maturity of outdoor fruit, my season of gathering was prolonged fully six weeks, as those in pots were that time in advance of my outdoor crops. I potted a batch of sturdy plants in 12-inch pots, in maiden loam, adding a little rotten dung, and placed them as near to the glass as possible in a greenhouse when they had set their fruit. I gave them a top-dressing of thoroughly rotted manure, with the addition of copious supplies of manure water two or three times a week, keeping them well pinched back to the fruit, and a good supply of early Tomatos was secured with comparatively little trouble. *E. Morgan, Harrow-on-the-Hill.*

Preserving Grapes.—The mode of preserving cut bunches of Grapes now in operation at Heckfield, as described by your correspondent "A. D." (p. 1382), was tried most successfully last winter by Mr. Clarke, gardener to Colonel Long, Bromley Hill. His plan was exactly the same as that adopted by Mr. Wildsmith, and the circumstances precisely similar. Muscats and Black Hamburghs were the kinds tried, and when the supply was exhausted in March they were quite plump, and the flavour unexceptionable. *W. Rust, Castle Hill, South Molton, Devon.*

The Mesembryanthemum.—I hail with pleasure your editorial remarks on the above interesting class of plants at p. 1373. Since my remarks in these pages last autumn, I feel convinced, by the tone and inquiries which several letters I have received contained, and the great interest many of the visitors have taken in the small collection I have here, that they will, ere long, become a very popular class of plants. Indeed, as I before stated, a more pretty and interesting tribe of plants are not to be met with. There can be no doubt a large collection of these, well grown and suitably placed, and planted for effect, as I once had the pleasure of beholding, is not to be excelled by any other class of plants, Orchids excepted. In them we have freedom of growth, profusion of flowers, the most charming colours, and, without a doubt, in some respects the most remarkable plants in the world. Their leaves have some of the most singular shapes which are known in the vegetable kingdom; the capsules have somewhat the appearance of little Figs; the papillæ or warts, of the largest subgenus, in some instances look like pimples full of moisture, and glitter in the sunshine like bubbles of ice. The different varieties bloom at different seasons—spring, summer, autumn, and winter. As you stated, few plants are better adapted for rockeries, balconies, baskets, &c., and are of so easy culture that they may be termed everybody's flower, but, like many other good old-fashioned flowers of our forefathers, have of late years been sadly neglected. I hope to give them a good trial out-of-doors next season, by planting them in two new panel gardens, now in course of formation. I am pleased to say that the Earl of Stamford and Warrington has suggested and sanctioned several important alterations and improvements in his extensive pleasure-grounds, &c.; by so doing the bedding will be more varied, which could not be well done on the very large circular beds, so well known at Enville for many years, and which will still remain. *Edward Bennett, Enville Gardens, Stourbridge.*

The Service Tree.—Accompanying this I send you two small branches of Service trees. No. 1 was taken from a large tree, which bears annually great quantities of fruit, and at the time I write has from 8 to 10 bushels on it, notwithstanding that a great many were blown down by the late winds. I find them very useful to make an extra dish. If carefully gathered and stored away, like Pears, they will keep till Christmas. By many they are preferred to Medlars, as they are not so dry, and are more refreshing. The size of the trunk of the above tree, at 1 foot from the ground, is 7 feet 9 inches, and at 8 feet high, 6 feet 3 inches; it then throws out large spreading branches 35 or 40 feet high. No. 2 was taken from a much smaller tree, which is not so prolific as No. 1. Please say which is the true Pyrus domestica. [Both.] *T. Foster, Gr., West End Lodge, Esher, Surrey.*

Smilacina bifolia.—Since reading your article on this plant (p. 794), I have waited for further information from some of your able correspondents; in the meantime, until this is afforded, I send a few notes of my own limited observations. Noticing the plant in Mr. Salter's catalogue (which will in future be missed), I obtained a good pot of it from him in March last, and turned it out on a cool border near a flourishing bed of Lily of the Valley, supposing it to have a similar habit, which proved correct—in growing, flowering, and fading, the two plants kept equal pace. The Smilacina is a miniature of our old garden favourite, Convallaria majalis, but without the fragrance and graceful bend which give this such a charm; the spike, too, is relatively shorter. The foliage is slightly revolute, shining, acutely heart-shaped, rising about 2 inches above the soil; the spike of small white flowers half an inch higher. So humble a flower cannot be suitable for English nosegays, unless for the button-hole; the neat, bright leaf, and small rounded spike of flowers, with the addition of a double Violet, would be just the thing for that. The plant is too small for the border, but would well fill a nook on the shady side of a rockery, which, while it affords a setting for such little gems, is surely not altogether "a delusion and a snare." The authors of "The Flora of Middlesex" state that a very large patch of Smilacina bifolia is growing at Ken Wood, where it can be proved to have been for more than 90 years past. It bears fruit there, and one would like to know whether the berry is scarlet, like that of the Convallaria. Like this, it is a shy bearer. As two other habitats in England are known, it has been claimed as, possibly, a native plant. *S. S.*

Onion Growing.—"R. D." (p. 1375) recommends frequent pinching in of the neck. If this pinching is to be severe enough to injure the vessels of the neck, and impede the free motion of the sap, will it not injure the development of the already scanty foliage of the Onion, and thereby injure the bulb also? If the pinching is not to proceed to such an extent as to impede the sap, of what use can it be? Perhaps "R. D." will favour your readers with some further information as to the practice which, it seems, is adopted at Banbury so successfully. *S. B.* [See an article in our columns, 1866, p. 193. EDS.]

Trees Suitable for Seaside Planting.—At p. 1377, "D." asks if Pinus austriaca is a good tree for planting in such a situation for shelter. I think "D." cannot be wrong in choosing it as the most suitable Pinus for that purpose; but maritima is nearly as good. There are growing here, within 150 yards

of high-water mark, in one of the most exposed situations in the South of England, many of the first named Pinus, from 1 to 12 feet high, pictures of health. P. insignis is also well adapted for the purpose, and besides is one of the handsomest of the whole tribe, and a very fast grower. Abies Douglasii seems also likely to do well in such a position, as there are some young plants here thriving very well. Unless "D." particularly wishes to have all evergreens for his purpose I should strongly advise him to use a greater portion of deciduous trees. Among the most suitable are the Black Italian and Balsam Poplars, English Elm, and Turkey Oak; these all do well on the coast, and as soon as they are established they require no more tying, their strong roots holding them fast against wind storms. One other tree, which must be placed first on the evergreen list, is the Evergreen Oak, the best of all for seaside planting. It, however, requires careful planting, and attention for the first year, or a great percentage of them are almost sure to die; but once get them established and they soon repay any extra care bestowed on them. [Certainly.] Amongst evergreen shrubs the first which must be named is the Phillyrea, as no amount of wind seems to affect it; the next in point of merit is Euonymus japonica: though only dwarf and slow growing, it is invaluable for seaside planting. The Sweet Bay, Laurustinus, and Portugal Laurel, also do well where they can get a little shelter from the sea spray. Of deciduous shrubs, the Tamarix, Persian Lilac, Red Dogwood, Gueldres Rose, and Venetian Sumach, are the best growers in the cold stiff clay of this place. Of trees suitable for ornamental purposes on the sea-coast, there is not a great variety to select from. The Retinosporas appear likely to do well. The worst of all here is the Wellingtonia gigantea, about 130 plants of which have been planted at various times, not one of which is doing well. I attribute this more to the heavy soil and bad drainage than to anything else, as during about four months of the winter we generally have the water standing within from 20 to 30 inches of the surface, and have no means of getting rid of it, the ground being nearly level with the sea. *John May, The Gardens, Westfield, Hayling Island, Hants.*

—— In answer to "D.," whose letter appears at p. 1377, we can say that the Austrian Pine does succeed well at the seaside, and that the following, among other trees, are also suitable for such situations:—Pinus insignis, Sea Buckthorn, Turkey Oak, Minorca Holly, Hydrangea, Tamarix gallica, Acer platanoides, Norway Maple, and other varieties; Arbutus Unedo, Evergreen Oak, Abele Poplar, Pinus Pinaster, Broom of sorts, Lycium, Myricaria germanica, Colutea arborescens, Eleagnus argentea, Laurustinus. *James Dickson & Sons, "Newton" Nurseries, Chester.*

—— Permit me to inform your correspondent "D." (p. 1377) that I planted, upwards of 20 years ago, some hundreds of the Pinus austriaca, for the Honourable E. Herbert, at Street, in the parish of Blackawton, near Dartmouth. They were planted on the high cliffs, against which the sea is constantly beating, and are exposed to cutting winds from every quarter. I visited the place a few years since, and found that the trees had made good use of their time and withstood the storms unhurt. I also find that the Ilex, Arbutus, Aristotelia, Holly, Hydrangea, Cornus, Cistus, &c., withstand the sea blast there and grow remarkably well. *J. Mitchell, Truro.*

Bougainvillea glabra.—The vast extent of the country of Mexico, where B. spectabilis is a native, is, we know, on the north side of the isthmus which connects North and South America, forming the north part of Central America, and from the singularity of its construction the coasts alone possess a warm climate, whilst the temperature of the interior ranges from extreme heat to extreme cold, according to the elevations of the various points above the level of the sea. Both Mr. Bennett and his controvertists are, unquestionably, right in their assertions with regard to the temperature suited for the thriving and flowering of this plant; and I may also add that my own experience tends to confirm the fact, for when I lived at Dangstein as under-gardener a large plant was in bloom there for some considerable time, being literally covered with its lovely floral bracts. Now this plant was growing in a low-roofed stove, where the main bulk of Orchidaceous subjects were growing; it was planted in a box, and this was placed immediately over the hot-water pipes; the branches were judiciously trained, and tied out thinly to a wire trellis, nearly close to the roof of the south side of the house, to receive all the light possible, which seems particularly essential for the proper culture of the Bougainvillea. Since that time I have had opportunities of seeing it growing elsewhere, and in an equally exuberant condition, but I must admit that it has been on every occasion in stoves, where either Pines or regular stove plants were growing. I have myself, however, this year grown a number of young plants in pots in a house intermediate between greenhouse and stove. The greater portion of these young plants are now showing for bloom, though, as might be expected from their size, this cannot be very profuse this year. The chief points for the successful growing of the Bougainvilleas are, no doubt, allowing them to make an abundance of growth during the growing season, for which proper soil, extra heat and moisture are required, and well exposing the wood to the action of sunlight. *George Nevalyn, The Royal Nurseries, Slough.*

—— I have no doubt the above plant may be grown in a warm greenhouse or heated potting-shed, but the question at issue is, not where it may be grown, but whether it is a greenhouse plant. I do not recognise it as such; if so, Hoya carnosa, that will stand more hardships and a greenhouse temperature, should certainly be termed a greenhouse plant also. Perhaps some of your correspondents will tell us it is such. *Edw. Bennett, Enville.*

Pears Affected with Sunstroke.—I send you an illustration of the powerful effect of the sun during the past season in the case of some Pears, which, as you will perceive, has received seven sunstrokes. The sort sent is Beurré d'Aremberg. Williams' Bon Chrétien was very bad, as well as several others on the same wall—aspect S.W. *James Silver.* [An extreme case. Eds.]

Oncidium Papilio var. Krameri.—This is a very distinct variety of the old and well-known "Butterfly Orchid," from which it may be readily distinguished by its shorter flower-stems being cylindrical, with thickened nodes or joints (not compressed or ancipitate, as are those of its congener); the lip is serrulate, and beautifully crisped or frilled round the margin of the central lobe; the whole flower is richer in colour than in the old species; again, the brown markings of the broad lateral sepals are disposed in the form of spots or irregular blotches, instead of bars. This splendid variety is of comparatively recent introduction, its habitat being Central America, but it will undoubtedly become a general favourite; and as it has lately been imported in considerable quantities, we may hope to see it pretty generally distributed ere long. It flowers freely, and, like its congeners, has the advantage of blooming for a very lengthened period from the apex of the old flower-stems, in a manner analogous to that of the old "Wax Plant" (Hoya carnosa), or its relative, Centrostemma acuminata (Cyrtoceras reflexum). Such being the case, of course they must not be cut if future flowers are desired, but should a plant throw up several flower-stems, as frequently is the case, it will be found that its growth becomes considerably checked, as they will keep on blooming for months without making fresh bulbs, consequently it will sometimes be found necessary to remove them in order to promote a vigorous growth. The parent species, O. Papilio, is a native of Trinidad and Venezula, and has besides two other well-marked varieties. O. Papilio var. majus has larger, brighter-coloured flowers, and O. Papilio var. pictum has dark-coloured flowers, the central lobe of the lip being beautifully spotted round its margin, and the whole flower has a very pleasing appearance. They grow freely on blocks with fresh Sphagnum, but require an abundant supply of moisture whilst making their growth. *F. W. B.*

Vine Roots.—Those who prefer inside borders for Vines or Peaches should rely upon the inside entirely, and take precautions against the roots getting outside at all, otherwise they will defeat their object, for, plant as they may, the best part of the roots will find their way outside if it is possible, and eventually the trees will come to rely almost entirely on these. The roots, like the branches, seem to turn towards the sun, and I know some eminent gardeners who maintain that they prefer to run in the opposite direction to the branches. Be this as it may, it is, I think, an undeniable fact that they prefer to go outside. I know more than one instance of an inside border being made with the greatest care, the roots of the Vines being all turned carefully inwards at planting, and at the end of two or three years they have been found in far greater number and activity in the common garden soil outside, 10 or 12 feet from the house—a space which had eventually to be treated as the border, and the Vines bore amazing crops. Four years ago I planted a vinery in a well prepared inside border, 16 feet wide, with an additional 6 feet outside, confined with a brick wall all round. The Vines were planted inside, and the roots trained inwards. I now find that they are ramifying in crowds against the brick wall outside, and, as they are doing well, I see nothing for it but removing the garden walk farther back, and giving the Vines additional space. In lifting some Peach trees lately, which had been planted inside some years ago, I found two-thirds of the roots outside, though the inside border had always received the most attention. Indeed, I may say that I never knew an exception to this rule. This instinct of the roots is very suggestive, and I should like to hear the opinion of your readers upon it. *J. S.*

How to Destroy Ants.—It was said of old that "in the multitude of counsel there is wisdom." While disavowing any pretensions to be considered a wiseacre, or any wish to disparage the methods suggested by other correspondents for destroying these pests, permit me to recommend to any one so troubled to lightly dust their haunts with the best Peruvian guano, dried, and finely powdered—they seem to shun it as they would a pestilence. I have repeatedly adopted this method, and have recommended it to others, always with satisfactory results. *Geo. Neville, Gr., Leigham Court, Streatham Hill, S.W.*

Foreign Correspondence.

A Flower Show in New England.—A flower show in New England differs little from one in Old England, for New England is, in many respects, more English than England itself; and Boston, Mass., is simply a first-rate and improved English city on another shore, and, being the most English of English cities here, one naturally expects its horticulture to be the most developed—and this is the case. With a fine summer and autumnal climate Boston does not hold her flower shows in tents, as occasionally her fine blue sky is diversified by storms of wind and rain which make short work of tents, &c. So the Bostonians have built a large structure for their meetings; and the Horticultural Hall—"a beautiful edifice of dressed granite, much admired for its classic style and elegant proportions," to use the words of "Appleton's Guide,"—is situated in one of the principal streets, and embellished externally with statues of Flora, Pomona, and Ceres, furnished with an extensive and excellent collection of horticultural books—perhaps the best collection I have yet seen put together, and with very good arrangements for its various exhibitions. It is probable that a horticultural hall will become a feature in each large city in the Union. There is one at Philadelphia considerably larger than the one at Boston, but not so fine architecturally; both of the buildings, however, are much superior to anything of the kind in Britain. The show held in Boston on September 20 offered a good opportunity of studying the capabilities of the country, and was a very interesting display. Stove, greenhouse, and various other potted plants were there, but we may pass them by, as they are merely expensive luxuries, possible in almost any climate; they teach us nothing of the country, and have no influence on the happiness or well-being of its inhabitants. The marked feature of the show was its fruit. The hall had more the appearance of what is a special fruit show in France or England than an ordinary miscellaneous exhibition. The display of Apples was remarkably fine, long and wide tables being densely covered with large and handsome fruit. Many of the kinds were, however, in a green and imperfect state, inasmuch as the date was too early to see Apples in perfection, as a class. At later shows they are said to be much finer. The Pear show was also very fine, I think a few degrees better than we could display in England. It is the custom here to cultivate particular varieties to a much greater extent than in England; thus the Pear known to us as Williams' Bon Chrétien, and here as the Bartlett, is cultivated everywhere, both for use when ripe and for preserving abundantly for use throughout the year. It attains a higher character here than in England, generally has not the somewhat disagreeable musky flavour it has at home, and is often seen of a fine clear lemon-yellow; one dish of 12 Bartletts at this show weighed together 8 lb. 6 oz. Flemish Beauty Pear seemed as large as what we should at home call large Easter Beurré. New England is considered the best part of the Union for Apple and Pear culture; Californian fruits are praised as something wonderful, but some Eastern fruit growers dispute this, and say they have grown quite as large. Perhaps I shall be able to judge when I reach San Francisco. Of Grapes the display here was very fine—both native and European kinds covering a large space. The European kinds, which in all cases here must be grown under glass, inasmuch as out-of-doors they are destroyed by mildew, were as fine as at an average English show but not so well coloured, and the native Grapes, though smaller, looked excellent; however, they are very objectionable to the European palate, though two or three varieties are good and distinct in flavour, and it is not unlikely that in time to come they may originate a good and very distinct race of Grapes. Americans say that once the palate is used to these Grapes they become very agreeable. Most of the autumnal productions of our English gardens were seen here in fair condition—Cabbages, Turnips, Beets, Potatos, &c., though the last seem more sappy and less desirable than with us, and I must say I have not tasted anything like such good Potatos in this country as in Britain. Tomatos are of course a feature, they are of more importance here than the Potato itself; I wish our climate would permit them to become generally popular in England. Gourds are also seen in considerable numbers, not the kind we have in England, but large and rough-looking sorts, none of which seem so desirable as the Vegetable Marrow. Melons, both water and musk, as our common Melon is here called, are very fine—this is the country for Melons. Heads of Indian Corn, so much eaten here in the green state, form an item in the prize lists, and are very large and handsome. But strangest of all to the English eye are the enormous Egg-plants—the eggs of Egg-plants I mean. Imagine a dark violet-coloured fruit, 8 inches through and 10 inches high, weighing about half-a-dozen pounds, and you may have some notion of them. It has been the driest season here that people have experienced for many years, so they say—"the Egg-plants are small this dry season!" An official of the show told me they sometimes weighed as much as 12 pounds, which seems prodigious, considering the size and stature of the plant. Wild flowers were shown here pretty much as in England—only instead of Meadow Sweets and Forget-me-Not, we

have Golden Rods and Michaelmas Daisies, and the fringed Gentian, with a garnishing of red autumn leaves. *W. Robinson, in "Nottingham Guardian."*

Notices of Books.

Choice Stove and Greenhouse Ornamental-leaved Plants, *containing Descriptions of upwards of 800 Species and Varieties, accompanied by Instructions for their Cultivation.* With Illustrations. By B. S. Williams, F.R.H.S. London: Sold by the Author.

This is a sequel to the volume on "Flowering Stove and Greenhouse Plants," published in 1869 by Mr. Williams, and is on the same plan. First, there are chapters devoted to general matters, such as the construction of hothouses, glazing, heating, cisterns, shading, soil, potting, watering, insects, &c., followed by others on Palms and their uses, succulent plants, with select list; subtropical gardening, with lists; window plants, with various lists; and horticultural exhibitions. We take as a specimen of this part of the work the article on exhibitions, in much of which we agree, though it is probably written under a misconception of the extent and meaning of the reductions which are contemplated, and to which allusion is made:—

"We have been connected with these public exhibitions for many years, and we are fully impressed with their utility and beneficial influence upon horticulture generally. A difference of opinion in this respect has sprung up recently, and a few visionary articles have been written, which prove nothing but want of knowledge and bad taste on the part of the writers. It is a fact beyond dispute, that horticultural societies throughout the three kingdoms have been the means of promoting the science of horticulture, and to their influence, fostering care, and encouragement, is due the introduction of the many plants which now ornament our stoves and greenhouses, as well as the open air—both of those yielding fine flowers and ornamental foliage. Such subjects as these, when brought together at an exhibition, and made to form the basis of a gorgeous display, impress the enthusiastic beholders with a love for plants, and many of our leading amateurs have assured us, that these floral displays were the means of first instigating them to become horticulturists.

"Having for many years been constant visitors at these shows, and taking an active part in these displays, both at home and abroad, we have been able to judge practically of the progress these have been the means of producing in plant cultivation, and in the effective grouping of plants, also in regard to the great variety of objects brought for public competition. Being fully alive to all this, it has necessarily caused us extreme regret to see the backward tendency displayed by our metropolitan horticultural societies during the present season; for just at the time when we have become fully aware of our error in devoting our whole energies to produce flowers only, to the utter neglect of plants of elegant forms and beautiful leaves, and are earnestly endeavouring to retrieve this error, and when, too, we are introducing these plants largely for the decoration of our gardens in the open air, the societies have totally withdrawn their encouragement for the production of them; and by their silence respecting them—by their not asking for plants remarkable for the beauty of their foliage to grace their exhibitions, they seem to ignore the existence of grand specimen plants, whether ornamental in foliage or flowers. How such a state of things has originated it is difficult to say, but of this we are fully assured, that the exhibitions without these fine ornamental-leaved plants will be miserable in the extreme. What lent the great charm to the great London and Paris International flower shows but the elegant Tree Ferns, and those of humbler growth, the noble Palms and Musas, besides the vast quantities of other ornamental-leaved plants there brought together? The various shades of green and variegated leaves formed an agreeable contrast with, and served to enhance the beauty of, the masses of bloom staged with and around them, and what would these exhibitions have been without such plants? Again, what is it that causes all visitors to plant exhibitions upon the Continent to pronounce them finer than our own? It certainly is not their grand Heaths or New Holland plants, for such things are not well grown by Continental cultivators; neither is it their magnificent stove flowering plants and Azaleas, for with these we are infinitely their superiors; but it is through the quantity of Ferns, Palms, and ornamental leafage generally introduced, and which is judiciously arranged with their somewhat inferior flowering subjects. These materials being grouped for effect, the appearance produced is most enchanting, such as we have never yet equalled. This is the only reason that all reporters receive a more favourable impression abroad than at home. Yet such as these are the very plants that are to be banished as specimens from our flower shows in the metropolis! Let us fain hope that those who perpetrate such barbarisms—who thus try, as it were, to hurl horticulture back into its dark ages, may speedily see the error of their ways. They manage these things far better in the provinces, and the authorities of such centres of horticulture as Manchester, Leeds, and York, are too well aware, and appreciate too well, the effect large ornamental-leaved plants produce, to ever think of discarding them from their exhibitions. At the same time they are fully as well aware that the mill operatives and mechanics are great admirers of beautiful-leaved plants as well as of flowers, and to banish either section from their great Whit-week display would not only cause wide-spread dissatisfaction, but would tend materially to diminish their exchequer; for it must be borne in mind that at the provincial flower shows the working classes constitute a great portion of the visitors. Many of them are enthusiastic botanists and amateur horticulturists, and it is a rich treat to which they anxiously look forward, and one that enables them to refresh their memories and gladden their sight with the beautiful works of Nature, of which to a great extent their daily occupation deprives them. We say, long may such societies flourish—and flourish they must and will, whilst their efforts and all tend towards the education and elevation of the masses, which is the noblest aim of life."

Fig. 254.

The remaining and larger proportion of the book is devoted to chapters, in alphabetical order, on such genera of plants remarkable for the beauty of their leaves, as Mr. Williams selects for commendation. An example will show better than any description the manner in which this section of the volume is worked up, and we take as samples the remarks on Beaucarnea, with which we are able to give, through the courtesy of Mr. Williams, one of the illustrations to the volume (fig. 254), that of Beaucarnea recurvata, a fine decorative subject for a cool conservatory.

"*Beaucarnea.* A small and exceedingly curious genus of Mexican Bromeliaceous plants. They form slender woody stems, with a remarkably swollen or napiform base. The general opinion is that they are of extremely slow growth, and unless treated in a liberal manner as to soil and watering, they probably would be so, but under favourable treatment good specimens may be obtained in the course of a few years. Beaucarneas are both grotesque and graceful in habit, and form striking objects in the conservatory, or in the open air during summer. They should be potted in rich fibrous loam and sand, with ample drainage, and, during the growing season, must be supplied liberally with water. They may be increased by cuttings when these can be obtained, but chiefly by seeds, which hitherto have been imported from their native country, no specimen, as far as we are aware, having flowered in European gardens. They have been sometimes cultivated under the barbarous name, Pincenectitia.

"*B. glauca.* In this species the stem is slender, while the swollen base becomes woody and hard with age. It bears a crown of long, pendent, glaucous leaves, which are from 2 to 3 feet in length, and present the appearance of a beautiful fountain. Native of Mexico.

"*B. glauca latifolia.* In general appearance this resembles the preceding, and, indeed, differs from it only in its stouter and more robust stem and broader leaves. Native of Mexico.

"*B. longifolia.* This is the most distinct and beautiful species of the genus. The stem is stout; leaves from 6 to 10 feet in length, narrow, pendent, forming a beautiful vase-like centre, and dark green in colour. Native of Mexico.

"*B. recurvata.* This species is sometimes to be met with under the name of B. tuberculata. Our woodcut illustration [Fig. 254] gives a good idea of its general appearance, and our readers may judge that such a plant, with its bright green pendulous leaves, must form a beautiful object, either in the open air during summer, in the conservatory, or, indeed, in any position. It is a native of Mexico.

"*B. stricta.* Stem stout, with a swollen base, as in all the other species. The leaves are some 3 feet or more in length, less than an inch broad, and very glaucous. Native of Mexico."

It will thus be seen that this volume, like its predecessor, will be very useful to those engaged in the cultivation of plants, and who are in need of instruction, both as relates to the selection of plants and their subsequent management. The descriptions are simply popular memoranda, intended to give some idea of the character and the leading features of the plants, and are in no way of the nature of botanical descriptions; while the remarks on cultivation are the reflex of the author's own practical experience. Possibly in the genera, where selection has been necessary, we might not in all cases have chosen exactly the same species or varieties, but those who in this respect submit to be guided by Mr. Williams, will not go far astray. One feature in particular will render this work very useful to gardeners, viz., that it contains a popular account of most of the introduced Palms, a class of plants, concerning which information is much needed amongst cultivators, and which we have ourselves done something to supply by the series of papers from Dr. Seemann's pen, which we have recently published. Altogether we heartily commend the book.

Florists' Flowers.

Perhaps of all flowers the Violet is as much prized as any other that commends itself to the regard of mankind. The little single London Violet, as it is termed, a bunch of which can now be obtained in the streets of London for a penny, is all the more acceptable because fragrant flowers of outdoor growth are very rapidly passing away. Of the common kinds there are, in addition to the one already named, the single Russian, and a larger form of it known as the Russian Superb; the Giant, the Neapolitan, so much used for forcing, and the single White, all of which are more or less cultivated in gardens, and included under the general head of Sweet Violets. How the common field kinds light up our woods and beautify shady nooks in the spring time, is well known to all frequenters of the country; in some spots they can be seen by thousands, about the roots of pollard trees, and along the shady sides of the watercourses.

"When Beechen buds begin to swell,
And woods the blue-bird's warble know,"

then Violets can be seen peeping forth from amid the half-decayed leaves shed last year, obedient to the law that unfolds their tiny blossoms, and diffusing their pleasant fragrance.

The Violet is fond of a rich loam to grow in, and prefers a spot shaded to some extent, and tolerably moist. To see them in perfection, and enjoy the rich exhalation of their exquisite perfume, one needs to visit places like Belvoir Castle in the early spring months, where they are very largely grown, because so well adapted to such places. Beds of the large Russian and Czar Violets meet one at many points; their perfume sweetens the air, and you linger among them even when the keen wind stirs the long dark boughs of the leafless trees. Violets are a prime feature at Belvoir, and they occupy the van of the floral procession that makes spring gardening there such a happy festival. A moderately heavy soil is provided for them here, overlaid with decayed leaves. The beds are placed under the shade of trees, and when in April the plants are lifted, divided, and planted away to make growth for another year, similar conditions of soil and aspect are provided; and though some years ago it was difficult to grow Violets at Belvoir, now they are common, and thrive as well as can be desired. Shade during the morning, midday, or early part of the afternoon seems indispensable; hence their summer quarters are found near trees with spreading boughs. Those who say that Violets should be suffered to remain in the ground undisturbed should go to Belvoir to see how their theory wears when the converse of it is practically applied. Cultivators are now generally advocating the practice of lifting and dividing the plants annually, "cutting away all old and weak crowns and runners, and trimming the roots, trenching and manuring the ground, and replanting them. The best time for doing this is immediately after the flowers are over—about the middle or end of April, or the beginning of May," according to the locality. As in woods it is nearly always seen that Violets flourish under trees, and on banks where the leaves congregate in autumn, so does it suggest that leaf-soil mingled with the soil in which they are to grow, and applied as a top-dressing, is an important ingredient, highly conducive to their well-being. Mr. Ingram asserts that the secret of his success with the Violet at Belvoir consists in that he simply applies to it, when under cultivation, something of the conditions under which it is found growing wild.

Violets are readily increased by using the runners as cuttings. It is simply necessary to plant them in light, rich, sandy soil, on a warm, shady border, or in a cold frame; the latter is the best, when it can be appropriated to the purpose. Here they should be wintered, and planted out in the following April, and pushed on into vigorous growth.

Some of the bettermost kinds consist of Arborea, a distinct and fine variety, flowers blue, large, and very double, and an abundant bloomer; Brandyana, a distinct and fine variety, flowers large, very double, dark purple, striped with white and pink; Devoniensis, bearing large dark blue single flowers, which are very fragrant, a distinct and fine variety, blooming profusely; King of Violets, dark indigo-blue, flowers large and double, a very fine variety; Marie Louise, a distinct, novel, and beautiful variety, flowers double, colour lavender-blue, with white centres, a continuous bloomer through the winter months; Reine des Violettes, flowers white, slightly shaded with blush, very large and double, and extremely free blooming; Rubro-plena, flowers double, and of a pale reddish brown hue, novel and fragrant; Scotch, a distinct and very fine variety, flowers dark purple, very large and double, free and continuous bloomer, and of vigorous growth; Suavis, flowers single, large, and of a pale lavender hue, very fragrant, free, and distinct in character; and the Czar, a large and beautiful variety, producing enormous single dark purple flowers, which are freely produced, and very fragrant. V. odorata pendula, known as the Sweet Violet of New York, is highly spoken off; the flowers are large, double, of an azure-blue colour, and highly fragrant.

Of the scentless American species, V. obliqua striata deserves to be grown for its pretty striped flowers, which are very attractive when the plant is well grown. Others are pretty, but the fact that they are void of fragrance tells against them. Perhaps, of the two, they are more showy than the scented varieties, as they have a better habit of throwing up their blossoms above the foliage, and in addition to being perfectly hardy they are also of free growth. V. pedata is a charming thing for spring flowering, but should be grown in pots, unless in a sheltered locality, and where the soil is light and well drained. This pretty species wants to be seen as Mr. Ingram grows it at Belvoir, in order to fully appreciate its chaste beauty; there, peeping out from under neighbouring plants that give it shelter without smothering it. *R. D.*

Garden Memoranda.

Cricket St. Thomas, the Seat of Lord Bridport, stands very secludedly in a beautifully timbered and undulated part of the southern division of the county of Somersetshire, three and a-half miles from Chard, and about five from Crewkerne. From the latter town, Cricket St. Thomas is approached by the Axminster Road, from which at various points during the route some of the grandest pieces of scenery for which the country is remarkable may be seen, particularly a splendid view of the much-admired Vale of Taunton, and which is gained from a rising eminence near the entrance gates to Lord Bridport's Park. After entering at the lodge gates, the carriage road winds circuitously on the side of a hill for more than a mile before the kitchen garden, and the mansion, come in view. From the kitchen garden we proceed through a door in the boundary wall on to a terrace leading to the flower garden, this side of the wall alluded to being completely covered with fine Magnolias, several of which were in bloom at the time of our visit. On the other hand, the ground slopes down to a continuous sheet of water in a small valley, which is retained by damming a small stream which empties itself into the River Axe. The opposite side is thickly planted with trees, with an undergrowth of Rhododendrons, which have a very pleasing effect when in bloom, and seen from the garden side. At the end of the Magnolia wall, encircled with thriving groups of Hollies, Laurels, and other evergreen shrubs, stands a small but picturesque church, Cricket St. Thomas being a parish of itself. The village bearing that name formerly stood where the flower garden now is, but was rebuilt in another situation by the late Lord Bridport.

Passing the church, down a flight of stone steps, the mansion is approached by a broad walk, and here is a feature in effective flower gardening which we never before saw so well carried out. "What are those dense bushes of scarlet that are placed along the walk—not Ixoras, surely?" we asked, as we saw them in the distance, with something akin to delight. "Oh, no," said Mr. Davis, his lordship's obliging and acomplished gardener; "they are single bushes of scarlet Pelargoniums:" and so we found them, single plants, 4 feet high and the same through, as neatly trained as the large bushes of Ixoras which we occasionally see from the collection of Mr. Micholls at the metropolitan exhibitions, and covered with grand trusses of scarlet flowers. These plants were about four years old, and all that is done to them is simply to take them up in the autumn, cut them well back, and plant them as thickly as possible in square boxes, after which they are placed in a cold vinery until spring, when they are taken up, fresh potted, and pushed along gently until bedding-out time. When planted out they require to be regularly pinched and tied out, a work well and quickly done by a practised hand, and of course they require to be well watered in dry seasons. At the end of the walk stands the mansion, on either side of this front of which is a small conservatory; whilst on the sloping lawn opposite are splendid specimens of standard Portugal Laurels, as well as several handsome specimens of coniferous trees. On the south-east side of the mansion the conservatory is continued, and in front of it there is a very neat geometrical garden. The flower garden proper lies to the left, at the end of the lawn, and is reached by a series of terraces. On this spot, which is not yet quite finished, the old village stood, the ground has been partly filled in and laid out on a gentle slope, and in addition a good sheet of water has been made by the means before mentioned. Nothing now remains to indicate what the place once was, with the exception of a piece of old rustic work, which formed one of the old cottages, and a similar building the other side of the water, which does duty as a Swiss cottage. From this garden fine views of the valley on the right, and of the mansion on the left, are obtained. At the far end of the wood on the opposite hill, through which there is a series of carriage drives, there is an enclosure of about 2 acres, where the rougher kinds of vegetables are grown.

Along the stonework of the terraces a great many vases are placed, all neatly filled with bedding plants; and the lawns are studded with Golden Thujas and other Conifers, whilst on the left is a continuous belt of very handsome trees, including fine specimens of Elms and Beech, Pinus insignis, Picea Nordmanniana, and P. Pinsapo, which have been planted about 15 years. Conifers make a very perfect growth here, but not quickly.

In the conservatories adjoining the mansion we noticed some fine healthy Camellias and Azaleas, &c., and also, growing on the walls, the very interesting Physianthus albens (fig. 255—see opposite) in fruit Acacia dealbata, one of the most useful plants for producing cut flowers; Maurandya Barclayana, covered with bluish white flowers; Habrothamnus elegans, Brugmansia sanguinea, a very large specimen with a profusion of flowers; the showy Fuchsia fulgen; Luculia gratissima, a fine plant from which many seedlings have been raised, varying very much in character. We were informed that one so raised was exceedingly fine. The pretty, sweet, white-flowered Gomphocarpus fruticosus, Erythrina crista galli, and Cassia corymbosa, were also all in flower, helping to make the houses gay and attractive.

Adjoining the conservatories, at the southern end, there is a Citron-house, in which there are three fine old trees planted against the wall, and from these a large quantity of Lemons are regularly obtained for preserving.

From this place we retraced our steps to the kitchen garden, noticing *en route* several handsome Conifers, particularly a specimen of Wellingtonia gigantea growing on a gentle slope, and which measures 36 feet 6 inches in height; and also a fine bold piece of rockwork, covered with hardy trailing plants, from the top of which a partial view of Forde Abbey, the seat of W. H. Evans, Esq., is seen, as well as the hills of Lyme Regis.

Cricket has a good reputation for its Pines, and justly so, for Mr. Davis does them well. There are three lean-to houses devoted to their culture, and the system followed is to grow and fruit them altogether. When a plant has done its duty, and has to be removed, a sucker is put in its place, and there it remains until its fruit is cut, which generally takes about 12 months. The plants are grown in pots in poor sandy peat, plunged in leaves, under which there is a hot-water tank, which supplies the bottom-heat; and, in addition to the water supplied to them, liquid manure is afforded about twice a week. Amongst the plants, which were particularly strong and clean, were many large fruits in various stages of development. The varieties principally grown are the Providence, Queens, Prickly and Smooth-leaved Cayennes, Black Jamaica, and Charlotte Rothschild; and with these and the system of culture adopted, Mr. Davis has generally a supply of fruit for his employer's table all the year round. There are in all about 160 plants, and the following statement of the weight of some of the best fruits will speak for itself as regards quality:—Charlotte Rothschild has produced fruit weighing 9½ lb.; Smooth Cayenne, 11¾ lb., and from 7 to 8 lb. at Christmas; and a Providence which weighed 14 lb. 11 oz. Frequently there are plants which produce two or more good-sized fruit at the same time; one such was exhibited by Mr. Davis at one of the meetings of the Horticultural Society when they were held in Regent Street, which called forth a great amount of praise from the late Dr. Lindley; and we may be sure the specimen was worth it, for the Doctor seldom gave much praise undeserved. Peaches, Nectarines, and Cherries, were also well done under glass, the Cricket Nectarine—a seedling raised here—is much esteemed, as also the Black Circassian, amongst Cherries. There are several vineries, in the earliest of which the fruit was cut; but in those coming on the sample of Grapes was very good, notwithstanding that some of the borders had been renewed, in consequence of the Vines having shown a decline in vigour and fruitfulness. In addition to the above houses there are others which contain excellent collections of stove

and greenhouse plants, and Orchids. In the open quarters, the vegetables had a very fresh and healthy appearance, notwithstanding the drought. We also noticed a splendid batch of Strawberries in pots for forcing. These are layered in ordinary 3 and 4 inch draining tiles, cut into short lengths, with remarkably successful results, as, being sunk a little into the ground, the soil retains moisture better, and the task of watering is consequently much lessened. When ready they are potted off into 32-sized pots, and grow into dwarf stocky plants, with such broad thick crowns as the forcing gardener delights to see. Should there be any over the quantity required for potting they are left in the tiles, and are simply placed on the shelves in the spring, where they do well, and come in useful for lengthening the supply. Chrysanthemums are mostly treated in a similar manner, and Mr. Davis finds that he can command a good stock of dwarf bushy plants, with foliage right down to the bottom, and which come in exceedingly useful for decorating the conservatories with very little trouble.

Obituary.

Died, at Woburn, Bedfordshire, on October 20, James Loudon, Esq., late of Wilga, near Warsaw, Poland, only brother of the late John Claudius Loudon. We shall make further allusion to the career of this gentleman in our next number.

Miscellaneous.

Habrothamnus fasciculatus. — When well grown, this grand old Mexican plant stands second to none as a decorative plant for the conservatory. It is of vigorous growth, and a profuse bloomer, even in midwinter. It is particularly well adapted for growing as a single specimen, or for covering a wall or pillar in lofty structures, as well as those of moderate proportions. When grown on pillars perhaps it is seen to greatest advantage. There is one in the conservatory at this place that I planted from a small pot two years since; it is now 15 feet high, and well-proportioned, and was covered with bloom from top to bottom from the middle of October till February; it is growing on a pillar between an Acacia grandis of the same height on one side, and a Passiflora on the other, and its appearance is strikingly beautiful. It is planted in a well-drained soil, composed of one-half rather heavy but rich turfy loam, and the remainder leaf-mould and road-drift in equal proportions. It blooms on the last year's growth, and should not be pruned until it has done blooming, and the wood is thoroughly ripened; even then it must be done carefully by spurring the weakest shoots, and shortening others in proportion to their strength, while some may be laid-in their full length to increase the size of the plant if required. This mode of treatment will ensure a good winter bloom, but by a judicious pruning and thinning of the branches at different times in the year, the plant can be made almost a perpetual flowerer. It should have abundance of water when growing, and manure-water once a-week. *Thomas Record, in "Florist and Pomologist."*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Many subjects, comprising what are usually termed New Holland plants, or such as require similar treatment, will now afford a valuable and cheerful display in conservatories and greenhouses. To meet their requirements, however, a specially adapted temperature must be maintained in all instances where large numbers of such plants are cultivated, and indeed, where a few only are grown, if the health or longevity of the plants is a matter of consideration. Referring more immediately to the kind of plants which are in bloom now, or are coming into bloom, I would instance *Cytisus*, *Ericas* (such as hiemalis), *Leschenaultias* (intermedia especially), the showy Heath-leaved *Leptodactylon californicum*, and another Californian evergreen, *Diplacus puniceus*. On the other hand, where a display is kept up with plants requiring far less care or cultural skill, such as Zonal Pelargoniums, Chrysanthemums, Lobelias, and the like, a warmer temperature, with an equal amount of fresh air during the finest parts of the day, may be needful, in order to render the atmosphere as dry as possible, so that the flowers may not in any way succumb to damp, which they do very quickly if not cared for in this way. It may be well to intimate, that in instances where plants of greater value, such as Orchids, and all kinds of exotics, are removed to such structures simply for the display of their blooms, a temperature must be kept up in harmony with that from which they are removed. In connection with this subject the fact should be borne in mind that, with a dry atmosphere, a much lower temperature is quite safe where no young growths are actually being made. One other great enemy, cold draughts, must be carefully guarded against in any and every form. Old bulbs of *Cyclamens*, which are now showing prominently for bloom, and especially if they are growing in small sized pots, may be materially benefited by receiving occasional applications of wholesome liquid manure. Water should be given with great care to all valuable plants after this date, particularly to such subjects as *Indian Azaleas*, *Ericas*, *Epacrises*, &c. Keep *Cinerarias* perfectly free from such pests as greenfly; and in the case of any of these that are pushing up the bloom-shoots, give manure water freely. To the uninitiated I would say, do not pot Cinerarias after the crown has made a start for flowering.

FORCING HOUSES.

Look carefully over every bunch of Grapes, and if any decaying berries are found, carefully remove them, for at this season they quickly injure those in close proximity to them. Keep some of the foliage moderately green as long as there are many bunches of Grapes hanging upon Vines, as there is little doubt but that these aid in keeping the berries fresh for a longer period. Those who have not yet acted upon my previous suggestions regarding heavy rains, and have not covered over such Vine borders as are intended to be started at an early date, will now find that the soil has probably become drenched or soaked

through. The necessary covering should not be delayed a moment longer, unless a fine drying morning is likely to occur, when the air should be allowed to have free action on the whole border, in order to dry the battered surface before the covering is placed on it. A little warmth should now be kept in the heating media by day in all houses where the Vines are carrying a crop in conjunction with an abundance of fresh air. During dull weather use great moderation in regard to the internal heat supply of Pine stoves. Afford water very sparingly to all the younger batches of successionals; indeed, if a circumspect watering be given to them about once in 16 days, or every three weeks, it will suffice in the majority of instances, as the latest moisture existent in the fermenting materials will help to carry them along well for the next month or two. Collect and place together a quantity of fermenting materials, to be ready for use in any emergency. The time of year is now so far advanced that nothing should be left to chance. In instances where any *Peach* or *Nectarine trees* are badly infested with red-spider, and the leaves are now past being of material use to the trees, it may be advisable, with a view to destroy the pests—no other plants being in the structure—to wisp the ripest leaves off with a few besom twigs held tightly in the hand, and subsequently to burn a little sulphur in the house. Bear in mind, however, the quantity of sulphur used must be very small, as it is possible the young wood may receive more or less injury by an immoderate use of it.

HARDY FRUIT GARDEN.

Push forward the alterations contemplated in flower gardens with the utmost despatch, as we may anticipate ungenial weather at a very early date. Those flower-beds now emptied of their summer occupants, should be finally planted with spring-flowering plants by this date. Where this is not yet done let the operation be performed at once, so that the freshly transplanted subjects may gain root-hold before severe weather sets in. Dwarf *Box trees*, *Hollies*, *Aucubas*, *Laurels*, *Mahonias*, *Rhododendrons*, *Arbutus*, and *Arbor-vitæ*, all prove useful in filling these beds for producing a bushy winter garniture in company with spring flowering plants.

KITCHEN GARDEN.

A row or two of early *Peas* may now be sown to stand the chance of an early spring supply, though in the generality of instances those sown later do equally well. Earth-up all autumn plantations of *Cabbages*, *Coleworts*, and the like, and still give attention to the plantations in order to make up all further vacancies caused by injurious insect agency, &c. Take up the remaining stock of autumn *Cauliflowers*, and either lay them in a frame or hang them up where sufficient protection is afforded against frosts. Push all trenching and digging operations forward with despatch. *W. E.*

TOWN GARDENING.

The beds and borders intended for *Bulbs* should be at once forked over, levelled, and have the roots planted out, choosing a dry day for this operation. *Tulips* and *Hyacinths* should be planted diagonally about 6 inches apart, and about 3 inches deep from the upper side of the root. Each hole should be made with a trowel, and a little silver sand should be put in before the bulb is put in position, when it should be covered with a little more sand and have the earth levelled over it, and gently patted down with a spade. The following varieties are very distinct, and flower well in town either in beds, boxes, or pots for the windows:—*Double Tulips*—Tournesol, yellow and red; Gloria solis, brown and yellow; Rex Rubrorum, scarlet; Duc Van Thol, red and yellow. *Single Tulips*—Pottebakker, white; ditto, yellow. *Single Hyacinths*—Belle Africaine, dark blue; Chas. Dickens, blue; Grand Vainqueur, white. *Polyanthus Narcissus* — Grand Monarque, white; Grand Soleil d'Or, yellow. These two I consider the best, but any of the varieties are of easy culture, and very useful for outdoor decoration; these and *Jonquils* require precisely the same treatment in the borders as the *Hyacinths*. The following varieties of *Crocus* are all fine flowers and free bloomers, and make a nice edging round the margin of beds, planted 2 inches apart and 2 deep; or in patches of 5, 2 inches apart, in separate colours:—*Large Yellow*—Sir Walter Scott, lilac and purple, very fine; David Rizzio, deep purple; Ne Plus Ultra, light blue; Queen Victoria, pure white. The above can all be successfully grown in boxes and pots for the windows, if treated after the following manner:—The boxes should not be less than 7 inches deep, and the same in width, with holes bored in the bottom, and broken pots placed over them for drainage. Fill them with fresh mould and two rows of Hyacinths, or one of Hyacinths and one of Tulips may be planted alternately, 2 inches deep, in silver sand, as directed for the beds; and Crocus planted round the edge. These may then be stood in an airy place, where they can have a mat thrown over them in sharp weather; and when they begin to make their appearance in the spring they should be removed to the windows. *J. D.*

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

During the Week ending Saturday, October 22, 1870.

Names of Stations.	Temperature of the Air.							Fall of Rain.
	Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	62·8	31·3	31·5	56·3	37·0	22·3	47·1	1·88
Blackheath ..	59·9	29·8	30·1	57·1	31·1	21·7	44·2	1·32
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	60·1	35·6	24·5	55·5	42·9	12·6	48·2	1·65
Wolverhampton	58·1	35·6	22·5	54·3	42·3	12·0	48·3	2·67
Leicester ..	59·7	35·2	24·5	55·1	42·7	12·4	48·9	1·60
Norwich ..	59·0	37·5	21·5	55·7	43·5	12·2	49·6	1·35
Nottingham ..	60·0	35·7	24·3	56·8	42·1	14·7	49·0	1·19
Sheffield ..	59·0	40·1	19·0	54·0	44·1	10·5	49·0	1·31
Liverpool ..	59·0	41·0	18·0	55·0	45·8	9·2	50·4	1·68
Manchester ..	59·3	41·0	18·3	55·0	45·0	10·0	50·0	2·16
Salford	60·1	37·0	23·1	55·5	42·0	13·5	48·8	2·83
Bradford	57·5	38·1	19·4	53·0	41·0	12·0	47·0	1·12
Leeds	61·0	41·0	20·0	54·0	46·1	8·0	50·0	1·85
Hull	59·0	38·0	21·0	54·1	42·1	12·0	48·0	1·13
Newcastle ..	53·0	40·0	13·0	52·0	42·3	9·7	47·2	1·34
Edinburgh ..	59·7	38·0	21·7	..	..	..	49·5	0·93
Glasgow	56·4	36·0	20·4	..	..	..	46·3	1·36
Dundee	54·0	39·0	15·0	..	..	..	45·8	1·10
Aberdeen	54·3	37·2	17·1	..	..	..	47·9	1·84
Paisley	58·0	39·0	22·0	..	..	..	49·0	2·69
Greenock	56·8	42·0	14·8	..	..	..	48·2	3·00
Leith	59·8	38·0	21·8	..	..	..	48·7	0·69
Perth	58·0	37·0	21·0	..	..	..	47·8	2·25
Dublin	61·9	36·0	25·9	..	..	..	49·5	1·07

STATE OF THE WEATHER AT BLACKHEATH, LONDON, FOR THE WEEK ENDING WEDNESDAY, OCTOBER 26, 1870.

1870 Month and Day.	At 9 A.M. Readings of					Hygrometrical Deduction from Glaisher's Tables, 5th edition		
October.	Barometer reduced to 32° Fahr.	Dry Bulb Thermometer	Wet Bulb Thermometer	Dew Point	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.		
	Ins.	Deg.	Deg.	Deg.		Gr.		
0. Thurs.	29.32	41.8	41.1	40.1	87	3.0		
21. Friday	29.71	49.8	46.2	43.1	80	3.1		
22. Satur.	29.71	53.4	53.2	51.0	86	4.2		
23. Sunday	29.29	52.1	52.1	52.3	100	4.4		
24. Monday	29.71	49.7	47.3	44.7	84	3.4		
25. Tues.	28.95	52.0	47.7	43.4	73	3.2		
26. Wednes.	29.1	46.4	44.0	43.1	93	3.2		

TEMPERATURE OF THE AIR. WIND. RAIN

1870 Month and Day	Highest.	Lowest.	Range in Day	Mean.	Departure of Mean from Mean of 59 Years	Direction	Horizontal Movement.	In Inches.
October.								
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
20. Thurs.	51.3	41.7	9.6	46.2	− 2.9	WSW WNW	595	0.33
21. Friday	59.6	45.5	14.1	49.6	+ 0.7	N.W.	277	0.00
22. Satur.	59.0	47.1	12.8	52.5	+ 3.8	S.W.	235	0.14
23. Sunday	58.8	46.0	12.8	51.5	+ 3.0	S.W.	465	0.57
24. Monday	56.1	45.0	11.1	49.6	+ 1.4	WSW W	425	0.02
25. Tues.	53.0	45.5	7.5	48.4	+ 0.5	WSW	215	0.00
26. Wednes.	47.9	42.0	5.9	44.1	− 3.5	WSW	289	0.00

Oct. 20. Generally cloudy. Occasional heavy rain. Heavy gale.
— 21.—Variable, but fine. Hail.
— 22.—Generally overcast. Rain fell more or less heavily from 2 P.M. till 8 P.M.
— 23.—Very variable. Occasional heavy showers of rain, sleet, or snow. Hail. Thunder and lightning.
— 24.—Generally cloudy in night, then cloudless. A little rain fell in the morning. Much frost. Aurora at 9.0 night.
— 25.—Generally cloudy till night, then variable. Continuation of the Auroral display.
— 26.—Cloudy. Foggy. Rain fell at 6h. Frequent flashes of lightning, at night.

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *Young Gardener.* Kemp's "How to Lay Out a Garden," and Repton's "Landscape Gardening."

CLIMBERS: *S. C.* The best evergreen climbers for a north wall are the Ivies, of which more or less may be selected according to taste. We should recommend you to include in your selection Hedera colchica (Reggneriana), canariensis, algeriensis, a very fast grower; palmata, rhombea variegata, latifolia maculata, digitata. To these add, of other plants suitable for covering walls, Garrya elliptica, Magnolia grandiflora ferruginea, Jasminum nudiflorum (evergreen twigs), Cotoneaster Simonsii, Crataegus Pyracantha, and Berberis Darwinii; and of deciduous plants, Bignonia radicans major, Pyrus japonica, Ampeiopsis Veitchii, Clematis Jackmanii and rubella, and Aristolochia Sipho.

HEATING APPARATUS: *A Correspondent* recommends Plumb's Patent Gas Boiler for heating small greenhouses, and describes it to be of simple construction, heated by gas, provided with a double action burner, so that if wanted it can be heated in a very short time, and the double action burner then turned off, leaving sufficient heat to keep it working. There is no danger, it is said, of the gas fumes destroying the plants, the apparatus being supplied with an escape tube. We know nothing more of it. The maker should advertise it.

NAMES OF FRUITS: *R. W. R., Staffs. Apples:* 1, Reinette du Canada; 2, Rhode Island Greening; 3, Rymer's; 8, Royal Codlin; 9, Golden Noble; 14, Bedfordshire Foundling. *Pears:* 16, Passe Colmar: 17, Glou Morceau; 15, Althorpe Crassane; 19, Louise Bonne of Jersey; 20, Crassane. We cannot undertake to name so many.—*J. Pristo. Apples:* 1, Ribston Pippin; 2, Reinette du Canada; 3, Blenheim Orange. *Pears:* 5, Beurré Diel.—*T. H. Pears:* 2, Napoleon; 3, 5, 7, we believe Beurré Diel; 4, Fondante d'Autômne; 6, Knight's Monarch.—*B. W.* 8, Vicar of Winkfield; 9, 11, Chaumontelle; 10, Marie Louise; 13, Glou Morceau; 14, Passe Colmar.—*Hendon.* Your Grape is the true White Muscat of Alexandria.—*John Young. Pears:* 1, 5, Beurré Diel; 2, Rondelet, we think, but are not quite sure; 3, Urbaniste; 4, Beurré Bosc; 6, Napoléon; 7, Glou Morceau; 8, Thompson's; 10, Beurré Superfin; 12, Vicar of Winkfield.—*J. T. Apple:* Winter Strawberry. We must again request those sending fruit to be named not to send more than half-a-dozen sorts at a time. It is a most unreasonable tax on our time and good-nature to do otherwise.

NAMES OF PLANTS: *W. C. R. D.* Tricyrtis hirta.

NEW HEBRIDES PETTICOAT: *Sir W. C. T.* We think your suggestion is likely to be correct, especially from the fragrance of the specimen.

OAKS: *D. W. P.* Apply to your nurseryman, or consult our advertising columns.

SCLERODERMA VULGARE: *Sir W. C. T.*, in reference to the statement that S. vulgare is probably poisonous, says that he has partaken, without ill-effect, of S. Cepa, and that he is inclined to believe that, like their congeners the Lycoperdons and "Bovista, they are harmless. Our experience, however, of S. vulgare is such that we earnestly caution experimenters not to try it.

COMMUNICATIONS RECEIVED:—J. A. T. your letter has been forwarded to R. D.—A. Fairall (next week)—E. G. H.—W. F.—D. G.—S. J.—J. C.—J. M.—A Sub.—Obtor.—D. W.—A. M.—G. B. W.

Markets.

COVENT GARDEN.—Oct. 28.

Notwithstanding we have reached so far on in the season, there are still abundant supplies, and Continental goods show a large increase again this week, especially in the case of Grapes from Spain and Portugal, which realise from *6d.* to *1s.* per lb.; Dutch Hamburgh Grapes, the same; the quality of the latter is better than usual. Amongst flowers we have Pelargoniums, Bouvardias, Orchids, Pompon Chrysanthemums, Mignonette, Heaths, and dwarf evergreens.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	1 0	2 0	Oranges, per 100 ..	10 0	20 0
Figs, per doz. ..	0 6	— 1 0	Peaches, per doz. ..	2 0	— 4 0
Grapes, per lb. ..	1 0	— 3 6	Pears, per doz. ..	1 6	— 3 0
Lemons, per 100 ..	9 0	— 14 0	Pine-apples, per lb.	6 0	— 8 0
Melons, each ..	1 0	— 3 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. lb. ..	0 2	to 0 4	Horse Radish, p. bun.	3 0	to 5 0
Beet, per doz. ..	2 0	— 3 0	Potatoes, p. score ..	1 6	— 3 0
Brus Sprouts, ½ sieve	3 0	— 3 6	Mint, per bunch ..	0 3	— 0 6
Cabbages, p. doz. ..	1 0	— 1 6	Mushrooms, p. pott.	1 0	— 1 6
Carrots, p. bunch ..	0 4	— 0 8	Onions, per bunch ..	0 4	— 0 9
Cauliflowers, p. doz.	1 6	— 3 0	Parsley, p. bunch ..	0 2	— 0 4
Celery, red, p. bun.	1 6	— 2 0	Salsafy, per bundle	1 3	— 1 6
— white, do. ..	1 0	— 1 6	Shallots, per lb. ..	0 8	— 1 0
Cucumbers, each ..	0 6	— 1 0	Spinach, p. bushel..	2 0	— 3 0
Do., retail, p. lb. ..	0 4	— 0 6	Tomatos, per doz..	1 0	— 1 6
Garlic, per lb. ..	0 0	— 0 0	Turnips, yng., p. bun.	0 4	— 0 6
Herbs, per bunch ..	0 2	— 0 4	Veg. Marrows, p. doz.	2 0	— 3 0
Potatos, Regents, per ton, 60s. to 80s. ; Kidneys, 60s. to 120s. ; Rocks, 50s. to 60s.					

Dutch Flower Roots.

FRANCIS & ARTHUR DICKSON & SONS have received from the most celebrated growers in Holland their first large importation of the above, and have the satisfaction to say that the Bulbs are large, sound, and well ripened. Early orders respectfully solicited. Descriptive Priced CATALOGUE post free on application.
The Old Established Seed Warehouse, 100, Eastgate Street, and the "Upton" Nurseries, Chester.

FIELD BROTHERS Tarvin Road Nursery, Chester, beg to offer the following :—Strong Dwarf MOSS ROSES, 18s. per 100; WHITE DARK, 2 feet, handsome plants, 25s. per dozen, 200 per 100. MUTEAS, 2 feet, 24s. per dozen, per 100; 6 of each THREE BOY, 2 to 2½ feet, 4s. per dozen, 25s. per 100. LAURUSTINUS, 1 foot, 12s. per dozen, 70s. per 100. HUTCHINS, mixed dwarfs, 4s. per dozen, 25s. per 100. Orders can be confidently recommended. A remittance or reference from unknown correspondents.

To the Trade.

LOMARIA GIBBA, 12s. per dozen, or £5 per 100, Beautiful plants. DRACÆNAS, all the leading sorts, in 60 and 48 pots, 18s. to 42s. per dozen. DRACÆNA AUSTRALIS, fine specimens, from 7s. 6d. to 21s. ARDISIA CRENULATA, fine stuff, in large 60's, 50s. per 100. Fine young AZALEAS, from 6s. to 9s. per dozen. FERNS, all the leading sorts, cheap. ACACIA ARMATA at 6s. and 9s. per dozen. POINSETTIAS, fine plants; single heads, 9s. per dozen, from two to three heads, 12s. per dozen, or £5 per 100.
J. HAWKINS, Bush Hill Park, Enfield, Middlesex Nursery, Shepherd's Bush, W.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2*s.* in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is described their name, the quality, the country where raised, the year they first fruited in, the habit, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, as many that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches in winter, and in Summer manage them so that there is growing healthy and fruitful trees, such as J. S. offers.

Notice to the Seed Trade.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL LIST of GARDEN and AGRICULTURAL SEEDS for the present season is now ready, and upon application. Samples and stocks are very fine, and prices very low.

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-year-old Plants. Lowest price on application.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

Rollisson's Telegraph Cucumber.

WOOD AND INGRAM offer this, the best ALL THE YEAR ROUND CUCUMBER out, in packets of six long seeds for 10, or 12 for 1*s.* 6*d.*
This is the only variety grown where this seed was raised, and a small house, 21 feet by 14 feet, produced during the season 624 first class fruit. N.B. Postage stamps no other letters.
The Nurseries, Huntingdon.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply the following, Extra forcing SEAKALE, 10s. per 100; 2d size, 5s. per 100; 3d size, 3s. ASPARAGUS, 1 year old, 3s. per 100; 2 year old, 2s. 6d. per 100, cheaper in 1000. CABBAGE PLANTS, SCOTCH MARKET, EAST INDIAN, IMPERIAL, 3s. 6d. per 1000; RED DUTCH, 5s. per 1000.

WANTED, an active GARDENER, to PURCHASE HALF-SHARE in a small Nursery, Florist, and Jobbing business in Islington. Low Lease. £50 cash.—C. R., 150, Rotherfield Street, Islington, N.

WANTED, a FLORIST, to Manage a Business; his Wife to take charge of Shop.—Apply by letter, stating salary and all particulars, to B. F., 260, Marylebone Road, N.W.

WANTED, a WORKING MARKET GARDENER, in a new ground near London. One who has a thorough knowledge of Cropping, and who has had the control of a number of Men. Must produce certificates of competency and good reference.—Address, stating wages required, to H. A. Z., Post Office, Heston, Hounslow, W.

WANTED, in South Wales, an active and competent WOODMAN, to Plant, Thin, and otherwise attend to Woods and Plantations, partly hard wood, but principally Larch. Wages, £1 per week. House and Garden.—Messrs. GADSDEN AND TREHERNE, 28, Bedford Row, W.C.

Packer.

WANTED, a NURSERY PACKER.—Apply, stating age, wages, &c., to EDWARD HOLMES, Whittington Nursery, Lichfield.

Seed Trade.

WANTED, an experienced SHOPMAN.—An active, general hand, who can keep his department in first-class business.—Address, A. Z., Post Office, Sales necessary.—Apply, stating wages expected, to R. B. MATTHEWS, Seed Merchant and Nurseryman, 95 and 97, Victoria Street, Belfast.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

To Gardeners and Bailiffs (Head, Foremen, or Under).
JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and TESTIMONIALS of QUALIFICATIONS for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & Co. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

Gardeners.
B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those in whose conduct and abilities are worthy of their trust.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

GARDENER (Head).—Age 26; thoroughly understands the duties.—Mr. WILKIE, Oak Lodge, Kensington, W.

GARDENER (Head).—Age 36, married; well understands the profession in all its branches. Highly recommended, with excellent character and testimonials.—A. B. C., Mr. Lowe, Nurseryman, &c., Queen Square, Wolverhampton.

GARDENER (Head).—Age 28, no incumbrance; understands the profession. Good recommendations from present and previous employers.—H. B. S., Mr. Randall's, Nurseryman, Exe Bridge, Exeter, and at 89, Cirencester Street, Harrow Road, Paddington, W.

GARDENER (Head), age 36, married, one child.—WILLIAM EARLEY is now at liberty to engage with any Nobleman or Gentleman requiring the services of a first-class practical Gardener, who has had extensive experience in every department connected with Modern Horticulture. He has 13 years' excellent character from his late employer, who is anxious to procure him a permanent situation.—W. EARLEY, *Gardeners' Chronicle* Office, W.C.

GARDENER (Head), married, no family.—F. HILL is desirous of engaging with a Nobleman or Gentleman requiring the services of a first-class Gardener. Has had good experience in the Forcing of all kinds of Fruit and Flowers, well up in the Management of Stove and Greenhouse Plants, including Orchids. Can receive highest testimonials from last employer, also previous ones. F. HILL, 2, Grove Cottages, Sycamore Terrace, New Malden, Kingston-on-Thames, Surrey.

GARDENER (Head), age 41, married.—A. CALDER is desirous to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener, having lived 18 years as Head Gardener in last situation; well versed in Forcing of all kinds of Flowers, Fruit, and Vegetables; understands the Management of Greenhouses, Stove Plants, and Kitchen and Flower Gardening. No objection to look after Meadow Land. Character will bear the strictest investigation.—A. CALDER, Thames Ditton, Kingston, S.

GARDENER (Head), and BAILIFF or GARDENER.—Age 40, married; 25 years' experience. Thoroughly understands Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, Kitchen and Flower Gardening, the Management of Woods, Arable and Pasture Land, and Stock, Buying and Selling, Rearing, &c. Very highly recommended. Married Daughter, Character will bear the strictest investigation.—ALPHA, 2, Cambridge Villas, Cambridge Street, Gloucester.

GARDENER (SINGLE).—Thoroughly understands the profession.—A. B., Davis's, Stationer, Harlesden Green, N.W.

GARDENER (SECOND), in a Nobleman's or Gentleman's Garden.—Age 22. Two years' character.—A. Z., Fern Bank Road, Ascot, Berks.

GARDENER (UNDER, and IMPROVER).—Age 20, has had some general experience, and in Houses, Vineries, &c. Well recommended by his late employer.—F. W., Mell's Rectory, Frome.

GARDENER and STEWARD, or GARDENER.—A thoroughly competent, practical, and respectable Man, who has had unusually favourable opportunities for forming an extensive acquaintance with the most approved methods of Cultivation, and the most select varieties of Fruit, Flowers, and Vegetables; Ornamental Planting, and the cheapest and best Markets to purchase from. Credentials unexceptionable.—I. N. L., 39, Stamford Road, King's Road, N.W.

GARDENER, or GROOM and GARDENER.—Has a good knowledge of the Management of Poultry. Good character.—J. COX, Holmer Green, Penn Street, near Amersham, Bucks.

To Nurserymen.
FOREMAN (UNDER), in the Ground Department of a large Nursery.—Age 25, respectable, has had experience in Budding, Grafting, &c.—H. B., Spring Grove Nursery, Isleworth.

ESTATE AGENCY, with or without the Management of a Home Farm, Wanted by a Gentleman of great experience in every description of Agriculture as practised in Scotland and the North of England. The Advertiser is a good Accountant and a thorough man of business; and also has some knowledge of the Management of Woods and Plantations, and of Surveying and first-rate security.—BETA, Post Office, Appleby, Westmoreland.

GENERAL ESTATE MANAGER.—An active Man, of great experience; has had the Superintendence of extensive Works in Drainage, Road Making, Fencing, Planting, &c.; could undertake the entire Management, or would serve as Steward of a small Farm if necessary. Most satisfactory testimonials and references.—G. E. M., *Gardeners' Chronicle* Office, W.C.

GENERAL MANAGER, or TRAVELLER and SALESMAN, for a large Nursery.—An active Man, well qualified, is open to an engagement as above. The most satisfactory testimonials and references.—X. K., *Gardeners' Chronicle* Office, W.C.

PACKER (ASSISTANT).—Nearly three years' experience. Highest testimonials to character from present employers.—A. B., 42, Mordaunt Street, Brixton, S.

Seed Trade.
SHOPMAN or WAREHOUSEMAN.—A young Man, possessing a good knowledge of the above business, will shortly be open for an engagement. Is also acquainted with the Grain and Manure Trade. Highest recommendation from present and former employers.—I. D., Lower Cross Street, Hitchin, Herts.

SHOPMAN.—Age 23; is open to an engagement. Seven years' experience.—J. T., Post Office, Perth, N.B.

SHOPMAN.—Ten years' experience in First-class Land and Provincial Houses. Good practical knowledge of the business in all its branches. Well conversant in Plants, &c.—W. L. G., Mr. Hugh Gallimagh, Queen Street, Newry.

Seed Trade.
SHOPMAN, or in the Office.—A young Man, with six years' experience, wishes to engage himself as above. Can keep a Set of Books, either Double or Single entry.—A. H., 6, Mayfield Loan, Newington, Edinburgh.

To the Seed Trade.
SHOPMAN.—Age 24; thoroughly understands the business in all its branches. Good experience in several Wholesale and Retail London Houses; has also a good knowledge of Plants. First class reference from late and present employer.—W. S., 9, St. John's Wood Terrace, London, N.W.

SHOPMAN (ASSISTANT), or in the Warehouse.—Age 21.—Seven years' experience in the Wholesale and Retail Seed Trade. Good references.—A. B., Post Office, Leicester.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for Excellent Seed Corn and Seeds.

To the Trade.—Agricultural and Garden Seeds.

H. AND F. SHARPE are now prepared to make special offer of the above Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected Stocks, and free from adulteration of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech.

For	TRADE PEDIGREE MARK.	Seed.

WHEAT, BARLEY, and OATS. Apply to Captain HALLETT, Brighton.

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 20 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Foulkershook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Primrose Inn."
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Works of the above description by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.
Park Fencing undertaken to any extent.
N.B. Plans and Designs for Horticultural Buildings, &c., &c.
Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, VALUER, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.
SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E.

TO BE SOLD, the desirable LEASE and BUSINESS of an old-established and well-known NURSERY, situate in a leading thoroughfare, 4 miles from Covent Garden Market; it covers 1 acre in extent, and nearly all covered with glass; there is also a spacious Seed Shop, with commanding front, Counting-house, Stable, &c. Increase about to be made to premises. This offers an excellent opportunity to an energetic person with some capital, or to a country firm desirous of extending their business to London. Present owner retiring from the business.
Full particulars may be had of F. W. SEARLE, Agent, 6, Bishopgate Street Without, E.C.

SALES BY AUCTION.

Bedfont, Middlesex.

CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. WATERER AND SONS have been instructed to SELL by AUCTION, upon the Premises, late in the occupation of Mr. Holland, and land adjoining, Bedfont, Middlesex, on TUESDAY, November 1, at 11 for 12 o'Clock, a large quantity of NURSERY STOCK, comprising about 20,000 Spruce Firs, 15,000 Berberis, 2000 Rhododendrons, Green and Variegated Hollies, Portugal and Laurels, Limes, Horse Chestnuts, Horse Chestnuts, Ferns, choice Roses, Box Edging, 500 Arbor vitæ, and other Shrubs; also a few Forest Trees, including Witham and other Peats, Wellington and other Labels, Plums, Pears, Apples, and Currants.
May be viewed two days previously and morning of Sale. Catalogues had upon the Premises, of Mr. W. SHERBORN, Bedfont; and of Messrs. WATERER and SONS, Auctioneers and Estate Agents, Chertsey, Surrey.

Warminster, Wilts.

HIGHLY IMPORTANT to NOBLEMEN, GENTLEMEN, and Others PLANTING.

MR. W. ABRAHAM has received instructions from the Proprietor of these extensive and old-established Nurseries (Mr. George Wheeler), to SELL by AUCTION, with reserve, on TUESDAY, November 1, and three following days, a fine collection of Coniferæ, and other Trees and Shrubs, in good condition for immediate removal. They consist of Deodars, Abies, Taxus, Thujas, Cupressus, Biota, Pinus, &c.; very fine Weeping Trees, viz., Beech, of two kinds; Elm, Lime, Ash, Thorn, Holly, &c.
Extra fine Trees of Purple Beech; Ford's and Purple Elm; Beech, Purple, Cutleaved, Macrophylla, &c.; Maple, fine American sorts; Azaleas, Rhododendrons, Hollies, Box, Laurels, Sweet Bays, &c.; Standard Pears in a large quantity, a large quantity of other Trees and Shrubs, enumerated in the Catalogue.
The stock may be viewed, and Catalogues obtained, 10 days prior to the Sale, at the Nurseries, of the Auctioneer and Valuer, Goldworth Nursery, Woking, Surrey.

Buscot Park, near Faringdon, Berks.

IMPORTANT NOTICE to NOBLEMEN, GENTLEMEN, and the TRADE, of an EXTENSIVE and UNRESERVED SALE of NURSERY STOCK.

MR. W. ABRAHAM has received instructions from the Proprietor (W. H. Campbell, Esq.), to SELL by AUCTION, on the Premises, at the Home Nursery, one mile from the Faringdon Station (via Uffington and Shrivenham), on the Great Western Railway), on TUESDAY and WEDNESDAY, November 8 and 9, at 12 o'Clock punctually each day, large quantities of healthy, well-rooted CONIFERÆ, EVERGREENS, DECIDUOUS, and FOREST TREES and SHRUBS, these not being required to plant the estate this season. They consist of 300,000 Ash, 1 to 4 feet; 70,000 Common and Colchic Laurel, 1 to 2½ feet; 70,000 strong Quick; 30,000 Quick seedlings; 20,000 Berberis; 40,000 Spruce; 20,000 Horse Chestnut; 10,000 Horse Chestnut; 100,000 seedling Quick; 15,000 Spruce; 1000 Thuiopsis; 800 Retinospora; 300 Thuia Lobbii; 10,000 Chinese Arbor-vitæ; 3000 Scotch Fir, 15,000 Austrian Pine; 3000 Laburnums; 2000 Box; 100 Wellingtonia, 1 to 2 feet; 500 Cedrus Deodora, 2 feet; 300 Standard Roses; 1000 Pinus insignis, 1 foot, in pots; Sycamore, Cupressus, 1500 Laburnums, of sorts, in pots; Aucuba, &c.; also 4 sacks of Sangster's No. 1 Peas.
Full particulars in Catalogues, to be obtained 10 days prior to the Sale, on application at the Nursery, or of the Auctioneer and Valuer, Goldworth Nurseries, Woking, Surrey.

St. John's Nursery, Woking.

MESSRS. PROTHEROE AND MORRIS respectfully inform Noblemen, Gentlemen, Nurserymen, and others, that the important SALE of valuable NURSERY STOCK, consisting of a large quantity of strong well-transplanted Forest Trees of clean growth; fine Dwarf-trained, Maiden, and Standard Fruit Trees, &c., &c., now taking place on the Premises, St. John's Nursery, Woking, Surrey, will continue on MONDAY and TUESDAY NEXT, at 11 for 12 o'Clock precisely each day, by order of the Executors of the late Mr. Wm. Jackman, without reserve.
N.B. The stock includes many thousands of fine Larch, Ash, Birch, Spanish Chestnuts, Green Hollies, Spruce Firs, &c.
Now on view, and Catalogues had

Sale of First-Class Dutch Bulbs, Standard Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, on TUESDAY, November 1, at half-past 12 o'Clock precisely, a first-class COLLECTION of HYACINTHS, TULIPS, CROCUS, NARCISSUS, &c.; a choice assortment of 300 Standard and Dwarf ROSES, of the best varieties; Hardy RHODODENDRONS, and other American Plants, &c.
On view the morning of Sale. Catalogues may be had at the Rooms as above, and of the Auctioneers.

Camberwell, Surrey, S.E.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK, TWENTY GREENHOUSES and PITS, HOT-WATER PIPING, BOILERS, BRICKS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by the Executrix of the late Mr. Wm. Barnes, to SELL by AUCTION, without reserve, on the Premises, the Camden Nursery, Southampton Street, Camberwell, S.E., on WEDNESDAY, November 2, and two following days, at 11 for 12 o'Clock precisely each day (unless previously disposed of by private contract), the whole of the valuable NURSERY STOCK, including a choice assortment of Evergreen and Coniferæ Shrubs, comprising many handsome specimens adapted for immediate effect, viz., Wellingtonias, Araucarias, Cedars of Deodara, Irish Yews, Golden Yews, Cupressus Lawsoniana, boreals, Thujas of sorts, Cedrus Libani, &c.; choice hardy American Plants, including 1000 choice Rhododendrons by name, &c.; a large quantity of fine Fruit Trees, comprising 1000 Pears, Apples, Pears, Plums, and Cherries; 1500 fine Standard and Dwarf trained Peaches, Nectarines, and Apricots; Dwarf-trained Apples, Pears, Plums, and Cherries; also 4000 Gooseberries and Currants, 500 Ornamental and Forest Trees, Deciduous Shrubs, Hardy Climbers of sorts, choice Standard and Dwarf Roses, Greenhouse Plants, Vines in pots, a large quantity of Garden Edging Tiles, Box Edging, &c.; together with 20 Greenhouses and Pits in capital condition, 57,000 Bricks, 2000 feet of Hot-water Piping, two powerful Boilers, York Paving, Slate and Wood Shelving, Garden Pots, and numerous other effects.
The Stock may be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers, Leytonstone, E.

Edgware, N.W.

IMPORTANT SALE of VALUABLE NURSERY STOCK and CHOICE GREENHOUSE PLANTS.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Whitchurch Rectory, Edgware, 10 minutes' walk from Edgware Station, Great Northern Railway, on WEDNESDAY, November 2, and following day, at 11 for 12 o'Clock precisely each day, by order of the Proprietor, a portion of the valuable NURSERY STOCK, consisting largely of choice Coniferæ, such as Deodars, Thujopsis, Irish Yews, Golden Ditto, Cupressus Lawsoniana stricta, 3 to 4 feet; quantities of Araucarias, Cedrus Deodara, Retinospora of sorts, handsome specimen Abies in choice variety, &c.; also 500 Standard and Dwarf Roses of the best varieties, Standard Rhododendrons, 4 to 6 feet; and Dwarf do. by name; 2000 Portugal Laurels, 3 feet; a large quantity of Golden Queen and other Hollies, Acer Negundo variegata, Purple Beech, &c.; about 1000 Evergreens, Shrubs, Climbers, Ferns, &c., principally in bearing condition; likewise a quantity of well-grown specimen Greenhouse Plants, comprising Azalea indica, double Camellias, choice Tree Ferns, Cycads, Dracænas, &c.
May be viewed two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Tottenham, N.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. Alexander Johnstone to SELL by AUCTION, on the Premises, Ferry Nursery, Philip Lane, Tottenham, Middlesex, 10 minutes' walk from Park Station, Great Eastern Railway, on SATURDAY, November 5, at 11 for 12 o'Clock precisely, without reserve (the term having expired, and the land being required for building purposes), the whole of the valuable NURSERY STOCK, consisting of a varied and choice assortment of 12,000 Evergreens, ranging all sizes, and including many fine specimens, admirably adapted for effective planting. The stock comprises fine Chinese and other Arbor-vitæ, Wellingtonias, Cupressus, English Yews, Araucarias, Euonymus, variegated and green Hollies, Portugal and Common Laurels, Aucubas, Rhododendrons, fine standard Roses, clean grown Fruit Trees, &c.
May be viewed two days prior to the Sale. Catalogues may be had of Mr. A. JOHNSTONE, Nurseryman, Tanner's End, Edmonton; and of the Auctioneers, Leytonstone, E.

Streatham Hill, S.W.

IMPORTANT CLEARANCE SALE of EVERGREEN and DECIDUOUS SHRUBS, CHOICE and RARE CONIFERÆ, ROSES, FRUIT TREES, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. George Clarke to SELL by AUCTION, on the Premises, the Streatham Hill Nursery, 5 minutes' walk from Brixton Rise Establishment, Streatham Hill, Surrey, on MONDAY, November 7, and three following days, at 11 for 12 o'Clock precisely each day, without reserve (the leasing expiring), the whole of the valuable NURSERY STOCK, required for building purposes, the whole of the valuable NURSERY STOCK, comprising a large quantity of unusually effective specimen Evergreen and Coniferæ Shrubs, including 3000 Portugal Laurels, 3 to 8 feet; 1000 Aucubas, 2000 Arbor-vitæ, Golden and Silver, 1 to 5 feet high, by 1 to 4 feet through; 1000 Golden Arbor-vitæ, 1 to 5 feet high, by 1 to 4 feet through; 1000 Cedrus Deodara, including some splendid specimens 20 feet high; 1000 Variegated and Green Hollies, some very large; 1000 Cupressus Lawsoniana, 1000 Rhododendrons, 8000 Tree Box, and thousands of others, the whole of which will remove safely; also 3500 Standard and Dwarf Roses, the whole of the valuable Fruit Trees, clean-grown fine Azalea indica, including some fine specimens for exhibition, &c.
May be viewed prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Sydenham, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Kirkdale Nursery, Sydenham, Kent, S.E. (two minutes' walk from Sydenham Railway Station), on FRIDAY, November 11, at 11 for 12 o'Clock precisely, by order of Mr. George Seiley, without reserve (the lease having expired and the property being immediately required for building purposes), the whole of the valuable NURSERY STOCK, consisting of a choice assortment of Evergreen and Coniferæ Shrubs, Hardy Climbers in pots, together with some Standard and Dwarf Roses, and numerous other effects.
Further particulars next week.

Edmonton, N.

CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. C. Woolven, to SELL by AUCTION, on the Premises, the Langhedge Nursery, Edmonton, Middlesex, N. (10 minutes' walk from Park Station on the Great Eastern Railway), on FRIDAY, November 11, at 11 for 12 o'Clock precisely, without reserve (in consequence of the Great Eastern Railway Company taking possession of the remaining portion of the nursery grounds), the whole of the NURSERY STOCK, consisting of 20,000 fine Evergreen and Coniferæ Shrubs, clean-grown Fruit Trees, 1200 Ornamental and Forest Trees, 6000 fine Standard Roses of the best varieties, 2000 Cupressus, Golden Queen Hollies, Ligustrum persicum, in pots; a nearly new Cylinder Boiler, and numerous other effects.
Further particulars next week.

Peckham, S.

CLEARANCE SALE of VALUABLE NURSERY STOCK, CHOICE GREENHOUSE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Executors of the late Mr. W. Ivery to SELL by AUCTION, on the Premises, The Hanover Nursery, Rye Lane, Peckham, on MONDAY, November 14, and following days, at 11 for 12 o'Clock precisely each day, without reserve, the whole of the valuable NURSERY STOCK, including a large quantity of Evergreen and Coniferæ Shrubs, fine Fruit Trees, choice Greenhouse Plants, &c.
Full particulars next week

Wandsworth Common, S.

CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Wandsworth Common Nurseries, Surrey, S., on MONDAY, November 21, and following days, at 11 for 12 o'Clock precisely each day, by order of Mr. Robert Neal (a part of the ground being required for building purposes), a portion of the valuable NURSERY STOCK, consisting of many thousands of Evergreen and Coniferæ Shrubs, Ornamental and Forest Trees, clean-grown Fruit Trees, Hardy Climbing Plants of sorts, in pots; choice Standard and Dwarf Roses, &c.
Further particulars will appear next week

SALE THIS DAY AT HALF-PAST TWELVE O'CLOCK.

Bulbs from Holland, Roses and Plants from Surrey.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, October 29, at half-past 12 o'Clock precisely, first-class Standard ROSES, Hardy TREES, Specimen CONIFERS, RHODODENDRONS, and other plants from Surrey: STRAWBERRY plants, and a Collection of the finest Double and Single HYACINTHS, TULIPS, CROCUSES, NARCISSUS, IRIS, LILIUMS, GLADIOLI, and other BULBS, just arrived from Holland.
On view the morning of Sale, and Catalogues had.

Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY and WEDNESDAY, October 31 and November 2, at half-past 12 o'Clock precisely each day, several large importations of DUTCH BULBS, just arrived from well known farms in Holland.
On view the mornings of Sale, and Catalogues had

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, November 1, at half-past 12 o'Clock precisely, several valuable PENS of choice POULTRY and PIGEONS, from well-known Breeders and Exhibitors. Detailed particulars in Catalogue.
On view the morning of Sale

Important Sale of Plants,

At the ROYAL HORTICULTURAL GARDENS at CHISWICK.

MR. J. C. STEVENS begs to announce that he has been favoured with instructions from the Council of the Royal Horticultural Society to SELL by AUCTION, at the Gardens at Chiswick, during the month of NOVEMBER, a large number of Specimen CONIFERÆ, AUCUBAS, HOLLIES, LAURELS, LAURUSTINUS, RHODODENDRONS, Hardy AZALEAS, splendid Pyramid and Dwarf-trained FRUIT TREES, FIGS in pots, and a great variety of other Hardy Trees and Shrubs.
More detailed particulars in future Advertisements.
Auction Rooms and Offices, 38, King Street, Covent Garden, W.C.

Sale of an Entire Herd of Pure-bred Shorthorns,

At BRAILSFORD HALL, near DERBY.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on WEDNESDAY, November 9, at 1 o'Clock, at Brailsford Hall, between Derby and Ashbourne, the ENTIRE HERD of pure-bred SHORTHORNS, numbering about Fifty Head, the property of William Cox, Esq. These animals have been gathered together in small lots during several years past by the late Farmer, for the purpose of improving the Stock in the district. They will be found very useful Cattle, of Knightley, Kirklevington, and other good blood, and are worthy the attention of many Farmers. Most of them are excellent Milkers, combining therewith fine quality, substance, and heavy flesh. Mr. Torr's Grand Marshal (21,865), and Lord Bearsley Jupiter (24,228), Mr. Blackwell's noted Prize Bull, have been used
Catalogues, with Pedigrees, may be had of JOHN THORNTON 15, Langham Place, London, W., or at the place of Sale.

GLOUCESTERSHIRE ROOT FRUIT, and GRAIN SOCIETY'S SHOW will be held in Gloucester, on NOVEMBER 9, when PRIZES in SILVER CUPS and MONEY will be awarded to the amount of £131 4s. 6d.
ENTRIES CLOSE on OCTOBER 29.
Schedules of Prizes and all particulars may be had on application.
A. C. WHEELER, Hon Sec.
Gloucester, Oct 23 PETER DREW, Assist. Sec.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870.

SPECIAL PRIZES for SUTTONS' CHAMPION SWEDES, at the ROYAL BERKSHIRE ROOT SHOW, to be held at READING on SATURDAY, November 26. The following valuable Prizes for SUTTONS' Champion Swede will be awarded:

	£	s.	d.
For the best 24, a Silver Cup, value	10	10	0
For the second best 24, money or plate, value	5	5	0
For the third best 24	3	0	0
For the fourth best 24	2	0	0

Also Prizes for best MANGEL, "TURNIPS, KOHL RABI, CARROTS, &c. No charge for entry.—For full particulars apply to SUTTON AND SONS, Seed Growers, Reading, Berks.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of all CATTLE, SHEEP, PIGS, DOMESTIC POULTRY, CORN, ROOTS, and IMPLEMENTS will be held in BINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.
Prize Lists, Certificates of Entry, and every information may be obtained from the Secretary.
The ENTRIES CLOSE on TUESDAY, November 1.
JOHN B. LYTHALL, Secretary.
Offices—30, New Street, Birmingham.

SMITHFIELD CLUB FAT CATTLE SHOW.—The ANNUAL SHOW of FAT CATTLE, SHEEP, and PIGS, will be held at the AGRICULTURAL HALL, ISLINGTON, on MONDAY afternoon, December 5, and Four following Days.
Intending Exhibitors are requested to apply for Certificate Forms by the reference letters as under.

CATTLE.—Form A For an OX or STEER (in any Class).
" B. For a COW or HEIFER (in any Class).
" C. For a PAIR Fore-horn Stock.
SHEEP. " D. For a Pen of three WETHERS.
" DD For a Pen of three EWES. [Stock.
" E. For a SINGLE WETHER SHEEP in Extra
PIGS. " F. For a pen of three PIGS (in any Class).
" G. For a SINGLE PIG in Extra Stock.

ENTRIES for LIVE STOCK CLOSE NOVEMBER 1.
Prize Lists, Forms of Certificates, and all information may be obtained on application to Mr. DAVID PULLEN, Assistant Secretary, at the Office of the Honorary Secretary, corner of Half-Moon Street, Piccadilly, London.
N.B. All communications respecting the Show must be addressed to the Assistant-Secretary, as above, and should bear outside the words "Smithfield Club Show."

The Agricultural Gazette.
SATURDAY, OCTOBER 29, 1870.

THERE is no such agricultural genius as Mr. LOUDON, and no book so charming to young farmers, and to some old ones, as his stout "Encyclopædia," in one volume. The farming may be a little old—it begins about the time of the Flood! and it does not begin a day too early, nor does LOUDON write a page too many!—but his able, sanguine, rapid, and most entertaining pen fell from its master's hand; he died, standing and dictating, 27 years ago.*

You will find in LOUDON the agriculture of every age and of every country. We shall never

* As will be seen from p. 1447, his only brother, James, died at Woburn on October 20

forget the pithy narratives, the vivid descriptions, and the curious woodcuts, which map the earth, so far as rural affairs are concerned, and leave hardly a corner of it unexplored. What a condenser he was!—he gives wonderful lists of authors, men, books, and things, besides abstracts that always contain the pith of the whole matter, leaving really nothing in the originals but waste words. And he was a great explorer both of English and foreign literature connected with his subject. Who but LOUDON would have hunted up those two quarto volumes on the agriculture of Surinam, published in the last century by Captain STEDMAN? Probably no one but LOUDON ever read the ponderous tomes, but they contain some curious pictures, so they were duly condensed. The author is depicted reclining in a hammock suspended in a tree, with a bark hat and a fragrant weed, surrounded by tropical vegetation, at once the most beautiful in form and the most lavish in fruit. The agriculture of Surinam is briefly described, and the doings of the adventurous Captain STEDMAN, and how he kept a wife, pigs, bees, sheep, and cattle, and had children and slaves, &c.

We could not notice an error of Mr. LOUDON'S, which others have adopted till this day, without a prefix recalling his merits. In his "Encyclopædia" Mr. LOUDON remarks that in the North of Europe irrigation is limited entirely to grass land, and it is applied for the purpose of increasing or maintaining heat, and of stimulating by manure held in solution by the water; and great care is requisite to prevent the water from proving more injurious than useful. In hot countries water is valuable by moderating the temperature of the soil; and putrescent manures, though not altogether neglected, "are much less necessary than in cold countries, and can be done without where there is abundance of water; there water, intense heat and light, a consequently moist atmosphere, and a soil well pulverised by art, supply everything necessary for luxuriant vegetation. Hence it is that agriculture admits of two grand divisions; that of the cold climates, which may be called agriculture by draining and manures, and that of the hot climates, which may be called agriculture by irrigation."

Intermediate agriculture, or mixed culture by watering and manuring, prevails in the South of France, Spain, and Italy. "These leading divisions are by no means so absolute as to be determinable by degrees of latitude, so much depending on physical circumstances, as elevation, soil, &c.;" but as an approximation which may suggest some general ideas in the mind of the agriculturist, he submits the following divisions:—

"The agriculture of irrigation may be considered as extending 35 degrees on each side of the equator.

"The agriculture of manures and irrigation from the 35th to the 45th degrees north and south of the equator.

"The agriculture of draining and manures from the 45th degrees north and south of the equator to the 67th degree, or polar circle.

"The arts of fishing and hunting, as the only means of subsistence, from the 67th degree, or polar circle, to the pole."

No one possessed more ample materials for generalising and bringing before the mind of his readers bold and striking conclusions, and no one used them more skilfully than LOUDON, but in this instance he was a little too bold and broad to be accurate, and others have construed him too literally. It was not remarkable, perhaps, that Dr. SCHLEIDEN should have repeated these fallacies more arbitrarily in his "Principles of Scientific Botany," building upon them a large hypothesis, though probably he would not have done so except in controversial discussion of the "humus theory;" but it shows the defects of English university education that a wrangler and don of Cambridge should have written a book recently, repeating the superstition that water *per se*, heat and light, may render the use of manure unnecessary.

Sir H. DAVY and LIEBIG, the great expounders of the chemistry of the soil and the nutrition of plants, were not of yesterday. Some of our readers may remember the excitement of the early days of agricultural chemistry. It is 30 years since a great flood of agricultural chemists and teachers passed over the land; and when, at length, the flood abated, it left many of us in a slough of despond and ignorance.—We know all about the meat and drink of man and animals, because we have a large experience; and when we are told that a Chinaman lives on Rice, slugs, and swallows' nests, we believe it to be possible. We rejoice to learn that there is no Malt-tax in the East; and, on the other hand, we regret that millions of mankind get no better beverage than tea. But the food of plants! It used to be thought they lived on earth; but then there were the Orchids that grow on bits of wood, and may be suspended in the air, and the parasites that fasten themselves to Thorn trees or Clover. Yet all plants live on organic and inorganic elements, which they obtain respectively from the air and the soil; some indirectly from the soil, as when Orchids feed on wood, or water-plants find their inorganic food dissolved in the stagnant pool in which they float. Plants, therefore, are intermediate between the soil and animals or man himself, and all the races, whether tropical or northern, live on the same kind of food. Dismissing from our notice all the lower forms of plants, and all, in fact, but the crops we grow, it may safely be asserted that when these are removed from the soil for our use and are not allowed to decay, as in Nature, on the spot where they grew, they exhaust it rapidly. The soil may be restored in various ways, viz., by means of minerals applied in the shape of superphosphate, bones, guano, &c., or by returning to earth the *dead body* of the plants themselves, as in dung. By these, or other methods of manuring, the soil is restored in all parts of the world, and nowhere by a more complete and painstaking system than in certain countries within 35° of latitude from the equator. The fertility of some tropical and subtropical regions is very great, but it is not due to heat, light, or magic, but to manure, in the case of the cultivated land, and to the decay of vegetation in other cases.

However favourable the climate, the soil of hot countries becomes exhausted as rapidly as our own, if treated badly. We have often introduced foreign agriculture to the notice of our readers; we have reviewed the productive farming of China, Mysore, Japan, and other countries, where the magic of manuring is understood as well as in this country; and we have noticed the rapid exhaustion of corn and cotton soils in the Southern States of America, where most of the produce is exported. It might be said that the laws of exhaustion and fertility are exceedingly stringent. Every plant that grows, and yields its fruit for man or animals, is subject to these laws. Even on the fertile plains of the Amazon and the Oronoco, and in the Caraccas, an alimentary tree, which has for centuries afforded the chief sustenance of millions of the human race—the Cocoa tree—has failed where the plantations have at length exhausted the soil. But a tree which grows comparatively slowly, and has a peculiar power of extracting nutriment, besides feeding at a considerable depth, only exhausts slowly.

Let us now however give the origin of those errors about tropical vegetation which have spread so far. There are two or three rivers—notably the Nile and the Ganges—which periodically overflow, and fertilise the plains of Egypt and Bengal by becoming—let us say for the sake of brevity—the manure-carriers of those countries. We will only add, with regard to the general law of the exhaustion of soils and the means of its prevention, that these exceptions prove the rule.

RECENT intelligence respecting the PROGRESS of CATTLE PLAGUE on the Continent does not add much to our previous information, nor is it a matter of much consequence that one or two districts are added to the list of infected places; we know that the plague prevails in Germany and France to an extent that is without precedent in the present century, and we can fully understand that the few precautions which can be enforced exert but a very partial action in preventing the extension of the malady. In Prussia, Saxony, Wurtemburg, and Baden, as reported in our last article, the disease exists. France does not furnish us just now with much detailed news, and the people who write have quite other matters than the health of cattle to engage their attention; but there can be no doubt that the disease is spreading as rapidly in that country as in Germany, whenever there are animals to be attacked. We have previously reported the disease as being present in Lorraine, Alsace, in the department of Seine and Marne, at Gravelotte, and at Bar-le-Duc. Rumour now adds Paris to the list, but there is no positive evidence of the cattle plague having actually entered the city; the report, however, comes to us with a fair amount of probability in its favour. Round Metz the disease is very virulent, both among cattle and sheep; it still prevails also in Roumania, Transylvania, and Gallicia, in Poland, in several Russian provinces, and along the shores of the Black Sea.

German cattle and sheep continue to be imported to this country, and up to this time no case of cattle plague has been detected. The majority of the animals are landed at Plaistow, and are slaughtered there, to the manifest and outspoken discontent of the importers, who draw up petitions and arrange deputations for the attainment of some object which no one seems clearly to understand. One satisfactory result seems likely to arise out of the state of things which has been brought about by the extensive prevalence of the cattle plague in Europe: the City authorities, to whose propensity to slow motion the *Lancet* recently paid a tribute, seem to be aroused. It has probably dawned upon them, at least those of them who are interested in the water-side market, that cattle and sheep will be sent to a place of slaughter upon the banks of the Thames; and that a space of three or four acres does not adequately represent the extent of ground required for the accommodation of three or four thousand animals per week. It is not, perhaps, pleasant for the committee to reflect that, if the principle had been fully admitted at first, a properly arranged market might have been already in active operation.

Smallpox and scab among sheep are prevalent in several districts round Stettin; but no further report of the sheep-pox in Friesland has been received.

In various parts of England, foot-and-mouth disease, pleuro-pneumonia among cattle, scab in sheep, are doing much damage. Local authorities, in some counties, are in favour of the extreme measure of stopping all traffic in animals for a time, and in this idea they are backed by some farmers. Taking the general opinion, however, we apprehend that such restriction would meet with strong opposition. And of the efficacy of the measure we entertain decided doubts. Unless fairs and markets and movement of cattle could be stopped all over the kingdom—and this, as we have before shown, is quite out of the question,—very little advantage would be gained.

Prohibitions affecting the trade of one or two counties might be partially successful in arresting the spread of foot-and-mouth disease particularly, and of pleuro-pneumonia in a less degree, the latter disease having a longer period of incubation; but it is reasonable to imagine that as soon as the restrictions were removed, the disease would enter the country again, and spread as rapidly as before. Fairs and markets are doubtless points to which many infected animals converge; dealers, we know, are not over scrupulous, and if the animals are not sold in one market no apprehension of infection will prevent them from sending them to another at a distance, and this in spite of the risk of infecting railway cattle trucks and cattle pens on the route.

If the Orders of Council had been scrupulously observed, which provide for the proper disinfection of pens and trucks and other places in which diseased animals have been kept, this source of danger would be lessened, but as far as we can learn the law is in these matters a dead letter. We find all sorts of open channels for the conveyance of infection, but we seldom have an opportunity of observing the application of any well directed and consistent means of prevention.

—— THERE was a small supply of English Wheat at Mark Lane on Monday last, and prices rose 1*s.* and 2*s.* a quarter on those of the previous week. Oats also were 1*s.* and 1*s.* 6*d.* dearer. On Wednesday these advanced prices were fully maintained for all kinds of grain.——At the Metropolitan Market on Monday the best qualities of meat commanded rather higher prices, but for the average and inferior kinds there was a dull sale. On Thursday the quality of stock was inferior, but a ready clearance was obtained for all kinds.—— In the wool market there is an active demand for all qualities, especially the inferior kinds suitable for army goods.

—— MR. JAMES ALLEN RANSOME, the senior partner of the Orwell Works, Ipswich, having this summer completed his fiftieth year of connection with the works, the wish was expressed by some of the old hands that a suitable testimonial could be presented to him in this year of jubilee, as an expression of the

affectionate regard in which he is held by all. Accordingly a meeting of foremen and representives from the offices was held, and it was determined that a voluntary subscription should be raised for the purposes indicated. That the contributions should be spontaneous and free, a box, on the principle of the ballot, was placed in every shop, and into these the men could put whatever contributions they pleased. The result was that £70 was thus contributed, and with this sum a very handsome timepiece and set of bronzes were purchased. The massive timepiece is mounted on black and green marble. On a gold plate let into the base is the inscription—

"Presented to

"JAMES ALLEN RANSOME, ESQ.,

By the officers and workmen of the Orwell Works and Waterside Works, on the completion of his fiftieth year of business connection with these establishments, as a voluntary tribute of the esteem in which he is held by the subscribers.—Ipswich, September, 1870."

A letter of Mr. ARTHUR COLE, the secretary of the Testimonial Committee, accompanied the gift, and the following is Mr. RANSOME'S reply :—

"The Old House, Carr Street, Ipswich,
September 27, 1870.

"Dear Arthur Cole,—On my return from the seaside I find your kind address, accompanied by the magnificent testimonial, with which the officers and workmen have been pleased to present me on the occasion of my having completed the fiftieth year in connection with our establishment.

"I am deeply touched by this manifestation of the kindly feelings of those who have been associated with you in arranging this welcome and altogether unanticipated surprise, and greatly does it add to my estimate of its value to feel the thoughtful and kindly consideration that has dictated the mode and manner in which your munificent gift should reach my hands, and I trust to you to convey to your associates in this matter my appreciative acknowledgment. Much as I have reason to value this testimonial for its intrinsic beauty and value, you who have so long known me will scarcely need the assurance that in the affectionate regard of which your testimonial is the outward symbol, I have a deeper and far higher gratification, in the recognition it conveys to me of the harmony that has hallowed our mutual relations for so many years, and which during half a century has never been broken, nor, I believe, even disturbed. I am sensible that this acknowledgment is but a very feeble expression of my grateful feeling or of my personal gratification, but I trust to its acceptance by you in the fulness of the spirit of mutual regard.

"I remain, dear Arthur, yours very sincerely,

"J. ALLEN RANSOME.

"To A. T. Cole, for the officers and workmen of the Old Foundry and Waterside Iron Works."

—— We learn that the Rev. J. C. CLUTTERBUCK, of Long Wittenham, near Abingdon, who has acted on the Thames Conservancy Board since its reconstitution under the Act of 1867, vacates his seat (in rotation) this autumn. Apart altogether from his fitness as the representative of any special class or locality interested in the proceedings of the Board, there is in his personal fitness for the duties of the office ample reason why his re-election is most desirable. To exact knowledge of the river and its basin, both topographical and geological, acquired during long residence on its banks, and particular acquaintance (the result of long study) with the whole question of the rainfall and water distribution within the basin of the Thames, Mr. CLUTTERBUCK adds just the personal qualifications which fit him for dealing with whatever angry differences may arise out of the questions of expenditure, taxation, and responsibility with which the Conservancy Board have to deal. It will be a public loss if his experience, knowledge, temper, and popularity, should cease to be of service.

—— Mr. H. J. MORGAN, secretary of the Metropolis Sewage Company, writing from their Lodge Farm, Barking, of which he has the management, thus comments on Mr. BAILEY DENTON'S paper on Sewage Utilisation, published last week :—

"My attention has been called to a paper which Mr. BAILEY DENTON presented to the British Association at Liverpool on the subject of irrigation. As he seems to have been misinformed as to the system pursued upon this farm, I desire to explain that the object which has influenced our proceedings for upwards of four years has been to obtain a knowledge of the practical and profitable use of sewage, so as to ascertain its exact value to the farmer. The land upon which it has been chiefly used is of such a porous nature that, even without any subsoil drainage, filtration would have followed its application, but inasmuch as the land destined to receive it was drained by 5 feet and 7 feet drains when in preparation, the whole of the sewage-water has passed through the soil into them, and been carried into the neighbouring stream in a perfectly filtered state. It is true that preparation was at first made for using the sewage which escaped from one set of beds by distributing it a second and a third time over land at a lower level; but as the quantity of sewage which was necessary to a dressing was so readily absorbed by the beds to which it was in the first instance applied, little or no water was available for redistribution; and as the experiments required that a record of the exact quantities of sewage supplied to each crop should be kept, all communication between the beds has for some time been cut off. Had Mr. BAILEY DENTON been acquainted with these particulars he would, in place of quoting this farm as one of the many instances of irrigation only, have alluded to it as hitherto the largest experiment of irrigation coupled with filtration."

—— The first case heard under the NEW LAND ACT came before Mr. ROLLESTON SPANNER, Q.C., the Chairman of the county Tipperary, on Wednesday of last week, at the Quarter Sessions of Clonmel. An ejectment was brought by the Irish Land Company to recover possession of a farm in the occupation of a man named M'GRATH, who had bought its goodwill for £40 from a tenant, but was never recognised by the plaintiffs. Notwithstanding this fact, he claimed compensation for disturbance. The Chairman decided, that in consequence of the subletting the defendant had no claim or *locus standi*. The agent of the property, however, consented to allow him seven years' compensation, deducting, of course, a year's rent which was in arrear. It was explained to him that it was entirely owing to the liberality of the company that he received any compensation.

—— Mr. AMOS writes to correct an error in the printed report of the trials of double-furrow ploughs at Peterborough, given last week. The Ipswich plough is shown as drawing 7 cwt. 7 lb., instead of 6 cwt. 1 qr. 1 lb.—an important difference—as the double ploughs of Messrs. RANSOMES, in both classes, registered a lower draught than any to which prizes were awarded.

OUR LIVE STOCK.

CATTLE.

THE Scaleby Castle sale, which was postponed on account of the prevalence of foot-and-mouth disease, took place on the 20th inst. Notwithstanding Mr. Fawcett's high reputation as a breeder, the sale was not characterised by high bidding, and the modest average of £25 15*s.* 4*d.* over 53 head of cattle disposed of was the general result. Although healthy, the cattle were many of them still tender in their feet; and this, added to the discomfort of a wet day, militated against the success of the auction. *Elvira 12th* by RICHARD (16,834) was bought by Mr. Dalton for 41 gs.; *Archduchess* by IMPERIAL OXFORD (18,084), and from Chilton stock, became Mr. J. A. Mumford's, at 34 gs.; and *Royal Paulina* by ROYAL DUKE (25,015), was sold to Mr. Brocklebank for 46 gs. In the bull section ROYAL DUKE was reserved; EMPEROR MAXIMILIAN was purchased by Mr. R. Burden for 47 gs.; and VALIANT OXFORD, a six months' old calf, bred by Lord Kenlis, got by BARON OXFORD 3D, from *Violante Butterfly* by ROYAL BUTTERFLY, and previously combining the best Towneley blood through FREDERICK (11,489) with that of the Bates bulls 2D CLEVELAND LAD and DUKE OF NORTHUMBERLAND, brought the highest price of the day, 67 gs., becoming the property of Mr. Fair.

—— A large company assembled on Tuesday, the 18th inst., to witness the sale, by Mr. Strafford, of a selection of Shorthorns from the herd of Sir George Philips, of Weston Park, Shipston-on-Stour. Gentlemen interested in Shorthorns came from all the principal breeding counties, and fortunately, and somewhat exceptionally, the day was fine. About 300 gentlemen sat down to lunch, presided over by Mr. Clayden, of Littlebury, supported by Mr. Hardy, M.P., and Messrs. J. K. Fowler, of Aylesbury; G. and T. Graham, Birmingham; J. C. Adkins, of Milcote, Henry Adkins, of Birmingham; H. J. Sheldon, of Brailes House; J. G. Curtler, Worcester; G. Garne, of Churchill Heath, &c. The animals were brought out in good trim, or, as stated by the chairman, "neither too fat nor too lean." They may be described as a useful, rent-paying lot, apart from their pedigree attractions, and full of "character." The Knightleys enjoyed the greatest share of attention, and eight of the "Rosy" tribe averaged the high figure of £111 8*s.* 7½*d.* The sale opened with *Sweetheart 2d*, by EARL OF DUBLIN (10,178), a grand cow in her time, but oppressed with the weight of 19 years. She became the property of Mr. Walton for 20 gs. *Polytint*, by EARL OF DUBLIN (10,178), another fine old specimen of Knightley breeding, and just entering her 15th year, became Captain Winnell's at 42 gs. This was the oldest representative of the "Rosy" family, and as such we may mention that her dam was *Cornbind* by JANIZARY (8175), and that she traces back through *Florence* by LITTLE JOHN, and *Cathleen* by CALIPH (1774), to the original *Rosy* by ROB ROY (557). *Lactea*, by SARAWAK (15,238), another daughter of *Cornbind* by JANIZARY, was knocked down at 45 gs. to Mr. J. C. Adkins. The first sensational price was given by Messrs. F. Leney & Son, who secured *Lactea Oxonensis*, a daughter of the cow last mentioned, and by IMPERIAL OXFORD (18,084), for 200 gs. *Polycherry*, by 3D DUKE OF GENEVA (21,592), and a grand-daughter of *Polytint*, made the highest price of the day, the glass running out at 205 gs. in favour of Mr. H. J. Sheldon, of Brailes. *Lactine* and *Polygeneva*, respectively the daughters of *Lactea* and *Polytint*, and both by 3D DUKE of GENEVA, were both secured by Lord Faversham, the first for 175 gs. and the second for 110 gs. The general results of the sale were as follows :—Forty-seven animals realised £2080 10*s.*, or an average of £44 5*s.* each; 38 cows made an average of £48 2*s.* 4*d.*, and the nine bulls made £28 each. Dividing the females into groups, according to their families, the 13 Fawsleys and Sweethearts, despite the small prices of the older representatives, made on an average £88 16*s.* 9*d.* each; the 10 Welcomes made £33 4*s.* 4*d.* each; the six Gwyneths made £20 1*s.* each; and 18 animals with shorter pedigrees made £24 16*s.* 5*d.* each.

At the conclusion of Sir George Philip's sale six young bulls, bred by Mr. Sheldon, of Brailes House, were offered, and sold for an average of £44 2*s.* each, and a total of £264 12*s.* The highest price was given by Mr. G. Garne, for EARL OF WARWICKSHIRE 3D by DUKE OF BRAILES (23,724), and from *Lady Emily* by 7TH DUKE OF YORK, for 67 gs. Mr. C. Hobbs, of Maisey Hampton, Gloucestershire, secured LORD HASTINGS, by EARL OF WARWICKSHIRE (26,079), and a descendant of *Foggathorpe* by MARLBRO', for 48 gs. The following is a list of prices and purchasers :—

Name of Animal.	When Calved.	Price.	Purchaser.
Cows and Heifers.		Gs.	
Sweetheart 2d	1851	20	Mr. Walton.
Fawsley Garland	1856	25	Mr. Bliss.
Polytint	1856	42	Captain Winnell.
Lactea	1858	45	Mr. J. C. Adkins.
Sweetness	1860	50	Mr. J. Hardy, M.P.
Wallflower	1862	42	Mr. J. J. Stone.
Welcome 2d	1863	40	Mr. J. Stone.
Fawsley	1863	62	Mr. T. G. Curtler.
Hyacinth	1864	23	Mr. Walton.
Genoa	1864	30	Mr. Blundell.
Rosalind	1865	27	Mr. J. J. Stone.
Welcome 3d	1866	40	Captain Barclay.
Hannah 2d	1866	32	Mr. J. J. Stone.
Lactea Oxonensis ..	1867	200	Messrs. F. Leney & Son.
Winsome	1867	52	Captain Barclay.
Genevieve	1867	42	Mr. J. J. Stone.
Ida	1867	27	Mr. Walton.
Willow	1867	28	Mr. J. J. Stone.
Fair One	1867	92	Mr. Walton.
Fidgeree	1867	24	Mr. J. J. Stone.
Rosine	1868		Not offered.
Lucy	Feb., 1868	32	Mr. Taylor.
Blantyre	May, 1868	36	Captain Barclay.
Tasmania	July, 1868	58	Mr. J. J. Stone.
Lurline	July, 1868	26	Mr. J. J. Stone.
Polycherry	Sept., 1868	205	Mr. H. J. Sheldon.
Gadsaire	Feb., 1869	26	Mr. J. J. Stone.
Lucina	Mar., 1869	175	Lord Faversham.
Polygeneva	Mar., 1869	110	Lord Faversham.
Rosalind	April, 1869	42	Mr. T. G. Curtler.
Wayward	Dec., 1869	28	Mr. J. J. Stone.
Dora	Dec., 1869		Not offered.
Dovedale 3d	Jan., 1870	16	Mr. J. J. Stone.
Rose	Jan., 1870	14	Mr. J. J. Stone.
Gossamer	Feb., 1870	16	Mr. J. J. Stone.
Fair Maid	Mar., 1870	10	Mr. T. G. Curtler.
Welcome 4th	April, 1870	33	Mr. C. W. Brierley.
Wall Fruit	April, 1870	11	Mr. J. J. Stone.
Willow Twig	May, 1870	30	Mr. Blundell.
Genesee	May, 1870	8	Mr. J. J. Stone.
Bulls.			
MERRIMAC	1867	33	Mr. Hutt.
GRAND DUKE OF WATERBURY	Oct., 1868	32	Mr. Canning.
GLORY	June, 1869	29	Mr. Wheeler.
GILBANT	June, 1869	25	Mr. Moore.
WHITE	June, 1869	25	Mr. Arkell.
HOLLINGSIDE	June, 1869	40	Sir R. Bulkeley.
POLYTECHNIC	Mar., 1870	39	Mr. Hutt.
WORTH	July, 1870	13	Mr. Taylor.
HARRY	July, 1870	6	Mr. Jarrett.
Mr. H. J. Sheldon's Bulls			
WHARFDALE DARLINGTON	Sept., 1869	26	Mr. J. J. Stone.
PUCK	Sept., 1869	40	Mr. Benson.
SABINUS	Oct., 1869	45	Mr. Bliss.
EARL OF WARWICKSHIRE 3D	Nov., 1867	67	Mr. G. Garne
LORD HASTINGS	Nov., 1867	48	Mr. C. Hobbs.
BISMARCK	Jan., 1870	26	Mr. Latham.

—— We learn from Siddington that a second calf, this time a bull, has been dropped to 2D DUKE OF TREGUNTER. The dam is *Gazelle 5th* by 7TH DUKE OF YORK.

—— The following cattle were shipped per "European" for Canada on the 24th inst. :—*Wild Eyes*, *Duchess*, and *Waterloo 35th*, from Nunwick Hall sale; *Lady Worcester*, from Mr. Harward's herd; and *Star Queen*, from Mr. Brewer's stock. Also two very good yearling bulls from Mr. Torr's, and one from Mr. Aylmer's. These were consigned to Mr. Cochrane. Accompanying these animals were *Innocent*, an immense cow, bred by Mr. Charles Barnard; BOTHWELL, bought at Mr. Hewer's sale; and LORD YORK, bred by Mr. Harward, of Winterfold. These last are the property of Mr. S. Beattie, whose name has recently so often appeared in connection with Shorthorn sales.

POULTRY.

WHEN exposed to the air an egg soon loses its original freshness, in consequence of the escape of part of its moisture, and the consequent entrance of air. This evil may be prevented in several ways. One of the least troublesome is to grease the surface of fresh eggs intended for cooking, and so close the pores. It is not very material what grease is used, provided it is fresh and sweet. Butter is perhaps the least desirable, as it contains curdy matter, which becomes tainted after long exposure to the air. Lard, or melted suet, is better, and in France bees-wax and oil is sometimes employed, and answers remarkably well. Another method of preventing the access of air is to plunge the eggs into a thin creamy mixture of freshly slaked lime and water, in which they will keep good for pastry purposes for months. Eggs intended for hatching should be kept in a situation where evapora-

tion of moisture through the pores of the shell is prevented as much as possible. Placing them with the larger end upwards in a box, with bran, is a very common mode of keeping eggs intended for hatching.

HOWARD'S NEW DOUBLE FURROW PLOUGH.

THE improvements which the Messrs. J. & F. Howard have recently made upon their double furrow plough will readily be understood from the annexed illustration (fig. 256). At the trials of the Peterborough Agricultural Society this new implement proved itself a complete success, both as to the quality of the work done and the lightness of draught, carrying off the first prize in its class as a general purpose double plough. The trials have been reported, and the dynamometrical experiments of C. E. Amos, Esq., will be found in our last week's paper. We confine our notice to the improvements effected in the mechanism of this new implement as compared with the old ones of this form.

The engraving is from a photograph of the furrow side of the implement. We have seldom seen a mechanical likeness taken with greater distinctness, the several parts being shown with a clearness which almost renders description unnecessary. The plough consists of two expanding beams, each of which carries a coulter and body. The coulter-share and breast are similar to those of their 1st prize general purpose ploughs, but the frame is different, and instead of a slade the two ploughs have an oblique friction wheel common to both, running in the furrow of the last plough. That part of the left hand beam to which the frame is attached by two bolts, extends back on a line with the part to which the coulter is fixed, the two screw nuts being seen immediately under the right handle, and to this extended portion of the beam the standard of the sole friction wheel is fixed. The expanding mechanism consists of two pairs of expanding slide bars, each pair in a box—the one a little behind the last coulter, and the other in advance of the front coulter, with a rod and double nut-screw, halfway between, for screwing in or out the beams to any desired breadth of furrow slice required. The two front wheels are not opposite each other, as in the common ploughs, and in the old double-furrow ploughs, the land-wheel being considerably in the rear of the furrow-wheel. This unequal oblique-angled tripod position of the three bearing wheels involves not only special mechanism, but greater stability to the implement, increases the means of adjusting the depth of the furrow-slice, and of steering when at work, and of turning out and in at the land's end. The furrow-wheel is steered by horizontal working levers, the land-wheel is adjusted by vertical action levers, both extend back to the handles, and the special mechanism of each of the two lever systems and mode of working them by the ploughman will readily be understood from the engraving.

It will thus be seen that, with the exception of the coulter-share and breast, the new double plough, compared with the old, is one entire piece of novelty. Into the details of the old mechanism we need not go, as the more recent of them appear as different stages in the details, so to speak, of the new implement.

Our next head is the performance of the new implement in the field. It is easily turned out and in at the headlands, and when once entered it goes almost of itself to the opposite headland. In the United States of America the ploughman rides upon his "jemy plough," steerage lever in hand, as we do on steam-ploughs, attention to the steerage wheel being all that is required. No doubt a short apprenticeship has to be served in learning to work double ploughs as in learning to work single ploughs, but good ploughmen with the latter will soon become good ploughmen with the former. The handles are essentially useful, but the grand thing is to make the implement go on its own tripod anti-friction bearings, with as little work at the handles as possible. And with regard to the quality of the work, the working parts of the two ploughs being those, so to speak, of the 1st prize Leicester general purpose ploughs, they make equally good work; and the probability is that in the hands of ploughmen generally better work will be made with double ploughs than is now being made with single ones.

Experience and the dynamometer represent the saving of horses at one horse in four. In other words, one ploughman with a team of three horses will do as much work in a day with a double-furrow plough as two ploughmen with four horses and two single ploughs—the amount of individual labour to man and horse being in favour of the double-furrow plough. The results of some experiments may be on the one side of this general rule, whilst the results of others may be on the opposite side, so that the general truth may, in the present initiating experience with double ploughs, be said to lie halfway between. As we improved single-furrow ploughs we reduced the draught of the horses, and as our ploughmen improved in holding them a further reduction of draught was gained. From such data it is but reasonable to conclude that as we improve in the construction and working of double-furrow ploughs the gain will increase in their favour.

The cause of such a difference in horse-power and resistance in ploughing, forms an interesting question. That the reduced resistance of the double plough is due to a reduction in friction, may be granted. But this general solution of the question is far from satisfactory when its details are gone into; for friction wheels have long been used on single-furrow ploughs without materially reducing draught. True, a friction wheel itself incurs less or more resistance, and as there are three wheels on a single-furrow plough and no more on a double plough, there is a saving of one friction wheel behind and two in front. But will this difference in the mechanism and wheel friction account for the difference of draught? Proof in the affirmative is certainly wanting. If we examine closely the difference in the application of the forces in hauling and holding single and double ploughs, and the leverage and fulcrage involved in the construction of the former plough as compared with that of the latter, to which the two forces are thus applied, we shall find other reasons to account for difference of draught than a reduction of wheel friction and sole friction. The handles of a common plough form a lever of considerable power; and when it is borne in mind that the pressure on the fulcrum is equal to the two opposing forces in the balance, it is easy accounting for the heavy draught of a common swing plough. By applying wheels in front the character of the leverage is changed, and draught reduced, but the force applied to the handles greatly increases friction and resistance. Good ploughmen have long been familiar with the fact that the less force they apply to the handles the freer and easier the team goes. By double ploughs we are getting rid of this lever friction behind. In front, again, horses pull at different angles, and hence against each other, and against the resistance which these two or three forces overcome; and as there is a difference in the economy of force between a two-horse team in a single-furrow plough and a three-horse team in a double-furrow plough, the practical question arises, what that difference is. In each case much depends upon how the horses are yoked and driven, and in both there is not only a sacrifice of motive power, but also an increase of resistance from the adverse or cross-purpose manner the available force is applied. In illustration of this, we may observe that steam-power by means of a wire rope hauls the implement with a greater economy of force applied than does horse-power, and with comparatively no increase of resistance to the implement. The difference between steam and horses in this respect is far greater than is generally credited, but the old knotty problem, "how best to yoke the horses so as to reduce draught and resistance to a minimum," we must reserve to some future day.

Another improvement in the double plough illustrated merits special notice at this season, when bottom-bound land should be subsoiled. Thus by removing the leading plough body and attaching a subsoil body by the two bolts shown on the side of the right-hand beam, the implement is converted into a single-furrow subsoiling plough, hauled by three horses instead of four horses, on the old single-furrow plough plan, avoiding at the same time the trampling of the newly subsoiled bottom by the feet of the horses. Thus the subsoiler follows the furrow horse immediately before the furrow-slice of the left-hand plough being turned over the loosened subsoil, so that both subsoil and staple are left in the best possible state for aëration and drainage, and at a corresponding reduction of draught and resistance, as in double-furrow ploughing. *W. B.*

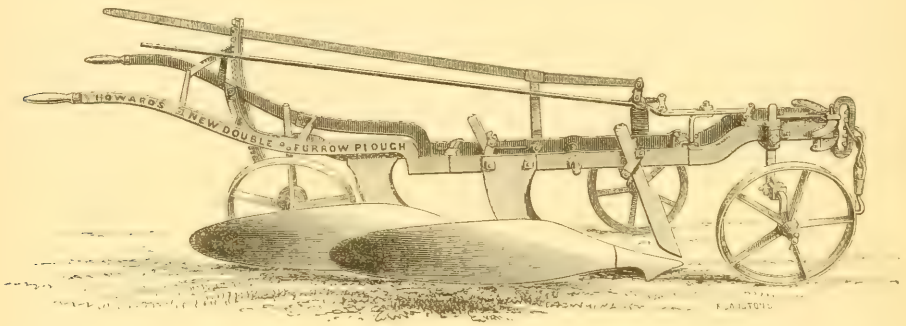

FIG. 256.—NEW DOUBLE-FURROW PLOUGH.

STEAM IN ITS RELATIONS TO AGRICULTURE.

PROBABLY the indirect effects of steam upon our social life has done as much or more to improve agriculture than its direct application to the land. Even the horses step quicker in the plough at sight of their great rival—steam. And the colossal giant that has quickened the march of cart-horses has stirred the thoughts and quickened the energies of men. The stagnant quagmires of dull routine have been drained dry, the hard grain of stolid ignorance has been broken up by steam, and now it stands panting to do us other service. You tantalise the giant because it cannot fill the land with manure, or the farmer's brain with skill. Such treatment is hardly just or logical. Steam can do many things for farming, but it cannot do all, therefore run down steam! Rather let us set it to all kinds of work that it can do better than any other force. Farming, as you very truly remark, is a big job, but so is steam a big power. It is our mightiest controllable embodiment of sheer force. No weight is too great for it to lift, no load too heavy for it to carry, no resistance too formidable for it to overcome. It can drain, trench, plough, roll, harrow, drill, sow, mow, cut, reap, carry, thresh, clean, stack, and sack, and do all these with a swiftness and cheapness that defies competition. The work is better done, and in less time, by steam, than by any other power. Steam can form more and better tilth in a day than a plough can in a week.

Perhaps this saving of time in our fickle climate is the most valuable service rendered by steam to farming. Is time money in agriculture, or is it not? [How often, in passing through fields of uniform quality, we observe differences of yield amount to several quarters per acre. Whence these disparities? One portion was got in before the rains, and the other after. The despatch begotten of steam would have enabled it to be all sown together, and probably returned a difference in the yield. In this sense, then, time is money]; and the employment of steam-power, by enabling the farmer to be "aye ready," would give him the option of choosing the best possible seed-time and harvest.

But time is money in another season. In the early days of husbandry the husbandman was necessarily his own drudge; all the heavy labour was done by himself. Progress in those days was slow or impossible, the entire powers of men were expended on physical labour. As capital accumulated other men were hired to do the heavy work, and the minds of the agriculturists grew and progress was made. One more step, and the lower animals were pressed into the heavy work; and agricultural progress can now be pretty well measured by the number of horses employed in given countries. But the day of the redemption of the horse from the dreary drudgery of walking slowly up and slowly down the weary furrow, from dawn to dark, seems at hand. Brute force will give up the lazy

work of farming to steam-power. Already the stolid tread of horse, and the weary steps of men, are giving way before the shrill shriek of the whistle, and the puff, puff, puff of the steam-engine on our headlands. Every horse, therefore, will be replaced by a fat bullock. More beef, as well as more corn, will thus be grown. The strain upon horseflesh will likewise be loosened, and more of it will be available for necessary but neglected purposes. There are few farms, for instance, of any pretence upon which a scavengering man and horse could not find profitable employment. Waste in the wrong place means loss, disease, and death; in the right place it stands for money, wealth, happiness, and life. The place for all sweepings of roads, scourings of ditches, bottoms of ponds, coarse herbage, and droppings by the wayside, is the foldyard; but much of all this is now wasted, owing to the necessary strain upon horseflesh. Remove this strain, by making steam our drudge, and horse labour can not only be reduced, but much of it more profitably employed. The backbone of farming lies in the muckyard; let but the dunghill be bulky and good, and the returns will be satisfactory.

But the despatch born of steam will not only set free horse-power, but give the farmer leisure for thought and time for improvement. The art of agriculture is not yet perfect. Much has yet to be learned on the raising and fattening of stock, the chemistry of manures, the mechanism of good tilths, the improvement of plants by selection, hybridisation and cross-breeding; the procuring of larger, heavier, finer cereals and roots, and improved modes of replenishing the earth with greater plenty and subduing it to greater usefulness. Steam would liberate the time now absorbed in daily routine, the constant supervision of mere mechanical drudgery, and provide leisure for these and many other equally pleasing and profitable pursuits.

True, we cannot expel Nature by steam-power, but we can do far better, we can subdue her. Mechanics cannot do all, but they can do very much for agriculture. It is much to chain steam to the hand of labour, to bring it in fact upon wheels to wait upon our work in the field, and to pull or drive all our implements of husbandry through or over the earth with the same precision and certainty as it drives the spinning or weaving machines in our factories. In fact we, too, are spinning and weaving,—the earth, the air, the water, the heat, life itself, are our raw materials; and beef, bread, and covering our finished products. During the entire progress of farming, motion of various kinds is made. Much of this, such as the motion of fluids in living tissue, the diurnal and annual motion of the earth, the movement of the air and the perpetual upward and downward motion of the water, are effected for us, and beyond our control. But independent of all these material forces that work for us, we have many weights to be lifted, furrows to be turned, transpositions of matter to be effected, before earth, air, heat, and water can be moulded by the vital principle into the finished products of meat and bread. And all these secondary forces steam is ready to set and keep in motion on our behalf. And yet with the most perfect consciousness of its power and ability to propel, dig, crush, rend, lift, or carry anything, there are those who tell steam to its hot, hissing face, that agriculture is too big a job for it. This is as much as to say that the power that has ploughed every ocean cannot plough our little fields—that the might that can crush bars of iron as if they were so much blancmange, cannot break a clod, and that the great carrier of the world cannot carry our harvest home. Well, it may be so. But at present I am sceptical, and believe that the future prosperity of agriculture is largely dependent upon the amount of steam-power employed upon it. The more steam the greater prosperity, and *vice versâ*. *D. T. Fish, F.R.H.S.*

CAMBRIDGE LOCAL EXAMINATIONS.

THE following is the speech by Mr. C. S. READ, M.P., lately delivered at Norwich, on the occasion of presenting prizes and certificates to the successful candidates in the Cambridge Local Examinations:—

He assured them that he appeared before them that day with considerable reluctance and the greatest diffidence. In the first speech he made in the House of Commons, he said he hoped he should not speak in Parliament on any subject that he did not understand; but he was over persuaded on this occasion to say a few words on a subject he did not pretend to comprehend in all its details, and with some of the operations of the scheme he was entirely unfamiliar. Indeed, he felt something like a real agricultural bull in a literary china shop—but although he had no doubt his presence would create a certain amount of consternation among them, if he did transgress, he hoped they would attribute it to his ignorance, and to no desire to hurt the susceptible feelings of any who might be among them. When he considered the number of learned men who had addressed them on these occasions, —he remembered Lord Fortescue, Mr. Thomas Dyke Acland, Mr. Charles Buxton, and other distinguished men—and when he came to think of their late respected chairman, Sir John Boileau, who, although dead, still spoke to them in the liberal donation that day presented to the senior candidate,—a man who was a learned and accomplished scholar, who was thoroughly versed in the arts and sciences, and whose literary and antiquarian researches were known throughout the country—when he (Mr. Read) thought how many highly educated University men had addressed them, he felt his own incompetency the more, he having had no such advantages. But Mr. Hinds Howell was good enough to say that, after so much learning, some plain, practical remarks from a middle-class man might be acceptable. He could only hope they would be. In order to show them how practical he was, he would begin by advancing a theory. His theory about the Universities was, not only that they should be seats of religion and learning, but he wanted them to be great educational suns, round which all the schools in the kingdom should, as planets, revolve. In former days the Universities had partaken more of the properties of the moon; they had absorbed from the upper ten thousand a large portion of the intelligence of the country and had reflected it back in rather dull, cold, and uncertain rays. He wished, on the other hand, that there should be a symmetrical diffusion of these beams of knowledge throughout the whole kingdom, through every class of the community, and by this means he felt confident these great national institutions of religion and learning would become a vast deal more popular and more appreciated than they were now. And he believed nothing had done so much to increase the interest of the middle class in the great Universities of the kingdom than these examinations. From what he know of their scheme, it seemed to him to be thoroughly practical and useful, and he was sure the smallest certificate of superiority of culture and of merit was a badge of the highest honour, and one which in his day he should have been very proud indeed to have received.

Then, as to the objections taken to this scheme, the first one he had heard advanced was that masters devoted too much of their time to the clever boys. Of course it was much easier and more pleasant to teach a willing lad than some stupid boy who wouldn't learn. If a boy was dull he could not help that, but if he was idle into the bargain he must remember that not only would his schoolmaster not take much interest in him, but no one else in the world would care much for him. But if they looked at the results he thought they would find the objection removed. If there were only one or two candidates from a great school then it might be that those boys were "crammed" for the examination, but when they saw that the best schools sent a great and continuous supply of scholars to these examinations, it proved that the whole of the tuition of the school was good. Then, as to the boys being "crammed." From the papers he had seen, and the way in which the examinations were conducted, he believed it impossible for a boy to answer like a parrot, but he must have a thorough radical knowledge of the subject in which he was examined. Middle-class education was much better now than it was when he was a boy. The children in our workhouses at the present day received a much better education than our fathers,—that he was perfectly convinced of,—but he thought middle-class education in some districts was still bad in quality and deficient in quantity, and somewhat over-dear. He had said that the high and low classes had received the greatest educational advantages; it was the agricultural and commercial classes, especially the farmers and small traders that had, till within a period of very recent date, been most neglected in education. And it was difficult to know what to advise a small farmer and little trader in the country to do. He did not like to send his lad to the National School, but this he (Mr. Read) thought was a mistake, as the National Schools in the future would be better rather than worse in the quality of secular education; and if a proper fee was paid, he could not see why the small trader should not share the same benefits with the labourer and artizan. Then, as to middle-class schoolmasters. Elementary teachers had all to be certified, and the masters of grammar schools who had taken their degrees and passed sundry examinations gave an assurance that they were men of distinguished learning; but with regard to middle-class schoolmasters, they had no special training whatever. If a trade failed it was a matter of training for the individual to set up as a schoolmaster, to "teach young gentlemen, giving them the best education at the least possible cost." No doubt, under such circumstances, education was a failure; but as other men had to take a degree and pass an examination, such as a lawyer, a doctor, or a chemist, he said that it would better also to require that middle-class schoolmasters should give some assurance to the public that they were qualified, and had the capacity for teaching. He hoped he should not be supposed to cast reflection upon those who had proved by their success that they were excellent schoolmasters and could impart the best knowledge. They knew that some people, if ever so clever, could not by any possibility impart that knowledge to others; and then there were the other duties of moral and religious training, which he would certainly not look over, but he said that some examination or some certificate ought to be insisted upon, now that education had become so general, from all schoolmasters, of whatever degree and whatever position.

There was a good deal of active, and still some latent, educational power in the endowed schools of England. The Act which was passed last year, the Endowed Schools Act, would, he hoped, if used with moderation, produce a certain amount of good; but he thought the original style of education, which was in fashion two or three centuries ago, when grammar schools were established, had been adhered to too rigidly. By this means the chief benefits of the schools had been given to the professional men rather than to the most needy of the middle class, and he thought that new schemes had done good, and he believed would do more good. He referred particularly to the Commercial School at Norwich, which had been so great a success. What we wanted was, not a few grand schools, with distinguished masters to preside over them for a time, but he believed the requirement of the country was that our grammar schools, wherever they were, should be all useful and serviceable in the locality; and he wished very much that some scheme could be devised by which all the endowed schools should be a connecting link between the Universities and the elementary schools, by which a really clever boy, however poor he might be, would be able to obtain the highest and best education.

There was some good and well-meaning men who were always afraid of hurting the susceptibilities of people who who were beneath them in position, and who objected very much to the name of "middle class." Now, he gloried in that name. Extremes were bad, and they knew that the wisest and richest man of his day said:—"Give me neither poverty nor riches; feed me with food convenient for me." He believed the middle classes were the happiest, because they were the least tempted and most contented. In referring to classes, he would say that no country had flourished long without a good middle class, and he believed the middle class of England were the backbone of the country. Speaking roughly, but practically, there were three classes in the country; they could not define them to a nicety, as they blended one into the other; they might subdivide them if they pleased, but there was no reason why anybody in this land should not rise in his class, and also, if he had superior abilities, and a sufficient amount of perseverance, why he should not in the end rise from one class to another. He did not think that, in dealing with education, they could overlook these classes. Some people said, "Oh! give all the same start in life and a similar education." This was a grand idea, but impossible in practice. How could they give the boy who was a labourer, and had to leave school at 10 or 11, or the farmer or tradesmen, who had to leave school at 15 or 16—how was it possible to give him the same education as the man going to college, and who would not probably take his degree till 21? If a builder had to rear totally different structures, he would lay different foundations both in quality and extent. If a man was going to finish his education at college, they might make the foundation so broad, so solid, so general, as to be able to build anything upon it, whether a church, a law court, or a baronial hall; but if they had nothing to rear upon it but a cottage, a farm-house, or a shop, they must not spend all their time and materials in the foundation, because by the time the man wanted the roof to cover him he would find that he had completed nothing. Therefore, he said, after the first great elements of knowledge had instilled, the education of the middle classes should have distinct reference to the line of life to be pursued. He hoped he should not be supposed to detract in any way from the great advantages of the highest education. If there was time and scope for the higher branches of study they must be an immense advantage, and no one could appreciate them more than he did. And then it was necessary to expand the boy's mind by classics and mathematics, by which they might be sure, whatever his line of life, whether in politics, literature, or any of the learned professions, all these grand subjects would be useful. But if a boy was intended for agriculture or trade, there were so many industrial arts and applied sciences which must come into his everyday occupation, that he (Mr. Reed) contended it was better for him to have a good elementary training in respect than to have only a smattering of the dead languages, which, he thought, was all a boy could possibly obtain if he left school at 15, before the active duties of life began. The middle-class examinations, he found, embraced subjects useful in business. He might be told there were not many candidates, and few passed. Perhaps there were few teachers; all those subjects were new. They had had the old standard classics for years; but, probably, as arts and sciences became more popular, boys would take a greater interest in them, and there would be more candidates.

He was going to tread on further dangerous ground, and in the presence of so many preceptors he feared he should be considered pedantic, but he hoped he should have the boys on his side. When they taught a child they made him learn his letters, and tried to knock English grammar into small boys long before they understood the greater portion of it. The only argument they could advance in those days of dull teaching was that the boys must master these hard dry things before pleasanter could be taught; but he said that as soon as they could reason with a lad, and enlist his sympathies or self-interest, the more readily would he take hold of and appreciate his duties. He had to differ from that high authority, Mr. Thomas Dyke Acland, who some seven years ago, in delivering a most excellent address in that room, said something which at the time struck him (Mr. Read) as cold and hard. It was this. Speaking to boys like those present, and not to children, he said—"Boys must learn things because they were told to learn them, and because they were hard, because they found them very difficult and troublesome, and because they could not learn them easily; and when they were 25 and had boys of their own they would find the use of them." This argument reminded him very much of the master who, before he flogged a boy, told him his school days would certainly be the happiest of his life. He, fortunately, had no son, but unhappily he was much nearer 45 than 25, and he could truly say that those studies that seemed to be the most interesting and comprehendable had been most useful to him. Mr. Acland, they must remember, was an exceptionally good and clever boy; he told them how he worked when other boys played, and he (Mr. Read) was sure that some of what he called his recreations would be regarded by them now as very hard work. It was necessary for boys of Mr. Acland's stamp "to grasp principles in order to master details;" but he contended that the great majority of middle-class boys had not the time or ability to grasp all these great principles, and he had generally seen that the attempt to learn the theory of everything ended in knowing the practical part of nothing. He contended that it would be better if the master could point out, and the scholar appreciate, the special advantages of a peculiar line of study. Surely a young farmer would take more interest in the elements of chemistry than in Latin grammar; a trader would, perhaps, like to know more about our colonies than the history of Greece or Rome; and the merchant's clerk would more fully appreciate book-keeping than solving a problem in Euclid. He had no idea about technical education being taught in school. School was

the place of preparation, not of business; that must be taught in the farm, the shop, or the counting-house; but, he said, that in the limited time a schoolmaster had at his disposal to train a boy he should try not only to make him an intellectual lad, but also try to prepare him afterwards to become an intelligent, successful man of business. He had no wish to find fault; but he might give them a few illustrations of what he meant. He remembered when he was at school that boys were construing Latin who could not do a lesson in English parsing; that others were at Latin verse who could not write a good and hardly a correct letter. Boys he had heard of who had been reading Homer, and who, although they had been intended for the Church, could not read a chapter in the Bible better than a head-boy in a National School. He believed that in this day there was a special defect in spelling. He remembered once that a sharp boy said that he thought it was the sign of an extremely narrow intellect if they could not spell words in more ways than one. He was a bad hand himself at orthography, and he knew the pain and trouble and loss of time it had been to him. This defect was not confined to the middle class, but he had found that candidates he had recommended for the civil service had almost all of them been "plucked" for bad spelling. He was told that they could not expect such elementary studies as reading and spelling to be taught in the great public schools, that boys ought to learn them before going there. But it was a defect, and a defect he trusted which would soon be remedied. Now, the great schools of this country were sometimes said to turn out a great number of very stupid men. His answer to this was, "Yes, because there are so many idle boys." He happened to be at a party the other day of eight or ten gentlemen, all of whom had had the advantage of going to public schools and the Universities except himself. They were lamenting, one and all, that they had not made more use of these advantages, and he asked them if they could point out to him what was the chief hindrance? They were all men of good standing and ample fortunes, and they one and all said that the greatest hindrance they had to making the most of their educational advantages was the knowledge that they would not be required as a condition for their living. Therefore, when they, middle-class boys, thought that it would be hard for them to struggle in life in order to get a competency, let them remember that they had one temptation less. There are some fond parents who do not like large schools. Well, he thought that, except for very little boys and exceptionally stupid ones, moderately large schools are the best. First of all, they were the cheapest; and he very much regretted that Norfolk had not the advantage of a good middle-class college such as their Suffolk neighbours had at Framlingham. When they had a good large school they were sure to attract boys from a distance, and this was essential, because it made the world wider in the school and brought new ideas and enlarged views. In these days of postal telegrams and express trains—in Norfolk, however, there was no express train except in name,—in these days of cheap travelling it was astonishing to him to find that farmers generally sent their boys to school at the nearest market town, whereas, if they would send them to the best schools they would find their provincial accent and country manners so improved that they would not think for one moment of the extra expense of a few shillings for the train.

There was one difficulty in education which he thought would not affect middle-class education, and that was what was known as the religious difficulty. He had never yet met with a man who was so thoroughly foolish—he was almost going to say so wicked—as to wish to have a boy at boarding-school without some definite religious teaching; and he must also say, with their permission, that he thought the religious difficulty they had heard so much of in Parliament, if it was not created was at least intensified very much for political purposes. He grounded this upon the following:—He had the honour to present to the Lord President of the Council a memorial signed by the masters of National Schools in this county, praying that there might be some fund set apart for aged and disabled schoolmasters. He went with a very large deputation of National schoolmasters, of British and Foreign schools, and of schools belonging to different Dissenting denominations. All these men taught where there was a conscience clause, and in summing up the number of pupils who took advantage of this conscience clause it was astonishing to him to find the percentage so homœopathic. He was afraid to say what it was, for it was so ridiculous, but he was told that it was only one in 5000. He himself was educated partly at a Dissenting school. During that period of his school days he attended regularly to all the religious instructions given by his very excellent master; and he could truly say, as far as he could remember, that he heard there nothing in faith and doctrine which was repugnant to the Church of England; and he had always since lamented that such small differences as existed should cause such great schisms in the Church of Christ. Now, if there had been a conscience clause at that time, and he had been told he might play marbles instead of reading the Bible, and if his parents had been foolish enough to allow him to take advantage of that conscience clause, he was sure of this—that he should have made a more indifferent Churchman than he was now, and he was quite certain he should have been a worse man. But, perhaps, they would allow him to add that he had no sort of faith in those wandering Christians who roam about from fold to fold, and find no rest for their unstable feet; nor had he any sympathy whatever, but a pious dread of that increasing number of scientific men who tell us that they could worship God better in a field than in a church, and hold more exalted communion with their Maker in the contemplation of the works of Nature, than they could in those sacraments God himself had ordained for their edification and comfort.

Mr. Read concluded as follows:—

Now, let me tell you how very pleased I am to have distributed these prizes to-day. Although we have been told that there have not been so many candidates for examination, let me assure you that you cannot have three such bad years as the last three seasons have been to the agriculture of Norfolk, without its telling upon all the middle class. I hope when the present depression has ended we shall recover our proper proportion in these examinations, and I am glad to think that though the quantity has been somewhat poor, the quality has been super-excellent. I dare say some of you boys will think, you that are now entering upon life, that you have a great and difficult task before you, but you have begun so well—those I see before me—that there is no reason why some of you should not be eminently successful, and there is every reason why each one of you should have a career of useful and prosperous industry. As the lower orders become more educated it is more than ever necessary that we of the middle class should become more enlightened. We have happily no great war to clear off our middle classes, which has been the case in Germany within the last few weeks, but our population increases and multiplies, and, therefore, a great number of the middle class must make up their minds to emigrate. Happily for us, the British empire extends to every quarter of the globe, and we find our colonies in every clime, and some of you will have the privilege of taking the blessings of education and civilisation to remote corners of the earth. Let me give a few words of friendly advice to those of you now entering life. Whatever may be your position, however much you may be mixed up in the mass with other human beings, or however isolated be your lot, I hope that all of you will remember your individual responsibilities and duties. When you leave school still strive after knowledge as if the diffusion of learning depended on your attaining it. As future men of England act as if the dignity of the Crown and the welfare of the country depended on your own patriotism. In all your business transactions let them be as scrupulously honest as if the good name of every Englishman depended on your truthfulness. And before all, and above all, bring your Christianity into everyday life, so that men "may see your good works and glorify your Father, which is in heaven."

LARGE OR SMALL FARMS.

[The following is a paper on this subject, read by Mr. Bailey, at the recent meeting of the British Association in Liverpool.]

AT THE reading a paper at our meeting at Exeter, last year, it was suggested by an agriculturist from York hire that it would be serviceable were I to give them a paper on small farms, and, if so, he and his friends would go to the meeting of the British Association, at Liverpool, in September, 1870; consequently, I now appear before you, and will be as brief as possible. 1st, Are small farms profitable to the owner or landed proprietor? 2d, Are they so to the tenant or occupier? 3d, Are they advantageous to the labourer? 4d, Are they advantageous, nationally, as compared or in contradistinction to large? We will first take a proprietor, say, of 4000 acres: he lets the whole out variously; it is all arable, and the average 20s. per acre, without buildings: he divides it, by the advice of his agent, or of his own inclination, into various sized farms, thus:—

No.	Acres each.	Cost of Buildings.	Rental.				
		£	s.	d.	£	s. d.	£ s. d.
1	80	100	0	0	120	0 0	80 0 0
2	200	2500	0	0	300	0 0	200 0 0
4	400	4000	0	0	500	0 0	400 0 0
3	150	2400	0	0	180	0 0	450 0 0
1	100	1000	0	0	120	0 0	300 0 0
1	80	1200	0	0	72	0 0	180 0 0
1	20	200	0	0	48	0 0	60 0 0
5	20	600	0	0	120	0 0	100 0 0
28		14,800	0	0			4740 0 0

The land cost him, at 30 years' purchase, £120,000; the outlay for homesteads, &c., is £14,800, on which outlay he reasonably requires a larger interest than 3 per cent. on account of repairs, insurance, &c., say 5 per cent.; that is—3 per cent. on first cost and 5 per cent. on outlay for buildings. On the three largest, *i.e.*, one of 1000 and two of 500 acres each, the outlay could not be less than £4000; for the remaining moiety of the estate let out in 20 of the aforesaid small size farms, the least possible outlay for homesteads, &c., would be £10,800: 5 per cent. interest on the outlay of the three is £200, that of the twenty smaller £540. This calculation sufficiently explains one of the reasons for landed proprietors liking to let in large rather than small farms; the larger outlay is not convenient to all—it increases trouble to themselves, steward, or land-agent. With large farms he has men of better education, capital, and position for his tenantry, such as he would ask to breakfast, and talk over the foremost topics of the day, or of long winter evenings invite with the medical man and clergyman to a rubber of whist, a game of chess, &c. On the other hand, if he has plenty of spare capital, he may afford to sacrifice 1 or 2 per cent., and wish to see 20 or any number of occupants, instead of one, two, or three, and thus show an amiable leaning towards small occupiers. Secondly, are small farms profitable to the tenant? It was said by the wisest of men, "Blessed is he that sendeth forth the boot of the ox and the ass," with reference to the agricultural operations of the East; and again, "In all labour there is profit." Experience confirms the fact—*i. e.*, I take it, in all well-directed labour. Only a close comparison will enable us to determine the relative advantages or disadvantages of small holdings. It would be wearisome and unprofitable to particularise every size of farm; and, instead of giving the calculations of ten, five will suffice, first premising that the occupiers of 1000 acres should possess a capital of at least £8000, equivalent to £8 per acre; those of 500 acres and below, not less than £10 of capital to the acre. Findlater, in his "Agricultural Survey of Peebles-shire," some years ago, stated that it was necessary for the tenant to make three rents, since which, with the increase of rents, tithes, rates, taxes, wages, and our less frugal mode of living, it will perhaps be conceded that four rents must be made of the produce. Thus:—

Acres.	Rent.	Capital.	Produce.
1000 .. .	£1000	£8000	£6000
100	110	1000	550
50	70	500	280
25	45	250	180
10	10	100	64

But in the smallest, or 10-acre, it must be greater, as the occupier, not having wages, must live out of the produce. To go a little more into detail:—

Dr.	£	s.	d.
Rent	10	0	0
Tithes, rates, &c.	4	0	0
7½ acres ploughed twice, harrowing, rolling, &c. ..	3	15	0
5 bushels seed Wheat at 5s.	1	5	0
2 bushels seed Barley at 4s.	2	0	0
4 bushels grass seeds at 3s.	0	12	0
Turnip, Mangel, Swede, and Carrot seed	1	0	0
With Potatoes for planting, hoeing, wages	2	10	0
	£	1	2	0
Cr.				
2½ acres Wheat, 32 bush. per acre, 10qr. at 50s. ..	£25	0	0
2½ acres hay at 8os.	10	0	0
5 acres barley, 32 bush. per acre, 10qr. at 32s. ..	10	0	0
5 acres fallow, viz., Turnips, Mangel, Swedes, Carrots, and Potatoes	45	0	0
	£	0	0

In this calculation nothing is debited or credited for manure, as, supposing pigs are kept, the manure would suffice, and about balance the account of their keep and attendance, little profit beyond that being generally made by fattening. The above shows a balance of £64 18s. on the year's labour, care and thrift; certainly not too great a reward for honest industry and the decent rearing up of a family. The occupier of 25, 50, or 100 acres works himself, or fails to keep his position. I will take the 100 acre occupier: he occasionally puts his hand to the plough, and is always occupied on his farm, employs a carter, a ploughboy, a lad as shepherd, looking well to the flock himself, also a good labourer for the general work of the farm, such as reaping, mowing, hoeing, ploughing, threshing, hedging, ditching, manuring, &c. Four horses are kept, one used occasionally as a nag, four being necessary to make a second plough team, &c. Small farms, with their enclosures, are not so favourable to sheep breeding, or to the health of sheep as the larger. The 1000 acre farm, where no steam-plough is used, employs rather less manual labour in proportion to the acreage, but a much less proportionate number of horses, viz.,—22, or one horse to 45¼ acres, whilst the 100 acre farmer keeps one horse to 25 acres. Horse-labour is lessened on large farms by the fields being larger, there not being so much time lost in turning in large as in small fields, whether ploughing, sowing, drilling, harrowing, rolling, &c. Hedging, fencing, and ditching are much less proportionately in large occupations. Mowing, reaping, and hoeing by hand, being paid by the acre, differ little in large and small holdings. Cropping, the same proportions of seed being sown, will not materially differ. Harvesting or housing the crop is in favour of large farms; the proportion to be carried at any given time when fit, with the larger appliances at command, of course facilitates the operation, and consequently the safer housing of a crop. In my observations in various counties, one in the north-west, a parish of 7500 acres, mostly in small farms of 20 acres to 100 acres, the farming was considered bad, the occupants eking out a bare subsistence. One occupier of 22 acres supplied me with particulars of rent, tithes, rates, &c., with produce. He was a blacksmith also, and the most he had ever made of his produce beyond the consumption of his own family was £20 in any one year. I will take one in the southern part of the kingdom, where there is a hamlet of a few hundred acres in a wild but beautiful locality. The owners have from half an acre to three acres each, many of whom are said by persons capable of judging to be little better off than paupers. Again, look at the New Forest, Hants. About No Man's Land and Rufus's Stone (where the occupiers of the turf huts, with small pieces of land, have the forest right of turning out the pigs for the "mast"—*i. e.*, Acorns and Beech-nuts—also their ponies, peat-cutting, and Heather, for the manufacture of besoms, which they take to Southampton, Romsey, Lymington, and Salisbury markets on a two-wheeled truck, which they call a "molly-wander"), the survey will not be found favourable to the small holding. A great deal has been said in Parliament, and out of it, on the 60,000 acres of land in the New Forest producing a nett revenue to the Crown of only £1700,†

* Two acres of the four roods, worth in the 2s. and £25; half-acre P. tat., *i.e.*, 40 poles, at 2 bush. per pole, at 5s. per bush., £5.

† In Committee of Supply, July 21, 1870, it was elicited by Alderman Lawrence that the nett income from 63,000 acres was only £1767.

which might be sold off in various sized farms, and produce £50,000 per annum: in doing which there might be a stipulation, after the foresters were compensated, that every purchaser should be compelled to erect cottages, with allotments of land to each, sufficient for the labourers required in cultivating the said farms. I will observe that in small farms, such as conacre, there cannot be that division of labour necessary to economic production, the mechanical power which lessens cost in manufactured articles bringing them within the reach of all, are not available, viz., 1, the lever; 2, the wheel and axle; 3, the pulley; 4, the inclined plane; 5, the wedge; 6, the screw; but which machinery, including the steam-plough, is now getting into use on large farms. H. G. Hind, in his work on Nova Scotia, says "one cause of mining operations failing to pay is a want of steam and other powerful machinery." In the report by Dr. Augustus Voelcker and H. M. Jenkins, F.G.S., on the agriculture of Belgium, published in the "Journal of the Royal Agricultural Society," pp. 31 to 38, part 1, v. 6, it is shown that in that country, the *beau ideal* of small farming, the 10-acre farmer has no larger income than an English labourer; but, heavy as the Government and notary's fees are, he manages to buy a small piece of land at 40 years' purchase by his great thriftiness. (Read, if time, two pages "Belgium Farm," p. 82.) Farming and the minute subdivision of land in France show results unfavourable to small farms. France by soil and climate might be a great exporter of corn, yet of 13,843,124 cwt. of corn imported up to June 30, 1870, —50 per cent. from Europe—not one came from France, and only 1 per cent. in 1866, and none in the previous year, 1868. People entitled to credit for disinterested motives agree that in Ireland the very small holdings are injurious to all. In a recent lengthy tour in that beautiful country, amongst others N. F., Esq., J. P., owning a large estate (farms 150 acres, amateurly, as a landlord and a master is a pattern of liberality, and as such justly esteemed by all parties), gave me as his decided opinion that small holdings were a great evil. At the banquet of the Royal Agricultural Society of Ireland, August 3, 1870, Earl Spencer, the Lord-Lieutenant, who on agricultural affairs is a great authority, made some observations on large and small farms, expressing a wish "to see a variety of farms spread over the country suitable to the peculiarities of different districts." By the third report of the Commissioners the condition of the agricultural labourer in Wales has vastly improved since the completion of railways, opening up as they have the mineral wealth, and facilitating the locomotion of the workpeople in that delightful principality. You hear nothing of the land question. Scotland has taken the lead in agriculture, and is quite able to keep it: her sons, being educated and thrifty, are capable and willing to migrate, instead of remaining at home clamouring and pining after small, trifling holdings of land. It would be well if more of the sons this side the border were like them. I must withhold the exact returns of some various sized farms, but I can state with confidence that the profits are below that to which they are assessed under schedule D to the Income-tax,* especially in light land districts, for the past three years in particular. Where tenants are men of skill, capital, and enterprise, occupying 300 or 400 acres, with substantial and good homesteads, there is an error in throwing two or three of such farms into one, sometimes done to suit the whims of a steward, though the owner borrow the money to erect the buildings, and men of respectability, after very many years' tenancy, get notice to quit.

In conclusion, in laying out a large estate, I would by no means set out farms of one uniform size, though I think it is shown that the large are most advantageous to the proprietor. If there is a saving of manual labour, with so decided an economy of horse labour as from 25 to 50 per cent., a larger amount of sheep and cattle reared for the market, production of cereals, &c., increased with a proportionate less capital, then large farms are more beneficial to the tenant than the smaller, always bearing in mind that no farm can be occupied with advantage to the occupier, proprietor, labourer, or the country, unless the tenant has ample capital; to which I will add skill, enterprise, and security of tenure. As regards the labourer, the work done on small farms is often slovenly, on the larger more piece-work is done; the labourer earns more wages, and this by giving a better description of labour: he is better housed, and has that great desideratum, an allotment of ground, raising vegetables for, and training his family early to weed, hoe, &c., as well as keeping him from the beer-house, with its deplorable concomitants. Increased production at less cost, especially as regards the prime necessaries of life, is of first importance, whether by knowledge of chemistry as applied to land in manures and management, or extent of operations on a large scale, the improvement of stock with the capabilities of fatting, and the like it, must, by leaving more capital for other objects, increase trade and commerce, and thus to an indefinite extent advance the national weal; consequently, large farms, rather than small, are advantageous to the proprietor, tenant, labourer, and nation at large.

Note.—Since writing this paper I have seen a letter on "The Climate of Ireland," by "W. D. C.," published in the "Journal of the Society of Agriculture," August 19. He says, "The improvement of Ireland is only to be effected by a system of large farms." "The popular wish, however, is for small holdings." "It is thought that the country, when divided into Potato gardens, and all covered with cottages, will be a paradise. But this poor man's paradise, beginning with a few years of felicity, will assuredly lead to the pauperism of ages."

* I have heard that near Newbury, Berks, a profit of £5d has been obtained off an acre of land; that the pasture land which has had the Bedford sewage applied to it yielded £40 per acre; again near Lewisham, in Kent, where there has been an enormous outlay in cultivation and in the erection of hothouses, glass sheds, and the like, the produce has been £3000 and even as high as £4000 from one acre. But these are exceptional, and in no way of general or even frequent adaptation. We must bear in mind, science does not rest on isolated instances, but on an accumulation of facts.

COMPOSTS.

Few things are so little understood as composts in which to grow plants, yet if we take up any treatise on plant culture, such as Loudon's "Arboretum Britannicum" or Sweet's "Propagator," after stating the name of the plant and the country it came from, we find the soil in which it grows, or rather the compost or mixture of soils most suitable to grow it in, set down as of the highest importance; thus the genus Epacris would be marked as a New Holland plant, and requiring to be grown in sandy peat. The Heaths from the Cape of Good Hope, and the Rhododendron and other hair-rooted plants from America, would all be set down as requiring a compost of peat and sand, and their cuttings can hardly be struck in any medium so freely as in one of silver sand without a particle of earth of any kind. When we read of some new manure with a name compounded of ancient Greek and dead Latin, we might readily suppose that a remedy had at last been found for all the shortcomings that poor farmers and gardeners have suffered from since man began to multiply upon the face of the earth. The extreme dryness of guano and the extreme wateriness of town sewage will help us a good deal in the way of sober reasoning on this matter of composts; for, notwithstanding the condemnation with which both were met at their advent, they can now hold their own against all comers; yet nothing will grow in the best guano as imported, neither will any plant, save the coarsest aquatics, grow in the ordinary sewage of a large town. One is too dry and concentrated, and the other, having no body, would run away; for the water in sewage is just as much a carrier of manure without truck or barge as the Bridgwater Trust are carriers by water; and when the soil has unloaded the water of its goods in the same way as the workers in a beehive unload their carriers, the surplus water must be got rid of by drains, for the composts in which all plants not aquatics are to be grown must not be in the character of a slough or gutter,—indeed, the water will right itself, if the means be given, for we see it rise upwards of its own accord from the saucer when the earth in the flowerpot is dry; and, again, we see it run downwards into the saucer when the flowerpot has been over watered, but in both cases it leaves the soil or compost, just as it ought to be, neither dust-dry nor miry wet, and the communication between all the parts of the compost is kept up, principally by the agency of water; and the sacred penman must have known well in those early days the sterility of dry compost, when he spoke of a "garden without water." Few things deceive the farmer more than that of the value he sets upon wet straw as a compost, for it is by no means of a spongy nature, like sawdust or peat, to absorb urine or other moisture in cow-houses or stables, but it is a bulky product of the farm, and litters everything. It is easy enough to get straw trodden under foot in the farmyard and well wetted and dirtied, but the value of such wet dirty straw as manure or compost in which to grow plants would hardly pay for its being carted to the field. When leaves of trees, straw, and the like get rotted down to leaf-mould, they lose in bulk but not in value, for they have to come to that pass before they can be taken up into the new vegetable, and therefore they are only advanced a stage, and that in the right direction, by being reduced to powder.

In horticulture an ordinary compost for the potter's bench would be made up of equal parts by measure of loam, peat, leaf-mould and sand; and no one would question for a moment that such a compost or soil extending over acres of a farm would grow fine crops of all ordinary agricultural productions. In ordinary cases loam would be the staple soil, and compost for such a soil would consist of the proper application of small quantities of the other ingredients, as peat, leaf-mould, and sand. I have merely put this case in order that I may be clearly understood, as no rule could be laid down to supply the wants of any soil unless those wants were made manifest. Our hills and moors are mostly covered with sandy peat in various depths, and from this soil there frequently rises the finest forests of Fir trees; and although this example is patent to everybody, I have seen plants of the Pine and Fir tribe mulched with farmyard manure containing plenty of ammonia, and they died,—the manure was good, but in this case misapplied. Sand is nowhere respected as a soil to grow any profitable crop in, yet what gardener is there that does not use it heavily in composts for most plants, from the Pine-apple downwards. But for all that, has any man ever seen a farmer sanding his soil, unless it be in the case of sea sand containing shells, which is sometimes carted to do the work of lime along the seaboard? Lime is important for most cereals in corning them, and for agriculture generally; it is useful in composts, but not mixed with other manures, but applied directly to the soil; but when this practical idea has been imported into horticulture by inexperienced parties, and the Cape Heaths and American plants have got a taste of it they have died by inches. Salt applied to a green field usually deepens the green of the grass, and kills the Moss in old pastures, but for want of knowing the proper dose to apply I have seen a field salted "liberally," but instead of its producing grass for milch cows it produced Mushrooms, and the Moss and grass came off like a shorn fleece. It will readily be seen that it is easy to give a compost heap a lick of salt, soda, or the like whilst under handling by itself, whereas it could not be distributed over acres without extra care and cost. Maiden loam, marl, and the like, will make what cooks would call stock for compost, the following ingredients or seasonings to come from more costly quarters, where a pinch of this or that may be added to suit the circumstances of the case. I am well aware that all this is already done for the farmer by the manufacturers of manure, as Turnip manure, corn manure, &c.; but what is aimed at here is the application of composts in bulk, composts which no dealer could supply, by means of which such as guano, salt, soot, soda, &c., would have a body, and be no more an essence only, and liable to be washed out too easily. But this is not all, for the quality of the produce is affected by the kind of manure or compost in which it has been grown. I could instance crops of Turnips that were deficient in keeping qualities and also in feeding qualities, and the Potato crop is a notorious example of quality injured or improved by compost.

I once had an experiment with goat's dung, and the Cabbages grown with this manure had when boiled the rank smell of the goat. The compost, being the storehouse or stomach whence the plant draws its supplies, must be looked to that it be in a healthy state, for although many plants are foul feeders, yet some of them have constitutions that can digest crude materials better than others, and however dirty this department may be it must not be overlooked. All gardeners are aware of the process of hotbed making, in which the dung has to be "sweetened" before using, and when this has been accomplished the atmosphere of the Melon frame is certainly the very best that ever plants were grown in, and rare Orchids and the like have been put into a dung-frame to get them to make a start. Jerusalem Artichokes, grown in loam on one side of the river Churnet, were as good and as white as the best Cauliflower for table use, whereas those grown on black soil on the other side of the river, only a mile apart, were only fit for game to peck at, having ugly streaks of a bluish black through them when boiled.

All these examples clearly point in one direction—that the manure, whether guano, or the like, should not be used as a simple, but compounded with other bulky ingredients, in which it should be buried, and that for reasons which will be best understood by practical men, when I remind them that many crops do best when the manure has been first partially exhausted upon a previous crop. In speaking of maiden loam, that is, good earth,—not subsoil that has never borne a crop,—its value in horticulture is thoroughly understood and duly appreciated, for if we sow Mignonette in maiden loam we may reckon upon a fine crop and highly fragrant flowers, but only for once, the second year it usually falls off, the cream of the loam is gone. And yet this case of loam is like that of the sand above stated; it would seem folly to cast maiden loam upon the top of a clay field, but it is far otherwise in real practice. The late Mr. F. Dickson, the eminent nurseryman of Chester, told me of a neighbour of his who marled a clay field for Wheat, and a part of the field was not so marled, and when the harvest time came Mr. Dickson was anxious to see the effect of what he considered a very unreasonable experiment; but the ears of Wheat were nearly an inch longer where the ground was marled than where it was not, and Mr. Dickson's opinion was practical as well as honest. Fuller's earth has been found to surpass any loam, clay, or marl as a compost for the choicest kinds of Roses; and any one seeing this earth could tell at a glance that no root of any plant had ever penetrated into it, so that its treasures, whatever they might be, have been locked up from use for ages past, and yet it falls freely in water into very fine particles; and this, too, like the maiden loam with the Mignonette, casts up its cream with the first crop of Roses, and needs renewal annually.

In the archives of horticulture there are to be found many well established facts which seem to illustrate certain principles which have to be kept in view by all cultivators, whether they be foresters, farmers, or gardeners; and although the day may be gone by for dogmatising, there is still a craving for truth; and experience is charging, as usual, a high figure for her teaching, holding up to view the errors of others as beacons to warn the unwary, and chronicling cases of successful issue to cause emulation. In many cases the selection of the compost to grow a plant in is all that

we can do for it; the issue of all beside has to be left in abler hands. *Alex. Forsyth, 9, Islington Square, Salford.*

Home Correspondence.

Ransome's Double Plough.—In the report of implements at the Oxford meeting of the Royal Agricultural Society, July 23, 1870, an illustrated notice is given (p. 1009, fig. 187) of the double plough of the Messrs. Ransomes, Sims & Head, which gained the 1st prize in the first class at the trials of the Peterborough Agricultural Society reported in your columns, the plough trials October 15, and dynamometrical last week, October 22. In your report of the Smithfield Christmas Club Show, December 11, 1869, p. 1294, an illustrated notice is given of the double plough exhibited by the Ransomes in the Agricultural Hall, and on comparing it with fig. 187 it will be seen that the improvements recently made consist in the means of adjusting the breadth of the furrow-slice, the lifting apparatus for throwing the implement out of work by the pull of the team, and the central wheel and carriage for turning the plough at the land's-end. This principle of lifting and turning the implement at the land's-end is that of an expired patent of William Smith, Esq., of Woolston—the father of steam-culture, the fruits of whose inventive talents are now being reaped abundantly all the world over. *W. B.*

Mustard Growers and Mustard Buyers.—Some of your readers may not be aware that the condiment which they eat with their roast beef is nearly all grown within a circle of 30 miles radius, taking Wisbech as its centre. In this district several thousand acres are generally devoted to the growth of Mustard seed, and it is at this season of the year that it is brought to market and sold to the manufacturers, who come down to Wisbech for five or six Saturdays in October and early part of November. The number of buyers is, however, confined to about half-a-dozen, and these gentlemen before coming into the market arrange among themselves the highest price they intend to give for the finest samples of seed, and offer the grower a sum in proportion to the condition of the seed, always, however, keeping within the pre-arranged maximum. This year, the area devoted to the growth of Brown Mustard seed has been unusually large, and the manufacturers being aware of this, have fixed the highest price at such a low figure, that many of the farmers who have annually grown a considerable quantity, have declared that they intend to discontinue cultivating it altogether; and, indeed, the merchants of late years have always lowered the price each succeeding season, so that even if the farmer could always insure securing his crop in good dry condition, the price offered him by the buyers is so low, that it is not worth growing. As a mere shower of rain falling upon the crop as it lies in the field cut, but uncarried, is sufficient to turn the seed grey, no one can rely upon producing a brown sample of seed with any degree of certainty; in fact, in ordinary seasons there are more grey samples shown than brown, and this greyness lowers the market value of the seed in many cases to the extent of 50 per cent. Unfortunately, too, for the farmers the early part of the spring was unfavourable for the growth of the plant, and the crop on some of the old lands has been very light, the yield in many instances not exceeding 16 bush. per acre, and I have heard of several cases in which the produce has been under 12 bush.; but owing to the greatly extended area which is now yearly sown with Mustard, from the fact that some landlords have withdrawn the restrictions with regard to the growth of this crop, which in many of the old leases, and in some at the present time, is classed among the "pernicious seeds," the supply is always amply sufficient for the requirements of the manufacturers. As the seed itself is of no value to the farmer for feeding purposes, he must sell at whatever price he can, or if speculative he may keep it until next year, with the pleasing prospect of having to take a lower sum still, for now the Mustard makers find that there is always enough grown for their demands, they lower their price to such an extent that it is a certain losing game for the farmer to grow it. But this state of affairs will ere long be remedied, for as the farmers generally cease to cultivate it, the buyers, finding that the supply is not equal to their wants, will outbid each other, and the growers then will have the advantage. Some 30 years ago the growth of this crop was much more limited than at present, for no one thought of growing Mustard, except on land newly broken up from grass, and it was usual to take three or four crops of this seed in succession. In those days the manufacturers gave more than double the price that they now offer, to induce the farmers to grow it, and now that its cultivation is extended, they refuse to give more than about 12s. per bushel for the finest samples; but though the price of the raw material is cent. per cent. lower than it was years ago, the manufactured article is still the same as ever, so that the trade, if a good one then, must now be enormously profitable. It is an established fact that farmers are given to grumbling, but if the manufacturers could only have heard one-half of what was said of them by some of the Mustard seed growers last Saturday, they would have been more surprised than gratified. So long as the present monopoly exists in the crushing trade, the poor farmer may sigh in vain for a high price, for the buyers have it all their own way, and the grower must grin and bear it. Still, there is one thing left for the farmer, which will next year be carried out to a great extent, and that is—to grow some other crop. *Nemesis, October 19.*

Paterson's Bovinia Potato (see p. 1245).—I planted 3 lb. of this Potato cut into sets, which planted two rows, — paces long and 4 feet wide; the produce was "half a bag" (80 lb.), equalling 266 lb. per 10 lb. of sets, of good sizable Potatos, none enormously large. I have not tested their quality for table, they were not fully ripe; judges here much approve their appearance. I am hopeful for it; the economy of seed will be great. I think it should not be planted thicker than at least double the distance apart of such as Rocks (and cut sets used), and mayhap the greater the distance apart the greater the crop, it is such a strong grower, looking to me like the ideal of a Devonshire sort I have "heerd tell o'; yet so long as ee keep round hoeing (moulding) 'um, so long wool thay drow out fresh taters at every moor" (root). *R. H. Poynter, Taunton.*

On Drying Roots.—Some year or so ago I was permitted by your courtesy to address myself, through the medium of your journal, to the agricultural interest on the subject of concentrated root food. It is not on this subject (though on one nearly allied to it) that I now wish to address you. I may say, however, in passing, that careful experiments made last year by Mr. Colman, of Norwich, the celebrated starch and mustard manufacturer, completely corroborate and establish the value I attached to the concentrated root by my trials; and that I look forward to the manufacture of Mangel cake in connection with sewage farming as opening up a new source of manufacture to this country. I believe, also, at the same time, that its manufacture will not be resorted to by the farmers, as I once thought it would. There is, however, one other portion of my patented process to which I think the attention of the farmers has not been sufficiently turned—I mean the partial drying of roots in the clamp. I have invented a simple process by which the roots may be partially dried in the clamp, without any extra labour whatever, and at the cost of a few pounds per clamp—about £5 or £6 for a clamp of 240 tons, exclusive of the cost of apparatus. What advantage is there in this process? asks a farmer. Simply this: that the value of the root for feeding purposes is just doubled in value. Mangel is calculated by farmers to be worth about 6s. per ton for feeding—*i. e.*, 1 ton of Mangel will make 6s. worth of beef or mutton; by my process it will make 12s. A clamp of Mangel, therefore, of say 240 tons, would, by the old process, make £72 worth of meat; by my process, £144, less £5 or £6, the cost of fuel. It is all very well to tell us this, says the farmer, but how can you prove it? Prove it yourself, my dear sir; you can do so most easily. There are few farmhouses which do not contain a brick bread oven. Take a barrowful or two of fresh Mangel from the field, and put them into the oven to bake until they are reduced to about half their weight and half their bulk; if burnt or blackened no matter, the sheep will not like them the less. When cold, cut them up, and give them, after having just tasted them yourself, to see how good they are, to your stock. See with what eagerness they devour them in preference to any other food. Look at the result in four weeks' time. In this particular season, when hay is so scarce and dear, this system will be most valuable, as I believe, with a little chopped straw mixed with it, stock will require no hay whatever. All I say is, let the farmer try the simple plan I recommend of baking in the oven; his own experience will tell him in a minute I am right. *Hugh Smith, 21, Westbourne Terrace Road, London, W.*

Town of Linlithgow and its Sewage.—My attention was painfully arrested by some evidence given on September 23 before the Commission on the Pollution of Rivers, respecting the town of Linlithgow. This town is very pleasantly situated, and seems to have considerable attractions, with its interesting ruins (the birthplace of Queen Mary) and its beautiful lake. But it seems that the town is the abode of much disease, and that the lake, instead of being pure water, is pestilential. It seems that the sewerage of the town is execrable, and that its contents, to a large extent, are deposited in the lake. It is painful to think that the inhabitants seem to be helpless and unable to devise a remedy—which seems to be very simple—but perhaps they are not to be blamed (while they are deeply interested in the matter), at least, if they are, the same blame seems to attach to almost every town in the kingdom. It so happens that I have some knowledge of the localities of Linlithgow, at least enough to enable me to state, in general terms, what I think ought to be done—leaving details to be taken up when a disposition to provide a remedy may manifest itself. In as few words as may be, I would suggest what might be done. 1st. That the sewerage of the town should be put into a good state by relaying it with large glazed earthen pipes, the sewers on the south side of the railway being carried through the railway, so as to be conjoined with those on the north side. 2d. That the whole sewers should be carried westwards, and down towards—but not too close to—the edge of the lake, and an intercepting sewer of sufficient size to be constructed round the south-west curve of the lake, into which larger sewer the whole smaller sewers should be conveyed. The large sewer to be carried to a point somewhat below the sluice, where the outfall from the lake issues. 3d. That at this point a covered reservoir should be constructed, and a steam engine be erected (probably of 20-horse power, perhaps less, would be sufficient) and connected with an iron pipe, through which the sewage should be sent to its ultimate destination. 4th. That an agreement should be entered into with an owner of land as near to the reservoir as can be found, who shall agree to take the whole sewage for application to his land, either for the purpose of market gardening or general agriculture, or a combination of both, from which would arise such benefits as would well enable him to pay a price for the whole sewage of the town. 5th. It is a rough estimate; but, assuming a population of 5000, it is believed that £1500 or £2000 might cover the cost of the necessary works, and that it would be a good bargain for a landowner to pay 5 per cent. annually for the valuable manure which he could obtain; to which might be added a small assessment on the town—the combined amounts to enable the town slowly to pay off the capital expended. No doubt these ideas may be improved upon, but they are at least suggestions for more minute consideration, and they embody principles which may be very beneficially reduced to practice. *N.*

Mr. Mechi's Reflections on British Agriculture.—[The following letter was addressed to Mr. Mechi by an old and esteemed agricultural improver well known in Manchester:—]

"Esteemed Sir,—Being alone this evening doubtless, in some degree, imparted a more reflective thoughtfulness to my feelings, which were in much sympathy with yourself, as I perused and reviewed the report of the Essex meeting, detailed on p. 10 in Monday's *Mark Lane*, and compared that account with what I find on p. 3 of the same paper, under 'Reflections on British Agriculture,' which, permit me to say, is one of your happiest addresses. I say the contrast of the way in which the speaker is listened to, in the one place opposed by stolid prejudice, ignorance, and brawl—I know not what else to designate the opposition you met with—and then read the 'reflections' by the same individual, the conclusion I come to is that agriculture owes you much; that we farmers are greatly indebted to you for your indomitable energy, zeal, and singleness of purpose in developing sound progress in husbandry pursuits, and in everything—be it science, mechanical, or in associating chemistry with our farming pursuits; to sum up altogether, you have largely contributed to the advancement of agriculture. Your name will live in history, and often be quoted as an authority in many matters pertaining to farming. I seem prompted to write these few lines expressive of a kindred spirit's sentiments with your own, though in a more limited sphere, perhaps; but I know by experience what it is to contend with ignorance and prejudice amongst too many farmers, when, with honesty of purpose and purity of motive, you seek to raise them in the social scale, and to rouse them to see things as they are and must be by the inevitable changes of the progress of the times we are living in. I can imagine you wrote the 'Reflections' after the Essex meeting, and again my spirit ventures to associate in sympathy of real feeling with you. Doubtless many scores of men do so also, and if only a few make free to convey an expression of like sentiments as I presume to do, it may serve—as I intend and hope for—somewhat as an antidote to the one and an encouragement to the other; for be assured your labour has not been in vain, but much that you speak and more that you write will prove as—

'Bread cast on the waters.'

"Farewell!—it is now midnight. May health, with prolonged life and much happiness, be meted out to you by the Great Husbandman of all on the earth and all in heaven, is the sincere desire of, "Yours faithfully,

"——, *near Manchester, Oct.* 13."

"*J. J. Mechi, Esq., Tiptree.*"

Foreign Correspondence.

ZSCHOPAU, SAXE, *October* 19: *Pneumatic Sewage Carts.*—In answer to the inquiry of your correspondent, R. Binns, Ulverston, in the *Agricultural Gazette* of the 15th inst., I beg to state that not only at the Hague and Vienna, but almost every large town in Germany, the pneumatic sewage cart is used with perfect success.

Four years ago a company was formed at Berlin, under the name "Ceres," and it has extended its branches to nearly all the large towns, for the purpose of emptying cesspools, drains, &c., without smell, and at one-fourth the labour and cost. Not eight miles from where I live is the large manufacturing town of Chemnitz, with 80,000 inhabitants. No other carts are used but these. By the aid of a small pump the contents of the drains, cesspools, &c., are passed through a 5-inch vulcanised indiarubber tube direct into the cart, which is perfectly air-tight. These tubes are joined together as required any reasonable distance, and the passers-by do not perceive the slightest effluvia. I have often seen them at work in thoroughfares in the day time, and can testify to their thorough efficiency.

I shall be happy to procure any information that

may be required on this subject, being personally acquainted with the patentee. *George Paston (of Chatsworth), Zschopau, Saxony.*

Farmers' Clubs.

BLANDFORD.

The Principles involved in the Breeding of Stock.—Mr. SPOONER, of Ealing, Southampton, lately delivered the following address on this subject :—

Thoughout the whole range of creation there is nothing perhaps which strikes the mind of the student of Nature with greater force than the wonderful provision made for the preservation and sustentation of animal life. There is no spot so barren but what some vegetation appears, and whenever this is the case, animal life in some form corresponds with the supply of food. Provision is made for maintaining and augmenting the species far beyond the supply of food, and thus the struggle for life goes on; the weakest goes to the wall, and the strongest propagate their kind. This phenomenon has been termed by Mr. Darwin "natural selection," which term, however, does not carry with it its own solution, but demands some little explanation. Not only is the surface of the earth instinct with animal existence, but even the very air we breathe is full of the germs of animal or vegetable life, ever ready and ever seeking the proper niches to enable it to increase and multiply. The theory of spontaneous generation which has been so long and so vigorously maintained, and which from time to time appeared to be supported by phenomena which could scarcely be disputed, and could not well be otherwise explained, has at length received its quietus, and has yielded to the facts developed by modern research; and the old doctrine, "*Omne ex ovo*," has been proved to be sound. Decaying substances are soon peopled with animal life, but this does not take place provided all contact with external air is prevented; nor does it result if the air to which it is exposed has been first deprived of all its germs by means of fire. It would appear as if the same scientific truths which modern discoveries had brought to light were believed in with such absolute proof years ago; for Hudibras wrote:—

> "Great fleas have little fleas
> Upon their backs to bite them;
> And little fleas have lesser ones,
> So on, *ad infinitum*."

"Like begets like" is an axiom that cannot be disputed, and examples are continually met with showing how types are handed down from father to son, and from generation to generation; and yet, as propagation is effected by parents very dissimilar from each other, there are causes in operation which result quite as much in diversifying the race as in handing down the types from one age to another; so that we may be probably correct in saying that no single individual is the precise counterpart of one gone before. What, then, is this vital union, or rather, what is it not? It is not a merely mechanical union, like the combination of spirit and water, or the composition of the atmospheric air. It is not chemical union which, by the combination of two substances, produces a body totally different from either of the elementary bodies, such, for example, as water—the product of the combination of two gases, oxygen and hydrogen. Vital union is probably partly mechanical, and slightly analogous to chemical union, but, differing materially from either, undoubtedly, *sui generis*. Each parent possesses certain peculiarities, but by no means in equal proportions, and there are no fixed rules enabling us to judge precisely what the effect will be of certain combinations, but yet there are certain truths, or rules, although abounding with exceptions, which careful observation has detected and recorded. Of these the first in importance is the influence exercised by either parent on the offspring. When the influence of one is greater than the other, the term prepotency is used to denote the superior influence. And although this prepotency may belong to either parent, yet in the majority of instances, so far as external form goes, it belongs to the male. This is partly owing to the fact that the vital functions, the internal frame, and the central and nervous systems, which are unseen, more frequently follow the female, whilst the more visible features, such as the external form, the skin, the back, and hind quarters, the size and general shape, is generally influenced by the male parent. Sometimes the very opposite is the case, and then the female is said to be prepotent. (Illustrations of the truth of the above remarks were then given by the lecturer, in cases where the male animal was superior in size and weight to the female, in horses and sheep of different breeds, in cattle, and the Manx cat.) In the human race a tall family was often the progeny of a tall husband and short wife. Sometimes the opposite alliance produced the same result, and sometimes part of the family were tall and the other part short; but it is scarcely ever the case that a mean or average size resulted from the union of parents of opposite statures. That the constitution, temper, and mental condition more frequently follows the female parent, is generally acknowledged; and it is considered as essential to the production of a clever family that the mother should be distinguished by mental gifts. It is well worthy of notice, the astonishing manner in which peculiarities and predisposition to disease is propagated, although such predisposition may not manifest itself till a good portion of a lifetime is passed away. An hereditary disease or peculiarity appears perhaps at about the age of 50, and not before, and yet the germ of predisposition inherited from the parent must have existed all this period. (The lecturer then proceeded to speak on Reversion, a term which, he remarked, was given to that well-known phenomena of certain peculiarities disappearing in one generation and re-appearing in the next, or subsequently.) It was this fact that, with animals when the first cross had proved eminently successful, a continuation of the cross-bred animals has by means of reversion caused all sorts of incongruous results to crop out, so as greatly to disgust the would-be improver. So strongly has this been felt by many breeders, that they have condemned crossing altogether except for purposes of the butcher, or confined to the first cross. Indeed, at one time this was the leading doctrine of the most prominent men belonging to our agricultural societies, who clung with superstitious tenacity to the doctrine of purity of blood, believing it to be the ark in which alone true safety was to be found. Time was when prizes were only given to three breeds of sheep supposed to be pure.

Cross Breeding.—Now what do we see? Improved Hampshire Downs, Shropshires, New Oxfordshires, and others, all from cross-bred parentage, but non-recognised as distinct breeds, and all considered worthy of prizes and of encouragement. These breeds may be considered as the successful results of crossing, scientifically and practically carried out, and although, no doubt, contemporaneously with these successful examples, many others have been made which have ended in failure, yet we cannot shut our eyes to the fact that new and distinct breeds have been thus created, and have been so perfected by rigorous weeding that they require no further crossing, but only careful selection, and may now justly take rank as distinct breeds. Although there was no reason to doubt but that the Southdown is a pure breed, greatly improved by selection, yet the Leicester breed was raised by crossing in the first place. It was as essential to have the best and purest parentage on the one side as the other. The Hampshire and Wiltshire Downs originally were large, bony, uncouth sheep, with horns, which latter were got rid of by means of Sussex rams, but still remained a very useful though coarse sheep, till Mr. Humphrey commenced his improvement some 30 years ago by means of two of Mr. Jonas Webb's prize Southdown rams, from which were descended all the rams he afterwards used or let, although he replenished his flock and maintained his size by occasional purchases of ewes. This improvement has been carried out with the greatest success by Mr. James Rawlence and others. The Oxfordshire breed is the result of the cross of the Cotswold ram with the Hampshire Down ewe. The Shropshire is indebted to both Southdown and Leicester for the improved breed of sheep recognised under this name. Thus, without disparaging the effects of those who have devoted their attention to the improvement of pure breeds, some of whom he was glad to see present this evening, whose exertions were worthy of the highest praise, yet all must acknowledge the great success that has attended the establishment of the breeds he had mentioned. Indeed, he considered that more skill and more science had been shown by the breeders of sheep than by the breeders of any other kind of animals. A certain want had been felt, and breeders set about to supply the want, whether it was greater size, earlier maturity, or larger or finer wool; and when the want was supplied and the breed established, further crossing had, for the most part, been discontinued. The Royal Agricultural Society, not leading, but falling in with the improvement, greatly aided and extended the movement. But whilst this was the case with sheep, it was far otherwise with horses. With the exception of cart-horses, the breed of which had certainly been greatly improved by the encouragement given by the Royal and other societies, he considered that other useful breeds would have been better if these societies had never existed; but to this he would refer again before he concluded. Crossing had been adopted with great success with pigs, for, although certain distinct breeds had long been known, such as the Berkshire, Yorkshire, and Sussex, yet it would be somewhat difficult to give a correct nomenclature to all the different breeds. The Royal Society have long since fallen back on the distinction of "large and small," "white and black" pigs. It would almost appear that the rule with regard to pigs must have been derived from Shakespeare, who in "Macbeth," in the incantation of the witches, says :—

> "Bubble, bubble, toil and trouble;
> Fire burn and cauldron bubble.
> Black spirits and white,
> Blue spirits and grey,
> Mingle, mingle, mingle,
> Ye that mingle may."

So with pigs it may be said to have been—

> Black pigs and white
> Blue pigs and grey,
> Mingle, mingle, mingle,
> Ye that mingle may.

In-and-in Breeding.—In-and-in breeding had been more successful with horned cattle than with any other animals, and with the Shorthorns it appeared to have been followed out without those objectionable results which were often considered to attend the practice. These objections were a disposition to barrenness, and want of vigour, and the increase of those diseases to which the parents are most liable. In the human subject it was considered—and with good reason—that the alliance of near relations was conducive to scrofula, insanity, and barrenness. The truth appeared to be that certain diseases and peculiarities were hereditary in particular families, which by alliance with relations became two-fold increased, whilst by alliance with other families not liable to such diseases there was a fair chance of the defects in question being crossed out. With cattle, and with Shorthorn cattle more particularly, by employing healthy parents, possessing great excellency and few if any defects, the benefits of the latter have been kept up without the evils which have so frequently followed the practice, and thus we have the celebrated Duchess and other families handed down in unrivalled perfection. In no breed of animals have the females been so highly estimated, which is shown by the remarkable sums given for the best cows at the leading sales. One interesting fact is well illustrated in the breeding of cattle, viz., the power of transmitting the milking, or female qualities, by means of the male, which must therefore have possessed the germs of those qualities belonging to the opposite sex. This was well shown by the Alderney bull, which was as important as the cow in transmitting rich milking qualities. Mr. Spooner thought, however, it was rather to be regretted that in giving premiums for cattle more attention had not been paid to the milking qualifications, but the purposes of the butcher had alone been regarded. Thus while some of the old milking breeds have almost died out, their places have been supplied by cross-bred and mongrel animals to a very large extent, it being considered in many instances that for dairy purposes pure-bred animals were not so profitable, more particularly on moderate pastures. With regard to horses, all must agree that the difficulty of suitably mounting a welter weight is greater than ever, and it is also an acknowledged fact that it is more difficult than ever to provide remounts for the cavalry and artillery. Why should this be the case, when it is well known that a good animal costs no more to keep or to rear than a bad one, and that such vast sums have been expended in breeding from thorough-bred horses? He well remembered the horses that used to be cast and sold out of the cavalry and artillery some 30 years ago, and how immeasurably inferior were the cast horses of the present day. He had occasion to look over a lot of horses thus cast a very few years since, and there was not one in twenty but what was faulty in structure, or had some hereditary defects. Why was this the case, but because it had become at first the convenience, and then the custom, to use broken-down race horses alone for stallions for getting saddle horses, which fashion the Royal and other Agricultural Societies, instead of opposing, had done their utmost to encourage. A certain few had set themselves up as law makers in this respect, and in total abnegation of the principles of science and physiology, except such as were derived from the training stable, and they have ventured to proclaim certain dogmas which others have been weak enough to regard like the laws of the Medes and Persians. These dogmas were that pure blood must be had on one side, and that side the male, and that thorough-bred horses alone possessed it. But to this he replied, 1st, That by using thorough-bred horses for successive years, in the course of ten generations they would have only about one-thousandth part of the original breed left, from which they derived their bone and substance, their constitution and digestive organs. 2d, That the female was as important as the male in breeding. 3d, That principles that had proved so successful with sheep and other animals would prove equally successful with horses. Thus after trying to get superior horses, in a few generations the animals became weedy and degenerated, and we were obliged to begin again, starting, perhaps, from the plough tail. He had no wish to underrate the good qualities of blood horses, but freely acknowledged that no other in the universe possessed so much speed and endurance, or could make such extraordinary muscular efforts, or whose nervous and vital systems were more wonderfully developed, or could better transmit their good qualities; but at the same time they were bad doers, were narrow and small in the carcase, and deficient in bone, requiring large quantities of the most nutritious food, and were, from their thin skin, very susceptible of cold, and incapable of standing the rough treatment and rigours of a campaign. The original parents, Barbs and Arabs, first introduced in the reigns of James and Charles, were small animals, about 14 hands, and the size of their descendants has been obtained by high feeding from their earliest. There is thus a perpetual tendency to reversion, particularly when excessive feeding is not adopted.

Conclusion.—He would, therefore, in conclusion, with a view to remedy these evils, suggest the following plans: As in consequence of the discouragement hitherto given by the leading Societies, it would not pay private individuals or companies to establish any scheme for the improvement of ordinary saddle horses, it must be done by the Government, or the aid of the

State; and first he recommended the doing away with Queen's plates, which, however useful in past days for improving the breed of horses, were no longer of any utility. The Turf, he thought, could take care of itself, and the money might be devoted to a national purpose, viz., the encouragement of the breeding of cavalry and other useful horses. Secondly, Government stud farms should be established, not so much for the breeding of weight-carrying hunters and cavalry horses as for the breeding of horses and mares calculated to produce them. Hampton Court might well lead the way in this respect. It would be far better than keeping it up to play second fiddle to Mr. Blenkiron. There might also be half-a-dozen other Government studs in suitable parts, and the loss on these farms would be but little, and would soon be repaid by the better supply and cheaper cost of good, sound, and valuable horses, many of which would make first-class hunters, and others valuable horses for cavalry, artillery, and harness purposes. All faulty animals should of course be weeded out annually. The greater part of the mares might be sold in foal, and the best of the young horses as stallions. He verily believed that if some such plan were adopted, in a few years they would be able to mount the cavalry as they ought to be mounted, and supply the country with valuable horses for all purposes, and in place of the worthless weeds that now abounded.

The stud farms in different parts of the country, to accomplish the ends in view, should be furnished with at least:—

1st. One thoroughbred stallion, the most calculated to get weight-carrying hunters and saddle horses, with suitable mares.

2d. One seven-eighths-bred stallion ditto.

3d. One or more three-fourths-bred stallion.

4d. One or more half-bred ditto.

These stallions to be available for the neighbouring farmers as well as for the stud farm.

5th. Mares, young and fresh, with size, substance, shape, and action (a few of which can still be obtained), but without pedigree, for alliance with stallions Nos. 1 and 2.

6th. Mares with the above qualities, but possessing one-fourth blood, that is, descended from a thoroughbred sire, and fit for alliance with stallions of Classes 1, 2, and 3.

7th. Mares with above qualities, and possessing one-half blood, suited for stallions 1, 2, and 3.

8th. Mares possessing three-fourths and seven-eighths blood, of proved excellence, and suited for stallions 3 and 4.

Discussion.

Mr. H. Fookes said as regarded sheep he had more practice than many present. There were many breeds of sheep which always did best in certain localities that suited the particular breed. Mr. Spooner had alluded more particularly to the Hampshire Down. There was no breed of sheep that had exhibited more improvement than they had during the last 20 years, especially in the Salisbury district. The late Mr. Humphreys told him at the cattle show at Islington some few years since, that all his best shearlings were descended from one of his ewes. The late Mr. Roper, of Clenston, bought a ram at Wilton fair some years ago. Mr. Rawlence, of Bulbridge, and himself sent ten ewes each to him; when the produce were shearlings. Mr. Rawlence exhibited Down ewes at the Bury St. Edmund's meeting of the Royal, and he (Mr. Fookes) exhibited shearlings for the cup at Dorchester, as Southdowns. They both took the prizes, and in each pen of ewes were descendants from Mr. Roper's sheep. This proves what may and can be done by judicious crossing. As regards the Shropshire, every breeder has a peculiar breed of his own, and if they would only look at the report of judges at the late Oxford meeting they would find in the conclusion of their report that they laid down stringent rules to guide the Shropshire breeders as to what a Shropshire sheep ought to be. He had acted as a judge of Shropshires at the Royal on two occasions. At the Battersea meeting there was a wonderful show, and at the present time he believed Lord Chesham's were as good as any. Every one must be very careful how they begin crossing; the first cross invariably did well, but he should advise all parties to keep the animals that were most suitable to his farm and his district. He had always stood by the Southdowns, and tried to keep them as well as he could, combining size, quality, and plenty of good wool.

Mr. J. Ford quite agreed in regard to Southdowns being the purest breed of sheep, but it was impossible to maintain a pure breed in Dorset without occasionally going into Sussex, and getting some from there. He had done so for 30 years. The late Mr. Jonas Webb had, he believed, had some of the best Southdowns possible to be obtained, but he could not get on without occasionally obtaining some of the original breed. He (Mr. Ford) was also a believer in pure breeds of cattle, but as with sheep so with Herefords or Devons. To keep up the purity of the breed, and prevent deterioration of stock, it was necessary to go into North Devon or Herefordshire. People could not be too careful in crossing, but certainly great improvement in herds had arisen by judicious crossing. He also quite agreed with Mr. Spooner in his remarks about the old Hampshire Downs, as being the most ugly sheep ever bred, but the improved Hampshires were very different. As regarded the Shropshires he was of opinion that they were almost all cross-bred. Mr. Newman, who had some of the best, had a Southdown ram from Mr. Webb's flock, and he noticed in Lord Chesham's show of them that there was more of the Southdown than anything—some of them had very fine wool, and others had wool as coarse as hair. He (Mr. Ford) said that a farmer should study to get such animals as were suitable for his farm, and having procured a good and suitable breed not to chop and change about too much.

KELSO.

Farmyard Manure.—Mr. Usher of Stodrig opened the evening discussion—the subject being, "Is it possible to farm arable land profitably without the application of farmyard manure?" He said he had brought forward the subject entirely for the sake of getting information, because on a little farm like his there was no difficulty in getting over it with farmyard manure. In making Turnips he always put the whole dung of the farm over his fallow break, giving it perhaps 12 tons per acre and so having tons of extra manure. All that he could say on the subject was theoretical, but he thought that if he was farming without farmyard manure he would be always inclined to top-dress grass land with Peruvian guano before sowing Oats, and after that he would make the Turnips with a considerable quantity of extra manure, and eat the Turnips on the ground with sheep, so as to get a little manure in that way, and to farm very high in every respect. He would also use a great deal of oilcake upon grass, which he did at present; but he thought that in farming land without farmyard manure there would be more need to do that.

Mr. Scott, Spylaw, thought the subject required very little discussion, because it was already proved, and must be patent to all of them, that land could be farmed without farmyard manure, and farmed profitably and well; and the improvements that had taken place on their steep hillsides and high-lying places where farmyard manure had never yet gone, were ample proofs of that. Farming, at one time, could not have been either well or profitably carried on without farmyard manure; but since they had got such an abundant supply of manures and feeding stuffs, he thought there was not the slightest difficulty.

Mr. Roberton, Whitehill, thought that the straw on a farm would pay nobody better than the farmer in putting it on his land. He believed there was no manure better than farmyard manure.

Mr. Burn, Ednam, thought a good deal depended on the locality. If it was in the neighbourhood of a town they would be able to sell the straw readily, and he was of opinion that they could farm land very profitably in certain localities by selling all their straw and buying artificial manures. He did not put the dung over his whole farm, but generally near the farm steading, so as to save labour. By putting bone manure on the land, the succeeding crops were equally as good as with farmyard manure.

Mr. Thomson, Belville, thought that land could be farmed more profitably without farmyard manure than with it. If they sowed Turnips with a sufficient quantity of artificial manure, and raised a good crop, he had no doubt that they would be paid by sheep-eating those Turnips, and not only be paid with that, but that they would have a first-class crop of Wheat, or other white crop afterwards.

Mr. Howie, Haddon, agreed with the plan of applying all the farmyard manure near the steading, and thus saving cartage; and about the growing of white crops after Turnips where there had been no farmyard manure, he thought that if the land was allowed to lie a year in grass, that it grew these crops as well afterwards as if farmyard manure had been applied.

Mr. Penny, Bartlehill, was of opinion, not that arable land, for he thought that was too wide, but Turnip land could not be farmed to advantage without farmyard manure. It might be done very well on strong clay land, but they would find that it was a very great want on light soils.

The Chairman said, that on his farm he had some very steep land—nearly the steepest, he believed, in the county of Roxburgh,—and he had cultivated for above 50 years some 30-acre fields that had never got a particle of farmyard manure, and the land was in as good condition as the field which had received dung every season. He found that 6 cwt. of bones or 4 cwt. of Peruvian guano were very nearly equal, and that either of them was as good as from 16 to 20 cart-loads of farmyard manure. He held, therefore, that it was quite possible to keep land in a good state of cultivation without farmyard manure, and to grow as good crops as with it of Turnips, corn, or grass. The great object was to get good grass, so as to keep a considerable number of cattle or sheep upon it, as the droppings kept the land in good heart.

Notices of Books.

The Journal of the Royal Agricultural Society of England. Second Series. Vol. VI., Part 2. John Murray, Albemarle Street.

The *Agricultural Gazette* was confident and energetic in its condemnation of the appointment of Mr. Jenkins to the editorship of the English Agricultural Society's Journal. If there were any need of professional knowledge for such an office the appointment was indefensible; if the Society itself derived any of its power or efficiency from the professional knowledge and position of its leaders, these were especially necessary in its office-bearers; in fact, the logic of the case, inevitable and unquestionable, was dead against the resolution at which the committee of appointment had arrived. We are now very glad to confess—"so much the worse for the logic!" The appointment has been a great success. The Journal is better edited than it has been since the earlier volumes of it appeared, and we do not hesitate to say that the 600 pages of the number, whose second part has just appeared, contain more of the useful, the interesting, and the new in agriculture than any corresponding number of pages we have ever elsewhere seen. The completeness of the work, as an agricultural picture of the current year, is also satisfactory. The reports of the Oxford showyard appeared soon after the meeting, and are well done—the implements especially being described in full and satisfactory detail. The various classes interested in agricultural progress and success—the various departments of agricultural practice and science—the various pictures of farm practices afforded by different localities in our own and other countries, are all represented in this volume. Mr. Stratton on the farm labourer and Mr. Bailey Denton on village sanitary economy furnish admirable essays in which the labourer is concerned—the prize farm competition at home, Belgian, American, and Swedish management abroad, furnish matter of interest to the English farmer—Dr. Voelcker keeps us up the mark of advancing knowledge along the line connecting agriculture and chemistry: in particular there is a good report on the last attempt to extract a manure from sewage by the so-called "A. B. C." plan—the Scilly Islands, Monmouthshire, and Cheshire, furnish local agricultural pictures—the Veterinary College report on the health of the live stock of the farm—Hops, Potatos, Mangel, Wheat, Barley, and Swedes, are the subjects of special agricultural essays—a good deal of special attention is given to the dairy;—there is, in fact, hardly any one, either in the ordinary rank and file of the English farmer, or especially interested in any of the directions in which his business is developing, but will acknowledge that Mr. Jenkins has been a most successful caterer.

Of the current part we have hitherto referred in particular only to the report on the Oxfordshire prize farms. We shall hereafter give extracts from other of its contents. Meanwhile we take from a paper by Professor Wrightson, the following account of experiments in wide drilling and tillage of Wheat, which may perhaps be turned to account this year:—

"The usual width of drilling Wheat being about 9 inches, it was resolved—(1) to omit every alternate row, leaving a space of 18 inches between the rows; (2) to omit two drills, and leave two, making a space of 27 inches between double rows 9 inches apart; (3) to omit two drills and leave two, forking the interspaces during the summer; (4) to attempt the cultivation of Carrots or Potatos between Wheat rows arranged as just described; (5) to try the effect of firmly pressing land with the foot in winter and spring.

"In carrying out these experiments the Wheat was in some cases sown with the drill in the usual manner, and the surplus rows were obliterated by the hand-hoe soon after the blades of corn appeared above ground. In other cases the drill was set so as to deposit the seed at the required width.

"The objects of these experiments were as follows:—To show (1) how far a free admission of air and light influences the growth of the Wheat plant; (2) how far interculture is beneficial or the reverse; (3) the effect of thin seeding.

"Similar experiments upon Barley were also undertaken, with interesting results. The following is a list of the plots required for carrying out these trials:—

2 plots in which 2 rows were alternately omitted and left.
2 ,, in which 2 rows were alternately omitted and left, the interspaces being forked twice through the summer.
2 ,, the same as the last, but with Carrots or Potatos planted in the interspaces.
2 ,, firmly pressed with the foot.
2 ,, untouched for comparison.

"*Wide Drilling and Interculture.*—'In wide intervals,' says Tull, 'we can raise a good crop with less labour, less seed, no dung, no fallow; but not without a competent quantity of earth, which is the least expensive of anything given to corn.' Tull has had a few ardent followers, among whom the late Mr. Smith, of Lois Weedon, may be mentioned as a faithful disciple. Some encouraging results, obtained by Mr. J. A. Clarke from a field cultivated upon modified Tullian principles, were published in vol. xxv. of the Royal Agricultural Society's Journal, and were the immediate cause of a series of wide-drilled plots upon the College Experimental Farm in 1865. A piece of winter-drilled Wheat was selected, and alternate rows were cut out with the hoe, leaving the Wheat rows 18 inches apart. In like manner three rows were removed and three left, forming triple rows with 40-inch interspaces. Of these plots some were forked, and others merely hand-hoed. As the experiment was only commenced on April 18, the result, as might have been expected, was not favourable to wide intervals. It was, however, worthy of notice that although half the Wheat was removed, the produce from the wide-spaced plots was, in spite of the unfavourable conditions of the experiment, equal to 27 bush. per acre, while the ordinary untouched Wheat yielded 32 bush. per acre.

"These experiments were repeated on a more extended scale in 1868, a season in which wide drilling and forking could hardly be thought advantageous. Both Wheat and Barley were subjected to the trial, care being taken that the superfluous rows should be removed before they could interfere with the future prospects of the remaining rows. Some of the wide-spaced plots were twice forked during

the summer, while others were kept free from weeds by means of the hand-hoe. The results are embodied in the following Table :—

Results of Wheat Experiments, 1868.

Plots.		Head Corn per Plot.	Bushels per Acre.	Weight per Bushel.
		lb.		lb.
1	Alternate rows obliterated ; spaces forked	46	26 6	65
2	Alternate rows obliterated ; remaining rows singled into tufts or bunches	35 5	22 8	62.5
3	Ordinary Wheat for comparison .	45	30 8	64.75
4	Three rows left and three hoed out ; spaces forked	39	25.2	64
5	Alternate rows obliterated ; spaces not forked..	44	28 4	64
6	Alternate rows obliterated ; remaining rows 'tufted' as in 2 ..	38	24 4	64
7	Three rows left and three obliterated ; not forked	42	26 8	64 75
8	Alternate rows obliterated ; spaces not forked	44	28 4	64.75
9	Three rows left and three hoed out ; spaces forked	32	20 4	65
10	Ordinary Wheat	4 5	29 2	65 5
11	Three rows left and three hoed out ; spaces forked	36	23.2	65
12	Alternate rows obliterated ; spaces forked	40 5	26	65

"Inspection of this Table shows :—

"1. That in no case was the crop so good as in the case of the Wheat cultivated in the usual way.

"2. Plots in which the alternate Wheat rows were obliterated were so nearly equal to those of ordinary Wheat that, since half the seed might have been saved by sowing at once with a wide drill, the advantage is pretty equal in both methods.

"3. The forked Wheat was generally worse than the corresponding unforked, a result borne out by the experiments of 1865.

"4. Since 25 and 26 bushels per acre were obtained from half the land under crop in the cases of Plots 4 and 7, the question whether the interspaces would have borne as large a crop of Wheat the succeeding year, as at Lois Weedon, is worthy of attention."

Farm Memoranda.

North Riding of Yorkshire.—A clear month of continuous drought after the ingathering of the harvest gave ample facility for the cultivation and cleaning of foul stubbles to all who chose to embrace the opportunity. In our own case forking, at an expense not exceeding 1*s.* 6*d.* per acre, has perfectly freed our stubbles from the little Couch we grow, and all is now clean, ploughed, and ready for spring tillage.

Speaking of Couch, we may by the way record our opinion that very much of it is owing to the foul state of the Rye-grass seed which is sown with the Clovers. For several years we have been reducing the quantity per acre of the former and increasing the latter, with an effect so favourable that this year we have sown Clovers only.

On the 7th inst. the drought gave way, and since then we have had very heavy falls of rain, the gauge to this date registering 5¼ inches, a fall very unprecedented in so short a time. With the low range of temperature now current we cannot expect much improvement in the pastures, but with moderately mild weather there should yet be a considerable increase in the root crops. One result of the copious rains has been to wash off the plague of lice with which almost all our fields were to a greater or lesser degree affected, and which entirely stopped the growth of the plants. The long drought also on some lands induced grub at the root, especially among white Turnips, and as a whole our Turnip crops will be very deficient.

Some of our fallow lands have been seeded with Wheat, but the greater portion is yet to sow ; if the weather holds dry, it would be completed with the land in very fine order.

Potatos have been harvested dry and in good condition, and almost entirely free from disease. Crops not abundant.

Fat cattle and sheep are selling well, where really prime, but owing to a deficiency of winter food, many are now consigned to the butcher, which, under ordinary circumstances, would not have come out until February and March. So far as this district is concerned, the supply then must be very short.

Our autumn fairs at Masham, Leyburn, &c., chiefly for the sale of lambs, have been very dull indeed, and a fall in price to the extent of 3*s.* a-head for half-bred lambs from last year's prices may be quoted.

The foot-and-mouth disease has been prevalent in various localities in this Riding, but we now trust it is on the decline. A circular from Mr. Thomas Scott, a land agent in the city, has been forwarded to some of our principal landowners, detailing a cure for this disease, but it does not appear to throw more light on the matter than what was already well known. Cooling draughts, accompanied with judicious feeding, that is, food requiring little mastication, and nutritious, in order to sustain the condition, seems to be all that is necessary. *W. F. M., October* 20.

West Sussex : *October* 22.—Wheat sowing has now begun, and the land works well. We have delayed until the rain came, as the land was too light and dry ; but now the seed-bed is firm and mellow. We are still puzzled about the proper quantity of seed to sow, but all are tending to the thin-seeding system, and about 2 bush. is the greatest quantity that most people use, and many about 1½ bush. It does not appear to make much difference whether we use 1 or 2 bush. One seems to be enough to take out all that the land is capable of producing, and two can do no more, and at harvest we find little difference ; but there is, of course, a great difference in the expense of seed ; and perhaps the winter appearance of thin-seeded Wheat has a great tendency to shake our faith in the system, as we do not like our crops at any time to look worse than our neighbours. But there is no doubt that gradual reduction will be the order of the day.

There has not been quite so large a proportion of Wheat threshed as usual up to the present time, and on all sides we hear that the yield is much better than was expected on the heavy lands. On the light lands it will not be good.

Barley does not turn out a heavy crop, but still all that we expected, and where sown in time, the quality is pretty good. Oats, except the very earliest sowings, are a very poor crop.

The Mangel crop is now being taken up and is very good, and thin planting seems to answer particularly well with it this year, as all outside drills are twice as large as the others ; they look as if they were a different sort, and treated to an extra quantity of manure, and perhaps 3 feet each way for the plant is not too much, though one hardly likes the thinning out to that extent. As they are the only good root crop that we have this year, they are likely to be more extensively sown next season.

Swedes and Turnips are a poor crop, and will not last the sheep long ; a hard winter will put us to some trouble to get food for them, and cattle feeding with roots is nearly out of the question ; beef is now getting very scarce and dear, and the quality rather inferior.

There has been a good deal of Rye, Vetches, &c., sown to help over the winter, and all looks very healthy and forward, and may help us over our difficulties. At all events there is no chance of meat being cheap for nine months to come, as no food can grow to bring it out before that time.

Work is now well forward, though there is not much Wheat sown ; the land is nearly all ready.

Live stock of all kinds are still dear, and we hear complaints of foot-and-mouth disease, but not very near us ; there is, however, such a tendency to keep the knowledge of it from the public, that we have to be more careful than perhaps need be the case. *G. S.*

Woolston, Castle Hill, and Purton : *Steam Cultivation.*—I have harvested my fifteenth crop under steam-power culture, and I have now done the whole of my steam-power work for my sixteenth crop. Here are the operations, with costs, and some particulars :—

"1870.—Finished harvest August 27.

"Sept. 12.—Started the smasher on No. 4, heavy land—a Pea and Bean stubble, 24 acres.

"Sept. 13.—Worked on till 8.30 A.M., when it began to rain ; worked a quarter of a day only.

"Sept. 14.—Wet in the night, and wet again this morning ; started work at 1 P.M.

"Sept. 15.—Fine ; worked and finished the 24 acres at 4.50 P.M. ; then shifted the tackle to No. 3, heavy land, 29 acres.

"Sept. 16.—Started the smasher on No. 3, heavy land, and did about 9 acres.

"Sept. 17.—Did about 9 acres.

"Sept. 18.—Sunday.

"Sept. 19.—Did about 9 acres.

"Sept. 20.—Finished the 29 acres at 10.45 A.M. Consumption of coal for the 53 acres, 4 tons 15 cwt., at 12*s.* The cost of this work stands thus : Men, at 16*s.* per day, for 6¾ days, £5 8*s.* ; coal, 4 tons 15 cwt., at 12*s.*, £2 17*s.* ; oil, at 9*d.* per day, 6¾ days, 4*s.* 10½*d.* ; wear and tear, &c., at 1*s.* 6*d.* per acre, £3 19*s.* 6*d.* ; total, £12 9*s.* 4*d.*, or an average of 4*s.* 8¾*d.* an acre for the 53 acres.

"After finishing No. 3, heavy land, I lent the engine and cultivator to Mr. Whiting, to do by contract 32 acres of Bean stubble for Mr. Lines, of Woolston.

"Sept. 24.—Engine brought back, after finishing Mr. Lines' work, at 1.30 P.M. Mr. Lines informs me that the consumption of coal for the 32 acres was 3 tons 5 cwt., at 18*s.* per ton.

"Sept. 25.—Sunday.

"Sept. 26.—Started the ridger and subsoiler on No. 2, heavy land, a Wheat stubble for Beans, covering in the manure with a reaped stubble as well as ridging and subsoiling the land 10 inches deep at one operation. Did about 5 acres.

"Sept. 27.—Did about 6 acres.

"Sept. 28.—Did about 6 acres.

"Sept. 29.—Finished No. 2—22⅝ acres, at 3.10 P.M. ; then shifted the tackle to No. 1, heavy land, and did an acre.

"Sept. 30.—Did 6 acres.

"Oct. 1. Did 6 acres.

"Oct. 2.—Sunday.

"Oct. 3.—Finished No. 1—16½ acres, at 1.30 P.M. Consumption of coal for the 39 acres, 4 tons 8 cwt., at 12*s.* Depth of work, 10 inches. Shifted the tackle to No. 6, light land.

"Oct. 4.—Started the ridger and subsoiler on No. 6, light land, working it a foot deep, and did 6 acres.

"Oct. 5.—Did 6 acres.

"Oct. 6.—Finished No. 6—14 acres, at 9.30 A.M., then shifted the tackle to No. 4, light land, and did about 3 acres.

"Oct. 7.—Did about 6 acres.

"Oct. 8.—Finished the 12 acres 10 inches deep at 12.10 P.M., and then packed the tackle up for the year.

"Consumption of coal for the two fields, containing together 26 acres, 2 tons 12 cwt., at 12*s.*"

The cost for the 65 acres of ridging and subsoiling stands thus :—

		£	s.	d.
Men, at 18*s.* 6*d.* per day for 12 days ..	..	11	2	
Coals, 6 tons 10 cwt., at 12*s.*	..	3	13	0
Oil, at 9*d.* per day, for 12 days ..	..	0	9	0
Wear and tear, &c., at 1*s.* 4*d.* per acre	..	4	17	6
		£20	6	6

or an average of 6*s.* 3*d.* per acre.

I do not give the cost of men in detail, for they are the same men who worked the tackle last year ; therefore their daily cost is the same.

On my farm there are now 166 acres of arable land. The working time of the engine for the next year's crop has been 183¾ days, and the total consumption of coal 11¼ tons. The work was begun on September 12, and finished on October 8, and therefore monopolised the very best part of the season ; for as I keep tackle for my own use only, I brought it out as soon as I was ready, and I have done before the short days begin. Besides all that, this has been an excellent season for working, for the rain that fell at the end of harvest cooled the land and made it work mellow and nicely when we began, and the rain that hindered us a day and a quarter did good, for it cooled the land again before the ridger and subsoiler was set to work. People make a very great mistake who fancy that the land cannot be too dry for steam-power work, for smashing is more valuable when done when the land is cool and mellow than when done dry, and the ridging and subsoiling cannot be done well when the land is dry and hard, and besides all that, the wear and tear is very much less when the land is cool, and so is the consumption of coal.

Now I will give you the particulars, showing the part the preceding steam-power work takes in the preparation of my seed-beds for my next year's crops.

Nos. 4 and 3, heavy land, Pea and Bean stubbles, containing together 53 acres, have been in my occupation for one year only. Last year 17 acres of it was smashed once over, at a cost of 5*s.* 1*d.* per acre, and was crossed once with horses, at a cost of 2*s.* per acre, bringing the cost of seed-bed up to 7*s.* 1*d.* per acre for Peas ; 19½ acres of it was smashed once over, at a cost of 4*s.* 8*d.* an acre as the cost of seed-bed for Beans. The remaining 16½ acres was fallow for Beans. The whole of this land is now not clean, but it is sufficiently so for Wheat next year. The smashing that it has just had, with a heavy harrowing, has brought most of the bits of Twitch to the surface. I am now forking the remaining bits up and throwing them roughly upon the surface. A man can do his 3 acres a-day, therefore the cost is but a trifle. The cost of my seed land for next year's Wheat crop will (excepting the little forking) stand thus :—A steam-power smashing, 4*s.* 8½*d.* per acre, and a heavy harrowing, 1*s.* 3*d.* per acre ; total, 5*s.* 11½*d.* per acre.

Nos. 2 and 1, heavy land, Wheat stubble, containing together 30 acres, are my old heavy ploughed land, and are now worked by steam-power for their sixteenth crop. The ridging and subsoiling 10 inches deep at one operation has cost 6*s.* 3*d.* per acre, and that is the total cost of seed-bed for next year's Bean crop. The Wheat was reaped by hand. The uncut stubble was manured with about 12 tons of manure per acre. Yet the steam-power ridger and subsoiler turned the stubble with the dung in at one operation. The land is clean—mark you, I say clean—for there is a vast difference between clean and cleanly, which you will hereafter hear something about. This heavy land of mine after its fifteenth crop under steam cultivation, is, I say again, clean. For years back I have paid a farthing for every bit of Twitch that has been seen by my men when hoeing the corn upon it ; at that cost for some years it has not cost me over 6*d.* per acre a-year. Horse-power could not give at any cost such valuable work as this steam-power ridging and subsoiling is, neither could man at £2 an acre.

No. 6, light land, 14 acres, a Barley stubble ; the fourth white-strawed crop in succession has now been ridged and subsoiled a foot deep for Barley again next year. The ridges will need harrowing down in the spring, and that is all ; therefore, the seed-bed for the next crop will stand at 6*s.* 3*d.* an acre worked a foot deep ; £2 an acre by man could not equal it. The land is clean, although it is now prepared for the fifth white-strawed crop in succession.

No. 4, light land, 12 acres, a Wheat stubble manured with 12 tons of manure, and has been ridged and subsoiled, 10 inches deep, by steam-power. This land is clean after its 15 crops under steam-power, therefore will need nothing but harrowing down in the spring before it is planted for roots. Excepting the spring harrowing, the cost of seed-bed will be 6*s.* 3*d.* an acre.

No. 1, light land, 12 acres, is roots, and will be worked by my horses in the spring for Barley.

No. 2, light land, 13 acres, is Clover lea, and my horses are now ploughing it over for Wheat.

No. 3, light land, 11 acres, is seeded with Clover, therefore will not need an operation this autumn.

No. 5, light land, 12 acres, was ridge-ploughed and subsoiled last year for Beans ; that operation left the land after the Bean crop came off in so nice a state that

cultivating once over with horses, at a cost of 2*s.* per acre, was all that was needed this autumn for Wheat next year. The Wheat was drilled four days back.

This gives the particulars of my seed-beds on the whole of my 166 acres of arable land. Now, I will compare notes with Mr. Ruck, as I promised in my last letter t at I would do so, by calling his attention to the fact that he did not make his seed-beds by steam-power at the lowest possible cost. Look to his Purton work done by contract, for Wheat after Wheat, done not over 5 inches deep. A fair estimate came out at a cost of 21*s.* per acre. This land was not clean, although Mr. Ruck has been a cultivating man by steam-power for 11 years. I credited it with the other farms with the word "cleanly," for that was the least I could say for them. Now I will tell him that it never will be clean so long as he continues his present practice of scratching his land over by steam-power, as shown to me on September 23. Here is his practice :—Two 10-horse power engines are set to work to pull an 8-foot cultivator to and fro across the field. All they could do the first time over was to work it with narrow shares, and thus groove the land 4 or 5 inches deep, tearing the little patches of Twitch to bits. The second time over we put wide shares upon the implement, to chip up the humps that formed the grooves and thus scattered the Twitch. The long pieces were seen upon the surface, while the short bits were buried in the soil, and thus planted for the next year's crop. Now, compare this with my land worked for the fifth white crop in succession. The seed-bed worked a foot deep for next year's crops stands at 6*s.* 3*d.* an acre, and the land is clean after its fourth white-strawed crop in succession. You see, I win upon the point of cleanliness, for my land is clean and his is not ; then my depth stands at a foot, and his at 5 inches, and my cost stands at 6*s.* 3*d.*, while his stands at a guinea an acre.

The Ampney Farm is not clean. Cleanly is all that I can say for it ; and as there is no steam cultivation going on there I shall go on to Castle Hill for my next comparison, where I saw two 14-horse power engines pulling to and fro a cultivator 12 feet in width the third time over a Bean stubble, and thus scattering and burying the Twitch to grow again, as I did at Purton. Mr. Ruck's cost per acre stood at 21*s.* Of this sum 12*s.* stood for interest, wear and tear, and depreciation, and when I found that £1400 of tackle was mainly used upon the Castle Hill Farm, I could not make it come to a less sum. His depth of working was about 5 inches. Now, as this was a Bean stubble worked for Wheat, let us compare it with my 53 acres of Bean stubble worked for Wheat. The cost of seed-bed stands at 5*s.* 11½*d.* per acre ; depth of work, 5 inches ; and the land, although worked as by steam-power for the second time only, is quite as clean as Mr. Ruck's Bean stubble is. Thus I beas him, for I win with 5*s.* 11½*d.* per acre against his 21*s.* an acre, leaving depth and cleanliness to stand equal.

Now, let us look to his Wheat and other stubbles, being prepared for something, I cannot tell you what. Some 150 acres of them had been smashed and crossed by steam-power to a depth of 5 inches, for cleanliness they would stand the same as the other farms did. The cost of this smashing and crossing, according to the cost of work on the Bean stubble, would stand at 12*s.* 8*d.* What else they would need to complete the seed-beds I cannot tell you. Now compare with this my 39 acres of heavy land Wheat stubble worked for Beans next year. The depth of work is 10 inches ; the cost for ridging and subsoiling, completing the seed-bed at once, is 6*s.* 3*d.* per acre, and the land is clean. Thus I win in depth by 10 inches against 5 ; in cost by 6*s.* 3*d.* against 12*s.* 8*d.*, to start with ; what else I cannot tell you ; and in cleanliness, for my land is clean and his is not.

I thank Mr. Ruck for having given me the chance to see for myself, which has thus enabled me to show to the public the cost of seed-beds made by the big costly tackle worked privately and by contract against little tackle worked privately ; but, in conclusion, I will bring a bit of contract work with little tackle against the work done with his big tackle.

On September 20 I lent my engine and cultivator to Mr. Whiting to work 32 acres for Mr. Lines, of Woolston (Mr. Whiting, of Castlethorpe, has worked by steam-power for 14 years two sets of Smith's tackle, doing his own work and contract work as well ; his occupation is nearly 700 acres). The engine and cultivator, after completing the 32 acres, was brought back on the 24th, therefore I will charge it with five days' work, according to my own expenses ; then I will allow 1*s.* per acre for the removal of tackle to and fro, 1*s.* per acre for extra pay and lodging of men ; and I will give Mr. Whiting 5*s.* per acre profit. The cost stands thus :—

Men at 16*s.* per day for five days	..	..	£4 0 0
Ditto for lodging at 1*s.* per acre..	..	..	1 12 0
Conveyance of tackle	..	..	1 12 0
Profit to contractor.. ..	..	..	8 0 0
Oil, at 9*d.* per day	..	..	0 3 9
Coal, 3 tons 5 cwt., at 18*s.*	..	..	2 18 6
			£18 6 3

This work done once over for Mr. Lines was done deeper and better than Mr. Ruck's was at three times, and as the land was about the same for cleanliness as Mr. Ruck's was, it could be made clean at much less cost than Mr. Ruck's could, as the bits of Twitch are brought up unbroken to the surface (Mr. Ruck will never know what cheap farming by steam-power is until he has learnt how to farm clean). Then this contract work, with little tackle, wins by 11*s.* 6*d.* an acre against Mr. Ruck's big tackle work done at a cost of 21*s.* per acre, and the land is in a better state for cleaning ; and it is conclusive that the contract plan is an extravagant plan of applying steam-power to the cultivation of the soil, and, besides all that, every man's work needed doing when mine was done. *William Smith, Woolston, Bletchley Station, Bucks.*

Willow Hall, Thorney, near Peterborough.—The farm on which the final trials of the two-furrow ploughs, at Peterborough, and the annual match with single furrow implements took place, is remarkable for the condition in which it is kept. The name of the farm is Willow Hall, Thorney, and Mr. A. Goodman has long been known for his enterprise, and the perfect manner in which he carries out every detail of the farm. We never saw a farm in better condition. Such a weed as a Dock, Thistle, or bit of Twitch or Couch-grass can scarcely be found, and if a patch of the latter should appear at the end of a course, from seed having been sown unwittingly, it is forked out before the plough or cultivator is set to work. By this plan every stray root or patch is taken bodily out, and not broken to be spread and transplanted about other parts of the field. As for Docks, they are easily exterminated if the requisite cost and trouble of taking them out be incurred. A Dock is an easily assaulted enemy to cultivated crops, but Thistles are more difficult. Mr. Goodman, however, has exterminated these plants, which are such pests in many places, and were so in a case of his own, till his perseverance for three years mastered them. This was on a new farm he took some years since. Mr. Goodman's plan is to spud them as soon as they fairly make their appearance an inch or two aboveground. We never saw pastures in better condition than are the Willow Hall grass fields. In spudding Thistles, it is considered better in this part of Lincolnshire not to spud or cut them too deeply below the surface. If you insert the instrument as low down as possible, so as to get below the hollow part of the stem, the sound part heals up at once, and vigorous lateral shoots are subsequently made by the plant. By cutting the stem, however, a cup-like hollow is exposed, and moisture then accumulates and hangs, to the increased injury of the plant. By doing this, weak plants are soon killed, and strong ones are made weaker and weaker till they in time, by the end of two or three years, succumb to the use of the pruning-hook or spud.

Another point of Mr. Goodman's farming we must not omit to mention. About five years ago a set of Messrs. Fowler and Co.'s traction engines and steam-ploughing apparatus were bought for Willow Hall. Mr. Goodman met Mr. John Fowler at a market dinner, and some conversation took place on the subject of steam-ploughing, in the course of which Mr. Fowler made some statements as regards the cost of the system. To this Mr. Goodman replied that if he (Mr. Fowler) could prove by figures what he had urged he would have a set at once. A meeting for this purpose took place, and the result was, as we have said, Mr. Goodman had a set. Mr. Goodman has two farms, amounting to about 1100 acres. To work the arable land of them there were, five years ago, 18 horses. One of Mr. Fowler's statements was that these might be reduced to 10 at once. This condition Mr. Goodman accepted as tenable, and he simultaneously sold eight horses and bought a steam plough, since doing which, 10 horses have done all the draught work of these two farms. Further than these relations we cannot go to-day, except it be to say that Mr. Goodman prefers digging stubbles for fallowing to either ploughing or cultivating them. *North of England Farmer.*

Miscellaneous.

Artificial Butter.—Apparently astonishing as the idea is, the manufacture of artificial butter (*beurre artificiel*) is seriously contemplated in France. A Parisian contemporary states that M. Mèye, of Paris, has taken out a patent for the manufacture of artificial butter, which, according to the journal in question, is to be used as a substitute for that ordinarily exported to England and Russia. The description of the process is, that animal fat is subjected to great pressure, by which the stearine is extracted for making candles, or *bougies* ; an oily material being at the same time obtained, the composition of which is identical with that of butter. The question then arises, how is the taste of this "composition" to be rendered similar to that of butter? M. Mèye is quite equal to the occasion; he says that he subjects the animal oil to a succession of scientific processes and manipulations, the nature of which he explains at great length, and with marvellous ingenuity. He traces the relations of unsophisticated grease to sophisticated fat, and crowns the edifice in rare style, by showing the precise identity of each with what he calls "butter," and indulges in the most sanguine anticipations about the success of his "invention." *Food Journal.*

Adulteration of Milk in New York.—The law of the State of New York in regard to adulterating milk is as follows :—Sect. 1. "Whoever shall knowingly sell, supply, or bring to be manufactured to any cheese factory in this State, any milk diluted with water, or in any way adulterated, or milk from which any cream has been taken, or milk commonly known as skimmed milk; or whoever shall keep back any part of the milk known as 'strippings ;' or whoever shall knowingly bring or supply milk to any cheese manufactory that is tainted or partly sour for want of proper care in keeping pails, strainers, or any vessel in which said milk is kept, clean and sweet, after being notified of such taint or carelessness ; or any cheese manufacturer who shall knowingly use, or direct any of his *employés* to use, for his or their individual benefit, any cream from the milk brought to said cheese manufacturer, without the consent of all the owners thereof, shall, for each and every offence, forfeit and pay a sum not less than 25 dols., nor more than 100 dols., with costs of suit, to be sued for in any court of competent jurisdiction, for the benefit of the person or persons, firm, association, or corporation, or their assigns, upon whom such fraud be committed."

The Week's Work.

October 29 : *Turnip Fallows* extend over a very large area of the cultivated land of the kingdom. Over the whole of Scotland, and a great part of the north of England, with most of the sister country, for example, about a fifth part of the arable land is under Turnips. Such an extent of land shows the importance of the crop, and all who have any successful experience in its growth are familiar with the advantage of a thorough deep tillage at this season, subsoiling when the bottom is unsound, so as to increase the depth of the staple when the noxious matter is either neutralised or washed out by drainage.

Draining should commence immediately after harvest, and be prosecuted with vigour so long as there is a wet furrow of land on the farm. It is generally advisable to do so much yearly, and the break under fallow or lea is the portion usually set apart for drainage, the ploughing after being followed by subsoiling, which greatly promotes the work of drainage and aëration.

Top-dressing leas for cropping may be done as late as the beginning of November, the ploughing being deferred until the top-dressing has produced the desired effect on vegetation and any effete organic matter on the surface, which is known by the green sward produced,—in other words, the top-dressing should be well worked into the roots of the grass with a chain-harrow ; and as soon as the more soluble and fertilising portion is washed into the land, and the grass up, so as to prevent the compost on the surface falling to the bottom of the furrow when the land is ploughed, the ploughing may be done. In examples where the land lies two years in grass—the first year hay and the second pasture,—some prefer top-dressing after the hay crop, the compost being applied as soon as the cattle are housed, or sooner, if the stock can be removed to other pastures, or soiled indoors. Clay may also be applied to the hay stubble in frosty weather ; but of this more afterwards, when the frosty weather comes ; so may chalk to a different class of soils, but lime compost may be applied in autumn.

Lea Ploughing for Oats or spring Wheat usually followed the ploughing of Wheat and Oat stubble for Turnips, according to the old practice ; but steam culture is turning topsy-turvy many old tillage rules, for those who smash only plough their leas with their teams while they are smashing up their stubbles by steam, so that where the latter has to be hired the former may take precedence as to time ; but the more advanced plan is to do both the smashing and ploughing by steam, the advantage on the one being as great as on the other.

Threshing proceeds the moment cattle are housed for the winter, a regular supply of straw for provender and litter being daily required. Straw may be cut into chaff and salted in bins, but the more newly-threshed it is the more valuable for cattle food, for the small allowance of salt is insufficient to preserve it from waste, more especially when the straw has suffered deterioration either from lodging, bad harvest weather, or dampness in stacking. Any coarse straw of inferior quality may be threshed out and stacked for litter.

Highland Sheepwalks present a very different practice from those of the southern counties of England at this season. From the more elevated and exposed districts the flocks are removed to the lowlands ; on the more sheltered, shepherds have to contend with the heavy snowfalls which now become common. Rams are got into condition for being turned to the ewes about the middle of November. Towards the close of October sheep-bathing commences. Various baths are used, as "the turpentine bath," or the more common one—a decoction of tobacco, to which is added spirit of tar and soap. To cure scab some add "sulphur-vivum," but bad cases of scab require sheep-ointments, as preparations of carbolic acid and mercury ; others smear with a compound of tar and butter—a gallon of tar poured into from 6 to 8 lb. of melted butter, being a common salve calculated to smear a score of blackfaced or Cheviot wethers. Smearing kills tick and defends the skin from cold and rain, but

it less or more injures the wool. Old wedders are sold for fattening in the lowlands on Turnips, and draft ewes not sold last month are disposed of as early in this as sales can be effected, and served with Leicester rams as soon as they arrive at their new quarters.

Milch Cows should now be "taken" with their winter dietary. In this there are two extreme exceptions—the one where a regular supply of sewage grass is yet obtained, and the other the old practice of not housing before the fires are lighted in November. It would make a long story to tell how much milch cows suffer under this latter practice, for the cold nights skim their milk, consume their butter, and eat the very flesh off their bones. The counter practice is to keep up animal heat, by artificially warming and ventilating the cowhouse, along with a nourishing diet of steamed food; milch cows thus housed and fed yielding as rich milk as in the summer time.

The Dairy now requires artificial heat to keep it dry, thoroughly ventilated, and at the proper temperature (60°); and if this is done, and the cows properly attended to as above, a rich supply of butter may be made for market, good cheese may also be made, but at more expense for fire.

Swine.—Dairy porkers and bacon hogs now thrive amazingly. Full-grown hogs can be forced forward very fast on steamed Potatos mashed with barley meal or Indian Corn meal, seasoned with a handful of acorn meal, and a little sour wash to swill down with. Such food makes first-rate bacon. *W. B.*

Notices to Correspondents.

MIXTURE OF MANURES WITH SOIL: *B. R.* The efficacy of a manure is greatly influenced by the mechanical condition of the land, by the composition of the soil, and by the mode and time of the application. Guano is superior when in a finely powdered condition. Superphosphate is better when applied to land with a liquid manure drill. By these means the manure is finely divided and more uniformly distributed with the soil than when carelessly applied.

Markets.

HOPS.

BOROUGH MARKET, Oct. 27.

Messrs. Pattenden & Smith report a continued steady demand for consumption for all descriptions, the present low rates inducing buyers to operate somewhat more freely than is usually the case at this period of the season. The supply of choice samples is exceedingly limited.

MARK LANE.

MONDAY, Oct. 24.

There was a small supply of English Wheat to this morning's market, which was sold at an improvement of 1*s.* to 2*s.* per qr. The attendance was fair, and, with a moderate demand for foreign, a like advance was obtained. Barley sold at the extreme prices of this day se'nnight. There was no change in the value of Beans or Peas. Oats were 1*s.* to 1*s. 6d.* per qr. dearer. Flour was in fair demand, at 1*s.* per barrel, and 1*s.* to 2*s.* per sack more money.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	45—54	Red.....	42—54
— — fine selected runs..do.	49 - 57	Red.....	46—55
— — Talavera	50—60		
— — Norfolk	—	Red.....	—
— — Foreign	41—63		
BARLEY, grind. & dist..grist to 332...Chev.	42—45	Malting ..	36—41
— Foreign .. grinding and distilling	25—33	Malting ..	33—40
OATS, Essex and Suffolk	25 —27		
— Scotch and Lincolnshire..Potato	27 —29	Feed	—
— Irish ..... Potato	26—28	Feed	24—27
— Foreign .....Poland and Brew	24—26	Feed	19—24
RYE	32—36	Foreign ..	33—36
RYE-MEAL, Foreign			
BEANS, Mazagan.... 43*s.* to 47*s.*..Tick	49—50	Harrow ..	49—50
— Pigeon .... 51*s.* to 59*s.*...Winds.		Longpod..	—
— Foreign .....Small	45—47	Egyptian .	42—44
PEAS, White, Essex, and Kent..Boilers	38—40	Suffolk ..	40—42
— Maple, 40*s.* to 44*s.* .....Grey	36—40	Foreign ..	36—40
MAIZE	—	Foreign ..	29—31
FLOUR, best marks delivered..per sack	39—47		
— 2d ditto .....ditto	32—44	Country ..	32—44
— Foreign ..... per barrel	25—28	Per sack..	36—62

WEDNESDAY, Oct. 26.

Trade ruled quiet here to-day, but values were firmly supported for all kinds of grain. The show of English Wheat was small, but of foreign large; the demand was moderately active, at Monday's advance. Barley met a steady sale, at firm currencies. Malt was unchanged in price, but the inquiry was very limited. There was a good show of Oats, but values were well sustained. Maize sold on former terms; and no alteration took place in the quotations for Beans or Peas. The Flour trade was quiet, at stationary currencies.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 1130	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	9190	850	16,390	1000 brls.
	10,320	850	16,390	

LEEDS, Oct. 25.—We have a capital sale for Wheat to-day, at 2*s.* per qr. advance over last Tuesday's currency. Barley quite as dear, although common sorts go off slowly. Beans make fully late rates. Other articles as before.

AVERAGES.

	Wheat.	Barley.	Oats.
Sept. 17	46*s* 6*d*	36*s* 4*d*	23*s* 9*d*
— 24	45 4	36 2	20 7
Oct. 1	46 1	36 7	22 8
— 8	46 5	36 11	21 11
— 15	47 0	36 7	22 5
— 22	47 3	36 5	22 2
Average ..	46 5	36 5	22 3

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Oct. 27.

Trade, in consequence of large supplies of fodder from America, Scotland, Ireland, and other countries, rules steady, and prices remain at about last quotations.

Prime Meadow Hay	127*s.* to 135*s.*	Clover, old	120*s.* to 140*s.*
Inferior do.	110 120	Inferior do.	115 125
New Hay	— —	Prime 2d cut do...	120 130
Inferior do.	— —	Inferior do.	105 115
Straw	30 34		

American Fodder, in bales, per ton .. 100*s.* to 125*s.*
Scotch, ditto ditto .. .. 105 — 120
Irish, ditto ditto .. .. 95 — 115

CHARLES JAMES EASTON.

CUMBERLAND MARKET, Thursday, Oct. 27.

Sup. Meadow Hay	124*s.* to 140*s.*	Inferior Clover ..	120*s.* to 130*s.*
Inferior do.	110 118	Prime 2d cut do..	— —
New do.	— —	New do.	— —
Inferior do.	— —	Straw	34 40
Superior Clover ..	140 150		

JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Oct. 24.

We have a much smaller supply of Beasts, and the average quality is inferior; choicest descriptions are readily disposed of, at fully late rates, and in a few instances higher prices are obtained; other kinds meet with a dull sale. There are not quite so many Sheep as last week; trade is, however, very dull, and on the average prices are scarcely as good. Choice Calves are scarce and dear. Our foreign supply consists of 900 Beasts, 5740 Sheep, 228 Calves, and 180 Pigs; from Scotland there are 130 Beasts; from Ireland, 600; from Norfolk and Suffolk, 20; and 1315 from the Midland and Home Counties.

	s.	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*
Best Scots, Herefords, &c. ..	5	8to6	0		Best Long-wools ..	5	4to5	8	
Best Shorthorns..	5	6—5	10		Do Shorn	—	—	—	
2d quality Beasts	3	0—4	4		Ewes & 2d quality	4	4—4	10	
Best Downs and Half-breds ..	5	8—6	0		Do. Shorn	—	—	—	
Do. Shorn	—	—	—		Lambs	—	—	—	
					Calves	4	4—6	4	
					Pigs	4	0—6	0	

Beasts, 2965; Sheep and Lambs, 17,100; Calves, 236; Pigs, 270.

THURSDAY, Oct. 27.

We have nearly as many Beasts on offer as last Thursday, but the average quality is still very inferior; choicest qualities are readily disposed of, at fully Monday's quotations; indeed, a fair clearance is effected of all kinds. The supply of Sheep is about as usual, and is in excess of the demand; prices for business done are as on Monday. Choice Calves are still scarce and dear. Our foreign supply consists of 550 Beasts, 3670 Sheep, 340 Calves, and 210 Pigs.

	s.	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*
Best Scots, Herefords, &c. ..	5	8to6	0		Best Long-wools..	5	4to5	8	
Best Shorthorns ..	5	6—5	10		Do. Shorn ..	..	..	—	..
2d quality Beasts	3	0—4	4		Ewes & 2d quality	4	4—4	10	
Best Downs and Half-breds ..	5	8—6	0		Do. Shorn ..	..	..	—	..
Do. Shorn	—	—	—		Lambs	..	..	—	..
					Calves	4	4—6	4	
					Pigs	4	0—6	0	

Beasts, 1040; Sheep and Lambs, 7100; Calves, 380; Pigs, 220.

METROPOLITAN MEAT MARKET.—Oct. 27.

Best Fresh Butter	20*s.* per dozen lb.
Second do. do.	18*s.* „ „
Small Pork, 5*s. od.* to 5*s. 4d.*; Large Pork,	3*s. 8d.* to 4*s. 4d.* per 8 lb.

COALS.—Oct. 26.

Hastings Hartley, 16*s. 6d.*; Walls End Haswell, 19*s. 6d.*; Walls End Hetton, 19*s. 6d.*; Walls End Hetton Lyons, 17*s. 3d.*; Walls End Kelloe, 18*s. 3d.*; Walls End East Hartlepool, 19*s.*; Walls End Trees, 19*s. 3d.*—Ships at market, 26; sold, 24; unsold, 2; at sea, 75.

SEED MARKET.

The agricultural seed trade continues in the quiet state noted in our last. A few parcels of fine new English red Clover seed have been sold in our market, but the high prices demanded prevent any great amount of business being transacted. Alsike and white Clover seed are both very firm; best qualities appear to be very scarce. We have more inquiry for new home-grown Trefoil seed. Bird seeds are unchanged in value. Sowing Rape seed continues to advance in price. White Mustard seed is steady. We have a good demand for feeding Linseed. Windsor and Longpod Beans are in fair request. Foreign Italian and Rye-grasses are without alteration. Winter Tares move off pretty freely, at the low prices now current. New spring Tares are offering on moderate terms.

JOHN SHAW & SONS, 16, Water Lane, London, E.C.

ENGLISH WOOL.

The market remains unaltered, but the feeling is one of confidence, and we believe that prices are not likely, under any circumstances, to give way; whilst any settlement of the Franco-Prussian dispute would inevitably cause a sharp rise.

JOHNSTONE'S ST. MARTIN'S RHUBARB.—The Subscribers are pleased to be able to state that they have received very favourable accounts of the above excellent new variety of Rhubarb, of which they sent out several thousand roots last season.

EXTRACT from "Gardeners' Magazine" of October 15, 1870:—"I have a very high opinion of Johnstone's St. Martin's, having planted it late in the season. I am as yet unable to say anything about its earliness or size, but both colour and flavour are first-rate. I intend grubbing up some of the old stools, to allow of its being planted more extensively."

Strong roots, 2*s.* each; usual discount to the Trade.

W. P. LAIRD AND SINCLAIR, Nurserymen and Seed Merchants, Dundee, N.B.

WRIGHT'S GROVE WHITE CELERY.—One of the largest and best flavoured bleaching varieties ever introduced; after the same character as the Grove Red sent out by me. It has been awarded the First Prizes at the two Celery Shows held at Retford, the average size of the Sticks exhibited being 9 lb. each. It was raised by myself, and will be found one of the best White Celeries in cultivation. This is the first season I have been able to introduce it to the Trade, and as the stock of seed is limited, early orders are requested. Price 1*s.* per packet, or 9*s.* per dozen.

W. WRIGHT, Seed Merchant, East Retford.

Agents: HURST AND SON, 6, Leadenhall Street, London, E.C.

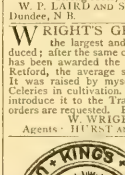

Important Notice.

TO SECURE A GOOD CROP of MANGEL WURZEL ROOTS for 1871, the land should be prepared between now and Christmas, and the Seed secured from

KING'S UNRIVALLED PRIZE STOCKS, harvested in fine condition, at very moderate prices, on all orders received now, to be delivered next spring. None but seed from the best selected roots kept.

Carriage paid to all Stations on orders above 20*s.*

JOHN K. KING, Seed Grower, Coggeshall, Essex.

ESTABLISHED 1703.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—

WHEAT MANURE, strongly recommended for Autumn Sowing.

DISSOLVED BONES, for Dressing Pasture Lands.

PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.

Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.

116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Peruvian Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 4 to 7 per cent. of Ammonia with a trace of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken

REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.

"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,

Signed "AUGUSTUS VOELCKER.

The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz., "THE TENANT-FARMERS' MANURE COMPANY."

Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.

Particulars will be forwarded on application to the Secretary, or may be had of the Local Agents.

THOS. T. MACADAM, Secretary.
Chief Office—109, Fenchurch Street, London, E.C.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.

All other MANURES and CAKES as per Price List, supplied on the lowest terms.

Apply for prices, &c., to JOHN BENNET LAWES, 59, Mark Lane, London, E.C., Dublin, Shrewsbury, and Cardiff.

GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1*s.* per lb., 8*d.* per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 10*s.* per gallon.

SILVER SAND, of the finest quality, for Horticultural purposes, at 20*s.* per ton; smaller lots at 2*s. 6d.* per cwt.

WM. RUSHFORTH, Seed Merchant and Nurseryman, Leeds.

The Cheapest and Best Insecticide.

LOOPY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.

Sold by Nurserymen, Seedsmen, and Florists,

In Tins at 1*s.*, 2*s. 6d.*, and 5*s.*

Powder Distributors, 2*s. 6d.* and 3*s. 6d.* each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt, 10*d*; ½ cwt, 1*s*. 2*d*; and 1 cwt, 1*s*. 4*d*., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

The Noted French Cold Grafting Wax
(MASTIC IHOMME LEFORT),
For Grafting, Budding, Healing, &c., may be obtained of
HOOPER AND CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsman and Nurseryman.

Red Spider.

Magnified.

GISHURST COMPOUND.
Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1*s*., 3*s*., and 10*s*. 6*d*.
Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea, London, S.W.

Wheat Sowing.

DOWN'S FARMER'S FRIEND, for Preventing the Smut in Wheat, and the Ravages of the Slug, Grub, and Wireworm. A 9*d*. packet is sufficient for Six Bushels of Seed Wheat, which can be dressed and hit to sow in a quarter of an hour.
Testimonials from the largest Wheat Growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed for every district.
Full directions for use are given with each packet.
Prepared at the Manufactory, Woburn, Beds.
CAUTION.—To guard against fraudulent imitation and consequent disappointment, see that the signature of HENRY DOWN is on the label.
Agents in every Town throughout England, Scotland, and Ireland.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
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Manufactory, 6, Bankside, Southwark, S.E.

Greenhouses.

H. FREEMAN AND SONS, HORTICULTURAL BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 106, Mare Street, Hackney, E., have about to situate (CASH) HOUSES, Glazed, ready for Fixing, 42 feet long by 11 wide, price £53; 21 feet by 13 feet, £38; 12½ feet by 10 feet, £15. A handsome CONSERVATORY in stock, 19 feet long by 8 feet wide, £110. Estimates given for any branch in the above line, in Wood or Iron.

HOT-WATER PIPES, BOILERS, &c., &c., of superior quality.

				2-inch.	3-inch.	4-inch.
				per yard	per yard	per yard
ELBOWS, No 12	..	..	each	0 11	1 5	1 11
T-PIPES, No 33	..	..	..	1 0	1 9	2 6
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	..	..	..	9 0	10 0	11 0

The above, nett cash prices, delivered at London, Liverpool, Bristol, or equivalent
GEORGE ROBINSON, 16, South Wharf, Paddington Basin; and at Dial Iron Works, Stourbridge.

W. H. LASCELLES' MACHINE-MADE MELON LIGHTS.

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		Each.
6 ft. by 4 ft. Lights, 2 in thick, unglazed	..	£0 5 0
" " Primed and Glazed with 10 oz. Sheet	..	0 11 0
" " with Stout portable Box, not Painted	..	1 3 0
" " Painted four coats, and Handles on	..	1 8 0
" " Packed and Delivered in Railway van	..	1 10 0
6 ft. by 8 ft., Double Lights, do	..	2 15 0
GREENHOUSES	..	Per ft. super.
Woodwork only Prepared and Fitted	..	0 0 9
" Primed and Glazed with 16 oz. Sheet	..	0 0 9
" Delivered, and Fixed with Ironwork	..	0 1 0
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Finsbury Steam Joinery Works, 121, Bunhill Row, E.C.

Portable and Fixed Hot-water Apparatus
FOR
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WITH
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

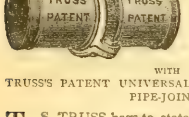

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SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEREMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

TROTMAN'S HOT-WATER GAS STOVE the best method of Heating small Greenhouses. *See Gardeners' Chronicle*, 8th inst.
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STOVES.—TERRA COTTA, for GREENHOUSES, BEDROOMS, &c., give continuous healthy heat for 24 hours for 1*d*. without attention. At MAPPIN AND WEBB'S, Oxford Street and Cornhill; and at the Patentee's, JOHN ROBERTS, 104, Camberwell New Road, London, S.W.

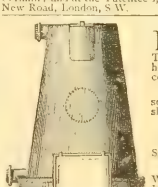

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These BOILERS are adapted for setting in Brickwork, or as shown in sketch they require NO BRICKWORK.

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Who have in general use, and which Joiners have for their durability and economy attained a celebrity far surpassing any other Boilers ever invented.

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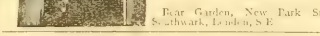

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WROUGHT and CAST-IRON CONICAL, SADDLE, and IMPROVED CONICAL, also Elliptic Boilers, from 24*s*. each.

Improved Conical. *Tubular Boiler.*

Improved and extra strong CAST-IRON TUBULAR BOILERS, with cross Boot Water Bars, from 45*s*. each.
CAST and WROUGHT IRON PORTABLE BOILERS, on Stand, for use without Brickwork, from £6. each.

Portable Boiler *Elliptic Boiler.*

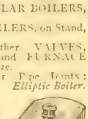

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INDIA RUBBER for Pipe Joints: Sockets require no other packing, and are perfectly water-tight.
Cocks and the various manufacture, delivered at Railway or Wharf in London.
LYNCH WHITE,
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Midland Horticultural and Hot-Water Engineering Works, Loughborough.

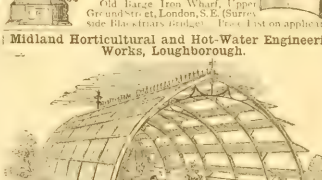

T. G. MESSENGER will be happy to prepare Plans and Estimates from instructions sent him; or, if preferred, will wait personally on any Ladies or Gentlemen at their residences.
T. G. M. does not confine himself to any limited modes of construction, but will carry out the designs of Architects according to their details, or he will apply his principles of construction to their designs. The satisfactory completion of all work undertaken is guaranteed.
T. G. M. solicits Public attention to his PATENTED BOILER, which is exceedingly powerful and economical in fuel. His Patented Valve gives complete satisfaction in every case. Many thousands are at work. Price on application. A fully Illustrated Catalogue is forwarded post free for 33 postage stamps.

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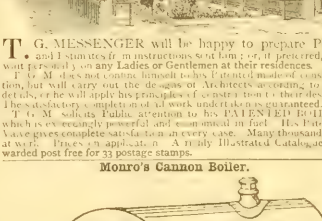

J. JONES AND SONS deliver HOT-WATER PIPES and CONNECTIONS, with BOILERS, of every make, free to any station in England, for cash with order; or they allow a liberal discount for cash at their wharf in London. Lists on application.
J. JONES AND SONS, Iron Merchants, 6, Bankside, Southwark, London, S.E.

Smokeless Stoves.—No Flues.—Portable.

NASH AND JOYCE'S PATENT, for CONSERVATORIES and all other places, from 12*s*. 6*d*. to £15 15*s*. Duplexes. PATENT FUEL, 18*s*. per 20cwt: in bags and sacks of 30lb and 60lb at 2*s*. 6*d*. and 5*s*.
AMERICAN CHARCOAL BOX-IRONS, always bright for use, without cleaning. The Iron is a miniature portable stove. Light, cheap, clean, and durable. Price 5*s*., 6*s*., and 7*s*.
Manufacturing, Mincing, and Sausage-Filling Machines of the best makers, 10*s*. 6*d*.
The COTTAGE KNIFE CLEANERS give to Knives a brilliant polish and keen edge with little labour, 3*s*. 6*d*., 5*s*. 6*d*., 10*s*. 6*d*.
PORTABLE VAPOUR BATH, with Medical Testimonials,—Bath and large Cloak, £1 11*s*. 6*d*.
SWAN NASH, Ironmonger, 253, Oxford Street; and JOYCE'S STOVE DEPOT, 219, Newgate Street.

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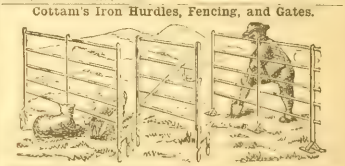

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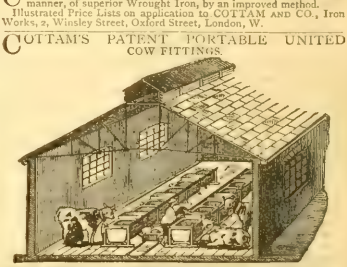

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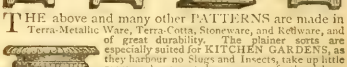

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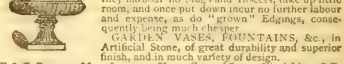

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13 by 11	14 by 11	..	..		
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18 by 12	19 by 12	16 by 12	17 by 12		
16 by 13	17 by 13	20 by 12	..		
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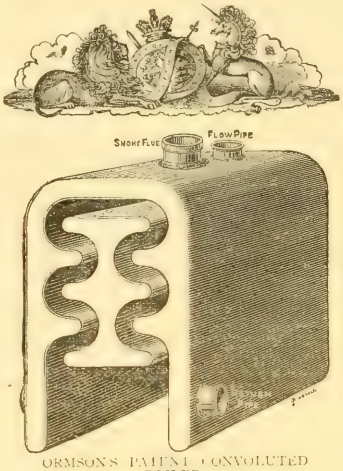

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Thousands of feet of Pipe Heated from one Boiler.

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AND HOT-WATER APPARATUS MANUFACTURER to the COMMISSIONERS of HER MAJESTY'S ROYAL PALACES and PUBLIC BUILDINGS, and to the ROYAL HORTICULTURAL SOCIETY,
STANLEY BRIDGE, KING'S ROAD, CHELSEA, LONDON, S.W.

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PATENT TILE WORKS,
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This is the OLD FIRM, and they continue to Manufacture every class of ORNAMENTAL and PLAIN TILES by the most improved processes, after
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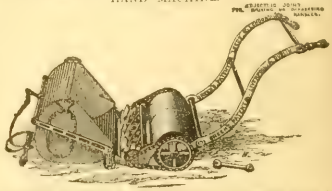

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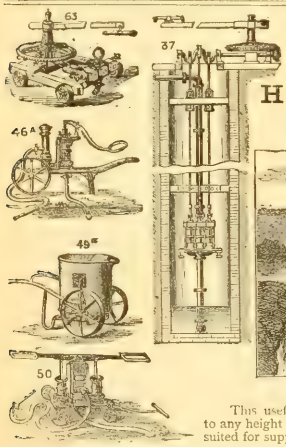

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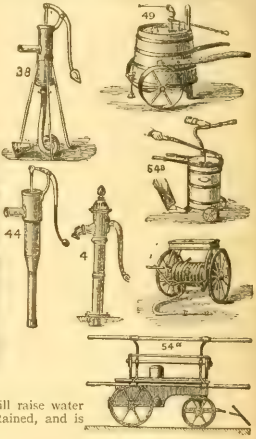

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This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 45.—1870.] SATURDAY, NOVEMBER 5. { Registered at the General Post Office as a Newspaper. } Price 5d. POST FREE, 5½d.

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Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE.—FULL PRICE will be given at the Office for Clean Copies of No. 5, January 29, 1870.
Office, 41, Wellington Street, Strand, W.C.

NOTICE to SUBSCRIBERS.—On and after this date the SUBSCRIPTION to the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE will be £1 3s. 10d. for 12 months, including postage, instead of £1 6s., as heretofore.
May be had of all Booksellers.
Published by W. RICHARDS, 41, Wellington Street, Strand, W.C.
October 1, 1870.

BRISTOL CHRYSANTHEMUM, CUT FLOWER and FRUIT SHOW.—The SEVENTH GRAND SHOW will be held at the Rifle Drill Hall, Queen's Road, on THURSDAY, November 10. Schedules, &c., may be had on application to
G. WEBLEY,
F. G. HARRIS, } Hon. Secs.

THE PLUMSTEAD, WOOLWICH, and CHARLTON CHRYSANTHEMUM SOCIETY will hold their THIRD ANNUAL EXHIBITION at the Town Hall, Woolwich, on FRIDAY and SATURDAY, November 11 and 12. Admission on Friday till 6 P.M., 1s.; after 6 P.M., on Friday, 6d.
34, New Road, Woolwich, S.E. F. T. DAVIS, Hon. Sec.

THE STOKE NEWINGTON CHRYSANTHEMUM SOCIETY will hold its TWENTY-FOURTH ANNUAL EXHIBITION in the Assembly Rooms, Defoe Road, Church Street, Stoke Newington, on TUESDAY and WEDNESDAY, November 15 and 16. Admission, first day, 1s.; second day, 6d.
W. T. HOWE, Hon. Sec.
1, Downs Park Road, Shacklewell, E.

Chrysanthemums.

ADAM FORSYTH begs to inform his Friends and the Public generally that his GREAT COLLECTION of SPECIMEN and other CHRYSANTHEMUMS are NOW in FLOWER, and may be seen every day, Sundays excepted.
Brunswick Nursery, Stoke Newington, N.

THE GENUS HYDRANGEA.—The leading varieties mentioned at p. 1373 of the *Gardeners' Chronicle*, Oct. 15, and especially large quantities of the extra fine HYDRANGEA OTAKSA. See FLORE, xvii., p. 35 (in double plate), and CATALOGUE, No. 136 M.
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WINDEBANK AND KINGSBURY, Bervoir Mount Nursery, Southampton.

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To the Trade.

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MR. ALEXIS DALLIERE, Nurseryman, Ghent, Belgium, begs to inform Amateurs and the Trade that he has just published an English Edition of his CATALOGUE, which may be obtained post free on application to his Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

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CHARLES TURNER can still supply strong Plants from the ground, and in small pots, to insure a crop of fruit next season, of the leading kinds.
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STRAWBERRY PLANTS for SALE.—Good Plants, ready for Forcing, in 32 and 48 pots; about 1000. The sorts are, Keen's Seedling and Charles Napier. 15s. per 100.
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To the Trade.

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VAN HOUTTE'S CATALOGUE.—Nos. 132, 134 K., 135 L., 136 M., are to be had in London of Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

SPIGELIA SPLENDENS ("FLORE," xvii., 121, 123).—One of these plates (double size) presents the whole plant in flower. N.B. Strong plants can be sent now, in dry state, at 4s.
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J. ROUSE, Eastgate Nursery, Peterborough.

CARTER'S BULBS and SEEDS, carriage free. See page 1468 of this week's *Gardeners' Chronicle.*

Hyacinths, Tulips, and other Bulbs.

WM. CUTBUSH AND SON'S importations of the above have just arrived, and have every appearance of being above the average quality, for which they have been noted for many years. CATALOGUES post free.
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SUTTONS' GUINEA COLLECTION of FLOWER ROOTS, for Indoor and Outdoor Cultivation, forwarded carriage free by rail. In ordering, please say whether for indoors or outdoors.
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SUTTON AND SONS, Reading, Berks.

Suttons' Fresh Imported Flower Roots, Carriage Free.

SUTTONS' AUTUMN CATALOGUE for 1870 is now ready, and may be had gratis and post free.
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WOOD AND INGRAM beg to offer SHOW PINKS, in 12 fine varieties, named, extra fine plants. One pair of each for 10s., package included.
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Carnations, Picotees, and Pinks.

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LOUIS VAN HOUTTE, Royal Nursery, Ghent, Belgium

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To the Trade.

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EVERY GARDEN REQUISITE KEPT in STOCK at
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TO BE SOLD, cheap, ALBERT RHUBARD, 2- and 3-yr. planted. For price per 100 or 1000, apply to
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CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5s. per 1000; also Drumhead or Cattle Cabbage Plants at 3s. 6d. per 1000, can now be supplied by
W. VIRGO AND SON, Woodcote Nursery, near Guildford.

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G. WALKLING, Nurseryman, High Road, and College Park, Lewisham, S.E.

DICKSONS' IMPROVED MUSHROOM SPAWN.—New Spawn, of finest quality, now ready. CIRCULAR, with price and testimonials, on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

The Best New Potato for 1871.

SUTTONS' RED-SKIN FLOURBALL.—For full particulars, see p. 1469 of this week's *Gardeners' Chronicle*
SUTTON AND SONS, Seed Growers, Reading.

MYATT'S DWARF-TOP PROLIFIC KIDNEY, and other SEED POTATOS. Prices on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

To the Trade.

SEED POTATOS.—GRYFFE CASTLE and PATERSON'S VICTORIA, fine (true) sample, about 8 tons of each to offer, price £5 per ton.
W. JACKSON, Blakedown Nursery, Kidderminster.

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JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

British and American Orders.

LOUIS VAN HOUTTE, having made advantageous arrangements with the various Steamboat Companies for the transmission of goods, matted Baskets or Hampers of an ordinary size can now be sent direct from Ghent to any of the following Ports for the sum appended, which sum will be charged in Invoice:—Leeds, Harwich, London, and Middlesbrough Tees, for 5s. each; Newcastle on Tyne and Liverpool, for 7s. 6d. each, and to Belfast, Cork, Dublin, Glasgow and Leith, for 10s. 6d. each.

SPECIAL RATE FOR FREIGHT TO LONDON ONLY:—

1 package weighing	1 to 4 lb	.. .. ..	..	2s. 6d.
1 "	5 to 10 lb	.. .. ..	..	2 0
1 "	11 to 25 lb	.. .. ..	..	3 0
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1 "	31 to 50 lb.	.. .. ..	..	4 0
1 "	51 to 100 lb.	.. .. ..	..	5 0
Matted Baskets, each	.. .. ..	.. .. ..	..	5 0

It must be distinctly understood that the above rates do not include the cost of the materials used in packing; these are, however, in all cases, charged as low as possible.

From the above named towns to the final destinations the re-expedition is made by special agents, at the cheapest rate and by the shortest route.

It was formerly customary to charge the uniform rate of 5s. per package to London; this method proved naturally unsatisfactory, as small packages were thereby overcharged.

The advantage of the present system for the Buyer will readily be perceived. For example, a party ordering 50 Hyacinths, weighing nearly 10 lb., can now receive these Bulbs, free in London, for 2s. 6d.; 100 Hyacinths, weighing 20 lb., for 3s.; 200 Hyacinths, weighing 40 lb., for 4s., and so on. Another example:—A basket containing 50 Camellias, with buds, or the same number of Indian Azaleas of the usual size, will be delivered free in London, or any of the first four ports enumerated above, for 5s.

U. S. A. Payments on LOUIS VAN HOUTTE'S account may be made to Messrs. AUSTIN, BALDWIN AND CO., 72, Broadway, New York, to whom, also, all Orders from unknown parties or from those with whom L. V. H. has had no previous transactions, must be sent.

Royal Nursery, Ghent, Belgium.—October, 1870.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.

The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.

The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.

The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, at 2s. 6d. per packet, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint; and of the following Agents:—

ENGLAND

Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
" Wood & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
" A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, King's Road, Chelsea.
" S. Sharp & Sons, Newcastle on Tyne
" Hooper & Co., Covent Garden, London.
" Butler, McCulloch & Co., Covent Garden, London.
" G. Gibbs & Co., Down Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London.
" Downie, Laird & Laing, London and Edinburgh
" P. Lawson & Son, 20, Budge Row, London
" Rutley & Silverlock, London
" Dick Radclyffe & Co., 129, High Holborn, London, W.C.
" Fisher, Holmes & Co., Handsworth Nurseries, Sheffield.
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., High Holborn, London, W.C.
" Minter, Nash & Nash, 60, Strand, London, W.C.
" Cole & Loomer, 49, Darley Street, Bradford
Mr. George Tredgett, Cambridge
" J. S. Woodthorpe, Sible Hedingham, Essex.
" G. Hinsman, Fareham
" B. Brecher, Halifax, Yorkshire.
" W. Knight, Hailsham, Sussex
" Timothy Brigden, South-Eastern Railway Station.
" W. Paul, London
" E. Holmes, Whittington Nursery, near Lichfield.
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire.
" B. S. Williams, Upper Holloway, London.
" E. Cooling, Derby.
" James Wood, Newport, Isle of Wight.

SCOTLAND.

Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow.
" P. Lawson & Son, Edinburgh
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling.
" T. & R. Thune, 60, Buchanan Street, Glasgow.

IRELAND.

Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin.

BELGIUM.

Mons. Louis Van Houtte, Ghent.

PRUSSIA.

Messrs. Platz & Son, Erfurt.
" Ferdinand Juhlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

AMERICA.

Messrs. B. K. Bliss & Sons, New York.

MYOSOTIS DISSITIFLORA.

B. S. WILLIAMS

Has much pleasure in offering good Seedling Plants, in quantity, of the above superb New Spring Bedder. It blossoms three weeks earlier than M. sylvatica, far more profusely, of a bright azure-blue colour, and is quite as hardy.

Extracts from *Gardeners' Chronicle.*

"For beauty M. dissitiflora carries all before it, captive at its sweet will, and reigns supreme without a rival over all the Forget-me-Nots." "For earliness, compactness, and general effect, it is far in advance of M. sylvatica, and the individual blooms are nearly twice as large. We say, emphatically, that no arrangement of Spring Decorative Gardening can be complete that excludes Myosotis dissitiflora."

Price—per dozen, 6s.; per 100, 40s.

B. S. WILLIAMS, VICTORIA and PARADISE NURSERY, UPPER HOLLOWAY, N.

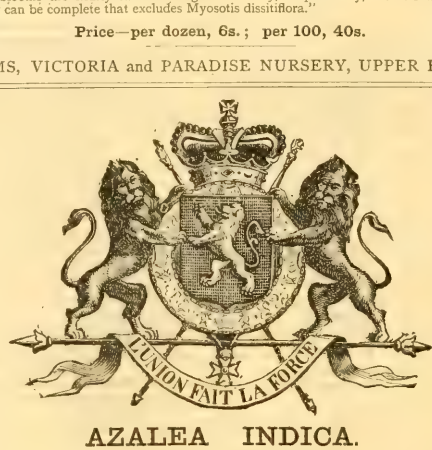

AZALEA INDICA.

LOUIS VAN HOUTTE

BEGS TO OFFER THE FOLLOWING VARIETIES, HIS OWN SEEDLINGS:—

		Each.			Each.
510	ALEXANDRE DUMAS	.. 6s. 6d., 12s.	103	MDME. GUSTAVE GUILMOT	.. 6s. 6d., 12s.
488	HIPPOLYTE VAN DE WOESTYVE	6s. 6d., 12s.	487	" IRIS LE FEBVRE	.. 6s. 6d., 12s.
507.	JULES VAN LANGENHOVE	.. 6s. 6d., 12s., 20s.	484.	MDLLE. JULIE VAN LANGENHOVE ..	6s. 6d., 12s., 20s.
503.	MDME. AIME VAN LANGENHOVE	.. 6s. 6d., 12s.	513.	" LEONIE VAN HOUTTE	6s. 6d., 12s., 20s.
482	" ALEX. HARDY	6s. 6d., 12s., 20s.	498.	" MARIE LE FEBVRE	6s. 6d., 12s., 20s.
501	" ALEX. VAN LANGENHOVE	.. 6s. 6d., 12s., 20s.	486.	" MARIE VAN HOUTTE	6s. 6d., 12s., 20s.
485.	" CAMILLE VAN LANGENHOVE	6s. 6d., 12s., 20s.	494.	MARECHAL MAC MAHON	6s. 6d., 12s., 20s.

☞ *The Plants are beautiful, and fit for Exhibition.*

LOUIS VAN HOUTTE begs to offer also, by the dozen, first-rate, large plants, AZALEA INDICA, in the way of Bernhard Andreas, Duke of Nassau, Hermine, magnificens, punctulata, Roi Léopold, Souvenir du Prince Albert, a plant of each amongst the dozen, plants a foot across, full of buds, for 42s. per dozen.

QUITE NEW HARDY JAPAN AZALEAS.

The three next Numbers (a one) of Vol XIX. of the FLORE DES SERRES will contain these extraordinary fine kinds, bearing flowers as large as large Rhododendron flowers, and as hardy as Oaks. Very strong plants, each bush full of flower-buds, 8s.; a dozen in mixed varieties for 80s.

The three first Numbers of Vol. XIX. of the FLORE DES SERRES will be ready in beginning of next month.

GHENT AZALEAS.

(Quite Hardy.)

40	first-rate varieties, strong, with buds.		
25	" " "		
12	" " "		
VAN HOUTTE'S FLORE-PLENO,	do.	do	each, 3s. 3d. to 8s.
	small,	do.	" 1s. 8d.
BOUQUET DE FLORE,	small,	do.	" 1s. 3d.

HARDY RHODODENDRONS.

PRINCE CAMILLE DE ROHAN ("Flore," X., p. 241), fine plants, for early forcing, furnished with from 3 to 5 flower-buds, each 2s., per dozen 20s.; 8 to 15 flower-buds, each 4s., per dozen 40s.; 18 to 25 flower-buds, each 8s., per dozen 80s.

NEIGE ET CERISE ("Flore," XIII., p. 185), fine plants for slowly forcing, with from 8 to 25 flower-buds, each 8s., per dozen 80s.

PRINCESS of WALES ("Flore," XVIII., p. 55), very hardy, fine plants, 8 to 15 flower-buds, 12s.

ROYAL NURSERIES, GHENT, BELGIUM.

EASTES' KENTISH INVICTA PEA.

MESSRS. JAS. S. EASTES & CO.

TAKE LEAVE TO ANNOUNCE

THAT THEY ARE IN A POSITION TO OFFER THE ABOVE IMPORTANT PEA TO THE PUBLIC.

The "KENTISH INVICTA PEA" was raised by a well-known Kentish raiser of new Peas, in the year 1867, and passed into Messrs. EASTES' hands in the spring of 1868; and knowing the importance of thoroughly testing the properties of a new Pea before submitting it to the public, they have carefully grown it each year in their trial grounds, and have also had it tested in the trial grounds of some of the leading Seed Merchants, and the result in every instance has been the same, proving the "KENTISH INVICTA" to be the quickest and earliest *Blue* Pea ever introduced.

EASTES' KENTISH INVICTA PEA is a round Blue Pea, about "two feet" in height, with straight, handsome, well filled pods; is earlier than the best stocks of Daniel O'Rourke, and Dicksons' First and Best, whilst the fact of its being a "Blue" Pea proclaims it to be infinitely superior in flavour to any White Pea in cultivation.

ASHFORD, KENT.—Oct. 29, 1870.

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application.

The stock of Seedling and Transplanted LARCHES, SCOTS FIRS, and other FOREST TREES is both unusually extensive and superior in quality. When personal inspection is not convenient, samples and special offers will be sent if required.

Edinburgh and London (20, Rudge Row, Cannon Street, E.C.

SEEDLING FOREST TREES, CONIFERS, FRUIT TREE STOCKS, TREE SEEDS, &c.—The Administration of the Pomological Institute, Ringelheim, Hanover, Germany, beg to inform the Trade generally, that they have just published their CATALOGUE of the above (all at greatly reduced prices), and that it may be had post free on application to their Agents, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

Special Offer to the Trade.

LAURUSTINUS, fine bushy plants, well set with flower-buds, in 5 sizes, 1 foot and 3 feet, 20s. per 100.

TREE BOX, very fine bushy stuff, 2 to 3 feet, some variegated, 25s. per 100.

The above will remove with splendid root, and can be put either on Midland or Great Western Rail.

DOUBLE WHITE PRIMROSES, 12s. 6d. per 100.

TRITOMA UVARIA, best variety, fine strong plants, 25s. per 100.

JOHN MORSE, Nurseryman, Dursley, Gloucestershire.

The Belgian and Other First-rate Fruit Trees.

LOUIS VAN HOUTTE begs to announce that the English issue of his CATALOGUE, No. 136 M., has been sent to his Customers. This Catalogue also contains the CONIFERS, the ORNAMENTAL TREES and SHRUBS, ROSES of all kinds and GESNERIACEOUS PLANTS, to be had at a very cheap rate, in dry roots, sent prepaid by post in small tin boxes. The unforeseen unexpected Novelties therein advertised are of such an important value that they will in all manners attract the attention of those prudent enough to prepare in the autumn, so as to have an enjoyable view of this novel tribe of plants, flowering from March until late in the autumn.

Royal Nursery, Ghent, Belgium.—October 29.

Magnificent Trees for Avenue Planting.

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX.

WM. WOOD AND SON have to offer a splendid stock of the following remarkably well-grown Trees:—

ROBINIA PSEUD-ACACIA, 6 and 8 feet.
ASH, WEEPING, extra fine, 7 to 9 feet stems.
CATALPA SYRINGÆFOLIA, 8 to 10 feet.
ALLANTUS GLANDULOSA, 6 feet.
ELMS, extra fine, consisting of American, English, Cornish, and other varieties, 6 to 8 feet, 8 to 10 feet, and 10 to 12 feet.
LABURNUMS, 8 to 10 feet.
HORSE CHESTNUTS, Common and Scarlet, extra fine plants, 7 to 8 feet, 8 to 10 feet, 10 to 12 feet, very fine specimens.
AMERICAN WEEPING WILLOWS, 7 to 8 feet.

CATALOGUES gratis on application.

Ornamental Trees and Shrubs.

LOUIS VAN HOUTTE begs to announce that his CATALOGUE, No. 136 M., contains a large quantity of the finest TREES and SHRUBS in cultivation. He directs especial attention to the finest and the grandest of all the LILAC TRIBE, viz. the GLADLEY (*Flore*, xv. p. 237), and the GLOIRE DE MOULINS (see Catalogue, No. 136 M., p. 41).

Amongst many fine hardy Trees and Shrubs, the following are to be found in the Catalogue:—Abies Nordmanniana, Aucuba, Cupressus Lawsoniana, Negundo fol. arg. var., pulymorphum atropurpureum, dissectum, palmatum (see the "Flore"), Amygdalopsis Lindleyi (alias Prunus triloba); Aucubas, all the best varieties; Berberis, new and fol. arg. marginatis; Cerasus hortensis roseo flore pleno, Mahaleb fol. arg. marg., sinensis pendula flore roseo; Cornus mascula fol. arg. marginata, Sibirica fol. albo-marginata; Cotoneaster frigida fol. arg.; Corylus Avellana pendula, Bergeri macrocarpa (long-fruited, with enormous fruits) from the Black Sea; Deutzia crenata fl. albo pleno, purpurata, and many others; Dimorphanthus mandshurica, a noble Araliaceous shrub, twice the size of the Aralia japonica; Fagus sylvatica latifolia nigra, leaves twice the size of the usual black-leaved Beech; Fraxinus excelsior pendula, stems 9 feet high; Hibiscus syriacus fol. var.; Hydrangea Otaksa, stellata prolifera ("Flore," xvii. p. 35, and xviii. p. 109; at this page is a review of the genus Hydrangea found in the trade); Ilex aquifolium fol. arg. var., pendula (on 6 feet stems), elegantissima fol. var., and all the best sorts,—large plants, 2s. 6d. and 5s.; Juglans ailantifolia (from Japan, bearing enormous leaves), monophylla, &c.; Kolreuteria Japonica; Liriodendron tulipiferum fol. aur. var., a new kind; Malus floribunda, all the sizes; Pavia indica, Platanus californica, Pterocarya sinensis; Quercus Robur concordia (large yellow-leaved), Dauvessei nigra true, a grand plant, stems and bold stems); Salix babylonica "alba nana, a new Weeping Willow, a great deal superior to the common one, more robust, vigorous; Ulmus campestris aurea, Berardi; a great many Weigelas, and amongst them the hybrids named carminea, Hendersoni, Kermesina, Lavallei, Lemoinea, Lowii, &c.

Royal Nursery, Ghent, Belgium.

GLADIOLUS GANDAVENSIS, and AMARYLLIS.—Selection of the finest varieties, may be had from November to April. CATALOGUE, containing detailed descriptions, will be published at the end of November next.

AMARYLLIS (Hardy Hybrids).—The culture of the Amaryllis has been for a number of years, and still continues to be, one of the leading features of this Establishment. From year to year no efforts have been spared to bring to greater perfection this beautiful tribe of plants. To effect this, the choicest sorts have been selected from all existing collections, so that, by careful and judicious hybridisation, a very superior class of well-formed flowers has been obtained. I am now offering strong bulbs of my newest varieties, which, for general excellence, are not to be surpassed, if equalled.

At the International Exhibition of 1868, held in Ghent, the First Prizes were awarded to the Collections exhibited by this Establishment.

The author of the excellent "Traité Théorique et Pratique de la Culture des Plantes de Serre Froide," M. P. E. De Puydt, in the April Number, p. 300, of the 58th Volume of the "Revue Trimestrielle," published in Brussels, speaks as follows with reference to the Collections shown on this occasion:—

"One genus of plants, by the splendour and infinite variety of its flowers, struck all connoisseurs with astonishment. The Amaryllis, far from being of recent introduction, has become under the clever hands of Mr. Van Houtte completely transformed, and carried to such a degree of perfection as to be almost incredible. In one of the salons of the Exhibition we observed hundreds of these fine plants, with large flowers, striped, flaked, and edged with every shade of colour, from the purest white to the richest crimson. A new variety which had been crowned approached even violet. Mr. Van Houtte's selection was at once irreproachable and unsurpassed as regards size."

At the International Exhibition held at Brussels in the month of April last year, Five First Prizes, including Two Gold Medals, were awarded to my Collections.

Collections of Amaryllis have been made up for convenience, and comprise only those sorts producing finely-formed flowers of the richest colours, all of which were specially selected during the past blooming season.

FINE DISTINCT VARIETIES.

Collection	£	s.	d.	Collection	£	s.	d.
A 6 fine varieties for ..	0	8	0	J 12 "	0	15	0
B 6 "	0	16	0	J 12 "	0	60	0
C 6 "	0	12	0	K 12 "	0	80	0
D 12 "	0	12	0	L 12 "	0	50	0
E 12 "	0	16	0	M 25 "	0	60	0
F 12 "	0	24	0	N 25 "	0	80	0
G 12 "	0	40	0	O 25 "	0	160	0
H 12 "	0	40	0				

LOUIS VAN HOUTTE, Royal Nursery, Ghent, Belgium.

Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (illustrated) of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

CISTERNS.—One or Ninety CIRCULAR IRON CISTERNS, 12 inches diameter, 28 inches deep, 14th of an inch thick; will hold 80 gallons. Price, painted, 28s. each; Galvanised, 38s. each.

SOUTHWARK GALVANISED IRON COMPANY, Sumner Street, Southwark, London, S.

MINTON AND CO. Beg to inform the Public that they keep a Stock of their ENAMELLED and MAJOLICA TILES At the China and Earthenware Manufactory, PARK VILLAGE EAST, REGENT'S PARK, 28, Walbrook, Mansion House, London.

They have no connection with any other House of the same name. Please to note the address.

New Garden Peg.

H. YOUELL has much pleasure in stating that he is now sending out his NE PLUS ULTRA PIN, for pegging down all kinds of plants or layers, &c.

The *Gardeners' Chronicle* of October 8, says:—"A capital peg for the purpose. The wire is so bent as to form a loop at the top above the hook, and this serves as a handle. Price 1s. per 100. A liberal discount to the Trade.

H. YOUELL, Ladywood Road, Birmingham.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING AND BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them by Gardeners which were not of their make, all of which are warranted both by Sellers and Makers.

S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

PAXTON WORKS, Sheffield. Established upwards of 125 years.

Irrigation.—To Gardeners, Agriculturists, &c.

FOR SALE, a Bargain, in Cases only of 555 feet (18s feet of each size), about Two Miles length of best GALVANISED IRON PIPING, light and strong—24 W gauge—2½ inches, 3 inches, and 3½ inches in diameter. Price 4d., 5d., and 6d. per foot respectively. Has borne a pressure of above 40 lb. to square inch, or 90 feet head. Sample lengths of the three sizes, nested, will be sent on receipt of Post-office order for 20s.; crossed to bankers. If not approved of can be returned at the carriage both ways. Address,

IRRIGATOR, H. Greenwood, Advertising Agent, Liverpool.

By Appointment to H.R.H. the Prince of Wales.

BARTON'S PATENT STABLE and HARNESS-ROOM FITTINGS, &c., in great variety. Patronised also by the King of the Belgians, the King of Italy, the King of Holland, by the principal Nobility of the Kingdom, and adopted by the first Architects and Builders of England and the Continent.

For alterations of Stables a competent person can be sent to any part to inspect and give Estimates.

Iron Mangers from 10s. 6d. each; Harness Brackets, in sets, from 5s. 6d.; and Stable requisites in general.

Fully Illustrated Catalogue sent on receipt of six stamps.

JAMES BARTON Iron Works, 370, Oxford Street, W.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The Articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 30s. per doz., or £10 p. 100.
" Good named kinds, £5 to £7 10s. per 100.
" Common mixed colours, £2 10s. per 100.
" Van Houtteï fl.-pleno, strong bushy flowering plants, 1½ to 3 feet, 42s. to 120s. per dozen and upwards. This is one of the most beautiful of the Double Azaleas.

Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower-buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens.

ANDROMEDA FLORIBUNDA.—Good plants, 18s. to 30s. per doz.

RHODODENDRONS.—We invite the special attention of Rhododendron buyers to this part of our stock. We have miles of borders in which the plants vary from 1 foot to 20 feet high. Every plant a specimen, and comprising all sorts excepting the common Ponticum.

Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent on application.

Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Rotten Row were nearly all of them supplied from Knap Hill. As no description on paper can give an adequate idea of these plants, we have had a fine example photographed, which is given in our Catalogue, just published.

RHODODENDRON PONTICUM, for Cover, £7 10s. to £15 per 1000.
" " varieties, named, from layers, 10 varieties, 50s. to 100s. per 100.
" Dwarf varieties, the best kinds and nice plants, £5 to £7 10s. p. 100.

Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s. to 100s. per 100.
" Larger and very bushy plants, £10 to £20 per 100.

Caution.—We have grown very largely for many a large number of Rhododendrons from layers, and we now have a stock of more than 200,000 plants of named varieties, which we believe are quite unequalled, being without doubt the best plants we have ever seen. We supply them, all layers, at from 50s. to 200s. per 100. A sample, the only guide, will be sent on application.

HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, by name, including Menaziesias, every plant a specimen; 6s. per dozen, 40s. per 100.

" The free growing varieties of VULGARIS, &c., 30s. per 100, £10 per 1000.

" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, £5 per 100.

KALMIA LATIFOLIA, from 50s. to 100s. per 100.
" Nice blooming plants, £5 to £10 per 100.
" Larger, 30s. to 50s. per dozen and upwards.
" MYRTIFOLIA, 42s. to 60s. per dozen.

All other American Plants are grown to a large extent.

HOLLIES.—The stock of Hollies on this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.

COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100; 3 to 3½ feet, £5 to £7 10s. per 100; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.

Handsomely shaped and beautifully grown Pyramidal plants.

We have a number of very large Green Hollies, 12 and 15 feet high.

WATERERS HOLLY.—We have these in large numbers and of GOLDEN QUEEN. All sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.

PERRY'S WEEPING HOLLY STANDARDS.—A large number.

NEW GOLDEN WEEPING HOLLY.—Nice bushy heads.

The COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, magnificent plants.

VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high.

YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 14 feet. These are invaluable as blinds.

IRISH YEWS, of all sizes, up to 10 feet.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN. } Handsome Pyramidal plants, 5, 6, 7, and
" VARIEGATED. } 8 feet high. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.

AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high.

LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.

LAURUSTINUS and BAYS.—Fine Standards, in tubs.

Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted:—

ABIES ALBERTUS, 5 to 6 feet, 42s. per dozen; 7 to 8 feet, 60s. These are fine plants of handsome habit. Every plant a specimen, and comprising all sorts excepting the common Ponticum.

ABIES ORIENTALIS, 4 to 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. and upwards.

PINUS CEDRUS, splendid trees, 7, 8, and 10 feet high.

PINUS PINSAPO, 2 to 2½ feet, 30s. to 42s. per dozen; 3½ to 4 feet, 7s. 6d. to 10s. 6d. each; larger, 5 to 6 feet, 21s. each and upwards

PINUS NOBILIS, 1½ foot, very stout, 18s. per dozen, £5 per 100; 2 to 3 feet, 60s. per dozen; 4, 5, 6, 7, to 10 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards.

PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high, 18s. per dozen; 2½ to 3 feet, 5s. to 7s. 6d. each; larger specimens, 4, 5, 6, 8, and 10 feet.

PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.

PICEA LASIOCARPA (WEEPING), handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, and 8 feet high, 21s. each and upwards; and all have been transplanted within 12 months.

CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; 5 to 7 feet, 60s. to 84s. per dozen; 8, 10, and 12 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards

CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, 4, and 5 feet high.

CUPRESSUS LAWSONIANA GRACILIS } 3 to 4 feet, 42s. to
" ARGENTEA } 84s. per dozen.

JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.

THUJA LOBBII, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.

THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen.

THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.

WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—

ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET HORSE CHESTNUTS, 8 and 10 feet high.
ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, girting 5 to 6 inches 4 feet from the ground.
BEECH, PURPLE, 10 to 15 feet; 12 to 14 feet, fine trees.
BEECH, COMMON, 8 to 10 feet.
BIRCH, WEEPING, 8 to 10 feet.
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet.
LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.
MAPLES, 8 to 10 feet.
OAKS, ENGLISH, 8 to 10 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high. The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBARDY, 10 to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
AILANTUS, 8 to 10 feet.
CATALPAS, 6 to 8 feet.
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years.

Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

New Soft-Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready. It contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest price consistent with quality and correctness. See List, and present quotations
New Florist's Flower and Florist's Flower Seed Merchant, Woolwich.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, Pandanuses, and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.
Conservatories furnished, and Choice Plants supplied for Balls or Dinner table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

THE CORSICAN PINE, PINUS LARICIO.—Allied to the Scotch Pine, but a much handsomer and finer tree. Equally hardy with P. sylvestris. Its wood is more weighty and resinous, and consequently more compact, stronger and flexible. It grows well on the summit of the highest mountains in Corsica, and succeeds well in Scotland, even in the Highlands. As an ornamental tree, it deserves to be planted extensively for its very regular and handsome form, and the intensely dark green of its abundant foliage. It also deserves planting on a large scale as a useful tree, on account of the great rapidity of its growth.—*London's Encyclopædia*, p. 802; *Abbreviator*, iv., p. 2204.
Pine 5s per lb., seed fresh and true species, in sealed packets
Messrs. R SILBERRAD & SON 5, Harp Lane, London, E.C.
LOUIS VAN HOUTTE, Royal Nursery, Ghent, Belgium

Cheap Conifers.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, has much pleasure in offering the following CONIFERS at reduced prices, of which the carriage will be paid to London or Goole, charging 5s per package:—

ABIES NORDMANNIANA, fine stuff, 1 foot high, £5 per 100.
„ PINSAPO, strong plants, 1½ to 2 feet, £5 per 100
CRYPTOMERIA ELEGANS, in small pots, 42s. per 100.
PINUS MASSONIANA, in small pots, 6 inches high, £50 per 100
THUJOPSIS DOLOBRATA, in pots, 63s. per 100
WIDDRINGTONIA ERICOIDES, fine plants, 25s. per 100.
GINGKO BILOBA, fine, 3 feet, 63s. per 100
BIOTA AUREA, 1 foot, fine plants, 63s. per 100
„ ELEGANTISSIMA, in small pots, 42s. per 100
THUYA ELLWANGERIANA (Tom Thumb), fine plants, 1 foot high, 63s. per 100
RETINOSPORA PISIFERA AUREA, in small pots, 35s. per 100.

SPECIMEN CONIFERS, &c.
Extra large plants, for immediate effect.
ABIES EXCELSA CLANBRASILIANA, 1 foot by 4 feet, 3s. 6d. to 5s. each
„ MENZIESII, 6 to 8 feet, 5s. to 7s. 6d. each
ARAUCARIA IMBRICATA, 4 to 5 feet, 15s. to 21s. each.
„ 6 to 10 feet, 63s. to 105s. each
CEDRUS DEODARA, magnificent specimens, 12 to 16 feet, 30s., 42s., and 63s. each
CUPRESSUS LAWSONIANA, 10 to 12 feet, 21s. to 31s. 6d. each
PICEA PINSAPO, 5 to 6 feet, 63s. to 84s.; 8 to 9 feet, 105s. to 126s. each.
„ PINSAPO, 2 to 3 feet, 3s. 6d. to 5s.; 3 to 4 feet, 7s. 6d. to 10s. 6d. each; Standards, 4 to 5 feet, 21s. to 42s. each
PINUS AUSTRIACA, 6 to 7 feet, 7s. 6d. to 15s. each
„ CEMBRA, 4 to 6 feet, 3s. 6d. to 5s. each
„ PICEA, 4 to 6 feet, 3s. 6d. to 5s. 6d. each.
„ INSIGNIS, 8 to 10 feet, 3s. 6d. to 42s. each.
„ PYRENAICA, 4 to 6 feet, 7s. 6d. to 15s. each
TAXUS BACCATA FASTIGIATA (Irish Yew), 2 to 3 feet, 1s. 6d. to 2s.; 4 to 5 feet, 2s. 6d. to 3s. 6d. each
„ BACCATA VARIEGATA, 1½ to 2 feet, 1s. 6d. to 2s. 6d. each.
THUJA GIGANTEA, 10 to 12 feet, 42s. to 63s. each.
„ LOBBII, 6 to 10 feet, 63s. to 84s., and 105s. each.
„ WAREANA, 5 to 8 feet, 3s. 6d. to 5s. each.
„ ORIENTALIS, 4 to 6 feet, 3s. 6d. to 5s.; 6 to 8 feet, 7s. 6d. to 10s. 6d. each
THUJOPSIS BOREALIS, 8 to 10 feet, handsome plants, 42s. to 63s. each.
WELLINGTONIA GIGANTEA, 4 to 6 feet, 7s. 6d. to 10s. 6d.; 6 to 8 feet, 15s. to 21s.; 8 to 10 feet, 21s. to 42s. each
BOX (TREE), Green and Variegated, 6 to 8 feet, fine specimens, 7s. 6d., 10s. 6d., and 15s. each
LAUREL (Portugal), extra fine specimens, 3 to 5 feet, 3s. 6d. to 5s. each
LIME (Weeping), 8 to 10 feet, 3s. 6d. to 10s. 6d. each
FIR, fine ornamental trees, in great variety.
WILLIAM BRYANT, The Nursery, Rugby.

PAUL'S NURSERIES,
WALTHAM CROSS, N.
ROSES.
ROSE PRINCESS CHRISTIAN is one of the grandest Roses in cultivation. The best Rose of the present year. The great Rose of the Show. Standards and Dwarf Standards, 10s. 6d. each
Dwarfs, 7s. 6d. each
Standard ROSES, 15s per dozen, and upwards
Dwarf Standard ROSES, 12s. per dozen, and upwards.
Dwarf ROSES, 9s. per dozen, and upwards
„ in pots of extra size, prepared for forcing, 24s. per dozen, and upwards
Climbing ROSES, strong plants, 9s. per dozen and upwards.

HYACINTHS, TULIPS, &c.
Choice named HYACINTHS, 6s. per dozen, and upwards.
Bedding HYACINTHS, 3s. 6d. per 100, and upwards.
„ TULIPS, 3s. per 100, and upwards.
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, of sorts, 2s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000
All other Bulbs equally moderate in price.

NEW GERANIUMS
WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each.
AVALANCHE, do., do., 7s. 6d. each
MARCHIONESS.—The finest Silver Variegated Zonal kind, and the finest grower out, 15s. each
WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each
ROSEBUD.—The finest variegated for bedding, 10s. 6d. each.
AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.
The finest and most extensive collection in Europe, 12 each and upwards.

EVERGREENS, CONIFERS, &c.
The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently transplanted specimens.

FRUIT TREES.
APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES, FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.
PRICED CATALOGUES, free by post.
IMPORTANT.—Address WILLIAM PAUL (the Christian name in full), Paul's Nurseries, Waltham Cross, London, N.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.
Exotic Nursery, Tooting, Surrey, S.W.

Dutch Flower Roots.

ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers.
DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted.
Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application.
Sion Nursery, Thornton Heath Surrey, and at the East Surrey Seed Warehouse, South End, Croydon

Dutch Flowering Bulbs and Autumn Seeds.

WILLIAM SKIRVING announces the arrival of his Annual Stock of DUTCH FLOWERING BULBS, comprising Hyacinths, Tulips, Crocus, Anemones, Ranunculus, Narcissus, &c., all carefully selected, CATALOGUES of which can be had free on application.

AGRICULTURAL SEEDS for PRESENT SOWING.
Best sorts of WHEAT, grown on his own Farms; WINTER VETCHES, RYE, and a general assortment of GRASS SEEDS for Laying Down Permanent Pasture, or for One or Two Years' Mowing for Green Food.
Early orders are respectfully solicited, and can be executed either at the Seed Warehouse, Queen Square; or at his Nursery and Seed Establishment, Walton-on-Thames.
Queen Square, Liverpool, October 1, 1870.

Now Ready, Free by Post,

GEORGE JACKMAN and SON'S Illustrated Descriptive Priced CATALOGUE of Standard, Pyramid, Dwarf, and Trained FRUIT TREES of the leading kinds; Standard and Dwarf ROSES of select and choicest varieties; a fine hardy collection of AMERICAN PLANTS, rare and hardy CONIFERS, CLEMATIS, EVERGREEN and DECIDUOUS TREES, SHRUBS, and FOREST TREES, &c.
The Catalogue will contain a series of five large Engravings of Clematis for which this Establishment is famed, taken from Photographs

REFLEXED FORM, No. 3

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials.
Engraving No. 1 For Conservatories, Terraces, &c.
„ No. 2 For Lawn, Flower Garden, &c.
„ No. 3 For Hedges and Permanent Bedding, &c.
„ No. 4 For Festoons, Verandahs, &c.
„ No. 5 For Rockery, Rockwork, Ruins, &c.
"This Establishment is favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*
Woking Nursery, Surrey.

INTENDING PLANTERS are respectfully invited to inspect the extensive stock of FOREST TREES and SHRUBS grown in these Nurseries, all of which are in fine condition, and can be highly recommended.
THOS. THURTON, The Nurseries, Basbot, Surrey.
T. T. would be happy to receive Notice from intending Visitors, as he would be in a position to offer every facility for their doing so.

Araucaria imbricata.—Perfect Specimens,
WELL GROWN and very HANDSOME

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX.
WM. WOOD and SON have a large Stock of the above. Price per plant:—

2 feet	..	..	..	£0	5	0	8 feet	..	..	..	£2	2	0
5 feet	..	..	..	1	1	0	10 feet	..	..	..	3	3	0
6 feet	..	..	..	1	5	0	Larger, up to 30 feet.						

Price on application

TO PLANTERS and OTHERS.—SIX ACRES of very superior transplanted EVERGREEN and other TREES and SHRUBS on the Kempton Park Estate, one mile from Hampton and Sunbury Stations, on the Thames Valley Railway, consisting of—

Araucaria imbricata	Pinus Lawii	Pinus Pinsapo	
Pinus Douglasii	Thuja gigantea	Thuja aurea	
Cupressus Lawsoniana	Thujopsis borealis	„ compacta	
Picea Nordmanniana	Picea nobilis	Retinospora	
Pinus excelsa		Wellingtonia gigantea	

And a great variety of others, including some magnificent specimens.
JOHN MARTIN, Bailiff on the Premises, will attend to all purchasers.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 7 ft. | COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, the fly set with buds.
The above have recently been transplanted, are very bushy hand some plants, and quite safe. Price per dozen or hundred on application.
Floral Nursery, Hailsham, Sussex.

Planting Season.

TO PLANTERS OF PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN and HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at very moderate prices, in order to clear the land for building purposes.
Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees generally cultivated in Britain, many of which are of large sizes, well adapted for giving immediate effect.
To Gentlemen wishing to make New or improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.
Nursery and Seed Stores—Walton-on-the-Hill.
Seed Warehouse—15, Queen Square.
Liverpool, September, 1870.

WINTER AND SPRING FLOWERS.

CARTER'S
COLLEGIONS OF
HYACINTHS, TULIPS,
CROCUS, &c.,

Include only the best kinds, and being made up in a most liberal manner, these Collections offer the most desirable medium to ensure an effective display in the Drawing Room or Garden.

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR CULTURE.
Packing and carriage free.

COLLECTION No. 1, complete, price 84s.
COLLECTION No. 2, reduced quantities, price 63s.
COLLECTION No. 3, reduced quantities, price 42s.
COLLECTION No. 4, price 21s., comprises—

12	Hyacinths, in 12 extra fine named sorts	6	Tulips, Tournesol
		3	„ Rex rubrorum
6	Polyanthus Narcissus, in 6 varieties	3	„ La Candeur
		3	„ Royal Standard
12	Ionquils, sweet scented	6	„ Yellow Prince
50	Crocus, finest named	3	„ Rosa Mundi
1	Diehytra spectabilis	6	„ Duc Van Thol
1	Lilium speciosum	1	Amaryllis formossissima
6	Scilla sibirica	6	Ixias, finest mixed
24	Snowdrops, extra large selected	6	Sparaxis, finest mixed
		6	Tritelcia uniflora

COLLECTION No. 5, reduced quantities, price 10s. 6d.

EVIDENCE OF QUALITY.

From C. H. HAWKINS, Esq., *Colchester, November* 15, 1869
"The bulbs arrived quite safely, and I have the pleasure to send you a cheque for them. I sent a like order to another house at the same time, and I think it only right to say that while theirs were more numerous, yours were the finer, firmer, and heavier."

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR AND OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 6, complete, price 84s.
COLLECTION No. 7, reduced quantities, price 63s.
COLLECTION No. 8, reduced quantities, price 42s.
COLLECTION No. 9, price 30s., comprises—

12	Hyacinths, in 12 extra fine named sorts for pots or glasses	12	Scilla Belgica, mixed
		75	Crocus, blue
12	„ in 3 colours for bedding	75	„ striped
12	Narcissus, double, white	75	„ large yellow
12	„ Poeticus or Pheasant's-eye	75	„ white
30	Tulips, extra fine mixed	36	Anemone s, extra fine mixed
6	„ Tournesol	8	Gladiolus Brenchleyensis
6	„ Duc Van Thol	12	Iris, extra choice mixed English
3	„ Royal Standard		
3	„ La Candeur	12	„ extra fine mixed Spanish
3	„ Yellow Prince	12	Ionquils, Campernelle
3	„ Rex rubrorum	30	Ranunculus, extra fine, mixed
12	Double Daffodils		
12	Star of Bethlehem	50	Snowdrops

COLLECTION No. 10, reduced quantities, price 15s.

EVIDENCE OF QUALITY.

From W. E. MARTIN, Esq., *Hereford, June* 6, 1870.
"The bulbs supplied by you last autumn, made a glorious show all through the spring. They were a splendid collection of 500 plants, and were admired by everybody who saw them."

CARTER'S COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 11, complete, price 84s.
COLLECTION No. 12, reduced quantities, price 63s.
COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, price 21s., comprises—

12	Hyacinths, in 3 colours	25	Crocus, blue
12	Narcissus, double white	50	„ striped
12	„ Poeticus or Pheasant's-eye	50	„ large yellow
12	Double Daffodils	50	„ white
12	Tulips, extra fine mixed, double	24	Anemones, extra fine mixed
12	„ extra fine mixed, single	6	Gladiolus Brenchleyensis
12	„ extra fine mixed, late	12	Iris, extra choice mixed English
12	„ Duc Van Thol		
6	Polyanthus Narcissus, fine mixed	12	„ extra fine mixed Spanish
		3	Lilium candidum
6	Campernelle Jonquils	3	„ tigrinum
12	Star of Bethlehem	24	Ranunculus, extra fine mixed
6	Tritelcia uniflora	50	Snowdrops
6	Dog's tooth Violets	24	Winter Aconites

COLLECTION No. 15, reduced quantities, price 10s. 6d.

EVIDENCE OF QUALITY.

From D. MATHER, Esq., *Chipping Norton, July* 11, 1870.
"I was much pleased with the whole collection of bulbs, they have been a great success."

JAMES CARTER AND CO.'S CATALOGUE of Hyacinths, Tulips, Crocus, and other Bulbs, Roses, Fruit Trees, &c., containing full particulars of the above Collections, will be forwarded Gratis and Post Free on application.

CARTER'S COLLECTIONS of HYACINTHS.

For the convenience of those Customers who do not wish the trouble of selecting for themselves, is offered the undermentioned Collections of Hyacinths, *the selection of which being left to their judgment and experience*, will be found perfectly adapted for the purposes stated.

A.	12	good varieties Double Hyacinths, for pots, 7s. 6d.
B.	12	„ Single Hyacinths, for pots, 7s. 6d.
C.	12	„ Double Hyacinths, for glasses, 8s. 6d.
D.	12	„ Single Hyacinths, for glasses, 8s. 6d.
E.	12	very fine varieties Double Hyacinths, for pots, 9s. 6d.
F.	12	„ Single Hyacinths, for pots, 9s. 6d.
G.	12	„ Double Hyacinths, for glasses, 10s. 6d.
H.	12	„ Single Hyacinths, for glasses, 10s. 6d.
I.	12	best varieties Double Hyacinths, for pots, 12s.
K.	12	„ Single Hyacinths, for pots, 12s.
L.	12	„ Double Hyacinths, for glasses, 12s.
M.	12	„ Single Hyacinths, for glasses, 12s.
N.	100	Hyacinths, in 100 best varieties, £6 6s.
O.	100	Hyacinths, in 50 best varieties, £4 4s.
P.	50	Hyacinths, in 50 very fine varieties, £2 10s.
Q.	50	Hyacinths, in 25 very fine varieties, £1 17s. 6d.

All Seeds and Bulbs carriage free, and 5 per cent. allowed for cash payments.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

SUTTONS'

FRESH IMPORTED

DUTCH FLOWER ROOTS

CARRIAGE FREE.

SUTTONS' COMPLETE COLLECTIONS OF

HYACINTHS, TULIPS, CROCUS, LILIES, ANEMONES, &c., &c.,

For Indoor or Outdoor Cultivation, to produce a good display during the Winter and Spring.

COLLECTIONS for OPEN GROUND.

No. 1. £2 2s. 0d. Carriage free. | No. 2, £1 1s. 0d. Carriage free. | No. 3, 10s. 6d.

COLLECTIONS for POTS and GLASSES.

No. 4, £2 2s. 0d. Carriage free. | No. 5, £1 1s. 0d. Carriage free. | No. 6, 10s. 6d.

THE BEST TWELVE HYACINTHS FOR 12s.

For further particulars of Flower Roots, and complete Cultural Instructions, see SUTTONS' AUTUMN CATALOGUE, Gratis and Post Free on application.

THE

HEAVIEST CROPPING POTATO

and the best cooking Potato in cultivation is

SUTTONS' RED-SKIN FLOURBALL.

This extraordinary Potato, sent out last season by us, has given the most complete satisfaction. It has the peculiar merit of producing tubers all of uniform size, which are very large. While most other red varieties boil yellow, this is white, of particularly fine flavour, and is most correctly described as "Flourball." For supplying the London dining rooms especially, we feel confident it will supersede every other kind when sufficiently known. In a field where many other sorts were all more or less diseased, our "Red-skinned Flourball" was entirely free, which we can only attribute to its remarkably vigorous growth.

From Mr. B. BARHAM, *Gardener to the* Right Honourable Lord Ormathwaite, *Warfield Park*

"The Red-skinned Flourball Potato you sent me is a most extraordinary kind, producing tubers varying from 1½ to 2 lb. weight Certainly the largest Potato I have ever seen."

From Mr WM JACKSON, *Blakedown Nursery*

"We have lifted the 'Red-skinned Flourball' Potato we had from you. The crop was enormous, exceeding many of the American kinds, and the quality when cooked is so good that without the least hesitation I must say it is the best Red Potato I have ever seen."

From Mr. W. F. BENNETT, *Steward to* Lord Norbury, *Talence*

"The Red-skin Flourball Potatos are a first-class quality, great croppers, and quite free from disease."

From Mr. C. BEALBY, *Donnington*

"The Red-skinned Flourball Potatos are very heavy croppers, several of the tubers weighing as much as 2 lb each Altogether they are very large size and good in form."

From Colonel J. LE COUTEUR, *Belle Vue*

"Half a peck of Red skin Flourball Potatos produced 18 lb weight; they are fine sized, excellent and mealy, floury, no sign of disease"

We are now prepared to book Orders for the above splendid Potato. The retail price last year was 7s. 6d. per peck, and we had sold out before the season was half over. Our Retail Price this year is **5s. per Peck.**

Trade Price may be had on application.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN, READING.

Hardy Herbaceous Plants.

LOUIS VAN HOUTTE begs to announce that his CATALOGUE, No. 135 L, contains a great choice of the best HERBACEOUS HARDY PLANTS, and amongst them the Variegated-leaved POLEMONIUM, DODECATHEON JEFFREYI, the best DELPHINIUM, SPIRÆA JAPONICA, &c.

SPIRÆA JAPONICA, strong plants, 40s. per 100: SPIRÆA PALMATA, 10s. each; and thousands of others by the dozen, &c.

Royal Nursery, Ghent, Belgium

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash:—

GOLDEN TRICOLORS—Lady Cullum, 3s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s. 6d. SILVER TRICOLORS—Caroline Longheld, 6s.; Italia Unita, 2s. 6d. GOLD and BRONZE ZONALS—Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; F. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Painted Lady, 3s. 6d.; Princess of Wales, 4s.; Standard Beauty, 6s. DOUBLE-FLOWERED—Capitaine L'Hermite, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeaux, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of 200 varieties post free.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Notice.

H. LANE AND SON'S Descriptive CATALOGUE can be had free by post on application. It contains a List of 500 varieties of ROSES (including the new ones, all at the same price), a choice collection of RHODODENDRONS, all the new and popular FRUITS, a fine collection of CONIFERS, HARDY ORNAMENTAL TREES and SHRUBS, AZALEAS, &c.

The Nurseries, Great Berkhamsted, Herts.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES.

The American Nursery, Bagshot, Surrey.

The Gardeners' Chronicle

SATURDAY, NOVEMBER 5, 1870.

We own to a feeling of disappointment at the present state of EDUCATION among YOUNG GARDENERS. It is clear, from the official reports, that the numbers of young men who present themselves for examination by the officials of the Royal Horticultural Society and the Society of Arts, always small, are falling off, and falling off not in numbers only but in quality. That there should be a lack of emulation in country districts where the means of self-improvement are scanty or difficult of attainment, and where the numbers are small and widely scattered, is not so much a matter of surprise as it is to find the apathy, lack of interest, and downright ignorance, which characterise so many of the coming generation of gardeners who are learning their vocation in the environs of large towns where the means for improvement abound. Too often conceit keeps pace with ignorance. Those who have much to do with large bodies of young gardeners complain that while comparatively slight efforts are made by the young men to attain a thorough knowledge of their business, their self-esteem is becoming more and more offensive.

We fear there is much truth in these statements. We cannot honestly say that the young gardeners, as a class, are likely to be improvements on their predecessors. On the contrary, the general lack of interest in all but a few specialities, such as bedding-out plants and the like, seems to us likely to result in the formation of a race of gardeners who—always allowing for exceptions—will be considerably inferior to their predecessors in general knowledge of their business.

Gardening is an art and it is a science. In so far as it is an art the pupil can hardly hope to excel his master. So far as practical skill is concerned, there are limits beyond which the craftsman can hardly hope to pass. In so far as gardening is a science—and we use the word science here in its most comprehensive sense—every one of us, little or great, on whom beneficent Providence has bestowed ordinary intelligence, has the power if he have but the will to add to the general stock of knowledge, to raise himself above the level of his predecessors, to cast honour on his instructors by bettering their tuition. If gardeners are to hold their own they must early prepare themselves for the task, or assuredly they will sink in public estimation, they will lower themselves to the grade of brainless labourers when they might command the position and the profits of skilled artisans. Nor are the inducements to exertion few—there is a greater demand for gardeners than ever. Nor is it to the point to lament the insufficient remuneration awarded to gardeners; for as a general rule a man's work earns what it is fairly worth, and if it does not, the means of restoring the balance in this country are happily not far to seek.

If complaint be made that there is no demand for a superior class of gardeners, that the market is already overstocked, there are other lands in which a gardener's skill is valued. We are not alluding now to ordinary emigrants, with sturdy arms, willing minds, and cheerful temper—they are wanted in all our colonies; but we have in view the Cotton fields, the Tea plantations, the Cinchona nurseries of India, the vineyards of the Cape and of Australia; the forests to clear, to manage, to create; the fibre plants to be utilised; all occupations demanding for their successful performance the skill of a well-trained gardener, and the intelligence of a man sufficiently educated to rise above the benumbing, paralysing influence of the rule of thumb. Here is scope for a large number of superior gardeners. Here are means open to the aspirant to push his own fortunes while he does good service to his employers, and lays the foundation of the prosperity of the succeeding generation. To a large extent this defective condition of the younger race of gardeners is due to a want of sufficient education in childhood and youth; and we press on the attention of those on whom rests the heavy responsibilities of educating the children of the working classes the following remarks on the subject of education lately made public by Dr. LYON PLAYFAIR:—

"Under our present system of elementary teaching, no knowledge whatever bearing on the life-work of the people reaches them by our system of State education. The air they breathe, the water they drink, the tools they use, the plants they grow, the mines they excavate, might all be made subjects of surpassing interest and importance to them during their whole life; and yet of these they learn not one fact. Yet we are surprised at the consequences of their ignorance. A thousand men perish yearly in our coal-mines, but no schoolmaster tells the poor miner the nature of the explosive gas which scorches him, or of the after-damp which chokes him. Boilers of steam-engines blow up so continually that a committee of the House of Commons is now engaged in trying to diminish their alarming frequency; but the poor stokers who are scalded to death or blown to pieces, were never instructed in the nature and properties of steam. In Great Britain alone more than 100,000 people perish annually, and at least five times as many sicken grievously, out of pure ignorance of the laws of health, which are never imparted to them at school; they have no chance of learning them afterwards, as they possess no secondary schools. The mere tools of education are put into the hands of children during their school time without any effort being made to teach them how to use the tools for any profitable purpose whatever; so they get rusty or are thrown away altogether. And we fancy that we have educated the people! Our pauperism, our crime, and the misery which hovers on the brink of both, increase terribly, and our panacea for their cure is teaching the three R's up to Standard III. The age of miracles has passed by, and our large faith in our little doings will not remove mountains. It is best to be frank. Our low quality of education is impoverishing the land. It is disgracefully behind the age in which we live, and of the civilisation of which we boast; and until we are convinced of that we cannot be roused to the exertions required for its amendment. In censuring the low condition of knowledge in our primary schools, as represented by the results of the Revised Code, I do not aim to restore them to the position which many of them had before it. That code was, in fact, rendered necessary because their aggregate teaching was not sufficiently large and diffused to justify the increasing expenditure. In imitation of our classical schools, verbalism and memory-cramming had grown up as Tares and choked the growth of the Wheat. Words had taken the place of conceptions. A child could tell you about the geography of the wanderings of the children of Israel, but had no conception whatever of the ordinary phenomena around it. It was hopeless to put to them the commonest scientific questions. Whence comes the water that fills the Thames? What is the origin of hail, snow, rain, or dew? Why does the sun rise in the east, or set in the west? What produces night and day, summer and winter? In history they could rattle out to you the names and dates of kings and queens, perhaps even the names and ages of all Queen Anne's children as they died in childhood; but, as a true historical conception, apart from memory-cramming of words and dry facts, to be vomited forth upon the examiner, it required a very good school under the old system to find it. Words, instead of ideas, were worshipped. Inspection, under the old system, did something to correct this tendency to verbalism and cram; under the new system they had no time, and, if they had, would find fewer of the higher subjects taught in any way. The teaching of science, if properly done, is the reverse of all this, and will go far to remedy its defects. Books in this case ought only to be accessories, not principals. The pupil must be brought in face of the facts through experiment and demonstration. He should pull the plant to pieces and see how it is constructed. He must vex the electric cylinder till it yields him its sparks. He must apply with his own hand the magnet to the needle. He must see water broken up into its constituent parts, and witness the violence with which its elements unite. Unless he is brought into actual contact with the facts, and taught to observe and bring them into relation with the science evolved from them, it were better that instruction in science should be left alone. For one of the first lessons he must learn from science is not to trust in authority, but to demand proof for each asseveration. All this is true education, for it draws out faculties of observation, connects observed facts with the conceptions deduced from them in the course of ages, gives discipline and courage to thought, and teaches a knowledge of scientific method which will serve a lifetime. Nor can such education be begun too early. The whole yearnings of a child are for the natural phenomena around,

until they are smothered by the ignorance of the parent. He is a young Linnæus roaming over the fields in search of flowers. He is a young conchologist or mineralogist gathering shells or pebbles on the sea shore. He is an ornithologist and goes bird-nesting ; an ichthyologist and catches fish. Glorious education in Nature, all this, if the teacher knew how to direct and utilise it. But as soon as the child comes into the school-room, all natural God-born instincts are to be crushed out of him ; he is to be trained out of all natural sympathies and affections. You prune and trim, cramp and bind the young intellect, as gardeners in olden times did trees and shrubs, till they assumed monstrous and grotesque forms, altogether different from the wide-spreading foliage and clustering buds which God himself gave to them, and which man is idiot enough to think he can improve. Do not suppose that I wish the primary school to be a lecture theatre for all or any of the "ologies." All the science which would be necessary to give a boy a taste of the principles involved in his calling, and an incitement to pursue them in his future life, might be given in illustration of other subjects. Instead of mere descriptive geography, drearily taught and drearily learned, you might make it illustrative of history, and illustrated by physical geography, which, in the hands of a real master, might be made to embrace most of what we desire to teach. The properties of air and water, illustrations of natural history, varieties of the human race, the properties of the atmosphere as a whole—its life-giving virtues when pure, and its death dealings when fouled by man's impurities—the natural products of different climes, these and such like teachings are what you could introduce with telling and useful effect. Far better this than overloading geography with dry details of sources and mouths of rivers, of isothermal lines, latitudes and longitudes, tracks of ocean currents, and other tendencies towards the old verbalism and memory-cramming. If I have explained myself with clearness, you will see that while I advocate the introduction of higher subjects into our schools, I wish them to be of immediate interest and applicability to the working classes. The main difficulty in education is getting them to stay long enough at school. Teach them, while you have them, subjects of interest and utility. The short time will thus be made productive, and inducement will be offered for its extension. Six months spent in teaching future labourers the geography of the wanderings of the children of Israel, is sheer waste of time, either for their eternal or temporal interests. Think of the few precious hours as the training for a whole lifetime, and let us use them by giving living and intelligent learning, not obsolete and worthless instruction. Those who are believers in the teaching of the great secondary schools of this country will deem my aspirations for the improvement of primary education low and utilitarian. Frankly I admit the latter. Such a style of education will never realise Lord Brougham's hope that the time may come when every working man in England could read Bacon ; but it might contribute to the fulfilment of Cobbett's desire, that the time might come when every man in England could eat bacon. I deny, however, that the utilitarian view of primary education is ignoble. The present system is truly ignoble, for it sends the working man into the world in gross ignorance of everything that he is to do in it. The utilitarian system is noble, in so far as it treats him as an intelligent being, who ought to understand the nature of his occupation, and the principles involved in it. The great advantage of directing education towards the pursuits and occupations of the people, instead of wasting it on dismal verbalism, is that, while it elevates the individual, it at the same time gives security for the future prosperity of the nation. In the industrial battles of peoples, we are content to leave our working classes armed with the old Brown Bess of warfare, while men of other countries are arming themselves with modern weapons of precision. In the competition of nations, the two factors of industry—raw material and intellect, applied to its conversion into utilities—are altering their values. The first is rapidly decreasing, the second quickly augmenting in value. We anchor our hopes on the sand, which the advancing tide of knowledge is washing away, while other nations throw out their anchors on firm ground accumulating around, and enabling their vessels to ride in safety. There are instances of nations, rich in the natural resources of industry, yet poor from want of knowledge how to apply them ; and there are opposite examples of nations utterly devoid of industrial advantages, but constituted of an educated people, who use their science as a compensation for their lack of raw material. Spain is an example of the first class, and Holland of the second.

—— "Last July," writes M. NAUDIN, "I planted a FLOWER of OPUNTIA FICUS INDICA to ascertain if the ovary would produce roots and shoots. The experiment succeeded perfectly. From the upper edge of the ovary where the petals are inserted sprang three vigorous shoots, suitable for propagating the plant. A similar experiment tried on a species of Opuntia naturalised in the ravines here (Collioure, Eastern Pyrenees) was attended with like results. Hence the inference that the inferior ovary of Cactaceæ is a branch, as is indeed admitted by the majority of botanists of the present day." With reference to this point we may cite a passage from Dr. MASTERS "Vegetable Teratology," p. 178, omitting the references to other publications there given :—"The fruits of Opuntia Salmiana, fragilis, monacantha, and of some species of Echinocactus, have been observed to form small fruit-like branches around their summits. M. NAPOLÉON DOUMET describes the fruit as ripening as usual, but as being destitute of seeds in the interior ; after a little while the fruit begins to wither, and then a circle of small buds like those of the stem may be seen at the top of the fruit, each bud springing from the axil of a little tuft of wool and spines found on the fruit. These little buds elongate into long shoots, produce flowers the following year, which flowers exhibit the same peculiarity. GASPARINI and TENORE are said to have recorded the same fact as long since as 1832." Still more to the point is the record given, in the same volume, of an experiment tried by VON MARTIUS with the unripe fruits of Lecythis, which were found to produce buds when placed in the earth, and of another trial in which BAILLON succeeded in causing the development of buds on the inferior ovary of Jussiæa.

—— Mr. MEEHAN, whose observations on plant life we have often had occasion to refer to, states that in the case of the PETUNIA, which produces in America abundance of seed, he had always observed the humble-bees taking a short cut to get at the honey in the flower by making a slit in the base of the tube instead of inserting their proboscis down through the flower. In adopting this surreptitious mode of rifling the flower, the bees do not return good for evil by "setting" the flowers, as they would do if they entered the flower in the ordinary way. How, then, are the seeds produced? At length, says Mr. MEEHAN, the mystery was explained : though no insect but the humble-bee visited the flowers by day they were thronged by Sphinx moths at night. These were the insects through whose agency the fertilisation of these flowers is carried on.

—— The following is the list of the subscriptions already received, or promised, towards the RIVERS' PORTRAIT FUND :—

Allsopp, H., Esq., Hindlip Hall, Worcester	..	£5	5 0
Barnard, Wm., Esq., Sawbridgeworth	..	1	1 0
Blackmore, R. D., Esq., Teddington	..	1	1 0
Bottomer, Fredk., Markree Castle, Colloney	..	10	10 0
Darwin, C., Esq., F.R.S., Down, Beckenham	..	2	2 0
Dombrain, Rev. H. H., Westwell Vicarage, Kent	..	0	10 6
Fitzgerald, Mrs., Shalstone, Buckingham	..	1	1 0
Harrison, John, Rose Nursery, Darlington	..	0	10 6
Hole, Rev. S. Reynolds, Caunton Manor	..	5	0 0
Hooker, Dr. J. Dalton, C.B., F.R.S., Kew	..	2	2 0
Hopkyns, D. D., Esq., Weydale, Guildford	..	5	0 0
Journal of Horticulture, Proprietors of	..	5	0 0
Kingsley, Rev. W., South Kilvington	..	2	2 0
Masters, M. T., M.D., F.R.S., Hawley	..	1	1 0
Moffat, Mr. A., The Gardens, Hindlip Hall	..	0	10 6
Moore, T., Esq., F.L.S., Chelsea	..	1	1 0
Morris, Mr. John, Wether-field	..	1	1 0
Newington, Dr., Ingchurst	..	3	3 0
Paul, Mr. William, Waltham Cross	..	1	1 0
Peach, Robert C., Aigburth-de-Street	..	2	2 0
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Radclyffe, Rev. W. F., Okeford Fitzpaine	..	5	0 0
Rendle, Mr. W. E., Welbeck Street	..	1	1 0
Roden, Dr., Kidderminster	..	2	2 0
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Speed, Mr. Thos., Chatsworth Gardens	..	1	1 0
Taylor, Mr. T. (Webber & Co.), Covent Garden	..	1	1 0
Turner, Mr. C., Slough	..	0	10 6
Warner, Mr. J. H., The Abbey, Leicester	..	1	1 0
Wilson, Edward, Esq., Hayes, Bromley	..	2	2 0
Wilson, G. F., Esq., F.R.S., Heatherbank	..	2	2 0

Subscriptions addressed to Dr. HOGG, 99, St. George's Road, London, S.W., will be promptly acknowledged.

—— We learn from the daily papers that the ALBERT EMBANKMENT is shortly to be planted with Planes, like its fellow quay on the north bank of the Thames. There is now no doubt that the Plane is well suited for a town tree, and is perhaps the very best for London, still there are many other trees nearly as good, and which should for variety sake be tried—such as the Sycamore, certain of the Poplars, Sir CHARLES WACHER's Maple, the Ailantus, and some of the American Oaks. The Naples Alder, A. cordata, is a good town tree, but could hardly be procured in sufficient quantities ; Planera crenata is also employed in Paris, in the vicinity of the New Opera House, but the trees were too young when we saw them for us to be able to express any opinion as to its merits. A walk through St. James's Park would furnish valuable hints to town planters.

—— Under the name of ABIES PECTINATA MASSONII, M. ANDRE describes, in the last number of the "Illustration Horticole," a curious variety of the Silver Fir, in which the leaves, in place of being disposed in two ranks (distichous), are arranged in a spiral manner, as in A. Pinsapo.

—— Some of our French contemporaries were beginning to lament, before the outbreak of the war, that a number of the PLANE TREES planted in Paris were perishing, owing to having been planted in too shallow a soil, so that the roots speedily came into contact with the hard limestone rock, which they could neither penetrate nor utilise. We have heard rumours of similar shallow planting in the case of the plane trees on the Thames Embankment, but learnt, on good authority, that this is not true. If it had been so, in a few years' time, when the soil became exhausted, the trees would have gradually died, and we should be told that Plane trees will not grow in London.

—— The Report of the Royal Botanic Garden, Mauritius, to which we have elsewhere alluded, contains a descriptive account of some sixty varieties of SUGAR CANE. It is understood that the majority of these varieties originate, not from seed, but from sports, so that permanence of character cannot always be secured by the use of buds. Of the Ribbon Cane, indeed, we read as follows in the above cited Report :—

"Ribbon Cane, New Caledonia, forwarded from Queensland. This is a very fine cane, striped green and pale red, spreading in habit, and of ordinary size, hardy, souches abundantly, grows rapidly, flowers freely and early. On examining the plants of this cane at 'Mon Plaisir,' a plant was noticed producing green instead of striped canes. On further examination two other plants were found, one of which was producing striped canes from one eye, and green canes from another eye, both of which eyes belonged to the same piece of cane, while the other plant was producing both striped and green canes from one and the same eye."

—— The President elect for the next meeting of the AMERICAN ASSOCIATION for the ADVANCEMENT OF SCIENCE is Professor ASA GRAY ; the place of meeting, Indianapolis. In 1872 this association will probably hold its Court at San Francisco, on the invitation of the California Academy of Sciences.

—— We learn from the *American Entomologist and Botanist* that the BOTANISTS of New York have formed themselves into a club, named after one of the most distinguished botanists of America, the TORREY CLUB. The Club publishes a monthly Bulletin, the object of which is "to form a medium of communication for all those interested in the flora of this vicinity, and thus to bring together and fan into a flame the sparks of botanical enthusiasm at present too much isolated." It is many years since a similar botanical club or society has existed in London.

—— The new arrangements in regard to the SAMPLE POST press somewhat heavily on the leading retail seed houses, as they are debarred from sending parcels of seeds by post at sample-post rates without incurring heavy risks. A meeting of representatives of the nursery and seed trade was held at Anderton's Hotel, Fleet Street, on Wednesday last, Mr. ALFRED SUTTON, of Messrs. SUTTON & SONS, Reading, presiding, to take the matter into consideration. From a statement made by the Chairman, it would appear that the subject of the new arrangements is now under the consideration of the Postmaster-General, and there was reason to believe that there would be a return to the old plan. It was thought advisable, however, to prepare for an adverse decision, and a subscription was entered into, and a basis of operations decided on, with a view to future action. Mr. RICHARD DEAN, Ealing, W., is the Hon. Sec. *pro tem.*, and to him any communications can be addressed.

—— We are requested to state that Mr. T. J. BOLD, of Long Benton, Newcastle-on-Tyne, will thank those of our correspondents who are troubled with ANTS, to send specimens to him for identification. They may be enclosed in quills, plugged with cork or wood, and forwarded through the post with little trouble. We understand that Mr. BOLD has in the hands of the printers a list of beetles, in which 1520 species are enumerated : a pretty good number for the northern counties.

—— The RAINFALL during the week ending October 29, was large in some parts of England and Scotland. In England the amounts at the different places varied from 1.96 inch at Salford, to 0.12 inch at Newcastle, with a mean for all stations of 1.01 inch, and in Scotland from 2.11 inches at Greenock, to 0.20 inch at Dundee, with a mean for all stations of 0.85 inch. The MAXIMUM TEMPERATURE of the AIR in England ranged from 60°.2 at Portsmouth, to 53° at Newcastle, with a mean for all stations of 57°, and in Scotland from 62°.4 at Glasgow, to 52° at Dundee, Aberdeen, and Greenock ; the mean for the different stations was 55°.3. The MINIMUM TEMPERATURE of the week in England—the lowest was recorded at Portsmouth, viz., 34°.2, and the highest at Liverpool, viz., 43°, whilst the mean for all stations was 39°.2. In Scotland the lowest was recorded at Aberdeen, viz., 33°.9, and the highest at Greenock, viz., 43° ; the mean for the several stations was 37°.3. The MEAN TEMPERATURES of the different stations in England were very uniform, the range between the highest and lowest being only 3°.6 ; the mean was 47°.4. In Scotland, the mean for all stations was 45°.8. On Monday evening (24th), the heavens were illuminated by a brilliant display of Aurora Borealis, and, on Tuesday evening (25th), Aurora Borealis and Aurora Australis.

—— We regret to find that the publication of the AMERICAN ENTOMOLOGIST and BOTANIST is to be suspended until 1872, owing to the ill-health of the Editor. This periodical was so well carried on that we can but receive this intimation with apprehension.

New Garden Plants.

ONCIDIUM CRISTA GALLI, *Rchb. fil.*

Pentapetala macropetala pusillum, pseudobulbiferum. Folius cuneato-ligulatis acutis acuminatisve ; pedunculis folia vix excedentibus apice racemosis ; bracteis ochreatis spathaceis elongatis, sepalis oblongis acutis, lateralibus nunc basi connatis, nunc liberis, petalis oblongis obtusis nunc apiculatis, labelli lacinia lateralibus postice cuneato-hastato ovatis ; lacinia antica lato unguiculata æquilata triloba ; lobis lateralibus semiovatis, lobo antico bifido lacinulis antrorsis porrectis obtusis, callo baseos depresso apice acuto utrinque bi-tricrenato ; area circum circumscripta geminis utrinque, lamellis geminis ante apicem acutum, alis columnæ humillimæ semiovatis denticulatis seu integris ; rostello minute ornithorrhyncho —(?) *Oncidium iridifolium*, Lind. Bot Reg xxii. ix 1, 1836, non ' *Oncidium crista galli*, Rchb. fil in Mobl et Schlechtendal Bot. Zeit. 1852, p 697 ; Lindl. Folia, Oncidium, nr. 96. Walp Ann vi. 746. Rchb. Beitrg. Cent Am. 71 — (?) *Oncidium decipiens*, Lindl. Folia, i ; Oncidium, n. 68 ; Walp Ann. vi. 747.

Planta elegans valde, tenellas ut mirum situm in Angha triginta anni, adhuc jam floruisse. Folia pseudobulbi stipantia quaterna, imo sena, septena, basi vaginæ loco dilatata, sed nunquam

articulata, raro latiuscula, vulgo bene angusta; radices adventitiæ filiformes valde tenues; pseudobulbus anceps bene rugosus, in uno tantum specimine, quod est præsto folium unum evolutum fert foliis reliquis duplo brevius, in omnibus reliquis specimibus præsto est apiculus rudimentum folii; pedunculi sat numerosi, nunc quatuor in una planta.

We feel doubtful whether the Oncidium iridifolium of the Bot. Reg. is the same as the plant alluded to. We found out that in 1836 the late Dr. Lindley had given the representation of a flat-leaved Oncidium under the name of the sword-leaved O. iridifolium, saying, "folia nunc equitantia, nunc explanata" (see Bot. Zeit. *l. c.*). These characters could by no means apply to the same plant. Now Dr. Lindley combined with it our Oncidium crista galli, since he quoted Galeotti's number, 5289, quite as we did, yet taking our Oncidium crista galli apart, and calling the plant of Bot. Reg. and of Galeotti O. decipiens. Looking once more to the plate in the Bot. Reg. we feel more doubtful than ever. The plant represented by Miss Drake has no pseudobulbs at all, and if the callus is well represented it must be very different. It looks, however, much like crista galli, and there is no living authority as to whether the plant is represented carefully from the original, or from a cut leaf and a peduncle. There is not much of phyllotaxis to be seen in the representation, and seven flower-stalks (two 2-flowered ones) are a large number for 13 leaves.

Nevertheless, it was a great success to flower in 1835 such a tender, tiny plant as this, at Wentworth, in Lord Fitzwilliam's garden. The collectors may at that time have valued their plants, more and taken better care of them, than is the case now-a-days, when hecatombs are killed for the sake of a few.

We were highly pleased to obtain a living specimen of the true O. crista galli from Messrs. Veitch, who imported it last year from Costa Rica. It is a small thing, no doubt, and yet the comparatively large flower is interesting. Mr. Wendland had also previously found it in Costa Rica. His plant bore a self-coloured lemon-colour flower; that of Messrs. Veitch has a few pink blotches, both on the petals and on the lip. The great majority of our specimens came from Oaxaca in Mexico, most probably distributed only by Galeotti, but collected by Jurgensen. It is a very interesting fact that the single leaf at the top of the small glaucous pseudobulb is a mere abortion, we having seen only one specimen (in our possession) with a fully developed leaf there. The pseudobulb sent by Messrs. Veitch has the small abortion of that leaf. *H. G. Rchb. fil.*

STROPHANTHUS BULLENIANUS, *Mast.*, *sp. nov* (*fig.* 257).

Ramis, petiolis, pedunculis, sepalisque hispidis; foliis ellipticis-oblongis, basi rotundatis, nonnunquam inæquilateris longiuscule acuminatis, supra glabriusculis subtus villosis; petiolis 3-4 lin. longis, spinulas axillares minimas per paria dispositis obtegentibus; cymis ramosis laxis pluriforis, bracteatis; bracteis linearibus deciduis; calyce glanduloso campanulato vix semi-polito, profunde 5-partito, lacinias lineari oblongis; corollæ hypocrateriformis tubo basi dilatato erubescente, limbo patente 5-partito, segmentis flavidis purpureo-maculatis ovatis patentibus superne conniventibus longiuscule acuminatis, æstivatione contorte imbricatis; staminodiis 10, oblongis subcarnosis per paria e fauce tubi, inter petala, emergentibus; staminibus 5 exsertis, filamentis crassis, brevibus subulatis; antheris conniventibus; syngenesis, ad apicem trochleariformem stylo agglutinatis; connectivo crasse coriaceo, intus loculos quatuor ferente quorum exteriores steriles longiores, interiores dimidio breviores polliniferi; ovario ut in congeneribus; folliculis (ex speciminibus exsiccatis descriptis) binis erectis parallelis 20—24 poll. longis linear-oblongis coriaceo-lignosis apice longissime acuminatis; valvis extus (cortice delapso) fibrosis, intus flavidis nitidis; seminibus fusiformibus 14—15 lin. longis lano goss ypino albido obtectis.—*Hab.* Afric. trop. occident. ad Old Calabar ubi legerunt Mann, n.n. 1444! 2247! Rev. W. C. Thomson, 221! In ins. Fernando Po, Mann, 1444!

Some months since we were favoured by Mr. Bullen, the curator of the Royal Botanic Garden, Glasgow, with specimens of the above described Strophanthus, which proved, on examination, to be identical with native specimens in the Kew Herbaria, gathered by Mann and by the Rev. W. C. Thomson, and for the opportunity of examining which we are indebted to the unvarying courtesy of the officials of that establishment. The plant is a climbing shrub, whose technical description, so far as essentials are concerned, is above given, and whose general aspect the accompanying sketch (fig. 257), from the pencil of Mr. Fitch, sufficiently pourtrays. The flowers are by no means devoid of beauty. In colour the tube is pinkish, the limb yellow, with purplish spots, while the curious tails to the petals are of a purple hue. From a structural point of view the flowers are very curious in their long-tailed petals (not so long, however, as in some other species), the glands in the mouth of the corolla, which probably represent abortive stamens, the anthers with two half-lobes sterile and elongated, and two shorter ones pollen-bearing, the whole firmly connected together, and adherent to the pulley-shaped end of the style in such a manner that it would seem as if the pollen must fall on its associate stigma, and self-fertilisation result. The immensely long follicles (20 to 24 inches), terminating in long tail-like projections, as in Martynia, are also noteworthy. We have only seen them in the dried specimens, but as some interest pertains to them, we have added a figure of them.

Very probably this plant, like its congeners, has a poisonous milky juice. One species, S. hispidus, closely allied to the one now described, supplies, it is said, a poison with which the West African natives anoint their arrows. We believe that this latter species will shortly be figured in the "Icones Plantarum." Perhaps it is the same as that alluded to in Mr. Bullen's note, which we subjoin on account of the valuable hints it contains as to the cultivation of these plants. *M. T. M.*

"I have forwarded a small box containing leaves and flowers of a species of Strophanthus, the first I have ever succeeded in flowering, although from the reputed beauty and form of the flowers, I have devoted considerable attention to them, in a cultural point of view, both as regards soils and climatical conditions; and have so far succeeded in growing specimens very successfully, but never flowering them,* which I attributed to planting in soils always too rich. The same plant was grown under similar treatment last year, soil excepted. The year previous I grew an unnamed species of Strophanthus, probably not the same as that just described, in a Cucumber-house, planted out and trained on the wires under precisely the same conditions which secured a good crop of Cucumbers, but to my great annoyance I got no flowers for my pains. Having used a variety of strong soils, I determined, while I had the opportunity, to try what the opposite extreme would do, and accordingly beat out the soil from the ball of a very old Erica, which had to all appearance occupied the same pot for a goodly number of years, and had died from the natural consequences of exhaustion and old age. And into this poor, light, sandy peat the plant was potted in March of this year. The growth is not strong, but healthy; many of the young shoots, most of which are flowering in clusters at the extremities, vary from 2 to 6 inches in length. They require a hot stove and frequent use of the syringe to keep down red-spider. I think it one of the most beautiful flowers I have seen, and well worth making better known. *Robert Bullen.*"

* The old Strophanthus dichotomus, an Indian plant, is not difficult to grow or flower. We have always grown it in peaty soil, and in an ordinary stove, associated with other shrubby stove plants, and under these conditions it flowered annually. Eds.

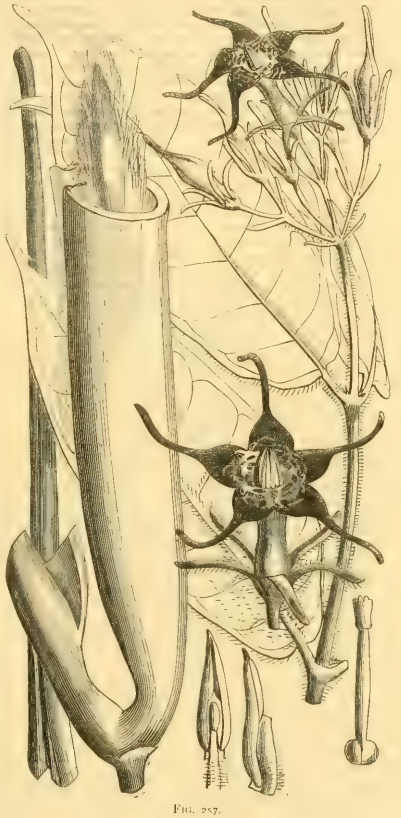

FIG. 257.

THE ART OF GARDENING.

FROM this title, it must not be supposed that I am going to enter upon the merits and demerits of the various systems of gardening at present in vogue, or that I intend to advocate any particular arrangement as *par excellence* "the Art of Gardening." But a curious little work, the name of which forms the heading of this paper, having recently been put into my hands, I believe that a few remarks upon some of the interesting points, which it undoubtedly presents, will prove acceptable.

This book—the 3d edition of which was published in 1688—was written by J. Woolridge, Gent., and treats not only of the plants to be cultivated, but of everything connected with a garden; giving directions for the making of "arbours and banquetting-houses," for the placing of grottos and statues, and many other matters. The first thing that strikes one is the contrast between the plants which were then popularly cultivated, and those which find most favour at the present day. A great difference we should of course expect: but until one actually considers the matter, by running over the names of our modern favourites, one can scarcely realise how great it is. Geraniums, Lobelias, Calceolarias, Ageratums, Verbenas, Petunias, Heliotropes—these, and the more recently introduced "foliage plants" were unknown, not only as outdoor plants, but even in greenhouses; and that for very many years after the date of this book. We hear much now-a-days from the opponents of the "bedding-out" system of "old-fashioned gardening;" and it may be worth while considering what this really was. We must not suppose, for instance, that the greater number of the herbaceous plants, which are now coming into fashion, have any claim to the title of "old-fashioned;" some of the most popular of these are of more recent introduction than those above enumerated which they are intended to replace. And while deprecating the vulgar and gaudy blaze of colour which, in too many places, is the result of the "bedding-out" arrangement, I can scarcely picture to myself our gardens if deprived, say, only of their Pelargoniums, not to mention the many other brilliant flowers which share their popularity.

Our author gives us a very good idea of the plants which were most common in gardens at the date of his work, when he speaks "of some more vulgar flowers." "There are many Flowers," he says, "that either for scent or shew are raised in the more ordinary Country Gardens, that several Florists have taken a great deal of pains and care exactly to describe, and the manner and method of propagating them, which here shall only be named, as the Aconites or Wolfbane, Pilewort, Crowfoot, Batchelor's-Button, Marsh-Marigold, Hollow-root, Monks-hood, Cranes-bill, Bellflowers, Champions, Nonsuch or Flower of Bristol, Princes-feather or Common Amaranthus, Dames Violet or Queen's Gilliflowers, Rockets, Double-Pellitory, Double-Featherfew, Double Camomil, Double Dog-Fennil, Double Lady-smocks, Double Daisies, Toadflax, Fox-gloves, Grove-Thistles, Scabious, Blewbottles, Moth-Mullens, Nigella or Fennel-Flower, Thorny-Apple, Balsame Apple, Apple of Love, Candy Tufts, Snail-flowers, Satten-flower, and Flower of the Sun. These every Colona knoweth how to plant, sow, or propagate." Such were, then, the commonest garden flowers of this period, the very names of which will be strange to many of our readers. I may note, as among the more strange-sounding of them, the Hollow-root, a translation of Radix cava, the old name for Corydalis solida, and an allied species; Nonsuch or Flower of Bristol, which is now popularly known as the Scarlet Lychnis (L. chalcedonica); Double Pellitory, that form of Achillea Ptarmica which is now cultivated as "Fair Maids of France" [? Ranunculus aconitifolius]; Double Dog-Fennel—Matricaria Chamomilla, or M. inodora, with the disk-florets converted into ray-florets; Grove-Thistles—probably Onopordum Acanthium; Snail-flower—Medicago orbicularis, which is still found in some old gardens, and is so called from the curious appearance of its spirally twisted legumes; and Satin-flower—the "Honesty" (Lunaria biennis).

These being the "more vulgar flowers," it may be worth while to glance at some of the more "select" ones. After enumerating "flower-bearing trees," "Bolbous-rooted Flowers," which include Tulips, Hyacinths, Daffodils, Lilies, Saffron Flowers, Iris, &c., and "Tuberose Rooted Flowers," which are confined to Anemones and "Peonyes," our author comes to "divers other Select Flowers." First among these, not only numerically, but in Mr. Woolridge's estimation, comes the Gilliflower: not the Gilliflower of modern writers, but that of Chaucer and Spenser—the Dianthus Caryophyllus, "vulgarly termed Carnations from those ancient English Flowers that were usually of a Flesh Colour." Our author is loud in its praises.

"Notwithstanding the Flower-bearing Trees are compleat Ornaments with little trouble; the Bolbous-rooted Flowers so illustrious that they merit great esteem from the most curious, being less subject to casualties than most others, and the Tuberose Roots yield such incomparable Beauties in the spring; yet must they concede to the Gilliflower, the pride of the summer, that hath its scent as pleasing as its variegations beautiful.

> 'Lovely Carnations then their Flowers dilate,
> The worth of them is, as their Beauty, great.
> The smell is excellent.'—RAPINUS."

Here, parenthetically, I may ask, who was Rapinus? or Rapin? for, as we gather that he was a French writer, the latter is probably the correct form of his name. He appears to have sung the "art of gardening" in verse, as fully as Mr. Woolridge detailed it in prose, for here are quotations from his poems on every branch of the science, translated, probably, by his admiring friend, the author. The verses are certainly not elegant, and in the original would probably be very quaint; can any reader tell us more about him or his book?

Minute instructions for the cultivation and propagation of the Gilliflower are given; and "Sweet Williams, Sweet Johns, and London Pride," are referred to as "pretty Fancies, near of kin to the old English Gilliflowers." By the last of these names is meant, not Saxifraga umbrosa, which at present goes by the name, but a Dianthus, probably a variety or ally of the Sweet William, which was the "London Pride" of the older writers. Threlkeld, in 1727, was, so far as I know, the first to publish the name in connection with the plant which now so generally bears it.

Next we come to the "Stock-Gilliflowers and Wall-Flowers." Of the former, now usually abbreviated into Stocks, we have full particulars as to the mode of obtaining double-flowered forms. "If there be five Leaves in a Blossom, the seed thence produced will bring double Flowers." This seed "must be sown at the full of the Moon, or in two or three days after; and when come up 4 or 5 inches high, take them up and plant them out, which prevents their running up to stalk, which labour you may reiterate twice before Winter." But this is only the commencement of your labours. Whether the dogma relative to the five-petaled flowers producing a double-blossomed race is, after all, not to be relied on, I cannot say; but that many other means are essential to the desired end is obvious: for "If you remove, water, and shade them every time to preserve them (it being a Summer work), and do it the first time three days after the Full, and twice more before the next Change, and again three days after the next Full, and once more before the succeeding change (all these removes to be in barren Ground): then at the third Full Moon, eight days after, remove them again into rich Ground, wherein they are to stand: it is said that it will make them bring forth double Flowers;" to which I would only add, that if there be any truth in the proverb, that "patience and perseverance shall be rewarded," very double flowers indeed ought to be the reward of the gardener who displays such an amount of both as the above directions would demand. The "influence of the moon over plants hath long been observed," continues the author, "and if it hath any such influence, then surely it is in the doubling of Flowers." Like many another dogmatic teacher, Mr. Woolridge seems often to doubt the truth of the dogmas which he himself proclaims; as in this and the preceding instance, with many more which we could cite did space permit. The Wallflowers are briefly dismissed; they are "so termed for that the single kind naturally affect to grow on old Walls, and that the double need the assistance of some Wall or other support." The latter fact is somewhat startling, but whether on the meaning of names or the growth of plants, Mr. Woolridge gives us many ideas "that were never made publick before." The succeeding sections are devoted to "Auriculas, Cowslips, and Primroses," the "Windsor Auricula" being "the most splendid of all the rest"—is it still known?—the "Hellebore, Ladies-slipper, and Lilly of the Valley," which is "wild in some places northward, as many fine Plants are in one place or other" (!)—the "Hepatica, Gentianella, and Dittany"—and then we come to "Flowers raised only from seed." Yes, the foregoing are all the perennials which our author enumerates; not only were bedding plants unknown to him, but our hardy Phloxes, our Dahlias, Chrysanthemums, Fuchsias, and many more such, were yet to come.

And now I must glance at the annuals—Larkspurs, Poppies, Hollyhocks, Snapdragons, Musk Scabious (Amberboa moschata), "called the Sultan's Flower, because the Grand Seignior affected to wear it in his Turbant;" Amaranthus, African Marigold ("a fair large Yellow Flower, but of a very naughty smell"); Greater Convolvulus, Marvail of Peru ("to be raised in a hot Bed"), Lupins, and "a sort of Kidney Bean that yields a fine scarlet Blossom"—these, with the exception of Columbines and the Everlasting Pea, both of which our author places in this group, are the only representatives of the class of hardy annuals. Where were the Mignonette, Eschscholtzia, Nemophila, Clarkia, Gilia, Sweet Pea, Virginian Stock, Collinsia, and the hundred and one annuals that we can procure, almost for nothing, and grow with little or no trouble, and which we are consequently too prone to neglect? In their native countries probably, for, so far as Mr. Woolridge's knowledge is concerned, they do not appear to have reached this.

Trees are by no means omitted in the work, but we cannot dwell upon them, although much interesting matter is given. Thus, of the Horse Chestnut we read that it "is very lately made English, being brought in its seed or nuts from Constantinople;" and it would appear that it had not become thoroughly acclimatised, as but "a few of the blossoms are succeeded by nuts," and that only "in some years." Although the number of fruits in proportion to the flowers is still small, they are produced every year in greater or less quantity. It is a curious fact that the native country of the Horse Chestnut, as of many other common trees and plants, is not definitely known. Professor Oliver, speaking of this tree and the Walnut, says:—"Persia and the Central Asiatic plateau generally are credited with these trees, and probably the guess is in the right direction, though no wild specimens exist of either species in our herbaria." But although we may not linger with the ordinary trees and shrubs, our readers, especially those who have devoted any attention to "foliage plants," will be interested in a reference to the chapter which treats of such as are "variegated or gilded-leafed." "There is no new thing under the sun," and therefore it is by no means surprising to find that, nearly two hundred years ago, people were just as fond of these varieties as they are at present; and we shall do well to remember that in this, as in other cases, we are but following in the steps of our forerunners, although more favourable circumstances enable us to achieve greater results. "For what can be more pleasant than to have Groves or Walks (when the Flowers that are but for a day are retired) apparrelled with gilded party-colour Garments, some with yellow and green, others with white and green, emulating the two Royal Metals that by the gilder's hand adorn the Palaces of Princes. The most excellent of all which gilded Plants is the Holly, whose Bark as well as Leaf is variegated with a bright yellow; the more beautiful is the Plant; yellow the Leaf is, the more beautiful is the Plant; some are strip'd throughout the Barks and Berries." Is this Holly with striped berries known to exist? The other gilded plants mentioned by our author are "Phylirea and Alaternus," Rosemary, Periwinkle, and Lily, with a marginal reference to a variegated Woodbine; and we have the following on "gilded weeds:"—"It is known to all Naturalists that the best Garden Ground is most prone to Weeds, which are its spontaneous productions, and seeing that Weeds are expected in our Grove, as well as in our Garden, it were better that it were in part supplied for want of gilded-leaved Flowers with gilded Weeds, whereof the Nightshade, otherwise a noisome Weed, but with its variegated Leaves, and here and there thinly dispersed, and gilded Mugwort, another Weed of the like nature, would make a good mixture with the other richer Dyes, like the ordinary Colours in a Picture, which serve to illustrate the more excellent. Some other sorts of Gilded Plants there may probably be, but these are all I have hitherto observed." The selection, therefore, was not very extensive, but we have here the germ of the taste for variegated foliage which has lately become rampant. *Apropos* of the "gilded Mugwort," we may observe that we met with it two or three months since in an old-fashioned Cheshire garden, and thought it quite as ornamental as the variegated Chrysanthemums which have been in favour. As to weeds, Mr. Woolridge would "give you Caution, not to use Malt dust in your Garden, for there are many Seeds of pernicious Weeds in it that have passed all the imbibitions, fermentations, and exsiccations of the Malt, and yet retain their vegetating nature, and will furnish you with new species of Weeds out of the Fields, that your Garden was not before acquainted withal."

So much, then, for the "ornamental garden" of two centuries back. I cannot now speak of the "tender exotick Trees," of the "Perennial Greens," or of "such plants that cannot endure cold," far less of the "Kitchin Garden," and the many matters connected with it, to which I may return on some future occasion. From what has been already said, we may obtain some idea of the limited resources enjoyed by those who have gone before us, and may gain as well a feeling of thankfulness for the greater opportunities which have fallen to our share. *James Britten, F.L.S.*

HARD-WOODED STOVE PLANTS.

Their Insect Enemies.

Hard-wooded stove plants have few equals, either as to their adaptability for the decoration of plant-houses or in furnishing a long succession of cut flowers. The different varieties of Ixora, especially I. coccinea, if well done, will produce their glorious heads all the pear round, which, even in winter, will keep fresh in water for a week in the temperature of an ordinary sitting-room. I. aurantiaca stands next, even a freer flowerer than I. coccinea, but it has smaller trusses. Then come I. javanica, amboinensis, and others, to which I must add the magnificent new white one, which I understand is to be sent out next year, and which, from what I have seen of it, will stand at the head of white stove flowers. Next to the Ixoras we have Dipladenias, Francisceas, &c. A single plant of Dipladenia amabilis, crassinoda, or magnifica, will furnish flowers every day for seven months out of the twelve. How often do we hear both gardeners and amateurs speaking in the highest terms of praise respecting these plants, and yet objecting to their culture on account of the serious amount of labour involved in keeping them free from the ravages of the different insect pests, which have a particular liking for them—in particular, mealy-bug and brown scale.

I grow here about a score of specimens of these plants, varying from 3 feet by 3, to 5 feet by 5, and the labour required in keeping down brown scale alone by sponging and brushing was a serious affair; taking one man two days a week during the growing season. To reduce the amount of labour I had tried washing with several compositions, which were only partially efficacious. I was recommended to try the "Abyssinian Mixture," but, having tried several others said to be infallible, and which ended in disappointment, I was sceptical as to anything killing insects without injuring the plants. In the summer of 1868 I had in a few small stove plants, which were submitted to the usual examination, but only a little brown scale being noticed, they were put upon a shelf in the stove near the specimen plants. Some time after I found they were covered with mealy-bug, and, still worse, it had spread over a number of the specimen plants, amongst others a large Ixora javanica, 5 feet by 5. This is one of the worst plants in existence to clean, the scales which it forms over all the joints of its young wood, and the bark on the old being full of cracks, presenting innumerable places for the deposit of eggs. Therefore I at once determined to try the "Abyssinian Mixture." I procured a dozen bottles, and commenced by using it at the prescribed strength, 4 oz. to the gallon. This killed some of the bugs, but left many alive. I next tried it at 5 oz. to the gallon, and used no water to wash it off, leaving the solution to dry on the plant. This left very few alive. I then applied it 5½ and 6 oz. to the gallon, and from that day to the present I have not seen a single bug about the place. Brown scale is also reduced to a minimum, so far as that in the present season there has not been a single hour's labour expended with sponge or brush upon our stove plants. We simply well washed them with the mixture, in the winter 6 oz. to the gallon, before active growth commenced, and once during the summer, at 5 oz. per gallon, on account of their young leaves being more tender than those of mature growth.

The directions for use on the label of the bottle are all right so far as the destruction of green-fly, thrips, or red spider is concerned. In fact, I find it will kill these insects at 2½ or 3 oz. to the gallon; but for bug or scale it requires to be used at the greater strength above stated, in all cases leaving the solution to dry on the plants. I am acquainted with many who have tried the mixture. Some succeed, others fail—often, I am convinced, through careless application, or from the want of studying the habits of the various insects. When we consider how infinitesimally small the eggs of those insects are, and the wonderful instinct displayed in depositing them in the most secure places, it becomes obvious that nothing but the most thorough application can succeed; and suppose that all the mature insects on a plant are killed, still sufficient time ought not to elapse between the dressings to allow of any eggs that might escape coming to maturity and breeding, otherwise it is obvious that all has to be begun over again. I use a galvanised iron trough 6 feet by 6 feet, and 6 inches deep; over this the plants are laid and syringed, keeping the plants turned, so as to get the solution in every crevice of the plants.

When dressing for the bugs, the largest plants were syringed by two men for an hour each, so as to insure wetting every part. With care there is little loss beyond as much as dries on the plant. Feeling the necessity of getting right down to the collar of the plants, and consequently of some getting to the roots, I thought I would try its effects absolutely on the roots. I selected small specimens of the following plants:—Ixora, Azalea, Fuchsia, Cineraria, Pelargonium, Alocasia metallica, A. macrorhiza, and others; and watered them at the roots until it came through the pots, 4 oz. to the gallon. I could not see that it had any effect upon the roots, and the plants grew in no way differently to others of their respective kinds to which the solution was not applied, but which were treated in all other respects the same. It is by far the most cleanly of all things that I have seen tried upon plants, leaving the foliage and wood as clean as if they had been polished, and it will not affect the most delicate flower. I have used it upon white Camellias, at 5 oz. to the gallon, buds of which were half open, and the same flowers when open were worn in a lady's hair—the solution being allowed to dry on. [We hope it did not rub off. Eds.] In the case of plants infested with mealy-bug, I should recommend three or four washings at intervals of 10 or 12 days. For scale, two or three dressings will suffice. In regard to the latter insect I find a great difference in its vitality, the insect on some species of plants being much easier to kill than upon others. The autumn and winter months are the best for using it, as then the growths are matured, and consequently will stand stronger dressings. When we consider the great saving of labour,

and the health and appearance of clean plants over those which are often met with literally scrubbed and sponged out of existence, I look upon the mixture as one of the greatest boons which plant-growers have had placed before them. *T. Baines, The Gardens, Southgate House, Southgate, N.*

THE VICTORIA ELECTRIC THERMOMETER.

This invention consists in the adaptation of a peculiar form of balance thermometer, designed by the patentee, Mr. G. Rothnie, to the purpose of connecting together separate wires, in connection with a galvanic battery. By the electric current thus set up a bell is caused to ring, or otherwise notice is given to those charged with the regulation of the temperature of a greenhouse or apartment that their attention is required.

The following description will, we trust, show its principle of action. From the accompanying engraving (fig. 258) it will be seen that the thermometer is suspended between two upright pieces of brass, and nicely poised on pivots. These upright supports are securely fastened to an alabaster stand, on each side of which is fixed a small brass pillar, having another piece of metal, either platinum or aluminum, screwed on to its top. This screw also answers the purpose of fixing the wires (shown at the side of each). Beneath the tube another platinum point is fastened at each end, so that on whichever side the tube may descend, it will bring in contact these two points, namely, that on the pillar and that on the thermometer. It will be seen that the two brass pillars are insulated, being fastened into the alabaster stand. Hence the electricity can only form a circuit when the thermometer is out of balance, and the platinum point at one end or the other touches the top of one of the pillars. In this case the wires inserted in their sides, being in connection with the "positive" end of a battery, conduct the electricity from thence through the platinum points and along the metal plate under the scale of the thermometer, and allowing it to escape by the pivots into the two supporting pieces of brass, it is conducted thence into the pillar seen in front, to which a wire is fastened leading into the earth, or negative end of the battery.

The wires (represented on each side of the instrument) are led from the hothouse, where the thermometer is placed, to the gardener's room. Each of these wires is connected with an electric bell, the one being of distinct sound from the other, so that the gardener may know by sound whether the house in question be hot or cold. Moreover, by means of the electric current, the words hot, cold, &c., may be made to appear in letters of fire, or an index may be made to point out the same facts. Where the gardener's house is situated at a considerable distance from the garden, in order to save expense one wire may be made to answer, the difference in that case being that only one bell will be rung. In houses or establishments where electric bells are already in use, the thermometer can easily be connected with them at very little expense.

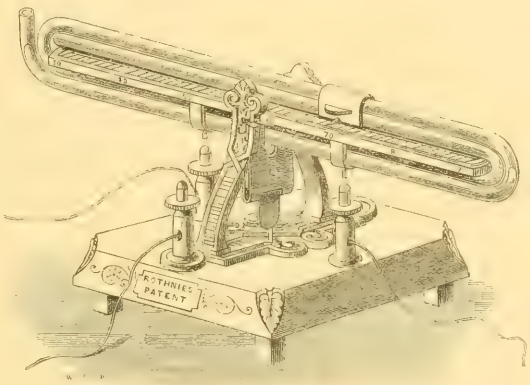

Fig. 258

The tube of the thermometer is coiled round a central piece of wood on which the degrees are marked, and on this is placed a sliding weight and index, so as to slide along the top of the graduated scale, and thereby permit of its being balanced at any temperature which may be required. If the temperature of the house be equal to that at which the index is set, the tube will be evenly balanced, but if either too hot or too cold, the bell will ring until such time as the heat is regulated to meet the required standard. It has been found that in ordinary cases this instrument would prove too sensitive or exact, to obviate which the centre of gravity is made to rise or fall, thus making the action slow or sensitive, as may be required. This, it will be seen, is effected by means of a screw fastened to the pendent beneath the tube.

The action of the instrument is the result of the expansion of spirit, which occupies the upper part of the tube, and rests on quicksilver in the lower part. This latter, by the expansion or contraction of the spirit, is displaced at one end of the tube and driven over to the other, as the heat or cold may predominate, and thus overbalancing the tube makes it descend so as to come into contact with the pillars on either side of the stand, as the case may be. The tube being formed of one length of thin glass, exposing a great surface to the air, is easily affected by heat or cold, which is of great importance.

Many other methods might be adopted to accomplish a purpose similar to that here described. The inventor, Mr. Rothnie, is, we are told, able to effect this in eight distinct methods, or rather applications of well-known principles. The Victoria Thermometer embodies one of these, and seems that most fitted for accomplishing the object for which it is intended, since it possesses the following qualities, viz., reliability, power, accuracy, and extreme sensitiveness, and, moreover, it is not liable to get out of order.

To show more clearly what is the power and sensitiveness of this instrument, let us see what it will effect. Take 1° of heat; this, even to the most sensitive person, would be imperceptible; aided by a common thermometer we might just perceive it. Applied to a long glass-tube, filled with quicksilver, it will only expand the metal in that tube 1-9990th part—or, in other words, a tube filled with quicksilver, 52 feet high, for 1° of additional heat will expand upwards 1-16th of an inch. Taking one of the most expansive of fluids—air—a tube 5 feet high, filled with air, will expand 1-8th of an inch in height, since air expands at the rate of 1-490th for one degree of heat. Now, the effect of one degree of heat on the Victoria Thermometer will be to cause it to ring a large bell upwards of 100 miles off. At the same time an index may be made to show whether it rings for one degree of heat or of cold; while at night it can be made to indicate the same in letters of fire. It may be made to open or shut a ventilator, to draw or shut a damper, to open or shut a valve in a hot-water pipe. Thus, to the gardener, or the maltster, or to any one who requires an even temperature in a building or apartment of any kind, it will give notice when the temperature therein is either too hot or too cold, and that whatever the distance at which it may be placed. In large buildings it might be of the greatest service in case of fire, by ringing an alarm bell on the top of the building.

To this description, for which we have to thank Mr. Rothnie, we need only add that the instrument appears to work in a very easy, regular, and simple manner.

EFFECT OF WIND ON TREES.

When one watches the limbs and trunk of a large tree blown about by the wind, how little one thinks of the powerful influences at work, affecting slowly and surely the well-being of the tree. As we notice the great strain to which it is subjected, we little think that every movement tends to render the tree more capable of resisting the force. What, then, is the effect of wind on trees? We all know that, in every plant, nutriment and water are absorbed by the roots, and conveyed upwards through the stem to the leaves. There the watery fluid is given off or exhaled, and the sap, which is thus supposed to be elaborated, descends through the outer parts of the stem to be used by the plant in various ways, such as the formation of new wood, and numerous other purposes essential to the life of the plant. Such is, then, the ordinarily described course of the sap. Fluid entering by the root, mixed with various materials, ascends through the tissues of the stem as crude sap. This is conveyed to the leaves, where it is elaborated by exposure to the action of the air, and deprived of a large amount of water. The elaborated sap next descends through the outer tissues of the stem and bark, and ultimately reaches the roots. It is evident that a very great amount of force is requisite to raise the sap through such a length of tissue as the trunk of an ordinary tree. Then, again, the quantity of sap required is very large, because the amount of evaporation of fluid from the leaves is very great. Many forces, exerting a very great amount of power, must therefore be constantly at work raising this large quantity of fluid necessary for the use of the plant.

In the first place, we must remember that the sap is not always in motion, and that the work of raising the fluid in the plant is not always going on. During the coldest part of the year, the sap is at rest [?], and no upward current will be detected in the plant. But when the warm spring weather commences, then we have the juices of the plant beginning to move. As the temperature rises, and the buds begin to swell, then the sap begins its upward course. The bleeding of trees in spring is a very familiar example of this beginning of the upward movement of the sap. When a tree, as a Maple or Birch, has been injured, as soon as the warm spring weather sets in, then large quantities of sap pour from the injured surface. The flow of sap from the wounds is not constant; it varies greatly with the temperature. The higher the temperature, the more sap exudes. Why is this? The elevation of the temperature causes the fluids and air contained in the tissues of the stem to expand, and hence the overflow. But there is still another very powerful cause. The roots seem to have the power of attracting fluid, and of absorbing it. This is conveyed through the tissues, and is forced up the stem, the attracting power of the root acting as a powerful agent in raising the sap. But after a time, we notice that the bleeding has ceased. The season has advanced, and the leaves begin to grow. Evaporation is now going on from the surface of the leaves, and a powerful attractive force is at work drawing the sap up to the leaves. The power thus brought into action tends to stop the bleeding, and as the leaves form, a new layer of wood begins to be developed, and the wound from which the bleeding took place is healed over by a layer of cork cells, which act as a protecting coating to the wounded surface. The tree is now actively growing, new cells are being rapidly formed, old ones are enlarging and taking up large quantities of water.

The minute vessels or tubes, through which the sap has to flow, act on account of their capillarity in arresting the flow, which goes on now with great force. But there is still another force at work, and one of great power. The stem is made up of cells and vessels. The sap is moving through the vessels in the outer layers of wood, called sap-wood, on account of its conveying the sap. These vessels have delicate walls, and can easily be compressed. What, then, is the action of the wind on these delicate vessels? As the trunk or branches are swayed to and fro by the action of the wind, the strain causes the vessels to be compressed laterally. They are full of fluid, and this fluid will also be compressed. The fluid cannot move backwards down the stem, because it is powerfully opposed by the force excited by the roots pressing the fluid up. The course of least resistance is upwards, the attracting power of the leaves is at work, and this assists the rise of the sap. As the tree bends, and the delicate sap-bearing tubes are compressed, an upward movement is given to the sap, and one acting with very considerable power. But the walls of the tubes are, to a certain extent, pervious to fluid. If the wall be examined by means of the microscope, minute pits or depressions will be noticed. These are caused by the hard matter which is deposited inside these tubes being irregular, and small rounded parts left uncovered by the thickening matter. From this porous or pitted vessel, small quantities of sap will be exuded, pressed out by the mechanical strain caused by the wind. Cell growth will be encouraged, and thus parts subjected to strains will be rendered stronger and more able to bear them. The course of the ascending sap can be very easily seen and demonstrated. Suppose we take a piece of the common Bay Laurel, so common in all our gardens. Cut a small branch, say with three or four leaves on it; place the cut end in a bottle containing a dilute solution of magenta—one drop to about half-a-wine-glassful of water. The branch and bottle are now to be exposed to the full action of the sun for a couple of hours, care being taken that the sun freely strikes the leaves, and that they are in no way shaded. When removed, a small piece, about a quarter of an inch, is to be cut off with a sharp knife, and the newly cut section examined. It will be found that there is a circle of magenta in the stem, between the pith and the outer layers. If a fine section be now made, and placed under the microscope, it will be seen that the young layer of wood cells has become coloured in certain parts. The cells are mostly small, but numerous larger openings are easily distinguished. These have become brightly coloured with magenta; and a small quantity having escaped through the walls of the tube, the smaller cells in the neighbourhood have become coloured.

Let us try another experiment. Take a small branch of the Bay Laurel, the same as in the preceding experiment: but instead of placing the thick end in the coloured solution, let us reverse it, and, cutting off the end of the stem above the second youngest leaf,

place the branch upside down in the coloured solution. After exposure to the sun, in the same way as the first one, it will be found, on microscopic examination, that precisely the same parts are stained. These experiments we have frequently repeated, using different materials, but with the same result. We are indebted to Mr. Herbert Spencer for pointing out the action of mechanical strains on the ascent of the sap. He also considers that the sap, instead of descending through the bark and outer parts of the stem, as the cambium, descends by the same channels as those by which it ascends. This is borne out by the experiments just mentioned. The simple experiment of putting a cut branch into a coloured solution, demonstrates conclusively the effect of leaves in attracting fluid through the tissues of the stem, when evaporation is made to take place rapidly from the surface of the leaf by exposure to the full rays of the sun. The influence of the high winds in spring and autumn on the sap contained in the tree, must be very powerful. How marvellous it is that the wind, which helps to evaporate fluid from the leaves, should also influence powerfully the ascent of fluid in the stem by its direct mechanical action; and also by submitting the part to the action of a powerful strain, actually tends, by exciting the action of the neighbouring cells, to render the stem stronger and more able to resist the violence of the storm. *W. R. M'Nab, M.D., Cirencester, in "Villa Gardener."*

GRAPE GROWING AT WOODSTOCK.

No record of Grape growing at Woodstock would be complete without some account of what Mr. Robert Fenn is doing at the Old Rectory House at the upper end of the town, and close by one of the entrances to Blenheim. The Vine-clad front, as well as the house itself, is quite hidden from the view of any one coming up the town through the principal street; and few would dream such a pleasant sight lay hidden close by. All that need be stated regarding these outdoor Vines is, that they cover the whole of that part of the house, and they have crept up on to the roof, and encircled in their many arms one of the principal chimneys, and on this some of the finest Grapes are produced. The crop averages about 6 cwt. annually (not 16 cwt., as stated on p. 1247), and the cool roomy cellars of the Rectory show to what purposes the Grapes are turned. Probably the visitor might travel a long way ere another such a wall met his gaze.

On a much less restricted scale than his pupil, Mr. Morris, Mr. Fenn has his vineries at the back of the rectory. The two conjoined would scarcely afford space enough to dine half-a-dozen persons capable of being crowded closely together, and yet they are a monument of economy in the utilisation of space. First there is a small lean-to vinery and orchard-house in one, very simple and cheap in construction, and put together after Mr. Fenn's own design. The house would be about 18 feet long by 5 feet in width, and the height at the back about 8 feet. The house is formed of woodwork and glass, the former screwed together in such a way that it could be taken to pieces at any time, and easily removed. Against the back wall were thickly planted Black Hamburgh, White Muscat, and Muscadine Grapes; and a small early White Tunisian Grape, received from Mr. Rivers, of Sawbridgeworth, some time ago, under the name of Muscat St. Lambert, and obtained by him from Tunis. It produces somewhat long tapering bunches of small white berries, oval, round, luscious, and with a decidedly brisk Muscat flavour. These Vines were loaded with bunches, and all were doing well, excepting the White Muscat, which requires more heat than Mr. Fenn can give it. Along the front of the house were a few fruit trees in pots, among them Mr. Standish's two new Peaches, Early Ascot and Marquis of Downshire, the former true, and showing a delicious luscious bright golden-yellow fruit, to all appearance like an early Salway, the flesh partly clinging to the stone. This, in the presence of a competent fruit judge, was tested against one or two well-known Peaches, and voted first-rate; very early, a good cropper, and a strong grower. The plant of Marquis of Downshire proved to be not true to name, as it should be as early as the Early Ascot. The plant growing under this name was evidently Royal George. By very simple means air can be given to this house, and the arrangement appeared every way satisfactory.

Next to this, and divided from it by a partition wall which forms the back of a small lean-to vinery, is another Grape-growing structure, formed out of two walls, about 4 feet apart, with a span-roof on the top, about 9 feet in height, and of the same length as the vinery. It was originally a henhouse, and by the removal of the roof, and the substitution of a slight span of glass, it has become a veritable vinery. Thus a building that proved too hot and close for the accommodation of ordinary barndoor fowls, is changed into a vinery, and proves its fitness by growing excellent Grapes. In this house are growing White Muscadine and Black Hamburgh Grapes, with a rod or two of the Black Esperione among them; the crops were plentiful, the bunches good, and the berries well coloured.

The mode in which this house is heated is as novel and curious as it appears to be satisfactory. Next door to it is a brewhouse. By inserting in the partition wall an old ironing stove, a furnace was obtained. Above this is an air chamber, and from this the hot air passes into the vinery. But as it is necessary to temper this heated air, Mr. Fenn has constructed passages on either side of the stove, having communication with the air chamber, and the fresh air passing upwards through these into the chamber mingles with the heated atmosphere there, and passes onward into the house. The contrivance answers well, and many dozens of bedding plants are preserved here during winter. The moral of this vinery points to the matter of economising space, and shows how, under apparently antagonistic circumstances, crops of fruit can be produced of a character not to be despised.

This interesting rectory garden shows several contrivances of a like economical and interesting character. When, more than 20 years ago, Mr. Fenn first commenced gardening, this garden was low, damp, and unfruitful. Many cart-loads of new soil have been added, and it is constantly being fertilised by utilising all the sewage, &c., from the rectory house. Nothing in this way is wasted. In the garden tanks have been constructed immediately below the surface of the soil. Into one of these is carried all the accumulations from the domestic offices above stairs, into the second flows the same yielded by the kitchen, scullery, and the offices on the ground and basement floors. The contents of these tanks are raised by means of a portable pump, and used for the purpose of irrigating the soil of the garden, and Mr. Fenn speaks in the highest terms of their value when so employed.

Into a third tank, so constructed and placed that nothing else can find its way into it, runs all the rain-water that can be obtained from the dwelling-house, outbuildings, &c. This, filtered through charcoal filters within the house, and obtained by means of a force pump, supplies all the water required for drinking and other purposes. Woodstock has suffered from a comparative scarcity of water during the drought, but here at the Rectory the rainfall of the previous winter sufficed to carry the inmates through the season, with some to spare for less favoured neighbours. I tasted a glass of the water so gathered and filtered, and had it been obtained from a clear spring welling up its precious contribution fresh from the bowels of the earth, it could not have been cooler or more palatable.

In common with many other houses built during the last, or the early part of the present century, the water-closets are external to the house. These Mr. Fenn has converted into earth closets, the receptacles for the deposits being bricked and cemented; and such, being removed once a year, places at his service for mixing with other manures an invaluable agent for replenishing the soil of his garden. The conversion of these closets is a work of several years' standing. Long before their utility, and the value of the principle from a sanitary point of view, was urged on the attention of the country as an important ramification of social science, the idea had been suggested to Mr. Fenn's observant mind, when a lad, residing in a densely-populated district of London. A workman whom he had to call on occasionally on business matters, occupying a small room on the first floor of a house, kept a favourite cat. As the arrangements of the building did not allow of the animal retiring to any outdoor place, a box of soil was kept in a corner of the room, and with the fine instinct natural to it, the animal sedulously covered all its deposits with a portion of the soil. The lad saw in this the operation of a simple principle which, in time, he developed into the system of earth-closets he so successfully works. *R. D.*

PLANTING IN SAND HILLS.

BETWIXT the arable lands of Moy and the southern shore of the Moray Firth, lie the extensive ranges of sand hills usually known as the sand hills of Culbin, forming a desert, and sterile to a degree, from the constant sand drift. In the year 1864 a measurement of this vast district was made, and the extent ascertained to be 3,466 acres. Some of the sand hills, chiefly those nearest to the sea coast, rise to the height of 100 feet, gradually undulating, in lower knolls, towards the arable land. The small estate of Kincorth is nearly surrounded on three sides by the sand hills, a portion of that property, next to the sand hills, being equally sterile. About the year 1831 or 1832 the proprietor of Kincorth planted with Scotch Fir (as an experiment, and with the view of protection) a portion of this sterile subject, and the planting soon began to assume a thriving state.

Encouraged by his example, and by the appearance of a considereble number of natural trees taking root through the hills, Mr. Grant, the proprietor of Moy, in the year 1840 began to plant within the district of the sand, commencing next to the arable land, and on the flatter portion, consisting partly of exhausted peat moss, and partly of pure sand drift. This experiment having also succeeded, other and larger portions were planted in 1841, and again in 1843. In the year 1853 about 160 acres more were planted, advancing further northwards, and nearer to the large sand hills, and this planting is now in a very thriving state, having, when planted, partial shelter from natural trees of some size. In 1862-3 another large portion was planted, but in about a month afterwards a heavy gale of wind from the westward covered up nearly two-thirds of the plants with sand-drift, and the remainder, which were rendered weak and sickly, were destroyed by rabbits, which by this time had got into the cover, so that this planting was a failure.

The several plantings, up to 1843, consisted of three-fourths of native Scotch Fir, and one-fourth of Larch, and the progress of the plants was remarkable. At intervals prior to 1857, I repeatedly measured the annual growths, and found very few under an average of 18 inches, and many upwards of 2 feet. By this time the wood had become so thick that it was quite impenetrable. Parallel and transverse paths or avenues were then cut through the whole for access. In 1857, I commenced to thin out the thickest portions, and this I did by cutting down the inferior plants and leaving them to rot on the ground, thus admitting the air more freely. The wood immediately afterwards made very rapid improvement. In the year 1859, I commenced cutting for pit props, and in that year realised upwards of £200, less expenses. Betwixt that time and 1865, a continued pit prop cutting has been carried out by a gradual process of thinning, the ground being in most cases gone over twice, and in some parts three times.

The whole expenses betwixt 1840 and 1865 of planting, dyking, draining, cutting out, and making roads, thinning, cutting props, &c., amount to the aggregate sum of £731 5*s.* 10*d.*, and this includes £50 for the planting of 1853, from which no return has yet been obtained, and may be deducted, £50—£681 5*s.* 10*d.* The aggregate sum obtained for pit props up to the end of 1865, amounts to £988 7*s.* 11*d.*, thus leaving an overplus of £307 2*s.* 1*d.*, to pay for interest on the original outlay, and without making any allowance for rent, the ground being nearly, if not altogether worthless. As a practical matter, it is proper to mention that while the Scotch Fir plants grow vigorously in the pure sand, the Larch plants die out, except in favoured spots; and in these I ascertained, by digging, that the tap-roots had found their way through the sand into moss or soil below. In these favoured spots, the Larches quite outstripped the Scotch Fir in their growth.

The survey, as before mentioned, shows the content of the whole sand hills to be 3,466 acres; of this there are 819 acres marked as under wood. This last, however, contains a considerable extent of natural wood, which does not fully cover the ground, partly planted upon 1859, and partly still in a natural state. But after making allowance for the extent under such natural wood, and also for the planting of 1853, I calculate that there are now at least 400 acres of 23 and 25 years' growth, in a highly thriving condition, and after another propping, probably two years hence, destined to form a most valuable plantation; and this, beside the 160 acres planted in 1853, not yet fit for propping. *W. Solandres, in "Land and Water."*

Home Correspondence.

Plant Cases.—"Patented, 'an improved case for the conveyance of plants;' why it is only of wood I we have used wood for many years past." Such an exclamation would be almost as much to the point as the letters of your correspondents last week, for they entirely lose sight of, or ignore, the main principle for which my case is patented. The general shape or design of the case is not new, nor is there anything new in its being constructed with legs, so that it may stand free from the deck; but there is something new in the frame of louvre boarding when applied to shading plant cases, as set out in my specification. For some years my losses have been so great in importing new plants, that it has led me to consider the causes, and anxiously to examine the plants and cases on their arrival; and from noticing that in some instances the tops only were dead, in other words the plants had died downwards, I came to the conclusion embodied in my specification submitted to the Solicitor-General. It reads:—"Heretofore great loss has been sustained in the transmission of valuable plants, owing to the direct action of the rays of the sun upon the glass covets of the cases containing the plants, the result of which has been the creation of what may be termed a 'steaming' heat within the case, so that the plants have been literally boiled. Great danger results also from the breaking of the glass on board vessels, which at present frequently happens, thus exposing the plants to the action of the sea air. Various devices have been resorted to for the purpose of obviating these serious evils, such as nailing across the case strips of wood, Bamboo canes, canvas, and other plans; but all the means hitherto used, so far as I know, have more or less failed to accomplish the object in view, as they either make the interior of the case too dark, or do not prevent the sun's rays from penetrating directly into the case. Now, in order to remedy the evils above referred to, and also to protect the plants from injury by the dripping on to them of the condensed vapour from the glass, I cover the glass with a frame or frames formed with louvre pieces, so arranged as to permit the necessary light to enter the case, but to protect the glass from the direct rays of the sun, and from breakage." This application, then, of louvre shading is the important principle of my patent. Ventilation is another, which, however, was not alluded to in the *Gardeners' Chronicle*, when the sketches of the cases were given. These sketches were made some

time ago; since which, in completing the patent, I added the feature of ventilation, arranged in a novel way, so as to entirely obviate any excessive amount of condensed vapour. Without having seen my new patent case, it is easy to understand how your correspondents recognised the features that were not new, and overlooked those that were. But I may explain that it was obligatory in the first case to set out a case, and deposit plans of its structure, in order to show the application and purpose of the louvre shading, &c. It is not, therefore, very surprising that the case should be set out with the "second-hand feature" of legs. As regards shape, light being so essential to the welfare of plants, I think a span-roofed case must be the best, as a span-roofed greenhouse is better than a lean-to. However, the louvre shading and ventilation is applicable to any form of case, although, in order to secure it, it was necessary to set out some particular form. Most practical men will, I think, agree with me that many of the suggestions in your last week's issue may be summed up in one word—impracticable. My cases will have to make way by their merits, and I am glad to say that orders are coming in from abroad, simply from the fact that it has been already found that plants reach their destination in better condition than in other cases. *William Bull, Chelsea.*

Saxifraga gibraltarica.—Having grown this plant for some years, I can confirm the account given by Mr. Maw (see p. 895) as to its behaviour during the mid-summer months. After flowering, the embrowned foliage closes over the terminal buds, which become for the time being so many hybernacula. About the end of August these buds expand, and the plant resumes its livery of green. No amount of rain will induce expansion before that time. *W. T., Ipswich.*

Smilacina bifolia (p. 1443).—Authors of British Floras will be found to differ greatly as to the colour of the berry of this plant. Bentham says it is "red;" Babington (with marks of quotation), "yellow with brown spots;" Boswell Syme describes it as "waxy-white, dotted with brownish red;" and Hooker as "white, dotted." Nor are Continental authors more in harmony, for Grenier and Godron, describe it as "a la fin rouge;" whilst in Reichenbach's plate (vol. x. t. 436) it is coloured a purplish-black. In 1866, as stated in the "Flora of Middlesex" (p. 278), some nearly ripe berries were sent me from the Kenwood locality; on each raceme (bearing about 20 flowers) only one or two berries were produced, and in a note accompanying the specimens it was stated that "the fruit was very scarce, birds or some-t ing eating it before fully formed." The berries are pale green, and spotted with numerous small dark claret-coloured irregular markings; probably when quite ripe they would have presented the colouration described by Boswell Syme. The fruit is 2-celled, but in those I examined one cell was abortive, whilst the other contained a single hard globose seed. I may add that I was anxious to see whether it fruited in its alleged native habitat near Hackness, in Yorkshire (certainly a very wild-looking station), and when in the neighbourhood this autumn (1870) I examined the spot, but was unsuccessful in detecting the plant. *Henry Trimen, British Museum.*

Melon Growing at Heckfield.—I always feel a peculiar satisfaction, either in seeing or reading of a good feat in practical gardening, and am always more disposed to emulate than to carp at such. It is in this spirit, and with a view to future work, that I have lately been analysing the possible means of taking five crops of Melons off the same plants during the season, as Mr. Wildsmith says he does, and here is the result. There are few Melons possessing vigorous constitutions, of which Queen Emma is an example, that have the rather rare property of bearing continuously. This season, since what I may call the first crop was cut, our Melon-house here, 36 feet long, was occupied until very recently with but four plants, that have borne well all along, and were showing well for fruit when removed there, but I could not really tell when one crop was ended and another begun. According to Mr. Wildsmith's statement (p. 1379), he cuts one crop of fruit, prunes, waters thoroughly, and crops again, and so on till the end of November. Now, with these data, and assuming that he cuts his first crop as early as the end of May, let us see what comes within the limits of possibility. Queen Emma is an early Melon, and when the vines become woody it will ripen its fruit in five weeks from the time of setting, but it often takes from six to seven weeks. Meredith's Hybrid Cashmere, the variety grown by Mr. Wildsmith, ripens ten days or a fortnight later than Queen Emma. We will say, however (allowing but one week to elapse between the cutting of one crop and the setting of the next), that a distinct crop is cut every seven weeks after his first crop, or four crops in 28 weeks. From the end of May till the end of November there are only 26 weeks; it therefore follows, even at this very rapid rate, with a second early Melon, and allowing everything to have gone on without a hitch, that such a feat is impossible. A crop every six weeks may be an extreme possibility, but I hardly think it is, with Meredith's Hybrid Cashmere, or, indeed, any other variety. This, however, it appears, is what Mr. Wildsmith claims to have done, and something more, for it seems his fifth crop was well advanced some time ago, with a prospect of a sixth. To accomplish such a feat, the plants would have to be sustained in the highest vigour for the long period of 10 months at least, from the time of planting, and this against a high and hurrying temperature. Mr. Wildsmith will, therefore, excuse your readers, I am sure, for being curious in the matter, and keep good faith with them by furnishing further particulars. In this expectation, therefore, I beg to ask him—1st, When he planted his Melons? 2d, When he finished cutting the first crops? 3d, How many fruit he has cut, not on the average, but at each crop? and lastly, is not 65°, which he says is a suitable bottom-heat temperature, a misprint? At this rate, he ought to take three crops off out-doors, but Melons starve here at such a temperature, and at most other places as well. *J. S. W.*

—— This interesting question seems to take the fancy of a few of your readers, and unbelief, or something akin to it, seems to peep out now and then. I think, if it is not too plain speaking, that this is simply on account of their not having accomplished such a feat as that recorded of Mr. Wildsmith. I have not the least doubt about it, having myself produced three crops from the same plants, and then might have had a fourth if I had had courage enough to have allowed the plants to remain, for they were green and healthy, being free from red-spider when I pulled them up; and they were crops and fruit which I should not have been ashamed to have shown to any gardener in Lancashire. Allow me ask "T. H." how he is going to get one plant to supply him with fruit till the middle of January. Surely his demand must be of the most limited character, or, if otherwise, a little information on the subject will, I have no doubt, enlighten a few of us; and on the other hand, how does he make it out that early Melons are not worth the trouble and expense of growing; as I am strongly of opinion that he will find a great many of a very different opinion on the subject. *James Stewart, The Gardens, Bellsfield House, Bowness, Windermere.*

A Modern Ice-house.—Although not strictly a horticultural question, yet anything that relates to the storing of ice has of necessity some amount of interest for gardeners, as the maintenance of a continuous supply of ice all the summer through forms, in most large establishments, no unimportant part of a gardener's duties. Assuming that ice is abundant in the winter, and that the houses at command are fully stored, the chances of maintaining a good supply will necessarily depend upon the capacity of the respective houses to withstand the action of the external atmosphere in warm weather, as, however constructed, it is impossible to prevent the admission of the external air at such times as portions of the store are required for use. Independently of this, there is also a continuous external action going on that very materially affects and lessens the bulk within, and is constantly producing waste. Here lies the most important point for consideration in the designing of ice-stores, as that mode of construction that promotes the least waste must of necessity be the most successful and worthy of general adoption. A year or two since this topic evoked considerable discussion in the columns of the *Gardeners' Chronicle*, and various were the opinions expressed, but beyond a partial advocacy by some of the building of ice-stacks or cones, and covering them with straw, I have no recollection that any novel suggestions were offered, or that any special proposition was made to adopt any other kind of structure for the ice-store than that which so generally prevails, viz., the ice-well or underground house. Within a short distance from my dwelling stands, close to the edge of a large sheet of water, an ice-house, built a few years since, upon modern principles, by a London architect, and although I am unable to give the exact dimensions, I may fairly liken it in appearance to a large chapel minus the windows. It is built of red brick, having walls of great thickness, and is roofed with slate, beneath which is felting, and under this, and held up by a ceiling of boards, is a layer of sawdust about 12 inches thick. The floor of the house is of gravel concrete, and has drains of glazed pipes running through it, into which pass all soakage as well as the waste water produced from the ice. At the outfall of the drain there is a valve, so that no external air can pass in that way. Over the concrete is laid a false floor of stout planks, and upon these the ice is placed. The house is divided into two compartments, each division holding, when full, about 600 tons; and even this large quantity has proved insufficient to meet the demand during the past summer, and the stock being nearly exhausted, the company to whom it belongs have just been placing within it a large portion of a cargo of some 200 tons of block ice from Norway, brought by a vessel to Southampton, and thence carted to the ice-house at Old Shirley, about 3 miles distant, from whence it will be taken as required, until Jack Frost shall once more hold our waters in his iron grip. Perhaps some curiosity will be expressed as to the purposes to which all this large quantity of ice is devoted. I will satisfy it. Visitors to the port of Southampton are pretty familiar with the magnificent steamships that constitute the fleet of the Royal Mail Steampacket Company, two of which are despatched every month to the West Indian Islands, running right down to Colon, and one starts every month for the Brazils and portions of South America. The most important part of their freightage is passengers, and, as these demand at the hands of the company not merely necessaries, but luxuries also, a constant supply of ice on board of each of these ships has become a matter of almost absolute necessity. At all events the anxiety thus displayed by this great shipping corporation to cater thus fully for the comfort of its passengers in the matter of ice only, speaks volumes for its care in other directions. The amount of ice taken by each ship varies according to the dimensions of the ice chests on board, but the average quantity is about 30 tons each voyage; and this is all got out of the store at night and carted into the ship a day or two before sailing. It will give some idea as to the value of this ice to the company, when I state that prior to the ships being enabled to carry as large a quantity as they do now, it was no uncommon thing for them to purchase a few tons out at Rio, at the rate of £30 per ton. Into one of the ice chests several cartloads of fresh meat is placed to keep the saloon table well supplied with this necessary for the greater portion of the run out, the contents of the other chest being applied to more delicate uses. Of course where a large supply of ice is so essential, it is incumbent upon the directors of the company to obtain it at the cheapest possible rate, and this they think they do by the building they have erected, and filling it themselves. Now the point of interest to gardeners will be as to the percentage of waste that takes place during the year in this modern house, and that I can inform them to be about 30 per cent., although that is materially affected by the degree of heat during the summer. As a means of resisting the action of the sun's rays, I have advised that a good coating or two of whitewash should be given all over the outside of the building, but the efficacy of this recipe seems to be doubted by those who constructed the building. It is just now a most appropriate period of the year to raise a discussion as to the merits of various modes of ice storing. My object in writing this has been to submit to others interested in it points that may or may not possess novelty. Perhaps other correspondents can give some accurate figures as to the percentage of waste in ice-houses under their control, and any observations cannot fail to be of interest that shall tend to establish the most efficient mode of ice-storing. *A. D.*

Onion Growing at Banbury.—The system of culture of the Onion in this district certainly includes pinching at the neck; but I imagine it is not performed till the neck has reached its proper dimensions. That it is performed was frankly confessed to me by cultivators; that it does not injure the bulbs can be seen from their splendid development; that the act of pinching judiciously and seasonably performed produces a most desired fineness about the neck, is effectually demonstrated in the same way. I should think the pinching process commences just sufficiently long before the Onion exhibition takes place to admit of the neck withering by the time the Onions are required for show; but as to the exact time when the process is commenced, I cannot pronounce an opinion. I have not got by me the article on p. 195 of the *Gardeners' Chronicle* for 1866; but to the best of my recollection that was silent in regard to the pinching process. Perhaps competing cultivators find it to be to their advantage to say as little about it as possible. It is perhaps related to the "floricultural millinery" it is the fashion of some to attack in these days, though dealings in the millinery line are by no means confined to florists. *R. D.*

Vine Borders.—At p. 1379, Mr. Simpson, in describing a Vine border at Wortley Hall, says it is composed of a stiff loam, almost clay, at 2 or 3 feet down, terminating at a depth of from 4 to 5 feet in a yellowish, loose gritstone. I doubt if Mr. Simpson will convince gardeners generally that the above description of Vine border is not favourable for the production of first-class Grapes; on the contrary, it is as nearly as possible of the same formation as much of the valley of the Thames, and where, as all who have ever lived on the borders of that favoured stream can testify, first-class Grapes are in many places produced with but very little trouble as regards border making. Take, for instance, the soil and its formation at Cumberland Lodge, Windsor, and compare it with that at Wortley, and I think a great resemblance will be found. The favourable condition of the soil for the production of Grapes at Cumberland Lodge has long been demonstrated by the splendid Vine which is such an ornament to the country. I could instance many other places in that district where the same comparisons could be drawn with regard to soil, and where first-class Grapes are grown; yet the same men who produced such Grapes there, have failed to do so in other places where the soil was of a different character. While on the subject of Grapes, I may mention an instance regarding shanking, which goes far to prove the value of the water cure for that pest. On the 3d of August last I had occasion to go to Twyford, Berks, and while there had the pleasure of looking through the gardens of T. Garth, Esq., at Haines Hill, where there is a small half-span-roofed pit, about 20 feet long by 9 in width, and in this pit was the heaviest crop of Muscats I have ever seen, considering the small amount of soil they had to grow

in, there being a walk and partition wall taken out of the small space inside. The border was only about 5 feet in width and 2 feet in depth, the roots being confined to the inside of the house. It was perfectly astonishing how such an immense crop could find sustenance, yet Mr. Williams, the gardener, assured me that they had borne similar crops for the last seven years. On observing a few shanked berries on the point of one of the branches I inquired if they usually shanked much; when Mr. Williams replied, that as soon as he saw the first symptoms he followed the advice he had seen advocated a short time previous in the *Gardeners' Chronicle*, and had thoroughly saturated the roots with water, which was about three weeks before I saw them, and it certainly had stopped it, for not another berry had shown any indication of shrivelling, but were ripening off beautifully. This is the toughest argument I have yet come across in favour of water as a cure for shanking, and my own practice with the Muscats here quite coincides with that above noticed. This season I have given nearly three times the usual amount of water to the inside borders, and have had scarcely a shanked berry, while some seasons before a good many have gone off just as they were colouring. For the information of those who do not know Twyfor d, I may state that it is only seven miles from Reading, and but a very short distance from the Thames; and to the peculiar properties of the soil of that locality Mr. Williams justly attributes the splendid crops of fruit, not only of Grapes, but of Peaches, Plums, &c., which he obtains under glass. *John May.*

Preserving Grapes.—One would imagine from so much recent writing respecting the keeping of Grapes in bottles that the idea was new. Within my recollection it has been in practice since 1854, but until about eight years since I must confess that I never saw a room fitted up, heated, and arranged expressly for keeping Grapes in bottles. Such, however, I met with at Kelham Hall, near Newark, the seat of G. H. M. Sutton, Esq.; and Mr. Cousins, the gardener there, informed me that he had practised this method for years with the best results; indeed, owing to the limited quantity of glass he was compelled to use the vineries for bedding plants—a practice, I am sorry to say, we are nearly all compelled to follow: reform is certainly needed in this respect, for go where you may, every nook and corner is crammed with bedding plants. Surely a few cheap structures for the occupants of the flower garden would be better and more in character than stuffing up the vineries and other fruit structures with Verbenas, Pelargoniums, &c., by the thousand. The demand for these plants being great at Kelham, Mr. Cousins had to adopt the above method of preserving Grapes, which, when I saw them, were in fine condition. This being just before Christmas, you will perhaps say it was too early in the season to pass judgment; but Mr. Cousins assured me that they would keep fresh and plump for months. I believe my friend, Mr. J. Miller, of Worksop Manor, has a plan of keeping Grapes for some length of time when cut, without the aid of bottles, and of which he may perhaps some day let us into the secret. No doubt where vineries have to be used for bedding plants during winter it is best to cut the Grapes early, but when the vineries are not required for storing of plants, let them hang on the Vines. I arrive at this conclusion from having seen the fine plump berries and splendid bunches at Welbeck at the end of March. After the season the bottles would be of great service. Perhaps Mr. Tillery would kindly tell us how long these Grapes keep plump after the time mentioned, that is, if he preserves them after that late season in bottles or otherwise. By the great quantity of West's St. Peter, Alicante, &c., that I witnessed the end of last March, the supply appeared as if it would last for some considerable time. In speaking of Kelham I am reminded of a good idea which I saw carried out there, viz., that of covering the approach to the mansion with glass; the whole of the circular part of the drive, and a large portion of the ground, is entirely enclosed with glass. The centre portion, instead of being a large plot of grass, as usually seen in front of the house, with a carriage drive round it, is a large raised mound, tastefully planted with dwarf shrubs and flowers; indeed, the whole of the enclosure was nicely arranged, and had the appearance of a large winter garden; the idea I consider worthy of imitation, not only for its beauty as a grand promenade, but for the great comfort and convenience it affords. Neither wind, wet, frost, or snow can either trouble or interfere with the entrance or exit of the occupants: whether the heads of the family or the domestics, all are alike cared for and sheltered under the crystal roof. *Edward Bennett, Eastville Hall Gardens, Stamford.*

—— A few years ago I had under my charge some old vineries which were not free from drip; and having also to keep large quantities of bedding plants, I found it impossible to keep the Grapes hanging without rotting after the middle of October. I therefore had boards about 6 inches wide fixed with brackets to the back wall of a fruit-room, on which I tied Beet or Mangel Wurzel roots. I then cut the Grapes with about 6 inches of wood below the bunch, and stuck the ends of them into the roots; letting the bunch hang below the board. Those Grapes served the dessert daily up to Christmas, and were quite good to the last. The sorts were Black Hamburgh and Muscat of Alexandria. I usually cut them from the Vines about the first week in October. The room was quite dry, and no other fruit was kept in it. This course I have pursued for a long time with the same success. *J. Middleton.*

A Plea for Vegetables.—I for one would gladly give 5*l.* towards the sum which Mr. Gilbert proposes to raise and appropriate to vegetables at the forthcoming provincial exhibition of the Royal Horticultural Society; but I think it would give more satisfaction if the sum, or such amount as may be raised, had a wider distribution than that which Mr. Gilbert suggests. The value of 10 gs. is a goodly prize for a tray of vegetables, and no doubt would cause a keen competition; but no greater contest need be required than that which took place at Old Trafford in 1869, when the highest prize for the best collection of vegetables did not exceed 5 guineas. At that meeting the liberal sum of £33 10*s.* was awarded in prizes for the best collections of 12, 10, 8, 6, and 4 varieties of vegetables, and three prizes were allotted to each class. No exhibitor could take more than one prize in a class, yet he could enter and take a prize in all the classes, which may seem fair enough, yet such a system has a direct tendency to bring the prizes into fewer hands; and when that is the case, less satisfaction must prevail. As a remedy, I would propose that collections of vegetables be divided into two classes, namely, trays of 12 and of 6 varieties, exhibitors being confined to one class and one prize. If such a sum as £30 could be raised from amongst gardeners or others, I would give £20 to the former, and £10 to the latter class, and divide these sums respectively into 10 prizes, ranging from £5 to 10*s.* for the best 12 varieties, and from 42*s.* to 10*s.* for the best 6 varieties. Such a plan, and would rather see the prize money restricted to two or three good prizes, as suggested by Mr. Gilbert. A gold watch of the value of 10 gs., as I have remarked, would cause keen competition, but, for myself, I would rather have a serviceable silver watch of less value than [illegible] more, I would rather have money than either. The majority of gardeners have very seldom an opportunity of sitting on velvet; and if the Royal Horticultural Society can, by adopting this distributive system in the prize list, give a greater number a chance of winning at their Nottingham Exhibition, I shall willingly subscribe my mite towards that purpose. *Andrew Murray, Bowl Hall, Worcester.*

Passiflora quadrangularis as a Conservatory Climber.—In answer to your correspondent "Enquirer" (p. 1378), I may state that the temperature in the [illegible] month of February, when it is allowed a little increase, say from 45° to 50°. But during the early winter months the house is to all intents and purposes a cool one. The lowest temperature observed was 30°, and this occurred on the morning of October 20, 1869, but there was [illegible] night before it had made much progress, and instead of burning, it went out. The only harm which befell the Passion-flower was, that every leaf which touched the glass was frozen to it. Some plants of Coleus were frozen through. This may appear strange, but it is none the less true. I have no doubt whatever but that [illegible] flower in an ordinary conservatory, or at least in one anything like that which I shall now describe. This conservatory is constructed of wood and glass, and [illegible] 18 feet in length and 26 feet in width, corresponding with the drawing-room, a door from which opens into it. The sides of the house and the end are 8 feet high, 2 feet 3 inches of which is a brick wall cased inside and outside with cement. The remaining 5 feet 9 inches is glass and wood, in the form of sashes, one above the other, and made to slide, by which means the house is ventilated. The roof is constructed on the ridge-and-furrow principle, there being three spans, each 8 feet 6 inches in width, and rising 3 feet above the end plate: it is a fixed roof. There is at the gable end of each of the spans a small window for ventilation if required, but I seldom use them, and there are two doors, one at each side of the house. The house is heated by hot water, a flow and return pipe being carried along the sides and one end. There are some high trees nearly close to it, which shade it somewhat in summer, but also exclude the sun in winter, yet the house is exposed on the south-east side to the full force of the east and south-east wind, for being on a hill we have an uninterrupted view of some 25 miles in an easterly direction. I may add that there are now hundreds of buds and several fully expanded blossoms on the plant, and I have only used fire once this autumn; I do not, however, think that all the hundreds that are now on the plant will expand in the conservatory as they would do in a warmer house. *N. Blandford.*

Storing Fruit.—Your correspondent "Quercus" recommends slate or marble for laying stone fruit on. I knew an old gentleman that kept all his best dessert Apples and Pears laid out singly on slates, that is, the bottom of his fruit-room benches was lined with slate. I have great faith in a slate bottom myself, and as we are all anxious to preserve our choice fruit in the best manner, this subject is very interesting. *Charles Lee, Gr., Boconnoc, Cornwall.*

Mushrooms.—As I have no recollection of Mushrooms growing so late in the season, and in such great quantities, as at the present time, perhaps to report the same may not be uninteresting. In this neighbourhood (Tawstock, North Devon) the harvest of Mushrooms commenced about the middle of August, and has not yet ended; although a lull took place in their production through a part of our second summer—a very dry and hot time during the three last weeks of September; and the crop also received a check from the two sharp frosts of the 9th and 10th insts., combined with some heavy soaking rain. The subsequent recurrence of warm, humid, or sultry weather, had the desired effect of reproducing this esculent with increased vigour, since which great quantities have been gathered daily; and a good supply found its way to the Barnstaple Market on Friday last, the 21st inst. This neighbourhood is celebrated for its productiveness in natural Mushrooms, and in my youthful days I have often roamed over fields gathering them for food, to be delighted with the sumptuous meals they would produce. After an interval of some years I now find myself over the same ground again, and may say to myself most truly—

"To thee, sweet memory, these delights we owe,
When o'er the walks of happiness below
We stray, once more, to mark the sunny scene
Where childhood danced, and rapture smiled between."

Tawstock, October 24.

Prolific Potatos.—Some of the largest roots of Potatos I have ever seen have been dug up from my garden this morning. One root (named the Rock) weighed 26 lb., single Potatos of which, in one or two instances, reached 1½ lb. Of the other, a Fluke Potato, the root weighed 14 lb. Is not this an unusually large yield? *Alnwick, October 24.*

Beet for Ornamental Purposes. I do not mean to say that Beet ought not to be planted in the flower garden, but when we have, as at present, such an endless variety of colours both in flowers and foliage, I incline to expel it from the flower garden, and let it suffice to ensure us a good supply in its proper place. As there are differences of opinion respecting the palate, so there [illegible] with regard to Beet as a bedding plant. But I cannot admit the utility of it as such, when we have other things better adapted for the [illegible] Iresine Lindeni, quite equal in colour to any of Dell's Beet, and which can be regulated to any height by simply pinching it in, an operation difficult to perform on the Beet. Another fine plant is Amaranthus melancholicus ruber, and then there is the Coleus and Perilla. With all these at our disposal, what need is there of growing vegetables in the flower garden? What next, I wonder? Variegated Kale has taken its place as a bedder, Beetroot is coming out with all its effulgent powers; what next shall I say?—why, Red Cabbage: [illegible] them, the Cauliflower stands out unrivalled as a free bloomer, a good quality approaching to bedding [illegible] their flower gardens, is to use every precaution in their selection, or their expectations will result in a season of utter disappointment and regret. *T. Morgan, Hanwell.*

Habits of Cuckoos.—Some four years ago I took a young cuckoo from a nest of the hedge-sparrow, put it into a cage, fed it with small pieces of meat, sopped bread, &c., and closely watched its manners. I kept it about two or three weeks, got it nicely strong, then took it back to the hedge at the bottom of my nursery-grounds, and left it to take care of itself. Last year my attention on several occasions was arrested by the unceasing energy of one of my little favourites, the hedge-sparrow (Accentor modularis) chirping its little note, backwards and forwards on the grass in front of my window, and when at dinner or breakfast we (my little boy and girls, for they became fully acquainted and eagerly watched the untiring and tender care of this foster parent) soon discovered, about 4 feet from the ground, in a Whitethorn hedge close by, its nest, containing a young unfledged cuckoo. I one day looked in its throat to find out what it could have been fed with, just after its mother had left it, and to my surprise, there appeared to be some hundreds of green aphides. It had not gorged them. Young cuckoos have large mouths and distended throats, of a bright saffron colour, and when being fed its voice is exactly like the hedge-sparrow's, only more shrill, being so much stronger. My little friend the hedge-sparrow, or some of its family, have for some years located themselves in this hedge, and I think it remarkable (although not a solitary instance) that the cuckoo female parent (I hesitate to call it a mother) should deposit its eggs (I understand it lays two eggs, but I have not heard or ever seen two cuckoos in one nest) in so public a place—on the side of the public road, and near about 4 yards from the gate and 12 from my house window. When the cuckoo became fledged, my children took it from the nest and fed it; it, however, flew away, and would not keep to the nest. It was quite plucky before leaving; even very young cuckoos possess the art of self-defence, will turn their heads towards one, and assume little airs and

sprightliness; when feathered they draw themselves up ready for attack, and assume the offensive, pecking at you like little sparrowhawks or kestrels. I think both male and female sound the well-known note, and the male often gives a shrill guttural warble, flies swifter, and generally lower. I have repeatedly watched them, but cannot attest it, and it may be the reverse. *Jabez Jay Chater, Gonville Nurseries, Cambridge.*

—— When a lad about ten years of age I well remember my brothers and myself finding in a bush of Rhododendron ponticum, near which we passed daily on our way to school, a hedge-sparrow's nest, containing four eggs, and a strange egg larger in size and of an altogether different colour. My father informed us this was a cuckoo's egg. We watched with much interest the result of the hatching process, and at the expiration of the proper period of incubation found that the nest contained three young sparrows, and a fourth occupant of the nest much larger in size. A few days after, imagine our surprise when we found the young sparrows lying on the ground beneath the nest, from which, it would seem, they had been forcibly ejected by the young cuckoo, who was now "monarch of all he surveyed." A daily visitation to the nest enabled us to mark the rapidity with which the usurper increased in bulk, till it soon exceeded that of the poor sparrow, whose resources appeared to be taxed to the utmost to supply the foundling with food. Anxious to preserve the cuckoo, we placed a net over the nest, and later placed the cuckoo in a cage, and still the sparrow brought it food; but there was no indication of the aid of the parent cuckoos, who had in this singular manner shelved their parental duties. In due time our young cuckoo was borne home, and kept in the cage till nearly Christmas, when, hard frost setting in, we found it one morning lying at the bottom of its cage, cold and stiff. So ended its eventful history. I give the results of my own experience, probably one which has not altogether passed from the recollection of my brothers. *Richard Dean, Ealing, W.*

—— Many years ago, when I was a youngster at work in a kitchen garden, I observed for some time a loud noise on the east side of the garden, as if an aviary of young parrots were being fed. In a few days from my first observation, as the noise became stronger and more frequent, my curiosity was raised to the hunting pitch to find out the source of this peculiar noise. Taking my stand as near as possible to where the noise proceeded from, I calmly waited in the shelter of a standard Autumn Bergamot Pear tree. While I stood there, ruminating in my own mind about the foreign noise, all at once up started the old tune from a Pear tree on a wall opposite my hiding-place, and on walking carefully up to the tree I saw at a glance the source of the unusual noise—a bird something like a young grey chicken, perched on the top of a chaffinch's nest, and being fed by the female chaffinch. I fancy I can now see the green maggot going down the gaping throat of the noisy bird. The difference between the two birds was very much as if a little King Charles spaniel was feeding a great bloodhound. I observed that mother chaffinch required to be very nimble on her legs in advancing and retiring, to prevent herself from tumbling into the monster's yellow gullet. After conveying the intelligence of my wonderful find to the gardener, he pronounced the bird a very fine cuckoo. I at once felt disposed to rear it, and to make it secure I adopted my goldfinch rearing-cage, which is simply a box with a wire front, putting in the cuckoo and fastening the box against the wall among the branches of the Pear tree. I had the pleasure for two or three days of assisting mother chaffinch in feeding the cuckoo, which was getting more shipshape, but one morning, to my great surprise, my cage was forcibly opened, and to my great grief, my cuckoo was stolen. This was the only young cuckoo that I ever had the pleasure of seeing. *J. Miller, Wadsley Manor.*

Foreign Correspondence.

The following passages are extracted from the Report of the Royal Botanic Garden at Mauritius for 1869:—The visitors to the gardens during the year numbered 46,133, the largest number yet recorded for one year, against 29,708 for the previous year, being an increase of 16,325. The largest number in a month (6431) was in November; the smallest in a month (1875) in March. The largest number in a week (2754) for the week ending November 7, and the smallest for the week ending March 28. The largest number in one day (1329) on November 2, and the smallest (4) on March 12. The number of plants supplied for planting on Government land was 11,415, and that sold was 1,279. The number of plants and packets of seeds sent abroad amounted to 723; and those received to 1330. Among the latter there are several worthy of note for their utility, viz.:—Æschynomene aspera, received from the Conservator of Forests, Madras, through the kindness of H.E. Sir H. Barkly; the plant from which are made the "topees" or pith hats of India. Terminalia tomentosa, a very large tree, sometimes attaining the height of from 70 to 80 feet to the first branch; its timber is valuable for several useful purposes, and its bark for tanning. Melia Azadirachta, a valuable tree for its timber, of easy cultivation, growing in almost any soil. Its bark is used as a substitute for quinine. The leaves when beaten into a pulp are applied externally with healing efficacy to bruises, ulcerous sores, sprains, &c., and when dry they are used to keep boring worms from books. Its fruit yields an acrid oil of some value, which is used by the natives of India as a remedy for leprosy; Mammea americana, said to be an excellent fruit. Musa textilis, the Banana which yields the well-known "Manilla Hemp." Erythroxylon Coca, a plant, the leaves of which are chewed by miners and others in Peru, to stimulate the nervous system,—a practice, the immoderate indulgence in which is said to be as injurious as that of eating opium. Anona Cherimolia, an excellent fruit re-introduced, the plant that was previously in the Gardens having been destroyed by the hurricane of March, 1868.

The plants noticed in the last report are doing well, especially the Durian and Mahogany trees. The former is now 9 feet in height, and some of the latter are about 12 feet. Dr. Hooker lately forwarded a further supply of the seeds of the Mahogany tree, which will be valuable, as the climate and soil of Mauritius seem to suit it.

The rainfall at the Gardens during the year was 65 inches, against 81 inches for 1868, and 56 inches for 1867.

Notwithstanding a decrease of 16 inches in the rainfall of 1869, as compared with the preceding year, the season was nevertheless a favourable one for the colony, the rains having fallen in the months they were most wanted. And while the protracted drought which prevailed during the closing months of the year was injurious to the young canes, it was highly favourable at the moment for sugar making.

About the beginning of this year a few of the most useful fibres, from plants that are common in Mauritius, were kindly forwarded by Messrs. Blyth, Brothers & Co., and Messrs. Currie, Fraser & Co., to their respective houses in London. These fibres were submitted to competent authorities for valuation. Reports on each kind were obligingly obtained. Some of the plants that produce these fibres require to be cultivated, but most of them are abundant, and grow everywhere in Mauritius, apparently without any care. The cultivation of these plants in the drier parts of the island, where there are thousands of acres at present lying waste, might not only be remunerative to the proprietor but also, in some degree, beneficial to the colony. The want of a proper machine for the extraction of the fibre is not likely to be long a desideratum, a reward of £5000 having been offered by the Indian Government for the machine found to be best suited for that purpose. A similar remark may also be made regarding the large quantities of waste forest lands in the higher parts of the island, where, either from too much cold or too much rain, the cultivation of the sugar cane is unprofitable. That land, however, is well adapted for the cultivation of coffee; and the greater part of it is capable of yielding an average of about 900 lb. the acre, per annum. The necessary buildings and machinery for pulping required on a coffee estate, of about 300 to 400 acres, can be put up at a cost of from 50 to 60 per cent. less than the machinery required on a sugar estate of the same size.

The expenses of the propagation, &c., of the new varieties of Sugar-cane in Mauritius, up to the end of July, amount to £449 4s. 6d.; and the receipts to date are £929 4s. In clear mornings preceded by clear nights in the cool season, the leaves of the canes are loaded with dew in bright globular drops, covering the leaves and hanging from the points and margins. From the rapid condensation of moisture, and the radiation of heat, during such nights, the leaves become tender, and if one touches them in the early morning, while the drops of dew are still on them, they feel nearly as cold as icicles. In the bright mornings which generally succeed these calm, clear, and cold nights, the first rays of the sun strike the dew drops, converting them into lenses which burn the leaves of some varieties in spots, and causing always the greatest injury to the tenderest kinds.

The 920 plants of Cinchona succirubra mentioned in the report (dated March 1) for 1868, were planted as stock plants from which to propagate. These have since been increased to a total of 2491.

With the propagating and hardening pits the present rate of increase will be nearly doubled; and instead of cuttings requiring from seven weeks to two months to root as they have done hitherto, they will be rooted and transferred from the propagating to the hardening pits in four or five weeks. Mr. Mackintosh reports favourably on the plants of Cinchona succirubra planted on Cluny estate in 1868, but some of those purchased this year, and planted on the same estate have died. Several plants of this species undisturbed at the nurseries have attained a height of from 4 to 6 feet since they were planted, in October, 1868. They are healthy and hardy plants. Further experience with Cinchona officinalis has proved it to be a worthless species for Mauritius; and it is to be feared that the Cinchona succirubra is the only quinine-yielding Cinchona that will succeed here. Several plants of Cinchona Calisaya, that were raised from seeds, have been planted in the open ground. Hitherto they have done well, but evidently they will not bear much cutting; and what may be termed the parent plants have been severely injured by being too often drawn upon for cuttings and layers.

An experiment on a small scale has been tried with the China Grass, which so far proves that the plant is hardy and will grow freely at Curepipe. It is also doing well on Cluny estate.

Societies.

Royal Horticultural Society: *Nov. 2.*—Sigismund Rücker, Esq., F.L.S., in the chair. The announcement of the awards of the Fruit and Floral Committees being completed, Major Trevor Clarke, in the absence of the Rev. M. J. Berkeley, said that though some fine Orchids were exhibited, there was a great dearth of species having any scientific interest. He exhibited specimens of the pretty purple Crocus longiflorus, a variety of autumn Crocus, not seen very often; then directed attention to the beauties of the Fairy Apple, a variety raised from seed of the scarlet-fruited Siberian Crab, probably fertilised by the pollen from some such variety as the Golden Pippin; and concluded by remarking that the rate of improvement attained by crossing a wild with a cultivated species, was most noticeable, and worthy the attention of all fond of hybridising.

Mr. Marshall, in reference to the specimens of winter flowering Carnations exhibited, said that to those who cherished a display of flowers during the winter months, these plants were invaluable, and that he could highly recommend them for that purpose.

Scientific Committee.—A. Murray, Esq., in the chair. But little business was transacted at this the first meeting of the committee since the recess. The Rev. M. J. Berkeley exhibited some Grapes the ovaries of which had not been impregnated, and wherein, as if by compensation, the receptacle of the flower had become succulent and fleshy, as in Anacardium. The specimens were interesting, as showing the manner in which the ovary becomes in certain cases "inferior."—Mr. Laxton showed some miniature Walnuts, gathered from a tree which usually produces fruit of the ordinary size. Some of these Walnuts had three, others four, carpels, but all were very diminutive.—Mr. Murray laid on the table specimens of the Barley-fly, Chlorops lineata, which had attacked the ears of the Barley, much as an allied species attacks the internodes of the Wheat, giving rise to what is called gouty Wheat.—A conversation then took place as to the re-appearance of sports, the question raised being, whether the same "sport" reappears in plants of the same variety. The general opinion was, that this does take place, instances being cited of the reappearance of the same sport in various Pelargoniums, especially in the variety known under the name of Stella.—It was asked whether Mrs. Pollock, which was stated to have originated from a sport, had ever been reproduced. We believe that sports of this kind do reappear, but as to Mrs. Pollock we believe that to have been a seedling, whose parentage has been given in our columns by Mr. Grieve.—Mr. Horne presented to the library a communication on Economic Entomology.—Mr. Rothschild's magnificent publication, "Les Promenades de Paris," was laid on the table for the inspection of the members.

Floral Committee.—W. B. Booth, Esq., in the chair.—A bright and cheerful little show, the Council room being well filled for the most part with Chrysanthemums, Orchids, Cyclamens, &c. Of Orchids, Lord Londesborough again sent an exceedingly fine group, which called forth much warm praise. In it were a specimen of the rich lilac-flowered Vanda cœrulea, with four good spikes; Oncidium macranthum, a plant with one spike, on which were six of its lovely flowers; O. crispum, with three spikes of its large rich copper-coloured flowers; and the bright yellow-flowered O. Rogersii; the extremely pretty Pleione Wallichii, and P. lagenaria; a two-spiked specimen of Zygopetalum crinitum; the ever attracting Odontoglossum Alexandræ; a splendid specimen of Cattleya Harrisonii, with eight spikes of rosy coloured flowers; C. maxima, a magnificent species, with five richly-coloured flowers; and the charming Phalænopsis Lowii, with one spike, on which were seven of its beautiful rose and mauve coloured flowers. Special Certificates were awarded to the two latter plants, to the Vanda, and also to the collection. Messrs. Veitch had a special award for a grand specimen of Zygopetalum maxillare; and First-class Certificates for Dracæna porphyrophylla, a vigorous-growing species, with long broad leaves of a deep bronzy colour; and Cattleya Dominiana lutea, a yellowish-lipped flower with faint purplish markings. With the above came a very fine example of Cattleya labiata, C. marginata, Angræcum bilobum, and the beautiful scarlet-flowered Aphelandra aurantiaca Roezlii, &c. Mr. Bull had a large collection of Orchids, Palms, &c., including Oncidiums, Vandas, Odontoglossums, Pleiones, Burlingtonias, &c.; also a specimen of Zalacca Wagneri, an East Indian spiny species, with irregularly pinnate leaves; Curculigo recurvata striata, a fine form, with a band of white along the midrib; and Licuala horrida, a species with fan-shaped leaves divided into five or more segments; and armed with strong spines at the edges of the petioles; to each of which First-class Certificates were awarded. From Mr. E. Culley, gr. to E. Salt, Esq., Fernichurst, came a fine specimen of an unspotted Odontoglossum Alexandræ; from Mr. Parker, of Tooting, flowering examples of Ixora amabilis; from Major Trevor Clarke, Begonia Craigii, a species with dark bronzy-purple leaves; from Messrs. Backhouse & Son, York, Begonia geranioides, a dwarf free-flowering species, with small green densely hirsute leaves and white flowers; from Messrs. Cutbush & Son, examples of Aucuba japonica fœmina var. aurea maculata, a compact-growing, boldly variegated variety, quite an acquisition, which received a First-class Certificate; from Messrs. E. G. Henderson & Son, a collection of winter-flowering Carnations, one of which, named Vulcan, orange-scarlet, was selected for a First-class award; and Mohria thurifraga

var. achilleæfolia, a beautiful greenhouse Fern, to which a similar award was voted. Special Certificates were awarded to Mr. Clarke, market gardener, Twickenham, Mr. C. Edmonds, Hayes, and Mr. Bull, gr. to J. Montgomery, Esq., Pole Hill, Hillingdon, for excellent collections of Cyclamens. Of Chrysanthemums, considering the earliness of the show for this flower, there was a very fair display. We sadly want a change in the method of training these plants for exhibition; true, the present plan of torturing the branches into all conceivable shapes, for the sake of getting extremely formal heads of bloom, answers very well for saving trouble and skill, but the upright-growing plants, as shown by Mr. James, have a far more pleasing and more natural appearance. This style should be encouraged as much as possible, when the schedules are drawn up, and not be left an open question, as is usually the case, and indeed was the case here, as the 1st and 3d prizes were awarded to plants tied to excess, Mr. James's naturally-grown specimens being placed 2d. In the 1st prize group of 6 large-flowered kinds, which was furnished by Mr. Rowe, gr. to Mrs. Lewis, The Rookery, Roehampton, the varieties shown were Lady Talfourd, Mrs. G. Rundle, Dr. Sharpe, Marshal Duroc, Prince of Wales, and Lady Hardinge. Mr. James had excellent specimens of Prince Alfred, Mrs. Haliburton, and Golden Queen of England, &c.; Mr. Forsyth, Brunswick Nursery, Stoke Newington, being placed 3d, his plants being scarcely fully enough in bloom. The best 6 Pompon varieties also came from Mr. Rowe, and consisted of golden and white Cedo Nulli, Queen of Anemones, Calliope, and Antonius; Mr. James again being placed 2d. Mr. Rowe came 1st and Mr. Forsyth 2d for 24 cut blooms, and in the class for 12 Mr. Rowe was 1st, Mr. Berry, Roehampton, coming in 2d, and Mr. James 3d. Amongst the blooms shown were excellent representatives of Empress of India, White Globe, Novelty, Queen of England, Jardin des Plantes, Lady Slade, Prince Alfred, and Mrs. G. Rundle. Prizes were also offered for 9 decorative berried plants in pots, but only one collection was shown, and that of a very poor description. Mr. Eckford, gr. to Earl Radnor, Coleshill, had a Second-class Certificate for a large scarlet-flowered Pelargonium, named King of Trumps; and Mr. Morris, Deptford, a special award for a group of Tricolor Pelargoniums, cuttings from seedlings raised in 1869. To Mr. Bull First-class Certificates were awarded for a remarkably showy Japanese Chrysanthemum, named Jane Salter, with flowers of a white and pinkish colour, measuring 7 inches across, a grand acquisition for the conservatory; and for Renown, a large brownish orange and well incurved flower. Messrs. E. G. Henderson also exhibited two Japanese varieties—Bismarck, uniform tawny-orange, with broad florets; and Erecta superba, rosy crimson, with stout spear-shaped florets, both of which gained First-class awards. Mr. Bull and Messrs. E. G. Henderson exhibited specimens of their respective plant cases, but as these have already been described in our columns, we need only say that much interest was manifested in their respective merits.

Fruit Committee.—G. F. Wilson, Esq., F.R.S., in the chair. This was another very satisfactory meeting, large numbers of Apples and Pears being shown. Messrs. J. & C. Lee offered a prize of £5 for the best three bunches of Madresfield Court Black Muscat Grape, but imperfect justice was done to the offer, for only two competitors appeared, and one of these was sadly below the mark, the prize being awarded by the committee to Mr. Stevens, gr. to His Grace the Duke of Sutherland, Trentham. Prizes were also offered by the Society for the best 6 dishes of dessert Pears, and for the best collection of Potatos. In the former class there was a very strong competition, some very excellent fruit being shown. The 1st prize was taken by Mr. Stephenson, gr. to F. C. Barker, Esq., Leigh Hall, Essex, with Duchesse d'Angoulême, Gloa Morceau, Beurré Colmar, Marie Louise, Grand Soleil, and Beurré Diel; Mr. Miles, gr. to Lord Carrington, Wycombe Abbey, being 2d with Huyshe's Victoria, Van Mons Léon le Clere, Beurré Bosc, Althorpe Crassane, Beurré Diel, and Marie Louise; and Mr. S. Ford, gr. to H. E. Hubbard, Esq., Leonards Lee, Horsham, 3d. Capital collections were also shown by Mr. Garland, gr. to Sir. T. Dyke-Acland, Bart., Killerton; Mr. Curtis, gr. to J. Ridgway, Esq., Fairlawn Park, Tonbridge; Mr. Gilbert, gr., Burghley; Mr. Gardiner, gr., Eatington Park; Mr. Tillery, gr., Welbeck; Mr. Parsons, gr., Danesbury; Mr. Frisby, gr., Blankney Hall, Sleaford, &c. Messrs. Veitch & Co. exhibited fine specimens of their Giant Autumn Cauliflower, which was shown on April 26 at the same time as Waweren and other varieties, and the same treatment since, and is just coming into use when the others are over. It is undoubtedly a good late autumn Cauliflower, but it is too large. What is most wanted is a medium sized variety, that covers in well. A good late kind of this character would be a real acquisition to gardeners. A First-class Certificate was awarded to it. Mr. Wells, South End, Essex, had a Special Certificate for a fine collection of Black Alicante Grapes, grown in his patent ground vineries without artificial heat. From Messrs. J. & C. Lee came a dish of the white fruited Vineyard Autumn Surprise Raspberry; from Mr. Challis, Wilton House Gardens, Salisbury, a seedling Pine, not considered of any great merit; from Mr. Lamb, gr. to G. F. Davey, Esq., Colston Basset, Bingham, a seedling green-flesh Melon, of good appearance, but it was too late in the season to be judged correctly; from Mr. Turner, Slough, two excellent dishes of Cox's Orange Pippin Apple; from Mr. Gilbert, a seedling Cucumber, black-spined, the result of a cross between Telegraph and Wonderful, and named Knight of St. Patrick; from Mr. C. B. Saunders, St. Saviour's, Jersey, a large collection of Jersey grown Apples and Pears, of a large size; from Mr. Gunn, gr. to J. W. Larkin, Esq., The Furze, Lee, Kent, some very large Tomatos in fact, too large and very coarse; from Messrs. Carter & Co., a collection of one dozen kinds of Celery, and large specimens of a Red-skinned Flourball Potato. Mr. Jennings, Shipston-on-Stour, sent specimens of his pretty little Fairy Apple, recently figured in the "Florist and Pomologist," but as yet too acid for use; and from Mr. Small, Colesbrook, came a seedling Apple named Queen Victoria, which, however, was recognised as Golden Noble. Special Certificates were awarded to P. N. Laurie, Esq., Paschall Park, Hayward's Heath, and to Mr. M'Kenzie, Alexandra Palace, for fine collections of Apples grown on cordons; and to Mr. Gardiner, gr., Eatington Park, for a collection of culinary and dessert kinds. Mr. A. Dean, Old Shirley, Southampton, sent, under the name of Beauty of Hants, a remarkably fine Apple, which was thought to bear too near a resemblance to Blenheim Orange to be recognised as distinct. The 1st prize for a collection of Potatos was awarded to Mr. Frisby, gr., Blankney Hall, Sleaford, the 2d being taken by Mr. S. Ford, with a collection of 55 varieties, certainly of finer quality than the large, coarse tubers shown in the 1st prize lot. The Chairman sent a beautiful dish of Beurré d'Anjou Pears; and from Mr. W. Ellis, gr. to R. Lewis, Esq., Greenford Hall, Middlesex, three bunches of Black Prince Grapes, the produce of Vines which had been cut back and lifted, in consequence of having been infested with mildew, two rods of which produced 60 bunches.

Notices of Books.

Handbook of British Fungi; *with full Description of all the Species, and Illustrations of the Genera.* By M. C. Cooke, M.A. First Part. Printed and published for the Author, 1870. Small 8vo, pp. 376.

The part before us of this very useful work carries the subject as far as the Fustballs, and those subterraneous Fungi which are most nearly related to them. The remaining part is in a considerable state of forwardness, and the whole will then give such a collective view of British Mycology as is not to be found in any other publication. Mr. Berkeley's "Outlines of British Mycology" give only the character of the larger Fungi, the names of the smaller and microscopic species being merely enumerated. The mycological student will, therefore, gladly hail the appearance of this work, not only for the reason just stated, but also because many species have been added to the British list since the publication of Mr. Berkeley's volume. Mr. Cooke has followed very closely Mr. Worthington Smith's arrangement of the Agaricini. We have already given our criticism of that arrangement, and further notes have just been published in this Journal from the pen of Professor Fries, so that we are not inclined to go again over the same ground, and the more especially because we would not seem to depreciate what has been so carefully and conscientiously done, though we do not agree in every point with Mr. Smith. Neither can we speak favourably of the separation of such species as Agaricus personatus and Agaricus nudus as a distinct genus (not subgenus) from Agaricus, however much it may be sanctioned by Fries. It is very desirable that the heavy outlay which the publication of the volume before us has involved should be met by an ample number of subscribers. The author has wisely for the present kept the book entirely in his own hands, and application should be made to him by letter* by those who wish to have this and the subsequent part. Mr. Cooke has reserved everything in the shape of preface and explanation of his views for the succeeding part, and it is very possible that when the whole is before us, we may feel inclined to advert to it again. Meanwhile we recommend the work to the notice of our readers, earnestly and conscientiously.

Obituary.

WE greatly regret to have to record the death of Dr. THOMAS ANDERSON, F.L.S., Superintendent of the Royal Botanic Gardens, Calcutta, and an occasional contributor to our columns. The following obituary notice is extracted from the "Journal of Botany:"—

"He was a devoted student of Natural History at Edinburgh, and selected the East India Company's service as likely to afford him opportunities for the prosecution of those studies, as it had done to many others. On the occasion of Dr. Thomson's leaving Calcutta, Dr. Anderson was appointed to the temporary charge of the Gardens, and afterwards succeeded Dr. Thomson when he retired from his office. Nearly two years ago he was compelled to return to England on account of dangerous illness, though his friends feared lest his strength should prove insufficient to bear the journey. His reached his native land in a very weak state, but soon recovered sufficiently to enable him to prosecute his botanical work. He began in earnest at the 'Flora of India,' and there was good reason to hope that this greatly desiderated 'Flora' would ere long have been published. About three months ago, however, he suffered a relapse, which compelled him to interrupt his labours, and to seek in quiet and rest the restoration of his health. He never rallied, and on October 26 died at Edinburgh. He laboured successfully in establishing the Cinchona plantations in the North of India, and published several interesting reports on the subject, abstracts of which have been printed at different times in this Journal. Our pages also contain an interesting account of the terrible cyclone which, in 1865, brought desolation to the Gardens under his care. Besides these official communications, Dr. Anderson has published the following papers on systematic botany:—'Florula Adenensis;' supplement to vol. v. 'Linn. Soc. Journ.' (1860). 'On Sphærocoma, a new genus of Caryophylleæ,' 'Linn. Soc. Journ.' vol. v. p. 15 (1861). 'An Enumeration of the Species of Acanthaceæ from the Continent of Africa,' 'Linn. Soc. Journ.' vol. vii. p. 13 (1864). 'On a Presumed Case of Parthenogenesis in a Species of Aberia,' *l. c.* p. 67. 'On the Identification of the Acanthaceæ of the Linnean Herbarium,' *l. c.* p. 111. 'An Enumeration of the Species of Ceylon Acanthaceæ,' in 'Thwaites' Enum. Plant. Zeyl.' p. 223 (1864). 'Aphelandra ornata from Brazil,' Seemann's 'Journ. Bot.' vol. ii. p. 289 (1864). 'On Two Species of Guttiferæ,' 'Linn. Soc. Journ.' vol. ix. p. 261 (1867). 'An Enumeration of the Indian Species of Acanthaceæ,' *l. c.* p. 425."

* Mr. Cooke's address is 2, Grosvenor Villas, Junction Road, N.

—— We regret to hear of the death, on August 4 last, of M. RUPRECHT, of St. Petersburg. The deceased botanist was born, in 1814, at Prague, where also he studied medicine. He was appointed conservator of the Botanical Museum of the Imperial Academy of Sciences in St. Petersburg in 1839, and in the interests of the Academy he undertook several journeys, notably in the Caucasian provinces, where he made large collections. For a short period he was assistant director of the Imperial Botanic Garden at St. Petersburg. Ruprecht did good service to science also in his publications on the Bamboos, on the floras of Samoiede, of the Ural, of Kamschatka, and of various portions of the Russian dominions. Of late years, also, he had turned his attention to agricultural subjects.

Miscellaneous.

THE ALARM BELL OF ATRI.

AT Atri, in Abruzzo, a small town
Of ancient Roman date, but scant renown,
One of those little places that have run
Half up the hill, beneath a blazing sun,
And then sat down to rest, as if to say,
"I climb no further upward, come what may,"
The Re Giovanni, now unknown to fame,
So many monarchs since have borne the name,
Had a great bell hung in the market place
Beneath a roof, projecting some small space,
By way of shelter from the sun and rain.
Then rode he through the streets with all his train,
And, with the blast of trumpets loud and long,
Made proclamation, that whenever wrong
Was done to any man, he should but ring
The great bell in the square, and he, the king,
Would cause the Syndic to decide thereon.
Such was the proclamation of King John.

How happily the days in Atri sped,
What wrongs were righted, need not here be said,
Suffice it that, as all things must decay,
The hempen rope at length was worn away.
Unravelled at the end, and strand by strand,
Loosened and wasted in the ringer's hand.
Till one, who noted this in passing by,
Mended the rope with braids of Briony,
So that the leaves and tendrils of the vine
Hung like a votive garland at a shrine.

By chance it happened that in Atri dwelt
A knight, with spur on heel and sword in belt,
Who loved to hunt the wild boar in the woods,
Who loved his falcons with their crimson hoods,
Who loved his hounds and horses, and all sports
And prodigalities of camps and courts;
Loved, or had loved them; for, at last grown old,
His only passion was the love of gold.

He sold his horses, sold his hawks and hounds,
Rented his vineyards and his garden grounds,
Kept but one steed, his favourite steed of all,
To starve and shiver in a naked stall,
And, day by day, sat brooding in his chair,
Devising plans how best to hoard and spare.

At length he said: "What is the use or need
To keep at my own cost this lazy steed,
Eating his head off in my stables here,
When rents are low and provender is dear?
Let him go feed upon the public ways;
I want him only for the holidays."
So the old steed was turned into the heat,
Of the long, lonely, silent, shadowless street;
And wandered in suburban lanes forlorn,
Barked at by dogs, and torn by Brier and Thorn.

One afternoon, as in that sultry clime
It is the custom in the summer-time,
With bolted doors, and window-shutters closed,
The inhabitants of Atri slept or dosed;
When suddenly upon their senses fell
The loud alarm of the accusing bell!
The Syndic started from his sweet repose,
Turned on his couch, and listened, and then rose
And donned his robes, and with reluctant pace,
Went panting forth into the market-place,
Where the great bell upon its cross-beam swung,
Reiterating with persistent tongue,
In half-articulate jargon, the old song:
"Some one hath done a wrong, hath done a wrong!"

But ere he reached the belfrey's light arcade,
He saw, or thought he saw, beneath its shade,
No shape of human form, of woman born,
But a poor steed dejected and forlorn,
Who with uplifted head and eager eye
Was tugging at the vines of Briony.
"Demeneddio!" cried the Syndic straight,
"This is the Knight of Atri's steed of state!
He calls for justice, being sore distressed,
And pleads his cause as loudly as the best."

Meanwhile from street and lane a noisy crowd
Had rolled together, like a summer cloud,

And told the story of the wretched beast
In five-and-twenty different ways at least,
With much gesticulation and appeal
To heathen gods, in their excessive zeal.
The Knight was called and questioned; in reply
Did not confess the fact, did not deny;
Treated the matter as a pleasant jest,
And set at naught the Syndic and the rest,
Maintaining, in an angry undertone,
That he should do what pleased him with his own.

And thereupon the Syndic gravely read
The proclamation of the King; then said:
"Pride goeth forth on horseback grand and gay,
But cometh back on foot, and begs its way;
Fame is the perfume of heroic deeds,
Of flowers of chivalry and not of weeds!
These are familiar proverbs; but I fear
They never yet have reached your knightly ear.
What fair renown, what honour, what repute
Can come to you from starving this poor brute?
He who serves well and speaks not merits more
Than they who clamour loudest at the door.
Therefore the law decrees, that as this steed
Served you in youth, henceforth you shall take heed
To comfort his old age, and to provide
Shelter in stall, and food and field beside."

The Knight withdrew abashed; the people all
Led home the steed in triumph to his stall.

The King heard and approved, and laughed in glee,
And cried aloud, "Right well it pleaseth me!
Church bells at best but ring us to the door,
But go not in to mass; my bell doth more;
It cometh into court and pleads the cause
Of creatures dumb and unknown to the laws;
And this shall make, in every Christian clime,
The Bell of Atri famous for all time."

—*H. W. Longfellow, in the "Atlantic."*

Note.—The poet does not tell us whether it was the white, or the black Briony. Bryonia dioica has long held a high position in the estimation of children, prize-fighters, and others liable to bruises, from the circumstance that a slice from its fleshy root, laid upon the part that has been struck, prevents its turning black. I therefore claim for Tamus communis the honour of having been the means of justice being done. *W. T.* [Was it a Briony at all? Perhaps a Convolvulus, or a *Bell flower*. EDS.]

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Cineraria, *Poinsettias*, and any large bulbs of *Amaryllids*, which are not showing a favourable disposition to bloom, should, in company with such subjects as *Gardenias*, be pushed along freely in a good brisk moist temperature, if they are wanted in flower at an early date, and the means for so treating them are available. Look carefully over all kinds of *Heaths* which form very dense foliage, so as to detect any symptoms of mildew, which, when found, should as early as possible be dusted over with flowers of sulphur. The minute leaves which have decayed amongst the lower parts of the branches should be removed, and the plants as well as the pots should be kept scrupulously clean. Finish pruning the *Roses* intended for early forcing, and keep the soil about their roots moderately dry for a time. Do not omit to gradually reduce the temperature as well as the moisture in *Orchid-houses* to the lowest admissible point; and in regard to the cooler section of Orchidaceous plants, let the air freely into those structures containing them, in a careful and judicious manner. Keep a dry atmosphere around all kinds of bedding stuff, and admit air freely and as constantly as possible.

FORCING HOUSES.

Push forward the usual and necessary preparations for the early forcing of *Vines*, *Peaches*, *Nectarines*, &c. This consists in dressing such plants as have not yet been gone over, and other routine matters of the kind. By withholding water altogether from *Pot Vines*, induce the wood to ripen readily. Lay the pots on their sides and secure the canes to a fully exposed wall, so that the limited amount of sun which we may yet be favoured with may exert its beneficial influence to attain that end. Immediately the foliage upon stools of *Seakale* and *Rhubarb* is ripened sufficiently for forcing, let some roots of the latter be taken up and placed into good strong heat in a Mushroom-house, or similar structure, where no light and but very little air is admitted.

HARDY FLOWER GARDEN.

The weather being still favourable for the prosecution of alterations, these should now be pushed forward with all reasonable despatch. Those who make it a rule to procure their own *Briars* for budding, should now get in the stock required. It is, however, almost as cheap to procure the Rose trees ready worked; besides, in so doing there is a chance of procuring newer and better varieties than the collection may contain. Push forward the planting of *Hyacinths*, *Narcissus*, *Tulips*, and other similar *bulbs* in the open borders during fine intervals. Especially is this necessary in regard to such as I have named, as it will give them more time to establish themselves in the ground than when placed in later during the colder winter months. Where a sufficiency of fermenting materials is not at hand for the formation of a good bottom-heat, it will be well to proceed with the collection of material, placing it in a large heap in any convenient place until required for use. Watch *Auriculas* to see that no form of decayed foliage, or drip, which are injurious to them, exists. Be very careful, moreover, not to overwater them at the root during this season, nor to keep too humid an atmosphere around them. They require all the air possible in conjunction with protection from rains, therefore the lights should be removed wholly by day and during fine weather. Prune and nail wall *Climbers* during spare intervals, and so make all things neat, preparatory for the winter. Keep *Carnations*, *Picotees*, and *Pinks* which have been potted up and placed in frames, sufficiently moist to insure as much root formation as possible; but do not, as I have before suggested, let water settle amongst the younger leaves in the heart of the plants.

HARDY FRUIT GARDEN.

All kind of *Currants* and *Gooseberries* may now be planted, whether for the purpose of making fresh plantations, or for filling up any vacancies which have occurred. Prune all the larger kinds of hardy fruits, such as *Pears*, *Apples*, and *Plums*, as opportunity offers; bearing the fact in mind that all the light and air possible should be admitted into every part alike, and that material aid in this wise is afforded by thinning out the growths of young specimens somewhat decidedly in the centre of the trees at their apex.

KITCHEN GARDEN.

Endive, *Lettuce*, and late *Cauliflowers* should still be taken up where they exist, to fill up the vacancies formed by use in any pits or frames. This is possible through the extreme mildness of this autumn season, which will afford to gardeners excellent aid in the production of a plentiful supply of such things, even up to midwinter. Earth-up all *Cabbages* when sufficiently large preparatory for an early frost, and as *Celery* grows so rapidly it will be necessary to place a little more earth, where the opportunity of procuring Bracken, Fern, or other suitable covering in readiness to cover it with when sharp frosts arrive does not exist. Make a sowing of *Radishes* upon a slight hotbed, where these are in demand, and keep up the regular sowings of small *Salading* at proper intervals. *W. E.*

TOWN GARDENING.

I SHOULD now recommend all intending cultivators of the *Chrysanthemum* to make their selection, as now is the best season, they being in full bloom, if they are required for border cultivation without being covered when in flower. Do not select from those in flower under glass, for there are many splendid flowers to be seen under glass which are of no use for growing out-of-doors without protection while in bloom. The suckers that come up from the root should be taken off and potted singly in a mixture of light loam and silver sand, and wintered in a cold frame, at the same time each plant should be correctly labelled, making the labels of white deal, painting with white lead and writing on the same while wet, when they will become indelible. Plants in frames will be much benefited by taking off all dead leaves, and by gently stirring the soil, taking off the frames in fine weather, and by covering them up in wet and frost. Clear the borders of all annuals, dead leaves, and rubbish, &c. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, NOVEMBER 2, 1870.

1870. MONTH AND DAY. October and Nov.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 50 Years	Wind. Direction.	Horizontal Movement.	Rain in Inches.
	Ins.	Deg	Deg	Deg.		Gr.	Deg	Deg	Deg	Deg	Deg		Miles	
27. Thurs.	29.17	47.3	41.1	41.0	80	3.0	55.5	41.1	14.4	47.5	+ 1.0	W. by S	705	0.00
28. Friday	29.00	47.0	45.8	44.5	92	3.4	52.2	41.8	7.4	47.7	+ 0.7	N.W.	135	0.29
29. Satur.	29.81	51.3	49.3	47.3	89	3.7	55.9	47.2	7.8	50.3	+ 3.5	N.W.	533	0.28
30. Sunday	29.75	53.7	51.1	50.1	89	4.0	55.1	47.1	11.7	48.5	+ 1.0	W.	370	0.00
31. Monday	29.38	55.1	55.1	55.1	100	4.9	56.4	44.8	11.6	49.8	+ 3.3	S.W.	325	0.47
1. Tues.	30.18	50.4	45.9	43.5	93	3.2	54.1	39.2	14.9	45.9	— 0.5	N.N.E.	290	0.00
2. Wednes	30.30	46.0	42.6	39.5	87	2.7	53.4	30.0	23.4	41.0	— 5.3	N.N.E. E.	90	0.00

Oct. 27.—Light clouds were prevalent till night; then cloudless. A shower of rain fell about 7 30 P.M.
— 28.—Overcast till the evening; then cloudless. Foggy.
— 29.—Overcast throughout. Rain fell almost continuously from 11 A.M till 9 P.M.
— 30.—Variable till night; then overcast. Slight fog.
— 31.—Cloudy till the evening; cloudless after 6 P.M. Rain fell between noon and 1 30 P.M.
Nov. 1.—Small amounts of cloud were prevalent during the day; cloudless at night. Very fine.
— 2.—Generally cloudless. Fog; hoar-frost.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, OCTOBER 29, 1870.

NAMES OF STATIONS.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg	Deg	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	60.2	31.2	29.0	50.9	38.3	12.7	45.2	1.29
Blackheath ..	58.8	41.1	17.7	54.1	41.8	10.3	48.2	1.16
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	55.2	41.5	13.7	54.1	44.6	9.8	49.0	0.66
Wolverhampton	55.8	42.5	13.3	53.3	43.6	9.7	47.6	0.63
Leicester ..	58.0	38.7	19.3	53.7	42.3	11.4	47.1	0.87
Norwich ..	55.5	39.2	16.3	52.4	42.6	9.8	47.6	0.70
Nottingham ..	58.1	38.1	20.0	54.0	42.3	12.3	47.5	0.43
Sheffield ..	57.0	41.5	15.5	51.4	41.6	9.8	46.5	0.90
Liverpool ..	58.0	34.0	24.0	54.4	45.3	9.1	49.8	1.43
Manchester ..	57.0	38.0	19.0	52.1	41.0	11.0	47.7	1.67
Salford	56.1	37.6	18.5	53.8	42.9	10.9	47.4	1.06
Bradford	56.1	41.2	14.9	53.4	41.5	11.9	47.0	1.52
Leeds	57.0	41.0	16.0	51.9	41.9	8.0	46.7	1.24
Hull	57.0	35.0	22.0	52.1	39.6	12.5	45.2	0.51
Newcastle ..	53.0	38.0	15.0	51.0	40.8	10.2	45.1	0.12
Edinburgh ..	54.7	40.0	14.7	..	..	..	46.6	0.30
Glasgow ..	62.4	34.1	28.3	..	..	..	46.2	1.40
Dundee ..	52.0	38.0	14.0	..	..	..	45.2	0.23
Aberdeen ..	52.0	33.0	18.1	..	..	..	44.0	0.60
Paisley	56.0	35.0	21.0	..	..	..	45.4	1.35
Greenock ..	52.0	41.0	11.0	..	..	..	46.0	2.11
Leith	57.0	40.2	16.8	..	..	..	46.7	0.45
Perth	56.0	34.0	22.0	..	..	..	45.6	0.59
Dublin	57.5	38.0	19.5	..	..	..	47.8	0.80

JAMES GLAISHER.

Notices to Correspondents.

*** Rev. W. F. Radclyffe desires us to state that he is put to much inconvenience from the circumstance that parcels are misdirected to him. The correct address for parcels is:—"Rev. W. Radclyffe, Okeford Fitzpaine, near Shillingstone. Carriage paid."

CAPE BULBS: *Subscriber*. They all require greenhouse culture. The larger ones, as Crinums, Cyrtanthus. Agapanthus, Nerine, should be potted in rich loamy soil. Ixias, Gladioli, Watsonia, &c., will do better in lighter soil; if somewhat peaty, all the better.

COLLOID: *Cornhill*. Jelly-like, from the Greek *Kolla*, glue; applied in contradistinction to crystalloid. Colloids are not readily miscible or diffusible, while crystalloids are eminently so. The word was first brought into use by the late Master of the Mint, Professor Graham.

DRYING FERNS: *Ponica*. There is no difficulty in the matter. Lay them flat between paper—bibulous paper is best, but even old newspapers will do; the greater the bulk of paper between the specimens the better—there should be at least several layers. Then press closely with a heavy weight. If you use lattice-work frames between every few layers, you need not change them till dry; if not, they should be changed two or three times into dry paper, at intervals of a day or two, according to the amount of dampness in them.

EUONYMUS WITH WHITE CAPSULES: *Correspondent*. We do not know the origin of this, but suppose it to have been a seedling variation. The variety in question is not very common.

FERNS: *W. M.* Gosden, Bryantii, Berk. Please, when you send again, wrap each specimen in a separate piece of thin paper. The Agaric was quite destroyed by the spores of the Geaster. Damp Moss is a very bad substance for packing Fungi. *M. J. B.*—*J. S.* The specimen has at last arrived. It is probably the mycelium of dry rot coloured with verdigris from the brass plate. Such forms of dry rot are not uncommon in vaults where there is wood. *M. J. B.*

HEATING CONSERVATORY: *W. H. J.* Trotman's apparatus is the best we know for warming a small conservatory. See our advertising columns.—*H. M. C.* See reply to above. You cannot have an open fire of any kind in a conservatory.

NAMES OF FRUITS: *E. M. T. Pears*: 1, Beurré d'Aremberg; 2, Passe Colmar; 3, Duchesse d'Angoulême; 4, Old Colmar; 5, Chaumontel; 9, Beurré d'Aremberg; 11, Glou Morceau; 12, Napoleon.—*J. G. Pears*: Knight's Monarch. *Apples*: 1, Flat Nonpareil; 3, Scarlet Nonpareil; 5, Winter Pearmain; 6, King of the Pippins; 8, Gellini; 9, Royal Somerset; the others we do not know.—*X. Y. Pears*: 1, quite rotten; 2, probably Beurré Diel; 3, Beurré Diel; 5, Beurré Bosc; 6, Chaumontel. *Apples*: 1, Dumelow's Seedling; 2, Margil; 4, Blenheim Orange; 5, Reinette de Laak; 6, Nonsuch.—*The Rev. B. W. Wright*. Your Pear, a very excellent one, is Grand Soleil.—*J. J. Pears*: 2, Josephine de Malines; 4, Grosse Marie; 3, 6, Althorp Crassane; 5, Easter Beurré. *Apples*: 1, probably Bess Pool; 4, Sops of Wine; 6, Downton Nonpareil.—*The Rev. E. Gauca*. E, Delaware, or Trumpington; X. X., King of the Pippins; X. X. X., Golden Reinette; the others are most likely local seedlings.—*H. C.* 1, King of the Pippins; 2, Broughton, or a scrubbily grown Newtown Pippin; 3, Margil.—*Abel Rairail*. Your seedling Apple, which is of very fine quality and appearance, we do not know.—*E. Morgan, Harrow-on-the-Hill*. Your Peach is the Salway.

NAMES OF PLANTS: *Adiantum*. 2, Adiantum hispidulum; 3, A. formosum; 4, imperfect; 5, Pteris hastata.—*F. L.* 1, Clitoria ternatea, Willd.; 2, Convolvulus pentanthus, Jacq.—*H. H. C.* Campanula rhomboidalis, L.—*Fred.* 1, Blechnum Spicant; 2, 5, 6, Lastrea dilatata; 3, Adiantum nigrum; 4, Athyrium Filix-fœmina.

PEARS FOR AN ORCHARD-HOUSE: *W. M.* We would recommend the following:—Williams' Bon Chrétien, Louise Bonne of Jersey, Fondante d'Autômne, Marie Louise, Baronne de Mello, Duchesse d'Angoulême, Flemish Beauty, Beurré Clairgeau, Doyenné du Comice,

Bergamotte d'Esperen, Winter Nelis, and Josephine de Malines.

PELARGONIUMS, &c. *S. J., Huddersfield.* Pelargoniums have irregular flowers in the wild state, though in the case of such as the Zonals, Tricolors, &c., the petals have been made regular by constant selection. Pelargoniums, also, have a spur or nectary adherent to the stalk of the flower. Geraniums, on the other hand, have no spur, but a regular flowers, destitute of spur, provided with five glands between the petals which are not found in Pelargoniums. The flowers of the Vine are produced from flower-buds placed, at first, on the ends of the shoots, but afterwards opposite to a leaf, owing to a change in the position of the inflorescence, which bends downwards. The tendril is really an abortive flower-stalk, on which flowers are not as a rule formed, though, as an exceptional thing, you may sometimes see them so placed.

PELARGONIUM: *J. C., Aberdeen.* There are much finer flowers to be sent out than your Lady Derby—which, however, appears to be one of good qualities, though it did not reach us in a very perfect state.

SCOTTISH ARBORICULTURAL SOCIETY: *A Subscriber.* Apply to Mr. Sadler, Botanic Gardens, Edinburgh.

VINE DISEASES: *J. W.* Your Vine leaves are infested with the insect which is doing such injury in France and in many establishments at home. You must burn every leaf, remove the soil, and wash the roots of your Vines, or not a tree will, in all probability, escape. *W. J. B.*

COMMUNICATIONS RECEIVED.—J. M.—J. N.—C. E.—A. M.—J. H—M. (next week).—R. D—D. T. F—R. L. B—J. S. E—C. R.—W. P. A—T. C. S—W. G.—T. C—Subscriber.—J. H.—Water Pot.—G. K.—H. F.—W. M.—J. L. D.—Prof. Koch.—T. H. G. (thanks for your suggestion).

DIED.—On October 28, at Nonsuch Park, Cheam, Surrey, ISABELLA C. CARSON, in the 53d year of her age.

Markets.

COVENT GARDEN.—Nov. 28.

We have nothing fresh to report; prices are nearly stationary, although the imports are somewhat reduced. Good English Grapes are in fair request, and prices have slightly improved. Amongst flowers we have Pelargoniums, Bouvardias, Orchids, Chrysanthemums, Mignonette, Heaths, and dwarf evergreens.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	2 0	Oranges, per 100	0 10	0 0
Grapes, per lb.	2 0	5 0	Pea-hos, per doz.	6 0	12 0
Lemons, per 100	9 0	14 0	Pears, per doz.	1 0	3 0
Melons, each	1 0	3 0	Pine-apples, per lb.	6 0	9 0

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusa-			Herbs, per bunch	0 2	0 4
lem, p. lb.	0 2	0 4	Horse-Radish, p. bun.	3 0	5 0
Beet, per doz.	2 0	3 0	Lettuces, p. score	1 6	3 0
Brus sprouts, ½ sieve	3 0	3 6	Mint, per bunch	0 3	0 6
Cabbages, p. doz.	1 0	1 6	Mushrooms, p. pott.	1 0	1 6
Carrots, p. bunch	0 4	0 8	Onions, per bunch	0 4	0 9
Cauliflowers, p. doz.	1 0	3 0	Parsley, p. pott or bunch	0 3	0 6
Celery, red, p. bun.	1 6	2 0	Salsafy, per bundle	1 3	1 6
— white, do.	1 0	1 6	Seakale, p. pun	4 0	4 6
Cucumbers, each	0 6	1 0	Shallots, per lb.	0 8	—
Do., retail, p. lb.	0 4	0 6	Spinach, p. bushel	2 0	3 0
Garlic, per lb.	0 3	0 6	Tomatoes, per lb.	0 6	1 0

Potatoes, Regents, per ton, 70s to 80s; Kidneys, 50s to 120s.
Rocks, 50s to 65s.

Roses.

ONE HUNDRED THOUSAND STANDARD ROSES

200,000 LOWARE HYBRID PERPETUAL ROSES

50,000 TEA-SCENTED ROSES

A magnificent stock to select from. CATALOGUES on application
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Mr. Laxton's New Roses.

H.R.H. PRINCESS LOUISE and PRINCE of WALES

PAUL AND SON have the pleasure to announce that the above have passed into their hands, and they hope to have them ready for distribution in a few of months, summer

Prince of Wales received a Prize Certificate at Birmingham; Princess Louise First-class Certificate at Crystal Palace Show.

Old Nurseries, Cheshunt, N.

New Roses, Gladioli, &c.

EUGENE VERDIER Fils Aîné, HORTICULTEUR, 21, Rue Dunois, Gare d'Ivry, Paris, begs to state that his CATALOGUE for the autumn is now ready, and can be had on application to his Agents, C. T. BLACKITH AND CO., Cox's Quay, Lower Thames Street, London, S.E.

N.B.—Orders will be received unconditionally, to be executed and forwarded as soon as the state of affairs in France will permit.

To the Trade.

LEWIS WOODTHORPE offers a superior lot of STANDARD and DWARF ROSES, by the thousand or thousand. Standard Marechal Niel, and Climbing Yellows, very strong. Also a stock of all FRUIT TREES, &c. CATALOGUES and prices which are low, free upon application

L. WOODTHORPE, Manor Nursery, Stisle Hedingham, Essex

Standard and Dwarf Roses.

LEWIS WOODTHORPE begs respectfully to call the particular attention of those about to plant to his immense stock of ROSES, which, from their great superiority, both in quality and vigour, cannot fail to give every satisfaction.

STANDARDS, very superior, selected, 15s. per dozen; £5 per 100.
HALF-STANDARDS are very superior, 12s. per doz.; £4 per 100.
DWARFS, on Manetti, strong, 9s. per dozen; £2 10s. per 100.
Extra quality, 12s. per dozen; £3 per 100.

Descriptive CATALOGUE of New and Choice Plants, Roses, Fruit Trees, &c., free upon application.

Special prices for large quantities and to the Trade

Manor Nursery, Stisle Hedingham, Essex

Planting Season.—Knowfield Nurseries, Carlisle.

MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN AND SEEDSMEN, Carlisle, beg leave to request the attention of the Nobility and Gentry to their EXTENSIVE STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c.; and Gentlemen intending to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

L. & B. are prepared to undertake the Laying out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties.

Fruit Trees, Roses, &c.

B. S. WILLIAMS can supply all the best kinds, true to name and in good condition; fine Fruit-bearing Trees, on French Paradise Stock, trained as Cordons. FOREST and ORNAMENTAL TREES of every description. Priced LIST on application
Victoria and Paradise Nurseries, Upper Holloway, London, N.

Fruit Trees, Roses, &c.

WILLIAM KING can supply extra fine 3-yr. old PYRAMID APPLES, PEARS, CHERRIES and PLUMS, at 8s. per dozen, 50s. per 100. Standard ROSES, 12s. per dozen, Dwarf do., 6s. per dozen. All the best sorts. New CATALOGUES free on application.
High Street Nurseries, Slough.

ORCHARD-HOUSE TREES.—Bearing Trees, in pots, of PEACHES, NECTARINES, APRICOTS, APPLES, PEARS, PLUMS, CHERRIES, FIGS, MULBERRIES, ALMONDS, VINES, and DWARF ORANGES. A Priced CATALOGUE of the above sent free on application.
THOS. RIVERS AND SON, Nurseries, Sawbridgeworth

Fruit Trees.

MAGNIFICENT Dwarf-trained PEACHES, NECTARINES, APRICOTS, PEARS, PLUMS, APPLES, and CHERRIES. Standard-trained PLUMS, Fruiting Trees.
Dwarf-trained FRUITING TREES of APPLES, PEARS, & PLUMS.
Pyramidal APPLES, PEARS, and CHERRIES.

WM. WOOD AND SON'S Nurseries have long been celebrated for the growth and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application.
Woodlands Nursery, Maresfield, near Uckfield, Sussex

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send for his CATALOGUE of the FRUIT COLLECTIONS of the principal Fruit Districts of England, in which is given the name, the quality, the country where raised, the year they first fruited in the, their bearing quality, their size, and general cultivation. The Trees have been much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pin hing, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches with a view; and in this shall realize lies all the art of growing healthy and fruitful trees, such as J. S. offers.

HARRISON'S NEW APPLE, ANNIE ELIZABETH.—This valuable Apple, which was awarded a First-class Certificate by the Royal Horticultural Society, 1868 (and figured in the "Florist and Pomologist," November, 1869), and is one of the best Apples ever offered; for culinary purposes it is unsurpassed, and for Christmas use cannot be excelled. It is of large size, deep colour on sunny side, white flesh, very solid and juicy, with an agreeable acid. A most remarkable keeper, having been in good condition to the middle of March.

The Tree is of sturdy upright growth, forming a beautiful pyramid, with immense leaves, some measuring 4½ inches across, and is a good cropper. Trade price on application
HARRISON AND SONS, William Street Nurseries, Leicester

THOMAS BUNYARD AND SON'S TRADE CATALOGUE may now be had on application. It contains low priced offers of Fruit Trees, Roses, Arbutus, Juniperus sinensis, Thuja aurea, Biota elegantissima, Chichester Elms, Ceanothus, Climbers, &c., &c.
The Old Established Nurseries, Maidstone.

THE beautiful PURPLE DOG'S-TOOTH VIOLETS. See article in *Gardeners' Chronicle* for October 22. Strong roots, 15s. per 100, 1s. per dozen, carriage paid.
Hayling Lands, Langstone, Havant, Hants. I can supply them cheaper than any house in the Trade. Trees upon application
THOS. SAUNDERS, The Nurseries, Lowestoft.

To the Seed Trade.—New Californian Annuals.

W. THOG, SEEDSMEN, Tavern Street, Ipswich, begs to announce that his descriptive Wholesale LIST of NOVELTIES, including the splendid Leptosiphon roseus, Godetia Whitneyi, Collinsia heterophylla, Coreopsis aristosa, Helianthus grandiflorum, and other choice seeds, is now ready, and may be had on application.

T. LINDEN (Establishment AMBROISE VERSCHAFFELT), Ghent, Belgium, begs to offer to the Trade:—
Fine CAMELLIAS, covered with flower-buds, including all the best known varieties, £5 per 100.
Fine VARIEGATED, covered with flower buds, including all the finest sorts, £5 per 100.
NEW and RARE PLANTS, Ghent for London and Goole every week, the passage is extremely moderate.

FOR SALE, a Fine Plant of CAMELLIA. CHANDLER'S ELEGANS, 7 feet 6 in., clear of pot, in exquisite health, with 300 fine flower buds, and called MARVELLOUSNESS of EXETER, in fine health and vigour, 6 feet, 3 feet by 5, with a clear stem 3 feet from pot
Each price apply to H. BOYCE, Clapham Road Nursery, S.

The Largest and Best Early Pea

For MARKET GARDENING PURPOSES is SUTTONS' IMPROVED EARLY CHAMPION.—Only four days later than Ringleader (the earliest known), and a week earlier than Daniel O'Rourke.
Lowest price per bushel and per quarter on application.
SUTTON AND SONS, Seed Growers, Reading

Seed Potatos.

G. AND J. RUMLEY have to offer a fine stock of the following, at moderate prices, viz.—ROYAL ASHLEAF, MAY QUEEN, PRINCESS ALICE, YORKSHIRE HERO, MARTIN'S KIDNEY, ALMOND'S YORKSHIRE HERO, MARTIN'S GLOBE, COLDSTREAM, &c. Prices on application.
Seed-walk Wellington Iron Bridge, Yorkshire

Rollisson's Telegraph Cucumber.

WOOD'S NEW CUCUMBER out-do this, the best ALL THE YEAR ROUND CUCUMBER out, in packets of six fine seeds for 1s., or 12 for 1s. 6d.
This was the only variety grown where this seed was raised, and a small house, or pit feet by 14 feet, produced during the season 924 first-class fruit.—N.B. Postage stamps with orders.
The Nurseries, Huntingdon.

JOHNSTONE'S ST. MARTIN'S RHUBARB.—The Subscribers are pleased to be able to state that they have secured the above fine variety, which they grow largely. Strong roots of Rhubarb, of which they sold 20,000 several thousand roots last season. Extract from "Gardeners' Magazine" of October 15, 1870:—"I have also many thanks to Mr. Johnstone, of Dumfries, having planted it late in the season. I am as yet unable to say anything about its excellence or size, but both colour and flavour are first-rate. I intend grubbing up some of the old stools, to allow of its being planted more extensively."
Strong roots, 2s. each; usual discount to the Trade.
W. P. KIRKWOOD AND SINCLAIR, Nurserymen and Seed Merchants, Dundee, N.B.

Choice Seeds—Now Ready.

DIMMICK'S VICTORIA WHITE COS LETTUCE.—The largest and best self-folding Lettuce ever offered; will keep longer than any other without running to seed. No garden should be without this variety.

VAN HEEDFOLDING GREEN COS LETTUCE.—An excellent and useful Summer Lettuce, as it keeps long without running to seed.

These Lettuces have proved themselves indispensable to all who have tried them.

NONPAREIL RED BEET.—The finest Red Beet in cultivation (with dwarf green top). Its splendid crimson colour and perfect shape render it most desirable where first-class quality is required.

Orders should be forwarded early, as the stock is limited.

Sole Agents, HURST AND SON, Seed Merchants, 6, Leadenhall Street, London, E.C.

WANTED, a married FOREMAN, with good character, and to live at the lodge. Wages 18s. per week.—Apply to the HEAD GARDENER, Fulwell Lodge, Twickenham, S.W.

WANTED, an ASSISTANT JUNIOR SHOPMAN, to live with employer on the premises—State reference, with salary, addressed I. B. THOMSON, 20, High Street, Birmingham

WANT PLACES.—Letters to be Post Paid.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.
JAMES CARTER AND CO., 237 & 238, High Holborn, London, W.C.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W recommending only those whose conduct and abilities are worthy of their trust.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, London, N.W.

GARDENER (Head).—Has a practical knowledge of Gardening in all branches. Six years' good character from last situation; good reason for leaving.—D. M., Post Office, Bracknell, Berks.

GARDENER (Head).—Single; well experienced in the Management of Vines, Stove and Greenhouse Plants, Forcing of Fruits, Vegetables, &c. Can undertake the Management of a large Establishment. Unexceptionable testimonials.—W. B., James Tynan, Seedsman, 68, Great George Street, Liverpool

GARDENER (Head), to any Lady or Gentleman requiring a first-class Gardener.—Age 40, married; one child, age 10. A thoroughly practical and respectable Man, who has had the Management of a Nobleman's Gardens and Plantations for the last eight years. Recommendations first-class.—M. B., Post Office, Langley Road, Watford, Herts.

To Noblemen and Gentlemen.

GARDENER (Head), age 30, married.—WILLIAM MARCHAM, for three and a half years Head Gardener at Bagshot Park, Surrey, who is leaving in consequence of the death of his employer, the late Sir James Clark, Bart., is now open for an engagement. He has had extensive experience in the Early and Late Forcing of Fruits, Stove and Greenhouse Plants, and Flower and Kitchen Gardening.—Address as above

GARDENER (Head), age 41, married.—A. CALDER is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener, having lived 18 years as Head Gardener in last Situation; well versed in Forcing of all kinds of Flowers, Fruit, and Vegetables; understands the Management of Greenhouses, Stove and Garden stuff, Flower Gardening. No objection to look after Meadow Land. Character will bear the strictest investigation.—A. CALDER, Thames Ditton, Kingston, S.

GARDENER (Head), or GARDENER and BAILIFF.—Well up in Plant, Fruit, and Vegetable culture, Landscape Gardening, and Grass Land; having lived 18 years as Head Gardener in last Situation; well versed in Forcing of all kinds of Flowers, Fruit, and Vegetables; understands the Management of Greenhouses, Stove and Garden stuff, Flower Gardening. No objection to look after Meadow Land. Character will bear the strictest investigation.—A. CALDER, Thames Ditton, Kingston, S.

GARDENER (Head Working), age 35, married.—WILLIAM HENDERSON, Fern Cottage, Bell Busk, Leeds.

GARDENER.—Age 44, married, no incumbrance; experienced. No single-handed place accepted. The highest reference.—W. W., Post Office, Faringdon, Berks.

GARDENER.—R. T. CRAGGS is open to engage with any Lady or Gentleman requiring a good practical Man in Early and Late Forcing, Propagating, Planting, and Flower and Kitchen Gardening; is also well up in the Cultivation of Hot and Cool Orchids. 16, Friars Walk, Exeter.

GARDENER (Single-handed, or JOBBING FOREMAN in a Country Nursery).—Age 21; thoroughly understands Flower and Kitchen Garden Work. Can have good references as to honesty, capability, &c.—W. J. M., 5, Albert Gardens, Kilburn Park.

GARDENER, or GARDENER and BAILIFF.—Married; thorough practical knowledge of Fruit, Flower, and Kitchen Gardening, and Forcing in all its branches, also Land and Stock. Wife could attend to Poultry, Dairy, and Flower and Kitchen Gardening; is also well up in the Cultivation of Hot and Cool Orchids. 16, Friars Walk, Exeter.

GARDENER, where assistance is given.—Age 32, married, two children; practical experience in every department. A total Abstainer.—SIGMA, School Lane, Bransford Road, St. John's, Worcester.

GARDENER (Under).—Age 21; has had seven years' experience. Has a good character.—G. BLATCHER, Willesborough Leese, near Ashford, Kent.

GARDENING.—A respectable well-educated Youth wishes to engage himself to the roughly learn the business of a Gardener, at a Nobleman's or Gentleman's Seat; will understand Stoves and Plantations. Apply to JOHN BERT, Derwen Fawr, Llandovery, South Wales.

GENERAL NURSERY FOREMAN and PROPAGATOR.—Twenty-five years' experience in all branches. First-class references.—A. B., Mr. Cooper, seed Merchant, 152, Fleet Street, London, E.C.

FIRST TREE GROWER and general NURSERY FOREMAN.—The Advertiser wishes to meet with a situation as above. Has been for 30 years among Fruits, and has a good knowledge of the Culture of Vines and Orchard House Trees, and is also a successful grower of Rhododendrons and Camellias.—A. B., Mr. Gosling, Mile Ash Nurseries, Derby.

BAILIFF, age 40, married.—A Gentleman can highly recommend, as above, a Man who has been in his service 6½ years; is a very clever, industrious, and trustworthy person, and quite capable of taking Charge of any Estate; well understands Woods and Plantations, Land and Timber Measuring, &c.—A B, Post Office, Bexley Heath, Kent

FARM BAILIFF (Working).—Age 24, single; well educated and highly respectable. Willing to make himself generally useful. Excellent reference.—H. H., Post Office, Ipswich.

AGENT or LAND STEWARD.—Has for the last 16 years had the Superintendence of an Estate and Home Farm in Scotland, combining considerable practice in the Erection and Repairs of Farm Buildings and Cottages, the Drainage of Land, Management of Woods, Plantations, Buying and Selling of Stock, &c., is desirous of a similar engagement. The highest testimonial from his present employer. Most respectable references can also be given.—P. F., Messrs. C. Lord and Son, Seedsmen, Liverpool and London.

SALESMAN.—Great experience in Market, Town, and General Nursery work. Thoroughly understands Planting, Table Decorations, &c. Highest testimonials.—A. Z., 67, Boston Place, Blandford Square, W.

SHOPMAN (Wholesale or Retail).—Has a good general knowledge of the Seed Trade; also of Plants. Eight years' experience. Good references.—S. T., *Gardeners' Chronicle* Office.

To the Seed Trade.

SHOPMAN.—Age 25; nine years' experience in a London Wholesale House. Unexceptionable references.—P. B., Post Office, Eastcheap, E.C.

To the Trade.—Agricultural and Garden Seeds.

H. AND F. SHARPE are now prepared to make a special offer of the finest Seeds, comprising TURNIP CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from admixture of any kind. They are all harvested in splendid condition.—Seed-growing Establishment, Wisbech.

Swede Turnip Seed.

J. DIXON, FARMER and SEEDSMAN, Hutton Roof Hall, Burton, Westmoreland, has orders to Dispose of 62 bush. of his growth SWEDE SEED, grown four miles below Kendal. The seed cored, and is offering it at 20s per bush. MARKET, EAST HAM.

IMPERIAL, 3s. 6d. per 1000; RED DUTCH, 5s. per 1000.

CABBAGE PLANTS.—Enfield Market, 3s. per 1000, 2s. per 10,000; Drumhead or Cattle Cabbage, 2s. 6d. per 1000, 20s. per 10,000. Free on rail. Larger quantities and wholesale prices on application. Remittance to accompany all orders.

CHRISTMAS QUINCEY, Seedsman, &c., Market Place, Peterborough.

For	TRADE PEDIGREE MARK.	Seed.

WHEAT, BARLEY, and OATS. Apply to Captain HALLETT, Brighton

RAYNBIRD, CALDICOTT, AWTREE, DOWLING AND COMPANY (Limited), CORN, SEED, MANURE, and OILCAKE MERCHANTS. Address, 20, Seed Market, Mark Lane, E.C.; or Basingstoke. Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The Nurseries are also but a few paces from the steps over Eccleston Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.

Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES and all particulars on application.

JAMES DICKSON and SONS, "Newton" Nurseries, Chester.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.

SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Mayland's Farm, Romford, Essex, E.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD and SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.

Park Fencing undertaken to any extent.

N.B. Plans and Designs for Building residences, &c., &c.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WANTED to RENT, a small NURSERY, FLORIST, and SEED BUSINESS Y. Z., Strontian Lodge, Cotham, Bristol.

Within 10 miles of London, near Railway Station.

TO BE SOLD (with possession), a very eligible piece of FREEHOLD BUILDING LAND, having valuable frontage to high road, with substantial Brick and Slate Residence; also the erection of eight Greenhouses, Pits of modern construction, Seed Shop and Sheds, and every appliance for carrying on a Florist and Landscape Gardener's business. The trade of Bedding Plants would prove a great success in the neighbourhood. Price for the whole, including stock in trade, £1800. Apply to

BROTHEROE and MORRIS, Auctioneers, &c., Leytonstone, E.

TO BE SOLD, the desirable LEASE and BUSINESS of an old-established and well-known NURSERY, situate in a leading thoroughfare, 4 miles from Covent Garden Market; is about 2 acre in extent, and nearly all covered with glass; there is also a spacious Seed Shop, with commanding front, Counting-house, Stable, &c. Lease about 10 years unexpired. This offers an excellent opportunity to an energetic person with some capital, or to a country firm desirous of extending their business to London. Present owner retiring, the business must be sold.

Full particulars may be had of F. W. SEARLE, Agent, 6, Bishopsgate Street Without, E.C.

Nursery and Seed Business to be Disposed of.

AN excellent and old established NURSERYMAN and SEEDSMAN'S BUSINESS is to be DISPOSED OF, in consequence of the death of the late Proprietor

The Stock will be found suitable in every respect for the requirements of the Business, and may be taken at a fair valuation (now at about £6000); and the terms of payment can be arranged to suit the convenience of the purchaser

The Nursery Grounds are situated within an easy distance from a flourishing and increasing Market Town, and the business is capable of great extension.

Apply by letter to B, *Gardeners' Chronicle* Office, W.C.

SALES BY AUCTION.

SALE THIS DAY, at 11 for 12 O'CLOCK PRECISELY.

Tottenham, N.

CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. J. Johnstone to SELL by AUCTION, on the Premises, The Nursery, Philip Lane, Tottenham, Middlesex, THIS DAY, without reserve (the term having expired, and the land being immediately required for building purposes), the whole of the NURSERY STOCK, consisting of a varied and choice assortment of 12,000 Evergreen and Coniferæ Shrubs, ranging all sizes, and including many fine specimens, admirably adapted for immediate effect.

Now on view. Catalogues had

Streatham Hill, S.W.

IMPORTANT CLEARANCE SALE of EVERGREEN and DECIDUOUS SHRUBS, SPLENDID SPECIMEN CONIFERÆ, ROSES, FRUIT TREES, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. George Clarke to SELL by AUCTION, on the Premises, the Leigham Court Road Nursery (a branch Establishment), Streatham Hill, Surrey, on MONDAY, November 7, and three following days, at 11 for 12 o'Clock precisely each day, without reserve (the lease having expired and the ground being immediately required for building purposes), the whole of the valuable NURSERY STOCK, comprising a large quantity of unusually effective specimen Evergreen and Coniferæ Shrubs, including 2000 Portugal Laurels, 2 to 8 feet; 2000 Aucubas, 2000 Chinese Arbor-vitæ, 3 to 20 feet; 1000 Golden Arbor-vitæ, 1 to 5 feet high, by 1 to 4 feet through; 1000 Cedrus Deodara, including some splendid specimens 20 feet high; 4000 Variegated and Green Hollies, 1000 Araucarias, 500 Cupressus Lawsoniana, 1000 Rhododendrons, 8000 Tree Box, and thousands of others, the whole of which will remove safely; also 3500 Standard and Dwarf Roses, 2000 fine Fruit Trees, together with 2000 fine Azalea indica, including some fine specimens for exhibition, &c.

May be viewed prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Sale of First-Class Dutch Bulbs, Standard Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, on TUESDAY, November 8, at half-past 12 o'Clock precisely, a first-class COLLECTION of HYACINTHS, TULIPS, CROCUS, NARCISSUS, &c.; a choice assortment of 300 Standard and Dwarf ROSES, of the best varieties, Hardy RHODODENDRONS, and other American Plants, &c.

On view the morning of Sale Catalogues may be had at the Rooms as above, and of the Auctioneer.

Sydenham, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Kirkdale Nursery, Sydenham, Kent, S.E. (two minutes' walk from Sydenham Station), on FRIDAY, November 11, at 11 for 12 o'Clock precisely, by order of Mr. George Selley, without reserve (the lease having expired and the ground being immediately required for building purposes), the whole of the valuable NURSERY STOCK, comprising 50,000 Laurels, 2 to 6 feet; 20,000 Portugal do.; 10,000 Aucubas, Arbutus, Berberis, Thuja aurea, ovalifolia and Private, Portugal and Common Laurel, Variegated and Green Hollies, 500 bushy Box, Irish Yews, Bays, Thujas of sorts, Thujopsis borealis, some very fine specimen Coniferæ, viz., Araucarias, Cedrus, Cupressus Lawsoniana, Pinus excelsa, also a quantity of Hardy Climbers in pots, in variety; Standard and Dwarf Roses, &c.

May be viewed until the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Edmonton, N.

IMPORTANT CLEARANCE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. C. Woolven, to SELL by AUCTION, on the Premises, the Langhedge Nursery, Edmonton, Middlesex, (10 minutes' walk from Park Station on the Great Eastern Railway), on FRIDAY, November 11, at 11 for 12 o'Clock precisely, without reserve (in consequence of the Great Eastern Railway Company taking possession of the remaining portion of the nursery ground), the whole of the valuable NURSERY STOCK, consisting of 20,000 Evergreen and Coniferæ Shrubs, including fine Chinese Arbor-vitæ, Red Cedars, Thujas of sorts, Irish Yews, Cupressus of sorts, Green Box, &c., ranging from 1 to 6 feet; 500 Aucubas, Laurustinus, Bays, Portugal Laurels, Thujas, Limes, &c.; Stools and Layers, Beds of Cuttings, in variety; clean-grown Fruit Trees, viz., Pyramids, Bushes, and Pleached Walks, and a splendid assortment of Forest Trees, also 6000 fine Standard Roses of the best sorts; 200 Cyclamen persicum, in pots; a nearly new Cylinder Boiler, and numerous other effects.

Now on view. Catalogues may be had on the Premises, and of the Auctioneers, Leytonstone, E.

Peckham, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, CHOICE GREENHOUSE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, the Rye Lane Nursery, Rye Lane, Peckham, adjoining Peckham Rye Station, on MONDAY, November 14, and following days, at 11 for 12 o'Clock precisely each day (by order of the Executors of the late Mr. W. Ivery), without reserve, the lease having expired, the whole of the valuable NURSERY STOCK, consisting of choice Coniferæ and Evergreen Shrubs, including 2000 Aucubas, 2 to 4 feet; 1000 Green, Variegated, and other Hollies, 2 to 6 feet; 1000 Bays, 2 to 8 feet; 2000 Laurustinus, 1 to 3 feet; 500 Laurustinus, 400 English and Irish Yews, 1300 Lygustrum, of sorts; 200 fine Yucca gloriosa, in flower; fine Fruit Trees; 4000 hardy Climbers, in pots or Standard, Dwarf, and Climbing Roses, together with 1500 choice Double Camellias and Azalea indica, very fine; 150 Ericas and Epacris, 6000 Pelargoniums and Geraniums, in all the leading sorts; also Hardy Herbaceous Plants, &c.

Now on view. Catalogues may be had on the Premises, and of the Auctioneers, Leytonstone, E.

Sunningdale Nursery, Bagshot, Surrey.

CLEARANCE SALE of SEVERAL ACRES of NURSERY STOCK, the land being required for building purposes by the Sunningdale Estate Company

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. Charles Noble to SELL by AUCTION, on the Premises, Sunningdale Nursery, Bagshot, Surrey (within five minutes' walk of Sunningdale Railway Station), on WEDNESDAY and THURSDAY, the 23rd and 24th days of NOVEMBER, without reserve, the remaining NURSERY STOCK, not disposed of at the last great Sale, in consequence of the unpropitious weather, and which must be cleared off the ground, the land being required for building purposes, comprising Evergreen Coniferæ and Deciduous Shrubs, ranging all sizes, including some remarkably handsome specimens of Thuja Lobbii, aggregata, Nootkatensis, Menziesii, and the unique Retinospora aurea, fully prepared for removal; some thousands of Rhododendron ponticum, 1 to 3 feet; also hybrid seedlings and finest named varieties; such as Hodsoni, Jacksoni, Nobleanum, Mrs. Noble, and the unique Mrs. Carr, together with a large quantity of clean-grown Standard and Pyramid Fruit Trees, viz., Apples, Plums, Cherries, Dwarf-bred Peaches, Nectarines, best Lancashire Gooseberries, Currants, &c.; Standard and Dwarf Roses of the best varieties; 10,000 Climbing Plants, in pots, &c.

May be viewed any day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, E.

Luncheon, by ticket, will be in readiness on the arrival of the Train leaving Waterloo at 11 o'Clock, which Train will be met by a Van, to convey Purchasers to the Sale.

N.B.—Railway communication is so complete that goods may be transmitted from Sunningdale Station to any part of England, Scotland, and Wales, without change of truck.

Wandsworth Common, S.

IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Robert Neal, to SELL by AUCTION, on the Premises, the Nursery, Wandsworth Common, Surrey, 5 minutes' walk from Wandsworth Common Station, on MONDAY, November 21, and five following days, at 11 for 12 o'Clock precisely each day, without reserve (a portion required for building purposes), the following valuable NURSERY STOCK, comprising 20,000 Common Laurels, 2 to 6 feet; 5000 Portugal do.; 2 to 9 feet; 15,000 Green and Variegated Hollies, 2 to 6 feet; 1000 English and Irish Yews, 15,000 Aucubas, 50,000 Lygustrum ovalifolium; 13,000 Berberis, of sorts; 10,000 Euonymus, 2000 Cedrus Deodara, 10,000 Spruce Firs, 2 to 5 feet; 2000 Rhododendrons, of sorts; 10,000 Box-leaved Privet; 3000 Arbor-vitæ, 2 to 9 feet; 5000 Arbutus, Laurustinus, Bays, 1000 Skimmia japonica, 1000 Cotoneaster, 20,000 Deciduous Shrubs, thousands of thousands of others; a large quantity of Ornamental and Forest Trees; 10,000 Fruit Trees, various; 5000 Standard and Dwarf Roses of the best varieties; 10,000 Climbing Plants, in pots, &c.

May be viewed three days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

Buscot Park, near Faringdon, Berks.

IMPORTANT NOTICE to NOBLEMEN, GENTLEMEN, and the TRADE, of an EXTENSIVE and UNRESERVED SALE of NURSERY STOCK.

MR. W. ABRAHAM has received instructions from the Proprietor (W. H. Campbell, Esq.), to SELL by AUCTION, on the Premises, at the Home Nursery, one mile from the Faringdon Station (on the Oxford and Faringdon branch of the Great Western Railway), on TUESDAY and WEDNESDAY, November 8 and 9, at 12 o'Clock punctually each day, large quantities of healthy, well-rooted CONIFERÆ, EVERGREEN and DECIDUOUS, and FOREST TREES and SHRUBS, these not being required to plant upon the estate this season. They consist of 300,000 Ash, 1 to 4 feet; 70,000 Common and Cochet Cuttings; 50,000 Beech; 30,000 strong Quick; 20,000 two-years seedling Oak; 5000 Berberis aquifolia; 20,000 Horse Chestnut; 10,000 Horse Chestnut; 100,000 seedling Quick; 15,000 Spruce; 1000 Thujopsis; 800 Retinospora; 300 Thuja Lobbii; 10,000 Chinese Arbor-vitæ; 3000 Scotch Fir; 15,000 Austrian Pine; 2000 Laurustinus; 2000 Box; 100 Wellingtonia, 1 to 2 feet; 500 Cedrus Deodora, 2 feet; 300 Standard Roses; 1000 Pinus insignis, 1 foot, in pots; Sycamore, Cupressus; 1500 Euonymus, of sorts, in pots; Aucuba, &c.; also 4 sacks of Sangster's No. 1 Peas.

Full particulars in Catalogues, to be obtained 10 days prior to the Sale, on application at the Nursery, or of the Auctioneer and Valuer, Goldworth Nurseries, Woking, Surrey.

Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY and WEDNESDAY, November 7 and 9, at half-past 12 o'Clock precisely each day, an importation of choice HYACINTHS, TULIPS, CROCUSES, IRIS, LILIUMS, GLADIOLI, and other Bulbs, just arrived from Holland, and lotted to suit the Trade and private buyers.

On view the mornings of Sale, and Catalogues had.

Established and Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, November 8, at half-past 12 o'Clock precisely, choice established ORCHIDS, many of them good specimens, in fine condition, consisting of—

Saccolabium præmorsum.	Dendrobium Schroederi
" Blumei majus.	Cypripedium caudatum gigan-
" Holfordii.	teum
Aerides Lawrenciæ.	Dendrobium Lindeni.
" Lindleyana	Odontoglossum Dawsoni.
" Feddingii	" Blundi
Phalænopsis amabilis.	" Alexandræ.
" grandiflora.	" triumphans.
" Schilleriana.	&c. &c.

On view the morning of Sale, and Catalogues had.

Consignment of Plants from Ghent, and Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, November 9, at half-past 12 o'Clock precisely, CAMELLIAS, INDIAN AZALEAS, AUSTRALIS, CHAMÆROPS HUMILIS, THUJA AUREA, EUONYMUS, ORANGE TREES, RHODODENDRONS, YUCCAS, Variegated HOLLIES, DRACÆNAS, TREE CARNATIONS, &c., from Ghent; and an importation of HYACINTHS, TULIPS, CROCUSES, IRIS, LILIUMS, NARCISSUS, GLADIOLI, and of other Bulbs, just arrived from Holland.

On view the morning of Sale, and Catalogues had.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, on THURSDAY, November 17, at half-past 12 o'Clock precisely, an Importation, just arrived, from New Grenada, consisting of choice CATTLEYAS, ODONTOGLOSSUMS, MASDEVALLIAS, EPIDENDRUMS, WARSCEWICZELLAS, &c., and from Moulmein, CYPRIPEDIUM PARISHII, and PHALÆNOPSIS LOWII.

On view the morning of Sale, and Catalogues had.

Important Sale of Plants,

At the ROYAL HORTICULTURAL GARDENS at CHISWICK.

MR. J. C. STEVENS begs to announce that he has been favoured with instructions from the Council of the Royal Horticultural Society to SELL by AUCTION, at the Gardens at Chiswick, during the month of NOVEMBER, a large number of Specimen CONIFERS, AUCUBAS, HOLLIES, LAURELS, LAURUSTINUS, RHODODENDRONS, Hardy AZALEAS, splendid Pyramid and Dwarf-trained FRUIT TREES, FIGS in pots, and a great variety of other Hardy Trees and Shrubs.

More detailed particulars in future Advertisements.

Auction Rooms and Offices, 38, King Street, Covent Garden, W.C.

Second Poultry Sale of the Season.

LUCAS'S REPOSITORY, LIVERPOOL.

MESSRS. LUCAS AND CO. will SELL by AUCTION, on FRIDAY, November 25, at 11 o'Clock prompt, at their Repository, Liverpool, THREE HUNDRED LOTS of Choice Domestic POULTRY and PIGEONS. No Entrance Fee for Pigeons; Poultry, 1s. per Pen. Entrance CLOSES on MONDAY, November 21. No more than 300 Lots offered. All Birds to be at the Repository on the Thursday evening, or before 9 o'Clock on Friday.

NOTE.—Three Birds in each Pen, except of great merit. Pigeons in Pairs

Sale of an Entire Herd of Pure-bred Shorthorns,

At BRAILSFORD HALL, near DERBY.

MR. JOHN THORNTON will SELL by AUCTION, without reserve, on WEDNESDAY, November 9, at 1 o'Clock, at Brailsford Hall, between Derby and Ashbourne, the ENTIRE HERD of pure-bred SHORTHORNS, numbering about Fifty Head, the property of William Cox, Esq. These animals have been gathered together and bred during several years from some of the best Herds, for the purpose of improving the Stock in the district. They will be found very useful Cattle, of Knightley, Kirklevington, and other good blood, and are well worth the notice of Dairy Farmers. Most of them are excellent Milkers, combined therewith with quality, substance, and heavy flesh. Mr. Torr's Grand Marshal (21,865), and Lord Penrhyn's Jupiter (24,228), Mr. Blackwell's noted Prize Bull, have been used.

Catalogues, with Pedigrees, may be had of JOHN THORNTON 15, Langham Place, London, W., or at the place of Sale.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870.

SPECIAL PRIZES for SUTTONS' CHAMPION SWEDES, at the ROYAL BERKSHIRE ROOT SHOW, to be held at READING on SATURDAY, November 26. The following valuable Prizes for SUTTONS' Champion Swede will be awarded:—

	£ s. d.
For the best 24, a Silver Cup, value	10 10 0
For the second best 24, money or plate, value	5 5 0
For the third best 24	3 0 0
For the fourth best 24	2 0 0

Also Prizes for the best MANGEL, TURNIPS, KOHL RABI, CARROTS, &c. No charge for entry.—For full particulars apply to SUTTON AND SONS, Seed Growers, Reading, Berks.

The Agricultural Gazette.

SATURDAY, NOVEMBER 5, 1870.

MEETINGS FOR THE ENSUING WEEK.

Nov. 7 { London Farmers' Club (Mr. A. S. Ruston on The Fens), at the Salisbury Hotel—6 P.M.

Nov. 8 { Central Chamber of Agriculture (Fire Insurance—Cattle Trade Regulations), at the Salisbury Hotel—11 A.M.

"THE owners of the CLAY LANDS of this country are to be congratulated. Their turn has come at last, and whereas the lighter soils, by marling, sheep feeding, and artificial manuring, have hitherto been foremost in the march of agricultural improvement—thus contributing more than any other to that increased productiveness of food which English fields have of late exhibited—we may now expect that by drainage and effective tillage the stiffer lands will take their turn in front—making the most rapid progress, yielding largest produce, most profit, and most rent."—"It is the clay farm that henceforth will be in the greatest demand. In hiring it you take not only the groundwork of a manufactory, but you have access to a mine. You take not only a

given surface, whose natural fertility is indicated by the sedge and rush and grass of untouched meadow land, and from which, by dint of air and rain and sunshine, you mow or reap a certain annual crop—but you have a depth of soil beneath that surface which the chemist tells you is full of valuable matter—much fuller than the sand soil is—which only needs skill for its extraction and utilisation." —These words were written in the *Agricultural Gazette* in 1862, and in the previous year an estate in Hertfordshire had been purchased, which was destined to illustrate their truth and force in a very remarkable degree.

Blount's Farm (450 acres), near Sawbridgeworth, was purchased nine years ago by Mr. JOHN PROUT, who had previously had practical acquaintance with agriculture in both England and the colonies. It is described in the report to the English Agricultural Society (1861) as a strong and clayey loam, lying upon a subsoil of drift clay and chalk gravel, divided by meandering watercourses and straggling fences into no fewer than 51 inclosures, averaging about 9 acres each. By grubbing up all the rough fence and hedgerow timber, by straightening watercourses and deepening outfalls, executing drainage, exchanging awkward corners with neighbouring proprietors, and making roads, the estate was soon brought into the best possible condition for profitable tillage. Cultivated by horse and steam power during the prosecution of these improvements, it is, now that they are completed, cultivated virtually by steam-power alone; and the result of nine years' occupation has been to entirely alter the character of the property, not only as the daylight shows it to the eye, but as examination of its depth, texture, and even apparent composition, reveals it to both sight and touch.

Having been lately over this farm, spade in hand, looking beneath the soil as well as testing the quality of the upper surface, we can point to it as a capital example of that strong treasure-box to which we referred eight years ago, to whose stores access has been at length effectually attained; so that whereas the land was formerly an inferior sample of a poor, wet, comparatively unfertile district, whose value, determined by the ordinary method of attacking it, was indicated by its purchase money—£35 an acre—it is now yielding produce worth, during a series of years, more than £10 per acre over its whole surface. How many square miles of poor, apparently unfertile clay, are there not in this country, whose owners, like the former proprietor of Blount's Farm, receive no more than 20*s.* an acre, really pocketing a full rent, and whose tenants laboriously extract not more than three or four times as much, believing they extract all the soil has to give them—ignorant that they have in possession or in occupation a mine of wealth already there, and only needing skilful working to display its stores upon the surface.

We do not, however, point out Mr. PROUT'S management as one which can be adopted everywhere; nor are we sure that it can be followed constantly even on this one estate. Barring a quantity of Clover and Sainfoin hay, amounting to about 60 or 70 acres in the whole, he has for many years had nearly the whole of his land in grain crops. The root crop, which was 60 acres in extent in 1862, was 25, and 30, and 20 acres in 1863, and 1864, and 1865; and since then it has been only 4, 8, 4, 1 and 2 acres—just enough for the provision of a cow or two for the house. The Wheat crop, this year 208 acres in extent, has varied from 130 to 223 acres during all these years; the Barley crop, this year 57 acres, has been from 30 to 120 acres annually in extent; Oats, of which there is this year none, has been generally 50 or 60 acres in extent; of Beans and Peas there have been from 50 to 100 acres. Of bare fallow there were 140, 182, 130, and 130 acres in the first four years, and 14, 55, and *none* in the last three years. In 1870 the cropping of 430 acres was—Wheat 209, and Barley 57; Beans 102, Hay 60, and Roots 2. *No live stock is kept;* and, except a mere scavenging heap, on which waste chaff and odds and ends are collected, *no dung heap exists.* The whole produce of the land—straw and grain and hay, is sold off the farm! An auction is held every year before harvest, and the sales have been, in 1867, £3330 5*s.* 9*d.*; in 1868, £4726; in 1869, £3742; in 1870, £5330. Sundry ricks of straw and hay remained on the land last week, yet to be removed; but otherwise, the whole produce of the year had gone. Not a head of cattle, sheep, or pigs, was to be seen; the Wheat is all in, the winter Beans are all up; stubbles are all ploughed; the work of the year, in fact, is already done—the four horses kept for hoeing, rolling, harrowing, and occasional carting are on the point of being turned into the strawyard; the old 14-horse power steam-engine, with clip-drum, travelling disc anchor, and all the old style arrangements, bought nine years ago, and still nearly as good as new, has now to be cleaned and set aside till the spring of 1871.

What about the labourers of the district?—The wages paid on this farm in 1868 had been £509 14*s.* 6*d.*; in 1869, £551 14*s.* 6*d.*; in 1870, up till the end of September, £520. Taken monthly during the past year the wages paid have been—January, £8 11*s.* 1*d.*; February, £11 13*s.*; March, £22 7*s.* besides £43 13*s.* paid as piecework (drainage, &c.) during these three months; in April, £41 9*s.*; in May, £27 3*s.* as daywork and £32 as piecework; in June, respectively, £36 7*s.* and £20 9*s.*; in July, £17 9*s.* and £20 18*s.*; in August, £60 and £22 2*s.* 3*d.*; in September, £53 3*s.* and £15 8*s.* The wages paid have been this year exceptionally large in summer, because of the early harvest forestalling the date on which the sale was announced, and thus putting some of the harvest work upon the tenant, which is generally done wholly by the purchaser. The labour of the farm, excluding harvest work, which may add another 10*s.* an acre, is thus rather more than 20*s.* an acre. This 20*s.* or more includes a certain quantity of winter drainage, of spring hoeing, all the haymaking, a small quantity of summer harvest work, all the horsemen's wages, and the whole of the manual labour connected with steam cultivation. The horse-power of the farm is four or five horses kept throughout the year, turned into strawyard with empty barn during winter, and two or three extra horses bought in summer and sold before winter every year. The wages paid upon Blount's Farm thus, probably, do not materially differ from those earned on an equal area of arable land around it.

The farm contributes nothing to the beef and mutton department of the national commissariat. It is as a grain producing plot of once poor clay—and as an illustration of the power of land drainage and steam cultivation to evoke an unsuspected fertility—that it is chiefly remarkable. Whether its powers in this respect, under Mr. PROUT'S management, which includes one yet unmentioned feature, shall be permanently maintained, we can hardly yet pronounce—but there has been no sign of failure yet.

This year one of the large fields of standing Wheat sold at £18 an acre, and the purchaser, timid over his venture, gave up his bid to Mr. PROUT for a bonus of £25. This plot, since threshed, has yielded, we were told, 8 qr. an acre, and its stubble is now full of a very fair and promising plant of Clover. The increasing sales of the last four years, moreover, show no sign of decreasing fertility. This is, however, no doubt to some extent due to large dressings of artificial manure. No cattle are kept, and no sheepfold exists, and there is no farmyard dung to apply; but large dressings of mixed coprolite-superphosphate and bone dust, are every year applied to all the crops. These purchases amount to more than £1000 a year—an enormous sum for 450 acres of land; and to this, together with the natural stores originally in the land, and the efficiency given by thorough tillage to the natural fertilising agencies, the extraordinary results which Mr. PROUT has hitherto achieved must be attributed.

Blount's Farm is a capital example of what steam cultivation can do, after, by drainage, clearance, and road-making, &c., clay soil has been prepared for it. A 14-horse power engine, bought nine years ago, and still almost as good as the day it was bought, has cost about £50 a-year in coals, and less than £80 a-year in all for ropes and repairs (including new firebox); and this, with less than 25*s.* an acre per annum for wages, has enabled the growth of from 330 to 380 acres every year of first-rate grain crops out of a total area of 450 acres of originally unkind land—wet, clayey, and unprofitable.

The land now is clean—deeply cultivated—dry—the work for the year is finished, and, except a certain quantity of rolling and harrowing and spring sowing and hoeing, the work up till harvest time next year is finished.

We state the case, in part as it appeared to us in part as it was related to us. * Blount's Farm is not, perhaps, an example which may everywhere be followed with the like success, even by owners of clay land; it may not be able permanently to maintain, upon the system which is practised on it, the increasing fertility which it has hitherto exhibited; but, both for landowners and for tenants of clay soils, it may confidently be taken as an illustration of the extraordinary scope which such soils present for an indefinite increase of productiveness, when, by the aid of land drainage and steam-power applied to cultivation, the natural stores of food for plants which they contain are made accessible.

POISONING of CATTLE by ACORNS has undoubtedly happened recently in several places, just as it happened in the autumn of 1868, and for the same reason there is an abundant crop of acorns with a scarcity of pasture. Farmers who have lost valuable animals from this cause express some surprise at the occurrence, and now and then we hear a note of complaint that some timely warning was not given. The only strange part of the matter is, however, that any warning should be needed.

In the latter months of 1868 the subject of acorn poisoning was thoroughly discussed in our own and other agricultural journals. It is true that no very definite conclusion was arrived at respecting the exact operation of the cause of the fatality, among young stock particularly, but it was clearly established that the consumption of acorns by young cattle led to very disastrous results; and, as far as the owners of stock were concerned, this fact, one would have thought, was worth recollecting. Hundreds of animals were affected during the time that the acorns lasted, and no treatment was found to be of much use; even the removal of cattle from the pastures where acorns abounded did not always prevent the disease; in fact, in many cases no serious symptoms appeared until a week or ten days after the acorns had been eaten. On reference to our notes of the cases which occurred two years ago, we find that the disease was first reported from Beckenham in Kent, where a number of young animals died soon after being placed in a pasture, which at the time was noticed to be covered with acorns. Similar cases were investigated in succession in other parts of Kent, and also in Hertfordshire, Lincolnshire, Buckinghamshire, Warwickshire, Berkshire, and Middlesex; and, subsequently, while making inquiries respecting outbreaks of various diseases among stock, we ascertained that acorn poisoning happened on many other parts besides those above named, although the cases were not reported at the time.

The symptoms which were shown by the diseased animals varied in accordance with the quantity of the food which they had consumed. Sometimes the animals were dull and dispirited, but gave no evidence of suffering. Constipation was usually present in the first stage, but very often diarrhœa succeeded and proved obstinate. The discharge of urine was generally profuse, but a remarkable symptom in all cases was the absence of colour in the fluid, which had the appearance of clear water. In some instances the animals suffered from abdominal pain, and some of them were affected in the brain, and were unable to walk without staggering about. After death the digestive organs were observed to be deranged, in some cases to an extraordinary extent; many of the morbid appearances were so like those which belong to cattle plague that some apprehension was felt at the time of the disease having again broken out. This suspicion was entertained in the cases especially of the animals which died in Kent at the commencement of the outbreak. Treatment was carried out in various parts of the country with but little success. In the first stage of the disease purgation seemed to do good, but very few animals recovered from the second stage, when diarrhœa had set in before any remedies were used. The great difficulty in selecting an antidote is due to ignorance of the nature of the poisonous agent.

An analysis of acorns shows that they contain a considerable proportion of starch, with a small quantity of albuminous matter, about 40 per cent. of water, and a trace of mineral matter. Tannic acid also exists, as may be demonstrated by merely putting a drop of perchloride of iron on the cut surface of an acorn—the black colour which immediately results is indicative

of the action of tannin on iron; but in what way tannin or gallic acid acts upon the organism to cause death has not yet been ascertained.

The practical conclusion to be drawn from the facts which we have before us is evident enough; cattle, especially young stock, should be kept from feeding grounds where acorns are plentiful. Sheep and pigs do not appear to suffer from the consumption of acorns as cattle do, the abundant crop may therefore be readily utilised; but if it is considered necessary to give acorns to cattle, they should be either boiled or dried before being used. Already many animals have died in Gloucestershire, Buckinghamshire, Shropshire, and also in Middlesex, and unless great care is taken young stock are likely to suffer as severely as they did two years ago. [A paragraph in these columns, a few weeks ago, pointed out both the advantages and the danger attending the use of acorns in feeding.]

—— Prices in Mark Lane on Monday were rather weaker than those of last week, and anything of inferior quality had to submit to a decline. On Wednesday they were, if anything, rather firmer.——At the Metropolitan Meat Market on Monday there was a large supply and a dull sale; on Thursday trade was very dull, and prices had a downward tendency.

—— We sincerely regret to record the death of Mr. G. P. Tuxford, of the Strand. As proprietor of the *Mark Lane Express* and the *Farmers' Magazine*, on which he had for many years left the impress of his own sound judgment and integrity, he had long rendered invaluable services to the interests and progress of English agriculture; and there are many in the agricultural world who will unite personal gratitude with their sense of public loss in the sorrow with which they hear of his decease.

—— The Committee on Education of the Council of the Royal Agricultural Society of England have made application for a renewal of the £200 Educational Grant for the ensuing year. It will be seen in another page that this has been granted, and the next examination will take place at the Society's House in Hanover Square, commencing on Tuesday, April 18, 1871. No candidate will be eligible for the Society's prizes who has completed his 21st year previous to March 1, but any candidate, irrespective of age, may compete for the Society's certificates.

—— We are requested to state that a slight inaccuracy occurs in the paragraph in last Monday's issue of *Bell's Weekly Messenger*, referring to a visit said to have been made to the Metropolitan Cattle Market by Lord Berners and several members of the Council of the Royal Agricultural Society of England. The explanation is, that Lord Vernon and Mr. H. M. Jenkins paid an unofficial visit to the Cattle Market on Monday last for their own private information. They had previously, in company with Lord Lichfield, visited the wharves where foreign cattle are landed; but they have hitherto expressed no opinion on any question connected with the home or foreign cattle trade, beyond their belief that the officials at the several places visited do their utmost to carry out the existing regulations.

—— The following correspondence has ensued upon Mr. Morgan's letter about the sewage farm at Barking, which we gave last week:—

(1). In the *Times, Oct.* 31.—"It is most satisfactory to observe in the letter of Mr. Morgan, of the Metropolis Sewage and Essex Reclamation Company, an acknowledgment of the principle advanced by me at the recent meeting of the British Association at Liverpool—viz., that the discharge from sewage-irrigated land should invariably be from 'out' of the subsoil, and not from 'off' the surface. After some years' experience on the Barking farm, Mr. Morgan concludes that all sewage used for irrigation which is not absorbed by vegetation on the surface should undergo natural downward filtration, which is only another term for thorough drainage. There is no point connected with the sewage question more important than this, for if irrigation and filtration be together carried out 'intermittently,' as it must necessarily be in the cultivation of sewage land, both the chemical and mechanical effect which Dr. Frankland has found to be produced by artificial filtration will be secured. The effluent water from the subsoil will not only leave behind it those elements which will be afterwards serviceable to deep-rooted crops like Mangel, Parsnips, Carrots, and Wheat, but all fear of noxious gases being evolved from the surface will be removed by the complete disappearance of sewage after it has carried its food to the growing plant. If it be authoritatively declared and clearly understood that no sewage shall pass from the surface of land into rivers and streams we shall have gained one great point, and the paper read by me for this practical purpose will have been successful. With respect to the particular case of Barking, I cannot admit that I was guilty of any misstatement. I took for my *data*, not my own observations, but the words of the Rivers Pollution Commissioners, who in their report of February 16 in this year, say that the sewage either sinks into the land or flows finally off the surface at the foot of the farm, which latter is just that condition of things which I have ventured to say should not exist, and which Mr. Morgan himself admits to be wrong, and I presume has now seen reason to alter. *J. Bailey Denton*, 22, *Whitehall Place.*"

(2). In the *Times, Nov.* 2.—"I see from Mr. Bailey Denton's letter on this subject in the *Times* of this morning that he cannot admit having been 'guilty of any misstatement' in classing the Barking sewage farm among the examples of what he calls 'irrigation only.' Such a classification is a misstatement, nevertheless, as Mr. Morgan has pointed out; and Mr. Denton would not have been 'guilty' of it if he had read with any care what is said of the farm in question in the report of the Rivers' Pollution Commissioners, to which he refers as his justification. He would then have known that sewage does not flow more than 50 or 60 yards over the surface of so porous and hollow a soil as they have at the Lodge Farm. All the effluent water there, except, possibly, that from the surface of the last 50 yards immediately above and around the point of exit, thus necessarily is, and has always been, true drainage water—making its escape solely through the two main drains expressly provided for it when the land was laid out for the Metropolis Sewage Company five years ago. I may add that the point referred to by Mr. Denton, or, as he puts it, 'the principle advanced' by him, in his paper on this subject before the British Association had been already, not only thus perfectly illustrated by the Lodge Farm experience, but fully discussed in the report of the Rivers' Pollution Commissioners. The efficiency of a frequently aërated filter as a cleanser of water containing organic impurities is one of the points most urgently dealt with in that report; and the parallel which it draws between filtration and irrigation under each of the several particulars on which their efficacy depends is drawn with especial care and precision when this one feature in the comparison is reviewed. 'A filter,' it is said, 'is not a mere mechanical contrivance. It is a machine for oxidising, and thus altogether transforming as well as merely separating, the filth of dirty water. And in this respect especially irrigation includes filtration. Sewage traversing the soil undergoes a process to some extent analogous to that experienced by blood passing through the lungs in the act of breathing. A field of porous soil, irrigated intermittently, virtually performs an act of respiration, copying, on an enormous scale, the lung action of a breathing animal, for it is alternately receiving and expiring air, and thus dealing as an oxidising agent with the filthy fluid which is trickling through it. And a whole acre of soil, 3 or 4 feet deep, presenting within it such an enormous lung surface, must be far superior, as an oxidising agent, for dealing with the drainage of 100 people, to any filter that could be practically worked for this purpose.' It is thus clearly pointed out that the depth of the soil, with its air-filled pores and passages, as well as its mere surface, covered with hungry plants, must be made to act in the work of defecation; and how is the depth of 3 or 4 feet of air-filled soil at all subject to which the Commissioners refer to be obtained where it does not naturally exist, except by means of just such 4-feet drainage as Mr. Denton recommends, on the principle 'advanced' by him at Liverpool? It must not, however, be inferred that the most porous soil, though especially good for sewage defecation, is necessarily the best for sewage irrigation. It is, on the contrary, one of the misfortunes of Lodge Farm that the land there is so hollow, and drains so easily. The consequence of this is that the valuable fertilising matters which sewage brings to it are to a great extent carried away (oxidised, no doubt, and rendered harmless, but not the less lost) in the drains. The samples of effluent water taken at Lodge Farm, of which analyses are given in the report of the Rivers' Pollution Commissioners, showed little more than half of the combined nitrogen of the original sewage remained unused, whereas at Warwick and at Rugby, both of which are quoted by Mr. Denton as examples of 'irrigation only,' the dirty water, flowing over a very much larger surface, and therefore feeding a very much larger number of plants, had given up in the one case nearly three-quarters, and in other 15-sixteenths, of its combined nitrogen before it left the land. The attention of the Commissioners was of course directed especially to the problem of sewage defecation; but there are those who are interested rather in sewage utilisation, and an experience of some years on the Lodge Farm, Barking, as well as large opportunity for observation elsewhere, leads me to recommend for them rather a soil on which, in spite of drainage, whether natural or artificial, sewage can be put to successive surface uses before it finally escapes, than a soil where it must at once sink beneath the spot to which it is conveyed. *J. Chalmers Morton, Harrow-on-the-Hill.*

—— A correspondence with the Inland Revenue Office, Edinburgh, on the subject of horse hire, has been published, from which we make an extract:—

(1). "Up to the present year a farmer friend of mine was in the habit of doing a little work with his horses for the neighbouring cottars, such as ploughing and working their bits of land, driving home their peats or coals, and carting any grass they may have bought at public sales, receiving payment—in some instances in money, and in some instances in work. I shall be glad to know if he can still follow out this practice without taking out a license to let horses for hire. If he must take out a license, will it be necessary that he take out a license for every horse he has? He will not have more than a pair of horses working as above described, though he has always four and sometimes more horses on the farm. Another point is this. You are no doubt aware that in the leases of many, if not the greater part of farms in Scotland, it is stipulated that the tenant shall perform a certain amount of carriage for his landlord, such as driving bark, coal, lime, &c. Is a farmer employing his horses doing this for his own farm, bound to take out a license? Is it not in a manner plying for hire?"

(2). "I am to acquaint you that horses otherwise exempt from license duty would become liable to duty by being let to other persons to be used in the manner stated which could not be considered 'solely for the purposes of husbandry.' A license should be taken out for every horse so used. I am to acquaint you, further, that the Board will not insist upon the payment of license duty for a horse kept solely for husbandry purposes which may occasionally be employed in drawing coals, bricks, &c., to its owner's house, or to the house of the owner's landlord, in conformity with any provision in that behalf contained in the lease under which the farm is held."

—— Mr. G. Hope, of Fenton Barns, has published the following letter on the Ball or Smut in Wheat:—

"I have long been of opinion that ball smut is a Fungus propagated by adhering to the seed, and unless this Fungus is destroyed before being sown, all the grains infected by it are sure to produce diseased ears. I must remark here that smut is of two kinds. In one of them the smut or black powder flies or wastes away before the sound Wheat becomes ripe, while in the other the powder is enclosed in a skin frequently strong enough to remain unbroken when passing through the threshing-machine. The larger number of balls, however, do get broken, the powder discolouring the sample, giving it a disagreeable smell, and a peculiar oily feeling, which judges know at once. It is this variety which is destroyed by pickling. The other appears to be propagated in some other way, at least as yet no remedy has been found for checking it. Many years ago, I rubbed smut balls amongst clean Wheat, then pickled part, and sowed both. The result was, the pickled seed produced a healthy crop, while of the unpickled portion there was hardly one sound ear. I have again and again seen the sowing of fields finished with unpickled seed tell to the spot where the dressed and undressed seed met. Old Wheat should not be pickled, as its vitality is sometimes totally destroyed by it, and the Fungus itself seems incapable of growth when upwards of twelvemonths old. I am far from saying that ball invariably follows when undressed Wheat is used for seed, as by a careful selection of seed this may be avoided for years. But the little trouble and expense saved by not pickling seed is trifling indeed in comparison to the security given. I have tried pickling Barley for blackheads, where the powder blows off before the grain is ripe, but, as in Wheat, without success. Still, I think it is worth, of further trial, as it has appeared to me, for the last two or three years, that many of the blackheads in both Oats and Barley are more nearly allied than formerly to the true ball in Wheat. I should like to see experiments made by steeping grain different lengths of time in sea water, or in water salted to the strength of swimming an egg. This is said to be a remedy against mildew and rust in warm climates, and possibly it may prove equally efficacious here."

—— We take the following paragraph from the columns of the *Pall Mall Gazette*:—

"Another uncomfortable as well as somewhat sickening disclosure relative to the spread of scarlet fever is made in the columns of the *Lancet* by Dr. Bell, Professor of Medicine in the University of St. Andrews. It illustrates one of the many exceptional ways in which the disease is propagated, and affords additional evidence, if any were needed, of the urgent necessity which exists for enforcing stringent measures against the present free intermingling which is permitted to take place between the infected and the healthy members of the community. Dr. Bell details the circumstances attending an outbreak of scarlet fever which was clearly traceable to the use of milk poisoned by the desquamating cuticle given off from the hands of infected persons who were employed to milk the cows of a particular dairy. The facts are shortly these:—Between May 9 and the end of July several cases of scarlet fever occurred among the servants and students of a certain educational institution healthily situated, well built, airy, and isolated in position. At the end of July the students dispersed. No fresh case occurred in the place (St. Andrews) till August 8, when the servant in a family visiting the place, and who had only been there a week, was seized with the disease. On the 9th, a nurse in another family of visitors sickened, and she and five others in the same house were attacked. Having accidentally heard that the boy who brought milk to the college where the disease first appeared had 'peeled off the skin,' according to his own statement, at the time of the outbreak, Dr. Bell set to work and ascertained the following facts:—That on May 1 the wife of the farmer who supplied the milk returned from a visit to a place where two deaths from scarlet fever had occurred, and fell ill within a few days. She milked the cows. After a while the boy whose occupation it was also to milk the cows and to take the milk to town had the disease lightly, and in due time 'peeled.' He continued all the time at his work. But now comes the interest of the case. On making out a list of the houses in which scarlet fever had showed itself in St. Andrews, and asking the dairy-woman for a list of the houses which she supplied with milk, with one exception there was a perfect agreement in the lists. In every house to which milk had been sent, scarlet fever had occurred. The cases were 26 in all. The attack of the members of the two families of visitors is accounted for by the fact that when the college broke up at the end of July the milk thus made available for the use of other customers was sent to the very houses in which the visitors resided."

OUR LIVE STOCK.

CATTLE.

Thirty-nine well-bred Shorthorns, the property of Mr. John Lynn, of Stroxton, near Grantham, were sold by Mr. Strafford, on Thursday, the 27th ult. The sale may well rank among the most successful of the season, some of the animals fetching above £100 each, and the entire number averaging £46. *Pompous* (lot 3) by Great Comet (16,192), the first of the descendants of *Priscilla* by The Bonus (10,922), bred by Earl Brownlow, and tracing back to Mr. Wilkinson's Lenton stock, and a very good animal, was purchased by Mr. Burtt for 44 gs. Next came *Cheerful*, a plain 8-year-old cow, by Mystic (20,391), and a daughter of *Coquette* by Mameluke (13,289). Col.

Towneley, although usually identified with Booth blood, purchased this representative of the famed Millcote Charmers for 60 gs. *Patelina* by WAVERLEY 4TH (21,084), another descendant of *Priscilla* by THE BONUS (10,922), and a very good young cow, became Mr. Wilkinson's property at 75 gs. *Seraph* by 6TH GRAND DUKE (19,876), and of the "Seraphina" family, a fair good cow, but roughish in her quarters, went at 100 gs., to Mr. J. Snodin; *Pride of Thorndale*, a very good 3-year-old heifer, was knocked down, at 71 gs., to Mr. N. Catchpole; *Gipsey Gwynne* by GRAND DUKE OF LIGHTBURNE (26,290), went into Lord Norrey's hands, at 100 gs.; and *Cheerful Rose* by CAMBRIDGE DUKE 4TH (25,706), calved in April of the present year, was sold to Mr. Graham for 62 gs. CAMBRIDGE DUKE 4TH (25,706), the sire of most of the young stock, although unquestionably well bred, being by 4TH DUKE OF THORNDALE, and of the celebrated "Cambridge Rose" tribe, did not exhibit, either in skin or coat, much of that quality which his lineage should have conferred. He was bought in at a reserve of 200 gs. PRINCE LINCOLN by THORNDALE GRAND DUKE (25,310), and of the "*Priscilla* by THE BONUS" family, brought 63 gs. from Mr. J. Upson; CANTAB by CAMBRIDGE GRAND DUKE 4TH, and of the "*Farewell* by YOUNG MATCHAM" tribe, was secured by Mr. Garfit at 55 gs.; and GRANDEE 2D, by the same bull, was bought for 50 gs. by Colonel Reeve.

There were also some pigs of the small white breed disposed of. "Young Lord," bred by the late Earl of Radnor, was sold to Mr. Foster for 12 gs., and a son of the boar just named was secured by Mr. Palethorpe for 10 gs. Mr. Barber bought a young boar, farrowed in August, for 5½ gs., and six hilts were sold at from 5 to 6 gs. each. The following is a list of the prices given for cattle:—

Name of Animal.	When Calved.	Price.	Purchaser.
		Gs.	
Cows and Heifers.			
Clematis	1856	32	Mr. T. J. S. Foljambe.
Ana	1858	31	Mr. Sharp.
Pompous	1861	44	Mr. H. Burt.
Cheerful	1862	60	Col. Towneley.
Carry	1862	30	Mr. Blakiney.
Princess of Wales	1864	56	Mr. Garfit.
Fair Maid	1864	34	Mr. Kirk.
Prima Donna	1865	40	Mr. J. H. Caswell.
Lady Julia	1865	37	Mr. T. Atwell.
Juliette	1865	30	Mr. Blankney.
May Dew	1866	37	Mr. J. Burgess.
Patelina	1866	75	Mr. Wilkinson.
Seraph	1866	100	Mr. J. Snodin.
Charm	1866	36	Mr. Garfit.
Charming	1866	40	Mr. J. H. Caswell.
Pride of Thorndale	1867	71	Mr. N. Catchpole.
Peep o' Night	1868	40	Mr. E. Wortley.
Proud Rose	1868	42	Mr. W. Holland.
Princess of Thorndale	1868	45	Mr. Johnstone.
Blanch Royal	1868	37	Mr. Wilkinson.
Peep o' Day	1868	28	Captain Archdall.
Lady Grey	1868	22	Mr. Wylde.
Gipsey Gwynne	July, 1867	100	Lord Norrey.
Lady	Sept., 1867	25	Mr. R. Burchnall.
Florence	Sept., 1867	18	Mr. Hall.
Pure Rose	Dec., 1869	45	Mr. J. Frudd.
Christmas Rose	Dec., 1869	37	Mr. Toljambe.
Primrose	Jan., 1870	42	Mr. Marrison.
Cheerful Rose	April, 1870	62	Mr. Graham.
China Rose	June, 1870	40	Mr. Toljambe.
Warm Rose	April, 1870	34	—
Darling Rose	July, 1870	31	—
Bulls.			
CAMBRIDGE DUKE 4TH	1867	200	(Reserved).
PRINCE LINCOLN	Aug., 1869	63	Mr. J. Upson.
DUKE OF SUEZ	Oct., 1869	40	Mr. S. Burchnall.
CANTAB	Nov., 1869	55	Mr. Garfit.
GRANDEE 2D	Jan., 1870	50	Colonel Reeve.
PRINCE IMPERIAL	Feb., 1870	48	Mr. Mackinder.
CO-RESPONDENT	April, 1870	32	Mr. Hack.
CHARLEY	Sept., 1870	17	Mr. Hack.
32 cows and heifers at		£40 0 0	£1472 0 0
7 bulls at		45 15 0	320 5 0
39 animals at		£45 19 2	£1792 7 0

—We are favoured with a copy of the Brailsford Hall sale catalogue. The sale of the entire herd, which is the property of William Cox, Esq., takes place under the management of Mr. Thornton next Wednesday. The list contains the names of 40 pedigreed animals, besides some superior dairy stock. There are representatives of no fewer than 16 families, the largest group numbering ten individuals, being descended from stock bred by Mr. Richardson, of Hart. In this family the Kirklevington blood is traceable through *Harmony*, a fine white cow, produce of LORD HARDINGE (10,449), and *Harmless*, both bred by the Messrs. Bell. The other animals are from well-known tribes, two being bred by Mr. Clayden, at Littlebury; and a few are of the same tribe as that from which the noted Osberton prize animals are descended. Several go back to Messrs. Booth, Rose, and Fisher's old herds in Nottinghamshire and to Mr. Smyth Owen's and other noted breeders' stocks. Many of the younger animals are by Mr. Torr's GRAND MARSHAL (21,865), a very fine bull, with several crosses of Booth blood upon the favourite Aylesby "G" tribe, whilst some of the cows and heifers are in calf by Mr. Blackwell's prize bull JUPITER (24,228), bred by Lord Penrhyn, with two crosses of Bates blood upon the "J" tribe.

—We hear from Wateringbury that Mr. Leney's *Countess of Wateringbury 2d* produced a splendid rich roan bull calf to GRAND DUKE OF KENT (26,289); and that *Oxford Fawsley 2d* has also dropped a very superior white cow calf to the same bull. This herd has also recently been enriched by two heifer calves by LORD OXFORD 2D, respectively from *Princess Alice* and *Maidenhair*, and two heifer calves by 15TH GRAND DUKE from *Twin Duchess 2d* and *Kentish Gwynne*.

STEAM CULTIVATION.

[We give in the following column the substance of a capital paper on this subject, by Mr. Isaac Robinson, lately read before the Wisbeach Chamber of Agriculture, in which the history and results of steam cultivation are described with both justice and completeness. We have been forced to condense Mr. Robinson's remarks.]

IN 1841 the first portable engine was exhibited at Liverpool as a great curiosity. We have now about 14,000 threshing engines in daily use amongst us. Such vast advantages have been gained by steam, as a motive power in other branches of industry, it is no wonder that attempts were made from time to time by energetic and persevering men to adopt the new power to the cultivation of their land. I will mention a few of the early pioneers.

In 1832, Mr. Heathcoat, of Tiverton, patented a set of steam cultivating machinery, which, I believe, began to work in 1834. This consisted of an engine, windlass, rope and anchor. The engine moved itself along one headland, and the anchor pulley along the opposite one, hauling the plough backwards and forwards between them. This did not prove a success, the cause being, I believe, the want of a better medium for transmitting power; hemp rope being too soon worn out, and chain being too heavy. In 1830, a Mr. M'Crae patented a system similar to Mr. Heathcoat's, but, being intended for the low level lands of British Guiana, where many fields are bounded by parallel canals, the engine and pulleys were placed in punts at opposite ends of the field, which were moved on as the work progressed. With these he worked a balance-plough, three ploughs pointing each way, supported on a high pair of wheels, as in our present system. In 1846 Mr. Osborn, of Demerara, ploughed with two engines; one at each end of the field. In 1849 Mr. Hannam used iron wire rope for steam culture.

In 1851 Mr. Wren Hoskyns, in his amusing "Chronicles of a Clay Farm," brought forward the theory of making a seed-bed in one operation, and thus dispensing with the successive processes of ploughing, harrowing and rolling, &c. He shows that as manual labour is principally vertical, as in digging, horse labour is horizontal, as in drawing a plough; so steam is rotatory in its action, as the fly-wheel of an engine. Taking, then, his idea from the claws of a mole, he proposed that a traction-engine should drag behind it a set of discs armed with revolving claws, which should rasp up the soil and leave the land behind it in the comminuted state of a mole-hill—a perfect seed-bed ready made. The fruit of this book was a perfect crop of patents, and many ingenious machines were made to carry out the theory—such as Romaine's cultivator—but the inventors did not take two facts sufficiently into consideration. First, that you cannot hurry Dame Nature. To make a good seed-bed soil requires, not only comminution into small particles, but also the beneficial effects of sun, air, rain, and frost—in two words, freedom from weeds and atmospheric influences. Second: To move a heavy traction-engine over rough ground takes up so much of its power that it has little to spare in dragging an effective cultivating implement behind it. I submit this last fact to the consideration of those who are inclined to believe that the traction-engine with india-rubber tires can drag a plough more economically than it can be hauled with wire rope.

But to return to our inventions, I must pass over the experiments of Sir John Lillie, Lord Willoughby d'Eresby, the Marquis of Tweeddale, and others, who, by their exertions, have paved the way of steam cultivation, and done much that has proved useful to subsequent inventions. As to later inventions and improvements their name is legion. Time would fail to give you even a slight sketch of the labours of Mr. J. A. Williams, Mr. Collinson Hall, Mr. Fisken, Mr. Boydell, Mr. Hall, Halkett, and others—not undervaluing their good service in the cause, but wishing rather to bring before you the names of the founders of the two systems of cultivation now in practical use among us—those of Fowler and Howard. The late John Fowler was one of those remarkable men possessing all the qualities of a great inventor; skill, ingenuity, indomitable energy and perseverance, a resolution never daunted by obstacles or failure, nor satisfied with any success short of completeness, and the rare ability of being able to learn by other people's failures, and profit by other people's experience, and of being able to call to his assistance a number of clever men who assisted him in his toils. I think I have heard that he spent three fortunes in perfecting his great invention, and he died in the prime of life, leaving his representatives to reap the fruits of his active and persevering exertions in a large and ever increasing business. In 1854, Mr. Fowler exhibited at Lincoln a draining plough worked by steam. In 1856 he showed at Chelmsford his well-known balance-plough, worked by a stationary engine on the roundabout system. Next year at Salisbury, Mr. Fowler began the direct system; he mounted a portable engine on a windlass-frame, which moved along the headland by an anchor fastened a-head. An improved anchorage pulley moved along the opposite headland as the work proceeded. In the same year the Highland Society awarded him the £200 prize, as having found an economical substitute for horse-power. In 1858 the Judges of the Royal Agricultural Society at Chester, awarded the £500 prize to Mr. Fowler, saying in their report: "It is beyond question that Mr. Fowler's machine is able to turn over the soil in an efficient manner, at a saving, as compared with horse-labour, of, on light land, 20 to 25 per cent.; on heavy land, 25 to 30 per cent., and in trenching (deep cultivation), 80 to 85 per cent.; while the soil is left in a far more desirable condition, and better adapted for all the purposes of husbandry." It was on this occasion that steel-wire rope was first used, and from this dates the economical commencement of steam cultivation. Since 1858, Fowler's tackle has received upwards of £3000 worth of prizes at the different shows where it has competed; each year showing an improvement in some detail. 1200 hands are now employed at the Leeds factory, in a trade which, I believe, is now only in its infancy.

After John Fowler, I would mention to you the name of Mr. William Smith, one of the fathers of modern steam cultivation. He is a farmer at Woolston, Bucks, and his occupation is 200 acres of heavy land, or less. Having become convinced of the superiority of cultivating over ploughing, by reasons I propose to mention presently, he invented his cultivator (which was made under the superintendence of Mr. Fowler), and in December, 1855, he began steam-cultivating, with a 7-horse portable engine, and smashed up Oat, Pea, and Wheat stubbles with satisfactory results. Mr. Smith's system has not been greatly altered since its introduction, and is in common use on hundreds of farms. The engine and windlass are fixed in one corner of the field, round which field the rope runs, carried on rope porters, and the cultivator is hauled between the shifting pulleys at each headland. At the Chelmsford show in 1856, Mr. Smith competed for the prize; but, although the work was fairly done, the judges did not consider it more economical than horse labour. Mr. Smith did not exhibit at Salisbury, but made his appearance again at Chester in 1858, by his manufacturers, Messrs. Howard, of Bedford, who have since conducted the manufacture on their own account in the spirited and energetic manner that distinguishes that eminent firm. Messrs. Howard cultivated the land assigned to them in good style, and the judges awarded to them the large gold medal of the Society. The same day the award was published Mr. Smith's neighbours and friends presented him with a tea service worth 100 gs., as a testimony of their sense of the mechanical skill, talent, and perseverance evinced by him in bringing to a practical result the application of steam-power to the cultivation of the soil. Mr. Smith since this time has shown no inclination to hide his light under a bushel; he has published pamphlets and letters, and delivered speeches innumerable; but if he has viewed his own inventions and practice with somewhat too favourable an eye, and those of other inventors with some amount of prejudice and distrust, we must remember that he has used steam cultivation for nearly 15 years, that all this time his farm has been open to the inspection of all the world, and that he has been able to give the plainest practical evidence of the profitableness of steam tillage, and thus fairly earned the gratitude of his brother farmers, and of the community at large. Since 1858 Messrs. Howard have gained many prizes for their steam cultivating machinery, and have made many hundred sets of tackle, principally on the roundabout system advocated by Mr. Smith. I am glad to notice, however, that they now adopt also the direct system of Fowler, cultivating with a traction engine on each headland, certainly the most economical method of applying power, where it can be adopted. It is noticeable also, that since 1858 Messrs. Fowler & Co. have manufactured many more cultivators than the ploughs with which they won the Chester prize.

After this sketch of the introduction of steam cultivation, let me call your attention to some of the practical questions of my subject. First, the advantages of cultivating over ploughing. At certain times of the year every farmer is glad to employ a cultivator, grubber, or scarifier, and acknowledges the benefit of doing so; but the obstacle to their more extended use is to be found in the fact that every effective implement of the kind is more or less of a horse killer. Mr. Smith was, I believe, the first to demonstrate that the cultivator, when drawn by steam-power, is not only an auxilliary but a vastly superior substitute for the plough. I will read you an extract from his letter to Mr. Greaves, 1856:—

"The most approved of our common ploughs simply and absolutely turn over the soil, placing the former surface from 4 to 6 inches below, and bringing up the smooth surface of the under soil to the top. By this process all the seeds, weeds, and roots are deposited below the surface; whence the weeds which are propagated from roots or layers—such as Couch-grass, Water-grass, Crowfoot, Coltsfoot, and others—being divided by the plough are indefinitely multiplied, and do in fact, after four or five years, become increased to so great an extent as to render it absolutely necessary for the farmer to leave his land practically barren for the purpose of removing

these obnoxious weeds; to do which the plough entirely fails him, and he is driven to the scuffler, cultivator, or other implement which he has invented for the purpose. Roots also of the Thistle kind spread horizontally just beneath the pan which is trodden down by horses, and unless recourse be had to subsoiling, can scarcely be eradicated at all."

Mr. Smith then goes on to contrast ploughing with spade husbandry 10 to 12 inches deep, and questions whether it would be generally advantageous to cultivate more than 6 or 8 inches deep, if the subsoil were to be laid upon the top, as is commonly the case in ploughing. Following out these thoughts, and endeavouring to find an economical substitute for the spade, Mr. Smith not only invented an efficient cultivator but he made it take the place of the plough for all operations, except ploughing Clover layers. Ever since 1856 he has stuck to his text, with these results: his farm is as free from weeds as a garden, his crops have increased, and his land is cultivated at much less expense than before. Wherever steam culture is used, ploughing is used less and cultivating more than before; for we find by experience that by cultivating you can destroy weeds better, work your land deeper, and leave it in a more productive state. There is some land, however, where inversion of the soil is desirable, and the plough is the best implement. What is called "digging" also is very popular in some places; it is done by substituting digging breasts for the ordinary mouldboards. The land is worked 10 or 11 inches deep, and is partially inverted, as when done by the spade.

Let us now consider some of the advantages of steam cultivation.

1st, it deepens the soil. There are thousands of acres of good land in this and nearly every other county of England that have never been ploughed more than 4 or 5 inches deep. Year after year the plough-slade has ridden over the subsoil and the hoofs of the horses have trampled it, until it has become a solid pan, effectually preventing the roots from penetrating or even the water from passing through it—in fact the subsoil has become "puddled clay," like the bottom of an artificially-made pond. Now modern farming condemns this; and many good farmers make a practice of subsoiling their land, two furrows deep, once in every rotation, in spite of the expense; but steam does this more effectually and much cheaper. I could point out to you land in this neighbourhood which had grown nothing for years, until it was steam cultivated, and it then, and since, has produced most luxuriant crops of Wheat and Oats. Mind, we do not want the raw clay brought to the top, and the good soil and manure buried 5 inches below it—as a gentleman near St. Ives told me he had served some land six years ago, the effect of which was five years' bad crops—but we want to keep the good soil at the top, freshened with a slight mixture of subsoil, and we want to smash up the solid pan, letting the surface water down by the drain, and exposing the heavy subsoil to the combined influences of sun, air, rain, and frost, so as eventually to make it good soil, fertile and productive. What becomes of those large lumps of clay left on the surface where draining has been going on? Atmospheric influences pulverise them, they mix with the neighbouring soil, and so far from injuring they actually improve it—so is it with the portions of the subsoil brought up by the cultivator. To get the full benefit of steam cultivation, it is, however, necessary that clay land should be broken up when dry, or it soon consolidates again, nearly as hard as before. The Beetroot growers of France and Germany have become converts to deep cultivation; for chemists have shown them that more sugar and spirit can be obtained from a ton of roots grown on deep soils than from the same weight grown elsewhere, for it is that part of the Beet underground that is richest in sugar. Consequently they are now largely buying steam tackle (or were, before this unhappy war broke out) and working their land 18 to 24 inches deep. Mr. Campbell, of Buscot Park, who grows Sugar-Beet on a very extensive scale, loosens his land 24 to 27 inches deep, and finds a great advantage in doing so. I confidently look forward to the time when deep cultivation will be the rule, and not the exception, in this country.

The second advantage I claim for steam cultivation is expedition. You can break up your land more quickly than by horses, at a time of the year when time is money. I have often seen a good crop on a field which could never have been cleaned and sown that season had it not been for steam-power. But steam not only thus helps the backward farmer, but it prevents a man thus ever getting behind. Look at the advantages of steam cultivation, are they, even now, estimated as they ought to be? I say, fearlessly, they are not, or we should not see such a quantity of stubble land unbroken in October. It is directly after harvest, when the sun is hottest, when the land is driest, when the weeds are most easily destroyed, when you can give a half-fallow to your land, when one day's work is worth a week's labour in the spring, it is then that the land wants breaking up. I believe that a farmer who buys extra horses for this work does wisely. But, by the steam-cultivator, you can smash up 10 to 30 acres a day. The steam-horse wants no rest, you can work him from sunrise to sunset, you can even work by night if you have hands enough to manage him, as Mr. Campbell has done by the use of the magnesium light. People speak of the great expense of steam cultivation, the question is, can we properly estimate the value of work done at such a time? A reaping-machine costs a great deal of money, but if you can cut 12 acres a day with it, when your Wheat is all ripe together; how trifling in comparison is the outlay! On many farms whole fallows have been done away with by the use of autumnal steam cultivation, and the land nevertheless kept quite free from weeds.

The third advantage of steam cultivation is that it improves drainage. On ill-drained land, especially where the subsoil is a horse-trampled pan, the rainfall runs off the surface by grips and water-furrows, into the ditches, and thus its valuable chemical constituents are lost to the soil: nor is this all, the water which is retained and cannot get away, stagnates and keeps the land wet, cold, and sterile, while on well-drained land, when the pan has been broken up and horses kept off it, water-furrows are unnecessary, the rain filters through the thirsty soil to the drains, leaving most precious manure behind it. By doing away with grips and water-furrows you not only utilise the land thus wasted, but the reaping-machine and every other implement is worked with greater ease and economy. I could also give you examples of farms where by steam tillage they have been able to grow Turnips and feed them off the land, which was before impossible.

The fourth advantage of steam cultivation is, that on heavy land you save those 350,000 hoof-marks they tell us horses leave in every acre of land ploughed. When your clay land is dry, it is too hard to plough, when wet, the weight of the plough and the trampling of the horses poach the subsoil into the pan we have spoken of. But the steam-hauled implement leaves no mark behind it, and in unfavourable seasons, when you cannot get horses on the land at all, you can still use steam.

The fifth advantage in using steam is that you are able to work a farm with less horses, and spare the horses you keep for the hardest work. Horse labour is the great expense of the farm. Look at the first cost of a horse, take the annual depreciation of his value, cost of his keep, blacksmith's, saddler's, farrier's, and implement makers' bills, add cost of ploughmen and horse-keepers' wages, and you will find the expense to be from £40 to £50 a-year. Mr. J. Chalmers Morton, in a paper read before the Society of Arts, gives the statistics of the horses kept on 21 different farms, and the average cost of each of the 282 horses was £46. On a large farm there are always horses kept, all the year round, for the sake of their work at certain seasons of the year. Substitute steam labour at such times, and you save, not only the difference of their keep for the few weeks, but for the whole year. Supposing that by the partial use of steam you can save four horses' keep—at Mr. Morton's estimate that would amount to £184. Some people have saved much more than that. If you look at the Royal Agricultural Society of England's report on steam cultivation, 1867, when its commissioners visited 140 farms under steam tillage, you will see that nearly all these farmers have largely reduced their horse labour, some keeping ten and some even 25 horses less than before.

The sixth advantage of steam cultivation is that, by its use, the land requires less working, and fewer operations, such as ploughing, harrowing, rolling, clod-crushing, &c. Even when used occasionally, steam-cultivated land is easier to work for years afterwards; but, if the full benefit of steam be obtained—the land broken up at the proper time, and not a horse-hoof allowed to trample and poach the land afterwards—if steam be used continually, and not occasionally, for the light operations of the farm every year, as well as for the deep cultivation every four years, the saving would be enormous. Mr. Smith asserts that the total cost of preparing his seed-bed for Wheat is 7s. 6d. an acre, including every expense; but we must remember that this is after years of continuous steam cultivation.

The seventh advantage of steam cultivation is that it improves the position of the agricultural labourer; it enables a man to earn better wages for himself with less toil, and to do a better day's work for his master; it quickens the pace, and makes a man more handy, smart, active, and self-reliant. I do not think that it will displace any manual labour, but it will rather turn the labour to better account.

The eighth advantage of steam cultivation is, that you can get better crops at less expense, and that the fertility of the land is increased by it. By deep cultivation and good drainage the temperature of the land is raised, the land dries quicker in a wet season, and in a dry season like this year's summer it remains moist and does not parch under the blazing heat of the sun. I could give you facts from my own observation as to the increase of crops from its use, but prefer to refer you to the employers of steam labour round us, and also to the report of the Royal Agricultural Society, mentioned above, where you will find an increase of from 4 to 8 bush. of Wheat an acre obtained in many places. How is it that a labourer can afford to give double the agricultural price for his allotment? how is it that a market gardener can raise such large crops from land no better than that of his neighbours? Liberal manure does something no doubt, but the great secret is in spade cultivation, by which the land is kept free from weeds and open to the rich fertilisers contained in every breeze and in every shower of rain. That it is not the manure, look at the Lois-Weedon system of growing Wheat. You know that by a strip of fallow between every three rows of Wheat you may grow a good crop of Wheat for 20 years in succession if you will, without a spadeful of manure (as the Rev. Samuel Smith has done), and then have the land in as good a condition as ever. What is the secret? only that the land has been kept open to receive Nature's bounty. I have not gone into the question of the peculiar advantages of steam cultivation on light land, because in this neighbourhood our land is principally heavy or else in small fields; but I will say briefly that where the enclosures are of good size, as in parts of Lincolnshire and Norfolk, steam has won triumphs as signal as any of those gained on heavy soil, and is of equal value to the farmer.

To recapitulate in brief a few of the advantages of steam cultivation:—It deepens the soil, and does it more cheaply than horse labour, and much more efficiently; it enables the land to be worked at the best time of the year more expeditiously, and thus destroys weeds; it improves the drainage, and thus makes the land drier, warmer, and more open to receive the blessings of the rain; it saves expensive horse labour; it prepares a seed-bed in fewer operations; it improves the position of the labourer; and increases fertility. My subject is not exhausted, gentlemen, but I fear that I have already trespassed too long on your patience. Had I time, I should have been glad to have given you a sketch of the various kinds of steam cultivating machinery now in use, and the latest improvements in practice; to have discussed the best kind of tackle suitable for farms of different kinds, and the expense of purchasing and working them; the cost of hiring them in different counties, and the customs belonging to them; when it pays best to buy and when to hire; the causes of success, and the causes of failure, with illustrations from modern practice; but time fails. I will, therefore, only notice some of the objections urged against steam-cultivation, and some of the obstacles to its progress, and then briefly consider how the objections may be met and the obstacles removed. Objections against buying tackle:—Want of capital, want of mechanical skill, the example of those who have tried it and not succeeded, the difficulty of getting men to manage the machinery, the risk of breakages, and the cost of repairs; against buying tackle in partnership there is the possibility of all the partners wanting it at the same time, and the additional difficulty of managing men who have to serve several masters. Objections against hiring:—Farmers cannot sell part of their horses, because they cannot be sure of getting tackle when they want it; and, having horses enough to do their farm work, hiring steam is an extra expense; and then, you know, contractors charge such high prices. General obstacles:—No leases, want of Tenant Right, fear of disturbance or increased rent, bad leases, compelling a certain rotation of crops, or forbidding the use of the scythe or reaping machine, timber in fields and hedges, bad roads, small fields, crooked hedges and ditches, want of draining, bad water, want of water. My answer to these objections is this: That any energetic young farmer, who will give his mind to it, may soon acquire enough knowledge to drive an engine and to see that his men keep the machinery in order. Such an one will have little difficulty with either men or machinery; and for him £700 to £800 laid out in steam tackle will be an investment that will pay him tenfold, as it has done hundreds of practical men. As to hiring, if you make a bargain beforehand with a contractor, you are certain of getting tackle when you want it, and can thus get rid of the extra horses. As to the high prices charged, the great point to be considered is, whether the value of the work done is worth the money, all things considered. Competition brings all prices to a fair level. If the trade be profitable, contractors will be multiplied; if unremunerative, they will soon be starved out. But it is evidently to the advantage of the steam-employing community that the men who spent their time and capital in order to bring steam cultivation within the reach of the smallest occupier, should be able to live by their business. Let farmers only prepare their farms properly for steam cultivation, and offer a good breadth of land; and they will be surprised how cheaply and eagerly contractors will work for them. How, then, is a farm to be prepared for steam, to get its full benefits? For this landlord and tenant must unite and work together. In this district we suffer principally from two great hindrances—brackish water, which destroys an engine's fire-box in two seasons, and small and irregularly-shaped fields. In time, however, pits will be dug, and tanks made to retain that valuable rain-water which we now waste so carelessly. Mr. Torr, of Aylesbury, and others, for example, have filled up open ditches, laid pipes instead, and conducted these mains into corner tanks, where two or three fields meet. Fields of 30 to 100 acres will be the rule, not the exception; and their boundaries will be straightened. New farm roads, straight and good, will be made, on which engines can stand when at work. Trees and other obstructions will be removed. A knowledge of steam-cultivating machinery will be deemed as essential a part of a young farmer's education as the rearing of stock or the rotation of crops;

and the next generation of farmers' sons will compete for silver cups at the local shows for steam cultivating, instead of ploughing.

FOREIGN WAR AND ENGLISH AGRICULTURE.

[At a recent meeting of the Hertfordshire Chamber of Agriculture, the following discussion took place on "The Influence of War and its Effects on Agriculture."]

MR. LATTIMORE said: In the good old times it was the fashion to argue that the farmers of the country, of all other classes, were most desirous of war, because of its enhancing the prices of their produce; and he must say that, when we look back to the French war at the commencement of this century, from 65 to 67 years ago, we must admit that there was some reason for the accusation. Owing to a variety of causes the price of bread rose to 2*s.* the quartern loaf. A general opinion prevailed amongst agriculturists that their interests were connected with what were called the warlike tendencies of the age. He was anxious that at the present time the public should not be misinformed as to the general feeling of the agriculturists of this country. They did not wish for war in order that it might bring about a temporary advancement of prices, because they knew by experience that the debt of the country, and the consequent taxation arising from war, falls ultimately upon them and their interests.

The increase of debt and taxation resulting from war is a most difficult thing to get any relief from. With respect to the enhancement of prices at the beginning of the last century, it presented a very singular contrast to the present war. Instead of an advance, there has been a very great decline in the price of Wheat, which has gone down from 6*s.* to 8*s.* per quarter since the commencement of the war, notwithstanding the immense destruction of agricultural produce which has been going on in the provinces of France. As agriculturists they had nothing to hope from war on our own shores, nor did he think they had anything to hope from war at a distance. There was a very great mistake in the public mind in regard to the agricultural views and feelings on this matter. This question leads to that of the derangement of the currency of a country where war has taken place. The measures taken to raise money destroy trade, and the prices of articles of prime necessity are forced down to an artificial standard. Then there was the inevitable accompaniment of loans, which would have the effect of crippling France for many years, may be, for some generations to come. The first grant of the war amounted, he believed, to 500,000,000 f. A large sum was granted under Palikao's Ministry, and a third grant was voted under the Republic. The provinces and all the large towns were raising enormous sums by some means or other, in order to assist in repulsing the enemy. And then we must picture to ourselves the pestilence, the cattle plague, and other plagues following in the train of the contending armies.

He mentioned these things in order to strengthen his position, that the interests of the English farmer are always in favour of peace. Facts and common sense must bring him to the right conclusion, that his interests are inseparably bound up with the general prosperity of the community at large. But how does the present war affect England? When the subject came before Parliament at the close of the session the House of Commons, with its usual liberality in expending the public funds, voted a sum of two millions to put things right, and ensure the efficiency of our military forces. They might depend upon it that these two millions will be very soon considerably increased—it may be, doubled; nor should he like to pledge his reputation that it will not be trebled. Everybody is calling out for efficiency. We want protection; and we must be able to match our own resources against those of any foreign Government.

He wished to call their attention to the present state of English agriculture and its future prospects. We have had two or three seasons which have been exceedingly unfavourable, to our light lands especially, and also to other uncertain lands. He wished them to bear in mind that all these risks and uncertainties fall on the occupier. He would ask them whether they had gained a single point for which they had agitated, whether taxation has not increased, and whether local burdens have not also increased? Their rents and taxes are fixed beyond their control, and their tithes, depending as they did on the rotatory wheel of a seven years' average, were now advancing; and he asserted that the only item of expenditure over which they had any control was that of labour, and they would find, before long, the labour question to be one of the most important of the day. He wanted them to be prepared to meet it, because they would be charged again, as they had been in the past, with being cruel and unrelenting in their treatment of their labourers—especially because at times they discharged some of their labourers and reduced the wages of others.

He mentioned this because the prospect next winter was likely to be a serious one, and because he had seen in a local paper that morning a reference to the subject, to which he begged leave to call their attention. At the dinner that week of the West Herts Agricultural Society, the Rev. Canon Gee was reported to have said that as he was leaving the ploughing field after the distribution of the prizes some man asked him to "come down a little more heavily on the farmers and induce them to do more for their labourers." It was a serious matter for reflection how they were going to employ all their surplus labour next winter, so that local distress might not be laid at their doors. War had left them a load of debt and taxation, and they had been unable to free their industry from any burden. He wanted them to look the difficulty in the face. He did not want the farmers to become justly charged with being cruel and harsh to their labourers. Stern necessity might compel them to employ a smaller number of labourers than they would otherwise retain in their service.

He had spoken of the war as affecting the interests of the agricultural community, but it was not easy to separate the interests of the commercial classes from those of agriculture, for if they do not immediately act upon each other, they do so ultimately. There are the effects of war on the great moneyed interest. Let them consider the panic which took place at the commencement of this war, both in regard to foreign and English stocks—the consequent loss of many millions sterling, and the very great ruin and rout amongst the stockbrokers, and let them remember the feeling of distrust which spread amongst the trading and commercial interests. If they read the accounts of the wool trade, in which they as farmers had a great interest, they would find that it was paralysed in consequence of the war, and that the cotton trade has been exceedingly bad, although it has not perhaps been affected so seriously as the wool trade. The immense increase of the national debt of France must also affect our own trade, and eventually that of Europe and America, and the whole world. In the present state of things everything vibrates from the centre to the poles. No country is cut off from communication with the rest of the world as in former days, when Bonaparte promulgated his decrees. The effect of a war between two great nations is felt throughout the civilised world. All classes have regard to their own interests, they all like prosperity better than depression. He knew that the agricultural interest has often been charged with selfishness, and with the desire to enhance the prices of their produce, even at the cost of war. He repudiated the idea altogether. If war gave them a temporary advantage, it would inflict a tenfold penalty on them afterwards; but it is natural to all classes to derive as much profit as they can from their several occupations.

He now came to speak of what he regarded as the true and permanent interests of agriculture. He wanted freedom for their industry and security for their capital. With respect to the burdens of taxation, he claimed an equal interest for the agriculturists of this country in the public expenditure, and the general economy and efficiency of the public service. They might increase the public expenditure, and yet the efficiency of the public service might not be advanced at all. We have too many field-day displays, instead of the settled, solid, industrious determination of every man to learn his duty thoroughly, and perform it effectively. If they could extend this determination to the agricultural labourer, it would tend as much to his interest as to that of the farmer. In war agriculture was the first interest to suffer, and he believed it would always feel the ultimate burden to the latest hour of its existence. Their prosperity must always depend on the power of consumption in the people. He would not detain them longer, except to move the following resolution:—"Resolved that, in the opinion of this meeting, the influence and effect of war is equally disastrous to the prosperity of agriculture, and to that of the community at large."

MR. KIMPTON seconded the motion.

MR. M'GEACHY.—I do not know that the few words that I shall venture to say will exactly be in support of Mr. Lattimore's resolution, though I agree with much that he has said. I think the resolution proceeded in some degree upon the assumption that there is an impression in the country that the agricultural classes are particularly in favour of war. I do not think that at present any one can legitimately say there is any ground for such a charge—for a charge, and a very serious charge, I conceive it to be. The state of this room proves that the agricultural classes, at any rate in this county, are not particularly anxious on the subject, or, I presume, they would be here to state their opinion on one side or the other. But I agree entirely with what Mr. Lattimore has said as to the great importance of bringing the real grievances of the agricultural and other classes before the Legislature of this country at this particular period. If instead of being satisfied with getting from members a general opinion on the war, some decided steps were taken by the agriculturists, either in their Chambers, or individually, to impress on their county members what their opinions are upon particular subjects—for example, upon the subject of game—they would then bring things to some practical conclusion. I believe that incalculable damage and injury is done to this country by the attempt to keep up a show of perfect acquiescence and contentment, when in reality very great discontent prevails, and very great differences of opinion exist.

The state of the country is ostensibly and apparently perfectly secure and flourishing, although in many parts of it the condition of things is anything but satisfactory. With regard to the agriculture of the great agricultural county of Norfolk, for instance, instead of advancing and improving, it is unquestionably retrograding. There are at this moment about 18,000 acres of land in that county without tenants, and with no prospect of getting any. I am informed, on excellent authority, that this arises entirely from the extravagant extent to which game has been not only maintained, but increased in that county. A gentleman of late years has been a resident and a landed proprietor in that district—one who we might suppose would carry good with him wherever he goes, and one who, we believe, is at least desirous of doing so. I see it stated by persons who speak from experience that since the Prince of Wales has become landowner, the game-ridden counties of Norfolk and Suffolk are actually worse off in respect to game than ever. That is a most dangerous state of things. I do not know whether the members of the Chamber are disposed to agree with me, but I venture to move, as an amendment to the resolution which has been proposed, "That it is the opinion of this Chamber that the frightful war which has broken out in Europe, and the enormous amount of our present taxation in a state of peace, makes it a matter of common sense and sound policy to set our own house in order by removing all the grievances of which the agricultural classes have to complain, and that it is therefore expedient to memorialise the Government to take means, without delay, for effectually dealing with the crying grievance of the Game Laws.

MR. DIMSDALE said, considering that the subject of discussion was the war and its influence upon agriculture, he was certainly not prepared for the introduction of a discussion upon the Game Laws. He entirely agreed with Mr. M'Geachy that the Game Laws is a question which ought to be discussed in a meeting of that Chamber at the earliest possible opportunity, and that the county and borough members should distinctly state what their opinions are. He did not wish to be the only member to be shot at, but if it was thought desirable to have a conference on this subject, and the county members would attend, he himself should be willing to take part in it. He neither thought the Game Laws should remain in the condition in which they now are, nor was he prepared to go in for their total and immediate repeal. He therefore had more reason to be glad of an opportunity of stating his convictions on this subject. It was comparatively easy to say "Aye," or "No;" but when you could neither say one nor the other, you required a longer time for expressing your real sentiments. He quite agreed with what had been said in reference to the importance of bringing all classes of the community together, of finding out their grievances, and of endeavouring to remove them. In former years the agriculturists had shown themselves, if anything, rather too reticent in the expression of their grievances. It was much better that they should make them known in a clear, definite, and distinct manner to those who had the power of remedying them, than to allow them to create a state of alienation and ill-feeling, which is very injurious to the community.

DRAUGHT OF HORSES IN PLOUGHING.

THE old question, "how best to harness our team to the plough," has been revived by the recent dynamometrical experiments in favour of double-furrow ploughs as against the draught of single-furrow ploughs. It required an Act of Parliament to prohibit Irish farmers from yoking their teams to the plough by the tail, and when it is borne in mind that the ground under each of the four feet of a horse forms a fulcrum to the system of levers thus applied, something more has been said in support of the old Hibernian line of draught than some may imagine, for it has been argued that the diagonal of the forces involved is the line of the tail and backbone. But the forces thus indicated by the fulcrage of the ground under the feet also represent vertical angles, so that there are two forces for every foot, eight for every horse in the team. And as the horses pull horizontally and vertically at different angles against each other, it will be seen that the application of such a number of forces to the plough is far from a simple question.

By various modes of equalising the draught of the horses, by the traces and whippletrees, the different forces are in a great measure resolved into a common diagonal, usually termed the line of draught. Thus, if there are two horses in the plough, of unequal strength, we give the weaker horse the long end of the yoke. In like manner we equalise the whippletrees for a 3-horse team pulling abreast, and by the addition of a chain and pulley we equalise the draught of a double team, whether two or three horses abreast. The draught of a 3-horse team can also be equalised—one horse, either in the furrow or on the land, before two abreast.

There is much in the advance thus made that commends it to a favourable notice, but more perhaps that requires reconsideration with a view to further improvement. Those who have studied the matter practically in the field when holding the plough, will readily perceive that the theory of a line of draught assumes a centre of resistance never met with in ploughing. They also know that "a bad going team makes a worse going plough." Likewise when the point of the share comes against a stone,

that such is the point of resistance for the time being, and that the vertical angle of draught is increased. If the land horse pulls at an angle inwards to or outwards from the furrow horse, that will shift the line of draught laterally, and hence the centre of resistance. If the horses walk with unequal step, that affects the line of draught laterally; and however well matched they may be, and however well timed the step, there is less or more of a rise and fall at every step—much greater in some horses than in others, and this affects vertically the line of draught in a corresponding degree. Add to these the manner ploughmen change the assumed centre of resistance by unequal pressure on the handles, laterally and vertically—purposely, no doubt, to keep the centre of resistance where it should be, but practically proving its tendency to shift by adverse forces—and it will readily be seen that the line of draught on paper conveys but a very general idea of what it is in practice.

This, although essentially necessary to notice, is not exactly the peculiar view of the subject which we propose discussing. The two questions we wish specially to raise at this time are, (1), the difference, if any, between the centre of resistance in single-furrow ploughs and double-furrow ploughs; and (2), the economy of muscular power in the resolution of the numerous forces involved into a common diagonal or line of draught in hauling single-furrow ploughs and double-furrow ploughs, and how this affects draught as indicated by the dynamometer.

What has already been said applies to the centre of resistance of single-furrow ploughs, and, therefore, this side of the first question may be considered disposed of.

The centre of resistance of a double-furrow plough will lie somewhere between the two ploughs. Assuming, therefore, the two furrow slices are equal, as they ought to be, the edge of the second furrow may be taken to represent a bird's-eye view of the line of draught. In the annexed printer's rule diagram (fig. 259)

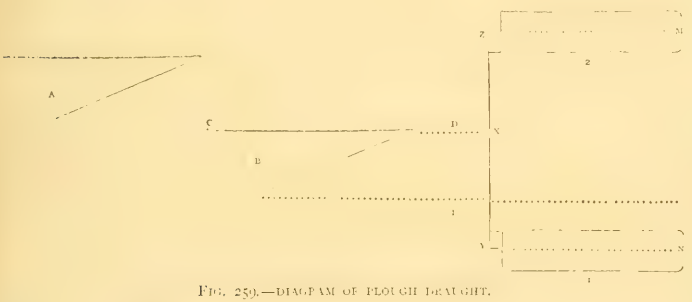

Fig. 259.—DIAGRAM OF PLOUGH DRAUGHT.

let the angles A and B represent the bodies of the two ploughs; let the dot C be the centre of resistance; the dotted line D the line of draught, E the edge of the last furrow or unploughed land, Y Z the line of whippletrees connected to the line of draught at X, and the double lines 1 and 2 the path of the off and near feet of two horses, and the dotted lines M N the two lines of draught. How and where to yoke the third horse we s hall notice further on.

The distance between D and E is the breadth of the furrow, and if we assume this to be 10 inches, X Y and X Z will each be 15 inches, N being in the middle of the open furrow, and the two forces M and N 30 inches asunder, the former (M) representing the land-horse and N the furrow-horse. If we further assume that the horses are equally matched, the force M equals the force N. Now, as the tines M and N should always remain parallel to each other and to D, it follows that the distance X Y is arbitrary, and that the distance X Z must be equal to it when ploughing two 10-inch furrow-slices. If we reduce the breadth of the furrow-slice without reducing Y Z, *i. e.*, the length of the whipple-trees, the horses, if coupled proportionally closer, would pull at an angle inwards to each other less or more sideways, at a sacrifice of muscular power and applied force. If the heads of the horses are not coupled proportionally closer, but remain, 30 inches asunder, the position of the furrow-horse N, which is arbitrary, would be worse, and the sacrifice of muscular power and applied force greater, and the land-horse M would pull as much outwards as the furrow-horse pulls inwards. But were the land-horse coupled so as to be enabled to pull parallel to the open furrow, the sacrifice of muscular power and applied force would fall wholly on the furrow-horse. If the breadth of the furrows is increased without increasing the length of the whipple-trees or line Y Z, the horses, if coupled proportionally wider, would pull outwards at an angle from each other, when similar sacrifices would be experienced.

If we next take an example of unequal forces, then as the distance X Y is arbitrary it follows that the long end of the yoke, to which the weaker horse is applied, must be the land's end. In examples of this kind the horses require to be driven carefully, which is often very difficult to do, owing to unequal step; for if the furrow-horse moves an inch in advance of the land or weak horse, the latter will fall more than an inch behind, owing to difference in the length of leverage. In other respects Y Z must be shortened or lengthened, according as the furrow-slice is made narrower or wider, to avoid sacrifice of muscular power and applied force as in the preceding example.

We now come to the problem of yoking another horse, so as to make a 3-horse team. Three plans merit notice, and these we shall examine separately.

1. From the data given under the last example of the weaker force on the land, it will readily be seen that three horses cannot be yoked abreast without sacrificing muscular power and applied force, however close they may be driven. This arises partly from the distance X Y being limited to the breadth of one and a-half furrow-slice, as the force N should be in the middle of the open furrow, and partly from the impracticability of making the opposite end, X Z, half the length, as that would not afford sufficient space for the two land horses to walk. Three horses working abreast must not be confined, otherwise the middle one will become overheated; and, besides overheating, when driven too close they knock against each other, thus producing effects too obvious to mention. According to this plan the point X would require to be at Z, immediately behind the middle horse, which would shift D, the line of draught. No doubt by means of a land-hake or bridle the point X could be shifted to Z, the distance X Z making, with the beam of the plough, a bent lever. But although the device is in common use in ploughing soft boggy land, where all the horses have to walk on the land, the theory is more apparent than real, for the line of draught D, although it would not be shifted to Z, it would be shifted to within a third or so of the distance from it, so that considerably more draught would be required to haul the ploughs. A similar increase of draught would be the result were the ploughs constructed to work with two horses hauling on the land abreast the furrow-horse.

2. The second plan of yoking a 3-horse team is to put two horses in the furrow, the one before the other, and to yoke the other horse on the land to the long end of an equalising yoke. According to this plan it is easy to lengthen X Z so as to make the force M balance twice the force N, and to make the forces pull parallel to D as seen from a bird's-eye view. But it is otherwise when we examine the vertical angles which the several lines of draught make with the surface of the ground. Thus the rear horse in the furrow pulls at a greater angle than the leading horse in the furrow, while the latter pulls at a greater distance from the plough, or point of resistance C; some difficulty, therefore, is experienced not only in equalising the draught of the two furrow-horses to each other, but also the draught of the two furrow-horses to that of the land-horse, the three forces applied being unequal quantities when the three muscular powers are equal, and to equalise the two ends of the yoke X Y and X Z to different breadths of furrow-slice.

3. The third plan of yoking a 3-horse team is two abreast in the rear and one in front on the land, yoked to point X by means of a long chain, and the leading horse pulling in the line of draught D, as seen from a bird's-eye view, or plan view, as in the annexed diagram. Thus seen the draught of the leading horse does not interfere with that of the other two, and it is more easy to equalise the yoke for different breadths of furrow, and although the leading horse is equally distant from the point of resistance, as in the second example, yet being in a line with it, it is less objectionable: but it is more difficult to drive the leading horse on the land than in the furrow, more especially when ploughing narrow, as his two feet next the furrow are apt to slip in; and at the headland it is necessary to turn in before the traces are allowed to slacken, to prevent the feet of the rear horses getting over the long chain by which the leading horse is yoked. If the leading horse walks at a greater distance from the edge of the furrow than the line of draught, D, the line of draught will be shifted and the other two forces deranged. In a practical light there are several objections, therefore, to this plan of yoking a 3-horse team.

As to the plough, when we examine the action of the wheel in the furrow, behind the furrow-horse, with that of the wheel on the land, and the action of the two with that of the wheel behind in the last furrow, we find more to interfere with the centre of resistance and line of draught than the hauling of the team in front. It is just as necessary that the wheels move in parallel lines as it is that the horses move in parallel lines, and that the pressure upon them shall be reduced to a minimum; for when they move in different lines from each other and from the lines of draught, and press heavily and unequally on the ground, such facts prove so many adverse forces.

The steering of the implement by the leading or rear-wheel, for example, proves the effect which its course has upon the direction of the ploughs, and hence the centre of resistance C, and line of draught D; and when we further examine the manner, or oblique force, or rather resolution of forces by which this is done, we also perceive that any obliquity in the running of the wheels must increase draught, as indicated by the dynamometer. So in like manner, if we see any oblique action of the ploughs on the land side or furrow side, in squeezing up the furrow-slice to any peculiar form, the conclusion is increase of draught; and as extra pressure on the wheel indicates pulling at a higher vertical angle, we arrive at exactly the same conclusion. *W. B.*

Home Correspondence.

Ransome's Double Plough. — Having noticed the letter of your correspondent, "W. B.," under the above head in your paper of last week, we feel it due to ourselves to state that, though "W. B." may have noticed some points in our plough which he considers similar to those in an expired patent of William Smith, Esq., of Woolston, our plough is manufactured under a distinct and separate patent, which has not yet been published by the Patent Office, and that when he has an opportunity of examining the patent, he will find that our invention is perfectly distinct from that to which he refers. *Ransomes, Sims & Head, Ipswich.*

The Sewage of the Town of Ayr.—I would propose, 1st, That the sewers of the whole of that part of the town which lies on the south side of the river, shall be so arranged and conducted as to concentrate at, and converge to, a point, on the margin of the sea, to the south of the County Buildings. That from this point the whole of the sewage of this, the largest part of the town, shall be conveyed in a sewer (one or two large earthen pipes) along the margin of the sea, to a point very near to the mouth of the River Doon, taking advantage of the lowest ground, so as to secure a gentle fall, at which point a covered reservoir of moderate size shall be constructed, which shall receive the whole contents of the sewer for a given number of hours. 2d. That, at the proposed reservoir near the mouth of the River Doon, a steam-engine should be erected, probably of 25-horse power, to drive a plunger forcing pump, in order to propel the sewage in an iron pipe to its ultimate destination. 3d. That a well-considered and equitable agreement should be entered into between the authorities at Ayr and the proprietor and tenant of the farm of Greenan (the extent of which farm is believed to be about 300 acres), under which agreement the sewage should be taken for application to the lands of Greenan on terms to be agreed on. 4th. That a position should be fixed on, on the highest ground in the farm of Greenan, where a large covered reservoir should be constructed, into which the sewage should be pumped as a storage, when not wanted for immediate application to the land, such reservoir to be constructed by the owner of the land; but the arrangements as regards pipes for distribution should be such that the sewage should, if possible, go direct to the land, the storage being resorted to only when this could not take place. Let it be supposed that the works to be executed by the authorities at Ayr should cost £3000, £4000, or even £5000. In consideration of receiving the whole sewage delivered on the land, let the proprietor and tenant of Greenan undertake (as they may agree) to pay 5 per cent. annually on the sum expended, for five years, and after that time 7½ per cent., and when the capital sum was repaid, perhaps the payment might revert to 5 per cent. In no event could the annual payment exceed 20*s.* or 25*s.* annually per acre, on the whole acreage of the farm; a very small sum for manure of such value, which could not fail to add to the value of the farm to a far greater amount than the payment. The working and maintenance of the steam engine would be a small annual charge upon the town of Ayr, but for it there would be purity and health to the whole inhabitants. As regards the farm of Greenan, it is believed that such an arrangement would raise its value indefinitely; but instead of entering on any statements here, as to the advantages of using sewage in agriculture, reference may be had to a letter from Mr. Mechi, published in the *Times* newspaper, September 23, 1870, on "The Use of London Sewage." There can be no doubt but the letter of Mr. Mechi is deserving of the most careful attention. The same system could be applied to the sewage of that part of the town which lies on

the north side of the river, on a scale proportioned to the population. It could be made to concentrate at a suitable point, to be fixed, and conveyed by similar means, adapted to the local circumstances, to the Prestwick Sands, or other suitable land, on which it would confer the like benefit. *N.*

Sewage Utilisation: the "A. B. C." Process.—From correspondence and remarks in your own and other journals, it would appear an impression is gaining ground that the "A. B. C." system of utilising sewage has been extinguished. So far from this being the case, the process is going on at Leamington, and will also shortly be at work, and visible, at Hastings and other places. The cost has been reduced both by cheaper chemical substitutes and mechanical improvements, and the committee of the Leamington Local Board (appointed specially to inspect and visit the works) report on the freedom from nuisance, and bear testimony to the absence of all cause of complaint from the process, as now conducted. Our silence has been caused by a determination to arm ourselves with such chemical and other proofs in refutation of the unfair arguments, and unjust insinuations of the Royal Rivers Pollution Commissioners (in their recent report) as will entirely overthrow their conclusions, founded as they are on false premises. These proofs are being prepared in the form of a protest addressed to the Home Secretary, which will shortly be made public. Meanwhile, I would ask town authorities to suspend their judgment, and not incur expenses which they would hereafter regret if (as I feel confident of doing) we can show the unsoundness and unfairness of the Commissioners' report, and can prove that the "A. B. C." process really does abate a nuisance, does purify the sewage, and render its effluent water fit to enter running streams, and does produce a dry, inodorous manure, and at such cost as yields a handsome profit, while its great fertilising properties obtain for it a ready sale; in fact does solve the great sewage question. *C. Rawson, General Manager of the Native Guano Company (Limited), 1, St. Swithin's Lane, London, Oct.* 26.

Paterson's Bovinia Potato.—I recently saw in your columns a statement given of the produce from 10 lb. of the above Potato. I also planted 1 lb. last spring, and when taken up their weight was 66 lb. exactly. If you think this worthy of notice, please to insert it. *Wm. Peachey, Gr. to Mr. Hole, Quorn Lodge, Loughborough.*

Ploughing Match at Market Drayton, Salop.—Here, on Friday last, we witnessed one of the most spiritedly carried out ploughing matches of the season, several very clever schemes being for the first time introduced, greatly to the furtherance of the benefits that accrue from these meetings. First, there were prizes awarded for the best double-furrow ploughs taking prizes for efficiency, simplicity, lightness, strength, and durability of construction, with the most varied powers of efficient performance of work in the field with the least labour to man and horses. Then there were prizes to the ploughmen who performed their part the best, taking into consideration the efficiency of, and labour required by, the implement used. Similar prizes were given for single-furrow ploughs in the champion class. There were also 26 pair-horse teams competing on a field of Clover root, soil sandy loam, which showed both the powers of the men and excellence of the ploughs to great advantage. The judges were:—Mr. J. Webb, New House, Chetwynd; Mr. J. Young, Keele; and Mr. H. Denton, the eminent engineer, Wolverhampton, mechanical judge. These gentlemen did their duties under almost incessant rain, with an amount of careful attention to the various points and parts of their onerous duties, that inspired the onlookers with confidence in the inquiry. The competitors in the double-furrow champion plough class—Ball & Son, Rowell; Corbett & Son, Wellington; Corbett, Shrewsbury; Fowler's, by Gouldburne & Wilkesby, Chester; Hornsby & Sons, Grantham; Howards, Bedford; Ransomes & Sims, Ipswich; and Underhill, Newport. The work done by the most of them was satisfactory, although it was evidently generally hard work for both man and horse. The 1st prize for the best plough was awarded to Messrs. Howards' double-furrow plough, with steerage, and leverage for raising it out at the ends and regulating the depth while in progress; 2d prize, to Corbett & Sons, of Wellington. Messrs. Ransomes & Co.'s and Messrs. Ball & Son's ploughs were highly commended on account of the excellency of the work. The 1st prize to the best double-furrow ploughman was awarded to James Barker, champion ploughman to Ransomes & Co.; 2d prize, to Mr. Corbett's (of Shrewsbury) champion man, John Spencer. Highly commended: John Clarke, Messrs. Ball & Son's champion. In the single-furrow champion class the plough prize and ploughman went together, Ransomes & Co.'s plough taking the 1st prize, and their celebrated man, Barker, 1st prize as best man; Stephen Blunt, Milton, Northampton, taking the two 2d prizes as owner and holder of Howard's plough. In the local class, the whole 26 teams did their work exceedingly well, but that of the prize-takers was of champion class style. 1st prize to Lord Combermere's carter, J. Evanson, with a Howard's plough; 2d to Mrs. Ward's carter, Allen Jarvis, with Howard's plough, 3d to Mr. Burgess's carter, W. Elson; the 4th and 5th prizes were won by Hornsby & Sons' ploughs, but we did not obtain the names or number when read out. The *Newport and Market Drayton Advertiser* did very good service by publishing immediately the lots were drawn the number of lot, owner of team, ploughman's name, and ploughmaker in all of the classes, tabulated in four columns upon a card; these were sold on the ground at twopence each, and such accommodation to all visitors was well patronised, and would have been at double the money. *L. P. B.*

Foreign Correspondence.

TORONTO: *Insects Destructive to the Wheat Plant.*—A considerable portion of the following information has already appeared at different times in the columns of the *Gardeners' Chronicle and Agricultural Gazette;* but as the readers of a newspaper are constantly changing and being added to, and as comparatively few people file and bind any kind of newspaper for future reference, repetition is more admissible in the transient literature of the day or week, than in any other class of publication. Those who already know all about it need not read the following observations, to those who do not they may be interesting.

I observe that the agriculturists of Britain have lately suffered by the scourge of the Wheat midge, and that considerable alarm has been felt in agricultural circles in the advent and increase of that pest; and well may they feel alarm when they are informed, that the insect in question has for the last 20 years so devastated American and Canadian Wheat fields, as to reduce the growth of the fine white Wheats which used to flow into Britain in a continuous stream from this continent to a minimum, and that it has reduced the entire growth of fall or winter Wheat throughout the continent fully 50 if not 75 per per cent.; whilst the quality of all fall Wheat is so reduced that the high prize of £25, given by the Canada Company annually at our yearly Provincial Agricultural Exhibition of Canada for the best 25 bush. of fall Wheat, does not now produce samples (even when prepared in the most careful manner) equal to the general crop of 20 years ago, and which, in the greatest beauty and evenness of size of grain and purity of colour, used to fill our storehouses by hundreds of thousands of bushels. Whole shiploads, as received in detail from the farmers' waggons in those days, showed an average sample better than is now produced as a specialty.

The three great insect enemies to the Wheat crop are the Hessian fly (Cecidomyia destructor), the Wheat-stem fly (Chlorops pumilionis), or an American species of that insect as yet unnamed, the Wheat midge (Cecidomyia tritici); and there is another which often does us great mischief, but of which entomologists do not treat. It is an insect as small as the Wheat midge, it pierces the grain whilst in a soft state, deposits its egg in the body of the Wheat corn, in a similar manner to the Pea bug (Bruchus pisi), and the worm or maggot of which remains imbedded in the substance of the grain until it has destroyed it and is ready to complete its transformation; when it leaves the grain, and doubtless retires to the earth in the same manner as its congeners, and hybernates, so to speak, in its chrysalis form until the following summer calls it into activity.

The ravages of the Hessian fly have been dreadful, and those of the Wheat-stem fly equally bad, so much so that in a still day you could stand and look at the crop in the right season on a still day, and see the stems of Wheat fall right and left, weakened and cut off in the tender portion of the stem and at the joints by the worm of the Wheat-stem fly, until the stems could not bear the weight of the heads of grain, and so fell or broke down.

Happily, however, these are things of the past; they still exist, but only cause a small percentage of destruction; and as one enemy is quite sufficient to deal with at a time, I shall confine myself for the rest of this article to the "Wheat midge."

The Wheat midge makes its first appearance for destructive purposes just so soon as the ear of the fall Wheat shoots forth from the sheath; the flies flutter about the plant day after day as it ages, and gather strength for mischief, until the fly has attained its full strength, the ovipositor is fully formed, and the female of the fly is in a fertile condition. It then seizes on the separate chests of the ear of Wheat, pierces them with its ovipositor, and in the act of so doing lodges, within the space which in future should hold the "pickle" or grain of Wheat, a tiny yellow egg; the ovipositor is then withdrawn, and a second and third egg deposited in the same way, but it only appears to deposit one egg at one piercing. When I call it an egg I am perhaps wrong, and should perhaps call it a maggot,—if it is a maggot it does not show signs of life for some days,—and as in its after changes the yellow skin in which it is enveloped is never parted with, it may in this first stage be called either egg or maggot; it is of a bright orange colour, and is plainly discernible to the naked eye. As it attains strength or life it works down to the bottom of the grain-case, and establishes itself at the side of the stem of the future blossom of the grain; this it pierces, and as the juice which should form the future grain exudes from the wound, it devours it, and seems to keep the wound in a fresh state, until the maggot has attained its full strength and growth, then it either crawls up the sheath and falls from the top of it to the ground, or it remains in the sheath and falls into the chrysalis state there (most of them, however, leave the sheath and fall to the ground); there it works its way into the soil, turns into a chrysalis within its yellow skin, and remains till the following summer, when it comes forth from the soil again as a fly to renew its ravages. When the Wheat is badly attacked, every space where a grain should be is occupied by these little yellow worms, until the entire crop is destroyed, and it will not pay the cost of threshing. The insect commences at the lowest grain of the ear, and then continues from chest to chest until the top is reached.

Sometimes the insect is not ready as soon as the grain is, then the lower kernels of the ear will be full, and fair Wheat, while the middle and upper are destroyed. When the grain has become developed, and has attained a certain stage of growth, although it is still soft, the insect cannot injure it, but for a time it grows with the grain, until it actually forms a depression in the outside or bran of the grain, but then the grain is safe and comes to perfection. So numerous are these worms, that if you take a small bundle of the affected ears, say five or more, and beat them gently on a sheet of paper, the yellow maggots will come out by hundreds, and can be collected into quite a heap.

All those which do not escape from the ear and fall on the ground are carried into the barn, and remain in the ear until threshed, when quantities are separated by the fanning mill, and go into the small seed drawers of that mill, and are of course destroyed by the farmer. Those which escape hatch out into the small flies as soon as the spring is far enough advanced; and the manure in the farmyard, the straw which remains unconsumed, and the surface of the stackyard and threshing floor, all in time yield their quota of insect life on the arrival of the proper season.

Now if the maggots which fall on the ground were always allowed to remain undisturbed in their winter quarters, until the season naturally brought them forth, we should have one season of fly and have done with it. All the Wheat which was in a proper state would be destroyed, whilst that which was either too early or too late would escape; for it has been ascertained beyond question that the egg-depositing time of the insect does not (individually) extend to a greater length of time than from ten days to a fortnight, perhaps not so much; but with so tiny an insect it is very difficult to ascertain exactly all the course of its life. The time it comes forth for mischief is the evening, and it continues its egg-depositing throughout the night, whilst the dew renders the casing of the grain the softest and the most easily pierced. Take a light into a Wheat field at night, in still weather, and you will see countless millions of these midges at their deadly work; but during windy weather, and during day time, they lie hidden amongst the leaves of the Wheat.

When the Wheat stubbles are ploughed, and the surface of the soil inverted, the insect, in its chrysalis state, is buried with it, but after ploughings and cultivations again bring it to the surface, or so near to it that it can wriggle itself through the soil to the surface; and then, as soon as the temperature is favourable, it comes out as a fly, and is off to the nearest Wheat field.

In Canada, and a great portion of America, we cannot be sure of our Clover crop, unless the Clover is sown with the fall Wheat; or at all events we can be more sure of that crop when fall Wheat is seeded down; and it is, therefore, the custom to get the Clover crop from the previous year's Wheat stubble, hence the first crop of midge comes from the Clover fields which were Wheat stubble. As soon as the temperature allows they come forth among the Clover, and the field seems alive with them; these, as soon as strong enough, attack the nearest Wheat, and no barrier can stop them.

The Wheat-midge always attacks the Wheat field from the outside; the parts round the fence are always the worst affected, while sometimes the centre of the field will entirely escape. The enemy is not hatched in the growing Wheat field, but always comes from abroad.

When midge-infested Wheat stubbles are ploughed in the fall or early spring, and then reversed in the proper season, the yellow chrysalids, now grown to their full extent (for they certainly grow whilst in the chrysalis form, and in this differ from other insects which undergo similar changes), are seen by countless millions. They cover the reversed furrow like yellow seed, and as the surface of the tilled soil is reduced by the harrow, they fall into the tracks of the harrow, and rest at the bottom, and look like drilled seed, plainly visible in the little furrows when looking lengthways of them. Of course, these all come forth as soon as they are ready, into the fly shape, and these only form a portion of what are in the soil. As Wheat stubbles are ploughed and worked at different times during the spring and summer, the midge season is lengthened out by successive crops of the insect, developed as often as a new crop of them is exposed to the air.

Having thus traced this destructive insect from one stage to another, we will now refer to the various means which have been adopted to guard against its ravages.

As a matter of course, there has been any amount of quackery and charlatanism brought forth by such a visitation. Thousands of schemes have been adopted, but the only ones really effective have been very early sowing in the fall, on early ground, and the late sowing of spring Wheat; the first mentioned, in favourable land, comes a few days before the midge; the latter mentioned comes into blossom after the midge season has passed.

At first the fall Wheat only was affected, with us, by midge, and spring Wheat (even when sown at the earliest possible moment) escaped, and we all supposed that the sowing of spring Wheat only, and the banishment of fall Wheat, was the cure; but we were soon undeceived. When the midge had not fall Wheat to attack it attacked spring Wheat, while in a proper state for it, until now early-sown spring Wheat is as badly affected as fall Wheat. This reduced us to further straits, and we tried every known kind of Wheat sown very late in the fall; some of the latest kinds of these escaped the midge, but, unfortunately, late-sown fall Wheat is in Canada peculiarly susceptible of rust, and on a great scale this remedy proved worse than the disease. It is a curious fact that no fall Wheat in Canada sown later than the first week in September can be depended on not to rust; and our best farmers often finished their fall Wheat sowing by September 1. Our early-sown fall Wheat ripens in the July following.

It was soon observed that certain districts (unfortunately small in extent) missed the midge, and it was at first supposed that the "ground" was midge proof, but close observers soon discovered that it was a matter of season only, and that so closely did failure follow success, that the low moist spots in a field of Wheat (otherwise free from midge) would be affected as badly as any other land, and it was only the few days' difference in growth (that of the wet land being somewhat later) that caused the difference.

It was also found that these same midge-proof lands, if heavily manured for the Wheat crop, so as to defer the stage of safety for a few days, were affected as badly as any other, and therefore everything which would retard the crop, even at the expense of an extra fertility, had to be abandoned.

Most of our Canadian lands, however, are not of this nature; taken as a whole the country is very level, and where the melting snow of winter and the spring rains cannot run off with great rapidity the ripening of the crop is delayed, and the produce is brought into the season of danger and destruction from midge.

So things went on for some years, until a sample of good white fall Wheat became a rarity in the market, and the interest of the farmers was brought to the lowest ebb. Spring Wheat, when sown early, was destroyed by the midge, and when sown late all, except one kind, ran the greatest risk of being destroyed by the rust; and indeed immense areas of spring Wheat were so destroyed, until scarcely anything but the "Fife Wheat," the kind free from rust, was grown. Just then our neighbours, the Americans, discovered a kind of Wheat which was stated to be midge proof, and which experience has shown to be so, —that grain, though vastly inferior to our old white Wheat, is now very extensively grown. Several other kinds, also, midge-proof, have been found, and we are now proceeding with an annually increased growth of fall Wheat, which, although not so good as it used to be, meets the wants of the country, and makes up in a great measure for the mischief of the midge.

Some kinds of spring Wheat also resist the insect, more or less, and we hope for its ultimate extinction as an agricultural plague.

Fortunately for Canada, just at this period a great demand sprung up for Barley in the States. The price of that grain rose to a great height, and the export from Canada is now very large; and this, and the midge-proof kinds of Wheat has restored, in a great measure, the prosperity of our farmers.

For some years the midge attacked the Barley, the insect pierced the skin of the grain, and the worm lived and thrived, and destroyed the grain so affected; but it never could emerge from the Barley, and thus finally perished; the Barley is but little affected in this way now.

This slight sketch will show the British farmers what they have to dread in case the midge becomes (so to speak) an epidemic in the Wheat; and it may convince them of the importance of the question. Millions of dollars annually, ever since it first attacked our Canadian Wheat, would not compensate for the losses sustained. Fortunately, however, the midge, like all insects of that class, is affected by a parasite which preys on and ultimately destroys it, and which seems to come with it and attack it just as its depredations become the greatest.

This parasite (indeed, we believe there are several, but they all work alike) is also possessed of an ovipositor; it also pierces the hulls or covering of the grain, but instead of searching for the grain it searches for the midge which is destroying it; it deposits its eggs in the body of the yellow worm, the eggs hatch and became other worms, which consume the midge alive, and so weaken it that it cannot undergo its proper transformations, and so perishes; whilst the parasite, which is called an "ichneumon," comes forth from the body of its victim, and finally becomes a perfect fly, again to attack the midge in the following season.

All our Canadian and all American experience has shown that there is no cure for the midge, no means of destroying it; but we are a people the last to succumb under such a misfortune, and the visitation has brought forth a number of scientific writers who have made that and similar insect plagues their study, and who have discovered and revealed many interesting facts relating to it, but none of which have been turned to much practical use. Thus it was soon found that burying the midge in the ground at full plough-gauge destroyed it: one of the naturalists got a quantity of the maggots (or chrysalids), kept an exact account of their number, and buried them at different depths in earth, under bell-glasses. He kept the earth in a natural state, and watched the result: those buried at 1 inch all came forth, so did those at 2 inches; at 3 inches but a few came out; at 4 inches only one or two, and at a greater depth all perished. This showed that deep burying of the surface soil would be effectual, and ploughs which took off the first 2 inches of the soil, and threw it into the furrow, whilst the main body of the plough followed and buried what was first removed so deep that the midge could not come to the surface, was clearly effectual; but all farmers could not be prevailed to use the implement, or to cultivate shallowly afterwards, and thus the efforts of those who did so were frustrated; besides this we could not lose our Clover crop, and we could only raise it on the Wheat stubbles with any certainty—so the plan failed, but the plough remained, and a most excellent and useful implement it is. I have seen a field of Wheat stubble so buried by this plough, that no one could tell what had grown in the field from a view of the surface—not a straw remained above the ground, while the furrow-slice being divided in two left the land in a most perfect state of tillage. This plough is much used to plough under Clover and other green crops, and buries them admirably.

Were I to go fully into the subject of our remedies, I might fill a volume, and the information so given would be curious, but of little practical use in England. I will, in a few lines, describe how the midge came upon us, and then close this somewhat lengthy communication.

The advent of the midge took place in the United States in 1828, it travelled northward and westward until it met the great rivers and lakes which divide Canada from the United States—there it paused for a time, but it crossed the river St. Lawrence, the river Niagara, and the river St. Clair, at which places the dividing waters are not greater than an insect could be conveyed either by its own flight or by the assistance of the wind; from these three points it invaded Canada: its advance was about nine miles a year, and it seemed to gather strength as it advanced, until the whole of the provinces of Lower and Upper Canada have been devastated. Now we have strong hope that its natural enemies are at work to keep it under, and no doubt when they once attain the power which their constantly increasing numbers give, the ravages of the midge will cease or become so trifling as to be borne without complaint or notice.

The American entomologists long since advocated the plan of "importing" the destructive parasite of the midge from Europe, where it is known to exist in large numbers, but the public generally (having already suffered dreadfully from the imported plagues of the Hessian fly and the midge,—for they all allege that the latter came from Europe as well as the former) were afraid of importing something worse than they already had, and the scheme was frowned down. There are several sorts of midge, but the general characteristics are as follows:—

"A small orange coloured fly (or flies, as there are several species), with delicate transparent irridescent wings and long slender legs. The length of the insect is about one-tenth of an inch, rather less than more; the breadth of its expanded wings slightly exceeds the tenth of an inch. One kind is clear winged, another has spotted wings, and the male and female of each variety are somewhat different, leading casual observers to call them different sorts. The female only is supplied with the ovipositor, which pierces the shell or husk of the grain; the species, however, are all alike in habit, and all produce the orange-coloured egg, or maggot, which is so destructive and apparent in the ears of the grain." Of course a good magnifying glass is necessary to observe them closely, as an entomologist would do, but the unfortunate results are only too visible to the farmer without glasses of any kind.

Of late years a belief has begun to spring up, that the insect attacked the different kinds of grass seed which are large enough to allow them to work, but this wants confirmation. So numerous were the insects in the midge season a few years since, that in the city of Toronto (though, perhaps, the nearest field of Wheat was two miles off) a close observer would find one or two of the orange-coloured flies in every pane of glass in the windows of our dwelling-houses; thus showing that they either conveyed themselves, or were wafted by the winds, for considerable distances.

The writer does not pretend to be a scientific entomologist, but he has made a particular study of the subject here treated on, and the information now afforded may be relied on as thoroughly practical. During the last 20 years he has most carefully studied the subject; he is greatly interested in agriculture, and has continually been in communication with practical and observant farmers from all parts of the provinces, collating and comparing their information with his own; he has studied every work on the subject he could obtain, and for many years has kept patches of as many as ten kinds of Wheat growing in his garden, so that the habits of the insects might be under observation night and day. There may doubtless be more scientific treatises to be found, but there can be none more practical and truthful than the foregoing. *Vectis, Toronto, Canada, October* 18. [Many thanks.]

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, Nov.* 2. — Present—Lord Vernon, President, in the chair: the Earl of Lichfield, Lord Chesham, Lord Tredegar, Lord Walsingham, Sir Watkin Wynn, Bart., M.P.; Mr. Amos, Mr. Barnett, Mr. Booth, Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, M.P.; Mr. Druce, Mr. Edmonds, Mr. Brandreth Gibbs, Mr. Holland, Mr. Hornsby, Mr. Wren Hoskyns, M.P.; Colonel Kingscote, M.P.; Mr. Leeds, Mr. Milward, Mr. Pain, Mr. Randell, Mr. Ransome, Mr. Ridley, M.P.; Mr. Rigden, Mr. Stone, Mr. Thompson, Mr. Torr, Mr. Welby, M.P.; Mr. Wells, M.P.; Professor Simonds, and Dr. Voelcker.

Henry Chaplin, Esq., M.P., Blankney, Lincoln, was elected a Governor of the Society.

The following new members were elected:—

Arnold, William, Lichfield Street, Tamworth.
Baxter, Benjamin, Elslack Hall, Skipton.
Beckett, Samuel, Eccleston, Chester.
Boucher, A. E., Wolverley, Kidderminster.
Clerk, Arthur, The Mead, Chepstow.
Davey, J. G. Ellis, Horningtoft, Letcham.
Dunlop, Alexander M., 1, Westminster Cambers, Victoria Street, S.W.
Gilbey, Walter, Hargrave Park, Stanstead.
Hetherington, R. Bealy, Park Head, Silloth.
Holman, Stephen, Spring Lodge, Ealing.
Howells, J. Lewis, Blackwood, Monmouth.
Lovatt, Henry, Finchfield House, Wolverhampton.
Poole, Commander George, Llangynider, Crickhowell.
Shuttleworth, Alfred, Heighlington, Lincoln.
Tangye, Richard, Cornwall Works, Birmingham.
Townshend, C. Uniacke, Hatley, Burlington Road, Dublin,
Wall, T. Senior, 120, Maida Vale, London.
Ward, T. Johnson, New Leaze, Olveston, Bristol.
Waterer, Anthony, Knap Hill, Woking.

FINANCES.—Colonel Kingscote, M.P., presented the report, from which it appeared that the Secretary's receipts during the past three months had been duly examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and found correct. The balance in the hands of the bankers on October 31, was £1406 10*s.* 4*d.* The quarterly statement of subscriptions and arrears to September 30, and the quarterly cash account, were laid on the table. The arrears then amounted to £1303. The committee recommend that the £1800 now at deposit be transferred to the current account.—This report was adopted.

JOURNAL.—Mr. Thompson (chairman) reported that it had been intimated to the committee as highly probable that £200 will be offered to the Society by gentlemen resident in Shropshire and Staffordshire for two prizes of £100 each to the best-managed arable and dairy farms respectively, within a limited distance of Wolverhampton; and that the committee, therefore, requested the Council to decide whether, in case of such offer being formally made, the committee shall be at liberty to announce the willingness of the Society to offer second prizes of £50 each; also whether the committee, after ascertaining the views of the subscribers, shall arrange the limits of the district to be included, and the other conditions of competition. It was also reported that the Society's publisher had received a lawyer's letter on the subject of the reflections on Messrs. Bradburn & Co. in the report of the Chemical Committee lately published, and that the committee recommended that they be authorised to support the course adopted by the Chemical Committee.—This report was adopted.

After a conversation, in the course of which Mr. Thompson stated that the expenses of the last farm-prize competition amounted to about £325, including the 2d and 3d prizes given by the Society; notwithstanding this expenditure the Journal Committee had recommended that the scheme be carried into other districts, on account of the interest of the competition, and the value of the report to the readers of the Journal; and Mr. Thompson particularly referred to Mr. Keary's report of the Oxford Prize Farms, as showing clearly two points:—1st, that the 1st prize had been awarded on the satisfactory ground of profitable farming, and not to a model farm; and, 2dly, that the profitable cultivation of poor land like that of the stonebrash was to be done by a large expenditure in cake and corn. He also remarked that Mr. Keary had brought out the weak points in the various farms in a clear but unobjectionable manner. The Earl of Lichfield, in seconding the recommendation of the committee, expressed his conviction that the £200 would be raised by the landowners of the

two counties, and his satisfaction with the report of the Oxford competition. Mr. W. J. Edmonds gave notice that in December he would move that the sum of £10 be voted to the Cirencester Chamber of Agriculture, for the purpose of assisting its committee to carry out, in conjunction with the Professors of the Royal Agricultural College, manurial and other experiments upon corn and root crops.

SHOWYARD CONTRACTS.—Mr. Randell reported that as Mr. Penny's contract expires after the Wolverhampton meeting, the committee recommended that a general table of conditions and specifications, prepared by the surveyor, should be printed under his direction, and sent to the members of the committee for their consideration before the December Council meeting; that the tenders be then advertised for, and that they be sent in by January 20, to be opened and classed by the surveyor and Mr. Randell, who will report on them to the February meeting of the committee. It was also recommended that the members' tent shall be made available, with accommodation for writing, &c., during the whole period of the country meeting; that Messrs. Suttons' suggestion to keep separate the stands occupied by manure-merchants be adopted; and that the surveyor be requested to proceed to Wolverhampton, and to set out the levelling required in the showyard for the use of the local committee.—This report was adopted.

IMPLEMENT.—Mr. Thompson reported that several letters had been received from implement makers, containing suggestions of alterations in the conditions of competition at Wolverhampton, which had been sent them in accordance with the resolution of Council in August last; some slight alterations had been adopted, and the conditions, as revised, were recommended for adoption by the Council. The committee also recommended the following addition to the prize list, viz. :—

For the best root or stone extractor £10

The committee having received the instructions of the Council to consider what prizes should be offered for implements and machinery employed for the cultivation of Hops, they recommended the offer of the four following prizes, viz. :—

1. For the best machine for the cultivation of Hop gardens, to supersede manual labour £20
2. For the best machine for washing the Hop plant to remove the aphis blight 10
3. For the best Hop-presser 10
4. For any other improved implement, or implements, used in the cultivation or management of Hops 10

It was recommended that all the implements entered for trial shall be in the yard by the evening of Saturday, June 24, and other articles by Tuesday evening, July 4. With reference to the question of duplicates the committee recommended that no exhibitor be allowed to enter duplicates of the same article, and that a maximum fine of 10 per cent. on the declared price, and a minimum fine of £1, be imposed for each article exhibited in breach of this rule. They also recommended that if this rule be adopted the regulations affecting miscellaneous articles and the space required by exhibitors remain otherwise as heretofore. It was also recommended that in future no medal be awarded to any implement included in the quinquennial rotation which is not placed in the classes tried at that meeting, or to any miscellaneous article capable of trial, until it has been subjected to such trial as the stewards may direct; also that no commendations of miscellaneous articles be made by the judges. This report having been adopted, a vote of thanks was unanimously offered to Mr. John Medworth, on the motion of Mr. Thompson, for the classified list of implements exhibited at Oxford, prepared by him for the use of the committee.

GENERAL, WOLVERHAMPTON.—Lord Walsingham reported the recommendation of the committee that the showyard at Wolverhampton be open from the morning of Monday, July 10, until Saturday evening, July 15, at 6 o'clock inclusive, and that the implement yard alone be open to members and the public on Saturday, July 8, during the usual hours. On the question, "that this report be adopted," being put to the Council, a discussion arose, in which Mr. Thompson, Mr. Dent, Mr. Rigden, Mr. Ransome, Mr. Amos, Mr. Booth, and Mr. Wells, followed by Lord Walsingham, successively opposed the recommendation of the committee, on the ground that exhibitors objected to their stock being so long away from home, that the actual receipts, as proved by the experience gained by trying the two plans at other large towns (Manchester, Leeds, and Newcastle especially), were not much increased by the extra day, while the expense to the Society was considerably enhanced, and that to the extension of the Society's show for so long a period as even five days. is to be attributed the small show of horses which characterised the Society's meetings. On the other hand, it was urged by Lord Lichfield, who had proposed the additional day in committee, as well as by Mr. Torr and Mr. Randell, that Saturday was the only day on which the working-classes could visit the showyard. Ultimately, it was proposed by Mr. Thompson, and seconded by Mr. Dent, "That the showyard at Wolverhampton shall be open on the same days as at Oxford." The amendment having been put from the chair, it was carried by 22 votes against 7; subject to which the report of the committee was adopted.

STOCK PRIZES.—Lord Walsingham presented the report of the committee, embodying the first draft of the stock prize-sheet for the forthcoming Wolverhampton meeting. After some discussion, the report was received, and referred back to the committee with some suggestions for their consideration, and resolutions for incorporation in the regulations of the prize-sheet, namely :—It was moved by Mr. Booth, seconded by Mr. Torr, supported by Mr. Bowly and Lord Walsingham, and carried unanimously, "That each animal entered in the Shorthorn classes shall be certified by the exhibitor to have not less than four crosses of Shorthorn blood, which are registered in the Herd Book."

On the motion of Mr. Milward it was resolved that in the pony classes the height should be altered from 14.2 to 14 hands, and that the classes immediately above them should range from 14 hands to 15.2.

It was moved by Mr. Dent, in conformity with the resolution passed at the June Council, that prizes of £10 and £5 be offered for the best and second best mule, irrespective of age or sex. This motion having been seconded by Lord Chesham, and commented on by Mr. Pain, Mr. Randell, and other members of the Council, was put to the vote, when there appeared eight for it and the same number against it. The President thereupon gave his casting vote against the proposal.

Mr. Milward gave notice that at the next meeting of the Council he would move, "That the resolution of June 1, respecting prizes for mules and asses, be rescinded."

On the motion of Sir W. W. Wynn it was resolved that the consideration of the Stock Prizes Committee be directed to the question whether prizes may not be given to Cheviot and other mountain sheep; and at the suggestion of Col. Kingscote, M.P., the Stock Prizes Committee were requested to consider whether it is not expedient that in the classes for "mare in foal, or with foal at foot," the sire of the foal, as well as the sire of the mare, should be given on the certificate of entry.

A memorial from some breeders of Berkshire pigs was also referred to the Stock Prizes Committee.

EDUCATION.—Mr. Holland (chairman) reported that the committee made application for the renewal of the education grant for the ensuing year, and in the event of its being granted they recommended the following alterations in the Society's previous regulations :—

1. That the next examination should commence on Tuesday, April 18, 1871.
2. That the forms of entry, duly filled up, together with a certificate of general education, must be forwarded to the secretary by March 1, 1871.
3. That no candidate shall be eligible for the Society's prizes who has completed his 21st year previous to the said March 1; but that any candidate, irrespective of age, may compete for the Society's certificates.
4. That the prizes for aggregate merit, to be awarded to successful candidates who are eligible and are placed in the first class, shall be :—1st prize, £25; 2d, £10; 3d, £5.

This report having been adopted, the education grant was renewed for the year 1871.

A letter was read from Mr. Alfred Rogers on the subject of inspection of shearing.

The Earl of Lichfield gave notice, that at the next monthly Council he would move, "That in selecting a town for the holding of the exhibition in 1872 the plan of the Bath and West of England Society be adopted."

The December general meeting was ordered to be held on Thursday the 8th proximo, at 12 (noon).

BATH AND WEST OF ENGLAND.

October 24.—At the usual meeting of the Council of this Society it was resolved that the Guildford meeting, 1871, shall commence on Whit Monday, May 29; and having approved the stock and poultry prize sheets ordered that they be forthwith printed and circulated. The amount offered in prizes by the Society is much greater than at any former meeting, in addition to which there are liberal local prizes for Wheat, Hops, and groups of Southdown ewes and lambs. Sussex cattle are placed on the same footing in the prize sheet as Devons, Herefords, and Shorthorns; £20 and £10 being offered in the old bull class; £25 and £10 for 2-year-old bulls; £10 and £5 for bull calves (an entirely new class); £15 and £10 for cows; £15 and £10 for heifers not exceeding three years old; and £10 and £5 for heifers not exceeding two years old. There are also prizes of £10 and £5 for four classes of Channel Islands cattle. In the sheep classes several additions have been made. Prizes are now offered for Kent, Leicester, Cotswold, Southdown, Hampshire Down, Shropshire, Oxfordshire, Somerst and Dorset Horn, Exmoor and other mountain sheep. In the horse classes there are prizes of £25 and £15 for agricultural stallions foaled before 1866; £20 and £10 for agricultural stallions foaled in 1869; £15 and £5 for mares and foals, or in foal; and £15 and £5 for fillies foaled in 1869; in the hunter classes £25 and £10 for mares or geldings foaled before January 1, 1867, ditto for those foaled in 1867; £10 and £5 for fillies or geldings foaled in 1868; £10 and £5 for colts or fillies foaled in 1870; £15 and £5 for hack mares or geldings foaled before January, 1867; ditto, ditto, foaled after 1867; and the usual prizes for ponies not exceeding 13 and 14 hands high. As a means of encouraging the horse show the Council have resolved again to reduce the charge for horse boxes in the showyard. In the pig classes the usual prizes are offered for animals of the large and small breeds, and there are separate classes for Berkshire pigs, which will not be allowed to compete with animals of the large or small breed. To encourage proficienev in horse-shoeing Mr. Miles, of Exeter, again offers three prizes; it being stipulated that no man who has won a 1st prize in this competition will be eligible to enter. In the stock classes all entries must be made on or before April 12; in the poultry classes on or before May 1.

Among the special conditions affecting the exhibition of stock are (1) the appointment of "two inspectors to examine sheep on their admission to the showyard, with instructions to report to the stewards any cases in which sheep have not been really and fairly shorn bare," and (2) that "all cattle will be required to be paraded in the ring at least once a-day at the discretion of the stewards."

Members subscribing not less than £1 per annum, elected on or before the last Tuesday in February next, will be entitled to exhibit with special privileges.

The Implement Committee reported that they had amended the regulations with a view to the exclusion from the showyard of any frivolous objects, and any articles thought unsuitable or foreign to the purposes of an agricultural meeting. In other respects the regulations are identical with those of last year.

The Meeting of 1872.—Mr. H. Williams having presented an invitation to the Council, from a public meeting of the inhabitants of Dorchester and neighbourhood, for the Society to hold its meeting there in 1872, a deputation was appointed to visit the town, to inspect the ground offered for showyard and fields, and to report to the Council at the next meeting.

New Members.—Mr. C. G. Robert, Shotter Mill, Haslemere, Surrey; Captain Long, Woodlands, Congresbury; Mr. W. Baker, Temple Street, Bristol; Mr. John Galpin, Dorchester.

Farmers' Clubs.

SMITHFIELD.

COUNCIL MEETING: *November* 2.—Present: The Earl of Powis (President) in the chair; Lord Tredegar, Lord Walsingham (Vice-Presidents); Mr. H. Aylmer, Mr. Barnett, Mr. J. Beasley, Mr. J. N. Beasley, Mr. Canning, Mr. Clayden, Mr. Downing, Mr. Samuel Druce, Mr. Joseph Druce, Mr. Duckham, Mr. Walter Farthing, Mr. Brandreth Gibbs (honorary secretary), Mr. Charles Howard, Mr. Leeds, Mr. Newlon, Mr. Henry Overman, Mr. Rigden, Mr. Torr, Mr. J. S. Turner, Mr. Henry Webb.

The honorary secretary was authorised to make the usual application for a licence for holding the Show.

The same committee as last year was appointed to make arrangements as to the disinfecting cattle conveyances as heretofore.

Mr. C. Stephenson, of Woburn, Beds, was elected a member of Council in place of Mr. Twitchell, deceased.

The Council prepared the house list of eight members of the Club for election on the Council, to succeed the eight who retire by rotation.

Mr. James Edward Ransome was elected a member of the Implement Committee, in place of Mr. Head.

The offer of the Earl of Powis, the President, of a prize for the best instrument which shall be an efficient substitute for the poleaxe for slaughtering animals by separating the spinal marrow was accepted, viz., £20. The instruments to be delivered at the office of the honorary secretary on or before October 1, 1871, and the exhibitors to show in practical operation at such time and place as the judges appointed by the Club shall determine.

It was determined not to have an annual dinner this year.

It was decided to discontinue the report on the animals exhibited at the show.

Authority was given for Messrs. Thomas, the Club silversmiths, to prepare the pieces of plate and silver cups to be awarded at the ensuing show. Several letters were read, and instructions given, in reference thereto.

The following were elected members of the Club :—Rev. G. Baily, The Vicarage, Swindon, Wilts; A. Bengafield, Stalbridge, Dorset; Jno. Byron, Kirkby Green, Sleaford; Grimwood Cooke, Horseheath Park, Cambridge; James Davy, Flitton Barton, North Molton, Devon; F. H. Everett, The Grove, Bridgham, Harling, Norfolk; Richd. David Jenkins, Pantirion, near Cardigan; Geo. King, Saffron Walden, Essex; Richd. Pocock King, Southstoke, Wallingford; Thos. Kingsley, Boar's Croft, near Tring, Herts; John A. Mumford, Chilton Park Farm, Thame, Oxon; Martin Nockolds, Saffron Walden, Essex; John Price, Court House, Pembridge, Herefordshire; Thos. Rush, Chalk Farm, Babraham, Cambridgeshire; Chas. Southwell, Albion Foundry, Rugeley; John Tazewell,

Hay Grove, Bridgewater ; Hy. Wood, Woolley House, Romsey, Hants.

The best thanks of the meeting were voted to the Right Hon. the Earl of Powis, the President, for his able conduct in the chair.

Notices of Books.

Agri-Horticultural Society of Madras: *Proceedings of Meeting of Committee.* July 6, 1870.

We have received a copy of the monthly Transactions of this Society, which, if they may be taken as an average publication, bears high testimony to the great public value of the Institution. The following is an extract from a capital report on the culture of Horse Gram (Dolichos uniflorus) :—

"*Horse Gram* (*Dolichos uniflorus*).—This plant belongs to the order Leguminosæ, the order which includes Beans, Peas, Vetches, and Clover. It is a hardy plant, and thrives on the poorest soils.

"2. The soils of this district contain a very small proportion of lime ; and this plant, like all leguminous plants, requires a good deal of lime before it can mature its seed. It has been ascertained from experiment, that unless the manure applied contains a considerable percentage of lime, the tendency of the plant under better cultivation is to produce leaf, rather than seed ; this tendency has been utilised, and by deeper cultivation and the application of a moderate dressing of manure we have succeeded in growing good fodder, at a very moderate cost.

"3. During the past eight months, on this farm, we have cultivated nearly 20 acres of Gram, simply for green fodder, and though the weather during the past six months has been extremely dry, the results have considerably exceeded our expectations. In proof that our circumstances are not of a favourable character, I need only mention that our soil contains 89 per cent. of sand ; and that, with the exception of a shower on February 17, we have not had a drop of rain during the past 16 weeks. Our first crop was sown on August 3 ; we commenced cutting this crop on October 13 ; the yield was 10,642 lb., or 4 tons 15 cwt. 8 lb. per acre. No manure was applied in this instance, as the soil was in good condition. The crop was ready for cutting at least two weeks before it was harvested ; the actual time required in coming to maturity was, therefore, only two months. During showery weather the crop reached maturity in six or seven weeks ; from the results of my experiments during the last eight months, I am convinced there is no difficulty, in this district, in growing four crops between August 1 and end of April.

"4. In preparing the soil for the Gram we proceeded as follows :—Ploughed 5 or 6 inches deep, harrowed across the line of the plough ; spread about 5 tons of manure per acre broadcast over the land ; ploughed in the manure, and then levelled the plough furrows with the chain-harrows. The seed was then sown in lines, varying from 18 inches to 24 inches apart, according to the season and quality of the soil ; if the season was unfavourable, and the soil poor, we placed the lines closer together ; if the season was favourable, and the land in good condition, we placed the lines further apart. We sowed the seed at the rate of from 30 to 40 lb. per acre. After sowing, the chain-harrows were passed over the surface and covered the seed. One application of manure will suffice for the four crops. It is necessary to hoe the crop during its growth. We found two bullock-hoeings and one hand-hoeing sufficient for each crop.

"5. The crop should be cut immediately the flower appears, and removed from the ground at once ; the land should then be ploughed and re-sown on the same day. It is very necessary to sow immediately after ploughing, for, if the moisture is allowed to escape, the Gram will remain a long time in the soil before germinating. Once get the Gram aboveground, and the crop is comparatively safe.

"6. When cut before maturing its seed, the cultivation of Gram improves rather than impoverishes the soil. True, there will be a slight loss in the mineral constituents of the soil ; still, as this plant appropriates such a large amount of atmospheric food, and stores it away in its roots, and as these roots, weighing from 800 to 1000 lb. per acre, are left in the soil, its condition must be improved.

"7. The crops grown during the past three months did not yield so much fodder as those grown during or immediately after the rains ; however, they yielded :—7582 lb. per acre, 6969 do., 4355 do., 6480 do., 5614 do., or 6200 lb. per acre. As I have previously stated, we have grown crops that yielded 50 per cent. more fodder, and I might fairly record the average for the whole season at 25 per cent. above this result, however, I prefer taking the lower figure in my calculations, as the more certain.

"8. The cost of producing one ton of Gram fodder is as follows :—

	Rs.	A.	P.			
First Crop.						
1 Ploughing	1	0	0			
1 Harrowing	0	0	0			
5 Tons of manure	5	0	0			
Spreading do	0	2	6			
1 Ploughing	0	12	0			
1 Harrowing	0	2	0			
35 lb. of seed	0	12	0			
Sowing	1	0	0			
1 Chain-harrowing	1	2	0			
After Cultivation.						
2 Bullock-hoeings	1	8	0			
1 Hand-hoeing	1	0	0			
1 Cutting	0	8	0	Rs.	A.	P.
				12	0	6
Second Crop.						
The same expenses, less cost of manure, &c.				6	14	0
Third Crop						
Same as last				6	14	0
Fourth Crop.						
Same as last				6	14	0
				32	10	6

"Thus four crops, each yielding 6200 lb., give a total of 24,800 lb. of green fodder, at a cost of rupees 32-10-6, making the cost of 1 ton, rupees 2-15-1.

"9. A crop of Gram may be obtained before the regular cold season crop is sown ; thus, if sown in the early part of August it will be ready for cutting in the first week of October, or it may be grown after the removal of the regular crop. Last season we had two crops of Gram fodder, and one crop of Maize, off one piece of land. The Gram was sown in August and reaped in October ; the Maize was sown in October and harvested in January ; the second crop of Gram was sown in January and was ready for cutting in April.

"10. The following experiments were made to ascertain the feeding value of Gram fodder :—

"(*a*). On February 2, two bullocks were put up to feed ; one was fed on grass, and the other on Gram fodder ; each animal received besides, 2 lb. of Maize, 2 lb. of cake, and 1 lb. of Tour* daily.

"The animals were weighed at the end of every 10 days ; the following are the results :—

Dates of Weighing.	The Bullock fed on Grass.	The Bullock fed on Gram Fodder.
	lb.	lb.
February 2	384	360
,, 12	406	375
,, 22	415	375
March 4	423	388
,, 14	431	396
,, 24	439	403

"The animal fed on grass increased 46 lb. in weight, and that fed on Gram fodder increased 43 lb. The former gave an increase of 11.97 per cent., while the latter gave an increase amounting to 11.94 per cent. Practically the results were the same.

"(*b*.) At the same time two pens of sheep, each containing five wethers, were put to feed. One lot was fed on grass, and the other lot on Gram fodder ; besides this, each lot received daily 5 lb. of Maize, 5 lb. of bran, and 5 lb. of cake ; at the end of every 10 days each lot was weighed ; the following are the results :—

Dates of Weighing.	Five Sheep fed on Grass.	Five Sheep fed on Gram Fodder
	lb.	lb.
February 2	234	209
,, 12	232	201
,, 22	226	196
March 4	240	207
,, 14	242	224
,, 24	242	229

"The lot fed on grass only increased 19 lb. in weight, whilst the lot fed on Gram fodder increased 29 lb. The grass was the ordinary Hurrialee† grass, such as is collected by grass-cutters for horses. At the usual rate paid to grass-cutters, this grass costs 10 rupees per ton. The Gram fodder, as I have already stated, only costs 3 rupees per ton.

"11. Gram fodder may be made into hay ; when well made, the hay has a pleasant aromatic smell. It is readily eaten by horses. I have had no opportunity of experimenting with it in feeding horses ; but several gentlemen, who have tried it on my recommendation, speak very favourably of it. One ton of the fodder makes about 5 cwt. of hay. One ton of the hay will therefore cost about 15 rupees.

Summary.

"1. Gram is easily grown ; it will grow on the poorest soils.

"2. When well manured and properly cultivated it answers all the purposes that Vetches do in the practice of the British farmer.

"3. A piece of fresh soil produced in two months a crop averaging 4 tons 15 cwt. 8 lb. per acre.

"4. Five crops, grown without any rainfall, gave an average yield of 6200 lb. per acre.

"5. The seed may be sown at the rate of 35 lb. per acre, in lines, 20 inches apart, and about 2 inches deep in the soil.

"6. The crop should be cut immediately the flower appears.

"7. When cut before maturing its seed, Gram improves rather than impoverishes the soil.

"8. Four crops may be grown during one season, producing 10 tons of fodder at a cost of 2 rupees 15 annas and 1 pie per ton.

"9. A crop of Gram fodder may be obtained either just before, or immediately after, the cold weather crop.

"10. Gram fodder is as nutritious as Hurrialee grass, and costs only 3 rupees a ton, whilst the grass cost 10 rupees.

"11. Gram fodder may be made into hay. One ton makes about 5 cwt., and the cost per ton is about 15 rupees.

(Signed) "WILLIAM R. ROBERTSON.

"Government Experimental Farm,
Sydapet, Madras, May 21, 1870."

We add here that the Indian authorities want to introduce a cheap and efficient chaff-cutter for the preparation of coarse fodder. We shall probably do no disservice by mentioning that Colonel Boddam, who is in special employment under the Indian Government for the improvement of agriculture in the Mysore province, and whose address is "Agri-Horticultural Society, Bangalore," would be glad to hear from manufacturers of chaff-cutters as to the possibility of supplying a cheap and efficient implement of that kind in quantity. He says :—

"We want to try and get the natives to feed their cattle better, give them better forage, and utilise those kinds which are already available. For six months of the year (during the dry months) there is an absolute want of grass, the natives here are not sufficiently provident to lay in hay, and the better class of cultivators feed their cattle either on 'paddy' straw, *i. e.*, Rice straw, or Kurbee, the stalks of Cholum and Jowarie, which are much the size and thickness of Indian Corn ; the jungle grass, too, is very coarse, more adapted for thatching than fodder ; but on these the cattle have to subsist, there is nothing else for them than jungle leaves, no root crops or oilcake, &c. I believe much waste might be saved, and the coarse food better assimilated, were chaff-cutters used. I wish to try and get a cheap and serviceable kind of chaff-cutter, that could work up such coarse materials as these ; it must also be very simple in mechanism, so that, when out of order, it may be repaired by a village blacksmith. Above all, the price must be low, or the people will not be able to buy it."

Colonel Boddam begs us to refer this letter to any agricultural implement maker, and ask him to make such a chaff-cutter, and send it out to him for experiment. We prefer to publish the above memorandum, believing that he will thus receive from many of the English manufacturers catalogues or specifications which may enable him to select what he needs.

* Cajanus indicus. G. B. † Cynodon dactylon. G. B.

Farm Memoranda.

SOUTH GLOUCESTERSHIRE : *Nov.* 1.—About a fortnight ago several strong gales passed over this district, blowing down a great quantity of unripe acorns ; and when the cattle had the run of the trees, and were allowed to eat them *ad libitum*, their poisonous nature very soon proved fatal to scores of cattle, chiefly yearlings. The symptoms this year are strikingly different to what they were two years ago, although then a great number of cattle died from eating too many. A large percentage was saved under proper veterinary skill ; but, alas ! this year veterinary aid has been of no avail, even when applied by the most skilful ; for by the time the poor animal began to show signs of sickness, the poison had done its deadly work. The first symptoms would lead one to suppose that they were suffering from husk, as its first appearance was amongst the yearlings (a very common malady along the autumn months in this locality), but we were not left long in doubt ; the animal failed its food, rumination entirely ceased, the stomach began to swell, and in a very short time the beast died from intense inflammation of the stomach. Upon examination after death, the manyplies was found in most cases to be charged with dry thin cakes of compressed food, upon removing which the membrane of the stomach peeled off in a dark rotten mass. Most of the blood appeared to have escaped from the vessels and turned into a watery fluid in the cavity of the chest and around the intestines, which probably accounts for the swelling before death ; the heart soft and flabby ; the paunch in most cases distended and badly inflamed. A considerable quantity of acorns and acorn hulls were readily found, proving beyond doubt that blood poison was the immediate cause of death, aided, no doubt, by a weakly constitution, brought on through a summer of insufficient keep, followed by an autumn of unusual early frosts and cold rain. *J. W.*

Obituary.

DIED, at Woburn, Bedfordshire, on Thursday, October 20, in the 73d year of his age, JAMES LOUDON, Esq., late of Wilga, near Warsaw, Poland. By the death of this gentleman (who was the only brother of the late John Claudius Loudon, the eminent author) the family of the well-known name of Loudon may be said to have become almost extinct ; for he has left no issue, and the daughter and only child of the elder brother passed prematurely from amongst us about seven years ago. As the subject of this notice did something for the advancement of agriculture in Poland, a few particulars respecting him will not be out of place in these columns. Mr. James Loudon, at an early period of his life, was sent to Poland by his elder brother, and became a partner in some large ironworks which were established at Warsaw. Subsequently, in 1832, having a taste for rural pursuits, he purchased the estate of Wilga (once the property of a Polish nobleman), on the river of that name, a tributary of the Vistula, with a view of introducing into Poland the improved system of British agriculture ; and he continued to reside there, and to cultivate a large part of the estate, until about nine years ago, when, feeling a desire to spend the few remaining years of his life in this country, he returned to England, and took up his residence at Woburn, where he died after a short illness, and where his loss will be much felt. The estate, to the improvement of which Mr. Loudon devoted the best years of his life, consists of 1800 acres, in a flat country, and is about 30 miles from Warsaw, with which city there is good communication both by land and water. The soil is light in most places, but in others it is loamy. About one half is covered with wood, chiefly Birch, Poplar, and Scotch Pine, which is felled at stated intervals, and is floated down the Wilga and the Vistula to Warsaw, where it is sold as fuel. The culture pursued on the arable land is the convertible system of—1, Turnips ; 2, corn, chiefly Barley and Wheat ; 3, Clover ; and 4, Oats. The Turnips and Clover are consumed in the feeding-houses by milch cows, or cattle for the butcher,

The corn is either ground into flour, or malted and brewed into beer, or distilled into spirit, for both of which there is an ample market at Warsaw. Butter and cheese are made, for which there is also a great demand. The great drawback to farming in Poland is the want of moral principle in the labourers, who require constant watching, both to keep them at work and from stealing and drinking; but as this has arisen from the harsh treatment to which, as slaves, they have been subject from their masters through many generations, it will, it is hoped, in time be diminished by kindness to the adults, and by the general education of the children. The soil and climate of Poland are much more favourable for agriculture and gardening than is generally supposed. Though the winters are much more severe than in the neighbourhood of Edinburgh, the summers are warmer, and corn and fruit ripen much sooner and better. Since the peace of 1814, several Scotch farmers have settled in different parts of Poland within reach of Warsaw. *D. W.*

Miscellaneous.

HARVEST BEER.—Mr. Mundella gave us recently a glowing description of the iniquities of the Truck system in the North, which, in spite of the Truck Acts, virtually compels the working man to take out his wages in kind, and places a very strong temptation in his way to spend some portion of it in drink; and he alluded to one member of the House of Commons itself, an employer of labour on a large scale in the iron-fields of Scotland, who holds no less than 11 spirit licenses in respect of as many stores attached to his works. It is difficult to understand what kind of a conscience this gentleman keeps, or how he could take part in a debate on the Education Bill, which has for its object the elevation of the people, when he himself is so active an agent in keeping down those who are in his employ, to say nothing of his evasion of Acts which he perhaps helped to pass, and which make payment in kind illegal. A more demoralising and iniquitous practice than that which Mr. Mundella so eloquently denounced cannot exist. Not only is it a bad principle, justly forbidden by our laws, to let payment in kind be reckoned as part of wages, but all trade arrangements which encourage men to drink, whether they wish to do so or not, are injurious; and for both these reasons our most intelligent farmers are endeavouring to break through the practice of allowing drink at harvest time. It is better for both parties to pay the men a fair rate per acre, leaving it to each man to spend what he pleases in drink out of it; and it is a great question whether it was any benefit, or whether it was not rather the reverse, that the agricultural labourer was specially exempted from the operations of the Truck Act of 1831. Some of the old school, who say they "never mow so well as when they are a *little* bit fresh," and have faith in the strengthening properties of beer, would of course stick to the drink, though even they would not take so much as they do now; but there are others who have discovered the great truth that beef and bread are the real source of strength, and these men would much prefer to work upon water, or cold tea, and spend some of the extra money on better food. They might get a little "chaffed," but they would be well content to take that good-humouredly; they would find themselves so much stronger, healthier, and happier, with none of the depression after harvest that the drinking men feel when the large allowance of beer is taken off, and the extra money they had earned would be a nice little help to clear off that bugbear of a labouring man's life—the score at the shop: whereas it too frequently happens that the free drinking of the harvest field has left behind it a craving for drink which requires to be kept up, even when harvest wages are over, so that the man is none the better for his extra pay for which he has worked so hard. But suppose that an intelligent employer of labour sees all this, and wishes to alter his mode of payment. His difficulty would be, that the opposition would come from the men themselves. He would be accused of that terrible offence, the desire to "rob a poor man of his beer," even though he professed himself willing to give the full value of the beer in money. It is not easy to persuade labourers that the heady feeling—"pot valiancy"—caused by drink is not real strength, but merely a sensation of strength due to fictitious excitement of the brain, which urges them to greater exertion without supplying the means for maintaining it, and has to be paid for afterwards by corresponding reaction or depression, which tells us, in unmistakeable language, that more has been taken out of the system than the drink put in. We are not amongst those who call every man who takes a glass of beer with his dinner an incipient drunkard; we believe that good home-brewed ale taken in moderation is a very wholesome drink; all we wish to point out is that where a certain allowance of drink is given as part of the wages for harvest work, a man drinks it because it is there, and is part of "his rights," but it not only does him no good, in the way of giving him strength, but it weakens his constitution by stimulating him to work beyond his real power, and thus lays the foundation of a premature decrepit old age. We believe the value of harvest drink is paid for six times over: first in the cost of the beer or cider itself at harvest time every year, and five times that amount in subsequent poor-rates. We hear a great deal about raising the condition of the agricultural labourer, and very many of his employers are, we know, sincerely desirous to do so; but they will be his best friends, and contribute most to bring about so desirable a result, who will have the courage to break through this custom of giving drink in lieu of wages. Let him have the value of the drink by all means. If the labourer were better fed the master's work would be better done, whilst the man himself would have better health, and a happier home,—he would escape the misery of limbs crippled with rheumatism and back bent with prematurely exhausted strength,—whilst one-tenth of the money saved from useless and mischievous expenditure in drink would, if invested in a good friendly society, purchase him an annuity which would save him from the degradation of the workhouse in his old age. *Wilts Standard.*

The Week's Work.

NOVEMBER 5.—*Wheat Sowing* conclude with the least delay on fallows, Clover and Bean stubbles, and also after root crops, as soon as they are removed from the ground. Seeding the land should now be kept close up to the ploughs even in dry seasons, for however settled the weather may be at the close of the day, it may be otherwise before morning. This precaution is all the more necessary when the work of ploughing or smashing is done by steam, owing to the rapidity with which the instrument goes ahead; so that if such is used, the steam seed-drill and harrow should also be used, and therefore the safest plan is for the steam-engines to go back in time, and bring the seeding close up to the ploughing. If rain falls over night, the seed-bed is better before than after the rain; and if, on the other hand, it continues dry and frosty, the seed-bed will improve just as well after the Wheat is sown as before, and in many cases better; and when rain falls immediately after seeding clayey land is not so liable to run together when cultivated and drilled by steam as when worked wholly by horses.

Mangel Wurzel.—Finish harvesting as directed last month, however promising the weather may be for the ensuing weeks. If frost has set in before they are stored, so as in the slightest degree to affect the bulbs, and if a frosty night is followed by a change, it is generally advisable to give them a day or two of fresh weather to recover, provided the risk is not greater than the advantage likely to be gained. Sudden changes have been the peculiar characteristics of the season in some places, and if there is any prospect of a return of frost, pull and store in small pits. If, in very bad cases, a deep outcasting is made with a plough, and three or four drills on each side thrown in and covered with the fresh earth, many, if not the whole of the bulbs, will recover, and be fit for storing in a week or so. Pits should be examined before they are finally earthed up for the winter, whether the bulbs were touched with frost or not. Small pits may be made sufficiently close to each other, that in turning two or three may be stored in one, and this is the safest plan when there exists any suspicion of frost-bitten Mangels. The expense, compared with the safety of so valuable a crop, is comparatively nothing. Select a fine drying day for turning, and throw aside all bulbs in the slightest degree affected. By cutting off the frost-bitten or rotten portion, what remains may be given to store cattle, so that the loss actually sustained may be trifling.

Swedes and Kohl Rabi are harvested in the same way as Mangel Wurzel. They are less liable to be injured by frost than Mangels; but the difference, so far as storing is concerned, is not so great as is generally imagined; so that an equal degree of precaution is necessary to avoid rotting in the pits. Both crops suffer much in the pits, where the bulbs are broken or cut too close in topping and tailing so as to bleed, for although they may not rot, yet mouldiness takes place, thereby injuring their dietetic value to neat cattle and sheep. It is always better to throw aside broken bulbs for immediate use than to store them in pits, for, whether they become mouldy or rot, they affect and injure the whole pit.

Belgian and Common Carrots and Parsnips, if not already harvested, should now be secured in store for immediate or winter use without delay. The same precaution requires to be observed in storing them as directed above for the other root crops. If any roots are frost-bitten, they should, when intended to be stored in barns, be spread out rather thinly over the floor of some temporary store, or on the ground, where they can be covered with straw until they are fit for storing in the barn of the usual depth. Belgian Carrots intended for ewes and lambs should be stored near the place where they are to be used.

Turnips, Hybrid and Yellow, store as Swedes. If intended to be consumed on the land by sheep, it is better to store in long narrow pits than to collect large quantities together. From 10 to 20 drills may be stored in a deep plough outcasting, and covered with the plough; or if to be used immediately they may be covered with the tops. And when stored this way the shepherd folds close up to the outcasting, and when bulbs stored in one outcasting are finished he brings up his fold or nets to another, until the whole field is folded. Sometimes part of the crop is stored at the homestead, and the remainder in the field for folding; but the only difference which this involves in the storing is a greater distance between the pits or outcastings in which the bulbs are stored. Turnips are sometimes "clamped," *i.e.*, pulled and carted to some spare ground, where they are set close two rows in depth, with the tops and tails on, and lightly covered with straw or horse-dung to defend them from frost.

Early Lambs force forward for Christmas; and in doing so it should be borne in mind that fineness of quality as also weight depends much upon the quality of the food of the ewes, and what the lambs themselves eat exclusive of milk, and that rich milk is the natural and best food for making fine rich lamb—that which will fetch the top price in the shambles; and it should farther be borne in mind that quantity of milk in fattening lambs will not make up for quality. In point of fact, a large bellyful of thin milk, or washy food of any kind, is injurious to both ewes and lambs; so that when put upon succulent green food of any kind the ewes should have an extra allowance of ground corn and Clover hay. Moreover, in cold or wet weather at this season, succulent, washy food is more objectionable than in the warm dry weather of summer. Corn is better for making rich milk than cake, Clover hay than meadow hay, other things being equal. Cabbages are better than Turnips, and the yellow-fleshed varieties of Turnips are to be preferred to the white-fleshed. But of all our root crops grown the Belgian Carrot is perhaps the best for milch ewes at this season. Sheltered pastures are essential for ewes and lambs, for nothing reduces the quantity and quality of milk more than exposure to cold wet weather. As a rule, the skins of ewes and lambs should be kept dry and comparatively warm, and if this cannot be done out-of-doors, house the flock at once in roomy pens, and feed wholly on artificial food; and this applies to ewes that are lambing, or whose time is nearly up. In-lamb ewes for lambing in January and February should also have shelter, and where this cannot be had naturally, stuffed hurdles or straw webbing should be used, one row standing above the other, so as to form a semi-roof for the ewes to go under in bad weather. *W. B.*

Markets.

HOPS.

BOROUGH MARKET, NOV. 3.

There has been no alteration in the quotations of English Hops since last Monday. The demand continues good. Fine qualities of Bohemian Hops, ready for immediate delivery, command an advance of 3*s.* to 5*s.* per cwt.

MARK LANE.

MONDAY, OCT. 31.

The supply of English Wheat to this morning's market was small; good conditioned parcels brought the full prices of this day se'nnight, but anything inferior was cheaper. For foreign the demand was limited, but on the business done last week's rates were paid. There was no change in the value of Barley, Beans, or Peas. The Oat trade was dull, at 6*d.* to 1*s.* per qr. less money. Flour was unaltered.

Price per imperial Quarter.	*s.*	*s.*		*s.*	*s.*
Wheat, Essex, Kent, Suffolk. White	45—54		Red.....	42—54	
— — fine selected runs..do.	49 - 57		Red.....	46 - 55	
— — Talavera	50—60				
— — Norfolk	—		Red.....	—	
— — Foreign	41—63				
Barley, grind. & dist. 29s to 33s. Chev.	42—45		Malting ..	36—41	
— Foreign .. grinding and distilling	25—33		Malting ..	33—40	
Oats, Essex and Suffolk	25—27				
— Scotch and Lincolnshire.. Potato	27—29		Feed	—	
— Irish ..... Potato	26—28		Feed	24—27	
— Foreign ..... Poland and Brew	24—26		Feed	19—24	
Rye	32—36		Foreign ..	33—36	
Rye-meal, Foreign					
Beans, Mazagan.... 43s. to 47s.. Tick	49—50		Harrow ..	49—50	
— Pigeon .... 51s. to 59s... Winds.	—		Longpod..	—	
— Foreign ..... Small	45—47		Egyptian ..	42—44	
Peas, White, Essex, and Kent.. Boilers	38—40		Suffolk ..	40—42	
— Maple, 40s. to 44s. ..... Grey	36—40		Foreign ..	36—40	
Maize	27—		Foreign ..	29—31	
Flour, best marks delivered.. per sack	39—47				
— ad ditto ..... ditto	32—44		Country ..	32—44	
— Foreign ..... per barrel	25—28		Per sack..	36—62	

WEDNESDAY, NOV. 2.

There was a small show of English Wheat on sale here to-day, and no improvement was noticeable in the quality of the samples. There was not much activity in the trade, but prices ruled firm, and factors showed no inclination to accept less money. Foreign Wheat met a quiet sale on former terms. Barley was steady in value and demand, for both malting and grinding descriptions. The malt trade ruled dull, at late rates. There was a large supply of Oats, and the quotations had a drooping tendency. Beans and Peas changed hands on former terms. The Flour trade ruled quiet, and country qualities were 1*s.* per sack lower. Foreign Flour was unaltered in value.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 430	Qrs. 890	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	16,630	3260	77,800	— / 5970 brls.
	17,060	4150	77,800	

HULL, Nov. 1.—At our market to-day there was a small show of English Wheat, which sold very slowly at last week's prices. In foreign Wheat very little business done. English white was quoted at 54s. to 56s. per qr.; red, 50s. to 52s.; Dantzic and Konigsberg white, 53s. to 57s.; mixed, 50s. to 52s.; Baltic red, 49s. to 51s.; Danish and Hamburgh, 48s. to 50s. Malting Barley was quiet, but grinding quality was in fair request, at the extreme rates of last week. Beans, Peas, and Oats were fully as dear, but not much business doing in any of them.

AVERAGES.

	Wheat.	Barley.	Oats.
Sept. 24	45s 4d	36s 2d	20s 7d
Oct. 1	46 1	36 7	22 8
— 8	46 5	36 11	21 11
— 15	47 0	36 7	22 5
— 22	47 3	36 5	22 2
— 29	48 6	36 9	22 4
Average ..	46 9	36 6	22 0

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Nov. 3.

There were only limited supplies of all descriptions on offer to-day, owing to the heavy showers which have fallen. The demand was moderately active, at about previous currencies.

Prime Meadow Hay	125s. to 135s.	Clover, old	130s. to 140s.
Inferior do.	110 120	Inferior do.	115 125
New Hay	— —	Prime 2d cut do..	120 130
Inferior do.	— —	Inferior do.	105 115
Straw	30 34		
American Produce, in bales, per ton ..			100s. to 125s.
Scotch, ditto ditto ..			105 — 120
Irish, ditto ditto ..			95 —115

CHARLES JAMES EASTON.

CUMBERLAND MARKET, Thursday, Nov. 3.

Sup. Meadow Hay	130s. to 140s.	Inferior Clover ..	120s. to 130s.
Inferior do.	110 124	Prime 2d cut do..	— —
New do.	— —	New do.	— —
Inferior do.	— —	Straw	34 38
Superior Clover ..	140 150	JOSHUA BAKER.	

METROPOLITAN CATTLE MARKET.

MONDAY, Oct. 31.

We have a larger supply of Beasts here to-day, and it is reported there is a good supply at the water-side, consequently trade is very dull, and prices are lower; a few choicest qualities were nearly reach our late quotations. The number of English Sheep is very small, and although trade is dull, prices are quite as good for the choicest qualities as for some time past. Choice Calves are still scarce and dear. Our foreign supply consists of 1320 Beasts, 6200 Sheep, 340 Calves, and 200 Pigs; from Scotland there are 110 Beasts; from Ireland, 830; from Norfolk and Suffolk, 20; and 1045 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools	5 4to5	8
fords, &c. ..	5 6to5	8	Do. Shorn ..	— —	—
Best Shorthorns ..	5 4—5	6	Ewes & 2d quality	4 4—4	10
2d quality Beasts	3 0—4	0	Do. Shorn ..	— —	—
Best Downs and			Lambs	— —	
Half-breds ..	5 8—6	0	Calves	4 4—6	4
Do. Shorn ..	— —		Pigs	4 0—6	0

Beasts, 3325; Sheep and Lambs, 16,500; Calves, 355; Pigs, 270.

THURSDAY, Nov. 3.

The number of Beasts is about the same as last Thursday, with no improvement in quality; we have scarcely any choice descriptions on offer; trade is very dull, and prices have a downward tendency. There are very few fresh English Sheep, and the foreign are not so plentiful; a clearance is consequently nearly effected, although trade is not brisk. Choice Calves are very scarce, and continue dear; trade is dull for other kinds. Our foreign supply consists of 430 Beasts, 2500 Sheep, and 190 Calves.

	s. a.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools..	5 4to5	8
fords, &c. ..	5 6to5	8	Do. Shorn ..	— —	—
Best Shorthorns ..	5 4—5	6	Ewes & 2d quality	4 4—4	10
2d quality Beasts	3 0—4	0	Do. Shorn ..	— —	—
Best Downs and			Lambs	— —	—
Half-breds ..	5 8—6	0	Calves	4 0—6	
Do. Shorn ..	— —		Pigs	4 0—6	4

Beasts, 1000; Sheep and Lambs, 5200; Calves, 270; Pigs, 50.

METROPOLITAN MEAT MARKET.—Nov. 3.

Best Fresh Butter .. .. .. 20s. per dozen lb.
Second do. do. .. .. .. 18s. "
Small Pork, 5s. 0d. to 5s. 4d.; Large Pork, 4s. 0d. to 4s. 4d. per 8 lb.

COALS.—Nov. 2.

Cowpen Hartley, 16s. 9d.; Holywell Main, 17s. 3d.; Tanfield Moor Butes, 14s. 9d.; West Hartley, 16s. 9d.; West Wylam, 17s. 3d.; Walbottle Hartley, 15s.; Eden Main, 17s. 3d.; Walls End Hetton, 19s.; Walls End Hawthorn, 16s. 9d.; Walls End Easington, 17s.; Walls End South Hetton, 18s. 6d.; Walls End Stewarts, 18s.; Walls End Hartlepool, 18s.; Walls End East Hartlepool, 18s. 6d.; Walls End Original Hartlepool, 19s.; Walls End Tees, 18s. 9d.—Ships at market, 83; sold, 66; unsold, 17; at sea, 10.

SEED MARKET.

We have more inquiry for Clover seed and also for Rye-grass and Italian. It appears probable that no large quantity of red seed can be expected this season from the Continent; it is, however, impossible to say how much may come to hand from America. Alsike and white Clover seed continue firm. For new English Trefoil seed there is now an improved demand. White Mustard seed is steady, at the recent advance. Rape seed has become very scarce. New Hemp seed is slightly dearer. Canary seed without alteration. Winter Tares, without being cheaper, are in diminished request. We have a fair inquiry for Windsor and Longpod Beans. There is a ready sale for large Blue Peas for boiling.

JOHN SHAW & SONS,
Seed Merchants, 16, Water Lane, London, E.C.

ENGLISH WOOL.

During the past week a fair trade has been done, at pretty steady prices. At one time, on the advice of the surrender of Metz, and the hopes that this would lead to peace, there was a decidedly better feeling, and more money was in some instances asked. Since then, the immediate cessation of hostilities appearing more doubtful, things have again become quiet, but the general feeling is hopeful, and great confidence is expressed in the future.

Notices to Correspondents.

AGRICULTURAL IMPORTS FOR NINE MONTHS: *R.*

Articles.		Quantities Imported. 1869.	1870.
Animals, living — Oxen, Bulls, and Cows	No.	151,238	115,166
Calves	..	23,884	25,155
Sheep	..	573,886	496,655
Lambs	..	12,774	10,947
Swine and Hogs	..	48,755	71,854
Bones burnt or not, or as Animal Charcoal)	tons	59,473	60,947
Corn—Wheat From Russia	cwt.	4,761,704	7,013,763
Denmark	..	294,588	271,093
Prussia	..	3,514,380	2,273,174
Schleswig, Holstein, and Lauenburg		42,240	21,536
Mecklenburg	..	447,909	455,165
Hanse Towns	..	549,311	272,400
France	..	309,017	89,249
Illyria, Croatia, and Dalmatia	..	822,818	45,272
Turkey and Wallachia and Moldavia	..	1,984,755	301,136
Egypt	..	761,740	100,584
United States	..	7,938,818	9,475,497
Chili	..	499,468	461,312
British North America	..	1,247,220	1,630,243
Other countries	..	429,983	206,001
Barley	..	5,599,023	5,458,244
Oats	..	4,347,656	8,200,093
Peas	..	570,494	1,540,260
Beans	..	1,317,855	1,083,675
Indian Corn, or Maize	..	11,644,890	12,115,668
Wheat meal and Flour—Hanse Towns		301,145	541,006
France	..	1,030,034	627,646
United States	..	968,593	1,577,717
British North America	..	273,516	273,983
Other countries	..	828,590	559,948
Indian Corn Meal	..	4,385	4,168
Flax and Tow or Codilla of Flax			
Russia	..	746,119	1,173,774
Holland	..	87,725	145,497
Belgium	..	124,509	145,013
Other countries	..	141,512	297,499
Guano—West Coast of Africa	tons	2,147	1,880
United States	..	363	20
Peru	..	84,602	177,462
Bolivia	..	1,612	955
British West India Islands	..	1,161	..
Other countries	..	2,264	22,735
Hemp and Tow or Codilla of Hemp—			
Russia	cwt	333,855	307,630
Venetia	..	177,601	150,638
Illyria, Croatia, and Dalmatia	..	38,370	10,519
British India	..	22,383	21,630
Philippine Islands	..	69,650	91,116
Other countries	..	59,258	61,372
China Grass	..	11	951
Jute and substances of the nature of Hemp	..	1,854,378	1,940,201
Hides, untanned —Dry—From British India		158,518	269,666
Other countries	..	52,847	72,623
Wet—From Argentine Confederation and Uruguay	..	144,359	178,818
Brazil	..	68,886	116,076
Australia	..	26,078	15,072
Other countries	..	106,859	111,623
Hides, tanned, tawed, curried, or dressed (except Russia Hides)	lb.	6,583,228	8,158,560
Hops	cwt.	184,435	71,233
Oil Seed Cakes	tons	109,658	105,382
Potatos	cwt.	1,366,488	739,325
Provisions—Butter	..	854,075	793,341
Cheese	..	578,265	672,649
Eggs	No.	362,754,300	361,377,000
Fish, cured or salted	cwt.	330,869	405,487
Lard	..	187,711	150,845
Meat, fresh or slightly salted—Beef	..	7,488	7,007
Pork	..	19,565	18,519
Meat, salted—Bacon and Hams	..	573,912	451,465
Beef, salted	..	178,485	126,791
Pork	..	122,579	149,253
Meat, not otherwise described	..	44,175	64,936
Saltpetre	..	172,730	189,966
Cubic Nitre	..	609,635	781,693
Seeds—Cotton	tons	85,636	98,761
Clover	cwt.	178,439	174,943
Flaxseed and Linseed	qr.	769,128	769,216
Rape	..	94,357	241,684
Tallow, from Russia	cwt.	77,185	21,152
Australia	..	330,691	355,287
South America	..	293,246	328,308
Other countries	..	149,414	216,453
Wool, Sheep and Lambs' — From Europe	lb.	16,450,132	11,952,058
British Possessions in South Africa	..	24,020,870	21,190,437
British India	..	13,315,035	7,630,928
Australia	..	131,921,572	164,281,180
Other countries	..	13,335,720	11,907,453
Alpaca and the Llama tribe	..	2,019,763	2,513,650
Yeast, dried	cwt.	83,648	93,561

CATTLE LITTER. A recent extract from the *Nottinghamshire Guardian* was mistakenly attributed to the *Northamptonshire Guardian*.

EXHAUSTION BY OVER-STIMULATION.—In p. 1389*d*, for "Pears" read "Peas;" for "swinish" read "poisonous;" for "brittle as flax" read "brittle as glass;" and in col. *b*, for "vitality" read "utility."

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 21s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Gorsline, Liverpool.

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 21, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
The Secretary, REES and CO'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.
MANUFACTURED BY THE

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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have caused for it another title, viz., "THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures
Particulars will be forwarded on application to the Secretary, or may be had of the local Agents.
T. T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.
All other MANURES and CAKES as per Price List, supplied on the lowest terms.
Apply for prices, &c., to JOHN BENNET LAWES, 59, Mark Lane, London, E.C., Dublin, Shrewsbury, and Cardiff.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, for Dressing Pasture Lands.
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and other MANURES for Corn, Grass, and Roots.
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.
116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

TOBACCO TISSUE, for FUMIGATING GREENHOUSES.—Will destroy Thrip, Red Spider, Green and Black Fly, and Mealy Bug, and is recommended by the appearance of blowing, and is entirely free from paper or rags. Price 3s. 6d. per lb., carriage free. A reduction in price for large quantities.
Sole Agents for Messrs. ROTHWELL and SONS, Tobacco Manufacturers, 112, St. John Street, Clerkenwell, E.C., of whom Copies of Testimonials may be obtained; and of all Seedsmen and Nurserymen.

GENUINE TOBACCO PAPER, of the finest quality, for Fumigating purposes, 1s. per lb., 84s. per cwt. Superior TOBACCO JUICE, for Sheep Washing, &c., 10s. per gallon.
SILVER SAND, of the finest quality, for Horticultural purposes, at 20s. per ton; smaller lots at 2s. 6d. per cwt.
WM. RUSHFORTH, Seed Merchant and Nurseryman, Leeds.

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

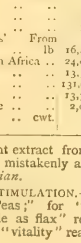
Red Spider.

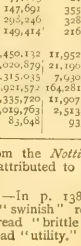
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Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
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THE GRANITIC PAINT, the best for the finest painting and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.
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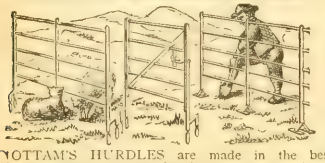

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Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS

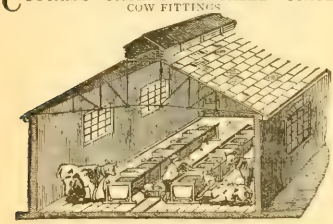

Their advantages are: Stability, and but few removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over gorging. Cleanly, durable, and impervious to infection, being all of Iron. Priced Fittings per Cow, £5.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

CONSERVATORY BASKETS.

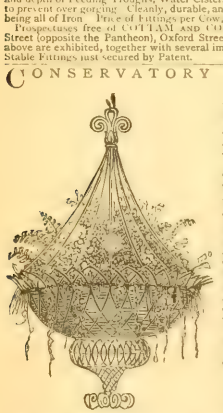

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, at opposite windows, or elsewhere; Suspending Baskets for Greenhouses; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.
Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.
Minton's Ornamental Tile Flower Boxes.
All kinds of Wire Work made to order.

R. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Portobello Terrace, Notting Hill Gate, London, W.
Illustrated Catalogues of the above on application.

Kosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

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14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s per Ton less. A coarser grained Sand 4s. per Ton more.
Samples of Sand by post on receipt of stamp
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

HORTICULTURAL BUILDINGS
OF EVERY DESCRIPTION
DESIGNED, BUILT, and EFFICIENTLY VENTILATED and HEATED.

Estimates given to Architect's Plans and Specifications, or to Rough Sketches, with particulars of size, form, and style of Building required

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TROTMAN'S HOT-WATER GAS STOVE the best method of Heating small Greenhouses See *Gardeners' Chronicle*, 8th inst.
Spring Grove Nursery, Isleworth, W.

GREEN'S PATENT IMPROVED TUBULAR HOT WATER BOILERS
They are specially adapted for heating Greenhouses, Conservatories, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

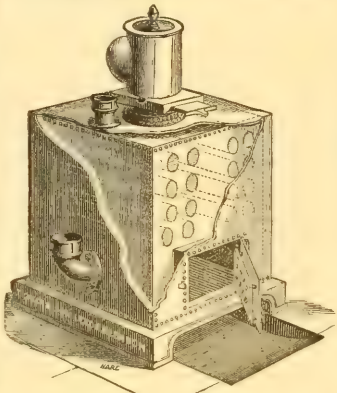

The following are the advantages of these Boilers —
1. They require no setting in brickwork.
2. They are complete in themselves, having perfect means of regulation
3. They take up little room, and can be put in places inaccessible to other boilers.
4. They are great economisers of fuel, owing to the large amount of heating surface upon which the fire acts in a direct manner
5. Any number of flows and returns can be annexed to the boilers by means of T pipes.
6. By means of mud-doors they can be readily cleaned out when required
7. The chimney is made of cast iron, which can either be taken through a roof or trained into a flue, to meet the convenience of the situation they may be fixed in.
8. They are fed from the top, so that the fire can be banked up to last from 12 to 24 hours when required, without being attended to
They are warranted to be the most effective and durable boiler ever invented
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HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
Plans and Estimates on application.
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Portable and Fixed Hot-water Apparatus

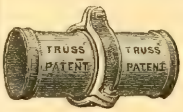

FOR
HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,
WITH
TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY. The Trade supplied.

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Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder,
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Smokeless Stoves.—No Flues.—Portable.

NASH AND JOYCE'S PATENT, for CONSERVATORIES and all other places, from 12s. 6d. to £10. 10s. Guineas. PATENT FUEL, 18s. per 120 lb.; in bags and sacks of 30 lb. and 60 lb. at 4s. 6d. & 9s.
AMERICAN CHARCOAL BOX-IRONS, always bright for use, without cleaning. The Iron is a miniature portable stove. Light, cheap, clean, and durable. Price 5s., 6s., and 7s.
Masticating, Mincing, and Sausage-Filling Machines of the best makers, 10s. 6d.
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PORTABLE VAPOUR BATH, with Medical Testimonials.—Bath and large Cloak, £1 11s. 6d.
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New Leaf Rake.

ASHBY, JEFFERY, AND LUKE, of Stamford, have just brought out a new WHEEL HAND RAKE for RAKING LEAVES; it is fitted with movable steel teeth placed very close together, which adapt themselves to the inequalities of the ground, and gather six or seven times as much as the ordinary Rake. They discharge their load by a slight movement of the hand, and can be easily worked by a woman or a boy. Price 4s.

JONES'S PATENT DOUBLE L SADDLE BOILER.

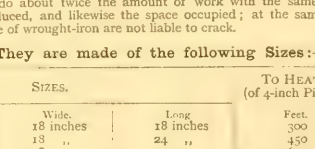

These Boilers possess all the advantages of the old Saddle Boiler, with the following improvements, viz.:—The water-space at back and over top of Saddle increases the heating surface to such an extent that a Patent Double L Saddle Boiler will do about twice the amount of work with the same quantity of fuel; the cost of setting is also considerably reduced, and likewise the space occupied; at the same time these Boilers are simple in construction, and being made of wrought-iron are not liable to crack.

They are made of the following Sizes:—

Sizes.			To Heat (of 4-inch Pipe).	Prices.		
High.	Wide.	Long	Feet.	£	s.	d.
20 inches	18 inches	18 inches	300	5	0	0
20 ,,	18 ,,	24 ,,	450	6	0	0
20 ,,	18 ,,	30 ,,	600	7	0	0
24 ,,	24 ,,	24 ,,	700	8	0	0
24 ,,	24 ,,	30 ,,	850	10	0	0
24 ,,	24 ,,	36 ,,	1,000	12	0	0
24 ,,	24 ,,	48 ,,	1,400	15	0	0
28 ,,	28 ,,	60 ,,	1,800	20	0	0
30 ,,	30 ,,	72 ,,	2,600	30	0	0
36 ,,	36 ,,	96 ,,	4,500	50	0	0
48 ,,	48 ,,	108 ,,	7,000	75	0	0
48 ,,	48 ,,	144 ,,	10,000	100	0	0

And are kept in Stock, and Sold only by the Inventors and Patentees,
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Indestructible Terra-Cotta Plant Markers.

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ARCHANGEL MATS, under present value; PETERSBURG MATS at old prices. Samples and prices at J. BLACKBURN AND SONS, Russia Mat and Sack Warehouse, 4 and 5, Wormwood Street, London, E.C.

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PROTECTION from the SCORCHING RAYS of the SUN.

WOOL NETTING, 3 yards wide and 72 Gd. per yard.

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Two yards wide .. .. 15. 9d. per yard.
Three yards wide .. .. 2s. 6d. per yard.
Four yards wide .. .. 3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 55s. or 8½d. p yard.
HESSIAN CANVAS, do , do., 54 and 72 inches wide, 63d. and 8½d. per yard.

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For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C. ; and Steam Plough Works, Leeds

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GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

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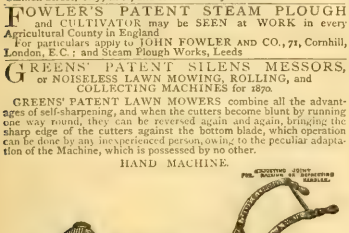

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.

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CONSERVATORY and ORCHARD-HOUSE GLASS.

Genuine White Lead, Oils, Colours, Brushes, &c.

GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNECTIONS, &c

Prices upon application

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JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

Each.—s. d.		Each.—s. d.	
2 inches in diameter .. 0 3½	12 inches in diameter .. 1 9		
3 " " .. 0 4½	13 " " .. 2 0		
4 " " .. 0 5½	14 " " .. 2 6		
5 " " .. 0 6½	15 " " .. 3 0		
6 " " .. 0 8	16 " " .. 3 6		
7 " " .. 0 10	17 " " .. 4 0		
8 " " .. 0 11	18 " " .. 5 0		
9 " " .. 1 2	19 " " .. 6 0		
10 " " .. 1 4	20 " " .. 7 0		
11 " " .. 1 6			

BEE GLASSES, with ventilating hole through knob.

4 inches in diameter .. 0s. 6d.	9 inches in diameter .. 1s. 8d.
5 " " .. 0 8	10 " " .. 2 0
6 " " .. 0 10	11 " " .. 2 6
7 " " .. 1 1	12 " " .. 3 0
8 " " .. 1 4	

Ether flat or conical tops.

CUCUMBER GLASSES.

	Each.—s. d.		Each.—s. d.
24 inches long	2s. 0d.	16 inches long	1s. 4d.
22 "	1 10	14 "	1 2
20 "	1 8	12 "	1 0
18 "	1 6		

HAND GLASSES, WITH OPEN TOPS.

	Each.—s. d.		Each.—s. d.
12 inches	0 6	20 inches	10 6
14 "	0 7	22 "	11 6
16 "	0 8	24 "	12 6
18 "	0 9		

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS PAINTS of various colours ground ready for use.

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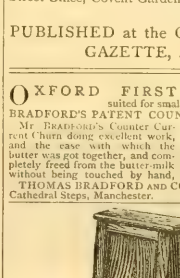

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"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadesful put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them

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"January, 1870."

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Testimonials from the largest Wheat Growers in the Kingdom, bearing testimony to its great power and efficacy, may be had of Agents, who are appointed for every district.

Full directions for use are given with each packet.

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CAUTION.—To guard against fraudulent imitation and consequent disappointment, see that the signature of HENRY DOWN is on the label.

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German Spring Hair Stuffing ..	65s 6d. ..	87s 6d. ..	95s 6d.
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N.B.—Only One Ticket can be issued to each applicant, who is requested to bring his name, address, and occupation written on a piece of paper, for which the ticket will be exchanged

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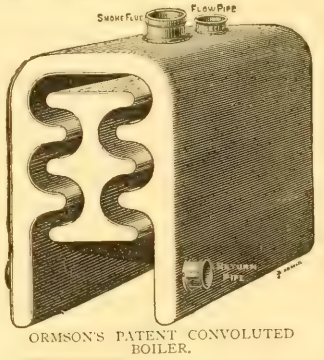

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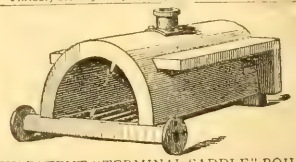

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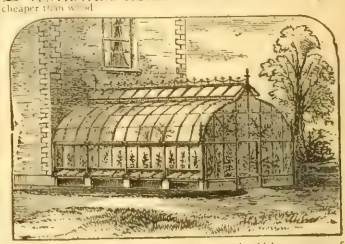

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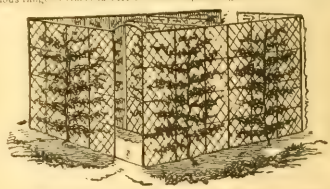

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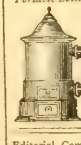

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JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

Notice to the Seed Trade.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL LIST of GARDEN and AGRICULTURAL SEEDS for the present season is now ready, and can be had upon application. Samples and stocks are very fine, and prices very low

Transit Agency for Plants, Seeds, &c.

C. J. BLACKITH AND CO., Cox's and Hammond's Quays, Lower Thames Street, London. Forwarders to all parts of the World.
N.B.—Mr. BLACKITH is sole Survivor of the late Firm at BETHAM AND BLACKITH

MR. ALEXIS DALLIERE, NURSERYMAN, Ghent, Belgium, begs to inform Amateurs and the Trade that he has just published an English Edition of his CATALOGUE, which may be obtained post free on application to his Agents, Messrs. R. LIBERRAD AND SON, 5, Harp Lane, Great Tower Street, E.C.

The Best New Potato for 1871.

SUTTONS' RED-SKIN FLOURBALL.—For full particulars, see p. 1501 of this week's *Gardeners' Chronicle*
SUTTON AND SONS, Seed growers, Reading.

FOR SALE, BOVINIA POTATOS.
Apply to
H. W. BRIDPORT, Market Gardener, Nursling, Hants.

SEED POTATOS for SALE.—About 10 tons Early Shaws.—Apply to the Grower,
A. STYLES, Stone, near Greenhithe, Kent.

MYATTS DWARF OF PROLIFIC KIDNEY, and other SEED POTATOS. Prices on application
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

ASPARAGUS PLANTS, for Forcing, 2-yr. old, 5s per 100, 40s per 1000 Sacks 1s 4d each Remittances to accompany all orders
CHRISTMAS QUINCEY, Seedsman, &c., Peterborough.

Asparagus Plants for Forcing.

J. SANDY AND SON, The Nurseries, Stafford, have some thousands extra strong roots, price 25s. per 1000. Cash with order

To the Trade.

ASPARAGUS ROOTS.—100,000 3-yr. Asparagus Roots also a quantity of Seakale Roots for Forcing. To be Sold Cheap, in consequence of having to give up the occupation of the land.
GEORGE WINFIELD, Gloucestershire Seed Warehouse, Gloucester.

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W C

MAGNIFICENT SEAKALE ROOTS, for Forcing, 12s 6d per 100
W. HOOPER, New Wandsworth, S.W.

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5s. per 1000; also Drumhead or Cattle Cabbage Plants at 3s 6d. per 1000, can now be supplied by
W. VIRGO AND SON, Wonersh Nursery, near Guildford.

The Largest and Best Early Pea.

For MARKET GARDENING PURPOSES is SUTTONS' IMPROVED EARLY CHAMPION.—Only four days later than Ringleader (the earliest known), and a week earlier than Daniel O'Rourke
Lowest price per bushel and per quarter on application.
SUTTON AND SONS, Seed Growers, Reading.

Eastes' Kentish Invicta Pea.

The EARLIEST ROUND BLUE PEA in CULTIVATION.
MESSRS. SUTTON AND SONS beg to announce that they have purchased a portion of the Stock of the above Pea from Mr. Eastes. Lowest Trade Price may be had on application to SUTTON AND SONS, Seed Growers, Reading.

PAUL'S NURSERIES,
WALTHAM CROSS, N.

ROSES.

ROSE PRINCESS CHRISTIAN.—"One of the grandest Roses in cultivation." "The best Rose of the present year." "The great Rose of the Show." Standards and Dwarf Standards, 10s. 6d. each. Dwarfs, 7s. 6d. each.

Standard ROSES, 15s. per dozen, and upwards.
Dwarf Standard ROSES, 12s. per dozen, and upwards.
Dwarf ROSES, 6s. per dozen, and upwards.
" in lots of extra size, prepared for flowering, 24s. per dozen, and upwards.
Climbing ROSES, strong plants, 9s. per dozen and upwards.

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s. per dozen, and upwards.
Bedding HYACINTHS, 5s. per 100, and upwards.
" TULIPS, 3s. per 100, and upwards.
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, assorted, 2s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000.
All other Bulbs equally moderate in price.

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each.
AVALANCHE, do., do., 5s. each.
MARCHIONESS.—The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.
WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each.
BONFIRE, the finest scarlet for bedding, 3s. 6d. each.
AMETHYST, ROADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 2s. each and upwards.

EVERGREENS, CONIFERS, &c.

The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequent, mass planted specimens.

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES, FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post.

IMPORTANT.—Address WILLIAM PAUL (the Christian name is full), Paul's Nurseries, Waltham Cross, London, N.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an acquisition since it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties; but F. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited as four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—

The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.
The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.
The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.
The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, at 2s. 6d. per packet, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 27 and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint; and of the following Agents:—

ENGLAND

Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London
" Wood & Ingram, Huntingdon
" J. & C. Lee, Hammersmith
" Thomas Davies & Co., Liverpool
" A. Henderson & Son, Bedford
" Sutton & Sons, Reading.
" James Veitch & Son, King's Road, Chelsea.
" S. Nairn & Sons, Newcastle-on-Tyne
" Hooper & Co., Covent Garden, London.
" Butler, McCulloch & Co., Covent Garden, London.
" G. Gibbs & Co., Down Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London
" Downie, Laird & Laing, London and Edinburgh
" F. Lawson & Son, 19, Hedge Row, London.
" Rutley & Silverlock, London
" Dick Radclyffe & Co., 129, High Holborn, London, W.C.
" Fisher, Holmes & Co., Wandsworth Nurseries, Shefford
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., High Holborn, London, W.C.
" Miniter, Nash & Nash, 60, Strand, London, W.C.
" Child & Lorimer, 49, Darley Street, Bradford.

Mr. George Trudgett, Cambridge.
" L. S. Woodthorpe, Sible Hedingham, Essex.
" G. Hinsman, Fareham
" B. Bradley, Halifax, Yorkshire
" W. Knight, Hailsham, Sussex
" Timothy Brigden, South Eastern Railway Station
" W. Paul, London.
" E. Holmes, Whittington Nursery, near Lichfield
" W. Bull, King's Road, Chelsea
" E. Taylor, Malton, Yorkshire
" B. S. Williams, Upper Holloway, London
" E. Cooling, Derby.
" James Wood, Newport, Isle of Wight.

SCOTLAND

Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow
" F. Lawson & Son, Edinburgh
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling
" J. & R. Thyne, 60, Buchanan Street, Glasgow.

IRELAND.

Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin.

BELGIUM.

Mons. Louis Van Houtte, Ghent.

PRUSSIA

Messrs. Trier & Sons, Erfurt
" Ferdinand Jubilee's Successor, Erfurt
Mr. Ernst Benary, Erfurt.

AMERICA.

Messrs. B. K. Bliss & Sons, New York.

Violets.

NOW READY for PLANTING OUT, for the coming season, a large quantity of all sorts of VIOLET PLANTS, including the Giant, King, Queen, Neapolitan, Russian, Tree, &c., full of bloom. List of prices sent on receipt of stamp for postage
JOHN STEDMAN, Violet Grower, Thornton Heath, Surrey.

THE beautiful PURPLE DOG'S-TOOTH VIOLETS.
See article in *Gardeners' Chronicle* for October 22. Strong roots, 5s. per 100; 1s. per dozen,—2d. per dozen extra for postage.
Having nearly 1 acre of GLADIOLI, I can supply them cheaper than any house in the Trade. Prices upon application.
JOHN STEVENS, The Nurseries, Coventry.

TULIPS.—A Collection of 40 rows, 280 roots, comprising the finest Show varieties, as exhibited at the Cambridge Competition of 1869, will be DISPOSED OF, a Bargain, say £10, or any part selected. The whole warranted fine strains. A LIST can be obtained with address,
Mr. ALEXANDER, 299, Goswell Road, E.C.

Fruit Trees, Roses, &c

WILLIAM KING can supply extra fine 3-yr. old PYRAMID APPLES, PEARS, CHERRIES and PLUMS, at 8s. per dozen, 50s. per 100. Standard ROSES, 12s. per dozen; Dwarf do., 6s. per dozen. All the best show sorts. CATALOGUES free on application. High Street Nurseries, Lincoln.

Shrubs, Evergreens, and Fruit Trees.

ROBERT CORNWELL, AND CO. have to offer SPRUCE, SILVER, SCOTCH, and AUSTRIACA FIRS, 3 to 4 feet; AMERICAN and CHINESE ARBOR-VITÆ, 4 to 6 feet; PRIVET, 3 to 6 feet; Variegated and Green BOX, 2 to 4 feet; Variegated and Green HOLLIES, 3 to 5 feet; IRISH YEWS, 3 to 4 feet; PINUS EXCELSA, 6 to 8 feet; Bushy LAURELS, 3 to 8 feet; PORTUGAL LAURELS, 2½ to 3 feet; Bushy LAURUSTINUS, 2 to 3 feet; some extra handsome ones, 4 by 4 feet; 500 STANDARD ROSES, GOOSEBERRIES, CURRANTS, RASPBERRIES, and STRAWBERRY Plants of sorts; 2, 3, and 4 year old APARAGUS; 1000 yards of BOX EDGING, cheap, to clear the ground. *Note.*—Opposite the Red Lion, Barnet.

Planting Season.

To PLANTERS of PUBLIC PARKS, CEMETERIES, or PRIVATE GARDENS.

WM. SKIRVING solicits inspection of his unrivalled Stock of choice EVERGREEN HARDY SHRUBS, FOREST and ORNAMENTAL TREES, which he is disposing of at very moderate prices, in order to clear the land for building purposes.
Among the Evergreens are many thousands of fine specimens of variegated and broad-leaved Green Hollies, and an immense Stock of all other Hardy Evergreen Flowering Shrubs and Ornamental Trees generally cultivated in Britain, many of which are of large size, well adapted for giving immediate effect.
To Gentlemen wishing to make New or improve Old Pleasure Grounds this is an excellent opportunity, for such an extensive and well-grown Stock of Trees and Shrubs is seldom to be met with.
Nursery and Seed Stores—Walton-on-the-Hill.
Seed Warehouse—15, Queen Square.
Liverpool, 1st September, 1870.

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive LIST of STANDARD, Pyramid, Dwarf, and Trained FRUIT TREES of the leading kinds; Standard and Dwarf ROSES of select and choicest varieties; a fine hardy collection of AMERICAN PLANTS, rare and hardy CONIFERS, CLEMATIS, EVERGREEN and DECIDUOUS TREES, SHRUBS, and FOREST TREES, &c.
The Catalogue contains a select but full list of the Improved Clematis, for which this Establishment has been celebrated.

REDUCED FORM, No. 3.

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials.

Engraving No. 1. For Conservatories, Terraces, &c.
" No. 2. For Lawns, Flower Garden, &c.
" No. 3. For Hardy and Permanent Bedding, &c.
" No. 4. For Festoons, Verandahs, &c.
" No. 5. For Rockeries, Rockwork, Ruins, &c.

"This Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*
Woking Nursery, Surrey.

Notice.

GEORGE JACKMAN AND SON beg respectfully to inform the Public that they are in as good position to supply general orders as heretofore. The Auction Sale (by order of Executors), was simply a portion of surplus specimen Trees, &c., averaging 6 to 25 feet high.
Woking Nursery, Surrey.

N.B.—This Firm must not be confounded with the "Clearance Sale (Oct. 24 and 25) of Jackman's Nursery," through the death of the late Mr. William Jackman.

SPECIMEN CONIFERS, &c.
Extra large plants, for immediate effect.
ABIES EXCELSA (LAMBRAIANA), 1 foot by 4 feet, 15 to 18 each
" 6 to 8 feet, 63s. to 105s. each.
" MENZIESII, 6 to 8 feet, 5s. to 7s. 6d. each
ARAUCARIA IMBRICATA, 4 to 5 feet, 15s. to 21s. each.
" 6 to 10 feet, 63s. to 105s. each.
CEDRUS DEODARA, magnificent specimens, 12 to 16 feet, 30s., 42s., and 63s. each.
CUPRESSUS LAWSONIANA, 10 to 12 feet, 21s. to 31s. 6d. each.
LICEA EXCELSA, 5 to 6 feet, 63s. to 84s.; 8 to 9 feet, 105s. to 126s. each.
" PINSAPO, 2 to 3 feet, 5s. 6d. to 5s.; 3 to 4 feet, 7s. 6d. to 10s. 6d. each; handsome plants, 4 to 5 feet, 21s. to 42s. each.
PINUS CEMBRA, 4 to 6 feet, 3s. 6d. to 10s. 6d. each.
" EXCELSA, 4 to 6 feet, 3s. 6d. to 10s. 6d. each.
" INSIGNIS, 8 to 10 feet, 10s. 6d. to 42s. each.
" PYRENAICA, 1½ to 2 feet, 7s. 6d. to 15s. each.
TAXUS BACCATA VARIEGATA (fine Vases), 2 to 3 feet, 15s. 6d. to 21s.; 3 to 5 feet, 42s. to 63s. each.
" BACCATA VARIEGATA, 1½ to 2 feet, 3s. 6d. to 5s. each.
THUJA GIGANTEA, 9 to 12 feet, 42s. to 63s. each.
" LOBBII, 6 to 10 feet, 21s. to 42s. each.
" WAREANA, 5 to 8 feet, 3s. 6d. to 5s. each.
" ORIENTALIS, 4 to 6 feet, 3s. 6d. to 5s.; 6 to 8 feet, 7s. 6d. to 10s. 6d. each.
THUJOPSIS BOREALIS, 8 to 10 feet, handsome plants, 42s. to 63s. each.
WELLINGTONIA GIGANTEA, 4 to 6 feet, 7s. 6d. to 10s. 6d.; 6 to 8 feet, 15s. to 21s.; 8 to 10 feet, 21s. to 42s. each.
BOX (TREE), Green and Variegated, 6 to 8 feet, fine specimens, 3s. 6d. to 5s. 6d., and 7s. each.
LAUREL (Portugal), extra fine specimens, 4 to 5 feet, 3s. 6d. to 5s. each.
LIME (Weeping), 8 to 10 feet, 3s. 6d. to 10s. 6d. each.
ELM, fine ornamental trees, in great variety.
WILLIAM BRYANT, The Nursery, Rugby.

THE AMERICAN NURSERY,
BAGSHOT, SURREY,
Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed selections from their general stock; every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 to 8 to 12 feet
CUPRESSUS LAWSONIANA, 3 to 4 to 6 to 10 feet
" LAWSONIANA ARGENTEA (JOHN WATERER'S var.).—By far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each
" MACROCARPA, 1 to 6 feet, 42s. per dozen
THUJA AUREA.—Beautiful plants, about 2 feet, 42s. per dozen; larger, 5s. to 21s. each.
" GIGANTEA.—An unequalled stock of hundreds of Seedlings, 4 to 6 to 8 feet, 3s. 6d. to 5s., 7s. 6d., and upwards
We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless.
THUJOPSIS BOREALIS, 3 to 4 feet, 30s. per dozen; extra fine, 5 to 6 and 7 feet, 5s. to 10s. 6d. each.
" DOLABRATA.—Fine plants, 5s. to 7s. 6d. each.
" " VARIEGATA, 5s. to 7s. 6d. each
WELLINGTONIA GIGANTEA.—Good plants, 30s. per dozen; 2 to 3 feet, 42s. to 60s.; larger, up to 10 feet, 7s. 6d. to 63s. each
ABIES NOBILIS, handsome plants, from 5s., 7s. 6d., and upwards.
" NORDMANNIANA, 2 to 3 feet, 7s. 6d. to 10s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 12 feet, 31s. 6d. and upwards, each
" LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each.
" GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to 63s. each
" PINSAPO, 2 to 3 feet, 5s.; 3 to 5 to 8 feet, 7s. 6d. to 63s.
" DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 10 feet, 3s. 6d. to 7s. 6d. and upwards.
" MAGNIFICA, 4 to 6 feet, 21s. 6d. to 42s.
" ORIENTALIS, 3 to 5 to 8 feet, very beautiful examples, 21s. and upwards each.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; larger up to 12 feet
YEWS, COMMON.—Immense quantities, 2 to 3 to 4 to 6 feet, from 18s. to 60s. per dozen.
" IRISH.—Perfect columns, up to 12 feet.
" GOLDEN, as Standards on Irish stems, perfect globes, 31s. 6d. to 42s. each
HOLLIES, GREEN COMMON.—Many thousands, of all sizes, from 1 foot up to 10 feet.
" the best GOLDEN, WATERERS', and SILVER varieties, in any quantity, and of all sizes.
STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each.
" " WATERERS' variety, many hundreds of symmetrically grown specimens, perfectly straight stems, 42s. to 105s. per pair.
" WEEPING, GREEN, and SILVER VARIEGATED, fine plants, from 21s. each.
" PORTUGAL LAURELS.—Very close grown handsome plants, 1 to 6d. to 21s. each; very large imposing specimens, 42s. to 63s. each
STANDARD ROSES, of the most approved kinds, £5 per 100.

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, for undercover or shrubberies, strong established plants, £10 10s. per 1000; larger, 25s. to 63s. per 100
" CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 50s. to 75s. per 100.
" better class (SEEDLINGS) and named varieties for extensive planting, £5 per 100
" of superior kinds, many on own roots, £7 10s. to £10 per 100.
" very superior, leading, crimson, rose, white, £2 10s. to £15 p. 100
" STANDARD and HALF-STANDARD, of the most imposing varieties, of all shades of colour, from 21s. to 63s. to 105s. each
AZALEAS, common kinds, 50s. to 75s. per 100.
" very best, in fine plants, £10 per 100
KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen.
" LATIFOLIA, 18s. to 30s. per dozen.
ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen

We have likewise immense quantities of the leading kinds of
EVERGREENS OF ALL SIZES,
SUCH AS
AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYRÆA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.
We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.
CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application.
A strong Tree-planting Machine can always be had on hire.
Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I (British Ferns and their varieties, 36 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

BOX EDGING.—A large quantity of good Box Edging, fit for replanting, to be SOLD cheap, as the ground must be cleared.
Apply to Mr. MOORE, Versailles Nursery, William Street, Hammersmith, W.; or, to Mr. CHANDLER, Horticultural Valuer, Underhill Road, Dulwich, S.

INTENDING PLANTERS are respectfully invited to inspect the extensive stock of FOREST TREES and SHRUBS grown in these Nurseries, all of which are in fine condition, and can be highly recommended
THOS. THORNTON, The Nurseries, Bagshot, Surrey.
T. T. would be happy to receive Notice from intending Visitors, as he would be in a position to offer every facility for their doing so.

THOMAS BUNYARD AND SON'S TRADE CATALOGUE may now be had on application. It contains low priced offers of Fruit Trees, Roses, Arbutus, Juniperus sinensis, Thuia aurea, Ibota elegantissima, Chichester Elms, Ceanothus, Climbers, &c., &c.
The Old Established Nurseries, Maidstone.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat—1862, for "Excelsior" Seeds.

To the Trade. Agricultural and Garden Seeds.

H. AND F. SHARPE are now prepared to make special offer of the above Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from admixture of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new footpath leads you to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are cordially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON AND SONS, Royal Nurseries, Chester.

WRIGHT'S GROVE WHITE CELERY.—One of the largest and best flavoured bleaching varieties ever introduced; after the same character as the Grove Red sent out by me. It has been awarded the First Prizes at the two Celery Shows held at Retford, the average size of the Sticks exhibited being 18 inches. It was raised by myself, and will be found one of the best White Celeries in cultivation. This is the first season I have been able to introduce it to the Trade, and as the stock of seed is limited, early orders are requested. Price 1s. per packet, or 9s. per dozen.
W. WRIGHT, Seed Merchant, East Retford.
Agents: HURST AND SON, 6, Leadenhall Street, London, E.C.

Choice Seeds—Now Ready.

DIMMICK'S VICTORIA WHITE COS LETTUCE.—The largest and best self-folding Lettuce ever offered; will keep longer than any other without running to seed. No garden should be without it.
CAUVS SELF-FOLDING GREEN COS LETTUCE.—An excellent and useful Summer Lettuce, as it keeps along without running to seed
These Lettuces have proved themselves indispensable to all who have tried them.
NONPAREIL RED BEET.—The finest Red Beet in cultivation (with dwarf green top). Its splendid crimson colour and perfect shape render it most desirable where first-class quality is required.
Orders should be forwarded early, as the stock is limited.
Sole Agents: HURST AND SON, Seed Merchants, 6, Leadenhall Street, London, E.C.

BROCCOLI, ELLETSON'S NEW SURPRISE, large late white protecting.—This variety is a great improvement upon the Mammoth Cauliflower Broccoli sent out 20 years ago by J. & J. Elletson, of Thorganhald. It has given universal satisfaction, and proved itself to be the best late white Broccoli extant. Price 1s. per packet.
CUCUMBER, FOSTER'S X.L., fine long Ridge.—This new variety is a remarkably fine, hardy, long, dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. Price 1s. per packet.
MELON, LORD NAPIER, New.—A handsome exhibition variety, golden yellow, and beautifully netted; green-flesh, melting, juicy, and delicious in flavour; free setter, and hardy in constitution. Price 1s. 6d. per packet.
EDMUND PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street, Hull

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 18s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.

All other MANURES and CAKES as per Price List, supplied on the lowest terms.

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Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited),
Chief Offices—109, Fenchurch Street, London, E.C.
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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz., "THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
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LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, for Dressing Pasture Lands.
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Docks or Warehouse.
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REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 27 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.
"SIR,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

TOBACCO TISSUE, for FUMIGATING GREENHOUSES.—Will destroy Thrip, Red Spider, Green and Black Fly, and Mealy Bug, and burns without the assistance of blowing, and is entirely free from paper or rags. Price 3s. 6d. per lb., carriage free. A reduction in price for large quantities.
To be had of Messrs. ROBERTS AND SONS, Tobacco Manufacturers, 112, St. John Street, Clerkenwell, E.C., of whom Copies of Testimonials may be obtained; and of all Seedsmen and Nurserymen.

The Cheapest and Best Insecticide.

DUTY FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

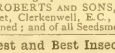

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributers, 2s. 6d. and 5s. 6d. each
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
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GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.
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The Noted French Cold Grafting Wax
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For Grafting, Budding, Healing, &c., may be obtained of
HOOPER AND CO., Covent Garden, W.C., Sole Wholesale Agents for the United Kingdom; also through any London or Provincial Seedsman and Nurseryman.

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COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
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Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent overgorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.
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CONSERVATORY BASKETS.

Strained Wire Trainers for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any portion, on the Lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories. Wire Work Flower Stands for Conservatories. Vases for Conservatories, Pleasure-grounds, &c.
Conservatories filled up with Flower Stands, Baskets, Wires, &c.
Miniature Ornamental Tale Rose Boxes.
All kinds of Wire Work made to order.
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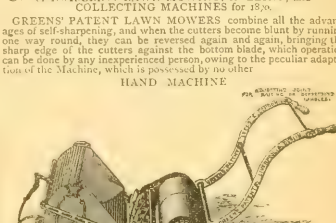

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Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.
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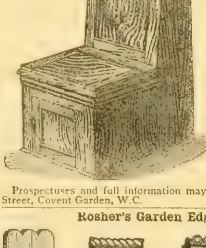

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From Mr W. GILBERT, *Lower Seal, Ewhy.*
"I am perfectly satisfied with the Closets, and find what I had imagined would be a great difficulty—the supply of Dried Earth—to be no obstacle; as, by laying by a few bags of earth in the summer, I have a plentiful supply, without any trouble of artificial drying. I have used the Manure to my Rose Trees (a couple of spadefuls put into a bucketful of water), and have had the finest blooms this summer I ever had in my life. They have been admired by every one who has seen them.
"W. GILBERT.
"January, 1870."
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Rosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The plainer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.
Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability. Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—
Nos. 14s. per Ton, 12s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp
FLINTS and BRICK RUBBISH for Rockeries or Terneries. KENT PEAT and LOAM supplied at lowest rates
F. & G. ROSHER.—Addresses see above
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

MYOSOTIS DISSITIFLORA.

B. S. WILLIAMS

Has much pleasure in offering good Seedling Plants, in quantity, of the above superb New Spring Bedder. It blossoms three weeks earlier than M. sylvatica, far more profusely, of a bright azure-blue colour, and is quite as hardy.

Extracts from *Gardeners' Chronicle.*

"For beauty M. dissitiflora carries all before it, captive at its sweet will, and reigns supreme without a rival over all the Forget-me-Nots." "For earliness, compactness, and general effect, it is far in advance of M. sylvatica, and the individual blooms are nearly twice as large. We say, emphatically, that no arrangement of Spring Decorative Gardening can be complete that excludes Myosotis dissitiflora."

Price—per dozen, 6s.; per 100, 40s.

B. S. WILLIAMS, VICTORIA and PARADISE NURSERY, UPPER HOLLOWAY, N.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS—Seedlings of the very finest varieties, for blooming, plants, will be supplied at 30s. per dozen, or £20 per 100
" Good named kinds, £5 to £7 10s. per 100
" Common mixed colours, £2 10s. per 100
" Van Houtte, Helena, striped bush flowering plants, 1½ to 1½ feet, 42s. to 72s. per dozen and upwards. This is one of the most beautiful of the Double Azaleas.

Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower buds, and of rich, free, healthy, and vigorous habit. Hundreds of splendid specimens.

ANDROMEDA FLORIBUNDA, fine plants, 18s. to 30s. per dozen.

RHODODENDRONS.—We invite the special attention of Rhododendron growers to this part of our stock. We have imense borders in which the plants vary from 2 to 8 feet high. Every good variety, specimen, and compromise, all sorts excepting the common Ponticum.

Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent on application.

Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Bottles Row were nearly all of them supplied from Knap Hill. As no description can appear equal to an adequate view of these plants, we have had a fine example photographed, which is given in our Catalogue just published.

RHODODENDRON PONTICUM, for stocks, 7s. per 100; £4 per 1000.
" 9 varieties, named, from layers, to varieties, 50s. to 100s. per 100.
" Dwarf varieties, the best kinds and nice plants, £5 to £7 10s. p. 100.

Seedling RHODODENDRONS, raised from the best hardy named kinds, and of extra great variety of colour.—Nice bushy plants, 50s. to 100s. per 100.
" Larger and very bushy plants, £10 to £20 per 100.
" We have 4,000 to 5,000 varieties, from a large number of Rhododendrons in layers, and we now have a stock of more than 100,000 plants of named varieties, which we believe are quite unequalled, being without exception the finest plants we have ever seen. We supply them, all layers, at from 50s. to 200s. per 100. A sample, the only guide, will be sent on application.

HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, by name, including Mediterranea, every plant a specimen, 6s. per dozen, 40s. per 100.
" The free growing varieties of VULGARIS, &c., 30s. per 100, £10 per 1000.
" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, 45s. per 100.

KALMIA LATIFOLIA, from 50s. to 100s. per 100.
" Nice blooming plants, £5 to £10 per 100.
" Larger, 30s. to 60s. per dozen and upwards.
" MYRTIFOLIA, 42s. to 60s. per dozen.
All other American Plants are grown to a large extent.

HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.

COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100; 3 to 3½ feet, £5 to £7 10s. per 100; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.
Thousands of beautifully grown Pyramidal plants.
We have a number of very large Green Hollies, 12 and 15 feet high.

WAVE-LEAVED HOLLY.—We have these in large numbers and of all sizes, as Pyramids, Globes, and Standards, each, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photographed Waterer's and Golden Queen Holly, being fair examples of our stock.

PERRY'S WAVING HOLLY STANDARDS.—A large number.

NEW GOLDEN WAVING HOLLY.—Handsome bushes.

The COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, magnificent plants.

VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely-grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high.

YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 14 feet. These are invaluable as Screens.

IRISH YEWS, of all sizes, up to 10 feet.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN—Handsome Trade plants, 5 to 7 feet
" VARIEGATED 12 feet high. An enormous quantity of well grown bushy plants, 3, 4, 5, and 6 feet high.

AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high.

LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.

LAURUSTINUS and BAYS.—Fine Standards, in tubs.
Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and high trained—

ABIES ALBERTUS, 5 to 6 feet, 42s. per dozen; 7 to 8 feet, 60s.
" BRUCEANA, 4 to 5 feet, 42s. per dozen; 5 to 6 feet, 60s.
" CANADENSIS, transplanted 1870.
ABIES ORIENTALIS, 4 to 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. and upwards.
PINUS AUSTRIACA, splendid trees, 7, 8, and 10 feet high.
PINUS PINASTER, 2 to 2½ feet, 16s. to 24s. per dozen; 3½ to 4 feet, 5s. 6d. to 10s. 6d. each, larger, 5 to 6 feet, 21s. each and upwards.
PINUS NOBILIS, 1½ feet, very stout, 18s. per dozen, £5 per 100; 2 to 2½ feet, per dozen, 42s. 6d., 5 to 6 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards.
PICEA NORDMANNIANA, very handsome plants, from seed, 6 inches high and wide, 42s. per dozen; 2½ to 3 feet, 5s. to 7s. 6d. each; larger specimens, 4, 5, 6, 8, and 10 feet.
PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.
PICEA LASIOCARPA, 3 feet, handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, and 8 feet high, 21s. each and upwards; and all have been transplanted within 12 months.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; 5 to 7 feet, 60s. to 84s. per dozen; 8, 10, and 12 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.
CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, 4, and 5 feet high.
CUPRESSUS LAWSONIANA GRACILIS, 3 to 4 feet, 42s. to 60s. per dozen.
" ARGENTEA—84s. per dozen.
JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.
THUYA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.
THUYOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen.
THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.
WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—

ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET HORSE CHESTNUTS, 8 and 10 feet high.
ÆSCULUS HIPPOCOMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, giving 5 to 6 inches 4 feet from the ground
BEECH, PURPLE, 6 to 8 feet; 10 to 12 feet, fine trees
BEECH, COMMON, 8 to 10 feet
BIRCH, WEEPING, 8 to 10 feet.
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet.
LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground
MAPLES, NORWAY, 8 to 14 feet.
OAKS, ENGLISH, 8 to 10 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high.
The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBARDY, 10 to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
AILANTUS, 8 to 10 feet.
CATALPAS, 6 to 8 feet.
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years
Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

WINTER AND SPRING FLOWERS.

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COLLECTIONS OF
HYACINTHS, TULIPS,
CROCUS, &c.,

Include only the best kinds, and being made up in a most liberal manner, these Collections offer the most desirable medium to ensure an effective display in the Drawing Room or Garden.

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Packing and carriage free.

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JAMES CARTER AND CO.'S CATALOGUE of Hyacinths, Tulips, Crocus, and other Bulbs, Roses, Fruit Trees, &c., containing full particulars of the above Collections, will be forwarded Gratis and Post Free on application

Eastes' Kentish Invicta Pea.

J. C. & Co. having purchased part of the stock of this fine Early Pea, will be happy to quote special prices to the Trade for large quantities on application

Red-skinned Flourball Potato.

J. C. & Co. have purchased a stock of this fine Potato from the original raiser. Too much cannot be said in its favour, as it is the heaviest cropping and best cooking late Potato in cultivation; especially valuable for late use and winter storing, and producing tubers all of uniform size, which are very large. While most other red varieties boil yellow, this is white, of particularly fine flavour, and is most correctly described as "Flourball." The "Red-skinned Flourball" is entirely free from disease. Special price to the Trade for large quantities may be had on application.

☞ CARTER'S LIST of NOVELTIES for 1871 is now ready, and may be had on application.

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THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

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FRESH IMPORTED

DUTCH FLOWER ROOTS

CARRIAGE FREE.

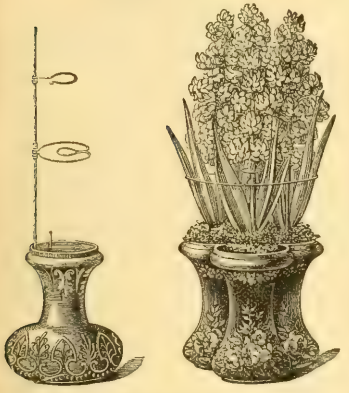

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For Indoor or Outdoor Cultivation, to produce a good display during the Winter and Spring.

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No. 1, £2 2s. 0d. Carriage free. | No. 2, £1 1s. 0d. Carriage free. | No. 3. 10s. 6d.

COLLECTIONS for POTS and GLASSES.

No. 4, £2 2s. 0d. Carriage free. | No. 5, £1 1s. 0d. Carriage free. | No. 6, 10s. 6d.

THE BEST TWELVE HYACINTHS FOR 12s.

For further particulars of Flower Roots, and complete Cultural Instructions, see SUTTONS' AUTUMN CATALOGUE, Gratis and Post Free on application.

THE

HEAVIEST CROPPING POTATO

and the best cooking Potato in cultivation is

SUTTONS' RED-SKIN FLOURBALL.

This extraordinary Potato, sent out last season by us, has given the most complete satisfaction. It has the peculiar merit of producing tubers all of uniform size, which are very large. While most other red varieties boil yellow, this is white, of particularly fine flavour, and is most correctly described as "Flourball." For supplying the London dining rooms especially, we feel confident it will supersede every other kind when sufficiently known. In a field where many other sorts were all more or less diseased, our "Red-skinned Flourball" was entirely free, which we can only attribute to its remarkably vigorous growth.

From Mr. B. BARHAM, *Gardener to the* Right Honourable Lord Ormathwaite, *Warfield Park*

"The Red-skinned Flourball Potato you sent me is a most extraordinary kind, producing tubers varying from 1½ to 2 lb. weight. Certainly the largest Potato I have ever seen."

From Mr. WM. JACKSON, *Blakedown Nursery*

"We have lifted the 'Red-skinned Flourball' Potato we had from you. The crop was enormous, exceeding many of the American kinds, and the quality when cooked is so good that without the least hesitation I must say it is the best Red Potato I have ever seen."

From Mr. W. F. BENNETT, *Steward to* Lord Norbury, *Valence*

"The Red-skin Flourball Potatos are a first-class quality, great croppers, and quite free from disease."

From Mr. C. BEALBY, *Donnington*

"The Red-skinned Flourball Potatos are very heavy croppers, several of the tubers weighing as much as 2 lb. each. Altogether they are very large size and good in form."

From Colonel J. LE COUTEUR, *Belle Vue*

"Half a peck of Red skin Flourball Potatos produced 18 lb. weight; they are fine sized, excellent and mealy, floury, no sign of disease."

We are now prepared to receive Orders for the above splendid Potato. The retail price last year was 7s. 6d. per peck, and we had sold out before the season was half over. Our Retail Price this year is **5s. per Peck.**

Trade Price may be had on application.

SUTTON AND SONS,

SEEDSMEN TO THE QUEEN, READING.

FRANCIS & ARTHUR DICKSON & SONS, The Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

LILY of the VALLEY, imported Clumps, 18s. to 24s. per dozen.—These are specially grown for early forcing, and are much superior to English grown; producing very large and fragrant flowers in great profusion.

SPIRÆA JAPONICA, imported Clumps, 12s. to 18s. per dozen.—For Conservatory or Greenhouse decoration in Spring nothing can be finer, and for table decoration or for bouquets it is unsurpassed. It is admirably suited for early forcing.

New Soft-Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready. It contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest price consistent with quality and correctness. See List, and present quotations.

New Florist's Flower and Florist's Flower Seed Merchant, Woolwich.

Scarce Liliums.

JOHN BELL has pleasure in being able to offer fine flowering BULBS of CONCOLOR and SINICUM, two very scarce Lilies, full descriptions of which were given in the *Gardeners' Chronicle*, October 29, p. 1439.

CONCOLOR ... 2s. 6d. each; 24s. per dozen
SINICUM ... 1s. 6d. each; 15s. per dozen

Price to the Trade on application.

The Norwich Nursery Seed Warehouse, 10 and 11, Exchange Street, Norwich.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.

B. S. WILLIAMS cordially invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.

Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

The Gardeners' Chronicle

SATURDAY, NOVEMBER 12, 1870.

SOME people might think it a sign of weakness, or as evincing a low taste, to get enthusiastic about VEGETABLES, to interest oneself with Cabbages, and Potatos, and Onions, and Carrots, and such like vulgar fare. Let such people hold to their opinion, if it so pleases them. In our opinion, a good plot or quarter of green Coleworts, for example, when thoroughly up to the mark, is just as pleasing—more so indeed, because less often seen, than a gaudy rainbow ribbon border, a house of Grapes, all sensational as it may be, or one of the most expensive Orchids. Vegetables, when grown well, have such a rich look about them, such a look of freshness and of usefulness, that they are quite as pleasing as any other crop of the garden, and, further, they show the cultural skill of the gardener quite as much.

There is a tendency in the modern school of gardening to look down upon the cultivation of vegetables as a matter quite beneath their notice. Any amount of attention is paid, it may be, to bedding plants and Grapes, but vegetables, although in such universal request, are shunned and neglected. There is no disguising the fact, that vegetables are not in general so well cultivated as they should be. This may arise partly from a want of interest regarding them, but not unfrequently from a lack of knowledge. It is, however, pleasing and encouraging to be able to record that in some of the first kitchen gardens, and notably at Frogmore, the very highest and finest garden in the realm, the cultivation of vegetables is carried out in excellent style, on which account, we think, a slight record of the practice followed in this and other establishments will be valued by our readers. Mr. ROSE, although at the top of the tree in gardening, as HER MAJESTY'S gardener, is nevertheless one of the most practical and skilled vegetable cultivators to be met with. At Frogmore this talent is brought to bear on the vegetable department, and with what results may be seen by any one who visits the royal garden.

To see the vegetables at Frogmore is of itself well worth a long journey; and to see and learn how they are cultivated affords a lesson worthy of serious attention. The extent of ground occupied by vegetables here is very great, acres of certain articles being grown which in ordinary gardens are confined to a few rods. At the end of October, the long borders of green Coleworts were wonderfully fine. They were planted about a foot apart each way on the inner border, about 10 feet wide and several hundred yards in length, and formed one dense mass of beautiful little hearted Cabbages. What an excellent vegetable this is for supply up to Christmas, and how very seldom we see it in perfection in gentlemen's private gardens, although in the market gardens it is much cultivated. Coleworts are in some ways superior to Cabbages; they are not so rank and coarse, especially for autumn use. Then there was a quarter, of about half an acre, of Walcheren Cauliflowers, all heading in beautifully, just coming into use, the heads of even moderate size, solid, and no blanks. Carrots were just being taken up at the time of our visit, and such crops—Short Horns, Intermediates, and Altringhams, all good; and Carrots just lately brairded. But Carrots as well as Potatos are generally good this season. Celery was to be seen by the tens of thousands in single trenches, and was very fine. But one of the most wonderful sights here at this season is undoubtedly the Endive—border after border planted with curled Endive, some finely blanched and fit to cut; and still they plant bed upon bed of small young stuff, for late spring supply. The Brussels Sprouts, the Savoys, and the Cottager's Kale, are apparently favourite vegetables, while the fine lots of Spring Broccoli and Scotch Curlics are all fresh and good. One large tract of land is devoted to Asparagus, the stems as thick as one's thumb; another contains thousands of roots or crowns of Seakale for forcing; and another again contains several thousand stools, three years successions, of Horse Radish.

Let us also call attention to the kitchen garden at Burghley Park, Stamford, under the charge of Mr. GILBERT. Here, again, the cultivation of vegetables is one of the features of the place. Mr. GILBERT has had much experience in London market gardening, and at Burghley he is now carrying out the system there followed in good style, as is evidenced by the fine quality of his produce, which has been from time to time exhibited at South Kensington. During the hot dry month of last July, when at Burghley, whilst in most other places things were parched up and withering—Cabbages, Cauliflowers, Peas, &c., almost at a premium—they were to be seen at Burghley in the greenest luxuriance. Peas, also, were excellent; the first had been gathered in the beginning of June, and at Burghley they are still gathering green Peas, and this is November. Mr. GILBERT is, moreover, one of the most successful cultivators of the Mushroom in this country, and grows them in a very simple manner—in great ridge beds in the open ground, protected simply by long litter. Thus throughout the whole winter abundance of Mushrooms of the finest quality are produced. Now all this is highly meritorious; and yet, by numbers of our kid-glove brethren, such proceedings are looked upon as low, and derogatory to their high calling; and vegetables are voted common.

There is something more than mere loving interest in vegetable culture displayed by Mr. ROSE and Mr. GILBERT. There is something also, besides the fine soil, &c., which some say is accountable for the successful results we have here chronicled. There is undoubted skill and knowledge; there is attention paid to the preparation of the soil, to the manuring, digging, hoeing, and stirring of the same, to the knowing when to sow and how, when to plant and how, when to water, and other matters. The past season has been, as we all know, a very trying one for vegetation generally; and vegetables in particular, by reason of their greater succulency, have suffered much. But neither at Frogmore nor Burghley has there been, or is there now, the least appearance of its effects, and the secret of this success lies in *deep-digging, trenching, and manuring.* Mr. ROSE trenches all his vegetable ground every other season from two to three spits in depth. Mr. GILBERT follows the same practice, and manures heavily. This deep trenching of the land enables the roots of the plants to extend more, to get from the drought above to the cool moist soil below, and thus makes them independent of dry seasons; while in wet seasons the ground being more loose is also drier. The better the soil is prepared the more quickly vegetables will grow, and the quicker they grow the more tender they are. The rock on which most of us fail in respect to vegetable culture is in the preparation of the soil, in particular in the matter of deep trenching. Let us trench our land deeply, turning up the good fresh soil from the bottom (as far as it is good), and thus we may secure good crops of vegetables, and render ourselves independent and prepared alike for either wet or dry seasons.

THE alteration produced in the CELLULAR TISSUE of plants by PARASITIC FUNGI is often very remarkable. The leaves of the common garden Anemone when attacked by an Æcidium are so different from the ordinary leaves that they cannot at once be recognised. But the change in this case is nothing compared with that of a species which attacks Elder in the United States (Æ. sambuciatum), where the shoots are

curled after the fashion of the stags-horn branches of the Ash. Cystopus candidus, again, sometimes swells the inflorescence of the Cabbage in the most extraordinary way; but the most remarkable, perhaps, is the effect of Ustilago Mayiolis on the stalks of the Indian Corn, of which our figure (fig. 260), from specimens forwarded by Mr. HANBURY, gives a faithful representation. There is a very good illustration of the general appearance of the plant when attacked by the Fungus in BONAFOUS' Monograph of Zea, but the best analysis is that by CORDA, in "Oekonomische Neuigkeiten," 1846, p. 656. The parasite attacks many portions of the inflorescence, the bracts being equally attacked with the other parts, nor does the stem itself escape. A vertical section shows the globose granulated spores arranged in radiating lines, with intermediate tissue. Sometimes only a portion of the spike is affected, the remaining flowers escaping, those at the top being generally less affected than those at the base, though the contrary is sometimes the case. It is often extremely destructive on the Continent. We have seen specimens before, from Canford, in Dorsetshire, but it is not a common parasite in this country. *M. J. B.*

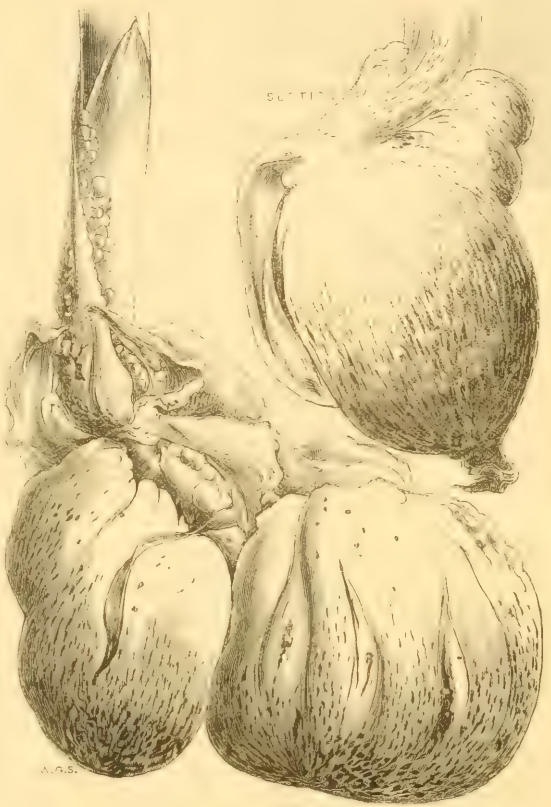

— MR. BARRON, in the last number of the *Florist and Pomologist*, points out a SUBSTITUTE for GRAFTING WAX, which he thus describes:—"Not long ago, the Mastic Lhomme Lefort, or cold grafting wax, was first brought under our notice, and this we have found exceedingly handy when grafting small things, on account of its being ready for use at all times. Latterly we have been using another material, which for certain purposes is infinitely more handy, superseding indeed not only the grafting wax, but the very matting or string by which we tie graft and stock together. This material is nothing more nor less than sheet indiarubber. It was Major CLARKE, than whom there is no greater or more original horticultural experimentalist, who first called our attention to it, and it is really very wonderful how handy it is. Indiarubber may be purchased, in sheets of about the thickness of brown paper, from some of the London shops which deal in articles of that class, for very little—6*d.* or 1*s.* the square foot. The undressed sheets are the best. Before using it, wash it in clear water, and dry it by dabbing it with a handkerchief or cloth. These sheets are cut as required into pieces of about an inch in length, and about an eighth of an inch in width, according to the space to be covered, and the little band so formed is twisted round in the same way as a piece of matting would be, and of course elongates considerably, encompassing the stem two or three times. The end is simply, yet securely fastened, by just pressing it firmly into the other with the thumb-nail. This forms it into a simple elastic band, which keeps its hold as long as required. For grafting choice little subjects, and for delicate operations, the small strips of sheet indiarubber are extremely handy and useful, and far more easily fitted than a piece of matting."

—— We are requested to state that HER MAJESTY'S COMMISSIONERS for the EXHIBITION of 1851 notify that an Act, intituled "The Protection of Inventions Act, 1870," 33 and 34 Vict. cap. 27, has been passed for the protection, amongst other things, of the exhibitors at the Annual International Exhibitions, and contains provisions similar in character to those which were effectual for the protection of inventors at the Exhibition of 1862, in pursuance of "The Protection of Inventions and Designs Amendment Act, 1862."

—— Dr. F. VON MUELLER calls our attention to certain plants meriting introduction into British and other conservatories; among them are two, both in cultivation in the Melbourne Botanic Garden, and which deserve particular praise. *Boronia megastigma*. It is loaded for many weeks of the spring with its black and yellow flowers, and exhales a most powerful aromatic perfume; so much so, that the presence of the plant in any garden at flower-time is recognised at long distances. It is easily multiplied from cuttings. *Eucalyptus pacifolia*.—A South-west Australian tree, so called on account of the resemblance of its leaves to Ficus rubiginosa. Indeed, its broad leaves, horizontally placed, render the tree very umbrageous, and in aspect very different to most kinds of Eucalyptus. In many respects the plant is allied to Eucalyptus calophylla, but the panicles are crimson; hence the tree when in bloom is a splendid object to behold, the red trusses of the copious flowers being visible at a long distance.

—— Dr. W. R. M'NAB announces in the columns of *Nature* that lithium citrate, a salt easily taken up by plants, and detected with the greatest readiness by the spectroscope, is an excellent agent to employ in experiments undertaken for the purpose of ASCERTAINING the RATE of ASCENT of FLUIDS in PLANTS. In one instance the fluid had risen 9 inches in 30 minutes, in another 5¼ inches in 10 minutes. This method, says Dr. M'NAB, is greatly superior to the use of colouring matters, which seem to experience considerable resistance in their passage through the vessels. We are promised further details shortly: in the meantime we heartily thank Dr. M'NAB for entering upon a line of research which British botanists have so grievously neglected of late years. As the basis of successful culture, whether in the field or the garden, must depend on an intimate knowledge of plant life, and of the power of turning that knowledge to practical use, so we hail Dr. M'NAB's researches with the more fervour, and anxiously await the details he promises.

—— We learn from the New York papers that Mr. J. TAPLIN, who has now charge of the plant growing in the establishment of Mr. G. SUCH, of South Amboy, N. J., is keeping up his credit as a skilful English gardener. At a recent exhibition in New York he produced many new plants—amongst them Alocasia Veitchii, Maranta Veitchii, Anthurium Scherzerianum, &c., in a condition such as they had never before been seen in that country. Mr. SUCH's exhibition consisted of Orchids, Ivies, Venus' Fly-traps, Ferns, and Lycopodiums, specimen plants in bloom, variegated plants, and a miscellaneous collection of twenty different plants.

—— The following subscriptions have been received towards the RIVERS' PORTRAIT FUND, in addition to those announced at p. 1470:—

Fisher, Holmes & Co., Sheffield	.. ..	£2	2 0
Fish, D. T., Hardwicke Gardens, Bury St. Edmunds		0	10 6
Newton, W., Esq., Hillside, Newark	.. ..	1	1 0
Press, W., Esq., 6, Crescent, Cambridge	.. ..	1	1 0
Smith, C. Roche, Esq., F.S.A., Strood, Kent	..	1	1 0
Warner, Mr. Thomas, Leicester Abbey	.. ..	1	1 0
Chapman, Mr. John, Kingston Lacy	.. ..	0	3 0

—— Under the designation of CHLORALUM, a solution of hydrated chloride of aluminium has been introduced, which bids fair to take up an important position among antiseptics and disinfectants. Every variety of fœtid and offensive organic ammonia—and it is substances of this class that produce the different varieties of stink arising from garbage—is, observes the *British Medical Journal*, instantly absorbed by these solutions, as it would be by so much acid. Many bad smells which carbolic acid might indeed overpower in virtue of its own strong odour, but which it cannot destroy, are at once removable by chloride of aluminium. Thus the fœtid stench from cabbage-water is at once removed by chloralum, but not by carbolic acid. In this respect, chloralum has some advantages over even permanganate solution, which destroys fœtor by oxidising the fœtid substance, but which is almost powerless against, or acts very slowly upon, some varieties of malodorous things that have the property of not being very easily oxidisable. Even chloride of lime is hardly so potent against some kinds of fœtor as is chloralum. The agent in general use to which chloralum most closely approximates is chloride of zinc, which, like it, is specially potent against offensive organic ammonias. Suppose that chloride of zinc, instead of being poisonous, were innocuous; that, instead of being corrosive, its strong solution were incapable of damaging textile fabrics; and suppose that its cost price were diminished one-tenth, then it might be an adequate representative of this new antiseptic and disinfectant.

—— In stating, says *Nature*, that we believe that the ENGLISH ECLIPSE EXPEDITION is now finally arranged, it is due to the Government to add, and we do so with the greatest pleasure, that it is now quite clear that only a small part of the blame, which certainly attaches to some one, can be laid at their doors. In fact, explanations certainly are due from those who have had the management of the now famous joint committee. It appears that a deputation was named, and accepted the trust of representing the requirements of Science to the First Lord of the Treasury, which trust they neither fulfilled nor handed back to the committee, in order that another deputation might be appointed. We next hear of a letter written to the wrong Government department; and last of all, we are informed that the letters of the Government department—the last, we believe, written not later than the beginning of September—stating, among other things, that an application should be made in October, when the possibility of granting ships could be better discussed—had not been brought before the joint committee, which was summoned by the secretary for November 4. It is not for us to censure such conduct as this, but it is our clear duty to point it out, and we hope the matter will be taken up. In spite of this mismanagement, however, we hear that the Government are prepared to aid, both by money and ships. There is still time to organise an expedition which shall do much good work, though perhaps it is too late to send out and erect the largest class of instruments. Large instruments, however, will be in the hands of the members of the American Government Expedition, so that this is the less to be regretted.

—— The MAXIMUM TEMPERATURE of the AIR in England during the week ending November 5, ranged from 60°.2 at Portsmouth (extreme South), to 51° at

Newcastle (extreme North), and the mean for all stations was 54°.6. In Scotland they ranged from 56° at Paisley and Perth, to 50° at Aberdeen, with a mean for the several stations of 53°.6. The MINIMUM TEMPERATURES in England were lower than those in Scotland. In the southern country, Portsmouth was distinguished in having recorded the minimum of 25°.8, and at several other stations temperatures below 30° were registered. The mean for all stations was 30°.9. In the northern country the lowest temperature was recorded at Paisley and Perth, viz., 32°; and it is remarkable that in both countries the stations at which the maximum temperatures of the week were registered are the same from which the minimum temperatures are returned. The mean of all lowest in Scotland was 32°.4. The MEAN TEMPERATURES of the week in England ranged from 45°.9 at Leeds to 42°.6 at Manchester, with a mean for all stations of 44°. In Scotland the mean for the several stations was 0°.7 higher, viz., 44°.7. The RAINFALL was not so great as in the preceding week, the largest amount which fell in England being only 1.07 inch, whilst at Newcastle no rain was registered; the mean for all stations was 0.45 inch. In Scotland the falls were less than in England, the largest fall being 0.44 inch, and the mean for the different stations was 0.17 inch only.

—— We learn that the renowned COLLECTION of ORCHIDS lately belonging to Mr. Consul SCHILLER, of Hamburgh, has become the property of M. LINDEN, of Brussels and of Ghent.

—— Mr. F. N. MENZIES, secretary, has authorised us to state that the HIGHLAND and AGRICULTURAL SOCIETY having recently resolved to grant First and Second-class CERTIFICATES in FORESTRY, a meeting of the Board of Examiners appointed by the Society took place on November 4, when the following gentlemen passed the necessary examinations:—For First-class Certificate: C. F. Bligh, England; G. Y. Wall, jun., Durham. For Second-class Certificate: William Baillie, forester, Whittingham, East Lothian. The examinations were conducted by Dr. Cleghorn, Stravithy, St. Andrews, and Mr. John Macgregor, Ladywell, Dunkeld, for the Science of Forestry and Practical Management of Woods; Prof. Balfour, Edinburgh, for the Elements of Botany; Prof. Wilson, Edinburgh, for the Nature and Properties of Soils, Drainage, and Effects of Climate; Mr. A. W. Belfrage, C.E., Edinburgh, for Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Draining, Bridging, and Roadmaking; Implements of Forestry; Mr. Kenneth Mackenzie, C.A., Edinburgh, for Book-keeping and Accounts.

—— We have received from Mr. EASTES, of Ashford, Kent, a sample of his new INVICTA PEA, a small smooth Pea, reputed to be as early as Ringleader. When we have given it a trial we will report on its merits.

New Garden Plants.

LUISIA MICROPTERA, *Rchb. f., n. sp.*

Foliis teretibus subvalidis; racemo pauciflore; sepalis ligulatis acutis petalis longioribus; labelli portione basilari ovata juxta basin utrinque uncinata, portione antica lato ovato triangulo.

A little thing, with terete acute leaves and small racemes of little flowers; sepals and petals straw colour; lip half-purplish half-yellow (viz., the anterior parts); column purplish; anther case purplish, with two yellowish eyes in the centres of both halves. Sent by Col. Benson from Assam to Messrs. Veitch, who kindly forwarded the plant to me. *H. G. Rchb. fil.*

CUCUMIS HOOKERI, *Nádr., n. sp.*

Annuus, multicaulis; flagellis bimetralibus, gracilibus, scaberrimis; foliis profunde 5-lobatis, lobis obtusis crenulato-denticulatis, sinubus inter lobos rotundatis, floribus luteolis; fructibus pollicem humanum crassitudine aequantibus aut paulo superantibus, ovoideo-cylindricis, dense aculeatis, colorem purpureo-fuscum quum adolaverunt induentibus, lineolis albis circiter decem longitudinaliter fasciatis.

Ex Africa interiore loco non indicato oriundus. Semina a Clar. Jos. Hooker communicata in "Horto Cocolibero," quamvis tarde sata (id est exeunte junio) mirum in modum creverunt. Species cum nulla ejusdem generis confundenda, fructuum colore, aculeisque robustis et fere spinescentibus peculiariter insignis. *Carolus Nandin.*

*ORIBATA GENICULATA** (*Latreille*).

A MITE INJURIOUS TO PINUS SYLVESTRIS IN SCOTLAND.

At the end of May last Mr. George Norman kindly sent to us from Forres a considerable number of young shoots of Pinus sylvestris, a few of which bore male blossoms.

All these twigs were infested with brown, more or less smooth, gall-like knots or swellings of about the size of a large Pea or Bean, some even as large as nuts, and many of them completely surrounded the twig. Dissection proved these knots to consist of incrassated bark, surrounding a cellular mass, which was intermixed with resin in small hollows, but no trace of animated life could be at that time detected in them. So we laid the knots by in a box, with a loosely fitting cover to admit the air. In July the apartment in which the box was kept was invaded by a horde of very minute Acari in countless numbers, upon whose obnoxious presence we looked with feelings akin to those with which the French nation must by this time regard the appearance of the light horse of their opponents—that is to say, we should have liked to crush our unwelcome visitors, only they were so numerous and so alert! Sorely puzzled for a time how to account for their coming, and decidedly adverse to lean upon the "free and easy" crutch of spontaneous generation, we began to examine our boxes; when, on opening the one with the pine-knots, it required not much penetration to see that they were the breeding places of the mites, for they positively swarmed with them in various stages of development.

We follow Hartig* in describing them. 1st stage: Mite vermiform, very elongated, a $\frac{1}{160}$th Parisian line in length. Only two pairs of legs at the thorax; legs six-jointed, ending in two bristles, one of which is fringed and carries at its basis a wheel-shaped organ. Head protruded into a snout, exactly like that of a pig. Body thickly covered, from the thorax downwards, with regular rows of small protuberances. Two filaments above the anus. Abdomen containing two vesicles.

2d stage: Body oviform, contracted in front and behind, with two palpi curved downwards. Snout transformed into a protruding, horn-like under-lip. Four pairs of six-jointed legs, with double claws, and a wheel-shaped organ at the basis of the tarsus; between, one bristle. Anal opening clearly visible.

3d stage: Body nearly disciform, with small thorax and head, pear-shaped; two short, deeply serrate mandibles. Two four-jointed short palpi. Four pairs of legs, with incrassate thighs and double claws. Colour of the body and of its juices lobster-red (krebsroth). Interior containing pale green vesicles, which, under pressure, protrude from the mouth.†

In the 2d and 3d stage here described, the mites are very active, and leave the galls; hence we draw the practical inference, that foresters and gardeners who desire to prevent their appearance on fresh and intact branches, particularly on leaders, should remove and immediately burn the attacked parts in spring, before the mites make their appearance. So long as the mites are in the egg state, this will be successful, but it is quite useless to wait until one sees the Acari move about. We are perfectly aware that in extensive woods this remedy cannot be carried out with much hope of ultimate success, but in the case of isolated ornamental trees, or groups of such, on lawns, &c., the trouble of removing the knots will be amply repaid by the healthier and more symmetrical growth of the branches, as the presence of the galls causes them to assume all sorts of ungainly and distorted shapes, besides rendering them resinous, peculiarly brittle, and therefore liable to break, if shaken by gusts of wind or weighed down by snow or icicles. *Albert Müller.*

* Genus Notaspis, *Hermann*, or Sarcoptes, *Hartig*.

† Hartig here remarks that this circumstance probably induced Chabrins to suppose that some species of mites discharge their eggs through the mouth

* "Forstliches, &c. Conversations Lexikon," 1836, pp. 737, 738

THE ARRANGEMENT OF FLOWER SHOWS.

RETURNING to this subject, I think there cannot be a doubt, except in the minds of those in which the worship of the past has become chronic, that the arrangements want thoroughly regenerating, and that the best stepping-stone to such a consummation would be to forget all that has been learned and begin again from the beginning. Long lanes of canvas, containing long lanes of tables, spotted and spangled in heterogeneous confusion, may have attractions for some, but they must be a dissight to every person in whom the organs of order and harmony are at all developed. I could appreciate a long tent, in which the tallest plants should be placed in the centre, and tail off to each end, or I could put up with an arrangement in which the tallest plants were placed at the ends, and swept gracefully to the centre—in fact, any form in which the line of beauty should have a place; but I cannot bring myself to look favourably upon the "higgledy-piggledy" arrangements of short here and long there, which looks more like separate stalls in a market than an exhibition turned out and appointed by the first horticultural society in the world. The Royal has never been great in matters of taste, but there can scarcely be a question that the arrangements of a quarter of a century ago were much more effective than they have been of late years. It may be that there was more and better material, greater variety in the collections, and more of them; indeed, though my old friend Mr. B. S. Williams insinuates that by curtailing the foliaged plants we are perpetrating a "barbarism," and going back into the "dark ages" of horticulture, I willingly confess that sometimes, with congenial friends, I take a retrospective glance at those "dark ages," and should, I think, die happy if I could see a repetition of those splendid exhibitions in the reality. I can look back with my mind's eye to those glorious banks of Orchids, when the names of Lawrence, Rucker, Blandy, Holford, Warner, Veitch, Rollisson, and others, stood in front of large collections. I could look with rapture upon collections of 40 to 50 stove and greenhouse plants, such as Goode, Barnes, Hunt, Green, Fraser, Cole, May, Speed, and Dods, used to show; I could put up with the Cacti of Green, Falconer, Lawrence, and Barnes, the Heaths of May, Hunt, Barnes, Fairbairn, Rollisson, Jackson, Lawrence, Veitch, Pince, Epps, Cole, Quilter, and Rucker; and I should not be annoyed if I could raise—from the "tomb of all the Capulets," I fear—the Leschenaultias of Kent and Surrey, the Pimeleas of Ealing Park, the Boronias of Fraser, the Gompholobiums of May, and, above all, the bright blue Hoveas of Upright and others. Yes, I could go back to those "dark times" with the affection of a first love, and I would not care if, with the command of such material, the foliage plants were absent altogether. These names, and the productions which they represent, will not be strange to Mr. Williams, and if he will reflect a little, he will, I think, confess that it would be better to revert to those "dark ages" than plunge headlong into a primæval forest of foliage plants, which we were fast doing. Still for all that I have no objection to foliage plants in due proportion; but as the Apple pie all Quince was not eatable, so I think exhibitions all foliage plants would soon cease to be attractive. Given space, heat, and moisture, and all but the strictly herbaceous kinds of foliage plants are ready for exhibition any day, and every day in the year; given the same conditions with flowering plants, and it requires great forethought and consummate ability to stage 20 to 50 flowering plants in perfect condition on the same day; therefore, in point of skill in cultivation, evidence of the ability of the gardener, and his mastery over his business, the cultivators of foliage plants must rank very much below the cultivators of those which flower. I can allow Mr. Williams to mount his new hobby, but I cannot allow him to ride rough-shod over the friends of my youth. The bright gems I have named, so long as memory hold its domain, will ever be bright to me.

But to our tents, and if these long lanes of canvas are still to be persisted in, which I am told they are, is there no possibility of driving a curved or serpentine line through them? I know the bugbear of the tent poles will be cited at once against such a scheme, but in these engineering days I think that difficulty might readily be got over, and if it could not, why then we must convert them into pyramids of living plants, as Mr. Ingram did four years back at this place. With a serpentine wire, small plants would fit appropriately into the narrow places, while the large ones would take their proper and prominent positions. Then if Messrs. Minton, Maw, Seeley, Doulton, and others would send handsome vases or baskets, I should have no objection to give them standing-room among the plants, and place a handsome specimen in each. Such an arrangement would, I think, be a little more sightly than the long lines of tables which have prevailed for so many years.

We will now have a look at the large circular tent. As we saw it at Oxford it contained in the centre a stage scarcely large enough to take the miscellaneous collections of Mr. Baines and Messrs. Cole. These, for the size of the tent, formed a mere knot, around which was some 12 or 15 feet of grass walk, and then an outer margin of plants principally of the foliage class. Some of these were so tall, Mr. Williams' particularly, that they had to be slanted at an angle of 40° to 50° to get head-room. Now, I have no hesitation in saying, that there had been no stage in the centre, but, on the contrary, a circle at least half the diameter of the tent had been devoted to the foliage plants, a much finer effect would have been produced. Then I would have had a walk of 10 or 12 feet wide, with an outer margin of flowering plants, the bright gems to the setting of Mr. Williams' pet foliage. Here also I would borrow from the artist, or even the sculptor, furnishing their contributions with the best plants that could be found. Tents so arranged, I venture to say, would produce a very different impression to the present worn-out plan—would have more of the character of conservatory decoration, while the introduction of vases, or even statuary, in proper places could not be objected to. Tables for plants I would dispense with almost entirely, except for the very smallest; and if they were raised at all, it should be upon grass banks. A stage may be a necessity in cultivation, but a well-grown plant never looks so well as it does in a natural position, and that is upon the ground.

So far I have dealt with plants in pots, but there are plants which may be suspended in baskets, and those also I should like to have a place. Those who have seen the baskets of Achimenes at Chatsworth, spheres 4 to 6 feet in diameter, with thousands of flowers upon each, or the large baskets of Epiphyllums now coming into bloom at the same place, or even the baskets of Ferns and Lycopods, will know what I mean by suspended baskets for exhibition. They might be difficult to move, but, once exhibited, they would create quite a sensation, as I think every person who has seen them at Chatsworth will admit.

An arrangement such as here indicated might make the long tents endurable, but for convenience of access, facility of viewing, and comfort to visitors, commend me to the medium-sized tent, where the plants shall be classified as much as possible, and where I can find the thing I want to see, without wading through a lot of things which I do not care about. Finally, for to-day, I may repeat that I am strongly impressed in favour of separate tents for those large nurserymen who would undertake to furnish them in a proper manner.

I believe such tents would conduce very much to the interests of those who undertook to furnish them, and would make a distinct and splendid feature in the exhibitions. I have before said that at Oxford the groups of new or rare plants staged by Messrs. Veitch and Mr. Williams were the most interesting things there, but the plants were very much crowded together, when they ought to have had ample space to show themselves and each other. For such tents, of a size to be agreed upon, I should not object, considering the cost of removal, to give prizes of £50, £40, and £30, and I would allow the exhibitors to decorate the tents, either by statuary or upholstery, in any way they thought proper. The Rev. C. Padley, when, on the occasion of the meeting of the British Association, he brought his collection of Polystichums from Plymouth to Nottingham to exhibit, had a tent to himself, and fitted it to his own taste. The tables were covered with dark crimson cloth, and from the roof of the tent were festoons of pink calico covered with Nottingham lace. This had the effect of warming the tent up, and bringing out in relief a collection of plants which otherwise must have looked green and cold. This may be a new feature in floral exhibitions, but I am convinced the decorator and upholsterer may yet be employed with advantage. [Yes—but with discretion.] The subject of fruit and cut flowers—a dangerous subject to interfere with—must stand over for a future notice. *William P. Ayres, Nottingham, Nov.* 1.

TABLE PLANTS.

THE decoration of the dinner-table with fine and beautiful plants is a subject requiring a good deal of attention, and in order to produce a fair supply of them for all the year round it requires considerable attention on the part of the cultivator. I will mention some of those I have found to give most satisfaction, with a few notes about them that may be of interest.

Hydrangea japonica variegata. — Cuttings of this inserted in spring and grown on during the summer will produce some plants as suitable for decoration in autumn as could be desired. They require to be grown in a little heat to bring out the variegation well, otherwise there is no more trouble required for them beyond the common treatment of greenhouse plants. When they can be obtained with six or eight fine leaves on each plant, they are very handsome objects indeed, although common, and they stand the injurious effects of house decoration better than most plants.

Pilea moschata I have found to be a very pretty and interesting plant. It has a pleasing transparency of stem and leaves when seen under artificial light, and its numerous small leaves and reddish flower-buds, which come on the upper side of its branches, makes it an agreeable plant for a change. It is a stove plant of the easiest culture, and can be increased rapidly.

Funkia ovata variegata.—Although this is not a new plant it is one of the prettiest of all when its foliage is in a young state. Its undulating and ovate leaves, with much white blended irregularly in different shades of light green round their edges, strikes down the veins towards the midrib in stripes. It is a hardy herbaceous perennial, growing about 9 inches high. This is a plant that highly deserves to be more used.

Adiantum cuneatum is still one of the best of all plants for general house decorating purposes. Young plants of it should be raised annually by sowing spores in small pots and laying pieces of glass over them for security, or they may be found self-sown on the surface of the pots of other plants in the Fern-house. When kept in a nice stove atmosphere they should be quite serviceable when about nine months old. Pteris serrulata cristata is another easily grown and most useful greenhouse Fern.

Caladiums are very elegant and beautiful leaved plants for the earlier part of the year. Such kinds as Chantinii and Wightii, potted in light sandy soil and small pots, produce more serviceable plants, with less vigour of growth. The kinds named Belleymei and argyrites are still great favourites, especially the latter, which can hardly be encouraged to grow too much.

Croton variegatum.—This stove plant, with its golden variegation, reddish petioles, and young wood, blending together, has a very rich appearance. It roots freely in the usual cutting compost in a warm propagating pit ; and strong cuttings put in the early part of the year will become very useful plants when nine months old. C. angustifolium is also a very graceful form in large plants, with its beautiful drooping foliage, but it does not show its character well when young. There are several other fine and beautiful species of this genus, but I have not seen any of them yet used for table.

Bambusa Fortunei variegata is a hardy, nicely striped-leaved plant, a good deal resembling the common variegated garden grass, Phalaris arundinacea, although much dwarfer. It does not grow more than 9 inches to a foot high. This will be found a very serviceable plant for winter work ; and as it throws up from its root plenty of young spray, it can easily be propagated.

Euonymus japonicus aureo-variegatus is a very useful plant for winter. Its beautiful golden young stems and central portion of dark green, oval leaves, gives it a very prepossessing appearance. It is a hardy evergreen, standing freely several degrees of frost. Cuttings put in in a little heat soon become plants, and the management required for it need only be of the most ordinary description. It should be pinched two or three times, in order to get the plants stocky.

Aucubas, in some kinds, are worthy of fair credit for table, especially the smaller green-leaved A. himalaica, which produces berries, though smaller in size than those of A. japonica, very plentifully on young plants. A. latimaculata is one of the best kinds yet for fine foliage.

Coronilla glauca variegata.—Its compact habit and pleasing appearance make it a very useful plant for table decoration. It can be struck from cuttings any time in a little heat, and serviceable plants can very soon be produced by pinching once or twice.

Selaginella caulescens.—This is the prettiest of all this tribe I have yet seen for table. It makes nice plants about a foot across, its delicate leaves radiating gracefully from its centre. It requires a moist stove atmosphere, and is a kind that increases by division of the plant. S. Martensii and its variegated form are also most useful kinds.

Weatherill's hybrid Solanums cannot be too highly praised for their beautiful berry-bearing properties during winter. Seed sown in a little heat in spring, and grown in cold frames during summer, make nice plants the first season. Older ones succeed well planted out all summer in the garden, and lifted again in autumn when their berries are well set.

Coprosma Baueriana variegata is perhaps the finest of all the variegated plants it resembles. It has a clear, shining appearance, and a purer variegation than Euonymus latifolius argenteus, which it is not unlike. It is a beautiful plant. *R. M.*

TIMBER AND CONSTRUCTION.—No. I.

ONE architectural characteristic of the present day is the substitution of iron for the various materials used in construction down to the earlier portion of the nineteenth century. The origin of the change was not of an architectural nature. It was neither the destruction of forests, the loss of skill, the sudden discovery of any new material or property of a material, or any of those changes to which we are accustomed to attribute the previous modifications in the form of Christian architecture. But the seed and principle of the new style is referrible to the fact that, some 60 years after Watt had first learned how to derive motive power from the expansion of water by heat, a colliery labourer succeeded in applying that same power to the propulsion of carriages by land.

With the construction of the Liverpool and Manchester Railway, in 1828 and 1829, an entirely new era was inaugurated. Structural requirements were altered, and the effect of the alteration very soon became evident in monumental form. With an increased facility for the transmission of heavy weights over lines of iron rail, a demand for an improved mode of bridging over rivers, roads, or other openings, sprang up. The supply and the manufacture of iron thus received a stimulus, and the iron trade, in its turn, reacted upon the designs of the architect, and of the naval constructor, by giving him a material which was virtually a new one. Men of practical mechanical genius first laboured to produce structures of wrought iron of which the expense should be reduced to a minimum. Thus Sir Charles Fox, then a subaltern of Robert Stephenson, designed that simple, inexpensive shed roof, for the Euston Square passenger station, which for some time was the normal type of similar structures. The taste and lavish expenditure of Isambard Kingdom Brunel next produced the Great Western Station at Paddington. The need of bridging the Menai Straits led to the construction of the hollow box girder, and the piercing of London with railways induced the execution of those effective, but hideous bridges, the aspect of which so afflicts the man of taste. Soon the displacement of architectural requisites by structural combinations that took no heed of any laws but those of strength spread from the floor to the roof, —from the bridge to the station ; and men vied with one another in the erection of the largest, the most unnecessarily costly, and the most hideously unarchitectural forms that the world has yet seen.

The use of iron for railway purposes has crept in, to an extent constantly increasing, in civil buildings. Vast shop and warehouse fronts of iron are filled with plate glass. Permanent exhibition buildings are erected, of that perishable combination of iron, glass, and wood, which may answer, on a small scale, for a conservatory, but which is the most costly style of structure, as far as maintenance goes, of which we have any experience. Connected with the same increased energy in our workshops are the increase in the power of artillery, the improvements in the manufacture of shot, the launching of iron and of steel armoured vessels, and the construction of shields for fortresses, as to which, at the present moment, the art of defence is somewhat ahead of the art of attack. *The Builder.*

(*To be Continued.*)

Home Correspondence.

Cotoneaster Simonsii.—Now that deciduous trees have taken on the autumn colour of their leaves before throwing them off, the wood landscape is at present rich in all the colours of the rainbow, from the Beech changing to orange, the Oak to red, the Maple to yellow, the Ampelopsis Veitchii on the wall to scarlet, and numerous other shades of colour, all indicating that the deciduous tribe of plants are going to rest. Thus is fulfilled the saying, that "Coming events cast their shadows before." And when these have departed, the ornamentation of our gardens must be kept up by evergreen, variegated, and berried plants, and the foremost among the last mentioned class should be Cotoneaster Simonsii. Grown as a standards it has, when luxuriantly covered with its rich coral-like berries, a wonderful effect in brightening up the front of a lawn or shrubbery. The foregoing may also be well assisted with plants of Skimmia japonica, whose scarlet berries are almost as plentiful as its leaves, and which forms a grand undergrowth for ornamenting the garden during the winter months of the year. *James Neilson, Rose Hall, Falkirk.*

Water-Tanks.—This last summer I (like many others) have been short of water, and had to entirely depend upon pump water, which, by-the-by, is always our principal source of supply at all seasons. I have, for many years, had one or two open tanks in the garden for the water to be pumped into several hours before using it ; alas ! I fear this is often done but a short period before using, when the demand upon the waterpot is great. The consequence is that, after a few weeks watering, the surface of the soil, and the outside of the flower-pots, are covered with a slimy (mossy) green matter, that materially checks growth, and has, besides, a general bad effect. The water being hard and strongly impregnated with iron, is, in my opinion, the cause. If possible, I am desirous of remedying the evil. I have an idea that if I had built a partition tank, two-thirds of this being filled with gravel, so that the whole of the pump-water must first pass through the bed of gravel previous to going into the open tank whence the water is taken for watering, it would considerably soften the water, and remove this injurious effect. Before doing so, I should like to have the opinion of some of your correspondents as to cause and effect. *Waterpot.*

Habits of Cuckoos.—Some years ago I observed a young cuckoo in a robin's nest in my garden. This nest was built upon the steep sloping ground of a haw-haw, so that it could be inspected perfectly well from the gravel walk above it, and I may mention that many people came to see it. The robins were occupied from morning until dark, almost incessantly, in supplying the voracious young cuckoo with food ; this appeared to consist chiefly of green caterpillars, so far as I could judge ; but as I collected some of these, and tried to feed it myself, without success, the young cuckoo refusing to swallow those I gave it, perhaps I was mistaken respecting the particular kind of caterpillar. Eventually, after the robins had exerted themselves most laboriously for a long time in its behalf, the young cuckoo quitted the nest, and I noticed that it remained for several days in the garden near its former habitation, but I could not ascertain whether the robins continued to feed it then or not. I may add also, that at the time this bird was first seen in the robin's nest I could find no trace whatever of any eggs or young robins having been displaced from the nest. *H. F., Royston.*

—— Your correspondent at p. 1443, wishes to know if any other bird, excepting the wagtail, will rear young cuckoos. Allow me to inform him that I have found them several times in the nests of robins, as well as in those of wagtails, but I never saw the parent cuckoo feed its young. I have seen the foster parents feed them regularly, and have done so myself with raw meat. I may also mention, that I have never heard the notes of the cuckoo so late as August, though there is always a great number of them in this neighbourhood during the season. *G. Harwitt, Cadland, Southampton.*

Petunias Out-of-Doors have been very gay and attractive this season, flowering from the end of May till the end of September, and very much admired they have been by every one fond of this flower at that season. Attention has before been called to this fact by a correspondent as to their usefulness for outdoor decoration, and I beg to bring them to notice as useful indoor decoration also. I send you a few flowers, cut from a bank of them growing in pots. A pinch of seed was sown in June, and the plants potted on as found necessary into 9-inch pots, in good loam without any dung—for I find in this they flower more profusely than in richer stuff. They are now a mass of variously-coloured flowers, striped and spotted in all shades of colour—on the same plant in many instances. I venture to say that no flowering plant at this season is more attractive. Seedlings, as in the Calceolarias, are infinitely better for pot culture than cuttings. I fully expect these plants to flower right on through the winter. *H. Knight, Floors.*

Autumn Cauliflower.—Seeing by your report of the proceedings of the Royal Horticultural Society, at p. 1478, that Messrs. Veitch & Sons exhibited fine specimens of a Giant Autumn Cauliflower, and reading your comments thereon, I am induced to send for your inspection a sample of autumn Cauliflower, which I have in cultivation here. You will observe that it is medium-sized, beautifully white, very close, and last, but not least, the leaves cover in well. The above

stock was sown this year on a slight hotbed made up for Radishes in the middle of January. In due time the plants were pricked out into a cold frame, and were afterwards moved to their final quarters in May. One very important feature is the fact that this one sowing has supplied us for the last three months with heads similar to that now forwarded, and will hold out yet another fortnight. I intend next year to sow it about the middle of March and the middle of April, when I anticipate it will supply us with Cauliflowers till the end of January. In conclusion, let me state that we have a batch of Walcheren just coming into use, which will carry our supply up to Christmas, but the heads are poor and loose compared with those now forwarded. *Thomas Simpson, Broomfield.* [The specimens sent are perfectly in accordance with our correspondent's observations. EDS.]

Larch Timber.—Is, or is not, Larch inflammable? I ask, because I have always read that it was not, but I find no difficulty in burning Larch faggots, or even half-rotten stems and stumps. I wish to build with it. Is it (Scotch, of large scantling) more obnoxious to the worm than seasoned deal? An answer will greatly oblige *Somerset.*

Ailantus. — Near to the fine tree of Ailantus glandulosa, growing in the Master's garden at University College, Oxford, there is a young plant, perhaps a seedling, that exhibits a totally different form of foliage, &c., from any of the numerous suckers in its vicinity, so much so that I am, with Dr. Plumptre's permission, induced to send you the accompanying sketch, which is about one-fourth the size of the plant, just to convey to you an idea of its appearance. The cotyledons are not traceable, therefore I cannot decide as to its being a seedling or not; but as the plant, if a sucker, is entirely of this year's growth, the fact of its flowering so young, to say nothing about the variety of its foliage, is to me a singular novelty. I cannot attempt a theoretical explanation, but have no doubt the probable cause of its departure from the general habit of young Ailantuses will readily be accounted for by you. *W. H. Baxter, Botanic Gardens, Oxford.* [The sketch (fig. 261) has certainly the appearance of a seedling, judging from the lower leaves, but we think it is more probably a sucker. We have been informed that one species of Rhus has been known to throw up a flowering branch with leaves differing from those of the ordinary kind, and we should be glad if any reader can confirm this statement. In any case the instance is very curious. EDS.]

FIG. 261

Aquilegia. — What is the derivation of the word "Aquilegia?" Most writers derive it from *aquila*, an eagle; but I have somewhere seen it derived from *aqua* and *lego—i.e.*, the "water carrier," in allusion to the water-holding powers of the flower. This has at the least the merit of giving some account of the termination "legia," which requires to be explained in some way. *Aquilejus* is a true Latin word, and if the derivation is from *aquila*, it is a curious anomaly in a plant name that the scientific name should be derived from the Latin name of one bird, and the common English name (Columbine) from the Latin name of another bird, the most un like, *columba*, a dove. Parkinson says it is sometimes called "Aquileia," or "Aquilina." These are clearly from *aquila;* and it may be that "Aquileia" was sometimes written "Aquileja," which was softened into "Aquilegia." "Columbine" is so old as an English name, that I should not be surprised to find that there was a Latin name for the plant (like Columbina, or Columbaria) older than "Aquilegia," but I have not yet met with it. Can any of your readers refer me to an older authority than Parkinson for "Aquilegia," or to an older authority than Shakspeare for "Columbine?" *Henry N. Ellacombe, Bitton Vicarage, Gloucestershire.*

A Plea for Vegetables.—Yes, Mr. Gilbert, you are quite right (see p. 1442)—vegetables are not shown as they ought to be. Neither are they, I make bold to observe, grown so well as they might be. The vegetables, as a rule, at our exhibitions present but a sorry appearance, and excite but little interest: Mr. Gilbert does not tell us exactly why. There is a good deal, no doubt, in the "setting of them up;" they would look all the better for being "artistically arranged," as Mr. Gilbert would have them—in shallow boxes, with garnishing of Parsley and Moss, &c., and I have seen good vegetables look thoroughly bad, simply through the slovenly manner in which they have been set on the table. But that is only one point. Are vegetables sufficiently encouraged by the promoters and managers of our exhibitions? I think not. There are but few prizes offered for vegetables at any of our great exhibitions. Yet, singular to say, for those few that are, there is but little competition. Whose fault is this then? We must be careful how we find fault. Vegetables—there is no use denying it—have not a very attractive appearance at a great West End flower show, and managers of these affairs must look to that which gives the most general satisfaction. The encouragement of horticulture is another thing; where that is taken as a motto, vegetables ought most assuredly to be fully represented. If there is any meaning for the provincial meetings of the Royal Horticultural Society, it is for the encouragement and development of the horticulture of that district. Take the majority of gardens, then, in the country, and what are the gardener's most important duties? The production of vegetables, without a doubt. True, he may not take so much delight amongst the Cabbages as amongst fruits or flowers, but if not, his path is at least not smooth. It is here where the shoe is continually pinching. I quite approve of Mr. Gilbert's suggestion, indeed I think very "muchly" of it—that "we gardeners, amongst ourselves, should raise a sum to be awarded as prizes for vegetables." £20 might easily be raised in sums of 5*s.* or 10*s.* each. Put down my name, if you please, Mr. Editor, for the latter sum as a commencement, and send the hat round. Watches as prizes are very good, but the solid cash is better worth the money; £10 in Bank of England notes would be infinitely more valuable than a gold watch at that price, to most gardeners. Let us try, then, what can be done. It is to be hoped, however, in the forthcoming schedule of prizes to be offered by the Royal Horticultural Society, liberal, very liberal prizes will be offered for vegetables of all sorts, so that gardeners will have no excuse for want of encouragement. I should have separate prizes for every vegetable in season, and for collections as well, and sufficient of each to make an imposing appearance. To show 50 pods of Peas is most absurd. Of what use are 50 pods? and how very insignificant are plates of Potatos, six in each. They give one very little idea of the true quality of the produce. I should have at least 1 peck of Peas and 1 peck of Potatos, 6 Cabbages, 6 Cauliflowers, 2 dozen Onions, and so on. Then that would do away with that littery, weedy appearance which vegetables put up in small quantities have; and a far better estimate of the general produce would be obtained. I would have each collection or each exhibition placed in a box or basket not exceeding a few inches in depth. We should then have a show of vegetables worthy of being looked at. Vegetables to the front! *B.*

—— I have read Mr. Gilbert's excellent suggestions at p. 1442, and agree with him that vegetables do not occupy the post of honour which they ought to do at horticultural shows, and I for one, though a gardener in a small way, will gladly subscribe my mite to further his good intentions. Having invented some very useful cases for the exhibition of flowers and fruits, this suggestion set me thinking, and I fancy I can contrive a respectable exhibition case that will not be very costly, for the purpose of showing specimens of vegetables, and setting them off to the best advantage. If the Royal Horticultural Society will allow me, I will give one of my vegetable exhibition cases for a prize in any class for vegetables which they may think proper to award it to. *W. F. Chapman, 6, Hillfield Parade, Gloucester.*

—— The suggestion made by Mr. Gilbert is a capital one, and, if carried out in a proper manner, must result in a very interesting display of the products of the garden. I should, however, propose a limited collection of 20 or 25 varieties, salad plants included; and these I would not crowd into a tray or basket, but each variety should stand distinct, and as far as possible in a natural manner. For this purpose I would have a table, upon which should be placed some light plunging material, 6 inches deep, and in that I would plunge jars, to be filled with water, in which the Brassicas, Lettuces, and the like, should stand in a natural manner. The smaller vegetables, Peas, French Beans, &c., should be placed in shallow punnets, also plunged, and then the whole surface should be covered with nice green Moss. In this manner, something like artistic effect might be produced, while from the vegetables standing in water they might be kept fresh for a four days' show. Nothing looks so bad as fading vegetables; but, staged as I have suggested, they might be sprinkled over with water and covered down with a sheet at the close of each day's exhibition, and the following morning they would open out quite fresh. This is a prize to which every seedsman in the country ought to contribute, as it will tend to bring new varieties of vegetables into notice, and must result in benefit to the trade. I do not know that the contributions need be confined to 5*s.*, as the old story of many pickles still holds good. As an earnest of my feeling in the cause, I will undertake to provide £5 towards the prizes, but that I shall obtain where and how I can; and if I cannot get silver, copper will be accepted. For such purposes, I have great faith in the nimble sixpence. *W. P. Ayres.*

—— I quite agree with Mr. Gilbert's suggestion that we ought to have a vegetable exhibition, as a means of stimulating to a higher degree the cultivation of the most useful of all garden products, and for the exhibiting of such in a proper and gardener-like manner. Unlike fine fruit, they are not so easily damaged in carriage, and will be conveyed a much greater distance in safety, and with more likelihood of being crowned with success. To give the field as wide a scope as possible, let the collection consist of nothing but vegetables for "The Gardener's Prize," or such vegetables as can be grown in a kitchen garden; or, if fruit is included for the sake of variety, let it be outdoor fruit only. The question would be respecting the given quantity selected from so many sorts. I further agree with Mr. Gilbert's proposed manner of raising the money, and likewise with his plan of subdividing the prizes. *J. Miller, Worksop Manor.* [We have received several other communications on this subject, which entirely coincide with the suggestions made by Mr. Gilbert. It should, however, be mentioned that the *Gardeners' Chronicle* prizes, in the exhibitions for which vegetables occupied a prominent place, did not lead to very keen competition. EDS.]

Achapesnorricher, or Hardy Ridge Melon.—Allow me to bear testimony to the excellence of this Melon. I purchased in April last a shilling packet, containing eight seeds, from which I raised in a Cucumber frame six plants. In the beginning of June I planted them out on a small bed of rough dung, covered with stiff mould, and over the plants I placed an ordinary hand-glass. They soon began to grow, and in a fortnight I left them free from any protection. I had six very fine fruit, large, of good shape and excellent quality, altogether much superior to anything I anticipated. My first fruit was cut on September 1, and the last on October 1. I consider it a great acquisition. *W. W. D., Lordine, Exehurst, Hawkhurst.*

Preserving Grapes at Heckfield.—Allow me to thank Mr. Dean for his supplementary remarks at p. 1443 in reply to my question. We learn at p. 1382 that an "entire house of Grapes was cut and bottled on October 26," and that they kept in good condition till the end of the following February—four months; and we are further told at p. 1443, that the house from which these Grapes were cut was a late house, being "quite ripe about the middle of September." One important particular, too, in connection with this circumstance is the fact, that each bunch was

cut with 6 inches of wood below it, or between the bunch and the Vine. I have to-day (November 11 examined my late vinery, where we have a good crop still hanging, and where the foliage is in the most perfect state of green; and I find that if I were to cut this crop with 6 inches of wood below the bunch, I should have very little pruning to do in the middle of January, as the major part of these bunches are not more than 10 inches from home, some few not more than 6 inches, and as five-sixths of my spurs carry a bunch, I should thus denude the Vines of such a vast quantity of wood and foliage as would cause a severe shock to the entire system of the Vine, which would ultimately end in disaster. Of this there can be little doubt, as the office which such a vast amount of wood and foliage performs in the proper development of the organs of the Vine, accelerating maturity, and thereby laying the foundation of future success, must be patent to all without demonstration here. I am quite convinced, on the other hand, that more mischief arises from allowing a heavy crop of Grapes to hang on the Vine for three or four months after being ripe, than a great many people are aware of; but whether the sudden denuding of the Vine of the greater part of its nearly green foliage, as Mr. Wildsmith must have done, is not going to the other extreme, and likely to end in the same disaster, time will prove. Extremes generally meet. This idea of preserving cut Grapes has been in operation for many years in this country, though probably never on so large a scale as at Heckfield. My own experience proves that it will preserve the Grapes plump for a long time, but it will greatly deteriorate their flavour, as might be expected from the quantity of water the bunch absorbs. I have proved, too, that the same action of absorbing occurs if the wood above the bunch is placed in the bottle, and this is rather important, inasmuch as a greater amount of wood and foliage may thereby remain on the Vine, while the cut Grapes will keep equally plump. I trust such an important matter as this will call forth the practical opinions of other of your correspondents, that it may be well ventilated; because if it can be proved that an entire house of late Grapes can be cut as early as October 26 without injury to the Vines, and be kept in good condition, it will be of the utmost service. *Thos. Simpson, Jr., Heckfield.*

Early Ascot and Marquis of Downshire Peaches.—I was astonished to read the account given by "R. D." (at p. 1474) of these Peaches. Mr. Standish kindly presented me with one tree of each. They were planted near together on a wall facing South. My garden, being exposed, is late. The Early Ascot was ripe August 26, the Marquis of Downshire coming in a fortnight later. The habit and appearance of the last-named tree is exactly like the Royal George, but the Marquis has glands, and the Royal George has none. The fruit of the former is an elongated round, while that of the latter is a flattened round. The Early Ascot is most distinct; it has a deep suture on one side, dividing the Peach into two lobes. It has no pubescence, but is smooth as a Nectarine. The colour is not golden, but deep blood-red, almost as dark as the Violette Hâtive and Belle-garde Peaches. It is A 1, and when I buy more trees I shall add two more of it to my collection. Three of the best novelties are Dr. Hogg, Early Ascot, and the Nectarine Peach, which is also quite smooth as a Nectarine, and of first-rate excellence as a late Peach. It follows the excellent Barrington. I have just added two more trees of it to my collection. I cannot think, from the description given of the Early Ascot, that Mr. Fenn can have got it true to sort. If my Marquis of Downshire is correct, it is not as early as the Early Ascot. I advise those who do not know them to buy the three Peaches already named, and also two grand Nectarines, namely, Pine-apple and Victoria. Mr. Standish states that Marquis is superior to the Early Ascot. At present I cannot agree with him: it is, however, a very good Peach, and a great bearer. *W. F. Radclyffe.*

Earthing-up.—In "Cuthill on Market Gardening," p. 3, it is said, "there is no drawing up of the mould to keep the Cabbages, as some suppose, from being blown down. Drawing up the mould is never practised by the best gardeners." At p. 11, writing of the Potato, he says, "the plants are never moulded up, a plan which weakens the Potato more than anything else." At p. 17, writing again of Cabbages, he says, "the plants are never moulded up—a bad practice for almost any crop." I find instructions given regularly in the *Gardeners' Chronicle*, as season requires, to mould up this and the other crop. When doctors differ who shall agree? Which plan is really the best? If not to be moulded up, ought the vegetables, &c., to be planted or sown in rather deep trenches, and earthed up to the level only of the ground. I, as well as others, would be glad to have this point cleared up. *Amateur.* [Will some of our practical readers give us their views on this subject? Eds.]

Conservatory Shading.—Having recently erected a conservatory, I found it impossible during the past summer to shade the plants from the rays of the sun, which scorched them. Inside blinds proved of no use, and the house was too lofty and too exposed to admit of outside blinds being used. In Paris the houses are shaded with outside wooden blinds fixed close to the glass, and having something the nature of Venetian blinds fastened together with wire, but the laths of wood are narrower, and there is a considerable space between each. They seemed to answer the purpose admirably, and can be taken down in winter. Can any of your readers tell me where in England I can procure these blinds? The French call them *claies à ombrer*, and sell them at 4 f. *le mètre carré*. I quote from a paper before me of "L. Binet, serrurerie artistique, Avenue des Arts, Levallois-Perret, près Paris." *John Malleson.*

Root Clubbing *v.* **Pond Mud.**—Will any of your correspondents who may have had experience in the emptying of old ponds, and the subsequent distribution of the mud, kindly inform me whether any subsequent crops grown more or less on such land were at all affected with clubbing?—I mean especially Coleworts, smooth or rough-leaved, Turnips, &c. *William Earley, Valentines, Ilford.*

Trial of Peas at Seaham Hall Gardens, Sunderland.—All the varieties were sown on February 23, 1870:—

Name.	Height.	When in Flower.	Ready.	Kind of Crop.	Average Produce in a Pod.
	feet				
*Ne Plus Ultra	7	June 17	July 3	Good	6 to 7
Harrison's Glory	5	June 17	July 4	Good	6
Improved Green Marrow	4½ to 5	June 12	July 6	Good	6
Dwarf Sugar Loaf	3	June 22	June 28	Good	4 to 6
Fortyfold	4	June 13	July 9	Good	4 to 6
*Veitch's Perfection	4 to 5	June 17	July 4	Very Good	5 to 6
*Blue Scimitar	4 to 4½	June 15	July 9	Good	5 to 6
Dr. Hogg	4	June 17	July 1	Good	6 to 8
Champion of England	4½	June 17	July 8	Good	4 to 6
Dickson's First and Best	3	May 23	June 18	Good	5 to 6
*Laxton's Supreme	5	June 13	July 1	Very Good	8 to 9
Tom Thumb	2 to 3	June 2	July 1	Good	5
Maclean's Prolific	5	June 12	June 28	Good	5 to 6
Nonpareil	4	June 12	July 2	Good	6
Laxton's Prolific	4	June 12	July 4	Good	6 to 9
Advancer	7	June 13	June 29	Good	8
British Queen	4 to 5	June 13	July 2	Good	6 to 7
Waterloo	5	June 16	July 9	Good	6 to 7
Management Dwarf	2½	June 16	July 8	Good	4
*Little Gem	1 to 1½	May 31	June 16	Very Good	5
*Premier	4	June 16	July 12	Good	6 to 7
*Prince of Wales	4 to 5	June 13	July 9	Very Good	6 to 7
Auvergne	5	June 12	July 8	Good	6
Wonderful	4 to 6	June 15	July 8	Good	6 to 8
Eley's Essex Rival	4	June 14	July 6	Good	5 to 6
*Taber's Perfection	3	May 30	June 29	Good	5 to 6
*Sutton's Ringleader	3	May 23	June 18	Very Good	5 to 7
Bishop's Longpod	5	May 30	July 4	Good	6
Paradise Marrow	4½	June 14	July 4	Good	6
*Sutton's Early Champion	3	May 19	June 15	Good	5 to 6
Suprême	5	June 12	July 5	Good	4 to 7
Nelson's Vanguard	2½	May 27	June 26	Good	6 to 8
*Hundredfold	4	June 5	June 29	Good	6 to 8
Sangster's No. 1	3	May 26	June 26	Good	5 to 9
Telegraph	5	May 30	July 2	Good	5
*Multum in Parvo	1 to 1½	June 10	June 27	Very Good	6
Eugenie	1 to 2	June 14	June 30		6
Prince	5	June 14	July 8	Good	6 to 7
Knight's Tall Marrow	6	June 16	July 9	Good	6 to 7
Dickson's Favourite	4	June 11	July 1	Good	7

a Good for general crops.
b Good for garden purposes. Handsome.
c This Pea is the best of all the varieties to grow in dry weather. After all the other kinds were ripe this kept green.
d Ought to be earliest and best varieties.
e Quite a large variety. Foliage light green, the pods are large but not well filled. I think in a favourable season it will be the best Pea in cultivation.
f Second-rate, not a good cropper.
g Best for early use, requires no stakes, and good flavour.
h One of the best for general use.
i A first-class variety; distinct and broad pods.
k A very good useful Pea.
l Much like Dickson's First and Best, and Early Champion
m Much like Dickson's First and Best
n Much like Pea on a small scale, the pods a dark green.
o A very good useful Pea.
p A good second early variety.

The seed was supplied by Messrs. Veitch & Sons, and was found to be true to name and good. I had the assistance of several gardeners to decide their merits. Those marked with an asterisk were thought to be superior to all the other varieties. *Robert Draper, Gr., Seaham Hall.*

The Alligator Pear or Avocado (Persea gratissima).—At p. 1438 you give a short account of this plant having been exhibited last year for the first time by R. Hinds, Esq., this being the only instance that I know of its having fruited in England. A gentleman brought me one of its fruit twelve months ago, from the West Indies, from the seeds of which I have now a plant about 5 feet high, and which is looking gross and well. It would be conferring a favour upon me if Mr. Hinds or some of your numerous readers would oblige by giving a few hints as regards soil, heat, &c., and its culture generally. *C. Edwards, Park House, Wimbledon.*

Potato Grafting.—There are various opinions regarding Potato grafting, as commented on by you at pp. 1277, 1437. Some parties totally discard the idea of any change being produced by this process, and others, though admitting a change, attribute the same to the natural tendency of the Potato to sport. Having for a time given some attention to the subject by varied experiments and observation, I submit to you the results of a few of my experiments this season for the benefit of your readers, who may be induced thereby to try for themselves; and by way of encouragement, I beg to state that out of 59 grafts which I put down this year, I had only two which did not succeed and grow a crop. The process which I follow is to insert the graft almost completely through the body of the stock. The conclusions which I have arrived at are that from grafting in this manner three distinct kinds of Potato can be produced in one season—that is, a facsimile, a direct cross, and an intermediate, in the tubers as well as the haulm, and which, so far as I can judge, may be due to the assimilation of sap produced from the union of the stock and graft. Seeing, therefore, that a direct cross can be got from this process in one season, not only may the shapes of Potatos be thus improved, but certain early varieties which we have at present that do not grow a large enough crop for general cultivation and of medium quality, may be grafted with a large cropper of fine quality, thereby producing new varieties with both qualities combined; so that we may not be left entirely to the seed apple for new sorts, as this requires a series of years of careful selection to bring out anything new. In the experiments which I made this year, and proceed to note below, I give the results from both stock and graft, which in the first four lots are very much alike, perhaps owing to the stock and graft being both finely shaped Potatos, but in the last two lots, Nos. 5 and 6, where the stock and graft are at the greatest extreme, the result is very marked, the stock of the latter being the most unshapely kidney in cultivation, and the graft perfectly round with a pure white rough skin, the produce of some throwing strongly to the graft—indeed, there was not a full kidney-shaped Potato at the root, those having that tendency being no more than Fluke shaped, all the others perfectly round or nearly so. Experiments.—Lot No. 1: stock, the Early White Don, which is a very large cropper, and very fine quality with rough skin; graft, the Early Coldstream, a small cropper and middling quality with smooth skin; produce of same at one root, 3 rough skinned, 4 medium rough, 2 smooth skinned. Lot No. 2: stock, Coldstream Early; graft, Early White Don; produce, 4 rough skinned, 1 medium, 4 smooth. Lot No. 3: stock, Early Striped Don; graft, Coldstream Early; produce, 1 rough white skinned, 2 medium white skinned, 2 smooth white skinned, 2 rough skinned striped, 4 smooth skinned striped. Lot No. 4: stock, Coldstream Early; graft, Early Striped Don; produce, 1 rough white skinned, 1 medium white skinned, 2 smooth white skinned, 2 smooth striped skinned, 4 rough striped skinned. Lot 5: stock, Early White Don; graft, Blue Kidney; produce, 7 kidney shaped and blue, 2 kidney shaped and pink, 5 round and rough skinned blue, 6 round and almost white. Lot No. 6: stock, Blue Kidney; graft, Early White Don; produce, 5 fluke shaped and blue skinned, 4 round and pure white skinned, 5 round and pink skinned, 4 round blue with white crown and eyes. *Charles Rintoul, Kingston, North Berwick, Oct 31.*

Begonia weltoniensis.—This plant, which is at once so graceful and beautiful, so easy of culture and so inexpensive, is useful to all who have heavy demands for cut flowers and flowering plants for the dinner-table. It is a subject which should be found in every garden, for it does well when bedded out, as its beautiful deep green leaves, crimson stems and flower-stalks, holding the dense pink sprays of bloom just clear of the foliage, add an air of refinement to the gorgeous occupants of the flower-beds. From this time onwards through the winter months it blooms in abundance, the beautiful pink flowers being larger than those produced in summer, and showing how well the situation in a cool

stove suits it; this, and the rich silky appearance of the foliage when seen fully in the sun, or under the lights on the dinner-table, combine to gain for the plants the admiration of all who see them. *T. C. Sage.*

Melon-growing at Heckfield.—Not having anticipated such an amount of anonymous banter on this subject, I have not fortified myself with as many particulars, dates, &c., as I otherwise would have done, but another season I must spare time to keep a special journal for the benefit of "T. C.," "T. H.," "J. S. W.," and others. At present, my only notes are—"Planted first Melons, January 19, 1870," "Cut first Melon, May 3." My next notes reach June 22 and 23: "Two dinner parties at Eaton Square: cut four Melons of 'second crop' for ditto." After this I have no notes referring to the Melons in question, so I can only say that the crops were good, very good; that I was just a little bit proud of them, and only too pleased to show them to all callers, assuring them that they might go and do likewise with that same kind, and, in at least a dozen instances, I let them taste the fruit and gave them seeds. I do not for a moment think that it is any extraordinary skill which I possess in Melon cultivation that has given me such a good supply of fruit, but I attribute it rather to that one particular kind, which in constitution is the hardiest, the earliest, the handsomest, the most prolific, and best in flavour I have ever met with. Now, as regards Queen Emma, to which "J. S. W." alludes (p. 1475): I thought I knew that kind, but was surprised to read that it was an early one, which it certainly is not at Heckfield. It was raised here by the late Mr. Dwerrihouse, from Heckfield Hybrid, crossed with Meredith's Cashmere, and was grown by myself under his directions, and he, with myself, then thought it to be superior to either of its parents; it, however, turned out inconstant, or, in other words, it did not always come true, I have, therefore, quite discarded both it and Heckfield Hybrid in favour of Meredith's, and intend to stick by my perpetual friend, notwithstanding that it has got me into hot water. It is a real good one, nor does it require more than 65° of bottom heat, at all events I never let it have over 70°, or it might serve me out by only giving me one crop instead of four or five. I should then be in as bad a plight as "T. C.," but, unlike him, I should then be glad to accept a Melon from any friend. I have now said all I intend to say on the subject; and in conclusion, my employer wishes me to add, "that he never saw so many, or ate better, Melons in any one season before," which few words are quite sufficient to repay me for all the doubts and insinuations of others. *W. Wildsmith.*

Do Plants Absorb Water, &c.—Permit me to thank Mr. Thompson for his admirable criticism and most informing letter. There does not seem much difference between us now. It is to be hoped that this awful war may soon come to an end, and that the French philosophers may be able to resume their investigations, and repeat their experiments. Until this is done by some one, I continue sceptical about the inferences deduced from the test of the balance. Perhaps Mr. Thompson might be able to give us some fresh facts from actual experiment, and thus lay us under fresh obligations. Already I feel indebted to him as a model controversalist, whom it is alike a pleasure to agree with or an honour to contend against. *D. T. Fish.*

Fruit Sunstruck.—To show that Mr. Silver's instance of sunstruck Pears (p. 1444) is not an isolated case, allow me to state that here, this season, the phenomenon was very apparent on such Pears as Gansel's Bergamot, Glou Morceau, and Beurré de Capiaumont. Such varieties, however, as Beurré Rance, Beurré Diel, Easter Beurré, Crassane, Ne Plus Meuris, and Brown Beurré, were not in the least affected, doubtless owing to the comparatively rough texture of their epidermis which was better able to resist the influence of the sun's rays. I may add, that Peaches, Nectarines, Apricots, and notably Coe's Golden Drop and Magnum Bonum Plums, were also more or less similarly affected, and to a greater degree than I have ever witnessed previously. *Wm. Gardiner, Gr., Lower Eatington Park, Stratford-on-Avon.*

Mr. Rivers' Portrait.—While firmly believing that a man's character and work—what he is and what he does—are his best memorials, still to those who may not know the one, or may forget the parentage of the other, such tangible memorials as statues or portraits are of special use. And those who need no such help to recall or perpetuate the memory and express appreciation of benefactors, find an outlet for their esteem in embalming the good deeds of those they have known and loved in the speaking canvas, breathing marble, perpetual prize, or educational or other foundation. By such modes of acknowledging merit, we stimulate the best energies of the living, while reverently laying our Laurel leaves upon the graves of the dead. But why mostly the dead? Nearly all our testimonies to merit are tinged with this regret. Those to whom they are offered are beyond the reach of our praise. But in this case it is different; the gentleman whom we have the opportunity of honouring is still in our midst. This ought to be enough for us all. In his presence, and against his expressed wish, I cannot use any language like persuasion. In honouring him we but do credit to ourselves. Among living horticulturists I know none more worthy to be placed beside a Lindley in the place of honour than Mr. Thos. Rivers. Most unlike, and yet the same, in an unconquerable energy that could not be baffled, and which nothing could turn from its purpose, both lives, though in diverse ways, were consecrated to the advancement of horticulture. Frequently differing from each, I have always admired both for their determined opposition to prejudice, misconception, and ignorance. Perhaps no two men were ever more faithful to truth, as they have seen it, than the late Dr. Lindley and our revered friend Thos. Rivers. I am afraid some of our younger men hardly know how much we are indebted to Mr. Rivers. You refer to him as a vegetable physiologist. I have long been familiar with his pursuits in this direction. Those who have read—and all your readers should read—Darwin's "Plants and Animals under Domestication," will see how largely we are indebted to Mr. Rivers. But it is, after all, as a fruit grower that Mr. Rivers is best known; and it is in this field that he has won his greatest reputation, and rendered the most distinguished service to practical horticulture. The Rev. Reynolds Hole facetiously calls Mr. Rivers a Field-Marshal among Roses. No one will question his right to rank as such. But if such is his rank in Flora's glowing army, then he is a king over Pomona. For years he has exercised sovereign authority among fruits, calling new and superior varieties forth at his bidding, laying for them new and strange foundations, giving them new constitutions, moulding them into fresh shapes, reducing their size, giving them portability, and making fruit trees fertile at pleasure. In one word, it is not too much to say, that Mr. Rivers has revolutionised the whole theory and practice of fruit growing, by raising new varieties, by the careful selection of stocks, by double grafting, by new modes of training and root pruning. Time, which used to be the most important factor in the cultivation of fruit, is now reduced to a minimum. As far as fruit planting and eating is concerned, Mr. Rivers has virtually lengthened our lives 1000 per cent. We can now reap in two years what, before his labours, we had often to wait twenty for. And then there is the great boon that any one, mechanic or labourer, may have a small tree, in a portable form, of the best variety, at a cheap rate. This universality of fruit cultivation, bringing it within reach of all, is another of the great boons we owe to Mr. Rivers. By orchard-houses, ground vineries, Rendle's protectors, glass-covered walls, and Beard's glass walls—by every contrivance by which fruit cultivation could be extended, improved, or cheapened, Mr. Rivers has striven to show how easily and successfully fruit of the highest quality can be grown. Any one of these services entitles Mr. Rivers to a place beside, or between, a Lindley or a Veitch. And the simple enumeration of these will surely suffice to make us all share in rendering honour to whom, emphatically, honour is due. May I be allowed to suggest that the smallest contributions may express as much or more esteem than the largest? I have the honour of knowing Mr. Rivers personally, and I believe a penny or a shilling would be as much appreciated from the struggling or the poor as a five-pound note from the more prosperous. A guinea is a high subscription from a gardener, and I send half-a-guinea. Of this I am sure, that twenty guineas, if I could afford it, could neither measure nor express my sense of the great and lasting benefits Mr. Rivers has conferred upon horticulture. *D. T. Fish.*

The "Flourball" (?) Potato.—I am not a little surprised to observe the reappearance of this designation of a well-known Potato in your columns. It is a most unpleasant duty to have to make assertions of this description, but I have no hesitation in saying that, in my opinion, the Red-skinned Flourball Potato sent out last winter under that name at the fancy price of 7*s.* 6*d.* per peck, and offered again this season at something less, is nothing more nor less than the "American Red" sent out by Mr. Walker two years since, and which has already been extensively grown under that name. I have tested them under both names, and have seen them tried elsewhere together, with the same result. I must freely grant that it is a fine late market or cottager's Potato, and one that I invariably recommend. A gentleman in this locality purchased a peck of it last spring, and grew it, but I am able to state that his satisfaction was not great when he found that a market gardener living close by was growing a large quantity of the same, and had had the stock by him for two or three years. I hear also that a dealer in Southampton had been purchasing it in large quantities from a grower in the New Forest, at £5 per ton, the Potatos in each case being identical with American Red and Flourball. Those grown so largely in this neighbourhood are from American importations, and this tends to show that the name of American Red is its most correct appellation. It may interest market gardeners, and others who grow for sale, to hear that when these Potatos were first offered to the Southampton public they were so greedily sought for that the vendors soon withdrew their stocks from sale, in order to grow more largely another season, as the popularity of the sort was established without question. Valuable, however, as they esteem it to be, they have expressed not a little surprise on hearing the price at which our trade has been offering it. The intimation sought to be conveyed, that this Potato enjoys a comparative immunity from disease, is rather beside the question, as we have had scarcely the slightest symptoms of disease this year, or even for two or three years past, consequently the same might be said of a hundred other kinds. I earnestly hope that our Potato crops may never again be put to such a test. That this sort produces exceptionally big tubers seems also to be with many a great recommendation. What use these big Potatos are when grown, except to give to the pigs, I am at a loss to discover; certainly no one who loves a good Potato will ever eat "big" ones, when nice moderate-sized ones are to be had. I invariably advise the culture of these big Potatos on moderately rich soil, so that a crop that is at once abundant, medium-sized, and cheaply raised, may result. A distinct Potato, that still in external appearance most closely resembles the American Red, *alias* Flourball, is the Red Regent, but it differs in the colour of the flesh, which is yellow, and in the haulm, which is more spreading, whilst that of the first is very upright. That this latter Potato is of South American origin I have reason to believe, as I first obtained it through the medium of a commander of one of our Brazil steam-packets, who brought some from thence. On growing it by the side of the Red Regent I found them to be identical. A yellow kidney from Burmah also proved to be the same as the Chalmore Kidney. *Alex. Dean.*

How to Destroy Ants.—Some time ago our early Peach-house became badly infested with ants, which were introduced into the house with some fresh turf from a dry old pasture. It is more than possible that they came in the shape of eggs, as none were observed until the trees were coming into flower. As the temperature increased, and the buds began to develope their flowers, the little busy ants began to lay siege to the stamens by eating them over as soon as they appeared. I may state that guano, Pooley's Powder, hot water, and Gishurst Compound were used to eradicate them with more or less success. Hot water, where it could be used freely, was very effectual. Gishurst, in strong doses, was likewise effectual where it could be applied; rotten Apples were used as traps with some effect, in the way of first catching the ants and then killing them. Cotton wool or sponge soaked in treacle proved the best decoy, the soaked pieces of cotton wool being placed in their principal runs, and watched with a little careful attention; and what between squeezing and scalding them, the house was soon cleared of the pests. *J. Miller, Worksop Manor.*

The Royal Ascot Grape.—I take this to be in all respects a Grape for general cultivation, and one likely to be as universally grown as the Black Hamburgh. It is particularly an amateur's Grape, one that can be relied on, that will grow and produce good fruit under some of the many disadvantages amateur Grape cultivators have to contend with. The story of its origin has frequently been told; the question now is, Is the Grape worthy of cultivation? On a few occasions this summer I had met with it, and wheresoever or by whomsoever it was grown, its praises were sung without a discordant note breaking in upon the complete harmony of the hymn of praise. Surely, thought I, this must indeed be a Grape worthy of all commendation. Finding myself in the neighbourhood of Ascot one day, about the middle of September, I looked in upon Mr. Standish, and saw his house of the Royal Ascot Grape, just in its prime, when—

> "rich treasures of the bending Vine,
> Black-black, in beaded clusters, added
> Their glories to the store"

of

> "The teeming wealth of harvest yet unreaped"

which Pomona, this wonderfully fructiferous season bore, as she moved onwards in her triumphal progress. There was a commodious span-roofed house, containing 44 Vines, that were planted out in the month of May, 1868, covered with capital bunches of full, plump, fine-coloured berries, of a fine, brisk, rich acid flavour—nectariferous globules, pregnant with exquisite juices, as refreshing as they were wholesome. The best rod had 10 nice bunches, and the weight of Grapes in the house averaged about 4 cwt. Here is a Grape that bears freely and constantly, that colours easily and eats deliciously, and appears in nice compact bunches, the which, if not over large, are at least plentiful, and look well on the table. Its virtues seemed so self-evident that I, who don't pretend to be an authority in the matter of Grapes, and who am, nevertheless, sceptical enough to think that, just because a new Grape is brought into notice amid a flourish of trumpets it is not necessarily something that transcends all that has gone before, felt bound to air my Latin, and exclaim—*Esto perpetua.* Mr. Standish terms it a perpetual Grape, and to justify this designation he asserts that it is so fertile in character as to "throw out lateral branches in every direction covered with bunches which never fail to set, notwithstanding the Vines may be carrying a heavy crop." He stated respecting the Vines in this particular house that they were planted, as before stated, in May, 1868, that they were stopped, and from the lateral shoots fruit was produced and ripened. In April, 1869, the

Vines started into growth, and bore a crop in October; and similarly in the present year: and so in about 2½ years three crops of Grapes were obtained. Summing up the general qualities, it appears the Vine possesses a hardy and vigorous constitution, crops freely, sets well, and colours nicely, while the bunches are handsome, the berries even and plump, and good eating. These are surely characteristics of a good, reliable, everybody's Grape; these being granted, then the conclusion seems inevitable—the Royal Ascot Grape is one that should be generally planted. So thinks one who, not presuming to be a Grape authority, is simply *R. D.*

Apple, "Beauty of Hants."—That an apparent seedling Apple from the Blenheim Orange should possess some features similar to the parent, is not remarkable, and might naturally lead such a body as the Fruit Committee to believe that it was in reality that variety, inasmuch as it is characteristic of human nature to discern defects more easily than improvements. That the Apple in question does present improvements upon the Blenheim Orange, I have no hesitation in asserting, as in the same garden in which the tree is growing—in the same description of soil, and at a few yards' distance, are also growing two strong, healthy, robust trees of the Blenheim Orange, and in no case is the produce of the latter at any time so fine, so conical in shape, or so highly coloured, as is that of the Beauty of Hants. Those who fancied the sample of it shown at South Kensington might have been grown upon a wall, seemed more determined to pay the compliment of approval rather to an exceptional situation than to the fineness of the variety. The fruit was, however, not grown upon a wall, but upon an ordinary free grown tree in the open ground, and some 12 or 14 years old, having no special culture whatever applied to it, but simply treated as any other orchard tree. The secretary of the Fruit Committee writes me that the committee were dubious about it. Perhaps after reading what I have said here their doubts may be removed; but at least it is something gratifying to hear from so eminent an authority as Mr. Barron, that if it was Blenheim Orange it was "surpassingly well grown," and that he thought "he had never seen any so beautiful." I thank the committee for its opinion, but I shall still remain perverse, and out of regard to the county continue to call it the Beauty of Hants. *Alex. Dean.*

Vine Roots.—In answer to your correspondent, "J. S.," p. 1444, I may state that there is little doubt but that the heat of the sun has the power of attracting the roots of trees planted in forcing houses, and to a very great extent, hence the cause of outside borders being filled whilst that inside contains but few roots. Still the difficulty complained of by "J. S." may be overcome, as I will proceed to show. The inside borders here have been filled within the last twelve months with the roots of Vines planted about six years ago. Having taken charge of these gardens fourteen months since, I examined the inside border of the earliest vinery, and found but few roots. When I commenced forcing this house, on November 20, I had a bed made which covered the front part of the border, including the stems of the Vines, with fresh horse-droppings, about 12 inches in thickness. This bed was turned over at intervals, and a little fresh material was added when necessary, to keep up a gentle heat until the end of January, when it was removed. The stems of the Vines had emitted roots all round, and for about an inch under the surface of the soil. These roots were encouraged by gentle waterings with warm water; they have continued to increase during the summer and autumn, and are now a complete mass of healthy roots, quite independent of any formed previous to last autumn, and capable of supporting a heavy crop of Grapes independent of the outside border. There are many advantages in having an inside border well filled with roots, more especially where Vines have to be forced early, as we can keep the roots in a corresponding temperature with the foliage, and have thorough control over the soil as regards moisture, &c. If "J. S." will give my plan a trial, and report the result, it would greatly oblige me, and probably many others in the profession. *W. Clark, Gr. to H. Bentley, Esq., Woodlesford, Leeds.*

—— At p. 1444 "J. S." asks your readers if any suggestion can be given for the roots of Vines planted in inside borders making towards the soil outside, although all possible pains have been taken to keep them within. Permit me to record what I have noticed with my Vines. In the first place, as a rule Vines planted inside do not receive anything like the proportion of water which they require when in active growth; in fact, it should be the rule to provide plenty of water inside the house, and that as warm as the internal temperature at least, before planting the Vines. I have totally given up growing the Vine trained to the roof, as is the usual custom; mine are all trained to poles, like Hops, and, to use a Hop grower's phrase, four and six poles to a hill, *i. e.*, four or six poles to a Vine, according to its vigour. This mode of growing allows the sun to heat the inside border, which it cannot do when the roof is shaded with the foliage of the Vine. In breaking up my plantation of Vines last year at Mount Pisgah, I observed that the roots of the Vines did not show any desire to ramble outside (although not confined with brickwork), or to work downwards towards the subsoil, by which I was led to the following conclusions: First, plenty of moisture inside prevented the Vines pole-seeking it elsewhere; secondly, the Vines being pole-trained allowed the sun to heat the inside border, so that they got more warmth inside than without, which no doubt had some effect in keeping them at home. I build my houses span-roofed, and have them glazed to the ground, to admit all the sun and light possible. Each year I top-dress with a compost of nightsoil, bone dust, lime, and fresh earth, which has been mixed and turned over some time out-of-doors. This "refresher," I think, also tends to keep the roots where they should be, near the surface, and within bounds, as if they went farther they would altogether fare worse; it must also be taken into account that I use only grafted Vines, with two, three, and four sorts worked upon the same stock, and with various stocks to suit different Grapes. At my new residence all the Vine-houses will be planted inside with grafted Vines in borders about 2 feet deep, 40 feet long, 20 feet wide, the house 12 feet high to the ridge of the roof. This is the size of my span-roofed house—an early one, a late one, a house of Frontignans, another of Muscats, with a house for pot Vines only, and a long lean-to for hardy Grapes, with no fire-heat, to produce some fruit for the table, but principally for wine making. If desirable, any point gained by my grafting, pole training, and top-dressing, I shall be happy to communicate to brother amateurs through this journal. [Please do. Eds.] I may remark that some Grapes of my growing were noticed in these columns last year as "large, fine, and very clean Grapes and foliage," although they were grown not more than one mile from the dirty, smoky town of Sheffield. *R. M. W., Fir View, near Sheffield.*

Foreign Correspondence.

Vegetable Products of Portugal. — Melons and Water-Melons, especially the latter, are objects of field cultivation in the Portuguese provinces around Oporto. The kinds mostly grown are the Cantelupes, and the common green smooth-skinned sort, and more rarely the Musk Melon. The Melon is not grown with other crops, but by itself, in land ridged up with shallow furrows 8 or 10 feet apart. A rich soil, a dry atmosphere, and water of irrigation in dry seasons, produce very large crops. Water Melons are grown on the same system, and give a less precarious and a larger return than the Sweet Melon, and their abundance and cheapness allow of their very common use by the peasantry.

Oporto is the chief port of exportation for the large variety of Onion which is known in trade as the Spanish or Portugal Onion. Its cultivation is as follows: In the month of October the seed is sown in a sheltered spot, in very well manured seed-beds. In about ten days the plants appear, and are watered in dry weather, weeded, and the surface occasionally stirred with a sharp-pointed stick. The young plants, not subjected to any severe frost (for the thermometer seldom falls below 30° Fahr.), enjoy an uninterrupted growth till spring-time. In March they are taken up, being then some 5 to 8 inches in height, and planted from 12 to 15 inches apart in furrows made by the hoe in well-ploughed and harrowed land. The furrows are filled to the depth of 3 or 4 inches with well-rotted manure, with which the roots of the young plants are placed in actual contact. A very essential condition of the successful cultivation of the Onion is water. The abundant and timely irrigation of the growing crop requires great and constant care. After transplanting, the crop has two to five hoeings and weedings. With the last weeding are sown either white Turnips, Maize, or, more rarely, grass seeds. The Onion crop is off the ground in August, and sometimes in July.

The pollarded Oak and Chestnut, the white and black Poplar, are found encircling almost every field of Maize, and in the Minho they are a distinctive feature of the scenery. The pollards afford a cutting of firewood every winter. The Poplar gives most wood, but the Oak and Chestnut branches have nearly double the heating power, and the Chestnut, in addition, gives some fruit, even when pollarded. It is therefore the most valuable, and would still be, as it once was, the most abundant in the province of the Minho but for a disease which was observed (or first recorded) in 1838, and which is gradually extending to and weakening the whole race, and will, no doubt, eventually lead to their displacement as pollards by the Oak and Poplar. The disease attacks also, but less severely, the non-pollarded Chestnut trees. The Vine in this Maize-growing district is grown on these pollarded trees and on trellises. It is pruned when the supporting tree is cut back in winter, and gets no cultivation but what it shares with the crop growing beneath it. The Vine strikes its roots so far into the soil that it probably does no harm beyond the slight injury caused by the shade of its dense foliage in summer. The Vines give a harsh dark-coloured Grape, and the wine is of the kind known as "green wine," and rarely keeps sound a whole twelvemonth. It is a rough, harsh, acid wine, of powerful flavour, and exceedingly disagreeable to those who are not accustomed to its use. The process of wine-making is as simple as that process can be. The Grapes are gathered in the middle of September, thrown into stone vats or into wooden tubs, and trodden out by one or more men; the whole mass of skins, must, and stalks, is left together to work out the process of fermentation; and when it has distinctly arrived at the vinous stage of that process, the liquid is drawn into casks, to be left, loosely bunged, till the cold weather of November checks the sub-fermentation, which continues after the wine has left the press. The wine then deposits some of the matter held by it in solution, or in suspension, and becomes clear. It is the custom to leave the wine on its lees. It is fit to drink as soon as it is clear, but goes on improving until the following autumn, beyond which time its preservation is doubtful.

In the forest zone two species of Pines are found, the Stone Pine (Pinus pinea) and the Maritime, or common Pine (Pinus maritima). The latter is far the most abundant, the quickest growing, and the hardiest Although the Maritime Pine closely resembles the Scotch Fir in appearance, its wood is far inferior in quality; in damp situations it rots quickly, and if used for indoor work and kept dry, it is in a year or two bored into, and honeycombed by a small beetle. It is, nevertheless, the wood used throughout the country for general purposes and for shipbuilding, and it is not unusual for the timber to be sawn into deals, planed, and made up into doors, window-frames, panels, &c., in the forest itself. The Stone Pine gives a more durable and a more even wood, but the tree is too scarce in the North to have any economical value. The Maritime Pine yields a coarse turpentine, with the usual treatment, but the tree is never put to that use in this country. Besides the loss to which the dead wood is subject by insects, the living tree is attacked very destructively by the caterpillar of a moth (Bombyx processionis), which forms gregarious nests in, and devours, the tender tops, and in some years commits great ravages. The other products of the Pine forests are the cones and pine-needles for firing, and the cones of the Stone Pine, whose kernels are edible.

The workers in the Pine forests, the wood-cutters and collectors of forest products, to support the cattle which they have to employ take a crop of Oats, of Barley, or of Rye, here and there, in favourable spots under the shade of the Pines, and let the ground they have cropped remain fallow again for several years afterwards; and wherever water is to be got, the valleys in the very thick of the forest region show all the tillage of the Maize-growing district, but such spots are rare. It is on the southern part of the consular district, where the forest zone is displaced by marsh land, and where the waters of the Vouga and other slow-flowing streams meet the sea, that a small area devoted to Rice is found. The mode of cultivation has no great difference from, and no superiority at all over, that followed in other countries; none is grown on the dry system, as in India. The Rice is inferior in quality, is consumed in the country, and in yield does not compare with what is grown in hotter countries; but, though the Rice fields are generally fitted for the production of other cereals, their yield is so far greater under Rice than under any other crop, as to make up for the dearness of labour in the Rice fields. The essential conditions in Rice cultivation are, 1st, a constant flow of water over the Rice fields; 2d, that the ground should have such a slope that the Rice fields may be formed into beds, each at a lower level than the one above it, whereby the water may be drained completely and successively from one to the other. In tropical countries, where the moisture prevailing through the rainy season is sufficient for the growth of the plant, no great injury to health is caused by its cultivation; but in Europe, where the moisture must be artificially produced, Rice-growing land is rendered unhealthy, and in Portugal there has for some years been a popular demand for the abolition of Rice cultivation.

Rice is usually sown broadcast, in the field itself, in March and April, but in some places the better system prevails of sowing in beds and transplanting. In spring the Rice beds are ploughed thrice, lightly manured, the clay dykes surrounding them put in order, and the young plants, or seeds, as the case may be, are often planted in water ankle-deep. The water is kept flowing constantly, if possible, till the grain is formed; it is then shut off, and the water in the Rice beds evaporates, or sinks into the ground, by the time the plant is ready for the sickle. This process it is, taking place under the hot suns of July and August, which makes the cultivation of Rice so exceedingly unhealthy. The result of recent legislation, embodying popular opinion on this subject, is to limit the area of Rice cultivation. No fresh ground can now be converted into Rice fields, unless that ground is already a marsh, and therefore, presumably, not to be made more pestilential by the cultivation of Rice.

The acorns of the Cork tree (Quercus Suber) are a good food for pigs; the wood is used for the wheels of carts, but has no great value; the bark of the smaller branches is used for tanning, the leaves in hard winters are given to sheep and cattle, which are said to thrive on them, and the bark of the trunk in a wine-producing country is, of course, in great demand. The cork is likewise exported in considerable quantities, but is inferior in value to Spanish cork.

The Cork tree will not thrive in poor land, and the soil beneath the trees is often cultivated every year; or, if not, is ploughed up every three or four, manured

and sown with artificial grasses, whereby at least some pasturage is obtained for sheep, the productiveness of the tree in bark and acorns much increased, and the growth of Furze and Heather under the trees prevented, and, consequently, the risk of fire, the principal danger to be feared in a Cork grove, is diminished. The cork is removed every seven years in March or April, and the tree pruned in the following winter. After the first removal of the cork, the annual production of the acorns is diminished one-half.

The existence of Olive trees, in this northern half of the kingdom, is almost always found to be coincident with a bad system of farming. The trees, planted at a distance of from 20 to 30 feet asunder, admit, while they are young, of the cultivation of the usual districtal crops beneath them; but as they grow up, their evergreen foliage and encroaching roots render this double utilisation of the soil impossible. The Olive grove is usually set on a steep declivity, and being seldom terraced (as is the custom of the Italians), the best part of the soil is slowly washed away by the rains; and this loss of humus not being repaired by the scanty leaf-fall of the tree, nor by any surface cultivation, the trees degenerate and the crops diminish. Had the same ground been planted with Cork trees (and the soil that suits the one is generally fitted for the other), the constant growth of Furze beneath the trees, and the recurring necessity for its removal, would, even if the ground were not kept in constant cultivation, have supplied the farmer with the means of producing manure, which, as the proprietor of an Olive grove, he is without. Therefore, it is almost always found that Olive groves and poverty go hand-in-hand. These circumstances, and a disease which some 50 years ago blighted the trees, and whose effects have continued (perhaps from the degeneracy of the tree), are probably the causes that Olive trees in Portugal present so striking a contrast to the vigour and vitality of trees in the Olive groves of Lombardy and of the South of France. *From the Report of Mr. Consul Crawford.*

Societies.

SCOTTISH ARBORICULTURAL.—The seventeenth annual meeting of this Society was held on November 2, in Craigie Hall, St. Andrew Square, Edinburgh. There was a very large attendance of members from all parts of the kingdom. Mr. Robert Hutchison, of Carlowrie, President of the Society, occupied the chair; and among those present were Professor Balfour, Dr. Cleghorn, of Stravithy, Capt. Doveton, Mr. J. Ord Mackenzie, Mr. Edward Loraine, of the Riding Mill, Northumberland; Mr. William M'Corquodale, Scone; Mr. Gorrie, Mr. J. Sadler, Lecturer on Botany, Royal High School; Mr. Thomson, Chopwell Woods; Mr. J. Grant Thomson, Grantown.

Professor Balfour moved the re-election of Mr. Hutchison as President. Mr. Hutchison had done a great deal for the Society, in which he took so much interest, and in fact they could hardly get on without him. Mr. William Thomson, Chopwell, moved the re-election of Mr. Sadler, as Secretary, to whom the Society was equally indebted for its present flourishing condition.

These appointments were unanimously agreed to.

Professor Balfour, Dr. Cleghorn, Mr. Loraine, Mr. William M'Corquodale, and Mr. Thomson, Grantown, were elected Vice-Presidents for the year, and the other office-bearers were re-appointed.

The President then delivered his inaugural address. After returning thanks for re-election, he congratulated the Society on the progress it had made during the past year, both in the accessions to its ranks, and in the useful work performed. The two most noteworthy and important events in their history had been, he said, first, the royal favour graciously bestowed upon us in the Queen having been pleased to become patron of the Society, and the interest she had thereby evinced in the advancement of Scottish forestry; and, secondly, our recognition by the British Association as fellow-workers with them in the great battle of knowledge against ignorance, and in the form of a grant from them in money to aid us in examining more accurately into the great phenomena of Nature, which are constantly passing under our observation. The importance we have gained in becoming affiliated members of that great scientific association cannot be overrated, and it should be, as I hope and believe it will be, a powerful incentive to us all to use our utmost endeavours to prove ourselves worthy of being thus enrolled in the great army of science by each contributing his quota of observed and ascertained facts. And here you must allow me to impress upon you the vast importance of accuracy in all your observations; of never taking anything for granted, or "reasoning by analogy," but of bringing everything to the stern test of experiment—not of one experiment merely, but of repeated and painstaking investigation. We must not be disappointed if many a theory which looked beautiful, and appeared to be founded upon a rock, melts away when exposed to the touchstone of proof, and we must remember that he who exposes and demolishes a false theory, and thereby clears the field, does as necessary and useful a work as he who constructs a true one to take the place of the pretender who has been dethroned. The progress of the industrial arts in the present day places within our reach many advantages over our ancestors in the perfection of the instruments we have to work with in our observations and experiments, and the proper application of these should not be overlooked in scientifically and accurately examining any of the products of the vegetable world, or any of those beautiful but mysterious processes of Nature in the forest or the field, which in the daily life of every member of this Society come under his notice. Amongst the most useful of these is the microscope. The more powerful lenses have an almost miraculous magnifying power, and have already, in every field of science, proved of immense use in investigating and ascertaining the more recondite processes of Nature; and in our own particular department of research, even a small common portable microscope will be found to shed much light on objects too small to be carefully examined by the naked eye. An intelligent and minute application of this medium would prove invaluable to every forester in extending his knowledge of the nature and causes of disease in tree-life, and of the ravages of many insects and parasites whose history is yet but imperfectly known; and might further be useful to him in suggesting many purposes to which the bark and fibres of the roots and leaves of plants might be profitably applied. I believe that every object in Nature is designed for use to man, as well as for beauty, and that as our knowledge advances we shall find that each is a necessary part of the whole, and that without even the smallest and most insignificant stone the great temple of Nature could not have been built up. But we must ever bear in mind that the best tools are valueless in the hands of an incompetent workman, and that the only education which is worth anything is the education we give ourselves by training our minds to habits of observation and accuracy. All that others can do for us is to furnish us with the tools—we ourselves must use them.

There are one or two practical hints, gentlemen, I would suggest as being likely to be helpful to us in this work of self-education, especially in its bearing upon our own special department of investigation as an Arboricultural Society; and the first thing that seems to me likely to be of material service to us is the formation of natural history clubs, or field clubs as they are called—that is to say, local groups of foresters associated together, who might meet once a fortnight to communicate and criticise observations made or experiments tried by its members. I feel sure that the institution of such local centres of self-help would prove of immense service to the cause of arboriculture. We are so constituted that sympathy in our pursuits or occupations is almost indispensable to us. There are, it is true, minds so raised above the common level that the receiving of sympathy is an impossibility. These are the great pioneers of the vanguard of civilisation—men who, like Galileo, are found of their generation that their discoveries draw down upon them only ridicule or persecution. All honour to them when they persevere in their thankless task—when, having borne the burden and heat of the day alone, they die uncheered by human sympathy or appreciation, supported only by the feeling that they have done their duty, that they have not hid their talent in the earth, but have endeavoured to use it to good advantage. True, as years roll on, the truth and value of their discoveries make themselves felt, and men raise monuments to their memory, and their names become household words, wherewith the new leaders of the host are cheered and encouraged, but the ears are dull to whom these praises would have been sweet, and the heart is cold which would have beat higher for the sympathy and encouragement of its fellows. Gentlemen, such minds of self-reliant independence are rare, and there are many who, though they cannot lead the forlorn hope, can yet do good service as one of a regiment fired with a common enthusiasm, and fighting for a common cause. There are also many in whose minds the fire of genius lies latent, waiting only for the spark which is to call it forth; and therefore, I say, that the good resulting from such local clubs or associations as I have mentioned may be incalculable, and likely to prove one of the most potent agencies in the advancement of scientific knowledge. And in connection with these clubs, and growing out of them, I strongly advocate the institution of local museums, where specimens of all the animals and plants indigenous to any district may be preserved, arranged, and classified, with all their history and peculiarities noted and described, so as to be a help and incentive to the lovers of natural history in the neighbourhood, and to assist in opening their eyes to the wonder and beauty that everywhere surround our common life, and in raising their daily tasks from mere drudgery into an intelligent cooperation with Nature in benefiting and advancing the welfare of our race.

On the motion of Mr. E. Loraine, a vote of thanks was accorded to the President for his interesting address. Nearly 80 new members were then admitted.

The Secretary (Mr. Sadler) read the report of the committee appointed to represent the Society at the meeting of the British Association at Liverpool. The committee, consisting of the President, Professor Balfour, and Dr. Cleghorn, had made application to, and succeeded in getting from the British Association a grant of £20 for the purpose of making investigations into the effect of the denudation of trees on the temperature and the rainfall of Scotland. The committee recommended that the Society should supplement that grant by £5, in order to provide instruments, charts, &c., to observers. The grant from the British Association, although small for so important an investigation, was yet a recognition that the services of the Society to the science of forestry in the kingdom were valuable.

Dr. Cleghorn moved the approval of the report, and referring to the importance of the phenomena connected with the effects of tree denudation on the temperature of a country, expressed the hope that good observers would be got, and that they would be provided with good instruments. He hoped the Society would go forward earnestly and patiently in its great work. It was a good sign of the progress of the times that 11 young men were completing their education in Scotland as foresters for India.

The report was approved, and a vote of thanks awarded to the deputation.

The Chairman, in acknowledging the compliment, expressed the hope that the grant from the British Association would be continued, as the series of observations needed would extend over several years. He expected they would receive a grant for the same purpose from the Highland Society of Scotland, double that accorded by the British Association.

Mr. Methven, treasurer, read the financial statement for the year, which showed a balance in hand of £60.

Prize Essays on Arboriculture. Mr. Gorrie, chairman of the Judges' Committee, then submitted the report on the competitive essays on different subjects connected with arboriculture, for which the Society offer prizes of gold, silver, and bronze medals. On the present occasion, the chief—indeed, the handsomest—prize that has ever been offered under the auspices of the Society, was a silver cup, value ten guineas, presented by Messrs. Mitchell, Arnott & Co., seedsmen, Hanover Street, for the best essay on practical arboriculture. Five essays were sent in, and the judges awarded the cup to Mr. William Gilchrist, forester, Cluny Castle, Aberdeen. The judges reported that they placed next in order of merit the essays of Mr. William Thomson, Chopwell, Durham; and Mr. A. Gilchrist, forester, Ury, Stonehaven; and inasmuch as they considered these two essays of equal merit, and scarcely inferior to the first prize, they recommended that the Society should award a gold medal to each, which was unanimously agreed to. The following is a full list of the ordinary medal prizes awarded by the Society:—On trees and shrubs best adapted to resist the attacks of rabbits—James Craig, forester, Erskine House. On cutting large timber by axe or saw—1st, James Milne, assistant forester, Cluny Castle; 2d, Thomas Hogg, assistant forester, Hampton Court. On the rise and fall in the value of timber within the last ten years—gold medal—Robert Hutchison of Carlowrie. On preserving timber from decay — David Hamilton, forester, Tillichewan. On extensive planting — James Brown, jun., Craigmill, Stirling. On woods and railways —William Brown, land valuator, Edinburgh. On preparation of plantation produce for sale—William Thomson, Chopwell, Durham. On "Is grease injurious to the health of trees?"—James Craig, Erskine House. On the reclamation of neglected plantations—William Thomson, Chopwell.

The President formally presented the silver cup to Mr. Gilchrist, and expressed the hope that the example shown by Messrs. Mitchell, Arnott & Co. would be followed by other gentlemen in the trade. It was intimated that next year Messrs. Peter Lawson & Sons would offer a prize of five guineas for the best essay by a practical forester on a subject prescribed by the President and Vice-Presidents, and Mr. Thomas Methven offered a prize of five guineas for the best collection of cones produced in Britain.

The President exhibited a very simple but ingenious instrument for ascertaining the altitude of trees; but, as it has not yet been patented, details of its construction cannot be given. A table was set apart for the display of cones. A fine collection of branches with cones, grown in Hampshire, was contributed by Messrs. Mitchell, Arnott & Co., amongst the specimens being beautiful examples of Pinus Pinea, P. muricata, P. austriaca, P. excelsa, Cedrus atlantica, Cedrus Libani, Wellingtonia gigantea; Mr. Anderson, Oxenford Castle, exhibited a remarkably fine specimen in cone of Pinus excelsa. A beautiful section of the wood of the well-known Araucaria imbricata was exhibited from Dupplin Castle, Perthshire, from which also a specimen of the silver variety of Abies Douglasii, with cones, was shown.

The annual dinner of the Society was held in the afternoon, in the Albert Hotel, Hanover Street—Mr. Hutchison, of Carlowrie, the President, in the chair; and Professor Balfour and Mr. Thomson, Chopwell, croupiers.

Notices of Books.

Thirteenth Annual Report of the Board of Commissioners of the Central Park, New York, *for the Year ending December* 31, 1869.

This is a volume of much more interest than garden or park reports usually are. It consists of 187 pp. of well printed and well arranged matter, descriptive of the progress made in the park during the year. At a time when we are likely to hear a good deal about American gardening from the fluent pen of Mr. Robinson, it may not be amiss to glance through this report, and see how one at least of the American public parks is conducted.

Every convenience and healthful recreation is provided for the visitor to the New York Central Park by the Board of Commissioners; and, judging from the official return of the numbers who patronised it, it seemed to be thoroughly appreciated, the pedestrians alone who visited it in one month in 1869 amounted to 561,963; this, of course, was the largest monthly attendance, the return for the year showing no less a number than 3,265,541, and to this are to be added equestrians, occupants of carriages, and even velocipedes.

We cannot do better than let the report speak for itself, and for that reason we will extract a few of the most striking and important items. To commence then with the planting operations; we read that "5954 evergreen trees and shrubs, and 6568 herbaceous and bulbous plants, have been planted during the year; of these, 3429, mostly good-sized trees, have been taken from the dense plantations of the park."

A Palæozoic Museum has been established under the direction of Professor Waterhouse Hawkins, and a museum of Natural History, and a gallery for the reception of works of art, are in course of construction. The need and utility of such an institution is very well advocated in the following words:—

"There exists in all civilised communities a strong desire to rescue from destruction, and to preserve for future ages, those works of art and skill that justly confer on their authors a fame among men. Growing out of this desire, not only among modern nations but among those of ancient date, a great collection has been assembled of statuary, paintings, and other art works that command the admiration of succeeding ages, and compel a respect for the enlightened sentiment that has been

instrumental in their preservation. So pervading is this sentiment, and such hold has it upon educated men of all nations, that the conqueror who, even amid the excitements and passions of war, wastes these treasures of time, or suffers them to be pillaged, is justly regarded as an enemy to the best interests of our race, and is characterised as such in the pages of history."

"Under a popular government in which the laws, in effect, compel the distribution of individual accumulations of property at brief periods, and in which the transmission of great estates from generation to generation, by entail or other artificial means, is prohibited, the tendency and the disposition is to mass valuable works of art and skill under the management of corporations, or bodies having perpetuity of existence, for the benefit and the use of a wider or more restricted public, as the nature of the collections may demand.

"In our country it is only by giving the whole people an interest in these collections that they can be successfully gathered and preserved through long periods of time. We have, in this country, no dynastic families or laws of primogeniture, by means of which collections can, as in Europe, be handed over unimpaired to succeeding ages; and many individuals whose wealth and taste, or the necessities of whose studies and business have led them to gather for their own use, or for the enjoyment of their families and friends, galleries of choice and expensive works of art, or valuable collections of books, are actuated by a high public spirit, in search of some agency through which they can pass over these treasures for the perpetual use and enjoyment of their fellow men. For these reasons, in no country will collections of this character be so extensive, so valuable, and so rapidly gathered as in this, if the proper means can be discovered for their preservation and transmission. It is becoming apparent also, that the more valuable and extensive of these collections should be located in large cities, the centres of population and of business, where people naturally tend, and where conveniences of residence and travel admit of their examination and study. It is equally certain that such collections will not be committed to any custodian that is liable to be influenced and changed by the exigencies of the frequent political conflicts that are generated under our government. That agency only that can give assurance of permanency, of integrity, and intelligence, will be entrusted with the guardianship of things that all ages and all cultivated men hold valuable."

The museum has already purchased "the entire collection of the late Prince Maximilian, known as the Weid Collection, comprising 4000 mounted birds, 600 mounted mammals, 2000 fishes and reptiles. Selections from the Verreaux Collection at Paris, 2800 mounted birds, 230 mounted mammals, 400 skeletons. The entire collection of American and foreign birds, about 2500 in number, lately belonging to D. F. Elliott, Esq. A series of 250 birds of Siberia, from M. Vedray, of Paris." Carriages are provided in the park for the accommodation of visitors. "They are fitted up and kept with great neatness and care, and provide for the comfort of passengers, both in sunshine and in rain. The drivers are careful men, in uniform, and all are under the control of the park commissioners. The rate of fare for going round the park is 25 cents." It was in contemplation this year to provide other forms of carriages for one, two, or four persons, all to be placed under the same management.

Boats are provided on the lake, a playground is set apart for boys, another for girls, and the smaller children are well cared for by the board, as they have provided for them "their shelter and running stretch, their playground and swings, and other paraphernalia for amusement. Visitors have the opportunity of witnessing the play of the children, and discreet park keepers are detailed to prevent any improper intrusion upon them."

"The children's department of the park has been the subject of constant attention on the part of the board, and their convenience, amusement, and comfort, have been attended to in such wise as to lead to a very general use of the park by them." "Small carriages for children, drawn by goats, are hereafter to be provided for park use; one is already established and running about the walks, and is often laden with a prattling freight."

Mineral waters are dispensed at the springs, and a photographic house has been erected for the use of visitors; and last, but certainly not least among the numerous amusements provided is music, which holds a prominent place. From this report we learn officially to what extent the authorities of New York provide healthful recreation and instruction for their fellow citizens.

The report itself is a good specimen of what such reports might be made; besides being printed in clear type, and on good paper, it is illustrated by photographic and lithographic views in the park, meteorological tables, and a well-drawn up list of living birds and animals.

The Apiary.

If the operation of driving had been done earlier in the autumn, when the combs were cut out of the cottager's straw hives, there would have been found in some of the combs brood from the late laying of the queens, or some late swarms, or casts would certainly have had brood. We can state that we raised queens in October the year before last, although this has been a most extraordinary season for queen raising (artificially)—since they have made their exit in 11 or 12 days, whilst the generally received book information states 14 or 16 days as the time required for a queen bee to emerge from her cell. We find also that swarms and casts have not been so certain and abundant in Surrey and Kent. A common cottage hive, which had constantly swarmed in June, and generally sent out a cast, has thrown off its swarm, but failed in the cast; and we have to record the sad fate of the colony, that it has terminated a case of a trial cottage hive, which had been under strict watching for nine years, during which period it had never failed to swarm in June, and send forth its cast, except in the present season, and five years ago when no casts were raised. Also a box hive, which had been in use 14 years, came to an untimely end. The combs, however, were of great interest, proving the fact of the queen cells being always raised at the edges of the combs in a normal state, and that, after so many years, the bees were able to obtain the wax from the honey cells, and the non-breeding cells alone, as the accumulation of cocoons made it necessary to break away the sides of the combs to obtain the breeding length for the workers. We found the accumulated fæces under the cocoons more than an eighth of an inch, including of course the three or four cocoons of each year's raised larvæ. The cottage hive had been well painted and cared for, as well as the box, and the combs and the whole of the interior were as pure and sweet as a newly inhabited hive or box, smelling of the propolis, and sweet balsamic scent of the Poplars, not a chink or crack in the wood, or a fold of the straw hive but was so sealed up that no wax moth larvæ could invade the interior. These hives were in a most excellent locality for bee pasturage, and the bees stored honey in caps as well for the benefit of the owners—giving an example how bees will thrive even in a limited space; their old breeding combs were returned, and although latterly reduced in numbers from the combs being cleared away, yet the bees seemed to have made up for it by early swarming, and only having the one cast for the one young queen to lead off annually; but this year's want of new labourers, just after swarming, and the honey harvest failing after the first fortnight, the open food cells were soon emptied and the brood with the young queen or queens perished, though the bees held on in hopes until nearly September, when only 200 or 300 were left, and they disappeared in October.

But to revert to the brood combs: these must be most carefully handled or the brood will perish; smoke, or exposure to cold, and certainly any pressure on the cells, will cause havoc among the larvæ. The combs should be kept on their ends, and held by the honey-cells at the top. We allude, of course, to the combs taken out of cottage hives, or even the bars of Grecian hives or boxes, where the combs are merely attached to the upper bars, and have been cut away from the sides of the hives and boxes, just as in the usual cottage hives, only there will be the great advantage of lifting and holding the combs by the bar of wood instead of the honeycombs. It will be necessary to cut away these bars if they are to be introduced into the bar-frame hive; or, as we have selected to accept the "honey-trough hive" as the practical hive of the day, all these combs, being

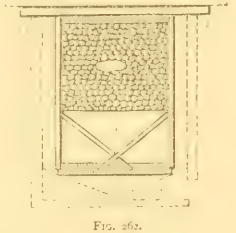

Fig. 262.

longer than they are deep, will have to be sliced off the exact inside measure of the bar-frames, which will be about 8 inches long, and the depth will be nearly 9 inches, at least of the more central breeding combs taken out of the common cottage hives. If two slips of laths (some should be ready cut of 6 inches, and 4 inches in length), with notches in the ends, which will run on to the ¼-inch upright slip of the bar-frame (at C D, fig. 262), which forms the bottom part of each frame; the comb is made to fit, by a cross cut at the top of it, into the angle of the ¼-inch guide-bar at the top of the frame (*vide* A B, fig. 262), which has been already waxed, as a guide for the bees; then, introducing one of the 6-inch laths at the bottom of the comb, put in a shorter one, either of 3 or 4 inches length, as a cross-prop to the longer one already slipped on the bottom bar of frame (at E, and crossed at F), when the comb will be wedged up, as if by cross-shores at the bottom, and in the sharp angle of the top guide-bar. When these combs have been thus arranged in each of the frames, not less than three combs in each hive, the bees will very soon secure the combs to the top of the frame and the sides, inside each frame; and they can be so arranged and kept for the bees to raise the brood, or store up the winter stores, which the careful bee-master should always supply them with before the cold weather commences. Each comb will hold about 3 or 4 lb. of syrup. The mode of feeding for the winter and spring we will describe in our next paper; but care must be taken that combs are fixed and filled before the frost sets in. Of course, if old stocks and casts have been strengthened, feeding alone will be necessary. *M. D.*

Florists' Flowers.

For several years past it has been our custom to pay a visit to the principal growers and exhibitors of that universal autumn favourite, the Chrysanthemum, and to sum up the progress made during the previous season in these columns. Many of us have seen and admired the glorious banks of bloom which, thanks to the Salters, father and son, were always provided at the Versailles Nursery; and many there are who experience regret at learning that, in so far as that establishment is concerned, its bright autumn show has for ever passed away, the ground having been secured by a railway company. Then, again, the flower has lost, since last season, one of its most ardent cultivators in the person of Mr. Broome, who always provided a rich treat for the City folk in the Temple Gardens. We have yet to learn whether his successor pays as much attention to this essentially town flower as did honest "Sam Broome," though we know that his old *confrère*, Mr. Dale, still remains true to his favourite. Owing to the exceedingly dense fog which enveloped the city on Wednesday last, when we purposed to pay a visit to the Temple, we must defer any notice of the Chrysanthemums here exhibited until our next.

"At least a week too early," was the general remark on the occasion of the Chrysanthemum show at South Kensington, on November 2. True, some of the plants had fine heads of fully expanded blooms, but generally they were not nearly forward enough to form a correct estimate of their merits. Some days later we saw the Chrysanthemums at the Brunswick Nursery, Stoke Newington, of which Mr. Adam Forsyth makes an annual display. For exhibition purposes Mr. Forsyth grows a number of dwarf well trained plants, whilst those which so admirably fill his show-house are grown on the single stem principle, with at the most one or two good blooms on each. The blooms this season we considered much finer and of better quality and substance than have been seen for the past two or three seasons. In this house the following—which may be considered a choice selection—are now in great perfection:—Beverley, white, an excellent flower; Gloria Mundi, a fine yellow, well incurved; Prince of Wales, a beautifully incurved purplish violet flower; Golden Beverley, bright in colour, and equal in substance to the white variety; White Globe, a perfect ball in a shape, some of its flowers measuring 5 inches through; Queen of England, a fine deep blush flower, had blooms which measured quite 6 inches across; Prince Alfred, rosy crimson, a large finely incurved flower; Bronze Jardin des Plantes, bright carmine-orange, one of the very best; Faust, an incurved crimson-purple flower,—the plant is dwarf in habit, and has good bold foliage; Lady Hardinge, pale rose; Formosum album, white, and Formosum luteum, fine yellow—both first-rate varieties; Little Harry, golden amber, a fine plant for specimens; General Hardinge, indian-red, petals large and bold; Lord Derby, a rich deep purple, with stout well-incurved petals, a fine flower; Pink Pearl, delicate pink, the flowers are rather small, but very pretty; Chinese Orange, pale orange, suffused with red—an old but very scarce flower, with stout, well-incurved petals, a very useful variety; Miss Marechaux, white tipped with pink, very good; Empress Eugénie, pale rosy lilac, a large well-incurved flower; and Hereward, purple with silvery back, large and nicely incurved, &c. Of the flowers sent out from this establishment in 1869, the following, which were noticed at the time, may be again mentioned as proving to be excellent in character:—Rotundiflora, pearl-white, changing to pale lilac as the flower expands; Miss Mary Morgan, delicate pink, petals broad and well incurved; Blonde Beauty, white, delicately striped and tipped with pale rose—a grand flower; and Golden John Salter, rich golden yellow changing to amber. Of new kinds sent out this year, Mr. Forsyth has four, viz., Duchess of Roxburghe, orange and rose, with broad stiff petals, the flower very large and beautifully incurved; Robert Bruce, rich crimson, reflexed, in the way of, but considered better than, that useful old flower, Dr. Sharpe; Mr. W. H. Morgan, light orange-carmine, incurved, large in size and perfect in construction; and Mr. Cole, a large blush Anemone flower, with bold disk, said to be a free bloomer, and consequently a useful variety for cut flowers. The Japanese varieties, with their quaint forms and brilliant colours, are rapidly rising in popular estimation, and well they may, for handsomer subjects for conservatory decoration at this dull and cheerless season there cannot possibly be. Large, bright, and decided in colour, very attractive, and good bloomers, what can better be used for completing the last link in the yearly garland of beauty, with which our gardens are adorned? Those who intend growing this section—and all should give them a trial—will find in the following selections a very useful and

reliable guide:—Chromatella, bright orange-yellow; James Salter, lilac or mauve, shaded towards the centre; Dr. Masters, very distinct, with sword-like florets, opening with a large centre of bright yellow; Leopard, bright indian-red, with large yellow spots; Meteor, bright golden yellow, changing to orange; G. F. Wilson, very large double flowers, of a dark golden yellow colour; Comtesse de Beauregard, dark rose, very fine; Prince Satsuma, also golden yellow, and very double; the Daimio, pink, changing to rosy lilac, one of the showiest; Yeddo, lilac, a curiously incurved flower, rosy lilac in colour, with a lighter shaded centre; and Red Dragon, chestnut-red, tipped with yellow, and frequently spotted with gold. Several new flowers in this class have been exhibited this season, but of these more anon. All who have the opportunity should pay a visit to the Brunswick Nursery at once, or a rich treat will be missed.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

In order to forward the early flowering of *Cyclamens* not yet in bloom, and to induce a finer quality in the individual flowers, it is a good plan at this season to give them a slight increase of temperature. They should be placed in as light and fully exposed a situation as it is possible to get in the houses containing them. Any plants that do not throw up their flowers as freely as may be wished for, may be materially benefited by plunging them into moderate bottom heat. This, in connection with the treatment suggested above, and with occasional applications of wholesome liquid manure, will soon give them a vigorous start. Perhaps few plants more thoroughly enjoy a perfectly clean condition of foliage than these, though none can be happy with the surface of their leaves covered over with any matter likely to injure or limit the extent of their functions. Tree and other kinds of perpetual *Carnations*, which are so easily flowered during the winter months, will now make a display in cool greenhouses, if properly grown on for the occasion. It is needless to state that these plants will not succeed in pots, unless good drainage is provided for them. Hence I need not qualify the suggestion I am about to make, by saying that they must not by any means be permitted to become sodden at the roots. When the buds are swelling, and the drainage is perfect, water freely; this is the only way to obtain fine blooms, and to prevent a large percentage of the flowers from turning blind. I do not allude to this as a modern practice, for the older fanciers—Hogg, for instance—used to employ these means freely, even for the purpose of assisting the later winter blooms of varieties less adapted for forcing than such as, happily, we now possess. *Herbaceous Calceolarias* will now be making rapid progress towards the formation of fine plants, as they delight in a cool, somewhat damp, atmosphere. The main point to be attended to in their culture at this season is to keep them in as cool a place as possible, but not perfectly protected from frost.

FORCING HOUSES.

Do not omit to see that *Vineries* in which Grapes are still hanging are carefully looked through as often as possible, to detect at the earliest time any decaying berries which may exist in any of the bunches. Remove at once every berry so affected. During moderately fine intervals secure all the ventilation possible by opening both the front and back lights a little; this, of course, when the external air is dry and moderately soft. Do not lose a day in collecting the necessary amount of leaves, &c., for *Pine pits* during fine intervals, as they keep much better when collected thus early and before they commence decaying. Those who wish to cut ripe Grapes from *Pot Vines* in April next should introduce them into heat without further delay; or rather, I should say, into a temperature commencing at temperate, and gradually rising to 82° or 85°. Also prepare the required amount of bottom heat, into which it will be necessary to plunge the pots. Let *Fig trees* gradually go to rest, by withholding water altogether.

HARDY FLOWER GARDEN.

Finish planting all kinds of plants intended for early spring blooming, where this has not already been done; as even now there is some risk of being overtaken by bad weather. Cut away all young flower-spikes pushing up from *Hollyhock* stools, and draw the soil up to, and around the stools. Those who meditate laying down grass this season, should do so with as little delay as possible. Conversing on this subject with one of our most practical horticulturists, he said:—"November is the month for this operation; if this period be let pass by, we may have following in its wake, frost, snow, and other opposing elements, likely to last the winter through until March or April arrives, and with it a dry period and more powerful sun, which acting in conjunction, will destroy the best plants in any turf." Those who intend keeping their flower beds empty until next May should now have them dug deeply, placing the bottom spit on the surface, so that the frost may exert its beneficial influence. In digging these over it is better to give them a coating of good leaf-mould—partly decomposed only, than to do so in the spring immediately before planting out, which often causes the plants to run to leaf at the expense of flowers. *Tulips* should have all been got in by this time, and a better season for the operation could not well be wished for. Clean the roots of *Ranunculi* from any soil or litter attached, and put them in a dry place.

KITCHEN GARDEN.

It is customary—following a very antiquated rule—to bank over the crowns of *Asparagus plants*, in such a manner that frost cannot possibly reach them, to their supposed injury. This, I have no doubt, is a useless procedure, and one which, to say the least, is not in keeping with any natural law whatever. I do not advise any one to follow my suggestion entirely, but the fact is worthy of consideration. By affording to the elements an unimpeded course more good is likely to accrue from their influences on the soil than is the case when the crowns are buried at such a depth that these cannot reach them. A trial should be made with a row, or bed or two, regarding which a future report would be of some interest. Give attention to the stock of *Potatos*, now that the first "sweating" is past. Place stable litter around stools of *Globe Artichokes* at the first approach of severe frosty weather. Make a sowing of some early kinds of *Peas* on a warm sheltered aspect; also another sowing of *Broad Beans*. Make all necessary preliminary arrangements for the covering over of *Parsley*, *Endive*, &c., which are likely to afford a useful crop onwards. Keep the soil free and open amongst beds of *Spinach*, gathering the leaves singly and without injury to the plants when a dish is wanted for use. Rake, sweep, and clean up all tree leaves or other symptoms of decay likely not only to maintain moisture, but to impede a free circulation of air. *W. E.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, NOVEMBER 9, 1870.

1870. MONTH AND DAY.	At 9 A.M. Readings of Barometer reduced to 32° Fahr	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.
November	Ins.	Deg.	Deg.	Deg.		Gr.
3 Thurs.	30.35	55.5	54.1	52.1	89	5.1
4 Friday	30.30	49.1	49.4	47.1	1.8	2.9
5 Satur.	30.31	48.5	48.1	44.1	92	3.2
6 Sunday	30.42	49.5	48.1	44.0	89	3.1
7 Monday	29.61	48.0	46.0	39.7	71	2.4
8 Tues.	29.61	46.0	39.3	28.5	45	1.8
9 Wednes	29.77	48.8	45.5	37.0	66	2.2

1870. MONTH AND DAY.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range in Day	Mean.	Departure of Mean from Average of 50 Years.	WIND. Direction.	Horizontal Movement.	RAIN. In Inches.
November	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
3. Thurs.	44.7	37.8	12.0	36.1	—10.0	W.	60	0.00
4. Friday	50.5	30.4	20.1	42.4	— 3.5	WSW.; NE.	105	0.00
5. Satur.	51.6	42.8	8.8	46.6	+ 0.9	E.	99	0.00
6. Sunday.	48.0	37.0	11.0	41.9	— 3.6	Variable	110	0.00
7. Monday	51.6	34.0	17.6	42.2	— 3.1	SW.	155	0.04
8. Tues.	49.9	34.2	15.7	41.4	— 3.6	SSW. variable	105	0.00
9. Wednes	42.6	35.4	7.2	38.5	— 6.2	N. NE.	109	0.00

Nov. 3—Small amounts of cloud prevalent. Foggy.
— 4—Generally overcast. Drizzle in the morning.
— 5—Generally overcast and foggy all day.
— 6—Overcast throughout. Foggy.
— 7—Generally cloudy. Rain fell between 1.15 P.M. and 2.15 P.M.
— 8—Cloudy and foggy.
— 9—Overcast. Dense fog during the morning and early afternoon hours.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS.

DURING THE WEEK ENDING SATURDAY, NOVEMBER 5, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Ranges of Weeks.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	60.2	25.8	34.4	55.5	31.3	24.2	42.7	0.15
Blackheath ..	56.4	29.8	26.6	52.0	37.1	14.9	44.1	0.47
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	53.9	29.4	24.5	51.1	36.8	14.3	43.3	1.07
Wolverhampton	52.1	30.1	22.0	49.3	37.3	12.0	42.7	0.59
Leicester ..	55.2	29.7	25.5	50.6	38.1	12.5	44.8	0.67
Norwich	54.5	32.7	21.8	52.1	39.8	12.3	45.3	0.60
Nottingham ..	54.9	30.8	24.1	52.4	38.3	14.1	44.7	0.55
Sheffield ..	57.0	31.0	26.0	50.9	39.9	11.0	44.6	0.49
Liverpool ..	52.8	35.8	16.7	50.2	42.0	8.2	45.4	0.34
Manchester ..	53.5	29.0	24.5	52.6	33.9	18.7	42.6	0.40
Salford	53.5	31.1	22.4	50.2	37.2	13.0	43.0	0.38
Bradford	55.2	34.8	20.4	52.8	39.9	12.9	45.9	0.79
Leeds	51.0	32.0	23.0	52.3	40.8	11.5	45.9	0.28
Hull	51.0	29.0	25.0	51.9	36.3	15.6	43.4	0.08
Newcastle ..	51.0	32.0	19.0	49.8	38.7	11.1	43.6	0.00
Edinburgh ..	54.7	35.0	19.7	..	..	..	45.5	0.10
Glasgow	52.2	32.5	19.7	..	..	..	44.1	0.21
Dundee	51.0	36.0	18.0	..	..	..	44.0	0.05
Aberdeen ..	50.0	37.2	12.8	..	..	..	45.3	0.16
Paisley	50.0	32.0	24.0	..	..	..	41.8	0.29
Greenock	52.0	37.0	15.0	..	..	..	44.8	0.31
Leith	53.2	34.5	19.7	..	..	..	45.3	0.10
Perth	50.0	32.0	24.0	..	..	..	44.2	0.09
Dublin	..	..	..	..	..	..	..	..

JAMES GLAISHER.

Notices to Correspondents.

A GARDENER IN EMBRYO. We are thankful to you on being placed under a gardener who uses "profane and disgusting language." It is certainly not necessary to become a "Great Bagnard" in order to become a good gardener. We cannot entertain the idea of your superior, at the same time it is clear, from your mode of writing your mother tongue, that you yourself have much to learn.

ARUM DRACUNCULUS AND RICHARDIA ÆTHIOPICA. *J. F.* The former is hardy, and very handsome; but the latter requires shelter in the winter.

BOOKS: *I. I. H.* The best English book we know on the general subject is "Brown's Forester." The subject of moving large trees is fully and specially treated on in M. Alphand's "Les Promenades de Paris," noticed at p. 1381; and much information on the same subject is scattered through our own volumes.

EARLY POTATOS: *A. A.* The Rev. Mr. Radclyffe kindly obliges us with the following notes in reply to your question:—"In my judgment, the best early Potato in the world, which is not a frame Potato, is the old original Ashleaf; but, as it requires extra cultivation, and shelter from spring frosts, which destroy the haulm, I recommend the Royal Ashleaf, which is very hardy, a good cropper, always level and uniform in shape, and very good. Myatt's Ashleaf is also an admirable early out-of-doors Potato. I do not keep any very early round Potatos. These are early and good, and the only two kinds in the line of round that I keep,—Gryffe Castle Seedling, and Napoleon, *alias* Early Emperor. The former is the best and nuttiest of the class Regents, and the last has no equal for shape (true Pebble), and is mild and good. Both are early ripeners. I have heard the Early Oxford well spoken of, but I have had no experience of it. *W. F. Radclyffe.*"

ELM TREE UNHEALTHY: *E. F. F.* Something wrong at the roots; bad drainage or unsuitable soil. Exactly the same thing happened to some of the Elms and Beeches in Kensington Gardens this last summer. We attributed it to decay at the roots. There was no appearance of insect agency in them. But our correspondent says nothing of the state of the wood below the bark in his tree, nor anything about the subsoil or drainage. The prospects of the tree are not encouraging.

FERNERY: *A. P.* A house 40 feet by 20 feet, with the sides of rockwork so constructed as to form recesses, the floor more or less excavated to give height and variety of surface, and the roof in flat ridges and constructed of rough sheet glass, would afford a good basis for a fernery. The Tree Ferns might occupy the central portions of the house, with pathways about and beneath them.

FRUITING SEEDLING PEARS: *Subscriber, Reading.* Pear trees are very slow in fruiting. We have some, and we have seen many, nearly 20 years old, and yet they show no signs of fruiting. It is weary work waiting for them. The best way to bring them to fruit is to bud them or graft them on to the branches of older trees against the wall, or double work them upon Quinces. You may also pot them and fruit them in the orchard-house. Budded on Quinces they would fruit in about three or four years; left growing on their own roots, they might perchance fruit in six or eight years, or perhaps twenty. It is all chance.

FUNGUS: *W. M.* The little scarlet Fungus is Agaricus coccinellus, Ehrenberg. The Geaster is truly G. Bryantii. The orifice is not plicato-sulcate in G. limbatus. The Agaric with a viscid pellicle, has not the same coloured spores as A. æruginosus. It appears to be an undescribed species. It is possible that the Agaric you mention with yellow-brown spores may be A. durus. *M. J. B.*

LAURUS NOBILIS: *R. H. P.* A narrow leaved form, perhaps L. nobilis var. salicifolia.

NAMES OF FRUITS: *N. V. Pears:* 2, Knight's Monarch; 3, Glou Morceau; 4, Beurré d'Aremberg; 5, small Fondante d'Autômne; 6, Vicar of Winkfield. —*R. Austell. Plum:* Coe's Late Red.—*Charles Lee.* 1, 2, Beurré Diel; 3, Triomphe de Jodoigne; 4, Vicar of Winkfield; 5, Hacon's Incomparable; 6, Easter Beurré; 7, 8, Napoléon; 9, Seckle; 10, Winter Nelis. —*J. B., Pears:* 1 and 2, smashed; 4, Chaumoutel; 2, Beurré Diel; 8, Glou Morceau; 9, Beurré Clairgeau; 10, Maréchal de la Cour; 11, Nutmeg; 12, Passe Colmar.—*H. J. C. Apples:* 1, Sturmer Pippin; 3, Hautbois; 4, Red Bough; 8, King of the Pippins; 9, Scarlet Nonpareil.—*G. B. Apples:* 1, Alfreston; 3, Holland Pippin; 4, probably Keswick Codlin; 5, King of the Pippins; 6, Downton Pippin, not the Golden Pippin. *Pears:* 1, Bezi d'Heri; 2, Beurré d'Anjou; 3, Easter Beurré.—*C. H. D. Pear:* Burgomeister. The Apples are very puzzling. We will try what we can do by next week.

NAMES OF PLANTS: *J. Luff.* We cannot name your plant from the scrap sent.—*W. F., jun.* A species of Aralia, but we cannot determine which.—*J. L. T.* The Spindle tree, Euonymus europæus. Thuja occidentalis, and probably a variety of Biota orientalis; but we should like to see the latter in flower or fruit, before speaking with confidence.—*J. D. & S.* Materials insufficient, but looks like one of the varieties of P. ponderosa.—*X. Y. Z.* The fruit sent belongs to a species of Hickory, which, we cannot say, without leaves.—*A. B.* Both are varieties of Epiphyllum truncatum. We cannot distinguish them by single flowers alone, as there are many of them differing only in the shade of colour; they require to be compared with authentically named plants. Asplenium marinum. The larger Selaginella is Martensii, the other is imperfect, wanting the stem. For a drawing-room glass, Lastrea glabella, Pteris serrulata, and its crested variety, Asplenium marinum, Adiantum Capillus-Veneris, and A. setulosum, Lomaria lanceolata, are suitable, and afford much

variety of form and character.—*J. P. F.* Probably Cotoneaster affinis.

PAINTING RAILS.—*G. E. M.* If there is any loose rusty matter, by all means remove it before painting again; but if not, do not break the surface. The other question is referred.

SCALE, &c., ON PEACH TREES.—*T. C. R.* You must persevere. It is to be got rid of. Give your trees a good painting with Gishurst Compound, or soft-soap and sulphur, thickened to the consistency of paint by mixing it with soil; with this you will be able to give them a good coat. Paint them with this as often as you see any appearance of the pests.

VINE DISEASE: *G. N.* You will see on looking back that we have already figured the insect, and it has been repeatedly alluded to in our columns by Prof. Westwood, Mr. Berkeley, and others.—*R. M.* Probably the disease in question is the one to which so much attention has been called in our columns. For a remedy see p. 1277 in our 39th number.

CATALOGUES RECEIVED:—C. Turner, Catalogue of Roses, Fruit Trees, and Coniferæ.—T. Perkins, Wholesale Catalogue of Nursery Stock.—F. & A. Dickson & Sons, Descriptive Catalogue of Roses and Hollyhocks.—E. H. Krelage & Son, Catalogue Spécial des Tulipes.—Narcisse Gaujard, Ghent, Wholesale Catalogue of Nursery Stock.—John Stewart & Sons, Catalogue of Nursery Stock.—W. Chater, Catalogue of Hollyhocks, Roses, &c.—W. Drummond & Sons, Catalogue of Forest, Ornamental, and Fruit trees.—Louis Van Houtte, Catalogue of Fruit Trees, Conifers, Ornamental Trees, Roses, Gesneraceous Plants, &c.—William Paul, Catalogue of Roses.—George Prince, Catalogue of Flower Roots, Roses, and Strawberry Plants.—Peter Lawson & Son, Catalogue of Forest Trees, Shrubs, &c.—J. Smith, Wholesale Catalogue of Trees, Shrubs, &c.

COMMUNICATIONS RECEIVED:—J. C. T.—G. N.—R. H.—R. M.—E. R.—J. B. T.—W. B.—R. L. M.—A. F. S.—F. F.—R. G.—J. G. T.—Winton.—W. J.—H. G.—H. W. C.—A. B.

Markets.

COVENT GARDEN.—Nov. 28.

A thin attendance of buyers has somewhat interfered with business, but the general tendency is towards improvement. The Continental supplies are well kept up, but are not quite so regular as usual. Some good American Newtown Pippins are to hand this week; they realise from 2*s.* to 3*s.* per dozen. Amongst flowers we have Orchids, Chrysanthemums, Mignonette, Heaths, and dwarf evergreens.

FRUIT.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Apples, p. ½ sieve	1 6	2 0	Oranges, per 100	8 0	12 0
Grapes, per lb.	2 0	3 0	Pears, per doz.	1 6	3 0
Lemons, per 100	6 0	8 0	Pine-apples, per lb.	8 0	30
Melons, each	1 0	3 0			

VEGETABLES.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Artichokes, Jerusa-			Horse-Radish, p. bun.	3 0	5 0
lem, p. lb.	0 2	0 4	Lettuces, p. score	1 6	3 0
Beet, per doz.	2 0	3 0	Mint, per bunch	0 3	0 6
Brus. Sprouts, ½ sieve	2 0	3 6	Mushrooms, p. pott.	1 0	1 6
Cabbages, p. doz.	1 0	1 0	Onions, per bunch	0 4	0 9
Carrots, p. bunch	0 4	0 6	Parsley, p. bunch	0 2	0 4
Cauliflowers, p. doz.	1 6	3 0	Salads, per bundle	1 1	1 6
Celery, red, p. bun.	1 6	2 0	Seakale, p. pun.	4 0	4 6
— white, do.	1 0	1 6	Shallots, per lb.	0 8	—
Cucumbers, each	1 0	1 6	Spinach, p. bushel	2 0	3 0
Garlic, per lb.	0 8	—	Tomatos, per doz.	1 0	1 6
Herbs, per bunch	0 2	0 4			

Potatos, Regents, per ton, 120s. to 80s.; Kidneys, 90s. to 120s; Rocks, 80s. to 60s.

POTATOS. Southwark, Nov. 7.

During the past week the arrivals coastwise have been moderate, but heavy by rail and road from the home counties. The trade has been very dull, at the following quotations:—Yorkshire Regents, per ton, 70s. to 80s.; Lincolnshire do., 60s. to 70s.; Dunbar and East Lothian do., 70s. to 80s.; Perth, Forfar, and Fifeshire do., 60s. to 70s.; Kent and Essex do., 50s. to 60s.; Do. Rocks, 45s. to 55s.

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 23, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TASARNOG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.
JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London.

Archangel and Petersburg Mats.

ARCHANGEL MATS, under present value.
PETERSBURG MATS of old prices. Samples and prices at
J. BLACKBURN AND SONS, Russia Mat and sack Warehouse, 4 and 5, Wormwood Street, London, E.C.

E. T. ARCHER'S "FRIGI DOMO."—Patronised and used for Frogmore and Kew Gardens. It is made entirely of prepared wool, and a perfect non-conductor of heat or cold where it is applied.
PROTECTION from the SCORCHING RAYS of the SUN
WOOL NETTING, 23 yards wide and 11 oz. per yard
"FRIGI DOMO" CANVAS

Two yards wide	15 oz. per yard
Three yards wide	21. 8d. per yard.
Four yards wide	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 8½d. to 8s. 6d. per yard
HESSIAN CANVAS, do, do, 54 and 72 inches wide, 6½d. and 8½d. per yard.
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Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (Illustrated) of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society.
The above can be had, of all sorts, wholesale of
CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Pits, &c.
Plans and Estimates on application.
J. JONES AND SONS, 35, King Street, Cheapside, London, E.C.
Manufactory, 6, Banksside, Southwark, S.E.

Greenhouses.

H. FREEMAN AND SONS, HORTICULTURAL BUILDERS and HOT-WATER APPARATUS MANUFACTURERS, 106, Mare Street, Hackney, E. Good substantial-made GREENHOUSES, Glazed, ready for Fixing, 42 feet long by 12 wide, price £60; 21 feet long by 12 wide, £26 10s.; 10 feet by 10 feet, £18. A handsome CONSERVATORY in stock, 36 feet long 18 feet wide, £110. Estimates given for any branch in the above line, in Wood or Iron.

HOT-WATER PIPES, BOILERS, &c., &c., of superior quality.

			2-inch.	3 inch.	4 inch
HOT-WATER PIPES, Nos. 6 and 7—per yard			*s. d.*	*s. d.*	*s. d.*
			1 0	1 5	1 11
ELBOWS, No. 12	.. ..	each	1 0	1 0	2 6
T-PIPES, No 33	.. ..	,,	2 0	2 10	3 9
SYPHONS	.. ..	,,	1 4	2 4	3 8
VALVES	.. ..	,,	7 6	10 0	11 0

The above, nett cash prices, delivered at London, Liverpool, Bristol, or equivalent.
GEORGE ROBINSON, 16, South Wharf, Paddington Basin; and at Dial Iron Works, Stourbridge.

MINTON, HOLLINS, AND CO., PATENT TILE WORKS, STOKE-ON-TRENT.
This is the OLD FIRM, and they continue to Manufacture every class of ORNAMENTAL and PLAIN TILING, by the most improved processes, after
UPWARDS OF THIRTY YEARS' EXPERIENCE
London House: 60, Cornhill Street, Regent Street, W.
Manchester House: Bridgewater Offices Chambers, 110, King Street.

THE GRANITIC PAINT, the best for the finest painting and the roughest work, used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Breweries, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.
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DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Porous Bricks and Stone, Cement and Plaster, preserved from decay.
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CONSERVATORY AND ORCHARD-HOUSE GLASS.
Genuine White Lead, Oils, Colours, Brushes, &c.
GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNEXIONS, &c.
Prices upon application.

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As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each Box contains 100 feet. The prices only apply to the sizes stated Squares 20 by 12, 20 by 11, 20 by 14, 20 by 15
16 oz. to the foot.

	21 oz.
Fourth qualty .. .. 150 feet	135 6*d.*
Third quality .. .. 100 feet	225 6*d.*
Seconds .. .. .. 182 6*d.*	265 6*d.*
English .. .. .. 250 feet	275 6*d.*

The above prices include the boxes, which are not returnable.
HORTICULTURAL GLASS.
Stock sizes, 16-oz., in 100 feet boxes, boxes included.
These prices only apply to the sizes stated.

				48hs	32ds.	24d
				s. d.	*s. d.*	*s. d.*
11 by 9	12 by 9	13 by 9	14 by 9	13 6	15 6	17 0
12 by 10	13 by 10	14 by 10	15 by 10			
13 by 11	14 by 11	..	..			
14 by 12	15 by 12	15 by 13	16 by 13			
18 by 12	19 by 12	16 by 12	17 by 12			
16 by 13	17 by 13	20 by 12	..			
10 by 14	20 by 13	18 by 13	..	15 0	16 0	18 6
	17 by 11	18 by 14	..	16 to 17 oz. to the foot.		
	20 by 14					

SMALL SHEET SQUARES (in 100 feet Boxes).

6 by 4	6½ by 4½	7 by 5	7½ by 5½	.. 12s. 6*d.*
8 by 6	8½ by 6½	9 by 7	9½ by 7½	.. 13s. 6*d.*
		10 by 8	10 by 8½	.. 13s. 6*d.*

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WM. WOOD and SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.

Park Fencing undertaken to any extent.

N.B. Plans and Designs for Horticultural Buildings, &c., &c.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, VALUER, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.

SALES and VALUATIONS carefully and promptly conducted.

Nursery and Seed Business to be Disposed of.

AN excellent and old established NURSERYMAN and SEEDSMAN'S BUSINESS is to be DISPOSED OF, in consequence of the death of the late Proprietor.

The book will be found suitable in every respect for the requirements of the Business, and may be taken at a valuation (estimated at about £1000); and the terms of payment can be arranged to suit the convenience of the purchaser.

The Nursery Grounds are situated within an easy distance from a flourishing and increasing Market Town, and the business is capable of great extension.

Apply by letter to Messrs. NUTTING AND SONS, Seed Warehouses, 60, Barbican, London, E.C.]

SALES BY AUCTION.

Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on MONDAY and WEDNESDAY, November 14 and 16, at half-past 12 o'Clock precisely each day, an importation of choice Double and Single HYACINTHS, TULIPS, IRIS, CROCUSES, NARCISSUS, GLADIOLI, LILIUMS, and other Bulbs, just arrived from Holland.

On view the mornings of Sale, and Catalogues had.

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, November 15, at 1 o'Clock precisely, an assortment of first-class POULTRY and PIGEONS, from the yards and lofts of well known Breeders and Fanciers.

On view the morning of Sale, and Catalogues had.

Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, on THURSDAY, November 17, at half-past 12 o'Clock precisely, in Importation, just arrived from New Granada, consisting of choice CATTLEYAS, ODONTOGLOSSUMS, MASDEVALLIAS, &c., including ODONTOGLOSSUM WARSCEWICZELLAN, &c., and from Moulmein, CYPRIPEDIUM PARISHII, and PHALÆNOPSIS LOWII, &c.

On view the morning of Sale, and Catalogues had.

Important Sale of Plants,

At the ROYAL HORTICULTURAL GARDENS, CHISWICK.

MR. J. C. STEVENS begs to announce that he has been favoured with instructions from the Council of the Royal Horticultural Society, in consequence of the grazing now upon the ground, to SELL by AUCTION, on the Premises, at the Garden, Chiswick, on THURSDAY, November 24, and following days, at 12 o'Clock precisely, a magnificent and grand Specimen CONIFERS, and HARDY TREES and SHRUBS, consisting of Wellingtonias, Cupressus, Piceas, Cedars, Pinuses, Araucarias, very fine Yews, Hollies, from 10 to 20 feet, Rhododendrons, Laurels, Box, Berberis, Euonymus, Aucubas, Golden, English, and Irish Yews; Pampas Grass, Yuccas, Scarlet Chestnuts, Laburnums, Pyramidal Thorns, Ivies, Standard and Dwarf trained APPLES and FILBERTS, Red and Black CURRANTS, GOOSEBERRIES, RASPBERRY Canes, FIGS in pots, and a great variety of Hardy Trees and Shrubs, many of them suitable for Lawn specimens, and useful to suit both large and small growers.

On view three days prior, and mornings of Sale, per Catalogues only, price 6d each, which may be had of Mr. HOLLAND, at the Garden, at the Royal Horticultural Gardens, at South Kensington, and to Mr. BARRON, at the Chiswick Gardens, and of Mr. J. C. STEVENS, Horticultural Auctioneer and Valuer, 38, King Street, Covent Garden, London, W.C.

Peckham, S.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, CHOICE GREENHOUSE PLANTS, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, on the Premises, The Hanover Nursery, Rye Lane, Peckham, adjoining the Station of the London, Chatham, and Dover Railway, on MONDAY, November 14, and following days, at 11 for 12 o'Clock precisely each day (by order of the Executors of the late Mr. W. Iverl), without reserve, the whole of the valuable and extensive STOCK of the NURSERY STOCK, consisting of choice Conifers and Evergreen Shrubs, including 2000 Aucubas, 1 to 4 feet; 1000 Green, Variegated, and other Hollies; 1000 Chinese Arbor-vitæ, 3 to 6 ft.; 3000 Euonymus, 1 to 3 feet; Laurustinus, 500 Englished and Irish Yews, 1500 Ligustrum, of sorts; 200 fine Yucca gloriosa, in flower; fine Fruit Trees; 4000 hardy Climbers, in pots; 1000 Standard, Dwarf, and Climbing Roses, together with specimen Double Camellias and Azalea indica, very fine; 150 Ericas and Epacris, 6000 Pelargoniums and Geraniums, in all the leading varieties; 2000 Hardy Herbaceous Plants, &c.

Now ready. Catalogues may be had on the Premises, and of the Auctioneers, Leytonstone, E.

Sunningdale Nursery, Bagshot, Surrey.

CLEARANCE SALE of SEVERAL ACRES of NURSERY STOCK, the land being required for building purposes by the Sunningdale Estate Company.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. Charles Noble to SELL by AUCTION, on the Premises, Sunningdale, Bagshot, Surrey (within five minutes' walk of Sunningdale Railway Station), on WEDNESDAY and THURSDAY, November 16 and 17, at 12 o'Clock, without reserve, the remaining CLEARANCE STOCK, not disposed of at the last great Sale, in consequence of the unpropitious weather, and which must be cleared under a notice to give up possession in March next, comprising Evergreen Coniferous and Deciduous Shrubs, ranging all sizes, including some remarkably handsome specimen, viz., Picea Lobbii, gigantea, Abies Douglasii, Wellingtonia, Junipenus, &c.; carefully prepared for removal; some thousands of Rhododendron ponticum, 1 to 3 feet; also hybrid seedling and finest-named varieties, such as Blandyanum, Lady E. Cathcart, Mrs. and Mr. John Waterer; together with a large quantity of clean-grown Standard and Pyramid Fruit Trees, viz., Apples, Plums, Pears, Cherries, Standard Peaches, Nectarines, best Lancashire Gooseberries, Currants, &c.; Standard and Dwarf Roses of the best varieties in cultivation.

May be viewed any day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, E.

Luncheon, by ticket, will be in readiness on the arrival of the Train leaving Waterloo at 11 o'Clock, which Train will be met by a Van, to convey Purchasers to the Sale.

N.B.—The Railway communication is so complete that goods may be transmitted from Sunningdale Station to any part of England, Scotland, and Wales, without change of truck.

Sale of First-Class Dutch Bulbs, Standard Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at the City Auction Rooms, on FRIDAY, November 18, at half-past 12 o'Clock precisely, a first-class COLLECTION of HYACINTHS, TULIPS, CROCUS, NARCISSUS, &c.; a choice assortment of 300 Standard and Dwarf ROSES, of the best varieties, Hardy RHODODENDRONS, and other American Plants, &c.

On view the morning of Sale. Catalogues may be had at the Rooms as above, and of the Auctioneer.

Wandsworth Common, S.

IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK.

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Robert Neal, to SELL by AUCTION, on the Premises, the Nursery, Wandsworth Common, Surrey, 5 minutes' walk from Wandsworth Common Station, on MONDAY, November 21, and five following days, at 11 for 12 o'Clock precisely each day, without reserve (a portion of the land being required for building purposes), the whole of the VALUABLE NURSERY STOCK, comprising 20,000 Common Laurels, 2 to 9 feet; 5000 Portugal do., 2 to 6 feet; 15,000 Green and Variegated Hollies, 2 to 6 feet; 1000 English and Irish Yews, 4 to 6 feet; 10,000 Laurustinus evallofolium; 13,000 Berberis, of sorts; 10,000 Euonymus, 2000 Cedrus Deodara, 10,000 Spruce Firs, 2 to 6 feet; 20,000 Rhododendrons, of sorts; 10,000 Box-leaved Privet; 3000 Arbor-vitæ, 2 to 9 feet; 5000 Arbutus, Laurustinus, Bay, 1000 Cotoneaster, 20,000 Deciduous Shrubs, various, and thousands of others; a large quantity of Ornamental and Forest Trees; 10,000 Fruit Trees, various; 5000 Standard and Dwarf Roses of the best varieties; 10,000 Climbing Plants, in pots, &c.

May be viewed three days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.

To Nurserymen and Others.

MESSRS. HOFMAN AND SON will SELL by AUCTION, on the Premises, Albemarle Nursery Grounds, Great North Road, Potters Bar, on MONDAY, November 14, at 2 o'Clock precisely, in ONE LOT, FOURTEEN nearly new GREEN HOUSES, fitted with Hot-water Pipes, Boilers, Furnaces and Fittings. About 130 feet of PIT LIGHTS and the wood ERECTION of POTTING HOUSE.

May be viewed two days prior to and day of Sale. Particulars and Conditions of Sale had on the Premises; of Messrs. C. AND J. ALLEN AND SON, Solicitors, 17, Carlisle Street, Soho; and of the Auctioneers, 1, Castle Street, Leicester Square, W.C.

Second Poultry Sale of the Season.

LUCAS'S REPOSITORY, LIVERPOOL.

MESSRS. LUCAS AND CO. will SELL by AUCTION, on FRIDAY, November 25, at 11 o'Clock prompt, at their Repository, Liverpool, THREE HUNDRED LOTS of Choice Domestic POULTRY and PIGEONS. No Entrance Fee for Pigeons; Poultry, 1s per Pen. Entrance CLOSES on MONDAY, November 21 — more than 100 Lots offered. All Birds to be at the Repository on the Thursday evening, or before 9 o'Clock on Friday Noon. —Three Birds in each Pen, except of great merit. Pigeons in Pairs.

Important Sale of Shorthorns.

MR. STRAFFORD begs to announce that he has received instructions from Mr. B. Wainman, of Whitley Manor, Newport, Salop, to SELL by AUCTION, without reserve, on MONDAY, November 14, at the Midland Counties Repository, Birmingham (being the week of the Show), a choice HERD of superior SHORTHORNS, consisting of about 30 Head of Bulls, Cows, and Heifers, that are chiefly descended from the old and famed herds of Mr. Cooper, of Coton, Mr. Peacock, of Haddockstones, with the introduction of some good blood from Lord Feversham's, Lord Penrhyn's, Captain Gunter's, Mr. McIntosh's, Mr. Maynard's, and other celebrated breeders. The sires latterly used are of the Kirklevington sort.

Catalogues, with pedigrees, and other particulars, may be had on applications to Mr. STRAFFORD, 9, Close, Square, London; or of Mr. WAINMAN, Whitley Manor, Newport, Salop.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870.

SPECIAL PRIZES for SUTTONS' CHAMPION SWEDES, at the ROYAL BERKSHIRE ROOT SHOW, to be held at READING on SATURDAY, November 26. The following valuable Prizes for SUTTONS' Champion Swede will be awarded:—

	£	s.	d.
For the best 24, a Silver Cup, value	10	10	0
For the second best 24, in money or plate, value	5	5	0
For the third best 24 " "	2	0	0
For the fourth best 24 " "	1	0	0

Also Prizes for the best MANGEL, TURNIPS, KOHL RABI, CARROTS, &c. No charge for entry.—For full particulars apply to SUTTON AND SONS, Seed Growers, Reading, Berks.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, ROOTS, CORN, POULTRY, CORN, ROOTS, and IMPLEMENTS will be held in BINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30, and December 1, when PRIZES to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.

The Exhibitors and the Public will be admitted to Bingley Hall to witness the Judging of the Cattle, Sheep, Pigs, Roots, Corn, and Poultry, on Saturday, November 26, at 9 o'Clock, A.M., upon payment of 10s. each.

Admission on Monday, November 28, to non-Subscribers, until 5 o'Clock, 5s.; after that hour, 1s.

The Exhibition will also be opened on Tuesday, admission 1s all day. On Wednesday and Thursday, until 5 o'Clock, 1s.; after that hour, 6d.

For special Railway Arrangements see the Advertisements and Bills of the several Companies.

The ANNUAL GENERAL MEETING will be held at the Hen and Chickens Hotel, New Street, Birmingham, on THURSDAY, December 1, at 12 o'Clock, to Elect a President for the ensuing year, the Council for the ensuing three years, and upon general business.

JOHN B. LYTHALL, Secretary.

Offices of the Society, 39, New Street, Birmingham.

The Agricultural Gazette.

SATURDAY, NOVEMBER 12, 1870.

THE report of last week's Council meeting of the Royal Agricultural Society of England is full of interesting matter.

We are very glad to learn from it that Mr. MASON's liberal offer this year of a prize for the best cultivated farm is to be repeated in the Wolverhampton district; and that the difficulty anticipated for the judges, arising out of the dissimilar characters of the farms which they would have to compare, is at least halved for next year by the offer of two such prizes—one for arable and the other for dairy farmers. On the motion of Mr. THOMPSON, the chairman of the Journal Committee, it is resolved to offer second prizes in the several cases, and to confer upon the committee the power of arranging the details of the competition. There is a considerable expenditure connected with these farm competitions—no less than £325 has been spent in this way this year,—but we are sure that the funds of the Society cannot be better laid out. We obtain a handsome and therefore stimulating travelling premium, which may be said to influence the agriculture of all England once in about 12 or 14 years—and founded on this we have also an instructive report upon the leading features of good agriculture, which must exert a sensible influence on the agriculture of all England once in every year. No part of the Society's expenditure can be named which more directly carries out the objects for which the Society itself was constituted. It will no doubt be a part of the committee's care to ensure efficient inspection, comparison, and description of the occupations. It is desirable that both adjudication and report be not left too long in one set of hands. Mr. HALL KEARY and his colleagues deserve our thanks for their careful and conscientious work; but it is not desirable that the modes of judgment or canons of criticism, by which awards may be determined, should be sterotyped; and we shall be all the better for the application of fresh minds every year to the problem, which will, doubtless, annually be put before the Judges of the Society. In reference to Mr. THOMPSON's remarks on this year's award, we venture to say, (1) that in no case this year could the prize have been awarded to what we presume is meant by "model" farming—in every instance, we believe, the competing farms are held simply for the profits of the business; and (2) we are not certain that the comparison of Kirtlington and Ashgrove, which we lately made, does illustrate the belief of the judges, that the profitable cultivation of poor stone brash soils is to be done only by a large expenditure in cake and corn. This, however, is a point to which we must return.

One other capital point in last week's proceedings has yet to be named. The Council do not abandon their educational scheme, and the terms on which they receive agricultural students in 1871 are somewhat relaxed from those of the past year. The experience hitherto of the Education Committee has not been particularly encouraging. In 1868 they had candidates enough, but not one passed! This roused the Cirencester authorities, and in 1869 the College candidates had what may be pronounced an excess of success, for in 1870 a maximum of age was fixed, which looked as if intended to debar the College competition altogether. At any rate it had that effect, and it debarred almost all other competition into the bargain. In 1871, competitors for the *prizes* must be—as last year they were required to be—under 21 years of age; but the Society's "certificates" may be tried for irrespective of age. We do not see why, if a certificate may be granted to a man of 25, or even 30, if he should deserve it, a prize should not be accessible as well. It appears to us that the Society had better seek candidates in the first instance anyhow,—competition by young students if possible, but, anyhow, COMPETITION—only gradually introducing whatever restrictions they may deem desirable. Let us hope, however, that this last relaxation may be of some service, and that at least a score of adult candidates and a score of younger students may compete next year for the certificates and prizes which the Society offer.

One other paragraph in last week's report deserves a note. Mr. W. J. EDMONDS, than whom no one on the Council is characterised by more dispassionate good sense, will move at the next Council meeting, that a small grant be made to the Cirencester Chamber of Agriculture, who, with the aid of the Professors of the Royal Agricultural College, are conducting a series of manure experiments on corn and roots. We earnestly hope that this may be the commencement and inauguration of a more active and cordial relationship, for their mutual advantage, and for the better promotion of their mutual objects, between the chief central and the local agricultural societies of the country. In no other way, we are persuaded, can many of the objects of the Society be more effectively promoted than by the establishment of friendly relationship with Farmers' Clubs. It ought to be considered an additional motive in this direction, that in this instance the Society will be availing itself of the services of the Royal Agricultural College. Mr. EDMONDS will have done a very great agricultural service if he shall succeed in establishing friendly relations between the local agricultural societies, whether Clubs or Chambers, and the Royal Agricultural Society of England.

THE usual crop of letters to the newspapers on ACORNS as food, and acorns as poison, which follows every summer favourable to their abund-

ance, has at length, we hope, been harvested in full. There can be no doubt that cattle have died, and that cattle, sheep, and pigs have lived, on acorns. That they are good food when properly administered, has long been matter of common experience, and that young cattle, pinched in withered pastures, may take them to excess, and die of consequent inflammation, is also sufficiently notorious. That they are useful as cattle food appears, indeed, in the records of our courts of law. At Hull, last year, evidence was given that 297 tons of acorns had been ground into meal—making very good "buff'em" for cake!—"buff'em" to cake being much the same as "bunkum" is to speech. Acorns were that year to be had for £1 a ton at Smyrna. Prices here have varied between 6*d.* and 14*d.* a bushel. Almost the whole truth on the subject has been already given in our columns (see p. 1387); nevertheless, we give the following recent correspondence on the same subject:—

1. *Sir G. Jenkinson* writes to the *Times* stating that several cattle had died on his land from eating acorns.

2. *Lord Rosslyn* corroborates Sir G. JENKINSON'S letter. He had lost two Alderney cows, after a few hours' illness, the *post mortem* examination proving the cause of death to be acute inflammation of the coats of the stomach, produced by undigested acorns and Oak leaves.

3. "*T. S. B.*," Hatherop, lost young Alderney cattle, a present from Hertfordshire. A *post mortem* at once revealed the cause of death. In the passage where food, having been once masticated, returns for the process of rumination, was a compact lump of acorns, which had evidently been only slightly crushed when eaten, and which the stomach had been unable to prepare and to forward for the next operation. The cattle had come from a pasture studded with Oak trees, and had been observed, a day or two before their journey, to be devouring the fallen acorns with much greediness. But this was a case of choking rather than poisoning.

4. *The Rev. C. F. Watkins*, of Brixworth, who had opened the correspondence with an urgent remonstrance against wasting the valuable store of food falling around us, writes to vindicate himself against the presumption that he had recommended the use of acorns for cattle:—"I did no such thing. I recommended them only for swine and sheep, and Horse Chestnuts for milch kine. Experience justifies me so far; and the unusual scarcity of the hay and Turnip crops this year seemed to me to render the information I possessed a national property, which it would be almost criminal to withhold. At the same time I took care to guard that information with prudent directions for gathering and securing the crop in a dry and ripe state, and ministering it in due proportion. Had these suggestions been followed, Sir G. JENKINSON'S cattle could not have suffered; but when the acorns were allowed to strew the parks and fields, and the cattle to roam about and gorge themselves with the rough esculent *ad libitum*, it is not to be wondered at that the clogged and distended organs of digestion should lose their natural powers, and injurious gases affect the stomach."

5. *Mr. White*, agent to Sir W. CAREW, of Ivybridge, says that he has employed persons to collect acorns at 1*s.* 3*d.* a bushel. "Sir W. CAREW has had cattle grazing in the lawn of 40 acres and several other fields, where there are many large Oak trees, and this year they have borne immense quantities of acorns, which, together with lots of small branches, have been blown down by the severe gales; yet the bullocks which have been depastured there have been perfectly healthy."

6th, and lastly, "*W. M.*" writes a very sensible letter on acorn feeding to the *Times*. "I believe them to be just as poisonous to cattle, and no more so, than turtle and cold punch are to the traditional alderman. Cattle show no more reason, especially after such a hungry summer, than humans do when they come across rare and delicious food, and show as little respect for the coats of their stomach. If DIVES would permit LAZARUS to pick up his superfluous acorns (which jealous DIVES very rarely will), LAZARUS would get a store of pig food for the winter, and DIVES would not have to lament over cattle dying through disgraceful gorging—eating till they literally burst."

—— PRICES in Mark Lane did not vary from those of last week for all good samples.——In the Metropolitan Meat Market there was a small supply, and prices were higher.

—— AT a Council meeting of the CENTRAL CHAMBER of AGRICULTURE, held on Tuesday, Sir MASSEY LOPES, Bart., M.P., the Vice-President, in the chair, the report of the Local Taxation Committee was read and adopted. It briefly recapitulated the progress made in the discussion of the subject at a large number of meetings of magistrates in different parts of the country. It was also resolved, "That this Council recommends provincial Chambers to memorialise their respective Courts of Quarter Sessions on the subject of the increased taxation, arising from rates levied under the authority of those Courts."—Mr. C. S. READ, M.P., moved, "That the 'average clause,' as insisted upon by the new regulations of the principal fire insurance offices, is inapplicable to a property so variable in amount and in value as agricultural produce." If the offices would only take the average prices obtained, and the average crop which was yielded, he would not object to the clause.—This resolution was passed, and on the proposition of Captain CATLING it was resolved that the secretary be instructed to invite from non-associated offices a declaration of their terms for the insurance of farming stock. A committee was appointed to confer with the various insurance offices as to the most equitable terms for the insurance of farming stock and produce.—The thanks of the Council were voted to the Right Hon. W. E. FORSTER, M.P., for the prompt manner in which the powers of the Contagious Diseases (Animals) Act were put in force upon the outbreak of cattle plague on the Continent.—It was resolved that the interests of both producers and consumers demand that effective regulations for waterside slaughter should be applied, with the least possible delay, at every port at which foreign animals are admitted, with quarantine for store stock, and the hope was expressed, "that HER MAJESTY'S Government will not hesitate to adhere to and support the provisions of the Contagious Diseases (Animals) Act, with reference to the establishment of a permanent Metropolitan Cattle Market, and that when such a market has been opened, the present restriction against the removal of cattle from the metropolitan area will be rescinded."—Lastly, special attention was called to the exorbitant charges of the railway companies for the conveyance of dead meat.

—— "THE FEN COUNTRY" was the subject, on last Monday, of a paper by Mr. A. S. RUSTON, of Aylesby House, Chatteris, before the London Farmers' Club, of which we give extracts in another page. It was followed by a discussion, of which the following is a summary:—Mr. BROWN commenced the discussion by giving his concurrence to the paper generally. Mr. RUSTON had treated the subject with so much ability as to leave little room for remark, except, perhaps, upon the diversity of opinion which existed amongst the farmers of the different levels. They were not only at variance on Fen farm practice, but opposed still, as they had hitherto been, to further improvement. —Mr. LITTLE thought several things in Fen management were open to criticism. Considering, for example, how much Fen land suffered from drought in the summer time, he thought the command they had of fresh water flowing past in plentiful abundance to the sea, at a higher level, might be turned to profitable account. Under such favourable circumstances the land could be watered at a small outlay of capital on the part of the landlord, and less on that of the tenant. He might quote the Bedford Level, to which the paper specially alluded, as having suffered perhaps more from drought than the other levels, and where command of fresh water and corresponding gains were, in his opinion, equally promising. The other two topics to which he should refer, were the natural increase of the value of land arising from the progress of improvement and population, and the vast amount of expense arising from Parliamentary and other extravagances with which the Fen country was burdened. In calculating the increase of value, he thought the paper had not given sufficient credit to the farmer; and he thought that, although further legislation was needed, yet Fen farmers had ample reason to complain of what they experienced relative to the latter.—Mr. G. MARTIN said that, with improved drainage, the greater breadth of clayed land, and the increasing use of phosphatic manures, strongly commended by Mr. RUSTON, he thought more food for sheep was grown, and that more sheep per acre were kept than was perhaps generally imagined. He differed from the paper in its reference to the horses of the Fen country, for he thought it could no longer boast of its breed, as a good colt was with difficulty to be found.—Mr. MECHI agreed with Mr. LITTLE as to the use of water, but he thought sewage would suit the Fen country better than pure river water.—Mr. BELL took exception to what was said against small occupations, which in the South Level were becoming highly remunerative as market gardens, and the like, the occupiers being both prosperous and respectable. And he did not see why the same degree of success should not apply to the small occupations of the other levels. With this exception he gave the paper his warmest approbation. —Mr. READ, M.P., said the paper was an excellent one, and so ably handled as almost to exclude discussion. He then pointed out some anomalies in Fen farming and characteristics of Norfolk Fen land. Drainage does not always pay, and steam engines were only used to remove flood-water. Some soils become so comminuted, light and loose, as to drift before the slightest breeze. They wanted claying, and as that lay 20 feet below the surface, it was expensive to bring up and apply. He would remind Mr. RUSTON, too, that the windmill was in some places superseding steam-engines (an announcement which excited a general laugh). He next reviewed the gang system, the want of proper cottages, with gardens, on farms, so as to place the workpeople as near their work as practicable, and under the eye of their employers—the obvious duty of landlords in this matter—the laudable manner in which some landowners were discharging this duty, quoting the Duke of BEDFORD as an example.—Mr. NEALE found fault with the paper for the absence of practical detail. He thought, for example, that the quality and quantity of clay to be applied per acre should have been stated; some clays below Fen land were rich in lime, others poor, and so on. He wanted clay, but had to cart it from a distance, which greatly increased the cost of application. He then went on to detail his own experience in the puddling of the centre of embankments to prevent "ooze and bursting." His own Fen had subsided some 7 feet, and was very much infested with weeds.—The CHAIRMAN, in his summary of the discussion, drew special attention to what Mr. LITTLE and Mr. READ had said relative to the use of water and the duty of the landlord in this and other respects.

—— On Monday last the Court of Common Council adopted the report of their Markets' Committee, recommending the purchase of the Deptford Dockyard site for the NEW FOREIGN CATTLE MARKET, to be erected and managed by the Corporation in terms of the Contagious Diseases (Animals) Act of 1869. The site is to cost £91,500, for an area of 22 acres, with a river frontage of 1012 feet; and the total cost of the market is expected to reach the sum of £160,000. The decision has evoked considerable variety of opinion on the part of those interested in the meat trade of the metropolis—the selection of a locality on the south side of the river without railway communication being condemned by many in the interest of consumers, who are for the most part on the north side of the river. There had been, of course, previous to the decision, and no doubt will continue to be until the decision shall be considered irreversible, great energy of personal effort in this matter for the service of private interest—an energy which has, we think, rather injured the cause which it professed to advocate. No doubt the risk of contagion is reduced by the selection of the southern site, and we presume that the Home Cattle Defence Association are to be congratulated on the decision which has been arrived at; but the site from which the interests of consumers would be served is so clearly among those which have been rejected that we cannot but think that some prejudice against them must have been excited in the minds of the Market Committee—how excited, it is impossible to say.

—— The following is a statement of the entries to the forthcoming MIDLAND COUNTIES SHOW at Birmingham, showing a large increase on last year:—

	1866	1867	1868	1869.	1870.
Cattle .. .	116	122	173	111	131
Sheep .. .	[illegible]	[illegible]	103	52	75
Pigs	[illegible]	[illegible]	17	15	61
[illegible] .. .	[illegible]	[illegible]	1[illegible]	1[illegible]	231
[illegible] .. .	[illegible]	15	21	[illegible]	40
Poultry .. .	1[illegible]	[illegible]	15	1,[illegible]	[illegible]
Pigeons .. .	41[illegible]		1[illegible]	482	441
Total . .	[illegible]	[illegible]	[illegible]4	2823	1130

—— There are one or two particulars regarding Mr. PROUT'S experience at Blount's Farm, which may be placed on record in greater detail than we gave them last week. The following is the cropping, within an acre or two, of the farm during the last nine years:—

	Wheat.	Barley.	Oats.	Beans or Peas.	Hay.	Roots.	Bean Fallow.
1862 ..	..	5	140	..	67	60	140
1863 ..	110	60	82	..	126	65	132
1864 ..	132	65	55	..	114	70	130
1865 ..	77	60	65	54	80	20	131
1866 ..	104	114	69	..	52	4	..
1867 ..	67	..	15	60	..	8	105
1868 ..	172	60	65	72	82	4	14
1869 ..	106	..	70	60	72	1	88
1870 ..	200	67	..	100	60	2	..

The following is the quantity of work done each year by the steam cultivator:—

	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.
	A.	A.	A.	A.	A.	A.	A.	A.
Subsoiling	277	191	168	..	..	..	..	..
Ploughing	1491	429	496	10	637	321	386	251
Scarifying	449	284	317	..	174	257	116	282
Total ..	2217	864	981	410	811	578	502	533

The total payments to Messrs. FOWLER during these nine years, and up till now, for new fire-box, repairs, and ropes, &c., has been £695, about £77 a year!

—— Mr. G. H. MAY, of Elford Park, Tamworth, has published the following statement of facts, not guesses, of the yield of corn within a radius of 7 miles of his place:—

Threshed Barley.	Per Acre.
20 acres light land	20 bushels
64 ,, ,, ...	24 ,,
10 ,, ,, ...	22 ,,
7 ,, ,, ...	24 ,, thin.
6 ,, sand land	16 ,,
7 ,, strong land	32 ,,
8 ,, good light land	28 ,,
14 ,, ,, ...	18 ,,
Wheat, threshed.	
10 acres good loam	40 ,,
6 ,, light land	16 ,,
3 ,, good land	36 ,,
7 ,, strong land	27 ,,
14 ,, medium	20 ,,
11 ,, light land	16 ,,

He adds:—

"Most of the land is of an average quality, and some of it farmed well. I have threshed three ricks for seed. Five acres of Fenton White on strong land, after Beans, manured, gave 33 bush. per acre; 8 acres of Chidham White, off light land, clover lea, gave 32 bush. per acre; and 8 acres of Essex Rough Chaff White, from good loam,

top-dressed with Proctor & Ryland's wheat manure, gave 42 bush., weight 64 lb. and 65 lb. per bush.—so various, and in many cases so sadly deficient, are our two main crops. Grass we have none, Turnips are filthy, Mangels are pretty good. All our feeding cattle are in the yards. Wheat sowing is progressing favourably, 'the useful trouble of the rain' having come. Farming prospects are not very attractive. Pulpers, chaff-cutters, and hard cash will be in requisition this winter."

—— The Rev. H. N. Ellacombe, of Bitton, Gloucestershire, writes as follows, on the subject of Parochial Registers, with reference to a letter in the *Times* from Mr. Porter:—

"Mr. Porter states that 'it is illegal (Act 6 & 7 William IV., cap. 86) to bury any corpse without a certificate from the civil registrar.' This is not so. On the contrary, it is illegal to refuse 'to bury any corpse that is brought to the church or churchyard, convenient notice having been given thereof before;' and if any minister shall refuse to bury, 'he shall be suspended by the Bishop of the diocese from his ministry for the space of three months' (68th Canon). The Registration Act in no way altered this, but simply enacted that 'if any dead body shall be buried for which no such certificate (*i. e.*, by the registrar or coroner) shall have been delivered, the person who shall bury or perform any funeral shall forthwith give notice thereof to the registrar within seven days,' under a penalty of £10. This is a very small burden to lay on a clergyman; and in my own parish I always advise the poor not to go to the registrar, either in the case of a birth or death, for it is the registrar's duty to go to them. This gives me the very slight trouble of a short note to the registrar, after the funeral, but it saves them a long walk (sometimes from 6 to 10 miles in this district), and the loss of a day's work."

—— Mr. Meyerstein, agent for the sale of "Genuine Leopoldshall Kainit" in this country, referring to recently published circulars on the subject of "Crude immense collection of specimens is the result, from which the stands at the Smithfield show will be supplied. Messrs. Carter require all roots sent to them for adjudication to reach them by November 30.

OUR LIVE STOCK.

CATTLE.

An inspection of the accompanying Table shows at least one use of reporting upon farm management, namely, the capabilities of land of various qualities to maintain live stock. We would especially commend to the attention of our readers the comparison between the areas under roots and summer forage crops and the winter and summer stock maintained. This, taken in connection with the amount expended upon purchased foods, should be an instructive lesson upon meat manufacture in the case of well-managed farms. Mrs. Millington, in good root years, is able to maintain 1000 sheep on 200 acres of roots, or 5 sheep per acre; and this with a liberal use of cake. Mr. Treadwell maintains 570 sheep—some 50 or 60 of which are sold as rams—upon a main crop of about 35 acres of roots, supplemented with Turnips sown between Bean rows after the last hoeing. This is, we consider, a remarkable case of heavy stocking, and could only be carried out by the large expenditure of £1400 per annum on cake and corn. It is also noteworthy that upon this farm a large head of cattle is kept, which must throw the sheep almost exclusively upon the resources of the arable land.

Mr. Z. Stilgoe's farm is scarcely less remarkable for the large amount of live stock maintained. Thirty-six acres of regular root crops, supplemented with late sown Turnips after Beans, &c. (which never can amount to more than a very moderate crop), supports 600 Fordyce, for 50 gs. Cupbearer, recently used in the herd, was purchased by Mr. M'Combie for 38 gs. Another excellent bull was secured by Lord Fife for 53 gs., and Lord Huntly gave the highest price of the day, 67 gs., for Lively, a 2-year-old heifer.

—— On invitation I went to Mappowder to-day (Nov. 3), to see my friend, Mr. James's, Hereford bull, 14 months old, bought of Mr. Philip Turner. It is a most superior animal, of first-rate formation and quality. It is the best bull I have ever yet seen at Mappowder, being level all over, with perfect muzzle, head, eyes, and horns. His name is Leopold, and he won the 2d prize at Ludlow. His blood is good on both sides. Leopold is by Bachelor (2941), a son of the Adforton Douglas (2505), from a cow by Sir Thomas, descended from Master Butterfly (1313), King James (978—a son of Walford), and Original (216). The dam of Leopold, *Kathleen*, a Bolingbroke cow, bred also *Minerva*, the 2d prize heifer at the Manchester Royal Agricultural Society's Show, and which was there sold for exportation to New South Wales. The pedigree of *Kathleen* is ancient and very good. I also had the pleasure of reviewing *Miss Wren*, who is in first-rate fettle for Islington. I hope she will be 1st prize in her class and gold medalist; but I remember Napoleon's words: "High in morning, low at night." Exhibitors should remember that "there are always as good fish in the sea as ever came out of it." They should send good animals to the show, and not be offended if others send better. I was curate of Mappowder when the late Mr. James introduced the first Hereford bull, bought of Mr. Turner, of Noke. I must congratulate his son of the Leen upon the much superior bull now sent to improve my friend's herd. *W. F. Radclyffe, Okeford Fitzpaine.*

Name of Occupier.	Description of Soil.	Area.	Arable	Pasture.	Roots.	Vetches	Seeds	Other Forage Crops.	Oil-cake.	Other Food.	Corn Consumed on Premises	Cows.	Calves.	Yearlings	Steers	Fattening	Total.	Ewes.	Lambs.	Ewes and Theaves.	Tups and Colts.	Extra.	Work.	Breed Mares	Extra.
		A.	A.	A.	A.	A.	A.		£	£	£														
Mrs. Millington, Ardley	893 Light thin loam, resting on stone brash	820	70	200	?	200	150	acres Mustard, after seeds	1200	..	..	..	..	..	70	400	400	400	400	200	80 to 100		18	.. ..
Mr. Treadwell, Upper Winchendon	420 Rather strong clay, loam of good quality	120	240	5	14	50	4	acres Cabbages; Tankard Turnips after winter Beans. 4 acres Rye	600	200	600	30	20	20	20	20	110	220	270	220	270	80	5 sows; produce fatted		9	.. ..
Mr. Craddock, Lyncham	503 Various	353	150	..	..	..	4	course and fourcrase	..	..	..	15	..	..	..	..	..	90	200	250	200	250	..	3 sows; produce fatted	..	..	..
Mr. N. Stilgoe, Adderbury ..	507 Arable, land, light red loam; pasture, stiffer	271	236	41	..	..	45	Rape and White Turnips after Beans	?	?	?	40	10	12	10	20	92	200	250	200	250	..	6 sows; produce fatted	10	..	2
Mr. Z. Stilgoe, Adderbury ..	340 Do. Do.	215	125	56	..	..	36	Do. Do.	?	?	?	..	..	..	..	..	70	200	250	200	250	150	4 sows; produce fatted	8	..	..
Mr. Denchfield	252 Good deep soil	168	84	28	?	28	?	?	?	?	?	..	..	..	..	..	40	140	160	140	160	150	..	..	..	..
Capt. Dashwood, Kirthington ..	1072 Thin loam, of poor quality	927	145	120	..	111*		17 acres Rape	2000	?	?	90	Shorthorns fatted in winter					580	625	500	625	..	100		27	.. ..
Mr Latham, Little Wittenham ..	500 Strong, and mixed gravel loam	360	140	Rotation very various, as much root and forage crops for sheep as possible					?	?	?	..	..	..	..	..	..	400	1450	400	225	..	Alarge number		..	..

* Including 44 acres of Sainfoin. † 10 fatting, and 10 in-calvers. ‡ 225 lambs, 225 sold as fat lambs.

Potash Salts" as Manure, has sent us a correspondence between Dr. Voelcker and himself, from which we extract Dr. Voelcker's statement that:—

"1. Calcining does not increase the fertilising properties of the sulphate of potash contained in kainit.

"2. In the experiments, which he made solely with a view of ascertaining for what crops, upon what soils, and in what circumstances potash salts may be used with advantage in agriculture, he employed various compounds of potash, and not exclusively Dr. Frank's potash salts.

"3. The precise conditions in which potash may be applied advantageously to the land are not as fully apprehended by many as they should be, and he therefore gave Mr. Meyerstein authority to quote any of his published experiments which are calculated to help the farmer to make a right and profitable use of potash manures. On the strength of these experiments, Mr. Meyerstein was justified to recommend native kainit as one of the forms in which impure potash salts may now be purchased, and potash applied to the land at a moderate cost."

—— Both Messrs. Sutton, of Reading, and Messrs. Carter, of Holborn, adopt the best possible means of securing a collection of the largest and best grown roots of Mangel Wurzel, Swedes, common Turnips, Carrots, Cabbages, and Kohl Rabi, by offering Prizes to Cultivators all over England—sums varying from £10 to as many shillings—for the best and largest specimens of any of these farm crops. Messrs. Sutton have thus for 20 years held an annual show at Reading. The Royal Berks Root Show, which takes place on Saturday, November 26, is really one of the best annual exhibitions of root crops in the kingdom—and has no doubt done a great deal both to promote competition among root growers and to extend the business of the enterprising firm under whose management it is conducted.* At 237, Holborn, too, prizes under no fewer than 22 classes are offered for Swedes and Mangels, and other roots, whether grown from the seed supplied by Messrs. Carter or not: and an sheep in the winter; and although, as in other cases, the 125 acres of pasture will carry a portion of the ewe flock, yet, when we remember that 70 head of cattle are also maintained, we have a striking case of heavy stocking. Such a tabular statement as that appended to these remarks also teaches the importance of a more definite object in the inspection of farms. If, for instance, more perfect information had been obtained in all the cases visited, respecting the amounts of food and hay expended, as well as exact data regarding the root and forage crops, weight of beef, mutton, and wool sold off in the year, &c., the community might have been put in possession of many most important facts worthy of being worked out, and from which important generalisations might have been drawn. It is to be hoped that, in any inspection of farms hereafter to be made, the judges will be provided with a certain number of propositions (and we here speak more particularly of questions relating to live stock) which would guide their questions so as to enable them to obtain data for establishing important agricultural truths.

—— Mr. William S. Marr, of Upper Mill, N.B., recently sold 20 young Shorthorn bulls and about 16 heifers, Mr. Mitchell, of St. John's Wells, performing the duties of auctioneer. The total proceeds of the sale were £1059 10s., or an average of £25 14s. on the bulls, and £26 13s. on the heifers, which, considering that 22 of the animals disposed of were calves, must be looked upon as very satisfactory. Prices were uniform, and, with few exceptions, ranged between 20 and 30 gs.

—— The Castle Fraser herd of pure polled Aberdeen cattle was disposed of recently. The herd comprised 25 head, and had long been known in connection with the name of Colonel Fraser, its spirited owner. The entire number disposed of realised rather more than £38 each. *Sybil*, a 6-year-old cow, became Mr. M'Pherson Grant's property at 63 gs. *Blanche* was secured by Mr.

* Messrs. Sutton require all specimens, sent to them in competition for their prizes, to reach them not later than Thursday, November 24.

POULTRY.

At the tenth exhibition of the Southampton poultry show, over 600 pens of poultry and pigeons were exhibited. Dorkings were especially well represented, and the competition among chickens of this breed was very severe. Spanish, Cochins, game, French fowls, and Bantams, were all well represented, and the light Brahma chickens were considered a truly magnificent collection. The judges were Mr. Hewitt for poultry, and Mr. Esquelant for pigeons. The following is the prize list:—

Spanish.—Cup, H. Yardley; 2d, Nicholas & Howard.

Dorkings.—Cup, J. Martin; 2d, T. Briden. Chickens: 1st, L. Patton; 2d, J. Martin.

Cochins.—1st, H. Lingwood; 2d and 3d, J. Cattell.

Brahmas.—1st and 2d, H. Lingwood. Light: Cup and 2d, H. M. Maynard; 3d, H. Dowsett. Chickens: Cup and 2d, Mrs. Williamson; 3d, H. M. Maynard.

Game.—Black and other breeds: Cup, H. Gibson; 2d, J. Laming. Chickens: 1st, J. Laming; 2d, E. Bell. Any variety: 1st, H. M. Julian (duckwing); 2d, J. Mason (duckwing).

Hamburghs.—Pencilled: 1st, F. Pittis, jun. (silver); 2d, W. K. Tickner (gold). Spangled: 1st, Mrs. Pattison; 2d, N. Barter.

Polish.—Any variety: 1st, A. Cruttenden (gold); 2d, J. Hinton (silver).

French Fowls.—1st, Hon. C. Fitzwilliam; 2d, H. S. Fraser. Chickens: Cup, Hon. C. Fitzwilliam; 2d, J. J. Malden.

Any other variety.—1st, — Walker, jun. (black Hamburghs); 2d, J. Hinton (Malays).

Bantams.—Game: Cup, H. C. Rogers; 2d, J. C. & E. Nesbitt. Any other variety: 1st, M. Leno; 2d, E. Cambridge.

Ducks.—Aylesbury: 1st and 2d, Mrs. M. Seamons. Any other variety: 1st, C. N. Baker (Mandarin); 2d, G. Scutt Rouen).

Geese.—1st, J. K. Fowler; 2d, Mrs. M. Seamons.

—— As in the case of many other varieties of fowls, writes Mr. Tegetmeier, Cochins are known popularly by a name to which they have no claim. Mr. Robert Fortune, who has passed many years in various parts of China, says: "The man who first gave these fowls the names of Cochin-Chinas has much to answer for. I firmly believe that what are called 'Cochin-Chinas' and 'Shanghaes' are one and the same. One thing is certain; the breed you have in this country as Cochin-China are plentiful about Shanghae. They were discovered there after the war,

and were frequently brought to this country, and taken to India, by captains of trading vessels. Was not this the date of their introduction to England? And what grounds has any one for supposing the fowls ever saw Cochin-China?" It may be though: that this variety might have been earlier known, owing to our long-continued commerce with Macao and Canton, but Mr. Fortune says that is a breed but little known in those warmer parts of China, and that "in fact the Southern Chinese were as much struck with the size of the breed as we were." He adds, "the Shanghae breed seems to be more common about Shanghae than anywhere else in the north; but I found it over all the low country of that part of China. The southern breeds have been long well known to ship captains and English residents; but there is nothing very marked in their character."

ASHGROVE, KIRTLINGTON, AND WOOLSTON.

WHAT can we learn by the "Reports on Farm Prize Competition," published in the Royal Agricultural Society's Journal, vol. vi., part 2? is a question that may be fairly asked by every farmer in England. I can discuss the report if I cannot answer the question.

The "1st prize farm," occupied by Mrs. Millington, of Ardley, contains 820 acres of arable land and 70 acres of pasture, all of poor quality—stone brash. For 15 years it has been worked upon the well-known four-course shift, viz., roots, Barley, seeds, and Wheat. The roots and seeds having been consumed upon the land, the average produce sold off has been 410 acres of Wheat and Barley. The estimate or value of this we are not told. About 70 head of store cattle are wintered and sold out in the spring. If they pay for the cake they eat, that is all that is expected of them.

Four hundred Lincoln ewes are kept, 150 going out every year, with the surplus produce of lambs at 12 or 13 months old, fat. In good Turnip years 200 sheep are bought in the autumn and sent out fat in the spring. Value or profit is not shown here. From 80 to 100 pigs are generally kept, and for the most part sold off as stores. Value or profit is not shown here.

To grow the roots about 40 tons of superphosphate are used yearly, and the whole of the manure made upon the farm goes yearly upon the seed land, and is ploughed in for Wheat the next year.

The annual cake bill for feeding cattle and sheep has been £1200.

We are told that the labourers get well paid, but there are no particulars given.

Upon this evidence the judges jump at the conclusion that this farm has been worked "with a view to profit." I say jump at the conclusion, for they must have done so, as there is nothing in the report to show that Mrs. Millington is farming at a "profit;" the word "view" must have been drawn heavily upon. The judges found Mrs. Millington's farm clean, and they had a right to infer that her rent was paid, and as she showed them "great kindness and hospitality" they were bound to infer that she was earning her bread, but as to profit they say nothing. Mrs. Millington ought to get more than the bread she eats for the interest of her money and work on an 890-acre farm, and the judges ought to have proved the point clearly out.

The evidence on the 2d and 3d prize farms is quite as blind as it is upon the first prize farm; therefore I shall not trouble you with it in detail, but will go at once to the judges' comparison of Captain Dashwood's farm with the prize farm (see p. 270 of the Journal).

Captain Dashwood's farm at Kirtlington contains 927 acres of arable land, and 145 acres of meadow and pasture, all of poor quality, stone brash, worked upon a six-course shift, four-sixths in Wheat, Barley, and Oats, the half of a sixth in Pulse, and the other half in seeds, and one-sixth in roots.

For roots the land is manured with cart dung, guano, and superphosphate.

Wheat is grown after Mangels, and Barley after Swedes; both are top-dressed with nitrate of soda in the spring.

Seeds are sown after Mangels and Swedes, and seed land is ploughed over and planted with Wheat, and gets heavily top-dressed with nitrate of soda in the spring.

Five hundred Oxford Down ewes are kept grazing, and average produce of over 600 lambs, the surplus of which, after filling up the flock, are fed off yearly, at about 12 months old, with the draught ewes. Short-horned cattle are bought in the autumn, and are made fat upon roots and cake. We are told nothing about the number of cattle thus kept. About 100 pigs are kept and fed.

The labourers are well cared for.

Upon this slender evidence the judges tell us and Captain Dashwood that at Ardley one-half only of the arable land is annually under white grain crops; that much reliance is placed upon the fertilising power of ake-and-corn-eating sheep. While at Kirtlington four-sixths of the arable land is given up to cereal crops, nitrate of soda being the great stimulant there to force extra crops:—

"In very favourable seasons the system is said to answer, but this year it is certainly a failure. . . . The whole blame is laid upon the season, but we think that want of condition is the real reason why light land at Kirtlington has suffered so much more by drought than similar light land at Ardley. The fact is, that the system of growing corn by means of stimulating manure has been pushed too far, and the elements of fertility have not been restored to the soil in the same ratio as they have been abstracted. A trying season has come and the crops have failed."

Upon the preceding evidence Kirtlington practice is condemned. Why the judges should condemn it I cannot understand, when they recommend somewhat the same practice to be carried out at Ardley. Here is what they say,—"We venture to give an opinion that small dressings of nitrate of soda, mixed with salt, judiciously applied several times in the spring, would yield good return for the outlay (see p. 255 of the Journal) for the Wheat crop." If the use of nitrate of soda is bad at Kirtlington, I take it that it would be bad also at Ardley, for the soils are the same in character,

The judges do not clearly show Kirtlington practice, for although they show that some cattle, sheep, and pigs are fed, they do not show the extent. From another quarter I learn that on that farm there is upwards of £2000 worth of cake and other food for stock every year consumed upon the farm, and £800 worth of artificial manure is applied. Why, then, here, as well as at Ardley, "much reliance is placed upon the fertilising power of cake-and-corn-eating sheep," as well as upon a top-dressing for Wheat, that the judges recommend at Ardley and condemn at Kirtlington.

The judges, after condemning the Kirtlington practice of growing four-sixths white grain crops, tell us that Mr. Lawes contends that corn may be grown year after year by the use of artificial manure, yet doubts whether, upon "light thin soils," the alternation of green and white crops can profitably be departed from; and then, running away from their shield, "light thin soils," set up by saying, "on more than one farm which we examined, deep and excellent steam cultivation had been relied upon to grow repeated corn crops without manure, and although on strong, good soils this may answer for a time, we believe that, in the long run, the true system is to endeavour to keep as much stock as possible, and not to grow corn upon too many acres." Then it is plain that this exception, "light thin soils," is cut from under them. They mean on all soils. Now, I will prove that they are wrong by testing the value of their produce of meat and corn on their "1st prize farm" against the value of the corn produced on my heavy clay land. Their farm has had 15 years of its present practice, and my 40 acres of heavy land have had 15 years' practice under steam-power culture; therefore, we start fair upon that point.

The value of the Ardley farm produce of corn and meal stands thus:

410 acres of Wheat and Barley, at £10 per acre	£4100
Gain on pigs	200
Gain on sheep, including wool	1200
Gain on oxen	500
	£6000
Deduct from this the artificial manure and cake bill	[illegible]
The total gain	£4[illegible]

or an average on the 890 acres of [illegible] £4 5s per acre.

The value of the corn produce on my 40 acres of heavy clay land that has been under steam culture for 15 years:—

40 acres at £10 per acre	£400
Deduct from this the artificial manure bill	40
Total gain	£360

or an average on the 40 acres of £9 per acre.

This land of mine has been under corn crop 14 years out of the 15, and there is no sign whatever of exhaustion of fertility, and it can be kept clean under steam-power for ever under corn crops at much less cost than the light land at Ardley can under an alternation of green and white crops; therefore, I must be the winner in cost and produce. What others do under steam culture, "without any manure," I have nothing to do with. What I do on my own clay land can be done on the vast track of clay land extending from Woolston to Claydon on the "sketch-map" in the Royal Agricultural Society's Journal, right on to Lechlade, shown upon the said "sketch-map." What the occupiers on those clay soils have been at I cannot understand, for had they bestirred themselves they must have beaten Mrs. Millington on her poor "stone brash."

I shall go on growing corn on my heavy clay land year after with the aid of £1 worth of artificial manure per acre yearly in addition to the straw grown upon the land (with little or no cake) converted into manure. Therefore the Royal Agricultural Society's judges and all the world may see what may be done on our heavy clay soils. It is of no use for the Royal Agricultural Society's judges to try to run Mr. Lawes' experiments and statements down, for the evidence at Woolston is getting very heavy in support of them.

If the judges had tested Kirtlington against Ardley upon an average of years according to a money value per acre, there would not have been much difference, yet it might have been in favour of Kirtlington. The judges judged according to an exceptional dry year, and Ardley won. Therefore, Mrs. Millington is quite entitled to her prize.

I beg that you will publish this, and thereby let the clay-land men in Oxfordshire, both tenant and landlord, know that they are asleep to have allowed "stone brash" to have beaten them, and, in addition to that, save me the trouble of sending separate copies to the leading agricultural papers, for I cannot afford the time and labour to do it. *William Smith, Woolston, Bletchley Station, Bucks, Nov.* 1.

FAT STOCK versus BEETROOT SUGAR.

IN part 1 of the Royal Agricultural Society of England's Journal for 1870, Dr. Voelcker gives us a very interesting article upon "Beetroot Pulp," from which, if you will allow me, I will deduce a few results. Many a man reading this article hastily would run away with the idea that it is possible to sell his Sugar-Beet to a manufacturer at 20s. per ton, and get them "all" back again at 12s. per ton, minus the sugar, and that what he gets back is really invaluable for cattle feeding, as the pure root would be. A little consideration of the matter, however, and a few simple calculations from Dr. Voelcker's analyses, will show that his article will bear no such interpretation.

Dr. Voelcker gives the following as the composition of fair average Silesian Sugar-Beet grown in England:—

Water	84.5
Sugar	9.5
Other matters	6.0
	100.0

He also tells us that Beetroot pulp, after the root has been grated and pressed in the manufactory to extract its juice, contains:—

Water	70.0
Sugar	1.5
Other matters	28.5
	100.0

Most men, when looking at these figures, will be struck by the large quantity of water still left in the pulp, and at first will think that the pressing has been very ineffectually done, as so little of the water seems to have been taken away. This, however, is not the case, for if these figures be worked out it will be found that 19 tons of raw Beet only produce 4 tons of pressed pulp, 15 tons being removed by the action of the press. This calculation is on the assumption that the press removes nothing except sugar and water—an assumption not strictly true, but still sufficiently near to illustrate what I desire to point out.

Now, 19 tons of Beet, worked out according to Dr. Voelcker's analysis, ought to contain, pounds weight—

Sugar	4043.2 lb.
Water	35[illegible]
Other matters	2553.6 ,,
	42560.0 ,,

But again, 4 tons of pressed pulp, worked out by Dr. Voelcker's analysis, ought to contain, pounds weight—

Sugar	134.4 lb.
Water	6272.0 ,,
Other matters	2553.6 ,,
	8960.0 ,,

And the 15 tons taken away by the press would contain, in pounds weight—

Sugar	3908.8 lb.
Water	29691.2 ,,
	33600.0 ,,

Now, let us look at the money, and see how much money the farmer gets for parting with these 3909 lb. of sugar. The Beet is sold, I believe, at 20s. per ton delivered at the factory, and the farmer buys back the refuse at 12s. per ton, put into his cart at the factory. To cart away the refuse costs the farmer nothing, because his carts are there, whether or not delivering Beet, but to deliver the Beet from his farm at the factory must cost a good deal. I do not think I overestimate if I assume that it will take 5s. per ton off the price, leaving the nett price 15s. per ton. Well then, if a farmer sells 19 tons of Beet he receives 19 × 15 = 285s.; but he pays back 48s. for 4 tons of pulp, which his Beet produces, leaving him just 237s., or £11 17s. as the nett sum he gets for 3909 lb. of sugar, or rather less than 6s. 9¼d. per cwt., or £6 15s. 10d. per ton.

Now, the question I desire to ask those practical farmers, who are engaged in growing and selling this Sugar-Beet, is this: If you could buy pure sugar, laid down in your own farmyards, for £6 15s. 10d. per ton, or less than three farthings per pound, do you not think it would pay you to give it to your fatting stock at that price? If so, then why should you sell it to the sugar manufacturers? *G. A. H.*

THE LAW OF HYPOTHEC.

1. *What it Was.*—The landlord had in security of his rent not merely the tenant's personal obligation expressed in the lease, but a real and preferable right in the fruits of the ground, and in the cattle and other movable effects, such as furniture and implements brought upon it by the tenant.

The corn and other fruits were hypothecated for the rent of that year whereof they were the crop; and it might happen that several years' crops would stand hypothecated for the rent of those years respectively of which they were the crops, though the landlord might not have attempted their recovery by an action for

many years together. The cattle, household furniture, and implements of husbandry, could not, like the fruits, be hypothecated for the crop of a particular year. They were subject generally to the landlord's hypothec, which, to be effectual, required to be made special by sequestration within three months after the last conventional term of payment of the rent; which three months being expired, the hypothec ceased for the rent of that year.

2. *What it Is.*—By the Hypothec Amendment (Scotland) Act, 1867, which applies to farms or land with the buildings thereon, occupied for farming purposes only, the landlord's hypothec is not to be available beyond three months after the rent is payable, except during leases current at the passing of the Act, unless made real by sequestration duly registered. Agricultural implements, furniture, and furnishing are by this statute exempted from sequestration at the instance of the landlord; but the farm crops and stocking still remain subject to it.

3. *Its Advantages to the Landlord.*—It is a good guarantee of two years' rent. This is a very common practical illustration. James Thomson is a tenant of a farm for 19 years from Martinmas, 1852; his lease will expire at Martinmas, 1871; he has not paid any rent for crop 1870, which is due by the obligation in his lease in equal halves at Whitsunday and Martinmas, 1870. He has just reaped the crop of 1870. As Thomson has a good stock of cattle and horses, the landlord has allowed him to sell off the corn crop of 1870; but on February 10, 1871, he makes his hypothec special by sequestration of the cattle and horses for payment of the rent of crop 1870; and he will secure the rent for payment of crop 1871 by sequestrating in security that year's crop when sown down. Thomson will pay 4*s.* per pound to his ordinary creditors; but the landlord's claim for two years' rents and crops, and the costs of sequestration, will be paid in full. The following illustrations will show the practical working of the hypothec in a more general way:—

(1.) Whitsunday entry.—Rent payable—Whitsunday after sowing, and Martinmas thereafter.
(2.) Whitsunday entry.—Rent payable—Martinmas after shearing, and Whitsunday thereafter.
(3.) Whitsunday entry.—Rent payable—Lammas after sowing, and Candlemas thereafter.
(4.) Martinmas entry.—Rent payable—Whitsunday after sowing, and Martinmas thereafter.
(5.) Martinmas entry.—Rent payable—Martinmas after shearing, and Whitsunday thereafter.
(6.) Martinmas entry.—Rent payable—Lammas after sowing, and Candlemas thereafter.

Nos. (1) and (4).—The tenant has not paid his rent for crop for 1870 within the year. On February 10, 1871, a sequestration is used for payment. The landlord not only may do so, but after the crop of 1871 is sown down, probably on May 16, 1871, he may use his sequestration for the rent of crop 1871.

Nos. (2) and (5).—The tenant does not pay his rent for crop 1870 before Whitsunday, 1871. The landlord in that case will sequestrate before August 15, 1871, for payment of rent crop 1870, and in security of his rent crop 1871.

Nos. (3) and (6).—The tenant does not pay his rent for crop 1870 before May 1, 1871. The landlord will at May 1 sequestrate for the rents of crop 1870 and 1871, for payment and in security respectively.

In other words, the law of hypothec, taking a very moderate view of its operation, secures the landlord in a first and preferable charge of two full years' rents, and the costs of the proceedings over the crop and stocking; and these must be paid in full before the other creditors of the tenant receive a shilling from that part of the tenant's estate—subject also to the claim of the Crown for taxes and of servants' wages for the current term. And should the tenant not become utterly bankrupt within the currency of a 19 years' lease, the same process may be repeated often enough yearly thereafter by the landlord, if necessary, till the tenant is exhausted and gives place to another; and this is very often the result of private arrangement.

Now that household furniture and furnishing are exempt from the operation of the right of hypothec, these will be sold off, or at least reduced to the lowest ebb, and the proceeds paid over to his landlord before a farmer will submit to a sequestration being obtained and registered against him in the Sheriff Court; so that practically the only part of the tenant's estate from which the general creditors may derive an advantage by the late Act will be the agricultural implements.

It enables a landlord to select a tenant without sufficient means for a farm. There is a farm to be let. Six farmers offer. Four offer rents not much different. Two are far above the rest. On inquiry, it is found that these two are scarce of capital for the farm. The other offerers have sufficient means. If the landlord is in fair circumstances, and is in other respects a good man, he will not take the highest offer, but accept the highest offer of a man of capital. It is not so with a needy landlord; he will, in nine cases out of ten, select the highest offerer for his tenant, and increase his borrowing powers and his income with the increase of his rent-roll. Thus it enables a bad landlord to rack-rent his estate, and otherwise oppress a helpless tenantry.

The poor or the bad landlord, in accepting the highest offer, knows quite well that if his new tenant has not sufficient means of his own to plenish, stock, and sow the farm, he will get ample credit to enable him to sow the first year's crop, and to put some cattle and implements upon the farm, That, and the offer of the high rent together, answers the landlord's purpose. The law of hypothec is at his call, and he is secure of his rent, at least for a time.

It enables a sportsman to be a game preserver on arable or grass and corn farms, as well as on mountain and forest. Of late years more especially, hunting has been so much in fashion among the rich classes, as to have made the preservation of low country game a source of considerable income to needy and greedy landlords. The consequence is, that, not content with the high rents drawn from the farms, many of them raise rabbits and hares, and feed them on their farmer's crops, without any abatement of rent, and either shoot them down themselves for the market, or let them to sporting tenants at high rents. But for the law of hypothec, the fear of a small dividend, and the salutary dread of having his farms left unlet in his own hands, might help to moderate the rapacity of this the worst species of game preserver; but if, along with the abolition of the law of hypothec, there is given to tenants an inalienable right of killing rabbits and hares jointly with the landlord, it will be the farmers' own fault if they do not protect their crops. Meanwhile—It enables the landlord to draw two rents—one from the tenant-farmer, who receives value in the use and occupation of the land—another rent from the sporting tenant or the game-dealer from animals fed on the tenant-farmer's crops, at the tenant-farmer's cost, from which he derives no profit, but suffers much pecuniary loss, and receives no compensation.

4. *The Farmer's Losses by It.*—It compels the tenant to buy his labour and his land in the dearest, and to sell the produce in the cheapest market. The converse of this in regard to every other article of commerce, except land and its service, is now not only the law of the United Kingdom, but, next to the Bible, the glory of this nation among all the nations of the earth. So long as protection to native industry was maintained to be sound political doctrine by the foremost statesmen of the day, the landlords had something to say for the law of hypothec as a *quid pro quo* for the protection then afforded to the tenant-farmers against the market of the world. But now that protection is removed, and that free trade has been the acknowledged law of trade for 22 years, it is unaccountable to find that no Conservative or Whig Government—no, not even a Conservative or Whig Member of Parliament, has even yet brought in a Bill to the British House of Commons to abolish this remnant of class legislation—this relic of feudalism—in the year 1870. Upon this subject "Whig and Tory all agree" to do nothing effectual at least. The recent Act noticed above is a sham and an insult to common sense; and there is too much reason to fear that the well-to-do landlords, irrespective of their politics, are prepared to sacrifice the whole farmer class to the necessities of their poor neighbour landlords, rather than come forward manfully and secure for the Scottish tenantry the benefits of free trade, now enjoyed by every other class of the community.

Since the representation of the people in Parliament was amended in 1832, it has been very decidedly the policy of landlords to do away with small holdings of land. In doing so, there is little doubt that they were more or less influenced by these considerations—viz., the extension of their political influence, and the putting of their houses in order to prepare, by the removal of the working classes to towns, or to the colonies, for a real Poor-law, and not a sham one, such as we had in Scotland then, and continued to have till 1845.

As the Reform Act of 1832 had fixed £50 of rent as the lowest qualification of Parliamentary voters for occupiers of land in counties in Scotland, possessions of less value than £50 of rent per annum had lost, in the eyes of their owners, all political significance; and, partly for political purposes, and partly to try and shift a prospective burden from the country to the town, the owners of those small possessions added field to field, their crofts ceased to exist as crofts, and their occupants were removed to another sphere. In this way—Its indirect operation for the last 35 years has been to diminish the supply of the labour market, and to increase, in fact nearly to double, the rate of money wages.

The amount paid in servants' wages on an ordinary farm is now about double of what it was 35 years ago.

It has been already shown how it is an instrument in the hands of a bad or poor landlord to raise rents to an unnatural height. That cause, and the excessive rise in wages, have together reduced the farmer's profits to a minimum, and in many instances to *nil*.

In place of helping the saving and industrious farm-servant to his thrift, by placing him in a possession suitable to his savings, the existing system leaves him no alternative but either to continue a farm-servant till he is an old man, or to become farmer of a possession far too large for his means. Human ambition is tempted by the facilities now afforded for getting credit, and the desire to improve social position in the scale of society; the landlord, as has been seen, has a state guarantee for his rent, and the farm-servant too often becomes the farmer chiefly upon borrowed capital, at a rent which no farmer with suitable means will give for it, and in this way it deprives capital of its just weight and consideration in competition; it drives capitalists from the tenancy of land, and retards the application of scientific skill and capital to the material improvement of the country, so much to be desired in the present state of agriculture.

It is true there are still some small crofts to be had, but they are so few in number, and the applicants are so numerous, that they bring higher rents in proportion than larger lots of land when the competition is not so great. But if every occupier of land is now to have a county vote, whose dwelling-house by itself is worth £5 or £6 of yearly rent, there will be no longer any reason why there should not be small holdings of the value of £5, £10, £15, £20, £25, £30, £35, £40, and £45. Such an arrangement would benefit all classes. It is natural, just and moderate, fitted to check undue speculation in landlord and tenant, to improve the condition of the working classes, to regulate wages by a fair supply of labour, and improve the internal strength of our country by encouraging a large increase of the country population, which is far below what it ought to be in agricultural counties, although it may be still in excess in some highland and island districts.

There is no doubt that every county in Scotland has good landlords in it; but is it right or reasonable that the comfort and happiness of such an important class as the farmers should depend upon the caprice of any landlord for the time being—upon avarice or folly—upon poverty, speculation, or adventure—or upon politics or headstrong passion?

Yet that such is the condition of the Scottish farmer is the honest open truth. There is no gainsaying it; and as regards politics, a tenant-farmer's vote, till two years ago, was counted on by his landlord as surely as his rent.

There is no such condition attached to the tenant's vote in the Reform Act of 1832. It is not attempted to be conditioned for in the written lease. The vote, then, belongs to the occupier; and it has been his right for 35 years, and may be called the birthright of this generation. The time has come when the Scottish farmer must no longer sell or barter it with his landlord, like as did Esau of old to his own brother.

It is the duty of every Christian tenant-farmer, possessed of the qualification, to exercise his birthright according to his conscientious convictions before his God, to whom alone he is answerable for the trust which his country has committed to his keeping. Surely he cannot be accused of rashness in doing so, as he has hitherto patiently lived a political childhood and youth, and only claims manhood and freedom at the ripe age of 35 years.

5. *The Losses of the Community by it.*—It has been already shown that one of the evil consequences of the law of hypothec is to drive away skill and capital from the occupancy of land. It has also been pointed out how, in many cases, farms are tenanted by people destitute of sufficient capital and skill to do justice to the proper culture and cultivation of the soil. In these cases it is not to be expected that the land will produce such abundant crops as when it is well done to by high farming. The yield per acre will of course be less in every kind of crop when the land is stinted of manure, and otherwise badly farmed. In this view the law of hypothec limits the productive powers of the soil, diminishes its fruits, and stints the home supply to the public.

While it protects, by a preference of full payment, the servants and the landlord, it leaves the rest of the community at the mercy of circumstances. The tenant-farmer depends much on the public for the means of sowing, stocking, manuring, and labouring his farm, and for his furniture and implements of husbandry. These creditors are left, in cases of bankruptcy or insolvency, to be paid with such small dividend as may remain for division among the general body after the servants and the landlord have been paid in full.

The classes thus injuriously affected are, among others:—1, the banker; 2, the manufacturer; 3, the farmer; 4, the clothier; 5, the grocer; 6, the ironmonger; 7, the general merchant; 8, the mason; 9, the wright or carpenter; 10, the blacksmith; and 11, the manure merchant; and the other members of the community who supply the local classes, and all who buy from them. All these are obliged to be satisfied with the remnant that remains after the claims of the servants and landlord are paid in full; while servants and landlord get 20 shillings per pound, all the rest get probably from one shilling to five shillings per pound—seldom much more.

6. *The Question of Credit.*—If the law of hypothec shall be abolished no one will have a right to complain if the result brings with it forehand rents. No one complains of the merchant who sells only for ready money. Still everybody knows that one of the evils of the present time is the too great facility of obtaining credit. Few farmers of character and suitable means who propose to take farms will object to pay forehand rent, and such as do object will find plenty of landlords to deal with them on credit, but the question of ready money and credit is one to be settled entirely betwixt landlord and tenant in each individual transaction; and every landlord, in his dealings with his tenants, who are his customers, will, under a new system, be

put on an equality in that respect with other men of business, with the same advantages and the same risks. Such is the Landlords' Law of Hypothec in Scotland in the year 1808—its advantages and its disadvantages.

COTTAGES.

THE accompanying illustrations (fig. 263) were given many years ago in the *Agricultural Gazette*, and are reproduced, as representing still the two systems of two bed-roomed and three bed-roomed arrangements, with as pleasant a cottage-like exterior as any that have since appeared. They appeared originally in the "Quarterly Review" (1860), in an article which discussed the condition of our labouring population and the subject of cottage architecture in a very practical and instructive manner.

The condition of country cottages was thus described :—

"Off the high-roads, or far away from the landlord's eye, and indeed in whole villages where moral and physical stagnation have settled side by side, there are dwellings to be found which in the wretchedness of their accommodation almost equal the worst in our town courts. It may be feared that the majority of cottages have only a single bedroom. Hardly any but modern ones have three. * * * The view taken by the landlord class, till of late years, has unfortunately been through the short-sighted spectacles of stewards and agents, who could urge any amount of outlay on farm buildings, except for those on whose inhabitants all the work of the farm depended. While houses, extravagant in size and character, have been built for the tenants, and barns and sheds for every kind of stock, and every conceivable use connected with them, have been erected by their side in portentous ranges, the cottages for the shepherd, or the waggoner, or the ploughman, were not allowed to enter into the calculations of farm improvement. Not only were the horses and oxen literally far better housed than those who looked after them, but the true remunerative policy was held to be, to pull down every labourer's dwelling as it fell vacant, nor was the vacancy always waited for. In those which are called "close parishes," where the whole belongs to one proprietor, and where, therefore, it was possible to stop any demand, however urgent, for the erection of new cottages when old ones had been demolished, the work of destruction was often systematically carried out, till only one or two houses were left for private convenience, perhaps for picturesqueness, or at a wife's entreaty. Nor was this so much cruelty to the dispossessed as dishonesty towards the neighbouring parishes, on whom the outcasts were thrown."

The demand for agricultural labourers and the greater value of labour, untaxed by a morning and evening walk of three or four miles to the scene of it, is now awakening men's minds to the importance of more abundant accommodation of the right kind for our farm labourers and their families. Agricultural societies have offered prizes for plans on which adequate accommodation may be best provided—and the reviewer discussed their merits and demerits in detail. The first prize plan (1849) of the Royal Agricultural Society was condemned as "full of errors." "A second prize, given by the same Society in 1856 to Mr. Isaac (Royal Agricultural Society's Journal, No. xxxvii.) is a considerable advance on their first plan. The arrangement is compact and good, but the fire-place in the corner of the living room may be objected to, and there is space lost in the construction of the staircase. The elevation would be improved by making the windows broader and lower, and the paneled front door and knocker might be dispensed with. The plainer elevation is far superior to the gabled or ornate one. The estimated cost of the former is £170. These estimates are too low for the work. The Duke of Bedford's design for three cottages, two with three bedrooms and one with two bedrooms, has many points to recommend it." Its plans and elevations will be found in No. xxiii. of the Royal Agricultural Society's Journal.

A plan of the "Cottager's Improvement Society" is thus referred to :—

"We prefer a plan of the Society's, where, by placing one of the bed-rooms on the ground, two other sufficient rooms are gained on the upper storey. It would seem an improvement on this plan if the pantry or north end of the lean-to were continued, so as to be flush with the back wall, giving room for a porch at the south or front end, with a side entrance into the living-room. The offices in this design—which is Mr. Slater's, and of which the details are here given—are rightly kept separate, and the whole aspect is that of a thoroughly English cottage."

Nos. 1, 2, and 3, give the elevation, ground floor, and bed-room floor of Mr. Slater's cottage.

"In 1858 Mr. Bentley, of Rotherham, offered prizes of £20 for the best, and £5 for the second best design for a pair of cottages (which might also be built singly), the expense not to exceed £110 for the single cottage or £200 for the pair. The conditions were very well considered, except perhaps the requirement that the plan should equally apply to a single and a double tenement. Seventy-six plans were sent in, and exhibited at the show of the Yorkshire Agricultural Society at Northallerton. Mr. C. W. Strickland, in the most practical pamphlet on 'Cottage Architecture'* which we have seen, gives an account of the competition, and ably analyses the respective merits of 15 selected designs."

Nos. 4, 5, and 6, give the elevation, ground plan, and bed-room floor of Mr. Strickland's own design, which is characterised as by far the best yet offered to the public :—

"It is an acknowledged rule, that the nearer a building approaches to a cube the greater will be the economy of construction. All cottage designers have therefore endeavoured to avoid projections and recesses of any kind, and to bring their ground plans within a square or a parallelogram; but Mr. Strickland rightly remarks that this arrangement has been found almost universally fatal to the obtaining three good bed-rooms above without loss of space below. In his own plan he departs from this rule, thereby entailing some extra complication and, probably, expense in the construction of the roof, but his whole arrangement is so excellent that this slight increase of cost should not deter the proprietor from adopting so perfect a model, especially as much picturesqueness is gained to the building by the break in the side-wall. We give the ground* and bed-room plans of a pair, to which we would add nothing but a small fire-place in the scullery. It will be observed that this design has every convenience which has ever been called for in this class of building; an entrance giving separate access to the living-room, the staircase, and the pantry; the scullery communicating with the living-room, and having a back-door of its own; the best room, above and below, is to the front, as is also the entrance-door; of the three bed-rooms two have fire-places, and all are of fair size, with windows and bed-site well placed. The actual and relative proportions of the living-room, scullery, and pantry are very good, and, granting that the cottage faces south, the pantry has a north aspect. The chimneys are all in the centre of the house, and carried up into one stack. The dust-bin, office, &c., are supposed to be detached. The whole contrivance is so good that, by placing a kitchen-range in the scullery, and making the scullery-door open, as it might, into the lobby, any lady with one servant might comfortably live in the cottage and miss no point in arrangement which the best class of houses offer, while nothing is sacrificed to take away from the more hand-to-mouth conveniences and homely comforts of a working man's large family. It is equally good as 'a cottage of gentility,' and as a labourer's dwelling. No elevation accompanies Mr. Strickland's excellent plan; but Mr. Slater, whose attention has been for some time given to cottage-building, has kindly supplied the annexed design, which embodies the simplest, and, as we conceive, the most pleasing type of an English cottage, real and unpretentious, but well-proportioned, and linked to the national associations of a labourer's life. It might, perhaps, be still further improved by an angular porch over the front door, or by a lean-to passage, closed or open, its entrance ranging with the front wall of the house."

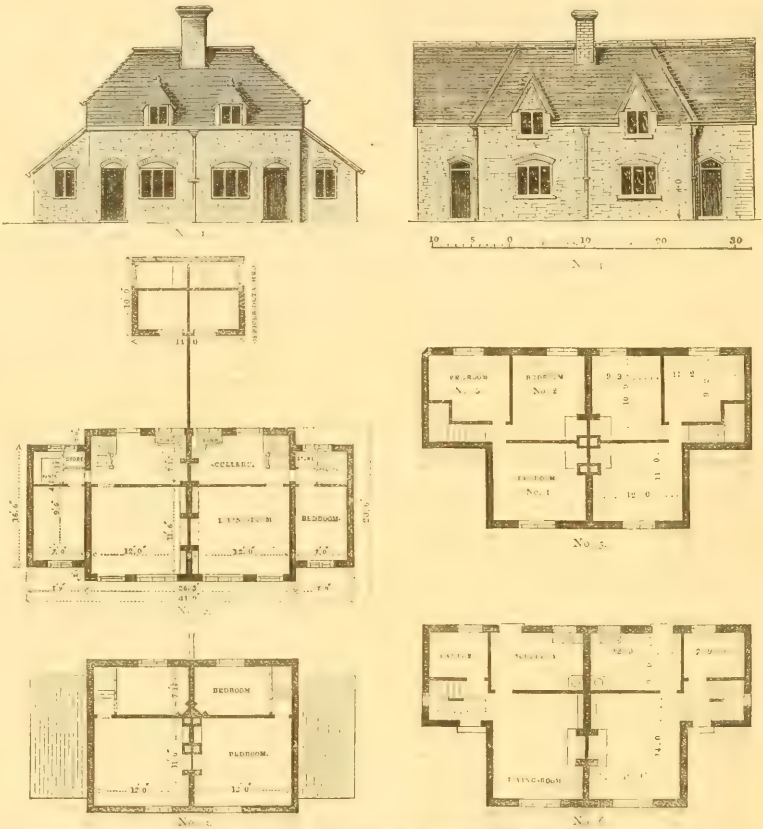

FIG. 263.—LABOURERS' COTTAGES, DESIGNED BY MR. SLATER AND BY MR. STRICKLAND.

CATTLE SHOWS AND PLOUGHING MATCHES.

[At a late quarterly meeting of the Ayrshire Farmers' Club, Mr. CALDWELL, Knockshoggle, read a paper on this subject.]

ARE cattle shows and ploughing, as at present conducted, advantageous to agriculture? My answer is in the affirmative.

1. *Ploughing Matches* are held for the purpose of encouraging and rewarding by premiums those who excel in the art of turning up the soil in the way best

* "Cottage Architecture: Plans, &c." By C. W. Strickland, Esq. York, 1859.

* In this and the preceding plan we have shown the outer walls 11 inches thick.

adapted for producing a good crop, and for most effectually keeping down grass and weeds. The ploughing which practical judges approve of is that which is straight, evenly held, well packed, the grass well put in, the seams between the furrows close and clean, the seed-bed as deep as possible at the given width of furrow, the furrows so set that when measured the face or socket of the furrow will measure about half an inch more than the back or cutter-cut, the finish neat and narrow, and the ridge so ploughed that when you stoop and take an angle view over it every furrow will meet your eye in its proper order. Many of you have heard that the pane of the furrow should describe an angle of 45 degrees; but this is a shape of furrow I have never seen, and so acute an angle is altogether impracticable. The slope of furrow-slice that good judges approve of is, I find, about 60 degrees. If cut much more acute the pane will be too thin, the back weak, and the furrows will want that body and substance necessary to give the ploughing the required solidity. If cut much more rectangular or square we lose that depth of seed-bed and twine of furrow so much prized in first-class ploughing, and the nearer we approach the square, brick-shaped furrow, the plough gradually loses command, the grass is near the top, the furrows sit on their edge, and are generally badly closed and shaky. The latter is, in my opinion, the worse of the two extremes.

A new era has dawned by the introduction of the double-furrow plough. The features that commend it to our notice are speed and saving of man and horse labour; and, so far as I am able to form an opinion, the double plough on even-surfaced land will, in a great measure supersede the single one. Many people thought that the double plough would not be suitable for lea ploughing; but the work performed by it at the various matches has been so satisfactory as to remove such prejudices from unbiassed minds; and we may now look upon it as an established, economical, and labour saving implement. There is no doubt but there is room for improvement in this implement. We cannot expect perfection yet, any more than there was with the reaping-machine when first introduced; but I confidently hope that ere long our energetic and persevering local implement makers and plough doctors, when educated at the public seminary of competition, will bring them to the same pitch of perfection to which they have brought the single one. Allow me, then, to close this part of my subject by stating that, as everything that is worth doing is worth doing well, so also is ploughing. I believe that we are indebted in a great measure to ploughing matches for the uniform good ploughing to be seen everywhere throughout the country, and also for the almost unexceptionably good working of the ploughs now-a-days. By these matches we know where to get good ploughmen and good plough makers when wanted. Competition has placed Ayrshire ploughmen at the top of the tree, for we find on two occasions, where a number of them were pitted against an equal number from Renfrewshire, Ayrshire was the first, and on the next occasion sustained her pre-eminence; and on Tuesday week one of Ayrshire's sons, who has been well trained in the school of competitions, carried off first honours in the open Derby ploughing at Johnstone against half a hundred from other quarters. I now pass to the other division of my subject.

2. *Cattle Shows* are, and have been, held for the ostensible purpose of stimulating and in some measure rewarding the owners and breeders of the different animals whose properties and qualities are best adapted to the objects for which they are required in agriculture. For instance, the properties of a Clydesdale horse are soundness of wind and limb, strength of body and bone, with symmetry and action. The properties of the sheep are quantity and quality of wool and mutton. As the Ayrshire milch cows are the objects of the greatest interest and attraction, and as time will not admit of entering fully into the others, I propose to confine my remarks to this class. The properties which our judges approve of, and which, I beg to say, I endorse, are as follows:—The head of the cow short, and wide at the forehead; the eyes prominent, clear, and expressive; the horns long, strong, high, and curved back; the neck long, and fine at its connection with the head, and free from loose skin or dewlap; the back straight from the roots of the horns to the tail, the shoulder thin at the top; the forequarters light, the middle short and deep, widening and deepening backwards, and well-arched ribs, filling well up behind the shoulder blade; the hindquarters long, the hock bones wide apart and somewhat prominent, with wide haunches, broad short thighs, tapering to a small, clean, wiry bone under the knee; the skin moderately thin and elastic, the bran close, soft and curly, with a silky feel; the milk veins well developed, the milk vessel long, wide, and well-attached to the body, the sole or under surface a plane and running parallel to the swell of the belly; the vessel well rounded and firmly bound up behind with four moderately-sized, cork-shaped, plumb-hanging teats, so planted that when viewed from behind one-half of the space is between the teats, and the other two quarters outside; and when viewed from the side one-third is before, one-third between, and the remaining third behind. I admit that some of these properties, such as the size or shape of the head and horns, the shape of vessel, or size and formation of teats, have nothing to do with the milk-giving properties of the animal. These go to constitute beauty, and when we get the elements of beauty and usefulness combined, we have a specimen of the prize-taking, milk-giving, money-bringing, pure-bred Ayrshire cow, not only valuable to sell, but often more truly valuable to keep as a breeder.

Some discussion has lately arisen as to the best size of cows, some alleging that judges did not attach so much importance to it as it deserved. Size has always been regarded as a point of merit, but certainly not as a leading one, by judges; nor do I think it has any right to be, for we find that size has little to do either with the milk-giving or money-bringing properties of the cow, and we find that different sizes are adapted to different soils and climates—that the smaller-sized one is best suited for bare clay soils and upland districts, and the larger sized one for the fertile plain. The greater number of farmers breed young cattle for filling up their stock when the aged or those that fall out of tid are withdrawn, hence it follows that from the abundance of winter feeding and luxuriance of pasture, or, on the other hand, from scarcity in winter and indifferent pasture in summer, as the case may be, Nature in this, as in many other things, beautifully adapts the size of the cow to the requirements of soil, climate, and quality of feeding. Those in favour of the larger-sized cow say that as all come to the shambles at last there is a loss in the smaller-sized one. This objection is, I think, more imaginary than real, for we find that a given quantity of feeding sufficient to feed five of the former will do six of the latter, the aggregate weight being nearly equal, the difference being in number only. Some allege, that with all our shows the cattle are deteriorating in size and quality. To this doctrine I do not subscribe. I find that in 1837 there were 38 entries for aged cows and 3-year-old cows at the Ayrshire show, and in 1868 there were 116 entries of the same age. I venture to say that in the former year Ayrshire could not have turned out such a number of beautiful well-bred cows as was shown in 1868 and 1869; and I likewise hazard the opinion that those specimens which carried away the premiums have never previously been surpassed, for be it remembered that in 1868 and 1869 Ayrshire competitors won and retained first and second place in the open show against all comers.

Allow me, in conclusion, to say that we will do well to cultivate, to keep pure, and, if possible, to improve this valuable breed of cattle named after our county; and we are quite safe to accept and endorse those points of excellence to which judges give precedence, for we find that judges are not fanciful theorists, but selected from amongst the most interested, practical, and experienced of the agricultural community.

Mr. CRAIG (Polquheys) was glad to hear the double-furrow plough was taking so well amongst his low country friends. He hoped they would soon be able to bring it to the mountainous districts also. As to the exhibitions of stock, he was perfectly convinced that Mr. Caldwell had taken the right view. His description of the Ayrshire cow might not please every one, but it was the one generally adopted by the judges, and contributed greatly to the beauty of Ayrshire animals. There were a few points that might be criticised from the weight-making point of view. For instance, he did not think that short heads contributed so much as some breeders imagined to the making of a useful animal. He thought the head should be a little longer than the present fashion. With a small head they were sure to have a small animal. Otherwise he thought the description of the cow was particularly good. One of the chief benefits of shows in his opinion had been to teach the public what to breed from, and the form of animal that would be best for them to rear. Where the judges were properly selected, all who came to the showyard had an opportunity of seeing the animal that was considered the best by men of knowledge and skill.

Home Correspondence.

Mr. Smith, of Woolston, *v.* **the "Chamber of Agriculture Journal."**—I have seen a copy of the *Chamber of Agriculture Journal*, of October 31, 1870, in which it is said—"When Mr. Smith publishes statements which are calculated to foster a very erroneous impression, he deserves to be contradicted." So says Mr. Smith, but claims space to question the "Journal's" contradictions. I told the truth as to the depth of work and cleanliness on Mr. Ruck's farms. Mr. Ruck's land was not clean, "cleanly" was all that I could say for it, and none of the work that he showed to me exceeded in depth over 5 inches. Now, let us look to evidence in support of the charge that my "comparison of cost cannot but produce a completely false impression upon unwary readers." The "Journal" says:—"Mr. Smith speaks of a seed-bed on his own farm, worked a foot deep, for next year's crop, at 6*s.* 3*d.* per acre;" that "it is grossly unfair to print these sums as being the cost of tillage operations on his method." And in support of this it states that I did "in 18½ days 53 acres of smashing and 65 acres of ridging and subsoiling," and in stating the cost it says that "Mr. Smith puts wear and tear, &c., at 1*s.* 6*d.* per acre for the smashing, and 1*s.* 4*d.* per acre for the ridging and subsoiling." Here I will state at once that the 1*s.* 4*d.* an acre for ridging and subsoiling was a mistake of the printer's, for from my start, according to a letter published in the *Mark Lane Express* of November, 1856, and all subsequent writings of mine, I show that I have on all occasions fixed 1*s.* 6*d.* an acre as my estimate for interest and wear and tear on all kinds of work. Just look at my letter in the *Times;* you may see the mistake. 65 acres, at 1*s.* 6*d.* an acre, comes to £4 17*s.* 6*d.*, the sum shown to have been charged, whereas 1*s.* 4*d.* comes to only £4 6*s.* 8*d.* That little point is corrected. The paper goes on to say, "at this rate the total wear and tear, &c., or, in other words, repairs, depreciation in value of the engine and apparatus, and interest upon the prime cost, amounts to only 9*s.* 5½*d.* per day, or £8 17*s.* for the year's operations." This 9*s.* 5½*d.* per day, and £8 17*s.* for the year, need a little correction to make the 1*s.* 4*d.* to 1*s.* 6*d.* right; but as it is of so little importance, I shall leave my reviewer to do that. Then he goes on to say:—"That this is egregiously below the mark, appears from the following consideration." "Mr. Smith says he keeps his tackle for his own use only, but we suppose that the engine drives the threshing-machine for knocking out all his produce on his 166 acres of arable bearing the proportion of straw cropping stated by himself; his threshing can hardly occupy more than 28 days: and we will assume that the engine works for 47 days in a year, and that the cultivating tackle works for 19 days in a year. What the actual repairs amount to in a course of years we do not know, and what sum Mr. Smith paid for his machinery we forget, but in stating the case as it would be with anybody else employing such a set of apparatus, we shall not be far wrong if we take the repairs, depreciation, and interest upon capital at 12½ per cent. per annum upon £240 for the 10-horse engine, and upon £220, the price of the simplest form of round-about tackle, with the two Woolston implements." This is a "false" basis, and likely to "produce a completely false impression upon unwary readers," and to prove it I shall make extracts from a battle fought oft a year ago upon this point (see the *Agricultural Gazette*, Nov. 13, 1869, p. 1193). Here is what I say:—

"I must, however, give my 'account of repairs' (for the year):—

One new share to ridging plough	..	..	2*s.* 0*d*
Eight new shares to smasher	..	..	8 0
Total	..	..	10 0

Since writing the preceding it has occurred to me that I ought to have gone into the interest of money and wear-and-tear question, to show that in my case no extra capital is needed to work my farm by steam. My old arable land needed six horses to work it under horse culture; under steam culture I have never used but three, and they, as I have heretofore shown, only work 118 days a year; on the farm that I have just bought four horses have always been kept to work the heavy arable land, and I never knew a profit made by a horse on it; yet I have known of many a dead one. I have started off with five to do the two farms, and this week will complete their work for the year, excepting job work; and that will be very light, for nearly the whole of the tiles are already drawn, and laid upon the new portion of my farm for draining. Therefore I am a gainer of six horses. Let us put them, with their tackle and implements to work with, at £40 each. I need less capital upon that point £240. Now fix their keeping (less the value of their manure) at £25 each, in this way at the end of the year I save £150. Now let us put the case, taking the half of the engine and tackle, as 'G. A. H.' says, at £375." ('G. A. H.' charged the other half of the engine to threshing, and rightly so too.) "Now for the other side:—

Six horses, with their tackle and implements (less needed)	..	..	..	£240 0 0
Keep for a year of six horses	..	..	..	150 0 0
Total	..	..	..	£390 0 0

This gives a gain to me at the end of the first year of £15, therefore no extra money is needed, and I am a gainer every year afterwards of £150 for horse-keeping."

That was my position last year, and so it is this year, therefore it is of no use for my reviewer to try to stun me with a lot of interest on tenant's capital, for in my case, and many others using small tackle, little or no extra tenant's capital is needed; therefore his 12½ per cent. may go to the dogs. People who will spend a lot of money on large tackle must pay a lot of interest, wear and tear, and depreciation upon it; therefore I have proved that my public statements are not calculated to foster erroneous impressions. I can prove that in all valuations, &c., interest on horses is never charged. If you want the evidence, I will give it. When a man starts steam culture all you can charge interest for is the extra capital needed over horses. *William Smith, Woolston, Bletchley Station, Bucks, November* 3.

Desiccated Grains as Cattle Food.—In 1865 the devastation caused by the cattle plague in the dairies of London and its vicinity cut off almost entirely the means of disposing of brewers' and distillers' grains—the refuse left in the mash tun after extracting the wort. Where 1*s.* per qr. had been received 1*s.* had to be paid to have them removed from the brewery, for they turn sour in a few hours, and in a day or two become putrid. In the summer of 1865, two gentlemen, connected with one of the large London breweries, conceived the idea of drying or desiccating them, so that they might be kept without deterioration. After a series of experiments, they invented machines whereby the object might be attained, at a slight cost, and likewise purchased patents for effecting the same purpose. The produce, when analysed by Dr. Voelcker,

was found to contain singularly nutritious elements, which, by the repeated "cooking" of the grains, were all thoroughly digestible by the stomach of the animal. And the desiccated grains gradually came into favour with farmers, horse keepers, and others. The business founded by these gentlemen became so extensive that it was formed into a company, about two years ago, and has now its chief manufactory in London, with branches at Dublin, Liverpool, Norwich, Bristol, Burton-on-Trent, &c., the total production of which amounts to 120 tons per week. The machine in which the grains are desiccated is of peculiar construction, but not complicated or liable to get out of order [see p. 798, 1868]. The cattle food produced thereby sells readily at two-thirds of the price of best linseed cake, from which an estimate may be formed of its value. Hitherto wet grains had been the food of cows only, to which they were often given in a sour state, thereby injuring the animal; but after this process they are relished by all descriptions of stock, and are particularly suitable for sheep and lambs. *E. B.*

Paterson's Bovinia Potato.—Your correspondents are giving their experience of the productive qualities of this popular cattle Potato. A result just attained in my neighbourhood may not be uninteresting to your readers. Last spring, Mr. A. Tegler, of Maybush, near Southampton, planted 4 lb. weight of seed of this variety in richly manured land, and lifted his crop on November 2, when, to his surprise, he found 7½ cwt. of our Hampshire bushels, and weighing 4 cwt., thus realising just 1 cwt. of produce to each 1 lb. of seed planted, many of the tubers being 2 lb. to 2½ lb. in weight. As to the number of sets into which the seeds were cut, or the mode of planting and cultivation adopted, I can give no information. I know that the soil where they were grown is, in hot seasons, of the very driest kind, and I should not be surprised to hear that this great crop was the result of superturberation. At all events, it is worthy of recording, as being one of the most extraordinary results I have yet heard of. *Alexander Dean, Old Shirley.*

—— I see that Paterson's Bovinia Potato has been noticed in the last two or three numbers of the *Gardeners' Chronicle*. I planted 7 lb. of it last April, and the produce is 6 cwt. 3 qr. *Wm. Wilkin, Gr., Raynham Hall, Norfolk.*

French Agriculture.—"Well may M. de Lavergne speak in terms of exultation of Normandy as the most favoured portion of his native country!" What, then, of the rest of France? Is a capital of £400 to 125 acres (10,000f. to 50 hectares) sufficient for good farming? Are ploughs sometimes without coulters and with wooden mouldboards adapted to good tillage?—yoked, too, at times with only one horse but little heavier than an English cab-horse, and in front an ox, perhaps intended to add weight by its low yoke; at times going to the other extreme of four and five horses at length. Is it economical to let the team stand at one end of the newly-turned furrow whilst the ploughman goes back and sows it? Will Wheat grow to the best advantage when the seed is dropped between the overturned slice of weeds cut off the surface and the bed of roots divided scarce 3 inches deep? What kind of hand labour can be expected with spades having long poles for handles, and blades over one-eighth of an inch in thickness? Are Cabbages with stalks 6 feet high, surmounted by a small crest of leaves, which are broken off day by day, a paying sort? Are razor-backed pigs paying? Are cattle with their heads tied down to their feet to prevent their straying, likely to thrive? Are horses overladen, and quivering beneath the lash of the peasant, who urges them on with infernal yells, likely to do a full day's work? Will crops be prolific in half-acre fields, surrounded by hedgerows full of misshapen pollards, and studded with fruit trees? Are homesteads (save the mark!) little better than Irish cabins, and surrounded with filth and untidiness, the abodes of intelligence? What would our farmers think of bundles of dried grass, mouldy by storage in barns, for hay? Yet the favoured regions of Manche and Calvados are the daily witnesses of these things. *Reflector.*

Mr. Robinson on Steam Cultivation.—Mr. Isaac Robinson, in his paper on steam cultivation, is incorrect when he says, "After John Fowler I would mention the name of Mr. William Smith, one of the fathers of modern steam cultivation. . . . He invented his cultivator (which was made under the superintendence of Mr. Fowler)." My cultivator was made by my own blacksmith, under my own superintendence, therefore Mr. Robinson is wrong upon that point, and this cultivator of mine was made before "John Fowler" began anything upon steam cultivation; therefore my start was ahead of him—I commenced in 1855, and he began in 1856. Mr. Robinson is incorrect again when he says:—"Mr. Smith did not exhibit at Salisbury, but made his appearance again at Chester, in 1858, by his manufacturers, Messrs. Howard, of Bedford, who have since conducted the manufacture on their own account." Now, it was not until the spring of 1861 that the Messrs. Howard commenced making "on their own account." It was in April, 1861, when I left them. Mr. Robinson should keep dates better than he does, for I am not "one of the fathers," but the father, of modern steam cultivation; and I stand A 1 as to the cost of seed-bed even now. *William Smith, Woolston, Bletchley Station, Bucks, Nov.* 5.

Chinese Sheep.—In your volume for 1860, p. 126, there is an interesting account of a very prolific breed of Chinese sheep. Can you give any further information about them, and can they now be obtained in England? If this note should meet the eye of the Editor of the new edition of Stephen's "Book of the Farm," it may perhaps direct his attention to these apparently very useful sheep. I have not seen the old edition of the "Book of the Farm;" I am therefore ignorant if there is any mention of the breed already in the work. What is the Polder-Holstein breed, mentioned towards the end of the above-named article? It appears to me that by judiciously crossing these Chinese sheep with our improved breeds, we should add to the prolificacy of the latter without doing harm to their good qualities, and thus lessen the necessity for importing sheep from the Continent, and introducing small-pox and other diseases. Indeed, by an increased use of the preserved Australian meat—at least amongst the poorer classes—in addition to the introduction of the Chinese sheep, we might do away with the importation altogether. *Charles Palmer, Stewkley Grange, Leighton Buzzard, Bucks.* [If we remember aright, some of the Chinese sheep found their way to the Prince Consort's Farm at Osborne. Perhaps information may be had thence.]

Mixed Bone Dust and Coprolite Superphosphate.—I was much interested in the account you gave last week of Mr. Prout's (of Blount's Farm) system of farming, and astonished at the statements, "No live stock kept," "no dungheap exists," that the crops averaged over £10 per acre over a series of years, that the Wheat crop this year yielded 8 qr. per acre, and that these results are attributed to steam cultivation, and the application of mixed coprolite superphosphate and bone dust, at a cost of about £2 10*s.* per acre. As an amateur small clay-land farmer, it would be to me, and to other occupiers of clay land, most instructive and interesting if you would be kind enough to communicate the quantity of coprolite superphosphate and bone dust applied to each crop, and the *modus operandi*. The time of applying it would be, I presume, at the time of sowing, and not as a top-dressing. I have always been led to believe that bone dust had very little fertilising effect on clay land, and that it was only suitable for light and porous soils. With the increasing price of guano, and the uncertainty as to its quality, it will be a great boon to clay-land farmers if ground bones and superphosphate can be substituted for guano, for by dealing with respectable firms a genuine article of uniform value can always be obtained. *Thos. Jenkins, Coventry.* [The bone dust is in part disintegrated by mixture with the acid superphosphate.]

Carrots.—In gathering our crop of Carrots at Garthdee, near Aberdeen, we took up a large number of roots, 21 inches long, by 9½ in circumference at the top. Some of these Carrots weighed as much as 4 lb. each, 20 of them 56 lb. We should be glad to hear if this is an unusual size. *John Morr & Son, Garthdee.*

Societies.

HIGHLAND AND AGRICULTURAL.

At the first monthly meeting for the season, the following report on the different specimens of horse-shoes exhibited at the Dumfries show was read:—

The Charlier Shoe possesses the following advantages: Lightness; a true bearing on the crust; frog pressure; avoids all suction, and cannot pick up a stone; does away entirely with the use of the drawing knife; is very easily fitted, as the gauge knife can only cut the proper seat. These shoes appear to be more adapted for light work than for draught horses. In expressing this opinion, the committee regret that they have had no opportunity of seeing horses shod on this principle for a sufficiently long time to give them a practical illustration of the system.

Gray's patent Grooved Steel-faced Horse-shoes.—Workmanship good, and price reasonable. We think some improvement might be made in the method of nailing, especially in the lighter shoes.

Robertson's Snow Plates.—These are only adapted for slow work.—There is some merit in the invention, and if further improved upon might be found useful in cases of sudden falls of snow. Portable Frosted Horse-Shoe: not so serviceable, and more complicated.

(Signed) WILLIAM VARLEY, V.S. (1st Class), 13th Hussars.
J. ANSTRUTHER THOMSON.

Dumfries, July 29, 1870.

A silver medal was awarded to M. Charlier.

Forestry.—The Government reply to a memorial on this subject from the Society was as follows:—

"India Office, S.W., July 29, 1870.

"My Lord Marquis,—I am directed by his Grace the Secretary of State for India in Council to acknowledge the receipt of the memorial, dated June 1, which was presented to him on the 15th inst., on behalf of the Highland and Agricultural Society of Scotland, stating objections to the present system of training young men for the forest service of India in France and Germany. In reply, I am desired to inform your Lordship that the present system was adopted, after very idelibertate consideration of the question, as well by the authorities best qualified to judge of the requirements of the service in India as by his Grace's predecessors in the department, and his Grace is satisfied that the conclusion arrived at was sound. As the first set of these young men were sent to India only at the close of last year, there has been as yet no opportunity of forming a judgment on their practical fitness for the duties required of them; but it is impossible to speak too highly of the attention which is bestowed upon the young men already sent for training in France and Germany, and of the supervision which is exercised over them in all respects. Judging, however, from the reports received from the foreign establishments in which they are placed, from the statements of the young men themselves, and from the expression of their parents or guardians in respect to their position abroad, the Duke of Argyll has every reason to expect that the system will prove successful in supplying a body of well-trained and competent gentlemen for service in the higher grades of the forest Department in India. A mere inspection of the Continental forests, as proposed in the memorial presented by your lordship, would not answer the objects which the Secretary of State in Council and the Government of India have in view. I am to point out that how sufficient soever the training in what may be called the auxiliary sciences, mathematics, surveying, mechanical and natural sciences, may be in this country, it cannot, in his Grace's opinion, be doubted that the science of managing and administering forests on a large scale, is not and cannot be so fully developed here as it is in France or Germany, where forestry is recognised as one of the scientific professions, for which public forest schools are established, and where the forest lands are of vast extent and managed upon principles more nearly approaching those which are most suited to forests in India than is the system pursued in England and Scotland. His Grace is not prepared to admit that the same results could be obtained in Great Britain as are gained by the training in France and Germany. He would therefore regard it as most unfortunate should the present outbreak of war between France and Germany lead to an interruption of the present system; but as Her Majesty remains at peace with the Sovereigns of both these States, the Duke of Argyll does not anticipate that such an interruption will be necessary. I am to add, that although the knowledge of the French or German language is required of candidates only in order to enable them to receive the teaching imparted to them abroad, it is a knowledge, nevertheless, which cannot fail to prove of the highest service to them in their subsequent career, as the best books on the science and practice of forestry are undoubtedly written in those languages.

I am, &c.,
(Signed) "J. COSMO MELVILL.

"The President of the Highland and
Agricultural Society of Scotland."

The Secretary stated that the India Board have now sent a number of students to St. Andrew's, to study under the auspices of Dr. Cleghorn, these students having been ordered home from the forestry schools of France and Germany in consequence of the war.

It was further reported that the next examination of candidates for the Society's forestry certificates would take place on the 3d and 4th current.

Farmers' Clubs.

LONDON.

The Fen Country: Nov. 7.—Mr. C. Howard in the chair. Mr. A. S. RUSTON read a paper on this subject, the greater portion of which was an elaborate and very interesting historical essay. The following are extracts from the more strictly agricultural part of the lecture:—

Drainage.—Cultivation and drainage have gone on hand in hand, each improvement in the one leading to a corresponding improvement in the other. During the early drainage history most of the low-lying Fen lands were kept in grass, as they could not be profitably brought under cultivation in consequence of their liability to inundations during every recurring flood. Some farmers ventured to sow a few Oats on the higher lands, but not until May was well in and the winter rainfalls had passed away to sea. By-and-by Oats were grown more largely, and Wheat was cultivated to some extent. Then came the system which prevailed very generally in the Fens for a good number of years, and which was to let the land keep in grass for two or three years, then pare and burn, and sow with Coleseed to feed with sheep during the winter months, to be followed by Oats, and then Wheat; and again sow down with seeds, to remain two or three years—often three. This virgin soil, under such management, produced Coleseed of most extraordinary fattening qualities, and perhaps there has never been any natural food that would compare with it, or that would in so short a time produce so much weight of mutton. It was otherwise with the seeds, for after the first year they contained comparatively little nutritive properties, and their long continuance on the land made a fine refuge and breeding-ground for the wireworm, to which the succeeding crops ofttimes bore indubitable testimony; and to this day they remain the greatest foe to successful cultivation the Fen farmer has, and it is a very occasional year when his Oat crop is not more or less ravaged by them.

Probably the greatest improvement, next to drainage, and consequent upon it, is the practice of claying Fen lands. The value of clay, I believe, was first accidentally discovered by some which had been thrown from the ditches having been spread round the outsides of the field, and which produced most marvellous effects upon the growing corn crops. Our fathers were not slow to learn, and were very soon led to

adopt a system of claying which still continues, some lands having been gone over three or four times. The plan is this: pits or trenches are made down the field, from 2½ to 3 feet wide, and from 12 to 16 yards apart; two spits of clay are taken therefrom, and spread upon the intervening land, the peat or clunch subsoil being thrown to the bottom of the trench; and when all is finished the pits are ploughed in, and the land being loose, and easily moved, is soon levelled again. The cost of claying is governed by the depth at which the clay is found from the surface of the land; but improved drainage occasioning a continual subsidence, as I have already observed, is bringing it within easy reach, and thousands of acres can now be done at a cost of 30*s.* per acre, and under; and no money expended upon a Fen farm yields so quick and so bountiful a return. The application of clay to these light soils not only gives solidity, but being possessed of considerable fertilising properties, greatly enriches them. Happily, the Fen lands very largely rest upon a clay bed; but the clay is not of a uniform quality. That which is blue, and of a soft buttery nature, contains the most lime and is the best fertiliser. Some is silty, and some stony and hard, and these do little more than solidify.

Claying. — The next great improvement consequent upon the drainage of Fen lands is their deep cultivation, to which reference has already been made. To talk of turning over a furrow slice 30 inches in thickness must sound to a clay-land farmer something like a piece of exaggerated nonsense, and may put his credulity to the test as surely as some of the wonderful statements he occasionally meets with now-a-days in agricultural newspapers; but you, sir, know it is no exaggeration. Deep cultivation on Fen land is generally accomplished by horse-power, as the great underground forest offers considerable obstacles to the application of steam. A pair of horses in a common plough go first, and take a furrow 4 or 5 inches thick, and are followed by a huge implement made expressly for the purpose, and which is pulled by six, eight, or ten horses, as the case and required depth may be. This plough buries the furrow turned over by the small plough, and brings the subsoil well on to the top, that its vegetables properties, by exposure to the atmosphere, may become speedily decomposed, and made available as food for plants. One object in putting the top furrow down is to get it as far as possible beyond the reach of atmospheric influence, with the idea that under these circumstances the Twitch or Couch and weed roots will die and decay. It certainly is a very clever and ingenious way of cleaning land, if it can only be done; but my experience and observation lead me to the conclusion that it far oftener fails than succeeds. I think land should be quite clean ere it is deep ploughed. There can be no doubt but deep cultivation tends to preserve moisture in the soil in dry seasons, and to facilitate drainage in wet ones. It also unlocks those hidden treasures in which are so many elements of fertility, and consequently increases the producing power of the land. Drainage, clay, and deep tillage, to which should be added superphosphate of lime and the water-drill, have completely metamorphosed the country, and altogether changed its modes of husbandry; and perhaps at the present day there is no country which is so utterly defiant of system. Every one sows what he thinks he will, and by proportionately liberal management labours under no apprehension that his soil will become exhausted; nor will it, if he treats it generously, and cultivates it wisely.

Rotation of Crops.—Although there is no uniformity of system in the cultivation of Fen lands, there is, however, a five-course shift which has found favour, and which prevails more largely than any other, and to which several farmers pretty strictly adhere. This is the order of it:—Mangels, Kohl Rabi, Coleseed, or Cabbages, which are gradually growing into favour; Oats; Wheat; seeds; Wheat. The green crops and the Oats are sown with artificial manure, the farmyard manure being reserved for the Wheat crops. This rotation appears well suited to the Fens, and has been pursued with considerable success; but, as I have intimated, Fen farmers are impatient of the restraints of system, and break away from them to follow their own inclinations. A ride through the Fen country at the proper season will afford ample evidence of the truthfulness of this. In addition to the crops ordinarily found on a farm will be seen Coleseed, Turnip seed, Linseed, Mustard and Cress growing as seed crops, and Potatos and Carrots extensively cultivated for the London and other large markets. Turnips are not at all suited to Fen soils. They grow of a woody fibrous quality, coarse, and long in the neck, and possessing scarcely any nutriment; they are, indeed, almost valueless as food for stock, and are, consequently, not cultivated. Kohl Rabi and Mangels are much better: but these, like the hay, straw, and other products of Fen land (Coleseed excepted), are very deficient in fattening properties.

Manures.—I have referred to the water-drill and superphosphate of lime, and their value in the successful cultivation of Fen lands. Our Fen soils appear to yield much larger supplies of ammonia than of phosphates, hence the free application of phosphatic manures is accompanied by much greater and more palpable results than is the case where ammoniacal manures are used. Probably there is no part of the kingdom where the application of phosphates to the soil has produced such startling results, and especially where they have been applied with the water-drill. The Fens have not been specially famed for the breeding of either cattle or sheep, but from very early times they have been noted for their good breed of cart-horses. The decreased acreage of grass seeds, consequent upon the increased acreage of corn and other crops, has largely tended to diminish the number of animals bred; but the show of cart colts, both as regards number and quality, on July 1 of every year at Thorney, is pretty good evidence that Fen farmers have not altogether lost their long-enjoyed and well-merited reputation.

Social Circumstances.—The Great Level, even now, under its more perfect drainage and improved cultivation, offers very few tempting residential inducements, and formerly, under other and more unfavourable circumstances, it repelled rather than invited residence. Hence it is no uncommon occurrence in many parts of the Fens to find both farmer and labourer residing in the town or village, rather than upon the farm. Another cause has largely contributed to this. Throughout the Fens there are a comparatively large number of small freeholders; and where those are found the farms generally are small, and a person's occupation is not uncommonly made up of three or four or more of these small holdings, which he finds can be more satisfactorily managed by residing in the town away from all, than by living upon any one of them. To an assembly of practical agriculturists I need scarcely say that these occupations are altogether bad; they fearfully multiply the difficulties of management, and tend to increase the cost and diminish the profits of cultivation. These small ownerships, too, operate prejudicially to the labourer. Were the lands, as in some other districts of the country we find them, chiefly in the hands of a few large proprietors, these might then be held responsible for the provision of proper and adequate cottage accommodation for the labourer; but as it is, such responsibility appears to rest on no one, and the poor man is driven to seek such a home as the village can offer, and instead of being on the farm ready for his work, has, morning and evening, to walk to and fro, thereby increasing his own toil, and with no corresponding gain, but an actual loss to his employer. This is an unmitigated evil, but where to find and how to apply the remedy is a problem difficult of solution; but time may eventually solve it, and it is earnestly to be hoped it will, for the cottage accommodation which these villages afford is painfully insufficient. Families are oft-times crowded into miserable wretched hovels, totally unfit for human habitations, where, huddled together, regardless of age or sex, they grow up insensible to those moral instincts and refined susceptibilities to which modesty and virtue give birth, and lamentably exhibit that boldness and unblushing effrontery which are the natural outgrowths of sensuality and lust; and so long as their homes, if homes they can be called, remain unimproved, they must tend to foster every social evil, and continue hotbeds of immorality, bringing forth abundant fruit in the future, as they have done in the past, and to a great extent neutralising the efforts which religion and education so zealously put forth, and which are designed and calculated to improve the condition of the labouring classes. Some fearful facts confirming the correctness of these statements might be adduced.

Another feature peculiar to the cultivation of Fen lands is the large employment of children. Perhaps nowhere else do weeds grow so thickly and luxuriantly as in the Fens, and it is a constant labour to eradicate them; and to accomplish this, resort has been had to what are popularly known as agricultural gangs. Already the gang system has been reported upon by Government commissions, and has formed the subject of legislative enactment. Much that has been said has been more caricature than the representation of facts. The very worst cases have been hunted out, and when well-dressed and garnished have been presented as truthful pictures of the whole, and have elicited an amount of sympathy which might well have been reserved for more needy objects. That evils did exist, and required to be remedied, I readily admit. The licensing of gang-masters and the separation of the sexes are steps in the right direction; but I cannot resist the conviction that much of the immorality ascribed to the gang system might, with far greater truthfulness, be attributed to the home influences I have just attempted to describe. Here lies the root of the evil, and here philanthropy and legislation should seek to apply the remedy. The sensational pictures of cruelty and slave-driving, and the like, might, with equal propriety, be presented as representations of the schoolmaster as of the gang-master. Whether children are receiving school or technical education, they alike require to be under control and management; and it would be as unwise to send them into the fields to labour, as it would be to send them to school to study, without the superintendence and direction of a master. The duty of the gang-master is simply to teach them how to do their work, and to see that they do it; and I presume the duty of the schoolmaster is very similar. This does not necessarily imply cruelty or immorality. Under right and judicious management, I conceive it is to the advantage of the children that they should be employed in suitable field labour during the summer months. They are there learning that which will be a practical benefit to them in subsequent years; and the labour, whatever may be said to the contrary, is not excessive, and tends to promote, and not to impair, health and vigour of body; and the earnings of these young people form a most important item in the family income, and can ill be spared. After a good deal of reflection, I have arrived at the conclusion that children of a suitable age should be permitted to engage in field work, which is always plentiful during the summer months; and should be kept at school during the winter months, when their services are not required on the farm. Where farms are sufficiently large, I prefer a private gang. I have not employed the public gangs; but my plan has been to take my own labourers' children, with a few others occasionally, and to place them under the supervision of the best man for the purpose I have in my employ, and I have reason to be well satisfied with this arrangement.

One essential to successful farming is a good road. Hitherto the subject of good roads has received comparatively little attention in the Fens; Fen farmers are now awaking to their importance. In a recent Act of Parliament some powers were given and some provisions made for the gravelling and improving roads within the confines of the Middle Level, from which considerable good has resulted; and a more wide and comprehensive scheme has been projected and advocated by Mr. Wm. Marshall, of Ely, to whom be all praise for his able and untiring efforts. His scheme formed the subject of discussion some few months ago at the Cambridge Chamber of Agriculture, and will, I trust, ere long receive the practical attention of the Legislature. Bad roads add greatly to the cost of cultivation, and are a constant nuisance to all who have to use them.

The value of Fen lands has increased or decreased, just as the drainage has been efficient or otherwise. In 1651 Lord Arundel, one of the Earl of Bedford's associates in draining the Great Level, became so discouraged by the reverses and losses sustained by the adventurers that he sold his 5900 acres for 3*s.* 9*d.* per acre, the same land now being worth probably from £30 to £50 per acre. Many farms have in former times been sold at very little over their present annual rentals, and some at even less. Through the kindness of Mr. Richards, of Wimblington, I am able to present the assessments to the poor rates of certain lands in the parish of Doddington, made at different periods, showing the influence which improved drainage has had upon the value of Fen lands.

	Acres.	Rateable Value				Acres.	Rateable Value		
1736..	200	£40	0	0	1813..	60	£21	0	0
1784..	200	60	0	0	1869..	60	63	1	4
1822..	200	100	0	0					
1869..	200	238	0	3	1757..	20	2	0	0
					1784..	20	5	0	0
1784..	60	15	0	0	1869..	20	26	0	0

LAVENHAM.

Waste of Force in Agriculture.—Mr. D. T. Fish, of Hardwicke, read a paper on this subject lately, from which we make some extracts:—

The forces employed in agriculture are many. There is, for instance, mechanical force, vital force, intellectual force, social force, political force, and what are called natural forces, such as heat, light, air, water, &c., and it would be easy to show that, in the practice of agriculture, there has been, there is, in regard to the employment of most or all of these forces, more or less of waste. But it may perhaps be better to treat the subject somewhat differently. Looking at agriculture as a great factory for the production of breadstuffs, meat, wool, sugar, &c., let us note the loss of force in regard to its driving power, its raw material, its skilled workmen, and its finished products. There are three great moving forces that drive the complicated machinery of agricultural production—capital, skill, and labour.

1. *Capital.*—The land is crying out for more capital. The machinery of farming is, in many cases, only going at half speed, in most it is working short time for lack of money. And yet money is plentiful and cheap, and investments in land are proverbially safe and reasonably profitable. True, it cannot offer the visionary dividends so freely offered by bubble companies. It possesses, however, legitimate attractions for capital of the highest order. Investments in land are proverbially safe. Whatever else fails the land remains. No seed yields so good a harvest as money wisely sown and planted in or on the land. How is it, then, that money flows very sluggishly landwards? Various reasons may be assigned. I will advert to only a few. Many harp upon the well-worn string, that farming does not pay. I don't believe it, you don't believe it; and so I dismiss it at once. A second check to the flow of capital has been the inordinate desire for land. More land has been the cry of the farmer, rather than more capital. The possession of land has far outrun the means of the occupier to do it justice. Agriculture has sustained great loss by the diffusion of force. An acre of land well cultivated is worth more than a whole farm of weeds or bare fallow. The farmers' rules in regard to land have been, "Get all you can, keep all

you've got, and ask for more." Thus the driving power—capital, has been broken up into forceless fragments by being too widely spread out. You know the difference between a thick and a thin coat of manure. It is just so with capital. Concentration is power in both cases alike. If you have capital enough keep the whole of your land by all means; but if your driving power is not equal to working it well, give up half of it and concentrate your force upon the other half. A man may remain poor on 200 acres who would become rich on 100. By the reduction of acres you might save half the rent and taxes and working expenses and double your produce. But there is another cause—deeper-rooted and more difficult to remedy than over-occupation, that arrests and hinders the flow of capital to the land. The investments are safe, the profits reasonable, but the returns are somewhat slow. The commercial codes for money-making, small profits and quick returns, are hardly applicable to agriculture. A good deal may be done, by catch crops, to reap two harvests within the year; but only one of them is likely to prove very profitable. Slow and sure, however, is some compensation to set up against the loss of speed. But, supposing any doubt should arise about the security, then the chief attraction that draws money landwards vanishes. Now it so happens that probably one-half of the land of England and Ireland is let and held upon terms that seriously imperil the safety of the occupiers' investments. True, the farmer is free enough to put money into the land, but is he equally free to take it out again? One man sows capital, it may be plentifully, on the land, and another is permitted to reap his harvest. Who can wonder that thin seeding is the rule while such miscarriage of right and justice are either sanctioned by law or permitted by custom. Can money ever flow freely landwards while there is the barest possibility of such a loss of tenants' property. None have such a strong interest in the enrichment of the land as the landlord; by granting leases for 7, 14, or 21 years, capital will flow freely to it, and the tenant-farmers' investments be made as safe as they are profitable.

2. *Skill.*—The second driving power of agricultural production is skill. Much is needed to develope the full force of capital invested in land. Men may sow their fields with gold dust, and yet not reap bountifully. In fact, the more money employed, the greater the force used, the more need of skill to turn it to profitable account. Any boy may drive a donkey, but it needs a skilful rider to manage a full-bred racer, or one of your splendid hunters. But perhaps the difference between these two is not equal to the distinction between old-fashioned farming and the farming of to-day. The one was the old road waggon, the other is the express train; and yet the skill of the driver has remained in many cases almost a constant quantity. "As we were in the beginning, are now, and ever shall be," is the theory and practice of too many agriculturists. Now what is the cause of our frequent failure? Half-knowledge. We are sometimes told, indeed, that learning and skill are of no use in farming, and that practical men without education rear, buy, and feed stock with greater success than the most learned farmer. The fact is, gentlemen, such men are highly educated in their special department. They have acquired a technical education in their special business. By carefully observing the habits and studying the nature of animals, and noting the effects of certain food, their rule of thumb becomes gradually and imperceptibly converted into a law of science; for what after all is any science worthy of the name, but simply the products of all the best experience of the past classified and condensed into simple formula for general use in the present or future. Though we are not to live in the past, it is our duty and interest to learn all we can from it. We hear much now-a-days about the necessity for technical education. The members of every trade are calling out for an education for that trade. If this is needful in other trades and manufactures it is much more needful in this great national industry of farming. Other manufacturers mostly concern themselves with one thing, the cotton-spinner spins cotton, the silk-weaver weaves silk, the iron-founder moulds iron, and so on; but the farmer touches, changes, and transforms all, from the sun in the heavens to the mud in pond or ditch; from the solid earth to the invisible air; from the breath of life to the foul odour of death and corruption, all are utilised and transformed by the agriculturist. Nor has he to deal with matter only, but with mind. Throughout his whole life it is his to bend force to purpose, and to enlist the services of both in the economy of production. A want of skill and the loss of force are convertible terms. The motive powers of production are strong or weak, safe or dangerous, profitable or unprofitable, in exact proportion to the skill with which they are driven.

3. *Labour.*—Our last driving force is labour. It should be good in quality, sufficient in quantity, and skilfully used. Bad labour, whether of men, horses, or steam, at any price is dear and a clear loss of force. This is too obvious to need further illustration. But a deficiency in labour is almost equally improvident. Set a horse, a man, or a steam-engine to do work beyond their strength, and you not only lose the force expended, but you strain and weaken the sources of your working power. It is impossible to develope to the fullest extent the resources of an under-powered farm. The work is ever lagging behind like a terrible nightmare on the energies of all concerned, and no choice of opportunity, one of the grand secrets of successful farming, is offered. It is of vital importance that the labour forces should be used at the right time and place, and in the best manner. Time is a most important actor in the economy of agricultural production. A week's difference in the start may make all the difference between success and failure at the end.

The right application of force is of still greater importance. Force is developed to be utilised. What should we think of a man who kept a steam-engine going for the sake of the mere motion? The driving-wheel of the steam engine moves that it may drive something else. Even the force that moves it is so much deducted from its working power. This is a principle of immense importance to the full utilisation of labour. The nett weight of all implements must be deducted from their working capacity. Every ounce on plough, cultivator, cart or waggon, beyond what is needed to impart the necessary strength, is so much labour lost. Even the power expended in hauling a ton of coal to the pit's mouth diminishes its working power by that amount. You seem to lose sight of this in many of your implements of husbandry. In many of these one-third—in some perhaps one-half—of the working force is expended upon moving their dead weight. What about your carts and waggons, and the practise of placing three horses in a waggon in single file? Have you ever thought how often in a mile these draw altogether at the same instant and in the best line of draught for urging the load forward? And then, what do your tumbrils and waggons weigh? Is there no superfluous weight about them? Have they only mass enough of timber and iron to carry the loads, and no more? And what about the friction of four wheels on the ground, while two only might suffice? If you employ a waggon of 1 ton weight to carry 2 tons more, one-third of the dragging force is wasted on the waggon. The same rule holds good in regard to all other implements; the lighter they are and the less friction they have the more actual work may be got out of them. A maximum of work, with the expenditure of a minimum of effective force, is the principle to aim at. The recognition of this law would make you see to your farm roads as well as to your wheels and the weight of your implements; for every large stone, every deep rut and steep hill, robs your horses of force, and takes from the sum of their productive labour.

I will not insult your common sense by dwelling upon the enormous loss of force that is sustained by under-feeding your animals; as well try to reap a profit by starving the fires of a steam-engine as to get paying work from under-fed animals. The stomach is the great centre of physical force, the only bank from which animals can draw to replenish their expended energy. The same law holds good with men. Of all labour that of under-fed, badly-housed, half-clad labourers is the most expensive and inefficient. "A bold peasantry, their country's pride," can never become a reality, unless they have plenty to eat.

If spared to bring the remainder of this subject before you next year I shall seek to show that vital force may be converted into heat, size, or work, at will. The first demand, however, upon vital force is for the preservation of life. For this purpose an immense amount of lifting, and circulating, building up and pulling down, force is employed. The next demand upon vital force is for heat; the temperature of the human body must be kept up. It is always the same in a state of health, whether the body be half scorched under a tropical sun, or nearly frozen amid dreary wastes of eternal ice and never-melting snow. The under-fed and over-fed have to keep up the same temperature. Now vitality, heat, and working force, both feed at the same table, the stomach. The two first come first, nay they never leave, and consequently they are first served. Then size comes and finds little, and labour, power, or strength comes and finds none, consequently this labour power goes empty away. Harsh words are often used, and men are called lazy when they are merely hungry. As reasonably expect to reap Wheat from Thistles, as to get a full measure of work from a half or altogether empty stomach. To the lassitude of hunger, is often added the loss of force from cold. We have already seen that heat and motion and work are very much alike. This principle is a most important one in regard to the clothing and feeding of our labour power. If you want a full measure of work from a man, keep him comfortably warm. The man who has had to fight against the cold all night is weaker in the morning than he who has been sufficiently covered in bed. The same rule holds good by day. Clothing husbands the heat of the body, and hinders the caloric from devouring the portion that ought to be reserved for the sustentation of working power. Another great loss of force arises from lodging the labourer at a distance from his work. What would you think if it was proposed to you to build your stables two or four miles away from your farms? Why, you would say no farmer could be so foolish as to make his horses do one day's work on the road, and another in his fields—and yet this is what is expected from the labourer in many districts. Early and late, on many of the roads around Bury, labourers are seen wearily trudging to and from their daily work. They go to their respective farms, their masters rise from comfortable beds and well-spread breakfast tables, and step out into their yards to give orders for the day. The men are all there to time. Many know little and care less where these men have slept, how they have been covered in bed, where they have breakfasted, or how or upon what they have dined. What is that to them?—it is everything to them! The labour power in man is a limited quantity. It is generated and sustained by food, and by that alone. If food is good and abundant, strength and capacity for work are sufficient. If otherwise, weakness must be the result. These labour machines may look all right, but, in fact, a large proportion of their labour power is already gone. They were full of working force probably when they started from home, but they have left a portion of it at each step of their long journey on the road. There it lies uselessly wasted; like water spilt on the ground, it cannot be gathered up again. All that labour, that strength, thus recklessly scattered upon the road is lost to your fields. It is just as if you sent your corn to market in a cart or waggon with an open bottom and a hole in each sack. At every jolt on the road the corn would run out, and when you reached the station, every sack would be a bushel (less or more short. The labourer who has to walk far to and from his work is just such a sack. Half emptied of his force before he reaches your farm, a full measure of work from him is an impossibility. Agricultural production can never be driven at full speed until the labourer and his work are brought together, and he is comfortably housed, warmly clad, and well fed.

Next, then, to the cry of more capital—if, indeed, it is not but another form of the same cry—is that of more and better cottages for and upon the land. Then, and not till then, will human labour be fully utilised, and the full measure of available force be put on the land, instead of being recklessly squandered on the journey to and from it. But the labourer himself is far from being a perfect working machine. His lack of intelligence is a serious loss of force. Ignorance is not only the parent of wickedness, but of weakness. True, the race is not always, but it generally is, to the swift, and the victory to the strong. Knowledge is power. In agriculture, as in all other productive enterprises, there is a best way of lifting and carrying, draining and ploughing, reaping, sowing and mowing, feeding and tending stock, making and mending roads, or cleaning ditches even; and the intelligent will find it out and practise it. Besides, though to many of you a horseman is only a horseman, and nothing more, all men are higher and better than mere mechanical machines. Intelligence tells for much in the mere work of the world; but it is even more valuable in moulding and enriching character, and in reforming, ennobling, and strengthening the domestic, social, and public life of the nation. True, one often hears, especially in these rural districts, that a little learning is a dangerous thing. Exactly so, but the danger comes from the littleness, and safety is found, not in extinguishing this rushlight, but in providing a candle of sufficient illuminating power to enable men to see things clearly as they are. Every day's experience convinces me more strongly of this truth,—that the more a man knows the better he will do his work, and the more happy, contented, and useful he will be in that sphere of life or of duty to which God has been pleased to call him. If you wish to develope to the utmost the working force of your labourer, boldly add to your other cries that of "Education!"

Such, gentlemen, are some of the most important of your driving forces in the economy of production,—capital, enough of it, freely invested, safely kept, and certainly recovered; skill, with eagle eye applying and reaping the legitimate profits of capital; labour, plentiful, near at hand, full of force, and of the highest quality.

FIOFIELD AND WALSHAM

At the late annual meeting of this Society, Mr. C. S. Read, M.P., said:—

It was just 12 months since that he had the pleasure of speaking to them upon what he thought would in all probability be the main features of the Irish Land Bill. The Bill brought in by the Government embodied a great many of those ideas. He was very happy indeed in being able to support the general principle of the Bill; but one thing which he could not support, and which he opposed with all his might, was that new property which had been acquired by an occupier of land in Ireland—that was to say, apart from all improvements, over and above any outlay that had been made—that whenever the landlord had to turn him out, he should be able to demand, if he was a small tenant, seven years' rent from the landlord simply because he had been evicted. Mr. Read thought this would in the end militate against the tenant. He did not believe it possible to do an injustice to one class at the expense of another, but that in the end the injustice would fall upon that class for whose benefit it was wrought. Therefore, with the competition there was for land in Ireland, he had not the slightest doubt that if the landlord had to pay the fine, he would make the incoming tenant repay it, either

in the shape of what was called "Ulster tenant-right" or in the shape of increased rent. Just contrast what had been done in Ireland with what was done in England. In that district of Norfolk, leases were not the rule: he wished they were, and he affirmed that it was not right that the whole of the improvements of the tenants of this county should be at the mercy of the landlords. If a landlord liked to evict a tenant—however enterprising and good that tenant might be—he could confiscate his improvements without paying him a single sixpence. Mr. Read maintained that this was wrong; but he was at the same time sure that few landlords in this county ever did it. He had never known any one to do it of late years—and all honour to the landlord for not doing it. What Mr. Read contended for was, that there should be a good custom—whether it be a custom of the country or a custom established by the law of the land—by which, when a man was ejected from his farm he should be paid for the improvements he had made, just the same as he was paid in Lincolnshire, where farming had advanced under that system better than it had done in any other part of the country. Although the landlords in Norfolk had not taken advantage of the power they possessed, yet estates might change hands, and, as life was uncertain, a good landlord might die, and be succeeded by some one who either did not understand business or did not care for his tenantry; therefore, the tenant-farmers of England ought to have some protection for the improvements they had made.

Another point to which Mr. Read drew attention, as far as regarded the evils averted in Parliament from the agricultural interest, was that the Chancellor of the Exchequer had not succeeded in making them pay a tax for their farm-horses. In that district farmers grew something better than stones; therefore, they repaired their roads principally with gravel, which was carted from a considerable distance. On wet days they sent the whole of their horses to the gravel pit to cart gravel to repair the roads, and for that reason, if this exemption had not been insisted on by the House of Commons, almost every horse in that neighbourhood would, he believed, have been liable to the duty on horses. It was only by the kind assistance of the Speaker that they obtained a small majority against the Government; and although the Prime Minister said at the time that he should take time to consider the position of the Government, Mr. Read was happy to say that the Ministry did not resign, while agriculturists were exempt from the duty on farm-horses. Mr. Read then expressed an opinion that agriculturists ought to help their neighbours to get rid of the tax now imposed upon the horses used in trade. He could not understand why the butcher or the baker should not be exempt as well as the farmer. This tax upon horses was an impost upon trade and industry, and, therefore, as farmers enjoyed an exemption from it, they ought to try all they possibly could to get it extended to those engaged in mercantile pursuits.

Mr. Read next referred to the discussion which took place upon what was called Sir Baldwin Leighton's "Police Poaching Bill." On that occasion he made a speech in the House of Commons which he was afterwards told was most illogical. He admitted that the Act had done a certain amount of good; and yet he voted against it. Now it was quite possible that a very bad law, if judiciously administered, might be productive of some good; and he was sure that the judicious management of the Act in the county of Norfolk, and the certain amount of good which had arisen out of it, were principally owing to their excellent chief constable. But it did not at all follow that the law itself was not bad, or that the objections which he took to the Bill when it was before the House did not now exist; in fact, those objections existed exactly as before. All the laws relating to assessment and to game were exactly the same now as they were then, and, therefore, as he out of Parliament opposed the measure, so he thought it his duty to follow the same course in the House. Mr. Read, explaining why he opposed it, said he would not dwell very long upon what was called the moral aspect of the question. In Parliament one heard a great deal said about the temptation it was to a poor man to snare a hare. He did not very much believe that sort of thing. A man knew very well that he had no more right to snare a hare than he had to rob a hen-roost; and that he was breaking the law of his country. Therefore there was not, he thought, very much temptation one way or the other. Poultry might now and then cause a little breeze between the farmer and his wife—for the cocks and the hens would eat the cake out of the manger from the fat bullocks, the turkeys burrow in the Barley stacks, and the geese invade the standing corn—yet a man and his wife are one, or were one until the "Married Women's Property Bill" was passed. But for all that a man and his wife in the main were one still, and it did not signify much into whose pocket the price of the poultry, &c., went. But ground game, Mr. Read maintained, was generally fed at the expense of other people—at the expense of one's neighbours or tenants. He would go further, and say that game did not pay for the protection it enjoyed. If a farmer had the shooting it was immediately assessed to the poor rates; if the shooting were kept by the owner it was not assessed. There was not a hen-roost in the country, he believed, but was assessed to the poor rate. In that district plantations he knew paid a nominal sum for the underwood which they contained; but, generally speaking, throughout the country plantations were exempt. But game was more than exempt. Where game existed in very large quantities upon a farm, it so deprecated its assessment that it threw a heavier burden on the rest of the ratepayers. Again, under this Act game had exceptionally unfair privileges. If a policeman found a suspicious looking man on the road at 5 in the morning with a bag in his possession containing a hare, the latter could be immediately confiscated, and the man without further trouble would be liable to conviction and punishment. But supposing it was a goose in the bag, that was all the difference. A prosecutor must first of all come forward and say he had lost the goose, and next that the goose was his; but nothing of that sort was required in the case of the game. Therefore, he said to the supporters of this measure, "If this be a good principle—and I won't say it is not—you ought to extend it to other kinds of property; and all people who at unreasonable hours of the night or early in the morning are found in possession of what may be called suspicious property, should be called upon to give an account of how they became possessed of it. The burden of proof that he came by it honestly should be with him." He had been asked whether he was not ashamed to go into the lobby as the only Conservative amongst a whole lot of Radicals to vote against the Bill. His reply was, that he was not exactly proud of his company; but he knew no party and he followed no leader when he thought that party and those leaders were opposing the true interests and welfare of the tenant-farmers of England.

Mr. I. B. Coaks, in proposing "The health of the Judges," reminded the tenant-farmers that there was an important body, called landlords. He was led to make that remark in consequence of what had fallen from Mr. Read, the tenant-farmer *par excellence*, and the most able representative of a class in the House of Commons. But that ability might sometimes be stretched a point too far. While admiring as an entirely independent man the tone and moderation of Mr. Read's remarks, Mr. Coaks thought the hon. member had not done bare justice to the landlord. Mr. Read suggested that the landlord should keep a good bull for the use of his tenant. No doubt that was an extremely popular proposition, and as it would not involve a very great cost, probably it was a boon which the landlord might confer with less inconvenience to himself than many others expected of him. But he demurred to the proposition that the hare had the same right of protection as the hen on the roost, and that policemen could and ought to stop a man who had a hen in his pocket with as much reason as a poacher who had a hare in his possession. The hon. member for South Norfolk had, Mr. Coaks thought, been a little illogical on this point. Mr. Read told them that he voted against the Bill, but that he approved of a great many things which the Bill had worked out.

Mr. Read remarked that he said it had done some good.

Mr. Coaks added that Mr. Read said he opposed the Bill because it did not embrace the right of a policeman to stop a man with a goose. That was not Mr. Coaks' logic. Because the Act did not go far enough in that respect it was no reason why it was not a good measure for enabling the administrators of the law to stop the man with the hare. What he would do was, extend the law rather than complain of it. As one connected with the administration of justice, he had not the slightest hesitation in declaring his opinion that the Act had been one of the wisest and most beneficial measures which had been put upon the statute book. Many who had troubled themselves to think at all on this question must agree with him that poaching was the first step to crime—it was the hare first and the goose afterwards. A law that would help to stop the career of crime by beginning with the hare was a beneficial one. It was pleasant to hear Mr. Read talking upon the interest of his class without putting it into collision with that of the landlord. At the North Walsham Association some remarks were made—to which he took entire exception—to the effect "that the Legislature had not dealt out a fair measure of justice to the tenant as distinguished from the landlord." That was a very grave and serious charge. Where could the landlord make many concessions? He was told that he would have to do so. That might be so. What rate of interest did the landlord get at the present moment upon the capital he had invested in land? Was it not almost property without income? Did he get more than 3, or at the most, 3¼ per cent. for his money? If, perchance, he had the misfortune to borrow, what was his experience? While he was making only 3 or 3¼ per cent. of his own money, he had to pay 4 per cent. for what he borrowed.

Sir E. Lacon: Five per cent.

Mr. Coaks thought it was a great mistake that tenant-farmers should be asked to believe that the landlords had the power of relieving the depression which now existed in agriculture. If the landlords were to surrender half their rents to the tenants, that would not, he believed, be equal to the great losses the agricultural interest had experienced in various ways. He held it to be uncommercial in spirit to expect that the landlord was to put his hand into his pocket to meet all shortcomings arising from circumstances over which he had no control. The proposition laid down by the speaker (Mr. Howard Taylor) at North Walsham was in effect that the Legislature had protected the landlords at their tenants' expense. That proposition he denied, and he challenged proof of it. He was astonished that such a statement should have been made without meeting with a reproof. Independent of the point of game, there were few points in which the tenant must allow himself to rely for help upon his landlord. As to the protection to tenants of which Mr. Read spoke, there was one custom of the country here, another in Suffolk, and another in Lincolnshire. Why had the Lincolnshire custom, which Mr. Read suggested should be introduced into Norfolk, not been adopted here? Because the lands of Lincolnshire were adapted to the custom which there existed, and the lands of Norfolk were suited to the custom which here prevails. In Suffolk, where there was heavier land, there was a different custom, for drainage and like things were preserved to the tenant on his eviction. In that part of Norfolk where drainage was not so necessary, and where improvements required to be renewed almost year by year, the wisdom of those who had long farmed the land had not set up a custom which preserved to them the rights and customs which were adapted to other districts. It was not, at all events, a complaint against the landlords that no such custom existed; and it was manifest that if an allowance had to be made to the outgoing tenant for unexhausted improvements, the landlord would simply ask the incoming tenant to repay him. It was, therefore, not a landlord's question at all—it was a simple question of requiring more capital. One of the greatest mistakes of the present day was, that men sought farms of 300 acres when they had only capital enough to cultivate a farm of 200 acres. Although he had not had much to do with farming, yet he had had much to do with farmers—and much of the distress and disappointment he had witnessed in the career of farming had arisen from a want of capital at the outset. That surely was a tenant-farmer's not a landlord's question. The Malt-tax Mr. Coaks held to be quite as much a landlord's question as a tenant's. So far as he had been able to understand that question, he held it to be due to the landed and to the farmer's interest that there should be a repeal of the Malt-tax. When protection fell the Malt-tax ought to have fallen also. Mr. Coaks concluded by saying that the spirit of the Legislature did not bear the interpretation put upon them by the speaker at North Walsham, and he could not allow this opportunity to pass without entering his protest against it.

Farm Memoranda.

Wester Ross: *Nov.* 2.—Another dry summer, and another short crop; but as this is the third dry summer in succession, we are getting accustomed to short straw, and think less about it than we did the first year. These dry years have been greatly more favourable to farmers occupying Wheat-growing farms than those whose farms are in the higher and later districts, and where Oats are principally grown; indeed, having been so dry, and with so much sunshine, they have been admirably suited for growing and maturing Wheat; and this year, although the winter and spring were so severe as to thin out very greatly the young plants, our Wheat is threshing out pretty satisfactorily. A very large breadth of Wheat is now being sown after grass, Potatos, and Turnips. A few years ago very little Wheat was sown after grass, but now nothing is more common than to see grass manured, seed-furrowed, and sown with Wheat. The weather for field labour is now all that could be desired. For some time the leas were too hard and dry; but of late we have had shower after shower so continuously, and yet in such moderation, that the soil has become well saturated while the work has been little interrupted. In the North we are doing what we can to make up for the lack of Wheat-sowing in France and Prussia, although the result of our labours may be scarcely appreciable. It might be the wiser course for France, having now satisfied the world of her manly endurance of a kicking when down, to accept of such terms as she can get, to arise from the dust, and set to securing her next year's crop. The Barley crop with us is about an average in grain, with a small supply of straw. The grain is not so fair as we anticipated, but weighs well, and fetches over 30*s.* per qr. Oats are once again the lightest crop. They are short, both in straw and in grain. In most fields there was a large number of black ears, and in some from a third to a fourth of the whole crop, which must seriously interfere with the yield. In all the higher districts, where Oats are almost the only cereal grown, these late years have told disastrously. Potatos are very abundant, and of the finest quality, but fetch a small price, and are in little demand. Never did our Turnips come away better than this year. The braird was quite regular, and after singling they started off most promisingly, but by-and-by they were overtaken by drought, and in the struggle became deadly pale. With these showers they have recovered, and regained their natural colour, but must now remain an inferior crop. On some deep soils they are about an

average, but on all the lighter soils and in some whole districts they are not more than half a crop. The earlier sowings of Wheat are coming aboveground, and grass is now fresher than it was some weeks ago. Stock of all kinds are so dear that there is little prospect of satisfactory remuneration for winter keep. *T.*

HAMPSHIRE: *November* 1.—The sowing season for Wheat having again arrived, it is satisfactory to know that a finer season has never been known for the preparation of the land for that crop, which, together with the abundant showers that have lately fallen, has rendered the seed-bed capable of producing a regular plant of Wheat.

The work of the farm is at present unusually forward, particularly where steam cultivation has been resorted to. Upon many farms the land intended for next year's root crop has been completely tilled, leaving little or nothing to be done in the spring months. The seeds of all kinds of fodder crops, such as Rye, Trifolium, Vetches, &c., have been got in well, and now exhibit an exceedingly even and promising appearance. Root crops, with the exception of Mangel, everywhere are deficient in plant, except some of the later sowings. All, however, are now growing rapidly, and more winter provision for cattle will be available than was expected: still, there cannot be an average amount of provender, which will, in consequence, require to be supplemented by oilcake, Maize, and various other substitutes. The hay crop was never known to be worse in this county, some important farms having little or none for use. This, will, no doubt, lead to and induce the severest economy of dry food for cattle. The year 1868 was a deficient season for roots, but the hay crop of that year was abundant and of good quality. The economy of feeding during that and some previous seasons, as a matter of policy, will this year have to be extended as a matter of necessity, and may eventually be the means of introducing into more general use the system of commingling straw chaff with other feeding stuffs, and prove the advantages of a plan whereby the straw may be turned to better account than rotting in huge heaps in the open fields.

The value of store sheep has gradually improved during the autumn, although the root crop is deficient. This is, however, to be accounted for by the short stock in the country, for the statistical returns, if they can be trusted, exhibit a decrease of over two millions during the last two years. There is also a large decrease in the number of pigs, but it is small in cow cattle, although these are less than last year's return. It is matter for serious complaint that we cannot obtain these returns earlier; at present we never get them until all the principal stock fairs are over, therefore they are useless to either buyers or sellers for that season. Foot-and-mouth disease still prevails in the county, and proves a serious impediment to fairs and auctions of horned cattle. The price of Wheat has rather improved lately, probably owing to the demand for seed, and the prospect of the future, in consequence of the destruction of crops and desolation going on in France, and it is likely that Wheat will pay better than money for keeping for some time to come. We still find the markets well supplied with Wheat, and the crop is still reported large and yielding well wherever there was a regular plant at harvest. It is a noticeable feature that most of the farms in high condition have withstood the effect of drought much better than land whereon the expenditure of oilcake and manures has been neglected. This view of the question finds a remarkable confirmation in the award of prizes for the best cultivated farms at the Oxford meeting of the Royal Agricultural Society, as the farms which showed the heaviest outlay in manures and feeding stuffs gave the best appearance in crops both of roots and grain. The last number of the "Journal of the Royal Agricultural Society" gives the report of the chemical committee on adulterated manures and feeding stuffs. This should be read by every farmer in the country, as it exhibits the inferior quality of both manures and cake sold to them in many instances. The analysis also, as given by Dr. Voelcker, the consulting chemist to the Society, is especially interesting to the inhabitants of towns, wherever they have sewage in large quantities to be disposed of; and knowing that many of the farmers and people in towns get no opportunity of perusing these articles in the Journal, the newspapers would confer a benefit by quoting from these reports, more particularly those numbered xxii. and xxxiii. in the last number just issued. *Joseph Blundell, Southampton.*

Miscellaneous.

MORAL PRIZES TO AGRICULTURAL LABOURERS.—What we have to regret is that in four or five associations features are retained against which the common sense of the country has long been convinced. At one meeting, we perceive, a prize is still given for "best attendance at church, and good conduct." Why should a man be paid half-a-crown for looking after his own salvation? Surely if there be any pursuit which should afford its own reward this is it. Another prize which would be well abolished is that which is given to married couples for "bringing up the largest family with no, or the least, parochial relief." This prize must often fall to a couple through mere accident. Providence has blessed them, say, with good health, strong children, a good employer, and plenty of work, while another couple have been obliged, through accident, sickness, want of work, or other cause beyond their control, to procure assistance from the parish, and are thus prevented from winning the prize, though they have made efforts quite as praiseworthy as the other couple, and stand in much greater need of the money. Is this fair as between families dwelling in the same neighbourhood? We think not. To reward a man, again, who has subscribed for the longest period to a benefit society, seems a very unkind thing to men who have never had the money to subscribe, or who, having subscribed, have had to withdraw it for some emergency. We commend these observations to those who have the management of Labourers' Friend Societies, and appeal to them whether it would not be wise to do what has been done at Roding—viz., abolish the "moral prizes" altogether. *Chelmsford Chronicle.*

Obituary.

THE death of Mr. ROBERT HOLMES, of Moycashel, Westmeath, is announced, of which the *Illustrated News* thus speaks:—Ireland has lost one of those early pioneers to whom she, as well as many English graziers, are greatly indebted for the goodness of their stock. It was a habit to call inferior-looking cattle "Irish bred," but the great improvement in the stock that has of late years been sent across the Channel is often the talk of the day. One of the earliest to foresee the want of good herds in Ireland was the late Mr. Robert Holmes, who has just passed away in his 68th year. Called to the Bar when a young man, he travelled much in England, and become a clever judge and breeder of racehorses, under Mr. John Scott's tuition. In company with two other Irish gentlemen, he visited the great Chilton sale of Shorthorns, in 1829, and purchased the Victoria and Britannia families, which he afterwards made famous. He also imported a large number of pure-bred cattle to his estate at Moycashel, in the county of Westmeath, and was the means of spreading not only good stock in his country but of encouraging young men to pay more attention to breeding. Nature endowed him with fine judgment, a marvellous memory, and an amiable disposition, and those who once knew him or heard his "eloquent discourse" rarely forgot him. One of his great stories was the purchase of Brown's heifers at £5 apiece after the Chilton sale, and the refusal of an inferior white heifer by MATCHEM, which Mr. Bates afterwards purchased and founded the "Oxford" tribe. In 1853 he gave up his herd, which averaged 60 gs., and was considered at that time a wonderful result. He married late in life, and, for the education of a large family, resided at Sydenham, where he died, beloved and respected by relatives and old friends.

—— We regret to announce the death of Mr. WILLIAM STANLEY PURDON, senior proprietor of the *Irish Farmers' Gazette*, which took place at his residence at Windy Arbour House, Dundrum, early on Saturday morning, the 29th ult.

The Week's Work.

NOVEMBER 12.—*Martinmas* is the winter term in Scotland when farms are entered, servants engaged for the winter half-year, and when the books are balanced. Old style, however (November 22), is generally kept. Formerly it was a quarterly term in England, but it has long since given place to Michaelmas. In the olden time the killing of oxen and salting of beef at this season was universal, not only in England, but throughout the whole of Northern Europe. The term "mart," or "mairt," a fat beeve, familiar in Scotland and the North of England, is derived from the practice of Martinmas slaughtering. Tusser alludes to it thus in his "Husbandry:"—

> "When Easter comes, who knows not than
> That veal and bacon is the man;
> And Martinmas beef doth bear good tack,
> When country folks do dainties lack."

Manure, Economy of.—The old plan, still common, is to mix the daily cleanings from the stables, cow-houses, and stalls for fatting bullocks and young stock, in the strawyard, where the older store cattle are kept. Under this system, the liquid which flowed from the yards in wet weather, and the drainings from the housed stock were conveyed either into a tank for application to the land in a liquid form, or on to earth in a pit for making compost. Most farmers have both a liquid manure tank and a compost pit. The liquid from cattle fed in boxes or sheds is wholly absorbed in the manure. Under this mixed system there is a great waste of manure both from the housed stock and the yards, with the exception of the feeding boxes and sheds; and the two exceptions, more especially the latter (sheds), are often attended with much waste from being unequally trodden and mixed with the droppings of the cattle, so that decomposition sets in unequally. Where cattle have sheds to go under, for example, they leave much of their droppings outside, so that what is inside is often poor—fire-fanging taking place less or more all round the walls, in the corners and under racks, &c. The same takes place in feeding-boxes, where the mixing of the droppings and wetted litter are neglected to be mixed equally all over the box, and trampled hard at the sides and corners with the foot, where the fatting bullock cannot tread it down.

A Covered Homestead is to be preferred to open yards, under proper ventilation and management, there being a threefold economy in favour of the former. Thus there is (1) a saving of food, (2) stock thrive better, and (3) there is no waste of manure. But the mere covering of a homestead will not of itself effect such results; on the contrary, it requires increased skill and labour under each of the above heads before the threefold economy can be effected; more attention requires to be paid to the preparation of food, the health of cattle, and the management of the manure, so as to have it of uniform quality, and free from waste and noxious gases. A sprinkling of dry earth, on the principle of the earth-closet system, is the best deodoriser, but unless the manure in the feeding-boxes and covered yards is properly mixed, the different kinds together, and the wet with the dry, and all uniformly consolidated, there will be a waste of both dry earth and manure.

The Stable.—Farm-horses keep in healthy working condition. Some begin about this time to reduce the allowance of corn for the winter months, but the practice is based upon old notions out of date; for by starting early and working late the horses can do nearly as much work in winter as in summer, whether ploughing or carting. Many farm-stables are dirty, badly lighted and ventilated, and horses suffer much during the long night's confinement in such places: the smell when they are entered in the morning is enough to kill a dog, so to speak.

North Country Flocks.—As the weather becomes colder flocks require more food and shelter, also in stormy weather, if practicable—shelter being equivalent to so much food. In the lowlands of Scotland, and northern counties of England, the rams are taken from the ewes from the middle to the latter end of the month. But some defer putting the rams to Blackfaced ewes intended to lamb in the more elevated walks until the end of the month or beginning of December. In the less elevated districts and moorland walks of the lowlands of Scotland and England the bathing or smearing of Blackfaced and Cheviot flocks, which remain on them all the winter, is finished. In such walks the heather, and some of the mountain grasses, are now in their prime, supplying an abundance of keep, not only relished by sheep, but also by the small neat cattle of such districts; so that in open weather stock do well. But the change from sunshine to storm is often rapid, so that what stock gain one week they are apt to lose the next, unless the run affords shelter, Gorse, &c.

Gorse comes into use when the grasses fail. When properly bruised it makes an excellent diet for milch cows, ewes, and lambs, and Gorse should be more extensively grown for both these purposes. Sheep also browse the plant greedily, and therefore it should be grown more largely on mountain walks both for shelter and food. If a man can cut as much in a day as will supply 16 cows, and if an acre and a half will yield this supply for a month, it is easy to calculate the value of an acre in comparison with grass or any other crop. The calculation thus made is at the rate of 3 bush. of bruised Gorse to each cow daily, with 2 bush., and roots of some kind, an acre would serve the 16 cows six weeks, and so on.

Fatting Stock, as they take to their winter food, will bear a little forcing. The expression will not perhaps be relished by some, any more than the practice itself, but successful experience has long ago proved to farmers that unless their bullocks and sheep begin to lay on carcase weight fast about this time, it will not pay; hence the practical rule, "Start your beef and mutton manufactories into full play in November." To have animals in the full enjoyment of the highest degree of health on winter food, is a totally different thing from gross obesity. The latter should be carefully avoided. *W. B.*

Notices to Correspondents.

AUSTRALIAN MEAT: *C. P.* Lb. for lb. we should greatly prefer the bacon, but £ for £, probably, in Australian meat you would find the most nourishment.

BOVINIA POTATO: *C. P.* We understand it to be one of Paterson's Seedlings.

CECIDOMYIA TRITICI: *J. Slater & Co.* The Wheat-fly (Cecidomyia Tritici) appears about June 21, when the Wheat is beginning to show its young ears. The eggs are laid—from two to ten—in the glumes of the florets of the grain; the grubs are hatched therefrom in about seven days. The food of the young grub is the pollen of the anthers. On this it feeds for three weeks or a month. Then it burrows into the ground to the depth of half an inch, and there remains in the pupa state till the following year. The fly is small, like a gnat, of an orange colour, the wings being rounded at the tip, and fringed with hairs. The female is furnished with a retractile ovipositor, four times as long as her body, and as fine as a hair, for depositing her eggs, at the base of the inner chaff-scales. The eggs are laid after sunset.

GRASS LANDS: *T. S. P.* sent us last year a letter, in which he said:—"I have bought a small place of 9½ acres round a house, half of which is covered with Furze and Heather, having been common-land enclosed, lying on the lower Bagshot sands, in Hampshire, there-

fore poor, light, sandy, gravelly soil. I am desirous of bringing some 3 acres of this into grass (if possible), and I am not quite satisfied that I am pursuing a right course; will you be good enough to advise me? Part I have trenched 2 feet deep, burying the surface that depth, and taking out the roots of the large Furze bushes; the rest I am paring and burning, and intend to collect the ashes into large heaps, and cover them with earth for the winter, and then trench the remainder; and in April sow grass and Clover seeds with these ashes." Will he be good enough to state what his further experience has been? Bone dust and the sheep fold are the things to bring fertility to poor, sandy soils.

HORSE KEEP: *R. W.* asks:—"Now that hay is so dear, could any of your correspondents inform me what would be the proper amount of food for a horse in moderate work per day? I propose to give my horses (hacks and harness horses) a mixture of chopped hay and straw, mixed with Oats and Indian Corn. And I should be glad to know what would be considered a sufficient quantity of this mixture for each of them per day."

TRIFOLIUM INCARNATUM: *A. H. F.* says:—"I have sown 12 acres of Oat stubble with it, about 35 lb. per acre, on a thin soil of a hill, looking south. Will it make hay? Why not let it stand more than one season, since the practice, I am told, is to break it up for Swedes or Rape? (It has never been sown in this district before.) What tonnage of hay per acre will it yield? as it may lose so in weight as to be more profitable as a green food." [It will make a coarse hay—cut it before it is full blown. A good crop should make 40 to 50 cwt. of hay per acre. It is an annual, and will not yield a second crop.]

Markets.

HOPS.

BOROUGH MARKET, Nov. 10.

Messrs. Pattenden & Smith report a steady retail demand for consumption for all healthy grown samples, prices being nominally unchanged. Inferior sorts command scarcely any attention.

MARK LANE.

MONDAY, Nov. 7.

There was a very short supply of Wheat from Essex and Kent to this morning's market, much of which was in poor condition; good dry parcels were sold at the prices of this day se'nnight, but those out of condition and inferior were 1*s.* per qr. cheaper. The market was well attended, but few transactions took place in foreign, at unaltered prices. Barley was very slow, and secondary qualities of malting rather cheaper. Beans and Peas were unchanged in value. The Oat trade was quiet, at last Monday's rates. Flour rather easier.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	45	54	Red	42	54
— — fine selected runs..do.	49	57	Red	46	55
— — Talavera	50	60			
— — Norfolk			Red	—	
— — Foreign	41	63			
BARLEY, grind. & dist., 29*s* to 33*s*.	Chev.	42	Malting	36	41
— Foreign .. grinding and distilling	25	33	Malting	33	40
OATS, Essex and Suffolk	25	27			
— Scotch and Lincolnshire	Potato	27	Feed	—	
— Irish	Potato	26	Feed	24	27
— Foreign	Poland and Brew	24	Feed	19	24
RYE		32	Foreign	33	36
RYE-MEAL, Foreign					
BEANS, Mazagan	43*s*. to 47*s*.	Tick	49	50	
— Pigeon	51*s*. to 59*s*.	Winds.	—		
— Foreign	Small	45	Egyptian	42	44
PEAS, White, Essex, and Kent	Boilers	38	Suffolk	40	42
— Maple, 40*s*. to 44*s*.	Grey	36	Foreign	36	40
MAIZE			Foreign	29	31
FLOUR, best marks delivered, per sack		39	47		
— 2d ditto	ditto	32	44	Country	32	44
— Foreign	per barrel	25	28	Per sack	36	62

WEDNESDAY, Nov. 9.

There was a small show of English Wheat on sale here to-day, the fresh arrivals having been insignificant; the supply of foreign, however, was large. In all descriptions sales progressed slowly, and only a moderate quantity of produce changed hands; nevertheless, Monday's prices were maintained for both English and foreign descriptions. The Barley trade ruled firm; choice malting sorts were scarce, and fetched very full prices. Oats were dull, but without quotable change in value; the supplies were large. Maize was unaltered in value. Beans and Peas changed hands quietly on former terms. Town-made Flour was unaltered in price, while foreign and country marks supported late rates.

ARRIVALS OF GRAIN, &C., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 590	Qrs. 1690	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	7740	5500	36,270	160 10,050 brls.
	8330	7190	36,270	

HULL, Nov. 8.—At our market to-day there was a short supply of English Wheat, which met a limited demand at about 1*s*. per qr. below the prices of last week. In foreign very little done, at a similar reduction. English white, 53*s*. to 55*s*. per qr.; red, 50*s*. to 52*s*.; Dantzic and Konigsberg white, 52*s*. to 54*s*.; mixed, 47*s*. to 49*s*.; Danish and Hamburgh, 46*s*. to 48*s*.; Baltic red, 45*s*. to 47*s*.; Grinding Barley met a fair sale, at full prices. Oats in retail demand, at late rates. Beans and Peas were each in active request, and fully as dear as last week. In Linseed a fair business was done, at a slight advance.

AVERAGES.

	Wheat.	Barley.	Oats.
Oct 1	46*s* 1*d*	36*s* 7*d*	22*s* 8*d*
— 8	46 5	36 11	21 11
— 15	47 0	36 7	22 5
— 22	47 3	36 5	22 2
— 29	48 6	36 9	22 4
Nov. 5 .. .	49 9	36 8	22 7
Average ..	47 6	36 7	22 4

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Nov. 10.

Prime Meadow Hay	130*s*. to 140*s*.	Clover, old	130*s*. to 140*s*.
Inferior do.	110 120	Inferior do.	115 125
New Hay	— —	Prime 2d cut do. ..	120 130
Inferior do.	— —	Inferior do.	105 115
Straw	30 34		

CUMBERLAND MARKET, Thursday, Nov. 10.

Sup. Meadow Hay	132*s*. to 140*s*.	Inferior Clover ..	120*s*. to 128*s*.
Inferior do.	115 124	Prime 2d cut do. ..	— —
New do.	— —	New do.	— —
Inferior do.	— —	Straw	36 40
Superior Clover ..	136 147		JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Nov. 7.

The number of Beasts is very small, and there are very few choice qualities; prices are higher for all descriptions, and an early clearance is effected. The supply of Sheep is about the same as last Monday; the demand has increased, and prices have advanced a little. The very few choice Calves on offer are dearer. Our foreign supply consists of 1165 Beasts, 7650 Sheep, 290 Calves, and 300 Pigs; from Scotland there are 155 Beasts; from Ireland, 400; from Norfolk and Suffolk, 20; and 1035 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5 8	6 0	Best Long-wools	5 8	6 0
Best Shorthorns ..	5 6	5 8	Do. Shorn	— —	— —
2d quality Beasts	3 8	4 4	Ewes & 2d quality	4 8	5 0
Best Downs and Half-breds ..	5 10	6 4	Do. Shorn	— —	— —
Do. Shorn	— —		Lambs	— —	— —
			Calves	4 0	6 4
			Pigs	4 0	6 0

Beasts, 2775; Sheep and Lambs, 16,640; Calves, 320; Pigs, 400.

THURSDAY, Nov. 10.

The supply of Beasts is not so large as last week, and there is no improvement in quality; prices are not altered, but several of the lowest descriptions remain unsold. There are a few more Sheep, but the average quality is very inferior. There is very little business doing; we cannot, however, quote lower than Monday. Trade is not so brisk for Calves, and prices are rather lower. Our foreign supply consists of 460 Beasts, 3130 Sheep, 245 Calves, and 140 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5 8	6 0	Best Long-wools	5 8	6 0
Best Shorthorns ..	5 6	5 8	Do. Shorn	— —	— —
2d quality Beasts	3 8	4 4	Ewes & 2d quality	4 8	5 0
Best Downs and Half-breds ..	5 10	6 4	Do. Shorn	— —	— —
Do. Shorn	— —		Lambs	— —	— —
			Calves	4 0	6 4
			Pigs	4 0	6 0

Beasts, 830; Sheep and Lambs, 6780; Calves, 335; Pigs, 150.

METROPOLITAN MEAT MARKET.—*Nov.* 10.

Best Fresh Butter .. .. .. 20*s*. per dozen lb.
Second do. do. .. .. .. 18*s*. ,,
Small Pork, 5*s*. 4*d*. to 5*s*. 10*d*.; Large Pork, 3*s*. 8*d*. to 4*s*. 8*d*. per 8 lb.

COALS.—*Nov.* 9.

Holywell Main, 17*s*. 3*d*.; West Hartley, 16*s*. 9*d*.; West Wylam, 17*s*. 3*d*.; Walbottle Hartley, 15*s*.; Walls End Harton, 17*s*.; Walls End Braddyll's Hetton, 17*s*. 9*d*.; Walls End Hetton, 18*s*. 9*d*.; Walls End Hawthorn, 16*s*. 9*d*.; Walls End South Hetton, 18*s*. 6*d*.; Walls End Hartlepool, 18*s*.; Walls End Kelloe, 17*s*. 6*d*.; Walls End East Hartlepool, 18*s*. 3*d*.; Walls End South Kelloe, 18*s*.; Walls End Tees, 18*s*. 6*d*.—Ships at market, 32; sold, 24; unsold, 8; at sea, 30.

SEED MARKET.

Clover seed now begins to attract increased attention; the stocks of old and yearling seed are without doubt very light, and no great quantity of new seed is yet offering. Some few parcels of new American red Clover seed have recently arrived, and have been on sale at moderate prices. As France and Germany will be out of the market this season (neither country having any seed to send us), it is probable that the United States will be our chief source of supply. New home-grown reds being in limited supply, command high rates. Trefoil is without alteration. There has been some speculation in Alsike and white Clover seeds; prices of these descriptions are tending upwards. Very little new French Italian is now offering from the other side, and values are consequently hardening. Rye-grasses are exceedingly firm. In bird seeds we have no change to report. White Mustard seed continues steady. For Rape seed we have an improved demand, at enhanced currencies. Feeding Linseed is in better request. Windsor and Longpod Beans move off at last week's quotation. For Haricot Beans and boiling Peas we have a ready sale. There is now scarcely any inquiry for winter Tares.

JOHN SHAW & SONS, Seed Merchants,
16, Water Lane, London, E.C.

ENGLISH WOOL.

Notwithstanding the rupture of the negotiations for an armistice, holders keep very firm; and although this state of affairs naturally restricts business, still there are no signs of any probability of giving way, and the lower grades, if anything, are rather more in demand.

GREEN'S PATENT IMPROVED TUBULAR HOT WATER BOILERS

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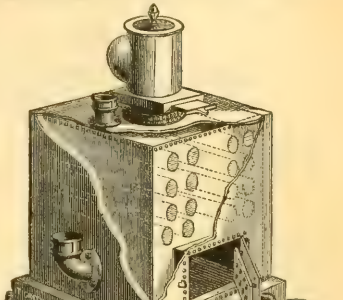

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3. They take up little room, and can be put in places inaccessible to other boilers.
4 They are great economisers of fuel, owing to the large amount of heating surface upon which the fire acts in a direct manner
5 Any number of flows and returns can be annexed to the boilers by means of T pipes.
6 By means of mud doors they can be readily cleaned out when required.
7 The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation they may be fixed in
8 They are fed from the top, so that the fire can be banked up to last from 15 to 20 hours when required, without being attended to.
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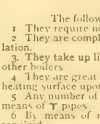

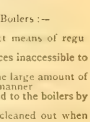

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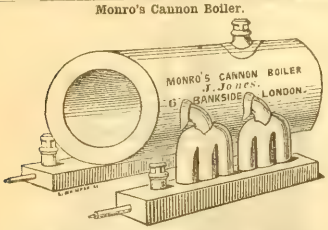

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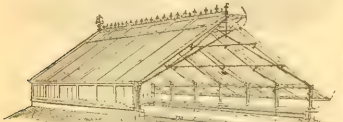

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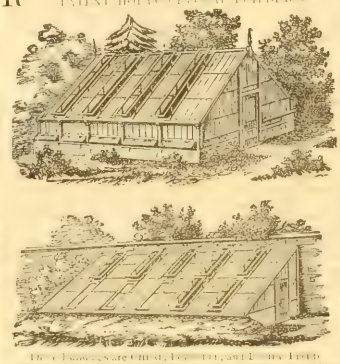

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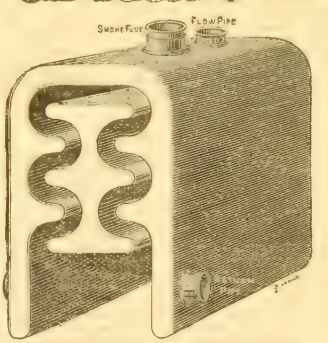

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The whole in very great quantity and stout vigorous condition, with fine roots, for safe removal.

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JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

The "Newton" Nurseries are within 10 minutes' walk, by the new road over Flookersbrook Bridge, from the Railway Station.

EASTES' KENTISH INVICTA PEA.

MESSRS. JAS. S. EASTES & CO.

TAKE LEAVE TO ANNOUNCE

THAT THEY ARE IN A POSITION TO OFFER THE ABOVE IMPORTANT PEA TO THE PUBLIC.

The "KENTISH INVICTA PEA" was raised by a well-known Kentish raiser of new Peas, in the year 1867, and passed into Messrs. EASTES' hands in the spring of 1868; and knowing the importance of thoroughly testing the properties of a new Pea before submitting it to the public, they have carefully grown it each year in their trial grounds, and have also had it tested in the trial grounds of some of the leading Seed Merchants, and the result in every instance has been the same, proving the "KENTISH INVICTA" to be the quickest and earliest *Blue* Pea ever introduced.

EASTES' KENTISH INVICTA PEA is a round Blue Pea, about "two feet" in height, with straight, handsome, well filled pods; is earlier than the best stocks of Daniel O'Rourke, and Dickson's First and Best, whilst the fact of its being a "Blue" Pea proclaims it to be infinitely superior in flavour to any White Pea in cultivation.

ASHFORD, KENT.—Oct. 29, 1870.

Editorial Communications should be addressed to "The Editor:" Advertisements and Business Letters to "The Publisher," at the Office, 41, Wellington Street, Covent Garden, London, W.C.

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THE GARDENERS' CHRONICLE

AND

AGRICULTURAL GAZETTE.

No. 47.—1870.] SATURDAY, NOVEMBER 19. { Registered at the General Post Office as a Newspaper. } Price 5d. POST FREE, 5½d.

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Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE.—FULL PRICE will be given at the Office for Clean Copies of No 5, January 29, 1870.
Office, 41, Wellington Street, Strand, W.C.

NOTICE to SUBSCRIBERS.—On and after this date the SUBSCRIPTION to the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE will be £1 3s. 10d. for 12 months, including postage, instead of £1 6s, as heretofore
May be had of all Booksellers.
Published by W. RICHARDS, 41, Wellington Street, Strand, W.C.
October 1, 1870

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
The dates of MEETINGS during 1871, are—

WEDNESDAYS.		
January 18.	May 3 and 17	September 6 and 20
February 15	June 7 and 21	October 4.
March 1 and 15.	July 5 and 19	November 1.
April 5 and 19.	August 2 and 16.	December 6.

GREAT SHOW at NOTTINGHAM, June 13 to 17 inclusive
Schedules of Prizes for the Meetings, can be had on application to JAMES RICHARDS, Royal Horticultural Society, South Kensington, W

ROYAL BOTANIC SOCIETY, REGENT'S PARK.—The days fixed for the EXHIBITIONS in the GARDENS next season are:—
SPRING FLOWERS.
WEDNESDAYS and THURSDAYS - March 22, 23; April 12, 13
SUMMER EXHIBITIONS.
THURSDAY and FRIDAY, May 25, 26.
WEDNESDAY and THURSDAY, June 14, 15.
WEDNESDAY and THURSDAY, July 12, 13
By order of the Council, W. SOWERBY, Secretary

To Nurserymen, Contractors, and Others.

THE METROPOLITAN BOARD OF WORKS hereby give notice that they are prepared to RECEIVE TENDERS for the Execution of the several Works connected with the Pleasure and Flower-gardening-out of the open spaces on the Albert Embankment, and the Planting of a Line of Trees along the Embankment, in accordance with Plans and Specifications, which may be seen on application to Mr. J. W. BAZALGETTE, Engineer of the Board, at the Office, Spring Gardens, between the hours of 9 A.M. and 4 P.M.; or on Saturdays between the hours of 9 A.M. and 2 P.M.
Tenders, sealed and endorsed "Tender for Planting the Albert Embankment, &c." must be addressed to the Clerk and delivered at this Office not later than 4 o'clock on Monday the 21st November inst
JOHN POLAND, Clerk of the Board.
Spring Gardens, S.W.—November 11, 1870.

VINES, VINES, now ready for planting out. Descriptive CATALOGUES post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

Vines.

B. S. WILLIAMS has this season a splendid STOCK of all the best and newest kinds Priced LIST on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N

Vines, Vines.

THORNTON has much pleasure in offering all the leading varieties of well-grown VINES, from eyes, grown and ripened without fire-heat.
Heatherside Nurseries, Bagshot, Surrey.

EXTRA STRONG FRUITING VINES. Two Thousand close-jointed, thoroughly ripened Canes, can be supplied, of the leading varieties, for fruiting in pots, and for planting Descriptive CATALOGUE upon application.
JAMES DICKSON and SONS, Newton Nurseries, Chester.

Vines, from Eyes.

JOHN BELL has a large stock of strong Planting and Fruiting VINES, of all the leading kinds, 3s. 6d., 5s., and 7s. 6d. each. Price to the Trade on application.—The Norwich Nursery Seed Warehouse, 10 and 11, Exchange Street, Norwich.

GRAPES FIRST YEAR.—Rods 10 feet long and upwards, will carry from 12 to 18 bunches, from 5s. to 10s 6d each, prepared without heat, and acknowledged to be the finest Canes in the kingdom.
RANSLEY THORNTON, F.R.H.S., The Nurseries, Epsom.

Carnations, Picotees, and Pinks.

CHARLES TURNER can supply, from his extensive Collection, strong plants of all the classes of the above CATALOGUES on application The Royal Nurseries, Slough

JOHN FRASER, of the Lea Bridge Road Nurseries, E., begs to announce that he can now offer unusually fine healthy Plants of TREE CARNATIONS, and many varieties of Winter-flowering HEATHS, in large quantities. It may be remarked that Heaths are well adapted for the decoration of the dinner-table.
Prices on application

Carnations, Picotees, and Pinks.

JOHN BESWICK, FLORIST, Chadderton, near Manchester, can supply a fine Collection of the above in the best named Show varieties. Prices on application. The Trade supplied.

Carnations, Picotees, and Pinks.

J. BOOTH, FLORIST, Pole Lane, Failsworth, near Manchester, is now offering the above, in all the best named show varieties. Trade supplied. CATALOGUES now ready.

CALCEOLARIAS, Herbaceous, of very choice strain; nice healthy plants, pricked over out of pans, free by post, 25 for 4s., 50 for 7s. 6d., 100 for 14s. Trade price on application per 100 or 1000
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster

Pelargoniums for the Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices:—100 plants, distinct sorts, for 5s.; 50 plants for 3s.; or 25 plants, distinct sorts, for 2s. Package included.
Crown Nursery, Reading.

LILIUM AURATUM (English-grown roots) can be supplied by the dozen, hundred, or thousand, at
Mr WILLIAM BULL'S Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

To the Seed Trade.

STUART AND CO.'S Wholesale CATALOGUE of CHOICE FLOWER SEEDS, on application, including select strains of Primula, Carnation, Cineraria, Zinnia, &c., and the leading novelties of the season 5, Tavistock Row, Covent Garden, W.C.

WEBB'S NEW GIANT POLYANTHUS, Floral Flower, and GEM of COWSLIP SEEDS; also Plants of all the varieties, with Double PRIMROSES of different colours; AURICULAS, both Single and Double; with every sort of Early Spring Flowers. LIST on application.—W. WEBB, Calcot, Reading.

WEBB'S PRIZE COB FILBERTS, and other PRIZE COB NUTS and FILBERTS. LISTS of these varieties from Mr WEBB, Calcot, Reading.

To the Trade.

FRUIT TREE STOCKS, CHERRY, CRAB, PEAR
Strong, transplanted, and extra strong. Prices upon application
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

To Landowners, Nurserymen, and Seed Merchants.

FOR SALE, ACORNS, QUERCUS COCCINEA (the true scarlet Oak), grows wonderfully in gravel ground, gives a large income, and is a real treasure for heaths and other unproductive land.
Mr. HASTIER, 6, Water Street, New Bridge Street, London, E.C.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply the following for cash.—Line Forcing SEAKALE, 10s per 100; second size, 5s; third size, 3s. ASPARAGUS, 3 years old, 3s. per 100; 2 years, 2s.; cheaper per 1000. RED DUTCH CABBAGE Plants, 5s per 1000; and LAST HAM and DWARF YORK plants, 3s 6d p 1000

Asparagus Plants for Forcing.

J. SANDY AND SON, The Nurseries, Stafford, have some thousands, extra strong roots, price 25s per 1000 Cash with order

To the Trade.

ASPARAGUS ROOTS.—100,000 3-yr. Asparagus Roots; also a quantity of old Roots for Forcing. To be Sold Cheap, in consequence of having to give up possession of the land.
GEORGE WINFIELD, Gloucestershire Seed Warehouse, Gloucester

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

SUTTONS' GUINEA COLLECTION of FLOWER ROOTS, for Indoor and Outdoor Cultivation, forwarded carriage free by rail In ordering, please say whether for indoors or outdoors
SUTTON AND SONS, Importers, Reading, Berks

The Successful Cultivation of Hyacinths.—See SUTTONS' AUTUMN CATALOGUE for 1870, which may be had gratis and post free on application.
SUTTON AND SONS, The Royal Seedsmen, Reading, Berkes.

Suttons' Fresh Imported Flower Roots, Carriage Free.

SUTTONS' AUTUMN CATALOGUE for 1870 is now ready, and may be had gratis and post free.
SUTTON AND SONS, Importers, Reading, Berks.

WANTED, about 10,000 MANETTI STOCKS, suitable for spring working. Address, stating cash price, to MANETTI, Mr. Dickson's Centre Avenue, Covent Garden Market.

To Plant Growers.

WANTED, 200,000 Autumn-sown ENFIELD CABBAGE PLANTS, true. Apply, stating price per 1000, to G. WILKINSON, Skirbeck, Boston, Lincolnshire

WANTED, One PICEA AMABILIS, One PSEUDO-LARIX KÆMPFERI, One SCIADOPITYS VERTICILLATA—specimen or half specimen plants, with decided leads and in good order for removal. State price, height, &c.; and whether grafted or seedling, to
GARDENER, Pampesford Hall, Cambridge

WANTED, Standard HAZEL PEARS, 4 to 5 feet stem State quantity and price to
THOMAS IMRIE AND SONS, Nurserymen and Seedsmen, Ayr.

Garden and Flower Seed Drawers.

WANTED, a Set of above, in good order. Apply, stating price, to
A.H., Messrs. W. H. Smith & Son, 85, Mid-Abbey Street, Dublin.

EVERY GARDEN REQUISITE KEPT in STOCK at CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

CARTER'S BULBS and SEEDS, carriage free. See page 1531 of this week's *Gardeners' Chronicle*

To the Trade.

CARTER'S LIST of FLORAL and VEGETABLE NOVELTIES for 1871 is now ready, and may be had on application
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

New Rhododendron, the Crown Prince.

JOHN WATERER AND SONS have great pleasure in introducing this really magnificent variety. Its colour it is a very clear bright rose, having an immense yellow blotch, of great substance, immense flower, and of most excellent habit. Good plants 21s each The American Nursery, Bagshot, Surrey.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 56 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

EVERGREEN OAKS.—A large quantity of fine transplanted Evergreen Oaks, from 2 to 2½ feet, for SALE, nice healthy stuff, well rooted, and will move well
Apply to the GARDENER, Surrenden, Plackley, Kent.

STRONG Transplanted LARCH, OAK, SPRUCE, SYCAMORE, BIRCH, ELM, ALDER, HORSE CHESTNUT; also large HOLLIES and YEWS, 5 to 7 feet, 3 to 5 feet through, several times removed Prices on application to
J. HUDDART, Farrington Hall Nursery, Ribbleton, Preston.

STRONG Transplanted LARCH, SCOTCH, SPRUCE, and FIRS, AUSTRIACA, POPLAR, LIME, OAK, ALDER, THORNS, PRIVET, and BEECH We have an immense stock of the above Gentlemen requiring will be liberally treated.
JOSEPH TREMBLE AND SONS, Penrith

To Cultivators of New Roses.

THE Administration of the Horticultural Establishment of Ringelheim, Hanover, Germany, earnestly requests all Cultivators of NEW ROSES, to send their CATALOGUES, or special offers of Novelties, either direct to them, or to their Representatives, Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

To the Trade.

STANDARD ROSES, extra fine, £3 10s. per 100; Dwarf, on Manetti, fine, £2 per 100.
W JACKSON, Blakedown Nursery, Kidderminster

STANDARD ROSES.—All the leading sorts, 15s. per dozen. DWARF ROSES, all the leading sorts, 6s. per dozen. DESCRIPTIVE LIST sent free on application.
HUSSEY AND SON, Mile End Nursery, Norwich.

CHOICE ROSES.—The finest stock of Tea, Noisette, China, and other Roses to select from, all strong and healthy, in Pots Descriptive Priced LIST on application to
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Roses.

CHARLES TURNER'S Descriptive and Priced CATALOGUE of ROSES is now ready.
It also contains full LISTS of FRUIT TREES, SHRUBS, CONIFERÆ, &c., and will be had post free on application.
The Royal Nurseries, Slough

Francis & Co.'s Catalogue of Roses.

E. P. FRANCIS AND CO.'S New Edition of the above is published, and will be sent gratis on application. Their stock, both of STANDARDS and DWARFS, is very superior.
The Rose Nurseries, Hereford, Herts.

HALF SPECIMEN TEA-SCENTED ROSES, established in 6 inch pots, for forcing, exhibition, or greenhouse culture Extra fine plants, 24s. to 30s per dozen, in large quantities.
WM WOOD AND SON, The Nurseries, Maresfield, near Uckfield, Sussex

Fruit Trees, Roses, &c.

B. S. WILLIAMS can supply all the best kinds, true to name and in good condition; fine fruit-bearing Trees, on French Paradise Stock, trained as Cordons FOREST and ORNAMENTAL TREES of every description. Priced LIST on application.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

RICHARD SMITH'S ROSE LIST, containing all the leading and most popular kinds of Roses, may be had free by post.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their Synonyms, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

Strawberries.

CHARLES TURNER can still supply strong Plants from the ground, and in small pots, to insure a crop of fruit next season, of the leading kinds
The Royal Nurseries, Slough

Mulberries, Mulberries.

PONSFORD AND SON offer MULBERRIES by the dozen or 100
Longhborough Park Nurseries, Brixton, S.W.

FOR SALE, a dozen large ORANGE TREES, from 8 to 10 feet high, in tubs, ready for removal. Can be removed now, or in spring next. Inquire of
Mr. JARMAN, Gardener, Wherstead Park, Ipswich

ORCHARD HOUSE TREES, Fruiting in Pots.—Peaches, Nectarines, Plums, Pears, Apples, Figs, Apricots, Cherries, Mulberries, and Oranges.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5s per 1000; also Drumhead or Cattle Cabbage Plants at 3s. 6d. per 1000, can now be supplied by
W VIRGO AND SON, Wonersh Nursery, near Guildford.

FOR SALE, BOVINIA POTATOS.
Apply to
H. W. BRIDPORT, Market Gardener, Nursling, Hants.

SEED POTATOS for SALE.—About 10 tons Early Shaws.—Apply to the Grower,
A. STYLES, Stone, near Greenhithe, Kent.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash :—

GOLDEN TRICOLORS—Lady Cullum, 2s 6d ; Mrs. Pollock, 2s ; Sophia Dumaresque, 2s 6d. SILVER TRICOLORS—Caroline Longfield, 6s ; Italia Unita, 2s 6d. GOLD and BRONZE ZONALS—Black Knight, 6s ; Cleopatra, 5s ; Duke of Edinburgh, 4s ; F. G. Henderson, 2s 6d ; Her Majesty, 3s 6d ; Luminator, 6s ; Painted Lady, 2s 6d ; Princess of Wales, 4s ; Stanstead Beauty, 6s. DOUBLE-FLOWERED Capitaine L'Hermite, 3s 6d ; Madame Lemoine, 2s 6d ; Madame Rose Charmereau, 3s 6d ; Triomphe, 2s 6d. A Priced LIST of 200 varieties post free.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

New Soft Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready. It contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest prices consistent with quality and correctness. See List, and present quotations.

New Florist's Flower and Florist's Flower Seed Merchant, Woolwich.

Winter and Spring Flowering Plants

FRANCIS & ARTHUR DICKSON & SONS have a magnificent stock of the above, in fine, strong, healthy plants, including ACACIAS, AZALEAS, CAMELLIAS, CARNATIONS (Tree), CYCLAMEN, CYTISUS, EPACRIS, ERICAS, LILY of the VALLEY (imported clumps), SPIRÆA JAPONICA (ditto ditto), VIOLETS, &c. Also a splendid Collection of Plants suitable for Table Decoration, including Palms, &c. For prices and particulars, see General PLANT CATALOGUE, which will be sent free per post on application.

"Upton" Nurseries, Chester

Cheap Conifers.

A. VAN GEERT, NURSERYMAN, Ghent, Belgium, has much pleasure in offering the following CONIFERS at reduced prices, of which the carriage will be paid to London or Goole, charging 5s. per package :—

ABIES NORDMANNIANA, fine stuff, 1 foot high, £5 per 100.
" PINSAPO, strong plants, 1½ to 2 feet, £5 per 100.
CRYPTOMERIA ELEGANS, in small pots, 42s. per 100.
JUNIPERUS MASSONIANA, in small pots, 6 inches high, £30 per 100
THUJOPSIS DOLOBRATA, in pots, 63s per 100
WELLINGTONIA ERICOIDES, fine plants, 25s per 100.
GINGKO BILOBA, fine, 30s. per 100.
BIOTA AUREA, 1 foot, fine plants, 65s per 100
" ELEGANTISSIMA, in small pots, 42s per 100
THUIA ELLWANGERIANA (Tom Thumb), fine plants, 1 foot high, 63s per 100
RETINOSPORA PISIFERA AUREA, in small pots, 35s. per 100

Notice.

H. LANE AND SON'S Descriptive CATALOGUE can be had free by post on application. It contains a List of 500 varieties of ROSES (including the new ones, all at the same price), a choice collection of RHODODENDRONS, all the new and popular FRUITS, a fine collection of CONIFERS, HARDY ORNAMENTAL TREES and SHRUBS, AZALEAS, &c.

The Nurseries, Great Berkhamsted, Herts

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants

Exotic Nursery, Tooting, Surrey, S.W.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains the names of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES.

The American Nursery, Bagshot, Surrey.

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application. The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies.

The "Woking Nursery" is easily reached by South-Western Railway (main line) to Woking, and goods can be sent through, if upwards of 1 ton, to all parts of the kingdom, which is an immense saving of package and carriage. An inspection of the Nursery will well repay Purchasers, but to those who cannot personally pay a visit, the following summary of the principal stock, averaging from 1 to 5, 9 and 12 feet high, will give some idea of the resources of this Establishment, viz. :—

125,000 Standard, Pyramid, Dwarf Maiden, cutback, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, PEARS, PLUMS, APPLES, and CHERRIES.
25,000 STANDARD and DWARF ROSES, of select and choicest varieties.
200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the common hybrid Catawbiense and Ponticum.
750,000 CONIFERÆ, which embrace most of the fine hardy species and varieties of the following genera :—Abies, Araucaria, Cedrus, Cupressus, Juniperus, Picea, Pinus, Retinospora, Taxodium, Taxus, Thuja, Thujopsis, Wellingtonia, &c.
450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following :—Acacia, Ailantus, Alder, Almond (flowering), Althæa frutex, Arbutus, Ash, Aucuba, Bay, Beech, Berberis, Birch, Bladder Sena, Box, Broom, Calycanthus, Chestnut, Cherry (flowering), Chimonanthus, Cotoneaster, Cornus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolreuteria, Laburnum, Laurel, Leatherwood, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Phillyrea, Philadelphus, Plane, Poplar, Privet, Pyrus, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c.
2,000,000 FOREST TREES, viz.—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.
20,000 CLIMBERS, thus—Bignonia, Climbing Roses, Ivy, Jasmine, Passion-flower, Periploca, Laburnum, Virginian Creeper, Wistaria, &c.
20,000 CLEMATIS, principally the "Woking Hybrids"

This Catalogue contains a set of five large Engravings of Clematis, for which this Establishment is famed, taken from Photographs

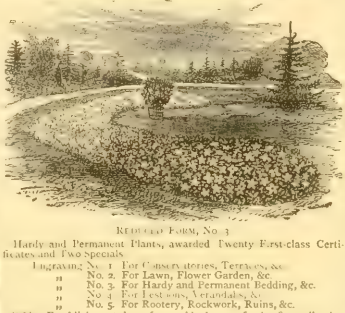

REDUCED FORM, No. 3

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials

Engraving, No. 1 For Conservatories, Terraces, &c.
" No. 2. For Lawn, Flower Garden, &c.
" No. 3. For Hardy and Permanent Bedding, &c.
" No. 4 For Hot-houses, Verandahs, &c.
" No. 5. For Rockery, Rockwork, Ruins, &c.

"This Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*

Woking Nursery, Surrey.

FRANCIS & ARTHUR DICKSON & SONS, The Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester

LILY of the VALLEY, imported Clumps, 18s to 24s per dozen —These are specially grown for early forcing, and are much superior to English grown ; producing very large and fragrant flowers in great profusion

SPIRÆA JAPONICA, imported Clumps, 12s to 18s per dozen — For Conservatory or Greenhouse decoration in Spring nothing can be finer, and for table decoration or for bouquets it is unsurpassed. It is admirably suited for early forcing.

Fruit Trees.

MAGNIFICENT Dwarf-trained PEACHES, NECTARINES, APRICOTS, PEARS, PLUMS, APPLES, and CHERRIES.

Standard-trained PLUMS, Fruiting Trees

Dwarf-trained FRUITING TREES of APPLES, PEARS, & PLUMS.

Pyramidal APPLES, PEARS, and CHERRIES.

WM. WOOD AND SON'S Nurseries have long been celebrated for the growth and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the year they first fruited in, the raiser, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches in winter ; and in this shorta dvice lies all the art of growing healthy and fruitful trees, such as J. S. offers.

TO the TRADE.

Dwarf-trained (all extra fine Trees)

Moorpark Apricots | Plums—Green Gage, Kirk's, Coe's
Cherries, May Duke, Morello, &c. | Golden Drop, Victoria, &c.

Also Copper, Purple (best variety), Cut-leaved, Fern-leaved, and Weeping BEECH, 4 to 5 feet and 5 to 6 feet Prices and samples on application to

EWING, CHILD, AND CO., The Royal Norfolk Nurseries, Norwich.

HARRISON'S NEW APPLE, ANNIE ELIZABETH.—This valuable Apple, which was awarded a First-class Certificate by the Royal Horticultural Society, 1868 and figured in the "Florist and Pomologist," November, 1869, is one of the best Apples ever offered ; for culinary purposes it is unsurpassed, and after Christmas becomes a good fruit for dessert It is of large size, deep colour on sunny side, white flesh, very solid and juicy, with an agreeable acid. A most remarkable keeper, having been in good condition twelve months after gathering

The Tree is of sturdy upright growth, forming a beautiful pyramid, with immense leaves, some measuring 4½ inches across, and is a good cropper. Trade price on application.

HARRISON AND SONS, Royal Midland Seed Warehouse, Leicester

Northampton Nurseries.

JOHN PERKINS, SEN., begs to call the attention of Noblemen, Gentlemen, and others engaged in planting to his extensive stock of the following, the whole of which will be offered at unusual low prices :—

Whitethorn or Quick, extra fine, 3 years transplanted.	Hornbeam, 1½ to 2 feet.
	Evergreen Privet, 1½ to 2 feet
Spruce Fir, 2½ to 4 feet.	Berberis aquifolia, 1 to 1½ foot
Scotch Fir, 1½ to 2 feet.	Green Box, 1½ to 2 feet, and 2 to 3 feet.
Larch Fir, 1½ to 2 feet, and 2½ to 3 feet	Portugal Laurel, 1½ to 2 feet, and 2 to 3 feet
Pinus austriaca, 1½ to 2 feet	Common Laurel, 2 to 3 feet.
Birch, 3 to 4 feet	Black Italian Poplar, 4 to 6 feet
Beech, 2 to 3 feet, and 3 to 4 feet.	Blackthorn, 1½ to 2 feet.
Hazel, 2 to 3 feet	

Large stocks of all kinds of ROSES, FRUIT, FOREST, and ORNAMENTAL TREES, &c., &c., is very extensive and in the best possible condition for removal, having been frequently transplanted.

Descriptive Priced CATALOGUES, free by post, or on application to 52, Market Square, opposite the Corn Exchange, Northampton.

NEW POTATO, "HEADLEY'S NONPAREIL."

This UNRIVALLED POTATO was raised from seed in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second-early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

Mr. SHIRLEY HIBBERD, says :—"This has been grown at Stoke Newington three years in succession, and has been most constant in character, and is really the best Potato of its class we know—its class, moreover, is one of the best. It is a heavy cropper, the bulk of the crop medium-sized and handsome, and it ripens off completely immediately after the first-early sorts. The tubers are handsome, very even ; the flesh yellowish, very dry, fine in texture, and of the finest flavour. It is so good a keeper that we can depend upon it until June."

OPINIONS OF THE PRESS.

"R. Headley.—Your seedling Potatos were quite first-rate ; white, mealy, and excellent in flavour."—*Gardeners' Chronicle, Oct.* 30, 1869.

"White Kidney, a very fine variety, a heavy cropper, uniform in size, ripening off all at once quickly and completely ; flesh yellowish, dry, mealy, and of the most delicate nutty flavour ; a heavy crop was harvested July 14."—*Gardeners' Magazine, Jan.* 30, 1869.

"Seedling Potato (R. Headley).—In shape the tubers resemble those of the Fluke. They are like them also in flavour, but are more mealy."—*Journal of Horticulture, Oct.* 21, 1869.

The undersigned are enabled to offer the above valuable variety in quantity to the Trade,

PRICE ON APPLICATION.

HURST AND SON, 6, LEADENHALL STREET, LONDON, E.C.

'EASTES' KENTISH INVICTA PEA.

MESSRS. JAS. S. EASTES & Co.

Take leave to announce that they have DISPOSED of their STOCK of the above first-class new Pea to the undermentioned Seed Houses, and to whom they beg respectively to refer the numerous members of the Country Trade who have written to them for price, &c. :—

Messrs. CARTER, DUNNETT, AND BEALE, 238, High Holborn.
Messrs. HURST AND SON, 6, Leadenhall Street.
Messrs. MINIER, NASH, AND NASH, 60, Strand.
Messrs. SUTTON AND SONS, Reading.

The "KENTISH INVICTA PEA" was raised by a well-known Kentish raiser of new Peas, in the year 1867, and passed into Messrs. EASTES' hands in the spring of 1868 ; and knowing the importance of thoroughly testing the properties of a new Pea before submitting it to the public, they have carefully grown it each year in their trial grounds, and have also had it tested in the trial grounds of some of the leading Seed Merchants, and the result in every instance has been the same, proving the "KENTISH INVICTA" to be the quickest and earliest *Blue* Pea ever introduced.

EASTES' KENTISH INVICTA PEA is a round Blue Pea, about "two feet" in height, with straight, handsome, well filled pods ; is earlier than the best stocks of Daniel O'Rourke, and Dickson's First and Best, whilst the fact of its being a "Blue" Pea proclaims it to be infinitely superior in flavour to any White Pea in cultivation.

ASHFORD, KENT.—Oct. 29, 1870.

Suttons' Red-skin Flourball Potato,
The BEST COOKING and HEAVIEST CROPPING LATE VARIETY.

SUTTON AND SONS are now prepared to receive orders for the above splendid POTATO, pronounced by all who have tried it to be the best late variety ever introduced. Orders executed strictly in rotation. Price 5s. per peck. Trade price on application.
SUTTON AND SONS, Seed Growers, Reading.

SPRUCE FIR, very Strong, from 1½ to 2 feet, 2 to 3 feet, and 3 to 4 feet; SCOTCH FIR, 1½ to 2 feet; ASH, 3 to 4 feet; OAKS, 2½ to 3 feet; CUPRESSUS, 1 and 2 feet, all fine transplanted stuff; ENGLISH YEWS, PORTUGAL LAURELS, PRIVET, &c. Gentleman planting largely will be liberally treated with. Special prices upon application to
WOOD AND CO., Timber Growers, Nurseries, Worcester.

FOR SALE, the following Plants, delivered at the Farnsdon Station, Great Western Railway :—
50,000 ASH, 3 to 4 feet, twice transplanted, 15s. per 1000.
100,000 ASH, 2 to 3 feet, do. do., 12s. per 1000.
12,000 COMMON LAUREL, 3 feet, 30s. per 1000.
500 COLCHIC LAUREL, 2 feet, 10s. per 100
10,000 CHINESE ARBOR-VITÆ, 2 to 3 feet, 60s. per 1000.
500 THUJOPSIS BOREALIS, 2 to 3 feet, 70s. per 100.
500 RETINOSPORA ERICOIDES, 1 foot, 8s. per 100.
100 STANDARD ROSES, named sorts, 9s. per doz.
Apply to H. CAMPBELL, Esq., Buscot Park, Lechdale, Gloucestershire.

A NOBLE AVENUE for £20, consisting of 100 WELLINGTONIA GIGANTEA, about 4 feet high This, the most noble of all trees, a native of California, where it attains a height of 400 feet, with a trunk 40 feet through, is of rapid growth, hardy, and noble in form The bark of a Wellingtonia at the Crystal Palace, recently destroyed by fire, gave an idea of the grandeur of the tree

Or an AVENUE of 100 SUPERB ABIES DOUGLASII, about 10 feet, for £20. This evergreen Fir is the most noble, of rapid growth hardy, produces valuable timber, clean, heavy, and free from knots, of the colour of Yew wood. It is a native of California, where it grows upwards of 300 feet high, with a trunk 10 feet through. The largest at Kew is of this tree, and was, when growing, 309 feet high. There is at Dropmore (Bucks) a specimen nearly 100 feet high, a model of beauty, and, as seed was first imported in 1826, it cannot be more than 44 years of age.
RICHARD SMITH, Nurseryman and Seed-Merchant, Worcester.

To the Trade.
SEEDLING and TRANSPLANTED FOREST TREES and

MESSRS. QUETTIER AND SON, Ussy, France, beg to say that their CATALOGUE of the above is now ready, and may be had upon application to their representative,
Mr. W. H. DAVIS (to whom all orders will be thankfully received), 3, Chancellor Road, West Dulwich, London, S E

PLANTING SEASON.—The PRICED LIST of Seedling and Transplanted FOREST TREES, and EVERGREEN and FLOWERING SHRUBS, is now ready, and to be had on application.
WILLIAM URQUHART AND SONS, Dundee.

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

EDWARD TAYLOR, Nurseryman, Malton, Yorkshire, offers as under :—
TRITOMA UVARIA, strong, 12s. 6d. per 100.
" " GRANDIFLORA, 12s 6d per 100.
" " GLAUCESCENS, 4s. per dozen.
ARUNDO CONSPICUA, 25s. per 100.
TRITONIA AUREA, fine bulbs, 8s. per 100.
LILIUM LANCIFOLIUM RUBRUM and ROSEUM, very large roots, 6s. per dozen.
GOOSEBERRIES, 150 choice sorts, 2s. per dozen, 10s per 100
TULIPS:—Fine English mixed Show, 3s. 6d. per 100, 30s. per 1000.
" " Double mixed, 4s. per 100
" " White La Candeur, 14s per 100.
" " Peony-red and Gold, 6s. per 100.
" " Gloria Solis, 4s. per 100.
" " Mariage de ma Fille, 12s per 100
" " Rosa Mundi, Single, 3s. 6d. per 100.
DAFFODILS, 2s. per 100.
NARCISSUS, Double Roman, 12s. 6d. per 100.
POLYANTHUS NARCISSUS, of sorts, 8s. to 12s. per 100.
ANEMONES, Single Scarlet, 2s. 6d. per 100.
Double Scarlet, 7s. per 100.
Single, mixed, 2s. per 100.
HYACINTHS, choice named, 4s. and 5s. per dozen, 30s. per 100
CATALOGUES free, on application.

Roses.
ONE HUNDRED THOUSAND STANDARD ROSES.
200,000 DWARF HYBRID PERPETUAL ROSES.
60,000 TEA-SCENTED ROSES
A magnificent stock to select from. CATALOGUES on application.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

THE beautiful PURPLE DOG'S-TOOTH VIOLETS. See article in *Gardeners' Chronicle* for October 22. Strong roots, 5s. per 100, 1s. per dozen,—2d. per dozen extra for postage.
Having nearly 1 acre of GLADIOLI, I can supply them cheaper than any house in the Trade. Prices upon application.
JOHN STEVENS, The Nurseries, Coventry.

To Amateurs and the Trade.—Roses and Fruit Trees.
LEWIS WOODTHORPE offers a very superior lot of carefully cultivated and well-grown ROSES—Standards at 12s. and 15s. per dozen; Dwarfs at 6s. per dozen. A choice stock of all FRUIT TREES, &c.
☞A Descriptive CATALOGUE of New and Choice Plants, Fruit Trees, and Roses, sent free upon application. Trade Lists with special Trade Prices free.
L. WOODTHORPE, Munro Nursery, Sible Hedingham, Essex.

To the Trade. Agricultural and Garden Seeds.
H. AND F. SHARPE are now prepared to make special offer of the above Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from adulteration of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech.

Notice to the Seed Trade.
ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL LIST of GARDEN and AGRICULTURAL SEEDS for the present season is now ready, and can be had upon application. Samples and stocks are very fine, and prices very low.

Everlastings, Hyacinth Glasses, &c.
JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (illustrated) of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application.
JAMES CARTER, DUNNETT, and BEALE, 237 and 238, High Holborn, London, W C

TURF, TURF.—The finest Downs Turf, trucked. For price, &c., apply to
Mr. R. TANTON, F.R.H.S., Nurseryman, Epsom.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

Dutch Flower Roots.
CROYDON. A. HENDERSON. EAST SURREY SEED WAREHOUSE. ESTABLISHED 1828.
ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers
DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted.
Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing Catalogues gratis and post free upon application
Seed Nursery, Thornton Heath Surrey, and at the East Surrey Seed Warehouse, North End, Croydon

Hyacinths, Tulips, and other Bulbs.
WM. CUTBUSH AND SON'S importations of the above have just arrived, and have every appearance of being above the average quality, for which they have been noted for many years. CATALOGUES post free.
Highgate Nurseries, London, N.

To the Trade.
FINE Standard trained MOORPARK APRICOTS, PEACHES, and NECTARINES.
5,000 Dwarf-trained do. do.
2,000 do. do. VICTORIA and other sorts of PLUMS.
The above are of very superior quality.
Standard APPLES, PEARS, PLUMS, MEDLARS, and CHERRIES.
Transplanted FOREST TREES—Larch, Spruce, and Scotch Fir, Beech, Birch, Ash, Elm, Oaks, Spanish and Horse Chestnuts, Poplars, Sycamore, and Hornbeam
Standard LIME, and Common BEECH, BIRCH, ALMONDS, grafted English ELM, White ABELE and other POPLARS.
50,000 LAURELS, 1 to 2 feet, and 2 to 3 feet, fine
5,000 STANDARD ROSES.
A large quantity of 2 and 3 yr Transplanted WHITETHORN or QUICK. Samples and Prices above on application to
FRED PERKINS, Bedford Road Nursery, Northampton.

Planting Season.—Knowfield Nurseries, Carlisle.
MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, beg leave to request the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c., and feel much intending to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.
L. & B. are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.
Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found worthy of their best varieties.

Araucaria imbricata.—Perfect Specimens,
WELL GROWN and very HANDSOME.
WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX

WM. WOOD and SON have a large Stock of the above. Price, per plant :—

2 feet	.. ..	£0 5 0	8 feet	.. ..	£2 2 0
4 feet	.. ..	1 1 0	10 feet	.. ..	3 3 0
6 feet	.. ..	1 11 6	Larger, up to 30 feet		

Price on application.

INTENDING PLANTERS are respectfully invited to inspect the extensive stock of FOREST TREES and SHRUBS grown in these Nurseries, all of which are in fine condition, and can be highly recommended.
THOS. THORNTON, The Nurseries, Bagshot, Surrey.
T. T. would be happy to receive Notice from intending Visitors, as he would be in a position to offer every facility for their doing so.

The Fairy Apple.
JOHN JENNINGS begs to inform his Friends and the Public that he is now sending out the above beautiful APPLE An illustration of it, and a description by Dr. Hogg, is given in the "Florist and Pomologist" for 1870, page 201, where he says that it is "Destined and worthy to take its place amongst the worthiest of its kind" Dwarf maiden trees, 7s 6d each
Nurseries, Shipston-on-Stour.

TO BE SOLD, cheap (the property of a Gentleman discontinuing their growth), a quantity of PINE PLANTS, clean and healthy, both Fruiting and Succession; also some fine specimen ORANGE TREES, CAMELLIAS, AZALEAS, and other Stove and Greenhouse Plants. Lists and further particulars by applying to Mr. FOWLER, Krupton, near Andover; or Mr. KEYNES, Nurseryman, Salisbury.

Winter Flowers.
AZALEA HYBRIDA ODORATA is the best and most convenient plant for winter and early spring blooming, the flowers being white and very fragrant one truss, with a few other flowers, will make a beautiful bouquet. Small plants bloom freely, and my large plants have from 40 to 50 flower-buds on
RHODODENDRON MULTIFLORUM, a small-leaved, bushy-growing plant, producing thousands of white flowers.
Both of the above are hardy. Prices and other particulars of these and other plants raised by me forwarded on application to
ISAAC DAVIS, Nurseryman, Dorchester.

New Peas. Notice to the Trade.
EASTES' KENTISH INVICTA PEA.
HURST AND SON have the pleasure to announce that they are part Purchasers of the stock of the above New Pea, and will be happy to quote price on application.
HUNTINGDONIAN PEA.
A new variety to be introduced this season, it is about ten days earlier than Champion of England, splendid flavour, and very heavy cropper; individual peas very large, of a beautiful dark green colour; pods long and well filled from end to end. Height 4 feet
Apply to HURST AND SON, 6, Leadenhall Street, London, E.C.

Shrubs, Evergreens, and Fruit Trees.
ROBERT CORNWELL AND CO. have to offer SPRUCE, SILVER, SCOTCH, and AUSTRIACA FIRS, 3 to 4 feet; AMERICAN and CHINESE ARBOR-VITÆ, 2 to 3 feet; PHŒNICEA, 10 4 feet; COMMON BOX, 2 to 4 feet; Variegated and Green HOLLIES, 2 to 3 feet; IRISH YEWS, 3 to 4 feet; PINUS EXCELSA, 6 to 8 feet; Bushy LAURELS, 3 to 5 feet; PORTUGAL LAURELS, Bushy 5 feet; LAURUSTINUS, 2 to 3 feet; some extra handsome ones, 4 by 4 feet; 500 STANDARD ROSES, GOOSEBERRIES, CURRANTS, RASPBERRIES, and STRAWBERRY PLANTS; 2-, 3-, and 4-year-old ASPARAGUS; 1000 yards of BOX EDGING, cheap, to clear the ground. *Note.*—Opposite the Red Lion, Barnet.

Special Offer of large Evergreens, &c.
WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following :—

LAURUSTINUS, 5 to 6 feet	PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 9 ft.	COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet	
RHODODENDRONS, 2 feet, thickly set with buds.	

The above have recently been transplanted, are very bushy hand some plants, and quite safe. Price per dozen or hundred on application.
Floral Nurseries, Epsom.

SEEDLING and TRANSPLANTED FRUIT, FOREST, and ORNAMENTAL TREES, CONIFERS, TREE SEEDS, &c.—The Administration of the Pomological Society, Ringelheim, Hanover, Germany, beg to call attention to their new PRICE LIST, in which they offer all the above at exceptionally low prices.
The Trade and all requiring large numbers of Roses, Seedling and Transplanted Conifers, Forest Trees, Fruit Trees, Stocks, such as Quinces, Pear Stocks, Paradise Apple, &c., will find the terms most advantageous, and the quantity to be disposed of almost unlimited.
The List will be sent post free on application to the London Agents of the Institute,
Messrs. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

Standard Pears.
H. LANE AND SON have a large Stock of all the leading varieties of the above to offer, strong and fine, by the 100 or 1000.
The Nurseries, Great Berkhamsted, Herts.

Cyclamens.—To the Trade.
R. CLARKE, MARKET GARDENER, Twickenham, has a large stock of good plants, in one size only, from own saved seed, many of them in fine bloom; same as exhibited at South Kensington, November 2, and awarded Special Certificate. Price 30s. per 100, delivered in London and suburbs, on application. Also some Seed of this beautiful strain to be had.

Two New Peas for 1871.
EASTES' KENTISH INVICTA, the earliest round Blue Pea
MACLEAN'S "BEST OF ALL," splendid large Wrinkled Marrow.
For illustrations see p. 1533 of this week's *Gardeners' Chronicle.* Trade prices and descriptions on application.
SUTTON AND SONS, Seed Growers, Reading.

FRUIT TREES, very strong, and warranted free from Blight — The Pomological Institute of Ringelheim, Hanover, Germany, can supply splendid specimens of Fruit Trees at very low prices, and which they guarantee entirely free from American Blight The Institute begs to call special attention to this, as it is very difficult at the present time to obtain Fruit Trees which have not been attacked more or less seriously by this formidable enemy Prices on application either to the Institute, or to
Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower street, London, E.C.

Cottam's Iron Hurdles, Fencing, and Gates.
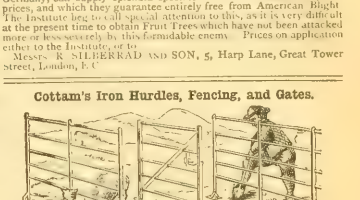
COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method.
Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Wansley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS
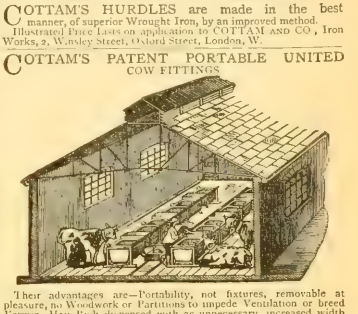
Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rack dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 25s.
Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

OSLER'S CRYSTAL GLASS CHANDELIERS, Table Glass of all kinds, CHANDELIERS in BRONZE and ORMOLU, Moderator Lamps, and Lamps for India.
London : Show Rooms, 45, Oxford Street, W.
Birmingham : Manufactory and Show Rooms, Broad Street.

CONSERVATORY BASKETS.
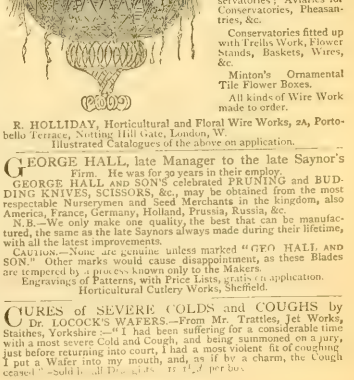
Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing; Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, and opposite windows, or anywhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.
Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.
Minton's Ornamental Tile Flower Boxes.
All kinds of Wire Work made to order.
R. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Portobello Terrace, Notting Hill Gate, London, W.
Illustrated Catalogues of the above on application.

GEORGE HALL, late Manager to the late Saynor's Firm. He was for 30 years in the employ
GEORGE HALL, AND SON'S celebrated PRUNING and BUDDING KNIVES, SCISSORS, &c., may be obtained from the most respectable Nurserymen and Seed Merchants in the kingdom, also America, France, Germany, Holland, Prussia, Russia, &c.
N.B.—We only make one quality, the best that can be manufactured, the same as the late Saynors always made during their lifetime, with all the latest improvements.
Caution.—None are genuine unless marked "GEO. HALL AND SON." Other marks would cause disappointment, as these Blades are tempered by a process known only to the Makers.
Engravings of Patterns, with Price Lists, gratis on application.
Horticultural Cutlery Works, Sheffield.

CURES of SEVERE COLDS and COUGHS by Dr. LOCOCK'S WAFERS.—From Mr. Trattles, Jet Works, Staithes, Yorkshire :—"I had been suffering for a considerable time just before returning into court, I had a most violent fit of coughing I put a Wafer into my mouth, and, as if by a charm, the Cough ceased"—Sold by all Druggists, 1s. 1½d. per box.

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees
QUICK, and all other Hedge Plants
COVERT PLANTS, in great variety
FRUIT TREES, including all the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained, &c.
ROSES, Standards, Dwarfs, on own roots and Manetti stock, &c.
VINES, all the leading varieties, in 2000 well ripened Canes, for fruiting in pots and for planting out
EVERGREENS, in great variety, including large quantities of all the choicest Hollies, &c.
CONIFERS, including Picea nobilis, Nordmanniana, &c.
ORNAMENTAL TREES and Plants, of all sorts.
The whole in very great quantity and stout vigorous condition, with fine roots, for safe removal.
Priced LISTS and all particulars on application to
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.
The "Newton" Nurseries are within 10 minutes' walk, by the new road over Flookersbrook Bridge, from the Railway Station.

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application
The stock of Seedling and Transplanted LARCHES, SCOTS FIRS, and other FOREST TREES is both unusually extensive and superior in quality. When personal inspection is not convenient, samples and special offers will be sent if required
Edinburgh and London (20, Budge Row, Cannon Street, E.C.)

EXTENSIVE SALE of Transplanted FOREST TREES, SHRUBS, &c.

300,000 2-yr. Seedling 2-yr. transplanted SCOTCH FIR.
300,000 2-yr. " 3-yr. " " 1 to 2 feet
300 000 NORWAY SPRUCE, in sizes, from 9 inches to 3 feet
100,000 ENGLISH OAK, from 1 to 3½ feet, in sizes
100,000 THORNS for QUICKS, from 1 to 2 feet.
50,000 LARCH, from 12 to 20 inches.
1-yr. Seedling LARCH, fine, 1s. per 1000.

All the above are well grown, healthy, and well rooted. Inspection invited. To be Sold cheap, by special offer. Samples and prices on application
DAVID DOW, Nurserymen and Seedsman, Falkirk.

Magnificent Trees for Avenue Planting.

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX.
WM. WOOD AND SON have to offer a splendid stock of the following remarkably well-grown Trees :—
ROBINIA PSEUD-ACACIA, 6 and 8 feet.
ASH, WEEPING, extra fine, 7 to 9 feet stems
CATALPA SYRINGÆFOLIA, 8 to 10 feet.
AILANTUS GLANDULOSA, 6 feet.
ELMS, extra fine, consisting of American, English, Cornish, and other varieties, 6 to 8 feet, 8 to 10 feet, and 10 to 12 feet.
LABURNUMS, 6 to 8 feet.
HORSE CHESTNUTS, Common and Scarlet, extra fine plants, 7 to 8 feet, 8 to 10 feet, 10 to 12 feet, very fine specimens
AMERICAN WEEPING WILLOWS, 7 to 8 feet
CATALOGUES gratis on application

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction ; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom ; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS. — The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 30 per doz., 21s. 6d. to 42s. per 100
" Good named kinds, 25 to 45 per 100
" Common mixed colours, 15 per 100
" Van Houttei fl.-pleno, strong bushy flowering plants, 1½ to 3 feet, 42s. to 120s. per 100, and upwards. This is one of the most beautiful of the Double Azaleas.
Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower-buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens
ANDROMEDA FLORIBUNDA. Good plants, 18s. to 24s. per doz.
RHODODENDRONS.—We have for some time paid special attention of Rhododendron buyers to this part of our stock. We have miles of borders in which the plants vary from 2 to 8 feet high. Every plant inspected, and, consequently, in keeping the common sorts down.
Named RHODODENDRONS. Low bushy sturdy plants, and consisting of the best hardy kinds, 25 to 45 per 100. A sample of 50 will be sent on application.
Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Rotten Row were nearly all of them supplied from this Nursery, so no description can give an adequate idea of these plants, we have had a fair example photographed, which is given in our Catalogue, just published.
RHODODENDRON PONTICUM, for Cover, 45 to 85 per 1000
" " varieties, named, from layers, to varieties, 50 to 100 per 100
" " Trees, the finest specimens, 3 to 4 yards high, 25s. to 42s. to 3 to 100
Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s. to 100s. per 1000
" Larger and very bushy plants, 4 to 5 to per 100
☞ We have grown for some years past a large number of Rhododendrons from layers, and we now have a stock of more than 10,000 plants of named kinds, which we believe are quite unequalled, being without exception the best plants we have ever seen. We supply them, all layers, at from 50s. to 200s. per 100. A sample, the only point to name, will be sent on application.
HARDY HEATHS. The most distinct and beautiful winter and spring varieties, in name, including Mediterranea, every plant a specimen, 15 to 21 per doz., 9s. per 100.
" The free growing varieties of VULGARIS, &c., 30s. per 100, 4 to per 1000
" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, 4 per 100.
KALMIA LATIFOLIA, from 50s. to 100s. per 100.
" Nice blooming plants, 45 to 4 to per 100.
" Larger, 30s. to 60s. per dozen and upwards.
" MYRTIFOLIA, 42s. to 60s. per dozen.
All other American Plants are grown to a large extent.
HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869
COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100 ; 3 to 3½ feet, 63s. to 84s. per 100 ; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.
Thousands of beautifully grown Pyramidal plants
We have a number of very large Green Hollies, 12 and 15 feet high.
WATERER'S HOLLY. We have these in large numbers and of
GOLDEN QUEEN Tall sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.
PERRY'S WEEPING HOLLY. STANDARDS.—A large number.
NEW GOLDEN WEEPING HOLLY. Nice standards.
THE COMMON WEEPING HOLLY—6, 7, 8, and 10 feet high, magnificent plants.
VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high
YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 14 feet. These are invaluable as blinds.
IRISH YEWS, of all sizes, up to 10 feet
YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.
BOX, GREEN. } Handsome Pyramidal plants, 5, 6, 7, and
" VARIEGATED. } 8 feet high. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.
AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high
LAURELL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.
LAURUSTINUS and BAYS.—Fine Standards, in tubs.
Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted :—
ABIES ALBERTIANA, 5 to 6 feet, 42s. per dozen ; 7 to 8 feet, 60s
These are beautiful plants, transplanted 1870.
ABIES NOBILIS, 3½ to 4 to 6 feet, 5s. to 7s. 6d. each ; 7 to 8 feet, 10s. 6d. and upwards
PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.
PINUS EXCELSA, 3, 4, 5, 6, 7, and 8 feet high, 21s. each and upwards
PINUS NOBILIS, 1½ foot, very stout, 18s. per dozen, £5 per 100 ; 2 to 3 feet, 30s. per dozen ; 4, 5, 6, 7, 8 to 10 feet, splendid specimens, from 5s. 6d. to 42s. each and upwards
PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s. per dozen ; 2½ to 3 feet, 5s. to 7s. 6d. each ; larger specimens, 4, 5, 6, 8, and 10 feet.
PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.
PICEA PINSAPO, GRIFFITHII, fine handsome plants, 25s. each, 4s. 6d. per dozen, 3, 4, 5, 6, 7, and 8 feet high, 21s. each and upwards ; and all have been transplanted within 12 months.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen ; 5 to 7 feet, 60s. to 84s. per dozen ; 8, 10, and 12 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.
CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly pyramidal, 2, 3, 4, and 5 feet, 18s. each
CUPRESSUS THUYOPSIS GRACILIS } 3 to 4 feet, 42s. to
" " ARGENTEA } 84s. per dozen.
" JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen ; 6 to 7 feet, 84s. per dozen ; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.
THUJA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen ; 3 large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.
THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high ; hundreds of most beautiful plants, 21s. to 84s. per dozen.
THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.
WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted :—
ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET HORSE CHESTNUTS, 8 and 10 feet high.
ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet.
The scarlet and common Horse Chestnuts have fine heads and stout stems, and branch from the ground.
BEECH, PURPLE, 6 to 8 feet ; to 12 feet, fine trees.
BEECH, COMMON, 8 to 10 feet.
BIRCH, WEEPING, 8 to 10 feet.
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet
LIME, COMMON, fine ; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.
MAPLES, NORWAY, 8 to 14 feet.
OAKS, ENGLISH, 8 to 10 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high.
The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBY, 8, 10, to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
AILANTUS, 8 to 10 feet
CATALPAS, 6 to 8 feet
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years.
Samples, the only guide as to their true value, will be forwarded on application. Any, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

PAUL'S NURSERIES,
WALTHAM CROSS, N.

ROSES.

ROSE PRINCESS CHRISTIAN —"One of the grandest Roses in cultivation" "The best Rose of the present year" "The great Rose of the Show." Standards and Dwarf Standards, 10s. 6d. each Dwarfs, 7s. 6d. each
Standard ROSES, 15s. per dozen, and upwards.
Dwarf Standard ROSES, 12s. per dozen, and upwards.
Dwarf ROSES, 9s. per dozen, and upwards
" in pots of extra size, prepared for forcing, 24s per dozen, and upwards.
Climbing ROSES, strong plants, 9s. per dozen and upwards.

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s. per dozen, and upwards
Bedding HYACINTHS, 18s. per 100, and upwards.
" TULIPS, 3s. per 100, and upwards.
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, of sorts, 2s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000
All other Bulbs equally moderate in price

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white 7s. 6d. each.
AVALANCHE, do , do., 7s. 6d. each
MARCHIONESS —The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.
WALTHAM BRONZE — The deepest and richest in colour of all the bronze section, 2s. 6d. each, 10s. each
BONFIRE, the finest scarlet for bedding, 2s. 6d. each
AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 1s. each and upwards.

EVERGREENS, CONIFERS, &c.

The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently transplanted specimens.

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state, in addition, GRAPE VINES. FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post.

IMPORTANT.—Address WILLIAM PAUL (the Christian name in full), Paul's Nurseries, Waltham Cross, London, N.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA. —This new and lovely Mignonette will be an universal favourite ; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety ; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogised, and sent out to the Public as something very superior, when they are no better than existing varieties ; but E. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz. :—
The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870.
The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870.
The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870.
The Brighton Horticultural Show, First-class Certificate, June 28, 1870

The above will be sent out in October, at 2s. 6d. per packet, and may be had wholesale and retail of F. PARSONS, Nurseryman and Seedsman to Her Majesty, 191, and 28, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint ; and of the following Agents :—

ENGLAND
Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
" Hurst & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
" A. Henderson & Co., London
" Sutton & Son, Reading
" James Veitch & Son, King's Road, Chelsea.
" S. Saint & sons, Newcastle on Tyne
" Bunyer & Co., Bridge Garden, London.
" Butler, McCulloch & Co., Covent Garden, London.
" G. Gibbs & Co., Town Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London
" Downie, Laird & Laing, London and Edinburgh.
" F. Lawson & Co., Dublin, Grafton Row, London.
" Rutley & Silverlock, London.
" Dick Radcliffe & Co., 199, High Holborn, London, W.C.
" Fisher, Holmes & Co., Wadsworth Nurseries, Sheffield.
" Woolliffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., High Holborn, London, W.C.
" Minter, Nash & Nash, 60, Strand, London, W.C.
" Child & Lorimer, 49, Darley Street, Bradford.
Mr. George Tredgett, Cambridge.
" L. S. Woodthorpe, Sawbridgeham, Essex.
" G. Hinxman, Fareham.
" B. Bracher, Halifax, Yorkshire.
" W. Knight, Bedford, Somerset.
" Timothy Brigden, South-Eastern Railway Station.
" W. Paul, London
" E. Holmes, Mevagissey Nursery, near Lichfield.
" W. Bull, King's Road, Chelsea
" E. Taylor, Malton, Yorkshire.
" B. S. Williams, Upper Holloway, London.
" E. Cooling, Derby
" James Wood, Newport, Isle of Wight.

SCOTLAND
Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow.
" P. Lawson & Son, Edinburgh.
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling.
" J. & R. Thyne, 60, Buchanan Street, Glasgow.

IRELAND.
Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin.

BELGIUM.
Mons. Louis Van Houtte, Ghent.

PRUSSIA.
Messrs. Platz & Son, Erfurt.
" Ferdinand Juhlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

AMERICA.
Messrs B. K. Bliss & Sons, New York.

WINTER AND SPRING FLOWERS.

CARTER'S
COLLECTIONS OF
HYACINTHS, TULIPS,
CROCUS, &c.,

Include only the best kinds, and being made up in a most liberal manner, these Collections offer the most desirable medium to ensure an effective display in the Drawing Room or Garden.

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR CULTURE.
Packing and carriage free.

COLLECTION No. 1, complete, price 84s.
COLLECTION No. 2, reduced quantities, price 63s.
COLLECTION No. 3, reduced quantities, price 42s.
COLLECTION No. 4, reduced quantities, price 21s.
COLLECTION No. 5, reduced quantities, price 10s. 6d.

CARTER'S COLLECTIONS OF BULBS
FOR INDOOR AND OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 6, complete, price 84s.
COLLECTION No. 7, reduced quantities, price 63s.
COLLECTION No. 8, reduced quantities, price 42s.
COLLECTION No. 9, reduced quantities, price 30s.,
COLLECTION No. 10, reduced quantities, price 15s.

CARTER'S COLLECTIONS OF BULBS
FOR OUTDOOR PLANTING.
Packing and carriage free.

COLLECTION No. 11, complete, price 84s.
COLLECTION No. 12, reduced quantities, price 63s.
COLLECTION No. 13, reduced quantities, price 42s.
COLLECTION No. 14, reduced quantities, price 21s.
COLLECTION No. 15, reduced quantities, price 10s. 6d.

JAMES CARTER AND CO.'S CATALOGUE of Hyacinths, Tulips, Crocus, and other Bulbs, Roses, Fruit Trees, &c., containing full particulars of the above Collections, will be forwarded Gratis and Post Free on application.

Eastes' Kentish Invicta Pea.

J. C. & Co having purchased part of the stock of this fine Early Pea, will be happy to quote special prices to the Trade for large quantities on application.

Laxton's Quality Pea.

A second-early wrinkled Pea, of great productiveness and fine flavour; is a great improvement on all the second-early wrinkled Peas at present in cultivation. Has been grown in the Trial Ground, and highly recommended by the Royal Horticultural Society of London. Lowest price to the Trade may be had on application.

LAXTON'S QUANTITY PEA.—A fine-flavoured variety, selected from "Laxton's Quality" for its robust habit and extreme productiveness; it also differs in the shape of its pods. Exhibited and highly commended by the Royal Horticultural Society of London. Lowest price to the Trade may be had on application.

☞ CARTER'S LIST of NOVELTIES for 1871 is now ready, and may be had on application.

JAMES CARTER & CO.,
THE ROYAL SEEDSMEN, 237 and 238, HIGH HOLBORN, LONDON, W.C.

TO THE TRADE.
SUTTON & SONS
OFFER THE FOLLOWING
NEW PEAS FOR 1871.

Eastes' Kentish Invicta Pea.

Maclean's "Best of All" Pea.

For Descriptions and Trade Prices apply to
SUTTON AND SONS,
SEED GROWERS, READING.

Cover Planting.

J. SANDY AND SON beg to offer MAHONIA AQUIFOLIA, 3 feet, three years transplanted, £4 per 1000
COMMON LAURELS, 1½ to 2 feet, bushy, two years transplanted, £5 per 1000. The Nurseries, Stafford.

GEORGE FARNSWORTH, The Nurseries, Matlock, has to offer a large quantity of the undermentioned, which he can strongly recommend :—

ASH, Mountain, 2 to 3½ feet
LARCH, 9 to 15 inches, 1 to 1½ foot, 1½ to 2 feet, 1½ to 2½ feet, 2 to 3 feet
SCOTCH FIR, 1½ to 2 feet, 2 to 3 feet
SPRUCE, 1½ to 2 feet
LIMES, from layers, 2½ to 3½ feet
POPLAR, Black Italian, 3 to 4 feet
QUICK, strong.
SYCAMORE, 1½ to 5 feet
3-yr. SEEDLING RHODODENDRONS, 1 to 1½ feet, 1½ to 2 feet
BERBERIS AQUIFOLIA.
Prices and Samples on application.

To the Trade.

JOHN BELL offers very fine Standard MAY DUKE CHERRIES, tall, clean, and straight stems, 75s. per 100; some extra large heads, two years worked, 12s. per dozen. Samples sent if requested. — The Norwich Nursery Seed Warehouse, 10 and 11, Exchange Street, Norwich.

Thorn Quicks.

To NURSERYMEN, RAILWAY and ENCLOSURE PLANTERS.
SAMUEL ROBINSON has a fine class of strong QUICKS to offer, from 3 to 4 years transplanted, and 2 to 4 feet high. Bushy SPRUCE, 2 to 4 feet; adapted for Christmas Trees. HOLLIES, well furnished, 3 to 6 feet. Samples charged
Shaw House, Melbourne, near Derby

LARCH.—Very fine, 9 to 18 inches, 10s. per 1000. SCOTCH FIR, 1 to 2 feet, fine, 11s. per 1000. QUICK, 1 to 2 feet, bushy, 11s. per 1000.
W. JACKSON, Blakedown Nursery, Kidderminster

Standard and Dwarf Roses.

GEORGE DAVISON'S stock is very fine, and will be Sold at any reasonable Price, as they must be cleared. Many Thousands of TEA ROSES in pots, 60 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied. CATALOGUES on application.
Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA.
White Cross Nurseries, Hereford.

THOMAS BUNYARD AND SON'S TRADE CATALOGUE may now be had on application. It contains low priced offers of Fruit Trees, Roses, Arbutus, Juniperus sinensis, Thuia aurea, Biota elegantissima, Chichester Elms, Ceanothus, Climbers, &c., &c.
The Old Established Nurseries, Maidstone

Rhododendrons for Potting or Planting Out,
HARDY SCARLET, WHITE, and other CHOICE NAMED.
W. H. ROGERS, Red Lodge Nursery, Southampton, offers a large and splendid assortment of the above, well blooming buds, at 18s., 24s. and 30s. per dozen
Also, KALMIA LATIFOLIA, ANDROMEDA FORMOSA, and AZALEA AMŒNA, at 9s., 12s., and 18s. per dozen

Scarce Liliums.

JOHN BELL has pleasure in being able to offer fine flowering BULBS of CONCOLOR and SINICUM, two very scarce Lilies, full descriptions of which were given in the *Gardeners' Chronicle*, October 29, p. 1440
CONCOLOR, 2s. 6d. each, 24s. doz. SINICUM, 1s. 6d. each, 15s. doz.
Price to the Trade on application. The Norwich Nursery Seed Warehouse, 10 and 11, Exchange Street, Norwich.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Draczenas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit
Conservatories furnished, and Choice Plants supplied for Balls or Dinner table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

The Gardeners' Chronicle
SATURDAY, NOVEMBER 19, 1870.

THE rule of thumb and the rule of science may be said to mark two different and distinct epochs in the history of cultivation, but whether, so far as the MANAGEMENT of FRUIT TREES UPON WALLS is concerned, the rule of science is superior to the rule of thumb in the production of fruit is somewhat questionable. Half a century ago science had taken but a very doubtful and feeble grasp of garden cultivation; the votaries of it, few and far between, saw through a glass dimly, and advanced accordingly. Since then the rule and compass have made rapid strides in directing the training of our wall fruit trees—so much so, that it was thought almost better that the trees should not bear fruit than that it should be produced upon a crooked or misplaced branch. Hence, if a Peach or Apricot tree was procured from the nursery, though it was full trained, and had been in a state of preparation for several years, it must, when planted, submit to the prescribed rule, and though the branches might be several feet long, they must be ruthlessly foreshortened to within a foot of the ground. Then they must be trained so that the two sides of the tree would correspond exactly, and if they did not do so, better to destroy a branch than to sacrifice the harmony of the system of training. With Pears, Plums, and every other variety of wall tree, the same rule prevailed, and to get from the centre shoot of each a leading shoot, to be cut down the following season, and a pair of corresponding shoots to go towards forming the body of the tree, was in accordance with the prescribed rate of progression, and the custom of the times. At this rate, to get the allotted space for a tree covered in six or eight years was not bad work. Of course, at

the same time, everything approaching luxuriant growth must be subdued. "Basket-rods" could not be tolerated at any price, and hence the trees made slow but steady progress, so steady that they might be considered to have been dwarfed into premature old age while they were yet in their infancy.

Now, if we look to trees planted anterior to that period, to that grand old tree at Chatsworth which produces its 1200 to 1500 matchless Peaches annually, to the Peach trees as we saw them upwards of 30 years ago at the Vice-Regal Lodge, Carton, Drumcondra, and other places in Ireland, we perceive that the rule of science had not been observed in their early training, but, on the contrary, a sort of wild luxuriance had been allowed to prevail—a luxuriance which had resulted in constitutional vigour, and fruitful and mature old age.

What shall we say of that? Was a tree ever dwarfed into constitutional vigour, or, seeking animal analogy, can the lungs be taken away and the body remain healthy? Of course we know we are treading upon tender ground in thus throwing a doubt upon the learning of the recent period of supposed progress, but truth must be spoken, even though it militates against preconceived prejudices; and so examined, we suspect much of what we considered progress will, physiologically examined, be found, like the Highlandman's march, an advance of "two steps" backwards. In fact, we fear root-pruning, thumb-screwing, or excessive pruning or dwarfing by any process of that kind, can only be regarded as stealing a march upon time, which march in the end must be repaid with heavy interest.

Where does the fruit that supplies our markets come from? We do not mean the dozens and pounds, but the bushels and tons. Does this come from thumb-pinched, root-pruned, or crippled trees? Not a bit of it; but from trees which, after the first few years of their early growth, have been independent of Nature's journeyman, who know not his influence, and now ignore his interference. Go to the western orchards of Devon, Somerset, Hereford, and Wiltshire; the midlands of Worcester, Staffordshire, Warwick, and Notts, and what do we find? Not orchards that are indebted to the cultivator, beyond their first planting, for their existence, but which, left alone, produce sacks or tons of fruit. These are the real supplies of our markets. And what do they teach us? Not that fruit trees can be profitably dwarfed into fruitfulness, but that dwarfing is a process that may anticipate time, but not result in prolonged and ultimate profit. No person can travel through the counties we have named—and many [more which it would be easy to name—and see two, three, four, or more waggons drawn up under each tree, and the fruit being beaten from them by the sheer force of strong sticks, for cider purposes, without being convinced that these trees are the real sources of our supplies, and that cultivation adds comparatively but a handful to meet the actual requirements of our fruit eaters.

Look through the fruit gardens of the metropolis, or any of our large centres of population, through orchards planted for profit, and do we find any dwarfing there? Not a bit of it. But on the contrary, the trees are allowed to grow as they please, the removal of a crowding branch or two being all the pruning they receive. And is not this a lesson worth studying and learning? Yes; but since the facts ignore our fancies, and militate against recent teaching, we seek to ignore them. Looked steadfastly in the face, tested by results and not by fancies, we conclude the fruit markets of the world are not much indebted to the dwarfing processes for their supplies; but, on the contrary, these processes have their results more in anticipating time, and providing a little fruit for the supply of individuals, than in supplying the markets of the world. We shall return to this subject.

FEW physiological subjects are at the present moment of greater interest, and indeed importance, than the agency of ORGANIC GERMS, whatever their nature may really be, in the production and diffusion of disease. The speculations of Dr. HALLIER excited so much attention in this country, more indeed than they would have done had the accuracy of his knowledge of the minuter Fungi been more justly estimated, that our Government very properly sent out two very promising young medical men to India to investigate the subject, but directing them to pay especial attention to the nature and cause of cholera. After personal communication with DE BARY, PETTENKOFER, and Dr. HALLIER himself, and the best authorities in the country, they proceeded to India; and we have now before us the first portion of the report of Mr. LEWIS, and which completely justifies the selection that was made.

The subject is one that is surrounded by so many difficulties, and requires such a length of time before a complete series of trustworthy observations can be made, that it was impossible to arrive at once at a sound conviction on every point that arose; still the matter is of such present importance that it has been judged fit to publish a preliminary account of a portion of the observations which have been made.

The report now before us, printed at Calcutta in the present year, consists of 96 pages of letterpress, with 24 plates and three maps, all of which are executed in a style which may safely bear comparison with any illustrations of the same nature which have hitherto been published. That the full scope of the observations may the more easily be apprehended, Mr. LEWIS has very wisely reproduced the more important portions of Dr. HALLIER'S figures, and those of Dr. SWAYNE and Mr. BRITTAN, from the *Lancet* and *Medical Gazette;* and we cannot help remarking that Mr. LEWIS has shown throughout an impartiality and good feeling which are very greatly to his credit. The number of observations he has made is enormous, and we know that he has for several consecutive hours watched the same individual objects with a view to ascertain the course of their development. So rapidly, however, do changes take place, that he has sometimes found, when his attention has been diverted for a short time by some necessary avocation, that the whole aspect has been changed, and the very points which he wished to have ascertained have eluded his observation.

The report is divided into two parts: the first concerning the theory of the Fungoid origin of cholera and the microscopic objects found in choleraic evacuations; the second containing remarks regarding the soil of certain places in relation to PETTENKOFER'S theory of the connection of cholera with the variations in the level of the subsoil water. Our remarks at present must be confined to the first.

It is impossible in a journal like the *Gardeners' Chronicle* to detail all the different points which have by degrees been elicited. Those who are interested in the subject will be sure to apply to the Report itself. Our best course will be to give the result of the long series of experiments as far as they at present throw light upon the subject, which we will do in Mr. LEWIS' own words, remarking that, in our opinion, they are fully confirmed by a close examination of the facts:—

1. That no cysts exist in choleraic discharges which are not found under other conditions.

2. That cysts or sporangia of Fungi are but very rarely found under any circumstances in alvine discharges.

3. That no special Fungus has been developed in cholera evacuations, the Fungus described by HALLIER being certainly not confined to them.

4. That the still and active conditions of the observed animalculæ are not peculiar to this disease, but may be developed in nitrogenous material even outside the body.

5. That the flakes and corpuscles in rice-water evacuations do not consist of epithelium, nor of its *débris*, but that their formation appears to depend upon the effusion of blood-plasma; and that the peculiar bodies of PARKES found therewith, correspond very closely in their microscopic and chemical characters, as well as their manifestations of vitality, to the corpuscles which are known to form in such fluid; these are generally, to a greater or less degree, associated with blood-cells, even when the presence of such is not suspected, especially as the disease tends towards a fatal termination, when the latter have been seen to replace the former altogether.

6. That no sufficient evidence exists for considering that vibriones, and such-like organisms, prevail to a greater extent in the discharges from persons affected with cholera, than they do in those from other persons diseased or healthy; but that the vibriones, bacteria, and monads (micrococcus) may not be peculiar in their nature—for these do vary,—may not be the product of a peculiar combination of circumstances, and able to give origin to peculiar phenomena in a predisposed person, is "not proven."

Apart from the especial subject in view, Mr. LEWIS has given much information on many points as regards the development of minute organisms, and has drawn especial attention to the fact of the formation of false cells in different solutions, which resemble real cells so closely as to be capable of deceiving any one who has not paid long attention to such matters. He is inclined to believe that the true fructification of Mucor and Penicillium may be produced on the same thread, though he does not speak very confidently; but so strange are the multitudinous forms of fructification in Fungi, especially when we take into consideration the Saprolegnieæ which are most intimately connected with Mucor, that we are prepared for almost any anomaly.

We may add, that the illustrations are peculiarly useful, as they are all drawn to a scale; while the diameter of any object can be readily ascertained by comparing them with the one-thousandth of an inch scale placed at the foot of each plate. *M. J. B.*

—— THE following extracts from the *Times* will be of interest to those who knew Paris in its "garden days," or to those who are familiar with the descriptions given in our own columns of the PARKS and GARDENS of PARIS:—

"The Champs Elysées are given up to the National Guard, the garden of the Tuileries to the Artillery, that of the Luxembourg to sheep and cattle, and the parks of Monceaux and the Buttes-Chaumont to the storage of petroleum. The Avenue de la Grande Armée, that wide, handsome thoroughfare leading to the Arc de Triomphe, has now a telegraph station on its summit, and is provided, moreover, with the electric light. The avenue itself has been turned into an artillery camp. Adjoining the railway station a stone barricade, some 5 feet high, with apertures left for musketry, has been constructed across the road, and a similar barricade has been erected in the adjoining Avenue de Malakoff. Some little distance behind the above barricade, in the Avenue de la Grande Armée, is a second barricade of earth, while about 20 yards in advance of it one perceives that the gilt-tipped iron railings, which indicate the limit of the *octroi*, have been lined on the inside with stout timber, pierced with loop-holes for musketry, in front of which is raised a wooden stage for the marksmen to stand on, forming altogether no less than three lines of defence behind the ramparts. In advance are the drawbridges, clamped with iron rods and bars, and raised with heavy chains, and flanked with massive masonry, loopholed in 38 places. The side towards the Avenue de Neuilly, together with the massive posts of drawbridges, are tinted green to resemble the turf of the ramparts, and render them undistinguishable from it at night-time. A couple of 24-pounders peep through the embrasures of the flanks of the adjacent bastions, in lieu of the 6-pounder field-pieces formerly mounted there. In advance of the drawbridge an extensive angular-shaped earthwork has been thrown out, stretching some distance into the Avenue de Neuilly, and diverting the narrow roadway leading thereto circuitously to the left. This earthwork is strengthened behind with tall stockades, and has a second row of stockades in the rear, converting it, as it were, into a veritable redoubt. Other stockades are, moreover, carried across the *fosse* on both sides of the drawbridge, and one noticed that the large iron gas and water pipes laid bare where the moat has been continued across the road, were cased with timber covered over with long iron spikes.

"On emerging from the narrow circuitous covered way, a scene of utter desolation presents itself. For rather more than 800 feet in advance, which is the distance the 'Zone des Servitudes,' as it is styled, extends, all the beautiful trees that lined the avenue have been felled, all the handsome houses on either side razed to the ground, and all the charming gardens destroyed; some little of the *debris* alone remains, from among which women and children are picking out every morsel of firewood. On one's left hand is the Bois de Boulogne, laid perfectly open at this end to the road, with every tree that came within the inexorable 800 feet felled, some 18 inches or so of the stems being left standing above the ground, all of which are sharply pointed for the benefit of those venturesome Prussians who may chance to trip over them while attempting a night surprise.

"At the foot of the redoubt huge branches of trees, sharpened into innumerable points that thrust themselves menacingly forward, are interlaced together to form a kind of natural and most formidable *chevaux-de-frise*. The slope of the embankment is, moreover, faced with stout planks dotted all over with long, sharp iron spikes, while the top is studded with several rows of short posts, having stout wire running from one to the other a few inches above the ground, to trip up the too confident Prussian, who, having run the gauntlet of the improvised *chevaux-de-frise* and the steep incline of spikes, is determined upon carrying the redoubt.

"Not merely has a good third of the Bois de Boulogne been sacrificed to the exigencies of the defence of Paris, but the remainder has for the most part undergone considerable transformation. The outskirts are covered with felled trees, among which numerous wood-cutters and *charbonniers* are at work, the latter burning charcoal for the use of Parisian *ménages*, which are beginning to lack not merely food, but fuel to cook it with. More towards the Seine one comes upon a regular intrenched camp, in which soldiers of all arms are found—artillery, chasseurs, gendarmerie, troops of the Line, and Gardes Mobiles, many of whom have constructed cosy-looking huts, well lined in the inside with dry leaves, and affording far more efficient protection against the increasing inclemency of the weather than the regulation tent. The avenues of the wood are every here and there barricaded; its sham lakes have become mere stagnant pools, and its sham cascade is dry. In advance of it, however, some defensive works have been thrown out, and as for its mimic rocks, these have been converted into miniature forts. The *tour du lac*, that brilliant reminiscence of the past *régime*, is now reserved to the *forestiers* and *militaires*, who, at this epoch of prospective famine, devote themselves to dragging the lakes of their few remaining fish, which, sold by auction at the *halles*, realise incredible prices; or to chasing some

occasional deer, or shooting such tame and wild fowl as have chanced to escape the shots of previous marksmen.

"The Bois de Boulogne seems to have been considered as a source of danger of itself; and hence it is that since the investment of Paris it has been sacrificed with a bold hand. For upwards of a quarter of a mile in advance of the ramparts, and along their entire extent, the trees have been relentlessly felled; only here and there have a few clusters of large trees been permitted to remain. No doubt this has been done to guard against a night surprise on the part of the enemy, whereas the new works which have been constructed have been necessitated by the dangerous proximity of the Prussian positions at St. Cloud, Sèvres, Meudon, and Clamart, all within a couple of miles of the *enceinte*."

—— Considering, says *Nature*, the many uses to which INDIARUBBER is now applied, one of the most important being its recognised superiority over gutta-percha for deep-sea telegraphs, and remembering the fears entertained some time back of the probability of a decrease in the supply, owing to the exhaustion of the forests consequent upon the immense demand, it is gratifying to learn that the quantity of rubber exported from Para during the past year exceeded that of the previous year by 22,731 arrobas (an arroba is equal to about 25½ lb.), and by £241,250 in market value. It is true that the more accessible rubber districts are becoming exhausted, and give a smaller yield than in former years, but the rubber-bearing country is so extensive, and its rivers so incompletely explored, that the newly-discovered sources will, no doubt, more than make up any deficiency arising from the exhaustion of the old. It is difficult, however, to obtain accurate or reliable information from those engaged in the collecting of the rubber. The continued demand for rubber, which is collected with comparatively little labour, and requires but little skill and experience, absorbs all the attention of the natives over other products, and the constant rise in its value so stimulates its production, that it is more than probable there will be for some years to come an annual increase in the quantity imported of at least 10 per cent.

—— We have been favoured by Messrs. PERKINS & SONS, Coventry, with samples of a new Lycopod, a variety of SELAGINELLA MARTENSII DIVARICATA, which we propose to call ALBO-LINEATA. It has the pretty branching and somewhat arching habit of its parent, but differs in this respect, that instead of being everywhere green, the curving portions a little below the pallid tips, and just where most exposed by the curve to full light, have the stipular leaves entirely, and the lateral ones partially, changed to white, this colour being, as we learn, taken on in succession by the young growth as it developes. The effect of the variegation is that of a longitudinal white line running along the green shoots; and this effect is, we understand, equally brought out under artificial light, so that neat little specimens would be admirable decorative objects for the dinner-table. It is a style of variegation we have not before observed in these plants, the change of colour taking place principally in the epidermis of the stem, and in the stipular leaves, so that the flattened branches are green with a central median line. The variegation is similar throughout the whole plant, being principally apparent just below the tips, and is, we understand, perfectly constant. *M.*

—— There is one peculiarity about the treatment of CORDON APPLES noticed by Mr. FISH, in a communication to our contemporary, the *Florist and Pomologist*, which he regards as of some importance. The trees, he states, have neither been pinched nor cut since they were planted. They were planted in good loam in the spring of 1869, maiden trees on the French Paradise stock, and tied to their supporting wires full length. During the summer they put forth leaves along their whole leagth, but made no growth, while most of the buds were plumped up into well-rounded fruit-buds. Neither pinching-thumb nor slashing-knife has yet touched them, and they are studded with blossom-buds. This has determined our friend not to cut back maiden or newly-planted cordons, but to leave them at full length, when they immediately turn their attention to fruit-bearing. If cut back at first they make wood, and starting vigorously on this tack he fears it might be found they would not know when to stop. "Some have complained of cordons running out into cart-ropes the first season. To all who have complained of excessive growth, or to those who grow much fruit in little space, I confidently recommend the simple plan of pruning not at all. To this I would add the short injunction,—Don't pinch should the fruit not check growth sufficiently, but replant the cordon in the autumn, and leave the top full length."

—— In a recent number of the *Pharmaceutical Journal* a paper appears, by Mr. COOKE, on the GUARANA, the seeds of a tree named the Paullinia sorbilis, belonging to the order Sapindaceæ, and abundant in the province of the Amazons. The fruit is scarcely as large as a Walnut, and contains five or six seeds, which are roasted, then mixed with water and moulded into a cylindrical form resembling a large sausage, and finally dried in an oven. Before being used it is grated into a powder, very like powdered Cacao in appearance. Two spoonfuls of the powder are mixed in a tumbler of water, and this drink is regarded as a stimulant to the nerves, and, like strong tea or coffee, is said to take away the disposition to sleep. The active chemical principle is an alkaloid which Dr. STENHOUSE has shown to be identical with theine. Guarana contains more than double as much of this alkaloid as good black Tea, and five times as much as Coffee, the proportion being 5.07 per cent. in Guarana. It is rather a singular coincidence that the same alkaloid should prevail in all the principal substances employed in a similar manner as beverages in different parts of the world, in the Tea of China and India, the Coffee of Arabia, the Cacao of Central America, the Maté of South America, and the Guarana of Brazil. Guarana is a nervous stimulant and restorative.

—— In the State of Santander, Colombia, as we learn from *Nature*, one of the most important sources of state revenue is the manufacture of so-called STRAW HATS. These hats are chiefly made in the Bucaramanga district, and are of a very fine and white material, but still not equal to the celebrated Panama hats, as they soon become dirty, owing to the plait not being drawn sufficiently tight. The weekly sale of hats in the above district averages from 600 to 800 dozen, the lowest quality of which fetch about £1 4*s.* the dozen, and the finest quality often realising as much as £1 10*s.* to £1 16*s.* each. These latter are principally made near Zapatoca, which also has a large trade, but not to the same extent as Bucaramanga. They are for the most part exported to Havana and the United States, where there used to be a great demand for them, but now the trade seems somewhat to have diminished. In the first half of last year 250 cargoes were exported, and as each cargo contains 1200 hats, some idea may be formed of the large quantities manufactured. The above is gathered from a report on the industrial resources of the State of Santander. The hats referred to are described as being made of a white kind of "straw." We have not seen any of the actual material, but think, in all probability, the so-called straw may be the split leaves of some Palm, perhaps Thrinax argentea, which was imported in considerable quantities some years ago, and manufactured at St. Alban's into "chip" hats.

—— We have to announce the following subscriptions to the RIVERS PORTRAIT FUND, in addition to those already given:—

Anderson-Henry, T., Esq., Edinburgh	..	£1	1 0
Anderson, T., Esq., 6, Marine Parade, Brighton	..	3	0 0
Bunn, Richard, Esq., Ulverston	..	1	0 0
Lane, Messrs. H. & Sons, Berkhamstead	..	2	2 0
Spivey, Mr. E., Hallingbury Gardens, Bishop Stortford	..	1	1 0
Young, Mr. G., Audley End Gardens	..	0	5 0

—— An interesting EXHIBITION OF FRUIT has been recently opened at APPENZELL, Switzerland. Eight communes have furnished 689 exhibits, comprising 80 sorts of Apples and 120 of Pears. The fruits are arranged according to the height above the sea of the localities where they are grown. Thus, in the lowest zone are shown fruits which have been produced from 1300—2000 feet above the sea; in the next, those grown at an elevation of 2000—2600 feet; in the third group, those gathered at a height of 2600—3000 feet; and lastly are exhibited fruits produced above the last-mentioned elevation. Great care has been taken to ensure the accurate nomenclature of the fruits exhibited.

—— The RAINFALL during the week ending Nov. 12 was chiefly confined to the stations on the east coast, both in England and Scotland. (See Mr. GLAISHER'S Tables in our present issue.) In England the greatest amount was recorded at Newcastle, viz., 1.60 inch, and at one or two places no rain fell. The mean fall for all stations was 0.29 inch. In Scotland the largest fall was recorded at Aberdeen, viz., 0.96 inch, whilst at some stations no rain fell: the mean for the several stations was 0.19 inch. The MAXIMUM TEMPERATURES in England ranged from 54°.8 at Portsmouth to 45° at Newcastle, with a mean for all stations of 49°.5. In Scotland they ranged from 53°, at Perth, to 47°.7; at Aberdeen, with a mean for the several stations of 50°.6. The MINIMUM TEMPERATURES in England ranged from 21° at Hull, to 31°.5 at Norwich, with a mean for all stations of 28°; whilst in Scotland they ranged from 19° at Paisley, to 31° at Dundee, Aberdeen, and Greenock, with a mean for all stations of 27°.8. The MEAN TEMPERATURES of the week in England were very low, ranging from 34° at Hull, to 39°.6 at Liverpool, with a mean for all stations of 37°.6; and in Scotland they ranged from 35°.9 at Paisley, to 38°.5 at Greenock, with a mean for the several stations of 37°.4,—the mean temperature of the two countries, as determined from the observations taken at 22 stations, being nearly the same.

PORTRAITS OF GARDEN PLANTS.

ABIES GORDONIANA PUMILA, *Rev. Hort.* 1869, 215, fig. 52.

The Abies Gordoniana, of Carrière, is the Abies grandis of Gordon, not of Douglas, and what is called in some gardens Abies sp. from Vancouver. Of this plant the above variety is a miniature, forming a very compact pyramidal shrub, with numerous erect branches, clothed with scattered and sometimes distichous leaves, which are deep green above and are marked with two glaucous bands beneath. It is more hardy than its parent, and the leaves are said to be less liable to become scorched, while it has the property of producing all its branches erect. It has been obtained in the French gardens, by M. Malet.

ANTHURIUM ORNATUM, *Bot. Mag.* t. 5848.

A handsome tropical perennial Orontiad, with ovate or oblong-cordate green leaves, on slender terete petioles, the green scapes also terete, and terminating in linear oblong white spathes, 5—6 inches long, and slender cylindrical purple spadices of about the same length. It is a native of Venezuela, and was flowered in April, 1869, in Mr. Saunders' rich collection.

BRODIÆA COCCINEA, *Florist and Pom.* 1870, 145; *Bot. Mag.* t. 5857.

A charming Liliaceous hardy bulb, with lax linear foliage, and tall erect scapes, bearing an umbel of 5—15 drooping flowers, 1½ inch long, tubular, 6-lobed, rich blood-red below, the apex of the tube and the segments yellowish green. Professor Wood has made of this plant a new genus, which he calls Brevoortia Ida-Maia; but though differing from the previously described species of Brodiæa in the length and cylindrical form of the perianth, and in the great size of the scales at its mouth, Dr. Gray thinks it should be retained in that genus, and with this view Dr. Hooker coincides.

CEREUS FULGIDUS, *Bot. Mag.* t. 5856.

A very handsome tall-growing stove succulent, with elongate 3—4 angled stems, spiny at the nodes, and large showy flowers, 6—7 inches across, of an orange-scarlet colour, having the inner petals blood-red, and glossy, with a metallic lustre. The habit is that of C. speciosissimus. The history of this plant is quite unknown, but it has been cultivated for many years at Kew, flowering annually.

CITRUS TRIPTERA, *Rev. Hort.* 1869, 15, fig. 2.

A vigorous Aurantiaceous shrub, said to be hardy, furnished with robust branches, often more or less flattened, bearing stiff spines, and having subpersistent trifoliolate leaves, with sessile elliptic-obtuse leaflets on a winged petiole. The fruits are spherical, about 1½ inch in diameter, and of an orange-yellow when ripe. The plants flower and fruit twice a year. It is also known as Citrus californica, and Citrus trifoliata, under which latter name it is sometimes confounded with Triphasia (Limonia) trifoliata. A native of China and Japan.

COTYLEDON AGAVOIDES, *Refug. Bot.* t. 67.

This elegant Mexican Crassulaceæ forms a stemless greenhouse succulent, with rosulate, ovate, glaucous-green, thick, fleshy leaves, which are narrowed to a rigid spiny point; it thus acquires a close resemblance to a miniature Agave. The flower-stem is slender, 8—12 inches long, and bears a few dull orange flowers. It is commonly called Echeveria agavoides, and was introduced to our gardens by M. Jean Verschaffelt, of Ghent.

COTYLEDON CALIFORNICA, *Refug. Bot.* t. 70.

This pretty, dwarf greenhouse succulent, the Echeveria californica of gardens, bears a good deal of resemblance to Cotyledon (Echeveria) farinosa. It forms rosettes of ligulate lanceolate acute farinosely-glaucous leaves, and developes lateral flowering stems, a foot long, bearing short ovate amplexicaul leaves, and a bifid or trifid raceme of pale yellow flowers. Native of California.

COTYLEDON FULGENS, *Refug. Bot.* t. 64.

A handsome greenhouse succulent, better known as Echeveria fulgens. It has glabrous stems, 4 to 6 inches high, furnished with obovate-spathulate pale glaucous-green leaves, which are arranged in a thin rosette; and throws out leafy flowering branches, 12 to 18 inches long, bearing an irregular panicle of nodding racemes of bright coral-red flowers, yellow at the base. Introduced from Mexico to the gardens of W. Wilson Saunders, Esq.

COTYLEDON GIBBIFLORA METALLICA, *Refug. Bot.* t. 65.

This fine greenhouse succulent, the Echeveria metallica of gardens, is a beautiful conservatory plant, and also useful for bedding-out in summer. It has broad obovate-spathulate leaves, measuring nearly 6 inches across, and rather more in length, of a beautiful purplish glaucous metallic hue, and bears on a longish stem a loose thyrsoid panicle of from 30 to 60 yellowish flowers, tipped with red. The plant, which is a native of Mexico, is a most ornamental introduction, but is regarded by Mr. Baker, in his recent revision of the group, as a variety only of C. gibbiflora.

CRATÆGUS LOBATA SEROTINA, *Rev. Hort.* 1869, 79, fig. 20.

A vigorous growing, small spineless Rosaceous tree, with large sub-persistent oboval leaves, entire or sometimes lobed near the apex, and large brown-dotted yellow very ornamental fruits, ripening towards the end of the winter. It is also known as C. olivæformis in the French gardens.

DRACÆNA CYLINDRICA, *Bot. Mag.* t. 5846.

A stove Liliaceous shrub, with erect undivided stems, clothed with linear-lanceolate or obovate-lanceolate bright green spreading leaves, gradually larger upwards. The stem terminates in a cylindrical sessile spike of small white flowers. Native of the Old Calabar River, where it was found first by Mr. Gustav Mann, and subsequently by the Rev. W. C. Thomson, by whom it was introduced to the Edinburgh Botanic Garden.

ERITRICHIUM NANUM, *Bot. Mag.* t. 5853.

A dwarf, densely tufted alpine Boraginaceous perennial, with short stems, linear-obovate or oblong leaves, and brilliant azure-blue flowers with a yellowish eye. To the skill and energy of Mr. Backhouse, of York, is due the credit of being the first to rear to perfection "the most brilliant of all those diminutive alpine gems which inhabit the loftiest summits of the European mountains." Mr. Backhouse's plants flowered in May.

GREVILLEA BANKSII, *Bot. Mag.* t. 5870.

A robust tree-like greenhouse Proteaceous shrub, with leaves 4—8 inches long, deeply pinnatifid into broadly linear decurrent segments, whitish and silky beneath; the

flowers are red, in dense terminal racemes. It comes from the barren hills of Queensland. The plant figured was raised and flowered in August last by Messrs. Osborn & Sons, of Fulham.

THE FOREST AND CHACE OF MALVERN.

In a recently published part of the "Transactions of the Naturalist's Field Club," is a most interesting paper by Mr. Edwin Lees, F.L.S., on "The Forest and Chace of Malvern," with notices of the most remarkable old trees remaining within its confines. The almost universal admiration for, and interest in, forest trees of great antiquity or of noble growth, must be our excuse for reprinting a few extracts from the paper in question, which we doubt not will be acceptable to many of our readers. The paper commences with an historical notice of the "Forest and Chace," and proceeds to say that at the present time but few extensive commons or wastes are left within it, and fewer still vestiges of real forest ground. Little, if any, of the original forest, as understood by the term, now remains; for the woods that have been suffered to exist are composed either of bushy underwood that is felled every seven years, or of trees that are permitted to run up into thin lank trunks for the supply of Hop poles.

Near a fish pool in the middle of a pasture, that centuries ago formed part of a park belonging to the Bishop of Hereford, in the parish of Colwall, are two of the oldest Oak trees anywhere about the Malvern hills, and known as the Colwall Oaks. The largest of these trees has been much shattered, and has lost some of its finest branches. The base of the trunk is rather more than 60 feet in circumference, but it diminishes so rapidly, that, at a yard from the ground, it measures only 27 feet in circumference. The companion tree to this measures 45 feet round its swollen base. Mr. Lees considers it not at all improbable that these trees are 800 or 900 years old. "Yet," he says, "900 years will not carry us back into Druidical times, and probably no tree now exists in the precincts of Malvern Chace that stood in its leafy amplitude at the invasion of Julius Cæsar."

Fig. 264.

A peculiar form of pollard Oak, a figure of which is given, and from which we have made the accompanying sketch (fig. 264), is mentioned as standing in a field near the Severn, and is a characteristic specimen of what is called a Bur Oak. These Oaks, it is said, may be occasionally seen in old hedgerows. Another tree, called the "Devil's Oak" (fig. 265), shows a peculiar swelling of the lower parts of the branches, which, decaying, produces some grotesque appearances. The name of Devil's Oak, however, is said to have been derived "from some sweeps having been seen to emerge in the mist of an autumnal morning from its cavity, where they had been sheltering, and, as they disappeared in the fog, looked very much like young devils." Several other singular forms of Oaks are mentioned, as, for instance, that shown at fig. 266. In this case, after the tree has been frequently lopped, a crowd of young branches have grown on the upper parts.

A variegated Oak, having its leaves blotched with white, now stands in Cowleigh Park. Many instances of gigantic and spreading Yew trees are known to most of us, but there is a singular looking one standing on Conygree Hill, Bromsberrow—the most singular we ever remember having seen. The base of the trunk is gnarled and twisted, and the branches are so numerous and thick that it is not easy to tell which is the main stem. It measures about 25 feet in girth, and its age is estimated at about 1000 years.

With regard to the Lime, Mr. Lees says—"Some difference of opinion has been expressed by botanists and historians of forest trees as to the claims of the Lime or Linden to nativity in Britain, but in the shape of Tilia parvifolia it occurs in so many woods and coppices in the Malvern country eastward of the hills, that its claims as a native tree appear to be indisputable, though none of any great size can be noted in woods. But the Lime is there mostly cut down as coppice wood, and few trees of any great age are suffered to stand. I have observed the Lime abundantly in woods at the Berrow, in a wood at the eastern base of the Herefordshire beacon, in High Grove, Mathon, in a wood on the Little Storrage, at Roseberry Rock, &c. By the side of Leigh Brook it forms bushes to some extent, and in woods and coppices about Leigh the Lime appears with the character of Tilia europæa. In the parish of Bromsberrow

Fig. 265.

Fig. 266.

is a fine specimen of T. parvifolia, standing where some roads meet near the Brownsend, and this is called the Brownsend Lime, but it has been planted evidently. Some very fine trees of Tilia europæa now stand in a field about half a mile south of Bromsberrow Church, and by the side of the road leading from Ledbury towards Gloucester. Two of these, growing near each other, have become conjoined, both by the amalgamation of their arms and by a lateral junction at the root. The largest of these trees is 27 feet in circumference at 3 feet from the ground, and is 36 feet round the base; the other is 11 feet 3 inches in girth at a yard from the ground, and 19 feet in circumference at the base. The whole mass, if measured as one tree (and the interval between the boles where the connecting root joins them is only 19 inches), is full 48 feet in circumference.

In a field on the Priory Farm, Little Malvern, are several large trees of Tilia grandifolia, but these do not belong exactly to forest times, having certainly been planted either by one of the priors of Little Malvern, or some of his lay successors to the priory lands. The flowers of this species are larger and sweeter in scent than the common kind, and the pallid bracts are more evident. The leaves are not larger than those of T. europæa, but they are downy beneath, and the tree better deserves the trivial name of grandiflora, from its larger and more odorous flowers. A singular form of Maple (Acer campestre) is mentioned as standing in a field at Powick, "which exhibits a very old, decayed, and hollow bole, from which a younger one proceeds, itself of considerable size, and spreading much beyond its parent. The girth of the combined boles near the base exceeds 14 feet, which is greater than has been before recorded of any English Maple. It is estimated that the oldest portion of this tree is about 700 years.

Some of the Service trees (Pyrus torminalis) situated in the parish of Powick have indications of such a great age, that it is said they may not unreasonably be referred to the period of the reign of Edward I.

The Ash (Fraxinus excelsior) is a very widely-distributed tree, and some very fine specimens exist in the neighbourhood of Malvern. One is mentioned which measured 36 feet round, and at 3 feet from the base the bole was 22 feet 2 inches in girth, the radius of the longest arm was 36 feet, and its height was 91 feet. In the churchyard at Eldersfield, also, some very large pollard Ashes exist.

Elms, Alders, Willows, Birches, Hawthorns, and Mountain Ashes and other species of Pyrus, all come in for careful notice in Mr. Lees' paper, to which, for want of space, we must refer those of our readers who are specially interested in this branch of dendrology. *J. A.*

ALOE FIBRE.

No tropical plant is better known to the gardener than the American Aloe (Agave americana), and no indigenous plant is perhaps more important in Mexico, supplying, as it does, the favourite beverage of the natives, some particulars about which will be found in the *Gardeners' Chronicle*, p. 1243, 1866, and p. 209, 1867. We now wish to refer to it, more especially as a fibre-producing plant.

The well known thick leaves are composed of firm pulpy matter, in which are embedded numerous strong fibres; these fibres, when extracted and clean, form the "Mexican fibre" of commerce, quantities of which are regularly imported into this country for use in the manufacture of brushes. There is no question as to the strength and durability of this fibre; and the ease with which it is bleached, and its whiteness after bleaching, are strong recommendations for its use for certain articles of trade. For ropes and brush-making it is well adapted, and in its native country, as well as in other countries where it has been introduced, it has always found a use amongst the natives, either for cords, ropes, fishing-nets, hammocks, the rigging of ships, and even in the construction of bridges. It is said that the roots as well as the leaves yield a strong fibre. The fibre is extracted by steeping the leaves in water and afterwards beating them, and scraping off the fleshy matter, washing the fibre, and finally bleaching. Numerous varieties of the plant exist in Mexio, some of which are useful only for the juice they yield; others for their fibre; while others yield neither fibre nor juice, and

are used only for hedges. The fibre-yielding forms of Agave are known in Mexico as "Henequin," or "Zenequin," to distinguish them from the maguey or pulque yielding. The chief cultivation of the best sorts is confined to the peninsula of Yucatan; the inferior varieties are found in the valleys of Mexico and Puebla, and especially upon the plains of Apam, as well as upon the mountains in the vicinity of the town of Tula, in the State of Tamaulipas. The leaves of the fibre-yielding sorts are narrower, more supple, and of a darker green than those yielding juice, and their edges are commonly tinged with pink. Of these fibre-yielders four distinct kinds are known to the natives, namely, the "Chelem" and "Cajeu," which grow entirely wild, and the "Yaxqui" and "Sacqui," which are cultivated on an extensive scale. The leaves of the "Yaxqui" are of a more vivid green colour than those of the wild varieties of the plant, and their fibre is of a more elastic and finer quality, whilst that of the "Sacqui" is of inferior quality, but more abundant. The first named variety of the plant is commonly known under the name of "Henequin verde," or green Henequin, whilst the latter is called "Henequin blanco," or white Henequin, and constitutes the great agricultural wealth of the two districts of the peninsula of Yucatan. The plants are propagated by transplanting them so soon as the offshoots or suckers are two years old; and at five years old they begin producing fibre, the leaves being cut off at stated periods. The plant can be cultivated in almost every kind of soil, but flourishes most in arid stony places, usually attaining an age of 14 or 15 years. Although this particular form of the plant would appear to be an exclusive production of the peninsula of Yucatan, it has still been found to thrive very well in the island of Cuba, and in the higher districts of the State of Orizaba.

Agave fibre, under the name of "Ixtli," and known in Yucatan by that of "Josquil," was turned to various uses by the ancient inhabitants of the central provinces of the Mexican empire, where it is still twisted into thread for shoe-making purposes, twine, thin ropes, "lazoes," &c., and woven into sack cloth. The only part of the Mexican empire, however, where this branch of industry is pursued upon any very extensive scale is Yucatan, producing very considerable commercial activity, and especially since about the year 1840, when it was discovered in the United States that Agave fibre cables possessed the great advantage over those of Hemp of being more flexible and more serviceable in high latitudes; which discovery increased the demand for Agave to such a degree as to cause it to rise in value from about four or five reals per arroba (the current price until then) to eleven reals, a price which it commanded during several years; the average price being now from about seven to eight reals, and the supply often not equalling the demand, owing to the tedious nature of the process until then observed, of separating the fibre from the rest of the leaf by hand, a good workman not being able to clear more than 100 leaves per day. Great efforts were made to cause machinery applicable to the purpose to be invented, rewards being offered, both by private associations and by the State, for any machine which would prove to be efficacious, Agave leaves being sent from Mexico to Great Britain and the United States to be operated upon, since a machine which had been invented and introduced into Mexico, in 1833, by Mr. Perryne, an American, had been found to be useless, owing to neither the form of the combs, nor their motion, corresponding to the peculiar shape of the plant's leaves. No better success attended a machine introduced by another American, Mr. Hitchcock, in 1847, nor that subsequently introduced by Mr. Thompson, of Boston; until at last, Don Jose Maria Millet, a native of Mérida, the principal city of Yucatan, obtained an exclusive privilege from the Minister of Public Works for a machine of his invention, by means of which he was able to clear about 6 arrobas of fibre per day, the services of only two men and two boys being necessary to work the levers, by means of which the wheels and combs were set in motion. One of these machines has been taken to the city of Mexico to be applied to the extraction of the Agave fibre produced upon the plains of Apam, where so many of the leaves of the Agave are now wasted, and left scattered about the plantations.

Whilst the cultivation of the Agave fibre may be said to extend throughout the whole of Yucatan, there are near upon 40 estates upon which it is exclusively produced; and it is affirmed that the annual commercial movement, including the price of freight, transport, &c., connected with the production of this article in the peninsula of Yucatan, involves a circulation of from 400,000 to 450,000 dols. annually. *John R. Jackson, Acq.*

IRISH GARDENING.

DESCRIPTIONS of gardens, even to the veriest detail, are not without value as furnishing instructive matter to all who read and digest them, but unfortunately they are too open to much the same rebuke as a perpetual calendar of operations, or a packet of love letters. They are too monotonous, sometimes too dull, and with too much of repetition about them. If there is point about them, its piquancy is lost from their coming in frequent contact with the eye. Given the stock memoranda of half-a-dozen country seats, with their demesnes or domains, and their belongings, and you have a full, true, and particular account of the scenery, the wood and the water, the flower gardens, the forcing and fruit departments, with all the details, from Black Hamburgh Grapes to Telegraph Cucumbers, and from Orchids and Ixoras to Heaths and Acrophyllums. Of course a little repetition is unavoidable, but there is no very good plea, considering the extent of the kingdom of gardening, for hearing the same story twenty times told. Selection of subjects that passed before the eye, with such remarks as experience and judgment prompt, shall form the order of procedure of this and subsequent papers, although they are intended to be somewhat of a rambling and discursive character.

The writer had for years longed to visit the beautiful Emerald Isle, to see both its arboriculture and its horticulture, and it was with feelings of gratification such as animates all who step upon new ground for the first time that he began his little tour of inspection, threading his way from the place of disembarcation by the assistance of an Irish jaunting car to the

Royal Botanic Garden, Belfast.—There is a good deal interesting to be seen in this garden, and a good deal uninteresting. Like most Botanic Gardens not favoured with a Government subsidy, there is the manifest want of what the Hieland Minister in search of a wife demanded as a *sine quâ non*—"the wherewithal." Without the wherewithal, certainly, no garden can keep pace with the onward march of these times. There is so much demanded in the way of outdoor decoration as to entail considerable expense, and then the keeping up of an interesting botanical collection, both outdoors and indoors, is a work of magnitude, involving skill and pains and assiduity. There has not been wanting a little of each of these laudable qualities employed in the past, judging by the landmarks left to take observations from, but there is somewhat of a baldness throughout of all we expect to see in visiting a botanical garden, which the present curator, Mr. Johnston, is endeavouring, to the utmost of his power and within the limits of his means, to correct. The masses delight in a great summer show of gaudy flowers, and this has been provided them copiously—possibly too much so to please the eye of any one accustomed to criticise gardenesque scenery. It would be all well enough if there were ample means at disposal to carry out elaborate plans of massing plants for contrast, or for shading out into agreeable lines of beauty, such as we see at Battersea, and almost at Battersea alone—on a scale of magnitude as to detail corresponding with the magnitude of the ground work decided upon to be clothed. But where ambition leads one to clothe a large surface with ill-conditioned ill-assorted plants, after no proper design, but ranging one colour after another, it is often, when full grown, little else than a mere daub, about as confused as the colours on an artist's palette. This is what often brings, and very properly too, bedding-out into disrepute. Bedding-out is a capital idea, if capitally done; but the effects of it often are about as conspicuous for glaringness *sans* taste as the dress of a coquettish country girl, or the shawl of a collier's wife. The display in the garden in question was a very good one for attracting the eye of the masses, but to have carried it out upon the advanced æsthetic, and yet not unnatural, plan of grouping and designing with a variety of plants suitable for that kind of decoration, would have involved help and means far beyond the proper estimates. As gardening is not often a paying concern, either in gardens public or private, an excess upon estimated expenditure when the balance for the year is struck, is an uncomfortable little difficulty to get over, as most of the craft tied down to conditions and estimates well know. The curator, wisely for his position, takes "the bull by the horns," makes the most of a display with the materials he has to work from, and the labour employed; and if the finished designs give offence to the eye of those whom some might incline to call hypercritical, it is a matter of little moment. "Satisfy our constituency, and let the tongues of other people wag: when we make a little money by the sixpences and shillings of admittance, we may do greater things with the scope at our command. Remember the apothegm, quoted till it is almost threadbare, 'first catch your hare,' and then you will see the wisdom of catching the eye of the multitude." Just so; and it is a right and proper thing to use all honest means for attracting public attention, for it not only has the tendency of educating the taste, but in commanding the suffrages of the multitude it eventually repays the teacher, and that ought to be far more an object of the Botanic Garden Company ("Limited") than it is now. See what Mr. Findlay has done, and may do, at Manchester. It is only a question of time; and a garden that was burdened with debt to the not inconsiderable amount of £8000, shall not only be in a solvent, but a highly flourishing state. This turn in the tide of affairs is entirely due to the giving up Whitsun week for what is called "flower showing." His pupil at Belfast is setting afloat a scheme of something the same character, and his *debut*, which the writer witnessed, was a most praiseworthy one, remunerative even, and yet only prolonged for two days, and one of the days for storm and tempest such as might not be unworthily placed in the category of days reckoned up by the "oldest inhabitant." Given a popular centre, and he is almost a dunce, in business matters at least, who cannot bring the people out in paying quantities to see flowers and fruit. Unstinted for means and gardens, Belfast as well as Glasgow will flourish (*vide* the city coat of arms); dole the funds out with a sparing hand, and what availeth genius, even supposing it was to be found (which many people question) in the cranium of a gardener?

But to return to what is to be seen worthy of note in the garden, we were glad to find some favourites "in the wood" which might escape the observation of some altogether. We ourselves, in the matter of trees, are planting for posterity, and we are exceedingly glad to find some valuable out-of-door heirlooms handed down to us by our forefathers. Furnishing of that kind is invaluable, simply because we cannot reproduce it in a lifetime. Lots of money and time are spent upon the Lilliputs—what Mr. Robinson calls the fugacious tenderlings—while the giants that make up the backbone of our landscape are expected by many to live for ever, for the question of succession and selection is hardly thought over by many of our bran-new class of modern gardeners. Here is to be seen a very fine assortment of Oaks, and foremost among them for beauty of foliage and vigour of constitution is the Quercus pannonica. This Hungarian Oak is undoubtedly hardy enough all over our climate, and it is a species that ought to be planted by every one that is introducing trees for effect. Then there is the Italian Q. Mirbeckii; the beautiful pale green leaved Q. virens, the Live Oak of the Southern States of America, a capital tree for contrast among its compeers; the fine cut leaved form of Q. Robur—heterophylla, a distinct variety; its equally beautiful fellow of the same group, fastigiata, a proper characteristic name, looking to the habit of the tree. For very prominent leaved sorts we noted Q. Turneri, a Levant species, with great deeply-incised lobed leaves, flat and shining like a piece of silk. This, along with the Caucasian Q. castaneæfolia, will form fine objects in the landscape, the leaves of the latter being quite Magnolia-like, and dying off as red and beautiful in its way as Berberis canadensis.

Ireland is quite a home for Coniferæ. Not a spot of gardenesque scenery will you tread upon but some of the family rise up in beauty before you. Here many of them do well, those that did not look comfortable in their quarters, singularly enough, being Abies (Picea) Pinsapo, A. cephalonica, Picea Lowii, which does not get along well in many places, and the Deodar (Cedrus Deodara). About the two latter one is not so much surprised, as they generally thrive better in such marly strata as abound in Yorkshire and Leicestershire, than upon the chalky formation which generally margins our coasts. The two former luxuriate within the influence of the ocean breezes, provided they are accommodated with shelter, so that there are hopes of improvement in growth of the species in question in the Belfast garden.

Among two-leaved Pines the Corsican (Pinus Laricio) is growing away admirably. The Calabrian (P. Laricio calabrica) is a prominent sort, distinct from either the Ceraniean or the Corsican. It forms a far more columnar tree than either, and is a capital sort for planting. The Laricio itself is a fine-leaved species, bearing darker cones than its varieties, distributed geographically wide apart. The Scotch Pine, P. sylvestris, is forming itself into a model tree in the grounds, and is so dense in habit and so densely clothed with leaves as almost to be mistaken for some new introduction. Pallas's Crimean Pine (P. Pallasiana) partakes somewhat of the character of P. austriaca, but differs in the very important particular of having hooked cones. The Aleppo Pine (P. halepensis) is not a sturdy grower, but is a marked plant in a collection, growing low, somewhat like P. Pinea. The Pyrenean hooked-cone Pine (P. uncinata) is a fine dark-leaved sort, with great spreading branches, that layer themselves on the ground, and in a favourable locality would continue to go on doing so to an indefinite extent. Pinus Pinea has attained almost to its full height, forming a spreading-habited tree of the moderate height of 16 feet. Dr. Moore, who is full of Coniferæ lore, and who inspected the ground along with the writer and some others, related the following anecdote:—Tweedie, a well-known name among a host of intrepid collectors,—who, by the way, sent home Verbena Melindres in his travels in Patagonia,—was reduced to the starvation point, and gladly availed himself of the seeds of the Stone Pine to keep up life. Some of these, which he collected and preserved, were sent home to England, and are now forming trees in the Glasnevin garden.

Chief among three-leaved Pines worthy of notice in the gardens is Pinus insignis, one of the very best, certainly, of Californian introductions where the climate suits it. Sabine's North American species (P. Sabiniana), and Coulter's Californian species (P. Coulteri), are both doing well, the former being singular in the twist of its branches. These, along with P. ponderosa, formed the chief of the three-leaved section.

The Weymouth Pine (Pinus Strobus), which is the chief of the five-leaved section, was doing grandly, and is quite distinct from the Californian Mountain Pine (P. monticola), in having seed twice the size. The Bhotan Pine (P. excelsa) can only be tolerated as a species; its ornamental features seldom, if ever,

establish themselves in many portions of the island, and that only in localities where they have shelter of the most encompassing kind.

Douglas's Fir (Abies Douglasii) is not much at home upon ground where chalybeate springs prevail. It likes a very rich marly bed, or delights to wind its roots among the chinks of red sandstone. Abies Banksii is growing well, but the place to see this in grand style is at Lord Elibank's, Garrein Hall. Other species of Spruce did not strike us as noteworthy; the more beautiful of them, as has already been commented upon, not taking to the conditions presented for their acceptance. *A.*

WITHERING, PANNING, AND FINAL DRYING OF TEAS.

THE great expense of charcoal has long caused it to appear desirable to devise a means of finally drying Teas, which will be at once more economical, manageable, and cleanly, and yet less dangerous and prejudicial to the quality of the Tea. The Tea pan here represented (fig. 267) is the ordinary Tea pan (A) with a double casing (B), and connections (C) for joining the one to the other. By giving the pan a square bottom, and casting a return connection therein, it may be made to act as a boiler for a small apparatus, by which means there would be the greatest possible economy of heating material. For large establishments, however, auxiliary boilers had best be used, to insure a more certain and rapid circulation. These boilers may either be independent of, or act in conjunction with, the Tea pans, as may be thought most desirable; it is quite practicable to connect the pan with the pipes by other connections than those represented above, and to render them suitable for fixing under special circumstances.

The pans should, if possible, be set over furnaces, however, as it may sometimes be necessary to increase the heating surface, in the event of a sudden demand upon the apparatus, such as the bringing in of large quantities of wet, green leaves, &c. It may perhaps be necessary to remark here, for the information of the non-practical reader, that the hot-water system may be modified to suit almost any circumstances, and may be applied to a building of any size; it may either be applied to a temporary building or a substantial one, as well to a building with wattle sides as to a well-finished brick and tile structure. By using vulcanised indiarubber for joints, socket pipes may be taken to pieces at will, or they may be permanently fixed in their position. It is only necessary to know the required amount of pipe, and the maximum degree of heat desirable, and then to supply the requisite boiler surface is a simple arithmetical question. The maximum heat required in the manufacture of Tea is 200° Fahr., an amount which may be safely maintained on the surface of the Tea pan when the green leaves are undergoing their so-called "first roasting;" these green and succulent leaves, under the ordinary pressure of the atmosphere, have, like water, a limit to their capacity for heat.

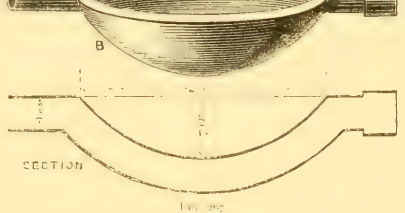

Fig. 267

Water cannot be heated to more than 212°, nor can the green leaves of Tea be heated to more than 160°, so long as active evaporation is taking place. The purpose of roasting the green leaves of Tea on a heated iron vessel is to liberate and evaporate the acrid juices, and at the same time to render the leaves sufficiently pliable for the rolling process; but so objectionable has the primitive Tea pan, heated by a wood fire, proved to many managers, that they have preferred to trust to sun-heat rather than risk their leaves on a vessel which is often dangerously overheated in the hands of natives, who cannot be expected to understand regulating fires for the preservation of volatile oils, &c. The object of the inventor is not so much to supersede the ordinary Tea pan, however, as to utilise it as a boiler for the drying pipes (this by a very simple arrangement may very readily be effected), which drying pipes are to supersede charcoal fires. These drying pipes will be laid in a parallel course round the inside of the Tea-house, and immediately above them will be placed wire-bottomed sieves containing the Teas to be dried. It is important to explain here that Tea is, to all intents and purposes, manufactured before it receives this final drying—that is, it has been roasted to evaporate the acrid juices, and to render the leaves sufficiently pliable to receive the twist and curl communicated by the rolling process, it has also been fermented to convert a portion of its sugar into acid, after which it is exposed to the sun and air, or artificial heat, to still further evaporate the juices, so that, when the Teas are placed over the charcoal fires, more than three-fourths of the moisture has been dispelled.

It will readily be understood what great danger there is of these comparatively dry leaves being burnt over open charcoal fires, and also the great attention required to prevent the particles falling through the sieves on to the fire, and thus creating a smoke, to the great injury of the aroma and flavour. Indeed, this so frequently happens, that a certain class of teas are often depreciated in value from 4*d.* to 6*d.* per lb. from these causes alone. It is scarcely necessary to point out the great danger from fire, and the anxiety caused to a manager where these open fires are used in buildings with wooden sides and thatched roofs. In connection with this subject, it is highly important to understand that too great a degree of heat will destroy the aromatic and volatile oil to which Tea owes so much of its taste and nearly all its aroma. It is not one of the least recommendations of the hot-water system to know that, while the boiling-point of water will not entirely destroy the volatile oil, 140° Fahr. is sufficient to resinise and develope in the highest degree this peculiar and very important principle. The surface heat of a range of pipes of any length may, if desirable, be maintained at 180° throughout; and, that this heat may be utilised in the greatest possible degree, it is proposed to construct ranges of shelves above the pipes, on which to spread the green and wet leaves during the prevalence of the monsoon rains, and thus to wither them independently of the sun. A complete apparatus for an estate of 200 acres might be put on board ship for £200, and making the liberal allowance of 50 per cent. for freight, cost of erection, and repairs for 20 years, the cost on the plantation would be, say, £300, or £1 10*s.* per acre. Against this cost must be set the price of charcoal, which, for an estate of 200 acres yielding 3 maunds, or 240 lb., of Tea per acre will cost quite 1*s.* 4*d.* per maund of Tea, or 4*s.* per acre per annum, or say £800, or £4 per acre for 20 years. *James McPherson.*

Home Correspondence.

Management of Plantations.—I wish to ask about a hard-wood plantation which I have lately felled. It consisted of Elm, Beech, Sycamore, &c. These stumps are putting up many young growths, which are now 4 or 5 feet high, and as much, or more, in diameter, each forming a bush of some 40 or 50 straight shoots. These, with some Larch, Spruce, &c., which I have planted among them, I look to for the future wood. Now I want to know what to do with these aforesaid shoots. Should they be thinned out now to about two or three, some 4 feet apart, in each clump, in order that they may not be drawn up too weakly, or should they be left for shelter, &c., until they are taller and strong? I wish to do the right thing, as I have seen the terrible effects of bad management in these affairs. *G. F. M.* [As "G. F. M." has allowed a large number of shoots to spring from the stumps of his felled timber, the sudden removal of all but three or four, which is about the number which should permanently remain, would be unadvisable this year. The best plan to pursue so as to keep in action the whole of the roots, which the trees have been induced by the abundant development of shoots to form, is to thin progressively. Cut out about half the shoots this season, leaving the most promising for future selection. Next year the thinning must be repeated, and by that time it will probably be found that three or four vigorous shoots have taken the lead—will have sufficient power to employ the roots already formed. In regard to the time for pruning, the present is as good as any, as the cuts would heal before very severe weather sets in. "G. F. M." does not say for what purpose the timber he proposes to grow is required. He must remember that it can never equal that grown from maiden trees, nevertheless the practice he proposes to adopt is one that is profitably pursued by many foresters, particularly in the neighbourhood of large manufacturing towns or mining districts where poles and timber props are always in request, and light wood for crates and other purposes can readily be sold. Local considerations of demand of course serve to affect the practice and period of cutting and thinning. *W. I., Belvoir.*]

Plant Cases for Exportation.—Now that this subject is being investigated, it should be gone into thoroughly, so that we may get as much light as possible thrown upon it. Your correspondents seem to think that the shape of the case is the chief ground of success. Now my experience leads me to differ from them on this point. I freely admit that, as in building a greenhouse, the more perfect they are, and the better they are adapted for the required purpose, the more may success be calculated on; but what good is a greenhouse and plants unless some attention is paid to them? Who would expect to find a plant alive in his Wardian case, even if at home, if it were left for two or three months to itself? I am convinced it is worse than useless to send out our best plants in such a way for anything beyond a month's voyage. If Mr. Bull has invented a system of ventilation that will work well at the required time without any attention, he certainly deserves a good royalty—not otherwise. It is my firm belief that the louvre system of shading will exclude far too much light for quick-growing plants in dull weather, and that it only ought to be used during glaring sunlight, or for bulbous plants, or plants that are dormant. I have just sent off two cases to the Governor of Gibraltar, one filled with choice bedding plants and the other with 18 plants for immediate use on the dinner-table. In packing these I have adopted some recent improvements, and when I hear of their arrival and condition I will send full particulars. What has made me pay more attention to this subject than I should otherwise have done is this:—About four years ago I happened to be in the Wellington Road Nursery when a boat-basket, about 18 inches long, containing Verbenas, arrived from New York: the plants were packed just as one would pack them for a short journey, and had only a thin material like tiffany over them. To the surprise of every one, they came over in beautiful condition. The next time I called I made inquiry concerning the American Verbenas, and found they had lost only one out of eighteen, and that one, no doubt, was not very healthy when sent off. This convinced me that there was much yet to be learned in respect to the exporting and importing of plants, particularly when I was shown the heavy lean-to cases, made of inch boards, which are used for the purpose. Having at the time an order from Mr. Branning, St. Kilda Nursery, Melbourne, I determined to imitate, as nearly as practicable, the boat-basket already alluded to, and Mr. Branning reports that "a great percentage of the plants came alive; out of the entire number 28 survived the voyage," and the success has resulted in an increase of one case per year. I have now shipped four on board the "George Thompson," besides supplying other plants for the decoration of the cabin. For the latter, plants are now greatly in request in the case of passenger ships, and both the captains and their wives manifest a great interest in them, and pride themselves on whatever plants they have—more, indeed, than many occupants of villas at home. These plants get every attention paid to them, so far as the knowledge of the seamen extends. When the ship returns, I will make a minute report upon all the plants, and send it to you. I was surprised, when I last visited this ship, to see the nice bushy, healthy plants of both Fuchsias and Pelargoniums, some of which, I was told, had been to Melbourne and back three times; and I was also surprised to see nearly all passenger ships fitted up, in suitable parts, for plants. The wheel-house, where there is a good share of light, is considered the greenhouse, and plants are drafted from thence into the principal cabins as required. Here are fitted shelves, with holes in them to admit 5 or 6-inch pots, The plants are looked upon as of more value than when on land, and the captains assure me that their plants always look best at the latter end of their journey, simply because they get better attention. This reveals the whole secret of success about the Verbenas in the boat-basket. Those who export plants should make friends with the captain or his mate, or even with any one on board; this is the main point. I have never found any difficulty in getting plants out to any part successfully by this means. But if cases are put on board without any one to care for them, and have the blinds always down, while they get neither water nor air for two or three months, there can only be one result in the majority of instances. Plants will no more live on board ship than at home without attention; and under such circumstances I am not at all surprised at the many failures recorded. In regard to exporting plants successfully, I cannot do better than repeat the truthful proverb,—"Whatever is worth doing is worth doing well." *Henry Cannell, F.R.H.S., Woolwich.* [We have received a long letter on this subject from Messrs. Henderson, publication of which is unavoidably deferred. EDS.]

Pollarding Oaks, &c.—With access to various books of reference I am unable to ascertain—(1), the proper time of year for pollarding Oaks, and how to cut the limbs as to length left; (2), the best distance at which to plant Chestnut, or Chestnut and Larch, for the production of underwood for Hop poles, hoops, &c.; (3), how to treat Holly, as regards trimming, manuring, &c., so as to obtain a good hedge in the least time. I venture, therefore, to have recourse to you for information on these points. *Winton.* [The best time to pollard Oaks is from December to March; in young trees 1 foot, in older trees 3 to 4 feet may be left. The distance to plant Chestnut and Larch for poles, &c., is 4 feet, or 3422 per acre. To form Holly hedges in as little time as possible select a sandy loam, if possible, and well manure it when the fence is to be planted.

Keep it free from weeds for two or three years, after which trim it at the sides to the width you want your fence, and if any of the plants want to form leaders cut them (the central shoots) out, so that the fence may thicken regularly and grow to one height. *M. C.*]

Eucharis amazonica.—I have at this time two 18-inch pots of the lovely Eucharis amazonica in fine condition; there are on one 18 stems, and on the other 17, with from five to six flowers on each stem, each flower 4½ inches in diameter; the leaves are large and green, and nearly hide the pots. The same plants were in flower in January of the present year, and again in July last. The flowers last a long time on the plant, or cut and placed in water. *Richd. Carr, Taverham Hall, Nov.* 14.

Flowers for Decoration.—As well as the Petunias mentioned by your correspondent, Mr. Knight (p. 1504), for "in-and-out decoration," I beg also to call attention to fine and distinct varieties of the common Antirrhinum for the same purpose. Towards the end of autumn and the earlier part of winter, flowers of almost any kind are valuable, and it is of great advantage, where there is anything like demand for them, to find some in the borders fit for cutting when most other things are destroyed by frost. I find that distinct sorts of Antirrhinum come in well for mixing among cut flowers and other decorative material; and even for the conservatory, where there is a scarcity of flower, and want of variety, nice plants of it do well if lifted from the open border, with good balls, and carefully potted. *R. M.*

Habits of Cuckoos.—When a boy, and in search of birds' nests in Northumberland, I found a young cuckoo in a small nest similar to that of the white-throat. The nest was in a Hazel bush, and when it became too small for the cuckoo I took it out, enlarged it, and placed the cuckoo in it at the bottom of the bush. The next time I visited the spot both were gone. I supposed it to have been taken away. The next I found was on a grassy bank, in the nest of the meadow-pipit; but after a visit or two it also disappeared. Some time after I found a meadow-pipit's nest containing six eggs, five of which were her own, the other was much larger, rounded at both ends, but of the same colour. Early one morning, on going to the spot, I saw the mother with one of her young in her bill, pinching and pecking it. She afterwards dropped it on the edge of the nest, and flew away, leaving it nearly dead. One lay outside bleeding and quite dead, two were in the nest unhurt. The fifth egg was chipped ready for hatching, and it turned out a fine little cuckoo. The next time I visited the place there was not a trace of anything to be seen except the cuckoo and the foster parent. Many years after this occurred I found a meadow-pipit's nest on the grassy bank of a haw-haw, but I took little notice of the eggs it contained. A few weeks after I was cutting the grass off the bank, and a young cuckoo flew out, not more than 2 feet from the nest. I was surprised to see the quantity of insects which had been carried to feed that single cuckoo. I may add that I never saw the meadow-pipit in the north of England before March, nor later than September. During 23 years' residence in the south of England I have never seen the meadow-pipit except in November, and then only a pair at a time. *John Brown, Bentworth, Alton, Hants.*

The Flourball Potato.—A correspondent in last week's *Gardeners' Chronicle* states that in his opinion a certain American red Potato is identical with the Red-skin Flourball, though, he adds, "I must freely grant that it is a fine late market Potato, which I invariably recommend," as also that it is white, while other red-skin Potatos are yellow, fleshed. Our Red-skin Flourball was obtained from a most respectable gardener near Reading, as a new and distinct variety; and though we had watched its growth during the summer, and the crop at the time of lifting, we certainly had never seen any red-skin Potato so white and mealy, or so heavy a cropper. Mr. Wm. Jackson, of Blakedown Nursery, an experienced Potato grower, has recently (quite unsolicited) given us his opinion, saying,—"We have lifted the Red-skin Flourball Potato we had from you. The crop was enormous, exceeding many of the American kinds; and the quality when cooked is so good, that without the least hesitation I must say it is the best red Potato I have ever seen." Numerous American seedling Potatos have been introduced into this country, some of which we have bought under their respective names; but certainly we have never sold any of these, or any other Potato, as "Red-skin Flourball." *Sutton & Sons, Reading.*

Calceolarias.—Will you be good enough to inform me if the Calceolarias named Ambassador and Sparkler are both alike except in name? *North.* [To this inquiry Mr. Cannell has kindly furnished the following reply:—"The Calceolarias in question are certainly different. I know them well. Ambassador was raised about 14 years ago by Mr. Burley, of Limpsfield, near Godalming, Surrey, who at that time used to exhibit at the Regent's Park. His son raised Pelargonium Lord Derby at Mann's. There was also another Ambassador, which sprung up somewhere in Scotland, about six years ago, as a new kind, but it proved to be the same. These half-bred varieties between the bedding and herbaceous kinds seem to grow and do much better in the North than in the South. Sparkler was sent out by Mr. W. Bull about eight years ago. There was a bed of it at Battersea Park the same year in which Pelargonium Stella made such an impression, and both were greatly admired. The two Calceolarias are very similar in appearance as regards the foliage, though that of Sparkler is more sharply pointed, but when they are in bloom they are very distinct. Ambassador grows about 12 inches high, and the blossoms are of a beautiful bright crimson-bronze: it is a self-coloured flower. Sparkler is much taller-growing, and this is its greatest fault, as when planted out it will grow quite 16 inches high, producing very slender flower-stalks, not sufficiently strong to support the flowers in rough weather; the colour of the flowers is similar to that of Ambassador, but perhaps not quite so bright, but it has one most distinct peculiarity, that of possessing a pure yellow cap. The variety called Victor Emmanuel is most like Ambassador." EDS.]

Cœlogyne (Pleione) præcox var. Wallichiana.—This mountain gem will now be flowering in most collections, its rosy purple flowers reminding one very forcibly of the "autumnal Crocus" (Colchicum autumnale), being borne just after the leaves have fallen off the quaint-looking warted pseudo bulbs. In many collections the pretty C. lagenaria will bear it company. I saw a pan of the former in the rich collection of E. Salt, Esq., Fernichurst, a week or two ago, which bore 36 flowers, nearly all fully expanded. It was a sight not often to be enjoyed. These beautiful little strangers grow well in decayed leaf-mould, with the addition of a little coarse white sand, the whole being covered with a layer of living Sphagnum. When growing they require an abundant supply of water, but the pan or pot must be well drained, in order to allow all superfluous moisture to pass readily away. After the leaves turn yellow and fall off, water must be gradually withheld, or there is danger of the bulbs rotting at the base. *F. W. B.*

Exhibiting Pears.—We country folks do not understand upon what points of merit the judges award prizes to this fruit at the London shows. If there happen to be a few Pears on a tree, and those are of extra size, will that, if they are sent, make a point of merit? If well up in size but picked too soon (for the purposes of exhibition) and likely be as tough as a cricket ball a month hence, is that another point? I think Pears should be ripe when exhibited, and also fit to eat. *Country Jan.*

Late Peas.—Peas have been very plentiful here this season, the last dish was gathered on November 8, from plants on the open border. We could have had them a fortnight later if they had been protected from frost. *R. L. M., Ringwood.*

Earthing-up Vegetables. — "Amateur," at p. 1506, asks for information on this subject, and refers to the divergence of opinion existing amongst practical men. I have never read the treatise published some years ago by the late Mr. Cuthill, who was, beyond question, a first-class grower for market in his day; but I consider the method of growing vegetables in a garden for home consumption, and that for market purposes only, as something widely different. The Cabbage plants grown in kitchen gardens have to be so cultivated as to produce fine Cabbages, and also a subsequent supply of greens—a practice which I can say but little in favour of, though that matters not. The market gardener plants thickly—these plants, as soon as they begin to "heart-in" a little, being pulled up and sent to market in bunches at once. Here, then, is a case where, whatever may be advanced in favour of earthing-up, it would not by any means pay. In regard to Potato-growing I distinctly differ with the statement that moulding-up is unnecessary or that it weakens, in any degree, the plants so treated. If "Amateur" has not dived into these matters beyond what he professes, I can offer him as my reasons for recommending the moulding-up of Potatos a valuable suggestion, which will be of some benefit to him in regard to his future practice. Simply moulding-up Potatos, in a thoughtless, purposeless manner, is of no use, or indeed, as Mr. Cuthill has remarked, "worse than useless. To mould Potatos up successfully the operation must be done at a certain time in their growth. But how is this time to be judged? Why, by simply arriving at a knowledge as to what we shall gain by the performance. The Potato set, as is well known, does little else than produce the young shoots, the better the set the stronger these will be. The young shoot issuing through the ground, as soon as it begins to make a little show of leaf, begins also to form roots for its support, which emanate from its stem above the set. Now, let "Amateur" observe, if at this particular time, when the young, tender stem is capable of emitting roots freely, fresh mould or earth is carefully drawn up around it, then finer and more numerous roots are formed, and the plants go on progressing. Not alone are feeder roots thrown out scout-like into this kindly feeding ground, but roots intended for tuber formation come more plentifully, and finding things so felicitous around imbibe strength and producing power. Hence a good crop accrues. Then as to the adverse side. By moulding-up the haulm when some 5, 8, or 12 inches high and above, and when the base has become hard by age and exposure, we not only run the risk of destroying the points of the roots already pushed out around, but bury them to an unnecessary depth. Indeed it is an injurious practice, as it is not a natural one. One word in reference to earthing-up Cabbage plants. This I advise should be done in part against wind waving, especially whilst severe frosts prevail, as the lower leaves of each plant, shrinking from their severity, collapse as it were, and thus losing their natural supports, the plants are dashed to and fro against the frost-bound ground. I also advocate it to induce greater root formation, knowing how freely the tribe will root in a multitude of ways into soil within their reach. *William Earley.*

Brown Scale.—My Peach and Nectarine trees were much infested and injured by scale last year. I applied to Mr. Rivers, who recommended methylated spirits (6*s.* per gallon); this I applied to the twigs infested, and found it a complete remedy. This year I have seen but few scale. *W. F. Radclyffe.*

Blinds for Shading.—We notice to-day an inquiry from Mr. John Malleson for some blinds, and from the description given, conclude they are the same as the sample herewith enclosed. We have successfully applied them for conservatory and room blinds; this year we find they give universal satisfaction. Their advantages are as follows:—They are easily fixed, as we send them complete, according to size required, and can be fixed by any one. They are made for both indoor and outdoor use, They have the advantage over the Venetian, as they are not so heavy, and, when rolled up, take up about one-third the space. They effectually exclude the sun without excluding the light, as is the case with Venetians. They admit perfect ventilation without draught, and exclude dust, an important advantage over Venetians. As you will see, they are very light and handsome in appearance. We can supply them in width from 1 to 7 feet. The action used to draw them up is very simple, and stops the blind at any height. It is made as in the model sent, and another form to fix to the side of any sash which can be fixed to any blind. *Dick Radclyffe*, 129, *High Holborn.* [We have seen the blinds alluded to by our correspondents in use. They are lighter than those that were in use at La Muette, and closely resemble those used in India. We think highly of their utility. But how about the cost? EDS.]

Inarching Vines.—I have a house full of the Lady Downes' Seedling Vines, three years old, a few of which I intend to inarch. Will any of your correspondents favour me with the names of the four best late keeping Grapes for the purpose, and which will do well in the same house as that variety? Also, will the inarching succeed if performed at the end of January, and previous to commencing forcing? *A Constant Subscriber.*

Salad and Vegetable Cases.—I am much obliged for your kindness in giving my offer a corner in your valuable journal. Since writing I have submitted my salad and vegetable cases to Mr. Gilbert, of Burghley, who highly approves of them, and I am making him samples of them, which he intends using on the 7th. I think I have met the difficulty, or rather suggestion, of your correspondent, W. P. Ayres, if he will kindly suspend his judgment until he has seen my cases, presuming, of course, that vegetables should be shown on an inclined plane, similar to flowers, and which in my case is provided for, at the same time that provision is made for the luxuriance of the exhibits during a four days' show. *W. F. Chapman.*

Table Plants.—I was surprised to find nice little plants of the Coleus, the Centradenia rosea, and the fruit-bearing Skimmia japonica, omitted in "R. M.'s" collection. The two first are among the best things for the purpose, and much better, in my opinion, than white variegated plants. But perhaps "R. M.'s" list is not concluded; if so, I beg his pardon. *Gaiety.*

Autumn Cauliflower.—Messrs. Veitch & Son are reported to have shown a late variety named "Autumn Giant," stated to have been sown on April 23, along with Walcheren and others; the latter being now gone past, while the former was just coming to perfection. I may be allowed to state that my Walcheren seed (supplied by Messrs. Barr & Sugden), sown on April 10 and 25, is just now, and has been for three weeks past, everything that could be wished for. I may add that I cannot understand the words "too large," as applied by your reporter. Surely the committee know that small Broccoli or Cauliflowers are far easier to grow than large ones. *R. G., Stamford.* [We quite agree with "R. G.," that it is much easier to produce small than large heads of Cauliflower, but we still retain our opinion, that the small, quickly grown, and well covered in heads are the best for table. EDS.]

A Plea for Vegetables.—I quite agree with Mr. Gilbert's suggestions for getting up prizes for vegetables at the Royal Horticultural Society's Show at Nottingham, but not in giving watches for prizes instead of money, because the latter is acceptable to everybody, and if the winner thought he should like to have a watch, there would be no difficulty in his getting one after. Neither do I approve of exhibiting unlimited collections, and looking at the greatest variety and the garniture as the principal point; I believe in limited quantities, let the number be what

it will, and then every man stands square to begin with, and the judges are better able to give satisfaction. If £20 or £30 can be collected, I shall have great pleasure in adding my mite towards it. I think the committee cannot make much improvement on the Manchester schedule for 1869. Mr. Meikle's suggestion of making only two classes, and 10 prizes in each class, is merely to get quantity instead of quality. Who would like to travel 100 miles to Nottingham for the chance of one 1st prize, or return home with a 10th prize, if they are only allowed to exhibit in one class? I believe in a liberal schedule, with limited numbers in each class, and with not more than three prizes to each, allowing exhibitors to compete in as many classes as they choose, but not to take more than one prize in each class. This, I think, would bring together a first-class show of vegetables. *James Smith, Gr., Wm. Blackburn, Esq., Waterdale Sutton, near St. Helen's, Lancashire.*

—— I beg to thank Mr. Meikle for his considerate reply to my former letter, nevertheless, I must beg leave to differ with him on the question of money *versus* gold watch. I think that even gardeners ought if possible to hand down something to posterity. I know of nothing more suitable than a gold watch, when in after years our sons may exclaim, with pride, "This is the watch my father won at the great horticultural show at Nottingham, the first time the Royal Horticultural Society took the bold, but certainly the wise step, of going single-handed." With respect to the sum of £30 being raised, as suggested by Mr. Meikle, I may say that this meets with my entire approval, but let us obtain £20 first, after that we shall have a better opportunity of judging of the desirability of going further. *R. Gilbert, Burghley.*

Fuel for Stoves.—I have one of Joyce's patent stoves: will some of your readers kindly inform me whether common charcoal will answer the same purpose as the patent fuel for heating a conservatory, or whether the fumes of the charcoal would be injurious to vegetable life? *E. Morgan, Harrow-on-the-Hill.*

Aquilegia.—The derivation of this word, from *aqua* and *lego*, is probably correct, for the last syllables could not be formed from *aquila*. In what way the Columbine resembled an aquilegium, or ancient rain-gauge, is not at all obvious. Mr. Ellacombe will find Columbine in a Herbal written by H. Lyte, and published in 1576, when Shakespeare was only twelve years old. *R. C. A. Prior.*

—— Aquilegia may be from "aqua-lego," denoting its being a water collector, or from "aquila-lego," from its natural selection of the habitat of eagles, as the varieties introduced into England have been mostly from mountainous or very cold countries. There is no doubt in my mind why it was called Columbine. There is a colour called "columbine" (Latin, columbinus), "a kind of violet, or changeable dove colour." *W. F. Radclyffe.*

Pleroma elegans.—Most gardeners who entered on their apprenticeship about the middle of this century, if they had anything to do with stove plants, will remember the purplish flowers of Bentham's Pleroma, often borne in those days at the tips of tall dwindling shoots. The old variety is now seldom seen, for like other, perhaps even more valuable plants, when well grown, such for instance as Combretum paniculatum, with which I was pleased to make a fresh acquaintance at the Lea Bridge Nurseries a few months since, many of the old favourites are grown out of date. Nor is it to be regretted in regard to the old Pleroma when we consider what a "gem of the first water" we happily possess in the modern introduction from the Organ Mountains—P. elegans. Whether grown as a pot plant, or turned out into a conservatory or intermediate house, this is really one of Flora's brightest gems. But P. elegans has one great drawback which will ever tend to keep it out of the first rank of popular favourites, and that is, it will only grow or thrive properly in an intermediate house. It will, in fact, neither flourish in cool stoves nor flower so freely as we might wish for in cold greenhouses, so that those only who possess conservatories and really intermediate houses have any chance of succeeding with it. To grow it into fine bushy specimens and to flower it well in pots, it requires a porous, fibrous mixture of peat, loam, silver sand, and potsherds broken small, as well as thoroughly prepared drainage. There should be about five parts of peat to about four of yellow fibrous loam. As in the case of many choice flowering greenhouse plants, small shifts only should be afforded, and not until the roots have attained fair possession of the soil. Like all plants which produce flowers most freely upon the points of last season's, or the previous summer's shoots, it is very essential that each current season's growth should be thoroughly well ripened. To this end, an uniformly warm dryish corner, with a tolerably free exposure to the air, must be selected for it, after it has made its growth, in a temperature seldom falling below temperate; but though a good uniform supply of root moisture is necessary at the active growing season, a very moderate supply only must be afforded after the growth is completed. During its resting period, with the atmosphere as dry as it can well be around it, the temperature may be permitted, as occasion may require, to fall as low as 45°, but never lower; indeed, if not so low by a few degrees so much the better. In general terms, I may say, do not shift any plant after July 1, nor pinch back the young shoots. *William Earley.*

Lycaste leucantha.—This old plant is but seldom seen in flower. Its sepals are of a bright apple-green, its petals pure white, its lip white, fimbriate, the central lobe set with short white hairs. The flowers are about 3 inches across, and have a very chaste appearance. It appears nearly related to Lycaste macrophylla (Lindley), which has brownish sepals, white petals, and a whitish lip spotted with reddish brown. Both species are now flowering in the collection of C. Stead, Esq., Baildon, Leeds. *F. W. B.*

Beet for Ornamental Gardening.—I am afraid that Mr. Morgan (p. 1476) has himself been unfortunate in the stock of Beet that he has hitherto grown in his flower garden, or he would not speak of its uses there in such disparaging terms, or give such *ad miserecordiam* advice to his readers. The Beet most usually recommended for the ornamental garden is generally known as Dell's Crimson. Whether this is correct or not I do not know. The sort I have grown for two years past was obtained originally from a gardener in this neighbourhood, who has grown and selected it so carefully for several years that, if an acre of it were grown, there would not be found a single imperfect plant amongst the whole lot. The leaves reach to an average height of 12 inches, are remarkably even, and have a handsome reflexed habit. The colour is of a rich, glossy, slatey crimson, and is not excelled by any other foliage plant of its colour. I do not understand what Mr. Morgan means by saying, "that 'pinching' is an operation difficult to perform on the Beet." I should not have dreamt of doing it at all; neither would he, if he had a good variety. Neither Amaranthus, Perilla, or the Iresine Lindeni, are so manageable, so graceful, or so effective, as good Beet foliage, whilst the labour of pinching in the former plants is considerable. All that you have to do to treat Beet fairly is to plant it out just where its full height will make it in perfect conformity with its surroundings, and it has no better contrastings than lines or margins of Centaurea candidissima, or Golden Feather. As to the attempt to ridicule the use of Beet in the flower garden, I pass that by. What matters whether it is tap-rooted or fibrous-rooted?—it is a splendid decorative plant, nevertheless. *A. D.*

Larch Timber.—For the information of your correspondent, "Somerset," I beg to say that I live in a house in which there are some floors laid down with Larch, and also some screens of the same material. These screens look remarkably well if well oiled and not painted. "Somerset" will find all the Fir tribe of trees more or less inflammable, owing to the turpentine in them. Scotch Fir is used for rough work, but is not considered equal to Larch for building purposes. *Henry Mills.*

Potato Grafting.—As this matter is still *sub judice*, I beg to tender some further evidence and to make a few remarks. With a view to ascertain at what period the scion unites with the tuber or stock, early last spring six white Potatos were carefully grafted with sections of a blue sort, furnished each with an eye, and planted in separate pots. Four of these were placed in the sunny window of a sitting-room to hasten their growth, and the remaining two at the foot of a south wall in the garden. When, after three or four weeks, green leaves appeared above the surface, they were turned out and examined, with the same result in all: the rootlets had made growth and were in full activity, but no union had taken place between scion and tuber. The parts were healthy, and at a later period would most likely have united, when granular substance had been thrown out from the vegetating shoot, and, perhaps also, from the tuber. This experiment, then, is adverse to the opinion that a union is effected with the first growth, and leads to the question why Potato grafting should be so much more effective than other grafting. Rather, it would appear, that the influence should be less, as the Potato scion has so early an independent growth. Granting, what cannot now well be doubted, that a union between the scion and tuber of the grafted Potato does take place, and that the young shoot does draw support and nourishment from the tuber as well as from the soil, through its own roots, why should all this differ so widely in its effect from the common grafting of an Apple scion on an Apple stock, in which case we do not find in the produce a blending of colours and of qualities? A Potato, we are told, is an enlarged bud or congeries of buds on an underground stem, and a bud is the complex of a plant. Perhaps, after all, the varieties Mr. Fenn has produced by grafting on the tuber may be but analogous to those procured, very often, by grafting, for example, the Apple on the Apple stock. This success has been rather in producing ill-formed tubers than in blending sorts. Now, the Apple is considerably affected in size and solidity by the stock on which it is grafted, as all gardeners know. I have seen the Jenneting doubled in size by growing on the free stock. Some Pears are stony when growing on the Quince, but we do not find a blending of qualities and flavours. The fruit is the same, though not quite so good; and so with Grape and other fruits, on which, as on the Potato, grafting has sometimes a marked but very limited effect. *S. S.* [It is something to have it acknowledged that a change does take place in consequence of grafting. We want to know now the why and wherefore, and the extent of the changes. Eds.]

Unprofessional Horticultural Spelling.—Horticultural readers are often furnished with considerable food for amusement when reading reports of horticultural matters in their local papers. The *Haunts Independent*, in an account of a fancy dress ball given at Southampton recently, tells us that there was a variety of plants, "including archia seboldia, lomaria gabbo, pandanus javalica variegata, dafen bachalata maculata," &c. Reporters for the general press would find an occasional dip into the mysteries of horticultural Latin not an unserviceable study, and would, perchance, save themselves and the papers they represent from becoming the subjects of well-deserved ridicule. *A. D.*

Keeping Late Grapes.—As your correspondent, Mr. Bennett (p. 1476), mentions my name in connection with keeping late Grapes in bottles of water, I have much pleasure in giving my experience in the matter. The Black Alicante, Gros Guillaume, Trebbiano, and West's St. Peter which he saw, were cut from a late vinery in the middle of November, and they kept plump and good for nearly four months. The bottles were pint porter ones, with a piece of string tied on their necks to fasten them to the wires of another late vinery, where the Grapes were uncut. When the bottles were fastened to the wires, and the bunches placed in them, they balanced so far as to hang down quite clear of the foliage; but a few larger and longer bottles were used to balance the largest and heaviest bunches. About 6 or 7 inches of the wood was left below each bunch to put into the bottles, and a few pieces of charcoal were put into the bottom of each bottle to keep the water sweet, which it did until all the Grapes were used. Some 3 or 4 dozen of these bottled Grapes were likewise tied on the outside of the shelves in a dark fruit room, and, with care in picking out any decaying berries, they kept as well as those in the vinery. I believe that late Grapes keep best, and are better flavoured when allowed to hang on the Vines; but in cases where the vineries want painting, as in my case, or when bedding plants are wanted to be put into them, the keeping of Grapes in bottles of water will be found very useful to many gardeners. Another great object in keeping the very latest lot of Grapes in water is to give the Vines a chance of being pruned and dressed before they begin to break, in April or the beginning of May. In the end of April in 1869 the latest Vines of Lady Downe's Seedling here were showing bunches with bursted berries from the flow of sap, and the Vines were quite in leaf before all the bunches were cut. Late Vines must suffer by such treatment year after year, and henceforth I intend cutting all the Grapes in March, and bottling them. When late Grapes are fully ripe and beginning to shrivel they will not lose flavour by keeping them in bottles of water, even if kept for many months. Your correspondent, Mr. Simpson (p. 1505), will be perfectly safe in cutting his house of late Grapes, with 6 inches of wood below the bunches to put in the bottles of water, if this is done in November. After that period late Vines derive but little more benefit from the sun or artificial heat in ripening the wood. *William Tillery.*

Croton variegatum var. angustifolium.—I notice at p. 1504 that "R. M." does not think this is a good subject for table decoration in a young state, but I must say that I have invariably found it one of the most beautiful plants that can be grown for the purpose indicated, and much more graceful than any of its numerous congeners. We have now young plants varying from 18 inches to 2 feet high, clothed for nearly their entire length with green and golden foliage. These plants were struck in February of the present year, and have been grown in a hot, humid East Indian house, with a mean temperature of 75°. Certainly these cannot be called old plants, and still they have had their characteristic pendent habit for some months. They have but one stem, and the recurved foliage gives one an idea of a fountain playing in the sunlight. *F. W. B.*

True Service Tree (Pyrus domestica).—Some months ago there occurred several notices of this tree in your columns (pp, 39, 76, 177, 313), and there seemed some confusion amongst your correspondents as to whether it was P. domestica or P. torminalis they were speaking of, and especially as to the rarity of the former in England. Your correspondent, T. Foster, having again revived the subject (p. 1443), I should like to say, *à propos* of the true Service, that when I was at Wiesbaden, in August, 1868, the fruit was brought into the market there from the surrounding villages by the poor people, who offered them for sale at a very low price. Not having seen them before, I was very curious to know what they were, and although I could clearly see they belonged to a Pyrus of some species, I asked the vendors what they called them, and was answered, either "Speirling-birne," or "Speirling-beeren," I could not precisely tell which; but your readers may know that "birne" is German for Pear, and "beeren" for berries. On my return home I satisfied myself that they were the True Service, and on turning to old Gerarde (edition, 1597, p. 1288),

I found him saying, that "the berries or fruit of the Service tree is called in high Dutch, 'Speirling,'" and Parkinson (edition, 1640, p. 1421), says, "the Service is called by the Germans 'Sperwer-baum'—the tree, and 'Sper-bieren'—the fruit." Parkinson's description of the two species is interesting, and is as follows:

"The True Service Tree (Sorbus legitima) groweth in time to be a great and a tall tree, spreading sundry great branches covered with a rough greyish bark, wheron grow large winged leaves, greater and longer than those of Ash, and each of them broader, more blueish green, and harder, and more greyish green underneath, and more dented also about the edges; the flowers grow in clusters, at several places on the branches with the leaves, consisting of four white leaves apiece, after which follow the fruit as big as Walnuts shelled out of the green husks, tending to yellow when they are ripe, with broad, brown kernels within them; in some round, which are accounted the best; in some oval, that is long and round; and in some almost Pear-fashion, which, like other Services, are hard and harsh when they are ripe, and must be hung up on strings in a warm room, or laid covered with straw, chaff, or some clothes, to make them mellow fit to be eaten, which then will be more pleasant than mellow Medlars; the wood is very firm and close, and yellower than the Ash."

"Our common Service Tree (Sorbus torminalis, *sive* vulgaris) riseth up to a reasonable height and bigness, spreading largely, with a whitish coloured smooth bark; the leaves grow singly by themselves, which are not winged, but broad, and cut into sundry divisions, and broad at the bottom next to the stalk, of a sad-green colour; the flowers grow in clusters, of a whitish colour at the end of the branches for the most part, which are succeeded with smaller round berries than the former, and browner also, containing within them small, blackish, hard kernels. These must likewise be mellowed to be eaten, or else let hung on the branches until the frosts mellow them on the trees, unless the birds devour them being neglected; the wood hereof is of a brownish yellow colour and hard.

"The first is seen with us but in few places, and those only planted for their rarity. The second is found in many places of England."

The tree (No. 1) mentioned by Mr. Foster must be a fine specimen, and its locality is worthy of being recorded in your columns. *W. Marshall, Ely, Nov.* 1.

P.S. While I am writing of Wiesbaden, let me add that Sambucus racemosa, in the warm, moist garden surrounding the Kursal, was covered with its beautiful scarlet fruit, although one of your correspondent's (p. 9) suggests that it would do best in high and dry situations.

Education of Gardeners.—In your leader at p. 1469, you acknowledge a feeling of disappointment at the present state of education among gardeners. The same thing has puzzled me for three or four years at least. I do not wish to say anything disheartening to the young gardeners, but would like to see them take the hint, and be up and doing. I have often doubted whether the wages movement has been at all in their favour. I took part in that movement, and did what I could to better their condition, but ever since I have noticed a falling off. The young men are more independent, they have more money to spend, and are better able to join in with the stablemen and the house servants generally, or to frequent the village alehouse. It is well known to us all that they could not have worse company; as the old saying has it, "When a gardener is a big man in the hall he is a little man in the garden." I am pretty well acquainted in the counties of Aberdeen, Kincardine, and Forfar, a hotbed for apprentice gardeners, and I find that the business is easy to get at, that numbers of uneducated youths take to it; they are generally, with a few exceptions, the sons of the labouring class who have large families. The parents get their sons, when from 14 to 16, into the squire's garden for perhaps seven, eight, or nine shillings a week, and have no apprentice fee to pay; they are off their hand at once, an dmanage to shift for themselves. Before leaving home they have perhaps been in the habit of frequenting the ploughmen's bothy, after which, when they are able to keep company and to splice their sixpence with Mr. Flunky, they think they have got promoted a step; no need for self-improvement, they are all right when they get into company with that gentleman, hence the depth of their ignorance when they come to an examination. Much good advice has been given from time to time in the columns of the *Gardeners' Chronicle*, and I think it would be a movement in the right direction were a few words of advice to be given them occasionally, and a few hints on subjects most beneficial for them to learn. *Peter Bell, The Insch.*

Mrs. Pince's Black Muscat Grape.—Notwithstanding the high testimonials which were given this Grape by many eminent horticulturists previous to its being sent out, it has since fallen low in the estimation of many, and even of some who were at first its greatest admirers; but whether this is caused by any fault in the Grape, or by the treatment which it has received from the hands of its cultivators, we have yet to learn. It has, however, now become widely distributed, and many good growers have tested its merits, so that their opinion as to its quality, favourable or otherwise, if recorded in the pages of the *Gardeners' Chronicle*, would, I am sure, be read with interest. The discussion would certainly allow those who are halting between two opinions to arrive at definite conclusions. Many assert that to grow it to perfection it must have a high temperature, whilst others advocate the cool orchard-house treatment. Having fruited it in the Muscat-house here, also in a house with comparatively cool treatment, I will briefly state my experience. The Vines in both instances were planted out in the borders, which had previously been well prepared, and received the same treatment as regards pruning, &c. In the Muscat-house they show by far the largest bunches, which set well, the berries swell oft evenly, and to a large size. But the somewhat drier atmosphere, and the more light that is admitted by lateral pruning, which gives a good finish to the Muscat of Alexandria, fails to do the same with Mrs. Pince's Black Muscat; and the colour of the latter, as grown in the Muscat-house here, may be described as dingy red, although in bunch and berry they are in every respect all that can be desired. Those grown in the cold house break freely and very strongly; they show an abundance of good-sized bunches, which set well. The berries swell off to a moderate size, but unfortunately many of them, after attaining the size of Peas, will remain stationary, which fault often destroys the appearance of the bunch; notwithstanding they finish off in the cold house a good-sized bunch, with berries of a medium size, with a deep bloom, and as black as Sloes. The flavour and keeping qualities of this Grape are too well known to need any comments from me; they are points on which I feel confident no one will disparage it; but when grown as it should be for late purposes, its flavour, like that good variety, Lady Downe's Seedling, does not, in my opinion, get to its best until after Christmas. My experience with Mrs. Pince's Muscat leads me to believe, that to grow it to perfection it requires a house devoted to its culture, similar treatment to that generally given to Muscats until the ripening process commences, when a cooler and moist atmosphere should be maintained, with an abundance of air; if these points are attended to, with the culture generally given to the Grape Vine by skilful cultivators, I doubt not that Mrs. Pince's Black Muscat will produce bunches and berries of a size not to be surpassed, while at the same time the colour will be as black as Sloes, with a deep bloom, and a rich Muscat flavour, and with keeping qualities unsurpassed, if equalled, by any Grape Vine we have in cultivation. *Thos. Foote, Haldon Gardens, near Exeter.*

Societies.

BRISTOL CHRYSANTHEMUM AND FRUIT SHOW: *Nov.* 10.—This exhibition, the seventh of the Bristol and Clifton Chrysanthemum shows, was held at the Rifle Drill Hall, Queen's Road, Bristol, and proved an unqualified success. Last year the show was held under difficulties, the present committee having only taken its management upon themselves in the middle of the year. This year, however, they were enabled to make their preliminary arrangements sufficiently early, and the result was pronounced by the judges to be as fine a display of the subjects exhibited as could be produced out of London. The long corridor by which the hall is approached was so perfectly draped with evergreens that it formed quite an arcade of foliage, from which clusters of golden Pompon Chrysanthemums hung in bold relief, contrasting admirably with the dark leaves amidst which they were interspersed. In the spacious hall itself the same taste was displayed, and blending with the Chrysanthemum and fruit were specimens of Zonal Pelargoniums, a large collection of ornamental foliage plants and Ferns, together with some artistic floral designs. Glancing first at the Chrysanthemums ranged round three sides of the hall a decided advance upon last year could readily be noticed, notwithstanding that the present has not been a remarkably good season for them, and is also rather late. In the 1st class, which was for nine varieties, Mr. J. Rugg won the 1st prize against Mr. J. H. Nash and Mr. G. H. Ames, the magnificent plants of these competitors nearly filling one side of the room. Mr. Rugg had a superb specimen of Mrs. G. Rundle. His examples of Alma and Golden Queen were also noticeable for their richness. Mr. Nash's beautifully coloured Gloria Mundi and also Queen of England attracted notice; and amongst Mr. Ames' nine varieties were a symmetrically grown specimen of Lady Godiva and a richly coloured Alma. In the class for six varieties, large-flowered, the competition lay between Mr. W. H. Wills and Mr. H. W. Green, the former taking 1st prize with Empress of India, Gloria Mundi, White Christine, Mrs. Murray, &c., while the latter's collection included a fine specimen of Mrs. G. Rundle. The Pompon and Anemone flowered varieties, though not so pretentious as their large-flowered rivals, presented a pleasing variety, and were very numerously represented. Classes 12, 13, and 14 (grown as pyramids) were also a special feature on this side of the hall. The standards shown at the bottom of the room were very choice, especially specimens of Bronze Jardin des Plantes, Miss Nightingale, and Mr. Astie. A portion of the fruit, a capital collection of Zonal Pelargoniums, and the miscellaneous plants shown by Mr. Joshua Saunders, Mr. J. Lucas, and Mr. W. H. Wills, completed the circuit of the room, the miscellaneous plants including some very interesting exhibits, and near them were the single specimens of new or rare plants. This latter prize was taken by Mr. Lewis Fry with Croton irregulare, Mr. J. Lucas coming in 2d with Dracæna Guilfoylei. Down the centre of the hall was a wide stage, on which a grand display of stove and greenhouse and ornamental foliage plants, towering high above the luscious fruit and the rich flowers ranged round its base, formed a charming centre piece to the show. For the 12 ornamental foliage plants there were four competitors, Mr. H. W. Green carrying off the 1st prize. Particularly noticeable amongst his plants were Adiantum farleyense, Caladium Lowii, Croton variegata, Alocasia variegata, &c. Mr. Lewis Fry came 2d, and conspicuous amongst his display were Crotons and Palms. The contributions in the six varieties, and the stove and greenhouse Ferns, were also exceedingly good, Mr. S. Budgett showing some very choice Ferns. The cut blooms (Chrysanthemums) were perfect, and it would be almost impossible to surpass those with which Mr. Rowe, of Roehampton, Surrey, carried off the prize. Near to these were staged bouquets for the hand, and the vases of flowers for table decoration. For the latter there was a very close competition, and the 1st prize was awarded to Mr. R. P. King, but Mrs. F. Baskerville's contribution, which took the 2d prize, was in the estimation of many equal, if not superior, to it in skilful and delicate arrangement, and the taste displayed by nearly all the competitors elicited repeated commendations. One of the great attractions was the splendid collection of fruit. There were in all nearly 500 dishes of Apples, Pears, and Grapes of superb quality, and the competition was so keen that the judges had the utmost difficulty in awarding the prizes. The Grapes from Mr. R. Cole, Mr. Crawshay (of Cyfarthfa), Mr. W. Pethick, and Mr. E. Sampson were deserving of all praise. Mr. Digby, of Sherborne Castle, Dorset, sent upwards of a dozen Pine-apples, weighing from 6 to 7 lb. each. The Walnuts shown were of a monstrous size, as were also the Apples; and the curious specimens of Prickly Pears won as much attention as any of the varieties amongst the fruit. Amongst the 13 special prizes the committee offered a silver cup for the best collection of fruit to be exhibited by fruiterers of Bristol and Clifton, which was won by Mr. J. Saltford, of Clifton.

DEVON AND EXETER HORTICULTURAL: *Nov.* 11.—The last exhibition of the season, in connection with this Society, took place in the Victoria Hall, Exeter, down the centre of which the stove and greenhouse plants and pot Chrysanthemums were displayed; the cut Chrysanthemums being arranged across the space beneath the orchestra, and the other three sides laid out with fruit. It was intended that the great feature of the show should be the Chrysanthemums, but the fruit unmistakeably bore off the palm. There were nearly 400 varieties of Pears and Apples on view, and amongst them the newest kinds from Flanders and France; probably no county in England could produce a finer show of hardy fruit, and Devonshire has not made enough of its productive excellence in this respect. Interesting to connoisseurs were the labelled trays of Pears and Apples belonging to Mr. R. T. Veitch, who very creditably sustained his rapute as a cultivator of fruit trees. Prizes were not offered for Grapes, but there was what may be called a scratch collection, and very good proofs of the geniality of the climate of Devon were furnished in the outdoor specimens; of greenhouse varieties, Mr. Cuthbertson furnished some capital long bunches. Sir T. D. Acland and Mr. J. C. Bowring were the principal amateur contributors of stove and greenhouse plants. Mr. R. T. Veitch had also an extensive array, including some choice Orchids, and in his collection of things notable was a mammoth Gourd, weighing 186lb. Mr. W. H. Morgan, of Plymouth, surpassed all competitors in the Chrysanthemum section, carrying off the 1st and 2d prizes—open to all England—for the collection of 12 and 18. His blooms were remarkable for their roundness and compactness, and for the perfect way in which they rose to a point in the centre. Mr. J. Tolman, of Alphington, took the 2d prize in eighteens, and Mr. J. Morgan, of Plymouth, the 2d in twelves. Mr. Tolman's specimens maintained the credit of the neighbourhood of Exeter worthily. To Mr. J. Daw's excellent 18 an extra prize was deservedly awarded. A curious basket of wool flowers was sent for inspection by Miss Thyrza Warren, of Wellington. Among the fruit exhibited the following were conspicuous:—Pears, dessert, in dishes of 9: Althorpe Crassane, Baronne de Mello, Beurré Bachelier, Beurré d'Arenberg, Beurré Diel, Beurré Rance, Bezi Mai, Calabasse Grosse, Chapman's Passe Colmar, Chaumontel, Conseiller de la Cour, Doyenne du Comice, Dr. Trousseau, Duchesse d'Angoulême, Eliza d'Heyst, Eyewood, Gansel's Bergamotte, General Todleben, Glou Morceau, Hacon's Incomparable, Huyshe's Prince of Wales, Huyshe's Prince Consort, Huyshe's Victoria, Knight's Monarch, Le Curé, Marie Louise, Ne Plus Meuris, Van Mons Léon le Clerc, Winter Nelis. Kitchen Pears: Bellissime d'Hiver, Bezi d'Heri, Catillac, Gilogil, Spanish Bon Chrétien, Uvedale's St. Germain, Verulam. Apples, dessert, in dishes of 9: Golden Reinette, Herefordshire Pearmain, Lamb Abbey Pearmain, Margil, Pearson's Plate, Ribston Pippin, Scotch Russet, Stunmer Pippin, Adam's Pearmain, Aromatic Russet, Ashmead's Kernel, Coe's Golden Drop, Cornish Gilliflower, Cox's Orange Pippin, Court of Wick, Golden Harvey, Taunton Golden Pippin. Kitchen Apples: Alfriston, Blenheim Orange, Devonshire Buckland, Dumelow's Seedling, Maid of Wilts, Ford's Flat-eyed Pippin, Hawthornden, Keswick Codlin, King of Pippins, Knott's Seedling, Irish Red Streak, Monstrous Pippin, Pound Pippin, Prince of Wales, Warner's King, Winter Greening. One of the most interesting subjects shown consisted of 12 sorts of Apples, in dishes of nine each, furnished by Mr. Eveleigh, gr. to R. N. Thornton, Esq. These beautiful Apples, grown by Mr. Eveleigh on the cordon system, are the first, we believe, ever produced or exhibited in the West grown on the cordon. The fruit was very fine and clear, although the little trees had been only planted a twelvemonth in March last. Mr. Thornton has carried out very extensive improvements in his garden at Knowle House, Sidmouth, such as making extensive new pleasure grounds and flower-gardens, and erecting a large extent of glass, in the form of pineries, vineries, Peach-houses, conservatories, plant-houses, pits, &c. He has also made a large new kitchen-garden, and as an edging

to its extensive walks Mr. Thornton kindly allowed his intelligent, persevering gardener to plant, to a large extent, the little Cordon Apples, already so fruitful and interesting. *J. B.*

STOKE NEWINGTON CHRYSANTHEMUM SHOW: *Nov. 15 and 16.*—This Society, one of the oldest of its kind near the metropolis, held its annual show on the above dates in the New Assembly Rooms, Church Street, with quite the average amount of success. The available space was very well filled with specimen plants and cut blooms, relieved with a few floral designs for the decoration of the dinner-table, and a large collection of good but wretchedly named fruits. The principal winners in the classes for flowering plants were Mr. J. G. Drain, Mr. A. Forsyth, Mr. Clark, Mr. Rowe, Mr. James, and the indefatigable Honorary Secretary, Mr. W. T. Howe. Amongst the best examples of the large flowered varieties the following were most noticeable for their excellent development and finish:—Annie Salter, Dr. Sharpe, Mrs. G. Rundle, Christine, Prince Albert, Guernsey Nugget, Empress of India, Golden Eagle, Mr. Brunlees, John Salter, White Globe, &c. In the Pompon classes, White, Lilac, Brown, and Golden Cedo Nulli, Bob, Madame Marthe, Golden Aurora, Mustapha, and Antonius, figured most conspicuously. The classes for cut blooms were well represented, the competition being in most cases very strong. On the point of quality, this branch of the exhibition is deserving of much praise, but as we noticed no particularly new flowers amongst them, we must spare our readers the infliction of a list of names.

Notices of Books.

The Wild Garden, *or our Graves and Shrubberies made Beautiful by the Naturalisation of Hardy Exotic Plants: with a Chapter on the Garden of British Wild Flowers.* By W. Robinson, author of "Alpine Flowers for English Gardens," &c. London: Murray. Pp. 236.

This useful little book consists of four parts. The first is explanatory, telling the author's object in writing it, and this in brief may be described as an attempt to extend the cultivation, in suitable spots, of our more interesting wild flowers, and such hardy exotics as may fitly accompany them. The second is a brief description of hardy exotics suitable for naturalisation in our woods and shrubberies, explaining the general character, height, colour, time of flowering, and mode of propagating of each. The third is devoted to selections of hardy exotic plants for naturalisation in various positions. The fourth discourses upon the garden of British wild flowers. The book has our commendations, both on account of its object and its execution, and we cannot better support these commendations than by giving a sample of each of its four divisions:—

"My object," says the author in his introductory or explanatory remarks, "is now to show how we may, without losing the better features of the mixed bedding or any other system, follow one infinitely superior to any now practised, yet supplementing both, and exhibiting more of the varied beauty of hardy flowers than the most ardent admirer of the old style of garden ever dreams of. We may do this by naturalising or making wild innumerable beautiful natives of many regions of the earth in our woods, wild and semi-wild places, rougher parts of pleasure grounds, &c., and in unoccupied places in almost every kind of garden.

"My reasons for advocating this system, as I do, are as follows:—First, because hundreds of the finest hardy flowers will thrive much better in the places I recommend for them than ever they did in the old-fashioned border. Even comparatively small ones, like the Ivy-leaved Cyclamen, a beautiful plant that we rarely find in perfection in gardens, I have seen perfectly naturalised and spread all over the mossy surface of a thin wood. Secondly, because they will look infinitely better than ever they did in gardens, in consequence of fine-leaved plant, Fern, and flower, and climber, ornamental grass and dwarf trailing shrub, mutually relieving each other in ways innumerable as delightful. Any one of a thousand combinations, which this book will suggest to the intelligent reader, will prove as far superior to any aspect of the old mixed border, or the ordinary type of modern flower garden, as is a lovely mountain valley to a country in which the eye can see but canals and hedges. Thirdly, because, arranged as I propose, no disagreeable effects result from decay. The raggedness of the old mixed border after the first flush of spring and early summer bloom had passed was intolerable, bundles of decayed stems tied to sticks making the place look like the parade-ground of a number of crossing-sweepers with their 'arms piled.' When Lilies are sparsely dotted through masses of Rhododendrons, as I recommend, their flowers are admired more than if they were in isolated showy masses; when they pass out of bloom they are unnoticed amidst the vegetation, and not eyesores, as when in rigid unrelieved tufts in borders, &c. In a wild or semi-wild state, the beauty of individual species will proclaim itself when at its height; and when passed out of bloom, they will be succeeded by other kinds, or lost among the numerous objects around. Fourthly, because it will enable us to grow hundreds of plants that have never yet obtained a place in our 'trim gardens,' nor ever will be admitted therein. I allude to the multitudes of plants which, not being so showy as those usually considered worthy of a place in gardens, are never seen there. The flowers of many of these are of the highest order of beauty, especially when seen in numbers. An isolated tuft of one of these, seen in a formal border, may not be considered worthy of a place at any time—in some wild glade, in a wood, associated with other subjects, its effect may be exquisite. We do not usually cultivate Gorse or Buttercups, yet Mr. Wallace, the distinguished naturalist and traveller, says—'During 12 years spent amidst the grandest tropical vegetation, I have seen nothing comparable to the effect produced on our landscapes by Gorse, Broom, Heather, wild Hyacinths, Hawthorn, and Buttercups;' and these are but a few conspicuous members of our indigenous flora, which is by no means as rich as those of many other cold countries! In every county in the British Isles there are numbers of country seats in which one hundred types of vegetation, novel, yet as beautiful as, or more beautiful than, those admired by Mr. Wallace, may be established; for there are in the colder parts of Europe, Asia, and other countries, Heaths handsomer than those usually grown, many 'wild Hyacinths' beside the common English one, many finer 'Buttercups' than those commonly seen, and numbers of Hawthorns besides our common May; not to speak of many other families and plants equally beautiful. Among the subjects that are usually considered unfit for garden cultivation may be included a goodly number that, grown in gardens, are little addition to them; I mean subjects like the American Asters, Golden Rods, and like plants, which merely tend to hide the beauty of the choicer and more beautiful border-flowers when planted amongst them. These coarse subjects would be quite at home in copses and woody places, where their blossoms might be seen or gathered in due season, and their vigorous vegetation form a covert welcome to the game preserver. To these two groups might be added subjects like the winter Heliotropes, the handsome British Epilobium angustifolium, and many other plants which, while attractive in the garden, are apt to spread about so rapidly as to become a nuisance there. Clearly these should only be planted in wild and semi-wild places. Fifthly, because we may in this way also settle the question of spring flowers, and the spring garden, as well as that of hardy flowers generally. In the way I suggest, many parts of every country garden, and many suburban ones, may be made alive with spring flowers. The blue stars of the Apennine Anemone will be seen to greater advantage 'wild,' in shady or half-shady bare places, under trees, than in any conceivable formal arrangement; and it is but one of hundreds of sweet spring flowers that will succeed perfectly in the way I propose. Sixthly, because there can be few more agreeable phases of communion with Nature than naturalising the natives of countries in which we are infinitely more interested than in those of greenhouse or stove plants. From the walls of the Coliseum, the prairies of the New World, the woods and meadows of all the great mountains of Europe; from Greece and Italy and Spain, from the sunny hills of Asia Minor; from the arctic regions of the great continents—in a word, from almost every region interesting to the traveller he may bring seeds or plants and establish round his home the pleasantest souvenirs of the various scenes he has visited.

"Moreover, the great merit of permanence belongs to this delightful phase of gardening. Select a wild rough slope, and embellish it with the handsomest and hardiest climbing plants,—the noble mountain Clematis from Nepal, the sweet C. Flammula from Southern Europe, and the magnificent new hybrid Clematises (if the earth be rich and there are rocks and banks on which they can be so arranged that they will not be overrun by coarser kinds, and that their masses of shoots may spread and bask in the sun till they glow into sheets of purple of various shades), 'Virginian creepers' in variety, Rubus biflorus, with its whitewashed stems, and other kinds; various species of hardy Vines, Aristolochias, Jasmines, Honeysuckles—British and European, wild Roses, &c. Arranged with some judgment at first, such a colony might be left to take care of itself; time would but add to its attractions, and the owner might go away for ten years, and find it more beautiful than ever on his return."

As illustrating the style of the second division, we take the few remarks referring to the interesting family of Croci, and which are as follows:—

"Naked-flowered Crocus. Crocus nudiflorus. Southern Europe. Bulb; 6 inches; purple; autumn; division.—In the grass in glades, by wood-walks, &c. This plant is naturalised in several parts of England.

"Showy Crocus. Crocus speciosus. Hungary. Bulb; 3 inches; purple; autumn; division.—In similar positions to preceding; also on banks and bare spots near fringes of shubberies, &c., in sunny spots.

"Susian Crocus. Crocus susianus. Turkey. Bulb; 3 to 4 inches; yellow; early spring; division.—Sunny banks, in short grass, in any soil.

"Imperati's Crocus. Crocus Imperatonius. Italy. Hardy bulb; 4 to 6 inches; lilac-purple; very early spring.—In short grass not mown till rather late in the season, in warm, sunny spots, where its early-flowering habit may be encouraged.

"The common yellow and blue Crocuses, *C. aureus* and *C. vernus*, may be naturalised with facility in grassy spots, as may the Scotch Crocus, *C. biflorus*, and indeed most of the other species."

The scope of the third division, mainly devoted to lists, will be manifest from the remarks, here quoted, relating to the naturalising of plants beneath specimen trees on lawns, &c. On this topic our author observes:—

"Where, as is frequently the case, the branches of trees, both evergreen and deciduous, sweep the turf—and this, as a rule, they should be allowed to do in nearly all cases where they are planted in purely ornamental grounds—a great number of pretty spring flowers may be naturalised beneath the branches, where they thrive without attention. It is chiefly in the case of deciduous trees that this could be done; but even in the case of conifers and evergreens some graceful objects might be dotted beneath the outermost points of their lower branches. However, it is the specimen deciduous tree that offers us the best opportunities in this way. We know that a great number of our spring flowers and hardy bulbs mature their foliage and go to rest early in the year. They require light and sun in spring, which they obtain abundantly under the deciduous tree; they have time to flower and develope their leaves under it before the foliage of the tree appears; then, as the summer heats approach, they are gradually overshadowed by a cool canopy, and go to rest undisturbed; but the leaves of the trees once fallen, they soon begin to appear again and cover the ground with beauty. An example or two will perhaps explain the matter more fully. Take the case of, say, a spreading old specimen of the handsome Weeping Mountain Elm. Scatter a few tufts of the Winter Aconite beneath it, and leave them alone. In a very few years they will have covered the ground; every year afterwards they will spread a golden carpet beneath the tree; and when it fades there will be no eyesore from decaying leaves as there would be on a border—no necessity for replacing the plants with others; the tree puts forth its leaves, covering the ground till autumn, and in early spring we again see our little friend in all the vigour of his glossy leaves. In this way this pretty spring flower may be seen to much greater advantage, in a much more pleasing position than in the ordinary way of putting it in patches and rings in beds or borders, and with a tithe of the trouble. There are many other subjects of which the same is true. We have only to imagine this done in a variety of cases to see to what a beautiful and novel result it would lead. Given the bright blue Apennine Anemone under one tree, the Snowflake under another, the delicately-toned Triteleia under another, and so on, we should have a spring garden of the most beautiful kind."

Then finally comes the garden of wild flowers, and here the author asks:—

"Need we grow weeds to have a fair representation of beautiful British wild flowers? No such thing! It will be my pleasant task to look over the whole British flora with the reader, to tell him where to find and how to grow the rarer kinds, and to enumerate all that are ornamental; and in doing so I shall have to name a great variety of plants, but not one weedy subject I hope. In the season of wild flowers, when many of us stray into the fields, or on to the hills, to find many a gem which I advise should be grown in the garden instead of being made a mummy of, the more beautiful British flowers will prove much above the delightful in wild and half-wild places near our gardens, and scrambling over slopes and through hedgerows, alive and full of change, than ever they have done in the best herbarium.

"So far as I am acquainted with the labours of British botanists or horticulturists, none of them have ever attempted a selection from our wild flowers as adapted for garden use. The botanist, as a rule, deals with things in a wild state only, and therefore the subject has never been thought of by him; the horticulturist generally deals only with the useful or the conspicuously attractive, and has never thought of culling the higher beauties of our flora. But why should this be so? 'Botany,' says Emerson, 'is all names, not powers;' and assuredly, if it does not lead us to a real enjoyment of our wild flowers, it is barely worthy of a better character. To flatten and dry a number of wild plants and leave them in dust and darkness is necessary for botanists, but it is not likely to cause any wide-spread human interest in such things; and therefore I propose that we look through the list of British wild flowers and endeavour to rescue the subject from its present dry-as-dust character."

And to accomplish this he runs his pen over the various orders, culling and commenting upon those best suited to furnish his wild garden.

We have now, we trust, brought forward evidence sufficient to show that the commendation we have bestowed on the volume is not undeserved. It is a blow aimed at the vulgar craving for mere colour-effect in flower gardening, and as such has our sympathy.

Garden Memoranda.

THE TEMPLE GARDENS.—Regularly as cheerless, foggy November comes round, these City gardens put on their bright floral garb, and form an object of attraction for thousands upon thousands of pent-up Londoners and sight-seeing provincials. This year there is no falling off, either in the number of visitors or in the number or quality of the Chrysanthemums. Mr. Dale's collection, which is even larger than usual, is, for the want of glass, placed under a canvas screen. His flowers are remarkably good as a whole, whilst those of Guernsey Nugget, General Slade, Gluck, Lady Hardinge, Mrs. Haliburton, Jardin des Plantes, Golden Eagle, Astrolabe, an old Chinese variety, representations of which are nearly always found on old firescreens; Rev. J. Dix, Cherub, Prince of Anemones, White Globe, Mrs. G. Rundle, Golden Queen of England, and Nil Desperandum, are of rare excellence. Owing to the extensive alterations which are being made, consequent upon the completion of the Thames Embankment, Mr. Dale has not so many beds of Chrysanthemums as usual, but as something like 2000 loads of maiden loam have been carted here to raise the level of the ground, we may expect to see some surprising results another year. Mr. Broome's successor, Mr. Newton, has provided a much neater display than we have seen there for some time. His show-house is more satisfactory than heretofore, and there is an air of uniformity and neatness about the place which used to be wanting, when old mats were the principal sheltering material. The number of varieties here is much larger than Mr. Dale's, but for quality the latter carries the day. The most noticeable flowers were, Mrs. Huffington, Prince Alfred, Sanguineum, General Slade, White Globe, Orlando, Mr. Sharpe, Christine, Lady Talfourd, and Jardin des Plantes.

Miscellaneous.

CHURNING SONG.

Katie: Pink-eyed Daisies, Asphodel,
Clover-balls, and Pimpernel,
Sweet wild flowers that check the mead
Where the milky mothers feed,
Listen, listen to our song
While the churn-rod drives along.

Fair to look at are our kine,
White as milk, or red as wine,
Black as Sloes, or Strawberry-pied,
Satin-skinned and gentle-eyed.
Go where'er ye will, I ween,
Better cows were never seen.

Naughty kine, why will ye roam
When our Marian calls ye home?
When ye wander past the creek
Robin has to help her seek.
Rosy-red is Marian then
Ere she brings ye home again.

Marian: Little elves that all the day
Rock amid the wild flowers spray,
Come and cluster on my arm,
Say the spell and work the charm;
Hasten! and I will not tell
Of your doings in the dell.

Oh! the melody of birds!
Oh! the lowing of the herds!
And the busy wild bees hum!
And the muffled partridge-drum!
And the blue skies spread above!
And the breeze's tale of love!

White as milk the Daisies be,
White the wood Anemone,
Red the scented Clover-ball,
Red the wild Rose over all.
Rosy red and milky white,
All love's colours blend in light.

So the loving ray comes down
Golden as a monarch's crown;
So the loving light looks up
Golden from the Buttercup.
King and peasant, sun and flower,
All are golden in love's hour.

Splash and splutter! Butter! butter!
How it heard the words I utter!
Cream, like maidens, gives its treasure
Only at love's long sought pleasure.
Katie, take it off to town,
Ralph is there to drive you down.

J. J. P., "In Public Opinion."

AMMONIA AND VEGETABLE DYES.—M. Vogel has recently published the results of some experiments on the changes produced by ammonia in some vegetable colours, especially those of flowers, which he thinks may be of practical importance in the manufacture of vegetable colouring matters of a character similar to aniline dyes. The colouring matter he states to be of two kinds, united with a different degree of persistence to the tissue of the flower itself, and requiring a shorter or longer time to produce any alteration. The change produced in the colour of some flowers, as the Rose and Phlox, by the fumes of Tobacco, is entirely due to its ammoniacal element. M. Vogel found that some colours are altogether unchanged by lengthened exposure to ammonia, as, for instance, yellows, all reds (except in the case of the Zinnia, which is converted into a brown-red), and dark Violets. Blue is sometimes unaltered, sometimes changed into a dirty green, and then bleached. In some cases, not only the colour, but the tissue of the flower is destroyed. The changes are generally the same as those that take place during the withering of the flower. *Society of Arts Journal.*

STRAWBERRIES.—From amongst several hundred seedling Strawberries which we have tasted and examined this season, the following are selected as those which have most struck our fancy, and seem the most promising. The following four varieties may indeed be looked upon as real acquisitions, which we shall be glad to welcome when their owners think fit to introduce them:—1. Waltham Seedling.—A hybrid raised between Crimson Queen and Sir Charles Napier, and partaking, to a certain extent, of the characteristics of both parents, though in general outward appearance more nearly resembling Sir C. Napier, but sweeter and richer. The fruit is of about the same size, and produced in as great abundance. The colour is somewhat darker, approaching a deep red; the flesh firm, juicy, rich, and very pleasant; habit of the plant, robust and vigorous; leaves dark green and sturdy; a most extraordinary cropper, and a decided improvement upon Sir Charles Napier as to quality of fruit and vigour of plant. Raised by Mr. W. Paul, Waltham Cross, and selected out of several hundred seedlings, many of which possessed points of great merit. 2. The Amateur.—The fruit of this is of large size, and of very handsome appearance; the colour of a deep dark crimson; the shape roundish-obovate and cockscombed; flesh bright red, somewhat soft, but of very pleasant flavour. This extremely promising variety is a seedling raised by Mr. Bradley, the raiser of Dr. Hogg, Sir J. Paxton, and Oscar, whose name is thus an almost sufficient guarantee of its merits. Mr. Bradley states that it surpasses every other variety he has grown, both for size of berry and productiveness. It is very sturdy and robust in constitution, retaining the foliage well throughout the winter. The fruit commences to ripen about the same time as that of Sir J. Paxton, and the plant continues long in bearing. Recommended as being particularly suitable for amateurs who can only cultivate one variety. 3. Duke of Edinburgh (Moffat).—This is a hybrid resulting from a cross between Keens' Seedling and Elton Pine. The fruit is very large, cone-shaped, and irregularly cockscombed; the colour deep dark crimson; the flesh dark, moderately firm, yet juicy and pleasant, but not particularly rich in flavour. Its large size and fine colour give it a noble appearance, which will make it a great favourite for market purposes. It comes into use the same time as Keens' Seedling, but keeps up a much better succession, affording fruit in a good state for four weeks. The habit of the plant is robust, and it is a most extraordinary cropper. Raised by Messrs. Moffat, fruit-growers, near Edinburgh. Received a Certificate from the Royal Caledonian Horticultural Society. 4. Royalty.—This is a seedling raised from a cross between Black Prince and British Queen, both of which it considerably resembles in outward appearance. The fruit is of medium size, ovate in form, with a well-defined neck, the colour bright shining red; flesh pale red, solid, rich, and very pleasantly flavoured. In general appearance this most nearly resembles Myatt's Eliza, although quite distinct from that variety. The plant is of vigorous growth, and an abundant bearer. Raised by Mr. Trotman, Isleworth. Received a First-Class Certificate from the Fruit Committee of the Royal Horticultural Society. *A. F. B., in "Florist and Pomologist."*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Camellias, those gayest of all winter-blooming plants, must have something more than ordinary attention at this time, if they are expected to form fine large blooms and to carry the buds to a successful successional issue. All such plants will now be engaged very actively in the development of their flower-buds. With a view to aid each plant as much as possible, the foliage should be kept scrupulously clean, a resort to actual sponging being perhaps of most use; and generally there is time at this particularly dull period of the year for the proper performance of this operation. Equally important is a liberal supply of water at the root, given with a proper attention to all the circumstances of the case. True though it be that a scarcity of root moisture often causes the plants to shed their buds, this disheartening effect is as frequently attributable to an excess of moisture, causing the soil they grow in to become clammy through improper drainage, whence results ulterior stagnation. Whilst, therefore, water may be advantageously afforded at the root with judicious freedom at this season, it should only be given after a due consideration of the kind of soil that the plants are growing in, and of the condition of the drainage. In any case pot plants will invariably need the most, unless they have been very recently fresh potted. The rule will not always hold good in the case of plants which have long been turned out of pots into open borders, as these are often very shallow, and filled to excess with roots. Remove all decayed leaves from *Indian Azaleas* at the earliest moment after they have ceased to be serviceable to the plants. Specimen plants of these having ample pot-room will need a more careful supervision in the matter of watering than the above, as, though they likewise are advancing slowly to the flowering period, the strain is not yet so greatin regard to them, from the fact that in a majority of instances they will not bloom at so early a date, and by shedding many of their older leaves the tax is not so great on the roots. In the case of plants which are more or less pot-bound, and intended for early and it may be severe forcing, a plentiful supply should be given constantly. Give room to the earlier batch of *Cape Pelargoniums*, that each plant may enjoy a free unencumbered circulation of air, and all the light possible. Stop the grosser shoots, and, where practicable, tie out into proper shape such as need it. Upon fine days give air so freely as to assimilate the outer air with that within the structure as much as possible. During any spare moments, which may be met with at this period of the year, attention may be given to label-making and to the proper naming of all the plants. Above all, see that the names are correctly spelt, as few things deteriorate a gardener's prestige in his employer's or any visitor's estimation as plants—to the especial study of which his whole time is supposed to be devoted—badly named. In my recent visits I have seen the best-made labels, and a good bold hand-writing, wasted from the inability to spell correctly the names even of popular old stove climbers. Young gardeners have no excuse for this, as every kind of useful dictionary is within their reach.

FORCING HOUSES.

Those who are starting their early *Vineries* should give proper consideration to the Vine borders. If these are without-doors, the necessary thickness of fermenting materials must be maintained not only to keep the cold outer air from entering, but also to retain whatever warmth may still be left within, and to insure a temperature congenial to root formation upon or near the surface, for in most thriving Vine borders many roots exist at no great depth below the surface. Be careful, however, not to let the heat rise to excess; if maintained between 50° and 60° at first it will suffice. If no suitable materials have yet been placed on out-door borders of later vineries as a protection from any heavy falls of snow which may occur, these should be placed on at once. Where the Vine borders are within-doors, and entirely under command, as is "proper," they should first have a preliminary watering with soft water, not too cold, and in a few days afterwards they should have a thorough good soaking with a good wholesome manure of moderate strength, which will no doubt incite all semi-dormant spongioles to assume activity. In regard to *Pines*, little can be added besides a suggestion regarding the proper maintaining of all necessary artificial warmth around such as are grown or wintered in pits chiefly by these means. There are instances when it is of some importance to retard fruit which is ripening for a week or two. This may be done by removing the pot containing it to the fruit room, or some place having a minimum temperature of not less than 50°, and where the air is perfectly dry. It is important to remove it when the soil within the pot is moderately dry. The plants should be pulled out of the tan-pit, and allowed a day or so to cool somewhat before removal. Give to each successional bed of *Mushrooms* a soaking with tepid water after the spawn has been placed therein some five weeks, and immediately any buttons show, commence damping down the floor, and syringe all surfaces frequently, to maintain a moist atmosphere.

HARDY FLOWER GARDEN.

Place cinder-ashes or refuse Cocoa-nut fibre around stools of *Tritomas*, &c., removing under cover such things as *Herbaceous Lobelias* of the fulgens type, *Mirabilis*, &c. Cover up *Myrtles* which are intended to remain in the open ground, and give to *Pansies* a good dressing with finely sifted and decomposed leaf-mould, placing it carefully in small mounds around the base of each plant. Similar but coarser material may be placed on to beds of *Lily of the Valley*. As soon as the bulbs of *Gladiolus*, taken up previously, and hung in a dry shed or so to ripen off, have their leaves and stems decayed, cut them away, and store the bulbs in a cool, not over-dry place, taking care to label the different sorts.

HARDY FRUIT GARDEN.

Cover up *Fig trees*, by the customary method of bundling the branches together in straw or by any other method that may suggest itself. Place a coating of manure at the base of all young trees supposed to have roots near to the surface, and which are known to be within the reach of frost. Finish releasing the young branches of *Peach* and *Nectarine trees* from actual contact with the wall, and so induce the wood to ripen the better by allowing a freer contact with the air. Be careful so to secure the young branches that they do not snap off, or receive injury by rubbing against the wall through wind-waving. Any walls which need pointing should now have that operation performed, before a frosty period sets in.

KITCHEN GARDEN.

The first actual hard surface frost having been experienced, it will be well now to be prepared for the worst. Delay in regard to making the necessary preparations for duly covering over the choicest vegetables, coming in for earlier use, will militate against those who neglect the timely warning. Where *Sorrel*, *Mint*, *Tarragon*, and such like herbs, are in great request in the kitchen, it will be well to take up roots and pot them firmly to commence forcing at once. Make up a bed likewise for forcing early *Asparagus*. A good bulk of fermenting material must be got together, if there is to be no aid from hot water. Where a beginning has not been made with *Seakale* or *Rhubarb* forcing, a batch should now be placed in the Mushroom-house for an early supply. Both air and light must be scrupulously kept from the former. In order to keep air away it is very advantageous to place over the crowns after they are planted a layer, a few inches thick, of dry leaves. Finish laying down and earthing over the stems of *Broccoli*, as previously advised. Look over the stock of "roots," and especially *Onions*, which will need sorting. Choose from amongst these the soundest, and have them roped and hung in a cool place to come in late in the spring for use when the general crop is done. *W. E.*

TOWN GARDENING.

I HAVE already advised that intending cultivators of the *Chrysanthemum* should make their selections, and in case they have not had the opportunity of doing so for themselves, I here append a list of those most suited for outdoor culture. *Whites:* Beverley, Christine, Defiance, Mrs. Haliburton, Marchioness, Queen of the Isles, and Vesta. *Yellows:* Annie Salter, Aurea multiflora, Chevalier Domage, Gloria Mundi, Beverley, Christine, Hermine, Guernsey Nugget, Temple of Solomon, Golden Queen, Changeable Yellow, and Golden Trilby. *Reds:* Antonelli, Nil Desperandum, Pio Nono, Sir Talford Carey, Julie

Lagravère, Dr. Sharp, and Dr. Rozas. *Peach and Rose.* Ariadne, Alfred Salter, Queen of England, Princess Marie, Pilot, and Mrs. Sharpe. The above will all do well out-of-doors, but will be much improved if flowered under glass. By those who have the facility of glass, the following beautiful varieties should also be grown:—Princess of Teck, General Hardinge, John Salter, Crimson Velvet, Bouquet des Fleurs, Two-coloured Incurved; and the grotesque Japanese varieties, which are remarkable for their great diversity and novelty of colour. Of *Pompon* kinds, the following are hardy, and free bloomers, and well adapted for massing:—*Whites:* Cedo Nulli, Miss Tallourd, Model, Madame Martha, and Trevenna. *Yellows:* Cedo Nulli, Drin Drin, General Canrobert, Berrol, and Aigle d'Or. *Rose:* Adonis, Duruflet, Ranunculus, and Florence. *Brown:* Autumna, Bob, La Lilliputienne, Mr. Campbell, Madame Pépin, Aurora Borealis, and Miss Julia. *Pink:* Adèle. Madame Rousselon, Attila, and Trevenna. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, NOVEMBER 16, 1870.

1870 Month and Day.	At 9 A.M. Readings of Barometer reduced to 32° Fahr	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition: Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
November.	Ins.	Deg.	Deg.	Deg.		Gr.
10 Thurs.	29.65	35.0	34.1	32.6	91	2.1
11 Friday	29.89	35.0	34.3	33.1	88	2.1
12 Satur.	30.28	42.0	41.0	38.7	87	2.7
13 Sunday	30.15	37.4	37.0	36.4	96	2.5
14 Monday	29.64	44.2	42.9	38.8	80	2.7
15 Tues.	29.58	41.2	41.0	39.5	96	2.8
16 Wednes	29.59	42.7	42.3	39.5	92	2.8

1870 Month and Day	Temperature of the Air: Highest	Lowest	Range in Day	Mean	Departure from Mean of 15 years (1855-69) according to Greenwich	Direction of Wind	Rain: Duration of Rain	In Inches
November	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
10. Thurs.	40.1	33.4	6.7	36.6	-2.8	N	2.5	0.60
11 Friday	39.1	31.3	8.0	35.4	-3.7	N	9.5	0.10
12. Satur.	42.2	29.1	13.1	35.1	-3.7	WSW	13.5	0.07
13 Sunday.	45.0	31.0	14.0	37.3	-1.5	WSW	12.5	0.56
14 Monday	48.5	33.3	15.2	41.1	+2.8	WSW	13.5	0.07
15 Tues	50.9	40.0	9.9	45.5	+7.4	variable	2.0	0.01
16 Wednes	51.1	42.3	12.0	47.8	+9.8	WSW	2.5	0.01

Nov. 10—Heaviest thunderstorm I remember. Lightning very vivid.
" 11—Thunder in the night. A small quantity of rain fell in the morning.
" 12—Generally cloudless. A very fine day.
" 13—Clouds till the evening, then clear. Lightning to the north during the early morning.
" 14—Generally cloudy, but fine. Lightning vivid in the north at night. Distant thunder.
" 15—Windy, and quite cloudless. Lightning vivid in the north at night. Slight thunder.
" 16—Small amount of hail must have fallen in the night, as the ground was whitened in the morning. Heavy showers during the day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS.

DURING THE WEEK ENDING SATURDAY, NOVEMBER 12, 1870.

Names of Stations	Temperature of the Air: Highest	Lowest	Range of Week	Mean of all Highest	Mean of all Lowest	Mean Daily Range	Mean.	Fall of Rain
	Deg	Deg.	Deg	Deg.	Deg.	Deg	Deg	In.
Portsmouth ..	51.8	24.2	30.6	49.1	28.8	20.3	38.4	0.00
Blackheath ..	51.6	29.1	22.5	44.8	34.0	10.8	39.1	0.03
Bristol ..	..	..	..	..	..	..	..	..
Birmingham ..	48.2	29.5	18.7	43.1	35.1	7.8	38.9	0.14
Wolverhampton	47.7	28.3	19.4	42.0	34.4	7.6	37.6	0.25
Leicester ..	50.6	26.2	24.4	45.5	31.8	13.7	..	0.07
Norwich ..	50.8	31.5	19.3	44.9	34.5	10.4	..	0.00
Nottingham ..	48.2	25.7	22.5	43.2	31.9	11.4	37.1	0.04
Sheffield ..	52.2	30.0	22.0	43.4	34.8	9.2	37.6	0.09
Liverpool ..	50.2	33.1	17.1	44.5	39.1	5.4	41.8	0.30
Manchester ..	..	..	..	..	..	..	..	..
Salford	51.5	25.6	25.9	44.2	29.9	14.3	36.5	0.23
Bradford ..	48.0	21.4	26.6	41.1	31.3	9.8	36.2	0.08
Leeds	49.0	30.0	19.0	41.3	32.9	11.4	38.0	0.00
Hull	49.0	21.0	28.0	42.1	29.1	13.0	34.0	0.05
Newcastle ..	45.0	30.0	15.0	40.7	32.0	8.7	35.7	1.00
Edinburgh ..	50.7	29.0	21.7	..	..	..	37.3	0.20
Glasgow ..	50.3	24.0	26.3	..	..	..	37.1	0.09
Dundee	50.0	31.0	19.0	..	..	..	37.3	0.03
Aberdeen ..	47.5	31.0	16.5	..	..	..	37.5	0.02
Paisley	52.1	19.0	33.0	..	..	..	35.9	0.00
Greenock ..	50.0	31.0	19.0	..	..	..	38.0	0.03
Leith	52.3	29.6	22.7	..	..	..	38.1	0.04
Perth	53.0	27.0	26.0	..	..	..	37.5	0.00
Dublin	51.0	26.0	25.0	..	..	..	37.6	0.11

JAMES GLAISHER.

Notices to Correspondents.

BOOKS: *W. A.* Paxton's "Botanical Dictionary:" Bradbury, Evans, & Co., 25—*Inquirer.* McIntosh's "Book of the Garden" was published in two volumes. Any publisher can get it for you.

FUNGUS: *F. W. B.* Your stinking friend is Phallus impudicus, an abominable nuisance.—*W. M.* 1, A. furfuraceus; 2*, Oidium fructigenum, on a Quince; 2, new species, A. (Pholiota) Marshallii; 3, form of A. personatus approaching sævus, though the stem has no lilac tint, the mycelium has; 4, A. orbatus; 5, Stereum purpureum. *M. Y. B.*—*R. M. Y.* Your Agaric is Agaricus nudus of Bulliard, very nearly allied to A. personatus, which is wholesome, but an indifferent article of food. *M. J. B.*

GESNERAS: *G. McG.* Pretty varieties, but not possessing sufficient distinctness of character to merit general cultivation.

GUNNERA SCABRA: *Moorhill.* This is not a water plant. It may be grown out-of-doors in Hants with very little protection.

JAPANESE PLANT: *A. Hampton.* Judging from your description, your plant is Primula cortusoides; but, if you will send us a leaf and a flower, we shall be able to tell you if our guess is correct, and your description, therefore, trustworthy.

LILIUM *Canadense Reader.* Sow now in drysh soil, and keep dormant till spring.

MELON GROWING AT HECKFIELD: *J. S. W.* Enough has been said on this subject.

NAMES OF FRUITS: *A. F. S. Pear:* Josephine de Malines.—*W. Bushell. Pears:* 1, Bergamotte d' Esperen; 2, Glou Morceau. *Apples:* 1. Northern Sweet; 3, Bath; 6, Dumelow's Seedling; 7. Winter Pearmain; 8, Beachamwell.—*F. B.* 1, Northern Greening; 2, Pigeon; 3, McLellan; 4, Rostoken.—*T. F., Redcastle.* 1, Fondante d' Autômne; 2, Bergamotte.—*J. B. Tibbits. Apple:* Scarlet Crofton.

NAMES OF PLANTS: *W. J., Graham's Town.* Your Orchid is Aerides crispum. Of course, you are aware that this is an Indian (not an African) plant. If it has flowered at Graham's Town, we should very much like to have particulars of your mode of treating it.—*J. M. H.* The Spindle tree, Euonymus europæus.—*Rosebud.* 3, Erica caffra; 4, E. gracilis; 5, E. Willmoreana, var.; 1, probably a seedling barren frond of some Lomaria; 2, probably Asplenium vivipara—we cannot name Ferns from barren fronds; 6, we do not recognise from scrap sent.—*J. D. & S.* Send better material.

PELARGONIUM: *S. H.* Foster's Orion is, "botanically speaking," certainly a Pelargonium, and not a Geranium.

PRUSSIAN CARP: *R. A.* Apply to Mr. Kennedy, Covent Garden Market.

SEEDS OF CONIFERS: *L. M. K.* Apply to Messrs. Charlwood & Cummins, Covent Garden.

UTRICULARIA: *F. W. B.* Give the plant as much light as possible. We should doubt the efficacy of the dry treatment, but if you have plants enough try both methods.

VINE DISEASE: *H. W. M.* You may rest assured that the leaf you have sent is not affected with the new Vine disease. The spots are merely an exuberance of cellular tissue, and are harmless. *M. J. B.*

VINES, MUSCAT: *Green.* Your Vines being young, we would not recommend you to force them early this season; say, shut up your house sometime in February, and gradually raise the temperature, by applying fire-heat, to 60° by night, until the bunches are showing, then raise it to 70. Keep the atmosphere in the house humid, by frequently syringing every part. As a constant reader, see weekly Calendar of Operations for instructions.

CATALOGUES RECEIVED.—Stuart & Mein, Catalogue of Fruit, Forest, and Ornamental Trees, Shrubs, and Roses, &c.—J. Jefferies & Sons, Catalogue of Forest, Fruit, and Select Ornamental Trees, Shrubs, and Roses, &c.—James Dickson & Sons, Catalogue of Forest Trees and General Nursery Stock, &c.

COMMUNICATIONS RECEIVED:—S. H.—J. H. H.—P. B.—A. H.—J. H. V.—J. M.—E. H.—M. D.—W. S.—R. A.—W. A.—G. M. G.—W. R. F.—D. T. F.—T. W.

Markets.

COVENT GARDEN,—Nov. 16.

Very little variation is experienced here, but good articles are in better request. Hothouse Grapes have somewhat advanced in price; Almeira and other Portuguese sorts are abundant, but not particularly good this season. Foreign Hamburgh are nearly done. Some good parcels of Newtown Pippins are now coming in, of better quality than former consignments. Amongst flowers we have Orchids, Chrysanthemums, Heaths, and dwarf evergreens.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, ½ sieve	1 0 to 2 0		Oranges, per 100	6 0 to 12 0	
Grapes, per lb.	1 0 — 6 0		Pears, per doz.	1 0 — 3 0	
Lemons, per 100	6 0 — 12 0		Pine-apples, per lb.	5 0 — 8 0	
Melons, each	1 0 — 3 0				

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. ½	0 2 to 0 4		Horse-Radish, p. bun.	0 0 — 0 0	
Beet, per doz.	0 2 — 0 3		Lettuces, p. score	1 6 — 3 0	
Broccoli, per bundle	0 4 — 0 6		Mint, per bunch	0 3 — 0 6	
Brussels Sprouts, ½ sieve	2 0 — 3 0		Mushrooms, p. pint	1 0 — 1 6	
Cabbages, p. doz.	1 0 — 1 6		Onions, per bunch	0 4 — 0 9	
Carrots, p. bunch	0 4 — 0 8		Parsley, p. bunch	0 2 — 0 4	
Cauliflowers, p. doz.	1 6 — 3 0		Salsafy, per bundle	1 0 — 1 6	
Celery, per bundle	1 6 — 2 0		Seakale, p. pun	1 0 — 1 6	
— white, do.	1 0 — 1 4		Shallots, per lb.	0 8 — 0 —	
Cucumbers, each	0 6 — 1 0		Spinach, p. bushel	2 0 — 3 0	
Garlic, per lb.	0 8 — 0 —		Tomat, per doz.	1 0 — 1 6	
Herbs, per bunch	0 2 to 0 4				

Potatos, Regents, per ton, 60s to 80s.; Kidneys, 80s to 120s.; Rocks, 50s. to 60s.

POTATOS.—Southwark, Nov. 14.

During the past week the arrivals coastwise have been small, but plentiful by rail and road. The trade is a shade better for best samples, at the following quotations:—Yorkshire Regents, per ton, 70s. to 80s.; Lincolnshire do., 60s. to 70s.; Dunbar and East Lothian do., 70s. to 80s.; Perth, Forfar, and Fifeshire do., 60s. to 70s.; Kent and Essex do., 50s. to 60s.; Do. Rocks, 50s. to 55s.

LAND AGENT WANTED.—An active, intelligent Man, between 30 and 40 years of age, having a thorough knowledge of Estate work, and the Value and Management of Light Land, including Draining, Fencing, Planting, &c., and fully competent to prepare Plans, Specifications, and Estimates for, and superintend the Erection and Repair of Farm Buildings. Must have unexceptionable character, and be accustomed to correspondence in a similar situation. Full particulars, stating age, family, salary, and references, &c., to be addressed to G. P., 21, Arundel Street, Strand, London, W.C.

FARM BAILIFF WANTED, in about three months, a competent to take full Charge of a first-class Arable and Stock Farm, situate within 20 miles Eastward of Hyde Park Corner, of 1,000 acres in extent, is thoroughly drained, possesses new farm buildings of improved construction, and is provided with a house and garden.—Address, stating age, qualifications, and wages, whether married or single, salary expected, and reference to, A. B., care of Mr. William Lucas Bickseller, 21, Great Russell Street, Bloomsbury Square, London, W.C.

WANTED, an UNDER GARDENER, principally for the Out-door Work. Age not under 20, good character, and experience. Wages, 15s. with lodging.—Mr. KINGTON, Brantingham Thorpe, Brough, East York.

WANTED, an intelligent active YOUNG MAN, with a fair knowledge of the Trade, as Assistant Shopman.—Apply to Mr. E. COOLING, Seedsman, Fleetbank, Derby.

WANTED, a steady, industrious YOUNG MAN, thoroughly competent to take the Management of Greenhouse and Bedding Plants. One who can Bud and Graft well preferred. State references, and wages required.—R. THORNHILL, Nurseryman, Bowdon, Cheshire.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nurseries, Lower Sloane Street, S.W.

GARDENERS and BAILIFFS, suitable in capacity for large or small requirements, are on our Books. For particulars, apply at CLARK AND CO.'S Seed Establishment, 42, Bishopgate Street Without, London, E.C.

JOSEPH MEREDITH, The Vineyard Gardens, Langham, begs to inform Noblemen and Gentlemen that he has GARDENERS and Warrington Nurserymen, Johns Weald, N.W. Wages, and all other particulars.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and NAMES of FRIENDS, to whom LETTERS may be FREELY POSTED. Only those who can send unquestionable references to apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may depend on CARTER AND CO. supplying the most stringent qualifications, references, testimonials as to ability, honesty, &c.

JAMES CARTER AND CO., 237 and 238, High Holborn, London, W.C.

Gardeners.

B. S WILLIAMS has much pleasure in stating that he has open his GARDENERS REGISTER now. Men of the first testimony can apply, provided to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring Men may rely upon B. S. WILLIAMS recommending only those whose conduct and abilities are worthy of their trust.

Upper Holloway Nurseries, Upper Holloway, London, N.

FRANCIS & ARTHUR GIBBS & SONS, 469, New Oxford Street, (late 417), are open to receive Applications from MEN of the above Classes, and to recommend Persons for these with great confidence, and only after the most careful inquiries as to character, capability, and general fitness.

To Noblemen and Gentlemen.

GARDENER (HEAD), age 36, married, two children.—HENRY CLARKE, three years Head Gardener to Earl Cowper, Panshanger, Hertford, is desirous of recommending to any Nobleman or Gentleman requiring a competent person in every department of the profession, including the Superintendence of all Repairs, Painting, Glazing, and Heating, Hothouses, Pineries, Conservatories for Ornamental purposes, and very successful Exhibitor of Fruits. Leaving on account of the retirement of his present employer. He can highly recommend his SECOND MAN (married) as Gardener and Bailiff, or Head Working Foreman.—HENRY CLARKE, Brockett Hall, Welwyn, Herts.

GARDENER (HEAD), age 41, married.—A. CALDER is at liberty to treat with any Nobleman or Gentleman requiring the services of a thoroughly practical Gardener, having lived 13 years as Head Gardener in last situation; well versed in Forcing of all kinds of Fruits, Vegetables, and Flowers; understands the Management of Greenhouses, Stove Plants, and Kitchen and Flower Gardening. No objection to look after Meadow Land. Character will bear the strictest investigation.—A. CALDER, 21, Thames Mitton, Kingston, S.

GARDENER (HEAD).—Age 35, married; thoroughly practical in all branches; good Plantsman, Florist, and Muscat Grape Grower. Good character.—A. B., 130, Clarendon Street, Westbourne Park, W.

GARDENER (HEAD), age 36, married, one child.—Thoroughly practical in all branches; can highly recommend his present employer, who is anxious to retain his permanent situation. To save trouble, a first-class place only treated with.—W. EARLEY, Managing New Garden Works, Valentines, Ilford, E.

GARDENER (HEAD). Married, no children, a highly respectable and well educated Man, thoroughly competent in all branches of the profession. Moderate wages accepted, with comfortable cottage. First-class character.—The GARDENER, Grenard Lodge, Rochampton, S.W.

GARDENER (SINGLE-HANDED), or under a good Gardener. Age 20; character and references. Three years.—C. W., Post Office, Red Hill, Surrey.

GARDENER (UNDER), in a good Garden Establishment under the Foreman.—Age 20.—G. R. H., Post Office, Woodbridge, Ipswich.

GENERAL NURSERY FOREMAN, SALESMAN, and PROPAGATOR.—Is well qualified for the above, can Correspond in French, and has had 20 years' experience in each branch of the Trade. Good references.—MANAGER, Mr. Cooper, Seed Merchant, 152, Fleet Street, London, E.C.

FOREMAN (or SECOND HAND, under glass).—Thoroughly understands the management of Hothouses, Conservatories, &c. Used to Cut Flowers. Unexceptionable character. Two years excellent character.—Address, stating terms, &c., F. W. S., Red House, Thursley, Winchester, Hants.

STEWARD or BAILIFF, age 29, married.—A Gentleman wishes to find a situation for his late Bailiff, can strongly recommend him as an active, intelligent, and thoroughly practical Man, for seven years in both capacities.—Address, A. B., Messrs. J. Carter & Co., 237, High Holborn, London, W.C.

STEWARD or BAILIFF (age 39, married).—A Gentleman wishes to find a situation for his late Bailiff, and can strongly recommend him as a thoroughly intelligent, and thoroughly practical Man. Has been accustomed to Farming Operations.—A. B., Post Office, Bexley Heath, Kent, S.E.

To the Seed Trade.

SHOPMAN. A young Man, has had five years' experience in the Seed Trade.—G. R., Post Office, Alton, Hants.

SHOPMAN.—Single; 15 years' experience in the Seed Trade, and a good knowledge of the Florist business. Good reference.—C. C., Mr. Pestridge, Seedsman, Greenway, Uxbridge.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s 6d; ½ cwt., 21s; 1 cwt., 42s, with full directions for use. For further particulars see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.

All other MANURES and CAKES as per Price List, supplied on the Lowest terms.

Apply for prices, &c., to JOHN BENNET LAWES, 53, Mark Lane, London, E.C.; Dublin, Sackville-street; and Cardiff.

Autumn Sowing.

ODAMS'S NITRO PHOSPHATE or BLOOD MANURE
ODAMS'S DISSOLVED BONES
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

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This Company was formed for the purpose of bringing under the direct notice of Agriculturists, circumstances that have earned for it another title, viz., "THE LEVANT FARMER'S MANURE COMPANY."

Its members are cultivators of upwards of 2,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.

Further notice will be forwarded on application at the Secretary's office, or be had of the Local Agents.
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LONDON MANURE COMPANY (Established 1840) have now ready, for delivery, nine days sold to
WHEAT MANURE, strongly recommended for Autumn sowing.
DISSOLVED BONES, for Dressing Pasture Lands.
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, and Rock Dock or Wrathmell Salt.
116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Hemp Winnowed), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains a large proportion of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered free at railway stations, carriage paid by London seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES and CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the proportion available and soluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to Agriculturists, the more I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed "AUGUSTUS VOELCKER.
"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Notice to Introducers or Cultivators of New Plants.

THE HORTICULTURAL ESTABLISHMENT of RINGELHEIM, Hannover, Germany, represented in England by Messrs. R. SMITH & CO., 5, Hart Lane, Great Tower Street, London, E.C., undertakes the Introduction of NEW PLANTS that appear in England, Flanders, Germany, or elsewhere, and is provided with legal Contracts and Introduction Agents in the Countries that appear especially favourable for New Plants. Duplicates of Herbarium specimens, and the conditions under which they are willing to Cede the Right of Sale
Letters to be addressed to the present Partner, or to Messrs. R. SMITH and SON, as above.

THE "UNIVERSAL NURSERYMAN and HORTICULTURAL REVIEW."—The Administration of the Pomological Institute of Ringelheim, Hannover, Germany, have to inform the British public that, in consequence of numerous applications, they have determined to publish their Horticultural Journal, the "Universal Nurseryman," in the English language, and that the First Number will positively appear on January 1, 1871. In order to avoid delay, all persons who may wish to subscribe are requested to apply at once to Messrs. R. SMITH and SON, 5, Hart Lane, Great Tower Street, London, E.C. (the Representatives of the Institute in England), who will be happy to send Prospectus free on application.

The conditions remain the same as previously stated, but there will be one important alteration in the Journal, viz., that each Number will contain nearly double the matter stated in the Prospectus already issued. Every Amateur of Horticulture will, it is felt, find it become an indispensable guide and counsellor, as, in addition to the usual instruction, and discussion attached to every novelty that appears, not only in plants, but in everything that appertains to the garden, numerous Coloured Plates, splendidly executed, together with many highly finished and exact drawings, will illustrate articles written by the best authors and other competent persons. The rapid increase in the number of subscribers since its appearance is an undeniable proof that the public appreciates every effort to render information generally the Numbers that have appeared up to this time.

Certificates of approbation and encouragement from the "Ministères Agricoles" of nearly all European countries, as well as from nearly every Botanical Society, proves the utility, the great importance, and the merit of this work, which is doubtlessly destined to become the Companion of every one.

WANTED to PURCHASE, a SECOND-HAND GREENHOUSE, for Plants, with suitable Heating Apparatus complete, in good order, 20 feet long, about high at back, 12 feet broad, 6 feet in front.
Particulars and price to be addressed to D. E. B., 9, Stratford Place, London, W.

To Market Gardeners.

TO LET, a COTTAGE, with about Two Acres of Garden Ground, adjoining the grounds of the British Society's Christian Home, Agowan Street, Leytonstone, E.
Apply to the Superintendent, at the Home

TO BE SOLD, very cheap, a VINERY, 37 feet long by 15 feet wide. Heating apparatus complete. Offices at Eden Lodge, South Kensington.

Landscape Gardening, Groundwork, the Making of New Roads, Planting Gardens, Parks and Pleasure Grounds, Irrigation, Drainage, &c.

WM. WOOD and SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and specifications supplied at the shortest notice.

Park Fencing undertaken to any extent.
N.B. Plans and Designs for Horticultural Buildings, &c., & Waterside Nursery, Muswell Hill, near Uxbridge, Middlesex.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, Valuer, &c., Goldworth Nurseries (late R. Donkin), Woking, Surrey.
SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER for the late Firm of J. & J. Fraser, Lea Bridge Road, undertakes HORTICULTURAL VALUATIONS of every description. SALES by AUCTION, &c.—Malmains Farm, Kegworth, Notts.

Nursery and Seed Business to be Disposed of.

AN excellent and old-established NURSERY and SEEDSMEN'S BUSINESS is to be DISPOSED OF, in consequence of the death of the late Proprietor.
The Stock will be found suitable in every respect for the requirements of the Business, and may be taken at a valuation (estimated at about £6000); and the terms of payment can be arranged to suit the convenience of the purchaser.
The Nursery Grounds are situated within an easy distance from a flourishing and populous Market Town, and the business is capable of great extension.
Apply by letter to Messrs. NETTING and SONS, Seed Warehouse, 360, Oxford-st., London, W.

TO BE LET, a FARM of 31 Acres. The whole has been Gardened and well Manured, and is now well Cropped. There are Five Cottages, small House, and suitable Buildings, Fixtures, &c. Stock to Purchase at a fair Valuation. TENANT to Enter at Michaelmas next. Rent moderate, and Lease to be granted if required. Possession of Stock at fair valuation. The owner has an abundant supply of Manure. Apply by letter only,
F. C., 7, Canonbury Place, Canonbury Road, Islington, N.

SALES BY AUCTION.

Wandsworth Common, S.

IMPORTANT and EXTENSIVE SALE of VALUABLE NURSERY STOCK

MESSRS. PROTHEROE AND MORRIS have received instructions from Mr. Robert Neal, to SELL by AUCTION, on the Premises, the Nursery, Wandsworth Common, Surrey, 5 minutes' walk from Wandsworth Common Station, on MONDAY, November 21, and five following days, at 11 for 12 o'clock precisely each day, without reserve (a portion of the land being required for building purposes), the following valuable NURSERY STOCK, comprising 20,000 Common Laurels, 2 to 6 feet; 5000 Portugal do., 2 to 6 feet; 10,000 Green and Variegated Hollies, 2 to 5 feet; 2000 English and Irish Yews, 15,000 Aucubas, 50,000 Ligustrum ovalifolium; 13,000 Berberis, of sorts; 10,000 Euonymus, 2000 Cedrus Deodara, 10,000 Spruce Firs, 5000 Arbor-vitæ, of sorts; 5000 Rhododendrons, of sorts; 10,000 Box-leaved Privet; 3000 Arbor-vitæ, 2 to 9 feet; 5000 Arbutus, Laurustinus, Bays, 1000 Skimmia japonica, 2000 Cotoneaster, 20,000 Deciduous Shrubs, comprising a number of others; a large quantity of Ornamental and Forest Trees; 10,000 Fruit Trees, various; 5000 Standard and Dwarf Roses and the usual Sundries, expose in convenient Lots.
Catalogues may be had at the Sale Grounds; also at the Offices of the Auctioneers and Valuers, Leytonstone, E.

Sale of First-Class Dutch Bulbs, Standard Roses, &c.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, at their Auction Rooms, 67, Cheapside, on TUESDAY, November 22, at 12 precisely, a large collection of HYACINTHS, TULIPS, CROCUS, and other DUTCH BULBS; also a small quantity of Standard and Dwarf ROSES, of the usual sorts; Hardy RHODODENDRONS, and other Ornamental Plants, &c.
On view the morning of Sale. Catalogues may be had at the Rooms as above, and of the Auctioneers.

Important Sale of Plants,

At the ROYAL HORTICULTURAL GARDENS, CHISWICK.

MR. J. C. STEVENS begs to announce that he has been favoured with instructions from the Council of the Royal Horticultural Society, in consequence of their giving up a portion of the ground, to SELL by AUCTION, on the Premises, at the Royal Gardens, Chiswick, on THURSDAY, November 24, and following days, at 12 o'Clock precisely, each day, a large number of Specimen CONIFERÆ, including a quantity of Silver Firs, Retinosporas, Wellingtonias, Cupressus, Piceas, Cedars, Pinuses, Araucarias, very fine Green Hollies, from 10 to 20 feet; Laurustinus, Rhododendrons, Laurels, Box, Berberis, Euonymus, Aucubas, English, and Irish Yews; Pyramidal Arbor-vitæ, Double Scarlet Chestnuts, Double Pæonies, Standard and Dwarf-trained ROSES, splendid Pyramid PEARS, Standard and Dwarf-trained APPLES and CHERRIES, Red and Black CURRANTS, GOOSEBERRIES, RASPBERRIES, and FIGS in pots, and a great variety of Hardy Trees and Shrubs, many of them suitable for Lawn specimens, and lotted to suit both large and small purchasers.
On view three days prior, and mornings of Sale, per Catalogues only, to be had on the Premises; or of Messrs. R. HANDLEY & SONS, Nurserymen, Tamworth; and of Mr. R. HAYDEN, at the Royal Horticultural Gardens, Chiswick; of Mr. J. STEVENS, Horticultural Auctioneer and Valuer, 3, King Street, Covent Garden, London, W.C.

Important Sale of Shorthorns.

MR. STRATFORD begs to announce that he has received instructions from Mr. J. Worsnop, of White Moor House, near Nottingham, to SELL by AUCTION, at the Nursery, on MONDAY, November 21, at the Midland Counties' Exhibition, Birmingham (being the week of the Show), a choice Herd of Superior SHORTHORN CATTLE, consisting of about 30 head of Bulls, Cows, and Heifers, that are chiefly descended from the old and famed Herds of Mr Cooper of Ox Close, and Mr. Peacock, of Haddockstones, with the introduction of Animals from Lord Feversham's, Lord Penrhyn's, Captain Gunter's, Mr. McIntosh's, Mr. Maynard's, and other celebrated breeders. The sires latterly used are of the Kirklevington sort.
Catalogues, with pedigrees and other particulars, may be had on application to Mr. STRATFORD, 12, Hatton Street, Dublin; and Mr. WAINMAN, Whitley Manor, Newport, Salop.

Rugby.

HIGHLY IMPORTANT SALE of SPECIMEN CONIFERÆ and EVERGREENS in VARIETY.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. W. Bryant (successor to the late Mr. J. Fatley) to SELL by AUCTION, without reserve, on the Premises, The Rugby Nursery, Rugby, Warwickshire, on TUESDAY, December 6, at 11 for 12 o'Clock precisely, a quantity of surplus NURSERY STOCK, comprising about 1000 Specimen CONIFERÆ, which for numbers, variety, and quality cannot be surpassed. The plants range from 6 to 15 feet, and are all in excellent condition for Transplanting, many of them having been carefully prepared. The stock comprises many handsome specimen Wellingtonia gigantea, 6 to 8 feet; beautifully furnished Picea lasiocarpa, 5 to 7 feet; fine Cedrus Deodara, 6 to 8 feet; some unusually fine examples of Araucaria imbricata, Picea nobilis, Picea magnifica, Taxodium, Pinsapo, Excelsum, Cupressus, Abies Morinda, Abies Douglasii, Abies Menziesii, and a number of others. Fine standard Weeping Limes, likewise a quantity of smaller shrubs, viz., ashy Portugal Laurels, Hollies, Box, Phillyreas, &c.; Forest, Ornamental, and Deciduous Trees, Roses, &c., of them having been carefully prepared. The stock comprises many handsome specimen Wellingtonia gigantea, 6 to 8 feet; beautifully furnished Picea lasiocarpa, 5 to 7 feet; fine Cedrus Deodara, 6 to 8 feet; some unusually fine examples of Araucaria imbricata, Picea nobilis, Picea magnifica, Taxodium, Pinsapo, Excelsum, Cupressus, Abies Morinda, Abies Douglasii, Abies Menziesii, and a number of others. Fine standard Weeping Limes, likewise a quantity of smaller shrubs, viz., ashy Portugal Laurels, Hollies, Box, Phillyreas, &c.; Forest, Ornamental, and Deciduous Trees, Roses, &c., of them having been carefully prepared.
On view two days prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, E.
N.B. Purchasers of specimen Coniferæ are particularly invited to inspect the stock, as it seldom occurs that a collection of such magnitude and value is offered for Sale by Auction.

The Royal Berkshire Root Show.

READING, NOVEMBER, 1870

SPECIAL PRIZES for SECTIONS' CHAMPION SWEDES, at the ROYAL BERKSHIRE ROOT SHOW, to be held at READING on WEDNESDAY, NOVEMBER 30, the following Special Prizes [illegible] will be awarded:—

	£	s.	d.
For the second best 24 [illegible]	[illegible]		
For the second best 24 [illegible]	[illegible]		
For the third best 24 [illegible]	[illegible]		
For the [illegible] best [illegible]	[illegible]		

Also Special Prizes for best MANGEL, TURNIP, RUTA BAGA, CARROTS, &c. No charge for entry.—For full particulars apply to SUTTON and SONS, Seed Growers, Reading, Berks.

THE BIRMINGHAM CATTLE and POULTRY SHOW, 1870.—The TWENTY-SECOND GREAT ANNUAL EXHIBITION of FAT CATTLE, SHEEP, PIGS, IMPROVED POULTRY, CORN, ROOTS, and IMPLEMENTS will be held in BINGLEY HALL, on SATURDAY, MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, November 26, 28, 29, and 30 [illegible], when PRIZES [illegible] to the amount of TWO THOUSAND ONE HUNDRED POUNDS will be awarded.
The Exhibitors and the Public will be admitted to Bingley Hall to witness the Judging of the Cattle, Sheep, Pigs, Roots, Corn, and Poultry, on Saturday, November 26, at [illegible] o'clock precisely each day.
Admission on Monday, November 28, to non-Subscribers, until 5 o'Clock, 5s.; after that hour, 1s.
The Exhibition will also be opened on Tuesday, admission 1s. all day. On Wednesday and Thursday, until 5 o'Clock, 1s.; after that hour, 6d.
For Special Railway Arrangements see the Advertisements and Bills of the Several Companies.
The ANNUAL GENERAL MEETING will be held at the Hen and Chickens Hotel, New Street, Birmingham, on THURSDAY, December 1, at 12 o'Clock, to Elect a President for the ensuing year, to fill [illegible] Vacancies, also [illegible] Stewards.
JOHN B. LYTHALL, Secretary.
Offices of the Society, 30, New Street, Birmingham.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.—AGRICULTURAL EDUCATION.—The EXAMINATION of CANDIDATES for the SOCIETY'S PRIZES will take place in the week commencing TUESDAY, APRIL 18, 1871. The age of Candidates for the Society's Prizes must not be above [illegible] years; but Candidates [illegible] of age may compete [illegible] Society's certificates. Copies of the Form required to be [illegible] [illegible], Hanover Square, London, W. H. M. JENKINS, Sec.

The Agricultural Gazette.

SATURDAY, NOVEMBER 19, 1870.

MEETING FOR THE ENSUING WEEK

SATURDAY, Nov. 19 { [The Show of the Manchester Agricultural Society opens this day.]

THE letters on THE SEWAGE QUESTION in another column—the one by Mr. HOPE, on sewage utilisation, and the other by Mr. BAILEY DENTON, chiefly on sewage defecation,—have very considerable agricultural importance.

On the former subject, Mr. HOPE no doubt believes, as we do, that success depends on bringing the quantity of sewage with which we have to deal in contact with a sufficient number of plants before it leaves us: and perhaps he is right in contending that the best result will be attained when that quantity of sewage is equally divided among that number of plants. But this can be accomplished artificially only at excessive cost. Sewage, a wonderful fertiliser when applied 1000 tons per acre, is the poorest manure per ton that agriculture knows; and it must be distributed at a minimum expense, or it will not pay. It must virtually carry itself, and the soil itself must carry it, or the cost of its conveyance will trench too severely on the return from it. It is for this reason that the owners of town sewage are advised to prefer such land for irrigation as will carry it a considerable distance before it altogether sinks away.

Even Mr. HOPE, we venture to say, does not provide upon his Romford farm a separate artificial conduit for every plant he grows, in order that each may receive its allotted share of unexhausted sewage. He objects, indeed, to the catchwater system of irrigation, but his land, too, is used as a carrier to some distance from the artificial conduits which he provides; and any difference between him and Mr. MORTON is, therefore, one merely of degree. These artificial channels must not be too frequent, or they will be too costly; and hence the recommendation of land of such slope and texture as will enable us to place them 15 or 20 yards apart—or even more; only then, seeing that water will not long continue evenly distributed over a surface down which it trickles, it will be necessary to provide a contour-catch, in order that the effluent water may be collected and made to start fair again upon a second slope. The lower slopes treated thus will not be less fertile than the upper ones. All analyses hitherto of effluent water from irrigated land have shown that after the best agricultural use has been made of the sewage, whether in the case of hollow and porous or comparatively impervious land, it still contains an immense quantity of fertilising matter—no longer filthy, indeed, but still valuable—which the last and lowest surface it has fed has failed wholly to extract. Such water is, indeed, often still so

rich in fertilising matter that it would even pay to lift it for re-use. How much more, then, would it not pay to let it distribute itself without the cost of pumping over yet another surface, if land available for such use of it could be had.

On the subject of sewage defection, to which the second letter on p. 1549 refers, we do not see that there is much difference between Mr. DENTON'S views and those which he attacks. He, too, is ready to defend the conclusion to which the report of the Rivers Pollution Commissioners points, that the thorough oxidation of sewage is best effected by using it in irrigation over a sufficient area, and through a sufficient depth of soil. It is, however, much easier to assert a principle with confidence than it is either to defend it by intelligent reference to the results of chemical research, or to carry it into successful practice.

Analyses of effluent sewage water cannot be fairly compared in order to determine the relative merits of the processes to which they are respectively due, except in cases where there has been no dilution by the addition of subsoil water, where the conditions as to season and vigour of crop growth have been alike, and above all, where the results themselves are the results of one and the same method of analysis. For these reasons Mr. DENTON'S comparison of Carlisle, Bedford, and Penrith, and especially of Briton's Farm, Romford, with Lodge Farm, Barking, can really lead to nothing.

On the difficulty of carrying into successful practice the principle of using both surface and depth of soil in sewage irrigation, we may refer to the field of stiff clay soil which now receives the drainage of Harrow-on-the-Hill. All the lower parts of that field are drained, in order that the effluent sewage may at last sink into the ground, as Mr. DENTON would have it do, before finding its way into the natural watercourses of the valley. We were lately over the ground, and the foreman showed us plots where £40 worth of Potatos, of Cabbages, and Mangel Wurzel had been grown per acre. These, however, were all on the comparatively flat, undrained upland ; the lower slopes are covered with Italian Rye-grass. We asked why they had not grown more of the garden crop on the drained land. "Oh," said the foreman, "there would have been ne'er a bit of good in trying that, for all last summer the sewage there just ran down the nearest crack into the drains, and straight out of the field"—thus giving both utilisation and defecation the go-by, in spite of the soundest possible theory to the contrary, and a really well devised plan for carrying it into operation.

It appears to us that there is some danger, in our discussions of the sewage subject, of refining too minutely over theories and methods. The differences of result, which are due to mere management and superintendence—to farming and "drowning"—are very much greater than those due to theoretical distinctions between irrigation proper and "irrigation only," or between irrigation as Mr. HOPE conducts it, and catchwater irrigation, which he condemns.

—— PRICES in Mark Lane on Monday and Wednesday were firmer, or even in advance of last week.—— At the Metropolitan Cattle Market, also, trade was brisk, and both beef and mutton in demand fully up to the supply.

—— Mr. CAIRD sends an interesting account to the *Times* of the PROGRESS of the ENGLISH BEETROOT-SUGAR MANUFACTURE. He says that the sugar made by Mr. DUNCAN this season at Lavenham, in Suffolk, from Beet grown by the farmers in that neighbourhood, has brought the highest price in the market for sugar in crystals. Mr. DUNCAN is at present converting into sugar about 400 tons of roots a week. This is now the third year of the Lavenham factory, and of the growth and manufacture of English beetroot-sugar on a considerable scale—a scale equal in extent to that of Continental sugar factories. The anaylsis of the roots in both previous years had shown the quality to be satisfactory, but chemical and mechanical means for fully extracting it proved defective. There have been many other difficulties inseparable from a new undertaking, inexperienced hands not being the least, but perseverance and the exercise of great intelligence have triumphed, and the successful introduction of a new and most profitable agricultural industry into England has been accomplished. Mr. DUNCAN has now satisfied himself that the growth and manufacture of beet-sugar can be carried on in Suffolk with quite as much success as in the North of France. The following are the figures of last year's working. The total value of the syrup produced is £960. The expenditure, including cost of roots, Government duty, and working expenses, does not exceed £660. So there is a handsome balance for interest of capital and profit, besides the value of the refuse pulp sold, and thus returned to the land for cattle food. The roots are, no doubt, richer in sugar this year than usual, but, on the other hand, sugar is very cheap. Broadly stated, the conversion of the roots into sugar has more than doubled their value, though bought from the farmer at a price more remunerative to him than any other article he produces. The land is not impoverished, as nearly all the feeding properties of the Beet are returned to it to fatten cattle. The whole available surplus labour of an agricultural parish receives indoor employment, in the sugar factory, during three or four months of the slackest time of the year, and at good wages. Capital is profitably employed, and trade of all kinds in the neighbourhood benefited, while the general supply of sugar is augmented.—This opens a large question. If, in the southern and eastern counties, we can grow beet-sugar as profitably as in the North of France, we can compete—as France has successfully competed—with Cane-sugar from any quarter. To what extent would it be prudent, with our present limited experience, to anticipate the successful application of this new industry in England? Mr. CAMPBELL, of Buscot Park, in Berkshire, is conducting on a great scale a similar experiment, so far as the growth of the Sugar-Beet is concerned, but with the ultimate intention of being able to convert the root either into sugar or spirit, as may at the time be most profitable. The weight and quality of the Sugar-Beet grown on his estate this season cannot be surpassed. Thus, in Berkshire as in Suffolk, the soil and climate have proved equally suitable. There is no appreciable difference in the climate of the counties adjoining these, and we may therefore reasonably assume that, on all soils on which Mangel is now advantageously grown in the counties from the Wash to the English Channel, Sugar-Beet may be gradually introduced. Now it so happens that two-thirds of the entire acreage of Mangel in the United Kingdom are grown in these southern and eastern counties. There is as yet no means of judging how much further the limit may be extended. It is very likely that the south-eastern counties of Ireland may be found suitable. And here a very important consideration should not be overlooked. The farmer will run very little risk by trying the experiment as a grower of Beet, for Dr. VOELCKER has clearly shown by analysis that 1 ton of English Sugar-Beet is equivalent in nutritive qualities, as cattle food, to 1¼ ton of common Mangel. Therefore, if the farmer cannot deal with the sugar factor, he can use the Beet with the same advantage for cattle food, as, though the crop is less bulky, his 20-ton crop of Beet will be as nutritive as the 30-ton crop of Mangel. About 200,000 acres of Mangel are grown annually within the area indicated. One-fourth of this, if applied to Sugar-Beet, should yield 60,000 tons of sugar, or about one-tenth of the present consumption of the kingdom. This would seem a not very remote result of more extensive trials, and, when attained, the further progress would be rapid. While, however, Mr. CAIRD, whose words we have been all along quoting, feels great confidence in the future profitable extension of this industry, he offers a word of warning. It did not pay Mr. DUNCAN either the first or the second year, and he is no ordinary man. He combines in a remarkable manner business capacity with chemical and engineering knowledge. These, with further experience, carefully sought on the Continent, and that within his own factory at Lavenham, have led him to an entirely successful issue in the third year. But the business is quite new in this country, and men are not yet educated to it. Enough, however, has been done to show that success may be anticipated by those who can bring to it a like command of capital, skill, and perseverance.

—— In reference to our remarks last week on the educational scheme of the Royal Agricultural Society, and its connection with the Royal Agricultural College, it may be well to reproduce here an extract from the speech of the Principal of the College on the distribution of the prizes, &c., in December, 1869 :—

"He would make one remark with respect to the Hanover Square examinations, and that was—whether future students were prize-takers at them or not—the College would always owe the system a debt for having laid bare a weak place in its course of study. Until the examinations were held in Hanover Squre, and our diploma candidates subjected to the examination of a London accountant, he (the Principal) had lived under the conviction that the graduates at least were fair book-keepers. Messrs. QUILTER & BALL had removed the delusion, and the result was an immediate, and, he trusted, a lasting gain to the College. The examinations in London were valuable, not so much in rewarding efficiency as in directing professional study by fixing a standard, and stimulating all engaged in agricultural education to work up to it."

—— We are fortunately able to give, along with Mr. CAIRD'S portrait on the adjoining page, extracts from the newspapers of the day, giving favourable accounts of two of the agricultural enterprizes in the production of which he had taken active interest. His own letter to the *Times* on the beet-sugar manufacture bears satisfactory testimony to the success of the system ; and regarding the other, the introduction of the Cheddar cheese manufacture into Galloway and Ayrshire, we quote the following from a recently published account of the Ayrshire cheese show at Kilmarnock : — Mr. HEWITT, of London, one of the judges, said the cheese shown was fit to compete with any cheese manufactured in the empire. It had been well handled, well made, well manufactured, and the quality was as good as could be expected from such a season as last, for the weather had been unfavourable for cheese-making, and had affected the flavour more or less, and also the colour. There was nothing in the show which should not give the association encouragement. Mr. OSBORNE noticed the fact that Galloway makers had carried off many of the best prizes. The circumstance arose, he thought, from their not having in Ayrshire such good houses to ripen the cheese, and he believed landlords were somewhat to blame in the matter. The cheeses were only half made in the chessats, and unless they were properly cared for in the houses they could never be shown as first-class cheese.—Mr. BAIRD, the chairman, said : The Ayrshire Agricultural Association had done a great deal of good to property in Ayrshire. It has, no doubt, enhanced the value of land, and he was surprised that all had been done by the tenants, the proprietors doing comparatively nothing. Proprietors are now getting rents they never would have had but for this and other societies. Standing between the member for South Ayrshire and the Provost of Kilmarnock, he ventured to express the Radical sentiment, that property has its duties as well as its privileges. The exhibition had shown that it requires all the ability of Ayrshire farmers to keep pace with those around them. They are excellent makers of cheese, and show first-rate produce ; but the first prizes always go away to Galloway. They must call upon the proprietors to give them better houses. "Don't let the judge say the cheese is only half made, or spoiled after they come out of the chessats. If you have not houses, then you have not a complete steading, and are not fit to manufacture cheese."—The Hon. Mr. VERNON, with all deference to the Chairman, thought the success of Galloway dairymen was not altogether due to the want of cheese-houses, as he knew of many farms where there were excellent houses in Ayrshire. It was hardly possible that the landlords could do all that was expected of them, for farmers knew they had had bad harvests recently, and rents were not always forthcoming. Cheese-houses, besides, were very costly parts of farm buildings.—It is evident, nevertheless, that Ayrshire dairying is in an improving and prosperous condition, and that the Society is developing the improvement due to the introduction of the Cheddar system of manufacture.

—— There are several noteworthy COMPETITIONS among AGRICULTURAL LABOURERS, fostered by particular associations, which ought to be more general than they are. Among them is the annual competition among field-drainers, before the Peterborough Society, and the annual competition among engine-drivers, before the Faversham Association, of which the following account has just been given :—

"The engine used for these trials was an 8-horse power portable, to which was attached a friction-brake carrying a load equal to a duty of 8-horse power, fitted with a self-acting counter to indicate the number of revolutions obtained by each man. Messrs. EDWIN NEAME and ARTHUR CURLING, who officiated as judges, gave close attention to all the details of the trials ; Mr. AVELING, of Rochester, acting as consulting engineer.

"Each of the drivers was provided with 84 lb. of coal, 8 lb. of wood, and 4 oz. of oil (any oil left was accurately measured) ; the difference of water-level in boiler at commencement and conclusion of trial was calculated at the rate of 500 revolutions per inch. The following were the conditions :—Before starting the fire-box of engine to be cleared out, and the oil-cups filled by the driver who has just concluded his trial ; 60 lb. of steam the highest pressure allowed ; the driver to attend and oil all bearings ; the trial to terminate as soon as the pressure of steam falls below 45 lb. ; no person permitted to speak to the engine-driver. The following Table shows the result of trials :—

Name of Driver.	Oil used	Revolutions obtained.
Thomas Turner .. .	1½ oz.	7757
Wm. Easdown .. .	3 ..	8243
Wm. Turk .. .	1¾ ..	8374
Ed. Pawtney .. .	1 ..	6917
W. Holness .. .	2 ..	6733
A. Sampson .. .	2½ ..	7718
T. Hadlon .. .	2 ..	7553
Jas. Payne .. .	2 ..	7625
Wm Black .. .	1 ..	7346
George Dalton .. .	1¾ ..	7449
Jas. Philpett .. .	3¼ ..	7534
Chas. Stone .. .	1¾ ..	8470
Rd. Stickle .. .	3¾ ..	7717

The 1st prize, a silver medal and £3, was awarded to CHARLES STONE ; the 2d, a silver medal and £2, to WILLIAM TURK ; and the 3d, divided, to WILLIAM EASDOWN 15s., and THOMAS TURNER 5s. (This prize was divided in consequence of the excess of oil used by EASDOWN.) A lad named WILLIAM ILLMAN, in the employ of Mr. AVELING, obtained 8885 revolutions, using 1½ oz. of oil, for which performance he was presented by the judges with £1. From the Tables given above the advantages derived from these trials are evident ; they show that the best result obtained was 8885, equivalent to

a consumption of 82½ tons of coal in a year, calculated at 250 working days; the worst result obtained was 6733 revolutions, equivalent to a consumption of 104 tons of coal—showing a difference of 21½ tons. The smallest quantity of oil used was 1 oz., or 17 gall. per annum; the greatest was 3¾ oz., or 65 gall. per annum.

Saving of coals, 21½ tons, at 20s. = £21 10 0
" oil, 48 gall., at 5s. 6d. = 13 4 0

Showing a saving of .. £34 14 0 per annum.

Besides this it must be noted that in ordinary work the worst driver would show a much worse result in comparison with the best. The medals and prizes were presented at the dinner by the Chairman, Lord SONDES."

—— At a meeting of the committee of the Farmers' Club, on Monday, November 7, Mr. JAMES HOWARD, M.P., in the chair, it was resolved:—That the thanks of this committee be offered to the Right Hon. W. E. FORSTER for the energetic measures which have been recently taken by the Privy Council to prevent any importation of foreign cattle diseases. At the same time, the committee beg to express a hope that separate markets for the sale and slaughter of all foreign stock will be enforced at the ports of landing throughout this kingdom.

—— A "MANGEL WURZEL DINNER" was given at Tarporley the other day—not that Beet itself figured unduly in the bill of fare, but that, as Mr. J. VERNON, of Willington, the host, explained, in the spring of this year his worthy friend the Vice-President having thrown down the challenge to grow an acre of Mangels second to none in the county, he had accepted the challenge, and, having been fairly beaten, he was now proud to pay the penalty in the shape of providing the present entertainment. Though in one sense a loser, nevertheless his crop was so much larger than usual that, after paying for the banquet, he was still in pocket. —The health of Mr. HARLOCK, of Nantwich, the Vice-President, having been duly honoured, he attributed most of his success in growing heavy crops to a liberal supply of town manure. His father, who had made his fortune with farming, used to say, "I am master at home, but muck is master in the fields."—On the invitation of M. HARLOCK, Mr. J. CORNES, of Hurleston, explained his mode of growing green crops. He, in the first place, had some good and useful land, he took the utmost pains in keeping it clean, and always kept it up to the mark for any crop. In this instance he had used 5 cwt. of Mr. MANOCK's prepared bone manure, with 13 cwt. of guano to the statute acre. With the same manure he had taken several of Mr. MANOCK's prizes, and beaten his worthy friend, Mr. HARLOCK, in Swede Turnips; and if this was to be carried out another year he would certainly enter the list as a competitor, believing such rivalry would do much good.—Upon this the CHAIRMAN could do no less than propose the very good health of their worthy friend, the bone and manure dealer, Mr. MANOCK, without whom they should come badly off. He always praised the bridge that carried him safe over, and Mr. MANOCK had always served him honestly and well.—In returning thanks Mr. MANOCK said he felt highly honoured by such complimentary and flattering remarks as had been made both by the CHAIRMAN and all around that festive board. In confirmation of the high opinion Mr. HARLOCK held as to sewage and town manure, he would refer them to a paper read by himself, on the "Gold Mines of England, Town Sewage, &c.," some six weeks ago, in this very room, and he was glad to find that more attention was being directed to this subject every day. Still they must not let their worthy vice-president frighten them by saying that he had got the best manure.—We entirely agree with Mr. CORNES in praising local rivalry.

NOTEWORTHY AGRICULTURISTS.

MR. JAMES CAIRD, C.B.

[We extract the following memoir and borrow its very successful portrait from the new number of the *Farmers' Almanac*, just published by Cassell & Co.]

MR. CAIRD'S agricultural career extends over a period of more than 30 years. Educated at the High School and University of Edinburgh, and having studied agriculture in Northumberland and the border counties, he undertook, in 1836, when barely of age, the management of a large farm in Galloway; and since that time he has always held farms in Scotland or in England in

JAMES CAIRD, C.B.

his own occupation. One of the earliest to welcome all the aids to energetic land management, he had already, in 1843, published the results of his experiments with Peruvian guano in the growth of Potatos; and from that time he has been a frequent contributor to the agricultural journals on whatever subjects were of foremost agricultural interest. Experimenting on land-drainage as well as on manure, he early disputed the method recommended by Mr. Smith, of Deanston, and in 1845, in the presence of that gentleman, called in question, at the meeting of the Highland Society, his practice of filling drains with stones to the bottom of the plough-furrow, showing by the results of his experience that this was not only costly, but injurious. These were his earliest contributions to the progress of English agriculture which the last 30 years have witnessed.

After the reaction followed the abolition of the Corn-laws, when vigorous efforts were being made to subvert that policy, Mr. Caird published, in 1849, a pamphlet on "High Farming as the best Substitute for Protection," and a few months later a second pamphlet, entitled "High Farming Vindicated," both of which attracted great public attention. Subsequently, on the invitation of Sir Robert Peel, he visited the distressed districts of Ireland, and suggested remedial measures to the Government, publishing a volume on the subject in 1849. In 1850-1 he became Commissioner to the *Times* in an agricultural inquiry over England, the results of which were published in that paper from week to week, and afterwards collected into a volume, entitled "English Agriculture," which, besides obtaining a large circulation at home and in America, has been translated and republished in France, Germany, and Sweden.

At the general election in 1852, Mr. Caird was invited to represent his native county in Parliament, but was defeated at the election by a majority of one. He entered Parliament in 1857, where he was the advocate of all measures bearing on the improvement of land, successfully opposing the proposal to place a new duty on certain descriptions of corn used for feeding cattle, expounding the impolicy of discouraging the growth of Barley by an unmodified Malt-tax, taking a prominent part in committees and in the House in inquiries and discussions on Irish land tenure, the utilisation of sewage, emigration, the Game Laws, and from year to year explaining the prospects of the country in regard to its supplies of corn. Retaining his practical connection with agriculture during his Parliamentary career, he took a leading part at this time in introducing the Cheddar system of cheese-making into the south-west of Scotland—a system which has greatly contributed to the prosperity of the dairy districts of that part of the country. He visited the United States in 1858, and published a small volume on the "Western Prairies." In 1860 he carried a motion to extend the Census Inquiry in Scotland to the character of the house accommodation of the people, and thus, in the census of 1861, laid bare the startling fact that two-thirds of the people were found to be lodged in houses of only one and two rooms—a condition of things generally thought inadequate for decent accommodation. In 1863 he carried a motion which led to the collection of agricultural statistics in Great Britain. In 1864 he was appointed chairman of the Sea Fishery Commission, with Professor Huxley and Mr. Shaw Lefevre, M.P., for his colleagues. In 1865 he was appointed one of the Inclosure Commissioners, the acceptance of which office obliged him to resign his seat in Parliament as member for Stirling. In 1869 he revisited Ireland, and published a pamphlet on the Irish land question, soon after which he received the Companionship of the Bath. He has latterly taken an active interest in the introduction of Sugar-Beet cultivation in this country, which he recommended in 1850. In 1868 and 1869 he published successive papers on the "Food of the People," read before the Statistical Society. Mr. Caird is a magistrate and deputy-lieutenant of his native county, Wigton. No one can better claim a place among the foremost in a series of English agricultural portraits.

OUR LIVE STOCK.

CATTLE.

ALTHOUGH no very high prices were given at Brailsford Hall, on the 9th inst., the result of the sale was considered to be satisfactory to the owner and the auctioneer, and we understand that the average of £26 2*s.* 7*d.* was higher than had been anticipated. There was a large company, and the stock was brought

out in good condition, despite the late difficult season and a recent visitation of foot-and-mouth disease. This herd was the property of Wm. Cox, Esq., and its disposal was entrusted to Mr. Thornton. Forty animals were sold, and among the best prices given may be mentioned 35 gs. for *Daphne* by DUKE HUMPHREY (15,910). This cow has been a local prize-taker, and was secured by Capt. Aveling. *Sarah Ann* by VICTOR (19,058), a direct descendant of *Seraphina* by ZENITH, and previously from Chilton stock, became Mr. Garfit's property for 30 gs.; *Maria 11th* by MASTERMAN (20,311), was bought for 33 gs. by the Rev. H. O. Wilson; *Wattock* by 2D GRAND DUKE OF OXFORD (17,906), and descended on the female side from *Lobelia* by GREY FRIAR (9172), *Lady Rosch* by LITTLE JOHN (4232), and *Anna* by YOUNG NORMAN, was secured for 50 gs. by Mr. Garfit; *Statira* by JUPITER, with no "Herd Book" number, and descended from Towneley stock, brought 39 gs. from Mr. J. Norwood; *Adeline* by WHITE VELVET (19,146), was sold to Mr. Williams for 45 gs.; *Harmony* by LOUIS BLANC, also an unnumbered bull, was purchased by Mr. J. Norwood for 34 gs.; and *Young Wattock* by GRAND MARSHAL (21,865), and of the same Knightley blood as *Wattock*, brought the highest price of the day, 53 gs., becoming the property of Mr. Curtler. The only two bulls whose sales need be mentioned are YOUNG DUKE OF BRAILES, purchased by Mr. Sanday for 33 gs., and CROWN PRINCE by GRAND MARSHAL, sold to the Rev. H. Beckwith for 30 gs. The 26 cows and heifers brought upon an average £29 6*s.* 4*d.* each, and 14 bulls realised £20 4*s.* 3*d.* each, the total proceeds of the sale being £1045 5*s.* 6*d.* A considerable proportion of the young stock were by GRAND MARSHAL, an excellent bull, with famous ribs and loins, and plenty of hair, not to be wondered at when we remember that he comes from Aylesby, and traces from Mr. Torr's "G." tribe, covered with several excellent Booth crosses. At the conclusion of the Shorthorn sale a few dairy cows, by good Shorthorn bulls, were sold at prices varying from £19 to £28; one by WINTERBOURNE (27,826), and in calf to GRAND MARSHAL 2D, fetching the high price of £43, for which sum she became Mr. F. Wright's property.

—— The tenth number of Thornton's Circular has appeared. As in other numbers, the awards of prizes at our principal shows and the results of sales occupy the first part, after which is an unusually long and encouraging list of exportations, filling more than eight pages, prices being in all cases suppressed. The exportations have been consigned to Australia, Canada, Chili, the Cape of Good Hope, and New Zealand. Lastly, we notice a goodly list of animals for private sale, containing a large number of very excellent pedigrees. The heading, "forthcoming sales," is entirely wanting, clearly showing that the season for Shorthorn auctions is over. We may, however, look forward to the spring, hoping that next year may be as fruitful in good sales and long prices as the present has been.

—— In the Table showing the amounts of stock maintained on the various farms examined for Mr. Mason's prizes, published last week, the heading "tups and culls" ought to have been "tegs and culls." The gaps in the Table, in which an attempt was made to compare the amounts of live stock maintained on the "prize farms," are in themselves instructive. Our wonder is excited at the great differences in the numbers of animals supported. As a consequence we ask why one farm of 890 acres maintains at best only 1000 sheep in winter and 70 store cattle, while another, 420 acres in extent, is populated with 570 sheep and 130 cattle? Also, how it is that while one farm of 1072 acres winters 1125 sheep and fats 90 Shorthorns, another farm of 252 acres is stocked with 450 sheep and 40 cattle? The two large farms containing 1962 acres of land winter 2125 sheep and 160 cattle, while the two smaller farms, containing 672 acres, winter 1020 sheep and 170 cattle. Bringing these figures down to more comparable proportions, we find in the case of the larger occupations each 100 acres maintaining 108 sheep and 8 cattle, while each 100 acres of the smaller occupations supports 151 sheep and 25 cattle. Again, we learn from the Table that the proportion of arable to pasture land is very much greater in the case of the larger farms—a somewhat strange commentary upon what has been urged by certain agricultural teachers that arable land will not only supply corn but a larger proportional amount of "meat" than pasture land. We are aware that the larger farms are described as poor and somewhat thin soils, while the smaller farms are evidently of better quality; but we want more information, and can scarcely attribute the whole of the difference to quality of soil. It would at least have been satisfactory to have had a more accurate idea of such differences, either by rent paid or yielding power of the land, as well as of the amounts of food consumed. Last week we urged the importance of a clearer idea as to the objects to be kept in view in inspecting farms. Here is one presented, which may be thus expressed. How is it that the smaller farms, with a less proportion of arable land, are made more productive in beef, mutton, and wool? Is the difference in natural fertility sufficient to account for these discrepancies? Is the expense of production greater in the case of small farms? We ask these questions, but the late report is quite inadequate to the answer. We desire to know how a large head of stock is maintained, and the information supplied to us is too meagre for our purpose. To render such inspections more valuable, the committee should be accompanied by a secretary able to suggest questions and arrange results obtained in reply. Without system the information is too apt to be incomplete, shapeless, and difficult to compare; but with a scientific appreciation of what is really wanted, the value of the knowledge that would be obtained can hardly be overrated.

—— We have to acknowledge the receipt of the Whitley Manor Shorthorn sale catalogue, just issued by Mr. Strafford. It contains the name of twenty-one females and seven bulls, all of which will be brought to the hammer on the 28th inst. Amongst the most attractive features of the catalogue are two well-bred "Darlingtons"—*Lady Wharfdale*, by ROYAL WHARFDALE (22,805), and from Mr. Tomlinson's, *Miss Oxford*, by 6TH DUKE OF OXFORD (12,765); a large number of representatives of Mr. Peacock's (of Haddockstones) best families, and other well-bred cattle descended from Mr. Cooper's herd, long known in connection with Ox Close. Bates bulls have been recently used.

THE BULLOCKFOLD.

THERE are several reasons why farmers prefer sheep to bullocks as the more profitable animal: when folded all their manure is at once applied to the soil; 13-14ths of it is urine (by far more valuable than the solid), and it sinks at once into the soil, where its most useful portions are arrested and retained for the food of plants. There is, in fact, no waste and no expense in thus applying the manure, but with bullocks in the ordinary farmyard there is waste of manure by rain or the drippings from untroughed buildings; then there is carting to a dungheap, unloading, turning it over, refilling and recarting, and a further waste by exposure and washing.

There is also a great waste of valuable straw, which might more profitably be used as food. All these evils and losses are caused by open farmyards, the abolition of which I am endeavouring most strenuously to enforce. I know the difficulty of overcoming old attachments, I was going to say prejudices, but I cannot believe that my brother agriculturists will, in this enlightened age, sacrifice their pockets at the shrine of their prejudice. I am, therefore, about to prove in this paper that the bullockfold, or covered yard, is almost as uncostly and beneficial to the farmer as the sheepfold, and that it has very great advantages over the turning out and roaming-at-large system,—in fact that, as regards the health and progress of the animals, the quality of the manure and the cost of its application, the bullockfold or covered and enclosed yard has an immense advantage over the ordinary open farmyards with sheds.

I don't expect everybody to believe this. I remember the time when everybody did not believe in gas, steam, railways, or telegraphy, so I shall not be surprised or displeased at such a misbelief.

The health and progress of the animal, and the quality of the manure in enclosed and covered yards, depend upon certain arrangements, which I will detail; and it must be remembered that I am speaking with the authority of a practical experience of 25 years. At a recent agricultural meeting, when I recommended covered and enclosed yards, there was a general exclamation that animals there would be unhealthy, and so they would under the following conditions.

One of the greatest curses of agriculture is want of ventilation, and it is this which causes farmers to believe in and prefer open air. The poisonous exhalations from our skins and from our lungs, as well as those from animals, must prove injurious to health unless permitted to escape and to be replaced by pure air. Every public man and many private persons must know by their feelings, and show it by their gaping, that confinement in an unventilated room (shut up in a close box, in fact) is discomforting, distressing, and unhealthy. Fortunately for Britons, the open fireplace and lofty chimney cause a draught, and come in mitigation of evil consequences; but there are no chimneys in our bullock stalls and stables. Ninety-nine out of a hundred of even our new farm sheds and stables have no opening in the roof, consequently farmers, from costly experience, prefer open yards and sheds for their horses, because they know that their animals would be unhealthy in those closed boxes or apartments. Louvre boards in the roof are of little use, for the air flows in at one side and out at the other, without entering the body of the enclosure. Again, one large circular or square opening in the roof will not permit the hot air to escape; but divide the opening into two parts, or have two circular openings, and you at once get a circulation,—the hot and foul air going up one opening, and cold fresh air coming down the other.

In the case of the louvre board, I use a dependent board, about a yard deep; and I can see by the steam that the fresh air entering at one side of the louvre boards drives the air or steam downwards, and forces it up and out at the other side, thus causing constant change and circulation of air.

I have also openings of about 9 inches by 3 under the wall plate, and above the animals, which increases circulation in hot weather. Candles go out where there is no circulation of air for want of fresh oxygen, and we are only living candles or fires on a larger scale. I some time since quoted an interesting instance of the evil effects of want of circulation of air. A well-known Yorkshire agriculturist had a long enclosed shed for his calves, and very successful he was as regards their health. The shed had a door at each end, and somehow or other one of these doors would be frequently left open, so, after some years, one doorway was built up and closed. Once so lucky with his calves, now a change took place, and many losses happened. No one could account for this unfavourable change, but at last it was thought that the building up of the door might have had some influence, so that was reopened, and the calves again prospered. In my place of business, in Regent Street, where we burn 50 gasiights, the heat and effluvia were annoying and injurious to our goods and health, until we adopted Watson's ventilators, which at once put us all right. They consist simply of a tube divided vertically, with a dome to keep out rain; we know in a few moments by our feelings whether they are open or closed.

The diseases in our pigs are often caused by want of circulating air, they huddle together and poison the atmosphere, especially on soft barley-straw, which permits no air to pass under them. On boarded floors with openings, or sparred floors, no evil results can occur, because the air circulates beneath and among them, and the impure air is carried away. When I had 360 pigs closely packed on sparred floors, with a deep space under them, I never had disease among them, although many farmers thought there would be; shut up horses in a close stable, and some of them will get farcy, or other complaints. A putrescent unchanged air must prove injurious to both man and beast. One fertile source of lung complaint, fever, and disease in cattle, is variation of temperature. Woolly animals are less subject to it than hairy ones, and one of the great advantages of the enclosed and covered yard system is equable temperature.

I remember dividing a lot of cattle, putting six of them in a barn, the rest in the enclosed shed with sparred floors. The barn door was opened once a month for threshing, the animals got cold and lung complaint, the others in the shed were perfectly healthy.

As autumn approaches, with its wet days, cold nights, easterly winds, and hoar frosts, there also comes ill health among our cattle. This is not the case in well ventilated, enclosed, and covered sheds. At this season of the year, while animals are putting on their winter greatcoats, they should be most carefully housed. The losses by turning out horses, as well as cattle, is very considerable and alarming in its total. In the shed with sparred floors I have not lost an animal for 20 odd years, and scarcely any in the others. During the cattle plague, with 70 cattle, young and old, we escaped the disease, although our neighbours suffered.

But while commending bullock houses, a word of warning is necessary. If you litter heavily, as in the open farmyard, you will have fermentation and disease. Straw should be used very sparingly, just enough to keep the animal clean. He will tread it down into a wet paste, and thus exclude air which otherwise would, with loose heavy littering, produce fermentation, fire-fanging, and disease. We seldom remove the manure until it is 18 inches deep, short, and fit to go at once on the land. I prefer a shed that will hold a score of bullocks. Shorthorns soon agree together. In single boxes they cannot tread down the litter close to the sides.

Drafted ewes fatten quickly in houses, the food prepared and brought to them. At Tiptree it would be a vain attempt to fatten them in the open field on the roaming-at-large principle. This is contrary to the general impression, but there is no mistake as to the fact, and as to what is the more profitable mode. In feeding stock we should study Nature. A good pasture contains a great variety of grasses, varying in composition, time of ripening, &c. Let us take the hint, and supply a variety to our shedded animals. Mr. Horsfall's admirable practical and chemical practice in the matter of stock feeding is recorded fully in vols. xvii. and xviii. of the "Royal Agricultural Society's Journal," and deserves, and will repay, a careful study. For growing animals variety of food adapted to their wants is indispensably necessary, for their frame must be built up with all the requisite materials, or they will never be perfect and profitable animals.

My animals, whether in the field or in the house, are fed on cake, hay-chaff, straw-chaff, corn (ground), malt combs, bran, roots (pulped), or green food cut into chaff, a little condiment, and rock-salt to lick. In these we have matter for the formation of bone and muscle, and other portions of the body.

Our ideas in regard to stock are still very pastoral. When I say that I have only 1-12th of my land in permanent pasture, I am asked, Then how can you feed your stock? I reply, "with Beans, Oats, Clover, Tares, Mangel, Turnips, and Kohl Rabi, supplemented with the straw of all the crops cut into chaff, and aided by cake."

It is worthy of notice and remembrance that the Prize Oxford Farm, of 880 acres, had only 80 acres of poor, ill-conditioned pasture, and that the praise and prize were given for the well-managed and productive

arable land. The live stock question is a vital one for agriculture. The hundred and odd candidates for our Agricultural Benevolent Institution almost invariably preface the causes of their misfortune by "Losses on live stock." Nor can I wonder at this when I see and know how inefficient and improper is, too often, its management. A sudden change of wind to the North or East, hoar frost on the food, and other causes of disease and death to which exposed animals are liable, inflict immense loss on agriculturists, and should warn our landowners to provide the means for preventing such casualties; and farmers should learn to believe in the use of them.

I have named the bullockfold because it is the same in effect as though the bullocks were folded on the land. Nothing is wasted, for all the manure, solid and liquid, is applied to the soil, and at the smallest cost. No artificial manure can compare in cost or effect with this.

It appears to many remarkable that there should be scarcely any smell from the manure. If there was, it would be a sign of improper and excessive littering. The manure is so trodden and compressed that air is excluded, and heat, fermentation, and smell prevented. When, however, the manure is broken up by forking it into the carts, its smell and power are unmistakeable. *J. J. Mechi, Tiptree, November.*

SEWAGE IRRIGATION.

[Further correspondence has ensued on Mr Morgan's letter (p. 1453) we take the following extracts from the *Times*.]

(No. 1). I feel constrained to differ from the recommendation with which my friend, Mr. Morton [see p. 1483], closes his letter in your columns of this morning; and as I know well that he would be the first to allow that no one has studied the irrigation side of the sewage question more attentively than myself, I am sure that he will acquit me of presumption in differing from him. He recommends the laying-out of land for sewage irrigation in such manner that the sewage can be passed over several "successive surfaces;" in other words, on the "catch-water" system, and he is led to this recommendation by the fact that the effluent water at the Lodge Farm contains a considerable amount of the original nitrogen transformed from the condition of ammonia to the harmless one of nitrates and nitrites. If the reasons were as he supposes, the recommendation would be wise; but there is no part of the complicated sewage question more complex than the consideration of the different conditions under which the whole of the nitrogen may be extracted, or the whole converted into harmless combinations, or a part extracted and a part converted, or, finally, a part extracted and a part passed away in an impure condition, all of which results may be obtained by different processes of sewage irrigation. It is difficult in the space of a letter fully to explain what would supply matter for two or three lectures, but the following short extract from a lecture which I delivered at Liverpool last night will give a rough outline of some of the objections to the "catch-water" system:

"Suppose, for instance, that the sewage has to flow over three pieces of land, numbered respectively 1, 2, and 3, it is manifest that the whole bulk of the sewage delivered out of the carrier which discharges immediately upon No. 1 flows on to that plot. But as part of the liquid will be absorbed into the soil and crops of No. 1, the sewage will be diminished in quantity when it arrives at No. 2, and again still further diminished in quantity when it arrives at No. 3, but it will also in each case be diminished in strength and fertilising power. Consequently, if No. 3 gets enough, No. 1 will get too much, and if No. 1 gets only enough, No. 3 will get too little. To this it is answered, I know, that there are always means of watering No. 3 and No. 2 without watering No. 1. If so, why not always follow this system, and what then becomes of the so-called catch-water system? But the supporters of the catch-water system defend it by saying that as the sewage always flows over several successive areas of land before it is finally discharged into the surface, it must always be thoroughly purified. This, of course, is a complete *non sequitur*, but supposing that it was not, what would become of this assertion when our friends proceed to irrigate No. 3 next the outfall, to the exclusion of Nos. 2 and 1? Clearly as the land is especially laid out to enable the water to flow off the surface of No. 3, either into the actual outfall itself or into an open ditch delivering into the outfall, there is absolutely no means of securing the purification of the sewage under such circumstances. The fact that it flows off the surface shows that there is more liquid applied than the land can absorb, and the moment that this arises and the discharge begins, that moment must the danger of imperfect purification commence. In fact, if we are to believe that that part of the crop on plot 3, in the case above sketched out, which grows next to the side of the discharging ditch or outfall, is as luxuriant as every other part of the crop, it is manifest that the sewage in its normal state of impurity, that is fertility, must have been brought into direct contact with these individual plants."

In short, what possible advantage is obtained by pouring over any one area of land more sewage than that particular area can absorb and utilise?

My farm, near Romford, recently described in your columns, is laid out in such a way that no sewage can escape except through 6 feet of soil, to the drains, and the arrangement is such that the individual dressings of sewage are only enough to moisten the upper mould. But the Lodge Farm was laid out by a Wiltshire water-meadow surveyor, as if for the unlimited use of water, instead of the economical use of a valuable liquid manure, and the beds are so wide that when the sewage is delivered sideways out of the carrier across the slope of the bed, long before the lower portion of the bed can be manured, sewage must have descended far through the subsoil below the portion of the bed nearer the carrier. Probably the great bulk of the sewage at present wasted at Lodge Farm escapes in this manner, and, unfortunately, against my remonstrances, the secretary of the company has increased this evil in the course of the past year. There are, however, other chemical reasons which might partially account for the facts adduced by Mr. Morton, but which I cannot now go into. I only wish clearly to enunciate this one proposition, that there can be no possible advantage in pouring over any particular piece of land more sewage than that piece of land, by itself, can utilise. *W. Hope, Parslows, Nov. 2.*

(No. 2). As the point or "principle" to which I called the attention of the British Association at Liverpool is the same as that which for several years past I have advocated in your columns and in various published papers, it may appear to your readers a matter to which it is unnecessary I should again recur; but, the fact is that, in spite of the emphatic way in which Mr. Morton supports the view that no sewage should be applied to land, by way of irrigation, which does not pass "through" as well as "over" it, an opinion prevails in the country that sewage may be more economically applied without infiltration than with it, and that, therefore, drainage is not the complement of irrigation as I have stated it to be. It is quite true that the excellent and convincing report of the present Rivers Pollution Commission of February last establishes the value of intermittent downward filtration as a certain means of purification, but the public are not told that sewage after feeding vegetation by irrigation should necessarily pass through the soil over which it is run; on the contrary, though the Commissioners admit that it is precisely in those cases in which sewage is absorbed and disappears that the effluent water is most completely purified. They draw the attention of towns to the possibility of constructing artificial filters, or contriving natural ones of comparatively small extent, as a means of cleansing the refuse of towns with large populations, without declaring it to be a *sine quâ non* that no sewage should pass directly off the surface of irrigated land into the water-supplying tributaries of the country. If, however, I have misinterpreted their report, and it is really the intention of the Rivers Pollution Commissioners to impress upon the country the absolute necessity of filtration in all cases, I am content to waive any claim I may have incidentally raised of having previously called attention to the point.

As to Barking, I submit to the correction of Mr. Morton; though, since the facts which misled me bear so materially upon the important point just explained, I must ask your permission to add a few more words. When I had the pleasure of accompanying Mr. Morton and other gentlemen over the Lodge Farm it was particularly explained to me to be the intention of the company—and I saw arrangements made for the purpose—to carry the sewage from one slope on to another, and to repeat the application even a third and fourth time. This system—which I am now informed has been abandoned, though still recommended by Mr. Morton, if I understand him rightly—is opposed to the principle upon which so much stress has been laid, and which is admirably carried into practice by Mr. Hope, at Briton's Farm. It is opposed to it because it is manifest that the quantity of sewage to be applied to any given space cannot be economically regulated, and that the quantity and strength of the sewage passing off as the "tail" water of one slope to become the "head" water of another must depend upon several conditions over which the irrigator has no control; while it is equally certain that if the sewage will pass from one bed to another there is no reason why it should not eventually pass off the last slope into the river itself. The "catch-water" system of irrigation, in fact, is only rightly applied where none but hilly land can be obtained, though it may be justified when from uncontrollable conditions the sewage cannot be all absorbed. It was the existence of the catch-water system at the Lodge Farm, coupled with the words of the Commissioners in describing the irrigation there—viz., that the sewage "either sinks altogether into the land, or flows finally off the surface at the foot of the farm,"—that led me to suppose that the inferiority of the effluent water was due to the mixture of surface sewage with under-drainage water. The quantity of ammonia contained in the effluent water, which ultimately passes from the farm into the stream, is stated by the Rivers Pollution Commission to be .425 in 100,000 parts, which, compared with that of the effluent water discharged from the under-drains at Briton's Farm (where Mr. Hope takes care that every drop of sewage is absorbed on the one slope to which it is applied), amounting to .065, is so great as to require some further explanation. It will probably be found in the fact that some sewage finds its way directly from the surface into the under-drains without the requisite filtration, and, it so, such action is not very different from that of sewage passing off the surface into the stream. That I am not assuming an improbability is shown by the fact set forth in the report I have quoted, that the effluent sewage water taken from the surface at Rugby contains precisely the same proportion of ammonia as the drainage water at the Lodge Farm, while the proportions of ammonia in the effluent water at Penrith, Carlisle, and Bedford, where filtration is adopted, are shown to be respectively .001, .025, and .095 in 100,000 parts. These remarks are not offered as any criticism of the Barking works, but simply as explanatory of the principle I hope to see established.

The whole discussion cannot fail to satisfy those who are interested in the subject that land may be too porous for the purpose of irrigation if drained in such a way as to militate against perfect filtration. The very careful experiments made and published by me in 1855 and in 1856-7, when considered in conjunction with the chemical experiments of Dr. Frankland on the purifying effects of downward filtration, cannot fail to prove that there is no soil, however stiff, so impenetrable as to prevent its becoming a natural filter if disintegration of the surface soil is secured by deep cultivation and an effective discharge from the subsoil by thorough drainage. *J. Bailey Denton, 22, Whitehall Place, London, Nov. 4.*

SMUT IN WHEAT.

At a recent meeting of the East Lothian Farmers' Club, when the subject for discussion was "This Year's Wheat Crop—the Ravages of Insects," one of the speakers alleged that much nonsense had been spoken in the course of the debate, and judging from what has since been spoken and heard on the subject, it is certain that such an opinion is not confined to the individuals alluded to. The Club meets monthly, on market days, the discussions taking place after dinner in presence of a reporter, and the uttering of nonsense upon such occasions is not likely either to further the objects of the Club or do credit to the farmers of East Lothian. In making a few remarks on some of the subjects noticed at the meeting in question, I shall first consider the preparation of the seed and the soil for a Wheat crop, as being more particularly connected with the operations of the farm at the present season of the year, and upon another occasion recur to some of the insects injurious to the Wheat plant.

It has long been the practice to prepare the seed, previous to being sown, with compounds supposed to prevent smut in the succeeding crop. One kind of smut is found occupying the ear in place of grain, is round, covered with a skin (and hence, perhaps, the provincial name of "ball"), filled with blackish powder, offensive to the smell, and is injurious to all the products of which flour is a component part. In separating the grain from the straw the smut balls are often broken by the threshing-machine, and still more frequently by the flail, and their black dust, which is seed, may be seen adhering to the grain. There is no doubt of smut being a vegetable Fungus, and that the vitality of its seeds can best be destroyed when seen on the grain by the various specifics used in preparing the seed. The accepted theory of the propagation of smut is that the seeds or spores are taken up by the roots of the Wheat, and carried by its circulating fluids into the ovary of the flower, where the Fungus is developed. Whatever degree of truth there may be in this theory, the experience of ages has proved that unless the seed has been properly prepared by a preventative for smut, the crop seldom escapes injury from this Fungus. The various preventatives of smut used throughout Britain are supposed to act either by washing off or destroying the vitality of its seeds adhering to the grain, and anything whatever which will affect this object without injuring the germinating powers of the Wheat may be used with safety. The "pinch of snuff," which may be called "The Durie Pickle," would undoubtedly prove an excellent preventative of smut when used as a drier to wetted Wheat, but would prove too expensive at the present time. The propriety of taking precautions against smut was so impressed upon me in early life that the dressing of seed Wheat was never dispensed with except in cases when a small quantity of unprepared seed was wanted to finish the sowing of a field, and in such instances only were the crops infested with smut. Wherever Wheat is extensively grown, a few smutted ears may occasionally be seen, but the farmer who neglects to use one of the simple and inexpensive preventatives of smut may justly be considered to be foolhardy. In former times, when seed Wheat in this country was dressed with liquids injurious to vegetation, such as stale urine and strong saline pickle, the life germ of the seed was often weakened, if not entirely destroyed, and more especially when the Wheat was of a previous year's growth, arising, no doubt, from the increased absorbent powers and weakened vitality of the old seed. Ears of smut balls and ears of perfect grain are often found on the same plant, and occasionally smut balls and perfect grain in the same ear, and more than once I have seen a grain partly smutted and partly sound.

For more than a dozen of years past I have grown experimentally, on a small scale, many new and old varieties of Wheat without using any means to prevent smut, and except in cases when a variety was first

added to the collection no smut has been found. The practice followed has been to winnow the chaff from the grain with my own breath, and over a table to separate the good seeds from the bad with my fingers. No change of seed, soil, or of climate can be said to have taken place, and at present no deterioration can be traced in any variety.

There is another kind of smut where the grain and chaff come forth from the sheath blackened and destroyed, which is often plentiful amongst Barley and Oat crops, but rare amongst growing Wheat, and is generally blown off by wind, and in such cases the grain is but little injured. About half a century ago this kind of smut was always present in crops of a variety of Wheat then pretty extensively grown under the name of Dudgeon's Wheat, and was characterised by the flag leaf withering into a brown colour when the ears appeared. More recently, a variety raised at Castlemains, Dirleton, with a club-shaped ear, inherited this defect to a considerable degree. At the present time, with careful inspection, this kind of smut may be detected all over the county.

An opinion was brought forward in debate that land which had carried a crop of Beans ought to be twice ploughed with a view to benefit the following Wheat crop. The ploughing of such land twice assists the removal of Couch-grass and other root weeds, as well as kills the slug, or brown snail; but militates against the crop. If the question is put in the shape of whether the Wheat plant thrives best on a loose or a compact soil, there will be little difference of opinion amongst practical farmers. *Patrick Shirreff, Haddington, Nov. 7.*

DOUBLE FURROW PLOUGH.

THE farmers of Kildare, and more especially those of the extensive district around Athy, have had, by means of the Athy Farmers' Club, many interesting agricultural exhibitions, and these of various kinds, brought prominently under their notice during the last five years; but, perhaps, the trial of double-furrow ploughs held at the farm of George Low, Esq., Grangenolvin, on Monday last, was the most interesting of any.

The double-furrow plough is not by any means of recent invention, but in its present almost perfect state, that implement has not been long before the public. There are about 20 manufacturers in the kingdom of as many different double-furrow ploughs; but this number does not represent those actually in the market. Only three makers, however, were represented—Grey, of Uddingston; Ransome & Sims, and Mitchell, of Peterhead. Grey's double-furrow plough was the one recognised as the most excellent at the last Queen's County ploughing match, but on the excellence of one or other of the three ploughs we shall on this occasion have no cause to pass an opinion, because we have below that of six gentlemen, eminent for their experience in all matters belonging to agriculture. We shall, therefore, only say that the field kindly given by Mr. Low was one of 30 acres in extent, and laid down about five or six years, consequently it was in capital order to test the capabilities of each plough. There were a large number of the local gentry and farmers, who evinced the keenest interest in the proceedings. Mr. Low, although the match was held a long distance from his residence, had an abundant supply of refreshments for those present. The trial lasted from 11 o'clock till 5 in the evening, and the result, as given by the judges, who were most painstaking, is as follows:—

"Of the ploughs entered for competition only three were brought forward, viz., one by Messrs. Ransome & Sims, of Ipswich; one by Messrs. Mitchell, of Peterhead; and one by Messrs. Grey, of Uddingston.

"The judges were instructed to take into account price, draught, and suitability and efficiency of each plough for general purposes, in awarding the handsome cup so liberally given by Mr. O'Neill, of Athy; and to award the medal given by the Club to the best adaptation of skim-coulters.

"The prices of the ploughs, delivered at Athy, were stated by the exhibitors to be as follows:—

Ransome & Sims' plough	£9	0	0
Pair of skim-coulters, extra	0	10	0
Grey—plough	13	13	0
Pair of skim-coulters, extra	0	10	0
Mitchell—plough (no skim-coulter)	14	10	0

"The first trial took place in a lea field; the soil light, even, and free from any large stones. Each plough opened its work for itself, and in this operation Ransome's undoubtedly did best; but that might, perhaps, depend more on the skill of the ploughman than on any inherent merit in the plough itself. The size of the sod ploughed was fixed to be 6 × 9 inches; and though the work done by Ransome appeared the neatest, some of the judges preferred that done by Mitchell, the latter seeming to lay on and pack together the sods better than Ransome. All the ploughs cut the furrow quite square.

"The draught, when tested by the dynamometer, was very nearly equal for all, about 5½ to 5⅝ cwt.; and was very little affected by the addition of the skim-coulters.

"On testing a Scotch single plough of Mr. Low's, which was doing very fine work in the same field, with a skim-coulter on, the draught was found to be about 4 cwt., with same sized sod, 6 × 9 inches, showing that each horse in the single plough has quite as much to do as each horse in the double plough.

"The ploughs were afterwards tried in a pretty heavy piece of stubble land, which had been previously ribbed and harrowed down. In this they ploughed from 6 to 9 inches deep, and Grey and Ransome seemed equally efficient, and both superior to Mitchell, the mouldboards of the latter carrying a great deal of clay along with them, and never appearing to clean.

"On considering the whole performance, and taking price also into account, the judges were unanimous in awarding the cup to Ransome; and as Mitchell had no skim-coulter, nor any means of attaching them to his plough, and as Gray only had one on, the medal also fell to Ransome, whose skim-coulters worked very easily. *Wm. Young, J. B. M'Culloch, Patrick Lyons, W. Davidson, Jas. Harrington.*" *—Dublin Farmers' Gazette.*

Home Correspondence.

Kainit Potash Salts.—Mr. Meyerstein's remarks on kainit in your last number appear to require some explanation, if they are to be of any use to farmers; for though their absolute correctness is unassailable, they are likely to produce a false impression among readers not intimately acquainted with the subject. Mr. Meyerstein will, I trust, acquit me of any desire to enter into personal controversy, or to cry down his article, but, as an agriculturist, having made the agricultural use of potash salts my study, both scientifically and practically, by studying the works of our foremost chemists, and by making experiments myself and watching such as were made by others, from the time almost of their first employment for agricultural purposes, I consider it my duty to my brother farmers to prevent any such false impression from gaining ground. I am perfectly convinced that Mr. Meyerstein had not the intention of producing them for selfish purposes. The first question addressed to Dr. Voelcker was this:—Does calcining increase the fertilising properties of the sulphate of potash contained in kainit? Dr. Voelcker's answer was a plain "No." The question is, no doubt, of some interest, but as it is answered in the negative, and nobody has publicly asserted the contrary, viz., that calcining does increase the fertilising properties of the one ingredient of kainit, it is practically of very little value. What a farmer would ask, is not—Does calcining increase the value of one constituent? but does it increase the value of the whole stuff? Had Mr. Meyerstein put this question to Dr. Voelcker, the "No" would have been changed into emphatic "Yes." As Dr. Voelcker has communicated his opinion on the subject to me in a confidential manner, I do not consider myself at liberty to quote it at large. But I think I may venture on saying so much, especially as the question is one that, to people acquainted with the matter, affords not the slightest doubt. All chemists that have written on the subject agree in this, and the general practice in Germany, where kainit and other potash salts are best known, fully bears out their opinions. Calcining does very much increase the value of kainit, and it does so in three respects—1, by reducing the proportion of useless ballast, and raising that of potash; 2, by reducing the proportion of the injurious chloride of magnesia; 3, by thereby making the stuff less hygroscopic, and therefore less likely to deteriorate by keeping. The most important of these points is the first, especially to English consumers, living at a great distance from the mines. An article, containing 26 or 27 per cent., or else 28 or 30 per cent. of sulphate of potash, has a higher value than one containing only 23 per cent., not only from its greater proportion of potash, but on account of its reduced bulk, which lessens materially the cost of freight and carriage. At such great distances as this the concentrated article is always comparatively the cheapest. Crude kainit, indeed, often contains more than 23 per cent., but so does the calcined exceed its guaranteed proportion, being the very same stuff as the crude, from the very same mines, minus so much moisture, and with so much chloride of magnesia decomposed. More than 23 per cent. is not guaranteed, and so farmers cannot count on buying more. A practical proof for the soundness of the doctrine, that calcined is superior to crude, will be found in the fact, that German farmers have long since pronounced in favour of the former, and use comparatively very little of the crude. I am in a position to speak with authority in this respect, as I have been for some time settled in Germany as an agriculturist, and have taken a great interest in the potash question. It stands to reason that if calcining does not improve the character of the stuff, the sixteen or twenty odd manufacturers at Leopoldshall and Stassfurt engaged in that process would not go to the extra expense and trouble. They could not have done so merely to evade the restrictions imposed by the temporary monopoly of the firm whom Mr. Meyerstein represents, for that monopoly is only a few months old; whereas kainit has been discovered, calcined, and sold ever since 1865, and other potash salts as much longer again. Another point in danger of being misinterpreted, to the prejudice of other firms, is Mr. Meyerstein's advertising as "sole agent for the sale of genuine Leopoldshall kainit." Mr. Meyerstein's friends have the monopoly for exporting crude kainit, but the other Stassfurt and Leopoldshall firms are free to export as much calcined as they please, which is just as genuine, and comes from the very same mines. There is, moreover, very little fear of adulteration, as long as the proportion of potash is guaranteed; for the recommendation of kainit is its comparative cheapness as a sulphatic potash salt. Merchants are not in the habit of substituting a more costly for a cheaper article; and if they did, in this case buyers would not be the losers, as the adulterated stuff would probably contain less of the injurious chloride of magnesia. I have offered these remarks in the interest of farmers, and shall be obliged to you for allowing them a place in your paper. *Henry W. Wolff, 18, Mecklenburgh Square.*

Carrots.—I beg to inform Messrs. Moir & Son, of Garthdee, that when gathering in our crop of Carrots a fortnight ago, they turned out so very good that I measured some 2 feet 3 inches in length, 13 and 14 inches in circumference, and weighing 4 lb. 14 oz. each; they were Altringham Red and Belgian White. Seven of each together weighed 54 lb. One root of James's Intermediate weighed 4 lb. 2 oz., and measured 16 inches in circumference; it was the largest, but many of James's weighed 3¼ lb. The ground they were grown upon is a very strong clay resting on chalk, and in the winter previous to sowing had been deeply trenched, and at the bottom of the trench a good quantity of stable manure, just as it came out of the stable, was placed, to lay the soil as light as possible, and caused the crop, which was a very heavy one, to stand the drought very well, but many seeds never germinated until we got some rain in August. *J. T'Anson, Idsworth Park, Horndean, Hants.*

—— In answer to Messrs. John Moir & Son (p. 1520), I may state that at the Banbury Root Show, held on Tuesday, Nov. 8, 12 Red Altringham Carrots were exhibited, weighing 41 lb. Two of them pulled down 8 lb. 3 oz., were 29½ inches long by 10 in circumference; 12 White Belgian were shown, weighing 42 lb.; 12 Banbury Improved White Spanish Onions weighing no less than 15½ lb. *H. Deverill, 73, High Street, Banbury.*

Acorn "Poison."—As respects the acorn "poison," I see no difference between it and the poison which Dr. Lancaster says is always produced by indigestion. The matter seems very simple. Set a boy to eat a quantity of nuts, shells and all, rather rapidly, and see whether they are quickly digested; and, doubtless, gallic acid was not intended for food—nor are any skins. I once nearly poisoned a large mastiff by giving him a quantity of Potatos boiled with their own water; and I believe every skin has its peculiar protecting fluid, which is unfit for food. *F. S.*

The Potato Crop in the Wisbech District.—The taking up of the Potato crop is by this time completed, and although I have to report an exceptionally large yield, I must also add that, "taking it for all in all," it is anything but a good one, for in very many cases the diseased tubers amount to one-third, and in some even to half the entire produce. The epidemic has this year attacked the round large-topped varieties far more than the long or kidney-shaped sorts, which grow with less leaf and haulm, and the crops on the better class of Potato land seem in many cases to have suffered considerably more than those on the strong and unkind soils. I have this week been over several farms in the south of Lincolnshire, near Long Sutton, which, as your readers are doubtless aware, comprises some of the most splendid land in the country, and a large tract of which is annually devoted to the cultivation of this crop, and it was on these farms that I saw the immense quantity of diseased Potatos. In one case, where the sorting of Rocks was taking place, the number of "brown" ones was quite equal to one-third of the whole; but, as the crop had been secured in a dry condition, the diseased tubers had not become more affected than when first put in the grave, and were being carted to the homestead to be consumed by stock, on which, with cake and meal, they are rapidly making meat. In another instance, however, a grave of Regents was being examined, and was in a shocking state of decomposition; the weather having been somewhat wet when the Potatos were taken up, the diseased among them began to heat, and more than half of them were quite rotten and useless, whilst those that were untouched by the disease were almost unsaleable, being so unsightly and offensive from contact with the decayed ones. Another farmer in the same parish has grown about 10 acres of Flukes, and these are much better, being only a little diseased; although the yield, as usual with the Fluke, is much less in weight than that of the Rock. In other parts of the district, on the peaty soils, the disease has attacked the crop extensively, in so much that some of the growers do not think it worth the trouble of sorting out the few good ones, but are consuming the whole of the crop as they are taken out of the graves. I need hardly say that the cases referred to are exceptional, but it is a great rarity to hear of anyone having a crop without a taint of the disease. On the farm with which I am connected we have between 20 and 30 acres of Flukes, of which 10 acres were grown on land broken up from grass, after four years' under brown Mustard, and the soil rather strong for Potatos. In this field there were scarcely any bad ones at all, but on another piece of good loamy soil the diseased Potatos will be equal to one-fifth of the produce. As these two fields were planted at or about the same time, with the same kind of seed, and taken up in the same week, it is fair to presume that it is the difference of soil which has caused the above results, thus upsetting the theory that the disease is entirely due to

atmospheric influences. Any discovery for the prevention of the disease would be the greatest possible blessing to the public. *Nemesis, November* 2.

Relative Value of Clay Land.—In the year 1836 I happened to be living at ease in Surrey, and remember reading at that time a book on the agriculture of the country, by Malcolm. I was particularly struck by the account which Mr. Curtis (the Editor of the "Botanical Magazine"), gave of his working on a piece of clay at Walworth—because near the village where I resided was a hamlet called Claygate, and I had occasional disputes with a small farmer of that place respecting the working of the land. It was about the time when Sir Robert Peel was preaching up the necessity for deep ploughing and effective draining; and I tried to persuade the small farmer, who always croaked about the coldness and poverty of the soil, that it only wanted labour—as I saw that Plum trees bore abundantly. It is a curious illustration of the slow progress which ideas make in England, that 30 years have passed, and this fact of the comparative value of strong land is yet discussed. I remember hearing at the same date (1836) discussed, in a bookseller's shop at Kingston, the expediency of equalising the poor rates, which now seems likely to be done in about ten more years. *F. S.*

Fox Hunting.—Among the grievances under which farmers suffer, I think the injury to young Wheat and seeds in the winter caused by hunting is a serious one. This is particularly the case on stiff plough farms. Of course the larger grazing fields of Leicestershire or Northamptonshire may not suffer so much; but on clay plough land near covers, in wet weather, I am sure the loss of plant must be great, for the footmarks of the hunters remain all the summer after. The hunters also break down rails and hedges, and leave gates open, and disturb flocks, doing hurt to inlamb ewes. All these annoyances are a loss in money to the farmer. I do not object to the landowners or any class amusing themselves, but I think their amusement should not be carried on to the injury of others. I am afraid it is of no use as yet opposing fox-hunting or game preserving at the expense of tenants, but I hope the time will come when the farmer's property in England, Scotland, and Wales, will be as well cared for by Parliament as the farmer's property in Ireland has been. I know that the House of Lords is composed almost exclusively of landowners, who also have a majority in the Commons inclined to support landowning interests. The best way, in my opinion, and the quickest way of redressing farmers' grievances will be to return more tenant-farmers to the House of Commons. Surely every division of a county can furnish at least one farmer who will make as good a member as the present one—much better, if we look to tenants' interests. If we had 50, or 100, or 200, Reads, and M'Combies and Hoskynses in the House of Commons, such things as turning a tenant out by a six months' notice to quit, and seizing his improvements, would soon be put an end to. It is this notice to quit hanging over our heads that makes us dumb when speaking of laws passed by landlord Parliaments. If land-occupying were as fairly represented in Parliament as land-owning is, many things which now oppress the country would be got rid of. *H. H. O., Warwickshire, Nov.* 14. [Does our correspondent suppose that a Parliament of tenant-farmers would put down foxhunting !]

Foreign Correspondence.

Cabaña de los Alamos, Buenos Ayres: *Aug., 1870.—The Problem of Wool Production under Given Conditions.*—What an infinity of mistakes could be avoided, and to how much better advantage could men work, had they but thorough knowledge of the natural laws which govern the various industries which they practise. What marvellous results have accrued to agriculture and stock-farming economy during the past quarter of a century, through the lights which science has shed. Let us cull a few of these lights, and apply them to an industry which is here, in the River Plate, practised in the rudest and most blind manner, viz., wool-growing.

The general practice assumes, that wool of any description can be grown equally well anywhere, and under all conditions indiscriminately, and apparently too on the assumption of sufficient or insufficient food, health, or disease. There is no greater fallacy. We can no more grow the true Saxon Negrette, or Lionese, character of wool on the natural pasture of this country than we can grow Cabbage in the moon.

Wool is affected in its every condition, quality, length, character, and quantity, by the food on which the sheep are fed, on the same principle that soil determines the class of herbage—its quantity and quality—that grows on it. All practical and experienced flockmasters know, and professional writers proclaim that sheep like and thrive on a variety of food, but few, if any, state specifically what varieties of food are calculated to result definitely in producing different effects, much less the reason why. Yet it is to the last degree important that these things should be generally known amongst farmers, as thereby thousands would be spared comparative failure. We are told that high feeding will give quantity and increased fibre, but we are not told why feeding on Peas, Maize, Clover, or Alfalfa, green or as hay, Turnips, Mangel, &c., will give rise to a certain character of wool, and feeding on Oats, Barley, meadow grass, green Rye, or Barley and meadow hay, which, as well as the first enumerated, constitute high feeding, will give rise to a totally distinct character of wool. We are told that the sparse short grasses of hill runs suit small sheep with small fleeces of short fine wool, but not the reason why (or only a loose and incomplete one) such a scant herbage gives scant carcase and scant wool. I will endeavour to supply this deficiency briefly but definitely.

The first step must be to state the inorganic constituents of wool; say, silica, 16.74; phosphoric acid, 15.12; sulphuric acid, 12.94; lime, 15.06; potash, 4.12; soda, 2; common salt (chloride of sodium), 11.94; oxide of iron, 20; magnesia, 1.45. This is the only analysis (it is by Nisbit) I can find, and is made to do duty in the very few works on sheep that give an inorganic analysis—proving how inconsiderable has been the attention paid to this important matter. It is not stated even what class of wool, nor where grown, nor how the sheep had been fed, whereas the relative proportions of the constituents would be materially different in different classes of wool off sheep differently fed; however, it is a fair assumption that the sheep had fed over lime or chalk soil, otherwise the relative proportions of lime and potash would have been different.

The next step is to state the parts which these inorganic substances play in the organism of the wool. The phosphate and the sulphur appertain to, and bear relation to, the nerve or nitrogenous substance; the silica (in combination with the alkalies) goes to form the serrated or scaly crust; the oxide of iron appertains to the nerve and the crust; sulphur and phosphorus may be stated to contribute to the peculiar lustre of the wool; but, as regards this, their function is not accurately determined; the common salt is, as in all animal organisms, essential to the organisation of the whole. That which may be called the external character of the wool, the greater or less firmness and transparency of the crust, the sharpness and more or less tenacity of the points of the scales or serrations, depends entirely on the relative proportions of silica, potash, lime, and soda present in it, and this again depends on the relative proportions of these same present in the food on which the sheep habitually feed. A deficiency of silica, and a relative excess of lime in the food, will give rise to dulness, brittleness, and very inferior felting property in the wool. Lime and potash replace each other to a great extent in vegetable and animal organisms; if, therefore, potash is considerably in excess of lime in the feed, that is, if such feed has been grown on a soil rich in potash, and only moderately charged with lime, there will be a different result. In herbage in which the alkalies are largely present, there is generally little silica, often a large proportion of carbonic acid, the phosphoric acid below the quantity present in the less alkaline pastures, and the sulphur rather over,—a composition of feed which developes the hydrocarbons both in the carcase and wool of sheep fed on it; and provided potash predominates, and not lime, the wool will be pliable, soft, moderately bright (or not dull), and full rather than fine in fibre, if the sheep have been kept in good healthy condition, but it would be decidedly deficient in felting property, *i.e.*, in sharp serration and crisp elastic curl—so that, if not of combing length, it would be of small value.

I may here mention that writers on sheep attribute the harshness and brittleness of wool grown in lime soils to the lime or chalk dust mingling with the yolk, and converting it into soap, the whole washing out when rain falls. This is only the lesser cause; the chief cause is the substitution of lime for potash and soda, and a deficiency of silica in the crust. Food that has silica considerably in excess of potash, and potash largely in excess of lime, will give rise to the brightest wool, the sharpest and most tenacious serrations, and the nerve organism will be in relation to the hydrocarbon as the phosphoric acid is to the potash. If the nerve or nitrogenous elements are relatively (not actually, for the carbon of food must always greatly exceed the nitrogen) in greater force than the hydrocarbon or starch, both being present in moderate or store stock force, the wool fibre will be very fine but nervous (a fine felting wool), short in staple, in fleece small; and the sheep habitually so fed will be light in carcase, and indisposed to fatten. Food comprising a variety of which one part contains silica in excess and phosphate in considerable proportion, and the other part little silica but much potash, is that which favours a large meat and fat product, an abundant wool clip of bright, pliable, tough, nervous, and long staple—a fine combing wool with felting properties, in degree corresponding to the proportion of silicated substances in the mixed food.

It now only remains to examine carefully and comparatively the inorganic analysis of the chief food substances which constitute the food of sheep, to arrive at a certain knowledge of the character of wool which can be obtained off the herbage which Nature provides in different localities, or which the farmer can produce on different soils. There is a general resemblance in the composition of the straight-leaved meadow grasses; each variety, however—and there are many—differs somewhat from the others, and soils affect all in more or less the same way. I have, therefore, struck an approximate average of the analysis of several sorts made by Professor Way, and give it in the first line. In the second line an analysis of meadow hay, composed of many sorts, and evidently cut off a rich lowland soil, viz., rich in phosphate: this analysis is by Potter. I have also given two or three analyses of Clovers, &c., grown on different qualities of soil, and two of Alfalfa, one of the varieties of the Trefoil order, by Way, Voelcker, and Anderson. The composition of the various Trefoil families is so similar that is only necessary to give the analysis of one sort (red Clover), grown on three different soils, to answer for the whole variety; single analyses of grain and straw by Way suffice. There is a plant which is not elsewhere considered as a food, but which here constitutes a very large proportion of the feed, viz., the Cardo jasnal, soft Thistle. No analysis exists of this; but by taking into account the habits of the plant and its effects as food we can, by analogy, arrive at a tolerably correct estimate; and I may put it down as containing more water, more carbonic acid—from the fact of very broad-leaved plants absorbing carbonic acid in proportion to their surface—less phosphate and potash, and silica perhaps in about same proportion as in the Clover.

	Silica.	Phosphoric Acid.	Sulphuric Acid.	Carbonic Acid.	Lime.	Oxide of Iron.	Potash.	Soda.	Common Salt.	Chloride of Potash.	Magnesium.	
Meadow grass	37.00	9.00	3.30	2.05	7.00	2.50	28.15	..	3.50	7.35	2.60	Grown on a soil rich in potash.
Meadow hay	30.60	17.35	2.10	0.69	8.24	1.82	25.68	10.89	5.09	..	4.0	Grown on a soil very rich in phosphates.
Clover	0.69	6.71	1.85	23.47	22.62	0.26	36.45	..	1.51	2.39	4.08	Loam, medium.
Clover off a lime soil	2.60	6.88	4.40	20.94	35.74	0.95	11.30	..	0.58	5.92	10.58	Lime soil.
	1.313	5.00	3.18	17.701	30.908	1.470	13.928	2.39	8.096	..	0.176	
Alfalfa do.	5.9	5.96	2.85	26.48	45.94	0.73	10.2	..	1.90	1.54	3.60	Do.
Do., off a vegetable loam	2.44	5.75	4.27	15.92	18.31	1.98	24.49	..	1.70	10.35	4.64	Vegetable loam.
Oats	49.44	21.53	0.13	..	4.22	0.36	13.97	1.50	..	..	8.82	
Barley	50.68	28.53	1.91	..	1.63	2.13	21.14	..	1.01	3.63	7.26	
Peas	1.84	28.85	5.85	2.12	4.5	..	41.56	5.02	4.30	..	6.46	
Maize	1.33	53.69	..	..	0.59	0.49	28.37	1.74	..	..	13.69	
By Way: Oat straw ..	47.68	22.61	2.25	..	4.22	0.39	13.97	1.50	..	..	8.82*	
By Boussingalt: Do., cut ripe	42.60	3.19	4.37	..	8.84	2.42	0.609	4.69	..	..	2.38	
Barley-straw	68.50	7.20	1.09	..	3.79	1.36	11.22	..	2.14	..	2.70	
Wheat do.	67.1	7.05	5.59	..	4.44	1.54	10.03	0.85	..	..	4.27	
Potash	1.04	1.23	2.26	29.03	4.36	0.73	12.68	0.24	9.60	..	5.73	By Way.
Field do.	20.03	4.83	6.77	..	54.91	0.40	4.73	..	..	..	6.22	By Sprengel.

* This has evidently been cut green, otherwise it would not have had nearly so much phosphate, the which would have passed into seed had it been dead ripe.

As regards soils, it is only necessary for me to say, that soil in which lime is present to excess is detrimental to wool; that lowland alluvial soils are richer in carbon and nitrogen, richer in available potash and phosphates than the more shallow hill pastures, and that therefore in these latter the pasture is less developed and less nutritive or feeding; while the silica bears a full relation to the nutritive constituents. The deep rooting Trefoil families, Clovers, Alfalfa, Melilot, &c., find congenial conditions in deep rich soils, especially in such a soil as prevails in Buenos Ayres, viz., a rich loam, overlying a silicic clay very rich in potash.

Hence it is that it is true that the finest short felting Merino grown on natural pastures is produced on the short, crisp, silicated herbage of hill pastures; and the flexible tough combing wools and fat sheep on the low lands; the respective character of the products corresponding to the quality of the feed of the sheep.

I now call attention to the feed of the German races, Saxon, Silesian, Negrette, under which the finest fibre and the highest felting quality of all wools is attained. Summer: Fine upland pasture, supplemented with grain and soiling (green fodder cut) when required. Winter: Fine upland hay, Oats, Oat-straw, Wheat-straw, Rye-straw, and occasionally a little Clover-hay, &c.; and occasionally, also, a little green feed in the shape of 2 or 3 lb. of Potatos or other esculents—a regimen abounding in silica, and the reverse of fattening, as will be seen by reference to the analysis. Compare this with the herbage of the rich alluvial fined camps of Buenos Ayres, where Trefoil and Thistle

largely predominate, while, owing to continued overstocking, the silicated narrow-leaved grasses (Gramineæ), are in minimum or where they are in quantity on the crude camps, they are in by far their greater proportion so coarse as to be unsuited for sheep. There are also many herb plants, broad-leaved, such as Flor Morado, Alfilerilla, &c., non-silicates, but fattening; and in the case of stock sheep artificially fed, Alfalfa, green or as hay, and Maize, constitute the chief food, in both of which silica is in very limited quantity.

It becomes self-evident, on a careful examination of the analysis of various food plants, and taking into consideration the quality of the soil, that the conditions present in the alluvial plains of Buenos Ayres are diametrically opposed to the production of very fine wool that would possess very high felting properties. The herbage does not furnish the wherewithal to form that indurated crust with the sharp serrations which are the essentials of felting property in high degree; also the predominance of hydrocarbon elements is not favourable to the extremely fine fibre, all nerve and crust, which attains for the Saxon and other wools their very high value for the manufacture of superfine cloths. On the other hand, the conditions of the herbage, if fair play is given by not overstocking the camps, clearly indicate length, substance, abundance, softness, and pliableness; and when the fine silicated grasses (Graminaceæ) are in full proportion to the Trefoil, &c., really good though not first-rate felting properties, but still, and above all, essentially a fine combing Merino type—the class which is, perhaps, the most rare, and, at the same time, of most general application. Also, these conditions are eminently favourable to the production of a meat making sheep, provided they are carefully bred to good form and the land not overstocked.

It can easily be conceived by those who are conversant with the science (for it is a science, and a very difficult one) of breeding, what the effect would be of introducing types of sheep that had been created under a treatment such as the Saxon and other German races of short felting wool sheep have for numerous generations been subjected on to soil and herbage such as the natural pastures of Buenos Ayres afford. The essential constituents of the bright indurated crust and intensified nerve which characterises fine, short, felting wools, could not be replaced or compensated by the hydrocarbon elements which predominate in the pastures of this country—the speciality of the race or races would necessarily be utterly lost; and slovenly breeding, absence of care, and the prevalence of skin disease (the chief features of sheep-farming in Buenos Ayres), would effectually interfere to prevent the assumption of a new type which would carry with it any good quality whatsoever. This is precisely what has taken place here through the extensive introduction of the German families of Merino, and hence the inferior value of the wool.

The question naturally arises, What is to be done under the circumstances? The answer is perfectly plain. Only by crossing the flocks with a race of Merino sheep—and Merino is the only admissible breed to yield wool of great length, strength, nerve, substance, and bold character, and to weighty square carcase of good feeding and fattening form—is there any possibility of achieving a character of product and type of sheep that will harmonise with the conditions of soil and herbage, and the wool of which will take high standing and value in its class. This may readily be comprehended on the consideration of the fact that such a type of sheep, and such a character of wool as I indicate must necessarily have been produced under a long continued regimen analogous in its relative proportions of nutritive matters and inorganic constituents to that which the natural pastures of the La Plata plains will yield, if only fair play is given them and judgment used in depasturing.

To convey more clearly to the minds of non-scientific readers the nature of the functions which silica in combination with alkalies performs, or is made to perform, in the arts as in Nature, I subjoin the following: The bright crystals of felspar rock are composed of silica and potash, and glass is composed of fused silica, potash and soda, and in the inferior qualities a little lime or chalk is added. The glossy indurated crust with which frescoes are preserved, and which gives to plaster work the gloss of polished marble, also the crust that is deposited on the surface of soft stone in buildings to save it from crumbling under atmospheric action, is composed of fused silica and potash. The bright indurated crust which coats the straw of corn plants of the order Graminaceæ, and the stems of the grasses of the same order, consists of silica, potash, soda and lime in relative proportions, according to the class of soil on which grown. The bright indurated crust of hair and wool is organised out of the same, and bears relation to the respective quantities of these constituents in the food which the animals consume—the fine short hair of the shining coats of the English blood horses results from their high breeding and high feeding on meadow hay (and grass) and Oats, or their equivalents, containing much silica, exactly in the same way that the fine short Saxon wool has been produced off feed of a similar composition.

I may add that in the process of coating or crusting stone in buildings, the preparation of silicate of potash which is used (liquid glass as it is commonly called) contains a large proportion of potash, which is one cause of its soft or semi-liquid and soluble condition, that immediately after the application of the silicate preparation a wash of muriatic acid (or sulphuric acid) is given. This combines with a certain portion of the potash (or soda, for both, or either, are used in making liquid glass), and separates it from the silica, bringing to the surface the excess of potash in the form of loose powder, as muriate or sulphate of potash (or soda), which is brushed or washed off, leaving the hard silicate deposited firmly on the stone. From this operation I infer that wool which is well coated with indurated silicate suffers less from the operation of removing the carretilla by means of sulphuric acid than wool less protected against the action of the acid on the animal tissues.

Touching the power of the grasses of the order (Graminaceæ) to dominate Thistles, &c., see a few remarks, pp. 190—195, second edition of "States of the River Plate." In Bañado ground, where neither the Trefoil nor Thistle will grow, there are different agencies at work, but this and numerous other points affecting particular localities more properly belong to a detailed consideration of the treatment of camps and the production of special herbage affected by special local geological conditions, &c. I may, however, state that Bañado herbage, also that of any low camps not perhaps coming under the denomination of Bañado, but where certain Pajas and Puma grasses (Parto puna) are present in quantity, is deficient in alkalies with an excess of hydrated silicic acid,—conditions unfavourable [illegible]

Societies.

THIS annual show—established in 1869 by Mr. Peter James Perry—was held for the second time on the 8th inst., and was remarkably well attended. The judges on this occasion were Finlay Dun, Esq., of Weston Park, and Charles Simmons, Esq., of Henley-on-Thames. We give the weights of the 1st prize roots:—

[illegible]

M.P., Wroxton Abbey: 116½ lb.

[illegible]

Wroxton: 91½ lb.

Thursby, Esq., Wormleighton House: 109½ lb. Other two lots [illegible]

Thursby, Esq., Wormleighton House: 291 lb.

[illegible]

Broughton Castle: 41 lb.

[illegible]

Tew: 42 lb.

[illegible]

Bedford.

12 White Spanish Onions (3 entries).—1st, 25s., Mr. J. Tims, Wroxton: 15½ lb.

There was one important feature in the above show, and that was, the marked improvement apparent in the quality and weight of all the productions exhibited in the various classes, which far surpassed those of 1869. Thus testifying that Mr. Perry's numerous friends accept and appreciate the good purpose for which he instituted this annual exhibition of roots.

[illegible] Mr. JOHN PITFIELD, of Symondsbury, read the following [illegible]:—

I will not pause to consider the locality from whence this beautiful and symmetrical breed was first derived, as I intend to confine my remarks to what comes under my own observation. It is probably true that at one time they were to be found only in one part of Devonshire, though now it would be absurd to imagine there are no good and pure animals out of the county whence they take their name. We have only to visit our agricultural shows to prove there are many choice herds of Devons not only in Dorsetshire but in several other distant counties. We must not, on the other hand, believe that everything that is called a Devon necessarily is one, for every little animal in a market or fair is often, if not generally, pointed out as one, because it is red and very small. That there are small Devons I do not attempt to deny, but that there are also fine weighty ones I think you will all allow. The sire does not so much depend on the breed as the management, as I hope to prove to you by-and-by. I maintain that a good Devon can be, and must be, a fine "proofy" cow, which gives a good quantity of unusually rich milk; and I maintain that the oxen which earn money, and whilst at work grow into money more certainly than any others, are Devon oxen. I do not wish to make a bare assertion; we are practical men considering a practical subject, and I will endeavour to prove my statements. If there be no truth in what I say, let me ask why buyers come, not merely once, but again and again, to obtain steer calves in this very neighbourhood? They will soon be here again for another supply, for which they are glad to give a good price; so if any gentleman doubts my assertion I refer him to these annual purchasers. I know there are many—I dare say some now present—who will allow the hardy "proofy" quality to which I have alluded, but will add that the Devons are not the dairyman's cows, and therefore I repeat that a Devon need not be a little fat red cow which gives a very little milk, nor yet a great one which gives little or no milk. I believe the reason why Devons generally are supposed to be so small and such indifferent milkers, is that the principal breeders of the pure cattle have confined their attention too much to quality and symmetry, to the neglect often of those more important points, size and milk. They breed to sell or show, and therefore cultivate only those qualities that are pleasing to the eye. There are also some parts of Devonshire where, in consequence of climate or soil, we could only expect to meet with small animals of any breed; but that can be no reason why the owner of a herd, under different circumstances, should not succeed in obtaining a different class of animal. I do not intend to say anything about show stock, wishing to speak only of Devons as they are on the farm, paying as they do a very important portion of the rent. The pocket is the judge we have to encounter, and I hope to prove that this breed is well worthy the attention of any farmers' club. Therefore I will now proceed to say a few words about the Devon bull.

Taking into consideration his important position, I think we must reverse the usual order of things, and give the gentleman the first place, for, with a choice cow, we can with the best of luck only get one good calf a-year, whereas with only one very good bull and 50 or 60 moderately good cows we may get 50 or 60 very good calves, which shows how particular we should be in the selection of a male animal; a few pounds extra being well expended in the endeavour to obtain a promising lot of young stock. My experience leads me to say, avoid a very fat bull, and especially an old one. If you trust to the former you will probably go short of calves; if to the latter you will find your stock smaller than you would wish. I would select, then, a bull not more than four years old; if a yearling he must not be worked too hard, lest his growth and natural good qualities should run the risk of being checked, or of never becoming fully developed. I am always very particular never to use a bull from a bad milker, which I consider a most important matter; however good in other respects, he would not be desirable for a dairy. Time will only allow me just to touch on the more important points. He should be of a rich colour, with a good coat and skin, a clear white nose, a full bright eye, not too short a face, crowned by a pair of nice white horns, not too heavy or coarse, wide expanse of chest, great depth of girth, and a wide straight back; the tail well set on good hindquarters, no ugly hollows behind the shoulders or slack behind the ribs. I may mention that as with bipeds so with bulls, a bad temper seems hereditary; therefore it is highly requisite to use a good-tempered animal. His proper place, for various reasons, is a stall or loose box, as then many accidents may be avoided, and a great deal more be made of him than if he ran loose with the herd, which, considering the difficulty of finding and the price we have to pay for a really good animal, is of great consequence. Though a great believer in his wonderful "proofy" qualities and good constitution, I do not expect him to thrive without proper treatment. The food I recommend is hay, with the addition of a few Beans. This I have found to answer well, whereas oilcake, I am inclined to believe, renders him to a great extent unsuitable for the purpose for which he is intended. Whilst on this part of my subject I may add that the services of a first-class bull are worth, in my opinion, at least £2 2s. The owner of such an animal honestly deserves that sum, and the money will bring good interest to the man who expends it. We are all aware that there are, or rather were, several good herds of Herefords in this county; but of late years the number is certainly decreasing, in some instances being replaced by Devons, which fact bears out my view that they are more suited to this locality; and I think I may safely venture to back my favourite breed, for dairy purposes, against the choicest herd of the other sort that you can mention. I will conclude this portion of my subject by repeating what a farmer in the neighbourhood told me only a short time since. He keeps a dairy of cross-breds, and has tried both a Hereford and Devon bull; and he assures me the latter answers his purpose much the best in every respect. So, gentlemen, with this strong evidence I will leave well alone, and proceed to speak of the Devon cow; and as many of the remarks already made on the selection of the bull will apply to the cow, I will not repeat them, except to remind you she should possess size and quality.

I insist on quality, as I find the better bred the cow the richer the milk. We all know that the quantity is no criterion of the quality, and, as the dairyman requires butter and not "sky-blue," it is evident that quality is of greater moment. As regards the colour of the cow, of course she must be red. I have no objection, however, to a little white before the udder. Some persons do not dislike a kind of yellow tinge with the red, but I am inclined to think that colour no indication of strength of constitution. I will not dwell on the points of the cow, but pass on to consider her general management. I believe about the greatest fault we commit is in the treatment of our in-calf cows and heifers. Devons will stand poor living as well

and I think better than any other breed—indeed, I have invariably found that the best bred animals keep in better condition on the same allowance than half-bred, but no in-calf beasts should be kept entirely on straw. I highly approve of good straw keep; it is healthy and necessary; but I am fully convinced that the outlay in the shape of a little cake is fully repaid to the farmer, both by the animals and the manure; and even if the dairyman himself paid half the cost he would not be the loser, as it necessarily follows that when beasts calve down poor it must take them some time to get up their own strength and condition before they can do justice to the dairyman. I like my cows to get an early bite of grass, and, therefore, though I am blessed with no water meadow, I always contrive to lay up as much pasture land as I can spare for early use. With reference to barreners, I arrange to take my own away from the dairy about October 11, and even then I find that they are very good beef. Quality tells again here. When offered for sale the superiority of good beasts is immediately shown, for we must all have remarked how quickly the best animals are disposed of for best prices at an auction. A great improvement is manifest in late years with regard to the provision of shelter for cattle; but there is room for still more. Money expended in the erection of stalls is not lost. Warmth economises food, and we must all be aware how much hay is wasted by being thrown down before cattle in the fields. Time will not admit of my going into statistics; but when I say that no dairies in this neighbourhood are let at a higher rent than my own and other good Devon herds, I hope I bring forward a strong argument to prove the statement that Devons can be, ought to be, and are, suitable and good for dairy purposes. As regards heifers, I would say that, as a rule, they ought not to calve under three years old. Though I adopt the common practice of selecting a few of the larger ones, and allowing them to calve at two years, I often find that a heifer of two years old gives more milk than when she is three years old; but at four years I frequently find that she will answer the expectation formed when she first calved. I need not say that in-calf heifers should be placed where they are well under the eye of master or man, and that they should be kept better than cows. My dairyman usually takes them as cows. Two-year-old barren Devon heifers of course will do well upon straw, and, if the straw be good, will require no artificial help. Yearlings I like to see in loose boxes, where they are to be had. I would give good hay, water, and a little corn. I find that a mixture of crushed Beans, Oats, and Flaxseed answers well, and by using it I save my roots. Young calves of course require care and attention. I generally retain almost all my calves, binding the dairyman not to sell any without my sanction, and allowing him a quarter's rent of a cow for each calf, finding the corn myself, which is generally cracked Beans, as I have discovered nothing better. When the calves are turned out I keep them well during the first year, and still continue the Beans in the proportion of about one pint to each calf. Those dropped after March I do not turn out at all during their first year, and by this treatment I find that when spring comes round they have nearly overtaken those summered out-of-doors. These, gentlemen, are about all the remarks I can offer this evening; and, in conclusion, if in 1808 it could be said that the Devons "are an important breed of animals, active at work, and [their aptitude to fatten is unrivalled," I feel quite satisfied that the statement can be repeated in 1870: and, as a proof of the truth of a great deal that I have said, I shall be very happy to show any of you my own herd, and allow you to form your own conclusions. In the meantime, if you will kindly pull my paper to pieces as much as you like, I shall be pleased, as I shall then have reason to think that some of my remarks are worthy of notice, and that the only object I had in view will be obtained, which was to create a discussion which may tend to help us to pass not merely a pleasing and convivial, but an improving evening.

Discussion.

Mr. John Pope, the chairman, said Mr. Pitfield had challenged them to prove that a mixed-bred animal would give as good butter and milk as a Devon. He (the chairman) considered there was no doubt Mr. Pitfield was wrong as regarded the quantity of milk; without question the cross-bred gave more milk than the pure Devon. A person who owned an excellent herd of Herefords would no doubt give a direct contradiction to any assertion that Mr. Pitfield had a superior dairy. He (the chairman) believed there was no dairy in the neighbourhood to surpass Mr. Trask's at Mapperton Marsh. He differed from the lecturer as to the treatment of calves, and considered the harder they were bred the harder they would be in after life, and a better cow would be produced. The same rule applied to lambs. He did not mean to say they should stop them, but by too high treatment the cows were often deformed and weakly. The best and hardest cows were those bred in the open air, and which lived without much artificial food, such as cake, corn, and Beans. He thought if they were kept upon hay and grass only, the cows would be better and more useful than those which were kept in houses and fed with corn, cake, and other things. They might not reach that perfection of symmetry which some persons aimed to produce, but they would be more hardy. They all knew that a man might be acclimatised to almost anything; and so with calves. They must approach this question from a practical and not a theoretical point of view—as farmers keeping animals for profit, and not as gentlemen amateurs who kept a few "fancy" beasts in their parks. Where they as agriculturists had to keep three or four cows, the amateur might only run one, and it was a different thing to keep beasts for profit instead of pleasure.

Mr. Trask was happy to have heard Mr. Pope's complimentary remarks respecting his dairy of Herefords. With regard to the treatment of calves, he might say he had never been in the habit of giving them corn in houses until last year, when keep was short, and even then he had difficulty in getting them to eat from the troughs. Last year he gave the later calves a little corn, just as they were about to be turned out. He believed with the chairman that the hardier calves were kept in their younger days the stronger they would be when turned out. With respect to the age at which to breed from heifers, it had been his practice to commence at two years old; and he found as a rule the calves were larger than when the heifer did not begin till the third year. Every year told upon a cow: and he thought it advantageous to commence breeding as early as possible. He understood Mr. Pitfield to say, that after a person once bought Devon calves they would not care to have anything else; but he (Mr. Trask) had had people come to his farm and refuse to purchase any except they had a white face.

Mr. A. J. Pitfield could not quiet agree with Mr. Trask as to keeping calves too hard. He liked to keep them in growing condition and in good order; but he differed from the lecturer as to housing calves. It made them tender, and, although they looked well in the warm summer weather, they required to go into the box again directly the cold was felt, and oftentimes the result was that the farmer had a number of slipped calves. He advocated that they should have a shed into which they could go at will, and that they should be kept in growing condition. He considered that the great point in which farmers were at fault was the selection of the bull from which to breed. It was a singular fact, and no doubt Mr. Warren and other Devon and Hereford breeders would confirm the remark, that heifers would invariably take after the sire, and the steers or bulls would take after the dam. The same remark applied to sheep—a good chilver always resulted from a good sire.

Mr. Davy agreed with every remark that had fallen from Mr. Trask relative to the Hereford breed of cattle, and none of the arguments which Mr. Pitfield had brought forward would induce him to depart from his favourite breed. The Herefords would live in any locality; they were hardy, and produced good milk and butter, and his dairyman would say none could surpass them. Their value, of course, depended very much upon the management of the owners. For his own part he generally reared a few more calves than he required for the dairy, and from these he selected the best milkers, so that if any heifer did not produce sufficient good milk he had her turned out. As regarded the sire, they should be particular in the selection of a good animal from a well-known superior cow. He had lately taken a trip in Herefordshire, and had selected a bull from an 80-cow dairy: this he intended to breed from for dairy purposes. He was of opinion that they could not, as a rule, obtain the greatest quantity of milk from the most fleshy beast. He had a half-sister to the steer which won 1st prize in the Hereford class at the Christmas show in London, and if any gentleman present was to see her he would say she was not worth £10, but she was a splendid animal, and had reared two admirable calves. He had 31 cows in his dairy, and could safely say that not one of them had ever tasted cornet, cake, or artificial food of any kind; they were fed entirely on hay and grass, and very often they could be grazed to over 50 score in weight. The Herefords could be grazed to great weight, at little expense, which was, of course, an advantage to the farmer. Mr. Pitfield had the advantage of him at the last Melplaish show, but he did not think that gentleman could say his beasts were fed only on hay and grass.

Mr. J. Pitfield.—They had nothing more whatever.

Mr. Davy.—But what was their condition when heifers?

Mr. J. Pitfield replied that his yearlings kept indoors thrived on half the amount of corn that others did.

Mr. Davy said his heifers were fed on hay only, and he could raise them well and make a good price for them. But he repeated that Mr. Pitfield had the advantage of him at the Melplaish show, and as he had heard that that gentleman intended to retire from competition this year he hoped he would reconsider his determination and allow him (Mr. Davy) to have yet another "shie" at him, at all events.

Mr. J. Pitfield said what he had intended to do at the next Melplaish show was to exhibit extra stock in all classes for which prizes were offered by the society. He was going to do this for the purpose of just "comparing notes." But as it was Mr. Davy's particular wish to compete with him, he would afford him the opportunity.

HADDINGTON

The Wheat Crop and Insect Ravages.—Mr. Douglas, of Athelstaneford, presiding, said the subject was a very important one to farmers, as it entered largely into the margin of profits. There had been considerable ravages in the Wheat crop this season caused by the presence in the ears of the plant of a little grub, the presence of which was plainly the effect of the kind of weather which they had had. He believed that the pickling of the Wheat was generally observed in that county, and where it was so he thought it had the effect of preventing the ravages of insects, and of blights generally. He thought it was usually admitted that the critical stage in the growth of Wheat was when it was first coming into bloom; and if they had anything like violent winds before the bloom was reasonably developed, it tended to injure the crop. It had also been remarked by many practical men that a murky sort of weather had a very injurious effect upon the formation of the ears. He had no doubt that good fair weather, with a sufficient supply of sunshine, had a very beneficent influence on the success of the Wheat growing. Wheat was a plant which could stand more drought than any other of the serials, as it struck its roots very deep into the soil, and adapted itself very much to the season, and therefore was not so dependent upon the rainfalls as were other of the serial crops. For the last three seasons they had not had very good Wheat crops in comparison with former years, but, even in the very dry season, in East Lothian the crop had been as good generally as in past years. This year, in fact, had been good in comparison. I have read that this year the Wheat crop over the country was below the average. In the county they had had several fine crops, but he believed that this year's would not compare with the Wheat crop of last year.

Mr. Scot Skirving held that there was no doubt that in this very dry season they had been more subject to blights and insects in the crops than they had been for a long time past. They had heard a great deal lately of scientific agriculture, but he thought that it might be better if they were to study a little natural history, as it would be a very great step towards devising a remedy if they could only get to know what the evil really was. It was well known that the flies devoured the Wheat, and he thought they should encourage the insectivorous birds, who were their natural enemies. There were some blanks in the Wheat crop this year, owing, he supposed, to the ravages of an insect which had settled in the Wheat. It was a very minute insect, about the twelfth of an inch long—all white, except in the head, which was black. It did not attack the root of the Wheat, nor indeed all the stems, but it got into one or two stems only and left the rest. He did not know its natural history, but it was not so dangerous as the grub. There were two ways in which the grub might be encountered. The one was by ploughing and exposing it to the atmosphere, and the other by leaving it to its natural enemies in the air.

Mr. Hope, of Fentonbarns, thought that this year's crops in Wheat were full average crops, though there was no doubt there had been considerable ravages by insects. He recommended double ploughing for counteracting these insect ravages. In the years from 1827 to 1831 the average produce of the Wheat crops was only 18 bushels per acre—that was after Beans.

Mr. Durie, of Barneymains, recommended late sowing for the prevention of blights, and did not believe in the efficacy of "pickling" for preventing "ball." If they would now sow one-half of a sample "pickled," and put a pinch of snuff on the other, he would back the snuff. He thought that the best preventive was dry sowing.

Several gentlemen made some further remarks, in which dissent from Mr. Durie's opinion in regard to "pickling" was expressed; after which

The Chairman closed the discussion, giving it as his opinion that the existence of insects and blights was no doubt owing to the ill-regulation of the seasons; and that if a well-regulated succession of the seasons could be secured, their work would be easy; and the best way to secure good crops was to work the land well, and open it up by good ploughing and harrowing to its full capacity of giving proper food to the plants. [These proceedings are commented on in another page by our correspondent, Mr. Shirreff, of Haddington.]

THE AGRICULTURAL SHOW AT SIDNEY.

August 30.—It is held in Prince Alfred's Park, where a splendid pavilion has been erected by the Corporation for the use of the Society from year to year, at a cost of £23,000, this being filled mainly with what is non-agricultural. The park, which consists of 19 acres, is thickly strewn with sheds for horses and cattle, for sheep and pigs, all being strikingly pretty and impervious to the rain. The arrangements in this respect very much excel those of the "Royal" at home. Altogether these sheds cover about 3 acres of ground, the agricultural implements being abroad—that is to say, not under shelter. The stewards of the non-agricultural sections got to work about ten days before the opening, and immediately after a dinner given by Mr. John Young, the contractor, to his workpeople, their wives and families, and a host of other people, including the notabilities of the land. This gathering of about 5000 souls tested the stability of the building, and proved its aptitude as a dancing hall, the presence of Lord and Lady Belmore being agreed upon as the sign for the formation of quadrille parties. The live stock were admitted to the ground between Saturday, the 27th, till 10 o'clock A.M. on Monday, the 29th, the judges commencing their labours at 11 o'clock on the latter day. The horse-boxes are arranged round a circus 120 yards in diameter, and the cattle stalls round one of similar dimensions. The judging was not exactly private, nor was it public, but it was conducted with great care and despatch, and I may say that I never say a finer lot of animals in any show in England. Money has been freely expended in the purchase of pedigree animals by our breeders—the best studs, herds, and flocks in the old country are here fully represented, and young stock of remarkable quality are rising up and selling well. The common price for a yearling bull that can show a good strain is about £100, and blood is rising in estimation. Some

of your readers will be glad to know the prices made at the sale which concluded the first week of the exhibition. Mr. W. J. Dangar, for instance, sold seven of his Shorthorn exhibits, principally yearlings and 2-year-olds, which averaged £83 10s. A 3-year-old bull, GARIBALDI, was sold for 350 gs.; GRENDON OXFORD for 245 gs.; DAISY DUKE, a 2-year-old, for 200 gs. Out of eleven yearlings offered for sale six went far above 100 gs., and out of eleven calves sold none made less than £50.

In consequence of the interference of rain the judging was not completed on Monday, but when the park was thrown open to the public on Tuesday, the 5s. visitors, in sauntering about in search of specimens of equine and bovine beauty, found the prize tickets attached to nearly all the stalls. The parade of the horses and cattle in their respective rings formed an attractive feature of the show morning and afternoon. The horses were 138 in number, the cattle 229. Of sheep there were but 30 pens, in consequence of the existence of the Scab Act, which subjects to quarantine process all sheep that visit the port with the view of returning. Of pigs there were 26 pens; of poultry, 313 entries; and of dogs there were 211. The principal breeders of Shorthorns and the principal prize-takers were Messrs. W. J. Dangar, A. A. Dangar, R. L. Jenkins, Walter Lamb, Mrs. Clark Irving, Messrs. Barns, Smith & Co., J. W. Chisholm, Thomas Lee, and W. & C. Durham.

The chief competitors and prize winners in Hereford classes were Messrs. J. Nowlan, G. H. Cox, Sloper Cox, G. Loder, J. White, Barns, Smith & Co., Charles Reynolds. Lord Belmore's prize for the best male animal in the yard went to Mr. R. L. Jenkins' bull THEODORE, an imported animal, two and a half years old, sire HEIR OF YORK—and nearly perfect. His lordship's prize for the best female went to Mr. Loder, who exhibited a nameless yearling Hereford of singular promise. The principal exhibitors of blood horse stock were Messrs. A. Town, R. Bowman, A. A. Dangar, Sir W. Macarthur, E. K. Cox, A. Cobcroft. The agricultural machinery not yet removed is almost wholly from Melbourne. Not one of our own makers seems to have dared to put in an appearance, which is not a circumstance most favourable for the interests of those English makers whose agents they also are. The ploughs and some other field implements were tried, and all other things that were competing and could be tried in the park were tried. Reapers and mowers could have no trial, there being no crops to be cut. A large shed was erected for machinery in motion and was filled with specimens of gold washing, quartz crushing, and pumping and sheep washing apparatus, all very interesting.

The day of the opening was very fine, and the attendance was large and fashionable. The opening day and the day following were proclaimed public holidays; comparatively few of the population availed themselves of the privilege of paying 5s. on the first day, and a large section of the remainder spent their leisure looking at what was going on from the outside, the fence not being very high. The second holiday was a shilling day, and gave 30,000 visitors. The Thursday was a half-crown day, and gave us 10,000; and the remainder were shilling days. The affair is now shorn of a large share of its interest, the live stock having gone, but still there is much to see in the non-agricultural sections, which are thrown open in the evening as well as the day.

Notices of Books.

Land for the Million to Rent: *addressed to the Working Classes of England.* W. Macintosh, 24, Paternoster Row, E.C.

This little tract is an energetic, not to say enthusiastic, advocacy of the allotment system for mechanics and town labourers. Landowners near towns should let out land, even at £6 to £8 per acre, in quarter acre or half acre plots, and these should be taken by the labouring classes living in the streets. They can carry in a wheelbarrow home-made manure enough to the land for the maintenance of its fertility. They must manure the plant rather than the land—they must manure every crop—they must apply the manure to every plant. Let them not be alarmed. They may in this way get three good crops every year out of the ground, and the 4 tons of manure which they will annually provide from their own resources, together with deep digging, shall keep the land in better condition than that in which the large occupier of land can keep it by the ordinary mode of manuring. They must read the tract "Manure for the Million," as to the method in which the manure is to be provided; and for the cultivation of this plot, with the aid of this manure, the following instructions are given in these pages. The mode of cultivation and cropping is given for one acre, but will apply equally, or still better, to any smaller area.

"Well, he enters on his tenancy in September. Let him at once dig as deep as he well can strips or patches throughout the acre, 12 inches in width, and let them lie 4 feet apart, that is, 4 feet from inner edge to inner edge. If we consider the acre to be an exact oblong (220 yards by 22 yards) this would give 132 of such patches, each 66 feet in length. Now, these as soon as ready (and it will not take a long time to dig the fifth of an acre), should be planted with Cabbage plants, which may commonly be had at this season for 2s. 6d. or 2s. per 1000. In following years these may be raised from seed. These plants should stand 2 feet apart in the row, one row being 1 foot lower than the other, so as to give more room for each plant. Into each hole before the plant is set there should be thrown an ounce of dry-earth manure.

"As soon as the tenancy has commenced, there should be sown on a perch or more of the land 1 peck or 1½ peck of the best seed Wheat, and when Cabbages are planted, then midway between the strips or patches dig 132 more, only making these 2 feet wide. Into these, in open weather during the months of December, January, or February, the Wheat sown in September is to be transplanted. It should be done thus:—A woman and child, or two children, should stand on each side of the patch, and as each space of 1 foot is dug, the one furnished with a basket of earth-manure should, with a small shovel holding a ½ lb. weight, throw it into the trench, while the other, furnished with a basket of Wheat plants, should lay five of these plants along the trench, just 6 inches apart. The manure required for this would be about 1 ton.

"Then, as soon as these Wheat plants are in the ground and well rooted (that is about the middle of February), let the 12 inches remaining between the Cabbages and the Wheat be well worked with the German hoe, which may be struck 6 or 7 inches into the ground. This tool is not so well known in this country as it ought to be. The blade should, for stiff land, be 8 inches long, 2 inches wide, 1 inch in thickness at the eye into which the handle (strong as that of a good pickaxe) is inserted, and tapering to a rather sharp edge. The handle is in general 4 feet in length, with something of a crook at the end. The effect of this hoeing, both on the Cabbages and the Wheat (especially from the depth to which the tool may be made to descend), is very beneficial.

"Now the Cabbages may be expected to be fit to cut long before the Wheat is high enough to injure them. But some time before this I should recommend that, having slightly hoed the ground between the Cabbages, there should be placed midway between each of the two rows of Cabbages, at intervals of 2 feet, really good Potatos—the earlier kind the better. Each Potato should have 4 oz. of dry-earth manure placed beneath, and it should at once be covered 6 or 8 inches deep with earth carefully drawn with a hoe from between the Wheat and the Cabbages. Then, when the stalk or stalks have grown to a sufficient length, instead of earthing-up, fasten them down with a forked stick. They will soon strike and produce Potatos. I have seen 30 good-sized Ashleaf Kidney Potatos thus produced from two Potatos planted 3 feet apart.

"After this hoeing, and about the time when the Wheat is in blossom, there should be scattered over the space between the Potatos and the Wheat, and also amongst the Wheat, the seed of the stubble Turnip. The plants will not be hurt by the gathering of the Wheat, and the crop may be very good."

The author further discusses what may be done with the produce, and the upshot is, that the labourer living up till 60 years of age, and maintaining himself by the wages of his ordinary employment, materially supplemented by his garden plot, cultivated during his own odd hours, and by the help of his children, may then be able to retire from the ordinary work of his life, take 4 or 5 acres of land in the country, and get out of it a comfortable support for his old age, while paying for the land and a good cottage £20 or £25, in some cases even £30 or £40.

This is a picture drawn by a benevolent man, who has long laboured in the service of the poor. We used the word "enthusiastic" in the outset of this notice; it is not a bad word, nor does it necessarily signify a distorting or misleading, or even a useless tendency. The writer of these pages will never make his town labourers tenant-farmers in their latter days; but if he shall induce any considerable number living in towns or villages, by the aid of the neighbouring landowners, to give their now wasted fragments of time to garden work, he will have done them and their families an inestimable benefit. The allotment system, properly conducted, is the means of moral as well as of intellectual improvement; and we very much sympathise with the concluding passage in this tract by the Rev. Henry Moule, vicar of Fordington, Dorchester:—

"With respect either to the dwellings, the employment, or the education of the working classes,* let them [owners of land] not content themselves with the reports of inspectors; let them look themselves into these things; let them observe the thousands of families of those classes who, in towns no larger than this town of Dorchester, are compelled to live either in lodgings, perhaps, or in cottages without a foot of garden ground, with one or more houses close at hand licensed to tempt them to waste their time, to squander their earnings, and to hurry themselves and their families to ruin and to sin. Let them weigh well that which throughout this address I have desired to keep before you—that a larger share in the tenancy of the land around such a town would greatly remedy these evils; and then let them boldly and honestly put to their conscience this question—Are not the following passages of the Word of God as closely applicable to the use of land under such circumstances as to anything else?

"'Whoso hath this world's good, and seeth his brother have need—(such need as I have pointed to)—and shutteth up his bowels of compassion from him, how dwelleth the love of God in him?' (1 John iii. 17.)

"'To him that knoweth (how he ought) to do good, and doeth it not, to him it is sin.'" (James iv. 17.)

* We have in the county of Dorset some noble instances of the care taken by landowners to provide the working-classes on their estates with good cottages and gardens

Farm Memoranda.

BLOUNT'S FARM, SAWBRIDGEWORTH.—[The following report on this farm, to which we have referred during the past two weeks, has since appeared in the *Times*.]

We have to relate a nine years' experience of heavy land husbandry, which is in many ways so extraordinary as to merit a more than usual degree of public attention. In the autumn of 1861 Mr. John Prout, a gentleman practically conversant with farming in Cornwall and in Canada, purchased two farms near Sawbridgeworth, in Hertfordshire, comprising 450 acres of clay and strong loam upon a subsoil of drift clay and cretaceous gravel. The land was undrained, except in parts by shallow thorn drains; it had a staple soil 5 inches deep, having been for years ploughed at that depth by 3-horse teams; it was foul with root weeds, and in a very low condition of fertility. The cost price, including every expense connected with the purchase, amounted to £35 per acre. Drainage with pipe tiles, laid 3½ feet deep, and at intervals of 10 or 11 yards, was the fundamental process in the improvement; but as the cost and remunerative character of such an operation are thoroughly understood, it is not necessary to enter into the details of the work. The expense of providing new outfalls may, however, be mentioned. Cutting 130 chains length of new straight open ditches, filling up the old wandering watercourses, and levelling in a few moats, ponds, and waste places, cost £156; but as the area of ground to the extent of 2½ acres was thus acquired, adding so much to the estate at the price of £35 per acre, the outlay really incurred in providing these improved drainage outfalls was only £68. The two holdings in one ring fence numbered no fewer than 51 enclosures, averaging not quite 9 acres each; and what with meandering watercourses, straggling fences, brushwood, pollard trees, and other inferior timber, these antique boundaries were wasteful of ground, harbourers of weeds, birds, and vermin, obstructive of economical tillage operations, and very expensive to keep in repair. In the first four years Mr. Prout grubbed up nearly 6½ miles length of bushy hedgerow, and filled in the ditches alongside, the outlay being £155. And as the abolished fences had averaged 7 yards in breadth—measuring between the outside furrows made by the plough—the estate gained 16 acres of cultivable land, worth, at the same price as the whole, no less than £560. The hedge roots were given to the labourers, the brushwood was either buried in drains or used for burning; but the 920 trees, consisting of pollards and trees of little value, came in for gates, gate-posts, and other stuff, valued at about £42. The total cost of the clearance was thus £311 in four years; the immediate return was 18½ acres of land at £35, or £647 10s., making, together with the wood, £689 10s. What the perpetual yearly gain in cheaper tillage operations, cleaner fields, and better crops may amount to is a matter for conjecture, but it must be very considerable. By exchanges of plots with the neighbouring owners the outside boundaries were made rectilinear, and the farm was divided into seven spacious fields of a generally quadrilateral figure. A main centre road of gravel was made, together with four straight grass roads of 10 feet breadth (formed by simple ploughing and rolling, and partially coated with small stones picked off the land), and from these roads or headland paths Mr. Prout's steam-ploughing engine cultivates every field, water for the engine being supplied from wells sunk at convenient points along the roads. The outlay for this great facility of transport, and for the means of keeping the heavy engine off the land, was very little; considering that, for 62 chains length of new grass road laid down, 74 chains length of old road were ploughed up and added to the arable surface. The work of reclamation was completed in four years; at the end of which period the farm had been brought into the cleanly condition of a well-kept garden, and the whole had been ploughed and subsoiled 14 to 16 inches deep. At what expenditure of capital was this mechanical result effected? It is remarkable that the steam and horse power together cost no more than the horse labour which would have been necessary to carry on the whole system of management with a 5-inch deep staple. Thus, the maintenance of the ten horses which Mr. Prout employed may be put down at £30 per horse, or £300 a-year. The outlay for the steam work, as calculated in Mr. John Algernon Clarke's report in 1865, was also about £300 a-year, including allowance for wear and tear, depreciation in value, and interest upon the prime cost of the machinery. This total cost of the horse and steam-draught power, namely, £600 a-year, is just the sum that would have maintained a force of 20 horses, at £30 per horse, as required for the 450 acres arable under the old shallow-ploughing system without steam. The manual labour bill was a more serious matter, amounting to about £3800 in the four years, or an average of £2 2s. per acre per annum. But as this included all the work connected with tile-draining the whole of the land (which expensive improvement will not need repetition), we have here no very formidable excess over and above a scale of labour expenditure which is common in high farming.

Now, let us inquire what Mr. Prout had gained by this re-modelling and clearing his farm, by drying and aerating his subsoil, and trebling the cultivated depth of his staple. If we said that, in place of a farm worth 27*s.* per acre (which was the former rent) he was now in possession of a farm worth a rental of 40*s.* per acre, we should not be overstating the profit which permanently accrued to him for his four years' moderate outlay in improvements. As actual evidence of the high degree of productiveness developed in the soil by the deep steam tillage, we have the extraordinary system of farming which has been, and is still being, pursued upon it.

In 1864, the third year of Mr. Prout's occupation, the Wheat, Barley, and Oat crops off 250 acres were sold by auction, as they stood upon the land, the purchasers taking away both corn and straw. Most part of the roots on 30 acres were also disposed of at the same time, together with about 300 tons of straw, the produce of about half that number of acres in the preceding year, 1863. When the Committee of the Royal Agricultural Society visited the farm in the autumn of 1866 they found that the whole of the land had been under crop that year, including 223 acres of Wheat, 124 acres of Barley, 60 acres of Oats, 33 acres of Tare and Sainfoin hay, and 4 acres of roots, and all had been sold just before harvest, the purchaser reaping, carting, threshing, and carrying away both grain and straw. The same exhausting practice has been continued every year since that time, so that all the corn, all the straw, and all the hay (with small reservations toward feeding the few farm horses kept) have been sold off the land in 1867, 1868, 1869, and 1870, and in the present year every acre has borne produce. The peculiarity of the business is that this successive corn farming is conducted without any live stock. In 1863 Mr. Prout fattened 58 oxen; in 1864 he kept only a single cow; in 1865 he fed 14 bullocks; and they were the last that have been on the land or in the premises. In 1868 a few pigs were fattened, but since then the only animals kept have been one milch cow and six working horses. Mr. Prout has no pigs, and has never had a sheep on the farm during the whole of his nine years' occupation. Thus it has not been by a plentiful consumption of sheep and cattle food that the fertility of the soil has been kept up; and the Committee of the Royal Agricultural Society reported in 1866 that "the course here pursued is exceptional, and must soon come to an end. Manure will soon be needed. When this time comes Mr. Prout is prepared to maintain a flock of sheep, to grow plenty of roots for them, and to feed the roots off upon the land, heavy as it is." But upon visiting the place a few days ago, after Mr. Prout has had four years' longer experience of his land, we find all thought of the sheepfold or the yard of cattle, or even of purchasing stable manure from London in return for the straw sold off, to be as remote as ever. Mr. Prout raises crops from every acre of his farm solely by virtue of deep steam culture and the application of artificial manures. His plan is to give a dressing of about 5*cwt.* worth of bone dust and superphosphate per acre for every crop, a portion of the mixture being guano, when one white straw crop follows another. Look now at Mr. Prout's position. His crops just before harvest in the present year, comprising 208 acres of Wheat, 57 acres of Barley, 102 acres of Beans, and the hay of 55 acres of Sainfoin twice mown, were sold on the ground for £5330, the Wheat averaging £15 per acre, the Barley £10 per acre, and the Beans £8 17*s.* per acre; and, though in some cases the judgment of the buyers may have been at fault, the fact that many of the purchasers have bought cropping on the farm year after year, shows that the prices realised at the auctions cannot be generally in excess of the true market value. The produce of the year 1870 has made £5330. What is the expenditure? So little manual labour is involved in pursuing the corn husbandry of this farm that the labour account, including the wages of the steam-plough men, and also £50 worth of work upon permanent improvements, comes to only £520 for the year. Six horses (there will be only four in future), for which food is partly purchased and partly deducted from the saleable produce of the farm, may be put at £180 a year. So astonishing has been the saving in tillage operations, consequent upon the cleanliness, the depth, and the improved texture of the soil, that the only steam work required for the year has been 530 acres of ploughing and scarifying, all executed in the two months between harvest and the middle of October, and the cost of coal for the 14-horse power Fowler engine has amounted to not more than £42. We may add £5 for oil, &c. Then the item of wear and tear on the engine and machinery has averaged for the nine years £77 per year, including a new firebox only just put in, renewals of wire rope, shares, and all wearing parts, and some rather expensive substitutions of improved mechanism at various times, for Mr. Prout's apparatus was procured before many important improvements had been introduced. The number of days' work per year being only about half what it was in the earlier part of Mr. Prout's undertaking, it is not fair to saddle an average cost of wear and tear upon the year 1870, but for the sake of being within the mark in our statements we will do so. The engine and machinery at the present time appear little the worse for their nine years of service; but we must set down for depreciation in value, say 5 per cent. upon the prime cost of £1065, or £53, and we must add interest upon capital, also at 5 per cent., or £53 more. The cost of steam, horse, and manual labour, then, amounts to £930. Add for seed, say £250, and for artificial manures about 50*s.* per acre, or £1150, and the main working expenses of the farm amount to £2330. We may allow £2 per acre for rent, and 10*s.* per acre besides for rates, taxes, and other outgoings, making together £1120, and we have a total yearly outlay of £3450, procuring a return of £5330, and leaving £1880 as tenant's profit. A rare season for corn farming must be credited with much of this grand result; but the deficient harvest of 1869 yielded a produce which sold for £3742, although 55 acres were that year in fallow; and in the good year 1868 the auction of grain, straw, and hay realised £4726. So that the average annual return for 1868, 1869, and 1870 has been £4600; and at the present rate of expenditure—namely, £3450, the tenant's yearly profit has averaged £1150.

Of course, the mere impossibility of finding a market for an unlimited quantity of straw must prevent such an export system of agriculture from becoming general; but if the straw were converted into manure and returned to the soil in the usual order of husbandry, the purchased fertilisers would not be required. Mr. Prout's experience, however, proves what a wealth of fertility is latent in the depths of a strong subsoil; and there are thousands of farms in England needing only the same thorough cultivation and liberal manuring to yield a similar enormous profit.

Carse of Gowrie.—[A writer, whose signature was well known to agricultural readers a quarter of a century ago, thus describes this celebrated Scottish corn-growing district in the *North British Agriculturist.*]

The feeding byres throughout the Carse being just in the way of filling up, I shall in the meantime postpone my observations on them, and proceed with my description of the farming pursued on the two properties adjoining to Lord Kinnaird's. These are Inchmartin and Ballendeen. The proprietor of this latter property is Captain Trotter, who resides in Ballendeen House—a mansion of great beauty and neatness. It is in close proximity to the Braes of the Carse, in a line with Rossie Priory, and nestling among woods and wilds of transcendant beauty. The principal farm on the estate is Easter Ballendeen. Mr. Comrie has adopted a high class of farming, and carries it out with vigour, energy, and effect. He occasionally gets the use of Lord Kinnaird's steam-plough about this season of the year, and turns over a field or two, which are left untouched until spring. One was thus done last year, and the crop was unquestionably greatly improved. We have noticed the Turnip crop on this farm this year to be very good, and some of the bulbs to be of immense size. The soil for the greater part is a very stiff clay, and in some seasons requires very great labour before the seed can be committed to it.

Wester Ballendeen is much the same, and is occupied by a tenant of great intelligence, and one who has farmed it for a long time with great satisfaction. This farm, extending higher on the Braes, has more of black land, and, of course, much more easily wrought. There is a third farm on the Braes, equally well wrought as those mentioned. Here we have the fields enclosed with hedges, as well as on the farm of Southfield, which brings us into the higher altitudes of the Braes of the Carse, where the culture takes another shape, and where Oats and Barley are of more importance. The remainder of this highland district is in the occupancy of the lairds of Pitkendy, Lockton, and Whitehills, which extend as far back as the most northern parallel of the Tedlow hills, which divide the Carse from the plain of Strathmore. Mr. Playfair, of Whitehills, has but recently taken possession. His property is much improved by plantations, and the fields are inclosed in the majority of cases by these hedges. Inchmartin is one of the finest properties in all the Carse, the annual rental being about £5000 or £6000. The property has been for a long time in the Allen family, and the late Colonel Allen, father of the present proprietor, had greatly distinguished himself in the wars against the first Napoleon.

It is these proprietors, when they take to farming, furnished with abundance of capital, and determined to lay it out according to their fancy, that make real and permanent improvements. The farm was therefore thoroughly drained; the "pows," which in the Carse are deep, wide ditches, deepened, and abundant supplies of lime manure supplied. Mr. Allen did not live to attain his majority, and the farm was let and handed over to the present occupant at a valuation, who undoubtedly will call forth all his energies in order to maintain his character and reputation. The crack farm on this estate is Middlebank, on which there are 11 or 12 pairs of horses. There is also a steam-engine for driving the threshing mill, a splendid and convenient steading, with a large and capacious house, quite in keeping with the farm. There is also a bothy, in which a number of young lads reside; and there is also kept an evening class for the use of the ploughmen, and at the expense of my Lord Kinnaird, albeit not one of his own men attend it.

The soil of the farm is the very best—that to the south of the turnpike being an excellent clay, whilst the point to the north is mostly black land. The farmer here has made an innovation which promises to be very successful, and is already imitated by many of the Carse farmers. We allude to the excellent plan adopted by Mr. Anderson of allowing so many of his fields to lie for two years under pasture. We believe these fields are enclosed with palings, and advertised and let to grazers for summer use, a plan which pays very well, and which is found to be very beneficial to the soil. It is no doubt attended with a little expense for the railings, and some trouble is entailed on carrying water to the beastials in seasons such as that now passed. We have traversed the Carse east and west, north and south, as well as diagonally, and are forced to say that this is a paragon of a farm. It is refreshing for a farmer at the present day, when travelling along the public road, to see such magnificent Turnips. Just now, a little below the road, and near West-town, are white Turnips, the like of which for size we have not seen for 10 years. The stackyards are full of corn, and we believe the Potato crop is equally promising. We believe the secret of Mr. Anderson's success to be in keeping on his farm trustworthy men as servants. The present foreman or grieve has been on all along, we have been told, and is a most excellent and intelligent man, knowing thoroughly his work, clearly understanding his situation; and having all the means and appliances to boot to carry out his system, he does it, and does it completely.

The implements of husbandry employed on this farm are always of the first class, and of the best possible order. Every new and improved article is at once procured. Contiguous to this farm is that of Charleston, much smaller, and the soil much inferior, but farmed and manipulated with consummate skill. The clay is very stiff, requiring much exposure for pulverising it. It is also very expensive for manures; but the managers do not grudge this, and they reap their reward in extra heavy crops. On this farm the fallow Wheat was reported as being superior to any in the Carse. The farm of Westmill ranks second to Middlebank, and for exposure, land, and other conveniences, is not inferior to any in the district. Lying at the foot of the Braes, it is somewhat low, and has no great fall to carry off the water by a system of draining. The leading drains, however, are being deepened, and an improved system is likely to be adopted by the tenant who has entered at Whitsunday, and has commenced various improvements in a spirited manner. There is water-power on this farm for threshing—the steading very superior, but roofed with reeds, and, what we should consider an inconvenience, encroaching too much on the road. It is a notorious fact, along the whole of this distant road all the farmhouses and steadings are similarly situated. The remainder of this valuable property is occupied by one or two excellent farms on the Braes, and cultivated with great success. There is none of the land allowed to lie in pasture, and the fields more enclosed than they used to be. There is a considerable range of hills under wood, in which all sorts of game, capercailzies, grouse, roebuck, hares, and rabbits abound, but are not overstocked. The lower parts furnish partridges and pheasants in plenty. From what we could make out, the proprietor himself has not been trained as a farmer. He has been fortunate in procuring a good factor, and there are great hopes of his turning out an excellent and liberal landlord.

One who has Whistled at the Plough.

Miscellaneous.

How to Manage a Parish.—The Rev. W. M. Sherwood, rector of Broughton Hackett, near Worcester, has embodied in a letter to the Women and Children's Employment Commission the result of 33 years' experience in the management of a country parish. When Mr. Sherwood came into the neighbourhood his parishioners were constantly begging, and used to make a parade of their poverty. They were criminal also. "During the first three years, at each recurring quarter sessions and assizes, there were some of my parishioners for trial. My congregations were small, there was no respect paid to the clergyman, nor did the people appear to respect themselves. The only schools were small dame schools, where little was taught at a charge of 6*d.* weekly, but a few big boys went to a school four miles off." Now for the present state of things:—"At the present time, I believe, there is not a single poacher, and I can call to memory only one prosecution for crime within a dozen years; we have few of the miserable begging class, my congregations are doubled, every respect is paid to the clergyman, and often respect of the most delicate and gratifying character. We have a school for boys and girls within a reasonable distance, at a low charge. The population is rather less, though the houses have increased about nine per cent., and there seems to be rising up a feeling against female labour out-of-doors, except at haymaking, harvest, and fruit-picking seasons. The number of illegitimate children has diminished considerably, and the people most decidedly value very highly the opportunity of educating their children. As an instance of this I heard of a man taking his two boys from work at 2*s.* 6*d.* each weekly, in order to send them to school, thereby resigning at least one

quarter of his income." Mr. Sherwood adds :—"The squire is a Roman Catholic. His charities seldom pass through my hands. There is no co-operation, and therefore it cannot be said that I work under favourable circumstances." In succeeding paragraphs Mr. Sherwood explains how it is that he has succeeded as he has :—"I will tell you now my system. I have explained to the people in and out of the pulpit that every man, however poor, is entitled to respect in his own house from the highest in the land. That as I would not allow a duke to interfere in my affairs, so I have no right to interfere in the affairs of the labourer. If his Grace were to presume to meddle in my house, I must either resent his interference, or plead my comparative poverty and ask help. The labourer chooses the latter course, and becomes a beggar. If he comes to me begging, I then am at liberty to ask questions, and I do ask ; but if he wants wine or other things medicinally, which are, of course, beyond his reach, I do not ask questions except as a doctor does ; I say, 'I give as one friend to another, after the same fashion as the squire gives me a brace of birds.' Money I seldom give, but when I see it is really needed I prefer giving the larger sum once to the smaller sum twice, because I wound the man's pride less. I also give secretly, and discourage too many thanks. So far from treating them as children I always treat them as if they possessed more judgment than in my own mind I give them credit for, trying to the utmost not to wound their feelings. It used to be the custom for clergymen to look up non-churchgoers and those who neglected school. I have avoided this, aiming at making them feel that church and school are for them to use if they value them, and that I am aware that they are not generally so stupid as not to value them ; that in fact they know their own interests. It so happens that between 1863 and 1867 I left my parishes in charge of a curate, and I took charge, during that period, of parishes in Leicestershire, Warwickshire, Herefordshire, Shropshire, and Surrey, and I did not find any better church attendence, school attendance, or better morals, greater cleanliness, more independence, *i.e.*, self-dependence, or anything to make me feel otherwise than proud of my own labouring parishioners. I attribute much of my success to the fact that I have no rich people to give alms, nor any fund whatsoever to draw on except a small amount of sacramental arms, and the trifle which I, who am not rich, can afford. I come to the conclusion that to check female labour in the fields, to prevent pauperism, to encourage education, to promote cleanliness, honesty, and general good conduct, we must not meddle too much, but must encourage self-respect and pride, and show respect ourselves towards the cottagers. I deprecate most earnestly any attempt to force education or to check female labour by legislation. I am convinced, by long experience and much thought, that almsgiving largely is most mischievous, especially when given by trustees, whether of endowed charities or of funds collected from living donors, the said trustees not distributing their own money, but what belongs to other people. I believe most firmly that the four millions annually given in London is one great cause of London pauperism. From these observations you will rightly conclude that I consider the cottages generally a disgrace to the owners, and a great cause of the evils we would remove. A family cannot respect itself if it is forced to live like pigs. You may be assured that the agricultural mind is not nearly so dull as is usually supposed, but it is decidedly slow of utterance ; it feels the difficulty of expression, just as an uneducated man, however intelligent, would feel the difficulty of writing down in clear language matters which he may thoroughly understand. The reports of inspectors on this head I consider contemptibly worthless." *Pall Mall Gazette.*

A Contrast betwixt 1776 and 1870. — Dr. Franklin described the farmer's condition, in 1776, as follows :—

> "Farmer at the plow,
> Wife milking cow :
> Daughters spinning yarn,
> Boys threshing in the barn :
> All happy to a charm."

Another gives the account of 1870 as follows :—

> "The farmer gone to see a show,
> His daughter at the piano ;
> Madam gaily dressed in satin—
> All the boys are learning Latin.
> With a mortgage on the farm."
>
> —*The Farmer.*

The Week's Work.

November 19. —*Thorough Drainage* execute on all wet lands requiring it, placing the drains sufficiently near each other, and the pipes of a proper size, to remove the heaviest shower of rain as fast as it falls. Much clay land is only half drained, from the drains being placed too far asunder. Thus, when placed 24 and 36 feet apart, it will often pay to put an additional drain between every two, and when 36 feet apart we have opened two drains with advantage, the distance being then 12 feet apart. At this season the pipes or stones should be put in, and covered close up to the digging, so as to obviate falling in of the sides from the weather.

Subsoiling is subsidiary to drainage, whether the land is drained naturally or artificially, and therefore all lands ploughed this month should also be subsoiled, if the bottom requires loosening, as all subsoils occasionally do. Thus, the soleing of the plough, and the treading of the horses in the bottom of the furrow, together with the action of the roots of plants, produce "bottom-bound," "heath-pan," or "moorband," which covers a much larger area of the country than is generally imagined ; and now that ploughing and subsoiling can be done at one operation by steam or double-furrow horse-ploughs, the work should be done at this season. Calcareous limestone and clay soils require subsoiling as well as ferruginous, sandy, and gravelly soils, on which a hard pan of moor-band often exists several inches deep, through which the roots of plants cannot penetrate. And, besides being impervious, it is generally poisonous also, so that in subsoiling it should be broken as fine as possible, and left below until either changed by oxidation, or else washed out by the rains. It has justly been said that to double the depth of the staple by subsoiling and after deep cultivation is equivalent to doubling the area of the land subsoiled, *i.e.*, the roots of plants have twice the area of land in which to obtain plant-food.

Straightening Watercourses, if not already done in cases where the new cuts could not be opened in the summer time when the crops were on the land, should now be finished without delay. Where there is much carting in filling up the old channels, the work may be delayed until frosty weather. A drainpipe should be placed in the bottom of the old cut before it is filled and levelled.

Live Fences finish plashing and switching, grub up crooked and superfluous ones, and plant new where required, so as to lay out the land in the most profitable manner for steam culture. Where there is a command of stone from quarries near at hand, walls built with lime mortar make the best fences, and they are cheaper in the end than either dry stone dykes or live fences, as they occupy less ground, last longer, afford better and healthier shelter for live stock, and are free from the objection of nursing weeds and harbouring vermin of various kinds.

Land-fast Stones, and other obstructions to steam culture and subsoiling, remove. A great many stones in the subsoil that cannot be brought to the surface by horse-teams, can be loosened by steam ; others require very little manual labour to enable steam to bring them to the surface. Upwards of 100 tons of large stones per acre are thus being removed by steam-trenching implements, with a success almost incredible. There are, however, large stones that require to be blasted with blasting powder, and rock cropping out to the surface that requires to be quarried, and removed before steam can be started. Few improvements pay better than the removal of large stones and the deepening of shallow rocky ground, such soils being naturally grateful for all they receive.

Trenching, with pick and spade, when the land is very full of large stones or rock, is generally to be preferred, and often absolutely necessary, both in reclaiming new lands and in deepening old. If the land requires to be drained, the stones may be broken and used in filling the drains ; and the several works of draining, trenching, removing the stones, and filling the drains, may proceed together. Thus open and fill two or three drains—let the draining proceed,—start a "gang" or company of hands to trench each space between the drains, the one gang keeping in advance of the other ; start a third set of hands to gather the stones into small boxes made for the purpose, and to carry them across the untrenched land to the drains. Let a fourth company break the stones and fill in the drains. In this way we have drained and trenched large areas of old and new land by contract, at about £10 per acre. Any quantity of stones may be consumed in the drains, but when the stones from the land do not fill them, either tiles must be used, or a supply of stones got from somewhere else to fill up deficiencies. In each case the increase of produce redeemed the expenses within two rotations. In two cases the first crop paid off the whole, with a large margin over.

Surface Drainage attend to everywhere, so as to prevent pools of stagnant water after heavy rains, on farm roads, grass lands, and in water furrows. Thorough underdrainage should render open water furrows unnecessary, but such thorough drainage is more frequently the exception than the rule, and therefore open water furrows, in which water flows, should be gone along after every heavy storm, and any clod that has fallen in, or silting up that has taken place should be removed, the clods and silt being spread thinly over the land. Where land is being ploughed that requires cross water furrows they should be opened with the spade daily as the work advances, so as effectually to remove any rainwater over night, or what may fall during the day. The ditches should also be gone over, and the mouths of the main drains, so as to detect in time any stoppage that may have taken place. As a general rule, half the expense will keep things right that is required to put them to rights when once they are allowed to go wrong, and it must be borne in mind that this latter expense is but a fraction of the loss sustained.

Swine.—Bacon hogs fatten as the days shorten. Attend to the due proportion of sour food, otherwise quality will be inferior, and weight short. This also applies to small porkers, and indirectly to breeding sows.

Sewage Farming continues with decreasing activity as the weather grows colder and wetter. The yield of Italian Rye-grass begins to fall off rapidly ; but in our southern counties the average of the month will not fall much under a half or third of the summer cuttings. Owing to the decrease of solar light, the grass is more liable to blanch towards the bottom, and therefore should be cut shorter than in the summer time ; and, with an extra handful of meal, the grass, mixed with Clover hay or brown meadow hay chaff, forms the best food for milch cows and young stock at this season. *W. B.*

Notices to Correspondents.

Acorns : *Bradfield.* The master of the Bradfield Union says, the great yield of acorns which this year has so usefully supplemented the scanty crops of cattle food, has been keenly competed for in his neighbourhood—the price sometimes demanded, and paid, being 50 per cent. more than what has been here the standard in time gone by, viz., 1*s.* per bushel, and opinion is much divided as to their relative value. Will any of our correspondents state the reliable quantitative analysis, which would greatly aid in arriving at a satisfactory conclusion on the subject?

Dried Grains : *Y. K., Henley,* asks where the dried grains, referred to last week, may be purchased. We can only say that Messrs. Milburn are the manufacturers. They should advertise them.

Wheat Plant : *R. H., Lancaster.* The plant sent is a Wheat plant. Dissect it, and you will find and recognise the young ear.

Markets.

MARK LANE.

Monday, Nov. 14.

The supply of Wheat from Essex and Kent to this morning's market was small, and the prices of this day se'nnight were well maintained. There was a fair attendance, and a moderate business transacted in foreign at last week's rates. The finest samples of malting and grinding Barley were unchanged in value, but secondary sorts were difficult of sale, at 1*s.* to 2*s.* per qr. decline. Beans and Peas were unchanged in value. For Oats there was a good demand, at extreme prices. Flour was fully as dear.

Price per imperial Quarter.	*s.*	*s.*		*s.*	*s.*
Wheat, Essex, Kent, Suffolk. White	45—54	Red.....		42	54
— — fine selected runs..do.	49 — 57	Red.....		46	55
— — Talavera	50—60				
— — Norfolk	—	Red.....			—
— — Foreign	41— 63				
Barley, grnd. & dist., 228 & 330	Chev.	42—45	Malting ..	36	41
— Foreign .. grinding and distilling	25—33	Malting ..		33	40
Oats, Essex and Suffolk	25 -27				
— Scotch and Lincolnshire.. Potato	27—29	Feed		—	
— Irish ..... Potato	26—28	Feed		24	27
— Foreign .. Polard and Brew	24—26	Feed		19	24
Rye	32—36	Foreign ..		31	36
Rye-meal, Foreign					
Beans, Mazagan.....432. to 472.	Tick	49—50	Harrow ..	49	50
— Pigeon .....512. to 592.	Winds.	—	Longpod..	—	
— Foreign ..	Small	45—47	Egyptian .	42	44
Peas, White, Essex, and Kent..	Boilers	38—40	Suffolk ..	40	42
— Maple, 492. to 442.	Grey	36—40	Foreign ..	36	40
Maize		—	Foreign ..	29	31
Flour, best marks delivered.. per sack		39	47		
— 2d ditto	ditto	35	42	Country ..	32	44
— Foreign	per barrel	25—28	Per sack..	36	62

Wednesday, Nov. 16.

Influenced by the activity which was apparent at Liverpool yesterday, the tone of this market was firm, and an increased amount of business was transacted, at the extreme currencies of Monday last ; in fact, a slight advance was occasionally perceptible. There was a limited supply of English Wheat on offer, and the arrivals from abroad were very small. The demand for all descriptions of both red and white was moderately animated, and prices were well maintained. Barley was in good supply and request for choice qualities, at firm quotations. Malt was dull, but not lower in value. The market was well supplied with Oats. The inquiry was steady, at full currencies. Beans and Peas were purchased to a fair extent, at prices quite as high. Flour was in steady demand, and firm in value.

Arrivals of Grain, &c., into London by Water Carriage.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 170	Qrs. 980	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	—	1790	11,860	670
				— brls.
	670	2770	11,860	

Hull, Nov. 15.—At our market to-day there was a fair show of English Wheat, which met a ready sale at an advance of 1*s.* per qr. In foreign but little business was done. English white was quoted at 53*s.* to 55*s.* per qr. ; red, 49*s.* to 51*s.* ; Dantzic and Konigsberg white, 53*s.* to 57*s.* ; mixed, 50*s.* to 52*s.* ; Baltic red, 49*s.* to 50*s.* ; Danish and Hamburgh, 48*s.* to 50*s.* Fine malting Barley sold at last week's prices, but secondary qualities hang on hand ; grinding descriptions were very scarce, and fully as dear. Beans, Peas, and Oats were firmly held, but not much doing in them. For Linseed holders were firm, both for present and future shipments. For feeding seed there was good inquiry. Cakes and oil were both dearer.

AVERAGES.

	Wheat.	Barley.	Oats.
Oct. 8	46s 5d	36s 11d	21s 11d
— 15	47 0	36 7	22 5
— 22	47 3	36 5	22 2
— 29	48 6	36 9	22 4
Nov. 5	49 9	36 8	22 7
— 12	50 5	36 11	23 8
Average ..	48 3	36 8	22 6

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Nov. 17.

Prime Meadow Hay	130s. to 140s.	Clover, old ..	..130s. to 140s.
Inferior do. ..	..110 120	Inferior do. ..	..115 125
New Hay	— —	Prime 2d cut do..	120 130
Inferior do. ..	.. — —	Inferior do. ..	..105 115
Straw	.. 30 34		

CUMBERLAND MARKET, Thursday, Nov. 17.

Sup. Meadow Hay	130s. to 140s.	Inferior Clover	..110s. to 126s.
Inferior do. ..	..110 124	Prime 2d cut do...	— —
New do.	— —	New do.	— —
Inferior do. ..	.. — —	Straw	.. 34 40
Superior Clover	.. 134 140		JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Nov. 14.

We have an unusually small number of Beasts on offer, and very few are of best quality; consequently prices are higher than on Thursday for all descriptions. The supply of Sheep is about the same as last week, both as regards numbers and quality. The trade is not brisk, yet prices remain about the same. Choice Calves are scarce and dear. Our foreign supply consists of 540 Beasts, 5120 Sheep, 116 Calves, and 150 Pigs; from Scotland there are 205 Beasts; from Ireland, 400; from Norfolk and Suffolk, 20; and 1035 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	10to6 2	Best Long-wools	5	8to5 10
Best Shorthorns ..	5	0—5 10	Do. Shorn ..	..	.. — ..
2d quality Beasts	4	0—4 8	Ewes & 2d quality	4	6—5 0
Best Downs and Half-breds ..	5	10—6 2	Do. Shorn ..	..	.. — ..
Do. Shorn ..	..	.. — ..	Lambs	..	.. — ..
			Calves	4	0—6
			Pigs	3	6—5

Beasts, 2200; Sheep and Lambs, 16,800; Calves, 122; Pigs, 270.

THURSDAY, Nov. 17.

We have a larger supply of Beasts than last week; the demand is, however, good, especially for best qualities, and prices remain unaltered. The number of Sheep is about the same as last week, principally consisting of Ewes and middling Sheep; choicest descriptions being scarce are readily disposed of; in some instances rather higher rates are obtained. The late high prices for Calves are barely maintained, yet choice qualities are dear. Our foreign supply consists of 515 Beasts, 2600 Sheep, 226 Calves, and 50 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	10to6 2	Best Long-wools..	5	8to5 10
Best Shorthorns ..	5	6—5 10	Do. Shorn ..	..	.. — ..
2d quality Beasts	4	0—4 8	Ewes & 2d quality	4	6—5 0
Best Downs and Half-breds ..	5	10—6 2	Do. Shorn ..	..	.. — ..
Do. Shorn ..	..	.. — ..	Lambs	..	.. — ..
			Calves	4	0—6 4
			Pigs	3	8—5 8

Beasts, 1150; Sheep and Lambs, 6800; Calves, 230; Pigs, 60.

METROPOLITAN MEAT MARKET.—Nov. 17.

Best Fresh Butter .. .. .. 20s. per dozen lb.
Second do. do. .. .. .. 18s. ,,
Small Pork, 4s. 8d. to 5s. 4d.; Large Pork, 3s. 8d. to 4s. 0d. per 8 lb.

COALS.—Nov. 16.

Hastings Hartley, 16s. 9d.; Holywell Main, 17s. 3d.; Springwell Hartley, 14s. 0d.; West Hartley, 16s. 9d.; Walls End Haswell, 19s.; Walls End Hetton, 19s.; Walls End Hetton Lyons, 17s. 6d.; Walls End Russel's Hetton, 17s. 9d.; Walls End Tunstall, 17s. 6d.; Walls End Hartlepool, 18s. 3d.; Walls End Kelloe, 18s.; Walls End East Hartlepool, 18s. 9d.; Walls End Tees, 18s. 9d. —Ships at market, 25; sold, 25; at sea, 15.

SEED MARKET.

Our seed markets now exhibit increased animation, and values of all descriptions are exceedingly firm. A fair amount of business, at improving rates, has recently been transacted in Clover seeds. New Trefoil meets with more inquiry. Grass seeds are held with great firmness. Foreign Italian continues scarce and dear. Tares, both spring and winter, are without alteration. Hemp and Canary move off freely, at last week's quotations. There is just now only a poor demand for garden Peas and Beans. Feeding Linseed is in fair request. Rape seed is still advancing in price. Mustard seed is quiet but firm. November is generally a quiet month in the agricultural seed trade, but there are indications that a fair amount of speculation will shortly spring up in white and red Clover seed.

JOHN SHAW & SONS, Seed Merchants,
16, Water Lane, London, E.C.

ENGLISH WOOL.

The fear of political complication with Russia, owing to the re-opening of the Eastern question, has unfavourably affected all classes of wool except those lower grades which are in great demand for army purposes. The unfavourable tone, however, so far, is confined to a restriction of purchase to immediate wants, and has not caused holders to reduce their prices. The article is otherwise in a very sound position.

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MR. CRANSTON'S Patent Houses are for inspection at his residence, Parkfield, Pershore Road, Birmingham, and may also be seen by permission in most parts of the country

"Perfect ventilation without admitting rain or moving any of the glass."

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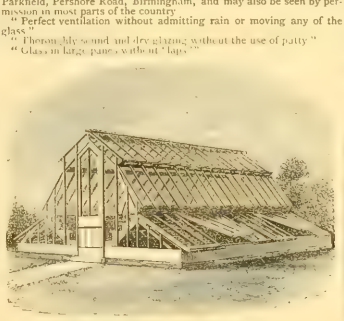

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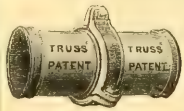

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	Each.
6 ft. by 4 ft. Lights, 2 in. thick, unglazed	£0 5 0
,, ,, Primed and Glazed with 10 oz. Sheet	0 11 0
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,, ,, Painted four coats, and Handles on	1 8 0
,, ,, Packed and Delivered in Railway van	1 10 0
6 ft. by 8 ft., Double Lights, do.	2 15 0

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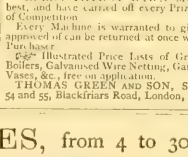

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2 inches in diameter ..	0	3	12 inches in diameter	..	1	0
3 " " ..	0	4½	13 " "	..	2	0
4 " " ..	0	5½	14 " "	..	2	6
5 " " ..	0	6½	15 " "	..	3	0
6 " " ..	0	8	16 " "	..	3	6
7 " " ..	0	10	17 " "	..	4	0
8 " " ..	1	0	18 " "	..	5	0
9 " " ..	1	2	19 " "	..	6	0
10 " " ..	1	4	20 " "	..	7	0
11 " " ..	1	6				

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4 inches in diameter ..	0	6d.	9 inches in diameter	..	1s.	8d.
5 " " ..	0	8	10 " "	..	2	0
6 " " ..	0	10	11 " "	..	2	6
7 " " ..	1	1	12 " "	..	3	0
8 " " ..	1	4				

Either flat or conical tops.

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24 inches long ..	2s.	0d.	16 inches long	..	1s.	4d.
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20 " " ..	1	8	12 " "	..	2	6
18 " " ..	1	0				

HAND GLASSES, WITH OPEN TOPS.

Each	s.	d.		Each	s.	d.
12 inches ..	0	6	20 inches	..	10	6
14 " ..	7	0	22 "	..	11	6
16 " ..	8	6	24 "	..	12	6
18 " ..	9	6				

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"The upright form of Boiler is usually made on a circular plan, rather than a square, it seems feasible that the Boilers on the oval but the oval form given to Mr. GRAY'S variety of it is said to be plan should bring the tubes more completely within range of the preferable in consequence of its bringing the tubes in closer contact burning fuel; and this being so, the change, though a slight one, with the fire. The usual form of a furnace being a parallelogram is no doubt an improvement."

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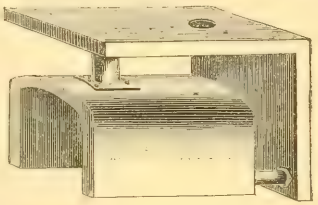

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20 "	18 "	24 "	450	6	0	0
20 "	18 "	30 "	600	7	0	0
24 "	24 "	24 "	700	8	0	0
24 "	24 "	30 "	850	10	0	0
24 "	24 "	36 "	1,000	12	0	0
24 "	24 "	48 "	1,400	15	0	0
28 "	28 "	60 "	1,800	20	0	0
30 "	30 "	72 "	2,600	30	0	0
36 "	36 "	96 "	4,500	50	0	0
48 "	48 "	108 "	7,000	75	0	0
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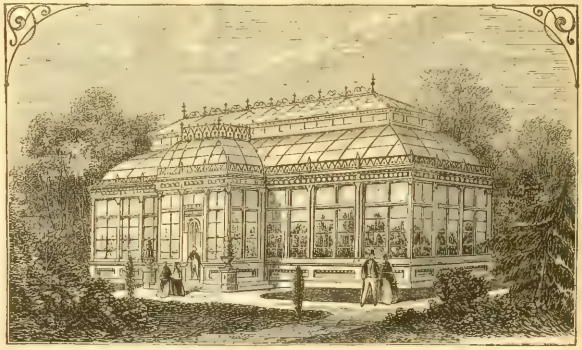

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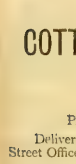

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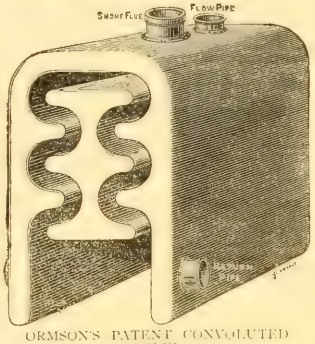

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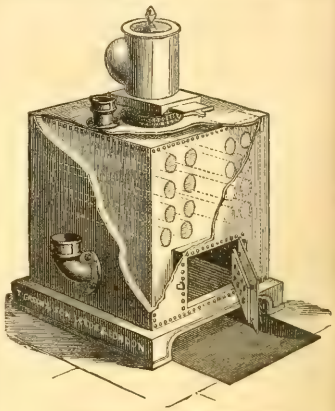

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AND
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NOTICE.—The GARDENERS' CHRONICLE AND AGRICULTURAL GAZETTE for December 3 will contain Plan and Description of Works now in progress on the VICTORIA EMBANKMENT, and a full REPORT of the BIRMINGHAM CATTLE SHOW.

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Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE.—FULL PRICE will be given at the Office for Clean Copies of No. 5, January 29, 1870.
Office, 41, Wellington Street, Strand, W.C.

NOTICE to SUBSCRIBERS.—On and after this date the SUBSCRIPTION to the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE will be £1 3s 10d. for 12 months, including postage, instead of £1 6s, as heretofore.

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Published by W. RICHARDS, 41, Wellington Street, Strand, W.C.
October 1, 1870.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

NOTICE.—MEETING OF FRUIT and FLORAL COMMITTEE, on WEDNESDAY, December 7, at 11 o'Clock. GENERAL MEETING at 3. Band of the Royal Horse Guards at 2. Admission 2s. 6d.

*** A Prize of £5 is offered for this Meeting, by J. Bateman, Esq., F.R.S., for the best Collection of Cut Flowers of Cattleyas Mossiæ labiata, &c., such flowers to be at the disposal of the Society.

ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.

The dates of MEETINGS during 1871, are—
WEDNESDAYS.

January 18.	May 3 and 17.	September 6 and 20
February 15	June 7 and 21.	October 4.
March 1 and 15.	July 5 and 19.	November 1.
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GREAT SHOW at NOTTINGHAM, June 13 to 17 inclusive.
Schedules of Prizes for these Meetings can be had on application to JAMES RICHARDS, Royal Horticultural Society, South Kensington, W

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GEORGE DAVISON'S stock is very fine, and will be Sold at any reasonable Price, as they must be cleared. Many Thousands of TEA ROSES in pots, 36 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied.

CATALOGUES on application.

Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA

White Cross Nurseries, Hereford

Roses.

ONE HUNDRED THOUSAND STANDARD ROSES.

200,000 DWARF HYBRID PERPETUAL ROSES.

50,000 TEA-SCENTED ROSES.

A magnificent stock to select from. CATALOGUES on application

WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

To Amateurs and the Trade.—Roses and Fruit Trees.

LEWIS WOODTHORPE offers a very superior lot of carefully cultivated and well-grown ROSES—Standards at 12s. and 24s. per dozen; Dwarfs at 9s. per dozen. A choice stock of all FRUIT TREES, &c.

A Descriptive CATALOGUE of New and Choice Plants, Fruit Trees, and Roses, sent free upon application. Trade Lists with special Trade Prices free.

L. WOODTHORPE, Munro Nursery, Sible Hedingham, Essex.

Scarce Liliums.

JOHN BELL has pleasure in being able to offer fine flowering BULBS of CONCOLOR and SINICUM, two very scarce Lilies, full descriptions of which were given in the *Gardeners' Chronicle*, October 29, p. 1419.

CONCOLOR, 2s. 6d. each, 24s. doz. SINICUM, 1s. 6d. each, 15s. doz.

Price to the Trade on application.—The Norwich Nursery Seed Warehouse, 10 and 11, Exchange Street, Norwich.

Araucaria imbricata.—Perfect Specimens,

WELL GROWN and very HANDSOME.

WOODLANDS NURSERY, MARESFIELD, NEAR UCKFIELD, SUSSEX

WM. WOOD AND SON have a large Stock of the above. Price, per plant :—

2 feet	..	..	..	£0	5	0	3 feet	..	..	£2 2 0
5 feet	..	..	..	1	1	0	10 feet	..	..	3 3 0
6 feet	..	..	..	1	11	6	Larger, up to 30 feet			

Prices on application.

THE beautiful PURPLE DOG'S-TOOTH VIOLETS. See article in *Gardeners' Chronicle* for October 22. Strong roots, 5s. per 100, 1s. per dozen,—2d. per dozen extra for postage.

Having nearly 1 acre of GLADIOLI, I can supply them cheaper than any house in the Trade. Prices upon application.

JOHN STEVENS, The Nurseries, Coventry

Winter Flowers.

AZALEA HYBRIDA ODORATA is the best and most convenient plant for winter and early spring blooming, the flowers being white and very fragrant; one truss, with a few other flowers, will make a beautiful bouquet. Small plants bloom freely, and are large plants in three years' time. 18s. per dozen.

RHODODENDRON MULTIFLORUM, A small leaved, bushy growing plant, producing the usual scarlet flowers.

Both of the above are of the easiest culture, and are worth a trial as these and other plants raised by me forwarded on application to

ISAAC DAVIES, Nurseryman, Ormskirk

Rhododendrons for Potting or Planting Out,

HARDY SCARLET, WHITE, and other CHOICE NAMED.

W. H. ROGERS, Red Lodge Nursery, Southampton, offers a large and splendid assortment of the above, with blooming buds, at 18s., 24s., and 30s. per dozen.

Also KALMIA LATIFOLIA, ANDROMEDA FORMOSA, and AZALEA AMŒNA, at 18s., 24s., and 30s. per dozen.

A NOBLE AVENUE for £30, consisting of 100 WELLINGTONIA GIGANTEA, about 4 feet high. This, the most noble of all trees, a native of California, where it attains a height of 440 feet, with a trunk 40 feet through, is of rapid growth, hardy, and noble in form. The bark of a Wellingtonia at the Crystal Palace, recently destroyed by fire, gave an idea of the grandeur of the tree.

Or an AVENUE of 100 SUPERB ABIES DOUGLASII, about 10 feet high, for £20. This, the most noble of evergreen trees, is of rapid growth, hardy, produces valuable timber, cones, heavy and free from knots, of the colour of Yew wood. It is a native of California, where it grows upwards of 300 feet high, with a trunk 10 feet through. The finest at Kew is of this tree, 70 feet high, and 5 feet 6 inches in girth. There is at Dropmore (Bucks) a specimen measuring at the present time 95 feet high, and 90 feet through the branches, with a trunk 9 feet in circumference at 4 feet above the base. The above can be seed home by Mr. Frost, the present gardener, in 1868, and is now a model of beauty.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of the specimens of the following :—

LAURUSTINUS, 5 to 6 feet	PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 9 ft.	COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet	

RHODODENDRONS, 3 to 5 feet, thickly set with buds.

The above have recently been transplanted, are very bushy hand some plants, and quite safe. Price per dozen or hundred on application.

Floral Nursery, Hailsham, Sussex.

Planting Season.—Knowfield Nurseries, Carlisle.

MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, beg leave to invest the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c ; and Gentlemen intending to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

L. & B. are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction ; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom ; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 30s. per doz., or £10 p. 100

„ Good named kinds, £5 to £7 10s. per 100

„ Common mixed colours, £2 10s. per 100

„ Van Houttei fl. pleno, strong bushy flowering plants, 1½ to 3 feet, 42s. to 72s. per dozen and upwards. This is one of the most beautiful of the Double Azaleas.

Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower-buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens.

ANDROMEDA FLORIBUNDA.—Good plants, 18s. to 30s. per doz.

RHODODENDRONS.—We invite the special attention of Rhododendron buyers to this part of our stock. We have miles of borders in which the plants vary from 2 to 8 feet high. Every plant a specimen, strong and well sorts excepting the common Ponticum.

Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100 A sample of 12 will be sent on application.

Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Rotten Row were nearly all of them supplied from Knap Hill. As no description on paper can give an adequate idea of these plants, we have had a fine example photographed, which is given in our Catalogue, just published.

RHODODENDRON PONTICUM, for Covert, £7 10s. to £15 per 1000

„ „ Gardens, named, from layers, £10 to £20 per 100

„ „ Finer named, from layers and cuttings, 50s. to 100s. per 100

„ „ Finer named, from layers, 2 years' grafts, £5 to £7 10s. per 100

Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s. to 100s. per 100

„ Large, extra fine plants, £10 to £20 per 100

„ We have grown for the sale last a large number of Rhododendrons from layers, as I consider they make a finer and more than 100,000 plants of named sorts, which we believe, are quite unequalled, being without exception the best plants we have ever seen We supply them, all layers, at from 50s. to 100s. per 100 A sample, the only guide, will be sent on application.

HARDY HEATHS—The most distinct and beautiful winter and spring varieties, by name, including „ Menziesia, every plant a specimen—6s. per dozen, 40s. per 100

„ The free growing varieties of VULGARIS, &c., 30s. per 100, £15 per 1000.

„ MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, £3 per 100

KALMIA LATIFOLIA, from 50s. to 100s. per 100

„ Nice blooming plants, £5 to £10 per 100

„ Extra size 10 to 15 feet and upwards.

„ MYRTIFOLIA, 42s. to 60s. per dozen

LAURELS.—Large American Plants are grown to a large extent

HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.

COMMON GREEN HOLLIES—Stout, 2 to 2½ feet, 42s. to 60s. per 100; 3 to 4 feet, 72s. to 96s. per 100; 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.

Thousands of beautifully grown Pyramidal plants

We have a number of very large Green Hollies, 12 and 15 feet high

WATERER'S GOLDEN QUEEN HOLLY—Large plants, 21s. and 42s.

GOLDEN GULLY—In all sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are unrivalled by the most beautiful plants to be found in any Nursery or Garden. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.

PERRY'S WEEPING HOLLY STANDARDS.—A large number.

NEW GOLDEN WEEPING HOLLY—Nice Standards.

The COMMON WEEPING HOLLY—6, 7, 8, and 10 feet high, magnificent plants.

VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high

YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3 to 4 feet high, and larger sizes from 8 to 14 feet. These are invaluable as blinds

IRISH YEWS, of all sizes, up to 10 feet.

YEWS, GOLDEN (Taxus baccata elegantissima).—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN. } Handsome Pyramidal plants, 5, 6, 7, and
„ VARIEGATED. } 8 feet high An enormous quantity of well-furnished bushy plants, 3, 4, 5, and 6 feet high

AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high

LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869

LAURUSTINUS and BAYS.—Fine Standards, in tubs.

All other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted :—

ABIES ALBERTUS, 5 to 6 feet, 42s. per dozen ; 7 to 8 feet, 60s These are beautiful plants, transplanted 1870.

ABIES ORIENTALIS, 4 to 6 feet, 5s. to 7s. 6d. each ; 7 to 8 feet, 10s. 6d. and upwards.

PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.

PINUS PINSAPO, 2 to 2½ feet, 30s to 42s per dozen ; 3½ to 4 feet, 7s. 6d. to 10s. 6d. each ; larger, 5 to 6 feet, 21s. each and upwards

PINUS NOBILIS, 1½ foot, very stout, 18s. per dozen, £5 per 100 ; 2 to 3 feet, 60s. per dozen ; 4, 5, 6, 7, to 10 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards.

PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s. per dozen ; 2½ to 3 feet, 5s. to 7s. 6d. each ; larger specimens, 4, 5, 6, 8, and 10 feet.

PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.

PICEA LASIOCARPA, 3 feet, handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, and 8 feet high, 21s. each and upwards ; and all have been transplanted within twelve months.

CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen ; 5 to 7 feet, 60s. to 84s. per dozen ; 8, 10, and 12 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, 4, and 5 feet high.

CUPRESSUS LAWSONIANA GLAUCA ARGENTEA } 3 to 4 feet, 42s. to 84s per dozen : beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.

JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen ; 6 to 7 feet, 84s. per dozen : beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.

THUJA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen ; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference

THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high ; hundreds of most beautiful plants, 30s. to 84s. per dozen.

THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.

WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities All are straight, handsome, well balanced trees, with stout stems and finely rooted :—

ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.

ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen

ÆSCULUS ROSEA, SCARLET HORSE CHESTNUTS, 8 and 10 feet high

ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, grafting 5 to 6 inches 4 feet from the ground

BEECH, PURPLE, 6 to 8 feet ; 10 to 12 feet, fine trees.

BEECH, COMMON, 8 to 10 feet

BIRCH, WEEPING, 8 to 10 feet

HORNBEAM, ENGLISH, 8 to 10 feet

ELMS, 10 to 15 feet

LIMES, 10 to 12 feet ; splendid trees, 5 to 6 inches round the stem 4 feet from the ground

MAPLES, NORWAY, 8 to 14 feet.

OAKS, ENGLISH, 8 to 10 feet.

SCARLET AMERICAN OAKS, 10 to 12 feet.

PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high. The Planes on the Thames Embankment were supplied by A. W.

POPLARS, LOMBARDY, 10 to 15 feet.

SYCAMORE, 10 to 16 feet.

WALNUTS, about 10 feet.

AILANTUS, 8 to 10 feet.

CATALPA, 6 to 8 feet

MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years

Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

NEW POTATO, "HEADLEY'S NONPAREIL."

This UNRIVALLED POTATO was raised from seed in 1860, by Richard Headley, Esq., of Stapleford. It has never produced a diseased tuber, is a heavy cropper, very hardy, and superior in flavour to any kind hitherto in cultivation. Although a second-early variety, ripening by the middle of July, it has the great merit of keeping perfectly sound and fit for use until August in the following year.

Mr. SHIRLEY HIBBERD, says :—"This has been grown at Stoke Newington three years in succession, and has been most constant in character, and is really the best Potato of its class we know—its class, moreover, is one of the best. It is a heavy cropper, the bulk of the crop medium-sized and handsome, and it ripens off completely immediately after the first-early sorts. The tubers are handsome, very even ; the flesh yellowish, very dry, fine in texture, and of the finest flavour. It is so good a keeper that we can depend upon it until June."

OPINIONS OF THE PRESS.

"R. Headley.—Your seedling Potatos were quite first-rate ; white, mealy, and excellent in flavour."—*Gardeners' Chronicle, Oct.* 30, 1869.

"White Kidney, a very fine variety, a heavy cropper, uniform in size, ripening off all at once quickly and completely ; flesh yellowish, dry, mealy, and of the most delicate nutty flavour ; a heavy crop was harvested July 14 *Gardeners' Magazine, Jan.* 30, 1869.

"Seedling Potato (R. Headley).—In shape the tubers resemble those of the Fluke. They are like them also in flavour, but are more mealy."—*Journal of Horticulture, Oct.* 21, 1869.

The undersigned are enabled to offer the above valuable variety in quantity to the Trade.

PRICE ON APPLICATION.

HURST AND SON, 6, LEADENHALL STREET, LONDON, E.C.

Northampton Nurseries.

JOHN PERKINS, SEN., begs to call the attention of Noblemen, Gentlemen, and others engaged in planting to his extensive stock of the following, the whole of which will be offered at unusual low prices :—

Whitethorn or Quick, extra fine, 3 years transplanted	Hornbeam, 1½ to 2 feet.
Spruce Fir, 2½ to 3½ feet	Evergreen Privet, 1½ to 2 feet
Scotch Fir, 1½ to 2 feet	Berberis Aquifolia, 1 to 1½ feet
Larch Fir, 1½ to 2 feet, and 2½ to 3 feet	Green Box, 1½ to 2 feet, and 2 to 3 feet
Pinus austriaca, 1½ to 2 feet.	Portugal Laurel, 1½ to 2 feet, and 2 to 3 feet
Birch, 1 to 4 feet,	Common Laurel, 2 to 3 feet
Beech, 2 to 3 feet, and 3 to 4 feet.	Black Italian Poplar, 4 to 6 feet.
Hazel, 2 to 3 feet.	Ilex Aquifolium, 1½ to 2 feet

J. P.'s stock of all kinds of ROSES, FRUIT, FOREST, and ORNAMENTAL TREES, &c., is very extensive and in the best possible condition for removal, having been frequently transplanted

Descriptive Priced CATALOGUES, free by post, or on application to 52, Market Square, opposite the Corn Exchange, Northampton

EXTENSIVE SALE of Transplanted FOREST TREES, SHRUBS, &c

300,000 2-yr Seedling 2-yr transplanted SCOTCH FIR.
300,000 2 yr " " 1 to 2 feet.
300 000 NORWAY SPRUCE, in sizes, from 9 inches to 3 feet
100,000 ENGLISH OAK, from 1 to 3½ feet, in sizes
100,000 IBERIS, or ever flowering, from 1 to 2 feet.
50,000 LARCH, from 12 to 20 inches
150 Seedling LARCH, fine, 12. per 1000

All the above are well grown, healthy, and well rooted Inspection invited. To be Sold cheap, by special offer. Samples and prices on application

DAVID DOW, Nurseryman and Seedsman, Falkirk

Magnificent Trees for Avenue Planting.

WOODLANDS NURSERY, MARK-FIELD, NEAR UCKFIELD, SUSSEX

WM. WOOD AND SON have to offer a splendid stock of the following remarkably well-grown Trees :—

ROBINIA PSEUD-ACACIA, 6 and 8 feet
ASH, WEEPING, extra fine, 7 to 8 feet stems
CATALPA SYRINGÆFOLIA, 8 to 10 feet
AILANTUS GLANDULOSA, 6 feet
ELMS, extra fine, consisting of American, English, Cornish, and other varieties, 6 to 8 feet, 8 to 10 feet, and 10 to 12 feet.
LABURNUMS, 6 to 8 feet.
HORSE CHESTNUTS, Common and Scarlet, extra fine plants, 7 to 8 feet, 8 to 10 feet, 10 to 12 feet, and very fine trees
AMERICAN WEEPING WILLOWS, 7 to 8 feet.
CATALOGUES gratis on application

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees.
QUICK, and all other Hedge Plants.
COVERT PLANTS, in great variety.
FRUIT TREES, including all the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained, &c.
ROSES, Standards, Dwarfs, on own roots and Manetti stock, &c
VINES, all the leading varieties, 2000 well ripened Canes, for fruiting in pots and for planting out
EVERGREENS, in great variety, including large quantities of all the choicest Hollies, &c.
CONIFERS, including Picea nobilis, Nordmanniana, &c.
ORNAMENTAL TREES and Plants, of all sorts
The whole in very great quantity and stout vigorous condition, with fine roots, for safe removal
Priced LISTS and all particulars on application to
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester
The "Newton" Nurseries are within 10 minutes' walk, by the new road over Hockersbrook Bridge, from the Railway Station

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application.
The stock of Seedling and Transplanted LARCHES, SCOTS FIRS, and other FOREST TREES is both unusually extensive and superior in quality. Intending purchasers inspection is not conveniently, samples and special offers will be sent if required.
Edinburgh and London (20, Budge Row, Cannon Street, E.C.)

FOR SALE, the following Plants, delivered at the Faringdon Station, Great Western Railway :—
50,000 ASH, 3 to 5 feet, very bushy, and splendid plants, 9s. per 1000.
100,000 ASH, 2 to 3 feet, do. do., 12s. per 1000.
12,000 COMMON LAUREL, 1½ to 2½ feet, 30s. per 1000.
500 GOLDEN ELDER, 2 feet, 10s. per 100
20,000 CHINESE ARBOR-VITÆ, 2 to 3 feet, 60s. per 1000.
500 PINUS INSIGNIS, in pots, 12s. per 100.
700 THUJOPSIS BOREALIS, in pots, 15s. per 100
500 RETINOSPORA ERICOIDES, 1 foot, 8s. per 100
100 STANDARD ROSES, named, sorts, 9s. per doz.
Apply to W. H. CAMPBELL, Esq., Buscot Park, Lechdale, Gloucestershire

INTENDING PLANTERS are respectfully invited to inspect the extensive stock of FOREST TREES and SHRUBS grown in these Nurseries, all of which are in fine condition, and can be highly recommended.
THOS. THORNTON, The Nurseries, Bagshot, Surrey.
T. T would be happy to receive Notice from intending Visitors, as he would be in a position to offer every facility for their doing so

"NEWTON" NURSERIES, CHESTER.—These extensive and well-stocked Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application
JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

FRUIT TREES, very strong, and warranted free from Blight.—The Pomological Institute of Ringelheim, Hanover, Germany, can supply splendid specimens of Fruit Trees at very low prices, and which they guarantee to be perfectly free from attacks of blight. The Institute beg to call special attention to this, as it is very difficult at the present time to obtain Fruit Trees which have not been attacked more or less by the very formidable enemy Prices on application either to the Institute, or to
Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Bessacarpus, Dasylirions, &c.; Aroids and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times will repay a visit
Conservatories furnished, and choice Plants supplied for Balls or Dinner-table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

SEEDLING and TRANSPLANTED FRUIT, FOREST, and ORNAMENTAL TREES, CONIFERS, TREE SEEDS, &c.—The Administration of the Pomological Society, Ringelheim, Hanover, Germany, beg to call attention to their new PRICE LIST, in which they offer all the above at exceptionally low prices.
The Trade and all requiring large numbers of Roses, Seedling and Transplanted Conifers, Forest Trees, Fruit Trees, Stocks, such as Quinces, Pear Stocks, Paradise Apple, &c., will find the terms most advantageous, and the quality unsurpassed with Nurserymen.
The List will be sent post free on application to the London Agents of the Institute,
Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that he is now sending out the above beautiful APPLE. An illustration of it, and a description by Dr. Hogg, is given in the "Florist and Pomologist" for March, 1870, in which he says that it is "Destined and worthy to take it, place amongst the worthiest of its kind." Dwarf maiden trees, 7s. 6d. each.
Nurseries, Shipston-on-Stour.

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application. The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies

The "Woking Nursery" is easily reached by South Western Railway (main line) to Woking, and goods can be sent through, if upwards of 1 ton, to all parts of the kingdom, which is an immense saving of package and carriage. An inspection of the Nursery will well repay Purchasers, but to those who cannot personally pay a visit, the following summary of the principal stock, averaging from 1 to 5, 6, and 10 feet high, will give some idea of the resources of this Establishment, viz. :—

125,000 Standard, Pyramid, Dwarf Maiden, cutback, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, &c., of the leading well-known kinds.
25,000 STANDARD and DWARF ROSES, of select and choicest varieties
200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the common hybrid Catawbiense and Ponticum.
750,000 CONIFERÆ, which embrace most of the fine hardy species and varieties of the following genera :—Abies, Araucaria, Cedrus, Cupressus, Juniperus, Picea, Pinus, Retinospora, Taxodium, Taxus, Thuja, Thujopsis, Wellingtonia, &c.
450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following :—Acacia, Atlantus, Alder, Almond (flowering), Althæa frutex, Arbutus, Ash, Aucuba, Bay, Beech, Berberis, Birch, Bladder Sena, Box, Broom, Calycanthus, Chestnut, Cherry (flowering), Chimonanthus, Comptonia, Cornus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolreuteria, Laburnum, Laurel, Laurustinus, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Phillyrea, Philadelphus, Plane, Poplar, Privet, Pyrus, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c.
2,000,000 FOREST TREES, viz. :—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.
20,000 CLIMBERS, thus—Bignonia, Climbing Roses, Ivy, Jasmine, Passionflower, Periploca, Vinca, Virginian Creeper, Wistaria, &c.
70,000 CLEMATIS, principally the "Woking Hybrids."

This Catalogue contains a set of five large Engravings of Clematis, for which this Establishment is famed, taken from Photographs

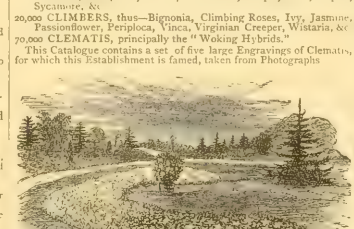

REDUCED FORM, No. 3

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials.

Engraving No. 1 For Conservatories, Terraces, &c.
" No. 2. For Lawn, Flower Garden, &c.
" No. 3. For Hardy and Permanent Bedding, &c.
" No. 4. For Festoons, Verandahs, &c.
" No. 5. For Rockery, Rockwork, Ruins, &c.

"This Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*

Woking Nursery, Surrey.

New Soft Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready. It contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest rates consistent with quality and correctness. See List, and present quotations.
New Florist's Flower and Florist's Flower Seed Merchant, Woolwich

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash :—
GOLDEN TRICOLORS. Lady Cullum, 2s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s. 6d. SILVER TRICOLORS.—Caroline Longfield, 6s.; Italia Unita, 2s. 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; E. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Painted Lady, 3s. 6d.; Princess of Wales, 4s.; Standard Bearer, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeaux, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of 200 varieties post free.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire

Winter and Spring Flowering Plants.

FRANCIS & ARTHUR DICKSON & SONS have a magnificent stock of the above, in fine, strong, healthy plants, including ACACIAS, AZALEAS, CAMELLIAS, CARNATIONS (Tree), CINERARIAS, DEUTZIAS, EPACRIS, ERICAS, LILY of the VALLEY (imported clumps), SPIRÆA JAPONICA (ditto ditto), VIOLETS, &c. Also a splendid Collection of Plants suitable for Table Decoration, including Ferns, &c. For prices and particulars, see General PLANT CATALOGUE, which will be sent free per post on application

"Upton" Nurseries, Chester.

Notice.

H. LANE AND SON'S Descriptive CATALOGUE can be had free by post on application. It contains a List of 500 varieties of ROSES (including the new ones, all at the same price), a choice collection of RHODODENDRONS, all the new and popular FRUITS, a fine collection of CONIFERS, HARDY ORNAMENTAL TREES and SHRUBS, AZALEAS, &c.
The Nurseries, Great Berkhamsted, Herts.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.
Exotic Nursery, Tooting, Surrey, S.W.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Horticultural Gardens, Kensington, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most appropriate sorts, with heights and prices, as well as the leading EVERGREENS and ROSES.
The American Nursery, Bagshot, Surrey.

Planting Season.

TO BE SOLD, cheap, the ground being required for other purposes, 6 acres of RHODODENDRONS, from 1 to 3 feet high, bushy hybrids, well set with bud, the finest lot in England; AZALEAS, strong and bushy, well set with bud; POPLARS, in variety, 2 to 12 feet high; SPIRÆA, 2 to 3 feet; HORSE CHESTNUTS, SYCAMORES, NORWAY MAPLE, 2 to 8 feet; COMMON LAUREL, 1 to 3 feet, bushy; and other Forest Trees, Shrubs, &c. Best show GOOSEBERRIES in variety
B. WHITHAM, The Nurseries, Reddish, near Stockport.

PAUL'S NURSERIES, WALTHAM CROSS, N.

ROSES.

ROSE PRINCESS CHRISTIAN.—"One of the grandest Roses in cultivation." "The best Rose of the present year." "The great Rose of the Show." Standards and Dwarf Standards, 10s. 6d. each Dwarfs, 7s. 6d. each.
Standard ROSES, 15s. per dozen, and upwards.
Dwarf Standard ROSES, 12s. per dozen, and upwards.
Dwarf ROSES, 9s. per dozen, and upwards.
" in pots of extra size, prepared for forcing, 24s. per dozen, and upwards.
Climbing ROSES, strong plants, 9s. per dozen and upwards.

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s. per dozen, and upwards.
Bedding HYACINTHS, 18s. per 100, and upwards.
" TULIPS, 3s. per 100, and upwards.
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, of sorts, 2s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000
All other Bulbs equally moderate in price.

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each.
AVALANCHE, do., do., 7s. 6d. each.
MARCHIONESS.—The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.
WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each.
BONFIRE, the finest scarlet for bedding, 3s. 6d. each.
AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 21s. each and upwards

EVERGREENS, CONIFERS, &c.

The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently transplanted specimens

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES. FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post.

IMPORTANT.—Address WILLIAM PAUL (the Christian name in full), Paul's Nurseries, Waltham Cross, London, N.

The most Desirable Plant of the Season.

PARSON'S NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA.—This new and lovely Mignonette will be an universal favourite; it is so much superior in odour, habit, and colour—being nearly pure white—it cannot fail to be grown in preference to the other variety; the spikes are large and beautifully shaped, and one Pot of it will perfume a whole House. There are many Plants advertised, eulogized, and sent out to the Public as something very superior, when they are no better than existing varieties; but P. PARSONS assures the Public this new Mignonette is a great acquisition, and cannot fail to take pre-eminence of all others. It has been exhibited at four of the principal shows this year, for which it obtained the highest honours that could be awarded, viz.:—
The Royal Botanic Society, Regent's Park, First-class Certificate, March 30, 1870
The Royal Horticultural Society, Kensington, First-class Certificate, May 4, 1870
The Grand International Show, Crystal Palace, First-class Certificate, May 21, 1870
The Brighton Horticultural Show, First-class Certificate, June 28, 1870.

The above will be sent out in October, at 2s. 6d. per packet, and may be had wholesale and retail of P. PARSONS, Nurseryman and Seedsman to Her Majesty, and 98, Western Road, Brighton, and at Hassocks' Gate Nurseries, Keymer, Hurstpierpoint; and of the following Agents :—

ENGLAND
Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenall Street, London
" Wood & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith
" Thomas Davies & Co., Liverpool.
" A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, King's Road, Chelsea.
" S. Nairn & Sons, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
" Butler, McCulloch & Co., Covent Garden, London.
" G. Gibbs & Co., Down Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London.
" Downie, Laird & Laing, London and Edinburgh.
" P. Lawson & Son, 20, Budge Row, London.
" Rutley & Whitehead, 39, Strand, London.
" Dick Radclyffe & Co., 129, Holborn, London, W.C.
" Fisher, Holmes & Co., Handsworth Nurseries, Sheffield.
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., High Holborn, London, W.C.
" Minter, Neale & Co., Strand, London, W.C.
" Child & Lorimer, 49, Darley Street, Bradford.
Mr George Tredgett, Cambridge.
" L. S. Woodthorpe, Esq., Hedingham, Essex.
" G. Hinxman, Fareham
" B. Bracher, Halifax, Yorkshire.
" W. Knight, Hailsham, Sussex.
" Timothy Brigden, South-Eastern Railway Station
" W. Paul, London
" E. Holmes, Whittington Nursery, near Lichfield
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire.
" P. S. Williams, Upper Holloway, London.
" E. Sim, Derby
" James Wood, Newport, Isle of Wight

SCOTLAND
Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow
" P. Lawson & Son, Edinburgh.
" Stuart & Mein, Kelso
" W. Drummond & Sons, Stirling
" J. & R. Thyne, 60, Buchanan Street, Glasgow.

IRELAND.
Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin

BELGIUM.
Mons. Louis Van Houtte, Ghent.

PRUSSIA.
Messrs. Platz & Son, Erfurt.
" Ferdinand Juhlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

AMERICA.
Messrs. B. K. Bliss & Sons, New York.

WRIGHT'S GROVE WHITE CELERY.—One of the largest and best flavoured bleaching varieties ever introduced; after the same character as the Grove Red sent out by me. It has been awarded the First Prizes at the two Celery Shows held at Retford, the average size of the Sticks exhibited being 6 lb. each. It was raised by myself, and will be found one of the best White Celeries in cultivation. This is the first season I have been able to introduce it to the Trade, and as the stock of seed is limited, early orders are requested. Price 1s. per packet, or 9s. per dozen.
W. WRIGHT, Seed Merchant, East Retford.
Agents: HURST AND SON, 6, Leadenhall Street, London, E.C.

BIRD'S "KING of the CUCUMBERS."—The best for exhibition. Length 14 to 16 inches. White spine, handsome fruit, short neck or handle. Price 2s. 6d. per packet.
BIRD'S "QUEEN of MELONS."—The best green-fleshed Melon, handsomely netted, fine flavour. Average weight 5 lb. Price 1s. 6d. per packet. May be had of all the Seed Trade, and of
JAMES BIRD, Nurseryman and Seedsman, Downham Market.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply the following for Cash:—Fine Forcing SAKALE, 10s. per 100; second size, 5s.; third size, 1s. ASPARAGUS, 3 years old, 3s. per 100; 2 years, 2s.; cheaper per 1000. RED DUTCH PICKLING CABBAGE Plants, 5s. per 1000; and EAST HAM and DWARF YORK plants, 3s. 6d. p. 1000.

CHARLES TURNER can strongly recommend the following New CUCUMBER and MELON, as possessing great merit:—

CUCUMBER, BLUE GOWN, raised by Mr. Lockie, Court Gardens, Marlow, has been most successfully exhibited during the last two seasons, both in London and the provinces. It has been awarded Nine First Prizes, and Three First-Class Certificates, and most favourably spoken of in the various garden periodicals.

The *Gardeners' Chronicle*, for June, 1869, says:—"Mr. Turner, of Slough, sent a box containing three remarkably handsome fruit of Blue Gown Cucumber, each measuring upwards of 26 inches long, of a uniform thickness throughout, covered with a beautiful bloom, and small black spine. This is the same variety that was shown in such fine condition on a former occasion, and proved to be of excellent flavour, and was awarded a First-Class Certificate."

The same journal, for September 3, 1870, says:—"Mr. Turner's Blue Gown is a black-tipped spine, very handsome, and has, as yet, carried everything before it." Price per packet, 2s. 6d.

MELON, GREEN GEM, raised by Mr. Lawrence, Farnham Castle. This fine-flavoured and superior variety will become, and remain, as great a favourite as Scarlet Gem, sent out by Charles Turner. The flesh is melting, rich, and refreshing, very pleasing to the palate, and has a very thin skin. 2s. 6d. per packet.
The Royal Nurseries, Slough.

PAUL & SON'S ROSES.

PAUL & SON, THE OLD NURSERIES, CHESHUNT, N.,

RESPECTFULLY SOLICIT ORDERS FOR

STANDARD, HALF-STANDARD, and DWARF ROSES.

The Stock has never been equal to that now offered, either in quantity or in quality. The season is most favourable for planting, and the almost universal failure of stocks from the dry spring will render Roses scarce and dear next season.

The following are the very moderate Prices of this Season, and should be taken advantage of:—

Fine FULL and HALF-STANDARDS, good heads and roots, older kinds, 18s. to 21s. per dozen, £7 per 100.
" " " newer kinds, 24s. to 30s. per dozen, £9 to £10 per 100.
DWARFS, strong, on Manetti or own roots, older kinds, 12s. per dozen, £3 15s. per 100.
" " " newer kinds of 1868-9, 18s. per dozen, £6 per 100.
" " " novelties of 1870, 36s. per dozen.
ROSES established in pots, for Forcing or Exhibition, 30s., 42s., and 60s. per dozen.
SPECIMEN ROSES, in pots, 15s. to 42s. each.
The COLLECTION of FIFTY KINDS, as shown by us at National Rose Show—for varieties see Catalogue.
The 50 fine STANDARDS, £3 15s.; or the 50 DWARFS, 50s.

DESCRIPTIVE PRICED LIST, with special remarks on New Roses, Post Free on application.

DARLINGTONIA CALIFORNICA.

MESSRS. JAMES VEITCH & SONS

Have just received in splendid condition, direct from California, a limited number of the above, which they offer at the following low prices. Many of the larger plants have now pitchers measuring from 6 to 8 inches in length, and all are fine healthy pieces.

Smallest Sized Plants, **21s.**; fine Plants, with good Pitchers, **42s.**; a few Specimen Plants at **63s.**

SPECIAL TERMS TO THE TRADE ON APPLICATION.

ROYAL EXOTIC NURSERY, KING'S ROAD, CHELSEA, S.W.

VEITCHS' AUTUMN GIANT CAULIFLOWER.

MESSRS. VEITCH & SONS

DESIRE TO CALL ATTENTION TO THIS

NEW AND EXTREMELY VALUABLE LATE CAULIFLOWER.

It is perfectly distinct from any other sort, the leaves are long and tapering, and the habit of the plant is robust, but very upright and compact. The heads are magnificent, beautifully white, large, firm, and compact, and being thoroughly protected by the foliage, remain longer fit for use than any other sort. If sown in April it will succeed the Walcheren, and coming in between that variety and Snow's Winter Broccoli, is a great acquisition to all gardens. It was awarded a First-class Certificate by the Royal Horticultural Society, November 2, 1870, when Messrs. V. & S. were generally congratulated on having brought such a fine variety before the public. Many letters, speaking in the highest terms of this Cauliflower, have been received, and it cannot be too strongly recommended.

The following is an Extract from the *Gardeners' Magazine* of November 5, 1870:—

"Messrs. Veitch & Sons exhibited their New Giant Autumn Cauliflower, which from its gigantic size and fine appearance attracted a considerable amount of attention, and was deservedly awarded a First-class Certificate. Five or six heads were shown, the largest measuring upwards of 12 inches in diameter, and all were perfectly solid and of the purest white. It was stated that seed of the Giant Autumn, Walcheren, and several others were sown at the same time, and all the plants grown under exactly the same conditions, and that the Giant Autumn did not turn in until all the others were past. Its being fit for use so late in the season is a most important quality, and without doubt it is one of the most valuable and distinct vegetables that has been introduced for many years past."

Mr. HENRY CHILMAN, Somerley Gardens, writing in the *Florist*, says:—

"This is certainly one of the best additions to the Brassica family we have had for some years past, the heads produced by this fine sort being compact and of marble-like whiteness. From the high recommendation given to this variety in the Catalogue whose name it bears, I was induced to try it, and can fully endorse every word said there in its favour. All who have not hitherto included this variety in their Seed Lists would do well to do so; there is little doubt of those who have once tried it neglecting to do so again. The crop we are now cutting gives promise of a supply for five or six weeks to come."

In Sealed Packets, 2s. 6d. each.

The following Seedsmen have obtained a supply direct from us, viz.:—

Messrs. Barr & Sugden, 12, King Street, Covent Garden
" Carter & Co., 237, High Holborn.
" Jas. Dickson & Sons, 102, Eastgate Street, Chester.
" E. G. Henderson & Son, St. John's Wood.
" Hurst & Son, 6, Leadenhall Street.
" J. & C. Lee, Hammersmith.
Messrs. Minier, Nash & Nash, 60, Strand.
" Osborn & Sons, Fulham.
" Smith & Simons, Glasgow.
" Sutton & Sons, Reading.
" Wood & Ingram, Huntingdon.
Mr. R. Cooper, 152, Fleet Street.
" R. Veitch, Exeter.

Price to the Trade on application, or of either of the London Wholesale Houses named above.

ROYAL EXOTIC NURSERY, CHELSEA, S.W.—Nov. 22, 1870.

BARR & SUGDEN,

12, KING STREET, COVENT GARDEN.

THE GARDEN INDOORS—THE GARDEN OUTDOORS.

INDOORS.

What is more delightful in winter than to be surrounded with flowers—thereby conquering Nature, and bringing out the blossoms of Spring in the period of snow, and especially where the artificial appliances of glass are either wanting or limited? The Hyacinth, the Narcissus, the Tulip, the Crocus, the Snowdrop, the charming Scilla, and others, with their accommodating habits and easy culture, may be enjoyed in their full bloom, fragrance, and beauty, as much in the cottage as in the palace.

COLLECTIONS OF BULBS,

SPECIALLY SUITED FOR PRESENT PLANTING.

100 named HYACINTHS	300 SNOWDROPS
50 named POLYANTHUS NARCISSUS	300 CROCUS
	50 SCILLA SIBIRICA
200 named TULIPS	8 CYCLAMEN PERSICUM
50 sweet scented JONQUILS	50 TRITELEIA UNIFLORA

£4 4s.; half the quantity, £2 2s.; quarter the quantity, £1 1s.; eighth the quantity, 10s. 6d.

OUTDOORS.

In spring how eagerly we look for the first signs of returning life and beauty, in the wee, timid flowers that seem born of the snow, followed by the Primrose in the copse, the Cowslip in the mead, and the Blue Bell by the wayside. But what of our gardens? Too frequently empty beds, which might otherwise be clothed with beauties, for delicacy of colour, chasteness of form, richness and variety, not to be met with in the gaudy flowering of a summer flower garden. Now is the time to furnish the beds, and the following are part of the materials, to turn the wilderness of our garden in spring into a paradise of beauty.

COLLECTIONS OF BULBS,

SUITABLE FOR SPRING GARDENING.

150 HYACINTHS	500 SNOWDROPS
50 POLYANTHUS NARCISSUS	50 SCILLA SIBIRICA
	50 TRITELEIA UNIFLORA
200 GARDEN NARCISSUS	200 ANEMONES
400 TULIPS	200 RANUNCULUS
500 CROCUS	

£4 4s.; half the quantity, £2 2s.; quarter the quantity, £1 1s.; eighth the quantity, 10s. 6d.

COLLECTIONS OF PLANTS,

SUITABLE FOR SPRING GARDENING.

200 PANSIES and VIOLETS	200 FORGET-ME-NOTS
200 DAISIES	200 SILENES

and 50 sundry plants, including Spring-flowering PHLOXES, &c.,

£4 4s.; half the quantity, £2 2s.; quarter the quantity £1 1s.; eighth the quantity, 10s. 6d.

B. & S.'s CATALOGUE contains all that is necessary in Bulbs and Plants for Winter and Spring Gardening, and may be had free on application.

BARR AND SUGDEN,
12, KING STREET, COVENT GARDEN, W.C.

THE ROYAL SEEDSMEN.

CARTER'S

NEW PEAS FOR 1871.

LAXTON'S QUANTITY PEA.
Price to the Trade on application.

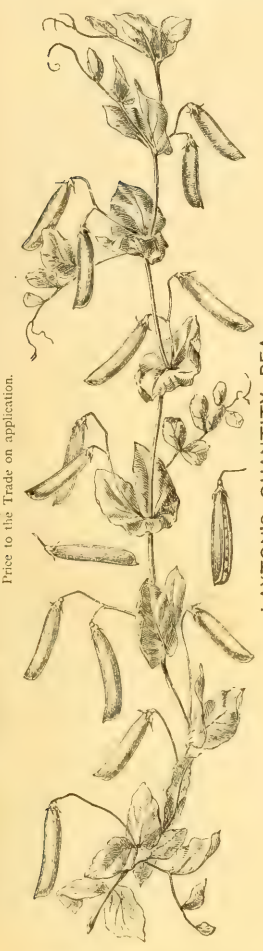

LAXTON'S QUANTITY PEA.
A fine flavoured variety, selected from "Laxton's Quality" for its robust habit and extreme productiveness; it also differs in the shape of its pods. Exhibited, and Highly Commended by the Royal Horticultural Society of London.

Stereotypes of this Block can be supplied by J. C. & Co

LAXTON'S QUALITY PEA.

A second early wrinkled Pea of great productiveness and fine flavour; it is a great improvement on all the second early wrinkled Peas at present in cultivation. Has been grown in the Trial Ground, and Highly Commended by the Royal Horticultural Society of London.

Price to the Trade on application.

EASTES' KENTISH INVICTA PEA.

J. C. & Co. having purchased part of the stock of this fine early Pea, will be happy to quote special prices to the Trade for large quantities.

CARTER'S COLLECTIONS OF HYACINTHS, TULIPS, &c.

The most liberal assortments for in and outdoor culture, 10*s.* 6*d.*, 21*s.*, 42*s.*, and 63*s.* each.

☞ As the season is now advancing, intending Planters should secure their supplies at once.

JAMES CARTER & CO.,
237 and 238, HIGH HOLBORN, LONDON, W.C.

THE

HEAVIEST CROPPING POTATO

IN CULTIVATION IS

SUTTONS'

RED-SKIN FLOURBALL.

This extraordinary Potato, SENT OUT LAST SEASON BY US, has given the most complete satisfaction. It has the peculiar merit of producing tubers all of uniform size, which are very large. While most other red varieties boil yellow, this is white, of particularly fine flavour, and is most correctly described as "Flourball." For supplying the London dining rooms especially, we feel confident it will supersede every other kind when sufficiently known. In a field where many other sorts were all more or less diseased, our "Red-skinned Flourball" was entirely free, which we can only attribute to its remarkably vigorous growth.

From Colonel J. LE COUTEUR, *Belle Vue*

"Half a peck of Red skin Flourball Potatos produced 18*9*lb weight; they are fine sized, excellent and mealy, floury, no sign of disease."

From Mr. B. BARHAM, *Gardener to the* Right Honourable Lord Ormathwaite, *Warfield Park.*

"The Red-skinned Flourball Potato you sent me is a most extraordinary kind, producing tubers varying from 1½ to 2 lb weight Certainly the largest Potato I have ever seen."

From Mr. W. F BENNETT, *Steward to* Lord Norbury, *Valence*

"The Red-skin Flourball Potatos are a first-class quality, great croppers, and quite free from disease."

From Mr C BEALBY, *Donnington.*

"The Red-skinned Flourball Potatos are very heavy croppers, several of the tubers weighing as much as 2 lb. each. Altogether they are very large size and good in form."

From F CHARLTON, Esq., *Ollerton House*

Oct. 22, 1870.—"I have forwarded to your address, by Great Northern Railway, a small basket containing a sample grown from the peck of Red-skinned Flourball Potatos you invoiced to me on January 15 last I do not know whether you will consider the Potatos of extraordinary growth, or only what is commonly produced from this particular kind of seed. My gardener informs me one of the samples sent weighs 2 lb good weight, and that the average of the lot sent to you is nearly one pound and a half. The product he considers an exceptionally fine one."

From Captain HERON, *Manley Hall.*

Oct. 26, 1870.—"I consider your Red-skinned Flourball Potato a good cropper and good eating Potato, and so far quite free from disease. I shall be glad of a couple measures more if you have them to part with."

From Major CLARKE, *Wilton Park.*

Oct. 26, 1870.—"The Sutton's Red-skinned Flourball Potato is very prolific, quite free from disease, very handsome, and beautifully white."

From R. P AMPTHILL, Esq., Q C (M P), *Wyckhold Hall*

Nov. 5, 1870.—"I beg to inform you that your Red-skin Flourball Potato produced this year an excellent crop, quite free from disease, and tubers of remarkable size—one as much as 26 ounces."

From Mr. F. THORNE, *Gardener to* K. D. Hodgson, Esq., *Ashgrove.*

Nov. 10, 1870.—"I have lifted the Red-skinned Flourball Potato I had from you; they are extraordinary croppers, of great size, and quite free from disease—a first-class Potato"

From the Rev H H DOMERAIN, *Wetwell Vicarage*

November 17.—"I have found your Red-skinned Flourball an admirable Potato; prolific, and unequalled for baking."

From Mr. J. BIRD, *Gardener to* R. D. Barclay, Esq., *Eastwick Park.*

November 19.—"From 1 peck of your Red-skinned Flourball Potato I have grown 5 sacks and a peck, many of the Potatos weighing over 2 lb.

We are now prepared to receive Orders for the above splendid Potato, which will be executed strictly in rotation. The retail price last year was 7*s.* 6*d.* per peck, and we had sold out before the season was half over. Our Retail Price this year is **5*s.* per Peck.**

Trade Price may be had on application.

SUTTON AND SONS,
SEEDSMEN TO THE QUEEN,
READING, BERKS.

Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (illustrated) of EVERLASTING, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

LILIUM AURATUM, &c.—English-grown Roots of LILIUM AURATUM, 12*s.* 6*d.*, 25*s.* 6*d.*, 35*s.* 6*d.*, and 55*s.* 6*d.* each, and upwards; LILIUM LANCIFOLIUM, ALBUM, RUBRUM, and ROSEUM, and all other LILIES.

See DESCRIPTIVE CATALOGUE, free on application

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

To the Trade.

HYACINTHS, TULIPS, POLYANTHUS, NARCISSUS, CROCUS, SNOWDROPS, WINTER ACONITES, &c. All first class, and of first importation, picked roots.

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

To Amateur Rose Growers and the Trade.

HYBRID PERPETUAL ROSES, CLEMENCE RAOUX and EDWARD MORREN.—These are decidedly the best of 1869, and two of the most beautiful in cultivation. Strong plants, standards, 1*s.* 6*d.*, dwarfs, 2*s.* 6*d.* each. Trade price, per doz. or 100, on application.—HENRY BENNETT, Manor Farm Nurseries, Stapleford, near Wilton, Wilts.

Vines from Eyes.

JOHN BUTCHER begs to offer the following VINES, in good strong planting Canes, 6 to 9 feet long, short-jointed, and well ripened, viz.:—

MADRESFIELD COURT, MRS PINCE'S MUSCAT, and ALICANTE. Warranted true, and very cheap for cash Price on application

JOHN BUTCHER, Nurseryman, &c., Stratford-on-Avon

GRAPES FIRST YEAR. Rods 10 feet long and upwards, will carry from 12 to 18 bunches, from 5*s.* to 10*s.* 6*d.* each, prepared without heat, and acknowledged to be the finest Canes in the kingdom.

RANSLEY TANTON, F.R.H.S., The Nurseries, Epsom.

To the Trade.

CARTER'S LIST of FLORAL and VEGETABLE NOVELTIES for 1871 is now ready, and may be had on application

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

EVERY GARDEN REQUISITE KEPT in STOCK at CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

To Architects, Landscape Gardeners, and Others.

CITY of ROCHESTER.

ROCHESTER CASTLE RECREATION GROUNDS and PUBLIC WALKS.—The Committee for Laying-out the Grounds of Rochester Castle as Ornamental Recreation Grounds and Public Walks are desirous of being FURNISHED with DESIGNS.

The work also involves the preparation of approaches and the repair of some of the walls, and the laying out of a small piece of land for building purposes.

A Copy of the Plan, showing the levels, may be obtained on application to me on and after November 28 instant, and on payment of 5*s.*, which will be returned to each Competitor.

A General Statement of the requirements of the Committee will also be furnished on application.

The Committee offer the following Premiums, viz.:—£30 to the Competitor whose Design shall be declared first in merit; £20 to the Competitor next in order of merit; and £20 to the Competitor third in order of merit.

If the Design of the Competitor declared first in order of merit be carried out by the Committee, the person sending the same is to be employed at the usual Commission, of £5 per cent, to carry out his Design.

The Designs of the Competitors first and second in merit to become and be the absolute property of the Committee, to be used by them as they may think fit.

The Committee do not bind themselves to carry out the Design decided as first in order of merit, or any other

All Designs to be sent to my Office not later than WEDNESDAY, January 4, 1871.—By Order of the Committee,

RICHARD PRALL, Town Clerk.

Rochester, November, 1870.

The Gardeners' Chronicle

SATURDAY, NOVEMBER 26, 1870.

MEETING FOR THE ENSUING WEEK.

THURSDAY, Dec 1—Linnean .. .. 8 P.M.

THAT portion of Mr. LEWIS' report, to which we have already alluded, p. 1534, which relates to Professor MAX VON PETTENKOFER'S theory as to the connection of CHOLERA with the variation in the level of the subsoil water, is very clearly expressed, as follows :—

(1). There exists a specific cholera poison, which (2) reaching the soil undergoes various stages of development, providing (3) that a certain amount of moisture is present; (4), should the ground not possess the requisite amount of moisture, or either too dry or too wet when the poison is placed therein, the latter will retain its vigour until the requisite conditions return; but (5) these having returned, it does not follow that an epidemic will forthwith break out, unless (6) certain meteorological conditions are present (the precise nature of which is unknown), and especially there must be (7) a predisposition to the disease in persons coming within the area in which the poison is found.

Both in Dr. HALLIER'S and Prof. PETTENKOFER'S theory an organised germ is supposed; but while Dr. HALLIER asserts that it is of a fungoid nature, the latter leaves it doubtful whether it is an animal or vegetable germ.

Mr. LEWIS has taken great pains to examine the nature of the subsoil in places which have notoriously been most affected with cholera, and has figured the bodies which have been developed in moistened soil from Meerut and Peshawur. These belong mostly to low animal forms, as Monas lens, Amœba, Euglena, Panophrys, &c. In one case he observed septate spores, which might belong to individuals of more than one class of Fungi, and on others the doubtful bodies known under the name of Vibriones. There was nothing, however, as far

as his observations already go, to confirm Professor PETTENKOFER'S views, which, however, as regards the condition of subsoil water, without reference to the question of organised germs, undoubtedly require further investigation.

Dr. BUCHANAN, one of the distinguished sanitary officers of the Medical Department of the Privy Council, testifies to the matter-of-fact portion of his statement, viz., the connection of certain diseases with the level of the subsoil water, though he explains it in a different way; and we may remark, that the place from which we are writing was notoriously subject to fever, though the subsoil is gravel, till the level of the water was permanently altered by extensive drainage.

We have given Mr. LEWIS' remarks almost in his own words. It is of course impossible for us to go through the details of his observations, which for the present are confessedly incomplete, but the subject is too important in its physiological, no less than its sanitary aspects, to pass it by altogether. *M. J. B.*

WE lately observed that some little discussion had been going on in the pages of one of our local contemporaries (*Kensington News*) about the merits of the "FLOWER WALK" in KENSINGTON GARDENS. It appears that some heretic had dared to doubt the surpassing excellence of that triumph of horticultural genius, and he had accordingly been denounced as heresy should be by the orthodox.

The incident set us thinking how difficult it is to judge matters of taste and effect upon any fixed principles of art. As the West-End reader may be aware, the "flower walk" is a favourite promenade for the Kensingtonians, especially the very young members of their body, and those to whom the future rectitude of their backbones and dispositions is entrusted. It is a long walk running along the south boundary of the Kensington Gardens, parallel to the railing which separates it from what was the continuation of Rotten Row. It is perfectly straight, narrow in comparison to its length, and has on each side a flower-border about twice its breadth, backed with shrubs and low trees; there is nothing of the nature of a vista at either end; in reality, the ground is a little higher at one end than the other, but it looks as if it were level. The reader will see that the basis has nothing in particular to recommend it; it would appear to have all the worst faults that the plan of a flower-walk could have; and yet, by a judicious use and intermixture of shrubs and trees, it has been made a charming walk, which is very deservedly popular. A weeping Elm has been most dexterously and happily treated so as to throw a branch like an arch over the walk; and although there is nothing at the end to form a picture for this frame, the frame is so pretty that one never misses it, and the eye is satisfied with the mixture of colour and foliage which lines either side of the path.

The moral that we draw from this is, not that the original plan in such matters is of little moment, but that however bad a plan may by force of circumstances be pressed upon a gardener, he need never despair. The resources of Nature are infinite, and a judicious use of handsome trees and shrubs, well tended and healthily grown, will enable him to turn defects into beauties, and to introduce the charm of variety and grace where sameness and stiffness might seem to have marked a spot for their own.

—— NONE of us fail to admire the great beauty of the HORSE CHESTNUT TREE when clothed with its glorious racemes of white flowers. It is at once the most striking, beautiful, and grandest of all our large flowering trees; whether simply as an ornamental tree, as a single specimen on our lawns, or as an avenue tree, it is the most noble. Its great massiveness of character—its large, deep green, and beautiful foliage, its freeness of growth, and its hardiness, all combine to make it the most useful and generally adopted; and when in flower we all pause to admire it. Such is the common Horse Chestnut (*Æsculus Hippocastanum*), the one which we most commonly meet with. It is to see the great avenue of Horse Chestnuts when in flower that the people of London flock year after year in tens of thousands to Bushey Park in the month of May. Those who have once seen this grand avenue can never forget it, with its miles of Horse Chestnuts in full flower. It is simply a glorious sight. In the great beauty of all the varieties many may not have observed that some are more handsome than others; some have larger and finer spikes of flower than others, and so present a more handsome appearance. In the gardens of the Royal Horticultural Society at Chiswick, where the collection of ornamental trees is most varied and extensive, in that portion of the ground which will shortly be given up for building purposes many varieties of the genus Æsculus exist, which are very distinct in appearance and character. There are two trees in particular, which for some years past have greatly attracted our attention. The flower-spikes on these are almost twice the size, and twice as beautiful as the ordinary one. The leaves of these trees, too, are very distinct, being much larger in every way, and of a paler and more delicate green colour. Many visitors to the gardens have noticed the exceeding beauty of these trees, as compared with the common variety growing beside them. To further satisfy ourselves on this point, we have compared specimens of the flowers and leaves with those in Bushey Park, Kew Gardens, &c., and can find none to equal them; and this, the most beautiful of all the Horse Chestnuts, is called Æsculus ohioense, the Ohio Horse Chestnut. Such is the name, at all events, which it has borne and still bears at Chiswick; and it would be well for Fellows of the Society to secure buds of these trees ere they become doomed by the builder. In DE CANDOLLE'S "Prodromus" we find Æsculus ohioense noticed and described as having the "flowers white, numerous, racemose," and the "fruit about half the size of the common," which scarcely agrees with the examples at Chiswick, the flowers of which do not differ in appearance, only in the spikes being larger and far finer; the petals have the same bright rosy tip. The leaves are larger and of a paler green, and the seed is much about the same, or of the average, size. In some other botanical works Æ. ohioense or ohiotense seems confused with Æ. pallida, and Æ. glabra; but from these it is very distinct. We simply call attention to Æsculus ohioense as it is grown at Chiswick.

—— We are delighted to find that our Government are not the "Philistines" they have been represented to be. Not only will a ship be furnished to convey the observers of the approaching ECLIPSE to Spain, but funds to defray the transit of the astronomers to Naples will be forthcoming, and a ship to carry them on to Messina. The various European Governments have been requested to aid, and generally the influence is being brought to bear in every way. The whole blame for the delay, says *Nature*, must fall on the representatives of science—the joint committee. This is rather a mortifying conclusion to arrive at; but in any case we are glad to find that satisfactory conclusions are likely to be arrived at, and that our Government is absolved from blame.

—— We have been favoured by Sir W. C. TREVELYAN, Bart., with the following communication, in reply to a question, whether, in the interests of science, BOTANICAL SPECIMENS, of no commercial value, could be transmitted, as formerly, by SAMPLE POST:

"General Post Office, London, Nov. 18, 1870.

"Sir,—In reply to your letter of the 9th instant, I have to inform you that botanical specimens are not transmissible by pattern post, as they cannot be regarded as *bonâ fide* trade samples or patterns, to which the pattern post is restricted. I have, &c,

"JOHN TILLEY."

This restriction is so vexatiously absurd that we think a little pressure on the part of those interested would ensure its removal. There can be no question, judging from the experience we ourselves have had, that the restriction in question entails a direct loss to the revenue. Our Government is not insensible to the considerations of £ *s. d.*, and hence there are grounds for hope that a return to the old system will, sooner or later, be made.

—— We learn that, on November 14, our correspondent, Mr. ALEXANDER DEAN, was presented with a watch by the members and friends of the Shirley, Millbrook, and Freemantle Horticultural Society, on his leaving Old Shirley, for his new residence at Bedfont, Middlesex. The chairman of the Society, Mr. W. F. MAYOSS, in presenting the testimonial, said that, in looking back through the past history of the Society, and watching its progress from childhood to manhood, he did not forget how much was owing to the persistent and strenuous efforts of Mr. DEAN, both in its organisation and support; and that, not like those who would kick away the ladder on which they had risen, they had wished to present him with some small token of their regard, but the true reward would be his consciousness of their feelings.

—— We learn that a committee has been formed at Stamford, under the Presidency of THOMAS LAXTON, Esq., to take into consideration the proposed GARDENERS' PRIZE scheme, suggested in these columns by Mr. GILBERT, of Burghley, and to settle the preliminary matters in connection with the same. The Marquis of EXETER has been pleased to head the subscription list, with the sum of £5.

—— Among newly published books we may refer to a second edition of Professor BENTLEY'S *Manual of Botany* (CHURCHILL), long a favourite text-book with medical students. The physiological portion, which seems somewhat meagre, has been revised by Dr. TRIMEN, and the whole work has been very carefully revised, and in some parts re-arranged and rewritten, so as to adapt it more than ever to the requirements and convenience of students.—A second edition of Mr. C. GROOM NAPIER'S capital little book on the *Food, Use, and Beauty of British Birds* (GROOMBRIDGE) has also been issued. We had occasion to speak in terms of commendation of the former edition, and can do so now with even more reason. To the present edition is prefixed, by way of preface, the Act, passed last year for the preservation of sea-birds, an Act we are glad to learn, that has already produced good results. A similar Act for the protection of land birds would be even more beneficial to gardeners and farmers, though, in the face of some arrant depredators, they are not always willing to admit the fact.—Messrs. GROOMBRIDGE also publish what appears to us to be a very sensible little treatise on *Home-made Wines: how to Make and Keep Them*, appropriately written by G. VINE. It is too late in the season to set to work with Grapes, Rhubarb, Cowslips, or numerous fruits, but the reader will find in the pages of the book we are referring to instructions for the manufacture of wine from Lemons, malt, Oranges, Raisins, Parsnips, and Turnips, all of which may be proceeded with now. The directions seem simple and clear, but we have no experience of the result of the process. Turnip wine is stated to be much recommended for persons of gouty habit. We are disposed to wait till gout comes before partaking the wine in question, at least as a beverage.—A second part of the *Farm, Garden, Stable, and Aviary*, devoted to "the garden," and edited by J. E. B. C. (HORACE COX, 346, Strand), has just been published in a second edition. It appears to be a mere reprint or *rechauffé* of articles published at various times in the *Field* and other journals. As the articles are arranged in alphabetical order the book may be serviceable to the experienced gardener who wants a hint, but it is not so well suited to the wants of the amateur or inexperienced practitioner.—A second volume of the *Birds of Norfolk*, by HENRY STEVENSON (VAN VOORST), has been issued, and sustains the high reputation which the first volume gained from its wonderful word-painting of scenery, and the accuracy of its accounts of the appearances and habits of birds. At third volume will complete the work.—Under the title of the *Best of Everything*, Messrs. KENT & CO. publish an *olla podrida* on the plan of that very popular book "Enquire Within," and indeed compiled by the same Editor. The title is somewhat ambitious, and should rather have been "Something of Everything"—good, bad, and indifferent, from the treatment of sick parrots to the consideration of the Married Women's Property Act.

—— A correspondent asks us to request nurserymen to LABEL the TREES and PLANTS which they send out in a more intelligible manner. He complains that the names, as a rule, are so badly written, that in the case of fruit trees, which bear common or "fancy" names, they cannot be recognised as quickly as they should be; and suggests that printed labels should be used as freely as in the seed trade.

—— The MAXIMUM TEMPERATURES of the AIR in England during the week ending November 19 ranged from 51°.4 at Portsmouth (extreme South) to 41° at Newcastle (extreme North), showing a range of 10°.4 between these two stations; the mean of all highest for the several stations was 45°.9 In Scotland the maximum temperatures ranged from 45°.2 at Leith to 42°.9 at Aberdeen, with a mean for all stations of 44°.3. The two extremes of the MINIMUM TEMPERATURES in England were confined to the two northern stations, Hull and Newcastle, 23° being recorded at the former and 31° at the latter station; the mean for all places was 27°.7, which is 2°.8 lower than the mean for the several stations in Scotland, viz., 30°.5. The MEAN TEMPERATURES in England ranged from 40°.2 at Portsmouth to 32°.3 at Hull, with a mean for all stations of 36°.7; whilst in Scotland they ranged from 39° at Perth to 37°.2 at Glasgow, with a mean for the several stations of 38°.3, being 1°.6 higher than the mean temperature of England. The RAINFALL: More or less rain was reported as having fallen throughout the two countries, the heaviest falls, however, being confined to Scotland. In England the largest amount registered at any one station was at Liverpool, viz., 0.90 inch, and the smallest at Hull, viz., 0.16 inch, with a mean for all stations of 0.44 inch; whilst in Scotland, at Greenock and Perth, the falls amounted to 1.30 inch and 1.64 inch respectively: the mean for the several stations exceeded that of England by 0.34 inch. (See Mr. GLAISHER'S Tables in our present issue.)

—— From America we learn that it is in contemplation to make a collection of Oaks in Fairmount Park, Philadelphia, in commemoration of the MICHAUX, father and son. The MICHAUX GROVE is to consist of two Oaks of every kind that will endure the climate. It will be remembered that the elder MICHAUX was the author of the "Histoire des Chênes de l'Amérique," while the son published the valuable "Sylva Americana." The Grove is to be maintained by the income of a legacy of 6000 dols. bequeathed by the younger MICHAUX to the American Philosophical Society in trust for arboricultural purposes, which legacy is now devoted by the Society to this use.

—— The medical papers record a case of supposed POISONING by the BERRIES of the GUELDER ROSE. The whole case is built on assumptions, for it was not

shown that the child whose death was the subject of inquiry had eaten any berries at all, and no evidence was brought forward to show that the berries of the plant alluded to, even had they been eaten, would have produced fatal effects. The stomach was perfectly empty, and no poisonous substance and no signs of poisoning were discovered, hence it was concluded that death had been caused by the absorption of the active principle of some narcotic poison! We have not the whole of the evidence before us; perhaps if we had we might not think, as we do now, that the conclusions arrived at by the doctors and the jury were singularly inconclusive. We may add that in Norway the berries of the inculpated plant are commonly eaten.

—— The most extensive of the COLONIAL FLORAS projected by the late Sir W. HOOKER—that of AUSTRALIA—is, thanks to the untiring industry and sagacity of its authors, Mr. BENTHAM and Dr. F. VON MUELLER, approaching completion. The fifth volume, containing the Proteaceæ and other orders, has recently been published (REEVE & Co.). The materials for this vast undertaking are collected in Australia, submitted to a preliminary investigation by Dr. VON MUELLER, and then forwarded for comparison with European collections and descriptions by Mr. BENTHAM. In this manner, more than 50 large packing cases, containing nearly a thousand bundles of dried plants, with notes, have been forwarded from Melbourne to Kew, hitherto without accident. As this work must form the basis of all future researches in scientific or economic botany, so far as Australia is concerned, it is impossible to over-rate its importance.

—— The following additional subscriptions to the RIVERS PORTRAIT FUND have been received:—

Bass, A., Esq., Moat Bank, Burton-on-Trent	..	£1	1 0
Bromfield, Rev. R. O., Sproughton, Kelso	..	1	1 0
Burnell, Mr. E., Chappel, near Halstead	..	0	10 0
Moody, Mr. H., Bury, Lancashire	..	0	10 6
Saltmarsh & Son, Messrs., Chelmsford	..	1	1 0
Tweedale, Mr. W., Bury, Lancashire	..	0	10 6
Wesselhoeft, Mr. John, Hamburgh	..	0	5 0

—— The war, in the exercise of its remote influences is, according to the *Times*, giving at the present time a twofold prominence to the Island of MADEIRA. Coincidently with the neglect of the vineyards of France and Germany, an overflowing vintage has been gathered in. A large increase of produce was naturally expected from the progress of an extending Vine culture; but a circumstance apparently trivial, a general paucity of seeds in the Grape, was unforeseen, and has caused the yield to overflow the provisions of the most liberal calculations. There is a scarcity of casks to store the new wines, the few coopers on the island not being able to meet the demand on their labour. The absence of seeds, however, is stated by Dr. GRAHAM, a Madeira authority, to be a constant result of a moist winter and spring. As a health resort, also, Madeira now obtains unwonted prominence by the defection of the popular winter retreats of the South of France. Notwithstanding the suggestions of circuitous routes to avoid disturbed districts, many persons prefer facing a sea voyage to the doubtful society of an excited and revolutionary population.

—— In a paper lately read before the Royal Society, Mr. BROUGHTON gives the result of some chemical and physiological experiments on living CINCHONA PLANTS grown in the Neilgherry Cinchona plantations. From these experiments it would appear that the alkaloids, quinine, cinchona, &c., exist in the cellular tissue of the living bark in combination with tannic acid. These "tannates" are supposed to be formed in the cells in which they are found, and not transferred from other portions of the plant. The effect of the sun's rays falling on the bark, either while still living and on the tree, or when separated, is shown to be prejudicial to its contained alkaloids.

New Garden Plants.

JACOBINIA CILIATA. *Nees ab Esenb. in D.C. Prod.* xi. 331.

Caule quadrisulcato, juvenili puberulo; foliis lanceolatis, acuminatis, brevipetiolatis, glabris; floribus in apice ramorum axillaribus, subsessilibus, oppositis; bracteis bracteolisque lineari-setaceis, longe ciliatis, calyce longioribus; corollæ tubo labia æquante.

A flowering specimen of the above Acanthad has been kindly submitted to us by Messrs. Veitch. It is not only interesting as a novelty to our gardens, and as a free flowering stove shrub, but also from the locality where it was discovered. The plant in question was originally described from specimens collected by Tweedie in Chile (St. Jago), but subsequently specimens were collected in Central America (Panama), by Seemann, Sutton-Hayes, &c. The present example was discovered in Venezuela. The range, then, of this heretofore little known species is very considerable. The plant has much the appearance of the old Justicia anisophylla, having the same general habit and form of leaf, but in the flowers it more resembles an Eranthemum. The flowers are densely packed in stalked axillary clusters, and as they are very freely produced, and open in succession, the plant has the desirable quality of being what is termed a "continuous bloomer," at any rate, in the dull season when flowers are specially valuable. The leaves are lanceolate, glabrous. The bracts and calyx-lobes are linear-lanceolate and ciliate. The corolla-tube is cylindrical, bent towards the apex, and longer than the calyx; its limb is distinctly two-lipped, ringent, and of a purplish colour; the upper lip consists of two linear-oblong segments, the lower of three broadly ovate or rounded lobes, of which the central one is rather the largest, and marked with white streaks. The stamens, two in number, spring from the upper part of the tube of the corolla. The anthers are exserted, two-lobed, the lobes divergent at the base, from the great width and thickness of the connective. The ovary is oblong, ciliated, girt at the base by a fleshy, cup-like disk, and surmounted by a long, slender style, ciliated at the base. The stigma is somewhat dilated and divided into two appressed, roundish lobes. The fruit is capsular, ovate-acute, two-valved. The seeds are attached to thick, cup-shaped processes or retinacula. The plant will prove a desirable addition to our list of winter-flowering stove shrubs. *M. T. M.*

*PLANTS AS MANUFACTURERS.**

WE have been accustomed to admire plants for their beauty, to love them for their sweetness, and to prize them for the value of their products. But few have any clear notions concerning the arduousness of their labours or the importance of the work which they perform. The life of plants seems to us a life of ease, a season of quiet repose, a waiting for all things to be done for them. Such views are wholly mistaken. No life is less selfish, none more fully occupied than that of a plant. The fact is, we have treated our plants very much as we have done our human flowers. We too often ignore their real life work and sterling merits, and then weave a sort of fairy veil of fiction and romance wherewithal to adorn them, as we think; but such meretricious ornaments only disfigure or conceal their beauty, tenderness, and love. It is with plants as it is with Eve's fairest daughters. No one can be insensible to the charms of a pretty face; it attracts like a magnet; but when we come near to confess our admiration or adore its beauty, and find mind and heart, voice and character, all in harmony with that face—then—well then we find an angel, and can but wish to possess, and, to use the language of the Prayer-book, worship her. Now every plant is such an angel. Its worth and its work exceed its beauty. What it is and what it does is of more importance to us than what it looks. Not that I would decry beauty. It is a heaven-sent boon. And I like to picture our great Father filling the earth with all things needful for His children, and then, just as a fond mother, after packing her boy's kit or trunk will put her own likeness, wet with tears of love, in his Bible, so the Almighty, in the overflowing tenderness of His affection, dipped His hand in glory and strewed beauty broadcast over the earth and across the heavens, in order that we might all see it together, and be glad.

But my theme is not the beauty of plants, but their work. Of course it is impossible to ignore the fact that the workers are beautiful, and like much of the work appointed to our daughters of beauty, the work of plants is mostly hidden from common eyes. We hear much about the rights of woman, perhaps it is needful to extend them. But no one can rob her of her highest prerogative, that of smiling her sweetest smiles, and doing her noblest work within the secret chamber of her home. Silently as the dew she refreshes all; softly as the sunlight falls upon the leaves her work is done, without noise or confusion. It is very much thus with plants. They are manufacturers, it is true, but we never hear the clink, crash, whirr, or deafening din of their machinery in motion. They darken the heavens with no reeking clouds of foul smoke, no hissing volumes of spent steam. They both spin and weave, but no rush of spindles or sound of shuttles is heard. They pack up millions of tons of goods for transportation to the farthest ends of the earth, without the aid of hydraulic pressure or huge packing-boxes. They lift thousands of tons of water and produce from the earth into the air, without the help of cranes or lifting tackle of any kind. This noiselessness is the more marvellous, when we remember that there is no division of labour in those plant factories. Each does all its own work for itself. Finishing houses are unknown in these factories; and what perfection of finish we have in leaf and flower, and root and branch, timber and bark! What artist could meddle with but to mar the finish of that fine fruit and those glorious flowers we have seen here to-day. You can do great things in the way of manufacture. The raw material of the world comes into your ports, and your exports are the admiration, envy, and delight of all nations. But in design, in texture, in skill, and in finish, plants are far in advance of all human manufactures. No skill of man can create a living Daisy; but observe that humble plant, spreading its few simple leaves on the ground,—it takes a few atoms of earthy matter and compounds them with some raindrops and a sheathful of sunbeams, and forthwith the

"Wee, modest, crimson-tipped flower"

opens its eyes to gaze upon the sun.

From these general remarks let us descend—shall we not rather say, ascend?—to particulars. The basis of all manufacture is raw material. Without this nothing can be made. Whence comes the raw material of plants? They are rooted to one spot, and have neither carriers, railways, nor fleets of merchant vessels at command. How, then, do they get the raw material to keep their factories going? In the olden times rocks were rent, avalanches rolled, water dashed and leaped with wild and hurried steps, strata were denuded and upheaved, volcanos shot out flames of fire and showered forth red-hot ashes, and myriads upon myriads of living things lived and died and found graves in this great globe—the earth—before the raw material for the basement floor of this great plant manufactory was provided. And now plants draw their raw material from the earth, from the waters above, upon, and under the earth, and from the invisible air.

The wind is freighted with fresh supplies of raw material for plants, the clouds are their water carriers, the lightning their swift-winged messenger to announce their wants in cloudland or across the earth or ocean, and bring back tidings of coming cargoes. The four so-called elements of the ancients, earth, air, fire, and water, are laid under contribution by plants. They absorb, utilise matter in all states and conditions—solid, liquid, gaseous, visible and invisible, clean or foul, comes equally welcome to plants. We hear of great things being done by the use of waste. Old and apparently useless matters are torn up and fined down, and new products spring forth as if by magic. Fortunes have been built up out of shoddy. Plants are likewise distinguished in this line. Theirs is the largest shoddy factory in the world. They are Nature's universal scavengers, always sweeping up, utilising, transforming, glorifying, dirt, shoddy, waste, and converting it into products of the highest value. Nothing escapes the keen, eager search of plants. They question the winds in their hurried courses, and ease them of their loads. They invite the dew to adorn them with its necklace of pearls, that they may drink in its nourishing sweetness. They tenderly, firmly hug all kinds of earth, that they may take all they need for themselves out of it. They run up into, and wave themselves about in the air, that they may feed upon its carbon and ammonia. In one word, their field for the supply of raw material is the world; and having done their best to empty it, they turn their pleading flowers and inviting leaves towards the sun, and proceed to do their utmost to absorb all its heat, to use up its light, to exhaust its chemical forces, and empty it of its energia, or life-giving powers. Such is the baldest possible outline of some of the chief sources from which plants draw their supplies of raw material.

No sooner are their factories furnished with these, than forthwith they hasten to convert them into finished products. But to this end motive power is needed. Rest is the grave of production, motion its life. Whence this bustle and stir in these great centres of industry? You are all busy as bees, either in the act of manufacturing or in removing the things made, from where they are not wanted to where they are. To alter the form, character, place of matter, these are the foundations of your industry, the basis of your commercial greatness. It is these pursuits that block your railways with traffic, crowd your river with shipping, fill your shops and warehouses with the riches and wealth of the globe. But the cause of all this is moving power employed upon raw material. Steam, human strength, and skill keep all the machinery in motion, and you are rich and prosperous just in proportion to the time and energy with which productive force moves. Plants form no exception to these laws. They can manufacture nothing without moving force, and that force is never absent, unless it is bound in the iron fetters of frost, or arrested by the colder grasp of death. True we cannot hear the rush of the sap, the heat that quickens falls softly on leaf and flower, like the fond mother's kiss on the lips or cheek of her sleeping infant. Chemical compositions or decompositions which are incessantly proceeding in plant factories give forth no sound. The lightning plays among leaves and flowers without scorching spot or hissing noise. The energia of the sun stimulates the life of the plant to the utmost, though the summons to awake is unheard by mortal ear. But is there, therefore, no motion? Nay, are not all the greatest movements in Nature silent? We hear not the stars in their hurried courses. The daily revolution of the globe gives forth no crashing intonation.

The motive powers used in plant factories are various—heat, light, chemical affinity, and life are probably the chief. It is impossible to dwell upon either of them. Life and heat are perhaps the most important, and between them they do an amount of work that is perfectly astounding. We know little of either; possibly they are closely related, almost synonymous. The sun in a secondary sense may be said to be the source of both, but they work everywhere to produce motion. Between them they set and keep all the fluids of plants in perpetual movement, and these fluids are the carriers of nearly all that is needed to build up structure and manufacture produce. Independently of the force expended on production, plants perform other and highly important work. They pump a great proportion of the water of the world, and thus enrich and fructify, by watering the earth. The sun is the greatest, strongest raiser of water. But the sun and the atmo-

* Read by Mr. D. T. Fish, at the Gardeners' Soiree held on Tuesday evening last, in connection with the Liverpool Chrysanthemum show

sphere draw their supplies chiefly from the surface of the earth, rivers, and oceans. The roots of trees go deeper down for their water, and the leaves distribute this water at a high elevation. What the force of steam is to your factories, these and other forces are to plant manufactories. They pervade, move, quicken, drive the entire machinery of production. Every part of the plant is set to work in extending, spinning, weaving, transforming, finishing something. The designs are most perfect, the products more varied than can be enumerated or imagined. Do you ask what plants make? Rather inquire what they do not make. They make fruit, flowers, corn, wine, oil, gum, resin, pitch, timber, Cotton, Flax, fibre, Tea, Coffee, starch, Rice, spices, acids, perfumes, and medicines. They have mainly formed the tilth of our fields—they constitute our coal measures. And all these things are made out of the most unlikely elementary materials.

Consider the Lilies, the Roses, the Violets, in their sweetness; the Orchids in their gorgeous colouring and marvellous beauty of structure, perfect mimics of some of the most exquisitely and elaborately formed insects. Look at the Oak tree in its strength, and the tiniest Moss in its shrinking weakness; then remember that a few morsels of solid matter,—a few drops of water,—some fleeting sunbeams with invisible food searched out of the air, have formed them all. These are brought in to those marvellous manufactories, plants, and forthwith duly delivered is all this beauty, sweetness, and glory. The transforming powers of plants are beyond comprehension. For what skill of man could compound such a varied bouquet of sweet odours from such crude elementary matters as these?

Do you ask if over-production is ever known in these plant factories? Well, sometimes, though it is not the evil that it is among you. For the very act of production is almost as serviceable to us as the products manufactured. Incidentally, as it were, the mere working of plants fills our rivers and purifies our air. Then there is no waste in Nature: "Gather up the fragments that remain, that nothing be lost," is her constant practice. What is not needed to-day will be wanted to-morrow. There is a case in point. Ages ago the world seemed in danger of being engulphed beneath the *débris* of plants. The strongest forms of plant life, stimulated by a hot steaming atmosphere, rushed up as if by magic. They decayed almost as rapidly. Decomposition added fuel to the energy of growth. The living fed upon the dead. A great contest raged throughout many ages between life and death. Production and destruction, growth and decay, ran a neck and neck race for the mastery of the world, and production won the race. The earth groaned beneath its huge load of carboniferous *débris*. At last its back bent and broke with the sheer weight, possibly; then there came a subsidence or overflow—a hotpress fresh strata rolled over—and the coal measures were fomed. And now, at the present moment, we are warmed by the heat, lighted by the light, and derive most of our working force from the energy of primeval suns. Had we seen all this we should have cried out what a shameful loss; but a greater than man said "Gather up the fragments" for the homes, the factories, the railways, the steamships of my great family in the nineteenth century, and all succeeding ages. And thus it came to pass that we filled our coal cellars with the carbon of the old world.

Many of your manufacturers excel in the art of packing, but never were goods so well or so closely packed as the coal measures. Living plants are likewise most skilful in this line. All their products are done up in handy bundles for transportation or conveyance to the end of the earth. Fancy the trouble it would have been to us had Wheat grains been the size of quartern loaves, Peas like dumplings, or Apples big as Pumpkins. A philosopher is reported to have once lain under an Oak; he was struck by the strength of its limbs, the size of its trunk, and the symbols of its mighty power. At last his eyes rested upon an acorn within its tiny cup. Beside grew a Gourd, with its large golden fruit. "Aha!" he exclaimed, "there is no God, for if there is he is neither Almighty nor Allwise. For here is a great mistake. Why was the weak Gourd chained to the cold earth with this huge fruit, while the Oak tree is only laden with the acorn. Clearly there ought to be an exchange in the produce. The Gourd for the Oak—the acorn for the Gourd." Just at that moment an acorn fell on to the presumptuous philosopher. So he leaped up, exclaiming, "God is right. Had the Gourd been raised so high and fallen so far it would have killed me."

The packages of plants are not only of the best size, but the wrappers are mostly air or waterproof. You all know the importance of this with perishable articles. Hams, tongues, meats, and sweets, can only be preserved in airproof packages. There is another singular peculiarity about the packing done by the plants. The entire plant is often stowed away within a single portion of it. Annuals are packed up within their tiny seeds, and bulbous plants within their bulbs. This is of immense importance for close stowage and safe distribution. This arrangement brings as it were the genial climes and bright suns of other countries to cheer and enliven this. What would many of our winter drawing-rooms and conservatories be without the sweetness and the beauty of good Dutch bulbs? These let loose before our admiring eyes all the grandeur and the fragrance born of John Dutchman's summer. In the same way Cape bulbs and Orchids bring to us, ready for immediate use, the glories of the tropical sunlight and the warm tints painted by the heat of such climes.

Finally, plants are cleanly manufacturers. They make little or no dirt. They touch decomposition at all points, but it is to recompose it. They absorb foul odours, but they are no longer foul, they convert them into sweetness. No law is needed to make plants consume their own smoke. They make none. No stringent enactments need to be enforced about their chemical processes: they are inoffensive. No scavengers are required to gather up their rubbish—they are their own scavengers. True, many of their working hands (the leaves) only live one year and then seek a grave upon or within the earth. But these speedily disappear, and are, in fact, again taken into the factory to strengthen and enlarge it.

The penalty exacted from most great centres of manufacturing industry and commercial activity is an excess of filth in the air you breathe, the water you drink, and the earth you live on. It was recently stated that Liverpool invites any disease that may be in the air, and that its foundations are tainted with disease. Your town is about the most dangerous to live in of any in England, the rate of mortality being alarmingly high. Doubtless your shipping, your tramps, your emigrants, are all dangerous at times to your health, and you seem to have other and special centres of contamination and pollution in your chemical works, and the immense numbers of bricks burnt in clamps round your suburbs. I think I never smelt so many or such curious odours as around Liverpool. It seems as if King Sulphur had been shaking himself up, and his fumes almost stifle the breath of strangers. Add to all these the inevitable pollutions arising from work, traffic, life combustion, respiration, decomposition, all fouling your great towns to the utmost of their capacity. We ourselves die daily, and, were our eyes set to a finer vision, we should see portions of every one of us in the apparently pure air of this room.

Do you ask me what all this has to do with the manufacturing powers of plants? It has everything to do with it. I have already remarked that plants are the cleanliest of all manufacturers, but we have seen that they are also shoddy merchants. Yea, more, they are chiefly this—they deal in pollution, and it is only through plants that the great problem of the day, "What shall we do with our dirt?" can be solved. There is no other mode of extinguishing dead matter but by its conversion into living substance, and plant manufacturers are alone equal to this stupendous undertaking. All other possible means have been tried and failed. We have sent our waste up into the air, and it has returned to us in fevers and pestilences. We have turned our streams of reeking sewage into rivers and seas until our great drinking cisterns have been poisoned at their sources. Then the more sensible cry arose, "To the land with your foul waste!" but the earth is tolerably full of graves already, and if we turn it into a great dry-earth closet or huge sewage-sponge, there is great danger that by-and-by it may revolve round the sun a fever-stricken world of pestilence and death. The antidote to pollution is living plants; these absorb, transform, utilise, and annihilate it. They weave these elements of disease and death up into the very staff of life. You tell me that such manufacturers do not thrive here. The few you have refuse to grow. The remedy for this is, more of them. Send 100 brave soldiers against 10,000, and no courage or skill can save them from destruction. It is just so here: pollutions abound in all directions, and you send out against them a few ragged hosts of weakly trees. The chief remedy for your alarming death-rate is more trees around your suburbs, all your open spaces filled with sweet flowers in the centre of your magnificent city. Fight fever with the sweet incense of lovely flowers, annihilate it with the absorbing force of fever-consuming leaves.

I think this city has the credit of being constitutional. Its voice is often raised against any change that might shake the stability of the British constitution. "The constitution is in danger;" one more perfect, more venerable than that you so much revere is in imminent peril. Your life depends upon its being maintained inviolate. The balance of parties, or rather forces, in the atmosphere is in great danger of being upset. A tremendous run is made in these centres of life and hives of industry for oxygen. You neither live nor work without it. On the other hand, whole volumes of dead carbon and other pollutions are thrown into the atmosphere. An actual scarcity of the former, and an excess of the latter, means suffering or death to us all. How shall we rally to the defence of the atmospheric constitution? We have no choice of instruments, we have but one; but that is all-sufficient. Plants alone can drain the air of its excess of carbon, and return to it a pure stream of oxygen. Every leaf, stem, and flower is employed night and day in restoring the atmospheric balance to an equilibrium. And, upon the whole, they have done their work perfectly. Here and there, and over such large towns as this, there are certain changes—an excess of foreign matter, dust, &c., in the air. But, as a whole, its constituent parts are the same. To rectify these partial changes which are so fatal to health, you must plant more extensively. Girdle your city round with a wide band of grand trees and green parks. Sentinel your streets with officers (sanitary trees) at regular distances, in green or golden uniforms, that will rest not from their labours day or night, nor leave for an instant their posts of danger and of duty; enwreathe your houses, homes, workshops, warehouses, mills, and factories with garlands of leaves and flowers; crowd your house-tops, window-sills, yards, and areas with objects of beauty and fragrance; let flowers wave down to you a joy from every giddy garret, and send up a symbol of trustful hope from every deep dank cellar, until they cover and gladden the earth as the "waters cover the channels of the sea."

Plants are the true patron saints of these hard-working utilitarian times. Their perfume is the best of all antidotes to all foul odours. Their life is a warfare with elements that would be death to us. They gladden, purify, and ennoble the highways and byways of life, providing for rich and poor, manufacturer and mill hand, prince and peasant alike, those grandest preservatives of health, a clean earth, pure air, and clear water. The ministrations of plants to man are constant. They never leave nor forsake us. They meet us on the threshold of life, they abide with us to the last. None are too poor to enjoy flowers, none so rich as to be able to dispense with them. Through plants we live, move, and have our being. They distil for us the breath of our life. They raise our water; they make our food. They provide our clothing, our medicine in sickness, our strength in manhood, our sweet interpreters in love, our solace in suffering, our transfigurators at death. For are they not all ministering spirits, sent forth to minister to those who are the heirs of life? Through the agency of plants, the worlds of matter and of life are linked together; and the three kingdoms—the vegetable, animal, and the mineral—are united in bonds closer than those of holy matrimony. They clothe the invisible air, and the wondrous light, heat, chemical force, and energia of the sun with bodies of marvellous symmetry, beauty, sweetness, and glory. The Poet Laureate has said or sung, that "Nature slopes through darkness up to God." As we try reverently to look through the mist that hides the life and the work of plants from our eyes, the veil of darkness is partially rent asunder, and we exclaim as we catch a glimpse of the wisdom that plans, the goodness that guides, and the power that governs all, that Nature is indeed, and in truth, the outer fringe of the glorious garment of God.

[We heartily commend to the notice of town gardeners the eloquent—and no less true than eloquent—words of our correspondent, Mr. D. T. Fish. It must not, however, be surmised that the Liverpool folk have been idle in the matter, whatever opinions may be held as to the management of the Sefton Park. EDS.]

HEATING AND VENTILATING GLASS STRUCTURES.

UNTIL the Crystal Palace was erected in Hyde Park in 1851 we had little idea, even in this country, what extensive structures could be made by means of a skilful combination of iron and glass. To show what could be effected in that way seems to have been reserved for Sir Joseph Paxton, who repeated his grand glass experiment at Sydenham even more effectually than at Hyde Park. Of this palace of glass, deservedly considered one of the wonders of the age in which we live, there have been since its appearance among us many imitations, but as far as I know none of them have as yet equalled the Sydenham erection, either as regards form or extent. The last point is indeed that to which the building owes its importance.

Unhappy France, even with her fine gardens, lakes, and fountains, has no equal in the shape of a glass building to that at Sydenham. America is equally destitute as far as glass architecture is concerned, and so are other countries; but I understand that in Russia a grand winter garden is to be formed for the Emperor, which will doubtless be on a scale worthy of the country for which it is designed.

Among the first of our large glass-houses is that at Chiswick, the original plan of which was, I believe, that of a cross with a dome in the centre, but only one quarter of it was ever completed. Then we had the grand conservatory at Chatsworth, covering about an acre of ground, and still later one of the finest houses of the kind in the country—the great Palm-house at Kew; a large winter garden in Regent's Park Botanic Garden, and others; but none of them by any means so extensive as the Paxton house at Sydenham.

To Sir Joseph Paxton belongs the merit of bringing prominently into practice glass-houses with ridge-and-furrow roofs, by the adoption of which any amount of ground may be easily covered with glass; and what renders them so valuable is, that they are equally adapted for small and large areas.

The annexed woodcut (fig. 269) furnishes an illustration of an arrangement on this principle, designed by me for the late Duke of Bedford. Connected with it is an aviary and a pretty little flower garden with fountain; the whole being well backed up with plantations, so as to afford shelter. The buildings, it will be seen, form a square, in which one long span-roofed house in three divisions occupies the centre, and in which six shorter ones of similar form, but somewhat lower, abut upon it on either side, in front of which is a glass-covered forecourt and field on the one side, and water on the other, for the accommodation of aquatic birds. Where

ornamental poultry, or other birds remarkable for their fine plumage or other attractive properties, are kept, few arrangements could be found to suit better than this, and few could be worked with greater economy—a pipe led from the glass-houses being all that is wanted in the way of furnishing artificial heat. Under such conditions not only rearing of young birds, but the work of acclimatisation [?], might be carried on with much advantage; while in the glass-houses might be produced everything necessary for the establishment to which they belong,

The allusion just made to artificial heat induces me to say a few words more on that important subject, as well as in reference to its in eparable relative, ventilation. Neither plants nor animals can live without a good supply of fresh air; I am, therefore, always anxious to have buildings of all kinds with which I am concerned properly provided with a plan for warming external air brought into them and circulating it through them without draught or waste of heat. Even ordinary fireplaces and chambers I feed with outside air brought in under the floors and let into rooms, after being warmed somewhere about or above the mantelpieces. The following data have been furnished from a schoolhouse, in which I put the plan into operation. Both class-room and school-room were of equal size, the school-room only being ventilated with warm air on my plan: the fires in both compartments were as nearly as possible equal in size, and the following is the result:—

Time	School Room.	Class Room.	
			November 12, 1863
7.30	50	50	Fire made at 7 o'c.
10	45	40	The sun out beautifully.
11	45	40	As large a fire as possible, one valve partially open, the other shut, the door between the rooms open.
11.50	48	42	Changed the thermometer from the walls to the wood.
2.05	80	43	The school doors have been kept shut, and a good fire.
4.35	50	45	The sun out all day
			November 13
7.5	38	41	Fire made
9	44	41	The sun out. The school-room open to the class-room, the valves closed
10	46	41	
11	47	42	
11.50	50	45	
2	50	45	
3.10	51	42	A very large fire kept
			November 14
7.5	32	32	Fire made
9.5	40	39	
10.30	45	43	
2.30	47	44	A very large fire all day

From this it will be seen that the balance of heating power is altogether in favour of the chambered fireplace.

What is wanted is a proper system of ventilation, carried out on ascertained principles, which clearly shows that, in connection with the hot-water apparatus in glass-houses, there should always be a warm-air reservoir, fed from the external atmosphere, but with means of regulating the supply; and that from this there should be a tunnel led along the course of the hot-water pipes, furnished with gratings, to be shut or opened as wanted, to allow the warm air to escape into the house.

To illustrate this matter better take an ordinary stoke-hole, in which a boiler, heating hot-water pipes, is set in brickwork, surrounded by a warm-air chamber, which should open into a warm-air tunnel following the course of the pipes—and the opening, or openings, through which the warm air escapes into the tunnel from the chamber should be furnished with slides, so as to allow of its being admitted or shut off at the option of the operator. As regards the hot-air chamber itself, it should be fed from some large reservoir of cold air placed on a lower level than that of the warm-air chamber, and the cold air should be let into or shut off from the latter at will, by means of sliding ventilators or valves,—the amount of air required in summer being very much larger than is necessary in winter. Whenever, therefore, the fire is lit, the whole machinery, so to speak, will be set in motion; and in order to husband all the heat possible to be procured from the fuel, the smoke, just after entering the chimney, should be so impeded in its course by iron plates, or damper, as to make it take a zigzag route, and thus to induce it to part with its heat in the proper quarter. The success of this arrangement lies very much in having plenty of space for the warm and cold air chambers, and in having proper acting valves between the two, and also between the hot-air reservoir and the external atmosphere.

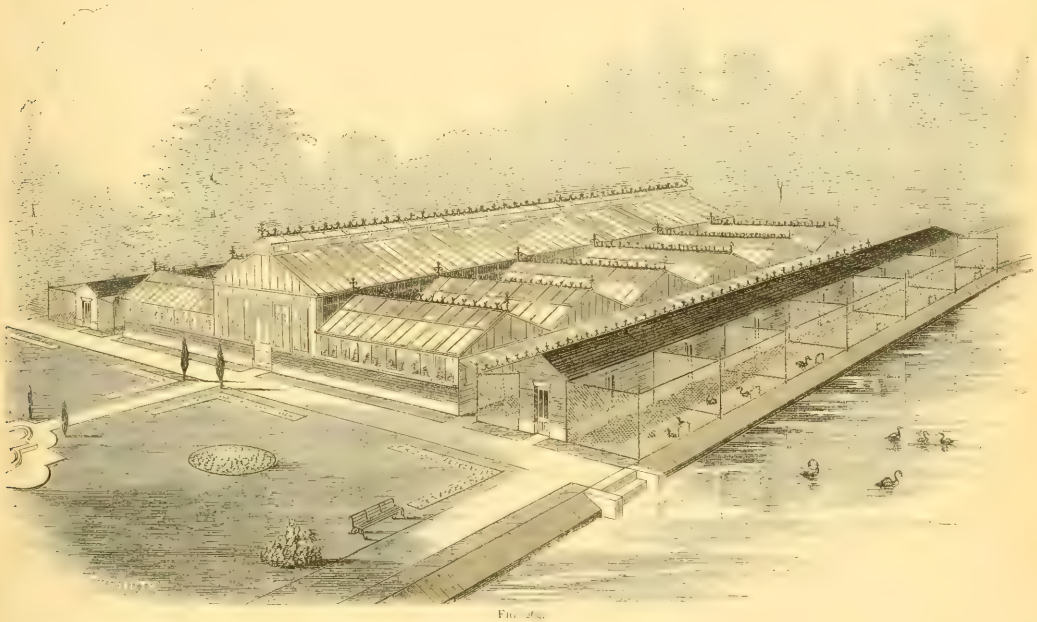

Fig. 264.

The air in a house thus warmed can never be in a stagnant, damp, or unhealthy condition. Over-heating and bad ventilation kills more than a cold atmosphere. By bad ventilation I mean air confined and over-heated through a deficiency of piping, or too small a pipe surface. According to the amount of air to be heated so must the heating power be, in order to efficiently warm its whole body. If, therefore, the pipes are too small, or have too limited a surface, and the warming medium within them has to be over-heated in order to keep up the required temperature, the air in close contact with them becomes, as it were, burned, and thereby deteriorated.

As regards the power of hot-water pipes to put air in motion, it is known from experiment that the heat which raises the temperature of 1 cubic foot of water 1° will heat 2850 cubic feet of air 1°. Suppose, then, we take a part of our heating apparatus to be a 9-feet length of 4-inch hot-water pipe, we shall find that it contains 1 foot of water, or 6 gallons. Placing this in a chamber for warming air for the purposes of ventilation, we shall find that, if we heat the water in this pipe 1° above the external atmosphere, it will require 2850 feet of air to be admitted to circulate about the building, and carry off this heat, to bring down the temperature of the water in the pipe to the same heat as that of the external air. The same principle regulates the laws of action as to any multiplication of power in the way of using heat for purposes of ventilation. For instance, if we fit up a coil of 4-inch pipes, 10 in number, of 9 feet lengths, in a chamber, the air in the chamber is increased in heating power ten times more or less in proportion to the quantity of water and piping used, and the temperature to which we heat it. Let us suppose that we have with the bends with which we form the coil of pipes 99 feet of 4-inch pipe: holding 11 feet cube of water or 66 gallons: if this is heated 1° it will take 28,500 feet of air to cool the water to its original temperature. But if we heat the water 10°, we shall also increase our warm and ventilating force ten times, and ten times as much air will be required to carry away our heat in order to bring down the temperature as before. Suppose, again, that we take the temperature of the external air to be 32° below freezing. If we wish to maintain indoors a uniform temperature of 60°, we increase the heating power, in reference to ventilation. This is a natural law, which at all times is, and will be, the same. Whatever may be the plan of our buildings, the power multiplies uniformly. What takes place in the case of the one 4-inch 9 feet length of hot-water pipe will also happen if it is 100 or any other quantity. The power of one foot of water for heating air being once found, allowing for density of the external air, we shall have no difficulty in getting at a thoroughly correct method of determining the temperature of heated air in connection with hot-water pipes; thus furnishing a reason why we want larger openings in summer than in winter, and why valves or regulators are indispensably necessary in all arrangements connected with heating and ventilating. My first calculation, I may observe, is for air saturated with water requiring more warmth to heat it than dry air.

The arrangement of the houses, which the accompanying woodcut represents, is particularly applicable to a sanitarium; for although, as a whole, they are perfectly unique, yet each is quite cut off from the other, and, if need be, might be locked up and kept private; each division might therefore have a separate owner, who could grow in it what he pleased, and in that way could gratify those predilections for gardening, which are more or less implanted in the natures of most persons of cultivated tastes.

The idea of the desirability of erecting glass-covered sanitariums in this country, affording to invalids the climate of Madeira, with home comforts, is not new. With one or two such buildings I am acquainted, and they answer the purpose for which they are intended so well that in my plan for Sefton Park, Liverpool, I made provision for a grand hotel, with connecting glasshouses, in which persons with constitutions shattered from long residence in foreign countries might find a climate suitable to their requirements, associated with a museum of living plants, many of them, it may be, from the very countries from whence they have come. In support of the utility of this scheme, I may add that glass erections, as health

improvers, have not escaped the attention of the faculty, and that medical men in London some few years ago contemplated getting up a company, to be called the Crystal Palace Sanitarium Company, having for its object the erection of places of this sort, to which they might occasionally send their patients. At Hayling Island, Isle of Wight, Bournemouth, and other south-coast watering places, there should, I think, be sanitariums having glass-covered winter gardens in connection with them, the latter being made sufficiently extensive to allow perfect freedom of action in the way of promenading or other exercise in a climate properly heated artificially with warm air, kept in constant motion in connection with efficient ventilation.

It is, however, as a neatly designed series of glass-houses for a private establishment that those under notice are brought before your readers, and for all purposes of cultivation few better arrangements could be found, combining, as they do, every requisite for the successful production of fruits, flowers, and early forced vegetables, while the aviary cannot fail to furnish additional interest. *J. Newton, Oxford Terrace, Hyde Park.*

LILIES.

(*Continued from p.* 1429.)

Japan.—The islands which form the empire of Japan are the headquarters of the genus, the portion of the globe inhabited by the greatest number and the most brilliant representatives of the group. It would appear, however, that this marvellous wealth of Lilies is not wholly indigenous, and that certain species of the genus have been imported into Japan from China, and particularly from the peninsula of Corea, a very inhospitable country for Europeans. The Lilium speciosum of Thunberg, for instance, is called by the Japanese Korai-juiri, or Corean Lily. Rigorously closed for a long time against the visits of strangers, Japan had been up to the last few years only superficially investigated by a small number of botanists, who were enabled to make a superficial study of the flora, thanks to the exceptional privileges accorded to them by a suspicious Government. Thus at the end of the 17th century Engelbert Kæmpfer owed to his profession as a physician, and to the services he rendered in that capacity, the exceptional permission to traverse a portion of this country, and on his return to Europe he published the results of his expedition in the five parts of his "Amœnitates Exoticæ." He made drawings on the spot of a number of Japanese plants, which, in 1791, long after his death, were published in 59 plates by Banks. At pp. 870—872 of the fifth fascicle of his curious work, Kæmpfer indicates, under their Japanese names, eight or nine Lilies which have been already alluded to.

The Swedish botanist, Thunberg, serving as surgeon in the Dutch-Japan Company, was enabled in 1775 and 1776 to explore different parts of this empire. I have already enumerated the seven species of Lily which he ultimately considered as new, although he had at first thought them to be the same as certain plants already described by Linnæus. He found also two others, one which he considered to be the same as Lilium pomponium (the Lilium callosum of Zuccarini), the other Lilium bulbiferum, but which Kœmer and Schultes described as L. Thunbergianum; but this was only the prelude to the discoveries, and especially to the importations, of Japanese Lilies which have been made during the 19th century. In truth for the last 50 years the acquisitions of species and varieties of this fine genus have been so great that at the present day it may be said that Japan alone equals in this respect all other countries put together. It is well, however, to observe that if we were to trust to the specific names which have been published, we should believe this Archipelago to be richer than it really is, for various plants have been considered and named as distinct species which will probably have to be united, when a careful examination, based on suitable materials, is made. Such a task would be difficult at the present time, and it is more prudent to limit oneself to the mere registration of the species that have been published.

The traveller who, without doubt, has done the most to extend our knowledge of Japanese Lilies, and has shown the greatest perseverance in introducing these plants into Europe, is Dr. Ph. F. von Siebold, of Wurzburg. Utilising for the benefit of science the relations which Holland alone, of the European states, was enabled to maintain with Japan, this zealous botanist, who was born on February 17, 1796, began, in 1823, to study the flora of this empire, in his capacity as physician to the Dutch Embassy. The object that he had in view, and which he never lost sight of till his death, was to form collections of living plants; these he subsequently despatched to Europe, either to the various botanic gardens of the Netherlands, or, more recently, to a horticultural establishment founded by himself, at Leyden, in 1844, and which was chiefly devoted to the introduction and culture of Japanese plants. Siebold established at Yeddo, in Japan, a garden in which he got together all the interesting plants of the country, and from that nursery he forwarded his supplies to Europe. Unfortunately the importations of new Lilies were not always successfully accomplished. In some cases the length of the voyage was fatal to them, and in other cases the right method of cultivation was not hit upon, so that some species of great interest have been lost to our gardens. Nevertheless, his trials were conducted with so much perseverance, that ultimately they were almost all successful, and even his death has not arrested the realisation of his plans, as his garden still remains, and is conducted on the same principles as when its founder was living. Siebold returned to Europe in the month of October, 1830, having made arrangements that during his absence Japan should continue to pay him the tributes of its plant-wealth. In 1859, when he was 63 years of age, he did not shrink from undertaking a second voyage to this far distant country, which had become to him as a second home.

The most important scientific result of the travels of Dr. von Siebold in Japan, has been the collection of the materials for a Flora of that empire. The editing of this work, the plan of which was sketched out on a grand scale, and in which fine coloured plates illustrated as complete a text as possible, was confided to Zuccarini, a German botanist of great merit, whose premature death arrested the publication of this work before the second volume was completed. The "Flora Japonica" only contained a single new species of Lily, that is to say, the Lilium callosum, Zucc. (in Sieb. et Zucc. "Flora Japon." i. 1835, p. 86, tab. 41), the Santan of the Chinese, the Fime-juri, that is to say, the pretty Lily of the Japanese; and of Kæmpfer's "Amœn. Exot.," fasc. 5, p. 871, which Thunberg had taken for the Lilium pomponium of Linnæus. Siebold endeavoured to introduce this plant in a living state into Europe, but M. de Cannart d'Hamale says that, like the Lilium maculatum of Thunberg, and the Lilium auratum of Lindley, it perished during the transit. At the present time it is doubtful whether it exists in Europe, and we have already seen that M. Leichtlin himself is not sure of the identity of the plant which he possesses under this name. Nevertheless, in the catalogue of the late Von Siebold's establishment, dated July, 1869, this species is noted as of recent introduction, and it is offered at the price of 40 francs the bulb, and it is cited at the same price in the general catalogue of the establishment for 1870-71. Nevertheless, we may ask whether this is the L. callosum of Zuccarini, as in the last catalogue the flowers of this so-called Lilium callosum are described as of a clear yellow colour, while in the description given by Zuccarini himself, the flowers are mentioned as of a fine minium-red colour, speckled with dark spots. Lilium callosum, Zucc., grows naturally in the mountainous and little wooded parts of Japan, at elevations of 165 to 650 yards and upwards, on which account it is often called "Joma-juri," or Mountain Lily. It is also cultivated in gardens, where it becomes larger and more vigorous than in the wild state. Its cylindrical, erect, simple, glabrous stem attains a height of from 2 to 3 feet, rarely more. At its base, and above the bulb, it has a number of closely-packed roots, and above this level it is marked with numerous brownish lines. Its leaves are nearly erect, narrow, and very acute, sessile, glabrous, of a bright green colour, and traversed by from 3—5 longitudinal nerves. The two or three lower ones are widely separated, while those in the centre and towards the upper extremity of the stem are much more closely packed. The upper ones become gradually shorter, and ultimately passing into the bracts, form a kind of head. The flowers of this Lily are, comparatively speaking, small, somewhat pendulous, arranged in a terminal cluster of 6 or 10 flowers each, of a minium-red colour, dotted with dark red spots, and supported on a slender stalk, about an inch and a-half in length, which springs from the axil of two linear bracts. These bracts are unequal in length, shorter than the flower-stalk, and thickened at the summit into a kind of blunt tubercle or callosity, whence the specific name. The perianth of the flower expands widely, and its segments are revolute, linear, acute, channeled above, keeled below. The stamens are shorter than the perianth and longer than the pistil. The pollen is orange. The style is shorter than the ovary.

The bulbs of Lilium callosum, as well as those of L. tigrinum, are eaten as food by the Japanese, who eat them boiled, roasted, or preserved.

(*To be Continued.*)

Home Correspondence.

Education of Gardeners.—You deserve the thanks of the profession for your able and outspoken article on this subject. I fear that your somewhat damaging estimate of the rising race of gardeners is only true. There are many noble exceptions, but in the main the standard is sinking, not rising. To stand still in these go-a-head times is virtually and relatively to retrograde. But what shall we say of those who are actually going backwards? Neither are the causes of retrogression shrouded in much mystery. Something may be put down to the frivolous tendency of the age: it lacks depth and solidity—two qualities indispensable to the making of a first-class gardener. There is no denying that the stream of knowledge has lost in depth what it has gained by diffusion. As far as individual attainment is concerned more has been lost in one direction than has been recouped in the other. The knowledge made easy by books of the present day destroys the taste and undermines the capacity for solid reading, or hard, honest, persevering study. Hence, instead of the solid, scientific, botanical, or horticultural works, that used to be actually devoured by young gardeners, you will find them now too often sighing over the adventures of Miss Evangeline Felicia Freelove, or dying with eagerness to see the end of some worthless adventurer. Even good novels, such as Scott's, Dickens', or the dramas of Shakspeare, not to name some of our best living authors, are too solid and sensible for some of the lackadaisical young men that one meets with now-a-days among the rank and file of rising gardeners. Such light and frivolous reading vitiates the mental appetite till it rejects wholesome food with something akin to the nausea that a diseased and pampered stomach loathes roast beef or plum pudding. Under such circumstances the very plenitude of wholesome food becomes a trouble. And so it is with some of your young men; they prate loudly about the abundance of horticultural literature, find fault with it all, and read none; or, if they read at all, it is so listlessly, that they neither "mark, learn, nor inwardly digest" it. Put the question to some of them that startled the solitary traveller of old—"Understandest thou what thou readest?" and the drawling answer in many cases would be, "How can we, unless some one explains it to us?" Explains! Why, our horticultural literature suffers from an excess of explanation; there is too much milk for babes, and but scant fare of strong meat for men. But, while the age and its listless idiosyncracies are responsible to some extent for the deterioration of our young men, there are other and more powerful causes at work in the same direction. Chief among them is insufficient reward. It is all very well to urge young men to raise themselves above the rank of brainless labourers, but the exhortation will be vain while the reward of their skilled labour does not exceed that of the unskilled workers. This is one of the greatest evils of gardening; unless a man really raises himself to the highest eminence above the level of his predecessors, as you put it, his remuneration is not better than a handy labourer. And if he does thus raise himself, the master gardener's wages does not exceed, it seldom equals, that of first-class mechanics. These considerations are beginning to tell with fearful force upon the supply of young gardeners. The consequence is, most of our young men are drawn from a lower grade now than formerly; their education has often been neglected, and such as it is, it is more an affair of word cramming, such as Dr. Playfair so forcibly describes, than that knowledge of things which he advocates as the basis of all sound instruction. The first is just the knowing the letters in the field of knowledge, the second is the ability to read and comprehend facts. And it is only facts that can nourish, strengthen, and expand the mind. Gardening as a science is hardly appreciated—scarcely ever rewarded. Those that grasp the handicraft tolerably well by rule of thumb, and can secure by any means—and some of the means used are dirty and despicable—the patronage of some one with power, succeed; the others, no matter what their ability, generally go to the wall. No one but a practical gardener of many years' experience can judge how little high attainments are valued. For many situations, and some of these the very highest, a reputation for scientific knowledge, and especially the ability to convey that knowledge to others, would be held as a disqualification. Writing gardeners are hardly more unpopular with the craft than with the classes above them. I have had many illustrations of this in my own experience; notably at the great show of the Royal Horticultural Society at Bury. I dragged myself from a sick bed to go down. Hardly had I entered the tent when I heard my name bandied about in a *coterie* of about half-a-dozen practicals. In front of some exhibit of mine, I forget what, stood the jeering jabberers: "Oh! yes, he can use his pen well, but did you ever," &c. But writing of exhibitions, it must have struck every one that it is only gardening as a handicraft that is rewarded. Only show good plants and fruit, and you are rewarded. But talk science, or explain to every one how they may go and do likewise, and you are fortunate if you gain a respectful hearing. We are told that virtue is its own reward, and the same may be said of science, but such rewards will neither feed nor clothe us or our children; and we find that in all other pursuits the rewards of knowledge, science, philosophy, are more substantial than are those of scientific attainments among gardeners, [?] in fact, the latter may be said to be *nil.* [?] Years ago I proposed, as one means of remedying this crying evil, that our great societies should offer a few prizes annually for the ablest essays by practical men. This was not listened to, and, if I mistake not, you poured cold water upon it by saying you did not like the prize essay system. I repeat the proposal now, and would suggest that a portion of the Veitch Memorial prize fund should be devoted to this purpose. Doubtless, the spheres of labour and of honour that you have pointed out—the Cotton fields, the Tea plantations, the Cinchona nurseries of India, and the vineyards of the Cape and Australia—open out alluring prospects of rewards for the young, the healthful, and the aspiring; but these, added to an efficient prize essay system, and much more than both, will all be needed to draw young men of talent and ambition,

and such are needed, to a profession in which the duties are so arduous, the prizes so few, and the blanks so numerous, as they are in gardening. *D. T. Fish.* [Our experience of prize essays by no means leads us to uphold the system. Eds.]

—— As a young gardener, I have read the articles in the *Gardeners' Chronicle* (pp. 1469, 1541) on the above subject, and feel very sorry to think that gentleman of experience, like our Editors and Mr. Bell, should have formed so bad an opinion of our intellectual abilities. I think the case is not quite fairly stated. 1st. You appear to base your opinion partly on the fact that the number of candidates for educational honours is on the decrease, but, I would ask, is that any criterion? Again, you say there is no lack of stimulant to exertion, "there is a greater demand for gardeners than ever." True, but has not the number of candidates, both for home and foreign supply, multiplied in a far greater proportion than that of places? Mr. Bell says we are more independent, &c. I have had but eleven years' experience in the profession, but I can freely say that for every young gardener given to drink or questionable company, with whom I have lived, there have been six the very reverse—some of whom came from the counties mentioned by Mr. Bell, and who were most intelligent, having their hours of study as regularly as those for meals. I may mention that at the place from whence I write,—where (thanks to the kindness of my employer) every possible comfort in the bothy is provided,—there are fifteen young journeymen who spend their evenings, some in botanical and others in mathematical studies, while others go into music and literature, &c.; and these young men, entirely out of their wages, keep up a reading room well supplied with horticultural and scientific periodicals, besides gradually forming a library (now of about 50 volumes), including the principal works of Loudon, Lindley, Thompson, &c., and other good scientific and educational works, for the use of themselves and those who may come after them. I have been here upwards of two years, and during that time I can affirm that there has not been one young gardener whose moral character would not bear the strictest scrutiny. I think that just as head gardeners take more interest in the comfort and acquirements of their journeymen, and display less itching for "apprentice fees," &c., so will they obtain a class of young men who are more intelligent, more obliging, and of higher moral character than at present. While agreeing with Mr. Bell that a few hints on subjects most beneficial would be acceptable, and that too close an intimacy with the house servants is not desirable, I cannot consider his remarks about "Mr. Flunky," &c., to be otherwise than an insult to the whole body of young gardeners. *An English Journeyman.*

Plant Cases.—There is one consideration arising from the reply (in so far as that is applicable to our previous remarks) given by Mr. Bull at p. 1474, relative to the cases exhibited, and which excites in us greater surprise than his claim to a patent, and that is, his ready assumption that the majority of practical men will agree with him that the reasons and suggestions adduced *pro* and *con* at p. 1441 may be summed up in one word—"impracticable." This is, indeed, a summary way to dispose of opposite facts and reasons by one easy stroke, and equally felicitous is the attempt to set aside other men's judgments. Such conclusions seem to verify a well-known fact, that the eye may be so long fixed upon a single object that it may lose sight of it; and it is equally true of mental operations, inasmuch as a preconceived notion or train of thought may so completely absorb the mind as to shut out every other consideration. Admitting that many of the remarks and suggestions stated by one writer were both impracticable and absurd in their import, it is not compatible with fair argument and honest reasoning to pass over all that is openly demonstrated in the statements of others. We deem it an unwarrantable assumption thus to ignore every legitimate inference and practical deduction based upon the experience of many years. In our last remarks we adverted to all the features and modifications recognised as improvements in the sketches given at p. 1372, which, if a *bonâ fide* outline of the registered case—as we infer it to be by the affixed stamp—does not appear to agree in all features with the one exhibited. As Mr. Bull has avowedly passed over every practical consideration in favour of the lean-to design, we are, in fairness to ourselves, justified in again adverting to its comparative merits. Apart from other alleged improvements in the span-roofed case, we can only admit that the louvre frame front, or screen, is a modification of the inclined shading strips in the lean-to, and which may be narrowed or made broader so as to admit a greater or less amount of light. Without giving credence to the statement that, in the old form of cases, plants have been "literally boiled," it would not be in the least strange that whole consignments of plants from abroad should have been eventually sacrificed by confinement in such barbarous structures as those exhibited by Mr. Bull, probably of foreign make. In adverting to the added feature of ventilation in the registered span case, which the defective outline at p. 1372 does not exhibit, and which we infer is but an expedient as yet unproved by experience, we further remark, that not only is our experience unfavourable to ventilation, but also that the recorded testimony of the most extensive establishments is altogether unfavourable to the propriety of admitting, directly or indirectly, a marine atmosphere to plants. Those cultivators whose personal observations are drawn from constant intercourse and experience with cases from every leading establishment abroad, bear ample testimony to the fact that every evil to which plant cases are exposed, either from defective packing, impure atmosphere, excess or deficiency of light, is aggravated exactly in proportion to the degree in which sea-air is admitted. The adoption of chambers or cavities made of double boards and filled with Sphagnum to absorb excessive moisture, looks very much like an added evil, and seems in a measure to increase the baneful effect by thus holding the moisture in solution to be again taken up by the atmosphere. This expedient recalls to our recollection the late Mr. Apsley Pellatt's suggested improvement for Heath-propagating glasses, by so curving the base of each inwardly as to form an interior gutter for holding the condensed moisture, thus retaining the evil requiring to be removed! It may be remembered that, in the lean-to case exhibited by us, the front gutter is so formed in connection with the end tubes as effectually to convey the moisture to the under strata of soil or charcoal drainage, there to be absorbed for the benefit of the root-fibres as required. In estimating the relative advantages of shape, Mr. Bull is of opinion that as light is so essential for the welfare of plants, the span-roof case should necessarily be the best, from the assumed fact that a span-roof house is better than a lean-to for the growth of plants; forgetting that the house-structure is formed expressly for growth and bloom, in which a diffused and regulated light is essential. The primary and principal object of the plant case is different, and so far from growth being essential, it is a positive injury. A degree of temperature which is least favourable to exciting growth, should be as nearly as possible the condition of the plant case. Other conditions of life being equal, the plants in a well-regulated case should be nearly stationary. Relatively, the fixed house is the nearest approximation to natural conditions of growth, in art structures; the portable plant case is the furthest extreme from those conditions consistent with the preservation of plant life, and light in each instance is only essential or beneficial to plants in proportion to their average vital force or vigour at any given period, varying with their conditions of growth in the scale of health or disease. Assuming the correctness of the foregoing remarks, we draw the following general inferences in relation to the adaptation of temperature in plant structures. The greater the average vigour of growth in plants, the greater is their power to endure exposure to intense light, and *vice versâ*. The atmosphere of plant cases being unsuitable for a continuous or healthy growth a degree of temperature least favourable to an artificial stimulus of their organs, by a suitably modified exposure to light and heat, is most conducive to their preservation in such structures for the usual periods of travel. In estimating the relative merit of the two cases, we submit the following practical considerations in favour of the lean-to design, as contrasted with the registered span-roofed one:—1st, the side chambers in the latter one, intended for retaining the moisture by the absorbent material therein, reduce the space for packing equal to one row of pots at least; 2d, allowing an equal base to each, the lean-to affords one-third more cubic or packing space, with the advantage of admitting a greater number of tall plants, with convenience for attaching them to the upright side; 3d, the lean-to affords threefold more space for attaching Orchids and other allied plants to the back upright; 4th, one of the most desirable features in all structures being the minimum degree of risk in breakage, the lean-to is greatly superior by presenting but one-half the extent of surface exposure to the dangers and exigencies attending a sea voyage. We have within the last few days sent two cases abroad, at the risk of the present unfavourable weather. We may also add that wood, being a well-known non-conductor of heat, the lean-to case is capable of maintaining, by its diminished surface-exposure, a higher and more equable temperature under the influence of extreme cold than the span-roof can do. On referring again to Mr. Bull's sketches of the registered case at p. 1372, we are at a loss to conceive why the outline there given differs from that of the case one exhibited. The open case is represented with a cross-barred light or sash, which was not seen in the case exhibited, and we are sure all parties interested in the subject would give credence to the outlines as *bonâ fide* representations of the case exhibited; even if the Solicitor-General's injunction by Royal Letters Patent allowed an accommodation clause for deviation in the case represented from the case intended, or for adding any new feature, as it might occur, to the original design at a later period. If the whole length or glass square of the lean-to pattern was only intended to be added as an improvement, why give the published outline with an inferior style of glazing unfitted to the purpose, every cross section or bar being a direct impediment to the removal of excessive moisture, whether condensed or otherwise? [The drawings alluded to were in our possession several weeks before they were published. Eds.] We trust that these remarks on plant cases will ultimately lead to a more practical knowledge of the necessary conditions of conveyance to and from foreign climes, not only as to the pattern of such structures, but also as to the most approved method of packing as now practised for miscellaneous groups. It may seem paradoxical thus attempting to achieve a complex object (often resulting in failure) by one uniform means,—in other words, by applying one condition of plant life to a diversity of structure and constitution. A more enlightened experience may lead to a higher application of portable plant cases, founded upon a recognition of, and adaptation to, the structural affinities and constitutional habits observed in plants. Extensive experience has amply proved that more of the present success attending the conveyance of plants in cases has been the result of the selection of really suitable plants for the object, and their due preparation previously to being despatched, than to any single feature in the case, other requisite conditions being equal. An error in the initiatory process of packing plant cases admits of no after remedy. We quite agree with Mr. Cannell, that, where influence can be secured with the captain of the ship, or, through him, with any lover of plants on board, that much benefit *might* accrue from one or two examinations of the plant case during long voyages. But we think any directions affecting properly packed cases, for giving water, or administering any remedies for incipient plant maladies, is a very hazardous risk, and in cargoes of really valuable plants we can easily imagine the reluctance of many intelligent commanders of ships to undertake the responsibility of such attentions, unless a tacit agreement is entered into for such. A fit and healthy condition of growth in plants for packing to distant climes ought not to involve the risk of injury from mildew, and other adverse agencies. The best preparation against all such plant enemies is prevention—not cure. *E. G. Henderson & Son.* [We are sure that our readers, like ourselves, would be glad to have the opinions of the authorities of the Royal Gardens at Kew, Glasnevin, Edinburgh, or similar establishments, on this most important matter. Eds.]

French Marigolds.—Last spring I purchased a packet of French Marigold seed, and gave it a trial, I may say with some doubt, seeing that good French Marigold seed is very difficult to obtain. About the middle of March I sowed it in a seed-pan, which was put into gentle heat. When the plants were fit to handle, I pricked them into boxes, and placed them in a cold frame, giving water as required, until the end of May. The bed I selected for them was a circular one, 10 feet in diameter, near to a walk (French Marigolds are not suitable for a bed, to be seen in the distance). I planted them, nothing more being done until they commenced to flower, when all selfs and singles were pulled up. I pegged the rest down, not over close to the ground, and had a bed from the middle of July, without either a single or self flower in it. Every bloom was distinctly striped up to the last petal. When any of the plants showed an inclination to run into a self, which they are very apt to do in damp weather, I thrust a fork in the ground below their roots and gave them a good shake up, lifting them, as it were, half out of the ground. Through this check the next blooms came all right again. For more than three months the bed was a solid mass of beautifully striped flowers, every petal being distinctly marked. I may add that they were very much admired by all who saw them. *William Grey, Auchnaba House, Lochgilphead, N.B.*

Wellingtonias.—There is growing at this place a handsome specimen, which was given to Mr. Field by Sir David Salomon about 13 years ago, then being only a seedling a few inches high. It now measures 33 feet 6 inches in height, 41 feet 10 inches in circumference of branches at the ground, and 5 feet 10 inches in circumference of stem 1 foot from the around. For the last two or three years this plant has grown nearly 3 feet in height each year. It is growing on a stiff clay, which has been moved, and where it seems just at home. *J. Allan, Ashurst Park, near Tunbridge Wells.*

Over-cropping.—On the other side of your journal thin-seeding has become a frequent expression. Too often it has been wrapped about with some flimsy ridicule, and, like a ball which has been flung against a wall, this has been thrown against its persevering advocate, Mr. Mechi, and, like a ball so thrown, it has bounded back again to the thrower. It would require a good thick skin to endure the pelting he has received. But few will venture to become a "directing post," if they are to receive the spleen of every passer-by. But other generations, because more wise, will venerate his name. We, on this side of your paper, have always been ahead of your "Agri." friends in matters of thin seeding, deep cultivation, &c. (But, O how they looked down upon us!) Nevertheless, as a rule, we err on the question of cropping. The cultivator does not know the number of evils which he has to attribute to over-cropping until he proves it. Do the Grapes shank? Do they become poor coloured and flavourless? Try less fruit for a year or two on the same amount of foliage-bearing wood. Are the Pears or Apples small or flavourless? Try less fruit. In seasons when they are

. bundant, take a third of the fruit away when small, leaving those only in situations where the strongest growth is seen. This will alter the "every other year bearers" into every year bearers, as well as cure other matters. The abundant crop of Peaches and Nectarines last season will probably, in those quarters where attention and thinning is not carried out fully, be followed by little or no fruit, and perhaps sickly growth of wood as well. O, what crops were to be seen last year! Fruit about one-third its natural size, yet considered a fine crop. Over-cropping is not confined to fruits; plants grown expressly for their flowers require equal consideration in this respect. Plants are often extremely dealt with, curtailing their growth and other matters, to bring them into a flowering state; they are afterwards allowed to carry such a crop of flowers that the plants, if they do not die in the attempt to expand them, are for ever afterwards sickly. If half of the flowers were picked off they would carry another crop for years successively, but the plant is sacrificed to insure a grand display. What a number of Camellias, Rhododendrons, Azaleas, &c., owe their death to this! Neither the advice which comes through the horticultural papers, nor even the fine examples of fine fruit and flowers which are produced by those who practise thin cropping, make the impression on the minds of many gardeners (so-called) as would the sight of a gaudy-leaved plant—a class of plants, by-the-by, which requires as little skill to sustain their beauty as anything connected with horticulture. I have heard it said this assisting Nature is all "humbug," that she will-balance herself. If so, it is "humbug" to prune, and to place trees against walls. If plants are placed in circumstances and situations which have been proved to have the effect of laying on a burden of fruit and flowers, is it not reasonable we should come to their assistance, to regulate and ease that burden which we helped to put on? This one thing Nature will do if unreasonably dealt with,—she will take her own time to regain her powers, or die in the attempt, and this to the annoyance of those who illuse her. *Proven.*

Protecting Roses.—I should be glad if some of your correspondents would give me a few hints as to the best way of protecting some of the more delicate sorts of Roses in winter, such as White Bath Moss, Lamarque, Souvenir d'un Ami, Maréchal Niel, &c. I am trying them in the open air here (West of Scotland) this winter, and fear they will require protection against our climate. The Roses I refer to are standards, about 3 feet 6 inches in height. A protection that could be easily removed on a fine day, and quickly replaced, I fancy would be the best. I should also be glad to hear of any useful book for the assistance of amateurs in cultivating Roses. I have already got Rev. Mr. Hole's interesting and amusing work, but it does not go into the details of pruning, budding, &c., to a sufficient extent to guide such a tyro as *J. M. M., Dumbartonshire.*

Brown Scale.—For the destruction of this pest on Peach and Nectarine trees, Mr. Radclyffe says he has been recommended by Mr. Rivers to use methylated spirits; will Mr. Radclyffe have the goodness to inform me, through your columns, how, and at what strength and time, he applies it? *T. P.*

Planting the Albert Embankment.—One of the most glaring insults I ever noticed appears in the front page of your paper of the 19th inst., under the heading "To Nurserymen, Contractors, and Others. — The Metropolitan Board of Works," &c. That advertisement appeared for the first time on the 19th inst., and the said nurserymen, &c., are very considerately told they may tender for the execution of the works and planting of the Albert Embankment, in accordance with plans and specifications, which may be seen on application to Mr. Bazalgette, between the hours of 9 A.M. and 4 P.M.; but, mark! Saturday, 9 A.M. and 2 P.M. The *Gardeners' Chronicle* is published on Friday, at 2 P.M., and, if all goes well, we in the country get it delivered on Saturday morning, but it is just as likely we get it at the mid-day delivery. For myself, I read the advertisement just about the time Mr. Bazalgette's office was closing, so that I should have stood a capital chance had I competed. I must have left by our first train (8.40) on Monday morning last; if no hitch occurred, I might have reached Spring Gardens, say by 10 o'clock. At 11 o'clock I must have been at Waterloo to return home, and go into calculations, &c., and at 2.26 the tender must have been duly sent off by rail to Waterloo to be forwarded to the office, and unless that was done by special messenger, I doubt if it would reach Spring Gardens by 4 o'clock. The utter absurdity of such conduct on the part of the Board is astounding: why is this done? Would it not be more in accordance with common sense to issue an announcement that the Board, at the suggestion of their surveyor, or in accordance with their own prearrangements, have engaged the Messrs. Yetheroe & Batson, the eminent nurserymen, Kamptulicon Nursery, Heathlands, Palestine, to plant the whole of the land, according to certain plans, &c., which plans probably have had the benefit of the well-known taste of the Messrs. Yetheroe & Batson, of course quite disinterested. The plants and trees there recommended have no reference whatever to the large and well-known stock grown in the Kamptulicon Nursery. But, to be brief, if there had been no inspiration, what an overwhelming number of tenders must have been sent in, because, according to my calculations, we nurserymen had just 360 minutes to make our railway journeys, examine plans and specifications, make calculations, and write out and deposit the tender at the Office of the Board of Works. Verily this is an age of wonders! *Charles Noble, Bagshot, Nov. 22.*

Late Grapes.—Since the introduction of the well-known variety, Lady Downe's Seedling, several others have been sent out, many of which are represented to be great acquisitions, possessing not only the late-keeping properties of Lady Downe's but in other respects very superior to it in quality. This it is not my intention to discuss *pro* or *con*, as that could be much more satisfactorily settled by a tribunal of competent judges, such as the Fruit Committee of the Royal Horticultural Society. If those who are pecuniarily interested in the distribution of these new varieties were to place in the hands of such Committee a prize so that each variety must be separately contested for, and the Horticultural Society were to add another for the best collection of late Grapes, the decision of the judges would be a valuable guide to those who have unsettled opinions respecting them. In my opinion the first step which should be taken in the matter is to affix to the word "late" a definite meaning, so that it may be fairly understood in what months in the year they are to be classed as such. This is of great importance, as it is well known that many of our good old sorts can be kept in good condition until Christmas, and even beyond that time, so that the season for late Grapes should not commence before January at the earliest. Those Grapes only which retain the best condition in any stated time from then to April should be considered of the highest merit. This would effectually prevent in the future the awarding of prizes to late Grapes in November. *Richard Westcott, The Gardens, Raby Castle, Darlington.*

Management of Fruit Trees upon Walls.—Allow me to thank you, Messrs. Editors, for introducing the subject of "hard pruning" to the readers of the *Gardeners' Chronicle.* There is much truth in the statements you so ably put forth, for there can be no doubt but that, in training our wall fruit trees, we do waste valuable time, and really lessen the fruit-producing capabilities of the trees. It was the wont of most of our best old fruit growers, men who grew for fruit only, and not for ornament, to clothe their walls in the quickest manner possible. They certainly had an eye for appearances, but they made that (and I think wisely) a matter of only secondary importance. Making use of every inch of wall space was their chief and main object; and truly, when one paid them a visit during the summer months, nothing could be seen which denoted a want of skill. On the contrary, such a medley of excellent fruit met one's eyes, enwrapped, as it were, in such a luxuriance of foliage, as we do not now often meet with. At the present day one tree must hardly be allowed to meet or touch another, for fear that it should occupy more than the allotted space, or prevent the equilibrium of the specimens grown, as you have said, "not for the fruits alone." I was so struck with this fact some few years ago, that I made it the special subject of a paper addressed to the Botanical Congress attached to the ever-to-be-remembered International Horticultural Exhibition of 1866. In that paper I aimed more at the injurious tendencies of the earlier course of restraint, and had not then temerity enough to carry the subject farther, knowing well that it takes a young man a long while to form under his own hands a full-grown fruitful tree. I am now more wedded to the "quick and fruitful" process than ever, still having an eye to appearances, but in a subsidiary view only to the former. The following is a quotation from the paper above referred to. Speaking of young trees:—

"Whether, when they get into the fruiter's hands, the knife be used sparingly or decisively, the past practice will exhibit itself in the emission of a few strong shoots only, from the apex of each shoot cut in. And only a close, observant practitioner knows how these strong woody shoots will elongate, even with the most determined pinching back of the young shoots as they appear. The more obvious consequence of giving this gross young wood to a tree as its future basis, is seen in the circle of non-fruiting wood formed around and over the base of the worked part—'a waste of valuable room.' Independently, however, of wasted space, the time expended in reducing these trees into fruiting form is, to a great extent, lost. The severing of these strong growths with the knife causes the heart to die back to a far greater extent than can be imagined by those who have not given their study to this subject. It begins some 2 or 3 inches below where the bud and stock form a junction, through what remains of the bud's first growth, and even onward through the separating point of the several shoots, as far as to where they were severed the second season. Take a transverse section of these parts, with the decayed lifeless medullary substance, and does it appear strange that large sections of our wall trees shrivel and die, the Apricot especially? These young trees, though they lose none of their vigour for the time being, the wood they produce, however, is ill matured, and devoid of flower-buds," &c.

Not only is the seed of a life of disease sown by this unnaturally severe system of branch-lopping in the infancy of the trees, but, as you justly observe, "by life-long repetition is it possible ever to dwarf a tree into constitutional vigour?" I look with much interest for your continuation of this subject. *William Earley, Ilford, E.*

Autumn Cauliflowers.—I sowed about the middle of April, Walcheren, Grange's Autumn, and Veitch's Giant Cauliflower at the same time, and have them all growing together on a south-east border. They were all planted at the same time, and treated in the same way; and I find that the latter variety is much superior to either of the others in the four following points, viz., later, hardier, and better in colour, and more compact in heads. I can candidly say that Veitch's Giant Autumn Cauliflower is the best I have ever seen, and would advise all who have not tried it to do so. *J. Allan, Ashurst Park, near Tunbridge Wells.*

Aquilegia.—I am glad to see that Dr. Prior gives the weight of his authority to the derivation from *aqua* and *lego.* But there is one fact in favour of its derivation from *aquila.* The modern French name for the plant is *aucolie*, which is clearly a corruption of its older French name, *akolye*, and that again seems clearly to be a corruption from *aquila.* Further inquiries have led me to the conclusion that the name of *Columbina* was given by Mathiolus, and at once Anglicised into Columbine, and that very soon after the name of Aquilegia was given by Dodonæus; and though accepted as the scientific name, it could not thrust out the more euphonious "Columbine." Reference to the works of Mathiolus and Dodonæus would probably give their own reasons for the names, but I have not access to them. Mr. Radclyffe's derivation from *aquila-lego* will not, I think, bear minute criticism, but his derivation of "Columbine" from the dove-colour seems very probable. In my last "Aquilegus" was in error printed "Aquilejus." *Henry N. Ellacombe, Bitton Vicarage, Gloucestershire.*

Does Colour indicate Flavour amongst Peas? —Are Blue Peas better Flavoured than White Ones?—In some recent advertisements, announcing the advent of another new Pea, "Eastes' Kentish Invicta," possessing all the usual wonderful qualifications of earliness, &c., we are further told that "the fact of its being a blue Pea proclaims it to be infinitely superior in flavour to any white Pea in cultivation." Now, if this is a fact, it is new to me. Will the introducers of this wonderful Pea be kind enough to inform me when this fact was discovered? Eastes' Kentish Invicta may be infinitely superior to all others, but that is not enough to establish the superiority of blue over white. We have at all events amongst the blues some of the very worst flavoured Peas in cultivation. Take the blue Prussian for an example, or the old Woodford Marrow, or even the Scimetar, and what can we say with regard to their superiority of flavour? Instead of being superior in flavour, the blue Peas are as a class decidedly inferior. Are not Essex Rival, the Paradise Marrow, or Princess Royal, amongst the whites, as good if not better flavoured than any of the blues? Flavour is in no degree determined by colour amongst Peas, no more than "go" amongst horses, and it is simply a mere "puff" to say so. Flavour is, however, given to the wrinkled Peas—that is a well-known fact, but equally so to both the blue and white varieties. Green Peas and blue Peas are fully more appreciated at table, but on account of the colour only, irrespective of flavour. The fact, then, of the superiority in flavour of this Pea is a myth. May it not be so as well with regard to its excessive earliness? The appearance of the dried seed resembling that of the Scimetar makes me rather sceptical on this point as well. However, we live in the age of wonders, and this may be the coming prodigy amongst Peas—who can tell? Can any one tell if Eastes' Kentish Invicta Pea has any connection with another Pea, sent out a few years ago, having a similar high-sounding name, viz., the Invicta Marrow? It has the dried seed of much the same appearance, as I find from my notes taken of it when growing in the Royal Horticultural Society's trial grounds at Chiswick. *Querist.*

A Plea for Vegetables.—Your correspondent, Mr. Gilbert, deserves great credit for bringing this subject under the notice of your numerous readers. Some of your correspondents seem to prefer money prizes to watches, but as Mr. Gilbert was the first to bring this subject under notice, I think his plan ought at least to have a fair field and no favour. The way I should propose to do this, would be for every subscriber to state, when he forwards the money to the proper quarter, whether he was in favour of the gold watch plan or of money prizes. I feel confident that, to give the prizes as the majority wish, would be most acceptable to all concerned. If the Royal Horticultural Society will consent to receive subscriptions for the above object, I shall feel a pleasure in forwarding my mite, and I have no doubt but that the gardeners of our country will soon subscribe the required amount. *J. Smith, Exton Park, Rutland.*

—— The present is a very suitable time for discussing matters connected with horticultural exhibitions, and exhibitors of plants, fruits, or vegetables, knowing of any shortcomings in their respective departments, should now come forth and discuss those matters, so

that there may be a possibility of having them rectified. The question of vegetables at our exhibitions, started by Mr. Gilbert, may not have the same importance as is attached to questions relating to plants or fruit. The desire of those parties interested in this matter is, not to see the Carrots and Turnips lifted above their station, but to enhance their appearance by displaying them to better advantage. Now I am of opinion that a collection of vegetables, say 12 varieties, look far better when placed on good sized dishes than when huddled together on a tray, however nicely they may be muffled up with a garnishing of Parsley. But, again, the appearance of those vegetables, with their good-sized dishes, may be completely spoiled by the form of the stage on which they have to stand. Those who witnessed the splendid assortment of vegetables at Old Trafford will remember how ridiculously high was the stage on which they were exhibited, and, without anything to break the monotony, the tent had a most uninviting appearance. Surely if the plebeians of the garden are worth a place at our exhibitions, they are worthy of a little more attention in seeing that they are placed to advantage. The following simple arrangement of the stage would give a good effect to the vegetables. Let the stage be erected in the form of four steps, the first 3 feet from the ground, the others rising to 4 feet. On the first three steps might be placed the vegetables, and on the fourth step, what I have never seen at horticultural exhibitions, Tomatos and Capsicums grown in pots. Well grown varieties of Tomatos and Capsicums, and some varieties of Solanums, would give a very rich effect, and would be quite in keeping with the objects staged in front. With regard to the prizes, I still maintain that the distributive system would give more satisfaction. The idea of making money at our exhibitions ought to be lost sight of; and if I am an exhibitor at Nottingham, I shall be proud to take even the 10th prize. *Andrew Meikle, Read Hall, Whalley.*

Channel Island Cabbages.—Among the many virtues of the Cabbage tribe there is one to which I wish to direct attention. In the Channel Islands the cattle are unusually tame, carrying their handsome heads elegantly, like deer, and they are usually tethered out on the pasture like so many yard-dogs, but their mainstay of food consists, for the most part, of Cabbages and plants of the Cabbage tribe, as Drumhead, Thousand-headed, &c. The climate is peculiar, and so are the products. The stems of the Cabbages grow more woody than usual and frequently draw up to a great height; in short, there is no place where the Cabbages assume so much consequence as they do in these islands, where they are certainly at home. I recollect seeing a handsome specimen of the Cesarean Cow Cabbage exhibited at a shop-door in Regent Street, London, where the seeds of that rare kind were to be had, as advertised, at the "paying" price of 20 seeds for 20*s.*, and they were said to grow high enough to form avenues to shelter cattle and sheep in the open fields. The late Mr. Fox, nurseryman, of Wetley Rocks, near Leek, Staffordshire, showed me tall specimens of handsomely curled Kale, several years old, that had not shown any signs of running to seed, with a hardened runt or castock not less than 4 feet high—a flowerless perennial shrub—with a tuft of leaves like a Tree Fern. Had such a plant been cut down or plucked up by the roots, its stem might have served some farmer as a stick to drive his cattle to the watering-place; but better things seem to be in store for Kail castocks, as they are called in North Britain, for I had a handsome walking-stick presented to me the other day, and when I saw its yellow knob and its well varnished cane-like leg, shod with iron, I could not help admiring the stalk from which such a shoot had sprung up. It is of the usual length and thickness of a stout walking-stick, very light, and the root end woody and hard, taking a good polish. This was a Cabbage stump from the Channel Islands! *A. Forsyth.* [We had once a grand specimen, which we used as a pointer to indicate diagrams in lectures; our ingenious auditors broke it, and the only redress we got was, "It was only a Cabbage stump." Eds.]

The Red-skin Flourball Potato.—I believe this will be a first-class Potato for growing on moderately rich soil. It is a hardy and robust grower, requiring plenty of room. Last spring I purchased 1 peck, and cut the tubers up into 208 sets, planted them in rows 2 feet 6 inches apart, and 20 inches apart in the rows. I lifted them three weeks ago, and the produce was 15 bushels 1 peck. Many of the Potatos weighed 2 lb., and in one instance 2½ lb. Is not this a magnificent yield? The sets were planted in shallow drills, and covered with charred ashes, the ground having been previously trenched 2 spits deep. To this I attribute the abundant yield. *J. Bird, Eastwick Park, Surrey, November 21.*

Peaches and Nectarines.—The Egyptians are a hieroglyphic nation, and instead of saying that a man is incommunicative they represent him by a dark lantern, as having light within and giving none out! I will try to avoid the hieroglyph! The season is now fully come for purchasing the above trees, so that the following may be useful:—1. A good selection of old sorts of Peach trees placed successionally: Early York, Grosse Mignonne, Royal George, Noblesse, Violette Hâtive, Bellegarde, Barrington. 2. New sorts placed successionally: Dr. Hogg, Early Alfred, Early Ascot, Marquis of Downshire, Prince of Wales, Nectarine Peach, and either the Princess of Wales or Lord Palmerston,—both very fine. 3. Nectarines, old sorts, placed successionally: Elruge or Violette Hâtive, much alike; Murray, White Nectarine, Newington. The last is a clingstone, very rich when ripened to shrivelling; it is also called the Rough Roman. 4. New sorts, placed successionally: Rivers' White, Rivers' Orange, Rivers' Pine-apple, and Rivers' Victoria; the two last are the largest and most valuable, — the last is the latest of all. If the reader wants a few of the new sorts, I can specially recommend the two last Nectarines, the Early Ascot Peach and the Nectarine Peach; they are both smooth as a Nectarine. The Nectarine Peach is the finest flavoured of all the late Peaches. If it is desired to extend the season into October, either Lord Palmerston or the Princess of Wales, both very large, handsome, and good for so late a season, will give satisfaction. Peaches which come in when ice is about, can hardly be expected to be as good as earlier ones. Both the White Nectarines should not be gathered till they are of a yellow colour. All the Peach and Nectarine trees here (112 in all) have borne capital crops, are hardy, excellent, and in first-rate condition for next year; the wood is ruddy, the skins hardened, and the fruit-buds plentiful. I have just finished pruning them. I have 19 trees of the Royal George, and it is impossible to speak too highly of its excellence, both as to its cropping and its flavour, and its habits. I have purchased two more trees of the Peach Nectarine, and when I have room I shall have two more trees of the Early Ascot (Standish's); they are perfectly distinct and first-rate, and do the raisers the greatest credit. *W. F. Radclyffe.*

Tree for the Seaside.—The deciduous Cypress, Taxodium distichum, makes one of the most beautiful of all trees for the seaside. In the neighbourhood of Cowes, Isle of Wight, I lately saw several fine specimens of it. Some of them were little over 50 yards from the sea beach, and their tapering form, excepting a few feet at the bottom, was fully furnished to the top. *R. M.*

Eucharis amazonica.—We have a specimen of this gem in flower in a 14-inch pot. It has twenty-six stems, with five or six flowers on each. We have other plants in 6-inch pots, which produced from four to six flower-stems each in May last. We intend to increase our stock, and flower each plant only once a-year, so that with twelve plants we hope to have it in flower all the year round. Our method of treatment is as follows:—We grow them in a compost of two parts of peat, one of loam, one of leaf-mould, and a little dry cowdung. The plants are kept at first in a stove temperature; they receive plenty of water and liquid manure three times a week until about three months before we wish them to flower. They are then removed to a greenhouse, and the supply of moisture is slightly reduced; they remain here until the tips of the flower-stems are just discernible above the bulbs, when they are taken back to the stove, there to remain until a number of the flowers are fully expanded. In summer, when the plants are at this stage, we transfer them to a cooler house, as the flowers last longer in such a position. During the winter it is best to rest them in an intermediate house, but at no time should the plant be allowed to droop from the want of water. *Scotia.*

Table Plants.—There are many other things I would like to briefly describe as being suitable for table decoration. I had not forgot the Skimmias mentioned by your correspondent "Gaiety," but as beautiful berry-bearing plants they are not equal to the Aucuba himalaica, which I noted. Coleus in some kinds are most beautiful things, but I thought they were too common. Regarding Centradenia rosea, does not "Gaiety" find that, although the plant has a beautiful habit, it is not distinct enough in the colour of its leaves and flowers to be a good table plant? However in this matter we are again reminded that the kind of other ornaments used on the dinner-table besides plants have a good deal to do with the plants that should be selected. Perhaps the finest table of plants I ever saw was made up, as far as I can remember, of pairs of well-flowered pots of Primula sinensis, red and white fringed, Hydrangea japonica variegata, Iresine Herbstii (this has a beautiful appearance at night), and pots of Crocuses, purple and yellow, these latter opening their flowers full during the evening. In reference to what "F. W. B." states about the Crotons, I have little further to add, but can he tell us why it is that they (Crotons) produce so much finer variegation in some places than in others? I hope at a future time to contribute further notes on table plants. *R. M.*

Earthing-up.—"Amateur" (p. 1506) should understand that the practice of earthing-up vegetables can be productive of no material benefit, except the vegetables in question have a tendency to throw out roots up their stems. That Cabbages, or, indeed, any of the Brassica tribe, are so benefited I do not believe; but I think the practice has been adopted in the case of those vegetables more as affording a means of support to them from rough winds when young than for any other reason. The same might be said of earthing-up Peas, Beans, &c. With Potatos it is very different, as constant experiments have shown that the more effectually they are earthed-up the larger is the produce. This is especially exemplified in what is known as the "single-hill system," where the tubers are planted at about 3 feet apart each way, and three or four earthings with the spade are given in the growing season; enormous crops are thus obtained. The evil of the common mode of earthing-up Potatos consists in the removal of the soil from the roots by means of the plough or hoe. This is a ruthless practice. If growers would give more space between the rows they would not fail to reap better crops. *A. D.*

—— I have frequently asked myself the question, What good is derived from earthing-up such crops as Cabbage, Cauliflowers, Peas, and Beans? To treat the Potato so I thought might be beneficial, inasmuch as it roots up the stem. Two years ago I gave this a trial by earthing every alternate four rows, in two or three different parts of the garden; but in digging the crops I found no difference. These, I must state, were early varieties, and were planted 8 inches deep. We have yet to learn why farmers spend so much time in this operation; many of them would be at a loss to tell us the reason why. We are often told that things grow much more rapidly after having been earthed-up. This is quite true; but it is so, not because the earth has been drawn up to them, but because it has been disturbed between them. Where land is light, apply the Dutch hoe vigorously amongst some of the rows, leave some undone, and earth-up others. I have no hesitation in saying that the first will be the best. Here we cannot do much with the hoe, some of the ground being so tenacious that I have seen the men compelled to have a pail of water to dip the spade in, so as to make it and the soil (or the clay) part company. Instead of hoeing and earthing up, we move it with the fork, generally by merely pushing the fork in a few inches, according to circumstances, giving it a shake once or twice, and then drawing it out, without turning the soil over, as in the operation of digging. *W. P. R., Holwood Park.*

Passiflora quadrangularis as a Conservatory Climber.—Permit me to thank "N., Blandford" for his answers to my enquiries, which are most full and conclusive. I shall now proceed to try it, and hope I may be equally successful. This noble plant will be a rich acquisition to our conservatories, for which I shall be most grateful to "N." and others who have given corroborative evidence for the fitness of this grandest of all the Passion-flowers for a temperate house. Has any one had any experience with P. racemosa as a conservatory climber? *Enquirer.*

The Royal Ascot Vine.—I quite agree with "R. D.'s" statement concerning the merits of this Grape, for I happened to be at the Ascot Nursery at the time it first fruited. As to its bearing qualities, I can vouch for it being all that can be desired, for on every lateral there were produced two or three bunches, which set most freely. I also think, with "R. D.," that when its merits become well known it will be as universally grown as the Black Hamburgh; and I am convinced that no Grape will better repay the cultivator for the trouble bestowed on it than the Royal Ascot. *Edward Hawthorn, Gr. to T. Kemp, Esq., Goldwell House, Newbury, Berks.*

—— A friend of mine has this Grape growing in what was formerly a Cucumber-house. It is planted inside, close up to the glass, the same as a Cucumber or Melon would be, and is trained on the extension system, having the whole range of the house and border to itself, with bottom-heat if required, and plenty of piping all round the house. I saw it in July, and a finer and more promising crop I never saw. There were about 50 good, equal-sized bunches, with berries as large as pigeons' eggs, and this in a little place with scarcely elbow-room. In September I went to see them again, and was never more surprised in my life. The greater part were cut, but in all the bunches that were hanging there was not one sound berry; in fact, they were all rotten—the skeleton of the bunches only hanging; such berries as were left kept dropping off whilst I was looking at them, and the floor was as much stained as if somebody had been thrashing the bunches with a stick. I understood my friend to say that they shanked nearly altogether. I cannot give the full account as to how this Vine was treated, but I may mention that there was no drip, for he had no rain until after my visit, and the house was well glazed. Can any of your correspondents account for this, or is this particular kind subject to shanking? This is the first season in which my friend has had any experience of this Vine, as it was planted before he took charge of the gardens. *R. H.*

Adiantum tinctum.—This delicate Maidenhair is well adapted for table decoration. In growth it somewhat resembles A. colpodes, but it has a more compact habit than that species. Its young growth is tinged with rosy purple, and its appearance under artificial light is all that can be desired. It grows freely in an ordinary stove. How seldom one sees a plant of the deciduous A. lunulatum, one of the most distinct and beautiful of all the Adiantums! *F. W. B.*

The Bovinia Potato.—About the middle of last April I planted five small sets, with only one eye each, of the above Potato. They were soon up

and growing away vigorously, and by the middle of August the tops measured over 8 feet across; hence I infer they should be planted something like that distance apart between the rows, if the ground is good. The produce was taken up to October 20, and weighed a little over 27 lb. Six of the largest tubers weighed, collectively, 8 lb., the largest one of all 1¾ lb. As regards quality, they may perhaps do for cattle, as their name implies, but for table I find them utterly worthless. I have tried them both baked and boiled, and in either case they were as soft as a Turnip, and quite uneatable. *J. Brown, The Gardens, Rockingham Castle.*

Societies.

HORTICULTURAL OF LIVERPOOL: *Nov. 22, 23.*—The Liverpool autumn show of Chrysanthemums and fruit has, from small beginnings, grown to be one of the principal floral events of the year. Liberal, courteous, and active management, together with a hearty spirit of good will between managers and cultivators, have jointly contributed to bring about this very satisfactory state of things, and the result is an exhibition which may fairly be said to stand at the head of all autumn shows. The Society is fortunate in having available for these gatherings, which take place at rather an inclement season, a noble hall, in which, once entered, visitors are independent of weather. The size and height of this hall admits, moreover, of its being lighted up with gas, so that the labouring and artizan population can be admitted during the evening. On the present occasion the show was an excellent one, though the weather was unfavourable in the extreme.

The main feature of this show was the Chrysanthemum, and a very large number of excellent plants and most admirable cut blooms were staged. The majority of the plants were grown in the slightly convex or equal specimen style, about 1½ foot above the pot, and from 3 to 4 feet in diameter, with the blooms regularly disposed over the whole surface, and standing from 3 to 6 inches above the foliage. The leading position was taken by Mr. Wilson, gr. to J. E. Reynolds, Esq., whose specimens, in the class of 9 large-flowered varieties, were admirably grown, symmetrical, and very finely bloomed. The 2d prize lot, which were also highly meritorious, came from Mr. Smith, gr. to J. Bland, Esq. Mr. Wilson carried off the 1st honours in the class for 6 large-flowered varieties, and in that for 9 Pompons. Some of the Japanese sorts were grown in a much more natural style, but being later bloomers they were scarcely sufficiently in flower. The best 3 came from Mr. Biggs, gr. to S. J. Arnold, Esq.; and Mr. Dunbar, gr. to F. C. Braun, Esq., was 2d. As yet these varieties are less effective exhibition plants than the ordinary Chinese sorts. A few pyramidal plants were produced, and afforded a nice variety on the stages; but, like the great pyramids of Azaleas, they were somewhat too formally trained in. Another form adopted here and there, and useful in grouping for effect, was the standard, with a stem of about 3 feet high, and an umbrella-shaped head of nearly as much diameter. One standard of Christine, which had the head of a short conical form, had a pretty effect. But there is a radical vice about all these modes of training, namely, that the plants are by far too much contorted. A more natural, even if somewhat taller, style of training would in every way be preferable. The worst example in the hall was a wide and slightly convex plant, in which the individual blooms were tied down quite flat on the foliage at regular distances apart. The Pompon varieties were grown in much the same style, but from the clustering character of their blooms the plants were not so formal looking. The varieties of Cedo Nulli—golden, white, and lilac—stood out the most prominently, and amongst dark-coloured sorts Bob was pre-eminent. The large-flowered sorts were too numerous to specify, but Mrs. Haliburton, Florence Nightingale, Empress of India, Hermine, Mrs. G. Rundle, among the light-coloured sorts; Lord Derby, Lady Hardinge, Hereward, and Lady Slade, among darker ones; and General Bainbrigg, among buffs, were among the more conspicuous.

The cut blooms were numerous and remarkably fine. Mr. McArdle, gr. to W. G. Bateson, Esq., took the 1st prize for 18; Mr. Rowe, Roehampton, the 1st for 12; and Mr. Rhodes, gr. to J. B. Morgan, Esq., the 1st for 6 varieties. We have rarely seen a finer lot of flowers.

Ferns were used with very good effect to mark the divisions between the classes of Chrysanthemums, and not only was the division of the masses of colour in this way eminently useful in breaking up the monotony of the banks of colour, but it became also serviceable to the judges. This is a feature which might advantageously receive more attention at our principal London shows than it usually does. The plants thus shown were mostly good examples of cultivation, not of large size, but fresh and good. Mr. Turner, gr. to E. Bates, Esq., had a plant of Adiantum cuneatum, in as perfect a condition as can well be imagined. A beautiful plant of Adiantum farleyense, 2 feet across and 1½ foot high, was shown by Mr. Simpson, gr. to C. W. Neumann, Esq.; and there was an extraordinary specimen of Goniophlebium subauriculatum. Of other good Ferns we noted Gymnogramma peruviana argyrophylla, and Pteris serrulata major, the latter a bold drooping form with exactly the habit of the ordinary serrulata, but with pendent fronds 3 feet long, and of exceedingly ornamental habit; it appears to be well appreciated in the midland and northern districts, but is not much known in the south.

There was a very good display of plants for dinner-table decoration, shown in threes, and set up in a moderately elevated position down the centre of the fruit table; they were not only well displayed, but formed a useful division. Small Palms, Dracænas, Crotons, Papyrus, predominated. Among decorative plants the pretty little White Roman Hyacinths made a display as chaste and agreeable to the eye, as it was grateful to the smell. They were shown in pans of a foot diameter, and the 1st prize lot, shown by Mr. Smith, gr. to J. Bland, Esq., had each from 30 to 36 spikes of flowers, fair, fresh, and fragrant. A nearly equally good lot came from Mr. Manderson, gr. to B. H. Jones, Esq. Poinsettias and Salvia splendens were invited in the schedule, but they were not particularly well brought out.

The show of fruit was admirable—both appearance and quality very much above the general average. The bulk, naturally enough, consisted of Apples and Pears, for which some 10 classes were provided, and there were no fewer than 500 dishes exhibited, while for Grapes there were six classes, all of which were well contested. In the class for two bunches of Hamburghs nothing remarkable was shown; Mr. Woolley, gr. to Sir W. Jackson, Bart., being placed 1st. The same exhibitor took the 1st prize in the class of single bunches of Hamburghs, with a large but somewhat loose cluster of well swelled berries. The 1st prize for 2 bunches of White was won by Mr. Jamieson, gr. to R. C. Naylor, Esq., with good Muscat of Alexandria; but in the single bunch competition Mr. Jamieson was beaten by Mr. Silcock, gr. to Sir C. Shackerley, Bart. The class of two bunches of Black Grapes, not Hamburghs, was led off by Mr. Potts, gr. to J. J. Knowles, Esq., who had very handsome, compact, well-swelled clusters of Alicante, beautifully grown and thoroughly well finished. Some good Barbarossas were staged by Mr. Woolley, gr. to Sir W. Jackson, Bart., and by Mr. Spencer, gr. to E. Houlgrave, Esq.; and Trebbianos, by Mr. Silcock, gr. to Sir C. Shackerley, Bart. Mr. Tyerman showed some remarkably fine clusters of Mrs. Pince's Muscat Grape, grown in Cornwall, in a greenhouse without fire-heat—large and handsome bunches, and well-swelled berries, thoroughly well coloured, with a fine bloom, but somewhat rubbed in travelling; they were scarcely ripe, but in every way a most promising sample, as indicating that a strong heat is not necessary for this variety, though some extra warmth, to assist in the last stage of ripening, might be beneficial.

A nice group of Pine-apples were set up, among them two very handsome fruit of the Smooth Cayenne; the 1st, rather more plumped out than the other, from Mr. Barnet, gr. to Rev. N. B. Botfield; and the 2d, weighing 8¼ lb., from Mr. Smith, gr. to H. Walker, Esq.

We noticed some of the hardy fruits set up in dishes with a garniture of Vine leaves, taking on the finely blotched and vivid colour which some varieties assume in Autumn. The fruit thus displayed had a very good effect, much to be preferred to that of those set up on the bare crockeryware.

One of the curiosities of the show was a peculiar kind of Gourd from old Calabar, shown by Rev. Dr. Thomson, to whom we are indebted for Clerodendron Thomsonæ, and some other fine plants from that country. This Gourd was of considerable size, elongated, and deeply fluted, with narrow projecting ribs. Its native name is Ubong, and its leaves and seeds are much used and highly esteemed by the natives.

In the evening, the exhibitors and members of the Society were entertained at tea by the committee of management, and several interesting papers were read. There were about 130 persons present, and the evening passed off most agreeably and instructively. Rarely is such an assemblage of gardeners to be met with, and it would be well if more meetings of this sort, free from the poison of stimulating drinks, and of an intellectual rather than a sensual character, were held throughout the country, not omitting the metropolis. A very interesting sketch of the progress of the Society, which we may probably allude to hereafter, was read by the secretary, Mr. Ker; after which followed an address on the importance of observing Nature, by Mr. Shirley Hibberd; a paper on Exhibitions, by Mr. Baines; and a paper on Plants as Manufacturers, prefaced by some stirring preliminary remarks on the value and importance of meetings of this kind, by Mr. D. T. Fish. This will be found at p. 1567.

Notices of Books.

Entomologie fur Gartner und Gartenfreunde: von Dr. E. L. Taschenberg: mit 123 holzschnitten. Leipzig, 1871. Williams & Norgate. (Entomology for Gardeners and Amateurs; with 123 woodcuts.)

Gardeners, foresters, and agriculturists are becoming more sensible of the importance of having a better acquaintance with that class of animals of whose power to blast their most promising prospects they are too often reminded by bitter experience. During the past generation it was reserved for men of science to press upon them the necessity of knowing something of the creatures upon whose sufferance they carried on their business, and to give them, if they chose to avail themselves of it, the necessary information. But it is an old saying, that one man may take a horse to the water, but ten men will not make him drink. Learned men expounded the mysteries of entomology to gardeners and cultivators with but little effect. Our own most shining lights, Curtis and Westwood, poured out their stores of wisdom and observation in papers, many of which first appeared in the pages of this journal. Boisduval in France, Kollar in Austria, and Ratzeburg in Prussia, have each in their own countries laboured in the same cause, besides many other scarcely less eminent men; but somehow, although the knowledge of entomologists was largely increased by their labours, the cultivators who had most need of it rested very much where they were.

There are symptoms, however, that the desire for such knowledge is spreading. In France a journal devoted to the subject of economic entomology, entitled "Insectologie Agricole," has for some two or three years been carried on with apparent success. In America, by far the most able and genuine work of the kind which has been done since the days when Curtis and Westwood were in their prime (*Laus Deo*, we have Westwood as fresh as ever, but his subject has been skimmed and the cream taken off it by himself and others), has appeared in a popular journal, entitled the *American Entomologist*—its editor Mr. Walsh, an Englishman of uncommon talent, whose melancholy fate, in the full tide of his success, by a railway train running over him, will probably be in the recollection of our readers. That work, although (perhaps because) its science was of the highest class, has been most popular, having upwards of 5000 subscribers after only a twelvemonths' duration. On the Continent excellent entomological exhibitions have been held, a main feature in which has been economic entomology. At home, the Horticultural Society's collection in the South Kensington Museum would not be such a constant attraction as it is, even in its present embryo state, were not the subject one in which general interest is felt. Indeed, the home correspondence in our own pages is a better guage of the interest taken in it than anything else we could select. Our readers cannot fail to have observed the increase in the number of applications we receive for information regarding it, and in the space necessarily occupied in satisfying them.

The work whose title we have placed at the head of this notice is another symptom of the growing demand for this class of information. Dr. Taschenberg is the Inspector of the Zoological Museum of the united Frederick Universities of Halle and Wittenburg, and has already published a work on the Hymenoptera of Germany. The present work is confined to the insects injurious to horticulture. It does not include those which more directly concern the agriculturist or the forester. It takes every order of insects in succession—beetles, bees, butterflies, flies, bugs, grasshoppers, green-fly, scale insects, &c., and gives an account of the hurtful species in each. He begins with a short description of the insect—its date of appearance its larva; and ends with details regarding its habits, and other particulars, and very often the description is accompanied with a figure. Many of the figures are exceedingly well executed, although they are not all equal. A few of the enemies of our enemies are similarly described, although this branch of the work is comparatively briefly dealt with. He also touches on worms and snails on the one hand, and useful birds and mammals on the other; and he concludes by giving a list of the principal garden plants, with references to the kinds of insects which attack them respectively. The work contains, in the compass of one volume (price 8*s.*), a great deal of information which any one in want of it would have to search through many volumes to obtain. It contains much that is not to be found in Curtis's "Farm Insects," and we do not think it contrasts unfavourably with Boisduval's "Entomologie Horticole," with which it more nearly corresponds. We may add that, after going over it with the view of spying out flaws and defects, we have found very few omissions, perhaps the most considerable being the Leopard Moth, which does so much mischief to fruit trees here, and which is surely not unknown in Dr. Taschenberg's district, and the smaller Xylophages, whose title to being reckoned hurtful may be open to question, as only attacking the trees after they are already failing.

Florists' Flowers.

A CORRESPONDENT asks for "A few hints on the HISTORY and CULTIVATION of the POMPON CHRYSANTHEMUM,"—the following remarks, from the pen of one of our most noted growers of these plants, will perhaps supply the information required:—The introduction of this little favourite took place about the year 1846, when Mr. Fortune brought from China a small-flowered variety known as the Chusan Daisy; and well do I remember first seeing it in bloom in a greenhouse at the Horticultural Society's Garden at Chiswick. I must say that at that time I had but a poor opinion of it, nor dreamed of its ever producing anything like a florists' flower, for the flower-heads were small, and with only one row of ragged petals, very similar to the wild Chamomile. We heard no more of the plant for some time, no one seeming disposed to cultivate such a weed; but to the surprise of all, about 1848 there were sent out from Versailles, I believe by Mr. Salter, of Chrysanthemum fame, some far superior flowers, which received the name of Pompons from their compact button-like form. La Lilliputienne, a very showy bronzy red flower, still holds a place in most garden collections, as also a pretty little sweet-scented variety called Le Nain Bébé. These were the forerunners of all the beautiful varieties we have now in cultivation, and which, like the large-flowered kinds, take various forms, such as incurved, reflexed, and Anemone-flowered, and they seem to be especially designed to form a contrast to them.

Trained plants of these Pompons make beautiful objects for the decoration of the conservatory for eight or ten weeks during the dullest season of the year, and for this purpose cuttings should be obtained in November, choosing, as the most suitable, strong free shoots, and extracting all the eyes from the part to be placed below the surface of the soil. They should then be potted into small pots, and be placed in a cold frame, where, protected from frost, they will root

freely, and by January will require shifting into larger pots. This being done, the young plants should be pinched back to encourage them to throw out lateral shoots, which, as they increase in length, should be pegged down. As soon as the laterals are 6 inches long stop them again, and continue the same process until the end of June. At this time they should have their final shift into 10-inch pots, in a compost of two-thirds of good loam and one of well-rotted dung, with a good amount of broken oyster shells for drainage. They should then be plunged in an open border, comparatively sheltered from strong winds, on a small pot turned bottom upwards, and be kept well watered, using liquid manure about twice a week. Keep them in this position until the second week in October, when they should be removed to a place of shelter safe from frost, and receive plenty of air in fine weather.

To get nice little plants to flower in small pots, cuttings should be put in about the last week in June, and be pinched back as before as soon as they are well rooted. The Pompons also come in very useful for planting in the front rows of borders, and make splendid beds when planted to a design, care being taken to harmonise the colours. For this purpose offsets from the roots may be planted singly, in any out-of-the-way border, to be removed to their flowering quarters later in the season; but I should recommend, if they are wanted especially for beds, that they be planted out, 9 inches apart, in May, and be pinched back when about 6 inches high. This will stimulate the growth of laterals, which should be tied across each other as they progress in growth, so as to regulate their height, and secure them in position without the aid of sticks. If offsets of the Cedo Nulli varieties are planted between the bedding plants in August, and kept well watered, they will produce a good show of bloom when the bedding plants are past, and will well repay the trouble bestowed on them. *T. D.*

Obituary.

At his residence, Tynemouth, Northumberland, on the 19th inst., in his 64th year, Samuel Finney, of the firm of Samuel Finney & Co., Nurserymen and Seedsmen, Newcastle-on-Tyne.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Keep the temperature low in stoves and similar houses, for to exceed a safe minimum at this season is mistaken kindness. For if we cause such subjects as the May or August-blooming Ixoras, and similar plants, to continue in flower; or, in the case of Ferns, which make their annual or bi-annual growths, we cause them to throw up fresh fronds out of season, we do not consult the future well-being of either. Every effort should be made to rest all kinds of plants not necessarily required to be active now; others, which are constant in their growth formation the whole year through, should be brought as nearly to a state of repose or quietude as their natural conditions will admit of. Such subjects as the tender variegated form of *Alocasia*, which now requires to be kept in a somewhat active state, need far more attention at our hands to land them in spring in a thriving, healthy condition than is apparent to casual observers; for, if by excess of heat a weak leaf-formation is made in the winter, or if through oversight the fleshy roots become sodden with moisture—both evils which aggregate quickly if not closely observed—a languid state of health ensues, which is followed, as a natural sequence, by a certain amount of ill success in their culture. Though I have referred to only one or two plants as an illustration, I am anxious to enforce these suggestions in their broadest sense and most general application, on all young cultivators. With even more weight would I enforce these and similar considerations on all who possess the tenderer, rarer, and more delicate forms of *Orchidaceæ*. Not only has the cultivator to contend against an undue thrifty growth, in their case, but it should be always borne in mind, that unseasonable growths, and an immatured fibre-formation therein, may, for all that has yet been adduced to the contrary, be the primary cause of the too well known "spot" disease. Those who require *Tulips* or *Hyacinths*—the Roman Hyacinths especially—in bloom about Christmas should afford them occasional waterings with moderately warmed liquid manure, and generally push them along by gradually raising the temperature until a good forcing atmosphere is attained. Those who are desirous of growing fine large specimens of *Chrysanthemums* should now put in cuttings of approved sorts, and give them all the aid at command to enable them to strike readily. It may be needless to remark that a cool, close atmosphere is most suitable to them if the pots containing them are placed into a nice moderately warm bottom-heat, and they are kept well watered. Let all plants intended for forcing, such as *Lilacs, Kalmias, Weigelas, Ghent Azaleas, Rhododendrons*, &c., be potted up, if not previously done, and have the pots plunged into suitable material, in a cold frame or other structure, where moderate immunity from frost exists.

FORCING HOUSES.

Those who have commenced to force *Vines* must proceed very cautiously at the first stage, and with the utmost moderation and regularity. A good supply of atmospheric humidity must be constantly maintained, and if it is possible to engender a nice warm atmospheric humidity by allowing steam to arise from a heap (of moderate dimensions) of fermenting materials so much the better. For not only does this gently rising steam attach itself with uniform constancy to the rods and slowly swelling buds, but we may infer that the more subtle ammoniacal properties pervading the structure afford nourishment to the young leaves as they are formed. Attend well to the bottom-heat of all pits or beds into which *Pines* are plunged, by testing the temperature periodically. Be very careful not to overwater any at the root, at this period, no matter in what stage of growth the plants may be; but rather afford less moisture than give them an excess at this particularly dull period. Give air as freely as possible at all times, no matter how little at a time, but do not by any means allow a cold draught to blow immediately upon the plants. Those who wish to start early *Peach* or *Nectarine houses* should commence by shutting up close for a week or two at first, and so, by slow degrees, increase the temperature regularly. Make, where necessary, another sowing of *Dwarf French Beans*, in 60-sized pots, to be thinned out and potted on when they have formed the "rough leaves" after the cotyledons. Those who force *Tomatos* as a permanent winter vegetable, must give them plenty of air, and force them along quickly in a somewhat dry heat when they commence flowering.

HARDY FLOWER GARDEN.

Push forward such work as renewing *Box edgings*, and let all vases, rustic blocks, &c., which are denuded of their summer garb, be emptied of the old soil which they contain, and have them filled with a good rich compost. If bulbs are intended to be grown in them, this will not interfere with the arrangement. All cold frames having the hardier kinds of plants in pots stored in them should now have the lights closed nightly, and mats placed over them if the least sign of a frost occurs. Do not lose any chance of giving air to *Auriculas, Carnations, Picotees*, &c., as their well-being depends greatly on studious attention to this matter at all times. Those who possess valuable *Tulips*, which should now be planted out as previously suggested, should place a covering of mats over the beds on the approach of very severe frosts. This may not seem necessary, but it is of much benefit to them at a period when they are just engaged in fresh root formation. Those who possess a bad lawn sward, and wish to renovate it at a little outlay, should choose a mild period to sow over it a mixture of Meadow Poa, Meadow Fescue, and Crested Dog's-tail, upon which a thick sowing of finely sifted leaf-mould, wood-ashes, and loam in admixture should then be made.

KITCHEN GARDEN.

Not an hour should now be lost in pushing forward all ground work, such as digging, ridging, trenching, and the like, in this department. Preparing for all possible contingencies, it will be well for those who contemplate making new *Asparagus beds* to prepare them at the earliest time possible, to admit of their duly settling down before planting time arrives. The essential conditions in the formation of a permanent prolific bed, are deep trenching and affording an abundant supply of manure. The greener or stronger the dung which is placed at the bottom or centre of the newly worked ground the better, and there need be no fear of using too much. Clean and manure *Herb beds*, if delayed so long, and attend to the *Box edgings* in this department, as advised should be done in the previous one. *W. E.*

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

DURING THE WEEK ENDING SATURDAY, NOVEMBER 19, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Work.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg	Deg	Deg.	Deg.	Deg	Deg	Deg	In
Portsmouth ..	51·4	38·0	22·8	40·1	32·2	10·9	40·2	0·53
Blackheath ..	48·8	21·3	24·5	44·6	30·7	13·9	37·6	0·18
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	46·1	29·3	16·8	44·2	32·7	11·5	38·0	0·49
Wolverhampton	45·9	28·1	17·8	42·6	30·6	12·0	36·7	0·47
Leicester ..	45·5	28·2	17·3	42·3	30·5	11·8	36·0	0·39
Norwich	48·7	30·5	15·2	42·2	32·6	10·2	36·7	0·34
Nottingham ..	48·1	27·1	15·0	43·0	31·1	11·9	35·8	0·38
Sheffield	46·8	28·4	18·4	41·0	31·1	12·4	37·0	0·39
Liverpool	47·0	26·5	20·5	44·7	34·0	10·7	39·0	0·99
Manchester ..	..	..	..	..	..	..	..	..
Salford	48·2	25·6	22·6	42·8	30·0	12·8	36·0	0·67
Bradford	44·1	20·5	23·6	42·9	31·0	11·9	36·1	0·62
Leeds	44·0	20·0	24·0	41·6	32·0	9·6	36·4	0·44
Hull	44·0	23·0	21·0	38·6	26·9	11·7	32·3	0·16
Newcastle ..	41·0	31·0	10·0	40·0	32·7	7·3	35·9	0·38
Edinburgh ..	44·7	33·0	11·7	..	..	..	38·7	0·30
Glasgow	44·4	30·4	14·0	..	..	..	37·2	0·92
Dundee	44·0	31·0	13·0	..	..	..	38·7	0·85
Aberdeen	42·9	29·0	13·9	..	..	..	37·4	0·03
Paisley	44·0	29·0	15·0	..	..	..	37·4	0·30
Greenock	45·0	32·0	13·0	..	..	..	38·9	1·30
Leith	45·2	32·9	12·3	..	..	..	38·8	0·32
Perth	45·0	29·0	16·0	..	..	..	39·0	1·04
Dublin	47·0	28·0	19·0	..	..	..	37·9	0·56

STATE OF THE WEATHER AT BLACKHEATH, LONDON,

FOR THE WEEK ENDING WEDNESDAY, NOVEMBER 23, 1870.

1870. Month and Day.	At 9 A.M. Readings of Barometer reduced to 32° Fahr	Dry Ther mometer	Wet Ther mometer	Hygrometrical Indication from Dalton's Tables, 30in. Dew Point	Degree of Humidity	Weight of Grains of Water in 1 Cubic Foot of Air.	Temperature of the Air. Highest	Lowest.	Range in Day.	Mean	Departure of Mean from Mean of 50 Years	Wind. Direction.	Wind. Horizontal Movement.	Rain. In Inches.
November	Ins.	Deg	Deg	Deg.	Deg.	Gr.	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
17. Thurs. .	29·31	42·8	42·2	40·0	92	2·9	44·3	39·4	12·9	41·7	— 6·6	S.W.	185	0·00
18. Friday .	29·49	43·8	43·6	42·3	96	3·1	44·8	31·6	13·2	38·2	— 9·9	W.	190	0·00
19. Satur . .	29·74	42·0	41·8	40·2	96	2·9	49·0	24·1	24·9	36·7	— 11·4	S.	260	0·12
20. Sunday .	29·73	40·1	39·7	37·5	92	2·7	48·2	36·9	11·3	42·1	+ 0·7	W.	285	0·11
21. Monday .	29·21	40·1	39·7	37·5	92	2·7	49·7	40·2	9·5	44·7	+ 3·3	S.S.W.	365	0·11
22. Tues. . .	29·02	47·0	46·7	45·0	92	3·3	52·9	38·8	14·1	45·5	+ 4·1	S.S.W.	435	0·23
23. Wednes .	29·01	49·1	48·9	47·5	96	3·6	54·0	42·6	11·4	47·5	+ 6·1	S.W.	465	0·23

Nov. 17.—Generally cloudless. Fine. Dry.
— 18.—Cloudless, very fine. Hoar frost in morning.
— 19.—Variable till afternoon, then overcast. Rain fell in the evening, and lightning was observed.
— 20.—Rain fell during the night, morning and generally during the day. Thunder and lightning at night.
— 21.—Generally cloudless. Fine. Dry. Occasional rain.
— 22.—Generally cloudy. Heavy rain fell occasionally. Thunder and lightning at night.
— 23.—Very variable. Occasional rain. Windy.

JAMES GLAISHER.

Notices to Correspondents.

Books: *E. P. D.* 1, Thomson "On the Culture of the Pine-apple;" and—2, the "Florist and Pomologist," or the "Botanical Magazine."—*Inquirer.* "Hogg's British Pomology" was originally published by Groombridge, Paternoster Row, but we believe it is now out of print.

Cutting Down Newly Planted Vines: *Humberer.* Yes! It is quite correct to cut down your Vines as recommended—to, say, three eyes or so above the point where the permanent side shoots could become developed. Thus, for instance, if your Vines are planted in the front of the house, either outside or inside, cut them back to three eyes above the front sill or plate—this might leave a cane 2 feet long. If planted in any position where shoots and leaves could be developed, cut your Vines to within 6 inches of the ground. The nurserymen leave them unpruned, so that they may be adapted for any position, and the planter can then cut them down to the lowest bud or required height. The *rationale* of cutting them back, is, that by doing so you concentrate the whole forces of the plant into the few buds, and thus produce a permanent rod of great strength for fruit producing. Next year you may leave, according to strength, 6 to 8 feet.

Dessert Apples: *W. M.* We would recommend the following:—Early Harvest, Gravenstein, Cox's Orange Pippin, Rosemary Russet, King of the Pippins, Cox's Pomona, Fearn's Pippin, Blenheim Orange, Courtpendu Plat, and Dutch Mignonne. Doubtless you could procure good fruit trees in pots from Jersey, but a far better way is to purchase the trees yourself, and then pot them, unless you want fruit immediately.

Ferns: *Y. F., West Gorton.* Keep water in the troughs by all means, but the actual syringing of the fronds is almost altogether dispensed with during the dull weather of winter. The frond is that of a seedling Phlebodium aureum.

Flanders Pippin Apples: *H. W. C.* This is distinct as we have it from the Mère de Ménage, being more of a Codlin shape, ribbed, yellow, flushed a little on the side next the sun. In season November.

Flowering of Kalmias: *An Amateur, Ballinasloe.* We have no doubt the humidity of your climate, which is so congenial to some plants, has much to do with the non-production of flowers on your Kalmias. Frequently, however, we have observed that K. latifolia will not bloom abundantly on this side of the Channel, unless the following conditions are assured:—The subsoil must be efficiently drained. They should be planted in prepared soil, not deeper than 18 inches. This should consist of peat, with a fifth part of gritty sand; but equal parts of peat and very sandy loam are preferable. The plants should have the fullest possible exposure to the sun the whole of the day, and especially in the early morning, and an occasional soaking of water during such excessively dry periods as was experienced during the past summer. *W. E.*

Fungus: *W. M.* Undoubtedly the Agaric of which you have sent the spores is A. inunctus, Fries. *M. J. B.*—*P. M. B.* The Fungus on old Pea sticks is Tubercularia vulgaris, an imperfect condition of Nectria cinnabarina. It occurs only on sticks, decayed stumps, or shoots which are already in a dying condition. *M. J. B.*

Heating a Conservatory: *D. R., Rochdale,* asks, "What number of cubic feet of the area of a conservatory should be allowed to every lineal foot of 4-inch pipe? The aspect of the conservatory is north-east, and the situation exposed and cold." If you

intend to place the pipes above the floor, 1 foot of pipe to 45 or even 50 feet of air will be sufficient. If you put them below the level of the floor, and cover them with an iron grating, add 3 inches more.

NAMES OF FRUITS: *S. Wells. Apples*: all three specimens proved to be Rosemary Russet. *J. H. V. Pears*: Hacon's Incomparable.—*J. J. Forrest. Apple*: not the Golden Reinette, but the Lemon Pippin.—*H. R. Fryer*: 1, Holland Pippin; 2, Old Pommeroy; 3, Hawick Golden Pippin; 5, Fine Golden Pippin; 7, French Crab; 8, Scarlet Nonpareil; 9, Court of Wick.

NAMES OF PLANTS. *J. H. Haward*. Panicum miliaceum; a grass very generally cultivated in India, being one of those which yield Millet.—*S. H.* One of our prettiest winter-blooming Acanthaceæ, the Beloperone violacea of Planchon; native of New Grenada.—*R. Bruce*. The Carob tree, Ceratonia Siliqua.

THE ABYSSINIAN MIXTURE: *G. H.* asks where this commodity can be obtained, and at what price per bottle.

VINE: *W. Allen*. Ciotat. The Alexandrian Ciotat, Parsley-leaved, Chasselas à feuilles laciniées.

CATALOGUES RECEIVED.—Little & Ballantyne, Descriptive Catalogue of Stove and Greenhouse Plants and Florists' Flowers; also Priced List of Seedling and Transplanted Forest Trees, &c.—J. M. Thorburn & Co., Wholesale List of American-grown Seeds for the European Trade, &c.—W. Cutbush & Son, Catalogue of Azaleas, Stove and Greenhouse Plants, Fruit Trees, Roses, &c.—J. Tremble & Sons, Catalogue of Conifers, Ornamental Trees and Shrubs, and Herbaceous Plants, &c.

ERRATUM: Last week, in answer to W. Bushel, "Rostoken" should have been "Rostocker."

COMMUNICATIONS RECEIVED:—J. P. C.—J. B.—W. M.—J. M —J. W.—J. H. J.—E. S. E.—Reason Why.—D. K.—G. F.—E. W.—W. S.—T. M.—S.—W. P. A.—J. C.—J. B.—J. J —Sutton & Sons.—T. W.

Markets.

COVENT GARDEN.—Nov. 25.

A fair amount of business is doing among better articles, the supply of common descriptions of Pears and Apples being, however, very heavy, and difficult of disposal at paying rates. Among the latest arrivals are Malta, Mandarin, and Tangerine Oranges. Jersey arrivals have been moderate. Amongst flowers we have Orchids, Chrysanthemums, Heaths, and dwarf evergreens.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	2 0	Oranges, per 100	3 0	12 0
Grapes, per lb.	3 0	6 0	Pears, per doz.	1 0	4 0
Lemons, per 100	6 0	12 0	Pine-apples, per lb.	4 0	7 0
Melons, each	1 0	3 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. lb.	0 2	0 4	Herbs, per bunch	0 2	0 4
Beet, per doz.	2 0	3 0	Horseradish, p. bun.	3 0	5 0
Brus. Sprouts, ½ sieve	3 0	3 6	Lettuces, p. score	1 0	3 0
Cabbages, p. doz.	1 0	1 6	Mint, per bunch	0 3	0 6
Carrots, p. bunch	0 4	0 8	Mushrooms, p. pott.	1 0	1 6
Cauliflowers, p. doz.	1 6	3 0	Onions, per bunch	0 4	0 9
Celery, red p. bun.	1 0	1 6	Parsley, p. bunch	0 2	0 3
— white, do.	1 0	1 6	Salsafy, per bundle	1 0	1 6
Cucumbers, each	0 6	1 0	Seakale, p. pun	1 0	1 6
French Beans, p. 100	3 0	4 0	Shallots, per lb.	0 8	
Garlic, per lb.	0 8		Spinach, p. bushel	2 0	3 0
			Tomatos, per doz.	1 0	1 6
Potatos, Regents, per ton	£5	£6	Kidneys, per ton	£6	£8
Rocks, 500 tbs.					

POTATOS. Southwark, Nov. 21.

During the past week the arrivals coastwise have been limited, but fair by rail and road. Trade has been a little better for best samples, at the following quotations:—Yorkshire Regents, per ton, 70s. to 80s.; Lincolnshire do., 65s. to 70s.; Dunbar and East Lothian do., 70s. to 80s.; Perth, Forfar, and Fifeshire do., 65s. to 70s.; Kent and Essex do., 55s. to 65s.; Do. Rocks, 50s. to 60s.

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3 yr. old Plants. Low net price on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

BROCCOLI, ELLETSON'S NEW SURPRISE, large late white protecting.—This variety is a great improvement upon the Mammoth Cauliflower Broccoli, sent out 20 years ago by J. & J. Elletson, of Thorngumbald. It has given universal satisfaction, and proved itself to be the best late white Broccoli extant. Price 1s. per packet.

CUCUMBER, FOSTER'S X.L., fine long Ridge.—This new variety is a remarkably fine, late, dark, Ridge Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. Price 1s. per packet.

MELON, LORD NAPIER, New.—A handsome exhibition variety, golden yellow, and beautifully netted; green-flesh, melting, juicy, and delicious in flavour; free setter, and hardy in constitution. Price 1s. 6d. per packet.

EDMUND PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street, Hull.

MUSHROOM SPAWN, best, about 100 lbs. bels. in large or small quantities.

PEAS.—Sutton's Ringleader, 1d. per quart.
" Sangster's No. 1, 2d., 1s. "
" Bishop's Longpod, 3d. 1s. "
" Tom Thumb, Dwarf and Early, 1s. 6d. per quart.

The above sorts have been ordered, being much approved last season.

EARLY LONGPOD BEANS, 8d. per quart.
EARLY POTATOS, the best kinds.
CATALOGUE of Seeds on application

JOSHUA MAY, Seedsman, 9, and 11, First 25, Bridges Street, Covent Garden, W.C.

THE AMERICAN NURSERY,

BAGSHOT, SURREY,

Near Sunningdale Station, South-Western Railway.

JOHN WATERER & SONS

Respectfully invite the attention of Gentlemen and Planters to the undernamed selections from their general stock; every plant may be depended upon as in the best order possible for removal, having been transplanted within the last season.

ARAUCARIA IMBRICATA, grand specimens, 4 to 6 & 8 to 12 feet
CUPRESSUS LAWSONIANA, 3 to 4 & 6 to 10 feet
" LAWSONIANA ARGENTEA (John Waterer's variety), by far the most desirable of all the glaucous varieties, 5s. to 7s. 6d. each
" MACROCARPA, 4 to 6 feet, 42s. per dozen
FRUTA AUREA.—Beautiful plants, about 2 feet, 42s. per dozen; larger, 5s. to 21s. each
" GIGANTEA.—An unequalled stock of hundreds of seedlings, 4 to 6 to 8 feet, 3s. 6d. to 5s. 7d. and upwards
We would remark, that unless plants are on their own roots of this fine Thuja they are quite worthless.
THUJOPSIS BOREALIS, 3 to 4 feet, 30s. per dozen; extra fine, 5 to 6 and 7 feet, 5s. to 10s. 6d. each
" DOLABRATA.—Fine plants, 5s. to 7s. 6d. each
" " VARIEGATA, 5s. to 7s. 6d. each
WELLINGTONIA GIGANTEA.—Good plants, 30s. per dozen, 2 to 3 feet, 42s. to 60s.; larger, up to 10 feet, 7s. 6d. to 21s. each
ABIES NORDLIS, handsome plants, from 5s., 7s. 6d., and upwards
" NORDMANNIANA, 2 to 3 feet, 2s. 6d. to 10s. 6d.; 3 to 4 feet, 21s.; 4 to 8 to 12 feet, 31s. 6d. and upwards, each
" LASIOCARPA, 3 to 4 to 5 feet, 10s. 6d. to 42s. each
" GRANDIS, 4 to 5 to 6 and 10 feet, 10s. 6d. to 21s. each
" PINSAPO, 3 to 5 feet, 5s. 7s. 6d. to 8 feet, 7s. 6d. to 15s.
" DOUGLASII, 3 to 4 feet, 30s. per dozen; 5 to 6 and 12 feet, 3s. 6d. to 7s. 6d. and upwards
" MAGNIFICA, 3 to 4 feet, 42s. 6d. to 42s.
" ORIENTALIS, 3 to 4 & 5 feet, very beautiful examples, 21s. and upwards each.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; larger up to 12 feet
YEWS, COMMON.—Immense quantities, 2 to 3 to 4 to 5 feet, from 15s. to 60s. per dozen
" IRISH.—Perfect columns, up to 12 feet
" GOLDEN, as standards on Irish stems, perfect globes, 10s. 6d. to 42s. each
HOLLIES, GOLDEN COMMON.—Many thousands, of all sizes, from 1 foot up to 6 feet
" the best GOLDEN, WATERERS', and SILVER varieties, in any quantity, and of all sizes.
STANDARD HOLLIES, GREEN, 10s. 6d. to 21s. each.
" " WATERERS' variety, many hundreds of symmetrically grown specimens, 7 to 10 feet high, 10s. 6d. per foot
" WELLINGTONIA GREEN, and SILVER VARIEGATED, fine plants, from 21s. each.
" PORTUGAL LAUREL.—Very close grown handsome plants, 2 to 3 to 4 feet, very large specimens, 30s. to 63s. each.
STANDARD ROSES, of the best English and French kinds, £5 per 100

AMERICAN PLANTS.

Of this very popular tribe of plants we have the pleasure of observing that our stock is unequalled, and that it is from our Establishment that nearly all the approved crimson varieties of Rhododendrons have emanated. The Grand Exhibition of Rhododendrons annually displayed at the Royal Botanic Gardens, Regent's Park, has been for the past 20 years supplied from our Nursery.

RHODODENDRON PONTICUM, of the darker sorts, extra strong, 30s. to 42s. (select plants, 42s. to 63s.) per 100
" CATAWBIENSE and HYBRIDS, bushy, well-grown plants, 30s. to 42s. to 63s. per 100
" better class (SEEDLINGS) and named varieties for extensive planting
" very superior, leading, named varieties, 63s. to 84s. per 100
" CUNNINGHAM'S WHITE, extra strong, 63s. per 100
" STANDARD and HALF STANDARDS, of the most approved varieties, of all kinds, from 10s. 6d. to 21s. each

AZALEA, common kinds, 50s. to 75s. per 100.
" very best, in fine plants, £10 per 100.
KALMIA MYRTIFOLIUM, very handsome, 30s. per dozen.
" LATIFOLIA, 18s. to 30s. per dozen
ANDROMEDA FLORIBUNDA, fine plants, 18s. to 42s. per dozen

We have likewise immense quantities of the leading kinds of

EVERGREENS OF ALL SIZES,

SUCH AS

AUCUBAS, BAY, BOX, LAURUSTINUS, COMMON and PORTUGAL LAURELS, ARBOR-VITÆ, PHILLYREA, &c.

From the immensity of our stock we are enabled to treat on most liberal terms, and Purchasers are recommended in every practicable case to visit and choose for themselves, it being an impossibility to adequately describe by advertisement.

We guarantee all plants sent out by us, in proof of which we will replace all failures which may occur the first season after planting.

CATALOGUES, describing faithfully the colours of Rhododendrons, with height and prices, will be forwarded on application

A strong Tree-planting Machine can always be had on hire.

Purchasers of large quantities are informed that Goods can be forwarded from Sunningdale to all parts of England in through truck, thereby causing a great saving in transit as well as diminishing the cost of package.

THE AMERICAN NURSERY,
BAGSHOT, SURREY

Notice to Introducers or Cultivators of New Plants.

THE HORTICULTURAL ESTABLISHMENT of RINGELHEIM, Hanover, Germany (represented in England by Messrs. R. Silberrad & Son, 5, Harp Lane, Great Tower Street, London, E.C.), undertakes the BRINGING OUT of ALL NOVELTIES that appear in the way of Plants, Ornamental Shrubs, Vegetables, &c., and earnestly beg all Cultivators and Introducers to inform them of all Novelties that appear, especially in Roses, Pelargoniums, Herbaceous and Greenhouse Plants, &c., and the conditions on which they are willing to Cede the Right of Sale

Letters (prepaid) to be addressed either direct, or to Messrs R SILBERRAD AND SON, as above

THE HORTICULTURAL ESTABLISHMENT of RINGELHEIM, Hanover, Germany (represented in London by Messrs. R. Silberrad and Son), offers the following articles at the undermentioned greatly reduced prices:—

ORNAMENTAL FOREST TREES.

QUERCUS AMERICANA RUBRA, fine seedlings, 1-yr., 5s. per 100, 40s. per 1000: 2-yr., 8s. per 100, 72s. per 1000.

ROBINIA PSEUD-ACACIA, fine seedlings, 1-yr., per 100,000, £15; 2-yr., do., £25; do., £48

BETULA ALBA (Birch), fine young trees, 7 or 8 feet high, per 10,000, £8; per 50,000, £32; per 100,000, £58

N.B. The above-named Seedlings are disposable, per 100,000, up to Three or Four Millions. For other sorts, see CATALOGUE, which Messrs. R. Silberrad and Son will send free on application.

SEEDLING AND TRANSPLANTED CONIFERS.

PINUS, ABIES EXCELSA, strong seedlings, 2-yr., 6d. per 1000, £2 8s. per 10,000, £20 per 100,000; transplanted, 3-yr., 12s. per 1000, £5 per 10,000, £44 per 100,000

PINUS, ABIES PECTINATA, strong seedlings, 2-yr., 12s. per 1000, £5 4s. per 10,000, £48 per 100,000; transplanted, 3-yr., 14s. 6d. per 1000, £6 8s. per 10,000; transplanted, 4-yr., £1 per 1000, £9 4s. per 10,000; £80 per 100,000

LARIX EUROPÆA, strong seedlings, 2-yr., 10s. per 1000, £4 per 10,000, £32 per 100,000; transplanted, 3-yr., 18s. per 1000, £6 per 10,000, £48 per 100,000; transplanted, 4-yr., 18s. per 1000, £7 12s. per 10,000, £64 per 100,000

PINUS SYLVESTRIS, strong seedlings, 1-yr., 3s. 6d. per 1000, £1 4s. per 10,000, £10 per 100,000; strong seedlings, 2-yr., 5s. per 1000, £2 per 10,000, £18 per 100,000

PINUS STROBUS (Weymouth), strong seedlings, 2-yr., 17s. 6d. per 1000, £7 per 10,000; transplanted, 3-yr., £1 4s. per 1000, £10 per 10,000

PINUS AUSTRIACA NIGRA, strong seedlings, 1-yr., 6s. 6d. per 1000, £3 per 10,000, strong seedlings, 2-yr., 8s. per 1000, £5 10s. per 10,000; transplanted, 2-yr., 11s. 6d. per 1000, £5 4s. per 10,000; transplanted, 3-yr., £1 per 1000, £8 10s. per 10,000

All the above Seedlings are well grown, healthy, and well rooted; and are for the greater part disposable by millions.

A reduction is made on all Seedlings when upwards of 100,000 are ordered.

The cost of packing (which is done with the greatest care, and according to the distance the plants have to travel does not amount to more than 10 per cent. of the amount of invoice on goods for England, &c.

For other Conifers (either in open ground or in pots) see our SPECIAL CATALOGUES

Orders accompanied by remittance or reference, if from unknown correspondents, should be sent immediately to

Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

STRONG Standard APPLES, PEARS, and WALNUTS; fine Standard and Dwarf trained APRICOTS, PEACHES, and NECTARINES; bushy LAURUSTINUS and PORTUGAL LAURELS, a select collection of Standard and Dwarf Perpetual ROSES of the best varieties, and other Hardy Flowering SHRUBS. Also, 4 to 5 feet, LAKE, SPRUCE, SCOTCH and AUSTRIAN FIRS, and all kinds of FOREST TREES. All the above have been regularly transplanted and are well rooted. Prices low. Cash.

CHARLES BURGESS, The Nurseries, London Road, Cheltenham.

Planting Season.

DICKSONS AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for Transplanting. They are growing on very exposed ground, are finely rooted, and their wood is thoroughly exposed. Single copies of CATALOGUES on application. Special prices will be quoted on the large quantities are taken. Established 1770.

WANTED, extra strong SEAKALE PLANTS, for forcing; also Dwarf trained MORELLO CHERRIES, and ditto MAGNUM BONUM PLUMS. Also Standard MULBERRIES

Address A. Z., Gardeners' Chronicle Office, W.C.

FRANCIS & ARTHUR DICKSON & SONS, The Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

LILY of the VALLEY, imported Clumps, 18s. to 24s. per dozen.—These are unequalled for early forcing, and are much superior to English grown; producing very large and fragrant flowers in great profusion.

LILIUM JAPONICA, imported Clumps, 12s. to 18s. per dozen.—The extensive use of this flower as a cut flower during the winter, and the large description of its capacity it is unsurpassed. It is admirably suited for early forcing.

Fruit Trees.

MAGNIFICENT Dwarf-trained PEACHES, NECTARINES, APRICOTS, PLUMS, APPLES and CHERRIES.

Standard-trained PLUMS, Bearing Trees.

Dwarf-trained BEARING TREES of APPLES, PEARS, & PLUMS.

Pyramid APPLES, PEARS, and CHERRIES.

WM. WOOD AND SON'S Nurseries have long been celebrated for the growth and careful training of Fruit Trees. The plants now offered are quite unsurpassed. CATALOGUES on application

Woodhouse Nursery, Maresfield, near Uckfield, Sussex

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps for J. S.'s first copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the time their best fruiting, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and starved by repeated pinchings, a system that is quite reprobate to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches in winter; and in this way only can trees fill the coat of growing healthy and fruitful trees, such as J. S. offers.

TO the TRADE.

Dwarf-trained (all extra fine Trees)

Moorpark Apricots | Plums—Green Gage, Kirke's, Coe's
Cherries, May Duke, Morello, &c. | Golden Drop, Victoria, &c.
Apples, Pears, Peaches, Nectarines, Cut-leaved Elder, Fern-leaved, and Weeping BIRCH, 4 to 5 feet and 5 to 6 feet. Prices and samples on application to

EWING, CHILD, AND CO., The Royal Norfolk Nurseries, Norwich.

Surplus Stock of

ALBERT, VICTORIA, and LINNÆUS RHUBARB, ASPARAGUS, KALE, SEAKALE, SKIMMIA JAPONICA, CLEMATIS LANUGINOSA, VIRGINIAN CREEPER, and PYRACANTHUS, to be sold cheap.

ISAAC DAVIES, Nursery, Ormskirk.

To the Trade.

FINE POINSETTIAS, with two and three heads, 18s. per dozen; single heads, 12s. per dozen, in fine condition. Fine LOMARIAS, from 12s. per dozen. DRACÆNAS, from 12s. to 42s. per dozen.

S. HAWKINS, Bishop's Road, Bayswater; and Oakland's Nursery, Shepherd's Bush, W.

Notice to the Seed Trade.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL LIST of GARDEN and AGRICULTURAL SEEDS for the present season is now ready, and can be had upon application. Samples and stock to carry time, and prices to suit.

FIVE HUNDRED THOUSAND extra fine Native SCOTCH FIRS, at from 15s to 20s per 1000, all other FOREST TREES, HEDGE PLANTS, &c., clean as Messrs. TREMBLE will undertake the safe delivery The Nurseries, Penrith.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING and COMPANY (Limited), CORN, SEED, MANURE, and OILCAKE MERCHANTS. Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke. Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.

Park Fencing undertaken to any extent.

N.B. Plans and Designs for Horticultural Buildings, &c.; & Woodlands Nursery, Marsfield, near Uckfield, Sussex.

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, VALUER, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.

SALES and VALUATIONS carefully and promptly conducted.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Mayfield Farm, Romford, Essex, E.

Nursery and Seed Business to be Disposed of.

AN excellent and well established NURSERYMAN and SEEDSMAN'S BUSINESS is to be DISPOSED OF, in consequence of the death of the late Proprietor.

The Stock will be found suitable in every respect for the requirements of the Business, and may be taken at a valuation (estimated at about £6000); and the terms of payment can be arranged to suit the convenience of the purchaser.

The Nursery Grounds are situated within an easy distance from a flourishing and increasing Market Town, and the business is capable of great extension.

Apply by letter to Messrs. NUTTING AND SONS, Seed Warehouses, 96, Barbican, London, E.C.

To Nurserymen and Others.

TO BE SOLD, a decided bargain, a newly-erected SIX-ROOMED GOTHIC VILLA, with nearly 4 acres of Ground, used as a Nursery, for £560. Hothouses, Sheds, and Stock, may be had on valuation by arrangement.

Apply to H. SIMMONDS, 62, High Street, Guildford, Surrey.

To Nurserymen, Florists, and Others.

TO BE SOLD, The PORTLAND NURSERY, at Tonbridge, Kent, containing 6½ acres, of which about 2 acres are stocked with Shrubs, Conifers, and Forest Trees, &c., and held on a 13 years' lease, with 4 Dwelling Cottages, at the rent of £80 a year. Stock to be taken by valuation from £200 to £300.

For particulars apply to Messrs. STONEWALL AND SIMPSON, Solicitors, Tunbridge Wells.

WANTED, an active GARDENER, to PURCHASE HALF-SHARE in a Small Nursery, Florist and Seed Business, in Islington. Long Lease. £150 cash required.—G. R. 12, Rotherhill Street, Islington, N.

LAND AGENT WANTED. An active, intelligent Man, between 30 and 40 years of age, having a thorough knowledge of Estate work, and the Value and Management of Light Land, including Draining, Fencing, Planting, &c., and fully competent to prepare Plans, Specifications, and Estimates for, and to superintend, the Erection and Repair of Farm Buildings. Must have unexceptionable character, and possess practical experience acquired in a similar situation.—Full particulars, stating age, family, salary, and references, &c., to be addressed to G. F., 21, Arundel Street, Strand, London, W.C.

WANTED, in about a month, a steady Young Man, as FOREMAN and PROPAGATOR, one who thoroughly understands Greenhouse and other plants, and who is an expert Grafter of Roses. Rhododendrons, &c. State age, references, and wages required.—Messrs. F. P. FRANCIS AND CO., The Nurseries, Hertford.

To Seedsmen.

WANTED, an UNDER SHOPMAN; one newly done with his apprentice may be preferred.—Apply, with particulars, to JAMES DICKSON AND SONS, 10, Upper Sackville Street, Dublin.

WANTED, an active GROUND FOREMAN, who thoroughly understands Fruit Trees, Roses, Evergreens, Conifers, and general Nursery Stock. Good references required. Write, stating wages and where last engaged, to JAMES W. TODMAN, Eltham Nursery, S.E.

WANTED, as UNDER GARDENER, an active Young Man, who understands his business.—Apply to the GARDENER, Hare Grove, Sutton, Surrey.

WANTED, a SHOPMAN, who thoroughly understands the Retail Seed Trade; also to travel occasionally. Unexceptionable references required.—Apply, stating all particulars, to J. AND W. YATES, Seed Merchants, Market Place, Manchester.

Northampton General Infirmary.

WANTED, as LODGE PORTER and MANAGER of Kitchen and Flower GARDEN, a steady respectable Man, who will also take himself generally. He must be married, but without family at home. Age, not under 30. Wages, if the whole charge of the Garden be undertaken, £1 a week; if not, 16s, with house, coals, and gas. Written applications, stating age, and accompanied by testimonials as to qualifications and character, to be sent, not later than Thursday, December 8, to the House Surgeon, at the Infirmary. N.B. As the office is one of great responsibility, no attention will be paid to testimonials which are not of the very highest character.

WANTED, as ASSISTANT SHOPMAN, an intelligent active Young Man, with a fair knowledge of the Trade.—Apply to Mr. F. COWLING, Seed Merchant, Derby.

WANTED, a Young Man as FOREMAN, to take charge of the Plant Houses—one who can grow Plants for Exhibition. Good wages to a suitable person.—Apply, by letter, to J. C. HIGGS, Caversham Park, near Reading.

WANTED, a Young Man, as ASSISTANT in a Seed Shop; one used to Retail.—Apply by letter, stating previous occupation and wages, to W. P., *Gardeners' Chronicle* Office, W.C.

WANTED, a steady industrious Man as UNDER BAILIFF. Must thoroughly understand the Management of Stock, and the general routine of Farming.—A. B., Post Office, Bromley, Kent.

WANTED, a respectable, active MAN, who thoroughly understands Ground-work, Levelling, and Planting. Liberal wages.—Apply personally to Mr. EPPS, Landscape Gardener, Lewisham, S.E.

WANTED, a First-class DAIRYMAID, or Man and Wife, to Manage Dairy, Cows, Pigs, and Poultry; without family preferred.—J. W. F., Post Office, Maidenhead, Berks.

WANT PLACES.—Letters to be Post Paid.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has open his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

To Gardeners and Bailiffs (Head, Foremen, or Under)

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen. Further particulars given on application to Messrs. F. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, N.W.

JOSEPH MEREDITH, The Vineyard, Garston, Liverpool, begs to inform Noblemen and Gentlemen that he has several GARDENERS, of First-class Certificates, requiring Situations, to be suited in Place, upon his recommendation.

GARDENER (HEAD), age 36, married, one child. WILLIAM EARLEY is now at liberty to engage with any Nobleman or Gentleman requiring the services of a first-class practical Gardener, who has had extensive experience in every department connected with Modern Horticulture. He has a 13 years' excellent character from his late employer, who is anxious to procure him a permanent situation.

To save trouble, a first-class place only treated with.—W. EARLEY, Managing Man to Garden Works, Valentines, Ilford, E.

GARDENER (HEAD). Age 34, married; thoroughly understands Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables, Kitchen and Flower Gardening, &c. Good character.—J. RICH, Shalimar Gardens, Acton, W.

GARDENER (HEAD), to any Nobleman or Gentleman in want of a thorough practical Man.—Reference to last and previous employer. J. S., Post Office, Bracknell, Berks.

GARDENER (HEAD).—Married, no children; a highly respectable and well educated Man, thoroughly competent in all branches of the profession. Moderate wages accepted, with comfortable cottage. First-class character.—The GARDENER, Grendon Lodge, Rotherhithe, S.E.

GARDENER (HEAD), married, no family.—F. HILL is desirous of engaging himself to any Lady or Gentleman requiring the services of a first-class Gardener. Has had great experience in all branches of Gardening; well up in the Management of Stove and Greenhouse Plants, Orchids, &c. Can produce and receive the highest testimonials from last employer.—No. 2, Grove Cottages, Sycamore Grove, New Malden, Kingston-on-Thames.

GARDENER (HEAD), where two or more are kept. Thoroughly understands all kinds of Indoor and Late Forcing, the cultivation of Stove, Greenhouse Plants, Orchids, &c., and the usual routine of Flower and Kitchen Gardening. Character will bear the strictest investigation.—R. BUCKINGHAM, The Rookery, Downe, Beckenham, Kent.

GARDENER (HEAD, WORKING).—Age 39, married; a trustworthy, steady Man, from the South. Thoroughly practical in all branches of Horticulture, having been brought up to it from childhood. Can be highly recommended. No single handed place accepted.—B., Mr. C. Miller, Golden View, Crook, Sheffield.

GARDENER (FOREMAN).—Age 24; good practical knowledge of the profession in all its branches, including Orchid culture. Ten years' experience. Can be highly recommended by previous employers in England and Scotland.—X. Y., Golden Acre Nurseries, Edinburgh.

GARDENER, in a small family.—Middle-aged, no family; thoroughly understands the profession, and willing to make himself useful. Wife a good Laundress, or willing to assist in the house, if required. Good references.—G. GRACE, Essex Cottages, Tadworth, near Reigate, Surrey.

MANAGER, in a Nobleman's or Gentleman's Nursery, as also had the Management of Woods and Plantations seven years' character.—D., Mr. Abraham, Goldworth Nurseries, Woking, Surrey.

LAYING-OUT, PLANTING, &c.—D. FERGUSON, late of Stowe and Aylsbury, having been extensively employed in Laying-out Grounds, Thinning Plantations, and Planting Undercover, &c., offers his services on moderate terms.—Whitton, Hounslow, W.

FOREMAN, in a Nobleman's Garden.—Good character from present employer.—H. JONES, Mr. Brydone, Gr. to Sir V. R. Corbett, Bart., Acton Reynold Hall, Shrewsbury.

To the Nursery Trade.

FOREMAN (WORKING), SALESMAN, or PROPAGATOR of Market Plants.—Understands the routine of Nursery Business in general. A sober, trustworthy Man, willing to make himself useful in a comfortable home, rather than more an object than high wages. Character and references good.—NURSERYMAN, 4, Carroll Street, Preston, Lancashire.

SALESMAN or TRAVELLER.—Thoroughly understands Market Work, Purchasing in Grand Nursery Business. Well known as a Salesman. Moderate salary. Highest references.—H. H., 320, Edwarde Street, Marylebone Road, N.W.

FARM BAILIFF, or to Manage an Estate.—Middle-aged; has had great experience in Farming, both on heavy and light soils, with the most modern improvements; the Buying and Selling of Corn, &c., and also the Buying, Selling, and Breeding of Stock. Highest references.—B. W., Messrs. Sutton & Sons, Royal Berkshire Seed Establishment, Reading.

FARM BAILIFF, or to Manage an Estate.—Middle-aged, married, no incumbrance, respectable; thoroughly understands the Raising of Sainfoin, the Dairy and Poultry. Good character.—H. H., Post Office, Fotton, Southampton.

BAILIFF.—Age 31, single; has had great experience. Good reference.—R. D., Mr. May, Seedsman, 15, Brydges Street, Covent Garden, W.C.

ASSISTANT, in the Wholesale and Retail Agricultural and Garden Seed Trade.—Age 21; will make himself generally useful. Two years' experience. Good references.—M. R., Post Office, Dundee.

To Seed Merchants.

ASSISTANT.—A Young Man, with eight years' experience of the Seed and Nursery Business, is disengaged. Good references.—W. S. SEEDS, 10, Lower Exchange Street, Dublin.

SALES BY AUCTION.

Dutch Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, on MONDAY, November 28, at half-past 12 o'Clock precisely, an importation of choice HYACINTHS, TULIPS, CROCUSES, NARCISSUS, IRIS, LILIUMS, GLADIOLI, and other Bulbs, just arrived from well-known Farms in Holland.

On view the morning of Sale, and Catalogues had.

Established and Imported Orchids.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, November 29, at half-past 12 o'Clock precisely, a Collection of ESTABLISHED ORCHIDS, in splendid condition, and any one wishing to add to their collection cannot do better than avail themselves of this Sale. Also, a few IMPORTED ORCHIDS.

On view the morning of Sale, and Catalogues had

Growing Crops and Market Garden Stock.

MR. SEARLE is directed by Mr. Harris to SELL by AUCTION, at Jamaica Level, Rotherhithe, on WEDNESDAY, November 30, at 11 o'Clock, excellent Victoria, Albert, and Linnæus RHUBARB, fine CELERY, Red CABBAGE Plants, MINT, and SEEDS; Waggon, two Spring Vans, two Carts, Cart-horse, Harness; 8½ three-light Boxes, 500 Hand-glasses, Market Baskets, Implements, Manure, and Poultry.

May be viewed on Tuesday, and Catalogues had of Mr. SEARLE, Auctioneer, 7, Bond Court, Walbrook, London, E.C.

Suttons' Red-skin Flourball Potato,
The BEST COOKING and HEAVIEST CROPPING LATE VARIETY.

SUTTON AND SONS are now prepared to receive orders for the above splendid TOTATO, pronounced by all who have tried it to be the best late variety ever introduced. Orders executed strictly in rotation. Price 5s per peck. Trade price on application.

SUTTON AND SONS, Seed Growers, Reading.

To the Trade.—Agricultural and Garden Seeds.

H. AND F. SHARPE are now prepared to make special offer of the above Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from adulteration of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech.

Seeds Direct from the Growers,
The BEST MEANS of PREVENTING DISAPPOINTMENT.
SUTTONS' SELECTED STOCKS of FARM SEEDS.
SMITHFIELD CLUB CATTLE SHOW.
STAND 79

SUTTON and SONS invite the attention of Visitors to their extensive Display of AGRICULTURAL PRODUCE, including very fine specimens of their improved varieties of MANGEL WURZEL, CHAMPION SWEDE, PURPLE TOP SWEDE, KOHL RABI, CARROTS, POTATOS, GRASS SEEDS for Permanent Pasture and other purposes.

Orders will be received and descriptive Catalogues may be obtained at the Stand, or post free on application.

All goods carriage free (except very small parcels); 5 per cent. allowed for cash payment.

SUTTON and SONS, Seedsmen to the Queen, Reading, Berks.

Birmingham Fat Cattle Show.

JAMES DICKSON AND SONS beg to intimate that they will have an OFFICE, No. 45, on the Ground Floor (underneath the Gallery, and nearly opposite the entrance), where they hope to have the pleasure of meeting with their Customers and Friends attending the Show.

"Newton" Nurseries, and 102, Eastgate Street, Chester.

Smithfield and Birmingham Cattle Shows.
PLANS of LABOURERS' COTTAGES.

THE ROYAL AGRICULTURAL SOCIETY'S MANCHESTER PRIZE PLAN will be exhibited at the Stands of Messrs. AMIES, BARFORD, AND CO., of Peterborough, who supply two complete Lithographic Working Drawings, and full Printed Specifications, price £2 2s; or, apply to the Exhibitor, Mr. JAMES MARLIN, Wansford, Northamptonshire.

CENTRAL CHAMBER of AGRICULTURE, ANNUAL MEETING.

The GENERAL BUSINESS COMMITTEE will meet at the Salisbury Hotel, Fleet Street, on WEDNESDAY, December 7, at 10 o'Clock.

Same day, at 2 o'Clock, MEETING of the COUNCIL, consisting of the Deputed Members from Provincial Chambers, and the 26 Elected Members of the Central Chamber.

Same day, at 3 o'Clock, or when the business of the Council is concluded, ANNUAL MEETING of the Subscription Members of the Central Chamber.

AGENDA.

To receive the Report of the Council.

To elect a Vice-chairman for the year 1871.

To elect Eight Members of the Central Chamber to be Members of Council, in lieu of the following, who retire by rotation, but are eligible for re-election:—Mr. Thomas Willson, Mr. H. George Andrews, Mr. William Biddell, Mr. Thomas Horley, jun., Mr. James Howard, M.P., the Earl of Lichfield, Colonel Tomline, M.P., Mr. James Webb.

To appoint Auditors.

Mr. Pusey Long will propose the following as a new Rule:—"That a subscription of £20 shall constitute any person a perpetual honorary member of the Central Council, entitled to speak and vote at all its meetings, but on travelling expenses of such perpetual honorary member to be allowed."

Mr. K. Jasper More will propose, and Captain P. G. Craigie will second, the following as a new Rule:—"That the March meeting of the Council shall extend over more than one day."

Mr. Thomas Willson will move as a new Rule:—"That the Business Committee comprise one Member from each Provincial Chamber, in addition to the 26 elected Members of Council of the Central Chamber."

To consider amendments of the Laws and Constitution, and Bye-laws, to be recommended by the Council.

And other Business.

JOHN ALGERNON CLARKE, Secretary.

The Salisbury Hotel, Fleet Street, E.C.

ROYAL AGRICULTURAL SOCIETY of ENGLAND.

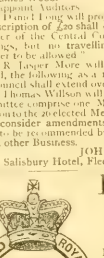

The GENERAL MEETING of MEMBERS will be held in the Society's House, 12, Hanover Square, on THURSDAY, December 8, at 12 o'Clock.

By Order of the Council,
H. M. JENKINS, Secretary.

London, November, 1870.

The Agricultural Gazette.

SATURDAY, NOVEMBER 26, 1870.

MEETING FOR THE ENSUING WEEK.

MONDAY, Nov. 28 to THURSDAY, Dec. 1 } The Agricultural Show at Bingley Hall, Birmingham.

THERE is a little yellowish dumpy fly that many of our country readers may have seen on their windows during the month of October, about which we wish to say a word or two. The thing is neither rich nor rare, but there is more than one reason why we should direct attention to it. It produces what is called GOUT in WHEAT. CURTIS studied and described its transformations, or those of a nearly allied species, some five-and-twenty years ago, as did other entomologists on the Continent at the same time, but there are still points in its history which require elucidation; and even although there were not, it is always desirable from time to time to endeavour to obtain fresh information as to the progress made by our insect enemies as well as any other enemies, so as to know whether they

are increasing or diminishing; nor is it less necessary to remind the agriculturist that they are still there, and that he must not relax in his precautions against them.

The little fly in question is called Chlorops lineatus, and from several inquiries having been made about it during the past month, we are inclined to suppose that it has appeared in unusual numbers this autumn; although possibly the circumstance may merely be the result of the increased interest which has lately been taken by the public in Economic Entomology. The most noticeable feature in it and its allies is that the thorax or back is marked with three greenish black stripes alternating with yellow. In fig. 270, A is a magnified representation of the insect, and B shows its natural size.

The first information we had of its appearance in numbers this autumn was the receipt, from our valued correspondent, "E. O.," of a small box full of a perfect swarm of living examples sent for examination. They came from the vicinity of Chepstow, and we may incidentally mention that the soil there is very heavy, and to a great extent remarkably stiff, lias clay. Our correspondent writes:

"I send you some specimens of a species of Chlorops, which I found in great quantities in the northerly corner of a stack of Barley, about the 24th of last month. I noticed a few at the same part of the stack a few weeks before, but they were not generally distributed in it, and after taking the specimens I enclose, the creatures disappeared almost entirely. The numbers at the time I took them were extraordinary; they fell from the stack to the sheet of paper, in which I caught them, in a shower of scores and hundreds, as ripe seed falls from the head of a plant, but only from one spot.

"I enclose some heads of Barley from the same stack, stunted and twisted, and scarcely half the size of the undamaged part of the crop. There are only two Barley fields in the neighbourhood of the stack. In one the crop was remarkable for its patchy appearance in the early part of its growth; and in the other, the Barley towards harvest time was most remarkable for its stunted appearance, and uneven ripening and height."

It may be of use to some of our readers to see the appearance of the Barley ears, which have suffered from the attacks of this insect (why it may be so we shall presently explain). We therefore give the accompanying woodcut from a sketch kindly supplied by our correspondent, (fig. 270). In another note, "E. O." mentions that one of the fields close to the stack in question was so perfectly like the state of affairs described by DAGONET, and quoted by CURTIS, that it might have been the same, viz.:—"The stalks attacked are scarcely more than half the height of those which are healthy; their maturation is retarded considerably; they are still very green when the others have became yellow from the effect of ripening; the ears have not yet emerged from between the leaves which sheathe them; they are short, small in bulk, and contain few grains; these, moreover, are starved, concealed, and curved." He adds another particular, which, however, was not observed by our correspondent,—"All the series or files of grain situated on the side where one finds the longitudinal channel hollowed out by the larvæ are entirely abortive, and contain no grains."

Although the insect itself is very well known, its history rests upon very few observations. CURTIS studied and described one species, Chlorops tæniopus, and his observations were limited to a fortnight in August, 1841, and an observation on July 2, 1844. Not enough for a life history, even although supplemented by a knowledge of the dates when the perfect insect had been observed. Dr. DAGONET at Chalons sur Marne, in 1839, observed our species in a more detailed manner, and for a longer period; and the result was that in the spring he found its larvæ causing a considerable swelling of the young Wheat plant above the joint, destroying the central leaves and the plant itself. Towards the end of April, or in May, these larvæ passed through their metamorphosis and came out as the perfect Chlorops. The pairing of the sexes takes place towards the end of May or beginning of June, and the female is soon occupied in laying her eggs upon the stem of the Wheat, which then commences to show the ear: the egg is deposited towards the lower part of the ear, at the bottom of the sheath of the leaves; about fifteen days afterwards the larva (yellow, oblong, and without legs) issues from the egg, and attaches itself to the stem of the corn immediately under the ear. It nourishes itself by nibbling a part of the surface of the straw, making a longitudinal groove, which reaches from the base of the ear to the first superior knot or thereby, but never penetrating into the interior canal of the straw. When it nearly reaches the knot, it usually has attained its full growth, and turns into a pupa in the furrow it has excavated. "In the following September the Chlorops hatches" (we presume he means emerges from the chrysalis state), "*and would live during many weeks, and then deposit her new eggs upon the Rye and corn quite recently sown.*"

We have not met with any farther original observations on this point, and shall be very thankful to any of our readers who can refer us to any, or can supply any additional information of their own; but it seems to us that the last few words in Dr. DAGONET's description, which we have printed in italics, leave something still to be desired. We have seen that the perfect

FIG. 270.

insects in May couple immediately after coming out as perfect insects, that their period of impregnation lasts only a few days, when the eggs are laid, and that the larvæ are hatched in 15 days after. Now, there must be a great alteration in the economy of the autumn brood in some respect or other. Do they couple together, as is the case with other insects and at other seasons, as soon as possible after emerging from the chrysalis, or do they put it off until the spring? We imagine that entomologists will say that they do not put off the marriage-day. Well, is the period of gestation altered in winter from what it was in summer—from six days to six months? If not, then where do they lay their

FIG. 271.

eggs, how long do they take to hatch, instead of the 15 days of summer? No food is ready for them for months; therefore, the choice of difficulties seems to lie between retarding the period of gestation and retarding the period of hatching, and the former seems to be most in accordance with other facts in other insects. It is obvious, however, that this is a point of considerable practical importance; for, if the eggs were laid at the beginning of winter, and hatched in spring, in all probability they would be laid on the ears of corn, out of which the swarms came, and would only be hatched after the plant begins to grow, when they might ascend the young stem to commence their work. It would obviously be suicidal on the part of the farmer to sow such grain. He would then eschew, for seed corn, not only any crop containing ears such as those we have above figured, but he would have nothing to do with any grain from any part of an infected stack. We have examined the ears sent us by our correspondent, without seeing any eggs; but they have been lying on our chimney-piece (not a favourable condition for their conservation), and, besides, must be so small as to be very difficult of observation. At the same time our own belief is, that the gestation, rather than the hatching of the eggs, is retarded; and we only state the difficulty in order to profit by as extended an expression of opinion as we can.

To sum up fairly, too, we should remind the reader that there is a great difference of habit between laying eggs on a pickle of dry grain in a stalk, and on the stem of a growing plant; but, on the other hand, there is a scarcely less remarkable difference between the habits of the spring brood and the summer brood, which we have above described, so much so as to have led Dr. DAGONET to say, that "the stems of the Wheat attacked by the larvæ proceeding from the second laying of the Chlorops, present some differences so singular and so remarkable, that it it surprising that no one up to the present time has ascertained the cause."

—— THE rapid rise in the price of Wheat last week, owing to political considerations, though fully maintained on Monday, was hardly kept up on Wednesday in Mark Lane.——Trade has been hardly so active in the Metropolitan Meat Market, as the supply has been somewhat in excess of the demand, and prices have been rather below those of last week.

—— A circular has been issued from the Veterinary Department of the Privy Council, calling attention to the fact, that RINDERPEST, the disease from which this country suffered so much in 1865-6, now prevails extensively in France and North and South Germany. Their Lordships have taken measures to guard against its introduction by imported animals; but as it is possible that the disease might be brought in by human beings, or by any means capable of transporting very minute particles of the contagious matter, it is especially necessary at the present moment that the inspectors of the local authorities should be on the alert. The detection of this disease requires special professional knowledge, and as it appears that some of the local authorities have appointed the local police and other non-professional persons as inspectors under the Contagious Diseases (Animals) Act, 1869, the Lords of the Council trust that such inspectors will not, in any district, be left without professional assistance, but that the local authorities will authorise them, in any case where there is a doubt as to the nature of a disease, forthwith to call in a professional inspector. Their lordships feel that they cannot too strongly impress upon the local authorities the urgent necessity for the most careful attention to the above-mentioned points: and they trust that, with regard to the returns relating to foot-and-mouth disease, the inspectors will be instructed to give increased attention to the other contagious and infectious diseases of animals, and more especially to those diseases which have any resemblance to cattle plague, or concerning the nature of which there appears to be any doubt.

—— The preparations for the approaching great EXHIBITION in BINGLEY HALL are steadily progressing, with every prospect of a satisfactory result. A complete statement of the entries in all departments shows an aggregate of 3130 against 2823 in 1869—an increase of more than 300. The cattle classes are all well filled, and some extraordinary animals, some of them referred to below, are expected in those for Scotch cattle. For the information of poultry fanciers, we have to announce that numerous entries of American varieties, including Dominique fowls and crested turkeys, have been made, and that the birds are on their way to Birmingham from the United States. The root department is expected to be unusually interesting. Besides the midland districts it will include specimens grown in localities so wide apart as Wales, the New Forest, and north of Aberdeen. The collection of Potatos will be very extensive, and, in all probability, exceedingly fine. The new American sorts will be well represented; as will also the Bovinia, the merits of which for feeding stock has for some time been attracting attention.

—— The *Scotsman* reports that Aberdeenshire and the North will this season furnish fully the usual quota to the great CHRISTMAS FAT STOCK SHOWS at Islington, Bingley Hall, York, and Leeds. Mr. M'COMBIE, M.P., of Tillyfour, has a stock of over 200 4-year-old bullocks, worth from £32 to £48 a-head, and about 150 store and breeding animals, many of them of rare merit. Within the last four weeks he has sent to the southern markets 60 fine bullocks, realising over £40 a-head. From Tillyfour will undoubtedly go the heaviest fat polled bullock that will be shown at Bingley Hall and Smithfield this year. This animal is a 5-year-old, and a full brother to the famous Black Prince, that for three years carried everything before him in these two exhibitions, and went, by desire of HER MAJESTY, past Windsor for the Queen's inspection. The Tillyfour ox of 1870, however, is not considered so fine an animal, but he is quite as fat, and of exactly the same girth—9 feet 10 inches. For several years the most successful exhibitor of fat

cows and heifers at the English shows has been Mr. REID, Greystone, Alford. Besides these, he forwards heavy consignments to the metropolitan Christmas market. Just now he has over 100 heavy bullocks preparing for this market, all of which are in fine condition. To Birmingham and Smithfield shows Mr. REID is to send a pair of prime fat heifers, one is a 3-year-old Shorthorn and the other a Highland heifer, four years old, purchased at Leeds show last year. Mr. REID has also two fine polled cows and one Shorthorn entered for York and Leeds shows. Mr. STEPHEN, Couglass, Inverurie, is to send to Birmingham and Smithfield his monster cross ox, which carried the fat stock challenge cup at Aberdeen in July last; and Messrs. MARTIN, Aberdeen, have four remarkably heavy bullocks also going to these exhibitions. The most noted is the 4-year-old red cross, which ran the Couglass ox so hard for the cup at Aberdeen. A massive white 3-year-old bullock is a large animal for his age, and the others are also very fat. Many other cattle are also named as ready for their southern destinations.

—— Mr. BOWEN JONES, of Ensdon House, near Shrewsbury, has published a letter, in which he points out the great waste of time and money which is inflicted on the towns which compete for the ANNUAL VISIT of the ROYAL AGRICULTURAL SOCIETY, by the plan of throwing the matter open to public competition, He is glad, therefore, to see that the Earl of LICHFIELD has given notice that at the next meeting of the Council of the Royal Agricultural Society of England he will move, "That in selecting a town for the holding of the exhibition in 1872, the plan of the Bath and West of England Society be adopted." The rule of that Society is to select a town and stipulate for certain conditions before agreeing to visit it. He trusts that his lordship will meet with sufficient support to carry his resolution. The following is his statement of personal experience on the subject :—

"From my experience as joint Hon. Secretary with Mr. C. PEELE, the town clerk of Shrewsbury, for promoting the visit of the Royal Agricultural Society next year to that town, I can testify to the present system being most unsatisfactory; and as a member of the Royal Agricultural Society I shall hail with satisfaction a change, which I believe will prove most beneficial to its interests. In Shropshire, between £5000 and £6000 was subscribed to meet the estimated expenses for holding the show. In the town of Shrewsbury and otherwise Mr. PEELE devoted a very considerable portion of valuable time in advancing the object in view. In the country a sub-committee of farmers spent several days exclusively in securing eligible sites for the show ground, and for the trial of implements, and making arrangements with the owners and occupiers for the use of the same. In addition to this labour and a considerable amount of anxiety to those who took an active part in the matter, expenses to the amount of £150 were incurred. As three towns were put in competition (and it is to be presumed that they each took the same trouble in the matter), the result was, that this labour and expense was thrown away in two instances, without, as far as I can see, the Society deriving any advantage therefrom; on the other hand, the unsuccessful localities, perhaps, each think that they have made out the best case, and that they deserve to have attained their ends, and smarting under defeat, a feeling of antagonism against the Society springs inio existence. This is certainly the case in many parts of this country, and I believe that its removal will be considerably aided by the proposed alteration."

—— According to the *Economist* the AGRICULTURAL STATISTICS of SOUTH AUSTRALIA for the year 1869-70 show that 63 out of every 100 acres harvested were under Wheat, the total area being 532,135 acres. The average yield was unusually small—5 bush. 45 lb. in all. The failure is traced to the deficient rainfall, the gross returns of the guage for 1869 having been 14.7 inches, against an average of 22.2 inches. It is mortifying to observe from the duodecennial statement of land covered with Wheat, and the returns derived therefrom, how often the average has fallen below double figures. In no less than five out of twelve years this has been the case, and the very highest yield has been 14 bush. 20 lb. Three bad harvests have followed one upon the heels of the other, giving an individual average of 4⅞, 9⅜, and 5⅜ bush., or a general average of 6⅜ bush. Mr. BOOTHBY computes that £2,000,000 sterling has been the money loss to the community through this triple failure, and not unreasonably uses that fact as an excuse for the depression among all classes, and more particularly among agriculturists and landed proprietors. The deficiency in hay was as marked, in a subordinate degree, as in Wheat. The area cut was 141,899 acres, or 35,255 acres more than in 1868-9, but the yield was 5060 tons less, the average produce being only 15 cwt., as against 21 cwt. in the previous year. There were 20,114 acres sown with Barley, against 21,244 in the preceding season, the gross produce being 180,107 bush., or 130,355 less than in 1868-9; the average in the one case being 8 bush. 49 lb., in the other 14 bush. 32 lb. The acreage under Oats increased from 4210 to 4438 acres, and, contrary to the characteristic of the season, there was a slight increase in yield. The average in 1869-70 was 14 bush. 33 lb., and the aggregate 65,777 bush.; in 1868-9, 14 bush. 2 lb., and 59,213 bush. Potatos gave very encouraging returns, the yield of 2856 acres being 65 cwt. to the acre, or 9293 tons in all; while for the preceding year the aggregate of 2684 acres was 6335 tons, or 47 cwt. to the acre. It only remains to deal with the live stock, and under this heading the information is of an unfavourable description. Losses from drought, perseverance in boiling down, and failure in the natural increase, has reduced the number of sheep and lambs from 4,987,024 to 4,436,955, the deficiency amounting to 550,069. The number of cattle has decreased from 123,213 to 119,697, and horses from 75,409 to 73,828. These figures are not very encouraging.

—— At last week's meeting of the Cirencester Chamber of Agriculture, Professor CHURCH, of the Royal Agricultural College, made some remarks on the subject of ACORNS, as to their SUPPOSED POISONOUS EFFECTS on animals, especially the animals of the farm. One correspondent of the *Times* had given an amusing reason for the indigestibility of acorns. He said "starch was indigestible; it required to be boiled before being eaten." Fortunately this gentleman did not give his name, but he said in his letter that if you boil it you multiply its value by five, and that starch, in an uncooked state, was injurious to animals. We use a good deal of Barley and Oats for animals, and do not find that starch, of which these substances contain 60 or 65 per cent., do them any harm, and we give it to them in an uncooked state, therefore we must abandon that notion. You might, however, as well enclose a bread pill in a Willow chip box as give an acorn in its closed husk to an animal. It must be remembered also, that the acorn is a large and dense seed, which contains, in addition to starch and oil, a considerable amount of tannin, so it suffers a disadvantage compared with those which do not contain tannin. If acorns were simply converted into flour, they would be rendered more digestible; and if in addition you destroy the tannin, you render the food still more palatable. You also render the starch more digestible by cooking, but not to the extent stated by the writer above referred to. There is another point in the case of animals poisoned apparently by acorns. They eat too many, and gorge themselves; and as the acorns do not digest, they produce a stoppage as the result. In 1865, there was a large crop of acorns, when several pheasants were sent to me apparently poisoned. They were killed by acorns having choked them; it being found that in the craw and other parts of the peculiar structure of the digestive organs of the bird that one or more of the seeds had lodged, and had caused inflammation. The horse chestnut lies under the same disadvantage, being enclosed in a similar indigestible case. There is not only the tannin to a considerable extent, but there is a quantity of a poisonous substance, which is very dangerous. It is, however, a small quantity, but it is quite possible that under some circumstances it may be more largely produced than in others. Acorns and chestnuts may be rendered still more agreeable as food by getting rid of their hardness, their large size, their indigestible exterior, and their tannin, and they may be softened and rendered more digestible by adding a small quantity of soda to the water in which they are steamed. About 4 oz. of soda to 1 cwt. of acorn meal will suffice to destroy the greater portion of the tannin, and by pouring off the water you get rid of the injurious matters.

—— At the opening meeting of the session in the room of the Society of Arts, last week, it was announced, that the scientific knowledge of our chemists has hitherto failed to discover any means by which meat could be brought in a raw state to this country from our more distant colonies. This is the more to be regretted, because, in many of our colonies and other parts of the world, there exist large herds of cattle and flocks of sheep, from which no addition to the food of our people is at present derived; their wool, tallow, and hides being all that reach this country. While, however, science is still at fault in providing a means of preserving meat in its raw state, specimens of preserved meat in tins have been laid before the Society, which show that great improvement has been effected in this method, and that more still may be expected in this direction. The efforts of preservers have been directed especially towards improving this method of treatment, so as to preserve the meat without destroying its flavour and texture, and thus to render it more palatable and nutritious. The Food Committee of the Society will continue its valuable labours.

—— The results of the autumn ROOT-CROP COMPETITIONS are now being published. At Banbury the results in a fertile district appear, and were given at p. 1552. At Gloucester the other day more than 600 single specimens or collections of roots, fruit, grain, cider, and perry were shown, most of them sent in competition for the £131 offered as prizes in money or cups. We extract the subjoined details from the *Gloucester Journal* :— "Mr. MULLIN'S 5 acres of Swedes, which took the prize in the 1st class, bore the heaviest roots which have yet been known in the competition. The average weight was 24 tons to the acre; the average of Colonel KINGSCOTE'S, 18 tons; of Mr. D. HOLBOROW'S Turnips, 20 tons; of Mr. LAWRENCE'S Mangels, 42 tons; and of Mr. R. F. ONSLOW'S, 37 tons. The latter were grown upon the bed of a pool. Farmers will reflect for themselves upon the remarkable extent of these weights after so unfavourable a season, and will be interested to know that the 60 or 70 exhibitors of Turnips, with four exceptions, came from the hills. This is a comparatively infertile district of thin brashy soil on calcareous rock. The disproportion between the number of the competitors and the value of the prizes in these different classes proves the genuine desire of the farmers to excel for excelling's sake. Chief among the roots exhibited were twelve splendid Mangels, each weighing 40 lb., and twelve Swedes, 22½ lb. each., contributed by Lord SUDELEY.

—— We have received from Dalquharan, near Maybole, a specimen Carrot, of a crop which was grown on land irrigated by underground channels after the fashion described in the "Notes on Sewage," at p. 1390. The general crop, we are informed, was very fine, and the specimen sent is by no means the largest that could have been taken. It exceeds 4 lb. in weight, and is 30 inches long. The terminal fibrous root has been to some extent preserved, and shows that the plant had gone far in search of the peculiar nutriment with which sewage thus applied had charged the subsoil. We must however add, that very little is to be learned from single instances in agriculture; and we fear that, however successful underground irrigation has proved in the cases known to us, it is far from likely that the method of surface irrigation, so simple, so effectual, and so cheap, will be abandoned.

OUR LIVE STOCK.

CATTLE.

THE following remarks upon the Warlaby herd are condensed from an excellent article in the *Richmond Chronicle* :—

Warlaby may be called one of the original seats of the renowned Shorthorn breed of cattle, and is at this time the residence of Mr. John Booth, a member of the family which has brought this splendid breed to perfection. Warlaby stands about two miles from Northallerton, in a rich, undulating, grazing country. This is the chief seat of the "manufacture"—for that is the term to apply to the process—of the Shorthorn, the starting point of a breed which may literally be said to be peopling the "outer world," as well as the world of Europe. In April, this year, the prize cow *Patricia*, one of the celebrities of last year's Royal Agricultural Show at Manchester went, at 1000 gs., with a beautiful roan heifer, *Minaret*, 250 gs., to Messrs. Walcot & Campbell, New York. The price of *Minaret* was 500 gs., but it was reduced in consequence of the purchasers having a heavy loss by a previous purchase. In July, *Lady Grateful*, one of Mr. Booth's famous cows, was bought by Mr. Cochrane, of Canada, for 1500 gs., and she is now claimed by our colonial brethren, let us hope, to be the mother of future fruitful herds, and will, it is believed, do honour to the original stock. She was accompanied by a beautiful red heifer, *Lady Booth*, at 500 gs., and ROYAL COMMANDER, a magnificent bull-calf, whose sire was COMMANDER-IN-CHIEF, was also purchased for 600 gs. by the same gentleman. Let us hope that in Canada he will produce the glories of the Warlaby herd. The United States were not successful in their importation, for the splendid cow *Patricia*, for which 1000 gs. was paid, died on landing at New York. It was one of the accidents of transhipment, for she was landed when the weather was hot enough to make the New Yorkers invent another batch of cooling drinks, and, unfortunately, to prostrate scores of them with sunstroke. FIELD-MARSHAL BOOTH, quaintly named after the owner of Warlaby, and a most promising bull-calf, was sent to Australia, an enterprising colonist (Mr. M'Dougall, of Warlaby, Australia) having paid 800 gs. for him, and MAJOR, another of the stock, was sold to the same colony for half that amount. These are the colonial sales for the season, and they sufficiently indicate the value which is placed on the Booth "blood" in the British colonies and the United States. It may be here mentioned that COMMANDER-IN-CHIEF, for whose use Mr. Booth was offered 300 gs. for the season, died on August 29. He was an animal beyond compare, and his death from inflammation was a serious loss, though he has left successors which, it is expected, will rival him in fame and in all the qualities of a successful sire.

But now let us take the road to the Hall through this row of cottages, and past the farmstead, and here we find a group already examining the herd, and expatiating on its beauties. An enthusiastic clergyman, evidently a Shorthorn devotee, and a worshipper of the Booth "blood," is pointing out *Lady Fragrant* to his friends, and probably a better *cicerone* could not be found. "Has she not a sweet head?" he asks; and she certainly is a most splendid animal, as the least professional of amateurs cannot fail to admit. She is graceful, yet enormous in bulk, and she has that modest and plaintive expression which poets have often referred to as indicative of sweetness in a higher class of animal. But we prefer to recite *Lady Fragrant's* glories in another line. She is the winner of 23 cups and prizes, and her owner has refused 2000 gs. for her from the purchaser of *Lady Grateful*. As a 2-year-old heifer she took the 1st prize at the Royal Agricultural Show at Plymouth, and twice in succession she won the prize at the "Royal" as a cow. At the Yorkshire Beverley Show she carried off two prizes—one as the best cow, and the other as the best female. At Wetherby she carried off the same prize, and in the same order, and at Doncaster she was the best 2-year-old, and won the Champion Cup as best Shorthorn animal in the show. She was the means by which the owner won the Durham county 100 gs. Challenge Cup, which must be won three years in succession before it is permanently retained. *Lady Fragrant* carried it off one year as a 2-year-old, and again as a cow, whilst COMMANDER-IN-CHIEF took it

between the periods of her triumphs. It should be said, however, that there was an interregnum in the contests, owing to the cattle plague, though the result would in all likelihood have been the same, as neither *Lady Fragrant* nor COMMANDER-IN-CHIEF were ever out of Mr. Booth's possession. So much for *Lady Fragrant*. "She is the finest cow in the world, sir," says the clerical *cicerone*, who, by the way, is never tired of lamenting the demise of COMMANDER-IN-CHIEF, who, in like manner, was the finest bull ever seen. But now away to the "pastures," where is a herd of cattle quietly browsing, each one almost worth a prince's ransom. They have had "no indulgence" as the civil herdsman, T. White, says. They are just recovering from foot-and-mouth disease, and are therefore not so blooming as usual. They have been out all the winter, a proof of their hardiness; and that prize cattle do not mean effeminate cattle, if we may apply that term. But they are a wonderful lot. There is *Lady Mirth*, half-sister to *Lady Fragrant*, and dam of *Lady Jane*, FIELD-MARSHAL BOOTH, LORD BROUGHTON, *Merry Pearl* (gone to the United States), *Lady Joyous*, and MERRY MONARCH. Here is *Alfreda*, mother of *Patricia* (which died in New York), *Alberta*, ENGLAND'S GLORY (now at the Royal Farm, Windsor), and PRINCE CHRISTIAN (now in Ireland). Here is *Melissa*, the mother of *Minaret* (in the United States), *Milicent*, and MARMION, sold to Lord Bolton. Here also is *Lady Beautiful*, own sister to *Lady Fragrant*, but not so grand a creature. She is the dam of a beautiful white bull-calf, KING JAMES, by SIR JAMES, for which Mr. M'Dougall offered 1000 gs. in vain; *Mabel*, a handsome cow; and *Lady Jane* by LORD OF THE VALLEY, dam of *Lady Booth*, sold to Canada, a truly magnificent cow. There are many other animals here with all the grandest characteristics of the Shorthorns, but now we must return to the foldyards, where BRITISH CROWN, a splendid 7-year bull, is brought out for inspection. A most kingly head and neck he possesses, and though he has never won the crown at the "Royal," he took the 2d prize at the Royal Show at Newcastle, as a calf, in 1864, the 1st at the Scarborough Show, and the 1st also at Howden. He had been in Ireland for three years and a-quarter, where he earned for his owner 650 gs. The herdsman says, with a sigh, that he is not like COMMANDER-IN-CHIEF, but he is a grand animal, nevertheless—"short-legged and dew-lapped," like the Thessalian bulls, whom Shakspeare immortalises, and of great length. KING RICHARD THE SECOND, ten months old, by COMMANDER-IN-CHIEF, out of *Lady Grateful*, a rich roan, and very handsome, promises to be a splendid animal. His mother was sold for 1500 gs. A white calf, calved in March, by *Lady Fragrant*, with COMMANDER-IN-CHIEF for its sire, inherits the splendid "blood" from both sides which our friend admires. It bears a strong resemblance to its dam, and it is hoped will unite the qualities of its grand predecessors. *Soldier's Daughter*, half-sister to COMMANDER-IN-CHIEF, is in the lower pastures, and, notwithstanding her recent suffering from foot-and-mouth disease, it is easy to discover her grand qualities, and to recognise at once the family merits she possesses. A white heifer, out of the *Soldier's Daughter*, by SIR JAMES, is a very fine animal indeed, with a model of a head, and a bulk conjoined with beauty which promises to add further renown to the Warlaby herd. The white colour so prominent in the herd, we are told, comes from *Lady Blyth*, and certainly it has its attractions, though the dappled roan of *Lady Fragrant* carries our suffrages. A sister of *Lady Perfume*, out of *Lady Fragrant*, with her mother's eyes, has never been shown, though she will bear a comparison with the best animals around her. *Lady Joyous*, from *Lady Mirth*, by COMMANDER-IN-CHIEF, and full sister to *Merry Pearl*, FIELD-MARSHAL BOOTH, &c., is in the low pastures, as is also *Milicent*, out of *Melissa*, by COMMANDER-IN-CHIEF. The last is two years old, and is a splendid creature. *Blooming Bride*, a first-class breeder, is here as well, as is also a white heifer, not yet named, her produce by COMMANDER-IN-CHIEF. She bears a strong resemblance to *Bride Elect*, whose grand-daughter she is, and is altogether a most promising animal. *Christmas Rose*, by LORD OF THE VALLEY, has borne two calves, though only three and a-half years old, and is a more promisingly fruitful mother of a good stock could hardly be seen. She has a fine head and bosom, and looks the picture of health and strength. GOVERNOR-GENERAL, two years old, by COMMANDER-IN-CHIEF, also promises to transmit the glories of his sire. He is a very handsome bull, lengthy, and with a good head. Such are the chief attractions at Warlaby, nor would it be easy to find anywhere others of the kind that outweigh them.

—— The Morayshire Farmers' Club has recently discussed the following important question: "In the breeding of farm-horses, what is the best time for mares to foal, and is it more profitable for the Morayshire farmer to breed the horses required for his farm, or to buy them?" In giving a condensed epitome of the result of this debate, the Chairman said:—"It appeared to be the general opinion that the proper time for foals to come was in the month of May or beginning of June, that they might have the advantage of an early bite of grass, and cause the loss of as little of the mother's work before foaling time as possible. Where farms were of a certain extent, and if they had peculiar advantages in the way of outlying pasture or marshy ground, it would be profitable for farmers to breed their own horses, but that the soil of the country was not particularly well suited for the purpose. The land was not heavy enough or good enough to give them the requisite bone."

POULTRY.

AT the recent Ipswich show some very excellent birds were exhibited, although from the near approach of our great winter shows, entries were not so numerous as on former occasions. Mr. Hewitt was the judge for poultry and pigeons, and the following awards were made:—

Game.—Black-breasted and other reds: 1st, S. Matthews' black red); 2d, W. Rayner (brown red). Very Highly Commended: H. C. Martin. Any other variety: 1st and Cup, S. Matthews (duckwing); 2d, W. Boyes (duckwing).

Dorkings.—1st, J. Martin; 2d, O. F. Creswell (silver grey). Very Highly Commended: Reid, F. Tearle, F. Partlett, and H. Jingwood.

Spanish.—1st and Cup, Howard & Nichols; 2d, F. James.

Brahmas.—Dark: 1st, H. Jingwood; 2d, Right Hon. Lady Gwydyr. Light: 1st and 2d, H. Dowsett.

Cochins.—Buff: Cup, 1st and 2d, Right Hon. Lady Gwydyr. Any other variety: 1st and 2d, H. Jingwood (partridge). Very Highly Commended: H. H. Bletsoe and H. Dowsett.

Hamburghs.—Pencilled: 1st and Cup, W. K. Tickner (gold); 2d, E. Clayton (gold). Spangled: 1st, W. K. Tickner (gold); 2d, J. Wright (silver).

French.—1st, C. H. Smith (Crèvecœurs); 2d, A. Taylor (La Flèche).

ASHGROVE FARM, NEAR BICESTER.

A VISIT to Ashgrove in September last enables me to add the following notes to the many which have been published on the Oxford Show Prize Farm. They are given just as they were taken, without regard to what has already appeared, whether in the "Journal of the Royal Agricultural Society," or the columns of the *Agricultural Gazette;* and I publish them with whatever errors may have befallen me or my pen, believing, nevertheless, that they fairly represent the condition and the management of what was evidently a very well-managed square mile (or rather more) of poor, thin, brashy, arable land.

Walking across grass fields and by green lanes from the ploughing match of the Bicester Agricultural Society (where, by the way, a very small assemblage of spectators were looking on at a very scanty competition, to which, however, the Ashgrove Farm had contributed a team), I soon came upon a large open tract, differing from the lands behind me in the size of its enclosures, and the straight, trim character of its fences. Here was a set of 30 or 40-acre fields clustered around a large and profit-like collection of well-built ricks, beside a central homestead; the whole evidently in the hands of a good manager. Crossing one of these fields, a Clover stubble full of close hard-cropped Rye-grass, which had received a dressing of well-rotted dung and was being ploughed for Wheat, I soon gained the public road, which divides the farm into two nearly equal parts; and walking some 200 or 300 yards further, reached a gateway away on the left, leading by the rickyard and the homestead to a comfortable farm-house. On the one side was a large open space, in which, at regular intervals, stood a noble row of rectangular well thatched corn-ricks; and on the other side, in a 30-acre field of Clover stubble, were several large heaps of farmyard manure, covered with a top layer of earth, and ready to be spread abroad as a dressing for next year's Wheat crop. The buildings are chiefly arranged in two parallel rows, facing one another, the interval being divided into yards, some of them without sheds: and the farmhouse is at the lower end of one of these rows. Beyond the house are two or three fields of permanent grass land—which have been drained, but still carry some of the original Thorn and Bramble, unstubbed, with which the surface had once been more thickly covered.

There are about 800 acres of plough land and 80 or 90 acres of this grass. The cropping for 1870 has been 120 acres of Wheat, 280 of Barley, 60, 125, and 16 respectively of common Turnips, Swedes, and Mangel Wurzel, and about 200 acres of Clover and seeds. This is the result of a strictly four-field rotation—one-quarter being in roots, as much in Barley, one-quarter in Clover after Barley, and then broken up chiefly for Wheat, but some of the lighter and poorer land for Barley again. Mrs. Millington, the tenant of Ashgrove Farm, has still four years of a 21 years' lease of the farm, and during these four years she is bound to cultivate the land upon the four-field system; she has, however, been at liberty up till now to grow what crops, and to take them in what order, she pleased. The late Mr. Millington had adopted the four-field course at the outset of his occupation, and acted on it by choice; and his widow, assisted by her brother, Mr. Ormond, has maintained his mode of cultivation since. That which the landowner had enjoined in his own interest upon the tenant towards the end of the lease, had been adopted by the tenant in *his* own interest throughout the 16 years of the lease which have elapsed. This fact has just to be recorded: it may be taken as a proof—not that there is not a more excellent way—that the old Norfolk system is still workable, and in good hands still answers on light soils, both for landlord and for tenant. The character of the Turnip crop, clean, even, and forward in spite of the dry suummer, with lots of growth in it still, and the large produce of corn, evidenced by the well filled rickyard, both declared that the land had been well done, and was in good condition.

The following, stated somewhat abruptly, are some notes of this 800-acre patch of thin and rubbly calcareous soil.—Laid out in large square fields it is cultivated by 18 horses, worked by three carters and six younger men. — The stock kept includes a flock of 400 Lincolnshire ewes, with their produce up till 12 or 14 months old, to which, according to the character of the Turnip crop, there is added a flock of 100 up to 200 sheep, bought every winter, and kept while the Turnips last. — There are two or three milch cows, and 20 to 25 calves are bought and reared and kept till two or three years old, when they are sold in store condition. — There are some 15 breeding sows, and there were a lot of 85 of all ages on the stubbles and in the yards at the time I visited the farm; these are sold chiefly as stores.

The practice is to cart the dung from the yards, where the straw is converted by the cattle and pigs during winter, wholly on the Clover stubbles before ploughing them for Wheat or Barley. The Turnips, Swedes, and Mangel Wurzel receive only superphosphate as their dressing. The corn stubbles receive a 3-horse ploughing before winter, and are crossed by the steam-cultivator in the spring. They are then harrowed and rolled, and, if necessary, crossed again with Coleman's grubber, and ultimately drilled on the flat, receiving 4 cwt. of superphosphate per acre applied with the water-drill;—8 to 10 pecks of Wheat, 3 bush. of Barley, and, when Oats are grown, 4 bush. of Oats are used as seed per acre. The Clovers—10 lb. of red and 10 lb. of white per acre — are sown along with 1 bush. of evergreen Rye-grass; or 2 bush. of Italian Rye-grass are sown along with 10 lb. of Trefoil. About one quarter of the Clover is mown every year for hay.—The horses receive a stone of Oats and Maize, mixed and crushed, daily, along with Vetches and Clover in summer; and along with a little oilcake, Clover hay allowanced, and Wheat chaff or Oat-straw chaff *ad libitum*, in w inter, when they also get occasionally a Swede or Mangel Wurzel as "green" food.

A large quantity of cake is consumed upon the farm by sheep. About £1200 is the annual amount of the cake bill. On this, and about £250 worth of superphosphate, and good cultivation, the maintenance of fertility depends.

The sales off the farm, in average years, are 120 acres of Wheat, at about 4 qr. per acre; 280 acres of Barley, at 5 qr. or less; upwards of £800 worth of mutton, 900 fleeces (300 tod) of wool; the produce, partly fat and partly stores, of 15 breeding sows; and some 20 or 25 two and three year old cattle in store condition. The outgoings, not to speak of cost of seed and rent, which latter may be 24s., or thereabouts, per acre, are represented by £1200 for wages, £1200 for cake, and £250 for superphosphate. — The implements used upon the farm include wooden framed ploughs, Coleman's grubber, Cambridge and common rollers, heavy, light, and chain iron harrows, common and water-drills and water-carts, Wood's and Samuelson's reaping-machines, a set of heavy carts and waggons, good barn machinery, including Tuxford's straw-lifter, Boby's screen, cake-crushers, winnowing-machines and chaff-cutters, &c. Of the £1200 representing the annual amount of the labour, probably £800 is paid for piecework; the carters receive £18, £16, and £14 per annum respectively, along with food. Beer is not given, except to labourers with the threshing-machines.—There is a good show of poultry, apparently in profitable condition—ducks, geese, turkeys, and Dorking and Hamburgh fowls.

Any departure from the four-field course of cropping is in the way of extending rather the restorative than the exhausting half to use the old phraseology. It is not departed from by taking a second corn crop after the grain grown upon the sheepfold, but by ploughing up any of the seeds that fall naturally to be succeeded by Wheat, for Mustard and for Vetches. Some acres of both are annually grown—in the former case in the late summer and early autumn months, to be fed off and followed by Barley instead of Wheat; in the latter case, any piece of the Clover that might be fouler than the rest is ploughed up for Vetches instead of Wheat, and this is followed by Turnips in the year when it should have been Wheat, coming in the following year for Swedes or Mangel Wurzel, and so regaining its place in the regular rotation, enriched and cleansed by a double fallow crop.

There is, I believe, no Sainfoin grown on Ashgrove Farm, which seems an odd omission of a most valuable crop, considering the special fitness of that class of soils to which the farm belongs for the crop in question.

Since transcribing my notes as above, I have again read both your report on pp. 1001 and 1002, and Mr. Hall Keary's in the "Journal of the Agricultural Society." I think the reporter in the former case was rather hard upon the implements and buildings which either caught or did not catch his eye. The buildings are certainly aggregated without much apparent purpose or design, and the yards in particular must be somewhat comfortless for winter stock; but they are in good order, and above rather than below the ordinary style of the country. Many capital farm implements are in constant use—reaping-machines and water-drills seen here are not yet universal as they ought to be—the water-cart especially, named as absent, is in constant use in summer time—the carts and waggons are heavier than need be. I entirely agree, however, with the remarks of the reporter on the live stock generally, and I think his whole statement a capital specimen of almost *impromptu* agricultural criticism, written, as it was, immediately on the announcement of the award.

In Mr. Keary's hands the farm has lost nothing of all the praise that it deserves. I have no doubt that he is right in recommending to the tenant the applica-

tion of top-dressings of nitrate of soda to the young Wheat crop wherever the dressing of farmyard dung to the Clover may have been inadequate. How it is that the practice recommended in this instance is reprobated in a case where a much larger outlay has been made on cattle food, I do not understand. Mrs. Millington may be cordially congratulated on a success which is due rather to patient continuance in common agricultural well-doing, than to any striking advance beyond the ordinary rules of good farming. *J. C. M.*

NITROGEN IN MANURES.

Mr. Alfred Sibson, F.C.S., consulting and analytical chemist, of 11, Eaton Terrace, St. John's Wood, publishes in his annual report the following remarks on the nitrogenous and ammoniacal element in manures. He says:—

There is still in many districts a great want of knowledge on the subject of vegetable nutrition and what constitutes money's-worth in the shape of artificial manure. An instance of this is afforded by the efforts made in several localities, in some cases at a large outlay, to prepare a so-called guano from sewage by precipitation. Town authorities are of course anxious to get rid of their sewage, and when led to believe they can do so at a profit by such processes, have been induced to enter upon schemes altogether wanting in sound principles. To the credit of farmers, however, the sale of such products does not appear to have met with the success anticipated by the promoters. It may be accepted as a chemical impossibility ever to prepare, by precipitation from sewage, a manure which shall repay its cost of production when its true commercial value is found either by practical experience or trustworthy analysis. There is no question of the manure value of human excrements, and it is quite possible to prepare from them a remunerative artificial manure, but this must be done before it has been mixed with water, since, when this has once been done, owing to the solubility of the valuable constituents, and to the fact that there is no practicable means of precipitating them again, such matter is practically worthless, except for irrigation; for which purpose, however, it is in my opinion far too little prized.

1. One of the best forms of nitrogen is undoubtedly that furnished by the organic matter of bones after having undergone a partial decomposition in the ordinary dissolving process by acid, and it is to this fact—added to that of the superiority of the phosphate also present—that the steadily increasing preference now given to good "dissolved bones" and "bone manures" is to be attributed. In the older plan of mixing the bone dust with the superphosphate after it is made, the nitrogenous matter is much less effective, from the slowness with which it comes into action, and still more so in the case of bone dust employed alone; the use of which indeed—except in peculiar cases—being now considered as almost a waste of bone material.

Assuming bones to contain nitrogen equal to 4½ per cent. of ammonia, it will require about 8 cwt. in a mixing of 40 cwt. to furnish .90 per cent. of ammonia in the manure: with the concentration in weight on mixing referred to in my last, and the small amount of nitrogen always present from other sources, the actual quality of ammonia in a manure so made will be about 1¼ per cent. From this example the nitrogen to be expected from more or less bone will be easily judged of. Referring to the idea entertained in some quarters, that bone manures should be made from nothing but bone dust and acid, it is now pretty well understood that it is not possible to produce such a manure at the price, with the amount of soluble phosphate, and especially in the condition now demanded by buyers.

2. Peruvian guano, both for use alone or as a constituent of compound manures, probably stands first as a source of ammonia, and it is much to be regretted that the fine deposits which have furnished the supplies of late years of such uniform quality, and having 17—18 per cent. of ammonia, are pretty well exhausted, as appears from the fact that samples of this quality are now rare. During the past season the best qualities have not averaged more than about 14 per cent., many being as low as 10. It should be understood that these remarks apply to samples "genuine as imported," the lower quality proceeding from the larger and varying percentage of sand naturally present in the inferior deposits. Caution is therefore especially necessary at present in the purchase of guano even when pure—while a large trade appears to flourish in adulterated guano—to judge from the samples that have been analysed during the past season: buyers should in all cases test the bulk delivered to them, as an analysis of some other portion is no protection. Assuming Peruvian guano to contain 14 per cent. of ammonia, 5 cwt. in 20 (in using guano for compound manures it is best to mix it with the other materials dry) will give 3½ per cent. in the mixture.

3. Ammoniacal salts afford the most concentrated source of ammonia—the sulphate when ordinarily pure having as nearly as possible one-fourth its weight of ammonia—hence 5 cwt. in 20 will yield 6¼ per cent. of ammonia, and as little as 1 cwt. in the ton, 1¼ per cent. The chloride or muriate is sometimes met with, and has as much as 36 per cent. when pure. Another salt—the sulphocyanide—has as much as 41 per cent. of ammonia, but is unfortunately detrimental to vegetation, and cannot be used with safety in manure: it has been used to "bring up" inferior samples of sulphate, and buyers of this article should be on their guard against it.

4. Patent ammonia is a useful source of ammonia, but is sometimes too impure to admit of being used with safety; 2 cwt. in 20 (at 10 per cent., though often 15 per cent.) will give 1 per cent. in the mixture.

5. Nitrate of soda is of especial value as a constituent of top-dressing manures, from the rapidity with which it acts, and even in small quantity (say 5 per cent. of the nitrate) will in favourable weather give a visible effect in two or three days. As a source of nitrogen, however, nitrate is much weaker than sulphate of ammonia, as it contains only about 19 per cent. ammonia (nitrogen equal to) in a good sample having about 95 per cent. of real nitrate, as against 25 in the sulphate. 141 lb. are therefore required to give as much nitrogen as 112 lb. of the sulphate. It may not be generally known that the nitrogen in nitrates is not obtained in the ordinary estimation of nitrogen by the chemist, but requires a separate special operation for its estimation, and without which the analysis of any manure containing nitrate will not be fairly represented.

6. Dried blood is a valuable source of nitrogen, and the most fertilising kind of animal matter obtainable, being especially suitable as a constituent of the best class of corn manures; 5 cwt. in 20 (at 12 per cent.) gives 3 per cent. in the mixture.

7. Shoddy or wool refuse is a useful and abundant source of nitrogen, supplying 7—9 per cent. of ammonia (nitrogen equal to), and when mixed in with the acid in the ordinary dissolving process undergoes a partial decomposition highly favourable to its assimilation by the plant: it also imparts a rich smell to the manure. Five cwt. in a mixing of 40 give about 1 per cent. of ammonia in the manure.

8. Refuse materials, except those rich in nitrogen—such as flesh and offal, horn, &c.—are only of very limited application as sources of ammonia, since they impart too much bulk and weight to the mixture to allow of the proportion of nitrogen reaching the desired percentage: thus a material containing 2 per cent. of ammonia, if used at the rate named for shoddy, will yield to the manure only .25 per cent.

FARM LABOURERS.

[At the recent meeting of the Freshwell Labourers' Friend Society, Colonel Brise, M.P., spoke thus of the condition of the labourer.]

This, our annual dinner, is the time that we review the condition of the Society. We examine, as far as we can, what benefit it has been to the neighbourhood, and whether it has exercised much influence for good. And if it has exercised any influence for good we endeavour, and we must endeavour as far as we can, to extend and enlarge that influence. We also generally examine the condition of the labouring classes in this district, and I think we have every reason to be satisfied with the effect that this Society has had upon that class. At the present time, and during the past midsummer, the labouring classes in these districts have, I am afraid, had rather a hard time of it. Those who were not in constant employment have had a very hard time of it. Owing to the deficiency of the hay crop, to the hot summer, and to the fact that the weeds have not grown so fast as usual, and owing, I suppose, to the Turnip land not being so difficult to keep clean as ordinarily, there has not been that demand for labour that in other seasons there has been, and consequently the labouring classes have been very much put to it during the last summer. But I hope sincerely,—I am sure we all hope, for we are all of one heart and mind in this matter,—I trust most sincerely that there won't be any scarcity of work in the forthcoming winter. A very early harvest, we know, is often productive of a bad winter for the labourer, but to be forwarned is to be forearmed, and therefore I hope, if there is a scarcity of labour in this district, that means will be taken to alleviate that distress which must inevitably ensue.

Well, I think myself a better feeling exists among the labourers of this district than there was in former times. They certainly seem to be improving in their moral condition and in their general habits; there is less drunkenness seen and less bad language heard among them. Now that is a decided improvement. I am not going to say it is altogether owing to the operations of this Society, but I believe it is, in great measure, owing to the general interest which is taken, more than heretofore, in the welfare of the labourers by other classes. I certainly can speak personally, from my own experience, and say that I find among the labouring classes there is not that distrust of their employers which formerly existed. They have more confidence in each other, and decidedly a much better feeling exists on the part of the employers towards their men. The labouring classes have their vices, no doubt, but I think, taking them as a class, the vices of the labouring population would bear comparison with the vices of any other class. But there is this to be said about them, the vices and crimes and immorality of the labouring class are more before our eyes, are more of a nuisance to us and to the community at large, than are the vices of the richer classes. The vice of the labouring class is always exposed and punished by the law, while the vices of other classes are looked over—fashion and the world condone them very often. There is no doubt that if they were as great an injury to us as the vices of the labouring classes we should hear much more of them—but it is very common for us to hear people speaking of the wealthier class, when contemplating their vices, to say, "Oh, but he's a good-hearted fellow, and nobody's enemy but his own;" but when a labouring man is guilty of any immorality he is somebody else's enemy besides his own.

If pauperism is a crime, then I am afraid we have some crime in this district. But although the tendency of the present Poor-law is to treat pauperism as a crime—and there are many of our great legislators, and men who have every sympathy for the poor, and who give practical evidence of their kind feeling towards the working classes; many men also, whose experience is in cities and in manufacturing districts, who do not hesitate to say publicly and openly that pauperism is a crime—still my experience (and yours probably is the same as mine) is different from that. Although this may be the case in large towns and cities (and I believe there is a great deal of truth in the statement that pauperism may always be traced to crime in those large towns and cities), yet it is not so in agricultural districts. The great tendency of the legislature is to legislate for the whole country on the feelings and wishes of the large towns and manufacturing districts; and I should not wonder if some further legislation comes before us in this way ere long. The Poor-law has certainly not had the effect of decreasing pauperism; but it has rather had the effect, if we may judge from statistics, of increasing it. But then we must recollect that the object of the Poor-law was not to diminish pauperism, but to relieve it, and to prevent starvation. Now I believe our present Poor-laws have a demoralising effect, I believe they tend to make men improvident. They keep down wages, and they break that spirit of independence which ought to exist among the poorer people of this country.

I believe the condition of the labouring classes in this country has deteriorated during the last century. From all we read and hear upon this subject we cannot help thinking that the labouring class has been retrogarding in its position since the year 1775. I will not go further back than that, but the evidence we have lately obtained from the report of the commission appointed to inquire into the employment of women and children in agriculture fortifies that observation, and you will find from that report that the position of the labouring class generally throughout the country is not considered to be so good as it was previous to the year 1775. The reasons assigned for this are three. First of all, it is stated that one reason is the increase in the price of provisions since that time, without a corresponding increase in wages. Then another reason is the consolidation of the large farms throughout the country generally. And the other reason is the increased amount of land that has been inclosed throughout the country generally, over which the labouring classes had rights and privileges, of which they are now deprived. You would not fancy it, I imagine, but if I am correct there are 7,000,000 of acres of land which have been enclosed in this country since that year. Well, that is a consolidation of farms, a large inclosure of lands, which has been of great benefit to the community at large. The public have benefited by it, but they have detracted considerably from the privileges of the labouring classes.

I said that the Poor-law had the effect of keeping down wages, and I believe it has; for there is no doubt if the Poor-law did not provide for people in their old age, better wages would have to be paid, and they would have to provide, by benefit societies, &c., for themselves in their old age. Therefore I say the Poor-law has a tendency to keep down wages, as well as to make men improvident. I wish myself most sincerely that our rate of wages in this district were higher than it is. But we cannot regulate that, the law of supply and demand must regulate that in a great measure. But I believe if we paid higher wages it would be beneficial to our interests rather than otherwise. I believe with higher wages our expenses per acre would be less than they are now. And I think I have very good reason for saying so, for I find in the report of the same commission to which I have previously alluded, the commissioners compare the wages given in Bedfordshire with those in Northumberland, and this comparison leads me to the conclusion I have just stated. They take a 400-acre farm in each county; the wages in Bedfordshire are higher than the wages in Essex and these parts of the eastern counties, and not so high as the wages in Northumberland. The wages in Northumberland are 15*s.* per week, on a 400-acre farm, and the rate of labour per acre was 23*s.* In Beds the expense per acre on a 400-acre farm was 30*s.* 3*d.* Well, now, we know that our rate per acre is considerably higher than either of those sums I have mentioned. I am now speaking with some authority—I am not so good an authority as my friend on my right, Mr. Clayden—but I have often heard some of our best agricultural men, whom we all admit to be the best farmers in this country, say they cannot farm their land under 40*s.* per acre, and that in a part of the country where wages are very much lower than in Beds or Northumberland. My own experience as a farmer for the last 20 years corroborates that opinion. I certainly think, as far as my experience goes, it would

more often be over than under that mark. But, perhaps, as an amateur farmer, making experiments, I may not be an authority upon that subject at all times.

The reasons why the Northumberland labourers are so much superior to our labourers are these—(that is, in the opinion of the commissioners) in the first place the Northumberland labourer is not a subscriber to any club. It is not necessary that he should be. He is taken by the year, and he is paid his wages whether he is sick or well, whether he is able to work from old age or not. Another reason is this, that he drinks very little ale or beer, and his children suck at the milk jug instead of at the beer barrel. These are the two main reasons, I think, for the superiority of the Northumberland over the Beds labourer. Some time ago, in the year 1855 I think it was, a Mr. Grey, of Northumberland, had some very large drainage works in hand. He wanted something like 2000 labourers, and could not get hands enough. He said his labourers were earning 23*s.* or 25*s.* per week, and he advertised for labourers in Beds, Herts, and these parts of the eastern counties. A great many went over, but these men, when they were put side by side with the Northumbrians, could not hold their own at all. Very few of them could earn over 12*s.* per week. They found the ground so much harder than they had been accustomed to, and they had so many difficulties to contend with, that in a short time they nearly all left and came home again. Only about 10 or 15 stayed. These happened to be working upon softer ground than the average, and they earned about 15*s.* per week. But large numbers from our part of the country, and from the eastern counties generally, came home finding they were not able to earn the wages of the Northumberland men. This shows the superior stamina of the latter, and that their wages, after all, are only in proportion to the amount of labour that is paid for.

I thank you very much for listening to the observations I have made; and I also thank you again very much for the interest you still continue to feel in the welfare of this Society. I do think that it is a very great satisfaction to feel that we all, employers of labour—I believe nearly all the employers of labour in this district—subscribe to and help this Society, if they do not always all attend at our annual dinner. It is a very great satisfaction and consolation to feel that we one and all, by subscribing to, and by supporting this Society, admit that some acknowledgment is due to the labouring class beyond the weekly payment of their wages. We show them, at any rate, that we have some sympathy towards them, and I believe that sympathy will not be bestowed in vain.

Home Correspondence.

Experimental Plots.—I am glad to find that the Council of the Royal Agricultural Society of England will be asked at their next meeting, "That a small grant be made to the Cirencester Chamber of Agriculture, who, with the aid of the Professors of the Royal Agricultural College, are conducting a series of manure experiments on corn and roots." There are one or two ideas that have from time to time crossed my untrained mind on this subject, which, put into form, might result in some such questions as the following; and Professor Voelcker's report on "Field Experiments on Mangel," in "Journal of Royal Agricultural Society of England," Part I., vol. vi., p. 152, would almost give a negative reply to my first inquiry, viz.—Is the soil on the several experimental plots analysed? At the page quoted we find:—"Several points are likely to arrest the reader's attention:—1. The land, although light, appears to have been in good agricultural condition, for the unmanured plots yielded," &c.; again, in next page, we find, "The soil of the experimental field was of a light, sandy character, and though naturally poor, it was in good agricultural condition, as the produce from the unmanured plot showed." Thus we see it is from the result grown or produced that the state of the fields is noted, and not from any scientific examination beforehand. If correct in drawing such an inference from the words I have quoted, may it not reasonably be asked, Why should we apply such and such manure to the soil, when, for aught we know to the contrary, the soil contains a sufficiency, as indeed it may a superabundance, of this or that constituent which we have a certain knowledge predominates in the manure we are about to apply? And even supposing agriculturists to be thoroughly up to their work, with the intimate knowledge which a lengthened residence enables them to bring to bear, yet such an acquaintance with the soil will be found but in a limited degree. And on a shifting from one district to another few are able to distinguish, with a proximate correctness, the manure most suited to their farms. Let it still be borne in mind, these experiments are made for the instruction of the youthful (whether in years or in practice) members of the agricultural community. And whilst testing the accuracy of the teachings of a science which has pushed forward agriculture with giant strides, we also open up new sources of wealth to the nation at large, not only in being able to draw more surely an increased supply from the land, but in preventing an incredible amount of waste of time, energy, and money, which all who have given this subject a thought must admit. On the other hand, let us take for granted that the plots in question are scientifically examined, would it not at least interest large numbers of the readers of the Journal of the Society to learn on undoubted good authority that a soil containing a given amount of constituents necessary for the growth of a plant might be, I would almost say compelled, to yield certain kinds and quantities of corn, roots, or grass in proportion to the liberality with which we supply those constituents which chemistry has shown are requisite, aided by atmospheric influence, which mortal man cannot control, but which, having a knowledge of (limited no doubt) he may enlist into his service—and the proper and correct use we make of those appliances for the thorough disintegration of the soil, the eradication of weeds, &c., which the ingenuity of man, prompted by years of practical working, has devised for us? Thus, at least, the mineral constituents requisite for the profitable and successful cultivation of the plant being added and mixed with the soil; the mechanical operations requisite carried out in proper time, and thus efficiently; good seed sown; all that human forethought and scientific research can devise, done—he will now rest, trusting in Providence for an ample supply of those atmospheric influences favourable to vegetation, causing his field to produce well-filled sheaves for his sustenance and comfort, and herbage for the animal creation placed under his dominion and care. I have mentioned, it would interest the readers of the Journal if these matters were put before them in some shape from which they may be able to draw their own deductions. At p. 361, a correspondent signing himself "Scientific Training" has given a form of account, which, to a certain extent, would answer our purpose. The mechanical operations necessary in the cultivation of a field having been efficiently carried out—in other words, being properly tilled and free of weeds—given the ash constituents contained in the ground, bearing in mind that atmospheric influences are constantly, though silently and invisibly, in operation, converting into active fertilisers substances that hitherto were dormant—and the very manure we apply to the soil, whether from our stalls, the manufactory, collected from the surface or extracted from the bowels of the earth each and every one of them has, if I may so express my ideas, a chemical function to perform, carrying out in the earth, more correctly and effectively, what the chemist can do in his laboratory—*e. g.*, the effect of lime upon green vitriol, a substance beyond a certain degree injurious, made beneficial to vegetation. I say, bearing this in mind—this atmospheric influence and chemical transformation, having within our grasp the condition of our soil, knowing chemically and commercially the value of our manures, and our desire to grow a successful crop of corn (say of Wheat 6 qr. per acre), the question to be asked is, What quantity of the inorganic constituents do I require to add to my soil in the manurial agency I am about to apply, so as to, humanly speaking, ensure the crop contemplated, leaving my land in equally as good a condition as before? It is to be hoped that those who are to be assisted by the Royal Agricultural Society of England will put into practical form the result of their investigations, so that any one who has the true interest of English agriculture at heart, as well as those who have studied the matter, will find no difficulty in fulfilling to the letter the excellent, but I fear much neglected motto of England's Royal Agricultural Society, "Practice with science." *West Indian.*

Fox-Hunting.—Under this heading I was sorry to read such a grumbling letter as that which appeared in your last impression, signed "H. H. O., Warwickshire." I, too, am a farmer, and I was almost going to say that I was glad I did not live in the same county as "H. H. O." Although incapacitated from hard riding now, I have for many years been delighted to follow that manliest of sports, and when, one day last week, the hounds came across my farm, I hastened to open the gate for them, and enjoyed the scene as well as the best of them. Let me tell "H. H. O." that mine is a heavy clay land farm, and when I have had a couple of hundred horses across a piece of seeds or Wheat, I could not admire the appearance of it, but at harvest I never could see that I was a sufferer. What, then, is a trifling eyesore to an individual to the pleasure and advantages which the sport affords to hundreds? Among the advantages attendant on this national pastime is its healthfulness to its followers. It also draws out their pluck and courage. A man who cares not about risking life and limb at a rasping bullfinch would not hesitate to risk them elsewhere if need be. The finest cavalry in the world might be drawn from the foxhunters of old England. It creates a demand for good horses, and hence improves the breed, and raises prices to a level which they would never otherwise attain. The chief advantage of all, however, is it being the means of causing the country gentry to spend half of their time and incomes among their tenants and neighbours in the country towns. As soon as the season is over they are all off to London, the Continent, or yachting, to Norway, or elsewhere; and were it not for field sports, what on earth is there for a gentleman to amuse himself with in the country? On the first meet of the season how jolly are the recognitions as we see the old faces back again. As an Englishman, I hope that fox-hunting may flourish for ever. I have made many valuable and lasting friendships in the hunting field. I have also learnt to know almost every farmer and farm within a radius of many miles; I also know who cultivates his land well, and who does not; and I have, through having kept my eyes open, picked up hints to improve my own practice. When one fine morning during the last summer I found my rickyard strewn over with a score of fine young fowls, the victims of Master Reynard, I did not sit down and write a grumbling letter to the papers, but I tried to take more care of what remained; and I will venture to give, in conclusion, a bit of sound advice to "H. H. O."—let him at once purchase a very quiet steed (anything at all wilful would evidently be at present beyond his calibre), and twice a week for three or four hours ride after the nearest pack of hounds; it will give him a more healthy liver; it will strengthen his mind, and improve his temper; and I should not be surprised if at the end of the season he found himself on his legs responding to the toast of "Success to Fox-hunting." *F. W. B., Buckinghamshire.*

—— You were good enough last week to give me space to complain of the annoyance and injury which some farmers suffer through foxhunting. I do not suppose that a Parliament of tenant-farmers would put down that sport. I have no wish to see a Parliament elected composed of farmers exclusively, but I think their stake in the country deserves to be better represented than it is. Land-owning is overwhelmingly represented in Parliament. Land-occupying is represented by only two or three members of the Commons. The Lords is an exclusively landowners' house, and the Peers subscribe largely to fill the Commons with members, who will support landowning interests. In this way such Acts as the Policeman-Gamekeeper Act got passed; in this way the landowners have hitherto been able to keep off probate duty from land, and were able to keep off succession duty up till a few years ago. But the Parliaments of landowners made all other classes pay both those taxes. In the same way, timber and game pay no rates. These are landlord's crops. All tenant's crops pay rates. I am quite sure that Parliaments of landowners have done wrong, and I do not wish to see any one class in so great a majority as to enable it to make selfish laws, like those I have pointed out. If tenant-farmers were adequately represented in Parliament, neither foxhunting, nor game preserving, nor seizure of tenant's improvements could be long continued by landlords, to the injury of their tenants. *H. H. O., Warwickshire, Nov.* 22.

Clay Cracking and Sewage.—The objection to sewage on clays, because the ground is hilly and the land cracks, and thus allows the sewage to pass without filtering, is easily removed. Why does clay crack? Because it is allowed to become too dry. Why permit it to become so, when you have at hand the means of preventing it? I believe that on clays our applications of sewage should be light but frequent—just as gentle and frequent showers would act naturally, especially on hilly ground properly underdrained. *J. J. Mechi, Nov.* 21.

Carrots.—If the Carrots mentioned by Messrs. John Moir & Son, of Garthdee, are of an unusual size, I have some much larger. I grew half an acre this year for experiment on heavy land, steam-ploughed, well drained, and manured at the rate of 15 cwt. of pollard per acre, price £4 10*s.* per ton. Most of them were clamped when I received your paper on Saturday last, but I had taken one of the largest out, weighing, after being washed clean, 6¼ lb., about 17 inches in circumference and 19 in length. Having sold a ton or so, I told my lads to pick out a few of the largest, from which I took five, weighing 25 lb. 1 oz., twelve weighing 54 lb. 13 oz., from 12 to 14 inches in circumference and 13 to 19 in length; and I found twenty weighed 83 lb. 5 oz., and I have plenty weighing from 3 to 4 lb. each. I believe, if I had told my men when taking them up to pick out the largest, I could have had ten weighing 56 lb. *W. Savill, Clavering, Essex, Nov.* 15.

Labourers' Cottages.—Allow me to make a few remarks on the plans and specifications of cottage dwellings that have lately been published in the *Agricultural Gazette*. It appears to me that all, or nearly all, are of too expensive a character to meet the real needs of the case. What is required in the majority of cases is a house that can be erected at such a cost to the owner, including all outgoings, as may be repaid to him in the shape of a moderate rent on the part of a tenant, say £4 or £5 per annum. Now, if £110 must be paid for the structure, as seems to be assumed by the particulars given, it needs at least an annual sum of £7 to repay interest, depreciation, repairs, and landlords' taxes; in addition to this, there is the rental of site and garden, fences, drains, walks, and outbuilding, for which a return of at least £1 per annum more will be required. This brings the rental to £8 a-year, a sum beyond the means of the great bulk of the labouring population. Where, then, can an economy be exercised? In the first place, I do not think that we need insist on the universal requirement of three bed-rooms, or even two, for there are many cases of old couples, widows, and children, or young married people, where the saving of rent implied in the occupation of a smaller house is of the first importance. Secondly, where the

larger home is demanded, I think that a scullery 12 feet by 6 feet is more than ample, for I have found by experience that when so large a space as that is given the whole family will crowd into it, reserving the best room for a Sunday show-room, thus defeating the object aimed at. Thirdly, I consider that a pantry is a needless luxury, for, as I have heard it said, "What is the use of building us pantries, if they give us nothing to put in them?" The requirement may be met by erecting in the scullery a large safe, with panels to the door of pierced zinc, and a small opening into the outer air by means of a drainpipe through the wall. Fourthly, a further economy may be effected by making the outer door to open directly into the sitting-room; and where the cottage is placed in a sheltered situation with a good aspect, and a porch is provided, I have not found this objected to. Fifthly, where a third bedroom is given, it is considered in this freestone district to be most cheaply obtained by raising the side walls somewhat higher, and forming a room in the roof. I believe that the cottages of our district, built as they are of stone, with walls not less than 18 inches thick, and stone-tiled roofs, are found to be more comfortable than those with thin brick walls and slates, being warmer in winter and cooler in summer. *C. P., Gloucestershire.*

Local Experience as a Guide.—I send you two extracts from my recent reading, which seem to me very apposite illustrations of the way in which a sensible man in untried circumstances may safely be guided by his own farm labourers accustomed to the soil on which they have been working all their lives. The first is an extract from the *Newcastle Northern Farmer*, and may be headed—

Rolling on a naturally heavy Soil. "The late Mr. William Hutley, one of the most intelligent farmers, a heavy or clay land farmer all his life, had recently taken a large clay farm in the Mersy Island district—at Wigborough, if we rightly recollect the name of the parish—in Essex, and when he went over to the farm the first March of his occupation, on riding over the fields he found that the severe frosts of the previous winter had converted the surface into an 'ash-heap' of loose soil. These fine particles consisted of small granulated atoms of clay that were light enough to allow Mr. Hutley's horse to sink in up to its fetlocks. Mr. Hutley's conclusion was the same as he and 999 farmers of clay would have come to, viz., that it wanted rolling down; and he said in a delicate off-hand manner to his bailiff not desiring to appear to be doubtful of the man's judgment in a matter which was apparently so common and simple—'You will get the 2-horse roller over this land as soon as it is dry enough.' Any expression more common-place than this could not well have been made; but to Mr. Hutley's astonishment, his bailiff—a respectable horseman, who had been in the parish from childhood upwards—pulled up short, as if astounded at his master's ignorance of the soil with which he had to deal. In further response the bailiff said, 'It won't do to roll th' Wheat, maister.' Here, it will be perceived, there was a dead-lock between general and local or exceptional experience. We need not follow up the subsequent consultation through all the discussion which ensued, but the end of it was, the bailiff said,—'If you roll this land ever so little, maister, you will roll away 2 qr. an acre,' and he would not yield a particle of his opinion. Upon this Mr. Hutley bethought himself of other local conditions, and he accepted his man's advice. 'But,' said Mr. Hutley, 'I tell you what you shall do—you may have your way, but I will support my judgment too—you shall put the heavy roller over 2 acres across the middle of this field, and we shall then see the difference.' The result at harvest time was, Mr. Hutley was bound to acknowledge, that the part rolled was 2 qr. an acre less in yield."

The following is my second example, taken from a lecture by Mr. Morton on Agricultural Education before the Royal Agricultural College, Cirencester. I will head it—

Rolling a naturally Light Soil.—"A friend of mine occupying a large extent of land in Gloucestershire took a farm in Sussex, on the edge of the chalk downs there—the two districts not particularly differing in their climate. The labourers employed upon that farm had been resident 20 and 30 years upon it, and of course knew perfectly the character of the land and the agricultural customs to which it had given rise. On arriving there one April morning, the new tenant was frightened to find them at work trampling the young Wheat in with long teams of oxen drawing heavy rollers twice to a place over the field, leaving the dry white chalky land behind them as hard as a road, and with really little better promise of a Wheat crop on it than the road itself presented. His opinion that local experience ought to override all other guides induced him to submit (for so he felt it at the time), and the result justified a practice against which all his previously acquired agricultural intelligence protested. The experience of the district had already proved its propriety—had proved the need of that induration of the soil, for the accomplishment of which, however, no doubt 'intelligence' may find some more compendious and less laborious means than the driving of long teams of heavy cattle over it appears to be. Skill, the result of local practice, as well as intelligence to be acquired from books, is needed for the efficient direction of the details of cultivation." *M. S.*

Potato Cultivation.—At the present time, the subject which seems to engross a large share of the attention of agriculturists and horticulturists is the enormous produce of that variety of Potato called Bovinia. It has occurred to me that, while looking at effect in this case, we may gather some information if we investigate cause. That the Bovinia Potato is very productive, *per se*, compared with other varieties, is granted; but that the enormous produce may be attributed to the inherent productiveness of this variety, is untenable. When the Potato could only be had at a price of 1*s.* 6*d.* per lb., it was not to be expected that there would be purchasers of large quantities; and as people are generally careful of what is costly, the Bovinia Potato received more attention than its neighbours. The consequence was, that from having more space allotted, and having greater care in after cultivation, the large crops which are now exciting the wonder of readers of agricultural papers have been produced. The cultivation of Potatos generally, through this country, is not as well understood as its importance merits. On most farms there is a portion of land devoted to Potato growing. The produce is either sold in market or consumed at home. Now very large Potatos are not generally as valuable in market as are those of medium size; but fortunately the Potato will, in its own way, produce its large, medium-sized, and small tubers, so that where Potatos are disposed of for consumption in towns, the medium-sized might be sold, and the very large and very small might be consumed at home. This year, having grown a large quantity of York Regents, owing to their cultivation there were a large number of Potatos of enormous size, weighing from 14 to 17 oz. each. Now these large tubers would spoil the marketable Potatos; but we shall be glad of them for home consumption. Experience has taught me that largely increased produce in Potatos will result from the selecting of proper-sized "seed," and giving more room to the plants. The "yard-apart system" is correct in theory, but owing to the large amount of manual labour required to carry it out it is not likely to be generally adopted. It may be interesting to here record a fact which came under my notice some time ago. It bears out the views of botanists regarding the formation of tubers and Potatos, and it has determined me as to my system of Potato growing. Whilst walking across a reclaimed field, upon part of which Potatos were grown upon the "yard-apart system," I noticed that some of the "hills," or mounds which had been raised around the Potatos, were made chiefly of the broken but undecomposed turf, so that the air had a pretty free circulation amongst the roots, stems, &c., of the Potatos, which ought to have been covered with soil; and as the earthing-up of the Potatos had been delayed a little too long, the consequence was, that the stems of the Potatos which had formed leaves were covered with earth. Now, as regards the botanist's view, that tubers are merely buds metamorphosed, I found in the axils of the leaves, where the soil covered the stem, a most beautiful merging of the bud into tuber. Some were more developed than others, but the *tout ensemble* proves the case for the botanists. If the tubers of Potatos are metamorphosed buds, which are so metamorphosed by being formed underground, it points to the advisability of well earthing-up the Potato stems.* My best crops are produced by using large-sized Potatos, by giving the sets more than the general allowance of space, and by a timely and sufficient earthing-up. At some future time I purpose going more into detail upon this subject. *T. C.*

Foreign Correspondence.

NEW ZEALAND.—The country is very fertile, and grows most kinds of crops to perfection, although, on the whole, it seems best adapted to the raising of horses, sheep and cattle. Our winter being mild (the mean temperature in the coldest month being 52°), vegetation never stops, so that we have grass all the year round, although not so luxuriant in the winter months as in the other parts of the year. Maize, Wheat, and Potatos do well, while Barley and Oats are considered a "risky" crop. The climate is rather fine for them. I believe they do well in Otago and Canterbury, where the mean temperature in the coldest month falls to as low as 42°. Vegetables and fruits of all kinds grow to perfection. The native Flax grows in abundance all over the colony, and its manufacture is becoming one of our chief industries.

As regards the class of people who should come here, I would first say no doctors need come; the people are too healthy, and do not require much of their services, and they are little use for anything else. No lawyer need come; they only breed mischief when they get the chance, and when they have no chance become "loafers." No engineers need come, unless they can make drains, put up fences, and other farm work. No carpenters need come, unless they can do any sort of rough work as well as their trade. No tailors nor shoemakers need come, unless they can put a stop to English manufacturers sending out goods at less than the price of material. No shopkeepers need come, as anyone can do that here when everything else fails him. No clerks need come, or, as sure as fate, they will either starve, or perhaps worse. No people should come unless they are able and willing to work hard, and take everything, rough and smooth, as they find it. Now for the class who should come. These are farmers and farm labourers, who have a little capital (not the gentleman farmers; we want them in the rough, and will make gentlemen of them afterwards), and could land here with from £80 to £100, or more—good, honest, hard-working men, who want to better their condition by buying for themselves and their families a piece of good ground at less than one-half of the rent they pay in a year to the lords of creation at home—men, with or without a young family, who could buy 100 or more acres, at from 5*s.* to 10*s.* and 15*s.* per acre, and settle down and cultivate it at once. Such men would benefit themselves and the country too.

It takes very little to start farming here in a small way, if a man goes properly about it. A cow can be had at from £5 to £12, and a horse from £8. I bought one a short time ago for £3 10*s.*, which does well all sorts of work. Sheep can be had at from 7*s.*, and pigs, say of 6 months old, at 15*s.* and £1. Rearing and feeding pigs and poultry is a very profitable business. Their first cost is small, and they soon multiply; and where a man has 100 acres of a farm, they need very little to keep them beyond the Fern roots and worms they get in the ground. Pork is always worth not less than 4½ per lb. White ham and bacon is worth from 10*d.* to 1*s.* 2*d.* per lb. Eggs are worth on an average 1*s.* 6*d.* per dozen all the year through; and poultry brings 1*s.* 9*d.* and 2*s.* each—sometimes 2*s.* 9*d.*

As regards the price of land, 50, 60, 100-acre blocks and upwards can be had at from 3*s.* up to 5*s.*, 10*s.*, 15*s.*, and £1 per acre; but strangers arriving here should be very cautious in buying land, until they get a little acquainted with the districts around them, as there are any amount of land agents who would sell them cheap land which would be of no use to them for settling in. There are sales of land by auction in Auckland every other day, where it can be bought at from 6*d.* per acre, which, if the persons knew it properly before buying, they would not have it as a compliment with £20 a year to live on it. I have again to refer to the Government in regard to this. In their surveys they blocked out parishes and their allotments, often reserving to themselves the best patches in a parish. Instance—an emigrant arrives, who is entitled to 40, 60, 80, or more acres for himself and family; he goes to the Government offices, is shown the plan, and as all the land looks flat on paper, the poor emigrant selects his land, and gets his name entered for it. After he goes to see it, he finds that it is almost inaccessible, and is composed of mountain ranges and deep ravines, in place of undulating ground and nice little creeks, as is marked on the Government plan. Now, this is what I call downright swindling, by the very parties who are supposed to protect people from being swindled. In place of the emigrant settling on his land he sells it by auction, to save himself from being taxed for roads, which have never been made within a distance of, perhaps, 10 or 20 miles of where his land is; and so on it goes, the same piece of land being sometimes mortgaged, and sometimes sold year after year, every purchaser getting swindled, and only the lawyers and auctioneers making anything by it. What a pity this fine country has been so wretchedly governed. If it had been otherwise, I believe it would ere now have been one of the best countries under the sun for a poor man or even a rich man to come to. As it is, in the meantime, no really poor man should come to it. Thousands of poor men are almost starving in it, and no work for them to do. In saying this, I refer to the class of men called tradesmen, and not to agricultural labourers, who, if good hands, can pretty often get work, although even they are rather plentiful just now.

I would warn the people at home to be very cautious in believing everything the emigration agents and other interested persons may say to them. The reasons they have for holding out fine prospects are obvious, and require no comment. The country is good, but poor—too poor for poor men to come to. I could say a great deal more on this subject, but will reserve it for a future occasion.

I shall now close my letter by saying to those who may wish to come here (and they should only be farmers who have money to start them, either in a large or small way, the latter being preferable) that, in place of great quantities of clothes and other articles many take with them, they should take cash only, in addition to what they really require on board ship, as clothes of all kinds are cheaper here than at home, besides being more suitable for the country. A good plough might be useful, although they can be had here at very little over the cost at home, after adding carriage; and if any who may wish to come have no friends before them, let me know before they do come. I shall be glad to meet them, and give the best advice my experience enables me. And if they make up their minds to rough it for a short time, they will, by leading industrious lives, in a short time attain a life of comfort and independence, which they never can do at home, where the "laird takes all the cream." *Quoted in "Dublin Farmers' Gazette."*

Societies.

GLOUCESTERSHIRE.

British and Foreign Agriculture.—At a recent meeting in this county, at Higham, Sir MICHAEL BEACH, M.P., said: The agricultural interest has in this country to contend against many difficulties: not the least of these is the difference in weather and climate between this and other more favoured countries of the world. I have travelled lately a

good deal, and I have seen in Spain, for instance, large tracts of land whereon with the merest scratching of the soil splendid crops of Wheat can be produced year after year almost indefinitely, and this simply because the heat of the sun and the climate generally are so much more genial than in England that the place may properly be called a Wheat-producing country. Then, again, not long ago I visited a still larger Wheat-producing country—those enormous plains and prairies of America which enable the inhabitants there to compete on such unequal terms with us in England. Their soil is inexhaustible because the extent of it is inexhaustible. When the farmer has used up one piece of land, all he has to do is to change his location and go to another: he has no trouble about manure, and need go to very little expense. Then, again, in California, I saw enormous tracts producing perhaps the finest crops of Wheat in the world; and the farmers there had the extra advantage that they had an ample length of fine weather, and no rain at the time of harvest, so that they were put to no expense either in gathering in crops or in providing halls or granaries wherein to store them: they simply threshed out the corn upon the ground and exported it at once. I mention these matters to show that we in England have rather a hard battle to fight against other countries in producing grain, though, fortunately, there are a pluck and an energy in Englismen—and nowhere more manifest than among our English farmers—which go far to conquer these obstacles of climate, and somehow or other enable us, by the application of skill and capital to the task, to obtain nearly all that it is possible to produce. That is one of the advantages connected with these societies, in encouraging the best manner of cultivating soil as regards ploughing.

But there is another and not a less important advantage, and that is the way in which they bring us together for pleasant social meetings. I am sure, from what we have read every day as to the horrors and miseries of the present war,—I do not want to say anything more than I can help about what is passing on the Continent at present; but just for a moment look at the effect in France of the connection between the agricultural interest and the State; if you had in France such a gathering as this, you would probably have found it under the direct patronage of Government, presided over probably by a Government prefect. If there had been present an independent Liberal member, such as my friend Mr. Price, he would have been subject to very grave suspicion on the part of the Government official, and would probably have had every word he uttered taken down, not by the reporters of the country papers, but by the police. The whole system, indeed, is thoroughly and entirely under a paternal Government. Well, now, we in England manage these things in a better fashion, and have done so for many years. We gather together on these occasions; we meet probably under a local landowner, who is a man—I don't refer to present company in particular—of considerable experience and ability in some point or other; we meet the principal farmers holding varying extents of land; and, in fact, such a gathering everywhere embraces different classes collected together for the expression and continuance of friendship and kindliness. Now, to my mind, this is no unimportant matter in what I hope will long continue a distinguishing principle in our English system: I mean the principle of local self-government. You see what has happened in France. Everything there was dependent upon a central Government. That has fallen through in a moment, and you have nothing left. There doesn't seem to be any single set of persons in the different districts of France who are recognised as the natural leaders of the people, to whom everybody looks up, and in whose hands in such a fearful crisis as this they are ready to place themselves. I do not think that under any circumstances such a state of things could possibly happen in England. Owing to our principle of local self-government we are used to act together in concert. People in that way learn independent thought and action among themselves; they learn also to whom they can safely trust for guidance and control in times of difficulty and danger; and if sometimes those questions occur which introduce a little dispute and unfortunate feeling among men who meet at the Board of Guardians or elsewhere, yet in gatherings like the present we meet together as friends, hear what one another has to say, see one another in our best and kindest moments, and I am quite sure that the intercourse gives an element of friendship to our connection in society generally, and of very great importance in the social economy of the country.

Mr. W. P. Price, M.P., said: I have just returned from a trip of the same character through the fertile plains of the Danubian Principalities and elsewhere, in districts which I should imagine might produce corn enough for all the world, but anything more barbarous than their system of cultivation I cannot conceive. The great undulating plains are covered with Wheat and grain and crops of different kinds. The Tartar natives once a year plough up the land with five pairs of oxen drawing a little wooden plough, exactly the same as that used in the Roman Republic, 2000 years ago; upon that, in the spring-time, they sow broadcast the Wheat or Maize or other grain. When harvest comes they cut Wheat and filth together. As soon as it is cut it is thrown into heaps, as we put hay together, and made into ricks at once. When they come to thresh it, it is thrown upon earthen floors, and simply trodden into chaff by pairs of oxen driven over it, and then it is exposed to the wind, so that the lighter parts of it may pass away whilst the heavier remain behind. What the produce of these countries might be if only they had a different system of cultivation it is impossible to say, but I can't help supposing that it might be at the least four or five times what it is. In some parts of the country the natives are no doubt alive to the evil of this condition of things. I saw on the banks of the Danube in many places steam-threshing machines bearing, I think, the name of Clayton & Shuttleworth, and in some places I saw ploughs which had evidently been imported. But on the Turkish side of the river that condition of things does not at all prevail. There they seem to set their faces altogether against any possible kind of improvement, and they seem also more barbarous in their method of cultivation; for when the corn is cut the farmer can't carry it away until the Government has taken its tithe of it. He has to wait until the Turkish functionary can come at his leisure, and take out every tenth stook to add to the Government revenue. The consequence of this state of matters is that I have passed by many miles of Maize and Barley and Wheat which have been reduced to an absolutely worthless condition by the bad weather to which it has been exposed while waiting for this process of tithing. I have no doubt that our own methods of cultivation were originally as barbarous as theirs. We have been rescued from that condition of matters partly by the instinctive enterprise of the country, partly by good laws, and partly by our security of property. But it cannot be doubted that within the last 20 years our agricultural progress has been stimulated very much by the action of such societies as these.

ROLLAY.

Cakes and Other Cattle Foods.—We extract the following from a recent lecture here by Mr. A. Spooner, of Southampton:—

Linseed cake justly stands at the head of our feeding stuffs, and, if good and genuine, will contain about 11 per cent. of oil, 28 per cent. albuminous or flesh-forming matter, 30 per cent. of non-nitrogenous matter, such as starch, sugar, and mucilage; 12 per cent. of woody fibre, and 5 per cent. of mineral matters. The oil must be regarded as the most valuable of the respiratory form, occurring in oilcake from the fact that, having an abundance of other respiratory matter, in the form of starchy substances, which are sufficient alone to sustain the animal heat, the greater portion of the oil is converted into fat in the animal system. Ten parts of oil is usually estimated as equal to 22 parts of starch. The proportion of nitrogenous matter is, generally speaking, greater than that found in any other natural produce used as food. Mucilage is also very abundant in this kind of cake, which is considered a valuable constituent in food. This mucilage is very characteristic upon mixing oilcake with water, when it becomes at once very gelatinous, and is employed amongst other tests of judging the quality. The only objection to linseed cake is its high price, which is governed not only by the demand and the supply, but also by the price of the oil. When the oil sells freely, and is in great demand, it stimulates the manufacture, but when the market is slow it tends to increase the cost of the cake. Linseed cakes are often, at the present time, very much adulterated, sometimes with bran, which, although perfectly harmless as a feeding ingredient, diminishes the value of the cake. At other times starchy materials, such as rice dust and damaged grain, are occasionally met with. These inferior cakes are usually sold at a lower price than the genuine ones, although "farmers" are somewhat loth to think them at all inferior in quality to those of a higher price, but rather think you are endeavouring to "sell" them should you ask a higher price than they have before been offered.

Rape cake, although formerly almost entirely devoted to the purposes of manure, is now extensively used as a feeding stuff. It does not differ very widely in general composition from the linseed. The following is its composition:—Oil, 11¼ per cent.; albumen, 30½; starch, &c., 28, and 8 mineral matters. Thus it contains a higher percentage of albuminous matters than linseed cake. However, it has a certain bitter taste, which somewhat lowers its merit as food. The chief objection to rape cake is its liability to contain the poisonous seed of oil of mustard, the presence of which can be detected by mixing a little with water, and subjecting it to heat, when the smell of the mustard is very easily recognised. It must be borne in mind that mustard is present more or less in almost every sample of rape cake. Practice is, therefore, requisite in a certain degree to ascertain to what extent the presence of mustard is injurious. Foreign rape cake is the best, inasmuch as it is made from seed grown in the North of Germany and France, which is purer than the East Indian seed, from which English cake is usually manufactured. As its cost is about two-thirds that of linseed cake, and its manuring value rather greater, it is valuable for growing stock.

Decorticated cotton cake is a valuable feeding substance. It is prepared almost exclusively in the Southern States of America, where the thick husk can be profitably stripped off. The taste and smell of this cake are peculiar, and less pleasant than linseed cake. It contains as much as 41 per cent of the flesh-forming element, and 16 per cent. of oil, as well as a considerable proportion of phosphates, and must therefore be regarded as a very valuable feeding stuff, although the quantity of respiratory matter is rather low compared to other cakes. If the feeding value of food were entirely proportionate to the amount of these constituents they contained, we should bring the value of decorticated cotton cake higher than that of linseed, but as this holds good only to a certain extent, we must take into consideration the taste and smell of the article, as well as the amount of essential constituents, before being able to decide upon its feeding value. The manuring value of the decorticated cotton cake, however, is fully equivalent to the high amount of nitrogen and phosphates it contains. It usually contains of starch, sugar, &c., about 31 per cent.; albumen, 23.7; oil, 6.2; mineral matters, 6.5. Common or undecorticated cotton cake contains rather a large amount of husk, and if given in very large quantities, is rather hazardous on account of injury which may happen to the animals fed upon an undue proportion of that substance. Notwithstanding, it is a valuable addition to our feeding stuffs if used with care.

Decorticated earth-nut cake is a sweet, palatable cake, extremely rich in flesh-forming constituents, containing as much as 40 per cent.; consequently its manuring value is high. It is produced from a nut found in Africa, after the extraction of the greater portion of its oil, which then leaves about 7 per cent. in the cake. Palm-nut cake is a useful growing material, particularly for pigs. It sometimes contains as much as 13 per cent. of oil, but the proportion is rather variable. Its flesh-making elements are rather low. We will now take an analysis of Beans, which is the next most concentrated form of food, and compare it with that of linseed cake, and we find that instead of having 12 per cent. of oil, it has only 2; 24 of albuminous compounds, 46 of starch, &c., and 3 of mineral matters. Now, since oil is estimated at more than double the value of the other carbonaceous matters, and again Beans containing considerably less of the flesh-forming elements than cake, it follows that the latter must be a very superior article to the former; and with Beans we also include Peas and Lentils, being both very similar in composition to Beans.

We will next endeavour to ascertain the value of some of the articles used as food from an analysis of them, but of course nothing like certainty can be depended upon. Some may consider and assign a great value to one constituent, and some to another. From what I have already said with regard to the parts each constituent of food performs in the animal system, I should feel justified in valuing the oil at £20 per ton, albumen or flesh-forming element at £20 per ton, starchy matter, &c., £12 per ton, and the mineral matters at £5. Then, supposing linseed cake contained 12 per cent. of oil, 29 of albumen, 30 of starchy matters, and 6 per cent. of mineral, we should bring the value of 100 tons to £1214—that is a trifle over £12 per ton, which is not far from the average cost. It is an easy way of estimating an analysis to take parts as representing so many tons, as I have done in the preceding instance. Now, if we were to value Beans in the same way, we should bring them to nearly £11 per ton. Nine sacks of Beans, at 24s. per sack, would amount to £10 16s. This, however, might be worked out in a different manner, as there are some Beans heavier than others, and some of higher price. Oats, again, contain a larger proportion of fatty matter than Beans, viz., as much as 5 per cent., but only a little more than half as much albuminous compounds, 57 per cent. of starch, &c., and 3 per cent. mineral matters. By the same method we should value Oats at £10 10s. per ton. Seven quarters and a half, 37 lb. to the bushel, at 28s. per qr., would just make that sum, which very much tended to support the relative value given to the different constituents of food. Barley, valued in the same way, comes to about the same price as Oats, taking the following percentages:—Fat, 2; albuminous matters, 11; starch, 66; and minerals, 3. Eleven sacks of Barley, 51 lb. to the bushel, at 38s. per qr., amounts to £10 9s. If we value the constituents of rape cake in the same manner as we have those of linseed cake, we should bring the value about the same, whereas the former can be bought at a considerably lower price than the latter; but there is this fact, that the animals did not like rape cake, owing to its bitter taste, which I have before alluded to, and it is necessary to study the animal taste as well as the food. Then, again, the oil is of a thinner substance, and consequently is considered to be less fattening than linseed oil. If we, therefore, were to value the oil the same as the starch, viz., £12 per ton, instead of £20, we should bring the value of rape cake to something like £10 per ton, showing that it is still cheap food if animals would eat it. The manuring value of rape cake, owing to its richness in nitrogenous matter, is high, being estimated at £4 0s. 9d. per ton. Decorticated cotton and earth-nut cakes, being still richer in those compounds, are estimated even higher in manuring value, viz., £5 6s. 6d. and £4 18s. per ton respectively, whilst linseed cake is £3 15s. 8d. per ton. Some people think it is more

profitable to buy Linseed than the cake. This might have been some years ago, when the former could have been bought at a comparatively cheaper rate than now, but, although it contains three times the quantity of oil, it has less of the flesh-forming and starchy matters. Therefore the cake must be more profitable than the seed for feeding purposes. If we take the analysis of Swedes we should find that the greater portion of them consists of water, viz., 89¼ per cent., thus leaving a very small margin for the really necessary constituents of food, which consist of 1⅛ per cent. of nitrogenous matter, 8⅛ of starchy matter, and ½ per cent. of mineral substances. What a great difference in composition to linseed cake. It shows the superior advantage of giving cake in combination with Turnips, inasmuch as it supplies those ingredients of which the latter is deficient—that is mainly the flesh-forming principles. By feeding alone on Turnips a much larger quantity of water is given than is desirable. It shows, likewise, that we were justified in placing a higher value on the flesh-making matters, because they are not found to a great extent in ordinary matters of food. If we value Swedes in the same way as we have done the various other articles, we should bring them above their real value, and the manuring value about 4*s.* per ton. The composition of Mangel is very similar to that of Swedes. It, however, contains a larger amount of sugar, and is consequently, on the whole, considered of greater value than Swedes.

On account of the large amount of nitrogenous matter present in oilcakes, the most profitable way of using it seems to be in combination with some article of an opposite character that is rich in respiratory matter, such as barley meal, Indian Corn, or the Carob or Locust Bean. Indian Corn is, however, now largely used alone for feeding purposes, the cost of this article being comparatively low, and its feeding qualities in proportion high. The Locust Bean, also known by the term St. John's Bread, contains a large amount of sugar, which affords a means of not only augmenting the respiratory elements in mixtures of food, but, at the same time, imparts a sweet flavour, making coarse or other food more palatable to the animal fed. This property is rather a drawback than otherwise in one respect, inasmuch as the Beans appear as nice to the boys on the farm as they do beneficial to the cattle. In fatting animals a food in which the respiratory matter predominates would seem to be most suitable, since the muscles or flesh are incapable of increase to anything like the extent as fat. Respiratory matter, in the form of vegetable oil, is most favourable for the formation of fat; hence the efficiency of oilcake, although the common respiratory matter, such as starch, sugar, mucilage, are also, though probably less easily, available for that purpose. We can scarcely give the animal too much nourishment, provided its health is maintained, as we thereby shorten the time of fattening, and thus save the food that would be otherwise consumed in sustaining the system during that period. But when the system is undergoing development, as in young or growing animals, we gain more the advantage of growth than the formation of fat, for which, of course, time to a certain extent is necessary, in which case the mineral elements are particularly required, as well as a due proportion of respiratory and flesh-making elements. Deficient food or, what amounts to the same thing, food which does not furnish the requisite quantity of the various nutritive elements required by the animal to meet the wants of its system, is always a loss to the owners of stock, from the fact that the animals cease to make progress and fall back, and thus it requires a much larger proportion of nutritive food to regain flesh than it otherwise would to have retained its former condition; and, again, all that food consumed, instead of yielding its proper return, was expended in keeping the animal alive. Moreover, in all the time consumed we might have been making progress. The quantity and quality of food required by an animal will be just in proportion to this demand upon its system. An animal has no power to produce anything which Nature has ordained that it should, unless the raw materials of the same are supplied in food. It is by carrying out with care and judgment the principles involved in the feeding of animals that we can expect to dispose of the many kinds of food at our command to the best advantage, and thereby to develope the resources of agriculture, and increase, it is hoped, the profits of farming.

Discussion.

Mr. Blundell said he was sure they were all obliged to Mr. Albert Spooner for giving them such an interesting lecture. He considered his remarks very good indeed, and at the same time he had deduced some very practical observations connected with a subject with which all agriculturists should be most intimately acquainted, and in which their interests were largely at stake. In order to know what was the nutritive value of the cake, the farmer should know what were its real ingredients. With regard to the two sorts of cake of which he had spoken, they could only test their value by analysis. Some men might say they could not do that, but there was no difficulty when they had the Royal Agricultural Society to fall back upon, as members of it could have anything analysed. By sending it to the Royal Agricultural chemist they could ascertain what that with which they were supplied was really composed of. It was important that agriculturists, seeing that cake was so dear, should ask the question, "Which is the best for cattle, cake or corn?" If they took into consideration the relative fattening properties of corn and cake, the same as Mr. A. Spooner had introduced to their notice, they would find that while corn stood pre-eminent and unassailable in fattening animals, that the residue left from corn was very different to that left from cake. In his (Mr. Blundell's) experience he could tell them what was the difference in the state of the land where £100 had been spent in feeding cattle with cake, and £100 in giving them corn. He considered whether the money might be laid out more advantageously in corn or in cake, yet the residue of cake on ploughed land on an after crop was superior to anything else that had come under his experience. One observation of Mr. Spooner's with regard to the value of Swedes and Mangels he could not quite understand. Probably the secretary would give them some observations upon it. As far as his experience went he thought a Mangel was of considerable more value for fattening purposes than a Swede, and if he was about to fat a bullock he would sooner have 60 lb. of Mangel than 75 lb. of Swedes—that was to say, it was one-fifth superior as a root food,—that was, that he would give one-fifth less of Mangel than he would have to do of Swedes. The precise value of these two thing by analysis had not been shown, and he hoped Mr. Spooner would himself give them some idea on that point.

Mr. James Withers said: Respecting the value of cake, he could say that there was a marked difference in the land where he had fed sheep on it and where they had had none. He fed 200 with it and 300 without it, and where the sheep which were fed on cake had been the Barley was one-third better. He could not see distinctly every field.

Mr. W. C. Spooner said: With regard to the value of Swedes, it appeared to him his son had taken the theoretical value as given by analysis, subject to all drawbacks. If they could extract all the water from Swedes and reduce them to cake, then the positive value would be something like what he had given it, seeing that for every 10 tons of nutritive matter nearly 100 per cent. had to be taken off for waste, cleaning, the carriage to the farm, &c., which reduced their value at least one-third, and what Mr. A. Spooner had stated would be the practical value of the Swedes if they were not attended with those circumstances. Mr. Blundell had asked a question with regard to hay, which stood by analysis at something like one-half of the value of many kinds of concentrated food, but in hay there was a considerable and continual waste. There were scarcely two blades of grass alike, and where the animal would eat one it often refused the other, and thus there was waste. Some was got together much better and in a sweeter condition than other parts, and that which was too dry was converted into woody fibre. This was one of the drawbacks with regard to hay, and he thought the best possible way of using it was by cutting it into chaff. He considered there was a great waste with it, and it was not worth the price at which it was now selling, viz., £6 or £7 per ton. It was made of that value in consequence of its scarcity, and because people in the town would have it for their highly fed horses. A statement had been shown to him with regard to some experiments tried a long time ago by Mr. McCulloch, in which Turnips were shown to be superior when grown with yard dung to those grown with guano. That was tried in Scotland, but there had been many experiments tried since, and, although they were in favour of what Mr. McCulloch had stated, yet they were nothing like the extent he had made out. In Scotland they found that the Swede Turnips were more productive than they were in England. There were not many people in England who would like to give their cattle 150 lb. of Swedes per day, but the practice showed their nutritive nature in Scotland. Mangels were never a large crop in Scotland, and they were not so nutritious. They found that Mangel Wurzel was more nutritious than Swedes, but at the same time they should not be given too largely. Mangels contained a very large quantity of salt, and they would find that the green leaves contained a much larger quantity than the roots, and that accounted for the leaves causing purging when given to cattle. He thought the great secret in all cattle feeding was a variety of food. Great care was required to be taken, for if they gave too much of one food, a large quantity passed away without being acted upon. By mixing concentrated foods with other things a much greater advantage might be obtained. Greater results have been obtained from giving a mixture of Beans and cake together. It had been shown that two different kinds of food given together caused an animal to do better because of the variety it contained. For instance, with too much cake the oil would be partly wasted, and it would pass away as unproductive matter. There was no doubt but that the practice of combining Maize with other food was a very good one. The paper read had shown that linseed and rape cake were three times more flesh-making, and was more beneficial as a manure. These were calculations made from analysis by Dr. Voelcker and Mr. Lawes. Indian Corn was put down at £1 5*s.* per ton as manuring value; linseed cake at £3 15*s.*; and rape at £4. Decorticated cotton cake was put down at £5 6*s.*, and decorticated earth-nut cake and others at about the same. Much depended upon the way in which the palate of the animal was suited. A gentleman, who was a successful exhibitor at Southampton, and also at Smithfield, had just had some Locust Beans. He had also a quantity last year, and he did not know what he wanted them for, unless they were given to the animals. No doubt one of his reasons was that they might have a variety of food, and so their palates would be tempted. He thought if people who relied upon the different sorts of condiments were to mix a few Locust Beans instead, they would find that their animals would eat their food better, and that much good would result from it. If any further explanations were wished he should be happy to give it.

Mr. Leane quite agreed with Mr. Spooner with regard to the feeding of cattle, but he was not aware there was so much salt in Mangel. He had been giving his beasts 140 lb. of Mangel, 7 lb. of linseed cake, 4½ lb. of cotton cake, and 6½ lb. of bean, pea, and barley meal each per day, but he never knew them so thirsty before. Since the Mangel had been taken away they had begun to refuse the water, which they wanted so badly before, and thus the cause was explained.

AYRSHIRE.

Farm Fences: their Erection and Management.—At a recent general meeting of this Club, the following paper on "Farm Fences—their Erection and Management," was read by Mr. Murdoch of Holehouse:—

Mr. Murdoch said: After making some investigation lately into the state of farm fences in this district, I am sorry to say I find they are in anything but a good condition. The hedge fences, as a rule, are full of gaps; while dead and half dead Thorns are very numerous. There are a great many good stone fences, but the majority are in a kind of tumble-down condition, and in much need of being rebuilt. They seem indeed in many cases to have been left to take care of themselves. Yet nothing is of more importance than good fences, and nothing gives more trouble and annoyance to the farmer than bad ones. The origin of fencing is believed to be a very ancient one. The general division of land into enclosures seems to have been a recent one in this country. In Ayrshire, probably, all the present fencing was erected within the last 100 years. Indeed, I have spoken with old people who remembered when a person could, and did, ride miles and miles straight through the country without coming in contact with more than one or two. Not unlikely the first attempt at fencing was directed towards keeping crummie out of the kailyard. There are three kinds of fences in general use amongst us, viz., Thorn, stone, and wire ones. Paling and flakes are also used, but only as temporary or movable ones. As there is no kind of fences so common in our cultivated districts as Thorn ones, so we shall consider their erection and management first.

The Characteristics of a good Hedge.—I think they are impenetrability, regularity, and occupancy of the least possible space. How, then, best to attain these ends are points for our consideration. We must, of course, first plant a hedge, next nurse and train it well, and then, if we have succeeded in erecting a good fence, the last, but not least, important matter is to keep it so permanently. But, again, how these desirable ends can be easiest accomplished is rather a subject of dispute, and one about which I have no decided opinion. In the planting of hedges two methods are pursued. One is to plant the young Thorns, or quicks as they are commonly called, on the brow of an open ditch, made for the purpose of keeping the roots of the young plants dry, the earth taken from the ditch being heaped up in a kind of bank above the rest of the plants. From the depth of the ditch, this covering is mostly fragments of subsoil matter. A fence of this kind will take up a stretch of land 6 or 7 feet broad. The other method is that of planting on the surface, or flat, as it is called. When this mode is adopted, the intended Thorn bed should be deeply dug or trenched to a width of 30 inches, and also a little raised above the general level by throwing some extra soil on it, six months or so before the plants are put in. Either of these modes may be adopted, according to pleasure or circumstance, and, if I may venture an opinion on their relative merits, I would prefer the latter. On good dry soils it seems to me to cause little difference which way the work is done. Planting on the surface takes up much less space, is the least expensive method, and, with equal soil and attention, will produce a fence equally good. In the old ditching system the ditches were made so large that they appear to me not only a waste of land, but a positive injury to the hedge itself. By having a deep ditch on one side, the roots are not only all forced to take one direction, but they also soon get bare in consequence of the earth falling down in winter when loosened by frosts or rain. Again, from being planted so much above the level of the soil, and covered with such a great bank of poor, cold subsoil clay, the plants have a hard struggle to live at all. The most favoured may indeed succeed in throwing out a few new shoots annually, but far more only leaves, while not a few annually give up attempting either. Unless when running water requires to be sent down the ditch I would reduce the size of the ditch as much as possible. Any surface water is much better carried off by drains, one of which should always be quite close to the hedge. In upland districts, with cold wet land, hedges should never be attempted. I have never seen them succeed.

Hedges may be planted with various kinds of plants, either singly or mixed, such as Whitethorn, Crab tree, Privet, and Beech. Whitethorn is mostly used alone, though I like a mixture better. In the rearing and training of young hedges, it is indispensable that they should be kept clean, and well defended by guard fences of some kind. I would be in favour of wire ones for this purpose. It is necessary, also, that they should be trimmed occasionally, and brought into form. I would not cut a young hedge before the second or third year. I would then cut both the breast and top shoots, and give it the wedge or Λ form—broad at the bottom and narrow at the top—leaving it about 2 feet high. I think many of our hedges are trimmed too narrow at the bottom to make

secure fences. I would afterwards trim them every second year for the next six or eight years, at each cutting allowing them to rise in height 6 or 8 inches, according to the progress they made. By this means, at the end of eight or ten years I would have a good fence, from 4 to 5 feet high, and be able to dispense with the guard or temporary fencing altogether. I am aware many treat their young hedges differently, and that even a few never cut them at all. Many are in favour of trimming every year, while some prefer one shape and some another. In reading a discussion on this subject that took place in England some time ago, I observed one of the speakers, a proprietor, contended that a hedge should be trained till it was 6 feet broad at the bottom, and he ended by showing what excellent protection such a fence afforded to game. This seems rather an unnecessary waste of land. Still, in looking at our best trimmed hedges, I think we err the other way. Land, no doubt, is valuable, but good fences more so.

The After-Management of Hedge Fences.—There are various systems pursued. The first is to cut the fence annually; the second, to cut it occasionally; and the third, which can only through courtesy be called a system, is to leave it alone altogether. The first gives the fence a very neat and tidy appearance, and those who practise the system consider the hedge thrives best under such treatment. This may be called the advanced system. The second, though less in favour, has most admirers, and is the one to which I belong, both in faith and practice. In comparing these two methods, I admit nothing gives a finer appearance to a farm than good, well trimmed hedges, yet, generally speaking, much depends on whether you have a purely cropping or grazing farm, and whether you are in a high, unsheltered situation or not. Besides, from all I can see, these finely trimmed hedges are frequently more open and bare at the bottom, however close they may be at the top, and are also in a less healthy and thriving state than those only cut every second or third year. Altogether there is more beauty than utility, more show than substance, and more expense than benefit about regularly trimmed fences. I will now leave the respective merits of these two methods to be more fully brought out in the discussion, and would only remark on the third, or let-well-alone system, and that with a view of mitigating that wrath to which I may be exposed for those who follow it, that such fences alone produce that splendid show of milk-white blossom which so much adorns the landscape, pleases the eye, inspires the poet, and perfumes the passing breeze, while they also provide a shady retreat for cattle from the summer sun, and a cozy shelter from the wintry blast. Hedges, however well or ill kept on a cropping farm, generally overgrow themselves in a longer or shorter period. There is, then, no other way of renewing it but that of cutting it in or ribbing it, and allowing it to make new wood all over. Either one or both sides may be cut, according to circumstances. When both sides are cut, the height may be brought down to about 3 feet. Cutting of this kind ought always to be done when the fields on each side of the hedge are under crop. If crop should only be on one side of the hedge, then I would only rib that side, leaving the other till a similar opportunity occurred, so as to prevent having it damaged by cattle. In ribbing a hedge, the cuts should all be carefully made upwards, and the side branches cut pretty close to the main standard. Cutting may be done any time between November and April. This method will generally restore an ordinary hedge, but something more is needed to restore our really bad ones, the handiwork of our predecessors, spoken of before. As perhaps nearly one-half of our hedges are of this character, the task is a difficult and expensive one. With not a few, I am convinced by far the best plan would be to root out the old plants altogether, and plant new ones a short distance from the old situation.

To Improve Old Hedges.—A very good method is to cut them about 6 inches from the ground, clean out all the old rubbish, dig along the back of the hedge, and plant the gaps with good strong young plants. I should prefer bush ones for this work. Another plan, called plashing, sometimes succeeds very well; where there is plenty of wood, a branch is laid down from each side of the gap when the fence is being cut, so that the two shall meet in the centre. They are then fastened to the ground by a peg. When gaps are very wide, however, there is no alternative but to fill them with plants, and when the soil is poor a little dung or rich earth may be applied to advantage. I have got another, and an entirely new plan to bring before your notice, and though a somewhat novel one, and one which you may be at first disposed to smile at, nevertheless I will state it. It is simply this: When you have an old hedge of the nature I have been describing, allow a good quantity of old grass and under-growth to collect about it. Some good March day set fire to it, and give the old half-dead stems a good scorching. They will, though apparently half burnt up, send out numerous fine strong healthy shoots—the basis of a new and better hedge. I saw a rather extensive instance of this kind of renovation lately. A neighbour of mine, who farms his own lands, had two or three fields which had neither been grazed nor cut for the last three years, and which were accidently burnt down last spring. As the amount of combustible matter was considerable, the hedges were much burnt, and seemed all but destroyed. Now, however, beautiful, long, healthy sprouts may be seen growing from the roots of the old plants; and while some of the old plants are seemingly dead in the tops, the greatest number are still alive. If the old Thorns were now cut down, I believe the hedges would be vastly improved. Whether equally good results would follow every such method, I don't pretend to say. Every one is at liberty to think as he pleases about the matter. We have now done with hedge fences.

In upland districts, or where the soil is cold, damp, or poor, by far the best fence to use is a stone one. It makes indeed a good fence on any farm, and for grazing land or march boundary it is invaluable. In erecting a dry stone fence, care should be taken to provide good large stones for the founds. The larger the stones, the stronger the fence will be. It is impossible to obtain large stones to build all the fence single, but I would have the butts or double parts short—not more than 4 or 5 feet. I consider a dyke built solely with small stones at the bottom a perfect waste of time and money. Five feet is a very good height for a fence of this sort, and if well built and limed on the top, it will last a lifetime. As to the cost, much depends on the distance the stones have to be driven. They are generally, however, driven by the farmer. The building itself may be done at from *9d.* to *1s.* per yard. There is many of our old stone dykes in much need of being rebuilt, and that operation can be done for a similar sum, while only a few additional stones are needed. A stone dyke, when erected, is a fence at once, gives good shelter, and entails almost no expense on the farmer afterwards for repairs, unless, indeed, it should be favoured with a passing visit occasionally from our hunting gentry; and then, though there should be a few gaps to build up, the honour of having to do so is considered to be ample recompense for the trouble. The farmer, besides, has the unspeakable gratification of seeing how quickly some can dismount and pull it down; or, better still, the noble chance of being offered *1s.* to do it himself; or, still further, being astonished at the style in which each, afterwards, charges and clears the few remaining stones. In some places gates have been wisely put up to prevent such things taking place. On the estate with which I am connected this has been partially done, and the results have been very satisfactory. The best description of fencing we have to consider is wire fencing. It makes a good fair fence, is cheaply and easily erected, occupies little space, and when well put up, keeps in cattle or sheep well. When it is intended to be used as a permanent fence, good strong wire and posts should be used, otherwise cattle will soon break or injure it. It may be erected at a cost of from *3d.* to *1s.* per yard, according to the strength and number of wires, and size of posts used. Railway companies are adopting wire in preference to Thorn and wood fences.

INVERNESS.

Storing Turnips.—At last meeting of this Society, Mr. MOLLISON, Dochfour, read a paper on this subject. The whole process of cultivating the Turnip is very heavy, the total cost on an average being not much under £9 per acre, exclusive of rent. Although it would not be fair to debit the Turnip crop with the whole of this cost, still a full crop cannot be grown at much less money. The loss caused by a failure in the crop spreads itself over a series of years. Not only must fewer stock be kept, but those that are kept are invariably stinted, and the effect of this on young animals is only felt in after years. The manure heaps will also be less in bulk, and greatly less in value; and, apart from this, a good crop of Turnips is of itself ameliorating to the soil, as its broad green leaves draw more from the manurial gases of the atmosphere than any other of our agricultural plants. Briefly sketching the history of the Turnip in this country, he showed that neither pains nor expense had been spared in its improvement and proper cultivation. No other crop could be influenced in the same degree by good or bad cultivation. It is nothing remarkable to find on poor soil, if properly cultivated and liberally manured, a crop weighing from 30 to 40 tons per acre; while on good soil, when cultivation and manuring are neglected, we may find the crop not exceeding 2 tons per acre, the very plants appearing as if they belonged to a different tribe. But after all this pains and expense, our Turnip crop is shamefully and wastefully exposed during winter.

After numerous experiments extending over a number of years I am convinced that every variety of Turnip as soon as it arrives at maturity of size, and gets into a state of torpor, immediately commences to lose its most valuable juices by evaporation, unless covered from the action of the atmosphere, and if exposed to frost this loss will certainly be greatly facilitated. Experiments have also satisfied me, that the better the quality the more readily will the Turnips be injured by frost. This, however, is not so surprising, as the most juicy Turnips are almost invariably the best. And while it is known that an average specimen of the Turnip contains from 80 to 90 per cent. of water, and that a freezing liquid expands and will burst the strongest vessel, we can readily imagine that the cells or vessels which are charged with the juices of the Turnips will be ruptured by the action of frost, and the whole natural arrangements of the bulb destroyed. In any case the loss by evaporation after the interior of the bulb has been so damaged will be excessive. In proof of which let two Turnips be weighed, say in the month of April, the one having been exposed where it grew to the severity of winter, the other having been properly stored immediately after arriving at maturity, and before being injured by frost, and of two yellows, the difference will be from 40 to 75 per cent., and of two Swedes from 10 to 30 per cent. I need scarcely say that the juices that do remain are greatly deprived of their pleasant taste and nutritive qualities. Every one knows that a Swede suffers less from the action of ordinarily severe frost than a yellow does, this is no doubt owing to the greater density of the Swede, the vessels or cells of which, being small, will not, although ruptured to some extent, facilitate the loss by evaporation to the same extent as in the more porous bulb of the yellow.

The opinion of the meeting was all but unanimous in favour of storing Turnips; but as to the mode of storing, various opinions were expressed.

Mr. LOGAN, Stonyfield, last season stored his Turnips about this time, covering them up, leaves and all, and not one went wrong.

Mr. CAMERON, Viewhill, let Turnips, when put in pits, have a little air; if they had not some air they began to mould. He did not approve of leaving shaws on if they were heavy.

Mr. MOLLISON said he had tried various ways for storing Turnips. A good way was to take a dozen or 15 drills, take the shaw and the tail slightly off, throw them into heaps, or into pits if the land was dry, put a little earth through them, and then cover them with five or six inches of earth. Mixing earth with them kept them nice and fresh. Turnips would keep in this way until June 26, and the cattle relished them much better than if they were stored without being mixed with earth.

Mr. SCOTT, Parks of Inches, stores eight weeks' Turnips, and then as long as the weather keeps open carts home what he requires, drilling up the rest with a plough. Those that were drilled up were as heavy as five of those that were not drilled, and had double the sap. Put on the harrows in spring, and you soon take off the earth.

Mr. HAMILTON, Cantraybruiach, had lifted in the field with the tops on when he did not require to eat the Turnips off with sheep. When he took the Turnips home, he lopped the root and crop, put them in pits, and put some turf over them.

Mr. MACPHERSON, Drumore, never stores his Turnips during frosty weather. If there was the least frost in them, only the breadth of a sixpence, they were sure to rot. Those that he cannot store he drills up. A week or two before the new year farmers require to have Turnips stored, or they run a great risk.

Mr. CRAN, Kirkton, was in favour of storing in heaps near the steading when Wheat had to be sown. In Aberdeenshire, which he knew best, they had always plenty of snow to cover their Turnips.

Mr. FRASER, Balloch, approved of drilling like Mr. Scott, but asked when Turnips were matured? In light lands, and with an open winter, they grew a great deal in November and December. By keeping them unstored until Christmas the crop would be about a third more.

The CHAIRMAN, in summing up, said the experience of the meeting in the way of storing was in favour of putting three or four drills together, and ploughing them in with a little soil. It appeared to be almost invariably followed with success, and so far as he could judge seemed to be the easiest way.

This concluded the discussion.

Notices of Books.

Successful Farming: *Its Essentials, &c., from the Diary of an Amateur Farmer.* By the Rev. W. Holt Beever, M.A., Oxon. Bradbury, Evans & Co.

There may be a good deal here on the essentials of successful farming, but it is the "&c." in the title of the book which most accurately describes its contents. Beginning, as on a key-note, with the maxim, "A place for everything, and everything in its place," there never was a performance which so belied its own leading doctrine. The following are the two lines with which the book begins:—"Under this heading I conglomerate at random, as they rise, all sorts of hints and ideas;" and the author thus fairly describes the jumble of incoherent fragments which he has collected over 200 pages within the boards of a very stylish binding.

Let us, nevertheless, admit that the gossip of an agreeable chatterbox is often vastly pleasanter to the ear than the heavy, though it may be wise and useful, conversation of an experienced man. Mr. Beever's pages will be read without labour, and he will thus beguile his readers into the reception of many a sensible and homely truth, which in clumsier hands might fail of gaining access where, nevertheless, it may be wanted.

It is impossible to take an extract which shall fairly illustrate the contents of such a mixture of scraps or

"odds and ends," as is here collected, and hardly possible to take one which does not illustrate the airy style of the collector. The following is given under the head of—

Reading.—"Do not confine yourself to agricultural subjects, nor neglect reading altogether. 'Tis a capital well to draw at. The weekly agricultural journals will solve many doubts for you, besides keeping you up in the knowledge of what is going in the markets—meat, wool, tallow, &c. If in spring time your young Wheat begins mysteriously to withdraw from existence, and your ewes throw dead lambs, and the foals are born but to expire, turn to the *Mark Lane Express*, and you will find an echo to your sorrows with probably an antidote appended. There is always an epidemic in such cases, unless the misfortune come of some exceeding carelessness on your part; in which case you will probably find out your error for yourself, though at a period too late to mend it. A literary drink of this sort, over a pipe, in the twisted seat on the lawn after breakfast, will point your plans, and put you on a good half-mile above your less studious neighbours.

"Practice and reading together, as a sandwich, with just the pepper and mustard of occasional discomfiture to flavour it, that's the way to get on in the end, my young friend.

"And yet just to show how little the profession generally avails itself of the advantage to be derived from books, only ten minutes ago, meeting an old and experienced farmer, I asked him, 'Well, what about the Wheat plant? There are great complaints of it being thin.' 'Eh, dear, yes; look at that field there' (pointing to one upon the hill in the distance), 'it's nearly all gone; it's the grubs do it.' 'Clover lay was it?'—'It was." You mean then the daddy-longlegs' grub?'—'I don't know, I'm sure, I never heard of that sort.' 'Is it like this?' (and I drew a rough sketch of the pest on the back of a letter).—'Yes, that's it; but I should have thought that the frost we have had would have killed them all; I'm sure they were ploughed down deep enough too.' As if the Nature that had directed the parent fly to deposit her eggs on the Clover lay, would not have provided in some way for the protection of the offspring!

"A widely prevailing popular error is it that worms, &c., are destroyed by hard weather. They need only bore deeper, if not otherwise protected by the trenches. They are not so neglected as the Crimean soldiers were. And instinct is often superior in its ways to reason. It is well known to the naturalist that 'even very severe cold is not necessarily destructive of the vital properties of organised tissues; so that on a restoration of the proper amount of heat, their functions may continue as before.' Fishes have been so completely frozen as to be brittle, and yet have revived when thawed. 'In one of Captain Ross's Arctic voyages, several caterpillars of the Laria Rossii having been exposed to a temperature of 40° below zero, froze so completely, that when thrown into a tumbler they rattled like lumps of ice. When thawed they resumed their movements, took food, and underwent their transformation into the chrysalis state. One of them, which had been frozen and thawed four times, subsequently became a moth. The eggs of the slug have been exposed to a similar degree of cold without the loss of their fertility.'

"Nor, again, will extreme drought destroy them. 'Many instances are on record in which snails and other terrestrial mollusks have revived after what appeared to be complete desiccation; and the eggs of the slug, when dried-up by the sun, or by artificial heat, and reduced to minute points only visible with the microscope, are found not to have lost their fertility, when they are moistened by a shower of rain, or by immersion in water, which restores them to their former plumpness. Even after being treated eight times in this manner, such eggs have been hatched when placed in favourable circumstances; and even eggs in which the embryo was distinctly formed, survived such treatment without damage.' ('Carpenter's Physiology.')

"The only way really to grapple with them, and that is not of necessity successful, is to lime and salt the surface well before you turn it in. It affords, so, an uncomfortable blanket for the lodger, especially when you have further tightened your hold upon him by the help of Crosskill's roller. It is essential to remember this, since ploughing a lay in for Wheat has been so stoutly advocated on the ground that the vegetable matter so buried is admirable feeding for the young Wheat.

"Our friend, the advocate of this view, of a certainty can never have been acquainted with the daddy-longlegs' son and heir; a visit from whom, we can seriously affirm, once to have experienced is never to forget.

"There is, or used to be, a notion that 'any fool' would do for a farmer or a parson. If a parent of means had a dull son, he always fixed him in a farm or sent him 'into the Church.' Both ideas are expiring, I am glad to say.

"To be a successful agriculturist, as a useful minister now-a-days, needs brains, heart, study, practice, energy, and kindness. At the homestead there must be an utter abolishment of all mouldy notions of wooden ploughs with four horses driven by a second man; as, in the pulpit, of lemon-colour hereditary manuscripts of dreary reasoning and vapid exhortation. There is more real life needed now, or the one may be relied on soon to empty his church, and the other to bolt at an early date before the bailiff.

"What a farmer Lord Dundonald would have made, if he had taken to it! We should soon have heard of startling, yet solid improvements. The man who could set his pursuers on a wrong tack during the night by hanging out a lantern on a tub set adrift; who could, in defence of a ruined tower, appal a gallant enemy by a *chevaux-de-frize* all hung, seaman-like, with shark-hooks on knotted cords; and who watered his ship, under dangerous circumstances, by lugging through the unwilling brine a foresail sewn up as a bag, and filled from boats

'By the blue rushing of the arrowy Rhone,'

would have soon, if it had pleased him, gone to the fore in the Southdown and Shorthorn line. 'The like o' he' had kept the market stirring, as his solitary black frigate kept the coast of France on the *qui vive*. Witness only what the lamented Sir J. Conroy did during only four years' absence from the camp and court; more, in fact, by a long score, than a whole legion of antique traditional agriculturists had done within a century—what with their hide-bound ridge-backed stock, their liming, their want of method, and their inveterate prejudice.

"Since writing the above, in Dickson's 'Modern Husbandry' I find frequent reference to a work by an earlier Lord Dundonald, 'On the Connection between Chemistry and Agriculture.' It is satisfactory to have made a so far successful hit.

"Each day tie up all the small ends of your work as they occur, no matter how small individually; as each post you should tear up every letter you have answered, and have no need to keep; it is astonishing how rapidly and closely they accumulate in a few years, most certainly to be a nuisance and obstruction, just as a stout meal of mincemeat is more likely than most meals to lead to internal disorder, because you are apt to underrate the unit, and so insufficiently go through your mastication.

"It is a bad thing in farming, as in any other pursuit, to let the mind range too far. It flushes birds there is no reason to disturb, and leads to unwise thinking, *alias* speculation. Confine yourself to the immediate—the needful. Life progresses despite and beside your planning and endeavours, and brings its duties all, as Francis' pike-tackle, with its hooks attached. There is a spice about the practical that keeps life comfortable. No visionary thinker but has dyspepsia, or the like."

Farm Memoranda.

AUCHLOSSAN, ABERDEENSHIRE.—[The following is an abridgment of a report given in the *Scotsman*, Edinburgh newspaper.]

In many respects, one of the most important undertakings in the shape of land reclamation ever effected by a tenant-farmer in the North has been accomplished on the farm of Auchlossan, Aberdeenshire, by James W. Barclay. These improvements are exceptional in Aberdeenshire in point of extent, and involved engineering difficulties of no ordinary character. Auchlossan is beautifully situated in the valley of Lumphanan. It is about 25 miles south-west of Aberdeen, and is intersected by the Deeside Extension Railway, and by a road which at one time was the most frequented, leading from the Mearns and Strathmore over the "Cairn o' Mouth" and Mount Keen to Donside, Huntly, and the North.

The improvements which we propose describing consisted chiefly of the draining of Loch Auchlossan and the reclamation of its bed. About 180 acres were wholly under water, and 60 acres were of a marshy nature. From a dense mass of Equisetaceæ and other aquatic plants vegetating in the loch, it was difficult to see where dry land ended and water began. The depth of water varied from 2 to 5 feet. The loch was long known as one of the best spots for wildfowl shooting in the North. While some good sport was yielded by the loch, its existence was by no means beneficial to the district. On the contrary, it proved detrimental to the salubrity of the climate; and the large mass of decaying vegetation every autumn must have had an unwholesome effect on health. The great mass of vegetation in the loch testified that under the water there was abundance of fertile soil. This, combined with the injury it inflicted on the neighbouring farmers, fostered a desire on the part of the landlords to have the loch drained and the bed reclaimed. The loch, being the joint property of three landlords—viz., Mr. Farquharson of Finzean, Lord Huntly, and Mrs. Shaw of Auchinhove—the difficulties consequent on the divided ownership could not be overcome till 1859. In that year, the proprietors requested Mr. J. F. Beattie, land-surveyor, Aberdeen, to prepare a plan for draining the loch; and the means by which the proprietors proposed to have the work accomplished was to give a tenant a lease for a certain number of years, free of rent, on condition that the tenant should drain and reclaim the loch at his own expense. It was advertised for some time, but no one was found possessed of sufficient capital or enterprise to undertake the work. Afterwards, however, Mr. James W. Barclay happened to visit the loch, and he forthwith submitted a plan of his own to the proprietors. The result was that Mr. Barclay obtained a lease of the arable land of Auchlossan Farm, extending to over 180 acres, and a lease of the loch, for 25 years. For the loch, the agreement bore that no rent should be charged during the first 20, and only £100 for each of the remaining five years. Owing to the difficult nature of the operations, the proprietors afterwards voluntarily extended the lease to 27 years.

At Whitsunday, 1860, Mr. Barclay got possession, and at once commenced his difficult task in accordance with his own plan, which was to divert the two principal streams by which the loch was fed. The burn that ran into the loch at the north-east end was, by means of a canal or ditch, carried along the east side of the loch, and joined the outlet at the south corner. In a similar way, the burn entering at the west end was taken along the south-west margin. The leading feeders were thus led off chiefly in the old bed, but without passing through the loch. There still remained the stagnant water, the surface rainfall, and a small streamlet entering at the north side, to dispose of. To accomplish this, a large drain, with an eye of 2 feet by 3, partly tunneled and partly excavated from the surface, was formed alongside, but about 14 feet below the former outlet.

After the execution of the main drain and the two side watercourses, the next step was to run open ditches through the loch to carry off the surface water, when some idea as to the after proceedings might be obtained. In the space of two days and nights the stagnant water disappeared. The whole area of the loch was then furrow-drained as speedily as possible. The general principle adopted was to cut the ditches from 2 to 3 feet deep, and leave them open for some time to allow the land to dry. The drains were afterwards deepened by about 18 inches, and filled immediately from the lower end to prevent slipping. The drains were about ten yards apart, fully 4 feet deep, and were all laid with coupled pipes 2 inches in diameter, the leaders having 5-inch pipes. The ground having been consolidated considerably ere the drains were finally excavated, the tenant hopes to have an ordinary drain depth after the soil has been quite pulverised, and the surface vegetable matter exhausted. The drains have given the utmost satisfaction. The leaders discharge their contents into the various large open canals which intersect the bed of the loch. With one or two exceptions, however, these canals have now been covered. Owing to the soft blue clay encountered in a part of the main cutting towards the loch, and, indeed, through a part of its bed, the sides of the watercourse had to be "stayed out." Posts about 7 feet long were driven into the soil, about 2 feet apart, at each side, supported by numerous stretchers with longitudinal backings. By the time the wood gets decayed it is expected the banks will be so consolidated as to hold out sufficiently.

But we must go back a little, for we find that the drainage was not completed before any portion of the ground thus reclaimed was under crop. Though it was the autumn of 1862 before the surface-water was run off, upwards of 20 acres were sown with Oats, and raised an excellent crop in 1863. Year by year considerable additions have been made to the acreage under crop until last season, when the whole bed of the loch and the surrounding marsh land, extending to 261 acres, formed an unbroken cultivated level, yielding fine heavy crops. A great part of the bottom of the lower loch was composed principally of dense masses of fine hair-like roots, matted together not less than 3 feet deep. These were the roots of the Equisetaceæ, and, with the roots of the various other grasses, were found rather troublesome to deal with, being very slow in decaying.

From the outset, the efforts of Mr. Barclay have been directed to the decay of the surface vegetation, in order to get down to the rich soil below. The soft spongy nature of the ground necessitated manual labour entirely for the first two or three years. Every acre of the loch had to be turned over by men with spades, not only during the first year, but the second, and in some parts more. The cost of delving alone was about 60*s.* per acre the first year, and 30*s.* per acre each succeeding season. Harrowing was also accomplished by manual labour, and it is needless to add that, from the expensive means employed, the land only received the minimum amount of this important branch of tillage. This year, and especially in the dry season of 1868, the crops of grain were very heavy, and of excellent quality. The yield of grain is quite in proportion to the bulk of straw, and the quality may be inferred when the weight is stated to range from 40 lb. to 44 lb. per bush.

Some of the ground carried its sixth succeeding crop of Oats this year without receiving manure of any kind. Excepting a crop of Turnips occasionally, to clean the land, there has been nothing sown but Oats, and it is not intended to change the present system so long as the crops continue as fine as hitherto. When the land is under Turnips—which has only occurred to the extent of about 30 acres during the last two or three years—about 3½ cwt. of phosphate per acre have been applied. This is all the manure of any description that Mr. Barclay has found it advisable to use on the new land, and he does not expect to require it more extensively for some years at least. As well as to prepare the ground for the seed the first few years, manual labour accomplished the gathering of the crops to the stackyard. For several years, however, this extra trouble and expense have been saved. This year it will be all ploughed by teams of oxen, and this autumn horses have been employed regularly on the new land, ploughing and carting. Every year as the matted material, formerly so abundant on the surface, disappears, the plough turns up a few inches of virgin soil, which, when harrowed, forms a fresh mould to cover the seed and nourish vegetation. So much consolidated has the bed of the loch now become that ploughing and harrowing are accomplished quite easily, and rolling was accomplished last season by means of oxen. This year there are about 35 acres yielding Turnips; and all over there is more than an average yield, while in some places the bulbs are of immense size. The land is not put under grass, as is common after Turnips, but sown with Oats, until its turn comes again for green crop. The average yield of grain last year was from 6 to 7 qr. per acre. In several fields as much as 10 qr. have been reaped off one acre. The land on Deeside being naturally light

and dry, there is often a scarcity of fodder, and therefore the reclamation of the loch is all the more valuable. In the first place, it is valuable to the tenant, inasmuch as the demand for fodder is generally greater in that district than in many others; and, in the second place, it is an advantage to the Deeside farmers to have a supply in the locality, by which they can eke out their own sometimes stunted crop. The extent to which the want of fodder prevails in that part of the country may be judged from the fact that Mr. Barclay received upwards of £500 for straw alone in 1868, sold almost entirely to farmers farther up Deeside.

Two service roads were formed through the new land, of a united length of 1000 yards. What was formerly the loch is situated entirely west of the railway, while a considerable part of the old arable land and the farm steading are east of the line. The drying of the loch has reclaimed 50 acres of land previously water-logged, along the margin of the lake. The whole expanse of about a mile from east to west, and in some parts nearly three-quarters of a mile from north to south, is within a few feet of being a dead level. The lowest part of the loch is fully 7 feet above the level of the main drain or tunnel, as it joins the new land at the southern corner. This does not afford a great margin, but it is sufficient to draw off the water through the leader drains. The former channel of the loch is about 410 feet above the level of the sea. Twenty-two acres at the north-west end of the lock have been improved since the water was run off, but belong to another tenant.

Alike the most formidable and expensive part of the operations was the tunnel and main outlet. It raised the sum actually required for reclaiming the land very considerably. This outlay, however, was inevitable. The drying and trenching cost in all over £5000, or about £23 per acre. The outlays have been very heavy, but there is every reason to expect that the enterprising tenant will, before the expiry of his lease, be amply remunerated for his enterprise and disbursements.

The arable land of the farm, thanks to an abundant supply of farmyard and artificial manure, is now in a high state of cultivation—forming a marked contrast to the condition in which it was when Mr. Barclay entered the farm only 10 years ago. The new land requiring no manure, the tenant is enabled to bestow more on the old arable soil. Mr. Barclay has at his own expense rebuilt and remodelled an extensive and commodious farm-steading. One byre, forming the north wing of the square, designed and built by Mr. Barclay, would compete with any of its kind in the county, both for extent and completeness of arrangement. There are between 30 and 40 head of pure polled cattle at Auchlossan, with one or two exceptions bred by the present owner. In this herd there are several good specimens of the Scotch polled breed. The origin of stock was selected in the Alford, Cromar, and Deeside districts—the centre of the best polled cattle. In 1869, Mr. Barclay got the 1st prize at the Royal Northern Agricultural Society's show at Aberdeen for a yearling polled bull of his own breeding. Last summer, an Auchlossan bull, still in the herd, came in 3d at Aberdeen, and a 2-year-old heifer, from the same place, stood 2d to Lively, then at Castle Fraser, but now in the possession of Lord Huntly. Besides these, there are other young beasts of merit in Mr. Barclay's herd. Three pairs of horses and four or five pairs of oxen labour the farm, which now consists of 410 arable acres of highly cultivated productive soil. The shifts on the old land are enclosed by substantial stone dykes.

It may be stated, that at the expiry of the lease Mr. Barclay gets nothing for his improvements, costly as they have been. Doubtless, however, the proprietors desire that he should be fully reimbursed for his expenses and rewarded for his trouble, since by Mr. Barclay's energy they will at the end of the lease have 240 acres of good arable land handed over to them, in lieu of what a quarter of a century ago was of no value whatever.

Miscellaneous.

FRENCH CHEESE.—The cheese manufactured in the old province of Bresse, now the department of the Ain, is made by boiling the milk, adding a little saffron, taking it off the fire, and putting it in the rennet immediately. The curd is then dried in a cloth, pressed for a few hours, put into a cellar, and salted five or six days after, this latter operation being continued for a month. Auvergne or Cantal cheese is made without boiling the milk, but curdling it while fresh from the cow; the whey being then separated, a man, with his legs bare up to the thighs, gets upon the table on which the curds have been put in a tub pierced with holes, and kneads the paste thoroughly with his arms and legs; an operation which lasts about an hour and a half. The uniform mass thus obtained is left to ferment for 48 hours, and then salted, put into moulds, and pressed for 24 hours; after which the cheeses are put into a cellar, frequently looked after and rubbed with a cloth dipped in fresh water. The celebrated Roquefort cheese, made in the village of that name in the Aveyron, is obtained with a mixture of sheep's and goat's milk; but even in the milking there is a secret, for when the udder appears to yield no more, the maid strikes it repeatedly with the back of her hand, whereby a little more milk is obtained, much richer in butter. This operation, which is utterly harmless, causes the udders to increase in size in course of time. The next reason assigned for the peculiar flavour of Roquefort cheese is, that when made into cakes it is kept in caverns hollowed out in a calcareous kind of rock which skirts the village; the temperature of these recesses is kept low by various contrivances, and seldom rises above 5° Cent. The cheese is made with the milk of the morning and of the evening before. The other manipulations present no peculiarity; but as for the veins, or *persille*, as they are called, they are obtained by mixing crumbs of mouldy bread with the curds. The quantity of this cheese annually supplied to the trade is 900,000 kilogr. (of 2 lb. each). Fromage de Brie is chiefly manufactured in the departments of Seine-et-Oise and Seine-et-Marne, to the amount of 2,500,000 kilogr. per annum. Rennet is put into the milk while warm from the udder; the curds are made into cakes, and laid on wicker trays, so that the whey may run off. After 24 hours they are salted, and then turned and shifted from time to time for the space of a fortnight or three weeks.

The Week's Work.

NOVEMBER 26.—*Stubble Land*, in early seasons like this, may get a thorough autumn fallow in the North of Scotland as in the South of England. It is otherwise in late seasons, ploughing the stubble being the principal team-work during this month, a deep winter furrow with four horses being all that the land gets. When stubble land is clean and free from weeds, as it always should be, and very generally now is, many prefer laying up the ridges in a deep winter furrow, under the conviction that teasing it afterwards with the scarifier does more harm than good. For Peas and Beans, farmyard manure is not unfrequently spread upon the stubbles, and either ploughed or ribbed in. In such cases the bottom should be subsoiled, as the manure requires to be covered with a shallow furrow. Manuring at this season is to be preferred to manuring in early spring, on the twofold ground that it suits the Bean crop better, and that any injury done the land in carting manure is rectified by the winter frost. The work of ridging, subsoiling, and covering the manure is much better and more effectually done by steam ridging and subsoil ploughs than by horse-ploughs—the land being left better drained, and exposed to the weather during winter. The above, however, chiefly applies to clean land. In all cases where the staple is full of Twitch and other weeds, advantage should be taken in an early season like this of giving the stubbles a thorough cleansing autumn fallow during this and the previous month in our northern counties, where stubble Turnips and smothering crops cannot be profitably grown.

Lea-ploughing for spring corn follows stubble-ploughing for root crops. During seasons like this, when the store of winter food in many places is short, cattle will be kept on the pastures longer than usual, if the weather permit, but as soon as stock are removed the plough, if the stubbles are finished, should enter, as the earlier lea is ploughed the better. Where wireworm is suspected, skim-plough the green sod into the bottom of the open furrow, covering it thoroughly with the furrow-slice, so as effectually to rot the whole of the vegetable and animal matter it contains, as this will deprive any insects which survive the winter of food in the spring; whilst at the same time the rotten organic matter thus reduced to the form of plant food will start spring corn rapidly, placing it beyond harm. On the other hand, when a green seam of grass is growing between every two furrow-slices, it not only robs the land of manure, but the tender roots of such grass furnish a plentiful supply of food for insects until the roots of the corn are available. Examples of old lea, with much effete vegetable matter on the surface, should have a light top-dressing of guano, lime, or liquid manure—according to the requirements of the land—10 days or a month before ploughing, purposely to rot the green sod when skimmed into and covered in the bottom of the furrow.

Sheep in the pastures should now be greatly thinned, and they should have ample hovel-room at night. Fields possessing suitable shelter should be reserved for breeding ewes in stormy weather, and where shelter does not exist naturally it should be provided artificially, not only for ewes and lambs, and in-lamb ewes, but also for young store sheep intended for breeding. The season, too, is one which requires special attention to outdoor flocks, both breeding and fattening, owing to the prevalence of disease on the one hand, and the peculiarities of the season on the other. Thus the long drought in some places, the high temperature of the earth, the bare pastures, and the refreshing rain of last month have set up a green, but very washy, bite, which may do harm unless a sufficiency of dry food is given along with it. If exclusively fed on such grass at this season, sheep will be liable not only to lung and bowel complaints, but also to the contagious diseases now decimating some flocks.

The Dairy.—Improvements in stock management are greatly in favour of dairy farming, the supply of milk and butter being little short of what it is in the summer time, both as to quantity and quality. The best mode of heating and ventilating the different departments of the dairy is still a matter of diversified opinion, whether by "hot-water," "flues," or "stove," or by a combinaton of these well known plans in horticulture. People are apt to think most of their own plans, but without going into details of controversy in this place, suffice it to say no little progress is being made, comparing one season with another, both as to improved practice and its extension. *W. B.*

Notices to Correspondents.

*** We have received communications from F. T. Tyndall, T. Gibbon, J. O., and H. S., which will appear next week.

BONES AND SUPERPHOSPHATES: *Mr. Thos. Jenkins, of Coventry*, asks for information as to the use of bone dust and coprolites, or mineral superphosphate of lime, as practised by Mr. Prout at his farm, near Sawbridgeworth. I have supplied all the manures used at Blount's Farm for several year's past, and have Mr. Prout's permission to give every information. It is his custom to buy largely of bone dust, and to mix it in about equal quantities with a soluble superphosphate of lime, allowing the heap to remain some little time before using. This mixture is applied liberally to all crops at the time of putting in the seed, and if in the spring any weak plots show themselves, they are top-dressed with some ammoniacal manure, as nitrate of soda or guano, at the same time keeping the land, where possible, well moved with the horse-hoe. *Edward Purser, 116, Fenchurch Street.*

TWO-INCH BONES: *One in Distress* asks for information where he can procure a quantity of 2-inch bones. He has repeatedly written to different manufacturers of manures, but as yet without success.

Markets.

MARK LANE.

MONDAY, Nov. 21.

There was a very short supply of English Wheat to this morning's market, which was sold at an improvement of 2s. per qr. upon the prices of this day se'nnight; the attendance was good; the business done in foreign was not large, but Friday's rates of 2s. to 3s. upon Russian and American, and 1s. to 2s. upon Baltic were obtained. Malting Barley was unchanged in value, but grinding was 1s. per qr. dearer. Beans and Peas brought extreme prices. The Oat trade was quiet, at an advance of 1s. to 1s. 6d. per qr. There was no alteration in the top price of town-made Flour, but American and country were 1s. per barrel and sack dearer.

PRICE PER IMPERIAL QUARTER.	s.	s.		s.	s.
WHEAT, Essex, Kent, Suffolk. White	48	56	Red	54	57
— — fine selected runs	52	60	Red	49	58
— — Talavera	53	62			
— — Norfolk	—		Red	—	
— — Foreign	45	64			
BARLEY, grind. & dist. 30s to 34s	Chev.	43	46	Malting	36	41
— Foreign grinding and distilling		25	33	Malting	33	40
OATS, Essex and Suffolk		20	28			
— Scotch and Lincolnshire	Potato	28	30	Feed	—	
— Irish	Potato	27	29	Feed	25	28
— Foreign	Poland and Brew	25	27	Feed	20	25
RYE		32	36	Foreign	33	36
RYE-MEAL, Foreign						
BEANS, Mazagan 43s. to 47s.	Tick	49	50	Harrow	49	50
— Pigeon 51s. to 59s.	Winds.	—		Longpod.	—	
— Foreign	Small	45	47	Egyptian	42	44
PEAS, White, Essex, and Kent.	Boilers	38	40	Suffolk	40	42
— Maple, 40s. to 44s.	Grey	36	40	Foreign	36	40
MAIZE				Foreign	30	32
FLOUR, best marks delivered	per sack	39	47			
— 2d ditto	ditto	33	45	Country	33	45
— Foreign	per barrel	26	29	Per sack	37	63

WEDNESDAY, Nov. 23.

The grain trade to-day, influenced by the more favourable aspect of the Eastern question, and by the large quantities of produce which are expected to arrive shortly, was depressed, and although no positive reduction took place in value, in some instances less money was accepted. There was a limited supply of English Wheat on offer, which came to hand in rather good condition. The demand was inactive, and prices ruled with a downward tendency. There was a large show of foreign Wheat on the stands, which sold slowly, at scarcely Monday's quotations. The market was well supplied with Barley; the business in choice descriptions was restricted, and other qualities were offered on somewhat easier terms. The Malt trade ruled dull, but prices were unchanged. There were extensive arrivals of Oats on sale, consequently the trade was inactive, and some difficulty was experienced in reaching Monday's prices. Beans and Peas were taken off cautiously, at previous quotations. Flour met with a limited inquiry, at drooping currencies.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch	Qrs. 810	Qrs. 290	Qrs. 30	Sacks. —
Irish ..	—	—	—	—
Foreign ..	10,890	3410	21,560	14,090 brls.
	11,700	3720	23,890	

LIVERPOOL, Nov. 22.—To-day's market was fairly attended by millers and dealers, but for Wheat there was only a limited consumptive demand, the prices obtained showing a depression of 3d. per cental since Friday. Flour dull, and about 1s. cheaper. The transactions in Indian Corn were unimportant, at about 3d. per qr.

decline. Oats neglected; Oatmeal unchanged; Peas, firm.

AVERAGES.

	Wheat.	Barley.	Oats.
Oct. 15	47s 0d	36s 7d	22s 5d
— 22	47 3	36 5	22 2
— 29	48 6	36 9	22 4
Nov. 5	49 9	36 8	22 7
— 12	50 5	36 11	23 8
— 19	49 10	36 8	23 11
Average ..	48 10	36 8	22 10

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Nov. 24.

Prime Meadow Hay	130s.to140s.	Clover, old ..	..130s. to 140s.
Inferior do. ..	..110 120	Inferior do. ..	..115 125
New Hay ..	.. — —	Prime 2d cut do...	126 135
Inferior do. ..	.. — —	Inferior do. ..	..105 115
Straw ..	.. .. 30 34		

CUMBERLAND MARKET, Thursday, Nov. 24.

Sup. Meadow Hay	130s.to140s.	Inferior Clover	..115s. to 124s
Inferior do. ..	..110 120	Prime 2d cut do...	— —
New do. ..	.. — —	New do. ..	— —
Inferior do. ..	.. — —	Straw	34 40
Superior Clover	..130 140		JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Nov. 21.

We have a large increase in the number of Beasts, but the average quality is very little better than last week. Prices are rather lower for all kinds; the reduction is, however, small for choicest descriptions; several inferior lots remain unsold. There are a very few more English Sheep, but the number of foreign has largely increased; prices are lower for all kinds, and a clearance cannot be effected. Calves are more plentiful; trade is slow, at reduced rates. Our foreign supply consists of 800 Beasts, 9000 Sheep, 173 Calves, and 130 Pigs; from Scotland there are 300 Beasts; from Ireland, 900; from Norfolk and Suffolk, 70; and 1090 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools	5 6to5	8
fords, &c. ..	5 8to5	10	Do. Shorn ..	.. —	..
Best Shorthorns..	5 4—5	8	Ewes & 2d quality	4 4 —5	0
2d quality Beasts	3 8—4	6	Do. Shorn ..	.. —	..
Best Downs and			Lambs	.. —	..
Half-breds ..	5 8—6	0	Calves	3 8—6	0
Do. Shorn ..	.. —	..	Pigs	3 8—5	8

Beasts, 3250; Sheep and Lambs, 21,100; Calves, 175; Pigs, 150.

THURSDAY, Nov. 24.

The supply of Beasts is shorter than on Thursday last; the demand is good, and Monday's quotations are rather exceeded for choicest kinds. Although the number of Sheep is small it is quite equal to the demand; there are very few buyers in attendance, and prices are not altered. The few Calves on offer are sold dear. Our foreign supply consists of 390 Beasts, 2450 Sheep, and 7 Calves,

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools..	5 4to5	8
fords, &c. ..	5 8to6	0	Do. Shorn ..	.. —	..
Best Shorthorns ..	5 6—5	10	Ewes & 2d quality	4 4—5	0
2d quality Beasts	3 8—4	6	Do. Shorn ..	.. —	..
Best Downs and			Lambs	.. —	..
Half-breds ..	5 8—6	0	Calves	4 0—6	0
Do. Shorn ..	.. —	..	Pigs	3 8—5	8

Beasts, 930; Sheep and Lambs, 4900; Calves, 33; Pigs, 5.

METROPOLITAN MEAT MARKET.—Nov. 24.

Best Fresh Butter	20s. per dozen lb.	
Second do. do.	18s. "	
Small Pork, 4s. 8d. to 5s. 0d.;	Large Pork, 3s. 4d. to 3s. 10d. per 8 lb.	

COALS.—Nov. 23.

Hastings Hartley, 16s. 0d.; Holywell Main, 17s. 3d.; Walls End Gosforth, 17s. 3d.; Walls End Haswell, 19s.; Walls End Hetton Lyons, 17s. 8d.; Walls End Kelloe, 18s.—Ships at market, 21; sold, 18; unsold, 3; at sea, 15.

SEED MARKET.

Our seed markets have during the past week exhibited a fair amount of activity; the tone of the trade has been very firm, and best qualities of new home-grown red Clover seed command a ready sale, at slightly enhanced values. There is but little English seed left over from last season, and the stocks on hand of old foreign are quite moderate compared with most seasons. New Italian and American red seed must be noted 2s. to 3s. per cwt. dearer. Of white Clover seed our growth this year is small, but the quality fine; the few parcels which are in this market are held for higher prices. Alsike being in short supply and good request, has advanced some 4s. to 5s. per cwt.; one lot realised £115 per ton. Of new Trefoil there is plenty offering, at very low currencies. For Italian and Perennial Rye-grass we have a brisk demand, at advancing prices. The unusually small quantity of foreign Italian which France has to send us causes Scotch and Irish grasses to be held with great firmness. White Mustard is now fully 2s. per bushel above the lowest point recently touched. English Rape, on account of its scarcity, is 3s. to 4s. per qr. higher. Bird seeds move off steadily at last Monday's rates. Feeding Linseed is dearer.

JOHN SHAW & SONS, Seed Merchants,
16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, Nov. 24.

The low prices current for useful qualities of Kent and Sussex Hops cause the trade to continue steady. Fine Bavarian Hops sell freely. Belgians are at advanced prices, but their market is now somewhat flat.

Transit Agency for Plants, Seeds, &c.

C. J. BLACKITH AND CO., Cox's and and Hammond's Quays, Lower Thames Street, London. Forwarders to all parts of the World.

N.B.—Mr. BLACKITH is sole Survivor of the late Firm of BETHAM AND BLACKITH

Red Spider.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.

Sold Retail by Seedsmen, in packets, 1s., 3s., and 10s. 6d.

Magnified.

Wholesale by PRICE'S PATENT CANDLE COMPANY (Limited), Battersea, London, S.W.

GEORGE HALL, late Manager to the late Saynor's Firm. He was for 30 years in their employ.

GEORGE HALL AND SON'S celebrated PRUNING and BUDDING KNIVES, SCISSORS, &c., may be obtained from the most respectable Nurserymen and Seed Merchants in the kingdom, also America, France, Germany, Holland, Prussia, Russia, &c.

N.B.—We only make one quality, the best that can be manufactured, the same as the late Saynors always made during their lifetime, with all the latest improvements.

CAUTION. None are genuine unless marked "GEO. HALL AND SON." Other marks would cause disappointment, as these Blades are tempered by a process known only to the Makers.

Engravings of Patterns, with Price Lists, given on application.

Horticultural Cutlery Works, Sheffield.

SILVER SAND and PEAT, in any quantity.—This Sand is acknowledged by Florists to be the best yet obtained. Price Lists on application to Mr. JOHN ARNOLD, Builder, 29, Clarendon Square, St. Pancras, N.W. Small orders executed at the Wharf, Maiden Lane, North-Western Railway Depot.

CHEAP PAVING TILES.—A manufacturing Firm have a considerable stock of PLAIN and ENCAUSTIC TILES, more or less damaged in the process of manufacturing, that they would be willing to dispose of at prices below those of the commonest description of Paving Materials. To Landed Proprietors these Tiles are invaluable for the floors of Cottages, Farmhouses, &c., and can be supplied at a very low rate

E. F., Post Office, Broseley, Salop.

THE GRANITIC PAINT, the best for the finest painting and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.

30A, King William Street, London Bridge, London, E.C.

LAWES' WHEAT MANURE for AUTUMN SOWING now Ready for Delivery.

All other MANURES and CAKES as per Price List, supplied on the lowest terms

Apply for prices, &c, to JOHN BENNET LAWES, 59, Mark Lane, London, E.C., Dublin, Shrewsbury, and Cardiff.

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz., "THE TENANT-FARMERS' MANURE COMPANY."

Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.

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C. T. MACADAM, Secretary.
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Registered August 4, 1869.
Office, 69, King William Street, London, E.C.

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Secretary, Mr. John Spencer.

Capital, £20,000; Shares, £2 each, £1 paid on allotment
Life Tickets, £3 3s., Annual Tickets, 10s. each, entitling the holder to purchase through his agency.

This Association has been formed by gentlemen engaged in Agriculture for the purpose of supplying members with Agricultural Implements or other goods, and more especially pure and genuine Oilcakes and guaranteed Manures, on the co-operative system.

Farmers' Clubs and large consumers of Oilcakes, Manures, &c., are invited to co-operate with this Association for the purchase of Agricultural requisites.

Further information, with Price Lists, Samples, and Analyses, on application to the Secretary.

The Association have regular importations of pure Linseed and Decorticated Cotton Cakes, direct from New York.

Best New York Linseed Cakes, in bags, £11 2s. 6d. per ton ex ship.
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Best Decorticated Cotton Cakes, in bags, £8 10s. per ton ex ship.
Special terms to large consumers.

Agricultural Land Improvements, Drainage,
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Incorporated by Act of Parliament in 1849.

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No investigation of title necessary, and no legal expenses incurred.

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The Company advances money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.

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To be had of Messrs. ROBERTS and SONS, Tobacco Manufacturers, 112, St. John Street, Clerkenwell, E.C., of whom Copies of Testimonials may be obtained; and of all Seedsmen and Nurserymen.

The Cheapest and Best Insecticide.
DUTFY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.

Powder Distributors, 2s 6d and 3s. 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—G.E.O. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.

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WHEAT MANURE, strongly recommended for Autumn Sowing.
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PREPARED and PURIFIED GUANO, for Corn and Roots, and every other MANURE of known value.
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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

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"London, January 15, 1870.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
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Retail of the principal Seedsmen. Prices on application.

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They have no connection with any other House of the same name
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PROTECTION from the SCORCHING RAYS of the SUN.
WOOL NETTING, 2 yards wide and 1s. 6d. per yard.
"FRIGI DOMO" CANVAS
Two yards wide .. .. 1s. 9d. per yard.
Three yards wide .. .. 2s. 8d. per yard.
Four yards wide .. .. 3s. 6d. per yard.
SCRIM CANVAS, 72 inches wide, 50 yards long, 3½ d. to 8½ d. p. yard.
HESSIAN CANVAS, do., do., 54 and 72 inches wide, 6½d. and 8½d. per yard.
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CONSERVATORY and GARDEN-HOUSE GLASS.
Genuine White Lead, Oils, Colours, Brushes, &c.
GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNECTIONS, &c.
Prices upon application

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As supplied by them to Mr. Rivers, to the Royal Horticultural Society, and to most of the Nobility, Clergy, and Gentlemen of the United Kingdom.
Each Box contains 100 feet. The prices only apply to the sizes stated
Squares 20 by 12, 20 by 11, 20 by 11, 20 by 15.
100 ft. in the box 21 oz.
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The above prices on Table the Lowers, which are not returnable.
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Stock sizes, 16 oz., in 100 feet boxes, boxes included
These prices only apply to the sizes stated

4ths.	3rds.	2nds.
s. d.	s. d.	s. d.
11 by 9 | 12 by 9 | 13 by 9 | 14 by 9	13 6	15 0	17 0
12 by 10 | 13 by 10 | 14 by 10 | 15 by 10			
13 by 11 | 14 by 11 | .. | ..			
14 by 12 | 15 by 12 | 16 by 11 | 16 by 12			
18 by 12 | 19 by 12 | 16 by 12 | 17 by 12			
16 by 13 | 17 by 13 | 20 by 12 | ..	15 0	16 0	18 6
16 by 14 | 20 by 13 | 18 by 11 | ..			
17 by 14 | 18 by 11 | .. | ..	16 to 17 oz. 19 the foot		
20 by 14			

SMALL SHEET SQUARES (in 100 feet Boxes).
6 by 4 6d by 4½ 7 by 4½ 7 by 5 .. 12s. 6d.
8 by 6 8½ by 6½ 9 by 7 9½ by 7½ .. 13s. 6d.
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London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.
LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS.
PAINTS of various colours ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes, BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHEET, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices and Estimates forwarded on application to
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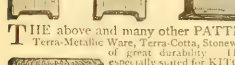
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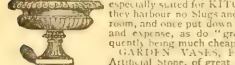
GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.
F. & G. ROSHER, Manufacturers, Upper Ground street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E. Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection
WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability, Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.
To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of Stamp.
FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates
F. & G. ROSHER.—Addresses see above.
N.B. Orders promptly executed by Railway or Vessel.
A liberal discount to the Trade.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe mark of Manufacturers, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
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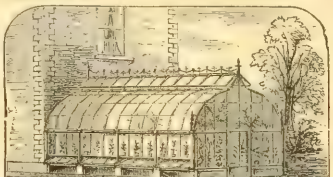
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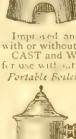
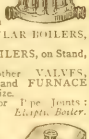
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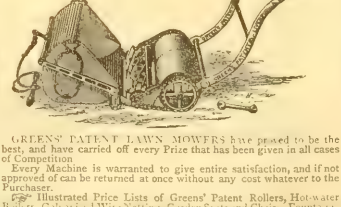
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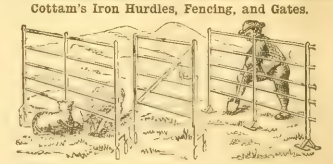
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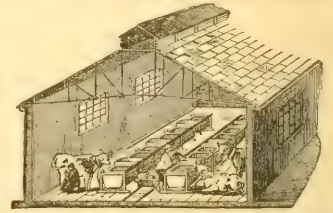
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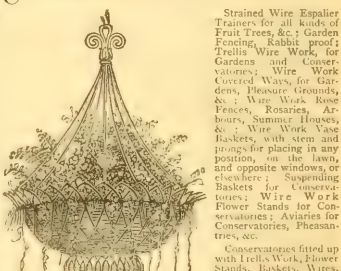
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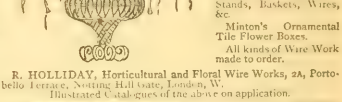
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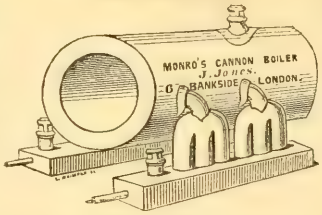

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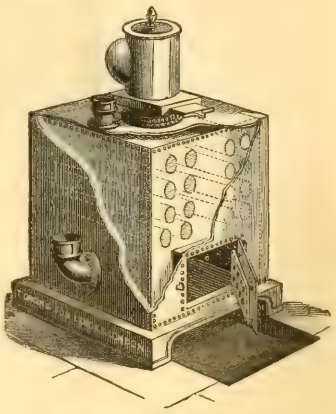

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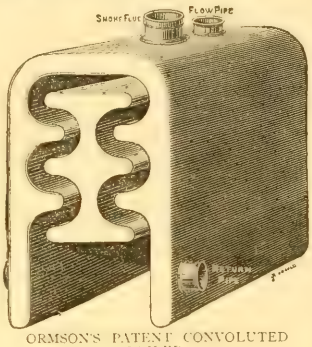

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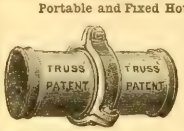

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 49.—1870.] SATURDAY, DECEMBER 3. { Registered at the General Post Office as a Newspaper. } Price 5d. { POST FREE, 5½d. }

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NOTICE.—A Special Edition of the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE, containing a full Report of the SMITHFIELD SHOW, illustrated, will be published on FRIDAY, December 10, in the Hall, Stand No. 161. Advertisements for this Number must reach the Office not later than Thursday morning, December 8.
Office: 41, Wellington Street, Covent Garden, W.C.

Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE.—FULL PRICE will be given at the Office for Clean Copies of No. 5, January 29, 1870.
Office, 41, Wellington Street, Strand, W.C.

NOTICE to SUBSCRIBERS.—On and after this date the SUBSCRIPTION to the GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE will be £1 3s. 10d. for 12 months, including postage, instead of £1 6s., as heretofore.
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ROYAL HORTICULTURAL SOCIETY, SOUTH KENSINGTON, W.
NOTICE.—MEETING of FRUIT and FLORAL COMMITTEE, on WEDNESDAY, December 7, at 11 o'Clock. GENERAL MEETING at 3. Band of the Royal Horse Guards at 2. Admission 2s. 6d.
*** A Prize of £5 is offered at this Meeting, by J. Bateman, Esq., F.R.S., for the best Collection of Cut Flowers of Cattleyas Mossiæ, labiata, &c., such flowers to be at the disposal of the Society.

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Early Rose can be supplied in smaller quantities at 6d. per lb.; carriage not paid.
JOHN COWEN, Red Hill, Surrey.

NEW POTATOS.—American Early Rose, Paterson's Bovinia, Red-skinned Flourball (Sutton's).
CHARLES SHARPE and CO., Seed Merchants, Sleaford, have pure, true seed of the above to offer. Price on application.
Priced Lists of Seed Potatos sent post free.

Twenty-one First and Ten Second Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and 10 Second Prizes for ROSES, exhibited at the principal Rose shows throughout the kingdom. It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.

The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.

Nurseries, King's Acre, near Hereford.

To the Trade.

CARTER'S LIST of FLORAL and VEGETABLE NOVELTIES for 1871 is now ready, and may be had on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.

Exotic Nursery, Tooting, Surrey, S.W.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES.

The American Nursery, Bagshot, Surrey.

Planting Season.

TO BE SOLD, cheap, the ground being required for other purposes, 6 acres of RHODODENDRONS, from 1 to 3 feet high, bushy hybrids, well set with bud, the finest lot in England; AZALEAS, strong and bushy, well set with bud; POPLAR, in variety, 9 to 12 feet high; SPRUCE, 1 to 3 feet; HORSE CHESTNUTS, SYCAMORE, NORWAY MAPLE, 2 to 8 feet; COMMON LAUREL, 1 to 3 feet, 100s; and other Forest Trees, Shrubs, &c. Best show GOOSEBERRIES in variety.

E. WHITHAM, The Nurseries, Reddish, near Stockport.

Rhododendrons for Potting or Planting Out, HARDY SCARLET, WHITE, and other CHOICE NAMED.

W. H. ROGERS, Red Lodge Nursery, Southampton, offers a large and splendid assortment of the above, with blooming buds, at 18s., 24s. and 30s. per dozen.

Also KALMIA LATIFOLIA, ANDROMEDA FORMOSA, and AZALEA AMŒNA, at 6s., 12s., and 18s. per dozen.

A NOBLE AVENUE for £20, consisting of 100 WELLINGTONIA GIGANTEA, about 5 feet high. This, the most noble of all trees, a native of California, where it attains a height of 300 feet, with a trunk 30 feet through, is of rapid growth, hardy, and noble in form. The bark of a Wellingtonia at the Crystal Palace, recently destroyed by fire, was an object of admiration at the foot of the tree.

Or an AVENUE of 100 SUPERB ABIES DOUGLASII, about 10 feet high, for £30. This, the most magnificent evergreen Tree of rapid growth, hardy, produces valuable timber, cheap, heavy, and free from knots; it is the evergreen Yew wood. It is a native of California, where it grows upwards of 300 feet high, with a trunk 60 feet to the first branch, as stated at Kew is of this tree, and was, when growing, 300 feet high. There is at Dropmore (Bucks) a specimen measuring at the present time 165 feet high, and 90 feet through the branches, with a trunk 16 feet in circumference at 4 feet above the ground. It was raised from seed sown by Mr Frost, the present gardener, in 1828, and is now a model of beauty.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
POECILE LAUREL, 5 to 6 feet | COMMON LAUREL, 6 to 9 ft
Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, this day set with buds.

The above have recently been transplanted, are very bushy, hand some plants, and quite safe. Prices per hundred on application.

Floral Nursery, Holdham, Sussex.

Fox or Game Covert.

W. MAULE AND SONS can supply, for this season's planting, —

BROOM, English, strong, 1½ to 2 feet, 25s. per 1000
BOX, Evergreen, bushy, 1½ to 2 feet, 25s. per 100; £11 per 1000
CURRANTS, black and red mixed, 6s. per 100; 50s. per 1000
FURZE, English, two years old, 10s. per 1000.

—— two-year-old, the very best transplanted, 25s. per 1000
LAURELS, black, 25s. per 100; £10 per 1000
MADONNA, Evergreen Barberry, 1 to 2 feet, 25s. p. 100; £10 p. 1000.
NORWAY SPRUCE, 2 to 3 feet, 30s. per 100; £12 per 1000
PRIVET, Evergreen, 30s. per 100
PERIWINKLE, broad leaf, 25s. per 100
SNOWBERRY, 25s. per 100
BITTER OSIER, 25s. per 1000.

Collections of miscellaneous Shrubs, for undergrowth and shrubbery plantations, of the following sorts, 50s. per 100: Yews, Hollies, Euonymus, Aucubas, Rhododendrons, Portugal Laurels, Lycetsmans, Brooms, &

Lists of Forest and Ornamental Trees sent on application.

The Nurseries, Bridge.

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees.

QUICK, and all other Hedge Plants.

COVERT PLANTS, in great variety.

FRUIT TREES, including the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained, &c.

ROSES, Standards, Dwarfs, on own roots and Manetti stock, &c.

VINES, all the leading varieties, in 2000 well ripened Canes, for fruiting in pots and for planting out.

EVERGREENS, in great variety, including large quantities of all the choicest Hollies, &c.

CONIFERS, including Picea nobilis, Nordmanniana, &c.

ORNAMENTAL TREES and Plants, of all sorts.

The whole in very great quantity and stout vigorous condition, with fine roots, for sale or removal.

Priced LISTS and all particulars on application to

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

The "Newton" Nurseries are within 10 minutes' walk, by the new road over Flookersbrook Bridge, from the Railway Station.

PAUL'S NURSERIES, WALTHAM CROSS, N.

ROSES.

ROSE PRINCESS CHRISTIAN.—"One of the grandest Roses in cultivation." "The best Rose of the present year." "The great Rose of the Show." Standards and Dwarf Standards, 10s. 6d. each. Dwarfs, 7s. 6d. each.

Standard ROSES, 15s. per dozen, and upwards.

Dwarf Standard ROSES, 12s. per dozen, and upwards.

Dwarf ROSES, 9s. per dozen, and upwards.

" in pots of extra size, prepared for forcing, 24s. per dozen, and upwards.

Climbing ROSES, strong plants, 9s. per dozen and upwards.

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s. per dozen, and upwards
Bedding HYACINTHS, 18s. per 100, and upwards.
" TULIPS, 3s. per 100, and upwards.
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, of sorts, 2s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000
All other Bulbs equally moderate in price.

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each.
AVALANCHE, do., do., 7s. 6d. each.
MARCHIONESS.—The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.
WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each.
BONFIRE, the finest scarlet for bedding, 3s. 6d. each.
AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 12s. each and upwards.

EVERGREENS, CONIFERS, &c.

The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently trans planted specimens.

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES. FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post.

IMPORTANT.—Address WILLIAM PAUL, the Christian name in full, Paul's Nurseries, Waltham Cross, London, N

New Plants

Now OFFERED for the FIRST TIME by

CHARLES NOBLE, Bagshot, Surrey.

CLEMATIS ALBERT VICTOR.
First-class Certificate, May 5, 1869.

Extra fine shape, each flower having eight petals, deep lavender colour, with brown ribs down the centre of each petal, the ribs changing to white, or nearly so, as the flower expands. Very free-flowering, and of a superb, thick velvety texture.

10s. 6d. each, or £4 4s. per dozen.

CLEMATIS LADY LONDESBOROUGH.
First-class Certificate, May 19, 1869.

Very fine shape, each flower having eight petals, colour a delicate silvery grey, white stripe down the centre of each petal; a pink stain at the base of the stamens gives it a pretty appearance. Good substance, and very free flowering; constitution very robust

10s. 6d. each, or £4 4s. per dozen.

CLEMATIS MRS. BATEMAN.
First-class Certificate, May 5, 1869; Special ditto, April 20, 1870.

Good shape, each flower composed of eight petals, colour pure white, with distinct band of glaucous cream-colour down the centre of each petal. Very free, and altogether a magnificent plant.

15s. each; the set of the three, £2 2s. When 12 are taken, four of each, they will be charged £4 4s. per dozen.

Send for CATALOGUE.

LUCOMBE, PINCE, AND CO.
PICEA NORDMANNIANA.

LUCOMBE, PINCE, AND CO.
STANDARD PORTUGAL LAURELS.

LUCOMBE, PINCE, AND CO.
PICEA PINSAPO,
WELLINGTONIA GIGANTEA,
and every other kind of Conifer; fine plants of all sizes, fit for removal.
CUT CAMELLIA BLOOMS,
and other choice flowers.
VINES in pots, largest and strongest.
FERNS, ORCHIDS, and all kinds of
STOVE and GREENHOUSE PLANTS.
COLCHICAN LAURELS, from 3 to 8 feet.
COMMON LAURELS, 30,000.
Exeter Nursery, Exeter

LARCH, fine stout, 9 to 18 inches, 10s. per 1000. SCOTCH FIRS, strong, 11s. per 1000. QUICKS, 1½ to 2 feet, strong, 12s. per 1000.
W. JACKSON, Blakedown Nursery, Kidderminster.

THE HORTICULTURAL ESTABLISHMENT of RINGELHEIM, Hanover, Germany (represented in London by Messrs. R. SILBERRAD and SON), offers the following articles at the undermentioned greatly reduced prices:—

ORNAMENTAL FOREST TREES.

QUERCUS AMERICANA RUBRA, fine seedlings, 1-yr., 5s. per 100, 40s. per 1000; 2-yr., 8s. per 100, 72s. per 1000.

ROBINIA PSEUD-ACACIA, fine seedlings, 1-yr., per 100,000, £15; 2-yr., do., £24; 3-yr., do., £48

BETULA ALBA (Birch), fine young trees, 7 or 8 feet high, per 10,000, £8; per 50,000, £42; per 100,000, £48

N.B. The above-named Seedlings are disposable, per 100,000, up to Three or Four Millions. For Quotations, see CATALOGUE, which Messrs. R. SILBERRAD and SON will send free on application.

SEEDLING AND TRANSPLANTED CONIFERS.

PINUS, ABIES EXCELSA, strong seedlings, 2-yr., 6s. 6d. per 1000, £2 8s. per 10,000, £20 per 100,000; transplanted, 3-yr., 12s. per 1000, £5 12s. per 10,000; £44 per 100,000.

PINUS, ABIES PECTINATA, strong seedlings, 2 yr., 12s. per 1000, £5 4s. per 10,000, £48 per 100,000; transplanted, 3-yr., 14s. 6d. per 1000, £6 8s. per 10,000; £56 per 100,000; transplanted, 4 yr., £8 per 1000, £64 per 100,000; £86 per 100,000.

LARIX EUROPÆA, strong seedlings, 2-yr., 10s. per 1000, £1 per 10,000, £32 per 100,000; transplanted, 3-yr., 14s. 6d. per 1000, £6 per 10,000, £48 per 100,000; transplanted, 4 yr., 18s. per 1000, £7 12s. per 10,000, £64 per 100,000.

PINUS SYLVESTRIS, strong seedlings, 1 yr., 3s. 3d. per 1000, £1 4s. per 10,000, £10 per 100,000; strong seedlings, 2-yr., 5s. per 1000, £2 per 10,000, £18 per 100,000.

PINUS STROBUS (Weymouth), strong seedlings, 2-yr., 17s. 6d. per 1000, £7 16s. per 10,000; transplanted, 3-yr., £1 4s. per 1000, £10 per 10,000

PINUS AUSTRIACA NIGRA, strong seedlings, 2-yr., 6s. 6d. per 1000, £2 per 10,000; strong seedlings, 3-yr., 8s. per 1000, £3 16s. per 10,000; transplanted, 3-yr., 14s. 6d. per 1000, £5 4s. per 10,000; transplanted, 4-yr., £1 per 1000, £8 16s. per 10,000.

All the above Seedlings are well grown, healthy, and well rooted; and are for the greater part disposable by millions.

A reduction is made on all Seedlings when upwards of 100,000 are ordered.

The cost of packing (which is done with the greatest care, and according to the distance the plants have to travel does not amount to more than 10 per cent. of the amount of invoice on goods for England, &c.

For the Conifers (either in open ground or in pots) see our SPECIAL CATALOGUES.

Orders not accompanied with remittance or reference, if from unknown correspondents) should be sent immediately to

Messrs. R. SILBERRAD AND SON, 5, Harp Lane, Great Tower Street, London, E.C.

AS AN AVENUE TREE
Nothing is so grand and beautiful as
ABIES NORDMANNIANA,
and they can be obtained of any size up to 6 feet; transplanted 1870.

RHODODENDRON THE QUEEN
(mind you get "The Queen") still remains as far superior to any other white Rhododendron as silver is superior to lead.

RHODODENDRONS, in VERY NAMED
kinds, in greatest profusion, full of buds; never so fine before.

DWARF ROSES,
as good as can be grown, and in any quantity.

FRUIT TREES.

APPLE, PEAR, CHERRY, PLUM, &c. Standard, Pyramid, Dwarf, and Trained; healthy, vigorous, and a capital selection.

The above are a few specialities offered by CHARLES NOBLE, but the Nurseries are replete with a large healthy stock of new Shrubs and Plants added to the same. The Nurseries (half a mile from Sunningdale Station, South-Western Railway) should induce all large planters to pay a visit, for seeing is the only way to understand the kind of plants sent out at the Sunningdale Nursery, and the prices charged will more than repay the journey.

Send for a CATALOGUE
Bagshot.—Nov. 1870

FOR PLANTATIONS, at wholesale prices, for cash, all transplanted and bushy, OAK, ELM, BIRCH, HORSE CHESTNUT, 2 to 3 feet high, stout, well rooted trees, 20s. per 1000; ASH, 3 feet, 20s. per 1000; HORSE CHESTNUT, 1-4 feet, 40s. per 1000; MAPLE, 2 to 3 feet, 20s. per 1000; LARCH, 6 to 9 inches, 10s.; 9 inches, 12s.; 9 to 18 feet, 20s. per 1000; SYCAMORES, 4 to 6 feet, 16s.; 7 to 9 feet, 25s. per 100; WALNUTS, 3 to 4 feet, 20s. per 100; BOX, for edging walks, 9d. per yard; Red Hedge CANES, strong, 6s. per 100, 50s. per 1000; SILVER FIR, 1 to 2 feet, 2s. per dozen; GUELDER ROSE, Red and Yellow RIBES, very thrifty, 3 feet, 3s. 6d. per dozen; Dwarf Perpetual ROSES—in Briar, 2s. per dozen; and other Nursery Stock

Remittance or reference required with orders.

A. WILKIN, Tiptree, Kelvedon, Essex.

FRANCIS & ARTHUR DICKSON & SONS,
The Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

LILY of the VALLEY, imported Clumps, 18s. to 24s. per dozen.—These are specially grown for early forcing, and are much superior to English grown; producing very large and fragrant flowers in great profusion.

SPIRÆA JAPONICA, imported Clumps, 12s. to 18s. per dozen—For Conservatory or Greenhouse decoration in spring nothing can be finer, and for cut flowers for bouquets it is unsurpassed. It is admirably suited for early forcing.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the year they first fruited in, the raiser, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Replant your branches in winter; and in this short advice lies all the art of growing healthy and fruitful trees, such as J. S. offers

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application.

The stock of Seedling and Transplanted LARCHES, SCOTS FIRS, and other FOREST TREES is both unusually extensive and superior in quality. When personal inspection is not convenient, samples and special offers will be sent if required.

Edinburgh and London (20, Budge Row, Cannon Street, E.C.)

NEW ZEALAND SEEDS, fresh arrival, in fine condition.

PHORMIUM TENAX, scarlet-edged, black-edged, golden-edged, and fol. var.; CORDYLINE INDIVISA, &c., 1s. per packet.

Price to the Trade on application

HOOPER AND CO., Covent Garden, London, W.C.

THE PATENT ACME
GARDEN FRAME AND GROUND VINERY

Will be EXHIBITED at the Meeting of the ROYAL HORTICULTURAL SOCIETY,

ON WEDNESDAY NEXT.

Full particulars will shortly appear in the *Gardeners' Chronicle.*

To the Trade.—Continental Flower Seeds, &c.

GEORGE MACINTOSH, Agent to F. W. Wendel, Seed Grower, &c., Erfurt, Prussia, begs to announce that he can now supply CATALOGUES of the above free and post paid on application.

The Nursery, High Road, Hammersmith, London, W.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION OF PLANTS, which at all times well repay a visit Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.

Victoria and Paradise Nurseries, Upper Holloway, London, N.

VINES and PINES.—Vines, for fruiting in pots and planting, of all the approved sorts, very fine canes Pines, Fruiting and Succession, in variety; all in splendid condition, never had scale.

M. ROCHFORD, Market Gardener, Page Green, Tottenham, N.

Planting Season. Knowfield Nurseries, Carlisle.

MESSRS. LITTLE and BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, beg leave to request the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c.; and Gentlemen intending to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

L. & B. are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties.

VEITCHS' AUTUMN GIANT CAULIFLOWER.

MESSRS. VEITCH & SONS

DESIRE TO CALL ATTENTION TO THIS

NEW AND EXTREMELY VALUABLE LATE CAULIFLOWER.

It is perfectly distinct from any other sort, the leaves are long and tapering, and the habit of the plant is robust, but very upright and compact. The heads are magnificent, beautifully white, large, firm, and compact, and being thoroughly protected by the foliage, remain longer fit for use than any other sort. If sown in April it will succeed the Walcheren, and coming in between that variety and Snow's Winter Broccoli, is a great acquisition to all gardens. It was awarded a First-class Certificate by the Royal Horticultural Society, November 2, 1870, when Messrs. V. & S. were generally congratulated on having brought such a fine variety before the public. Many letters, speaking in the highest terms of this Cauliflower, have been received, and it cannot be too strongly recommended.

The following is an Extract from the *Gardeners' Magazine* of November 5, 1870:—

"Messrs. Veitch & Sons exhibited their New Giant Autumn Cauliflower, which from its gigantic size and fine appearance attracted a considerable amount of attention, and was deservedly awarded a First-class Certificate. Five or six heads were shown, the largest measuring upwards of 12 inches in diameter, and all were perfectly solid and of the purest white. It was stated that seed of the Giant Autumn, Walcheren, and several others were sown at the same time, and all the plants grown under exactly the same conditions, and that the Giant Autumn did not turn in until all the others were past. Its being fit for use so late in the season is a most important quality, and without doubt it is one of the most valuable and distinct vegetables that has been introduced for many years past."

Mr. HENRY CHILMAN, Somerley Gardens, writing in the *Florist*, says:—

"This is certainly one of the best additions to the Brassica family we have had for some years past, the heads produced by this fine sort being compact and of marble-like whiteness. From the high recommendation given to this variety in the Catalogue whose name it bears, I was induced to try it, and can fully endorse every word said there in its favour. All who have not hitherto included this variety in their Seed Lists would do well to do so; there is little doubt of those who have once tried it neglecting to do so again. The crop we are now cutting gives promise of a supply for five or six weeks to come."

In Sealed Packets, 2s. 6d. each.

The following Seedsmen have obtained a supply direct from us, viz.:—

Messrs. Barr & Sugden, 12, King Street, Covent Garden.
" Burgess & Kent, Penkhull.
" Carter & Co., 237, High Holborn.
" Jas. Dickson & Sons, 102, Eastgate Street, Chester.
" Dickson, Brown & Tait, Manchester.
" Downie, Laird & Laing, Forest Hill.
" James Garraway & Co., Bristol.
" E. G. Henderson & Son, St. John's Wood.
" Hurst & Son, 6, Leadenhall Street.
Messrs. J. & C. Lee, Hammersmith.
" Minter, Nash & Nash, 69, Strand.
" Osborn & Sons, Fulham.
" Smith & Simons, Glasgow.
" Sutton & Sons, Reading.
" Wood & Ingram, Huntingdon.
Mr. R. Cooper, 152, Fleet Street.
" John Scott, Yeovil.
" R. T. Veitch, Exeter.
" B. S. Williams, Upper Holloway.

Price to the Trade on application, or of either of the London Wholesale Houses named above.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.—Nov. 22, 1870.

NOVELTIES FOR 1871.

MESSRS. VEITCH & SONS

BEG TO DIRECT ATTENTION TO

THE FOLLOWING DISTINCT AND STRIKING NOVELTIES.

CENTAUREA CLEMENTEI.

A robust and free growing variety, producing crowns of leaves deeply fringed and cut in lobes, the lobes again being fringed and cut. To the elegance of the foliage must be added the beauty of colouring the leaves in their earliest stage being so densely covered with down as to be perfectly white, and when matured and fully developed still retaining a bright silvery appearance.

This fine plant is similar in habit to C. candidissima, but is much finer in all its proportions, and may be used in the same way for grand masses, ribbon borders, or as a specimen on lawns.

Per packet, 1*s.* 6*d.* and 2*s.* 6*d.*

MELON.

COLSTON BASSET SEEDLING.

A beautiful netted yellow skinned variety, of very handsome shape and medium size, averaging about 3 lb. in weight; the flesh is almost white, of delicious flavour, exceedingly tender, and melting; the plant is of good constitution and a very free bearer. It was awarded the First Prize at the Royal Botanic Society's Exhibition in July last.

Per packet, 2*s.* 6*d.*

CUCUMBER SOOLY QUA.

NEW CHINESE VARIETY.

This remarkable vegetable, which created such a sensation when shown at the Royal Horticultural Society's Meeting on June 8, 1870, is wonderful alike for the immense size of its fruit, 16 large dark green glossy leaves, and the beauty of its flowers. In China it is used by the natives as a regular article of food, boiled with rice, or cooked in various ways, and is also much enjoyed by Europeans residing there. The fruit is of rapid growth, attaining in this country a length of 5 to 6 feet, and from 12 to 16 inches in circumference, and is used in the green state just when they attain their full size.

Per seed, 3*s.* 6*d.*

TOMATO HEPPER'S GOLIATH.

A very large red variety, raised by Mr. Hepper, Gardener, The Elms, Acton, who has placed the entire stock in our hands for distribution. It was exhibited at the Royal Horticultural Society's Meeting, October 5, 1870, when it was awarded a special Certificate, being the only Tomato which received a Certificate on that occasion. The fruit is considerably more than double the size of any other sort, frequently being from 1 to 1½ lb. in weight.

Per packet, 1*s.* 6*d.*

THE "CHELSEA" BLIGHT COMPOSITION,

FOR DESTROYING MEALY BUG, BLACK and WHITE THRIP, SCALE, GREEN FLY, &c.

MESSRS. VEITCH AND SONS having for some time used, with great success, a Composition for destroying insects on plants, have determined to offer it for sale, believing it will be a real boon to plant cultivators.

MESSRS. V. AND SONS have always found this Composition more efficacious than any other they have yet tried, and it has been constantly used by them for cleaning all kinds of Stove and Greenhouse Flowering and Foliage Plants, Orchids, and even Ferns, with the exception of the more delicate kinds, and the success which has invariably attended its use induces them to introduce it to the public. Full instructions as to its application accompany each bottle.

	s.	d.		s.	d.
Bottle sufficient to make 1 gallon of Mixture fit for use	1	6	Bottle sufficient to make 4 gallons of Mixture fit for use	5	6
Ditto 2 ditto	3	0	Ditto 8 ditto	10	6

PRICES TO THE TRADE ON APPLICATION.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.—Dec. 1, 1870.

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application. The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies.

The "Woking Nursery" is easily reached by South-Western Railway (main line) to Woking, and goods can be sent through, if upwards of a ton, to all parts of the kingdom, which is an immense saving of package and carriage. An inspection of the Nursery will well repay Purchasers, but to those who cannot personally pay a visit, the following summary of Stock, averaging from 4 to 5, or more feet high, will give some idea of the resources of this Establishment, viz.:—

125,000 Standard, Pyramid, Dwarf Maiden, cutback, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, &c., of the leading well-known kinds.

25,000 STANDARD and DWARF ROSES, of select and choicest varieties.

200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the common hybrid Catawbiense and Pontieum.

750,000 CONIFERÆ, which embrace most of the fine hardy species and varieties, of the following genera:—Abies, Araucaria, Cedrus, Cupressus, Juniperus, Picea, Pinus, Retinospora, Taxodium, Taxus, Thuia, Thujopsis, Wellingtonia, &c.

450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following:—Acæna, Atlantus, Alder, Almond (flowering), Althæa frutex, Arbutus, Ash, Aucuba, Bay, Beech, Berberis, Birch, Bladder Sena, Box, Broom, Calycanthus, Chestnut, Cherry (flowering), Chimonanthus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolkwitzia, Laburnum, Laurel, Laurustinus, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Phillyrea, Philadelphus, Plane, Poplar, Privet, Pyrus, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c.

2,000,000 FOREST TREES, viz.:—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.

20,000 CLIMBERS, thus—Bignonia, Climbing Roses, Ivy, Jasmine, Passionflower, Periploca, Vinca, Virginian Creeper, Wistaria, &c.

20,000 CLEMATIS, principally the "Woking Hybrids."

This Catalogue contains a set of five large Engravings of Clematis, for which this Establishment is famed, taken from Photographs.

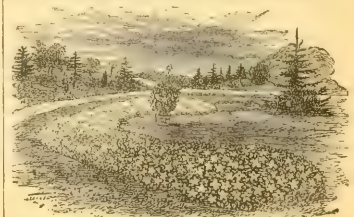

REDUCED FORM, No. 3.

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials.

Engraving No. 1. For Conservatories, Terraces, &c.
" No. 2. For Lawn, Flower Garden, &c.
" No. 3. For Hardy and Permanent Bedding, &c.
" No. 4. For Festoons, Verandahs, &c.
" No. 5. For Rootery, Rockwork, Ruins, &c.

"This Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*

Woking Nursery, Surrey.

Dutch Flower Roots.

ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers.

DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted.

Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application.

Sion Nursery, Thornton Heath Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

King's Acre Nurseries, near Hereford.

JOHN CRANSTON, PROPRIETOR.—These extensive Nurseries (Established 1785) have long been celebrated for the Culture of GENERAL NURSERY STOCK, and the several departments are replete with the most approved and desirable Plants at present in Cultivation, while the Collection is constantly enriched by the addition of recent introductions.

NURSERY DEPARTMENT.

ROSES.—All the New and Old Varieties. Superb Standard, Dwarf, Pillar, and tall Weeping Plants. Twenty-one First and Two Second Prizes at the principal Rose Shows of 1870.

CONIFERÆ.—Beautiful specimen Specimens of the leading kinds, of various sizes. All constantly transplanted.

ORNAMENTAL TREES and SHRUBS.—Evergreen and Deciduous Trees and Shrubs in great variety, including extra strong Trees for Avenues, Park Groups, &c.

FOREST TREES.—Larch, Spruce, Scotch, Pinus austriaca, Oak, Chestnut, Ash, &c., of various sizes.

FRUIT TREES.—The collection includes all the kinds most worthy of cultivation, and the Plants are carefully grown in every variety of form.

PLANT DEPARTMENT.

BEDDING and DECORATIVE PLANTS in great variety.

SEED DEPARTMENT.

GARDEN and FARM SEEDS carefully selected, and of the best quality possible.

Special Terms to extensive Planters.

DESCRIPTIVE PRICED CATALOGUE free by post on application.

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new walk recently made to pass by the steps over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.

Intending Planters are especially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES and all particulars on application.

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

New Fruits.

BURGHLEY PARK CHERRY.—Maidens, 7*s.* 6*d.* each; a few large fruiting trees, 10*s.* 6*d.* to 15*s.* each. Cuttings for grafting, 6*d.* each. Orders booked.

ANNIE ELIZABETH APPLE.—Fine Maidens, 2*s.* 6*d.* each

LORD BURGHLEY APPLE, 1*s.* each

The IMPERIAL CRAB, 2*s.* 6*d.* each.

Seed of CINERARIA ACANTHIFOLIA, saved this season, 2*s.* 6*d.* per packet

J. HOUSE, Eastgate Nursery, Peterborough.

Standard and Dwarf Roses.

GEORGE DAVISON'S stock is very fine, and will be sold at any reasonable Price, as they must be cleared. Many Thousands of TEA ROSES in pots, 40 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied. CATALOGUES on application.
Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA.
White Cross Nursery, Hereford.

Roses.

ONE HUNDRED THOUSAND STANDARD ROSES.
200,000 DWARF HYBRID PERPETUAL ROSES.
50,000 TEA-SCENTED ROSES.
A magnificent stock to select from. CATALOGUES on application.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

To Amateurs and the Trade.—Roses and Fruit Trees.

LEWIS WOODTHORPE, offers a very superior lot of early-budded, cold-grown ROSES.—Standards at 12s and 15s per dozen; Dwarfs at 6s per dozen. A choice stock of all FRUIT TREES, &c.
A Descriptive CATALOGUE of New and Choice Plants, Fruit Trees, and Roses, sent free upon application. Trade Lists with special Trade Prices free.
L. WOODTHORPE, Munro Nursery, Sible Hedingham, Essex.

THE beautiful PURPLE DOGS-TOOTH VIOLETS, see article in *Gardeners' Chronicle* for October 22. Strong roots, 5s. per 100, 1s. per dozen,—2d. per dozen extra for postage.
Having nearly 1 acre of GLADIOLI, I can supply them cheaper than any house in the Trade. Prices upon application.
JOHN STEVENS, The Nurseries, Coventry.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash:—
GOLDEN TRICOLORS.—Lady Cullum, 3s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s.; SILVER TRICOLORS.—Caroline Longfield, 6s.; Italia Unita, 2s. 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; E. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Tausted Lady, 3s. 6d.; Prince of Wales, 4s.; Stanstead Beauty, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeaux, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of 200 varieties post free.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Winter and Spring Flowering Plants.

FRANCIS & ARTHUR DICKSON & SONS have a magnificent stock of the above, in fine, strong, healthy plants, including ACACIAS, AZALEAS, CAMELLIAS, CARNATIONS (Tree), CINERARIAS, CYTISUS, EPACRIS, ERICAS, LILY of the VALLEY (imported clumps), SPIRÆA JAPONICA (ditto ditto), VIOLETS, &c. Also a splendid Collection of Plants suitable for Table Decoration, including Palms, &c. For prices and particulars, see General PLANT CATALOGUE, which will be sent free per post on application
"Upton" Nurseries, Chester.

Notice.

H. LANE AND SON'S Descriptive CATALOGUE can be had free by post on application. It contains a List of 500 varieties of ROSES, including the new ones, all at the same price, a choice collection of RHODODENDRONS, all the new and popular FRUITS, a fine collection of CONIFERS, HARDY ORNAMENTAL TREES and SHRUBS, AZALEAS, &c.
The Nurseries, Great Berkhamsted, Herts.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, two blooming plants, will be supplied at 10s per dozen, 45 for £4; £10 per 100.
" Good named kinds, £5 to £7 10s per 100
" Common mixed colours, £2 10s per 100
" Van Houttei II. plena, very double flowering plants, 12 to 15 inch, 42s per 100; per dozen and upwards. This is one of the most beautiful of the Double Azaleas
Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower buds, and others in wonderful bloom already in flower. Hundreds of splendid specimens.
ANTHOMEDA FLORIBUNDA.—Good plants, 18s to 24s per doz.
RHODODENDRONS.—Many thousands to special selection of Rhododendron buyers to this part of our stock. We have indexed boxes in which the plants vary to m 2 to 8 feet high. Every plant a specimen, and complete in every respect, the cost from 2s 6d per plant upwards.
Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent on application.
Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Rotten Row were nearly all of them supplied from Knap Hill. A personal inspection of these can give an adequate idea of these plants, we have had a fair example photographed, which is given in our Catalogue, just published.
RHODODENDRON PONTICUM, 6 to 8 feet, £7 per 100; 15 per 1000
" 9 varieties, named, from layers, 10 varieties, 5s to 10s per 100
" 10 varieties, fine, from layers, strong plants, 15s, £7 10s to 21s
Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 60s to 100s per 100
" Larger and very bushy plants, £10 to £20 per 100
" We have grown for some years past a large number of Rhododendrons from layers, and we now have a stock of more than 200,000 plants of named varieties, which we consider quite unequalled, being without exception the best plants we have ever seen. We supply them, all layers, at from 9s to 20s per 100. A sample, through post, of 12 for 2s, can be had on application.
HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, by name, including Mediterranea, every plant a specimen; 6s per dozen, 40s per 100.
" The tree growing varieties of VULGARIS, &c., 30s per 100, £10 per 1000.
" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, £5 per 100
KALMIA LATIFOLIA, from 50s. to 100s per 100
" Nice blooming plants, £5 to £10 per 100
" Larger, 30s to 60s. per dozen and upwards
" MYRTIFOLIA, 42s to 60s. per dozen.
All other American Plants are grown to a large extent
HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.
COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s to 63s per 100; 3 to 3½ feet, 63s per 100; 4, 5, 6, 7, 8, and 10 feet, 30s to 120s per dozen and upwards.
Thousands of beautifully grown Pyramidal plants.
We have a number of very large specimen Hollies, 12 and 15 feet high
WATERER'S HOLLY.—We have these in large numbers and of
GOLDEN QUEEN (all sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are unquestionably the most beautiful plants to be found in any Nursery, in large and fine
Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.
PERRY'S WEEPING HOLLY STANDARDS.—A large number.
NEW GOLDEN WEEPING HOLLY.—Nice Standards
The COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, magnificent plants.
VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES.—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high
YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 14 feet. These are invaluable as blinds.
IRISH YEWS, of all sizes, up to 10 feet.
YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.
BOX, GREEN. Handsome Pyramidal plants, 5, 6, 7, and 8 feet high. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.
AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high
LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869
LAURUSTINUS and BAYS.—Fine Standards, in tubs
Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely furnished:—
ABIES ALBERTIANA, 5 to 6 feet, 42s per dozen; 7 to 8 feet, 60s. These are be natiful plants, transplanted 1870.
ABIES, NOBILIS, 3, 4 to 6 feet, 5s to 7s 6d each; 7 to 8 feet, 10s. 6d. and upwards.
PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.
PINUS PINASTER, 2 to 2½ feet, 10s to 42s per dozen; 3½, 4 to 4½ feet, 60s to 84s per dozen; 5 to 6 feet, 21s each and upwards.
PINUS NOBILIS, 1½ feet, very stout, 18s per dozen, £5 per 100; 2 to 3 feet, 60s per dozen; 4, 5, 6, 7, 8, to 10 feet, splendid specimens, from 10s 6d. to 42s each and upwards.
PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s per dozen; 2½ to 3 feet, 5s to 7s 6d each; larger specimens, 4, 5, 6, 8, and 10 feet.
PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.
PICEA LASIOCARPA, 3 feet, handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, 8, and 10 feet, 21s each and upwards; and all have been transplanted within 12 months.
CEDRUS DEODARA, 2 to 3 feet, 30s per dozen; 5 to 7 feet, 60s to 84s per dozen; 8 to 10 feet high, moved since September, 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.
CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, 4, and 5 feet high.
CUPRESSUS LAWSONIANA ARGENTEA, 3 to 4 feet, 42s to 84s per dozen
JUNIPER, CHINESE, 4 to 5 feet, 30s per dozen; 6 to 7 feet, 84s per dozen. Beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.
THUJA AUREA, 2 feet and 3 and 4 feet round, 42s per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.
THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen.
THUJA LOBBII, 4, 5, 6, 7, 8, and 10 feet, moved in spring, 24s. per dozen and upwards.
WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—
ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET HORSE CHESTNUT, 8 and 10 feet high.
ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, grafting 5 to 7 inches 4 feet from the ground.
BEECH, PURPLE, 6 to 8 feet; 10 to 12 feet, fine trees.
BEECH, COMMON, 8 to 10 feet
BIRCH, WEEPING, 8 to 10 feet
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet.
LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.
MAPLES, NORWAY, 8 to 14 feet.
OAKS, ENGLISH, 8 to 10 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high. The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBARDY, 10 to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
AILANTUS, 8 to 10 feet.
CATALPAS, 6 to 8 feet.
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years. Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

BARR & SUGDEN,

12, KING STREET, COVENT GARDEN.

THE GARDEN INDOORS—THE GARDEN OUTDOORS.

INDOORS.

What is more delightful in winter than to be surrounded with flowers—thereby conquering Nature, and bringing out the blossoms of Spring in the period of snow, and especially where the artificial appliances of glass are either wanting or limited? The Hyacinth, the Narcissus, the Tulip, the Crocus, the Snowdrop, the charming Scilla, and others, with their accommodating habits and easy culture, may be enjoyed in their full bloom, fragrance, and beauty, as much in the cottage as in the palace.

COLLECTIONS OF BULBS,

SPECIALLY SUITED FOR PRESENT PLANTING.

100	named HYACINTHS	300	SNOWDROPS
50	named POLYANTHUS NARCISSUS	100	CROCUS
		50	SCILLA SIBERICA
200	named TULIPS	8	CYCLAMEN PERSICUM
50	sweet scented JONQUILS	50	TRITELEIA UNIFLORA

£4 4s.; half the quantity, £2 2s.; quarter the quantity, £1 1s.; eighth the quantity, 10s. 6d.

OUTDOORS.

In spring how eagerly we look for the first signs of returning life and beauty, in the wee, timid flowers that seem born of the snow, followed by the Primrose in the copse, the Cowslip in the mead, and the Blue Bell by the wayside. But what of our gardens? Too frequently empty beds, which might otherwise be clothed with beauties, for delicacy of colour, chasteness of form, richness and variety, not to be met with in the gaudy flowering of a summer flower garden. Now is the time to furnish the beds, and the following are part of the materials, to turn the wilderness of our garden in spring into a paradise of beauty.

COLLECTIONS OF BULBS,

SUITABLE FOR SPRING GARDENING.

150	HYACINTHS	500	SNOWDROPS
50	POLYANTHUS NARCISSUS	50	SCILLA SIBIRICA
		50	TRITELEIA UNIFLORA
200	GARDEN NARCISSUS	200	ANEMONES
400	TULIPS	200	RANUNCULUS
500	CROCUS		

£4 4s.; half the quantity, £2 2s.; quarter the quantity, £1 1s.; eighth the quantity, 10s. 6d.

COLLECTIONS OF PLANTS,

SUITABLE FOR SPRING GARDENING.

200	PANSIES and VIOLETS	200	FORGET-ME-NOTS
200	DAISIES	200	SILENES

and 50 sundry plants, including Spring-flowering PHLOXES, &c.,

£4 4s.; half the quantity, £2 2s.; quarter the quantity £1 1s.; eighth the quantity, 10s. 6d.

B. & S.'s CATALOGUE contains all that is necessary in Bulbs and Plants for Winter and Spring Gardening, and may be had free on application.

BARR AND SUGDEN,
12, KING STREET, COVENT GARDEN, W. C.

SMITHFIELD CLUB SHOW, 1870.

CARTER'S

STAND 75. STAND 75.

ANNUAL EXHIBITION OF

SPECIMEN ROOTS,

Produced from their seed, will be on view at STAND No. 75 during the Show, where orders will be received for Seed, to be supplied in Spring :—

CARTER'S MAMMOTH LONG RED MANGEL.
CARTER'S WARDEN ORANGE GLOBE MANGEL.
CARTER'S NEW INTERMEDIATE MANGEL.
CARTER'S IMPERIAL HARDY SWEDE.
CARTER'S PRIZE NURSERY SUGAR BEET.
&c., &c., &c.

☞ The specimens are the produce of ordinary field cultivation.

CARTER'S NEW PEAS for 1871.

LAXTON'S QUANTITY PEA.

(See Illustration in last week's *Gardeners' Chronicle*.)

A fine flavoured variety, selected from "Laxton's Quality" for its robust habit and extreme productiveness; it also differs in the shape of its pods. Exhibited before, and Highly Commended by, the Royal Horticultural Society of London.

Price to the Trade on application.

LAXTON'S QUALITY PEA.

A second early wrinkled Pea, of great productiveness and fine flavour; it is a great improvement on all the second early wrinkled Peas at present in cultivation. Has been grown in the Trial Ground, and Highly Commended by the Royal Horticultural Society of London.

Price to the Trade on application.

EASTES' KENTISH INVICTA PEA.

J. C. & Co. having purchased part of the stock of this fine early Pea, will be happy to quote special prices to the Trade for large quantities.

THE RED-SKINNED FLOURBALL POTATO.

Direct from the original raiser.

We have purchased a stock of this fine Potato from the original raiser; too much cannot be said in its favour, as it is the heaviest cropping and best cooking late Potato in cultivation; especially valuable for late use and winter storing, and producing tubers all of uniform size, which are very large. While most other red varieties boil yellow, this is white, of particularly fine flavour, and is most correctly described as "Flourball." The "Red-skinned Flourball" is entirely free from disease.

Price 5*s.* per peck.

Lowest price to the Trade on application.

CARTER'S ILLUSTRATED GARDENER'S AND FARMER'S

VADE MECUM FOR 1871

Is in the Press, and will be forwarded on receipt of stamps for 1*s.*

All Seeds and Potatos Carriage Free.

JAMES CARTER & CO.,
SEED FARMERS, 237 and 238, HIGH HOLBORN, LONDON, W.C.

SUTTONS'

SELECTED STOCKS OF

FARM SEEDS.

Specimens of Roots, the produce of the above, will be found on

STAND No. 79, SMITHFIELD CLUB SHOW.

The Heaviest Cropping and Best Quality

GLOBE MANGEL.

SUTTONS' BERKSHIRE PRIZE MANGEL.

SUTTONS' BERKSHIRE PRIZE MANGEL.

SUTTONS' BERKSHIRE PRIZE YELLOW GLOBE.—Specimens of the above 146 lb. each, from a crop producing 72½ tons per acre, on Messrs. SUTTONS' Stand 479 at the Cattle Show.

THE BIRMINGHAM AWARDS (1870).

SUTTONS' MAMMOTH LONG RED MANGEL was awarded the FIRST and SECOND PRIZES in the Mangel Class. Specimens (46 lb. each) may be seen on Messrs. SUTTONS' Stand (No. 79).

SUTTONS' IMPROVED GREEN KOHL RABI was awarded the FIRST PRIZE.

THE ONLY TWO SILVER CUPS for the best COLLECTION of ROOTS, with other Prizes and High Commendations, were awarded to the produce of SUTTON'S SELECTED FARM SEEDS, at the above Great Show.

THE BEST SWEDE IN CULTIVATION.

SUTTONS' CHAMPION SWEDE.

SUTTONS' CHAMPION SWEDE.

SUTTONS' CHAMPION.—Specimens of the above, weighing 22 lb. each, and which GAINED the TEN GUINEA CUP at the ROYAL BERKS ROOT SHOW, may be seen on Messrs. SUTTONS' Stand (No. 79).

Orders received at Moderate Prices.

All Goods Carriage Free by Rail, except very Small Parcels.

SUTTON AND SONS,
SEED GROWERS, READING.

Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (Illustrated) of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

To the Trade.

HYACINTHS, TULIPS, POLYANTHUS, NARCISSUS, CROCUS, SNOWDROPS, WINTER ACONITES, &c. All first-class, and of best importation, picked roots.

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

LILIUM AURATUM, &c.—English-grown Roots of LILIUM AURATUM, 10 6*d.*, 2*s.* 6*d.*, 3*s.* 6*d.*, and 5*s.* 6*d.* each, and 100 each; LILIUM LANCIFOLIUM, ALBUM, RUBRUM, and ROSEUM, and all other LILIES.

See DESCRIPTIVE CATALOGUE, free on application.

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

THE NEW POSTAL ARRANGEMENTS in their relation to the SAMPLE POST.—The attendance of Representatives of the NURSERY and SEED TRADES is respectfully requested at a MEETING, to be held at Anderton's Hotel, Fleet Street, London, E.C., on WEDNESDAY, December 14, at 6 o'Clock in the Evening.—To further consider the New Arrangements of the Sample Post, in so far as they affect the transmission of seeds by Post; and to receive a communication from the Post Office authorities relating thereto. RICHARD DEAN, Hon. Sec., *pro tem.*

Ealing, W., November 21.

To Architects, Landscape Gardeners, and Others.

CITY of ROCHESTER

ROCHESTER CASTLE RECREATION GROUNDS and PUBLIC WALKS.—The Council of the Laying out the Grounds of Rochester Castle as Ornamental Recreation Grounds and Public Walks are desirous of being FURNISHED with DESIGNS.

The work also involves the preparation of approaches and the repair of some of the walls, and the laying out of a small piece of land for building purposes.

A Copy of the Plan, showing the levels, may be obtained on application to me on and after November 28 instant, and on payment of 5*s.*, which will be returned to each Competitor.

A General Statement of the requirements of the Committee will also be furnished on application.

The Committee offer the following Premiums, viz., £40 to the Competitor whose Design shall be declared first in merit; £30 to the Competitor next in order of merit; and £20 to the Competitor third in order of merit.

If the Design of the Competitor declared first in order of merit be carried out by the Committee, the person sending the same is to be employed at the usual Commission, of £5 per cent., to carry out his Design.

The Designs of the Competitors first and second in merit to become and be the absolute property of the Committee, to be used by them as they may think fit.

The Committee do not bind themselves to carry out the Design decided as first in order of merit, or any other.

All Designs to be sent to my Office not later than WEDNESDAY, January 4, 1871.—By Order of the Committee,

RICHARD PRALL, Town Clerk.

Rochester, November, 1870.

The Gardeners' Chronicle

SATURDAY, DECEMBER 3, 1870.

MEETINGS FOR THE ENSUING WEEK.

MONDAY,	Dec. 5	Entomological	7 P.M.
TUESDAY,	— 6	Royal Botanic, Regent's Park (Fruit and Floral Committees), at S. Kensington	11 A.M.
		Do. (Scientific Committee)	1 30 P.M.
		Do. (General Meeting)	3 P.M.
THURSDAY,	— 8	Edinburgh Botanical	7 30 P.M.

It was the fashion once for Londoners to lament the absence of a Baron HAUSMANN, endowed with despotic powers, to be wielded for the IMPROVEMENT of our ugly METROPOLIS. It was the fashion with some to laugh at the Metropolitan Board of Works, just as one laughs—that is, if one does not grieve—over the proceedings of "Westries" or of Boards of Guardians. Nobody can say that the feelings just alluded to were wholly uncalled for. Any one who knows the grimy house-fronts of London, its narrow, tortuous city streets, wherein unfortunate passengers are stunned with noise, smothered in greasy mud, or powdered with dust and smut, obstructed in their transit in almost every possible manner, if not absolutely stopped in their career by a knock-down blow from the pole of an omnibus or the wheel of a "Hansom;" any one who knows the condition of London squares and specially of that square of squares hight Leicester; any one who knows these things, and had the opportunity of seeing the bright, handsome, clean, comparatively noiseless streets of Paris, before the siege, might well have been pardoned for wishing that an organising talent and a despotic power, similar to those which effected such wonderful results on the banks of the Seine, were wielded for a few years on the banks of the Thames. Whether, in the light of recent disclosures and recent events, such a wish is justifiable now, is a question we need not enter into; but whatever may happen to beautiful Paris, however many of her ornamental features may be destroyed or abolished, nothing short of absolute demolition can impair the material excellence of her main thoroughfares.

As to the Metropolitan Board of Works, its nature and constitution were too much akin to that of a gigantic vestry not to excite the facetiousness of the wags. Let those laugh who win. In view of recent events, it is quite clear that the Board in question has done its work well; so well, that we imagine there are few left now who would be bold enough to express their preference for the system *à la* HAUSMANN, over

our Board system, with all its admitted defects, half measures, and inconsistencies. It has carried out for the metropolis a system of sewers comparable only with those of ancient Rome, and sooner or later it must complete its beneficent work in this direction by utilising the material it now allows in great measure to be wasted. It has given us the noblest river-quay in the world; and has effected numerous comparatively minor but really very important improvements in our streets. It has secured to us Hampstead Heath, so dear to Londoners of all persuasions, so doubly dear to artists and naturalists; and—yes, it is a fact—it absolutely has had the hardihood to make overtures to Parliament and the persons most concerned, with the view of depriving us of our old laughing-stock—Leicester Square, and of rendering it, instead of an eyesore, a garden of beauty. We say that advisedly, for we have no doubt, from what we know of the gardening operations on the Victoria Embankment, that should the Board obtain from Parliament the sought-for powers, we shall in due time have a town square which will be a model of what such places ought to be, and which will show that we have no occasion to copy French models, or to adopt any other style of landscape gardening than our own.

On another page (1600-1) will be found some illustrations, showing what is being done in the way of GARDENING on the THAMES EMBANKMENT (North), which bears the name of the VICTORIA EMBANKMENT.

It may be well briefly to remind those of our readers who have not seen this fine specimen of English engineering, that the quay in question extends from Westminster to Blackfriars Bridges, a distance of nearly a mile and a-half, and following the bold curve that the river makes between the points mentioned. It consists of a bounding wall of granite, massively and handsomely constructed, and provided with landing-places and piers for the accommodation of the steam-boat traffic. This fine wall bounds a roadway some hundred feet in width (including the pathways on either side), and is planted with Planes. Beneath the roadway runs the Metropolitan District Railway, and on its landward side is a reclaimed space, varying in form and dimensions according to the disposition of the neighbouring streets, and the encroachments of public buildings, and the like. Thus, starting from Westminster Bridge and going eastward, we first come to the comparatively small enclosure (not shown in our sketch) nearly opposite to the Westminster pier, and which is, we believe, destined for the erection of a mansion and the creation of a garden court in front of it. Between this spot and the bottom of Whitehall Place the greed of the owners of property in that situation has compelled the Board to bisect the course of the Embankment by a wall, enclosing gardens set apart for the private use of the occupiers of houses. The width of the Embankment at this spot is such that the roadway does not suffer, though a grand opportunity for carrying out the Embankment-garden to its full extent has thus been lost. At the bottom of Whitehall Place, west of Charing Cross Station, is a small enclosure, or rather two or three small plantations, in one of which it is proposed to erect a statue to the late Sir JAMES OUTRAM. Eastward of Charing Cross Station, and between that and Waterloo Bridge, is the largest enclosure along the course of the quay. It consists of a central series of beds intended to radiate from a fountain or other central architectural object. From this centre extends a curving walk, running parallel or nearly so to the course of the Embankment, and flanked on either side by a sloping bank of grass, which is to be planted on the summit with belts of shrubs and deciduous trees. The walks are broad, nearly flat, and constructed of stones coated with asphalte, and covered over with fine shell-gravel. An edging of Ivy follows the course of the walks, and flower-beds will be here and there introduced. The whole will be enclosed by an elegantly designed iron railing. The old water-gate (Buckingham Gate), erected from the designs of INIGO JONES, would have formed an appropriate entrance, from the portion of the Embankment gardens we have just been alluding to, to Buckingham Street, had it been raised to the necessary height, but, as we learn, difficulties were thrown in the way by the proprietors of this fine architectural object, who have now the satisfaction of knowing that their gateway is half-blocked up by the mounds and shrubberies of the garden—an object of ridicule and commiseration, instead of being, as it ought to have been, a fitting ornament to the situation. It is such things as these, by the way, that leads us to ask "Where's HAUSSMANN?" To the east of Waterloo Bridge the river-terrace of Somerset House and the Temple Railway Station abut immediately on the roadway, but beyond this is again a small enclosure continuous with the Temple Gardens, which latter thus acquire considerable additional space, and in which, as we are told, great preparations in the way of fresh soil and the like have been made by the authorities in charge there, to grow Roses, so that once more White and Red Roses may be plucked from off the briars in this classic situation. Beyond the Temple no garden intervenes to mitigate the dismal hideousness of the adjacent structures, but these latter may have to make way for a new Mint.

A more detailed, or lengthened description of our grand river walk would be out of place. We have said enough to indicate its grandiose proportions, and to show that the gardening features it presents have been well cared for by Mr. M'KENZIE, who designed them, and by Mr. MESTON, to whom the contract for planting has been entrusted. To those who remember the old state of the river bank, its foreshore of reeking filth and dingy mud, in places more than 400 feet wide at low water, the present state of the Embankment presents the stronger contrast. Those who do not remember what was the state of affairs may, if they so choose, gain some idea by an inspection of the river between Blackfriars and London Bridges at low tide, and particularly on the Surrey side near Southwark Bridge. Higher up on the Surrey side at Lambeth a similar embankment, but on a smaller scale, has been formed. If the Board would forthwith stop the pottery kilns in that locality from belching forth their dense volumes of smoke, and put an end to the noisome trades carried on there, they would render a service to Londoners as great as any they have yet done. One word more, and we have done. St. Paul's Cathedral and Somerset House can now be seen as never they were before, and if only for this reason, the Metropolitan Board of Works has earned the thanks of Englishmen.

—— At a meeting of a committee of gardeners held at Stamford, on Wednesday last, for the purpose of carrying out Mr. GILBERT'S scheme for GARDENERS' PRIZES for VEGETABLES at the Royal Horticultural Society's forthcoming show at Nottingham, Mr. SMITH, of Exton Park, was appointed honorary secretary and treasurer; and as it is necessary that the amount required (£20) should be got in without delay, in order that the prizes may be placed at the disposal of the Society in time for the issue of the local prize schedule, it is requested that all gardeners desiring to subscribe, will at once send in their subscriptions to Mr. JAMES SMITH, Exton Park Gardens, Oakham. Post-office Orders to be payable at Oakham. It was determined at the meeting that the amount should be divided into three prizes, value £10, £6, and £4, to be given either in watches or money, at the option of the winner. An offer by Mr. CHAPMAN, of Gloucester, of one of his patent exhibiting cases, as a further prize, was accepted.

—— By the RESIGNATION of Mr. J. J. BENNETT, F.R.S., a vacancy is created in the office of keeper of the botanical department of the British Museum. Mr. BENNETT'S acquirements and amiability have long endeared him to all his fellow-workers, and ensured for him their lasting esteem. The appointment of a successor, we believe, rests with the trustees, a very heterogeneous body, with not a single botanist among them—scarcely one that can rightly appreciate the nature of the trust he has to fulfil. In the natural course of things Mr. CARRUTHERS, the senior assistant keeper, should succeed to the vacant post, and there will be a proper fitness of things in his so doing, inasmuch as the special department (that of fossil plants) which Mr. CARRUTHERS has cultivated with so much benefit to science and repute to himself is so particularly well represented in the Museum. With reference to other portions of the Botanical Museum, and in view of the contemplated removal and consequent rearrangement of the natural history collections, we may express a hope that the whole subject of the future management and maintenance of the botanical collections will receive attention, so that their value may be enhanced and some existing anomalies be removed.

—— In a lecture at Norwich recently, on RAIN, Mr. JAMES GLAISHER, F.R.S., said:—Desiring to ascertain the influence of the moon on the elements, he discovered, after a long series of observations, that on the 9th day of the moon there was much the most rain, and that on the first and last week of the moon there was the least amount. He had taken an account from 1815 to 1869 of every day on which there had been an inch of rainfall, and he had found that on July 26, 1867, the rainfall amounted to $3\frac{7}{10}$ inches—the largest amount that had fallen in one day at the Royal Observatory. From careful observations he had made he had no doubt that the moon did exercise an influence upon rain. Another investigation that he made was as to the time of day that rain fell most frequently, and he had found that the largest quantity of rain fell at about 4 o'clock in the afternoon.

—— Messrs. SUTTON & SONS have forwarded to us the following letter, received from the Secretary of the General Post Office, with reference to the SAMPLE POST question:—

"November 23, 1870.

"Gentlemen,—Referring to your further communication of the 22d instant, I have to inform you that the question has been submitted to the Solicitor to the Department, and that he is of opinion that the Postmaster-General has no power, under the new Post Office Act, to permit the transmission of any other articles than *bonâ fide* trade patterns or samples of merchandise at the sample rate of postage. It is to be regretted if the rule has in any case been evaded.—I am, &c.,

(Signed) "G. HARDY (for the Secretary),

"Messrs. SUTTON & SONS."

—— The TEMPERATURE of the AIR at the different stations in England and Scotland, during the week ending November 26, was several degrees above the temperature recorded at those places during the preceding week. The MAXIMUM TEMPERATURE in England ranged from 58°.9 at Blackheath, to 52° at Newcastle, with a mean for all stations of 55°.4 (nearly 10° higher than the preceding week). In Scotland the highest temperature was registered at Leith, viz., 51°.2, and the lowest maximum at Dundee, viz., 47°; the mean for the several stations was 5° above the mean of the week ending November 19, viz., 49°.2. The MINIMUM TEMPERATURES in England ranged from 30° at Hull, to 36°.9 at Blackheath, with a mean for all stations of 33°; and in Scotland, from 29°.7 at Aberdeen, to 36° at Greenock, with a mean for the several stations of 31°.9. The MEAN TEMPERATURES of the air during the week in England, ranged from 46°.8 at Blackheath (being more than 9° higher than the mean temperature at the same station during the preceding week) to 40°.8 at Hull, with a mean for all stations of 43°.5, being 3½° above the mean temperature of Scotland, which was 40°. The RAINFALL was distributed in a contrary manner to that of last week, the heavy falls being confined to England instead of to Scotland: the largest fall was at Eccles, viz., 2 inches, and the smallest at Hull, viz., 0.65 inch, with a mean for all stations of 1.27 inch; and in Scotland the heaviest fall occurred at Paisley, viz., 1.30 inch, and the lightest at Leith, viz., 0.37 inch; the mean for the several stations was 0.78 inch. (See Mr. GLAISHER'S Tables in our present issue.)

—— The Commons' Preservation Society has resumed its labours after the recess, and its members were recently called together to hear a report on the present state of the METROPOLITAN COMMONS. Arrangements of a highly beneficial nature have been made in respect of Wandsworth and Wimbledon Commons. Earl SPENCER, the lord of both manors, is to convey his estate and interest in the commons to a body of conservators, to represent the local and general public, taking in lieu of his rights an annuity equal to the profits he at present derives from the commons in their open, unenclosed state. This annuity it is proposed to provide by rates levied in the neighbourhood. The arrangements are to be carried out by private Bills, the notices for which have already appeared. Mr. PEEK, the member for Mid-Surrey, is one of the most active in promoting these measures. The agreement of the Metropolitan Board of Works to purchase the lord's rights in Hampstead Heath was also reported, and the society entered a protest against the payment of so large a sum (£47,000, or about £220 per acre) as tending to raise the demands of other lords of manors, and to prevent the general and complete preservation of metropolitan open spaces. The subject of Epping Forest was also under discussion, the Government Bill of last session being generally and emphatically condemned.

—— We learn from Dr. REGEL that the botanical collector, ROEZL, has lately traversed California, the Rocky Mountains, and the Mormon States, in his search for plants and seeds for introduction into our gardens. From the countries named he went to Santa Marta, and ascended the highest peaks of the New Grenadian Cordilleras, where he collected a large number of rare Orchids, which will shortly be offered for sale in London. A large collection of seeds of Bromeliaceæ has been made for the St. Peterburg Botanic Garden, as also of Fern spores. ROEZL'S last expedition in the Andes of New Grenada was made during the rainy season (May and June). It rained incessantly, and for 20 days M. ROEZL was never dry. Every day the traveller had to wade through torrent streams of ice-cold water. No wonder that under such circumstances he contracted fever. It was under these conditions, and at a height of 11,000 feet, that he collected 850 plants of that extraordinary Orchid, Telipogon Crœsus (Rchb. f.). We sympathise a great deal with M. ROEZL, and are grateful to him for the service he has rendered to gardens, but we must own to a feeling of satisfaction that he did not succeed in bringing a

single living tuber of this Orchid to Santa Marta. As soon as the tubers came from the cold into the hot country, says M. KOEZL, they perished as if they had been cooked. Perhaps, had he been less greedy, he might have been successful in transporting a smaller number of plants, and would not have contributed to the extermination of the plant in the localities indicated, while his own profits by the transaction would have been the greater. M. ROEZL intends returning to California, and from thence to pass to the Sandwich Islands. We learn that collections of seeds have already been received from M. ROEZL by M. ORTGIES, of the Botanic Garden, Zurich, who acts as M. ROEZL'S agent in the distribution and sale of the treasures sent home by him.

—— Some of our surgeons seem to have taken a hint from the gardener's practice of grafting or budding. Under the name of SKIN GRAFTING, a method has been devised by a French surgeon of transplanting small portions of healthy skin on to the surface of large ulcerated surfaces, which are often so long in healing over, and which, when they do heal over, leave such large scars. By the method now adopted, and when due precautions are taken, it appears that large, obstinate ulcers may be healed over in the course of a few weeks. The plan has been successfully tried in some of our London hospitals.

—— We have heard a great deal lately as to the origin of living GERMS, and the possible production of some diseases from them. The germ theory of the origin of disease is a very plausible one; it fits in very well with many phenomena presented by the diseases in question; nevertheless the majority, we believe, of the medical profession reject the theory as insufficient. Dr. RICHARDSON, for example, one of the most accomplished physiologists of the day, objects to the germ theory on these grounds:—1. The presence of the assumed germs is not proved; 2. The specific character of each assumed germ is not traceable in the malady supposed to be caused by its presence, but it is assumed that, as the disease is specific, so it must have been produced from specific causes; 3. If the germs were reproductive and indestructible the universe would become filled with germs, which as a media of disease would destroy a people. Neither fermentation nor putrefaction can be proved in any forms of disorder to which the germ-theory is applied. Dr. RICHARDSON'S belief is that the poisons which originate these diseases are not originally derived from without but from within, and are the results of morbid changes within the body. These poisonous excretions conveyed disease from one body to another. The poison might be destroyed, and then the disease caused by it died.

—— We learn that the magnificent COCHLIOSTEMA JACOBIANUM (of which we gave an illustration, 1868, p. 265) is now flowering splendidly with Mr. WILLIAMS, of the Victoria Nursery, Upper Holloway, who was the first in this country to flower and exhibit it. The original plant, which commenced blooming in April last, has since then been continually in flower, and is at the present time in finer condition than ever. Upon another specimen may be seen a flower-spike upwards of 18 inches in length, thus showing how mistaken were those who asserted that the flowers would never show up from amongst the leaves. These facts are the more worthy of notice on account of many persons having formed a wrong estimate of the value of the Cochliostema as a decorative plant, through seeing it exhibited in the provinces during the past season, where it certainly did not appear in anything like the perfection in which we recently saw it at Holloway.

—— We are informed that a very extensive collection of VARIETIES OF MAIZE, constituting probably the finest collection ever shown in Europe, will be exhibited at the ensuing meeting of the Fruit Committee at the Royal Horticultural Society's Gardens, at South Kensington, on Wednesday next. The Maize in question has been grown in the island of Guernsey, by the Rev. TH. C. BRÉHAUT.

New Garden Plants.

POLYGONUM (TINIARIA) SACHALINENSE, *F. Schmidt*, in Primit. Flor. Amurens., p. 233 (*anno* 1853).

Perenne. Caule erecto, valido, glabro, angulo-striato, simplici? [ramosissimo]; foliis breviter petiolatis, late ovatis, vel ovato-oblongis, acuminatis, inferioribus basi sub-cordatis, superioribus truncatis, omnibus discoloribus, subtus elevato-reticulatis, ochreis elongatis, glabris, membranaceis, nervosis, demum fissis, racemis axillaribus, singulis vel fasciculatis, folio multo brevioribus compositis densifloris, bracteis ovatis longe acuminatis, paucifloris; rachi crassiuscula, ramulisque fusco tomentosulis, pedicellis capillaribus infra medium articulatis perigonio fructifero 9-alato brevioribus; alis caryopsi triquetra, elliptica, acuta, nitida, spadicea latioribus; stylis trifidis brevissimis discretis inclusis; stigmatibus brevissime fimbriatis.

This Polygonum, for an inspection of which we are indebted to Mr. W. Bull, has more the aspect of a giant Dock than of a Polygonum. It is what an artist would love to paint as a "foreground" plant, or Mr. Robinson to put into his "Wild Garden." In truth, Dock-like though it is, it is a really handsome plant, and its large broad pointed leaves, glaucous on their lower surface, form an admirable contrast to the clusters of delicate greenish flowers in their axils. In a wild state the plant is said to exceed the height of a man. It is hardly necessary to give a detailed description of the plant—that may be found following the diagnosis in the work above cited. We may, however, add that it differs from P. cuspidatum in its angular striated stem, in its leaves, glaucous on the lower surface, and with the ribs covered with slender hairs, in the acuminate not obtuse bracts, as also in the characters presented by the fruit. The plant is a native of the Island of Sachalin and of the eastern part of Amoorland, and may therefore be expected to prove quite hardy. For shrubberies and waste places this plant will be well suited. *M. T. M.*

*FLORAL CRITICISM.**

THIS is a subject at once broad and comprehensive, affording scope for much more copious discussion than can be given in an essay as concise as this must of necessity be; for to enter into every detail of the subject—especially with regard to the standards of perfection, set up for the different members of the floral world,—would necessitate the writing of a good sized volume. It is incumbent upon a writer of an essay of this description to be brief and to the point, and this I have studied to be; and in so doing I have endeavoured to discuss the matter from a natural and not artificial point of view, commencing with the newly introduced individual, and passing thence to the training thereof.

Newly-introduced plants should possess in some degree the following properties, which form the points upon which they should be judged:—1, Novelty in bloom or foliage; 2, Hardiness; 3, Vigour; 4, Blooming capabilities.

1. *Novelty.* Diversity in shape or colour of foliage is as essential to the production of effect as diversity in colour or form of bloom, or in habit or mode of growth. Novelty in either respect should, therefore, be considered as forming a very essential point.

2. *Hardiness*, or adaptability to the climate of this country with as little protection as possible, is undoubtedly of the greatest importance to horticulturists generally, in consequence of the great expense attached to the cultivation of plants which do not bear up against our changeable climate and low temperature. The chief aim of collectors and introducers of plants should be to introduce such things as will involve the smallest possible amount of expense in their cultivation.

3. *Vigour.*—Hardiness and vigour of constitution are essential properties, for while we want hardiness we also require quick or vigorous growth and maturation, in consequence of the short and uncertain season wherein plants have to perform those operations.

4. *Blooming Capabilities.*—In addition to profusion we want duration and persistency, and more especially do we require persistency in conjunction with profusion. For if a plant be ever so profuse a bloomer, and the bloom drops as soon as it expands, it is comparatively worthless for decorative purposes.

Having considered the essential points from which a plant should be judged, I now pass to the consideration of the principles upon which the flower should be criticised. It is of the first importance that regard should be had to the chief characteristics of the order, class, or genus to which the individual may belong, and especially is this of importance with respect to double flowers; for to expect duplication to be as complete in a representative of the Geraniaceæ, as in Rosaceæ or Compositæ is unreasonable [What about double Zonal Pelargoniums? EDS.], in consequence of the difference existing between the number of stamens in the two first-named, and the composite nature of the latter. Neither can we expect it to be as complete or full in a flower whose æstivation is valvate, as in one in which the æstivation is imbricate. The forms assumed by flowers should also be considered in accordance with these general characteristics, whether they be regular or irregular.

The colour of the flower should in all cases be distinct from that of any previously known variety, except where it has other qualities of superior merit to commend it to notice, the resemblance of colour in many varieties of the same species being so considerable as to cause the greatest confusion. With colour, the stability of the same is essentially necessary, as is also good substance in the component parts; and more especially is this of importance in florists' flowers, for what presents a worse appearance than a washy and flimsy flower? As in plants, so with their bloom; we want such flowers as will stand, without losing their colour, a good drenching rain or syringing,—to one of which they will undoubtedly be in most cases made subject, especially the former, if the plants be hardy enough to be placed out-of-doors.

Odour is a property or qualification to be possessed in order to come near to perfection. Such odour to commend itself should be delicate and fragrant, for where the odour is strong, if placed in a confined atmosphere it becomes overpowering, and consequently obnoxious; strong-scented flowers are therefore comparatively worthless for use in the decoration of the sitting-room, where the air is undoubtedly confined.

To set up a standard by which flowers should be judged universally would be impossible, each species having a standard peculiar to itself. The point should be to ascertain what would make a plant or flower perfect, although there may be no chance of ever reaching it; and then the comparative merits of all plants or flowers might be judged by the degree in which they approached the imaginary standard of perfection.

Having thus considered the principles to be observed in the criticism of newly introduced plants, I pass to the most important of all with respect to a plant to be grown as a specimen of good cultivation, viz., its training.

The effect produced by plants, either individually or collectively, is regulated by the form they assume, or are made to assume. It is evident, therefore, that such forms only should be adopted as will produce good effects without in any way impairing the health, and consequently the beauty, of the individual. The modes of training of the present day are undoubtedly too conventional. Not only, in very many instances, is natural beauty sacrificed, but shapes and forms are adopted in which the greatest possible amount of distortion is necessary to obtain a given result, and this is detrimental alike to health and beauty, and very often diametrically opposed to natural disposition. Such modes of training should be discountenanced by censors, and only those should be admitted or encouraged that are most in harmony with natural disposition. Only just as much of the conventional should be admitted or allowed as may assist Nature in producing symmetry of form. The forms thus produced would not only be in harmony with Nature, but would produce an effect altogether ornamental, which would be much in advance of the tight-lacing system, of which we see so much.

There is no doubt that the loss of foliage from which so many trained specimens suffer before their blooming season arrives, is attributable, in a great measure, to tight-lacing, as is so often the case with Azaleas. The pyramid, or some modification of that form, is no doubt the form best suited to those plants—as well as to the majority of flowering plants, being more in accordance with natural disposition; but to tie in every twig so as to present the appearance of their having been cast in a mould, or glued to a shape made for the purpose, is not only unnatural, but injurious. Plants thus grown or exhibited are far from the standard of perfection set up by Nature. A plant denuded of the greater portion of its foliage, if ever so well bloomed, cannot justly be adjudged an example of perfection; and a plant tied so as to hide the foliage in endeavouring to expose the greatest possible amount of bloom to the eye at a glance, is an example of bad taste, and a direct violation of the principles daily exemplified in Nature. To give prominence to bloom is unquestionably correct, but not to the exclusion of foliage. Foliage is as essential as bloom to the production of effect. There are exceptions, where plants naturally produce bloom in advance of foliage. In such cases bad training or cultivation is not the cause but natural disposition. Plants, to show their beauty either individually or collectively, should not be made to assume anything like stiffness or formality. To produce the greatest possible amount of bloom and foliage in the smallest possible space as regards pot room, in plants for exhibition, should be held as essential, thereby shutting out from our exhibitions large and cumbrous pots.

The whole matter seems to resolve itself into the principle of setting up an ideal standard of perfection, consonant with the habits and general characteristics of different species, and deciding the merits of the plants by the degree in which they approach it. *A. Bradley*, 8, *Salisbury Road, Highgate Hill, late of Stoneleigh Hall, Bury St. Edmund's.*

* To this paper was awarded Lieut.-Col. Scott's prize of £5 5s. for the best essay on the Principles of Floral Criticism, May 4, 1870. Two other papers were sent in. Mr. Bradley obtained a First-class Certificate in Floriculture, and a Second-class Certificate in Fruit and Vegetable Culture, at the Royal Horticultural Society's Examination in December, 1869.

TRADE MEMORANDUM.

IT is not our custom to insert trade notices in other than the advertising columns of the *Gardeners' Chronicle*, but the enclosed, which has been forwarded to us by a correspondent, seems to merit public attention. We print it *verbatim*, but suppress the name, lest our regular advertisers should complain that we favoured the present firm with a gratuitous announcement; but we may remark that the name is one that has on several previous occasions been made the subject of comment in these columns:—

"MEMORANDUM.

"From ——, The Auction Rooms, ——, Manchester. | To ——.

"The Mart is situated within Two Minutes of Royal Exchange, Market Place, Stock Exchange, Victoria Market, Cotton Waste Dealers' Exchange, Wholesale Grocers and Foreign Butter Market, Corn Exchange, Victoria Station, &c. NOTICE to Nurserymen, we have held near 700 Sales of Choice Plants, Coniferæ, &c. And are Established Horticulturists of 60 years standing."

"We think it is verry strainge we cannot Manage to do some Business but rearly cannot pay in full before we receive the Goods we last Week drew £20 back for Goods paid for in Advance and was compeled to Isue a Writ before we could recover.

"I want 100 Dwarf Roses on Manetti Stock to be here on Tuesday and if you like to have them packed ready we will Immediately on receiving your reply send you Half the Amt 17s. 6d. in Stamps and Balance when they are to hand this may be a Breaking of Ground for Business Answer per return as some of us will have to go dawn to Rooms on Sunday for it have you the other Goods left put Half Dozn Marechal Niels in you could put amongst Dwarfs enclosed is Card for Bundle."

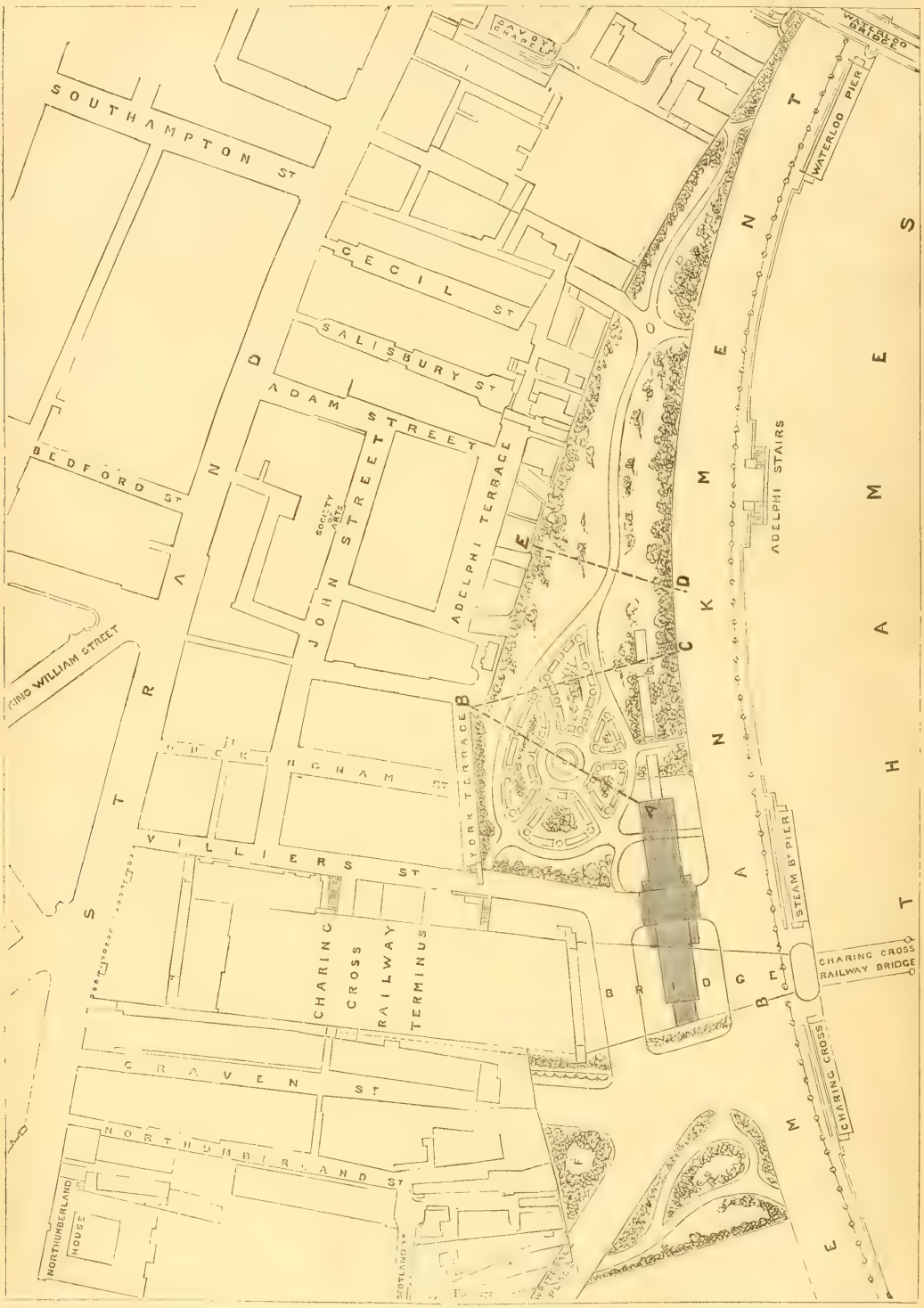

PLANTING THE THAMES EMBANKMENT.

THE following remarks are extracted from a report of Mr. McKenzie to the Metropolitan Board of Works, on the subject of planting the Thames Embankment (North), and which is further alluded to in our leading article. We need only note here that the ground has been for the most part laid out in the manner mentioned in Mr. McKenzie's report, and that his suggestions will be acted on :—

"I may state, at the outset, that I have avoided every-

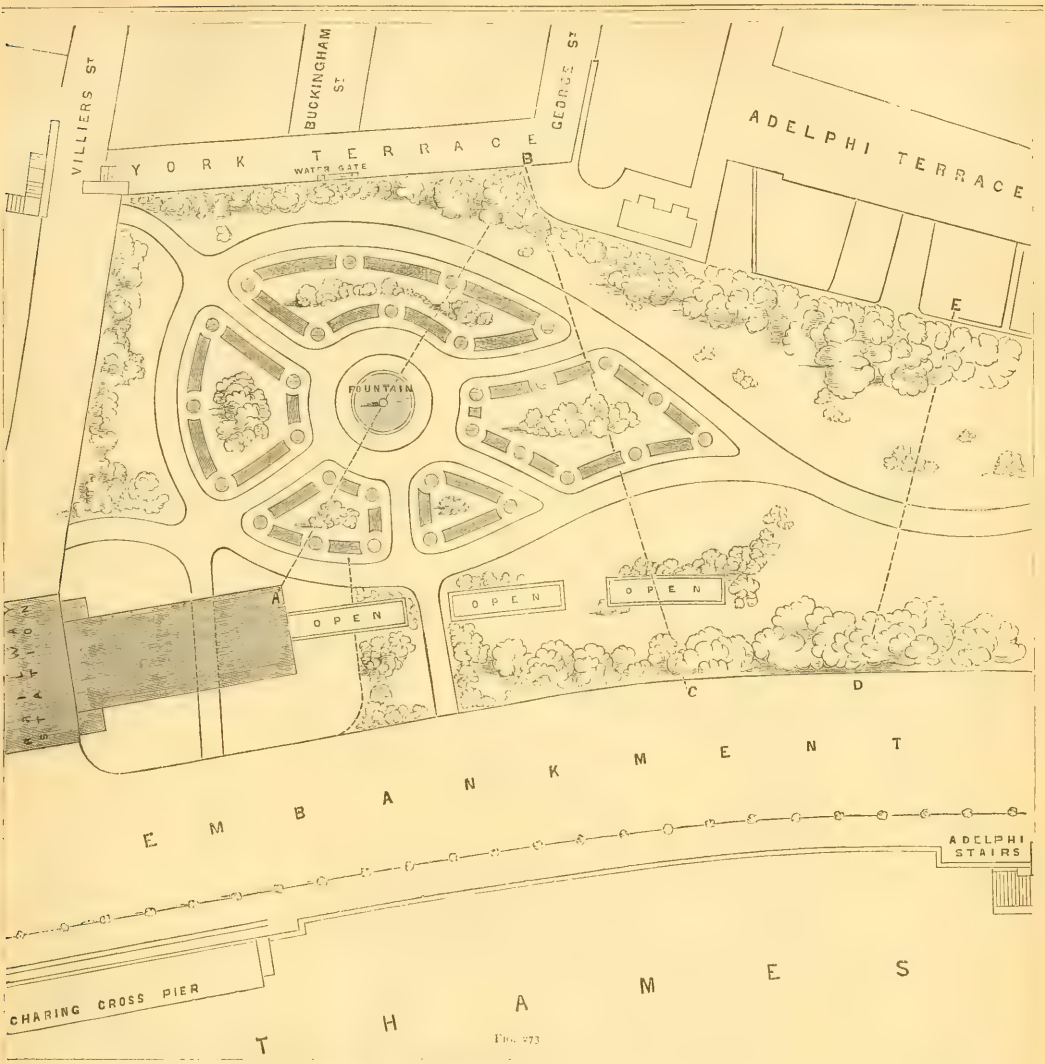

Fig. 273

thing in the way of expensive gardening, and where a doubt exists as to the ultimate use of the reclaimed ground, I have endeavoured to submit a plan, which, if carried out, will be effective at the present time, and capable of being cut up ultimately without a total disfigurement of the works proposed to be executed at this time. Of course, if it is the wish of your Honourable Board, a much more expensive system of gardening might be introduced, without much alteration to the design, by the introduction of statues, fountains, and vases.

"1st. The walks are so arranged as to give facility to the public from each of the recognised entrances, with a pleasant and diversified plantation on either side, at the same time preserving enough space for grass, which, in all cases, ought to be well kept.

"The plantations, although nearly continuous, are sufficiently broken to give glimpses from the Embankment roadway at such points as the breadth of the views will justify this being done.

"The plantations will be more expensive than at either of the parks [Finsbury or Southwark], for two reasons. First, the nature of the surroundings, so far as the Metropolitan Board of Works is concerned, is so much richer than anything surrounding either of the parks, that a different class of trees and shrubs will be required to dress the ground. Secondly, the variety of trees and shrubs suitable is much reduced, owing to the growth of many varieties being destroyed by the influence of smoke, and other causes inseparable from the position.

"The planting should be, to a considerable extent, of deciduous trees and shrubs, their beauty and brilliancy

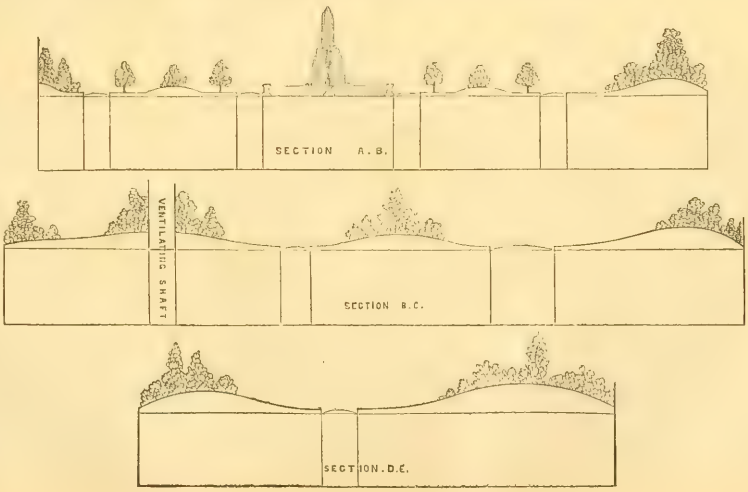

Fig. 274.

of foliage in spring will compensate, to a great extent, for the absence of foliage in winter, which is seldom bright, except after heavy rains. Thus, I should recommend the plantations to consist of groupings of Laburnums, Acacias, flowering Almonds, double flowering Peaches, and other rosaceous trees—of double and single Thorns, in groups of colours; also groups of trees conspicuous for their colour or variety of foliage, such as Copper Beech, Acer Negundo, variegatum, &c., and filling up between with evergreens, to give variety in winter, so as to afford interest to the plantations at all seasons of the year.

"Generally speaking, the plantations should consist of permanent plants, but I think it will be impossible to give general satisfaction without a few patches of flowers, judiciously and sparingly dotted about.

"In dealing with the ground, I have endeavoured, as far as possible, to adapt the design to future requirements."

The following references to the plan require explanation :—

Fig. 272 shows a general view of the Embankment between Whitehall Place and Waterloo Bridge. In the former situation, at F, it is proposed to erect a statue of the late Sir J. Outram.

Fig. 273 shows an enlarged view of the garden immediately to the east of Charing Cross station.

Fig. 274 indicates the lines of section marked in the preceding cuts by A B, B C, and D E, respectively. An additional row of Planes (P. acerifolia) is to be planted on the landward side of the roadway.

TIMBER AND CONSTRUCTION.—No. II.

(Continued from p. 1574.

CONCURRENTLY with this substitution of iron for wood, and for other materials, there has been, with very few exceptions, a wanton waste of the forest resources, not only of our own country, but of the entire world. Man has come to regard his early cradle, the forest, as an enemy, instead of as a benefactor. In England the prudent care of our forefathers to watch the growth of our forest trees—to secure a perennial supply of Oak for our ships, as well as of Yew for our bows, is altogether forgotten. The forest rights of the crown over a district that has been wooded since the time of Julius Cæsar—the forest of Epping,—have been so purposely neglected, that it has needed the very unmistakable expression of public feeling to elicit from the Solicitor-General anything more than a joke upon wolves and bears. The 100,000 acres of forest, under the administration of the Woods and Forests, have been so admirably managed, as to arrive at the result of a rental at the rate of 3*s.* 6*d.* (three shillings and sixpence) per acre. The wooden walls of old England are now so much an affair of the past, that it may be said that we only regard timber as necessary to ornamental landscape, or as a material for lucifer matches.

It is in this country and its dependencies, and in those of our American descendants, that the laws of Nature as to the clothing of the earth with timber have been the most persistently broken. But we are far from being alone in our folly. To whatever part of the world we turn we see indications that waste and destruction bring their own vengeance in their train. Of the effects produced upon climate by the denudation of the soil there is no room for doubt. To a certain extent the influence of human labour in the thinning of forests is beneficial. But the limits between culture and destruction are rarely maintained. In the year 1816 the forest came up close to the city of Philadelphia. The Delaware, a mile wide, was then often frozen in a single night. The edge of the forest has receded to a distance of more than 30 miles. The thermometer is now rarely down to zero, the river is hardly ever frozen, nor does snow lie long on the ground. In the forest it lies very long. The increased aridity of Palestine, of Spain, and of the south of France is well known. In the former case it has been partly caused by the cutting down of the Olive, a barbarous incident of warfare, merely forbidden by ancient law. In the last-named country it has been the need of fuel that has led to the denudation of so many districts, and the double evil has ensued—first, that the humidity of the climate has been reduced to a formidable extent; and, secondly, that when rain does fall, in any unusual proportions, the absence of the great natural absorbing power of forest districts allows the entire product of the rainfall to be discharged at once by the natural drainage, thus causing those floods which have proved so formidable in their ravages within the last few years.

The denudation of the forests of England is by no means a new grief. More than 200 years ago Mr. Evelyn complained of the rapid extirpation, "root and branch, of all those goodly forests and woods which our more prudent ancestors left standing for the ornament and service of their country." On the confiscation of the Church lands, in 1536, immense forests were cut down; and during the civil war that commenced a century later, many royal forests as well as private woods were entirely swept away. In France there yet exist 2,700,000 acres of State forest, earning a gross revenue of £1,740,000, and a nett revenue of £1,240,000 per annum. Bavaria contains nearly 2,000,000 acres of forest; Prussia, upwards of 5,000,000; Austria, no less than 13,000,000 acres, realising an annual export value of £3,000,000 sterling.

In France and in Germany exist schools of forestry in connexion with the service of the State, and men of a superior class of intelligence are carefully trained in these establishments for the scientific management of this important part of the national property.

In Bavaria there is a school of forestry at Aschaffenberg on the Maine. The candidates for admission must have passed good examinations in the higher public schools. The time of training extends over five years, half of which time is devoted to acquiring a practical acquaintance with the condition and care of the forests of the State. The special scientific course comprises lectures on forestry, management of forests, planting, division of forests into blocks, valuation surveys, rotation of classes of timber, and the due rotation between the maximum yield of a forest and its maintenance in an uninjured condition. Preparation, transport, and sale of forest produce forms another special branch of study. Botany, chemistry, zoology, physiology of plants, climate, and geographical distribution of plants form the natural science division of the course; and mathematics, pure and applied, engineering, surveying, and forest legislation complete the *curriculum*. On passing the final examination, the students are qualified for appointments in the Bavarian forest service.

In France a similar college exists at Nancy, where from 30 to 40 students are trained for the service of the State. The service is directed by the "Bureau Central de l'Administration générale des Forêts," and 849 *conservateurs* and *inspecteurs*, having under their orders 3500 *gardes généraux*, have charge of the public forests of France.

Forests schools are also established at Hanover, Neustadt, Eberswald, near Berlin, Tharandt, in Saxony, Eisenach, and other places in countries possessing State forests.

The threatened and very proximate exhaustion of the enormous forest and timber-growing jungles under the British rule in India has led to a tardy attention being paid to this important subject by the Indian Government.

From the report of Dr. Brandis, Inspector-General of Forests in India, it appears that the normal average of first-class Teak trees in a virgin forest is 14 per acre. A Teak forest at Maulmain, in the hands of the Government, extending over 550 square miles, has been found to contain only three full-grown trees in 2 acres, while damaged trees and stumps abound.

Forests of the Sâl or Saul tree replace those of Teak in Central India to the north of the Nerbudda river. A belt of forest, from five to twenty miles wide, extends for a length of 1500 miles along the foot of the sub-Himalayan range, and up to an elevation of 3000 feet. The Saul tree grows socially, and by its dark green foliage excludes the growth of other trees; being unlike the Teak in this habit of growth. In Oude and Nepal the jungles contain as many as 70 first-class trees per acre, together with from 200 to 300 of all sizes, springing up from seed. The system of letting these forests by contract in annual leases to the highest bidder, while bringing in a positively insignificant return, has had the effect of stripping all the accessible parts of this large district of full-grown trees. Such is the size attained by this noble tree, which, with a specific gravity less than that of Oak, possesses from one and a-half times to twice the strength of that wood, that the Nepal ferry-boats, used to contain from 10 to 15 men, with horses and cattle, are hollowed out of single logs. The tree takes about 100 years to arrive at this size. The British Sâl forests are computed to cover more than 3500 square miles, and a rest of 40 or 50 years will be requisite to replace this waste of first-class trees which has been so blindly permitted to go on.

From the state of the Sâl forests it may be concluded what is the condition of the supply of Teak, a tree which grows so much more sparely in its natural home. In 1822 the forests which the native princes had studiously preserved were thrown open to the public. Within eight years it was discovered that, owing to indiscriminate cutting, Teak timber fit for Government purposes was growing scarce, both in Madras and in Bombay. In 1839 Mr. Williams, the dockyard manager, reported, that within twenty-one months 40,000 Teak trees, between 12 inches and 6 inches in diameter, had been floated down by the contractors, whose indiscriminate waste was thus destroying the resources of the future. So great had been the destruction, that in 1842 the Government actually purchased 260 square miles of forest land for replanting with young Teak, for the use of the dockyards. It was found that the expense of thus preparing a single acre of forest nursery was greater than the value of the timber which could be grown on a square mile in 100 years! During the thirty years preceding this futile attempt to repair irreparable waste, the forests of Malabar, Canara, Goojerat, Bombay, Madras, Rajamunduy, Coimbatore, and Cochin, stocked with first-class trees fit to cut, and with an ample supply of young trees in all stages of growth, had been given over to destruction. The contractors took no heed of those who might come after them, and cut everything that came to hand.

During this time the forests of the Rajah of Travancore, under the charge of an English conservator, had yielded a regular revenue, while still containing a full supply of first-class trees. For every ten trees fit to cut, two were left for seed; and for every tree actually felled, ten were planted.

The Teak-growing districts of Burmah extend over more than 7000 square miles of forest. A system of well-devised management has been introduced into this district in 1860 by the conservator, Dr. Brandis. The forests are divided into six divisions, of upwards of 1000 square miles each, containing an estimated number of 100,000 trees in each district. The trees are divided into five classes, each individual being allowed a period of 24 years in each class, thus making the total life of the tree, from the germination of the seed to the felling of the timber, 120 years. The ordinary average of the forest gave 100 trees of the 1st, 2d, and 3d classes, and 200 of the 4th class, per mile. By cutting, therefore, only 80 of the 1st class in 24 years the forest is uninjured, and in the course of 120 years its stock of timber is entirely replenished.

The specific gravity of green Teak is greater than that of water. The dry timber, on the other hand, will float. It is therefore the practice to mark and girdle the tree three years before felling. The tree is killed by the destruction of its bark, and dies *in situ*. When felled it is dragged to the river by elephants, and floated down to Rangoon, the Government paying so much a log on its arrival. Under these arrangements the Burmese forests have kept up a good supply of timber without exhaustion, and have ensured an annual profit to the Government of £60,000, besides providing for the expenses of their own conservation, amounting to more than £30,000 a-year.

No less important than the conservation of our extensive forests, inexhaustible as they may prove under proper management, although readily destructible by the waste which we have been accustomed to allow, or rather to practise, is the introduction to the knowledge of the English builder and manufacturer of those noble and beautiful species of wood of which we command so great a variety. It is incredible to what an extent this part of the subject has been neglected. At the Paris Exhibition of 1867 timber from no less than 3769 distinct species of trees was collected from 45 different countries. Of this large number Europe contributed 395 species. Africa yielded only 252, showing that the resources of that large continent were almost virgin. Asia produced 858 species, Oceania 966, and America no less than 1298.

Among the most notable of these materials for the builder may be mentioned the Eucalyptus amygdalina from Victoria, which attains in the valleys of Daudemony and on the Yarra river the height of 420 feet. Dr. Mueller says that this amazing height is by no means exceptional, and that is due rather to great rapidity of growth than to extreme age. The White Gum (Eucalyptus Stuartiana) and the Stringy Bark (Eucalyptus obliqua) are said to exceed 300 feet in height, and to cover the plains and more barren mountains of Victoria. From the same vicinity come beautiful ornamental woods—the Senecio Bedfordii, a curious striped wood, and the Banksia serrata, marked with a pattern-like network. Gipps Land produces the Eucalyptus longifolia, said to last in the ground for 20 years, and the Acacia supporosa, an elastic wood, resembling Hickory, and yielding straight spars from 50 feet to 100 feet long.

British Guiana produces the "Greenheart" (Nectandra Rodiæi), called by the natives Sapicu, a timber which is remarkable both for its great durability and for its extraordinary strength, which is three times that of Oak. Balks of this timber, squaring from 18 inches to 24 inches, may be had from 60 feet to 70 feet long without a knot. In the same locality the Mora (Mora excelsa) attains a majestic height of from 100 feet to 150 feet. It is so tough that it is sure not to splinter when struck by cannon-shot. Its strength is more than double that of Oak, and it is said to be exempt from dry-rot. Of the seven species of timber which form the first class in Lloyd's classification for shipbuilding, Oak, which heads the list, seems to be far inferior to the East Indian, the Australian, and the African timber, to which we have referred. The list includes seven species of timber; the ordinary European Oak (Quercus Robur), the live Oak of North America (Quercus virens), African Oak (Oldfieldia africana), Teak (Tectona grandis), and Sâl (Shorea robusta), from East India; Mora (Mora excelsa), and Greenheart (Nectandra Rodiæi), from British Guiana, and Ironbark (Eucalyptus, species not named) from Australia.

It is beyond the limits of our space to describe the varied, mottled, striped and coloured woods which offer such admirable materials for the artist, whether for furniture, for doors, skirtings and wainscotings, or for inlay work. The use of dyed or stained wood for the latter is rendered unnecessary by the bounty of Nature. From the pure white of Satinwood, and of numerous other species, to the full lustrous black of Ebony, we can simulate almost any that form the resources of the vegetable world. French Guiana produces a violet wood of extreme beauty, the "Bois violet" (Copaifera bracteata), and the Caryocar glabrum, a splendid yellow timber. Brazil has a red wood fit for any kind of furniture, the Erythrospermum Balkasarii, and the Dalbergia nigra, a beautiful Rosewood. Venezuela has a Zebrawood (Cordia zebra); Natal produces Sneezewood (Pteroxylon utile), equal in beauty of grain to the best Bird's-eye Maple; Canada its White and Pencil Cedars (Thuja and Juniperus virginiana).

It is needless to refer to the economic products of the forests, apart from the actual timber: turpentine,

resin, Burgundy pitch from the Pine forest of the Lauder; cork from the South of France, Corsica, Algeria, Italy, and Spain; gum animi from Zanzibar; gum copal from Angola and Sierra Leone; gum acacia from Senegal and Mogador; gum arabic from different sources; Palm, Cocoanut, and other vegetable oils; coir and fibre; bark for tanning; Osier and Bamboo; corozo, or vegetable ivory, and nuts for turners' work (Phytelephas macrocarpa), from Ecuador; the vegetable wax of the Carnauba Palm (Corypha cerifera) from Brazil); caoutchouc, the milky sap of the Siphonia elastica, and other elastic gums, as well as logwood (Hæmatoxylon campechianum), and other dye woods, from the same rich vegetable district; bark mat from the bark of the Lime, the Russian source of supply for cordage, bags, mats, sandals, bassets, horse-collars, packing-cloths, and other purposes; black and grey Moss from Louisiana, used by upholsterers for stuffing; forest wood for the same purpose, formed from the needle-like leaves of the Pine; essential oil from the same tree, balsam, and spice. Such are but a few of what may be called the incidental products of the forest.

Our purpose will have been accomplished if we have succeeded in awakening attention, first to the fact of the invaluable stimulus to art in all its branches, no less than to civil and naval architecture, that must result from the attainment of a competent knowledge of the vegetable kingdom; and, secondly, of the absolute importance, as a branch of the great profession of which the architect, the engineer, the shipwright, and the surveyor are alike essential members, of the intelligent study of forestry. *The Builder.*

BROCKWORTH PARK PEAR.

In this we have a new Pear of the highest merit, taking rank with the finest of our old established varieties, and one which, extensive as our list of good Pears already is, must yet be added to our collections. The Brockworth Park Pear is a supposed English seedling from Gloucestershire, for which we are indebted to Messrs. J. C. Wheeler & Son, of Gloucester. It comes into use towards the middle and end of September.

The fruit is large, like that of Williams' Bon Chrétien, greatly resembling at the first glance a pale Louise Bonne of Jersey. It is pyriform in shape, somewhat irregular in outline, being bulged in the centre and slightly angularly moulded towards the eye, with a flat blunt end like Marie Louise. The skin is smooth, pale yellow, slightly flushed and streaked with crimson on the exposed side, and very beautiful. The eye is rather small, closed, having the segments of the calyx pointed, set in a very shallow basin. The stalk is about an inch in length, stout, obliquely inserted, without depression. The flesh is white, very delicate, and buttery, melting, juicy, rich, and vinous, greatly resembling in that respect Marie Louise.

Examples of this splendid Pear (fig. 275) were exhibited at a meeting of the Fruit Committee on the 21st of September last, when it was unanimously awarded a First-class Certificate. A drawing has been made for the *Florist and Pomologist*, to which we are indebted for the annexed cut. *B.*

Home Correspondence.

The Influence of Climate upon a few familiar Plants.—We all know what is meant by a fine growing season, but few persons realise what is expressed by sempiternal. Comparatively few persons have resided in localities possessing climates which are one eternal spring. In the Madras Presidency, between the 11th and 12th deg. of N. lat. and the 76th and 77th deg. E. long, are an isolated group of mountains called the Neilgherries or Blue Mountains. These mountains are on the confines of Malabar and Coimbatoor, from the plains of which provinces they rise abruptly to heights varying from 4000 to 7000 feet or so—the highest point of these piled-up mountains being 8760 feet. On all sides of the Big Hill (Dodabet) is a terraced plateau extending to the verge of the precipitous primitive rocks before named. On this plateau, which is several miles across, are four stations or villages, which are situated at various altitudes varying from about 5500 feet to 7500 feet above the sea. The most important stations are Ootacamund and the joint station of Coonoor and Wellington; on the N.E. side of the plateau is Kotergherry, at an elevation of about 6500 feet. Coonoor and Kotergherry are comparatively warm and dry climates, most European fruits, with the exception of those of the nut tribe (Chestnuts, Walnuts, Filberts, &c.), do exceedingly well, and Pears, Apples, Plums, Peaches, Pomegranates, Oranges, Guavas, Loquats, Granadillas, Strawberries, Plantains, &c., are often found growing side by side. Close by Coonoor Church may be seen two or three very fine specimens of Oak, always evergreen, and close beside them a group of Musa paradisiaca var. Roses are evergreen here, and bloom all the year through; the common Cluster Rose is generally used as a hedge plant, and Tea Roses are planted frequently. The Cloth of Gold Rose is seen in bloom here to perfection, and may now and then be seen covering the roofs of the cottages in company with Bignonia venusta, which is also magnificent when planted in a good, free, loamy soil, with a mean temperature of about 58°; the range of the thermometer is as much as 60°, however, and sometimes ice is formed during the nights of December and January. Tea is cultivated to a small extent in the neighbourhood of Coonoor, and it is of very excellent quality when well manufactured; it is also grown at higher elevations. At a height of 7500 feet Tea does not seed freely, although the plant seems to grow well enough; the Thea viridis varieties would be the best if they could be procured direct from China. All the European fruit trees seem to cease bearing at about 7000 feet. Peaches grow even more luxuriantly than at Coonoor, and are often evergreen, but they seldom ripen their fruit. Heliotropes, Aloysias, &c., attain magnificent proportions, being commonly met with in hedges, or as single bushes in gardens, and of a size vieing with our best specimens of Laurustinus. At Ootacamund, Nedderuttum, and elsewhere, the Government have established several plantations of Cinchona; the plants grow well, but the cultivation has proved expensive to the Madrassees; and the length of time elapsing before the trees yield a return, and the ultimate uncertainty of that return, is not likely to render the cultivation a favourite one with commercial men. Tea planters may, however, adopt the Darjeeling system, and plant belts of Cinchona on the margins of their estates with advantage, letting the trees take care of themselves when big enough. *James M. Pierson.*

Fig. 27

Aquilegia: Columbine.—I have observed several notices, which have appeared recently in your Journal, regarding these names, but I do not think that their real significance, as applied to the plant, has been given by any of your correspondents. Columbine, I believe, has reference to the resemblance which the five-spurred petals have, when inverted, to young doves surrounding a crown or well, and is from *columba*, a dove. One of your contributors suggests that the "dove-colour" of the flower has given rise to the name. Although the flowers are usually blue, they are also frequently red, white, and pink.

"The white, the blue, the flesh-like Columbine."

The generic name Aquilegia was, I have no doubt, given from the fancied resemblance that the petals had, when inverted, to a nest of young eagles, or young eagles drinking at a fountain—gathering water. *John Sadler, Royal Botanic Garden, Edinburgh.*

Habits of Cuckoos. A few years ago a long-tailed tit had built its nest in my flower garden, not far

from the house, and had deposited eight eggs. On the day following the laying of the eighth egg, a cuckoo's egg was laid in it. I do not think it possible that the bird could have laid it there, but fancy she must have introduced it with her beak. Is this often the case? In 1868 I found a cuckoo's egg in a titlark's nest, the nest containing four eggs altogether. In 1869 I took an egg of a cuckoo for my collection from a hedge-sparrow's nest built in a Furze bush; in this nest there were four eggs besides the cuckoo's. This year I found a young cuckoo just hatched in a greenfinch's nest. I was rather surprised at this at first, as I thought the egg was always laid in the nest of an insect-feeding bird, but on referring to "Yarrell" I find he mentions a case of one being found in a greenfinch's. Underneath this nest were four young greenfinches quite cold and dead, evidently turned out by the young cuckoo. When fledged I took him and reared him up by hand till he could peck, intending to try and keep him through the winter in a hothouse, but unfortunately he one day managed to effect his escape. *W. Broome, Elmhurst, Batheaston, near Bath.*

Planting the Albert Embankment.—A public work like this, which is a matter of interest, more or less, to all Englishmen, should have a wide scope for competition in carrying it out. If it was really imperative that the tenders should be in by the 21st ult., surely the Metropolitan Board might, by a great effort, have made it known earlier, so that the advertisement could have appeared in your paper of the 12th ult., and thus ensured a clear week for the nurserymen to make their estimates. Then it would have been competition—now it is but a mockery. No doubt it would interest many of my fellow tradesmen, as well as myself, if the Board would make known through your columns the name of the successful firm, together with the less fortunate ones whose tenders were not accepted. *A Wholesale Nurseryman.*

The Education of Gardeners.—Your correspondent, Mr. Bell, states that he is well acquainted with the counties of Aberdeen, &c.—a hotbed for apprentice gardeners, and he finds "the business is easy to get at, and that numbers of uneducated youths take to it"—at 7*s.*, 8*s.*, or 9*s.* per week, and no apprentice fee to pay. How can Mr. Bell expect to find the sons of labourers (who, he says, are generally the class from which these apprentices are drawn), able to pay apprentice fees? I cannot see how it is to be managed, when the labourer has a large family. Mr. Bell does not tell us how these boys have been employed up to the age of 16; I imagine they have not spent 14 years in a ploughman's bothy: but if so, why admit them into the garden? I have not the pleasure of being much acquainted with Forfar or Kincardine, but I know that many of our curators, gardeners, and estate agents, are exceedingly particular regarding the ability of their young men. At Kew, for instance, every young man has to pass a preliminary examination before he is admitted, and the only fault to be found with the system is that the examination is too light in its character. I would recommend every gardener to adopt the same system, and if he is careful to exclude every boy from his garden who will not pass a fair examination in the rudiments of education, he will confer a great benefit upon the next generation of gardeners and their employers. The *Gardeners' Chronicle* can offer suggestions, but the readers of the *Gardeners' Chronicle* must put their "shoulders to the wheel," if they desire to raise the *status* of their class above that of a "flunky." *Inter alia.*

—— When perusing your article upon the education of young gardeners, at p. 1469, the fact struck me that your observations were but too true. When living in the north of London seven or eight years ago, that benevolent lady, Miss Burdett Coutts, caused a school to be formed for her gardeners, and any others in the neighbourhood who liked to attend, free of expense. The instruction afforded was in botany and geometry, by Mr. M. C. Cooke, M.A., and I need scarcely say that with such an instructor at its head a very valuable school it was, especially to those who took an interest in it; but, alas! there were very few that did, most of them considering the instruction "too dry." In consequence there was often a very poor attendance—I think never more than eighteen, which eventually dwindled down to about six, when the school was discontinued. Now this does not speak much for science in gardening at the present time. I think it would be an excellent thing if there were discussion classes or schools instituted in all the suburbs of the metropolis, and, indeed, wherever enough gardeners could be got together to form a class, and I would suggest that each member should discourse on some subject in his turn, and each one pay a small contribution weekly, monthly, or quarterly, the discussions to be continued during five winter months. Although the free school mentioned above was a failure, it was because the subjects were, with two or three exceptions, too dry for the class of gardeners that attended. In discussion classes or schools the thing would be different, as there would be more animation thrown into the subject. The benefits that would accrue from such discussions must be patent to every one. *W. Sutton, Scrivelsby Court, Horncastle.*

—— As your correspondent, Mr. Bell, has been kind enough to take part in the wages movement, will he kindly oblige young gardeners by telling them when they may expect the advance; because if he thinks the present amount of wages sufficient, I must on this, as I do on many other points, beg to differ from him. If he wishes to see a superior class of young men, why does he not put his shoulder to the other side of the wheel, and push them forward instead of backward? Many head gardeners are no better than despots. Talk about the ploughman's bothy, why it cannot possibly be worse than some of the dens provided for the future head gardeners to live in. I myself have seen places considered good enough for them which were hardly fit for a member of the swine family. I have compared the young men so treated with those who had the greatest kindness shown to them, and have found the latter to be much superior, and have known amongst them men who had the love of a son for their masters, and tried to please them in every way; while, on the other hand, those who hardly dare to look at the head gardener's front door, much less enter it, were always eager to get away to any place where their company was more acceptable. I think that if more kindness was shown to young gardeners by their masters, they would try in every way to please and give them satisfaction, and were they to receive a few hints on subjects most beneficial to them, they would be grateful for them. *D. S. C., Algarkirk.*

—— Mr. Bell is very general in the few and certainly not over-complimentary remarks (see p. 1541) which he makes in reference to young gardeners. Surely he cannot imagine for a moment that all of us, as a class, occupy the very low position in the social scale that he assigns to us. Those with whom he is acquainted may frequent the tap-room or associate with the stablemen, but all must not be blamed for the errors and offences of a few. I am sure that but a small percentage of the class he names attend the examinations at all, but I know that the candidates who do are men with whom any head gardeners, however well educated, might associate without losing caste. There is a class among the rising horticulturists who work and study hard, doing their best to improve both their education and their talents, and it is erroneous to infer that young gardeners neglect these matters because they do not attend the examinations. Quite recently we were informed in a leading article that educated gardeners were required in the Tea, Cotton, and Cinchona plantations of India, and in the vineyards of California and the Cape. The question naturally arises, Who has the power of appointing gardeners to these situations? Supposing that a young gardener has so far improved himself, by well directed study, as to be competent to fill a position of this description, to whom must he state his case? I am very much afraid that if he lacks the advantage of having friends at court, he will be far from successful in his endeavours, even should he know where to apply, and that is not over clear at present. Were examinations to be held for some of our best places, both public and private, there would cease to be any reason for disappointment because gardeners did not attend. Rest assured gardeners know in which direction their interest lies, and were there any real and lasting good to be derived from examinations, they would soon avail themselves of those advantages. I am not a sceptic, but ever willing to be convinced by reason and sound argument, and if we had a few good situations to be contested for, examinations would then be attended in real earnest and not be neglected as at present. If a young gardener saw that passing the examinations gave him a standing, higher than he occupied before, then he would strive to excel. There is no demand for certificated gardeners at present, it is evident. Why do not some of our head gardeners set their younger brothers an example? bearing in mind the old proverb, "Example is better than precept." *F. W. B.* [The obvious advantage of examinations is, that they act as a stimulus to greater exertions in acquiring the knowledge requisite for every successful gardener. If they are unappreciated because some young men affect to despise them, and head gardeners look coldly on, the loss is the young gardener's. The examinations won't—cannot—do everything for him, but they are calculated to help him, and leisure time spent in preparation for them can scarcely be better employed. Eds.]

Rhamnus Frangula.—Will some of your correspondents please to give me some information regarding the above-named plant? My employer thinks of planting a quantity of it, to be used eventually in the manufacture of gunpowder. Can you tell me if it has been cultivated in England for that purpose, the most suitable soil to plant it in, the distance apart it should be planted, and the number of years it is likely to be before it is fit to cut, also the best way to increase it? I have been told that it will do well in wet boggy soil, such as the Alder will grow in, but I have not seen it in such a situation. As there are many thousand acres of such land in this country, a few practical hints would very likely be the means of a part of them being used for a useful purpose. *C. R.*

The Plague of Flies, and Winter Spinach.—About the middle of August I am in the habit of sowing a good breadth of prickly Spinach, choosing a warm, rich, and deeply-trenched border. This year, after the rains came, it looked as promising as I ever knew it in former years, until the plague of flies came, when, like every other green thing, the Spinach became literally covered with them. The flies have now gone, and with them nearly all my Spinach; that which is left is so very weak and sickly-looking, that I fear but few pickings will be obtained from it until it regains strength by the return of spring. Immediately over the Spinach border is a favourite wall of Peach trees—for I am an ardent lover of systematic training, and which I do not find inimical to the production of good fruit, and plenty of it—upon which the flies settled with such "prussianising" effect, that, though frequently mown down by charges of tobacco-water, until they lay on the ground underneath like a mouldy wave, they returned again and again to the attack; nor did they give in until, part by their sickening influence, and part by the autumnal ripening of the leaf, both the flies and the leaves fell to the ground and perished together. *Wm. Miller, Combe Abbey Gardens.*

Bunyard's Invicta Marrow Pea.—A correspondent asks if any one can give him information respecting a Pea called Invicta, sent out a few years since. We beg to say that we sent it out under the name of Bunyard's Invicta Marrow. It is a cross between Dickson's Favourite and Veitch's Perfection. The pods are very green, and for cooking it is one of the best. It has the merit of doing well on rather poor ground, and it is worthy of cultivation even with the best of the wrinkled kinds. The seed resembles Matchless Marrow. *Thomas Bunyard & Sons, Maidstone.*

Earthing-up Vegetables.—Potatos require to be covered with soil to a depth sufficient to allow of the formation of tubers from the stem for 5 or 6 inches above the set. This is accomplished with many by planting about 3 inches deep, and afterwards earthing-up to the required height, whilst others plant deeper and mould up very slightly, in some instances not at all. Now shallow planting, entailing the after labour of earthing-up, is a mistake; for in the first place the plants are quickly through the ground, and, if caught by frost, the stems often die back to the set; and the earthing-up, to be of any service, must be done early in their growth, which in rainy weather becomes a bad job. With the ground of a sufficiently deep tilth, the Potatos should be planted with their crowns at least 5 inches below the level of the ground; true they will be 10 days or a fortnight longer in coming through, but then they will escape whatever frosts there may have been during that time, and will push away stronger through the shoots having rooted freely in their progress to the surface. When the ground is very full of weeds it must be flat hoed. In doing this some soil will be moved away from the stems; therefore it is necessary to work about 2 inches of soil carefully among the young stems, and this is best done with a steel fork, so as to leave the ground free of footprints as the work proceeds. But, when the ground is comparatively free from weeds, the Potatos may be planted 6 or 7 inches deep, and so soon as they show above the ground, the whole surface of the soil should be well flat hoed, and left until lifting time. Shallow planting and earthing up, as generally practised, becomes a necessity when the ground is of shallow tilth, but with deep cultivation, and by planting deeper, the labour of after earthing and the trampling of feet inseparable therefrom is avoided. As to the Cabbage tribe, they should be planted in 4-inch drills, and at each watering given them in their young state a slight covering of the mould can be drawn over it. This is a capital plan where water is scarce. Ultimately the whole of the soil is hoed level, when the leaves will be close to the ground, and act as their own protection against wind and frost. *T. C. Sage.*

—— I for one do not adopt the earthing-up practice in growing vegetables. From observations extending over many years, I have come to the conclusion that it does no good, and from various causes often produces evil. Nor can I see anything in the lesson given to an "Amateur" by Mr. Earley (see p. 1539), that will induce me to try it again. We are first told that the method of growing vegetables in a garden for home consumption, and that for market purposes, are widely different. This difference is on the part of the market gardener, who knows that it won't pay to earth-up Cabbages. Now, I believe that the market gardeners are as shrewd about the pay question as other market folk, and if a greater weight or bulk of Cabbages could be got off a piece of ground by earthing them up, they would certainly do so. But we at home must not look at the pay question, but "must get large Cabbages." What sort of argument is this? Getting large Cabbages rests more with the space allotted to each individual plant than with earthing-up. The other half of the argument your able correspondent disposed of himself. To mould Potatos successfully we are told it must be done at a certain time. This particular time is when "the shoot has issued through the ground, and begins to make a little show of leaf." Now, I would ask, how much earth could any one draw "up" at this particular time without actually burying the stem? Is drawing up about an inch or so of earth around the stem "earthing-up?" How many times must one thus go over Potatos to get them earthed-up? I do not think this will make things so "felicitous" as we are asked to believe. I have found the roots next the "seed," which at first were intended for tuber formation, after the operation

of earthing-up, entirely barren, and another set was afterwards formed nearer the surface, which did their duty. Now, if the soil had not been deepened by this practice of drawing the earth over the roots the first set would have produced tubers, and that earlier. What is gained then by earthing-up but weakness and lateness? The earthing-up also often causes "green ends" to the tuber, the soil being taken away from the spot just where it is wanted. Mr. Earley must earth-up when there is next to nothing to "earth," or else he must earth-up every few days, or when it is "worse than useless," which he tells us is an injurious practice, and, moreover, not a natural one. When, I would ask, and by what means, does Nature earth-up? I think that what Mr. Earley says both for and against this practice will lead to its general abandonment. In my opinion he said more against it than for it. Again, we follow your correspondent into the Cabbage quarter. Now, if I could have "frost-bound ground" all the year round, to keep the soil snug about the stem, I would not earth-up. I do not believe in it, and am certain that it does harm to the roots to have the soil drawn away from them, a proceeding which allows the frost to act keener, and the raging wind to become a stronger enemy. The swaying of Cabbages by the wind when earthed-up causes a cavity round the stem down to the root; when rain comes it is full of water; when frost comes it is bound in ice, and the leaves stick to the drawn-up frost-bound earth. This is all prevented by not earthing-up at all, and if proper plants are planted at the proper time, there will be little room for earth about the stem, and they will have no long legs to hide. Earthing-up to blanch or to protect from frost I can understand, and shall adopt; but I cannot see in anything Mr. Earley has said that I am very wrong in not earthing-up my vegetables, although I am not a "market" but a "*Gentleman's" Gardener.*

Bouvardia triphylla.—When looking over the Royal Nurseries of Messrs. Standish & Co., at Ascot, in the month of September last, I was much pleased with a small plantation of this fine old species then in full bloom. Each dwarf bushy plant was densely covered with bright scarlet flowers, and I could not help thinking what a grand bedding plant Mr. Gibson could make of this at Battersea Park. And not only Mr. Gibson, but other people also, as this species must have a considerable amount of hardihood about it, seeing that it has stood out unharmed all the winter at Langport, in Somerset. I think a bed or two of this would most agreeably relieve some of the dazzling hues of the scarlet-flowering bedding Pelargoniums, of which many flower gardeners are getting heartily sick. I should think it would begin to bloom in July, and continue onwards till the end of September. I suppose B. triphylla is somewhat scarce, as it is seldom met with in catalogues, and so it can be classed with the undeservedly neglected plants, of which there are a good number, that, were they once more restored to our plant-houses and flower gardens, would be welcomed with more heartiness than many of the new plants sent out as such in the present day. *R. D.*

A Plea for Vegetables.—I beg to thank your numerous correspondents for the favourable manner in which they have commented upon my suggestions. I think that, upon the whole, we agree in the main, that £20 should be raised, and divided into three prizes. The offer of your correspondent, Mr. Ayres, to subscribe £5 is deserving of much praise. I am of opinion that nurserymen and seedsmen should not be allowed to subscribe towards "The Gardeners' Prize." If they wish to do a little in this way, let them take action on their own account; and if they could raise, say £40, and offer prizes for the best managed gardens in the Nottingham district, they would render a great service to horticulture; and, moreover, show the Council that the gardeners, nurserymen, and seedsmen meant business, and were in earnest in the matter. *R. Gilbert.*

Protecting Tea Standard Roses.—In reply to your correspondent, "J. M. M." (p. 1572), I would advise him to put some litter over the radius of the roots, and draw the earth over the litter. This is the way I adopt with my ground plants:—Thin out the useless wood from the centre of the standard heads, and shorten the main shoots a little. When severe frost is about to set in—usually in January, sometimes earlier—stuff some straw into the centre of the heads; and if the plants are exposed to wind, as here, tie the wedge of straw with bast. Frosts are seldom severe enough in February to hurt the heads or roots, therefore remove the straw as soon as danger is over. To protect the stem, tie long straws beneath the head, and let them hang down: you can tie them at the base; but, observe, no protection to the head and stem should be so close as altogether to exclude "air." Cranston's cultural directions are good; Mr. W. Paul's book on Roses is very good; so also is Mr. Rivers' book. Add the three to the excellent work of my friend, "S. R. H.," and you will have a complete Rose library. If you buy only one book, perhaps Mr. W. Paul's will best meet your correspondent's wishes. *W. F. Radclyffe.*

Covering up Fig Trees.—At p. 1543, "W. E." says, "cover up Fig trees by the customary method of bundling the branches together in straw," &c. I doubt very much if covering by the customary or any other method is of any service at this season. The most critical time is when growth commences in the spring, and when to have any chance of success the bundles must be undone. My experience teaches me that all the fruit buds that are too forward to stand the winter without protection are too forward to be of any use. All the fruit that will come to perfection next year will be very near the end of the present year's growth, and is now about the size of a Radish seed. The principal point in outdoor Fig culture is to get the wood ripened; and as I have no doubt my method of doing this differs from that of "W. E.," I will briefly state it. As soon as the fruit is off, and while the leaves are yet green, cut out all the wood that is not wanted for fruiting the following season (excepting young shoots at the base of the plants for succession); do not shorten branches, those you cut, cut clean out, leaving the short-jointed firm ones, and these so far apart that all the leaves shall be exposed to the light. The time at which I prune is about the third week in September; should the growth then be very soft, no great results can be expected the following season; the roots are probably wrong, and if they want shortening, now is the time to do it, viz., while the leaves are healthy and the trees have the power to heal their wounds before the coming winter. Figs bleed but very little if cut while the leaves are green, and the wounds are soon healed. When the leaves are fully developed in spring, I use the knife again if required, but September is the time for it, only it requires a firm hand to do enough to it. *Wm. Taylor.*

Brown Scale.—I put the methylated spirits on with a feather. I have never yet diluted it. If the foliage is young and tender, perhaps it would be best to dilute it—water and spirits half and half. When the leaves are full grown, the spirit may be applied pure. I put it on as soon as I detect the enemy. Scale affects chiefly, but not only, the rind of the twigs. As soon as I see ants running about my trees, I know that scale or aphides are upon them. *W. F. Radclyffe.*

Colour of Crotons.—Your correspondent, "R. M.," asks why these plants are better coloured in some places than in others. I consider that there are three points which require attention to produce well-coloured foliage, viz., abundance of light, plenty of heat, and a moderately poor compost to grow them in. Our plants of C. variegatum, C. pictum, and C. angustifolium, are all well coloured, and I attribute it mainly to those conditions. I once tried a cutting of C. variegatum in a compost of half-rotten hotbed manure, and half good stiff loam, with the addition of a little white sand. This plant was placed in a very shady position, and grew rapidly, but its leaves were but very faintly marked with gold. I then shook it out, and potted it afresh in a compost of turfy loam, road-scrapings, and sand, placing it after it had become established in a sunny position in the house. It gradually improved in colour, every new leaf being more golden than its predecessor. The effects of a rich compost are very remarkable on some variegated plants; but perhaps on none more striking than on Cyperus alternifolius variegatus, which I have invariably found loses its variegation in a rich compost. I am aware that there are some plants that colour better in shady situations, as Selaginella uncinata, and Campylobotrys (Higginsia) refulgens; but then these plants are not "variegated," using that term in its strict sense. I have proved over and over again, by direct experiments, that Mrs. Pollock Pelargonium will revert to a green-leaved Zonal if a too vigorous growth be induced by planting in rotten manure. Of course your correspondent cannot mean to imply that Crotons will colour better in some places than in others, supposing all other circumstances to be equal. *F. W. B.*

Abies Douglasii.—It may be interesting to some of your subscribers who delight in trees and planting, to hear of the rapid growth of the Abies Douglasii. I have just cut down one which was injuring a more valuable tree. It was 30 years old, grown in very poor soil upwards of 500 feet above sea level, and measured near the ground 9 feet 4 inches, and at 4 feet from the ground 5 feet 10 inches, in circumference, and was 62 feet high. *W. F. Tighe, Woodstock, Innistioge.*

Pleromas.—There were two handsome plants of Pleroma Benthamiana a few years ago in the large plant stove at Floors. There is a division of span-roofed houses there, seven in number, each 60 feet long, by 20 feet broad, standing at right angles, the width of a house apart, to a similar sized corridor extending along behind, and all heated from one stoke-hole. The central house in this lot is the one in which the Pleromas grew. There is a central bed in the house, in which Musa Cavendishii and several other things were planted out, and the Pleromas occupied part of this centre. Nothing could exceed the beauty of these plants in the autumn months, with their numerous large panicles of purplish blue flowers. If I recollect aright, they lasted fully six weeks in beautiful flower. They were never pruned, each succeeding year's growth being tied in, as is usually done with Chorozemas and many other like plants. Their flowers were not considered first-rate for house decoration, not lasting long enough, and not presenting such a good colour at night as some other things; but as a stove plant flowering in autumn, Pleroma Benthamiana is undoubtedly worthy of being better known. It is easily grown, making shoots 2 and 3 feet long in a season. A compost made up of equal parts of turfy peat and light fibry loam, mixed with some sand, will suit it well. It is a plant that, as far as I have seen, is not subject to the ravages of vermin. *R. M.*

The Royal Horticultural Society's Visit to Nottingham.—Will the Council of the Society take into consideration the desirability of keeping the show-ground open on the night preceding the show? It is particularly annoying to exhibitors, when they arrive late at night, to have to take a cab to their hotel, and another from thence to the show-ground next morning, to say nothing of the unnecessary expense incurred. Being a Nottingham man, I should like the officers of the Society to give these little matters the attention which they certainly deserve, but have never yet had, as by so doing I am confident that the exhibition will be carried through to a very successful issue. *R. G., Stamford.* [A very proper suggestion. EDS.]

Eucharis amazonica.—I have had in flower during this month four specimens of this plant in 15-inch pots; one had 27 stems, on each of which were from five to seven flowers, each flower measuring from 4 to 5 inches in diameter; the others had 25, 22, and 18 stems respectively—a grand sight. *D. C., The Gardens, Westbrook.*

The Extending System of Hothouse Building.—I have, no doubt like hundreds of others, greatly admired Mr. Newton's beautiful sketch of modern arrangements for greenhouses given at p. 1569. Having built my last erections on precisely the same principles, I can fully endorse all Mr. Newton has said of this economical and convenient system. As to their adaptability for sanitarium purposes, I have no doubt they are all that can be desired; but on this point I shall not attempt to enlarge. Having, however, had two years' experience of my seven houses, built in the same style, I thought that both Mr. Newton and others, who contemplate putting up similar erections, may be glad to hear if any improvement can be suggested; for, no matter how well a plan or suggestion may look on paper, or how much time and ability may have been spent on any new subject in order to arrive at perfection, there is sure to be discovered some little imperfection, or some little alteration or improvement found necessary to be made by those who have the actual working of the same. Mr. Newton has given some valuable hints about heating, &c., but he has forgotten to tell us anything about shading, which is of vital importance in a summer like that which we have just experienced. Now, when houses are built so closely that one gutter answers for two adjoining houses, it is very awkward for either shading, repairing, or painting, to be properly carried out. My houses are constructed with a pathway of about 18 inches wide between. When houses are so closely packed, all side ventilation for the inner houses is done away with entirely. Again, when houses are built so as to join each other, the top of each overshadows the front of the next one, which makes a great difference to the growth of plants in the short days, when the sun is low and its genial influence precious. Mr. Newton will find that the lower he can construct the middle transept, the better it will be for plants that are kept near where the house abuts against the transept, for they are sure to be more or less shaded from the sun morning and evening. My houses are built on rising ground, so that each house has a rise of 1 foot, and the roof of the transept is flat and low, thereby causing but little obstruction to light, and I have both side and top ventilation to all, which is a great advantage in hot weather, as some are 60 feet in length. I find that when they are so constructed, and the heating well arranged, with potting-bench, soil, &c., all under cover, where any desired temperature can be kept up, that the comfort and convenience can hardly be estimated except by those who have to put up with the inconvenience of continually passing and repassing from a warm to a frozen atmosphere, and exposing both the plants and themselves. This system of hothouse building has many advantages over the old plan of having greenhouses all over the garden; and if this system is properly begun, and the ground is favourable, it is easy to extend it to any number, size, length, &c., that may be required from time to time. I call it the extending system of greenhouse building. I have two boilers in case of a breakdown, and so arranged that I can work one, or even take either away, without interfering with the other, and each house can be heated separately or altogether, as may be desired. My principal boiler is one so highly recommended by Mr. Pearson, of Chilwell, and manufactured by Mr. Foster, of Beeston, at p. 662, 1869, and I consider it the best boiler I have ever used. *Henry Cannell, F.R.H.S., Woolwich.*

Goodyera discolor.—This, with its rich dark green foliage and spikes of white and lemon-yellow flowers, makes a pretty little table plant. It is a very easy plant to propagate, as its creeping rhizomes break freely in a moderate heat, 65° or 70° being quite sufficient. It is one of those old plants which one does not often see grown well, being generally subjected to a high temperature. The best specimen I ever saw was grown in a temperature of 65°, with an abundance of water, and

a free circulation of air. When well grown it flowers profusely, and as it blooms during the winter months, it is on that account the more valuable. *F. H. F.*

Keeping Late Grapes.—I think no more light can be thrown on the subject of keeping late Grapes, or rather on keeping Grapes late, than has already been done by your various correspondents. Grapes are only calculated to keep plump a certain length of time, and that depends principally on two things, the time of ripening and their being properly ripened, but I don't think that so much depends upon the former as the latter. Having now so many tough-skinned Grapes, we are enabled to prolong the season without much difficulty, even with only an ordinary amount of glass. But then, what is the gardener to do who is ordered to discard those tough-skinned Grapes? The benefit of hybridisation is absolutely lost to those who are obliged to grow only the more tender and finer sorts. My first practice in keeping Grapes after cutting was in the case of early Grapes. In the year 1853 I cut a whole house of Grapes, grown in pots, in the middle of May, and hung them up in a clean cool fruit-room, and at the Royal Botanic Society, on June 8, I was awarded a small silver medal for a dish of Black Hamburghs, and a certificate of merit for a dish of the Kempsey Alicante, and that after the Grapes in question had hung about 10 days in the fruit-room. At that time I was rather an enthusiast in the pot culture of the Vine, and could then easily have disposed of more Vines than I had accommodation to grow. A section of the house, with an account of the system which I adopted to fruit the pot Vine, was given in your columns some time ago (p. 141). The above Grapes were not cut with a little bit of the old wood, as is usually the practice when they are stuck in Mangel Wurzels, or hung in bottles, but, the Vines being planted out in troughs, as represented in the section, when the Grapes were thoroughly well ripened the canes were cut over close to the soil, and carefully carried with their crop to the fruit-room, and hung up, as it were, by the heels, leaves and all. There were upwards of 70 of them, and they gave the fruit-room a novel appearance at that particular season. The Grapes kept well in the above position without water-bottles or any other contrivance, and at that early season, with the dry atmosphere, I was not troubled with any damp berries. Some may be curious to know why I cut a whole house of Grapes in the month of May. It was simply an urgent case. The established Vines belonging to the house were showing bunches as they lay along the front of the house where they had been all winter, and I was somewhat anxious to get the principal Vines under proper protection. At various times, with more or less success, I have kept Grapes stuck in Mangels or in water-bottles. I find the Lady Downe's Grape the best of all the keeping sorts. To keep them long, the bunches require to be extra thinned, and, as I have before mentioned, well ripened. A good plan for keeping Grapes in small establishments, in order to prolong the season, is to have as many Lady Downe's Vines in pots as accommodation can be found for, and to keep them out as long as it will be safe. I have some ripening off now with very little trouble; by-and-by I shall convey them into a warm, dry room in the pots as they are. This is the best system which I know for keeping Grapes late. *J. Miller, Worksop Manor.*

Societies.

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA: *July* 5.—Mr. Thos. Meehan exhibited specimens of Rumex oblongifolius, a naturalised Dock, from Europe. He said that so far as he could ascertain from European specimens, and the descriptions of Babington, Bromfield, and other English botanists, the plant was there hermaphrodite; but here, as correctly stated by Dr. Asa Gray, it was monœciously polygamous. He thought the fact that plants hermaphrodite in one country became unisexual in another was worthy of more attention by those engaged in the study of the laws of sex than had been given to it. This Rumex did not stand alone; R. crispus and R. Patientia exhibited the same phenomenon. Fragaria was another instance well known to horticulturists, although the fact scientifically had not received due weight. The average tendency of the Strawberry in Europe was to hermaphrodiism,—here, to produce pistillate forms. He also called attention to the fact that in these American specimens unisexuality was in proportion to axial vigour. This law he had already explained in times past to the Academy, and new instances were scarcely necessary. Here, however, the moderately weak plant had more hermaphrodite flowers than the strong one; and in both classes of specimens the number of male flowers gradually increased with the weakening of the axis, until the ends of the raceme were almost wholly of male flowers. The first flowers on the strong verticils were usually wholly pistillate.

Professor Cope inquired whether the facts now noted by Mr. Meehan did not conflict with those he had before brough to the notice of the Academy in relation to coniferous plants? He understood that in them the female flowers were at the apex of the young shoots, and the male flowers in lower and more exterior positions.

Mr. Meehan replied that the facts were identical in both instances, in so far that the female flowers in coniferous plants were borne only on the strong vigorous shoots. These vigorous shoots would in time be crowded and weakened by shade, when they would cease to bear female, and produce male flowers only.

Professor Cope suggested that, without reference to the relative vigour of the shoots, the male flower was below, and the female flower above; in these Docks the female flower was below, and the male above.

Mr. Meehan said he had never placed any value on relative position, unless relative vigour went with it. In the case of coniferous trees,—Pinus particularly,—the male flowers were evidently partially formed the fall before expansion, and at the same time that bud scales were forming, and growth forces nearly at rest for the season. They were still in the weaker position, although appearing at the base.

Professor Leidy remarked that the interesting communication of Mr. Meehan had recalled to his mind a result of his experience, which he thought would accord with that of others,—viz., that species viewed as common to both Europe and America frequently exhibit slight peculiarities, which are distinctive of those of the two countries. It is what might be inferred, even if we admit the evolution of existing species from a common remote ancestry. A wide separation, with a considerable lapse of time and a modification of circumstances, are sufficient to account for the slight and acquired differences. Even where differences are not observed in form and structure, they may exist in the habit of the species. Thus the common wolf of Europe and America, viewed by many naturalists as of the same species, differs strikingly in character in the two countries. In the former it is a more fearless animal, not hesitating to attack man; in the latter it is said never to attack man. At an early period observers saw, or thought they saw, many of the same species of plants and animals indigenous to America that occur in Europe, and hence the common names of European species were applied to those of America. Gradually the list of species common to the two countries was much reduced, and now is comparatively small. As might be anticipated, in descending in the scale the species common to the two countries become more frequent; nevertheless, many of these common species exhibit geographical peculiarities, which by some naturalists would be regarded as sufficient to consider them distinct.

August 9.—Mr. Thomas Meehan said very little had been written about the causes of those bunches of branches often seen in trees, and called by the people "crow's nests," and by botanists "fasciations." Dr. Masters, in his "Vegetable Teratology," briefly refers to them, and refers to "over-nutrition" the cause of their existence. Mr. Meehan had watched almost daily during the past year one of Abies balsamea on his own grounds. The branchlets were weak, the leaves were comparatively long and slender, not distichously arranged, pale in colour, deciduous, and many of the branchlets died in the winter. All these were evidences of weak nutrition. He had found two trees of Sassafras, apparently of the same age, growing within a few yards of each other, but one with numerous fasciculated bunches. In addition to the characters in the other case, here the fasciculated tree was not as large as the other one. That weakness, not strength, was the cause, was also proved by facts from an opposite direction, —namely, the law of sex. He had already shown that a low condition of vitality favoured male, at the expense of female organs. He had found a large number of fasciculations in the common Blackberry, and in all instances, besides the yellowness and the other marks, there was a tendency to abortion in the pistils, an increase in the number of petals, and a development of foliaceous points to the usual calyx segments. So that his law of sex, as well as the usual phenomena of weakened vitality, indicated that it was this and not over-nutrition which caused fasciations in trees.

[Mr. Meehan appears to us to have confounded "fasciation" with a somewhat different phenomenon, "polyclady," in which, from some debilitating cause, such as the attacks of Fungus, an inordinate number of branches are produced. EDS.]

Notices of Books.

On the Geographical Relations of the Chief Coleopterous Faunæ. By Andrew Murray, F.L.S. (Journal of Linnean Society, vol. xi., pp. 1–80.)

In a communication to the Linnean Society, of a remarkable character for the boldness and originality of the views advocated, no less than for the adroitness with which they were upheld, and the humorous vein in which they were expressed, Mr. Andrew Murray discussed the Geographical Distribution of Beetles (Coleoptera). That paper, though read nearly two years since, has for some reason or other only recently been published. Though referring principally to beetles, it is a paper that is naturally of much interest to botanists, and even to gardeners, and should be read by all naturalists and by those who take an interest in the inhabitants of our globe, their present state and former history. Space will not allow us to analyse this memoir, but we may at least indicate the general nature of its contents.

In his preliminary remarks, Mr. Murray shows the peculiar value of a study of the distribution of the Coleoptera as exponents of the past geography of the globe, and very properly calls attention to the necessity of studying the relations of each class of beings by itself, lest events belonging to different dates be confounded. By-and-by, when all shall have been separately deciphered, the conclusions respectively drawn from each can be brought together, and some common general result arrived at. Mr. Murray deduces, from a general view of the geographical distribution of Coleoptera, a somewhat different arrangement of land and water in ancient times from that which is usually supposed to have existed, and strengthens his inferences by references to corresponding facts in other departments of natural history. Similar forms of life occur in the temperate and cold regions of both hemispheres, and the explanations hazarded to account for this are various, and they are ably discussed by Mr. Murray; thus, the diffusion of plants and animals by accidental introduction is shown by the author to be in its nature exceptional, and to bear no important part in the establishment of any definite fauna or flora. "Actual continuity of soil" writes Mr. Murray, "and non-interruption by borders, is I believe the only cause by which any fauna, with a definite character (and no true fauna is without one), has been produced, and subsequent isolation, at least so far as regards physical conditions, that by which it has been preserved." To the explanation that facilities for migration were afforded by the conditions present in the glacial epoch, Mr. Murray replies that the resemblances in question were already in existence before the glacial epoch commenced. Another supposed explanation of the fact that similar forms occur at distant places, is that they are the remains of a general fauna which in former times existed over the greater part of the whole world; but this is negatived by the fact, that from the very earliest geological epoch of which we have any evidence, there have been geographical regions with more or less distinct faunas and floras. Mr. Murray then falls back on the theory that geographical distribution is to be accounted for on a continuity of soil at some former period. With this idea in his mind, the author collocates all the Coleoptera into three groups or "stirpes:"—1, the Indo-African; 2, the Brazilian; and 3, the microtypal stirps.

The first includes Africa south of the Sahara, India south of the Himalayas, China, the Malayan district, the Indian Archipelago, and the New Guinea group. The Brazilian stirps inhabits a portion of North America as well as South and Central America east of the Andes, and north of the River Plate. The microtypal stirps includes the fauna of Europe, northern Asia, eastern North America, North-west America, Peru, Chili, Patagonia, New Zealand, and Australia. To account for this tripartite distribution, Mr. Murray does not hesitate to express his conviction that there "has been certainly one, possibly two, great continental routes of communication between the northern and the southern hemispheres, both lying buried in the ocean, one at the bottom of the Atlantic, the other in the depths of the Pacific." In this manner, from the presence of Brazilian types in West Africa, the author infers the former union of Brazil and that country. So far as flowering plants go the corresponding instances are so few and Mr. Murray's assumption is so large, that we hesitate accepting it as true, and prefer to look for some other explanation of the facts.

Mr. Murray then with great skill and much detail marshals his facts and discusses the course and limits of his three great stirpes. He deals, necessarily, mainly with Coleoptera, but he does not confine himself to those insects when a mammal, a plant, or a bird will help him out.

We cannot follow him in this portion of his subject, we may merely record a general impression that the so-called microtypal stirps, as it stands at present, is too miscellaneous an assemblage, and will probably have to be partitioned out differently in the future. But it is not fair to the author to criticise without giving chapter and verse for our criticism, and this would demand as much or more space than is filled by the author's paper itself, and would, we doubt not, demand a much larger stock of patience on the part of the readers in its perusal. Again, we are pretty sure to have opportunities from time to time of illustrating or invalidating Mr. Murray's theories, and so we merely commend them now to the attentive consideration of all whom they may concern.

The Apiary.

As the concluding subject for the season, we cannot do better than give the summary of the past statements of bee management, and close the bee history for the winter months (unless any points are required by our readers to be cleared up, and should call forth further remark), by giving the directions for feeding the transferred bees. At p. 961 we gave a short history of the laying and raising of the eggs of the bee, and challenged the practical remarks of our bee-keeping friends. With the exception of a question with regard to "parthenogenesis" of Siebold, by "I. O. W.," there have been no doubts stated by any writer. As to scientific discussion, we believe the pages of the entomological periodicals are better reserved for this purpose, while here we require the observations of the practical bee-master, whose facts will not only conduce to successful bee management, and materially aid the physiology and true history of the honey-bee, but satisfy the scientific observer. Reverting to p. 997: the life of the bee was there stated, and in August the number of cells and combs constructed, with the royal cradles and raising the queens. At p. 1221 a woodcut was given illustrating the mode in which the queen larva spins its cocoon. This we believe has never before been seen, as we had failed ourselves, for years, by attempting to remove the larva into glass tubes; but by the simple contrivance of making the queen cell to open with a lid, we have been enabled to examine every movement of the larva, and have thus briefly recorded the evidence. The workers and drones

were also afterwards submitted to some tests, and here we were fortunate enough to realise the whole process. At the Oxford show we selected a hive, called the honey-trough "bar-frame hive;" of this also we have been permitted to give a sketch, fig. 233. At p. 1350 directions were given how to drive the bees from cottagers' straw hives, and to introduce them into the "bar-frame hives;" and at p. 1510 we concluded our remarks upon how to fix the combs for the bees to cluster in and store food for the winter. With these few last directions for feeding we have summed up "bee management" as establishing an economical method for the apiary, which, if carried out in a good locality for honey gathering, we unhesitatingly state will be found at least as profitable, if not more so, and much more satisfactory, than the present haphazard method of bee-keeping. And success need have the mark of no system attached to it, or be called by the fictitious names of "storifying," "collatering," "nadiring," "ventilating," as applied to any kind of hive or box. The economy of bee life may be best studied when they are placed in a hive or box where every comb and cell can be separately examined when required, and the whole be free, dry, and perfect, as the natural habitats of the bee are the sole cause of mystery.

To feed the bees in the "honey trough" bar-frame hive—*vide Gardeners' Chronicle*, Sept. 10, p. 1222, fig. 233—open the back shutter, C D, remove the glass slide, and place under the slanting alighting-board the flat tray, with grooves cut in it, with the bee food, made according to the following prescription (from Bevan's "Honey Bee," p. 105); shut up the back shutter, and close the extremity at A B with a piece of perforated zinc; this will prevent any stranger bees from robbing or attacking the feeding bees. The bees will crawl down between the shutter and alighting-board, and transfer all the syrup to the combs. It is best to continue the supply until 15 or 20 lb. of syrup is stored away; there will be ample room in the seven sheets of combs, and the passages cut in the centres of the combs will give the bees the means of reaching their winter stores at any time they are required—the combs having been fixed with the inclination of the cell's mouth pointing upwards, as the syrup would run out of all the combs not thus properly adjusted. The food in question consists of 1 lb. of good brown sugar, 6*d.* per pound; one pint of ale; ½ lb. of coarse honey, about 8*d.* per pound, bought of the cottagers (comb squeezings), and a teaspoonful of salt, boiled to the consistence of syrup: let it stand and cool, when it may be bottled; each bottle will contain about 2 lb. of the required food for the bees. These bottles may be packed away, to be given when wanted in the autumn and spring. *M. D.*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Cleanliness and neatness should now be scrupulously carried out in conservatories, showhouses, or greenhouses proper. At this season the foliage undergoes a natural decadence, and dead leaves there will be in plenty, requiring regular and constant removal. It is only by going over each house and through each plant, weekly at the least, that it is possible to secure the medley of plants now growing together that amount of freedom from litter which is so desirable for the admission about each plant of as much fresh air as possible. *Chrysanthemums*, and especially those which flowered early, will now have become so shabby as to necessitate an early removal, notwithstanding all our efforts to the contrary. Those gorgeous decorative plants, *Poinsettias*, which are so well connected by their period of flowering with our approaching Christmas festivities, will now be forming their scarlet bracts. As there will be no further risk of injuring them through the use of strong liquid manures, these should be supplied freely, but not in a very crude state. Give each plant ample room to grow in, and plunge the pots into gentle bottom-heat. Poinsettias delight, especially at this season, in having their leaves frequently damped over. I find the best way of doing this is to use a small watering-pot with a very fine rose. To syringe them is not so well, on account of the glassy nature of their leaves, which does not admit of the water being ejected against them in any great force, and throws off the water before any good is effected. Pot on the later batches of *Cinerarias* and *Pelargoniums* as required. Uncover *Bulbs*, so as to ascertain if they have commenced growth sufficiently to necessitate their removal into lighter quarters, or to see whether they want watering, as a copious supply is necessary for them from the time they commence to grow actively. Chinese Primroses, or *Primulas*, must now be watered with great caution; if they are made too moist at the root at this time, there is a great risk of their rotting off at the collar. *Oranges* and *Lemons*, or more properly *Citrons*, will also require to be watered with caution. They should be allowed to enjoy as near an approach to rest at this time as is possible without undue injury to the peculiar functions of their leaves. Still admit air freely to all greenhouses during proper intervals, and also to Heath-houses at all times when the thermometer without does not denote too great a fall in the temperature, or when an unwholesome foggy atmosphere does not exist. Choose a favourable opportunity to look through all pits or frames containing plants into which a personal entry has not been prepared for. Remove every symptom of green mossy growth from the surface of the soil, as this, if left, becomes the precursor of further evils. If any *Aphis* is discernible upon such subjects as Cinerarias and Pelargoniums, a thorough course of fumigation should be undertaken at once.

FORCING HOUSES.

Proceed very slowly and cautiously, and with a temperature as nearly uniform as possible, considering that a steady advance is necessary in the early *Vinery* and *Peach-house*. Use water with tolerable freedom, bearing in mind the fact that as the heat increases so also must the density of the atmospheric moisture be made to increase, by repeatedly damping over all cool surfaces, &c. At the finest time of the day, and indeed at all times when the outer air rises to a temperature of from 50° to 55°, give air with tolerable freedom, even through the early part of the night, as it is sure to prove very beneficial. Of course this air must always be admitted through a properly placed aperture. The chief object to look to is to see that no draught be by any means permitted to reach the tender young growths; in view of which the air should be admitted most generally at the top of the house. There is one other way, however, which, with properly arranged appliances, will change the cold draught into acceptable, highly stimulating, fresh, warm air. This desirable object may be attained by placing air channels around the sides of the structure in such a position that the air can blow fully on to the heated pipes, &c., only. This, I scarcely need add, gives it greater buoyancy; and it passes into the structure and amongst the plants in the best possible condition for all the ends desired. In regard to *Pines*, do not by any means allow too much artificial heat. If the thermometer is never allowed to fall below 50° by night, more good will be done by keeping down the temperature as nearly as possible to that point, than by affording a greater amount of heat. When in keeping with the above, a mean temperature of 60° by day will suffice. A nice growing humidity must be assured to "fruiters" by means of slight sprinklings given to the walks and other cool internal surfaces.

HARDY FRUIT GARDEN.

Turn your attention now to the staking of all young *Orchard trees*. Secure each one firmly by means of stakes, ready for the ensuing summer, when the head may be expected to assume greater proportions and to need greater support. It is an excellent plan at this season of the year, in regard to all young trees planted from five to seven years ago, to pare the surface of the grass off, rolling the turves back in the form of a circle some 10 or 12 feet in diameter; and then to place a good layer of rotten manure on the under soil, carefully digging it in, so as not to injure the surface roots, or if the trees are planted too low, to place a thin layer of loam over the dung, and then, in either case, to replace the turves.

HARDY FLOWER GARDEN.

Look carefully through young plantations of *Pinks*, *Carnations*, *Picotees*, &c., to see if any are loosened by worms, or by any other means; if so, press them around firmly with the hands, and draw a little loose earth up to them. Look over *Rock Plants*, and place some kind of protection over the roots of the most delicate kinds, which are likely to receive injury during severe frosty weather, through the fact that from their position they are so much exposed to its action. Give all necessary protection to the tenderer kinds of wall *Climbing Plants*, such as *Magnolia grandiflora*, *Roses*—especially Fortune's white variety, &c., by anticipation, at the approach of a frost, rather than after it has come, and perhaps left irremediable injuries in its train. Now that worms have become troublesome by depositing their "casts" on grass swards, more attention than ever must be given to lawns. The quickest way to clear lawns is to roll them well over with a wide wooden roller. The earth casts adhere thereto, and are readily removed. *W. E.*

TOWN GARDENING.

Grass-plots and *Lawns* are growing very rank this season, owing, no doubt, to the rest which the grass had during the dry summer, and the late beautiful rains; but by no means mow again, for if sharp frost should set set in directly, the plants will go off, and be very unsightly during the winter. Roll frequently in mild weather, this will be the means of producing a close fine bottom. Cut out all dead wood, and other branches not required, from *Elms* and other large trees, and prune *Shrubs* and *Evergreens*: cut out from the shrubs all long rambling shoots of last summer's growth, and also low straggling branches, and shorten any main branches that grow irregularly, seeing that none of the branches of two or more shrubs interfere with one another. When the shrubs are pruned dig the ground between them, and remove all suckers sent up from the roots. *Window Plants* should have all the air possible in fine weather, and be watered sparingly about once a week on a fine day, seeing that the water does not afterwards stand in the pans. *Hyacinths* may still be put into glasses, as previously directed, and should any of the previous batch not be doing well take them out, gently wipe them, and replace in fresh water with a small piece of charcoal. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
FOR THE WEEK ENDING WEDNESDAY, NOVEMBER 30, 1870

1870. Month and Day.	At 9 A.M. Readings of			Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
November.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
24. Thurs.	29.27	55.0	51.4	47.8	779	3.8
25. Friday	29.27	49.7	46.5	45.1	85	3.5
26. Satur.	29.09	47.8	45.1	44.1	95	3.7
27. Sunday	30.08	49.0	46.0	45.0	103	3.6
28. Monday	30.17	42.0	42.0	42.0	100	3.1
29. Tuesday	30.23	42.1	40.6	39.2	82	2.9
30. Wednes	30.24	41.3	38.4	34.6	78	2.4

1870 Month and Day.	Temperature of the Air.					Wind.	Rain
November.	Highest.	Lowest.	Range in Day	Mean.	Departure of Mean for 50 Years.	Direction.	Horizontal Movement	In Inches
	Deg.	Deg.	Deg.	Deg.	Deg.		Miles.	
24. Thurs.	58.9	46.3	12.6	52.5	+ 11.5	S W	630	0.08
25. Friday	55.8	45.8	9.5	49.5	+ 8.9	S W	375	0.19
26. Satur.	55.6	38.3	17.3	46.7	+ 5.8	S by W	130	0.00
27. Sunday	47.4	36.3	11.1	41.6	+ 0.5	Calm	85	0.00
28. Monday	46.1	36.2	10.1	41.1	+ 0.2	S S E	100	0.02
29. Tues.	46.9	41.5	5.4	44.0	+ 2.4	E S E.	170	0.00
30. Wednes	42.7	35.0	7.7	38.7	- 3.2	E by S	285	0.00

Nov. 24 Very variable. A heavy fall precedent Rain fell heavily at night
— 25 Light clouds prevailed during the day Occasional showers at night
— 26 Overcast all day. Dull night; thick clouds last part
— 27 Cloudy all day
— 28 Generally overcast A dull day
— 29 Overcast throughout the day
— 30 Overcast A dull day. Slight rain

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
DURING THE WEEK ENDING SATURDAY, NOVEMBER 26, 1870

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	57.2	35.1	21.8	51.1	39.5	16.1	40.4	0.86
Blackheath ..	58.9	36.9	22.0	53.4	41.2	12.2	49.8	0.95
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	56.2	33.1	23.1	51.6	38.7	12.9	44.8	1.62
Wolverhampton	55.0	32.4	22.6	50.2	38.7	11.5	44.1	1.38
Leicester ..	59.0	31.5	24.5	50.2	37.1	13.1	44.3	0.82
Norwich	..	..	..	..	..	..	..	..
Nottingham ..	55.0	31.2	23.7	50.0	35.3	14.7	42.3	1.26
Sheffield ..	55.0	34.0	22.0	49.5	38.2	11.3	43.0	1.38
Liverpool ..	52.1	35.4	16.7	48.3	39.1	9.2	43.5	1.71
Manchester ..	..	..	..	..	..	..	..	..
Salford	54.5	31.1	23.4	49.5	36.5	13.0	42.7	2.00
Bradford ..	59.1	34.2	24.9	50.0	38.0	12.0	43.5	1.75
Leeds	55.0	33.0	22.0	48.0	38.0	10.0	42.7	1.89
Hull	56.0	36.0	20.1	47.9	34.3	13.6	40.8	0.65
Newcastle ..	52.0	35.0	17.9	49.0	38.0	8.0	41.7	0.66
Edinburgh ..	50.7	31.0	19.7	..	..	..	40.3	0.40
Glasgow ..	49.5	32.1	17.4	..	..	..	39.8	0.80
Dundee	47.0	32.0	15.0	..	..	..	38.3	0.65
Aberdeen ..	48.6	29.7	18.9	..	..	..	39.2	0.77
Paisley	50.0	32.5	17.5	..	..	..	42.3	1.30
Greenock ..	48.0	36.0	12.0	..	..	..	41.1	1.62
Leith	47.2	30.8	29.1	..	..	..	40.0	0.17
Perth	49.0	31.0	18.0	..	..	..	40.7	0.83
Dublin	57.2	32.0	25.2	..	..	..	42.7	0.46

JAMES GLAISHER.

Notices to Correspondents.

Arched Trellis: *T. H. Johnson*. There is a very fine arched wire trellis at Welbeck, Notts, the seat of the Duke of Portland, beautifully covered with Pears, &c, Mr. Tillery will perhaps state his experience of it.

Beet: *Wordsley*. Dell's Beet was catalogued last spring by Messrs. Veitch. We know nothing of the other, which is probably a kind selected by the grower. They are sown in spring as for the kitchen garden.

Chloralum: *E. A. S.* This fluid is patented by the company whose address is 1, Great Winchester Street, E.C.

Everlastings: *T. Battersly*. The four modern varieties of Helichrysum bracteatum are amongst the finest of all everlasting flowers. Then there are the Waitzias, the Rhodanthes, and Helipterum, among out-door annuals; and various kinds of Gnaphalium among perennials. A few select grasses for bouquets are Pennisetum longistylum, Eragrostis abyssinia and elegans, Airopsis pulchella, Agrostis retrofracta and nebulosa, Avena sterilis, Briza maxima and gracilis, Lamarckia aurea, Panicum capillare and miliaceum, Phalaris minor, Setaria auricoma and macrochæta, all annuals, besides the universal favourite perennial, Stipa pennata, or Feather-grass.

Giant Puff-Ball: *Beta, Dover*. If you are quite sure about the Giant Puff-Ball, and take it in its young state, while it is white throughout, you may eat it with safety. It is of very delicate flavour. Articles on Edible Fungi have been given again and again in our columns, as you should know if so old a subscriber.

Gun Licenses: *T. J., Tunbridge Wells*, asks "if a license is required for a gun, to be used only in scaring birds, such as bullfinches, tomtits, sparrows, blackbirds, &c., from gardens." No, according to the following,

amongst other, exemptions :—"(4). By the occupier of any lands using or carrying a gun for the purpose only of scaring birds, or of killing vermin on such lands, or by any person using or carrying a gun for the purpose only of scaring birds, or of killing vermin on any lands by order of the occupier thereof, who shall have in force a license to kill game, or a license under this Act."

NAMES OF FRUITS: *J. Brown.* 1, Lemon Pippin; 2, Kilkenny Pearmain; 4, Old Colmar; 5, Passe Colmar; 6, most probably Beurré Diel. The scarlet-berried fruit is Physalis Alkekengi.—*J. Stephens.* Your Pear may be Easter Beurré.—*J. F. C.* King of the Pippins.

NAMES OF PLANTS: *Subscriber.* We cannot name plants without flowers.—*C. W. F.* Too fragmentary, but apparently Selaginella pilifera.

POINSETTIAS AND AZALEAS: *Subscriber, Marlow.* Poinsettias lose their leaves through some irregularity in their management; what this may be, in your case, we cannot answer without a full knowledge of the conditions under which they have been growing. Too cold a temperature, excessive bottom-heat, want of water, an excessive use of liquid manure, or sudden changes, are each prime causes of the loss which you deplore. Azaleas—presuming that you allude to the Indian varieties, which should never be permitted to produce suckers,—may receive an occasional watering with weak liquid guano, at the time they are either actively engaged in the production of flowers, or are making their season's growth; never water them with it at any other season, nor too quickly after they have been fresh potted.

RADISH: *W. H. P.* China Winter Radish, as sold by Messrs. Vilmorin, of Paris.

WATER LILIES: *K. E. C.* If the common white Water Lily is not to be found wild in your locality, apply to your nurseryman, who will collect it for you, if he does not keep a supply for sale. It may be planted any time during winter or spring. They only want to be planted in the muddy soil at the bottom of a pond, or for a tank may be sunk in boxes or pans of heavy soil. In either case, the thick fleshy rhizomes should be kept down by a heavy weight till they root into the soil, otherwise they will be apt to float.

COMMUNICATIONS RECEIVED:—J. C. N.—J. R.—C. R—C. McD—A. B—J. R. J.—J. McL—R. D.—E. N.—Constant Reader (see p. 1566).—G. H. (next week)—D. Y. R. R.—A. D.—Dr. B.—C. B.—D. T.—G. W.—J. T.—J. W.—F. E. C.—D. B.—C. R.—W. & Son.—Lymington.—C. S.—H. C.—B. S. W.—J. G.

Markets.

COVENT GARDEN.—Dec. 2.

We have nothing very encouraging to report, stocks being very heavy, and dealers generally buying short. An unusual quantity of English Pines is in the market, and some good examples from the Western Islands. There have been heavy consignments of good Oranges from the same place, and Spain and Portugal. Amongst flowers we have Orchids, Chrysanthemums, Heaths, Cyclamens, and a few Primulas.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	to 3 0	Oranges, per 100	6 0	to 10 0
Grapes, per lb.	3 0	— 6 0	Pears, per doz.	1 0	— 4 0
Lemons, per 100	6 0	— 10 0	Pine-apples, per lb.	4 0	— 6 0
Melons, each	1 0	— 3 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. lb.	0 2	to 0 4	Herbs, per bunch	0 2	to 0 4
Beet, per doz.	2 0	— 3 0	Horse-Radish, p. bun.	3 0	— 5 0
Brussels-sprouts, ½ sieve	3 0	— 3 6	Lettuces, p. score	1 6	— 3 0
Cabbages, p. doz.	1 0	— 1 6	Mint, per bunch	0 3	— 0 4
Carrots, p. bunch	0 4	— 0 8	Mushrooms, p. pott.	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch	0 4	— 0 9
Celery, red, p. bun.	1 6	— 2 0	Parsley, p. bunch	0 2	— 0 4
— white, do.	2 0	— 3 6	Salsafy, per bundle	1 0	— 1 6
Cucumbers, each	0 6	— 1 0	Scorzalla, p. pun	1 0	— 2 0
French Beans, p. 100	3 0	— 4 0	Shallots, per lb.	0 8	— ..
Garlic, per lb.	0 0	— ..	Spinach, p. bushel	2 0	— 3 0
			Tomatoes, per doz.	1 0	— 1 6

Potatos, Regents, per ton, 60s. to 80s.; Kidneys, 50s. to 120s.; Rocks, 50s. to 60s.

New Soft Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready, and contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest price consistent with quality and correctness. See List, and present quotations.

New Florist's Flower and Florist's Flower Seed Merchant, Woolwich.

SUTTONS' MAMMOTH LONG RED MANGEL at the BIRMINGHAM ROOT SHOW, 1870.

This improved variety introduced by Messrs SUTTON AND SONS four years ago has again been awarded the FIRST PRIZE (as also the Second) at the above great Show, making the third consecutive year it has beaten all competitors.

Specimens may be seen in Messrs SUTTONS' Stand, No. 79, Smithfield Club Show; or,

Royal Berks Seed Establishment, Reading.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply the following for cash.—Tree Fencing SEAKALE, 10s per 100; second size, 5s; third size, 2s. ASPARAGUS, 3 years old, 3s per 100; 2 years, 2s; cheaper per 1000. RED DUTCH PICKLING CABBAGE Plants, 5s. per 1000; and FAST HAM and DWARF YORK Plants, 3s. 6d. p. 1000

SUTTONS' RED-SKIN FLOURBALL POTATO.

For cash and exceedingly heaviest cropping late variety

SUTTON & SONS are now prepared to receive orders for the above splendid Potato, pronounced by all who have tried it to be the best late variety ever introduced

From Mr. J. BIRD, *Gardener to* H. D. BARCLAY, Esq., *Eastwick Park*.

Nov. 10, 1870.—"From one peck of your Red-skinned Flourball I have grown five sacks and a peck, many of the Potatos weighing over 2 lb."

Orders executed strictly in rotation. Price 5s. per peck.

SUTTON AND SONS, Seed Growers, Reading.

Early Seed Potatos.

FOR SALE, a quantity of PRINCE of WALES EARLY RED GARDENEY POTATO.—Excellent cropper and good flavour, grown upon old sandy pasture land, earlier by fourteen days than the well-known Mona's Pride Potato; will stand early planting, and not liable to perish in the bud, like many of the early varieties.

Apply to GARDENER, Villa Marina, Douglas, Isle of Man.

The most Desirable Plant of the Season.

PARSONS' NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA. See previous Advertisement

AGENTS—ENGLAND.

Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
" Wood & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith.
" Thomas Dawson & Co., Liverpool.
" A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, King's Road, Chelsea,
" B. Nairn & Son, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
" Butler, McCulloch & Co., Covent Garden, London.
" G. Gibbs & Co., Down Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London.
" Downie, Laird & Laing, London and Edinburgh.
" P. Lawson & Son, 20, Budge Row, London.
" Rutley & Silverlock, London.
" Dick Radclyffe & Co., 103, High Holborn, London, W.C.
" Fisher, Holmes & Co., Handsworth Nurseries, Sheffield.
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., 238, High Holborn, London, W.C.
" Miner, Nash & Nash, 60, Strand, London, W.C.
" Child & Lormer, 40, Darley Street, Bradford.
" H. Clarke & Sons, 89, King Street, Covent Garden, W.C.
" Dickson, Brown & Tait, Corporation Street, Manchester.
" J. C. Wheeler & Son, Gloucester.
" J. Wrench & Co., London Place, E.
" Harrison & Sons, Market Place, Leicester.

Mr. George Tredgett, Cambridge
" L. S. Woodthorpe, Sible Hedingham, Essex.
" G. Hinxman, Fareham
" B. Bracher, Halifax, Yorkshire.
" W. Knight, Hailsham, Sussex.
" Timothy Brigden, South-Eastern Railway Station.
" W. Paul, London.
" E. Holmes, Whittington Nursery, near Lichfield.
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire
" B. S. Williams, Upper Holloway, London.
" E. Cooling, Bedale.
" James Wood, Newport, Isle of Wight.
" H. Watkinson, 6, Market Place, Manchester.
" R. Cooper, 152, Fleet Street, London, E.C.
" J. Fraser, Lea Bridge Road Nurseries, London, E.
" R. Smith, St. John's, Worcester
" John Scott, The Seed Stores, Yeovil.

Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow
" P. Lawson & Son, Edinburgh.
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling.
" J. & R. Thyne, 60, Buchanan Street, Glasgow
" Dickson & Turnbull, 26, George Street, Perth.

Mr. James Cocker, Aberdeen.

IRELAND.

Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin
Mr. J. W. Mackey, 40, Westmoreland Street, Dublin.

BELGIUM.

Mons. Louis Van Houtte, Ghent.

PRUSSIA.

Messrs. Platz & Son, Erfurt.
" Ferdinand Juhlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

AMERICA.

Messrs. B. K. Bliss & Sons, New York.

PARSONS' NEW HYBRID TREE MIGNONETTE, in packets of 1s per ounce, price on application.

PARSONS' superior PRIMULA,
" " CALCEOLARIA,
" " CINERARIA,

saved from the finest strains in cultivation, 2s. 6d. per packet.

F. P. has a first-rate collection of FRUIT TREES, both Trained and Pyramids, of which he solicits an inspection. Warranted true to name. Also a splendid collection of ROSES, including all the first varieties. PAMPHLETS, &c., on application. CATALOGUES and prices of which may be had on application.

F. PARSONS, Nurseryman, Seedsman, and Florist, 27 and 28, Western Road, Brighton Nurseries, Hassock's Gate, Keymer, Hurstpierpoint

To the Trade Only.

STANDARD ROSES—STANDARD ROSES.

JOHN PERKINS, SEN., begs to offer the following, which consist of the leading varieties—Standards, 3 to 5 feet stems, extra fine heads, 70s. per 100; Half ditto, 2 to 3 feet stems, extra fine heads, 55s. per 100. All communications to be particularly addressed, 52, Market Square, Northampton.

JOHN FRASER, of the Lea Bridge Road Nurseries, E., begs to announce that he can now offer unusually fine healthy Plants of TREE CARNATIONS, and many varieties of Winter-flowering HEATH, for conservatory decoration. It may be remarked that Heaths are well adapted for the decoration of the dinner-table.

Prices on application.

To the Seed Trade.—New Californian Annuals.

W. THOMPSON, SEEDSMAN, Tavern Street, Ipswich, has received from California his descriptive Wholesale LIST of NOVELTIES, including the splendid Leptosiphon roseus, Godetia Whitneyi, Collinsia bicolor, Clarkia pulchella, Eschscholtzia crocea, Helenium grandiflorum, and other choice seeds, is now ready, and may be had on application.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that he is now sending out the above beautiful APPLE. An illustration of it, and a description by Dr. Hogg, is given in the "Florist and Pomologist" for March, 1870, in which he says that it is "Destined and worthy to take its place amongst the worthiest of its kind." Dwarf maiden trees, 7s. 6d. each

Nurseries, &c., at Tunbridge Wells.

Surplus Stock of

ALBERT, VICTORIA, and LINNÆUS RHUBARB, FASTOLF RASPBERRIES, strong SEAKALE, SKIMMIA JAPONICA, CLEMATIS LANUGINOSA, VIRGINIAN CREEPER, and PYRACANTUS, to be sold cheap.

INNAN DAVIES, Nursery, Penmark.

Notice to the Seed Trade.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce that his SPECIAL LIST of GARDEN and AGRICULTURAL SEEDS for the present season is ready, and can be had upon application. Samples and stocks are very fine, and prices very low

BROCCOLI, ELLETSON'S NEW SURPRISE, large late white protecting.—This variety is a great improvement upon the Mammoth Cauliflower Broccoli, sent out 20 years ago by J. & J. Elletson, Chester. It has given universal satisfaction, and proved itself to be the best late white Broccoli extant. Price 1s. per packet

CUCUMBER, FOSTER'S X.L., fine long Ridge.—This new variety is a remarkably fine, hardy, long, dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. Price 1s. per packet.

MELON, LORD NAPIER, New.—A handsome exhibition variety, golden yellow, and beautifully netted; green-flesh, melting, juicy, and delicious in flavour; free setter, and hardy in constitution. Price 1s. 6d. per packet.

EDMUND PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street, Hull.

BIRD'S "KING of the CUCUMBERS."—The best for exhibition. Length 24 to 30 inches. White spine, handsome fruit, short neck or handle. Price 2s. 6d. per packet.

BIRD'S "QUEEN of MELONS."—The best green-fleshed Melon, handsomely netted, fine flavour. Average weight, 5 lb. Price 1s. 6d. per packet. May be had in all the Royal Trade seed of

JAMES BIRD, Nursery man and Seedsman, Downham Market.

Carnations, Picotees, and Pinks.

J. BOOTH, FLORIST, Pole Lane, Failsworth, near Manchester, is now offering the above, in all the best named Show varieties. Trade supplied. CATALOGUES now ready.

CYCLAMEN PERSICUM, in 48-size pots, just coming into beautiful bloom, in a variety of colours; 12s. per doz. These are fine plants, and will continue flowering during the winter months.

CHINESE PRIMULAS, in splendid bloom, Fern-leaf and others, of the richest colours and finest fringed flowers, unsurpassed by any strain in cultivation; 9d. and 1s. per dozen.

BRITISH QUEEN STRAWBERRY—Plants strong and true, 2s. 6d. per 100; 20s. per 1000. Terms cash

ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants

TWO NEW PEAS for 1871.—EASTES' KENTISH INVICTA, the earliest round blue Pea. MACLEAN'S "BEST of ALL," splendid large wrinkled Marrow.

Trade prices and descriptions on application to

SUTTON AND SONS, Seed Growers, Reading.

To the Trade.—Red-skin Flourball Potato.

WATTS AND SON invite the attention of Seedsmen to their stock of this very remarkable Potato, which is destined to become the leading winter variety, and which only requires to become known to be universally grown.

Purchasers can have fine specimens for Show.

Price on application.

WATTS AND SON, Florists, Seedsmen, &c., 56, Gold Street, Northampton.

CHARLES TURNER can strongly recommend the following NEW CUCUMBER and MELON, as possessing great merit:—

CUCUMBER, BLUE GOWN, raised by Mr. Lockie, Court Gardens, Marlow, has been most successfully exhibited during the last two seasons, both in London and the Provinces. It has been awarded Nine First Prizes, and Three First-Class Certificates, and most favourably spoken of in the various garden periodicals.

The *Gardeners' Chronicle*, in its issue of 1869, says:—"Mr. Turner, of Slough, sent a box containing three remarkably handsome fruit of Blue Gown Cucumber, each measuring upwards of 20 inches long, of a uniform thickness throughout, nearly curved with a beautiful bloom, and small black spine. This is the same variety that was shown in such fine condition on a former occasion, and proved to be of excellent flavour, and was awarded a First-Class Certificate."

The same journal, for September 24, 1870, says:—"Mr. Turner's Blue Gown is a black-tipped spine, very handsome, and has, as yet, carried everything before it." Price per packet, 2s. 6d.

MELON, GREEN GEM, raised by Mr. Jupp, Barnham Castle. This fine-flavoured and superior variety will become, and remain, as great a favourite as Scarlet Gem, sent out by Charles Turner. The flesh is melting, rich, and refreshing, very pleasing to the palate, and has a very thin skin. 2s. 6d. per packet.

The Royal Nurseries, Slough.

Notice.

KINAHAN'S LL. WHISKY DEPOT.—KINAHAN AND CO. have REMOVED to their new and spacious Premises, No. 64, GREAT TITCHFIELD STREET, OXFORD STREET, leading from Margaret Street, Regent Street, and Market Street, Oxford Street.

KINAHAN'S LL. WHISKY.—This famous and most delicious old mellow Spirit is the very

CREAM of IRISH WHISKIES,

in quality unrivalled, perfectly pure, and more wholesome than the finest Cognac Brandy.

Can be obtained all over the Kingdom, in the well known sealed and labelled bottles, or in bond for exportation at the Lond n Docks. Wholesale Agents to Messrs. BASS, GUINNESS AND YOUNGER, and Dealers in Foreign Wines and Spirits.

Grateful—Comforting.

EPPS'S COCOA.

BREAKFAST.

Each packet is labelled

JAMES EPPS AND CO., Homœopathic Chemists, London

Also Makers of the Homœopathic Cocoa or Evening Chocolate.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 10,000 for 35s.; cash on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

SHAW'S TIFFANY.

For Samples and Prices apply to

J. SHAW AND CO., 20, Oxford Street, Manchester.

RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application.

JAS. ANDERSON, 7, Commercial Street, Shoreditch, London.

E. T. ARCHER'S "FRIGI DOMO."—Patronised and used for Frogmore and Kew Gardens. It is made entirely of prepared wool, and a perfect non-conductor of heat or cold where it is applied

PROTECTION AGAINST FROST.

WOOL NETTING, 2 yards wide and 1s. 6d. per yard.

"FRIGI DOMO" CANVAS

Two yards wide	.. ..	1s. 6d. per yard.
Three yards wide	.. ..	2s. 8d. per yard.
Four yards wide	.. ..	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 5l.; 40 inches wide, 40 yards long, 2l. 8s.; 30 inches wide, 30 yards long, 1l. 12s.; 18 inches wide, 18 yards long, 18s.; 9 inches wide, 9 yards long, 6s. 6d. per piece.

SCRIM CANVAS, 72 inches wide, 70 yards long, 5l.; 40 inches wide, 40 yards long, 2l. 8s.; 30 inches wide, 30 yards long, 1l. 12s.; 18 inches wide, 18 yards long, 18s.; 9 inches wide, 9 yards long, 6s. 6d. per piece.

HESSIAN CANVAS, 40 inches wide, 40 yards long, 2l. 8s.; 30 inches wide, 30 yards long, 1l. 12s.; 18 inches wide, 18 yards long, 18s.; 9 inches wide, 9 yards long, 6s. 6d. per piece.

HESSIAN CANVAS, do., do., 54 and 72 inches wide, 6½d. and 8½d. per yard.

"FRIGI DOMO" CANVAS

Two yards wide	.. ..	1s. 6d. per yard.
Three yards wide	.. ..	2s. 8d. per yard.
Four yards wide	.. ..	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 5l.; 40 inches wide, 40 yards long, 2l. 8s.; 30 inches wide, 30 yards long, 1l. 12s.; 18 inches wide, 18 yards long, 18s.; 9 inches wide, 9 yards long, 6s. 6d. per piece.

HESSIAN CANVAS, do., do., 54 and 72 inches wide, 6½d. and 8½d. per yard.

ELISHA THOMAS ARCHER, Sole Maker, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen.

E. AND F. CROOK'S POULTRY APPLIANCES, of every description, as supplied to Her Majesty, the Nobility, Gentry, Amateurs, &c., at Farmers, &c., at Fairs.

An extensive selection of Poultry Appliances will be EXHIBITED at the CRYSTAL PALACE, during the Great Poultry and Pigeon Show on 7th, 8th, 9th, and 10th.

Amongst other Novelties will be the New Patent Machine for Cramming Poultry for the Markets, at the rate of 250 per hour.

5, Carnaby Street, Regent Street, London, W.

WANTED, an active GARDENER, to take the HALF-SHARE in a small Nursery, Florist and Jobbing business in Islington. Lease 4½ years. £50 cash required.—G. R., 12, Rotherfield Street, Islington, N.

WANTED, a respectable young Man as IMPROVER, in an establishment where the usual work of a large Garden is carried on. A Premium expected.—Direct to B., Mr. J. May, Seedsman, 35, Brydges Street, Covent Garden, W.C.

Northampton General Infirmary.

WANTED, as LODGE PORTER and MANAGER of Kitchen and House GARDEN, a steady, respectable Man, who will also make himself generally useful. He must be married, but without family at home. Age not under 30. Wages, of the whole charge of the Garden he undertakes, £1 a week, if not, 16s., with house, coals, and gas. Written applications, stating age, and accompanied by testimonials as to qualifications and character, to be sent, not later than Thursday, December 8, to the House Surgeon, at the Infirmary. N.B. As the office is one of great responsibility, no attention will be paid to testimonials which are not of the very highest character.

WANTED, a steady, respectable young Man as UNDER GARDENER, with some knowledge of Forcing preferred. State references, age, and wages required, to Mr. GOLDSMITH, Polesden Lacey, Dorking, Surrey.

WANTED, a good NURSERY HAND, who understands Propagating and Growing Plants for Market, and Planting, &c. None need apply who cannot get good testimonials from late employer.—Apply to H. CLARK, Manor Road, Wallington, Surrey

WANT PLACES.—Letters to be Post Paid.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unexceptionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely upon J. CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W recommending only those whose conduct and abilities are worthy of their trust

Victoria and Paradise Nurseries, Upper Holloway, London, N.W.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St John's Wood, N.W.

JOSEPH MEREDITH, The Vineyard, Garston, Liverpool, begs to inform Noblemen and Gentlemen that he has several GARDENERS, of First-class Certificates, requiring Situations, who he will be happy to recommend.

GARDENER (HEAD), age 36, married, one child.—WILLIAM EARLEY is now at liberty to engage with any Nobleman or Gentleman requiring the services of a first class practical Gardener, who has had extensive experience in every department connected with Modern Horticulture; he has 13 years' excellent character from his late employer, who is anxious to procure him a permanent situation

To save trouble, a first-class place only treated with.—W. EARLEY, Managing New Garden Works, Valentines, Ilford, E.

GARDENER (HEAD), age 32; married.—THOMAS TURNER, late Gardener to E. T. Simpson, Esq., of Walton, near Wakefield, is open to engage with any Nobleman or Gentleman requiring the services of a thorough practical Man. First-class growers of Fruit and specimen Plants, of which he has been a most successful exhibitor. Highest references from Mr C. Turner, Royal Nurseries, Slough; Mr Wills, F.R.H.S., Chelsea; also Mr. Scammell, Gr. to the Marquis of Lansdowne, Bowood, Calne, Wilts; Mr. Edgington, Gr. to the Countess Waldegrave, Strawberry Hill, where he has lived respectively as Foreman three years.—Ashburnham Nurseries, Chelsea, S.W.

GARDENER (HEAD), where two or more are kept. Thoroughly understands all kinds of Early and Late Forcing, the cultivation of Stove and Greenhouse Plants, Orchids, &c, and the usual routine of Flower and Kitchen Gardening. Character will bear the strictest investigation.—R. BUCKINGHAM, The Rookery, Downe, Beckenham, Kent.

GARDENER (HEAD).—Age 30, married; fully competent in every branch of the profession, including Specimen Plant growing. Can be highly recommended, with three and a half years' unexceptionable character.—A. B., Brook Street Post Office, Clapton, London, E.

GARDENER (HEAD).—Age 29, no incumbrance; fully competent; unexceptionable reference.—S. R., Mr. S. Randall, West of England Seed Establishment, Exeter.

GARDENER (HEAD).—Age 34, married; thoroughly understands Early and Late Forcing of all kinds of Fruits, Flowers and Vegetables, Plant and Flower Gardening, &c. Good Character.—J. KICH, Shalmar Gardens, Acton, W.

To Noblemen and Gentlemen.

GARDENER (HEAD), age 30, married, two children.—HENRY CLARK, over three Years Head Gardener to Earl Cowper, is now at liberty to engage with any Nobleman or Gentleman requiring a thorough practical Gardener. Leaving on account of this Establishment breaking up.—HENRY CLARK, The Gardens, Brocket Hall, Welwyn, Herts.

GARDENER (HEAD), where two or three are kept.—Married, no children; Scotchman; thoroughly understands the profession in all its branches. First-class references.—A. B. C., Post Office, Leatherhead, Surrey.

GARDENER and STEWARD, or GARDENER.—A thoroughly competent, practical, and respectable Man, who has had unusually favourable opportunities of forming an extensive acquaintance with the most approved methods of cultivating the most select varieties of Fruits, Flowers, Vegetables, Ornamental Planting, and Horticultural Buildings suitable for every purpose, and the cheapest Market for the supply of the same, is desirous of an eligible situation.—J. N. L., 30, Stanford Road, King's Road, Chelsea, S.W.

BAILIFF.—Married, no family; thoroughly understands the Management of a Farm and Woods. Buying and Selling. Can take charge of Cows and Poultry. Good references.—Mr. STEVENSON, Wood Park, Bromsgrove, Worcestershire.

FARM BAILIFF to a Nobleman or Gentleman.—Age 25; a Farmer's Son (Cumberland), well understands the profession; has been on own farm all his life, and wants a change. Understands Farming, and all its branches. Good reference.—J. F., Mr. Owen, Advertising Agent, 5, Bartholomew Close, London, E.C.

FARM BAILIFF, or to Manage a Gentleman's Estate.—Middle-aged, married, no family; respectable; thoroughly understands his business. Wife can manage Dairy and Poultry. Good character.—G. O., Mr. Dugood, Queen's Secdsman, Southampton

LAND AGENCY.—A Gentleman of experience and capital is open for Re-engagement.—R. BELL, Post Office, Wingate, County Durham.

To Nurserymen.

GRAFTER (under Glass). Is very successful with Roses, Rhododendrons, Camellias, &c; and thoroughly understands the Propagation of conifers, shrubs, &c. Five and three quarter years' good character.—H. G., Mrs. Smith, 5, East Street, Bridgwater.

IMPROVER, in a Wholesale or Retail Seed Warehouse.—Age 20; 3 years' reference. Salary immaterial.—ALPHA, Post Office, Gloucester.

To the Nursery and Seed Trade.

BOOK-KEEPER, CASHIER, &c., or in any position where a good general knowledge of the Trade, and strict attention to business is required. Age 30; a first-class London house. Unexceptionable references.—M. C., 223, Girlington Road, Bradford, Yorkshire.

SHOPMAN.—Eight years' practical experience in the Seed Trade, Wholesale and Retail. Good reference.—A. B., *Gardeners' Chronicle* Office, W.C.

SHOPMAN, or ASSISTANT. Age 29; twelve years in the seed Trade.—J. G., Post Office, Heath, near Wakefield

SHOPMAN.—Age 23; is open to an engagement. Seven years' experience.—J. T., Post Office, Perth, N.B.

Seed Trade.

COMMISSION WANTED. An energetic Man, who travels the whole of Ireland, desires Seeds on Commission from a first-class House. The Advertiser has a few Commissions from some of the best houses in England in other lines, and is anxious to add to those the Seed Trade, which would work well with them as he is thoroughly acquainted with the Seed Trade, and all matters incidental to it. Knows every man in the trade in Ireland. Has a first-rate connection, having been many years on the road for the best houses in Ireland. Can procure the highest testimonials and give security to a large amount if necessary.—A. C. D., 36, Lower Gloucester Street, Dublin

WM. ABRAHAM, HORTICULTURAL AUCTIONEER, VALUER, &c., Goldworth Nurseries (late R. Donald's), Woking, Surrey.

SALES and VALUATIONS carefully and promptly conducted.

Fruit Farming Company (Limited).

GARDENS and LAND WANTED. The Managing Director is now in a position to treat for the Rental of Gardens or Land for the Company. All offers to be made without delay. Gardens or Land within a circuit of 50 miles of London will be preferred.—Offices:

Mr WM. EDGECUMBE RENDLE, Fruit Farming Company, 68, Welbeck Street, Cavendish Square, London, W.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice

Park Fencing undertaken to any extent.

N.B. Plans and Designs for Horticultural Buildings, &c, &c.

Woodlands Nursery, Maresfield, near Uckfield, Sussex.

MR. JAMES FRASER (of the late Firm of J. & I. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c—Maylands Farm, Romford, Essex, E.

Nursery and Seed Business to be Disposed of.

AN excellent and old established NURSERYMAN and SEEDSMAN's Business to be DISPOSED OF, in consequence of the death of the late Proprietor

The Stock will be found suitable in every respect for the requirements of the Business, and may be taken at a valuation (estimated at present prices), and the terms of payment can be arranged to suit the convenience of the purchaser.

The Nursery Grounds are situated within an easy distance from a flourishing and increasing Market Town, and the business is capable of great extension

Apply by letter to Messrs NUTTING AND SONS, Seed Warehousers, Bedford Square, London, E.C.

WANTED, to RENT, about ONE ACRE of GARDEN GROUND, with a few Hothouses adjoining, suitable for a Florist and Jobbing Business.

Apply to V. S., The Gardens, Pymme's Park, Edmonton, N.

To Nurserymen, Florists, and Others.

TO BE SOLD, The PORTLAND NURSERY, at Tunbridge, Kent, containing 6½ acres, of which about 2 acre are stocked with Conifers, Forest and Ornamental Trees, and Shrubs, on a 13 years' lease, with a House and Cottage, &c., at the low rent of £80 a year. Stock to be taken by valuation—from £200 to £300.

For particulars apply to Messrs. STONEWALL AND SIMPSON, Solicitors, Tunbridge Wells.

FOR SALE, an old established NURSERY and SEED BUSINESS, within a few miles of London, containing about 14 Acres of General Nursery Stock, numerous Glass Structures, Seed Shop, Dwelling House, &c.

For particulars apply, by letter only, to G. H. H. C., 47, Bessborough Gardens, Pimlico, S.W.

SALES BY AUCTION.

Colney Hatch, N.

CLEARANCE SALE of VALUABLE NURSERY STOCK

MESSRS. PROTHEROE and MORRIS will SELL by AUCTION, on the Premises, adjoining the Clockmaker's Almshouses, Colney Hatch, Middlesex, on MONDAY NEXT, at 12 o'clock precisely, under instructions from the Proprietor, without reserve, the land being required at once for building purposes), the whole of the valuable NURSERY STOCK, consisting of a varied assortment of Evergreen and Deciduous Shrubs, Forest and Ornamental Trees, a choice assortment of Standard and Dwarf Roses, strong Climbing Roses, selected Fruit Trees, &c

Now in view. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

Rugby.

HIGHLY IMPORTANT SALE of SPECIMEN CONIFERÆ and EVERGREENS in VARIETY.

MESSRS. PROTHEROE AND MORRIS are instructed by Mr. W. Bryant (successor to the late Mr. G. Lindley) to SELL by AUCTION, on the Premises, The Rugby Nursery, Rugby, Warwickshire, on TUESDAY, December 6, at 11 for 12 o'clock precisely, a quantity of surplus NURSERY STOCK, comprising almost every variety of magnificent specimen CONIFERÆ, which for symmetrical form and beauty cannot be surpassed. The plants range from 6 to 15 feet, and are all in excellent condition for removal, the whole of them having been carefully prepared. The stock also includes handsome specimen Wellingtonia gigantea, 6 to 8 feet; beautiful furnished Picea Nordmanna, 6 to 7 feet; fine Cedrus Deodara, 8 to 15 feet; some unusually fine Araucaria imbricata, Cupressus Lawsoniana, Thujopsis borealis, Taxodium sempervirens, Abies Morinda, choice Thujas, Pinus, and Abies, of sorts; and numerous others. Also a large quantity of Standard and Dwarf specimen Evergreen shrubs, viz., bushy Portugal Laurels, Hollies, Box, Phillyreas, &c; Forest, Ornamental, and Deciduous Trees, Roses, &c.

On view the day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, N.E.

N.B. Purchasers of specimen Conifers are particularly invited to inspect the stock, as a seldom occurs that a collection of such magnitude and value is offered for sale by Auction

Leamington.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, fine CAMELLIAS and AZALEA INDICA, CHOICE FERNS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. W. Wills & Son to SELL by AUCTION, on the Premises, "The Home Nursery" (known as the Milverton Nursery), Leamington, on TUESDAY and WEDNESDAY, December 20 and 21, at 11 for 12 o'Clock precisely each day, without reserve (the land being required immediately for building purposes), the whole of the thriving NURSERY STOCK, consisting of a choice and varied assortment of Evergreen and Coniferæ Shrubs, comprising fine Bush pyramidal Portugal Laurels, Hollies, Yews, Box, Phillyreas, variegated and named Hollies, unique specimen trimmed Box, Rhododendrons, Spruce Firs, Standard and Dwarf Roses, large quantities of fine Standard and Dwarf Bedding, and other Fruiting Pear Trees; also some handsome specimen Camellias and Azalea indica, choice Exotic Ferns, &c.

May be viewed the day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY NEXT, at half-past 12 o'Clock precisely, FORTY LOTS of FINE FANCY CARRIERS, from Mr. Pryor, comprising Blacks, Duns, Blues, and Whites, including many promising young Birds; Almonds, Runts, Baldheads, and other Birds, from Mr Wood-house; the surplus stock of Pouters from Mrs Evans, of Lambeth; and a variety of other choice Poultry and Pigeons from the yards and lofts of well-known breeders and exhibitors.

On view the morning of Sale, and Catalogues had.

Tansley Nursery Grounds, near Matlock, Derbyshire.

To GENTLEMEN, NURSERYMEN, and OTHERS

IMPORTANT SALE of NURSERY STOCK.

MESSRS. ELSE AND NEWBOLD have been favoured with instructions, from Mr. Joseph Smith, Jun., of Moor Edge Nurseries, to SELL by AUCTION, without reserve, on MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, the 12th, 13th, 14th, 15th, and following days, if necessary, until disposed of, an extensive assortment of transplanted FOREST TREES and SEEDLINGS, choice EVERGREENS, flowering SHRUBS, &c., which must be cleared off before March 20 next.

The above Nurseries are two miles from Matlock Bridge, and four from Matlock Bath on the Midland Railway), at both of which stations conveyances are at hand.

Descriptive Catalogues may be had ten days prior to the Sale; and further information obtained of Mr. JOSEPH SMITH, at the Moor Edge Nurseries, Tansley, near Matlock; of Mr STEPHEN SMITH, of the same address; or at the offices of the Auctioneers, Matlock Bridge.

Seeds Direct from the Growers,

THE BEST MEANS OF PREVENTING DISAPPOINTMENT.

SUTTONS' SELECTED STOCKS of FARM SEEDS.

SMITHFIELD CLUB CATTLE SHOW.

STAND 79

SUTTON AND SONS invite the attention of Visitors to their extensive Display of AGRICULTURAL PRODUCE, including very fine specimens of their improved varieties of MANGEL WURZEL, CHAMPION SWEDE, TURNIPS, KOHL RABI, CARROTS, POTATOS, GRASS SEEDS for Permanent Pasture and other purposes.

Orders will be received and descriptive Catalogues may be obtained at the stand, or post free on application.

All goods carriage free (except very small parcels); 5 per cent. allowed for each payment.

SUTTON AND SONS, Seedsmen to the Queen, Reading, Berks.

To the Trade.

TURNIP and SWEDE SEED.—A few small lots, of extra fine quality, to be Sold cheap, for cash.

Apply to C. L., *Gardeners' Chronicle* Office, London, W.C.

SEED POTATOS.—PATERSON'S VICTORIA and GRYFFE CASTLE. About 6 tons fine seed of each to offer, price £5 per ton

W. JACKSON, Blakedown Nursery, Kidderminster.

To the Trade.—Agricultural and Garden Seeds.

HAND F. SHARPE are now prepared to make a special offer of the above Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from adulteration of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech

Smithfield Club Cattle Show, Dec. 5, 6, 7, 8, and 9, 1870.

STAND No. 78.

JOHN K. KING will exhibit Field Specimens of his unrivalled Prize Stocks of MANGEL WURZEL, SWEDES, TURNIPS, KOHL RABI, &c., &c.

Orders received at the above Stand for these Prize Stocks at very reasonable prices.

Smithfield and Birmingham Cattle Shows.

PLANS of LABOURERS' COTTAGES.

THE ROYAL AGRICULTURAL SOCIETY'S and MANCHESTER PRIZE PLANS will be exhibited at the Stands of Messrs. AMIES, HARFORD, AND CO., of Peterborough, who supply two complete Lithographic Working Drawings, and full Printed Specifications, price £2 2s.; or, apply to the Exhibitor, Mr JAMES MARTIN, Wansford, Lincolnshire.

CENTRAL CHAMBER of AGRICULTURE, ANNUAL MEETING

The GENERAL BUSINESS COMMITTEE will meet at the Salisbury Hotel, Fleet Street, on WEDNESDAY, December 7, at 1 o'clock

Same day, at 2 o'Clock, MEETING of the COUNCIL, consisting of the Deputed Members from Provincial Chambers, and the 26 Elected Members of the Central Chamber.

Same day at 3 o'Clock, or when the business of the Council is concluded, ANNUAL MEETING of the Subscription Members of the Central Chamber.

AGENDA.

To receive the Report of the Council

To elect a Vice Chairman for the year 1871.

To elect Eight Members of the Central Chamber to be Members of Council, in lieu of the following, who retire by rotation, but are eligible for re-election:—Mr Thomas Willson, Mr H. Genge Andrews, Mr William Bridges, Mr. Thomas Hilley, junr, Mr James Howard, M.P., the Earl of Lichfield, Colonel Tomline, M.P., Mr. James Webb.

To appoint Auditors

Mr. Daniel Long will propose the following as a new Rule:—"That a subscription of £20 shall constitute any person a perpetual honorary member of the Central Council, entitled to speak and vote at all its meetings, but no travelling expenses of such perpetual honorary member to be allowed."

Mr. R. Jasper More will propose, and Captain P. G. Craigie will second the following as a new Rule:—"That the March meeting of the Council shall extend over more than one day."

Mr. Thomas Willson will move as a new Rule:—"That the Business Committee comprise one Member from each Provincial Chamber, in addition to the elected Members of Council of the Central Chamber."

To consider amendments of the Laws and Constitution, and Bye-laws, to be recommended by the Council.

And other Business

JOHN ALGERNON CLARKE, Secretary.

The Salisbury Hotel, Fleet Street, E.C.

The Agricultural Gazette.

SATURDAY, DECEMBER 3, 1870.

MEETINGS FOR THE ENSUING WEEK.

Dec. 5 to Dec. 9 — Great Show of Smithfield Club, at the Agricultural Hall, Islington.

Dec. 5 — London Farmers' Club (Mr. Trask on Size of Farms), at the Salisbury Hotel—6 P.M.

Dec. 6 — Smithfield Club (General Meeting), at the Agricultural Hall, Islington—Noon.
London Farmers' Club (General Meeting), at the Salisbury Hotel—3.30 P.M.

Dec. 7 — English Agricultural Society (Council Meeting)—Noon.
Central Chamber of Agriculture (General Meeting), at the Salisbury Hotel—1 P.M.
Society of Arts (Mr. H. M. Jenkins on American Dairy Cooperation)—8 P.M.

Dec. 8—Agricultural Society of England (General Meeting)—Noon.

THE annual show of the Smithfield Club, and meetings of agricultural interest connected with other societies, will draw many from the country into town next week. Those of them who are members or exhibitors at the Smithfield Show will have access to the Agricultural Hall, Islington, at 9 A.M. on Monday, to see the judging of the various classes; and the general public will have access at 2 P.M., or sooner if the awards have been made—the entrance fee being 5*s.* then, and 1*s.* during the rest of the week.—On Monday, at 6 P.M., Mr. TRASK reads a paper on the Size of Farms before the London Farmers' Club, at 6 P.M., in the Salisbury Hotel.—On Tuesday the general meetings of the Smithfield Club and London

Farmers' Club are held. — On Wednesday Council meetings of the English Agricultural Society and of the Central Chamber of Agriculture take place; and the general meeting of the Associated Chambers is held at 3.30, at the Salisbury Hotel, on the same day. At 8 P.M. on Wednesday, Mr. H. M. JENKINS, Secretary and Editor of the Royal Agricultural Society of England, will read a paper on the Principle of Co-operation as applied to Agriculture, especially with reference to the American dairy factory system.—On Thursday the English Agricultural Society holds its general meeting, at noon. The Smithfield Club Cattle Show remains open till Friday evening.

"CAN'T the gentlemen who undertake to instruct us, point out the right manure for laying down this heavy land to grass?" So said a landowner to us, who farms in the Weald of Sussex, and has laid down some clay with tolerable success, after much perseverance, and a lavish use of manure. He finds that pasture pays best on heavy land, but it can only be obtained *de novo*, that is, out of a stiff arable field, by main force of manure. When once obtained, the turf can be supported with comparative ease, because manures come into use which would be thrown away on the cold, unclothed soil. Bones, finely crushed, in dressings of 2 tons [!] per acre, mixed with 3 or 4 cwt. per acre of superphosphate, and applied in February, are found to be remarkably renovating to the old turf. Wood ashes, plentiful in a wooded tract at 36*s.* per 100 bush., are an excellent spring dressing, and when once a turf is obtained it can be made the means of its own support and improvement by the oilcake fed on it.

We witnessed the process of laying-down in several stages; the youngest grass was sown on land fallowed for the purpose, and levelled by ploughing it as a last operation with a turnwrest plough. The seeds had been sown on September 1, which is not too late in this sheltered and mild district. This year, however, the dry season had been trying, and the young plants were weak, except on the south side of the field, where a hedge had sheltered them from the sun. Generally speaking the field was only yellowish, not green, as it would have been if the bare ground had been covered. It had been made friable and perfectly clean by the bare fallow, and was altogether as kindly for grass as its nature would allow. A main point in laying down any kind of land is to have it clean, and in the case of clays of a soapy texture they should be made friable and the surface oxidised by fallowing. Autumn sowing, therefore, is preferable to sowing with corn in spring, when the land is sometimes far from kindly after a wet season. Sowing in July, in Rape, which has been sometimes recommended, is not advisable, since the bane of grasses in clays is the absence of aëration and of a suitable tilth for the tender roots; and the treading of sheep, however light the fold, will increase the evil; and if the Rape has to be cut and removed, the field is robbed without adequate compensation, the roots of the crop are left in the ground and, in the words of an experienced practitioner, "you have made a mess of it."

Passing to the young grass in the next stage, viz., at 15 months old, we found it had been dunged in September; and this black dressing, now sinking into the layer and staining the yellow clay, opening its stubborn pores, attracting the delving worms, and modifying the top soil in many ways besides enriching it, is the price of pasture on Wealden clay. Of the future cultivation it is only necessary to say, that as much manure should be applied, and as often, as possible. The time of year is of little consequence. The pasture will always be ready for manure when manure can be found for it, for the object is not merely to fertilise but to render the ground more permeable, more attractive of the sun's rays, and more accessible to the roots of the grasses.

It is, to a considerable extent, the mechanical texture of the marls of Cheshire and Staffordshire that renders them peculiarly suitable to grasses and capable of being converted from arable to good turf in a few years. The best of the open marls and deep loamy soils on the new red sandstone can be converted into good pasturage in five years. By the process we have described, even Wealden clays may be made productive pasturage, though not so quickly.

It is said that the whole of this district—as big as a small county—would pay best in pasture, and that the whole of it would be laid down forthwith if it could be laid down with a wish, and without manure. And this is only saying, in other words, that the Wealden would pay better with more manure, which we can easily believe would be the case on the arable land as well as on the pastures; for manure in that rather poor country, with its primitive agriculture and simple manures, is said to "make a mark like a black spot on a white frock." Under these circumstances pasturage does not increase fast; but in the neighbourhood of high farming the green patch slowly follows the "black spot," and pastures are formed with profit.

WE had the pleasure of listening, on Wednesday evening, at the rooms of the Society of Arts, to a lecture on the UTILISATION OF PEAT, by Mr. ALLOWAY, an Irish gentleman, who has made this the subject of study and experiment for many years, and whose discourse upon it proceeded, like the burning of his own fuel, as certified to us by one of his correspondents, "steadily, clearly, *and* slowly," for upwards of an hour—"leaving but little ash," or residuum over which any one could pick a quarrel with him. Not, however, that we are bound to accept to their fullest extent all the statements of an enthusiast on his pet subject. Peat may be, as he says, and no doubt it is, an extremely intractable substance, but it can hardly be so obstinate as to yield only to the influence of "blarney"—that sort of blarney described to us as "the soft touch of a woman's hand;" for this was what we were informed. Mr. ALLOWAY has long since given up all the costly artificial contrivances for breaking up and squeezing or heating dry—churns and presses, rams, hot plates, and hot-air blasts. He digs his peat by spade, smashes it up with mallets during the winter months, moulds it by the hands of women and girls, to which alone its obstinacy yields, spreads the pats abroad on boards to dry, and packs them off, an almost wood-like substance, in bags like those of coke, for railway transit to the town. Neither are we bound to accept all his statistics—his 10,000 wooden tables, for example, 36 feet long, and 4 feet wide, which are to cost 20*s.* each, and which are to last "30 or 40 years, or even a few years longer," but which will themselves occupy and cover 30 or 40 of those "100 acres of deep bog," which, with "its breezes and its sunshine," is all that he proposes by their aid to turn to useful account. But we may be so certain Mr. ALLOWAY has adopted the right principle in turning the costless influences of Nature to his uses, instead of spending money, coal, or even peat, in the task of manufacturing and drying, that we may hope he has approached the solution of his difficult problem more nearly than any of his many predecessors. Anyhow, we are sure the Society of Arts have done well to direct the enthusiasm of so able a man as Mr. ALLOWAY upon the *vis inertiæ* of JOHN BULL and his brother PAT on this subject of the utilisation of their enormous stores of peat.

—— THE supply of home-grown Wheat was short on Monday last, the prices, nevertheless, had to fall before sales could be effected. On Wednesday prices were again somewhat lower.——Trade was good in the Metropolitan Meat Market on Monday. Notwithstanding a large supply the late prices have been fully maintained.

—— A valuable contribution to the literature of the sewage question has been made by Mr. BAILEY DENTON, in a lecture delivered last week before the Chamber of Agriculture, at Maidstone. We are unable to give a report this week; and next week too, we fear, our columns are preoccupied, but we shall not fail to lay the substance of Mr. DENTON'S statement before our readers as soon as possible.

—— Messrs. SUTTON, of Reading, have now for 21 years annually obtained from their customers all over the kingdom specimens of the various roots grown from seed supplied by themselves, in competition for a very liberal prize list: these they have exhibited on a Reading market-day some time in the end of November; and independently of the advantage to themselves of thus advertising the extent and merits of their wares, there can be no doubt that public service has been rendered by the interest thus excited in the production of the best and largest crops. The show has now grown to very large dimensions; and this year it included very remarkable roots of Mangel Wurzel, exceeding 40 lb. in weight, Swedish Turnip exceeding 20 lb., Kohl Rabi and other crops, which will be illustrated on the stand of this firm at Islington next week.—In Holborn, on premises occupied by Messrs. CARTER & Co., an equally extraordinary exhibition of specimen roots has been held, and the prizes offered by this firm—awarded by Mr. GARLIKE, of Ewelme, near Wallingford, and Mr. D. TOUGH, late of the Barking farm, and now of Lord WARWICK'S sewage farm, near Leamington—has had the effect of drawing together extraordinary specimens of Mangels, Swedes and Turnips, and Carrots and Kohl Rabi. These, too, will be seen at Islington, and, therefore, need not be further referred to. In both cases these shows have beaten the Birmingham show in respect of the Turnip, Carrot, and Parsnip "departments," excelled it even in respect of the Mangel Wurzel and Kohl Rabi exhibited, and been beaten by it in respect of the Potato show.

OUR LIVE STOCK.

CATTLE.

WE have before us a copy of "Duckham's Record of Hereford Transactions," just issued. The "Record" reminds us of the "Circular," with which we are now so familiar as a record of Shorthorn transactions, and a very similar arrangement obtains in both publications. Neither can be entirely divested of the character of sale catalogues, albeit of private sales, and yet both contain much valuable current information, which renders them useful to the breeders of either race of cattle. This is much to the credit of the respective authors, since by this means they happily combine business with instruction and amusement. The "Record" opens with the prize list, so far as the Hereford breed is concerned, of the Taunton, Oxford, and other English exhibitions, as well as of the Royal Irish Society at Ballinasloe. Next follows the account of Mr. Duckham's two periodical sales, in which 3-year-old cows made from 18 to 24 gs. each, and bulls sold at considerably more money, indicating that more importance is attached to the bull than the cow in breeding these animals, and that the art of breeding Herefords has not yet arrived at that fastidious stage which makes the Shorthorn breeder infinitely particular as to the dam's family or tribe. A list of 23 Herefords exported in 1870 to Australia, New Zealand, and America is next given, and this is followed by some account of the breed in its colonial quarters. The *Sydney Morning Herald* is a strong supporter of the "reds with white faces," and we call the attention of the admirers of the "red and white" to such passages as the following. Speaking of the third annual show of the Northern Agricultural Association, we find that "A glance at the cattle pens could not fail to establish incontestably one fact of great importance to the cattle breeders of the district, viz., the marked superiority of the Herefords as contrasted with the Durhams. Not only were they most numerous, but they were in better order, showed better breeding, and were in every way superior. * * * Though magnificent creatures when well fed and cared for, they (the Shorthorns) require more pampering and richer food than the New South Wales breeder can afford to give them. The Hereford, on the other hand, though a lighter (?) and less imposing animal, is of a hardier disposition, will stand rough usage, and fatten upon such grass as the colonial pastures provide for him." In an account of the normal stock of the same colony, it is interesting to learn that the principal breeds of Great Britain are to be there found in perfection, and that a walk through the cattle sheds of the Agricultural Society would induce a lover of stock to believe himself in England. "Not only are the principal breeds represented, but the principal herds also. The contest is almost as sharp about Bates and Booth, as it is at home." Again, in contrasting the merits of three rival breeds, we find the following remarks:—"The Devon is not much used. The native mountain spirit soon breaks the crust of civilisation, and becomes visible in wildness of eye, and a disinclination to human society, rather troublesome to the breeder. The debate concerning the merits of Shorthorn or Hereford is very strong. Both breeds have many advocates. It is generally admitted, however, that the Hereford travels better than the Shorthorn, and better endures periods of dearth and drought. A vast quantity of the cattle of this colony having to travel from 500 to 800 miles to the slaughter house, this quality is a consideration of the utmost consequence." For the encouragement of those who look forward to a not far distant time when the colonial demand for English pedigree stock will cease or wane, we may mention that "deterioration of character takes place quickly in the case of Australian imported cattle, and that it is necessary to stop this process by continued importation both of Hereford and Shorthorn blood." The record concludes with a list of 23 animals for private sale.

—— Our readers will remember that on July 12 last four representatives of the famous "Cambridge Rose" tribe were sold at Mr. D. R. Davies' sale for the enormous sum of £1450. The sale of *Moss Rose 2d* to Mr. Cheny for 800 gs. was the event of the day, the more astonishing when it was whispered that the high-priced animal was not safe for breeding purposes. The worst fears of the "croakers" have been realised, and we regret to say that *Moss Rose 2d* has not produced a calf. In such a case the question arises, who has to bear the loss. The query is scarce put before it is answered by Mr. Davies

himself, who handsomely writes to a contemporary that, while much regretting Mr. Cheny's disappointment he (Mr. Davies) will bear the loss of this untoward event.

AMERICAN "GANG-PLOUGHS."

PLOUGHS turning over two or more furrow-slices, or "gang-ploughs," as they are technically termed, have long been in use in the United States of America. The exact date of their invention, or introduction from England, where they were invented by Walter Blythe about the middle of the 16th century, we are unable to state. Improvements appear to have been patented at a very early date, but owing to the records of the American Patent Office having been burnt, nothing is known of them save the name. The first illustrated description of a "gang-plough" in successful use, which has come under our notice, is that of Wiard's, which received the medal of the American Institute at the New York Agricultural Society's Fair, 1843, and which we find in the *Albany Cultivator*, vol. i., p. 345, 1844. The illustration is imperfect; but from a letter-press description of this prize plough in another volume of the *Albany Cultivator*, four ploughs were fixed on a diagonal beam, in the rear of two wheels —the one wheel in the furrow and the other on the land, not unlike the half of Fowler's steam-plough in action, with means for steering and lifting the ploughs at the headland. Wiard's patent is dated 1843, and since that time, up to the close of 1867, considerably above 100 patents for gang-ploughs have been granted since 1856. The claims of patentees, with drawings of their gang-ploughs, &c., are published and open for examination in the reading-room of the English Patent Office, and to show the progression, the numbers for the respective years which we have examined may be quoted thus:—1856, 1; 1857, 6; 1858, 5; 1859, 1; 1860, 4; 1861, 2; 1863, 7; 1864, 9; 1865, 18; 1866, 24; and 1867, 24; total, 101 gang-ploughs.

To notice the numerous claims of such a list of gang-ploughs in detail, with the special mechanisms they represent, is far beyond our limits, but they may be examined under the following four heads, viz., 1, general features of an American gang-plough; 2, steerage; 3, raising the ploughs at the head-land; 4, yoking the horses.

1. An American gang-plough is steered either by the ploughman or horses. It goes alone without any "belabouring and twisting at the handles." In point of fact, 90 per cent. of their number have no handles. In the vast majority of examples the ploughman, who is generally the farmer or his son, rides on the implement, but some clever Yankees count this "lazy at the expense of their teams," *alias* "riding about the fields in their carriages," and so, in a few cases, the ploughman either walks beside his plough, or else behind, as English ploughmen now do behind their double-furrow ploughs, scarifiers, and cultivators.

2. *Steerage* is effected, either as we steer our horse-ploughs, steam-ploughs, steam-cultivators, and a few double-furrow ploughs, as Pirie's and Murray's; or else as we steer our mowing and reaping machines, and horse cultivators, scarifiers, &c. In examples of the former class some use a steerage-wheel, as in Fowler's steam-plough, or its equivalent; but the vast majority steer by means of a long lever from the standard of the front wheel or wheels; the ploughman in both examples being seated on his implement, steering with one hand and holding the reins in the other. In the earlier examples of the second class or method of steerage, the horses guided the implement by means of a castor-wheel in front, running in the furrow behind the furrow-horse—or two wheels on a castor standard, one wheel in the furrow and the other on the land. But the more recent example of this class is to steer by a pole as we steer our mowing and reaping machines. This method of steering the implement has given rise to an endless diversity of special mechanism in the attachment of the pole to the wheel carriage and carriage to the body of the gang-plough, but into the multifarious details of this kind which experience has found necessary to meet the requirements of American practice we need not enter; suffice it to say that the pole plan of steerage is becoming more and more general as old patents expire. We give an illustration of Hildreth's 3-furrow gang-plough in fig. 276, which we shall subsequently describe, noticing at the same time the difference between walking beside and riding on the implement.

3. The third characteristic of mechanism—viz., the lifting of the ploughs at the land's-end, has given rise to a greater amount of ingenuity than all the others. It may be said to embrace or to be a copy of all the plans which we have adopted in raising horse-ploughs and steam-ploughs, horse-cultivators, grubbers, and scarifiers, horse-rakes, mowing and reaping-machines, and also the coulters of our seed and manure drills. Thus, in several of the early pole-steerage examples the diagonal beam, &c., was raised in front, so that the shares were raised out of the ground, and the implement turned on the heel of the last or rear plough supported in front by the wheels, the principle of lifting and turning being that of a swing-plough, with this difference, that the ploughman applied his force to the lever in the former, instead of to the handles, as in the latter, thus altering the leverage and fulcrage—the team in both cases pulling the implement out of the ground, and turning at the headland. In other examples a friction-wheel is substituted, in place of the heel of the last plough—the wheel in some cases running vertically in the last furrow, in other cases running obliquely, as in Wilkie's, Pirie's, Murray's, and other English examples. Another plan was to raise the several ploughs in the gang individually as they came up to the headlands, on the principle adopted by MacRae for raising his steam-ploughs, manufactured by Edington & Sons, Phœnix Iron Works, Glasgow, in 1840, and successfully tried at Possil, in the neighbourhood, before it was sent out to British Guiana. But MacRae requires a spring to assist him to lift each plough at the headland; and for the want of a spring the American plan, first patented by A. & F. Smith, 1856, gave place to other improvements in subsequent patents. Another plan was, to make the horses raise the implement out of the ground by means of a chain, the weight of the implement in falling into the ground winding up the chain to be ready for the lifting movement at the opposite land's end, not unlike the principle of raising and lowering the coulters of a Suffolk drill, with this difference, that the horses do the work of raising the ploughs instead of the man at the drill. The endless list of lever movements, combined with castor-wheel, crank, chain, sector, and drum mechanisms, as exemplified in English and American scarifiers, cultivators, grubbers, mowing and reaping machines, is too familiar to our readers to require a detailed notice. No doubt some of the American patent propositions would prove novelties; but those which have been successfully reduced to practice in the United States have mostly been introduced into England.

4. When the implement is steered by a pole two horses are yoked abreast, as they are yoked in the mowing and reaping machine; and when steered by a castor-wheel in front, or with a lever movement by the ploughman seated on the plough, the horses are yoked as in the common plough or scarifier. Dr. Gardner, in his "American Farmers' Dictionary," published at New York, 1846, in referring to the draught of Wiard's prize plough, noticed at the commencement, says, "Wiard, of Avon, Thorp, and other instrument makers, have placed three or four small ploughs in a frame, so as to run as many furrows; in light sandy soils, and for an after ploughing these may answer, but if we have to hitch an additional horse there is little gain." From this it appears that in 1846 more than two horses were yoked in gang-ploughs, but with less advantage than when two could do the work, a conclusion which accords with that recently arrived at by Mr. Amos at the dynamometrical experiments of the Peterborough Agricultural Society, reported in the *Agricultural Gazette* October 22. Since 1846 gang-ploughs are being made stronger, and are frequently represented hauled by three horses abreast, or four horses in two pairs, the leading pair either hauling by a long chain or from the end of the pole, as in yoking four horses to a carriage.

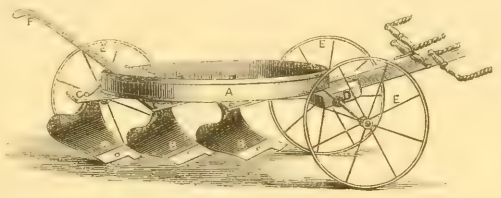

FIG. 276.—AMERICAN "GANG-PLOUGH."

The illustration of the gang-plough (fig 276) of G. W. Hildreth, of Lockport, N.Y., in the *Scientific American*, is an advertisement, and those acquainted with the manner our Transatlantic friends carry out this branch of art will be able to make the necessary degree of allowance it requires. Thus the form of the main frame in other drawings which we have examined is not that of an ellipse, but an oblique triangle, like one-half of Fowler's steam-plough frame, with the sides and angles so rounded as to permit of a wrought-iron band being shrunk or cooled on to it, for strengthening it, to meet the shocks experienced when the ploughs come in contact with tree roots, stumps, &c. For a similar reason the three ploughs are each fixed to the curved iron beam with a bolt, sufficiently strong for general work, but of less strength than the other parts, so that when a plough comes in contact with a fast root or stone the bolt breaks, and thus saves the implement, and the ploughman can replace the broken bolt by a new one for a trifle. The breadth of the furrow is adjusted up to 12 inches by shifting the ploughs nearer each other on the curved diagonal bar to reduce the breadth, and farther from each other to increase the breadth. The front of the breast is sharp, and cuts the sod from 1 inch to 6 inches deep, without a coulter—being in principle a smashing up plough. The pole is attached to a bolster, through which the axle of the front wheels passes, and the axle is cranked at both ends for the adjustment of the depth of the furrow-slice; the axle of the rear wheel is also cranked in a similar way, to correspond with the adjustment of the front wheels. The bolster, D, slides along the axle to correspond with the adjustment of the breadth of the furrow-slice—the right-hand front wheel running in the furrow behind the furrow-horse, and the rear wheel in the last furrow. The fore-end of the gang frame is connected to the bolster, D, by means of a "king-bolt," upon which it turns, and the bolster is fixed to the axle by a pin (not seen in the engraving), in such a manner as to adjust both the depth of the furrow and the angle of the pole to suit the horses. When once fairly entered the implement goes alone, and is steered by the proper driving of the team. At the land's-end the implement is lifted out by the short handle, and turns on the principle of a waggon, but to expedite backing when turning narrow at the crowns and out castings, the farmer lifts the rear wheel off the ground, when the horses can return with ease in their respective furrows, without stopping or delay. The patent is dated 1857, and the claims of the patentee refer chiefly to the mode of fixing the pole and bolster to the axle, there being nothing novel in the other parts. The ploughs are manufactured by the inventor to suit different soils.

Gang-ploughs are generally made of wood, and the bodies are either fixed to a diagonal beam or to parallel beams. When steered by a pole, and when the ploughman rides, the rear wheel is generally on the castor principle, to permit of turning freely at the headlands. When once started the standard of the castor may be fixed. The implement, in examples of this kind, requires to be lifted out by some lever, or lever-chain and drum device. In many cases the ploughman has similar means for adjusting the depth and breadth of the furrow-slice without leaving his seat. The design is often rather rude, but the parts are so contrived as to be put together for little money, and to go rapidly over the ground, reducing manual and horse labour to a minimum. *W. B.*

IRRIGATION.

ON the 57 millions of statute acres of Great Britain, if we take the average rainfall at 36 inches in the year, there descend in that time 200,000 millions of metric tons of water. This is what Nature affords us on the average. The season must be altogether unusual that does not provide us with a third of that unimaginable quantity. What do we do with it?

The answer is very simple. We get rid of it as fast as possible. In the first place, every house, with the exception of those thatched cottages that are rapidly disappearing from the face of the country, has a special provision for collecting rainfall, and not for storing it for use, but for turning it, in the shortest and most ignominious way, into the nearest river. Instead of collecting it for the service of the farmer, or even of turning it, as used to be the case in many a country town and village, through a bright open course, where it babbles as it runs along, and from which lead off many a grip and sough to gladden the adjoining fields, we get it underground as rapidly as we can, and there so deal with it that first it dilutes our valuable sewage to an extent which renders it both worthless and unmanageable, and then it goes on to poison our rivers, to kill the fish, and to spread the germs of disease through the country. That is what we do with our rainfall.

Every drop of water that we use in England (except salt-water baths) comes direct from heaven. Nature has given us certain reservoirs, of which we make use without observing their extent, or taking any of the steps which would so well repay the cost proper for providing auxiliary storage. On every porous soil, of sandy or gravelly nature, the rainfall penetrates till it is arrested by the first impervious stratum lying below. On this bed the water accumulates. If the clay forms a basin, the water forms a subterranean lake. It accumulates till the basin is full, then it runs off at the lowest places on the rim. These escapes are what are called springs. They often occur near the summit of a hill. Climb Skiddaw, or ascend Stanmore Hill. In each instance you will find the summit dry. In consists of a light porous soil. A little way down either highland, however, you find bog, or wet clay, or outsoak of some nature. Why is the ground at once so damp and so elevated? Simply because the rain collected over the whole top of the hill there runs over the edge of the clay which keeps it back. In chalk the case is somewhat different. Water seems to pass through chalk in a broken subterranean river, the level of the underground stream dipping rapidly as it approaches the natural outfall. The principle is the same as in more perfectly porous soils, but that modified form of gravitation which we call capillary, or possibly

chemical affinities not distinctly understood, affect the level of springs in the chalk.

To our habitual waste of the gift of heaven, that careless stupidity which allows the rain to fall where it will, and takes no need for the drought of to-morrow, we have one exception. We practise, where it can be done without expense, the most barbarous mode of irrigation yet known in the world. We know that for the support of vegetation we require an intermittent supply of water. Roots may be drowned, no less easily than fish may be drowned, by the improper supply of that element on which their life depends. We know by the world-old experience of Egypt that even the intermission which takes the form of a flood, and covers the face of the soil with a rich transported mud, has a wonderfully fertilising power. We also know that semi-aquatic plants—Reeds, Rushes, Bog-beans, and Water Soldiers—that grow in permanently wet, marshy situations, are useless to the farmer. With this knowledge in our possession we irrigate thus. Through a valley, which with a little aid from the engineer might be made a very garden of Eden, we lead the rain, or rather let it lead itself, in parallel channels. We bar any efficient draining by water-mills and weirs; we occupy from a fifth upwards of the whole area of the valley with water channels. We sometimes put down a wooden sluice or two, and we keep the whole soil, while grass ought to be freely growing, in a perpetual sop. As we do not cover all the ground with water we obtain abundant crops from about half the acreage; Flags, Reeds, coarse rushy grass, and watercourses, occupy the remainder.

Unirrigated England presents a noble field for the beneficial activity of the engineer. What we have already done in the way of deep draining, and of steam ploughing, is enough to teach us how much more may thus be effected. But to these important parts of farm engineering should be added a comprehensive and adequate system of dealing with our abundant rainfall. Lakes and reservoirs, open or subterranean, where available, fair channels for the conduct of the surface water, and for its distribution wherever gravity would allow, steam-power for the service of those districts where it might be requisite, or, at all events, that use of the windmill to which, in our Fen districts, we have recourse for getting rid of superfluous water, should be applied to raising supplies for irrigation. If this were combined with proper arrangements for watering, and not drowning the land; for the intermittent supply of the precious element, and for its reception unsullied by ill-use, into rivers abounding in fish—we should add a money value to a large portion of our 12,000,000 acres of permanent pasture, to say nothing of our 16,000,000 acres under cereals, green crops, and artificial grasses, that would be equal to the present fee simple.

The individual farmer in England may be hindered by a thousand obstacles from either perfectly irrigating or properly draining his land. But let us look a little wider than individuals; let us look at districts of country, grouped according to watersheds and watercourses. Considering the rainfall on which we can with certainty calculate, it is the fault of the owners and farmers of each such district if they suffer long from drought. *The Builder.*

BREEDING AND FEEDING.

[At a recent meeting of the Wimbish Farmers' Club, Mr Bone, of Avon, spoke as follows on "The Relative Advantages of Breeding and Fattening Stock, and Dairy Practice."]

He said he was about to speak of cattle and not sheep, to bring before them the necessity, as he believed there was, of feeding upon their different farms more animals in the shape of cow stock than they had hitherto been in the habit of doing. He knew that when the system of rearing and dairying alone was carried out on farms it was very impoverishing; no man could improve the condition of his farm and his stock if he simply went on that principle. To the "feeding" of animals, then, he wished to call their attention.

By a fair and proper practice of feeding animals it was possible to manufacture a good and first-class manure, and so get animals to pay for it; they would thus not have to put their hands into their pockets to any extreme extent for bone-dust, guanos, or other things of that sort. A great loss was sustained by farmers generally from the neglect of feeding animals in the proper way in order to obtain a good manure. They were aware that there were certain farms, used almost entirely for sheep, supposed to be not at all adapted for the rearing of cattle; he believed that even on those farms animals might be fed so as to get a sound and good manure. He had seen that upon some large farms, more particularly in North Hants, Wilts, and some parts of Dorset, straw was thrown aside as perfectly useless; its value was looked upon as nominal—sheep were kept upon those farms almost to the exclusion of anything in the shape of a bullock. Now he saw no reason why, with a little exertion, a little extra expenditure, an extra piece of roots should not be grown on such farms, in proportion to their size, which with the straw might be converted into a sound and good manure instead of being disposed of in the useless manner it at present was. He by no means meant to revolutionise the present system carried out; he did not mean to substitute bullocks for sheep. What he wanted was, to such an extent as was necessary, to convert the straw grown upon the farm into a thoroughly good sound manure. And this could be done with profit by keeping bullocks, growing a sufficient amount of roots for them, and feeding them with cake. To those who adopted the mixed system of farming, those who were corn growers, sheep growers, cattle growers, and dairy keepers, he wished to say that they ought to feed their animals to such a point as to become fit for the butcher, allowing them to consume a considerable amount of artificial food so as to make good manure, the land thereby being continually improved.

One great reason why, in some instances, the feeding of animals had not been successful was the indifference and inferiority of the animal set to work upon. No animals did so well as those bred on the place, provided they were bred carefully. The greatest inducement to a man to be careful in his breeding was that he intended finishing the animal for the butcher. He looked upon it as a sad reflection if a man who had been farming 30 or 40 years could not say that his stock was better than when he began business. By a judicious outlay and care the value of animals should, he held, be doubled. Profit arose from having a better animal to work upon. Then, again, milking and feeding properties might be and were profitably combined. He had thus recommended to them a system which he believed would pay; if it did not pay he was quite willing that the recommendation should fall to the ground. With reference to the estimates subjoined, his conclusion was that the system he had recommended would raise the productive powers of the soil. In order to keep up the fertility of the soil they should adopt the principle of feeding as well as rearing and dairying their animals. At the same time he could not advise that the feeding of animals should be adopted without the dairying. Taking the cost of rearing and fattening, he found that a 3-year-old bullock should be set down at £18 6*s.* 11*d.* For many years past he had reared the whole of the calves arising from his own herd, and the returns have been in accordance with the estimate submitted. Therefore, what he had just said was not mere theory. He found, taking the average of years, that he made something like £22 for a 3-year-old bullock. His system was an improving and not an impoverishing one. Regarding the question of dairying, he had never been able to get much more than £10 8*s.* 8*d.* (his estimate of the cost of keeping) from his dairy cows, and unless they made that sum they would be losers by the transaction.

Estimated Cost of Rearing and Fattening a Bullock to Three Years Old, time from January 1.

Value of calf	£3 15 0
Skim-milk up to the end of April (6 weeks, at 2*s.* 4*d.* per week)	1 17 4
3 lb. linseed per week for the same time, at 1½*d.* per lb.	0 4 3
1 acre of grass will keep four calves from end of April to September (or at 8*s.* per acre)	0 8 0
September 1st to December (roots, hay, grass, and roots 12 weeks, at 10*s.* 6*d.* per week)	0 16 0
The animal is now a year old, but still in the yard, and increasing in size.	
I estimate from December 1st to April 30, cake, hay and roots 17 weeks	1 5 0
They will now be turned to grass, and from April 30th to September 30th will require 2 acres of grass to keep three beasts at 35*s.*, which will give	1 3 4
From September 30th to December 31st they will still be receiving the same good liberal cake and roots, and also straw and hay (nothing in particular)	1 0 0
The animals are now two years old. We are now entering the third and last year, when the animal is to be matured. It will be more often housed in bad weather, with the most part grass in prime condition. I increase the quantity of roots to 2 bush. per day, and estimate the cost, with straw, at 3*s.* per week.)	
From December 31st to April 30th 17 weeks	2 11 0
We now go to grass again, and it will require 1 acre of grass, with the additions after mentioned, to keep the animal in fatting state from April 30th to September 30th, cost 35*s.* But as the animal will be taken entirely from the pasture and confined to the house from September 30th, the pasturage of the land from that time to December 31st must be deducted—say 15*s.*	1 0 0
September 30th to December 31st, on roots and straw in house, 13 weeks at 10*s.* 6*d.*	2 3 6
Cake expenditure: 3 lb. of cake per day from middle of June to end of September, when the animals are housed 15 weeks. 4 lb. of cake per day from September 30th to December 31st (13 weeks), after they are housed, making together 17 lb. at 11*s.* 6*d.* per cwt.	3 4 6
Care and attention for 13 weeks in house, at 6*d.*	0 6 6
Care and attention before this time, estimated at 10*s.* per head	0 10 0
	£18 6 11

Estimated Cost of Keeping and Maintaining a Dairy, at per Cow.

It will require 1 acre of land for summer pasture, which we estimate, as for the others, at	£1 15 0
It will require 1 acre of aftermath, value	0 13 0
Straw keep from November 1 to middle of February, 15 weeks, at 1*s.* 6*d.*	1 2 6
1½ tons hay, at standing price	3 15 0
Management, including wages, rent of house, fuel, wear and tear of dairy utensils at 6*d.* per head	1 14 6
In order to keep up value of dairy a yearly outlay is unavoidable, this I estimate at 10 per cent. Valuing the cow at £10 10*s.*, this expenditure will amount to	1 11 6
	£10 8 8

Discussion.

Mr. Marke could not fall in with the lecturer's conclusion, that dairying without feeding must impoverish the land; he thought the word "must" might be substituted by another one more appropriate. As regarded his own farm, he knew he could not profitably keep his dairy beasts in winter without giving them a large quantity of cake, which he was always in the habit of doing; the manure was scarcely worth carrying out if the beasts were fed on straw alone—they came on poor in spring and were more liable to disease than they would have been if well fed. He thought that the best way to make good manure in the straw-yard was by feeding on cake; he himself gave his beasts 4 lb. of cake per day, which carried them well through the winter, and kept them in a healthy state. He could not exactly see how Mr. Bone could make a 3-year-old bullock fat for £18; and the correctness of several items in the estimate be questioned.

Mr. T. H. Saunders agreed in the main with Mr. Bone's address. He himself had adopted the plan of the lecturer, who had not over-estimated the value of the bullock. According to his own experience £26 was the average price realised.

Mr. T. Dowden spoke to the advantage of grazing a full-grown animal. He was inclined to think that too much stress had been laid on breeding of stock in preference to dairying, and that Mr. Bone had under-estimated the produce of the dairy.

Mr. Bone explained that £10 8*s.* 8*d.* was not the estimated produce of a cow, but the estimated cost of keeping her.

The Chairman moved a vote of thanks to Mr. Bone for his address, the chief point of which was that they would be gainers in the improved condition of their land, by keeping an improved class of beasts by improved feeding. He thought nothing was more distressing than to see a lot of good valuable straw lying to rot, scattered on land simply as straw—it was an extravagant waste of the raw material. He decidedly approved of Mr. Bone's address—which went to show that that course which improved the land most was the greatest benefit to the tenant-farmer.

Mr. Bone in acknowledgment reminded the meeting that some sheep farms were not adapted to rearing cattle, yet he held that good cattle should be kept on such farms, and be made to pay in the manure produced. He showed that the system which he had recommended was a progressive one. He believed that the time was coming when straw would be made greater use of than had hitherto been the case. Mr. Marke seemed to think that dairying did not impoverish the land. Mr. Marke had stated how he conducted his own dairy, and, in doing so, showed that he adopted the very principle which he (Mr. Bone) advocated—feeding the animals well. If he went on feeding the animals with cake during the summer he would find a wonderful difference in the green land. He (Mr. Bone) had adopted the system of giving the growing beasts 3 lb. or 4 lb. of cake a-day in the meadows, which became, in the course of time, double their original value. No one could lay out money better than in cake, thus improving the green land; no land would better stand outlay for improvement than green land. At the same time he believed that the excessive use of concentrated food, such as oilcake, would ruin the farmer—he would never make an animal profitable if he gave it an enormous quantity of this; extremes in feeding as in everything else must be avoided. He submitted that in the use of roots as food for stock there was great room to exercise economy.

Home Correspondence.

Wheat Drilling.—Will you be so kind as to cause the following account of my Wheat drilling to be inserted in your valuable journal? October 11, I drilled a few perches of land, putting in one seed of Wheat in every square foot of ground; and this was in my own land. The quantity per acre would not have exceeded 3½ quarts. November 5 I also drilled a small quantity of land in a neighbour's field with the same quantity of seed per square foot of land, that is, a seed in every 144 square inches of land. November 9 I drilled a whole field of my churchwarden's, putting in 3½ pecks an acre in two-thirds of the field, and 1½ peck an acre in the other one-third. November 11 I drilled a part of a 90-acre field for a gentleman in a neighbouring parish, putting in exactly 9 quarts an acre, or 1 quart over a peck per acre. I observe particularly that the seed was measured to me by the owner of each field before it was put into my drill, and what remained in the drill after each operation was also measured by the owner of each field; the land drilled was also carefully measured by each owner of it and others; and the drilling was done in the presence of each owner, and of others as witnesses. My friends, and the readers of this paper in general, will perceive that these would have been fair examples of what are called thin seedings had the operations been performed a month or six weeks earlier; but the dates above are too late in the season to give thin seedings fair trials, for the plants ought to have been up and vigorously growing at the times when the above seedings were done; but late in the Wheat seeding season. As it was, I told the owner of each field that if the yield at harvest were not equal in quantity and quality to any Wheat crops on the same quantity of land he had on his farm (and I observe each farms very extensively), I would make up the deficiency in money. And I inform my readers, who may take interest in what is called thin seeding, that I myself consider these examples are not quite fair ones, on account of the lateness of the season only, when the seed was drilled, or otherwise, from long experience, I should have no doubt whatever but the crops on the lands I drilled would be equal, if not superior, to any in this neighbourhood; but late as it was, I have full faith that the yields will be good. My agricultural

readers will smile at this, and perhaps, I fear, do something worse; but I call to their recollections, or if not to theirs, to those of non-agriculturists, that as I regularly advertised, I seeded land for 14 years in succession, and that I never exceeded 2 pecks or 16 quarts an acre, and sometimes used less than 1 peck, and yet in each of two of those years I had 7 quarters of Wheat an acre, and that the general average of the 14 crops in 14 years was 44 bushels an acre; and observe also, my readers, my land was drilled and the seed measured, and the crops threshed and measured in the presence of as many men as I could induce to come and witness them; and some of my readers will also recollect that Mr. Piper, of Calne Engaine, Essex, was during the same number of years, as he showed by annual advertisement, also producing nearly equally as large yields on the same land of his from only half a peck of seed an acre; but he always put in his seed early. This is one of the secrets in the production of large yields from small quantities of seed; for should the plants be weak and thin upon the ground before the frost sets in, they are liable to be greatly injured and sometimes even killed in clear, cloudless, and frosty nights by the effects of radiation, and especially where the land is both wet and cold; hence thin seeders ought always to take care that their lands are thoroughly drained, or deep enough to raise the temperature of it, as well as to let out the water from it. But in concluding this article I hereby engage, should my life be spared, to produce roots of Wheat from a single seed each, having two thousand-fold. My friends, do not start at this; remember that years back I advertised that I would be led blindfold into my Wheat field and pull up root after root having two thousand-fold, and some even four thousand-fold. *Geo. Wilkins, Wix Tuarage, Nov.* 20.

The Transit of Cattle by Sea.—I came from Antwerp by the boat which reached Harwich on Wednesday, the 2d inst., at 3 A.M. On our arrival we found that the Rotterdam boat, which was eight hours overdue, had not arrived. While we were having our baggage examined, she came alongside the pier, and I obtained the following account of her voyage from two passengers, one of whom was a Falmouth pilot. They left Rotterdam early on the morning of Tuesday, November 1, with about the usual number of passengers and several hundred sheep and pigs. A great many of the animals were stowed in pens on deck, in the fore part of the vessel, where they were, of course, exposed to the full strength of the wind and waves. When outside the bar she encountered very heavy weather, which crippled her machinery to such an extent that they were obliged to proceed the whole distance across with only one paddle. This, together with the heavy sea, caused her to roll so much, and to make such little way, that, to lighten her head, they threw overboard as many as 60 sheep and pigs; in fact, as my informant said, "they threw them over by dozens." The animals remaining on deck suffered so much from the exposure, and from the seas which were constantly being shipped, that many more died, or were so injured as to necessitate cutting their throats to put them out of their misery. On hearing this I at once went down to the pier, and found they were then landing the remainder of the sheep. It is no exaggeration to say that quite one-third of them could not walk up the gangway, constructed with cross-bars for the purpose. They were dragged to the side and forced, by pushing, beating, and kicking, up the planks. One man stood by with a stick, spiked at the end, with which he stimulated the creatures' frantic efforts. Many of them struggled up in the most extraordinary manner by making a series of leaps on their knees, and nearly all were lame or crippled in some way. I do not cast any unnecessary blame on the men to whom was entrusted the task of landing these poor animals. They were compelled to get them out in the shortest possible time, and they resorted to cruel measures with evident reluctance. The sin of such abominable cruelty should be visited on those who continue to permit, in spite of repeated remonstrance, the transit of animals under such circumstances. I happened, quite accidentally, to ascertain from one of the crew of the Antwerp boat that horses are brought over in a totally different manner. Each has its pen, made of carefully rounded wood, so contrived as to prevent its being knocked about, or thrown off its legs. It is evident, therefore, that animals can be transported without being suffocated, bruised, maimed, and drowned, as the poor cattle are. The question then arises whether the Legislature ought not to enforce the transit of cattle in a similar manner. I have no doubt that the companies will stand aghast at the enormity of this suggestion: and as I fear it is in vain to hope that motives of humanity will bring about so desirable a result, we must seek for some more urgent incentive—one more nearly affecting our pockets and our sanitary condition. The fact is only too patent, that at present animals are treated during transit exactly like so many bales of goods. They are, in the first place, driven from their pastures in the far regions of Schleswig-Holstein, and other Continental districts, placed in the train, and despatched on a journey of some hundreds of miles. Arrived at the sea coast, after being shaken and bruised by continuous stoppages and shuntings, they are packed, without the least regard to number, and with the greatest possible haste, on board the first steamer, there to endure the horrors of a rough sea-passage, resulting in damage to life and limb, such as I have already described. On reaching England they are again crowded into a train, and again bumped and shaken all the way to town, where they at length arrive, after a course of suffering upon which it is sickening to dwell. Surely, however, a committee of gentlemen might be formed to deal with this question, either in connection with the Society for the Prevention of Cruelty to Animals, or with the Royal and other agricultural societies. No doubt many might be found who would be willing to act, and who, if intrusted with sufficient powers, would, I believe, in a very short time, be able to suggest and enforce such regulations as would to a great extent mitigate these evils. The limits of a letter will hardly admit of suggestions in detail; but the following would be among the most prominent points for consideration:—Whether it would not be possible to restrict the transit of cattle to ships constructed for the purpose, and reserved exclusively for this trade? Whether it is not possible to limit the number of animals in any one vessel, or in a certain defined space? Whether arrangements might not be made to slaughter animals abroad during the most stormy periods of the year, and bring over their carcases for the English market? Certain penalties might also be enforced for placing the animals in exposed parts of the vessels during stormy weather, and regularly appointed officers should always be stationed to see that the regulations are strictly carried out. I would further suggest that penalties should be inflicted for shipping or landing animals except in the presence of such officers. *S. H.*

Steam Cultivation.—The only means whereby to ascertain the real advantage of steam cultivation over the ordinary method adopted, is by collecting and comparing facts on the subject. In dealing with facts, we then know what we are about, and it is with the consciousness that the following facts may not uselessly be thrown away that I record them for the benefit of your readers. The field ploughed is heavy clay land, in places inclined to be gravelly—24¼ imperial acres; machinist agreeing to plough 9 inches deep, finding water-cart and the usual complement of men, while the hirer provides coals, and finds water and its conveyance to place of use. Time occupied in ploughing, 4½ days. From the foregoing the following may be summed:—

Steam-ploughing 24¼ acres at 12*s.*	..	£14	14 0
4 tons 5 cwt. of coal, at 10*s.*	..	3	8 0
Boy, 4½ days carting water, at 1*s.* 4*d.* ..	..	0	6 0
2 horses, 4½ days, at 8*s.*	..	1	16 0
Carting coals	..	0	5 0
Taking up gate-post	..	0	1 8
		£20	10 8

or 16*s.* 11*d.* per acre. One headland was afterwards ploughed with four horses, the depth not being within 2 inches of that steam-ploughed; the time occupied in ploughing it (1 acre) exceeded two days.

4 horses, 2 days, at 4*s.* each ..	..	£1	12 0
1 man, 2 days, at 1*s.* 8*d.*	..	0	3 4
1 boy, 2 days, at 8*d.*	..	0	1 4
Per acre	..	£1	16 8

The above headland is not included in the 24¼ acres. *Frederick T. Tyndall, Potton, Beds.*

Fowl Keeping.—I wish to ask Mr. Mechi, for the benefit of my neighbours, a few simple questions. There happens to be in the parish I reside in a very poor curate, and a half-pay officer equally or nearly as poor. From Mr. Mechi's glowing description of his profitable fowl-keeping both these gentlemen simultaneously agreed to try their hands at it, but both as simultaneously, though not in concert, have given the business up, as they have informed me, and because they found it to be a losing concern. Now if fowl-keeping could be made to answer, I am satisfied the parson and the soldier were just the men to make it do so, for two more economical men than each is I never in my life knew, nor men better adapted for the carrying economical matters of any kind on to perfection; and yet they lost money by fowl-keeping, though each charged himself for every egg used in his house and for every fowl sold; and if one by chance was cooked at home, that was accounted for at its full price. Now the premises of each were good, for to each were attached for them an otherwise useless stable and chaise-house, wherein the fowls were kept; but they lost money, as they clearly explained to me. I want Mr. Mechi, therefore, to be so kind as to explain how this was, and I do so on my own account, as well as that of my fellow parishioners. I have myself between 50 and 60 fowls, and among them are four full-grown males. At the Birmingham show I bought two of the males, but though they are very fine they are by the others considered as aliens, and so they do not coalesce, but would fight until they or the others were killed; but as the two belong to one and the same brood they agree pretty well together. Now all my friends at Birmingham told me that four cocks were necessary for 60 hens, to secure all the eggs being impregnated. Mr. Mechi, who always writes carefully and thoughtfully, wrote that 300 of his fowls left his homestead every morning after having been fed with barley, and that for those 300 he bought all his males, he wrote, and paid one guinea for each; and though he was "not a fowl-farmer," he said, "he had, nevertheless, game, and Chinas, and Brahma Pootras, and other choice breeds." Now what I want Mr. Mechi particularly to inform me is, how many males he bought for his 300 females, so that the eggs of all could be safely used for producing broods of chickens. Further, Mr. Mechi wrote that he kept each breed separate, though he permitted the whole to wander at large and mix together; and further still, that he changes his male birds about every two years, giving a guinea a-piece for each. Now, I have a letter from one of the largest fowl breeders in this country, and in a reply to my question, he writes, he has for general breeding purposes one male to every 18 hens, but he prefers a male to every 14 hens; and for his choice breeds, all of which he keeps quite separate, he has a male for every six or seven hens. Now, taking Mr. Mechi's males for his 300 females to be only one male for each 20 females, instead of one for each 18, he would require 15 males for his flock; and as he writes he gives a guinea for each male, and changes them every two years, his males cost him 15 guineas every two years. Taking all these things into consideration, and my own experience, and that of my neighbours, I can only account for the profits which Mr. Mechi makes by his flock of fowls by his breeding for their food the myriads of flies, worms, and slugs which, he writes, exist upon all his crops. I and my neighbours have not the means of breeding such myriads of living fowl-food, and if I myself had, I would dispense with my fowl breeding and fattening rather than have such myriads of living pests in my fields; but Mr. Mechi states they swarm on the food that is brought into his yards also. It is clear, therefore, to me, that fowl breeding and fattening on Mr. Mechi's system would not answer, unless the flies, and worms, and slugs breeding for food for them was carried on at the same time, and which, it is clear, is Mr. Mechi's secret. But there is another thing I am anxious to ask Mr. Mechi, namely, how he trains his flocks of fowls that they do not greatly injure and even destroy his crops? Last year more than an acre of my Wheat crop was destroyed that was near my homestead, and I lost from £15 to £20 worth of young Mangel by my own and some neighbours' fowls; and in a near small field of Clover and Rye-grass the whole of the Clover was picked out; and a neighbouring farmer showed me a measured acre and a-half of Wheat that was destroyed by his poultry. Now taking this loss at £15, and my own loss at £20, both of which are too low, I ask Mr. Mechi if he would give more in detail how cheaply to breed the myriads of living food for fowls, and how so to train fowls that they will not destroy sown and ripening corn, and also not destroy young Clover, Cabbages, Turnips, and Mangel? *A. B.*

Cheese Ripening.—In your impression of Nov. 19, p. 1546, when giving extracts from the newspapers of the day respecting the Ayrshire Cheese Show, I read:—"Mr. Osborne noticed the fact that Galloway makers had carried off many of the best prizes. The circumstance arose, he thought, from their not having in Ayrshire such good houses to ripen the cheese. The cheeses were only half made in the chessats, and unless they were properly cared for in the houses they could never be shown as first-class cheese." Would you, or some of your correspondents, kindly inform me the proper requisites for a cheese-room? In 1869 my cheese was not of so good a quality as I could wish, and thinking the room it was kept in after it left the chessat too variable in temperature, being sometimes between 70° and 80°, and then suddenly reduced to between 40° and 50°, I took two cheeses to my own dwelling, and kept one in a very similar room, the other in a very deep but dry cellar, where the temperature is very equal all the year. In one month there was a marked improvement in the latter, but no alteration in the former. I afterwards asked the factor to select me the worst cheese in the dairy. This I took, and cut into two parts, and kept one in the room, the other in the cellar. This cheese being older, the change or ripening was more marked and perfect in less time in the part kept in the cellar, but the other part still remained as it was. Persons, who are esteemed judges, said they were not the same cheese, that kept in the cellar being worth 2*d.* per lb. more than the other. To follow out the idea, but cautiously, because it was pronounced foolish, yea, madness, by old cheese-makers, I this year (1870) selected for a cheese-room the one best shaded from the sun and most equal in temperature I could find, and tried to keep it as cool as possible—my aim was 45°. In this room I put shelves on trellises to 7 feet high. When the heat of summer came, I could not prevent it rising to 68° and 70°, and then the cheeses on the upper shelves suffered much, whilst those on the lower were comparatively free from the effects of heat. But to carry out the idea a little further, on July 2, I took into a cellar, having a ventilation through it from north to south, a cheese made May 28, and laid it on a shelf in the middle of the cellar. This I call No. 1. On July 15, another (No. 2), made July 6, as soon as brought from the dairy was laid by the side of No. 1. Both cheeses were kept in the same place until October 3, when they were taken to the others in the room, lest the factor might give a biassed judgment. After he had looked the cheeses through, I told him I wished Nos. 1 and 2 for my own consumption. When he had bought the cheeses, he requested that he might have the two cheeses, and I should keep two others from the upper shelves instead. On October 8, the

cheese was taken to the warehouse, and thinking that when it was there I might ask the relative value, I did so, when he replied that No. 1 was decidedly the best cheese in the dairy, and the whole dairy was the best he had had from the place. This has been somewhat of my experience, and the result. But now, what really was the cause. If cause for effect is not known, we still labour in the dark. *J. O.*

Clay Farming.—The capabilities of clay land are well shown in the *Times* report on Mr. Prout's farm, but its last paragraph needs a little notice. I will quote the first part of it:—"Of course the mere impossibility of finding a market for the unlimited quantity of straw must prevent such an export system of agriculture from becoming general." This is quite correct, but the following that I shall quote is wrong:—"But if the straw were converted into manure, and returned to the soil in the usual order of husbandry, the purchased fertilisers would not be required." The question to be asked here is, what is "the usual order of husbandry" on clay soils? The general order stands thus:—1. The four-course shift—fallow, Wheat, Beans, and Wheat. In some cases Barley is planted instead of one of the Wheat crops, and in some cases a portion of the fallow is planted with Vetches and fed off by sheep instead of all dead fallow. The straw from the three corn crops is generally browsed, with little or no cake, by cattle and sheep, and trod into manure. This manure with the fallow every fourth year is the fertiliser, and keeps up a produce of about 20 bush. per acre, taking Wheat and Beans together on an average of four years, value, say, £5 an acre a-year. 2. The six-course shift practised by some of our best farmers—viz., Vetches fed on by sheep and fallowed, Wheat or Barley, Beans, Wheat, Clover fed on by sheep till July, then broken up and fallowed for Wheat the next year. The straw from the four corn crops is browsed, with little or no cake, by cattle and sheep. This manure, with the Vetch fallow and Clover fallow, is the fertiliser, and keeps up a produce of about 24 bush. per acre, on an average of six years' value, say, £6 an acre a-year. Lastly, my own practice, briefly shown in my letter of November 1, published at p. 1516, growing corn crops 14 out of the last 15 years. Here is the actual cropping on No. 3 heavy land to illustrate the whole:—1856, Peas; 1857, Barley; 1858, Beans; 1859, Wheat; 1860, Beans; 1861, Wheat; 1862, Swedes; 1863, Barley; 1864, Beans; 1865, Wheat; 1866, Beans; 1867, Wheat; 1868, Beans; 1869, Wheat; 1870, Wheat. The straw from the 14 corn crops has been browsed by cattle and sheep without any cake or corn, excepting the last year, in which I sold the wheat-straw off and bought some manure in exchange. The crop of Swedes in 1862 was eaten on by sheep, eating a little cake and corn as well as hay chaff; yet the land was so dirty that the sheep did no good, and I abandoned the practice altogether, for there was no pay belonging to it. In 1868 I gave a dressing of 2½ cwt. of superphosphate per acre for Beans, and a like dressing for Wheat in 1869, and also a like dressing for Wheat in 1870. The preceding shows the quantity of manure that has been used to keep this land in fertility for the 15 years, and the produce for the last three years stands thus:—1868, Beans, although a blighty year, 28 bush. per acre; 1869, Wheat, 38½ bush.; 1870, Wheat, estimated at quite 40 bush. per acre. Therefore the three last years of my practice on this land gives an average of 35⅝ bush. per acre. This, at 5*s.* per bush., gives a yearly value of £8 18*s.* per acre; and I feel certain that this value may be increased permanently by the use of a pound's worth of superphosphate a year. This answers the question, and shows that under the four-course shift a value of £5 an acre may be gained yearly; that under the six-course shift a value of £6 an acre may be gained yearly; and that under my system, worked by steam-power, growing corn crops yearly, a value of £8 18*s.* may be gained, and from my practice for the last three years of using superphosphate, I am quite certain that this £8 18*s.* may be increased up to £10 an acre. The produce on the whole of my old heavy land is worth more than that this year, and a good bit more too. Now I am come to the point that needs especial notice:—"But if the straw were converted into manure, and returned to the soil in the usual order of husbandry, the purchased fertilisers would not be required." Mr. Prout has departed from the "usual order of husbandry," and as his straw-selling plan cannot become general, another course must be practised,—viz., the purchase of fertilisers in one shape or another. My plan of browsing the straw with the purchase of some superphosphate appears to me to be a reasonable one. I am making arrangements to carry it out thus:—I am now putting a new homestead in the centre of my heavy clay land, and the cropping hereafter will stand thus:—Beans, Wheat, and Barley, a three-course shift; and I am making yards suitable for converting the straw produce from this cropping into manure. The bean-straw will be browsed in a yard by sheep, the sheep having a run in a grass field in the day time. Sheep do well in this way. I have practised this plan for 30 years. The barley-straw will be browsed in a yard by cattle in the winter; each ox will have an allowance of 4 lb. of cake per day. In this way the cake will get about paid for, giving the browse of the straw for nothing. The wheat-straw will be used for thatching and litter, the whole of which, in the end, will be go into manure. This manure will be supplied to the Bean crop yearly. A pound's worth of superphosphate will be given to the second year's crop, Wheat, and two pound's worth of superphosphate will be applied to the third crop, Barley. If Mr. Prout will thus manure his land he may keep on growing corn crops as long as he likes. *William Smith, Woolston, Bletchley Station, Bucks, Nov. 15.*

Ashgrove Farm, Bicester.—In common with many of your readers, I take a great interest in all that is published of the prize farm in Oxfordshire. Your correspondent, "J. C. M.," has let us rather more behind the scenes than we have hitherto been admitted, and we now have from his pen something authoritative as regards the Dr. and Cr. part of the business at Mrs. Millington's farm. On reflecting on the receipts and expenditure as stated by "J. C. M.," it seemed to me that there was not that amount of produce sold as there ought to be on such a farm; and when I went into the figures more fully, and contrasted the expenditure with the receipts, I was much astonished to find the result that I have arrived at. I think I am stating these pretty fairly thus:—

Receipts.

120 acres Wheat	..	..	..	..	..	£1200
280 acres Barley	..	..	..	..	..	2240
Meadow hay	..	..	..	..	..	650
Wool, 50*l*.	..	..	..	..	..	50
Produce of 15 cows	..	..	..	..	..	225
20 to 25 store cattle	..	..	..	..	..	250
250 small lambs	..	..	..	..	..	250
Poultry	..	..	..	..	..	50
						£4665
Less to balance	..	..	..	..	..	465
						£5130

Expenditure.

Rent, rates, &c. at 20*s.*	..	..	..	..	..	£1000
Wages	..	..	..	..	..	1200
Rates and taxes	..	..	..	..	..	100
Thrashing	..	..	..	..	..	150
Superphosphate	..	..	..	..	..	250
Cattle, horses, &c.	..	..	..	..	..	450
Seeds and implements	..	..	..	..	..	100
55 lambs bought in	..	..	..	..	..	110
15 sheep—bought in	..	..	..	..	..	30
Tradesmen's bills	..	..	..	..	..	200
Wear and tear of horses	..	..	..	..	..	100
Implements	..	..	..	..	..	100
Sundries	..	..	..	..	..	200
Interest on £2000 capital	..	..	..	..	..	140
						£4130

There are a few items on the expenditure side that I am obliged to guess at, such as tradesmen's bills, sundries, wear and tear on implements, and dead stock; but on referring to my own expenses I find I am putting it at about the same sum per acre, and therefore consider that I am not overstating the outlay. On the receipt side I have put the returns from the 15 breeding sows at £250; this, I consider, is a very ample sum, because I have not charged a farthing for their keep on the other side. I shall be glad if these figures draw out a reply from some of your correspondents, in order that as near an approximation as may be to the profits or losses on this farm (which is held up to us as a pattern) may be obtained. One of the weak points in the returns is 4 qr. of Wheat only per acre; another, in the sale of 20 to 25 store cattle yearly. *W. G. D.*

"Dragett."—This word occurs in a lease which demises property in Buckinghamshire, and is used in connection with agricultural matters; the statement occurring in the lease that a certain number of bushels per acre of "Dragett" are sown. Of course it is a local term; but whether it implies a mixture of grass seeds, or refers to a crop of Peas or Tares harvested in any particular manner, I am quite unable to tell. I should feel greatly obliged if any of your correspondents could enlighten me. *Student.*

Smut in Wheat.—Having seen several articles in the *Agricultural Gazette*, and some also in other journals, on this subject, I wish to inquire of correct and scientific Wheat growers, which they have proved to be the best plan to prevent smut, namely, to thoroughly cultivate their lands and put them into good condition, or to steep their Wheat seed in their smut-preventing embrocations, or to employ some learned Egyptian sibyl to charm their seed for them? I myself have grown Wheat for upwards of 60 years, and I never adopted any plan except the first and last of these three to prevent smut in my crops, and I never had smut but once, and that was when I had procured a little seed of a neighbour to finish my sowing with, and which seed had previously been wetted and dried, and the land so seeded grew smutty Wheat; but I am free to confess that this was merely accidental, as the seeding was too late in the season to secure a good crop. With reference to the second of the plans, my neighbours chiefly adopt it, and they have always smut more or less; but some few of them do not wet and dry, and they have a less quantity of smut than any of the others, and this year they have not adopted the wetting quackery at all. I venture to predict they will have less smut than others who have adopted it, as they cultivate better. There remains, then, for the intelligent farmers to adopt the third plan, if they must adopt quackery at all, and which I myself should do were I to use either of them, namely, to engage some learned sibyl, who (were I to cross her hand with silver, however small the piece might be) would not only charm my own seed but that of the whole of my parishioners also, and of that of the whole three kingdoms likewise, and especially were I, as the servant maids do, to cross it, and cross it again, and present the consulter of the stars with one or more of my best garments. In the latter case I have more faith in the freedom of my crops from smut than I should were the seed steeped in solutions compounded of all the drugs in the universe, for such, Mr. Editor, is my belief, founded on experience. *Geo. Wilkins, Wix Vicarage, Nov. 22.*

What has come of "G. A. H.?"—Is he asleep, or hath he gone on a journey? In the early part of the year your columns were nearly half-filled by his pen, and he was slaying here one and there another, or blazing down a whole column at once with his *mitrailleuse*. But the marvel of the whole thing is, whether resurrectionised or how I can't say, Mr. Smith, "West Indian," and a host of his opponents appear alive and all right, while he alone remains *non est*. A thought strikes me: his friend Alderman Mechi's balance-sheet for 1869, promised some months since, is not yet forthcoming; has he gone off to help him, and has the task of pulling the job off satisfactorily been too tough for the pair? Any how, or on any terms, I hope we shall soon hear from him. If his effusions ever failed of solid aliment, they had the merit of being amusing, and he seemed doing the same part by the journal as Lea & Perrins do by the solid joint. Speaking for myself, I miss him as much as I should the seasoning from a pork pie. If he does not soon show I shall feel inclined to invest a small sum with Mr. Pulvermacher, and send him an electric band. *Looker On.*

Beans at Wide Intervals.—In one of your previous numbers is an account of some experiments carried out by Professor Wrightson with regard to drilling Wheat at wide intervals between the rows, but without success. My object in troubling you is merely to give my experience with regard to growing Beans, drilled at wider intervals than usually adopted, and with good success; as by that means you obtain a fair crop of about 4 qr. per acre, and you are also enabled to keep the land clean, by making a very good summer fallow between the rows. This plan I have carried out in the Roothings of Essex, on land which requires periodical whole summer fallowing. I get the land on to the ridge as soon after harvest as possible (two ridges going to a stetch of 7 feet), and I put about 10 loads of dung per acre between the rows, if I have it to spare, if not, 5 cwt. of superphosphate per acre answers very well. I drill only one row on the middle of the ridge, and get as near 2 bush. per acre in as possible, with the aid of a double funnel to the drill, so as to receive the seed from both rows of cups into one coulter of the drill; put them in deep, and apply light roller on harrows. Early in spring, as soon as work and weather will allow, I go a bout with the plough between the rows, going within 6 inches of the Beans; in a month's time I plough it back again, and before hand-hoeing I run the horse-hoe up, so as to level the rows, and, after a good clean hoeing and hand-pulling between the Beans, as they ought to be thick in the rows, and therefore do not always admit of the hoe, I run Bentall's broad share (without the side wheels) up the rows, with three horses, letting it in deep; and a run over before harvest with the hoes, and an occasional horse-hoeing, enables you to have a clean Bean stubble after harvest, ready to be "mended" for Wheat, if necessary. You will find in a bean-straw season that the rows will touch each other, and the whole field appear as if it had been drilled in rows 18 inches apart. I was on a farm last year, where Mr. Beadel was valuing the crop for the incoming tenant, and he expressed his admiration of that mode of growing Beans, and said that he should try the same plan on his own farm. I believe some portion of the field was valued at 5 qr., the other portions being farmed differently. Two rows in a ridge answer very well on good and clean land, but you cannot make so good a summer fallow between the double rows as on the one-row plan, because the Beans get together quicker. *D. Gibbon, late Farm Steward, Ewell Hall, Ongar, Essex.*

Carrots.—Allow me to inform Mr. Moir that I have this season dug many Carrots (James's Intermediate), weighing from 4 lb. to 4½ lb. This morning (November 24) I weighed a Parsnip (Student), 9½ lb. when washed, measuring 21 inches in circumference at top. *Thomas Woodford, Gr. to His Grace the Duke of Abercorn, K.G., Eastwell Park, Ashford, Kent.*

The Transport of Agricultural Productions by Railway is exciting attention in many parts of the country. There is a general feeling pervading the growers of heavy root crops, that a considerable modification is requisite in the rates of carriage upon nearly all railways. It has been tritely said, that "railways almost annihilate time and space." This may be in reference to time, but in one important sense, not distance. The distant rates of carriage are great barriers to an increase of tonnage "by rail," and it is chiefly these rates that require material alteration, in fact, a serious reduction. Within the past 40 years there has been an astonishing increase in the growth of heavy root and esculent crops, *i. e.*, Potatos, Carrots,

Mangels, Turnips, Cabbage, Kohl Rabi, and also much garden produce grown in field culture. These crops are a wonderful addition, and a most acceptable acquisition to all large town populations. The great thing is this. How can the large towns be most advantageously supplied? Farmers are willing growers of these heavy root crops, provided a reasonable profit can be derived, but the charge of transit to a distant market is so costly, that it deters all growers except the occupiers of the best soils. Could our large towns be abundantly supplied, the benefit would be immense. Cow-keepers would derive great advantage by the supply of Mangels, Turnips, and Carrots, &c., and such businesses would greatly increase in number, and be of unknown benefit to poor populations. Potatos and like produce could be imported from greater distances, to the manifest benefit of all large towns. The greater extent of country brought under this order of cropping the greater the supply, the more moderate the price, and the far larger transport and tonnage for railways. It is to encourage remote districts in this growth, and to give all growers an additional incentive to continue the production of such supplies for the public good, that I advocate a new tariff on all railways. It should be based upon the principle of bringing all parts of the country into closer competition. At present, it is chiefly from the lands in the vicinity of large towns that supplies of heavy produce are obtained, and that at an expensive rate. Railways give every facility as respects distance to enhance such supplies, the only question being the cost of transit. Can the cost of transit be sufficiently reduced to meet the requirements of growers, and not be detrimental to railways? I think it can. Every railway has its rolling stock and staff. An extension of the growth of this heavy produce is simply more tonnage for railway carriage. A large increase of tonnage would satisfactorily admit of a reduction in the cost per ton, as witness our penny postage. I am not advocating a reduction to any extent of the tonnage for short distances; there are many reasons against that. The loading and unloading from trucks, and such costs, would tend much to make the road traffic preferable; but I am persuaded that, if railway tariffs of charges were more based upon quantities, values, bulks, weights, and distances, it would be far more satisfactory and beneficial to all parties. The most important is in reference to long distances. Could not a satisfactory reduction be made in proportion to distance?—*i.e.*, 10 miles, and under 20; 20, and under 50; 50, and under 100; above 150 miles as low a fixed rate as possible. Values might easily be fixed—as, for instance, grain, £12; Potatos, £4; manures, £5, &c. *O. F.*

Foreign Correspondence.

TRANSYLVANIA: *Herrmanstadt.*—In your paper of October 29, your correspondent of Zschopau, in Saxony, mentions the clearing of cesspools and drains by the pneumatic system. Being a constant reader of your paper, I was wondering why this system was never mentioned, it being so simple and expedient. Last summer I introduced here the machines made by Mr. Wannieck, at Brunn, in Bohemia, but Herrmanstadt being a town of only 20,000 inhabitants, and a rather out-of-the-way place, I preferred accepting a simple double-acting pump, called by the French *pompe a soufflet*, which has been used at Brunn for the last ten years with success. We do our work in the daytime, without the slightest disagreement to the passers by; the vessel into which the contents of the drain is pumped being quite air-tight, and the infected air which is driven out of it when filling being burned by a coal fire. We fill a tub of 32 cubic feet in the short time of eight minutes, and cart the contents on my fields, where it is mixed with town sweepings, and makes a capital manure. I shall be happy to procure more precise information on this subject. *Edgar de Müller.*

Societies.

MIDLAND COUNTIES AGRICULTURAL SHOW.

Bingley Hall, Birmingham.—There is a larger and more successful exhibition here, in, we believe, every one of its departments, than has for many years been seen. Probably the maxima of the exhibition are not so extraordinary as they have been, though it would be hard to match a Mr. Cock's 38 months old Hereford ox, which must weigh 13 cwt. of carcase, and is bigger, we imagine, and more profitable than so much cubic space filled with meat has ever been; but whole classes and sections of the show have never been surpassed. The Herefords, in particular, we suppose were never better. The sheep classes, which we remember 20 years ago, are magnificent. They are now as grand a collection of the best breeds as one sees anywhere. Lord Berner's Leicesters, Lord Walsingham's Downs, and a splendid show of Shropshires will not be beat at Islington. The pigs, too, are as good as ever. The poultry are a wonderful collection—swarming out of their proper locality, and encroaching on pigs and roots and sheep. 2578 boxes of birds, varying from the few ounces of the pigeon to the large fraction of a cwt. which one now gets in a turkey or a goose, constitute an exhibition in itself, really fatiguing in the enjoyment which it gives to the enthusiastic spectator. In the galleries, again, we have a show of roots and agricultural produce which is marvellously fine. The Mangel Wurzel and Kohl Rabi and Potatos, in particular, are wonderfully good. And below them, on the ground floor, is a collection of the best agricultural implements from all the leading manufacturers. And the leading manufacturers of manures, and seedsmen, too, have stands, which illustrate the value of their wares by the enormous roots grown by their customers.

The following Table will enable the reader to compare the show of this year with those of previous years, so far as mere quantity is concerned; and he may then gather, from our subsequent notes, some idea of the merits of the show of 1870 as to quality:—

	1863	1864	1865	1866	1867	1868	1869	1870
Cattle	163	151	136	116	122	173	111	151
Sheep	92	84	93	67	82	100	5	76
Pigs	93	91	73	63	81	47	45	61
Roots	124	109	110	66	71	174	120	234
Corn	50	60	45	36	44	42	36	46
Poultry	1505	1675	1670	1138	2107	2112	1971	2122
Pigeons	275	270	331	400	565	432	487	441
Total	2303	2394	2458	2886	3072	3086	2823	3130

THE CATTLE CLASSES.

The Hereford Classes take precedence of all others at Bingley Hall, and they generally fairly represent the noble breed of the adjoining county. This year the younger classes probably excel the older ones in merit. Mr. P. Turner's 1st prize ox is a looser built, softer handling beast than the larger, more even, firmer fleshed 2d prize ox of Mr. W. Heath. In the younger class, nine very fair specimens competed for the three prizes, and the 38 months old steer of Mr. B. Cocks, near Munslow, Salop, distanced all competitors. Girthing 9 feet 3, and 5 feet 10 or 11 inches long, he is probably twice the weight of a good ordinary butcher's beast of his age. His girth is enormous, his forequarters, with protuberant bosom, unequalled; and though he is not so perfect behind, he easily carries off the prizes offered for the best Hereford in the yard. There is a fair show in the cow and heifer classes, in the latter of which Her Majesty takes the 1st prize.

The Shorthorn Classes, numerous as ever, are not so distinguished for special merit as those of previous years. The 1st prize ox is exhibited by Mr. Pulver, of Kettering. He is a remarkably even and symmetrical well-fed roan—a well-arched body, filled up everywhere with thick and firm flesh, with rather defective hind-quarters, the girth 9 feet 2 inches, and length 5 feet 10 inches—hardly equal in dimensions to the 38 months Hereford, to which we have just referred. His more perfect symmetry gives you the impression, however, that he is smaller than the tape declares him to be. Mr. Pulver's ox, as our price list shows, accumulates in his own person a long list of prizes, amounting in all to upwards of £120. He was 1st at the Oakham agricultural meeting last week, and is to be exhibited at the Agricultural Hall next week. He takes the Gold Medal as the best ox and steer in any of the cattle classes here.

A thick, rather short, well-bred white ox, exhibited by Mr. Stratton, of Manningford Bruce, near Marlborough, takes the 2d prize in what is the largest class in the yard.

A fine collection of younger oxen and of cows is exhibited, neither class, however, being equal in merit to the very excellent class of Shorthorn heifers. The 1st prize heifer is sent from Aberdeen, a very beautiful roan, with cylindrical barrel, strong and broad back, pretty head, and excellent quality; exhibited by Mr. Reed, of Alford.

The Devons are smaller in number than usual, but we think of unusual merit. A good show of oxen, four good steers, and four each in the female classes, make up the show. The 1st prize steer, exhibited by Mr. Lee Senior, of Aylesbury, is about the same age as the 1st prize beast in the corresponding class of Herefords, but girths only 8 feet as compared with 9 feet 3 inches, and is 5 feet 2 inches in place of 5 feet 10 inches long. The extreme beauty of the breed saves it from being utterly swamped by the more useful Herefords and Shorthorns, and judges are constrained by it not unfrequently to place them in the very front rank of merit. Thus Mr. McNiven's Devon cow is not only 1st in her class, but pronounced the best cow or heifer of any breed in the yard, carrying off the Gold Medal.

The Longhorns make up better classes than they have done for some years. Seven or eight animals in all are exhibited by Derbyshire and Leicestershire.

The Scotch Breeds are a very good show. Mr. McCombie's ox, girthing more than any other beast in the yard, and longer too, but hollow-backed and clumsy, takes a prize for the best polled ox bred by the exhibitor. His rival in the class is Mr. Harrison's smaller but firmer, better beast, which takes the 1st prize. The West Highlanders are a good class.

The Cross-bred Class is as interesting as ever, though not of such first-rate merit as has been seen in previous years. The Prince of Wales exhibits a well-fed Norfolk ox. The influence of cross is shown curiously in Mr. Bettridge's ox by a Hereford bull out of a half-bred polled cow: the horns are not obliterated in the offspring, but curiously dwarfed. In all, 150 entries compete for the Society's prizes, and the show is a very good one as regards both quantity and quality.

THE SHEEP CLASSES.

constitute a better show than has ever before been seen in Bingley Hall. We remember the shabby entries of 15 or 20 years ago, and can congratulate the Society on the very great improvement which late years have witnessed.

The Leicesters are a fair show, in which Messrs. Herrick, Shipman, Gunnell, Pears, and others, exhibit a larger, longer wooled sheep against Lord Berners and Mr. Lister, and who stand by "quality," and are maintained in their position by the judges.

The Cotswolds shown are a fair collection, from only a few flocks; hardly any of them from the recognised Cotswold district, which possesses the grandest sheep in the world, but is careless about proving it by exhibition in public to those who are not in the secret.

The Southdowns are, as usual, beautiful. Here, as well as in the Leicester classes, the entries of the two leading breeders have been scattered about among the pens, but the judges are not to be misled. Lord Berners takes virtually all the Leicester prizes, and Lord Walsingham takes all the Downs. Colonel Kingscote receives a high commendation for a very good pen.

The Shropshires are a noble show. Here, too, it is plain that the judges have gone all for quality. The breed is not yet sufficiently uniform in character, but a sheep with a head as near that of the Southdown in form as may be, but with a much blacker face, seems to be the sought-for type. This and a large well made body, covered with a wool at once close and long, constitutes a very desirable breed.

The Oxfordshire Downs, more vigorous-looking, heavier in both wool and meat, and of equally good constitution, is represented by only a few entries.

The Cross-bred and their sheep include some good Hampshire Downs, Cheviot-looking Ryelands, and the produce of a second cross with long-woolled sheep upon West-country Downs, which looked like success.

THE PIG CLASSES,

hardly as numerous as heretofore, are perhaps barely up to the old style as regards merit. One is confirmed by a general inspection in the superiority of the well-bred Berkshire over all other breeds—neither the dumpy, short-nosed little breeds, nor the heavy, thick, disgusting mammoth brutes one sees among the larger white breeds equalling them in quality of lean meat, or serviceableness for that best of all forms of pig-meat, bacon.

Messrs. Duckering, of Northorpe, Kirton Lindsey, Lincolnshire; Mr. P. Eden, of Salford; the Rev. H. G. Baily, of Swindon; Mr. Fowler, of Aylesbury; Mr. J. Smith, of Arden; and Her Majesty the Queen, are among the successful exhibitors.

The following is the list of Judges, and their Awards:—

CATTLE.

JUDGES. Mr. R. J. Newton, Campsfield, Woodstock; Mr. Stiles Rich, The Cedars, Fearnhall Heath, Worcester; Mr. George Turner, Brampford Speke, Exeter.

REFEREE FOR THE ACTS OF STEWARDS. Professor Gamgee, 1, Great Winchester Street Buildings, London, E.C.

VETERINARY INSPECTOR. Mr. L. Stanley, 35, Islington, Birmingham.

HEREFORDS.

Class 1. Oxen or Steers, ex ceeding 3 years and 3 months old.—1st, £15, and Silver Medal as breeder. Exhibitor and breeder, Mr. P. Turner, Leen, Pembridge, near Leominster. 2d, £10, Mr. W. Heath, Ludham Hall, Norwich; 3d, £5, Mr. Henry Bettridge, East Hanney, Wantage, Berks. Commended: Her Majesty the Queen.

Class 2. Steers, not exceeding 3 years and 3 months old.—1st, £15, extra prize of £20 as best Hereford, extra prize of £10 given by T. Prime Bough, ex-mayor of Birmingham, as best Hereford bred by the exhibitor, and Silver Medal, as breeder. Exhibitor and breeder, Mr. B. Cocks, Tugford, Munslow, Salop; 2d, £10, Mr. B. Cocks; 3d, £5, Mr. J. Price, Court House, Pembridge. Commended: Mr. R. Shirley, Baucott, Munslow.

Class 3. Cows.—1st, £15, and Silver Medal as breeder. Exhibitor and breeder, Mr. T. Stone, Bourton, near Much Wenlock, Salop; 2d, £10, Mr. H. Ridgley, Steventon, near Ludlow; 3d, £5, Mr. T. Rogers, Coxall, Brampton Brian, Herefordshire. Commended: Mr. R. Hill, Orleton Court, Ludlow.

Class 4. Heifers.—1st, £15, and Silver Medal as breeder. Exhibitor and breeder, Her Majesty the Queen; 2d, £10, Mr. J. W. James, Mappowder Court, Blandford, Dorset; 3d, £5, Mr. J. Baldwin, Tuddington, Stratford-on-Avon. Commended: Mr. R. H. Ridler, Gatterton, Hope under-Dinmore, near Leominster.

SHORTHORNS.

Class 5. Oxen or Steers, exceeding 3 years and 3 months old.—1st, £15, extra prize of £20, as best Shorthorn, £15, given by the Earl of Aylesford, as best Shorthorn bred by the exhibitor. Gold Medal as best Ox or Steer, President's Prize of £25, Hotel and Innkeepers' Cup as best animal in the Cattle classes, and Silver Medal as breeder. Exhibitor and breeder, Mr. T. Pulver, Broughton, Kettering; 2d, £10, Mr. J. Stratton, Manningford Bruce, near Marlborough, Wilts; 3d, £5, Messrs. J. and W. Martin, Aberdeen. Commended: Mr. R. Wood, Clapton, near Thrapston.

Class 6. Steers, not exceeding 3 years and 3 months old.—1st, £15, and Silver Medal as breeder, exhibitor and breeder, the Earl of Aylesford, Packington Hall, Coventry; 2d, £10, Mr. R. Searson, Cranmore Lodge, Market Deeping; 3d, £5, Mr. J. Stratton, Manningford Bruce, near Marlborough.

Class 7. Cows.—1st, £15, Mr. J. A. Mumford, Chilton Park Farm, Thame, Oxon; 2d, £10, the Earl of Faversham, Duncombe Park; 3d, £5, the Marquis of Anglesea, Beaudesert, Staffordshire.

Class 8. Heifers.—1st, £15, and Silver Medal to the breeder, Exhibitor, Mr. J. Reid, Graystone, Alford, Aberdeenshire; breeder, Mrs. McWilliam, Buchaan, near Huntly, Aberdeenshire; 2d, £10, Mr. J. Hunter, Dibble, Fochabers; 3d, £5, Sir W. C.

Trevelyan, Bart., Wallington, Northumberland. Highly Commended: Mr. R. H. Harris, Earnhill, near Forres.

DEVONS.

Class 9. Oxen or Steers, exceeding 3 years and 3 months old.—1st, £15, extra prize of £20 as best Devon, and Silver Medal as breeder. Exhibitor and breeder, Mr. W. Smith, Hoopern, Exeter; 2d, £10, Mr. W. B. Shucklady, Upton Court Farm, Slough, Bucks; 3d, £5, C. McNiven, Esq., Perrysfield, Oxted, Godstone, Surrey. Highly Commended: Mr. E. Trood, Bowhay, Exminster. Commended: Mr. T. L. Senior, Broughton House, Aylesbury, and Mr. W. Farthing, Bridgewater.

Class 10. Steers, not exceeding 3 years and 3 months old.—1st, £15, Mr. T. L. Senior, Broughton House; 2d, £10, Her Majesty the Queen; 3d, £5, Mr. W. Smith, Hoopern, Exeter.

Class 11. Cows.—1st, £15, and Gold Medal as best cow or heifer, C. McNiven, Esq., Perrysfield, Oxted, near Godstone; 2d, £10, Mr. W. Aldworth, Frilford, near Abingdon; 3d, £5, Mr. W. Smith, Exeter. Highly Commended: Mr. W. Farthing.

Class 12. Heifers.—1st, £15, Mr. T. L. Senior, Aylesbury; 2d, £10, Her Majesty the Queen; 3d, £5, Mr. R. Burton, Place Barton, Broadclyst.

LONGHORNS.

Class 13. Oxen or Steers.—1st, £10, and Silver Medal as breeder. Exhibitor and breeder, Mr. J. H. Crewe, Bart., Calke Abbey, Derbyshire; 2d, £5, Mr. J. Godfrey, Wigston Parva, Hinckley.

Class 14. Cows or Heifers.—1st, £10, and Silver Medal as breeder, W. T. Cox, Esq., Spondon Hall, Derby; 2d, £5, Mr. T. Satchwell, Knowle.

SCOTCH BREEDS.

Class 15. Polled Oxen or Steers.—1st, £15, and extra prize of £20 as best Scot, Mr. R. H. Harris, Earnhill, near Forres; 2d, £10, Mr. W. Drysdale, Kilrie, Kinghorn, Fifeshire. Highly Commended and extra prize of 10 gs., given by Col. Ratcliff, for best Scot bred by the exhibitor: W. McCombie, Esq., M.P., Tillyfour, Aberdeen.

Class 16. West Highland Oxen or Steers.—1st, £15, Sir W. C. Trevelyan, Bart, Wallington, Northumberland; 2d, £10, the Earl of Southesk; 3d, £5, the Duke of Sutherland, Dunrobin Castle. Commended: Mr. R. Mowbray, Cambus, Stirling.

Class 17. Scotch Cows or Heifers.—1st, £15, W. McCombie, Esq., M.P., Tillyfour; 2d, £10, Mr. T. Bruce, Burnside, Fochabers. Highly Commended: Sir W. C. Trevelyan, Bart. Commended: Mr. J. Reid, Graystone, Alford.

WELSH BREEDS.

Class 18. Welsh Oxen or Steers.—1st, £15, Sir C. E. Isham, Bart., Lamport, Northamptonshire.

FOR OTHER PURE BREEDS AND CROSS BRED ANIMALS.

Class 19. Fat Oxen or Steers.—1st, £15, Messrs. J. and W. Martin, Aberdeen; 2d, £10, Lord Dunmore, Dunmore, Stirling, N.B.; 3d, £5, Mr. H. Bettridge, East Hanney, Wantage, Berks. Highly Commended: J. Stephen, Conglass, Inverurie, Aberdeen.

Class 20. Fat Cows or Heifers.—1st, £15, exhibitor, Lord Dunmore; 2d, £10, Mr. A. Cowie, Crombly Bank, Ellon; 3d, £5, exhibitor, Sir W. C. Trevelyan, Bart. Highly Commended: Lord Fitzhardinge, Berkeley Castle, Gloucestershire.

EXTRA CLASSES.

Class 22. Cows or Heifers, not qualified to compete in any of the preceding classes.—1st, £5, and Silver Medal as breeder, Her Majesty the Queen, Windsor Castle.

SHEEP.

JUDGES.—Mr. F. Spencer, Alma House, Claybrooke, Lutterworth; Mr. Wm. Rigden, Hove, Brighton; Mr. John Evans, Uffington, Shrewsbury.

LEICESTERS.

Class 23. Fat Wethers, not exceeding 22 months old.—1st, £15, extra prize of £10, given by the Linen and Woollen Drapers of Birmingham, and Silver Medal as breeder, Lord Berners, Keythorpe Hall, Leicester; 2d, £10, Lord Berners; 3d, £5, W. P. Herrick, Esq., Beaumanor Park, Leicestershire. Highly Commended: Mr. W. Brown, Holme-on-Spalding Moor, York.

LINCOLNS.

Class 24. Fat Wethers, not exceeding 22 months old.—1st, £15, extra prize of £10, given by the Linen and Woollen Drapers of Birmingham, and Silver Medal as breeder, Mr. T. W. D. Harris, Wootton, Northamptonshire; 2d, £10, Mr. C. Lister, Coleby Lodge, near Lincoln; 3d, £5, Mr. J. Pears, Mere, Lincoln. Highly Commended: Mr. J. Byron, Sleaford.

COTSWOLDS.

Class 25. Fat Wethers, not exceeding 22 months old.—1st, £15, extra prize of £10, given by the Linen and Woollen Drapers of Birmingham, and Silver Medal as breeder, Mr. R. Hall, Great Barford, Oxon; 2d, £10, Mr. R. Hall; 3d, £5, Mr. J. Baldwin, Luddington, Stratford-on-Avon.

SOUTHDOWNS.

Class 26. Fat Wethers, not exceeding 22 months old.—1st, £15, extra prize of 10 gs., given by W. Bromley-Davenport, Esq., M.P., and Silver Medal as breeder, Lord Walsingham, Merton Hall, Thetford, Norfolk; 2d, £10, Lord Walsingham; 3d, £5, Lord Walsingham. Highly Commended: Col. Kingscote, C.B., M.P., Kingscote, Wotton-under-Edge. Commended: H.R.H. the Prince of Wales, and Lord Sondes, Elmham Hall, Thetford, Norfolk.

SHROPSHIRES.

Class 27. Fat Wethers, not exceeding 22 months old.—1st, £15, extra prize of 10 gs., given by Mr. J. Nowdigate, Esq., M.P., and Silver Medal as breeder, Lord Chesham, Latimer, Chesham, Bucks; 2d, £10, Mr. W. Yates, Grindle House, Shifnal; 3d, £5, Lord Wenlock, Escrick Park, near York. Highly Commended: Mrs. Beach, The Hattons, Brewood, Penkridge. Commended: Mr. S. C. Pilgrim, The Outwoods, Burbage, Hinckley.

Class 28. Fat Wethers, exceeding 22, but not exceeding 34 months old.—Prize, value 10 gs., given by Messrs Mapplebeck and Lowe, of Birmingham, Lord Chesham, Latimer, Chesham. Highly Commended: Lord Wenlock, Mr. Beach, and W. O. Foster, Esq., Apley Park, Salop.

OXFORDSHIRE DOWNS.

Class 29. Fat Weathers, not exceeding 22 months old.—1st, £15, extra prize of £10, given by the Linen and Woollen Drapers of Birmingham, and Silver Medal as breeder, Mr. N. Stilgoe, Adderbury Manor Farm, Banbury; 2d, £10, Mr. Z. W. Stilgoe; 3d, £5, Mr. N. Stilgoe, Manor Farm, Banbury. Highly Commended: Mr. G. Street, Maulden, near Ampthill, Beds.

SHEEP NOT QUALIFIED TO COMPETE IN ANY OTHER CLASS.

Class 30. Fat Wethers, not exceeding 22 months old.—1st, £15, and Silver Medal as breeder, A. Morrison, Esq., Fonthill House, Tisbury, Wilts; 2d, £5, Mr. J. B. Downing, Holme Lacy, Hereford. Highly Commended: A. Morrison, Esq.

CROSS-BREDS.

Class 31. Fat Wethers, not exceeding 22 months old.—1st, £15, and Silver Medal as breeder. Exhibitor and breeder, Mr. M. E. Jones, Wellingboro' Lodge, Northamptonshire; 2d, £5, Mr. Z. W. Stilgoe. Highly Commended: Col. Loyd-Lindsay, M.P., Lockinge Park, Wantage, Berks; Mr. H. Purser, Willington Manor, Bedford.

EWES.

Class 32. Fat Leicester Ewe, having bred one or more Lambs.—Silver Medal, Mr. W. Shipman, Eaton Lodge, Melton Mowbray.

Class 33. Fat Lincoln Ewe, having bred one or more Lambs.—Silver Medal, Mr. J. Pears, Mere, Lincoln.

Class 36. Fat Shropshire Ewe, having bred one or more Lambs.—Silver Medal, Mr. G. A. May, Elford Park, Tamworth. Commended: Mrs. Beach, The Hattons.

Class 37. Fat Oxfordshire Ewe, having bred one or more Lambs.—Silver Medal, Mr. J. Treadwell, Upper Winchendon, Aylesbury, Bucks.

PIGS.

JUDGES.—Mr. Samuel Druce, Eynsham, Oxon; Mr. John Fisher, Carhead, Yorkshire; Mr. John Dale, Spetchley.

Class 39. Three Fat Pigs of one litter, not exceeding 10 months old.—1st, £10, and Silver Medal as breeder, Rev. H. G. Baily, Swindon; 2d, £5, Her Majesty the Queen; 3d, £3, T. L. Melville Cartwright, Esq., Melville House, Fife.

Class 40. Three Fat Pigs of one litter, not exceeding 15 months old.—1st, £10, Silver Cup, value 5 gs., and Silver Medal as breeders, Messrs. R. E. Duckering & Son, Northorpe, Kirton Lindsey; 2d, £5, Her Majesty the Queen; 3d, £3, the Earl of Aylesford, Packington Hall, Coventry.

Class 41. Fat Pigs, exceeding 15 months old.—1st, £6, Messrs. R. E. Duckering & Son; 2d, £4, Mr. P. Eden, Cross Lane, Salford; 3d, £2, Mr. P. Eden. Highly Commended, Mr. T. Bantock, Merridale House, Wolverhampton. Commended: Mr. J. Spencer, Villiers Hill, Kenilworth.

BREEDING PIGS.—BERKSHIRE.

Class 42. Five pigs of one litter, exceeding 3 and not exceeding 6 months old.—1st, £10, Silver Cup, value 5 gs., and Silver Medal as breeder, Mr. R. Fowler, Broughton Farm, near Aylesbury; 2d, £5, Mr. J. Smith, Henley-in-Arden; 3d, £3, Mr. H. Humfrey, Kingstone Farm, Shrivenham, Berks: Extra, Silver Medal, Mr. J. Spencer. Commended, Mr. R. Swanwick, Royal Agricultural College Farm; Mr. H. Humfrey, Kingstone Farm, Shrivenham.

PIGS OF OTHER LARGE BREEDS.

Class 43. Five Pigs of one litter, exceeding 3 and not exceeding 6 months old.—1st, £10, and Silver Medal as breeder, Mr. J. Wheeler, Long Compton, Shipston-on-Stour; 2d, £5, Mr. H. Robson, Penkridge; 3d, £3, Messrs. R. E. Duckering & Son.

PIGS OF A SMALL BREED.

Class 44. Five Pigs of one litter, exceeding 3 and not exceeding 6 months old.—1st, £10, Silver Cup, value 5 gs., and Silver Medal as breeder, Mr. P. Eden: 2d, £5, Mr. G. Turner, jun., Alexton Hall, Uppingham; 3d, £3, Mr. P. Eden; Extra, Silver Medal, Mr. M. Walker, Stockley Park, Anslow, Burton-on-Trent.

THE POULTRY CLASSES.

are simply overwhelming. Never, we presume, have there been more numerous or better classes, especially in the younger ages of Dorkings; and never better classes of Cochins. The Brahma Pootras are extraordinary for merit and for number. No longer the leggy birds they used to be, we have them now as plump as a Dorking. The Spanish breed has, we dare say, rather waned in popularity in the competition with the three breeds just named. The Hamburgh varieties are extremely beautiful, and well represented here. So are the Guinea fowl in all their classes. And the fancy breeds, bantams and others, are charming. There never was a better show, nor heavier, of geese and turkeys, nor a more beautiful show of pigeons. We extract the following particulars from the columns of the *Times*:—

"In ducks, the Aylesbury, though commanding a higher price with our poulterers, do not yet quite attain the weight of their darker brethren, the Rouens, the weight of the two prize winners (drake and duck) here being 19¼ lb. In geese, Mrs. Seamons, of Aylesbury—a notoriety, showed a couple that weighed 62½ lb., a greater weight than we ever remember. The turkeys were a splendid lot, and we congratulate Mr. Simpson, of West Farms, New York, on obtaining first honours in strong competition with a magnificent bird weighing 36½ lb., being a pound more than the second of Mr. F. Lythall."

THE ROOT SHOW

in the galleries is of very remarkable merit. The prize list given below indicates the number and variety of classes. They are of special merit where Mangel Wurzels and Kohl Rabi and Potatos are shown. The Mangels and Kohl Rabi shown by Mr. Dickenson of New Park, Sir F. Smythe, of Shrewsbury, and Colonel North, of Wroxton, may be named as of extraordinary merit. The Swedes and Turnips, Carrots and Parsnips, are not so good. There is a capital show of Peas and Beans and other grain, among the exhibitors of which Mr. F. Lythall is 1st wherever he has exhibited—easily 1st in respect of Peas and Beans, probably fairly 1st in some sorts of Wheat, but only equal with others in Oats and other sorts of Wheat.

An unusually fine display of Potatos was brought together, the exhibits being almost all good and some of them superlatively so. A new system of classification has been adopted at this show, which answers admirably: it is to offer prizes for named varieties; the following being those included in the prize list for the present show:—Ashleaf Kidney, Rivers' Royal Ashleaf Kidney, Gloucestershire Kidney, Daintree's First Early, King of Potatoes, Wheeler's Milky White, Flukes, Dalmahoy, Red Regent, Paterson's Victoria and Skerry Blue. The number exhibited is limited to twelve Potatos of a sort. By this method of classification tubers of the same variety only are brought into competition with each other—a vast improvement on the old-fashioned plan of classes for early and late kinds; or the other frequently adopted of rounds and kidneys. Each kind is by this new plan tested on its own merits. The same variety grown in different localities, in soils varying as much as the distances from which the tubers are brought, being exhibited together, opportunity for comparison is afforded, and much material for study is supplied to those interested, particularly as the Cattle Show Council include the following among their well considered regulations:—"Exhibitors are requested to state whether the crop was produced after a fallow or otherwise, the kind of manure used, dates of sowing, and any other particulars, which will be printed in the catalogue of the exhibition." In the catalogue, this information is given in nearly every instance. In addition to the classes for the varieties named, there is one for any other named variety. For all the classes there were 135 entries, and of these only a few were absent. In the extra class there were 37 entries. The kinds shown included the following:—Dunbar Regents, Nuneaton Seedling, Edgecote Seedling, Paterson's Own President Lincoln, Red Flukes, Climax, Lapstone Kidneys, American Early Rose, &c. Mrs. Paterson, of Dundee, exhibited numerous varieties of her seedling Potatos, which attracted much attention.

The following is the Prize List:—

CORN.

JUDGES.—Mr. E. Davenport, Quadrant, Birmingham; Mr. Isaac Kempson, Lionel Street, Birmingham.

WHEAT.

Class 1. Talavera Wheat.—1st, £2, Mr. F. Lythall, The Spittal Farm, Banbury; 2d, £1, Mr. S. Robinson, Shaw House, Melbourne, Derbyshire.

Class 2. White Wheat of any other variety.—1st, £2, Mr. G. A. May, Elford Park; 2d, £1, Mr. J. Greatorex, Stretton, near Burton-on-Trent.

Class 3. Red Wheat.—1st, £2, Mr. F. Lythall, The Spittal Farm, Banbury; 2d, £1, Mr. T. Hurley, jun., The Fosse, Leamington.

BARLEY.

Class 4. 1st, £2, Mr. G. J. Mitchell, Newton Mount, Burton-on-Trent (Chevalier); 2d, £1, Mr. J. H. Clark, Altwood, Maidenhead (Chevalier).

OATS.

Class 5. White Oats.—1st, £2, Mr. F. Lythall, The Spittal Farm, Banbury (Australian); 2d, £1, Mr. H. E. Raynbird, Basingstoke (Pedigree Canadian).

Class 6. Black Oats.—1st, £2, Mr. F. Lythall, The Spittal Farm, Banbury (Polands).

BEANS.

Class 7. 1st, £2, Mr. F. Lythall, The Spittal Farm, Banbury (French Eyes); 2d, £1, Mr. J. K. Fowler, Prebendal Farms, Aylesbury.

PEAS.

Class 8. White Peas.—1st, £2, Mr. F. Lythall, The Spittal Farm, Banbury (Banbury Prize-takers); 2d, £1, Mr. J. H. Clark, Altwood, Maidenhead (Ringwood Marrow).

Class 9. Blue Peas.—£2, Mr. F. Lythall, The Spittal Farm, Banbury.

Class 10. Grey Peas.—£2, Mr. F. Lythall, The Spittal Farm, Banbury (Partridge).

ROOTS.

JUDGES.—Mr. J. Mathews, Edgbaston, Birmingham; Mr. J. H. Burbery, The Chase, Kenilworth; Mr. R. H. Masfen, Pendeford, Wolverhampton; Mr. T. B. Wright, Quarry House, Great Barr.

Class 1. A Silver Cup, or other article of Plate, of the value of 5 gs., offered by Messrs. Proctor & Ryland, of Birmingham, for the best collection of the three following varieties, viz., Long Mangel Wurzel, Globe Mangel Wurzel, and Swedes—six roots of each to be shown for this prize alone.—Mr. John Hicken, Dunchurch, Rugby.

Class 2. A Silver Cup, value 5 gs., offered by Messrs. Sutton & Sons, Reading, for the best collection of the five following varieties, namely, six Long Mangels, six Globe, or Intermediate Mangels, six Purple-top Swedes, six Kohl Rabi, and six Turnips.—The Marquis of Ailesbury, Home Farm, Savernake Forest, Marlborough, Wilts.

Class 3. Kohl Rabi.—1st, £2, Mr. G. Fleming, Groundslow Farm, Stone; 2d, £1, Col. J. S. North, M.P., Wroxton Abbey, Banbury. Highly Commended: Mr. A. Tustain, Great Barford, near Deddington, Oxon; Col. J. S. North, M.P., Wroxton Abbey, Banbury.

Class 4. Long Mangel Wurzel.—1st, £2, Sir F. Smythe, Bart., Acton Burnell, near Shrewsbury; 2d, £1, H. Allsopp, Esq., Hindlip Hall, near Worcester. Highly Commended: the Marquis of Ailesbury, Home Farm, Savernake Forest, Marlborough, Wilts; J. Moore, Esq., Warwick, and Long Itchington; Mr. W. Dickinson, New Park, Lymington, Hants. Commended: Mr. W. B. Boxall, Strathfieldsaye, Winchfield, Hants; Mr. J. Hicken, Dunchurch, Rugby.

Class 5. Globe and Intermediate Mangel Wurzel.—1st, £2, Sir F. Smythe, Bart., Acton Burnell, near Shrewsbury; 2d, £1, Wilham Farm, near Somerton, Somerset. Commended: Mr. T. Gunnell, Willow House, Milton, Cambridge; H. Allsopp, Esq., Hindlip Hall, near Worcester; Mr. G. Fleming, Groundslow Farm, Stone; J. Moore, Esq., Warwick; Mr. W. Dickinson, New Park; Mr. C. West, Pangbourne; Col. J. S. North, M.P., Wroxton Abbey, Banbury.

Class 6. Swedes of any variety.—1st, £2, Mr. W. B. Boxall, Strathfieldsaye, Winchfield, Hants; 2d, £1, Mr. R. Shirley, Wilcott, Munslow, Church Stretton, Salop. Commended: Mr. T. Hinks, Halford, Shipston-on-Stour, Worcestershire.

Class 7. Common Turnips (white flesh).—1st, £2, Mr. H. Woods, Clipstone Park Farm, Mansfield, Notts; 2d, £1, Mr. H. Woods.

Class 8. Common Turnips (yellow flesh).—1st, £2, Mr. J. Stephen, Conglass, Inverurie, Aberdeen; 2d, £1, W. McCombie, Esq., M.P., Tillyfour, Aberdeen.

Class 9. Carrots of any variety.—1st, £2, Mr. H. Woods, Clipston Park Farm; 2d, £1, Mr. W. Dickinson. Highly Commended: Mr. G. Fleming, Groundslow, Stone. Commended: Mr. A. Tustain, Great Barford, near Deddington, Oxon.

Class 10. Ox Cabbage.—1st, £2, Mr. R. Hall, Great Barford; 2d, £1, Mr. J. Greatorex, Stretton, near Burton-on-Trent.

POTATOS.

Class 1. Ashleaf Kidney Potatos.—1st, 15s., Mr. F. Lythall, The Spittal Farm, Banbury; 2d, 10s., Mr. C. J. Perry, The Cedars, Castle Bromwich.

Class 2. Rivers' Royal Ashleaf Kidney Potatos.—1st, 15s., Mr. H. Woods, Clipstone Park Farm; 2d, 10s., Mr. J. Choyce, Pinwall Grange, Atherstone.

Class 3. Gloucestershire Kidney Potatos.—1st, 15s., Mr. Z. W. Stilgoe, Adderbury Grounds; 2d, 10s., Mr. T. Barnett, Walford, Herefordshire.

Class 4. Daintree's First Early Potatos.—1st, 15s., Mr. C. J. Perry, The Cedars, Castle Bromwich; 2d, 10s., Mr. J. Choyce, Pinwall Grange.

Class 5. King of Potatos.—1st, 15s., Mr. C. J. Perry, The Cedars, Castle Bromwich; 2d, 10s., Mr. G. A. May, Elford Park, Tamworth.

Class 6. Wheeler's Milky White Potatos.—1st, 15s., Messrs. J. C. Wheeler & Son, Seed Growers, Gloucester; 2d, 10s., Mr. E. Freer, The Grange, Ward End, Birmingham.

Class 7. Flukes.—1st, 15s., Mr. Z. W. Stilgoe, Adderbury Grounds, Oxon; 2d, 10s., Mr. C. J. Perry, Castle Bromwich.

Class 8. Dalmahoys.—1st, 15s., Mr. H. Woods, Clipstone Park Farm; 2d, 10s., Mr. J. Choyce, Pinwall Grange.

Class 9. Red Regents.—1st, 15s., Mr. A. Tustain, Great Barford, near Beddington, Oxon; 2d, 10s., Mr. Sumner, High Street, Birmingham.

Class 10. Paterson's Victoria Potatos.—1st, 15s., Mr. G. Mangles, Great Givendale, Ripon, Yorkshire; 2d, 10s., Mr. W. Birch, Barnacle, Coventry.

Class 11. Skerry Blue Potatos.—1st, 15s., Mr. A. Tustain, Great Barford, near Beddington, Oxon; 2d, 10s., Mr. J. Choyce, Pinwall Grange, Atherstone.

Class 12. Any other named variety.—1st, 15s., Mr. J. Choyce, Pinwall Grange, Atherstone (Red Fluke); 1st, 15s., Mr. C. Felton, Birmingham Nursery (President Lincoln); 2d, 10s., Mr. W. Birch, Barnacle, Coventry (Climax); 2d, 10s., Sir F. Smythe, Bart., Acton Burnell, near Shrewsbury (Lapstone Kidney).

The remainder of the show, un-urged by prizes, is nevertheless extremely interesting. Messrs. Griffin and Messrs. Proctor & Ryland beat all the galleries in the roots they show to illustrate the potency of their manures. The agricultural implement makers are also here in force, but as we shall have next week to give an elaborate account of their share of a larger exhibition, we shall postpone our reference to them.

Farmers' Clubs.

LIMERICK.

Pigs.—At a late meeting of this Club, Dr. RICHARD FITZGERALD read a paper on this subject :—

As different farmers have different methods, I think it better to describe my own way, and leave it for your discussion. I begin to send my sows to the boar on October 1; the young ones are born about February 1. Great watchfulness is at this time required, particularly with the first litter, as the mother is sometimes inclined to eat them, and I always have a woman or man sitting with the sow for the first three or four days; the best person is the woman or man accustomed to feed the sow. If she is a very large pig, a good plan is to have a rail nailed a foot from the wall and a foot from the ground; so that the young ones will have room to get under this in case the mother is inclined to lie on them. While suckling, the mother should get plenty of bran and hot water, and, if plentiful, some milk mixed with it; also a good hot mash of Potatos, with a mixture of Indian meal, barley meal, pollard, ground oats, and bran, put through the mess, which will add much to her milk, and consequently cause the slips to grow big and strong. Mangels or Turnips may be substituted for Potatos, but are not so nutritious. Great care should be taken not to change the diet of the sow too suddenly, as it may cause scour to the young pigs, which is a most troublesome disease. It may be checked at first; but if allowed to run any time it is impossible to cure it. The sow should be left with the young ones as much as possible for the first fortnight or three weeks, after which she may be let out in the field for two or three hours at a time. You may now begin to mix a little Indian meal with some skim-milk, which the young ones will gradually begin to partake of, and by increasing it by degrees, and keeping the sow longer away from them, you may wean them finally when about eight weeks old. When they are from four to five weeks old, the males should be castrated, which can be easily done; spaying the females is much more difficult. When my pigs are about nine weeks old, and well able to feed themselves, I generally sell them; and this I think the most paying time, as I get from £1 to £1 5s. a-piece for them, which brings in a nice sum for each sow, without very much expense. About May 1 the sow can go to the boar again, which will enable her to have her second litter by September 1, which will be fit to sell by November 1; so that two litters are reared by each sow in the year, which ought to bring in a clear profit of from £14 to £20 a-year for each sow. Before closing this part of the paper, I would wish to remark about the feeding of the sow when in young. The common practice when a sow is too fat is to half-starve her, for fear she would not carry her slips; but this is a very erroneous idea. Some breeds appear always in condition, or with a quantity of flesh on them; and if they are not fed properly when in young the offspring will be small, and if it is the first litter, the sows themselves will not grow, but will be always stunted. They should be well fed with plenty of vegetable diet mixed with a little meal and bran, but particularly the latter, which will keep them in a good state of health, and will make them good nurses when they have the young ones to feed. I will lastly consider what is the best mode of bringing the pig to maturity, or in other words, fit to be converted into pork or bacon. Having provided yourself, either from your own breeding, or having bought some when about eight or ten weeks old, you should first see that they have been properly weaned, as any sudden change of diet may bring on that scour before mentioned. They should now be fed regularly twice a day with the following mess: Some Potatos, Turnips, or Mangels, well boiled or steamed (the latter is the best), should be well chopped up, and some soup added. This soup can be well made of some Carrageen Moss, which can be found at most sea-bathing places, and when well boiled is converted into a jelly kind of substance, which the pigs relish very much. I would also add a little meal, which is composed of a little mixture of equal parts of Indian meal, pollard, palm-nut meal, ground barley, ground oats, and bran. In this mixture you combine the flesh-forming and fat-making substances, which are not contained in any one of them. A small quantity of this, mixed with the food, will suffice. On no account allow any dirt or decayed food to remain in the trough, after the pigs have done feeding, which, if allowed, soon becomes fœtid and bad, and taints the fresh food when put into the troughs. This will prevent the pigs from eating, and consequently will keep them back in condition. The hours for feeding should be about 8 o'clock in the morning and 4 in the afternoon. Between these hours they may be let run about in a field, which will assist their growth and enable them to procure other food, which they will do by feeding on the grass greedily. When about five months old they ought to be about 1 cwt., and fit for small porkers, but should be kept in the house altogether for a fortnight before being disposed of, giving them an extra feed in the middle of the day.

I will close this paper by giving you the probable cost of making bacon according to present prices, which, I think, will pay the farmer better by consuming at home than selling at the low prices as now given in the market. Suppose we take ten pigs, which we either buy or rear ourselves, and which at ten weeks old are worth £1 6s. each—the cost, then, is £13. The cost of meal—which consists of 10 stones Indian meal, 10s.; 10 stones ground barley, 10s.; 10 stones pollard, 10s.; 10 stones palm meal, 10s.; 10 stones bran, 10s.; and 10 stones ground Oats, 10s.—will be £3. We have to feed these pigs—say for four months—with 2 lb. of this meal a-day, the cost of which will be about 1s. a-week for each pig, or about 17s. for four months. To this must be added 34 stones of small Potatos, one ton and a-half of Turnips or Mangels, and the cost of soup, milk, and attendance, which would be as follows:—10 pigs, at £1 6s. each, £13; meal for 10 pigs, at 1s. a-week each, for 17 weeks, £8 10s.; 15 tons of Turnips or Mangels, at 14s. per ton, £10 10s.; cost of attendance, fire, soup, and sundries, £8. Total, £40, which would give £4 as the cost of each pig, which they ought to be well worth at this period, paying the consumer a fine price for his own commodity, and enabling him to collect a fine quantity of manure, without which no man can farm properly, and, above all, often tempting him to treat himself and his family to some of that favourite dish, viz., "bacon and greens."

WIGTON.

Turnips and Mangel Wurzel.—Mr. TODD, of Mireside, read a paper on this subject before the members of this Farmers' Club.

It would perhaps have been better if this subject had been introduced a few weeks earlier, as by far the most general system of growing root crops is after a crop of Oats; and I consider that to cultivate these crops with the best chance of success, we ought to commence with the preparation of the land—the Oat stubble—immediately after harvest, as soon as ever the Oats are out of the field, so that we are more likely to get the land properly worked while the weather is dry. The best way, in my opinion, is to plough the land over first, then apply lime.

One who is considered a good authority says:—"Lime is found to act in a very remarkable degree on the Turnip crop. Land that has never been limed, or which has not been so for a great number of years, either refuses to grow Turnips, or, if they do grow, they are always sadly injured ultimately by the disease called 'fingers and toes.' We have seen so many instances of this disease being removed by lime that we cannot look upon it in any other light than as a sovereign specific remedy in all cases of the same nature. We may, no doubt, reproduce the finger-and-toe disease by a too frequent repetition of Turnips on the same field, even although recently limed; but had it not been limed the disease would have been much more virulent. 'The Norfolk system of cropping, where Turnips are repeated every fourth year, would undoubtedly cause a total destruction of the crop, were it not for the long-continued custom of marling frequently, the consequence of which is, that Turnips are not more liable to disease in Norfolk than in other counties, where this crop does not recur oftener than every fifth or sixth year."

The lime might be laid down in cartloads, and slaked ready to put on the land as soon as it is ploughed over, then harrow it in, and with two or three times grubbing, and as many harrowings, it gets well mixed with the soil, to get cooled before the spring. Now clear the land of Couch-grass and other weeds which will all be brought to the top by the above operations, and if rather lumpy still, the best thing to run over it then is the chain-harrow, which will thoroughly separate all the weeds from the soil, and leave them loose and light on the top of the land, to be carted away, burned on the land, or ploughed in to rot during winter.

On sandy or gravelly soils, where we are most likely to fail during a dry summer, a covering of clay on such soils occasionally would be the greatest improvement, if it can be found at not too great a distance. For light peaty soils anything heavier, sandy clay would be best. The land should be ploughed again before winter, if the weather will admit of it being properly done, to have it thoroughly loose and clean, so as to require only one ploughing in the spring. A good deal of our success depends on the land being thus prepared in the autumn. The land receives much benefit by thus lying light and loose over the winter, and will be ready for stetching for geeen crop after one deep ploughing as soon as the land is dry enough in the spring, about the first or second week in April. Then after making the stetches or drills, putting in the manure (which ought to be broken very fine), and splitting the stetches to cover it in, the land is ready for the seed, and is no worse for lying a week in that state before the seed is sown, except on very stiff land. Mangels ought to be sown during the last ten days of April or first week of May. The late Mr. Rigg, of Abbey House, who was a very successful Turnip grower, found that May 25 was about the best time to sow Swedes in his day, but that is three weeks too late in our time generally; of course there is a difference of seasons. The first week in June is about the time to sow common Turnips. The drill ought to follow close after the plough in dry weather while there is moisture in the land. Get the land ready early for the seed, and if it should happen to be too dry, with most kinds of soil, we can wait a few days until rain comes. Turnips often miss or fail on account of the land not being sufficiently rolled and pressed down, and Mangels from the same cause. Where farmyard manure is used, particularly, the stetches ought to be well rolled and flattened down when the seed is sown at a dry time.

Seed drills with hollowed rollers are not the best kind. Neither is it good to sow without rolling at all. A light horse-roller which rolls two ridges or stetches at a time, with a drill held by a man attached to it behind, is the best kind. The roller passes once over the ridge before and once after the seed is sown. Sown in this way there is more moisture, insects cannot work so easily in the soil, and the plants come up stronger.

There is a field I have passed frequently this summer in coming to Wigton, of 3 or 4 acres, with only three or four cartloads of Turnips in the whole field. But in going to Dumfries show this summer, I saw that Turnips were much worse in the south of Scotland generally than in Cumberland. In some fields a fourth of the field was bare, and in others one-half. On certain patches of the field there are small worms at the root of the plant; you see the leaves begin to wither; then come the farmer's friends to destroy the worms and insects, and pull up those Turnips which had begun to wither and die; and thus a good deal of ground is yearly cleared. Occasionally we see failure from taking Turnips too frequently off the same land, particularly if it is a light, poor soil. Land is liable to be Turnip sick as well as Clover sick. Sometimes the seeds do not germinate, on account of the dryness of the season; there is not sufficient moisture in the ground, or they may be growing healthy and well, and all be destroyed by the beetle or flea.

Now, in my humble opnion, it is generally our own mismanagement in one way or another when we fail to get a crop, or to get the land clean. I have heard farmers say "we can never get the land clean for Potatos or Swedes—they have to be put in so early." But the land ought to be prepared in September and October, and for that purpose we should keep up our strength of men and horses after harvest, and not have the land to clean in the spring when the seed should be sown. We ought to grow more Mangels than we do. With proper management and good seed, we may grow as heavy a crop of them, or nearly, as of Turnips of any kind. We know they are not so likely to be destroyed by the flea. They will keep longer, and remain juicy and palatable long after the Swedish Turnip has become spoiled by age. Turnips should all be used by about the middle of March; and we ought to have plenty of Mangel Wurzel to use with dry fodder in the last two months of spring, before the cattle are turned out to grass; and Swedes are not likely to be destroyed either by the flea, by worms, by birds, or anything else if sown early—sown in the first or second week of May. Why should we be sowing them during the last ten days of May when they have the most enemies to contend with, and there is most risk? But if we should have to sow a part, then, during that time when the flea is strongest, it will be necessary to sow a pound more seed—at least 3 lb. per acre; and to dust the land over with lime just at the time the Turnips are coming through. A small addition in the quantity of seed at such a time has sometimes made all the difference between a good crop and no crop at all. Common Turnips may be sown up to June 20, but should seldom be sown later. We should always sow a small portion of the soft Globe Turnip, to be used first in the autumn, to be given to young cattle to learn them to break Turnips for themselves. A thing of the most importance is to get good seed.

If we cannot purchase good seed, would it not be better to raise our own? A small portion of my Swede crop this year is from 1 lb. of seed procured from a seedsman, at 1s. per lb. All the rest is from a farmer who raises his own from transplanted bulbs, and sells a quantity; the price paid for it was 2s. per lb. They seem to be both of the same kind of Turnip—are the

same colour, and the same shape of bulb. Any one walking across the field could not see a very perceptible difference, he could not easily tell where one ended and the other began, yet there is a difference of probably 4 or 5 tons per acre.

Better to pay half-a-crown per lb. to have it from selected transplanted bulbs than 1*s.* per lb. for seed grown from the promiscuous crop. We are told there is little profit to the grower who sells it thus raised at 2*s.*, but that it pays well to sell it at 2*s. 6d.* per lb. We can generally procure good Swede seed so grown; but the Yellow Bullock, which was once a great favourite and valuable root, is now so degenerated, that if seed growers do not take more pains with it, or if it cannot be improved or restored, must either be very little grown, or go out of cultivation altogether.

I should like to see a few members of this Club transplant a few bulbs in their gardens, of common Turnips, and try to improve that kind; this is the time to do it. They ought to be put rather deeper in the soil than Swedes; and it would be well to spread a little light manure over them to protect them from the frost. Those who are not in the habit of raising Swede seed could best do this. They should not be grown near together, else the produce would be hybrids. To show the difference there is in seed, it is right to state that before I began to get Mangel Wurzel seed from Mr Thomas Man, of Crockhurst, I never could grow crops of Mangel of above half the weight. At first—a few years ago—he gave me a small quantity which they had left after sowing their own. It was ready steeped, and was sufficient to sow one drill or stetch the length of a field where I that year had about 2 acres sown, the seed of which was from two different, but both respectable seedsmen. There was as great a weight on that one stetch as on any two of the rest of the 2 acres, and all the same way managed. I have got seed from Mr. Mann, and grown heavy crops of Mangels ever since. This year I had 7 lb. from him, and paid 2*s. 6d.* per lb. for it. That quantity was sown on nearly 2 acres of moss or bog land, with a proper Mangel drill, on May 1 and 3. The stetches were twice rolled, and being loose, light moss, was pressed down until the land was nearly level. Other years I have applied a little artificial manure, mixed with salt, along with farmyard manure, but this year have used only a rather small quantity of very rich farmyard manure, without either salt or artificial manure of any kind. The quantity, as near as I can tell, would be about 10 good cartloads per acre. Each row was set for five stetches. The heaps were about 7 yards apart, and about 12 heaps in a cartload. The land was limed and well cleaned in the autumn. We had two kinds sown—the Long Red, and the Yellow Globe. To ascertain the weights per acre, we carefully weighed, with the tops and tails on, but the soil clean washed off, 6 yards on a stitch of each kind where they seemed an average of the whole crop; also, 6 yards off an extraordinary crop of Swedes, grown on the same sort of soil in the same field, and managed in the same way. The Long Red Mangel Wurzel were 8 stones 2 lb.—number of bulbs, 21; Yellow Globe do., 7 stones 9 lb.—number of bulbs, 19; Swedes, 8 stones 11 lb.—number of bulbs, 21, each from stetches 6 yards in length by 31 inches in breadth. The weights per statute acre weighed, on October 21:—

	Tons.	Cwt
Red Mangel Wurzel	47	1 [illegible]
Yellow Globe, ditto	44	14 [illegible]
Swedes	51	5 [illegible]

A few days afterwards, thinking it would be more satisfactory, we weighed the tops cut off 21 Mangels on a 6 yards' length, and the tops off 21 Swedes on a 6 yards' length (all the tops cut off just a little above the point of insertion into the bulb), and found the weights to be as under:—

Tops off 21 Mangels .. .. 17 lb.
Tops off 21 Swedes .. .. .. 5 lb. 11 oz.

Weight of Tops per Acre.

	Tons.	Cwt
Mangels	6	5 [illegible]
Swedes	2	7 5 [illegible]

Weight per Acre, without Tops.

	Tons.	Cwt
Red Mangel Wurzel	41	4 [illegible]
Yellow Globe, do.	37	1 [illegible]
Swedes	49	1 [illegible]

When we succeed in growing a crop of Mangels to weigh upwards of 40 tons per acre, a few of them (the bulbs) will often be of this weight—15 and 16½ lb. A good many of them will weigh half a stone, and very few of them will be under 3 or 4 lb.

What is the value of such a crop of Swedes? To be sure we are within the actual weight, we will call them 40 tons. I think we may safely put them down at ¾*d.* per stone, to use for our own stock; ¾*d.* per stone, 6*d.* per cwt., 10*s.* per ton; then, £20 for an acre of Swedes or Mangels weighing 40 tons.

A writer, residing at Ipswich, Suffolk, in the Royal Society's "Journal," in a prize essay, says:—"In connection with a farmers' club we have often seen this crop weighed, and also Swedes. We found Beet to vary from 14 to 44 tons per acre, and Swedes from 10 to 25 tons." Here the best weighs 38 and 41 tons; but the Swede, instead of being little more than half, weighs more than the Beet. In the south of England there is an enormous advantage on the side of the Beet crop. Here, as regards weight, the advantage is slightly in favour of the Swede; but the Beet is more certain, and will keep longer.

We had Green-top, Yellow Bullock, and White Globe Turnips in the same field, but it was easy to see that they were not so heavy as the Swedes.

Before we get any of the better Mangel seed, the bulbs, although only about half the size, had more small fibres at the roots, brought up more soil with them when pulled, and were far worse to clean.

In thinning Turnips and Mangels the best way is by hand, then to be hoed not many days afterwards, taking care not to take too much soil from the plants, or to let them too much down. Three lads may thin or hoe an acre in a day.

The weight of the crop greatly depends on their being judiciously thinned. Don't mind for 2 or 3 inches either way, less or more, to leave the finest plant. The best average distance, for weight and quality, is, for Swedes 12, and common Turnips 10 inches; Mangels 10 to 12. The best width for the ridges or drills, from 30 to 33 inches.

When we pull and clean them for storing—that they may keep better—care should be taken not to cut into the bulbs, the tops should be cut off above the point of insertion into the bulb, so that the leaves fall separately on the ground, and are more easily ploughed in.

It is very common to let the Turnips to pull off. We see the people at work with them; one cut generally serves for the root, another for the top. They seldom strike more than twice when the work is let, often cut into the bulb, and often leave a great deal of soil on it. The better way is to take the soil carefully off with the back of the knife, and then, keeping the knife the same side up, pull it through the top from the underside at the exact place, without striking at it at all in cutting off the tops.

In storing, it is better if they are carted and covered up on the same day that they are pulled; a single night's frost may damage them very much, but they receive little harm from two or three nights frost as long as the roots are in the ground. Mangel Wurzel requires to be well covered up on the heaps, the way that we usually cover Potatos, with a little straw and a good thickness of soil.

The expense of cultivating an acre of either will often be from £8 to £9 for labour, manure, and rent of land; part of this expense for manure is chargeable to the next crop, particularly if the tops are ploughed in, and for cleaning upon all the crops; for the real cleaning crop in the rotation is the root crop. As it is an expensive crop at any rate, it is better to be at a little extra expense for manure and labour to get a heavy crop, as the value of it varies so much. We have seen some Turnips this summer worth not more than five or six shillings per acre (in one case which I mentioned to you), and a good crop may be worth from £15 to £20.

Long Red Mangel Wurzel (weight for statute acre, and number of bulbs).

Weight per acre.	Weight without Tops.	Number of Bulbs.	Average weight of each bulb.
Tons. cwt.	st. lb.		lb. oz.
47 4	8 2	21	5 [illegible]

Yellow Globe Mangel.

38 7	7 7	19	5 [illegible]

Swede.

47 1	8 11	21	5 [illegible]

My reason for introducing this subject is on account of the many great failures we see in the Turnip crop. We cannot travel 100 miles, either north or south, without seeing scores of acres bare, which ought to be growing Turnips.

Notices of Books.

Notes on Fields and Cattle: *from the Diary of an Amateur Farmer.* By the Rev. W. Holt Beever, M.A. Oxon. Bradbury, Evans & Co.

The amateur beginning an agricultural life, with a natural love for country pursuits, and with every faculty of his nature quickened and educated by a successful university career, is, we may presume, in the best possible circumstances for overtaking, if it be possible, the practical man who has been at it since his boyhood. And as there are many things which strike a stranger, which are passed unnoticed by others, it may be quite a fit and proper thing that he should write a book. Mr. Holt Beever's notes on fields and cattle, unlike those in an otherwise somewhat similar little book, to which we referred last week, are arranged. We have successive chapters, each full of matter, both original and extracted, and the whole is an agreeable and instructive series of "Notes," in which the practical man, as well as the mere student or beginner, may learn much that will be serviceable to him. Cows, horses, pigs, and sheep and fowls, are discussed in the first five chapters; reaping, threshing, haymaking, dairy management, judging, breeding, are discussed in the last seven. An extract cannot do justice to what is professedly a note-book, but the style which clings to its pages will be illustrated by a fragment anywhere. Let us, therefore, take a page on a subject which is just now occupying attention—the question of judging live stock:—

"The leading principles only I can hope to teach on paper: these the most ignorant person, possessed only of ordinary intelligence, and having such an eye for configuration as a few lessons in drawing ought to give, may acquaint himself with readily by a few evenings' study. He will require practice to impress them on his memory. All that I hope is to give the tyro an idea of what should be noticed. I just run him up handy a few plain deal shelves, in a ready position for him to fill by his further acquisitions of knowledge, and ticketed, as I have found them in my own experience most convenient—such as I consider, if I had found them placed, would have saved me much time and trouble. There is much, of course, that is ineffable; those nameless graces which 'seen, become a part of sight;' which, once appreciated, can never be forgotten, and, unhappily, spoil the eye for anything that does not come up to their height of beauty. The chief points, however, one may indicate with the pen. Having earnestly studied them thus represented, take the first opportunity you have of going round the stalls of the Royal Agricultural Society's Show with an accomplished friend, and have yourself taught the inner mysteries of 'handling:' that is, to judge by the touch an aptitude to fatten, or otherwise. Get aware of the changes which skilful trimming can ring in the appearance of a sheep. It will amuse you to watch the matutinal scientific oiling of the negro pig, and the grateful shower-bath they give his smoking skin through the common-place medium of a garden watering-can. It is requisite you should learn what value attaches even to a crease in the hide, when competition runs high between a porcine pair; and to the solitary extra inch of girth that decides between the claims of the rival Devon heifers.

"Be stirring early; you will have the showyard pretty much to yourself then. The active exhibitors you may probably find there. Many a hint you may get on feeding, by watching the servants in attendance on the stock. It is a grand sight, moreover, to see the procession of horses enter—of every shape and size and colour—from the magnificent, immense, dray champion to the clever Welsh pony, with its hunter points, its square action, and its indomitable spirit. It will be worth your while, further, to take home the slightest lock from the coat of the different prize sheep in the various classes, to be examined at leisure with a microscope, and preserved, as they will occupy no room, and may serve to keep up the measure of your acquirements on the important subject of wool.

"At this early hour of the day you will see the animals themselves in their freshness, while you are spared during the cool morning the unpleasant odours that repel at the crowded noon, more especially in the region of the pigs and sheep. You may then sit by on a truss of sweet hay in some empty stall, and chat with a friend, or take stock of the human creature in turn, as it drifts by in varied shades of character and colour. To enable you, however, to gain the primary idea of a good animal, that is to underlie the superstructure of your future more intimate acquisitions, draw a straight line A B, of any length you please. Divide it into thirds at B and C."

And so he proceeds with his diagrams.

Farm Memoranda.

ROXBURGHSHIRE: *Tweedside, November* 25.—We have been busy for the last two weeks storing our Turnip crop, but the unfavourable weather has retarded operations very much, although at the same time the fresh rains have tended to swell out the bulbs considerably. The crop has turned out wonderfully good after all the vicissitudes it has undergone, the attack of fly requiring them to be resown in many cases more than once; the drought and mildew, and lastly, the lice, were drawbacks, which have all been overcome; and the crop, though not an average, is very much better than any one could have expected. Turnips are now to be had on reasonable terms for eating on the ground with sheep. We hear of 7½*d.* being quoted for ewes, and about 5*d.* per week for hoggs. The roots are very sound, and stand more eating than last season.

Stock of all kinds has been exceedingly dear, and it would require beef and mutton to keep at the present high prices, in order to have a fair amount of pay off it.

The yield of the grain crops is much lighter than last year. Barley looked a fine crop when standing in the field, but when tested by the bushel it has not come up to expectations, although it will still continue to be the crop of the season; the quality is very fine, from 56 to 60 lb. per bush., and it fetches fair prices. Oats were short in the straw, and will not thresh out a full crop, but the samples are finer and more equal than last season. Potatos are not extensively grown in this county, but they have lifted a very bulky crop, and free from disease.

There have been several farms exposed to let here this autumn, for which there has been keen competition; they have been let an increase of from 30 to 100 per cent. over the former rents. *H.*

The Week's Work.

DECEMBER 3.—*Draining Operations* should now be prosecuted with vigour on arable farms, so as to get the work finished in time for the land being ploughed. There is still much land undrained, and large areas that have been only half-drained—a drain between every two being necessary to remove heavy showers, and thus avoid flood-water. Again, some of the drains in the earliest drained land are beginning to give way, and the wider the drains are placed asunder and the less perfectly the land is drained, the sooner the drains give way and require to be renewed by redrainage. It must ever be borne in mind that the artificial drainage of land is far from a permanent work. Such data further

prove that the action of a drain during its existence is not always uniform; much, of course, depends upon the nature of the land and the manner the work of drainage has been executed, together with the quality and durability of the draining pipes or materials used in draining. A bad pipe near the bottom of the field by giving way will destroy the drainage above it, hence the care with which pipes should be selected and put into the drain—all broken or improperly burnt ones being thrown aside. It follows also that drained land at this season should be carefully examined, to see that the drains are all acting uniformly. Where they discharge their contents into main drains, as they always should do, it is not easy to determine whether they are discharging equal quantities of water; but when a drain "bursts," *i. e.*, becomes choked, and ceases to act, the rising of the water and the wetness of the land around can easily be seen. In bad cases the drainage should be repaired immediately, and this is perhaps the best rule generally. But in young Wheats and seeds it may, in exceptional cases, be advisable to mark the wet spots, and defer the opening of drains until after the next harvest; or a temporary repair may be made by opening a cut between the drain that has burst and the one nearest to it, so as to turn the water of two drains into the latter. This, however, is an imperfect mode, and should not be trusted beyond the end of the ensuing harvest. In some cases the failure is so easily seen that a cut can be dug down to the broken pipe, or series of pipes where the ground has been washed away under (a very common mishap), and the repair effected at once. When drains begin to give way in this manner, the best plan is to open a series of cross main drains, before the Wheat is sown or seeds, so as to relieve the others, and expedite repairs between the mains thus opened, where the parallel drains give way.

Steam Culture, under favourable circumstances, should be finished by this time, and the exceptions should be proceeded with as fast as the facts of the case will permit, such as drainage and the like. This is perhaps the best time for breaking up by steam poor wet pasture lands that have been badly drained; also waste land that has never previously been subject to the plough, in order to get it exposed to the winter frost and rain. Where the bottom is of a suspicious character it is better to plough shallow and subsoil deep, so as to well ventilate the bottom. If this is thoroughly done the alternate freezing and washing, with oxidising of the air, will have a powerful effect in preparing the land for manure and the growth of crops. It often happens that inattention to the proper depth of ploughing and subsoiling is more than a season lost in the reclaiming of wet, clayey land, or land of any kind that has a bad bottom. Dry, calcareous, gravelly, and sandy soils form an exceptional class that may be cultivated by steam as successfully just now as at the close of harvest, so far as the mere work of ploughing is concerned, as they do not "squeeze" and "paste" like tenacious clays that have by this time absorbed their maximum of water; clayey soils of the latter class should be ploughed by steam when in a comparatively dry state, when, instead of "pasting," the furrow slice is left behind the implement broken into a thousand fragments.

Horse Ploughing prosecute in open weather. Owing to the early harvest, stubbles should have been finished before this, but in wet weather it is better to turn into lea fields until the stubbles dry than to poach the land. In late wet seasons in the North, stubbles liable to poach are not unfrequently left until spring for Beans, the Beans being sown in the stubbles and thinly covered by "ribbing," *i. e.*, stetches made by the common plough, each with one furrow. It is, however, only the heavier clay soils that are thus left to spring, and the practice is becoming less frequent, as the land is thoroughly drained.

Clay, Chalk, Marl, and Compost apply to grass land requiring them, in order that the coming frost and rains of winter may disintegrate and wash them in before the growth of spring commences. Some marly clays are sufficiently friable to be broken fine in the spreading for working in immediately by a chain-harrow; others require frost to break them down. Composts generally may be thus applied and harrowed into grass land. But when from 200 to 400 cartloads per acre of clay are applied, to change the texture of poor, sandy, gravelly and peaty soils, seed-harrows or the common harrow may answer better than the chain-harrow or bush-harrow—frequent harrowings being sometimes necessary to effect the disintegration and washing in. Chalk is also found so broken, when dug from pits or drifted strata under clays, as to be easily applied and harrowed in to clayey and peaty soils. On farms ploughed by steam, the carting of such applications forms profitable employment for the teams.

Anthills cut and spread. Frost and cold rains both kill the ants, but when spread abroad in fine open weather they are apt to find a lodging for the winter. Dig out at the same time and remove Tussack-grass, Docks, Thistles, and other weeds in the pastures. If the land is to be top-dressed immediately, it is better to cart off anthills, Tussack-grass, &c., to a compost hill, and mix with lime or liquid manure, so as to destroy animal and vegetable life.

Water Meadows.—Attend to the alternate floodings; in a season like this the process requires close watching. Where there is a limited supply of water, provision should, if possible, be made for turning it on to a dry field, as the respective flooded ones are gone over, so as to use the whole supply at command. In this way a very small supply of water judiciously applied may enrich a much larger area of land than is generally imagined, and 1 cwt. of guano or artificial grass manure sprinkled over the meadow by a broadcast manure distributor, will greatly reduce the quantity needed to insure a heavy crop of hay.

Fat Stock Exhibitions are now one of the chief attractions of the season. From the facilities which railways afford for travelling, the farmers of different counties enjoy the opportunity of seeing the fattening properties of different breeds, and of learning much that cannot be taught at home; and it is questionable if our Christmas meetings are so generally attended as they should be for educational purposes. No doubt the fattening process is too much in the extreme for many, but from an educational point of view the objection falls to the ground, for the fat ox, sheep, or pig can be sent to the shambles at any stage of the process. *W. B.*

Notices to Correspondents.

BONE DUST AND SULPHURIC ACID: *Mr. Hills.* We give a recipe for making superphosphate:—Plaster and puddle a floor of clay, and let it dry. Lay thereon a ton of bone dust—say 7 or 8 qr.; it should not be coarse, but need not be literally dust; if boiled or burned, so much the more favourable for the efficiency of the after operations. Pour water on the heap for a day or two, as long as any is absorbed; then flatten it down, and lay a lot of ashes round the edge. Pour on gradually 6 or 7 cwt. of sulphuric acid—four or five of the ordinary carboys. It should be poured into jugs, and thrown from the jugs on to the bones. The slowness of this plan, as well as its safety, is a recommendation. It will boil, and fume, and effervesce, and you had better stand to windward of it. Before night it will be quiet, and, if still very wet, it should have the ashes closely packed around it. They may be mixed with the heap in a day or two, and it will be fit for the drill in a fortnight.

Markets.

MARK LANE.

MONDAY, Nov. 28.

The supply of Wheat from Essex and Kent to this morning's market was very small, but to effect sales it was necessary to submit to a reduction of 1*s.* per qr. upon the prices of this day se'nnight; there was a fair attendance, but little inclination was shown to purchase foreign Wheat, and the few sales made were at a similar decline. Prime malting and grinding Barley was unchanged in value; secondary sorts of malting were difficult of sale, and cheaper. There was no change in the value of Beans or Peas. The Oat trade was steady at last day's rates. Country Flour was rather easier.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*
WHEAT, Essex, Kent, Suffolk.. White	48–56	Red..... 54–57
— — fine selected runs..do.	58–60	Red..... 47–53
— — Talavera	53–52	
— — Norfolk	—	Red..... —
— — Foreign	48–64	
BARLEY, grind. & dist. 30to 34s..Chev.	43–46	Malting .. 36–41
— Foreign .. grin ling and distilling	25–33	Malting .. 33–40
OATS, Essex and Suffolk	26–25	
— Scotch and Lincolnshire..Potato	28–30	Feed .... —
— Irish	27–29	Feed 25–28
— Foreign ...Poland and Brew	25–27	Feed 20–25
RYE	32–36	Foreign .. 33–36
RYE-MEAL, Foreign		
BEANS, Mazagan.... 42s. to 45s.	Tick	40–50 Harrow .. 42–50
— Pigeon ....51s. to 56s....	Wind-	Longp.sd. —
— Foreign	Small	45–47 Egyptian.. 42–44
PEAS, White, Essex, and Kent..Boilers		38–40 Suffolk .. 40–42
— Maple, 40s. to 44s.	Grey	36–40 Foreign .. 40–40
MAIZE		— Foreign .. 40–42
FLOUR, best marks delivered..per sack		39–47
— 2d ditto	ditto	33–45 Country .. 33–45
— Foreign	per barrel	26–23 Per sack.. 37–63

WEDNESDAY, Nov. 30.

The grain trade at Mark Lane to-day was depressed, but owing to more favourable weather values were maintained. There was a limited supply of English Wheat on the stands, which sold slowly at Monday's quotations. Foreign Wheat was in moderate supply and similar request, on former terms. With Barley the market was scantily supplied. Purchases were effected cautiously, at about previous currencies. Malt experienced a dull trade, but prices were without quotable alteration. There were good supplies of Oats on sale; the inquiry was inactive, but values were unchanged. Beans and Peas were taken off to a fair extent, at fully late rates. The Flour trade was depressed, but prices were supported.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 160	Qrs. 1109	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	3030	—	22,980	510 = 10,440 brls.
	3190	1109	22,980	

LIVERPOOL, Nov. 29.—To-day's market was thinly attended. The transactions in Wheat were of limited importance, and prices generally 1*d.* to 2*d.* per cental lower than on Tuesday last, except winter red; American, owing to scarcity, was unchanged. Flour quiet, and Beans and Peas 6*d.* per qr. lower. Barley unaltered. Oats 1*d.* per bushel, and Oatmeal 6*d.* lower on the week. Indian Corn in fair request, at last Tuesday's extreme rates.

AVERAGES.

	Wheat.	Barley.	Oats.
Oct. 22	47s 3d	36s 5d	22s 2d
— 29	48 6	36 9	22 4
Nov. 5	49 9	36 8	22 7
— 12	50 5	36 11	23 8
— 19	49 10	36 8	23 11
— 26	50 5	36 2	23 7
Average ..	49 4	36 7	23 0

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Dec. 1.

Prime Meadow Hay	130s.to140s.	Clover, old ..	..130s. to 140s.
Inferior do. ..	..110 120	Inferior do. ..	..115 125
New Hay	— —	Prime 2d cut do..	126 135
Inferior do. ..	.. — —	Inferior do. ..	..103 115
Straw	30 34		

CUMBERLAND MARKET, Thursday, Dec. 1.

Sup. Meadow Hay	130s.to140s.	Inferior Clover	..120s. to 128s
Inferior do. ..	..110 124	Prime 2d cut do...	—
New do.	.. — —	New do.	— —
Inferior do. ..	.. —	Straw	.. 30 40
Superior Clover	..136 140		JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Nov. 28.

We have a few more Beasts than on Monday last; the trade is, however, good, and late prices are fully maintained. The supply of Sheep is much smaller, but trade at the dead markets being heavy, we cannot quote any higher prices here. Calves are not sold quite so well as of late. Our foreign supply consists of 1390 Beasts, 6450 Sheep, 120 Calves, and 60 Pigs; from Scotland there are 260 Beasts; from Ireland, 900; from Norfolk and Suffolk, 50; and 985 from the Midland and Home Counties.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	5	8to6 0	Best Long-wools	5	4to5 8
Best Shorthorns..	5	6—5 10	Do. Shorn ..	..	— ..
2d quality Beasts	5	3—5 4	Ewes & 2d quality	4	4 5 0
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn ..	..	— ..
Do. Shorn ..	..	— ..	Lambs ..	..	— ..
			Calves ..	3	0—5 0
			Pigs ..	3	8—5 8

Beasts, 3585; Sheep and Lambs, 10,300; Calves, 130; Pigs, 120.

THURSDAY, Dec. 1.

The supply of English Beasts is about the same as last Thursday, but of foreign much larger; trade on the whole is dull, and a clearance is not quite effected; we cannot, however, make any alteration in quotations. There are a few more Sheep on offer, and they cannot all be disposed of; choicest descriptions find purchasers at Monday's rates. Choice Calves are in demand at rather higher prices. Our foreign supply consists of 680 Beasts, 2500 Sheep, 160 Calves, and 70 Pigs.

	s. d.	*s. d.*		*s. d.*	*s. d.*
Best Scots, Herefords, &c. ..	5	8to6 0	Best Long-wools..	5	4to5 8
Best Shorthorns ..	5	6 5 10	Do. Shorn ..	..	— ..
2d quality Beasts	5	8—4 6	Ewes & 2d quality	4	4—5 0
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn ..	..	— ..
Do. Shorn ..	..	— ..	Lambs ..	..	— ..
			Calves ..	3	6—5 0
			Pigs ..	3	4—5 4

Beasts, 1,310; Sheep and Lambs, 5,130; Calves, 203; Pigs, 100.

METROPOLITAN MEAT MARKET.—Dec. 1.

Best Fresh Butter	.. ..	..	20*s.* per dozen lb.
Second do. do. ..	.. ..	..	18*s.*
Small Pork, 4*s.* 6*d.* to 5*s.* 4*d.*; Large Pork, 3*s.* 8*d.* to 4*s.* 4*d.* per 8 lb.			

COALS.—Nov. 30.

Hastings Hartley, 16*s.* 3*d.*; Holywell Main, 17*s.*; Walls End Gosforth, 17*s.* 3*d.*; Walls End Harton, 17*s.* 3*d.*; Walls End Haswell, 19*s.*; Walls End Hetton, 19*s.*; Walls End Hetton Lyons, 17*s.* 3*d.*; Walls End Hawthorn, 16*s.* 9*d.*; Walls End Russell's Hetton, 17*s.* 6*d.*; Walls End Hartlepool, 18*s.* 6*d.*; Walls End Kelloe, 18*s.*; Walls End East Hartlepool, 18*s.* 9*d.*; Walls End Tees, 18*s.* 9*d.*—Ships at market, 47; sold, 40; unsold, 1; at sea, 25.

SEED MARKET.

We have to report increased animation in the agricultural seed trade; values of all descriptions are advancing. A good trade has sprung up for yearling red Clover seed; fine qualities of new English red come to hand very slowly, and meet with a ready sale, at enhanced rates. Alsike and white Clover seed must be quoted some shillings dearer since our last report. Of new Trefoil there is an ample supply, at unaltered currencies. There is but little offering of foreign Italian; prices are rapidly rising. Perennial and annual Rye-grasses are dearer. White Mustard seed is firm. Rape seed is noted 3*s.* to 4*s.* per qr. higher. Feeding Linseed is steady. Hemp and Canary seed are in fair request. Garden Peas and Beans are without change.

JOHN SHAW & SONS, Seed Merchants,
16, Water Lane, London, E.C.

HOPS.

BOROUGH MARKET, Dec. 1.

The demand is still principally confined to the medium qualities of Kent and Sussex Hops, though some considerable sales of the lowest and brownest Hops grown have also been effected. Bohemian Hops are neglected. Fine Bavarians sell a little more freely. Belgian Hops are firm in London, but the Alost market shows signs of weakness.

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited).
Chief Offices—109, Fenchurch Street, London, E.C.
Western Counties Branch—Queen Street, Exeter.
Irish Branch—30, Westmoreland Street, Dublin.

DIRECTORS.

Chairman—John Clayden, Littlebury, Essex.
Deputy Chairman—John Collins, 255, Camden Road.
Edward Bell, 38, Marine Parade, Brighton.
Richard Hunt, Stanstead Abbot, Herts.
Robert Leeds, Wicken House, Brandon, Norfolk.
George Saville, Ingthorpe, near Stamford.
Samuel Jonas, Crishall Grange, Essex.
Charles Dorman, 23, Essex Street, Strand, W.C.
Thomas Webb, Hildersham, Cambridgeshire.
Jonas Webb, Melton Ross, Lincolnshire.
C. J. Lacy, 60, West Smithfield, E.C.
Managing Director—James Odams

Bankers—Messrs. Barnetts, Hoares & Co., Lombard Street, E.C.
Solicitors—Messrs. Kingsford & Dorman, 23, Essex St., Strand, W.C.
Auditor—J. Carter Jonas, Cambridge.

This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz.,
"THE TENANT-FARMERS' MANURE COMPANY."

Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.

Particulars will be forwarded on application to the Secretary, or may be had of the local Agents.

CHARLES T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

Stand at the Smithfield Cattle Show, No. 55.

THE FARMERS' SUPPLY ASSOCIATION (LIMITED).
Registered August 4, 1869.
Office, 69, King William Street, London, E.C.

DIRECTORS.

The Rev. William Bayley, Castle Eaton Vicarage, Oxford
Thos. L. Melville Cartwright, Esq., Melville, Fife, and Newbattle Manor, Brackley, South Hampton-shire
Fredk. S. Champion, Esq., 5, Great Winchester Street Buildings, London.
Robert E. Oliver, Esq., Sholebrooke Lodge, Towcester, Northamptonshire
The Hon. Henry Petre, Chelmsford, Essex, *Chairman*
The Right Hon. the Earl of Rosslyn, Dysart House, Kirkcaldy, Fife, and Easton Lodge, Dunmow, Essex
Chas. Spooner, Esq., 1, Poet's Corner, Westminster.
John Trask, Esq., Northington, Hants.
Secretary, Mr. John Spencer.

Capital, £20,000: Shares, £2 each, £1 paid on allotment.
Life Tickets, £3 3s.; Annual Tickets, 10s. each, entitling the holder to purchase through his agency.

This Association has been formed by gentlemen engaged in Agriculture for the purpose of supplying all kinds of Agricultural Implements or other goods, and more especially Cake and Corn, Oilcakes and guaranteed Manures, on the co-operative system.

Farmers' Clubs and large consumers of Oilcakes, Manures, &c., are invited to co-operate with this Association, and the purchase of Agricultural requisites.

Further information, with Price Lists, Samples, and Analyses, on application to the Secretary.

The Association have regular importations of pure Linseed and Decorticated Cotton Cakes, direct from New York.

Best New York, Hull, or Liverpool, 11 lbs. £11 2 6d per ton ex ship
Best Western Linseed Cakes, 10 lbs. £10 5s 6d per ton ex ship
Best Decorticated Cotton Cakes, in bags, £8 10s per ton ex ship
Special terms to large consumers

Utilization of Sewage

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.
(Incorporated by Act of Parliament in 1849.)

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George Thomas Clark, Esq. | Henry Wm. Currie, Esq.
John Chevalier Cotfield, Esq. | Edward John Hutchins, Esq.
Principal Engineer—Mr. J. Bailey Denton.

Works of Sewage Irrigation are executed by the Company.

Arrangements will be made with Landowners, Boards of Health, Sewer Authorities, and others, for undertaking such works, and all works incidental thereto.

The outlay may be repaid by a sum in gross or by a terminable yearly payment, discharging in a fixed period the principal amount with interest thereon.

Applications to be made to ARTHUR MILMAN, Esq., the Secretary, at the Offices of the Company, 22, Whitehall Place, London.

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(Incorporated by Special Acts of Parliament.)

DIRECTORS.

John Clutton, Esq., 9, Whitehall Place, S.W.
Frederick L. Dashwood, Esq., Kirtlington Park, Oxford.
Henry Farquhar, Esq., 16, St. James Street, S.W.
Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
John Horatio Lloyd, Esq., 1, King's Bench Walk, Temple, E.C.
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.

The Company advances money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.

UTILISATION of SEWAGE.—The Company also advances money for the purpose of Works of Sewage Irrigation.

The whole outlay and expenses are liquidated by a rent-charge upon the land, redeemable principal and interest, over 25 years.

No investigation of title is required.

For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

TOBACCO TISSUE, for FUMIGATING GREENHOUSES.—Will destroy Thrip, Red Spider, Green and Black Fly, and Mealy Bug, and burns without the assistance of blowing, and is entirely free from paper or rags. Price 3s 6d per lb, carriage free. A reduction in price for large quantities.

To be had of Messrs. ROBERTS AND SONS, Tobacco Manufacturers, 112, St. John Street, Clerkenwell, E.C., of whom Copies of Testimonials may be obtained; and of all Seedsmen and Nurserymen

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 2s. 6d. and 3s. 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & Co.,
IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application.

87, BISHOPSGATE STREET WITHOUT, LONDON, E.C.

PORTABLE ENGINES, from 4 to 30-Horse Power.
THRESHING MACHINES, SINGLE, DOUBLE and TREBLE BLAST,
With Patent Rolled Steel Ribbed Beater Plates, and all other recent Improvements.

PATENT ROLLED STEEL RIBBED BEATER PLATES (Gray's Patent).

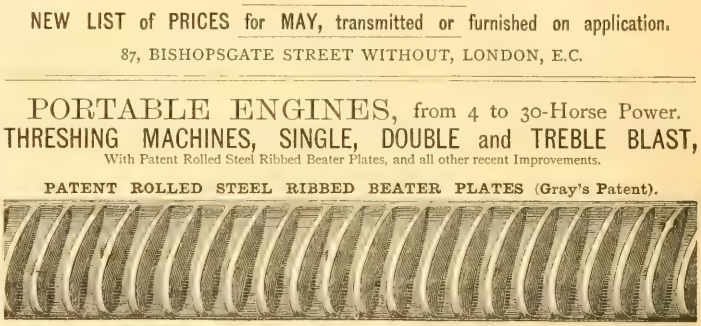

CLAYTON AND SHUTTLEWORTH, Sole Licensees and Manufacturers.

These Plates have been thoroughly tested, and are found to wear more than three times as long as the Malleable Iron Plates previously in use.

C. AND S. are prepared to supply Threshing Machine Owners and the Trade in any quantity; and they would caution purchasers against spurious imitations in Cast-steel, which, from their brittleness, are exceedingly dangerous to use. CAUTION.—Infringers of this Patent, whether makers or users, will be immediately prosecuted. CATALOGUES sent Free by Post on application to

CLAYTON AND SHUTTLEWORTH,
STAMP END WORKS, LINCOLN, or, 78, LOMBARD STREET, LONDON, E.C.

GRAY'S OVAL TUBULAR BOILER.
INTERNATIONAL EXHIBITION, CLASS IX., No. 2119.

MR. GRAY begs to call the attention of the Nobility, Gentry, Nurserymen, Gardeners, &c., to his

NEW OVAL TUBULAR BOILER.

Acknowledged by practical judges to be a great improvement on every form of Tubular Boiler yet introduced. It has proved itself superior to all other Boilers for quickness of action and economy of Fuel, doing its work with one-third less the amount required by any other.

Extract from Report in GARDENERS' CHRONICLE *of International Exhibition, May 24, 1862, page 476.*

"The upright form of Boiler is usually made on a circular plan, rather than a square, it seems feasible that the Boilers on the oval but the oval form given to Mr. GRAY'S variety of it is said to be preferable in consequence of its bringing the flues in closer contact. I should bring the tubes more completely within range of the heating gases, and thus bring so, the change, though a slight one, with the fire. He used fans of a fixed bend, a parallel form recommended as improvement."

They are made of all sizes, which, with prices, may be had on application.

JAMES GRAY, HORTICULTURAL WORKS,
DANVER'S STREET, PAULTON'S SQUARE, KING'S ROAD, CHELSEA, S.W.

JONES'S PATENT DOUBLE L SADDLE BOILER.

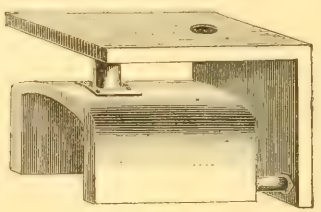

These Boilers possess all the advantages of the old Saddle Boiler, with the following improvements, viz.:—The water-space at back and over top of Saddle increases the heating surface to such an extent that a Patent Double **L** Saddle Boiler will do about twice the amount of work with the same quantity of fuel; the cost of setting is also considerably reduced, and likewise the space occupied; at the same time these Boilers are simple in construction, and being made of wrought-iron are not liable to crack.

They are made of the following Sizes:—

Sizes.			To Heat (of 4-inch Pipe).	Prices.		
High.	Wide	Long	Feet.	£	s.	d.
20 inches	18 inches	18 inches	300	5	0	0
20 ,,	18 ,,	24 ,,	450	6	0	0
20 ,,	18 ,,	36 ,,	600	7	0	0
24 ,,	24 ,,	24 ,,	700	8	0	0
24 ,,	24 ,,	30 ,,	850	10	0	0
24 ,,	24 ,,	36 ,,	1,000	12	0	0
24 ,,	24 ,,	48 ,,	1,400	15	0	0
28 ,,	28 ,,	60 ,,	1,800	20	0	0
30 ,,	30 ,,	72 ,,	2,600	30	0	0
36 ,,	30 ,,	66 ,,	4,500	50	0	0
48 ,,	48 ,,	108 ,,	7,000	75	0	0
48 ,,	48 ,,	144 ,,	10,000	100	0	0

And are kept in Stock, and Sold only by the Inventors and Patentees,
J. JONES AND SONS, IRON MERCHANTS, 6, BANKSIDE, SOUTHWARK, LONDON.

HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating

Improved Conical. *Tubular Boiler.*

GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c.
HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock.
WROUGHT and CAST IRON CONICAL SADDLE, and IMPROVED CONICAL, also Elliptic, Boilers, from 24s. each

Improved and extra strong CAST-IRON TUBULAR BOILERS, with or without Water Bars, from 12s. 6d. each.
CAST and WROUGHT-IRON PORTABLE BOILERS, on Stand, for use without brickwork, from 60s. each.

Portable Boiler. *Elliptic Boiler.*

Patent THROTTLE and other VALVES, FURNACE DOORS, BARS, and FURNACE WORK of every description and size.
INDIA-RUBBER RINGS for Pipe Joints; Sockets require no other packing, and are perfectly water-tight.
Goods, of the very best manufacture, delivered at Railway or Wharf in London.

LYNCH WHITE,
Old Barge Iron Wharf, Upper Ground Street, London, S.E. (Surrey side Blackfriars Bridge) Price List on application.

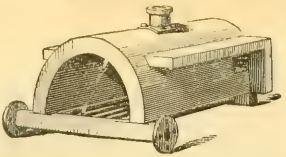

THE PATENT "TERMINAL SADDLE" BOILER is now at work in hundreds of places in all parts of the country, and commands universal admiration.
Illustrated Circulars, containing Opinions of the Press, Testimonials, &c., post free
J. IRELAND, Edward Street, Broughton Lane, Manchester

JAMES BOYD AND SONS, HORTICULTURAL Builders and Heating Engineers, Paisley, N.B.
CONSERVATORIES, GREENHOUSES, VINERIES, FORCING HOUSES, PITS, and every description of Horticultural Building, manufactured in Wood or Iron by Steam-power Machinery, and erected in any part of the United Kingdom. Manufacturers of Hot-water Apparatus for Heating Churches, Mansions, Warehouses, &c.
Plans and estimates on application

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.
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Manufactory, 6, Bankside, Southwark, S.E.

GREEN'S PATENT IMPROVED TUBULAR HOT WATER BOILERS.
They are specially adapted for heating Greenhouses, Conservatories, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

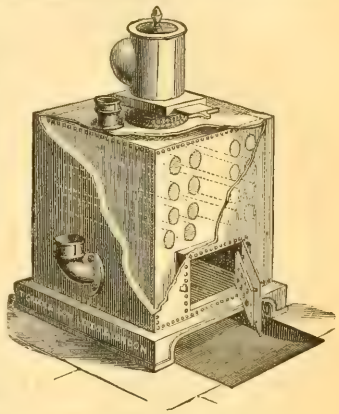

The following are the advantages these of Boilers:—
1 They require no setting in brickwork.
2 They are complete in themselves, having perfect means of regulation.
3 They take up little room, and can be put in places inaccessible to other boilers.
4 They are great economisers of fuel, owing to the large amount of heating surface upon which the fire acts in a direct manner.
5. Any number of flows and returns can be annexed to the boilers by means of T pipes.
6 By means of mud-doors they can be readily cleaned out when required.
7 The chimney is made of cast iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation they may be fixed in.
8 They are fed from the top, so that the fire can be banked up to last from 15 to 20 hours when required, with out being attended to
They are warranted to be the most effective and durable boiler ever invented.
Price Lists, with full particulars, free on application to
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HAYWARD, TYLER & CO.,

ENGINEERS, &c., 84 and 85, UPPER WHITECROSS STREET, LONDON, E.C.,

EXHIBIT THEIR WELL-KNOWN

PATENT UNIVERSAL STEAM PUMPS and UPRIGHT BOILER FEEDERS

Of which *Engineering* of Dec. 10, 1869, remarks:—"It is the most simple, direct-acting Steam Pump which has yet been introduced into this country; and we are glad to hear that it is steadily advancing in public favour."
They will also show a collection of PUMPS, HORSE WHEELS, GARDEN and FIRE ENGINES, and other articles important to Agriculturists, Brewers, &c.
They specially invite attention to their TWO-HORSE POWER STEAM ENGINES (Horizontal and Vertical), which will compare favourably with those of any makers, both in Price and Quality.

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WILL EXHIBIT at their STAND, No. 16, in the AGRICULTURAL HALL,

ONE OF THE

LARGEST COLLECTIONS OF AGRICULTURAL MACHINERY,

INCLUDING THEIR

STEAM PLOUGHS and CULTIVATORS,
CHAMPION PLOUGHS,
NEW CHAMPION DOUBLE PLOUGHS,
A NEW PATENT DOUBLE-FLANGED HARROW,
The ROYAL OXFORD SELF-ACTING HORSE-RAKE,
The BRITISH COMBINED MOWER and REAPER.
The INTERNATIONAL REAPER; and
The HOWARD PATENT SAFETY BOILER.

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JOHN FOWLER & CO.

WILL EXHIBIT THEIR

STEAM PLOUGHING MACHINERY,

EIGHT-HORSE POWER TRACTION ENGINE and DOUBLE FURROW PLOUGH.

For further information apply to
JOHN FOWLER AND CO., STEAM PLOUGH WORKS, LEEDS;
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Portable and Fixed Hot-water Apparatus

FOR HEATING CONSERVATORIES, HOTHOUSES, CHURCHES, PUBLIC BUILDINGS, PRIVATE RESIDENCES, &c.,

WITH TRUSS'S PATENT UNIVERSAL FLEXIBLE and LEAKLESS PIPE-JOINTS.

T. S. TRUSS begs to state that the immense number of APPARATUS annually Designed and Erected by him in all parts of the Kingdom, and for the Royal Horticultural Society at South Kensington and Chiswick, with unrivalled satisfaction, is a guarantee for skill of design, superior materials, and good workmanship; while the great advantage obtained by his Improved System cannot be over-estimated, consisting of perfectly tight joints with neatness of appearance; effects a saving of 25 per cent. on cost of apparatus erected compared with other systems; facility for extensions, alterations or removals without injury to Pipes or Joints; easily and expeditiously erected; an ordinary size apparatus is put up in a day; and perfectness of design supplied, insuring no extras.

BATH and GAS WORK ERECTED in TOWN or COUNTRY.
The Trade supplied.

Price Lists, Plans, and Estimates forwarded on application to
T. S. TRUSS, C.E., Sole Manufacturer,
Consulting Horticultural Engineer, Iron Merchant, Hot-water Apparatus Manufacturer, and Horticultural Builder,
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WILL EXHIBIT A COLLECTION OF THEIR

CELEBRATED AGRICULTURAL IMPLEMENTS AND MACHINES

AT THE ABOVE SHOW.

RANSOMES, SIMS, AND HEAD, would especially draw attention to their

PORTABLE STEAM ENGINES.
EXPANSION ENGINES, for ECONOMISING FUEL.
PATENT STEAM THRESHING MACHINES.
PATENT DOUBLE FURROW, TURNWREST, SUBSOIL, and CHAMPION PLOUGHS.
PATENT HORSERAKES, and PATENT HAYMAKERS.
BIDDELL'S PATENT MILLS.

ILLUSTRATED CATALOGUES, WITH FULL DESCRIPTION AND PRICES, FREE ON APPLICATION.

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ARCHANGEL MATS, under present value; PETERSBURG MATS at old prices. Samples and price list J. BLACKBURN AND SONS, Russia Mat and Sack Warehouse, 4 and 5, Wormwood Street, London, E.C.

HESSIANS and SCRIMS for COVERING.

44 inches, from 2d. to 5d. per yard, advancing 1d.
54 inch Hessian and Scrim, 3d., 3½d., 4d., 4½d. and 5d.d.
72 ,, ,, 4½d., 5d., 6d., 7d., and upwards.
J. BLACKBURN and SONS, Sack and Bag Makers, and Canvas Manufacturers, 4 and 5, Wormwood Street, London, E.C.

Glass for Garden Purposes.

JAMES PHILLIPS AND CO. beg to submit their REDUCED PRICES as follows:—

PROPAGATING GLASSES.

	Each s. d.		Each s. d.
2 inches in diameter	.. 0 3½	12 inches in diameter	.. 1 0
3 ,, ,,	.. 0 4½	13 ,, ,,	.. 2 0
4 ,, ,,	.. 0 5½	14 ,, ,,	.. 2 6
5 ,, ,,	.. 0 6½	15 ,, ,,	.. 3 0
6 ,, ,,	.. 0 8	16 ,, ,,	.. 3 6
7 ,, ,,	.. 0 10	17 ,, ,,	.. 4 0
8 ,, ,,	.. 1 0	18 ,, ,,	.. 5 0
9 ,, ,,	.. 1 2	19 ,, ,,	.. 6 0
10 ,, ,,	.. 1 4	20 ,, ,,	.. 7 0
11 ,, ,,	.. 1 8		

BEE GLASSES, with ventilating hole through knob

	s. d.		s. d.
4 inches in diameter	.. 0s 6d.	9 inches in diameter	.. 1s 8d.
5 ,, ,,	.. 0 8	10 ,, ,,	.. 2 0
6 ,, ,,	.. 0 10	11 ,, ,,	.. 2 6
7 ,, ,,	.. 1 4	12 ,, ,,	.. 3 0
8 ,, ,,	.. 1 4		

Either flat or conical tops.

CUCUMBER GLASSES.

	s. d.		s. d.
24 inches long	.. 2s 6d.	16 inches long	.. 1s 4d.
22 ,,	.. 1 10	14 ,,	.. 1 1
20 ,,	.. 1 8	12 ,,	.. 2 6
18 ,,	.. 1 6		

HAND GLASSES, WITH OPEN TOPS.

	Each s. d.		Each s. d.
12 inches	.. .. 0 6	22 inches	.. .. 10 0
14 ,,	.. .. 0 8	24 ,,	.. .. 11 6
16 ,,	.. .. 0 10	24 ,,	.. .. 12 6
18 ,,	.. .. 0 6		

London Agents for HARTLEY'S IMPROVED PATENT ROUGH PLATE.

LINSEED OIL, Genuine WHITE LEAD, CARSON'S PAINTS PAINTS of various colours ground ready for use.
SHEET and ROUGH PLATE GLASS, SLATES of all sizes.
BRITISH PLATE, PATENT PLATE, ROLLED PLATE, CROWN, SHILLI, HORTICULTURAL, ORNAMENTAL, COLOURED, and every description of GLASS, of the best Manufacture, at the lowest terms. Lists of Prices, &c., Estimates forwarded on application to
JAS. PHILLIPS and CO., 180, Bishopsgate Street Without, E.C.

RICHARDSON'S PATENT BOILER FLUE BUILDINGS

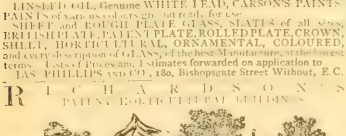

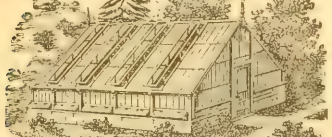

These buildings are COOL, DRY, and well VENTILATED. PERFECT VENTILATION is secured, without draught. Cold loss has complete protection from rain, wind, or frost now or ever. Illustrated Price Lists and Estimates, Plans of 240 different sized Houses, free on application to the Makers, enclosing a stamp for postage. Also the improved PORTABLE HOTHOUSES for the PEOPLE, the best ever offered. Guaranteed sound and good quality. Apply to
W. RICHARDSON AND CO., Horticultural Builders, Darlington.

CONSERVATORY BASKETS.

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c. Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and pedestal passing to any position, on the lawn and opposite windows or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Arches for Cross Paths, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wire, &c.

Minton's Ornamental Tile Flower Boxes.

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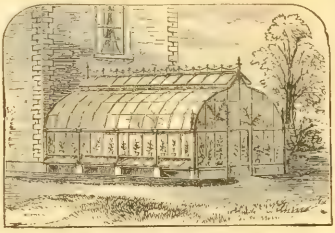

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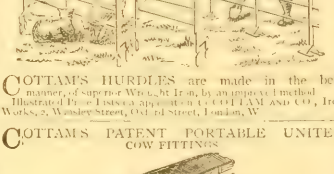

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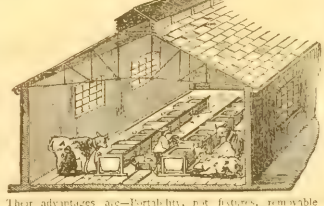

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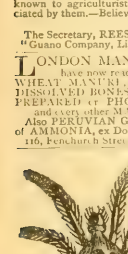

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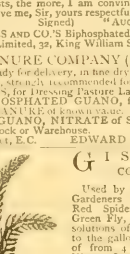

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Secured by Her Majesty's Royal Letters Patent (Two Separate and Distinct Patents, 1869 and 1870).

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THE RIGHT HON. THE EARL OF PORTSMOUTH, &c., &c.

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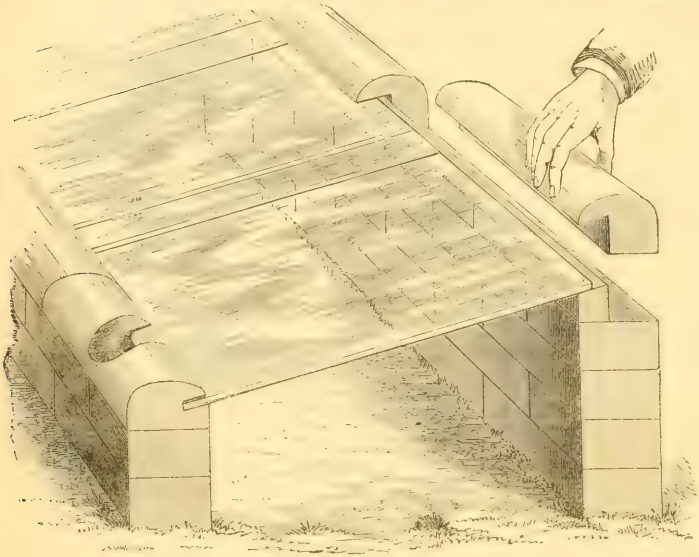

RENDLE'S

PATENT PORTABLE

PLANT PROTECTORS.

This Engraving represents the New Pattern. It will be seen that the top or grooved Brick is formed in two distinct pieces. The Glass rests on the front piece, and the other part can be instantly removed, so that the whole of the Glass can be set free from one end of the Protector to the other in a few minutes.

The under Brick is also made with an opening, so that, with the finger, the Glass can be removed or shifted at pleasure.

The Patent Grooved Bricks can be placed on ordinary Kiln Bricks set on the Flat. Full Directions for fixing them will be sent with each Invoice.

PRICES OF NEW "BELVOIR CASTLE" PATTERN.

NEW TARIFF AND CARRIAGE FREE TERMS.

The following Prices are for the Patent Grooved Bricks and the Glass:—

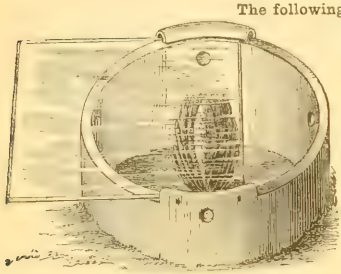

Patent Circular Ventilating Hand-Glass.

GROUND VINERIES AND PLANT PROTECTORS	Delivered in Truro or Bridgwater	Carriage Paid to any Railway Station in England and Wales, except Edinburgh, Dublin, Cork, or Belfast	Carriage Paid to any Railway Station in England and Wales or Edinburgh, Dublin, Cork, or Belfast
Ft. in length.	£ s. d.	£ s. d.	£ s. d.
10 Glass 9 in. wide for	0 12 0	0 14 6	0 17 0
10 Glass 12 in. wide ,,	0 14 0	0 17 0	1 0 0
10 Glass 18 in. wide ,,	0 19 0	1 0 0	1 3 0
10 Glass 24 in. wide ,,	0 18 0	1 2 0	1 7 0
100 Glass 9 in. wide ,,	5 0 0	5 10 0	6 10 0
100 Glass 12 in. wide ,,	6 0 0	6 10 0	7 10 0
100 Glass 18 in. wide ,,	7 0 0	7 10 0	8 10 0
100 Glass 24 in. wide ,,	8 10 0	9 0 0	10 0 0

A Reduction of 10s. per 100 feet will be made if 500 feet be taken at one time.

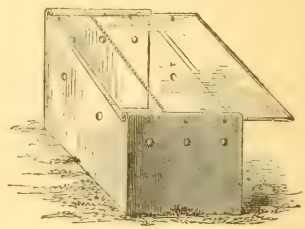

Patent Square Ventilating Hand-Glass.

PATENT CIRCULAR and SQUARE PROTECTORS or HAND GLASSES.

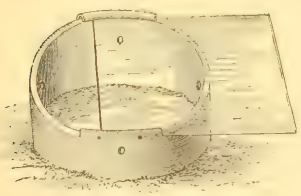

Patent Circular Ventilating Hand-Glass.

Patent Circular Hand-Glass.

Diam.	Per doz.—s. d.	Diam.	Per doz.—s. d.
No 1—4 in.	.. .. 8 0	No 5—12 in.	.. .. 20 0
,, 2—6 ,,	.. .. 8 0	,, 6—14 ,,	.. .. 12 0
,, 3—8 ,,	.. .. 10 0	,, 7—16 ,,	.. .. 40 0
,, 4—10 ,,	.. .. 12 0	,, 8—18 ,,	.. .. 48 0

These are most valuable, and will completely supersede the Ordinary Bell Glasses, Cloches and Hand Glasses, being so cheap and durable.

Patent Square Ventilating Hand-Glass.

No 1—6 by 9, 12s. per dozen | No 2—10 by 11, 28s. per dozen.
No 3—12 by 16, 36s. per dozen.

Rendle's Patent Ventilating Seed Growers and Propagators.

Lean to Lattern.	Doz.—s. d.	Span-Roof Pattern.	Doz.—s. d.
No 1—6 by 9 ..	.. 6 0	No 1—6 by 9 ..	.. 0 0
,, 2—10 ,, 14	.. 15 0	,, 2—10 ,, 14 ..	.. 18 0
,, 3—12 ,, 16	.. 30 0	,, 3—12 ,, 16 ..	.. 44 0

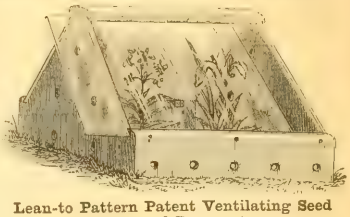

Lean-to Pattern Patent Ventilating Seed Grower and Propagator.

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 50.—1870.] SATURDAY, DECEMBER 10. { Registered at the General Post Office as a Newspaper. } Price 5d. POST FREE, 5½d.

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100,000 SCOTCH FIR, 9 to 15 inches
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WM. CUTBUSH AND SONS importations of the above have just arrived, and have every appearance of being above the average quality, for which they have been noted for many years CATALOGUES post free
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JOHN FRASER, of the Lea Bridge Road Nurseries, E., begs to announce that he can now offer unusually fine healthy Plants of TREE CARNATIONS, and many varieties of Winter-flowering HEATHS, in large quantities. It may be remarked that Heaths are well adapted for the decoration of the dinner-table.
Priced LIST on application

Dendrobium macrophyllum and its Varieties.

MR. WILLIAM BULL has just received an importation from Manilla, and can now offer this beautiful and hitherto expensive ORCHID at 15*s.* 21*s.* and 42*s.* per dozen
Establishment for New and Rare Plants, King's Road, Chelsea, London S.W.

Phalænopsis grandiflora.

MR. WILLIAM BULL has lately received several importations of the Manilla Timdalan Island variety. Also, the new white flowered CYPRIPEDIUM C. NIVEUM, and many other rare ORCHIDS. An inspection is invited.
Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

EVERY GARDEN REQUISITE KEPT in STOCK at
CARTER'S New Seed Warehouse, 237 & 238, High Holborn, London.

CARTER'S NEW PEAS for 1871. See p. 1630 of this week's *Gardeners' Chronicle*.
237 and 238, High Holborn, London, W.C.

TWO NEW PEAS for 1871.—EASTES' KENTISH INVICTA, the earliest round blue Pea. MACLEAN'S "BEST of ALL," splendid large wrinkled Marrow.
Trade prices and descriptions on application to
SUTTON AND SONS, Seed Growers, Reading.

New Potatos for 1871.

SUTTON'S Complete LIST of the best POTATOS (including the new varieties) is now ready, gratis and post free.
SUTTON AND SONS, Seedsmen to the Queen, Reading

EARLY SHAW, EARLY KING, DAWE'S MATCHLESS KIDNEY. A few Tons of each Apply to the grower, A. STYLES, Stone, near Greenhithe, Kent.

FOR SALE, BAVINIA POTATOS.
Apply to
H. W. BRIDPORT, Market Gardener, Nursling, Hants.

SEED POTATOS.—Mona's Pride, Rivers' Royal Ashleaf, American Early Rose, Lapstone Kidney, true stocks and fine samples. Prices on application to
JOHN MCHATTIE, Seed Merchant, Chester

NEW POTATOS.—American Early Rose Paterson's Bovinia, Red-skinned Flourball (Sutton's)
CHARLES SHARPE AND CO., Seed Merchants, Sleaford, have pure, true seed of the above to offer Price on application
Priced LIST of NEW POTATOS sent post free.

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5*s.* per 1000; also Drumhead or Cattle Cabbage Plants at 3*s.* 6*d.* per 1000, can now be supplied by
W. VIRGO AND SON, Wonersh Nursery, near Guildford.

Market Gardens, Biggleswade, Beds.

RICHARD WALKER can supply the following for cash:—ASPARAGUS, 2 yr. old, 3*s.* per 100; 2 yr., 2*s.*; cheaper per 1000. RED DUTCH PICKLING CABBAGE Plants, 5*s.* per 1000; and EAST HAM and DWARF YORK Plants, 3*s.* 6*d.* per 1000

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C

To the Trade.

TURNIP and SWEDE SEED.—A few small lots, of extra fine quality, to be Sold cheap, for cash.
Apply to C. L., *Gardeners' Chronicle* Office, London, W.C.

MOSS, MOSS, MOSS (Lycopodium denticulatum).—Now ready, 200 dozen (48's), in splendid condition, combining colour and form, price 3*s.* 6*d.* per dozen, delivered within a reasonable distance; or 2*s.* at home, from
R. B. SMITH, Nursery, Silchester Road, Notting Hill, W.

FOR SALE, good fibrous PEAT, at 14*s.* 6*d.* per ton, cash, delivered at Edenbridge, and London, Chatham, and Dover Railway, and South-Eastern Railway, Sevenoaks. Address
F. HAYNES, Brasted, Sevenoaks.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c.; Azaleas and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit

Conservatories furnished, and Choice Plants supplied for Balls or Dinner table Decoration

Victoria and Paradise Nurseries, Upper Holloway, London, N.

To the Trade.

HYACINTHS, TULIPS, POLYANTHUS NARCISSUS, CROCUS, SNOWDROPS, WINTER ACONITES, &c. All true to name, and of best importation, picked roots.

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

LILIUM AURATUM, &c.—English-grown Roots of LILIUM AURATUM, 1s. 6d., 2s. 6d., 3s. 6d., and 5s. 6d. each, and upwards; LILIUM LANCIFOLIUM, ALBUM, RUBRUM and ROSEUM, and all other LILIES.

See DESCRIPTIVE CATALOGUE, free on application.

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

New Seeds—"Only the Best."

MR. WILLIAM BULL'S CATALOGUE is in the Press, and will be issued in a few days

NEW VEGETABLES,
NEW FLOWERS.

"Only the best. *Vide* descriptions in Mr. WILLIAM BULL'S CATALOGUE "Every article priced"

Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.

Exotic Nursery, Tooting, Surrey, S.W.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES

The American Nursery, Bagshot, Surrey

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash:—

GOLDEN TRICOLORS.—Lady Cullum, 3s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s. 6d. SILVER TRICOLORS.—Caroline Longfield, 6s.; Italia Unita, 2s. 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; E. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Painted Lady, 3s. 6d.; Princess of Wales, 4s.; Stanstead Beauty, 6s. DOUBLE-FLOWERED.—Captaine L'Heretier, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeaux, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of 200 varieties post free.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

FRANCIS & ARTHUR DICKSON & SONS, The Old Established Seed Warehouse, 100, Eastgate Street, and the "Upton" Nurseries, Chester.

LILY of the VALLEY, imported Clumps, 18s. to 24s. per dozen.—These are specially prepared for early forcing, and are much superior to English grown; producing very large and fragrant flowers in great profusion.

SPIRÆA JAPONICA, imported Clumps, 12s. to 18s. per dozen.—For Conservatory or Greenhouse decoration in Spring nothing can be finer, and for table decoration or for bouquets it is unsurpassed. It is admirably suited for early forcing.

CYCLAMEN PERSICUM, in 48-size pots, just coming into beautiful bloom, in a variety of colours; 12s. per doz. These are fine plants, and will continue flowering during the winter months.

CHINESE PRIMULAS, in splendid bloom, Fern-leaf and others, of the richest colours and finest fringed flowers, unsurpassed by any strain in cultivation; 9s. and 12s. per dozen.

BRITISH QUEEN STRAWBERRY.—Plants strong and true, 2s. 6d. per 100; 20s. per 1000. Terms cash.

ELCOMBE AND SON, Nursery and Seed Establishment, Romsey, Hants

Planting Season.—Knowfield Nurseries, Carlisle.

MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN, and SEEDSMEN, beg to call the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c.; and Gentlemen intending to Plant this Autumn are cordially invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

L. & B. are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties

A NOBLE AVENUE for £20, consisting of 100 WELLINGTONIA GIGANTEA, 12 to 14 feet high. This, the most noble of all trees, a native of California, where it attains a height of 440 feet, with a trunk 40 feet through, is of rapid growth, hardy, and noble in form. The bark of a Wellingtonia at the Crystal Palace, recently destroyed by fire, gave an idea of the grandeur of the tree

Or an AVENUE of 100 SILVER ABIES DOUGLASII, about 10 feet high, for £20. This, the finest species of evergreen Fir, is of rapid growth, hardy, produces valuable timber, close, heavy, and free from knots, of the colour of Yew wood. It is a native of California, where it grows upwards of 300 feet high, with a trunk 10 feet through. The finest tree at Kew is of this tree, and was, when growing, 309 feet high. There is at Dropmore (Bucks) a specimen measuring at the present time 65 feet high, 9 feet through the branches, with a trunk 9 feet in circumference at 4 feet above the base. It was raised from seed sown by Mr. Frost, the present gardener, in 1828, and is now a model of beauty.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

King's Acre Nurseries, near Hereford.

JOHN CRANSTON, PROPRIETOR.—These extensive Nurseries (Established 1785) have long been celebrated for the Culture of GENERAL NURSERY STOCK, and the several departments are replete with the most approved and desirable Plants at present in Cultivation, while the Collection is constantly enriched by the addition of recent introductions.

NURSERY DEPARTMENT.

ROSES.—All the best New and Old Varieties. Superb Standard, Dwarf, Pillar, and tall Weeping Plants. Twenty-one First and Ten Second Prizes at the principal Rose Shows of 1870.

CONIFERS.—Beautifully-grown specimens of the leading kinds, of various sizes. All constantly transplanted.

ORNAMENTAL TREES and SHRUBS.—Evergreen and Deciduous Trees and Shrubs in great variety, including extra strong Trees for Avenues, Park Groups, &c.

FOREST TREES.—Larch, Spruce, Scotch, Pinus austriaca, Oak, Chestnut, Ash, &c., of sound, vigorous growth.

FRUIT TREES.—The collection includes all the kinds most worthy of cultivation, and the Plants are carefully grown in every variety of form.

PLANT DEPARTMENT

BEDDING and DECORATIVE PLANTS in great variety.

SEED DEPARTMENT.

GARDEN and FARM SEEDS carefully selected, and of the best quality possible

Special Terms to extensive Planters.

DESCRIPTIVE PRICED CATALOGUE free by post on application.

HAMMOND'S IMPERIAL HARDY

WHITE BROCCOLI,

1s. per Packet.

We have again secured the whole Stock of this very valuable Broccoli, from Mr. Hammond. Considering its quality and hardiness, it has only to be known to become the leading Broccoli grown.

WM. ARMITAGE & SON,

SEED MERCHANTS,

HUDDERSFIELD.

A few Extracts from Letters received fully prove the great value of this Broccoli.

Wilts. Forward me a Packet of Hammond's Imperial Hardy White Broccoli. I had a packet last year, and it has given me great satisfaction.

J. C. WILCOX, Florist,
May 14, 1870. Quemerford, Calne, Wilts.

Dorsetshire. Kindly forward 1 Packet Hammond's Imperial Hardy White Broccoli, I had some of you last year, and find it very good, as it stands better than any other kind I have.

F. J. ELLIS,
Claremont Gardens,
May 9, 1870. Weymouth.

Norfolk. Mr. Hitchman would thank Mr. Armitage to forward him 1s. Packet Hammond's Imperial Hardy White Broccoli. That had last year appears to have stood this severe winter well. Also Catalogue.

April 11, 1870. Park Lane, Norwich.

Essex. Your Hammond's Imperial Hardy White Broccoli has turned out well with me this spring, according to character, having stood the winter best of any I had. Send 1 Packet by post, stamps enclosed.

G. SACK,
Elmstead Brook, Essex.

Berkshire. I have seen some of the Hardy Broccoli in Berkshire (Newbury) very fine. Please send me 3 Packets, stamps enclosed.

W. EDMUNDS,
Bridge Street,
Banbury.

From the GARDENER'S MAGAZINE,

May 30, 1868.

"HAMMOND'S IMPERIAL HARDY WHITE BROCCOLI.—We have received samples of this variety from Mr. W. Hammond, market gardener, Birkby, Huddersfield, Yorkshire. The heads are large, even in outline and hemispherical, so close that there is not space anywhere for so much as the point of a pencil, the colour creamy white, average weight when trimmed for cooking 3 lb., in quality first-rate, as mild and sweet as a Cauliflower."

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.

Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES and all particulars on application.

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

IMPORTANT to LANDOWNERS, NURSERYMEN, &c.

7,000 ELMS, in varieties, 7 to 10 feet, per 100, 15s.
800 CHESTNUT, Horse, 7 to 8 feet, per 100, 18s.
4,000 SYCAMORES, 6 to 7 feet, per 100, 10s
700 YORKSHIRE HOLLY, 8 feet, fine, per 100, 18s
2,000 choice sorts of LILACS, 3 feet, per 100, 15s
3,000 TREE BOX, fine, in three varieties, per 100, 15s
1,000 LIMES, Red Twigged, 4 to 6 feet, per 100, 20s.
10,000 RASPBERRIES, Fastolff and Red Antwerp, per 1000, 30s.

WM. RUSHFORTH, Woodhouse Hill, near Leeds

Winter Flowers.

AZALEA HYBRIDA ODORATA is the best and most convenient plant for winter and early spring blooming, the flowers being white and very fragrant; one truss, with a few other flowers, will make a beautiful bouquet. Small plants bloom freely, and my large plants have from 40 to 50 flower-buds on.

RHODODENDRON MULTIFLORUM, a small-leaved, bushy-growing plant, producing thousands of white flowers.

Both of the above are hardy. Prices and other particulars of these and other plants raised by me forwarded on application to

ISAAC DAVIES, Nurseryman, Ormskirk.

Winter and Spring Flowering Plants.

FRANCIS & ARTHUR DICKSON & SONS have a magnificent stock of the above, in fine, strong, healthy plants, including ACACIAS, AZALEAS, CAMELLIAS, CARNATIONS (Tree), CYCLAMEN, CYTISUS, EPACRIS, ERICAS, LILY of the VALLEY (imported clumps), SPIRÆA JAPONICA (ditto ditto), VIOLETS, &c. Also a splendid Collection of Plants suitable for Table Decoration, including Palms, &c. For prices and particulars, see General PLANT CATALOGUE, which will be sent free per post on application.

"Upton" Nurseries, Chester.

LUCOMBE, PINCE, AND CO.
PICEA NORDMANNIANA.

LUCOMBE, PINCE, AND CO.
STANDARD PORTUGAL LAURELS, in tubs.

LUCOMBE, PINCE, AND CO.
PICEA PINSAPO,
WELLINGTONIA GIGANTEA,
and every other kind of Conifer: fine plants of all sizes, fit for removal.

CUT CAMELLIA BLOOMS,
and other choice flowers.

VINES in pots, largest and strongest
FERNS, ORCHIDS, and all kinds of
STOVE and GREENHOUSE PLANTS.
COLCHICAN LAURELS, from 3 to 8 feet.
COMMON LAURELS, 30,000.

Exeter Nursery, Exeter

The most Desirable Plant of the Season.

PARSONS' NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA. See previous Advertisement

AGENTS—ENGLAND.

Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
" Wood & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
" A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, King's Road, Chelsea.
" S. Nairn & Sons, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
" Butler, Mc Culloch & Co., Covent Garden, London.
" G. Gibbs & Co., Down Street, Piccadilly, London.
" W. Cutbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London.
" Downie, Laird & Laing, London and Edinburgh.
" F. Lawson & Son, 20, Budge Row, London.
" Burley & Silverlock, Bath.
" Dick Radclyffe & Co., 129, High Holborn, London, W.C.
" Fisher, Holmes & Co., Handsworth Nurseries, Sheffield.
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., High Holborn, London, W.C.
" Minier, Nash & Nash, 60, Strand, London, W.C.
" Child & Dorimer, 41, Wormley Street, Bradford.
" H. Clarke & Sons, 39, King Street, Covent Garden, W.C.
" Dickson, Brown & Tait, Corporation Street, Manchester.
" A. C. Wheeler & Co., Worcester.
" J. Wrench & Co., London Bridge, E.
" Harris & Sons, Market Place, Leicester.
" James Cranaway & Co., Purdham Down Nurseries, Bristol.
" James Dickson & Son, 102, Eastgate Street, Chester.
Mr. George Tredgett, Cambridge.
" L. S. Woodthorpe, Mile Hedingham, Essex.
" G. Hinxman, Fareham
" R. Bracher, Halifax, Yorkshire
" W. Knight, Hailsham, Sussex.
" Timothy Bugden, South-Eastern Railway Station.
" W. Paul, London.
" F. Holmes, Whittington Nursery, near Lichfield.
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire.
" B. S. Williams, Upper Holloway, London.
" E. Cooling, Derby.
" James Wood, Newport, Isle of Wight.
" H. Watkinson, 6, Market Place, Manchester.
" R. Cox, 158, Fleet Street, London, E. C.
" J. Fraser, Lea Bridge Road Nurseries, London, E.
" R. Smith, St. John's, Worcester.
" John Scott, The Seed Store, Yeovil.
" S. K. Barnely, 1, King Street, Ipswich.

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Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow
" P. Lawson & Son, Edinburgh.
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" W. Drummond & Sons, Stirling
" J. & R. Thyne, 60, Buchanan Street, Glasgow.
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Mr. James Cocker, Aberdeen.

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Messrs. W. Drummond & Son, 3, Dawson Street, Dublin
Mr. J. W. Mackey, 40, Westmoreland Street, Dublin.

BELGIUM.

Mons. Louis Van Houtte, Ghent.

PRUSSIA.

Messrs. Platz & Son, Erfurt.
" Ferdinand Juhlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

AMERICA.

Messrs. B. K. Bliss & Sons, New York.

PARSONS' NEW HYBRID TREE MIGNONETTE, in packets per ounce, price on application.

PARSONS' superior PRIMULA,
" " CALCEOLARIA,
" " CINERARIA,

saved from the finest strains in cultivation, 2s. 6d. per packet.

F. P. has a first-rate stock of FRUIT TREES, both Trained and Pyramids, of which he solicits an inspection. Warranted true to name. Also a splendid collection of ROSES, including all the finest varieties. CONIFERS, &c., of every description. CATALOGUES and prices of which may be had on application.

F. PARSONS, Nurseryman, Seedsman, and Florist, 27 and 28, Western Road, Brighton. Nurseries, Hassock's Gate, Keymer, Hurstperpoint.

New Fruits.

BURGHLEY PARK CHERRY.—Maidens, 7s. 6d. each; a few large fruiting trees, 10s. 6d. to 15s. each. Cuttings for grafts, 6d. each. Orders booked.
ANNIE ELIZABETH APPLE.—Fine Maidens, 2s. 6d. each.
LORD BURGHLEY APPLE, 1s. each.
The IMPERIAL CRAB, 2s. 6d. each
Seed of CINERARIA ACANTHIFOLIA, saved this season, 2s. 6d. per packet.
T. HOUSE, Eastgate Nursery, Peterborough

STRONG Standard APPLES, PEARS, and WALNUTS; fine Standard and Dwarf-trained APRICOTS, PEACHES, and NECTARINES; bushy LAURUSTINUS and PORTUGAL LAURELS; a select collection of Standard and Dwarf Perpetual ROSES of the leading sorts; strong Deciduous flowering SHRUBS; ASH, 3 to 5 feet; LARCH, SPRUCE, SCOTCH and AUSTRIAN FIRS, and all kinds of FOREST TREES. All the above have been regularly transplanted and are well rooted. Prices on application to
CHARLES BURGESS, The Nurseries, London Road, Cheltenham.

WANTED, the following, extra fine PYRAMIDS, in or out of pots. Pears and Plums must not be less than 6 feet; Peaches, &c., not less than 5 feet,—larger plants preferred.
1 Reine Claude de Bavay Plum, 1 Transparent Gage Plum,
1 Mitchelson's Plum, 1 Doyenné d'Ete Pear, 1 Jargonelle Pear,
1 Marie Louise Pear, 2 Peach Apricots, 1 Pine-apple Nectarine,
1 White Nectarine, 1 Victoria Nectarine, 2 Stirling Castle Peach,
1 Early York Peach.
WILLIAM BARRON AND SON, Elvaston Nurseries, near Derby.

Brockworth Park Pear.

FINE PYRAMID TREES of this MAGNIFICENT NEW PEAR may now be obtained, at 21s. each, of
J. C. WHEELER AND SON, Nurserymen, Gloucester, and 59, Mark Lane, London, E.C.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that he is now sending out the above beautiful APPLE. An illustration of it, and a description by Dr. Hogg, is given in the "Florist and Pomologist" for March, 1870, in which he says that it is "Destined and worthy to take its place amongst the worthiest of its kind." Dwarf maiden trees, 7s. 6d. each.
Nurseries, Shipston-on-Stour.

Orchard Planting.

W. MAULE AND SONS can supply strong STANDARD APPLE TREES, with straight 6 feet stems, at £10 per 100. All of which are the most esteemed kinds in the cider districts of Devon, Somerset, Gloucester, and Hereford.
The usual distance in Planting Orchard Trees in Grass Land is 30 feet apart. The Nurseries, Bristol.

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application. The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies.
The "Woking Nursery" is easily reached by South Western Railway (main line) to Woking, and goods can be sent through, if upwards of £100, to all parts of the kingdom, which is an immense saving of package and carriage. An inspection of the Nursery will well repay Purchasers, but to those who cannot personally pay a visit, the following summary of the principal stock, averaging from 1 to 5, 6, and 12 feet high, will give some idea of the resources of this Establishment, viz.:—
125,000 Standard, Pyramid, Dwarf Maiden, cutback, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, &c., of the leading well-known kinds.
25,000 STANDARD and DWARF ROSES, of select and choicest varieties.
200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the common hybrid Catawbiense and Ponticum.
750,000 CONIFERÆ, which embrace most of the fine hardy species and varieties of the following genera:—Abies, Araucaria, Cedrus, Cupressus, Juniperus, Picea, Pinus, Retinospora, Taxodium, Taxus, Thuja, Thujopsis, Wellingtonia, &c.
450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following:—Acacia, Ailantus, Alder, Almond (flowering), Althæa frutex, Arbutus, Ash, Aucuba, Bay, Beech, Berberis, Birch, Bladder Sena, Box, Broom, Calycanthus, Chestnut, Cherry (flowering), Chimonanthus, Comptonia, Cornus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolreuteria, Laburnum, Laurel, Laurustinus, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Philyrea, Philadelphus, Plane, Poplar, Privet, Pyrus, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c.
2,000,000 FOREST TREES, viz.:—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.
20,000 CLIMBERS, thus—Bignonia, Climbing Roses, Ivy, Jasmine, Passonflower, Periploca, Vinca, Virginian Creeper, Wistaria, &c.
20,000 CLEMATIS, principally the "Woking Hybrids."
This Catalogue contains a set of five large Engravings of Clematis, for which this Establishment is famed, taken from Photographs

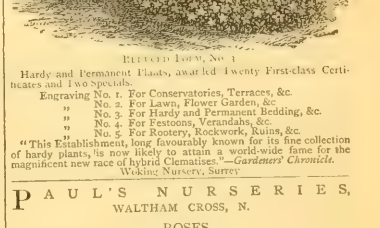

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Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials.
Engraving No. 1. For Conservatories, Terraces, &c.
" No. 2. For Lawn, Flower Garden, &c.
" No. 3. For Hardy and Permanent Bedding, &c.
" No. 4. For Festoons, Verandahs, &c.
" No. 5. For Rootery, Rockwork, Ruins, &c.
"This Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of Hybrid Clematises."—*Gardeners' Chronicle.*
Woking Nursery, Surrey

PAUL'S NURSERIES, WALTHAM CROSS, N.

ROSES.

ROSE PRINCESS CHRISTIAN.—"One of the grandest Roses in cultivation." "The best Rose of the present year." "The great Rose of the Show." Standards and Dwarf Standards, 10s. 6d. each Dwarfs, 7s. 6d. each
Standard ROSES, 15s. per dozen, and upwards.
Dwarf Standard ROSES, 12s. per dozen, and upwards.
Dwarf ROSES, 9s. per dozen, and upwards.
" in pots, for forcing, 24s. per dozen, and upwards.
Climbing ROSES, strong plants, 9s. per dozen and upwards.

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s. per dozen, and upwards.
Bedding HYACINTHS, 18s. per 100, and upwards.
" TULIPS, 3s. per 100, and upwards.
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, of sorts, 3s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000.
All other Bulbs equally moderate in price.

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each.
AVALANCHE, do., do., 7s. 6d. each.
MARCHIONESS.—The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.
WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each.
BONFIRE, the finest scarlet for bedding, 3s. 6d. each.
AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 12s. each and upwards.

EVERGREENS, CONIFERS, &c.

The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently transplanted specimens.

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES. FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post.

IMPORTANT.—Address WILLIAM PAUL (the Christian name in full), Paul's Nurseries, Waltham Cross, London, N.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The Articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 30s. per doz., or £10 p. 100.
" Good named kinds, £5 to £7 10s. per 100
" Common mixed colours, £2 10s. per 100.
" Van Houttei (Pieroni), strong bushy flowering plants, 1½ to 3 feet, 42s. to 120s. per dozen and upwards. This is one of the most beautiful of the Double Azaleas.
Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower-buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens.
ANDROMEDA FLORIBUNDA, 18s. to 30s. per doz.
RHODODENDRONS.—We invite the special attention of Rhododendron buyers to this part of our stock. We have miles of borders in which the plants vary from 2 to 8 feet high. Every plant a specimen, and comprising all sorts excepting the common Ponticum.
Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent on application.
Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Rotten Row were nearly all of them supplied from Knap Hill. As no description on paper can give an adequate idea of these plants, we have had a fair example photographed, which is given in our Catalogue, just published
RHODODENDRON PONTICUM, for Covert, £7 10s. to £15 per 1000.
" varieties named, the best kinds, 10 varieties, 5s. to 10s. per 100.
" Dwarf varieties, the best kinds and nice plants, £5 to £7 10s. per 100.
Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s. to 100s. per 100
" Larger and very bushy plants, £10 to £20 per 100.
☞ We have grown for some years past a large number of Rhododendrons from layers, and have now a stock of more than 200,000 plants of named varieties, which we believe are quite unequalled, being without exception the best plants we have ever seen. We supply them, all sizes, at from 20s. to 200s. per 100. A sample, the only guide, will be sent on application
HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, by name, including Menziesias, every plant a specimen; 6s. per dozen, 40s. per 100
" The free growing varieties of VULGARIS, &c., 30s. per 100, £10 per 1000.
" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, £5 per 100.
KALMIA LATIFOLIA, from 50s. to 100s. per 100.
" Nice blooming plants, £5 to £10 per 100.
" Larger, 30s. to 60s. per dozen and upwards.
" MYRTIFOLIA, 40s. to 60s. per dozen.
All other American Plants are grown to a large extent.
HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.
MIXED GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100; 3 to 3½ feet, £5 to £7 10s. per 100; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.
Thousands of beautifully grown Pyramidal plants.
We have a number of very fine Golden Hollies, 12 and 15 feet high.
WATERER'S HOLLY. } We have these in large numbers and of
GOLDEN QUEEN } all sizes, as Pyramids, Globes, and Standards, and taken altogether they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being four examples of our stock.
PERRY'S WEEPING HOLLY STANDARDS.—A large number.
NEW GOLDEN WEEPING HOLLY.—Nice Standards.
The COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, handsome plants
VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high.
YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 14 feet. These are invaluable as blinds.
IRISH YEWS, of all sizes, up to 10 feet.
YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN. } Handsome Pyramidal plants, 5, 6, 7, and
" VARIEGATED. } 8 feet high. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.
AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high.
LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.
LAURUSTINUS and BAYS.—Fine Standards, in tubs.
Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted:—
ABIES ALBERTUS, 5 to 6 feet, 42s. per dozen; 7 to 8 feet, 60s. These are beautiful plants, transplanted 1870.
ABIES ORIENTALIS, 4 to 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. and upwards.
PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.
PINUS EXCELSA, 2 to 3 feet, 18s. per dozen; 3½ to 4 feet, 7s. 6d. to 10s. 6d. each; larger, 5 to 6 feet, 21s. each and upwards
PINUS NOBILIS, 3½ feet, very stout, 18s. per dozen, £5 per 100; 2 to 3 feet, 60s. per dozen; 4, 5, 6, 7, to 10 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards.
PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s. per dozen; 2½ to 3 feet, 5s. to 7s. 6d. each; larger specimens, 5, 6, 8, and 10 feet.
PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.
PICEA PINSAPO, 3 feet, handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, and 8 feet high, 21s. each and upwards; and all have been transplanted within 12 months.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; 5 to 7 feet, 60s. to 10s. 6d. per dozen; 8, 9, and 10 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.
CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 3, 4, and 5 feet high.
CUPRESSUS LAWSONIANA GRACILIS } 3 to 4 feet, 42s. to
" ARGENTEA } 84s. per dozen.
JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.
THUJA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.
THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen.
THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.
WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—
ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET HORSE CHESTNUT, 8 and 10 feet high.
ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, giving 5 to 6 inches 4 feet from the ground.
BEECH, PURPLE, 6 to 8 feet; 10 to 12 feet, fine trees.
BEECH, COMMON, 8 to 10 feet.
BIRCH, WEEPING, 8 to 10 feet.
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet.
LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.
MAPLES, NORWAY, 8 to 14 feet.
OAKS, ENGLISH, 8 to 12 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high.
" The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBARDY, 10 to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
AILANTUS, 8 to 10 feet.
CATALPAS, 6 to 8 feet.
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted *within* two years.
Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

Cheap Roses and Vines.

KIRK ALLEN has to offer fine Standard ROSES, fully equal to any in the Trade—best varieties only, his selection, at 9s. per dozen. Dwarfs, ditto, ditto, 7s. per dozen.

Extra strong planting VINES of BLACK HAMBURGH GRAPE, 2s. 6d. each; ditto, ditto, Fruiting, 5s. 6d. each GOLDEN CHAMPION, strong planting Canes, 1s. each; extra strong Fruiting ditto, 5s. each. All package free.

The Nurseries, Brampton, Huntingdon.

The Nurseries, Wetly Rocks, near Leek, Staffordshire.

MR. A. B. FOX (Successor to the late G. F. Fox), of the above Nurseries, is now sending out his new WEEPING WILLOW, SALIX CAPREA PENDULA NOVA, the most beautiful Weeping Tree ever introduced to the Public. Descriptive CIRCULARS and price can be had on application.

A B F also begs to say that his TRADE LIST of SEED POTATOS and RHUBARB ROOTS is now ready.—Nov. 30.

To the Trade.

GEORGE R. DAVIDSON, The Nurseries, Newry, offers 500,000 LARCH, well grown, 15 inches to 3 feet; also 1,000,000 various FOREST TREES, 1 to 3 feet; 10,000 COMMON LAUREL, single plants, 1 to 2 feet; 5,000 SALE LAUREL, 1 to 2 feet; 2,000,000 THORN QUICKS, 1 and 2 yr. old; 45s. transplanted ditto. Samples on application. Steam to Liverpool.

TO BE DISPOSED OF, about 200 CEDRUS DEODARA, 10 to 12 feet high, and in rare condition for transplanting, every one of which has been removed since August, 1869, as they are now standing on ground that must be cleared by Lady Day next. No reasonable offer will be refused.

ANTHONY WATERER, Knap Hill Nursery, Woking, Surrey.

FOR SALE, fine SPRUCE FIR, 2½ to 4 and 5 feet; SCOTCH, ditto, fine, 4 to 5 feet; SILVER FIR, 3 feet. The above are thin on the ground and well rooted. LARCH, 1½ to 2 feet; QUICK, 2 to 3 feet; strong ASH, 3 to 5 feet; bushy LAURELS, 2 to 3 feet; GUELDER ROSE (strong), RIBES, SUMACH, &c. Fine specimen WELLINGTONIAS, 5 to 7 feet.

W. GROVE, Tupsley Nursery, Hereford.

Planting Season.

TO BE SOLD, cheap, the ground being required for other purposes, 6 acres of RHODODENDRONS, from 1 to 3 feet high, bushy, healthy, well set with bud; the finest lot in England; AZALEAS, strong and bushy, well set with bud; POPLARS, in variety, 2 to 12 feet high; SPRUCE, 2 to 3 feet; HORSE CHESTNUTS, SYCAMORE, NORWAY MAPLE, 2 to 8 feet; COMMON LAUREL, 2 to 3 feet, bushy; and other Forest Trees, Shrubs, &c. Best show GOOSEBERRIES in variety.

W. B. WHITHAM, Hollins Nursery, Werneth, Stockport.

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON and SON have to intimate that CATALOGUES for the present season may be had upon application.

The stock of Seedling and Transplanted LARCHES, SCOTS FIRS, and other FOREST TREES is both unusually extensive and superior in quality. When personal inspection is not convenient, samples and special offers will be sent if required.

Edinburgh and London Seed Warehouse, 23, George Street, E.C.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 9 ft. | COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, thickly set with buds.

The above have recently been transplanted, are very bushy, and some plants, and quite safe. Price per dozen or hundred on application to

Floral Nursery, Hailsham, Sussex.

Fox or Game Covert.

W. MAULE AND SONS can supply, for this season, the following:—

BROOM, English, strong, 1½ to 2 feet, 20s. per 1000
BOX, Evergreen, bushy, 1½ to 2 feet, 25s. per 100; £10 per 1000
CURRANTS, black and red, 1 yr. old, 3s. per 100; 50s. per 1000
FURZE, English, two years old, 1 to 2 feet, 5s. per 1000
" two years old, and one year transplanted, 20s. per 1000
LAURELS, bushy, 2½ to 3 feet, 40s. per 100
MAHONIA, Evergreen Barberry, 1 to 2 feet, 25s. p. 100; £10 p. 1000
NORWAY SPRUCE, 1 to 2 feet, 30s. to 40s. per 100
PRIVET, Evergreen, 50s. per 1000.
PERIWINKLE, broad leaf, 4s. per 100
SNOWBERRY, 2 to 3 feet, strong, 30s. per 100.
BITTER OSIER, 20s. per 1000.

Collections of miscellaneous shrubs, for underground and shrubbery plantations, of the following sorts, 50s. per 100:—Yews, Hollies, Euonymus, Aucubas, Rhododendrons, Portugal Laurels, Ligustrums, Broom, &c.

Lists of Forest and Ornamental Trees sent on application.

The Nurseries, Bristol.

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees.

QUICK, and all other Hedge Plants.

COVERT PLANTS, in great variety.

FRUIT TREES, including all the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained, &c.

ROSES, Standards, Dwarfs, on own roots and Manetto stock, &c.

VINES, all the leading varieties, in 2000 well ripened Canes, for fruiting, in pots and for planting out.

EVERGREENS, in great variety, including large quantities of all the choicest Hollies, &c.

CONIFERÆ, including Picea nobilis, Nordmanniana, &c.

ORNAMENTAL TREES and Plants, of all sorts.

The whole in very great quantity and stout vigorous condition, with fine roots, for safe removal.

Priced LISTS and all particulars on application to

JAMES DICKSON AND SONS, Newton Nurseries, Chester

(The Newton Nurseries are within a few minutes' walk, by the new road over Flookersbrook Bridge, from the Railway Station.

Casbon's Partnership.

NOTICE is HEREBY GIVEN, that the PARTNERSHIP heretofore subsisting between THOMAS CASBON, of the City of Peterborough, Market Gardener and Nurseryman, and JANE CASBON, of the same place, carrying on the Trade or Business of Market Gardener, Nurseryman, and Cowkeeping, has been this day DISSOLVED by MUTUAL CONSENT; and that the said BUSINESS is intended to be carried on for the sole use and benefit of the said JANE CASBON.—Dated 21 December, 1870.

GATES and PERRIAM, Solicitors, Peterborough.

To Architects, Landscape Gardeners, and Others.

TO BE LET,

ROCHESTER CASTLE RECREATION GROUNDS and PUBLIC WALKS.—The Committee for Laying-out the Grounds of Rochester Castle as Ornamental Recreation Grounds and Public Walks are desirous of being FURNISHED with DESIGNS.

The work also involves the preparation of approaches and the repair of some of the walls, and the laying out of a small piece of land for building purposes.

A Copy of the Plan, showing the levels, may be obtained on application to me on and after November 28 instant, and on payment of 5s., which will be returned to each Competitor.

A General Statement of the requirements of the Committee will also be furnished on application.

The Committee offer the following Premiums, viz.:—£30: the Competitor whose Design shall be declared first in merit: £20 to the Competitor next in order of merit; and £10 to the Competitor third in order of merit.

If the Design of the Competitor declared first in order of merit be carried out by the Committee, the person sending the same will be employed at the usual Commission, of £5 per cent., to carry out his Design.

The Designs of the Competitors first and second in merit to become and be the absolute property of the Committee, to be used by them as they may think fit.

The Committee do not bind themselves to carry out the Design decided as first in order of merit, or any other.

All Designs to be sent to my Office not later than WEDNESDAY, January 4, 1871.—By Order of the Committee,

RICHARD PRALL, Town Clerk.

Rochester, November, 1870.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 76 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of CHOICE and RARE FERNS, No. 7.

Foot's Cray Nursery, Sidcup Hill, Kent.

New Soft-Wooded and Bedding Plants.

H. CANNELL begs to state that his AUTUMN CATALOGUE is now ready. It contains all of the above sent out this season, also all the best older varieties in cultivation, at the very lowest price consistent with quality and correctness. See List, and present quotations.

New Florist's Flower and Florist's Flower Seed Merchant, Woolwich.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the year they first fruited in, the raiser, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches in winter; and in this shortadvice lies all the art of growing healthy and fruitful trees, such as J. S. offers.

FOR PLANTATIONS, at wholesale prices, for cash, all transplanted and healthy, OAK, ELM, BEECH, HORSE CHESTNUT, 2 to 3 feet high, stout, well-rooted trees, 20s. per 1000; ASH, 2 feet, 20s. per 1000; HORSE CHESTNUT, 4 feet, 30s. per 1000; MAPLE, 4 to 6 feet, 30s. per 1000; PLANES, 3 to 5 feet, 12s.; 6 to 8 feet, 20s. per 100; SYCAMORES, 4 to 6 feet, 16s.; 7 to 9 feet, 25s. per 100; WALNUTS, 3 to 4 feet, 20s. per 100; BOX, for edging walks, 3d. per yard: Red Grape CURRANTS, strong, 3s. per 100, 20s. per 1000. SILVER FIR, 1½ to 2 feet, 3s. per 100; GUELDER ROSES, Red and Yellow BIBES, very thrifty, 1 feet, 2s. 6d. per dozen; Dwarf Perpetual ROSES on Briar, 6s. per dozen; and other Nursery Stock.

Remittance or reference required with orders.

A. WILKIN, Upper, Kelvedon, Essex.

WRIGHT'S GROVE WHITE CELERY.—One of the largest and best flavoured bleaching varieties ever introduced; after the same character as the Grove Red sent out by me. It has been awarded the First Prizes at the two Celery Shows held at Retford, the average size of the Sticks exhibited being 2 ft. each. It was raised by myself, and will be found one of the best White Celeries in cultivation. This is the first season I have been able to introduce it to the Trade, and as the stock of seed is limited, early orders are requested. Price 1s. per packet, or 9s. per dozen

W. WRIGHT, Seed Merchant, East Retford.

Agents: HURST AND SON, 6, Leadenhall Street, London, E.C.

BROCCOLI, ELLETSON'S NEW SURPRISE, a large late white protecting.—This variety is a great improvement upon the Mammoth Cauliflower Broccoli, sent out 20 years ago in J. & J. Fleming's Trade List. It is equally as hardy, more uniform in growth, and proved itself to be the best late white Broccoli extant. Price 1s. per packet.

CUCUMBER, FOSTER'S X. L., fine long Ridge.—This new variety is a remarkably fine, hardy, long, dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps good to the last. All who have grown it are highly satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. Price 1s. per packet.

MELON, LORD NAPIER, New.—A handsome exhibition variety, golden yellow, and beautifully netted; green flesh, melting, juicy, and delicious in flavour; free setter, and hardy in constitution. Price 6d. per packet.

EDMUND PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street, Hull.

STEVENSON'S ABYSSINIAN MIXTURE, warranted to destroy Mealy Bug, Brown and White Scale, Thrip, and all Insects infesting Plants, without injuring the most tender Fungi.

This invaluable mixture has received the very highest commendations from many of the leading Horticulturists of this country.

Sold in 1s. 6d. packets, sufficient to make 2 gallons; 2s. 6d. per Kingdom, in bottles, 1s. 6d., 2s., 3s. 6d., and 5s. 6d. each, with directions for use.

Sole Manufacturer, F. STEVENSON, Lark Hill, Timperley, Cheshire.

TOBACCO TISSUE, for FUMIGATING GREENHOUSES.—Will destroy Thrip, Red Spider, Green and Black Fly, and Mealy Bug, and burns without the assistance of blowing, and is entirely free from paper or rags. Price 3s. 6d. per lb., carriage free. A reduction in price for large quantities.

To be had of Messrs. ROBERTS AND SONS, Tobacco Manufacturers, 112, St. John Street, Clerkenwell, E.C., of whom Copies of Testimonials may be obtained, and of all Seedsmen and Nurserymen.

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.

Sold by Nurserymen, Seedsmen, and Florists,

In Tins at 1s., 2s. 6d., and 5s.

Powder Distributors, 2s. 6d. and 3s. 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

ALEX. WILKIES

"CONDENSED" COMPOSITION,

THE CHEAPEST AND ONLY EFFECTUAL

MEALY BUG, SCALE, and THRIP DESTROYER.

One trial only is required to give it a pre-eminence over all other Insecticides. It has been in the hands of most experienced Gardeners for trial, and the under-named Nurserymen and Seedsmen will be happy to furnish a Printed List of Opinions and other particulars on application, and also to receive orders for the same. Sold in bottles at the following prices, viz., 2s., 3s. 6d., and 6s.

Messrs. Osborn & Sons, Fulham, S.W.
" Barr & Sugden, Covent Garden.
" Cuthbush & Son, Highgate.
" Dickson & Sons, Chester.
" Drummond & Sons, Stirling.
" Drummond & Sons, Dublin.
" Garaway & Co., Bristol.
" Hurst & Son, 6, Leadenhall Street, E.C.
" Henderson & Son, F. G., St John's Wood, N.W.
Messrs. Kennedy & Co., Dumfries.
" J. & C. Lee, Hammersmith, W.
" Robinson & Sons, Tooting, S.W.
" Sutton & Sons, Reading.
" Stuart & Mein, Kelso.
" Veitch & Sons, Chelsea, S.W.
Mr. John Cutbush, Barnet.
" J. Fraser, Lea Bridge Road, N.E.
" F. W. Kinghorn, Richmond, S.W.
" R. S. Williams, Holloway, N.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.

Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.

Wholesale by PRICE'S PATENT CANDLE COMPANY (Limited), Battersea, London, S.W.

VEITCHS' AUTUMN GIANT CAULIFLOWER.

MESSRS. VEITCH & SONS

DESIRE TO CALL ATTENTION TO THIS

NEW AND EXTREMELY VALUABLE LATE CAULIFLOWER.

It is perfectly distinct from any other sort, the leaves are long and tapering, and the habit of the plant is robust, but very upright and compact. The heads are magnificent, beautifully white, large, firm, and compact, and being thoroughly protected by the foliage, remain longer fit for use than any other sort. If sown in April it will succeed the Walcheren, and coming in between that variety and Snow's Winter Broccoli, is a great acquisition to all gardens. It was awarded a First-class Certificate by the Royal Horticultural Society, November 2, 1870, when Messrs. V. & S. were generally congratulated on having brought such a fine variety before the public. Many letters, speaking in the highest terms of this Cauliflower, have been received, and it cannot be too strongly recommended.

The following is an Extract from the *Gardeners' Magazine* of November 5, 1870:—

"Messrs. Veitch & Sons exhibited their New Giant Autumn Cauliflower, which from its gigantic size and fine appearance attracted a considerable amount of attention, and was deservedly awarded a First-class Certificate. Five or six heads were shown, the largest measuring upwards of 12 inches in diameter, and all were perfectly solid and of the purest white. It was stated that seed of the Giant Autumn, Walcheren, and Snow's Winter Broccoli were all sown at the same time, and all the plants grown under exactly the same conditions, and that the Giant Autumn did not turn in until all the others were past. Its being fit for use so late in the season is a most important quality, and without doubt it is one of the most valuable and distinct vegetables that has been introduced for many years past."

Mr. HENRY CHILMAN, Somerley Gardens, writing in the *Florist*, says:—

"This is certainly one of the best additions to the Brassica family we have had for some years past, the heads produced by this fine sort being compact and of marble-like whiteness. From the high recommendation given to this variety in the Catalogue whose name it bears, I was induced to try it, and can fully endorse every word said there in its favour. All who have not hitherto included this variety in their Seed Lists would do well to do so; there is little doubt of those who have once tried it neglecting to do so again. The crop we are now cutting gives promise of a supply for five or six weeks to come."

In Sealed Packets, 2s. 6d. each.

The following Seedsmen have obtained a supply direct from us, viz.:—

Messrs. Barr & Sugden, 12, King Street, Covent Garden.
" Burgess & Kent, Penkhull.
" Carter & Co., High Holborn.
" Jas. Dickson & Sons, 102, Eastgate Street, Chester.
" Dickson, Brown & Tait, Manchester.
" Downie, Laird & Laing, Forest Hill.
" James Garaway & Co., Bristol.
" E. G. Henderson & Son, St. John's Wood.
" Hurst & Son, 6, Leadenhall Street.
" J. & C. Lee, Hammersmith.
" Minier, Nash & Nash, 60, Strand.
" Osborn & Sons, Fulham.
" Smith & Simons, Glasgow.
Messrs. Sutton & Sons, Reading.
" Wood & Ingram, Huntingdon.
" Austin & McAslan, Glasgow.
" Fisher, Holmes & Co., Sheffield.
" Nutting & Sons, 60, Barbican, London.
" Rutley & Silverlock, 414, Strand.
" Dick Radclyffe & Co., 129, High Holborn.
" Thomas Davies & Co., Wavertree Nursery, Liverpool;
Mr. R. Cooper, 152, Fleet Street.
" John Scott, Yeovil.
" R. T. Veitch, Exeter.
" R. S. Williams, Upper Holloway.
" James Bird, Downham Market.
" E. Cooling, Derby.

Price to the Trade on application, or of either of the London Wholesale Houses named above.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.—Nov. 22, 1870.

MINTON, HOLLINS, AND CO., PATENT TILE WORKS, STOKE-ON-TRENT.

This is the OLD FIRM, and they continue to Manufacture every class of ORNAMENTAL and PLAIN TILES by the most improved processes, after

UPWARDS OF THIRTY YEARS' EXPERIENCE

London House: 50, Conduit Street, Regent Street, W.
Manchester House: Bridgewater Club Chambers, 110, King Street.

OSLER'S CRYSTAL GLASS CHANDELIERS, TABLE GLASS OF ALL KINDS.
CHANDELIERS IN BRONZE AND ORMULU.
Moderator Lamps, and Lamps for India
London—Show Rooms, 45, OXFORD STREET, W.
Birmingham Manufactory and Show Rooms, Broad Street.

Cottam's Iron Hurdles, Fencing, and Gates.

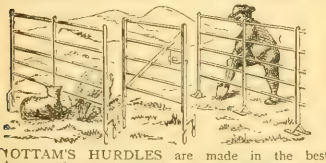

COTTAM'S HURDLES are made in the best manner, of superior Wrought Iron, by an improved method. Illustrated Price Lists on application to COTTAM AND CO., Iron Works, 2, Winsley Street, Oxford Street, London, W.

COTTAM'S PATENT PORTABLE UNITED COW FITTINGS.

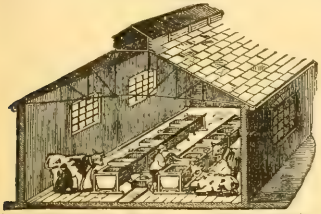

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventilation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover to prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55s.

Prospectuses free of COTTAM AND CO., Iron Works, 2, Winsley Street (opposite the Pantheon), Oxford Street, London, W., where the above are exhibited, together with several important Improvements in Stable Fittings just secured by Patent.

Caution to Gardeners.—When you ask for SAYNOR AND COOKE'S WARRANTED PRIZE PRUNING and BUDDING KNIVES, see that you get them. Observe the mark SAYNOR, also the Corporate Mark, OBTAIN WARRANTED, without which none are genuine.

S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been sold for the genuine one, and which has caused many complaints to be made to them of Knives which were not of their make; all of which are warranted both by Sellers and Makers.

S. & C.'S PRUNING and BUDDING KNIVES are the best and the cheapest in the market.

Paxton Works, Sheffield. Established upwards of 125 years.

CONSERVATORY BASKETS.

Strained Wire Espalier Trainers for all kinds of Fruit Trees, &c.; Garden Fencing, Rabbit proof; Trellis Wire Work, for Gardens and Conservatories; Wire Work Covered Ways, for Gardens, Pleasure Grounds, &c.; Wire Work Rose Fences, Rosaries, Arbours, Summer Houses, &c.; Wire Work Vase Baskets, with stem and prongs for placing in any position, on the lawn, and opposite windows, or elsewhere; Suspending Baskets for Conservatories; Wire Work Flower Stands for Conservatories; Aviaries for Conservatories, Pheasantries, &c.

Conservatories fitted up with Trellis Work, Flower Stands, Baskets, Wires, &c.

Minton's Ornamental Tile Flower Boxes.

All kinds of Wire Work made to order.

R. HOLLIDAY, Horticultural and Floral Wire Works, 2A, Portobello Terrace, Notting Hill Gate, London, W.

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Smokeless Stoves.—No Flues.—Portable.

NASH AND JOYCE'S PATENT, for CONSERVATORIES and all other places, from 12s. 6d. to Six Guineas. PATENT FUEL, 18s. per 120lb; in bags and sacks of 30lb and 60lb at 4s. 6d. & 9s. AMERICAN CHARCOAL BOX-IRONS, always bright for use, without cleaning. The Iron is a miniature portable stove. Light, cheap, clean, and durable. Price 5s., 6s., and 7s.

Mastic-stirring, Mincing, and Sausage-Filling Machines of the best makers, 10s. 6d.

The COTTAGE KNIFE CLEANERS give to Knives a brilliant polish and keen edge with little labour, 3s. 6d., 4s. 6d., 5s. 6d., 10s. 6d.

PORTABLE VAPOUR BATH, with Medical Testimonials.—Bath and large Book, £1 10s. 6d.

SWAN NASH, Ironmonger, 251, Oxford Street; and JOYCE'S STOVE DEPOT, 119, Newgate Street.

Everlastings, Hyacinth Glasses, &c.

JAMES CARTER, DUNNETT, AND BEALE'S Wholesale LIST (Illustrated) of EVERLASTINGS, DRIED NATURAL FLOWERS, HYACINTH GLASSES, and GARDEN REQUISITES is now ready, and will be forwarded post free on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN MOWING, ROLLING, and COLLECTING MACHINES for 1870

GREENS' PATENT LAWN MOWERS combine all the advantages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

HAND MACHINE.

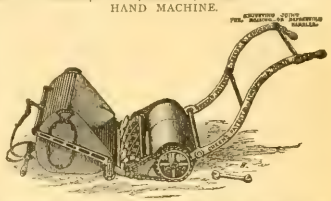

GREENS' PATENT LAWN MOWERS have proved to be the best, and have carried off every Prize that has been given in all cases of Competition.

Every Machine is warranted to give entire satisfaction, and if not approved of can be returned at once without any cost whatever to the Purchaser.

☞ Illustrated Price Lists of Greens' Patent Rollers, Hot water Boilers, Galvanised Wire Netting, Garden Seats and Chairs, Fountains, Vases, &c., free on application.

THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; 54 and 55, Blackfriars Road, London, S.E.

Kosher's Garden Edging Tiles.

THE above and many other PATTERNS are made in Terra-Metallic Ware, Terra-Cotta, Stoneware, and Redware, and of great durability. The planer sorts are especially suited for KITCHEN GARDENS, as they harbour no Slugs and Insects, take up little room, and once put down incur no further labour and expense, as do "grown" Edgings, consequently being much cheaper.

GARDEN VASES, FOUNTAINS, &c., in Artificial Stone, of great durability and superior finish, and in much variety of design.

F & G. ROSHER, Manufacturers, Upper Ground Street, Blackfriars, S.E. Queen's Road West, Chelsea, S.W.; Kingsland Road, Kingsland, N.E.

Illustrated Price Lists free by post. The Trade supplied.

ORNAMENTAL PAVING TILES for Conservatories, Halls, Corridors, Balconies, &c., as cheap and durable as Stone in blue, red, and buff colours, and capable of forming a variety of designs. Likewise more elaborate designs. Pattern Sheets of Pavement, with prices, forwarded for selection.

WHITE GLAZED TILES, for Lining Walls of Dairies, Larders, Kitchen Ranges, Baths, &c. Grooved and other Stable Paving Bricks of great durability. Dutch and Adamantine Clinkers, Wall Copings, Red and Stoneware Drain Pipes, Slates, Cements, &c.

To be obtained of F. & G. ROSHER, at their premises as above.

SILVER SAND (REIGATE), at the above addresses—14s. per Ton, 1s. 2d. per Bushel; 2s. per Ton extra for delivery within three miles, and to any London Railway or Wharf. Quantities of 4 Tons, 1s. per Ton less. A coarser grained Sand 4s. per Ton more. Samples of Sand by post on receipt of stamp.

FLINTS and BRICK BURRS for Rockeries or Ferneries. KENT PEAT and LOAM supplied at lowest rates.

F. & G. ROSHER.—Addresses see above.

N.B. Orders promptly executed by Railway or Vessel.

A liberal discount to the Trade.

WINDOW GLASS, SHEET LEAD, PAINTS, &c.

THOMAS MILLINGTON & Co.,

IMPORTERS AND MANUFACTURERS.

NEW LIST of PRICES for MAY, transmitted or furnished on application,

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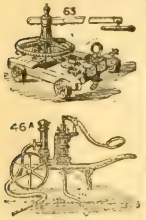

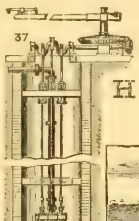

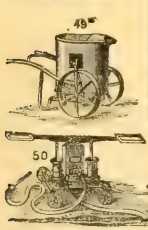

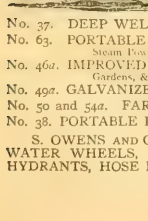

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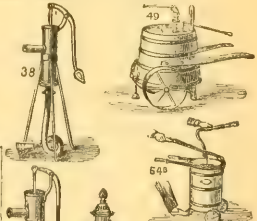

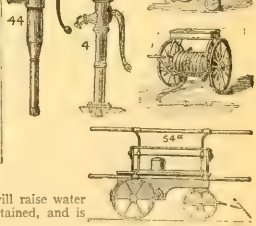

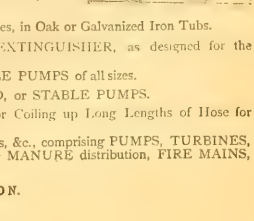

THE IMPROVED SELF-ACTING HYDRAULIC RAM.

This useful Self-acting Apparatus, which works day and night without needing attention, will raise water to any height or distance, without cost for labour or motive power, where a few feet fall can be obtained, and is suited for supplying Public or Private Establishments, Farm Buildings, Railway Stations, &c.

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No. 39b. IMPROVED HOSE REELS for Coiling up Long Lengths of Hose for Garden use.

S. OWENS AND CO. Manufacture and Erect every description of Hydraulic and General Engineers' Work for Mansions, Farms, &c., comprising PUMPS, TURBINES, WATER WHEELS, WARMING APPARATUS, BATHS, DRYING CLOSETS, GAS WORKS, Apparatus for LIQUID MANURE distribution, FIRE MAINS, HYDRANTS, HOSE PIPES, &c., &c. *Particulars taken in any part of the Country. Plans and Estimates furnished.*

ILLUSTRATED CATALOGUES CAN BE HAD ON APPLICATION.

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THE GARDEN INDOORS THE GARDEN OUTDOORS.

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What is more delightful in winter than to be surrounded with flowers—thereby conquering Nature, and bringing out the blossoms of Spring in the period of snow, and especially where the artificial appliances of glass are either wanting or limited? The Hyacinth, the Narcissus, the Tulip, the Crocus, the Snowdrop, the charming Scilla, and others, with their accommodating habits and easy culture, may be enjoyed in their full bloom, fragrance, and beauty, as much in the cottage as in the palace.

COLLECTIONS OF BULBS,

SPECIALLY SUITED FOR PRESENT PLANTING.

100	named HYACINTHS	300	SNOWDROPS
50	named POLYANTHUS NARCISSUS	100	CROCUS
		50	SCILLA SIBIRICA
200	named TULIPS	36	CYCLAMEN PERSICUM
50	sweet scented JONQUILS	50	IXIOLIRION UNIFLORA

£4 4s. ; half the quantity, £2 2s. ; quarter the quantity, £1 1s. ; eighth the quantity, 10s. 6d.

OUTDOORS.

In spring how eagerly we look for the first signs of returning life and beauty, in the wee, timid flowers that seem born of the snow, followed by the Primrose in the copse, the Cowslip in the mead, and the Blue Bell by the wayside. But what of our gardens? Too frequently empty beds, which might otherwise be clothed with beauties, for delicacy of colour, chasteness of form, richness and variety, not to be met with in the gaudy flowering of a summer flower garden. Now is the time to furnish the beds, and the following are part of the materials, to turn the wilderness of our garden in spring into a paradise of beauty.

COLLECTIONS OF BULBS,

SUITABLE FOR SPRING GARDENING

150	HYACINTHS	500	SNOWDROPS
50	POLYANTHUS NARCISSUS	50	SCILLA SIBIRICA
		50	IXIOLIRION UNIFLORA
200	GARDEN NARCISSUS	200	ANEMONES
400	TULIPS	200	RANUNCULUS
500	CROCUS		

£4 4s. ; half the quantity, £2 2s. ; quarter the quantity, £1 1s. ; eighth the quantity, 10s. 6d.

COLLECTIONS OF PLANTS,

SUITABLE FOR SPRING GARDENING.

200	PANSIES and VIOLETS	100	FORGET-ME-NOTS
200	DAISIES	200	SILENE

and 50 sundry plants, including Spring-flowering PHLOXES, &c.,

£4 4s. ; half the quantity, £2 2s. ; quarter the quantity £1 1s. ; eighth the quantity, 10s. 6d.

B. & S.'s CATALOGUE contains all that is necessary in Bulbs and Plants for Winter and Spring Gardening, and may be had free on application.

BARR AND SUGDEN,

12, KING STREET, COVENT GARDEN, W.C.

THE ROYAL SEEDSMEN.

CARTER'S NEW PEAS FOR 1871.

LAXTON'S QUANTITY PEA. Price to the Trade on application.

LAXTON'S QUANTITY PEA. A fine flavoured variety, selected from "Laxton's Quality" for its robust habit and extreme productiveness; it also differs in the shape of its pods. Exhibited and Highly Commended by the Royal Horticultural Society of London.

Stereotypes of this Block can be supplied by J. C. & Co.

LAXTON'S QUALITY PEA.

A second early wrinkled Pea, of great productiveness and fine flavour; it is a great improvement on all the second early wrinkled Peas at present in cultivation. Has been grown in the Trial Ground, and Highly Commended by the Royal Horticultural Society of London.

Price to the Trade on application.

EASTES' KENTISH INVICTA PEA.

J. C. & Co. having purchased part of the stock of this fine early Pea, will be happy to quote special prices to the Trade for large quantities.

CARTER'S COLLECTIONS OF HYACINTHS, TULIPS, &c.

The most liberal assortments for in and outdoor culture, 10s. 6d., 21s., 42s., and 63s. each.

☞ As the season is now advancing, intending Planters should secure their supplies at once.

JAMES CARTER & CO.,

237 and 238, HIGH HOLBORN, LONDON, W.C.

Seeds direct from the Growers, the best means of preventing disappointment.

SUTTONS' HOME-GROWN SEEDS,

CARRIAGE FREE.

SUTTONS' COMPLETE COLLECTIONS OF

CHOICE VEGETABLE SEEDS

FOR ONE YEAR'S SUPPLY.

EXCELLENCE AND ECONOMY COMBINED.

☞ The sorts included in these Collections are those which have proved to be the most prolific, best flavoured, and most worthy of cultivation.

	Suttons' £3 3 0 Collection for a Large Garden. Carriage free	Suttons' £2 2 0 Collection for a Medium size Garden. Carriage free	Suttons' £1 1 0 Collection for an ordinary Size Garden. Carriage free
PEAS, the best sorts	20 quarts	12 quarts	6 quarts
	8 ditto	4 ditto	2 ditto
FRENCH BEANS, Runners and Dwarfs	6 pints	3½ pints	1½ pint
BEET, the finest Dwarf Red	2½ ounces	1 ounce	1 packet
KALE, of best sorts	4 packets	3 packets	2 ditto
BRUSSELS SPROUTS	1 large pkt.	1 large pkt.	1 ditto
BROCCOLI, the best sorts	8 ditto	6 ditto	4 ditto
CABBAGE, best sorts	7 packets	6 packets	5 ditto
SAVOY, finest	3 ditto	2 ditto	2 ditto
CARROT, best sorts	16 ounces	10 ounces	3 ounces
CAULIFLOWER	2 large pkts	2 packets	1 packet
CELERY, white and red	2 ditto	2 ditto	2 ditto
COUVE TRONCHUDA	1 packet	1 ditto	1 ditto
ENDIVE, best sorts	1½ ounce	1 ditto	1 ditto
CRESS, plain, curled, &c.	1½ pint and 2 packets	½ pint and 2 packets	¼ pint and 1 packet
CUCUMBER, best sorts	4 packets	3 packets	2 packets
LEEK, Musselburgh	1 ounce	1 ditto	1 ditto
LETTUCE, Suttons' Cos, and others	6 packets	4 ditto	3 ditto
MUSTARD	1 pint	1 pint	4 ounces
MELON, choicest sorts	3 packets	2 packets	1 packet
ONION, Improved Reading and other	12 ounces	8 ounces	3 ounces
PARSLEY, splendid curled	2 ditto	1½ ditto	1 ditto
PARSNIP, Student	6 ditto	4 ditto	1 ditto
RADISH, finest sorts	20 ounces	12 ditto	5 ditto
SPINACH	4 pints	2 pints	1 ditto
SALSAFY	1 large pkt.	1 packet	..
SCORZONERA	1 ditto	1 ditto	..
TURNIP, fine sorts	16 ounces	8 ounces	3 ounces
VEGETABLE MARROW	1 large pkt	1 large pkt.	1 packet
POT HERBS, useful kinds	6 packets	4 packets	2 ditto
RAMPION	1 ditto	1 ditto	..
TOMATO	1 ditto	1 ditto	1 ditto
CAPSICUM	1 ditto	1 ditto	..
CORN SALAD	1 ditto	1 ditto	..
ORACHE	1 ditto	1 ditto	..

The above are the Quantities contained in our Complete Collections of Vegetable Seeds; but if any of the articles are not required, we shall be pleased to omit them and send additional quantities of others.

Complete Collections for Small Kitchen Gardens, 15s. and 12s. 6d. each.

Now in the Press, and will shortly be delivered to Customers Gratis, SUTTONS'

SPRING CATALOGUE

AND

AMATEUR'S GUIDE for 1871;

Being a complete Guide to the Kitchen and Flower Garden. Price to non-customers, 1s. (post free). Also SUTTONS' ABRIDGED SEED LIST FOR 1871, gratis and post free on application.

THE

HEAVIEST CROPPING POTATO

and the best cooking Potato in cultivation is

SUTTONS' RED-SKIN FLOURBALL.

This extraordinary Potato, SENT OUT LAST SEASON BY US, has given the most complete satisfaction. It has the peculiar merit of producing tubers all of uniform size, which are very large. While most other red varieties boil yellow, this is white, of particularly fine flavour, and is most correctly described as "Flourball." For supplying the London dining rooms especially, we feel confident it will supersede every other kind when sufficiently known.

From Mr J. BIRD, *Gardener to* R. D. Barclay, Esq., *Eastwick Park* November 19.—"From 1 peck of your Red skinned Flourball Potato I have grown 5 sacks and a peck, many of the Potatoes weighing over 2 lb.

From Mr B. BARHAM, *Gardener to the* Right Honourable Lord Ormathwaite, *Warfield Park*

"The Red skinned Flourball Potatoes you sent me is a most extraordinary kind, producing tubers varying from 1½ to 2 lb. weight. Certainly the largest Potato I have ever seen."

Orders for the above splendid Potato will be executed strictly in rotation. Retail Price **5s. per Peck.**

Trade Price may be had on application.

SUTTON AND SONS,

SEEDSMEN TO THE QUEEN, READING.

Roses.

ONE HUNDRED THOUSAND STANDARD ROSES.
200,000 DWARF HYBRID PERPETUAL ROSES.
50,000 TEA-SCENTED ROSES.
A magnificent stock to select from. CATALOGUES on application.—WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex.

To Amateur Rose Growers and the Trade.

HYBRID PERPETUAL ROSES, CLEMENCE RAOUX and EDWARD MORREN. These are decidedly the best of 1869, and two of the most beautiful in cultivation. Strong plants, standards, 3s. 6d., dwarfs, 2s. 6d. each. Trade price, per doz or 100, on application.—HENRY BENNETT, Manor Farm Nursery, Stapleford, near Wilton, Wilts.

ROSES.—Standard, Half-Standard, and Dwarf, of all the choicest and best Show varieties, including the new kinds of 1869.

Dwarfs, 10s., 12s., and 15s. per dozen
Standards, 15s., 18s., and 21s. per dozen.
Half-Standards, 12s., 15s., and 18s. per dozen.
Special offers for large quantities.
Descriptive LISTS gratis on application.
EWING, CHILD AND CO., The Royal Norfolk Nurseries, Norwich

Standard and Dwarf Roses.

GEORGE DAVISON'S stock is very fine, and will be sold at any reasonable Price, as they must be cleared. Many Thousands of TEA ROSES on pots, 36 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied. CATALOGUES on application.
Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA. White Cross Nurseries, Hereford.

Twenty-one First and Ten Second Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and 10 Second Prizes for ROSES, exhibited at the principal Provincial Shows, about the Kingdom. It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.
The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.
Nurseries, King's Acre, near Hereford

RICHARD SMITH'S ROSE LIST, containing all the leading and most popular kinds of Roses, may be had free by post.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonyms, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

THE NEW POSTAL ARRANGEMENTS in their relation to the SAMPLE POST. The attendance of Representatives of the NURSERY and SEED TRADES is respectfully requested at a MEETING to be held at Anderton's Hotel, Fleet street, London, E.C., on WEDNESDAY, December 14, at 6 o'Clock in the Evening,—To further consider the New Arrangements of the Sample Post, in so far as they affect the transmission of Seeds by Post; and to receive a communication from the Post Office authorities relating thereto. RICHARD DEAN, Hon. Sec., *pro tem.*
Ealing, W., November 21.

The Gardeners' Chronicle

SATURDAY, DECEMBER 10, 1870.

MEETING FOR THE ENSUING WEEK.

THURSDAY, Dec. 15—Linnean .. .. 8 P.M.

THE subject of VARIATION in PLANTS is one that naturally has great interest for the cultivator, and specially for those who are ever on the look out for varieties, which, in so far as they fulfil certain desiderated conditions, are looked on as improvements. The man of science, too, is always on the alert to find any clue which shall afford a rational explanation of the causes and mode of production of these variations. Very often it is obvious that external conditions exert a special influence in their production; thus we have dwarf stunted forms in the alpine districts, or it may be varieties with thick fleshy leaves by the sea side, or dense, much branched, often spiny vegetation in desert districts. And in these cases the adaptation to particular circumstances is so marked as to be apparent to the most superficial and untrained of observers. But in other cases peculiar forms or appearances present themselves we know not how or why.

There is, then, ample room left for abundant speculation, and this speculation naturally is directed into two main channels. Thus, we may be led to infer, or, perhaps, more correctly speaking, to guess, that a certain variation is due to a reversion to a pre-existent state of things; or, on the other hand, we may suppose that the variation is, as it were, a mark of progress, a starting-point for new variation. In the case of cultivated plants, which have been crossed and re-crossed *ad infinitum*, the sudden reappearance of some ancestral character, perhaps lost or latent for a lengthened period, is a sufficiently common occurrence, and the reversion may be complete or partial. The disentanglement of the commingled elements may be complete, or, at least, apparently so—it may present itself to any extent. It was asked the other day at the meeting of the Scientific Committee of the Royal Horticultural Society, whether the same sports were reproduced at different times?—whether, for instance, a particular "sport" having been once produced, a bud producing the same characteristics was ever produced from other plants of the same lineage?—and the answer was made in the affirmative.

Theoretically, we might well imagine that as these cross breeds are composed of the same elements, the disjunction of those elements would, under like circumstances, take place in like manner, and as a matter of fact in Pelargoniums we know that this is so. The same sport, to all appearance, is reproduced. We say to all appearance, because we should expect on minute examination to find certain minor differences, just as in the case of the kaleidoscope one gets the fragments of glass arranging themselves into patterns often very closely resembling one another, but not absolutely identical. At any rate, for all practical purposes it may be said that a sport is reproduced. Many of our ornamental trees, with laciniated foliage, fastigiate or weeping habit, and so forth, are known to have originated from sports, and we frequently meet with the appearance of bud variations of the same character. But here we find a difficulty. In the case of a cross-bred Pelargonium an occasional reversion is what one might expect; but the case is different, say in the case of a Beech tree, which pushes forth on a sudden, without our knowing why, a sport with deeply divided leaves. The "sport" in this latter case can hardly be of the same nature as that of the Pelargonium. In that plant we know the parentage, and we can trace in the bud variety the parental elements separated. In the Beech, which we have taken for an illustration, there is no such clue afforded us. True, the Beech may be cross-fertilised, and the offspring hence possess commingled characteristics, but the characteristics of the bud variety are to all appearance widely different from those of the parent forms known to us.

We have to deal then with sports—and sports. What we, in our ignorance, call by the same name are probably very different things—telling, could we but read it, a different tale. Again, we have yet to learn wherein consists—apart from their primary origin—the difference between seed variations and bud variations, between sports and seedlings. Some time since, when we raised this question in our columns, there were some who affirmed their ability to distinguish between a sport and a seedling, but as they never gave satisfactory evidence of their ability, never told us in what points the characteristics of a bud variety necessarily differed from a seedling variety; and as, moreover, their opinion was directly contrary to that of the majority, we take leave to retain our belief that up to this time no one has been able to discriminate between the two.

As all evidence relating to variation in plants, of whatever nature it be, is valuable, we shall make no apology for inserting here an extract from a paper on the plants of Auckland, New Zealand, by Mr. J. BUCHANAN, and which is contained in the second volume of the "Transactions of the New Zealand Institute," a publication on which we have already had occasion to comment in terms of well-merited praise:—

"In the district under notice, frequent instances may be found of that disposition to vary, so common among New Zealand species of plants, the cause of which by some has been ascribed to the whole flora having arrived at so delicate a state of balance, that any small disturbance will produce a great change; but I think it more probable that causes of change have always been in operation while a flora existed in the island; and if the range of latitude and thermal variations which must exist over such a range be considered, it will only require the transportation of plants from localities well suited to them, and *vice versâ*, to produce some variation, as we see. As might be expected, arid winds seem to exert a stronger influence in producing plant variation than even temperature. For instance, at the South Cape and Cape Maria, Van Diemen species, such as Myoporum lætum, Coprosma acerosa, and others, even under the dry, warm winds of that latitude, may be seen dwarfed and stunted, flattened out on the ground, and hiding themselves, as it were, behind the sand hills. The same may be seen at Mount Camel, where large patches of low copse forest of Dodonæa viscosa cover the ground, whereas the same plant at Nelson, 7° further south, forms a handsome, though small tree. In these cases, where the causes of variation are not so evident and direct as the action of arid winds, it would appear that the tendency of a plant to vary is increased with the distance from its centre of maximum growth.

"As illustrative of the influence of humidity or aridity on plant variation, Sophora tetraptera may be taken as an example. Near Dunedin it may be said to have acquired its maximum of growth under the conditions of excess of cold humid winds. On the west coast of the South Island, again, under conditions of warm humid winds, it is a delicate, drooping branched shrub-tree, while on the seaward grass hills of Marlborough, under the conditions of an arid cold wind, the same plant has become dwarfed to a few inches high, covering patches of ground, and rigid enough to be walked on. Temperature here shows the least influence, as otherwise the west coast variety would have been the largest. I am inclined to the opinion, that variation in some species shows its derivative track by the young plants reverting to some older type-form. As an instance of this, Weinmannia sylvicola is often seen in the young state, dotted over the open Kauri-gum land, having only imparipinnate leaves, while the older tree assumes a ternate form on the upper branches, and in full adult trees the foliage becomes unifoliolate in the upper branches, and ternate in the lower—thus, I infer, showing the typical foliage of two species now extinct. It is even probable that the above species has passed through one form that still exists in the south, Weinmannia racemosa, which also shows the extinct form of ternate leaves, but only in the young plant and lower branches."

—— WE understand that the Nottingham committee, at a meeting held on Tuesday last, has, in concert with the representatives of the Royal Horticultural Society, arranged that the Society's GREAT SHOW at NOTTINGHAM shall be held a fortnight later than was originally contemplated. The exact date will be duly announced. We also learn that a site, close to the town and suitable for holding the exhibition, has been found, and very properly adopted. We quite agree with those who think that a Nottingham show should be held at Nottingham. Surely a town which has found accommodation for the meetings of the British Association, can find space for a Flower Show.

—— The Liverpool Botanic Garden possesses a fine young plant of the COCO DE MER, or DOUBLE COCOA-NUT, Lodoicea sechellarum, which is yet new in cultivation, and which was raised in the garden, under the care of the talented curator, Mr. TYERMAN. An account of this plant, accompanied by drawings, was submitted to the British Association at its recent meeting in that town. The plant is still attached to the singularly-formed nut, and Mr. TYERMAN states that he had some difficulty in keeping the singularly elongated basal portion of the cotyledon from penetrating too deeply into the ground; but that after it had grown to the distance of about 2 feet, the germ developed a single sheathing leaf, shortly after which two of the ordinary leaves made their appearance.

—— Mr. G. B. BUCKTON has recently recorded in the pages of our contemporary, *Nature*, the results of his examination of the LIQUID SECRETED by the FLOWERS of CORYANTHES, the sample examined having been obtained from just opened flowers produced in the collection of Mr. WILSON SAUNDERS. Though the quantity was small, amounting only to about three cubic centimètres, or 1.18 cubic inch, the examination showed the following properties:—Clear and somewhat glutinous in consistence. Possessed of a high refractive power, and a specific gravity of 1.062. Odour pleasant but faint, becoming more marked by a gentle heat. Neutral to test papers. Becoming milky by concentration on the water bath, it finally yielded a transparent gum, insoluble in alcohol. Oxalates produced no precipitate of lime, but basic lead acetate gave a curdy reaction. Concentrated hot sulphuric acid blackened the liquid. Although the taste was not acid, the mawkish flavour would render it quite unpotable. This examination, therefore, proved the liquid to be something else than pure water. 100 parts of the liquid contained—water and volatile oils 98.51, non-volatile residue 1.49.

—— We have had an opportunity of examining some samples of CELERY, intended for the meeting of the Royal Horticultural Society, advertised by error for the 16th ult., and grown by Mr. PARSONS, of Danesbury. There were four sorts, two white and two red. The best of the whites by far was Williams' Matchless White, a tall Celery (3 feet), the weight of a stick of which was 5 lb. 5 oz. It was tender and solid, and of a remarkably sweet and mild flavour; in fact, all that could be desired. For comparison came a good sample of Turner's Incomparable, a well known and favourite dwarf sort, growing about 21 inches high, and weighing 3 lb. 1 oz., which proved less tender and much more strongly flavoured than the other. The best red was named Williams' Matchless Red; it grew about 3 feet high, weighed 4 lb. 14 oz., was remarkably solid and fleshy, tender, mild in flavour, and with very little colour. Matchless Pink, sent to compare with it, has very much the same appearance, and proved rather heavier, but was stronger flavoured. These two varieties of Matchless Celery are undoubtedly good, and might be grown without risk of disappointment.

—— We find in the *Florist and Pomologist* some memoranda respecting Mr. RIVERS' SEEDLING PEACHES and NECTARINES, which may be useful to those of our readers who may be about making selections for planting. Mr. TILLERY, of Welbeck, states that he has grown and fruited them in pots, and has found the following varieties to be great acquisitions as regards earliness and flavour. They were grown principally on a glass-covered wall, but a few of the varieties were fruited on a south wall without protection of any kind. Amongst Peaches, the Early Beatrice was the earliest in ripening, being quite ripe by the middle of July; it was juicy in texture, and the flavour was good. Early Louise ripened about the end of July, but was not so juicy nor so good in flavour as

Early Beatrice. Early Rivers ripened about the same time as the Early Louise, and was very juicy, with a rich, racy flavour. Dagmar proved to be a large and finely-coloured Peach, and ripened in the second week in August. Dr. Hogg, another large and also a fine-flavoured Peach, ripened about the same time as Dagmar. Early Silver, a very large and highly-flavoured Peach, ripened in the third week in August. Alexandra Noblesse, which has quite the pale colour of the old Noblesse, as well as its juicy and rich flavour, ripened in the end of August. Lord Palmerston, a very large, pale Peach, was ripe about the middle of September, but the flavour was not first-rate. Princess of Wales, another very large Peach, pale in colour, with rosy cheeks next the sun, did not ripen before the end of September. The order of ripening of the Nectarines was as follows:—Lord Napier, pale coloured and of good flavour, ripened in the beginning of August. Rivers' New White, better flavoured than the Old White, ripened in the middle of August. Rivers' Orange, a seedling from the Pitmaston Orange, an excellent high-flavoured variety, ripened in the end of August. Stanwick Elruge has a smack of the Stanwick flavour in it, and ripened in the end of August. Victoria, the latest of Mr. Rivers' seedling Nectarines, was very rich and juicy when grown in pots, and ripened from the end of August till the middle of September. He further reports that Dr. Hogg Peach, a variety of excellent flavour, has ripened on a south wall, and was in season in the end of August. The Pine-apple Nectarine likewise ripened on the same wall, and proved excellent, the flesh yellow, like Hunt's Tawny, very rich in flavour, and the colour of the fruit nearly black next the sun.

—— Adverting to Pears, M. Decaisne says that the fruits of the wild Pear present themselves either in the form of a depressed sphere or of an ovoid, narrowed towards the stalk. The green or reddish smooth skin, passing to brown as the fruit ripens, never presents the purplish colour that some of the cultivated varieties do. The flesh, at first hard, acid, or astringent, becomes gradually soft, and as it does so, exhales a peculiar vinous perfume. Cultivation, then, in the opinion of M. Decaisne, has produced the brilliant colouring of some Pears, the singular modifications of form and size of others, as well as the varying periods of maturity. At the same time, atmospheric agencies exert an influence which is not always susceptible of explanation. Thus, after the bright hot summer of 1865, in Paris, the Pears, far from being well coloured, had a green or pale red colour, so much so that some varieties could not be recognised; hence it is inferred that coloration of Pears is independent of the local influence of solar light, an inference borne out by the circumstance that the Pears of the South of France are not more brilliantly coloured than those of the North. The culture of Pears on a large scale seems, from philological considerations, to be of comparatively recent origin. At present large quantities of Pears are grown in Normandy and despatched to Epernay, where they are used in the fabrication of champagne, so that if the vineyards of that district are destroyed the orchards of Normandy may in a measure make good the loss.

—— Drs. Parkes and Wollowicz have recently put on record an account of very numerous experiments made by them with great care as to the Effects of pure Alcohol, Brandy, and Claret, on the human body. We cannot enter into the details as to the weight, circulation, temperature, chemical analyses of the secretions, and other observations made on the subject of these experiments—a strong, healthy soldier; but we may state that the conclusions arrived at in all cases—that is, so far as this man was concerned—were that alcohol in any form was not a necessity, and, indeed, was not desirable. The most marked effect was in increasing the force of the heart's action; but as the heart in this case naturally acted strongly and quickly enough, and alcohol increased its action too much, so the alcohol, even in moderate quantities, was deemed unnecessary.

—— The Meteorology of the Week ending December 3 was more seasonable than that of the preceding week, the difference being more perceptible in the rainfall, the mean of the highest temperatures recorded at each station, and the mean daily ranges. The Maximum Temperatures of the week in England ranged from 55°.4 at Portsmouth, and 48°.4 at Salford, to 45° at Leeds, with a mean for all stations of 47°.1. In Scotland the highest temperatures ranged from 46° at Paisley to 41°.7 at Edinburgh, with a mean for the several stations of 44°. The Minimum Temperatures in England ranged from 25°.2 at Portsmouth (south coast) to 34°.1 at Bradford, with a mean for all stations of 31°.2° higher than the mean of the different stations in Scotland (the lowest recorded being 25° at Glasgow), viz., 29°.1. The Mean Temperature of the air in England was 4° below that of the preceding week, when 43°.5 was recorded. In Scotland the difference is not so large, though it amounts to 2½°. The highest mean temperature at any station in each of the two countries was 40°.6 at Norwich, and 39°.1 at Greenock, whilst the lowest recorded was 38°.2 at Portsmouth, and 36°.1 at Paisley, the same two stations at which the maximum temperature of each country was recorded. Rainfall.—The only station where any large fall took place was Hull, where a fall of 6·10ths of an inch is recorded. Of the other stations, Sheffield and Edinburgh rank next with 0.14 inch and 0.10 inch respectively. The mean fall for each station in England was 0.08 inch, and in Scotland was 0.02. (See Mr. Glaisher's Tables in our present issue.)

—— At the recent meeting of the British Association, the President, Professor Huxley, read a paper on the Relations of Penicillium, Torula and Bacterium, in which he showed the extreme probability—verging as closely upon certainty as the great difficulties attending the inquiry admitted—that the two latter forms were but stages of the first. The experiments and researches which led to this view, and which had been conducted with extreme care, had produced the conviction that the movement of the minute germs, so much alluded to by experimenters, was to be accounted for by the explanation that it was the well-known Brownian movement. Further, the presence of Bacteria was accounted for on more ordinary principles than those of spontaneous generation.

Fig. 277.

—— We are glad to give insertion to the following note, in reference to the matter of the Education of Gardeners, and hope that the example there set may be followed in other quarters. We hope shortly to be able to publish the paper referred to:—

"Royal Vineyard Nursery, Hammersmith, W.
"Nov. 28, 1870.

"I have been requested to inform you that the gardeners employed here, having previously considered the subject, have formed a Society for Mutual Improvement.

"We meet together every Wednesday evening, when a paper is read by some one of the members, on any subject connected with our profession, and which is afterwards freely discussed by the members present.

"Although the Society is yet in its infancy, I am pleased to be enabled to state that we have had some good papers read and discussions thereon, and from the ideas and experience thus elicited, much information has been gained and disseminated.

"The enclosed paper was read at our last meeting, and it is the wish of the members that it should be sent to you for publication in the *Gardeners' Chronicle*, should you deem it worthy of insertion.—I have, &c.,

"Edward McDougall, Secretary."

—— The sole Editorship of the *Gardener* is henceforth to be entrusted to Mr. David Thomson, of Drumlanrig, in whose hands the value of the publication is not likely to be diminished.

—— The following is an American recipe for producing a dye called Solferino Pink:—

"Cut a piece out of the end of a Pumpkin large enough to admit the hand, take out all the seeds and leave the strings in. Mash Pokeberries (Phytolacca decandra) into pulp, and fill the cavity of the Pumpkin with them; stir them up well with the strings, and put the worsted yarn into the mixture; then cover it up close with the piece of Pumpkin that was cut out. The next day take out the yarn and dry it in the air; when dry, put the yarn back into the Pumpkin as before, and cover it up again till next day. Repeat this process every day till the desired shade of pink is obtained; then rinse the worsted out in cold, strong vinegar, and dry it for use. It will take a week to dye the deepest shade of pink."

—— In our notice last week of Cochliostema Jacobianum, we omitted to mention that it is most deliciously perfumed. A correspondent says:—"I know of no plant having the same exquisite scent, excepting Dendrobium primulinum, which is very similar in that respect."

New Garden Plants.

Calochortus Leichtlinii, *Hook. f. Bot. Mag.* t. 5862.

Humilis, foliis graminea 4 poll. latis, longe vaginantibus, dorso rotundatis, facie concavis angustè acuminatis, glauco-viridibus, marginibus incurvis; scapo gracili foliis paulo longiore 2–3 floro; spathis foliis conformibus; floribus 2½ poll. diam. late campanulatis; sepalis ovato-lanceolatis, recurvis, dorso medio fuscis, petalis demum reflexis, latissime obovato-cuneatis, apiculatis, marginibus sæpe crosis, albis, plaga parva purpurea supra foveam nectariferam 3 circularem, basim versus extus gibbosis, intus paucè ciliatis; antheris flavis obtusis, ovario lineari-oblongo, stylo brevi, stigmatibus 3 brevibus recurvis.

The above description and figure (277) are taken from a recent number of the "Botanical Magazine," a publication of which English botanists may well be proud. The species was discovered by M. Roezl, in the Sierra Nevada of California, and was transmitted by him to M. Max Leichtlin, of Carlsruhe, after whom it has been named by Dr. Hooker. The plant flowered in June last in the Royal Gardens, Kew, and our figure is sufficient to show that Dr. Hooker's eulogium is not by any means excessive. It is a bulbous plant with linear glaucous grass-like leaves, and the flower-stalks bear 2—3 flowers, shown of the natural size in our illustration. The calyx consists of 3 lanceolate sepals, of a greenish colour streaked with red. The petals are pure white, with a purple spot at the base on the inner surface, recalling that of some of the varieties of the Althea frutex. The back of the petals is traversed in the centre by a reddish stripe along the midrib. The flowers, says Dr. Hooker, open almost in pairs at a time, and last for several days in perfection. So beautiful a plant is likely to become an established favourite.

THE ARRANGEMENT OF FLOWER SHOWS.

Before proceeding further with this matter, it may not be out of place to inquire whether some improvement may not still be made in the selection of subjects for exhibition, especially so as to secure more variety. It is admitted upon all hands that the collections of stove and greenhouse plants, Heaths, &c., exhibited in small pots, formed a great and most important improvement in the exhibitions of the past season; and the question now is, cannot those collections be with advantage extended? For miscellaneous collections the limit of the pot is too small, and if the schedule said "in pots not exceeding 18 inches in diameter," it would be a great improvement, and afford exhibitors a wider range of selection. Then there is a manifest injustice in the amount of the prize offered—say £10 for 20 plants, which will require years to grow, while £4 is given for six Caladiums, which may be produced in a few months. I should recommend that this collection be extended to

thirty or forty distinct species or varieties, extending the size of the pot to not exceeding 18 inches, and that not more than two-fifths foliage and soft-wooded plants be admitted. This would give greater variety, and, I am sure, increased interest to visitors, while at the same time it would bring back into cultivation some of those gems the loss of which we are all deploring. A collection of the kind indicated ought to receive an award of £25 at least as the 1st prize. Such a prize would bring some competition, even in the country; indeed, as one who is likely to be a competitor, and who has some of the good old things, which he is not ashamed of, I would say this prize ought to be confined to country growers, say, within a given distance of the place of exhibition. Such a prize would give the best possible fillip to local plant growing, inasmuch as it would show local growers they had something to look forward to.

What about Pelargoniums? The tricolor and variegated classes, as seen at Oxford, are evidently used up, while the single specimens of doubles were merely examples of five, six, or more plants "stodged" into one pot, and thence possess no merit, except that of sophistication. Separate prizes for such things is money thrown away, and hence, I ask, why not quash these separate classes, and give prizes for, say, 25 or 30 of the most distinct and dissimilar Pelargoniums, admitting Cape species, Show, Fancy, Zonals, Tricolors, Variegated, Nosegays, &c. It is only necessary for a man to cast his mind's eye across these classes, and he will at once perceive that he has material for a richly coloured and most diversified group, both in flower and foliage. If Show, Fancy, and the Zonal classes are to be continued, let it be so; only, especially in the latter class, ignore the "pancakes," and let it be understood that no plant which is not a pyramid a yard high above the pot, and nearly as much in diameter at the base, can be admitted to competition. If Zonals are to be shown for their bedding qualities, then let them be grown in circular pans or baskets, 30 to 40 inches in diameter, so that each variety may show its natural habit. Square boxes for such purposes are an abomination, which ought to be placed among Mr. Williams' "barbarisms" of horticulture. Passing forward, Fuchsias worth looking at have ceased to be produced, and if not better grown should be struck off the roll of competition altogether. I do not say the same of Gloxinias, for, though not premiated by the Royal Horticultural Society, many of the more recent varieties, when grown to 20 to 30 inches in diameter and a dense mass of flowers, are matchless for exhibition purposes.

Of the new classes for hardy herbaceous plants I must have a word, but not of commendation at present, and that not from any defects in the subjects, but from sameness of colour and bad cultivation. Take them all through—Antirrhinums, Delphiniums, Phloxes, Pentstemons, &c.,—and there was not an exhibit at Oxford, to which a decent cultivator would feel proud to see his name attached; but from the various groups half-a-score or a dozen plants might have been selected which would have made a respectable group, and that from the simple fact that there would have been diversity of colour as well as of contour, and therefore something worth looking at. Again I say, have collections of herbaceous plants, say 50 distinct species or varieties, and not generic groups of six plants. Such, unless marvellously well grown, could never be effective. I will not say anything of Orchids, the atoms shown now being mere caricatures upon the plants we used to see 30 years ago. They may be more rare, and some of them more difficult to cultivate, but, with a few rare exceptions, when I look back to that period I feel ashamed of the present productions. How this is I cannot tell, but that it is so every one knows full well.

And of novelties or new things, what are we to say of them? Why, just simply this, that of the scores of plants premiated not ten in a year are worth house room, and I can safely say that the last ten years, Orchids excepted, have not given us 50 stove or greenhouse plants that I would give shelter to, and scarcely a first-class exhibition plant at all, except in the foliage sections. If these certificates had a money value, as they used to have, I have no doubt they would be much more sparingly distributed, and it would be well if it were so.

I have thus indicated some changes which I believe might be made with advantage, and would tend very materially to improve the exhibitions, and at the same time to save prize money. But I have no hope of any such changes being made. If what I have been told is in any way correct, the Council are determined to traverse "the old rut," and the same dreary waste of canvas is to be reproduced. We are told that 4 acres of tent room is required at Nottingham, which is full 3 acres more than is likely to be filled in a respectable manner. Mediocrity should not be the *forte* of the Royal Horticultural Society, but, on the contrary, everything that tends that way should be refused, and the *crême de la crême* of the country only be admitted. In fact the time has arrived when the Society, if true to itself and its mission, should receive the finest productions of the country only, and ignore everything of inferior quality. The time fixed for the show, June 14 to 17 inclusive, could not be worse. Notts has its specialities, and one of them is Roses, which taken at the proper time could scarcely be excelled by any county in England. But the time is a full fortnight too early, and hence our artizans who have been purchasing the new Roses with the hope of being able to exhibit them before the Royal Horticultural Society, will be disappointed. We must not be allowed to help ourselves, but other people must be brought here to take away the prizes. In fact, so far the Society has done everything in its power to disgust the town, and insure a failure. The problem of how not to do it is being solved with a vengeance. The Council was never celebrated for administrative ability, and truly it is getting worse and worse. *W. P. Ayres, Nov.* 21. [Some of the foregoing arrangements have since been modified. But how about the Nottingham committee? Has all this been done against its advice? or is the Society only following out the recommendations of those who are supposed to know the whole bearings of the question? EDS.]

MAIZE.

[The following paper, forwarded to Dr. Masters for presentation to the Royal Horticultural Society, was read at the general meeting on the 7th inst., in illustration of the remarkable collection exhibited by our correspondent.]

THE collection of Maize exhibited has been formed from various sources, but mainly from a selection from the splendid varieties shown in the American section at the Paris Exhibition of 1867. As this was an unique occasion, and specimens from every known variety of a country having such a wide range of climate, and one where the plant is so generally cultivated, were present, this would, of itself, commend the collection to European notice. Since that time seeds from other parts of the world have been procured, and an exchange effected with Messrs. Vilmorin of Paris, who have devoted considerable attention to the culture of Maize, the use of which is becoming very popular in France.

An experience of three very dissimilar seasons has been gained since 1867. A certain number of varieties have been discarded, either as too small, too coarse, or as ripening at too late a period of the season to make them generally serviceable. It was to be expected that the sorts which ripened the earliest would become most in demand, but there were other conditions to be fulfilled before Maize could be able to hold its ground against so many new and known vegetables. It was not so much a variety which should serve for cattle, or poultry, or even for grinding into flour, which was required, for such are now commonly imported more cheaply—at least so it seems at present—than they can be grown in our climate; but it was sought to popularise the manner of eating Maize so common in the States of America, and in other regions of the world (including even Southern Europe), as "green corn," *i. e.*, in a semi-ripened condition, when the grains had acquired the consistency and size of good Marrowfat Peas. The addition of a table vegetable of this delicious and nutritious nature—the food of millions of the human race—and yet, for want of experience of the sorts adapted to our climate, so strangely unappreciated here, seemed of no inconsiderable importance, the more so as it ripened in the late autumn, reproducing then the lost flavours of the early Pea and of the Asparagus. For this the ordinary yellow Maize is not suited, so that its culture becomes of little value. But the collection here exhibited claims not only to be the most complete which has probably ever been presented in Europe, but it also shows varieties which greatly excel the Maize known in this country and in France in size and in flavour, while they still fulfil the special conditions required in earliness. More than this, these ears are grown from seeds acclimated by three varied seasons in the Channel Islands, and are even immediately sprung from seeds of plants growing in the damp and sunless season of 1869, which plants were prostrated to the earth when at their fullest and most critical season of growth, on September 12, under the weight of a hurricane of 55 lb. pressure per square foot. The perfectly ripened specimens exhibited attest the vitality of Maize when treated with common care. Remarks on the different kinds will best be made as each is examined. A few observations must now be made on the

Uses of Maize.—It would be without interest here to speak of the numerous purposes to which this most valuable plant is put, when in a dried state, in tropical regions. The drought of past seasons shows the need of adding to our resources, if possible, whatever green fodder can be grown. There are certain kinds of Maize better adapted by their growth than others to fulfil this object, being hardy and rapid in increase, and at the same time abounding in saccharine juices, which animals will devour greedily. Even the stalks when hard can be utilised by slicing them, so that there is really no waste. Mention having been made of these varieties in the French scientific journals, a pressing request was sent here for a large quantity of seed for Brittany, there to be cut down and used as forage during the drought.

Culture.—The seeds should be sown in common raisin-boxes during April—early in the month in the south, and later in the north of England. In the Channel Islands they were sown in boxes very early in April, and planted out three weeks after. These boxes should be placed in a cool vinery, orchard-house, or pit, and the plants hardened off before planting. This would be best in May, earlier or later according to the season or locality, which a short experience would decide. The risk of the young plants is common to other vegetables—that of suffering from spring frosts; a little protection would obviate all this. But this season Mr. Dancer, of Chiswick, we are told, sowed a quantity of Maize in the open ground in March. It was cut down by the frost, sprang up again from the root, and yielded a heavy crop.

By the end of July our Maize plants were already 7 feet high, and were then secured from high winds by stout stakes at intervals, and thin cords stretched between them, to which the rows were easily tied. Not being able to give waterings, which materially aids the growth of a plant which luxuriates in the rich alluvial valleys of tropical countries, we had planted in shallow trenches filled with manure, and 3 inches of soil above it. These trenches retained the casual showers, and were gradually earthed in, as for Celery. The manure kept the roots perfectly fresh, and two slight waterings of liquid manure were given during the very dry summer. This attention is not greater than is always given to Peas and other vegetables. Failures are traceable to a neglect either of some, or even of all, of these means.

It is not quite so easy to ascertain the exact time to take the ears as "green corn" for the table. A day or two makes considerable change in their consistency. When as large and as hard as Marrowfat Peas, from 20 to 30 minutes' boiling is enough. Serve with fresh butter to spread over them, and they are thus ready. All the uses made of Peas for soups and stews are common to green Maize. The ears can also be roasted before the fire. When dry, these fine white varieties would produce very pure flour for puddings, &c.

Maize, in our climate, requires five months to mature the seeds for sowing, being one month more than in California. Some sorts ripened here in August. The stalks reached to 10 feet, a height only excelled in rich tropical soils. Where several sprang from the same root, the ears ripened soonest. Experiments were made in hybridising, with some results, and also in mutilating the male panicle of flowers with a view to increase the size of the ear. After several generations of mutilated plants had been experimented upon, it was found that the ears were increased sensibly in size. The produce of seed was at the rate of 95 bushels the acre, gathered as it was, not from selected plants, but from numerous varieties, some being too small.

Remarks on the Varieties.—Nos. 1, 2, 3, and 4 are specimens of the best pure white Maize from Georgia. This is the most delicate for table use; ripened this season at the end of September, and is an early sort, and the most valuable in every respect. No. 4 of these has spiky grains, and is even whiter than the others.

No. 5. King Philip, from M. Vilmorin; considered a good kind in France.

Nos. 6, 7, and 8 are "Flint Corn," very much like that grown near Bordeaux, but superior. No. 6 of these is a free-growing and valuable table Maize.

Nos. 9 and 10 are "Pink Corn." The first of these is a remarkably fine specimen, and this variety is earlier than the pure white, is delicate in flavour, and more valuable than No. 10.

No. 11 is the Giant Red, the largest of all, excellent, and a mid-season sort.

No. 12 differs from this in having smooth grains.

No. 13. Jaune Gros, from Vilmorin. This is much grown in the Touraine, and is the cheapest of all, but rather too coarse.

No. 14. A striped yellow originally from Pau, and raised from seed from plants grown in Yorkshire. A hardy and valuable kind.

No. 15. True "Yellow Pop Corn," from America. A very excellent kind, prolific and early, will be very useful for forage also.

No. 16. Jaune d'Auxonne, early, and good for grinding purposes.

No. 17. Improved Common Yellow, an excellent kind, raised here, and larger than the common one.

No. 18. A small, late, yellow Maize.

No. 19. A handsome and heavy spotted Maize, raised here this season in some quantity.

Nos. 20, 21, 22, 23, 24, and 25, are hybrids of various shades, easy to retain pure. An opinion as to the best would be valuable.

No. 26. A short corn; spiky.

No. 27. A new African Maize from Italy, very hardy and prolific, likely to be very useful.

No. 28. Handsome hybrid of this year—mid-season.

No. 29. Darkest ear ever raised here.

No. 30. "Blue Corn;" very difficult to ripen. One, more handsome, has disappeared from culture here; another has magnificent gold-striped leaves, with dark, hirsute stem,—equals the Japanese Variegated Maize for gardens, and is 9 feet high. Of this valuable kind but only a few seeds exist here, and no ear.

No. 31. Early White "Pop Corn." Dwarf, and curious, not being so profitable for a sweet meal as No. 15.

No. 32. Boston Ten-weeks' Maize. It excels the French Ten-weeks somewhat, but both are too small.

No. 33. Small-seeded red. Curious, and difficult to ripen.

No. 34. A similar variety; generally of the present size.

No. 35. Large pale red.

It remains only to add, that seed for sowing can be obtained in gardens in warmer districts, and always from such places as the Channel Islands ; while Maize, to be eaten green in the autumn, can be grown anywhere with common attention. The same may be said of its use for forage. *Th. C. Bréhaut, Richmond House, Guernsey, Dec.* 1.

ON IMPERFECT HYBRIDITY.

Among the same batch of seedlings from which I obtained × Veronica Andersoni (V. salicifolia—syn. V. Lindleyana, with V. speciosa) came one which, to all appearance, was a reproduction of the male parent pure and simple. And, deeming it nothing else, I presented it to a friend, V. speciosa being then comparatively a new plant ; and he, when he flowered it, came to tell me that it had come a very different thing when in bloom from the true V. speciosa, having much longer flower-spikes, and being of a much lighter colour than those in that species, that is, of a light crimson instead of a dark purple as in the V. speciosa.

A plant of this hybrid has since afforded a further illustration of a somewhat similar result.

Having obtained a suffruticose species of Veronica, under the name of × V. Daubenyana, with light coloured flowers streaked with pink lines, in the way of V. fruticolosa, I crossed it on the last-mentioned hybrid, which became the seed-bearer. From this cross I succeeded in raising only two plants, and one of these I believe I have lost. But they seemed both alike in foliage and habit, but both so like the hybrid seed-bearer that I felt doubtful whether the cross had taken. I cannot speak with confidence as to their being identically alike, but only of their general aspect. The plant I still possess flowered for the first time this past season, and the singularity of its bloom drew my attention to it more particularly than before. It had, like the seed-bearer, thick fleshy oblong leaves, but somewhat smaller and more closely set on the stem ; but instead of being, like it, simply crassiform [?], they were obliquely decussate, therein slightly approaching the male parent, a creeping alpine species, whose prostrate stems show still more the same deflected arrangement of the leaves. It was only on a close examination of the parts, however, that any resemblance to the male, × V. Daubenyana, could be observed. In fact, I looked upon it as another of the many failures I had had in my attempts to effect the inverse cross on it. When it at last bloomed my hopes of having effected a partial cross, if I may use such a term, were strengthened. Like × V. Daubenyana, which has a spikelet with a few blooms, it came even short of it, having had only two flowers, and these much lighter in colour, and so nearer to the male than the hybrid female parent. But whether this is its true permanent character I dare not assert, as it bore no more than this one spikelet of two flowers.

In the first of the above instances the hybrid seemed, till it flowered, a repetition of the male parent ; in the second it seemed, till it bloomed, a repetition of the female parent, with such slight differences in the arrangement and slightly smaller size of the foliage as might occur in a purely normal seedling. In fact, seldom have I ever seen two hybrids with so much of one parent and so little of the other.

I have no doubt something of the same kind occurs among Rhododendrons ; but I may only instance two cases—one where I crossed R. Edgworthii on R. caucasicum ; the seedlings, always few when the cross is a severe one (by which term I mean such instances as where the species do not affect each other kindly), were only two in number ; and though now about ten years old, they show no indications of setting for flower. But while they have both the glabrous foliage of the seed-bearer, and even the ochreous tint underneath, they differ in having oblong instead of its lanceolate leaves. But, though in these particulars they depart from the normal state of R. caucasicum, they have not one feature of R. Edgworthii, the male parent. The other case is where I crossed the same, Rhododendron Edgworthii on R. Jenkinsii. Here the seedlings, again only two in number, were all of the mother, except by having again the oblong foliage, in which, be it observed, it is a departure from both parents, both having lanceolate leaves—those of R. Jenkinsii being acutely so, but the hybrid in these latter cases is budded for flower, but the flowers of both parents are white, and both sweet-scented, and both among the largest of the genus ; the scents, texture, and forms of the flowers are different, so that I look for surer tests in the coming flowers—though these may be perplexing, too—than any that yet appears. It is proper to observe that I take the utmost precaution, in all my crossing operations, to prevent miscarriage in any possible way.

While treating of my difficulties with the Rhododendron Edgworthii, one of the most peculiarly constituted, as it is one of the most peculiarly featured, of all the Rhododendron tribe,—having its rugose leaves densely pubescent on the upper, while it is perfectly shaggy with tomentum on the under side, every stem being clothed with the same tomentum,—I have another most singular peculiarity to note in regard to it, viz., that while it will cross other species, it will take on a cross from none ; that is to say, while it has been repeatedly made the male, it has never with me, though I have tried it often, nor with any one else that I have heard of, submitted to become the female parent. I have crossed it repeatedly on Rhododendron ciliatum, one of the minor forms, too, of Dr. Hooker's Himalayan species. It has been crossed on R. formosum in this neighbourhood, I believe in the Stanwell Nursery, but I never could get it to take on any cross whatever. Rhododendron Nuttallii behaved with me in the same manner ; it would cross but not be crossed. But I did not persevere with it as I did with R. Edgworthii. Now, I do not assert absolutely that Rhododendron Edgworthii, in the numerous tribe of which it is a member, may not be hybridised with some other of its kindred, but I could never get it to reciprocate a cross.

And this remarkable circumstance of non-reciprocity has perplexed and defied me in innumerable instances throughout my long experience in these pursuits. It occurs to me that the pollen of larger forms might be of larger grains, and so might not pass through the necessarily small ducts of the styles of smaller species. Yet Rhododendron ciliatum, a tiny species, of 1 foot high, was crossed freely by R. Edgworthii, as I have just noticed—a species 6 feet high. I even crossed this latter species on a pure Indian Azalea, though, by pulling the seed-pod before it was ripe, I raised no seeds of this latter cross.

In these hasty observations I merely wish to direct attention to such instances of imperfect hybridity in certain species, and the non-reciprocity in others, as I have noticed, in the hope of perhaps drawing out from others their experience on such matters, which I humbly think are not unworthy the consideration of the Scientific Committee. *J. Anderson-Henry.* [A paper read at the Scientific Committee on Wednesday last.]

VINE GROWING AT WORTLEY.

For the last few years new hothouses have gradually taken the places of the old ones at Wortley Hall. These consist of vineries, Peach-houses, Fig-houses, Pine-stoves, forcing-pits, &c. When Mr. Simpson sets about making any alterations, either in the erection of a house or in the planting of it, he appears to throw his whole energy into the matter, so as to have a return of a given result, and that, if possible, of the best description. A little more than twelve months ago, when I called upon Mr. Simpson, his early Vines had started well into growth. The Vines in question were old ones, and arrangements were being made to replant the house the following season with a fresh lot of Vines. The soil for the new borders was stacked away in one of the back sheds. It was of the usual description, consisting chiefly of good sound loam and fresh cow manure, with an admixture of half-inch bones and sand. It was frequently turned, and allowed to remain in the shed until required for making the borders in the following spring. I again called at Wortley at the end of the following March, when I found the Grapes black and ready for cutting, with a fair crop of useful fruit.

After stating the above, I must now enter on the novel part of my subject. Having grown young Vines myself by the thousand, in one of our largest provincial nurseries, I must admit that I was surprised at the success of the system adopted by Mr. Simpson.

It may seem almost incredible, when I state that Vines in one row, and which reach to the top of this house, were never in a pot, nor in anything in the shape of a pot or box, from the eye until they were planted out for good in the prepared border ; but such is the fact, and the whole roof is now covered with well-ripened wood, the thickness of one's finger.

The system adopted in growing the Vine eyes I shall call the Wortley system. It is nothing more nor less than as follows :—An old door is hoisted up to the roof of a vinery at work to grow the young Vines on. Plunging the Vine eyes in bottom-heat is a thing of the past according to the Wortley system. The door being placed well up to the light, and strongly supported, pieces of turf are laid upon it, about 9 inches square, and about 10 inches or a foot apart. This may be otherwise arranged according to circumstances. In the centre of these turves a single Vine eye is placed. The spaces between them are filled with nice rich soil for the roots or spongioles to ramify in it after protruding through the turf. Having plenty of light and plenty of moisture, one can well understand how well the sod system succeeds. I think the Wortley system an admirable one for wholesale growers of the Vine, owing to its simplicity and its thorough efficiency. When the sods are full of porcupine quill roots, and these are ramifying in all directions in the rich soil, we need have no annoyance from tap-roots. As I have not the dates when the Grapes were all cut, I will suppose that the Vines were planted out in the end of April or beginning of May. In preparing the house for the Vines, a heap of the prepared soil was raised along the centre, about 3 feet above the level of the floor, the Vines being then carefully brought down from their aërial position and planted along the ridge of the bed of prepared soil ; and I am sure that no other system could answer the purpose better. There they may now be seen, and, as I said before, the whole roof is completely filled with well-ripened wood.

The principal object for planting this batch of Vines along the centre of the house is to keep up the supply of Grapes until the young Vines are well established in the outside border. When this is the case, they will be cut away as the stationary Vines progress. Along the front of this house was a magnificent lot in pots, and, like the planted-out ones, all with well-developed eyes, that might be trusted to carry any amount of Grapes. They were put into the fruiting pots at the same time as the others were planted out in the border, and I am sure it is a question which is the best. The canes of both lots run from about 10 to 14 feet each, and as to fruiting, that is a matter safely to be calculated upon ; for well-ripened young Vines, either in pots or planted out, seldom fail to show plenty of bunches ; and if discretion is not used by the cultivator in thinning the bunches in the early stages of fruitfulness, the Vines themselves soon begin to look stinted for a time, until they renew their vigour by extension of root and branch, and thus establish a fresh constitution with a renovated state of fruitfulness. *J. Miller, Worksop Manor.*

Home Correspondence.

Covering-up Fig Trees.—Mr. William Taylor's remarks concerning the culture of Figs in the open air (see p. 1605) are worthy of our special attention. I for one can testify to the correctness of his statements, in so far as the method enhances the early fruit-producing capabilities of the plants. There are facts, however, connected with the subject which require to be cleared up before we can venture freely on the newer system. My experience with autumn pruning only dates back to the autumn of 1868 ; and, though a full measure of success was the result, I am afraid that it was due more to the fine summers and mild winters which supervened, than to any immunity from injury by frosts which that system of pruning produces. Will Mr. Taylor kindly inform me, whether he practised this after a wet and more cloudy summer than either of those mentioned ?—and if so, and a sharp winter followed, whether the trees then uncovered came forth as successfully in the spring ? Further, I should like to know in what county he reaps such favourable results ; and whether he lives near the sea, more especially on the south coast. The saline air, it is well known, acts wonderfully in favour of outdoor Fig culture, even when grown as standards. As it is, a sharp winter not only kills the minute embryo fruit-buds, but also the wood ; hence we must protect the former to secure either. *William Earley, Ilford, E.*

Storing Fruit.—Various opinions are afloat as to the best method of keeping hardy fruit. Some insist that it ought to be kept in dark cellars, and the air excluded from it as much as possible, while others almost intimate that free ventilation, if not almost open exposure, is necessary. I have tried both plans, and must say that my efforts at keeping fruit in cellars has, on the whole, been unsatisfactory. About the fruit-room little that is fresh can be said, the fact being, that a great many gardeners are confined to a given room, the conditions of which are not always satisfactory. This is most unfortunate when the gardener is made entirely responsible, and when a long supply is expected. In former days gentlemen did not think it at all necessary to fit up shelves for fruit, but at the present time we all agree that a good fruit-room is amongst the most essential things in a garden, and most gardeners experience much pleasure in showing their brother chips over their fruit-rooms. A fruit-room, to be a good one, ought not to stand in an open exposed place, but against a good, dry, north wall. Its north side should be furnished with windows, which can be opened at any time ; and ventilation should be allowed for at the highest part of the room. Of course, for neatness, the walls ought to be underdrawn and plastered, but this is not so essential as thorough ventilation, by which means all noxious gases are allowed to escape us they are generated. It is well known that certain fruits give off exhalations different from others—Williams' Bon Chrétien Pear, for instance, is perhaps the most offensive Fear that we have, when any quantity of them get mellow together ; and, assuredly, the strong odour from them cannot do otherwise than hasten all other fruit to destruction, where the ventilation is defective. My object in writing this, is not to advance any new theory on keeping fruits, but to draw attention to a very neat and compact fruit cabinet, designed by my employer, John Walker, Esq. First, I will say that I can stow away in the cabinet about 90 stones of Apples or Pears, without heaping one upon another—and, in fact, scarcely touching each other. The cabinet is 8 feet 2 inches long, 3 feet wide, and 5 feet 6 inches high. It is divided into two compartments, each having two doors, and ten sliding trays, 5 inches apart ; each tray is made to hold 12 rows of fruit, but the best feature is, that the trays and doors are so contrived that when the trays are drawn out they rest upon the open doors ; by this means the fruit can be easily looked over, and afterwards be closed up in a very small space of time. There is a frame fixed under the cabinet to keep the doors in their proper position when open. The cabinet is very light and airy, and is made almost entirely of zinc, and it can be put up or taken down in a very short time ; in fact, it is the most complete thing I have ever seen for the purpose. It was made by a tradesman in Thirsk, who, I dare say, would be glad to furnish one to any lady or gentleman in want of a really good useful fruit-room. *Jos. C. Nicholson, Mount St. John, Thirsk.*

The Arched Trellis at Welbeck.—In reply to your correspondent, J. H. Johnson, I may say that the fruit trees trained on this trellis have done remarkably well since they have been planted, but perhaps the warm, dry summers of the last three years have had something to do with their fruitfulness. The soil in the kitchen garden here is of a very stiff and adhesive nature, with a subsoil of a strong red clay, so that in dry seasons fruit trees and vegetables do not suffer from the lack of moisture. Some of the best varieties of dessert Pears are planted on this trellis, on the south aspect, such as Marie Louise, Beurré Bosc, Gansel's Bergamot, Glou Morceau, Louis Bonne, Brown Beurré, Beurré Diel, and Superfin, and the fruit in general have been better coloured and flavoured than any grown on the walls. Specimens of the Marie Louise especially were of the deep russetty colour that this variety shows when in perfection. It is singular, however, that a tree of Marie Louise has this year produced on a north wall the largest and most russetty-looking fruit that I have gathered, but they were not so good flavoured as those grown on the trellis. On the north side of the trellis Apples of the best dessert kinds have likewise been planted, and they have produced crops of fine high coloured fruit. The fruit of Cox's Orange Pippin, Ribston Pippin, Margil, Cox's Pomona, Golden Reinette, Rosemary Russet, Sykehouse Russet, Court-pendu Plat, and the Melon Apple were especially fine, as regards size, colour, and flavour. Some single and double cordons of the Calville Blanc and other varieties of Apples, planted on the lowest line of wires, have likewise borne some good crops for the last three years. It was very consolatory to see, after the strong equinoctial gales in September, all the fruit trees on the trellis safe, whilst those exposed on standards in the borders and orchard were denuded of their fruit in great quantities. I intend planting some varieties of Apricots on the trellis opposite each other, so that when in flower or young fruit they can be protected all over with one covering in severe weather, and I expect the fruit will be better flavoured than those on the walls. *William Tillery.*

Horticultural Writers.—I think Mr. Fish (p. 1570) is hardly justified in assuming, upon his own experience, that horticultural writers are generally unpopular, either with the craft or the classes above them. Indeed, there is every evidence to the contrary. Taking the *Gardeners' Chronicle* as representing the cream of horticultural talent, I may say without hesitation that it is read by all classes, looked up to, and its teachings followed out when they are founded upon sound theory and practice; and the same may be said of other journals. In fact, some writers' names are almost a guarantee of circulation in some cases. When I was a journeyman in Scotland, a good few years ago, it was given out by a certain horticultural periodical that a well-known practical gardener would furnish a series of articles on kitchen gardening. On the strength of this promise every young man in the bothy in which I lived ordered the journal in question, and in many other bothies besides, of which I had a personal knowledge. Now what does this indicate? Simply this: that horticultural writers, like writers on other subjects, will command readers and respectful attention if it is known that their teachings faithfully reflect their practice; and that, as the late Dr. Lindley said, they can handle the spade as well as the pen: and surely it is not to be wondered at that it is only such men who are trusted as teachers. *J. Simpson, Worthy.*

Earthing-up Vegetables.—I feel obliged by the remarks of Mr. W. Earley, "A. D.," and "W. P. R.," in reply to my query as to the propriety of moulding-up plants, but they have all overlooked one part of it, viz., if not moulded-up, ought the vegetables, &c., to be planted or sown in trenches, and earthed-up gradually to the level of the ground? I would like to have their advice as to this. *Amateur.*

Orchid Cultivation.—A few weeks since, to occupy a leisure half hour at our exchange, I asked for the file of the *Field* newspaper, and there, I think under the date of October 8, found a letter from a Mr. J. J. Cooper, describing the annoyance he had experienced from the leeches while travelling in Upper Assam. This reminded me that years since, when reading up Sikkim Rhododendron cultivation, I had read a similar account in Dr. Hooker's Himalayan Journals; therefore I ordered a copy, and now feel quite ashamed that I have so long neglected such a complete description of the countries where so many of our Orchids come from. Upon the subject of the influence of sunlight, he says, in vol. ii., at p. 105:—

"The Dorjiling ridge varies in height from 6500 to 7500 feet above the level of the sea, 8000 feet being the elevation at which the mean temperature most nearly coincides with that of London, viz., 50°."

Again, at pp. 149 to 152, he gives a long and interesting comparison between the climates of Central and Eastern Sikkim, and Western Sikkim.

"In the former Peaches never ripen; the Apple seldom, and the Pear not at all. Vines, Figs, Pomegranates, Plums, Apricots, &c., will not succeed, even as trees. A singular and almost total absence of the direct rays of the sun during the ripening season is the cause of this dearth of fruit. Hence it appears that, though some English fruits will turn the winter solstice of Bengal (November to May) into summer, and then flower and fruit, neither these nor others will thrive in the summer of 7000 feet on the Sikkim Himalaya (though its temperature so nearly approaches that of England), on account of its rains and fogs. In the western (Simla, &c.) the winters are colder than in Sikkim, the summers warmer and less humid. The rainy season is shorter, and the sun shines so much more frequently between the heavy showers, that the Apple and other fruits are brought to a much better state. The rain gauge may show as great a fall here, but this is no measure of the humidity of the atmosphere, and less so of the amount of the sun's direct light and heat, intercepted by the aqueous vapour, for that instrument takes no account of the quantity of moisture suspended in the air, nor of the depositions from fogs, which are far more fatal to the perfecting of fruits than the heaviest brief showers. I have seen the Pine-apple plant, but I never met with a good fruit on it."

I put this last line in here that my remarks might follow. I have an idea the Pine plant is a sort of type of climate. Contrast it with the now received opinion that East Indian Orchids want more heat than any other; can they want more than a tropical Pine-apple? Animal life also shows clearly what the climate is at times, and Dr. Hooker complains very much of the leeches. Where else do we read of them in this way, dropping from the leaves of the trees upon the traveller—in Sir Emmerson Tennant's "History of Ceylon?" And A. S. Bickmore says he was just as much bled in Sumatra, in his "Malayan Archipelago." So we must class Phalænopsids with leeches, and Sikkim Orchids and Nepenthes. Then I was not so far wrong when I placed my Dendrobium Falconerii with them. Some will say, with all of them? Yes, all of them, for we have had a small leech on the Orchids now several years; where it came from we do not know. Where does greenfly come from? If any one should doubt this, let him turn to p. 60, vol. ii., and he will find Dr. Hooker distinctly says:—

"Sikkim is, geographically, peculiarly well situated for investigations of this kind. The Lachen Valley at this spot is nearly equi-distant from the tropical forests of the Terai and the sterile mountains of Tibet, for which reason representatives both of the dry Asiatic and Siberian, and the humid Malayan, floras, meet here."

Again, on page 61:—

"Space is also found for intercalation of types of a Malayan flora." "The Malayan by Magnolias, Vacciniums, Rhodendrons, and many genera of Orchids."

But did I boast that I had found out how to grow D. Falconerii? I hope not. The idea I had in my mind on sitting down was to show how little precise information is contained in the few words found in our Orchid catalogues. Comes from Assam: question, Siberian or Malayan? Thus it is quite as important to know the elevation at which Orchids have been found in Assam and Sikkim as it is in the Andes of Central America. If I have grown D. Falconeri well in one climate I have also grown others well in the more airy and sunnier climate described in my last letter, as being suited to Dendrobium cultivation. Every day I become more and more confirmed in my opinion that the house most suitable for an *omnium gatherum* of Orchids is the key to "Orchid growing made easy,"—a Pine-house. And I strongly advise those who have more houses to get rid of that old idea that East Indian Orchids must be grown in an East Indian house, Cattleyas and Lælias in a Mexican house, and Odontoglossums in an Odontoglossum house. Mr. Skinner is often spoken of as an advocate of cool treatment, yet he says, at p. 44, in vol. xxvi. of the "Botanical Magazine," that Cattleya Skinneri grows in the hot, damp coasts, giving the temperature as 80° to 85°, sometimes 95° during the day; and advises that it should also have the advantage of sunlight in addition. This completely agrees with my experience of this, and one or two other Cattleyas, though I am not now prepared to give a list of them; therefore I will return to Dendrobiums in particular, by giving a quotation from Mr. Fortune's lecture on the Kumquat before the Royal Horticultural Society, and will confine myself to three types; but the whole lecture is very interesting, and would bear reprinting:—

1. "The Tree Pæonia comes from the north of China, where it has cold winters. If it is transported to the south, the warm winters do not suit it, and it dwindles away and dies."

2. "Where the Kumquat is found in the greatest perfection, the common Orange will not stand the winter; whereas the Kumquat, when cultivated in the south of China, does not succeed, but the Orange grows in the greatest perfection,—the reason being, that the northern summers are frequently hotter than the southern, and range from 80° to 100° Fahr.; in winter it bears with impunity 10° to 15° of frost."

3. "The Mangosteen, which will only succeed in a climate such as the Eastern Archipelago, where it is always summer, and where the rain falls in heavy showers almost every day throughout the year."

Could we not find these three types in almost every class of Orchids? I gave you one list of Dendrobiums in my last letter, as wanting plenty of sun and air, but there is a second race, like D. formosum, eburneum, Lowii, and infundibulum, that I am not prepared to advise should be placed in the sun "till they look like dried sticks," as none of those I have named seem to like losing their leaves till they have flowered. The third list finds such as Falconeri, luteolum, lasioglossum, M'Carthiæ, and perhaps Devonianum, Cambridgeanum, and bigibbum; the first four and the last certainly like to flower from the green wood, and none of them can be kept too damp and warm. *G. H.*

Flowers versus Foliage.—Mr. Ayres, in his article on the arrangement of flower shows, at p. 1503, which I am sure will be read with much interest by all old as well as rising exhibitors, seems to infer from his remarks that Mr. B. S. Williams, in his recent work on "Ornamental Foliage Plants," would ignore the splendid flowering plants which he (Mr. Ayres) so well champions. He has evidently only read one portion of the work, and not the introduction, in which (at p. 2) Mr. Williams says:—

"Let us pause, however, and state distinctly that, great as our love may be for ornamental-leaved plants, we do not wish to exalt them to the annihilation of ornamental foliage plants, for although the beautiful leaved plants are exceedingly ornamental and gay when grouped together by themselves, we are fully persuaded that a judicious selection from both classes, according to the space at disposal, is the surest means of producing a gay and cheerful effect throughout the entire year."

If Mr. Ayres had read these lines he would not have imputed to Mr. Williams opinions which, from his standing as an "old exhibitor" (especially of flowering plants), he would feel were not in unison with his own convictions. *William Heale.*

Exhibiting Pears.—Being an occasional exhibitor of Pears at some of the London shows, I will endeavour to enlighten "Country Jan" (p. 1539) by briefly stating my experience as to what are the merits which the judges recognise. I have found that size and quality are the principal points; and as it has been stated in the regulations of each schedule of the Royal Horticultural Society for several years past, "All fruit sent must be ripe, and in such condition that their qualities may be fairly reported on," I have always been careful to send them ripe and fit for table. I first sent to the Royal Horticultural Society, in the autumn of 1867, a dish of Doyenne du Comice, which was awarded the 1st prize in a class for any variety, 27 dishes competing against it. On Nov. 17, 1868, I again sent Doyenne du Comice, and Winter Nelis, some of the latter weighing upwards of half-a-pound each, and was again awarded the 1st prize for the former, 21 dishes being shown in competition against it (this being the third successive year in which this fine variety came in 1st in classes for any sort). A Special Certificate was given to the Winter Nelis, as I could not take two prizes in the same class. On December 21, 1869, I competed in class 1 for the best winter dessert of Apples and Pears, 3 dishes of each, and was again placed 1st, and also for a similar collection on February 16 last. On the 2d of last month I sent 6 dishes of Pears, viz., Beurré Bachelier, Doyenne du Comice, Beurré d'Aremberg, Knight's Monarch, Van Mons Léon le Clerc, and Winter Nelis (the first four were from pyramids), all very fine and ripe—too ripe, as it proved, for the journey. They were sent off on the evening of the 1st, and on the 4th I received the following from a nurseryman to whom I had written to ascertain if the tree which produced Knight's Monarch (it having been supplied by him) was true to name, as, on account of their size, it was doubted by some in this neighbourhood. He wrote:—"Your Pears had been extra fine, but were all spoilt by the journey; Knight's Monarch quite correct, extra fine." From the Royal Horticultural Society I was officially informed that "they would have been awarded 1st prize, they were far superior in every way, but all of them were so terribly bruised that the judges could not admit them." I hope the above will be sufficient to show "Country Jan" what are likely to win or lose at a London show. He must not, however, suppose that we have only a few on a tree; our pyramids are now quite a network of string, the branches having been tied for support to the main stem, and several branches even then broke off with their weight of fruit, especially Conseiller de la Cour, Bellissime d'Hiver, and Catillac; Knight's Monarch, near the top of the tree, for about 3 feet, was as thick all round the main stem as a trace of Onions; Winter Nelis bears so thickly as to prevent growth, although the tree is only 12 years old. I append the weight of some of the Pears I have exhibited, viz.:—Doyenne du Comice, 1 lb. 4 oz., shown at South Kensington October 5, having prematurely fallen from the tree; Beurré Bachelier, 1 lb. 8 oz.; Beurré Clairgeau, 1 lb. 4 oz.; Beurré Easter, 1 lb. 5 oz.; Beurré Rance, 13 oz.; Glou Morceau, 15 oz.; Van Mons Léon le Clerc, 14 oz.; Chaumontel, 14 oz.; Winter Nelis, 8½ oz. *John Garland, Gr. to Sir T. D. Acland, Bart., Killerton, Exeter.*

Grapes Shanking.—The discussion on the shanking of Grapes, both at Bishop Stortford and elsewhere, has, it appears to me, cleared up much of the mystery connected with the subject. It has always been known that the proximate cause of shanking is a deficient supply of nourishment to the fruit, and it is now evident that the causes of this proximate cause may be, not only many, but opposite. Pearson, in his treatise "On Vine Culture under Glass," says:—

"It [the deficiency of nourishment] may arise from too many bunches being left on the Vine, or the roots being

in an unhealthy state. If the border be wet, or the roots too deep, from the constant digging and cropp ingof the border, it will cause the fruit to shank. Over-stopping, by preventing the formation of healthy foliage in sufficient abundance, is a frequent cause. When a Vine is allowed to make useless wood, which is afterwards cut out while the leaves are in a green state, the fruit will often shank the following season."

He thus divides the causes of the deficiency of nourishment into two, viz., over-cropping and an unhealthy state of the roots, and then gives a number of circumstances in which shanking is known to take place, which would naturally produce that unhealthy state. In a cold "wet border" roots, especially the finer and more useful ones, will perish in winter. "Preventing the formation of healthy foliage in sufficient abundance" will prevent a sufficient formation of those fresh roots on which the supply of nourishment for the present and following years appears to depend; for, as is well known, only those trees continue in health that continue to grow, and, therefore, form fresh roots from year to year. Again, cutting out all at once, "whilst the leaves are in a green state," a quantity of "useless wood" that has been allowed to grow, and which was busy forming roots, must not only give a severe check to the process, but may even seriously injure those that have been already formed by stopping in the vessels the large quantity of sap, which must have been there to correspond to the wood and foliage that was cut out. At the commencement of the writer's practice in grafting, he cut off the entire head of a fine standard Crab of considerable size, leaving only the trunk. Round the top of this three or four grafts were inserted, which all succeeded; but these being insufficient to take up all the sap that came from the roots, the extra quantity burst the bark and separated it from the trunk, thus causing the death of the tree. It is quite possible that Vine roots, which, being in the act of drawing sap abundantly, were suddenly deprived of a sufficient outlet for it, by a quantity of green wood and foliage being cut off, would be injured in some analogous way. Now for the facts that have been lately added to our knowledge on the subject. It appears that the celebrated Bishop Stortford Vines were planted in a border so porous that Dr. Lindley was able to probe it easily with his walking stick. That this excessive porosity would be likely to cause shanking, by occasioning a deficiency of moisture, is shown by the fact mentioned by Mr. J. May in the *Gardeners' Chronicle* of November 5, that in a dry inside border, where shanking used to take place, copious watering on its first appearance had been found to stop it completely. It is evident, too, that however healthy the roots might remain in this border in winter (when roots in a cold wet one would be likely to rot), they might suffer seriously from an insufficient supply of nourishment in dry summers; and that they might even become so dry that the tender extremities formed earlier in the season might perish. This would be a cause opposite to the one first mentioned, tending, on the principle that extremes meet, to the same result. Can any one tell whether the Bishop Stortford Vines, that shanked so pertinaciously, continued their growth with normal vigour to the end of the season? If they did not, this, taken in conjunction with the nature of the border, would be decisive of the question as far as they were concerned. But unless some new fact arises, the matter appears pretty plain as it is. I have a few Vines—Black Hamburgh (Frankenthal), Royal Muscadine, and Black Prince,—in a border that I fear is too porous. It was made in the following proportions of soil, &c.:—Six barrows of rotten sods from a stiffish loam, one of fine river sand and burnt earth, one of charcoal and broken bones, one of lumps of brick and mortar, with a plentiful sprinkling of pig's hair taken from the carcases of pigs when they were being scalded. So apprehensive was I of making the compost heavy that no manure was used. The depth is 2 feet, resting on a bottom of broken stone throughout. This border grows very fine Grapes—bunches upwards of 2½ lb., berries large, and quality unsurpassable. But I am obliged to undercrop to avoid shanking; with half or two-thirds of a crop the Vines should bear there is little or none: with anything like a full crop it is there, sometimes badly. Last summer I escaped better than before, without my knowing why at the time; it was probably because just as the fruit came to its full size I gave a heavy soaking with liquid manure. I believe that, considering the quantity of lightening materials in the compost—one-third of the whole, without counting the hair,—that less sand and burnt earth (which is equal to sand) would have been sufficient: with regard to remedies, I intend in future to do as Mr. Pearson advises, to cover my border on the approach of winter "with long manure one foot thick, which should remain till the Grapes begin to colour" in the following year. "In spring and summer it will retain the moisture, and do good till the Grapes, being full grown, are on the point of ripening, when it may be removed." I was unwilling to do this before from fear of making the border too heavy and solid by degrees; but I now see that a moderate amount of this is what is wanted. I will be ready too, should shanking still take place, with weak liquid manure to stop it, and have confidence in this in my case, though how it would be when the Grapes shanked from the border being too heavy and solid remains to be tried. In conclusion, the way to guard against shanking appears to be to avoid extremes—to have the border sufficiently porous without being too much so; to stop sufficiently to prevent overcrowding, and no more; to do this regularly, and not in quantity at one time; to crop moderately; and give a due amount of moisture when that appears deficient. *A. Boyle, Narberth.*

Russellia juncea.—This is one of the best plants for growing in a basket or pan suspended from the roof of the stove, and one that is almost continually in flower. I have always found it grown well in turfy loam and decayed leaf-mould, with a little white sand. It is truly a pretty object when covered with its delicate, rosy scarlet, tubular flowers, its foliage and stems being of the most delicate green.. *F. W. B.*

Fungophobia.—Some time ago Mr. Pearson, of Chilwell, in the *Gardeners' Chronicle*, gave it as his opinion that tanner's bark was a dangerous thing to put upon Strawberry ground—that it produced Fungus, and that Fungus in turn caused some of the plants suddenly to die off. In this opinion Mr. Pearson was supported by Mr. Ingram, of Belvoir (see p. 460). Now, it is not with a view to refute the argument adduced by those gentlemen that I now beg leave to draw attention to the subject, but to show that with me, and under my own observation, tan has just had the opposite effect. For years we have been at this place in the habit of emptying our tan beds on to the kitchen-garden ground—sometimes it is dug in, and sometimes put between the rows of our Strawberry beds as a mulching. A Strawberry plantation, which in 1869 had been tan-dressed, yielded this year a magnificent crop of fruit. The plants continued throughout the drought, and still are, in excellent health. I give this instance because some remains of the tan may still be seen on the surface of the ground. I have two other Strawberry plantations, situate at opposite sides of the kitchen garden, which had never been dressed with tan; the plants are in vigorous health, but it was amongst those two undressed plantations where I observed some of the stools suddenly to wither and die off, and no application of water, however plentifully applied, would save them. I thought of the observations of Messrs. Pearson and Ingram, and dug up several of the withered plants to search for Fungus, but no Fungus would turn up; but on the application of the spade, the ground underneath those dead plants revealed a complete state of induration, turning up in squares, trapeziums, and rhomboids, presenting fissures through which the water passed downwards as fast as it could be poured on, without any beneficial effect to the plants. I can only account for the dying off of those few plants by the ground on which they were planted becoming, by some means, over-saturated, and when in that state unnecessarily trodden upon, when drought came cracking and forming crevices as above described. I have further proof of the beneficial application of tan as applied to Rhododendrons. The pleasure-ground here, from the presence of lime, is unfavourable to a healthy growth of Rhododendrons; and my predecessor, Mr. Oliver, by a liberal application of tan, got up a very handsome avenue of Rhododendrons. Probably I might never have found out the cause of the luxuriance of those plants had it not been that an avenue happened to be formed in the middle of the old kitchen garden, which ten years ago it came to my lot to transform into a new one. Although only of the ponticum variety they were very handsome, and of immense proportions. At that time I was also making a green drive round part of the park, for the adornment of which I resolved to save and transport thither these beauties; and it was when we were engaged with their removal that we discovered the tan. The ground where they were taken to was of a peaty nature; they suffered but little check in their removal, and are still in the same place should curiosity lead any one to have a look at them. Many of my stove plants delight in tan; and if any of them happen to root through their pot or tub, they intantly take a growth which knows no bounds. Our old favourite, the Cissus discolor, I never saw more beautifully coloured than when rooting entirely in tan, and allowed to climb or trail in every imaginable direction. The splendid Medinilla magnifica, of which I gave an account in May last, see p. 701, as bearing at that time 208 blooms, we have lately raised out of the tan-bed, and reduced its branches to a radius of about 3 feet from the surface of the tub. On raising it out of the bed we found that its fibrous roots had made their way pretty freely through the box into the adjacent tan, and seemed to enjoy it. Close beside the Medinilla, and also in a wooden box, is a splendid plant of Ipomœa Horsfalliæ, which has flowered beautifully during the winter months for several years; its roots are ramifying all over the tan-bed, from which it derives the greater portion of its sustenance. In the adjoining house I have a Banana bed separated only from a bark bed by a dry brick wall; through these bricks the Banana roots strike with such unerring aim into the adjacent tan-bed, as if drawn by the attractive force of magnetism. In the same house is a plant of Pandanus utilis: although it appears to be growing in a tub of 20 inches, cubic measure, its roots are through the side and bottom drainage holes, running in great profusion into the surrounding tan. It may be interesting to give the dimensions of this tan-fed plant, and here they are:—10 feet through, 12 feet high, height of stem to the lower leaves 18 inches, circumference of stem under lower leaves, 22 inches; from this point it sends down into the surface of the tub—some down, and some on their way—about 30 supplementary or auxiliary roots. For the proportions of its top it is indebted to two immense suckers (each in themselves tidy plants) which have sprung from the base of the leaves. We have repeatedly been obliged to cut away some of its lower leaves to allow room to get about the house, and the roof of the house is now sadly too low for it. I have given the above instances of gross luxuriance in plants, surrounded as they are by tan and in close proximity to decayed wood, for a decaying tub must be such in every sense of the word—yet these form the material pointed to by Mr. Pearson as being the "harbingers and propagators of Fungus!" And Mr. Speed, of Chatsworth, who is quoted by Mr. Pearson, says that the stakes by which plants are supported have with him contracted Fungus, and killed "scores of plants" (see p. 702). With me the training stakes have hitherto been harmless. Fungus must be something akin to the rinderpest in cattle!—visiting some districts with great virulence, whilst others remain unscathed. Derby and Nottingham seem to be two of the visited or tainted counties, for we find Mr. W. P. Ayres (see p. 798) communicating some wonderful adventures he has had with Fungus, said to have had its origin in some horse-hoof parings which had been added to the material forming the mixture of a Vine border. I have been in the habit of collecting and using the sweepings of the blacksmith's shop for my Vine and other borders, with excellent results; and I recall at this moment one of the best Grape growers in England who has been for years in the habit of collecting horse-hoof parings, and regrets much he cannot get more of them. It seems singularly strange that certain materials, with certain men and in certain localities, should produce such wonderfully different results. *W. Miller, Combe Abbey Gardens.*

Nerine Fothergillii.—These old inmates of our gardens are sadly too much neglected, considering the very showy appearance which they have in the conservatory during the dull winter months. N. flexuosa is another paler flowered species. These, with a few plants of Salvia splendens, or, better still, the Salvia gesnerifolia, are admirable for brightening up the duller flowered Chrysanthemums. *F. W. B.*

New Grapes: their Merits and Demerits.—Your correspondent, Mr. Foote (p. 1541), has opened a subject which, if freely discussed, cannot but result with advantage to Grape growers generally. The discussion should not, however, be confined to Mrs. Pince's Grape alone, as the Madresfield Court and Golden Champion have been in cultivation quite long enough to be judged with it. If the subject is freely discussed, and your correspondents give brief details of their system of management, amount of success, &c., and experience during the past season, we shall be able to arrive at some definite conclusions regarding them all. In the spring of 1869 I put in eyes of each of the above-named sorts, which grew into 5 strong fruiting canes by the end of the season. In February last I had two plants of each sort (in 12-inch pots) placed in a house containing a mixed collection of Vines, which was started at that time. They were placed on the front shelf of the house, and trained up between the others, the canes being 7 feet long. They broke well and showed plenty of bunches from top to bottom, which I reduced to three on each Vine. They all received the same treatment, and the results were as follows:—Mrs. Pince set well and swelled regularly into medium-sized berries, with the exception of a few small ones, which were cut out. The bunches were compact, the berries coloured as black as sloes, and had a magnificent bloom. The health and vigour of the Vine was everything that could be desired, carrying fine healthy foliage to the end of the season. Some fruiting canes of the same sort were planted about the same time, in a newly made border in a Muscat-house. These showed a great number of bunches, which were reduced to four on each Vine. They set well, but produced a far greater quantity of small berries than those fruited in pots. The remainder swelled well, but did not colour well, with the exception of those nearest to the front ventilators; a fact which convinces me that this Grape requires an abundance of air at all times. The flavour of the latter was much better than those grown in pots. This Grape will prove itself to be first-rate. What we want to know regarding it is how to manage it better. Who that has seen the magnificent bunches produced during the past season in Mr. Pearson's nursery at Chilwell can say that they are not prepossessed in its favour? These were models of cultivation, perfect both in form and finish. Will Mr. Pearson kindly enlighten us regarding its cultivation? From the cases of the Madresfield Court I selected three of the best bunches for each rod. These were beautifully shaped, set freely, and went through their first swelling well, producing fine long berries, much larger than Mrs. Pince, but as soon as they began to colour the foliage began to show signs of exhaustion, and the colouring process fairly culminated in a fine foxey red. It may be said, that over-cropping was the cause; if so, how are we to account for what is to follow? A strong cane of the same variety was planted out in a Muscat-house in the spring of 1869. This year I left on this Vine two small bunches, which together

would not weigh 1 lb. These set and swelled well, but about colouring time, like those grown in pots, they began to show a want of vigour; some of the few berries did not colour well, but they were delicious in flavour. The leaves on the Vine were quite yellow when Mrs. Pince and Golden Champion were green. I consider the flavour of this Grape superior to Mrs. Pince, but I am afraid it has not such a good constitution. Of the Golden Champion three bunches were left on each of the plants in pots: they set well, and the berries swelled, I should think, to their full size; and, when quite ripe, were pronounced by my employer to be excellent. The largest bunch when cut weighed 3 lb. They coloured well, but with me they will not keep after they are ripe, as they commenced to shrivel directly. From a Vine planted out I took one bunch; this set and swelled well, but as soon as it began to ripen it also commenced to shrivel and shank. I also find it much given to spot. It has proved a very strong grower here during the past season, making leaves nearly twice the size of those produced by other Vines. It certainly is a magnificent Grape, but if its non-keeping qualities are general, it will not be of much use. I should like, however, to see it in a house by itself, where it may, perhaps, do better. It certainly will not ripen its wood in a late house in this part of the country. What decision, then, shall we come to regarding it? Mine is "fine for show but not for profit." *B. Wadds, Gr. to Sir J. H. Thorold, Bart., Syston Park, Grantham.*

Education of Gardeners. — Employers and employed are greatly indebted to you for your endeavours, but the evil will not cease till each employer will personally study his own establishment and learn why apathy, lack of interest, and downright ignorance veiled by low cunning, are so prevalent. In many instances love of personal ease, or lack of moral courage on the part of employers, throws an irresistible temptation before servants of all kinds, producing in under-gardeners an apparent ignorance of their proper business. Social etiquette too often decides that it is *infra dig.* for the master of the house to speak to an under-gardener without giving offence to the head, who virtually hires, orders, pays and discharges his subordinates, who see an amount of self-interested cunning daily blinding the eyes of the master of the house; and which leads the young gardeners to come to the conclusion that the master must be a bigger ignoramus than themselves, and that their business is to do only what the head gardener orders and to know nothing of any other person. This naturally produces an amount of self-esteem offensive to superiors. Another great cause is the laxity of employers, in the matter of giving and taking characters, or in not troubling themselves to make any inquiry at all. The readers of "Lothair" will remember head gardener Hawkins, but few employers would apply the lesson to themselves, it being so amusingly related. With your permission, I will give a case which recently came under my knowledge, and as there are points in it of general application it may prove of public value. A property was bought having four gardeners, the purchaser agreed to take them under good characters, the head at 25*s.* a-week, house and vegetables. On taking possession, the proprietor was asked by the head gardener, "what he should require out of the garden?" "Everything," said the master. "But," replied the gardener, "we gardeners have certain privileges, beneficial both to ourselves and to our employers, in the way of exchanges; and many things here belong to me, such as presents from my late master, cinders, tools that have never been used, &c. The cinders I have sold at 8*d.* per bushel, what shall I do with the others?" "Value them to me," said the new master; "with the understanding that hereafter everything that comes on to the premises belongs to me, and that nothing goes off without my knowledge." The object of selling the cinders would seem to be explained by the desire which the head gardener expressed to the first new servant who came, to make as many cinders as possible, as he wanted them for the garden, and from the quantity sold being reported as two sheep-gated waggon-loads (estimated at 400 bushels, half coal). Things went badly with the new owner's garden, the head was often away; apathy, want of interest, idleness, and want of attention set in. Only the shadow of a flower could be got by begging for it, an evident desire to control the pottering secret services of the second, and to keep the third and fourth gardeners ignorant, was visible to the casual observer. At last neighbours were consulted as to whether it was right that the garden should be made a nursery ground for the benefit of others than the master, and to the moral injury of the under-servants; and this ended in the closure of the garden. Then the head, as before, laid claim to sundry plants and tools as his own, contrary to contract, and was very offensive and defiant; but both he and his second obtained employment with a gentleman who never made the least inquiry as to the reason why they left their former situation. At the same time eighty of the best plants in the houses were claimed by another person, as having been sent in to winter, to the prejudice of neighbouring nurserymen. This is an extreme case. In my opinion the disappointment you feel depends on the apathy of the masters of establishments as to how their property is slipped away, so that their bedding plants look gaudy and gay. Gardeners are not so ignorant as they would appear to be of their business. Self-interest being the first consideration, much depends on the under-gardeners being kept ignorant of the doings of their head gardener. As a rule, the allowance of vegetables to the head gardener appears to be objectionable. It often, as I observe, leads to his becoming a small greengrocer, to the detriment of his master's household, and, as Mr. Peter Bell suggests (p. 1541, Nov. 19), to an out-door partnership with the stable men and indoor servants in their master's property in the shape of "perquisites," small at first but growing gradually larger, till (I have heard it stated, and I believe truly) one share in a large establishment is worth hundreds a-year [!]. I will cite a case reported [where?] some time back—arising out of the custom of ladies desiring to have their drawing-room and dinner-table gaily furnished, but considering it *infra dig.* to know anything as to the kitchen. The cook and butler each brought in their accounts, the gardener charged for seeds, each finding the money in advance and being paid periodically, "as per book;" the cook charged a good profit on her purchases, the butler was said to have produced a 2*s.* 6*d.* box of plate powder from a halfpenny-worth of whitening, a 1*s.* 6*d.* bottle of Day and Martin's from a penny skin of pasteblacking, and so forth; and one was charged with defrauding the master of the house; but the judge decided that as the master did not look after his own business, but allowed the servants to become traders for his benefit, they had a perfect right to charge him what they thought proper over the original cost, to cover the risk they ran of not being paid at all if he became insolvent. In this manner the thoughtless apathy of heads of families generates the evil so universally complained of in servants of all kinds. *A Subscriber.* [We have received a vast number of letters on this subject, to which we may take occasion to allude shortly. Eds.]

"Do Plants Absorb Water through their Leaves?"—It will be seen throughout Mr. Thompson's lengthy remarks, at p. 1442, that he involves in the essence of the above words, not only water in its liquid form, but also in the state of vapour which constantly exists more or less in the atmosphere. I have, therefore, taken up the subject with a view to prove, if possible, that plants do really absorb aqueous vapour [That is not doubted], and sometimes the liquid itself; and, moreover, the efficacy of this fact under certain circumstances. No doubt this is truly a question of "practical importance," and which, it is to be regretted, is considered as of little moment by many; or if any idea of its importance is entertained, it is but very little understood. It is universally known among gardeners that constantly dirty foliage is prejudicial to the well-doing of plants, but the majority of the fraternity are unable to assign the reason. I, therefore, hail with pleasure the introduction of this subject, although I am strongly inclined to disagree with Mr. Thompson on some points. First of all, I must mention an error which meets the reader's eye in the following words:—"When the sap has been duly elaborated, it has undergone a great change, having been converted into cambium or 'proper juice' peculiar to the plant in which it may be found, and in its descent along the alburnum down the branches and stem," &c. He must mean, I suppose, by the series of tubes in the liber, which, during passage, deposits the juice or nutritious food to form new wood and bark. The mode in which the sap is carried, or rather forced, up the stem and branches, was first pointed out by M. Dutrochet, and called endosmose. Now the meaning of this, I think, is very little known. The late Mr. Thompson, in his excellent work, "The Gardener's Assistant," quotes at length from authority to aid him in his efforts to expound the meaning of the word, and as the book is in the hands of most gardeners, I shall not encroach upon unnecessary space here; however, I should like to add a few words more relating to endosmose, as I do not myself quite understand a statement made on the subject in question in the above-mentioned work. Mr. Thompson quotes that: "It is a fact which probably no one will question, that when two fluids of unequal density are brought into contact in minute quantities without any membrane being interposed, they will intermix by diffusion, the rarer fluid intermingling itself with the denser one until, the one becoming gradually more dense, and the other less so, the whole mass acquires one uniform consistency." And that, "by filling a piece of thermometer tube with water, closing its upper extremity, and placing it vertically with its lower one in a solution of gum coloured with logwood, the latter will ascend and colour the former, showing that the diffusion is independent of gravity, and therefore may be inferred to be the result of that attraction which is exerted universally between the particles of matter varying in the inverse ratio of the squares of their distances, and in the direct ratio of their masses." Now I was under the impression that diffusion, like some other species of attraction, was not governed by this law. All forces which radiate from a centre do, as light, &c., and also magnetic attractions; others being governed by different laws, as capillary attraction, &c. Again, it is quoted that, "It is a fact, equally unquestionable, that if solutions of the same substance, in the same menstruum, but of different densities, be filtered through the same membrane, the rarer fluid will pass through with greater rapidity than the denser one." But this is sometimes inversely, as stated; for instance, make a solution (saturated) of common salt, and another of half the strength, and dilute until the strongest contains 1 per cent. of salt—the strongest will go through the membrane most rapidly, and as regards pure water, more rapidly, in the proportion of 565 to 560; there is no general rule as regards density, diffusion is affected by density, temperature, &c., and also by the nature of the solvent and substance. When two liquids are separated from each other by a porous membrane, a current or force is exerted by each—one wishes to take the place of the other; this is called endosmose (impulse from within). The following laws regulate it:—
α. When solutions of the same substances are taken, but of different densities, the quantities diffused in equal times are proportional to the densities, or *vice versâ*. β. In cases of solutions containing equal weights of different substances, the quantities depend, not upon the densities, but upon the nature of the substances. γ. The quantity varies with the temperature, chemical action takes place upon the material of the membrane, which is in a short time destroyed; substances, which although sufficiently porous, do not allow of chemical action, admit endosmose and exosmose to take place to so small an extent that it might be regarded as *nil*. Chemical action, electricity, decomposition, and all other forces, are very obscure as to their origin, but there is no doubt that forces can be converted into each other, and that matter is only a combination of such forces. But to return to the subject in question: Mr. Thompson reasons that it would be absurd (if I may so say) to suppose that absorption of aqueous vapours from the atmosphere by the leaves takes place, since superfluous water is given off by them in "abundance;" but nevertheless this must be the case, though in a much less degree than by the medium of the plants' roots and endosmose; and this varying according to the state of the weather and soil in which they are growing, as well as the peculiarities of the different species. We know too well the folly of cherishing a dry atmosphere in the neighbourhood of some plants while the sap is in active operation; the refreshing effects of a very slight shower of rain after a drought or even a few hours of hot and dry weather is forcibly manifested, as is also the impelling of water over plants by the syringe, when the roots have been kept supplied with moisture. I believe that soft-wooded plants in general love to grow in a pretty well saturated atmosphere. Take, for instance, the florist's Cineraria, with which every one is familiar. Is not a constant moist atmosphere best adapted for the well-doing of this plant? We might try our skill to cultivate it to our perfect satisfaction during a long-continued season of drought, providing shading and other means to secure a cooling atmosphere, but we are utterly beaten by Nature when she condescends to provide the condition essential to the plant's health, viz., a moist atmosphere, which, at the period I mean, is usually accompanied by cloudy weather; the water formerly contained in the high temperature is now depositing itself in very small globules. I am far from asserting that perpetual sunless weather is what plants require while growing, for sunlight is a stimulant especially needed by many vegetable subjects. My purpose at the present time is to illustrate the beneficial effects of moisture in the air with regard to vegetation. We observe a striking instance of the reverse to Mr. Thompson's ideas, when we witness the return of every summer: the plants which ornament our gardens flag and fade under the heat of the sun, no matter whether the soil is moist or dry; but when we examine them in the morning, we find that freshness and vigour has been restored by the leaf-absorption of dew; consequently, this fact cannot reasonably be attributed to the action of the spongioles, since they may have moisture already supplied to them by that contained in the soil; and in some instances we see the soil's surface, when very dry, to be in such a condition as to be apparently impenetrable by dew during such a short time. If we detach a branch from a plant, and immerse its summit in water, its absorbent property suffers no diminution, and it is evident that the absorption of the nutritious fluid is almost exclusively performed by some plants, particularly in the genus Cactus, and other succulent subjects, which grow in extremely dry places, such as on sunny rocks and in the sandy desert. On examining these plants, it will be found that their roots are very small, and thus furnish us with a proof just contrary to Mr. Thompson's theory; for had it been at all in harmony with this gentleman's views, it is certain that Nature would have provided these plants with extra roots to absorb as speedily as possible all the moisture within their reach whenever deposited upon these dry places, and likewise that from the air as it penetrated the interstices of the soil. With regard to the stomata in the cuticle and epidermis of plants, I cannot agree with Mr. Thompson, that their function is to obstruct the passage of moisture, and in lieu of their mouths contracting in moist weather, they, on the other hand, open, to allow of good evaporation—a fact confirmed by another, that those plants which have numerous large stomates, which grow in moist, shady places,

evaporation taking place there with greater difficulty than in more dry localities, whilst those plants which inhabit hot dry places have a much thicker epidermis with smaller or fewer stomates, which I infer to be thus arranged for the purpose of arresting too rapid evaporation by the leaves. From these facts I am inclined to agree with Mr. Fish on the point at issue, and to add that it can only be under abnormal conditions, that the leaves of plants do not at all perform the office of absorption of water, or aqueous vapour, in combination with the gaseous constituents. The upper surface of leaves is usually smooth, this being no doubt intended for some wise provision, and probably, as Mr. Thompson said, to throw off the water. Watery vapour and gases are, as before mentioned, absorbed by the pores situated on the under side of the leaves, which are generally covered with a light down favourable to this absorption. But this is not always the case ; absorption goes on equally by both surfaces of the leaves of herbaceous plants, these being nearer the ground, and immersed in a constantly humid atmosphere. There is, however, something more, which I believe we are as yet in ignorance of, relative to the cause or combination of these,—why the leaves of some plants are provided with better waterproof coverings than others, for not all evergreens are provided with stiff and leathery-like foliage, like our Holly. In the southern hemisphere, as Australia, South America, and Cape of Good Hope, where nearly everything is evergreen, few plants, comparatively speaking, belong to the above mentioned class, as the genus Ficus, Gardenia, &c. It seems, too, that these are not equally distributed over the vegetable world, nor yet even in the same latitude, as may be noticed by our long list of exotics, of which we find numerous species of this interesting evergreen class from China and Japan. Not having an opportunity of reading Mr. Fish's article I cannot remark on any of the other points in the argument, with the exception, however, of the concluding one in Mr. Thompson's reply. I find that the latter is unwilling to agree with the former in doubting whether aqueous vapour can be prevented from entering the pores of plants ; and, moreover, to confirm my remark, Mr. Thompson says, that "If this aqueous vapour is applied to the skin of an animal, or to the surface of the leaves of a plant, it obstructs perspiration, and if too long continued may bring on disease in both cases." The leaves of plants, as well as the skin of animals, are constantly in contact with, or rather enveloped by aqueous vapour, as this is always contained in the atmosphere more or less, varying in different localities and at different times, and depending chiefly upon the temperature of the air. The air usually contains from 50 to 70 per cent. of the quantity of aqueous vapour necessary to completely saturate it ; but in our country the air is frequently saturated with moisture, though the limits between 50 and 70 seem to be the most agreeable to the enjoyment of most animal life. Fownes, in his "Manual of Chemistry," says that, "1 cubic metre of air saturated with moisture at 25° C. contains 22.5 grammes of water, and if the temperature of this air be reduced to 0° C., it will then be capable of retaining only 5.4 grammes of water vapour, hence 17.1 grammes of water will be deposited as rain." To convert this into proportionate English equivalents, taking 1 cubic yard as the nearest approach to the cubic mètre (a cubic yard=1.308 or 1 $\frac{308}{1000}$ cubic mètre), would read thus :—1 cubit yard of air, saturated at 25° C. (or 77° Fahr.), contains 265.5 grains of water ; and if the temperature be reduced to 0° C. (or 32° Fahr.), it can only retain 63.734 grains of vapour, consequently 207.766 grains must be deposited in the form of rain. *George Newdyn, The Royal Nurseries, Slough.*

Foreign Correspondence.

Melbourne Botanic Garden.—The tree lines along the walks amount altogether now to 21 miles ; also, different kinds of trees have recently been chosen for these avenues, to exhibit the relative merits of each. The remaining portion of the reserve between the city bridge and the Botanic Garden has latterly also been planted with many additional kinds of Pines—not less than 21,000 Pines, representing very many species, being now grouped or scattered on the lawns. To prevent more completely a certain degree of monotony, which might be caused by the massive upgrowth of conifers, though many are of very distinct form, and though lines of deciduous trees dissect the lawns, I introduced into the incipient pinetum several hundreds of New Zealand Palm Lilies (Cordyline australis and C. indivisa), and also numerous groups of real Palms —for instance, the Gippsland Fan Palm, the New Zealand Nika-Nika, the Date, the Seaforthia, the Sabal, and a few others equally hardy. Many of these Palms or Palm-like plants have become already very conspicuous, and it may be readily foreseen that, within a few years, the environs of the city will assume by this measure an aspect so exotic, that a visitor viewing the suburban landscape will imagine himself to be within the tropics. To the Palm groves require still to be added in quantity the Chilian Jubœa and the equally hardy Chinese Livistonia. The various trees will form a nucleus for forest culture when gradually bearing seeds, and when not merely the protection but also the enrichment of the native forests will become an object of legislative enactment. The total number of trees now planted out approaches to 30,000. The Willow plantations along both the Yarra banks, from Prince's Bridge to Richmond, have been renewed or completed this year on the municipal side of the river by the aid of the Corporation. The renewal of the fences since the last floods, effected at great expense by the city council, has afforded for this purpose all the necessary security. Weeping Willows and various kinds of basket Willows have been chosen promiscuously to combine ornament with utility.

A dense belt of vegetation will thus guard against accidents, embellish the river, consolidate the banks, afford more shade, shelter the garden against the piercing westerly winds, and replace permanently the fences, apt to be carried away by the floods.

Tall Danubian Reeds, Callas, patches of Tea-tree (Melaleuca ericifolia, transferable in an upgrown state), Poplars, Ashes, Elms, Oaks, all of various kinds, Toi-Toi, Pampas Grass, Tamarix, Ampelodesmos, wiry Muehlenbeckia, Poa ramigera, will ere long impress on the once dismal swamps and river banks a smiling feature.

The many thousand large plants required for this purpose were partly supplied by donations or interchanges. Clover and Lucerne are also established on the lagoons and even on the rises.

The tall Indian Bamboo has been acclimatised, and is, with other Bambusaceæ and the Nile Papyrus, chosen to fringe the lake. In a climate like ours, which admits of the culture of so many tropical plants without glass protection, it is always an important object to group the greatest possible number of prominently remarkable plants from various parts of the globe suitably together. This, indeed, is one of the greatest charms in our horticulture. Throughout the garden ground numerous new species have been added annually, predominance being given to such shrubs and perennial plants as entail the least attention for maintenance. Were it otherwise, so extensive an area could not be maintained in sightliness, whilst here throughout the year the growth of weeds, annually more diversified, is to be coped with.

The whole area of the garden and arboreta now laid out comprises nearly 400 acres, including the lake with its six islands. To the latter, a seventh requires to be added, on the north-western extremity.

In special artistic ornamentation as yet little has been effected, the director deeming it of pre-eminent importance to devote his early means to the raising of trees and utilitarian plants, such as will mitigate the heat of our summer clime, and increase the salubrity of the city, or such as will play an important element hereafter in our rural economy, and originate new industries.

The abandoned quarries have been decorated with Agaves, Aloes, Mesembryanthema, some Pelargonia, and other rock plants ; while Brambles, Strawberries, and other wild fruit plants, attractive to children, have been planted in the gullies. Goodenias, Roses, and other shrubs line the river and lagoons. The Fern-tree gully has been extended, and to the various hardy arborescent Ferns, some perhaps a century old, huge square Todeas of great age, Staghorn Ferns, and very many other species, became added in masses. The kind of hedges now shown in different parts of the ground are very various, but that of Pittosporum eugenioides, first adopted by myself, is most admired, and called forth an extensive trade in this plant. Four other New Zealand Pittospora, as well as our native P. undulatum, are among those chosen for hedges. The Chamomile edgings, as time-absorbing as defertilising, and apt to be trodden down, become gradually abolished. Turkish Box, dwarf Roses, Veronica decussata, Rosemary, and most particularly Mesembryanthemum tegens, are substituted. The latter plant can be obtained largely from the Yarra flat, never fails in the heat of summer, and grows so depressed as to need only lateral trimming. Although large improvements have taken place on all the lawns, they still require gradually to be turfed with Cynodon Dactylon, a grass which is within a few weeks established, by casting its rhizomes, converted into small pieces, over the broken and levelled ground, a process extensively adopted by the director of the Sydney Botanical Garden. It tends also much to subdue weeds. On the even surfaces of ground clothed with Cynodon an ever-verdant fine turf can be maintained by the ready appliance of lawn-cutters and rollers. Banded flower masses might be interwoven ; but as yet such works of luxury, for which, after the lapse of the season, no permanent return can be shown, have not been attempted in this young establishment. There is, nevertheless, a gay display of flowers in the special garden land through the greater part of the year ; indeed, the variety is far greater than a superficial observer will imagine, inasmuch as the area variedly studded with flowers is so extremely extensive.

The incessant calls, however, to provide decorative flowers for public *fêtes*, tea meetings, and bazaars, not rarely deprive the garden of a real show of ornament. The plants throughout the ground are very extensively labelled, about 3000 iron labels being employed. Labels, however, with fused, and thus unobliterable letters, are here, as elsewhere, yet a great desideratum. In the large conservatory all plants are placed, for instruction's sake, along both sides of the stages, so as to represent those of the western and of the eastern hemisphere separately, the plants of the various families being again grouped together. In an inexpensive structure, far too modest to do justice to so grand a plant, the Royal Water Lily has flowered throughout two seasons, and repeatedly has ripened seeds, available for transmission to the hotter parts of Australia. The high temperature of the Victoria-house is inexpensively provided by its connection with one of the forcing pits, while, in the humid heat, Vanilla and many other epiphytal Orchids of the jungles of the torrid zone find here the conditions necessary for their permanent existence. The standard collection of Vines and orchard trees has annually been added to. Fruit from these has been supplied to public charities. The experimental ground has also annually grown richer. To attempt to specify the treasures of the garden, whether utilitarian or ornamental (many first introduced by the director into Australia), is beyond the scope of these pages. The special catalogue appended to this document will exhibit many which we possess, but not all, inasmuch as thousands of plants occur yet in too young a state to correct their erroneous appellations. Mere varieties and garden hybrids, as a general rule, have been excluded from the catalogue. The suppression of the two principal kinds of Mistleto (Loranthus pendulus and L. celastroides), which, on neglected ground, often manifest themselves by the widely visible dead ramifications of the trees, causes here much loss of labour. The introduction and multiplication of important plants, of industrial or medicinal value, has received careful attention. Thus, about 10,000 young Peru bark plants have been raised, comprising mainly Cinchona succirubra, C. Calisaya, and C. officinalis, the latter, the most hardy of all, predominating.

These plants have withstood the night frosts which we experience near Melbourne when merely placed in brush shades. On one occasion the thermometer in these shades sunk to 28° F., while in the open ground it stood at 24° F. near the surface ; still the plants suffered not further than getting some of the leaves and youngest branches injured, but soon formed new leaf-buds. These frosts affect, moreover, also some of the plants which inhabit the mild sheltered glens of our ranges, and I am therefore justified in anticipating that, in many of the warmer forest regions of Victoria the Cinchonæ could be grown to advantage, these plants being associated with Fern trees in their native haunts in the middle regions of the Andes. Coffee plants scarcely suffered in the brush shades, in which the temperature may be regarded almost analogous to that of our Fern-tree gullies. It would be very important to ascertain, by actual test in the ranges, whether the Coffee and Cinchonæ would yield prolifically. In such localities, under any circumstances, the Tea shrub would so luxuriate as to produce an abundant crop of leaves, since even in dry localities of the Botanic Garden, and in its poor soil, the Tea bushes have grown quite well. Cork Oaks, of which, like Tea, several thousand plants are reared, would also produce far more rapidly their useful bark in the ranges than near the city ; there the American Hickories and Walnuts, of which a copious supply of seedlings exist, would grow much faster. These, with the Red Cedar, West Australian Mahogany, Sumach, Scotino, Dates, Carob trees, Valonia and Dye Oaks, Mastich trees, Arrowroot, and perhaps also Tapioca, Tamarinds, and very many other prominent utilitarian plants, would thrive best in the rich humid soil of our mountains, and might occupy localities not readily eligible for cereals.

(*To be Continued*

Societies.

Royal Horticultural : *Dec.* 7.—W. Marshall, Esq., in the chair. The usual preliminary business being completed, Mr. Wilson announced the awards of the Fruit Committee, and stated that the prizes offered by the Rev. G. Kemp for hardy Grapes would be continued next year, but the competition would take place in November instead of October, as heretofore. The Rev. M. J. Berkeley then read the list of awards made by the Floral Committee, and said, in reference to a fine variety of Mormodes shown by Mr. Green, that he at first doubted whether it was a variety of M. Cartoni, but on referring to a plate of M. igneum in "Paxton's Flower Garden," vol. iii. tab. 93, he found that it was the variety *β*, there described. Mr. Berkeley then exhibited some Vine leaves which had been handed to him by Dr. Masters, and which were half-black and half-white in colour, and alluded to a Vine in the gardens at Wentworth which produced black and white berries on the same bunch, the leaves of which had never been variegated. Mr. Meehan's observations on fasciation, which appeared in our columns at p. 1606, then came under notice, and Mr. Berkeley remarked that there had been some confusion between fasciation and polyclady, in which an extraordinary number of branches are produced through the attacks of Fungi, and from other causes. A paper on Maize (see p. 1633) was then read, and it was afterwards announced that as there had been no exhibition for Mr. Bateman's prize of £5 for cut blooms of Cattleyas [labiata and Mossiæ, with their varieties], the prize would be again offered at the next meeting on January 18, but it would be divided into one of £3, and one of £2.

Scientific Committee.—A. Murray, Esq., in the chair. A bifid leaf of Chimonanthus præcox, forwarded by Mr. Parsons, gr., Danesbury, was shown. Mr. Squires, gr. to H. G. Ludlow, Esq., Heywood, near Westbury, sent parti-coloured leaves, green and purple, produced on small plants of a Vine grown from eyes this

season. The fruit of this Vine has been shown on more than one occasion, and presents a similar piebald appearance, some being half-black, half-white, others on the same bunch are wholly black or wholly white, and some of the bunches are entirely of the one colour or the others. From Mr. Mills, gr., Enys, Penrhyn, came a branch of White Currant, with unusually large rounded buds. The leaves on this particular branch are produced a week earlier than those on the other portions of the bush.

Mr. Murray read a paper from Mr. Anderson-Henry on Imperfect Hybridisation (see p. 1634), prefacing it with some remarks of his own, which will be printed in full in *Nature*.

Alluding to the phenomena of Mimetic Analogy, discussed by Messrs. Bates and Wallace and others, and lately averted to by Mr. Bennett in the columns of *Nature*, Mr. Murray proceeded :

"Mr. Bates found in the valley of the Amazons a number of species of a northern tribe of butterflies, wearing the colour and form of a Brazilian tribe, and so like in their varieties and strains that they obviously represent some different phenomenon from the ordinary one of mere difference in species. To account for this he devises a theory on the natural selection plan. The Brazilian tribe have a bad smell, and birds and insects of prey, consequently, do not feed upon them ; and the northern tribe, in the course of their variation in the dark, accidentally produce one something like the Brazilian one, which produces others in the same direction by natural selection, until the mimics are brought to perfection. But bad smell has not been observed in North America where similar mimicry occurs. Birds and insects of prey hunt by sight, and not by smell, and the various communications on the subject in *Nature* point out a variety of insuperable objections.

"The explanation I believe to be hybridisation, and from the information supplied by Mr. Henry I am enabled to say that there is not a phase nor a fact in the mimetic analogies for which I cannot produce the exact counterpart in the hybridisation of plants.

"In the first place the mimicked and the mimickers are always found together ; and even the mimickers of varieties are only found beside the varieties that they mimic.

"Now, it is plain, that if the resemblance be due to hybridisation it is inevitable that the two must always be found together, at least in the first instance. The natural condition is to find both together. But this is not the natural condition if the mimicry is produced by natural selection. The same enemies are found over thousands of miles ; and the same kind of enemies over tens of thousands ; and there is no advantage to be gained by mimicking one variety of Danais more than another. The same advantageous results would be obtained by mimicking in the east the form that prevails in the west, or in the north the form that prevails in the south ; but the imitation of each variety is limited to the district which it inhabits, however narrow and restricted it may be. Natural selection, therefore, fails entirely to account for the localisation of the varieties that are imitated.

"In the next place the mimicked occurs always in overwhelmingly greater numbers than the mimickers. This is quite what we should expect if the resemblance is due to hybridisation. Hybridisation is not the normal mode of producing either species or individuals. It is not the plan laid down by Nature. Being exceptional, it is of course comparatively rare. But there is no reason for rarity if it be the result of natural selection. That operation is going on equally upon all, and under that hypothesis mimicry is just as powerful an influence in modifying and producing forms as any other, and there is no reason whatever why it should have less conspicuous results. Indeed, it should have more, if we judge by the long-continued persistence of influence, which must have been in operation to produce such exact resemblances, and which, indeed, seem very much thrown away when confined to the one in a thousand mentioned by Mr. Bates.

"Although mimicry occurs between various tribes or genera, it has been observed most frequently in connection with the most common species of the country. This is what would naturally be the case with hybridisation, supposing all to start fair, and to be equally liable to hybridisation. But this is an assumption which we are scarcely warranted in making, and I therefore do not press this inference further than as of some conditional value.

"After the second generation of hybrids, those which do not revert to the type break out into an overflow of irregular variation, which supplies many of his most remarkable sports to the horticulturist, and many of his most puzzling difficulties to the systematic botanist. On the assumption that the mimicry in question is the result of hybridisation, we should therefore expect to find a marked degree of variation among the mimicking species. And so we do."

Mr. Murray cited evidence on this head, and then continued :—

"It seems a fair inference that when the mimicking species are not variable, they have been established before the second generation of hybrids, and where they are variable they have been established subsequent to the second generation, and have experienced the usual shock to stability occasioned by such repeated loosening of the fetters of specific identity.

"Mr. Bates' list of mimics and mimicked species shows, too, that when a species is mimicked by one species or genus it is often mimicked by more—a fact which, applied to the idea of hybridisation, simply means that that species had a readiness to take to itself wives of more than one of the nations round about. It is only what we find in plants—that some are more open to hybridisation than others, or perhaps analogous to our moral experience, that where scope is allowed to our own passions, license soon degenerates into libertinism.

"Another feature, familiar to all hybridisers, occurs in these mimicries. Notwithstanding the statement of Wichura to the contrary, it is now perfectly well known that in attempting to obtain a cross between two species, we often fail when we work with the male of one species and the female of another, while we succeed when we reverse the process, and take the male of the latter and the female of the former. In plants, the cases where this capability of crossing in only one direction occurs are beyond numbering. Mr. Isaac Anderson-Henry cites many of them in his late Presidential address to the Botanical Society of Edinburgh, and in the paper which I have now the pleasure to lay before the meeting. The very same thing has occurred with the mimicries recorded by Mr. Bates. They are all on one side of the house. The case which so often occurs in plants has obviously occurred among the butterflies. The cross has taken only from one side—which is it? Judging from the example of the mule it should be on the side of highest organisation ; that is, that the male parent has been of the lower organisation, and the female parent (the actual bringer-forth) of the higher. Now, which is the side of highest organisation in the Danaids and Pieridæ—is it that of greatest strength? If it were so, it would then be the Danaids, for they are larger, finer, and more powerful than the more northern whites. But organisation is a higher test than mere strength, and an advance in it is doubtless what must be the unconscious aim of the ambitious match-seeker. This, too, seems to be on the side of the Brazilian tribe. Mr. Bates so considers it, and his reason is that, the essential quality of butterflies being flight, the type which has most attention paid to its wings, and least to its legs, must be highest of its order. Others think differently, and say that a type which has had most of its limbs (its fore legs) almost atrophied cannot be so perfect an animal as one which has them all in perfection. But I agree with Mr. Bates on this point (at all events in his conclusion). The greater number of legs cannot be any indication of higher organisation, or a centipede might dispute supremacy with ourselves, and push us from our stools. The fewer limbs, that is, the simpler the apparatus that a creature can do its work with, the higher the perfection of the machine. Therefore, doubtless, the cross from which these mimics resulted was one by the males of the whites upon the females of the Danaids.

"Now what does plant-hybridisation tell us on this point? What does Mr. Henry say? "I regret to differ from so great an authority as Wichura (who had maintained that 'the products which arise from reciprocal crossing in plants, unlike those which are formed among animals, are perfectly alike'), and must venture to demur to the doctrine in more decided terms than Mr. Berkeley has done. I have had so many instances of hybrids taking sometimes to one side and sometimes to another—but most frequently to that of the mother—that to those who, like me, have tried their hand with many genera it would be a matter of supererogation to give instances. I have had them by the score."

"But the mixed product also corresponds with another fact observed in hybridisation. Mr. Henry informs me that in some of his crossings of plants he has only succeeded in altering the flower, the foliage continuing persistently the same as that of one of the parents. He has not succeeded in distributing the union through all parts. That is exactly parallel to what we see in these mimicries. In plants it may be a question whether we should consider the flower or the foliage as the more structural parts ; for my part I should take the flower as the more important, and therefore equivalent to the structure of the legs and wings, and the foliage and habit of the plant as equivalent to the colour and form of the wings and general appearance of the insect. In Mr. Anderson-Henry's case another phase of the mimicry, which I have no doubt will be found to have also its parallel in the hybridisation of plants, although I am not able to cite any instances exactly in point, is, that in species which have dissimilar sexes it sometimes extends to both sexes, the males being like the males and the females like the females, but in other instances is confined to the females. I believe that the reason why I have no case in point to cite in plants is, that it can only be had in dioecious plants ; and the hybridisation of dioecious plants has hitherto been scarcely at all attended to. Mr. Henry has some coming forward, but they have not yet flowered.

"The last point to be noticed is one of some importance, as being the only one furnishing a shadow of objection to the explanation of the mimicries in question by hybridisation. It is, that the nearest natural allies of both the mimickers and mimicked are not always to be found in the same district as them. This deserves the more attention, that it appeared so strong to Mr. Bates as to lead him to relinquish the idea of hybridisation as an explanation after it had crossed his mind.

"Before I proceed to show how simple the explanation of the absence of one of the parents is, I must beg to note, in passing, the admission that there are distinct forms whose intercrossing would produce the hybrids. That granted, I would remind the reader of what Mr. Bates has obviously overlooked, that we are dealing with a phenomenon, probably of a very ancient date, and that one side of the parental stock may have disappeared in the course of time. One of the parents we know to be present (the so-called mimicked), but there are excellent reasons, based on climatal considerations, why the other parent should not be present.

"There is yet another phenomenon connected with mimicry, which possibly may also be connected with hybridisation, viz., the occurrence of what Mr. Wallace has called dimorphism in insects among the mimicking or mimicked species. We must not, however, confound this dimorphism with Darwin's dimorphism in plants. The two are totally different things, and, as it seems to me, have no relation or analogy to each other. In plants the dimorphism is always confined to the reproductive organs, in insects it has apparently nothing to do with them. Moreover, it seems to me that all the instances of so-called dimorphism in insects that have yet been recorded are nothing but examples of variation, perhaps complicated by hybridisation.

"Dimorphism is confined to particular districts—as in the Papilio Turnus of North America, where all the females are yellow in the New England States and in New York, while in Illinois, and further south, they are all black, and in the intermediate region both black and yellow females occur in varying proportions.

"We scarcely suppose that one would have thought of calling this a case of dimorphism. If they did, then all climatal variations (and their name is legion) would come under the same category. It is only dimorphism, because the change is limited to the female, but the female is only part of the species.

"All these seem to me mere instances of climatal variation, in which the variation shows itself only in that part of the species called the female. An occasional case of variation from some other cause, as from hybridism, may possibly come to complicate this phenomenon ; but it appears to me to be sufficiently explained by variation, and the circumstance above mentioned is significant that where mimicry occurs in species having dissimilar sexes, it, too, is often confined to the female."

Floral Committee.—W. B. Booth, Esq., in the chair. This was the last meeting for the year, and it was announced that, in conformity with a proposal made some months since by Mr. J. Fraser, —in conformity, also, with the original constitution of the Committees,—both this and the Fruit Committee will be dissolved annually, and re-appointed by the Council. There was a good attendance. The number of subjects exhibited, as might be expected from the lateness of the season, was not large, but some good things were included amongst those shown. Mr. B. S. Williams was the only exhibitor of a group of Orchids, which consisted of Lælia anceps, a specimen with 10 beautiful flowers ; Odontoglossum cariniferum, a nice spike ; Calanthe Veitchii, Lycaste Skinneri, and the new and curious Warrea Wailesiana. Along with these came a group of Solanum hybridum compactum, dwarf, covered with berries, and as beautiful as ever. A Special Certificate was awarded to the collection. From Mr. Green, gr. to W. W. Saunders, Esq., came a very fine variety of Mormodes Cartoni, the flowers of which are at first of a dark orange-yellow colour, and afterwards change to a deep dull red. A First-class Certificate was awarded. Special awards were made to Dr. Ainsworth, Lower Broughton, Manchester, for a very fine spike of the deliciously scented Oncidium Barkeri (stated by Mr. Bateman to be the O. trigrinum of La Llave) ; and to Messrs. J. Brooke & Co., Fairfield Nursery, Manchester, for Dendrobium bigibbum with one spike, on which were 11 flowers ; with it was a small specimen of a fine variety of Odontoglossum Rossii. First-class Certificates were awarded to Messrs. Perkins & Sons, Coventry, for Selaginella Martensii alboli neata, a fuller notice of which was given at p. 1535 ; and to Mr. Goddard, gr. to H. Little, Esq., Cambridge Park, Twickenham, for a seedling Cyclamen persicum, named purpureum, a splendid flower, of a deep purplish rose colour. Mr. Rolfe, gr. to Sir E. C. Kerrison, Bart., Oakley Park, Eye, Suffolk, sent Capsicum Yellow Gem, a showy yellow-fruited decorative plant, to which a Special Certificate was voted. The same award was also made to Messrs. E. G. Henderson for a collection of dwarf hardy bedding plants, which included 113 species of Saxifraga, 70 species of Sempervivum, and 30 species of Sedum, &c. ; and for a collection of winter-flowering Tree Carnations ; to Messrs. Standish & Co., for a fine group of hardy berry-bearing plants [afterwards awarded a prize], including scarlet and yellow-berried Hollies, dwarf bushy and standard specimens of Aucuba, furnished with a fine crop of berries, but scarcely yet in perfection of colour ; Skimmia oblata, a handsome hardy plant ; and Raphiolepis ovata, a black-fruited plant, which is extremely hardy, and stands the smoke of towns well ; to Mr. Clarke, Twickenham, for a collection of about 80 plants of Cyclamens, remarkably beautiful and fresh ; to Messrs. W. & A. Brown, florists, Hendon, for a collection of Primulas and Cinerarias, the former exquisitely rich in colour ; and to Mr. Wiggins, gr. to W. Beck, Esq., Isleworth, for a large, nicely flowered collection of red, white, semi-double, and Fern-leaved Primulas. Mr. W. Lee, Arundel, Sussex, had a First-class Certificate for a seedling Tree Carnation, named White Nun, and one of the Second-class for a variety named Maiden's Blush, a larger and fuller flower, with a faint shade of blush running through the petals. Messrs. Veitch & Sons sent a hybrid Amaryllis, named Spotted Gem ; and from Mr. Trusler, Farnham, Surrey, came a a pretty white variegated seedling Carnation, named Sensation. Mr. G. Goddard had a small group of red Fern-leaved Primulas, and Mr. Drover, Trinity Nursery, Faversham, a specimen of the Resurrection Plant, Selaginella lepidophylla. Prizes were offered for 24 cut blooms of late-flowered and Japanese Chrysanthemums. Mr. Douglas, gr. to F. Whitbourn, Esq., carried off the 1st prize with a stand of excellent flowers, considering the lateness of the season, and the consequent difficulty of retaining colour in them. His best blooms were of Miss Marechaux, a very large flower, and of first-rate quality ; Lord Derby, reddish crimson, petals broad and well incurved ; Princess of Teck, white, with the back of the petals shaded with rose, &c. Mr. G. Goddard was 2d with a stand in which the principal feature was a group of the Japanese varieties, which had many admirers, notwithstanding their want of symmetry. Mr. H. Youell, Ladywood Road, Birmingham, exhibited specimens of a new garden-peg ; and Mr. Looker, Kingston-on-Thames, a specimen of his patent Acme garden frame. Mr. Looker says :—"The principal objection to the use of earthenware and glass for ground vineries, &c., has hitherto been that ventilation could not be obtained at the top without removing the glass, thereby incurring great risk of breakage. In the above arrangement the frame or vinery may be readily opened or closed without touching or in the slightest degree disturbing the glass. This is effected by the introduction of a light wooden ridge, which is so constructed that an opening for ventilation is left at the top throughout its entire length. The ridge is supported on angle pieces dowelled at the ends by which they are securely fixed at intervals in the inner sides of the earthenware chairs or tiles. The open ridge is closely fitted with

earthenware caps, which are easily removed for ventilation. A rebate is formed on each side of the ridge in which the top of the glass rests, the lower edge resting in a recess on the top of the chairs." We can only say that the arrangement appears to be satisfactory, and that such a frame must be of great service to amateurs.

Fruit Committee.—G. F. Wilson, Esq., F.R.S., in the chair. At this meeting prizes were offered for the best collection of salading materials. Two collections only were shown: Mr. Hepper, gr. to C. P. Millard, Esq., The Elms, Acton, was 1st, with an excellent lot, consisting of Cucumber, Endive, Lettuce, Beet, Celery, young Onions, Turnip Radishes, Corn Salad, Mustard and Cress, and Water-cress. These were all very good in quality, and were put up on plates garnished with the coloured leaves of Beet and curled Kales. Mr. Gilbert, gr. to the Marquis of Exeter, was 2d, with a smaller collection, staged in one of Mr. Chapman's new vegetable exhibition boxes, which was about 4 inches in depth, and divided off into numerous compartments, with a margin all round of about 2 inches, fitted with a zinc or tin tray, in which Mustard and Cress may be grown to make an edging to other products. Mr. Gilbert had very good examples of Celery, Lettuce, Endive, Beet, Mustard and Cress, Taragon, &c., and an excellent brace of Cucumbers. The contrivance appears to be very simple, and as effective as the flower packing cases, and will doubtless become quite as popular. Mr. Gilbert also sent a neat stand on which to exhibit Pine-apples. From the Rev. Th. C. Bréhaut came a grand collection of 35 varieties of Maize, grown in the island of Guernsey, to which a Special Certificate was awarded, and never more deservedly. A description of the varieties, with notes on their cultivation from the pen of the exhibitor, will be found at p. 1633. To Mr. Chaff, gr. to A. Smee, Esq., Wallington, Carshalton, Special Certificates were awarded for very fine collections of culinary and dessert Apples. Amongst the former, Lord Derby, Blenheim Orange, Gloria Mundi, Reinette du Canada, Calville Blanc, Alfriston, Dumelow's Seedling, and London Pippin, &c., were especially fine in size and colour. Amongst the dessert kinds, King of the Pippins was most conspicuous, on account of its large size and rich colour; Ribston Pippin and Cox's Orange Pippin were also fine in this respect, and these were backed up with Adams' Pearmain, Mannington's Pearmain, Golden Reinette, and Forge Pippin, in equally good order. Special awards were also voted to Messrs. Rutley & Silverlock, for fine examples of the Banbury Improved White Spanish Onions; to Messrs. Carter & Co. for a collection of vegetables, including remarkably well grown Long Red Surrey Carrots, also of the Improved Altringham and White Belgian varieties, and samples of Sutton's Red-skinned Flourball, and the American Red Potatos; to Mr. Hibberthwaite, gr., Acklam Hall, Middlesborough-on-Tees, for a large collection of Apples grown in that neighbourhood, the soil of which is said to be cold and damp; to Mr. Hepper for a splendid dish of Chaumontel Pears; to Mr. T. Bray, gr. to E. A. Sandford, Esq., Nynehead Court, Wellington, Somerset, for a capital dish of early forced Asparagus; to the Chairman, for a very fine dish of Josephine de Malines fear, produced on a pot tree, ripened out-of-doors; to Mr. Turner for an excellent dish of Cornish Aromatic Apple, an old variety, not half so much grown as it deserves to be; to Mr. Maclean, gr. to W. P. Herrick, Esq., Beaumanor Park, Loughborough, for a smooth-leaved Cayenne Pine, weighing 8 lb.; and to Mr. Sage, gr. to Earl Brownlow, Ashridge Park, for examples of Lady Downe's, Black Alicante, and Mrs. Pince's Black Muscat Grapes. Mr. William Paul, Waltham Cross, sent three new seedling Grapes, one of which was selected by the Committee for a First-class Certificate. It is a fine white Grape, with large oval berries, nearly 1¼ inch long, of excellent flavour, and almost transparent. The bunches are symmetrical in shape, and hang well. It was named Waltham Cross, after the place of its origination. Another white seedling Grape was also shown, by Messrs. Lucombe Pince & Co., Exeter, but it was not considered of sufficient merit to receive an award. From Messrs. Standish & Co. came a dish of the pretty Painted Lady Apple, which, however were not so good as they looked; and Mr. Cox sent a fine dish of Blenheim Orange. Mr. Gilbert had a seedling Apple named Meas' Seedling. From Mr. Wells, Southend, came a collection of 15 fine bunches of Black Alicante Grapes, grown in his ground vineries. They were well-shaped bunches, with good-sized berries, and carried a capital bloom. Mr. Cadger, gr., Luton Hoo, Beds, exhibited excellent specimens of Berkshire Challenge, Lord Kenyon's Favourite, and a large seedling Cucumber; good examples of Rollisson's Telegragh also came from Mr. Hepper. Mr. T. Clements, gr. to G. G. Hill, Esq., Blackwall Hall, Chesham, sent three large bunches of Black Alicante Grapes; Mr. Simpson, Broomfield, examples of an autumn Cauliflower, named the Desideratum; and Mr. J. Lee, Windlesham, Surrey, a fine box of honey in the comb, together with a new form of hive, of a very neat character. At the close of the meeting, which was the last of the season, a vote of thanks to the Chairman was proposed by Mr. William Paul, and carried unanimously.

Birmingham and Midland Counties Autumn Exhibition of Flowers and Fruits: *Nov.* 30 and *Dec.* 1.—This Society, founded very much on the same principle as the Liverpool Society, held its annual exhibition on Wednesday and Thursday last, and although the Great Cattle Show and the Poultry and Dog Show were held simultaneously, it was well patronised. The noble Town Hall was crowded each evening by artisans and others, who evidently highly appreciated the fine productions staged. On the second day the price of admission was reduced to 3*d.*, and the well-dressed and well-behaved concourse of people evidently highly appreciated the treat afforded them. Birmingham can well be proud of such an exhibition and its attendant visitors, who evidently criticised the flowers and fruit in a manner that showed their love for the beautiful. Chrysanthemums in pots were in great force. Mr. Gallier, gr. to J. Hawkins, Esq., and Mr. Page, gr. to T. Kenrick, Esq., were the largest exhibitors. The best cut blooms were from Mr. Fielding. In fruits, Pine-apples, Grapes, Pears, Apples, &c., were produced in great profusion by Mr. Cox, Madresfield Court; Mr. Ashman, gr. to G. F. Muntz, Esq., M.P.; Mr. Hunt, gr. to J. Breedon, Esq.; and Mr. Gardiner, gr., Eatington Hall, Stratford-on-Avon, *cum multis aliis.* The Chinese Primulas seem to be quite at home in Birmingham, some 40 yards of tables being filled with them, and in fine condition. Mr. Pope, nurseryman, exhibited the best, and Mr. Tomkins the second best, but only as regards cultivation; as to strains, both were equal.—Mr. Tomkins 1st with double varieties. Messrs. Felton & Sons exhibited a fine double variety, white, striped and flaked with carmine and beautifully fringed. Messrs. Felton & Sons also had a nice collection of stove and greenhouse plants.

Notices of Books.

The Natural History of Commerce. By John Yeats, LL.D., assisted by several Scientific Gentlemen. Cassell, Peter & Galpin. 1870.

Natural history and commerce are so intimately connected that any means, whereby science and trade can be still more closely bound together, ought to meet with the cordial support both of scientific and commercial men. Science owes much to commerce, but commerce owes still more to science, for it is to science alone that we look for a complete development of Nature's resources. Men whose lives are spent in commerce have golden opportunities of aiding science in various ways, and conspicuously in that branch which teaches us from what and whence our useful products are obtained. At one time much indifference was shown by business men to such matters, and inquiries bearing upon them were looked upon with a jealous eye, and information purposely withheld. Fortunately a better state of things now exists, and merchants and clerks are not unfrequently found who add to their business experience some knowledge of science in one or more of its various branches. The formation of museums of commercial produce in busy centres, and the establishment of natural history societies in provincial towns, have undoubtedly done much, and are still doing more, to create in the minds of young men a spirit of inquiry and observation. The mind so prepared naturally looks around for books to help it onward, or to confirm information previously gained, and the book now before us is one of a class intended for such a purpose. It has frequently been urged of late that England has no schools to compare with the commercial schools of France and Germany; Dr. Yeats tells us in his introduction that—

"The book is an attempt to supply young Englishmen engaged in mercantile pursuits with such knowledge of the earth and its productions as is regularly afforded in the Handels-Schulen of Leipsic, Berlin, Antwerp, and Amsterdam. In them the future Dutch or German merchant is taught to look beyond the limits of the Zollverein, and to regard the world at large as a vast storehouse, with the contents of which he must make himself familiar. At school he studies the sources of supply for the goods he must hereafter deal in. A counting-house, he is told, is a place in which he will be expected to use his knowledge, not to seek it. He is first made acquainted with the laws and conditions of soil and climate, and then brought into contact with specimens of produce from the different kingdoms of Nature; these he is required to examine and describe methodically. He is habituated to the use of scientific nomenclature, which is suggestive not merely of natural relationship among things, but of their chemical composition and other valuable properties."

The first part of this book is devoted to chapters on the definition and discovery of raw materials; on the climate of the British Isles, and of their botanical and floral regions; on the geology and its effects on agriculture; on British fisheries; on the climate and produce of the British colonies and other parts of the world; and finally on "Nature and man as agents of change," from which chapter we extract the following as an example:—

"By our acquaintance with the *facies* or landscape features of a floral region we are able to judge when and where we can with profit introduce or transfer the plants of one country or hemisphere to another. Thus it is that we have spread the useful food plants, fruits, fibres, and timbers, or strewn our colonies with wild flowers, associated with thoughts of home. The vegetable kingdom is full of striking examples. The fruits of Europe, mostly of Asiatic origin, were removed westward in the same zone, and subsequently to the New World. The diffusion has been carried still further into the zones of the southern hemisphere. The Vine now flourishes in South Africa and Australia. Grains, either tropical or northern, have gone with man into every habitable clime. Maize has enlarged its area into the three continents of the East, and Rice has spread almost as widely in the West. We owe to Chili the Potato, which has lightened existence to extra millions of mankind. The Pine-apple was a native of the Bahamas and Bermudas, and is now plentiful round the Mediterranean. Tobacco, unknown till the sixteenth century, belts both sides of the equator far beyond the tropics. Cloves and Pepper are acclimated in each of the Indies, though native only to the East. Coffee, also, indigenous to Arabia or Abyssinia, has sped through the tropical zone. Thus, also, with the fauna, we have aided Nature in the distribution of her productions, enriching each zone with the representative species of its corresponding zone. The wild horses and cattle of South America seem destined to exterminate the native llama. The English sheep in Australia have driven the kangaroo inland, and threaten its extinction. The effect of introducing our domestic animals into other countries has been to increase our resources for food and clothing, to add to wealth and to the duration of human life."

The second part of the book is devoted to the commercial products of the vegetable kingdom, and is divided into two groups:—1, food plants; and 2, industrial and medicinal plants. The information here given, so far as it goes, is generally good, but there are many important omissions. The botanical names are, with few exceptions, accurately spelt, and the natural order is given to each plant. We take Safflower as an example:—

"Safflower (Carthamus tinctorius, L., natural order Compositæ) furnishes a beautiful rose colour, which is used for silks, cottons, and the manufacture of rouge. Safflower is an annual herbaceous plant, somewhat resembling a Thistle, to which it is allied. The leaves are ovate-lanceolate, somewhat spinous, alternate, sessile; flowers yellow. The Safflower is a native of the Levant, and is cultivated in China, India, and in the south of Europe. The dye is obtained from the florets. These are gathered, pressed into little cakes, dried, and then packed in strong bales, weighing about 2 cwt. each. As found in commerce, these cakes consist of flaky masses of a red colour, intermixed with yellow filaments, the former tint being due to the corolla, and the latter to the stamens. The flowers thus contain two colouring principles, one yellow, soluble in water, and the other rosered, called carthamine, or carthamic acid, soluble in alkaline solutions; this latter, when precipitated from its solution, dried, and mixed with finely-powdered talc, constitutes rouge. It is the carthamic acid which renders the Safflower valuable as a dye. The greater portion of the Safflower imported into this country comes from Persia, Egypt, and the East Indies. The imports, in 1851, were nearly 600 tons."

We think it a pity that the imports have not been brought down to a later period. None are more recent than 1867. The book is not without errors, which should be carefully corrected in the next edition—thus we read at p. 221, that Ebony (Diospyros Ebenum) is a native of Mauritius, whereas it is a native of Ceylon; the Mauritian Ebony being furnished by Diospyros reticulata. Dalbergia latifolia is also given as the source of East Indian Ebony, which, in fact, is the produce of probably two species of Diospyros, viz., D. Melanoxylon and D. Ebenaster—Dalbergia latifolia being the East Indian Blackwood, which is very similar to Rosewood in its veining, but is nearly black in colour. The beautiful wood, known as Calamander wood, is not mentioned. It is also produced by a Diospyros, viz., D. quæsita.

Other mistakes might be pointed out, but they will no doubt meet with proper attention in a new edition.

The third and fourth parts of the book, being devoted to the commercial products of the animal and mineral kingdoms, are somewhat beyond our province. We can only say that in point of arrangement they are similar to the vegetable portion. The book will no doubt circulate amongst those interested in Nature's productions, but we much doubt whether it will be the means of ever bringing about such an amount of acuteness and perception as the author seems to think a man capable of attaining, when he writes such sentences as these:—"A worker in wood will tell, from the texture and grain, not merely the species but the variety of the tree, and the place of its growth."

The Apiary.

Beehives.—It is, I believe, a practice with all scientific bee-keepers to have the end of the frames towards the entrance of the hive. I am now constructing a frame-hive according to my own fancy, and should, therefore, like to know the object of this arrangement. I have 16 good stocks in round straw hives, but my bees do not always build their combs in the same direction: much seems to depend on the first start. I am, therefore, inclined to look upon the position of the frames as a matter of little importance. Your opinion will much oblige *Reason Why.*

[The "reason why" the ends of the frames are made towards the entrance of the hive is to facilitate the entrance of the bees direct to the combs within each bar-frame. These combs are always parallel, at least in the true "bar-frame hives," with the slanting alighting boards. With the long slit, or entrance the whole length of the box, it is quite obvious the bees have to crawl a shorter distance to their own selected combs than if a mere hole be left in the centre of a box on a flat floorboard, and; as "Reason Why" states truly, the bees do not build their combs in the same direction in the common straw hives, so also they often deviate in the badly constucted frame-hives, because in the frames made longer than deep (as the Woodbury frames are) the bees commence on the foundations, on the same long frame; and when the combs approach each other the bees will deviate from the centres and the following combs, taking the outer directions on each side of the frame. At last the

combs are built and attached to two and three frames diagonally, and make the frame-hive as of little value as a common box or straw hive, for the honey-combs can only be lifted out in a mass. The shorter distance of the true bar-frame hive being shorter than deep (with the more modern guide-bar also attached within this shorter space), the bees invariably follow the line of each frame, and have no temptation to build upon two foundations : *vide* the example given in the honey-trough, p. 1222, *Gardeners' Chronicle* of September last. *M. D.*]

Miscellaneous.

THE TREE.

THE Tree's early leaf-buds were bursting their brown :
"Shall I take them away?" said the Frost, sweeping down.
" No : leave them alone
Till the blossoms have grown,"
Prayed the Tree, while he trembled from rootlet to crown.

The Tree bore its blossoms, and all the birds sung :
"Shall I take them away?" said the Wind, as he swung.
" No : leave them alone
Till the berries have grown,"
Said the Tree, while his leaflets quivering hung.

The Tree bore his fruit in the midsummer glow :
Said the girl, " May I gather the berries or no?"
" Yes : all thou canst see :
Take them ; all are for thee,"
Said the Tree, while he bent down his laden boughs low.
From Herr Bjornson's "Arne."

PATENT LAWS.—An amusing satire on the Patent Laws, and on the mode of procedure to be adopted for securing "letters patent," is contained in a recent number of the *Cultivator and Country Gentleman*. The scene is supposed to be laid in America ; but the state of things in this country is so nearly the same, that the satire is quite as applicable here as on the other side of the Atlantic. As the specifications are somewhat lengthy, we cannot reproduce them *in toto*, nor the woodcuts by which they are illustrated, but we may briefly state that one John Smith, of Smithtown, is supposed to have invented a new and improved method of feeding hogs, which consists mainly in so suspending the animal that the sustenance which it takes is compelled to ascend in an upward direction, by which means the food becomes thoroughly digested, and thus imparts all its nutritious qualities to the animal. The arrangement consists of suitable ropes and pulleys, by means of which poor piggy is swung head downwards, by a hook fastened to his tail. If the animal is of the curly-tailed breed, it will be sufficient simply to hook into a curl of the tail ; but if straight-tailed, it will be necessary to effect a union by tying. By the improved method of feeding not only is indigestion prevented, by causing the food to be taken more slowly and in an upward direction, but in the case of a hog suspended by the tail, the weight of the food, added to the weight of the animal's body, will render the position somewhat painful, and the animal will accordingly be disposed to cease eating before he has quite surfeited himself, which is in exact accordance with strict hygienic principles. The inventor's claim is investigated in due time, when it is found that one John Jones has already patented an invention, with the same object of causing the food to pass slowly through the animal, but that the means employed are substantially different. Mr. Jones simply depresses the feeding-trough below the level of the ground, in order that the food may be compelled to pass in an upward direction. Some slight amendments are ultimately made in Mr. Smith's specification, to meet the objection that a hog suspended by his hind feet in a butcher's stall is a "pachyderm in a vertical position," as set forth in Mr. Smith's claim, although it is affirmed by the latter gentleman that it is not suspended, as (by the tail) nor for the purpose (feeding) described.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

THE present naturally dull and depressing atmosphere, surcharged as it is with moisture when it enters plant-houses, should induce all who study the well-being of their greenhouse plants and bedding stuff, to give a little heat occasionally, for the double purpose of dispelling the dampness which may have collected amongst the plants, and of maintaining a lighter and more rarified atmosphere. It is not only essentially necessary to do this on a dull day only, but heat may be afforded with perhaps even greater benefit where the external air is clear. Again, the air in such houses having been so damp, and the amount of light so limited, many plants will have lost their usual vigorous tone of health, and have become incapable of warding off the dampness alluded to, hence the decay of some portion of their foliage naturally follows, which is frequently observable by the tips of the leaves commencing to die off first. From the want of more light, the plants are incapable of digesting the moisture which permeates every breath of air around them A languid performance of the most ordinary, though essential, functions of life takes place, and goes on increasing stage by stage, until the stalky framework only is left of a plant previously clothed with the most luxuriant foliage. Thus it will be seen how essential it is to furnish, by artificial means, the nearest approach to more favourable conditions. We cannot command the sun's rays, which, with rapidly diffused light, warm and dry the air. We have it in our power, however, by placing the pipes or flues low in the body of our plant-houses, to waft warm currents of air upwards throughout the space confined under glass ; and we should not fail, as I have observed, to take advantage thereof on every possible occasion. Be particular at this season not to permit *Caladiums*, which are generally stored away in some out-of-the-way corner, to become too dry. They are very liable to a disease like the dry-rot, which destroys or greatly injures the tuberous roots. Though *Gloxinias* and *Clerodendrons*, &c., should now be kept cool, care should be taken not to let the temperature fall much below temperate, as they do not well submit to it, the former especially. If there is not room, or from any other cause it is not desirable to keep the store pots of *Achimenes* packed away intact until the time for repotting arrives, the tubers may now be turned out, selected, and placed in smaller pots, or bags containing dry silver sand. Do not allow yourself to be lulled into a fallacious state of security in regard to cold frames or pits, or such as are imperfectly heated. I address these remarks more particularly to amateurs, who, unlike gardeners generally, have no straw stacks, &c., to rush to when the enemy—frost—shows an unmistakable advance. Obtain some kind of material suitable to your own requirements, bearing in mind that it should be dry, and possess as much elasticity as possible. Those who have delayed the pruning of their *Pot Roses* should now bring the operation to a close.

FORCING HOUSES.

Those who meditate starting *Pot Vines* at this time, cannot do better than procure materials, and make a hotbed within the house intended for them. Not only will this aid, by giving out a nice soft heat, but also by furnishing at the same time a nice warm humidity, laden with properties more or less ammoniacal, according to the materials used, which will prevent the formation of insect life, and is destructive to such as may already exist. It should be clearly understood, by the uninitiated, that the newest, or, as it is called, the "rankest," stable-dung, possesses no injurious properties for such a purpose. *Pot Roses*, *Dielytras*, *Ghent Azaleas*, *Bulbs*, *Solomon's Seal*, and the many other plants which are forced for their flowers, if plunged in such a bed will start well. It is, moreover, an excellent place wherein to plunge the *Strawberry* plants intended to produce the early crops. Be careful not to permit the heat to rise above 80° around all pots plunged as above. This is the maximum permissible temperature at this period, with any approach to safety, though a more kindly warmth at this dull season is always a mean of 67° to 70°. Maintain a nice warmth around the roots of *Cucumbers*, and study the requirements of the roots in connection with the drying effects of the underlying heating mediums. Give such a soaking of soft tepid water as is likely to reach the whole extent of the soil when it is given at all. With a brisk heat above afford a fair supply of moisture, but with as much fresh air as can well be allowed. If any plants are predisposed to fruit too freely thin them out, and do not overcrop the plants at this season. Where there is a sufficient number of plants it is advisable to let as many of them as possible have an occasional period of rest from food-producing, so that a freer growth may be made and the plants be allowed to gain more vigour, preparatory to the after production of a fuller crop.

HARDY FRUIT GARDEN.

Where a dressing of short manure has not been placed between *Strawberry plantations*, this should now be done. Lay it carefully amongst the plants, so as not to bury any of the leaves or crowns. This will be found a good time to make an attempt to destroy Moss, or other similar parasitical formations on fruit trees. The boles of old trees, if very bad, are better scraped with a suitable iron scraper. The next best antidote is lime and dry wood-ashes, well dusted over all the affected parts. Whilst this is being done, and the surface of the ground is dry and firm, an effort should be made to eradicate any symptoms of the *Aphis lanigera* or American blight. After forcibly removing the external woolly formations, I would suggest an application of methylated spirit.

KITCHEN GARDEN.

Should a sharp period follow the recent light fall of snow, the men's time may be profitably employed in looking over and through all root crops stored away in sheds, &c. Very frequently some of the stock, whether through the wounds made when taking them up, or through inherent disease, rot away, and if not removed, communicate the injury to those next to them. The Apple crop having been rather heavy this season, necessitated their being placed somewhat thickly together at the first. Now, however, as many have been used, room will be found to distribute them more thinly. The shreds and nails taken from wall-fruit trees should be divided, sorted, and stored away. The nails, when sorted, may be placed into a high heat, for the purpose of killing any insects or insect ova that may be on them, and to freshen them a little. For the rest, manure can be wheeled on to vacant ground. Horse-droppings should be collected for successional *Mushroom Beds*, and the earlier collected materials should be turned over for making hotbeds as soon as ready. *W. E.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON

FOR THE WEEK ENDING WEDNESDAY, DECEMBER 7, 1870.

1870. MONTH AND DAY. December.	At 9 A.M. Readings of Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point.	Degree of Humidity	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
1. Thurs.	30.49	36.8	35.2	33.0	86	2.2
2. Friday	30.44	32.1	30.0	25.2	74	1.6
3. Satur.	30.14	34.5	32.2	28.5	77	1.9
4. Sunday	30.13	32.5	29.6	23.2	67	1.4
5. Monday	30.18	29.3	28.5	25.7	89	1.7
6. Tues.	29.70	35.0	34.3	31.2	93	2.2
7. Wednes	29.55	34.2	33.0	30.8	87	2.1

1870. MONTH AND DAY. December.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Average of 9 Years.	WIND. Direction	Horizontal Movement.	RAIN. In Inches.
	Deg.	Deg.	Deg.	Deg	Deg		Miles	
1. Thurs.	39.3	30.0	9.3	35.5	— 0.6	Calm.	205	0.00
2. Friday	35.5	29.5	6.0	32.3	— 9.9	E.S.E. W. N. N.	125	0.00
3. Satur.	41.9	29.7	12.2	36.9	— 5.4	N.	315	0.00
4. Sunday	39.7	31.2	8.5	35.4	— 6.8	E.N.E. N.N.E.	280	0.12
5. Monday	33.7	25.3	8.4	29.4	— 12.8	S.W.	125	0.11
6. Tues.	36.9	32.1	4.8	34.4	— 7.7	S.W. N.	145	0.31
7. Wednes	37.7	30.0	7.7	33.8	— 8.2	N.	342	0.01

Dec. 1.—Cloudy. A little thin rain fell during the morning.
— 2.—Generally cloudy. Gloomy and foggy. Lunar corona at night.
— 3.—Overcast. A little rain fell.
— 4.—Variable. Rain and snow fell during the early morning. Generally fine.
— 5.—Overcast. Snow fell during the day.
— 6.—Overcast. Rain fell almost continuously till the evening.
— 7.—Cloudy. A fine day.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS.

DURING THE WEEK ENDING SATURDAY, DECEMBER 3, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	55.4	29.3	30.2	44.5	32.3	12.2	38.2	0.00
Blackheath ..	49.0	29.5	17.4	42.8	34.1	8.7	38.9	0.01
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	47.2	30.8	16.4	43.1	36.9	6.5	39.9	0.05
Wolverhampton	46.8	28.8	18.0	42.8	36.0	6.9	39.7	0.09
Leicester ..	47.5	31.0	16.5	43.8	35.6	8.2	39.5	0.05
Norwich	47.5	33.5	14.0	44.7	37.4	7.9	40.6	0.09
Nottingham ..	45.7	28.0	17.7	41.7	36.5	7.2	39.9	0.02
Sheffield	45.5	33.1	12.4	43.3	36.8	6.5	39.4	0.14
Liverpool	46.0	34.0	12.0	43.4	37.0	6.4	40.2	0.04
Manchester ..	..	..	..	..	..	..	..	..
Salford	48.4	32.0	16.4	44.0	36.3	7.7	40.0	0.02
Bradford	46.0	34.1	11.9	43.8	36.2	7.6	39.8	0.00
Leeds	45.0	34.0	11.0	42.6	35.9	6.7	39.4	0.04
Hull	46.0	29.0	17.0	43.6	34.6	9.0	38.9	0.59
Newcastle ..	46.0	32.0	14.0	43.0	34.0	9.0	38.3	0.00
Edinburgh ..	41.7	31.0	10.7	..	..	..	37.0	0.10
Glasgow	44.7	25.0	19.7	..	..	..	37.4	0.00
Dundee	43.0	32.0	11.0	..	..	..	37.9	0.00
Aberdeen	43.0	30.2	12.8	..	..	..	37.1	0.09
Paisley	40.0	27.0	13.0	..	..	..	36.1	0.00
Greenock	43.5	34.0	9.5	..	..	..	39.1	0.00
Leith	44.8	26.8	18.0	..	..	..	39.0	0.00
Perth	45.0	27.0	18.0	..	..	..	37.1	0.00
Dublin	54.2	34.5	19.7	..	..	..	42.9	0.00

JAMES GLAISHER.

Notices to Correspondents.

BOOKS : *G., Bath.* The book in question is published as a Government publication in India.

FLOURBALL POTATO : *G. King.* See our advertising columns.

HOT-WATER PIPES : *C. W. F.* We cannot tell, without knowing exactly what you have used, whether the varnish will be injurious or not. Are there any indications of damage? If so, you had better remove it by means of painter's solvent.

MEDLAR JELLY : *Mary* says :—" I shall feel obliged to any of your correspondents for a good recipe for making Medlar jelly. This fruit is plentiful and very fine this season."

MESSRS. WILLIAM ADAMS & SONS, *Fennell Street, Manchester.* We know nothing of the transaction to which you refer in your memorandum of the 6th inst.

NAMES OF FRUIT : *A Young Man from the Country.* Nos. 3, 4, 6, all probably King of the Pippins ; 7, Margil ; 8, Fearn's Pippin. *Pear :* Beurré Rance.—*J. C. & C.* Your Pear may be Vicar of Winkfield, but it is absurd to suppose that any one can name a Pear correctly from such a miserable specimen.

NAMES OF PLANTS : *Bob.* Pleopeltis venosa.—*H. J.* 1, Cypripedium venustum ; 3, Nephrolepis tuberosa ; 4, Goniophlebium appendiculatum.—*Reader.* Too imperfect.—*Thomas Davis.* Your hardy heaths are—1, Erica tetralix ; 3, E. cinerea ; and 2, Calluna vulgaris.

—*L. B.* Abutilon Duc de Malakoff, one of the hybrids from A. venosum. It may be planted against the rafter of a greenhouse, after the fashion of climbers, but is a coarse-habited plant.—*C. B.* Santolina Chamæcyparissus, one of the Sea Lavenders; frequently used as an edging plant.

THE POTATO TOURNAMENT: *An Admirer of the Noble Tuber* asks:—"From what cause the proposed Potato tournament was allowed to fall through after the project had received such assurances of support from the leading growers, as appeared in your columns?" We cannot say, unless it was from a lack of spirit, or, more probably, of funds. Perhaps some of our correspondents who advocated the subject will state the reason why. It certainly seems a pity that, for want of energy, such a project should not have been carried out.

CATALOGUES RECEIVED.—James Cocker's Descriptive Priced Catalogue of Forest and Fruit Trees, &c.—P. J. Perry, Catalogue of Hardy Shrubs, Conifers, Fruit Trees, &c.—G. Edwards, Catalogue of Roses, Fruit Trees, and Florist's Flowers.—Dick Radclyffe & Co.'s Illustrated Sheet of Horticultural Elegancies, &c.—Suttons' Amateur's Guide and Spring Catalogue.—E. G. Henderson & Son's Autumn Catalogue of Herbaceous and Alpine Plants.

COMMUNICATIONS RECEIVED:—H. J.—P. M.—P. B.—D. T. F.—W. T.—A Head Gardener.—W. M.—N. & S.—J. H.—A. D.—M. M.—R. G.—D. P.—Enquirer.—J. C. N.—J. D.—J. N.—E. M., Harrow.—D. J. N.

Markets.

COVENT GARDEN.—Dec. 9.

There is a slight improvement among the wholesale dealers, and orders from the provincial markets are more general than for some time past, but heavy consignments are difficult to dispose of. Good Hothouse Grapes, both Hamburghs and Muscats, command better prices. Pears consist of Glou Morceau, Winter Nelis, and Chaumontels; Apples of New Town Pippin, Ribston Pippin, Cox's Orange Pippin, and others. Amongst flowers we have Orchids, Chrysanthemums, Heaths, Cyclamens, Primulas, Tulips, Camellias, and Pelargoniums.

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	to 2 0	Oranges, per 100	6 0	to 10 0
Grapes, per lb.	4 0	— 8 0	Pears, per doz.	2 0	— 6 0
Lemons, per 100	6 0	— 10 0	Pine-apples, per lb.	4 0	— 6 0
Melons, each	1 0	— 3 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. lb.	..	1 0 to 2 0	Herbs, per bunch	0 2	to 0 4
Beet, per doz.	..	2 0 — 3 0	Horse-Radish, p. bun.	3 0	— 5 0
Brus. Sprouts, ½ sieve	1 0	— 3 6	Lettuces, p. score	1 6	— 3 0
Cabbages, p. doz.	1 0	— 1 6	Mint, per bunch	0 3	— 0 6
Carrots, p. bunch	0 4	— 0 8	Mushrooms, p. pott.	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch	0 4	— 0 9
Celery, red, p. bun.	1 6	— 2 0	Parsley, p. bunch	0 2	— 0 4
— white, do.	1 0	— 1 6	Salsafy, per bundle	1 3	— 1 6
Cucumbers, each	0 6	— 1 0	Seakale, p. pun.	3 0	— 3 6
French Beans, p. 100	3 0	— 4 0	Shallots, per lb.	0 0	— ..
Garlic, per lb.	0 8	— ..	Spinach, p. bushel	2 0	— 3 0
			Tomatos, per doz.	1 0	— 1 6

Potatos, Regents, per ton, 60s. to 80s.: Kidneys, 80s. to 100s.: Rocks, 50s. to 60s.

POTATOS.—Southwark, Dec. 5.

During the past week the arrivals coastwise have been fair, as well as by rail. The trade for all best descriptions keeps steady. The following are this day's quotations:—Yorkshire Regents, per ton, 70s. to 80s.; Lincolnshire do., 65s. to 75s.; Dunbar and East Lothian do., 75s. to 80s.; Perth, Forfar, and Fifeshire do., 65s. to 75s.; Kent and Essex do., 55s. to 65s.; do. Rocks, 55s. to 60s.

Chapman's Patent.

EXHIBITION and TRANSMISSION CUT FLOWER CASES, and the MULTUM IN PARVO VEGETABLE and SALAD CASES, for Exhibition purposes improved by Mr. R. Gilbert, of Burghley), on quite a new principle, may be obtained from any of the Agents, or

W. & S. JENNINGS, LTD. (Limited), High Orchard Works, Gloucester, Sole Manufacturers.

GEORGE HALL, late Manager to the late Saynor's Firm. He was for 22 years in their employ.

GEORGE HALL and SON'S celebrated PRUNING and BUDDING KNIVES, SCISSORS, &c., may be obtained from the most respectable Nurserymen and Seedsmen in the kingdom, also America, France, Germany, Holland, Prussia, Russia, &c.

N.B.—We only make one quality, the best that can be manufactured, the same as late Saynor's always made during their lifetime, with all the latest improvements.

CAUTION.—None are genuine unless marked "GEO. HALL AND SON" on the marks round the shoulder, as these Blades are tempered by a process known only to the Makers.

Engravings of Patterns, with Price List, sent gratis on application to Horticultural Cutlery Works, Sheffield.

OXFORD FIRST PRIZE CHURN, suited for small occupations.

BRADFORD'S PATENT COUNTER CURRENT. (See Report

Mr. BRADFORD'S Counter Current Churn does excellent work, and the ease with which the butter was got together, and completely freed from the butter-milk without being touched by hand,

THOMAS BRADFORD AND CO., 63, Fleet Street, London, E.C.: Cathedral Steps, Manchester.

THIEVES.—SPIKED PLATING, 2½d. per foot run, 6-inch wrought-iron strong spikes, 2½ inches apart, in length, from 6 feet to 18 feet: 3d. spikes, 1½d. per foot. Eight Tons of NAILS, from 2½ to 6 inches, 5½l. per Ton, wrought iron, of best quality, and less than ½ cut. Sheet Iron, 4d. per lb. Wire Netting. N.B. 500 Yards six wires deep TWISTED GALVANISED FENCING, 5l.10.

R. RICHARDSON, 99, Euston Road, London, N.W.

POULTRY HOUSE for Eight Fowls, 30s.; for Twelve Fowls, 40s., made in panels. TOOL HOUSE, 6 by 6, 3l. SHED, with Door and Window, 10 by 8, 5l. COACH HOUSE and STABLE, 14 by 14, 6l12. COW SHEDS and Outbuildings very cheap. PHEASANTRIES. WIRE TRELLIS for Flowers and Plants, 6-inch diamond mesh, 3½d. per foot.

R. RICHARDSON, 99, Euston Road, London, N.W.

The Noted French Cold Grafting Wax

(MASTIC HOMME LEFORT),

For Grafting, Budding, Healing, &c., may be obtained of HOOPER AND CO., Covent Garden, W.C., Sole Wholesale Agents for the Noted Kingdom; also through any London or Provincial Seedsman and Nurseryman.

Indestructible Terra-Cotta Plant Markers.

MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent post free on application; also Patterns of Ornamental Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley.

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, punched parchment, 4 inches long, 4s. per 1000, or 5000 for 25s., carriage paid to any railway station on delivery. Sample Label sent on receipt of a postage stamp. Orders delivered free in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society. The above can be had, of all sizes, wholesale of

CHARLES J. BLACKITH AND CO.,
Cox's Quay, Lower Thames Street, London, E.C.
Retail of the principal Seedsmen. Prices on application.

CHEAP PAVING TILES.—A manufacturing Firm have a considerable stock of PLAIN and ENCAUSTIC TILES, more or less damaged in the process of manufacturing, that they would be willing to dispose of at prices below those of the commonest description of Paving Materials. Any number of Patterns of these Tiles are available for the Floors of Cottages, Farmhouses, &c., and can be supplied at a very low rate

E. F., Post Office, Broseley, Salop.

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Beg to inform the Public that they keep a Stock of their ENAMELLED and MAJOLICA TILES

At the China and Earthenware Manufactory,
Stoke-upon-Trent, and at
28, Wall-street, Hatton Garden, London
They have no connection with any other House of the same name.
Please to note the address

Horticultural and Window Glass Warehouses.

JAMES MILES, 6, High Street, and 12 and 13, Blosson Street, Shoreditch, London, E.

CONSERVATORY and ORCHARD-HOUSE GLASS.

Genuine White Lead, Oils, Colours, Brushes, &c.

GARDEN ENGINES, PUMPS, SYRINGES, INDIA-RUBBER HOSE, TAPS, CONNECTIONS, &c.

Prices upon application

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs for Farm Buildings, sent by JEAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

HOT-WATER APPARATUS of every description, fixed complete in any part of the country, for Warming Greenhouses, Conservatories, Forcing Pits, &c.

Plans and Estimates on application.

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Manufactory, 7, 6, Bankside, Southwark, S.E.

SMOKY CHIMNEYS.—The best cure is the PATENT ALBERT CHIMNEY CAP. Three hundred on Buckingham Palace; and hundreds also on the halls and mansions of the nobility, public buildings, &c. Iron, painted wrought-iron, 3s. each; galvanised iron, 4s. each.

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THE GRANITIC PAINT, the best for the finest painting and the roughest work. Used in the Crystal Palace, Sydenham, by the Trinity House, the Brighton and Metropolitan Railways, and numerous other Public Companies, Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.

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DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Portus Bricks and Stone, Cement and Plaster, preserved from decay

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For Samples and Prices apply to
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RUSSIA MATS, for Covering Garden Frames.—ANDERSON'S TAGANROG MATS are the cheapest and most durable. Price List, which gives the size of every class of Mat, forwarded post free on application

JAS. T. ANDERSON, 7, Commercial Street, Shoreditch, London

Archangel and Petersburg Mats.

ARCHANGEL MATS, under present value; PETERSBURG MATS, all prices. Sample and prices at J. BLACKBURN AND SONS, Russia Mat and Sack Warehouse, 4 and 5, Worm-wood Street, London, E.C.

E. T. ARCHER'S "FRIGI DOMO."—Patronised and used for Frogmore and Kew Gardens. It is much cheaper of prepared wool, and a perfect non-conductor of heat or cold where it is applied.

PROTECTION AGAINST FROST
WOOL NETTING, 2 yards wide, and 1s. 6d. per yard
"FRIGI DOMO" CANVAS

Two yards wide	1s. 9d. per yard.
Three yards wide	2s. 8d. per yard.
Four yards wide	3s. 6d. per yard.

SCRIM CANVAS, 72 inches wide, 70 yards long, 6s. 6d. to 8l. 5s. per yard
HESSIAN CANVAS, do., do., 54 and 72 inches wide, 6½d. and 8½d. per yard
ELIJAH THOMAS ARCHER, Sole Maker, 7, Great Trinity Lane, Cannon Street, City, E.C., and of all Nurserymen.

THE ROYAL HORTICULTURAL SOCIETY REQUIRE a SUPERINTENDENT for their Gardens at Chiswick. Written applications, stating age, where employed, and testimonials, to be sent in on or before MONDAY, December 19, to Mr. JAMES RICHARDSON, Assistant Secretary, Royal Horticultural Society, South Kensington, W

To Rose Growers.

MESSRS. VEITCH AND SONS wish to ENGAGE a SUB-FOREMAN capable of taking charge of about Eight Acres of Nursery Ground, devoted more particularly to the cultivation of Roses in Pots and Standards, and also to the Budding, Grafting, and Cultivation of Roses, and also the choice kinds of hardy Trees and Shrubs, would find this a very comfortable situation. There is a good house on the premises, which is near the Combe Wood Nursery, Kingston Hill.—Apply in the first instance by letter, stating references, wages required, &c., to The Royal Exotic Nursery, King's Road, Chelsea, S.W.

WANTED, as HEAD GARDENER, where three are kept, a steady, industrious Man, fully competent in every respect.—Reference will be required to where employed, with all particulars, to Box No. 214, Post Office, Sheffield.

WANTED, an active MAN, with good recommendation, to take charge of the Houses in a small Nursery, where Soft-wooded Plants, Grapes, &c., are grown to some extent. Must be a good Propagator of Bedding, Azaleas, Camellias, &c., and will have to superintend the Budding and Grafting carried on.—State age, wages expected, and where lived last, to EDWIN HILLIER, Nurseryman, Winchester

WANTED IMMEDIATELY, TWO UNDER SHOPMEN, in a London seed House. Salary 18s. to 22s. a week, according to age and experience.—Write particulars to R. AND CO., *Gardeners' Chronicle* Office, W.C.

WANTED, a SHOPMAN, who thoroughly understands the Retail Seed Trade; also to Travel occasionally. Unexceptionable references required.—Apply, stating all particulars, to G. AND W. YATES, Seed Merchants, Market Place, Manchester.

WANTED, in a large Fruit Tree Nursery, a good WORKING UNDER FOREMAN, to assist in the Budding and Grafting, and the Execution of Orders. A good place for a suitable Man.—A. Z., *Gardeners' Chronicle* Office, W.C.

WANTED, in a Wholesale London Seed Establishment, a YOUTH to assist in the Shop, putting up Parcels, &c., one with a knowledge of the Trade preferred. Apply, stating age, experience, and salary expected, to ASSISTANT, Alfred Legerton, Seed Merchant, 5, Aldgate, London, E.

WANTED, in a Gentleman's Family in Yorkshire, a COOK-HOUSEKEEPER, who thoroughly understands her duties, and is a very good Cook. Wages £25 to £30. Wages from £18 to £20.—G. W. FLUXTON, York.

WANT PLACES.—Letters to be Post Paid.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.W.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, N.W.

JOSEPH MEREDITH, The Vineyard, Garston, Liverpool, begs to inform Noblemen and Gentlemen that he has several GARDENERS, of First-class Certificates, requiring Situations, who he will be happy to recommend.

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JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may rely on JAMES CARTER & CO. adopting the most stringent regulations in reference to testimonials as to ability, honesty, &c.

GARDENER (HEAD).—Married; thoroughly practical in the cultivation of Pines, Vines, Peaches, Melons, Cucumbers, Mushrooms, Stove and Greenhouse Plants, and Flower and Kitchen Gardening. Highest testimonials for character and ability.—K. J., Gardener's Post Office, Tatton, Southampton, Hants

GARDENER (HEAD); Age 30, married, one child.—THOMAS FOOTE, for the last five years Head Gardener at Haldon House, will shortly be disengaged, and begs leave to offer his services to any Lady, Nobleman, or Gentleman requiring the services of a practical man, well versed in the various branches of modern horticulture. Reference as to character and abilities kindly allowed by Sir T. Fuik, Bart., M.P., Haldon House, near Exeter

GARDENER (HEAD).—Age 31, married, no family; thoroughly practical. Has had great experience in Growing and Forcing Pines, Vines, and Greenhouse Plants, Flowers, and Kitchen Forcing of all sorts of Fruit and Vegetables; keeping the Conservatory gay throughout the year, and general Management. Fruit, Flower, Kitchen, and Pleasure Grounds. Can be recommended as a Gentleman-like and steady Servant. Testimonials of the highest order, and reference kindly permitted to late employer.—T. D., 2, Prospect Place, Hackney, N.

GARDENER (HEAD), or GARDENER and BAILIFF.—Age 32, 12 years' first-class experience. Unexceptionable character.—S. RANDALL, West of England Seed Establishment, Exeter.

GARDENER (HEAD, WORKING), married, from the South; steady, and thoroughly practical in all branches of Modern Gardening, Forcing all kinds of Fruits, Flowers, Vegetables, Erecting and Heating Horticultural Buildings, Laying out New and Remodelling Old Grounds. Can be highly recommended.—A.B., 28, Palestine Place, Whitham Road, Broomhill, Sheffield.

GARDENER (HEAD, WORKING).—Has a thorough knowledge of the Management and Growth of Grapes and Peaches, in and out of Pots; Melons and Cucumbers, in Frames, Pits, or Houses; Stove, Greenhouse, Conservatory, and Orchard House; a first-class Mushroom Grower, Kitchen and Flower Gardener. State particulars to C. H. S., 5, Packenham Street, Gray's Inn Road, W.C.

GARDENER (HEAD, WORKING), age 35, married.—WILLIAM HENDERSON, late Foreman to the gardens of Thomas Marmaduke Hutchinson, Esq., Hurworth Hall, Meltb., Rotherham, is at liberty to treat with any Lady or Gentleman to undertake the services of himself and wife as above. Can understand the Early and Late Forcing of Fruit, Flowers, and Vegetables, and the Management of Fruit, Flower, and Kitchen Gardens. Wife, having no family, can undertake the duties of Laundress, or take Charge of Gentleman's Residence. Unexceptionable character.—WILLIAM HENDERSON, Cocken Hall, Fence Houses, Durham.

GARDENER (HEAD), where two or more are kept.—Age 29, single; thoroughly practical in the various branches of the profession. Good character.—G. H., 2, Britannia Road, Surbiton, S.W.

GARDENER (HEAD), where two or more are kept.—Thoroughly understands all kinds of Early and Late Forcing, the cultivation of Stove and Greenhouse Plants, Orchids, &c., and the usual routine of Flower and Kitchen Gardening. Character will bear the strictest investigation.—R. BUCKINGHAM, The Rookery, Downe, Beckenham, Kent.

GARDENER (HEAD, OR SINGLE-HANDED).—Age 38, married, one child. Seven years' good character.—ALPHA, Post Office, Windlesham, Bagshot.

GARDENER.—THOMAS MYLES, for the last four years Gardener to the Hon. Mr. G. Hayter, Bart., South Mimms, Brackbell, is at liberty to engage with any Nobleman or Gentleman in want of a practical Man. Has a thorough knowledge of Early and Late Forcing, Plant Growing, and the Management of Kitchen and Flower Gardens, &c. Good character.—Post Office, Bracknell, Berks.

GARDENER (SINGLE-HANDED).—Age 28, married; can have an excellent character from his last employer, with whom he has lived four years. Further particulars can be had by reference to T. BANKS, Nurseryman, Thirsk, Yorkshire.

MANAGER, General or Assistant.—The Subscriber, who is possessed of a thorough practical knowledge of the Nursery and Seed Business, and practised also in Laying-out Grounds, Furnishing Plans and Estimates, &c., is prepared to treat for an Engagement in either of the above capacities, or for a Partnership in a respectable concern. Further particulars furnished on application addressed to Y. Y., *Gardeners' Chronicle* Office, W.C.

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H. AND F. SHARPE have fine stocks of the above, comprising AMERICA, EARLY ROSE, EARLY SANDRINGHAM, BOVINIA, and all the principal early and late varieties worthy of cultivation. The quality is very fine, and prices low. Special quotations on application.
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WATTIS AND SON invite the attention of the trade to their new and very remarkable POTATO, which is destined to become the leading winter variety, and which only requires to become known to be universally cultivated. Purchasers can have fine specimens for Show. Price on application.
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BIRD'S "KING of the CUCUMBERS."—The best for exhibition. Length 24 to 30 inches. White spine, handsome fruit, short neck or handle. Per packet 1s. 6d.
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LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, specially adapted for Autumn Sowing.
DISSOLVED BONES, for Dressing Pasture Lands
PREPARED OF PHOSPHATED GUANO, for Corn and Roots, and every other MANURE required.
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REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee to furnish, and is in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
Signed) "AUGUSTUS VOELCKER.
The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

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All other MANURES and CAKES as per Price List, supplied on the lowest terms.

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This Company was originally established in 1865, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz.,
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Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
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Capital, £200,000 : Shares, £2 each, £1 paid on allotment.
Life Tickets, £1 1s. ; Annual Tickets, 10s. each, entitling the holder to purchase through his agency.

This Association has been formed by gentlemen engaged in Agriculture for the purpose of supplying all kinds of Agricultural Implements or other goods, and more especially pure and genuine Oilcakes and guaranteed Manures, on the co-operative system
Farmers' Clubs and large consumers of Oilcakes, Manures, &c., are invited to co-operate with this Association for the purchase of Agricultural requisites.
Further information, with Price Lists, Samples, and Analyses, on application to the Secretary
The Association have regular importations of pure Linseed and Decorticated Cotton Cakes, direct from New York.
Best New York Linseed Cakes, in bags, £11 2s. 6d. per ton ex ship.
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Special terms to large consumers

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E.

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SALES and VALUATIONS carefully and promptly conducted.

Landscape Gardening, Groundwork, the Making of
NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.
Park Fencing undertaken to any extent.
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GARDENS and LAND WANTED.—The Managing Director is now in a position to treat for the Rental of Gardens or Land for the Company. All offers to be made without delay. Gardens or Land within a circuit of 50 miles of London will be preferred. Address,
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FOR SALE, an old established NURSERY and SEED BUSINESS, within a few miles of London, containing about 11 Acres of General Nursery Stock, numerous Glass Structures, Seed Shop, Dwelling House, &c.
For particulars apply, by letter only, to G. H. H. C., 47, Bessborough Gardens, Pimlico, S.W.

To Nurserymen, Florists, and Others.

TO BE SOLD, The PORTLAND NURSERY, at Tonbridge, Kent, containing 9½ acres, of which about 2 acres are stocked with Shrubs, Conifers, and Forest Trees, &c., and held on a 13 years' lease at the low rent of £80 per annum. Stock, &c., at the low rent of £80 a year. Stock to be taken to valuation—from £200 to £300
For particulars apply to Messrs STONEWALL AND SIMPSON, Solicitors, Tunbridge Wells.

Eaton Road Nurseries, Chester.

TO BE SOLD, with immediate possession, the desirable LEASES of the above old established and well known NURSERIES, in consequence of the death of the late Proprietor, Mr. George Chivas. The remaining Stock, with two Greenhouses, Pits, and Utensils in Trade, to be taken at a valuation. The whole or a portion of the Land (which extends over about 75 acres), can be taken at the option of the purchaser.
Apply to Mr. JAMES GIBSON, Executor to the late Mr. Chivas, 169, Upper Parliament street, Liverpool.

SALES BY AUCTION.

Plants and Bulbs from Holland.

MR. J. C. STEVENS will SELL by AUCTION, at his Rooms, 38, King Street, Covent Garden, W.C., on MONDAY, December 12, at half-past 12 o'Clock precisely, Standard and Pyramid FRUIT TREES, Specimen Conifers, Standard, Dwarf, and Weeping ROSES, RHODODENDRONS, HOLLIES, and other Plants, just received from various Dutch Nurseries; also an Importation from Holland of choice HYACINTHS, TULIPS, CROCUSES, IRIS, NARCISSUS, LILIUMS, GLADIOLI, and other Bulbs
On the morning of Sale, Catalogues may be had.

38 and 39, Gracechurch Street, City, E.C.
CONSIGNMENT from the INSTITUTE SALE.

MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, at the City Auction Rooms, 38 and 39, Gracechurch Street, E.C., on MONDAY, December 12, at 12 for half-past 12 o'clock precisely, about 200 choice Double CAMELLIAS and AZALEA INDICA, compact and very thriving plants of the best varieties, beautifully set with bloom buds; also a quantity of handsome standard and Dwarf ROSES, selected FRUIT TREES, specimen GREENHOUSE RHODODENDRONS, and other choice AMERICAN PLANTS; an assortment of CONIFERÆ, and EVERGREEN SHRUBS, DUTCH BULBS, &c.
On view Sunday morning, and Sale Catalogues may be had at the Rooms as above, and of the Auctioneers and Valuers, Leytonstone, E.

Leamington.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, fine CAMELLIAS and AZALEA INDICA, CHOICE FERNS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. W. Willis & Son to SELL by AUCTION, on the Premises, the Horticultural Establishment, as the Milverton Nursery), Leamington, on TUESDAY and WEDNESDAY, December 20 and 21, at 11 for 12 o'Clock precisely each day, without reserve (the land being required for building purposes), the whole of the thriving NURSERY STOCK, consisting of a choice and varied assortment of Evergreen and Coniferæ Shrubs, comprising fine Thujopsis, Cupressus, choice Abies and Thujas, Golden Yews, variegated and named Hollies, unique specimen trimmed Box, Rhododendrons, Spruce Firs, Standard and Dwarf Roses, large quantities of fine Standard Beech, Peaches, and Nectarines, and Silvering Fruiting Pear Trees; also some handsome specimen Camellias and Azalea indica, choice Exotic Ferns, &c
May be viewed any day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

Tansley Nursery Grounds, near Matlock, Derbyshire.

TO GENTLEMEN, NURSERYMEN, and OTHERS.
IMPORTANT SALE of NURSERY STOCK

MESSRS. ELSE AND NEWBOLD have been favoured with Instructions, from Mr. Joseph Smith, Jun., of Moor Edge Nurseries, to SELL by PUBLIC AUCTION, without reserve, on MONDAY, TUESDAY, WEDNESDAY, and THURSDAY, December 12, 13, 14, 15, and following days, if necessary, until disposed of, an extensive assortment of transplanted FOREST TREES and SEEDLINGS, choice EVERGREENS, flowering SHRUBS, &c., which must be cleared off before March 20 next.
The above Nurseries are two miles from Matlock Bridge, and four from Matlock Bath (on the Midland Railway), at both of which stations conveyances are at hand
Descriptive Catalogues may be had ten days prior to the Sale ; and further information obtained of Mr. JOSEPH SMITH, Jun., Moor Edge Nurseries, Tansley, near Matlock; of Mr. STEPHEN SMITH, of the same address; or at the offices of the Auctioneers, Matlock Bridge.

Third Poultry Sale of the Season.
LUCAS'S REPOSITORY, LIVERPOOL.

MESSRS. LUCAS AND CO. will SELL by AUCTION, on FRIDAY, December 23, at 11 o'Clock prompt, at their Repository, Liverpool, THREE HUNDRED LOTS of choice DOMESTIC POULTRY and PIGEONS. No Entrance Fee for Pigeons. Poultry 1s. per Pen. Entrance CLOSES on MONDAY, December 19. No more than 300 Lots offered. All Birds to be at the Repository on Thursday evening, or before 9 o'Clock on Friday.
NOTE.—Three Birds in each Pen, except of great merit. Pigeons in Pairs.

THE LANDS IMPROVEMENT COMPANY.—
(Incorporated by Special Acts of Parliament.)
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Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.
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Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.
The Company advances money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Owners in respect of their Fee Farms.
UTILISATION of SEWAGE.—The Company also advances money for the purpose of Works of Sewage Irrigation
The whole outlay and expenses are repayable by a rent-charge upon the land, redeeming principal and interest, over 25 years.
No investigation of title is required.
For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

Agricultural Land Improvements, Drainage,
FARM BUILDINGS, LABOURERS' COTTAGES, &c
THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY,
Incorporated by Act of Parliament in 1849.
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Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.
Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.
The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge of about 6 per cent in 31 years, or at the option of the Landowners in a shorter term.
No investigation of title necessary, and no legal expenses incurred.
Note.—The Company will undertake the Erection of Cottages for Agricultural Labourers at a reduced rate of commission and on very favourable terms.
Application to be made to ARTHUR MILMAN, Esq., the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

The Agricultural Gazette.
SATURDAY, DECEMBER 10, 1870.

WHAT IS THE STYLE OF FARMING WHICH OUGHT TO BE?

This is the question which includes the whole business—beginning, substance, end—of all our agricultural societies, chambers, meetings, shows! The fat stock show of the Smithfield Club—the lectures of Mr. TRASK and Mr. H. M. JENKINS—the annual report of the Royal Agricultural Society—have all been mere futility and empty fuss—worthless, except, perhaps, for a holiday excitement—if they have not helped the solution of this question, or somewhat enabled us to act upon the proper answer to it.

What then is good farming—that ideal of perfection which Mr. MASON probably had before his mind when his 100 gs. cup was offered at the Oxford meeting?—Is it the management of the "good tenant," from the land agent's point of view, whose land, and crops, and stock, rickyard, fences, roads, and implements, are all in tidy order—clean and trim and well arranged—painted, thatched, and mended; his stock in fair and comfortable plight—his crops always in and off in proper time—his labourers (old hands kept, and all in steady work) looked after by a careful master—the tenant himself punctual and exact in all his doings, especially on pay days—and, though (if we may gather it from our correspondents, "W. G. D.," and "J. C. M.") he may be making a bare living, yet, patted on the back by official men, awarded the 1st prize for his successful maintenance of the good old rules, and even made the occasion of rebuke to others by comparison.

Or is it that of the man whom you catch speaking to himself rather than for you, as you walk with him around his clean and well-tilled

fields:—"I know there's lots of money to be made at farming yet. I have had 25 tons a-year of nitrate up till now. I shall go in for 40 tons in '71.—You know," turning now to his companion, and speaking as if intending to be heard, "*You* know the condition of the land. I have been at it now for 16 years, gradually learning what even this poor soil will do if you keep stock enough, and feed it well. My Barley crop, where it was the third grain crop in succession, was the best I grew even in this dry summer on a shallow brash. So long as I grow crops like that, and keep my land as clean, I shall throw all the rules of crop rotations to the winds."

The two cases are not unfairly put, and they are fairly paralleled by the Kirtlington and Ashgrove farms, which have been lately described in our columns; and which are contrasted by Mr. HALL KEARY in his official report. His description of the "course of cropping adopted at Kirtlington shows," to use his own words, "a very different system of farming from that pursued at Ashgrove;" and he trusts "that Captain DASHWOOD will pardon a comparison which may be instructive." It is impossible to forget that the comparison which follows—the whole report, indeed—has been written by a land agent. "At Ashgrove and at Upper Winchenden, one-half only of the arable land is usually under white grain crops. The manure is all applied under ground, and much reliance placed on the fertilising presence of cake and corn-fed sheep; but at Kirtlington four-sixths of the arable land is given up to cereal crops, nitrate of soda being the great stimulant employed to force these extra crops from a somewhat exhausted soil."

The elements of good farming, according to this, consist in having one-half only of the land in grain crops; in putting the manure that is applied all under ground; and in depending on the fertilising power of cake-and-corn-eating sheep. We should rather sympathise with the tenant's view; and, certain that all other desirable conditions are then secure, say that the best system of farming is that which makes the most profit out of a 21 years' lease.

Surely a farm on which, every year, £4 worth of fat meat is produced per acre, over and above all purchases of stock; and on which more than £3 per acre is spent on cake and on manure, and £2 per acre so spent in wages as that the land is clean, the stock well done, and the crops first-rate, is not open to rebuke—hardly open, one would say, if it could be said without offence, even to an "instructive comparison" with any one. Mr. HALL KEARY may advocate strict obedience to the alternation of green and white crops, and we may, with Captain DASHWOOD, pardon him for the lesson which he thinks has been read to Kirtlington by the management at Ashgrove; but until the profit in the long run of the tenant is no longer the guide to agricultural progress, it will, we believe, be the system which he condemns rather than that which he approves, that will extend its rule. We have yet to learn how it is that a reporter who believes that "the true system of agriculture is to endeavour to keep as much stock as possible," even though he would not grow corn on too many acres—who believes that "reliance should be placed on the fertilising powers of corn-and-cake-fed sheep"—who thinks also that "small top-dressings of nitrate of soda mixed with salt, applied several times in the spring," would have been an improvement on Mrs. MILLINGTON'S management, has come to select Kirtlington, of all the farms he has inspected, for condemnation.

Kirtlington, on land which is hardly, if any, better naturally than Ashgrove, has for many years annually yielded twice as much meat, and 50 per cent. more grain, per 1000 acres, than Ashgrove farm. It has paid about one-half more wages to labourers, for whom it has provided first-rate cottages. It has always been as clean as Ashgrove; it has always paid as full a rent; and it has yielded, we engage to say, a much larger tenant's profit. Ashgrove, nevertheless, is placed highest on the list of all the Oxfordshire competing farms, and Kirtlington is placed the lowest. A hot, dry summer had dwarfed the straw upon some of its barest fields; and a land agent, trusting to the old fashioned rules by which an ignorant and untrusted tenantry were formerly prevented from injuring the landowner's interest, has been alarmed at the recklessness of a "free thinking" tenant, and has put as black a mark against his name as he knew how.

We don't in the least imagine that Mr. MASON'S public spirit will fail of its intended fruit on this account. His prize, the first of a long annual series, will have had the good effect of directing attention to the groundwork of that judgment of good farming which he desired. And the result, like that of free discussion everywhere, will, we doubt not, be the furtherance in the end of justice and of truth.

"THE SIZE OF FARMS" was the subject of an excellent paper by Mr. J. TRASK, Highlease, Yeovil, before the London Farmers' Club, Mr. H. TRETHEWY occupying the chair in the absence of the President, Mr. J. HOWARD, M.P., who has not yet quite recovered, we regret to say, from a recent illness. Mr. TRASK'S discussion of his subject was well received by a very large meeting of the Club, and the unanimous conclusion arrived at was that the size of farms must be left pretty much to itself. A report of the paper is given in another page (1656). Mr. C. S. READ, M.P., opened the discussion by alluding to the respective interests of the landlord and tenant in legislating on the question of tenant-right, and the impropriety of benefiting the one at the expense of the other. He then reviewed the condition of the small holdings of France and Belgium, whose peasant proprietors and tenants have a heavier yoke to bear than the English labourer, but are not in such comfortable circumstances. At the same time he thought some districts were favourable to small farms, other localities to large farms. A few small farms interspersed amongst the larger enable frugal and industrious labourers to advance themselves in the world. And small dairy farms are productive of more milk, butter, eggs, and poultry, per acre than large ones.

Mr. SMYTHIES drew attention to the position of small farmers and landlords in his own county, and in Radnorshire adjoining it. At certain seasons, as seedtime and harvest, the small holders found employment at home, but in the winter time it was otherwise. As a rule, their children were badly educated, parents being obliged to force them into service at an early age.

Mr. PAGET approved of small farms, in opposition to the previous speakers. He has 19 tenants farming about 13 acres each, who all find employment, and for the most part on their own holdings. Where small farmers worked as servants to large farmers they work their own farms in the evenings, overtasking themselves so that they are not fit for honest service next day. Where two small farmers kept a horse each, they joined to plough their land. He did not approve of small freeholders who could not make more than three per cent. for their invested capital, whereas small tenants' capital should yield at least 10 per cent.

Mr. MECHI took his stand on capital, and concluded that the laws which regulated the size of shops and manufactories ought to be left to regulate the size of farms. It was, in fact, best to leave things to regulate themselves. He then considered the amount of capital required per acre, estimating the maximum at £20, the minimum £5, supporting his assertion of the former by reference to the live stock of the farm and the large amount of machinery, manures, and feeding stuffs which the farm needs, independently of a heavy rate for land and house.

Mr. WELLS thought large farms the best for the nation; questioned the soundness of the argument that small farms are useful for advancing labourers; thought the labourer should have regular employment with remunerating wages.

Mr. NEALE thought supply and demand would regulate the size of farms, and pointed out that the requirements of many localities, in Cheshire and Lancashire, where small farms are necessary, to supply the dense population with dairy produce, eggs, and poultry. Some small farms, under 100 acres, of which he knew, had this year 47 tons of Mangel Wurzel per acre.

Mr. EDMUNDS repudiated the idea that England wanted an Irish Land Bill. Let landlords and their tenants solve the question among themselves.

The Rev. J. SMITHIES thought heavy clay land unsuited for small farms, and quoted examples known to himself of tenants ploughing with two horses, where four, if not six, were needed! On good light land small farms had a better chance of prospering.—Mr. BROWN agreed with Mr. TRASK, as to the greater competition for small farms; drew attention to the greater expenditure for houses on small farms than on large; and quoted some small dairies which paid well where the landlord let grazing to the cows.—Mr. OWEN also agreed with Mr. TRASK: though large farms were better schools of practical education than small ones; the size of a farm should be such as to employ a staff of labourers sufficient to "equip" threshing machines, &c., so as to profit by the best mechanical appliances; drew attention to the heavy loss by trees, fences, &c., in small fields; and concluded, amidst much laughter at the results of elaborate discussion, that they should leave the question of the size of farms to take care of itself.

The CHAIRMAN, in his summary, drew attention to the three interests connected with the subject, viz., those, respectively, of the landlord, the tenant, and the labourer. "The man who farmed his own estate," he declared, generally "had a bad landlord."

—— ON Monday the price of Wheat rose 1s. in Mark Lane, and again on Wednesday it was rather higher.——Trade was rather dull at the Metropolitan Meat Market on Monday, and a complete clearance of inferior stock was impossible.

—— At the annual meeting of the SMITHFIELD CLUB on Tuesday, Lord PENRYHN was elected President for the year 1872, and Mr. BRANDRETH GIBBS continued secretary. The Marquis of EXETER had been elected at the annual meeting last year as President for 1871. In the course of the proceedings, Lord POWIS (who was in the chair) referred to a correspondence with M. DROUYN DE LHUYS with regard to the raising of a fund in England to assist French agriculturists who had suffered in the war. That gentleman, who is President of the French Society of Agriculture, had obtained from his Government assurances that every facility should be given to such distributions of seed or supplies as the committee might have at its disposal. An appeal to the agriculturists of England on behalf of their brethren across the Channel will therefore be made.—The attendance at the annual show of the Club at the Agricultural Hall, during the past week, has been about as large as last year, viz.:—775 on Monday; 21,587, including H.R.H the PRINCE of WALES, on Tuesday; and 37,092 on Wednesday.

—— The Midland Counties Agricultural Society, whose SHOW in BINGLEY HALL, Birmingham, closed on Thursday of last week, has had a most successful meeting. The receipts during the week stand thus, in comparison with other years:—

	1866	1867	1868.	1869.	1870.
	£	£	£	£	£ s. d.
Monday ..	234	249	213	195	280 0 0
Tuesday ..	158	247	244	180	385 8 0
Wednesday ..	102	257	201	427	464 1 6
Thursday ..	113	223	289	424	492 14 6
	647	976	947	1356	1602 3 6

—— The annual meeting of the CENTRAL CHAMBER of AGRICULTURE was held on Wednesday, Colonel TOMLINE, M.P., in the chair. Sir MASSEY LOPES, M.P., was the Chairman named for the ensuing year, Mr. EDWARD HENEAGE, of Hainton Hall, Lincolnshire, Vice-Chairman; and Mr. CHARLES CLAY, of Walton Wakefield, and Mr. J. ALGERNON CLARKE were re-elected as treasurer and secretary respectively. The treasurer's report was read, and it was stated that both income and expenditure had been greatly increased this year, and the balance would have been equal to that of last year but for a payment of £50 made to the committee appointed to consider the subject of local taxation. After other formal business the annual report was presented. In the first place the Council called attention to the continued progress being made in the Central Chamber, both in members and organisation. There are now 91 Chambers directly or indirectly affiliated with the Central Chamber, and, from returns already given in, the members had been found to number about 17,000. Of 56 entitled to be directly represented on the Council, 39 had attended during the year. The report then proceeded to refer to matters on which the Council had debated. On the Elementary Education Act the Council had declared against the compulsory clauses, as unjust to labouring parents when applied to children near 12, but it was in favour of regular attendance up to 10 years, supplemented by partial attendance after that age. The Council also considered the taxation for education should be general, and not local; that it should, in fact, come out of the Consolidated Fund. The subjects of turnpike roads, the licence-duty on farmers' horses, the Property-tax assessment, and agricultural statistics had been considered during the year, and a deputation to Mr. LOWE on the Malt-tax had been received. The question of weights and measures and their anomalies had been referred to a committee. In the matter of local taxation, a resolution had been passed to the effect that the present mode of local taxation operated to the discouragement of agricultural investment. The Gun-tax question had been debated, and the Council had arrived at the opinion that the duty should be paid on general certificates. With regard to the Game Laws, the Council had declared that excessive preservation of game was incompatible with good farming, and they

desired to see rabbits and hares excluded from the operations of the Game Laws. The cost of carriage by railway of dead meat, and the insurance of farming stock, had been among the other questions debated. The report was adopted, and thanks to the Chairman concluded the proceedings.

—— The Duke of ARGYLL presided this week at a meeting held in Bishop WILSON'S Memorial Hall, Islington, to witness the presentation by Miss BURDETT COUTTS of prizes and certificates to a number of drovers who had been ascertained to have treated gently and humanely the animals under their charge. The Duke said the Cattle Show was deemed an apt occasion for a meeting like the present. Although a remarkable Hindoo, who had recently visited England, had, on his return to his own country, taken every opportunity of expressing his horror of the meat-eating propensities of Englishmen, the Christian religion did not forbid the use of animal food; but it did inculcate the avoidance of all unnecessary suffering upon animals. Last year, when horrible accounts of the sufferings of cattle in their transit from abroad were made public, Miss BURDETT COUTTS had addressed a letter to the press, in which she appealed to the public to take measures to prevent such things. Subsequently the Ladies' Humane Education Committee was formed for educating young persons connected with cattle, and giving instruction to adults of that class; and this committee had instituted the system of giving prizes to persons who had deserved commendation for humanity to cattle. Certificates and prizes were then given to 45 metropolitan drovers and 10 provincial shepherds by Miss COUTTS, who said a kindly word or two to each recipient. A lecture by Mr. ELLIS DAVIDSON, entitled "Horns and Hoofs," illustrated by coloured sketches drawn in the presence of the audience, concluded the proceedings.

—— The Royal Agricultural College Club meet and dine together twice in the year—once during the Royal Agricultural Society's show week, and again, also, during the week of the Smithfield show. About 22 old students and friends of the College met at "The London" on Tuesday night. Mr. HOLLAND, whose name is so closely connected with the College and with the whole question of agricultural education, presided; and Mr. BOWLY, of Siddington (who, we understand, is the President-elect for the coming year), occupied the Vice-chair. Dr. VOELCKER, Professor WRIGHTSON, of the College, Mr. BALDWIN, of Glasnevin, and Messrs. CADLE, of Gloucester, KIMBER, J. S. CLARKE, A. J. HILL, C. G. ROBERTS, H. M. TAYLOR, G. W. GRAY, and other friends of the College, were also present. The after-dinner discussion related principally to the institution of agricultural experiments under the auspices of the Club. There is now a large number of farmers and land agents connected with the Club; and the fact that these gentlemen are scattered over the whole of the kingdom confers upon this Association more than ordinary powers in undertaking extensive and simultaneous experiments. The Club experiments, as explained by Mr. ROBERTS, might emanate from past or present Professors of the College, or other members of the Club, who would make suggestions to the Secretary. These suggestions would be reduced to a practical form, embodied in a circular; and finally, members of the Club would be asked to carry them out. The results might afterwards be published, and would no doubt tend to the promotion of agricultural progress, and to the credit of the Royal Agricultural College—both of them very desirable ends at which to aim.

NOTEWORTHY AGRICULTURISTS.

MR. EDWARD HOLLAND, OF DUMBLETON HALL, NEAR EVESHAM.

THERE is no man, probably, to whom English Agriculture is more indebted. The maintenance of the Royal Agricultural College has especially been his work. During its earlier years, the difficulties which gathered round it must have beaten it altogether down had it not been for Mr. Holland's public spirited resolution that it should not fall; a resolution which for many years involved for himself a very heavy pecuniary responsibility.—His active labours both in Parliament and out of it—though chiefly as a working member of both farmer and lawnowner, and in the promotion of general agricultural progress and improvement through education and agricultural societies, but directly, on his own estate and elsewhere, has Mr. Holland worked heartily for the welfare of the agricultural labourer. A single illustration of this—words spoken "out of the abundance of the heart" in behalf of the labourer—is all we are are able here to give of the way in which his influence has always been exerted. The subject was discussed at a meeting of the Gloucestershire Agricultural Society, three years ago, and this is what Mr. Holland said:—

"What we want for the labourer more than anything else is to instil into him some sense of self-respect. How is that to be done? By books or schools? Not so. It is to be done by putting him in a decent position. The man, the members of whose family sleep all together in one room without separation of sex—he cannot have self-respect. The man who lives like a brute, grovelling in filth, without a feeling of kindness or sympathy for those who are about him, between man and man or man and master—he cannot have self-respect. All these things are to be remedied - and how! Not by the employers only, but by employer and landowner working hand in hand. What makes the difference between the labourer and one of ourselves? Is it intellect, or anything essential to human nature? Isn't it the difference that exists in the advantages which have come from the education of our circumstances? Take two boys of equal intellect. We will call the one—son of a rich man—John Plantagenet; the other, one of a family living in a hovel, John Smithers. Plantagenet is taken care of in every way. If he grows up, he grows up with an idea of cleanliness; he is well washed, and it does him good though he cries over it at the time. Suppose he is untruthful, and tells a lie; he is not immediately thrashed to his life's end, as poor John Smithers would be, but he is told at an early age how sorrowful a thing it is to be false, and how necessary it is for a man wishing to do well in the world to have a sense of truth. The boy in the hovel, if he is caught stealing an Apple, or anything of that kind, he is beaten, with reference to naught save the punishment the mother or the father may be able to give him. He goes into the field. After a time, as he grows up, he helps to crowd the family cottage improperly. Perhaps he takes service in a parish that does not belong to him. Has he a home there? No. He may have part of a hovel. Then come the winter nights. Where can he find a fire? He goes to the public-house. We know the rest. Now I say, if it had so happened, as they say it has happened in fairy times, that a change had taken place in the position of the two children, Plantagenet would have been as brutal and as filthy as little Smithers; and Smithers, in his new position in the large and rich house, would have been brought up with all due sense of purity, mentally, intellectually, and morally. I put these cases before you, to show you that the individual intellect has nothing to do with the position of a poor man; but the vital question is the mere chance of circumstances. I tell you intellect is not wanting, the better feelings of humanity are not wanting, circumstances alone are the preventing cause to the poor lad, whom, as far as self-respect and good behaviour are concerned, we ought to put in the same position as the richer one. Now we cannot all do that: but we may all attempt to do it; and I believe that until we do attempt it, we shall not improve the position of the agricultural labourer by any amount of school education. I thank you for listening to these few words, which, really and truly, I believe I ought to act upon, if I intend doing my duty to the labourer."

EDWARD HOLLAND, OF DUMBLETON.

We might have quoted speeches given in the often-filled position of chairman at club, society, and social meetings, which should illustrate the professional

On the Council of the Royal Agricultural Society of England he has laboured for many years, especially as Chairman of their Education Committee; to which, thanks to his tenacity of purpose, we owe whatever has been yet done by the Society in promotion of one of the principal objects for which it was incorporated.

And not only indirectly, by labours in the interest of agricultural societies, national, county and local—whenever agricultural improvement, social or material, could be promoted, must be barely named.—To a local society, inspired by him, we owe one of our most carefully considered schemes of tenant-right, defining the relations of the landowner and outgoing tenant. Published, after long and elaborate examination on all sides by a committee of owners and agents as well as occupiers of land, all inspired by his own disinterested public spirit, it is probably to be considered more trustworthy than anything that has appeared upon that subject.—To Mr. Holland's own county societies, especially that of Gloucestershire, a great deal of the agricultural progress of the West of England is due, and no one in these societies can be named whose influence has contributed more constantly or more efficiently to this end.

knowledge of an accomplished agriculturist—the spirit, power of rebuke or of encouragement, the wit and humour which such an office needs, and which in Mr. Holland it has always had. We prefer to quote a speech which shows him as a wise and good, large-hearted man, using his popularity and influence for the very highest ends.

Mr. Holland has left England with his family, proposing to spend the winter in Malta. During his absence, his many agricultural friends, and especially those who are connected with the Royal Agricultural College,* are engaged in the work of arranging, as his welcome back to us, the presentation of a testimonial which shall worthily express, not merely the general sense of his great public services in the agricultural world, but that warmth of affectionate regard in which everybody holds him.

OUR LIVE STOCK.

CATTLE.

At the sale of Mr. Wainman's stock (by Mr. Strafford) at Birmingham, on the 28th ult., no large prices were given, if we except 110 gs. for *Darlington 16th*. *Malabrian 6th* was sold for 41 gs., and *Lady Wharfedale* made 35 gs. Archduke brought 41 gs., Lord Thorndale 42 gs., and two bull calves respectively 29 and 27 gs. each.

—— There will be an important sale of Shorthorns at Kingscote next March. Colonel Kingscote is decidedly "overstocked," and this is his only reason for wishing to part with some of his favourites. Draft sales labour under certain disadvantages, simply because people are suspected of a wish to reserve their very best stock when they find it necessary to dispose of a portion of it. Colonel Kingscote, however, will insure the utmost confidence of breeders by the plan he proposes of selling several entire families just as Mr. Bowly sold his "Musicals" two years ago. The Kingscote catalogue makes its appearance in January; the current edition, therefore, contains the names of many animals that have been sold, and of two or three which have unfortunately died, while the latest births are not yet recorded. With the help of this somewhat imperfect source of information, we are able to mention that a very principal feature in the coming auction will be the "Cerito" family, comprising seven females in breeding condition, besides many bull and heifer calves. *Carrie Walton*, a noble red cow in her seventh year, heads the tribe, and exhibits an attractive pedigree, commencing with her sire, 2d Earl of Walton (19,672), bred by Mr. Harvey. She is from a cow by Col. Kingscote's Viceroy (13,045), which was from *Cerito 2d* by Earnest (9091). The blood may next be traced to Panton in Lincolnshire, and previously to the famous stock so long bred by Messrs. Mason, R. Booth, R. and C. Colling, and Mr. Champion. Upon this excellent foundation we find first-rate Duchess bulls, such as Duke of Wharfedale (19,648) and 2d Duke of Wetherby (12,618), have been used. Next in the list appear a goodly array of representatives of the celebrated "Chaff" family, beginning with *Clarissa* by Oxford Duke (18,408), and tracing to the late Earl Ducie's *Chaff* by Duke Cornwall (594), and previously extends back to good Colling strains, in which the names of Comet and Cupid occur. Whether or not the two Darlingtons, *Dora* by 2d Duke of Airdrie, and *Doralice* by 2d Duke of Wetherby, will be sold, is still a question, but we feel confident that their presence in the sale catalogue will both embellish it and render it the more attractive. We cannot even name all the animals which it is proposed to sell, but the large group commencing with *Heliotrope* by Archduke (14,099) must not be omitted from this brief notice. This tribe, once possessed by the late Earl Ducie, traces back to *Hebe*, by Mr. Mason's (of Chilton) Spectator (2688), and previously to Wilkinson's and Collings' stocks, and contains a large number of individuals. An attractive feature in the coming sale will be a considerable assortment of the famous "Seraphina" family, represented by *Duchess of Slimbridge* by Chaffcutter (12,572), and other good animals by Wetherby and Milcote sires. The bulls will comprise many representatives of the families already enumerated, and the whole catalogue will comprise between 40 and 50 exceedingly well bred animals. The younger stock owes much to the services of 3d Duke of Clarence, bred at Wetherby, a Duchess bull of the purest pedigree and highest quality, and we do not hesitate to prophecy high prices and a good company when the time comes.

—— The Smithfield Show may be in general terms spoken of as a success. The Shorthorns were not specially well represented, Mr. Pulver's ox and the heifer class being redeeming features. Many of the animals sent to represent this, the most famous of our breeds, were deficient in size and condition. Herefords and Devons, on the other hand, formed an exceedingly good show, especially the latter, which took off the prizes, for the best animals in all the cattle classes, offered for either sex. Among sheep, the Southdowns were worthy of the highest praise, and we would specially mention Lord Walsingham's pen of wethers in the heavier class, under 23 months old. Lord Berners also exhibited some first-rate Leicesters.

—— We have received the following news of recent Hereford sales:—Mr. Gilbert Davidson, of Sidney, has secured an excellent pair of animals, namely, Julius Cæsar, by Prince Edward, and grandson of the celebrated Franky (1243). This promising young bull is also a grandson of Lord Berwick's well-known cow, *Carlisle*, afterwards the property of Mr. Duckham. The other animal referred to is *Beatrice 5th*, the 1st prize at Ledbury in the yearling heifer class in 1869. We also learn that Mr. White, of Martindale, Hunter's River, Sidney, is sending out *Lady Edith*, a magnificent heifer, first shown at the Tredegar meeting in 1868, where she took the 1st prize for heifers, she being only a calf of six months old. She was bred by Mr. Rodgers, of the Rodd, and is by Sir F. Bailey's Stanway. Mr. White has also purchased *Venus* by Franky (1243) from Mr. P. Turner. She wast he best of a pair of prize heifers exhibited at the late Ludlow and Hereford meetings.

POULTRY.

The Crystal Palace Poultry Show opened on Wednesday. An exhibition in which £700 were promised as prizes could not fail to be attractive, and this, with the addition of 37 cups or pieces of plate, contributed by various breeders to form extra prizes, must have been a special inducement to send birds. There were 1100 pens of fowls, besides turkeys, ducks, geese, and pheasants; while the pigeons, comprising 800 cages, were pronounced by the judges to be one of the finest collections over seen in this country. Mr. Wilkinson's arrangements were most excellent, the pigeons being placed under light wire-work cages which stood in double rows on two long tables, extending along the nave from the centre transept to the crystal fountain, while the poultry occupied a portion of the south gallery and the carriage department.

KIRTLINGTON, OXFORDSHIRE.

On the morning of my visit to the Oxfordshire Prize Farm, reported at p. 1580, I had been over Captain Dashwood's very similar land at Kirtlington, which is within an easy walk of Ashgrove. A comparison of these lands had indeed been challenged by their respective tenants when they both entered the lists for Mr. Mason's prize: but it is seldom that the circumstances of two occupations are so nearly alike, or one would think, therefore, that the relative merits of two different styles of management could more easily be determined. Certainly none of that difficulty which most of us anticipated for the judges of the Oxfordshire-show farms, arising out of the variety of soil and style which fell to be compared, had any place in the decision here. Kirtlington and Ashgrove do not differ much in the extent occupied by their tenants—they differ very little in the character of their soil—they differ nothing in respect of climate—and they differ nothing in the relation of the landlord and the tenant. In each case a full rent is paid for a term of years, and the occupier is left to manage the land as he pleases till within four years of its termination. The landlord in the one case has indeed equipped the land with two homesteads as perfect of their respective kinds as any in the country, and supplied the land with cottages of the very best description for the accommodation of its labourers; and in the other no cottages and comparatively imperfect buildings exist. This difference between the two estates has not, indeed, been allowed by the judges of the Society to have any influence on their determination of the merit due to the tenants of the farms; but I see that your contemporary, the *North British Agriculturist*, points out that it is not made clear that the responsibility of these deficiencies at Ashgrove does not, to some extent, rest upon a tenant under a 21 years' lease; for he might have had the better equipment had he deemed it necessary by paying an adequate interest on the outlay; the higher rent, in short, which is paid at Kirtlington, in consequence of a large outlay by the landlord in this very way. Be this, however, as it may, it is no part of my plan to contrast the two farms just now, but to give the contents of my note-book regarding the latter, in order that any one who chooses may perform this comparison for himself.

The following, then, are my notes of Kirtlington. Lying eastward of the scattered village and the well-timbered park of Sir Henry Dashwood, the Northbrook and Slade farms occupy a wide tract of large open fields, enclosed partly by neat Thorn fences and in part by walls; the country generally being sheltered, not by hedgerow timber, but by ornamental Fir and Larch plantations in belts and clumps. The soil is, for the most part, a thin calcareous brash on rock, excepting the low-lying fields upon the former farm, some of which are a deep and heavy calcareous clay, requiring the land drainage it has received. The two farms, now held as one, are occupied by Captain Dashwood, partly as a tenant at will, and partly under a 21 years' lease; liberty to cultivate as he chooses being granted till within four years of the end of the term, when the 4-year course is enforced. The two farms, though provided with separate homesteads, are under one management—570 acres, however, lying around the Northbrook homestead, and 500 around the Slade. Of these 1070 acres, about 100 acres are in permanent grass, the remainder has been cropped during the present year as follows:—170 acres of Wheat (after Trifolium, Rape, and Peas); 330 acres of Barley (half after roots and half after Wheat and Oats); 80 acres of Oats (20 acres after Mangel Wurzel, 20 acres after Swedish Turnips, and 40 acres after Wheat); 30 acres of Beans (after Barley); 42 acres of Peas (20 after Sainfoin, and 22 after Barley); 42 acres of Mangel Wurzel; 80 acres of Swedes (16 of them after Italian Rye-grass sown on the previous Wheat stubble), 9 acres of Rye, and 15 acres of Vetches, followed by Turnips; 18 acres of spring Vetches, followed by Rape; 18 acres of Trifolium, followed by Rape; 76 acres of Clover, and some 60 or 70 acres of Sainfoin. It will be seen that no fewer than 630 acres out of 970 are in grain crops—only 122 are in root crops, the remainder being in Rye, Vetches, and Trifolium, followed by Rape, only 76 acres in Clover.

Reverting to the original division of the land into two farms, each with its set of buildings, I may refer to those of Northbrook—with their covered yard, stable on one side, and range of feeding-boxes and piggeries on the other, and open yards for young stock further still—as an example of the very best arrangement known to the architecture of the farm. Those at the Slade farm, again, are on the plan recommended by the late Professor Low, where the large open square, surrounded on all sides by different ranges of buildings, is abandoned for a series of smaller yards covering the ground, each with its shed, all having a common aspect, and with stabling, cart-sheds, barns, and higher buildings, arranged so as to be easy of access in themselves, so as to be of convenient access from one to another between those parts related in their uses, and so as that the higher buildings shall provide shelter for yards that would be otherwise exposed. There is accommodation on the farms for labourers to the extent of sixteen cottages, with two or three bedrooms each. The cottages and buildings of these farms together are quite models of what land equipment of this kind should be. I may mention further on this subject, that a square chain of Potato land and a bit of garden ground is let with every cottage, and the rent charged is 1*s*. 6*d*. a-week. Of the £2000 and upwards paid annually in wages, as large a proportion as possible is paid by the piece. All harvest work—tying and stooking after the reaper, pitching to harvest carts, building and thatching; pulling, and loading, and piling and thatching roots; dung filling and dung spreading, hoeing and mowing, &c., are all paid by the piece, and no beer is given in wages.

The two farms together are worked by 28 horses, 70 to 100 acres of stubble being, moreover, cross cultivated by steam-power during autumn. A rent averaging about 27*s*. an acre is paid. The wages paid amount to close on £2 an acre. The cake and cattle food brought on the farm amounts to rather more than £2 an acre annually. The purchase of manure amounts to about £800 a-year, including over 15 tons of guano, 30 tons of superphosphate, and 25 up to 40 tons of nitrate of soda. The heavy cropping of the land—Barley following Wheat after Beans—corn crops coming even more frequently than that ins ome cases—is justified, I was going to say, by the enormous purchases of cattle food and manure used upon the land: I will rather say it is justified by the result. The Wheat crop—Talavera, Red-straw White, and Burrell's Red, sown with 1 bush. of seed per acre in the outset, increasing to 6 pecks at last—yields on this poor, thin, un-Wheat-like soil from 3½ to 4 qr. per acre on an average. The Oats (White Tartars), sown with from 8 to 10 pecks per acre, yield 8 to 9 qr. The Barley (Scotch Chevalier), sown with 7 or 8 pecks up to 10 pecks after the last bit of sheepfold, yields 5 qr. on an average. All corn crops taken after corn receive a spring dressing of 1½ to 2 cwt. of nitrate of soda per acre; and a strip left undressed across each field shows how well the dressing pays by the difference exhibited at harvest time.

The stock of the farm includes a breeding flock of 500 Oxford Downs; and some 600 fat sheep, 12 and 13 months' old tegs, sold partly naked and partly in their wool, together with a portion of the fattened ewes, are sold every year. Ninety beasts, in good store condition, are bought in every autumn at two or three years old, for £12 to £16 a-piece, and they are sold off by May in heavy flesh, having had a minimum allowance of 3 lb. of cake daily each, together with pulped roots and chaff. Thirty breeding sows are kept, and some 300 fat bacon hogs are sold every year. Upwards of £2000 worth of cake and food are purchased every year for these cattle, sheep, and pigs; and this, with 600 acres of straw, 40 acres of Mangel Wurzel, about one-third the acreage of Swedes, brought home, and large quantities of cut Clover and Sainfoin, makes an enormous quantity of the very best farmyard dung, some 3000 cartloads of which (made chiefly under shelter) are carried every year to the fields. During the first year, for example, 42 acres of Mangel Wurzel received 18 loads apiece per acre, besides 2 to 3 cwt. of guano, and 3 cwt. of superphosphate per acre; 80 acres of Swedes received 16 loads apiece, together with a dressing of superphosphate and guano put in with the water-drill; 10 acres of Rye had received 16 loads per acre; 10 acres of Vetches 18 loads per acre; 16 acres of

* Mr. C. G. Roberts, M.R.A.C., Slotter Mill, near Haslemere, Surrey is one of the secretaries to this movement; Mr. A. J. Hull, M.R.A.C., 8, Mourgate Street, E.C., will also receive subscriptions.

Italian Rye-grass, 16 loads per acre; 4 acres of Lucerne, 20 loads per acre, besides 20 or 30 acres of the young Clover a good dressing. The system here is to put the farmyard manure wholly on the growing green crops, and to let the corn crop depend upon the condition of the land, *plus* a top-dressing of nitrate of soda in the spring. Even Beans in general have been no exception to the rule. This year, however, a dressing of manure has been put on Barley stubble, which has been prepared for next year's Peas. It is plain that if a great extent of corn crop and a comparatively small extent of root crop is each year grown, yet the latter are wonderfully well done, and the farm reaps the benefit indirectly of more than a double rent spent on cake and on manure.

Of the crops, as I saw them in September, it was impossible to speak too highly of the Mangel Wurzels; the Swede crops, too, some of the early sown already fully ripe — the white Swedes after Italian Rye-grass, however, still full of growth, and as even and beautiful as a garden—were most satisfactory. Some of the Turnips after Rye were forward, clean, and good; and a lot of Rape was in prosperous condition. The rickyards were full of Wheat and Barley, Oats, and Peas and Beans—neatly built, in round or rectangular ricks as the case might be, and the thatching was just completed. The sheep were scattered over the Clovers, or just about to be folded on the forwardest Rape. The pigs were, some of them, being herded on the stubbles, and others were fattening in the styes. The winter stock of cattle had not been bought in. The horses—a capital lot—kept all the year round in the stables, receive 1 bush. of Oats and 1 peck of Peas apiece weekly during the seasons of light work, and double allowance when on full work, together with a bushel of chaff of hay at night, and corn chaff *ad lib.* A few Mangels are given them in the winter time, and they receive Clover and Vetches during spring and summer. There is capital accommodation for fourteen at Kirtlington, and for as many at the Slade.

The whole farm was clean and prosperous-looking, the labourers comfortable and well-conditioned. Mr. Hebgin, the resident farm-steward, has the whole occupation completely in hand; and I believe that Captain Dashwood is doing more to feed the people, at the same time that he is paying heavy wages to the labourer, a full rent to the landlord, large sums to dealers in manure and cattle foods, and making a fair income for himself, than any tenant of 1000 acres of poor light land I have anywhere else yet seen. *J. C. M.*

[We add the following figures illustrative of the arrangement of the principal block of buildings in the Northbrook homestead:—

Fig. 279 is a plan of these buildings, and the following are references to the index letters:—

a a, central covered yard, divided into three; *b b*, cattle-boxes, stalls, or piggeries; *c*, piggeries and sties; *d*, food-house for pigs; *e e*, gangway; *f*, food-house; *g*, sheds and yards for young cattle; *h h*, stable; *i i*, mangers in horse-stalls; *j j*, doorways (also in fig. 282) for passing soiled litter into central yard; *k*, water-trough; *l*, mangers and troughs for cows and pigs. The dotted lines indicate drainage, excepting the squares marked on the line of stabling, which indicate the position of the skylights.

Fig. 280 is an elevation of the southern end of the buildings, representing in succession, from the reader's left to right, stable, central yard, with its gateway for the removal of dung, &c., steaming and food house, and open yards.

Fig. 281 represents a section of the whole building across the line B B on the plan at fig. 279.

Fig. 282 represents a section, on a larger scale, of the stabling. This is a good illustration of economical and sufficient housing for the horses of the farm; 6-feet stalls, with ample gangway behind them, are provided with manger and rack; water is at hand in two or three troughs, at which the horses drink when coming in from work. Ventilation is provided in the simplest way, by an occasional ridge-tile being lifted out of the regular course, and bedded at either end upon its neighbours—the under boarding being there left open. And light, as already said, is provided from the roof by skylights, and by hanging lamps at night.

We take the figures by permission from "The Farmer's Calendar," published by Messrs. Warne & Co., of Bedford Street, Covent Garden.]

FIG. 279.—KIRTLINGTON FARM BUILDINGS.

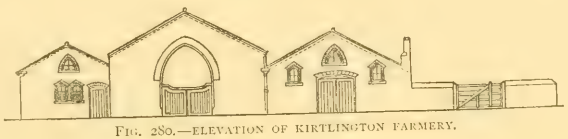

FIG. 280.—ELEVATION OF KIRTLINGTON FARMERY.

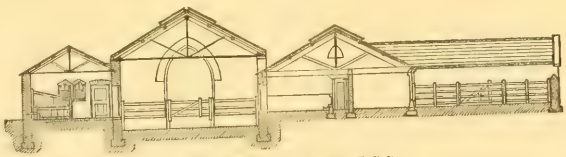

FIG. 281.—SECTION ON LINE B B.

—— I see on page 1614, that your correspondent "W. G. D." has used my figures in connection with the Ashgrove farm in a sort of *reductio ad absurdum* of its management, so far as the livelihood of the tenant is concerned. I have not looked particularly into his valuation of receipts, but his items of expenditure are, I think, so clearly in excess of the truth, that it is possible for Mrs. Millington to have made a fair living, even on my imperfect showing. Her actual outgoings, according to "W. G. D.," are £5205 a-year, against £5240 of receipts; and she has, besides, to keep her horse stock, and implements good, to pay for sundries, and interest on £6000 of capital. But this sum of £5205 of expenditure is nearly £600 beyond the truth, as I believe. The rent, including all outgoings under that head, I put at 24*s.* per acre; I do not know the actual amount, but that is what I would suppose it to be. This over 880 acres is less, by £70, than "W. G. D." puts down for rent, and rates, and taxes. The corn for 18 horses, at 1 stone a day a-piece throughout the year, will not cost more than £320, making his charge £130 too much under this head. For seeds and seed corn, considering the facilities a farmer has for easing his bills here, I think he has charged at least £80 too much. The charge for 150 sheep is clearly altogether in excess, for the £850 receipts for mutton must represent the annual return from the 400 ewes, and is a moderate estimate even then. The 150 sheep bought, in good Turnip years, will more than repay their purchase money; so that at least £225 must be knocked off the expenditure account as given here by "W. G. D." His tradesmen's bills, considering that a blacksmith's and carpenter's shop is part of the farm equipment, is also probably put at least £50 too high; and the items thus knocked off amount to upwards of £550, making, with the balance of £35 in the tenant's favour, about £600, out of which wear and tear on implements and horses, sundries and interest, have to be deducted. Even this is a very moderate return, but it is not the dead failure at which "W. G. D.'s" calculation pointed. And it is by no means certain that an examination of the receipts might not tend to a considerable stretching of his figures, which would still further help the result. His 20 to 25 3-year-old store cattle, either heifers in calf or steers ready for the grazier, are put certainly too low at £270. He is wrong, too, I submit, in considering the 4 qr. of Wheat per acre of the Ashgrove land "a weak point" in the returns. It is a large average crop for the soil. *J. C. M.* [It may be added here, with reference to the plan of farm buildings adopted at Northbrook, Kirtlington, that a similar plan has been carried out on the Prince Consort's Flemish Farm in Windsor Great Park. The scheme is, however, there completed by the addition of a cross set of buildings, including threshing and straw barns, and other places, which at Northbrook are provided for otherwise. The late Mr. Turnbull, architect at Windsor Castle, was the designer of these buildings. Those at Kirtlington were erected from the designs of Mr. Wilkinson, of Oxford.]

FIG. 282.—SECTION OF STABLE.

SMITHFIELD CLUB CATTLE SHOW.

ON Monday morning the Agricultural Hall, Islington, opened for the 73d annual show of the Smithfield Club, and it has since been full as usual of the crowds of spectators who are each year drawn together by the best collection of agricultural results which is anywhere to be seen. A show of Devon cattle of great excellence, if of somewhat diminished number, one of the best collection of Hereford beasts that has ever been exhibited—classes of Shorthorns not quite up to the usual standard of merit—first-rate classes of Sussex cattle, small entries of Norfolk, Longhorn, and Welsh cattle—a noble show of Scotch cattle, and a long row of cross-bred and extra stock, make up the cattle show—237 entries altogether, about a score above the show of 1869. Of the sheep classes, as interesting as ever, and the pigs, not quite up to their usual mark, a report will be found below. Around the live stock and in the galleries is the usual extraordinary collection of first-rate agricultural machinery of all kinds, of which also a report will be found in the following pages; and the stands of the agricultural seedsmen are even more remarkable for the size and perfection of their specimens.

THE CATTLE CLASSES

number 237 entries, of which 33 are Devon, 44 are Hereford, and 45 are Shorthorns, the remainder being Sussex, Scotch, cross-breds, and others.

The Devon classes are of unusual merit. The younger class includes 7 entries, of which Mr. Taylor's very

thick and symmetrical steer—only 28 months old, but as heavily covered with flesh over back and loin as if it were 12 months older—is first. Mr. Farthing contributes a good second, of the same age; and Mr. Smith's steer, just over 2 years old, astonishingly heavy and ripe for his years, is the largest and youngest in his class.—In the class of steers under 3½ years some of the Birmingham cattle reappear. Mr. Senior's 1st at Bingley Hall is beaten here by Mr. McNiven of Oxted, whose ox, good in rib and loin and flank, is rather narrow behind. The ox shown in this class by Her Majesty the Queen, and Mr. Smith's ox too, 2d and 3d at Birmingham, are not placed here, the 3d prize going to Mr. Gibbs, of Taunton.—The older class of Devon oxen includes several of the Birmingham class—among them Mr. Smith's 1st prize; they are none of them decorated here—being all fairly beaten by Mr. W. Taylor's 4½-year-old ox, which takes the prize as the best ox in any of the cattle classes, an honour which has very rarely fallen to the Devon breed. He is very thickly covered along a very straight back and over rib and loin, and is particularly good forward rather than behind. He girths 8 feet 7, and is 5 feet 3 inches long, a large size for the breed. Mr. McNiven, a most enterprising exhibitor, takes the 2d prize, and Mr. Aldworth, of Abingdon, the 3d.

In the small but very beautiful class of Devon heifers the order of the Birmingham judges has been maintained, so far as two out of three of the animals are concerned which appeared at both shows. Mr. Senior's wonderfully ripe and thick 2½-year-old heifer is 1st in both shows, and Her Majesty, 3d here, had been 2d previously. The Birmingham 2d prize heifer, shown by Mr. Burton, is here placed 3d.—The older class of Devon cows contains only two of the same class at Bingley Hall. Mr. Aldworth's 2d prize cow there is 2d here; Mr. McNiven, who was 1st there, has brought another cow here, and she is placed 3d; but they are both beaten by Mr. Ford's remarkably evenly and thickly covered cow, whose only fault is a little coarseness of the shoulders. The whole class is very good.

The Hereford classes are, in our opinion, the leading feature of the show. Six steers, seven young oxen, and no fewer than fourteen older oxen, both of the latter classes of first-rate merit, make up a noble display. There is a small but good class of heifers, and a larger class of cows. The 1st prize in the younger class goes to a 2 year and 5 months old beast, already 8 feet 6 inches round and 5 feet 5 inches long, and this in spite of, if anything, a little failure behind the shoulder, where the girth is taken—his great point being the weight of flesh he carries over the back and loin and rib. How good the next class is may be gathered from the fact, that both the 2d and 3d prize Birmingham beasts are not noticed; the Queen's ox, however, properly named *Deception*, which is 2d here, was not noticed there. The 1st prize steer, not yet three years old, is remarkably massive and thick for so young a beast, deep and wide and thick, especially in front.—But it is in the older class where the style and perfection of the Hereford, as a meat-making animal, is seen. There are here fourteen beasts, averaging rather more than 19 cwt. a-piece live weight, five of them exceeding a ton in weight, and six out of the fourteen are still three years old. The 1st prize goes to the ox shown by Mr. Agate, of Horsham; he is 8 feet 9 inches round and 8 feet 6 inches long, three years and five months old, and weighs 19 cwt. 2 qr. 16 lb., and is uncommonly well made and covered well all over back and loan and flank and rib, suffering, however, from inability to stand well upon neglected feet, and thus drooping somewhat behind, and no doubt suffering from this, when compared with the Devon and Shorthorn prize oxen for the "Cup."

The small class of heifers contains some remarkably thick and well-fed animals for their age. Mr. James, of Mappowder, to whose herd Mr. Radclyffe has borne testimony in our columns, takes the 2d prize, the Queen being 1st, with a small but very thick little beast, with well sprung ribs, well covered back, and very thick and good in round and thigh. They were 1st and 2d at Birmingham also, and Mr. Baldwin was 3d at both places. The cows are a fair class: the prize list is given below.

We now come to the *Shorthorn classes*. Her Majesty's ox, shown in the young class here, is hardly ripe enough to win. The Earl of Aylesford's 1st prize steer is a very fine roan, with broad back, short neck, and otherwise looking as if the feeding process was complete. Colonel Loyd Lindsay's 2d prize dark roan is hardly so perfectly up to the mark.—The second class of steers contains a number of white cattle. Mr. Searson's, 2d to Lord Aylesford at Birmingham, is here in a different class, and thus placed 1st. He is 8 feet 1 inch in girth, and had lost, so the herdsman said, 7 inches since he came out, being off his feed. He is beautiful forward, with a particularly pretty head, rather defective behind shoulder, good back and rib and flank. Mr. Stratton, of Manningford Bruce, second in this class, is 1st among the older steers, and Mr. Richard Stratton 2d. The 1st prize white ox is as true as a cylinder forward, perfect behind shoulder, remarkably true and good everywhere, girthing 8 feet 8 inches, 5 feet 2 inches long, and weighing 18 cwt. alive. Messrs. Martin, of Aberdeen, send the 2d prize ox, higher, longer, coarser-looking, not nearly so perfectly exhibiting the character of a well-bred Shorthorn.

The heifers are a large class—more's the pity. Mr. R. Stratton is 1st with a beauty, thickly covered with flesh, 3 years and 4 months old, just ready for the butcher when she ought to have had a calf at her foot. The 2d prize goes to Moray, and the 3d to Aberdeen. A very large number of distinctions cross the Tweed this year. There are many commendations in this class, and it is remarkably good throughout. Cows also are very good, Lord Feversham being 1st.

In the well-filled classes of the *Sussex breed* there are a wonderfully even set of cattle, varying from the true large upstanding red Sussex to the smaller, shorter-legged red Devon—and both breeds are in the county, for one prize in the Devon classes goes to Sussex. Here, however, are ripe beasts 2½ years old, of the undoubted Sussex type. Lord Leconfield shows a heifer 2 years and 5 months old, taking the 1st prize in her class. The classes are full, and the annual show in this part of the Hall always speaks well for the public spirit of the Sussex men.

Of *Norfolk* cattle there are but three entries. H.R.H. the Prince of Wales shows a very good ox and takes the prize; and there are two heifers exhibited. The *Longhorn* breed is also very poorly represented, so far as number goes.

This cannot be said of the *Scotch* cattle. There has rarely been a better show of West Highlanders. An extraordinary red ox, five years old, deeper, we think, than any beast in the yard, and showing less daylight under him, takes the 1st prize. The 2d goes to Mr. Leigh, of The Hoo, near Luton, who has annually a capital show of fat Highland beasts in his stalls.

The Polled breeds are also represented well. Mr. Harris is 1st with a capital representative of the Aberdeenshire, very even and deep and wide and ripe. Mr. McCombie, M.P., is 2d, with a beast weighing 4 cwt. more. In the cow class, too, Mr. McCombie can this year only attain 2d honours. The *Irish* and *Welsh* breeds are very poorly represented.

We now come to a large class of cross-bred beasts, to which we may hereafter refer in illustration of the relative influences of male and female on their produce. They are a fair show of the advantages which the cross of a Shorthorn or a pure bred Hereford or Devon produces on a less perfect breed. The "extra" cattle shown include animals of various merit; one, however, of pre-eminent excellence. Mr. Pulver's ox, 1st in every way at Birmingham, is placed 1st here also.

We were not present when the judges selected the best of all the winners for the 100 gs. cup, and therefore extract the following from the columns of the *Times*:—

"When all the 1st prize steers and oxen in the classes were marshalled in the central area in competition for the cup, the Sussex ox was the first ordered out, then the two cross-bred steers, then the Shorthorn steers, and so on in rather quick succession, until four picked animals remained—viz., the Devon ox, the 2-year-old Hereford steer, the 2-year-old Shorthorn steer, and the Scotch polled steer. Finally, the contest lay between the Devon and the Scot; and the little red beat the substantial black. The Devon heifer won her silver cup against the Shorthorn heifer and Shorthorn cow as final competitors. Lastly came the trial for the Champion Plate of £100 to the best beast in the show; and here the two 1st prize animals, male and female, in the two classes of extra stock, were brought in to measure their merits against those of the two conquering Devons. This last struggle lay between the Devon heifer and the Shorthorn steer which had been the crack beast of the Birmingham Show, and this fine steer was decreed the victor. This is Mr. Pulver's great winner of the year, which, having carried off £121 worth of honours at Birmingham, £124 worth of prizes before that, now takes £110 more; making, in all, £355 of winnings, and is finally sold for £100 to a Gloucester butcher."

The following is the Award of Prizes:—

Judges.—Devons, Herefords, Sussex, Norfolk and Suffolk, Polled and Longhorn: G. W. Baker, Orwell Park, Ipswich; Edward Searle, Berwick, Lewes, Sussex; J. Pope, Horningsham, Warminster, Wilts.—Shorthorns, Scotch, Irish, Welsh and Cross: H. Aylmer, West Dereham Abbey, Stoke Ferry, Norfolk; C. Randell, Chadbury, Evesham; James Topham, The Hemplow, Welford, Rugby.

Class 1. Devon Steers, not exceeding 2 years and 6 months old.—1st, £20, and Silver Medal to the breeder, W. Taylor, Glynley, Westham, Sussex; 2d, £15, W. Farthing, Stowey Court, Bridgewater; 3d, £10, W. Smith, Hoopern, Exeter. Highly Commended: Her Majesty the Queen. Commended: E. Trood, Exminster.

Class 2. Devon Steers, not exceeding 3 years and 3 months old. – 1st, £30, C. McNiven, Perrysfield, Godstone; Silver Medal to the breeder, J. A. Smith, Bradford Peverell; 2d, £20, T. L. Senior, Broughton House, Aylesbury; 3d, £10, G. Gibbs, Bishop's Lydeard, Taunton, Somerset. Highly Commended: J. Overman.

Class 3. Devon Steers or Oxen, above 3 years and 3 months old.—1st, £30, W. Taylor, Glynley; Silver Medal to the breeder, R. Stranger, Molton; 2d, £20, C. McNiven, Perrysfield; 3d, £10, W. Aldworth, Frilford, Abingdon. Highly Commended: Her Majesty the Queen. Commended: Mr. Coate, Ham, moon, and the whole class.

Class 4. Devon Heifers, not exceeding 4 years old.—1st, £25, T. L. Senior, Broughton House; Silver Medal to the breeder, the late C. Gibbs, Bishop's Lydeard; 2d, £15, R. Burton, Place Barton, Broadclyst; 3d, £10, Her Majesty the Queen. Highly Commended: J. H. Buller, Crediton.

Class 5. Devon Cows, above 4 years old.—1st, £25, J. Ford, Rushton, Blandford; Silver Medal to the breeder, R. Mogridge, South Molton; 2d, £15, W. Aldworth, Frilford; 3d, £10, C. McNiven, Perrysfield. Highly Commended: W. Smith, Hoopern.

Class 6. Hereford Steers, not exceeding 2 years and 6 months old.—1st, £20, W. Groves, Brompton, Shrewsbury; Silver Medal to the breeder, the late Hon. H. N. Hill; 2d, £15, Her Majesty the Queen; 3d, £10, Francis Evans, Bredwardine, Hereford. Highly Commended: R. Shirley, Church Stretton.

Class 7. Hereford Steers, not exceeding 3 years and 3 months old.—1st, £30, the Earl of Darnley, Cobham Hall, Gravesend; Silver Medal to the breeder, E. Thomas, Monaughty, Knighton; 2d, £20, Her Majesty the Queen; 3d, £10, J. Price, Court House, Pembridge, Leominster. Highly Commended: C. Hall, Croydon.

Class 8. Hereford Steers or Oxen, above 3 years and 3 months old.—1st, £30, J. Agate, Warnham, Horsham, Sussex; Silver Medal to the breeder, R. E. Middleton, Shelderton, Aston-on-Clun; 2d, £20, J. G. Leigh, West Hyde Farm, Luton; 3d, £10, J. Ford, Rushton. Highly Commended: W. Heath, Ludham Hall, and P. Turner, Pembridge. Commended: the class generally.

Class 9. Hereford Heifers, not exceeding 4 years old.—1st, £25 and Silver Medal to the breeder, Her Majesty the Queen; 2d, £15, J. W. James, Mappowder Court, Blandford; 3d, £10, J. Baldwin, Luddington, Stratford-on-Avon. Highly Commended: W. Heath, Ludham Hall, Norwich.

Class 10. Hereford Cows, above 4 years old.—1st, £25, and Silver Medal to the breeder, T. Instone, Bourton, Much Wenlock; 2d, £15, R. Hanning, Creton Court, Ludlow; 3d, £10, H. Ridgley, Steventon, Ludlow. Commended: Sir J. R. Bailey, Bart., Glanusk Park.

Class 11. Shorthorned Steers, not exceeding 2 years and 6 months old.—1st, £20, and Silver Medal to the breeder, the Earl of Aylesford, Packington Hall, Coventry; 2d, £15, Lieut.-Col. Loyd-Lindsay, V.C., M.P., Lockinge Park, Wantage; 3d, £10, R. N. Morley, Leadenham, Grantham.

Class 12. Shorthorned Steers, not exceeding 3 years and 3 months old.—1st, £30, and Silver Medal to the breeder, R. Searson, Cranmore Lodge, Market Deeping; 2d, £20, W. Booth, Bart., Paxton Park, St. Neot's; 3d, £10, J. Stratton, Manningford Bruce, Marlborough.

Class 13. Shorthorned Steers or Oxen, above 3 years and 3 months old.—1st, £30, and Silver Medal to the breeder, J. Stratton, Manningford Bruce; 2d, £20, J. and W. Martin, Aberdeen; 3d, £10, R. Stratton, Burderop, Swindon.

Class 14. Shorthorned Heifers, not exceeding 4 years old.—1st, £25, and Silver Medal to the breeder, R. Stratton, Burderop, Swindon; 2d, £15, J. Hunter, Dipple, Fochabers; 3d, £10, J. Reid, Ulcombe, Maidstone, Aberdeenshire. Highly Commended: Sir W. C. Trevelyan, Bart., Newcastle-on-Tyne. Commended: J. C. Sherrard, Reigate, and the Earl of Radnor, Coleshill.

Class 15. Shorthorned Cows, above 4 years old.—1st, £25, and Silver Medal to the breeder, the Earl of Feversham, Duncombe Park; 2d, £15, J. A. Mumford, Chilton Farm, Thame; 3d, £10, Mr. Mace, Shenton, Northleach.

Class 16. Sussex Steers or Oxen, not exceeding 3 years old.—1st, £20, W. Sturt, Fetcham, Leatherhead; Silver Medal to the breeder, T. Child, Horsham; 2d, £10, J. Neale, Cold Waltham, Petworth; 3d, £5, J. E. and A. Heasman, Angmering, Arundel. Commended: E. and A. Stanford, Eaton's Shurst, Sussex.

Class 17. Sussex Steers or Oxen, above 3 years old.—1st, £25, and Silver Medal to the breeder, J. M. Montefiore, Worth Park, Crawley; 2d, £15, J. E. and A. Heasman; 3d, £10, Lee Steere, Jaye's Park, Dorking. Highly Commended: Mary Coote, Jumping, Arundel.

Class 18. Sussex Heifers, not exceeding 4 years old.—1st, £20, and Silver Medal to the breeder, Lord Leconfield, Petworth House, Petworth; 2d, £15, Lee Steere, Jaye's Park. Highly Commended: J. M. Montefiore, and J. Russell, Hurstpierpoint. Commended: the class generally.

Class 19. Sussex Cows, above 4 years old, that must have had at least one live calf.—1st, £20, and Silver Medal to the breeder, Lee Steere, Jaye's Park; 2d, £15, J. Shoosmith, Berwick, Lewes. Commended: W. Neale, Petworth.

Class 20. Norfolk or Suffolk Polled Steers or Oxen, of any age.—1st, £15, H.R.H. the Prince of Wales, Sandringham, King's Lynn; Silver Medal to the breeder, the late J. Savory, Rudham, Brandon.

Class 21. Norfolk or Suffolk Polled Heifers or Cows, of any age.—1st, £15, W. Clapper, Catfield, Stalham; Silver Medal to the breeder, E. Cooke, Stalham Hall; 2d, £10, C. Symonds, Aylmerton, Roughton.

Class 22. Long-horned Steers or Oxen, of any age.—£10, and Silver Medal to the breeder, W. T. Cox, Spondon Hall, Derby.

Class 23. Long-horned Heifers or Cows, of any age.—£10, and Silver Medal to the breeder, W. T. Cox.

Class 24. Scotch West Highland Steers or Oxen, of any age.—1st, £30, R. Barcham, Thurgarton, Hanworth; 2d, £15, J. S. Leigh, The Hoo, Luton, Beds. Highly Commended: R. Jardine, M.P., Lockerbie. Commended: Sir W. C. Trevelyan, H.R.H. the Prince of Wales, the Duke of Sutherland, and W. Symonds, Epping.

Class 25. Scotch West Highland Heifers or Cows, of any age.—£15, Sir W. C. Trevelyan, Bart.; 2d, £10, J. Reid, Graystone, Aberdeen.

Class 26. Scotch Horned Steers or Oxen, of any age.—£10, R. Wortley, Suffield, Aylsham, Norfolk.

Class 27. Scotch Horned Heifers or Cows, of any age.—No entry

Class 28. Scotch Polled Steers or Oxen, of any age.—1st, £30, R. H. Harris, Earnhill, Forres, Moray; Silver Medal to the breeder, R. Bruce, Forres: 2d, £15, W. McCombie, M.P., Tillyfour.

Class 29. Scotch Polled Heifers or Cows, of any age.—1st, £15, J. Bruce, Burnside, Fochabers; Silver Medal to the breeder, W. Brown, Inverness; 2d, £10, W. McCombie, M.P.

Class 30. Irish Steers or Oxen, of any age.—No entry.

Class 31. Irish Heifers or Cows, of any age.—£10, Lord Berners, Keythorpe Hall, Leicester.

Class 32. Welsh Steers or Oxen (Runts), of any age.—1st, £20, Sir C. E. Isham, Bart., Lamport, Northampton; 2d, £10, R. D. Jenkins, Pantirion, Cardigan.

Class 33. Welsh Heifers or Cows, of any age.—Prize withheld.

Class 34. Cross or Mixed-bred Steers, not exceeding 3 years old.—1st, £25, W. Drysdale, Kinghorn, Fifeshire; Silver Medal to the breeder, J. Cruickshank, Aberdeen; 2d, £15, trustees of R. Moir, Meikle Tarty, Ellon; 3d, £10, R. Bruce, Newton of Struthers, Forres. Highly Commended: Messrs. Martin, Aberdeen. Commended: T. L. Senior, Aylesbury, and H. S. Stratford, Thorpe.

Class 35. Cross or Mixed-bred Steers or Oxen, above 3 years old.—1st, £25, and Silver Medal to the breeder, W. Brown, Linkwood, Elgin; 2d, £15, J. Stephen, Conglass, Inverurie, Aberdeen; 3d, £10, W. Scott, Glendronach, Huntley, Aberdeen. Very Highly Commended: Messrs. Martin, Aberdeen. Highly Commended: the Earl of Dunmore, J. Overman, H. Betteridge.

Class 36. Cross or Mixed-bred Heifers, not exceeding 4 years old.—1st, £20, the Earl of Dunmore, Stirlingshire; Silver Medal to the breeder, J. Minty, Ellon; 2d, £10, A. Cowie, Crombly Bank, Ellon. Highly Commended: Sir W. C. Trevelyan.

SHEEP.

THE sheep classes are a most excellent show; indeed, we may say some of the pens have on this occasion exceeded the fine specimens which have been sent from the same flocks in previous years. Thus we have Lord Walsingham's pen of yearling Southdowns of

excessive size, so to express it, for the breed, as they weigh no less than 6 cwt. 2 qr. or 244 lb. per sheep, live weight, while their form and quality cannot be surpassed. On this result we cannot do less than congratulate Mr. Henry Wood, his lordship's agent, and Day, his lordship's shepherd, as well as Lord Walsingham himself. To these sheep, however, we shall again have to refer, as there are some curious comparisons to be made between them and the Hants and Shropshires.

The Leicesters continue to be placed in the first position by this Club, and Lord Berners almost as regularly takes the lead in prizes. On this occasion his lordship takes the 1st prizes in each of the two classes in which he exhibits. The weight of the prize pen in the "open" class is 6 cwt. 3 qr. 21 lb., and that of the pen "not to exceed 200 lb.," is 5 cwt. 2 qr. 11 lb. These weights, remarkably enough, are heavier than any other of the prize wether Leicesters, and one pen only of coarser sheep exceed them by 2 lb. on the pen. The Keythorpe Hall sheep, however, are very fat and firm, from being most skilfully fed to the greatest possible weight their frame would allow. These are certainly very remarkable sheep, and while their family likeness shows their purity of breeding, their wool is no less suggestive of a brief discussion on this product. It has been frequently mentioned, both at this and previous shows, that these sheep are not of the character which farmers, who have to look to their rent, can patronise. This view, however, we look upon as a mistake, for the value of these sheep consists in their purity. We are not prepared to admit that these sheep are in the most profitable form for producing meat for the million and wool for the woolstapler; but it is not on these direct productions that their value now depends, for whenever these sheep are put to common flocks of Leicesters, or to coarser breeds, as the Lincolns, Cotswolds, and Hants and Wilts Downs, their issue considerably increases in comparison to the size and weight of the sire. It is in the purity of these sheep that their value lies, and in practice that value consists in the manner in which they are calculated to bring into form and quicken the maturity of families or breeds which are defective in these essentially modern attributes. Mr. Brown's and Mr. Foljambe's pens of wethers, and Colonel Lowther's ewes "that must have had a lamb," are also good specimens of this pure breed, to the qualities of which so many other breeds and crosses are indebted.

The Southdowns, however, are undoubtedly the centre of attraction, as their close even coats and fine docile countenances and perfectly symmetrical forms in their show dress are sure to catch the eye of amateurs and the uninitiated public, as well as the breeders and feeders, all of whom take a great interest in their progressive appearance. Lord Walsingham, as we have said, is here 1st in two instances, with pens that must be seen or photographed, or painted on canvas, to be appreciated. No words can describe their perfection. The Duke of Richmond, Mr. Foljambe, H.R.H. the Prince of Wales, Lord Braybrooke, Lord Sondes, Mr. Rigden, Mr. John Overman, and Sir William Throckmorton, also sent some excellent pens of this breed.—The class for sheep under 200 lb. each live weight, in which all the above celebrated breeders and feeders sent pens, was very properly highly commended by the judges. The 2-shear sheep of this breed were also of their usual excellence for form and substance; but one point of the remarkable comparisons to which we have referred is the fact, that the Duke of Richmond's 1st prize pen is only 9 lb. heavier than Lord Walsingham's pen of shearlings, that the Sandringham pen is only 10 lb. heavier, while Mr. Taylor's commended pen is 48 lb. lighter. The only sheep which bear any fair comparison are Mr. Overman's, which weigh 1 qr. 24 lb. heavier than the Merton shearlings.

Now we will take the *Wilts* and *Hants Downs*. In these classes there are some splendid sheep for size and weight of flesh; but their lean or muscular character—which is so great a trait in their favour—is indicated by their less ripe condition when compared with the former breeds; for, although their frame is so much larger, from the want of a comparative maturity through lacking a predisposition to get fat, they weigh only 3 qr. 2 lb. more than the 1st prize Southdowns. Mr. Morrison's Hants sheep, however, are of very fine quality, and of excellent condition for the butcher, while their want of comparative weight does not in any way detract from their special value, for if the two pens were kept on for the next three, six, or twelve months, the increase of the Hants over the Southdowns would be double or treble. In this, of course, we are not overlooking the extra food the larger sheep would eat as compared with the smaller, but we are desirous of showing that the Hants and Wilts Downs, although they are ugly to look at, have their special value as producers of a large quantity of mutton in heavy joints, while the quality of their fat and lean is scarcely second to the Southdown, and it is equal to any other breed in the kingdom.

The Shropshires may be taken as the next important class, for the breeders of these sheep act in a very spirited manner, and quite eclipse, both in number and form, the Lincolns, the Cotswolds, and the Oxford Downs, as other tribes of sheep extensively cultivated on their own ground. Lord Chesham is again 1st in each class of wethers. Here, we may first remark, is another of the curious comparisons of the live weights. The 1st prize Shrops are 42 lb. lighter than the Merton Southdowns. This is a point for Messrs. Masfen, Horley, and Coxon to discuss. The 2-shear, it is true, come more up to the Shropshire professed standard, but here there is the singular fact that the 2d prize pen—Mrs. Beach's splendid sheep for length and quality—weighs 60 lb. more than Lord Chesham's. Taking these sheep, however, altogether, they are a good show, and well merit the perseverance in giving them a public standard and the care in feeding which has been bestowed on them by the Shropshire and Staffordshire men. Mr. Nock's sheep are useful, but they are not at all equal to his last year's show. One of Lord Wenlock's pens is heavy and useful, but the older sheep are evidently an odd lot, which are as ill-looking as a whole as they are odd individually. And Mr. W. Yates, Grindle, sends a pen that are worthy of far more than they had accorded them at this show. Mrs. Beach's older pen, however, is, in our opinion, the best three sheep of all the pens of this breed.

The Oxfordshire Downs, the *Cotswolds*, and the *Lincolns* are not numerous, as we have intimated. The principal exhibitors will be found in our prize list. The Oxford Downs have the merit of producing the heaviest pens in the hall, and the further merit of a pen of ewes being heavier than the wethers. The former weigh 7 cwt. 2 qr. 22 lb.; and the ewes, the age of which is 45 months, weigh no less than 8 cwt. 1 qr. 26 lb. The Lincolns are good in themselves, but they are hardly up to the character of this favourite breed in their own country and its bordering districts. And the Cotswolds, although large and well fed, do not create that admiration which has usually been justly bestowed on their long, curly, whitened locks.

There are, besides, a few *Rylands*, *Cheviots*, *Dorset* and *Mountain* sheep, and some crosses. The Cheviots and the crosses are worthy of particular notice. The former, hardy and thrifty hill sheep, are rapidly coming to the front as a breed adapted for lowlands as well as the hills, for there is great size and much quality in the improved pens here exhibited, while in the crosses Mr. Overman exceeds himself with his Leicester Downs, for they are one of the best pens, if not the best pen, we ever saw.

The following is the Prize List:—

JUDGES.—Leicesters, Cotswolds, Lincolns, Kentish Crossbreds, Oxfordshire, Sir Suntuary, &c.: Charles Clarke, Scopwick, Lincoln; R. Garne, Aldworth, Northleach; G. Wallis, Old Stifford, Bampton, Faringdon. Southdowns, Hampshire, Shropshire, Ryeland, &c.: H. Fookes, Whitechurch, Blandford; T. Horley, The Fosse, Leamington; W. Sainsbury, Hunts House, West Lavington, Devizes.

Class 37. Fat Wether Sheep of the Leicester breed, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, Lord Berners, Keythorpe Hall; 2d, £15, W. Brown, High Gate House, Holme-on-Spalding Moor; 3d, £5, J. Newman, Harrowden, Bedford. Commended: Col. Lowther, M.P.

Class 38. Fat Wether Sheep of the Leicester breed, 1 year old (under 23 months), each sheep not to exceed 200 lb. live weight.—1st, £20, and Silver Medal to the breeder, Lord Berners; 2d, £15, W. Brown; 3d, £5, F. J. S. Foljambe, M.P., Osberton Hall, Worksop.

Class 39. Fat Ewes of the Leicester breed, above 3 years old (that must have had a lamb).—£10, and Silver Medal to the breeder, Col. Lowther, M.P., Oakham.

Class 40. Fat Wether Sheep of the Cotswold breed, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, R. Hall, Great Barford, Beddington; 2d, £15, J. Wheeler, Long Compton, Shipston-on-Stour; 3d, £5, J. Baldwin, Luddington.

Class 41. Fat ewes of the Cotswold breed, above 3 years old (that must have had a lamb).—£10, and Silver Medal to the breeder, J. Baldwin.

Class 42. Fat Wether Sheep of the Lincoln breed, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, C. Lister, Coleby Lodge, near Lincoln; 2d, £15, J. B. Swallow, Horkston Villa, Barton-on-Humber; 3d, £5, J. Pears, Mere Branston, Lincoln. Highly Commended: T. W. D. Harris, Wootton. Commended: J. Byron, T. Gunnell.

Class 43. Fat Ewes of the Lincoln breed, above 3 years old (that must have had a lamb).—£10, and Silver Medal to the breader, F. Sardeson, Cranwell, Sleaford. Highly Commended: J. Pears.

Class 44. Fat Wether Sheep of the Kentish or Romney Marsh breed, 1 year old (under 23 months).—1st, £15, and Silver Medal to the breeder, J. Stewart, Elmsted Court, Ashford; 2d, £10, F. Murton, Smeeth, Ashford.

Class 45. Fat Wether Cross-bred Long-woolled Sheep, 1 year old (under 23 months).—1st, £15, and Silver Medal to the breeder, T. W. D. Harris, Wootton, Northampton; 2d, £10, Sir W. De Capell Brooke, Bart., Kettering. Highly Commended: J. Newman.

Class 46. Fat Wether Sheep of the Southdown breed, 1 year old under 23 months).—1st, £20, and Silver Medal to the breeder, Lord Walsingham, Merton Hall, Thetford; 2d, £10, F. J. S. Foljambe, M.P.; 3d, £5, the Duke of Richmond. Highly Commended: H. Humphrey.

Class 47. Fat Wether Sheep of the Southdown breed, 1 year old (under 23 months), each Sheep not to exceed 200 lb. live weight.—1st, £15, and Silver Medal to the breeder, Lord Walsingham; 2d, £10, Sir W. Throckmorton, Bart., Farringdon; 3d, £5, Lord Sondes. Highly Commended: the Duke of Richmond and the whole class.

Class 48. Fat Wether Sheep of the Southdown breed, 2 years old (above 23 and under 35 months).—1st, £15, and Silver Medal to the breeder, the Duke of Richmond; 2d, £10, John Overman, Burnham, Sutton. Commended: W. Taylor, Westham, Sussex.

Class 49. Fat Ewes of the Southdown breed, 3 years old (that must have had a lamb).—£10, and Silver Medal to the breeder, Lord Walsingham. Highly Commended: Lord Dacre.

Class 50. Fat Wether Sheep of the Hampshire or Wiltshire Down breed, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, A. Morrison, Fonthill House, Tisbury, Wilts; 2d, £15, J. Russell, Dartford; 3d, £5, R. and J. Russell, Dartford. Highly Commended: J. and M. Arnold. Commended: W. G. Duncan, Bradwell.

Class 51. Fat Ewes, of the Hampshire or Wiltshire Down breed, above 3 years old (that must have had a lamb).—£10, and Silver Medal to the breeder, J. D. Allen, Tisbury.

Class 52. Fat Wether Sheep of the Shropshire breed, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, Lord Chesham, Latimer, Bucks; 2d, £10, T. Nock, Sutton Maddock, Shiffnall; 3d, £5, Lord Wenlock, Escrick Park. Highly Commended: S. C. Pilgrim.

Class 53. Fat Wether Sheep of the Shropshire breed, 2 years old (above 23 and under 35 months).—1st, £15, and Silver Medal to the breeder, Lord Chesham; 2d, £5, S. Beach, Penkridge. Highly Commended: J. Coxon.

Class 54. Fat Ewes of the Shropshire breed, above 3 years old (that must have had a lamb).—£10, and Silver Medal to the breeder, Lord Chesham. Very Highly Commended: T. Nock.

Class 55. Fat Wether Sheep of the Oxfordshire breed, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, Sir H. W. Dashwood, Bart., Kirtlington Park, Oxford; 2d, £15, the Duke of Marlborough; 3d, £5, N. Stilgoe, Manor Farm, Adderbury. Highly Commended: Lieut.-Colonel Loyd Lindsay. Commended: the class generally.

Class 56. Fat Wether Sheep of the Oxfordshire breed, 2 years old (above 23 and under 35 months).—£10, and Silver Medal to the breeder, A. Rogers, Bromham, Bedford.

Class 57. Fat Ewes of the Oxfordshire breed, above 3 years old (that must have had a lamb).—£10, and Silver Medal to the breeder, J. Treadwell, Upper Winchendon, Aylesbury. Highly Commended: C. Howard, Bedford.

Class 58. Fat Wether Sheep of the Ryeland, Cheviot, Dorset, or any other pure breed not specified in any of the foregoing divisions.—1st, £15, and Silver Medal to the breeder, H. Farthing, Bridgewater; 2d, £10, J. B. Downing, Holme Lacey, Hereford; 3d, £5, Sir W. Gordon G. Cumming, Bart., Altyre Forres. Highly Commended: R. Jardine, M.P.

Class 59. Fat Wether Sheep, of any White-faced Mountain breed, of any age.—1st, £15, and Silver Medal to the breeder, J. Tapp, Twitchen, South Molton; 2d, £10, W. Smith, Exeter. Highly Commended: C. McNiven.

Class 60. Fat Wether Sheep, of any Black-faced or Speckled-faced Mountain breed, of any age.—1st, £15, and Silver Medal to the breeder, the Duke of Roxburghe; 2d, £10, the Earl of Strathmore. Highly Commended: J. McGill.

Class 61. Long and Short-woolled Cross-bred Fat Wether Sheep, 1 year old (under 23 months).—1st, £20, and Silver Medal to the breeder, J. Overman, Burnham Sutton; 2d, £15, H. Purser, Bedford; 3d, £5, J. Newman, Harrowden. Highly Commended: T. Rush. Commended: Z. W. Stilgoe and J. Mason.

Class 62. Long and Short-woolled Cross-bred Fat Wether Sheep, 1 year old (under 23 months), each Sheep not to exceed 220 lb. live weight.—£10, and Silver Medal to the breeder, Overman, Burnham Market.

PIGS.

THESE animals include 54 pens, not a large entry, but the uniform good quality of the entire collection makes them an admirable display in proof of the perfection to which this branch of breeding and feeding is now carried. There is nothing about this department that is either pecuniarily or sentimentally objectionable, excepting perhaps the fact that the 2d prize in Class 69 is withheld, a conclusion which has set the exhibitors in that class a-grumbling, and the more so, as they do not see the grounds for such treatment, as the Rev. G. Bailey's good pen of Berks, which were 1st at Birmingham, are there. Some of the pens, however, in this class are not up to "show" condition.

In the class for "any white breed" Captain Warren's is a capital pen, of fine quality, with enough hair on them to indicate their thrifty and hardy character; and here Her Majesty the Queen has a pen which is a good second. The older pens of the same breeds are even better, and there are various opinions as to whether Mr. Lynn's were not more deserving of the first position than are the Messrs. Duckering's.

The black breeds are also a great show, the appearance of which, however, was detracted from by the death, on Saturday night, of two out of the three of Lord Aylesford's swine, which result is attributed to travelling and the cold. Mr. Coate, Hammoon, Blandford, here shines again with three excellent pigs, and on this occasion he is better than ever, for his pigs have been frequently flabby and oily of late years; but these pigs are firm, as well as large and well formed. This breeder, as will be seen, is first in both classes for black pigs.

The official list of weights does not include the pigs, which we much regret, for if any use can be made of these returns, it would certainly be in the case of pigs.

The following are the Awards:—

JUDGES.—Thomas Baldwin, Glasnevin, Dublin; E. Little, Lanhill, Chippenham; G. M. Sexton, Wherstead Hall, Ipswich.

Class 63. Pigs of any White Breed, not exceeding 9 months old.—1st, £10, and Silver Medal to the breeder, Captain R. P. Warren, Worting House, Basingstoke; 2d, £5, Her Majesty the Queen.

Class 64. Pigs of any White Breed, above 9 and not exceeding 12 months old.—Not sufficient merit.

Class 65. Pigs of any White Breed, above 12 and not exceeding 18 months old.—1st, £10, and Silver Medal to the breeder, R. E. Duckering & Son, Northorpe; 2d, £5, J. Lynn, Stroxton, Grantham. Highly Commended: Captain R. P. Warren.

Class 66. Pigs of any Black Breed, not exceeding 9 months old.—1st, £10, and Silver Medal to the breeder, J. Roberson, Clayford, Herts; 2d, £5, J. Coate, Hammoon.

Class 67. Pigs of any Black Breed, above 9 and not exceeding 12 months old.—1st, £10, and Silver Medal to the breeder, A. Benjafield, Stalbridge, Blandford, Dorsetshire; 2d, £5, C. McNiven, Perrysfield.

Class 68. Pigs of any Black Breed, above 12 and not exceeding 18 months old.—1st, £10, and Silver Medal to the breeder, J. Coate, Hammoon; 2d, £5, Capt. R. P. Warren. Commended: C. McNiven.

Class 69. Pigs of any other breed, not exceeding 9 months old.—1st, £10 and Silver Medal to the breeder, J. Biggs, Cublington, Leighton Buzzard, Beds; 2d, £5, withheld.

Class 70. Pigs of any other breed, above 9 and not exceeding 12 months old.—1st, £10 and Silver Medal to the breeder, S. Druce, Eynsham, Oxford; 2d, £5, J. Biggs, Cublington.

Class 71. Pigs of any other breed, above 12 and not exceeding 18 months old.—1st, £10, and Silver Medal to the breeder, the Marquis of Ailesbury, Savernake Forest; 2d, £5, J. P. King North Stoke, Wallingford.

EXTRA STOCK.

£10, and Silver Medal, for the best Steer or Ox, T. Pulver, Broughton, Kettering, Northampton. Very Highly Commended: W. Heath. Highly Commended: R. Jardin, M.P. Commended: R. Barcham.

£10, and Silver Medal, for the best Heifer or Cow, E. Walter, Tangley Farm, Wokingham, Berks. Highly Commended: C. McNiven, Perryfield; and Her Majesty the Queen. Commended: J. Perkins.

Silver Cup, value £5, for the best Wether Sheep of the Leicester, Cotswold, Lincoln and Kentish, or other Long-wool breed, L. Byron, Kirkby Green, Sleaford.

Silver Cup, value £5, for the best Wether Sheep of the Southdown, and Hampshire or Wiltshire Down breeds, Lord Walsingham. Highly Commended: Duke of Richmond, S. J. Follambe, M.P. Commended: R. and J. Russell, J. Russell, H. H. Penfold, A. Morrison, and Lord Braybrooke.

Silver Cup, value £5, for the best Wether Sheep of the Shropshire, Oxfordshire, Cross-bred, or any other breed not specified above, J. Newman, Harrowden, Bedford.

Silver Cup, value £5, for the best single Pig, the Earl of Aylesford, Packington Hall, Coventry, Warwick.

SILVER CUPS.

Silver Cup, value £40, for the best Steer or Ox in any of the classes, W. Taylor, Glynley, Westham, Sussex.

Silver Cup, value £40, for the best Heifer or Cow in any of the classes, T. L. Senior, Broughton House, Aylesbury, Bucks.

Silver Cup, value £20, for the best pen of Leicesters, Cotswolds, Lincolns, Kentish, or other Long-woolled breed, in any of the classes, Lord Berners, Keythorpe Hall, Leicester.

Silver Cup, value £20, for the best pen of 1-year-old Southdowns, Hampshire, or Wiltshire Downs, Lord Walsingham, Merton Hall, Thetford, Norfolk.

Silver Cup, value £20, for the best pen of 1-year-old Shropshire, Oxfordshire, Cross-bred, or any other breed of sheep (not specified in the Prize List) in any of the classes, J. Overman, Burnham Sutton, Burnham Market, Norfolk.

Silver Cup, value £20, for the best pen of Pigs in any of the classes, A. Benjafield, Stalbridge, Blandford, Dorsetshire.

CHAMPION PLATE.

A piece of Plate, value £100, to the exhibitor of the best Beast in the Show (extra stock included), T. Pulver, Broughton, Kettering, Northampton.

A piece of Plate, value £50, to the exhibitor of the best pen of Sheep in the Show, Lord Walsingham, Merton Hall, Thetford, Norfolk.

IMPLEMENTS.

THE implement show this year in the Agricultural Hall is fully an average, both as to useful novelty and the selection of old and well-tried machinery. The exhibition of roots far exceeds what could have been expected from the nature of the season. In that department we shall have to give each stand a separate notice, but the other entries it will be necessary to classify, beginning with tillage implements.

Steam Culture.—Were John Fowler & Co. to exhibit examples of steam-culture engines and apparatus of their five systems, they would do more than fill the lower department of the Agricultural Hall allotted for implements; and if we add to the steam-tillage appliances of this firm those of the Messrs. J. & F. Howard with the other exhibitors under this head, as Fisken, Aveling & Porter, Edington — the latter showing ploughing engines only—the reader will understand that the respective exhibitors have to make the best selection they can to represent, with the aid of drawings and models, their respective manufactures, and this they do on the present occasion very successfully. The last season has illustrated practically in the provinces the advantage of steam-culture over horse-culture in a very remarkable manner, and this, no doubt, is one of the reasons which is making this class of implements and machinery more than usually attractive and popular, not only to the agricultural interest, but with the public generally. J. Fowler & Co. exhibit a 14-horse power steam ploughing engine, an 8-horse traction engine, a light-land turning cultivator, and a heavy-land turning cultivator. The light-land cultivator is shown in the place of a six-furrow balance-plough entered, but there is less loss in this, as Fisken's tackle is working a balance-plough and several cultivators, as subsequently noted.

Fowler's six-furrow balance-plough (fig. 283), and five-furrow and eight-furrow ploughs, shown at Oxford, are great improvements, not only for the ploughing of light, sandy, and gravelly land, but also for ploughing heavy land a second time with a light furrow. To the light-land farmer a light-land plough is a *sine quâ non*, and therefore on that head no two opinions exist on the subject. But in heavy-land steam tillage it is otherwise, the credence being very common that the cultivator and ridge-plough are all that is required for secondary operations. Such, however, is a very serious mistake, for in autumn and also spring and summer fallowing we have seen more loss sustained in a single season from the improper covering of farmyard manure and compost and in the burying of lime too deep than would purchase a five or six-furrow balance-plough. There are also examples of the primary tillage of leas and stubbles, where heavy land should be ploughed light in order to rot vegetable matter in the surface, and to permit of its being afterwards ploughed 2 or 3 inches deeper in order to bring up a fresh clod for the winter. In these and numerous other examples, which might be quoted, the six-furrow plough is as valuable to the heavy-land farmer as to the light-land farmer. No doubt it may be argued in steam-culture as it has been argued in horse-culture that the farmer who has a three-furrow deep tillage plough can set his implement to plough half the ordinary depth, and thus obviate the expense of an additional six-furrow plough. But just as in the case of the economists who use a 2-horse plough with one horse, so is it in this case; for an implement made to plough 10 or 12 inches deep will never do good work ploughing 4 and 6 inches deep, and the difference is far greater than is generally imagined, and will soon redeem a six-furrow plough.

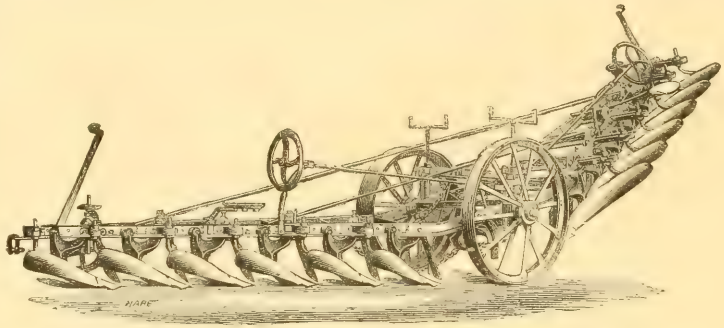

FIG. 283.—SIX-FURROW BALANCE PLOUGH.

Fowler's Patent Turning Cultivators are a great improvement on the old balance cultivators for ordinary tillage operations, both in light and heavy land. It is, perhaps, almost superfluous to say that heavy-land cultivators are similar to light-land ones, save in the strength and weight of material, and that in commencing steam-ploughing stronger implements are needed than afterwards; but the latter argument, although sound, is of less weight in practice than some may at first sight calculate, for it is better to loosen the bottom with subsoil ploughs, and then afterwards to bring up or break with the cultivator an inch or so of the subsoil at a time, and as light-land implements require to be made sufficiently strong for this amount of extra work, the conclusion is obvious. Thus, at the Oxford field trials we saw one of Fowler's light-land cultivators let down so as to bring up nearly 6 inches of the hard subsoil to the surface. The implement was being shown to a purchaser, and it was let down in order to show that it was capable of working six inches deeper than the land had previously been cultivated by steam. At the headland the workman on the implement turns in and takes on fresh ground with a degree of facility and accuracy which requires to be seen to be practically appreciated at its true value. In this respect the implement is far superior to the old balance-cultivator, or to any of the other steam-cultivators now in use, whilst from headland to headland it is more easily steered; it is also lighter in draught, and requires less house-room when not in the field. But, just as heavy-land ploughs are required for heavy land, so is a heavy-land cultivator (fig. 284) required to smash up sun-baked clays in autumn fallowing after harvest. The engraving represents a powerful tillage implement, capable of smashing up very heavy land to a great depth. It is free from complication of mechanism, and so designed that the resistance falls very equally on the working parts, which are both strong and simple. The main axle that carries the frame and rear wheels is cranked, and as the frame carrying the tines is connected to this

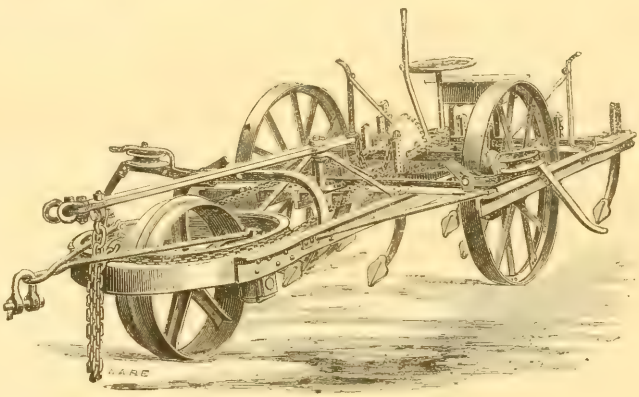

FIG. 284.—TUENING CULTIVATOR.

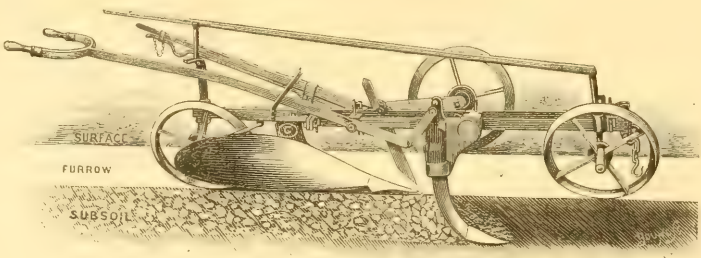

FIG. 285.—DOUBLE-FURROW PLOUGH.

crank, the latter (the tines) can be lowered or raised, and thus adjusted to any required depth. The breadth of the implement may be increased or reduced as the land requires. The two ropes become alternately the hauling rope and the tail rope, and at the land's-end, when the change takes place in the act of turning, self-acting rope-guides receive the previously hauling rope, which now becomes the tail rope, and what was formerly the tail rope becomes the hauling rope, the alternate change being thus self-acting, requiring comparatively no guidance from the workman. The two ropes—or e from each engine—or one from the engine and the other from the anchor, as the case may be, are attached to the two ends of the forked lever, which turns in an upright-staged standard, seen about the middle of the implement. The other end—the short end of the turning lever, is attached by means of a chain to the toothed sector pulley, and as the long levers are turned round in the above change of rope, the implement is raised out of the ground. The broad front wheel works in a turntable frame, and is steered by chain and wheel seen at the seat of the workman. Thus when the implement comes up to one headland the engine on the opposite headland is thrown into gear, and as the tail rope immediately becomes the hauling rope, it pulls the lever round, which raises the implement, the sector rack being held by the vertical hand-lever at the workman's seat. When up to the proper height the lever comes against a stop, pulls the implement round, and thus takes on fresh ground. The steersman then relieves the sector catch, when down drops the implement into work, the turning at the headland occupying less time than is required to describe it.

The Messrs. J. & F. Howard exhibit a steam-plough and cultivator, also their detached winding drums; and in the gallery the Ravensthorpe Engineering Company exhibit a model of Fisken's tackle, referring visitors to Mr. Johnson's farm, Acton, where their light-rope system is at work, hauling John Fowler & Co.'s balance-ploughs and cultivators, giving very general satisfaction to visitors. The Fiskens, it must be borne in mind (David Fisken and Thomas Robert Hay Fisken) are the inventors of the first balance-plough. They appeared at the Carlisle meeting of the Royal Agricultural Society of England, 1855, but not having capital to work their project they sold their balance-plough, and thus were sheltered for 14 years. But patent laws no longer stand in the way, and it must afford all who appreciate what the balance-plough has done for steam culture no little pleasure to see its true inventors successfully in the field. Since 1855 the-light rope system has been much improved, and is now well worth the attention of the agricultural public.

Double-furrow Ploughs.—G. W. Murray & Co. exhibit three double-furrow ploughs, two for turning two furrows, and the other (fig. 285) for turning one furrow-slice, with a subsoiler in front for loosening the subsoil in the bottom of the furrow behind the furrow-horse. This is a much more effective plan of subsoiling than the old one, as the furrow-slice is turned over the newly loosened subsoil, thus leaving the land in the best possible state for aëration and drainage, with the fertilising processes that follow. When the work was done on the old plan, either with two teams—one in the subsoil plough, and the other a common plough, or with a subsoiler at the heel of a common plough—the furrow-horse of the latter team trod and consolidated the newly loosened subsoil. Even the feet of the ploughman holding the subsoil-plough did much harm to land naturally adapted to run together in the bottom, and besides better work done, there is a great economy of horse-power, fully as much as when turning two furrow-slices. By removing the subsoiler, and fixing a breast, the implement is converted into a two-furrow plough. At the Oxford meeting of the Royal Agricultural Society, this combination of plough and subsoiler received the highest commendation of the judges. Whether used in this combined form, or as a double-furrow plough, the implement is remarkably light in draught, thus proving that it is constructed on sound principles. The simplicity of the mechanism and plainness of the illustration render a detailed description unnecessary. The lever on the left hand regulates the depth of the furrow-slice, and throws the implement out at the headland, by means of the land-wheel. The long lever to the leading furrow-wheel is for steering, and the two handles form a third lever for adjusting the depth of the subsoiler.

Double-furrow ploughs are also shown in the gallery by Mr. Perkins, Hitchen, with a chain device for steering the two furrow wheels; also by Mr. Corbett, of Shrewsbury, and by Bail & Sons, Rothwell, Northamptonshire. Messrs. R. Hornsby & Sons show several double ploughs with steerage, and drop wheels for turning; also means for increasing depth and breadth of furrow. The steerage and turning wheels are both very ingenious. Messrs. J. Fowler & Co. exhibit a double-furrow Pirie plough. W. S. Underhill shows two double ploughs. Messrs. J. & F. Howard exhibit two new double-furrow ploughs, with a very simple and effective steerage and method of raising the implement out of the ground. Thus the two beams are jointed before the leading plough coulter, and by means of leverage the beams at this part rise upwards, and thus throw the weight of the ploughs and frame on to the two front wheels and the furrow-wheel in the rear. The Messrs. Ransomes, Sims & Head exhibit their new patent double-furrow plough, of which we gave an illustrated notice at the Oxford meeting (July 23, p. 1009) to which we refer, and since which time it has gained a considerable number of prizes. Instead of the usual steerage and toilsome lifting apparatus they have introduced two self-acting lifting and turning wheels in the centre of the implement. When the ploughs are in work, one of these wheels forms the land wheel, while the other rises by self-acting mechanism and remains suspended above, but on reaching the end of the furrow it is lowered, and by its combined action with a spike, which enters the ground, the implement is immediately lifted out of work on to the two wheels by the onward movement of the horse. When thus raised this very simple but ingenious device forms a two-wheeled carriage, as it were, upon which the implement runs along the headland when ploughing broad ridge-and-furrow work, and at the crowns and outcastings it can be turned in with the greatest ease exactly as required. Side and sole friction has been obviated by a friction wheel at the rear of the last plough in a manner which has reduced draught to a minimum, the dynamometer proving, at the great Peterborough trials, that the implement was considerably lighter in draught than any of the other prize implements.

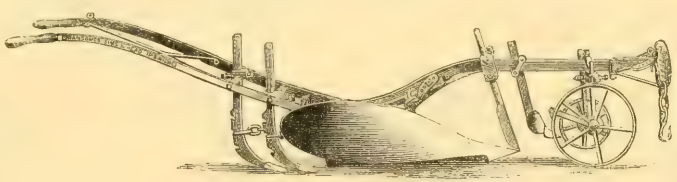

Fig. 286. FIRST-PRIZE PLOUGH.

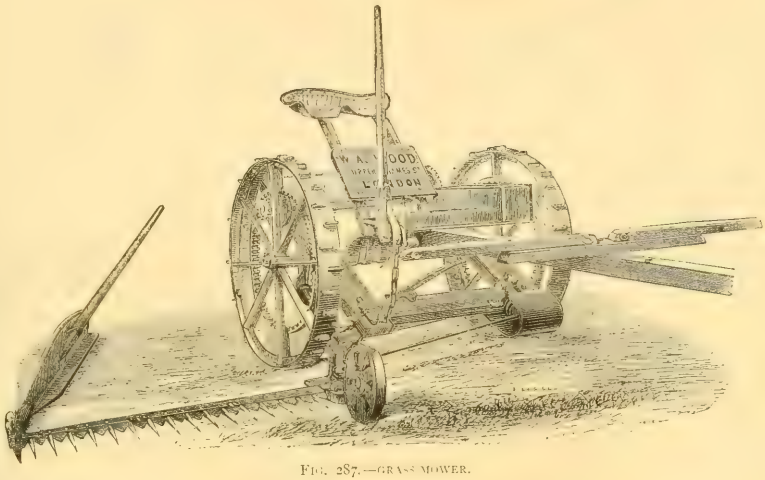

Fig. 287.—GRASS MOWER.

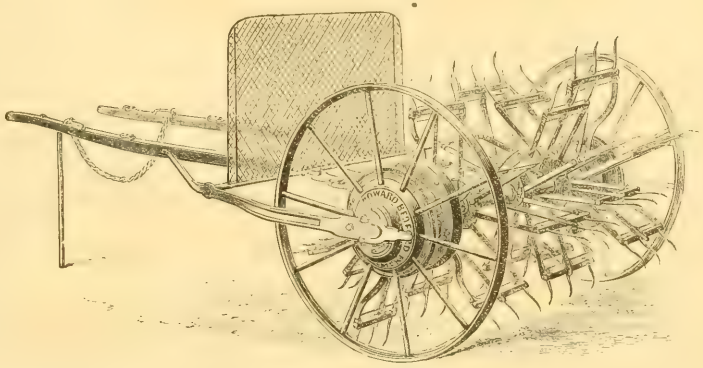

Fig. 288.—CENTRAL ACTION HAYMAKER.

Horse Ploughs.—Double-furrow ploughs have nearly driven the old common ones out of fashion. The latter, nevertheless, are fairly represented; but with one exception, on the stand of the Messrs. Ransome,

Sims & Head, which merits special notice, we shall not individualise exhibitors.

Fig. 289 represents the Messrs. Ransome, Sims & Head's 1st prize plough at the Newcastle and Leicester meetings of the Royal Agricultural Society, furnished with grubbers; the invention of Mr. Robinson, a practical Middlesex farmer. For deep ploughing these ploughs were never beaten; and as deep ploughing is now the order of the day, and shallow ploughing the exception, the implement may justly be termed "the Champion Plough of England." It would take a very elaborate series of mathematical drawings to show how this plough turns the deep-furrow slice and lays it in the manner it does, leaving a clear open furrow for the next turn: we here allude to what the judges said in their report at Leicester, and perhaps we should not be thanked were we thus to lay open the grand secret in the manufacture. But be that as it may, the Smithfield Club Show is not the time for the solution of such a question. But speaking generally, the wrought-iron beam, instead of being a single bar, is made double at the lower end, where it embraces the body or frame of the plough. By this construction the beam acquires a degree of stiffness sufficient to obviate vibration, whilst it at the same time admits of simpler fastenings for the coulter and steam coulter, thus further increasing stiffness. It is a well-known fact that any spring or vibration of the beam greatly increases draught. For a similar reason the handles are braced by diagonal stays. By this formation of the beam and handles the greatest strength is obtained by the less weight of iron. The plough is fitted with a lever neck, by which more or less pitch is given to the share. The two grubbers are not rigidly fixed, but have sufficient play to permit of their going laterally when they come in contact with a stone or any similar obstruction in the land, and to give them strength the other way they have each a drag-chain fixed in the body. Their object is to break pan and gradually deepen the soil, and also to loosen the soil below in ploughing in manure with a shallow furrow. For this latter purpose they are admirably adapted, for the manure laid thus upon a loosened and properly aërated soil is in the best possible state for thorough incorporation with the land; whereas the manure, when turned down into a hard or close bottom, is often more than half lost. Fig. 290 is a front view of the wheels on a larger scale. The judges in their report of the Leicester trials of the Royal Agricultural Society, 1868, spoke in the highest terms of these wheels. They are constructed on the same principle as carriage wheels, the hubs being bored, and the axles turned and capped so as effectually to keep out dirt, and they are easily oiled without the wheels being taken off. They are attached to the beam at each end of the cross-bar in a very simple and efficient manner, the cross-bar being held in its place by a clasp. An adjustable socket, with a vertical and horizontal hole, is put on to each end of the cross-bar. The stalks of the land and furrow wheels are passed through the vertical hole, and the socket works horizontally on the cross-bar. The set screws which hold the stalks in the sockets are very accessible, little time being occupied in altering either the width or depth. The hake is also furnished with a fine adjustment, so that the plough can be made to run perfectly true, thereby contributing greatly to reduce draught.

One-way Ploughs.—Ransome, Sims & Head exhibit their one-way prize plough, and overhead, in the gallery, Mr. Davey, of Crofthole, Cornwall, shows his Excelsior turnwrest plough, with a very simple ingenious device of a sort of parallel movement of locking the wheels, so that what was the land wheel the one is the furrow wheel the opposite way. At the land's-end the change from land wheel to furrow wheel, and *vice versâ*, is remarkably simple and self-acting. The Messrs. Howard exhibit improved harrows, but generally harrows, scarifiers, and grubbers, are not more numerous than usual. The reverse is the case with chain-harrows, horse-hoes, harrows, &c., for drilled crops. The growth of root crops is becoming every year more and more the badge of successful farming, and as farmers advance in this direction more mechanical appliances are needed to stir the soil between the rows. Rollers and clod-crushers are well represented by the Crosskills, Beverley; Amies & Barford, Peterborough; Cambridge & Co., Bristol.

Howard's Central Action Haymaker.—The Messrs. J. & F. Howard manufacture haymaking machines with the axis of the fork-barrel in a line with the axis of the wheels, as in fig. 288, and also with the axis of the fork-barrels in the rear of the axles of the wheels.

FIG. 289.—SPECIMEN ROOTS SHOWN AT THE AGRICULTURAL HALL.

The above figure contains portraits of four exhibited roots, the property of Messrs. Carter and Messrs. Sutton, drawn in the scale of one inch of Nature.—No. 1, is Carter's Long Mangel Wurzel, grown by W. T. Beamish, of Kilmeaden, Carrick-on-Suir, County Cork, which had been previously shown at the Royal Agricultural Society, and weighed 42 lbs.—No. 2, Carter's Warden Globe Mangel, grown by Mr. W. Gurdon, of Brantham Court, Manningtree.—No. 3, Suttons' Champion Intermediate Mangel, grown by Mr. McVicar, steward to Lord W. D'Eresby, Granthorpe Hall, Lincoln.—No. 4, Suttons' Berkshire Prize Globe Mangel, the largest Globe Mangel in the Hall, grown by Mr. Wren, of Whitley, Reading.—No. 5, Suttons' Mammoth Long Red, grown by Mr. Larkin, of Maidstone, weighing 46 lb.—No. 6, a Globe Mangel, exhibited by Messrs. Carter.—No. 7, Suttons' Globe Mangel, grown by Messrs. Hepburn & Son, Dartford, weighing 36 lb.—No. 8, Suttons' Swede, weighing 23 lb., the largest we saw in the Hall, grown by Mr. W. Joyce, of Abbey Farm, Waterford.—No. 9, Sugar-Beet, from Lodge Farm, Barking.—No. 10, Kohl Rabi, shown by Messrs. Sutton, grown by Mr. Morten, near Rickmansworth, in Hertfordshire.—No. 11, Suttons' Pomeranian Turnip.—No. 12, Student Parsnip, grown by Mr. Hall Dare, Newtownbarry.—No. 13, White Carrot, shown by Messrs. Sutton.

In the former case, when the wheels and the fork-barrels have a common axis directly in a line, then the forks lift the grass immediately under this line in tedding; consequently, as in the parallel case of the mower and reaper, where the knife cuts in a line with the ground under the wheel, the machine is enabled to work equally well in crossing furrows and crowns of ridges, and on unlevel ground as on level ground; another advantage is, that there is less dead surface, so to speak, for the grass to lodge upon, and thus clog the working of the machine. The obvious effects of these improvements is not only better work done, but also greater strength and durability, with a considerable reduction of draught to the horse. On the other hand, when the axis of the barrels is behind the axis of the wheels, the forks strike the ground when the wheels enter a furrow; and when the wheels begin to rise on the opposite side the forks rise also, and thus leave grass lying in the bottom of the furrows untouched. Equally bad work is made in passing over the crowns of the ridges. The same thing is experienced in passing over undulating surfaces, although less in degree. And the same bad work would be experienced were the axis of the fork-barrels in front of the axis of the wheels. Another advantage of the central or common axis is, that the working of the machine is less affected by the movement of the horse, for the distance between the axis of the wheels and the axis of the fork-barrels forms a lever, and the longer this lever the greater the velocity and stroke against the ground, and *vice versâ*; consequently with a common axis the leverage action is *nil*, and the harm from the rise and fall of the step of the horse comparatively so. Hence the familiar fact that a smooth, easy-going horse makes a good going haymaking machine, and a rough goer the reverse. Springs and similar devices may mitigate in degree injury to the forks, and also in some measure compensate for the quality of the work done. But the set-off is, at the best, but a poor apology for unsound design in the construction of the machine. The difference between a good going and a bad going machine in the hay field is not easily estimated, for in dry, hot, scorching weather much of the hay will be overmade before the bulk is ready for carrying; while in wet, catchy weather the hay is liable to be stacked

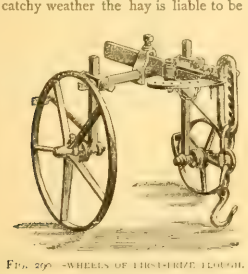

Fig. 269.—WHEELS OF THE THREE-HORSE PLOUGH.

before it is all ready, and hence to firefang; or if the farmer waits until the whole is dry, it is liable to be caught by rain, and hence to become mouldy if not to rot, and be fit only for litter and the dunghill. A good haymaking machine is invaluable, and however difficult it may be to work out details to meet the diversified requirements of the hay field, let the foundation of construction be sound in principle, with a central or common axis for the wheels and for the barrels. One common error fallen into is to think that the horse and machine should do everything and the driver nothing, for in windy weather more depends upon the driver than upon the horse and machine, and a very gentle breeze has a powerful effect upon the working of the machine, proper driving making good work, while bad driving makes the reverse.

There is a good show of haymaking machines in the Hall, almost all the other firms who supply the hay field being exhibitors. Horse-rakes are more numerous than usual. G. O. Gooday, of Chelmsford, exhibits his thatch-weaving machine; Francis Morton & Co., of Liverpool, London, and Glasgow, a hay-barn. At the opposite corner, Teaghe & Smith show, as last year, a model of Garrard's circular rick-cloth for hay or corn stacks. Edgingtons and Unite exhibit rick-cloths in abundance for oblong stacks of hay and corn.

[We are compelled to postpone till next week our further remarks on machinery, implements, and farm requisites in general.]

SEEDS AND ROOTS.

Thomas Gibbs & Co., Seedsmen to the Royal Agricultural Society of England, corner of Half-Moon Street, Piccadilly, have a very excellent show of roots and seeds, considering the season. The roots are not so large as we have seen, but the quality is fine.

J. C. Wheeler & Son have most excellent Red and Orange Globe Mangel Wurzel, also of Long Red Mangel. The Yellow Tankards and the Swedes are very good for the season, so is the green Kohl Rabi. Potatos very superior.

George Gibbs & Co., of Down Street, Piccadilly, have a most surprising show of roots, both as to size and quality. With the exception of the Cabbages, which are less than last year, we do not recollect of this stand having had a more attractive appearance. The Long Red Mangels are great roots, so are the Yellow Oval and Globe, the Kohl Rabi and Swedes, also Turnips and Potatos. The Cabbages are also fine for the season, and so are the Carrots.

Raynbird, Caldecott, Bawtree, Dowling & Co. have a small selection of roots. The bulbs are not extravagantly large, but the quality is fine. There are some good Long Red Mangels. Seeds, manure, and cake are all of the very best quality.

Isaac Wright & Son, Great Bentley, Essex, has this year a fair show of roots, considering the season.

Harrison & Sons, Royal Midland Seed Warehouse, Leicester, have a most excellent stand. Their Normanton Globe Mangel Wurzel weigh, some of them, no less than 35 lb., whilst a Long Yellow Mangel Wurzel is 39 inches in length. The Long Red Mangels are also wonderful roots, the Kohl Rabi fine, ditto Swedes. The Bovinia and Early Rose are superior, and the Nuneham Onion the best we ever saw, the quality being so exceedingly fine. The quality of the seeds is also superior.

James Carter & Co., of 237, High Holborn, have a most splendid show. Some of the Long Red Mangel Wurzel weigh 48 lb. each, being the largest, we believe, in the Hall. The Long Yellow Mangels are good, and so are the Yellow Intermediate. Carter's Warden Mangel Wurzel are superior roots both as to size and quality, and so are the Red Globe Mangel Wurzel; purple and green Kohl Rabi very good. Belgian and common Carrots good, so also Parsnips. Sugar-Beet good; a fine show of Potatos and seeds. (See fig. 289.)

John K. King, seed-grower, Coggeshall, Essex, has a larger and finer show than usual. The two rows of Mangel Wurzel are very superior, both as to size and quality, and his Swedes are of the very best quality. Seed fine.

Sutton & Sons, Reading, have the best show of roots we ever saw on their stand. Their Mammoth Long Red Mangels are of incredible size and weight, and unrivalled as to quality, and so are their Yellow and Intermediate Globe Mangel Wurzel. Some of the Long Reds measure 39 inches in length, and weigh upwards of 46 lb., Intermediate Yellows 35 lb. Some of their Mangels yielded 72 tons per acre. Their Swedes are very fine, and so are the purple and green Kohl Rabi. Their improved yellow and white-fleshed Turnips are uncommonly fine, and so are their Sugar-Beet and Belgian Carrots. Some of the Sugar-Beet, the produce of London sewage, grown on Lodge Farm, Barking, weighed 14 lb., and at the rate of 45 tons per acre; Mangels from the same place, upwards of 60 tons per acre; Bovinia Potatos fine. Early Rose and other new varieties super-excellent. They show the selection of Potatos for which the Royal Horticultural Society gave them the Special Certificate of Merit, Sept. 7, 1870. (See fig. 289.)

Mr. W. Hope, Farsloes, shows what Romford sewage can do in the growth of all kinds of agricultural produce. The different varieties of Cabbage, including Brussels Sprouts, are wonderful productions, the largest in the Hall, and the different kinds of Mangel Wurzel bear grand testimony to the force of sewage. Kohl Rabi and Swedes very fine, Carrots and Sugar-Beet super-excellent. The Bovinia Potato exceedingly large and fine, and so are the Early Rose. One of the maxima of the whole show is at this stand, *under* it we should say—hidden from view—whereas it ought to have been atop of it; but the authorities would not allow their rules as to height of stand to be broken! It would have crowned the edifice, as it were, for a nobler plant of Thousand-headed Cabbage was never seen—or a better testimony to the fertilising effect of sewage. It had been grown on the poorest gravel soil, watered with the Romford drainage.

Alfred Hall, Westbury Farm, Westbury, Wilts, has a fine show of roots, considering the season.

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

MONTHLY COUNCIL: *Wednesday, Dec.* 7.—Present: Lord Vernon, President, in the chair. The Earl of Lichfield, the Earl of Powis, Viscount Bridport, Lord Tredegar, Lord Walsingham, Sir A. K. Macdonald, Bart.; Sir Massey Lopes, Bart., M.P.; Sir Watkin W. Wynn, Bart., M.P.; Mr. Baldwin, Mr. Barthropp, Mr. Booth, Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Clive, Mr. Davies, Mr. Druce, Mr. Edmonds, Mr. Brandreth Gibbs, Mr. Holland, Mr. Hornsby, Mr. Wren Hoskyns, M.P.; Mr. Lawes, Mr. Leeds, Mr. Milward, Mr. Pain, Mr. Randell, Mr. Rigden, Mr. Sanday, Mr. Shuttleworth, Mr. Thompson, Mr. Torr, Mr. Webb, Mr. Wells, M.P.; Mr. Whitehead, Mr. Jacob Wilson, and Dr. Voelcker.

The following new members were elected:—

Armstrong, W. J., Fairlie, Greenock.
Baker, Thomas, Blackstone, Bewdley.
Broadbent, J. H., Sealand, Chester.
Burney, Thomas, Eastleigh, Hants.
Corden, Arthur H., Brineton, Shifnal.
Corden, John, Great Chatwell, Newport, Salop.
Crosthwaite, Peter, Monk's Hall, Keswick.
Gilbey, Alfred, Wooburn House, Beaconsfield.
Hall, W. Henry, Glen Parva, Leicester.
Harding, William, Marksbury Vale, Bristol.
Harrison, T. Ashton, Stalybridge, Cheshire.
Key, Major-General G. W., Manor House, Coates, Cirencester.
Mawer, Edward, Thorney, Peterborough.
Newport, Henry A. Wakeman, Coton Hall, Bridgnorth.
Nicholl, G. Whitlock, The Ham, Cowbridge.
Nuttall, James, Chaddesden, Derby.
Orlebar, H. Amherst, The Rocks, East Grinstead.
Playfair, George G., Erroll Villa, Southbrook Road, Lee, Kent.
Rayner, Captain W. S. M., Lounde House, Benlob Hill, Upper Norwood.
Round, D. George, Portland House, Edgbaston, Birmingham.
Sankey, Thomas, Burntwood, Lichfield.
Thompson, E. J., Timperley, Altrincham.
Wilding, Joseph, Bank House, Tyldesley.
Williams, John, Gwernhefin, Bala.

FINANCES.—Major-General Viscount Bridport (chairman) presented the report, from which it appeared that the Secretary's receipts during the past month had been duly examined by the committee, and by Messrs. Quilter, Ball & Co., the Society's accountants, and found correct. The balance in the hands of the bankers on November 30 was £1535 14*s.* 9*d.* The committee recommended that Mr. H. J. Hine's salary be increased to £100 per annum. The committee had met ten times and made nine reports.—This report was adopted.

JOURNAL.—Mr. Thompson (chairman) reported that a letter had been received from Captain Dashwood, in reference to the farm-prize competitions; it was recommended that Captain Dashwood be thanked for his communication, which raised some important questions, and informed that the committee would take them into careful consideration in the event of future competitions being sanctioned by the Council. It was also reported that the committee had met ten times during the year, and made nine reports, and that they recommended the addition of the name of Mr. Charles Whitehead to the list of the committee.—This report was adopted.

CHEMICAL.—Mr. Wells, M.P., presented the following report:—

Dr. Voelcker reports the following case of a manure sent to him for analysis, by Mr. C. S. Read, M.P., under the name of Holman's Blood Manure. This manure was found to have the following composition:—

Moisture	30.02
*Organic matter	22.02
Tribasic phosphate of lime, bone phosphate	5.06
Oxides of iron and alumina	5.10
Sulphate and little carbonate of lime	18.11
Alkaline salts and magnesia (chiefly common salt)	6.06
Insoluble siliceous matter	12.73
	100.00
*Containing nitrogen	1.91
Equal to ammonia	2.32

This manure was manufactured by N. R. Holman, manufacturer and dealer in agricultural tillages, Newhall Mills, Attercliffe, and Sheffield.

The price of this manure is £6 a ton, delivered carriage paid to any station within 50 miles of Sheffield.

In a trade circular, Mr. Holman speaks of his blood manure as having acquired a world-famous reputation as one of the best and cheapest tillages, and invites his friends and all consumers to an inspection of the numerous testimonials with which he has been favoured. He likewise gives an analysis, of which the following is a copy:—

Analysis of Blood Manure.

Medical Institution, Sheffield.

A sample of artificial manure, received from Mr. Holman, was found, on analysis, to contain in 100 parts:—

Moisture and organic matters, containing 17.72 of ammonia, equivalent to 14.58 of nitrogen	64.40
Insoluble silicate and sulphate of lime	11.00
Phosphate of lime, equivalent to 4.34 phosphoric acid	9.40
Oxides of iron and alumina	2.35
Carbonate of lime	5.00
Ditto magnesia	1.80
Alkaline salts (chlorides and sulphates)	4.45
Ditto (soluble silicates)	1.60
	100.00

March 1, 1865. (Signed) W. BINGLEY, Ph.D., F.C.S.

In this analysis the manure is represented to contain more ammonia than the best samples of Peruvian guano. Supposing the sample analysed by Dr. Bingley contained only 10 per cent. of moisture, and not 32, like the sample sent to me by Mr. Read, I am at a less to understand how the remaining 54.4 of organic matter could have yielded 17.72 of ammonia.

That amount of the richest available nitrogenous organic matter, or even of pure sulphate of ammonia, produces considerably less ammonia than 17.72 per cent. However, presuming the analysis to be correct, the question which would naturally be asked by any intelligent farmer who knows something of the market price of fertilising materials, is: Is it probable that a manure manufacturer will sell an artificial manure at £6, when he can get for the ammonia alone, which is represented to be present in a ton of the manure, over £16?

Attention is directed to this analysis, because in many instances farmers are led astray by printed analyses, which many regard as a sufficient guarantee of the good quality of the manure to which they refer. Whenever an analysis is shown, when an artificial manure is offered for sale, and such an analysis should prove to be satisfactory, we would advise the intending purchaser to obtain in the first place a statement in writing that the bulk of the manure on delivery shall be equal in composition with that given in the printed analysis; and in the next place he should draw from various parts of the bulk several pounds of the manure, mix all the samples well together, and forward such a fairly drawn and prepared average to a competent and trustworthy agricultural chemist for analysis. Neither printed analyses nor printed testimonials

in themselves have any practical value, and both are often used for the purpose of deception,

The sample of Holman's Blood Manure, analysed by me, it will be seen, instead of 17.72 per cent. of ammonia, as represented in the printed analysis, yielded only 2½ per cent. ; and instead of 9.4 per cent. of phosphate of lime, only 5 per cent. ; and, besides a large proportion of sand and useless earthy matter, it contained 31 per cent. of water in round numbers. Such a manure would be dear at £2 5s., and I would not recommend any one to buy it at £2 a ton.

Mr. C. S. Read has kindly favoured me with the subjoined letter, and given me leave to lay it before the Chemical Committee :—

Holman's Manure.

Honingham Thorpe, Norwich, Nov. 16, 1870.

My dear Sir,—On receipt of your analysis of Mr. Holman's manure, I wrote to him, stating "that I certainly should not pay for the manure." At Mr. Holman's earnest request I did not send the manure back, but agreed to his proposition to "pay whatever it was worth, according to the crop it produced." I thought that it would be a good opportunity of testing the soundness of your analysis, and accordingly sowed 4 cwt. per acre of this manure and two different kinds of superphosphates, both costing the same price as Mr. Holman charged for his manure, viz., £6 per ton. They were applied for white Turnips after Peas, and a strip of land was left, upon which no manure of any kind was sown. The two superphosphates have grown a nice little crop of Turnips, but I can see no difference at all between the unmanured plot and Mr. Holman's blood manure. I ought to add that Mr. Holman states, the "second crop is equally benefited as the first." I hope, for his sake and mine, it will be *more so*.

Yours faithfully,

Dr. Voelcker. CLARE SEWELL READ.

The committee would call attention to the frequent inferiority of certain manures sold under the name of fish-and-blood manures. A sample of such a fish-and-blood manure (sent by Mr. J. N. Young, Orlingbury, Wellingboro'), had the following composition :—

Moisture	13 86
*Organic matter	24 70
Oxides of iron and alumina	4·43
Phosphate of lime	1·92
Sulphate and carbonate of lime	32·72
Alkaline salts and magnesia (chiefly common salt) ..	3·69
Insoluble siliceous matter (sand)	17·75
	100·00
*Containing nitrogen	1·20
Equal to ammonia	1·45

This so-called fish-and-blood manure is very poor in phosphate of lime ; and as dry blood and flesh yield about 16 per cent. of ammonia on decomposition, the sample analysed, producing not quite 1½ per cent. of ammonia, cannot have contained much blood or fish. It is principally composed of carbonate of lime, earth, and sand, mixed with various kinds of organic refuse matters, a little blood, some fishery salt, and a few fish-bones. Such a manure is barely worth 25s. a ton, but was sold at £6 a ton.

With respect to feeding cakes, Dr. Voelcker reports the case of a linseed cake, which was sold to Mr. Jas. J. Bibby, Hardwicke Grange, Shrewsbury, branded "W H Genume." This cake he found to be adulterated with earth-nut cake, and to be of the following composition :—

Moisture	9·80
Oil	9·40
*Albuminous compounds (flesh-forming matters) ..	26·15
Mucilage, sugar, and digestible fibre	30·84
Woody fibre (cellulose)	17·56
Mineral matter (ash)	6·25
	100·00
*Containing nitrogen	4·19

In answer to an inquiry for particulars of the purchase, Mr. Bibby writes that he bought a lot of 5 tons in July from Messrs. Fields' Mercantile Company (Limited), Shrewsbury, as a genuine cake, at £11 7s. 6d. per ton, delivered. Messrs. Fields, the dealers, state that the maker is W. Holt, of Hull.

The following correspondence ensued :—

Hardwicke Grange, Shrewsbury, Nov. 2, 1870.

Dr. Voelcker, London, E.C.

Dear Sir, I duly received yours of the 19th and 21st ult., with analysis and report on a sample of adulterated linseed cake branded "W H Genuine," and, as requested, I write to inform you of the particulars of the purchase.

The sample is from a lot of 5 tons bought in July from Fields' Mercantile Company (Limited), Shrewsbury, as a genuine cake, price £11 7s. 6d. per ton, delivered—"Earles & King's" Liverpool cake being then £12 7s. 6d. per ton, delivered. Messrs. Fields, who are dealers, inform me that the maker is W. Holt, Hull. I have written for an explanation, and annex a copy of my letter and of the maker's reply, &c.—I am, dear sir, yours faithfully, JAS. J. BIBBY (pro Jos. Winchester).

Copy.

Grinshill, Shrewsbury, October 26, 1870.

Messrs. Fields' Mercantile Company, Shrewsbury.

Gentlemen,—In July last I bought from you a parcel of 5 tons linseed cake, branded "W H Genuine," which was described by your manager and sold as a genuine linseed cake. I regret to say, however, that the analysis of a sample by Dr. Voelcker shows the cake to be adulterated, and, of course, inferior in quality to genuine linseed cake. I enclose an extract from Dr. Voelcker's letter, and a copy of his analysis ; and waiting your reply,—I am, yours faithfully, JOSEPH WINCHESTER.

Copy.

Shrewsbury, October 31, 1870.

From Fields' Mercantile Company.

To Mr. Jos. Winchester, Grinshill.

We beg to hand you a copy of the letter which we have received from the crushers at Hull, and we trust that it will be acceptable and satisfactory.

Copy of Enclosure with the above.

Hull, October 28, 1870.

Messrs. Fields' Mercantile Company.

Dear Sirs,—In reply to your favour of yesterday, enclosing "copy of analysis, &c., of 5 tons linseed cake, marked "W. & H.," "Genuine," and supplied to you in July last, we beg to state that the term "genuine," as a trade brand, is not understood to signify a pure cake, which, as you are aware, is always sold at 20s. to 25s. per ton more money, and at the time we sold you the 5 tons referred to we were selling pure cakes at 22s. 6d. more. The difference between "pure" and "genuine" cake, when these brands were first introduced, was simply that the former was made from the finest seed imported, and the latter from a secondary or inferior growth, containing a considerable percentage of non-feeding admixture, such as hay seeds, &c., and generally more or less of grit, which washers have found great difficulty in screening from the seed : in fact, it could not be entirely removed. For some time past, therefore, it has been the general custom of the trade to use fine clean seed also for "genuine" cakes, reducing the price by the admixture of a small proportion of other good feeding stuff, thus producing what we believe to be a better feeding cake at the same cost. We may add, that we have always supplied to our friends a cake of quality at least equal to any on our market at the same price, and the analysis you have sent us shows that the cake sent you was of good feeding quality, and, we believe, for feeding purposes if anything a little cheaper in proportion than a "pure" cake at 20s. to 25s. per ton more money.

Copy of reply to the foregoing.

Grinshill, Shrewsbury, November 2, 1870.

Messrs. Fields' Mercantile Company, Shrewsbury.

Gentlemen,—I have to acknowledge receipt of yours of 31st ult., enclosing copy of a letter from the manufacturers of the cake, bought from you in July, in reply to the complaint of its being adulterated.

As the cake was not only sold as branded "Genuine," but as a "Genuine Cake," I do not consider the explanation at all satisfactory. No trade usage can justify an adulterated cake being sold as "genuine."

I was not aware, till your secretary informed me on Saturday last, that the makers quoted for "pure" cake a higher price than "genuine," and I consider that this fact being known to you ought to have led to inquiries before the sale as a pure cake of that branded "Genuine."—I am, gentlemen, yours faithfully,

JOSEPH WINCHESTER.

P.S. I send a copy of the correspondence to Dr. Voelcker.

Two other cases, where cakes sold as pure were found on analysis to be adulterated—one with oat-dust, and the other with earth-nut cake and beech-nut cake, came under Dr. Voelcker's notice ; but the committee think that the evidence in these instances, though sufficiently convincing, might not have the requisite legal force to warrant the publication of the names of the vendors.

In pursuance of the recommendation made by the committee in their last report, a suggestion was forwarded to Messrs. Thomson, Bonar, & Co. that some standard of quality for guano should be settled upon by the importers, and all cargoes valued accordingly. This communication has been transmitted by Messrs. Thomson, Bonar, & Co. to Senor Toribio Sanz, the agent of the Peruvian Government, and this gentleman has undertaken to submit the matter to the authorities in Peru.

With reference to the case of Mr. W. Bradburn, the committee have to report that they have received notice from that gentleman's solicitor that it is his intention to take legal proceedings against the Society ; and the secretary having been requested to furnish the name of the Society's solicitor, it is recommended by the committee that the question of choosing a solicitor to represent the Society in this case be referred to the Finance Committee.

The committee have met six times, and issued reports in March and June.

They recommend that extracts, as usual, from Dr. Voelcker's quarterly report, be published in the agricultural journals.

They recommend the following to be the list of the members of the Chemical Committee :—William Wells, M.P., Lord Vernon, W. J. Edmonds, D. R. Davies, J. D. Dent, M.P., Sir Massey Lopes, E. Holland, C. Wren Hoskyns, M.P., Lord Lichfield, J. B. Lawes, Dr. A. Voelcker, Jacob Wilson, and C. Whitehead. —These reports were adopted.

STOCK PRIZES.—Mr. Milward (chairman) reported that the list of prizes to be offered by the Wolverhampton local committee had not been completed, and that they therefore recommended the publication of the Society's prize-list as sanctioned by the special Council summoned for the purpose, with an announcement that a complete prize-sheet giving the prizes offered by the local committee will be issued as soon as possible. The annual report of the committee was also presented. These reports were adopted. In accordance with the notice given at the last monthly Council it was then moved by Mr. Milward "that the resolution of June 1, respecting prizes for mules and asses be rescinded." This motion was seconded by Mr. Jacob Wilson, who stated that the Welsh agricultural societies whose prize-sheets he had been able to obtain did not offer prizes for these animals, although Wales was considered their great stronghold. The motion was supported by Mr. Randell, Mr. Booth, and Mr. Torr, who maintained that the small farmer should rather be encouraged to breed mountain ponies of good character in preference to donkeys. On the other hand the Earl of Powis supported the June resolution, which had been proposed by himself, on the grounds then stated, and remarked further that it was as desirable for the Society to aid the small farmer by offering prizes for asses, as to aid the large farmer by offering prizes for steam-engines. He was supported by Lord Walsingham, who considered the breed of donkeys capable of great improvement ; by Colonel Challoner, who urged the quality of endurance possessed by mules ; and by Mr. Wren Hoskyns, on the ground that if such animals were extensively employed in agriculture, it was the duty of the Society to attempt to improve the breed. Ultimately, it having been acknowledged that, as mules are not breeding animals, it would be against the practice of the Society to offer prizes for them, the question was put with reference to donkeys. On a division, Mr. Milward's motion was carried by 20 votes against 7.

VETERINARY.—Major-General Viscount Bridport (chairman) reported that, up to the present time, they had received no report from Professor Simonds with regard to the experiments which they had requested him to make in pleuro-pneumonia. The committee had met four times during the year and made four reports, and they recommended that the name of Mr. M. W. Ridley, M.P., be added to the list of the committee. —This report was adopted.

GENERAL, WOLVERHAMPTON.—Mr. D. R. Davies reported that the ex-mayor, on behalf of the local committee of Wolverhampton, having explained that the siding from the goods station to the showyard, which the local committee had undertaken to make, would entail considerable expense on them ; the committee recommended that the Wolverhampton local committee be relieved of their undertaking to make the aforesaid siding, on the condition that the expenses to exhibitors shall not be thereby increased, and that the local committee add prizes to the amount of £1000 to the Society's prize sheet. The contract between the local committee and the Society not to be in any other respect affected by this agreement.—This report was adopted.

SHOWYARD CONTRACTS.—Mr. C. Randell reported that the members of the committee had each been supplied with a copy of the conditions and specifications for a new contract for the erection of showyard works, as ordered by the Council, and that these conditions having been finally considered by the committee, they recommended that they be now printed under the direction of the secretary, and that he be authorised to advertise for tenders. It was also reported that the surveyor had supplied the Wolverhampton local committee with a plan of the intended showyard, and had given instructions for the necessary draining, levelling, removal of fences, and forming approach-roads. The annual report stated that the committee had met nine times and made seven reports to the Council ; that they had been perfectly satisfied with the showyard works as carried out by the present contractor under the superintendence of the surveyor ; and that, as the existing contract will expire at the conclusion of the Wolverhampton meeting, they had made the necessary preparations for obtaining tenders for a new contract to commence at that time.—These reports were adopted.

SELECTION.—On the motion of the chairman of this committee (Mr. Thompson) the list of the committee for the ensuing year was discussed and agreed to. The annual reports of the Implement, House, and Education Committees were also received and adopted.

The Earl of Lichfield moved, "That in selecting a town for the holding of the exhibition in 1872, the plan of the Bath and West of England Society be adopted." In support of his motion he urged the unnecessary expense that many towns are put to under the present system, and the feeling of annoyance caused by defeat, which he regarded as more important to the Society than the question of expense. The effect on the success of the meeting was also stated to be very marked, as many did not subscribe to the local fund of the successful town on the ground that they wanted the meeting held at one of the other towns which had been put in competition. In anticipating objections that might be brought forward, he urged that the only advantage accruing to the Society by the competition was occasionally an increased subscription from the winning town, all other arrangements being made after the selection of the town. Mr. Holland, in seconding the motion, stated that the Bath and West of England Society found no difficulty in working their scheme, and that by it no jealousy was created, and no expense incurred. Mr. Rigden, although a member of the Council of the Bath and West of England Society, preferred the plan of competition ; and considered that quite as much offence would be given to the towns not selected, as is now taken by those which compete unsuccessfully. Mr. Randell and Mr. Milward urged the greater requirements of the Royal Society, and the difficulty that would be raised if the first town selected were either incapable or unwilling to receive the Society. Mr. Wren Hoskyns and the President gave instances of the bad feeling which had been created, in the districts in which Herefordshire and Derbyshire are situated, by unsuccessful competition ; and Mr. Torr rebutted the charge, which was made in some districts, of the conclusion of the Council in certain cases having been foregone. Mr. Thompson referred to the gradual expansion of the Society's exhibitions under the competition principle ; but at the same time considered that now it might be advisable to discuss whether the annoyance caused in some instances might not be averted by a modification of our practice. He therefore suggested that the subject should be referred to a committee. Lord Lichfield having adopted this suggestion, it was resolved :—

"That a committee be now appointed to consider and report to the Council whether it is in their opinion desirable to make any change in the present mode of inviting competition between the leading towns of the district selected for the Society's country meeting ; the committee to consist of the Earl of Lichfield, Mr. Wells, M.P., Mr. Wren Hoskyns, M.P., Mr. Randell, Mr. Torr, and Mr. Jacob Wilson.

The secretary was then instructed to send the usual letters to Cardiff, Newport, Cheltenham, and Hereford. Mr. W. J. Edmonds withdrew the motion of which he had given notice, viz. :—

"That the sum of £10 be voted to the Cirencester

Chamber of Agriculture, for the purpose of assisting its committee to carry out, in conjunction with the Professors of the Royal Agricultural College, manurial and other experiments upon corn and root crops."

A communication was received from the Royal Dublin Society, stating that in accordance with a newly-enacted bye-law, the President of the Royal Agricultural Society was *ex officio* an honorary member of the Royal Dublin Society.

A letter having been read from Mr. C. E. Amos, the Society's consulting engineer, resigning his office, it was moved by Lord Bridport, seconded by Mr. Thompson, and carried unanimously, that

"The Council have received with much regret the resignation of Mr. Amos, the consulting engineer of the Society, and they cannot do so without recording their sense of the very valuable services rendered to the Society by Mr. Amos for so many years, and that it be referred to the Committee of Selection to consider and report to the Council in what mode their appreciation of the valuable services rendered by Mr. Amos can best be expressed and conveyed to him."

A letter was read from Mr. Hassall, resigning his seat at the Council.

The annual report of the Council to the general meeting was prepared.

GENERAL MEETING: *Thursday, Dec.* 8.—At the general meeting held this day, in the Society's room, there was a full attendance. The report of the Council is given below. It was approved, but not before it had been criticised by several speakers. The topics discussed were—(1), the state of the Society, as to both its numbers and its funds; (2), the Oxford prize farms, and the propriety of giving such prizes for the future, which was concurred in; (3), the twofold office of Mr. Jenkins, as editor and secretary; (4), the steam-plough conditions at Wolverhampton; (5), the chemical examination of manures and feeding stuffs by Dr. Voelcker, which was generally approved of; and (6), means for getting Peruvian guano in a pure state for the future.

In addition to these subjects, the storage of water in the winter time for summer use in country places, was named as deserving the attention of the Society; and it was suggested by Mr. Sidney, in a vigorous speech, that reports on the agriculture of the various districts into which England might be divided should now be prepared, defining the progress which had been made during the Society's existence. Lord Vernon, the President of the Society, promised that this suggestion should be taken into consideration. Among the speakers were Messrs. Neale, Roberts, Sidney, Dr. Voelcker, Messrs. H. S. Thompson, Maxwell, Botley, Martin, and Phillips; also Lord Vernon, who, as retiring President, received a cordial vote of thanks from a crowded meeting. The following is the Report:—

REPORT OF THE COUNCIL.

The Council of the Royal Agricultural Society of England, in presenting their half-yearly Report, have to state, that since the last general meeting in May, 3 governors and 39 members have died, and the names of 60 members have been removed from the list; on the other hand, 3 governors and 172 members have been elected; so that the Society now consists of 74 life governors, 74 annual governors, 1547 life members, 3899 annual members, 15 honorary members, making a total of 5609.

Conformably with the provisions of the Charter, the Council have enacted the following bye-law:—"Members who have paid their annual subscriptions for 20 years or upwards, and whose subscriptions are not in arrear, may compound for future annual subscriptions, that of the current year inclusive, by a single payment of £5."

The half-yearly statement of accounts to June 30, 1870, has been examined and approved by the auditors and accountants of the Society, and has been published for the information of the members in the last number of the Journal. The funded capital of the Society remains the same as at the last half-yearly meeting, namely, the permanent fund of £20,000 New Three per Cents, and the reserve show fund of £4612 7*s.* 8*d.* New Three per Cents; but the deficiency in the showyard receipts at the Oxford meeting entailed a cost to the Society of more than £2000. On the 1st inst. the actual balance of the current account at the London and Westminster Bank was £1535 14*s.* 6*d.*

Notwithstanding this pecuniary loss, the Council have reason to congratulate the members of the Society on the result of their second meeting at Oxford. The entries of implements, cattle, sheep, and pigs, were more numerous than at any previous meeting of the Society, while the quality of the animals exhibited in most classes reached the highest standard.

The most distinctive feature of the Oxford meeting was the competition for the farm-prizes offered by Mr. Mason and the Society for the two best-managed farms in the Oxfordshire district. The awards of the judges were made known at the general meeting of members held in the showyard, and on their recommendation a 2d prize was added by the Society. The report of the competition, with descriptions of the prize and commended farms, written by Mr. H. W. Keary, one of the judges, has been published in the last number of the Journal. The farming of every district has its strong and its weak points, and each season its peculiarities. To point out and record these seems a fitting object for the Society's efforts, and must offer valuable and instructive lessons to agriculturists generally. The Council are endeavouring to promote a continuation of these competitions by offering, in conjunction with the landowners of Shropshire and Staffordshire, similar prizes for the two best managed arable and dairy farms in a districts to be hereafte determined upon in connection with the Wolverhampton meeting.

The Council refer with satisfaction to the two numbers of the Society's Journal published during the current year, which contain papers of more than ordinary interest. The report on the Agriculture of Belgium especially calls for particular notice, as it is an able description of the rural economy of a country whose farming has been so frequently and so loosely described by agricultural writers, that a detailed and trustworthy account of the daily doings of Belgian farmers is a valuable addition to existing knowledge on the subject. It is very creditable to Mr. Jenkins that in the short period which has elapsed since his appointment as Editor, he should have made himself sufficiently conversant with both the science and practice of agriculture to be able to write a report of this high character.

In accordance with the Society's classification of implements for trial at the country meetings, machinery suitable for steam-cultivation will be tried at Wolverhampton. Keeping in view the increasing importance of steam-power as a means of good cultivation, and especially as a means of improving heavy land, the Council have extended and developed the scheme of prizes hitherto offered for implements and sets of tackle suitable for steam-cultivation. In order to meet, as far as possible, the requirements of every class of agriculturists, they have decided to offer prizes for the best combination of machinery for the cultivation of the soil by steam-power, under three heads, viz., (1) without imposing any restrictions, (2) limiting the weight of the engine to 10 tons, and (3) stipulating that the combination of machinery can be worked by an ordinary farm-engine, whether locomotive or portable. The President of the Society has still further extended this scheme by offering a silver cup, value £100, for the best combination of machinery for the cultivation of the soil by steam-power, the cost of which shall not exceed £700, the engine to be locomotive, and adapted for threshing and other farm purposes. In this way the Council have endeavoured to include the whole subject so far as concerns the sets of tackle; and in addition, with a view to render the result as complete as possible, they have decided to offer a special prize for the best implement of each description suitable for steam cultivation, viz., windlass, snatch-block or a substitute, plough, digger, cultivator, harrow, roller, drill, skim-plough or scarifier, root or stone extractor, and subsoiler. They also offer a prize for the best implement or part of tackle not qualified to compete under the foregoing heads, and for the best combination of any two or more of the above mentioned implements, not qualified to compete for the general prizes. The Wolverhampton prize-sheet further deals with the subject of steam-traction, and prizes are offered for the best agricultural locomotive engine applicable to the ordinary requirements of farming, and for the best waggon for agricultural purposes to be drawn by the above mentioned engine. The Council have also decided to offer a series of prizes for implements and machinery used in the cultivation and management of Hops.

The continued increase in the number of implements exhibited at the country meetings of the Society has again received the careful attention of the Council. They have decided that no exhibitor shall be allowed to enter duplicates of the same article, and that a maximum fine of 10 per cent. on the declared price shall be imposed for each article exhibited in breach of this rule; but that in no case shall the fine be less than £1. They hope that this step will have the desired effect of preventing any unnecessary extension of the exhibition without curtailing its usefulness or diminishing its interest.

The Council have received with much regret the resignation of Mr. C. E. Amos, the Consulting Engineer of the Society. In recording their high sense of the very valuable services which Mr. Amos has rendered to the Society during the 23 years that he has fulfilled the important duties of his office, they feel sure that they are expressing the general opinion of the members of the Society.

The regulations affecting the awards of medals to miscellaneous articles have also been revised, and it has been resolved that in future no medal shall be awarded to any implement included in the quinquennial rotation which is not placed in the classes tried at that meeting, nor to any miscellaneous article capable of trial until it has been subjected to such trial as the stewards may direct.

In the stock prize-sheet for the Wolverhampton meeting the Council have made further additions to the prizes which have hitherto been offered for live stock. In particular, they have offered a 4th prize in the classes of Shorthorn bulls above one year old, but have somewhat reduced the amount of the 1st prize; they have offered separate prizes for the two breeds of Guernsey and Jersey cattle; and they have decided to establish a series of classes for Cheviot and other mountain sheep. In order to insure the purity of blood of the Shorthorns exhibited at the Society's country meetings, it has been resolved "that each animal entered in the Shorthorn classes shall be certified by the exhibitor to have not less than four crosses of Shorthorn blood, which are registered in the Herd-Book."

The Council have been requested by Her Majesty's Commissioners for the International Exhibition of 1871 to assist them in forming a collection of live specimens of the best breeds of animals whose wools are principally used in the woollen and worsted manufactures, by recommending breeders of good examples of the different classes of Long-wool, Short-wool, Down, and Mountain sheep. The Council have therefore placed in the hands of the Commissioners the catalogue of stock exhibited and the list of stock prizes awarded at the last three country meetings of the Society.

The Council have fixed the commencement of the Wolverhampton meeting for Monday, July 10. The arrangements for the arrival and departure of the stock, and for the opening and closing of the showyard remain the same as at Oxford; but as the trials of implements will be of an unusually extensive nature, it has been decided that they shall commence a fortnight before the show instead of a week.

During the past half year the consulting chemist of the Society has presented two quarterly reports on manures and feeding stuffs forwarded to him for analysis by members of the Society. These reports, giving the names of the dealers and the analyses of the substances, are regularly published in the agricultural journals as well as in the Journal of the Society. This publication has produced some dissatisfaction on the part of vendors whose articles have been analysed; but the Council are prepared to defend their action in this matter, and believe that no part of their work is more valuable to agriculture than the analysis and exposure of inferior or adulterated manures and feeding stuffs. In several instances the dealers have made money compensation to the purchasers, and the Council regret that in some of these the purchasers have been unwilling to give up the names of the dealers, resting satisfied with the settlement made in their individual cases.

The variation in the quality of guano, as now imported, has been under the consideration of the Chemical Committee, and a communication has been addressed to Messrs. Thomson, Bonar & Co., the agents of the Peruvian Government, suggesting that the guano trade might be regulated by some standard analysis, and that deductions from the price might be made according to the variations from such standard. Up to the present time, however, no satisfactory settlement of this matter has been suggested.

The Council have renewed the education grant for the year 1871, subject to the following alterations in the scheme which was tried this year:—

1. That the next examination shall commence on Tuesday, April 18, 1871.
2. That the forms of entry, duly filled up, together with a certificate of general education, must be forwarded to the secretary by March 1, 1871.
3. That no candidate shall be eligible for the Society's prizes who has completed his 21st year previous to the said March 1; but that any candidate, irrespective of age, may compete for the Society's certificates.
4. That the prizes for aggregate merit, to be awarded to successful candidates who are eligible, and are placed in the first class, shall be:—1st prize, £25; 2d, £10; 3d, £5.

The Council have watched with apprehension the spread of rinderpest on the Continent. The establishment of waterside markets, the slaughter of cattle from the scheduled countries at the port of landing, and the inspection which the animals undergo before embarkation, and after their arrival in this country, encourage the Council to hope that we may escape another outbreak of the cattle plague in England.

By order of the Council,
H. M. JENKINS, Secretary.

SOCIETY OF ARTS.

On the American System of Associated Dairies, and its bearing on Co-operative Agriculture.—Mr. H. M. JENKINS, F.G.S., Secretary of the Royal Agricultural Society of England, read a paper on the above subject before this Society on Wednesday evening, from which for the present we must be content to take the following extracts, as it is reported in the Society's Journal of this week:—

Intimating that his chief object was to contrast the English system of private dairies with the American system of dairy factories, and to point out the mechanical, financial, and other advantages of the latter, Mr. Jenkins first referred to the process of

Cheese-making in a Private Dairy.—Dairy cows are milked twice a-day, and the morning's "mess" of milk is, for the purpose of cheese-making, which I shall take for our type, added immediately to that obtained the previous evening. The whole of the milk is poured into what is known as a "cheese-tub" in private dairies, or a "vat" in factories. In the former case, straining, or some other device, is resorted to for the purpose of thoroughly mixing the two lots of milk, and evenly distributing through them the cream which had partially risen on the evening's mess during the night; but in many cases this difficulty is evaded by skimming the cream before the addition of the morning's milk, and thus whole-milk cheese is not made in those dairies. In a well-arranged factory, however, the cream is prevented from rising by a simple mechanical contrivance, which will presently be described.

From this point I will now, for the sake of clearness, sketch a particular instance of English cheese-making in a private dairy, as it came under my own observation. The "cheese-tub" was simply a tub—and nothing more—of unpainted wood, as clean as a "new pin." It was placed on a stand to raise it to a height convenient for the dairymaid; and at the time when I arrived at the dairy, the rennet and annatto had just been added, a portion of the milk having been first heated and added to the remainder to raise the whole to the temperature thought necessary, which was guessed at by dipping in the hand. In the course of about an hour the curd became separated from the whey, most of which was then baled out, and a portion put into a saucepan to warm. The curd, being thus left exposed, was cut up by the dairymaid and her two assistants with long-bladed knives, first into long slices, then into large cubes, and finally into pieces about the size of nuts. The whey, when warm enough, was poured on the cut curd, which was stirred about with the hand to ensure its being as thoroughly scalded as the rudeness of the process would permit. The whey was then, for the second time, separated from the curd, but now as carefully and as thoroughly as possible. The circumstances of the case soon exhausted the resources of the baler, although she had been aided by her coadjutors, who gathered up the

curd to one side of the tub, and retained it there with their hands, as well as raised that side by means of pieces of wood placed beneath it in succession as they were required. When the curd was taken out it was put into a temporary cheese-vat in a cloth, and placed in a cheese-press for a short time, with a view of squeezing out as much as possible of the whey that still remained in. It was then taken out, broken again, put into the usual mould, and again pressed. From this time, for several days, beginning with twice a day, following with once a day, and lastly missing a day, the cheese would be well salted on the outside, and would have a new cloth or bandage after every salting. Finally, the cheese would go to a cheese-room, where it would be turned every day, and where, by means of sundry devices, the dairymaid would court the production of a coat of mould of the fancied colour, contour, and condition.

Such, although an antiquated, is still not an uncommon method of cheese-making in an English dairy. On the farm which I have more particularly kept in view during the foregoing description, and on which 50 cows were kept, the presiding dairymaid was the farmer's daughter, a delicate-looking girl, whose dress and address, manner, and conversation, would have made one conceive it impossible that this was her daily occupation, had she not been bending over a primitive cheese-tub, the sleeves of her dress pinned back over her shoulders, and her whole attention absorbed by the curdling mass before her. But, as a fact, her laborious duty commenced at six o'clock every morning, and there can be no doubt whatever that the quality of the cheese turned out of that dairy depended almost entirely on the sensitiveness of the tips of her fingers.

Factory Cheese-making.—Now let us see what an American cheese-factory is like. To enable you to thoroughly appreciate the great advance which this system exhibits over the one just described, Mr. Gilbert Murray, of Elvaston, Derby, has kindly exhibited a model of the cheese-factory on the American system, recently established at Derby; and I have taken the following description of the operations from the report of the implement trials at the Royal Agricultural Society's meeting at Oxford,* where a silver medal was awarded to this model. It is on the scale of 1½ inch to the foot, and represents a factory designed for the manufacture into cheese of the milk of 300 cows:—

"The cans used for conveying the milk from the farm to the factory are cylindrical, of the same width throughout. The lid exactly fits the cylinder like a piston, and so accommodates itself to the supply of milk, thus preventing waste or undue agitation. In the centre of the lid is a tube projecting 6 inches inside; this, when filled with cold water, tends to lower the temperature of the milk. As the evening's milk arrives it is emptied into a large tin which stands on the platform of a portable weighing machine, the weight being duly entered in duplicate, one entry going back to the sender. In the bottom of the weighing-tin is a brass valve, corresponding to a hole in the centre of the weighing-machine platform; to this valve a small brass chain is attached, by which it can be raised and the milk allowed to escape into a tin tube, which conveys it direct to the vats in the making-room. The vats consist of two separate parts; the outside part is constructed of 2-inch deal board, tongued and grooved, and supported on wooden legs; the inner case consists of strong tin secured to a rim 4 inches deep and 2 inches wide; in the inside, between the bottoms of the outer and inner vats, is a space of 2 inches, which contains the steam-pipes, and into which cold water is carried, in order to lower the temperature of the milk when required. As soon as the whole of the evening's milk has arrived, and been run into the vats, the cold water is turned on, and soon fills the space between the vats, about 6 inches from the bottom; and at the contrary end to which the water enters, an overflow-pipe is inserted; this pipe carries the water to a small overshot water-wheel, the small quantity of water gives a regular but intermittent motion to the wheel; this motion is communicated to a shaft running longitudinally through the building; to this shaft are again attached a series of wooden rakes, which float on the surface of the milk, and by their action keep up a continuous motion, thus preventing any cream from rising. When the morning's milk arrives, it is weighed and run into the vats, and mixed with that of the previous evening; by opening a tap at the bottom of the vat the cold water is all run off, and steam turned on by an inch-pipe running round the inside of the vat. This pipe has small perforations throughout its length, and through these the steam is equally distributed; when the proper temperature has been attained, the rennet and annatto are added, the mass is well stirred, and is then covered up until the curd has formed. To facilitate the separation of the whey, the curd is cut with knives specially constructed for that purpose; the temperature is then slowly raised, until the whey has arrived at a proper state of acidity; it is then run off, by means of a syphon, into a drain in the floor, which conveys it into the whey cistern outside; the curd is then tipped into the dry vat, and is here well stirred by the hand and exposed to the atmosphere, the principal object being to lower the temperature of the curd before salting. In order to reduce manual labour to the minimum, in many of the American factories there is a difference of 3 feet in the level of the floor of the making-room. By opening a trap in the end of the milk-vat, the curd is emptied into the dry vat without being touched by hand. The curd, when salted, is put into hoops; these are placed in the presses, and pressure of from 3 to 5 tons applied."

In the course of about an hour the compressed curd is taken out of the press, for the purpose of receiving the permanent bandage, which was formerly distinctive of American cheese. It is then returned to the press, where it remains until the next morning, when it is taken to the curing-room and greased. Two men and a lad can, by the American method, make the cheese from the milk of 300 cows, whereas we have seen that, in the old-fashioned instance of English cheese-making just described, it required the aid of the three women to make cheese from the milk of 50 cows.

Advantages of the Cheese Factory System.—These will probably have already suggested themselves to you. They may, however, be conveniently epitomised under two heads, viz., (1) Economy of Production, and (2) Superiority of Produce.

Under the first, the most important item is the saving of labour, and more especially of skilled labour. The same processes have to be gone through whether the milk under treatment is yielded by 50 cows or by 500; and it is not too much to say that, whereas 10 private dairies, of 50 cows each, would require at least 10 skilled dairymaids and as many unskilled assistants, one factory, receiving the milk of 500 cows, would not require more than one skilled hand, and three or four, at most, assistants. As a matter of £ *s. d.* alone, this difference is sufficiently important; but dairy-farmers know perfectly well that a still more important consideration is the difficulty of getting and keeping skilled dairymaids. Indeed, this difficulty has become so great, that it is a recognised fact that prime cheese is made, as a rule, only by farmers' wives and daughters. Other items conducing to economy are: saving of outlay in the purchase of dairy utensils, in the annual expenditure for repair, and many smaller considerations.

Under the second head, "Superiority of Produce," a still greater advantage is obtained. It is not pretended that a factory is a talisman which makes good cheese by magic; but it is claimed for the factory system that cheese made in large quantities, by skilled workmen, using the most approved machinery, and working by definite rules, will make cheese of better and more even quality than that made in the majority of farm-houses. No doubt the very best cheese-makers will make as good cheese at home as can be made in a factory; but, as a practical fact, the quantity of the prime article thus produced is very limited, and the ordinary private make of American cheese fetches in the market at least 10*s.* per cwt. less than that made in factories.

[Mr. Jenkins then gives a history of the cheese-factory system, which we hope to give hereafter. The remainder of the lecture we shall also give next week.]

* "Journal of the Royal Agricultural Society," 2d series, vol. vi., part 2, p. 510.

Farmers' Clubs.

LONDON.

The Size of Farms.—On Monday evening Mr. TRASK read a paper on this subject, before a large audience. We take the following extracts:—

In treating of the size of farms, it must be clearly understood that I am speaking of farms which are cultivated for the purpose of producing the staple food of the community, and affording at the same time a fair return on the cost of production. I shall leave gardens and gardening entirely out of the question, nor shall I refer to the systems that prevail in other countries. I shall proceed, therefore, to an examination of the results of the two systems—of large and small farming, which are exemplified under similar advantages, as regards soil and climate, in different parts of our own country.

Small Farms.—I shall now call your attention to the condition of the occupiers of small farms, both as proprietors and as tenants, with the state of the agricultural labourers in large-farm districts; and I am happy to find that a great deal of most valuable information has been collected by the Royal Commissioners on the employment of children, young persons, and women in agriculture, which throws considerable light on this part of our subject, and to which I must allude.

I will first refer to Mr. H. Tremenhere's report on the counties of Cumberland and Westmoreland, where there is a predominance of small farms, and farmed, too, by the owners themselves, known in these counties from time immemorial as statesmen or estatesmen. The Assistant Commissioner says of them that, "excepting on the land of some of the larger proprietors, the farming of the statesmen is generally bad. There is little spirit of improvement in the class. If they possess a little money they prefer hoarding it in their oaken chests to laying it out on the land. 'Would you not,' was inquired of an old statesman, 'expend a shilling on your property if it would eventually return you five shillings?' 'No: I would rather button it up in my breeches' pocket; it would be safer there,' was the reply." The roads leading to their homesteads are generally so bad, that it has been said that the only safe mode of reaching them would be by a balloon. The midden or dung-pile is close to the door of the dwelling-house; the land, generally undrained, is prolific of Rushes, and the whole appearance of the property denotes poverty, slovenliness, and neglect. Mr. Tremenhere then goes on to speak of the state of the children of those proprietors: "the effect," he says, "of these small properties on the children of their owners is not favourable, for they are often kept from school for months to assist in the work of the farm. On inquiring of one at what age his children began to assist in the farm work: 'as soon as they could crawl' was the reply; and I believe I am correct in stating, that as a rule the children of the smaller proprietors feel the disadvantages of a neglected education through life, and do not prosper in the world so well as those of agricultural labourers." And he concludes that, "If it is important that the soil should be cultivated with the maximum effect, the small statesmen of these counties certainly do not satisfy that desideratum; half-shepherds, half-husbandmen, they are deficient in the spirit and enterprise which agriculture requires, and they are without either capital or skill. In the districts where tillage prevails they are singularly out of place. In small sheep and dairy farms they have a more legitimate occupation, and they will probably linger long in the secluded mountain dales, a remnant of that community of small proprietors, whose simple manners and sturdy independence have long given to this part of England one of its most marked characteristics." I have not hesitated to give this extract from the report of the Royal Commissioners, because the information was so recently collected by the Assistant Commissioner on the spot, and doubtless under a due sense of the responsibility that was attached to the important office he filled. You will not fail to notice that these statesmen of Cumberland and Westmoreland are the proprietors as well as occupiers of the land, the very position that is considered by the advocates of the small-farm system, to be most favourable to its success. But the most conclusive evidence against the system is the fact that the number of small holdings is rapidly diminishing, and has been continually diminishing for many years past; if the small-farm system was at all successful or advantageous to the community, it is quite certain that the number of small farms would increase instead of diminish. But the real fact of the matter is that the profession of small farming does not generally answer in practice in this country, and the occupiers, whether they are the owners also, or not, have found it much more to their interest to work as ordinary farm labourers for regular weekly wages than continue in the occupation of such small farms as those of 10 to 20 acres in extent. I might give you abundant evidence of the truth of this statement from all parts of the country; thus, at Burbage, in Wilts, Mr. C. G. Bolam, agent to Lord Ailesbury, stated to one of the Assistant Commissioners that "there are a number of small accommodation holdings of from 2 or 3 to 20 and 30 acres at Burbage. The land being very rich and productive, the tenants are enabled to raise good crops at a comparatively small outlay. They pay an accommodation rent for these lands, and make a livelihood by growing vegetables, seed, &c., and making milk and butter for the markets. They are, as a body, almost worse off than many of the labourers; their capital is small; their work very fitful, at times very hard, at others very slack. The result of these intervals of comparative ease is too often the formation of vicious habits, and their want of education and training prevents them from profiting by the start beyond the ordinary farm labourer." This view is also confirmed by the vicar of Burbage, Archdeacon Stanton, who says of these men that "he does not think that they are as well off as many who work regularly as day-labourers. If they get an unusually good crop they become extravagant; they don't save, and suffer from want during the winter when no work is to be had." The Commission found also an universal concurrence of opinion, that the state of education among small farmers was even worse than among the ordinary farm labourers.

Large Farms.—In the large-farm districts we are met with the fact that, a large increase has taken place during the last 25 or 30 years in the rate of wages; thus, in Wiltshire, Messrs. Rawlence and Squarry give it as their opinion that the wages of young unmarried men have increased about 40 per cent., and those of older men about 10 or 12: the difference being attributed to the fact that married men are less disposed to move than unmarried men, and are content with a smaller sum as an inducement to remain in one place.

If we turn again to another part of the country, we find that Mr. Stanhope ascertained in the northern part of the great wold district of Lincolnshire, where the farms run mostly from 800 to 1000 acres and upwards in extent, that "the work is plentiful and certain, and the wages high, and the labourers having this are not inclined to leave the place. Their wives," he says, "are too well off to work." These facts may be allowed to speak for themselves, I think; but, as a rule, under our system of large farms, it is beyond a doubt the fact that a good, honest, and industrious labourer seldom or never wants for work at good wages. Before I have done with the state of the labourers, however, I may perhaps mention that, in a letter to me some two or three years ago, Mr. J. S. Mill referred to the exorbitant price which the agricultural labourer had to pay for many of the necessaries of life in country villages, "a thraldom from which," he said, "only co-operative stores could relieve him." I can hardly go into the question of co-operative societies here, and of the difficulties, insuperable I think, which would attend their introduction into agricultural districts; but I may mention the course which has been successfully pursued in this matter by a Wiltshire farmer, who farms between 1500 and 2000 acres of land. He found when he entered on his farm that his labourers were paying considerably more than they ought for almost every article of consumption which they required; he, therefore, determined upon purchasing these things at the wholesale rate himself, and he placed a person to sell it to his workpeople at a price that just cleared the original cost and expenses, and they are highly pleased with the change, which has proved a very great advantage to them; it has no affinity to the truck system, as the labourers are all paid their wages in money; but they are only too glad to get their wants supplied at the reduced price at which they are offered to them at the shop provided by their master. It will be seen, therefore, that a remedy for the exorbitant prices which the agricultural labourers are charged for things in some districts can be provided by large farmers following the example I have given, which the small farmer could not do. In fact, the small farmer takes little or no interest in the condition of the labourers, for he only occasionally employs them at all. I now approach another most important part of our subject, viz., the advantages which the large-farm system is, and has been, to the country generally. Here, again, the evidence is almost wholly in favour of large farms. Where can we

find, in any part of the kingdom, any considerable quantity of naturally poor land brought into a state of fertility but by large farmers, men of capital and enterprise? These are the men who, by the aid of the best mechanical appliances, have accomplished this, and created quite a revolution in British agriculture, principally by the large use of artificial food and manures,—aids which the small farmer, I believe, avails himself but very little of. When driving through a part of South Wiltshire lately, I passed through a large farm where two powerful steam-engines were at work with the cultivator, and smashing up the stubbles in beautiful style; the very next farm was in a most discreditable state, and on my inquiring of a friend the cause of this, his reply was, that "it was a small farm, and the occupier had not the means to do it;" it was some of the best land, however, but the result was as I have just stated. And I believe, as a rule, this is the general experience with small farms, especially in tillage, and particularly where the land is not naturally fertile: in such districts the evidence is conclusive, that only by men of capital, or (I must add since the meeting of the Royal Agricultural Society this year at Oxford) ladies of capital, can such land be successfully farmed. The power which the large farmer can bring to bear on any of the operations of the farm is an immense advantage. The fickleness of the climate, too, in this country gives a great advantage to the large farmer, who, by concentrating his power, can take advantage of the most favourable opportunity to perform, in an expeditious manner, the most important operations in agriculture. All in this assembly are aware of the success which has attended the introduction of steam-power as applied to the cultivation of our clay soils in different parts of the country. Now, I hold it to be quite impossible for steam cultivation to be used successfully under the small-farm system; this, I believe, no practical man will be found to deny. But it is asserted by the advocates of the small-farm system, who, it is perhaps needless to say, are not practical farmers, that machinery may be hired round by co-operative freeholders with more economy than if employed for only a single farm. My answer to this is, that while the machinery was travelling about from one farm to another, and taking it up and setting it down, the whole work might be done on a large farm by the farmer who has the machinery and the labour at hand to work it.

Farms for Rising Labourers.—The impossibility of an industrious and thrifty labourer rising to the position of a farmer has been referred to as against the system of large farms, and I am quite sure that no large farmer can be found who would not be most happy to see the agricultural labourer raise himself to that position, if, by doing so, he would benefit his condition. But he could not hope to obtain that position unless he had the opportunity of doing so by entering on small farms at the outset:—

There is, however, the plan of letting plots of land, that is suitable for the purpose, to the most careful and industrious of labouring families, for the purpose of keeping a cow or two—a plan that has answered well in many places, and which I have no hesitation in commending; for, besides the advantage it gives the labourer of improving his position, I know that one or two cows kept properly by themselves will yield more milk than if they were in a herd of 40 or 50 cows; and the system, as I just said, has been found to answer very well in practice. But this has not been the case where a man with two or three cows has been tempted to do nothing else; thus, in Derbyshire, Mr. Cottingham, agent to the Duke of Devonshire, says that "a man with an allotment of, say 10 acres, to keep a couple of cows, is better off than the holder of 20 or 30 acres, or a farm just big enough to tempt him to do nothing but work on the farm. I reduced one man," he said, "to 10 acres from 20, to compel him to work; and he afterwards told me I had made a gentleman of him. Of course, in commending this system, I am assuming that the cows are managed by the most careful and thrifty persons. To suppose that it would be successfully carried on by the generality of our labouring families would be a very great mistake indeed. But I am sorry that I cannot give you as much official data respecting the numbers of the occupiers of different classes of farms as I could wish; the official statistics do not afford the desired information, nor, indeed, as much as they might very easily afford: they give, however, the average extent of land returned by each occupier in England as about 60 acres.

[Mr. TRASK concluded with remarks, which we shall give next week, on the greater rents paid by small farmers, owing to the excessive competition for small holdings.—A reference to the discussion which ensued is made in another page.]

Markets.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Dec. 8.

Prime Meadow Hay	130s. to 140s.	Clover, old	130s. to 140s.
Inferior do.	110 120	Inferior do.	115 125
New Hay	— —	Prime 2d cut do. ..	126 135
Inferior do.	— —	Inferior do.	105 115
Straw	33 38		

METROPOLITAN CATTLE MARKET.

MONDAY, Dec. 5.

We have a larger number of Beasts on offer, but the average quality is by no means good, consequently prices are not lower for choicest kinds, and a clearance of inferior cannot be made. There are a few more Sheep than last week, and trade is dull; there is, however, very little alteration in quotations. Calves are selling about the same as on Thursday. Our foreign supply consists of 1220 Beasts, 4360 Sheep, 155 Calves, and 150 Pigs; from Scotland there are 250 Beasts; from Ireland, 900; from Norfolk and Suffolk, 260; and 1350 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	8to6 0	Best Long-wools	5	4to5 8
Best Shorthorns..	5	6—5 10	Do. Shorn	—	—
2d quality Beasts	3	8—4 6	Ewes & 2d quality	4	4—5 0
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn	—	—
Do. Shorn	—	—	Lambs	—	—
			Calves	3	8—6 0
			Pigs	3	4—5 4

Beasts, 3080; Sheep and Lambs, 17,140; Calves, 160; Pigs, 200.

THURSDAY, Dec. 8.

The number of Beasts on offer is considerably larger than for several Thursdays past, and the demand is limited; however choicest descriptions are by no means plentiful, and readily make Monday's quotations. We have but few Sheep on offer, and those of middling quality. Trade is dull, and they cannot all be disposed of. Choice Calves are scarce; they are quickly sold, at higher rates. Our foreign supply consists of 950 Beasts, 1080 Sheep, 230 Calves.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	10to6 0	Best Long-wools..	5	4to5 8
Best Shorthorns ..	5	8—5 10	Do. Shorn	—	—
2d quality Beasts	3	8—4 6	Ewes & 2d quality	4	4—5 0
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn	—	—
Do. Shorn	—	—	Lambs	—	—
			Calves	4	0—6 4
			Pigs	3	8—5 8

Beasts, 1660; Sheep and Lambs, 4880; Calves, 283; Pigs, 60.

METROPOLITAN MEAT MARKET.—Dec. 8.

Best Fresh Butter .. .. .. 20*s.* per dozen lb.
Second do. do. .. .. 18*s.* "
Small Pork, 5*s.* 0*d.* to 5*s.* 4*d.*; Large Pork, 3*s.* 8*d.* to 4*s.* 4*d.* per 8 lb.

MARK LANE.

MONDAY, Dec. 5.

There was a very short supply of English Wheat to this morning's market, which was sold at an advance of 1*s.* per qr. upon the prices of this day se'nnight; American was also in good demand, at a similar improvement, but for Baltic we cannot raise our quotations. Malting Barley was a very dull sale, and cheaper; grinding firm. There was no change in the value of Beans or Peas. Oats were 1*s.* per qr. dearer. Flour brought rather more money.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	49	—57	Red.....	55	—58
— — fine selected runs..do.	53	—61	Red.....	50	—59
— — Talavera	54	—63			
— — Norfolk	—	—	Red.....	—	
— — Foreign	45	64			
BARLEY, grind. & dist., 30*s.* to 34*s.*..Chev.	43	—46	Malting ..	36	—41
— Foreign .. grinding and distilling	25	—33	Malting ..	33	—40
OATS, Essex and Suffolk	26	—28			
— Scotch and Lincolnshire..Potato	28	—30	Feed	—	
— Irish .....Potato	27	—29	Feed	25	—28
— Foreign .....Poland and Brew	26	—28	Feed	21	—26
RYE	32	—36	Foreign ..	33	—36
RYE-MEAL, Foreign	—	—			
BEANS, Mazagan.....42*s.* to 47*s.*..Tick	49	—50	Harrow ..	49	—50
— Pigeon ....51*s.* to 59*s.*..Winds.	—		Longpod..	—	
— Foreign..... Small	45	—47	Egyptian .	42	—44
PEAS, White, Essex, and Kent..Boilers	38	—40	Suffolk ..	40	—42
— Maple, 40*s.* to 42*s.* .....Grey	36	—40	Foreign ..	36	—40
MAIZE	—		Foreign ..	30	—32
FLOUR, best marks delivered..per sack	39	—47			
— 2d ditto ..... ditto	33	—45	Country ..	33	—45
— Foreign ..... per barrel	26	—29	Per sack..	37	—63

WEDNESDAY, Dec. 7.

At Mark Lane to-day the grain trade was characterised by an increased amount of firmness, and the tendency of values was towards further enhancement. There was a short supply of English Wheat on sale, the condition of which was good; sales in all qualities were effected rapidly, at the extreme advance current on Monday last; foreign Wheat was in moderate supply and similar demand, at improving prices. The supply of Barley was fair; malting samples, owing to their inferiority, were purchased on rather easier terms, but grinding qualities experienced a healthy inquiry, at full quotations. The Malt trade was depressed, but prices were unchanged. The market was well supplied with Oats, which sold briskly, at prices tending upwards. Beans, Peas, and Maize were in good demand, at fully previous quotations. Flour was taken off with activity, at firm quotations.

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	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 110	Qrs. 640	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	3870	980	29,560	{ — { — brls.
	3980	1620	29,560	

LIVERPOOL, Dec. 6.—Attendance at to-day's market thin. Wheat in moderate demand at the opening, but towards the close transactions were more freely made; red descriptions 1*d.* to 2*d.*, and white 1*d.*, per cental dearer than last week. Flour unchanged. Oats scarce, and 1*d.* per bushel advance on the week. Oatmeal unaltered. Indian Corn supports last week's rates; other articles unchanged.

AVERAGES.

	Wheat.	Barley.	Oats.
Oct. 29	48*s* 6*d*	36*s* 9*d*	22*s* 4*d*
Nov. 5	49 9	36 8	22 7
— 12	50 5	36 11	23 8
— 19	49 10	36 8	23 11
— 26	50 5	36 2	23 7
Dec. 3	52 5	36 1	23 10
Average ..	50 2	36 6	23 3

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ELBOWS, No. 12 .. .. .. each	1 0	1 0	2 6
T PIPES, No. 33 .. .. .. "	2 0	2 10	3 9
SYPHONS .. .. "	1 4	2 4	3 8
VALVES.. .. .. "	9 0	10 0	11 0

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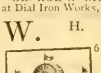

6 ft. by 4 ft. Lights, 2 in. thick, unglazed.. £0 5 0
" " Primed and Glazed with 16 oz. Sheet 0 11 0
" " with stout portable Box, not Painted 1 3 0
" " Painted four coats, and Handles on 1 8 0
" " Packed and Delivered in Railway van 1 10 0
6 ft. by 8 ft., Double Lights, do. 2 15 0

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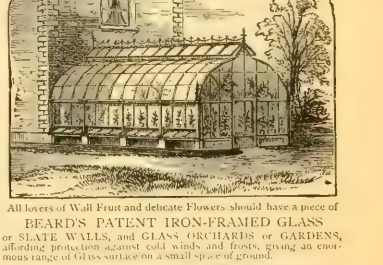

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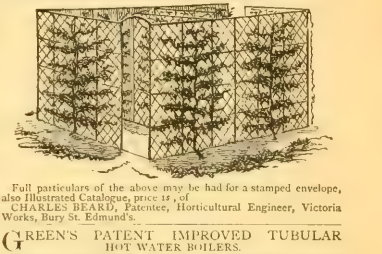

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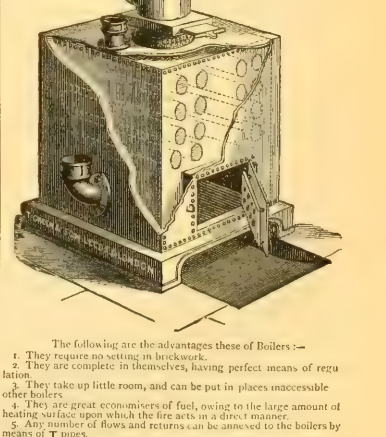

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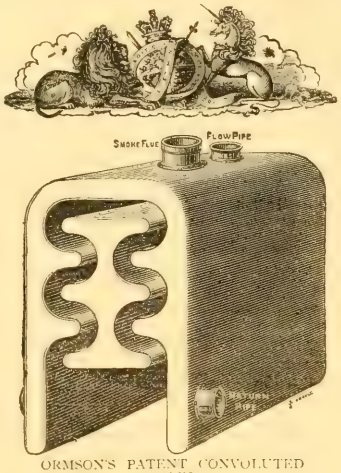

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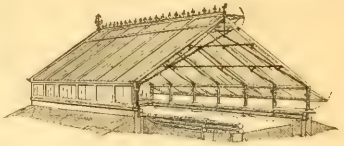

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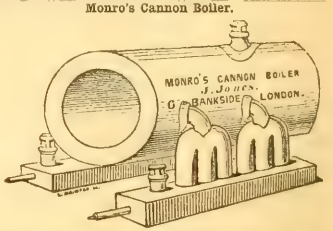

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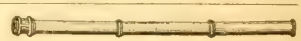

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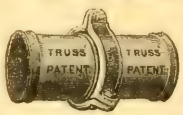

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Mr. WILLIAM BULL'S Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

WEBB'S NEW GIANT POLYANTHUS, Florist Flower, and GIANT COWSLIP SEEDS; also Plants of all the 3 varieties, with Double PRIMROSES of different colours; AURICULAS, both Single and Double; with every sort of Early Spring Flowers. Full Catalogues on application.—W. WEBB, Calcot, Reading.

Pelargoniums for Million.

JAMES HOLDER'S unrivalled Collection of French, Fancy, and Show varieties is now ready, at the following low prices—100 plants, distinct sorts, for 50s.; 50 plants for 30s.; or 25 plants, distinct sorts, for 20s. Super and package included.
Crown Nursery, Reading.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 36 pages, including list of Hybrids), containing Fernsof his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent

To the Trade.

TROPÆOLUM CANARIENSE.
Price on application
DOWNIE, LAIRD, AND LAING, 17, South Frederick Street, Edinburgh

Christmas Trees.—Spruce Firs from 1 to 15 feet.—See THOMAS CRIPPS AND SON'S TRADE CATALOGUE for the present season.
The Nurseries, Tunbridge Wells.

Laurustinus.

J. J. HARPUR, NURSERYMAN, Wexford, begs to offer the above in quantity Free to Liverpool or Bristol. Prices on application

To the Trade.

TRANSPLANTED NATIVE SCOTCH FIRS,
WILLIAM URQUHART AND SONS, Dundee

PLANTING SEASON.—The PRICED LIST of Seedling and Transplanted FOREST TREES, and EVERGREEN and FLOWERING SHRUBS, is now ready, and to be had on application.
WILLIAM URQUHART AND SONS, Dundee

To the Trade.

LARCH, extra fine, 9 to 18 inches, 9s. per 1000; £4 0 per 100,000. SCOTCH FIR, fine, 1 to 2 feet, 10s. per 1000; QUICKS, strong, 12s. per 1000.
W. JACKSON, Blakedown Nursery, Kidderminster.

TO the TRADE.
50,000 SCOTS FIR, native, 1½ to 2½ feet.
50,000 9 to 15 inches
2,000 CUPRESSUS LAWSONIANA, 6 inches to 2 feet.
Samples and prices on application to MITCHELL AND YOUNG, Brechin, N.B.

To Planters.

TO BE SOLD, cheap, SCOTCH FIR, 2 to 3 feet; FINUS LARICIO, 3 feet; BEECH, 6 to 8 feet; ALDER, 6 feet; HOLLIES, 2 to 3 feet; and other Trees. All well rooted.
WILLIAM URQUHART AND SONS, Dundee

FOR SALE, an exceedingly fine specimen of THUJA AUREA, 10-yr. growth, about 5½ feet high, 5 feet wide, and 14 feet in circumference, perfect in shape, price £40.
J. A., 3, Abchurch Lane, E.C.

ONE THOUSAND YARDS of DWARF BOX, not moved for 12 years; each yard would make from 4 to 6. To be SOLD or EXCHANGED for ECHEVERIA METALLICA, or SECUNDA GLAUCA, per 1000.—Bedding Plants.
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WANTED, GORDON'S PINETUM.—Apply, stating price, to Rev. J. B. NORMAN, Edgware, London.

Seedling Wellingtonias.

WANTED, a quantity of 1 and 2-yr., in pots. Quote price per 1000
RICH. HARTLAND, Lough Nurseries, Cork.

WANTED, LIMES, 10 feet high, suitable for Avenue planting. State lowest price per hundred to
EDMUND PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street; and 75, 76, and 77, High Street, Hull.

WANTED, strong transplanted LARCH, healthy and well rooted, 2 to 3½ or 4 feet. State price per 1000
FRANCIS & ARTHUR DICKSON & SONS, The "Upton" Nurseries, Chester.

WANTED, BRUSSELS or COMMON PLUM STOCKS, fit for working.
JAS. GARAWAY & Co. require the above. Send sample, price, and number to spare to
JAS. GARAWAY AND CO., Durdham Down Nurseries, Bristol.

WANTED, BROMPTON, COMMON, and BRUSSELS STOCKS for quartering Quote size, price, and quantity to
THOMAS BUNYARD AND SONS, Maidstone, Kent

CARTER'S GARDENERS' and FARMERS' VADE MECUM is now ready, and should be consulted by all who possess a garden. Post free, 1s.; gratis to purchasers.
JAMES CARTER AND CO., 237 and 238, High Holborn, London, W.C.

CARTER'S NEW VEGETABLES and FLORAL NOVELTIES for 1871. Detailed CATALOGUE post free on application
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AGRICULTURAL, GARDEN and FLOWER SEEDS.—Special prices, and advantageous offers of above, may be had on application to
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For 1871.

JOHN DOBSON AND SONS' CATALOGUE of VEGETABLE, FLOWER, and AGRICULTURAL SEEDS is now ready, and will be forwarded post free on application.
Woodlands Nursery, Isleworth, W.; and High Street, Hounslow, W.

To the Trade.

DOWNIE, LAIRD, AND LAING have now published their SPECIAL LIST of SEEDS, which will be sent free to intending purchasers.
Stanstead Park, Forest Hill, S.E.

To the Trade.—Continental Flower Seeds, &c.

GEORGE MACINTOSH, Agent to F. W. Wendel, Seed Grower, &c., Erfurt, Prussia, begs to announce that he can now supply CATALOGUES of the above free and post paid on application.
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CALCEOLARIAS, Herbaceous, of very choice strain; fine healthy plants, pricked over out of pans, free by post, 25 for 4s.; 50 for 7s. 6d.; 100 for 14s. Trade price on application per 100 or 1000.
H. AND R. STIRZAKER, Skerton Nurseries, Lancaster.

Fruit Trees, Roses, &c.

B. S. WILLIAMS can supply all the best kinds, true to name and in good condition; fine fruit bearing Trees, on French Paradise Stocks trained on Cordon, PYRAMIDAL and ORNAMENTAL TREES of every description. Priced LIST on application.
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RICHARD SMITH'S ROSE LIST, containing all the leading and most popular kinds of Roses, may be had free by post
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

RICHARD SMITH'S FRUIT LIST contains a sketch of the various forms of Trees, with Directions for Cultivation, Soil, Drainage, Manure, Pruning, Lifting, Cropping, Treatment under Glass, also their synonyms, quality, size, form, skin, colour, flesh, flavour, use, growth, duration, season, price, &c. Free by post for one stamp.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester

SUTTONS' AMATEUR'S GUIDE for 1871 is now ready, price 1s.; gratis to customers.
SUTTON AND SONS, Seedsmen to the Queen, Reading

FOR a LARGE GARDEN, SUTTONS' £3 3s. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round.

FOR a MODERATE-SIZED GARDEN, SUTTONS' £2 2s. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round.

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FOR a SMALL GARDEN, SUTTONS' 10s. 6d. COLLECTION of VEGETABLE SEEDS, carriage free, will produce a complete supply all the year round.

SUTTONS' COMPLETE COLLECTIONS of VEGETABLE SEEDS.—For prices and full particulars apply to SUTTON AND SONS, Seedsmen to the Queen, Reading

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5s. per 1000; also Drumhead or Cattle Cabbage Plants at 3s. 6d. per 1000, can now be supplied by W. VIRGO AND SON, Wonersh Nursery, near Guildford.

To the Trade.

TURNIP and SWEDE SEED.—A few small lots, of extra fine quality, to be Sold cheap, for cash.
Apply to C. L., *Gardeners' Chronicle* Office, London, W.C.

RICHARD WALKER can supply the following for cash:—Second size SEAKALE, 5s. per 100; third size, 3s.; ASPARAGUS, 3yr. old, 2s. per 100; 7 to 9 yr., 2s.; cheaper per 1000; RED DUTCH PICKLING CABBAGE Plants, 5s. per 1000; EAST HAM and DWARF YORK Plants, 3s. 6d. per 1000.
The Market Gardens, Biggleswade, Beds.

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application.
JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

Potatos.

EARLY SHAW and EVERGREEN REGENTS (true stock). Price per cwt. or ton on application to JAMES FRASER, Maylands Farm, Romford, E.

SEED POTATOS.—Paterson's Victoria, extra fine, at £5 per ton; Gryffe Castle, the best round Potato, £5 per ton. All true and selected.
W. JACKSON, Blakedown Nursery, Kidderminster.

SEED POTATOS.—Royal Ashleaf, Mona's Pride, Gloucestershire Kidney, Erin's Queen, Martin's Globe, Coldstream, Yorkshire Hero, &c., true and fine samples. Prices on application to
G. AND J. RUMLEY, Newton-le-Willows, near Bedale, Yorkshire.

NEW POTATOS.—American Early Rose Paterson's Bovinia, Red-skinned Flourball (Sutton's), CHARLES SHARPE AND CO., Seed Merchants, Sleaford, have pure, true seed of the above to offer. Price on application.
Priced Lists of Seed Potatos sent post free.

Seed Potatos.

H. AND F. SHARPE have fine stocks of the above, comprising AMERICAN EARLY ROSE, EARLY SANDRINGHAM, BOVINIA, and all the principal early and late varieties worthy of cultivation. The quality is very fine, and prices low. Special quotations on application.
Seed Growing Establishment, Wisbech.

THE ACME GARDEN FRAME and GROUND VINERY.
See large Advertisement at p. 1692 of this week's *Gardeners' Chronicle*.

LUCOMBE, PINCE, AND CO.
PICEA NORDMANNIANA.

LUCOMBE, PINCE, AND CO.
STANDARD PORTUGAL LAURELS, in tubs.

LUCOMBE, PINCE, AND CO.
PICEA PINSAPO,
WELLINGTONIA GIGANTEA,
and every other kind of Conifer; fine plants of all sizes, fit for removal
CUT CAMELLIA BLOOMS,
and other choice flowers
VINES in pots, largest and strongest
FERNS, ORCHIDS, and all kinds of
STOVE and GREENHOUSE PLANTS.
COLCHICAN LAURELS, from 3 to 8 feet.
COMMON LAURELS, 30,000.
Exeter Nursery, Exeter

New Seeds—"Only the Best."
MR. WILLIAM BULL'S CATALOGUE
is now ready
NEW VEGETABLES,
NEW FLOWERS.
"Only the best." *Vide* descriptions in Mr. WILLIAM BULL'S CATALOGUE. "Every article priced."
Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W.

Dutch Flower Roots.
CROYDON. A. HENDERSON & SON'S SEED WAREHOUSE. SURREY. ESTABLISHED 1828.
ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers.
DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted
Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application
Sion Nursery, Thornton Heath Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

J. TROTMAN, Spring Grove Nursery, Isleworth, has the following to offer at very moderate prices:—
Limes, 8 to 9 feet
Birch, 8 to 9 feet
Laburnum, 8 to 9 feet
Mountain Ash, 8 to 9 feet
Poplar, White, to 12 feet.
" Lombardy, 10 to 12 feet.
Poplar, Black Italian, 10 to 12 feet
American Arbor-vitæ, 3 feet.
Tree Box, 3 feet.
Ampelopsis Veitchii, 2 to 4 feet
Laurustinus, bushy, 2 feet
Thuja aurea, 1½ foot
ROYALTY STRAWBERRY for name of which see *Gardeners' Chronicle*, November 19th will be sent out next season

The most Desirable Plant of the Season.
PARSONS' NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA. See previous Advertisement
AGENTS—ENGLAND.
Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
" Wood & Ingram, Huntingdon.
" J. & C. Lee, Hammersmith.
" Thomas Davies & Co., Liverpool.
" A. Henderson & Son, London.
" Sutton & Son, Reading.
" James Veitch & Son, King's Road, Chelsea.
" S. Nairn & Sons, Newcastle-on-Tyne.
" Hooper & Co., Covent Garden, London.
" Buttler, Mc Cullan & Co., Covent Garden, London
" G. Cobbs & Co., Down Street, Piccadilly, London
" W. Cuthbush & Son, Highgate Nurseries, London, N.
" Osborn & Sons, Fulham Nursery, London
" Downie, Laird & Laing, London and Edinburgh
" P. Lawson & Son, 29, Budge Row, London.
" Rutley & Silverlock, Edmonton
" Dick Radclyffe & Co., 129, High Holborn, London, W.C.
" Fisher, Holmes & Co., Handsworth Nurseries, Sheffield.
" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
" Carter & Co., High Holborn, London, W.C.
" Milner, Nash & Nash, 60, Strand, London, W.C.
" Child & Lorimer, 49, Mark Lane, London
" H. Clarke & Sons, 49, King Street, Covent Garden, W.C.
" Dickson, Brown & Tait, Corporation Street, Manchester
" J. C. Wheeler & Son, Gloucester
" J. Wrench & Co., London Bridge, E.
" Harrison & Sons, Market Place, Leicester.
" James Cunaway & Co., Durdham Down Nurseries, Bristol
" James Dickson & Son, 102, Eastgate Street, Chester.
" Chivas & Wester, 108, Eastgate Street, Chester.
" R. G. Henderson & Son, St. John's Wood, London, N.W.
Mr. George Tredgett, Cambridge
" L. S. Woodthorpe, Sible Hedingham, Essex.
" G. Hinxman, Fareham.
" B. Bracher, Halifax, Yorkshire.
" W. Knight, Hailsham, Sussex
" Timothy Bingley, South-Eastern Railway Station
" W. Paul, London
" E. Holmes, Whittington Nursery, near Lichfield
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire.
" B. S. Williams, Upper Holloway, London
" E. Cooling, Derby
" James Wood, Newport, Isle of Wight
" H. Watkinson, 6, Market Place, Manchester.
" R. Cooper, 152, Fleet Street, London, E.C.
" J. Fraser, Lea Bridge Road Nurseries, London, E
" R. Smith, St. John's, Worcester.
" John Scott, The Seed Stores, Yeovil.
" S. R. Barnett, 1, King Street, Norwich.
SCOTLAND
Messrs Smith & Simons, Howard Street, St Enoch Sq., Glasgow
" P. Lawson & Son, Edinburgh.
" Sharp & Menzies, Leith.
" W. Drummond & Sons, Stirling
" J. & R. Thyne, 60, Buchanan Street, Glasgow
" Dickson & Turnbull, 26, George Street, Perth
Mr. James Cocker, Aberdeen.
IRELAND
Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin
Mr. J. W. Mackey, 40, Westmoreland Street, Dublin
BELGIUM.
Mons. Louis Van Houtte, Ghent.
PRUSSIA.
Messrs. Platz & Son, Erfurt
" Ferdinand Ichlee's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.
AMERICA.
Messrs. B. K. Bliss & Sons, New York.
PARSONS' NEW HYBRID FREE MIGNONETTE, in packets of per ounce, price on application.
PARSONS' superior PRIMULA,
" " CALCEOLARIA,
" " CINERARIA,
saved from the finest strains in cultivation, 2s. 6d. per packet.
P. P. has a first-rate stock of FRUIT TREES, both Trained and Pyramids, of which he solicits an inspection. Warranted true to name. Also a splendid collection of ROSES, including all the finest varieties. CONIFERS, &c., of every description. CATALOGUES and prices of which will be had on application.
P. PARSONS, Nurseryman, Seedsman, and Florist, 27 and 28, Western Road, Brighton Nurseries, Hassock's Gate, Keymer, Hurstpierpoint

SENECIO ARGENTEUS.

NEW HARDY PERENNIAL BEDDING PLANT.

As a very WHITE FOLIAGED plant, that will grow freely in any common border, and when once planted will take care of itself, being perfectly hardy, we believe that this plant will gain universal favour. It forms dense compact rosettes, in the style of Centaurea candidissima, 3 or 4 inches high, and 4 to 6 inches across, retaining their whiteness throughout the year. The beauty and rarity of this species have drawn forth almost rapturous descriptions from the few travellers who have reached its alpine fastnesses. We have proved it for the past two winters, and recommend it with the utmost confidence as one of the most valuable hardy plants that it has ever been our good fortune to introduce. First-class Certificate Royal Horticultural Society.

Price 5s. each, 50s. per dozen.

BEGONIA GERANIOIDES.

The Snowdrop itself scarcely surpasses the whiteness of the blossoms of this plant, which, as an ornament for greenhouses, blooming profusely during the autumn and winter months, is really charming. The habit is very dwarf and compact, with neat foliage, and flowers nearly an inch across. Introduced by us from Natal, and figured in the "Botanical Magazine" for 1866, tab. 5583. **Price 5s. each.**

JAS. BACKHOUSE AND SON, NURSERIES, YORK.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 20s. per doz., or £10 per 100
" Good named kinds, £5 to £7 10s. per 100
" Common mixed colours, £2 10s. per 100
" Van Houtte (plena), strong bushy flowering plants, 1½ to 3 feet, 12s. to 42s. per dozen and upwards. This is one of the most beautiful of the Double Azaleas.
Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens.
ANDROMEDA CALYCULATA, Good plants, 18s. to 30s. per doz.
RHODENDRONS.—We invite the special attention of Rhododendron buyers to this part of our stock. We have made extra efforts to unite the plants vary from 2 to 8 feet high. Every plant a specimen, and comprising all sorts excepting the common Ponticum.
Named RHODODENDRONS.—Low bushy sturdy plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent on application.
Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard RHODODENDRONS in Rotten Row were nearly all of them supplied from Knap Hill. As no description on paper can give an adequate idea of these plants, we have had a fair example photographed, which is given in our Catalogue, just published.
RHODODENDRON PONTICUM, for Cover, £7 10s. to £15 per 1000
" 12 varieties, named, from layers, 10 varieties, 5s. to 10s. per 100
" Hardy Varieties, for cut flowers, 10s. to 15s. per 100.
Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 5s. per 100.
" Larger and very bushy plants, £10 to £20 per 100
Cgr. We have grown Le some years past a large number of Rhododendrons from layers, and we must have a stock of more than 100,000 plants of named varieties, which we believe are quite unequalled, being without exception the best plants we have ever seen. We supply them, all layers, at from 50s. to 200s. per 100. A sample, the only guide, will be sent on application.
HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, by name, including Menziesias, every plant a specimen, 12s. per dozen, 90s. per 100.
" The free growing varieties of ALLGARIS, &c., 30s. per 100, £10 per 1000.
" MEDITERANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, £5 per 100
KALMIA LATIFOLIA, from 6s. to 10s. per 100
" Nice blooming plants, £5 to £10 per 100
" Large, 30s. to 60s. per dozen and upwards
" MYRTIFOLIA, 42s. to 60s. per dozen.
Our stock of these American Plants are grown to a large extent.
HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.
COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100; 3 to 4 feet, 84s. per 100; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.
Thousands of beautifully grown Pyramidal plants.
We have a number of very large Green Hollies, 12 and 15 feet high.
WATERER'S HOLLY.—We have these in large numbers and of GOLDEN QUEEN all sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Hollies, being fair examples of our stock.
PERRY'S WEEPING HOLLY STANDARDS.—A large number.
NEW GOLDEN WEEPING HOLLY.—Nice Standards.
The COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, magnificent plants.
VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES—Hodgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 3, 4, 5, 6, 7, 8, and 10 feet high.
YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8 to 14 feet. These are invaluable as blinds
IRISH YEWS, of all sizes, up to 10 feet.
YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.
BOX, GREEN Handsome Pyramidal plants, 5, 6, 7, and
" VARIEGATED 7 8 feet high. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.
AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high.
LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.
LAURUSTINUS and PANDORA, Standards, in tubs.
Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted:—
ABIES ALBERTUS, 5 to 6 feet, 42s. per dozen; 7 to 8 feet, 60s
These are beautiful plants, transplanted 1870.
ABIES ORIENTALIS, 4 to 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. and upwards.
PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.
PINUS EXCELSA, 5 to 6 feet, 30s. to 42s. per dozen; 3½ to 4 feet, 7s. 6d. to 10s. 6d. each; larger, 5 to 6 feet, 21s. each and upwards.
PINUS INSIGNIS, 1½ foot, very stout, 18s. per dozen, £5 per 100; 2½ to 3 feet, 60s. per dozen; 4, 5, 6, 7, 8, to 10 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards
PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s. per dozen; 2½ to 3 feet, 5s. to 7s. 6d. each; larger specimens, 4, 5, 6, 8, and 10 feet.
PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.
PICEA LASIOCARPA, fine bushy specimen plants, 15s. each, £6 6s. per dozen; 3, 5, 6, 7, and 8 feet high, 21s. each and upwards; and all have been transplanted within 12 months.
CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; 5 to 7 feet, 60s. to 84s. per dozen; 8, 10, and 12 feet high, moved since September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards.
CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 3 to 4 feet, 42s. per dozen.
CUPRESSUS LAWSONIANA GRACILIS, 3 to 4 feet, 42s. to ARGENTEA, 84s. per dozen.
JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.
THUJA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference.
THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen.
THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.
WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—
ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.
ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.
ÆSCULUS ROSEA, SCARLET HORSE CHESTNUT, 8 and 10 feet high.
ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet.
The scarlet and common Horse Chestnuts have fine heads and stout stems, gaining 5 to 6 inches 4 feet from the ground.
BEECH, PURPLE, 6 to 8 feet; 10 to 12 feet, fine trees.
BEECH, COMMON, 8 to 10 feet.
BIRCH, WEEPING, 8 to 10 feet.
CHESTNUT, SPANISH, 8 to 10 feet.
ELMS, 10 to 15 feet.
LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.
MAPLES, NORWAY, 8 to 12 feet.
OAKS, ENGLISH, 8 to 10 feet.
SCARLET AMERICAN OAKS, 10 to 12 feet.
PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high.
The Planes on the Thames Embankment were supplied by A. W.
POPLARS, LOMBARDY, 10 to 15 feet.
SYCAMORE, 10 to 16 feet.
WALNUTS, about 10 feet.
ASH, MANNA, 8 to 10 feet
CATALPAS, 6 to 8 feet
MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years
Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application.

The stock of Seedling and Transplanted LARCHES, SCOTS FIRES, and other FOREST TREES is both unusually extensive and superior in quality. When personal inspection is not convenient, samples and special offers will be sent if required.

Edinburgh and London (96, Fleet Street, Temple Bar, E.C.)

Planting Season.

DICKSON AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for transplanting. They are growing on very exposed ground, are finely rooted, and their wood is thoroughly ripened. Samples and Catalogues on application. Special prices will be quoted where large quantities are taken. (Established 1770)

Planting Season.—Knowfield Nurseries, Carlisle.

MESSRS. LITTLE AND BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, beg leave to request the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c.; and Gentlemen intending to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

L. & B. are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties.

FOR PLANTATIONS, at wholesale prices, for cash, all transplanted and healthy, OAK, ELM, BEECH, HORSE CHESTNUT, 2 to 3 feet high, stout, well-rooted trees, 20s. per 1000: ASH, 2 feet, 20s. per 1000: HORSE CHESTNUTS, 4 feet, 30s. per 1000: MAPLE, 2 to 5 feet, 30s. per 1000: LABURNUMS, 3 to 5 feet, 12s. 6d. to 8 feet, 20s. per 100: SYCAMORES, 4 to 6 feet, 36s.; 7 to 9 feet, 25s. per 100; WALNUTS, 3 to 4 feet, 20s. per 100; BOX, for edging walks, 9d. per yard: Red Grape and Black CURRANTS, strong, 2s. per 100, 9s. per 1000; SILVER FIR, 1½ to 2 feet, 3s. per dozen; GUELDER ROSES, Red and Yellow BERRIES, very thrifty, 3 feet, 3s. 6d. per dozen; Dwarf Perpetual ROSES on Briar, 9s. per dozen; and other Nursery Stock.

Remittance or reference required with orders.

A. WILKIN, Tiptree, Kelvedon, Essex.

A NOBLE AVENUE for £20, consisting of 100 WELLINGTONIA GIGANTEA, about 4 feet high. This, the most notable of all trees native of California, when it attains a height of 440 feet, with a trunk 40 feet through, is of rapid growth, hardy, and noble in form. The bark of a Wellingtonian at the Crystal Palace, recently destroyed by fire, gave an idea of the grandeur of the tree.

Or an AVENUE of 100 SUPERB ABIES DOUGLASII, about 10 feet high, for £20. This, the most noble of evergreen firs, is of rapid growth, hardy, produces valuable timber, and, when young, the foliage, from its colour of Yew wood. It is a native of California, where it grows upwards of 300 feet high, with a trunk 10 feet through. The big stuff at Kew is of this tree, and one of 30 feet high, 30 feet high. There is at Dropmore (Bucks) a specimen measuring at the present time 65 feet high, and 90 feet through the branches, with a trunk 9 feet in circumference at 4 feet above the base. I was raised from seed sown by Mr. Frost, the present gardener, in 18-8, and is now a model of beauty.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees.

QUICK, and all other Hedge Plants

COVERT PLANTS, in great variety

FRUIT TREES, including all the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained, &c.

ROSES, Standards, Dwarfs, on own roots and Manetti stock, &c.

VINES, all the leading varieties, in 2000 well ripened Canes, for fruiting in pots and for planting out.

EVERGREENS, in great variety, including large quantities of all the choicest Hollies, &c.

CONIFERS, including Picea nobilis, Nordmanniana, &c.

ORNAMENTAL TREES and Plants, of all sorts.

The whole in very great quantity and about vigorous condition, with fine roots, for safe removal.

Priced LISTS and all particulars on application to

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester

The "Newton" Nurseries are within 10 minutes' walk, by the new road over Hookersbrook Bridge, from the Railway Station.

Planting Season.

STRONG transplanted LARCH, SPRUCE, and PINUS AUSTRIACA, PRIVET, POPLAR, QUICKWOOD, LAUREL, YEWS, BERBERIS, ARBOR-VITÆS; Standard, American, and Kilmarnock WEEPING WILLOWS; GOOSEBERRY and CURRANT TREES; also, Standard, Pyramid, and Dwarf-trained APPLES, PEARS, PLUMS, and CHERRIES. Priced CATALOGUES may be had on application

WITTY AND SON, The Nurseries, Cottingham.

Planting Season.

TO BE SOLD, cheap, the ground being required for other purposes, 6 acres of RHODODENDRONS, from 1 to 3 feet high, bushy hybrids, well set with bud, the finest lot in England; AZALEAS, strong and bushy, well set with bud; FOPLARS, in variety, 2 to 12 feet high; SPRUCE, 1 to 3 feet; HORSE CHESTNUTS, SYCAMORE, NORWAY MAPLE, 2 to 8 feet; COMMON LAUREL, 1 to 5 feet, bushy; and other Forest Trees, Shrubs, &c. Best blow GOOSEBERRIES in variety.

B. WHITHAM, The Nurseries, Reddish, near Stockport.

TO BE DISPOSED OF, about 200 CEDRUS DEODARA, 10 to 15 feet high, and in rare condition for transplanting—only one of them having been removed since August, 1869, as they are now standing on ground that must be cleared by Lady Day next. No reasonable offer will be refused.

ANTHONY WATERER, Knap Hill Nursery, Woking, Surrey.

IMPORTANT to LANDOWNERS, NURSERYMEN, &c.

2,000 ELMS, in varieties, 7 to 10 feet, per 100, 15s.

800 CHESTNUT, Horse, 7 to 8 feet, per 100, 18s.

4,000 SYCAMORES, 6 to 7 feet, per 100, 15s

700 COCKSPUR THORNS, 8 feet, fine, per 100, 18s.

2,000 choice sorts of LILACS, 3 to 4 feet, per 100, 15s.

3,000 TREE BOX, fine, in three varieties, per 100, 15s.

30,000 GIANT ASPARAGUS, 1 yr., per 1000, 15s.

1,000 ROSE of SHARON, per 100, 15s.

WM. RUSHFORTH, Woodhouse Hill, near Leeds.

To Planters of Ornamental Trees.

J. SCOTT, Merriott, Somerset, offers, from his large collection, the following, at prices much below their real value; all are grown singly, and have been used to the ground, viz.:—

ABIES MENZIESII, 4 feet, 15s. per dozen.

ARAUCARIA, 2 to 3 feet, 30s. per dozen.

PICEA DOUGLASII, 2 feet, 18s. per dozen.

" PINSAPO, 18 inches to 2 feet, 18s. per dozen.

PINUS CEMBRA, 4 to 7 feet, 2s. 6d. to 5s. each.

" INSIGNIS, 2 to 5 feet, 12s. to 30s. per dozen.

BIOTA ORIENTALIS, 3 to 6 feet, 6s. to 9s. per dozen.

" GLAUCA, 6 feet, 24s. per dozen.

" SIEBOLDII, 4 feet, 24s. per dozen.

" " AUREA, or Golden Arbor-vitæ, 2 feet, 24s. per dozen; 3 feet by 2 feet, 60s. per dozen

" " ELEGANTISSIMA (the golden pyramid), 1 to 2 feet, 60s. per dozen.

" PENDULA, 6 feet, 10s. 6d. each

CRYPTOMERIA JAPONICA, 4 to 6 feet, fine, and well made, 18s. to 24s. per dozen.

CUPRESSUS SEMPERVIRENS, 4 feet, 18s. per dozen

" LAWSONIANA, in variety, 3, 4, 5 to 6 feet, 12s. to 24s. per dozen; less by the 100

" LUSITANICA, 3 to 5 feet, 24s. to 30s. per dozen

" MACROCARPA, 2½ feet, 9s. per dozen

" NUTKAENSIS, 3 to 5 feet, 30s. to 48s. per dozen

" THUIFERA, 4 to 6 feet, 30s. to 48s. per dozen

SEQUOIA SEMPERVIRENS, 10 feet, 2s. 6d. each

THUJOPSIS BOREALE, 2 to 3 feet, 18s. to 30s. per dozen

THUJA WARREANA, the perfect yellow specimens, 30s. to 60s. p doz

" CRAIGIANA, fine, 4 to 6 feet, 12s. to 30s. per dozen

" LOBBII, fine, 5 to 7 feet, 18s. to 30s. per dozen

" OCCIDENTALIS, 6 to 7 feet, fine, 18s. per dozen.

" PLICATA, 2 feet, 2s. 6d. each.

" WAREANA, 2 to 4 feet, 18s. to 24s. per dozen

JUNIPERUS VIRGINIANA, 4 to 6 feet, 9s. to 18s. per dozen.

TAXUS, Common Yew, 2 to 4 feet, 12s. to 18s. per doz.; 7 to 10 feet, 5s. each

IRISH YEW, 10 feet, fine, 20s. each.

The above are a few of J. Scott's immense stock, CATALOGUES of which will be sent on application.

The fine BROCKWORTH PARK PEAR should be in every collection, 21s. each, quite new; also the BENEDICTINE, 7s. 6d. ea.

Planting Season.

THOMAS KENNEDY AND CO. offer the following transplanted TREES, &c., which are healthy, well grown, well rooted, and in excellent condition for removal. Prices on application

100,000 BIRCH, 1 to 1½, 1½ to 2, 2 to 2½, and 2½ to 3 feet

500,000 LARCH, 1 to 1½, 1½ to 2, and 2 to 2½ feet.

1,000,000 SCOTCH FIR, true native, 6 to 12 in., 12 to 18 in., and 1 to 1½, 1½ to 2, and 2 to 2½ feet

500,000 SPRUCE FIR, Norway, 9 to 12, 12 to 18, and 15 to 18 inches, and 1½ to 2 feet

50,000 PINUS AUSTRIACA, 9 to 15, and 15 to 18 inches, and 1½ to 2 feet

50,000 PINUS LARICIO, true Corsican, 12 to 15, and 15 to 18 in.

100,000 OAK, English, 1½ to 2, 2 to 2½, 2½ to 3, and 3 to 4 feet

50,000 POPLAR and HUNTINGDON WILLOW, 2 to 2½, 2½ to 3, and 3 to 4 feet

50,000 PRIVET, Evergreen, 1½ to 2, 2 to 2½, and 2½ to 3 feet

2,000,000 THORNS or QUICKS, 1, 2, and 3 yr. transplanted, 1 and 2 yr. transplanted, and extra strong.

50,000 WHIN or GORSE, 1½ to 2, and 2 to 2½ feet.

Besides the above they have an extensive general stock of FOREST, FRUIT, and ORNAMENTAL TREES, DECIDUOUS and EVERGREEN SHRUBS, &c., which they are selling at moderate prices.

Railway Station Nurseries, &c., Dumfries.—December, 1870.

BIRD'S "KING of the CUCUMBERS."—The best for exhibition. Length 24 to 30 inches. White spine, handsome fruit, short neck or handle. Price 2s. 6d. per packet

BIRD'S "KING of the MELONS."—The best green-fleshed Melon, handsomely netted, fine flavour. Average weight 5 lb. Price 1s. 6d. per packet. May be had of all the seed Trade, and of

JAMES BIRD, Nurseryman and Seedsman, Downham Market.

To the Trade.—Red-skin Flourball Potato.

WATTS AND SON invite the attention of Seedsmen to their stock of this very remarkable POTATO, which is destined to become the leading winter variety, and which only requires to become known to be universally cultivated. Purchasers can have fine specimens for Show. Price on application.

WATTS AND SON, Florists, Seedsmen, &c., 56, Gold Street, Northampton

FOR SALE, good fibrous PEAT, at 14s. 6d. per ton, cash, delivered in Edenbridge, and London, Chatham, and Dover Railway, and South-Eastern Railway Stations. Address

J. HAYNES, Bracted, Sevenoaks.

EPPS'S SELECTED PEAT for Choice Plants, Ericas, Azaleas, Ferns, &c., superior to anything of its kind yet sold, fit for immediate use, lightly packed in 1 bushel sacks, 2s.; per cwt., 8s.; free to London, and to any Station where four casks are ordered. Specially selected for Orchids, 12s. extra.

Post Office orders to W. JAS. EPPS, Horticultural Depôt and Peat Stores, Lewisham, S.E.

The Cheapest and Best Insecticide.

DUTY-FREE TOBACCO.

BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants. Sold by Nurserymen, Seedsmen, and Florists, In Tins at 1s., 2s. 6d., and 5s. Powder Distributors, 2s. 6d. and 3s. 6d. each.

"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.

Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

ALEX. WILKIE'S

"CONDENSED" COMPOSITION,

THE CHEAPEST AND ONLY EFFECTUAL

MEALY BUG, SCALE, and THRIP DESTROYER.

One trial only is required to give it a pre-eminence over all other Insecticides. It has been in the hands of most experienced Gardeners for trial, and the under-named Nurserymen and Seedsmen will be happy to furnish a Printed List of Opinions and other particulars on application, and also to receive orders for the same. Sold in bottles at the following prices, viz., 2s., 3s. 6d., and 6s.

Messrs. Osborn & Sons, Fulham, S.W.
" Barr & Sugden, Covent Garden
" Cutbush & Son, Highgate, N
" Dickson & Sons, Chester
" Drummond & Sons, Stirling
" Drummond & Sons, Dublin
" Gaiway & Co., Bristol
" Hurst & Son, 6, Leadenhall Street, E.C.
" Henderson & Son, 67, St John's Wood, N.W.
Messrs. Kennedy & Co., Dumfries
" J. & C. Lee, Hammersmith, W
" S. Nilsson & Sons, Tooting S.W.
" Sutton & Sons, Reading
" Stuart & Mein, Kelso
" Veitch & Sons, Chelsea, S.W.
Mr. Wm. Cutbush, Barnet
" J. Fraser, Lea Bridge Road E.
" F. R. Kinghorn, Richmond, S.W.
" B. S. Williams, Holloway, N.

VEITCHS' AUTUMN GIANT CAULIFLOWER.

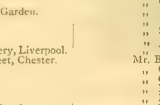

MESSRS. VEITCH & SONS

DESIRE TO CALL ATTENTION TO THIS

NEW AND EXTREMELY VALUABLE LATE CAULIFLOWER.

It is perfectly distinct from any other sort, the leaves are long and tapering, and the habit of the plant is robust, but very upright and compact. The heads are magnificent, beautifully white, large, firm, and compact, and being thoroughly protected by the foliage, remain a longer fit for use than any other sort. If sown in April it will succeed the Walcheren, and coming in between that variety and Snow's Winter Broccoli, is a great acquisition to all gardens. It was awarded a First-class Certificate by the Royal Horticultural Society, November 2, 1870, when Messrs. V. & S. were generally congratulated on having brought such a fine variety before the public. Many letters, speaking in the highest terms of this Cauliflower, have been received, and it cannot be too strongly recommended.

The following is an Extract from the *Gardeners' Magazine* of November 5, 1870:—

"Messrs. Veitch & Sons exhibited their New Giant Autumn Cauliflower, which from its gigantic size and fine appearance attracted a considerable amount of attention, and was deservedly awarded a First-class Certificate. Five or six heads were shown, the largest measuring upwards of 12 inches in diameter, and all were perfectly solid and of the purest white. It was stated that seed of the Giant Autumn, Walcheren, and several others were sown at the same time, and all the plants grown under exactly the same conditions, and that the Giant Autumn did not turn in until all the others were past. Its being fit for use so late in the season is a most important quality, and without doubt it is one of the most valuable and distinct vegetables that has been introduced for many years past."

Mr. HENRY CHILMAN, Somerley Gardens, writing in the *Florist*, says:—

"This is certainly one of the best additions to the Brassica family we have had for some years past, the heads produced by this fine sort being compact and of marble-like whiteness. From the high recommendation given to this variety in the Catalogue whose name it bears, I was induced to try it, and can fully endorse every word said there in its favour. All who have not hitherto included this variety in their Seed Lists would do well to do so; there is little doubt of those who have once tried it neglecting to do so again. The crop we are now cutting gives promise of a supply for five or six weeks to come."

In Sealed Packets, 2s. 6d. each.

The following Seedsmen have obtained a supply direct from us, viz.:—

Messrs. Austin & McAslan, Glasgow.
" Backhouse & Son, York.
" Barr & Sugden, 12, King Street, Covent Garden.
" Burgess & Kent, Penkhull.
" Carter & Co., 237, High Holborn.
" Chivas & Weaver, Chester.
" Davies & Co., Thomas, Wavertree Nursery, Liverpool.
" Dickson & Sons, Jas., 100, Eastgate Street, Chester.
" Dickson, Brown & Tait, Manchester
" Downie, Laird & Laing, Forest Hill.
" Fisher, Holmes & Co., Sheffield.
" Garaway & Co., James, Bristol.
" Henderson & Co., A., Edgeware Road, London.
" Henderson & Son, F. G., St John's Wood.
" Hurst & Son, 6, Leadenhall Street.
" Lee, J. & C., Hammersmith.
" Minier, Nash & Nash, 60, Strand.
Messrs. Nutting & Sons, 60, Barbican, London.
" Osborn & Sons, Fulham
" Rollo & Son, 6 to 8, Dock, 290, High Holborn
" Rutley & Silverlock, 412, Strand.
" Smith & Simons, Glasgow.
" Sutton & Sons, Reading.
" Wood & Ingram, Huntingdon.
Mr. Bird, James, Downham Market.
" Cooling, E., Derby.
" Cooper, R., 158, Fleet Street.
" Holmes, Edward, Whittington Nursery, Lichfield
" Mackey, W., Dublin.
" Scott, John, Merriott.
" Turner, Chas., Slough.
" Veitch, R. T., Exeter.
" Whomes, James, Windsor
" Williams, B. S., Upper Holloway.

Price to the Trade on application, or of either of the London Wholesale Houses named above.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.—Nov. 22, 1870.

Planting Season.

THOMAS KENNEDY AND CO. offer the following transplanted TREES, &c., which are healthy, well grown, well rooted, and in excellent condition for removal. Prices on application

100,000 BIRCH, 1 to 1½, 1½ to 2, 2 to 2½, and 2½ to 3 feet

500,000 LARCH, 1 to 1½, 1½ to 2, and 2 to 2½ feet.

1,000,000 SCOTCH FIR, true native, 6 to 12 in., 12 to 18 in., and 1 to 1½, 1½ to 2, and 2 to 2½ feet

500,000 SPRUCE FIR, Norway, 9 to 12, 12 to 18, and 15 to 18 inches, and 1½ to 2 feet

50,000 PINUS AUSTRIACA, 9 to 15, and 15 to 18 inches, and 1½ to 2 feet

50,000 PINUS LARICIO, true Corsican, 12 to 15, and 15 to 18 in.

100,000 OAK, English, 1½ to 2, 2 to 2½, 2½ to 3, and 3 to 4 feet

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" Drummond & Sons, Dublin
" Gaiway & Co., Bristol
" Hurst & Son, 6, Leadenhall Street, E.C.
" Henderson & Son, 67, St John's Wood, N.W.
Messrs. Kennedy & Co., Dumfries
" J. & C. Lee, Hammersmith, W
" S. Nilsson & Sons, Tooting S.W.
" Sutton & Sons, Reading
" Stuart & Mein, Kelso
" Veitch & Sons, Chelsea, S.W.
Mr. Wm. Cutbush, Barnet
" J. Fraser, Lea Bridge Road E.
" F. R. Kinghorn, Richmond, S.W.
" B. S. Williams, Holloway, N.

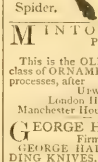

Red Spider. Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1869, against Red Spider, Mildew, Thrips, Green Fly, and other Blight, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. It has proved many preparations intended to supersede it.

Sold Retail by Seedsmen, in boxes, 1s., 2s., and 10s. 6d.

Wholesale by PRICE'S PATENT CANDLE COMPANY (Limited), Battersea, London, S.W.

MINTON, HOLLINS, AND CO., PATENT TILE WORKS, STOKE-ON-TRENT.

This is the OLD FIRM, and they continue to Manufacture every class of ORNAMENTAL and PLAIN TILES by the most improved processes, after

UPWARDS OF THIRTY YEARS' EXPERIENCE!

London House: 59, Conduit Street, Regent Street, W.

Manchester House: Bridgewater Club Chambers, 110, King Street.

GEORGE HALL, late Manager to the late Saynor's Firm, was for many years employed by

GEORGE HALL AND SONS celebrated PRUNING and BUDDING KNIVES, SCISSORS, &c., may be obtained from the most respectable Nurserymen and Seed Merchants in the kingdom, also America, France, Germany, Holland, Prussia, Russia, &c.

N.B.—We only make one quality, the best that can be manufactured, the same as the late Saynors always made during their lifetime, with all the latest improvements.

CAUTION.—None are genuine unless marked "GEO. HALL AND SON." Other marks would cause disappointment, as these Blades are tempered by a process known only to the Makers.

Engravings of Patterns, with Price Lists, gratis on application.

Hecla Works, Sheffield.

To Amateur Rose Growers and the Trade

HYBRID PERPETUAL ROSES, CLEMENCE RAOUX and EDWARD MORREN.—These are decidedly the best of 1869, and two of the most beautiful in cultivation. Strong plants, standards, 3s. 6d., dwarfs, 2s. 6d. each. Trade price, per doz. or 100, on application.—HENRY BENNETT, Manor Farm Nursery, Stapleford, near Wilton, Wilts.

ROSES.—Standard, Half-Standard, and Dwarf, of all the choicest and best Show varieties, including the new kinds of 1869

Dwarfs, 10s., 12s., and 15s. per dozen.
Standards, 15s., 18s., and 21s. per dozen.
Half-Standards, 12s., 15s., and 18s. per dozen.
Special offers for large quantities.
Descriptive LISTS gratis on application.
EWING, CHILD AND CO., The Royal Norfolk Nurseries, Norwich.

ALL the LEADING KINDS of Standard ROSES, 2-yr. buds, fine, 75s. per 100.
Dwarf ROSES, 50s. per 100.
Dwarf-trained PEACHES, NECTARINES, and APRICOTS, unusually good, 30s. per dozen.
Dwarf-trained PLUMS, 21s. per dozen.
Bushy GREEN HOLLIES, transplanted, 25s. per 100.
Very bushy GREEN HOLLIES, four times transplanted, 60s. per 100
G. PIERCE, Nurseries, Yeovil, Somerset

Standard and Dwarf Roses

GEORGE DAVISON'S stock is very fine, and will be Sold at any reasonable Price, as they must be cleared. Many Thousands of TEA ROSES in pots, 36 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied. CATALOGUES on application.
Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA
White Cross Nurseries, Hereford.

Twenty-one First and Ten Second Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and 10 Second Prizes for ROSES, exhibited at the principal Rose Shows throughout the kingdom. It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.
The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.
Nurseries, King's Acre, near Hereford.

King's Acre Nurseries, near Hereford.

JOHN CRANSTON, PROPRIETOR.—These extensive Nurseries (Established 1785) have long been celebrated for the Culture of GENERAL NURSERY STOCK, and the several depart ments are replete with the most approved and desirable Plants at present in Cultivation, while the Collection is constantly enriched by the addition of recent introductions.
NURSERY DEPARTMENT
ROSES.—All the best New and Old Varieties. Also Standard, Dwarf, Pillar, and tall Weeping Plants. Twenty-one First and Ten Second Prizes at the principal Rose Shows of 1870.
CONIFERS. Beautifully shaped specimens of the leading kinds, of various sizes. All extremely transplanted.
ORNAMENTAL TREES and SHRUBS.—Evergreen and Deciduous Trees and Shrubs in great variety, including extra strong Trees for Avenues, Park Groups, &c.
FOREST TREES.—Larch, Spruce, Scotch, Pinus austriaca, Oak, Chestnut, Ash, &c., of various sizes.
FRUIT TREES.—The whole of the finest and most worthy of cultivation, and the Plants are carefully grown in every variety of form.
PLANT DEPARTMENT.
BEDDING and DECORATIVE PLANTS in great variety.
SEED DEPARTMENT.
GARDEN and FARM SEEDS carefully selected, and of the best quality possible.
Special Terms to extensive Planters.
DESCRIPTIVE PRICED CATALOGUE free by post on application

To the Trade.

PAUL AND SON, The "Old" Nurseries, Cheshunt, have still unexhausted stocks of the following articles, which are quoted in the Trade Lists:—
New ROSES of 1870, strong, in pots.
New and rare ROSES, as Duke of Edinburgh, Marquis de Mo tier mart, &c.
Standard ROSES, leading kinds, fine in head and root
Dwarf TEA ROSES, in pots for win ter forcing, and planting
Standard APPLES, 6 to 8 feet stems
" PEARS, of leading market kinds, as Louise Bonne, Williams' Marie Louise
* * These are worthy the attention of Market Gardeners
APPLES and PEARS, dwarf-training FILMS and CHERRIES, fan-trained Standard WALNUTS, MEDLARS, and ALMONDS.
MR. RIVERS' LIVELY and portable QUICKWIRE FRUIT TREES, Variegated, and others.
ORNAMENTAL TREES, Variegated, and others.
LIMES, very straight, 8 to 10 and 12 feet high
LABURNUM, very cheap stocks, of
Double CHERRIES, in pots for forcing
New Variegated MAHALEB CHERRIES
American and Kilmarnock WEEPING WILLOWS
ARAUCARIA IMBRICATA, 2½ to 5 feet high, of the finest green imaginable, grand plants
MEXICAN PINUS, of sorts
WELLINGTONIAS, all removed spring of 1870, &c., &c.

Cheap Roses and Vines.

KIRK ALLEN has to offer fine Standard ROSES, fully equal to any in the Trade—best varieties only, his selection, at 9s. per dozen. Dwarfs, ditto, ditto, 7s. per dozen.
Extra strong planting VINES of BLACK HAMBURGH GRAPE, 2 feet each, ditto, ditto, Fruiting, 3s. 6d. each. GOLDEN CHAMPION, strong planting Canes, 3s. each; extra strong Fruiting ditto, 5s. each. All package free
The Nurseries, Brampton, Huntingdon.

To the Trade.

JOHN DOBSON AND SONS beg to thank their numerous friends for their kind favours, and to state that their new TRADE LIST of choicest CALCEOLARIA, CINERARIA, PRIMULA, BALSAM, CYCLAMEN, and INTERMEDIATE STOCK SEEDS, is now ready, and will be forwarded, post free, to those who may not have received one. To those who have not yet given our Seeds a trial, we can recommend them with the greatest confidence as unsurpassed in the Trade.
Woodlands Nurseries, Isleworth, W.; and High Street, Hounslow, W.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the year they first fruited, the raiser, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your branches in winter, and in this standard of less all the trees growing healthy and fruitful trees, such as J. S. offers.

Extra Fine, in Quantities, and Cheap.

STANDARD DAMSONS, Common; and APRICOTS, Moor Park
Dwarf-trained FRUIT TREES, especially APPLES
KALMIA LATIFOLIA, very fine, for planting
ABIES NORDMANNIANA, 9, 12, to 24 inches; as far through
JUNIPERUS CHINENSIS, fine, 1, 2, 3, to 5 feet
PINUS AUSTRIACA, 1½ to 2½ to 4 feet.
SALISBURIA ADIANTIFOLIA, good, 4, 5, to 6 feet
ARBUTUS, Common, bushy, 1 to 2½ feet
LAURELS, Common, 1½ to 3½ feet
" Portugal, extra fine, bushy, 2, 3, to 4 feet.
Standard and Pyramid THORNS, Paul's new double scarlet.
YEWS, English, extra fine, 3 to 6 feet.
Prices will be quoted on application, quantities taken, by applying to GEORGE JACKMAN AND SON, Woking Nursery, Surrey.

PAUL'S NURSERIES,
WALTHAM CROSS, N.

ROSES.

ROSE PRINCESS CHRISTIAN.—"One of the grandest Roses in cultivation." "The best Rose of the present year." "The great Rose of the Show." Standards and Dwarf Standards, 10s. 6d. each Dwarfs, 7s. 6d. each.
Standard ROSES, 15s. per dozen, and upwards.
Dwarf Standard ROSES, 12s. per dozen, and upwards.
Dwarf ROSES, 9s. per dozen, and upwards.
" in pots of extra size, prepared for forcing, 24s. per dozen, and upwards.
Climbing ROSES, strong plants, 9s. per dozen and upwards

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s. per dozen, and upwards.
Bedding HYACINTHS, 18s. per 100, and upwards
" TULIPS, 3s. per 100, and upwards
Choice named TULIPS, 1s. per dozen, and upwards.
CROCUS, of sorts, 2s. per 100, and upwards.
LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000
All other Bulbs equally moderate in price.

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each
AVALANCHE, do., do., 7s. 6d. each.
MARCHIONESS.—The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.
WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each.
BONFIRE, the finest scarlet for bedding, 3s. 6d. each.
AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 1s. each and upwards

EVERGREENS, CONIFERS, &c.

The choice sorts singly or by the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently trans planted specimens.

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, in the finest possible health, worked on the best stocks, many trees in a fruiting state. In addition, GRAPE VINES. FILBERTS, FILBERTS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post

IMPORTANT.—Address WILLIAM PAUL (the Christian name in full), Paul's Nurseries, Waltham Cross, London, N

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application. The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies.
The "Woking" Nursery is easily reached by South Western Railway (main line) to Woking, and goods can be sent through, if upwards of 1 ton, to all parts of the kingdom, which is an immense saving of package and carriage. An inspection of the Nursery will well repay Parties intending to purchase, who can personally prove and the following samples of the principal Stock, averaging from 1 to 5, and 12 feet high, will give some idea of the fine trees of this Establishment, viz.:—
125,000 Standard, Pyramid, Dwarf Maiden, cutback, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, &c., of the leading well-known kinds.
25,000 STANDARD and DWARF ROSES, of select and choicest varieties
200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the compact and beautiful Rhododendron CAUCASICUM
250,000 CONIFERÆ, which contains most of the fine hardy species and varieties of the following genera: Abies, Araucaria, Cedrus, Cupressus, Juniperus, Libocedrus, Pinus, Retinospora, Taxodium, Taxus, Thuia, Thujopsis, Wellingtonia, &c.
450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following:—Acacia, Adantaea, Abies, Almond flowering, Althæa, Ivies in Arborescent Ash, Aucuba, Bay, Beech, Berberis, Birch, Bladder Senna, Box, Broom, Calycanthus, Chestnut, Cherry flowering, Choisyas, Cistus, Comptonia, Cornus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolreuteria, Laburnum, Laurel, Laurustinus, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Phillyrea, Philadelphus, Plane, Poplar, Privet, Quince, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c
2,000,000 FOREST TREES, viz.:—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.
25,000 CLIMBERS, thus—Ivy, Jasmine, Pass onflower, Periploca, Vinca, Virginian Creeper, Wistaria, &c.
70,000 CLEMATIS, principally the "Woking Hybrids."
This Catalogue contains a set of five large Engravings of Clematis, for which this Establishment is famed, taken from Photographs

REDUCED FROM NO. 3

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials

Engraving No. 1. For Conservatories, Terraces, &c.
" No. 2. For Lawn, Flower Garden, &c.
" No. 3. For Hardy and Permanent Bedding, &c.
" No. 4. For Festoons, Verandahs, &c.
" No. 5. For Rootery, Rockwork, Ruins, &c.

"This Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of hybrid Clematises."—*Gardeners' Chronicle.*
Woking Nursery, Surrey.

HAMMOND'S IMPERIAL HARDY

WHITE BROCCOLI,

1s. per Packet.

We have again secured the whole Stock of this very valuable Broccoli, from Mr. Hammond. Considering its quality and hardiness, it has only to be known to become the leading Broccoli grown.

WM. ARMITAGE & SON,

SEED MERCHANTS,

HUDDERSFIELD.

A few Extracts from Letters received fully prove the great value of this Broccoli.

Wilts. Forward me a Packet of Hammond's Imperial Hardy White Broccoli. I had a packet last year, and it has given me great satisfaction.
J. C. WILCOX, Florist,
May 14, 1870. Quemerford, Calne, Wilts.

Dorsetshire. Kindly forward 1 Packet Hammond's Imperial Hardy White Broccoli, I had some of you last year, and find it very good, as it stands better than any other kind I have.
F. J. ELLIS,
Claremont Gardens,
May 9, 1870. Weymouth.

Norfolk. Mr. Hitchman would thank Mr. Armitage to forward him 1s. Packet Hammond's Imperial Hardy White Broccoli. That had last year appears to have stood this severe winter well. Also Catalogue.
April 11, 1870. Park Lane, Norwich.

Essex. Your Hammond's Imperial Hardy White Broccoli has turned out well with me this spring, according to character, having stood the winter best of any I had. Send 1 Packet by post, stamps enclosed.
G. SACK,
Elmstead Brook, Essex.

Berkshire. I have seen some of the Hardy Broccoli in Berkshire (Newbury) very fine. Please send me 3 Packets, stamps enclosed.
W. EDMUNDS,
Bridge Street,
Banbury.

From the GARDENER'S MAGAZINE,
May 30, 1868.

"HAMMOND'S IMPERIAL HARDY WHITE BROCCOLI.—We have received samples of this variety from Mr. W. Hammond, market gardener, Birkby, Huddersfield, Yorkshire. The heads are large, even in outline and hemispherical, so close that there is not space anywhere for so much as the point of a pencil, the colour creamy white, average weight when trimmed for cooking 3 lb., in quality first-rate, as mild and sweet as a Cauliflower."

The advantages of procuring Seeds direct from the Growers cannot be over-estimated.

James Carter & Co's Seed Growers

237 and 238, HIGH HOLBORN, LONDON, W.C.

CARTER'S

COLLECTIONS OF

NEW VEGETABLE SEEDS

Will produce a supply of Choice Vegetables all the year round.

Packing and Carriage Free.

CARTER'S

No. 1 COLLECTION of VEGETABLE SEEDS

(suitable for Cottage Gardens), price **12s. 6d.**

Packing and Carriage Free.

CARTER'S

No. 2 COLLECTION of VEGETABLE SEEDS

(suitable for a Small Garden), price **21s.**, contains :—

13 pints PEAS, including Carters' First Crop, Laxton's Supreme, and other choice varieties for succession
2 pints BROAD BEANS, in variety.
1 pint Dwarf FRENCH BEANS, best.
1 pint RUNNER BEANS.
1 large packet BEET, Carter's St. Osyth
3 large packets WINTER KALE, in variety
1 large packet BRUSSELS SPROUTS, best
1 packet ALBERT SPROUTS (a delicious variety).
4 large packets BROCCOLI, for succession
4 large packets CABBAGE, for succession
1 large packet SAVOY, best.
packet CAPSICUM.
3 ounces CARROT, best, for succession
1 large packet CAULIFLOWER, Carter's Dwarf Mammoth.
2 large packets CELERY, Dwarf White, Mammoth Red.
4 ounces CRESS, plain.
1 ounce CRESS, Austrian.
1 packet CUCUMBER, Carter's Champion (frame).
1 large packet ENDIVE, French curled.
1 large packet LEEK, Ayton Castle.
3 large packets LETTUCE, Cos and Cabbage in variety.
4 ounces MUSTARD.
1 packet MELON, Carter's Excelsior.
2 ounces ONION, in variety.
1 large packet PARSLEY, finest garnishing.
1 ounce PARSNIP, best
6 ounces RADISH, long and Turnip Rooted.
6 ounces RAPE SEED, for salad
1 pint SPINACH, summer and Winter.
3 ounces TURNIP, best for succession.
1 packet TOMATO, best.
1 packet MOORE'S VEGETABLE CREAM.
2 packets POT HERBS.

Packing and Carriage Free.

CARTER'S

No. 5 COLLECTION of VEGETABLE SEEDS

(increased quantities and varieties), price **30s.**, contains :—

10 quarts PEAS, including Carter's First Crop, Laxton's Supreme, and other choice varieties for succession
3 quarts BROAD BEANS, in variety
3 pints FRENCH BEANS, Dwarf and Runners
1 ounce BEET, in variety
3 large packets KALE, in variety
1 large packet BRUSSELS SPROUTS, best
1 packet ALBERT SPROUTS (a delicious variety).
5 large packets BROCCOLI, for succession.
5 large packets CABBAGE, for succession.
2 large packets SAVOY, best.
1 packet CAPSICUM.
6 ounces CARROT, best, for succession
1 large packet CAULIFLOWER.
2 large packets CELERY, in variety
1 packet CORN SALLOAD.
8 ounces CRESS, in variety.
2 packets CUCUMBER, in variety.
1 large packet ENDIVE.
1 large packet LEEK, Ayton Castle
3 large packets LETTUCE, in variety
½ pint MUSTARD.
2 packets MELON, best varieties.
4 ounces ONION, in variety.
1 packet ORACH or MOUNTAIN SPINACH
2 ounces PARSLEY, finest garnishing.
2 ounces PARSNIP, the Student.
8 ounces RADISH, long and Turnip in variety
1 packet RAMPION.
8 ounces RAPE SEED, for salad.
1 pint SPINACH, summer and winter.
1 packet SALSAFY.
1 packet SCORZONERA.
6 ounces TURNIP, best for succession.
1 packet TOMATO, best.
1 packet MOORE'S VEGETABLE CREAM.
4 packets POT HERBS.

Packing and Carriage Free.

CARTER'S

No. 3 COLLECTION of VEGETABLE SEEDS

(suitable for a Garden of half an acre), price **42s.**

Packing and Carriage Free.

CARTER'S

No. 4 COLLECTION of VEGETABLE SEEDS

(suitable for a Large Garden), price **63s.**

Packing and Carriage Free.

CARTER'S

GARDENER'S & FARMER'S VADE MECUM

Illustrated, containing detailed Lists of New and Choice Vegetable Seeds, Floral Novelties, Farm Seeds, Spring Bulbs, New Plants, and every garden requisite, is now ready, and will be forwarded Post Free for 1s. ; gratis to purchasers.

N.B. As many complaints are annually received from Customers of the non-delivery of their Vade-Mecum, J. C. & Co. will be pleased to forward duplicate copies in all such cases on application.

5 per Cent. Discount for Cash.

JAMES CARTER AND CO.,
SEED FARMERS,
237 and 238, HIGH HOLBORN, LONDON, W.C.

Seeds direct from the Growers, the best means of preventing disappointment.

SUTTONS'

HOME-GROWN SEEDS,

CARRIAGE FREE.

NEW OR IMPROVED VEGETABLES.

SUTTONS' IMPROVED WHITE SPROUTING BROCCOLI.

This is a great improvement on the White Sprouting Broccoli introduced nine years since, and after careful selection we have succeeded in establishing it as a perfectly distinct variety. It possesses the excellent qualities of the Purple Sprouting as regards productiveness and quick growth, but is of finer flavour, and a good white

Price **1s. 6d.** per Packet.

SUTTONS' NEW EARLY FORTYFOLD CUCUMBER.

A great novelty and valuable acquisition, offered by us now for the first time. It is exceedingly prolific, may be grown in precisely the same manner as an ordinary Ridge variety, and also succeeds well in frames or greenhouses. The fruit is of good flavour, excellent for salad or pickling, and will be found specially useful to Market Gardeners for sale as Gherkins, on account of its quick growth, easy culture, and productive habit

Price **1s.** per Packet.

THE

HEAVIEST CROPPING POTATO

and the best cooking Potato in cultivation is

SUTTONS' RED-SKIN FLOURBALL.

This extraordinary Potato, SENT OUT LAST SEASON BY US, has given the most complete satisfaction.

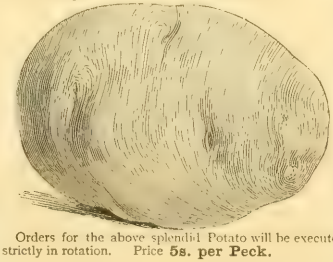

Orders for the above splendid Potato will be executed strictly in rotation. Price **5s. per Peck.**

For further particulars of CHOICE VEGETABLE SEEDS, see SUTTONS'

DESCRIPTIVE CATALOGUE for 1871,

Gratis and Post free.

All Goods Carriage Free by Rail, except very Small Parcels.

SUTTON AND SONS,
SEED GROWERS, READING.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Palms, Ferns, &c. ; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, &c. ; Aralias and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.

B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTION of PLANTS, which at all times well repay a visit.

Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration

Victoria and Paradise Nurseries, Upper Holloway, London, N.

To the Trade.

HYACINTHS, TULIPS, POLYANTHUS NARCISSUS, CROCUS, SNOWDROPS, WINTER ACONITES, &c. All first-class, and of first importation, picked roots

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

LILIUM AURATUM, &c.—English-grown Roots of LILIUM AURATUM, 12 6d., 25 6d., 3s. 6d., and 5s. 6d. each, and upwards ; LILIUM LANCIFOLIUM, ALBUM, RUBRUM, and ROSEUM, and all other LILIES.

See DESCRIPTIVE CATALOGUE, free on application

BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c. is now published, and will be forwarded to applicants.

Exotic Nursery, Tooting, Surrey, S.W.

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. The new short route is to pass (by the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.

Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.

CATALOGUES and all particulars on application.

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash :—

GOLDEN TRICOLORS.—Lady Cullum, 3s. 6d. ; Mrs. Pollock, 3s. ; Sophia Dumaresque, 2s 6d. SILVER TRICOLORS.—Caroline Longfield, 6s ; Italia Unita, 2s 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s ; Cleopatra, 5s ; Duke of Edinburgh, 4s ; F. G. Henderson, 3s 6d ; Her Majesty, 3s 6d ; Luminator, 6s ; Painted Lady, 3s 6d ; Princess of Wales, 4s ; Stanstead Beauty, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s. 6d. ; Madame Lemoine, 3s 6d ; Madame Rose Charmeteux, 3s 6d ; Triomphe, 3s 6d. A PRICED LIST of 200 varieties post free.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES

The American Nursery, Bagshot, Surrey.

The Gardeners' Chronicle

SATURDAY, DECEMBER 17, 1870.

IT is always pleasant, frequently profitable as instruction to others, to chronicle success, honestly attained ; and hence we believe that the history of the LIVERPOOL HORTICULTURAL SOCIETY, which we print in another column, may afford both pleasure and profit to many of our readers, in these days when societies, provincial and metropolitan, often seem in danger of being totally wrecked, and are frequently compelled to hoist signals of distress. It will be seen that the Society in question has virtually had an uninterrupted course of prosperity, and who can doubt, on reading the record of its operations, that this prosperity has been in a great measure brought about by unanimity of feeling—by managers and members, exhibitors and committees, prize-givers and prize-winners, all pulling in the same direction.

One important point brought out by this historical record is the direct influence of good exhibitions upon cultivators and cultivation. The fact was indeed known already, but in these advanced days there are to be found those who hold the doctrine that exhibitions have done their work, and that they may now be looked upon as nothing more than fashionable gatherings, or mere pleasure parties. Liverpool tells another tale. Ungainly Chrysanthemums were banished by the advent of Mr. BROOME'S well-grown plants, and common-place Hyacinths no more appeared after Mr. CUTBUSH'S superior ones had been seen. The examples in these cases, as in hundred of others unrecorded, have had a double influence ; they served first as models which local growers tried to imitate ; and secondly, as incentives to cultivators to aim at even greater perfection than the model set forth —and this, indeed, is not unfrequently attained. Take away the examples made prominent by the flower show, and the inducement to strive after excellence is withdrawn. The effect is, perhaps, more directly evident at a provincial show, where the level of excellence is generally less elevated than at the metropolitan shows, but it is no less surely doing its work at the latter, though its workings may be deeper, and therefore its course the more silent.

One of the elements of success in the case of the Liverpool Society, we cannot doubt, has been

united action and mutual confidence between the managers and the exhibitors. It is a most important matter this, in the working of all societies, whether large or small. To win prosperity, all petty jealousies must be laid aside, and all honest workers—honest be it noted—must work on together harmoniously for the general good, sinking minor differences of opinion, and ignoring the shibboleths of partisanship. This feeling of mutual respect and confidence, may no doubt be greatly increased by such friendly meetings as that alluded to at p. 1574, in which while there was something to learn from the addresses delivered, the main point was the establishment of good fellowship. Our Royal Horticultural Society sadly wants this element distributed throughout the whole of its horticultural machinery, and then, no doubt, it would afford a new proof that union is strength; but such a meeting as that at Liverpool would not, we fear, be possible in the metropolis, where so many different types of opinion come to the front, each more or less represented by a coterie. Were it possible, we can imagine no more mighty lever for raising the position of horticulture, by presenting to the world a perfect and complete picture of success, which could not fail to raise the influence as well as the *status* of all its professors.

—— The Royal Horticultural Society's Meetings and Shows at South Kensington for 1871, are fixed to take place on the following days, namely, on Wednesdays, January 18, February 15, March 1 and 15, April 5 and 19, May 3 and 17, June 7 and 21, July 5 and 19, August 2 and 16, September 6 and 20, October 4, November 1, and December 6. The date of the Great Provincial Show at Nottingham, originally fixed for June 13—17, has been altered, and it is now arranged that it shall commence on June 27, and continue till July 1. The principal meetings at South Kensington will be those on March 15, April 19, May 17, June 7, and July 5, the latter being the National Rose Show.

—— The days fixed for the Exhibitions of the Manchester Botanical and Horticultural Society, in the gardens at Old Trafford, next season, are, we understand, as follows:—The National Show —now become one of the most important events of the year—will commence on May 26, and continue till June 2; this will include the Royal National Tulip Society's Show on May 26—27. In addition to this, a great Exhibition of American Plants will be made by Mr. Anthony Waterer, of Knap Hill, the period extending from May 26 to June 17; and an Exhibition of Roses and Fruits will take place on July 7—8.

—— The Royal Botanic Society has just issued schedules for its two Spring Shows in 1871, which are each to be of two days' duration, and are fixed to take place on March 22—23 and April 12—13. As usual, New Plants and Plants of Economic interest are admissible, though not scheduled. The Society's Summer Shows are announced for May 25—26 (Thursday and Friday), June 14—15, and July 12—13 (Wednesday and Thursday).

—— On Wednesday evening last a meeting of nurserymen and seedsmen was held at Anderton's Hotel, Fleet Street, to consider the recent Post Office Arrangements respecting the Sample Post, and to devise, if possible, some means of procuring a return to the old system. The chair was taken by Mr. Barr, who shortly explained the object of the meeting. Letters were read from many of the principal firms in the nursery and seed trades concurring in the object of the meeting, and detailing the hardships which the writers had suffered in their dealings with their customers through the sudden determination of the Post Office to allow nothing but genuine samples of merchandise to be transmitted by sample post. A similar letter was read from the secretary to the Royal Horticultural Society, in which it was stated that the Fellows of that Society sent out 1000 parcels of seeds annually at a cost of 3*d.* each parcel, and the proposed change would raise the cost to 1*s.* each parcel. Mr. Bull explained the interruption the recent changes had caused to the seed trade, and stated that the commerce in small parcels of seed sent to India and other distant places would be completely destroyed if those parcels were not permitted to go by sample post. In conclusion, he suggested that the only practical remedy would be to bring the matter before the House of Commons. There was a general concurrence of opinion in the meeting as to the propriety of this course, and resolutions were proposed and carried to that effect, and a committee was appointed to consider the best means of ensuring the repeal of the obnoxious regulations.

—— Among the curious incidents of the frightful war in France may be mentioned an Attack made recently on an English Steamer plying between Jersey and Granville. On arriving recently at the latter place a mob assembled on the quay, and gave vent to their indignation at the shipping of a quantity of Mistleto, objecting to its being permitted to leave the country, as it might be used for feeding sheep! The shipment was, however, proceeded with, but before it could all be placed on board the mob proceeded to overt acts of violence. In view of existing circumstances no British lad or lass would object to the retention of the Mistleto to feed the Brittany sheep, especially as the mystic ceremonies connected with Mistleto could be so much more agreeably performed *sub rosâ*.

—— We insert the following by way of Caution, a caution, moreover, which no one who knows the frequent carelessness in such matters will deem misplaced:—On Friday night a fire occurred at Syndale, the seat of Lieutenant-Colonel Hall. At the end of the long range of excellent stabling recently erected, was a boiler room, for the purpose of heating the horticultural buildings, and beyond this a two-storey building, some 50 feet long, the upper portion of which was used as a fruit store, and the lower portion as a potting room. The fire originated in the boiler room, and it is supposed to have been caused by the overheating of a flue, near which were several rafters, which became ignited. The flames quickly ascended to the fruit store, which, with its contents, consisting of about 100 bushels of choice fruit, was completely destroyed.

—— The following additional subscriptions have been received towards the Rivers' Portrait Fund:—

Grundy, Robert, Esq., Bury, Lancashire	..	£0	10 6
Lee, Mr. George, Clevedon, Bristol	..	0	5 0
Pratt, John, Esq., Sawbridgeworth	..	1	1 0
Spencer, John, Esq., Bowood	..	1	1 0
Stegeatt, F. C., Esq., Weymouth	..	1	1 0
Wise, Thomas, Esq., Boston	..	1	1 0

—— At a meeting of the Royal Botanic Society, Regent's Park, on Saturday last, the Chairman of the Garden Committee called the attention of the meeting to a fine plant of Fourcroya Selloi, now in flower in the conservatory. This plant, which is a native of South America, and was presented to the Society by the King of Portugal in 1854, began about three months ago to throw up a flower-stem, which at first grew very rapidly, and is now about 25 feet high. The Secretary reported that the new east wing of the conservatory was just completed, and it was hoped that the subscriptions from the Fellows would soon enable the Council to proceed with the erection of the west wing, and thus finish the building.

—— The following subscriptions have been received by the Hon. Secretary and Treasurer, Mr. James Smith, Exton Park Gardens, Oakham, towards the Gardeners' Prizes for Vegetables, at the Royal Horticultural Society's forthcoming Exhibition at Nottingham, viz.:—

Mr. Gilbert, Burghley, Stamford	..	..	5£ 0*s.*
Mr. Gabbet, Orton, Oundle, Stamford	..	..	5 0
Mr. Smith, Exton Park, Oakham	..	..	5 0
Mr. Easlea, Gr. to J. Paxton, Esq., Stamford	..	..	5 0
Mr. Meikle, Reed Hall, Whalley	..	..	5 0
Mr. Peachey, Quorn Lodge, Loughborough	..	..	5 0
Mr. Taylor, Longleat, Warminster	..	..	5 0
Mr. Mitchell, Riddington Hall, Nottingham	..	..	5 0

Gardeners wishing to subscribe, are respectfully requested to forward their subscription to the above address without delay.

—— The following extracts from a private letter, received per Balloon Mail, from a well-known French nurseryman shut up in Paris, will be read with interest at this juncture. It is dated November 29, and was received on December 7:—

"Some days before the investment of Paris, I sent Madame —— and our six youngest children to Touraine, and since then I have received no news from them. I can write to them, but it is very difficult to get a reply, though this is easier now than it was, thanks to carrier-pigeons and to micro-photographs. See to what straits we are reduced! When will the peoples be wise enough to live at peace with each other, and not concern themselves with the quarrels of their sovereigns? Never, I fear; war being a fatal scourge, destined to be inflicted from time to time on mankind. My house being within range of a powerful battery, has already suffered much damage, and would have been destroyed but for its solid construction. The enemy is in force at Bourg-la-Reine; but if, as everything leads us to hope will be the case, we succeed in dislodging him from the surrounding heights, he will soon take his departure. I do not know in what condition I shall find my poor nurseries, and this after the many years during which I have striven so earnestly to make them as complete as possible. The first stage was happily accomplished, and now, when I was about at length to reap the benefit of my incessant labour, this catastrophe has befallen us. Many years will be required to repair all this. I had a good stock of Peaches this year, but I do not know whether the Prussians have respected them. The miserable plight we are now in cannot last for ever."

—— Mr. Edmonson, Dame Street, Dublin, has sent us a specimen of his Drying Paper for drying plants for the herbarium or for letter copying. It is well adapted for its purpose.

—— In the second volume of the "Transactions of the New Zealand Institute" we find a paper on the Naturalised Plants of New Zealand, by Mr. T. Kirk. The author gives an extensive list of the plants introduced into New Zealand, specifying the probable mode of their introduction and the degree of citizenship to which they have attained:—

"It is but a century," writes Mr. Kirk, "since the islands were discovered by Cook; less than 60 years since the early visits of whalers, and the establishment of the first mission stations; and not half that period has elapsed since settlement was commenced in a systematic manner; yet already the number of naturalised plants,—that is to say, of non-indigenous plants propagating their species, and becoming diffused without the intentional agency of man, or even in opposition thereto, in the province of Auckland alone,—is equivalent to fully 30 per cent. of the entire number of flowering plants found within the limits of the colony; a proportion equalling, as we have already seen, that which exists in the British Islands, with a commerce dating from a period anterior to the Christian era. Some of these introductions have largely displaced the original vegetation in many localities, from the North Cape to the Bluff; from the sea level to the highest spots on the hills trodden by the miner or shepherd; while others are confined to a limited area, and apparently exercise no direct influence on the original flora."

The mere fact of rapid increase, however, is no proof that the plant so increasing is necessarily of foreign origin. On this point Mr. Kirk gives the following caution:—

"There is some danger of attaching too great importance to the rapid spread of plants in certain localities as evidence of their exotic origin, for example, Gypsophila tubulosa and Polygonum aviculare, are regarded as introduced chiefly on this ground. But truly native plants, as Microlæna stipoides, and Danthonia semiannularis, have increased in an equally remarkable degree in the northern part of this province during the last four or five years, and have evinced a surprising power of adaptation to altered and altering circumstances, beyond having become plentiful in undisturbed localities, where they were formerly scarce. Facts of this kind, however startling in their nature and obscure in their origin, are of high significance and importance in their relations, and show most forcibly the impolicy of adapting sweeping conclusions, and the necessity for patient and continuous observation."

The following comparative statement of the numbers and degree of citizenship of the species, supposed to have been introduced into New Zealand, is given by Mr. Kirk:—

Denizens	..	..	..	..	..	..	109
Colonists	..	..	..	..	..	..	111
Aliens	..	..	..	..	..	..	31
Extinct and erroneous	..	..	..	..	..	..	12
Probably indigenous	..	..	..	..	..	..	9
Position not known	..	..	..	..	..	..	20
Total	..	..	..	..	..	..	292

—— The Maximum Temperature of the air in England during the week ending December 10, ranged from 39° at Norwich to 46° at Bradford and Hull, with a mean for all stations of 43°.4; and in Scotland from 43° at Paisley and Greenock to 46° at Perth, with a mean for the several stations of 43°.3. The Minimum Temperatures recorded in England were much lower than those recorded in Scotland; in the former country, 20°.4 at Nottingham and 30° at Leeds are the two extremes; whilst in Scotland they are represented by 25° at Perth and 31° at Greenock. The mean for all stations in England was 24°.9, or 2°.5 lower than the mean for the several stations in Scotland, which was 27°.6. The Mean Temperature of the different stations throughout the two countries increase as we go northward. In England the lowest mean temperature of any station is 32°.3 at Portsmouth, closely followed by 32°.5 at Blackheath, and the highest is 37°.9 at Leeds, ½° above that of Bradford; the mean for the eight southern stations is 33°.1, and of the eight northern is 36°.2. In Scotland the lowest mean is 36°.4 at Paisley, and the highest is 37°.7 at Dundee and Leith, with a mean for all stations of 37°.2, showing an amount of 4°.1 above the mean temperature of the eight southern stations of England. Rainfall.—Rain and snow have fallen in large amounts at most of the stations, particulary on the East coast. The largest fall in England occurred at Newcastle, viz., 1.82 inch, with 1.60 inch at Leeds, 1.50 inch at Hull, and 1.46 inch at Norwich; and the smallest took place at Portsmouth, viz., 0.35 inch; the mean for all stations was 0.97 inch, being ¼ inch above the mean of the different stations in Scotland, which was 0.74 inch, the mean for the latter country being caused by the large fall of 2.46 inches at Perth. (See Mr. Glaisher's Tables in our present issue.)

—— The *New York Times* states that an ice machine, constructed on Tellier's principle, is now being exhibited in the United States. The material used is gaseous ammonia, which is liquefied by pressure. It is said that the machine will make 100 tons a day, at a cost of 4*s.* or 5*s.* per ton; and that the ice made by it is transparent and durable. The cooling effect of the vaporisation of liquefied ammonia may be applied to chambers containing articles of food to be preserved, or refrigerators might be constructed on any scale.

—— Every one at all conversant with plants knows the beauty of the Pampas Grass, and fully appreciates its merits. It is, however, one of the giants of the flower-garden, growing not only to a considerable height, but also forming immense masses or tussocks if it grows in any degree satisfactorily. This shuts it out from situations where the space is limited, however much its peculiar type of beauty may be desired; and though

its rival, the Arundo conspicua, is less bulky, it is not less aspiring. Those who desire it, may now, or shortly will be able to obtain a dwarf form of Pampas Grass, GYNERIUM ARGENTEUM PUMILUM, which is exactly suited for positions where a miniature Pampas is desired. It is a tufted plant with all the features of the ordinary Pampas, except its bulk and height, as may be judged from the fact that its flowering culms rise only about 3 feet, where the ordinary kind grown beside it reaches 6 or 7 feet. The panicle is erect, silvery, and of somewhat pyramidal outline, in which respect it seems to differ from the ordinary form. It is a seedling, now of several years' probation, raised by Mr. CHARLES NOBLE, of the Sunningdale Nursery.

PORTRAITS OF GARDEN PLANTS.

DODECATHEON MEADIA FRIGIDUM, *Bot. Mag.* t. 5871.

A beautiful hardy perennial of the Primula order, with oblong-ovate entire leaves, short scapes, bearing an umbel of about four flowers, of a deep reddish purple, the most brightly coloured form which is known. It is "a native of the Rocky Mountains, and coast ranges of western North America, from latitude 35° North, in California, to the Arctic sea-coast, abounding in mountain slopes, rocky places, and stony often saline plains, ascending to 7000 feet in the Cascade range, and replacing in Western America the usually large and paler-flowered typical D. Meadia, of the United States." The Kew plants were raised from seed collected in the mountains of British Columbia.

IRIS IBERICA, *Bot. Mag.* t. 5847.

A very remarkable dwarf Iridaceous plant, 3—6 inches high, with glaucous linear-ensiform recurved leaves, and very large solitary flowers, the outer segments of which are erect, roundish, white, the inner ones deflexed, broadly oblong, yellow-green, covered with dark purple reticulations. It is a native of the Iberian provinces of the Caucasus, and of Imeretia (not of the Iberian peninsula), and was flowered in May last by Mr. Ware, of the Hale Farm Nurseries, Tottenham.

ŒNOTHERA (GODETIA) WHITNEYI. *Bot. Mag.* t. 5867.

A hardy annual Onagraceæ, one of the branching habit, growing about a foot high, bearing oblong-lanceolate leaves, and the whole upper part covered with large showy crowded flowers of a delicate rosy tint, with a large crimson blotch towards the base; the petals are 1¾—2 inches long and obcordate. It was introduced and flowered last summer, by Mr. Thompson, of Ipswich. "Dr. Asa Gray, the authority for this species, describes it as 'the most splendid of all the Godetias, and very desirable for cultivation from the fine colour and great size of the flowers crowded at the summit of the stem,' and states that he has named it after Professor Whitney, the distinguished head of the Californian State Geological Survey, in the prosecution of which it was discovered. It was first collected by Dr. Bolander, botanist to the Survey, on the plains at Shelter Cove, Humboldt County, California, in 1867." In Dr. Gray's dried specimens the flowers are 4 inches in diameter. The plant is very remarkable for its dwarfness, combined with the large size of its blossoms, which are very much larger than in G. Lindleyana, and of similar colour. We shall publish a figure of it shortly, together with some further comments on it from the pen of Professor Asa Gray.

ONCIDIUM LIMMINGHEI. *Flore des Serres*, t. 1827.

A beautiful little stove Orchidaceous epiphyte, furnished with a creeping rhizome which bears short ovate distichous leaves; the pretty yellow flowers have the lip beautifully spotted with crimson. It is a native of the Caraccas, and is quite a little gem amongst tropical Orchids.

ONCOSPERMA VAN HOUTTEANUM. *Flore des Serres*, t. 1798.

A beautiful stove Palm, the young plants of which are furnished with fine arching pinnate leaves, whose reddish stalks bear numerous dark-coloured, long, needle-shaped spines. It was introduced from the Seychelles by M. Van Houtte.

PADUS CORNUTA. *Rev. Hort.* 1869, 275, fig. 64.

A robust-growing hardy Rosaceous shrub, of distinct aspect, growing from 12—20 feet high, and having short erect branches, with deep red bark, and oval or elliptic-acuminate, undulated, dentato-serrate leaves, about a foot long, of a shining green above, and glaucescent beneath. The white flowers are arranged in dense, erect, cylindrical spikes. It is the Cerasus cornuta of Wallich, and is thus named because the fruits are usually horn-shaped, owing to the attack of a Fungus. Native of Nepal.

TACSONIA QUITENSIS ERIANTHA, *Bot. Mag.* t. 5750; *L'Illust. Hort.* t. 595.

A fine greenhouse or conservatory Passionflower, climbing freely, with deeply 3-lobed leaves, clothed with white wool beneath, and long-tubed, bright rose-pink flowers. It grows at a high elevation on the temperate Andes of Ecuador and New Grenada, and has been introduced by Is. Anderson-Henry, Esq. Dr. Hooker adds this remark in reference to the garden T. mollissima:—"I doubt much this being the true mollissima, which has densely tomentose stems; it more resembles quitensis."

UROPETALUM UMBONATUM, *Refug. Bot.* t. 17.

A greenhouse Liliaceous bulb from the Cape of Good Hope, grown in the collection of Mr. Wilson Saunders. It has broadish linear leaves, and slender flower-scapes, bearing secund racemes of cernuous yellowish green flowers, the inner connate segments of which are yellow. The flowers of both this and the following are somewhat inconspicuous.

UROPETALUM WELWITSCHII, *Refug. Bot.* t. 16.

A greenhouse bulb with linear leaves, and producing a slender erect scape, with a few cernuous green flowers, the inner segments of which are connate, spreading at the tip, and of a bright green. Introduced by W. Wilson Saunders, Esq., from Angola.

MARITIME PLANTS OF THE GREAT LAKES AND THE INTERIOR OF AMERICA.

THE occurrence on the shores of the great lakes and in the interior of the continent of a considerable number of plants which are usually confined to the vicinity of the seashore, has given rise to some speculation as to the cause of the phenomenon. The plants of this character are not confined to any particular family, although the grasses and sedges are probably most frequently represented. On the beach, in the vicinity of Chicago, the Sand-reed (Calamagrostis arenaria) sends its long, fibrous, matted roots deeply into the sand, binding together the shifting soil, giving stability and permanence to the lacustrine boundaries. The Bur-grass (Cenchrus tribuloides) presents here and there prickly clumps, which are the horror of bare-footed juveniles; and the Baltic Rush (Juncus balticus) by means of its creeping, tangled rhizomes, striking root at every joint, is an efficient co-worker with the Sand-reed in giving firmness to the sandy shore.

This work is also performed by various species of Cyperus, Scirpus, and Carex, which, however, are more extended and cosmopolitan in their range. In the low ground, back from the lake, the Squirrel-tail grass (Hordeum jubatum) waves in graceful billows before the breeze. The Arrow-grass (Triglochin maritimum) is common in the wet marshes near the lake; and in pools connected with the lake are many Pond-weeds, among them a species (Potomageton pectinatus) which also abounds in similar situations along the seacoast.

The seaside Spurge (Euphorbia polygonifolia) luxuriates in the clean, loose sand of the ridges near the lake shore.

Atriplex hastata, a plant of the Pig-weed family (Chenopodiaceæ), common on the seashore, has also recently been found in the vicinity of the lake. Another remarkable plant of this family (Corispermum hyssopifolium) is an immigrant to the lake borders from the far North-west, and has followed the line of the lakes down as far as Buffalo on Lake Erie.

There are perhaps no Compositæ in the neighbourhood of the great lakes which are at all peculiar to the seashore. The Artemisia caudata which occurs on the New England coast appears also on the lake shore, but is not confined to it, being found also far in the interior.

The Prickly Pear (Opuntia vulgaris), once very abundant in sandy fields north of Chicago, still occurs in limited quantities, and when in bloom presents a very showy appearance, from the large yellow flowers with which the prickly masses are covered.

The Beach Pea (Lathyrus maritimus) also makes its appearance on the shores of the great lakes, seemingly quite as much at home as in the vicinity of salt water.

Of Cruciferous plants from the seashore, we have the Sea Rocket (Cakile americana) growing in the pure sand "almost to the water's edge."

The seaside Crowfoot (Ranunculus Cymbalariæ) is abundant in the neighbourhood of Chicago, and in the vicinity of the Salina (N.Y.) salt-springs, but not elsewhere East until we reach the Atlantic coast.

The attention of our Chicago botanists has been directed to this subject, and some theories have been advanced as to the origin or introduction of these peculiar plants.

In a paper read before the Chicago Botanical Society, by Mr. H. A. Warne, after a review of most of the plants which we have mentioned, he proceeds to say:—

"It is an interesting question why it is these maritime plants are found so far inland, and yet confined to the borders of the great fresh-water lakes. How came they here? Have they by some means been brought from the eastern coast, and become accustomed to new conditions of life, passing through a process of weaning from a saline soil and atmosphere? Or have these species, wherever found, no special relish for maritime conditions of life, including the presence of salt? Two of the plants enumerated, it appears from 'Gray's Manual,' are also found inland around the salt springs at Salina, N.Y., thus seeming to be naturally attached to a saline region. It is, therefore, the more remarkable to find them here by the side of fresh water, and restricted to the region of the great lakes.

"The other species mentioned are all true maritime plants, but do not so plainly indicate the relish for salt. Yet still the question returns, how shall we explain the presence of these seaside plants here? How shall we solve the relation of the great lakes to the sea? The problem may seem utterly insoluble; but if we accept the theories of those distinguished naturalists who pronounce each vegetable organism the lineal descendant of the plants of the past, even to the remotest epochs of geological history, however changed they may be from original types, and adapted to modified conditions of life, we may readily find a solution of their presence here, in the existence of a vast ocean, of which the chain of great lakes are but the pools remaining after a redistribution of the waters, freshened, it may be, by means not beyond the limits of scientific explanation. Granted this, and we see in these strangely placed plants the lineal descendants of maritime races, inhabiting the coast of a sea once stretching from the lakes to the Atlantic, and adapted, by degrees, to the conditions of a life beside fresh waters.

"An interesting natural feature supporting our hypothesis of an extensive ocean, embracing the great lakes, is found near the city, in the terrace elevated some 25 feet above the present level of Lake Michigan, and extending, I am told, for many miles, forming evidently the ancient lake boundary. This is peculiarly apparent in the neighbourhood of Calumet Lake, which, without doubt, once formed part of Lake Michigan. The terrace here is about a mile distant from Calumet Lake, and standing upon it, and looking down upon the flat lands below, as the eye follows the curve of the high land, the basin-like form strikes the eye with conviction, and one instinctively grasps the conclusion that here, in the remote past, was the shore of Lake Michigan, which, in its retrogression, left this noble terrace and Calumet Lake as mementos of the day of its wider sweep and oceanic proportions.

"Viewing this terrace botanically also, we find new confirmation of our theory. One is struck immediately by its older aspect, compared with the low grounds between it and the lake. While these have the marked indications of comparative newness, and of submersion beneath the waters, the terrace lands, in soil and vegetable growth, suggest the idea of immemorial highlands; and a close examination of the plants supports the first impression. The change in the flora of the neighbourhood, within the space of a few rods, as one walks up the terrace from the low grounds to the woodlands above, is actually startling. Beside the noble tree growth, we find a multitude of plants suggesting the Eastern States. Comptonia asplenifolia, the Blue Berry, the Ferns Osmunda regalis and Claytoniana, Houstonia purpurea, the Orchids Habenaria tridentata and lacera, with that curious plant, rare everywhere except the seacoast, Xyris flexuosa, and everywhere one treads on the soft Mosses of Eastern woods."

Let us repeat these inquiries: Are these plants the remains of an ancient maritime vegetation; or have they been brought here by the general agencies of plant distribution, and found conditions of soil, humidity of atmosphere (modified by the existing large bodies of water), &c., favourable for their growth, the presence of salt water not being one of those conditions?

Let us add another: May these species be of a cosmopolitan character, spreading over vast areas, and accommodating themselves to a great variety of circumstances?

In determining these questions, it is necessary to take a somewhat enlarged view of the geographical range of the species which have been referred to, and of such others as may throw light on the subject.

Thus, the Baltic Rush (Juncus balticus) follows the course of the lakes from the St. Lawrence to Chicago, reappears on the Western rivers, extends into the Rocky Mountains, and thence to the Pacific coast from California to Alaska.

The Arrow-grass (Triglochin maritimum) has quite as extended a range, occurring in the prairie marshes or bogs, reappearing in the Rocky Mountains on muddy banks of the Grand and Green Rivers, and again on the Pacific.

Almost the same may be said of the Squirrel-tail grass (Hordeum jubatum), although its selection of soil is different.

The seaside Crowfoot (Ranunculus Cymbalariæ) appears again on the sandy borders of the Platte, in Colorado, and also on the west side of the mountains. Artemisia caudata and Atriplex hastata may be named in the same connection.

We have not observed Rumex maritimus in the immediate vicinity of the great lakes, but it is found on marshy prairies 30 or 40 miles back from the lake, also in Missouri, and again on the borders of ponds and rivers west of the Rocky Mountains. The Willow Dock (Rumex salicifolius) of the coast of Massachusetts and Maine, also grows on Western river banks, as at Omaha, and west of the mountains in Middle Park, and again on the Pacific. One of the peculiar plants of the lake border which we have mentioned (Corispermum hyssopifolium) does not occur on the Atlantic, but is found on our North-western coast in Alaska, and on sandy river banks in the interior basins.

Indeed, on the great plains, and in the basins west of the mountains, there are still other plants which are usually regarded as maritime; for instance, Glaux maritima, Chenopodium maritimum, and Sesuvium Portulacastrum; also the grasses Brizopyrum spicatum, and Tricuspis purpurea.

It would seem that with respect to all the plants we have had under consideration, the presence or vicinity of salt water is not a necessity; but for some the moist sandy soil, and for others also, the modifying influence of large bodies of water, are the conditions suitable for their propagation.

Probably there are some terrestrial plants to which salt is an essential element, and which cannot be made to flourish except in the neighbourhood of that element. Such plants as the Saltwort (Salsola Kali), the Seaside Plantain (Plantago maritima), Marsh Rosemary (Statice Limonium), the Sea-lungwort (Mertensia maritima), the Samphire (Salicornia), and others of similar habit, have not been found except in the immediate vicinity of salt water.

We are, however, fully disposed to admit that there is much plausibility in the supposition that these peculiar lake shore plants are vestiges of the vegetation that once flourished upon the borders of the great inland seas which at a comparatively recent time spread over

the interior of this continent. We do not consider the question settled, but present these researches as a contribution toward a more comprehensive view of the question. *American Entomologist and Botanist.*

CROTONS.

SOME time since we described some eight-and-twenty varieties of Croton (Codiæum) variegatum, which had been for the most part introduced into this country by the late Mr. John Veitch, and referred them to their respective types. (See 1868, pp. 843, 943.)

We had some doubts at the time whether our labour in discriminating and describing these protean forms was not thrown away, so numerous were the variations. We were induced to undertake the task from the exceeding beauty of their coloration and the interest attaching to their diverse forms. In the latter point of view some are especially remarkable. We are glad to find, after this lapse of time, that the characteristics we assigned to these varieties have proved much more constant than we expected, a circumstance of greater importance from a horticultural point of view than in a merely botanical sense. Now, thanks to the Messrs. Veitch, we are enabled to give illustrations of some of the best among these varieties :—

C. maximum (fig. 291), so called from the great size of its leaves. The midrib and secondary veins are of a golden-yellow colour, and map out the upper surface of the leaf into a series of green oblong markings, giving the whole a very rich effect.

C. Veitchii (fig. 292, p. 1669) is one of the handsomest of the pink-leaved series. The upper surface of the leaf is dark green, the midrib and its primary subdivisions of a bright claret colour, while the under surface is also claret coloured.

Fig. [illegible]

MANAGEMENT OF EXHIBITIONS,

AS EXEMPLIFIED IN THE HISTORY OF THE LIVERPOOL HORTICULTURAL SOCIETY.

[The following is an abstract of a historical sketch of the operations of this Society, read by Mr. R. Wilson Ker, Honorary Secretary, at a Soirée, or Evening Meeting of Exhibitors, November 25, 1868.]

THE subject which has been assigned to me by the arrangement committee of this reunion is one which I would much rather had been entrusted to some other gentleman who could have had the same information which I shall have the pleasure to lay before you, and who would not have laboured under the same difficulty of relating the progress of the exhibitions which I do, from having had so large a share in their working and management.

It will be in the memory of some here present that in the autumn of 1862 Mr. Geo. Davies spoke to many gentlemen and gardeners, advocating a Spring Show; and eventually a meeting of exhibitors and others favourable to the project was held in the Clarendon Rooms, on October 12, 1862—a little more than six years ago. It was then unanimously agreed to support a Spring Show, and Mr. G. Davies was appointed chairman of the following committee :—Messrs. Barton, T. Davies, Freeman, Griffith, R. P. Ker, J. B. Leatherbarrow, Richards, Sorley, Thompson, Wareing, Williams and Bisset, with myself as hon. secretary. The first schedule, which contained 25 classes, and six special prizes, in all amounting to £44, was at once arranged. The question as to where the show should be held brought out great difference of opinion, some thinking that the Clarendon Rooms would be large enough; but ultimately it was felt that, to have a good show, it must be held in a popular and suitable place, and that the noble hall above [St. George's] was the proper place in which to hold it. As the date fixed for this first show approached, many were the prophets of evil, but somehow or other the committee felt confident of success, and boldly carried out their programme, which resulted in a show which, from its entire novelty and excellence, was a surprise to all, and was so well patronised that, instead of a deficit, a balance of £23 10*s.* 6*d.* was left, after paying all expenses.

And now that the Spring Shows had been so auspiciously commenced, it occurred to me that a Winter Show of Chrysanthemums and Fruit would prove a stimulus to the growth of a most important class of plants, and afford an opportunity of displaying the fruit-growing capabilities of the district. The suggestion brought forth various opinions; but at a meeting held in April, 1863, it was decided not to hold a winter show. I was discouraged, but yet hopeful; and, after waiting a fortnight, again called the committee together, asking them to reconsider the question. The result was the first Chrysanthemum show, held in November, 1863. Many here will remember that show, when Chrysanthemums were exhibited in the style so long prevalent and so ugly. It was their first and last appearance in that form; still they were well flowered, though they could not compare with the three specimens kindly brought down from London by Mr. Broome, and which proved such excellent examples of what could be done with the Chrysanthemum, though on the next occasion they were equalled, and have since been quite eclipsed. Great as was the success, as an exhibition, of this first winter show, it resulted in a financial loss of £21; so that the year closed with the small balance of £2 8*s.* 6*d.* in hand, which, I am glad to say, has remained the smallest balance up to the present time.

In March, 1864, the first spring show was quite eclipsed in the quantity and quality of all the plants, especially in the Hyacinth classes; for at the preceding exhibition the collections shown by Mr. Cutbush were distinctly visible on account of their size and symmetry, while on this occasion the local growers had made such a wonderful advance, that their productions almost equalled those from the south. The second spring show proved a great success in every respect, leaving a balance of £72. November of the same year saw a marked improvement in the culture of the Chrysanthemum, and a large increase in the Fruit; and as the public now expected this autumn *fête*, it was so increasingly visited that a loss of only £4 15*s.* was sustained, and the committee confidently expected that the next show would pay. In 1865 the prizes at the spring meeting were increased to £80, and a most excellent and complete show left a balance of £63. This year the autumn show had become popular, and instead of a loss, brought the sum of £10 18*s.* to the funds, which, at the end of 1865, amounted to £146. At the March show of 1866, £115 was paid in prizes, and a balance of £37 left; and the committee having a large sum in hand, following the example of Birmingham and other great centres, decided to hold a Rose show. This, as an exhibition, has not had a parallel in this town; never before in Lancashire was there such a gathering of the queen of flowers, while the general classes were replete with rare and grand examples of Orchids, Ferns, foliage plants, &c. But in consequence of the severity of the weather, which, after a long period of warm, sunny days, suddenly became very wet and cold,—Barned's Bank, too, had just collapsed, and the commercial crisis was agitating this trading community to its core—the Rose show of 1866 resulted in a loss of £164. But this did not discourage the committee, for they determined to hold the Chrysanthemum show for two days; and on this occasion it proved their mainstay, leaving a balance of £29, which enabled them to pay the remaining debts of the Rose show, and left a balance of £11 in hand at the end of the year. In 1867, for the first time, the good fortune of the spring show deserted it, so severe was the weather. A loss of £33 was sustained; but the autumn show, which was again held for two days, and at which the Musical Society rendered valuable assistance, was so successful that it enabled the committee to commence the present year (1868) free of debt, and with £30 in hand.

The exhibition of March, 1868, was the best ever held here; and while the largest amount ever paid in prizes (£120) was then awarded, it also left the largest surplus of any show, £83. When in 1863, six years ago, £49, and this year £120, was paid in prizes, it must be evident that these shows have progressed in the right manner—moving with the times—each exhibition being surpassed by its successor, both in the plants shown and in the appreciation of the visitors. The following statement will give the best idea of the amount paid in prizes :—At the six spring shows £550 15*s.* has been paid; at the six autumn shows £548 has been paid; and this, with £204 17*s.* 6*d.* paid at the Rose show, amounts to the large sum of above £1300 paid in prize-money during the past six years, without any deduction whatever.

Gentlemen, I am sure you will agree with me that this is a very large sum; but well has it been contended for, and ample has been the stimulus it has imparted to good gardening. The evidences of this are before you in the glorious show in the hall above us; but not there alone, for every gardener for many miles round has felt the influence of these exhibitions, and the spring show, as well as this, I am thoroughly satisfied, are only fair representations of the gardening of the district. Would that all the exhibitions in Liverpool as fairly represented its gardeners' abilities and productions! But many, I find, think that the sums paid in prizes are almost the only large expenses connected with these gatherings, and that there should be a large surplus left from each. Now, the rent of this hall for two days is close on £50; and when you think that 1000 persons must pay 1*s.* each before even that can be paid, you will see what a large number of visitors are required even to pay expenses. Since 1863, and including this show, £407 has been paid in rent for this building; excluding this show, £451 has been paid for advertising, bill-posting, and printing; £58 for baize and calico to cover the stages; £103 for judges; £239 for music; £306 for carpenters, fitting up and removing stages, &c., postage, wages of clerks, refreshments, and the many incidental expenses connected with such shows; and at the present time there is £105 in hand. There is one feature in the support we receive which I believe will secure the permanency of these exhibitions, and that is, that they are supported by the people of this great town, and not by a long and varying subscription list, liable to be changed at any time; and I know it will surprise you when you learn that the whole amount received in subscriptions or donations since 1863, including £44 collected in aid of the first Hyacinth show, barely exceeds £100. The whole of the large show, barely exceeds £100. The whole of the large amounts paid for the prizes, &c., have been received at the doors, or from the sales of tickets; and I hope that these shows will be carried on so long as, while serving the cause of gardening, they are so heartily enjoyed and supported by the populace.

And now, after the pleasing statement I have been permitted to make, brought about mainly by your exertions and hearty support, when you see that a small number of your body have so successfully carried out these meetings, both for your benefit and that of your

profession, I cannot help thinking that it is a most extraordinary fact that the gardeners around this great town, numbering, as they do, many hundreds, having as great an amount of intelligence, tact, thought, and ability, as any other body of men, have not done anything towards establishing a Gardeners' Society. Here, in Liverpool, every trade, profession, or study has its particular society. We have a Chemists' Association, two or three Microscopic Societies, Engineers' Society, Geological Society, and many others I could name; and it does seem to me, that you, the gardeners of Liverpool, are not true to your best interests if you do not have a society for yourselves. I am not now alluding to a benefit society, though I believe that is quite practicable, but to a society which should take cognizance of gardening in all its forms, hold periodical meetings, and seek to draw out the knowledge and experience of its members for the good of all. There is ample scope for such a society, and abundance of ability among yourselves to carry one on, if you will take it in hand. I came across a balance-sheet of the Naturalists' Field Club the other day, that is, a society established for the social study of natural history. It numbers some 700 members, and, with heavy expenses for printing, lectures, books, &c., it always has a large balance; yet the subscription is very small—5*s.* per annum. I believe there are fully as many gardeners and principal assistants within a short radius of Liverpool. But suppose that 300 could be found to join such a society, with a subscription of 5*s.* per year—it is very little, only 5*d.* per month, 1¼*d.* per week, and surely within the reach of all—that would yield an income of £75. And what would this supply? Firstly, a comfortable place of meeting, which could be open one or two evenings each week, where members could meet each other; it would provide two copies of each of the weekly or monthly serials on gardening, and one copy each of those grand works which are from time to time published, treating of special orders of plants, &c., such as Warner's "Orchids," Lawson's "Pinetum," &c. These in themselves would provide much matter for discussion and remark, and would soon form the nucleus of a library of reference. Then weekly or fortnightly meetings could be held, at which papers on horticulture and kindred subjects should be read and discussed, plants and fruits named; and, as the society grew, many advantages and means of imparting information would be apparent. I ask, gentlemen, is this worth attempting? I am satisfied it is, and that its advantages would be most patent to those who were at first lukewarm. What is your present position? Not what it should be by a long way; and if you would rise, it must be by such means as I have endeavoured to put before you. Those whose tastes, luxuries, and necessities are now so fully gratified by your exertions and abilities will soon see that, while it is your interest to form a strong and prosperous Gardeners' Institute, it is theirs to assist your efforts, as I have no doubt they will, by becoming honorary members, by donations of books, and oft, I hope, by coming amongst you.

These, gentlemen, are thoughts which have long impressed themselves on my mind, and I venture to hope that if there is among them anything feasible which commends itself to you, that you will, ere spring, form the germ of a society which shall take deep root in this locality, and be the means of doing good both to yourselves and your profession.

[The above interesting paper was supplemented, on the occasion of the show held in November last, by a sketch of the further working of the Society up to the present time, of which we add the principal features.]

On the present occasion, the duty of offering some further comments on the exhibitions of the past two years devolves upon me. The spring exhibition of 1869 will long be remembered as one of the red-letter days amongst Hyacinth growers, for never were such brilliant collections of these spring favourites staged. The same may be said of all classes. In Azaleas, forced plants, and, indeed, through all the vernal plants, profusion of well-developed flowers was most marked; everything was successful, and the large amount of £121 was paid in prizes, while a balance of £43 remained from the seventh spring show.

When the November meeting came round in due course, the great difficulty was to find space for the magnificent Chrysanthemums, without largely trenching on the space required for visitors. Of the quality of the plants little need be said, save that, whilst covered with well-developed blooms, they were rather too large. All other plant classes were well filled, and many of them better represented than on any former occasion.

You will well remember with what feeling our old friend Mr. Broome related the story of his gardening life, and how heartily he appreciated the token of our respect which was presented to him when last we assembled here. Last year he made the gift the companion of his journey, and with pleasure he grasped it when he was amongst us, showing it with honest pride. The last communication I had from him was printed and issued with the schedule for this exhibition: it told that when he returned to his own home he thought over his visit, and endeavoured to give us sound advice. We had hoped to see his genial face, and hear his ready practical remarks for many years to come, for he had been with us every November since 1863, but, as you know, he was suddenly cut off, almost in his own garden, and without any lingering illness or pain. All who knew him and have met him here will, I feel sure, miss him from amongst us, for whilst a kind genial man, he had been, in all that related to Chrysanthemums, our guide, philosopher, and friend. I am sure you will all regret his loss, and learn with pleasure that when, a few months after his death, a few friends in London determined to erect a memorial over his grave, our committee, as representing the gardeners of this district, contributed £20 to that object.

Last year there was a grand display of fruit in all the classes. The competition was very keen, and many extra prizes were awarded. The total amount paid was £147, being, like the spring show, larger than any preceding.

This year the March meeting was in the various plant classes again in advance of all others; yet, from the immature state of Hyacinth bulbs, such a fine display of noble spikes of flower was not possible as in 1869. This is a circumstance over which our gardeners have no control, and which will recur at intervals. The exhibition throughout was of great beauty, for even in the classes for bulbs the competition was great. The awards amounted to £131—again in advance of any previous show, and yet the balance left over was £20.

Then followed the May show, and on no former occasion had your skill and knowledge produced such an exhibition. All the classes were completely filled, and the hall with difficulty contained the plants. Azaleas were in great beauty, noble Palms and foliage plants, Tree Ferns, Pelargoniums, &c., formed an exhibition for variety and excellence surpassing all before, and though this was admittedly an experimental show, it was a great success, £121 having been paid in prizes; the balance of £26 4*s.* was paid to the treasurer of the Stanley Hospital.

This brings me, in the annals of our Society, to the exhibition of this day, of which suffice it to say, that it is the best November meeting yet held. There is more variety, greater taste, and none of those unwieldy plants which have been seen on former occasions, and which will now be remembered as horticultural curiosities; and I am sure that in the grouping and arrangements the best has been done in the short time at command.

Fruit is all that could be wished, and is keenly contested in all classes. The prizes to-day amount to £150, making a total of over £2000 disbursed amongst the gardeners of this district during the past eight years, and this without the help of any subscription list, but simply supported by the payments at the doors and by sale of tickets, for the people of this great town anticipate these exhibitions and look on them as the source of the most enjoyable events of the year. Commenced in 1863, without capital, after paying this large sum of £2000 in prizes, all the other necessary items for rent, &c., it certainly is a pleasant position to have a balance of £200, and no debts!

You will remember that at our former meeting I suggested and urged the need of a Gardeners' Society for the purpose of drawing out for the good of all that knowledge and experience of which so much exists latent amongst the gardeners of this neighbourhood, and for the closer union and advantage which such a Society would beget. It is a pleasure to me to find that one such Society has been organised. The Toxteth Park and Aigburth Gardeners' Society has now been in existence for eight months, and has been quietly developing itself, to the instruction and advantage of its increasing members. It has held a most social and entertaining *soirée* in inaugurating the second session; and it is very pleasing to see its officers and many of its members here to-night. I trust it may gain strength and prosper, so as to be the forerunner of several kindred societies in the environs, or of one central society for the district.

I will not now detain you much longer, but I am forcibly reminded by some very interesting papers, kindly sent me by Mr. Davies a few days since, that whilst we are under the idea that great deeds in horticulture are done in our day, those who went before us were also working earnestly in the path we are now pursuing. I find that in 1828 spring shows were held in the York Hotel, of the second of which a report was sent me. Of the amount of prizes then awarded there is but one index from which to form an estimate, that is the prize for the best pan of Tulips, which was a silver cup, value £5 5*s.*; and in the separate Tulip classes seven prizes seem to have been given. It is not long since I heard a complaint that our present prize for 18 cut blooms Chrysanthemums [£2 10*s.*] was too much; if so, what shall be said of the prize for the Tulips? I am sure, taking the skill required to produce such blooms as are exhibited to-day into account, that, compared with six Tulips, they are worth

Fig. 298 (see p. 1668).

a £10 prize. After Tulips single stove plants received eight prizes amongst them: two Oncidiums, one of which was first shown by Mr. Harrison, of Aigburth; then Maranta zebrina, Thunbergia alata, shown by Bannerman & Co., the predecessors of Mr. Skirving; Burchellia capensis, Ixora coccinea, and Erythrina crista galli, complete the list. Greenhouse plants were Calceolaria corymbosa and rugosa, the type of our bedding plants; Fuchsia conica and gracilis, Polygala latifolia, Correa speciosa, and Melaleuca fulgens; the Calceolarias being 1st. Pelargoniums and Heaths were shown by Mr. Thomas Davies, of Wavertree, who is, I believe, present. Hardy shrubs were Azalea pontica and Rhododendron catawbiense, whilst the double Gorse obtained the 4th prize. Herbaceous plants contained many of those gems which are so deserving of culture, and so much neglected. Black and White Grapes, Melons, Strawberries, Mushrooms, French Beans, were shown, so that, despite the dear glass and the flues, forcing was well done. An extra prize was awarded for a specimen of that fine Palm, Sabal Blackburniana, with flower and fruit, to J. J. Blackburne, Esq., of Hale Hall.

Again there is a report of a meeting held on Aug. 5, 1830, and this time a cup was given for a stand of Carnations,—still the same liberality. Then follows the stove premiers, Cattleya Loddigesii, Crinum amabile, Cuphea Melvilla, shown by Mr. Skirving, who, as you know, is still in business; as also is Mr. Cunningham, who exhibited Erica ventricosa; and Mr. Davies, Erica Aitoniana. Dahlias were then beginning to be very popular; they were shown in all cases as single blooms, classed as purples, scarlets, and mixed.

There is also an account of a spring show held on April 28, 1830; and here I would especially note the end of the report, which says, "The prize money fixed upon by the committee amounted to £50, but the valuable productions in all the departments being so numerous, they were induced to give the very large amount of £30 in extra prizes." Now, the amount disbursed at the present exhibitions is about £130, and I certainly think that 280 forty years ago was a better contribution to the cause of horticulture than the sum we now pay, considering the noble, varied, and beautiful plants, which the enterprise and research of the present time has placed in the hands of our growers, I trust the exhibitions will go on improving, and with them the gardening of the whole country—both of those who exhibit, and those who do not; and that when others come after us, they will be able to say that at least we were as earnest and energetic in the cause of gardening as our predecessors of 1830.

LILIES.

(Continued from p. 1595.)

One very pretty species, the introduction of which is due to Siebold, and of which many varieties have been introduced, is L. Thunbergianum of Rœmer and Schultes (Syst. vii., p. 415). Thunberg at first considered this, in his "Flora Japonica," p. 133, as L. philadelphicum, Linn., and later ("Trans. Linn. Soc." ii., p. 333), he referred it to L. bulbiferum. Wildenow, however, while he still retained it under the latter name, remarked that the plant differed from the common L. bulbiferum; and in the fine work of Redouté on Liliaceæ, tab. 210, our present plant is cited as a variety of bulbiferum. L. Thunbergianum, Rœm. et Schult., is a plant 1 to 2 feet in height. Its stem is simple, thickly beset with leaves, does not produce bulbs, and is marked by projecting lines running down from the sides of the leaves and thus rendering it angular. It is more or less downy above, but this character is not constant. The leaves are alternate, lanceolate, gradually tapering at the apex, sessile, and rather broad at the base, which clasps about a third of the circumference of the stem. They become gradually longer from the base upwards, the four or five uppermost forming a sort of false whorl; they are glabrous, shining, flat, and with the midrib prominent on the under surface. The stem of this Lily bears at its extremity one, two, or rarely three flowers, which are large, erect, and bell-shaped. The peduncle has a bract towards the centre. The colour of the flower varies from bright orange to delicate apricot, and has some dark spots towards the centre. The segments of the perianth are spreading or a little reflexed at their extremity, oval lanceolate, downy at the apex, contracted into a stalk or claw at the base (especially in the case of the inner segments), and traversed by a median furrow whose edges are downy. The stamens are one-third shorter than the perianth, nearly equal to the pistil. The pollen is orange or orange-brown in colour. The green ovary is twice shorter than the style, which latter is coloured and (in the fresh flowers) trigonous throughout its whole length.

Siebold distinguished several varieties of L. Thunbergianum, and the catalogue of his establishment for 1870-71, lately published (four years after the death of the celebrated botanist-traveller), contains no less than 16, while four additional ones, viz., cupreum flore-pleno, marmoratum, grandiflorum, and scarlatinum, are included in M. Max Leichtlin's list, thus raising the number to 20. It is true that among these varieties there are some on which Ch. Morren founded a distinct species, L. fulgens ("Notice sur les Lis du Japon"); these are the varieties called, by Siebold, L. Thunbergianum atro-sanguineum and L. Thunb. atrosanguineum maculatum. These varieties are usually called in gardens L. atrosanguineum, and are catalogued under this name in M. Van Houtte's list. But after an attentive comparison of these various plants, and of the characters proposed as differential, I do not see any reason to retain L. fulgens as a distinct species, but rather I adhere to the opinion of M. Siebold, which, moreover, is shared by Professor Karl Koch ("Wochensch." 1865, p. 99). The habit, indeed, is the same, the leaves are alike, the pubescence is too variable to furnish a specific character, while the flowers do not furnish any trustworthy point of distinction, and even the warts on the inner surface of L. fulgens are not wanting in the most marked specimens of L. Thunbergianum.

As to Lilium venustum (Kunth. "Enum." iv., 1843, p. 265), also introduced by Siebold, and placed by him along with many others in the botanic garden of the University of Ghent, where it flowered first in 1833; it likewise is very closely allied to L. Thunbergianum, if it be not a variety of it, as indicated in Siebold's Catalogue for 1870-71. The habit and proportions are the same, the leaves are nearly identical, rather longer, perhaps, and a little narrower, often more spreading. The flowers have the same general form, the same dimensions, and are only distinguished by the circumstance that in L. venustum the segments of the perianth are narrower, of a uniform orange-apricot colour and destitute of spots, but these differences are very slender for specific distinctions. I should, therefore, be disposed to follow the example of Siebold's Catalogue, and call this Lily L. Thunbergianum venustum. Moreover the three Japanese plants just alluded to have offered to descriptive botanists such slight differences that M. de Cannart d'Hamale himself, who admits them as specifically distinct, only cites in support of his opinion the height of their stem, the form of their leaves, and the colour of the flowers. We have just seen that these differences are very slight, if they exist at all. The same author in retaining the three as distinct has experienced so much difficulty in referring to them the numerous varieties in gardens, that he has been obliged to give up the task. "It might be said," he writes, "that Nature has taken delight in torturing the sagacity of botanists, and has defied the efforts of science, in offering an amalgam of forms and colours which, while collectively belonging to the three types cited, do not really belong to any one of them." Rather may it not be said that it is the botanists who have tortured Nature, in persisting in their endeavours to distinguish three specific types where one form only is present.

Considered as I believe it should be, and in the manner it was regarded by Siebold, who, having observed it under all its forms in its native country, was better able to appreciate its characters than any one else, L. Thunbergianum offers numerous varieties, great diversity of colour—from deep purplish red, as in a plant received from M. Krelage, of Haarlem, as L. Th. grandiflorum, and bright scarlet (L. Th. scarlatinum, Leicht.), to clear orange-yellow, and almost golden (L. Th. aureum and aureum nigro-maculatum). I think that we ought to combine with Thunbergianum the L. aurantiacum (Paxt. "Mag. Bot." vi., 1839, p. 127—128). In gardens this name aurantiacum is ordinarily applied to L. Thunbergianum venustum. It may be remarked, that this denomination, L. aurantiacum, and that of L. aurantium, were given, as M. de Cannart d'Hamale remarks, the first by Dumont de Courset, the second by Loudon, to L. croceum, Chaix. L. Thunbergianum has also other synonyms, which it is desirable to notice—such, according to M. Cannart d'Hamale, is the L. formosum, A. Verschaff. ("Ill. Hort." 1865, pl. 459); such also is, as remarked by Morren ("Ann. Soc. Agr. et Bot. de Gand," ii., p. 412—413), the L. sanguineum, Lindl. ("Bot. Reg." 1846, t. 50), concerning which Lindley himself wrote—"This may be considered as a variety of L. Thunbergianum," although a few lines further on he said it was nearer to L. philadelphicum, an affinity not easy to justify. M. M. Grönewegen, of Amsterdam, and Krelage, of Haarlem, have also distributed a number of varieties of L. Thunbergianum under the Japanese names of Kikok, Kimi-Gago, Ja-Ethal, Sy-Yets, Fiu-Kwama, and Feki-Nata. Having procured nearly all these plants from M. Krelage, I have ascertained that the two first belong to L. Thunbergianum aureum, that the fourth is closely allied to it, and that the third is a variety with 2—3 large flowers of a reddish orange colour, passing to orange in the middle of the segments, and with some point-like reddish-brown markings.

A very curious form of L. Thunbergianum is that which has been called, by M. Lemaire, L. fulgens var. staminosum, "Ill. Hort." 1864, t. 422. This plant has reddish orange flowers, marked internally with oblong dark brown points, and more or less semi-double, by the transformation of stamens to petals. In two flowers, received from M. Victor Lemoine, of Nancy, the three outer stamens are alone petaloid. These stamens presented a remarkable appearance; their filaments were developed into the form of an anther, with petaloid lobes and petaloid connective, thus having all the appearance of a petaloid anther, but each was surmounted by a perfect untransformed anther. This malformation does not add to the elegance of the flower. In M. Max Leichtlin's list is mentioned a variety with double flowers, L. Thunb. fl.-pleno, which is much more double, and more beautiful than the one just mentioned. According to Siebold the bulbs of L. Thunbergianum are commonly eaten in Japan.

Home Correspondence.

The Education of Gardeners.—Whatever education a boy may have received at school, I contend that his education commences when he first enters a garden, and that he himself is the chief schoolmaster; for I take it as granted that, independent of religious views, a gardener's education consists in gaining a thorough experimental and practical knowledge of manual labour, which must be acquired by using the tools. A man who does not know this, whatever position he may hold, cannot thoroughly know his business; theoretically he may, practically he cannot. I do not say that he must be successful in every department, because that would be perfection, and the cry would no longer be "Excelsior," but "Eureka," but I much doubt if that will ever be. When a man can properly use a tool himself he can see with half a glance whether the work is going on properly or not, and he can better enforce his reproofs if need be by taking the tool and showing how it should be done. Proceedings of this kind are not at all rare,—take for instance a common illustration: a young gardener is sent to prune some Gooseberry trees, he perhaps has said he "knew how," &c., but what is more annoying than to find, when making an inspection, that perhaps half-a-dozen of your best trees have been spurred in to about two eyes and every particle of good young fruit-bearing wood cut away? The only reply one can get is "That's as we done it at t'other place, and they done wery well." One should be able to correct a man in any department. Pruning is a most essential part of a gardener's education, though it is sadly neglected; even the "knifemen" in nurseries might learn some important lessons, for the pruning as shown by the plants sent out from some establishments is a disgrace to the age. Many old nurserymen would have thrown hundreds to the five-heap, rather than have allowed such plants to go out of the place. Perhaps one other illustration of my meaning may be allowed, that of filling a barrow with a shovel, of soil, gravel, or clay: now, simple as the operation is, many who read these remarks will admit that they do not know how to frame properly for the purpose of getting an easy leverage for themselves. Many young men have come to me on the different works I have been employed upon, calling themselves gardeners out of a situation, asking for a job; perhaps one has said he wanted a foreman's situation under the head gardener. I have replied, "Then you understand ground-work and the forming of new gardens?" "Oh yes, sir, I can do that." I have given them the opportunity of trying for a few weeks or months, as the case might be, but they have been quite bewildered and lost in the work. In placing themselves for shoveling they stoop, with both feet near together, and placing the shovel near the soil to be moved, make a sledge-hammer of their knees against the eye of the shovel, and so drive it with both knees at once, to the punishment of those poor limbs, and as they think, no doubt, with ease to their backs. I will not attempt to describe the lifting process, for that is worse, and it is too undignified for this class of gardeners to learn to fill a barrow with the same ease as a good labourer would, because they can pot Scarlet Pelargoniums and other bedding plants, and perhaps may be able to grow some Cabbages. I say perhaps, because he may have been one season in a nursery where he "growed plants for market," and two years in a gentleman's garden, and now wants a second gardener's position. Not long since, a young man about 24 years of age asked me for work, producing a testimonial from a large nursery firm; the signature I knew to be genuine. On the faith of that, and having a quantity of planting to do, I employed him, thinking he might be very useful. When he got hold of the spade and began digging, he was one of the most ridiculous objects one could well imagine; he had his feet within two or three inches of the blade, in a stooping attitude, both hands on the top of the eye of the spade, and his left foot stamping on the right side of the blade, so that the whole of the other men who were looking at him began to laugh. Yet he thought he was man enough to take a single-handed place. I simply adduce these cases to show the class of young men in gardens as opposed to young gardeners, and that there is a great defect in the practical education of gardeners in the present day. David Bell's theory is not sound as regards wages; young gardeners who mean working their way up, are not too well paid. Pay a man his full worth, taking all his advantages into account, and excite a spirit of practical emulation,—not in the higher branches first and in practical gardening labour after, as I regret to say is too often the case. A gardener's education is mental, and I think the chief defect arises in this department. A few years since in all large towns, strikes for wages were the order of the day among the artizans; trade was good, capital was to be had in abundance, mushroom fortunes were made in a day, villas were built and occupied, and a gardener was

required. Everything was going at a racing pace, the artizan class was well paid and was absorbing the best educated lads from the National, British and other denominational schools at higher wages than could be got in the various gardens. Gardeners were wanted; the supply was kept up by an influx of non-educated youths or such as could scarcely read at all, at low wages. Anything served so long as wages were low, from the grower for market upwards. At the same time sprang up a most extensive trade in jobbing in every town, a taste grew for bedding and bedding only, and the growth of soft-wooded plants was the rage. Pelargoniums and such things only were chiefly grown. These young jobbing gardeners, under-gardeners in suburban villas, and nursery *employés*, are now all gardeners, and are gradually getting absorbed into country gardens, to the disgust of gardeners of the other generation, taking with them the habits they have acquired in the three places I have mentioned, wanting the same wages, working the same hours, having the same independent happy-go-lucky ways as the town, spending their evenings at the public-house for want of better intellectual company, binding themselves in company of ignorance, pride, self-opinion, conceit, and a number of other things, which leaves no time for self-culture, and no self-denial. *D. F. N.*

—— Mr. Fish says of some of our young men that "they prate loudly about the abundance of horticultural literature, find fault with it all, and read none." I have been a humble contributor to horticultural literature, and if the number of copies sold be evidence of the number of readers, I have a right to conclude that a very large number do read horticultural works, and especially when written in plain intelligible language. But Mr. Fish very ably exposed the evil which hangs like a cloud over the whole profession, and deters thousands of intellectual men from joining it, —the miserably poor prospect of obtaining even decent wages. It would be an interesting return, if it could be obtained, "the number of gardeners who receive £100 per annum, the number who receive 30*s.* to 40*s.*, the number who have 20*s.* to 30*s.*, and the number who have less. I mean gardeners in regular places, not journeymen, for they are worse off. What youth, if he have any brains, would not prefer to be a mechanic? Even a labourer has better pay than hundreds of gardener. Well may Mr. Fish say, "this is one of the greatest evils of gardening;" and after all that has been written upon the subject, I cannot see how prize essays can mend it. *G. Glenny, Norwood.*

—— "An English Journeyman" must not think that I place all young gardeners on a footing with Mr. Flunkey, as I know there are many very deserving and intelligent young men who would disdain to be seen in company with that gentleman. A few such letters as that from "An English Journeyman" would be an example to others. He says that the remarks I made about Mr. Flunkey are an insult to all young gardeners. Would that all who deserve it would take it as such, and act accordingly. "Inter alia" says he would recommend every gardener to exclude all boys from the garden who did not pass a fair examination in the rudiments of education. I beg to differ with him on that point; I should have better hopes of a boy who had a liking for the business, and very little education, than of one who had a good education, and only took to the business because it is easy to get at. "D. S. C." asks when they may expect their advance of wages—did they not get it some time ago? Here wages rose from 9*s.* and 10*s.* a week, to 14*s.* and 15*s.* Perhaps "D. S. C." did not get a rise, because he did not deserve it. I find that one man is underpaid at 20*s.*, whilst another is overpaid at 10*s.* How is it that the best men are always contented, and have the least to say about their wages, whilst a poor hand is always brawling about them? "D. S. C." complains of many head gardeners being no better than despots; for my part, when a journeyman, I was always treated with respect by the different gardeners I served under, and was always made welcome to their house when on business, or in search of information on any subject whatever. What more could one wish for? Your correspondent also talks of the dens of bothies; I trust these hovels are numbered amongst the things that were, although, I must confess, I have spent many a pleasant day in them, and very agreeably turned over the leaves of Don's "Catalogue," and Hooker's "British Flora," in search of names of plants gathered on the hills and in the glens, in bothies where we had more light from the chimney-top than from the window, in the summer evenings. How is it that so few young gardeners go botanising now-a-days? I scarcely find a young gardener that knows the name of a native flower or of a herbaceous plant. I have been one of a dozen who went away after six o'clock on Saturday night, travelled from 40 to 50 miles in search of plants, and were at our post again on Monday morning (although it was not commendable to go in search of plants on the Sunday). There is nothing of that now-a-days. Gardeners do not seem to require a knowledge of native or herbaceous plants at the present time. "F. W. B." says there is no demand for certificated gardeners at present; allowing that to be so, there certainly is the honour of taking a certificate, and they lose nothing by it. It would be a grand object for young gardeners when they go to Edinburgh from the North, as they all flock there a year or two after their time is out, were the nurserymen they go to to ask them a few simple questions, such as, What sort of Apples and Pears best suited the place you left?—What kinds of Strawberries were grown?—Which was the earliest Pea?—What season were the Peaches and Apricots pruned on the open wall?—Why did the gardener not prune them at the same time as he pruned the Apple and Pear trees?—Why are Roses not pruned earlier?—What sort of soil is the best for Camellias? &c. These questions are very simple, but the fear of the examinations would make the young gardener prepare to meet them beforehand, and these would would get installed in his mind, and help to prepare him for a more searching examination when he came to be subjected to it afterwards. *P. Bell.*

—— With a view to improve the position and prospects of young gardeners, I beg leave to make the following suggestions as to the establishment, under the auspices of the Royal Horticultural Society, of a system of registration of schedules and of local examinations. I propose that the Royal Horticultural Society should establish a register, and in the next place something in the shape of a schedule, entering into the schedule the principal requirements of the profession, with the rudiments of such scientific knowledge as they might think proper to insert. The schedule would require to be a duplicate of the register, in case the apprentice at any time should lose his schedule, and with it a few years' marks of provincial examinations. I think the system will require to be worked on somewhat similar compulsory principles to those of the new School Board, but ultimately I am quite positive the system would work on a thoroughly voluntary plan, to the great benefit of those it would concern. When a young man makes up his mind to be a gardener, he should furnish himself with a schedule from the Horticultural Society as his apprentice indenture, the Society charging a small sum to pay the expenses of registering the applicant's name, &c. Some of the requirements marked in the schedule the candidate may have learnt at the Board of Education school previous to his embarking in his new undertaking, and it would be well for him before his time is fully taken up with practical duties, to thoroughly well establish them in his memory. We will now consider the young man fairly entered upon his apprenticeship, with so much education as to be able to apprehend the full meaning and bearing of his schedule in all its points; if not, he must set about this duty with as much assiduity as he possibly can muster, so that he may have a clear understanding of the consequences of any deficiency in a proper knowledge of the business he has taken in hand. With his schedule in his room, and his employer in the garden, let us endeavour, if possible, to let our new system be a Silens Messor machine, with as little jarring amongst the cogs as possible. Gardening, as a rule, is not wholly reached mechanically, although the plumb and rule are often used; the professional gardener requires to be in a great measure a walking barometer, with his mind always on the alert, and with ability enough to comprehend the seasons, and to be able to make the most of every available circumstance. I think, in the next place, that it would be highly beneficial for the working of the system to establish provincial or local examinations, to be held periodically during the winter months at the time and place most convenient, and where our young gardeners could have their previous season notes examined, and discussed by a quorum of professional gentlemen, selected in accordance with the different branches of education specified in the schedule, namely, gardening at large, botany, forestry, farming, and chemistry. To reward industry, and to cause a local stimulus and competition among the young men themselves, something in the shape of a badge or *bâton* might be held by those successful competitors who are able to carry off the highest number of marks. Such prize might be hung up for public exhibition in their respective lodges. The marks, whether few or many, should be entered in each young gardener's schedule opposite the branches competed for, with the signature of the examiner, time, and place, &c. After each local examination it would be necessary for each apprentice to forward his schedule once a year, in order that his marks may be transferred to his folio in the Royal Horticultural Society's register. I consider this of great importance to the register, as, in case of loss, the apprentice could at any time, by sending his number to the Horticultural Society, obtain a fresh schedule filled up with the marks previously sent to the Horticultural Society after the periodical examinations, by paying the Society a fee for extra trouble. I should consider a mark or two honourably gained from some of our more conspicuous provincial gardeners a high compensation for sleepless nights and close study. In the event of our young gardeners turning up at some of the various nursery firms with a well-marked schedule, adorned with the signatures of those gardeners whose very names are as "household words," the schedule would show at once the capabilities of the applicant. By connecting the young gardener with the Horticultural Society, he could at any time when he thought proper stand on its roll for examination. I sincerely trust that the schedule system may be the means of causing a "self" interested rivalry amongst young gardeners themselves by leading them to employ their hours to the best advantage. *J. Miller, Worksop Manor.*

Bee Soup.—In the *Gardeners' Chronicle* of December 26, 1857, there is an article about a food for bees, called bee-soup, consisting of cake made from the pressed seeds of Sesamum. Will any of your correspondents inform me if they have ever used this as a winter food for bees, and if so, how is it given to them, and where can it be procured? *Hamilton H. Howard, Gurney's Manor, Hingham, Norfolk.*

Table Plants.—Under this heading, at p. 1573 of the *Gardeners' Chronicle*, Crocuses are mentioned as very suitable for the purpose. I am much surprised that the winter flowering bulbous plants in general have hitherto not been recommended for this purpose. The whole tribe of Duc Van Thol Tulips can be had in full bloom in the middle or end of November, with Amaryllis purpurea (Vallota purpurea), and some other Cape bulbs; also Tritoma Uvaria grandiflora, which is a most noble flower at night. Then single Tulips: Blanc rouge bordé, Pourpre Van Boll, Vermillon brillant, Le Matelas (rose), Pottebakker (yellow and white); and Double Tulip Tournesol, the ordinary and the yellow kinds, in the beginning of December, with some single Hyacinths, and Scilla bifolia and amœna. A few days later we may select from Narcissus of Marseilles and Narcissus nanus, Hyacinthus botryoides, early Crocuses, versicolor and the new varieties of Cloth of Gold, Convallaria majalis and Bulbocodium vernum. At Christmas the following sorts are available:—Amaryllis formosissima, Narcissus Bulbocodium, Triteleia uniflora, plants of single and some double flowered Hyacinths. In the beginning of January plenty of double-flowered Hyacinths, Crocosmia aurea, Crocuses, and some Amaryllis, are to be had, and after this the whole tribe of Dutch flower bulbs till about April or May. No other flowers are so easy to grow as flower bulbs; no others are so well adapted for the purpose of table decoration, on account of their infinite variety and bright colours. They only want surrounding with a little green Moss, Selaginella, or Fern fronds, to make the whole interesting and beautiful; moreover, they are to be obtained at a very low cost. The only difficulty in their culture, if difficulty it is, is to make a good selection, and to plant at the right time, which, for the first period of flowering, is in August. Popular as bulbous flowers are in England, I wonder that some industrious London gardener has not yet taken it for his speciality, as it would certainly be very remunerative, as he could provide the market with flowering bulbs from the middle of November till May—nearly half a year, during the greater part of which all other flowers are very scarce. For the most part, too, they are not so well adapted for table decoration as bulbous flowers, which in general possess more brilliant colours. Besides this, it is one of their good qualities that they can easily be transplanted, when in full bloom, into baskets, &c.; so that the same flowers can be used more than once, which is an additional reason for their employment for table decoration. *G. W. F. H., Haarlem.*

Covering up Fig Trees.—Your correspondent at p. 1605 doubts the desirability of covering up Fig trees at this season of the year. He says, "My experience teaches me that all the fruit-buds that are too forward to stand the winter without protection, are too forward to be of any use." In that I entirely agree with him. But in the next sentence, where he says, "All the fruit that will come to perfection next year will be very near the end of the present year's growth," I beg to differ from him, and think that were he to follow my plan, he would find that, not only is fruit to be obtained from the end of the present year's growth, but from the whole length of it. If he would remove in early autumn those fruit-buds which he describes as "too forward to stand the winter," he would find that a second fruit-bud would be formed by the side of the spot whence each of the first had been removed, equal to those at the extremity of the shoot. This cannot be done, of course, if the wood is not well ripened, which result I obtain by a process similar to that of your correspondent, which I have followed to advantage, not only with Figs, but with Peaches, Nectarines, and trees of a like nature. Peaches especially, I think, are benefited by it, as light and air are admitted among the branches, which is essential to the well ripening of the wood, and wounds made then will have time to partially heal before the approach of winter, which prevents the gumming so often seen when trees have been hard cut in winter pruning. *J. H. H.*

How to Destroy Insects in General.—I have used the following mixture for some years with success in the destruction of such pests as mildew, scale, mealy-bug, red-spider, and thrip; in fact, it is my only remedy in the case of trees, shrubs, and stove and greenhouse plants, but much care is required in its use as regards strength, and thorough syringing afterwards:—2 oz. flowers of sulphur, worked into a paste with a little water, 2 oz. of washing soda, ½ oz. common shag Tobacco, and a piece of quicklime about the size of a duck's egg; put them all into a saucepan with 1 gall. of water, boil, and stir for a quarter of an hour, and let the whole settle until it becomes cold and clear. It should then be poured off, leaving the sediment. It will keep good for a long time. In using it, add water, according to the strength or substance of the foliage. I formerly used 1 oz. of soft soap with the other ingredients, but I find it is effectual without, and it does not now leave any marks on the leaves,

I would simply suggest a fair trial, and I think no one who uses it properly will regret its use, or very seldom be without a good jar of it. In a nursery among young fruit trees subject to American aphis, or curled and mildewed foliage, I do not know its equal, even for black-fly on Cherries will not stand it. I can point to some fruit trees in a gentleman's garden which two years since were fast dying when I was called in. I had them syringed, and the shoots untacked from the wall, and dipped in this mixture. This was done three times during the season, and they are now strong, healthy, and vigorous. *D. J. Northwood.*

Manure for Nursery Grounds.—Will you kindly give me your opinion on the following :—Supposing A. B. has a nursery ground, of 20 acres, situated four miles from his place of business in town, and he has to cart his manure for the above from different places in the said town, which costs him 3*s.* per load for hauling. The dung is not rotten, but green out of the stable, and costs 1*s.* 6*d.* per load. What I wish to know is, whether there is an artificial manure that will answer a nurseryman's purpose in the growth of trees, shrubs, &c. ?—and, if so, would it be cheaper to use it than to pay 3*s.* per load for hauling green stable manure? *Enquirer.* [Perhaps some of our friends will kindly give us their experience on this point. Eds.]

The Silver Fir.—I wish to ask a question about Silver Firs. I have planted a good many here, and they seem to be doing exceedingly well and are about 7 ft. high. Notwithstanding this, I hear that my grandfather planted a good many some 40 years ago, and that they all died off when they were about 15 ft. high. Is the Silver Fir in the habit of dying off thus suddenly? The soil and situation are excellent for most trees, though the subsoil is a strong clayey marl, and very retentive in places. There are some very fine Silver Firs, however, about a quarter of a mile from here. *G. F. M.*

Salvia patens, Blue.—The value of this plant for mixed borders cannot be overrated, nor have I seen any plant of the same colour to equal it for summer bedding. But why is it so scarce? I am told by some that the roots don't keep well, that they refuse to start, &c. But how are they kept? Well, they are generally thrown down in the corner of a shed and, not being fully matured, soon wither to such an extent that they refuse to break when brought out in the spring. I have cultivated this Salvia for a good many years very successfully. My plan is as follows :—As soon as they are cut up by frost in autumn they are lifted and cut over, afterwards put pretty thickly into ordinary bedding plant boxes, with a few handfuls of soil to each root ; they are watered well, and set in any warm place to make them break, which they will soon do. When the young shoots are about an inch or two in length, they are removed to a cooler place amongst the bedding plants until March, when they may be divided into the desired quantity and be potted singly or returned to boxes, when a good stock of strong plants will be the result. *John Taylor, Rose Hill Lodge, Batcheriby, Carlisle.*

The Propagation of Centaureas.—Having heard of many failures in the propagation of Centurea ragusina I am induced to give you my method of propagation, which I have found to answer admirably. First, take the cuttings about the beginning of September, take off the bottom leaves and leave only about an inch of wood. Insert the cuttings thus prepared in 60-sized pots, in a compost of loam, leaf-mould, and sharp sand, about one-third of each ; plunge them in a cold frame, and keep them close for about four weeks, by which time they will be rooted. Great care must be taken in watering. I water the dry ones only and am careful that no water is allowed to fall on the leaves, as that might cause them to damp off. When they become pot-bound I usually shift them into 48-sized pots, in which they remain until bedding-out time, and make nice plants. *G. Warren, Frodsge Castle, Sussex.*

The Red-skin Flourball Potato.—We send you a medium sample of our own crop of this variety. Those sent average more than 1 lb. each, which we think will be large enough for the table. We have many tubers 2 lb., some over that weight, and one even 3 lb. It is the best crop with us this season, and has proved so vastly superior to all others growing in the same fields, such as Red Regent, *alias* Lord Holland, Rintoul's Early Don, Bovinia, Farmer's Glory, &c., that we discard all these in its favour. This grand sort appears to be quite independent of weather, for it grows proudly on in drought, and does not "super-tuber" when rain comes ; neither is it subject to disease. It has a noble, robust, and hardy habit, and produces an abundance of white blossoms. *T. Watts & Son, Northampton.* [The samples sent justified their name, alike when baked or boiled. Eds.]

Management of Plantations.—I thank your correspondent much for his remarks in answer to my question about the management of plantations, and yourself for inserting them in your paper. I beg to tell your correspondent, "W. I.," that the plantations in question are intended to grow fine handsome timber for ornament ; would he, therefore, tell me whether it would be necessary to grub up the live stumps of the felled trees, or would it be sufficient to plant a few other hard-woods among the Pines and stumps, and knock over and destroy the shoots from the stumps until the lately planted ones keep them down and overcome them of themselves? *G. F. M.* [As your correspondent wishes handsome and healthy timber, and the plantation is regarded as important, I think he will do well to grub up the old stumps. By so doing he will remove what would prove troublesome, as he would otherwise have to look through the plantation frequently to keep down the suckers from the old roots, and in the act of removal he will expose a certain portion of the soil to the action of the weather, and so render it better for the young trees. When it is considered that many deciduous trees derive vigour, quality, and bulk from the soils in which they grow, that they flourish while in possession of all the available riches of fertility within the scope of their roots, and decay when all the food within the grasp of these roots is exhausted, it is evident that fresh and virgin soil is better for timber trees than that exhausted by successive growths of trees on the same land turned over and exposed to the disintegrating influences of the atmosphere. The soil undergoes a chemical renovation, and is thus fitted to support a new growth of timber. I do not know what kind of soil your correspondent's plantation possesses, but it must be wonderfully good to support in unimpaired vigour successive crops of timber ; he may be assured that care in the preparation of the soil, care in planting, and attention bestowed for the first few years in the removal of weeds, &c., will assist in securing a certain meed of success. *W. I.*]

Monstrous Poppy Capsule.—I send a monstrous or abnormal form of Poppy-head, which seems to be surrounded by numerous pseudo-capsules in the place of stamens, &c. The crop amongst which this grew was late, on account of long early drought, and the laterals of this and most of the other plants were beheaded as the flowers fell off. The form of this main head was not noticed until the gathering of the

Fig. 293.

rest for seed-saving, and it was frost-bitten before perfectly ripe. I enclose a few seeds for testing their vitality, &c. *James Russell, Lyme Park, Stockport.* [Such instances as that forwarded by our correspondent are not very uncommon. We reproduce, from a former volume, a cut (fig. 293) which almost precisely represents the condition of affairs in the specimen now forwarded. A German botanist states that the peculiarity in question was reproduced by seed for two years in succession ; other cases are cited in Dr. Masters' "Vegetable Teratology," pp. 303—310. Eds.]

Earthing-up Vegetables.—"A Gentleman's Gardener" is not contented with affording his quota of useful information, but also felt disposed to bring down "an old house" about my ears. Allow me a few lines to reply. I am taken to task for asserting that market-gardeners aim principally at the production of quantity, and gentlemen's gardeners bulk and quality. The market-gardener dibbles five plants into the space which should be allotted to the production of one, were it to be grown skilfully. At the earliest moment possible, and when the least heart is observable, these are drawn, bundled by the dozen, and sent to market. Did your correspondent need to purchase such a dozen, and a shilling was the charge, he may vaunt of the shrewdness of the vendor with even greater gusto, so poor a supply would they prove him. Not so are Cabbages, grown with any aim at excellence. This all real gardeners know, though townsfolk, and such as have to depend on the "one a penny" produce of your correspondent's "shrewd men," unfortunately do not ; though there may be an exception, as, sometimes at the fag end of a season, those who have not sold out bring in a moderate sample. In regard to Potatos, when the young growths have commenced to make a show of leaf, the stems will have become about 3 inches in height ; this I before stated purposely, because the leaf does not form until the stems are well through the ground ; and that is the time at which I advise earthing-up. No heed need be taken of the leaves, as they will, if covered, issue forth with even greater vigour. Your correspondent asks, "When and by what means does Nature earth-up?" I will tell him. If he will go on to pasture land, there he may see, surely though silently, the unerring work going on in the multitude upon multitude of "earth casts" distributed amongst the growing herbage, and this at a period when the growth of the plant is the least active. If he be not satisfied, let him follow that tool so useful to his calling, the turfing-iron, and see turves pared off. Then he may ask himself the question, how is it there are no stones, and that the older the pasturage the deeper they are? Because the natural process of earthing-up has produced soil separated from the stones on the surface. Further, he may place his hand on to the tufts of herbage growing from any old wall. Whence come the earthy substances there aggregated? Or let me refer him to an old British plant which will not often bear transplanting, and which is to be met with more frequently and the most luxuriantly in positions where a constant process of earthing-up is going on. The poet has very harmoniously alluded to it—

"I know a bank whereon the wild Thyme blows."

For are not these banks generally ant-hills, and do they not constantly increase in size through the little excavators bringing the lower earth up? "A Gentleman's Gardener" will not earth-up, "because water is likely to stand around the stems of the plants at the apex of the ridges" (!) and he would not earth-up Potatos because it would blanch the young stalks of the growing haulm. I advise moderately shallow planting at the first, for the very reason that the stems may meet the light quickly and strongly, that they may not be blanched in process of growth, as they always are, as a necessary consequence in cases of deep planting. If, as I believe, deep planting is not good, spare me from the supposition that I wish to make bad worse, and to increase the evil by placing a lot of additional soil thereto, which in a word would be to produce just such a state of things as your correspondent seems to deplore in other practices. As to his "saws" about "wasting the time occupied in earthing-up" and "trampling on the ground," they are beneath the notice of practical men. *William Earley, Valentines, Ilford, E.*

—— I certainly had imagined that the question concerning this subject, which is freshly put by "Amateur" (p. 1635), has been fully answered when in my previous communication I stated that, unless plants possessed the peculiarity of throwing out roots above the ground line, earthing-up could not possibly be of benefit, excepting, of course, for blanching purposes. Certain kinds of vegetables are often sown or planted out in trenches in the summer for facility of watering, and, as in the case of Celery, to facilitate blanching ; but to the veriest tyro it must be evident that if you sow or plant in a trench you rob the plants of just that depth of soil that has been excavated, and this top soil is invariably the best for vegetable growth throughout the whole of a cultivated garden. The most essential part of successful vegetable culture consists in deep cultivation of the soil, and certainly it would be the reverse of wise to throw out a trench several inches deep and thus make the soil beneath less, rather than more. If "Amateur" can work his garden ground for a depth of from 2 to 3 feet, and can give it in addition plenty of manure, he will find that under such conditions vegetables will grow and become productive in a far greater ratio than if sown or planted in trenches. *A. D.*

Pruning Shrubs.—It is now near the time when the hall and the cottage, the church and the chapel will be decorated with evergreens. At some places, where it is neatly done, little will suffice, but in others cartloads will scarcely be sufficient. Cottage windows will be darkened, and such dense bunches will be seen hanging about the houses, that the voices of the inmates will seemingly have a new tone. If the greens are dry, let this be so again and again—I would not deprive the children of their Christmas greens any more than deprive their papas and mammas of their Mistleto and Holly. That is Christmas to them—let them enjoy it ; enjoy it they will, but what about pruning the shrubs? Would it not be better for them, if severe weather should come upon us, that Christmas was deferred until the month of April? Notwithstanding what old Abercrombie tells us, and what is repeated at p. 1607, by "J. D.," I think much mischief is done to shrubs by pruning at this time of the year in our climate. I know one is very apt at this season of sweeping and cleaning to out with the knife and trim the shrubs. This is a sore temptation to one who must have everything orderly about him. It generally happens that those branches which would afford protection to the rest of the bush are the first victims of the knife. We all know that the outer part of the shrubs are, by the action of the sun and air, prepared in a greater degree to withstand cold than those parts immediately under them. This preparation has been going on for some time. The difference of hue and substance, of both leaves and wood, in those parts from the rest is manifest to all. If, then, these outer branches are gone, those under them, which have not had this preparation, must suffer. Thus it is explained why we see brown patches in shrubs after such pruning. If those who were about to cut evergreens were to take the branches from the least exposed part of the shrub, little harm will follow. Those branches at the bottom, or under and between the others, may be spared with-

out danger; but to cut away all the outer branches—the part which has been naturalised, so to speak, to bear Nature's blast—is cruel and unnecessary. Those parts can be arranged and cut away to any model, but wait until the cuckoo comes. *Laurus.*

The Potato Tournament.—Although not one of those who publicly gave their adhesion to this proposition, yet I had privately done so early in the season; but even then, owing to the drought, I was haunted by hopes and fears so largely as to the character of the crop of tubers that would be found when lifted, that I had great doubts as to the possibility of my being enabled to take part in it. Certainly with a fine and careful selection of over 100 kinds, I had a right to expect that I should have stood a very good chance, and have had no fear as to the result had the weather favoured me. But Paul's planting was little favoured unless Apollos watered, as I found during the past summer's Potato experience; and as I could not show samples that would do justice to the fine sorts they represented, I preferred not to contest the glove. I have no doubt similar reasons actuated others, and thus the matter dropped, but another year we may be better favoured, and then perhaps the great tournament may come off in spite of the jibes and sneers from certain quarters. As it is there has been no lack of Potato exhibitions this autumn, but they partake too largely of the cattle show type, big as Pumpkins and about as nice; and if the proposed tournament was to be one of skittles they would do admirably for balls. In an old Irish song we are told that,—

"A kidney tatie, sich a size,
Ketched poor Pat right between the eyes;"

and from this I infer that Bovinias and Flourballs were common in those days, and if they approached in weight to their namesakes, of which we hear so much now, then terrible must have been the strife in that

"Grand Potato war
At the wake of Teddy the Tiler."

I hope the knights of our Potato tournament will, like the knights of old, fight only with eyes for the fair, the beautiful, the good. *Alex. Dean, Bedfont.*

Exhibiting Pears.—Can Mr. Garland explain why his Pears exhibited on the 2d of last month were ripe? The kinds mentioned by him usually become fit to eat in the middle of December, and last a month later, yet he tells us they were so ripe as to be made unfit for exhibition in their transit. Were they grown indoors? This season has been favourable, I know, to early ripeners, but he has done this before in other seasons. Mr. Garland is not alone in this matter. I have seen the names of Pears exhibited (as ripe?), when at the same time I have had them hanging on a tree against a wall. I have fine fruit (possibly as heavy as Mr. Garland's) of the same varieties as those exhibited some weeks ago, but which are not yet ripe, nor will they be for a week or two. *Country Jan.*

Hardy Primulas.—Some little time since several of your correspondents gave us some interesting papers on Primulas. In the lists there given us, however, I failed to notice several very beautiful species which appear to be almost or entirely out of cultivation in this country, but which, if one may judge from figures, hearsay, and description, ought to be in every herbaceous collection. I cannot speak from personal knowledge, for it has never been in my power to procure them. If I were not a parson, tied down by home duties, I would go myself to their respective habitats, and bring home either plants or seeds. As it is, I can only appeal to those whom duty or pleasure may take into the regions where these pretty plants grow, and ask them to be kind enough to put a few seeds in an envelope and direct it to a stranger who will thank them most gratefully. The following species—all, I believe, from the Himalayas or Sikkim—are very interesting and pretty:—Primula elliptica, P. rosea, P. minutissima, P. Moorcroftiana, P. obtusifolia, P. petiolaris, and P. Telemachia. Then there is the beautiful P. imperialis, from Java; P. magellanica, whose name speaks for itself; P. pusilla, an inhabitant of North America, I think; and the three Caucasian Primulas mentioned in Mr. Freshfield's interesting work, P. Meyeri, P. grandis, and P. pycnorhiza. I shall be glad if any one can tell me where I can procure living plants of P. luteola (which I have in vain tried to raise from seed), P. Parryi, P. Stuartii, P. capitata, and P. stricta. I am anxious to have a perfect collection of this beautiful genus. *H. Harpur-Crewe, Rectory, Drayton-Beauchamp, Tring.*

Bresee's Prolific Potato.—Last spring I cut 1 lb. of this Potato into 56 sets, and placed them in sand, in the Mushroom-house, till they began to grow. I planted them on March 28, in rows 2 feet 6 inches apart, and 12 inches apart in the rows; I then covered each set with a handful of ashes. I also used a little manure from an old Mushroom-bed, and ½ lb. of guano. When lifted, on October 3, the weight produced was 156 lb. 6 oz., and the quality was very good. From 1 lb. of Climax, planted at the same time, and treated in the same manner, which were lifted on September 17, the produce weighed 73 lb. 6 oz.; and I believe the crop would have been larger if they had not ripened off before the rain came. The quality was remarkably good, and the size even. When cooked they are white and floury. *D. Parish, Gr. to Rev. W. Heberden, Great Bookham, Surrey.*

Dipladenia boliviensis.—This appears to be a most useful autumn and winter flowering plant. A specimen here has been flowering since the spring, and from the appearance of the buds, which are now forming (December 12), it will probably continue in flower all the winter. It is growing in an intermediate stove, and seems to require the same treatment as Stephanotis floribunda. The flowers are white, with a creamy-yellow throat, and have a firm waxy consistency, which, with the addition of the accompanying sprig of gracefully shaped shining leaves, makes it highly desirable either for the adornment of a lady's hair or for mixing with other flowers in drawing-room stands. A flower with foliage is enclosed for inspection. *J. Pearson, Rangemore.*

Cheating Gardeners, &c.—Of course it is not desirable to hold with the cinder selling gardener whom your correspondent (see p. 1637) so truthfully [?] describes, but are not such cases the exception rather than the rule? After giving us the doleful tale of the cinder selling gardener, "A Subscriber" goes on to tell us of self-interest being the first consideration; "much depends on the under-gardeners being kept ignorant of the doings of the head gardener," &c. What are under-gardeners kept ignorant of? Your correspondent seems to begrudge a poor gardener a few vegetables, and goes on to say, "It often, as I observe, leads to his becoming a greengrocer, to the detriment of his master's household." I suppose he insinuates that gardeners sell their employers' vegetables, &c. I have lived under head gardeners 14 years, and think I can safely say not one of them carried on the greengrocery business. We then learn from "A Subscriber" that head gardeners are in partnership with stablemen and indoor servants, purposely to rob their masters of perquisites. I know nothing of stablemen's or indoor servants' perquisites, but I should like to know how the gardeners' perquisites are obtained, especially when, as stated, they are worth hundreds per annum? I am afraid these places are very scarce, or we should not have so many poor gardeners, and no need of a Gardeners' Benevolent Institution. "A Subscriber" then goes on to drag the poor gardener into the same category as the cook and butler; of course, as he has it, the cook looks out for herself, and the butler has a good share of interest for cash laid out in whitening and Day & Martin, but when has the gardener ac hance of "chalking on?" as the employer himself, or his agent, generally inspects the said bills. I think "A Subscriber's" remarks are an insult to all the respectable gardeners of the kingdom, and should he happen to be a "master," as he so definitely puts it, I pity the poor gardener from my heart who has to serve him. *R. S., Newburgh Park, Yorkshire.*

—— "A Subscriber" taxes the whole gardening community with being as morally debased as it is well possible to be, and also as being possessed of such an amount of "self-interested cunning" as is positively serious to contemplate. Your correspondent (I was going to say "informer"), sees in British gardeners qualities which I do hope and trust few employers will ever believe they are possessed of. We all know that there are gardeners and gardeners, and that occasionally black sheep will "crop up" in all classes; but I defy your informant to prove, even if he follow up his police report inquiries, that the number of black sheep amongst the craft exceeds the number, or anything like it, of the criminals which are turned out by every other class of society. Many employers, I have no doubt, can testify how particular their gardeners are in hunting up every bit of combustible refuse about their establishments, even to the sawdust from the pits, which they mix with the fuel; and what for, if not economy? Let me tell "A Subscriber," that could he learn the amount of expenditure of very many of our best kept gardens, he would be very greatly surprised at the smallness of the outlay. As to paying gardeners for seeds, "according to book," the system has anything but probability upon its face. If employers do not choose to have their annual bill for seeds sent direct from their nurserymen, they at least have it in their power to see the receipts for such outlays as gardeners make on their behalf. This system of dishonesty, which "A Subscriber" saddles on the whole class of gardeners, must meet, as it deserves, the utmost disapprobation of all right-minded men, whether they are employers or not. I protest most heartily against the statements made by your correspondent, and regret much that there are employers (and I admit that gardeners are not without faults) who can resort to such mighty recriminations against a class who, I am sure, claim at their hands, and with all justice, a far better display of feeling. *William Earley, Ilford, E.* [It will be seen on reference to "A Subscriber's" letter, that he does not include the whole gardening community in his accusation, but refers to special instances. Eds.]

Brown Scale.—In reference to Mr. Radclyffe's remarks on the application of undiluted methylated spirits for the destruction of this pest, I beg to state that pure spirits of wine, or alcohol, is equally destructive, and not injurious to leaf or branch. The spirit of tar, or other compounds used to make the pure spirit undrinkable, is not needed to destroy the scale, and is more injurious to leaves and tender stems than the spirit itself. Like Mr. Radclyffe, I always find the presence of ants a sure sign that other insects are near at hand; but I never yet found that the ants cleared any plant of either scale or aphides, or that they made any sensible progress in this direction. *D. T. F.*

Pleroma Benthamianum is, undoubtedly, a very fine autumn-flowering plant, as "R. M." observes. The lankiness of old plants is a great objection, however, and hence we find it more convenient to strike a dozen or two of cuttings in spring, and grow them on liberally with Euphorbias, Poinsettias, Begonias, &c., and in this way comparative dwarf-flowering plants are gained by autumn. The Pleroma elegans we find of far greater use. The flowers are larger, and last longer after being cut, and moreover, each small twig produces a finely developed flower, suitable for bouquets and other purposes; whereas, if a flower of the P. Benthamianum is wanted, the single flower must be wired, or the whole panicle must be cut. I consider the P. macranthum a great improvement on P. Benthamianum, but not more useful nor earlier grown than P. elegans. Of the latter we have fine large bushes 6 feet high, which commence flowering in August, and even now several flowers continue to open up, which at this season of the year are most beautiful and valuable. Planted out as we have them in our corridor, and encouraged in a free and easy way, without staking, twisting, or other training contortion, it makes a splendid autumn and winter flowering plant. Another year I purpose discarding in the main the P. Benthamianum for the P. macranthum. M. Linden showed this in a very dwarf flowering state at the Paris (1867) exhibition, where it was greatly admired. It requires a little more heat than P. elegans, but not so much as P. Benthamianum; and this is an important thing to keep in view now-a-days, when a decided preference is given by most employers who are lovers of flowers, to those flowers produced in an enjoyable temperature. Another useful Pleroma is to be found in Pleroma sarmentosum, which flowers at this season and onwards. It requires similar temperature and treatment to the P. elegans, and though it is not so good habited yet a weedy straggling growth may be pardoned at this season, when flowers, of whatever shade of colour, are valuable. *H. Knight, Floors, Dec. 8.*

The Extending System of Hothouse Building.—I am pleased to learn that the plan of building, of which I furnished you with a sketch (see p. 1569), has been put into practice by your correspondent, Mr. Cannell, and that he approves of it. Doubtless, having little alleys in the furrows, as he suggests, would be found in practice to be very convenient in many respects; but in that case double walls, I presume, would be necessary; whereas, in my plan, economy, not less than neatness of aspect, was a chief consideration. The plan is, however, now fairly before the public, and as other criticisms on it, besides those of Mr. Cannell, may yet be published I shall defer all comments thereon until after their appearance. *J. Newton, Oxford Terrace, Hyde Park.*

Eucharis amazonica.—I am anxious to give my meed of praise to this plant. I have never grown large specimens of it, such as described by "D. C." and others; but by keeping it growing and feeding it regularly I find it is almost a perpetual flowering plant, and for vase or bouquet work it is one of the best if not the most useful plant we have. Its spike of pure white blossoms, with a few Fern fronds, forms regal furnishing for any vase on any table, while its fragrance sweetens all within reach. Single flowers mounted are admirable for centres and outer rows of bouquets. They look well in any part of a bouquet, but as centres or outer row flowers their beauty of form is best seen, combined with scarlet or blue flowers and fringed with Fern. *D. T. F.*

Tomatos.—I was surprised, on looking over Messrs. James Carter & Co.'s list of new seeds, to find that they represent their new "Trophy" Tomato as having received a Special Certificate at the meeting of the Fruit Committee of the Royal Horticultural Society on October 5. Allow me to state that I was the only exhibitor of a dish of Tomatos at that meeting, and that my Tomato, and not Messrs. Carter's "Trophy," received the certificate above-mentioned. The whole stock of seed of my variety has passed into the hands of Messrs. Veitch & Sons for distribution. *John Hepper, The Elms, Acton.*

Foreign Correspondence.

MELBOURNE BOTANIC GARDEN (*concluded from p.* 1638).—Observations in reference to the effect of night frosts on the principal plants, as well as records concerning the flowering time of various species, are registered in the office. Notes are also accumulating respecting the adaptability of the dry desert tracts, and again of the alpine highlands, to certain cultures. By a Parliamentary return submitted last year it was shown that, from 1859 till July 8, 1867, not less than 355,218 plants were distributed to the public reserves, cemeteries, church and school grounds of Victoria. During 1868, again, 49,475 plants were rendered available for this purpose. These distributions comprised very many of the rarest Pines and other select plants, often

not otherwise available, many requiring two years' attention in the nurseries here, thus involving the necessity of maintaining, during some years, approximately, 40,000 plants alone under pot culture. Bearing in mind the increasing extent of trading establishments, exceedingly well conducted, it is worthy of the consideration of the Government whether these distributions from a public establishment should not be materially decreased, or abolished altogether. Numerous plantations, by the impetus given, are now established on public grounds throughout the colony, from whence, moreover, seeds and cuttings might be locally obtained. Eminently useful plants of many kinds have, for local experiments, been widely scattered over the country. The Treasury Reserve received last year 245 to some extent already upgrown Coniferous trees.

Turning to the special phytographic department, it may be observed that the Museum now contains about 350,000 prepared and arranged plants; the Australian portion being richer than that of any kindred institution in existence.

During the Intercolonial Exhibition an apt opportunity arose to represent more fully the technological value of many native vegetable products, and for this purpose, from the ordinary resources of the establishment, a laboratory was constructed. I need not detail the experiments conducted in reference to the value and percentage of many kinds of paper material, essential oils, dye stuffs, wood vinegar, tar, wood spirits, and tannic acid, from native plants, especially trees; on all of which ample information was offered in the documents concerning the Exhibition. These phytochemical observations have since been continued as far as circumstances permitted.

Appended to this report are the tables of very extensive series of analyses, conducted in detail by Mr. Chr. Hoffmann, in reference to the yield of potash in our more gregarious native trees. They show that the manufacture of this alkali can be pursued here more profitably than in those countries in which the supply of original timber is far less extensive than in Victoria. The examination into the yield of iodine and bromine in our sea-weeds is commenced, likewise the yield of soda in one of the principal littoral plants is recorded. I have entered also on a series of toxicological researches, by which it is hoped the nature of those poison plants so injurious to stock will be fully elucidated.

The large reserve between the St. Kilda Road and the Yarra is converted, within the last five years, from a treeless waste into an incipient forest. From year to year additional kinds of trees become interspersed; thus shade and shelter as well against the north-western desert winds, as also against the south-west antarctic storms, will be more and more obtained. Few even of our metropolitans seem aware that the verdant valleys which, within five minutes' drive from the City Bridge, slope gently to the Yarra, afford already charming picnic grounds, on which, free from the dangerous vicinity of the reptiles of our ranges, field amusements can be enjoyed simultaneously with views of rare beauty. Access of carriages to the whole of this rising ground and its gullies is permitted, under the anticipation that all ordinary caution will be exercised to prevent injury to the young trees. By the gradually denser growth of grass, Lucerne, and Clover plants, the so-called Cape-weed (Cryptostemma calendulaceum) has become largely suppressed; but inasmuch as the director of the grounds has repeatedly been accused of having brought this and other weeds, as well as some winged invaders, into our colony, it may be right to place it here on record, that the whole of these assertions are contrary to fact, for in 1833 Baron Von Huegel had noticed and recorded the Cryptostemma as an inexterminable weed of Australia. A gardener's cottage has for some months occupied the last of the empty old quarries, until then a favourite retreat of vagrants.

For more than a mile's length basalt boulders have recently been brought from Jolimont, by permission of the city council, to line the intended footpaths on both sides of the main drive. The drive itself, to the width of 20 feet, requires to be macadamised, for which purpose the boulders may be utilised, whenever more elegant linings can be substituted for them.

Sir William Macarthur's method of wrapping hard seeds in moistened cloth to speed their germination has been adopted to advantage.

A variety of Bamboos and different Sugar-canes were secured, including the hardy Chinese cane; 48 kinds of vines were added on behalf of the Acclimatisation Society to the already large collection, which includes the white and black American Scuppernong, the Sultana Raisin Grape, the French Cognac Grape, Follet Blanche, and many other famed kinds, new or rare in Australia. The true Oriental Dye Saffron, Colchicum, the oil-yielding Sesamum, the Tussac-grass of the Falkland Islands, the Caper (quite an ornamental plant), the wide-spreading avenue Acacia of West Australia (Acacia saligna), Ficus Sycomorus (the best of all avenue trees of the Orient), the Clove, Rhamnus utilis (yielding the green satin dye of China), the Sapodilla, the Avocado Pear, the Indian Teak, Cassava, Squill, Turmeric, the medicinal Bhel fruit, the Tree Cotton, Mangosteen, edible Vanguiera, Aya-pana, Gelsemium, and many other important plants, are more recent acquisitions to the garden. Although it may as yet be impossible to cultivate remuneratively the Saffron and many other of the plants indicated, it remains evidently the aim of a public institution to establish such plants in the country.

Turning to the nursery department I can report favourable progress, notwithstanding the precarious supply of water during the great heat. For the first time in Australia masses were raised of plants of Assam Tea (the seed kindly supplied, on the director's wish, by W. H. Birchall, Esq.); so also large numbers of the White-heart Hickory or Mocker-nut (Carya tomentosa), of the delicious Pecan-nut (Carya oliviformis), the Butter-nut (Juglans cinerea), the Black Walnut (Juglans nigra), the Himalayan Oak (Quercus incana), the Chestnut Oak (Q. Castanea), the American Swamp Oak (Q. Prinos), the Bur Oak (Q. macrocarpa), the White Oak (Q. alba, a most valuable timber tree), the Jersey Pine (Pinus inops), the American Pitch Fir (P. rigida), the Douglas Pine, the noble Himalayan Pinus longifolia, the Chinese Fir, the Balm of Gilead Fir (P. balsamea), the double Canada Balsam Fir (P. Fraseri), the West India Pencil Cedar (Juniperus bermudiana), and the American Cherry Birch (Betula lenta).

Many other highly valuable trees have been lately introduced, but not really in masses. Secured were, however, large supplies of the seeds of Pinus Gerardiana (the Tibet Ree or Shungtee), which furnishes sweet edible nuts for Indian and Persian bazaars; and grains also were obtained in quantity of Juniperus religiosa (the Himalayan Pencil Cedar). Many good-sized plants of the latter are since several years on our lawns. Nearly all the tree seeds from the United States were obtained through the generous aid of Prof. Asa Gray, of Boston.

Perhaps the most remarkable of all plants lately brought under cultivation is the deadly poisonous Phytostigma venenosum, the Calabar Ordeal Bean, a plant of the utmost importance in ophthalmic diseases. The large hard Bean was buried fully four years in soil before it germinated.

As decennia roll on, many of the trees, which under great efforts are now introduced, will undoubtedly bear prominence in our forest culture, a great subject which more and more presses on legislative attention, since already so much of the native timber in all the lowlands has been consigned to destruction. If, in densely populated countries like Belgium, one-fifth of the whole of its territory is scrupulously kept under forest culture, it ought to be a final aim, in a far hotter clime, to maintain a still greater proportion of its area covered by woods, if the comforts and multifarious wants of a dense population are to be timely provided for. It is especially in the western and northern parts of Victoria where exertions in this direction have to be made; it is there where extensive shelter and retention of humidity is needed, and there also where artesian borings, on spots indicative as eligible, would vastly promote the raising of forests.

If a proper museum were established in the garden, the timber, resins, gums, dyes, paper-materials, drugs, oils, alkalies, and many chemical educts from plants of Australia could be contrasted with similar products of other countries; the processes of manufacture and their technological and commercial value be demonstrated; while subjects relating to culture of any kind could be elucidated, diseases of plants by objects and drawings illustrated, and many other kindred inquiries drawn into the vitality of practical application. Thus I may instance that it seems not generally known how our common Eucalyptus leaves under Ramel's process can be converted into cigars, or how the same leaves serve as a remedy in intermittent fever.

Alluding to the "Flora of Australia," elaborated by Mr. Bentham, Dr. von Mueller writes:—"We may reflect, not without pride, on the fact, that a similar descriptive work exists not even yet for the vegetation of Europe; and we may also remember that, without a work of this kind, the confused vernacular appellations, and any medicinal technological, cultural, or other observations on the native plants, could not be reduced to a solid scientific basis. R. Brown's celebrated 'Prodromus,' issued in 1810, comprised only about one-third of the Australian plants then known, and even the orders elaborated in his volume have been augmented by more recent researches almost threefold. Of the 'Fragmenta Phytographiæ Australiæ,' the sixth volume has also been completed last year, and the seventh is commenced. Within the few next years I trust it will be in my power, if Providence grants me life and strength, to issue, on the plants of each of the Australian colonies, a special volume, for which much preliminary work has been done."

The library has lately been further enlarged, but mainly from the director's private means. Personal travelling expenses since 1852, and all outlay for scientific and local journals, British and foreign agencies, means of conveyance for attending at the city, office, light, and many other official expenses, as well as the courtesies which are demanded from a public department frequented by very numerous visitors, have also ever solely and readily been defrayed from the administrator's own resources, who, not for any selfish purposes whatever, ventures to place these facts, after the lapse of many years, on record, but simply in justice to himself, because the obligations devolving on him in maintaining the efficiency and dignity of the department seem not at all understood.

When now long past the zenith of ordinary life, he can with fairness assert, that 30 of his best years have been absorbed almost entirely in phytologic and cognate pursuits; that almost 17 years have been devoted cheerfully and exclusively to the main foundation and on struggling services of his department, and this, he may add, with the sole aim of endeavouring to effect some lasting good to the great country which, since 22 years, he adopted as his permanent home.

Societies.

LINNEAN: *Nov.* 3.—G. Bentham, Esq., President, in the chair. The Rev. S. Mateer was elected a Fellow. The following papers were read:—I. *Notes on a Solitary Bee, allied to the Genus Anthidium*, Latr., by J. P. Mansel Weale, B.A.——II. *Notes on some Species of Habenaria found in South Africa*, by the same. In one species of this genus, the name of which was not given, the author stated that the very long arms of the rostellum, combined with the stigmatic processes, formed a long narrow bridge leading to the mouth of the nectary; consequently in this species fertilisation was simple in the extreme, as any insect settling on the bridge must almost certainly deposit one or both of the pollen masses on the stigmata. The plant, which at night gives out a strong odour somewhat resembling Vanilla, did not, he said, appear to be visited by diurnal insects, but must be very attractive to nocturnal ones, for although each spike bore many flowers, and the plant itself grew in considerable abundance, almost every flower became fertilised. In H. bilabrella the rostellum and stigmata stand well out in front of the flower, but the author suggested that the flower of this species, which is deliciously scented at night, must be visited by insects on the wing, as the standing surface is small and inconvenient, and yet the fertilisation of the blossom is equally well effected as in the former. The foregoing and some other species were very fully described.——III. *Notes on a Species of Disperis found in the Hagaberg, South Africa*, by the same. After detailing the structure of the flower and the supposed mode of fertilisation, the author concludes:—"This is the only instance that I know of amongst Orchidaceæ in which the adaptation suggests that the tarsi of insects are the agents of fertilisation, although in Asclepiads they would appear to be in some instances the normal method."——IV. *Some Observations on the Fertilisation of Disa macrantha*, by the same. In this plant the blossoms, which emit abundantly towards night an overpoweringly heavy perfume, vary from pure white, with a few pale mauve spots on the petals and lip, to a bright rich purple, sometimes having the spots small and indistinct, and sometimes forming large scarlet or orange-coloured blotches. The brilliant colour, heavy odour, and conspicuous size of the plant and its flowers, are sufficient to attract both day and night flying insects, so that the author believes it must be frequently visited, though he had not observed this to be the case. Nevertheless, the plants bear abundance of seed; but then, it is added, self-fertilisation must be frequent, since a very slight jerk when the flower is fully expanded suffices to eject the pollen-masses from the widely open cases, and bring them in contact with the stigma. Both D. grandiflora and cornuta are comparatively sterile, although apparently so well adapted for being fertilised by insects; yet in this species (D. macrantha), where self-fertilisation cannot be rare, the plants produce an abundance of seeds. Here the anther erect, as in the bud, or still more supine, as in D. cornuta, self-fertilisation would be impossible, and other contrivances for fertilisation would be necessary. This is the case in D. cornuta, where the pollinia undergoes an upward movement after removal. I mention these circumstances with the view of seeing them worked out in the other species. At present it would seem strange that out of three very conspicuous species, the most fertile should be one frequently liable to self-impregnation. [?]——V. *Some Observations on the Mode in which certain Species of Asclepiads are Fertilised*, by the same.

Nov. 17.—Dr. J. D. Hooker, C.B., Vice-President, in the chair. The following papers were read:—I. *Contributions to the Natural History of the Passifloreæ*, by Dr. M. T. Masters. This paper treated of the morphology of the whole order, including the organography of all the genera; the minute anatomy, mode of development, manner of fertilisation, and the movements which take place in the stamens and pistils of Passiflora; the affinities of the order, together with an inquiry into the value of characters and the mode of estimating them; a complete list of the genera and species, with detailed descriptions of all the species which are not either American or African (and which will be published respectively in the "Flora Brasiliensis," and in the "Flora of Tropical Africa);" and, lastly an account of their geographical distribution. (1). Organography.—The tendrils, as shown by their development, minute anatomy and position, and the fact that they occasionally bear flowers, are merely modified flower-stalks. The leaf, whether single or divided, always commences in development at the apex, and proceeds from above downwards. There are three bracts instead of five; their position, as well as that of the other parts of the flower, relative to the axis, has been somewhat incorrectly described by Payer, Griffith, and Schleiden. Jussieu and St. Hilaire held that there is no true corolla in the Passion-flowers, but two calycine whorls, because both organs fall at the same time, but the mode of development, and the internal structure clearly demonstrate that the inner whorl is a true corolla. The calyx is quincuncial, while the petals appear simultaneously. The flower-tube is, according to Bentham, composed of a union of the calyx and corolla, but the author, on the other hand, believes it to be an expansion of the axis. Its development, like that of the corona, is comparatively late. The form of the corona was traced from its simplest form in Turnera to its most complicated arrangement in some Modeccas and Passifloras; in all cases it is a mere projection from the flower-tube, and is of late development, and morphologically of little importance, though

essential to the individual life of the plant. Each separate thread of the corona has its own distinct vascular bundle. The inner portion of the flower-tube is a glandular secreting surface. The stamens, unlike those of Cucurbitaceæ, are not perigynous, but truly hypogynous. The gynophore becomes gradually developed, raising the stamens with it. The anthers are in true Passifloreæ invariably two-celled. The pistil is singularly uniform, one-celled, made up of three united carpels, with three parietal placentæ and three stigmas. (2.) Mode of Fertilisation.—The arrangement of the sexual organs favours cross-fertilisation. The anthers, originally introrse, become, when fully developed, distinctly extrorse, owing to a peculiar structure of the apex of the filament, and it is thus rendered difficult for the pollen to fall on the stigmas of the same flower; it falls on to the rays of the corona, which are said to be the seat of the perfume in these flowers, and on which insects alight in search of the honey concealed at the base of the tube, and thus carry the pollen away to other flowers. Some species are more easily fertilised by pollen belonging to a different species than by their own; hence hybridisation is probably frequent. (3.) Affinities.—Dr. Masters connects the Passifloreæ rather with the Turneraceæ, Samydaceæ, Violaceæ, and Sauvagesiaceæ, and even with Frankeniaceæ, rather than with the Cucurbitaceæ, chiefly on account of their truly hypogynous stamens, and abundant albumen. (4.) Geographical Distribution.—The order is essentially tropical, occurring between 30° N. and 30° S. latitude. The genus Passiflora is almost exclusively American, and chiefly Brazilian; a few outliers of the true Passion-flowers occur, however, in Madagascar and Mauritius, the latter probably introduced, and in North America there is a very remarkable form, the P. incarnata, or original Passion-flower of the Jesuits; it is an annual, and apparently an alien, but remarkably uniform and invariable; its representative in Brazil is P. edulis, a climbing shrub, and an extremely variable plant. On the western side of the Andes you get entirely different forms, especially the Tacsonias, which have generally a much longer flower-tube. In India there are a few species, not belonging to the American section of the order, but to the Polyantheæ, which are found also in Ceylon and the Indian Archipelago, and one outlying species in an island near Hong Kong. In Australia and the Pacific Islands occurs a perfectly distinct group; in New Zealand another quite dissimilar form is met with. In Africa, no true Passion-flower is indigenous, except the one in Madagascar. In tropical Africa, however, several very peculiar genera occur wholly different from those on the American or Asiatic continents, but comprising few species, thus adding another illustration of the circumstance that numerous generic types, each poorly represented as to number of species, occur in Africa. Two new genera were proposed, viz., Dilkea, named in memory of the late Sir C. Wentworth Dilke, Bart., who rendered such great services to horticulture, a Brazilian genus, in some respects intermediate between Passiflora and Smeathmannia, and differing from Passiflora and Tacsonia, to which otherwise it is closely allied in the stamens, being scarcely, if at all, removed from the base of the flower-tube, in the number of stamens, and of styles (eight and four respectively), in the linear anthers, and in the peculiar corona; and Atheranthera, an Angolan plant, discovered by Dr. Welwitsch, related to Modecca, but having curiously irregular flowers, one-celled anthers, and a paniculate inflorescence. — H. *Images of the White-beaked Bottle-nose, Lagenorhynchus albirostris*, Gray, by Dr. Murie.

Obituary.

At his residence, Dulwich, Surrey, on the 2d inst., in his 68th year, Mr. James Bennett, many years gardener at Willdernesse Park Kent, and Haggerstone Castle, Northumberland.

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

Cape Pelargoniums should now be kept rather cool and dry, and what water they require should be given in the morning of fine days. Any excess of moisture which flows from the pots, over and above what the roots may have retained around them, will then have time to dry away before the time for closing up the house for the evening arrives. As I have repeatedly suggested, do not use fire-heat unless the temperature is likely to fall below 40°. A moderate temperature is in all ways most suitable to their wants. Keep a sharp look-out for aphis pests, which often crop up at this season upon such subjects, as well as on herbaceous Calceolarias and Cinerarias. Fumigate at the earliest moment all plants affected therewith. *Cinerarias* will, in many instances, be producing their flowers, and should receive applications of liquid manure alternately with fresh water. When it becomes imperative at this season to economise space by every manner of means, some such plants as the ornamental-leaved *Begonias, Hedychiums, Hydrangeas* (not being yet required for forcing), *Neriums*, &c., may be placed thickly together, and be kept rather drier at the root than other plants at this season. Some of the larger leaves may be removed from the Begonias, in fact, they may be induced to undergo a season of comparative rest. *Orchids* may be looked over, and some of the stronger kinds, which are least likely to receive injury through having fresh materials placed around any young growths forming at the base, may be top-dressed, by pressing around them moderately firmly the necessary quantity of very fibrous peat and Sphagnum, with bits of charcoal, finishing off the surfaces of each ball firmly and neatly. Stoves should now be kept up to a mean of 60°, if any show of flowers is required. *Euphorbias*, flowering *Begonias*, *Pentas carnea*, *Impatiens*, &c., will help to make up a display. Let all conservatories or show-houses be rearranged, if not weekly, at least once every 9 or 10 days, when every form of decay, whether of flowers, or leaves, must be scrupulously picked off and removed. A neat and orderly method of rearranging and setting the whole very materially enhances the general appearance of a properly furnished house; affording a tone of cheerfulness in keeping, with such an amount of pleasure as it should be the wish of all good gardeners to provide for their employers. This in itself is still further enhanced by varying as much as possible, at each re-arrangement, the general distribution of the plants within the structure. To change the appearance of the house so as to afford an occasional surprise, and to do away with that monotonous appearance too often witnessed, should be the aim of all.

FORCING HOUSES.

Those *Vineries* and *Peach* or *Nectarine houses* which are being forced must be pushed along with the utmost moderation, as any false step made now, such as forcing too hard, will not be easily rectified by-and-by. A steady but sure advance at this time will assure a greater margin for hastening them all the more some weeks hence. Guard the young growths tenderly from cold, draughty winds, affording in the meantime as much fresh air as possible. The uninitiated should understand that when fine sunny days are experienced, then, and then only, with the aid of solar heat, may the temperature be permitted to rise freely with a due proportion of air. Look periodically through all bunches of Grapes still hanging, and remove carefully every decayed or decaying berry: keep up in such houses as dry an atmosphere as possible, to which end a little fire-heat will occasionally be required. Of course untidiness in any shape or form should not be permitted. Decayed leaves should not be allowed to lay about in the houses. This is a matter not often well attended to in vineries, which, being entirely denuded of their fruits, have the dead leaves still hanging about upon the rafters, and strewed along the floors, and thus maintaining around them an unnecessary degree of humidity, to say nothing of the want of neatness. *Cucumbers* should now have every encouragement afforded them to form strong, healthy leaves, as, unlike the more congenial summer period, when a few healthy leaves are capable of carrying many fruit, it requires many leaves for the production of a single fruit now. Continue to collect the necessary quantity of horse-droppings fresh from the stable, and unmoistened by extraneous water in any way. Permit a moderate quantity of dry straw litter to become mixed with it. Turn the whole heap over, when a sufficiency has been collected to form a bed, some three times in succession, at intervals of three to four days, so as to neutralise by these means all possible chances of excess of heat at a future time when the bed is made up and spawned. Those *Mushroom beds* which are already made, and the temperature of which, when well beaten down, does not exceed 67°, should be spawned and covered over lightly; but do not add soil for three or four days, not, in fact, until it is seen whether violent fluctuations of heat are likely to follow. Introduce *Dutch Bulbs*, *Pot Roses*, *Lilacs*, *Azaleas*, *Rhododendrons*, *Deutzias*, *Kalmias*, *Daphnes*, *Sweet Briars*, &c., into proper forcing-pits or houses successively, and in quantities as may be required. Afford these a bottom-heat averaging 77°, with a humid atmosphere not exceeding 65° at the earlier stages, and when dull weather exists, without.

KITCHEN GARDEN.

On the first appearance of sharp frosty weather take up from the open borders a stock sufficient for two or three weeks' use of *Jerusalem Artichokes*, if the whole crop is not already stored; also of *Turnips*, *Horse Radish*, and *Parsnips*, if these latter are left in the ground instead of being taken up, which is always advisable, and store away safely. A neglect in this wise often causes much unnecessary trouble and labour. Keep all *Lettuces* growing in cold frames for present use as dry as possible, giving a free supply of air upon all occasions when no frost is to be feared. Remove every form of decay from all kinds of vegetables after each frosty period, and proceed with the earthing-up of late *Celery*, weather permitting. *W. E.*

TOWN GARDENING.

The beautiful Lilies, *Lilium auratum* and *L. speciosum*, do well in town, and fine roots can be now purchased at a moderate price. They should be at once potted, one root in a 32-size pot, in a compost of two-thirds sandy loam and one rotten dung, with plenty of fine broken crocks placed in the bottom for drainage. Place the root half-way down in the pot, just covering it with soil, and gradually fill it up as the stem advances in growth. They should then be placed out of the reach of frost, and when they begin to shoot give all the air possible in fine weather. The Chrysanthemums and Pompons have now done flowering, and should be taken up and laid in rows close together, labelling and keeping each root separate; they can have a mat thrown over them in sharp weather, for though they are tolerably hardy, I have known a sharp frost kill many if not covered. Their removal will likewise clear the ground for dunging and digging. Trees and shrubs can be planted now, but from my experience of town gardening I would recommend planting in February if the weather is open, or as soon after as is possible; for if they are removed then with care, they will start afresh in the spring, whereas if planted now they get choked with soot, and don't start so freely. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON,
For the Week ending Wednesday, December 14, 1870.

1870. Month and Day.	At 9 A.M. Readings of: Barometer reduced to 32° Fahr.	Dry Ther. mometer.	Wet Ther. mometer.	Hygrometrical Deduction from Glaisher's Tables, 5th edition. Dew Point	Degree of Humidity.	Weight of Vapour in a Cubic Foot of Air.
December	Ins.	Deg.	Deg.	Deg.		Gr.
8, Thurs.	29.56	28.2	27.0	22.2	77	1.5
9, Friday	29.57	31.1	30.8	30.0	95	2.0
10, Satur	29.82	33.6	33.2	32.1	93	2.1
11, Sunday	29.71	31.4	31.8	31.1	93	2.3
12, Monday	29.43	36.7	36.1	36.0	97	2.6
13, Tues.	29.36	48.2	48.2	48.2	100	3.8
14, Wednes	28.99	55.1	54.1	52.2	93	4.0

1870. Month and Day.	Temperature of the Air. Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean of Week from Mean of 30 Years.	Wind. Direction.	Horizontal Movement.	Rain. In Inches.
December	Deg.	Deg.	Deg.	Deg.	Deg.		Miles	
8, Thurs	32.1	29.2	2.9	30.7	— 12.1	N.	160	0.11
9, Friday	32.9	30.6	2.3	31.7	— 9.6	WNW. WSW.	130	0.17
10, Satur	34.9	32.2	2.7	33.6	— 7.4	S.	116	0.01
11, Sunday	39.7	34.4	5.3	35.0	— 5.7	S.E.	165	0.04
12, Monday	48.0	32.1	15.9	40.0	— 0.7	S.E. S.	240	0.23
13, Tues.	48.7	45.7	3.0	47.1	+ 6.9	SW. S.	475	0.11
14, Wednes	57.4	45.7	11.7	51.5	+ 11.1	S.W.	620	0.39

Dec. 8.—Generally overcast. Snow fell almost continuously.
— 9.—Overcast. Snow fell throughout the day. Foggy.
— 10.—Overcast.
— 11.—Variable. Very fine at times. Rain and sleet fell at night.
— 12.—Overcast during the morning and at night. Variable during the afternoon. Rain fell heavily during the day.
— 13.—Overcast throughout. Rain fell frequently during the day.
— 14.—Overcast till night; then generally cloudless. Occasional heavy showers of rain fell.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS
During the Week ending Saturday, December 10, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest	Range of Week	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	41 8	23.0	18.2	36.9	29.5	12.1	33.3	0.35
Blackheath ..	40.8	25.3	15.5	35.0	29.6	10.4	32.5	0.84
Bristol ..	..	..	..	..	..	..	..	..
Birmingham ..	42.7	25.5	17.2	37.5	23.5	7.0	33.0	0.59
Wolverhampton	41.3	20.7	20.6	36.0	29.2	6.8	32.6	0.49
Leicester ..	41.0	21.7	21.3	37.1	27.2	9.3	32.3	0.73
Norwich ..	39.0	27.7	11.3	36.3	30.2	6.7	33.4	1.43
Nottingham ..	41.1	29.4	23.7	38.8	29.5	9.3	34.0	0.86
Sheffield ..	45.2	24.5	20.5	39.8	31.0	8.8	35.7	1.11
Liverpool ..	44.0	27.5	16.5	39.0	31.1	6.8	35.5	0.68
Manchester ..	..	..	..	..	..	..	..	..
Salford ..	44.7	23.9	21.7	40.1	29.5	9.6	35.1	0.40
Bradford ..	40.0	20.0	17.0	41.3	33.5	7.8	37.3	1.19
Leeds ..	45.0	30.0	15.0	41.1	31.8	6.3	37.0	1.00
Hull ..	47.0	21.0	25.0	40.1	29.4	10.7	34.7	1.50
Newcastle ..	45.0	28.0	17.0	40.2	32.8	7.4	36.1	1.82
Edinburgh ..	43.7	29.0	14.7	..	..	..	36.9	0.60
Glasgow ..	43.5	25.7	17.8	..	..	..	35.7	0.04
Dundee ..	45.0	22.0	18.0	..	..	..	33.7	0.90
Aberdeen ..	45.3	28.5	16.8	..	..	..	37.0	0.90
Paisley ..	44.0	26.0	17.0	..	..	..	36.4	0.00
Greenock ..	43.0	31.0	12.0	..	..	..	37.1	0.25
Leith ..	43.9	28.7	16.2	..	..	..	37.7	0.71
Perth ..	46.0	25.0	21.0	..	..	..	37.6	2.49
Dublin ..	..	..	..	..	..	..	..	..

James Glaisher.

Notices to Correspondents.

Approaching Royal Marriage: *G. L. D.* Doubtless your suggestions will be attended to. We hope, however, we shall not be near when the bagpipes make "the herrings jump several feet out of the water." We should prefer our herrings caught in the ordinary manner.

Books: *J. D.* "Pettigrew on Bees." A new edition of Dr. Bevan's "Honey Bee" is also announced, which will probably suit your purpose.

Conservatory Plants: *G. T. C.* You will find the following a good selection. Foliage plants:—Aralia Sieboldii variegata, Araucaria excelsa, Beaucarnea tuberculata, Chamærops humilis, Corypha australis, Dracæna indivisa Veitchii, D. terminalis, Latania borbonica, Oreopanax dactylifolium, Phormium tenax variegatum, Sealorthia elegans, Yucca aloifolia variegata, Y. quadricolor. Flowering plants:—Aphelexis macrantha purpurea, Brugmansia sanguinea, B. suaveolens, Genista Everestiana, Imantophyllum miniatum, Kalosanthes coccinea, Lilium auratum, L. speciosum rubrum, Statice profusa (Rattrayana), Tacsonia Van Volxemi, Tropæolum Jarratti, Epiphyllums of sorts.

Cottage Plans: *Mrs. P.* Many thanks; please send them.

Foliage versus Flowers: *Mr. Heale* requests us to

correct a clerical error, which crept into his note on this subject last week. For "ornamental foliage plants," read "ornamental flowering plants," which is the correct quotation from Mr. Williams' book.

FROST ON CHRISTMAS DAYS: *Gardener.* The lowest temperature on Christmas Day, 1860, was 8° below zero, at Nottingham. The lowest temperature on Christmas Day, 1861, was 23°, and the lowest temperature was zero at Lampeter, in January, 1867.

HERBARIUM SPECIMENS: *H. G.* Strapping or pinning (with entomological pins and neat strips of paper) Fern fronds is all very well if the sheets are not much used, and are handled very carefully; but where they are in any bulk, and are often referred to, the fronds should be stuck down to the surface of the paper, for which purpose there is nothing better than thin carpenters' glue (best glue), kept gently heated while being used, so that it may not work clammy. With finely cut fronds it requires laying on carefully, and with a light even hand.

HOT-WATER PIPES: *R. K.* No; the wooden stage will not be affected by the pipes of an ordinary hot-water apparatus, under the conditions named, if there is sufficient space to permit the circulation of air between the pipes and the wood.

MEDLAR JELLY.—The following replies have been received to the inquiry of "Mary":—"Take Medlars, when they are quite ripe, wash them, and put them into a preserving pan, with as much water as will cover them; let them simmer till they have become a pulp, then strain them through a jelly-bag, and to every pint of liquor add three-quarters of a pound of loaf sugar, and boil it an hour and a half." *A Lady.*—When the Medlars are quite ripe, bruise them and put them in a large stew-pan. Well cover them with water, and boil them half an hour; then strain them through a flannel bag. To a pint of juice add three-quarters of a pound of lump sugar; boil the juice three-quarters of an hour, then put in the sugar and boil it 25 minutes. *G. T.*—Put the Medlars in a pan, and cover them with water. Boil them to a pulp, then strain through a cloth, and to every pint of the liquor add 1 lb. of lump sugar, and boil the same as Apple or Currant jelly. When Medlars are scarce a second supply of water may be added, and sometimes a third. The Medlars may be done green, or ripe (rotten). *A. S. K.*

PRIMULA: *S. R. H.* The ordinary double Fern-leaved variety.

TAXATION OF HOT-HOUSES: *J. G.* inquires to what extent market-gardeners' hot-house glass is liable to taxation, in so far as regards local rates and Government taxes, and whether any one can refer him to any previous legal decisions on the above subject? Will some of our correspondents kindly answer "J. G.'s" inquiries.

VINE BORDERS: *J. W.* The materials you describe, "road-scrapings and manure," we certainly should not select for the composition of our Vine borders, excepting in limited quantities for admixture with other soils. Your border, we should say, is fully porous enough—at least the material, and Vines will only succeed in such material by frequent heavy top-dressings and constant waterings, which was perhaps the intention of their maker. The 16 inches of broken bricks below are necessary for drainage: that you could not improve. We think that if the soil is really so poor and sandy as you describe, you might greatly improve it by the addition of some good turfy maiden loam of a more clayey nature, and some ground bones as a top-dressing a few inches this year, and a few the next, as your roots reach it. Vine borders can scarcely be too porous, but then the materials should be of a nature suitable for the sustenance of the plants; those you describe we do not think are so.

WILLOWS.—The Weeping American Willow is known in the nurseries as Salix americana pendula, but no such name is known to botanists. The Kilmarnock Willow is a variety of Salix Caprea. Salix daphnoides is not British, but Swiss; it has been erroneously recorded as British. We do not know the Red-heart Willow, nor the Cornwall Willow.

COMMUNICATIONS RECEIVED:—R. H.—A. H.—F. B.—W. J.—F. F. P.—A Sub.—R. B. M.—J. H. D. J. K.—R. M. G. G.—J. S.—T. R.—W. T.—A. F.—T. C.—P. S. R.—R. W. K.

Markets.

POTATOS. Southwark, Dec. 12.

During the past week the arrivals coastwise and by rail have been more plentiful, and the prices of the former week were barely maintained. The following are this day's quotations:—Yorkshire Regents, per ton, 70*s.* to 80*s.*; Lincolnshire do., 65*s.* to 75*s.*; Dunbar and East Lothian do., 75*s.* to 80*s.*; Perth, Forfar, and Fifeshire do., 65*s.* to 75*s.*; Kent and Essex do., 55*s.* to 65*s.*; do. Rocks, 55*s.* to 60*s.*

COVENT GARDEN.—Dec. 16.

Trade generally is in much the same condition as indicated in our last report. The slight improvement then noticed has been maintained, but no advance in prices can be effected without shortening sales. The return of mild weather induces large holders to give way. We do not expect any improvement in the Potato market during the present month. Amongst flowers we have Orchids, Chrysanthemums, Heaths, Cyclamens, Primulas, Hyacinths, Tulips, Camellias, and Pelargoniums, and a large supply of dwarf evergreens and "Christmas trees."

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve	1 0	to 2 0	Oranges, per 100	0 0	to 0 0
Grapes, per lb.	4 0	— 8 0	Pears, per doz.	2 0	— 6 0
Lemons, per 100	6 0	— 10 0	Pine-apples, per lb.	4 0	— 6 0
Melons, each	1 0	— 3 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. lb.	0 2	to 0 4	Herbs, per bunch	0 2	to 0 4
Beet, per doz.	2 0	— 3 0	Horse Radish, p. bun.	3 0	— 5 0
Brus. Sprouts, ½ sieve	3 0	— 3 6	Lettuces, p. score	1 6	— 3 0
Cabbages, p. doz.	1 0	— 2 0	Mint, per bunch	0 3	— 0 6
Carrots, p. bunch	0 4	— 0 8	Mushrooms, p. pott.	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch	0 4	— 0 9
Celery, red, p. bun.	1 6	— 2 0	Parsley, p. bunch	0 2	— 0 4
— white, do.	1 0	— 1 6	Salsafy, per bundle	1 3	— 1 6
Cucumbers, each	0 6	— 1 0	Seakale, p. pun.	3 0	— 3 6
French Beans, p. 100	3 0	— 4 0	Shallots, per lb.	0 6	— 0 —
Garlic, per lb.	0 8	— 0 —	Spinach, p. bushel	2 0	— 3 0
			Tomatos, per doz.	1 0	— 1 6

Potatos, Regents, per ton, 60*s.* to 80*s.*; Kidneys, 80*s.* to 120*s.*; Rocks, 50*s.* to 60*s.*

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that he is now sending out the above beautiful APPLE. An illustration of it, and a description by Dr. Hogg, is given in the "Florist and Pomologist" for March, 1870, in which he says that it is "Destined and worthy to take its place amongst the worthiest of its kind." Dwarf maiden trees, 7*s.* 6*d.* each

Nurseries, Shipston-on-Stour

Brockworth Park Pear.

ORDERS for fine PYRAMID TREES of this MAGNIFICENT NEW PEAR

Are now being booked, for execution in strict rotation as received. The demand is so great that Purchasers may now ensure the first selection for next season.

J. C. WHEELER AND SON, NURSERYMEN, Gloucester, and 59, Mark Lane, London, E.C.

New Fruits.

BURGHLEY PARK CHERRY.—Maidens, 7*s.* 6*d.* each; a few large fruiting trees, 10*s.* 6*d.* to 15*s.* each. Cuttings for grafts, 6*d.* each.

ANNIE ELIZABETH APPLE. Fine Maidens, 2*s.* 6*d.* each

LORD BURGHLEY APPLE, 1*s.* each.

THE IMPERIAL CRAB, 2*s.* 6*d.* each

Seed of CINERARIA ACANTHIFOLIA, saved this season, 2*s.* 6*d.* per packet

I. HOUSE, Eastgate Nursery, Peterborough.

Fastolf Raspberry (True).

ISAAC BRUNNING begs to offer good well-ripened CANES of the above unrivalled RASPBERRY, in packages containing 25 for 3*s.*, 50 for 5*s.*, 100 for 9*s.* Also, GLADIOLUS BRENCHLEYENSIS, very showy scarlet flowering bulbs, 1*s.* 6*d.* per dozen, 9*s.* per 100; true old crimson CLOVE CARNATIONS, 2*s.* per dozen, 15*s.* per 100; BRUNNING'S PRINCE of SCARLETS, &c. Magnificent variety, 4*s.* per dozen; FELLOWES ATTRACTION PICOTEE, 4*s.* per dozen; Herbaceous CALCEOLARIAS, a superb strain, 4*s.* per dozen, 12*s.* per 100; AMERICAN ROSE POTATO, 5*s.* per peck, 6*d.* per lb. No charge for package. The usual discount to the Trade.

ISAAC BRUNNING, Great Yarmouth Nurseries.

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAURELS, 5 to 7 ft. | COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet
RHYNCOSPERMUM, very thickly set with buds

The above have recently been transplanted, are very bushy and some plants, and quite safe. Five per cent off one hundred on application.

Floral Nursery, Hailsham, Sussex

Winter and Spring Flowering Plants

FRANCIS & ARTHUR DICKSON & SONS have a magnificent stock of the above, in fine, strong, healthy plants, including AZALEAS, CAMELLIAS, CARNATIONS (Tree), CYCLAMEN, CYTISUS, EPACRIS, ERICAS, LILY of the VALLEY (imported clumps), SPIRÆA JAPONICA (ditto ditto), VIOLETS, &c. Also a choice selection of Plants suitable for Table Decoration, including Palms, &c. For prices and particulars, see covered PLANT CATALOGUE, which will be sent free per post on application

"Upton" Nurseries, Chester.

Winter Flowers.

AZALEA HYBRIDA ODORATA is the best and most convenient plant for winter and early spring blooming, the flowers being white and very fragrant; one truss, with a few other flowers, will make a handsome bouquet. Small plants bloom freely, and my large plants have from 40 to 50 flowers heads on.

RHODODENDRON MULTIFLORUM, a small-leaved, bushy-growing plant, producing thousands of white flowers.

Both of the above are in fine bloom. Prices and other particulars of these and other plants raised by me forwarded on application to

ISAAC DAVIES, Nurseryman, Ormskirk.

FRANCIS & ARTHUR DICKSON & SONS, The Old Established Seed Warehouse, 106, Eastgate Street, and the "Upton" Nurseries, Chester.

LILY of the VALLEY, imported Clumps, 18*s.* to 24*s.* per dozen.—These are specially grown for early forcing, and are much superior to English grown; producing very large and fragrant flowers in great profusion.

SPIRÆA JAPONICA, imported Clumps, 12*s.* to 18*s.* per dozen.—For Conservatory or Greenhouse decoration in spring nothing can be finer, and for table purposes or for bouquets it is unsurpassed. It is admirably suited for early forcing.

Choice Seeds from Prize Flowers, saved by

JOHN DOBSON AND SONS, exclusively from the finest varieties in cultivation, in sealed packets.

CALCEOLARIA, splendid strain, 1*s.* 6*d.*, 2*s.* 6*d.*, 3*s.* 6*d.*, 5*s.*

CINERARIA, 1*s.*, 2*s.* 6*d.*, 3*s.* 6*d.*

PRIMULA SINENSIS FIMBRIATA ALBA, or RUBRA, or Mixed, 1*s.* 6*d.*, 2*s.* 6*d.*, 3*s.* 6*d.*

BALSAM, very fine, 8 varieties, 1*s.*, 2*s.*

CYCLAMEN, 1*s.*, 2*s.* 6*d.*

Woodlands Nursery, Isleworth, W.; and High Street, Bromley, W.

To Architects, Landscape Gardeners, and Others.

CITY of ROCHESTER.

ROCHESTER CASTLE RECREATION GROUNDS and PUBLIC WALKS.—The Committee beg to give notice that the time stated in the former Advertisements for sending in Designs has been extended from January 4 to February 4, 1871; and further, that DESIGNS will be received either to a scale of 10 feet to an inch, as stated in the Conditions, or to a scale of not exceeding 20 feet to an inch, at the option of the Competitors.

By Order of the Committee,

RICHARD PRALL, Town Clerk.

Town Clerk's Office, Rochester, December, 1870.

PARTNER.—WANTED, a MANAGING PARTNER, in the Seed Trade. Established 25 years, and capable of great extension. In the North of England. This is a valuable opportunity.—For particulars address A. B., *Gardeners' Chronicle* Office, W.C.

FRANCIS & ARTHUR DICKSON & SONS, 106, Eastgate Street, Chester, have an OPENING for an active YOUNG MAN in their Farm Seed Warehouse. Must be specially acquainted with Agricultural Seeds, and be able to execute Orders for the same with despatch. Unexceptionable references as to character and ability required. Apply as above, stating age, experience, and salary expected.

WANTED, an experienced NURSERY PACKER.—Apply, stating wages expected, to G. AND W. YATES, Seedsmen and Nurserymen, Manchester

WANTED, young Men, as IMPROVERS. Lodgings on the Premises.—A. HENDERSON, Sion Nursery, Thornton Heath, Croydon

Seed Trade.

WANTED, an IMPROVER.—Apply, stating age and salary required, references, &c., to CHARLES H. DICKSON, Manchester.

WANTED, an ASSISTANT.—Must have a thorough knowledge of the Seed Trade. One having a knowledge of Nursery Business preferred. None but steady competent Men, who can give references that will bear strictest scrutiny, need apply to H. A. B., Mr. Quick, Merchant, Barnstaple, Devon.

WANTED, in a Wholesale London Seed Establishment, an ASSISTANT SHOPMAN.—Must have a knowledge of the Trade.—Apply, stating age, experience, and salary required, to ALFRED LEGERTON, Seed Merchant, 5, Aldgate, London, E.

WANT PLACES.—Letters to be Post Paid.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen requiring Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, N.W.

To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Lady or Gentleman requiring GARDENERS or BAILIFFS may freely apply to J. CARTER & CO., stating the most stringent regulations in reference to testimonials as to ability, honesty, &c.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD and UNDER GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust

Victoria and Paradise Nurseries, Upper Holloway, London, N.W.

Seed Trade.

COMMISSION WANTED.—An energetic Man, who Travels the whole of Ireland, desires Seeds on Commission from a first-class House. The Advertiser has a few Commissions from some of the best Houses in England other Trades; and is anxious to add to those the Seed Trade, which would work well with those he has. He is thoroughly acquainted with the Seed Trade, and all matters incidental to it. Knows every man connected with Trade in Ireland. Has a first-rate connection, having been many years on the road for the best houses in Ireland. Can procure the highest testimonials and give security to a large amount if necessary.—A. C. D., *Gardeners' Chronicle* Office, W.C.

GARDENER (HEAD).—Age 32, married, no incumbrance; thoroughly understands the profession in all its branches. Good references.—D. G., Post Office, Riverhead, near Sevenoaks, Kent.

GARDENER (HEAD).—Age 30; thoroughly practical. Could Manage Land and Stock. Wife can take charge of Dairy or Poultry. First class characters.—G. M., 11, Allen Street, Bagshot Street, Walworth, S.E.

GARDENER (HEAD), to any Lady, Nobleman, or Gentleman requiring the services of a first-class Gardener.—Testimonials may be had by applying to Mr. Roberts, Gr. to Lord C. Paget, Plasllanfair, Anglesey, North Wales; also from Mr. Speed, Gr. to Lord Penrhyn, Penrhyn Castle, Bangor, North Wales; and from Mr. Bisset, Gr. to the Earl of Sefton, Croxteth Park, Liverpool.—C. W. COOK, 9, Harpur Street, Red Lion Square, London, W.C.

GARDENER (HEAD), married, no family. F. HILL is desirous of engaging himself to any Lady or Gentleman requiring the services of a thoroughly practical Man. Well understands the Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables; general routine of Gardening. Has had great experience in the cultivation of Orchids. Can receive highest testimonials from late employer.—F. HILL, 2, Grove Cottage, Sycamore Grove, New Malden, Kingston-on-Thames, Surrey.

To Noblemen and Gentlemen.

GARDENER (HEAD).—W. NICHOL, Gardener to G. H. Powell, Esq., Drinkstone Park, Bury St. Edmund's, would be glad to recommend a thoroughly trustworthy Man, Charles Ford, to any Nobleman, Lady, or Gentleman, requiring the services of a thorough practical Man. Well up in growing Specimen Stove and Greenhouse Plants. Obtained a Certificate in Floriculture in April, 1870. Twelve years' experience

GARDENER (HEAD, WORKING).—Age 40, married, from the South; thoroughly practical in all branches of Horticulture. Is well known to Mr. Henderson, Pine Apple Nursery, Edgware Road, London, who will see, or answer any inquiry from, any Lady or Gentleman requiring a thoroughly practical and steady Man. Can be highly recommended.—A. B., 24, Palestine Place, Broomhill, Sheffield.

GARDENER (HEAD, WORKING), age 35, married.—WILLIAM HENDERSON, for the last 3 years gardener to Thomas Marrian, Esq., Thurcroft Hall, Maltby, Rotherham, is at liberty to treat with any Lady or Gentleman requiring the services of a thorough practical Gardener; well understands the Early and Late Forcing of all kinds of Fruits, Flowers, and Vegetables; and the Management of Fruit, Flower, and Kitchen Garden. Wife, having no family, can undertake the duties of Laundress, or take Charge of Gentleman's Residence. Characters will bear investigating.—WILLIAM HENDERSON, Cocker Hall, Fence Houses, Durham.

GARDENER, under the Foreman, in a Gentleman's Establishment.—Age 20; two and-a half years' character from last place.—JAS. HAYES, Tanner's End, near Edmonton, N.

GARDENER, where two or three Men are kept.—Married; understands Vines, Cucumbers, Melons, Wall Fruit, and Flower and Kitchen Gardening. Two years' character from present employer.—The GARDENER, Brook Heath, Dreamore, Salisbury, Wiltshire

GARDENER (SINGLE-HANDED, or where a Lad is kept).—Age 26, no incumbrance, respectable; understands the Cultivation of Vines, Melons, Cucumbers, and Flower and Kitchen Gardening. Wife can attend to Lodge. Good reference.—H. FINN, Gardener, Fairfield House, Harrow Weald, Middlesex.

IMPROVER, in a Wholesale or Retail Seed Warehouse.—Age 20; 3 years' reference. Salary immaterial.—ALPHA, Post Office, Gloucester.

LAND AGENCY.—A Gentleman of experience and capital is open for Re-engagement.—R. BELL, Post Office, Wingate, County Durham.

BAILIFF, or to Manage an Estate.—Middle-aged, married, no family, respectable; thoroughly understands the business. Wife can manage Dairy and Poultry. Good character.—Y. Z., Mr. Tegood, The Queen's Seedsman, Southampton

FARM BAILIFF (WORKING).—No family; has had great experience in the Management of Farm Stock and Land. Wife a good Dairywoman.—Mr. T. DODDS, Mount Pleasant, Wakefield, Yorkshire.

BAILIFF (WORKING), or COWMAN, in a Gentleman's Family. Long experience in Stock and Poultry, and good Pig Killer. Good character.—S. T., Post Office, Mitcham, Surrey.

CLERK, or ASSISTANT SHOPMAN.—A young Man; has been three years at the Trade. A situation in which he could acquire experience more an object than salary.—J. P., 108, Cork Street, Dublin.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited),
CORN, SEED, MANURE, AND OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

To the Trade.—Agricultural and Garden Seeds.

J. AND F. SHARPE are now prepared to make special offer of the above Seeds, comprising TURNIP, CARROT, MANGEL WURZEL, RUTABAGA, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from adulteration of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech.

JOHN K. KING, SEED GROWER, Coggeshall, Essex (Stand No. 78, Smithfield Club Cattle Show), exhibits his unrivalled Stocks of hardy Prize MANGEL WURZEL, SWEDES, GREEN GLOBE TURNIPS, KOHL RABI, &c.

Special prices for these unrivalled Stocks up to December 31, 1870.

KING'S CHAMPION ORANGE GLOBE MANGEL WURZEL. 5*l.* per lb.
KING'S YELLOW GLOBE, fine variety, 8*d.* per lb.
KING'S LEVETHAM LONG RED, 10*d.* per lb.
KING'S fine LONG YELLOW, 8*d.* per lb.
KING'S RED GLOBE, 9*d.* per lb.
KING'S INTERMEDIATE, 9*d.* per lb.
Sample per the cwt. Carriage paid to all stations.
A SILVER CUP and other Prizes will be given for Competition to Growers of Roots from Seeds supplied by J. K. KING, from these stocks, next season.—Address as above.

Notice to the Trade.

HURST AND SON beg to inform the Trade that they hold part of the Stock of LAXTON'S NEW PEAS, QUANTITY and QUALITY, also EASTES' KENTISH INVICTA, and will be happy to give prices on application.

Trade CATALOGUES are now ready, containing all the novelties for the season

HURST AND SON, 6, Leadenhall Street, London.

NUTTING AND SONS, 60, Barbican, London, E.C., beg to offer the following PEAS:—
NUTTING'S No. 1, WRINKLED.—One of the earliest wrinkled marrows; very prolific, and fine flavour, 2*s.* per quart.
NUTTING'S MULTUM IN PARVO.—A new early, and exceedingly prolific dwarf wrinkled marrow, with broad and well-filled pods, and of excellent flavour, 2*s.* 6*d.* per quart.
THE FORTYFOLD. A superior variety, tall-branching habit, large curved pods, very prolific, and of first-rate quality, 1*s.* 6*d.* per quart
LORD PALMERSTON.—A superior dwarf wrinkled marrow, with fine long well-filled pods, excellent flavour, 2*s.* 6*d.* per quart.,
Trade price on application

BROCCOLI, ELLETSON'S NEW SURPRISE, a large late white protecting.—This variety is a great improvement upon the Mammoth Cauliflower Broccoli, sent out 20 years ago by J. & J. Elletson, of Thornaby-on-Tees, and has given universal satisfaction, and proved itself to be the best late white Broccoli extant. Price 1*s.* per packet.
CUCUMBER, FOSTER'S X.L., fine long Ridge.—This new variety is a remarkably fine, hardy, long, dark green Cucumber, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. Price 1*s.* per packet.
MELON, LORD NAPIER, New.—A handsome exhibition variety, golden yellow, and beautifully netted; green-flesh, melting, juicy, and delicious in flavour; free setter, and hardy in constitution. Price 1*s.* 6*d.* per packet.
EDMUND PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street, Hull

REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery, on application, and in the confident belief that it will be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken
REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England
"Analytical Laboratory, 11, Salisbury-square, Fleet Street, E.C
"London, January 15, 1870
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent of moisture, and fully 21 per cent of valuable and easily soluble phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
ODAMS'S DISSOLVED BONES.
ODAMS'S SUPER-PHOSPHATE of LIME.

MANUFACTURED BY THE

PATENT NITRO-PHOSPHATE or BLOOD MANURE COMPANY (Limited).
Chief Offices—109, Fenchurch Street, London, E.C
Western Counties Branch—Queen Street, Exeter.
Irish Branch—40, Westmoreland Street, Dublin.
DIRECTORS.
Chairman—John Clayden, Littlebury, Essex.
Deputy Chairman—John Collins, 265, Camden Road.
Edward Bell, 48, Marine Parade, Brighton.
Richard Hunt, Stanstead Abbot, Herts.
Robert Leeds, Wicken House, Brandon, Norfolk.
George Saville, Ingthorpe, near Stamford.
Samuel Jonas, Crishall Grange, Essex.
Charles Dorman, 23, Essex Street, Strand, W.C.
Thomas Webb, Hildersham, Cambridgeshire.
Jonas Webb, Melton Ross, Lincolnshire.
C. J. Lacy, 60, West Smithfield, E.C.
Managing Director—James Odams
Bankers—Messrs. Barnetts, Hoares & Co., Lombard Street, E.C.
Solicitors—Messrs. Kingsford & Dorman, 23, Essex St., Strand, W.C.
Auditor—J. Carter Jonas, Cambridge.
This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz.,
"THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
Particulars will be forwarded on application to the Secretary, or may be had of the local Agents.
C. T. MACADAM, Secretary.
Chief Offices—109, Fenchurch Street, London, E.C.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10*s.* 6*d.*; ½ cwt., 21*s.*; and 1 cwt., 42*s.*, with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, SUPERPHOSPHATE of LIME,
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.
116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

Landscape Gardening, Groundwork, the Making of NEW ROADS, PLANTING GARDENS, PARKS and PLEASURE GROUNDS, DRAINING LAND, &c.

WM. WOOD AND SON are prepared to undertake and execute Work as above to any extent, either by contract or otherwise. Estimates, Plans, and Specifications supplied on the shortest notice.
Park Fencing undertaken to any extent.
N.B. Plans and Designs for Horticultural Buildings, &c., &c.
Woodlands Nursery, Mareshield, near Uckfield, Sussex

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS on every description, and SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E

FOR SALE, an old established NURSERY and SEED BUSINESS, within a few miles of London, containing about 14 Acres of General Nursery Stock, numerous Glass Structures, Seed Shop, Dwelling House, &c.
For particulars enquire personally, by letter only, with name and address, to "GERANIUM," 6, Gloucester Road, Seven Sisters' Road, Holloway, N.

To Nurserymen and Florists.

TO BE SOLD, with immediate possession, the LEASE, GOODWILL, and STOCK in TRADE of a BUSINESS, long and favourably known for 30 years' standing, situated in the best part of St. John's Wood. The premises comprise a pretty Villa, with large area of ground, Six large Glass-houses, &c. Proprietor leaving for the country. For further particulars apply to
Mr. WOODS, House Agent, 16, Wellington Road, St. John's Wood, N.W.

To Nurserymen, Florists, and Others.

TO BE SOLD, The PORTLAND NURSERY, at Tonbridge, Kent, containing 6½ acres, of which about 2 acres are stocked with Shrubs, Conifers, and Forest Trees, &c., and held on a 13 years' lease, with a House and Convenient Garden at the low rent of £80 a year. Stock to be taken by valuation—from £2000 to £3000.
For particulars apply to Messrs. STONEWALL AND SIMPSON, Solicitors, Tunbridge Wells.

SALES BY AUCTION.

PRELIMINARY NOTICE.—The celebrated HERD of SHORTHORNS belonging to Jon. Peel, Esq., at Knowlmere Manor, Clitheroe, will be SOLD by UNRESERVED AUCTION, during the SPRING. Further particulars will be duly announced.
JOHN THORNTON.
15, Langham Place, London.—December, 1870.

Leamington.

ABSOLUTE CLEARANCE SALE of VALUABLE NURSERY STOCK, fine CAMELLIAS and AZALEA INDICA, CHOICE FERNS, &c.

MESSRS. PROTHEROE AND MORRIS are instructed by Messrs. Wills & Son to SELL by AUCTION, on the Premises, "The Home Nursery" (known as the Milverton Nursery), Leamington, on TUESDAY and WEDNESDAY, December 20 and 21, at 11 for 12 o'Clock precisely each day, without reserve (the land having undergone and in course of building improvements), the whole of the thriving NURSERY STOCK, consisting of a choice and varied assortment of Evergreen and Coniferæ Shrubs, comprising fine Thujopsis, Cupressus, Retinospora Aurea and Thuyas, Golden Yews, variegated and named Hollies, unique specimen trimmed Box, Rhododendrons, Spruce Firs, Standard and Dwarf Roses, large quantities of fine Standard Beech, Peaches, and Nectarines, and large fruiting Pear trees; also some handsome specimen Camellias and Azalea indica, choice Exotic Ferns, &c.
May be viewed any day prior to the Sale. Catalogues may be had on the Premises, and of the Auctioneers and Valuers, Leytonstone, Essex, N.E.

38 and 39, Gracechurch Street, City, E.C.

CONSIGNMENT from GHENT for ABSOLUTE SALE.
MESSRS. PROTHEROE AND MORRIS will SELL by AUCTION, without reserve, at the City Auction Rooms, 38 and 39, Gracechurch Street, E.C., on SATURDAY, December 24, at 12 for half-past 12 o'Clock precisely, about 200 choice Double CAMELLIAS and AZALEA INDICA, compact and very thriving plants of the best varieties, beautifully set with bloom buds; also a quantity of handsome standard and dwarf ROSES, selected FRUIT TREES, Scarlet and Hybrid RHODODENDRONS, and other choice AMERICAN PLANTS: an assortment of CONIFERÆ, and EVERGREEN SHRUBS, DUTCH BULBS, &c.
On view the morning of Sale. Catalogues may be had at the Rooms as above, and of the Auctioneers and Valuers, Leytonstone, Essex. Further

In Liquidation.

Re JAMES FAIRHEAD, of 7, Borough Market, and 70, Borough High Street, S.E.
IMPORTANT to the SEED TRADE.

MESSRS. PROTHEROE AND MORRIS have received instructions from the Trustee to SELL by AUCTION, on the Premises, 70, Borough High Street, London, S.E., on THURSDAY, December 29, at 11 for 12 o'Clock precisely, the whole of the AGRICULTURAL, GARDEN, and FLOWER SEEDS, TRADE UTENSILS and IMPLEMENTS belonging to the above Estate.
Catalogues, when ready, may be had of Mr. BENJAMIN NICHOLSON, Accountant, 7, Gresham Street, E.C.; on the Premises as above; and of the Auctioneers and Valuers, Leytonstone, Essex. Further particulars will appear next week.

SALE THIS DAY AT HALF-PAST 12 O'CLOCK PRECISELY.

Hardy Trees and Shrubs, and Dutch Bulbs.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on SATURDAY, December 17, at half-past 12 o'Clock precisely, specimen Variegated and Green HOLLIES, RHODODENDRONS, CONIFERS, KALMIAS, LAURELS, FRUIT TREES, CARNATIONS, PICOTEES and PINKS, ERICAS, first-class English ROSES; Rustic Seats, Stools, Vases, Baskets, &c. Also an importation of choice DUTCH BULBS, CROCUSES, NARCISSUS, IRIS, LILIUMS, GLADIOLI, &c., just arrived from Holland.
On view the morning of Sale, and Catalogues had.

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on TUESDAY, December 20, at half-past 12 o'Clock precisely, valuable POULTRY and PIGEONS, including many Prize Birds from Miss E. Browne, Miss E. Williams, Miss J. Milward, Rev. G. Raynor, and other well-known Fanciers.
On view the morning of Sale, and Catalogues had.

Utilization of Sewage.

THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.
(Incorporated by Act of Parliament in 1849.)

Thomas Chapman, Esq., F.R.S.	The Rt. Hon. Viscount Combermere
George Thomas Clark, Esq.	Henry Wm. Currie, Esq.
John Chevalier Cobbold, Esq.	Edward John Hutchison, Esq.

Principal Engineer—Mr. J. Bailey Denton.
Works of Sewage Irrigation are executed by the Company.
Arrangements will be made with Landowners, Boards of Health, Sewer Authorities, and others, for undertaking such works, and all works incidental thereto.
The outlay may be repaid by a sum in gross or by a terminable yearly payment, discharging in a fixed period the principal amount with interest thereon.
Applications to be made to ARTHUR MILMAN, Esq., the Secretary, at the Offices of the Company, 22, Whitehall Place, London.

THE LANDS IMPROVEMENT COMPANY.—
(Incorporated by Special Acts of Parliament.)
DIRECTORS.

John Clutton, Esq., 9, Whitehall Place, S.W.	
Frederick L. Dashwood, Esq., Kirtlington Park, Oxford.	
Henry Farquhar, Esq., 16, St. James Street, S.W.	
Lord Garlies, M.P., 85, Eaton Square, S.W., and Galloway House, Wigtonshire, N.B.	
John Horatio Lloyd, Esq., 1, King's Bench Walk, Temple, E.C.	
Granville R. Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.	
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.	
Henry W. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.	
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.	

The Company advances money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.
UTILISATION of SEWAGE.—The Company also advances money for the purpose of Works of Sewage Irrigation.
The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.
No investigation of title is required.
For forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

DISTRESSED FRENCH PEASANT FARMERS.
APPEAL to ENGLISH AGRICULTURISTS.
A PUBLIC MEETING will be held at the SALISBURY HOTEL, Salisbury Square, Fleet Street, on MONDAY NEXT, the 19th inst., at 5 o'Clock P.M., for the purpose of appointing a COMMITTEE to receive SUBSCRIPTIONS of CORN and other SEEDS, to be supplied GRATIS to the SUFFERING PEASANT FARMERS of France, thus enabling them to Sow their Land, and avoid an otherwise inevitable famine.
The Chair will be taken by Lord VERNON, President of the Royal Agricultural society.

B. T. BRANDRETH GIBBS, Honorary Secretary of the Smithfield Club	Hon. Secs. *pro tem.*
H. M. JENKINS, Secretary of the Royal Agricultural Society.	
W. H. DELANO, Honorary Agent in England of the Société des Agriculteurs de France	

ROYAL AGRICULTURAL SOCIETY of ENGLAND.
FARM PRIZES.
In connection with the Country Meeting of the Society for the year 1871, the following PRIZES will be offered for the BEST MANAGED DAIRY FARMS in the Counties of Shropshire and Staffordshire, viz.:—
For the Best Managed Arable Farm:
First Prize, £100
Second Prize, £50.
For the Best Managed Dairy Farm:
First Prize, £100
Second Prize, £50
Forms of Entry and the conditions of Competition will be published in the first week of January, for which they may be obtained on application to
H. M. JENKINS, Secretary.
12, Hanover Square, London, W.

The Agricultural Gazette.

SATURDAY, DECEMBER 17, 1870.

THERE cannot be a doubt that the DEVON BREED of CATTLE has this year been displayed in force enough to materially delay the period when its precedence, even in the exhibition lists of the Smithfield Club, must be abandoned. Taking the cups for the best ox and the best heifer in all the classes in the Agricultural Hall, and looking from the galleries as like an early fattening profitable breed as either Herefords or Shorthorns, one cannot this year grudge the small red cattle their place of honour. While, however, after two-and-a-half years' feeding, the Devon does not come within one-half the weight of a well-fed Shorthorn at the same age—while it hardly makes any show at all at the great Christmas cattle markets—while it constitutes probably not more than 2 or 3 per cent. of the live stock of the country—the Shorthorns meanwhile influencing, or *being* probably thirtyfold as many, we cannot doubt that, in spite of the enthusiastic adherence of individual or local preference, the Devon breed is likely to decrease rather than increase.

This enthusiasm, however, in favour of a mere "family," as it may now be called—contrasting it with the general prevalence of other breeds of cattle—does a great deal to make the Smithfield Cattle Show as interesting as it is—a great deal even, by keeping the breeders of the more important classes on their mettle, to ensure the excellence of the exhibition generally. The classes of Devon and Sussex cattle are as large and good as many even of the Herefords and Shorthorns; and though a comparison of weights and ages in the several classes does not bear out the impression one gathers from the first general view of them, yet it is impossible to deny that the

maximum result attainable under special care even in these breeds of such limited importance is not undeserving the patronage of an agricultural society.

If we compare the average age and live weight of the several classes of the leading breeds, they stand as follows:—Seven Devon steers, averaging 28 months of age, averaged 10 cwt. 0 qr. 20 lb. in live weight; six Hereford steers, averaging 28 months of age, averaged in like manner 14 cwt. 1 qr. 13 lb. in live weight; and four Shorthorn steers, of 28 months, averaged 15¾ cwt. Taking the next class in point of age, eight Devon steers, 38 months old, averaged 13 cwt. 2 qr. 22 lb; four Hereford steers, 36 months old, averaged 15¾ cwt.; and five Shorthorn steers, of 35¾ months old, averaged 17 cwt. 0 qr. 18 lb. Plainly the difference here is very great. It is hardly so great in the older class of oxen, but it must not be forgotten that, in the case of pure Shorthorn herds, all first-class animals are kept for breeding purposes, and comparatively few find their way to the butchers' stalls. Here eight Devon oxen, 49½ months old, averaged 16 cwt. 0 qr. 26 lb.; 13 Hereford oxen, 48½ months old, averaged 19¾ cwt.; and nine Shorthorn oxen, 46½ months old, averaged 18 cwt. 3 qr. 10lb. This result is a great feather in the cap of the Hereford men, thought it must be noted that the class is just that in which the Herefords have been this year unusually good, and the Shorthorns, if anything, below par. The difference in age must also be observed.

Coming now to the female classes, in which both Devons and Shorthorns were this year very good, we have the following results:—Four Devon heifers, 37¾ months old, averaged close on 14 cwt.; five Hereford heifers, 40½ months old, averaged a little more than 14 cwt.; ten Shorthorn heifers, 37¾ months old, averaged 16 cwt. 0 qr. 12 lb. Again, four Devon cows (after breeding 12 calves) averaged, at close on seven years of age, 12½ cwt.; six Hereford cows (after breeding 17 calves) averaged, at 6½ years old, 16½ cwt.; and a noble class of seven Shorthorn cows (after breeding 15 calves), averaged, at 7 years and 8 months of age, 18¾ cwt.

On coming now to the Sussex breed, we have results not unworthy to be classed with these. Five steers, at 31 months old, averaged 15 cwt.; seven oxen, at 46½ months old, averaged 19 cwt. 0 qr. 12 lb.; eight heifers, at 41 months old, averaged 14¾ cwt.; and four cows (having had nine calves) averaged, at 6 years and 4 months old, 15¾ cwt.

The results upon the whole may be best gathered from the inspection of a Table:—

	No. in Class	Average Age.		Average Live Weight		
		yrs.	mo.	cwt.	qr.	lb.
Oxen.						
Devons	7	2	4	10	0	20
Herefords	6	2	4½	14	1	13
Shorthorns	4	2	4	15	3	0
Devons	8	3	2	13	2	22
Herefords	4	3	0	15	3	1
Shorthorns	8	2	11¾	17	0	16
Sussex	4	2	9	15	0	6
Devons	8	4	1¼	16	0	26
Herefords	13	4	5½	19	2	23
Shorthorns	9	3	10½	18	3	10
Sussex	7	3	1½	19	0	12
Cows.						
Devons	4	3	1¾	13	3	14
Herefords	5	3	4½	14	0	8
Shorthorns	10	3	1¾	16	3	12
Sussex	8	3	5	14	3	0
Devons	4	6	11¾	12	1	14
Herefords	6	6	6	16	2	5
Shorthorns	6	7	8½	18	1	23
Sussex	4	6	4	15	2	24

That seven Sussex oxen have beaten nine Shorthorn oxen at the same age in respect of average live weight, is no doubt a fact which will not be forgotten in any future discussion of the merits of the breed. It would be curious to note the report of the butcher in the two cases respectively. And perhaps some of the exhibitors in these two classes may be able to procure for us, from those to whom the beasts have since been sold, a report upon the carcase weight, with the properties of prime meat, in the several cases, in a sufficient number of instances to enable a trustworthy inference on this subject.

At the general meeting of the Smithfield Club last week, Lord POWIS, the retiring President, called attention to a correspondence with M. DROUYN de LHUYS, Minister under the French Empire, President of the French Society of Agriculture, and honorary member of the Royal Agricultural Society of England, on the subject of agricultural relief to certain districts in France which have been ravaged by the war. We have since received a letter on the same subject from Mr. BRANDRETH GIBBS, the Honorary Secretary of the Club, together with a correspondence, which we now lay before our readers:

TO THE EDITOR OF THE "AGRICULTURAL GAZETTE."

47, Half-Moon Street, Piccadilly, London,
December 14, 1870.

Sir,—I beg to hand you copies of letters received by the Earl of Powis, as President of the Smithfield Club, and alluded to by him at the general meeting.

In order to avoid loss of time, I then expressed my willingness to keep a register of such offers of seed corn, &c., and other contributions as English agriculturists might express to me their intention of sending in aid of the French farmers in distress.

Arrangements for a public meeting early next week are now in progress, the particulars of which will be notified by advertisement.—I have the honour to be, sir, your obedient servant,

B. T. BRANDRETH GIBBS.

Hon. Secretary of the Smithfield Club, and Hon. Member of the Société des Agriculteurs de France.

Copy of Letter from M. Drouyn de Lhuys to the Earl of Powis, President of the Smithfield Club.

3, St. Mark's Crescent, St Helier, Jersey,
Nov. 27, 1870.

My Lord,—Mr. James Howard, M.P., has conceived the generous idea of aiding the French cultivators who are victims of the war by the means set forth in the accompanying letter. I have been induced to communicate this project to the French Administration, in order that it might obtain the approbation and concurrence of English agriculturists, it might be carried out in France. The reply of the Minister of the Interior bears witness to his desire to secure the realisation of these views.

Unfortunately severe indisposition prevents Mr. Howard carrying out his design.

Will you permit me, my lord, in my double capacity of President of the Society of Agriculturists of France, and an honorary member of your Royal Agricultural Society, to place this noble inspiration under your distinguished patronage.

It appears to me that the Cattle Show offers a very favourable opportunity to address an appeal to the sympathies of the agriculturists of your country, either by a communication made to the Smithfield Club, or by means of the Press; if you think it advisable, the two accompanying letters might be placed in their hands. Will you excuse, my lord, this step, dictated by the confidence which our confraternity in agricultural matters inspires, and receive the assurance of my high consideration.

(Signed) DROUYN DE LHUYS
President of the Society of Agriculturists of France.

Copy of letter to Mr. James Howard.

3, St. Mark's Crescent, St. Helier, Jersey,
October 19, 1870.

Dear Mr. Howard,—The scourge which desolates our fields, not only exhausts our actual resources, but also threatens to destroy the means of future produce. This anticipation has suggested to you, as well as to many agriculturists of your country, the generous idea of coming to the aid of the French farmers and peasants ruined by the war, by placing gratuitously at their disposal, cereals, roots, and other seeds, necessary for sowing their fields.

You add that the intervention of the President of the Society of Agriculturists of France would contribute to give confidence to your countrymen that these succours would be judiciously distributed.

I would, in the first place, express to you our profound gratitude for this cordial proposition. The dispersion of the members of our Society in different places, as well as the interruption of communication between the different departments of France, detracts from the efficacy of my personal and direct action; but the following are, I think, the means to attain the object that you have in view:—

1. A committee should be formed in England to register the offers of subscriptions, to receive the grain, seeds, &c., and to forward them to the ports of France least exposed to hostile attacks.
2. The French Government should give to the authorities of those ports the order to receive these objects and store them.
3. French cultivators should be induced to communicate their wants by means of circulars, and notices in the journals.
4. Each application should be controlled by the mayor of the commune in connection with the president of the agricultural association of the locality.

Seeds should not be supplied to any applicant except on the production of a certificate signed by these two authorities, showing that he is a cultivator in distress, and that the grain is not intended for consumption but for sowing.

I think, as you say, that such a measure would have the effect of developing the sentiments of mutual good will which unite our two countries. Like the good earth itself, cultivators are grateful, and your countrymen may rest assured that they will not have sown in a barren soil.—Yours, &c.,

(Signed) DROUYN DE LHUYS.
President of the Society of Agriculturists of France.

Copy of Letter from the Minister of the Interior of France.

Ministère de l'Intérieur Cabinet.
Tours, October 24, 1870.

Sir,—I hasten to thank you for the communication contained in the letter which you have done me the honour to address to me, dated the 19th inst.

The offers of the English agriculturists, which you wish to transmit to me, cannot but be accepted with gratitude; they will be very useful to the invaded departments.

As soon as France shall receive advice that an English committee is formed, and that the grain seeds, &c., are collected, orders shall be given, either at Cherbourg or Brest, for the consignments to be got together and warehoused. A circular will be prepared for the prefects and mayors, in addition to which a notice will be inserted in the official journal. Those interested will thus be informed. The administration, with the societies and mayors, will regulate the demands of agriculturists.

Once more, sir, I thank you, and express my gratitude.

Receive the assurance of my most distinguished consideration.

(Signed) THE MINISTER OF THE INTERIOR.

—— THE Monday's cattle market at Islington hardly reached the numbers recorded of previous Christmas markets. There was, however, a large show of Shorthorn and cross-bred cattle; a small show of Herefords and Devons; and a magnificent display of Scotch cattle. Two score, or thereabouts, of Mr. MCCOMBIE's cattle sold for £45 a-piece. There were few foreign, and no French cattle. The prices were higher than those of the previous week for beef, but trade was dull, and prices lower, in the sheep market.——In Mark Lane, on both Monday and Wednesday, only good samples of Wheat maintained last week's prices.

—— On Friday last, in the Agricultural Hall, an ox was found suffering from the foot-and-mouth disease, and the whole of the cattle in the exhibition were thus made prisoners within the metropolitan district. Large numbers having been sold to country butchers, this of course threatened to create very great annoyance and loss to both buyers and sellers, and representations were made to the Veterinary Department of the Privy Council which procured some relaxation of the existing rule; so that, under special order, 70 or 80 of the cattle certified as healthy have been despatched to their respective destinations, each being accompanied by some one approved by the office and bound to certify that the animal had been taken straight to the shambles at the end of its journey, and there slaughtered. Those cattle which had been removed from the hall on the first closing of the show were not permitted to leave the metropolis; and in this predicament are all the QUEEN's cattle, which, therefore, with others similarly situated, have been slaughtered within the metropolitan district.

—— We understand that Mr. MCVICAR's Globe, or "Intermediate" Mangel, represented on p. 1632, as having been exhibited by Messrs. SUTTON, was shown on Messrs. CARTER's stand. It should have been stated in larger and more prominent type that the whole of these roots were drawn on a scale of one-fifth the natural size. The enormous Long Red Mangels shown by Messrs. CARTER and SUTTON, the extraordinary Globe Mangel (No. 4) exhibited by Messrs. SUTTON, and the Kohl Rabi also shown by the Reading firm, were true agricultural *maxima*. The Kohl Rabi truck us as being especially an extraordinary success.

—— A meeting between certain representatives of the Insurance Offices and a Committee of the Central Chamber of Agriculture, presided over by Mr. C. S. READ, M.P., which took place last week, resulted, we think, rather in a victory for the former. There is no getting over the principal fact, which seems to have been admitted, that the premium hitherto charged for insurance of farm stock has not, latterly, covered the risk. We condense the following statement of the argument from an interesting report in the *Mark Lane Express*:—Mr. READ, M.P., admitted that the companies had for some time been losing by their farming stock insurances, and that, therefore, they were fully justified in altering their regulations. He referred to the inconvenience of having to take out new policies every year, and to the immense fluctuations in value of a farmer's stock at different periods of the year, and suggested that the value for the purpose of insurance should be taken either on the average between the highest and lowest amounts of the year or on an average of several years. It was answered that practically it would be immaterial whether the insurance was based on the highest or on an average value of the year; because, if on the average value the rate must necessarily be increased to create a sufficient amount to meet the losses and expenses; that farmers were quite as well qualified as merchants to state the value of their propriety; that farmers had seldom occasion to arrange their insurances more than once a-year, while merchants had to watch the arrival of every ship in which they are interested, and to vary their insurances from day to day to keep themselves protected; that farmers had hitherto been, and are now, much more favourably treated than merchants, because they are only asked to pay on three-fourths of the highest value; while merchants, to be similarly protected, must pay on the whole value. —The case was supposed of Wheat being at 40*s.* per qr. when the insurance was effected, and rising to 80*s.* afterwards, which was answered by saying that if the owner was so fortunate as to have the value of his property doubled, he could not reasonably expect to receive the higher price without first compensating the insurers for the increased liability.—Allusion was made to the same rate and conditions being applied to scattered property as to that so placed that one fire could destroy the whole. It was replied that the same rate was not charged in every place; that in the Fen districts it had often been charged 10*s.* 6*d.* instead of 5*s.* per cent., and even at the higher rate many offices would not insure it. Also that in fact those owning scattered risks did pay less, because those whose property was so placed as to be liable to be destroyed by one fire would for their own protection pay on the full instead of on three-fourths of the value; moreover, that scattered ricks were very much more exposed to tramps and other mischievous persons than the property at the homestead, which was generally too well watched for them.—In the course of the conference the subject of the ability of the managers of the offices to form correct opinions on farming matters was spoken of, on which one of them said he must admit that he knew as little about farming as he did of many other things which had to be rated, but he added, when particular

subjects of hazard had to be considered, those who were thought best qualified to give information were applied to.—After further explanations the chairman said he supposed the committee must report that the managers *would not* alter the terms, for which he was requested to substitute the words *could not*.

—— The LEEDS SMITHFIELD CLUB has just held its eleventh show. The number of entries, as compared with last year, is as follows :—

	1869	1870.
Cattle	53	95
Sheep	13	29
Pigs	57	87

In the other classes a slight decrease. The show in its main features is a success ; the arrangement putting the cattle in the permanent buildings, instead of the temporary sheds, as last year, is a great improvement. With regards to the Shorthorns there were some excellent beasts. The outbreak of foot-and-mouth disease at Islington caused some vacancies in their ranks, which are to be regretted. No. 3, the winner of the Innkeepers' Plate, was a fine ox. In the cross-breds, No. 43, the winner of the Tradesman's Plate, is an excellent cow. No. 45, Mr. REID's, excellent, is the ornament of the show, winning the Mayor's Cup. Mr. REID carries off another plate with her sister, No. 83. The sheep classes are good. There are some of excellent quality, Nos. 98 and 96 amongst the long-woolled sheep, and No. 107, Lord WENLOCK's sheep, are excellent. The pigs are a good show, Mr. R. E. DUCKERING's black sow, which got the Cup, being specially worthy of note ; a pig of perfect form, she won honours at Birmingham. The poultry are a very good show ; and amongst the roots were some excellent specimens. *E. H. Marshall, Leeds.*

—— We have received from Messrs. CARTER, Seedsmen, of High Holborn, the following letter from an unknown correspondent, in whose proposals they think that English agricultural readers may take some interest :—

"1, Admiralitat Street, Hamburgh,
" Nov. 16, 1870.

"Messrs. CARTER & Co., High Holborn, London.

"Gentlemen,—I beg to offer you, as per enclosed pattern, about 300 cwt. of sand used for mixing Clover seed, at the very low prices of 10*s.* 6*d.* for uncoloured, and 14*s.* 6*d.* for coloured, per cwt., bag included, f. o. b. here, against cash at handing bill of lading.

"I make a large business therein to England, and as I suppose you want it also, I should be glad to receive your kind orders ; the sand could be delivered there about four or five weeks after ordering. You may rely on my discretion.

"Waiting your answer, I am, gentlemen,
" Yours respectfully,
" WM. HIRSCHMANN."

—— A letter from Mr. BEASLEY, of Chapel Brampton, in the *Times*, announces that Mr. BALDWIN, of Glasnevin, "principal inspector of agricultural schools in Ireland," and well-known also in the English agricultural world, believes that he has found a cure for pleuro-pneumonia in carbolic acid. We fear his confidence is the result of a too hasty generalisation. A veterinary surgeon in large practice known to us has for several years been experimenting with carbolic acid in pleuro-pneumonia without being able to speak so enthusiastically or so confidently as the writer of the following letter :—

"Contagious pleuro-pneumonia is propagated by a specific poison or *contagium*, which is generated in the lungs and expired in the process of respiration. It has hitherto baffled all treatment. I have devised a mode of dealing with it which so far has been eminently successful, and as the principle on which it is based is simple and sound, and has met the approval of the eminent men to whom I have communicated it, I give you a concise account of the *modus operandi*. I may premise that my great aim is to check the spread of the infection, but the means I take to carry out this object has a curative effect. The following is the course to be pursued when the disease appears in the herd :—First of all you isolate or remove the animal affected. Secondly, should the poison have been imbibed by one or more from the animal in which the disease has first appeared the great thing is to confine it to them, and this is the leading idea of the scheme, and it is accomplished by, thirdly, tying up the animals in a house. In my case the feeding troughs are placed round the cow-house, and the animals face the wall ; on this wall is fixed in front of each beast a square piece of coarse sacking ; the cloth is saturated three times a day with a solution of carbolic acid prepared as noted below. As the poison is eliminated from the system it is destroyed by the carbolic acid, which experience has proved to be the best disinfectant. Fourthly, in this way the infection cannot reach an animal free from it when the herd is tied up. The herd on which I first operated was gradually melting away before I commenced this experiment ; only one fresh case has manifested itself, and that animal has recovered. As to the curative action of carbolic acid I shall not say much, having no desire to intrude into the region of medical science. It is enough for me to say that the most eminent medical men now cause human patients suffering from certain forms of lung disease to imbibe carbolic acid ; this mode of treatment has been most successful, and from the *post mortem* appearances of the lungs in pleuro-pneumonia we should expect the imbibition of this acid would be equally efficacious in arresting the progress of the disease. To dissolve the carbolic acid of commerce it must be mixed with an alkaline substance. I use for the purpose lime, it is the cheapest and most easily obtained, but potash or soda would be better. The strength of the solution I employ is one part of carbolic acid to 50 of water."

OUR LIVE STOCK.

CATTLE.

LORD BRAYBROOK's herd has been enriched by the birth of a valuable roan heifer by Mr. M'Intosh's American bull, 3D DUKE OF GENEVA (23,753), and from *Thorndale Rose 2d* by 4TH GRAND DUKE (19,874).

—— "The 'Teeswaters,'" wrote the late Mr. Dixon, "were cattle of great substance but somewhat ungainly in form, and were thought to give less but richer milk than the 'Holderness' breed. The fragments of history on which their origin rests are somewhat shadowy and uncertain. Some contend, therefore, that they must be of Dutch origin, and only another version of the 'Holderness.' And others, with equal zeal, that their tap root is to be found in the West Highlands, or that the earlier breeders always fell back on its bulls for a cross if they thought that their herd was losing constitution." There is certainly some confirmation of this opinion in the peculiarly sharp horn and ink-black nose which will appear at intervals. The admirers of the "Princesses" make good "the claims of long descent" as far back as 1739 on Stephenson's farm at Ketton, and it is also said that the ancestress of the "Duchesses" roamed in Stanwick Park 200 years ago, and that none of the tribes had been out of the Northumberland family until Charles Colling bought them. Be this as it may, the "Teeswaters'" capabilities of development, which the St. Quentin, the Pennyman, and the Milbank families were among the first to recognise, had suggested itself to many a long-headed Durham farmer as well as the brothers Colling ; but private herd-books were hardly in vogue, and the patient pilgrimage of Coates through sunshine and shower, with his grey pony and saddle-bags, has not had the effect of tracing the breed further back than four crosses beyond HUBBACK, who was calved in '77. If the red and white Studly bull (626), bred by Sharter of Chilton, the founder of the "Gwynne" or "Princess" tribe, may claim to be the "Abraham of Shorthorns," James Brown's red bull (97), and Jolly's bull (337), are very early names on the roll. Seventeen or eighteen crosses separate the "Duchesses" from the one, and the Maynard and Mason tribes are in direct descent from the other. Only 710 bulls were registered in the first volume of Coate's Herd-Book, published in 1822 ; but the fifteenth showed, under Mr. Stafford's care, 1950 in two years ; and the seventeenth brought up the number to ZEMI (25,481). The germ of this wonderful array must have been considered an improved county breed as far back as 1787. Hutchinson, of Sockburn, had then a cow good enough to be modelled for the Cathedral vane, and had also beaten Robert Colling in a bull class. Other Durham breeders stood proudly forward on their family tribes. The "Lizzies" were with Charge, of Newton, and Rose's and Fisher's stock can be traced to Cornforth, of Barforth. Robert Colling had set his seal to Hill of Blackwell's herd, and nearly all the best men were dipping into the blood of Millbank, of Barningham. It was from his sort that there sprang the "old yellow cow," by PUNCH, which was grand-dam of "the white heifer that travelled." The Maynards were also in the front rank, and it became their sound family custom to pitch eight bullocks and as many heifers in Darlington market on the first Monday of March as a sample of the Eryholme pastures. The bullocks were from four to five years old, with fine, wide horns, good bone and very deep flesh ; and they were keenly looked out for, year after year, on the pavement opposite the King's Head. The aim of the brothers Colling was to reduce the size and improve the general symmetry and flesh points of their beasts. *Beauty*, sister to PUNCH (531), had spread their fame beyond the county, and in 1799 "The Durham Ox," by FAVOURITE (252), came out first at Darlington with his half-sister of the "Duchess" tribe. The latter was quite a wonder in her way, and confirmed Mr. Bates' fancy for the sort which was hereafter to be linked with his name. The subsequent travels of the ox brought a large bull trade to Ketton and Barmpton. Even at the Ketton sale, in 1810, the taste for Shorthorns was confined to Durham, Yorkshire, Lincolnshire, Northumberland, and Westmoreland. The spirit south of the Humber was, however, fairly roused at last ; and when, eight years after, the Barmpton herd came to the hammer, the representatives of four or five more counties were found at the ring side. Sir Charles Knightley gradually became quite a Whitaker of the midlands, when he gave up hounds in 1818, and laid himself in with the "Rosy" and "Ruby" tribes, and his friend Arbuthnot's bulls. Thus the breed, which then had its origin in the remote North, spread itself over the length and breadth of the country, and from thence to all parts of the world.

—— Mr. Darwin informs us, with regard to interbreeding, "there is more unanimity amongst pig breeders on the evil effects of close breeding than perhaps with any other large animal." Mr. Druce, a great and successful breeder, writes, "without a change of boars of a different tribe, but of the same breed, constitution cannot be preserved." Mr. Fisher Hobbs, the raiser of the celebrated improved Essex breed, divided his stock into three separate families, by which means he maintained the breed for more than 20 years "by judicious selection from the three distinct families." Lord Western was the first importer of a Neapolitan boar and sow. "From this pair he bred in-and-in, until the breed was in danger of becoming extinct, a sure result (as Mr. Sidney remarks), of in-and-in breeding." Lord Western then crossed his Neapolitan pigs with the old Essex, and made the first great step towards the improved Essex breed. Here is a more interesting case. "Mr. J. Wright, well known as a breeder, crossed the same boar with the daughter, grand-daughter, and great-grand-daughter, and so on for seven generations. The result was, that in many cases the offspring failed to breed ; in others they produced few that lived ; and of the latter many were idiotic, without sense even to suck, and when attempting to move could not walk straight. Now it deserves special notice, that the two last sows produced by this long course of interbreeding were sent to other boars, and they bore several litters of healthy pigs. The best sow in external appearance produced during the whole seven generations was one in the last stage of descent ; but the litter consisted of this one sow. She would not breed to her sire, yet bred at the first trial to a stranger in blood ; so that, in Mr. Wright's case, long-continued and extremely close interbreeding did not affect the external form or merit of the young ; but with many of them the general constitution and mental powers, and especially the reproductive functions, were seriously affected." Other cases might be cited corroborative of the above striking instance. We must not, however, suppose because this is the case with swine, it is also the same with every other domesticated animals. Sheep and cattle appear to bear close alliances for generation after generation without injury. The subject of interbreeding, therefore, requires careful study, and does not allow of hasty generalisations being made, as though the case of one species was applicable to all.

POULTRY.

"THE cost of keeping Cochins," says Mr. Tegetmeier in the "Poultry Book," "has been estimated by some authorities as upwards of 4*d.* per week each ; others regarding the expenditure required as little more than 1*d.* per week. As usual the truth lies between the two extremes. At the average prices of corn, when Cochins are entirely hand-fed, and have not the advantage of the stray grains of the farm and rick-yard, it will be found that they cost about 2*d.* per week each, provided they are confined to a not very extensive run. If, however, they have a free range they supply themselves with a very considerable quantity of food, as they graze, if the term may be allowed, to a much greater extent than any of the other varieties, the quantity of Clover consumed by them in this way being very large. But, even with these advantages, they consume much more than smaller breeds would do in the same situation. It is contrary to all experience to imagine that a bird weighing from 10 to 12 lb. should not require a greater amount of nourishment than would suffice for the support of another of half the weight. It would not be more erroneous to assert that a cart-horse could be kept on the same amount of provender as a Shetland pony, as to state that a gigantic Cochin could be maintained at the same cost as a spangled or pencilled Hamburgh."

SMITHFIELD CLUB SHOW.

[WE continue our report of the implements exhibited at the Agricultural Hall.]

Reaping and Mowing Machines are well represented. Considerable improvement has been made since the Oxford meeting, not only in working out and perfecting details, but also in the principle of construction. The Messrs. Burgess & Key take the lead with one new reaper, which merits special notice, and with various improvements in the details of their other machines. The Messrs. J. & F. Howard have also a new machine. Mr. W. A. Wood has made various improvements in his mower. These three stands require a detailed notice ; the others we must condense under a paragraph notice.

Burgess & Key's single-rake reaper, generally known as McCormick's, has been considerably improved in detail since the great reaper trials at Manchester (1868), and for light crops and all crops where one sheaf per one revolution is sufficient, it is without a rival ; and even when one sheaf is too large, the broad parcels are so regularly laid down that they can as easily each be bound up in two sheaves as if they were laid each in two separate parcels. The reels bring the standing corn more evenly and uniformly down to the knife, and the automatic differential movement of the rake has similar advantages over the oblique side conical action of the old Dorsey class of sheafers. The improvements above noticed refer to the adoption of all the recently patented ones relative to the direct thrust of the knife, the proper length of the connecting rod, the position of centres and fulcrage, so as to obviate counter action and the lubrication of axles. It would take more space than we have at command to

give a detailed description of such improvements individually, suffice it to say that they proved their own importance in the field last harvest. At the Paris Exhibition, 1867, it won "the Great Gold Medal and Decoration of the Legion of Honour as the best reaper in the world," and the above improvements bid fair to enable it to maintain its high position in the harvest field.

Burgess & Key's new reaping-machine belongs to the now common class of conical "self-rakers," first introduced by Samuelson, of Banbury, from the United States, where it was patented by Owen Dorsey in 1856. It, however, more closely resembles Hornsby's than Samuelson's self-raker, but it is free from the objectionable undulating cam mechanism, the adverse leverage action and intermediate gearing, and a bent standard, and consequently unequal centrifugal action arising therefrom. With the exception of the fulcrum at the rear end of the pole, subsequently noticed, all the centres connected with the reel-rake are vertically in a line with the centre of the main axle, and with the general fulcrum of the lever system, viz., the ground under the main wheel, any divergence from this being, practically speaking, *nil*. This construction is sound in mechanical principle, and constitutes the leading characteristic of this new reaper, all the other details of mechanism being subsidiary to it. As is almost always the case in questions of sound principle, the mechanism by which this favourable position of centres or fulcrage is obtained is of the simplest kind—incurring the minimum weight of material, with a corresponding reduction of tear and wear. Thus, a small bevel-pinion on the outer end of the axle or hub of the main wheel gears into a corresponding large bevel-wheel on the lower end of the upright rotary standard, that carries the rakes and reels, the arms of which are rigidly fixed in flanges in the top of this standard. It will thus be seen that the centre of resistance in reeling on the corn to the knife, and in sweeping the sheaf off the platform, may practically be said to be in a line with the centres of the standard driving pinion, and also axle of the main wheel—a slight curvature being given to the platform corresponding to the conical path of the rakes and reels. The reaper shown has two rakes and two reels, but one, two, three, or more rakes, with as many reels, may be used; and the size of the bevel-pinion and wheel on the standard may be made to suit any size of sheaf required. There is a very simple and clever device, too, for turning the main axle by means of a lever already alluded to at the rear end of the pole within the reach of the driver, so that he can throw both knife and rake into and out of action by one movement. The knife is driven by a separate system of gearing nearly as in their other machines, the crank being low, so as to bring the connecting-rod in a line with the knife when crossing centres, and thus effect what has been termed, although not correctly, a "direct thrust," so that the intermitted action of the rakes and reels do not interfere with the reciprocating and more uniform action of the knife. The invention has been on hand for some time past, but the details were matured in time to enable the reaper to be tried last harvest, and the results are in the highest degree satisfactory, thus promising a successful future.

Burgess & Key also exhibit their 2-horse mower and combined reaper and mower, both of which have been much improved since the Manchester meeting last year, by bringing the foot and hand levers within easy reach of the driver; and they also show their new 1-horse reaper, of which we gave a favourable illustrated notice on February 12, p. 223, to which we refer.

Howard's New Reaping Machine. — The Messrs. J. & F. Howard exhibit a new reaping-machine, of which we give an illustration (fig. 294). It is constructed on a different design from any of those they have previously shown, and is evidently a very great improvement. The mechanism is so simple, and the engraving so clear and distinct, that very little description will be necessary. The principles of the machine are retained, but it is differently put together, the result being a much more compact machine, more promising for the hard work of the harvest field. The rakes and knife are driven from a large bevel-wheel near the middle of the axle of the wheels. This wheel drives a small pinion, on the shaft of which are two pinions, one a small bevel-pinion for the rakes, and the other a spur-wheel for the knife, the principle being sound, and the same as in the old machine, viz., bevel-gear for the slow motion, but spur-gear for the quick. The crank and connecting rod are low, and the angular stroke on each side the line of centres equal, and hence the cutting power uniform. There are two cams, one for the reels and the other for the rakes. The rake-gear and knife-gear are each easily thrown out of and into action, and there is a very simple mechanism for regulating and adjusting the pole with the frame and line of draught, and the proportion of parts gives to the reaper a very agreeable and promising appearance as compared with the old machine, which was rather rambling in design, and not very well knit together for heavy harvest work. J. & F. Howard have also much improved their mowing machine.

The simplicity of the mowers and reapers exhibited from time to time by W. A. Wood, and their adaptation to the requirements of practice, have procured for them an extensive sale and use in this country. The draught is exceedingly light, and at all our great trials they go through their work successfully in dashing style, and the ready way in which duplicates of the working parts can be supplied and used in the place of those worn out is a great commendation. Several very important improvements have been made since the Manchester trials, and the illustration of the grass mower given on p. 1651, exhibited in the Agricultural Hall, will point out not only the improvements made upon it, but those also which are being applied to his other new machines. Thus the connecting rod has been brought more into a direct line with the knife, the connection has also been improved, while it is more effective and durable. The new method of self-oiling has also been adopted. The seat, seat standard, and the framing generally, and, consequently, "gear shifter," have been so remodelled and altered as to give the machine a different appearance from the old ones. An improved plan of fixing the bolts, nuts, and fastenings, greatly increases the strength and durability, without any additional weight; and those of our readers who are using Wood's grass-mowers will readily perceive other minor improvements.

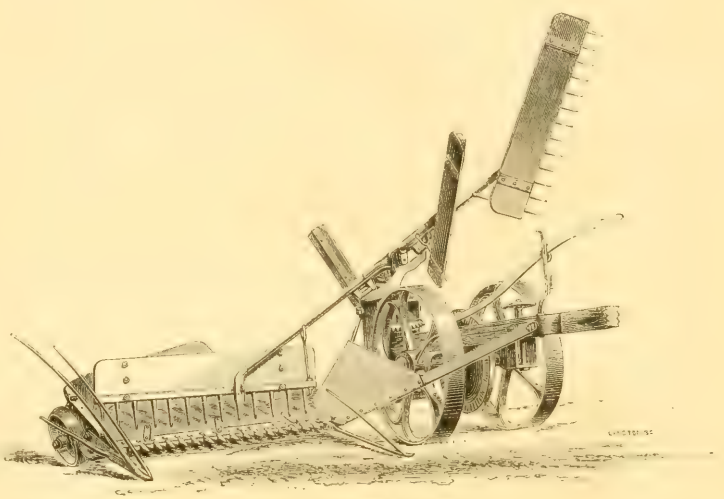

Fig. 294. HEATON'S MACHINE.

The Messrs. R. Hornsby & Sons have a splendid show of mowers and reapers. Very little alteration is perceptible since the Oxford meeting, or since they last year exhibited in the Agricultural Hall. The Beverley Iron and Waggon Company exhibit an improved Bell's reaper, and their self-tilting back delivery reaper. The self-tilting mechanism is a very ingenious device, and does its work in the harvest field most successfully. In the gallery, in addition to Burgess & Key's and Walter A. Wood's (already noticed), Samuelson & Co., of Banbury, have their usual selection of mowers and reapers; so have Hunt & Pickering, of Leicester; Henry & George Kearsley, of Ripon; and Picksley, Sims & Co., of Leigh. Thomas Perkins, of Hitchin, exhibits a variety of his shafts for reaping and mowing machines; also safety seat and seat standard for self-rakers, with throw-out gear. Mr. W. Smith, Royal Ironworks, Kettering, exhibits a number of his prize angular-edged grindstones for sharpening the knives of reaping and mowing machines. William Mitchell & Co., of Manchester, exhibit a series of six machines for sharpening the knives of mowing and reaping machines. They have introduced a metallic roller or ring into the middle of one of their small grinding machines, which appears to do its work admirably.

Seed and Manure Drills, Broadcast Seed and Corn Machines, and Manure Distributors form, as usual, a fine show. Below-stairs the stands of the Messrs. R. Garrett & Sons, R. Hornsby & Sons, Holmes & Sons, merit special notice; and in the galleries, James Smyth & Son, James Coultas (Grantham), Priest, Woolnough & Michel, R. & J. Reeves, have also fine selections. Josiah Le Butt shows his useful little gapping drills, for filling up gaps, so as to have a close crop. Coultas has improved his manure-box and plans for applying dry and liquid manures in any quantity per acre.

Hydraulic Machinery, and apparatus for irrigation works, &c., are above an average. On the first stand Messrs. John & Henry Gwynne exhibit pumps and machinery for irrigation; and many others of the large firms have pumps of some kind on their stands. In the gallery, the stands of Tangye, Brothers, & Holman, and of Hayward, Tyler & Co., exhibit specimens of steam and other pumps for irrigation on a large scale. E. Headley & Sons show their patent hydraulic apparatus for watering roads, gardens, and grass land. The articles shown are chiefly adapted for horticulture, but the plan is equally applicable to agriculture on a large scale. Thus were pipes laid down, the land between the hydrants, whether in grass or drilled crops, could be rapidly watered, filling it with as much water as it can retain. The large apparatus consists simply of a hose reel — the reel having two wheels and a handle, resembling a hand-truck. The hose may be 50 to 100 yards in length, one end would be screwed on to the hydrant, the other end terminates in a jet. One man wheels the reel outwards from the hydrant before him, while a boy guides the jet, distributing a heavy shower as he keeps out of the way of the reel. When all the hose is reeled off, the man draws back the reel behind him, reeling on the hose to the hydrant, the boy all the while distributing another heavy shower over a certain strip of land. They proceed outwards and inwards until they require to shift to another hydrant. In this way land may be watered as fast as a two or three-inch hose can discharge water, the quantity in any given time being according to the head pressure.

Steam Engines for all purposes connected with agriculture form a good show. Almost all the exhibitors below-stairs have steam-engines of some kind or other. Roby & Co., Lincoln, exhibit a road-steamer of their own make, according to R. W. Thomson's patent. It has a vertical engine, and is altogether a different affair from what was exhibited by Mr. Thomson himself at Manchester and Oxford. The Messrs. Ransome, Sims & Head, also manufacture road-steamers with indiarubber tyres, under Thomson's patent. They do not, however, exhibit on this occasion, but they show two portable engines—one an 8-horse power engine, capable of threshing from 600 to 700 bushels of corn per day of 10 hours, the corn coming from the machine ready for market. This engine is of the ordinary class used for threshing. The other engine has a steam-jacketted cylinder, double slides for cutting of the steam at the various positions of the stroke; it is also fitted with a double pump and feed-water heater in the smoke box, so that it is capable of performing a maximum amount of work at a minimum expenditure of fuel, and the boiler is fully equal to a pressure of 80 lb. John Fowler & Co. exhibit an engine with compensating wheels for turning and moving in sharp curves, and also a wheel with ring-segment tyres,

having clasp fastenings for the same purpose as those of Thomson's road-steamer, but really very different, and superior for turning and other respects. The Messrs. Clayton, Shuttleworth & Co. exhibit select portable, semi-portable, Oxford 1st prize, and fixed engines. Mr. Burrell shows his engine on springs. The Messrs. Howard have a model of their fixed superheater, but this year could not find space for their steam ploughing engine. Aveling & Porter have an 8-horse steam road-roller, a 20-horse ploughing engine, and a 5-horse traction engine, aloft in their own gallery. Woods, Cocksedge & Warner, Ruston, Proctor & Co., W. Foster & Co., and Marshall & Sons, show engines, and the Reading Iron Works Co., and Brown & May show their Oxford prize engines; and W. N. Nicholson, Newark, and a few others, show engines in the gallery.

Threshing Machines are, as usual, exhibited in large numbers. Roby & Co. show Bell & Roper's patent feeding apparatus. The threshing-machine being placed at a suitable distance from the stack, the receiving end of the carrying-trough, in which a spiked traveller band works, is placed on the stack, the discharge end over the threshing-drum. The sheaves are thrown into the hopper over the spiked traveller band, which draws and discharges them into a trough over the threshing-drum, and they are fed in regular quantities by steel fingers working between slots. They also show a threshing-machine the framing of which consists of angular iron. Clayton, Shuttleworth & Co. show their threshing-machine with patent beaters (fig. 296), the superiority of which is now acknowledged; also their stacking machine (fig. 295), which has recently been improved by a self-feeding apparatus, simple and effective in its performance. C. S. & Co. turn out more engines, threshing machines, and elevators, than any other firm in the Hall. The elevator is adapted for stacking hay and corn in harvest time, as well as straw when threshing. When used for stacking hay and corn it can be driven by an ordinary one-horse gear. It works at any angle from the threshing-machine, and elevates to a height of 27 feet.

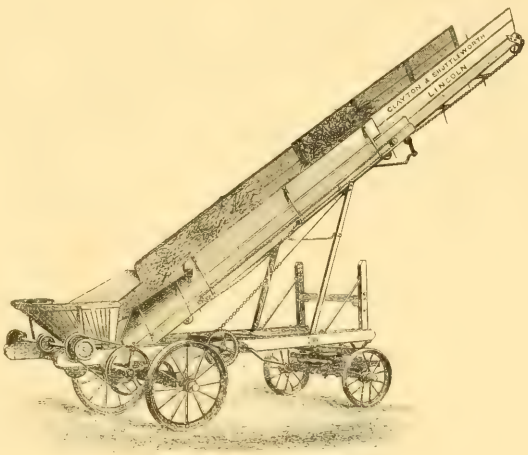

Fig. 295.—Stacking Machine.

Grinding Mills are, as usual, plentiful. Clayton, Shuttleworth & Co. have improved the framing of their grinding mill so that it may be taken to pieces for conveyance. Turner has as usual a large assortment of his mills, and the Ransomes and most of the firms below show mills of various kinds, also chaff-cutters, turnip-cutters, cake-breakers, and all the other articles for preparing food for cattle. Upstairs the show of this class of machines is always extensive.

Winnowing Machines, corn-screens, with the various articles required in the barn and granary, are also numerous, including weighing-machines, sacks, sack-barrows, &c., oil feeders, straps, and so on.

Drying Apparatus.—W. A. Gibbs, Esq., of Gillwell Park, exhibits a model of a hot-blast and sheaf-house for drying hay, flax, grass, wool, hair, &c.; also a model of a new machine for drying fresh or spent Hops, malt, brewers' and distillers' grains, wet corn, &c.

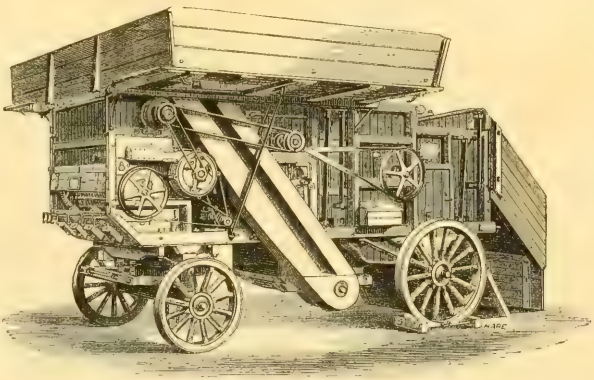

Fig. 296.—Threshing-Machine.

Carts, waggons, &c., are a fair show.

Iron and wire fencing, with articles of this kind, are numerous. Mr. Reed, Aberdeen, shows a model of a wire-rope bridge for parks and pleasure grounds, &c.; sheep-netting and articles of this kind are plentiful. Mr. W. Smith, Foston, Hull, shows a patent slide-rack for sheep, which was very justly highly commended by the judges at the Oxford meeting of the Royal Agricultural Society last summer.

Millstones, and the various articles required by flour-millers, form a good show, to which may be added leather bands, &c.

Dairy utensils are a fair show, and the same may be said for the requirements of the garden.

In the Avenue, C. F. Stoffell has a fine show of his fish manures, and articles grown by the same; carriages, dog carts and other light vehicles, sewing machines, &c., are exceedingly attractive. In the Bazaar, music, toys, and what-not are overpowering—cattle and horse-cribs, sheep-shearing and horse-clipping machines, wire-fencing, and horse-shoe nails of excellent quality; and here, also, H. R. Marsden, Leeds, exhibits a model of Blake's stone-breaker.

SEWAGE IRRIGATION.

By Mr. J. Bailey Denton.

[At a recent meeting of the Maidstone Farmers' Club, Mr. J. Bailey Denton C.E., read a paper on "Sewage Irrigation," from which we make the following extracts.]

To show you briefly the magnitude and importance of the subject under consideration, the statistics relating to the county of Kent will suffice. The population of Kent, exclusive of Greenwich and Woolwich, which are within the Metropolitan area, is upwards of 600,000, and the area of cultivated land is about 1,000,000 acres. The amount of excretal matter voided by human beings has been generally taken to be 3 lb. weight per head, including both sexes of all ages, and 600,000 people multiplied by that number of pounds, will give 1,800,000 lb. daily, or upwards of 800 tons. As I am not a chemist, to give you any opinion of my own of the "intrinsic" value of this excretal matter, I will content myself by stating that the lowest estimate arrived at by analyses made by our leading chemists has been 8*s.* 4*d.* per head per annum. Messrs. Lawes and Gilbert have, nevertheless, considered this to have been somewhat exaggerated, and have reduced it to 6*s.* 8*d.* The quantity of excretal matter will be about the same in all towns, and taken at the price mentioned, the value of the excreta from the 600,000 people of Kent, will amount to £200,000 a year, or nearly £600 a day. Associated with excretal refuse, other organic matter, which is useful as manure, is discharged from all dwellings. It consists of the slops of the kitchen and the chamber, the washings of the stables, cowhouses, kennels, and slaughter-houses, the discharge from urinals, baths, wash-houses, and breweries, and the cleansing of streets, &c. At present, however, experience does not confirm the chemist's value, for the return realised from the complex liquid known as sewage, is much less than the sum named as the "intrinsic value" of excretal matter alone. This arises from the fact that the actual, or I will call it the practical, value of sewage does not depend altogether upon the intrinsic or theoretical value of its constituents. If the quantity of water with which it is mixed is too little or too much, the value is correspondingly depreciated. For that reason it is most desirable to recognise some standard of dilution which may be taken as a datum of actual value. It is not possible to avoid the different degrees of dilution resulting from the varying quantities of water supplied to different towns. In some towns the supply reaches upwards of 100 gallons per head per diem, while in a majority of instances it varies from 15 to 40 gallons per head per diem. The mean quantity of water supplied to country towns may be taken at 20 gallons per head daily, amounting to 3½ tons annually, and this, I submit, is not a band standard of dilution to adopt as the criterion of the actual value of sewage. I will not trouble you with the calculations that have been made by chemists of the value of what they have termed "average sewage." I regret to say they differ very much, one penny and twopence per ton having been put upon sewage diluted up to 50 tons—that is 4*s.* 2*d.* to 8*s.* 4*d.* per head of the population. Some day or other, when we know better how to make the most of sewage, the maximum of these values, though they differ so materially, may be attained. At present I have been content to take the value per ton at the lower estimate of one penny, but instead of assuming the sewage to be diluted to the extent of 50 tons per head, I have taken as my standard the quantity I have already mentioned as that discharged from country towns—viz., 3⅛ tons—resulting in 2*s.* 8½*d.* per head, half of which, I think, should be considered as due to the town furnishing it, and half to the farmer developing its properties—one halfpenny per ton each. If I am right in taking this view, then the value of the wasted sewage of Kent will be reduced to £81,250. This is based on the assumption that the refuse of every inhabitant of the county is turned to account, which is not likely to be the case, and I only put the figures before you with the view of showing, as I have said, the magnitude of the subject, for £81,250 a year is equal to the value of the mean annual dressings applied under ordinary farming upon the four-course system of husbandry to 60,000 acres, or 1-17th of the cultivated land of the county.

The advantage to a town of making the sewers water-tight, and thus keeping the subsoil water from mixture with the sewage, is considerable; and the same may be said of the benefit to the farmer of a power of increasing the amount of dilution whenever extra water is wanted. [So great is the advantage of having a quantity of water at command when it is wanted, that at Breton's Farm, near Romford Mr. William Hope, V.C., has required, and the town has adopted, the plan of raising the effluent sewage water from the under-drains after it has passed through the land, for redistribution. At those times when the additional water is not wanted it passes directly into the stream.] There is no insurmountable difficulty in separating the sewage proper from foreign water; it is simply a matter of expense, and the advantages to which I refer will fully sanction the extra cost.

The quantity of land required for sewage irrigation, per hundred or per thousand people, will depend on several considerations; first, the character of the land; next, the extent to which (by natural or artificial drainage) filtration can be resorted to in connection with irrigation; and, last, the amount of dilution to which the sewage is subject. Upon the last point I have already said all that is necessary, and as the first and second points demand special attention on several grounds of economy, and I shall, therefore, treat them somewhat lengthily, I will at once state that as far as experience has gone the quantity of land required will vary from the minimum of 1 acre to every 100 persons

to the maximum of 1 acre to every 50 persons. With free soils, and a full recognition of the advantages of filtration in connection with irrigation, 1 acre may suffice to cleanse the sewage from 150 persons, and under the same condition 1 acre of what are called retentive soils may equally suffice to cleanse the sewage of 100 persons. But these quantities must be enlarged for two reasons—first, because provision must be made for increasing population, and, next, because it is most desirable to have a margin of extra land beyond that which is absolutely required for purification in order to allow of an alternation of cropping, and an occasional rest of the land from sewage. Again, if the sewage is diluted above the standard I have mentioned, as it frequently will be, the farmer will desire to spread it over as wide an area as he can, and he should be provided with land to enable him to do so. If filtration is resorted to at times as a separate process (irrespective of irrigation), the area may be reduced considerably.

I will now speak upon the two points just reserved. The necessity imposed by the general sense of the country upon all towns to discontinue the discharge of their sewage into rivers, and the absence of other means of purification, has obliged local authorities to apply the refuse of their towns to land without that regard to the varying character of the soil and subsoil which ought to govern all agricultural and horticultural operations, and without that regard also to the mode of distributing the sewage which will carry it to the roots of vegetation in the most acceptable way.

The primary, and in some instances the only, consideration hitherto has been to find land, the surface of which should be at such an elevation as to receive the sewage at the least cost. The nature of the soil has been altogether a secondary consideration, and reasons have been urged with equal earnestness for the selection of poor or rich land, and porous or stiff land; and we have often heard that none of these different soils could have too much liquid; that in point of fact light soils pared to assert that where irrigation is properly practised in connection with the intermittent downward filtration, which, as I have stated before, is nothing more than effective drainage, the very reverse occurs.

If, instead of wasting sewage by flooding, the land is so prepared that the whole surface receives and absorbs the quantity given to it, all objection ceases; the sewage farm does not then become a bog or a marsh, but as the liquid descends through the soil to the drains the land becomes sound to the tread and healthful in every respect. Then the evaporation of water, and the evolution of gases, are reduced to a harmless amount, resulting in a total absence from smell from the land itself as soon as the sewage has disappeared. I hope I make the difference between the two treatments clear to you, for success depends upon its recognition. I will not insult you as agriculturists with any argument to prove that it is our duty to aërate the soil as deeply as possible by drainage, and to increase the feeding ground of vegetation as much as possible thereby. We are now finding that we must look to the soil to take its turn, not only in the process of purification, but in the storage of manurial matter which vegetation cannot always appropriate; and it is inevitable that at no very distant period sewage farms will be considered incomplete if special provision is not made for the application of the sewage to fallow land during those periods of rest to which all vegetation is subject.

This will be done by preparing the whole of the sewage farm for the proper absorption of the sewage, recognising practically thereby the value of "intermittent" filtration, so well explained by the Rivers' Pollution Commissioners, who have recommended it as a work, not necessarily connected with irrigation (as I desire to put it), but as one to take its place where irrigation is impracticable. It should be quite understood that in the preparation of land for irrigation the depth of the drainage by which filtration

Geological Description of Soil	Locality.	Weight of soil dried at 120° Fahr. to constant weight	Weight after four days' absorption of water placed thereon Sept. 1, 1864	Addition to weight by water drawn up	Proportion gained by absorption, nearly	Weight after maximum pressure of 75 lb. per inch, Sept. 26, 1864	Weight after exposure to air and sun, Oct. 7, 1864	Loss of weight by evaporation	Proportion of weight lost by evaporation, nearly	Measure after pressure, Sept. 26, 1864	Measure after exposure to air and sun, Oct. 7,	Organic matter and combined water.	Sand.	Clay.	Lime.
Warp Clay	Barlaby, Somerset Clay ..	12	1 ..	4 ..	1 .0	1 ..	11 .6	..	1 .th	4 ..	4.068	.	..	..	..
London Clay	Regent's Park, Mudmassy ..	1	17 ..	5 ..	1 .2	1 ..	1 ..	..	1 ..	4 .6 .7	4 133	.47	12 .15	7 .30	2.79
Weadden Clay	Maresfield, Sussex ..	12	13 .57	3 .57	1 .3	14 .0	13 .35	1 .25	1 .6	4 .47	4 .0 .0	..	.	.	..
Drift Chalk on Kimmeridge Clay, called White Clay	Near Horncastle, Lincolnshire	12	14 .75	2 .75	1 .4	14 ..	11 .38	2 .2	1 .7	4 ..	4 .0 .6	1 .40	1 .67	11 .57	7 .30
Boulder Clay on Oxford Clay	Haddon, near Peterborough ..	12	17.06	5 .0	1 .5	15 .5	12 ..	.	1 .3	4 .6 .0	4 .6 .0	4 .51	6 .92	7 .41	8 .36
Oxford Clay	Orton, near Peterborough ..	12	15 .42	3 .42	1 .2	14 .17	11 .27	..	1 .7	4 .4 .0	4 .6 .0	2 .25	7 .62	9 .74	4.69
Lias Clay . . .	Vale of Belvoir, Lincolnshire	12	15.62	3 .62	1 .3	15 .30	11 .95	.40	1 .5	4 .7	4 .1 .0	4 .70	6 .0 .2	4 .34	4 .19
Red Sandstone from very stiff clay bed	Near Warwick	12	17 ..	5 .0	2 ..	16 .25	12.00	4.75	2 .7	4 .1	4 .2 .0	2 .69	11 .12	84 .03	2 .25

could not be too porous, because the sewage would readily infiltrate, nor heavy lands too stiff, because it could pass over them. Where the character of the soil has partaken of a clayey loam, authorities have not been wanting to declare that "the object of getting the sewage on the land was not to let it percolate into the ground,"* but contrary to the fundamental teaching of agriculture and horticulture, which leads us to believe that the root of vegetation should penetrate the soil, it has been declared that the sewage should be kept on the surface, as the roots of grass have the accommodating power of coming up to the surface, and absorbing the fertilising matter there. We know, too, that it has often been declared that subsoil drainage was altogether wrong, as the sewage got into the drain, and so passed into the brook or stream before it was properly purified. I cannot believe it is necessary to say much to satisfy you that these assumptions are unsound; that gravels and sands may be so porous and open that the sewage may pass through them without that cleansing which proper filtration secures; that a considerable portion of clay should exist in all irrigated lands; that all soils, whether clays or sands, should be naturally or artifically drained, but not so as to let the sewage into the drains without being previously filtered; and that, instead of "flooding" and "drowning" land, in imitation of Wiltshire water irrigation, the sewage should be as carefully and economically applied as practice will allow. With care, no more of the liquid need be seen on the surface than is sufficient to spread itself over the whole of the space it is intended to serve, and to completely saturate the soil and subsoil beneath. Having often declared myself the advocate of irrigation as the best, if not the only means of purifying sewage, and turning it to profit at the same time, I shall, perhaps, cause some surprise when I state that irrigation on the "flooding" and "drowning" principle may become very unhealthy wherever it is practised, and that it rightly deserves the character given to it by Mr. Thomas Hawkesley, who, on a recent occasion, declared that it turned land into bogs and marshes. But, while making this admission, I am equally prewill be effected should be such as to secure an aërated bed of soil containing that number of cubic yards which will ensure the necessary purification. Upon experiments on the porous soil of Beddington, in which there is very little clay, the Commissioners found that the effluent water was purified when the rate of filtration reached 7.6 galls. per cubic yard per diem, while with the light yellowish brown loam of the marlstone of the lower oolite, in which there is more clay, they found that the same sewage was purified when passing 9.9 galls. in 24 hours per cubic yard, adding that this latter result was equivalent to the cleansing of 100,000 galls. of sewage per diem by an acre of land, provided the drains for the effluent water were 6 feet deep. They state, too, that after a long series of experiments, there were no symptoms of clogging up or diminution of activity in this soil, and that the effluent water was always bright, inodorous, and nearly colourless.

The effect produced is thus explained by the Commissioners:—"A filter is not a mere mechanical contrivance. It is a machine for oxidising, and thus altogether transforming as well as for merely separating the filth of dirty water. And in this respect, especially, irrigation necessarily includes filtration. The superior capability which the soil of a field possesses in comparison with that in a limited filtration tank depends partly upon the immensely greater quantity of cleansing material which an acre drained perhaps 4 feet deep necessarily brings to bear on the filthy fluid, but also and especially on the fact that in the former case this appetite, is, except in winter time, always kept alive and fresh by the action of plant growth in constantly removing the deposited impurities and rebuilding them into wholesome organic structures." From this passage it will be seen that although the object of the experiments made by the Commissioners, as I have stated, was to show how soil-filters, specially contrived, might take the place of irrigation, they were still alive to the advantage of filtration accompanying irrigation. It is only to be regretted that they have not declared that it should be a *sine quâ non* that no irrigation works should be practised where the sewage passes directly off the surface into the river course, for then engineers, acting for town authorities, would prepare the sewage farm accordingly, by deep stirring of the surface soil, and deep drainage of the subsoil, as part of the irrigation works. When recommending downward filtration, the Commissioners impose the condition that it should be intermittent, in order to allow the complete aëration of the filtering bed between each passage of the sewage through it. This treatment, which would have to be arbitrarily insisted upon in artificial filtration, would naturally occur in sewage farming, as the soil would only be completely saturated upon each sewaging, after which it would rest until a repetition of the dressing.

But, you will ask, can filtration be ensured in all soils? Can clays act equally well with sand as filters, and can the air penetrate them with equal facility, so that the necessary oxidation may take place? I will now give you my reasons for believing that those soils in which a certain proportion of clay exists are better for the purpose than free soils. I take it for granted that the more finely comminuted the soil, so as to completely break up and divide the sewage as it passes through it, the more perfect will be the oxidation, and that no one will deny that the action of air and water upon clays is to divide the silicates in combination with alumina, or pure clay, into the smallest possible atoms, if protected from unequal atmospheric influences. I take it for granted, too, that those soils that have a greater power of retaining fertilising substances than others will be more effective in filtering sewage than soils which, with an equal degree of fineness, have not the same powers of retention. Clays, I believe, are known to have the power of retaining fertilising substances in a much greater degree than sands and gravels, although the powers of absorption in the latter may be greater. It is for these reasons that I consider loamy soils, in which clay forms a part, are those which, if properly treated by drainage and deep surface cultivation, are capable of becoming better filters than sandy and gravelly soils, which are not susceptible of the same amount of disintegration by the action of the atmosphere. I do not mean to say that I should select the stiffest clays for irrigation, but I have no hesitation in declaring that with the two conditions I have named clayey loams are those we should select, and that in point of fact it is much more likely that land may be too porous than too stiff. Before giving you proofs, I must explain to you the precise nature of the two conditions upon which the success of filtration through a clay soil depends. In the first place the under-drainage must be sufficient to prevent the water of attraction from rising up beyond that limit which will leave the aërated filtering bed of the necessary dimensions; and in the next place, the surface soil must be stirred and lifted by deep cultivation to a depth of at least 16 inches, and so treated afterwards as to maintain that pulverisation whereby the tendency to form channels would be overcome. It is upon this breaking up of the surface-pan (which should form part of the preparation of the land by the engineer), that the best results will depend, as the 16 inches of surface soil will be thus converted into a porous thick covering interposing between the atmosphere and the subsoil. It is only by the exposure of clay soils to unequal evaporation that the cracks which we observe, and which puzzle the irrigator, so often occur, and they would assuredly not exist where 16 inches of pulverised soil interpose with frequent sewagings to keep the soil moist. If, peradventure, cracks appear from any other cause, then the farmer must, by the growth of Italian Rye-grass and its web-like roots, introduce more vegetable matter into the soil, or by burning a part of the soil, aid the work of pulverisation. The proofs to which I have referred were obtained by experiments conducted by me to ascertain, first, the amount of air or water space within clays and loamy soils of different characters under different degrees of pressure, and next, their power of percolation. The first series were tabulated and published in 1854, in my treatise on "Land Drainage and Drainage Systems." The result they showed was that the air and water space varied as much as from one-half in the surface soil to as little as one-seventh in the subsoil, when under the extreme pressure of 75 lb. to the inch. The clay soil best known

* See discussion on Mr. Hope's paper on the treatment and distribution of town and sewage—"Transactions of the Institution of Surveyors," Vol. ii, p. 324.

in your county, viz., the Wealden clay, I found would, when occupying a surface position, absorb nearly one-third of its own weight, when dry, from a subjacent water bed, while the London clay would absorb the maximum proportion just named, *i. e.*, one half.

The Table of the results of these experiments (on the previous page) explains itself.

The differences in the wet and dry condition of soils shown in this Table indicate their capacity for water and air. To apply these facts to the subject before us we will assume that the land is drained 5 feet, or 60 inches, deep, and that there is, at least, 4 feet out of the 5 which will be free from the water of attraction, and, therefore, in a state of aëration in the interim between the sewage dressings. Of the surface soil stirred to a depth of 16 inches at least one-fourth will be occupied by air or water after the surface has been sown and compressed by harrowing and rolling; and of the remaining 32 inches of free subsoil at least one-sixth will be occupied in a like way. Thus the two together afford a reservoir capacity within the 5 feet at least 9 inches deep over the whole area of the farm, and if these 9 inches of reservoir were in a condition to be filled with sewage as distributed on the surface, 200,000 galls. would find a place in every acre. But if we consider that only half would be available, owing to natural impediments which may exist, the fact will be sufficiently striking. The figures, in point of fact, are only given to show that a very large air and water space exists in clays, which, with proper treatment, may be turned to account. But it may be stated that clay soils will not allow the passsge of water through them, let the air space be what it may, and it was to meet this objection that I carried out, in the winter of 1856-7, a second series of experiments. They are published in the "Journal of the Royal Agricultural Society," Vol. XX., Part II., and embrace different characters of land—free soils and stiff clays—100 acres in area,—and extended over a period of eight months (from October to May inclusive) so that comparisons of practical value might be made. The daily rainfall and discharges per acre from each description of land were recorded, and it was found that although the clays required more than three inches of rainfall in the autumn to satisfy the retentive properties before they commenced any outflow whatever, as soon as those powers were satisfied a large proportion of succeeding rains was immediately discharged from the under-drains. By the daily records, it appeared that in the month of January, when there occurred (on the 10th) a rainfall of of .542 inch, or 12,261 galls. per acre, the drains discharged within 24 hours as much as 6060 galls., or nearly half the rainfall, and continued to run copiously for the next five days, by the end of which time they had discharged 9-10ths of the rainfall that had fallen in the same period. Similar effects were repeated at different times in the remaining four months. Having said so much in favour of loamy and clay soils, I will only add that Dr. Voelcker, whose opinions as an agricultural chemist we all prize, has declared that he preferred the "better soils for the reception of sewage to poor land, because on the better description the benefits would be greater than on poor land, always provided that they were of a proper depth, and sufficiently drained to let the water pass through the soil. It was more a question of the division of the particles of soil." On another occasion he said, "when clay soils were properly subsoiled and drained, so that the water could freely percolate as through a sandy soil, they were better adapted for the reception of the sewage than the latter, and the crops, generally speaking, would be better. The reason was simple; in clay soils were found a greater abundance of mineral matters which plants keep as food."

I will now say a few words on sandy and gravelly lands. As long as the particles are small, and the filtering material uniformly divided, so that the air interstices exist equally throughout the whole, they answer the purpose very satisfactorily. Being naturally less productive than clayey loams, however, they require more sewage to maintain an equal quantity of growth, and being in themselves unequal in texture they frequently allow the sewage to pass through them unfiltered, and with considerable waste. This is shown to be the case in all the sewage farms now existing with a free soil in which special provision has not been made to prevent the sewage passing directly down from the surface to the drains, or to the subterranean water level existing lower in the earth. I shall presently show you the immense quantity of sewage which is absorbed and wasted by the porous soil at Barking.

These observations leave me little to say on the subject of the preparation of the land. It will have been understood from what I have already said that I consider drainage, natural or artificial, a *sine quâ non*, and that it should be so conducted in all cases, whether porous or heavy soils, as to secure active percolation down to the very base of the filter, by placing the drains sufficiently near to each other that there shall be no dead earth between them. The drains should be laid with special regard to the surface carriers by which the sewage is delivered and distributed, and also, in some degree, to the shape and position of the lands or slopes over which the sewage will have to run. Where the drains must pass under carriers they should be made water-tight, and the surface should be prepared so as to prevent the collection of sewage directly over the drains under any circumstances whatever. The absorption of the sewage by the soil should depend upon the uniform porosity of the soil rather than any direct influence of the drains.

In the case of a hospital in Surrey, where I have carried out the irrigation works with this point especially in view, the drains are so contrived that no sewage whatever runs over the surface immediately above the drains. The consequence has been that, although the liquid sewage of an average number of patients amounting to 235 daily, has been crowded upon 1¼ acre of land, the effluent water from the under-drains has been declared by Dr. Wm. Odling, F.R.S., to be "unexceptionable potable water." In this case the effluent water, when it reaches the level of the drains, mixes with a quantity of subsoil water.

The delivery of the sewage from a town to the land to be irrigated forms no part of the subject I have undertaken to speak upon. I will, therefore, assume that the sewage is delivered by the town (after the coarse solid portions are extracted) at those points on the sewage farm which will allow of its being distributed over the whole. The great point to aim at in laying out these carriers is to avoid as much as possible the exposure of the sewage, as it is from them, and from the collecting tanks, and not from the land, that offensive odour escapes. At present open carriers, either made of concrete or paved with earthenware, are considered the best. The natural shape of the surface governs the direction of the carriers, and the character of the soil governs the inclination of the slopes to be formed for receiving the sewage. If the soil is very porous, and the particles naturally coarse, the inclination must be steeper than where the soil is naturally retentive and the particles fine. The larger the bed or slope the better, as it can be more economically served with sewage; and it should always be borne in mind that the larger the space devoted to individual crops, the greater will be the profit, the farmer's labour being reduced proportionately to the increase of area. Mr. Hope, who has arranged his land at Breton's (which is of a porous character) on the ridge-and-furrow system, laid as flat as practicable, has declared that "the most convenient size of land is 40 or 45 feet wide from furrow to furrow, with a slope of 1 in 20 from furrow to ridge." In clayey loamy lands it is probable that double the width may be adopted without increasing the height of the ridge, and this would make the rate of inclination 1 in 40 instead of 1 in 20. Every case, however, must be treated on its own specialties, and it is better to act on a tentative plan rather than determine with precision beforehand what the size and inclination of the slopes or beds should be. I am led to say this from my own long experience as an agricultural engineer, and as a farmer, during which I have discovered how much land varies in character, and how different should be the treatment of each kind.

A great deal has been said by Mr. Morton in favour of the catch-water system of irrigation, such as is adopted universally in the hilly counties of Somerset and Cornwall. He considers this mode of distribution is the readiest and most practical way of applying sewage, because that portion which is not absorbed by vegetation and soil in the first bed can pass on to another, and, if necessary, to a third and a fourth bed, until it is either absorbed or sufficiently purified to enter the river courses. My objection to the catch-water system arises from the fact that the sewage to be applied to any given space cannot be economically regulated, and that the quantity and strength of the sewage passing off, as the tail water of one slope to become the head water of another, must depend upon several conditions over which the irrigator has no control; while it is equally certain that if the sewage will pass from one bed to another, there is no reason why it should not eventually pass off the last slope into the river itself. It must be clear to every one that one of two evils must arise from the catch-water system, *i.e.*, either the lowest land will receive very poor sewage (the "leavings" of the higher slopes), or the residuum of the sewage applied to the last slope will pass off its surface into the stream only slightly mitigated in character at certain seasons of the year.

[Mr. Denton proceeded to refer shortly to the impolicy of irrigation either showerwise or underground. He also referred to the need of providing roads for the removal of the produce. And the remainder of the lecture was devoted to a discussion of the crops by which sewage would best be utilised.]

Home Correspondence.

Sugar Beet.—The following is a history of our Sugar-Beet growing this last year, and if it is not as good as Mr. Duncan would like, I think it can be grown to please both him and us by means of sewage manure. 3 roods 28 perches were prepared for the seed, the land having, in grass and Cabbage, received much sewage. The seed was dibbled in between May 9 and 12, 1870. On May 31 a dressing of sewage was applied, and on September 29 to October 1 another small dressing was given because the leaves all fell with the heat and we were afraid to spoil the crop by refusing it stimulants. This dressing, Mr. Duncan tells me, played the very mischief, and lowered the rate of sugar by making the roots start off growing afresh. The weight per acre, as taken over the weighbridge from the ground to the clamp, came out at something over 47 tons, but as the earth was, in many cases, still clinging to the roots, we made a deduction from the gross weight to meet this, and reduced the weight of Beet to 44½ tons per acre. A Beetroot grower will judge whether this is a fair allowance, or if it is in excess of the requirement. Mr. Duncan has just sent me the result of analysing samples from 13 roots—the average weight being 1·5 lb. per root; the largest being 2 lb. 6 oz., the smallest 1 lb. 1 oz. The sugar percentage is 8·64, equal to about 3¾ tons of sugar per acre. (I think it is.) Now, this is a very good experiment, and I mean to try to do better next time, by using superphosphate on the sewaged land, and by omitting the last dressing of sewage which is considered so objectionable. The Mangel, sown late on the newly turned-up low-lying grass lands by steam, produced but 30 tons an acre, because it was put in late and the grub made patches in it. The Mangel put in between a Cabbage crop gave us 41 tons an acre, and the adjoining Mangel, put in (dibbled) as a crop by itself, gave 62 tons an acre, for 5600 tons of sewage! *H. J. Morgan, Metropolis Sewage and Essex Reclamation Company, 34, Clement's Lane, Lombard Street, E.C., Nov.* 28.

Royal Agricultural College.—It is gratifying to find that the members of this valuable institution have in view a proposal to testify their esteem and respect for E. Holland, Esq., and their appreciation of the services rendered by him in the earliest formation of this College, and for a period of twenty-four years, during which he has unremittingly given his personal support and voluntary supervision. A circular is now being sent out with a view of reaching each member, and those who have been students at the College, who are now located in every quarter of the globe; and of course any assistance that can be rendered to the committee to overcome the difficulty that arises in obtaining the addresses of early collegians will be much valued by them. There are, doubtless, many men who have received their early knowledge of agriculture at this College that this circular will never reach, nor the proposition made at the meeting of the Club, held at Oxford in July last, as to the manner of carrying out this desired object. As a member of the College I regret that the committee, in their circular, omit to state what resolution they have come to as to the manner of testifying their esteem. It has been placed in their hands to obtain contributions from a wide circle, and before they can expect the support that would most heartily be given by some hundred gentlemen, who have been at the College, the committee should state in what manner they had determined this shall be done. *M.R.A.C., St. John's Wood, Nov.* 29.

Fowl Keeping.—"A man convinced against his will is of the same opinion still;" it would, therefore, be useless to argue the question of poultry paying with your correspondent "A. B.," especially as he founds his arguments on misstatements. Here is one of them. He charges me with purchasing seven male birds annually, at a cost of £7 7*s.*; the fact being that I purchase two male birds every other year, at a cost of one guinea each,—so the charge is £1 1*s.* annually. It is absurd to say that poultry does not pay at market prices, because if they did not, either the prices must rise or the supply would diminish or cease. The same remark applies to all other agricultural produce. I am always ready to discuss fairly any agricultural question, but I must decline to argue with those who make incorrect statements of facts, and try to raise upon these misstatements correct conclusions. I must decline to be made responsible for words that I never spoke or wrote. *J. J. Mechi, Dec.* 3.

Fox Hunting.—Allow me to add to former communications one or two specimens of the loss and annoyance to farmers caused by this sport. I believe it is generally conceded that on stiff plough land fox-hunting cannot help doing injury, especially to Wheat and seeds. A neighbour of mine tried to prevent some hunters crossing his Wheat, and was insolently told by them that farmers were obliged to let hunters cross their land; that if they stopped hunters, and so offended the landlords, the latter would turn the farmers out of their farms. Another neighbour sowed Beans on a stiff piece of land between two woods. Just as the Beans were coming up, about 200 hunters, on a wet day, rode backwards and forwards across the field half a dozen times. Any one may guess what a modge the field was made. It drove the poor farmer half crazy. He could get no redress. Hares and rabbits, on game-preserved estates, also destroy the tenants' crops. The landowners, if they would, could stop the injury of both fox-hunting and game-preserving; but they will not. On one estate here, 3000 rabbits have been killed in one week. It is probably under the mark to say that on that estate each tenant of say 200 acres, has been robbed by game of more than £50 yearly for many years past. The poor tenants have no redress. When we had cattle plague, some few years ago, the hunters were asked to stop their sport till the disease abated; but they would not. They kept on running across diseased and healthy farms alike, at the great risk of spreading the contagion. Now, is any other country in the world thus placed? I know that the landowners dare not

do such things in Ireland; and I am not aware of any country where the selfish amusements of one class are permitted to destroy the property of another class. Do we not want for the rest of the nation a similar Act to protect tenants' property as poor Ireland has now? It is not a matter of party politics. Whig or Tory has nothing to do with it. It is simply a matter of justice and honesty between landlord and tenant. If a man has been induced to spend money in improving another's land, the farmer so doing ought not to be turned out at six months' notice, and have his improvements seized by the landlord. This is not often done, I allow, but it is done sufficiently often to show all tenants, from year to year, that their property in improvements lies completely at the mercy of the landlord. The prize farms in Oxfordshire were not so. Mr. Millington had a lease. I do not believe that the land of this country can ever be well cultivated until the property of the tenant is made as sacred by law as that of the landlord now is. Such a "felonious" power as the law now gives to landlords could not long exist, if farmers were fairly represented in Parliament. The House of Lords is composed of landowners almost entirely, and the Commons is packed by them as closely as they possibly can. By this means the landowners snugly contrive to "keep things as they are." The result is, that timber and game pay no rates; land pays no probate duty, and up till a few years ago paid no legacy or succession duty; while landlords can destroy crops by hunting and game breeding, and hold the power to turn out tenants at short notice, seize their improvements, and raise the rent to new tenants in consequence of those improvements. Is any other country in the world so treated? *H. H. O., Warwickshire, Dec.* 12.

Smut and Bunt in Wheat.—I hope you will spare me space in your valuable paper to reply to your correspondent, the Rev. Geo. Wilkins, of Wix, on his letter of inquiries as to the prevention of bunt in Wheat. He asks: "I wish to inquire of correct and scientific Wheat growers which they have proved to be the best plan to prevent smut, namely, to thoroughly cultivate their lands and put them into good condition, or to steep their Wheat seed in their smut preventing embrocations, or to employ some learned Egyptian sibyl to charm their seed for them? I myself have grown Wheat for upwards of 60 years, and I never adopted any plan except the first and last of these three to prevent smut in my crops, and I never had smut but once, and that was when I had procured a little seed of a neighbour to finish my sowing with." In the first place I conclude that the reverend gentleman means bunt, which is a different variety of the genus of parasitic Fungi, to which it and smut belong; presuming, therefore, that my conclusion as to his meaning is correct, I will try to answer his questions on the subject. Without pretending to call myself a "scientific Wheat grower," I think that forty years' experience as a farmer, with equally satisfactory results as regards freedom from bunt as your correspondent, is a sufficient warrant for me to express an opinion on the value of dressing Wheat for seed. With regard to the first plan named by the vicar I heartily concur, and I think no farmer will deny that good and clean cultivation is a great help in securing crops free from bunt; but I can only say that, on the land which I occupy, if we attempted to sow Wheat without previously dressing it, we should be certain to find bunts in the corn after threshing the crop; and the same would be the result on all the land in the district, and I should very much like to know the sort of soil that will not produce bunts, if the Wheat used for seed is at all contaminated with the spores of the bunt Fungus, and no measures are taken to remove them. As Mr. Wilkins states that he should have more faith in the charm of a gypsy preventing bunts in his crops than if "the seed were steeped in solutions compounded of all the drugs in the universe," it is obvious he ridicules the idea of steeping Wheat at all. Now, with all deference to his opinion as a parson, and a grower of Wheat "for upwards of 60 years," I beg most respectfully to state that he is altogether in error; for to any one who understands the origin of bunt in Wheat, the operation of steeping the seed before sowing it is clearly as necessary as the separation of weed seeds from the corn, inasmuch as the spores of the Fungus with which the seed is generally impregnated are quite as pernicious, and more disastrous to the crop than the weed seeds, which I suppose the reverend gentleman would hardly retain. I conclude by informing Mr. Wilkins that the application of arsenic to wetted Wheat, and sulphate of copper, or corrosive sublimate in solution, are used upon strictly "correct and scientific" principles, viz., "remove the cause, and the effect will cease." *Nemesis, Wisbech, December* 10.

Societies.

ROYAL AGRICULTURAL OF ENGLAND.

ANNUAL REPORT OF THE CONSULTING CHEMIST FOR 1870.—The publication of the periodical reports of the Chemical Committee has awakened the agricultural community to the painful fact, that oilcakes, as well as artificial manures, are frequently sold in an adulterated condition, or at prices much exceeding their real commercial value.

The analytical work in 1870 has increased in an unprecedented degree, no doubt in consequence of the issue of these reports.

Before 1868 the average number of analyses for members was about 330, for 1867 it amounted to 341. A considerable increase took place in 1868, when 432 analyses were made for members of the Society, and again in 1869, when 465 analyses were sent out from the laboratory. Notwithstanding this steady increase in the three preceding years, as many as 580 analyses have been referred to me during the past year, being an unprecedented increase of 115 analyses over the number sent out in 1869. The appended summary shows that a large number of guanos and artificial manures of the class of superphosphates were examined in 1870, as well as an unusually large number of oilcakes.

Comparatively few of the guanos were adulterated, but many were found damaged by sea water and of inferior quality. On an average the proportion of ammonia yielded by the guano analysed in 1870 little exceeded 14 per cent., and in several cases the proportion was less than 13 per cent.

It is to be hoped that the supply of guano from the Guanape Islands will turn out to be of a superior quality than has been anticipated.

I have recently made a number of analyses of Guanape guano for the Peruvian Government, and am glad to be able to report that nearly all the samples were much drier than those analysed in the preceding year. Although not equal in quantity to the best Chincha Island guano of former years, the Guanape Island guanos recently analysed by me are about equal to the average quality of last year's importations of Peruvian guano. It remains to be seen whether Guanape guano, which no doubt will be sold as Peruvian, is uniform in character.

By far the greater number of artificial manures—such as special Wheat, Oat, Barley, Potato, and grass manures—are mixtures of dissolved bones or superphosphates with ammoniacal salts, common salts, dried blood, nitrate of soda, and other nitrogenous fertilising materials. These manures are, therefore, grouped together with superphosphates. As many as 152 samples of superphosphates and similar manures were analysed by me in 1870.

Large sums of money are annually expended in the purchase of phosphatic manures, and as the quality of these manures varies exceedingly, and the actual price at which they are sold does not always correspond with the intrinsic value of the manure, it is highly desirable that purchasers of superphosphate or dissolved bones should buy these manures of a quality guaranteed by analysis. The following analyses of two superphosphates offered for sale in the same place, one at £6 3*s.* (cash) per ton, and the other at £4 3*s.*, afford a good illustration of the fact that a considerable saving may often be effected if the composition of rival superphosphates is determined previous to the purchase:—

Composition of Two Superphosphates.

	No. 1. Sold at £6 3s. nett cash.	No. 2. Sold at £4 3s. nett cash.
Moisture	12·36	12·92
Water of combination and } Organic matter } .. .	9·45	6·21
Triphosphate of lime monobasic phosphate of lime) ..	13·04	15·60
Equal to bone phosphate (tri-basic phosphate of lime) rendered soluble by acid	(10·42	(24·52)
Insoluble phosphates	1·25	8·14
Sulphate of lime	44·40	42·37
Alkaline salts and magnesia ..	1·03	·86
Insoluble siliceous matter	4·75	5·74
	100·00	100·00
*Containing nitrogen	·33	·08
Equal to ammonia	·40	·09

These two superphosphates have nearly the same commercial value. No. 1 contains a little bone; No. 2 is a purely mineral superphosphate. I should feel disposed to give from 5*s.* to 7*s. 6d.* more per ton for No. 1 than for No. 2. The sample marked No. 1 is rather dear at £6 3*s.*, nett cash, and No. 2 cheap at £4 3*s.*, nett cash.

Of the 32 samples of bone dust, not one was adulterated, which clearly shows that the unsparing publication of the names and addresses of dealers in adulterated bone dust has had an excellent deterring effect.

With respect to feeding cakes, I regret to have to report that linseed cake is still sold, as genuine and pure, which is largely mixed with rice meal, oat dust, pollard, mill-sweepings, earth-nut cake, cotton cake, and sometimes with more objectionable materials.

Linseed cake, when mixed with rice dust or pollard, is generally comparatively poor in flesh-forming matters, as will be seen by the following analysis of a sample of cake which was found adulterated with oat dust:—

Composition of a Sample of Linseed Cake, adulterated with Oat dust and similar starchy mill refuse.

Moisture	14·72
Oil	12·04
*Albuminous compounds (flesh-forming matters) ..	23·25
Mucilage, sugar, and digestible fibre	35·57
Woody fibre (cellulose)	8·24
Mineral matter (ash)	6·18
	100·00
*Containing nitrogen	3·72

It is, however, quite possible to supplement the deficiency of flesh-forming matters in a cake adulterated with starchy mill-refuse by incorporating at the same time with the cake a meal richer in nitrogen than pure linseed cake. Decorticated nut cake or decorticated cotton cake, being very rich in nitrogen, is sometimes used for that purpose, and the blending of the starchy matters poor in nitrogen with others abounding in that element is so skilfully performed by some notorious cake-crushers, that a cake is produced having almost precisely the same proximate composition as pure linseed cake. It is well to bear this in mind, for the fact that an oilcake on analysis shows the same percentage of oil, flesh-forming matters, woody fibre, &c., as pure linseed cake, is no proof that it may not be, after all, a mixed cake, and be composed of materials inferior in taste, digestibility, and condition to pure linseed cake.

Excellent decorticated cotton cake is sent over to England from America at the present time. When broken up fine, or, better still, when reduced to a coarse powder, decorticated cotton cake is a most valuable feeding cake for store cattle, when these have to be kept chiefly upon straw-chaff and a few roots. A mixture of finely-ground cotton cake or meal, linseed cake, and Indian Corn or Palm-nut meal in equal proportions, is also well adapted for fattening stock; and for milk cows, good decorticated cotton cake is preferred, I believe justly, to the best linseed cake.

Green German rape, or Rubsen cake, continues to be scarce, and ordinary rape cake is often so full of Mustard that it endangers the life of the animals to which it is freely given. Common rape cake should therefore never be given to stock without having been previously examined for Mustard. Most of the samples of common rape cake sent for examination I found utterly unfit for feeding purposes, and I would especially warn the members of the Society not to buy a variety of rape cake which has recently found its way into commerce under the name of yellow rape cake. Several samples of this species of cake I found so pungent that, in my opinion, less than half a cake would in all probability kill an ox.

Satisfactory reports of field experiments on root crops, on Potatos, and on grass land, have been received, and will form the subject of future contributions to the Journal. I may observe, however, in this place, that potash-salts have again proved to be very useful, in 1870, for Potatos and Mangels as well as for Clover seeds, and not only when used upon light sandy soils, but likewise when applied in conjunction with superphosphate to poor clay land.

The following are the papers contributed by me to the pages of the February and August numbers of the Journal for 1870:—

1. Field experiments on Mangels.
2. On Beetroot pulp.
3. On a peculiar kind of Swedish whey-cheese, and on Norwegian goat's-milk cheese.
4. Field experiments on Potatos.
5. On the composition and practical value of several samples of native guano prepared by the "A. B. C." process of the Native Guano Company.

Analyses made for the Members of the Royal Agricultural Society, December, 1870, to December, 1870

Guanos natural	64
Artificial guanos	13
Superphosphates, dissolved bones, Wheat manures, and similar artificial manures	152
Bone dust	32
Refuse manures	27
Nitrate of soda, sulphate of ammonia, and potash salts	31
Marls, limestones, and other minerals ..	20
Soils	14
Oilcakes	154
Feeding meals	18
Vegetable productions	13
Disinfectants	2
Waters	30
Sewage	3
Cider	1
Treacle	3
Examination for poisons	3
Total	530

(Signed) AUGUSTUS VOELCKER, F.R.S.

SOCIETY OF ARTS.

WE conclude Mr. Jenkins' paper read before this Society, on Wednesday, December 7.

Adoption of the American System in England.—Under this head I propose to give a summary of the steps which have been taken towards the introduction of the system of associated dairies into England.

At the annual dinners of the Midland and the Derbyshire Agricultural Societies, held in the autumn of last year, the cheese-factory system, its results, and its effect on the English dairy-farmers' interests, were prominently brought before the notice of Derbyshire dairymen, in the former case by a tenant-farmer (Mr. Nuttal), and in the latter instance by a Derbyshire landlord (Mr. J. G. Crompton). The words thus spoken were vigorous and well-timed, and they produced a corresponding result. I need not trouble you with a history of the subsequent meetings, the appointment of a committee, the discussion on its report, and the other details which led to the final result.

It is sufficient for me to state that, by the beginning of last April, an adequate guarantee fund was subscribed, a suitable building secured in the town of Derby, and a manager obtained from the United States. After some

considerable difficulty, and after canvassing the tenants on the different estates in the neighbourhood, it was found that the tenants on the estate of the Hon. Mr. Coke, and in the vicinity of Longford, were willing to send a sufficient quantity of milk to a second factory, if it were erected at Longford. Mr. Coke thereupon undertook to build the factory, and to give it and the plant charge free to the guarantors for one year. This matter being arranged, a second manager was telegraphed for from America, and thus the guarantors have been enabled this season to test the merits of the American system under a variety of conditions, viz. (1), in a town, and in an old building adapted to its present use; and (2) in a rural district, in a building specially designed for the purpose. I wish to state my opinions on these experiments with due submission. They are (1) that a factory is likely to be more successful in a rural district than in a town; and (2) that where an old building as capacious and as suitable as the Derby factory can be procured, it is not worth while to build a new one.

Until after the close of the present year, it will be impossible to say what are the pecuniary results of the Derbyshire experiments; and even then it will be difficult to place the account on a purely commercial basis, as both factories and their plants are lent rent free, while, on the other hand, large sums have been spent in bringing from America and keeping in England two skilled American cheese-makers.

Two items, however, are very striking, viz., labour employed, and price of produce. At the Derby factory, two men and a boy are sufficient to make and cure the cheese yielded by the milk of 300 cows; and at the Longford factory, the milk of nearly 500 cows is treated by two men and two boys. Then, with regard to receipts, without going into details, as the guarantors have not yet published their financial statement, it is sufficient to mention that the cheese hitherto sold has obtained prices varying from 80*s.* to 85*s.* per cwt. I will ask, however, how many private dairies in the county of Derby can boast of such a result?

Doubtless, there are many points of detail which require improvement, such as the more economical disposal of the whey, especially at the town factory, and a more important consideration is the proper cooling of the milk before it is sent to the factory. These and some other items might be profitably discussed before a more purely agricultural audience, but here I will merely refer back to what has already been said as to the system of cooling milk adopted at the creameries, and ask the promoters of the Derbyshire factories whether they cannot obtain a hint by carefully considering it.

The Cheshire Factory.—The remaining English cheese factory is on a more modest scale, and owes its existence to the enterprise of Mr. G. Jackson, of Tattenhall Hall, near Chester, who has advocated the adoption of the factory principle for many years. The following account of his factory is in his own words, as given in a letter which I have recently received from him:—

"It will be seen from your favourable review of my farm management in the 'Report of Cheshire Dairy Farming,' in the Royal Agricultural Journal, vol. vi., part 1, pp. 172—3, that my arrangement here is for 110 dairy stock, and two miles off I hold a dairy farm with 40 cows. Since the cattle plague I have been gradually decreasing the sheep flock and adding to my dairy stock, and this summer at both farms I have had in milk 90 cows, and purchased the milk from only one farm of 12 cows. In adopting the cheese factory system on a small and safe scale, I had in contemplation

"1. To bring all the milk from the three homesteads to one place, and put it under skilled management.

"2. To save labour, and so reduce the cost of cheese-making.

"3. To dispense with the annoyance of having together dairy and domestic servants, leading to frequent misunderstandings, and worse.

"I am happy to be able to assure you that, so far, the experiment has more than realised my expectations, although the season has been most unpropitious, both as to quality and quantity of milk, owing to the hot, dry summer.

"For the milk I have purchased I have paid 6½*d.* per 10 lb.; and as a gallon of milk should weigh 10 lb. 8 oz., it follows that I have given 6¾*d.* per gallon. We cannot, until the end of the year, tell the quantity of cured cheese obtained per gallon, but in the month of July (the cheese sold early in September) 10 lb. 14 oz. of milk gave but 1 lb. of cheese, so that either the milk in July, owing to the hot dry season, was unusually poor in casein, or we shall not equal the American factories, who average over 1 lb. of cured cheese from 10 lb. of milk.*

"From the whey we take per week about 8 oz. of butter per cow; this and the sour whey for the pigs will more than pay the expense of working the factory, and as milk at 6½*d.* per 10 lb. is equal to 7*2s.* 6*d.* for 120 lb., at 10 lb. 14 oz. for 1 lb. of cheese (and the price I made was 75*s.*) I have no cause to regret having given 6½*d.* for the small quantity of milk I purchased, although the farmer got the advantage equal to 7*2s.* 6*d.* per cwt., or 10*s.* per cwt. more than those small farmers who have made their cheese at home.

"A register is kept, in which is recorded:—1. The date. 2. The temperature of the dairy and of the milk at the time the rennet is added. 3. The weight of the milk in each vat or cheese-tub. 4. The number of drachms of rennet. 5. The time required for coagulation. 6. The number of pounds of curd when the salt is added, and the quantity of salt used. [In April and May it was 1 lb. of salt to 40 lb. of curd; in the summer, 1 lb. to 35 lb. of curd; and now, autumn, 1 lb. of salt to 35 lb. of curd.] 7. The time the cheese is put in the vats. 8. The number of cheese made. 9. The date when each cheese was made. From this it will be seen that for the old Cheshire 'rule of thumb,' we have substituted a systematic rule, which cannot fail to give more satisfactory results."

Co-operation in Agriculture.—I now turn to the subject indicated by the second division of the title of this paper. By the term "co-operative agriculture" I do not refer particularly to those joint-stock farming companies which have recently attracted considerable attention. I attach to the phrase a much wider signification, and this evening it has been my endeavour to trace the history of the development of its most vigorous manifestation.

We have in England, however, other examples which bear the impress of a vigorous youth; such is, for instance, the Driffield Linseed Cake Company, the Northumberland Steam Cultivation Company; but with regard to the utilisation of our home-grown produce, co-operation in agriculture can, as yet, hardly be said to have come into existence; but the efforts recently made towards the establishment of cheese factories shows that the day has nearly gone by when the English farmer will continue to be both producer and manufacturer. Butter and cheese are probably the only remnants of a system which once extended to all the wants of daily life, from the bread that was eaten to the clothes that were worn. The American farmer and the Swedish peasant-proprietor have both gone a step further. They produce the milk, and send it to the manufacturer to be made into butter or cheese. This is as much a matter of course to them as it is for the English farmer to dispose of his Wheat to be ground, and of his wool to be woven.

The reasons why a practice, which has been so long abandoned by us in the instances of corn and wool, should still be retained in the case of milk are simply these—first, corn and wool may be kept for months or years after they come into the farmer's hands, while milk must be dealt with in a few hours; therefore, without co-operation, it has been a necessity to manufacture the milk at home into a product that will keep, except where there exists a daily market for it at a moderate distance. A second reason is, that the processes of cheese and butter manufacture leave a residuum which, until now, could not be dealt with profitably except on the farm; but this is not the case with the other articles of agricultural produce.

The cheese-factory system meets both these requirements of the milk producer; therefore I believe it will ultimately succeed.

I am not aware that any organisation or company comparable with a butter-factory exists either in England or Ireland; but with regard to milk the case is different, as the Aylesbury Dairy Company, for the supply of London, and Harvey's Dairy Company, for the supply of Glasgow, are both founded on the same principle as the cheese-factory experiments which I have already described—that is, on the basis of the purchase of the milk.

The further development of the principle of co-operation is a striking characteristic of Continental agriculture. Every student of foreign farming must have noticed the great extent to which "industrial crops," as they are termed, are grown in certain parts of France, Belgium, and Germany. Sugar-Beet, one of the most important, is a fair example. It will not bear the cost of being conveyed a long distance, it will not keep for an indefinite length of time, and the residue of the sugar-factory or the distillery can be profitably used only on the farm. But the farmer is enabled to grow this very lucrative crop by co-operation with the manufacturer.

I do not intend to discuss the comparative advantages and disadvantages of growing Sugar-Beet in England—the question is too large and too complicated; but it seems quite clear that, if the Beet-Sugar manufacture is to be established in England, the farmers and the manufacturers must co-operate for that purpose. At present the farmer does not grow the root because there is no sugar-factory in the neighbourhood, and the manufacturer does not erect a factory because no Sugar-Beet is grown.

Similar reasons have prevented the extension of the cultivation of another lucrative crop, viz., Flax. The English farmer will not grow it for straw (its most valuable portion) because it must be retted before it is sold if he wishes to obtain the fair value for the fibre. His people do not understand the process, and the quality of the fibre is, therefore, more or less ruined. But if the example of the Belgian farmer were followed, the Flax would be sent to an English Courtrai, to be retted by competent people, just as, under the system of associated dairies, milk is sent to a factory to be made into butter or cheese by a skilful dairyman.

The following is an abridged report of the discussion which ensued on Mr. Jenkins' paper.

Mr. Trask, as a Somersetshire man, differed from Mr. Jenkins in his description of the system of making English cheese. He could produce cheese made in the Somersetshire dairies at a price that would beat the American, and be better in quality. The greater part of English cheese was of middling quality; still there were some cheese-makers who do make a superior article. The price of 6½*d.* a gallon for milk would not do, in his opinion. At the early part of the season it would not make a pound of cheese, but at the latter end of the season a gallon of milk would make above a pound. Mr. Jenkins had not said anything about the value of the whey, which he looked upon as very important.

Mr. Nuttall would just say that the whey ought to pay the working expenses of the dairy. He felt sure that cheese could be made at 2*s.* 6*d.* per cwt., and not 7*s.* or 8*s.*, as stated by Mr. Jenkins. This was a difference at once of 5*s.* England could make cheese that would be unequalled by any other country. He would undertake to say that the American cheese was not a bit better cheese than the English. There might be dairies that could produce as fine, but not finer cheese than he could in this country; and he would not hesitate to say that in this country it was made quite as good as in any other.

Mr. Greening (of the Agricultural Co-operative Society) said a clear distinction must be drawn between a joint-stock company and a co-operative company. A joint-stock company, as he understood it, was where the capital was found by one class, and the use of the society by the other. The profits belonged to the capitalists, and the management was placed mainly in their hands. If a joint-stock company is very profitable, the shares are bought up for the sake of the dividends. If it fails the shares again go down; but the co-operative undertakings in Lancashire and Yorkshire, which have been so successful, with the Society which he represented, were based upon the condition that the capitalist should take a fair interest, and that all interest of the profits should be taken by the users of the factory. The working men of Lancashire and Yorkshire had gone so far as to have three buyers of their own out in Ireland collecting the butter for themselves. Could not the English farmers unite and compete with this, and put a little profit into their own pockets?

Mr. Hayes said: in Wiltshire, Dorsetshire, and the whole West of England, the average of English cheese was deteriorating in value yearly; on the other hand, American is yearly improving. The quality this season of English cheese was very low. What was wanted was a school for cheese making. The dairymaid who can make good cheese has the greatest objection to tell her neighbours how she does it, because she is afraid she will not get a good price for her own. Under the factory system all that sort of thing is done away with.

Mr. J. G. Crompton said he was a member of the Derbyshire Committee of Management of the cheese factory about which they had heard so much that evening in the paper read. It was asked what do they do with the whey in America, and how is that whey utilised in an English factory? In America the co-operative system is carried out pure and simple. The proprietors of the factories are the resident factors or farmers, who come together, build their factory, buy all that is necessary, appoint their managing committee, make the best cheese they can, sell it, and, at the end of their season, divide the profits. The profit on the sale of hogs is divided among the contributors, and in some factories the contributors have a right of taking back whey in proportion to the milk that they have supplied. With regard to the associations which are in existence and working in Derbyshire, they are not at the present moment conducted on a complete co-operative system, simply because it was not probable that any number of farmers would come together and enter at once upon an entirely new system, which would involve a great amount of risk and a large amount of capital. The only method of giving the system a trial was by following the Derbyshire plan. Landowners and farmers interested in the experiment came together, and a guarantee for a large sum of money in case of its proving a failure was got together. So far as the experiment had gone it had been successful, the expectations being more than realised. The highest price realised this year has been between 70*s.* and 80*s.* per cwt.

Professor Voelcker, F.R.S., thought it would be well if two things were kept totally apart in the discussion—first, the system of co-operation as applied to the manufacture of cheese; and, secondly, the mode of operation adopted in the manufacture. A good deal had been said about the American plan of making cheese, but the Americans had simply adopted the only plan calculated to produce good cheese on a large scale. He believed that co-operation would be beneficial to poor farmers, and he was an advocate of the Cheddar system of manufacture. Cheese could be made of excellent quality, in Scotland, Derbyshire, America, or anywhere, under a system of co-operation. The land had very little to do with the quality of cheese, which really depended principally on the hands which made it. He should observe that this Cheddar cheese was produced by a plan which could be followed by any ordinarily intelligent man.

Dr. J. Crace Calvert, F.R.S., said he had heard in Lancashire and Cheshire, that, with a large number of farmers, it was not a question of making good cheese, but of making cheese at all; they had a great sale for the butter, and it paid them better to sell the butter, and make poor cheese, than to make good cheese and no butter.

Lord Lichfield complained that the discussion had been allowed to dwindle into a controversy on subjects totally irrelevant to the question in hand. They had perfectly succeeded in establishing co-operation in Derbyshire. He should be happy to put before the public a statement showing the entire history of the movement.

The Chairman (Lord Vernon) moved a vote of thanks to Mr. Jenkins for his paper. So far as the question of 6½*d.* a gallon for milk was concerned, that price was fixed upon after calculations had been gone into in his district most carefully by four or five leading dairy farmers, and they considered that milk at 6½*d.* or 7*d.* was equivalent to 70*s.* or 80*s.* per cwt. for cheese. He was not prepared to say that the cheese made in their dairy was the best, but he anticipated that the quality would very far exceed that produced from an equal area elsewhere in the county. It had been stated that the Royal Agricultural Society had neglected questions relating to the manufacture of cheese, but he held in his hand articles published in the Journal of that Society in 1860, on the subject of cheese making, which showed that this accusation was not true. The Royal Agricultural Society had had letters from America, asking scientific questions with regard to this subject, but hardly one had been sent by the farmers of England. He had, however, received a letter from a gentleman in Derbyshire, whose name he was not at liberty to divulge. That gentleman had, however, given him leave to make use of the letter. He said:—"By the kindness of Mr C——, I had the pleasure of looking over the Longford cheese factory, and was much pleased with the general arrangements, and with the uniform good quality of the cheese, which, though not equal to the finest Derbyshire cheese, is really above the average quality. The flavour is generally good, and there is no

* The American factories this year, during the months of May, June, and July, averaged 1 lb. of cheese to 10.54 lb. of milk, instead of the usual rates, 1 to 9.97.

really bad-flavoured cheese in the factory. The main fault is, that the meal is rather too close, and not so "fleaky" as is the fashion with English cheese. The reason of my troubling you with these remarks is, that Mr. C—— informs me that you are going to take the chair at a lecture to be given to-morrow upon cheese factory and cheese-making, and he particularly wished me to write you my opinion upon the Longford factory and the factory-made cheese." The statements in that letter were true, for he had seen the factories, and could speak personally on the subject. He trusted the system would take root, and spread all over the country, and thus enable them to improve their dairies, and to successfully compete with the American and other nations in the manufacture of cheese. He thought the paper a most useful one, and that the thanks of the meeting were due to Mr. Jenkins for the attention he had bestowed on so important a subject, and the information with which he had favoured them that evening.

The vote of thanks was seconded by Lord Lichfield, and carried unanimously.

Farmers' Clubs.

SMITHFIELD.

The General Meeting of members took place on Tuesday, December 6, under the presidency of the Earl of Powis.

The report of the Council stated, among other things, that it has been determined that no person acting as judge at the Birmingham and Midland Counties Show shall hereafter be judge in the same year at the Smithfield Club Exhibition. Additional precautions have been taken to prevent unqualified persons obtaining admittance into the hall previous to the appointed time. The Council have accepted the offer by the Earl of Powis, the President, of a prize of £20 for the best instrument for slaughtering animals, which shall be an efficient substitute for the poleaxe, by separating the spinal marrow. The competing instruments are to be delivered at the office of the hon. secretary on or before October 1 next, and the exhibitors are required to show the instruments in practical operation at such times and places as the judges appointed by the Club shall determine. The report also announces the discontinuance of the annual Club dinner. The annual report on the animals exhibited at the show will likewise cease to appear. Appended to the report is the balance-sheet for the year ending the 1st inst., which exhibits a balance in hand amounting to £2788, and stock invested in the Three per Cents, £4513.

The presentation of the champion plate and silver cups was then made.

The President having handed the £100 plate to Mr. Pulver, as the exhibitor of the best beast in the show,

Mr. PULVER, in expressing his acknowledgments, said it was now 20 years since he first appeared as an exhibitor at the Christmas shows, and when he did so he was unsuccessful, although he obtained a commendation. However, he resolved to persevere, and subsequently he had taken a great number of prizes, alike first, second, and third, as well as had some commendations, and had not ceased his exertions until he obtained the first honours of the yard. He believed he might venture to say that his ox made more money than any ox in England before; for he had taken 23 first prizes and one third, the total amount of which was £368 5s. When he had done exhibiting, too, he should receive £100 for him.

The next presentation of plate was that of £40 value to Lord Walsingham, the exhibitor of the best pen of sheep in the show.

Lord WALSINGHAM, in returning thanks, said, in adopting the breed of Southdowns he was mainly influenced by the idea of producing good mutton. When he entered into possession of his farm, about 30 years ago, he found a flock set down upon it, and from that time to this it had been rising little by little, until he had been able to gather great honours. He thanked the Club for giving him an opportunity of winning such a magnificent specimen of art, and he hoped that he should be equally successful in another year.

Other prizemen having spoken,

Lord BRIDPORT proposed the election of Lord Penrhyn as President for the year 1872. The noble lord was well known to have been a successful exhibitor on many occasions at the Smithfield Club Show; and would be happy to accept the office as President, if the meeting would do him the honour of electing him.

The motion was seconded by Mr. DUCKHAM, and agreed to unanimously.

The Marquis of EXETER moved the thanks of the Club to the Earl of Powis, for the able and zealous manner in which he had performed the duties of President of the Club for the year 1870.

Mr. C. S. READ, M.P., seconded the vote of thanks to Lord Powis, and whilst on his legs, threw out a suggestion for the consideration of the Council, when they came to revise the prize-lists for next year. He would direct their attention to Class 62 in the catalogue —that was to say the light weight cross-bred sheep, described as "Long and short-woolled cross-bred fat wether sheep, 1 year and under 23 months old, not to exceed 220 lb. live weight." He thought it undesirable that a great national club like this should encourage a weight that was not required. The light weight of a Southdown he could understand; but the light weight of a cross-bred, if it were of good quality, was something that he could not understand. Even with the Southdowns, when he saw that Lord Walsingham could bring them out at one year almost as heavy as if they were two years old, it seemed to him that the days of light weight for Southdowns were nearly at an end. But with regard to cross-bred sheep, which he looked on as the sheep for the million, he contended that the bigger and better they were the more advantageous would it be alike for the farmer and the consumer. He hoped, then, that the prizes for cross-bred sheep would not be reduced, but rather let them add to the number of prizes for yearling sheep.

The motion was carried by acclamation.

The Earl of POWIS assured the meeting that it had given him great pleasure to have been selected as the President during the current year.

LONDON.

AT the annual dinner of this Club, on Tuesday of last week, there was some capital speaking. The following are extracted passages:—

Mr. C. HOWARD (Chairman).—Warm defenders as we are of our present system of agriculture, we cannot shut our eyes to the fact that it might be very much better, and that a very much larger amount of capital might be beneficially employed in it. But is it likely, I ask, that men who have capital will embark it in the cultivation of much of the soil in this country while there is such an insecure tenure as we now possess? There are quite as bad landlords in England as there have ever been in Ireland. There are landowners here who tenaciously cling to feudal usages—whose tenants require quite as much protection as any on the other side of the Channel; and it is quite evident that if English agriculture is ever to assume the position which it ought to assume, a well-defined tenant-right is imperative. It may be said that on the large territorial estates generally of this country nothing of that kind is required. True there is greater security on those estates than on others; but, gentlemen, a Pharaoh may arise who "knows not Joseph," and great hardships may be endured in consequence.

Mr. H. CORBET (Secretary).—He felt more inclined to read an extract from a speech than to make one himself. However, an old schoolfellow of his, having thrown overboard his Latin and Greek, went to Australia to engage in farming operations there. Having recently returned to this country he called upon him last summer, and showed him an Australian newspaper, containing something that appeared to be of interest to them. This was an address delivered before the Victoria Agricultural Society on "Rational Cultivation." In the course of his remarks the lecturer said:—"First on the list of things that would tend to promote rational agriculture, I will venture to mention Farmers' Clubs, such as this Society has had the honour of introducing to the colony, or, as they might be called, farmers' schools for grown-up pupils, where each by turn is teacher and is taught. They are the most readily available and practicable means of agricultural education that we have at hand. These Clubs, and the national shows of the Royal and Highland Societies have done more to advance British agriculture to its present position of high excellence than anything else. They have taught the British farmer to think, and to express his thoughts. I can assure you, although you may not think it, I read with far more interest and profit the papers and discussions of some of those Farmers' Clubs in the old country than I do even the parliamentary debates in our own. Through these clubs, and the agency of the press in diffusing the knowledge gleaned at their meetings, and by that strength which such union gives, the British farmer is fast becoming a power in the state. Instead of being considered a mere cipher, and told how he was to vote at elections, he will ere long dictate to his landlords how they must vote in Parliament on such questions as the Game Laws and tenant-right." Now he (Mr. Corbet) thought it must be very gratifying to them living in the old country to find their glory wafted right and left across the sea—not the glory of England only, but the glory also of the Farmers' Club. Especially gratifying was it to him to find the questions of tenant-right and the Game Laws placed in such a prominent position. They had laboured earnestly and honestly on the question of tenant-right for the last 30 years; he thoroughly believed that on that question farmers were becoming stronger and stronger. He was quite sure that there was no flag under which tenant-farmers could fight better than under that of tenant-right.

Mr. C. S. READ, M.P.—We live in stirring times—we hear of "wars and rumours of wars;" and I am sure, gentlemen, you all joined in the devout hope of our chairman that this country may continue to be blessed with peace, and I would add that we must one and all pray that that horrible war which is now devastating France may shortly be brought to a close. We cannot, indeed, now look upon it as war, it is something like murder. Almost every one who now speaks in public about the war has a theory with regard to it. I have heard this theory advanced in order to account for the successes of the Germans over the French—that the physical superiority of the Germans is caused in a great manner by their having better military drill than the French. Now, as the French are constantly drilled, I should have imagined that the intermittent drill of the Germans is not quite as perfect as the French drill. However, I am not a judge on that point. Another theory is, that the German victories are owing to the superiority of their education; but if you examine the matter, you will find that the soldiers of German States which are not quite as highly educated as those of Prussia and Saxony are equally brave in the field. There are all sorts of theories and arguments on that subject, and, with your permission, I will give my theory. I believe that the superiority of the Germans consists in their being a beer-drinking people. I say it seriously—a sober, beer-drinking people. Beer is their national beverage. They have no Malt-tax; they have very little Beer-tax. You can get all over Germany a cheap, refreshing glass of beer, and I contend that that is very much better than the sour wines of France, which purge the body and set the teeth on edge. I would follow up that thought by saying, how comes it to pass that our agricultural labourers are so degenerate in physical strength? They are better paid, they are better clothed, they are better housed than they were 50 years ago; but they cannot undergo the same amount of physical toil, and I say we must look to the drink for the cause. The milk has been exchanged for wishy-washy tea; the home-brewed that was doled out regularly from the farmhouse, and the swipes that was brewed in the cottage, have been exchanged for horrible doctored publican's beer, supplemented now and then with a glass of poisonous gin.

I believe the last session was, as regards practical results, almost a blank. Perhaps you will ask me how it was that there were so many blank weeks in Parliament as regards the agricultural interest. I would say, and I say it boldly, that it is just the same in the House of Commons as out of it. The agricultural interest is the most powerful interest in the kingdom; but it is not united, and it loses its cohesion when it comes to practical work. We are the worst hands in the world at accepting extraneous help. I would ask whether the Corn-laws would ever have been repealed if the agitators for their repeal had not been ready to receive help from any one who would grant it, without inquiring what were his politics? I say we are to blame in that respect. We are, moreover, constantly carping at what we call crotchetty, enthusiastic men. We should utilise their enthusiasm. Remember that the world has been conquered and governed by enthusiasm. Coming outside Parliament let me begin with the various agricultural societies. There we meet with a great number of most useful, practical, well-worked societies; and I believe that they are all wanted, and that each one in its different line and vocation is doing an immense deal of good. Certainly I for one should have liked to see some of the junior institutions of that kind grafted upon the older ones. Still, there is sufficient room for all of them. But then up starts one of our eloquent speakers and ready writers, and says that we are constantly trying to foment discussions and divisions, and would not otherwise exist; and these, mind you, are not outside enemies, but persons who profess to be among our best friends. That, therefore, is one of the reasons why it comes to pass that the agricultural interest outside Parliament is not thoroughly united. And then, just look for one moment at the case of individual farmers. Go into any county you like, and take a body of farmers. For 25 years they have been "hoping against hope." Ever since the Corn-laws were repealed they have been promised this, that, and the other. Not a single promise has been redeemed, but instead of that, increased taxation has been constantly imposed. And then, if you do see a good, active, zealous man, you find that he is very apt indeed to fancy that his own locality represents the whole agriculture of the country. He makes a speech at his own Farmers' Club, and comes up here and lets off the steam, and then is dreadfully annoyed to find that other people don't think exactly as he does. I will exemplify that in my own case. On the very last occasion that I made a speech in the House of Commons the noble lord the member for Retford (Lord Galway) was good enough to tell me that I considered Norfolk to be all England. Now, then, let us look at some of our acknowledged grievances, and see how they are generally treated by farmers and by our friends. First of all, take the Malt-tax. What do our friends who are fond of wrapping us in wet blankets and dosing us with cold water say? "Oh it is possible to make better and perhaps a little cheaper beer, but as to you farmers, you would be inundated with foreign barley, and would not have a better price for your grain if the tax were repealed." Again, take the case of the Game Laws. If you were to get some modification or alteration of those laws, our kind friends, say the landlords, will be in exactly the same position as at first, and will just keep as much game as they please. Then there is the great question of tenant-right. We are told that we farmers should easily get this benefit, that we should have to pay for what we did not want and greatly to increase the capital which we employ in the land. As regards county financial boards, men say, "You will have higher rates." Further, there is the question of local taxation. During the last five-and-twenty years the whole of the increased local taxation has been paid by the tenants—I say, most distinctly and emphatically, the whole of the increased local taxation has been paid by the tenants; and, then, you are told that if there be a modification or alteration, the whole of the benefit will be enjoyed by the land-

lords. Well, then, suppose you get a Minister of Agriculture, what will he do? "He will," it is said, "make statistics compulsory, and tax our farm-horses." That is the kind of argument which you have at every market table, from some extraordinary individual it may be, but still he is, somehow or other, identified with the agricultural interest, and he may even be a tenant-farmer. It seems to me that we ought to try if we cannot put an end to that sort of thing; for it is because we have these schisms and divisions among ourselves that we do not make the progress that we ought to make. Well, then, look at agricultural meetings. If we go to one meeting and see a great many landlords at such meeting, we find some man starting up and exclaiming, "Undue landlord influence!" If we go to another meeting, and no landlords are present, we hear it said, "Landlords are not doing their duty, or taking a proper interest in agriculture!" You go to another meeting, perhaps, where the question of education was to be considered. There is no other class among the poor in whose education they ought to take, and do take, so much interest as they do in that of our agricultural labourers; yet, when they attend a meeting in any number, you are sure to hear the words, "Too much priestly influence." And then, when they have come to a real *bonâ fide* Farmers' Club like this, gentlemen go away and say—"Why these tenant-farmers seem, somehow or other, to forget that there is such a being as a landlord left." Let me just say this, gentlemen, in respect to our own Club—this is the greatest and best combination of practical farmers in the kingdom; but we have hitherto suffered a little through not having a sufficient number of landlords to take an interest in our proceedings, and therefore I cordially join in the congratulations expressed in the report of the committee, that in the past year we have added considerably in our list to the number of landlords and gentlemen having seats in the House of Commons who are connected with the agricultural interest. Now, gentlemen, let me just draw a moral from what I have said: Don't let any one say for a moment that any advantage which can be gained for agriculture can be appreciated exclusively either by the landlord, the tenant, or the labourer. It is impossible that it can be absorbed by one class. If it be a real benefit it will pervade the whole, although it is just possible that some one class may receive a larger percentage of benefit than others. And then, just let me say this—that there cannot be greater unity between landlord and tenant if they do not act together more than they have done. And I am quite sure that the more landlords and tenants know of each other—the oftener they meet, the more frequently they discuss together—the more respect they will entertain for each other, and the greater will be the amount of success, the prosperity, and advancement attained by agriculture. Gentlemen, one part of my toast is "Better health to Mr. James Howard, M.P., the chairman of the year." Mr. Howard has done good service to the cause of farmers in Parliament. It is most essential that the agricultural interest in Parliament should not be a party interest, which we expect would bring more Liberal members to speak for us whenever agriculture is assailed. Mr. Howard stands up in the House of Commons on our behalf; he not only speaks, but speaks well; and the only time that I have seen any impatience manifested towards him was when he rather displeased some of his Liberal friends, and they therefore endeavoured to stifle what he was saying. I am sure you will all sympathise with his family in relation to his present indisposition, which has no doubt been brought on by overwork. There are some people who rust up. Mr. Howard is not a man of that sort; and I believe—I am sorry for it, for our sakes and for the sake of his family—he has been wearing himself out. Before sitting down I wish to say one word with regard to our excellent chairman. It is not often that so good a substitute can be found as we have the good fortune to possess on the present occasion. If there be one man in the country whom I more respect than another, that man is Charles Howard. If I wanted to place before the world a good specimen of an intelligent, honest, and truly Liberal John Bull, I should present our excellent chairman. I believe that in every relation of life he is a pattern to us all, and I have great pleasure in including his health in the toast.

Notices of Books.

Our Farm of Four Acres, *&c.* Tenth edition. Chapman & Hall.

THIS very successful amateur performance has not, that we remember, been yet referred to in our columns. Its authors, having realised a tenth edition, are, indeed, beyond the influence of the reviewer; and, after all, we are not sure that there is much we would desire to see altered. Perhaps, like some of the engravings which illustrate its pages—that wonderful Cochin hen, for example, on the frontispiece—some of its statements are somewhat exaggerated. But it is a very pleasant history of country and domestic life, and, we doubt not, always virtually, if not always literally, true. It appears from the preface that, notwithstanding the charms and "profits" of an English country home, the writers of the book have emigrated. "They are now in a distant country, and it has not been possible to consult them on the additions which have been made to the present edition. The laying-out of a garden, the addition of a water-meadow, and a good deal of new matter on poultry keeping, has made the present work fuller and more useful than its predecessor." We take an extract or two from these new parts of the work:—

Mr. Jones upon the Farm Garden.—"Our friend, Mr. Jones, unlike most farmers, was really a good gardener, and his own garden was a model most worthy of imitation. 'Kitchen gardening,' he said, 'was only high farming; fruit growing, a work of art; and the proper arrangement of flowers the æsthetics of cultivation—even if it be only a Cauliflower; since any flower must be an advance upon Mangels and Turnips, and sewage grass. Indeed, we have been told that Cauliflowers are the only flowers that farmers care to grow. I regret this statement,' he would add, getting loquacious on the subject, 'not because it asserts too little, but implies too much. The majority of farmers' gardens that we have seen seem to say that their owners don't even care for Cauliflowers. In many of them this delicious vegetable is hardly grown at all; and if it is grown, it has to battle for life with smothering weeds, and seek out for juicy sweetness where it can never be found, in poor, hungry, parched-up ground. Farmers' gardens are too often like those of the sluggard; often a perfect wilderness in the midst of a surrounding Eden of well cultured fields. It is difficult to account for this neglect of gardening by farmers; perhaps the garden is too small to be noticed. The man who has just ploughed 500 acres thoroughly and well, will turn his garden off with half a digging. Manure is carted out by the score of tons, and yet as many barrow-loads are denied to the garden at his door. Gardening has been well described as attention to trifles; but it is altogether too trifling to claim the attention of a man who can tell at a glance the points or the worth of a bullock or a fat pig. I cannot quite account for this neglect; but no one acquainted with rural life can deny that the majority of farmers' gardens are either wholly or partially neglected, and unskilfully cultivated. There are, of course, many exceptions. Some farmers' wives have a passion for gardening, and where this is the case the mistress will by some means find or make labour, manure, and skill sufficient to do it justice. In such instances, the farmer himself is generally won over to the right side at last; and it is like an oasis in an arid waste, when we come upon a well filled, carefully-tended farmer's garden. Just as a good farmer can tell whether he is driving through a high or low farmed district without stopping—a single glance being enough to his experienced eye—so can we tell of cared for or neglected gardens by a bird's-eye glimpse at them. Gardens reveal the care and love bestowed upon them at first sight. They hide nothing under a bushel. Treat them well, tend them lovingly, and they show it. Neglect—starve them, and a host of weeds, or a barren waste of desolation, proclaims your folly, and reveals your niggardliness. Never is the saying more true than in regard to gardening, that the bountiful sower reaps bountifully.'"

We rather think we have met with Mr. Jones and his diagrams before; he is just the man to take up and extend "Our Farm of Four Acres," and the idea of taking the two acres of sewaged meadow as an adjunct, seeing that it was to be had on lease for £7 an acre for five years, was irresistible. We need not give the details, the result was as follows:—

"The produce of our new grass exceeded all belief; it kept 'Bobby' and the four cows and two heifers so fat and plump that they became quite saucy, and too lazy to care for the pasturage of the common. It seemed impossible, either by pasturage or mowing, to keep the grass down. At last we were advised to send bundles of it any market day to the neighbouring town: some said we might soon sell enough to pay for all that our cows ate, and the rent into the bargain. Fortunately, many carriers' carts passed the meadow gates; they were offered three penny bundles of sweet grass for twopence; this gave them a direct interest in the purchase and carriage. As a rule, carriers' carts are more lightly laden into market towns than out of them. At first but little was done with the grass—out of three dozen bundles, only one dozen were taken; next week the whole three were sold, and, after a time, the only limit to the number disposed of was the power to get them ready, and the quantity that could be spared. All the inns and the stock markets were furnished with our grass; the carriers recommended it to each other, and it could be seen everywhere. Between each cutting, the sewage of the little town was swept over it, and then the grass sprung up as if by magic. Tom was quite right—the meadow-grass sold paid for rent and labour, and gave us our grass free. We grew Turnips, Cabbages and Sugar-Beet on part of the land—all enormous crops, yielding 30 to 40 tons to the acre. Our cows did so well that we made about £14 from each of them that year. Our grain crops also yielded well; we had as much, or more, hay than usual off our old grass lands, though we had an acre less. We manured part of it heavily in the autumn, and seeing how useful sewage was on a large scale, we diverted all our own drainage on to part of 'Our Farm of Four Acres' with the best results. From this portion we took two crops of hay; the sewage and the water forced the grass forward, and we had no difficulty in cutting the two crops."

Farm Memoranda.

BEACON FARM: *Long Island, U.S.*—[The following grandiloquent description of this farm is taken from the *Times* of Dec. 10.]

As I stood to-day on Beacon farm, 4 miles from here, amid, as it were, its thousand hills, valleys, bays, and water views, along

"Old Long Island's sea-girt shore,"

with its herds of thoroughbred cattle, sheep, horses, swine, and poultry, and the luxuriant growth of various crops raised for their support, I felt as if I could bless that noblest Roman of them all in the agricultural world, Horace Greely, for his indefatigable efforts in the education of the American people to live a life of practical usefulness by the cultivation of the soil and animal kingdom, and to profit thereby. No man in America has done as much as Mr. Greely to infuse new life into our people, and to break down old and threadbare prejudices against earning an honest living by the sweat of the brow, and to dispel the fallacious idea that our great cities are the *ne plus ultra* of all the ambition of country young men, and that a living of some kind, and very often a doubtful one, can be got by their wits.

Beacon Farm has 1100 acres, 800 acres of which are tillable, and 300 acres of the most beautiful and picturesque timber groves, valleys, dells, and water scenery that can be found, the natural beauty of which would far exceed Central Park in its natural state. This farm is situated at Eaton's Neck, Long Island, and is accessible by the Long Island Railroad and by steamboat. Six years ago it was a sterile, barren piece of land, famous only for its lighthouse, white sand, and gravel, used for garden walks and roofs; but in the hands of the indefatigable and intelligent William Crozier it has been made to "blossom as the Rose," and the products of the vegetable kingdom stand like so many giants to chant the greatness of deep cultivation, mixing and remixing compounds, and compounding the various manures in plentiful abundance, forming, as it were, a vast storehouse of Nature's commodities to replenish the land and produce a bountiful harvest. These miniature mountains of manure are composed of the droppings and working of the soiling system in full perfection of two stallions, 50 horses and colts, 59 cows and heifers, nine bulls, 75 sheep, 50 swine, several hundred fowls, geese, ducks, and turkeys [This is not by any means a heavy stock for the extent of land to be manured by it], and immense supplies of salt hay and grass, refuse washed upon the shore, muck, leaves, and combination wash of the valleys, besides a moderate amount of bone flour, ashes, &c. Basins are made, and the manure factory placed therein, thus securing the liquids from many hills and valleys. The labourers in this department are a regularly-organised force, with their daily round of duties. Added to all these are the more extensive operations of renovating the land by growing crops and ploughing them under when in full growth. Forty acres of Buckwheat, averaging 3 feet in height, were ploughed in two weeks ago, and 20 acres left growing for future seed and chicken feed. The prominent crops of this season were in acres as follows:—Buckwheat, 60; corn, 60; Turnips, 27; Cabbages, 10; Mangel Wurzel, 10; Peas, 20; Carrots, 4; Potatos, 8; and Clover (seed, 20 lb. to the acre), 45. These are all consumed, and to be consumed, by the stock on the farm, except the Clover, which is ploughed in when very large.

The farm has its threshing-machine, steam and caloric power, root-cutters, steam boilers for feed (all food being steamed or cooked before feeding), scales for weighing everything bought, sold, or used; and an account in detail is taken of everything sold or used, even to a single egg, a half pound of butter, or a broiled chicken. The dairy of this establishment, with its modern buildings, ice-houses, and conveniences, producing milk and butter, unsurpassed in the world, from the famous Ayrshire and Alderney cows, would tempt the palate of the keenest epicure. This is under the special care of Mrs. Crozier, and is a model of neatness and convenience. The refuse of the dairy is cooked by special appliances, and given to the beautiful Berkshire hogs, with glossy satin coats, that Mr. Crozier presents to the world as the finest and most valuable of all hog creation, and in competition he seems to prove the assertion true, by every time carrying off the honours. The Berkshire hogs, from the Queen's farm, Windsor, Berkshire, are trimmed with white on nose, face, tail, and feet. JUDAH 6TH (round and full as an egg) and the young boar, KING CHARLIE, took the first prizes at Birmingham, England, in 1864 and 1866. The sows, *Alice*, *Marina*, *Biddy*, and *Scott* (with pig), are all imported stock from the Queen's farm; and also the sow *Victoria*, with 11 splendid pigs, nine days old, at her side, the enormous sum of 1000 dols. having been refused for the 11 pigs alone, the price being 1100 dols., and no less, or 100 dols. each. I was refused one at 99 dols.

The pride and glory of American cattle, triumphant over all the world, is the Alderney bull BEACON COMET. This bull weighs 1800 lb.; he took the gold medal at the New York State Fair in 1869, has taken nine first-class prizes, and has always taken the first premium whenever exhibited in competition, and will, after the Queen's County Fair, September 28, 29, and 30, be withdrawn from competition, because others will not compete where he goes. BEACON COMET is a silver-grey, or dark fawn colour, beautifully dappled, broad forehead, and head, nobly elevated, eyes very prominent, almost egg-shaped, with very rich, flat, yellow horns, tipped with black. His form is superb, carriage majestic, and he stands a good portion of the time with his tail carelessly lying on his back, as represented in the engraving in the *Country Gentleman*, which picture, as do all others of him, gives a very imperfect idea of this

noble animal. The bulls COMET 2D, HEATHER JOCK, HEATHER JOCK 2D (sold to Mr. Sargeant, of New Orleans), three years old; HEATHER JOCK 7TH, from the Ayrshire cow *Heather Belle*; IMPORTED JOCK, two years, red and white; YOUNG DOUGLAS, one year, out of *Betty 4th*, Ayrshire, got by BLACK DOUGLAS (Ayrshire); TOUCHSTONE (Jersey bull), 19 months, dam *Topaz*—HARTFORD, a dark mahogany, black nose, prominent eye; and WALTHAM, one month old, are all splendid specimens of full-blooded stock.

At the head of the list of cows in America stands *Imported Belle*, an Ayrshire cow, 13 years old; she has taken 13 first-class prizes, always carrying off the blue riband; milks 36 quarts per day, weight 56 lb. She is comparatively small in size, perfect in form, and elegantly beautiful, and is also imperfectly illustrated in the *Country Gentleman* and other papers. *Daisy* (Alderney), eight years old, will also be withdrawn from competition for the same reasons as BEACON COMET. *Merry Belle 4th* (Alderney), dam *Belle of Jersey* (own sister to BEACON COMET), took the 1st prize two consecutive years in the New Jersey State Fair, and 1st prize in Queen's County Fair in 1869. Her colour is fawn. *Lady Cuthbert* (Ayrshire), nine years old, bred by Mr. Dodd, of Montreal, Canada, is in calf by IMPORTED JOCK, the winner of many prizes. *Buttercup* (Ayrshire), four years old, with calf by IMPORTED JOCK. *Imported Jane* (cow), recently arrived from N.S. Whitney, of Montreal, Canada. *Heather Belle* (Ayrshire), and bull-calf, HEATHER JOCK 7TH, are very fine. *Betty 2d* (Ayrshire) four years, in calf by IMPORTED AYRSHIRE COMET; colour, red and white, and a perfect model of beauty. *Jeannie Deans* (Ayrshire), in calf by AYRSHIRE COMET 2D, was bred by the late George W. Lymond, of Waltham, Massachusetts, who imported the sire and dam of AYRSHIRE COMET. *Cowslip* (Ayrshire), three years; and calf BEACON HEATHER JOCK, red and white. *Sylvia* (Alderney), two years; took the 1st prize at the New York State Fair in 1869. *Josephine* (Alderney), four years, with calf by BEACON COMET, is a recent importation. *Zilla 2d*, 16 months old, has a calf from COMET. *Mary Belle*, one year, dark fawn or silver-grey. *Zella 3d* (Alderney), grey and white, one year. *Zella 4th* (Alderney), two years, fawn and white; and others. Cotswold sheep weigh from 150 lb. to 262 lb.

LORD CLYDE is a stallion 3 years and eight months old, weighs 1700 lb., 16¼ hands high, a dappled mahogany bay, black mane and tail, with white spot on the forehead. He is a wonderful creature, considering age, size, and activity. He was bought of Mr. H. Cochran, of Compton, Canada, and by him imported from Scotland. To improve the standard and endurance of American carriage horses is a subject of the greatest importance, as any amateur or sportsman will say on examination of the carriage horses as a class at Central Park on gala days, and Lord Clyde possesses all the points necessary for this much-needed improvement. A drive of 50 or 75 miles in a single day with most American carriage horses would unfit them for work for a week, and it is the hardy powers of endurance, robust constitution, combined with beauty of form and action, that are needed, and I believe will be found in Lord Clyde.

GENERAL GRANT.—This beauty is 16¾ hands high, 3 years old, weighs 1300 lb., and is a dappled mahogany bay, black legs and mane, white hind feet, and is a cross between the Morgan and Hambletonian; was sired at Boston by General Taylor's Berkshire BLACK HAWK. He is very stylish, of considerable speed, and is a true type of a very fine American horse. Many of his colts are on the farm, and most of them are from some of our fatest imported and Kentucky mares, the cross of the Hambletonian predominating, and already denote extraordinary speed at their ages.

The mares and colts are choice selections of thoroughbred animals, expressly for stock purposes, and in due time will prove their pedigree on the turf. The main varieties of fowls are Cochin China, buff Cochin, white Cochin, partridge Cochin, and black Spanish, the partridge Cochin being the favourite against the yard. Bronze turkeys, Aylesbury ducks, and Brahmin geese claim full attention for size, purity of blood, and beauty. The barns and sheds cover 5 acres of ground, and are located in different parts of the immense farm for convenience of the herdsmen, there being many dwellings thereon for the use of the men, thereby making them a home, and making them a permanent help.

A large-sized school-house has been erected, and is regularly supplied with a teacher, to instruct the children of the workmen, and is used on Sunday as a church. This building, like the lighthouse on Beacon Point (a part of this farm), points the weary mariner on life's journey to avoid danger and seek comfort where joys never end.

Mr. Crozier's office is a curiosity shop, decorated with the trophies of many a battle for popular favour at the fairs, and the evidence of the superiority of his methods of soiling, cultivation, judgment, and skill in this, his favourite vocation.

Soiling is a favourite and seemingly successful manner of producing results. He ploughs deep, manures well, and by the soiling system manufactures the necessary quantity of manure to enrich the ground and make it give forth its increase a hundred-fold. Upon one portion of the farm is a large sand hill, whence many thousands of loads of sand were carted away for the New York market. Upon this sand hill this season stands a piece of white corn of unusually large size and productiveness. All crops are tended with a horse and plough, or cultivator, and a hoe is a thing unknown in these fields, except for planting. The labour is mostly done by Germans and their women. Our Fritz is a curious specimen in his way. He is a small Prussian, of plain exterior, but has charge of the care, feeding, &c., of all the stock. His duties are arduous; but Fritz is always faithful to these, his family pets. When the stock is out for exercise it is all guarded by one young man with his shepherd dog, the latter performing the duties of at least five men or boys. Gentleness is a prominent trait in everything and everybody on Beacon Farm, and this is the first lesson to new beginners, and implicitly is it carried out in every department. It is noble; it is human. All is now bustle and activity, putting up the necessary articles, animals, &c., for the Queen's County Fair, on September 28, 29, and 30. With 70 entries, it requires between 20 and 30 waggons to convey the competing products from Beacon Farm. Quite an imposing caravan it will be indeed. Thus ends a busy day of what and how I saw all these gems of beauty, and I hope your readers will have the same enjoyment in its perusal that I had in seeing and preparing this imperfect description. There were many other items of interest that are prominent in the minds of our people. *Douglas, Northport, Long Island, Sept.* 24.

The Week's Work.

DECEMBER 17.—*Young Wheats, Seeds, and Autumn Fallows* require to be now and then examined, not only after storms but in open weather, to see if the surface-drainage and under-drainage are right. Although furrow-drainage ought to be the exception, and under-drainage the rule, the reverse of this is the case on too many clayey soils and wet-bottomed gravelly and sandy lands, so that the water-furrows require to be attended to as in the olden time, prior to thorough drainage. In a vast number of such examples more than half the rain-water in heavy storms may be seen at this season flowing in the open furrows, washing the very heart out of the land, and doing no end of harm besides, in undermining young Wheat and exposing the rootlets to the frost, and so on. In other cases the flow of water in the furrows finds its way into a main drain, in its course washing in much soil, and it may be filling up the drain. In such cases the water-furrows require to be gone over and put to right—the ingress of surface water to drains stopped, and the ditches at the lower end of fields cleared of all earth washed in. But the proper remedy is to mark such land, and drain it properly next year if it cannot be done this, by putting one or more drains between every two, as the amount of surface water in the furrows indicates, and to subsoil the bottom thoroughly, so as to let the rain-water down to the drains as fast as it falls during the heaviest shower. Badly drained land, or, what is the same thing, rain-water flowing in the furrows, admits of no apology, as the harm done is incalculable; more so, perhaps, to autumn fallows manured for Beans, Potatos, Mangels, &c., than in young Wheat and seeds. Stagnant water in pasture land and meadows is equally objectionable, and, therefore, it should be removed by under-drainage, which in most examples can be done at this season.

Subsoiling is one of those works not yet estimated at half its value. Where wet meadows and pastures have been drained they should also be subsoiled across the drains, the deeper the better. The work is best done by steam. Never mind surface appearances at this season. In point of fact the rougher the better, as the rain percolates more freely to the drains, drawing in air after it to subdue and sweeten sour bottoms and ferruginous subsoils. The malady is below the surface, and when it is removed by thorough drainage, washing, and aëration, the growing weather of spring, and the roller, as soon as the land will bear it, will put the sward in its proper green, healthy state, provided the grasses are of the proper sort. If however the grasses are bad, as is too generally the case, top-dress and sow seeds in spring to renovate the sward. On arable land let a subsoiler follow the plough on all hard bottoms that require drainage, washing, and aëration. Subsoils cannot be too freely ventilated at this season. Some clays may by this time be too soft, but we have subsoiled some very soft sticky Oxford clays about Christmas with horses, before steam had entered the field; and now, where steam is at command, sour bottoms may be sweetened without poaching the staple. Some gravelly clays full of large stones, can be more easily and effectually subsoiled at this season than earlier; and the same may be said of most ferruginous bound gravelly, and sandy subsoils. On some wet-bottomed sandy clays, before they were subsoiled, we have seen springs piping up in the bottom of the plough furrow, within a yard of the drain; but after subsoiling, the land was effectually drained as deep as the subsoil plough went, and changed in character, by lime and manure, from a worthless spueing clay to a rich Turnip and Wheat soil. Bad cases of this kind may require deep smashing as well as subsoiling, so as to break them up thoroughly to the proper depth, as they are liable to run together during heavy rains, and thus prevent the proper aëration of the subsoil, more especially when the subsoiling is done by horses, the furrow-horse walking on the newly loosened soil. When done by horses it should be with a double-furrow plough, the leading plough being a subsoiler, so that the furrow-slice of the rear plough is turned over the newly loosened subsoil in the bottom of the furrow behind the furrow-horse.

Wheat Sowing may be continued as last month in favourable weather. It is better to sow Wheat in December with a good season than in February and March with a bad one. Late autumn sowings, too, are sometimes better than early ones, and where there is a tempting seed-bed on a newly-ploughed lea furrow, or after Turnips and Cabbages, large breadths are accordingly sown. Considerably more seed is required than when sown in September or October, and care should be taken to drill it in at the proper depth, and with rather a roughish clod, to drink in heavy continuous rains should they fall immediately after seeding. Clayey soils not sufficiently under-drained, and also all naturally wet-bottomed soils, had better be ploughed up in narrow ridges or stetches, well rounded at the crown, with deep open furrows between, so that the young Wheat may braird and root safely, "high and dry," just as Wheat is said to grow on the lazy-beds of the Irish farmer in the moist climate of the sister country, where it rains "black, blue, and grey, all the winter over."

Live Stock.—December is pre-eminently a season when the breeding and fattening properties of the different breeds of neat cattle, sheep, pigs, and poultry, are discussed and tested in various ways, to determine which is the most profitable for this or that climate and course of management. At all our great exhibitions, the consumer is beginning to take as lively an interest in the matter as the producer. War and cattle plague on the Continent, foot-and-mouth disease and other maladies at home—and the peculiarities of the past summer, cannot fail to render the current season exceptional in many respects. Several questions are naturally suggested for investigation, viz., (1), the prevalence of disease; (2), the predisposing and other causes; (3), the large amount of inferior butcher's meat and dairy produce, together with the low price realised for such in the market compared with the primest qualities; (4), the comparative effects of disease on the above two qualities, inferior and primest, as to whether the low-priced live meat or primest quality suffers most; and (5), the course to be taken to improve quality and obviate disease. *W. B.*

Markets.

ENGLISH WOOL.

There has been a good steady demand during the week, especially for the lower grades, which continue to advance in price.

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Dec. 15.

Prime Meadow Hay	130s. to 140s.		Clover, old	130s. to 140s.	
Inferior do.	110	120	Inferior do.	115	125
New Hay	—	—	Prime 2d cut do.	126	135
Inferior do.	—	—	Inferior do.	105	115
Straw	38				

CUMBERLAND MARKET, Thursday, Dec. 15.

Sup. Meadow Hay	132s. to 140s.		Inferior Clover	123s. to 132s.	
Inferior do.	110	123	Prime 2d cut do.	—	—
New do.	—	—	New do.	—	—
Inferior do.	—	—	Straw	38	41
Superior Clover	138	147			

JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Dec. 12.

As compared with former years, we have a fair supply of Beasts, and better than was expected, considering the season we have had. On the whole the quality was good, but not so many of a show character as usual; the demand is good, and prices have advanced for all descriptions. The number of Sheep is large, but the average quality is very inferior for the day; there are scarcely any of a show description; trade is dull for everything but the choicest kinds. Choice Calves are very scarce and dear. Our foreign supply consists of 1010 Beasts, 4350 Sheep, 128 Calves, and 130 Pigs; from Scotland there are 1200 Beasts; from Ireland, 900; from Norfolk and Suffolk, 600; and 2715 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	6 0	to 6 4	Best Long-wools	5 6	to 5 10
Best Shorthorns	5 10	— 6 0	Do. Shorn	—	— —
2d quality Beasts	4 0	— 5 0	Ewes & 2d quality	4 4	— 5 2
Best Downs and Half-breds	5 10	— 6 2	Do. Shorn	—	— —
Do. Shorn	—	— —	Lambs	—	— —
			Calves	4 0	— 6 8
			Pigs	4 0	— 6 0

Beasts, 6425; Sheep and Lambs, 18,700; Calves, 160; Pigs, 260.

THURSDAY, Dec. 15.

We have a large supply of Beasts, and trade is dull except for the choicest qualities, these are sold nearly as dear as on Monday; there are several lots of inferior and second-class left unsold. The number of Sheep is considerably in excess of the demand; the few choice Downs and half-breds on offer meet with a ready sale, otherwise there is scarcely anything doing in this department. There are only a few choice Calves, but a large supply of inferior; the former are still very dear. Our foreign

supply consists of 1125 Beasts, 1860 Sheep, 284 Calves, and 10 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Hereford, &c. ..	6 0 to 6	2	Best Long-wools..	5 6 to 5	10
Best Shorthorns ..	5 8—6	0	Do. Short	— —	—
2d quality Beasts	4 0—5	0	Ewes & 2d quality	4 4—5	0
Best Downs and Half-breds ..	5 10—6	2	Do. Short	— —	—
Do. Short ..	— —	—	Lambs	3 8—6	8
			Calves	3 8—6	8
			Pigs	4 0—6	0

Beasts, 2475 ; Sheep and Lambs, 7300 ; Calves, 335 ; Pigs, 20.

METROPOLITAN MEAT MARKET.—Dec. 15.

Best Fresh Butter .. .. .. 20*s.* per dozen lb.
Second do. do. .. .. 18*s.* ,,
Small Pork, 4*s. od.* to 4*s. 4d.*; Large Pork, 3*s. 4d.* to 4*s. od.* per 8 lb.

MARK LANE.

MONDAY, Dec. 12.

The supply of English Wheat to this morning's market was small ; the condition not being good, millers were not disposed to purchase ; the best samples were taken at the prices of this day week, the remainder was unsold at a late hour. There was a fair attendance ; the little business in foreign Wheat done was at about the quotations of last Monday. Malting Barley was rather cheaper, grinding unchanged in value. Beans and Peas brought more money. The Oat trade was quiet, and prices were unaltered. Flour was unchanged.

PRICE PER IMPERIAL QUARTER.	s. s.		s. s.
WHEAT, Essex, Kent, Suffolk. White	49—57	Red.....	55—58
— — fine selected runs..do.	53—61	Red.....	50—59
— — Talavera	54—63		
— — Norfolk	—	Red.....	—
— — Foreign	45—64		
BARLEY, grind. & dist., 30*s* to 34*s*..Chev.	43—46	Malting ..	36—42
— Foreign .. grinding and distilling	25—33	Malting ..	33—40
OATS, Essex and Suffolk	26—28		
— Scotch and Lincolnshire..Potato	28—30	Feed	—
— Irish ..... Potato	27—29	Feed	25—28
— Foreign .....Poland and Brew	26—28	Feed	21 26
RYE	32—36	Foreign ..	33—36
RYE-MEAL, Foreign			
BEANS, Mazagan....43*s*. to 47*s*..Tick	49—50	Harrow ..	49—50
— Pigeon .....Fr. 50*s*..Winds.		Longpod..	
— Foreign .....Small	45—47	Egyptian.	42—44
PEAS, White, Essex, and Kent..Boilers	38—40	Suffolk ..	40—42
— Maple, 40*s*. to 44*s*. .....Grey	36—40	Foreign ..	36—40
MAIZE	—	Foreign ..	30—32
FLOUR, best marks delivered..per sack	39—47		
— 2d ditto .....ditto	33—45	Country ..	33—45
— Foreign .....per barrel	26—29	Per sack..	37—63

WEDNESDAY, Dec. 14.

The Corn Exchange to-day was thinly attended by millers. The business passing was on a very limited scale, and prices generally were lower than on Monday last. English Wheat, the supply of which was small, came to hand in indifferent condition, in consequence of the unfavourable weather. Transactions in all descriptions were restricted, and values occasionally gave way 1*s*. per qr. There were fair arrivals of Wheat from abroad, which sold slowly at a similar reduction. There was a good show of Barley on the stands ; both grinding and malting descriptions were difficult to dispose of, although easier terms were in some instances offered. Malt ruled quiet, but prices were unchanged. The market was moderately supplied with Oats. The demand was inactive, and prices were scarcely sustained. Beans, Peas, and Maize were purchased cautiously, at about previous quotations. The Flour trade was depressed, and prices had a downward tendency.

ARRIVALS OF GRAIN, &C., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. 370	Qrs. 150	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	4280	9700	5610	710 3560 brls.
	4650	9850	5610	

LIVERPOOL, Dec. 13.—The market to-day was moderately attended. After Wheat a very limited demand, at 1*d*. to 2*d*. per cental decline since last Friday on red American, and 1*d*. on white Californian. The aggregate sales are 20,000 centals. Flour is very dull, and nominally cheaper. Beans quiet, at 6*d*. per qr. decline. Saidi selling at 37*s*. to 37*s*. 6*d*. Oatmeal slow of sale, at late rates. Indian Corn in retail demand, at a reduction of 6*d*. per qr., Danubian closing at 31*s*. 3*d*.

AVERAGES.

	Wheat.	Barley.	Oats.
Nov. 5	49*s* 9*d*	36*s* 8*d*	22*s* 7*d*
— 12	50 5	36 11	23 8
— 19	49 10	36 8	23 11
— 26	50 5	36 2	23 7
Dec. 3	52 5	36 1	23 10
— 10	52 2	35 9	23 7
Average ..	50 9	36 4	23 6

SEED MARKET.

The seed trade continues in pretty much the position noted in our last. Fine new English Clovers are scarce, but the high prices at which they are held prevent any great demand. Alsike and white Clover seeds are both very firm. For Trefoil seed we have an improved inquiry, at enhanced rates. French Italian, being in exceedingly short supply, is rapidly advancing in value. Perennial Rye-grasses are also dearer. For Sainfoin seed long prices are demanded. Feeding Linseed meets with a ready sale at last Monday's currencies. Rapeseed is firm at the recent advance. Mustard without alteration. For new spring Tares more money is asked. Canary and Hemp seed move off steadily at full prices. With regard to garden Peas and Beans we have nothing fresh to report. JOHN SHAW & SONS, Seed Merchants, 16, Water Lane, London, E.C.

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Best New York Linseed Cakes, in bags, £11 2*s* 6*d* per ton ex ship.
Best Western Linseed Cakes, in bags, £10 7*s* 6*d* per ton ex ship.
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BARTON'S PATENT STABLE and HARNESS ROOM FITTINGS, BRACKETS, &c.

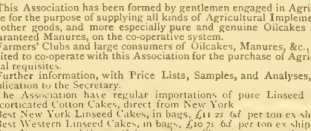

Patronised by H.H. the Viceroy of Egypt, the King of the Belgians, the King of Italy, the King of Holland, by the principal Nobility of the Kingdom, and adopted by the first Architects and Builders of England and the Continent. Illustrated Catalogues sent on receipt of six stamps.

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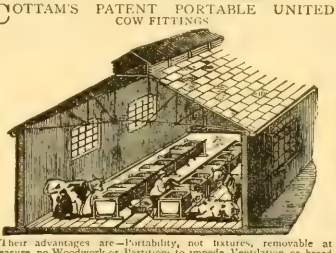

Their advantages are—Portability, not fixtures, removable at pleasure, no Woodwork or Partitions to impede Ventulation or breed Vermin, Hay Rick dispensed with as unnecessary, increased width and depth of Feeding Troughs, Water Cistern, and Patent Drop Cover o prevent over-gorging. Cleanly, durable, and impervious to infection, being all of Iron. Price of Fittings per Cow, 55*s*.

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GREENS' PATENT LAWN MOWERS combine all the advant ages of self-sharpening, and when the cutters become blunt by running one way round, they can be reversed again and again, bringing the sharp edge of the cutters against the bottom blade, which operation can be done by any inexperienced person, owing to the peculiar adaptation of the Machine, which is possessed by no other.

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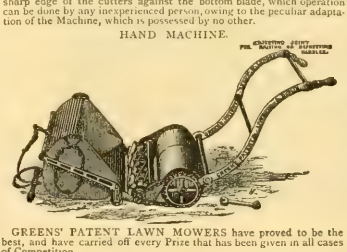

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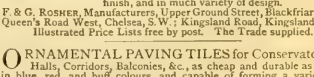

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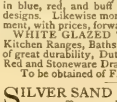

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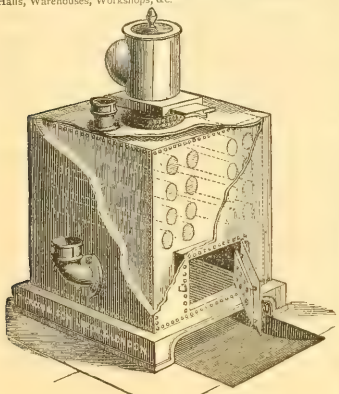

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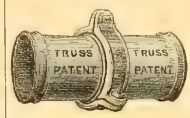

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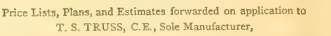

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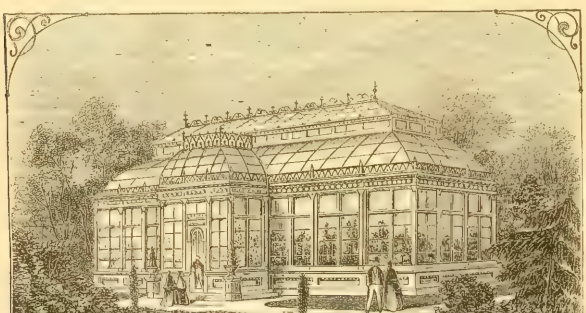

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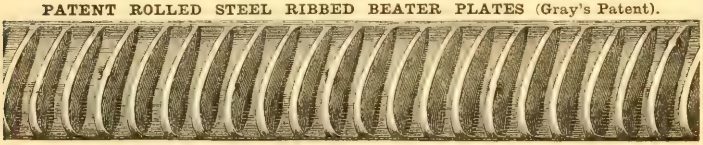

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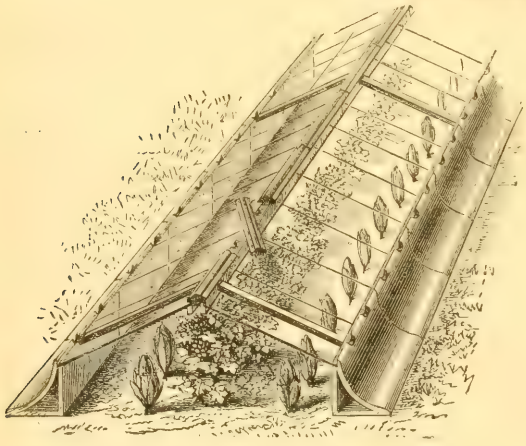

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AND
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SUTTONS' £3 3*s.* COLLECTION of GARDEN SEEDS, for a Large Garden, carriage free

SUTTONS' £2 2*s.* COLLECTION of GARDEN SEEDS, for an Ordinary-sized Garden, carriage free

SUTTONS' £1 1*s.* COLLECTION of GARDEN SEEDS, for a Smaller-sized Garden, carriage free.
SUTTON AND SONS, Seedsmen to the Queen, Reading

Hyacinths, Tulips, and other Bulbs.

WM. CUTBUSH AND SONS'S importations of the above have just arrived, and have every appearance of being above the average quality, for which they have been noted for many years. CATALOGUES post free
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Surplus Bulbs, Cheap.

HYACINTHS, TULIPS, CROCUS, NARCISSUS, BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

COLLECTIONS of BULBS and SPRING FLOWERING PLANTS.—Full particulars are given in large Advertisement, p. 1630 of *Gardeners' Chronicle*, Dec. 10
BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

SPRING FLOWER GARDENS.—Those who are planting large quantities of Bulbs and of Spring flowering Plants, can have special advantageous offers of such. See p. 1630, *Gardeners' Chronicle*, Dec. 10
BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

To the Trade.

DOWNIE, LAIRD, AND LAING have now published their SPECIAL LIST of SEEDS, which will be sent free to intending purchasers
Stanstead Park, Forest Hill, S.E.

To the Trade.—Continental Flower Seeds, &c.

GEORGE MACINTOSH, Agent to F. W. Wendel, Seed Grower, Erfurt, Prussia, begs to announce that he can now supply CATALOGUES of the above free and post paid on application
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N B.—Mr BLACKITH is sole Survivor of the late Firm of BEITHAM AND BLACKITH

CARTER'S GARDENERS' AND FARMERS' VADE MECUM is now ready, and should be consulted by all who possess a garden. Post free, 12 stamps; gratis to purchasers.
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For COTTAGE GARDENS, 12*s.* 6*d.*
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JOHN DOBSON AND SONS' CATALOGUE of VEGETABLE, FLOWER, and AGRICULTURAL SEEDS is now ready, and will be forwarded post free on application.
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1871.—Genuine New Garden Seeds and SELECTED SEED POTATOS.

JAMES DICKSON AND SONS will be happy to send their Priced Descriptive CATALOGUE for 1871, post free on application
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Potatos.

EARLY SHAW and EVERGREEN REGENTS (true stock). Price per cwt. or ton on application to
JAMES FRASER, Maylands Farm, Romford, E.

To Gardeners, &c.

—several Quarters of EARLY WHITE PEA.—DANIEL O'ROURKE.
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SEED POTATOS.—Paterson's Victoria, extra fine, £5 per ton; Gryffe Castle, the best round Potato, £5 per ton. All true and sele. ted
W. JACKSON, Blakedown Nursery, Kidderminster.

NEW POTATOS.—American Early Rose, Paterson's Bovinia, Red-skinned Flourball (Sutton's).
CHARLES SHARPE AND CO., Seed Merchants, Sleaford, have pure, true seed of the above to offer. Price on application.
Priced Lists of seed Potatos sent post free.

Seed Potatos.

H. AND F. SHARPE have fine stocks of the above, comprising AMERICAN EARLY ROSE, EARLY SANDRINGHAM, BOVINIA, and all the principal early and late varieties worthy of cultivation. The quality is very fine, and prices low. Special quotations on application.
Seed Growing Establishment, Wisbech.

MANY Thousand Seeds of genuine TELEGRAPH CUCUMBER. Packets 1*s.* and 2*s.* 6*d.*, stamps. Price to the Trade on application.
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CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5*s.* per 1000; also Drumhead or Cattle Cabbage Plants at 3*s.* 6*d.* per 1000, can now be supplied by
W. VIRGO AND SON, Wonersh Nursery, near Guildford.

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JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application.
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RICHARD WALKER can supply the following for cash:—SEAKALE, second size 5*s.* per 100; third size, 3*s.*; ASPARAGUS, 3-yr. old, 3*s.* per 100; 2 yr., 2*s.*; cheaper per 1000; EAST HAM and DWARF YORK Plants, 3*s.* 6*d.* per 1000; WHITE SPANISH ONION SEED, all new and genuine, 1*s.* 6*d.* per lb.
The Market Gardens, Biggleswade, Beds

FOR SALE, good fibrous PEAT, at 14*s.* 6*d.* per ton, cash, delivered at Edenbridge, and London, Chatham, and Dover Railway, and South Eastern Railway, Sevenoaks. Address
F. HAYNES, Brasted, Sevenoaks.

Now Ready, Free by Post,

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies.

The "Oak king Nursery" is easily reached by South Western Railway (main line) to Woking, and goods can be sent through, if upwards of 1 ton, to all parts of the kingdom, which is an immense saving of package and carriage. An inspection of the Nursery will well repay Purchasers, but to those who cannot personally pay a visit, the following summary of the principal stock, averaging from 1 to 5, 6 and 12 feet high, will give some idea of the resources of this Establishment, viz

125,000 Standard, Pyramid, Dwarf Medlar, cushaw, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, &c., of the leading well-known kinds

25,000 STANDARD and DWARF ROSES, of select and choicest varieties.

200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the common hybrid Ponticum and Pontic

750,000 CONIFERÆ, which embrace most of the fine hardy species and varieties of the following genera —Abies, Araucaria, Cedrus, Cupressus, Juniperus, Picea, Pinus, Retinospora, Taxodium, Taxus, Thuja, Thujopsis, Wellingtonia, &c.

450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following: — Acacia, Allantus, Alder, Almond (flowering), Althæa frutex, Arbutus, Ash, Aucuba, Bay, Beech, Berberis, Birch, Bladder Sena, Box, Broom, Calycanthus, Chestnut, Cherry (flowering), Chimonanthus, Comptonia, Cornus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolreuteria, Laburnum, Laurel, Laurustinus, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Phillyrea, Philadelphus, Plane, Poplar, Privet, Pyrus, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c

2,000,000 FOREST TREES, viz. :—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.

20,000 CLIMBERS, thus :—Ivy, Climbing Roses, Ivy, Jasmine, Passionflower, Periploca, Vinca, Virginian Creeper, Wisteria, &c.

70,000 CLEMATIS, principally the "Woking Hybrids."

This Catalogue contains a set of five large Engravings of Clematis, of which this Establishment is famed, taken from Photographs.

KEYED FORM, No. 3

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials

Engraving No. 1. For Conservatories, Terraces, &
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"This Establishment, being favorably known for its fine collection of hardy plants, is now likely to attain a world wide fame for the magnificent new race of hybrid Clematises." *Gardeners' Chronicle*

Woking Nursery, Surrey.

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WALTHAM CROSS, N

ROSES.

ROSE BRIDESMAID.—"One of the grandest Roses in cultivation." "The best Rose of the present year." "The great Rose of the Show." Standards and Dwarf Standards, 10s 6d each Dwarfs, 7s 6d each

Standard ROSES, 15s. per dozen, and upwards.

Dwarf standard ROSES, 9s. per dozen, and upwards

Dwarf ROSES, 9s per dozen, and upwards

" in pots of extra size, prepared for forcing, 24s per dozen and upwards.

Climbing ROSES, strong, plants, 9s per dozen and upwards

HYACINTHS, TULIPS, &c.

Choice named HYACINTHS, 6s per dozen, and upwards

Bedding HYACINTHS, 18s. per 100, and upwards.

" TULIPS, 3s per 100, and upwards

Choice named TULIPS, 1s. per dozen, and upwards.

CROCUS, of sorts, 2s. per 100, and upwards.

LILIUM AURATUM, English and Dutch grown roots, by the dozen, 100, or 1000.

All other Bulbs equally moderate in price.

NEW GERANIUMS.

WALTHAM BRIDE.—A profuse blooming pure white flower, leaves green, finely edged with pure white. 7s. 6d. each.

AVALANCHE.—Ditto, ditto. 2s. 6d. each

MARCHIONESS.—The finest Silver Variegated Zonal kind, and the freest grower out, 15s. each.

WALTHAM BRONZE.—The deepest and richest in colour of all the bronze section, 7s. 6d. each.

BONFIRE, the finest scarlet for bedding, 3s. 6d. each.

AMETHYST, BOADICEA, CARACTACUS, DARIUS, and MAGNUM BONUM, 2s. 6d. each.

PICTORIAL TREES and SHRUBS.

The finest and most extensive collection in Europe, 1s each and upwards.

EVERGREENS, CONIFERS, &c.

The choicer sorts single plants, the dozen, the common sorts by the 100 or 1000, at the lowest remunerative prices for frequently transplanted specimens.

FRUIT TREES,

APPLES, PEARS, CHERRIES, PEACHES, NECTARINES, and APRICOTS, Standards and Dwarfs, trained and untrained, Pyramids and Cordons, on the most opposite heads, worked on the best stocks, many trees in a fruiting state In addition, GRAPE VINES FILBERTS, FIGS, GOOSEBERRIES, CURRANTS, RASPBERRIES and STRAWBERRIES.

PRICED CATALOGUES, free by post.

IMPORTANT.—Address WILLIAM PAUL (the Christian name in full), Paul's Nurseries, Waltham Cross, London, N

GENUINE SEEDS ONLY.

JAMES VEITCH & SONS

BEG TO ANNOUNCE THAT THEIR

ILLUSTRATED PRICED CATALOGUE of GARDEN and FLOWER SEEDS for 1871,

WITH LIST OF IMPLEMENTS AND OTHER GARDEN REQUISITES,

Is now published, and will be forwarded Post Free on application.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS. — The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, nice blooming plants, will be supplied at 30s per doz., or £10 per 100

" Good named kinds, £5 to £7 per 100

" Common mixed colours, £2 10s per 100

" Van Houttei flore-pleno, strong, early flowering plants, 12 to 3 feet, 42s to 120s per dozen and upwards. This is one of the most beautiful of the Double Azaleas.

Large AZALEAS, of the finest varieties, 2, 3, 4, 5, 6, 7, and 8 feet high, covered with flower-buds, and objects of wonderful beauty when in flower Mixed colours, £2 10s per 100

ANDROMEDA FLORIBUNDA.—Good plants, 18s to 24s per doz

RHODODENDRONS.—We invite the special attention of Rhododendron buyers to this part of our stock We have made it a rule to keep in which the plants vary from 1 to 20 feet high Every plant is specimen, and comprising all sorts excepting the common Ponticum.

Named RHODODENDRONS.—Low, bushy, sturdy plants, and containing the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent in application

Standard RHODODENDRONS.—In these we possess the largest number of the finest specimens to be met with in any Nursery. The large Standard Rhododendrons in Rotten Row were nearly all of them supplied from Knap Hill As no description on paper can give an adequate idea of these plants, we have had a few of them photographed, which is given in our Catalogue, just published.

RHODODENDRON PONTICUM, for Covert, £7 10s to £15 per 1000

" " varieties, named, from layers, 10 varieties, 5s. to 100s. per 100.

" Dwarf varieties, the best kinds and nice plants, £3 to £7 10s per 100

Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s to 100s per 100

" Larger and very bushy plants, £10 to £20 per 100.

CAUTION.—We have grown for sale this year a large number of Rhododendrons from layers, and we now have a stock of more than 100,000 plants of named varieties, which we believe are quite unequalled, being without exception the finest plants we have ever seen We supply them, all layers, at from 50s to 200s. per 100 A sample, the only guide, will be sent on application

HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, many in bloom during November, every plant a specimen; 6s. per dozen, 40s per 100

" The free flowering varieties of VULGARIS, &c., 30s. per 100, £10 per 1000

" MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the scent of new-mown hay, 40s per 100.

KALMIA LATIFOLIA, from 50s. to 100s. per 100.

" Nice blooming plants, £5 to £10 per 100

" Larger, 50s. to 60s. per dozen and upwards.

" MYRTIFOLIA, 40s per dozen and upwards

All other American Plants are grown to a large extent

HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land Every plant that we shall sell has been transplanted since August, 1869.

COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s to 63s per 100; 3 to 3½ feet, £5 to £7 10s per 100; 4, 5, 6, 7, 8, and 10 feet, 30s to 120s per dozen and upwards.

Thousands of beautifully grown Pyramidal plants

We have a number of very large Green Hollies, 12 and 15 feet high.

WATERER'S HOLLY } We have these in large numbers and of

GOLDEN QUEEN. } all sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.

PERRY'S WEEPING HOLLY STANDARDS.—A large number.

NEW GOLDEN WEEPING HOLLY.—Nice Standards.

THE COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, magnificent plants.

VARIEGATED HOLLIES of the best kinds, and the following varieties of GREEN HOLLIES.—Hedgins, Scottica, laurifolia, myrtifolia, angustifolia, yellow berried. Purchasers may select from a stock of more than 20,000 handsomely grown Pyramidal plants, 2, 2½, 3, 5, 7, 8, and 10 feet high

YEWS, ENGLISH.—We have many thousands, well furnished and finely rooted plants, 3, 4, 5, and 6 feet high, and larger sizes from 8s. to 15s feet These are invaluable as blinds

IRISH YEWS, of all sizes, up to 10 feet.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN. } Handsome Pyramidal plants, 5, 6, 7, and

" VARIEGATED } 8 feet high An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.

AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high

LAUREL, PORTUGAL, 3, 4, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.

LAURUSTINUS and BAYS.—Fine Standards, in tubs

Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and finely rooted:—

ABIES ALBERTII, 5 to 6 feet, 42s per dozen; 7 to 8 feet, 60s. These are beautiful plants, transplanted 1870.

ABIES ORIENTALIS, 4 to 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. and upwards.

PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high.

PINUS PINSAPO, 2 to 2½ feet, 30s. to 42s. per dozen; 3½ to 4 feet, 5s 6d to 10s 6d each; larger, 5 to 6 feet, 21s each and upwards

PINUS NOBILIS, 1½ foot, very stout, 18s. per dozen, £5 per 100; 2 to 3 feet, 60s. per dozen; 4, 5, 6, 7, to 10 feet, splendid specimens, from 10s 6d to 42s each and upwards

PICEA NORDMANNIANA, very handsome plants, from seed, 2 feet high and wide, 42s per dozen; 2½ to 3 feet, 5s to 7s 6d. each; larger specimens, 4, 5, 6, 8, and 10 feet

PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s 6d. each and upwards.

PICEA LASIOCARPA, 3 feet, handsome plants, 15s. each, £6 6s. per dozen; 4, 5, 6, 7, and 8 feet high, 21s each and upwards; these will have been transplanted within 12 months.

CEDRUS DEODARA, 2 to 3 feet, 30s per dozen; 5 to 7 feet, 60s to to 84s. per dozen; 8, 10, and 12 feet high, moved since September 1869. Hundreds of splendid trees, from 10s 6d. each and upwards.

CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, 4, and 5 feet high.

CUPRESSUS LAWSONIANA GRACILIS } 3 to 4 feet, 42s. to ARGENTEA } 84s. per dozen.

JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.

THUJA LOBBII, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 4 to 5 feet high, 10 and 15 feet in circumference

THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen.

THUJA LOBBII, 4, 5, 6, and 8 feet, moved in spring, 24s. per dozen and upwards.

WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—

ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.

ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.

ÆSCULUS ROSEA, SCARLET HORSE CHESTNUT, 8 and 10 feet high.

ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, girting 5 to 6 inches 4 feet from the ground.

BEECH, PURPLE, 6 to 8 feet; 10 to 12 feet, fine trees.

BEECH, COMMON, 8 to 10 feet.

BIRCH, WEEPING, 8 to 10 feet.

CHESTNUT, SPANISH, 8 to 10 feet.

ELMS, 10 to 15 feet.

LIMES, 10 to 12 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.

MAPLES, NORWAY, 8 to 14 feet.

OAKS, ENGLISH, 8 to 10 feet.

SCARLET AMERICAN OAKS, 10 to 12 feet.

PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high

The Planes on the Thames Embankment were supplied by A. W.

POPLARS, LOMBARDY, 10 to 15 feet.

SYCAMORE, 10 to 16 feet.

WALNUTS, about 10 feet.

AILANTUS, 8 to 10 feet.

CATALPAS, 6 to 8 feet.

MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years.

Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

FOR PLANTATIONS, at wholesale prices, for cash, all transplanted and healthy, OAK, ELM, BEECH, HORSE CHESTNUT, 2 to 3 feet bush, stout, well-rooted trees, 20s per 1000; ASH, 2 feet, 20s per 1000; HORSE CHESTNUT, 4 feet, 30s per 1000; MAPLE, 4 to 5 feet, 16s per 100; LABURNUMS, 3 to 5 feet, 12s, 6 to 8 feet, 20s per 100; SYCAMORES, 4 to 6 feet, 16s, 7 to 9 feet, 25s per 100; WALNUTS, 3 to 4 feet, 20s per 100; BOX, for edging walks, 3d. per yard; Red Grape CURRANTS, strong, 8s per 100, 50s per 1000; SILVER FIR, 1½ to 2 feet, 8s per dozen; GUELDER ROSES, Red and Yellow RIBES, very thrifty, 3 feet, 3s. 6d. per dozen; Dwarf Perpetual ROSES in Briar, 6s per dozen; and other Nursery Stock.
Remittance or reference required with orders.
A. WILKIN, Tiptree, Kelvedon, Essex.

Planting Season. Knowfield Nurseries, Carlisle.

MESSRS. LITTLE and BALLANTYNE, NURSERYMEN, and SEEDSMEN, Carlisle, beg leave to request the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c.; and Gentlemen in letting to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

L. & B. are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties

NEW AND GENUINE SEEDS.

B. S. WILLIAMS

BEGS TO ANNOUNCE THAT HIS

DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS for 1871,

CONTAINING MANY NEW AND CHOICE FLOWER AND VEGETABLE SEEDS,
Is Now Ready, Post Free on application.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

WHEELERS' COCOA-NUT CABBAGE.

WHEELERS' COCOA NUT CABBAGE.

The COCOA-NUT is a new and very early variety, perfectly distinct, of most excellent flavour. It should be planted 18 inches apart, will yield an early and continuous supply. This Cabbage is a decided novelty, and a great acquisition.

"I consider the Cocoa-Nut Cabbage the best I have ever grown."
—A. PATERSON, *Pontypool Park Gardens.*

"The Cabbage Seed which I had from you last year has turned out excellent, not one in a thousand run to seed. All my neighbours have desired me to get some for them this year."—WM. SMITH, *Penally.*

Wheelers' Cocoa-Nut Cabbage, large packet, 1s.
" " " small packet, 6d.
Free by Post.

A List of the Trade, of whom this excellent Early Cabbage can be obtained will appear shortly.

Lowest Wholesale Price may be had on application to

J. C. WHEELER and SON,
59, MARK LANE, LONDON, E.C.

VEITCHS' AUTUMN GIANT CAULIFLOWER.

MESSRS. VEITCH & SONS

DESIRE TO CALL ATTENTION TO THIS

NEW AND EXTREMELY VALUABLE LATE CAULIFLOWER.

It is perfectly distinct from any other sort, the leaves are long and tapering, and the habit of the plant is robust, but very upright and compact. The heads are magnificent, beautifully white, large, firm, and compact, and being thoroughly protected by the foliage, remain longer fit for use than any other sort. If sown in April it will succeed the Walcheren, and coming in between that variety and Snow's Winter Broccoli, is a great acquisition to all gardens. It was awarded a First-class Certificate by the Royal Horticultural Society, November 2, 1870, when Messrs. V. & S. were generally congratulated on having brought such a fine variety before the public. Many letters, speaking in the highest terms of this Cauliflower, have been received, and it cannot be too strongly recommended.

The following is an Extract from the *Gardeners' Magazine* of November 5, 1870:—

"Messrs. Veitch & Sons exhibited their New Giant Autumn Cauliflower, which from its gigantic size and fine appearance attracted a considerable amount of attention, and was deservedly awarded a First-class Certificate. Five or six heads were shown, the largest measuring upwards of 12 inches in diameter, and all were perfectly solid and of the purest white. It was stated that seed of the Giant Autumn, Walcheren, and several others were sown at the same time, and all the plants grown under exactly the same conditions, and that the Giant Autumn did not turn in until all the others were past. Its being in for use so late in the season is a most important quality, and without doubt it is one of the most valuable and distinct vegetables that has been introduced for many years past."

Mr. HENRY CHILMAN, Somerley Gardens, writing in the *Florist*, says:—

"This is certainly one of the best additions to the Brassica family we have had for some years past, the heads produced by this fine sort being compact and of marble-like whiteness. From the high recommendation given to this variety in the Catalogue whose name it bears, I was induced to try it, and can fully endorse every word said there in its favour. All who have not hitherto included this variety in their Seed Lists would do well to do so; there is little doubt of those who have once tried it neglecting to do so again. The crop we are now cutting gives promise of a supply for five or six weeks to come."

In Sealed Packets, 2s. 6d. each.

The following Seedsmen have obtained a supply direct from us, viz.:—

Messrs. Austin & McAslan, Glasgow.
" Backhouse & Son, York.
" Barr & Sugden, 12, King Street, Covent Garden.
" Bunyard & Sons, Thomas, Maidstone.
" Burgess & Son, Fenkhill.
" Chivas & Weaver, Chester.
" Davies & Co., Thomas, Wavertree Nursery, Liverpool.
" Dickson & Sons, 102, Eastgate Street, Chester.
" Dickson, Brown & Tait, Manchester.
" Downie, Laird & Laing, Forest Hill.
" Fisher, Holmes & Co., Sheffield.
" Garaway & Co., James, Bristol.
" Henderson & Co., A., Edgeware Road, London.
" Henderson & Son, E. G., St. John's Wood.
" Hunter & Co., James, Bristol.
" Hurst & Son, 6, Leadenhall Street.
" Ice, J. & C., Hammersmith.
" Miner, Nash & Nash, 60, Strand.
" Nutting & Sons, 60, Barbican, London.
" Osborn & Sons, Fulham.
" Radclyffe & Co., Dick, 129, High Holborn.
Messrs. Rutley & Silverlock, 412, Strand.
" Smith, F. & A., Dulwich.
" Smith & Simons, Glasgow.
" Stuart & Mein, Kelso.
" Suttons & Sons, Reading.
" Wood & Ingram, Huntingdon.
Mr. Bird, James, Downham Market.
" Burridge, W. K., Ipswich.
" Chater, J., Cambridge.
" Cooling, E., Derby.
" Cooper, G., Derby.
" Cooper, R., 152, Fleet Street.
" Dickson, Charles H., Market Place, Manchester.
" Holmes, Edward, Whittington Nursery, Lichfield.
" Mackey, W., Dublin.
" Scott, John, Yeovil.
" Taylor, Edward, Malton.
" Turner, Chas., Slough.
" Veitch, R. T., Exeter.
" Whomes, James, Windsor.
" Williams, B. S., Upper Holloway.

Price to the Trade on application.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.—Nov. 22, 1870.

LUCOMBE, PINCE, AND CO.
STANDARD PORTUGAL LAURELS, in tubs.
PICTA NORDMANNIANA
WELLINGTONIA GIGANTEA,
and every other kind of Conifer; fine plants of all sizes, fit for removal.
CUT CAMELLIA BLOOMS,
and other choice flowers.
VINES in pots, largest and strongest.
FERNS, ORCHIDS, and other kinds of
STOVE and GREENHOUSE PLANTS.
COLCHICAN LAURELS, from 3 to 8 feet.
COMMON LAURELS, 30,000.
Exeter Nursery, Exeter

To Planters of Ornamental Trees.

J. SCOTT, Merriott, Somerset, offers, from his large collection, the following, at prices much below their real value; all are grown sturdy, and feathered to the ground, viz.:—
ABIES MENZIESII, 1 feet, 15s per dozen.
ARAUCARIA, 2 to 3 feet, 30s per dozen.
PICEA DOUGLASII, 2 to 4 feet, 18s per dozen
" PINSAPO, 18 inches to 2 feet, 18s. per dozen.
PINUS CEMBRA, 1 to 7 feet, 2s. 6d. to 8s. each
" INSIGNIS, 3 to 5 feet, 12s to 30s per dozen
BIOTA ORIENTALIS, 3 to 5 feet, 6s to 9s per dozen
" GLAUCA, 6 feet, 24s per dozen
" SIEBOLDII, 4 feet, 24s per dozen
" AUREA, or Golden Arbor vitæ, 2 feet, 24s. per dozen; 3 feet 3s; 4 feet, 60s per dozen
" " ELEGANTISSIMA (the golden pyramid), 3 to 4 feet, 60s per dozen.
" PENDULA, 6 feet, each 6d.
CRYPTOMERIA JAPONICA, 4 to 6 feet, fine, and well made, 18s to 24s per dozen
CUPRESSUS FUNEBRIS 4 feet, 18s per dozen
" LAWSONIANA, in variety, 3, 4, 5 to 6 feet, 12s to 24s per dozen; less by the 100
" LUSITANICA, 3 to 5 feet, 24s to 30s per dozen.
" MACROCARPA, 2½ feet, 9s. per dozen.
" NUTKAENSIS, 3 to 5 feet, 30s to 48s per dozen.
" TORULOSA, 4 to 6 feet, 30s to 48s per dozen
SEQUOIA SEMPERVIRENS, 10 feet, 2s. 6d. each
THUJOPSIS BOREALE, 2 to 4 feet, 18s to 30s per dozen
THUJA GIGANTEA, 3 to 6 feet, perfect specimens, 12s to 60s p. doz
" CRAIGIANA, fine, 4 to 6 feet, 24s. to 30s. per dozen.
" LOBBII, fine, 6 to 7 feet, 18s. to 30s per dozen
" OCCIDENTALIS, 6 to 7 feet, fine, 18s per dozen
" TRICOLA, 2 feet, 2s. 6d. each
" WARREANA, 2 to 4 feet, 18s to 24s per dozen
JUNIPERUS VIRGINIANA, 4 to 6 feet, 18s to 24s per dozen.
TAXUS Common Yew, 2 to 4 feet, 12s. to 18s per doz.; 7 to 10 feet, 5s each
IRISH YEW, 10 feet, fine, 20s. each.
The above are a few of J. SCOTT'S immense stock, CATALOGUES of which will be sent on application.
The fine BROCKWORTH PARK PEAR should be in every collection, 2s. 6d. each, quite new; also the BENEDICTINE, 7s. 6d. ea

Fine Forcing Seakale.

GEORGE CLARKE has a few thousands, very good 3/8 in. diam., to offer as under:—1st, extra fine, 12s per 100; 2d, good, 8s per 100. Remittance or reference to accompany orders from unknown correspondents.
Nurseries, Streatham Place, Brixton Hill, London, S.W.; and Mottingham, Kent, S.E.

BIRD'S KING of the CUCUMBERS.—The best for exhibition. Length 24 to 30 inches. White spine, handsome fruit, short neck or handle. Price 2s. 6d. per packet.

BIRD'S QUEEN of MELONS.
The best green-fleshed Melon, handsomely netted, fine flavour. Average weight, 5 lb. Price 1s. 6d. per packet. May be had of all the Seed Trade, and of
JAMES BIRD, Nurseryman and Seedsman, Downham Market.

To the Trade.

S. NAIRN AND SONS have the following to offer, all genuine and from selected stocks:—
CUCUMBER, IMPROVED SION HOUSE.
BROCCOLI, NE PLUS ULTRA (NAIRNS').
CANDYTUFT, DUNNETT'S CRIMSON.
WALLFLOWER, SNIDERS' CRIMSON.
LEEK, MUSSELBURGH (Scotch saved).
RAILSAM, SMITH'S Strain
Seed Warehouse, 67, Pilgrim Street, Newcastle-on-Tyne.

TOBACCO TISSUE, for FUMIGATING GREENHOUSES.—Will destroy Thrip, Red Spider, Green and Black Fly, and Mealy Bug, and burns without the assistance of blowing, and is entirely free from paper or rags. Price 3s. 6d. per lb., carriage free. A reduction in price for large quantities.
To be had of Messrs. ROBERTSON AND SONS, Tobacco Manufacturers, 112, St. John Street, Clerkenwell, E.C., of whom Copies of Testimonials may be obtained; and of all Seedsmen and Nurserymen

The Cheapest and Best Insecticide.
DUTY-FREE TOBACCO.
BY HER MAJESTY'S ROYAL LETTERS PATENT, AND BY PERMISSION OF THE HON. BOARD OF CUSTOMS.

POOLEY'S TOBACCO POWDER, for the Prevention and Destruction of Blight and other Diseases in Plants.
Sold by Nurserymen, Seedsmen, and Florists,
In Tins at 1s., 2s. 6d., and 5s.
Powder Distributors, 1s. 6d. and 6d. each.
"I find it exceedingly useful for killing the Aphides on Roses and other plants."—GEO. EYLES, Superintendent, Royal Horticultural Gardens, South Kensington. May 7, 1868.
Sole Manufacturer, T. A. POOLEY, Bonded Warehouse, Sussex Wharf, Wapping, E.

TRADE MARK

STEVENSON'S ABYSSINIAN MIXTURE, warranted to destroy Mealy Bug, Brown and White Scale, Thrip, and all Insects infesting Plants, without injuring the most tender foliage.
This valuable mixture has received the very highest commendations from many of the leading Horticulturists of this country.
Sold by all respectable Nurserymen and Seedsmen in the United Kingdom, in bottles, 1s. 6d., 3s., 4s. 6d., and 5s. 6d. each, with directions for use.
Sole Manufacturer, F. STEVENSON, Lark Hill, Timperley, Cheshire

Red Spider.

Magnified.

GISHURST COMPOUND.

Used by many of the leading Gardeners since 1859, against Red Spider, Mildew, Thrips, Green Fly, and other Blights, in solutions of from 1 to 2 ounces to the gallon of soft water, and of from 4 to 16 ounces as a Winter Dressing for Vines and Fruit Trees. Has outlived many preparations intended to supersede it.
Sold Retail by Seedsmen, in boxes, 1s., 3s., and 10s. 6d.

Wholesale by
PRICE'S PATENT CANDLE COMPANY (Limited),
Battersea London, S.W.

Planting Season.

TO BE SOLD, cheap, the ground being required for other purposes, 6 acres of RHODODENDRONS, from 1 to 3 feet high, bushy hybrids, well set with bud, the finest lot in England; AZALEAS, strong and bushy, well set with bud; POPLARS, 30 to 40 feet high; SPRUCE, 10 to 15 feet; HORSE CHESTNUTS, SYCAMORE, NORWAY MAPLE, 2 to 8 feet; COMMON LAUREL, 4 to 5 feet, bushy; and other Forest Trees, Shrubs, &c. Best short GOOSEBERRIES in variety.
B. WHITHAM, The Nurseries, Reddish, near Stockport

Planting Season.

STRONG transplanted LARCH, SPRUCE, and PINUS AUSTRIACA, PRIVET, POPLAR, QUICKWOOD, LAUREL, YEWS, BERBERIS, ARBOR-VITÆS; Standard, American, and Kilmarnock WEEPING WILLOWS; GOOSEBERRY and CURRANT TREES; also, Standard, Pyramid, and Dwarf-trained APPLES, PEARS, PLUMS, and CHERRIES. Priced CATALOGUES may be had on application.
WITTY and SON, The Nurseries, Cottingham.

TO BE DISPOSED OF, about 200 CEDRUS DEODARA, 10 to 12 feet high, and in rare condition for transplanting—every one of them having been removed since August, 1869, as they are now standing on ground that must be cleared by Lady Day next. No reasonable offer will be refused
ANTHONY WATERER, Knap Hill Nursery, Woking, Surrey.

IMPORTANT to LANDOWNERS, NURSERYMEN, &c.
7,000 ELMS, in varieties, 7 to 10 feet, per 100, 15s
800 SYCAMORE, 6 to 8 feet, per 100, 18s
4,000 SYCAMORES, 6 to 7 feet, per 100, 10s
700 COCK'SPUR THORNS, 8 feet, fine, per 100, 18s.
2,000 CHESTNUTS of LARCH, 3 feet, per 1000, 15s
3,000 TREE BOX, fine, in three varieties, per 100, 15s
3,000 GIANT ASPARAGUS, 2 yr., per 1000, 15s.
4,000 ROSE of SHARON, per 100, 8s
WM. RUSHFORTH, Woodhouse Hill, near Leeds

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following :—
LAURUSTINUS, 4 to 6 feet | PHILLYREAS, 6 to 8 feet
PORTUGAL LAUREL, 5 to 9 ft. | COMMON LAURELS, 6 to 9 ft.
Variegated HOLLIES, 4 to 7 feet
RHODODENDRONS, 3 to 5 feet, thickly set with buds.
The above have recently been transplanted, are very bushy hand some plants, and quite safe. Cash or reference required before delivery.
Floral Nursery, Hailsham, Sussex.

Winter and Spring Flowering Plants.

FRANCIS & ARTHUR DICKSON & SONS have a magnificent stock of the above, in fine, strong, healthy plants, including AGAPANTHUS, AZALEAS, CAMELLIAS, CARNATIONS (Tree), CYCLAMEN, CYTISUS, EPACRIS, ERICAS, LILY of the VALLEY (imported clumps), SPIRÆA JAPONICA (ditto ditto), VIOLETS, &c. Also a splendid Collection of Plants suitable for Table Decoration, including Palms, Ferns, &c. Low prices and particulars, see General PLANT CATALOGUE, which will be sent free per post on application.
"Upton" Nurseries, Chester

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees.
QUICK, and all other Hedge Plants.
COVER PLANTS, in great variety.
FRUIT TREES, including all the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained, &c.
ROSES, Standards, Dwarfs, on own roots and Manetti stock, &c.
VINES, all the leading varieties, in 2000 well ripened Canes, for fruiting in pots and for planting out.
EVERGREENS, in great variety, including large quantities of all the choicest Hollies, &c.
CONIFERS, including Picea nobilis, Nordmanniana, &c.
ORNAMENTAL TREES, Shrubs, &c., of all sorts.
The whole in very great quantity and stout vigorous condition, with fine roots, for safe removal.
Priced LISTS and all particulars on application to
JAMES DICKSON and SONS, "Newton" Nurseries, Chester.
The "Newton" Nurseries are within 10 minutes' walk, by the new road over Flookersbrook Bridge, from the Railway Station.

A NOBLE AVENUE for £20, consisting of 100 WELLINGTONIA GIGANTEA, about 4 feet high. This, the most noble of all trees, is of very rapid growth, where it attains a height of 40 feet, with a trunk 20 feet through, is of rapid growth, hardy, and suitable to form The Park of a Wellington at the Crystal Palace, exactly destroyed by fire, gave an idea of the grandeur of the tree
Or an AVENUE of 100 SUPERB ABIES DOUGLASII, about 10 feet high, 20 feet through, with a trunk to feet through. The largest at Kew is of this tree, and was, 1870, 90 feet high. There is at Dropmore (Bucks) a specimen measuring at the present time 95 feet high, and 90 feet through the branches, with a trunk 9 feet in circumference at 4 feet above the ground, planted from seed brought by Mr. Frost, the present gardener, in 1828, and is now a model of beauty.
RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

AS AN AVENUE TREE
Nothing is so grand and beautiful as
ABIES NOBILIS MAGNIFICA
and they can be obtained of any size up to 6 feet; transplanted 1870.
RHODODENDRON THE QUEEN
(mind you get "The Queen") still remains as far superior to any other white Rhododendron as white is superior to black.
RHODODENDRONS, FINEST NAMED
kinds, in greatest profusion, full of buds; never so fine before.
DWARF ROSES,
as good as can be grown, and in any quantity.
FRUIT TREES
APPLE, PEAR, CHERRY, PLUM, &c. Standard, Pyramid, Dwarf, and Trained; healthy, vigorous, and a capital selection
These are a few specialities offered by CHARLES NOBLE, but the Nurseries are replete with a large healthy stock of new Shrubs and Plants second to none The easy access (half a mile from Sunningdale Station, South-Western Railway) should induce all large planters to pay a visit, for seeing is the only way to understand the kind of plants sent out at the Sunningdale Nursery, and the prices charged will more than repay the journey.
Send for a CATALOGUE.
Bagshot—No. 1870

New Plants

Now OFFERED for the FIRST TIME by
CHARLES NOBLE,
Bagshot, Surrey.
CLEMATIS ALBERT VICTOR.
First-class Certificate, May 5, 1869.
Extra fine shape, each flower having eight petals, deep lavender colour, with brown ribs down the centre of each petal, the ribs changing to white, or nearly so, as the flower expands. Very free-flowering, and of a superb, thick, velvety texture.
10s. 6d. each, or £4 4s. per dozen.
CLEMATIS LADY LONDESBOROUGH
First-class Certificate, May 19, 1869.
Very fine shape, each flower having eight petals, colour a delicate silver-grey, with white stripe down the centre of each petal; a pink stain at the base of the stamens gives it a pretty appearance. Good substance, and very free-flowering, constitution very robust.
10s. 6d. each, or £4 4s. per dozen.
CLEMATIS MISS BATEMAN.
First-class Certificate, May 5, 1869; Special ditto, April 20, 1870.
Good shape, each flower composed of eight petals, colour pure white, with distinct band of glaucous cream-colour down the centre of each petal. Very free, and altogether a magnificent plant.
15s. each, or the set of three varieties for £2. 2s. When 12 are taken, four of each, they will be charged £4 4s. per dozen.
Send for CATALOGUE.

To the Trade.

HYACINTHS, TULIPS, POLYANTHUS NARCISSUS, CROCUS, SNOWDROPS, WINTER ACONITES, &c. All first-class, and of first importation, picked roots.
BARR and SUGDEN, 12, King Street, Covent Garden, W.C.

LILIUM AURATUM, &c.—English-grown Roots of LILIUM AURATUM, 12 6d., 25 6d., 35 6d., and 55 6d. each, and upwards; LILIUM LANCIFOLIUM, ALBUM, RUBRUM, and ROSEUM, and all other LILIES.
See DESCRIPTIVE CATALOGUE, free on application.
BARR and SUGDEN, 12, King Street, Covent Garden, W.C.

New Catalogue of Dutch Bulbs, Plants Suitable for BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, FRUIT TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants
Exotic Nursery, Tooting, Surrey, S.W.

New Seeds—"Only the Best."
MR. WILLIAM BULL'S CATALOGUE
is now ready.
NEW VEGETABLES,
NEW FLOWERS.
"Only the best" Fide descriptions in Mr WILLIAM BULL'S CATALOGUE. "Every article priced"
Establishment for New and Rare Plants, King's Road, Chelsea, London, S.W

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded on application. It faithfully describes the colours of the Rhododendrons, and also contains selections of the most approved VARIETIES, with heights and prices, as well as the leading EVERGREENS and ROSES.
The American Nursery, Bagshot, Surrey.

BENJAMIN S. WILLIAMS' GENERAL and NEW PLANT CATALOGUE for 1870, post free on application, contains Lists of Orchids, Palms, Tree Ferns, Stove and Greenhouse Ferns, Hardy Ferns, Filmy Ferns, &c.; Dracænas, Agaves, Yuccas, Beaucarneas, Dasylirions, Cycads, Aroids, and Camellias, Cape Heaths, New Holland Plants, and Amaryllis, &c.
B. S. WILLIAMS respectfully invites inspection of his numerous COLLECTIONS, which are in fine order at all times to well repay a visit.
Conservatories furnished, and Choice Plants supplied for Balls or Dinner-table Decoration.
Victoria and Paradise Nurseries, Upper Holloway, London, N.

The most Desirable Plant of the Season.

PARSONS' NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA. See previous Advertisement

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" Carter & Co., High Holborn, London, W.C.
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" C. W. Dyson & Son, Bloomsbury Street, Bradford.
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" John Waterer & Co., Dardham Down Nurseries, Bristol
" James Dickson & Son, 102, Eastgate Street, Chester.
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" F. F. Henderson & Son, St. John's Wood, London, N.W.
Mr George Iredgett, Cambridge
" I. S. Woodthorpe, Sible Hedingham, Essex.
" G. Hinxman, Pitfirrane.
" B. Bracher, Halifax, Yorkshire.
" W. Knight, Hailsham, Sussex.
" Timothy Brigden, South-Eastern Railway Station
" W. Paul, London.
" E. Holmes, Whittington Nursery, near Lichfield
" W. Bull, King's Road, Chelsea.
" E. Taylor, Malton, Yorkshire.
" B. S. Williams, Upper Holloway, London
" E. Cooling, Deptford.
" James Wood, Newport, Isle of Wight.
" H. Watkinson, 6, Market Place, Manchester.
" R. Cooper, 152, Fleet Street, London, E. C.
" J. Fraser, Lea Bridge Road Nurseries, London, E.
" R. Smith, St. John's, Worcester.
" John Scott, The Seed Stores, Yeovil.
" F. K. Burridge, King Street, Ipswich.

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Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow
" Austin & McAslan, 16, Buchanan Street, Glasgow.
" P. Lawson & Son, Edinburgh.
" Stuart & Mein, Kelso.
" W. Drummond & Sons, Stirling
" J. & R. Thyne, 60, Buchanan Street, Glasgow.
" Dobbie & Turnbull, 26, George Street, Perth.
Mr. James Cocker, Aberdeen.

IRELAND.
Messrs. W. Drummond & Sons, 58, Dawson Street, Dublin
Mr. J. W. Mackey, 40, Westmoreland Street, Dublin.

BELGIUM.
Mens. Louis Van Houtte, Ghent

PRUSSIA
Messrs Platz & Son, Erfurt
" Ferdinand Juhlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

AMERICA.
Messrs B. K. Bliss & Sons, New York.

PARSONS' NEW HYBRID TREE MIGNONETTE, in packets of per ounce, price on application.
PARSONS' superior PRIMULA,
" " CALCEOLARIA,
" " CINERARIA,
saved from the finest strains in cultivation, 2s 6d per packet.
F. P. has a first-rate stock of FRUIT TREES, both Trained and Pyramids, of which he solicits an inspection Warranted true to name Also a splendid collection of ROSES, including all the finest varieties. CONIFERS, &c., of every description. CATALOGUES and prices of which may be had on application
F. PARSONS, Nurseryman, Seedsman, and Florist, 27 and 28, Western Road, Brighton. Nurseries, Hassock's Gate, Keymer, Hurstpierpoint.

British Fern Catalogue.

ROBERT SIM will send, post free for six postage stamps, Part I. (British Ferns and their varieties, 76 pages, including prices of Hardy Exotic Ferns) of his PRICED DESCRIPTIVE CATALOGUE of BRITISH and EXOTIC FERNS, No. 7.
Foot's Cray Nursery, Sidcup Hill, Kent.

Choice Seeds from Prize Flowers, saved by

JOHN DOBSON and SONS, exclusively from the finest varieties in cultivation, in sealed packets.
CALCEOLARIA, second to none, 1s. 6d., 2s. 6d., 3s. 6d., 5s.
CINERARIA, 1s., 2s. 6d., 3s. 6d., 5s.
PRIMULA SINENSIS FIMBRIATA ALBA, or RUBRA, or MIXED, 1s 6d., 2s 6d., 3s. 6d., 5s.
BALSAM, very fine, 8 varieties, 1s., 2s.
CYCLAMEN, 1s., 2s 6d.
Woodlands Nursery, Isleworth, W. ; and High Street, Hounslow, W.

To the Trade.

JOHN DOBSON AND SONS beg to thank their numerous friends for their kind favours, and to state that their new TRADE LIST of choicest CALCEOLARIA, CINERARIA, PRIMULA, BALSAM, CYCLAMEN, and INTERMEDIATE STOCK SEEDS, is now ready, and will be forwarded, post free, to those who may not have received one. To those who have not yet given our Seeds a trial, we can recommend them with the greatest confidence as unsurpassed in the Trade.
Woodlands Nursery, Isleworth, W. : and High Street, Hounslow, W.

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. A new road (by the side of the steps) over Flookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain.
CATALOGUES and all particulars on application.
JAMES DICKSON and SONS, "Newton" Nurseries, Chester.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash :—
GOLDEN TRICOLORS.—Lady Cullum, 3s. 6d.; Mrs. Pollock, 3s.; Sophia Dumaresque, 2s. 6d. SILVER TRICOLORS.—Caroline Longfield, 6s.; Italia Unita, 6s. 6d. GOLD and BRONZE ZONALS. —Black Knight, 6s.; Cleopatra, 5s.; Duke of Edinburgh, 4s.; E. G. Henderson, 3s. 6d.; Her Majesty, 3s. 6d.; Luminator, 6s.; Painted Lady, 4s.; Queen of Whites, 4s.; Sensational Beauty, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s. 6d.; Madame Lemoine, 3s. 6d.; Madame Rose Charmeau, 3s. 6d.; Triomphe, 3s. 6d. A Priced LIST of 200 varieties post free.
ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Russell's Pyramid Primula.

GEORGE CLARKE has this season secured a quantity of this very fine strain, in excellent condition, which he recommends, feeling assured that no other possesses such a robust habit of growth, with really good flowers. Red and White, 2s. 6d. per pkt. Instructions for raising and growing sent if required
Nurseries Streatham Place, Brixton Hill, London, S.W ; and Mottingham, Kent, S.E.

Notice to the Seed Trade.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce his annual printed CATALOGUE of GARDEN, AGRICULTURAL, and FLOWER SEEDS, for the present season, is now ready, and can be had upon application. Intending purchasers will do well to see this before giving their orders Samples and stocks are very fine, and prices very low

Cheap Roses and Vines.

KIRK ALLEN has to offer fine Standard ROSES, fully equal to any in the Trade, 50s varieties only, his selection, at 9s. per dozen. Dwarfs, ditto, ditto, 7s. per dozen.
Extra strong planting VINES of BLACK HAMBURGH GRAPE, 2s. 6d. per dozen; ditto, ditto, GOLDEN HAMBRO' and GOLDEN CHAMPION, strong planting Canes, 3d. each; extra strong Fruiting ditto, 5d. each. All package free.
The Nurseries, Brampton, Huntingdon.

Roses.

ONE HUNDRED THOUSAND STANDARD ROSES.
200,000 DWARF HYBRID PERPETUAL ROSES.
50,000 TEA-SCENTED ROSES.
A magnificent stock to select from. CATALOGUES on application.
WM. WOOD AND SON, Woodlands Nursery, Maresfield, near Uckfield, Sussex

Roses—Roses—Roses.

J. HARRISON begs to inform his Friends and the Trade that he has still on hand a large stock of 60,000 of the finest Dwarf Hybrid Perpetual ROSES in England, which he is now selling at prices exceedingly low.
The Nurseries consist of 10 Acres of Nursery land, at Darlington, well stocked with FOREST TREES, SHRUBS, ORNAMENTAL TREES, FRUIT TREES, &c., at much reduced prices
CATALOGUES on application
North of England Rose Nursery, Darlington.

ALL the LEADING KINDS of Standard ROSES, 2-yr. buds, fine, 75s. per 100.
Dwarf ROSES, 50s. per 100.
Dwarf-trained PEACHES, NECTARINES, and APRICOTS, unusually good, 30s. per dozen.
Dwarf-trained PLUMS, 21s. per dozen.
Bushy GREEN HOLLIES, transplanted, 25s. per 100.
Very bushy GREEN HOLLIES, four times transplanted, 60s per 100
E. PIERCE, Nurseries, Yeovil, Somerset.

Standard and Dwarf Roses.

GEORGE DAVISON'S stock is very fine, and will be Sold at any reasonable price, as they must be cleared. Many Thousands of TEA ROSES in pots, 36 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied.
CATALOGUES on application.
Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA.
White Cross Nurseries, Hereford.

Twenty-one First and Ten Seconds Prizes for Roses.

JOHN CRANSTON obtained during the past season the large number of 21 First and 10 Second Prizes for ROSES, exhibited at the principal Rose Shows throughout the kingdom It is thus proved that his Nurseries stand unrivalled for the cultivation of the Rose.
The NEW ROSE CATALOGUE is now ready, and will be forwarded on application.
Nurseries, King's Acre, near Hereford.

King's Acre Nurseries, near Hereford.

JOHN CRANSTON, PROPRIETOR.—These extensive Nurseries (Established 1789) have long been celebrated for the Culture of GENERAL NURSERY STOCK, and the several departments are replete with the most select and desirable Plants at present in Cultivation, while the Collection is constantly enriched by the addition of recent introductions.
NURSERY DEPARTMENT.
ROSES.—All the best New and Old Varieties. Superb Standard, Dwarf, Pillar, and tall Weeping Plants. Twenty-one First and Ten Second Prizes at the principal Rose Shows of 1870.
CONIFERS.—Beautifully-grown specimens of the leading kinds, of various sizes All constantly transplanted
ORNAMENTAL TREES and SHRUBS.—Evergreen and Deciduous Trees, and Shrubs in great variety, including extra strong Trees for Avenues, Park Groups, &c.
FOREST TREES.—Larch, Spruce, Scotch, Pinus austriaca, Oak, Chestnut, Ash, &c., of various sizes.
FRUIT TREES.—The collection includes all the kinds most worthy of cultivation, and the Plants are carefully grown in every variety of form.
PLANT DEPARTMENT.
BEDDING and DECORATIVE PLANTS in great variety.
SEED DEPARTMENT.
GARDEN and FARM SEEDS carefully selected, and of the best quality possible
Special Terms to extensive Planters
DESCRIPTIVE PRICED CATALOGUE free by post on application.

The advantages of procuring Seeds direct from the Growers cannot be over-estimated.

"CARRIAGE FREE."

CARTER'S COLLECTIONS OF NEW VEGETABLE SEEDS

Will PRODUCE a SUPPLY of CHOICE VEGETABLES ALL the YEAR ROUND.

PACKING and CARRIAGE FREE.

CARTER'S

No. 2 COLLECTION of VEGETABLE SEEDS (suitable for a Small Garden), price 21s, contains —

13 pints PEAS, including Carter's First Crop, Laxton's Supreme, and other choice varieties for succession.
2 pints BROAD BEANS.
1 pint FRENCH BEANS.
1 pint SCARLET RUNNERS.
1 large packet BEET.
3 large packets KALE.
1 large packet BRUSSELS SPROUTS.
1 packet ALBERT SPROUTS.
4 large packets BROCCOLI.
4 large packets CABBAGE.
1 large packet SAVOY.
1 packet CAPSICUM.
3 ounces CARROT.
1 large pkt. CAULIFLOWER.
2 large packets CELERY.
4 ounces CRESS, plain.
1 ounce CRESS, Australian.
1 packet CUCUMBER.
1 large packet ENDIVE.
1 large packet LEEK.
3 large packets LETTUCE, Cos and Cabbage.
4 ounces MUSTARD.
1 packet MELON.
2 ounces ONION, in variety.
1 large packet PARSLEY.
6 ounces RADISH, long and Turnip Rooted.
6 ounces RAPE SEED.
½ pint SPINACH, Summer
½ pint SPINACH, Winter.
3 ounces TURNIP, best.
1 packet TOMATO.
1 packet MOORE'S VEGETABLE ASPARAGUS.
2 packets HERBS.

No. 6 COLLECTION of VEGETABLE SEEDS (increased quantities and varieties), price 30s., contains :—

10 quarts PEAS, including Carter's First Crop, Laxton's Supreme, and other choice varieties for succession.
3 quarts BROAD BEANS.
3 pints FRENCH BEANS, Dwf.
1 ounce BEET (and Runners.
6 large packets KALE.
1 large packet BRUSSELS SPROUTS.
1 packet ALBERT SPROUTS
5 large packets BROCCOLI.
5 large packets CABBAGE
2 large packets SAVOY.
1 packet CAPSICUM.
6 ounces CARROT, best.
1 large pkt. CAULIFLOWER.
3 large packets CELERY.
1 packet CORN SALAD.
8 ounces CRESS.
2 packets CUCUMBER.
1 large packet ENDIVE.
1 large packet LEEK.
3 large packets LETTUCE.
½ pint MUSTARD.
2 packets MELON.
4 ounces ONION, in variety.
1 packet ORACH.
2 ounces PARSLEY.
2 ounces PARSNIP. [Turnip
8 ounces RADISH, long and
1 packet RAMPION.
8 ounces RAPE SEED, for salad
½ pint SPINACH, Summer
½ pint SPINACH, Winter.
1 packet SALSAFY.
1 packet SCORZONERA.
6 ounces TURNIP, best.
1 packet TOMATO, best.
1 packet MOORE'S VEGETABLE ASPARAGUS.
4 packets HERBS

CARTER'S No. 1 COLLECTION of VEGETABLE SEEDS (suitable for Cottage Gardens), price 12s. 6d.

Packing and Carriage Free.

CARTER'S No. 3 COLLECTION of VEGETABLE SEEDS (suitable for a Garden of half an acre), price 42s Packing and Carriage Free.

CARTER'S No. 4 COLLECTION of VEGETABLE SEEDS (suitable for a large Garden), price 63s Packing and Carriage Free).

CARTER'S
VEGETABLE NOVELTIES for 1871.

A New Salad, CHINESE MUSTARD. Differing in seed and flavour from all other Mustards, will prove a valuable addition to our Salads. Per oz. 1s.6d.; per ½ oz. 1s.; per ¼ oz. 6d.

GILBERT'S IMPROVED VICTORY of BATH MELON.—The best green fleshed variety of the season. First-class Certificate, Royal Hort. Soc., June 29, 1870. 2s. 6d. per pkt.

COX'S GOLDEN GEM MELON.—The best light-fleshed variety of the season. First-class Certificate, Royal Horticultural Society, September 20, 1868; First and Second Prizes, Worcester Horticultural Society, 1870; and First Prize, Kidderminster Society, 1870 2s. 6d. per packet

NEW NEAPOLITAN MARZAGOLE ONION.—We have received this desirable novelty from the eminent raiser of the New Giant Rocca and other Mammoth Onions recently introduced by us. He informs us that it is by far the earliest Onion in cultivation. We have not yet had time to confirm this description, but from our past experience of this raiser's productions, we have every faith in his assertion respecting its value. We are also informed that if sown in the autumn this Onion will come into use in the month of March. Price 1s. 6d. per oz.; 2s. 6d. per pkt

The TROPHY TOMATO.—Awarded a Special Certificate by the Royal Horticultural Society, October 5, 1870. The largest variety in cultivation. 1s. 6d. per packet.

LAXTON'S QUANTITY PEA.—A fine flavoured variety, selected from Laxton's Quality for its robust habit and extreme productiveness. 5s. per quart.

LAXTON'S QUALITY PEA.—A second early Wrinkled Pea of great productiveness and fine flavour 5s. per quart.

EASTES' KENTISH INVICTA PEA.—The earliest round blue Pea in cultivation. 2s. 6d. per quart.

RED-SKINNED FLOURBALL POTATO.—A Special Certificate was awarded to us by the Royal Horticultural Society, December 7, 1870. Flesh very white, of particularly fine flavour. 5s. per peck; 16s. per bushel.

CAMBRIDGESHIRE KIDNEY POTATO.—We believe this to be the largest Kidney Potato fit for table purposes. 5s. per peck; 16s per bushel

KING of the EARLIES, or FIFTY DOLLAR POTATO.—1s 3d. per lb.; 7lb for 8s

BRESEE'S PEERLESS POTATO.—A new American variety, very highly recommended 1s 6d per lb.; 7lb for 9s 6d.

CARTER'S COVENT GARDEN GARNISHING PARSLEY.—First-class Certificate, Royal Horticultural Society, August 3, 1870, who speak of it as being a very fine curled variety. 1s per packet.

The PERFECTION of BEETS (CARTER'S), for Flower Garden Decoration or for Salad.—A Special Certificate was awarded to us at the Royal Horticultural Society, October 5, 1870, for a collection of the Beets, including the above variety, which was pronounced to be Perfection 1s per packet

CARTER'S
GARDENER'S & FARMER'S VADE MECUM

Illustrated, containing full descriptions of CARTER'S New and Choice Vegetable Seeds, Floral Novelties, Farm Seeds, Spring Bulbs, New Plants, and every garden requisite, is now ready, and will be forwarded Post Free for 1s.; gratis to purchasers.

N.B. As many complaints are annually received from Customers of the non-delivery of their Vade-Mecum, J. C. & Co. will be pleased to forward duplicate copies in all such cases on application.

Five per Cent. Discount for Cash.

JAMES CARTER AND CO.,
SEED FARMERS,
237 and 238, HIGH HOLBORN, LONDON, W.C.

Seeds direct from the Growers, the best means of preventing disappointment.

SUTTONS' HOME-GROWN SEEDS,

CARRIAGE FREE.

THE

EARLIEST ROUND BLUE PEA

IN CULTIVATION.

EASTES' KENTISH INVICTA.

This is a round Blue Pea, about 2 feet high, with straight, handsome, well-filled pods; is earlier than the best stocks of Daniel O'Rourke or Sangster's No. 1; and being a Blue Pea it is superior in flavour to any white variety. Messrs. SUTTON & SONS have purchased a portion of the stock of the above Pea.

Retail price, **2s. 6d.** per quart. Trade price on application.

THE

HEAVIEST CROPPING POTATO

and the best cooking Potato in cultivation is

SUTTONS' RED-SKIN FLOURBALL.

This extraordinary Potato, SENT OUT LAST SEASON BY US, has given the most complete satisfaction.

Orders for the above splendid Potato will be executed strictly in rotation. Price **5s.** per peck; cheaper in large quantities.

Now ready, price 1s., Gratis to Customers,

SUTTONS' SPRING CATALOGUE and

AMATEUR'S GUIDE for 1871. Also,

Suttons' Abridged Catalogue for 1871

Gratis and Post Free on application.

All Goods Carriage Free by Rail, except very Small Parcels.

SUTTON AND SONS,
SEED GROWERS, READING.

Brockworth Park Pear.

ORDERS for fine PYRAMID TREES of this MAGNIFICENT NEW PEAR

Are now being booked, for execution in strict rotation as received. The demand is so great that Purchasers may now ensure the first selection for next season.

J. C. WHEELER AND SON, NURSERYMEN, Gloucester, and 59, Mark Lane, London, E.C.

The Fairy Apple.

JOHN JENNINGS begs to inform his Friends and the Public that he is now sending out the above beautiful APPLE. An illustration of it, and a description by Dr. Hogg, is given in the "Florist and Pomologist" for March, 1870, in which he says that it is "Destined and worthy to take its place amongst the worthiest of its kind." Dwarf maiden trees, 7s. 6d. each.

Nurseries, Shipston-on-Stour.

STRONG Standard APPLES, PEARS, and WALNUTS; fine Standard and Dwarf-trained APRICOTS, PEACHES, and NECTARINES; bushy LAURUSTINUS and PORTUGAL LAURELS; a select collection of Standard and Dwarf Evergreen TREES of the leading sorts; strong Deciduous flowering SHRUBS; ASH, 3 to 5 feet; LARCH, SPRUCE, SCOTCH and AUSTRIAN FIRS, and all kinds of FOREST TREES. All the above have been regularly transplanted and are well rooted. Prices on application to

CHARLES BURGESS, The Nurseries, London Road, Cheltenham.

New Fruits.

BURGHLEY PARK CHERRY.—Maidens, 7s. 6d., each; a few large fruiting trees, 10s. 6d to 15s each. Cuttings for grafting, 6d each

ANNIE ELIZABETH APPLE.—Fine Maidens, 2s. 6d. each.

LORD BURGHLEY APPLE, 1s each.

THE IMPERIAL CRAB, 2s. 6d. each.

Seed of CINERARIA ACANTHIFOLIA, saved this season, 2s. 6d. per packet

T. HOUSE, Eastgate Nursery, Peterborough.

Extra Fine, in Quantities, and Cheap.

STANDARD DAMSONS, Common; and Dwarf-trained FRUIT TREES, especially APPLES.

KALMIA LATIFOLIA, with bloom, for potting.

ABIES NORDMANNIANA, 9, 12, to 24 inches; as far through.

JUNIPERUS CHINENSIS, fine, 1', 2, 3, to 5 feet

PINUS AUSTRIACA, 1½ to 2½ to 4 feet.

SALISBURIA ADIANTIFOLIA, good, 4, 5, to 6 feet.

ARBUTUS, Common, bushy, 1 to 2½ feet.

LAURELS, Common, 1½ to 3', feet

" Portugal, extra fine, bushy, 2, 3, to 4 feet.

Standard and Pyramid THORNS, Paul's new double scarlet

YEWS, English, extra fine, 3 to 6 feet.

Prices will be quoted according to quantities taken, by applying to GEORGE JACKMAN AND SON, Woking Nursery, Surrey.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, in which is given the name, the quality, the country where raised, the year they first fruited in, the raiser, their bearing quality, their size, and general cultivation. The Trees have been very much admired by all who have seen them, not being cramped, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and manage their roots well. Regulate your brain hes in winter, and in this short advice he's all the art of growing healthy and fruitful trees, such as J. S. offers.

Special Offer of Fruit Trees.

GEORGE CLARKE, having a surplus stock of fine Pyramid APPLE and PEAR TREES, in bearing condition, 8 to 12 feet high, begs to offer them at 18s. per dozen. They have been transplanted every year, and will consequently be but little affected by a removal. They are healthy, and true to name, full particulars of which will be forwarded on application to

Nurseries, Streatham Place, Brixton Hill, London, S.W.; and Mottingham, Kent, S.E.

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application.

The stock of Seedling and Transplanted LARCHES, SCOTS FIRS, and other FOREST TREES is both unusually extensive and superb in quality. When personal inspection is not convenient, samples and special offers will be sent if required.

Edinburgh and London (20, Budge Row, Cannon Street, E.C.)

The Gardeners' Chronicle

SATURDAY, DECEMBER 24, 1870.

WE are very glad to see that the seed trade is bestirring itself in the matter of the SAMPLE POST. Few, if any, of our great industries are more concerned in obtaining the repeal of the present obnoxious regulations than are the dealers in seeds, and large indeed must be the numbers of gardeners and amateurs to whom the old regulations were a boon, and to whom the present ones are a source of vexation, or even a positive impediment. We do not profess to know the precise grounds on which the Post Office authorities base their operations, but we can imagine that they have been induced to withdraw the convenient privileges afforded by the sample post for several reasons. They may have considered that by the introduction of the halfpenny postage card (for which in a great degree we believe we have to thank a well-known seed firm), they have conferred on us a boon greater than the one they have taken away, and they may have feared that the loss to the revenue would be too great to allow of the simultaneous existence of post cards and of cheap rates for sample postage.

Again, we have heard it said that so many things that were not *bonâ fide* samples were sent by this convenient means, that, in their care for the morality of the people, the Post authorities have instituted more stringent rules than heretofore, to prevent the violation of their rules, and to preserve the moral feeling of the public!

Lastly, the authorities may have feared that the resources of their staff would be unduly taxed by the great increase of work thrown on them by the introduction of post cards, the extension of telegraph and money order offices, and other matters of which the Post Office now takes control.

As regards the loss to the revenue, time will, of course, show, but our own idea is that, by the abolition of the sample rate, except for *bonâ fide* samples, the Post Office will be the loser in all ways. A lady in the country, for instance, would write for her packet of seed, and she would get it by return of post, but under present arrangements the amount of postage would, in many cases, exceed the value of the seed; in consequence the seedsman does not get the order, nor the Post Office authorities the postage of letter or packet. Our own experience will illustrate this point. Like most of our contemporaries, we were in the habit of receiving packets by sample post containing articles so multiform in their nature, that no one but those in like position to ourselves could form an idea of their variety—botanical specimens, plants to name, samples of seeds, fruits, manures, adulterations, black beetles, wasps, bugs, flies, Fungi, in fact anything and everything relating to gardening, farming, or natural history, of sufficiently small size and weight to be transmitted by post. Now, the influx has by no means wholly ceased, but it has materially diminished since the enactment of the new regulations. Many of these things doubtless could not be considered by any casuistry as *trade* samples, they had little or no commercial value, they were not articles of commerce, though some of them were trade articles. On this point the seed trade very pertinently asks, Wherein lies the difference between a sample of seed sent as a sample, and a small quantity of the same seed sent in execution of an order? Without an inquisitorial system on a gigantic scale, the Post Office authorities, not even with the aid of the "blind men" of the establishment who are supposed to see everything, or with the assistance of the subtlest casuist, could distinguish between one sample or packet and another. Nor do we think the casuists aforesaid would find an easy task to define what constitutes a sample, and till that is done the supposed immorality of sending things by sample post which are not samples in the opinion of the authorities, need not greatly trouble our consciences.

Seeing that the Post Office exists for the people and not the people for the Post Office, we submit that the promotion of the public convenience by all means consistent with effective administration is the first consideration. Any dictation as to the nature of the contents of packets transmitted through the post, with certain obvious exceptions, seems to us an absurdity. The proper course for the officials to follow would be to transmit packets of a certain weight or size, without reference to the nature of their contents. The conveyance of such small and light parcels as we are contemplating, would in no way interfere with the business of other carriers, while it would, both directly and indirectly, prove a very fertile source of revenue. Even with the halfpenny card rate, we believe the packet post would be so remunerative as to afford funds sufficient to defray the expenses of any additions to the staff which increased business might necessitate.

We perceive that other trading bodies, besides the seedsmen, are acting in this matter, and that the Society of Arts, which is as versatile in its aim as the elephant's trunk is said to be, has also taken steps to put this matter on a better footing. We believe outward pressure will do a great deal, but in the case of a public body, like the Post Office, the internal pressure of a deficient revenue is likely to do more; and if the seedsmen are able to show, as we have little doubt they will be, that in spite of, nay, rather in consequence of, the post card, a loss is likely to accrue to the postal revenue by the virtual withdrawal of the sample post, self interest of itself will dictate the abrogation of the present restrictions.

Our apiarian readers will find in another column a brief notice which may suggest to some of them a course of experiments which (who can tell?) may result in a profitable extension of their occupation. It appears that Messrs. Fortnum & Mason have presented to the food department of the South Kensington Museum a sample of Rose-coloured Honey. We have seen the sample, and can vouch for its beauty and delicacy. The comb is virgin, the wax almost white, and the honey limpid, pure, and of the colour of pale red currant jelly; and whether exposed in the cut cells, or seen shining through the white semi-translucent wax, the effect is exceedingly pleasing. How this is produced we are not told, farther than that it is the result of artificial feeding; most probably Messrs. Fortnum & Mason's purveyors have kept the secret to themselves, but it does not look as if it would be a difficult secret to find out, and they had better make hay while the sun shines; in other words, honey while the obscurity lasts.

We believe that it is still a disputed point whether any alteration takes place in the bee's honey-bag, by which the liquid sucked from flowers is converted into honey. Those who think that no alteration takes place, maintain that the honey exists in the flowers exactly in the same state as it is afterwards found in the combs; that all that the bees do is to transfer it from one store place (the nectary of the flower) to another (the comb), and that the short time that it remains in the honey-bag (rarely more than a few minutes) is too short to allow any great change to take place. Those who take the opposite view, argue that if no change takes place then it should follow that, when bees are fed upon molasses, or sugar and water, the contents of the honey-bag should be molasses, or sugar and water, and not honey. As, however, whatever goes into the honey-bag, nothing but honey ever comes out, we think the more reasonable inference is, that some rapid process of absorption of the more watery liquid, or some elimination, rejection, and passing on to the stomach of what will not make honey takes place, so that nothing but honey remains. We see, however, in the different colours of honey, gathered from different flowers, and notably in this specimen of Messrs. Fortnum & Mason's, that this sifting, or purification, cannot be, or is not, carried to absolute perfection. Honey from white Clover has a greenish-white hue; from Heather a rich golden yellow, and no doubt other differences may be observed in the colour, when any particular colour-giving flower is in especial abundance. Of all the red pigments known probably the most searching is that produced by the Cactus. We know that the fruits, or figs as they are called, of the Opuntia vulgaris, stain the liquid secretions of those who eat it blood-red. The fruit of O. Tuna is of the richest carmine, and forms a valuable pigment, employed at Naples as a water colour; and we all know the rich colour of the cochineal produced by the insect feeding on the Opuntia cochinillifera. We presume it would not be very difficult to colour honey or honey and water as we can sugar and water with cochineal, and by feeding the bees exclusively upon that coloured food a result similar to that obtained by Messrs. Fortnum & Mason's purveyors might be produced. Nay, it is very possible that no such roundabout means may be necessary. Feeding them upon currant or raspberry jelly or jam may, for aught we know, answer the purpose equally well.

But it is clear that this step in the refinement of honey once reached we shall not stop here. With the help of the chemist the beekeeper will be able to turn out in a few weeks honey of any hue to order, Apricot-coloured honey, orange-coloured honey, pea-green honey, blue honey, or, like the woollen case of the grub of the clothes moth (set to feed on different coloured clothes successively), comb filled with party-coloured honey, arranged in ingenious or artistic patterns and devices, for with a little contrivance the present systems of hives will allow any part of a comb to be shut off or made accessible to the bees at pleasure. Where the struggle is between Nature and Art, it would almost seem, now-a-days, as if Nature must, as a matter of course, go to the wall.

—— A Correspondent has kindly favoured us with a Post Card (*Feldpost-Correspondenzkarte*), written by a German serving with his regiment near Paris, and giving an account of the Condition of some of the Nurseries near that city. We see that our agricultural friends are devising means to assist their French brethren with seeds, &c., and it will become a question whether our nurserymen may not at the proper time follow so good an example, and transmit grafts or what not in aid of their distressed colleagues:—

"Châtenay, Dec. 4, 1870.

"On my return last night from an excursion to Versailles, Palaiseau, Longjumeau, and Corbeil, which occupied three days; I found your favour of the 27th ult., and hasten to give you the information desired. I am sorry I have but sad news about the establishments; they are all deserted, and the magnificent collections are perishing. In detail I can only report of the establishments of MM. Croux and Durand fils; the others near Bagneux, Châtillon, and Bourg-la-Reine we only passed several times at night, when marching to the batteries in course of erection, for the staying there during the daytime is not very agreeable on account of the shells from Vanves, Montrouge, and Bicêtre. M. Croux's principal establishment at Châtenay is the quarters of the Staff of the Bavarian Artillery; the large hot-house, 60 to 80 feet long, is occupied by the horses, the flower-tubs being made use of for cribs; the magnificent Conifers (Wellingtonias, Pinus Pinsapo, &c.), of which we found numbers of fine specimens, have all been cut down to form a fence along the road to Fontenay-aux-Roses, to prevent the French from having a look into our batteries from their forts. But the most sad sight is offered by the Jardin pour les études pomologiques, belonging to M. Croux, and situated near Aulnay. The beautifully trained fruit trees, after having been much broken by the pulling out of the wires, which were used for making gabions, are now completely eaten down by the 2000 sheep and 80 to 100 cows shut up in the garden. Nor have the nurseries in the open field been spared; the stems of the young trees had to serve as stakes for gabions, while the branches were used for fagots. A similar sad sight is afforded at the branch establishment of M. Durand fils, near Clamart; the greenhouses being, to a great extent, demolished by shot coming down here as thick as hail, and the plants they contain are dried up or frozen, for we had —6° R. = 18° F. the day before yesterday, and yesterday morning a considerable fall of snow. It will be about the same with the other establishments not visited by me, and it may be taken for granted that the losses of these people are beyond replacement, and will bring many of them to the grave."

—— Amongst Almanacs for the New Year we may notice "Whitaker's Almanac," as usual brimful of useful information. The same may be said of "Dietrichsen & Hannay's Royal Almanac." The "City Diary" is serviceable alike for provincials and citizens. Messrs. Letts have issued a series of diaries and almanacs for the pocket and the desk, of which we can speak most favourably. A good deal of information, some valuable, some curious, is given in "Orlando Whistlecraft's Weather Almanac" (Simpkin, Marshall & Co.) The same may be said of "Glenny's Garden Almanac" (Lemare); while *Punch*, in his "Almanac," does his best to be as facetious as in his weekly issue.

—— At the last meeting of the General Purposes Committee of the International Exhibition of 1871, it was settled that the price of the season tickets should be three guineas, as in 1862, but on this occasion the season tickets, besides giving admission to the fine arts and industrial exhibitions, will admit to about 130 day performances of music in the Royal Albert Hall, and to the great flower shows and the gardens of the Royal Horticultural Society. Further particulars will shortly be advertised.

—— The Christmas number of the *Graphic* is mainly commendable for the excellent engraving representing Dickens' library just as it was when that great teacher was taken from us. It is a view of an author's work-room, and nothing more—but then it is well done, and the author was Charles Dickens. Every pater or mater familias should think it a duty to invest in "Aunt Judy's Magazine" for their children, and if they also gave orders to their newsmen to supply the little people with "Good Words for the Young," they could not do wrong. To elder folk with a *penchant* for plant lore, the recent] Number of "Fraser's Magazine" will be acceptable as containing *inter alia* some articles on Mystic plants (Mistleto included) by Mr. Moncure Conway.

—— Dr. Alexander Prior has published a second edition of his erudite and useful work on the Popular Names of British Plants (Williams & Norgate). We shall take an early opportunity of alluding to its contents more at length.

—— M. Decaisne, Professor of Agriculture at the Museum, says *Nature*, has laid before the French Institute, of which he is a member, a scheme for the early growing of Cabbages, Radishes, &c., which are to be sown in land richly manured, kept for a fortnight, and used stem and root, as a new description of vegetable. This diet is intended to protect Parisians against scurvy when the use of salt beef becomes still more frequent than it is now. The working of this scheme is superintended by M. Joigneaux, the Editor of several agricultural papers. Different pieces of waste land close to the walls were appropriated, and vegetables of that description must be now actually on sale.

—— The Maximum Temperatures of the air in England, during the week ending December 17, greatly exceeded those in Scotland. (See Mr. Glaisher's Tables in our present issue.) In the former country the two extremes are represented by 58°.2 and 50°. recorded at Portsmouth (south) and Newcastle (north) respectively, and the mean for all stations is 55°.2; whilst in the latter country the highest recorded is 53°, at Paisley, and the lowest 46°, at Dundee; the mean for all stations being 48°.3. The Minimum Temperatures in England, however, were much lower than those in Scotland, for whilst in the southern country 19° was observed, in the northern country 26°.2 was the lowest; the mean of all lowest for

England is 27°.1, and for Scotland is 30°.3, showing a difference of 3°. The MEAN TEMPERATURES of the week, as if to prove how changeable is the climate of the British Isles, proceed in direct opposition to those of the preceding week. In England the highest was at Portsmouth, viz., 44°.6, being 7°.1 above the highest recorded in Scotland, viz., 37°.5 at Perth. Of the minimum, 35°.6 at Hull and 35°.4 at Glasgow is the lowest for each country; taking the eight southern stations in England we get 40°.6 as the mean, the eight northern 38°.4, and the eight stations of Scotland 36°.7, or nearly 4° below that for the southern stations of England. The RAINFALL was pretty evenly distributed throughout the southern country, for although the falls at Portsmouth and Blackheath were greatly in excess of the other stations, yet with these exceptions the amounts ranged between $\frac{1}{10}$ inch and 1 inch, but in the northern country four stations return more than 2 inches each, while two are below 1 inch. The largest fall in England was at Portsmouth, viz., 1.94 inch, and the smallest at Norwich, 0.66 inch, with a mean for all stations of 0.98 inch. In Scotland the largest fall was 2.60 inches, at Dundee, and the smallest, 0.59 inch, at Leith; with a mean for all stations of 1.77 inch.

—— We extract from the "Food Journal" the following letter relative to SCLERODERMA VULGARE as an ESCULENT FUNGUS:—

"I was somewhat surprised some time since, amongst a host of other inquiries respecting the qualities of particular Fungi, to have Scleroderma vulgare submitted to me; and still more so, after my evil report of it, to find that it had been largely eaten and pronounced very good. It is only in the young state, of course, that any question could arise about it; for, like its allied Puff-balls, when old it is filled with a mass of loathsome dust. I ought, however, to have recollected that its use as an article of food was no novelty, as under another and false name it has been largely employed at Paris instead of the Truffle of Perigord, to adulterate Perigord Pies, the quality of which were, in consequence, much deteriorated. Young specimens were given by the late Monsieur DESMAZIERES in his 'Plantes Cryptogames du Nord de la France,' fasc. xvi., 1836, as specimens of the white Truffle, though the structure is totally different. It is found abundantly in the neighbourhood of Mons, where it frequently appears in the market, and is sent from Belgium, in great quantities, to Paris. Some pains are taken to guard it in the place of its growth, by covering it with earth until of sufficient size, against the ravages of animals, but especially of the magpies. The same thing clearly is figured by CORDA, under the name of Pompholyx sapidum, who considers it superior to either the black or white Truffle. I am not certain whether Dr. BULL, who is such an authority on the subject, has really tried its culinary properties; but in a letter recently received, he says, 'I am afraid Scleroderma vulgare, though doubtless edible when young, like all the other Puff-balls, will scarcely do to recommend as edible, since it is so small and not attractive by its colour, even when young, and very dangerous at an earlier stage.' There seems always to be conflicting evidence about the quality of Fungi, the truth probably being that the same species may be wholesome or the contrary, according to local or climatic condition, or from idiosyncratic peculiarities of constitution. Sparassis crispa, one of the largest and most beautiful of our Fungi, has occurred lately in two or three localities; and I have myself had some dressed which came from Miss BROADWOOD, of Lyne, in Hampshire, which proved excellent. A single specimen, like Lycoperdon giganteum, is so large, that it would almost be sufficient for a Lord Mayor's feast. *M. J. Berkeley.*"

We may add, that our own experience of Scleroderma is decidedly unfavourable to its use.

New Garden Plants.

HYDRANGEA THUNBERGII, *Siebold, Nov. Act. Leopold. Carol.* xiv. 2, p. 690; *Siebold and Zuccarini, Icones et Descript. Hydrangearum*, ii., t. 8.

H. ramis flexuosis, foliis ovato-oblongis acutis tenuiter crenato-serrulatis glabris, cymis planis plerumque triradiatis, pedunculis pubescentibus, floribus difformibus, radiantibus sterilibus 8—10 patentibus, sepalis 4 coloratis e basi cuneata suborbicularibus retusis inter se aequalibus cyaneis, floribus fertilibus plerumque trigynis.—*Sieb. et Zucc. l. c.*

Siebold and Zuccarini describe this plant as a branched shrub, 2 to 3 feet high, having opposite petiolate ovate-oblong acute leaves, finely crenato-serrulate at the margin, and bearing terminal cymes 3 to 4 inches in diameter, consisting of flowers of two forms, the sterile ones on the circumference, the fertile ones in the centre of the cyme. The former have usually four calycine divisions, which are suborbicular, cuneate at the base, retuse, of a blue colour, and radiately venose. Of this plant they give a figure, which is in part reproduced in the annexed woodcut (fig. 297). In June last Messrs. Cripps & Son, of the Tunbridge Wells Nursery, sent us a variety of this species, in which the sterile flowers had the delicate colour of Peach blossoms (floribus persicis), and which was briefly alluded to at p. 922. They state that it proves to be a perfectly hardy shrub, and though not equal in beauty to those species which form large masses of the sterile flowers, H. Otaksa for example, it is a pretty outdoor plant, and quite distinct, as our figure will show. In Japan it flowers in May, while with Messrs. Cripps it blossomed in June, so that it probably produces its inflorescence thoroughout the early summer months. It grows naturally on the higher mountains of the provinces Awa and Sanuk in the Isle of Sikok, and also on the mountains of Nippon.

The dried leaves of this Hydrangea furnish, according to Siebold, a tea of a very *recherché* character, having a most agreeable taste, and bearing the name of Ama-tsjâ, or Celestial Tea. He further tells us, on the testimony of various authors, that this tea is used by the Japanese on the birthday of Siaka (Buddha), which falls on the eighth day of the fourth month, to pour over the image of the founder of their religion. This solemnity is called the baptism of the image of Siaka. *T. M.*

FIG. 297

ON RENOVATING VINES.*

IN considering the means whereby the condition of Vines may be improved, it will be well at first to examine the state of the roots, and to learn to what extent the borders may, or may not, be drained. Healthy drainage is of the utmost importance, therefore, be sure that the whole of the border is well cared for in this respect. If the soil is worn out it should be replaced with fresh cut turf, and an addition of crushed bones. If the roots are found rambling out of the prescribed space, do not hesitate to intercept them by cutting the runaway portions hard back. This is advice which some, no doubt, would hesitate to follow, but if carefully done it is a practice which will be found beneficial. There is one condition, however, which must be strictly attended to, and which is, that the wood of the Vines must be well ripened before such operations are commenced. The shoots on the Vines must also be carefully regulated, the aim being to obtain vigorous growths, which, with a sufficient allowance of space for large leaves to expand, will be capable of carrying two bunches each if required, rather than a great quantity of weak, spindly shoots, which will produce one bunch only on each spur. The operation should be carried out whilst the Vines are in full growth, and some care will be required in the matter of heating and ventilating.

I have proved by experience, that by carefully carrying out the foregoing treatment the results will be highly satisfactory. In the summer of 1867 I found it necessary to ascertain the condition of the roots of three houses of Vines at Surrenden. The quality of the Grapes at that time was very indifferent, the bunches of Black Hamburgh were small, and in some instances almost colourless, and the berries were oval, and with only one or two seeds in them. The Muscats were wretched, many bunches having only a dozen eatable berries on them, and the wood and leaves corresponded in size to those of Red Currant trees. Upon examination I found that the border, which was 12 feet in width and was bounded by a low retaining wall, was waterlogged. I learned that when the Vines were planted (about 12 years previously) the border was made along the whole length of the houses, 7 feet in width. The drainage of broken bricks and mortar rubbish was only 2 or 3 inches in thickness, and not one single drainpipe used. In fact the only thing approaching to drainage was a 4-inch brick tank 2 feet square, sunk below the level of the 2 or 3 inches of drainage at the outer extremity of the middle border. This was not cemented, so that in wet weather it collected the water only to give it off again through the interstices of the brickwork. This portion of the border was banked up with large limestones, and the remaining space of 5 feet to the boundary wall was laid over with limestones also, for, I suppose, appearance sake, certainly not for drainage, as they rested on cold wealden clay quite 1 foot above the drainage of the 7-feet border. However, as the borders became traversed with roots, there was no impediment to stop the latter from slipping between the embankment of limestones into the clay; and when they were observed it seemed that the whole of the vacant space left had been filled in with soil some 3 feet in depth, without interfering with the roots in the slightest degree, and all the limestones before mentioned were left as originally placed. The consequence was, the border became soddened with the autumn rains, and the young roots rotted at the very time when they should have been ripening.

In the first of these houses we commenced cutting the Grapes in the first week of August; the second house closely followed it, and the third one finished off a sparing crop, as best it could, with watery and colourless Grapes. In the middle of August I covered the whole of the border with such sashes as could be collected, to throw off the rain, and at the same time to retain heat in the soil. I then gradually reduced the thickest of the Vine shoots, and kept up a continual warmth in the pipes, with a liberal supply of air, both day and night. In a month's time the benefit of such treatment could be seen in the colour and firmness of the wood. Then, by degrees, I removed all the secondary shoots of the Black Hamburghs, whilst from the Muscats I cut away all the unripened growths down to the ripened portions, thereby, as I considered, doing away entirely with that watery sap, which would, doubtless, otherwise have found its way back through the Vines. Mildew was previously thickly studded over the shoots of Muscats and Frontignans; but the action of the heat and air, which ripened the wood, dried it to a green powder, which came off freely on the hands when touched.

In the end of October we commenced operations on the border by throwing out all the soil, limestones, and clay the whole length of the border, leaving it only 7 feet in width from the vineries, and to the depth of 3 feet—down, in fact, to the drainage of the original border, which could then be seen throughout its whole length and depth. We then removed the bed of clay to the depth of 18 inches below the level of the drainage, sloping gradually to the retaining wall, laid drains the whole length of the border, and then in the wall above mentioned for drainage. In doing this some few roots that could be well traced were securely pegged to the border, but by far the majority were cut clean away rather than follow them through the clay. Turf was laid over the drainage, good soil being placed upon it. The few roots pegged to the border were released, pruned, and laid out in the new border, and were covered to the depth of 6 inches with soil. It should also be mentioned that when the whole length of the border was exposed, we could distinctly trace a layer of leaf-

* A paper read at one of the meetings of the Royal Vineyard Gardeners' Mutual Improvement Society, Hammersmith.

mould, about 1 inch in thickness, covering the whole border, at 10 inches below the surface. In this Fungus was rampant, and we wheeled away the soil of the whole surface down to the leaf-mould, amongst which I found several roots in a rotten state. After the roots were pruned back to where they showed vitality, and were covered with about 6 inches of soil, the whole border was overlaid with long litter to the thickness of 18 inches.

The first house was started on January 1 following, and ripe Grapes were cut on June 1. The Muscats were well finished off by the first week in July, and the crop gave great satisfaction. But I may be asked, what about the new roots? Well, within a fortnight from the time of starting the house, the buds were on the move; they broke regularly and strongly, and continued to progress at favourable speed. When the bunches were stretching I examined the border, as well as just before they flowered; the pruned roots appeared exactly the same as when left in the autumn, and when the Grapes approached the stoning period the ends of the roots were only then showing callus. I was, indeed, anxious to see how they would get over the stoning; some hot dung was worked in with the litter already placed on the border in the autumn, and this gave a genial warmth. When they had stoned and appeared to be making their second swelling, I examined the border again, and was pleased to find masses of new roots issuing from the pruned portions some 6 inches in length, yet I could not see any protruding from the trunk of the roots so pruned, some of which, when cut, measured 1 inch in diameter.

After the Grapes were cut the soil was removed from amongst the roots in the remaining leaf-mould of the original border, 7 feet from the wall, to the depth of 1 foot, with the idea of thoroughly tracing and throwing out all the Fungus. To do this we worked freely amongst the roots with a small hand-fork and our hands, doing 2 feet widths at a time, and refilling with good freshly cut turfy loam, leaving the roots covered with only 3 inches of soil, which, however, later in the autumn was made up to 6 inches, at which time the turf soil packed in amongst the larger roots was becoming well filled with new rootlets: these ripened off well, and in the following spring of 1869 the buds broke within ten days of starting the house. The majority of the Hamburgh leaves were 15 inches across, and the bunches were large. The only covering the border had was that of sashes laid over to throw off cold rains at the time of the Vines being at work. In conclusion, I may state my belief that Vines will ultimate'y be lifted, root-pruned, and replanted quite as satisfactorily as other fruit trees. *T. C. Sage.*

EVERGREENS FOR TOWNS.

I SEND you a list of a few evergreens that will succeed, comparatively, very well in London gardens and squares, and which will do much in the way of removing the wretched pea-sticky appearance that most London gardens have in winter. Many of them will also thrive indoors in pots as well as out-of-doors. The great drawback to plants in London, indoors, is the gas, which kills all soft-leaved subjects directly; and it is only the hard thick leathery polished leaves that will withstand it. The best of all plants that I know of for this purpose is the Norfolk Island Pine (Araucaria excelsa), and after this are Thujopsis dolabrata and Ficus elastica. The following are for planting in the open air:

Acer rufinerve is a very strong grower, and has smooth leaves, which it retains long after all other Maples have dropped; even up to December 1 it was quite green in the open air. This plant has not yet been tried in London, but if any Maple will grow there this will.

Aucuba japonica (*male and female*).—The old Aucuba is well known as a London plant, but within a few years we have introduced the male variety, and have raised a lot of dark green-leaved kinds of both sexes, and which are very much more handsome than the variegated form. When loaded with their rich coral-looking berries, they are very beautiful to look upon. Some years ago, when I showed the first green-leaved variety, covered with berries, what a consternation it made. I sold this plant to a Belgian nurseryman for £50, and it was shown afterwards at the first Brussels International Show. Only fancy the London squares lighted up with such plants, loaded with their coral-looking fruit from Christmas until June.

Berberis Darwinii.—This plant is well adapted for London, and after flowering every year should be cut down. It is apt to grow wild, but if so treated every year after blooming, it will make a dense bush of beautiful polished leaves, and will produce a golden mass of blooms in the early spring. B. stenophylla belongs to the same category as the above, but has smaller leaves, and would do well to trail or be trained over rock or root work. B. japonica and B. Bealii, planted in rich earth and in a shady place, both do well in London.

Cotoneaster Simonsii does well, and is nearly an evergreen, a fast grower, very cheap, and loaded with red berries from September until Christmas.

Euonymus japonica, and its varieties, all do well in the London smoke, but in very severe winters they are cut to the ground. They are, nevertheless, well worth growing, as this only happens about every 10 or 15 years, and they come up again from the roots. E. latifolia argentea is a much finer thing, and has withstood 40° of frost without a leaf being stained. It is very constant, and, in fact, cannot be spoken of too highly. There are several more varieties in the same way as this, but which have not yet been thoroughly tried. E. macrophylla makes a good contrast to the above, having dark glossy green leaves, and is a very free grower.

All the common Privets do well in London, but the best is L. ovalifolium. It is nearly evergreen, and thrives in the very heart of London. Ligustrum coriaceum is a perfect evergreen, is very hardy, and for making an edging to other shrubs it is a real gem. Its leaves are like a bit of board, and polished like glass, so that dust and soot are easily washed off by rain. Then there is the beautiful L. japonicum and L. japonicum ovatum, which are covered with their elegant bunches of white flowers in August, as also is L. chinense sempervirens. All the strong Ivies do well in London, and so does the Quercus Ilex, but a lovely evergreen will be found in Raphiolepis ovata, which has thick horny shiny leaves, and is covered with a mass of white flowers in the month of June. Of Rhododendrons the strong free growers do pretty well in London, especially in the parks. Most of the Coniferæ do badly in London, but Thujopsis dolabrata is a marked exception, as it has been proved to stand well in the dusty thoroughfares leading into Covent Garden market. This plant has been cried down by a good many on account of its slow growth. I find it grows best on a sandy bank, and I have here plants that last year made shoots 18 inches long. My opinion is that this plant will prove the most useful and most beautiful in its way of all the Coniferæ. In Japan it grows to 80 feet in height, and looks like a giant Selaginella. Many years ago, before it was introduced into this country, whenever I conversed with the late Dr. Lindley about Coniferæ, he used to say, "You should get the Thujopsis dolabrata, you would make a fortune." I am quite sure he used to dream about it, so high was his opinion of the plant. If he were alive now how delighted he would be to see two plants growing near my house. On a steep, dry, sandy bank, Cephalotaxus Fortunei, and Taxus coriacea, when planted in rich soil, thrive well, and so also does Thujopsis borealis. There are two varieties of this plant, one being a close grower, the other having a weeping habit; nothing can be more beautiful than the latter variety. Another grand plant for London, if it should prove hardy, and it is said to have stood out in Holland, is Viburnum Sieboldi, having large thick polished leaves, and it is a quick grower; at any rate it will make a fine indoor companion to the Ficus elastica. *Jno. Standish, Royal Nursery, Ascot, Berks.*

ENGLISH LOCAL FLORAS.—IV.

IN 1805 appeared the first volume of the "Botanist's Guide through the Counties of Northumberland and Durham," by Messrs. Winch, Thornhill, and Waugh. This is arranged according to the Linnean system, and contains of flowering plants and Ferns 909 species, a larger number than had been enumerated in any previous local Flora. The localities given are few, but are evidently correct; the authors acknowledge the assistance of Messrs. Robson and Backhouse; 190 Mosses are given. The second volume appeared in 1807, and was edited by Winch and Thornhill, Waugh having died shortly after the publication of vol. i. In this, 32 flowering plants are added, including Cuscuta epithymum, which "in the year 1805 proved a destructive weed among the Heaths in the greenhouse of Mr. Falla, of Gateshead." Several additional Mosses are given, and the Fungi and Lichens (after Acharius) are enumerated, bringing the total number of species to 1885. Of Winch's later and more important works we shall speak hereafter.

In the same year we have "A Catalogue of the Plants growing in the Vicinity of Berwick-on-Tweed," by John V. Thompson, Esq., Surgeon to His Majesty's 37th Regiment. The arrangement is that of the "Flora Britannica," which seems to have been at that time the standard work, and includes portions of the counties of Northumberland, Durham, and Berwick, each indicated by its initial. The author tells us that "the references to my 'Hortus Siccus' have been subjoined, in consequence of my intention of depositing it in the shop of Mr. Reid, stationer, in Bridge Street, Berwick, where it will be at all times accessible to such gentlemen and ladies as may wish to consult it." The book contains 487 flowering plants and Ferns, the author having been very careful to admit only such as appeared to him truly native, and which he had himself identified. Thus the Elm, Oak, and Ash are omitted, as "not being found with us but in a cultivated state;" and many other plants are only referred to in foot notes, in consequence of doubts as to their nativity, or of the accuracy of his information. Some of these foot notes are interesting, as that on Smyrnium Olusatrum, which he mentions as "growing within the ruins of Dunstanborough Castle, [but] not indigenous there; a traditional story respecting its introduction by a Spanish vessel is generally credited." The book concludes with an enumeration of 77 Mosses and Fungi.

In this year also (1807) "Thomas Ordoyno, Nurseryman and Seedsman of Newark," published a "Flora Nottinghamiensis," of 334 pages. The general get-up of this volume is inferior to that of many of its predecessors, and the author, although he speaks patronisingly of Deering's book, was evidently not much of a botanist. His own observations seem to have been made chiefly in the neighbourhood of Newark, Southwell, and Mansfield; brief Latin and English characters for the genera and species are given, the former from the "Flora Britannica," the latter from Withering's "Arrangement." He records 662 flowering plants and Ferns, a number which shows but a slight advance upon that giving by Deering. There are fewer errors than one might expect, but we note no sign of introduction affixed to Pinus sylvestris and Fagus Castanea; while Spergula pentandra, one of the "excluded species" of the "London Catalogue," and Sonchus palustris, are no doubt mistakes. He considers that Deering mistook Habenaria bifolia (probably H. chlorantha) for the Lizard Orchis.

In 1813 Dr. Pulteney's "Catalogue of Dorset Plants," which was written for, and had appeared in Hutchins' "History of Hampshire," was reprinted in a separate form, with additions by the Rev. Edward Binfield and other observers. There are brief diagnostic characters of the genera, and references for each species are given to all the standard works of the period, going back in many cases as far as Turner. The author, indeed, seems to have taken some trouble in ascertaining the writers by whom the plants he registers were first recorded as British; and his catalogue is, on that account, interesting to those who investigate such mattters of chronological detail. Many localities are given, and the whole work bears upon it the stamp of correctness; as a slight instance of this, we may mention his doubts as to the nativity of Delphinium Consolida, Adonis autumnalis, and Verbascum Blattaria, which appear in the list. Of the Cryptogams, only the Ferns and Algæ are included.

The first edition of the "Flora Tonbridgensis," by T. F. Forster, F.L.S., was published in 1816. It is a localised list of between 700 and 800 flowering plants and Ferns, with a full enumeration of Mosses, Fungi, Lichens, and Algæ. No descriptions are given, the "Flora Britannica" being referred to for these, and "English Botany" for plates. There are coloured figures of Hymenophyllum tonbridgense, Blasia pusilla, and Buxbaumia foliosa; the second of these, however, as well as Splachnum ampullaceum, had been lost before the appearance of the work, owing to the draining of the localities where they grew. The date of the observations upon which this work is founded ranges from 1795 to that of its publication. In 1842, Thomas Forster, son of the author, published a second edition of this Flora, with a few additions. In this there is a brief but useful sketch of the life of Mr. T. F. Forster, and a preface "On the Soil, &c., of the district." This last contains some interesting notes on the local distribution of the Poppies, and an explanation of the means by which Meconopsis cambrica and Tragopogon porrifolius became introduced to the district. The following deserves the attention of any botanist at present residing in the neighbourhood:—"In 1822 I brought a large variety, which I call for the present Crepis biennis *β*, from Melun, in France; it subsequently spread in vast quantities into the neighbouring fields, owing to its having overrun my parterres, the seed being blown away by the wind. On visiting my old haunts, in 1832, I found it in various places in the neighbourhood." It would be interesting to know to what plant our author here refers, and whether it still exists at Tonbridge. Another note worth extracting is the following:—"Cardamine amara, until the summer of 1819, blew in beautiful luxuriance by the ditch that runs through the meadow below Hartwell; but, though the ground remained untouched, it ceased to grow there after the tremendous frost of January, 1820, when my thermometer went down to 7° below zero of Fahrenheit! nor has it appeared again in that place." Can any one inform us whether it has since appeared there?

In 1817, Thomas Purton, surgeon, of Alcester, published "The Midland Flora," in two volumes. In this work 689 flowering plants are enumerated, chiefly from Warwickshire and neighbouring counties, while 30 additional species are given in the appendix, mostly from Denbighshire and Monmouthshire. Brief generic and specific characters are quoted, chiefly from Withering's "Arrangement" and "English Botany," while notes and observations on the medical and economical properties, chiefly compiled from other works, are added. The Rev. W. T. Bree appears to have rendered much assistance in the work. The lower Cryptogams have their share of attention, and raise the number of species to 1133. *Apropos* of the Rubi, we have a quotation from the "Monthly Review" of 1816, to the effect that "the species and varieties present such approximations that they cannot easily be determined." If such was the case even then, when but few names encumbered our lists, what shall be said by botanists of the present day? In 1821 a third volume of this work, in two parts, appeared, in which we find 115 Phanerogams not included in the previous volumes. Many of these are from Oxfordshire, supplied by Baxter. The Roses are critically investigated, Lindley and Joseph Woods having assisted the author in his determination of them. There is a good figure of Juncus laniger, the plant now known as Luzula multiflora; and of the Fungi many excellent plates, amounting in all to 21, are given. These appear to have been favourites with Purton; he enumerates in all 417, and devotes much space to them, especially in this volume, and many

useful notes, original and compiled, are added. There is a very good index, and the synonymy all through seems to be carefully given; indeed we are told that this has been thoroughly examined, and not copied from other authors. In connection with this work should be mentioned "Plantæ Varvicenses Selectæ," by W. G. Perry (1820); it is chiefly a compilation from Purton's work, with additions by the author, and presents no features demanding special comment. *James Britten, F.L.S.*

THE WEEPING BEECH.

It is not too much to say that the Weeping Beech (Fagus sylvatica pendula) is one of the most strikingly beautiful of deciduous trees—its beauty being of the grotesque and picturesque rather than of the spruce and symmetrical order. It is so singularly erratic in growth that no two trees take the same character, and yet all alike possess a certain free and easy development, as if bidding defiance to rule and order, combining therewith a peculiar style of gracefulness in the weeping masses of pendent spray. Loudon does it no more than justice when he merely says (Arb. Brit. iii. 1952), that "it forms a very singular and highly beautiful object, well deserving a place in collections of weeping trees," for its grand mountain-like masses are so striking in character and so eccentric in form—here like a gentle slope, there like a craggy precipice—that no amount of praise could overstate its merits as an ornamental tree.

The accompanying woodcut (fig. 298) will show that we are not exaggerating. For the opportunity of introducing it in this place we have to thank Mr. A. Waterer, of the Knap Hill Nursery, Woking. It forms one of a series of beautiful illustrations to Mr. Waterer's new catalogue, a list which conveys just the sort of information which is most useful to planters in making their selections, and aids them still further by putting before them pictures of some of the fine specimens for which this establishment is famed. These illustrations—our present figure amongst them, have been copied from careful and excellent photographs taken in the Knap Hill Nursery, by Messrs. Letts & Co., of Diary renown, and who have also most charmingly rendered them in the engravings, as the present example will show.

The Weeping Beech is thus annotated in the catalogue referred to:—"A most grotesque, and at the same time picturesque tree, of singular beauty, and exactly suited for pleasure grounds. It is so erratic in growth, that a description would convey far less information than a reference to the accompanying figure, from a photograph taken in this nursery, where there is a still larger and finer tree," but which was, we understand, inconveniently large for illustration. The spread of the branches in the tree represented at fig. 298 is 32 feet.

Loudon mentions another Weeping Beech, which, according to the figure referred to in the "Encyclopædia of Trees and Shrubs," is very different from this. He writes: "The Rev. M. J. Berkeley informs me, in a letter dated June 2, 1837, that in one of the plantations bordering Milton Park, the seat of Earl Fitzwilliam, in Northamptonshire, there is a beautiful accidental Weeping variety of the Beech. The branches are beautifully pendent, and even the last 6 feet of the top bend down. The height is 50 feet." The general habit of this tree must be much more erect than that of the variety we here represent. *T. M.*

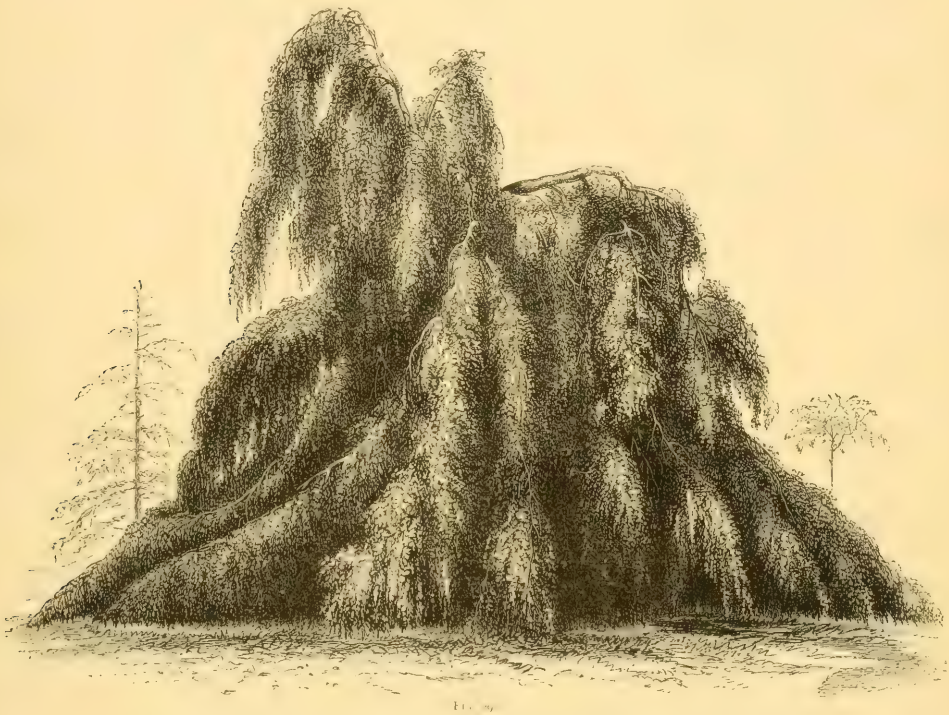

Fig. 298.

TABLE PLANTS.

Reidia glaucescens.—This is one of the prettiest of all the plants I know for either stove, house, or table decoration. It is a woody stove shrub, with narrowish compound leaves, which at first sight gives it the appearance of belonging to the Pea family. These are about 6 inches long and about an inch broad, each placed close to a row of small pinkish white tassels, which are the flowers, about an inch in length, hanging all along from the midrib of the leaf, which gives the plant an elegance that is almost beyond conception. All those who are in search of rare and beautiful plants for decoration should try this. It is worthy of a place in every collection. I may say it was Mr. Woodbridge, now of Sion, that first called my attention to its merits.

Correa magnifica.—This is one of the prettiest and most showy of all the winter-flowering greenhouse plants, and it will do also for the table when it can be obtained in nice bushy plants through frequent pinchings during the growing season. It continues flowering for months together, and its colour, which in the main is of an attractive red, makes it have a very striking appearance. The flowers are not large, being tubular, and superficially not unlike a Pentstemon. It requires treatment similar to most other New Holland plants, that is, greenhouse temperature in winter, the natural climate of this country in summer, with a soil equally made up of turfy loam, peat, and some sand. This is a plant that is worthy of more general culture, and its flowers are also useful for bouquets.

Sonchus laciniatus is a very graceful, deeply cut, green-leaved plant. Nice plants of it, about a foot high, have a very elegant appearance. It is a soft-wooded plant, with an erect stem, having leaves which radiate regularly outwards. It is not difficult to propagate, doing best in the temperature of a warm greenhouse. A soil such as is used for Cinerarias, or other such soft-wooded plants, will be found to suit it well.

Nephrolepis pectinata, when the plants are small, is a very handsome Fern for vases or for table. It has a beautiful habit, with artistically scolloped fronds, about a foot in length, and an inch in breadth, which curve outwards towards the top, giving the plant a very elegant appearance. It is not such a strong grower as either N. exaltata or N. davallioides, and is most useful for cutting from for mixing amongst cut flowers, or for adorning the front shelf of the Fern-house, where it is a general favourite. It can be easily increased, as numerous rhizomes spring up round the bottom.

Gesnera macrantha, with its beautiful green, oval, crenate, pubescent, opposite leaves, and velvety tubular red flowers, is very handsome indeed, in nice plants for the table. Its flowers contrast beautifully with its leaves, and altogether the plant is very charming. Under a magnifying glass the flowers are of the richest red velvet.

G. cinnabarina, *zebrina*, and *exoniensis*, remarkable for their beautiful foliage as well as flowers, are worthy of the very highest praise for winter decoration in the stove or house. Their flowers are mostly red, and not unlike miniature Foxgloves. The plants require stove temperature, with a soil composed to a good extent of peat, and they continue flowering the greater part of the winter months.

Sedum Sieboldii.—This common hardy prostrate plant, with roundish glaucous leaves and spreading branches, is very useful for house or table decoration in autumn. The plant has large heads of rosy pink flowers, and a habit slightly drooping, which gives it a fine effect when slightly elevated. When its succulent leaves are well bronzed under the sun's influence, it gives it an additional effect at night.

Selaginella apoda.—This is very pretty for small dishes for table, or, from its dwarf, dense green habit, for furnishing the surfaces of other vases that are not over well clothed below. In a shady stove it can be grown in almost any quantity, not being particular as to soil. A few days ago I put a nice pan of it into a room, with a small, well-coloured plant of Mrs. Pollock Pelargonium in the centre, and it had a very pleasing effect. *R. M.*

TRADE MEMORANDUM.

Mr. William Adams & Sons, of the Auction Rooms and Offices, Fennell Street, Manchester, consider themselves aggrieved by the Trade Memorandum which appeared in our columns of the 3rd inst., and have written to us, stating in effect, that they believe

there were, and still are, some persons of the same name who do not always pay for what they buy, but that the above-mentioned Messrs. William Adams & Sons have no connection with such persons.

Messrs. William Adams & Sons also complain that they have been annoyed by receiving applications for the payment of goods, of which they have no knowledge; and wish us to state, that the correspondent who forwarded the memorandum to us received a prompt remittance in full for his goods.

Home Correspondence.

Variation in Plants. — Variation in plants (see p. 1631) appears to me to be due to two principal causes —soil and climate. My special duties in India prevented me from paying any marked attention to the subject, but yet there were some few things constantly being obtruded on my notice which may interest the readers of the *Gardeners' Chronicle*. I mentioned in a recent issue (p. 1603) that several European fruit trees gave good crops of fruit within the tropics, at an elevation of from 5000 to 7500 feet. Strangely enough in this climate, which is so very similar to that of southern Europe, the Vine is very difficult to manage; something may be due to the variety, and something also to the soil and climate. At Coonoor, with a mean temperature a little above that of London, the Vine grows very well, and gets a partial wintering, that is, it loses its leaves for two or three months, but it is very seldom that it bears fruit. I had just began to grow the Vine when I left, and had a healthy little fellow or two about 18 months from the eye; one of these showed six bunches, three of which went off as if they had been scorched (perhaps they were) by the sun. The fate of the other three I do not know. Other persons have had Grapes for a year or two, and then their Vines have ceased to bear. On the Mysore tableland a very inferior white Grape is produced. The Chestnut is another strange example of unproductiveness in what I will here call the temperate fruit zone of the Neilgherries. The tree itself has hitherto refused to flourish, and never gets beyond a stunted little shrub: the same may be remarked of the Hazel and the Walnut. The Oak flourishes, but it is so altered that I would not pretend to say what species it is. The Elm quite refuses to grow; the Ash and Laburnum are mere shrubs; and although the Weeping Willow grows well, yet it cannot be found (at present) of the same size as in England. But although British forest trees seem to be stunted by the climate of the Neilgherries, trees from Australia or China bid fair to attain their natural proportions. The Eucalypti, the Acacia, and such of the Chinese Conifers as have been introduced, seem quite at home. Cedrus Deodara, however, shares the same fate as the British trees, and I do not think there is a healthy specimen 12 feet high. The same may generally be said of Pinus longifolia; there are, however, a few good trees of this latter on the verge of the Australian plantation near Bleak House, and if they are attended to they will seemingly make good trees. This Australian plantation at Coonoor is a great success, and although it is open to question whether it is managed in the best possible manner, yet for an abundant return of firewood in a short time, at a moderate expense, it is unequalled on the Neilgherries. It is planted principally with Acacia dealbata (the Silver Wattle); the wood of this species is of a light colour, and has a very beautiful grain, and although it is said to be comparatively useless as a timber, it is certainly a capital firewood. A great deal of A. Melanoxylon (?) is also planted here. If this is really the true Melanoxylon, it is (according to Australian accounts) worth taking care of. It is to be regretted that more of the quick-growing Eucalypti have not been introduced to the Neilgherries, comprising, as they do, so many valuable species, such as E. dealbata, gigantea (the Stringy Bark), rostrata, and Woollsii, from Victoria; and E. amygdalina, subulata, semicorticata, and also Cedrela australis, from New South Wales. The climate would probably suit all these species; nor should the reproduction of all the indigenous timber trees be neglected. Now, as to the disposition in these Australian timber trees to vary, much cannot be determined: the Silver Wattle exhibits a great many varieties, but I do not at all know whether the change has been produced since the introduction of the trees to Southern India; it may be presumed that these are seed variations, and that the varieties vary but slightly from the original stock. The Cinchona bids fair to vary indefinitely under cultivation, and Mr. Broughton's investigations will probably yield some highly instructive results with regard to some of these varieties when he begins to get specimens from the various altitudes. It is almost premature to speak of the effect of climate upon the Cinchona as yet, but it is evidently stunted and dwarfed by a hot, dry, arid climate. As a direct evidence of the effect of soil upon plants, I may mention an experiment of my own with the Tea plant. In 1865 I very carefully selected the seeds from a tree which I had remarked for its great luxuriance, and had them carefully planted in rich soil. The whole of these seeds grew and varied somewhat in appearance, but not in luxuriance. Some of the leaves were deeply serrated, others presented scarcely any serration, and so they continued up to October, 1867, when they were about 18 inches high. At this time they were transplanted, half of them to forest, the other half to grass land. Those on the forest soil maintained their luxuriance and evenness of size, but many of those on the poorer grass land began to show evident signs of a departure from the original type, even in 18 months. The Tea plant will probably afford a very good subject for inquirers, if it can be determined which is really the wild Tea plant. The Chinese seem to have been acquainted with a wild Tea (Ye-tcha, or Desert Tea), which is probably identical with Thea assamica. This Ye-tcha is spoken of in the "Botanical Magazine" for 1832, and is described as a tree, "with flowers of a golden colour (?); the stem being high, and the leaves of a bright green; it is used in the same manner as the common Tea." It will be interesting to trace the Tea plant from Assam, through Central Asia, to the green tea countries, and from thence to the Bohea hills and Canton. Nothing can be more dissimilar than Thea assamica, and some of the Box-leaved varieties of the old Thea Bohea type. A word about Orchids. There are some 12 or 14 East Indian Orchids growing (between 11° and 12° N. lat.) in climates varying from that of Lisbon to that of London. Aerides Wightianum or Lindleyanum, whichever it is, is growing side by side with Rhododendron arboreum or nilagiricum; this Neilgherry Rhododendron has a white variety, which is very scarce, and both the scarlet, the pink, and the white kinds, have a yellow "bloom" on the under side of the leaves, instead of the white "bloom" (?) of the Himalayan arboreum. How is this? And how did the Rhododendron get to the isolated mountains of Southern India at all? There are three or four terrestrial Orchids here which would be well worth introducing; a very fine Arrowroot is made from the tubers of one of them. This one has pink flowers as big as those of Orchis maculata, and would be almost hardy in England. Another one, with white flowers, has a most delicious perfume; another one, with yellowish green flowers, is very scarce, and is found in wet, marshy places. *James M. Pinwill.*

Silver Firs.—"G. F. M." asks if it is usual for Silver Firs to die off suddenly when about 15 feet high? and cites a report that this had happened to a good many planted by his grandfather some 40 years ago. I think I understand the case. About 40 or 50 years ago the Balm of Gilead (Abies balsamea) was in great favour in this country, and many were planted about that time. It is *a* Silver Fir, although not *the* Silver Fir, and the two are apt to be confounded together by those who are not arboriculturists. It has, however, the bad quality of being very shortlived, generally dying off when it is about 20 or 25 years old, and the tree perhaps 20 feet high. I can sympathise with "G. F. M." I used to be very fond of the Balm of Gilead, and planted many of them, and very beautiful and fragrant they are so long as they last. It is naturally a much more confined tree than the common Silver, and it gets more and more cut in, and the branches shorter and shorter, and the foliage more bunched and irregular, until it goes. The true Silver Fir, Abies pectinata, does nothing of this. "G. F. M." is perfectly safe with it. But I would still recommend him to plant some Balm of Gileads, with his eyes open, and be prepared for their dying before they reach 30 years. They are so beautiful, and their fine resinous smell so agreeable, that they are well worth growing even although they do not live for ever. We do not reject annuals, why then should we ignore vicennials? But it is only for decoration I recommend them. No one need plant them for profit. *A. M.*

Veitch's Giant Autumn Cauliflower.—As a late summer Cauliflower this is very useful if sown about the end of March, and as it is a vigorous grower it takes firm hold of the soil, and withstands heat and drought better than the quicker maturing summer kinds, and begins to turn in early in August; but the season when it is of most value extends from October to February. Early in the spring of 1869 I received a packet of seed. It was sown early in March, and although the season was unfavourable, I had a fine supply through August and September, when Walcheren was a complete failure. This year I deferred sowing until the second week in May. In due time the plants were transferred to a good border, under a west wall. They grew well all through the drought, and began to turn in early in November. A portion of the plants, as they became ready, was removed to cold frames, whence I am now cutting beautiful heads, 8 to 12 inches across, as white and close as curd, and as delicately flavoured as the "Early London" is in June. I have sufficient to last till the end of January, when Veitch's Early White and Snow's Broccoli will be in. I may observe that we had 17° of frost before we removed the last batch to the frames, and so ample were the guard leaves that the heads received very little injury. *W. Coleman, Eastnor Castle, Ledbury.*

—— I can fully corroborate the statements of some of your correspondents respecting the excellence of Messrs. Veitch's new Autumn Giant Cauliflower. I have had it here larger and heavier than any I ever saw before, and beautifully white and compact. It will be invaluable to those who want quantity and quality combined. I find it most useful for taking up (of a proper size) for winter use. I took up some a month ago and laid them in a shed with other sorts, and I find that while the others are more or less opened these are as close and as white as when taken up. *J. Day, Norton Hall, Daventry.* [Four specimens forwarded to us by Mr. Day weighed 13 lb. 14 oz. Eds.]

Management of Plantations.—Having had large and long experience in planting, both for ornament and profit, I wish to offer some remarks in reply to the inquiries of your correspondent, "G. F. M." Do not plant Silver Firs "in a strong clayey marl." My soil is of that character, and I have found that though after 80 years' of growth they overtop the Spruce, Elm, and Oak, and almost equal the Larch, all of which were planted in competition with them and with equal advantage, they never had symmetrical forms; they were broken by the winds, and were useless as timber. An avenue of them grew in my neighbourhood on light sand; they were beautifully feathered, but perished suddenly at the age of perhaps 100 years. In the same district where they grew (Sherwood Forest) there has been much complaint that Larches, after a promising growth of 50 years, contract a symptom of fatal decay in the form of a central cavity, which is attributed to some Fungus. My opinion, however, is that the Fungus is the consequence, not the cause of the evil, and that the latter originates in the absence of adequate moisture at the roots, just as this, in my judgment, is the *fons et origo malì* in the much debated question of the shanking of the Bishop Stortford Vines. By all means let "G. F. M." follow "N. T.'s" advice as to stubbing up the stumps before he commences his proposed plantation. *G. H. V.*

Vine Excrescences.—No one can have a greater horror of the knife recklessly applied in pruning than I have. When I read of the importance of gardeners being taught this branch of their profession, one's hair stands on end, and one wishes that they should be first taught the importance of leaving it alone. It is a surgical operation, and until gardeners and foresters are brought to regard it as such, it would be much better that it should be wholly forbidden—less mischief will be done on the whole. But, as a surgical operation, it then assumes a different aspect, and we may read of the successful use of the knife with much the same pleasure that a medical man may be supposed to read in the pages of the *Lancet* of some difficult excision, or the successful extirpation of some malignant tumour: and such a case has now come under my notice. Most of your readers are probably only too well acquainted with that mysterious subject—excrescences on Vines. Whether they be of the nature of hypertrophy, produced by excessive nourishment, or disease caused by improper food or treatment, or the work of insects, all agree that it is a very unsightly complaint, and one not easily got rid of. The following communication, received from an enthusiastic lady-naturalist, would seem to indicate that the case is one within the province of the knife:—

"I enclose some specimens of the gall-like excrescences of the Vine, occasionally mentioned in the *Gardeners' Chronicle*. Two years ago the Muscat of Alexandria on which they grew had accumulated such a mass of them that the gardener told me they were killing the Vine, and that it would certainly kill it to remove them. The galls (so to call them) were then in great masses round the first forks of the tree, and as large as half of a man's clenched fist.

'All swollen and ulcerous, painful to the eye,
The mere despair of surgery.'

Choosing the least likely of the two evils, I removed the galls very carefully myself, and no bleeding followed either then or in the following spring. The next year the galls grew again, though possibly not so vigorously, and I again removed them, cutting freely down with one of the curved chisels used in wood carving, so as to remove, as well as I could, the diseased growths at the point of attachment. This year the crop of galls has hardly amounted to a quarter of what it was previously, and most of the excrescences seem of a harder growth, more like wood and bark, than the previous formations, which appeared simply like great masses of wet spongy tissue; and I hope by again removing the diseased growths carefully to almost free the tree from these unsightly incumbrances. *A. M.*

Tinted Honey.—Messrs. Fortnum & Mason have presented to the food department of the South Kensington Museum a beautiful sample of pure virgin comb, filled with rose-coloured honey, said to have been produced by artificial feeding. *A. M.* [See p. 1698.]

Keeping Late Celery.—I have had some difficulty in keeping late Celery in the kitchen garden here, owing to the strong retentive soil causing it to rot in wet winters and springs. I have at last hit upon a plan of covering the rows with boards, in this fashion. These boards are nailed on a strong centre piece of wood at about the angle here represented, and are in lengths nearly 10 feet long, with a strong piece of pointed wood fixed at each end, to support the frame when pushed into the ground at the height required. When severe frosty weather is likely to occur, some litter is put round the necks of the Celery, and the boards are pushed down close to cover the drills up. This effectually prevents the frost from injuring the plants, and they can safely be taken out of the ground when wanted for use. In open weather, so as to give plenty

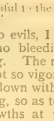

of air to the plants, the boards may be kept higher over the drills, to keep heavy rains or snow off them. I find old tan or charcoal dust good materials for earthing-up late Celery with, as they prevent slugs or other insects from harbouring amongst the plants. I formerly tried sawdust, but this substance, unless charred afterwards, is prejudicial to the soil. Where plenty of thin slabs can be had these wood coverings can be made at little expense, and after being done with for covering the late Celery they make useful shades for newly planted out early Peas, Cauliflowers, and many other things in the early spring months. *William Tillery, Welbeck.*

Tomatos.—Mr. John Hepper is rather loose in his statements; permit us to correct him. He states:—"Messrs. Carter represent their new Trophy Tomato as having received a Special Certificate at the Royal Horticultural Society." We do not represent the Trophy as being ours, we represent the Trophy as an American variety. Also, we state the fact that the Trophy Tomato has had a Special Certificate awarded, but we neither represent, nor do we infer, that the certificate was awarded to us. We opine that when a certificate is awarded to a new variety, the fact of the award is made public, and is not of a private or confidential character. Mr. Hepper is in error in supposing he has the whole stock of the seed, it may be purchased of any American seedsman, also of ourselves and others. We enclose our catalogue, and you will observe we make a marked difference between certificates which have been awarded to us personally, and certificates which have been awarded to others. *James Carter & Co., High Holborn.*

The Education of Gardeners.—Allow me to suggest the following sytem of examining, shaping the studies, and passing young and intelligent gardeners. 1st. Let the Royal Horticultural Society of London extend her educational functions and provide a system of examinations, whereby the most isolated young gardener in the United Kingdom may come forward, at the least possible expense of time and money, and be examined and classed according to his merits. 2d. To facilitate such a system let the Society appoint two or three head gardeners, in one or more places in all the counties of the United Kingdom, according to the area of the said counties. 3d. Let such gardeners, elected by the educational authorities of the Society, be examined and certificated as proper and qualified persons to conduct such examinations, and to frame the studies of gardeners. 4th. Should the Society find that it is not practicable for all gardeners who may offer or are deputed to such offices, to attend in London for examination and receive their certificates, let them employ an inspector or inspectors to visit localities where examinations are to be instituted, and to give the necessary certificates and instructions to the local inspectors. 5th. The Society should provide all rules and texts for examinations, and other materials, in the shape of models, diagrams, &c., for practical illustrations and for the framing of the young gardener's studies. 6th. Such examinations, should be held quarterly for classing and passing young men, according to the stages of progress in their profession; and reports of such examinations should be duly sent in to the Royal Horticultural Society. 7th. All certificated gardeners should be duly registered. I merely give this skeleton of a plan, which, if promoted by such a society as the Royal Horticultural Society of London, would, I feel confident, give a great stimulus to the aspiring young gardeners of remoter parts than Chiswick or Kew, but who are nevertheless enviously ambitious to come within the same pale as those privileged few. I cordially agree with many of your able correspondents as to the imperfect condition of the elementary education of young gardeners, and their want of application during the training course of their profession; but allow me to take exception to the remarks which Mr. Bell has thought proper to make as to the intellectual *status* of the young gardeners of Aberdeen, Kincardine, and Forfar. I know something of those counties, and I deny *in toto* that his statements give anything like a fair criterion of their educational condition, or even indicate the sources of selection. In conclusion, allow me to ask, would not the funds of the "Veitch Memorial," applied to a scheme of education for young gardeners, have furnished a more lasting and more graceful memorial than the "prize" system, adopted for the benefit of its contributors? *P. Middleton, Wynnstay Gardens.*

—— Education in itself is a good thing, but at the same time I think it is a great drawback to many gardeners, for many employers do not care for educated servants. If an employer gets a gardener to produce plenty of good fruit, flowers, and vegetables, that is all that he requires of him; and as for his education, he can put it in the dung-heap for aught his employer cares. In fact, ninety places out of every hundred require a man who is a thorough practical gardener, and at the same time a useful labourer. Such is my reason for thinking that a high standard of education is only wanted by, say, one gardener in fifty. The advocates of education tell us that they want to see the social *status* of gardeners much higher than at present. May I ask why gardeners, as a class, require so much more education than other servants? It is a well-known fact that they add much to the pleasure, luxury, and civilisation of the whole community; yet, after all, they are, as a class, elbowed, jostled, and thrust aside, both by employers and their servants. It is thought at many places that the garden is a necessary evil, and it ought to be added, that the gardener is a necessary evil also. Of course there are many noble exceptions, where an employer respects his servant for what he does in return for the money paid him. It is no use raising the standard of education for gardeners, unless the standard of wages is also raised in proportion, for low wages present the greatest difficulty that a gardener has to contend with at the present time. My idea of a gardener's requirements is that he should possess a large store of useful knowledge, *i. e.*, knowledge bearing directly upon his business; but education and practical knowledge are two very distinct ideas, hence we often see a vast amount of the former and but very little of the latter. Education has become quite a fashionable distinction, and yet to be highly educated is quite compatible with any degree of ignorance in practical knowledge. The latter is the powder that we must use to blast into fragments the rocky difficulties which we every day meet with in a garden. A garden is not such a flowery grove as some writers make it out to be. Nor is a garden the field for scholarship wherein to reap that reward which it deserves. The writer started, at the age of 13 years, as a "generally useful" boy, in a large private garden. After staying there six years, he went to another large place for improvement, where he paid to the head gardener 3*s.* per week for two years, and 1*s.* for the third year. Since that time he has been in nearly all kinds of situations, and at present is in an out-of-the-way place, with a wife and five boys (not one shall be a gardener), where he is expected to be a tolerably good gardener and common labourer at the same time, and for this he receives a little over £1 per week. *Thirsk, York.*

—— Allow me to remind Mr. Miller that the whole of his scheme is practically in force, and, indeed, is a much better one than could be organised by the Royal Horticultural Society. The Society of Arts holds annual examinations in fruit and vegetable culture, floriculture, and botany. Those who pass in these examinations need not present themselves at South Kensington, for the standard is much higher than at that place. The Society of Arts' examinations can be held anywhere where there is a mechanic or any other literary institution, and to successful candidates it offers prizes and certificates of three grades, but before any one can present himself for these, he must first pass a preliminary examination by the local board of such institution. If such is not in existence, any respectable body of men can constitute one. If there is not one in Worksop, Mr. Miller might lead the way, and give invaluable facilities to the young gardeners of the dukeries to gain their diplomas. I must further remind Mr. Miller that these examinations are held early in the year—February and April; therefore he (or any one else) should apply at once to the Secretary of the Society of Arts, Adelphi, London, who will forward the necessary instructions. Now there is no valid excuse why every young gardener should not be possessed of a certificate. There are few places which are not within a dozen miles of some town, and there are not many towns without an institution such as I have named; and should a young gardener be so isolated for a time, perhaps the next place he goes to will be nearer, and by sending for the Society of Arts' programme he can see yearly what he has to prepare for. *W. P. R.*

—— Waiving the question, Do we make the best use of our time or not? I think all parties agree that the highest standard of excellence attainable will be the best. If we ask how are we to improve? we are told, "by observation and study." In regard to the former, I think if we journeymen were to devote to vegetables and hardy fruits some of the time and interest which we now spend on merely decorative objects, we should eventually find it of much more service to us; but as to study, I may remark that the funds of a journeyman gardener are generally too limited to enable him to freely avail himself of the labours of the masters of the profession, unless he has access to a library. It is no easy matter to get such a one at small or medium-sized places, unless the proprietors provide it; and I think the more we rely on ourselves, and the less we expect from them, the greater success will attend our efforts. A young German once told me, that in his native town the gardeners had a library kept up by subscription amongst themselves, the books were locked in a case, kept at a house at which the members met once a month for exchange, &c., and he assured me the system worked well. Could not something like this be done in Great Britain, at towns in whose vicinities reside gentlemen employing three or four men? I should think some local florist, or seedsman, would let them have accommodation on easy terms, for the sake of the connection. Of course, books will not teach a man to use a spade or a knife properly, but to have access to a few sterling works is a great assistance to one determined to excel. One who has been always under glass may be awkward with tools at first, but outside operations are much healthier than those carried on indoors, and most men are willing to show a tyro, if civilly asked. *An English Journeyman.*

The Potato Tournament.—I can only answer for myself, and to those who do not watch the horticultural press, or who did not happen to be at the Royal Horticultural Society's meeting at South Kensington on September 21 last, I reply, my subscription was "to hand" in regard to the Potato tournament, and that I myself was "all there," and, if it please Providence, I intend to be there again and again as time rolls round. Thirty years battlings with the noble tuber have tolerably well strung my muscles to a degree of tension even not to know when I am beaten, which I certainly should have been, provided I had met with an antagonist, according as judgments go,—not because I could not show huge specimens, but because I set my face against them, as being illustrations of quantity *versus* quality, and therefore out of place at South Kensington. Should I live long enough, I may enjoy a sad triumph in visiting our meetings to find how long a time it has taken to displace the huge, deep or many-eyed coarse cattle type of Potatos, which are, in reality, only fit to feed cattle with; then to find the medium-sized sorts, of concentrated farina, sugar, and gluten, having been previously proved on many soils in regard to their suitability and productiveness, then and there cooked properly, both with and without their jackets, partaken of critically ere certificated with good characters, and for the sorts to be so distinct as to prevent the liability of their immediately sailing away synonymously or under false colours. The lesson will be learnt at last, I make no manner of doubt; and from what I have just hinted, your querist may tolerably well understand why Potato connoisseurs remain so few to the fore. Nevertheless, let me say to those who are nerving themselves—on account of the growing popularity the Potato question is beginning to assume—to enter the field, that unless they can wield a pen as well as a spade, and feel quite certain that their "inclination lies that way, sir," and have enterprise and energy, and a fortune that they do not know what on earth to do with—*Don't.*

New Grapes.—I agree with Mr. Wadds, that it would be very useful to persons intending to plant vineries, if your correspondents would state freely their experience with regard to the new Grapes lately sent out. It appears to me that it is generally the fate of every new variety to be tremendously puffed up at first, and to be as unfairly run down afterwards. Still there can be no doubt Vines have their idiosyncrasies, and that a kind which is all that can be wished under one mode of treatment is good for nothing under another. Even in the hands of first-rate cultivators the difference is quite remarkable. It will generally be found that some one variety is above the average quality in most places, whilst another, a favourite in others, is abused as worthless. I have only fruited Madresfield Court in pots, so can say little about it. I was surprised to see Mr. Wadds' remarks, because all I have heard is very much in its favour. I never grew a grape that so thoroughly disappointed me as the Golden Champion. It is a good setter, at least, such is my experience. My Vine had five bunches, and these were pronounced by good judges as "Grapes to be proud of;" but before they were ripe they spotted and shanked and rotted till there were not half the berries remaining. I was so disgusted with it that I dug it up and planted another in its place. I suspect it will be found to require heated borders, like those at Dalkeith, to grow it to perfection. I should be glad to hear a more favourable account of it from others, and to be convinced that I have been too precipitate in destroying it. There is little doubt it is a seedling from the Canon Hall Muscat, nor can I believe there is any other cross in it. Perhaps few, if any, have raised more seedling Grapes than I have, and I never saw a crossed Vine which did not show it was a cross by its foliage. I have at present a large number of seedling Black Alicante crossed with various kinds, and not one single plant resembles its parent, and so of many others. Now, no person can tell Golden Champion from Canon Hall Muscat till it fruits. Canon Hall is no doubt a crossed seedling from Muscat of Alexandria, and Golden Champion is harking back to the other parent, as breeders say. My experience of Mrs. Pince's Black Muscat is favourable; it was grafted on a Black Hamburgh, and grew very strongly; five bunches were left on the Vine the following year, and when they were in blossom I took a camel's hair brush, as large as a middle-sized painter's brush, and gently touched the flower. Every sort which is considered a shy setter is thus treated here, except seedlings and improved new kinds, which I carefully abstain from touching, being anxious to see if they will set without assistance. Under this management, perhaps in consequence of it, almost every berry set, and I had very handsome bunches of well-coloured fruit. Under very unfavourable circumstances these have kept perfectly, whilst Lady Downe's, in the same house, have kept very badly, but then the house is full of plants, and damp. I think there is little doubt this is a seedling from Lady Downe's, and like it requires to hang late to be in perfection; mine are improving in flavour as they get older. Many of those who have condemned it have, no doubt, judged it as soon as it was well coloured. Now, if Lady Downe's or Black Alicante were judged at that stage, what would be the verdict? Lady

Downe's is hardly fit to eat till January. I cannot think any of these late keeping Grapes are fit for a cold or cool house. They appear to me to require quite as much heat as Muscat of Alexandria to have them in perfection, but require air night and day to be well coloured, and I think Mrs. Pince's will be found no exception. I grew the Black Alicante in a cool house years before Mr. Meredith found out its value, but never thought anything of it; and I never saw Barbarossa worth eating till Mr. Speed grew it with Muscats, and found it one of the highest-flavoured late Black Grapes he had at Bury Hill,—and he had every kind thought worth trying. Grow Mrs. Pince's well, and keep her long enough, and I think she will, like old port, give satisfaction. *J. R. Pearson, Chilwell.*

—— In April, 1869, I inarched the Madresfield Court Muscat on an established Vine of the Black Alicante; it at once took, and made a first-rate cane of well ripened wood. I cut it down to about 6 feet. This year it showed over 30 bunches; on some of the shoots there were three bunches. I cut them all off except 13, which set well. The Vine has been very vigorous throughout, the berries swelled well, and looked very promising until they began to colour; then to my surprise they began to crack: as they cracked I cut them out, until I had completely disfigured the whole of the bunches on the Vine,—what few berries there were left did not hang long ere they began to shrivel. Golden Champion I inarched in the same house, and at the same time; I put this on the Black Hamburgh, and it made a very fair cane, not being quite so strong as the Madresfield Court. I cut it down to about 5 feet. This year it showed about two dozen bunches, which I reduced to ten. The berries swelled to an enormous size, but did not colour well in ripening; they were a month behind the Hamburghs in the same house. I kept some of them until the end of November, and very good they were. With me it has two faults, viz., that of not ripening its wood well, and being given to spot. I may add that the Black Hamburghs in the same house were all that I could desire, and kept well, as I have not cut them as yet. *W. H. Bannister, Vote House, Westbury-on-Trym, Dec.* 12. [Growth too rank, and berries too well fed. Eds.]

The Trophy Tomato.—I perfectly remember the circumstance of the award for the above being given by the Fruit Committee: a dish of very large Tomatos was exhibited without a name, and was recognised as an American variety called the Trophy. I notice Mr. J. Hepper, the exhibitor, accuses Messrs. Carter of calling it "their" Trophy; and he also calls it "my Tomato," and likewise talks about the "whole stock of the seed;" would it not be better for him to call it what it is, viz., an "American" variety, and not talk with that sense of proprietorship about an article which has been circulated pretty freely over the United States of America? *'Umble Bee.*

Gardeners and their Employers. — Surely "Subscriber" has gone to "Lothair" for his facts, or to a much lower source,—that of an uncultured, suspicious, narrow imagination. That any facts can be found among gardeners to justify the indiscriminate application of such epithets, I emphatically deny. In the interest of the class to which I have the honour to belong, I have a right to request "Subscriber" either to withdraw these charges or to prove them, with facts and cases properly authenticated. Four hundred bushels of cinders! Does "Subscriber" know how long it would take, in an ordinary mansion, to make 400 bushels of cinders? As there were three under-gardeners in this garden—or rather let us call it this school for scandal, or nest of artful dodgers—of course there must have been some glass structures to warm—possibly there were many. Was coal allowed *ad libitum* to heat the glasshouses, that the gardener's cinder-heap might grow? Or was all the glass heated with the cinders alone? If the former, truly "Subscriber's" predecessor must have been one of those almost extinct species—a marvellously simple country gentleman. If the latter, then he was a magician to be able to sell 400 bushels of cinders after heating his hothouses out of the cinder-heap. "Subscriber," like vaulting Ambition, has leaped too far, and no one with the slightest knowledge of cinder-making, even under the propitious breeze of favour from the housemaids, can accept the heap of 400 bushels for sale. Probably this supposed gardener might have been a charlatan or a rogue. "Subscriber's" sole object seems to be to exhibit him as such. The mere question put to his employer, what he should require out of the garden, is one that no good gardener would put. Fill it full with every possible luxury or beauty that it can be made to produce, is the short and emphatic rule of first-class men. The question as to the time when the family will be at home, is of vital importance in the case of exceptional crops to meet special seasons of excessive demand. It seems impossible to believe in the arrangement, that house cinders should be given as a perquisite to gardeners. They are consumed in every garden with which I am acquainted in aid of the furnaces, but as for claiming or selling them it seems utterly impossible; still strange modes are adopted by hard-hearted employers to eke out the low wages of their gardeners,—presents, gifts, rewards of various kinds are given, to my knowledge. There seems a strange repugnance to boldly raise wages. But good servants receive more, in many cases, than has been specified. I never heard of a cinder-heap as a gift in lieu of wages; but it might have been so. Certain it is, the man, instantly or ultimately, claimed it as his. The employer admitted the claim, took the cinders at a valuation, and very properly told him that he would have no more cinder claiming. The man then claimed other things, new tools, presents from his late master, &c. There was no dishonesty in this. I have known many cases where gardeners have received the stock of plants and other things. In all such cases they are as much his property as the employer's his. What can be freer than a gift? And why should the kindness of one employer be interpreted by another as a proof of villany in the recipient of it? Another great source of suspicion to "Subscriber" was, that the gardener claimed to exercise the right of mutual exchange of plants or cuttings, &c., with other gardens. I know no single garden of any note where this is not done, to the great advantage of all employers. It is, however, no pecuniary advantage to gardeners, as I never yet knew one single halfpenny to pass between gardeners in virtue of any exchange. The love of their business constrains them to assist each other in furnishing their employers' places in this way. All sensible gardeners, however, look upon all such plants as their employers' property. Every plant we receive from friends is as much our employers' as if it were bought and paid for with their money. Besides, these exchanges are mutual,—we give as well as take; and on this ground, as well as that glass, space, heat, soil, pots, skill, are our employers', all the plants given to us become as much the property of our masters as if their money had purchased them. Of course where plants are given to gardeners by their masters, or special leave is given to them to grow anything on their own account, it is different; but in the former case it is well to dispose of such plants at once, and the latter should be specified on paper. Such cases are wholly exceptional, and the latter seldom works well. But this wicked gardener also kept some one else's plants. This, I am sorry to say, is a common source of annoyance to gardeners. You have a large place; employer and gardener alike are beset to winter plants for various friends. Doubtless this gardener's late employer had yielded to such entreaties, and then the poor gardener is branded as a thief for letting the neighbours have their own plants back again. I have set my face like a flint for years against this wintering of other people's plants, not because I considered the practice dishonest—for I never was offered a halfpenny for doing so in my life—but because of the trouble, worry, annoyance, and loss of plants it entails. From the whole of "Subscriber's" charges it appears that, whatever the gardener was—and I confess to no liking for him,—he had served an indulgent employer, who adopted the vicious practice of eking out a low wage by giving various privileges or perquisites—a practice alike injurious to master and servant. Another master arose, who kept down the wages and cut off all the perquisites—25*s.* a week was a miserable pittance to a head gardener in a situation where three under ones were kept. Poverty and suspicion took the place of kindness and indulgence. Every action of the man and his subordinates was watched and suspected. Petty interference, growing dislike, the consciousness—true or false—of being sold, took possession of the master's mind. If the gardener claimed cinder, tool, or plant that had been given to him, it was robbery. If he sent back the plants of others, it was stealing his. If he exchanged plant or cutting, it was to his loss; and if the poor gardener took a bit of Cabbage for dinner, it was to open a greengrocer's shop. If he called at the butler's room, on his way to the study with his books (a general custom), it was that those books might be balanced together, so as to cheat him and divide the spoils between them. One word in regard to perquisites. With the exception of such things as house, vegetables, coal, or the keep of a cow, where convenience exists for it, all perquisites ought to be abolished. The way to get good gardeners is to pay good wages, and employ only men with blameless characters. Having found such, trust them to manage under you. If you wish to give orders, give them through the head-gardener, and not subordinates. The latter is a sure recipe for confusion, inefficiency and strife. It is like a fellow private instead of the colonel ordering a private soldier. As to the power of hiring, ordering, paying, and discharging through subordinates, which has so shocked "Subscriber," it is exercised every day by every head gardener worthy of the name. If a gardener cannot exercise such functions with wisdom and discretion, the employer's remedy is, first, remonstrance, and, finally, dismissal. As to money matters, all books and vouchers can be presented weekly, monthly, or quarterly, as desired. A balance-sheet is also often presented at the end of the year, whence a bird's-eye view of the entire expenditure under each head can be seen and questioned at once. As to an allowance of vegetables, I have never known this privilege abused. If "Subscriber" knows a gardener who is a greengrocer, and will take the trouble to inquire, he will find that he is selling his master's produce by his master's orders, and for his master's profit. No gardener ever would dream of doing such a thing on his own account, nor of keeping any for himself that might be required at his master's table. Your correspondent has either fallen into very bad hands indeed, or he has had a serious attack of bile. I counsel him to start afresh, with a fresh staff, and a new heart, and try kindness and liberality instead of harshness and distrust, and, above all, not to oppress the hireling in his wages; and he will find that gardeners are altogether different to what he had supposed, and will haste to blot out the bitter handwriting that he has written against us at p. 1637. Of this he may rest assured, that "like master like man" is well nigh an absolute truth. With the pithy and suggestive apothegm of the ancients I dismiss "Subscriber" to the stool of repentance, which he so much needs, or the dungeon of oblivion, which he so richly deserves. *D. T. Fish, F.R.H.S.*

Wellingtonia gigantea.—We have here a specimen of this tree, the growth of which you will probably consider worthy of recording in your columns. It has been planted eight years, and its dimensions are as follows:—Height, 32 feet; circumference of branches, 40 feet; circumference of trunk 3 feet from the ground, 4 feet. It is planted in a sheltered situation, at the foot of a hill facing the south. The soil is very poor and shallow, on a shelf of ragstone. *Wm. Howell, Gr. to Lord Vivian, Glynn Park, Bodmin.*

Budding Vines.—In the *Gardeners' Chronicle* of October 16, 1869, a very successful system of budding young Vines, by Mr. Stevens, of Trentham, was reported. This was described as "bud-grafting." The operation was so imperfectly described as to be somewhat obscure. In one house I have 15 varieties of Vines growing without any forcing, and which all produce abundantly, and, with the exception of two, ripen their produce between the last week of August and the first of October. These are of 10 years' growth, and I desire to cut back the two I refer to, which require a higher temperature, and graft or bud other varieties on the stocks when headed back. If Mr. Stevens will kindly state through the *Gardeners' Chronicle* about what date and in what manner he would recommend this operation to be performed, it would be an advantage to others so situated as well as to myself. *Charles Lawrence, Cirencester.*

Kales or Borecoles.—In more than one instance I have noticed in your paper laudatory remarks upon the highly intelligent and exceedingly respectable class of men who represent the seed trade. Far be it from me to say aught against them: I think them a most worthy class of traders, who leave very little unturned in the way of hunting up good stocks of seeds for their customers. Last year they succeeded in getting an Act of Parliament passed for doing away with the "ooo" system. Now, without troubling Parliament, what a happy thing it would be for their customers were they to have an Œcumenical Council and settle among themselves the names under which seeds should be sold. What should we think of drapers having six different fabrics which they send out for "unbleached calico!" and yet this is just what the seed trade have got to as regards Kales, as I propose to show from my own experiments, carried out during the present season. Asparagus Kale: From 13 different seed warehouses, embracing the leading wholesale and retail firms, I purchased parcels of "Asparagus Borecole." In four instances Couve Tronchuda was supplied, in five instances Jerusalem Kale, in two cases Buda Kale was given, in one instance Chou de Milan, and in another Ragged Jacks. Ragged Jacks: Under this name in two cases I received Jerusalem Kale, in another a coarse growing purple Kale, and in a fourth instance Chou de Milan. In the remaining instances I received the true Ragged Jacks. Buda Kale: For this in four instances I received Jerusalem Kale, in one case Couve Tronchuda, and the remaining instances were true. Delaware Kale: In eight cases I was supplied with Jerusalem Kale for this, and in one instance with Buda Kale, but in no instance a variety to represent a distinct Kale. Jerusalem Kale: In five I received what Mr. Cattell, of Westerham, calls purple Jerusalem; in one case I had the purple dwarf curled Kale; the remainder were the green curled Jerusalem. Lapland or Siberian Kale: In one case I received Egyptian, in another Buda, and in a third dwarf purple curled Kale. Chou de Milan: There was a wonderful unanimity in this; only in one instance did I get a different thing, and that was a green variety of Couve Tronchuda. Russian Kale was a mixture of Buda and Jerusalem Kale. Egyptian Kale: Very few offered this, and these seemed to be of one mind. Miller's Winter Kale proved to be Egyptian. Victoria Marrow Kale turned out Couve Tronchuda. Camberwell Kale proved to be Ragged Jacks. Cottager's Kale: There was no diversity of opinion as to this. Acme Kale proved to be Jerusalem. Buckman's Hardy Winter Greens differed from anything I grew, and seemed a sturdy plant, which is likely to stand the severest winters, and give plenty of green feed; but I can say nothing of its cooking quality, not having tasted it yet. Curly Greens, German Greens, Scotch Kale: There appears to be a great disposition here to multiply names. I had Prince of Wales, Tall Green Curled, Feathered Scotch, Abergeldie, Hansworth, Superb Tall, Superb Parsley Curled, Williams' Matchless, Pontefract Green Curled, Tynningham Green Curled, Williams' Dwarf Green Curled, Veitch's Dwarf Late Curled, Dwarf Curled Canadian, Moss Curled, Stuart & Mein's Extra Curled, Dickson's Imperial Dwarf Curled, &c. These were

simply variations in the selection; some few differ in the shade of green, but not one of the tall varieties possessed that pure character which, long ago, I was taught to believe that the fairies rode upon in Ireland, and to my personal knowledge and experience the lads and lasses in Scotland go after, on Hallow e'en, to see what luck they will have in a husband or wife. *Amateur.*

Lithospermum fruticosum.—Those who are searching for beautiful winter and spring flowering plants for cut flowers, will find in this a very valuable addition. A few weeks ago I lifted several plants of it from our herbaceous garden. The plants, for they are of a somewhat procumbent habit with a woody nature, were well set with flowering points. I potted them, and put them into a pit in a gentle heat, near the glass, and since they have produced a fine lot of flowers of the most beautiful blue colour, and which have been most valuable for small bouquets amongst white flowers. Indeed, I know of no small flower that is of such a beautiful blue at this season, equalling in colour any of the finest Delphiniums. It is of the greatest advantage in the making up of bouquets to find materials for the proper contrast of colour. *R. M.*

Bone Dust for Lawns.—Last spring I was ordered to bone-dust a lawn, my employer stating that a friend of his had done so, and so killed all the weeds. I applied the manure, and have now a double crop of Daisies and a Yarrow-like weed. This day (Dec. 10) I have been told to do it again. I do not know what to do with my lawn and terraces, which are grown over with this rubbish. I should feel obliged if you would inform me how to get rid of the nuisance? *E. B.* [We sent your letter to our correspondent, Mr. Fish, who replies as follows:—"It is altogether a mistake to suppose that any top-dressing will kill weeds on grass lawns without also killing the grass. I have seen an advertisement somewhere of some sort of sand for this purpose. It is a mere catch-penny—it cannot do it. Weeds are even more tenacious of life than grass itself. As for bone dust killing weeds on lawns, the thing is absurdly impossible. It will make the grass grow and weeds too, as described by 'E. B.' When ground to powder like flour, bone dust is a bad top-dressing for lawns—dirty, disagreeable, rank. Even as bone-flour I would not recommend it. A mixture of fresh earth, or ashes, or soot is much more effective. A dust of guano is likewise a good stimulant, applied in the autumn, but no top-dressing will destroy weeds. This can only be done by removing the turf, by incessant hand-picking, or by pickling the crowns of Daisies, Plantains, &c., with salt, or scorching their hearts out with vitriol. Thistles and Yarrow may be destroyed by incessant mowings, but not so Plantain or Daisies; they seem to enjoy being cut, and to grow all the stronger in consequence. Daisies especially are so difficult to extirpate that many give up the contest, and profess to like to see their lawns illuminated with their silvery eyelashes, dashed here and there with crimson flakes. But every weed beyond the stature of a Daisy is an utter abomination on the velvet pall of a well-kept lawn, and may be destroyed by perseverance in the manner here indicated." The experiments at Rothamsted and Chiswick show that it is not improbable that when we know more of the requirements of plants, an ingredient will be found which will favour the growth of the grass to such an extent as to make them outgrow the weeds. EDS.]

Hibiscus.—Can any of your readers give me any information about the double white Hibiscus in this country? Can it be seen anywhere? Will it stand the frost out-of-doors all the winter? In a garden at Biarritz, near Bayonne, in 1865-6, was a shrub of this species so flourishing that its stems, probably 20 in number, at a height of 10 or 12 feet from the ground, were (even the smallest) not less than 2 inches in circumference. During that winter the frost was so severe that the icicles from the clay bank, not 200 yards distant, were 3 feet long, and proportionate in size, and the bank faced the south and west, indicating a very low temperature generally. *F. P. B. M.*

Pleromas.—During the time I was at Floors, which was nearly three years, the Pleroma Benthamianum certainly proved to be a much more useful plant than P. elegans. What Mr. Knight says regarding them now, just shows how plants change, as far as their utility is concerned, by altered circumstances. Pleroma elegans, when I knew it there, stood in pots in the greenhouse, while now it is planted out in the corridor. But beautiful as that corridor used to look in the various seasons of the year, I have no doubt it could have been much improved by the introduction of such things as the most elegant Dacrydium Franklinii, D. cupressinum, Araucaria excelsa, &c., which please the most ordinary of observers. Another lot of plants, allied to the Pleromas, requiring intermediate temperature, are well worthy of more general culture, namely, the Monochætums. *R. M.*

Fungophobia.—I do not think that I gave undue importance to the injurious influence of Fungi when I attributed certain results that affected Mr. Pearson's plants to their action. I regard the whole tribe as powerful and inexorable agents of destruction, whose special function it is to hasten the removal of all dead and decaying or even debilitated vegetable or animal organisms; and one cannot but look upon Fungi endowed with a power and ubiquity which the wisest amongst us has not been able to fathom or pursue, without a feeling of dread, even while admitting the beneficence of the arrangement. Like their prototypes in animated nature, the vultures, they wait generally for death and decay before commencing their ravages, but an opportune proximity to living organisms is at any time a dangerous temptation. No one can doubt the destructive power of Fungi who has seen the outward development of the various forms of Polyporus on trees in active growth, and who has examined the wood of a tree on its fall (as fall it will if affected by Polyporus) and seen the filaments of this Fungus reaching through the concentric rings of the timber into the very heart of the tree. Nature is eminently conservative in her arrangements, and does not send her agents, like a band of Teutons, to desolate and destroy. She abhors weakness, and decrepitude and decay fall beneath her destructive fiat. The vigorous examples of vegetation, stimulated by the cultural skill of Mr. Miller, are no doubt able to throw off and defy their parasitic enemies. Because he passes unscathed through a fever infected neighbourhood, he must not deny that fever exists. When within a few years we have seen a Botrytis desolating our Potato fields, and an Oidium of insignificant proportions spreading through and destroying half the produce of the vineyards of Europe, we may pause and reflect; and certainly we should not ridicule those men whose appreciation of such facts is in advance of those who can only look at small hotbed examples, and, failing to read the lessons they give, venture to deny what they cannot philosophically understand. *William Ingram, Belvoir.*

Do Plants Absorb Water through their Leaves?—I noticed in the lengthy remarks of George Newlyn (p. 1637), on the above subject, that he, like most theorists, has a supreme contempt for facts, though he would have us think him a noticer of them; for, after struggling in vain to explain that tremendous word endosmose, and making a few remarks about spongioles,—which he seems to think are the procurers for the plant, though they are only protectors of the tender point of the root,—we find him saying that "it is evident that the absorption of the nutritious fluid is almost exclusively performed by some plants, particularly in the Cacti, and other succulent subjects"—though it is by no means clear whether he means that those plants absorb their nourishment through their leaves; if so, I should like him to point out the leaves of, say, Cereus speciosissimus, as that may be the best known to him. But the point he makes the most of, is the paucity of roots in succulent plants generally. Now I have had as much to do with this class of plants as most men, and my experience has been, that they are very strong rooters. Certainly if you drench them continually their roots will be few, but do they get stout in their native habitats? I have turned out plants of Cereus, Opuntia, &c., which have had one mass of roots strong enough to pierce any crevice, had they been on their native rocks. The Aloes and Agaves have roots long enough to penetrate the earth 6 to 8 feet; in fact you may turn them out of their pots, and find scarcely anything but roots. Again, the Mesembryanthemums grow on stony ground, and send down strong and tuberous roots, that are often in excess of their stem and branches; besides, it is a known fact that stones attract and retain moisture, so that when the surface is parched the roots are luxuriating in a cool and moderately moist position; therefore, I think if Mr. Newlyn will examine these plants he will find them to be some of the strongest rooted. Mr. Newlyn also seems to ignore the fact that, these plants having fewer stomata [and thicker wax-coated rinds] than most others, as a consequence lose less moisture by evaporation, and therefore need less replenishing; besides, succulent plants get a store of moisture during the wet season, to enable them to resist the drought. *J. Croucher, Kew.* [In a question where physiologists themselves are so much in doubt, it would be well not to express too positive opinions. Dr. McNab, of Cirencester, has recently published some experiments on the points raised by our correspondents, and to them we propose shortly to advert. EDS.]

The Plague of White Flies.—I presume this is what is meant by Mr. Miller at p. 1604, as almost destroying his winter Spinach, and hastening the falling of his Peach leaves. These beat all the other flies I have met with in their destructive power, and in difficulty of destruction. I have not had much experience of their ravages until within the last few years. Not content with feeding upon Brassica and Beech leaves when they are soft and tender, which was their usual food, they have lately risen to live on Peaches, Nectarines, Fuchsias, Salvia splendens, &c., to our great vexation and annoyance. Rapid in its movements as a midge on a soft summer evening, this fly is a difficult insect to destroy. Tobacco smoke, unless so strong and dense as to endanger the tender leaves on most plants, fails to suffocate it, and when one does succeed in killing hundreds, thousands more seem to spring forth from the dead to take their place. In the open ground this autumn all our Walcheren Broccoli were crippled and riddled with these flies, who crowded every leaf as if their under sides had been dusted with large particles of lime. The Cabbage plants are still in the same position, Peach and Nectarine leaves were laden with them. Tobacco-water, as described by Mr. Miller, killed its thousands, but tens of thousands escaped, and during their last days the leaves were marred and crippled in their functions, and literally brought to a premature death by the ravenous gnawings of these innumerable pests. The moment water or any death-dealing compounds agitate their feeding grounds, up they go into the air like a cloud of white dust, and there they abide in safety till the danger is past. I should be glad if any one can suggest an effective remedy for this pest. We have long been familiar with the pest of flies, which come to us in some form, size, or colour, almost as regularly as Roses in June. Mr. Hole will, I trust, forgive me the comparison, and the queen of flowers will never deem herself a pest. But of all flies, green, black, or grey, this white one is the worst, and the most difficult to destroy. I should be grateful for some better instrument of speedy extermination than streams of water, clear or foul, tobacco smoke, sudden pourings upon fly-whitened leaves, &c. Can any of your readers oblige with a simple and certain recipe for the complete subjugation, utter extermination, of this sharp-toothed, white-winged messenger of death to plants? If so, I will most heartily thank them. *D. T. Fish.*

Table Plants.—At p. 1671, your correspondent, "G. W. F. H." gives a good list of winter flowering bulbs; but, in my opinion, it is not so much the number of kinds that is required for table decoration, as a very careful selection of the most beautiful, elegant, and suitable of all sorts from any section of the vegetable kingdom. Without disparaging in any way your correspondents taste or love for those he mentions, I really think that some of them would not do well for table decoration. For example, Triteleia uniflora, although it is a pretty thing, is not the stamp of plant that is required, and I question very much whether it would look nearly as well on table as a nice pot of Snowdrops; and again, the Tritoma, although beautiful, is void of that elegance that is sought for in table decoration. What is most needed is a lot of plants which, at the different seasons of the year, and not altogether on account of their rarity, produce, when properly arranged, a fine effect at night. *R. M.*

Foreign Correspondence.

HAINAN.—The northern portion of this island, together with broad tracts on its north-western and south-western sides, are flat, or gently undulating, with only a few eminences, the soil being composed of marine deposit, and poor in quality. On its north-western coast, and notably at Heongpoo, Haosui, and Hungpe harbours, as also in the island of Naochow, there is abundant evidence of extinct volcanic action in the shape of trap-tuff masses strewed on the beach. This porous and vesicular rock is the chief stone used for building purposes in most parts of the island. "Saddle Hill," on the western promontory of Hoehow harbour, has been found to be an extinct volcano, and an eminence in the plain to the east of the capital bears every appearance of being another; and in our circumnavigating expedition we noticed others of similar character on the east and west coasts. The marine nature of the soil is attested by the fact of oyster and other shell beds cropping out along the banks of the main river, and by the occurrence of large masses of coral in the stream 12 miles from its mouth. The southern portion of the island consists of jungle-covered mountains, rising to an altitude of perhaps 7000 feet, with rich valleys between them. At their northern extremity granite was noticed, and in the south, where they extend to the coast, the rock appeared also to be granite. In the Tingan district slate is abundant, and used for building purposes. No coal has been discovered in these mountains, but they are said to be rich in minerals. In the Shih-luh-shan (Stone-green Hills), approachable from the Hoitow harbour, and about 26 miles from the coast, copper in the form of a green carbonate is found in quantity, and is exported to Canton, and used for painting porcelain. In the same neighbourhood both lead and iron are said to occur, the former containing 10 to 15 per cent. of silver. The lead mines were taken possession of by the Government, but they did not succeed in working them to profit. The older writers on China speak of gold as being the chief article of barter between the independent tribes and the Chinese, but I could learn nothing of its occurrence now.

The north-easterly portion of the island is exposed to the influence of the winter monsoon, and enjoys cool weather during the China cold season, while the mountains of the interior debar the south from the refreshing north-easters, and render it entirely tropical, and, according to the Chinese, very pestilential. The colonists in the south suffer greatly from a disease they call "changke," which produces swellings of the limbs and belly, and soon causes the system to succumb. They attribute it to the water of the hills; and it is said the older settlers take the precaution to boil in the morning what water they require for consumption during the day. Hainan lies in the direction usually taken by typhoons, and is visited each year by these devastating whirlwinds.

The visitor from China is specially struck with the abundance of the Cocoa-nut tree—a tree not found in the latitude of Canton—which meets the eye on all points of the island coast. In spite of the winter monsoon, it flourishes best in the north-east corner of Hainan, in the district of Wênechang. Farther in the interior, as the ground rises, the Pine (Pinus sinensis) appears, and in some spots clumps of Pine and topes of Cocoa-nut grow side by side. The Cocoa-nut also was found growing on the opposite shore of the Luichow peninsula, and on the small island of Naochow, off the right of the peninsula, in latitude 20° 45′. The Cocoa-nut is not known in Formosa, excepting in one spot at the foot of the mountains, about 20 miles from the S.W. coast, where a few trees flourish, which there is good reason to believe were introduced by the Dutch. The Areca was everywhere largely cultivated, as it is also in South China and Formosa. Fine Banyans shaded the villages, growing to a large size. I observed three species—the ordinary Ficus nitida, a large-leaved species found also about Canton, and a species with small glabrous leaf and yellow berry—all equally grand and umbrageous trees. On the high road to the capital and about the city itself two peculiar trees presented themselves—the one with black pods, 10 inches long, hanging downwards all over it; the other, with long scimitar-shaped pods, 20 inches long, covered with an ochreous woolly down. Both these were new to me, and I brought home specimens of the pods, and submitted them to Mr. Bennett, of the British Museum, who pronounces the first an Asclepiadeous tree of an unknown species, and the latter a Spathodea, nearly related to Spathodea stipulata. Other village trees not often seen in China were the Jack, the Bread Fruit, and the Tamarind.

In the mountain forests the Liquidambar formosana, of Hance, was the commonest tree, associated with noble Fig trees of great variety and beauty. Palms also were abundant; on the higher ground the Cocoa-nut giving place to Fan Palms, Caryota, Phœnix, &c. The undergrowth was traversed in all directions by Rattans and other tangles innumerable, so as entirely to impede passage through. The finest woods for fragrance and for sculpture are procured from the mountains of Hainan, and Du Halde, in his "Histoire de la Chine," states that the Emperor Keenlung had some carried to Pekin at immense cost to decorate a palace he was building for his sepulture. The most precious of these woods is the *hwa-le*, named by Europeans rose or violet wood on account of its odour, which the Chinese procure by barter with the hill tribes. Then the *kao-hên*, or eagle wood, a very hard timber, a specimen of which I procured at Hoitow, and brought home for the Kew Museum. There is also a very fine and incorruptible yellow wood, columns of which, of a certain thickness, are priceless, and said to be reserved, as is the hwa-le, for the service of the Emperor. This yellow wood is much used in the island for building purposes, but I noticed that its bright colour soon fades when exposed to the light. One tree exudes an abundance of a gummy matter, which is brought down in large lumps to the west coast, and thence exported for sizing purposes. Another tree, probably the same as the Aloexylum Agallochum (Loureiro) of Cochin China, yields the "ching-heang," or fragrant wood, so much sought after by the Chinese for incense and for carving into ornaments. This is procurable in large quantities in Nychow city in the south end of the island, where the best kinds are sold for about 1*s*. an ounce, and the coarser kinds, used for burning, for about 6*d*. a pound. The Chinese did not know the tree, and could give no account of it, but Loureiro says that it is only the decayed parts of the tree that are so highly scented, and he attributes it to a disease. In the south also they have the tree which yields the "dragon's blood," and others with sweet-scented sap used for incense.

About the jungles of the south a species of Alpinia, with upright flower, lately described by Dr. Hance, Her Majesty's Vice-consul at Whampoa, as A. officinarum, grows wild, and its roots yield to trade the valuable drug galangal. Its berries, which are also used as a drug by the Chinese, and were described and figured by Mr. Dan. Hanbury in 1855, are infused and taken by the aborigines as a substitute for tea. The Tea plant is cultivated in Hainan by the Chinese, and a very coarse kind of tea prepared from it; but whether it is indigenous to the island or has been introduced, I was not able to ascertain. The fruits of the country are Cocoa-nuts, Areca or Betel-nut, Mangos, indifferent Oranges, Limes, Jackfruit, Breadfruit, Papaws, Lichees, Longans, Jamboos, Carambolas, Bananas, and Tamarinds. *R. Swinhoe, in "The Field."*

Newburgh, U.S., *Nov.* 21: *A Trip to San Francisco.*—We have had the hottest season here I ever recollect, also very dry. The fruit crop has been very abundant over most parts of the Union, but in consequence of the extreme heat and drought the fruit is not as large as usual, and has ripened much earlier, and the winter varieties will not keep so long. The flavour generally has been fine.

Hon. Marshall P. Wilder, wife and daughter, Mr. Ellwanger and his wife, Mr. Berry, Mr. Downing and myself made the trip to California near the middle of June, and returned near the middle of August. We saw much of fruit growing, farming, &c. The Wheat crop is enormous, and of the very best quality, and the labour of gathering it very little, as they have no rain from April till November or December. The grain is never housed, but cut and threshed and cleaned with machines in the field, put into bags of 100 lb. each, and piled up into heaps in the farmer's barnyard on the ground until wanted for use, or taken to the railway depot and laid in large heaps on the ground until the freight cars are ready to take it away, which, we were informed, was sometimes two weeks to a month. We saw very large heaps of it at the depots as we passed along.

The next greatest production after Wheat is Grapes, the quantity of acres is large and the crops enormous. They require very little care in cultivation, are grown on stumps or stems from 2 to 3 feet high (some of the largest stems—15 years old—were 6 inches in diameter); the Vines are annually cut back to the stumps, and where they have grown 4 or 5 inches they are thinned out to about a dozen canes, which is all the care they get, except to keep the ground clean; a few, however, summer prune, but we saw no difference in the result. The varieties are all of the European kinds, and the bunches weigh from 1 to 5 or 6 lb. each, and occasionally more. They are all grown in the open ground and are perfectly hardy, their winter being very mild.

The fruit trees grow much more rapidly than with us, and come into bearing much earlier, and I think, but do not know, that they will not live as long as ours. The fruits are rather larger than ours, fair and handsome (no insects), the flavour equally as good as ours of such as were ripe when we were there, except Strawberries and Blackberries, which were not as sweet. They told us the late Pears were coarser in flesh and not as high flavoured, owing I suppose to the long-continued dry weather. Apples, except a few early kinds, are rather inferior. Their best Apples come from Oregon, and are said to be very fine.

Figs are remarkably fine in nearly all parts of the country, and very plentiful and cheap.

It is a singular country in some respects. Thus in some places you will see all kinds of fruit in one garden, viz., Apples, Peaches, Pears, Plums, Apricots, Grapes, all the small fruits, Oranges, Olives, Figs, Pomegranates, Almonds, English Walnuts, &c. We had a very pleasant visit, and the scenery going over the Rocky and Nevada Mountains was grand. *Charles Downing.*

Societies.

Darlington Horticultural Society.—The winter exhibition of this Society, held in the Central Hall, Darlington, was a complete success. The show of fruit was admirable, both for appearance and quality, and very extensive in variety, embracing both home and foreign produce, exceedingly well arranged. In the open collections were some rare and choice specimens, especially the one from Mr. Morton, which contained some exceedingly well-grown specimens of Apples and Pears. The tray of fruit from Mr. Westcott, of Raby, contained splendid bunches of Alicante and Child of Hale Grapes, and very fine Apples and Pears. Some splendid examples of Pine growing were given in the beautiful smooth Cayenne Pines of Messrs. Richardson and Westcott, the prizes going in the order named. Good examples of Grapes, both black and white, were brought together, and a close competition in Apples and Pears took place, amongst which were some very fine samples both in table and kitchen fruit,—Cox's Orange Pippin taking the lead in table Apples for flavour, though much finer specimens of Ribston Pippin were present. Amongst Pears for flavour nothing could approach Marie Louise, which took both the 1st and 2d prizes. Mr. Graham had a very fine collection of Apples and Pears, splendid examples of good cultivation. Collections of decorative plants were brought together in rather large quantities.

Chrysanthemums were not very largely shown. The policy of offering but one prize each in so many classes scarcely brings forth the full powers of the exhibitors, as it would do if keener competition was invited by a 2d prize [ay, or a 3d or 4th, or even more than that]. There was a very nice collection of table-decoration plants, six very choice ones were staged in the centre of the group, consisting of two of the beautiful new Crotons, two Draczenas, and two Solanum Pseudo-Capsicum—perfect gems. In the centre of the room were some excellent collections of Ferns and foliage plants, and in front of them very fine trays of vegetables, shown in large quantities, and of very excellent quality; indeed, vegetables at the northern shows are always well to the fore. The absorbing interest was, however, undoubtedly in the table decorations and bouquets, the former extending across one end of the room, making a splendid termination. On one of the side tables were arranged the hand bouquets, some of which were very beautiful, especially the 1st prize one, from Mr. Richardson.

Notices of Books.

The Miniature Fruit Garden. By Thomas Rivers. Sixteenth edition. Longmans.

A sixteenth edition! Think of that, ye penmen, and despair. Dip not your pens in the ink, ye critics; your services are clearly not called for. Following out this injunction, we merely cite the following passages from the preface to the new edition. Possibly at some other time we may make some further extracts from this volume, which should be in the hands of every——Stay: sixteenth edition! the recommendation is needless:—

"As a prominent, but not new feature, in this enlarged edition, I may refer to the management, and above all the protection, of low lateral cordon fruit trees. I have also pointed out more forcibly than in former editions the capability of growing choice Pears and Apples on any low cheap walls, and also against walls in kitchen gardens not fully furnished with trees,—in short, in all bare spaces so often found between wall trees in old gardens. These methods of cultivating choice Pears and the finer kinds of American Apples are worthy of much more attention than they have hitherto received.

"The method of cultivating the Prince Engelbert, and one or two other kinds of Plums as vertical single cordons, has been practised here for some few years; it is original, highly worthy of attention, and may be made a profitable venture, not only for the amateur but for the market-gardener.

"The management of those charming structures—ground vineries, is in this edition more fully gone into than before; in short, all the modes of culture hitherto recommended have been revised and made as perfect as practice can make them, for it must be recollected that all the modes of culture here recommended have been well tested, and no foreign practice recommended till found adapted to our wet English climate, the mean temperature of which is just about two degrees too low for the choice kinds of fruits to ripen without assistance."

—— Messrs. Williams & Norgate have submitted to us specimens of some new German Illustrated Works, which demand some notice, from their cheapness. The titles run as follows:—*Die Unkräuter des Feldes und Landes aus der landwirthschaftlichen Flora Deutschlands*, von Dr. W. Loebe—a treatise devoted to the weeds of fields and agricultural districts. It is illustrated by 50 coloured plates, and is published in parts. The illustrations are sufficiently good for the purpose for which they are intended.—*Forst Flora oder abbildung und beschreibung der für den Forstman wichtigen Wildwachsenden Bäume und Sträucher, so wie der Nützlichen und Schädlichen Kräuter*; von Dr. Dietrich. This is the fourth reissue of a very useful work for foresters and others desirous of knowing something of the trees and shrubs of Europe as well as of useful and poisonous plants. The work contains 300 plates, and is issued in parts. The first part contains descriptions and illustrations of Pinus sylvestris, Strobus, Cembra, and Mughus. We cannot praise the colouring of the plates.—*Atlas der Giftpflanzen, &c.*, von Dr. J. R. Linke. This is a small treatise on the plants poisonous to men and animals, intended for use in schools, and illustrated by 15 coloured plates. Generally speaking the illustrations are good.—We allude to these books on account of their obvious utility and cheapness. It would not be difficult to produce a superior class of books here, but we doubt whether there would be a sufficiently large sale to make the venture profitable at anything like the cost of the publications we have been alluding to.

—— The seventh number of *Mr. Warner's Select Orchidaceous Plants* (Reeve & Co.), issued some time since, contains finely coloured plates of the following species:—Dendrobium fimbriatum oculatum, the plant so commonly grown in Orchid collections under the erroneous name of D. Paxtoni, which is another thing altogether; Odontoglossum Warnerianum, an elegant species, related to O. nebulosum; and Schomburgkia undulata. The succeeding number is, we believe, nearly ready. At this season of the year, we are reminded that the volume, constituting the first series of this work, would form a choice Christmas present or New Year's gift.

Miscellaneous.

THE SISTER SPIRITS.

An Invocation for Christmas, 1870.

Float to us! fly to us! beautiful spirits!
Come to our hearts with the peal of the chimes
Come, Christian Charity,
Earth's greatest rarity,
Dark in thine absence with sorrows and crimes.
What though the poets and preachers extol thee!
Mens evil passions reject thee and scorn;
Angel! be near us
To bless and to cheer us;
Come to us! come, on the wings of the morn.

Float to us! fly to us! white robed, and lovely one;
Greatly we need thee, earth's hope and desire:
Come, gentle Peace, again,
Never to cease again;
Come to our counsels to guide and inspire!
War the exultant rides rough o'er the nations,
Burning the cities—unpeopling the dells;
Stay him! O Charmer!
Consoler! Disarmer!
And ring out his doom on thy jubilant bells.

Float to us! fly to us! beautiful spirits,
Charity, Peace, and Goodwill to Mankind.
Long have we waited,
Forlorn and belated,
And groped amid darkness, bewilder'd or blind.
Waited and wept with our harps on the Willows!
Sad, not despairing—though silent not dumb;
Come on the morning air,
Come on the voice of prayer,
Come on the Christmas chimes—lovely ones, come!

—*Charles Mackay, in "The Graphic."*

PEACHES.—The consumption of Peaches in the United States is immense. The *New York Times* says that in the season "every man, woman, and child luxuriates at a small expense in the most delicious fruit known to humanity." But it is admitted that the Peach of the southern counties of England is superior to the American, and that Covent Garden Peaches are from four to eight and ten times [?] as large as Washington Market Peaches. New York draws its supply chiefly from Delaware, Maryland, and part of Pennsylvania. Most of the fruit is sent by railroad in through cars; in favourable weather it arrives in much better condition by water, but weather cannot be relied on. The supply which reached New York and Philadelphia last year exceeded 4,000,000 baskets, a basket averaging 200 Peaches; but this year there is hardly half a crop, owing to an "eastern blight." The method of the Peach trade in New York in the season is this:—A trip to Jersey City about 1 A.M. will show a shabby-looking unwashed crowd awaiting the cars. As soon as they arrive no time is lost in selling, and 100,000 baskets are gobbled up very quickly, in quantities varying from 50 to 500 baskets at a time, by middlemen. Now comes the turn of the first-class retailers, who often spend 3 dols. to 5 dols. a basket for choice lots; then the grocers, a hard lot to suit, but good buyers; make a large hole in a consignment; after them come the apple-women, pretty hard at driving a bargain, but profitable customers in the main. The shippers and preservers come in later, and generally get fruit cheap. The last customer is the worst—the huckster. Be Peaches ever so good, or ever so rotten, he bides his time, and never misses a chance of pouncing on some unfortunate dealer mad with anger at being "stuck," and anxious to get back some of his money. Rarely, however, does this class of retailers get anything but the very worst article, or pay more than 75 cents a basket for it. When it is considered that on a moderate computation there are over 10,000,000 dols. embarked in the Eastern Peach trade, the profit on which exceeds 35,000 dols. per annum to the growers, labourers, and mechanics of the region, nearly 250,000 dols. per annum to the New York commission houses, 1,400,000 dols. to the railroad and freight companies, and perhaps another 3,000,000 dols. to the vendors in New York, an idea of the importance of the trade may be had. *Times.*

THE RIGHT TO THE ARCHITECT'S DRAWINGS.—Sir,—I see some judicial authorities seem to be of opinion that the original drawings of a building belong to the client, instead of the architect; if so, it suggests the following queries:—Is the architect required to furnish without charge copies of the plans for the use of the contractor? Is a sculptor entitled to retain the model from which he executes a statue which has been expressly designed for a client? If I order a piece of machinery, can I claim all working drawings or models which may have been prepared for the use of the workmen in the manufacture of the same? If I employ a solicitor to prepare a conveyance for sale of property, can I demand of him the draft copy? If Baron B., or any other judge, gives judgment against me in a cause, and I have consequently to pay the costs, am I entitled to demand the notes he takes on hearing the case? *A Puzzled Individual, in the "Builder."*

MCLAUGLIN'S GAGE PLUM.—This may be called a newish Plum, for although we have had the name presented to us in many fruit lists, nurserymen's and others, it is not to be found, as yet, in many gardens or collections of fruit. That it ought to be so, we venture to affirm; that it will be so, we venture to assert. Few who have seen this Plum fail to admire its appearance. It is both large and showy, and few who have tasted it but like its quality. It is juicy, melting, and rich. The fruit is of a large size, roundish-oblate in shape, like that of a small flat Peach, the diameter, which reaches from 1⅞ to 2 inches, exceeding the depth, with a deep suture on the side, and slightly hollowed at the apex. The skin is thin and tender, of a deep golden colour, dotted and speckled on the exposed side with deep crimson, like Jefferson, and having a thin bloom. Stalk, ¾ inch long, inserted in a small cavity. Flesh adhering to the stone, deep yellow, very juicy and rich. Mid-season. This is in all respects a fine Plum. The colour, texture of flesh, &c., more nearly resemble the Jefferson than those of any other variety. It is a cling-stone also, like the Jefferson, which is a slight disadvantage. The shape of the fruit is, however, very different, and it is larger, and possesses more of the Green Gage flavour. It is a robust-growing variety, and bears freely. For orchard-house cultivation, and for pot-culture, this variety is exceedingly well adapted, as it succeeds well under these conditions. Some fruits which we have grown this season in pots have been exceedingly handsome, and of most excellent flavour. *A. F. Barron, in "Florist and Pomologist."*

Garden Operations.

(FOR THE ENSUING WEEK.)

PLANT HOUSES.

AT this period of the year a great amount of care and watchfulness is required on the part of all gardeners, in regard to the inmates of their various plant-houses. No two days or nights can now be looked forward to as likely to be the same, whether as regards the temperature of the air or the condition of the atmosphere. Yet in the midst of the external vicissitudes a uniform temperature, with a supply of air as fresh and pure as possible, should be maintained. Practically, if the temperature out-of-doors averages 50°, give air, if in ever such small quantities. If foggy or damp, close every aperture, and whenever through frost the thermometer within falls below 45° of Fahrenheit in cool houses, or 57° in stoves, let the fires be pushed along more briskly, so that the temperature in either case does not fall lower than those stated. In instances where no great amount of frost is anticipated, the thermometer in all houses should be watched, so as to ascertain when the rise in the temperature takes place, consequent on the increased strength of the fire. If a sufficient amount of heat has been imparted to the house the fire should be moderated, otherwise too great a rise will quickly be the consequence. I have long been convinced that it is most beneficial to give air on all nice warm nights, the temperature not being less than 50°. Of course it must be given in quantities according to circumstances, and especially without adversely influencing the internal temperature. *Camellias* will now, in many instances, be swelling their bloom-buds freely, therefore let such plants have copious waterings with water from which the chill has been taken. Above all things, see that the foliage is scrupulously clean. Pot on a selection of the strongest plants of *Calceolarias* (herbaceous) for earliest blooming. The same directions also apply to successional *Pelargoniums* (of the forcing sections), *Cinerarias* which have not thrown up flower-shoots, &c. Water freely with manure-water all Cinerarias which are coming into bloom. Be particular in watering *Primulas*, which are showing for flower in any stage, not to allow the least excess of water to remain stagnant around the roots, or to collect around the collars of the plants, as it would invariably cause them to rot off. In regard to *watering* the general stock of plants, I would say, do not at this time water any plant not making growth or producing flowers, until it actually requires it. Be particular not to spill a drop more than is absolutely needful in cool houses.

FORCING HOUSES.

During adverse weather, and when it is not possible to continue outdoor operations, there will be an opportunity to give all late or successional *Vineries* a thorough good cleansing, in readiness for future work. The walls should have a good washing down if the old whitewash is at all loose or chippy in its nature; and the whole, when moderately dried, should have a good whitewashing with fresh slacked lime. The rafters, sashes, and all the paint should be thoroughly well scrubbed. Remove one or two inches of the old soil from the surfaces of indoor borders subsequently, and, before the paint is dry, syringe freely with hot water. Even the dormant Vines, especially if old, will not receive any injury if well syringed with water heated up to 140°. Those who habitually store away miscellaneous plants in vineries during the winter months should keep a very sharp look-out after all kinds of insects, *i. e.*, thrips upon India Azaleas, red-spider on Genistas, Clianthuses, Habrothamnus, &c., scale on Coronillas, Cassias, &c., and aphis on all kinds of ordinary bedding stuff; for if every attention be not given to these subjects an endless deal of mischief and anxiety may be laid in store for the ensuing summer. Give the most careful attention to *Vines* which are now showing the first leaves, allowing the temperature to gradually rise to a mean of 63°. Concerning *Pineries* little can be added, save in regard to the routine of management. Actual surface-syringings must seldom be permitted, but the surface of the tan-beds, floors, &c., may be frequently sprinkled, to afford a humidity capable of neutralising to the necessary extent the aridity of the atmosphere, caused by so much artificial heat. The mean temperature should at this time approach as nearly to a mean of 60° by night as possible, with an advance of about 4° by day, when the weather is dull, and a further advance of 6° more by sun-heat alone, making the highest permissible maximum on the finest days 70°. If a very severe period occurs about this time, it will be advisable to reduce the above by some 5°. Push *Strawberry plants* along very gently when the flower-spikes have commenced to start, taking great care not to force them unduly. Give an occasional watering with weak liquid manure, composed mainly of sheep's dung and soot; to the latter ingredient the plants are very partial. Those *Shrubs, Bulbs*, &c., which have been forced on for this festive season, should be removed, when in full bloom, into a warm conservatory, or similar structure, where, in company with the bright Poinsettias, Begonias, &c., they will last much longer in perfection. Early forced *Potatos* in pots may be grown on from this time to produce a supply. Pot good-sized sets singly in 60's. Remove all but the strongest shoot in each, and when the pots are well filled with roots, shift into 12-sized pots, placing three around the sides of each, into good turfy loam and leaf-mould. An ordinary temperature of about 55° is best suited to them.

HARDY FLOWER GARDEN.

Those who wish to protect the tenderer kinds of *Roses*, such as choice Teas, &c., should now place some dry bracken Fern between and around the branches. In the case of *Standard Roses*, the better way is to select from Furze plants branches having nice bushy heads upon stalks a foot or more long. With these to hand, first place an additional stake to each tree, then neatly arrange three or four of the Furze branches, so that the heads are amongst the branches of the Rose, and the stalks are brought down together in the hand against the stake and upright stem of the Rose. Tie these firmly, and then place one or more good supports around the upper portion, so arranging the Furze that the greatest possible protection is afforded to all the Rose branches when sharp frosts come.

HARDY FRUIT GARDEN.

Endeavour to get all pruning operations as forward as possible, ready for the advent of spring. Once the new year is entered the spring work seems to accumulate so rapidly that, if a good start is not already made, there is some danger of getting behind. Secure all newly planted and transplanted trees against boisterous weather; this is the more necessary after the past heavy rains, which have so greatly softened the soil around them. Look through *Fruit Room*, picking out all fruits that show the least symptoms of decay. Lately, during a very moist period, the fruit became very wet, so much moisture having attached itself to them. Get the atmosphere as dry as possible again by all legitimate means. Fresh lime that is newly slacked is an excellent absorbent of aërial moisture; a peck of such is capable of absorbing more than one gallon of water.

KITCHEN GARDEN.

If a fine drying period ensues, following the free and glorious rains which we have fortunately experienced lately, run the hoe carefully amongst all young outdoor plantations of *Lettuces, Endives*, &c., so as not unduly to bury the hearts of any, but nevertheless to loosen the soil as freely as possible amongst all. The surface has become somewhat flattened down, and so much hardened as to court the severer action of any frosts that may subsequently visit us. Place in heat a few roots of *Mint, Tarragon*, and other *herbs* likely to be in demand, such as *Sorrel*, &c., which are often wanted in some establishments. Those who force *Seakale* and *Rhubarb* under pots, &c., in open quarters, should frequently examine the heat of the fermenting materials during dull, rainy weather, as the fluctuations are often so great and sudden as to positively "cook" the crowns to death, to the loss of the supply. *W. E.*

TOWN GARDENING.

IT is not likely that much work will be done in the garden for some days to come, but I advise that, as well as keeping Christmas, a sharp look-out should also be kept to protect plants in frames from frost, snow, and rain, giving all the air possible in fine weather. Get all the dirty pots into the shed, so that when bad weather sets in a job may be found in washing them. Labels, pegs, and shreds should also be prepared; likewise look over the tools and see that they are all put in good order and ready for use, which will facilitate the work in spring. *J. D.*

STATE OF THE WEATHER AT BLACKHEATH, LONDON
FOR THE WEEK ENDING WEDNESDAY, DECEMBER 21, 1870.

1870. MONTH AND DAY.	At 9 A.M.						
	Readings of				Hygrometrical Deduction from Glaisher's Tables, 5th edition.		
December.	Barometer reduced to 32° Fahr.	Dry Thermometer.	Wet Thermometer.	Dew Point.	Degree Humidity.	Weight of Vapour in a Cubic Foot of Air.
	Ins.	Deg.	Deg.	Deg.		Gr.
15. Thurs.	29.18	44.2	41.0	43.8	98	3.3
16. Friday	29.69	40.6	38.2	38.1	81	2.4
17. Satur.	29.81	39.7	39.0	38.1	92	2.7
18. Sunday	29.95	41.9	40.1	40.1	88	2.7
19. Monday	29.70	43.0	42.4	45.0	85	3.5
20. Tues.	29.49	42.6	40.2	37.1	82	2.9
21. Wednes	28.64	29.6	29.1	14.5	51	1.0

1870. MONTH AND DAY.	TEMPERATURE OF THE AIR.					WIND.		RAIN
December.	Highest.	Lowest.	Range in Day.	Mean.	Departure of Mean from Mean of 30 Years.	Direction.	Horizontal Movement.	In Inches.
	Deg	Deg.	Deg	Deg	Deg		Miles	
15. Thurs.	47.7	43.2	4.5	45.2	+ 5.9	S.W. to N.E.	205	0.02
16. Friday	44.0	38.5	5.5	40.3	+ 0.3	N.E.	165	0.39
17. Satur.	41.7	33.5	8.2	37.6	- 2.2	N.E. to W.	160	0.01
18. Sunday	47.5	33.5	14.0	40.5	+ 0.0	W.	135	0.01
19. Monday	50.7	45.1	5.6	47.9	+ 8.5	W.S.W	565	0.12
20. Tues.	47.0	35.6	11.4	41.1	+ 2.2	W. to N.	370	0.03
21. Wednes	35.6	24.5	11.1	30.1	- 8.7	N. to N.E.	450	0.02

Dec. 15.—Generally overcast. Rain heavy almost continuously from 2 P.M. to Midnight.
— 16.—Generally overcast. Rain commenced falling about 2 P.M., and continued till late at night.
— 17.—Generally cloudy. Wind changed from S.W. to N.E. about 10 A.M.
— 18.—Overcast. Occasional rain.
— 19.—Overcast throughout. Rain fell continuously during the morning, and again at night.
— 20.—Generally cloudy. Fine.
— 21.—Generally overcast. Occasional snow.

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFERENT STATIONS

During the Week ending Saturday, December 17, 1870.

Names of Stations.	Temperature of the Air. Highest.	Lowest.	Range of Week.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	Fall of Rain.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	48.2	31.0	20.0	50.9	38.3	12.6	44.6	1.91
Blackheath ..	47.4	31.4	26.0	46.7	38.7	8.0	42.8	1.70
Bristol	..	..	..	..	..	..	..	..
Birmingham ..	45.0	26.8	27.2	45.4	32.1	10.1	40.3	0.84
Wolverhampton	45.2	29.3	26.0	44.3	33.7	10.1	39.2	0.74
Leicester ..	49.5	25.0	31.5	44.2	34.7	9.5	39.4	0.70
Nottingham ..	47.3	30.2	27.0	44.7	34.7	10.0	39.7	0.69
Nottingham ..	50.3	29.8	31.3	42.9	33.0	10.9	38.4	0.69
Sheffield ..	54.7	25.0	29.7	42.7	32.2	10.5	37.5	1.11
Liverpool ..	51.4	32.3	22.1	45.0	30.5	8.5	40.8	0.84
Manchester ..	..	..	..	..	..	..	..	..
Salford	50.4	21.0	35.4	44.3	32.5	11.8	38.4	0.93
Bradford	52.1	25.0	27.1	45.0	31.2	11.8	39.1	0.85
Lewis	53.0	26.0	27.0	44.4	31.9	8.5	38.1	..
Hull	55.0	19.0	36.0	41.1	30.9	11.1	35.6	0.72
Newcastle ..	50.0	30.0	20.0	42.7	33.5	9.2	38.1	0.93
Edinburgh ..	48.7	32.0	16.7	..	..	..	37.3	0.09
Glasgow	46.5	30.0	16.5	..	..	..	33.4	0.22
Dundee	46.0	30.0	16.0	..	..	..	36.4	0.06
Aberdeen	46.9	29.2	17.7	..	..	..	36.6	1.31
Paisley	53.0	29.0	24.0	..	..	..	39.0	1.83
Greenock	47.0	33.0	14.0	..	..	..	37.8	2.05
Leith	49.6	29.9	19.7	..	..	..	36.4	0.51
Perth	49.0	32.0	17.0	..	..	..	37.5	2.33
Dublin	54.0	23.5	30.5	..	..	..	39.2	1.07

JAMES GLAISHER.

Notices to Correspondents.

Alsomia melallica: *E. F. P.* You cannot do better than continue the treatment of the past month for another month at least. Then afford it the amount of bottom-heat which you suggest. When the roots have started into fresh growth, give a liberal shift into a compost of rough fibrous peat, chopped Sphagnum, sand, and a little thoroughly decomposed dung. Afford liberal drainage, potting as firmly as the admixture will admit of. Then return the plants into brisk bottom-heat: a liberal supply of heat, humidity, and root moisture should be gradually increased after starting. Let your Maranta zebrina remain in seeming quietude until the middle of January, when it may be potted into rough fibry broken potsherds, sand, &c. Plunge it into slight bottom-heat, start with a low temperature, and gradually proceed to a good liberal treatment by about the third week in March, when a fine leaf formation may be looked forward to.

Books: *J. M.* Hooker's "Students' Flora" will suit your purpose well.

Calathea vestita: *Rev. J. T. B.* Very fine, but not the largest we ever saw.

Cornwall. Willow. On any communications relative to us by stating what species the above-named Willow, used by basket makers, belongs?

Names of Fruit: *Shem.* Both the same; name unknown at present.

Names of Plants: *A. H.* Apparently not Cineraria maritima, but it is impossible to name it by the leaves only.

Pelargoniums: *A Subscriber.* To flower Pelargoniums well early in the year, it is necessary to commence an early system of treatment from the date of cutting the plants back in the autumn. If yours are well established, and were pinched back about the second week in November, you have a fair chance of accomplishing your object. Afford a minimum temperature of 50°, and never let it fall below a minimum of 45°. Keep the plants rather dry for another month. What perhaps you may consider immoderately dry, will be better than to afford too much moisture, which often causes the leaves to spot. Do not always leave them in a "thorough draught," though the air, when moderately genial, may blow freely into them.

Pomegranate: *A. B. C.* The Pomegranate, Punica Granatum, flowers during the summer months, and is a native of the south of Europe.

Rating of Hothouses, &c.—Nurserymen's and market gardener's pits, frames, and glazed erections are not rateable under 25 and 26 of Victoria, cap. 103. See *Gardeners' Chronicle*, Oct. 31, 1868, p. 1030. H. S.—Market gardener's hothouse glass enhances the value of the land for which the market gardener is rated, and is in that respect liable to all parochial taxation, and where it is detached and treated personally it would be scheduled for probate duty. *G. N. V.*

Catalogues Received.—W. P. Laird & Sinclair, Descriptive Catalogue of Fruit Trees, &c.

Communications Received.—J. C.—W. M.—T. L.—A Father—F. K. E.—J. T. Mc.L.—J. C. N.—D. S. C.—H. W.—L. B.

Markets.

POTATOS.—Southwark, Dec. 19.

During the past week the arrivals coastwise have been moderate, but more plentiful by rail and road. Trade slow, and prices looking down. The following are this day's quotations:—Yorkshire Regents, per ton, 70*s.* to 80*s.*; Lincolnshire do., 65*s.* to 75*s.*; Dunbar and East Lothian do., 75*s.* to 80*s.*; Perth, Forfar, and Fifeshire do., 65*s.* to 75*s.*; Kent and Essex do., 55*s.* to 65*s.*; do. Rocks, 55*s.* to 60*s.*

COVENT GARDEN.—Dec. 23.

Under the influence of approaching Christmas business has slightly improved, but no marked alteration in price has taken place. Good dessert Pears and Apples are abundant, and comprise all the usual varieties. Grapes and Pines are sufficient for the demand. Sea Kale is now coming very good. Cucumbers are scarce. Amongst flowers we have Orchids, Chrysanthemums, Heaths, Cyclamens, Primulas, Hyacinths, Tulips, Camellias, and Pelargoniums, and a large supply of dwarf evergreens and "Christmas trees." The following quotations for "bridal" flowers may be noted:—Orange blossom, very scarce, 6*d.* per flower on the spray; Azalea, 3*s.* per dozen blooms; Roman Hyacinth, 6*s.* per dozen sprays; white Hyacinth, 3*s.* per dozen blooms; Deutzia, 3*s.* per dozen sprays; Camellias, 15*s.* to 18*s.* per dozen; white Cyclamen, 2*d.* each (scarce); Paper Narcissus, 9*d.* per dozen sprays; Lily of the Valley, 1*s.* to 1*s.* 6*d.* per spray.

Fruit.

	s. d.	*s. d.*
Apples, p. ½ sieve ..	1 0	0 0
Grapes, per lb. ..	4 0	6 0
Lemons, per 100 ..	6 0	10 0
Melons, each ..	1 0	3 0
Oranges, per 100 ..	0 0	to 10 0
Pears, per doz. ..	2 0	6 0
Pine apples, per lb.	4 0	6 0

Vegetables.

	s. d.	*s. d.*
Artichokes, Jerusalem, p. lb. ..	0 2	0 4
Beet, per doz. ..	2 0	3 0
Broccoli, per bundle ..	1 0	2 0
Cabbages, p. doz. ..	1 0	1 6
Carrots, p. bunch ..	0 4	0 8
Cauliflowers, p. doz.	1 6	3 0
Celery, red, p. bun.	1 6	2 0
— white, do. ..	1 0	1 6
Cucumbers, each ..	0 6	1 0
French Beans, p. 100	2 0	4 0
Garlic, per lb. ..	0 8	..
Herbs, per bunch ..	0 2	0 4
Horseradish, p. bun.	3 0	5 0
Lettuces, p. score ..	1 6	3 0
Mint, per bunch ..	0 3	0 4
Mushrooms, p. pott.	1 0	1 6
Onions, per bunch ..	0 4	0 9
Parsley, p. bunch ..	0 2	0 4
Salsafy, per bundle,	1 0	1 6
Scakale, p. basket ..	1 6	2 0
Shallots, per lb. ..	0 8	..
Spinach, p. bushel..	2 0	3 0
Tomatos, per doz...	1 0	1 6

Potatos, Regents, per ton, 60*s.* to 80*s.*; Kidneys, 80*s.* to 120*s.*; Rocks, 50*s.* to 60*s.*

The Noted French Cold Grafting Wax

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For Grafting, Budding, Healing, and Layering, can be obtained of

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LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, pure hard parchment, 4 inches long, 4*s.* per 1000, or 10,000 for 35*s.*, cash only. Sample Label sent on receipt of 6 Stamps. Illustrated Catalogue free on Application by JOHN FISHER AND CO., Label Works, Bristol, Lambeth.

PRUSSIAN WOOD GARDEN STICKS and TALLIES, commended by the Royal Horticultural Society. The above can be had, of all sizes, wh. cash only of CHARLES J. BLACKWELL, Sole Manufacturer, Cross Lane Saw Mills, Seething Lane, London, E.C. Retail of the principal Seedsmen. Trade only supplied.

CHEAP PAVING TILES.—A manufacturing Firm having a large stock of TILES, MANUFACTURED TILES, can offer less damaged in the process of manufacturing, that they would be glad to dispose of the same. Address, TILES, 20, Mincing Lane, London, E.C., for description of Paving Materials. To Landed Proprietors these Tiles are invaluable for the floors of Cottages, Farmhouses, &c., and can be supplied at a very low price.

E. F., Post Office, Broseley, Salop.

SIR J. PAXTON'S HOTHOUSES for the MILLION. Price Lists free. A Pamphlet, with Views of these and other Glass Roofs, for two stamps.—HEATMAN AND MORTON, 14, Tichborne Street, Regent's Quadrant, London, W.

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TRIPLES, No. 1 .. .. ,, 2 0 2 6 3 0

SYPHONS .. .. .. ,, 1 4 1 9 2 3

VALVES .. .. .. ,, 0 9 1 0 1 6

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SCRIM CANVAS, 72 inches wide, 50 yards long, £1, 1*s.* 6*d.* a yard

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Particulars and Lithographed Plans of the Land to be laid out, and instructions generally as to the nature of the Designs wished, and of the scale, &c., on which the Plans are to be made, may be obtained of the Surveyor to the Commissioners.

Each Design to be distinguished by a motto, the Author's name and address to be enclosed in a sealed envelope, subscribed with his motto, and both to be sent to the Office of the Commissioners, at their Office, on or before the 7th February next

TO GENTLEMEN FARMERS.—The Friends of a young Gentleman of position, aged between 16 and 17, are desirous of placing him with a Gentleman Farming largely, competent to instruct him in PRACTICAL AGRICULTURE, and where his general education will be attended to. Hunting and Shooting required. —A. O., Messrs. Deacon's, 154, Leadenhall Street, E.C.

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WANTED, near London, an active MAN, who thoroughly understands the Propagation, Cultivation, and Value of Roses, Fruit trees, and general Outdoor Nursery Stock. Must produce references from last employer. Apply, in own handwriting, stating age, &c., to H. M., *Gardeners' Chronicle* Office, W.C.

WANTED, a SHOPMAN, capable of conducting the Retail Department of a London Seed Business.—Address, stating particulars as to experience, wages, &c., B., *Gardeners' Chronicle* Office, W.C.

WANTED, as SHOPMAN, a good Salesman, who has been accustomed to a Retail Shop Trade. Liberal salary will be given. Apply personally, if possible, or if the application is made by letter, state particulars as to experience, age, and salary, to BARR AND SUGDEN, 12, King Street, Covent Garden, London, W.C.

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To Gardeners and Bailiffs (Head, Foremen, or Under).

JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAMES, ADDRESSES, and COPIES of TESTIMONIALS, with age, &c., for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.

Any Person Gentleman requiring GARDENERS or BAILIFFS may apply at CARTER & CO.'s, stating the most stringent regulations in reference to testimonials as to ability, honesty, &c.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has now in his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.

Victoria and Paradise Nurseries, Upper Holloway, London, N.W.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. G. HENDERSON and SON, Vine Nurseries, St John's Wood, N.W.

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EXPERIENCED GARDENERS, also UNDER GARDENERS.—JOHN HARRISON, having a number of clever Men on his books waiting for Engagements, any Gentleman requiring Gardeners can apply to him personally, with Men of first-class character and abilities.—North of England Rose Nursery, Darlington

GARDENER (HEAD).—Age 40, married, from th South, is thoroughly practical in all branches of modern Gardening, including Heating, all kinds of Fruits, Flowers, and Vegetables, Kitchen and Flower Gardens, Stove and Greenhouse Plants, Fernery, Table Decorations, &c. Can be highly recommended. Wm. Fraser, Palestine Place, Whitham Road, Broomhill, Sheffield.

To Noblemen and Gentlemen.

GARDENER (HEAD).—W. NICHOL, Gardener to G. T. H. Powell, Esq., Drinkstone Park, near Bury St. Edmund's, would have pleasure in cordially recommending his Foreman, Charles Ford, to any Nobleman, Lady, or Gentleman, requiring the services of a thorough practical Man. Well up in growing Specimen Stove and Greenhouse Plants. Obtained a Certificate in Floriculture in April, 1870. Twelve years' experience.

GARDENER (HEAD), age 30, single.—J. MOWBRAY, Gardener, Burleigh, Cheshunt, Herts, is open to a re-engagement as above. He has a thorough practical knowledge of Grapes growing and all other branches of Gardening; is leaving present situation in consequence of the establishment being broken up, in which he has lived three years. Was previously Foreman in the Gardens of the Earl of Shrewsbury, Alton Towers, Sheffield. The highest references can be given.—Address as above.

GARDENER, where two or three Men are kept.—Married; understands Vines, Cucumbers, Melons, Wall Fruit, and Flower and Kitchen Gardening. Two years' character from present employer.—The GARDENER, Brook Heath, Breamore, Salisbury, Wiltshire.

SUPERINTENDENT or MANAGER, in a Nobleman's or Gentleman's Nursery.—Seven years' character—D., Mr Wraham, Goldsworth Nurseries, Woking, Surrey

To Nurserymen and Seedsmen.

NURSERY SALESMAN or SHOPMAN.—A young Man (age 27) is open to an engagement as above; is thoroughly practical, and has a first-class Knowledge of Seeds and Plants, Bookkeeping, &c. Has had experience in the Wholesale as well as the Retail Trade.—H. W., Messrs. Hurst & Son, 6, Leadenhall Street, E.C.

Seed Trade.

ASSISTANT, in an English or Foreign House (the latter preferred).—Age 18; two and a half years' experience. First-class references.—SEEDSMAN, Post Office, St. Giles, Norwich.

To the Trade.—Agricultural and Garden Seeds.

H. AND F. SHARPE are now prepared to make special offer of the above Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from adulteration of any kind. They are all harvested in splendid condition. Seed Growing Establishment, Wisbech.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING and COMPANY (Limited),
CORN, SEED, MANURE, and OILCAKE MERCHANTS.
Address, 26, Seed Market, Mark Lane, E.C.; or Basingstoke.
Samples, and the prices per bushel delivered free on Rail or Medals, 1851, for Wheat: 1862, for "Excellent Seed Corn and Seeds."

Notice to the Trade.

HURST AND SON beg to announce that their CATALOGUE is ready, and will be forwarded on application. It is their intention to post one to all customers; should, however, any not receive it, application should be made.
They hold in the stock of LAXTON'S NEW PEAS, QUALITY and QUANTITY, and also a portion of EARLIEST KENTISH INVICTA. Full descriptions will be found in Catalogue.
HURST AND SON, 6, Leadenhall Street, London, E.C.

NUTTING and SONS, 60, Barbican, London, E.C., beg to offer the following PEAS :—
NUTTING'S No. 1, WRINKLED.—One of the earliest wrinkled podded varieties, very prolific, and fine flavour, 2s. per quart.
NUTTING'S MULTUM IN PARVO.—A new early, and exceedingly prolific dwarf wrinkled marrow, with broad and well-filled pods, and of excellent flavour, 2s. 6d. per quart.
THE MARYBOYDLE.—A new and superior variety, tall-branching habit, large curved pods, very prolific, and of first-rate quality, 1s. 6d. per quart.
LORD PALMERSTON.—A superior dwarf wrinkled marrow, with fine long well-filled pods, and excellent flavour, 2s. 6d. per quart., Trade price on application.

WRIGHT'S GROVE WHITE CELERY.—One of the largest and best flavoured bleaching varieties ever introduced; after the same manner as the Grove Red, which can be had out by me. It has been awarded the First Prizes at the two Celery Shows held at Rochester, the same as the Sticks exhibited being 6 lb. each. It was raised by myself, and will be found one of the best White Celeries in cultivation. This is the first season I have been able to introduce it to the Trade, and as the stock of seed is limited, early orders are requested. Price 1s. per packet, or 9s. per dozen.
JAMES WRIGHT, Seed Grower, Hare Hatch, Twyford.
Agents: HURST AND SON, 6, Leadenhall Street, London, E.C.

BROCCOLI, ELLETSON'S NEW SURPRISE, large late white protecting.—This variety is a great improvement upon the Mammoth Cauliflower Broccoli, sent out 20 years ago by J. & I. Elletson, of Thorngumbald. It has given universal satisfaction, and protected itself to be the best late white Broccoli extant. Price 1s. per packet.
CUCUMBER, JOSTERS'S NEW, fine long Ridge.—This new variety is a remarkably fine, handy, long ridge, of good quality, and one that can be recommended with the greatest confidence. It is very prolific, and keeps its colour to the last. All who have seen it growing are satisfied that it cannot be surpassed, and those who have tried its flavour are convinced of its excellent quality. Length, 12 to 18 inches. Price 1s. per packet.
MELON, LORD NAPIER, New.—A handsome exhibition variety, golden yellow, and beautifully netted: green flesh, melting, juicy, and delicious in flavour; free setter, and hardy in constitution. Price 1s. 6d. per packet.
THOMAS PHILIP DIXON, Yorkshire Seed Establishment, 57, Queen Street, Hull.

A Boon for Grape Growers.

MEREDITH'S VINE, PINE, PEACH and PLANT MANURE, to be had in sealed bags of ¼ cwt., 10s. 6d.; ½ cwt., 21s.; and 1 cwt., 42s., with full directions for use. For further particulars, see Horticultural Gazette, Nov. 5, or, post free, on application.
JOSEPH MEREDITH, The Vineyard, Garston, Liverpool.

LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—
WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, for Root Crops and Lands.
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.
Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.
116, Fenchurch Street, E.C. EDWARD PURSER, Secretary.

REES and CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure ever introduced. In base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Anderson, Graham, Way, Ogston, and Mr. Sibson.
Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.
REES and CO.'S Biphosphoted Peruvian Guano Company (Limited), 32, King William Street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.
"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.
"January 15, 1870.
"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilizing character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, and fully the percentages of soluble and insoluble phosphates which I understand you guarantee. In short, it was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I am convinced, will it be appreciated by them.—Believe me, Sir, yours respectfully,
(Signed) "AUGUSTUS VOELCKER.
"The Secretary, REES and CO.'S Biphosphated Peruvian Guano Company, Limited, 32, King William Street, London, E.C."

Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE.
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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it another title, viz.
"THE TENANT-FARMERS' MANURE COMPANY."
Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.
Particulars will be forwarded on application to the Secretary, or may be had of the local Agents. C. T. MACADAM, Secretary.
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FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England.
For particulars apply to JOHN FOWLER AND CO., 71, Cornhill, London, E.C.; and Steam Plough Works, Leeds.

OXFORD FIRST PRIZE CHURN, suited for small occupations.
RADFORD'S PATENT COUNTER CURRENT. (See Report.)
Mr BRADFORD'S Counter Current Churn is excellent and the case with which the butter was got together, and completely freed from the butter-milk, without being touched by hand, also affords for perfectly cleansing the inside of the churn, combined with the superior quality of butter it produced, fully entitled it to the First Prize.
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THE GRANITIC PAINT, the best for the finest painting and the roughest work. Used in the Crystal Palace, Sydenham, by the Commissioners of Police, the Brighton and Metropolitan Railways, and very many Decorators, House Painters, Engineers, Architects, Contractors, Ironmasters and Shipbuilders.
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DAMP WALLS PREVENTED by the use of the SILICATE ZOPISSA COMPOSITION, and Porous Bricks and Stone, &c., for painting, preserving from decay.
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Robert E. Oliver, Esq., Sholebrooke Lodge, Towcester, Northamptonshire.
The Hon. Henry Petre, Chelmsford, Essex, *Chairman*.
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Chas. Spooner, Esq., 1, Fore Street, Westminster.
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Secretary, Mr. John Spencer.
Capital, £20,000; Shares, £2 each, £1 paid on allotment
Life Tickets, £3 1s., Annual Tickets, 10s. each, entitling the holder to purchase through his agency

This Association has been formed by gentlemen engaged in Agriculture for the purpose of supplying all kinds of Agricultural Implements or other goods, and more particularly the genuine Oilcakes and guaranteed Manures, on the co-operative system.
Farmers' Clubs and large consumers of Oilcakes, Manures, &c., are invited to co-operate with this Association for the purchase of Agricultural requisites
Further information, with Price Lists, Samples, and Analyses, on application to the Secretary.
The Association have regular importations of pure Linseed and Decorticated Cotton Cakes, direct from New York.
Best New York Linseed Cakes, in bags, £8 10s. per ton ex ship
Best Western Linseed Cakes, in bags, £10 7s. 6d. per ton ex ship.
Best Decorticated Cotton Cakes, in bags, £8 10s. per ton ex ship.
Special terms to large consumers.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL PROPERTY of every description, SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E.

FOR SALE, an old established NURSERY and SEED BUSINESS, within a few miles of London, containing about 14 Acres of General Nursery Stock, numerous Glass Structures, Seed Shop, Dwelling House, &c.
For particulars apply, by letter only, to G. H. H. C., 47, Bessborough Gardens, Pimlico, S.W.

To Nurserymen, Florists, and Others.

TO BE SOLD, the PORTLAND NURSERY, at Tonbridge, Kent, containing 6½ acres, of which about 2 acres are stocked with Shrubs, Conifers, &c., and held on a lease of 21 years, with a House and Cottage, &c., at the low rent of £80 a year. Stock to be taken by valuation—from £2000 to £3000.
For particulars apply to Messrs. STONEWALL AND SIMPSON, Solicitors, Tunbridge Wells.

TO BE SOLD, the STOCK, LEASE, and GOODWILL of a good NURSERY BUSINESS in the North of England (nearing districts), either for cash or security (a third can remain); a fine opportunity for an energetic practical man.
Full particulars on application, by letter only, with name and address, to "GERANIUM," 6, Gloucester Road, Seven Sisters' Road, Holloway, N.

Kensington Market Garden Ground.

TO BE LET for five years, TWELVE ACRES of GARDEN GROUND, in a good state of cultivation. For and usual crop and dressings, and manure to be taken at a valuation. Rent £70 per annum. House to be further part of the year.
Mr. STUTELEY, Architect and Surveyor, 4, Doughty Street; or of Messrs. TATHAM AND PROCTOR, 76, Lincoln's Inn Fields.

To Nurserymen, Gardeners, and Others.

TO BE SOLD, a very thriving and lucrative NURSERY and MARKET GARDEN, within 12 miles of London. The Land consists of about 9 acres, is well and abundantly stocked with Fruit Trees, Shrubs, Cedars, Oaks, Limes, and other young Forest Trees, which are now ready for removing, and would at once produce a large sum of money. The Fruit Trees include the choicest kinds of Pear, Apple, and Plum, now in bearing; and the varied stock of Shrubs and young Trees are in a highly promising and healthy condition.
There is a Cottage and large Propagating House (full of young Bedding and Greenhouse Plants) on the land, and also good Sheds and Stabling.
The Property is Leasehold for the term of 99 years, of which 77 years are now unexpired.
Immediate possession may be had, and a large part of the purchase money may remain on security of the premises.
This is an opportunity that rarely offers itself.
Further particulars may be obtained on application to
Mr. W. R. BROOK, Solicitor.
2 and 3, Abchurch Yard, London, E.C.

SALES BY AUCTION.

PRELIMINARY NOTICE.—The celebrated HERD of SHORTHORNS belonging to Jon. Peel, Esq., at Knowlmere Manor, Clitheroe, will be SOLD by UNRESERVED AUCTION, during the SPRING. Further particulars will be duly announced.
JOHN THORNTON.
15, Langham Place, London.—December, 1870.

Plants and Bulbs from Ghent and Dutch Nurseries.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on WEDNESDAY, December 28, at half-past 12 o'Clock precisely, choice CAMELLIAS, AZALEAS, RHODODENDRONS, specimen CONIFERS, Variegated HOLLIES, Standard and Dwarf ROSES, FRUIT TREES, DUTCH BULBS, &c.
On view the morning of Sale, and Catalogues had.

Lilium auratum from Japan.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W.C., on THURSDAY, JANUARY 5, at half-past 12 o'Clock precisely, about 7000 BULBS of LILIUM AURATUM, just arrived from Japan
On view the morning of Sale, and Catalogues had.

THE LANDS IMPROVEMENT COMPANY.—(Incorporated by Special Acts of Parliament.)
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Granville Ryder, Esq. (Managing Director), 2, Princes Terrace, Hyde Park, S.W.
Granville R. H. Somerset, Esq., Q.C., 6, Park Street, Westminster, S.W.
Henry R. West, Esq., Q.C., M.P., 10, King's Bench Walk, Temple, E.C.
Charles Watkin Williams Wynn, Esq., M.P. (Chairman), 2, Lower Berkeley Street, Portman Square, W., and Coed-y-Maen, Welshpool.
The Company advances money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.
IRRIGATION of SEWAGE.—The Company also advances money for the purpose of Works of Sewage Irrigation.
The whole outlay and expenses are liquidated by a rent-charge upon the land, redeeming principal and interest, over 25 years.
No investigation of title is required.
For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, Storey's Gate, Westminster, S.W.

Agricultural Land Improvements, Drainage,
FARM BUILDINGS, LABOURERS' COTTAGES, &c.
THE GENERAL LAND DRAINAGE and IMPROVEMENT COMPANY.
Incorporated by Act of Parliament in 1849.
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J. BAILEY DENTON, Principal Engineer.
Agricultural Improvements of any kind are executed by the Company, or the outlay thereon repaid to Landowners who prefer executing the work by their own Agents.
Tenants may also, by arrangement with their Landlords, procure the execution of such improvements.
The outlay, with all official expenses, may be charged on the Estate, and paid off by a rent-charge of about 6 per cent. in 31 years, or at the option of the Landowners in a shorter term.
No investigation of title necessary, and no legal expenses incurred.
Note.—The Company will undertake the Erection of Cottages for Agricultural Labourers at a reduced rate of commission and on very favourable terms.
Applications to be made to ARTHUR MILMAN, Esq., the Secretary, at the Offices of the Company, 22, Whitehall Place, London, S.W.

FRENCH PEASANT FARMERS' SEED FUND.
APPEAL to ENGLISH AGRICULTURISTS.
At a PUBLIC MEETING held at the SALISBURY HOTEL, Salisbury Square, Fleet Street, E.C., on MONDAY last, the 19th inst., the Right Hon. Lord STANLEY of Alderley, President of the Royal Agricultural Society, in the Chair, it was resolved to appoint a COMMITTEE for the purpose of COLLECTING DONATIONS in SPRING CORN, and SEEDS, and SEED POTATOES, for subsequent sale for their purchase, to enable the PEASANT FARMERS of FRANCE to SOW their LAND, and SAVE their NEXT YEAR'S HARVEST, thus averting an otherwise inevitable Famine.
The following Subscriptions were announced :—

The Right Hon. Lord Vernon	£50	0 0
The Most Noble the Marquis of Exeter	50	0 0
James Howard, Esq., M.P.	50	0 0
Messrs. Sutton & Sons	100	0 0
James Caird, Esq., C.B.	10	10 0
J. Speechly, Esq.	10	10 0
Robert Leeds, Esq.	5	0 0
John Clayden, Esq.	5	0 0
J. W. Bramston, Esq.	5	0 0
"Mark Lane Express"	5	0 0
E. W. Kingsbury	5	5 0
G. Maunder Allender, Esq.	5	0 0
S. Sidney, Esq.	1	1 0
Per A. Albright, Esq., of Birmingham		
A. Albright, Esq.	100	0 0
Sir T. Powell Buxton, Bart.	100	0 0
G. B. Lloyd, Esq., Mayor of Birmingham	100	0 0
John Edward Wilson, Esq.	100	0 0
Mrs. Wyatt G. Gibson	100	0 0
George S. Gibson, Esq.	50	0 0
Thomas Lloyd, Esq.	20	0 0
The Right Hon. Lord Leigh	10	10 0
Edwin Lander, Esq.	10	0 0
Thomas Ryland, Esq.	10	0 0
Miss L. A. Ryland	10	0 0
Jeremiah Matthews, Esq.	5	5 0
Charles Couchman, Esq.	5	0 0
William Sturge, Esq.	5	0 0
Robert Gutteridge, Esq.	5	0 0
T. B. Wright, Esq. (Midland Counties Herald)	2	2 0

A List of Donations of Grain and other Seeds will be published shortly.
Money Subscriptions will be received, and promises of Donations of Corn and other Seeds will be registered by—
B. T. BRANDRETH GIBBS,
JAMES JENKINS,
W. H. DELANO,
} Honorary Secretaries.
Salisbury Hotel, Salisbury Square, London, E.C.
Donations of Corn and other Seeds should be forwarded, carriage paid, to Odams' Wharf, Victoria Dock, E.
Subscriptions may also be remitted to the account of the "French Peasant Farmers' Seed Fund," JAMES HOWARD, Esq., M.P., Treasurer, at the Head Office and Branches of the London and County Bank.—Secretaries of Agricultural Societies, Farmers' Clubs, and Chambers of Agriculture are earnestly requested to aid this movement by organising Local Committees to collect Donations in the rural districts, and to otherwise aid the General Committee in London.

The Agricultural Gazette.
SATURDAY, DECEMBER 24, 1870.

The movement in behalf of the DISTRESSED FRENCH PEASANT FARMERS, inaugurated last Monday by the meeting reported in another page—Lord VERNON, the President of the Royal Agricultural Society in the chair—had already found expression in a considerable number of instances and centres throughout the country. The Midland Counties Agricultural Association, whose meeting precedes that of the Smithfield Club, did not separate without earnest sympathy with the proposal having been evinced. Mr. AVELING could speak of a meeting for the same purpose at Rochester. And there are many individual instances of liberality, showing that the need of offering relief has been generally felt. This makes us more hopeful for the result of Mr. HOWARD's letter to M. DROUYN DE LHUYS—a cry which has at length, we believe, roused the English agricultural

world to the great necessity of our French brother farmers. The speeches of Lord VERNON, Messrs. WREN HOSKYNS, ROBINSON, and ALERIGHT sufficiently describe the distress which already exists, and that greater distress which threatens many miserable districts in France unless help shall reach them before seed-time. They also explain the methods by which it is proposed that the help shall be applied. And, best of all, they give noble illustration of the actual amount of help which generous men are prepared to give.

The committee of superintendence who have been appointed will do well to seek the advice as well as to accept the gifts of the great seed firms, to whom Messrs. SUTTON have shown so excellent an example. They will also, we imagine, after clustering in numbers around Lord VERNON to show their interest in the work, do well as early as possible to transfer their responsibilities to a much smaller body, who may be able to give the time and consideration which must be devoted, if waste, delay, and neglect are to be avoided.

Let us hope that a suitable response will be made to their appeal by the great body of English, Scottish, and Irish farmers. Our correspondents "W. G. D." and "J. C. M." have been discussing lately the expenditure on seeds upon a single English farm. It appears that 10s. an acre is a moderate estimate of the cost of seeding arable land when more than a quarter of the occupation is in grass or Clover. More than £300 for every square mile, according to this rate, is needed. How many square miles are there not in the sister country, with that dense population which comes of small farming, whose inhabitants are despairing while we are feasting! Let not so great a contrast as the happy English Christmas time presents to that of France this year be destitute of fruit. It will undoubtedly add earnestness to many a prayer for the return once more of Peace on earth. Let that Goodwill to men, of which the time reminds us, find expression also in self-denying contributions to that special work of relief, of which as agriculturists we can understand the great necessity: and to which it is wisely proposed that the contributions of English agriculturists, which are now requested, shall be confined.

A CERTAIN REMEDY for PLEURO-PNEUMONIA would be a boon, which stockowners all over the kingdom would earnestly welcome. There have not been wanting "infallible specifics," from time to time, but their run has generally been very short, and altogether quackery has not found in the lung disease of cattle a favourable object of attention. The fact is, there is not much credit to be gained in dealing with a malady which is so generally fatal.

Some few of the many agents which have been tested, have undoubtedly proved beneficial in their effects upon the development of the disease, medicines which belong to the class of antiseptic tonics and stimulants, as creosote, ether, carbolic acid, have under various circumstances produced effects which entitle them to be considered among the most useful agents in the treatment of a disease which, at the best, is but little amenable to medicinal action.

Carbolic acid has been used to some considerable extent during the past three years, both as a remedy and also as a disinfectant; but until the publication in the *Times* of Professor BALDWIN'S letter to Mr. BEASLEY on the subject of the successful treatment of lung disease by this agent, no one thought of claiming for it any specific action in the cure of the affection, although many veterinary practitioners have employed it in conjunction with other forms of treatment.

The great difficulty which is experienced by practical observers in drawing any conclusions from the experiments which have at different times been carried out in reference to the cure or prevention of lung disease, is the capricious character of the malady. Sometimes, in spite of all the care which is exercised, the majority of the herd will be lost, while in another instance, under circumstances which are seemingly most favourable to the propagation of the disease, only one or two animals are attacked, and the affection disappears. So frequently are these discrepancies observed, that many stockowners ridicule the idea of pleuro-pneumonia being a contagious disease, and point to known instances of the sudden cessation of the affection after the loss of a single animal in the herd, in explanation of their disbelief.

Similarly, contradictory evidence is often given in reference to the effects of curative measures. One man has a run of successful cures for a time, and then the type of the disease is changed, and all the animals attacked die. Our experience with carbolic acid has led us to conclude that it possesses no specific properties as a remedy for, or a protection against, contagious lung disease of cattle; and yet we are satisfied from observation that the plan of procedure advocated by Mr. BALDWIN will, if carried out in all its details, be effective in preventing the spread of the disease. The efficacy of his system does not in reality depend upon carbolic acid at all, but, in plain terms, upon the rigid application of sanitary rules, the removal of sick from healthy cattle without delay, regulation of the diet, and the use of disinfectants. Carbolic acid as a disinfectant possesses some very important qualities; it forms with the atmosphere a medium which may be respired for some time without any injury to the membrane lining the air passages; it is volatile, and its odour in the cow-shed, or stable, will indicate its presence and prove that the attendant is not neglecting to employ it according to instructions; but, if owners of herds in which lung disease has broken out think to find in this drug a "cure" for the malady, and content themselves with merely administering a few doses to the sick cattle, and sprinkling the floor of the sheds in which the healthy animals are kept, we can assure them that they will meet with failure.

Strict isolation, careful attention to diet, ventilation, and cleanliness, we have often proved to be effectual in arresting the course of pleuro-pneumonia; but we have not yet discovered a chemical agent which alone is capable of curing or preventing the disease, when sanitary laws are set at defiance.

TWENTY years ago we directed attention in this Journal to the DIRTY SEED grievance. The publicity since given to this matter has probably rendered it impossible to find seeds in the market now of so base a sort as was common formerly.

The relation of this subject to the quality of "cake" is sufficiently obvious. In our Journal for January 8, 1859, will be found a paper on the use of dirty Linseed, in which we argued, (1), That Flax is not so remunerative a crop as it ought to be, because dirty seed is employed in its cultivation; and (2), That unless oilcake be priced strictly in accordance with its feeding value, the cheapest seed, but not the best, will be preferred in its production.

Now, the first statement has been borne out by observations of the quality, both of seed and fibre, when dirty seed was used. Flax Dodder—an imported weed, foreign Mustard seeds, and others, are evidences that weeds are sown with the seed; and we need not, therefore, dwell upon the injuries resulting therefrom. Our second proposition has been more than proved by the results of examinations into what we suppose would then, as now, be called genuine seed.

Having taken a sample of seed from a heap then going through the processes for making linseed cake, we have subjected it to examination with the following results:—

Results of Examination of a Parcel of Flax Seed used for Crushing.

Weeds, &c.	No. of seeds, &c.	Weight in grains.	Remark.
Sinapis arvensis and S. nigra	292	84	Probably other Mustards also
Agrostemma Githago (Corn Cockle)	24	32	A large, but dark weed seed, unknown in most foreign seeds.
Various undetermined weeds	17	40	Some grasses, as Millet, Darnel, &c.
Bits of dirt and stones	..	160	Probably derived from flax roots
	476	316	

Now, while this Table acquaints us with the fact that a pint of flax seed as imported into this country—and the evil might be increased if we grew from it—contained no less than *four thousand seven hundred and sixty weeds* to the pint, a further investigation into the matter as it affects cake, shows that in a pint of seed, which may practically be said to equal a pound, nearly half the weight of cake may be *weeds* and *dirt*.

Table of Weights of Flax Seeds and Foreign Matters in a Pint.

	Grains.	Grains.
Various weed seeds ..	= 760)	= 2476
Stones and dirt ..	= 1600)	
Weight of separated seed	= ..	2680

It follows, then, from these results, that, even without any intentional admixture, cake made from seed of this kind is not worth half the price of the truly genuine article; while at the same time it is called "genuine," or is said to be made of genuine seed as imported, simply because the manufacturer has not himself mixed anything with it. Dr. VOELCKER, however, reports cases where cakes, sold as "pure," were found on analysis to be adulterated with oat-dust, earth-nut cake and beech-nut cake. And every other agricultural analyist is acquainted with the frequency of samples of so-called genuine cake containing much rubbish, which must have been intentionally added.

In this state of the case it may be asked what ought we to do?—Simply make such frauds as those just exposed penal in fact, as, we presume, they already are in theory. Let the brand be what it may, "linseed cake" should be what its name imports, and not a mixture of earth-nut, beech-nut, or any other matter.

[We add, as capping the climax reached in the worst of these examples, the following copy of a letter sent to us from Liverpool—received there by a well known seed-crushing company, who, in forwarding this communication to us, add:—"It is, of course, untrue that the large houses here use this rubbish. Others besides ourselves have received a similar letter from the same man."

"46, East Lane, Bermondsey, London, S.E.
December 13, 1870.

"Sir,—I have some Cocoa-nut fibre dust of the finest quality, and used by many large firms in Liverpool, and other large firms throughout the country, for use in mixing cake.

"I can supply it at a cheap rate it does not deteriorate the quality, and adds fully 60 per cent. on the quantity used.

"Prices and terms sent on request. Soliciting the favour of an order, I shall be happy to afford you every information as to the use, &c., on conditions that they are private.—I am, gentlemen, your obedient servant,

"J. D. LEWIS.

"To the Secretary of the Mersey Seed Crushing Company, Liverpool."

It is well, while our Farmers' Clubs are just now engaged in discussing how they are to tide over a difficult season and keep their usual stock upon the diminished food supply of a dry summer, to place them especially on their guard. A scanty hay and Turnip crop necessitates unusual purchases of corn and cake; and so many traps waylay unwary purchasers, that good service is done by exposing such a glaring example as this letter offers. It is plain that care must be taken to deal only with respectable people. We do not know of any large firms in Liverpool, or elsewhere, who mix cocoa-nut fibre dust with their cake.]

—— PRICES fell 1s. or 2s. a quarter in Mark Lane on Monday last, rather, however, owing to the indifferent condition of samples. On Wednesday, trade continued dull.——At the Metropolitan Meat Market the supply has exceeded the demand in both the cattle and the sheep market, so that trade has been dull, and prices have been lower.

—— A correspondent on THE CAKE QUESTION tells us that his experience leads him out of the difficulty, by simply teaching him no longer to buy it. He purchases Linseed instead. Last year he fattened some Ayrshires—not always a profitable stock, except for the dairy—on Peas, tail Barley, and other tail corn, ground together, and found the mixture far more economical than cake. "Why, then," he asks, "should we not use our own corn in this way, and so let the fat beast carry the food there is in it to the market, leaving its manure behind, and thus saving us the costly cartage of corn, cake, and manures to and from town?" By all means buy "offal" of any sort that will suit your purpose cheaply, but pay for it as "offal," not as "genuine" cake.

—— Messrs. SHAW & SONS, who weekly supply us with a report of the seed market, have published a circular concerning the GROWTH this year of AGRICULTURAL SEEDS, from which we take the following:—

"The stock of old red Clover seed, left over from last year, consists of scarcely any English, and a very moderate quantity of foreign. The drought of the summer caused all descriptions of green food to be consumed by farmers, so that the acreage left for seed in this country was very small. Where seed has been saved from the first cut, the quality is fine, and the yield satisfactory; such seed, from its great scarcity, commands extreme prices. By far the larger quantity of seed saved in England is obtained from the second cut, the produce of which is small in grain and pale in colour—and the yield is not so good. In France the crop of Red Clover seed is almost a total failure. At the conclusion of the war the French will, without doubt, be large buyers from other countries. Belgium and Holland have a poor crop, and will both have

to import in order to supply their own needs. In Germany an average quantity of seed has been harvested, but the quality is poor; heavy rains having seriously damaged the seed at the period of its maturity. Italy has a fair crop, but the seed, as usual, is pale and weak. The only country we are warranted in expecting any quantity of red Clover seed from is America, where the crop is well spoken of both as to yield and quality; but whether she has a sufficient surplus to supply the deficiency of our own and other countries is exceedingly doubtful. The growth of white Clover seed in England is very small, but the quality fine. Germany has a large breadth, but the seed has suffered a good deal from the excessive wet. Belgium and Holland have produced very little, and France none. The crop of Alsike Clover seed in this country is short, but fine in quality. From Belgium we have none offering, and scarcely any from Germany. The stocks of old Trefoil seed are large; the breadth of English saved is small, but the yield is good. The prices now prevailing for this article are unusually low. On account of the drought, the crop of Italian Rye-grass seed in France is less than one-third of an average, and the war hinders the shipment of what little there is. The small stock now in London is held for higher prices. The crops of Scotch and Irish are of satisfactory quality, and prices are at present moderate. The English crop is small, and commands high rates. Scotch and Irish perennial and annual Rye-grasses are fair in quality, and are now in brisk demand, at advancing rates. The crop of Rape seed for sowing is very small, and stocks are exceedingly light. It has recently advanced 10s. per quarter. In consequence of an unprecedentedly large crop of Mustard seed, currencies have during the past autumn been lower than they have been known for many years; recently, however, there has been an advance of fully 2s. per bushel from the lowest point touched.

—— A comparison of the figures descriptive of number and price at the GREAT ISLINGTON MARKET at Christmas time, year by year, has some interest for agricultural readers. We quote the following, therefore, showing that this year's experience has not equalled the average of past years as regards supply, and somewhat exceeded it as regards price: –

Monday, Dec. 17, 1860.

	Price.			No.
	s. d.			
Beef	4 0 to 5 8	Beasts		7,343
Mutton	4 4 to 6 4	Sheep		10,120
Veal	4 0 to 5 4	Calves		[illegible]
Pork	3 0 to 4 8	Pigs		110

Monday, Dec. 16, 1867.

	s. d.			s. d.		
Beef	3 6 to 5	Beasts				8,111
Mutton	3 8 to 5 0	Sheep				20,840
Veal	3 8 to 5 0	Calves				298
Pork	3 0 to 4 10	Pigs				422

Monday, Dec. 14, 1868.

	s. d.			s. d.		
Beef	3 4 to 5	Beasts				5,200
Mutton	4 0 to [illegible]	Sheep				18,[illegible]00
Veal	4 0 to 5 0	Calves				2[illegible]
Pork	[illegible] to 5 0	Pigs				[illegible]

Monday, Dec. 13, 1869.

	s. d.			s. d.		
Beef	3 4 to 5 8	Beasts				6,750
Mutton	4 0 to 5 10	Sheep				17,470
Veal	3 6 to 5 8	Calves				153
Pork	4 0 to 6 0	Pigs				170

Monday, Dec. 12, 1870.

	s. d.			s. d.		
Beef	4 0 to 5 4	Beasts				6,[illegible]5
Mutton	4 4 to 6 2	Sheep				18,700
Veal	4 0 to [illegible] 0	Calves				[illegible]
Pork	4 0 to 6 0	Pigs				500

—— We gather the following from a Government report on COTTON IN INDIA for the present year. Cotton seed is now getting into more general use in America, also as food for cattle, but still its most essential elements find their way back to the soil in a very advantageous form, as all animal manures are there carefully preserved for the Cotton fields, whilst here, on the other hand, that advantage is lost in consequence of cattle manure being the favourite fuel used by natives for cooking purposes. The method of preparing manure from Cotton seed in America is simple and inexpensive. Alternate layers of it and stable litter are piled over each other in the open air; where the latter substance is unavailable the rich alluvial mud of "river bottoms" is substituted, and answers well. The seed soon heats and ferments, giving out ammonia in abundance. After standing two or three months the heap is turned over and mixed, it is then fit for use, and, with the addition of a little bone dust, guano, or some of the natural phosphates found in the country, which are cheap and abundant, a compost is found quite equal to the best patent fertilisers, and at a cost far below what freight and inland carriage would alone amount to in importing them into India.

THE FRENCH PEASANT FARMERS.

ON Monday evening last a public meeting was held at the Salisbury Hotel, Salisbury Square, to take steps for the collection of subscriptions in corn and other seeds, to be supplied gratis to the suffering peasant farmers of France, thus enabling them to sow their land, and avoid an otherwise inevitable famine. Lord Vernon, President of the Royal Agricultural Society, was in the chair.

Mr. B. J. BRANDRETH GIBBS, Hon. Sec. of the Smithfield Club, read the correspondence which has been already published in our columns between Mr. J. Howard, M.P., and M. Drouyn de Lhuys.

Mr. H. M. JENKINS, Secretary of the Royal Agricultural Society, read a letter from Mr. Howard, M.P., regretting that an illness which he could not disregard prevented him from being present at the meeting, as he had intended. The hon. member continued:—

"I would very briefly explain why I was induced to take up the subject of assisting the French cultivators. In the early part of October I met with friends from France who gave such a description of the desolation wrought by the contending armies, and the utter ruin which seemed inevitable to the farmers of France, unless by extraneous aid they could be supplied with seed wherewith to sow their fields, that after consulting with members of the Farmers' Club, of which I am the chairman for the year, I at once wrote to his Excellency M. Drouyn de Lhuys, the President of the French National Agricultural Society, to ask his advice and co-operation. It was my intention on receiving his reply to put myself in communication with your lordship as President of the Royal Agricultural Society, and other leading men in agriculture; but on the very day I received the reply of M. Drouyn de Lhuys, I was seized with an illness which prostrated me for a month. As soon as I began to recover, I wrote to his Excellency to say that I felt unable to prosecute the scheme, and recommended him to address the Earl Powis on the subject; for as the Cattle Show was at hand, his lordship, as President of the Club, would have an opportunity of bringing the subject before the farmers of England. I am very glad that the question has been taken up by your lordship and other influential men connected with agriculture, and I have no doubt that the farmers and landed proprietors of England will respond to the call for their aid in a manner not only gratifying to the general British public, but which will gladden thousands of the cultivators of the soil of France, and probably for generations beget in their minds and hearts kindly feelings towards the English people."

Lord VERNON, in explaining the objects of the meeting, said that it was totally unconnected with any of the agricultural societies, and he was all the more anxious to say this lest his presence should lead to the belief that the question had been taken into consideration by the Council of the Royal Agricultural Society, to which he belonged. He had been asked simply as an individual to take part in the proceedings, and had consented with the hope they all had in common of doing something that would help many fellow-creatures who were at present in great need. Neither had the meeting a political tendency. In the movement they had met to inaugurate they were not animated by especial sympathy for either of the parties to this terrible war. No doubt if the same distress had prevailed in Germany as in France, there would have been many agriculturists who would have been equally anxious to contribute to their necessities. If we considered that in the trail of the contending armies there followed inevitable desolation and destitution and misery, we could form an idea, though a very faint one, of the welcome reception which would await any such relief from this country as was now proposed. Nothing could be more terrible than the detailed accounts furnished us of the warfare which had been raging; and if the retrospect was terrible, and the present aspect dark, what was the future? It was not only that the people of France were now in many cases without homes and food, but there had been taken away from them all means of cultivating the soil; their implements had been destroyed, and there was nothing but starvation before them. To assist in the objects of the meeting was, therefore, well worthy of the great, and, he might add, prosperous agricultural body of this country, and they should the more sympathise with their neighbours, when they remembered that the French peasantry, who were a gentle, laborious, and thrifty race, were in nowise responsible for the causes which had led to these painful results. If any of the English agriculturists, therefore, felt disposed to take the matter up, and contribute either grain, material, or money, to assist the French peasantry, it would sow the seeds of an amity and goodwill between the two countries, which hundreds of years of ordinary intercourse would not have done. The committee must, however, be very particular in carrying out the necessary arrangements, to do nothing which would compromise the position of the Government of this country, and the utmost care would have to be taken that the contributions were strictly used for the purpose for which they were subscribed, namely, for the replenishing of the ground, and not for food.

Mr. WREN HOSKYNS, M.P., moved a resolution, nominating a committee "for the purpose of enabling the peasant-farmers of France to sow their land and save their next year's harvest." The persons who were thus to be aided belonged to a class who, had they had the opportunity, would, he believed, have done everything they could to prevent the war, from which they were now such dire sufferers. They should be preeminently objects of interest to us, because they were our neighbours and allies, and surely under the wonderful immunity we in this country had enjoyed from this four months' ruin and desolation, we ought not to be backward in giving our gratitude some practical form. Being in Lisbon some time ago, when the Portuguese relations with England were not of the most cordial kind, he could well remember how the traditions of the relief sent by us at the time of the earthquake, handed down from father to son, helped to lessen the unfriendliness which was imminent. He hoped, therefore, the movement they were establishing would be thoroughly taken up by agricultural England.

Captain GOODENOUGH, who had lately spent some weeks in the neighbourhood of Sedan, voluntarily aiding in the distribution of the French Peasants' Relief Fund, seconded the resolution. About Sedan, where there were manufactories, the people were not so purely agricultural as at Metz, but there such assistance as that proposed by the committee now being formed would be extremely valuable and welcome. In that district the farms were not, as in other parts of France, cut up into very small parcels, for there were some farms of the considerable size of 600 acres. Upon this property the steam ploughs which the Society of Friends were sending out would no doubt be able to work advantageously. He most cordially endorsed what the chairman had said with reference to the good feeling which was likely to be excited in France by expressions of sympathy like these on our part. Too much importance could not be attached to the caution to be non-political; and it was very satisfactory to know that all the efforts which the societies near Metz and Sedan had made had been not only received by the German authorities with great kindness, but seconded by them wherever possible.

Mr. AVELING, of Rochester, said that care must be taken not to cover ground which was already covered by other funds. A meeting of farmers at Canterbury on Saturday considered the question of seed contributions, and agreed to aid in the work to the utmost of their ability; but they came to a pretty unanimous conclusion that money contributions would be equal, if not preferable, to grants of grain and seeds. Antwerp, at the present moment, was overcrowded with corn and seeds, only waiting the conclusion of the war to dispose of them.

Mr. CORBET moved, and Mr. ALLENDER seconded, the appointment of Mr. Howard, M.P., as treasurer, and Messrs. Gibbs, Jenkins, and W. H. Delano, hon. agent in England of the Société des Agriculteurs de France, as hon. secretaries, and the motion passed unanimously.

Mr. ALBRIGHT moved, "that the secretaries of agricultural societies, farmers' clubs, and chambers of agriculture, and the clerks of corn and cattle markets, be and are hereby requested to give publicity to the appeal to be issued by the committee, and to aid in forming local committees to collect contributions, and to otherwise aid the general committee in London." While agreeing that contributions in money were desirable, he thought the committee would fail in their object if they confined their receipts to them, or expected large sums of money from the farmers. His own belief was, that for one case where they would get a farmer to put his hand into his pocket and give a guinea, there would be 20 who would willingly send a half-sovereign's worth of seed.

Mr. SUTTON, of Reading, in seconding the resolution, said that he knew of an area of land in France, 200 miles in length and 60 miles in width, which had been prevented from yielding crops by the armies marching over it. His firm had authorised him to offer a considerable quantity of useful seeds, but since he had been in the room it had occurred to him that money would be the most convenient. On behalf of Messrs. Sutton & Sons, of Reading, he therefore offered the committee £100 in cash.

Mr. TRETHEWY moved a resolution authorising the general committee to purchase seeds with the money subscriptions, after having ascertained what corn and other seeds are most likely to be useful.

Mr. J. R. ROBINSON, who seconded this motion, reminded the meeting that from the first a want of seed corn had been spoken of by the various gentlemen who had visited the devastated districts. The mayors of the villages also made an appeal at the commencement of the movement which the meeting was promoting. That appeal stated that "In the sections of country that have been traversed by the German armies nothing remains of the provisions that had been accumulated in time of peace. Our houses, stables, and barns are burned or riddled with cannon-shots. The fields and meadows are trampled down by the tread of embattled hosts. Neither cereals nor grass have been harvested this autumn. All our beasts of burden, all our beeves, sheep, and swine have been taken from us. Our labourers are either pressed into the French army as soldiers, or into the German army as teamsters. There remains not even seed-corn. We are destitute of strength to prepare the trampled ground for seed for next season's harvest, and destitute of material to sow." A letter received but a few days ago from France said upon the same subject:—"When we stopped, after a fatiguing round through a number of field lazarets, our talk turned upon the misery in which the peasants of the ravaged districts lingered between life and death, without nourishment enough to ward off the typhoid form of dysentery with which nearly all are afflicted, and which must shortly become epidemic unless energetic help arrives. When I understood that not only the horses, cattle, and strong men were gone, but that next year's supply of food would depend on grain to be sown, and that even the pittance necessary for this sowing was taken from them, while their agricultural tools and machinery, and even the vehicles that were not taken for army transports had been cut up and burnt for camp fire-wood—when I saw that they had neither victuals nor means of procuring victuals from the distant parts of the country, which are less depleted, I asked, 'What can be done

to help this wretchedness?'" There could be no doubt whatever, therefore, that seed corn was badly wanted in all directions, and the committee, happily, would have the advantage of not working in the dark. The Society of Friends amongst the distressed French people was represented by eminently practical men. He might mention as an interesting fact, supplied to him in a recent communication from the United States, that the American farmers were contemplating a movement similar to that under discussion. The object of these efforts in England, not being to pauperise the recipients of relief, it was most desirable, as soon as possible, to see the people depending upon themselves as before, and the operations of the newly-formed committee would, he believed, work powerfully towards that end, not only because it would assist a return to necessary farming operations, but because a revival of one form of industry generally awakened and strengthened others.

Mr. HALL suggested that the sackmakers of the country should be requested to supply the committee with bags gratis.

On the proposition of Mr. SIDNEY, seconded by Mr. LEWIS, the general committee were authorised to secure a suitable warehouse for storing contributions.

M. BARRAL, son of the well-known French agriculturist — the Editor of the *Journal d'Agriculture Pratique*—expressed his acknowledgment of the friendly generosity of the English people. He said:—I beg, in the name of France, and particularly in that of the French agricultural press, to give you our most grateful thanks for what you are doing; and we hope one day to show you how great are our gratitude and friendship towards England. Allow me to give our special thanks to your aristocracy, who are always at the head of such undertakings as the one that occupies you to-night; allow me to add that if we had in France such a noble, able, and kind-hearted aristocracy as yours, we should not ask for a republic, but would have the same form of government as your own.

Thanks were voted to the Chairman, and to the proprietors of the hotel for the use of the room.

Subscriptions to the amount of £1000 were sent in.

OUR LIVE STOCK.

CATTLE.

THE Knowlmere herd, so widely known in connection with the name of Mr. Jonathan Peel, will be sold by auction during the coming spring by Mr. Thornton.

—— A short time ago we noticed the first produce by Mr. Bowly's 2D DUKE OF TREGUNTER at Siddington. Since then other calves have been dropped to this exceedingly well bred bull, and among others we may mention that *Lady Bates 3d*, the property of Mr. W. W. Slye, of Beaumont Grange, has produced a red bull calf to him, which Mr. Slye speaks of as a long, good one, with a stylish head, and good quality of flesh. *Lady Bates 3d* has, we understand, "produced four calves since Mr. Slye bought her in 1867. BARRINGTON OXFORD (25,607), by Colonel Towneley's bull BARON OXFORD (23,375); a red and white heifer, *Lady Thorndale Bates*, by 4TH DUKE OF THORNDALE (17,750), now in calf to 2D DUKE OF TREGUNTER; and *Lady Thorndale Bates 2d*, a rich roan by 4TH DUKE OF THORNDALE, bought by the Earl of Dunmore, at four months old, for 400 gs."

—— A valued contemporary and leading authority on Shorthorns, gives the following account of the breeding of Mr. Pulver's celebrated Birmingham and Islington ox:—

"The sire of the Islington ox was BIDDENHAM (21,277), bred by Sir W. de Capell Brooke, and was the son of LORD STANLEY SPENCER (20,220), a white bull bred by Mr. Charles Howard, and got by HAYMAN (16,245), a Booth and Princess bull bred by Mr. Robinson, of Clifton Pastures, and from *Lady Selina Spencer* by 2D DUKE OF CAMBRIDGE, a descendant of the Chilton herd of Mr. Mason. LORD STANLEY SPENCER was a very fine animal, and a good stock-getter. The next bull under the general head of BIDDENHAM as the sire, was HERO OF KARS (19,986), bred by Mr. Stewart Majoribanks, and got by KING ARTHUR (a son of VENUS VICTRIX), and from a Goswick cow. The bull immediately preceding, still under the general head of BIDDENHAM, was HABEAS CORPUS (10,294), bred by Earl Ducie, and the property of Mr. W. Ladds, Ellington; got by WHITAKER'S COMET (8771), from *Fair Helen* by PETRARCH (7329), with male antecedents of YOUNG MATCHEM, PRIAM, YOUNG ALEXANDER, and PILOT. DRIVER (3620), a grandly descended bull, bred by the Duke of Buccleuch in 1838, inherited peculiarly fine blood, running up to NORTH STAR and C. Colling's WINDSOR (698), and DUNCAN (1942), was by COLONEL Cradock's MAGNUM BONUM (2243), from *Rosamond* by PIRATE (2431), with a pedigree proceeding from *Damsel* by BOUGHTON (90). . . . Such is the history of the sires of Mr. Pulver's ox, so far as they are comprehended under the name of BIDDENHAM. With regard to the female side, it may suffice, for our purpose, to examine the lineage of BRIGHTON (25,672), the sire of *Beauty*, the dam of the ox of 1870. BRIGHTON was bred by Mr. Bagshaw, and became the property of Mr. Pulver. His sire was Mr. Bagshaw's WINDSOR (23,225), the son of TESTATOR (20,938), very well bred, and of *Princess Alice* by POMPEY (10,622); the rest of the bulls under the head of Mr. Bagshaw's WINDSOR were AUCKLAND (5766), a Scaleby Castle bull by YOUNG GAINFORD; DUNCAN (1942), mentioned before; and TRINCULO (2775), from a line of fine old dams by bulls in whom very old blood put a stamp to which Mr. Bagshaw was partial.

—— Although *Punch* considers it as indeed sad that after moving the admiration of crowds both in Birmingham and London, and winning hundreds of pounds in prizes for his owner, the Pulver ox should have been sold for a "paltry" hundred pounds to be slaughtered at Gloucester, yet we cannot but think that such is the legitimate end of both the breeder's and grazier's art. We lavish encomiums upon symmetry, quality, and pedigree, but in the midst of all this it is wholesome to be reminded that, after all, the end of the Shorthorn and Hereford, the Devon and Sussex, is the same, namely, beef. After devoting much space for months past to the results of sales where pedigree and symmetry, fashion and beauty, have ruled the market, it seems only right at the present time to glance at our favourites divested of these distinctions of lineage and personal attractions, standing before the butcher as so much live beef or mutton soon to be converted into dead meat. The long lists of cattle markets and fairs furnish abundant material for our purpose. Take for instance, Northampton, famous for good cattle, where "two fine Shorthorn beasts, the property of Mr. Colledge, of Regent Square, Nottingham, and intended for Christmas beef, were exhibited;" the one having been purchased from J. Hardy, Esq., of Dumstall, Burton-on-Trent, and the other of Rowland Wood, Esq., of Clapton, for £60 and £65 respectively. Or Leeds, where one beast brought £80. Or Wakefield, where in a somewhat dull market some of the best beasts realised from £50 to £60 each. At Reading 500 beasts were brought into the market on Monday, the 12th inst., some of the best making from £36 to £54 each. A large number of sheep were also shown, the prices for which ranged as high as 106*s*. We are informed in the columns of the *Herts and Beds Express* of a wonderful sale conducted by Messrs. Harding & Eve, at Hitchin, where an experienced breeder "assured us that he could go round the yard and without difficulty draw 100 sheep from the pens better than the best 100 that were shown at Islington, and, as for the beasts, a primer collection of live beef could scarcely be desired." At this remarkable gathering of good animals were 123 cattle against 119 exhibited last year, and the average price was £35 6*s*. against £28 10*s*. last year. The highest price was £58 5*s*. against £60, and the total receipts, £4341 10*s*. against £3396 12*s*. 6*d*. in 1869. The admirable Sussex Downs of Lord Dacre, which have won distinction from judges at Hertford, Smithfield, and elsewhere, have nowhere showed in better form than here. The first ewe put up fetched £4 10*s*. from Mr. Finch, and this was the dashing prelude to a highly successful competition, as the lowest of Lord Dacre's prices was £3 12*s*. 6*d*. The 10 tegs of Colonel Ames were certainly about the finest lot we have seen this year; the one lot fetched 75*s*. and the other 73*s*. each, Mr. Tingey being the purchaser in both cases. Mr. James Low, of Baldock, and Mr. Charles Sworder, of Willian, may fairly divide between them the honour of sending the largest number of well made-up sheep in the yard. A few of Mr. Low's old Downs were enormous in bulk, and were fit for sale this time last year. Mr. Dick Atkins bought the dearest of them for £7 7*s*. 6*d*., Mr. Tingey gave £7 for another, and Mr. Mead £6 7*s*. 6*d*. for a third. Mr. Sworder's were not so heavy, though in quality they were no whit inferior: Mr. Davis, of Bedford, gave £10 6*s*. for one couple, and the average price of the whole lot was over 93*s*. per head. Mr. Richard Marsh's half-breds and Downs were very conspicuous for size and quality; Mr. Harris, of Finedon, gave £6 17*s*. 6*d*. for one, and the whole lot made a very stiff price. Some choice bullocks and heifers, belonging to Mr. S. Wollatt, of Aston Bury, started the cattle sale; then came a prime detachment of ripe Shropshire bullocks, something like Herefords in their general features, with long sweeping horns—not quite so fine in the frame as Herefords, but with plenty of bulk, well laden with choice meat. The Shorthorn bullocks of Mr. Richard Eve were all good, and the best went to Mr. Tingey for £40 10*s*. A very massive Shorthorn bullock, the property of Messrs. Lucas, of Hitchin, was knocked down to Mr. Barker for £52, being near £10 more than had been bid for him in his stall a few days before. The largest price in the sale was made by a splendid Shorthorn bullock belonging to Mr. William Lowe, of Beadlow, and purchased by Mr. Wilson, of Luton, for £58 5*s*., after a sharp and exciting contest among the butchers from far and wide. Last year Mr. James Low had the highest price (£60) for a bullock, but this year he was beaten by his own brother by just a crown. Mr. James Low's Shorthorn bullocks were very heavy; and besides the enormous meat-carrier which Mr. Walker bought for £58, there were several unusually fine beasts of the large, old-fashioned build; and if they had not the perfect symmetry of some lighter animals, it certainly was not for want of time in which to grow mature. We particularly noticed a splendid massive Hereford bullock, sent by Mr. Quenby, of Gravenhurst, of splendid proportions, and loaded all over with ripe meat, not overdone with fat; it fell to Mr. Hart for £46 10*s*., and will probably turn out one of the best bargains of the day. After a capital sale of Mr. Sowerby's two Shorthorn bullocks, the Herefords of Mr. J. S. Leigh commanded much attention, though some of the butchers were a trifle shy in bidding. These animals had perhaps the very best feeding and highest quality in the yard; they had taken their food so kindly that they were, as the poet says—

"——— Too good
For human nature's common food,"

though they brought tolerably high prices, and Mr. Leete saw his way up to £55 for the heaviest of the number. Mr. Francis Fowler's Shorthorn bullocks and heifers were especially good both as to size and quality, and made good money. Mr. Inskip, of Shefford Hardwicke, only sent one Shorthorn bull, but it was a wonder to see. It was not so much for his bulk but for his compactness, and the enormous weight of meat, reaching down to the ground almost, concentrated on a frame that did not look particularly large. The beast was calculated to weigh 26 cwt., and was sold to Mr. Stone, of London and Putney, for £54. Lastly, we have to refer to two north country sales, that of Mr. Carr, at Heslington, near York, where Scotch cattle realised an average of £24 each, and fat bullocks made from £34 to £38 apiece; and, further north, Lord Durham's most successful sale. Hence we learn that, co-extensive with the spread of pedigreed stock for breeding purposes, is the production of first-class butcher's meat. Such results as we have just recorded would have been unattainable but through the efforts of cattle breeders at the end of the last and commencement of the present century, sustained as they have been by the energy and enthusiasm of their successors.

POULTRY.

Fowl Keeping (see p. 1613).—Having had an experience of 18 years' fowl keeping, I can fully endorse what Mr. Mechi states as to their being profitable. I keep between 30 and 40 hens—never more than 40 nor less than 30,—nor have I ever had more than one male to serve that number. And of the eggs set, fully 95 per cent. have chicks in them; and should a hen "steal a nest," she invariably brings off a chick from each egg. Therefore, I am of opinion that 30 females are not too many for one well-fed, active young male. I invariably buy the heaviest and cleanest Wheat, Barley, or Indian Corn I can get—never less than a sack at a time, but generally two—with which they are thoroughly satisfied twice a day; when, after their morning's meal, they generally stray off and pick up myriads of ants, woodlice, &c.; and if there are not myriads of insect-food for fowls in "A. B.'s" neighbourhood he is much to be envied. If "A. B." and all other fowl keepers will thoroughly satisfy their fowls with corn—supplied to them—they will not meddle with standing corn, and with but very little of green crops; but they will stray off in search of worms and insects, and find them too, even on "A. B.'s" premises and fields. May not "A. B.'s" "poor curate and half-pay officer" attribute their failure to being too economical in the use of corn for their fowls? *T. C.*

PROFITS OF PRIZE FARMING.

No. I.—THE ASHGROVE FARM.

NOTHING is further from my wish than to prove a *reductio ad absurdum* of the management of this farm, but as it has been held up to the agricultural world as a model farm, having been considered by competent judges worthy of a splendid piece of plate, I think it only fair to look into its management, more especially when an article appears in the *Agricultural Gazette*, signed "J. C. M.," and giving its readers a very fair insight into the cost of management and the yearly receipts of the farm. I am willing to allow that I have in a few instances over-estimated the expenses. I allow that £480 for the keep of the horses is too much. I will acccept "J. C. M.'s" figures instead. As regards the rent, he said it was 24*s*. an acre, or thereabouts, but as he did not specify that that sum included rates and taxes, I charged for them also. I now accept the 24*s*. as being the rent, rates, and taxes per acre. I cannot accept his figures for the seeds and seed corn. I know of no facilities that a farmer has for getting his seeds or seed corn cheaper than other people. If he uses his own seed year after year he plainly does wrong, and if he does, he must charge himself market price for it in a case of this sort, where full value is allowed on the receipt side for all the corn he grows. According to "J. C. M.'s" own showing it must cost 12*s*. an acre for seed for the Wheat and Barley or Oats, therefore 400 acres cost £240. The Clovers and Rye-grass and Tares, at the prices these seeds have been for two years, cannot cost less than £1 per acre—for 20 lb. of Clover is sown per acre,—£260 is therefore a moderate sum for these seeds. I put £35 for Mangels, Swedes, and Turnips, and for this sum there will be only one sowing, and that not over thick; so instead of charging at least £80 too much, I charged £55 too little. Fault is also found with my estimate of the tradesmen's bills, at £200, and "J. C. M." says, considering a blacksmith's and carpenter's shop is part of the equipment of the farm, that I have, therefore, put the bills at £50 too high. True, there may be a shop of this sort on the farm; but, unless the work done in it is included in the

£1200 labour (and I do not think "J. C. M." means that), the mere fact of the shop being there will not lessen the work the two tradesmen have to do. In tradesmen's bills I include blacksmith, carpenter, bricklayer, harness-maker, wheelwright, ironmonger, farrier, druggist, ropemaker, sievemaker, machinist, limeburner, and if Ashgrove Farm gets off for £200 a-year, with all this array of demands, I think it does well. I cannot, therefore, reduce this item in my account. With a view of making the most favourable balance possible, I will reduce the wear and tear on the implements from £80 to £60, and as regards the bought-in sheep, I will allow them to make 10*s*. a head over cost price, that is £75, which, added to the £50 I have already allowed for mutton, over and above the £800, which "J. C. M." told us was about the amount realised for the produce of the 400 ewes, will, I think be a very fair return for mutton made upon this farm. I will reduce the sundries from £80 to £50, which must be a very reasonable sum for attending markets, carriage of various things, dressing ricks, and, in fact, the sundries that are so difficult to keep down. But there is an item which I must now add, and which I quite overlooked before, and that is steam threshing—not the labour for that, but the use of the engine and machine. There are supposed to be 1650 qr. of corn threshed yearly; for this I must charge £82.

My amended amount of expenditure shall therefore stand thus :—

Rent of 800 acres, including all rates and taxes	£660
Wages	1200
Linseed cake	1200
Superphosphate	250
Seeds and seed corn	535
Corn for horses (18)	320
55 calves bought in	60
Steam threshing	82
Tradesmen's bills	200
Wear and tear on horses	90
Ditto on implements	60
Sundries	50
Interest on £6000 capital	300
	£5297

It will be observed that I have not charged a farthing for the food of the 15 breeding sows, nor anything for coal for steam-threshing or steam-ploughing. "J. C. M." thinks that if the receipts were over-hauled they would bear stretching. I hope they may, most sincerely; for I should be glad to see the best farmed land within a certain radius of Oxford proving itself a paying concern. Here are the receipts :—

120 acres Wheat	£1080
280 acres Barley	2240
Mutton from 400 ewes and their produce	850
Wool	500
10*s*. a head on 150 sheep bought in to eat Turnips	75
Produce of 15 cows	250
20 to 25 cattle	400
Milch cows	25
Poultry	25
	£5445

I don't think this will admit of any stretching. Will it be said that the 400 acres of corn have realised for the last three years £3320 a-year, that is, £8 6*s*. per acre? Will 15 breeding sows make £250 a-year from simply the refuse on this farm? There is nothing charged for all the food they eat whilst suckling their litters. Is not £25 a good price for the chicken corn? I have, I firmly believe, stretched the receipts beyond what is reasonable, and I have also, I believe, reduced the expenditure far below what it really is, and yet I can only find £148 as profit. I hope my statements may be challenged again, and, if possible, a better Dr. and Cr. account made out. As I said before, I shall be truly glad to find I know nothing about it; for it is an awful consideration if the model farm can make but about 3*s*. 6*d*. an acre profit. What, then, must be the fate of the Treadwells, the Dashwoods, and the rest of the unsuccessful competitors? If I had included £75 for the food of the suckling sows, and the cost of coal on the expenditure side (and these ought to be there), and if I had put the receipts for the 400 acres of corn at what they have in all probability made—viz., £3000, or £7 10*s*. per acre, instead of £3300 or £8 6*s*. per acre,—the expenses would be about £5400, and the receipts only £5145, or, in other words, a loss of about £250 a-year; and I yet think that this is more likely to be the fact than a profit of £148. *W. G. D.*

No. II.—The Kirtlington Farm.

Having ventured to pick to pieces the Dr. and Cr. account of Ashgrove Farm, I will now, with your leave, do the same with Captain Dashwood's. As with the prize farm, so with this—I am obliged to guess at certain expenses as well as at certain receipts. Subjoined is what I have arrived at :—

Receipts.	
170 acres of Wheat	£1657
310 ,, Barley	2970
80 ,, Oats	750
30 ,, Beans	513
40 ,, Peas	513
Mutton : 600 fat tegs	1800
Wool of 600 do.	240
Wool of 300 ewes	180
Cull ewes fed off	440
300 bacon hogs	1650
90 bullocks	1700
	£11,920

Expenditure.	
Rent, 1070 acres, 27*s*.	£1444
Labour, 40*s*. per acre	2140
Cake and corn, 42*s*.	2247
Manure	600
Seeds and seed corn	600
Corn for 28 horses	534
Ninety bullocks, £14 each	1260
Steam threshing and coal	185
150 sheep tegs, 45*s*.	338
Seven rams	50
Tradesmens' bills	250
Wear and tear on horses	140
Ditto on implements	80
Sundries	100
Interest on £10,000 capital	500
	£10,668
Profit to balance	1,282
	£11,920

I have calculated the Wheat at 6*s*. 6*d*. per bushel, the Barley at 4*s*. 6*d*., the Oats at 3*s*. 3*d*.—taking the various quantities as stated by "J. C. M." in *Agricultural Gazette* of December 10. The Beans and Peas I have guessed at. I presume, judging from what I see and hear of Oxfordshire Down tegs sold in spring of the year at Bedford market, that I have not overstated their value out of their wool at 60*s*. each. Their wool I put at 8*s*. a fleece, which is very moderate, even at present price of wool. I have allowed the 90 beasts to make about £5 each for winter feeding—of course this can only be conjecture, for unless one sees an animal one cannot tell its value. The bacon hogs I have averaged at 10 score each; this is probably below weight, and I have only allowed 10*s*. a score for them. My endeavour has been not to "inflame" the receipts. As regards the expenses, I think I have put them as high as they will bear. The rent I take from "J. C. M.'s" statement; also the labour, the bought food, and the artificial manure. Having given credit for 600 fat tegs, which are, in all probability, all the lambs that come to maturity from 500 ewes; and having also allowed for 150 cull ewes fed off, I have charged for 150 she tegs bought in to keep up the flock, and I have also charged for the purchase or hire of seven rams. These two items are invented by me, nothing having been said about them in "J. C. M.'s" statement, but they are fair and reasonable charges. I have put the capital at an amount which may be considered high, but for such high farming as this the capital must be large. I have made it under £10 an acre, that is as little as it can be. The result is a clear profit of upwards of £1 an acre, a sum which is not disproportionate to the magnitude of the concern. A man risking a capital of £10,000, and having to give his talents and time to such a business, ought reasonably to expect such an income. I have charged nothing for a bailiff; in the Ashgrove accounts I made no such charge. This Kirtlington farm is rather larger, but its size is not unwieldy, and does not need more supervision than one business man can give to it. It seems then that at Kirtlington there is a gross return of about £11 4*s*. per acre, and an outlay of £9 18*s*. an acre. This sum shows that the capital is none too much. I have not had the advantage of seeing either Ashgrove or Kirtlington, but judging from what one reads of these two occupations, and working out the results to the best of one's ability, if I were asked to embark any capital in either, I should, without hesitation, declare for Kirtlington. *W. G. D.*

STRAW AS FODDER.

[At a recent meeting of the Newbury Farmers' Club, Mr. F. Everett, of Shaw Dean, read the following excellent paper on "The Use of Straw as Fodder."]

During such a season as we have just experienced, and having to meet the winter that now fast approaches, with hay and corn ricks of less bulk than the oldest of us perhaps can remember, and with a probable "yield," at any rate in this part of the country, decidedly below an average, how is the unenviable position in which we find ourselves to be met? How is the farmer's mainstay—his stock—to be kept, and forced sales to be avoided? Close the market for artificial feeding stuffs (which chemists are assisting us still further to purify), and deprive the farmer also of his straw, and nine out of every ten of the occupiers of land who during the last three years have found farming far otherwise than lucrative would be unable to meet the difficulties which lie before them.

There are many uses to which straw may be applied. The chief use which the English farmer makes of it should be allowed, in every lease, to depend upon locality and other surrounding circumstances. But the principal use that will be made of straw this year, in many instances, provided it can be made palatable, will be that, I presume, of increasing the supply of food for our stock. On this point it is my intention chiefly to dwell. But by appropriating a large quantity of straw as feeding material, we are at once met by a considerable difficulty, and one which I feel sure those who are present have already anticipated; I refer of course to the consequent reduction of the manure-heap. The best way to meet real difficulties is first to acknowledge them, and afterwards endeavour to apply a remedy. I am aware of the difficulty. For the present we have to do with straw considered exclusively as a source of food for stock. One essential of every feeding material is bulk; this, when stock will consume it, straw will undoubtedly supply; and that stock will consume straw during every season of the year, when properly prepared, I have myself abundantly proved. No amount of highly concentrated food that it will pay to give to an animal can ever supply the bulk that all food for animals must necessarily contain. On this point let us consult the heads of departments on our farms; their opinions cannot, with impunity, be always cast aside. What is the point on which carter, fogger, and shepherd for ever dwell—is it not a "belly full?" Shepherds are for the most part satisfied when this very essential point is gained, and I believe, as regards his flock, nothing adds to the profound satisfaction of the shepherd so much as seeing his sheep, both old and young, so full that he can hear that peculiar grunt, characteristic of entire satisfaction on the part of the sheep, as they recline under the weight of complete satiety. But bulk is not all that straw well-harvested, and not over-ripe, will supply.

We enter now upon one of the most interesting problems which can be presented for the consideration of practical men. The point to decide is this—what amount of real nutriment does straw contain? To obtain an answer to this question I shall quote largely from Dr. Voelcker's paper, published in the Royal Agricultural Society's Journal. It may be well, however, to bear in mind at the outset, that no experience which may have been individually gained regarding the feeding value of straw will be of much worth, as compared with the experience of another, unless the conditions under which both may have gained their experience are precisely similar, and for this reason : Straw in different states of maturity presents, on analysis, very different results; and I think I may also venture to say that those who have fed with over-ripe straw, and those who may have chanced to cut their corn before it has become over-ripe and given the straw to their stock, have likewise observed very different results. I have some right to make this remark, as I have fed with straw extensively under both conditions. As a feeding material, on the extent of maturity to which the straw is allowed to arrive nearly everything depends. We glean from Dr. Voelcker's paper the following facts :—

"Straw contains only from 14 to 17 per cent. of moisture; there is in it about as much solid matter as in meal and other kinds of dry food, although it is considered to be worth only from 20*s*. to 30*s*. per ton." (Since Dr. Voelcker wrote his paper, we know of course that straw has risen in value, and owing to his paper and increased experience, it will continue to rise.) "The bulk of straw, however, includes a large proportion of woody fibre, which, if digestible at all, is only partially assimilated in the system. Still, assuming that not more than one-third of the weight of straw is digested by cattle, and probably less by horses and sheep, and granting that the assimilable part is not food of the most nutritious character, straw will still have to be regarded as a more economical feeding material than any other which can be supplied." "It is undoubtedly a fact," Dr. Voelcker goes on to say, "that some practical feeders are in the possession of the secret of converting considerable quantities of straw into beef. What this secret is, perhaps, is not known even to themselves. It may be that the combination in which straw is given, or the preparation to which it is submitted before it is placed in the feeding-troughs, has something to do with the success attending its use; but it is yet more probable that on farms where straw is largely and economically cut into chaff and given to cattle, its condition, from early harvesting and other influences, is better than in other localities where the practice prevails of allowing corn to become over-ripe before it is cut. In consequence of this mischievous practice, straw gets more woody and less digestible than it would have been had the corn crop been cut earlier."

In the conversion of the cellular fibre of straw cut when not over-ripe into the woody fibre of over-ripe straw, much of its value depends, as we shall presently see. Dr. Voelcker has remarked that there is not so much difference in the value of the different kinds of straw, as between the same kind of straw in a condition somewhat unripe, and when arrived at full maturity. And he further points out the importance of ascertaining, if possible, whether woody fibre is in any degree digestible. "The older and harder the plant, the more woody or incrusting matter it contains." In green herbage, the insoluble residue obtained under analysis consists of celluton or cellular fibre; "whilst in fully matured and over-ripe herbs the insoluble residue principally consists of incrusting matter or true wood."

You will observe that cellular fibre and woody fibre, though found under different conditions of richness in straw, are both insoluble, and from a careful perusal of Dr. Voelcker's paper, I come to the conclusion that for all purposes of chemical investigation they must be considered as one and the same substance; but at the same time, over-ripe straw fodder contains woody fibre, and is not relished by cattle. Straw cut comparatively green contains cellular fibre, and is particularly palatable to stock. But again the question recurs, is this fibre, woody or cellular, actually digested by the animal organism? On this point allow me to quote Dr. Voelcker's exact words :—"As long as we are unacquainted with more perfect analytical methods, we cannot expect to ascertain by analysis whether cellular and woody fibre is digestible, wholly or in part, and to what extent." Here, as in so many other matters which have scarcely been touched upon by scientific men, the agriculturist

must be guided by his own experience, and not by the rash counsels and exaggerated statements of theorists, who are incompetent to form a sober and unbiassed opinion on a moot question. We know, indeed, that the condition of the woody fibre affects the nutritive value of all food in no mean degree. Whilst in root crops left too long growing on the land, or the fibre of grass and Clover left standing until dead ripe, these tissues are not readily digested, there can be no doubt that the soft fibre of young grass, Clover, and roots is readily assimilated in the animal organism, and transformed into starch, sugar, and finally into fat. For this reason grain crops, more especially Oats, when harvested early, produce straw which is greatly more nutritious than that of an over-ripe crop. In some parts of Scotland it is customary to cut the Oat when the top of the haulm is still quite green; and it is upon straw of that description that store cattle are kept during the winter almost entirely. The variable condition in which grain crops, as well as Peas and Beans, are harvested in England, fully explains the various shades of opinion which are entertained by practical men respecting the feeding properties of the straw of these crops, and the contradictory statements of writers on the subject. For this same reason the practical solution of the question, whether woody fibre is digestible or not, is surrounded by peculiar difficulties. Taking experience for our guide, it may be answered with equal truth in the affirmative or in the negative; for in a young tender condition we know from experience that cellular and woody fibre is digestible, whilst in a hard, dry, over-ripe state it is for the most part indigestible. Direct feeding experiments, highly desirable though they may be, will leave much uncertainty, however carefully they have been made, unless special regard is paid to the condition in which the straw is given to the animals; and after all, as it is not possible to describe with absolute precision its state of maturity and condition, no practical feeding experiment, be it ever so carefully conducted, can afford absolute numerical results, indicative of the extent to which woody fibre is digestible in all instances.

Let us turn to points upon which more certain information is presented to us—the amount of oil contained in straw, determined with precision, likewise that of albuminous or flesh-forming matter; also the amount of organic substances soluble in water, then as sugar, mucilage, gum, &c. That even wheat-straw is good for food when mixed with other substances, I know from information given me by one of the most practical men I have had the pleasure to meet, and on the farm which he manages I saw it being cut into chaff with green stuff as food for cattle. Dr. Voelcker's opinion of barley-straw is as follows:—"In my opinion barley-straw, not too ripe, is nearly equal to oat-straw reaped in the same state of maturity, and superior to wheat. It is usually richer in albuminous compounds than wheat-straw, although the larger portion of albuminous matter found in barley-straw is in part due to some Clover and grass which gets mixed up with the Barley crops." Of the value of oat-straw, as a food for all kinds of stock, I can speak with the greatest confidence. I have used it very extensively, and, without it, during the past summer, must either have sold my horned stock or bought food extensively, to a greater extent, probably, than would have paid. The oat-straw I used was that of last year, and, as may be supposed, was dry and uninviting in appearance; it was, however, cut into chaff, over which gruel, made from the best oilcake I could get, was freely sprinkled, and was allowed to remain in a heap 12 hours before use; this is a point of chief importance. Somewhat to my surprise, during the hot weather of last summer this mixture was greedily consumed by both cattle and horses, and kept them in good ordinary condition. In the case of the horses, I only gave it to such as were out of work. The same mixture was given to cows in milk, with addition of extra cake; these likewise kept their condition, but could not of course be expected to keep up the usual supply of milk, owing to the absence of grass. This year, finding oat-straw so valuable, even when fully ripe, I determined to follow out Dr. Voelcker's directions more exactly, and the worst portion of my Oat crop I cut green; it was made into oat hay; this is now being given to young cattle and cows as it is cut from the rick. The young cattle are doing well, and the milk from the cows immediately increased in richness when this food was given them. For sheep the same oat hay is cut into chaff, with the addition of a third part of meadow hay. The result with sheep I find to be that they crowd to their troughs as eagerly as when the best clover hay I can produce on the farm is supplied. It will be remembered, however, that even when Oats are harvested in this very green state, some corn will be found when the rick is cut, much more, probably, than would be expected.

It is now time that we should consider the chief objection to making a general practice of using straw as fodder. By doing so our supply of farmyard manure must be considerably reduced; and farmyard manure is a thing we cannot afford entirely to part with. But I would suggest improving the quality, to make up for the loss of quantity. I do not think one-third less manure carted on to the Clover lea in course or Wheat, provided it be rich and well made, instead of being, as we too often find it, poor and badly made, would be followed by any decrease of yield in the Wheat crop. More especially might we look for favourable results from such a system on our lighter soils. I am perfectly aware that the mere mechanical effect of long dung, and even straw alone, on some heavy soils, cannot be dispensed with, and the cultivators of such soils will be the last, and rightly so, to adopt any other system than that which they have pursued with great advantage, namely, carting out a considerable quantity of manure in a raw state, or littering their fields with straw and penning with sheep, as I observe to be the common practice near Devizes. But the cultivators of such soils do not compose the majority of farmers. A certain decrease in the mere quantity of our farmyard manure will not, therefore, be found, I think, generally speaking, a sacrifice too great to prevent an increase to the fodder supply by a greater addition of straw, provided the construction of farm buildings is such that this will allow of manufacturing home-made manure to the greatest advantage. Here is the real difficulty: badly-constructed buildings and too extensive open yards, no spouting round the building, no drains leading to a well-constructed tank, so that the liquid (the more valuable portion of animal excrement) may be pumped back and thoroughly absorbed by too solid manure. I forbear to pursue the question of buildings further. I should be departing too far from my subject. It is one, however, so interwoven with the consideration of the "use of straw," that it might perhaps be profitably taken up on a future occasion. By touching upon it, I make no sly hit at owners of land; but at the same time it is a known fact, to those best able to judge, that farming cannot be profitably conducted without good buildings, and that there is a great deficiency of good buildings throughout the country. Societies abound, which construct them on the best known principles; they may be paid for by annual rent-charge, imposed upon the tenant, and in most cases the tenant will be found willing to pay.

As a homestead admirably constructed, and on principles well adapted to economise litter, I would refer to that of the Home Farm at Wilton, on Lord Pembroke's estate, near Salisbury. Here there is no useless expenditure, no money wasted on mere ornament, and such buildings would not be inappropriate on any property of smaller extent. It was built before the late enormous expenditure made by the present enterprising agent; an expenditure amounting, I believe, to half-a-million; and observe, though money is borrowed from one of the Land Improvement Societies—not because there is any lack of wealth, as we all know, on the Pembroke Estate, but probably because the agent, being a real man of business, is aware that the means of raising money for the improvement of landed property is the most convenient and the most desirable, both as regards owner and occupier. The agent expects the whole sum, with interest, to be paid back in 30 years; we may hope, therefore, that the present owner will live to see his property so vastly improved, and the extra rent-charge entirely wiped off. The plan of the farm buildings at Ford Farm, St. Ann, in Cornwall, the property of the Rev. E. P. Norris, as represented in "Bailey Denton's Homesteads of England," appear to be well-constructed with the object of saving straw. Some valuable hints may be gained from this plan, with a view to the partial reconstruction of any old buildings. But I must bring to a close a subject on which I have been tempted to dwell at too great a length, on account of the many interesting points which it presents for our consideration. I have not touched on the value of bean and pea haulm; both are very highly valued by some farmers, and we are all aware of the value of pea-straw; that of Beans should be cut quite green, if we wish to use it as fodder. Dr. Voelcker places the different kinds of straw in the following order, beginning with the most nutritious, and ending with the least valuable, for feeding purposes: pea-haulm, oat-straw, bean-straw with the pods, barley-straw, wheat-straw, bean-stalks without the pods.

AGRICULTURE OF PORTUGAL.

FROM BRITISH CONSULAR REPORTS.

THE implements and tools in general use are ploughs of two sorts, harrows, a broad heavy hoe (which takes the place of a spade), a smaller one for weeding, and a small reaping-hook, which is used indifferently to cut grass and to reap the different grain crops. The ploughs differ very little from the old Roman type, and the description of the implement left by the Roman writers applies very nearly to the simple and smaller of the two kinds now used by the Portuguese. This plough consists of a beam, body, share, and sole, with one stilt. There is neither coulter nor mouldboard, but the share is carried far forward (as in the Kentish turnwrest plough), is lance-shaped, and turned slightly downwards. The work of the mouldboard is done by two upright pegs at the heel of the plough, which pegs press out the soil on either side. The whole plough can easily be carried afield on the shoulders of a labourer. It works only 4 or 5 inches deep, stirs the soil in parallel open furrows, and where the land is light and crumbling, as is generally the case, this slight working of it would seem to be sufficient. The other plough employed is a modification of the smaller and simpler one. It has two stilts, a low double mouldboard, instead of the upright pegs, and occasionally (when it is required to turn over a furrow-slice) a broad coulter is inserted in a hole in the beam, which works behind the point of the share, and serves to turn over the slice, its inclination being changed at the end of each furrow; but the Portuguese ploughman has often no occasion to alter his turn-furrow, being given to the bad practice of driving a curved furrow from the boundary of the field, and continuing it circularly to the centre till the whole field is ploughed. This plough will work as deep as 7 or 8 inches. The fields are so small and so irregular in shape, and the ground so easily worked, and again, the whole surface cultivated by each proprietor so limited, that it would be difficult to persuade a Minho farmer that a plough which only costs him 12s. or 14s., which he can repair himself with very little expense, and whose use he perfectly understands, is less suited to him than a more perfect and complicated instrument of five or six times the cost.

The harrow is also of the rudest construction, having 15 to 20 teeth of iron or wood set quincunx fashion into a strong oblong-square wooden framework with one cross-bar. Rollers are unknown, but as a substitute the harrow can be reversed and weighted with stones, and then drawn sledge-wise over the land. The hoe is indispensable in Portuguese field husbandry. The larger kind is a flat piece of iron, shaped like, and two-thirds as large as, an English spade, fixed at a slightly acute angle upon a long handle. It is used in earthing-up Maize, in planting field Cabbages, in making and altering watercourses, and in supplementing imperfect ploughing. It is worked with a skill that no labourer used to the different movements required by a spade could probably attain to. Ground can be prepared by it for seeds or for planting more quickly than it can be dug by a spade, although it is less completely stirred and turned over. The hoe is, perhaps, at a greater disadvantage as compared with a spade or shovel, in loading earth or other material into a cart, in doing which the labourer has to use a blanket, into which the earth is drawn by the hoe, and lifted when it is full into the cart. An English engineer in Portugal, however, says that the work of excavation, when the soil is light, can be performed with less labour with the hoe and basket than with the English navigator's pick and shovel.

The clumsiest of all Portuguese tools is the mowing or reaping hook, which, as the cattle are mostly stall-fed, is in constant use. It is in shape a short segment of a circle, of which the arc is about a foot in length, the edge is serrated and very sharp, and the hook can be used to cut grass not more than 5 inches high, the tuft of grass being grasped in the left hand, and the edge of the reaping hook being drawn against the stems. The work of cutting grass is exceedingly slow, and a man cannot cut more than a quarter of a rood in a day's work.

The cart used throughout modern Portugal is, like the plough, a modification of the old Roman type, two low wheels of solid wood, without spokes, and with iron tires, are fixed immovably to an axle, which revolves with them. The body of the cart is composed of four or five boards laid flat, and resting on two supports, whose lower sides are grooved where they rest on the axle. Straw or grass is retained on the flat table, formed by these boards, by six or more movable upright poles, fitting into iron-bound sockets at the sides and corners of the table-like boards, the centre board being prolonged forwards into a strong pole, to which the oxen are harnessed. In carrying stones, earth, or grain, a thick wattled and flexible hurdle, about 30 inches high, is fixed, in horse-shoe shape, upon the table of the cart inside the uprights, the opening behind is closed with a board. The whole cart is enormously strong, and the separation of the wheels and axle from the body allow it to stand the shocks and joltings of roads which are often little more than watercourses on the steep sides of hills.

The yoke is fixed to the necks of the oxen, in some parts of the country (the most hilly) to their horns, and when so fixed, a leather cushion takes off the pressure from the foreheads of the animals.

The cattle are a small variety of the dun-coloured breed found in most parts of the Peninsula. They are bred for draught rather than for meat; and, therefore, their points are not such as an English grazier would approve. The oxen average 52 inches in height at the shoulder, and 12 cwt. in live weight, when three-parts fat; but they reach 16, and sometimes even 18 cwt. They are compact in shape, with deep and most powerful shoulders, sturdy legs, and carry straightish horns of great width. Their strength, hardiness, quickness, docility, and great beauty of shape and colour, are generally appreciated by observant persons accustomed to the working cattle of other countries. Both cows and oxen are used for draught purposes. The beef is close-grained and good. An exportation of these cattle to ports in Great Britain commenced in 1847, and now averages 9500 head every year.

Horses are never used in agriculture in Northern Portugal. The indigenous breed are little more than ponies; a taller race, of very little value, from 14 to 15 hands in height, is bred in the plain country, and efforts are being made to cross and improve the breed

with French and Spanish horses. The sheep of the Minho and of the lowlands of Northern Portugal generally are the worst in the kingdom; one or two sheep often live with and follow the farmer's small herd of cows and oxen, but flocks are hardly ever seen.

The breed of pigs is said to be improving; it has still, however, all the marks of a neglected race—length of leg, largeness of bone, and coarseness of bristle. They fatten very slowly.

The chief feature of the tillage of this district is the growth of Maize, to which all other cultivation is made subservient. On deep, well-manured, and irrigated land Maize will produce from 20 to 60 imperial bushels of grain, of a value averaging that of Barley, about a ton of forage in early summer, and from half a ton to a ton of most nutritious and excellent straw food. In Portugal the stem of the Maize is not, as in tropical countries, too hard to be eaten by cattle. The Maize straw is indispensable for cattle feeding in winter in the Portuguese farming system. The same acre of ground on which Maize is grown likewise produces dwarf Beans and Gourds—about 2 to 5 bush. of the former, and from 1 to 3 tons' weight of the latter to the acre. So productive a crop, which, in land well manured and with water for irrigation available, would seem to be producible year after year without exhaustion of the land, is a temptation to ignore any system of rotation whatever; consequently, during the five hottest months of every year, the ground is occupied with this corn.

Maize can be sown as early as March in this latitude, but it is usual to put off the ploughing up of grass leas—which are then in full production—till as late as possible. The middle of April is the average date for sowing, but seed-time may be deferred till May 15 or 20, or even later. The seed is sown broadcast, after one or more ploughings with the larger kind of plough. If the land has been manured for a previous autumn crop of artificial grass, no manure (or but little) is put in at seed-time; but if not, a very liberal allowance of well fermented cow-dung, sometimes as many as 30 tons to the acre, is put upon the land. The manuring is repeated every year, but not to the same extent. It is spread upon the unbroken lea, and covered in at once by a deep ploughing. The land then undergoes some amount of cleaning and levelling with the hoe, which clears away the surface weeds; in some cases it is harrowed before sowing, but oftener not. The seed (from 6 pecks to 2 bush. per acre) is then sown broadcast and harrowed in. With each bushel is mixed a quart or so of some kind of dwarf Kidney Bean, and about half as much Gourd or Melon seed. The Beans and Gourd plants appear before the Maize. It is usual to hoe the Maize plant when the fourth leaf-spike shows, and 20 days afterwards the earth is drawn round the plants; from this time forward they are thinned out for cattle feed. When the flower has arrived at its full perfection, it is cut off with about 18 inches of the top of the stem, and used as a cattle food. Irrigation, whenever available, will have been freely used, soon after the plant has depth of root enough to stand the wash of the water, and until the whole plant begins to show yellow. The cobs are cut when the husk is quite dry and the seed feels hard beneath it, and the less critical operation of cutting the straw is often delayed if the weather be wet.

The operation of husking is often made the occasion of a feast—a kind of harvest home, when wine and dried fish and bread are given by the farmer, and large parties of the peasantry assemble, and work far into the night, to the music of guitars and violins.

The husked cobs are dried in the sun, on the threshing floor, and, in a month or less, are ready for threshing out, which is the universal mode in this country of getting out the grain. The straw, when cut, is left in stooks in the fields till it is dry enough to carry home.

It is clear that the whole system is open to several grave objections. Many of them, however, are incident to, and inevitable in, the nature of small properties. The mixing of several crops in one field has always been considered a fault in farming. In the case of the Portuguese farmer it is the result of some amount of forethought; being too poor to risk his whole income on a single crop, he calculates that, when he loses part of his corn in a dry year, he gets a large return of Beans; and that a year favourable to neither may give him a good crop of Gourds. His sacrifice of some of his Maize crop is, therefore, a rough kind of insurance against a total loss of it. The apparent waste of seed is required to allow of enough young plants being thinned out for the early summer food of his stock. The great amount of labour required in hoeing the land is a serious drawback to the system; but in a country of small proprietors, of small farms and capitals, and of small enclosures, it would be of far less advantage to replace manual labour by drills and horse-hoes, than in such a country as the United States; and the cheapness of labour in some degree compensates for the amount of it required.

With the last hoeing of the Maize, Rye-grass is sometimes sown, from which a first cutting is taken in October or November; but it is more usual to spread the Maize fields in September with all the manure which can be got, and to sow Rye-grass mixed with either Oats, Barley, or Rye; or, more frequently, these three come together on the manure itself, and then to plough in with the smaller of the two ploughs. This very wasteful and slovenly method of producing an artificial grass field, nevertheless generally results in an abundance of green food throughout the winter and spring. The Rye yields a first cutting in about five weeks, and a second, very abundant one is obtained from all the plants jointly at Christmas time; but the uncertain depth at which the seed is covered causes much loss of ground and labour, if the weather be either dry or very wet, at seed-time.

It is a constant practice in Portuguese husbandry to plant Cabbages in the Maize fields. When this corn is sown in spring time, a labourer cuts a hole or cleft in the ground with a single downward stroke of a broad hoe. He holds the hoe in the ground till an assistant has placed two young Cabbage plants, one at each corner of the cleft; the hoe is then removed and the earth pressed down. The men walk in a straight line across the field, planting two Cabbages at every second pace, and then trace similar parallel rows 12 or 15 feet apart, till the whole field is finished. In this way an acre of land can be planted by two men in less than three hours. In the heat of summer, and while shaded by the growing Maize, the Cabbage plants make little progress, but when the corn is reaped, and the field manured and ploughed for its crop of grass, the Cabbages grow rapidly, and throughout the winter afford a constant supply of leaves for house use, and for feeding cows and pigs, and even sheep. The Cabbage used for this purpose is a large variety of the Cabbage known at home as the Jersey Cabbage, and by the French as the "Chou Cavalier;" it grows to the height of 6 feet or more, if allowed to attain to its full size; the two lower leaves are picked off, week after week, till the whole plant is cut down in spring, to allow the soil to be again prepared for the Maize crop. It is the presence of the rows of Cabbage in the Maize stubbles that makes it necessary to use the small plough, and to work the land so that the plants may not be disturbed. After the plough has done what work it can, the untouched ground where the Cabbages stand is turned over with the hoe.

Root crops are of little importance to the Portuguese farmer. The porous soil would suit the Turnip admirably, but not the heat and dryness. They are grown, but with results unknown to the British farmer. A common way of growing them is to sow them upon the Maize stubble with Rye-grass; the roots are never hoed, and, entangled and obstructed by the grass, seldom exceed a large Apple in size. Again, they are sometimes sown after Onions, and with fair success. When, owing to bad seasons, or bad cultivation, the roots do not swell, it is common to let the Turnips run to flower, and a cutting is obtained from the leaves and flower stems in January and February. Rape or Mustard would, probably, be better suited for this purpose, but neither appears to be used. Potatos do not find any place in the simple system of Portuguese agriculture. They form no part of the general food of the people, are not used for cattle feeding, and are seldom grown at all, except in gardens or near towns. The same applies to Carrots, Mangel Wurzel, and Parsnips, the two latter of which are never seen growing in a field in Portugal. Swedes are grown, but far less frequently than Turnips. Having to be sown at the time of the autumn rains, their more tardy growth does not allow of their obtaining any size before the cold of winter. Wheat is the predominant cereal of the provinces south of Oporto, where large fields and a stiff soil are commoner than in the North. Its cultivation is adopted sometimes in rotation with Maize, or on soils too dry for the latter and too stiff for Rye, or when manure is not forthcoming for the Maize crop. The small-farm system does not, as may be supposed, favour the cultivation of Wheat, and the crops are seldom good. To judge by their appearance on the ground, 26 to 28 bush. would probably be an average crop of Wheat in these provinces. Winter Wheat is sown from November to the end of January, spring Wheat from January to March; both kinds are reaped in July. There are seven or eight varieties of Wheat, mostly of the bearded kinds. Hard Wheat and soft are in about equal proportions. Red Wheat is scarcely, if at all, known, probably owing to the absence of the strong dark clays to influence the colour of the skin of the grain.

Broad Beans are a common crop, and the early sowing which the climate allows is very favourable to their growth. They are sown broadcast, and their cultivation is the same as in Great Britain. The sort used in field culture appears to be only a very large variety of the common horse Bean.

Much more important and extensive objects of cultivation are the different kinds of Kidney Bean (Phaseolus vulgaris), of which there are six sorts of the dwarf variety and four of the climbing; the dwarf kinds differ considerably, not only in flavour and productiveness, but in the soils they require and the greater or less luxuriance of the plant, thereby enabling the farmer to grow the particular kind most suited to the soil and exposure of each field. The climbing Beans are less used, sometimes they are grown on sticks, but oftener on the stems of the taller kinds of Maize. The climbing sorts all require a richer soil than the dwarf Beans.

The Chick Pea (Cicer arietinum) is less cultivated in the northern than in the southern provinces, where it is an important part of human food; it is sown in autumn, and does well on light, dry, and sandy soils.

The Gourd and the tall Cabbage together may be said to take, in Portuguese farming, the important place of root crops generally in the English farming system. It is difficult to compute the yield of the Gourd by the acre, for the ground is never exclusively occupied by them; but it is probable that in a richly manured soil, with water for irrigation, a weight of 60 or 70 tons might be raised to the acre, about double the weight of a good crop of Swedes. Three or four very well marked species are grown; the largest is the round, white, smooth kind (a variety of Cucurbita Pepo) which have been seen growing in a field to the weight of 200 lb. The long, yellow and striped sorts are probably varieties of a different species (Cucuma Citrullus), and are those commonly employed. The Gourd is left on the ground, for a fortnight or more, after the Maize is carried; and, in that short time, greatly increases in size with full exposure to sun and air.

For cattle and pigs Gourds are a most valuable winter food, and they also enter largely into the consumption of all classes of the people. They keep sound in dry years till the end of February, and are not injured by sun or rain if kept standing in a dry place; it is usual, therefore, to lift them to the roofs of low buildings, along the tops of walls, or to leave them standing on rocky ground, whence they are removed as they are required for use. *J. R. J.*

(To be Concluded next week.)

Home Correspondence.

Testimonial in Honour of E. Holland, Esq.—The committee appointed to carry out the proposal made at Oxford could not at first tell precisely what form of testimonial would be acceptable to Mr. Holland and be generally approved by his friends and by the public. They have now decided that it is desirable to found a "Holland Scholarship" at Cirencester, and they will be happy to receive the assistance of your correspondent, "M. R. A. C.," and of all who may be willing to aid them. Those who contribute to the fund will at the same time be increasing the utility of the Royal Agricultural College and recording their appreciation of Mr. Holland's public spirit in the only way that would accord with his wish to decline testimonials of a personal nature. Subscriptions will be received by the hon. treasurer, Mr. A. J. Hill, 8, Moorgate Street, E.C.; and by C. G. Roberts, hon. secretary, Shottermill, near Haslemere, Surrey. *R., December 23.*

Mr. John Coates' Pigs.—I am glad to see that the Dorset farmers have distinguished themselves at Birmingham and Islington. I believe that some people think that Dorsetshire is the "Ultima Thule" of the creation, and that the Dorsetshire farmers are the penultimate of barbarism. This is a great mistake. We have many of the best stock and crop farmers in the kingdom. I have known farmers come from other counties with pockets full of money to teach the farmers of Dorset the way to cultivate, and in a few years they have gone off with their pockets turned inside out. I do not believe there is a county in England which, for its acreage, breeds and maintains so much stock as the county of Dorset. I hope it will become more and more a feeding county. We have many farmers who are both distinguished breeders and feeders. My present object, however, is to speak of Mr. Coates' pigs. They are admirable, being of great size, good form, good quality, and also good breeders and fatteners. About three months ago I paid him a visit (Hammoon is about three miles distant), and bought the best elt I ever saw, in fare to his noble boar, or, as a lady once called it, "gentleman pig!" She got so fat upon whey and grass, and what she could pick up in the yard, that she died in farrowing. Alas! my ten guineas! I bought another of his brother, Mr. W. Coates; and Mr. Sturt gave me a beautiful pair, male and female, so that I hope to regain what I have lost. About a week before the Islington Show I paid Mr. John Coates another visit; he then showed me the beautiful pigs (three each) in two ages, who have since won highest honours at Islington. He had a beautiful sow with 11 pigs—the best farrow I ever saw. Four of them were "gentlemen pigs." I bought the best, and gave it to my friend Mr. Sturt, whose fat pig won 1st prize at Sturminster, and also at Sherborne. It was a very good pig. I bought the pig for him, as his bailiff said they wanted fresh blood. Mr. Coates' pigs (black) are much the same as Mr. Sturt's, but longer. His present boar is the best of the kind I ever saw. I have here a sow, own sister to the ones Mr. McNiven won with at Islington last year; she is in fare to Mr. Coates' pig, and is a splendid animal. If her progeny are good I am going to give Mr. Sturt "a lady pig!" I have, therefore, now the power to cross three ways with splendid animals of the same kind but of different strains. Never breed from brother and sister. You will have bad luck, bad constitutions, and no tails. The best way to stop tails rotting off is to cut off a very small piece of the tail, as soon as they are born! I do not like a pig without a tail. Let me hope, then, that the victories of my friends, Messrs.

Ford, James, and Coates, and also of Mr. Benjafield, whom I have not the honour to know, but whose splendid Herefords and pigs I have seen, will dispel the mist of error that has so long hung over the Dorsetshire farmers. The above distinguished men are respectively the tenants of Mr. Sturt, Mr. Digby, Lord Portman, and the Marchioness of Westminster, and may be well called, if not invidious, among the young England of Dorsetshire estates. Mr. D. Coates, of Hammoon, is also a man of mark and a first-class grazier. The brothers won respectively the 1st and 2d prize for oxen at Sturminster. Mr. McNiven's bailiff, Mr. Marshellsay, is a native of Okeford Fitzpaine. He is a good judge of, and manager of stock. I think, when last in Dorset, he bought a successful animal of Mr. A. Smith, of Bradford, whose beautiful Devon bull and Devon heifer and calf I saw at the Sturminster show. The heifer was 2d prize at Taunton. *W. F. Radclyffe, Okeford Fitzpaine.*

Sugar-Beet.—Mr. Morgan, Metropolis Sewage and Essex Reclamation Company, p. 1083, shows to what weight per acre Beet can be grown, and Mr. Duncan, a practical authority, informed him of the mischief a "dressing of sewage" applied so late as September 29 and October 1 would do in causing a fresh start of growth of young leaves and roots, in each case at the expense of stored up sugar: to prevent this should be the aim of the Beetroot grower. A second growth injures the crystallisable sugar stored in the root, reducing it more and more into glucose the longer this second growth continues. It is surprising that resort should have been had to "a dressing of sewage" so late in the season, more particularly if it was contemplated that any of the Beet should undergo the process of sugar extraction. It is impossible to lay down in general terms the length of time the crop requires to arrive at maturity, this must in a considerable degree be influenced by the character of the land, its agricultural condition, and the season. The "crop" season here for Beet, as indeed for all bulb-producing plants, is comprised between the month of September and the end of the year. For Beet a showery and mild autumn would be looked upon by the manufacturer with as much uneasiness as a showery "crop" season is feared by the sugar-cane grower in the tropics, and for the same reasons, viz., a fresh growth, and the difficulties multiplying therefrom at almost every stage of the process. However, Mr. Morgan remarks:—"I mean to try and do better next time by using superphosphate on the sewaged land, omitting the last dressing of sewage, which is considered so objectionable." Will he allow me to suggest that one plot—an acre, if possible,—be dressed with superphosphate, or sulphate of potash, and sewage, as soon as the plant will admit; another plot, minus any application after the sowing of the seed; a third with sewage only, not to be applied later than July 1. Let a portion of each plot be sown in something approaching a furrow, to facilitate the moulding up of the plant. That the condition of the soil be tested by analysis, as left by the preceding crop, as well as the sugar percentage of the crop grown. *West Indian.* P.S. I may mention in the Beet it is found practically to be of great benefit to keep it under the soil as much as possible; the sugar cane, on the other hand, to admit air and light is of importance, which is done by "trashing and bedding."

Trial of Double-furrow Plough at Birkdale.—By the invitation of Messrs. J. & H. Keyworth & Co., Tarleton Street, Liverpool, I had the satisfaction of witnessing one of the most interesting trials of double-furrow ploughs of the season on Tuesday, December 6, —Mr. Halfey, of the Bold Arms Hotel, Southport, giving his Isle of Wight Farm, Birkdale, a few miles from that popular watering-place, for these trials. The soil is Fen, in a high state of cultivation. The first trial was on Clover lea, and each ploughman was to arrange his plough so as to give the best seed furrow not less than 6 inches deep. It was observed that, as Mr. Halfey's men had been ploughing the field 8 inches deep, all the competitors should go as near that depth as consistent with a good, well-turned square furrow, and the draught would be taken of each plough in its own lot, and the cubical quantity of earth moved per acre taken, and compared with the draught and distance travelled to move the said quantity of earth,—that is, the distance travelled and draught multiplied together, and divided by the cubic yards of earth moved. Howard's, at 7½ inches depth, gave 1008 cubic yards per acre, 20 inches wide gave 8027 yards travelled, draught 5 cwt. $8027 \times 5 = 44,635 \div 1008 = 44{\cdot}28$ cwt. of power per yard. Murray's, at 6 inches, gave 806 cubic yards, and at 19½ inches wide gave 9173 yards travelled, and the draught 5¼ cwt. $9173 \times 5\frac{1}{4} = 50,454 \div 806 = 62{\cdot}59$ of power per yard. Corbett's, at 6¾ inches deep, gave 907 cubic yards per acre, and at 2½ inches wide travelled 8729 yards, and draught 6¾ cwt. $8729 \times 6\frac{3}{4} = 56,738 \div 907 = 62{\cdot}56$ of power per yard. Cooke's, at 6½ inches deep gave 873 cubic yards per acre, and 20 inches wide gave 8927 yards travelled, and draught 6 cwt. $8927 \times 6 = 53,642 \div 873 = 61{\cdot}44$ of power per yard. Mr. Halfey's single-furrow plough, at 7½ inches deep, gave 1008 cubic yards of earth moved per acre, and at 10 inches wide travelled 17,855 yards per acre, draught 4 cwt. $17,854 \times 4 = 71,415 \div 1008 = 70{\cdot}85$ of power per cubic yard. We believe this single-furrow plough was just fair work, doing an acre in eight hours; and for the two horses, man, and tear and wear, 12*s.* 6*d.* will be a fair price. Therefore, if the single plough's 70·85, moving 1 yard, gives 1008 yards per acre for 12*s.* 6*d.*, Howards' 44.28 will do the same at 7*s.* 10½*d.*; Cooke's 61.44 at 10*s.* 10½*d.*; Corbett's 62.56 at 11*s.*; Murray's 62.59 at 11*s.* On the stubble field there were only Howard's, Cooke's, and Corbett's competing. Howard's, 8½ inches deep by 20 inches wide, travelling 8927 yards × draught 4¼ cwt. = 40,172, to be divided by 1142 cubic yards moved = 35.18 a yard. Cooke's, at 6 inches deep by 19½ inches wide, travelled 9173 yards, by draught 4 cwt. = 36,692 ÷ 806 = 45.50 a yard. Corbett's, at 7½ inches deep by 19 inches wide, travelled 9419 yards, by draught 5½ cwt. = 51,804 ÷ 1008 = 51.39 a yard. Taking the single plough datum of 12*s.* 6*d.* as a fair price for 4 cwt. draught of two horses a day, Cooke's plough would do 2 acres in that time, therefore 6*s.* 3*d.* would be the price to move the 806 cubic yards of earth at 45.50 of power a cubic yard = 6*s.* 3*d.*; by Corbett's (at 51.39 do.), = 7*s.* 1*d.*; by Howard's (at 35.18 do.), = 4*s.* 10*d.* per acre. Again take the widths as equal, which they are near enough, and divide the cubic yards moved per acre by the draught, and you will get the number of yards moved per cwt. of draught, worth 3*s.* 1½*d.* if continued for 17,854 yards. Howard's plough on the ley in that distance would have done 2 acres, and moved 2016 cubic yards, which gives, divided by his draught, 5 cwt. = 403 cubic yards; and this, divided by 37.5*d.*, gives 10.75 cubic yards moved for 1*d.* Cooke's, in like manner, at 6½ inches deep, would move 1746 cubic yards in 2 acres, with 6 cwt. draught, which gives 291 ÷ 37.5*d.* = 7.76 cubic yards moved for 1*d.* Corbett's, at 6¾ inches deep, would give 1814 cubic yards on 2 acres, draught 6½ cwt., 279 cubic yards ÷ 37.5*d.* = 7.44 cubic yards for 1*d.* Murray's, at 6 inches deep, would give 1612 draught ÷ 5½ cwt. gives 293 ÷ 37.5*d.* = 7.81 cubic yards for 1*d.* In fairness to Mr. Corbett we must remark that, his ploughing being 20½ inches and Murray's 19½ inches wide, accounts for their not coming out equal; in this rough way of putting it, calculated fairly, Corbett's is 7.63 cubic yards for 1*d.*, and Murray's 7.61. The single plough, at 7½ inches deep, showed 1008 cubic yards moved per acre in travelling 17,854 yards, draught 4 cwt. = 252 cubic yards per cwt. at 37.5*d.* = 6.72 cubic yards for 1*d.* On the stubbles, Howard's worked at 20 inches Cooke's at 19½ inches, and Corbett's at 19 inches wide: but putting them all at 20 inches wide, Howard's, at 8½ inches deep = 2284 ÷ 4¼ cwt. = 508 yards per cwt. ÷ 37.5*d.* = 16.21 cubic yards for 1*d.* Cooke's, at 6 inches 1612 ÷ 4 cwt. = 403 ; 37.5*d.* = 10.75 cubic yards for 1*d.* Corbett's, at 7½ inches deep = 2016 ÷ 5½ cwt.; draught, 367 ÷ 37.5*d.* = 9.78 cubic yards for 1*d.* The work done by both Cooke's and Howard's ploughs was quite equal to the best single-furrow ploughing, and Corbett's and Murray's were both good sound ploughing. It was truly gratifying to meet with a committee of gentlemen entering so cleverly into the solving of this problem of the advantages accruing to the farmer by the use of the most improved double-furrow ploughs, as compared with single-furrow ploughs. *L. P. B.*

Treatment of Pleuro-pneumonia.—Having suffered heavily in 1859, amongst many others in this quarter, from pleuro-pneumonia, I think it due to those who may experience similar attacks amongst their cattle to mention two modes of treatment that afterwards came to my knowledge. The disorder became very naturally the subject of discussion at the Farmers' Clubs, and amongst others at that of Hadleigh, where I mentioned my loss. This led to a communication from the bailiff to a lady (I think) in Surrey, who recommended a dose of Stockholm tar and salt; the inside of the mouth and nostrils being also well rubbed with the tar. I omit the dose of tar and salt; but before the autumn foggy nights set in every head of cattle on my farm has its mouth and nostrils well rubbed with tar. I may add here that carbolic acid lozenges are recommended by medical men, where there is a chronic tendency to bronchitis, or even a relaxed state of the bronchial tubes. My past experience leads me strongly to recommend the above treatment with tar. The internal dose of tar and salt may also be worthy of adoption, the bailiff who recommended it having used it with entire success over a long period of years. The other mode of treatment is of a totally different kind. Being on a visit near the borders of Yorkshire, I became acquainted with a "farrier and coo doctor," to use his own description of himself. His name was Johnson, of Mattersea, in Yorkshire. I regret to say both he and his daughter, who made up his medicines, are dead. I am informed that there is a brother, David Johnson, a blacksmith, of Stourton, near Retford, who has the recipe for his pleuro-pneumonia drinks. No doubt there are many owners of cattle now living who can testify to the great success with which he practised in the neighbourhood where he lived. He described pleuro-pneumonia to me to be a thickening of the blood, and his drinks therefore were given to thin the blood. I had some of these drinks from him, with directions for their proper administering, as well as from his daughter after her father's death. I believe I may say that I never lost an animal from the disorder to which the drinks were given. Perhaps this mention of Johnson, the farrier and cow doctor, of Mattersea, may lead to some further account of the practice of a man who, from the character given to me, deserved well of his country. *William Gurdon, Brantham Cross.*

Societies.

HIGHLAND AND AGRICULTURAL.

At the monthly meeting of the directors of this Society, held last week in their chambers, it was resolved that the anniversary general meetting of the Society should be held on January 18, and the show at Perth should be held on July 26, 27, and 28, 1871. The Board approved of the classes of stock for the proposed show at Kelso in 1872, as recommended by the committee on general shows.

Proposed Deputation to Agricultural Institutions Abroad.—At the meeting of the Board on November 2, the following letters from Mr. Melvin, Bonnington, were read, when the Board resolved to remit them to Dr. Anderson, the Society's chemist, for his report:—

"Bonnington, Ratho, June 30, 1870.

"Sir,—I regret, from having to attend the burial of a friend at same hour, I cannot be present at your meeting on Saturday. Had the subject been within the remit, I meant, if opportunity offered, to have proposed that a deputation of a landlord, a tenant-farmer, with a secretary acquainted with chemistry, be sent to several of the Government establishments abroad, where chemistry is applied to practical agriculture, and to report on the results which have been recently arrived at, with a view to ascertain whether or not many substances at present going to waste could not be utilised for the benefit of agriculture. All manurial substances are becoming scarce and increasing largely in price. Of course, had Dr. Anderson been in health he could have been the chemist. As it appears he cannot go, I would say a young man with a good acquaintance with analytical chemistry, though of course with no pretension to cope with the Doctor, would be the best to send. I am, &c. "JAMES MELVIN.

"W. S. Walker, Esq."

[This letter was addressed to Mr. Walker, of Bowland, as chairman of a special finance committee, and was handed to the secretary, who replied that there would be no meeting of the Board till November.]

"Bonnington, Ratho, July 5, 1870.

"Dear Sir,—I am sorry that the Board does not meet until November, as this shelves the proposal of a deputation this season, and postpones for another year the benefit which might arise to manure manufacturers and agriculturists from the knowledge which has been gathered in various Government institutions abroad, such as Saxony, Bavaria, and in other parts of Germany. I trust, however, that the subject will be brought before some of the members in such a way as they may obtain some information so as to show the value of an inquiry of this kind.—I am, &c., "JAMES MELVIN.

"F. N. Menzies, Esq."

"Bonnington, Ratho, Oct. 31, 1870.

"Dear Sir,—In your note to me of July 5, relative to my suggestion of a deputation to Germany, you mention that no meeting of the directors would be held until November. Allow me to say that I still consider a deputation as proposed of great importance—that is, as soon as matters are in a position from the war to allow of the information being obtained for the object stated in my letter of June 30, and also to enable the Society to place the chemical department in the position it ought to occupy in the Society's undertakings. I am not alone in thinking that Scottish agriculture has reached that stage when it can be more effectually advanced through this department than any other. Experience has shown that better breeds of cattle, sheep, and horses have not been produced by all the encouragement bestowed than existed 50 years ago. The values of the best breeds are certainly much more appreciated, and almost every one now can estimate their respective values fairly. So also with grain, seeds, and roots, and implements. Though it cannot be said of these that new varieties of the first and new forms of the last have not been introduced, yet when once introduced, they become known and are duly valued. It is different with manures and feeding stuffs. The progress of chemical knowledge has enabled manufacturers to supply substances unknown 20 years ago, many of which are excellent, of which the farmer, from the want of technical knowledge, can know nothing save by their effects. It is needless to say he is often disappointed, hence the necessity for readier means of detecting the true value, as experience proves that the demand for such articles is yearly increasing. Since the formation of the Agricultural Chemistry Association, I believe the manufactured manures and feeding stuffs have increased 100 per cent., while the price of horse and cow dung has also nearly doubled about Edinburgh, for instance. In the opinion of those well qualified to judge, in mining and manufacturing operations as much manurial substances are going to waste as would supply all the requirements of the agriculturist were they utilised. Some of these have already been so, such as the ammonia water from the paraffin works for long allowed to pollute the rivers; and now the sulphate of ammonia made from that water, the German and Belgian farmers buy it up from our own doors, while we send to Peru and the Pacific for guano. As much ammonia goes to waste in the ironworks as would, besides supplying our own wants, allow of exportation. Potash and phosphates are known to exist in the shales, and there seems no reason why the store of plant food deposited in the various strata, the remains of the animal and vegetable life of former periods, may not become useful in the present, did we know how to obtain it cheaply. The Society ought to bear in mind that while they have been patronising the results of the use of artificial feeding stuffs and manures, they have done little

directly to encourage these, and that of all the great varieties and immense money value of such articles used in agriculture, the Society has not directly been instrumental in procuring any of them.—I am, &c.,

"F. N. Menzies, Esq." "James Melvin.

Report on Mr. Melvin's Letters by Dr. Anderson.—I have carefully read and considered Mr. Melvin's letters proposing that a deputation should be sent to visit the agricultural experimental stations, of which more than 20 exist in different parts of Germany, and I am satisfied that much valuable information and many hints for the management of such establishments in this country might be obtained by such a visit. So far, however, as obtaining information regarding the nature of the work done there is concerned, it is scarcely necessary, for there is a journal published quarterly, under the name of the "Journal der Landwirthschaftlichen Versuchstation," devoted to the publication of their researches. The experimental stations are not Government institutions, though generally assisted by Government grants, but must be described as private establishments, mainly supported by the contributions of those engaged in agriculture in their neighbourhood, and they consequently vary very greatly in their nature. There is one, for instance, mainly supported by those engaged in the cultivation of the Sugar-Beet and the manufacture of sugar from it, in which, of course, attention is mainly confined to that subject, and so on in other cases—the particular requirements of each district regulating the inquiries taken up. I must explain, however, that the investigations are not of the kind Mr. Melvin seems to suppose. Their attention is mainly devoted to determining the fundamental laws of scientific agriculture, with the view, of course, of applying these to practice, and in some cases their immediate bearings on practice may not be at once obvious to the farmer. They are carried on at considerable expense, though very much less than would be required in this country. A complete station contains a laboratory, cattle feeding-house, a conservatory for vegetable experiments, and residences for the staff; while field experiments are carried out gratuitously by the farmers in the neighbourhood. For the establishment of a station a certain amount of capital is required, for the erection of the necessary buildings and annual funds, generally amounting to from £300 to £600. These sums appear, however, to be scarcely sufficient, and complaints of deficiency of funds are not unfrequent. If they are so in Germany, it will readily be understood that much larger sums would be requisite in this country, skilled labour being here much more expensive. The difference may be understood when it is borne in mind that a stonemason receives in Germany 12*s.* or 13*s.* a-week for twelve or thirteen hours' labour, while in this country a man who is often his interior gets from 30*s.* to 33*s.* a-week for nine hours daily. A similar difference exists in all sorts of work, and it is quite within bounds to say that altogether the cost of work there is less than half what it is in this country. As regards the future of the German stations, it cannot be said to be specially directed to the utilisation of refuse, and though doubtless nothing of this kind would be neglected, I cannot call to mind any such inquiry in their Journal, and I am certain that nothing of importance has been elicited, though the subject is of even greater moment in Germany than it is in this country, as all sorts of manufactured manures sell at a higher price there than they do here. As far as I have been able to see, I think there is no subject of agricultural inquiry which holds out smaller prospects of success than the investigation of refuse matters. At the time I became connected with the Society, it was considered to offer a large and important field of inquiry, and my attention was particularly directed to it, and ever since I have lost no opportunity of analysing and inquiring into the supply of such substances. The result, however, has proved very unsatisfactory. A great variety of such matters have been examined, and when the results obtained of any slightest interest a notice of them has been published in the Transactions, and though some of the substances have possessed a certain manurial value, in no case has it been such as to influence prices or to exercise any material influence on the practice of agriculture. Many of the suggestions which have been made regarding the use of refuse matters are of a singularly unpractical kind. Mr. Melvin, for instance, mentions in one of his letters that in the ironworks a quantity of ammonia is lost, which, if collected, would not only supply our home demand, but admit of large exports. This, however, is only true in the sense that when coal is burnt, ammonia is always set free and lost. If the coal now burnt in the ironworks could be distilled as it is in the gasworks, all this ammonia would be saved, but it is unnecessary to say that this would be incompatible with the use of the coal as fuel, and I fear we must be content to allow the ammonia to go to waste. Some years ago it was also announced that potash existed as a waste in one of the operations of the ironworks, and newspaper paragraphs dilated on the importance of the discovery to agriculture, but it was soon found that the quantity was small, and could be obtained only at intervals and with some difficulty, and I need scarcely say that no effect has been produced by it. Even the conversion of refuse fish into manure, which, when proposed, appeared to me to offer a reasonable prospect of success, has proved a failure, and though several works for the manufacture of fish manure were established, I am not aware that any of them are now in existence, and the cause of failure lies in the irregularity of supply, the fact being that unless the raw material can be obtained in a sufficient quantity to keep a considerable work constantly employed no profit can be obtained. Similar examples might be multiplied, but it is unnecessary to do so. I have enlarged upon this matter because Mr. Melvin seems to think that it has been overlooked, and forms an important field of inquiry, whereas it has been well examined, but without yielding results of much importance. It is true that the constituents of manures are rising in price, with the single exception of potash, which is now very much cheaper than it was ten years ago; but this is due not to the utilisation of refuse, but to the discovery of large deposits of potash salts in Northern Germany, at Hapfurt, the result of which has been to lower the price of muriate of potash from about £21 a ton to about £8 10*s.*, at which price it stood before the outbreak of the war, but which has risen this autumn to about £9 10*s.*, and this fact may be taken as showing that it is in the discovery of new sources of supply that agriculture must look for a reduction in price. The farmer may be sure that every kind of refuse which can by possibility be useful to him will soon be brought under his notice, for the competition which exists in all branches of manufacture leads the manufacturer to seek a use for everything he produces. These observations have led me away from the subject with which I started, and I shall only revert to it so far as to say that the proceedings of the German experimental stations are most unquestionably doing much for the establishment of the principles of scientific agriculture. Any attempt at a visit to them should, however, be postponed, for, independently of the season of the year, the war has, for the present, put a stop to all kinds of scientific work, and it would be a waste of labour to go to them until peace is quite re-established.

(Signed) Thomas Anderson.

The Board expressed themselves highly satisfied with Dr. Anderson's report, and considered that Mr. Melvin's proposals could not be carried out so long as the war continued.

WHITBY.

Steam Cultivation.—At a recent meeting of this Chamber a lecture was delivered by Mr. R. E. Brown, F.G.S., author of "The Book of the Landed Estate," and agent to Major Stapylton, Wass, Oswaldkirk, on "Steam Cultivation."

Mr. Brown commenced by describing the different engines used in steam cultivation. There was, 1st, what was commonly known as the double-engine tackle; 2d, the single tackle, with winding drums attached; 3d, the single-engine tackle, without drums attached; and, 4th, the traction engine, which pulled the implements over the land, as by Mr. Thompson's steamer.

Rival Systems.—There are, in reality, only two main systems:—1st, the double-engine tackle, and 2d, the single-engine tackle. We will suppose that a farmer decides upon adopting steam as a cultivating power on his farm, or that a number of farmers agree to join together as a company for the same purpose; the question would come to be asked—shall we purchase steam cultivating tackle with two engines or only one? Of course, the first cost of a double-engine tackle is very much more than a single-engine one, but the question is, will two engines plough or cultivate per acre cheaper and better than one engine? The best way to arrive at an answer to these questions is to first find the daily expenditure of each set, and then find how many acres each will work per day. The cost of a double-engine set of steam cultivating apparatus may be set down at £1400. I do not give this as the charge of any particular firm, but have taken it in round numbers as being very near the amount charged by all the different makers. This would be for two 12-horse power engines, with all necessary rope, plough, cultivator, porters, &c. It is probably somewhat more than the prices makers profess to take, but I have found that there are always extras to come in before a fair start can be made with a set of tackle. Well then, the interest of £1400, at 5 per cent. for one year is £70, being at the rate of 4*s.* 6*d.* for every working day in the year. The daily bill would therefore stand thus:—

	£	s.	d.
Interest on cash	0	4	6
Two enginemen	0	8	0
One ploughman	0	3	0
Two porter-boys	0	3	0
Man, horse and cart leading water to engines	0	7	6
Time of man, horse and cart leading coals to engines	0	5	0
Half ton coals per day, oil, cotton waste and grease to implements	0	9	0
Wear and tear of implements at 10 per cent.	0	9	0
	£2	9	0

Some of these figures may not meet the mark exactly, as, for instance, a farmer might be able to send a man, horse, and water-cart, at less than 7*s.* 6*d.* per day, and the distance from a railway station or seaport will affect the price of coals. For this sum of 49*s.* the two engines will plough or cultivate under ordinary circumstances 7 acres per day, being at the rate of about 7*s.* per acre. It will probably be said that the two engines will work up more than 7 acres per day. When the engines are fairly in position to work they will do more, but my own experience leads me to put it down at 7 acres on the average, after calculating all the time taken up by removing into position in a field, and other stoppages from work. So much for double-engine tackle. The first cost of a complete set of steam-cultivating apparatus, with one traction engine of 12-horse power, will cost about £750. The interest on this sum per annum, at 5 per cent., will be about £37 10*s.*, being at the rate of nearly 2*s.* 1*d.* per working day. To work this tackle it takes one engine-man, one anchor-man, one cultivator-man, and two porter-boys; the bill is therefore about £1 13*s.* 9*d.* It will be observed that the single-engine tackle requires one man more than the double-engine, because the cultivator is pulled direct between two engines, no anchor being required, while in the single-engine tackle, from the long lengths of rope in use, and the use of the anchor, an extra man is wanted. Well, then, what extent will a single-engine set plough or cultivate per day? My own experience with this tackle tells me that 5½ acres per day is about the average work. I have known 7 acres done in a day, and 6 acres to 6½ may be put down as the work done when the tackle is fairly set to work in a field. But then we must account for lost time in shifting from field to field, as with a traction engine steam is always up in removing and consequently expenses are going on. Taking 5½ acres as the average, this is at the rate of 6*s.* 1*d.* per acre, or 1*s.* per acre less than with the double-engine tackle. My conclusion is therefore in favour of the single-engine traction set so far. But here we have before us a single-engine set of tackle worked by a common portable engine and windlass. The first cost of this would be about £450, that is £250 for an engine, and £200 for tackle. The working expense of this per day would be £1 18*s.* 8*d.* Thus you have a larger expenditure with this set than with the single traction set, but a less first cost of £250; but then remember that every time you wish to remove your tackle you have to employ horses for this purpose; your engine is powerless to move without horses, and in every day's work this is a great inconvenience. It takes three men more to work the windlass tackle—one extra man to the windlass, and one extra anchor-man. The engine being stationary you have to work it on the roundabout principle. My conclusion is this: For very large fields, and where there is a large amount of work to do, use the double-engine tackle. But for general work, on such farms as we see every day in the North and East Ridings, and for the ordinary fields which we have, I decidedly say employ none but the single-engine traction set. Mr. Smith, of Woolston, county Bucks, tells us in a recent letter to the *Times*, that the cost per acre of breaking up his stubble land (a Pea and Bean stubble), was 6*s.* 3*d.* per acre. He makes the cost of his seed-bed for Wheat to be thus:—

	£	s.	d.
Steam-power	0	4	8½
Harrowing	0	1	3
A man forking 3 acres of Twitch per day at 2*s.* 6*d.* is per acre	0	0	10
Total	0	6	9½

But then we must remember that Woolston has been under steam cultivation for some years, and it will be easier now. To give you an idea of what steam ploughing companies charge for work done with their tackle, I may mention that an owner of land lately asked me to try and find him steam tackle to do up stubble land by contract. The estimates I received were that one gentleman, with a double-engine tackle, offered to cultivate me the land twice over at a depth of 9 inches for the sum of £1 per acre, and to be supplied with coals and water. Now, this would have cost for each single turn of the cultivator this:—

	£	s.	d.
Cultivating by contract 7 acres at 10*s.*	1	10	0
Coals to two engines, with cartage	1	4	8
Man and horse for water	0	8	0
Total	3	2	8

Being at the rate of nearly 14*s.* 6*d.* per acre. Another estimate is to cultivate the land twice over for 20*s.* per acre, and plough once over for 14*s.* per acre, with a supply of coals and water. Now, a case of this kind comes very expensive. Owners of steam-ploughing tackle expect, of course, to have interest for their cash, but in the instance I have stated the soil was very full of small stones, which would cause a great wear of points, but even at the heavy expense per acre which I have stated was estimated for the work is now being done. The land was formerly ploughed from 4 to 5 inches deep. The steam-cultivator is now breaking up the subsoil to a depth of 9 inches—not bringing the bottom soil to the top, remember, but simply stirring and loosening it. This will be done twice over, and then it will lie all winter to the action of the frost, and I feel sure the owner of the land will have a benefit next season. I do not think myself that from the point of cost any great advantage is gained by steam cultivation, but then you must consider the quality of the work done. It must be of great value to a farmer to be able to choose a time for doing certain work, and then to have it done in so short a time. With steam you can work up your stubble immediately after harvest, and in very many instances, where steam is the cultivating power, large breadths of bare fallow lands are now kept under a regular cropping, the result of steam machinery being able to keep heavy soils free and open.

Advantages gained by the use of Steam Cultivation.—This is really the great question to be asked, and which is often asked by farmers—What advantage do we gain by using steam as a cultivating power instead of horses? It is found that there are many advantages gained by the use of steam. Most farmers know the difference at the present day between threshing their grain by steam-power and the old-fashioned mill driven by horses. A sensible farmer will prefer having an engine and threshing machine in his stackyard, threshing and cleaning his grain fit for the market, to having his horses working on the old mill system. Well, the difference is just as much between the horse-plough and the steam-plough as between the horse threshing-machine and the steam threshing-machine, in so far as cost and trouble is concerned. I will just enumerate a few of the advantages gained by the use of steam in the cultivation of the soil, and then make a few remarks on each. 1st. That with steam you are more independ-

ent of the weather than with horses. 2d. That steam cultivation is a great advantage in the cultivation of a clay soil. 3d. The land can be kept cleaner by steam than by any other power. 4th. That it causes drains to work to more advantage. 5th. That better crops can be obtained by the use of steam-power. 6th. That it is the cheapest and easiest mode of cultivating deep. 7th. That it gives a cheap means of cultivating a large proportion of our waste lands to advantage. No clay-land farm at the present day is thoroughly worked without the use of steam in its cultivation. When a clay soil is worked by horses at a depth of from 4 to 6 inches, there remains underneath a baked and foot-trodden pan, through which very little can pass, either water or the roots of plants. I should advocate its being stirred, opened out, and made free, so as to make a way for water to pass through it instead of lying on the surface, choking, rotting, and keeping plants from growing freely. Do not turn it to the surface, but open it out so as the rain will wash through it, taking with it air and manure, and then the roots of grain and root crops will follow; they will have more room for their roots, and will be thankful for this privilege, and return to the farmer a heavier crop. This deep stirring can only be done properly by a steam-engine and a three, four, or five tined cultivator. . . . Steam-power is gradully becoming a means to enable us to reclaim our waste lands. With upwards of thirty millions of people in this country, we have just about an acre and 30 perches to each person in the kingdom. This includes all our hills, woodlands, and other wastes. The proportion is very small indeed; I am afraid we should fare badly if each of us had our share. We have therefore to depend in a great degree on a supply from other countries. Now by better farming on the lands which we have in cultivation, and by endeavouring to reclaim an extent of our wastes, we may very much improve our home produce. There is, no doubt, a very large proportion of our wastes which are so full of stones that steam-power could not in the first place be applied to them; but still there are many thousand acres which might be made to produce crops by a proper application of steam-power to them. There is a large extent of moorland in our own country which might profitably be reclaimed, a large extent of which I saw on my way from Malton to Whitby. We have notable instances of this in the case of the reclamation of Cannock Chase, the property of the Marquis of Anglesey. This has nearly all been brought into cultivation; and I may be allowed to mention the reclamation of a large part of Wass Moor, the property of Major Stapylton. We have there at work a single-engine set of tackle supplied by the Messrs. Howard, of Bedford, the engine is a traction engine of 12-horse power. The land at first was covered by a crop of Heath, this we set fire to, and cleared it off; we then had it cultivated by steam to a depth of 5 or 6 inches only, we then crossed it at the same depth. This leaves it in a very rough state, but exposes the soil to the action of the weather. We then harrow it twice over by steam-power, and this shakes all the soil from the rough pieces of Heath roots; next, we throw the rough pieces into heaps and burn them—the ashes of which give a very fair manuring to the soil. After these operations we cultivate the land for the third time, but this time to a depth of 15 inches. This breaks the subsoil without bringing it to the surface. I may state that we have very fine crops of Potatos, Turnips, and Rape this season from this land, and besides causing a great improvement to the property, it is paying, which is a most important point in any improvement. From the effect of steam cultivation on poor soils with stiff bottoms, I could point out to you fields which used to grow very poor grain crops, and which used to lay a bare fallow once in every four years; but now, after having been opened out and freed by steam-power, very excellent crops are grown, and, instead of bare fallows, first-class green crops are procured in regular rotation. You are probably aware that the growth of Sugar-Beetroot is causing attention in this country at the present time, a root which gives a good return in the shape of sugar extracted from it, and is a better feeder of cattle than either Turnips or Wurzel. Steam cultivation is a progress in farming, and, as Lord Ailesbury said the other day at Marlborough, "a stationary agriculture means an inefficient agriculture." This a fact which all of us should keep in mind. It will not do for the sons of Smith or Brown to go on and farm as old Smith or Brown, the father, or grandfather did in their farming days.

Discussion.

At the close of the lecture a general conversation ensued, in which it transpired that farmers in this neighbourhood could get their land cultivated by steam at the rate of £1 per acre if some neighbouring farmers joined to make up 100 acres. This was independent of fuel for the engine. Or an apparatus might be bought for £200, which could be worked with an ordinary engine, such as is used in threshing, or a company could be got up to purchase the whole machinery. The smallest field that could be brought under steam cultivation was 3 or 4 acres in extent.

Captain Turton observed that the moorland in Wass was very similar to that in the neighbourhood of Whitby, and when they heard it was raised from 1s. an acre by steam cultivation to such a condition that it now let at £1 an acre, it was sufficient to make their "mouths water."

Farmers' Clubs.

KINGSCOTE.

How to Winter our Live Stock.—At the first monthly meeting for the season of this Association, Mr. George Blackwell, jun., of Hazlecote, read a good practical paper on this subject.

We know that the backward spring kept our stock in the yard fully a fortnight longer than usual, making a still further inroad into the hay that ought to have been saved, followed by an unusually hot and dry summer, in which so little English hay was cut. We have again to begin our scanty stock of hay a month earlier than we mostly do; and these circumstances combined make it a greater difficulty to many farmers than has been known for several years. Under all circumstances, and especially in the position we are now in, warm and comfortable shedding is of the greatest importance, and I should recommend farmers who have not sufficient buildings to house their cattle well, to erect temporary places for them, as I feel sure it will repay them for their extra trouble and expense. We often allow our cattle to run too long in the fields without giving them a little dry food and shelter, and consequently, instead of improving the last month they are out, they go back. This we should guard against, as when animals go into the yard poor it takes a long time for them to regain what they have lost, as all animals require a sufficient supply to keep up the health and natural requirements of the system. If there is not enough feed in our pastures to do this we should supply artificial means. This attended to and the cattle comfortable in the yards, let us try and arrive at the best way of keeping them, not only through the winter, but in such a manner as will repay the farmer for his extra trouble and outlay.

The plan of keeping a certain portion of the beasts with oat and barley straw, with an allowance of from 2 to 4 lb. of cake per day, is one which is generally practised in the neighbourhood for store beasts, but should this plan be a good one, on most farms it would be impossible to carry it out this year, as through the scarcity of straw, if used in this extravagant way, there would not be sufficient fodder to last during the winter months. The system of more modern date is to cut the straw into chaff, mix it with pulped roots for store beasts, allowing for calves and in-season heifers one half hay. I think this a pretty good plan where the buildings are well placed near the centre of the farm, having good roads to the different fields. But unfortunately few are are in a position to carry out this method, as they require all the roots for their sheep.

Another plan is the cooking system, of which we have heard and read so much, and which I believe is economical; but I fear the want of suitable apparatus, and the cost of erecting such would deter a great many, if not all, tenant-farmers in this neighbourhood from adopting it, as we all live in hopes of better times. I saw the other day a portable chaff-cutter, made by Lane, of Cirencester, driven by an engine cutting two loads of straw and one of hay; the chaff, on being moved away from the machine, was trod by a boy who sprinkled it with salt, which kept the chaff in a mild state; it being found, I believe, a month or two after as good, if not better, than when stored. I doubt not this mixture would be considered pretty good, and one which would keep dry cows and store beasts from a year old and upwards in what we may call fair condition. But for calves, heifers in calf, cows near to calving, it would not be sufficient to keep them in a profitable condition, and it would be advisable to give them with a mixture of this sort, say 2 lb. of cake per day for a calf, or money value in bran, pollards, or any of our cereals ground into meal, and for in-season heifers 3 lb. of cake or other stuffs in like proportion. Had we a sufficient supply of this mixture we could get through the trouble pretty easily, but there are some farmers who have got the straw with a very small quantity of hay, so we must cut the coat according to the cloth, and for store cattle I should recommend cutting straw into chaff, and mix with either half a bushel of grains per beast, or 2 lb. of linseed ground into meal, soaked in water, and mixed with the chaff 24 hours before using. This, under present circumstances, is what I intend doing. The small quantity of hay you have got I should recommend being cut into chaff, one-third hay to two-thirds straw, and mixed with linseed meal or cake, as I have before stated, for calves and in-season heifers; and where the farmer has a few roots to spare give them to the last named animals, which would save the cake and corn bill a little.

We will now leave the cattle and proceed to the stable. Here I think we may do without hay, as I feel sure that Oats at 25s. per qr., and Maize at 33s. or 34s., are far cheaper feed for our cart-horses than allowing them hay. I think we can keep them with 1 bush. of Oats and half a bushel of crushed Maize per week, mixed with straw chaff; rack them up at night with pea or oat straw, and where practicable feed three times a-day. In the spring, when we work our horses harder, I think it a good plan to give them a few pulped Mangels if they can be spared, or a few brewers' grains, as it helps to entice down the dry chaff. Colts, I think, do best when allowed to run in a field by day, coming in at night, giving them a little bran, or, as it is at present dear, some crushed Maize and a few Oats. I feel sure they are kept much cheaper and healthier in this way than when entirely in the yard.

The next on the list are sheep, which, perhaps, of all others, are of the greatest importance to the farmer on the hills, as it is really almost, if not quite, impossible to farm successfully without them; and I feel sure that the better they are attended to, having a liberal supply of good food, the more they will pay. This year, I am thankful to say, notwithstanding the ravages of the grub and fly, we are much better off for roots than we were two years ago; and we have also to congratulate ourselves on rather an extra crop of seed hay, so that under these circumstances we are much better off for sheep keep than for our other stock. I am not aware of any better way of managing our sheep than that generally in use in this neighbourhood, except cutting the hay into chaff, which is gradually coming into practice, and which, if carried out this year, may help to save a considerable quantity of hay, and be a great help to our stack in the yard.

I will give you a short detail of my plan of management, commencing with the wether tegs, which we ought to bring out early in the spring. They ought to have an unlimited supply of well-cleaned cut Swedes three times a-day, taking care to give them no more at one time than what they will pick up night and morning, giving each 1 lb. of split Peas and Maize, with ¼ lb. of linseed cake, and, if possible, fresh ground every day. The chilver tegs I should also give as many roots as they can eat; but I do not consider it needful to cut for them when on Turnips, not keeping them so short as to make them pick up every bit, but let a few ewes follows after, which makes capital work. They also require cutting for when on Swedes, being so much harder than Turnips; and gnawing them in the spring when they are shelling their teeth, causes, I believe, a good many of our ewes to be broken-mouthed before they are over aged. Although I advocate giving the young sheep as many roots as they can eat, I prefer limiting the ewes, giving them only a sufficiency for moisture, as I have known very heavy losses in ewes and lambs from giving them too many roots. Where a farmer is without any roots, and with a short supply of hay, I should recommend the ewes running on a pasture field by day, and being folded at night, giving them half hay and straw cut into chaff, with 10 lb. of Oats per day, and a small quantity of cotton cake. Under all circumstances, the ewes must have sufficient nourishment to keep them up, as I know no animals less profitable than a lot of poor ewes. It is also a good plan to draw the young ewes from the old ones, and keep them rather better till lambing time, as they do so much better by themselves. After lambing there is, I think, no better plan than, when the lambs are sufficiently strong, turning them over the grass land with a supply of roots. The ewes with the twin lambs should be put by themselves, and I am sure the farmer will find it to his advantage to give them nearly one quart of Oats per day, as it helps to bring the lambs to something like uniformity of size, and the ewe, having extra requirements, needs extra support.

As regards pigs, they are a portion of the farm stock. I never saw a good farm without them, but I cannot see that our position this year respecting their food is at all different from other years, as the price of corn and grains, their chief food, is much the same, and as they are not particularly nice in their habits. Nevertheless, if there is any profit in keeping them, it is when they are kept in a good thriving state.

Discussion.

Colonel Kingscote fully agreed with Mr. Blackwell, and believed there was much loss to the farmer in keeping his cattle out too long in the autumn without extra food and shelter. He could, however, see they would not get through the winter without a supply of food in addition to that grown on the farm, however well managed; and, as Mr. Blackwell had said, it would be more profitable to keep the animals well, than merely in such a state as may be said to pass them through the winter. However expensive the system may appear, he did not see how it was possible to do this without putting their hands into their pocket, and buying some of the artificial foods which had been mentioned. He should like to know the opinions of those present as to which was the best food to buy, and the system of using it.

Mr. H. S. Hayward thought Maize good food when animals had a supply of green food, but where there was nothing but straw to cut into chaff he was of opinion that oilcake or linseed was far preferable, prepared in the manner recommended; but he did not agree with the general plan of feeding three or four times a-day. He believed, with all animals that chew the cud twice a-day was sufficient. He had had a good deal of experience, and he believed that animals fed only twice a-day did much better than under the general practice.

Mr. G. Robinson did not agree with Mr. Hayward's plan of feeding twice a-day. He fed a good many beasts every year, and he found the oftener they were fed the better they throve. He had heard of ram breeders and those who were in the practice of getting up sheep for show, get up in the night to feed them. If Mr. Hayward's plan was a good one, we spent a deal of time uselessly in waiting upon our animals. He carried out what may be called a cooking system on a small scale, and boiled ground maize and linseed to mix with his chaft. He believed this a more economical system than what had been recommended. He agreed with Mr. Blackwell in the system of sheep management, and found his ewes do

very well with half straw and hay cut into chaff with brewers' grains.

Mr. B. DREW said he lived in Hampshire some time, where they brought lambs out for sale at an earlier age and to greater maturity than any other county in England, and he believed their success depended entirely on the number of times they fed them in the course of the day.

HADLEIGH.

Sugar-Beet and Mangel Wurzel.—At the dinner of this Club, Mr. HAWKINS said he had grown Silesian Beet for the past three seasons. They were not a profitable crop, but he could only say that they had had three most unfavourable seasons, which might in some measure account for their not being so remunerative as he could have wished. The growth of Beans and Peas in his locality had been this year unremunerative. He generally grew his Silesian Beet in the place of Beans, Peas, or fallow. His Clover crop, which was beautiful last harvest, failed at Christmas. The Clover failing, he had no other resort but Beans and Peas; but he put in some Silesian Beet which yielded 15 tons per acre, and he sold it for £1 a ton. He was quite confident that the land was left in a much better state for the next crop after Silesian Beet than after Beans and Peas. He never ploughed the field till after March 1, the season then being very changeable; the Beet were in before the month of March was out. After they were in, they never had a drop of rain to do any good till just before harvest. The season before last he had over 22 tons per acre, which paid him very well indeed. The first season he only planted 6 acres, and the result then was 18½ tons per acre; and this season he was afraid he should not get more than 14 tons. That was the result of his experience of Sugar-Beet. He had this year sent something like 40 acres into the factory; but we might never live to see such a season again. The weather this season was the finest that could be desired for taking up the Beet and carting them to the factory. He had now a few more to send in, but he had received a communication from Mr. Porter, Mr. Duncan's manager, requesting him to reserve what he might have for a trial of his new traction engine, so that he should see the result of carting them from his occupation to the factory. If it could be carted at anything like a reasonable price, he had no doubt they would be larger growers of Beetroot than at present, and of course the carting was a very material item. At this season of the year, when everybody was getting up their land for the next season, they could not well spare the labour to cart 500 to 600 tons of Beetroot, as he had done this year, unless the weather was exceptionally favourable, as it had been this year. The carting was the great obstruction and detriment. Had they had showers opportunely in the month of May, the Sugar-Beet crop would have been far more extensive. As it was, Mr. Duncan had got the profitby getting the same quantity of sugar with less weight of root.

The CHAIRMAN asked Mr. Hawkins whether a Barley crop after Silesian Beet was worse or better than a Barley crop after common Mangel? Which drew the land the most?

Mr. HAWKINS said the first year after Barley he grew Silesian Beet, and had 18½ tons per acre. After Beet he had some Wheat upon it, and had the best piece of Wheat he ever had. The land would have been much better after Barley instead of Clover. He had ploughed it up before Christmas, but, the Sugar-Beet factory having been opened, he therefore, instead of Clover, planted Sugar-Beet. The next year he planted a field with common Beet and Sugar-Beet. He planted 3 acres of Sugar-Beet, 4 acres of Globe Mangel, and 4 acres of Long Mangel. The result of that was that he had 22 tons an acre of Sugar-Beet, and 37 tons per acre of common Beet. After that he planted the field with Barley, and he had, as near as possible, 10 coombs an acre. The Barley crop after Sugar-Beet was quite equal to the Barley crop after the other Beet, but they were not at all superior. Their show that day was a splendid show of roots, and amongst them he noticed a few specimens of Sugar-Beet. They, however, were a very coarse sample, and were grown too much out of the ground. They were not the sort that would be taken in at the factory. They, however, were a good size, and had been, no doubt, very nicely watered. He believed they were grown by Mr. Ensor. He did not think they need be at all afraid they would injure the land. He congratulated the members of the Club on their root show that day, and said if they came into his district they would not see a good piece of roots anywhere.

The CHAIRMAN called upon Mr. Rand to tell them how many years in succession he had grown Beet upon his unsound land.

Mr. RAND said the land had been broken up for 13 years, and he had grown Mangel upon it for twelve years out of the thirteen. He averaged 54 tons per acre for six years. One year he planted Oats, but they made so much straw that the corn was very poor. The seasons certainly must be vastly in his favour, as he had grown Mangels for thirteen years but one in succession. The largest crop he ever grew was 56 tons per acre. They had three competitors this year, and the best of these three grew 53 tons per acre, which was a very good crop. Mr. Rand complained that only £1 was given as a prize for unsound land, and said he thought a little advance upon that, or the offer of a second prize, would be very advantageous to the Society. He was quite satisfied that there was nothing better than to continue growing Mangels upon such soil as his as long as the land would produce them. He was sure nothing paid so well for a farmer to grow on that kind of land.

Mr. J. G. STOW, jun., one of the judges, said, although they had heard of three extraordinary heavy weights grown upon the unsound land, they had not a very good general report to give—in a great measure, no doubt, to be attributed to the season. Mr. Dipnall's they certainly found a very good stock, but the weight was not up to the standard. Mr. Gurdon they found had not got quite a full plant. He had only 76 roots to the rod, instead of 100, as last year. He thought they were Suttons' Mammoth. At Mr. White's they found some good roots, but he had not got a full crop. They were very large roots, but there were not many to the rod. Mr. Bacon's were a good plant, but they were not a good stock, and had not got enough top. The Rev. Mr. Gedge, of Bildeston, said he thought he could beat the neighbourhood, but he (Mr. Stow) thought he was too sanguine, and in order to give Mr. Gedge a place at the top of his list, he should be obliged to turn it upside down. In the unsound land they found an extraordinary piece at Mr. William Kersey's. They generally weighed a rod of Mangels in six basketsful, but this year they had to make nine. Mr. Rand's were the best stock, and they had not got so much top; but Mr. Kersey's were a very heavy weight, and also a very good plant and good stock. They saw some unusually large red Mangels at Mr. Kersey's, which looked more like little trees than anything else. At Mr. Samuel Kersey's they could hardly call the land unsound land, nor could it be called sound land. They were sown, he thought, rather too thick in places. He did not think he had so much weight as he would have had if he had sown them more uniformly. In Swedes and Turnips they began at Mr. Rand's, where there was not quite a full plant. Mr. J. G. Stow had a full plant. Mr. Gurdon's were an extraordinary plant, and sown very thickly. Messrs. Rand and Bacon had a good plant of white Turnips of full growth, but they were not equal to Mr. Gurdon's; he should think, planted rather later. There was only one entry of Kohl Rabi, a very good piece, but the top ones of the middle row in each stetch had something the matter with them. They would have been a very good plant had it not been for that. The Turnip crop was a great deal below the average, but the Mangels on unsound land were a great deal above the average.—In answer to Mr. Rand, Mr. Stow added that the Kohl Rabi made 19 tons per acre.

Mr. KERSEY should like to ask Mr. Cook how he farmed for his crop of Beetroot, which realised 56 tons per acre.

Mr. COOK said he was completely outdone; he did not think he should be called upon for an explanation. All the explanation he could give was that the season had been favourable to him. The land had grown Beet for nine years following, and he did not expect such a crop off it. He confessed he had neglected it. He had not a tumbril on his occupation, only a three-quarter load cart, and all that piece of land had had was ten of those three-quarter loads.

Mr. WILLIAM KERSEY, in answer to the Chairman, said: No one who had seen his roots, of course, could suppose they were grown with ordinary cultivation. About two years ago he carted upon the bank where they grew three-quarters of a load of pig manure, three-quarters of a load of horse manure, and a good pailful of guano and salt. If any gentleman liked to spend two sovereigns to get one he might do the same as he had done.

Notices of Books.

The Farmer's Almanac and Calendar for 1871. W. Ridgway, 169, Piccadilly.

Morton's Almanac for Farmers and Landowners. Cassell, Petter & Galpin, Ludgate Hill.

The Illustrated Farmer and Gardener's Almanac for 1871. Salisbury Square, Fleet Street.

They are named in the order of their age. Mr. Cuthbert Johnson's green-covered almanac and calendar has now instructed a whole generation of farmers. It is the same well packed cheery little annual as all these years have known it—mixing up well selected paragraphs which illustrate the progress of the year, with snatches of song and expressions of kindly good will on the part of its now veteran Editor. We take a gossiping extract for the benefit of our poultry readers:—

Henwives.—A very cheery writer, since we last addressed our readers, thus gives the result of picking the brains of sundry old women of their poultry lore ("Farm Mag.," vol. lxvii., p. 48). First, as to breed, Dorkings, living or dead, are the very pinks and patterns of poultry perfection. They have quite a talent for keeping themselves in condition, and are so well shaped that a moderate amount of flesh makes them look plump. Their chickens, indeed, are not quite so hardy as the Cochins, but with ordinary care there is no difficulty in rearing them. No hens are to be compared to them, either for affectionateness of cleverness. Then, as to management, gentleness cannot be too much recommended in the management of the poultry yard. A pet hen generally makes a good mother (the best I ever knew nestled in a doll's bed in the days of her chickenhood, and was fostered by a cat); but a wild, timid one is perpetually making herself and her chickens miserable about something or other, besides often trampling them to death from mere flurry and nervousness. And besides the profit that there is in making friends with them, there is a great deal of amusement. To know one turkey, goose, or duck is to know all; but hens, like other highly civilised races, manifest endless diversities of character. One is always getting into tandrums, hysterics of fear, anger, maternal affection, or all three together. Another, though a good sort of body in the main, is such a manager that there is no doing anything with her. She is so jealous of interference that she will keep her chickens out in the rain rather than allow any one but herself to put them up, and she will call them off from their dinner, if she be not allowed to scatter it on the ground, and manipulate it after her own fashion. The chickens of a third are always hungry, draggled and cross; wherever she has been, a couple of lost ones may be heard crying after her; while her neighbour's family will be plump, clean, and merry in the most unfavourable circumstances. When a hen wishes to sit she lies upon the nest, not rising when meddled with, but scolding vehemently, angry at the disturbance of her sweet maternal dream. This same peevishness of temper of hers is often taken advantage of when it is thought advisable to check the brooding inclination; such patients are confined together, and they soon forget all softer wishes and fancies in longing to be rid of each other's company. A less cruel way is to feed them highly, which will induce laying. The hen's natural nest consists of a hollow rudely scratched in the ground under cover of weeds or shrubs, a few dry stalks of grass or dead leaves surrounding the eggs, not under them. The best artificial one is a box half full of earth, with a little well rubbed straw over it. She likes to sit where she has laid, but she is much better away from the other hens, she being made to sit anywhere by giving her the eggs at nightfall, when she has just light enough to see them and arrange them to her satisfaction before she goes to sleep. A wearisome task indeed is before the poor bird. Think of sitting still for three weeks without as much as a novel to read or a bit of knitting work to do!"

Mr. Morton's Almanac is printed on a larger page, and decorated in some instances usefully, in others rather flashily. There are several portraits and short memoirs of noteworthy agriculturists, four of which have already appeared in the *Agricultural Gazette*, some of them very successful portraits, others not quite so good. The work is, in other respects, the same as heretofore—a compilation of the agricultural news of the year just past, with farm calendar and statistics serviceable for the year to come.

"The Illustrated Farmer and Gardener's Almanac"—a tremendous shilling's worth for size—is also very much as it was. It is, in fact, an exact reproduction of the previous year's publication as to a good many of its pages. The section, Agricultural Memoranda, issued on a capital plan, should be re-edited and corrected.

Farm Memoranda.

WEST SUSSEX: *Dec.* 13.—We are now in a dull time of year, when there is little out of the ordinary course of farming to take notice of. There is always a little interest attached to cattle shows that come about this time, and there are a few good beasts shown nearly always by the same people; there is a dinner party attended by the same people, and the same toasts responded to by the same orators, and in the same style—the subject being a little varied, as at present, war being the chief topic, and the need of keeping up our own army and navy the most important thing that should at present absorb the care of Government; but not a word about how cattle can be fatted to the best advantage. We never hear about what constitutes good farming in any way; the relations that exist between landlord and tenant, between employer and employed, we never hear a word about; indeed, Game Laws are never on the board here: and if meddling Whigs would only let us alone we would not take any notice of School Boards, or the new Education Act. In short we live quietly here, and don't want to meddle with anybody, and wish they would leave us alone.

But we have had our cattle show, and perhaps there were a dozen beasts, but mostly good. And we had a root show, where some fine ones were shown; and we had three or four samples each of red, white, and mixed Wheat, one or two of Oats, and three or four of Barley, to which one prize in each class was awarded. The amounts were small, as the subscriptions are falling off. And the dinner was very poorly attended. So that altogether our public appearance is not at all ostentatious. But for all that agriculture is not at such a low ebb as the above might make it appear; for in the general way there is perhaps hardly any country market that shows better bred mutton, and few districts that grow heavier crops of Wheat and other corn.

This year the corn is a fair crop with us, but we shall not be able to produce so much beef and mutton as usual, owing to the failure of roots; but still some will be brought out by some means, and cake and corn will be used more freely than usual, and more chaff will be cut up to be mixed with cake, and perhaps a few roots.

We have had a very dry autumn, and the wells are lower than they have been for many years, but rain has now come pretty heavy. The Wheat plant looks fair, but does not come on fast, and the slugs appear to be meddling with some of it. Work is rather slack now with us, and will be till the middle or end of next month, when Pea sowing will begin. *G. S.*

The Week's Work.

DECEMBER 24.—*Claying Fen Land* is extensively practised at this season. Sometimes the clay is carted, but over a large area of the Fen country the work is done by manual labour at from 30*s.* per acre and upwards. The clay or clayey marl is sometimes found only 2 or 3 feet below the surface of the peaty soil, but in other cases much deeper. It is not, however, so deep as it formerly was, owing to the general waste of the vegetable matter forming the soil, and the consequent subsidence of the staple below the original surface level. Narrow trenches are opened down to the clay, which is next dug up, and spread across between the trenches with the spade, or spade and harrow, when the trenches are wide asunder, at the rate of from 50 to 200 cubic yards per acre and upwards. The trenches are then filled with the peat earth dug out above the clay. The work is heavy when the clay lies at a considerable depth, but remunerating; and, although much land is annually clayed, yet the practice is limited compared with what it should be, and would be, could steam-power and machinery be successfully brought to bear upon it, either by digging or warping. Trials both ways have been made; the former (digging by steam) proved a failure, but the latter is a successful practice, which merits greater patronage than it at present receives.

Water Meadows, in southern counties at low levels, attend to as in November, making due allowance for a fall of temperature; not unfrequently the close of this month is as good for watering as the close of the last, but generally the earth and atmosphere both became colder. In the North frost and snow more frequently interfere with the operations. The thermometer requires close watching, even in open weather, and should a slight frost overtake, the opening of the sluices a little more, so as to supply an extra flow of water, may carry the waterman through, when otherwise his labours would be locked up in ice. Much depends upon the natural temperature of the water, and the land being irrigated, and the mode of irrigation. The temperature of the former (the water) will be influenced by that of the land over which, or through which, it flows in the carriers. With regard to the actual temperatures of the water and meadow, these should always be ascertained by a wet-bulb thermometer.

Irrigation Works.—This is a favourable time for the execution of such, most rivers being sufficiently high to determine practically "the influx and efflux levels," *alias* "feed and tail levels;" springs are likewise open, and the experience of the past summer ought to teach both landlord and tenant the propriety not only of laying out works for immediate use, but for storing water for summer use, if it cannot be got direct from springs or rivers, for applying more especially to grass land, whether lying in permanent meadow or under alternate husbandry. No doubt strong prejudices still exist to the irrigation of land only lying one, two, or three years in grass; but such prejudices are based upon a bygone experience, for the thorough underdrainage and subsoiling of land, with the liberal use of artificial manures, have removed the practical objections of the olden time. Water can be successfully applied to corn and green crops of every kind, including Turnips and Potatos as well as to grass, during the early period of their growth in spring and summer; but the water must be brought to the land before it can be so applied, and an effort should be made at this season to provide the supply for next summer, when pipes and other underground modes of conveyance can be laid down without interfering with growing crops. As to the immediate application of the water to grass lands, the water levels and surface of the land will determine the nature of the work. When the water can be applied to a plain sloping surface of permanent meadow or pasture, either on the ridge-and-furrow or catch-water plan, at 1*s.* or so per acre, the gutters from the underground mains being opened by a plough, the rule is plain.

Warping, natural and artificial, should both be carried out at this season, and the latter (artificial warping) to a much greater extent than has yet been done. A large area of poor peaty soil in North Lincolnshire and the West Riding of Yorkshire adjoining, has been successfully warped, and the whole of the Fen country and bogs of Ireland may be so warped in the same way. And besides fen and peat-bog there are immense tracts of sandy, gravelly, and chalky soil, capable of being warped at this season, when there is a command of water almost everywhere for the conveyance of the warp. As to the quality of the warp, it is not necessary that it should be "Nile mud," or Humber mud, or anything chemically like either. "Lay clay on sand and you buy land," is an old proverb, and the fertilising effects of clay is as well known on some Irish bogs as in the Bedford Level. And nothing would be more thankful for clay warp than poor chalky soils.

Chalking, marling, &c., are sometimes done wholly by manual labour, as claying is done in the Fen country. Thus in places where chalk is covered with a few feet of drifted clay, parallel trenches are opened, and the chalk dug out and spread between the trenches. In other cases the chalk is drifted into large beds and covered with a subsequent layer of drifted clay. In this case, also, the chalk may in many places be dug up and spread by manual labour; but in examples of drifted chalk it is more common to open pits, and apply the chalk by carting. Marl, shell sand, and green sand are applied in the same way, not only to clayey soils, but to all soils differing in character from themselves. When applied to peaty or fen soils, clay and sand should be mixed with the chalk and marl, or applied separately. Pure sand, applied to peat earth, will greatly sharpen and improve its quality in growing corn-straw and roots.

Carting in frosty weather is an old rule, and where the ploughing is done by steam, and the strength of teams reduced to what is required for constant carting, the work should be kept well in advance, the road work being done in open weather and the field work in frosty, and also in dry weather when the land will carry. Carting by steam has become an exceptional practice, but from the importance of getting the carting expeditiously done, it will no doubt with the progress of things very soon become the rule, and horse-carting the exception; or the two may be so combined that the bulk of the heavy work will be done by the former, leaving only light work and the minor details of the heavy work for the latter.

Fences.—The straightening of headlands and the enlarging of fields for profitable steam culture is giving rise to the removal of old hedges and the planting of new ones. Those that remain, when full of gaps, may be pleached and the gaps filled up with plants from the old hedges, and in stubbing them up the more healthy Thorns should be carefully topped and taken up for transplanting. In stubbing up an old hedge it is best to undermine it on one or both sides, as the roots are smaller and more easily cut the deeper you go. Thus, if there is no ditch, begin at one end by opening a trench two or three feet deep, or, practically speaking, down to a depth so that you can take plant after plant and pull them up by the hand. But if there is one or two ditches, put a drain pipe in one or a drain in each ditch should the land so require. Then, in covering the drain, undermine the hedge on one or both sides as the case may be. In this way an experienced hand will soon stub up an old hedge, taking care of all plants required for transplanting. In filling up gaps with old plants the gaps should be deeply trenched, and the ground manured with lime compost; and if gaps have arisen from the ground being too shallow, either on rock or moorband, the latter should be removed to let the roots down, and earth carted on to deepen the former. In some cases the rock may be removed before the earth is carted on. For planting young hedges the land should be trenched, &c., as will be shown next week.

Farm Horses keep in active working order, as directed last month. There is something in the dulness of the season, so to speak, that is peculiarly depressing upon their physical energies, which, if not counteracted by the proper means, will lower them in condition. Much of this is owing, doubtless, to natural causes, but more perhaps to the manner this noble animal is tied up to the manger in a narrow sloping stall in a dark and badly ventilated stable during the long nights of December—treatment diametrically at variance with his natural requirements. The day, it is to be hoped, is not far distant when a roomy loose-box will be considered as absolutely necessary for the hardworking farm-horse as for any of his race. The normal habits of the horse require to be thoroughly understood in order to provide for his artificial position as to housing, food, and grooming at this season.

Milch Cows timed to calve about this time require careful attendance, both as to dietary and household management. A milch cow stands tenfold more in need of a loose-box than a fattening bullock, and were milch cows thus housed and fed on wholesome food fewer mishaps would be experienced at calving time than are now complained of when tied up each to a stake in a narrow sloping stall. Cow-boxes should be cleaned out daily, the same as horse-boxes, and kept every bit as clean. They should also be roomy, well lighted and ventilated, and kept as nearly at a temperature of 60° as can be. The cold raw atmosphere of a damp house is as bad and unhealthy for a milch cow as it is for her owner, so that artificial heat is just as needful for the one as for the other; and few things will pay better, all things considered, than a small stove in the cow-house, whether the herd is kept for nursing or the pail, for it is now an established fact that a milch cow thus kept gives richer milk, and rich milk is just as good for the calf as for the butter and cheese manufactory, assuming the cows are properly fed. The influence of diet on milk must never be lost sight of, for although the best food will not compensate for cold, improper ventilation, &c., yet however comfortable the cow may be kept in a roomy box, bad food will make bad milk, and bad milk unhealthy calves, bad cream, and worse butter and cheese. If it is found impossible to keep farmhouses and labourers' cottages at a proper temperature, and free from damp and a polluted atmosphere, without artificial heat, how can it be otherwise with cow-houses and dairies in moist northern climates, where success depends so much upon a pure atmosphere of a proper temperature; and just now, when the health of live stock is the leading topic of the day, it becomes farmers to consider how far the treatment of milch cows with bad milk to calves is not laying the foundation of the predisposing cause of disease.

Ewe Flocks will this year require more careful attention than usual, both before and after lambing, in our southern counties, owing to the bareness of the pastures at the close of the summer, the autumn flush of grass, and absence of foggage. Those out-of-doors will require more hay and corn in the field. Lambing ewes should be fed indoors, and afterwards never allowed a run of the flushy green pastures with an empty stomach. *W. B.*

Notices to Correspondents.

SPARRED FLOORING: *A Country Parson* asks whether sparred or boarded floors, with water-tight pits underneath, really answer for fattening bullocks? He finds them recommended by Mr. Mechi in his book, "How to Farm Profitably." He has tried them on a small scale with two cows, but all his farming neighbours disapprove of them. He has not a weighing-machine, and cannot therefore speak confidently, but the animals do not appear to improve so much, nor to be so comfortable as those on straw. Would it not be better to have a lime-ash floor with a kamptulicon mat for bedding, and a pit 3 feet wide (behind the animal's heels) covered with a sparred floor or an iron grating, so that all the droppings, solid and liquid, might fall through? He has purchased some land and rents some, and wishes to fatten stock, if he can do so without loss, hoping by this means to find employment for some of the many able-bodied men who cannot find work in winter. [We do not recommend sparred flooring. With cows, especially, very little straw will suffice to keep them clean, and droppings and urine ought to fall into the gutter, and be taken out at least twice a-day. We have seen cocoa-nut matting provided in cowhouses, with very cleanly, and comfortable, and economical results. The best mode of feeding cattle is in roomy boxes, with sufficiently high roof, and without draught or disturbance; giving them plenty of straw, fern, or other leafy litter.]

Markets.

MARK LANE.

MONDAY, Dec. 19.

The supply of English Wheat to this morning's market was very small, and the condition generally bad; very little was sold, and we reduce our quotations 1*s.* to 2*s.* per qr. There was a fair attendance, but millers showed little disposition to purchase, and the few sales made of foreign were generally at a decline of 1*s.* per qr. upon the prices of this day se'nnight. Barley was 1*s.* per qr. cheaper. Beans and Peas were unchanged in value. The Oat trade was slow, at a reduction of 6*d.* to 1*s.* per qr. Flour was quiet.

	s.	*s.*		*s.*	*s.*
PRICE PER IMPERIAL QUARTER					
WHEAT, Essex, Kent, Suffolk	White	47—55	Red	51—56	
— — fine selected runs	do.	51—59	Red	48—57	
— — Talavera		52—61			
— — Norfolk		—	Red	—	
— — Foreign		44—63			
BARLEY, grind. & dist. 32s. to 33s.		42—45	Malting	35—40	
— Foreign .. grinding and distilling		24—32	Malting	32—39	
OATS, Essex and Suffolk		25—27			
— Scotch and Lincolnshire	Potato	27—29	Feed	—	
— Irish	Potato	26—25	Feed	24—27	
— Foreign	Poland and Brew	25—27	Feed	20—25	
RYE		32—36	Foreign	33—36	
RYE-MEAL, Foreign					
BEANS, Mazagan 43s. to 47s.	Tick	49—50	Harrow	49—50	
— Pigeon 51s. to 59s.	Winds.	—	Longpod.	—	
— Foreign	Small	45—47	Egyptian	42—44	
PEAS, White, Essex, and Kent	Boilers	38—40	Suffolk	40—42	
— Maple, 40s. to 44s.	Grey	36—40	Foreign	36—40	
MAIZE		—	Foreign	30—32	
FLOUR, best marks delivered	per sack	39—47			
— 2d ditto	ditto	33—45	Country	33—45	
— Foreign	per barrel	20—29	Per sack	37—63	

WEDNESDAY, Dec. 21.

There was a limited show of English Wheat on offer here to-day, for which the inquiry ruled very dull. Millers showed no disposition to make purchases, owing to the bad condition in which the samples came to hand, but holders were unwilling to accept less money than on Monday last. Foreign Wheat sold slowly, at the rates current on that day. Barley was dull, but without further change in value. Malt was without inquiry. Oats changed hands quietly on former terms. Beans and Peas maintained late rates, with a slow sale. The Flour trade was very inanimate, and the quotations tended downwards for both foreign and country marks.

ARRIVALS OF GRAIN, &c., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
	Qrs.	Qrs.	Qrs.	Sacks.
English & Scotch..	720	40	—	—
Irish ..	—	—	—	—
Foreign ..	4340	3510	32,520	5830 brls.
	5060	3550	32,520	

LIVERPOOL, Dec. 20.—A fair moderate business was done in Wheat, at last Friday's rates. Flour was in fair request and steady in value, some quantity being taken for the Continent. Beans steady; the bulk of the supply offering is of secondary quality. Barley and Peas unchanged. Oats and Oatmeal dull, and rates barely maintained.

AVERAGES.

	Wheat.	Barley.	Oats.
Nov. 12	50s 5d	36s11d	23s 8d
— 19	49 10	36 8	23 11
— 26	50 5	36 2	23 7
Dec. 3	52 5	36 1	23 10
— 10	52 2	35 9	23 7
— 17	52 5	35 4	23 4
Average ..	51 3	36 1	23 7

HAY.—per Load of 36 Trusses.

SMITHFIELD, Thursday, Dec. 22.

Prime Meadow Hay	130s.to140s.	Clover, old ..	..130s. to 140s.
Inferior do. ..	..110 120	Inferior do. ..	..110 125
New Hay ..	.. .. — —	Prime 2d cut do.	..126 135
Inferior do. ..	.. .. — —	Inferor do. ..	..105 115
Straw	.. 33 38		

CUMBERLAND MARKET, Thursday, Dec. 22.

Sup. Meadow Hay	130s.to138s.	Inferior Clover	..115s. to 130s.
Inferior do. ..	..110 120	Prime 2d cut do. ..	— —
New do.	.. — —	New do.	— —
Inferior do. ..	.. .. — —	Straw	38 42
Superior Clover	..138 147	JOSHUA BAKER.	

METROPOLITAN CATTLE MARKET.

MONDAY, Dec. 19.

We have a large supply of Beasts for the day, and being so near Christmas, the butchers have nearly completed their annual purchases of fat stock, consequently trade is dull and prices are lower, nor can a clearance be effected. Although the number of Sheep is small, it exceeds the demand. Choicest Downs and half-breds are not lower, but it is difficult to dispose of other kinds. Choice Calves are very scarce and very dear. Our foreign supply consists of 1000 Beasts, 2500 Sheep, 127 Calves, and 70 Pigs; from Scotland there are 200 Beasts; from Ireland, 550; from Norfolk and Suffolk, 750; and 795 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools	5	6to5 10
fords, &c. ..	5	8to6 0	Do. Shorn ..	..	— ..
Best Shorthorns ..	5	6—5 10	Ewes & 2d quality	4	4—5 0
2d quality Beasts	3	8—4 8	Do. Shorn ..	..	— ..
Best Downs and			Lambs	..	— ..
Half-breds ..	5	10—6 2	Calves	4	0—7 0
Do. Shorn ..	..	— ..	Pigs	4	0—5 8

Beasts, 3295; Sheep and Lambs, 12,940; Calves, 160; Pigs, 200.

THURSDAY, Dec. 22.

The number of Beasts is large for the day, but it mainly consists of those left over from last Monday; the few fresh choice qualities find purchasers at late rates. There is scarcely anything doing in the Sheep market. The supply is small, but it much exceeds the demand. There are very few choice Calves on offer, and they are sold very dear. Our foreign supply consists of 320 Beasts, 680 Sheep, 94 Calves, and 50 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Here-			Best Long-wools ..	5	6to5 8
fords, &c. ..	5	8to6 0	Do. Shorn ..	..	— ..
Best Shorthorns ..	5	6—5 8	Ewes & 2d quality	4	4—5 0
2d quality Beasts	3	8—4 8	Do. Shorn ..	..	— ..
Best Downs and			Lambs	..	— ..
Half-breds ..	5	8—6 4	Calves	4	0—7 0
Do. Shorn ..	..	— ..	Pigs	4	0—5 8

Beasts, 750; Sheep and Lambs, 2450; Calves, 110; Pigs, 80.

METROPOLITAN MEAT MARKET.—Dec. 22.

Best Fresh Butter .. .. .. 20s. per dozen lb.
Second do. do. .. .. 18s. ,,
Small Pork, 4s. 8d. to 5s. 2d.; Large Pork, 4s. 4d. to 4s. 8d. per 8 lb.

ENGLISH WOOL.

During the past week a large business has been done, in almost all cases at a slight advance. The demand for the inferior grades is in excess of the supply, and altogether the feeling in the market is more cheerful than for a long time past.

HOPS.

BOROUGH MARKET, Dec. 22.

There has been a fair amount of trade done during the week, chiefly in the lower classes of new English Hops. Sound 1868 American Hops are inquired for, but at very low prices.

SEED MARKET.

The close of the year being so near at hand, our markets are now very quiet; all descriptions of seeds are, however, held with considerable firmness, and a brisk business, with higher prices, is anticipated at the opening of the new year. New English red Clover seed, being in moderate supply, commands extreme currencies. In American red, cable advices just received from New York quote an advance of 2s. per cwt. Alsike and white Clover seed are firm. For old Trefoil seed we have an improved inquiry, whilst fine new qualities are noted 2s. to 3s. per cwt. dearer. Foreign Italian meets with a free sale, at rapidly advancing rates. Perennial grasses are again dearer. Owing to the cold weather, boiling Peas and Haricot Beans are in better request. Feeding Linseed is without alteration. Rapeseed continues exceedingly scarce, and must be quoted 2s. per qr. dearer. For bird seeds we have a good trade, at late rates. Spring Tares are steady. JOHN SHAW & SONS, Seed Merchants, 16, Water Lane, London, E.C.

COALS.—Dec. 21.

Adair's Main, 15s. 6d.; East Wylam, 15s. 6d.; Holywell Main, 16s. 3d.; West Hartley, 15s. 3d.; Walls End Harton, 15s. 9d.; Eden Main, 16s. 3d.; Walls End Braddyll's Hetton, 17s. 6d.; Walls End Haswell, 19s.; Walls End Hawthorn, 15s. 6d.; Walls End South Hetton, 18s. 3d.; Walls End Hartlepool, 17s. 9d.; Walls End Heugh Hall, 17s. 6d.; Walls End Kelloe, 17s. 6d.; Walls End East Hartlepool, 18s. 3d.; Walls End Original Hartlepool, 19s.; Walls End South Kelloe, 17s. 6d.—Ships at market, 83; sold, 77; unsold, 6; at sea, 35.

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They are specially adapted for heating Greenhouses, Conservatories, Churches, Chapels, Schools, Public Buildings, Entrance Halls, Warehouses, Workshops, &c.

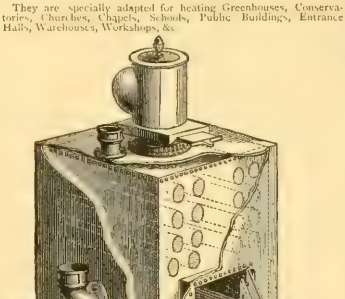

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4 They are great economisers of fuel, owing to the large amount of heating surface upon which the fire acts in a direct manner
5 Any number of flows and returns can be annexed to the boilers by means of T pipes
6 By means of mud-doors they can be readily cleaned out when required
7 The chimney is made of cast-iron, which can either be taken through a roof or turned into a flue, to meet the convenience of the situation they may be fixed in.
8 They are fed from the top, so that the fire can be banked up to last from 15 to 20 hours when required, without being attended to

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HOT-WATER APPARATUS erected Complete, or the Materials supplied for Heating GREENHOUSES, HOTHOUSES, CONSERVATORIES, CHURCHES, PUBLIC BUILDINGS, &c. HOT-WATER PIPES at wholesale prices; Elbows, T-Pieces, Syphons, and every other connection kept in stock

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Portable and Fixed Hot-water Apparatus

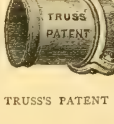

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	Each.
6 ft. by 4 ft. Lights, 2 in. thick, unglazed	£0 15 0
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Sheet	0 11 0
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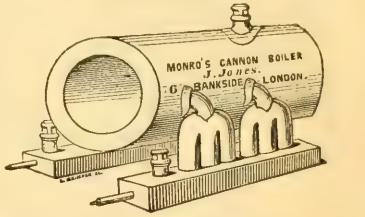

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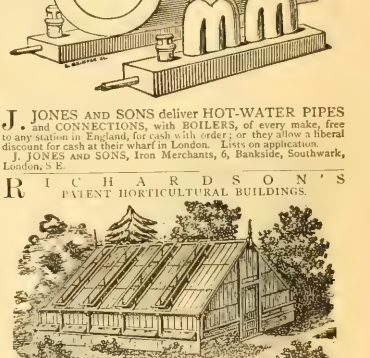

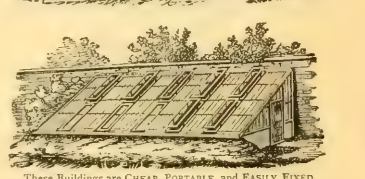

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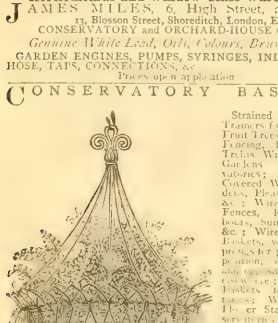

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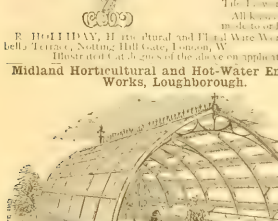

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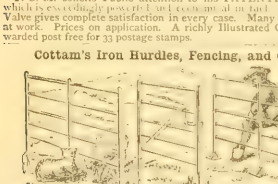

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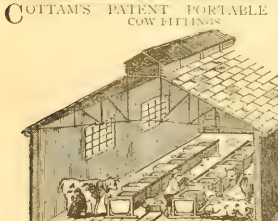

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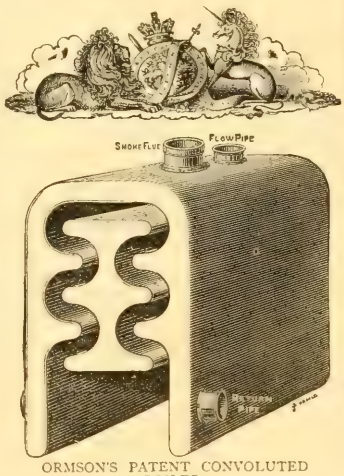

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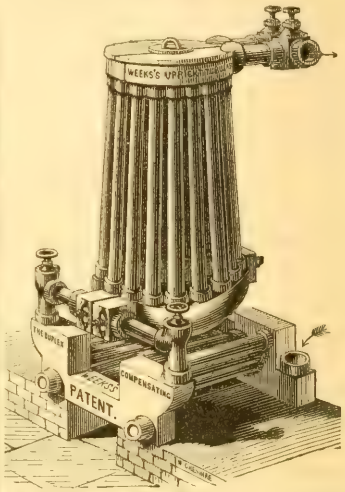

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THE GARDENERS' CHRONICLE
AND
AGRICULTURAL GAZETTE.

No. 53.—1870.] SATURDAY, DECEMBER 31. { Registered at the General Post Office as a Newspaper. } Price 5d. POST FREE, 5½d.

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Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE for JANUARY 7, 1871, will contain PORTRAITS of Dr. J. D. HOOKER, C.B., F.R.S., Director of the Royal Gardens, Kew, and of C. WREN HOSKYNS, Esq., M.P.; a PLAN of the FLOWER GARDEN at the Marquess of Westminster's Seat, Eaton Hall, Chester; and a REVIEW of the NEW PLANTS, FRUIT TREES, and VEGETABLES introduced during the past year, &c. Free by post, 5½d.

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JAMES CARTER AND CO., 237 and 238, High Holborn, London, W.C.

Trade List.

CHARLES SHARPE AND CO., SEED GROWER Sleaford, beg to acquaint the Trade that their WHOLESALE SEED LIST for the present season is now ready, and will be forwarded post free on application.

To the Trade.

DOWNIE, LAIRD, AND LAING have now published their SPECIAL LIST of SEEDS, which will be sent free to intending purchasers

Stanstead Park, Forest Hill, S.E.

New Catalogues.

DOWNIE, LAIRD, AND LAING'S CATALOGUES for 1871 of AGRICULTURAL, GARDEN, and FLOWER SEEDS, FLORIST FLOWERS, NEW PLANTS, ROSES, &c., are now published, and may be had on free application to

Edinburgh and Stanstead Mayfield Farm, Romford, Essex, and Forest Hill, London, S.E.

NEW and Choice Seedling GOLDING HOP SETS.—Raised by the advertiser, known to be the best in quality, and heaviest croppers, and never blight. 20,000 well rooted sets of the above at 1s. per 100; Cuttings at 3d. per 100; Plants at 2s. 6d. per 100

F. MANWARING, Mail Place, Benenden, Kent

SUTTONS' £3 3s. COLLECTION of GARDEN SEEDS, for a Large Garden, carriage free.

SUTTONS' £2 2s. COLLECTION of GARDEN SEEDS, for an Ordinary size Garden, carriage free

SUTTONS' £1 1s. COLLECTION of GARDEN SEEDS, for a Smaller-size Garden, carriage free.

SUTTON AND SONS, Seedsmen to the Queen, Reading.

1871.—Genuine New Garden Seeds and SELECTED SEED POTATOS.

JAMES DICKSON AND SONS will be happy to send their Priced Descriptive CATALOGUE for 1871, post free on application

"Newton" Nurseries, and 102, Eastgate Street, Chester.

Potatos.

EARLY SHAW and EVERGREEN REGENTS (true stock). Price per cwt. or ton on application to

JAMES FRASER, Maypole Farm, Romford, E.

To the Trade.

MYATT'S and RIVERS' ASHLEAF KIDNEY POTATOS. Prices and samples on application.

DOWNIE, LAIRD, AND LAING, Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

Seed Potatos.

H. AND F. SHARPE have fine stocks of the above, comprising AMERICAN EARLY ROSE, EARLY SANDRINGHAM, BOVINIA, and all the principal early and late varieties worthy of cultivation. The quality is very fine, and prices low. Special quotations on application.

Seed Growing Establishment, Wisbech.

Suttons' Potatos for Planting.

MESSRS. SUTTONS' Descriptive LIST is now ready, and may be had gratis and post free. Their stock of Potatos has been selected with great care, and can be relied on as perfectly true to name. Lowest price per cwt., sack, or ton, forwarded on application.

SUTTON AND SONS, Seed Growers, Reading.

Scarlet Runner Beans.

CHARLES SHARPE AND CO., Sleaford, have the above to offer to the Trade. Price on application.

CHARLES TURNER can still supply seeds of the new CUCUMBER, BLUE GOWN, and New MELON, GREEN GEM, at 2s. 6d. per packet.

The Royal Nurseries, Slough.

MANY Thousand Seeds of genuine TELEGRAPH CUCUMBER. Packets 1s. and 2s. 6d., stamps. Price to the Trade on application.

C. YOUNG, The Nursery, Balham Hill, London, S.W.

CABBAGE PLANTS.—Strong Early Battersea and Enfield Market Cabbage Plants at 5s. per 1000; also Drumhead or Cattle Cabbage Plants at 3s. 6d. per 1000, can now be supplied by

W. VIRGO AND SON, Wonersh Nursery, near Guildford.

HENRY'S HYBRID LEEK, in sealed packets, 1s. each. This is the largest and hardiest in cultivation.

DOWNIE, LAIRD, AND LAING, Edinburgh; and Stanstead Park, Forest Hill, London, S.E.

To the Trade.

DIMMICK'S NONPAREIL RED BEET.—The finest Red Beet in cultivation, in packets, direct from the grower. To be had only from

Messrs. HURST AND SON, 6, Leadenhall Street, London, S.E.

Asparagus Plants.—To the Trade.

JAMES CARTER, DUNNETT, AND BEALE, hold a splendid stock of 1, 2, and 3-yr. old Plants. Lowest price on application.

JAMES CARTER, DUNNETT, AND BEALE, 237 and 238, High Holborn, London, W.C.

RICHARD WALKER can supply the following for cash:—SEAKALE, second size 5s. per 100; third size, 3s.; ASPARAGUS, 3-yr. old, 3s. per 100; 2 yr., 2s.; cheaper per 1000; WHITE SPANISH ONION SEED, all new and genuine, 12.9d. p. lb.

The Market Gardens, Biggleswade, Beds.

Fine Forcing Seakale.

GEORGE CLARKE has a few thousands, very good clean stuff, to offer as under:—1st, extra fine, 12s. per 100; 2d, good, 8s. per 100. Remittance or reference to accompany orders from unknown Correspondents.

Nurseries: Streatham Place, Brixton Hill, London, S.W.; and Mottingham, Kent, S.E.

Cheap Geraniums.

ALFRED FRYER offers the following beautiful varieties, at per dozen, for cash:—

GOLDEN TRICOLORS.—Lady Cullum, 2s 6d; Mrs. Pollock, 3s; Sophia Dumaresque, 2s 6d. SILVER TRICOLORS.—Caroline Longueil, 6s; Italia Unita, 2s 6d. GOLD and BRONZE ZONALS.—Black Knight, 6s; Cleopatra, 9s; Duke of Edinburgh, 4s; E. G. Henderson, 3s 6d; Her Majesty, 3s 6d; Luminate, 6s; Painted Lady, 3s 6d; Princess of Wales, 4s; Stanstead Beauty, 6s. DOUBLE-FLOWERED.—Capitaine L'Hermite, 3s 6d.; Madame Lemoine, 3s 6d.; Madame Rose Charmeaux, 3s 6d.; Triomphe, 3s 6d. A Priced LIST of 300 varieties post free.

ALFRED FRYER, The Nurseries, Chatteris, Cambridgeshire.

Dutch Flower Roots.

CROYDON. A. HENDERSON EAST SURREY SEED WAREHOUSE ESTABLISHED 1828

ARCHD. HENDERSON begs to announce that he has received a large Consignment of Dutch and other Roots, carefully selected from the most celebrated growers.

DESCRIPTIVE and PRICED CATALOGUES are now ready, containing practical directions for their successful cultivation on all the various systems now adopted.

Also a CHOICE and SELECT LIST of VEGETABLE and HARDY FLOWER SEEDS for Autumn Sowing. Catalogues gratis and post free upon application.

Seed Nursery, Thornton Heath, Surrey, and at the East Surrey Seed Warehouse, North End, Croydon.

The most Desirable Plant of the Season.

PARSONS' NEW WHITE MIGNONETTE, RESEDA ODORATA EXIMEA. See previous Advertisement

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Messrs. Hugh Low & Co., Upper Clapton, E.
" Hurst & Sons, Leadenhall Street, London.
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" T. Lawson & Son, 90, Bridge Row, London.
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" Dick Radclyffe & Co., 129, High Holborn, London, W.C.
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" Woodroffe & Son, The Westbourne Nursery, Harrow Road, London, W.
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" W. Bull, King's Road, Chelsea.
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" H. Watkinson, 5, Market Place, Manchester
" R. Cooper, 152, Fleet Street, London, E. C.
" J. Fraser, Lea Bridge Road Nurseries, London, E.
" R. Smith, St. John's, Worcester.
" John Scott, The Seed Stores, Yeovil.
" F. K. Burridge, King Street, Ipswich.
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Messrs. Smith & Simons, Howard Street, St. Enoch Sq., Glasgow
" Austin & McAslan, 16, Buchanan Street, Glasgow.
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Messrs. Platz & Son, Erfurt
" Friedrich Dahlke's Successors, Erfurt.
Mr. Ernst Benary, Erfurt.

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Messrs. B. K. Bliss & Sons, New York.

PARSONS' NEW HYBRID TREE MIGNONETTE, in packets or per ounce, prices on application.

PARSONS' superior PRIMULA,
" " CALCEOLARIA,
" " CINERARIA,

saved from the finest strains in cultivation, 2s 6d per packet.

F. P. has a first-rate stock of FRUIT TREES, both Trained and Pyramids, of which he solicits an inspection. Warranted true to name. Also a splendid collection of ROSES, including all the finest varieties. CONIFERS, &c., of every description. CATALOGUES and prices of which may be had on application.

F. PARSONS, Nurseryman, Seedsman, and Florist, 27 and 28, Western Road, Brighton. Nurseries, Hassocks Gate, Keymer, Hurstpierpoint.

NEW AND GENUINE SEEDS.

B. S. WILLIAMS

BEGS TO ANNOUNCE THAT HIS

DESCRIPTIVE CATALOGUE of FLOWER, VEGETABLE, and AGRICULTURAL SEEDS for 1871,

CONTAINING MANY NEW AND CHOICE FLOWER AND VEGETABLE SEEDS,
Is Now Ready, Post Free on application.

VICTORIA and PARADISE NURSERIES, UPPER HOLLOWAY, LONDON, N.

GENUINE SEEDS ONLY.

JAMES VEITCH & SONS

BEG TO ANNOUNCE THAT THEIR

ILLUSTRATED PRICED CATALOGUE of GARDEN and FLOWER SEEDS for 1871,

WITH LIST OF IMPLEMENTS AND OTHER GARDEN REQUISITES,

Is now published, and will be forwarded Post Free on application.

ROYAL EXOTIC NURSERY, CHELSEA, LONDON, S.W.

NOTICE.

JOHN WILLS

BEGS TO INFORM HIS NUMEROUS FRIENDS AND THE HORTICULTURAL PUBLIC GENERALLY THAT HIS

NEW CATALOGUE of SEEDS, FRUIT and FOREST TREES, ROSES, SHRUBS, PLANTS, &c.,

Is now in the Press, and will be ready for distribution next week.

J. WILLS also begs to remind his numerous Friends, that all Letters should in future be addressed to his New Place of Business.

BY SPECIAL APPOINTMENT.

J. WILLS, F.R.H.S.,

ARTISTIC FLORAL DECORATOR, LANDSCAPE GARDENER, NURSERYMAN, and SEEDSMAN,
ROYAL EXOTIC NURSERY and FLORAL DEPOT, SUSSEX PLACE, OLD BROMPTON, LONDON.

SENECIO ARGENTEUS.

NEW HARDY PERENNIAL BEDDING PLANT.

As a very WHITE FOLIAGED plant, that will grow freely in any common border, and when once planted will take care of itself, being perfectly hardy, we believe that this plant will gain universal favour. It forms dense compact rosettes, in the style of Centaurea candidissima, 3 or 4 inches high, and 4 to 6 inches across, retaining their whiteness throughout the year. The beauty and rarity of this species have drawn forth almost rapturous descriptions from the few travellers who have reached its alpine fastnesses. We have proved it for the past two winters, and recommend it with the utmost confidence as one of the most valuable hardy plants that it has ever been our good fortune to introduce. First-class Certificate Royal Horticultural Society.

Price 5s. each, 50s. per dozen.

BEGONIA GERANIOIDES.

The Snowdrop itself scarcely surpasses the whiteness of the blossoms of this plant, which, as an ornament for greenhouses, blooming profusely during the autumn and winter months, is really charming. The habit is very dwarf and compact, with neat foliage, and flowers nearly an inch across. Introduced by us from Natal, and figured in the "Botanical Magazine" for 1866, tab. 5583. **Price 5s. each.**

JAS. BACKHOUSE AND SON, NURSERIES, YORK.

NOTICE.

MR. JAS. W. WIMSETT,

ASHBURNHAM PARK NURSERY, KING'S ROAD, CHELSEA, S.W.,

Begs to intimate that MR. JOHN WILLS is NO LONGER in his EMPLOYMENT, and that all LETTERS and BUSINESS COMMUNICATIONS should be addressed as above.

Planting Season.—Knowfield Nurseries, Carlisle.

MESSRS. LITTLE and BALLANTYNE, NURSERYMEN and SEEDSMEN, Carlisle, beg leave to request the attention of the Nobility and Gentry to their very extensive STOCK of FOREST and ORNAMENTAL TREES, SHRUBS, &c. Land-holders intending to Plant this Autumn are respectfully invited to inspect the Plants at their Nurseries, which they will find well grown and very suitable for exposed situations.

Lease are prepared to undertake the Laying-out and Planting of New Gardens, Parks, and Pleasure Grounds to any extent.

Their large Collection of FRUIT TREES, also Standard and Dwarf ROSES, will be found to include all the best varieties.

A NOBLE AVENUE, for £20, consisting of 100 WELLINGTONIA GIGANTEA, about 4 feet high, this, the most noble of all trees, a native of California, where it attains a height of 450 feet, with a trunk 50 feet in girth, is of rapid growth, hardy, and noble in form. The bark of a Wellingtonia at the Crystal Palace, recently destroyed by fire, gave an idea of the grandeur of the tree.

Or an AVENUE of 100 SUPERB ABIES DOUGLASII, about 10 feet high, for £50. This, the most noble of evergreen Trees, of rapid growth, hardy, produces valuable timber, close, heavy, and free from knots, of the colour of Yew wood. It is a native of California, where it grows upwards of 300 feet high, with a trunk 10 feet through. The Biggin Park Nursery, Uckfield, Sussex, contains 100 feet high. There is at Dropmore (Bucks) a specimen measuring at the present time 95 feet high, and 90 feet through the branches, with a trunk 9 feet in circumference at 5 feet above the ground. It was raised from seed sown by Mr. Frost, the present gardener, in 1838, and is now a model of beauty.

RICHARD SMITH, Nurseryman and Seed Merchant, Worcester.

Forest Trees, Ornamental Trees, and Shrubs.

PETER LAWSON AND SON have to intimate that CATALOGUES for the present season may be had upon application.

Their Stock of Seedling and Transplanted LARCHES, SCOTCH FIRS, and other FOREST TREES is both unusually extensive and superior in quality. When personal inspection is not convenient, samples and special offers will be sent if required.

Edinburgh and Woodhouse Close, Queen Street, E.C.)

AS AN AVENUE TREE

Nothing is more grand and beautiful as

ABIES NORDMANNIANA,

and they can be obtained of any size up to 6 feet, transplanted 1870

RHODODENDRON THE QUEEN

unsurpassed for its fine foliage and compact habit, is not surpassed by any other white Rhododendron as silver is superior to lead

RHODODENDRONS, FINEST NAMED

kinds, in greatest profusion, full of buds; never so fine before

DWARF ROSES,

as good as can be grown, and in any quantity.

FRUIT TREES.

APPLE, PEAR, CHERRY, PLUM, &c. Standard, Pyramid, Dwarf, and Trained; healthy, vigorous, and a capital selection

Planters are a few specialities offered by CHARLES NOBLE, but the Nurseries are replete with a large healthy stock of these shrubs and Plants second to none. By easy access shall aim a from sunning dale Station, South Western (by Railway) should induce all large planters to pay a visit, for seeing is the only way to understand the kind of plants sent out at the Sunningdale Nursery, and the prices charged will more than repay the journey.

Send for a CATALOGUE.

Lagshot.—Nov 1870.

PLANTING SEASON, 1870.

KNAP HILL NURSERY, WOKING, SURREY.

ANTHONY WATERER

RESPECTFULLY SOLICITS THE NOTICE OF INTENDING PLANTERS TO

THE FOLLOWING STATEMENT AND LIST OF PLANTS.

The Articles referred to have all been recently transplanted, have had ample space, and are in every particular certain to give the highest satisfaction; the Knap Hill Nursery is more than 200 acres in extent, and contains at the present moment the most extensive and important stock of HARDY EVERGREENS, AMERICAN PLANTS, CONIFERS, and STANDARD ORNAMENTAL TREES, FLOWERING DECIDUOUS SHRUBS, &c., in Great Britain. The Nursery is readily reached by Train from Waterloo to Woking. "Through Trucks" can be sent without the expense of package to any Railway Station in the Kingdom; and when quantities of two tons and upwards are sent in a truck, a considerable reduction will be made in the cost of the plants, and a special rate quoted for the carriage.

AMERICAN PLANTS.—The Annual Exhibition of Rhododendrons, in the large Tent in the Royal Horticultural Society's Gardens, is supplied by ANTHONY WATERER.

AZALEAS.—Selections of the very finest hardy kinds, nice blooming plants, well established as can be grown, 20s. per 100.

„ 60 named kinds, £5 to £7 10s. per 100.

„ Common mixed colours, £2 per 100.

„ Very handsome plants, well furnished with flowering plants, 12 to 15 feet, 42s. to 120s. per dozen and upwards. This is one of the most beautiful of the Deciduous Azaleas.

Large AZALEAS, of the finest varieties, 3, 4, 5, 6, 7, and 8 feet high, covered with flower buds, and objects of wonderful beauty when in flower. Hundreds of splendid specimens.

ANDROMEDA FLORIBUNDA. Good plants, 18s. to 30s. per doz.

RHODODENDRONS.—We invite special attention of Rhododendron buyers to this part of our stock. We have a lot of borders in which the plants vary from 2 to 3½ feet high. Every plant a specimen, and of the finest description in Rotten Row. Also a lot of Named RHODODENDRONS.—Low bushy stuff, plants, and consisting of the best hardy kinds, £5 to £15 per 100. A sample of 12 will be sent, if required.

Standard RHODODENDRONS.—Of these we possess the largest number of the finest specimens to be met with in any Nursery. The finest Standard Rhododendron in Rotten Row were nearly all of them supplied from Knap Hill. As no description in paper can give an adequate idea of these plants, we have had a fair example photographed, which is given in our Catalogue, just published.

RHODODENDRON PONTICUM, for Cover, £7 per 100; £15 per 1000

„ in variety, named, from layers, 10 to 12 inches, 50s. to 100s. per 100

„ Dwarf Varieties, for Pots, 12 to 15 inches, 50s. per 100

Seedling RHODODENDRONS, raised from the best hardy named kinds, and containing a great variety of colour.—Nice bushy plants, 50s. to 100s. per 100.

„ Larger and very bushy plants, £10 to £20 per 100

Cover.—We have grown for some years past a large number of Rhododendrons from layers, and we now have a stock of more than 200,000 plants of named varieties, which we believe are quite unequalled, being without exception the best plants we have ever seen. We supply them, all layers, at from 50s. to 200s. per 100. A sample, the plants good, and bushy, can be supplied.

HARDY HEATHS.—The most distinct and beautiful winter and spring varieties, by name, including Menziesias, every plant a specimen, 5s. per dozen, 40s. per 100.

„ The free growing varieties of VULGARIS, &c., 30s. per 100, £10 per 1000.

„ MEDITERRANEA ALBA and RUBRA.—Two very desirable spring blooming kinds, and having the seem of new-mown hay, £5 per 100.

KALMIA LATIFOLIA, from 9s. to 100s. per 100.

„ Nice blooming plants, £15 to £30 per 100

„ Larger, 30s. to 60s. per dozen and upwards.

„ MYRTIFOLIA, 42s. to 60s. per dozen.

All other American Plants are grown to a large extent.

HOLLIES.—The stock of Hollies at this Nursery is of the most extensive and varied description, and occupies many acres of land. Every plant that we shall sell has been transplanted since August, 1869.

COMMON GREEN HOLLIES.—Stout, 2 to 2½ feet, 42s. to 63s. per 100; 2½ to 3 feet, 63s. to 84s. per 100; 4, 5, 6, 7, 8, and 10 feet, 30s. to 120s. per dozen and upwards.

Thousands of beautifully grown Pyramidal plants.

We have a number of very large specimens, 12 to 16 feet high.

WATERER'S HOLLY.—We have these in large numbers and of GOLDEN QUEEN. all sizes, as Pyramids, Globes, and Standards, and, taken altogether, they are undoubtedly the most beautiful plants to be found in any Nursery in England. Our Catalogue contains a Photograph of Waterer's and Golden Queen Holly, being fair examples of our stock.

PERRY'S WEEPING HOLLY STANDARDS.—A large number.

NEW GOLDEN WEEPING HOLLY.—Nice Standards

The COMMON WEEPING HOLLY.—6, 7, 9, and 10 feet high, handsome plants.

IRISH YEWS, all sizes, up to 10 feet.

YEWS, GOLDEN and ELEGANTISSIMA.—We have these by hundreds, as Cones, Globes, and Standards up to 10 feet high. We believe no other Nursery affords such a variety of sizes and shapes.

BOX, GREEN. Handsome Pyramidal plants, 5, 6, 7, and 8 feet high, 42s. to 63s. per dozen.

„ VARIEGATED 12 to 15 inches. An enormous quantity of well-grown bushy plants, 3, 4, 5, and 6 feet high.

AUCUBA JAPONICA.—Thousands of sturdy bushy plants, 2, 3, and 4 feet high.

LAURUSTINUS (PORTUGAL), 2, 3, and 5 feet high, as bushes and Pyramids, all removed since August, 1869.

LAURUSTINUS and IVYS.—Fine Standards, in tubs

Of all other ordinary EVERGREENS we have an immense stock.

The following CONIFERS may be relied on as being handsomely grown and healthy:—

ABIES ALLEGHANIENSIS, 5 to 6 feet, 12s. per dozen; 7 to 8 feet, 60s.

These are beautiful plants, to replant 1870

ABIES CANADENSIS, 3, 4, 5, and 6 feet, 5s. to 7s. 6d. each; 7 to 8 feet, 10s. 6d. per plant.

PINUS CEMBRA, splendid trees, 7, 8, and 10 feet high

PINUS EXCELSA, 2 to 2½ feet, 30s. to 42s. per dozen; 3½ to 4 feet, 7s. 6d. to 10s. 6d. each; 4, 5, 6, 7, to 10 feet, splendid specimens, from 10s. 6d. to 42s. each and upwards.

PICEA NORDMANNIANA, very handsome plants, from seed, 3 feet high and wide, 42s. per dozen; 2½ to 3 feet, 5s. to 7s. 6d. each; larger specimens, 4, 5, 6, and 10 feet

PICEA MAGNIFICA or NOBILIS ROBUSTA, hundreds of plants, all from seed, 3, 4, and 5 feet high, 10s. 6d. each and upwards.

PICEA LASIOCARPA, 3 feet, handsome plants, 15s. each, 36s. 6d. per dozen; 4 feet, 21s. each, 42s. per dozen, each and upwards; and all have been transplanted within 12 months.

CEDRUS DEODARA, 2 to 3 feet, 30s. per dozen; 5 to 7 feet, 60s. to 84s. per dozen; 8, 9, and 10 feet high, massive specimens, September 1869. Hundreds of splendid trees, from 10s. 6d. each and upwards

CUPRESSUS LAWSONIANA ERECTA VIRIDIS, most perfectly grown plants, 2, 3, and 4 feet high.

CUPRESSUS LAWSONIANA GLAUCA, 12 to 15 feet, 42s. to 60s.

„ ARGENTEA 81s. per dozen

JUNIPER, CHINESE, 4 to 5 feet, 30s. per dozen; 6 to 7 feet, 84s. per dozen; beautifully furnished plants, 8 feet high, 10s. 6d. each and upwards.

THUJA AUREA, 2 feet and 3 and 4 feet round, 42s. per dozen; a large number of very fine specimens, 10 to 15 feet high, 10 and 15 feet in circumference.

THUJOPSIS BOREALIS, 3, 4, 5, 6, and 8 feet high; hundreds of most beautiful plants, 30s. to 84s. per dozen

THUJA LOBBII, 4, 5, 7, and 8 feet, moved in spring, 24s. per dozen and upwards

WELLINGTONIA GIGANTEA, 3, 4, 5, and 6 feet, recently removed.

The following TREES for avenues can be supplied in quantities. All are straight, handsome, well balanced trees, with stout stems and finely rooted:—

ACER PLATANOIDES, NORWAY MAPLE, 8 to 12 feet high.

ACER NEGUNDO VARIEGATA, standards, 18s. to 30s. per dozen.

ÆSCULUS ROSEA, SCARLET HORSE CHESTNUT, 8 and 10 feet high.

ÆSCULUS, COMMON HORSE CHESTNUTS, 8, 10, and 12 feet. The scarlet and common Horse Chestnuts have fine heads and stout stems, and are 6 to 8 inches round the stem at 4 feet from the ground.

BEECH, PURPLE, 6 to 8 feet, 10 to 12 feet, fine trees.

BEECH, COMMON, 8 to 10 feet.

BIRCH, WEEPING, 8 to 10 feet.

CHESTNUT, SPANISH, 8 to 10 feet.

ELMS, 10 to 15 feet.

LIMES, 10 to 15 feet; splendid trees, 5 to 6 inches round the stem 4 feet from the ground.

MAPLES, NORWAY, 8 to 14 feet.

OAKS, ENGLISH, 8 to 10 feet.

SCARLET AMERICAN OAKS, 10 to 12 feet.

PLANES, ORIENTAL and OCCIDENTAL, 10, 12, and 14 feet high.

The Planes on the Thames Embankment were supplied by A. W.

POPLARS, LOMBARDY, 7 to 10 to 15 feet.

SYCAMORE, 10 to 16 feet.

WALNUTS, about 10 feet.

ALIANTUS, 8 to 10 feet.

CATALPAS, 6 to 8 feet.

MOUNTAIN ASH, 8 to 10 feet.

The majority of these Trees have been planted within two years.

Samples, the only guide as to their true value, will be forwarded on application. We, however, feel confident that any one engaged in planting operations will not regret a visit to our Nursery.

KNAP HILL, near WOKING, SURREY.

New Catalogue of Dutch Bulbs, Plants Suitable for

BEDDING and DECORATIVE PURPOSES, SWEET VIOLETS, &c.

ROBERT PARKER begs to announce that his NEW CATALOGUE, containing SELECT DESCRIPTIVE and PRICED LISTS of DUTCH and other BULBS, PLANTS suitable for Bedding and Decorative Purposes, the QUALITY, TREES, SWEET VIOLETS, &c., is now published, and will be forwarded to applicants.

Exotic Nursery, Tooting, Surrey, S.W.

Notice to the Seed Trade.

ALFRED LEGERTON, SEED MERCHANT, 5, Aldgate, London, E., begs to announce his annual printed CATALOGUES of GARDEN, AGRICULTURAL, and FLOWER SEEDS, for the present season, is now ready, and can be had upon application. Intending purchasers would do well to see this before giving their orders. Samples and stocks are very fine, and prices very low.

Fruit Trees Grown for Sale by

J. SCOTT, Merriott, Somerset.—Before ordering send 2s. in stamps to J. S. for a copy of his ORCHARDIST and its COMPANION, a Catalogue of the finest Collection of Fruits in England, now in bearing, which proves the quality, the country where raised, the year they first fruited in, the raiser, their bearing quality, hardiness, and general cultivation. The Trees have been very much admired by all who have seen them, are clean, well-rooted, stunted, and spoilt by repeated pinching, a system that is quite retrograde to all the laws of physiology. Let your trees make wood and leaves, and ripening their wood, and not by cutting. Regulate your branches in winter, and in this season advise lies all the art of growing healthy and fruitful trees, such as J. S. offers.

Special Offer of Fruit Trees.

GEORGE CLARKE, having a surplus stock of fine Pyramid APPLE and PEAR TREES, in bearing condition, 8 to 12 feet high, to be cleared off this season, offers them. They have been transplanted every year, and will consequently be but little affected by a removal. They are healthy and true to name, full particulars of which will be forwarded on application.

Nurseries: Streatham Place, Brixton Hill, London, S.W.; and Mottingham, Kent, S.E.

Planting Season.

DICKSON AND CO., NURSERYMEN and SEEDSMEN, 1, Waterloo Place, Edinburgh, beg to call the attention of those about to plant to their very large and healthy Stock of FOREST TREES, FRUIT TREES, ORNAMENTAL TREES and SHRUBS, which are now in fine condition for Transplanting. They are growing on very exposed ground, are finely rooted, and the wood is thoroughly ripened. Samples sent and carriage paid. Special prices will be quoted where large quantities are taken. (Established 1770)

Special Offer of large Evergreens, &c.

WM. KNIGHT begs to call the attention of the Nobility and Gentry to a few thousands of fine specimens of the following:—

LAURUSTINUS, 5 to 6 feet | PHILLYREAS, 6 to 8 feet

PORTUGAL LAURELS, 5 to 7 ft. | COMMON LAURELS, 6 to 9 ft.

Variegated HOLLIES, 4 to 7 feet

COMMON HOLLIES, 4 to 5 feet, thickly set with buds.

The above have recently been transplanted, are very bushy handsome plants, and quite safe. Price per dozen or hundred on application

Floral Nursery, Hailsham, Sussex.

Planting Season.

TO BE SOLD, cheap, the ground being required for other purposes, a Series of RHODODENDRONS, from 1 to 1½ feet high, in bushy bods, well set with bud, the finest lot in England. AZALEAS, strong and bushy, well set with bud; POPULARS, 10 to 12 feet high, SPIRÆA PRUNIFOLIA, 2 to 3 feet; HORSE CHESTNUTS, SWEET BAMBOO, ARBOR VITÆ, 2 to 3 feet; COMMON LAURELS, 1 to 2 feet, bushy; and other Forest Trees, Shrubs, &c. Best sorts GOOSEBERRIES in variety.

B. WHITHAM, The Nurseries, Reddish, near Stockport.

FOR PLANTATIONS, at wholesale prices, for cash

all transplanted and healthy, OAK, ELM, BEECH, HORSE CHESTNUT, 2 to 3 feet, 10s. per 100; 3 to 4 feet, 20s. per 100; ASH, 3 to 4, 25s. per 100; HORSE CHESTNUT, 4 feet, 30s. per 1000; MAPLE, 4 to 5 feet, 30s. per 100; LABURNUM, 3 to 5 feet, 12s. 6d. to 15s. per 100; SPANISH CHESTNUT, 4 to 5 feet, 30s. per 100; 5 to 6 feet, 50s. per 100; WALNUTS, 3 to 4 feet, 20s. per 100; BOX, for edging walks, of 3 feet, Red Currie CURRANTS, strong, 8s. per 100, 50s. per 1000; HIGH PEAS, 3 feet, 3s. per 100; DWARF PEAS, Red and Yellow RHUBARB, thirty, 3 to 4 ft. 6d. per dozen; Dwarf Perpetual ROSES on Briar, 9s. per dozen; and other Nursery Stock.

Remittance or reference required with orders.

A. WILDSMITH, Nurseries, Kelvedon, Essex

Planting Season.

THOMAS KENNEDY AND CO. offer the following transplanted TREES, &c., all fresh and healthy, well grown, well rooted, and excellent condition for removal. Prices on application.

100,000 BIRCH, 1 to 1½, 1½ to 2, 2 to 2½, and 3 to 4 feet

500,000 SCOTCH FIR, 6 to 9, 9 to 12, 12 to 15, and 15 to 21 inches

1,000,000 SCOTCH FIR, true native, 9 to 12 inches, and 1 to 1½, 1½ to 2, and 2 to 2½ feet

500,000 SPRUCE FIR, 6 to 9, 9 to 12, 12 to 15, and 15 to 18 inches, and 1½ to 2, and 2 to 3 feet

50,000 PINUS AUSTRIACA, 9 to 15, and 15 to 18 inches, and 1½ to 2 feet

50,000 PINUS LARICIO, true Corsican, 12 to 15, and 15 to 18 in.

100,000 OAK, English, 1½ to 2, 2 to 2½, 2½ to 3, and 3 to 4 feet

50,000 POPLAR and HUNTINGDON WILLOW, 2 to 2½, 2½ to 3, 3 to 3½, 3½ to 4, and 4 to 5 feet

50,000 PRIVET, 1 feet, 1½ to 2, 2 to 2½, and 2 to 3 feet.

2,000,000 THORNS or QUICKS, 1, 2, and 3 yr. transplanted, 3 and 4 yr. transplanted, and strong seedlings

20,000 WHIN or GORSE, 1½ to 2, and 2 to 2½ feet

Besides the above they have a extensive general stock of FOREST, FRUIT, and ORNAMENTAL TREES, DECIDUOUS and EVERGREEN SHRUBS, &c., which they are selling at moderate prices.

Railway Station Nurseries, &c., Dumfries.—December, 1870.

Planting Season.

LARCH, SCOTCH FIR, ENGLISH OAK, and all other Forest Trees.

QUICK, and all other Hedge Plants.

COVERT PLANTS, in great variety.

FRUIT TREES, including all the best varieties of Apples, Pears, Peaches, Plums, Nectarines, &c., in Standards, Dwarfs, trained and untrained.

ROSES, Standards, Dwarfs, on own roots and Manetti stock, &c.

VINES, all the leading varieties, in 2000 well ripened Canes, for forcing and planting out.

EVERGREENS, in great variety, including large quantities of all the Choicest Hollies, &c.

CONIFERÆ, including Picea nobilis, Nordmanniana, &c.

ORNAMENTAL TREES and Plants, of all sorts.

The whole in very great quantity and stout vigorous condition, with fine roots, for safe removal.

Priced LISTS and all particulars on application to

JAMES DICKSON AND SONS, "Newton" Nurseries, Chester.

The "Newton" Nurseries are within 10 minutes' walk, by the new road over Flookersbrook Bridge, from the Railway Station.

NEW large late FRANKFORT CAULIFLOWER.

RED-SKIN FLOURBALL POTATO.

The above Cauliflower has been thoroughly tested, was introduced by us in spring 1870, and advertised in the *Gardeners' Chronicle* under the above, its true name, as being of great size, extremely hardy, and of excellent quality in almost every description of soil, and unaffected by weather or climate. It has in both seasons fully borne out all that has been said of it, as can be verified from the reports of numerous correspondents throughout the kingdom, who have had no difficulty in producing in the months of November and December large heads, beautifully white and very solid, measuring from 10 to 12 inches in diameter. Price per packet, containing 2000 seeds, 2s.

RED-SKIN FLOURBALL POTATO.—A most superior late Potato, which, when boiled is a pretty white colour and fine eating. If planted wide they yield an extraordinary heavy crop of finely shaped full-sized tubers. Price 2s. per pound, or 3 pounds sent carriage paid for 5s.

N.B. The supply of both the above being limited, early Orders are respectfully requested.

WM. DRUMMOND AND SONS, Seed and Nursery Establishment, Stirling, N.B.

Standard and Dwarf Roses.

GEORGE DAVISON'S stock is very fine, and will be Sold at any reasonable Price, as they must be cleared Many Thousands of TEA ROSES in pots, 36 sorts of the best New Roses of last year, 18s. per dozen, strong plants. The Trade supplied. CATALOGUES on application.
Specimen CONIFERS, SHRUBS, FRUIT and FOREST TREES, &c. Thirty Thousand, four times transplanted, PINUS AUSTRIACA.
White Cross Nurseries, Hereford.

ALL the LEADING KINDS of Standard ROSES, 2-yr. buds, fine, 75s. per 100.
Dwarf ROSES, 60s. per 100
Dwarf-trained PEACHES, NECTARINES, and APRICOTS, unusually good, 30s. per dozen.
Dwarf-trained PLUMS, 21s. per dozen.
Bushy GREEN HOLLIES, transplanted, 25s. per 100
Very bushy GREEN HOLLIES, four times transplanted, 60s. per 100.
E. PIERCE, Nurseries, Yeovil, Somerset.

Cheap Roses and Vines.

KIRK ALLEN has to offer fine Standard ROSES, fully equal to any in the Trade—best varieties only, his selection, at 9s. per dozen. Dwarfs, ditto, ditto, 7s. per dozen.
Extra strong planting VINES of BLACK HAMBURGH GRAPE, 2s. 6d. each; ditto, ditto, fruiting, 3s. 6d. each. GOLDEN CHAMPION, strong planting Canes, 3s. each; extra strong Fruiting ditto, 5s. each. All package free.
The Nurseries, Brampton, Huntingdon

"NEWTON" NURSERIES, CHESTER.—These extensive and old established Nurseries can now readily be reached on foot within 10 minutes' time from the Chester Railway Station. Also by short train, only 15 minutes from the Stores) over Dookersbrook Bridge, entering JAMES DICKSON & SONS' new road, close by the "Ermine" Inn.
Intending Planters are specially solicited to inspect the Stock, which, for quality, variety, and extent, is unsurpassed in Britain
CATALOGUES and all particulars on application
JAMES DICKSON and SONS, "Newton" Nurseries, Chester

Choice Seeds.

HENRY CANNELL begs to inform the Trade that he has a small quantity of the following SEEDS for DISPOSAL. They are warranted genuine and first-class in quality in fact they are from the sample now retailed to private customers, and cannot fail to give satisfaction. Prices on application.
PICOTEE and CARNATION,
BELGIAN PANSY,
BLACK PANSY,
HOLLYHOCKS,
ENGLISH QUILLED ASTERS,
DELPHINIUM FORMOSUM,
BALSAM,
SANDBECK PANSY,
ECHEVERIA SECUNDA GLAUCA,
AGERATUM IMPERIALE DWARF,
VIOLA LUTEA GRANDIFLORA,
LOBELIA SPECIOSA,
LOBELIA ERINUS ALBA,
LOBELIA PUMILA,
DOUBLE WOOLLIGIA,
ZONAL GERANIUMS, and
ANTIRRHINUM.
New Florist Flower and Vegetable Seed Manual, 1871, Warranted.

By Special Appointment to
HER MAJESTY and H.R.H. the PRINCE of WALES.

BALLS and PARTIES furnished with PLANTS of every description. A large stock of Ornamental-foliaged Plants kept for the purpose.

CONSERVATORIES
Furnished by the year or otherwise on reasonable terms

ALL KINDS of DINNER TABLE DECORATIONS
Sent out to any part of London, and arranged in modern and approved style, with the choicest plants and flowers of the season

CUT FLOWERS
Sent out loosely, or arranged into Bouquets by experienced and tasteful persons

BRIDAL, OPERA, and other BOUQUETS.
Gentlemen furnished, at their residences in town, with Button-hole Bouquets, and by post when in the country.

GARDENS
Experienced Workmen sent out to plan or attend to Gardens by the day, week, month, or year
Plans and Estimates prepared for new Ground Work, Plantations, Rock Work, &c.

GARDENERS
Many Cabinets and Shrubberies furnished

PLANS and ESTIMATES
Prepared for Erecting all kinds of Floricultural and Horticultural Buildings, Hot-water Apparatus, &c.
Experienced Workmen kept for this purpose.

J. WILLS, F.R.H.S., Artistic Floral Decorator, Nurseryman, Seedsman, and Florist, Royal Exotic Nursery and Floral Depot, Sussex Place, Old Brompton (near the Royal Horticultural Gardens), South Kensington, London, S.W.

To Planters of Ornamental Trees.

J. SCOTT, Merriott, Somerset, offers, from his large collection, the following at prices much below their real value; all are grown singly, and feathered to the ground, viz. :—
ABIES MENZIESII, 4 feet, 15s. per dozen.
ARAUCARIA, 2 to 3 feet, 30s. per dozen.
PICEA DOUGLASII, 2 to 3 feet, 18s. per dozen.
" PINSAPO, 18 inches to 2 feet, 18s. per dozen.
PINUS CEMBRA, 1 to 7 feet, 2s. 6d. to 5s. each
" INSIGNIS, 2 to 5 feet, 12s. to 30s. per dozen.
BIOTA ORIENTALIS, 3 to 4 feet, 6s. to 9s. per dozen.
" " GLAUCA, 6 feet, 24s. per dozen.
" SIEBOLDII, 4 feet, 24s. per dozen.
" " AUREA, or Golden Arbor-vitæ, 2 feet, 24s per dozen; 3 feet by 3 feet, 60s. per dozen
" " ELEGANTISSIMA (the golden pyramid), 3½ to 4 feet, 60s. per dozen.
" PENDULA, 6 feet, 10s. 6d. each.
CRYPTOMERIA JAPONICA, 4 to 6 feet, fine, and well made, 18s. to 24s. per dozen.
CUPRESSUS FUNEBRIS, 3 feet, 18s. per dozen
" LAWSONIANA, in variety, 3, 4, 5 to 6 feet, 12s. to 24s. per dozen; less by the 100
" LUSITANICA, 3 to 5 feet, 24s. to 36s. per dozen.
" MACROCARPA, 2½ feet, 9s. per dozen.
" NUTKAENSIS, 3 to 5 feet, 30s. to 48s. per dozen.
" TORULOSA, 4 to 6 feet, 30s. to 48s. per dozen.
SEQUOIA SEMPERVIRENS, 10 feet, 2s. 6d. each
THUJOPSIS BOREALIS, 2 to 3 feet, 18s. to 30s. per dozen
THUJA GIGANTEA, 3 to 6 feet, perfect specimens, 30s. to 60s. per dozen
" CRAIGIANA, line, 4 to 6 feet, 12s. to 30s. per dozen
" LOBBII, fine, 5 to 7 feet, 18s. to 30s. per dozen
" OCCIDENTALIS, 6 to 7 feet, fine, 18s. per dozen
" PLICATA, 2 feet, 2s. 6d. each
" WARREANA, 4 to 5 feet, 18s. to 24s. per dozen
JUNIPERUS VIRGINIANA, 4 to 6 feet, 9s. to 18s. per dozen
TAXUS, Common Yew, 2 to 4 feet, 12s. to 18s. per doz.; 7 to 10 feet, 5s. each
IRISH YEW, 10 feet, fine, 20s. each.
The above are a few of JAMES SCOTT'S immense stock, CATALOGUES of which will be sent on application.
The fine BROCKWORTH PARK PEAR should be in every collection, 2s. 6d. each, quite cash; also the BENEDICTINE, 2s. 6d. each

Paul's Nurseries and Seed Warehouse,
WALTHAM CROSS, LONDON, N.

NOW READY,
WILLIAM PAUL'S CATALOGUE
OF
VEGETABLE and FLOWER SEEDS, GLADIOLI, &c.,
Containing a Selection of Novelties, and of all the most approved older kinds, many home-grown and others drawn from the most reliable sources.

THE WALTHAM COLLECTIONS
OF VEGETABLE AND FLOWER SEEDS,
Which have given such general satisfaction in past years, are still made up of the most select sorts for large or small gardens

No. 1. COLLECTION of VEGETABLES and SALADS for Large Garden, 1 year's supply £3 3 0
No. 2. Do. Do. Do. for £2 2 0
Smaller Garden . . . . . .
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No. 4 & 5 Do. Do. Do. for
Small Garden . . . . . 15s. and 10s. 6d.

No. 1. COLLECTION of FLOWER SEEDS, £2 2 0
Contains 12 large Collections of the choicest imported Asters, Stocks, Balsams, Phlox Drummondi, Cannas, &c., 12 packets choice Greenhouse and Tender Annuals, 50 packets select Annuals, Biennials, and Perennials

No. 2. COLLECTION of FLOWER SEEDS, £1 1 0
Contains an equally good selection in smaller quantities

No. 3. COLLECTION of FLOWER SEEDS, 10s. 6d.
A choice and effective selection for Small Gardens

SEED POTATOS.
Warranted sound and true to name, true and true-cooking, and of excellent quality

All Seeds Carriage Free, except very small parcels.

IMPORTANT.—We, WILLIAM PAUL (the Christian name is real), Paul's Nurseries, Waltham Cross, London, N.

Now Ready, Free by Post.

GEORGE JACKMAN AND SON'S Illustrated Descriptive Priced CATALOGUE of their frequently Transplanted NURSERY STOCK, can be had on application. The Trees, Shrubs, &c., are in splendid condition for removal, remarkably well grown, and worthy the attention of intending Planters, the Trade, and Public Companies.
The "Woking Nursery" is easily reached by South Western Railway Trains, or by Road from Hyde Park Corner through it upwards of half of ports of the country, with a consequent saving of package and carriage. An inspection of the Nursery will well repay Purchasers, but to those who cannot personally pay a visit, the following summary of the principal stock, averaging from 1 to 5, 9 and 12 feet high, will give some idea of the resources of this Established Nursery :—
125,000 Standard, Pyramid, Dwarf Maiden, cutback, and trained APPLES, PEARS, PLUMS, CHERRIES, PEACHES, NECTARINES, APRICOTS, &c., of the leading well-known kinds.
25,000 STANDARD and DWARF ROSES, of select and choicest varieties.
200,000 AMERICAN PLANTS, including thousands of Rhododendrons, of choice scarlets and other fine hardy sorts, besides the common hybrid Catawbiense and Ponticum.
750,000 CONIFERÆ, which embrace most of the fine hardy species and varieties of the following genera :—Abies, Araucaria, Cedrus, Cupressus, Juniperus, Picea, Pinus, Retinospora, Taxodium, Taxus, Thuja, Thujopsis, Wellingtonia, &c.
450,000 EVERGREEN and DECIDUOUS TREES and SHRUBS, of the following :—Acacia, Ailantus, Alder, Almond (flowering), Althæa frutex, Arbutus, Ash, Aucuba, Bay, Beech, Berberis, Lycium, Buffalo-berry, Box, Broom, Calycanthus, Chestnut, Cherry (flowering), Chimonanthus, Comptonia, Cornus, Cotoneaster, Cytisus, Deutzia, Dogwood, Elæagnus, Elm, Escalonia, Euonymus, Fir, Forsythia, Gum Cistus, Guelder Rose, Holly, Hornbeam, Hypericum, Kolreuteria, Laburnum, Laurel, Laurustinus, Lilac, Magnolia, Maple, Oak, Pampas Grass, Peach (flowering), Phillyrea, Philadelphus, Plane, Poplar, Privet, Pyrus, Ribes, Rhus, Spiræa, Skimmia, Sycamore, Tamarix, Thorn, Tulip, Weigelia, &c.
7,000,000 FOREST TREES, viz. :—Acacia, Alder, Ash, Beech, Birch, Chestnut, Elm, Fir, Hazel, Hornbeam, Maple, Oak, Poplar, Sycamore, &c.
20,000 CLIMBERS, thus—Bignonia, Climbing Roses, Ivy, Jasmine, Passionflower, Periploca, Vinca, Virginian Creeper, Wistaria, &c.
70,000 CLEMATIS, principally the "Woking Hybrids."
This Catalogue contains a set of five large Engravings of Clematis, or which this Establishment is famed, taken from Photographs.

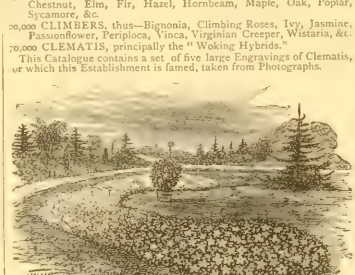

REDUCED FORM, No. 3.

Hardy and Permanent Plants, awarded Twenty First-class Certificates and Two Specials

Engraving No. 1. For Conservatories, Terraces, &c.
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" No. 3. For Hardy and Permanent Bedding, &c.
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" No. 5. For Rootery, Rockwork, Ruins, &c.

"The Establishment, long favourably known for its fine collection of hardy plants, is now likely to attain a world-wide fame for the magnificent new race of Clematises."—*Gardeners' Chronicle.*
Woking Nursery, Surrey.

The advantages of procuring Seeds direct from the Growers cannot be over-estimated.
"CARRIAGE FREE."

CARTER'S COLLECTIONS
OF
NEW VEGETABLE SEEDS
Will PRODUCE a SUPPLY of CHOICE VEGETABLES ALL the YEAR ROUND.
PACKING and CARRIAGE FREE.

CARTER'S

No. 2 COLLECTION of VEGETABLE SEEDS (suitable for a Small Garden), price 21s., contains :—
13 pints PEAS, including Carter's First Crop, Laxton's Supreme, and other choice varieties for succession
2 pints BROAD BEANS
1 pint FRENCH BEANS
1 pint SCARLET RUNNERS.
1 large packet BEET.
3 large packets KALE
1 large packet BRUSSELS SPROUTS
1 packet ALBERT SPROUTS
4 large packets BROCCOLI
4 large packets CABBAGE.
1 large packet NAVEW.
1 packet CAULIFLOWER.
4 ounces CARROT
1 large pkt CAULIFLOWER.
2 large packets CELERY
4 ounces CRESS, plain
1 ounce CRESS, Australian.
1 packet CUCUMBER
1 large pkt ENDIVE.
1 large packet LEEK
3 large packets LETTUCE, Cos and Cabbage
4 ounces MUSTARD.
1 packet MELON
2 ounces ONION, in variety
1 large packet PARSLEY.
1 ounce PARSNIP.
6 ounces RADISH, Long and Turnip Rooted
6 ounces SALAD SEED
2 pints SPINACH, Summer
2 pints SPINACH, Winter
3 ounces TURNIP, best
1 packet TOMATO.
1 packet MOORE'S VEGETABLE CREAM.
2 packets HERBS

No. 6 COLLECTION of VEGETABLE SEEDS (increased quantities and varieties), price 30s., contains :—
10 quarts PEAS, including Carter's First Crop, Laxton's Supreme, and other choice varieties for succession
3 quarts BROAD BEANS,
3 pints FRENCH BEANS, Dwf.
3 pints RUNNER BEANS.
3 large packets KALE
1 large packet BRUSSELS SPROUTS
1 packet ALBERT SPROUTS
5 large packets BROCCOLI
5 large packets CABBAGE
2 large packets SAVOY.
1 packet CAPSICUM.
6 ounces CARROT, best.
1 large pkt CAULIFLOWER.
2 large packets CELERY.
1 packet CORN SALAD.
2 packets CUCUMBER.
1 large packet ENDIVE
1 large packet LEEK.
3 large packets LETTUCE.
½ pint MUSTARD.
2 packets MELON.
4 ounces ONION, in variety.
1 packet ORACH.
2 ounces PARSLEY.
2 ounces PARSNIP. [Turnip.
3 ounces RADISH, long and
1 packet RAMPION
3 ounces SALAD SEED, for salad
½ pint SPINACH, Summer
½ pint SPINACH, Winter.
1 pint SPINACH, summer
1 packet SCORZONERA.
6 ounces TURNIP, best.
1 packet TOMATO, best.
1 packet MOORE'S VEGETABLE CREAM.
1 packet HERBS

CARTER'S No. 1 COLLECTION of VEGETABLE SEEDS (suitable for Cottage Gardens), price 12s. 6d. *Packing and Carriage Free.*

CARTER'S No. 3 COLLECTION of VEGETABLE SEEDS (suitable for a Garden of half an acre), price 42s. Packing and Carriage Free.

CARTER'S No. 4 COLLECTION of VEGETABLE SEEDS (suitable for a large Garden), price 63s. Packing and Carriage Free).

CARTER'S NEW PEAS for 1871.

LAXTON'S QUALITY PEA (see illustration).—A second early Wrinkled Pea of great productiveness and fine flavour, 5s. per quart

LAXTON'S QUANTITY PEA.—A fine flavoured variety, selected from Laxton's Quality for its robust habit and extreme productiveness. 5s. per quart.

LAXTON'S ALPHA PEA.—The earliest Wrinkled Pea. Price per pint, 3s. 6d.; per quart, 6s.

EASTES' KENTISH INVICTA PEA.—The earliest round blue Pea in cultivation. 2s. 6d. per quart.

CARTER'S FIRST CROP or RINGLEADER PEA.—The Royal Horticultural Society have carefully tested the merits of Early Peas at Chiswick, and have pronounced First Crop or Ringleader to be the earliest Pea in cultivation. Price 1s. 4d. per quart.

LAXTON'S SUPREME PEA.—A grand Pea, with remarkably large full pods. Price, 1s. 3d. per pint; 2s. per quart

HUNDREDFOLD, or the COOK'S FAVORITE PEA.—A grand Addition to Peas, and a very prolific bearer. Price, per pint, 1s. 3d.; per quart, 2s.

CARTER'S
GARDENER'S & FARMER'S VADE MECUM
Illustrated, is now ready, and will be forwarded Post Free for 12 stamps to purchasers.
N.B. As many complaints are annually received from Customers of the non-delivery of their Vade-Mecum, J. C. & Co. will be pleased to forward duplicate copies in all such cases on application.
Five per Cent. Discount for Cash.

JAMES CARTER AND CO.,
SEED FARMERS,
237 and 238, HIGH HOLBORN, LONDON, W.C.

Seeds direct from the Growers, the best means of preventing disappointment.

SUTTONS'

HOME-GROWN SEEDS,

CARRIAGE FREE.

THE

EARLIEST ROUND BLUE PEA

IN CULTIVATION.

EASTES' KENTISH INVICTA.

This is a round Blue Pea, about 2 feet high, with straight, handsome, well filled pods; is earlier than the best stocks of Daniel O'Rourke or Singleton's No. 1; and being a Blue Pea it is superior in flavour to any white variety. Messrs. SUTTON & SONS have purchased a portion of the stock of the above Pea

Retail price, 2s. 6d. per quart. Trade price on application.

THE

HEAVIEST CROPPING POTATO

and the best cooking Potato in cultivation is

SUTTONS' RED-SKIN FLOURBALL.

This extraordinary Potato, SENT OUT LAST SEASON BY US, has given the most complete satisfaction.

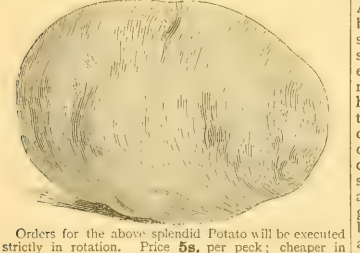

Orders for the above splendid Potato will be executed strictly in rotation. Price 5s. per peck; cheaper in large quantities.

Now ready, price 1s., Gratis to Customers,

SUTTONS' SPRING CATALOGUE and AMATEUR'S GUIDE for 1871. Also,

Suttons' Abridged Catalogue for 1871

Gratis and Post Free on application.

All Goods Carriage Free by Rail, except very Small Parcels.

SUTTON AND SONS,
SEED GROWERS, READING.

Choice Hardy Scarlet and other Rhododendrons.

JOHN WATERER AND SONS have the pleasure of announcing that their CATALOGUE of the above plants, as exhibited at the Royal Botanic Gardens, Regent's Park, is now published, and will be forwarded to applicants. It faithfully describes the colours of the Rhododendrons, and also contains a selection of the most approved CONIFERS, with heights and prices, as well as the leading EVERGREENS and ROSES.

The American Nursery, Bagshot, Surrey.

Genuine Seeds of Superior Stocks.

SEEDSMEN TO THE QUEEN.

FRANCIS & ARTHUR DICKSON & SONS, the Old Established Seed Warehouse, 106, Eastgate Street, and the Upton Nurseries, Chester, beg to intimate that their Priced Descriptive CATALOGUE of NEW and SELECT VEGETABLE and FLOWER SEEDS, &c., with Cultural Directions for 1871, is now published. Copies will be sent gratis and post free on application.

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THE GARDENERS' ROYAL BENEVOLENT INSTITUTION.—Notice is hereby given, that the ANNUAL GENERAL MEETING of the Members of this Institution will take place at the FREEMASONS' TAVERN, Great Queen Street, on THURSDAY, January 12 next, for the purpose of RECEIVING the ACCOUNTS of the Charity for the past year, and ELECTING OFFICERS for the ensuing year; also for the purpose of ELECTING FOUR PENSIONERS on the Funds. The Chair will be taken at 6 o'Clock precisely. The Ballot will close at 8 o'Clock precisely.

By Order, EDWARD ROGER CUTLER, Secretary.

11, Tavistock Row, December 28, 1870.

The Voting Papers have all been delivered, any Subscriber not having received one is requested to make immediate application.

The Gardeners' Chronicle

SATURDAY, DECEMBER 31, 1870.

MEETING FOR THE ENSUING WEEK.

MONDAY, January 2—Entomological .. .. 7 P.M.

So far as our microcosm is concerned, the retrospect of the EVENTS of the YEAR now at its close must read tamely beside the amazing history which our brother chroniclers of the general press will have to write. They will have to deal with a story of agony and horror such as the world has rarely before listened to. We, essentially devoted to the arts of peace, have a less eventful year than ordinary to look back upon.

Perhaps the most momentous circumstance that has stirred the horticultural public was the announcement, made early in the year, that the Chiswick Garden, with which so many memories are associated, was to be abandoned. As it turned out, the bark was worse than the bite. Chiswick remains—curtailed, indeed, but still retaining much that is interesting, and still affording space for those trials and experiments which, even in these later times, surrounded by many difficulties, Mr. BARRON has so successfully carried on. The portions of the garden to be given up comprise those departments which, from force of adverse circumstances, have been comparatively neglected of late years. The space retained, comprising some 13 acres, contains the great conservatory and orchard-houses—indeed the whole of the glass structures. This portion is to be surrounded by a wall and thoroughly remodelled, so as to allow of the experimental culture of fruit trees, vegetables, and the like, and will be ample for the carrying out those experiments on which the progress of horticulture in the future depends. It is earnestly to be hoped that Mr. BARRON, the value of whose services has been so conspicuous in these later times of discouragement, may remain at Chiswick to superintend the proposed remodelling of the garden, for which office assuredly none so competent can be found.

Scarcely less alarming than the announcement of the proposed abandonment of Chiswick, was the opinion expressed by Mr. GLAISHER, that the meteorological records kept for so long a series of years were in many respects valueless from various imperfections in the mode of observation, or in the registration of the phenomena. But this, too, proved in some degree a false alarm, or rather, we should say, that, thanks to the zeal and enormous labour of Mr. GLAISHER and his assistants, the records, which but for their assistance would practically have been valueless, have been expurgated and corrected, and will now take their place with honour by the side of any similar record. An abstract of some of Mr. GLAISHER'S work, comprising a comparison between the temperature as observed at Chiswick and at Greenwich respectively for every day during forty-four years, appeared in our columns, and full details will, we believe, shortly be published in the Society's Journal of Proceedings. If the Scientific Committee, under whose auspices this work has been carried out, had done nothing else but promote this undertaking, its establishment would not have been in vain. It is to be hoped that the new instruments which have been procured under Mr. GLAISHER'S direction, will soon be placed in position, and that the Chiswick records will again be put on a satisfactory footing. We cannot leave the subject of meteorology without alluding to some facts highly important to horticulturists, and for the establishment of which they have also to thank the eminent meteorologist to whom we have just alluded, viz., the circumstances that the greatest variations in temperature take place near the surface of the ground, and that the temperature is not uniformly lower at higher elevations, but often the reverse, and especially at night, when the temperature at 4 feet from the surface is observed to be lower than at an elevation of 22 feet.

One of the greatest events of the year was also essentially connected with meteorological conditions—we allude to the prolonged drought. This taxed the resources of our gardeners to the utmost, and often where all the means and appliances were at hand one thing was wanting—and that was water. As such a season is, to say the least, exceptional, we shall probably go on in the same reckless way as ever, and instead of making provision to store up the precious boon from heaven, we shall allow it to dissipate itself as before. If unsuitable to vegetable culture the heat and drought proved propitious to the fruit crops, which, generally speaking, were abundant.

The exhibitions of the season, both in London and the provinces, have, for the most part, been good, and the Wednesday meetings of the Royal Horticultural Society have more than sustained their reputation for variety and interest. The Oxford show, in itself good, was, so far as the arrangements connected with it are concerned, a faint repetition of the Manchester muddle. Among the provincial exhibitions we may specially allude to those at Manchester, Leeds, York, and Belfast, and to that held quite recently at Liverpool, as evidence of the public interest in these displays, and of the generally satisfactory state of horticultural skill, so far as it can be judged at such tourneys; while the meeting at the latter place afforded some evidence of the importance of establishing and fostering a community of feeling between the various elements of the horticultural world.

Among the gains to horticultural science during the year may be mentioned—though it would be premature to attempt to estimate their value—the numerous communications to the Scientific Committee of the Royal Horticultural Society on hybridisation, grafting, pruning, the influence of manures, &c. To these we may add an important paper of Dr. M'NAB'S, read before the Botanical Society of Edinburgh, and devoted to the elucidation of a subject under discussion at the present time in our columns, viz., the absorption and evaporation of fluids by and from plants, and to which we shall shortly have to refer more at length. It is only by direct experiment that the mysteries of vegetable physiology can be fully solved; observation will teach a great deal, and this we may look for at the hands of our intelligent gardeners, but the actions of living tissues are so complex, and are so masked or modified by various conditions, themselves only very partially known, that it is only by means of carefully devised experiments in the laboratory of the chemist or physicist that one can hope to arrive at a solution of the many problems which puzzle alike the man of practice and the man of science.

The peculiar features of French gardening have been amply treated of in our columns during the last few years, and it is a somewhat gloomy reminiscence to recal the circumstance that the latest account of Paris gardens, written from personal inspection, only a few weeks before the siege, are to be found in our own columns.

In our next issue we may take occasion to allude to some of the novelties which the zeal of our horticulturists has been instrumental in bringing to the front during the past season, and may then also allude to the prospects of the coming year.

JUDGING from the voluminous correspondence we have received, few subjects—not even Vine culture—have created so much attention among gardeners, especially young practitioners, as the remarks we felt called on to make a short time since on the EDUCATION of YOUNG GARDENERS (p. 1469). Mr. BELL'S comments (p. 1541) on the same subject have also called forth a very large number of letters. No one would expect or desire us to publish a tithe of these epistles. Nevertheless, we have experienced some satisfaction in their perusal, as they show that our remarks have "struck home;" and, more than that, that our statements remain so far uncontroverted, that not more than one or two of our correspondents have attempted to deny their general accuracy, while we, on our part, it will be remembered, were careful to allow for exceptions to the general rule. It must be remembered that our remarks had reference to the educational part of the question only. We did not and do not, as some of our correspondents have done, bring wholesale charges of dishonesty against a body of men who, as a class, may fairly lay claim to as much integrity as any other class of the community. Those who make undiscriminating charges of this kind, injure the cause they wish to serve.

In view of passing events, and of the dread lessons on the other side of the Channel, it behoves us all, as units in a nation, to ascertain whether our standard of right and wrong is as high as it ought to be, and whether we are doing our best to act up even to our own standard, imperfect as we must all confess that to be. If not, should a day of disaster come, we shall indeed be ill prepared to meet it. And from this point of view there is one circumstance that should never be overlooked, that, to a large extent, gardening is a luxury, and that whenever a pressure of evil times does come upon us, that part of our craft which is concerned with the ornamental rather than with the useful will of necessity be the first to feel the pinch of adversity.

Reverting to the immediate subject under discussion, we may repeat our impression, that the average qualifications among the present race of young gardeners, and always allowing for exceptions, is lower than it was. The great majority of our correspondents admit, or at least do not attempt to deny, the substantial truth of this proposition, and assign various matters in explanation, or extenuation.

In order that the question may be discussed in all its bearings, as well as from a sense of fairness to our young gardener correspondents, we have been induced to give the substance of their remarks, even though in some cases they are only indirectly connected with the subject at issue. In so doing we may have the opportunity of discouraging questionable practices, of refuting injurious statements, of quickening a sense of the reciprocal duties of employed and employer, and of contributing to the social and moral elevation of our guild.

These matters demand careful consideration. Sweeping statements, and a treatment of isolated or individual cases as if they were general, require, in this as in most other matters, to be sedulously guarded against. If we were to write down all young gardeners as conceited ignoramuses we should do grievous injustice. If we held up all foremen and head gardeners as the unmitigated blackguards and reprobates that some of our correspondents describe, we should be equally failing in our duty as honest chroniclers. There is no need to revile a whole class because some individuals among them act so feloniously as regards the cinders that, in his indignation, a correspondent's vision is so distorted that he sees bushels where no unprejudiced person could find a shovelful.

Clearing the ground for fair discussion in this way, we will now enumerate the principal causes as assigned by our correspondents themselves for the alleged deterioration of gardeners, and reserve any lengthened comment of our own till another opportunity.

Careless selection of lads.

Deficient or bad bothy accommodation.

Neglect of duty towards apprentices and improvers on the part of foremen and head gardeners; or, in some cases, harsh and overbearing treatment on the part of the superiors towards their subordinates.

Bad example set by head gardeners in their pursuance of practices of questionable nature, amounting in some instances to acts of dishonesty towards their employers in the matter of so-called "privileges," "percentages," "perquisites," "exchanges," underhand dealings with nurserymen and other tradesmen, and the like.

Insufficiency of wages.

Apathy of employers and mistaken notions of etiquette, preventing immediate intercourse and personal sympathy between employer and employed, and thus placing the young men entirely at the mercy of the head gardener.

Inhumanity of employers, demanding the possession on the part of the gardener of "no encumbrances," thus fostering immorality.

Extravagant requirements of employers, demanding of their gardeners that they should be grooms, dairymen, and the like, as well as gardeners.

To these we may add, of our own knowledge, the lamentable tendency which some gardeners have of disparaging their neighbours' practices, and in particular of making damaging insinuations as to the doings of their predecessors. If self respect and charity to others are not strong enough to prevent such exhibitions of petty spite, it is time that some means were taken to draw up and enforce a code of garden etiquette such as is so successful in other professions in securing the due fulfilment of obligations to one another and to the public.

We cannot enter fully into so vast and multiform a subject, but we may say, without fear of contradiction, that where there is a fondness for gardening, or a love of plants on the part of the employer, there also will be found that personal sympathy and interest in the welfare of his *employés*, to the absence of which we believe is to be attributed a large proportion of the evils above catalogued. In any case, the thorough honest performance of a gardener's duties cannot be expected unless the master not only interests himself in his own concerns, but also in those who are dependent on him. There is but one rule in these cases applicable to all sorts and conditions of men—"Do unto others as ye would they should do unto you."

—— An elaborate report on the INFLUENCE of VARIOUS MAGNETS on the GROWTH of PLANTS, as observed in the experimental garden of the Royal Horticultural Society at CHISWICK, during the year 1869, and drawn up by Dr. MASTERS and Dr. GILLET, has been published in the last number of the Proceedings of the Society. We shall probably have occasion to allude to some of the results obtained in a future number. We may now merely state that the main objects of the experiments, which have been carried out under the auspices of the Scientific Committee, were to ascertain what substances so favoured the growth of particular species of plants as to cause them to predominate in the mixed herbage of pastures, lawns, &c., and what substances promoted the growth of leaf as contrasted with that of stem, root, or flower; to endeavour to find out what substances favoured development, what maturation, and so forth. The experiments have been repeated during the past season, 1870, but the examination and digestion of the obtained results is necessarily a task involving much time.

—— The new and famous food, called ERBSWURZT, on which the German armies rely for sustenance when requisitions fail, is a peas-pudding sausage, made of a mixture of bacon, peculiarly prepared pea-flour, onions, and other ingredients, inclusive of salt. The Prussian War Office has created an establishment at Berlin capable of producing daily 75,000 sausages made of this preparation. The sausages are sent away to the armies packed in boxes containing 100 to 600, weighing 1 lb. each. They only require to be boiled in water for a very short time to be ready for the use of the soldier. The daily ration of each soldier is a sausage of 1 lb.—a quantity quite sufficient for each man. This establishment, working only for the armies, costs daily about £6000. The process by which the preparation is prevented from turning sour when kept is the discovery of a Berlin cook, named Grünberg, who is said to have received the sum of £5555 for his secret.

—— High authority, says the *United Service Gazette*, teaches us to "call a SPADE a SPADE," but what shall we call Dr. COLLIS BROWNE'S ingenious invention? He himself calls it a "Polyute," and many uses indeed it may be put to by the soldier. The back forms, as occasion requires, a spade, a frying-pan, or a breastplate; the handle can be used as a rest for the rifle, and, in addition, it can be easily transformed into a "pick" and an axe. Amongst the minor details of this novel implement are a saw, a hammer, and a match-box; and the whole is so light and portable as to be easily carried on the march. The cuirass and the rest we look upon as being peculiarly good ideas, and calculated to arrest the attention of the military authorities. Were it not, says our contemporary, that painful experience tells us that the doom of inventors is to be snubbed in all our public departments, we should expect to hear of Dr. BROWNE'S spade being forthwith handed over to the examination of a War Office committee.

—— We learn that the Rev. W. A. LEIGHTON has in preparation for publication a work on the LICHEN-FLORA of Great Britain, Ireland, and the Channel Islands. The work will be arranged as to families, tribes, and genera, on Dr. NYLANDER'S system, and the species will be grouped so as to facilitate the student in the ready and accurate determination of his specimens. A full diagnosis will be given of each species, with chemical reaction, and such remarks as may be occasionally necessary—its general habitat—relative frequency or scarcity—date of first discovery in Great Britain—and distribution according to the botanical provinces of Mr. H. C. WATSON and Professor BABINGTON, so far as at present ascertainable—synonyms—references to published figures both of the Lichen and its spores; and to published Exsiccati, Continental and British—general geographical distribution throughout the world—and ample special British localities. Persons desirous to possess the work are requested to send their names and addresses to the Rev. WILLIAM ALLPORT LEIGHTON, Shrewsbury.

—— Mr. W. F. CHAPMAN, whose box for the transmission of vegetables we had occasion to speak of in favourable terms some time since, has forwarded us some Chrysanthemums which have been preserved in one of his patent cases for the last three weeks, as evidence of the value of these cases for the transport and preservation of flowers. The evidence so afforded is very satisfactory.

—— The WEATHER in the WEEK ending December 24 was remarkable for extremes of temperature. On Sunday and Monday, December 18 and 19, the temperature was equal to, or exceeded 50° at all places excepting Liverpool, which was 49°.8. The mean of all was 51°.3. On Saturday, December 24, the places on the east of England, and those across the country from Norwich to Birmingham, and from Hull through Nottingham, experienced the lowest temperature, being 8° at Hull, 8¼° at Norwich, 9° at Leicester, and 10¾° at Nottingham, being lower than any since December 24, 1860. The temperatures both north and south of these places were of higher value, the mean of all was 13°.1. The average range in the week varied from 33° at Leeds to 42¼° at Birmingham, the mean range was 38¼°. The mean of all the highest temperatures on the week, taken day by day, was 37⅛°, and of all lowest was 27°; the average daily range was 10⅛°. The mean temperature of the air for the week was 32½°. The fall of rain was very variable; it was 1.25 inch at Norwich, besides a fall of snow of 6 inches in depth. At Portsmouth it was 0.05 inch only. The average for England was 0.7 inch. In Scotland the highest temperature varied from 47° to 50¾°; the mean was 49°.5, being 1⅜° lower than in England. The lowest temperature varied from 5° at Perth to 19¾° at Aberdeen; the mean of all was 14°.3, being 1¼° higher than in England. The mean temperature of the air for the whole week in Scotland was 33°.5, being 1¼° warmer than in England. The fall of rain in Scotland varied from no rain at Edinburgh to 2.3 inches at Aberdeen, the mean of all was 0.7, being the same as in England.

—— From the report of the COTTON DEPARTMENT of INDIA it seems that the crops in the several districts have, during the past year, yielded a satisfactory return. *Nature* also learns that a very extensive system of adulteration exists by mixing two or more qualities in one bale, to which a stamp, indicating a superior quality, is affixed. With regard to the use of English ploughs which have been introduced, it is said that "the cohesion and tenacity of the richer black Cotton soils are evidenced by the manner in which they get rent and cracked into deep fissures instead of becoming pulverised, by the rapid contraction they undergo when exposed to the fierce rays of the sun after the crops have been removed; and from the same cause the upper surface becomes baked and hardened into a crust, which is about as inaccessible to the plough as if it were a pavement. The cultivator has accordingly to wait until the advent of the monsoon has softened and removed this crusty impediment, and, if it should happen that the first crusts are very heavy and continuous, he is still further delayed from an opposite cause, namely, on account of his fields having become too soft for his cattle to move on, so that he has to wait for a favourable break to get rid of the surface moisture." In this state of the land the plough

gets clogged, and the animals have not strength to move the instrument, so that "both ploughs and ploughmen succumb, and the antediluvian implement of the ryot is found to be the only feasible one."

PHALÆNOPSIS AMETHYSTINA.

THE aërial roots of this plant (Phalænopsis Hebe, Rchb. fil. in Xenia Orch. ?) most nearly resemble those of Phalænopsis Schilleriana, being dark-coloured, and compressed or flattened, especially towards the apex. Leaves stout, rigid, oblong, tapering towards the base; 3—4 inches long, 2—2½ inches broad, their margins undulate. Peduncle simple or branched, 4—12 inches long, slender at the base, thicker towards the apex; bracts small, pointed. Flowers small comparatively, white and violet; sepals about half an inch long, oblong acute, the lateral ones connate, and joined to the prolonged base of the column, as in Dendrobium, and their lower margins distinctly revolute; posterior sepal slightly cucullate; petals rather smaller than the sepals, oblong spathulate, and rather obtuse at their apices. Like the sepals their colour is pure white, except at their extreme base, where they are minutely speckled with lilac. Lip 3-lobed; lateral lobes somewhat patent, cuneate or wedge-shaped, the superior margin being slightly serrulate, each having a tooth-like callus on the upper margin near the base. Colour white, suffused, and veined, or striate with violet-purple; the basal portion below the calli being yellowish, spotted with brown. The calli are connivent; central lobe rhombiform with two subulate attenuated cirrhi at its base, which are themselves whitish in colour and slightly serrulate; apex bifid or twice-toothed, a whitish ridge or lamella running down the central portion of the disc. The lip is prolonged at the back into a short, tapering, slightly compressed spur, of a yellowish colour. The remaining portion of the central lobe is a rich violet or amethyst-purple colour, the apex being white. Column short, ½ in. long, pale lilac; the stigmatic cavity is proportionately large, occupying nearly the whole under-surface of the column; anther case beaked or rostrate; pollinia sub-globose, the apex of the spathulate caudicula being prolonged beyond them very perceptibly.

This plant, although certainly not so showy as some of its congeners, is a pretty addition to a very beautiful genus. Its interesting flowers open in succession, so that the plant we have here continued for several weeks furnishing, one after another, many buds on its indefinite inflorescence.

The plant is easily recognised when not in flower by its oblong or subspathulate, deep green, striated foliage, the margins being undulated, reminding one forcibly of Angræcum Chailluanum.

The illustration (fig. 299) is taken from a plant in the collection of C. Stead, Esq., The Knoll, Baildon, near Leeds. *F. W. B.*

FIG. 299.

THE GALL MIDGE OF THE ASH.

(CECIDOMYIA BOTULARIA, WINNERTZ.)

IT often occurs that, long before autumn, particularly in dry seasons, the foliage of the common Ash (Fraxinus excelsior) shows signs of premature decay by turning sere and yellow on certain sheltered branches, which eventually shed their leaves much earlier than their neighbours. If we ask the cause of this, we are generally told that the leaves are blighted. But "blight" is such a convenient term when we want to gloss over our superficial knowledge of the diseases of plants, that we have long made up our mind not to be contented with this explanation. In the present instance our observations extend over four years' occasional investigations in Kent and Surrey. We meet with such unhealthy branches on trees of all ages as early as July and August, but it is in September that their yellow hue strikes us most forcibly. For example's sake, we single out one limb, and describe its condition as seen in September. Here and there we see one intact leaf, standing out by its greenness, but the rest are more or less discoloured, and, moreover, distorted, irregular in shape, and folded or crumpled up. We look for a common mark, how to distinguish these disfigured leaves from the normal ones, and we find it in a peculiar partial thickness of the midrib, which, besides, exhibits a longitudinal channel in many instances. Up till this time we have only been viewing the upper surface of the leaves; let us therefore inspect their underside as well. We raise the branch up, and the cause of its blighted appearance is explained. Every discoloured and disfigured leaf exhibits on its leaflets a more or less slender swelling of the midrib or of the stalk itself; in some leaves the whole midrib, from base to tip, is thus incrassated, and the lateral parts of the leaf folded edge to edge; in others their basal part alone is swollen up, and their anterior part more or less abortive. These pod-like swellings or galls are covered with a whitish or brown pubescence, and their juicy consistency shows that they serve as receptacles, diverting the sap, originally intended to supply the whole leaf; hence the sere appearance of the latter, hence its untimely decay.

If we now take a longitudinal section of the swollen midrib, we find that it contains a long cell, tenanted by one or several reddish yellow, footless, 14-jointed larvæ, of about a line in length. Their food consists of the juices exuding from the incrassated sides of their dwelling place; hence if we open the latter whenever we please, we shall almost always find it licked scrupulously dry, but strewn with the black excrements of its inhabitants. In about three weeks the larvæ are full-fed, when they become obese and sluggish; the irritation their licking produced on the sides of their chamber therefore ceases, the sap no longer flows steadily inward, but becomes accumulated in the more or less pod-shaped, fleshy halves of the gall; a consolidation of the two halves respectively ensues, and causes a longitudinal fissure between them on the upper side of the midrib, through which natural opening the larvæ drop to the ground, in which they bury. Here they shortly become sculptured pupæ, exhibiting all the limbs of the future fly, in thin semi-transparent sheaths, which are laid flat along the breast. In about three weeks from the time of burying, the mature pupæ force their way half out of the ground, and the perfect midges, by bursting their silver-white pupal skins, make their appearance. A few hours breathing give them the use of their wings and limbs. They are two-winged Cecidomyiæ, or gall-midges, and the species has been described by Winnertz under the name of Cecidomyia botularia. In its living state it is about a line in length; it is reddish yellow, with a white beak; its thorax shows three narrow, short, pale brown streaks; the poisers are pedunculated and whitish; in the segments the abdomen is brown, each segment with a fine brownish lateral streak; the hind border of the segments above and beneath is fringed with long whitish hairs. The six legs are long and slender, brownish, and clothed with a white pubescence. The wings are comparatively large, transparent, with sparse, greyish hairs, and suffused with a weak, iridescent violet; their veins are brownish. The feelers are brownish, 26-jointed in the male, and 14-jointed in the female; the latter is furnished with a short ovipositor.

The ravages of this midge are mostly confined to the lower and protected limbs of the Ash, and if the underside of the branches is examined, a glance shows the conspicuous galls; a practised eye will even soon tell an injured leaf by the peculiarities of its upper surface.

If we now look to a remedy, how most effectually to destroy the progeny of these midges, it is evident that we have to remove the affected leaves before the escape of their inmates. Such leaves should be burned and not simply thrown on the manure-heap, else instead of checking the plague we foster it; and as an additional precaution we would recommend, likewise, to destroy the whole foliage of the season, after its fall, instead of letting it rot on the ground. *Albert Müller.*

ABOUT WATERING.

"How often shall I water my plants?" asks the purchaser of a small bill at the nursery. In window gardening the water question is also one of the anxious ones, and even in the regular operations of gardening,

under the treatment of quite practised hands, the relation of water to plant life is not as clear as it might be.

We shall understand better how to water if we correct first some impressions derived from old works on physiology. It is said that plants want water. This is not strictly true. Water is found in plants, but it enters rather in the shape of vapour. A soil that is wet will grow only water plants; and it is a remarkable fact that these water plants seem to have very little water in them. A Reed or Bulrush grown in water has far less water in its structure than a nearly allied species grown on the dry land. The plants which have most fluid matter in them are those grown in the dryest places. The deserts of Africa abound in Euphorbias; while on the plains of Mexico the only moisture wild cattle can often get is from the large spiny Globe Cactuses, which they manage to cleave open with their hoofs.

A wet soil is totally unfit for plant growing. A plant standing 24 hours in water is often irreparably injured. A Hyacinth, to be sure, will live one season in water; but all the matter which goes to make up the flower is prepared the year before, and after flowering the bulb is exhausted and almost worthless.

A good soil for plant growing, therefore, is not one which will hold water; but one in which water will rapidly pass away.

The soil itself is composed of minute particles, through which air spaces abound. The water must be just enough to keep these particles moist, and the air in the spaces is thus kept in the condition of moist air. The roots traverse these air spaces, and it is therefore moist air which roots want, and not water.

If it were water simply which plants wanted, we should cork up the bottom of the hole in the flower-pot, and prevent the water getting away. Instead of this we try to hasten the passing of the water through as much as possible, by not only keeping the hole as clear as possible, but often by putting pieces of broken material over the hole.

A plant will generally be the healthiest, therefore, which wants water the oftenest. This will show that there are plenty of air spaces, and that the roots are making good use of them. If it does not often want water, it is in a bad way, and more water will make it worse.

How often to water then, will be according to how easy the water passes away. If when you pour water on earth it disappears almost instantaneously, it would be safe to water such plants every day.

And now for open air work. We often hear good men say about a piece of ground rather low, that it is wet in winter to be sure, but a few open ditches in winter to carry off the water will make all things right. But water in winter does not hurt things much. It is water in summer,—water while plants are growing, which hurts them. And the reason why land is wet in winter is because the conditions are such that water cannot pass rapidly away, and such land is of course the same in summer. Every shower takes several days to soak away, in the meantime the plants suffer.

So the constant aim of the cultivator, whether of plants in pots or things in the open ground, should be to make water always pass rapidly away, and yet to have the soil of such consistence that a moist atmosphere should be always present in the air spaces existing through it.

In its relation to moisture, we might say a little about the consistence of the soil. If the earth, for instance, were composed of all sand, there would be little moisture except in the air spaces. The particles of flint of which sand is composed are not capable of absorbing moisture, any more than we can get water to soak through a glass bottle. For moisture retaining purposes, therefore, sand is useless. But it is useful sometimes to add sand to clayey soils, which otherwise would lie so close that there would be no air spaces. It indeed helps to make air spaces, and has no other use. *American Gardener's Monthly.*

PLANTS FOR THE DWELLING HOUSE.

THE person of wealth may enjoy rich sensations of pleasure, drawn from the parterre and the conservatory, the man of science may increase his store of knowledge under the healthful excitement of a botanical ramble, and the poorest cottager with a garden has his hour of rest while admiring his border of simple beauties; but the inhabitant of the dingy dwelling-house, in the crowded city, has to seek Nature's treasures within its walls, and considering the few occasions in which he can derive assistance, he has in many instances shown an acute intelligence, and in many more an enthusiastic admiration, worthy of receiving every encouragement. Some time ago, while on a visit to Edinburgh, and wandering round the base of the Calton Hill, wondering at the senseless height of those nine-storey houses, I was surprised to see on the ledge of the topmost window a rude square box, with a very fair specimen of an Early York Cabbage, which had been grown in that unpromising situation. But to go a stage higher in the scale of cultivation. I must mention that in the town of Middlesborough in the month of July last, there were growing two pot Vines, one on each side of, and inside a small parlour window, upon which the sun-heat fell for the greater part of the day. These Vines were neither slender nor sickly, no Vine disease, spider nor thrip were to be seen, they were strong without being pithy, short-jointed, and the leaves of a good, firm texture.

I instance these for the purpose of showing how keenly cultivation is followed by some town residents, and how, in the most unpromising situations, and with means the most meagre, a great measure of success is obtained. It must be acknowledged that of late years great strides have been made in this department of gardening. No doubt this very desirable increase in a taste for the beautiful is to be attributed in a measure to the many public parks, and to the numerous private residences whose owners, from time to time, open their establishments for the accommodation of numbers of the working classes; and everything which can be done to further this object ought to be done. The first requisite for house plants is healthy, fresh and sweet soil in which to grow them; but how is the inhabitant of the large city to be furnished with this needful article? You may occasionally see him endeavouring to scrape a handful into his handkerchief through the rails of some public square; or if his employment should be in the suburbs, he may dig with his chisel from some waste ground which he supposes to be the very perfection of composts. Now that we are to have schools through those densely populated neighbourhoods cannot a depot of loam, peat, and sand be kept at each, and be either given away, or sold at a small cost, the schoolmaster undertaking the supervision. The lonely seamstress, together with the man of nerve and muscle, might each come at certain convenient hours, and have their pets attended to by giving them fresh soil, the healthiness of which would bring a sense-restoring balm to the inmates of the dwelling house. Nor should we stop here: plants also might be provided, and the best varieties given as a reward for past and encouragement for future care.

However well meant may be the practice of giving away the overplus and often worthless stock of bedding plants at the end of the season, it must lead in most cases to deception and disappointment. A plant which has been growing in the open soil all summer, and with mangled roots and bruised leaves, finds itself transplanted to the darkened living-room in the short dull days of winter, is not likely to thrive under such treatment. All gardeners know that the reverse of this must be; there is a time of careful nursing, with a little warmth, and afterwards the maximum of light and air, before the plant gains strength and vigour for the following summer. Instead of this, were the superintendents of our public gardens requested to provide for distribution, say, 10,000 suitable window plants, what an amount of good would be accomplished by leading the mind in a right direction, and diffusing an amount of innocent amusement and instruction which could not but be productive of lasting good. The expenditure to produce the above would be in providing extra pits, and some £50 per annum. To this there would no doubt be the usual objections—injury to trade, teaching people to be paupers, &c., to all which the usual answers might be returned.

I will not occupy your columns with long detailed lists of plants suitable for window culture, as so much depends upon the care and attention which they receive. To the beginner I recommend evergreen shrubs of a bushy, free growing habit. It is of some importance to one whose patience in plant culture has not been perfected, to have something at all times to look at, and which will stand a little extra care and fondling without material injury. When further initiated, climbers may be supplied, and there are no class of plants more worthy of attention. Imagine the parlour dressed out for the summer season, and having the borders of the windows fringed with growing Vines, the pots or boxes ornamented with a housewife's taste—it is a feast that will stand repetition. Creepers and trailing plants for basket decoration are indispensable, and the flower basket may yet be a common luxury for the rich as well as a constant grateful companion to the lonely one in his single room. Here the variety and growth are more than sufficient for every requirement; colours of all grades stand ready to the eye; shapes the most fantastic, simple, and pleasing; habits suitable for the warmth of the noonday sun, or for the cold, cheerless aspect of a sunless exposure, and many of them are of very simple culture.

I have seen it stated that there are varieties of the Fern that will stand the dry air of the living room. I have not found this to be the case for any length of time. A Fern case is a necessity in their culture, and this case may be anything from an 8-inch shallow flower-pot, with a glass globe, to a square box of wood and glass the full width of the window, and say 18 inches deep at the back, and 12 deep in front. The bottom of all such boxes must be protected from water drips, by having a lining of light lead over it, and rising 2 inches in depth all round the sides, and with a plug in the centre, or at one corner, to let off superfluous water. It will be ready when painted, &c., for the bottom covering, which should consist of very fine gravel, about half an inch deep. Cocoa-nut fibre, sawdust, and fine sand are all bad, holding, as they do, water in excess, and not admitting that free circulation of air which even here must go on if health is to be secured to the inmates. Perhaps, for a small Fern case, the best thing I can do is to describe one occupying the centre of a window in a room where a fire is seldom lighted, and at a house where I am a constant visitor. The box is octagonal in shape, 12 inches high, and 2 feet in diameter, the roof is hipped, and is also octagonal in form, and from the top to the bottom, perpendicular, is nearly 2 feet. This case has a pillar to stand upon, and upon which it is made to revolve at pleasure, and is a not unhandsome piece of furniture. On planting it, about an inch and a-half of square blocks of cork was placed at the bottom, and on this 1 inch of fibry peat. Trichomanes radicans was planted as an edging all round, then about 2 inches more soil and cork were put on, and the centre was planted with Adiantum Ghiesbreghtii. The sides were made good with small pieces of limestone, and the whole well watered with a fine rose. On cold nights the owner covers his treasures with a double blanket, and this is all the protection and nearly all the care required in a room facing the north. Again, wishing to possess a good specimen of Hymenophyllum tunbridgense for my room, I shaped a piece of rough cork the exact size of the pan in which in was to grow; this was rubbed well all over with damp (not wet) peat earth, upon this was laid small sprigs of Hymenophyllum with regularity, a little fine peat and sand was then sifted through the fingers over the root portion of the stem, a few small pieces of limestone were placed here and there over the surface. The whole was well watered through a fine rose, and covered with a bell-glass and left in the corner of a light airy room. In about six months the pan was one mass, presenting such a specimen as is seldom met with. These are simple instances of what may be done with this class of plants.

For a large case, and to an advanced cultivator, I can recommend the following as some of Nature's choicest gems:—Hymenophyllum demissum, H. caudiculatum, Trichomanes maximum, T. pyxidiferum, T. reniforme, T. Luschnathianum, T. anceps, and to these add Todea superba and pellucida. There are many others, but these, to my own knowledge, will grow well in a case if the following directions are secured. No direct light should at any time fall upon them, a covering of some light material being always kept at hand; a very dry air should be guarded against, and the box kept closed. In warm summer weather the box lid may be tilted several inches, and the plants watered overhead with a fine rose every morning. At other times be content with damping well the sides of the pots and bottom of the box. Neglect not the blanket covering in the cold winter nights. Put in peat and sand and a sprinkling of bruized limestone, and do not allow these delicate plants to be more than one year without a careful shift. Plants suitable for a window basket should not, in my opinion, be of that rambling character which is sometimes insisted upon. A good handsome basket may be planted thus:—Round the sides Campanula Celsii, round the edge Alyssum saxatile compactum, and for a centre a nice plant of Agapanthus umbellatus; another may consist of a good plant of Swainsona Ferrandii, and a few specimens of Nierembergia gracilis round the edges, and mixing with the foliage of the Swainsona. When nicely grown, this basket is fit for any drawing-room. A really good plant of Echeveria metallica for the centre, and an edging of Sedum Sieboldii also has a handsome appearance. The Nasturtium has been recommended for the vase and basket, but I have always found it to appear as tattered rags on a windy day. Cobæa scandens, the Maurandyas, &c., however excellent for a lofty conservatory, are not likely to give satisfaction in a dwelling-house; rather would I advise some varieties of Verbenas, Ivy-leaved Pelargoniums, Petunias, Cerastium, &c. To plant a basket as it ought to be done, requires a little more ingenuity than potting a plant. If of wire, the sides must be previously well lined with Moss, well steeped in boiling water, to destroy the eggs of insects, and whatever vegetable life there may be left in it. Then commence by laying a little Moss compactly on the bottom, build up the sides of the basket with Moss, and plant promiscuously but with regularity as you go on, in layers of soil introduced inside the Moss: when well up plant the centre, and finish the top by covering the surface, pegging all neatly to its place, and remove any rough points with scissors. The principal cause of failure in basket cultivation is want of attention to watering, and the not supplying that amount of moisture which is necessary for a healthy development. If these are at all times attended to, there is nothing in the basket more than in the common flower-pot to cause failure. Water with care and attention, use a fine rose, letting the water fall gently and evenly, and give time for absorption. Frequently during the summer season steep the whole Moss overhead for a short time, and hang in a temporary place to drip before taking it to the usual place. *John Richardson, Southend Gardens, Darlington.*

THE BEZI MAI PEAR.

THIS Pear (see fig. 300) is described by Dr. Hogg, in his "Fruit Manual," as follows:—"Fruit large, obovate, rather uneven and irregular in its outline. Skin yellowish-green at maturity, covered with fawn and brown dots. Eye open, placed in a very shallow basin, and scarcely depressed. Stalk an inch and a

quarter long, not depressed. Flesh white, and, when the fruit is thoroughly ripe, somewhat buttery, sweet, and richly flavoured. A good late dessert Pear, when it melts. Ripe in May." Mr. Scott, of Merriott, who received this variety from M. de Jonghe in 1866, gives its period of ripening, from March to May, and considers it a fine Pear for warm soils and situations. The tree grows freely on the Quince, and bears abundantly.

Home Correspondence.

Brown Scale.—I for one beg to thank Mr. Radclyffe and Mr. Fish for drawing attention to methylated spirits for the destruction of brown scale, presuming that a dressing of it is as effective, or perhaps more so, than the dirty, pasty mixtures which gardeners have hitherto been obliged to use, and for the making of which almost every gardener has his own particular recipe. This will confer a wonderful boon on those who have much Peach-dressing to do, for the annual dressing with the unpleasant "smudgy mixture" was in itself no small task. The season when scale propagates itself with most rapidity, is about the time of ripening and gathering the fruit. Its presence is soon indicated by swarms of wasps, blue-bottle flies, and ants, which, instead of clearing the trees of the pests, as we might be led to suppose they soon would from their diligence, serve rather the purpose of inoculating non-affected parts. If methylated spirits is effective, and followed with no ill effect to the wood, leaf, or bud, it may be applied at any time when scale makes its appearance without waiting for the time of the annual dressing. A few days ago I called upon the Messrs. Wyley & Brown, manufacturing chemists, of Coventry, for information respecting the methylated spirit. They had never heard of its use for killing insects on trees, and very kindly gave me a bottle of the spirit to try, and would only be too pleased to hear if my experiments with it against scale succeeded. Mr. Wyley told me his Peach trees were much affected with scale, and he could not get rid of it. I once cleared a Peach tree of brown scale with my finger and thumb, attacking the persistent pest as soon as I could see its tiny form, never letting it reach that stage when its scaly back becomes a covering for the spawn of thousands more, again to advance on the young wood. For several years we have been very successful in the use of tobacco-water for the destruction of green fly and red spider on out-door Peach trees, the black fly on Cherry trees, and also the little black slug on the Pear leaf. We are near to the Messrs. Griffiths & Avis, of Coventry and are never without a cask of their tobacco-juice, which we dilute to an effective strength. When kept clean and rid of those pests, it is astonishing what a healthy growth trees will take, and gratefully repay all the pains taken with them. I have a Cherry wall—the admiration of every one who sees it—for the success of which I attribute much to our perseverance in keeping the trees clean and free of insects. Some people say of those, as they do of my Vines, "it is the soil that does it," but never mind what does it, so that Grapes and Cherries are grown. To have a soil capable of growing good fruit, free of Fungus besides, is an acquisition worth having. *Wm. Miller, Combe Abbey Gardens.*

The Frost.—I have seen notices of the great cold within the last few days, but none of any cold so great as I noted here. I have two thermometers of Negretti—common iron ones—one facing due south, the other due north; each, on the morning of last Saturday registered the greatest cold of the night at zero, and each on the morning of Sunday registered the greatest cold of the night at 2° below zero. *G. B., Edenbridge.*

Effect of Frost on Ripe Grapes.—Through the negligence, or incapacity, or both, of one of the principal railway companies, a box of Grapes, sent to me on Dec. 22, was kept on hand till the 26th, through the severe frost of last week, being probably exposed during that time, as thousands of other parcels were, on the station platforms. In consequence the grapes were frozen, but I found the extreme cold had a very different effect on white and on black Grapes. The white ones (splendid Muscats) were utterly spoiled—soft, discoloured, and flavourless, in fact all but rotten, and perfectly useless. The black ones (Lady Downe's) after lying in a mild temperature for some time, proved not to be much affected in texture, though certainly somewhat deteriorated in flavour. Is it usual for white Grapes of the Muscat variety—it was the Muscat of Alexandria—to suffer in this way from exposure to extreme cold, while black ones are comparatively uninjured? *C.*

Potato Grafting.—Whilst the year 1870 is drawing to a close, be good enough to allow me to ring out my peal in regard to Potato grafting. Some time ago we were led to infer, "from trivial causes dire events arise;" and if these bloodthirsty times are to proceed, possibly "pounds of flesh" may become exactions, and "skin grafting" the antidote? But, like the farmers, I doubt if the "M.D.'s" will ever be brought to acknowledge that they were indebted for any ideas whatever to horticulturists. During a conversation I had some little time since with one of your correspondents, I ventured to say—we were treating on the subject of Potato grafting—that I favoured a plan of separating the Siamese twins, provided healthy flesh could be engrafted upon the severed parts, with the skins neatly matched, and got to cicatrise over; if—and a very large "if" indeed—that other little difficulty—if the arteries did not supervene. Then healthy living subjects would, I suppose, be induced, for a consideration, to part with a modicum of flesh from somewhere out-of-sight; or otherwise the parties concerned would submit to the infliction—a "scar" must be left somewhere. At any rate, I have met with my match in this idea of "skin-grafting," in reality, according to what you relate on page 1599; and it goes far to prove that what can be done with the delicate human cuticle, to serve a healthy effusion of blood, can also be achieved by the severance and union of the skin of one healthy Potato conjunctively with another, in furtherance of an intermingling of cellular tissue and sap—where lies the incompatibility? But to practice. My first essay in Potato grafting proved abortive; there was no healing over of the skins, and the progeny came exactly, for form and colour, like their prototypes, though small of tuber. Some sorts that I exhibited last year at South Kensington, on purpose to explain away this feature, came exactly from the same cause with the same results, and my newest trials in probing for effects this year consisted in purposely severing away the rinds, so that only the pabulums of the grafts and stocks were allowed contact, without a possibility of the skins uniting; and the result was no unions, no difference whatever in the appearance of the tubers from the sorts belonging to the grafts. This goes to prove plainly enough that, unless the skins do become united and heal over, or partially so, so as to allow an efflux of sap from the set to the graft, and *vice versâ*, there are no signs of hybridisation. Perhaps this trial may help Mr. Moggridge (p. 1314) to arrive at a different conclusion than that of mere "surgical operations" being the inducing causes of the changes seen, or otherwise, as you suggested in your leader (p. 1437). "The injury inflicted on the tuber has wrought the "mixed qualities which gardeners term sports." Not so, if the above experiment will serve to convince us, or the more common practice of slashing the tubers into "sets" at the season of planting. The latest aspect that I can offer ana'ogous to the "sport" which was sent to you, having two distinct sets of coloured tubers on one stem, is that of one of my most recent pollen crosses, where, amidst some very fine variations, which have completely lifted me from a "slough of despond," are a majority of inferior sorts, partaking of all the colours, but differing *in toto* from all the rest; there is one kind, which has "harked back," it appears, in habit, form, and colour to its ancient prototype. I happened to find it out by the merest chance, in consequence of taking the progeny as curiosities to South Kensington in 1869. The sort proved to be exactly like a wild sample which I saw growing, and which was sent direct from Peru to the gardens of the Royal Horticultural Society at Chiswick—a much more extraordinary thing to have happened than the circumstance of different coloured Potatos at a single root, which we may fancy as a mere endeavour, comparatively, to get back to the origin of its species. Whether if, as a correspondent again points out, Fenn's Onwards were grafted into Fenn's Onwards, and a proper cicatrisation of the skins took place, the operation would produce an unequal and an unlike progeny, I do not know; that must be tried. The game might prove worth the candle, to prove whether any change in the tubers would ensue, although I do not consider it in the light of advancing onwards. In the same category may be placed the duplex inter-stem-grafting theorists; amongst whom we may class, in this last respect, your correspondent, in issue No. 47, Mr. Charles Rintoul, who there has written you a very interesting letter on the Potato grafting subject, from whence I learn that Dame Nature has favoured him with her smiles to a far greater extent than she has deigned to encourage me; therefore, as he is a favoured individual, I look forward hopefully to him, he being besides an enthusiast in Potato culture, to assist us out of this "sub judice" case. From his pollen crops he has already helped us to two very good sorts indeed, namely, his early striped Don, and more recently to his "new early white Don," which I should like to find taking its place at your London public dining-tables, in lieu of the nasty coarse kinds which I get too frequently offered me there. My own chronicle of grafted hybrids appears on p. 1277, which you honoured with a leader. And now, to complete the summary, so far as I am aware of, for the year 1870, comes "the extent of the changes" from "S. S.'s" pen, with which he (on p. 1540) probes one to the very core. I never examine my grafted sets till I find young Potatos are forming at the roots, because an earlier disturbance would prove antagonistic to the union and proper healing of the skins; nor did I ever lead any one to suppose that Potato grafting was more effective and certain of accomplishment than any other grafting process. My experience leads me to say that generally it is not so certain, possibly from the quicker action required in the healing process of cohesion as compared with hard-wooded and thicker skinned plants. But as "S. S." "grants," and I can myself guarantee, a union between the scion and the tuber of the grafted Potato frequently does take place, and then a very ugly set of hybrids is usually the consequence. Three years' consecutive trials of some of the sorts so crossed prove with me to be a "set" continuity, both in flavour and feature, and a proof that they will remain blent, according to the practical evidence of my own senses, so far—whether permanently, time must show. But in regard to the analogy of the "Apple on the Apple stock," albeit that is comparatively no new thing, I certainly have an example of my own working out here. Some 11 years ago, I grafted some cankered scions of and from an old Ribston Pippin tree, in the last stages of decrepitude, on to a maiden stock raised from a pip of the Blenheim Orange Pippin, in the hopes of throwing fresh life and vigour into the former good old sort, which is fast "wearing out." A very handsome Apple, blending both the colour and flavour of the two varieties, but not having the form of either parent, is the result, and no advantage is gained, excepting it be in the perfect recovery of healthy wood and bark, for the flavour of the Ribston Pippin is completely spoilt as a dessert Apple, though I still remain "at issue" with the Fruit Committee of the Royal Horticultural Society as to their non-consideration of it as

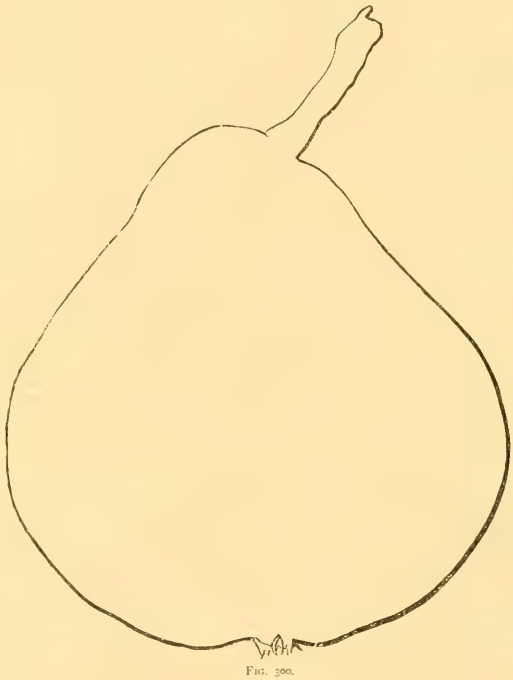

Fig. 300.

being a very early and a suitable hybrid for culinary purposes. But let that be as it may, this hybrid cross, showing the influence of the stock upon the graft, must be considered in confirmation, as I have fruited it with exactly the same results consecutively for eight years, viz., a continuity and "a blending of qualities and flavours," against which your correspondent sets his question. The flavour and consistency of the flesh of the above Apple most resembles that of the Blenheim Orange Pippin, whilst the wood and the foliage appear blended midway, partaking of both parents. Grapes and Pears I have not yet tried; but I think my memory serves me to say, from what I have read, that amidst a great many failures, good results do sometimes follow these operations of others; and that there appears to be no mistake, or "limits" about it. In conclusion, for this paper, and in regard to the future, I, with the Editors, "want to know the why and the wherefore?" "Ay, there's the rub!" I very much fear, mundanely speaking, that a very long time must pass away ere the veil is removed, or science reveals the wonderful and mysterious forces which so hamper the minds of speculative physiologists. But of this I am certain, however long and carefully wrought out our practice may have been, and however true to the point, or, at least to our own conceptions of it, we shall meet with demurrers, either to laugh at, or to question our peculiar searching species, to the end of the chapter. *Robert Fenn, Rectory, Woodstock, Oxon.*

Propagating Centaureas.—I have always been most successful in propagating this plant by putting the cuttings out on a sunny border along with Pelargoniums, &c., in light sandy soil, about the last week in August. If the cuttings are strong, I find that ninety-nine out of every hundred will take root. *John Clark, Rochampton Lodge, S.W.*

Late Grapes.—I am deeply interested in the subject of late Grapes, and I hailed with satisfaction the announcements ushering in Mrs. Pince's Black Muscat and Madresfield Court (black) as late keeping Grapes of high quality. I purchased them, and hoped in a couple of years to bid my old friend Lady Downe's an affectionate farewell; that time has elapsed, and still she remains queen of the late Grapes, for by this date both her rivals would require the skill of a Madame Rachel to hide their wrinkles, and what they will be like in March, when my old friend will be as plump as ever, I know not. Now this is very disappointing, if experience generally is like mine. It would be but right that whoever can show the Grapes I have referred to in February or March should do so, and save their reputation, and that of those who sent them out, founding their claims to patronage on their late keeping qualities. To exhibit a Grape at Christmas, and at once arrive at the conclusion that it is a late keeper, is premature; the Black Hamburgh can be kept till then, and its quality is far better than either. In fact, if Mrs. Pince's Muscat has not the quality of late keeping, it has no other good one. Then as to late White Grapes, I observe that one called White Lady Downe's is being sent out in Edinburgh: it was raised by Mr. Thomson, of Dalkeith. This was shown last spring, it is true, but not in good condition; and I now observe that Mr. Paul has shown his seedling Waltham Cross at a recent exhibition of the Royal Horticultural Society, and though it does not seem to have any peculiarity of flavour to recommend it, it gets a First-class Certificate apparently on the ground of its being a late keeper, though as yet there is no evidence of this quality. My own opinion is, that the parties who brought these Grapes before the public on the ground of their late keeping qualities are bound, in honour, to show that they are what they have represented them to be, by exhibiting them at the Royal Horticultural Society, say, next March. *A Grape Grower.*

Exhibiting Pears.—In reply to "Country Jan's" questions (p. 1673) respecting the ripening of my Pears, allow me to state that I consider the cause of their early ripening to be the unusually hot season. None of the sorts are grown indoors, and, with the exception of a few Winter Nelis, were not gathered until they began to drop from the trees. I am surprised at his having unripe fruit of Doyenné du Comice and Van Mons Léon le Clerc. I have grown the former twelve years, this being some time before it appeared in the fruit catalogues, and have never found either keep after November. *John Garland, Gr. to Sir T. D. Acland, Bart., Killerton, Exeter.*

Asparagus.—Our mode of preparing ground for Asparagus beds may not be uninteresting to those who have shallow soils; it is as follows:—Excavate a trench 6 feet wide and 3 feet deep, and such length as may suit the ground or the desired length of bed, reserving all the good soil at one side of the trench, and getting rid of the subsoil in the most convenient way. This trench will serve as a handy hole for all kinds of refuse for twelve months. Prunings of bushes may go into the bottom; throw in a little of the surface soil over the rubbish now and then during the summer, reserving 6 or 8 inches to finish the surface of the bed, care being taken to fill all firm and equal, so that there may be no uneven settling afterwards; a foundation thus prepared is just what the Asparagus delights in, as our beds will testify. The after treatment of these beds is simply a sprinkling of salt about the end of February, when they are forked over. We always allow the tops to remain on until this time, as we don't believe in sowing the beds with heavy top-dressings of manure during the winter. The beds have been unusually full of seeds this season, and it is a very pleasant sight to see our "garden friends and foes" meet in winter and feed thereon during hard weather. The best time to plant is early in March, keeping the crowns not less than 2 inches below the finished surface. Some of the beds here have been planted above 20 years, and are still very good. *John Taylor, Rose Hill Lodge, Botcherby, Carlisle.*

Veitch's Giant Autumn Cauliflower.—I beg to bear testimony to the great value of this Cauliflower for autumn use, and to corroborate all which your correspondents have said in its favour. I have grown it the last two seasons, and found it all that can be wished for, and a great boon to those who require a good late Cauliflower. It is of very rare occurrence that a new vegetable of sterling merit is brought before the public, and when we get such a meritorious article as this too much cannot be said in its favour. In the present day we get such trash imposed upon us by advertisements, that it is a relief and a pleasure to speak well of a good thing when there is a chance. I was somewhat surprised at the report given when this Cauliflower was exhibited at South Kensington. It was then stated to be too large. Did it not occur to the reporter that it was small before it got large, and that it could be cut in the former state for the master's table, and overgrown, or large ones, for the servants' hall? Had he to cater for a large establishment, where there are 18 or 20 to feed in the latter place daily, beside employer's and steward's-room table, I think he would not complain of a Cauliflower growing too large; at least I find it so. *D. Judd, Hawkestone, Shrewsbury.*

Silver Firs.—Your correspondent, "A. M.," p. 1702, writing about the Silver Fir, seems to suppose that the Balm of Gilead may have been planted instead of the Silver Fir. That may have been the case in some places, but I do not think it was so as a general rule; at least I am not aware that there are many remains of the Balm of Gilead to be found in woods. I have never come across any in my many wanderings, whilst the Silver Fir abounds in many large plantations. Near here, on the estate of the Earl Poulett, there are thousands of the Silver Fir, from 80 to 100 feet high and 3 to 4 feet in diameter. These fine trees tower above the other denizens of the woods, and are largely made use of in farm buildings, &c., upon the estate; the timber, when old, being heavy and solid, and of great durability. But about young trees, 30 to 40 years old, in the same plantations, these, like "C. F. M.'s," were nearly killed four or five years ago. From being the pictures of health they became diseased, and seemed as if they would all die outright; they have, however, recovered to a great extent, only the bottom branches are dead about halfway up the stems. The solution of this mysterious visitation I was, at first, inclined to think was Fungus, somewhat analogous to Potato disease. Again, I suspected it lay in the cells, having been fully charged with sap by the action of a warm and early spring, and then a sudden frost in May, such as we had on the 23d of that month a few years ago. As the disease in the Silver Fir seems somewhat analogous to what occurs in fruit trees, especially the Apple and Pear—the latter more particularly—after a severe frost, following a mild March and April—(I have in my nursery many striking examples of the action of frost upon trees when the vessels are charged with sap, I may mention particularly a tree of Flemish Beauty Pear that was just in the position of the Silver Firs)—and as my cure for canker so produced is rather novel, and was pooh-poohed by one of your contemporaries a week or two ago, I give it that the readers of the *Gardeners' Chronicle* may test it. It is—After a severe frost, when a tree has had its bark frozen, and sometimes the tissues of the whole tree injured, and the unmistakeable dead branches, as in the Silver Fir, begin to show themselves, I cut out every bit of the frozen bark, sometimes skinning the tree to a great extent, and cutting in the dead boughs to a healthy eye. The result is always decided. In paring off the outer bark, the inner bark must be left, as much as possible, entire. I have sent you the above, as I think the general opinion is, that canker and disease in trees are caused by the roots striking too deeply into damp or wet soil. I hold that the deep rooting habits of many trees, and find that a frost-struck tree is very much like a lightning-struck one—the after results are much the same, and probably the electricity of frost and the electricity of heat are not widely different in their nature and results. A great many trees that have had their bark frozen will in a few years throw off the said bark, and recover themselves with new, whilst others get so injured that they have not the power to do so unless assisted. *John Scott, Crewkerne.*

Education and Position of Gardeners.—In these days of universal education, I own I am surprised to see that so many of your correspondents appear to despise it, except so far as it has a commercial value. In future we must value education more as an addition to our means of happiness than as an aid to rise. I cannot agree with your Thirsk correspondent as to the miserable position of gardeners. There are enough prizes in the profession to make a young man, with his heart in his work (and no other is likely to excel in any profession), feel that he has a career before him, in which the able may command distinction, while no competent man need want employment. As to wages, I cannot help thinking that even your correspondent from Thirsk, "with something over £1 a week,"—probably a cottage, and some firing, and certainly his vegetables,—when he considers the difference between town and country prices, would find his position contrast favourably with that of many a mechanic earning £2 a week or more, whose education and apprenticeship have cost at least as much as his own, and whose occupation is neither as pleasant or healthy. I am sufficiently old-fashioned to believe that honest service honestly paid is creditable alike to employer and employed, and is the rule and not the exception. I am convinced that where the gardener is "elbowed, jostled, and thrust aside," that the fault is not on one side only. *J. S. H.*

Destroying Weeds on Lawns.—Mr. Fish remarks, at p. 1705, that one way of destroying weeds is "to burn their hearts out with vitriol." This reminds me that a friend once described to me a walking-stick which he had had made for that purpose. It was a sharp-pointed hollow tube filled with vitriol, with a spring at the top, on pressing which a single drop was discharged into the heart of the weed in which the point was stuck. Can Mr. Fish or any other correspondent tell me whether, and where, such an instrument can be bought? It would be pleasant to go about dealing destruction to intruders if it could be done without the fatigue of stooping. *A Lady.*

—— Although I am equally sceptical with Mr. Fish as to the efficacy of many of the preparations that are recommended for the removal of weeds from lawns, I am not prepared to endorse his assertion, that "it is altogether a mistake to suppose that any top-dressing will kill weeds on grass lawns without also killing the grass." Having had something to do with the experiment at Rothamsted in the summer of 1862, I had ample opportunities of observing and noting many strange and interesting results, caused by the application of top-dressings of various kinds and quantities to grass land, and am quite convinced in my own mind that the suggestion made by the Editors, to the effect that when we understand more of the relative and specific effects of manures on plants, that an ingredient will be found which will make the grasses out-grow the weeds, is even more than probable. The following comparative statement, drawn from my notes, taken on the ground during several months of close and daily observation of the plots of grass experimented upon, will, I think, support that view:—

Plot 12.—*Unmanured.*		Plot 13.—*Manured.**	
Graminæ	12 species	Graminæ	12 species
Leguminosæ	3 ,,	Leguminosæ	3 ,,
Labiatæ	1 ,,	Labiatæ	1 ,,
Umbelliferæ	1 ,,	Umbelliferæ	1 ,,
Ranunculaceæ	2 ,,	Ranunculaceæ	1 ,,
Rosaceæ	2 ,,	Rosaceæ	1 ,,
Compositæ	3 ,,	Compositæ	2 ,,
Stellatæ	1 ,,	Stellatæ	0 ,,
Plantaginaceæ	1 ,,	Plantaginaceæ	0 ,,
Polygonaceæ	1 ,,	Polygonaceæ	1 ,,
Miscellaneæ	1 ,,	Miscellaneæ	1 ,,
Cyperaceæ	1 ,,	Cyperaceæ	0 ,,

An examination of the above will show that five natural orders and nine species of the miscellaneous plants, or those that are regarded as weeds on lawns, disappear under the influence of top-dressing, but while the decrease of the number of species is something worthy of notice, the decrease of the number of the plants representing those that remained in the plot, as well as their diminution in strength, are still more considerable, but cannot be described by either words or figures. There was a large increase, on the other hand, in the Graminæ both as regards luxuriance and preponderance, of which some idea may be got by comparing the weight per acre of the same plots, which is as follows:—

Plot 12.	Plot 13.
23¼ cwt. per acre.	55¼ cwt. per acre.

Wm. Sutherland, Minto, Hawick, N.B.

Garden Memoranda.

COLESHILL, HIGHWORTH, WILTS, THE SEAT OF EARL RADNOR.—This fine country seat, set down in the midst of some rich woodland, and occupying a commanding position, from whence fine views can be obtained of the surrounding country, lies midway between the Faringdon and Shrivenham stations of the Great Western Railway, being distant about four and a-half miles from each. Any one going to Coleshill from Shrivenham station could take in Beckett Park, Lord Barrington's charming seat, which lies at the east end of Shrivenham village. Those who love grand trees, and under their dense spreading boughs could give up their souls to the tender spirit that pervades the shade these imperial denizens of the country affords, could find here, in the lofty Elms, the

* With 500 lb. sulphate of soda, 100 lb. sulphate of magnesia, 400 lb. salts of ammonia, and 2000 lb. sawdust per acre.

magnificent Oaks, and the richly clothed noble Beeches, "tongues in trees," and preachers of no common sermons; and beneath the shadows of the spreading Chestnut and the waving Pine find sufficient material for an hour's unalloyed pleasure and repose:

"As if from heaven's wide open gates did flow
Health and refreshment on the world below."

The trees at Beckett constitute its main feature, but there are many other matters full of interest to a horticulturist.

Limes are grand at Coleshill, and they are supposed to be some of the finest old Limes in England, and near the mansion is a pleasant walk under a short avenue of them—most deliciously cool and inviting on a sweltering summer's day.

The park of Coleshill Place, as it is termed, is some 400 acres in extent, set down in a pure country district, with but very little of the busy hum of town life. The mansion was designed by Inigo Jones, and is a solid substantial structure, facing due south, and commanding extensive prospects. Beech and Elms, fine pyramid Yews, with Limes dotted among them, form a cordon round the mansion, with outer cordons and irregular lines beyond, till the open country, and arable land, with attendant breaks of woodland, are reached. In the pleasure ground may be seen fine specimens of Abies Pinsapo, and Taxodium sempervirens; these last flourish as if in a very congenial home.

On the right of the mansion, and close to its north-west corner, is a short avenue of Elms, which was at one time the old coach highway; and the London coaches, before the counties were strapped together by the iron roads, used to pass under these Elms, but some years ago the road was diverted, to the manifest improvement of the property.

On the lawn, on the south front of the house, lies what there is of flower garden, and it is a single strip formed of two sets of choice beds. A new hybrid Ivy-leaf Pelargonium, after the type of Wills' new kinds, but raised by Mr. Henry Eckford, the gardener at Coleshill, and bearing trusses of crimson flowers tinged with purple, made a charming bed, and was edged with Sempervivum californicum. All the freedom of bloom of the ordinary Ivy-leaved Pelargonium seems to have been transmitted to this new hybrid. Coleshill, a rich scarlet zonal, also raised by Mr. Eckford, together with Merrimac, with fine cerise-crimson coloured flowers, made fine beds also. A good and pleasing bed was formed of Iresine Herbstii and Mrs. Pollock Pelargonium, mixed together; and yellow Calceolarias, edged with Pyrethrum Golden Feather, furnished a much better contrast than many might be supposed to imagine.

The kitchen garden lies near the mansion, and is of some 6 acres in extent. There are four vineries and other houses besides, but as the Earl of Radnor rarely occupies the mansion, but little is done in the way of plant growing. There is a small but good collection of Orchids. Of these Saccolabium Blumei majus, Cypripedium Stonei, and others, were in flower; and a fine plant of Peristeria elata was throwing up several blooming spikes. Of Saccolabiums there was a good collection, all in fine condition.

Mr. Eckford does not appear to be so ready to condemn Mrs. Pince's Grape as some other cultivators. He finds that it materially aids the Grape to give the Vines heat during the time of setting the berries, and as soon as it is in bloom he takes the top air off and keeps all draughts out of the house as much as possible. In one of his houses Mr. Eckford has a white Grape, which he states he raised from seed of the Black Hamburgh without any fertilising process. It seems to possess the merit of earliness, as it was over in an early vinery before the Black Hamburgh was well ripe, both Vines being started at the same time.

A few Pines are grown, principally Queens, Black Jamaica, and Smooth Cayenne. Barr's Monarch, a new green-fleshed Melon, was commended by Mr. Eckford as being a reliable and certain variety for a main crop. Coleshill Cucumber, one of the Sion House type, is a capital forcing variety, yielding abundance of good table fruits. There is a fine collection of pyramid Pears at Coleshill, all in rare health, and, in season, laden with fruits. Duchesse d'Angoulême, Jargonelle, Marie Louise, Van Mons Léon le Clerc, Napoléon, Ne Plus Meuris, Beurré de Capiaumont, and Bon Chrétien were all very fine. The bush Cherry trees on either side of a walk in the kitchen garden are a fine feature, and at Coleshill they do ten times better so grown than they do on walls, as they are apt to die, owing to the heat. Mr. Eckford does not summer prune these bushes. Some old Mayduke Cherries on walls went very bad, and nearly died. These were transplanted and grown as bush trees, and are now doing well. There were very fine crops of all kinds of fruit at the time of my visit, and Figs on walls were very fine. A low wall of Morello Cherries had enormous crops of fine fruit. All the shoots are not cut back or nailed in, only the leading ones, but thinned out, and the old wood throws plenty of young shoots that give abundance of fruit the following year; Mr. Eckford finds this mode keeps the wall cool, and the branches give some protection to the fruits.

It is more particularly as a florist that Mr. Eckford is known. As a raiser of Verbenas he can hold his own against Mr. Perry, even though he cultivates under totally different conditions. Mr. Perry grows his plants under glass; all of Mr. Eckford's are in the open ground, and have to battle with sun, wind, and rain alike. In several parts of the flower and kitchen garden could be seen patches of seedling Verbenas, and self-sown plants had sprung up on all hands. The Verbenas must be treated of separately, and under a different heading. The various types of Pelargoniums are hybridised, and with Ivy-leaved forms Mr. Eckford is fully abreast of Mr. Wills.

The visitor to Coleshill should not fail to look at the village of Coleshill, with its pretty, commodious, well-arranged cottages. Would that the dwellings of many an agricultural village were modelled after the same type! Sanitary science and social ethics would be largely the gainers. *R. D.*

Miscellaneous.

Botany in Medical Schools.—In an introductory lecture, delivered by Mr. Leo Grindon at the opening of the current session of the Manchester School of Medicine, the lecturer, alluding to the utility of a knowledge of *materia medica*, remarked that "It would especially ill become him to undervalue the right use of drugs, since the germ of the science of botany was found in the study of the vegetable portion of the *materia medica* by the pupils of Aristotle; and although an eminent physiologist and lecturer had quite recently expressed his opinion that both chemistry and botany should be omitted from the curriculum of study in medical schools, he could not but exclaim, God forbid that the day should ever come when it should be said that medicine was unfaithful to its first love, and that the allegiance of more than 2000 years had come to an end. It might be that Prof. Huxley objected rather to the particular portion of botany to which the student was too often required to give his first attention—an attention quite as frequently repelled by it as allured. The student who was wishful to learn how to distinguish Dulcamara from Belladona, and to possess clear notions of the general aspect of deleterious plants as contrasted with harmless ones, could not be expected to feel either gratification or encouragement in minute details respecting phyllotaxy and bothrenchyma. To the student, botany so initiated may well seem a useless burden, and he (the lecturer) could not see how the student was helped towards the practical knowledge of pharmaceutical and poisonous plants by being saturated with minute vegetable anatomy. Vegetable histology was one of the noble pastimes of every true botanist, and a large acquaintance with it was one of the special ornaments of his profession, but to commence with it was to enter the temple through the roof instead of the portico. He did not believe that Professor Huxley, or any one else, could deem it superfluous that the medical student, in addition to receiving a good groundwork of structural botany, with its complement of physiology, should be shown, as in their Manchester school, specimens, or other intelligible illustrations of every plant mentioned in the Pharmacopœia, and of every plant the name of which cropped up periodically in connection with deaths by accidental poisoning. That the practical department of botany involved in its teaching far more labour and anxiety of preparation than was needed for illustrations of histology might account for the preference given to the latter; and if teachers were not able or willing to undertake that labour, it certainly was a reasonable question—Had not botany better be out of the curriculum?"

The Pot on the Fire.—There is one mode of preparing food in general use in many parts of the Continent, which we should do very well more generally to adopt, that is "gentle simmering." In every or almost every French household there is the *pot au feu*. This permanent "pot on the fire," after the manner of the old-fashioned "digester," occupies a quiet little corner of the stove or fireplace. It can hardly be said to boil, but it simmers on gently, very gently, for hours. There it is the receptacle of many a little bone, whether the trimmings of poultry or butchers' meat. It matters not, every little stray fragment of wholesome meat finds its way there. A bit of liver is considered an immense improvement; and any vegetables that happen to be about add to its pleasant flavour, whether the tops of Celery, Jerusalem Artichokes—which, *par excellence*, make it delicious—or otherwise Carrots, Turnips, Leeks, &c. But supposing it were to be made altogether of fresh materials—which, indeed, in France it rarely is—this would be the proper recipe: Put a gallon of water into a pot; put into this three or four pounds of shin of beef, or any similar thing; add to this an onion or two, or some Leeks, Carrot, or other vegetable, three or four teaspoonfuls of salt, one of black pepper, three Cloves. Give it one boil up; skim it carefully. Now cover the pot closely, and let it cook gently for three or four hours at the least. About every hour throw a wineglassful of cold water into it, to make it clear. Taste: it may require a little more salt or pepper, according to taste. Pour this soup over toasted crusts of bread. Both soup and meat will be found delicious. The whole secret of this lies in the gentle simmering in a covered vessel, whereby the flavour is wholly preserved, and nothing is lost. A bullock's head so cooked is excellent. *People's Magazine.*

Garden Operations.

(For the ensuing week.)

PLANT HOUSES.

Some few of the fast growing creepers, such as *Allamandas*, *Stephanotis*, &c., which are now in a semi-dormant state as regards growth, may, if opportunity offers, be freely potted and trained preliminary to being started into growth at an early date. Keep *Ixoras* well up to the glass, so that they may enjoy the benefit of every ray of light, as even now they may be forming embryo flower-buds. Keep as uniform and moderate a temperature as possible, compatible with the requirements of the various plants. Stove plants should not now be kept in a temperature exceeding 60°, whilst those plants from more temperate regions, and, indeed, any stove plants which may be enjoying a season of rest, will eventually do better if a mean of 55° only be constantly maintained. Attend to soft-wooded plants and all such as are of a succulent nature, in regard to the periodical removal of the decaying leaves and the freshening up of the surface of the soil in which they are growing. The time has again arrived when all who anticipate a successful season should put things in order, preparatory to making a fresh start. There are many things, not quite matters of routine, which may perhaps require attention. If any boxes or tubs containing plants, in whatever position, require renewing or enlarging, this is the time when such work should be done. Perhaps trellises require enlarging or extending, but these and similar alterations and requirements will suggest themselves. Specimens of the showy old *Dendrobium nobile*, which have been kept in a cool house up to the present time, and are now showing for flower, should be removed into a house some few degrees warmer, and should have a very little water poured just round the inner sides of the pots, not so much to moisten the whole of the soil as to afford a supply of a slight degree of humidity in that situation. Amateurs and others who have but limited means, but who nevertheless endeavour to keep such things as *Coleuses* in cool houses, should keep the balls containing the roots as dry as possible without absolutely injuring the plants. Place a few *Cactuses* into a greater degree of heat (where there is a stock) to get an earlier show of bloom, and thus prolong their season of beauty.

FORCING HOUSES.

When *Vines* were started about the beginning of this month, it may be expected that the buds have fairly commenced to swell, whether any progress is to be seen superficially or not. The fermenting materials within such structures, where this has been made use of, may therefore now undergo a slight turning over, and have a little fresh material added to them, so that the cruder steam which arises soon after may have time to subside and become sweetened somewhat before the young leaves commence to expand. Carefully attend to the requirements of outdoor borders where these exist in connection with early houses, such as the above. As a matter of economy, as well as to aid in keeping up the necessary degree of heat with as much freedom from fluctuations as possible, it is an excellent plan to place a light covering of dry straw or Fern over the fermenting materials at the approach of frost, or when a fall of snow is anticipated. Should snow accumulate quickly upon any such materials, take care to remove it at the earliest possible moment, carrying it to a distance. *Figs in pots* may now be plunged into any such bottom-heat as the above may afford, and which is available for the purpose. Some amount of care will be needed to keep this bottom-heat at a safe minimum, which should not exceed from 78° to 85°.

HARDY FRUIT GARDEN.

Should a sharp period ensue, and there is every likelihood that this will be the case at the time these lines are written, it will be advisable to place long litter, leaves, or other kinds of material, over the roots of newly-planted fruit trees, or such other young ones as are likely to have the roots growing near to the surface of the ground, and to which it is possible the frost may penetrate.

HARDY FLOWER GARDEN.

Cold frames or pits, containing *Auriculas*, *Polyanthuses*, *Pinks*, *Pansies*, and other similar things, and which are well covered over with protecting materials, should be uncovered and fully exposed to the light as often as possible, when a penetrating frost with cold winds does not occur in the day time. Close all up, and cover over again early in the afternoon, before the temperature materially decreases. Use every precaution in regard to the protection of all the tender kinds of hardy climbing plants, such as *Magnolia grandiflora*, *Banksian Roses*, *Ceanothuses*, *Eugenias*, and the beautiful *Escallonias*, &c., which will all require to be well protected should the frost prove severe, as few of us forget the sad havoc which the severity of 1860-1 wrought amongst many such favourites. The same remarks apply equally to plants of more humble growth, as *Pampas grass*, *Tritomas*, and such of the tuberous class as *Alstrœmerias*, &c.

KITCHEN GARDEN.

In this department the operations must mainly be dependent on the state of the weather. *Lettuces* and

Endive wintered in cold frames for use as salading may (should the frost enter) be kept closed from both air and light until the weather again breaks, when both light and air may be admitted very gradually, and it will be found that if kept moderately dry little injury will have befallen them. Push forward all arrears of trenching, &c., when vacant ground still remains to be done, bringing up all arrears with despatch, so that a good start may be made in the ensuing season, which is even now gaining upon us apace. Finally, though a little out of order, I may here suggest that, as soon as the weather breaks, the ground being fit, all planting operations should be quickly finished. *W. E.*

TEMPERATURE OF THE AIR AND FALL OF RAIN AT DIFFEREAT STATIONS

DURING THE WEEK ENDING SATURDAY, DECEMBER 24, 1870.

NAMES OF STATIONS.	TEMPERATURE OF THE AIR. Highest.	Lowest.	Range of Weeks.	Mean of all Highest.	Mean of all Lowest.	Mean Daily Range.	Mean.	FALL OF RAIN.
	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	Deg.	In.
Portsmouth ..	51·2	18·4	35·8	39·8	27·8	12·0	33·8	0.05
Blackheath ..	50·9	15·3	35·6	38·4	27·3	11·1	33·0	0.17
Birmingham ..	51·5	17·8	33·7	39·2	27·1	12·1	32·6	0.63
Wolverhampton	51·0	12·9	38·1	37·0	23·8	13·2	30·4	1.00
Leicester ..	51·2	9·0	42·2	35·7	25·4	10·3	30·5	1.06
Norwich ..	50·0	8·5	41·5	35·1	27·0	8·1	31·2	1.25
Nottingham ..	50·0	10·7	39·3	35·5	26·6	11·0	31·1	0.60
Sheffield ..	51·0	13·5	37·5	37·0	28·0	9·0	33·4	0.59
Liverpool ..	49·8	18·2	31·6	37·0	28·2	8·8	32·6	0.80
Salford ..	51·5	12·2	39·3	37·3	28·1	9·2	32·6	1.03
Bradford ..	51·0	14·4	36·6	38·7	25·5	13·2	32·1	0.20
Leeds	52·0	19·0	33·0	40·0	31·1	8·9	35·6	0.49
Hull	50·0	8·0	42·0	34·9	21·9	13·0	30·3	0.09
Edinburgh ..	50·7	16·0	34·7	..	..	..	35·2	0.00
Dundee ..	49·0	16·0	33·0	..	..	..	32·7	0.55
Glasgow ..	50·6	15·1	35·5	..	..	..	34·3	0.43
Perth	50·0	8·0	16·9	..	..	..	33·3	0.33
Aberdeen ..	47·0	19·2	27·8	..	..	..	33·0	2.31

JAMES GLAISHER.

*** *Our weekly report of the State of the Weather at Blackheath is having arrived at the time of going to press, we are obliged to crave the indulgence of our readers till next week.*

Notices to Correspondents.

EVERBEARING UNDINE STRAWBERRY: *H. F.* The history of this Strawberry was given in our columns at p. 1278, 1869. We do not know where it is to be found in this country. Those who have it for sale should advertise it.

HEATING A HEN-HOUSE: *C. C.* The best way would be to carry the flue from the boiler through the hen-house. This may be done by a brick flue under the floor, or by 9-inch drainpipes above the floor, in either case keeping it free from wood. I have little doubt but that a hot-water pipe would work if the highest part of the floor was kept 1 foot below the top of the boiler; a 2-inch gaspipe may be tried at a small expense, putting a small airpipe at the extremity. I am supposing it to be an ordinary boiler, open at the top. *G. E.*

NAMES OF FRUITS: *Novice of Stoke.* We are not quite sure of the variety: it very much resembles Hawick Golden Reinette.—*G. S.* 1, Beauty of Kent; 2, King of the Pippins; 7, Yorkshire Greening; 10, French Crab. *Pears:* 5, Winter Crassane; 6, Knight's Monarch.

NAMES OF PLANTS: *E. Hughes.* 1, Allosorus crispus; 2, too imperfect; 3, Onychium japonicum; 4, Asplenium marinum; 5, Gymnogramma Mertensii.

QUERY: *R. W. C. Z.* The trees in Berkeley Square enclosure are Plane trees.

ERRATA.—At p. 1705, col. *b*, line 60, for "stout" read "that;" p. 1699, col. *c*, for "full growth," in the third line, read "green leaf;" for "thickest," in 68th line, read "thicket;" in 11th line from the bottom, for "then" read "through."

CATALOGUES RECEIVED.—Hooper & Co., Catalogue of Seeds for 1871.—James Veitch & Sons, Catalogue of Garden and Flower Seeds for 1871.—Charles Turner, Catalogue of Seeds for the Kitchen, the Flower Garden, and the Farm.—S. Williams' Descriptive Catalogue of Flower, Vegetable, and Agricultural Seeds, &c.

COMMUNICATIONS RECEIVED.—H. B.—F. W. B.—F. W. S.—A Constant Reader.—H. N. E.—A. M. A.—A. D.—A. Ferneau—R. W.—J. C.—A Head Gardener.—For Play—A. C.

Markets.

POTATOS.—Southwark, Dec. 26.

During the past week the arrivals coastwise have been plentiful, but the trade has been very slow—quite of a holiday character, and the following quotations were barely maintained:—Yorkshire Regents, per ton, 70*s.* to 80*s.*; Lincolnshire do., 65*s.* to 75*s.*; Dunbar and East Lothian do., 75*s.* to 80*s.*; Perth, Forfar, and Fifeshire do., 65*s.* to 70*s.*; Kent and Essex do., 55*s.* to 65*s.*; do. Rocks, 55*s.* to 60*s.*

COVENT GARDEN.—Dec. 30.

There is a very short supply of outdoor stuff, in consequence of the severity of the weather, and there is a very thin attendance of buyers. The prices, however, have not yet advanced to such an extent as to alter our last quotations. Good dessert Pears and Apples are abundant, and comprise all the usual varieties. Grapes and Pines are sufficient for the demand. Sea Kale is now coming very good. Cucumbers are scarce. Amongst flowers we have Orchids, Chrysanthemums, Heaths, Cyclamens, Primulas, Hyacinths, Tulips, Camellias, and Pelargoniums, and a large supply of dwarf evergreens and "Christmas trees."

FRUIT.

	s. d.	s. d.		s. d.	s. d.
Apples, p. ½ sieve ..	1 0	to 2 0	Oranges, per 100 ..	6 0	to 10 0
Grapes, per lb. ..	4 0	— 8 0	Pears, per doz. ..	2 0	— 6 0
Lemons, per 100 ..	6 0	— 10 0	Pine-apples, per lb.	4 0	— 6 0
Melons, each ..	1 0	— 3 0			

VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Artichokes, Jerusalem, p. lb. ..	0 2	to 0 4	Herbs, per bunch ..	0 2	to 0 4
Beet, per doz. ..	2 0	— 3 0	Horse Radish, p. bun.	3 0	— 5 0
Brus Sprouts, ½ sieve	3 0	— 3 6	Lettuces, p. score ..	1 6	— 3 0
Cabbages, p. doz. ..	1 0	— 1 6	Mint, per bunch ..	0 3	— 0 6
Carrots, p. bunch ..	0 4	— 0 8	Mushrooms, p. pott.	1 0	— 1 6
Cauliflowers, p. doz.	1 6	— 3 0	Onions, per bunch ..	0 4	— 0 9
Celery, 1st, p. bun.	1 0	— 2 0	Parsley, p. bunch ..	0 2	— 0 4
— white, ds. ..	0 4	— 1 6	Salsafy, per bundle,	1 3	— 1 6
Cucumbers, each ..	0 2	— 1 0	Seakale, p. basket..	1 6	— 2 6
French Beans, p. 100	3 0	— 4 0	Shallots, per lb. ..	0 8	— ..
Garlic, per lb. ..	0 3	— ..	Spinach, p. bushel..	2 0	— 3 0
			Tomatos, per doz...	1 0	— 1 6

Potatos, Regents, per ton, 60*s.* to 80*s.*; Kidneys, 80*s.* to 120*s.*; Rocks, 50*s.* to 60*s.*

SHAW'S TIFFANY.
For Samples and Prices apply to
J. SHAW AND CO., 29, Oxford Street, Manchester.

Great Reduction in Prices for 1871, of
GREENS' PATENT SILENS MESSORS, or NOISELESS LAWN MOWERS, ROLLING, and COLLECTING MACHINES.
THOMAS GREEN AND SON, Smithfield Iron Works, Leeds; and 54 and 55, Blackfriars Road, London, S.E.

THE ACME GARDEN FRAME and GROUND VINERY
The most perfect and effective as well as the cheapest Frame and Vinery yet brought out. See the *Gardeners' Chronicle*, December 17.
BENJAMIN COOKER, Inventor, Patentee, and Sole Manufacturer, Kingston-on-Thames.

Indestructible Terra-Cotta Plant Markers.
MAW AND CO.'S PATENT.—Prices, Printed Patterns, and Specimens sent Free on application; also Illustrated Patterns of Ornaments and Tile Pavements for Conservatories, Entrance Halls, &c. MAW AND CO., Benthall Works, Broseley

LABELS, LABELS.—PARCHMENT or CLOTH LABELS.—Tree or Plant Labels, parchment, 1½ inches long, 4*s.* per 1000, or 10,000 for 35*s.*, cash on delivery. Sample Label sent on receipt of postage-stamp for 1½*d.* Prize Medal awarded here in London by JOHN FISHER AND CO., Label Works, Boston, Lincolnshire.

CHEAP PAVING TILES.—A manufacturing Firm have a considerable stock of TILAIN and ENCAUSTIC TILES, more or less damaged in the process of manufacturing, that they would be willing to dispose of at prices below those of the commonest description of Paving Materials. To Builders and Proprietors these Tiles are invaluable for the floors of Cottages, Farmhouses, &c., and can be supplied at a very low rate.
L. T., Post Office, Broseley, Salop.

MINTON AND CO.
Beg to call the Public's attention to their New Stock of their ENAMELLED and MAJOLICA TILES
At the China and Earthenware Manufactory,
Stoke-upon-Trent,
28, Wall Street, Regent's Park, London.
They have no connexion with any other House of the same name.
Please note the address.

Caution to Gardeners.—When you ask for
SAYNOR AND COOKE'S WARRANTED PRUNING and BUDDING KNIVES, see that you get them. Observe the Name of Saynor, also their Corporate Mark, OBTAIN WARRANTED, without which none are genuine.
S. & C. regret having to caution Gardeners and others, but are compelled to do so, in consequence of an imitation, of common quality, having been put forward as genuine ones, which have caused many complaints to be made to them of Knives which were not of their make all of which are warranted both by Sellers and Makers
S. & C.'s PRUNING and BUDDING KNIVES are the best and the cheapest in the market.
Easton Works, Sheffield. Established upwards of 125 years

FOWLER'S PATENT STEAM PLOUGH and CULTIVATOR may be SEEN at WORK in every Agricultural County in England
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FOR SALE, several Second-hand SELF-MOVING THRESHING ENGINES, also suitable for Steam Cultivation on the Roads, &c., apply to
JOHN FOWLER AND CO., Steam Plough Works, Leeds; or 71, Cornhill, London, E.C.

OXFORD FIRST PRIZE CHURN, suited for small occupations
RADFORD'S PATENT COUNTER CURRENT. (See Report.)
Mr BRADFORD'S Counter Current is also the facility its construction affords for perfectly cleansing the machine after churning, combined with the superior quality of butter it produced, clearly entitled it to the First Prize.
THOMAS BRADFORD AND CO., 63, Fleet Street, London, E.C.; Cathedral Steps, Manchester

POULTRY HOUSE, 8 Fowls, 30*s.*; Largest DOG KENNEL, 30*s.*, Retriever size, 20*s.*, made portable; COACH HOUSE and STABLE, £12; COW SHED, £8; TOOL HOUSE, 6 feet by 6, £3; EMIGRANT'S HUT, 3 Rooms, £17; GALVANIZED IRON CHURCH, 24 by 15, Second-hand, £19. COTTAGES, PHEASANTRIES, OUTBUILDINGS.
R. RICHARDSON, 92, Euston Road, N.W.

OSLER'S CRYSTAL GLASS CHANDELIERS, LAMP GLASS OF ALL KINDS,
CHANDELIERS in BRONZE AND ORMULU
Moderator Lamps, and Lamps for India.
London Show Rooms, 45, OXFORD STREET, W.
Birmingham—Manufactory and Show Rooms, Broad Street

To Landscape Gardeners and Others.
THE BOURNEMOUTH COMMISSIONERS invite DESIGNS for LAYING OUT the proposed NEW PLEASURE GROUNDS, and offer a PREMIUM of THIRTY POUNDS for the DESIGN which they shall consider to be the best, and of FIFTEEN POUNDS for that which they shall consider to be the second best of those sent in.
The Designs selected for Premium shall become the property of the Commissioners, who shall be at liberty to carry out either of such Designs, or any modification of it, without, if they so think fit, any professional assistance from its author.
Particulars and Lithographed Plans of the Land to be laid out, and instructions generally as to the nature of the Designs wished, and of the scale, &c., on which the Plans are to be made, may be obtained of the Surveyor to the Commissioners.
Each Design to be distinguished by a motto, the Author's name and address to be enclosed in a sealed envelope, subscribed with his motto, and both to be sent to the Clerk of the Commissioners, at their Office, on or before the 7th February next.

WANTED, a well-educated YOUNG MAN, aged 18 or 20, to take Entire Charge of the Houses. Must have been brought up under Glass. Would have a boy under him. The Kitchen Garden and Grounds are under separate management.—Wages about 18*s.*; and Cottage.—M. R., Army and Navy Club, St. James's Square, W.

WANTED, a PROPAGATOR and GROWER.—Must be well up in Heaths, Azaleas, &c. State wages, age, and if married, to F., *Gardeners' Chronicle* Office, W.C.

WANTED, a SHOPMAN, capable of conducting the Retail Department of a London Seed Business.—Address, stating particulars as to experience, wages, &c., B., *Gardeners' Chronicle* Office, W.C.

WANTED, a FURNISHER.—Apply, stating age and salary required, references, &c., to J. WIMSETT, Ashburnham Park Nursery, King's Road, Chelsea, S.W.

WANTED, a skilled PACKER.—Preference given to one who has been accustomed to Pack Plants, and who is also a Gardener. Wages 25*s.* per week.—BARR AND SUGDEN, 12, King Street, Covent Garden, W.C.

WANTED, a CLERK.—One who has been in the Nursery Trade some years, a good Salesman, with a knowledge of the Names of Plants. A middle-aged Man preferred.—W. WIMSETT, Ashburnham Park Nursery, King's Road, Chelsea, S.W.

Seed Trade.
WANTED, a good COUNTER HAND.—Address, stating age, references, &c., CHARLES H. DICKSON, Manchester

WANTED, as SHOPMAN, a good Salesman, who has been accustomed to a Retail Shop Trade. Liberal salary will be paid.—Apply personally, if possible, or if the application is by letter, state particulars as to age and previous employment, to BARR AND SUGDEN, 12, King Street, Covent Garden, London, W.C.

WANTED, a respectable, well-educated Youth, as an APPRENTICE, to the NURSERY and SEED TRADE, by DOWNIE, LAIRD, AND LAING, Stanstead Park, Forest Hill, S.E.

WANT PLACES.—Letters to be Post Paid.

Gardeners.

B. S. WILLIAMS has much pleasure in stating that he has upon his GARDENERS' REGISTER many Men of the strictest integrity, thoroughly qualified to undertake the duties of HEAD GARDENER, HEAD GARDENER and BAILIFF, or UNDER GARDENER. Ladies or Gentlemen requiring such may rely upon B. S. W. recommending only those whose conduct and abilities are worthy of their trust.
Nurseries and Paradise Nurseries, Upper Holloway, London, N.W.

EXPERIENCED GARDENERS (or as GARDENER and BAILIFF), of various qualifications, recommended to Gentlemen.—Further particulars given on application to Messrs. E. G. HENDERSON AND SON, Wellington Nursery, St. John's Wood, N.W.

To Gardeners and Bailiffs (Head, Foremen, or Under)
JAMES CARTER AND CO. having many applications for the above, request that those WANTING SITUATIONS will send NAME, ADDRESS, and COPIES of TESTIMONIALS, for ENTRY in their FREE REGISTER. Only those who can send unquestionable references need apply.
Any Lady or Gentleman requiring GARDENERS or BAILIFFS may refer to James J. Carter & Co. on the most stringent regulations in reference to testimonials as to ability, honesty, &c.

GARDENER (HEAD), age 29.—J. LOVERIDGE is desirous of engaging with any Lady or Gentleman requiring the services of a thorough practical Gardener. Well understands the Laying out, Planting, and Stocking of Fruit and Flowers, and Vegetables. Has lived in the West and South, and Eastern Counties of England, and can be highly recommended by Mr. Daniells, Gr. to A. M. Munday, Esq., Shipley Hall, near Derby, where he has been upwards of two years, and six months as Foreman.

GARDENER (HEAD), age 30, single.—J. MOWBRAY, Gardener, Burleigh, Cheshunt, Herts, is open to a re-engagement as above. He has had experience in Pine and Grape Growing and all other branches of Gardening; is leaving present situation in consequence of the establishment being broken up, in which he has lived three years previously. Foreman in the Gardens of the Earl of Shrewsbury, Alton Towers, Staffordshire. The highest references can be given.—Address as above.

GARDENER (HEAD, WORKING).—The Advertiser possesses a thorough practical knowlege of the growth and management of Grapes, Melons, Cucumbers, Peaches, Mushrooms, Kidney Beans, Stove and Greenhouse Plants, a first-class Kitchen and Flower Gardener.—C. H. S., 5, Packenham Street, Gray's Inn Road, London, W.C.

GARDENER (HEAD, WORKING), age 35, married.—WILLIAM HENDERSON, for the last 3 years gardener to Thomas Mirman, Esq., Thurcroft Hall, Maltby, Rotherham, is at liberty to go on account of his employer leaving. He requires a thorough practical man, well qualified to Lay and Take Charge of all kinds of Fruits, Flowers, and Vegetables; and the Management of Pleasure Grounds and Kitchen Gardens. Wife having no family, can undertake the duties of Lady Dairy, or take Charge of Gentleman's Poultry. Character will bear investigating.—WILLIAM HENDERSON, Cocken Hall, Fence Houses, Durham.

GARDENER, married, with one child.—A Gentleman wishes to recommend his Gardener, who is leaving in consequence of change of residence. He thoroughly understands the profession, is honest, active, and industrious.—G. R., Esq., 30, Hyde Park Square, W.

GARDENER.—THOMAS MYLES, for the last four years Gardener to the Right Hon. Sir W. G. Hayter, Bart., South Hill Park, Bracknell, is at liberty to engage with any Nobleman or Gentleman in want of a practical Man. Has a thorough knowledge of Early and Late Forcing, Plant Growing, and the Management of Fruit and Flower Gardens, &c. Good character.—Post Office, Bracknell, Berks

GARDENER (SINGLE-HANDED, or where another is kept).—Age 26, no incumbrance; understands the Cultivation of Vines, Melons, Cucumbers, also Fruit, Flower, and Kitchen Gardening. No objection to Horse and Brougham. Wife can manage Laundry, Dairy, or Poultry. Good reference if required.—H. FINN, Gardener, Fairfield House, Harrow Weald, Middlesex, N.

TRIAL GROUND MANAGER.—Wanted, a situation as above, in a place where Agricultural, Vegetable, and Flower Seeds and Roots are grown. Has had great experience. Good references.—A. B., 5, Palmerston Street, Liverpool, S.W.

FOREMAN, SALESMAN, CLERK, &c., in a Nursery.—A well experienced and useful young Man. Good testimonials.—G. W., 3, Harbor Terrace, Matthias Road, Stoke Newington, N.

SHOPMAN. Age 23; seven years' experience. Is open to an engagement.—J. T., Post Office, Stonyky, Perth, N.B.

To Nurserymen and Seedsmen.
NURSERY SALESMAN or SHOPMAN.—A young Man (age 27) is open to an engagement as above; is thoroughly practical, and has a first-class Knowledge of Seeds and Plants, Book-keeping, &c. Has had experience in the Wholesale as well as the Retail Trade.—H. W., Messrs. Hurst & Son, 6, Leadenhall Street, E.C.

CLERK, or ASSISTANT SHOPMAN.—A Young Man, who has been three years at the Trade, is desirous of getting an engagement. A situation in which he could acquire experience more an object than salary.—J. P., 108, Cork Street, Dublin.

Notice to Purchasers of Farm Seeds.

MESSRS. SUTTON have now completed their stocks of FARM SEEDS, and their usual priced CATALOGUE will be published in February. Meanwhile Messrs. SUTTON will be glad to send prices to large purchasers on application, stating sorts and quantities required,

Royal Berkshire Seed Establishment, Reading.

RAYNBIRD, CALDECOTT, BAWTREE, DOWLING AND COMPANY (Limited), CORN, SEED, FLOUR, AND OIL FACTORS AND MERCHANTS. Address, 29, Seed Market, Mark Lane, E C ; or Basingstoke. Samples and prices post free on application. Prize Medals, 1851, for Wheat; 1862, for "Excellent Seed Corn and Seeds."

To the Trade. Agricultural and Garden Seeds.

H. AND F. SHARPE are now prepared to make LIBERAL OFFERS of Seeds, comprising TURNIP, CABBAGE, CARROT, MANGEL WURZEL, GARDEN PEAS and BEANS, &c., grown from the finest selected stocks, and free from admixture of weeds. They have still harvested in splendid condition. Seed Growing Establishment, Walsoken.

BIRD'S KING of the CUCUMBERS.—The best for exhibition. Length 24 to 30 inches. White spine, handsome fruit, short neck or handle. Price 2s. 6d. per packet.

BIRD'S QUEEN of MELONS.

The best green-fleshed Melon, handsomely netted, fine flavour. Average weight 5lb. Price 1s. 6d. per packet. May be had of all the Seed Trade, and of

JAMES BIRD, Nurseryman and Seedsman, Downham Market.

Rollisson's Telegraph Cucumber.

WOOD AND INGRAM offer this, the best All the Year Round Cucumber out,—a small house, 25 feet by 14 feet, in which the seed was sown on the 20th of January last, the first season 924 handsome fruit, 6 fine seeds 1s. 6d., or 12 for 2s. 6d. Postage stamps with orders.

W. & J. WOOD'S SEED LIST is now ready, and will be forwarded post free on application.

The Nurseries, Huntingdon.

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S. NAIRN AND SONS have the following to offer, all genuine and from selected stocks :—

CUCUMBER, IMPROVED TELEGRAPH.
BROCCOLI, VERY FINE WHITE.
CANDYTUFT, DUNNETT'S CRIMSON.
WALLFLOWER, SAUNDERS' CRIMSON.
LEEK, MUSSELBURGH (Scotch saved).
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Seed Warehouse, 62, Pilgrim Street, Newcastle-on-Tyne.

NUTTING AND SONS, 66, Baldwin, London, E.C., beg to offer the following HAY :—

No. 1, WRINKLED.—One of the richest wrinkled marrows, very productive, and true to sort, 2s. per quart.

MARROWFAT PEAS.—Very fine crop, early, and of good marrowfat flavour, with broad and well filled pods, and of excellent flavour, 1s. 6d. per quart.

THE Improved Dwarf Scarlet Runner, a most abounding habit. Large coloured pods, very good in quality, and of first-rate quality, 2s. 6d. per quart.

LORD PALMERSTON.—A superior dwarf wrinkled marrow, with fine long well filled pods, of excellent flavour, 2s. 6d. per quart.

Trade price on application.

RINTOUL'S NEW EARLY WHITE DON POTATO.—This is a great improvement on the variety sent out by us some years ago, being pure white both outside and inside, perfectly round, with a shallow eye, and is about ten days earlier than the red variety and an extraordinary cropper, whether for field or garden purposes. We feel assured this Potato will give every satisfaction. Per peck, 3s. 6d.; per bushel, 12s.; special prices for larger quantities. From numerous Testimonials in its favour the following are extracts :—

Mr. Robert Fenn, of *Woodstock, writes*: "I consider the New Early White Don Potato one of the best household or marketable sorts that we yet possess in the trade."

From Mr. Sherratt, *to Marquess of Tweeddale, Gardener, Yester, Haddington*.—"I have found Rintoull's New Early White Don Potato a first-rate one. It is a handsome, regular, excellent in quality, and fully two weeks earlier than the Dalmahoy, Smith's Early or Fortyfolds. I lifted this season 2 cwt. from 20 yards of drill. I will now give up these sorts for this variety."

From Mr. Anderson, *of Ormiston, Tranent*.—"I am much pleased with the New Early White Don Potato. I carefully compared the crop with the Dalmahoy, which was greatly in advance of the White Don. These are the two varieties in England who grow Dalmahoys to give them up for the White Don."

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DOWNIE, LAIRD, AND LAING, Nurserymen and Seedsmen, Edinburgh, and Mansfield Park, Forest Hill, London, S.E.

A Boon for Grape Growers.

MEREDITH'S VINE, PEACH, and PLANT MANURE, to be scattered broadcast at 7 cwt., 10s. 6d.; ½ cwt., 2s. 6d.; and 1 cwt., 4s., with full directions for use. For further particulars, see Descriptive Circulars, to be had post free on application.

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LONDON MANURE COMPANY (Established 1840) have now ready for delivery, in fine dry condition—

WHEAT MANURE, strongly recommended for Autumn Sowing.
DISSOLVED BONES, for Dressing Pasture Lands.
PREPARED or PHOSPHATED GUANO, for Corn and Roots, and every other MANURE of known value.

Also PERUVIAN GUANO, NITRATE of SODA, SULPHATE of AMMONIA, ex Dock or Warehouse.

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Autumn Sowing.

ODAMS'S NITRO-PHOSPHATE or BLOOD MANURE
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This Company was originally formed by, and is under the direction of Agriculturists, circumstances that have earned for it anoth er title, viz. "THE TENANT-FARMERS' MANURE COMPANY."

Its members are cultivators of upwards of 80,000 Acres of Land, which has been for years under management with Manures manufactured by the Company; consequently, the consumer has the best guarantee for the efficacy of the Manures.

Particulars will be forwarded on application to the Secretary, or may be had of the local Agents.

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REES AND CO.'S BIPHOSPHATED PERUVIAN GUANO (Registered Trade Mark, Flying Albatross), is now ready for delivery in quantity and in fine condition. It is believed to be the best Artificial Manure yet produced. Its base is Peruvian Government Guano; it contains 21 per cent. of Soluble Phosphates, 5 to 7 per cent. of Ammonia with Salts of Potash. See reports of Dr. Voelcker, Dr. Anderson, Professor Way, Mr. Ogston, and Mr. Sibson. Delivered in 2 cwt. bags, each of which is secured by a leaden seal, bearing the Company's Trade Mark. The analysis is guaranteed so long as the seals remain unbroken.

REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William street, London, E.C.

REPORT and ANALYSIS by DR. A. VOELCKER, Consulting Chemist to the Royal Agricultural Society of England.

"Analytical Laboratory, 11, Salisbury Square, Fleet Street, E.C.

"Sir,—Enclosed you will find the results of a careful analysis of a sample of your Biphosphated Peruvian Guano. These results speak for themselves. I need therefore hardly add anything in commendation of the high fertilising character of this valuable artificial manure. The sample examined by me contained only 10 per cent. of moisture, quite the proper percentage of soluble and available phosphates which I understand you guarantee to furnish, and was in a fine state of preparation. The more generally this manure will become known to agriculturists, the more, I should think, will it be appreciated by them.—Believe me, Sir, yours respectfully,

(Signed) "AUGUSTUS VOELCKER.

"The Secretary, REES AND CO.'S Biphosphated Peruvian Guano Company (Limited), 32, King William Street, London, E.C."

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Registered August 4, 1869
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Secretary, Mr. John Spencer.

Capital, £20,000 in 4,000 shares, each £5, paid on allotment.
Life Tickets, £2 2s. Annual Tickets, 10s. each, entitling the holder to purchase through his agency.

This Association has been formed by gentlemen engaged in Agriculture for the purpose of supplying all kinds of Agricultural Implements or other produce required by Farmers, and the genuine Oilcakes and guaranteed Manures, on the co-operative system.

Farmers' Clubs and large consumers of Oilcakes, Manures, &c., are invited to co-operate with this Association for the purchase of Agricultural requisites.

Further information, with Price Lists, Samples, and Analyses, on application to the Secretary.

The Association have regular importations of pure Linseed and Decorticated Cotton Cakes, direct from New York.

Best New York Linseed Cakes, in bags, £11 2s. 6d. per ton ex ship.
Best New York Linseed Cakes, broken, £11 15s. 6d. per ton ex ship.
Best Decorticated Cotton Cakes, in bags, £8 10s. per ton ex ship.
Special terms to large consumers.

MR. JAMES FRASER (of the late Firm of J. & J. Fraser, Lea Bridge Road), undertakes HORTICULTURAL VALUATIONS of every description, SALES by AUCTION, &c.—Maylands Farm, Romford, Essex, E.

WANTED to RENT, a NURSERY, SEED, and FLORIST BUSINESS.—Address, giving, full particulars, to A B, Stockwell Post Office, London.

Surrey (within 21 miles of the Metropolis).

TO BE LET, an excellent FARM, with Homestead and Four Labourers' Cottages, containing 150 Acres of Arable and 40 Acres of Pasture Land.

For particulars and to view apply to Messrs. WATERER AND SONS, Auctioneers and Estate Agents, Chertsey, Surrey.

To Gardeners, Fruiterers, and Others.

TO BE LET, for five years, with immediate possession, a SMALL RESIDENCE. Garden, about Two Acres; 20 Wall Trees, 120 Standards, Range of Lights, Gooseberry Bushes, &c. Rent £18, well-secured.

Mr WOODS, Auctioneer, Hounslow, Middlesex.

FOR SALE, an old established NURSERY and SEED BUSINESS, within a few miles of London, containing about 12 Acres of General Nursery stock, numerous Glass Structures, Seed Shop, Dwelling House, &c.

For particulars apply, by letter only, to G. H. H C, 47, Bessborough Gardens, Pimlico, S W.

To Nurserymen, Florists, and Others.

TO BE SOLD, The Valuable NURSERY, at Tenby, Pembrokeshire, consisting of Acres of which about 2 acres are stocked with Shrubs, Conifers, and Forest Trees, &c., and held on a 14 years lease, with a House and Cottage, &c., at the low rent of £30 a year. Good Premises, and a large connection. Absolute sale.

For particulars apply to Messrs. STONEWALL AND SIMPSON, Solicitors, Tunbridge Wells.

To Nurserymen, Gardeners, and Others.

TO BE SOLD, a very thriving and lucrative NURSERY and MARKET GARDEN, within 12 miles of London. Area, about 8 Acres, about Well and abundantly stocked with Fruit Trees, Shrubs, Cedars, Oaks, Limes, and other young Forest Trees, which are now ready for removing, and would at once realise a large profit on the money. The Fruit Trees include the choicest kinds of Pear, Apple, and Plum, now in bearing; and the varied stock of Shrubs and young Trees are in a highly promising and healthy condition.

There is a Cottage and Large Propagating House full of young Bedding and Greenhouse Plants on the land, and also good Sheds and Stabling.

The Property is Leasehold for the term of 99 years, of which 77 years are now unexpired.

Immediate possession may be had, and a large part of the purchase money may remain on mortgage of the premises.

This is an opportunity which rarely offers itself.

Further particulars may be obtained on application to

Mr W R BROOK, Solicitor,
2 and 3, Abchurch Yard, London, E C.

SALES BY AUCTION.

Periodical Sale of Poultry and Pigeons.

MR. J. C. STEVENS will SELL by AUCTION, at his Great Rooms, 38, King Street, Covent Garden, W C., on TUESDAY, January 3, at half past 12 o'Clock precisely, SIXTY LOTS of Grey Call Ducklings and DARK BRAHMAS, WHITE COCHINS, ROUEN DUCKS, and GAME BANTAMS, from Mr H. Dowsett; also some fine PARTRIDGE COCHINS from Mr E. Tudman; and a variety of other choice POULTRY and PIGEONS from the Yards and Lofts of well-known Breeders and Exhibitors.

On view the morning of Sale, and Catalogues had.

Kingscote Park, Gloucestershire.

IMPORTANT SALE of SHORTHORNS

MR. STRAFFORD is favoured with instructions from Colonel Kingscote, C.B., M.P., to announce for SALE by AUCTION, at the Home Farm, Kingscote Park, near WOTTONSEAD, March 8 next, about SIXTY HEAD of PURE BRED SHORTHORNS from this celebrated Herd, which has been long and carefully bred from some good old sorts, and for several years Bulls of the famed Kirklevington blood have been used. Most of the Young Stock are by the 3d Duke of Clarence (23,727), a truly grand specimen of the unrivalled Duchess family.

Catalogues with Pedigrees will be issued in due time, and announced with further particulars in future Advertisements.

London : 13, Euston Square, December 31st, 1870.

Agricultural Land Improvements.

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The Company advances money, unlimited in amount, for all purposes of Agricultural Improvement, including the erection of Cottages and Farm Buildings, to the Owners of settled and other Estates, and to the Clergy in respect of their Glebe Lands.

UTILISATION of SEWAGE.—The Company also advances money for the purpose of Works of Sewage Irrigation.

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For Forms and further information apply to GRANVILLE R. RYDER, Esq., Managing Director, No. 1, Great George Street, St ey's Gate, Westminster, S.W.

Notice.

THE GARDENERS' CHRONICLE and AGRICULTURAL GAZETTE for JANUARY 7, 1871, will contain PORTRAITS of J. D. HOOKER, C.B., F.R.S., Director of the Royal Gardens, Kew, and of C. WREN HOSKYNS, Esq., M.P.; a PLAN of the FLOWER GARDEN at the Marquess of Westminster's Seat, Eaton Hall, Chester; and a REVIEW of the NEW PLANTS, FRUIT TREES, and VEGETABLES introduced during the past year, &c. Free by post, 5½d.

Published by W. RICHARDS, 41, Wellington Street, Strand, W.C.

The Agricultural Gazette.

SATURDAY, DECEMBER 31, 1870.

"SUN AND SHOWER," and Nature's other influences, assist or control the labours of the farm; and all the skill, even of a scientific farmer, may be defeated by a storm, or frost, or by an inclement season. We all lean heavily on Nature, trusting much to unseen powers, and dependent on forces which we cannot control. Farming, however, is not subject to chance in a greater degree than other affairs. There is a law of average which excludes the influence of seasons, and the best arrangement is sure to be the most successful in the long run. But, apart from the general dependence of agriculture on natural laws, which are ever, visibly or invisibly, in operation in our fields, some farmers depend on the silent operations of Nature in another and more matter-of-fact sense. They leave to the influence of time and weather what would be more rapidly accomplished by other and more artificial methods. On some farms, for example, the bare fallow is still made the means of slowly manuring and of slowly cleaning the land, with the least possible assistance from the hand of man.

And in some other instances this natural system of farming is adhered to, when, by the aid of proper appliances in machinery, and by the practice of a higher art, production might be greatly increased.

We have recently laid before our readers the results of steam cultivation on Blount's Farm, and the effects of deep cultivation and manures in developing the resources of clay soils; we may now, by way of contrast, describe a less artificial kind of farming.

During a recent journey through the Weald of Sussex, and an inspection of many clay farms, we were much struck with the farming of that district, representing, as it does, what perhaps may be called the "natural" principle of management with the least possible assistance from the various improvements which capital has introduced into farm practice. The parish of Rusper, reached from either Crawley or Horsham station, may be taken as the head-quarters of the "natural" process of farming, but there are scores of parishes and scores of thousands of acres of land where exactly the same system is pursued.

The common rotation is:—1, fallow; 2, Wheat; 3, Oats; 4, seeds. This simple rotation of three crops and a bare fallow is sometimes modified by transposing the Oats and seeds; in no case, however, is any quantity of roots ventured on; they are considered to "poison the land." The only exception to bare fallow, with four or five ploughings, is a patch of Tares for the horses and, in favourable seasons like the present, a patch of Trifolium incarnatum. On the best land and when the manure can be spared, a few Peas are sown instead of the seeds, but this is on a small scale. To grow an acre or two of Mangel and white Turnips on a hundred-acre farm is a bold adventure, only attempted on some few farms, and on spots that are supposed to be peculiarly favourable. A few scores of bushels of Swedes are usually bought for the horses.

As to the other live stock, a couple of sows are kept, and their produce partly sold and partly made into pork and bacon for the men and boys who do the field-work, a couple of cows for butter and for rearing calves, a few "young things" of the hardy Sussex breed, and a score of Kentish sheep running in the leas and stubbles and over the little fields and their margins, and into the lanes, wide hedges, and copses during the winter, complete the head of live stock.

A little cake is bought, for cake is cheaper than roots, and it is given to the yearlings, or to a cast cow that it has been decided to fatten. Wheat is the only produce sold, except butter of late years, and the little yard of yearlings with the spare pigs and, in some cases, capons among other poultry. The Apple orchard yields cyder for the family.

This is the primitive agriculture that prevails in many parts of the Wealden, with little variation. The clay farms seldom exceed 200 acres, and often fall below 100 acres, bearing rents that are not often more than 20*s.* an acre, and frequently do not exceed 7*s.* 6*d.*, ranging very commonly from 10*s.* to 15*s.* That the system has not been profitable during the last few years there can be no doubt, for farms were scarce three years ago, and rents in many cases had risen, but at present there are many farms to let. That improvements have been attempted, and sometimes unsuccessfully, we have been assured; and, indeed, we know of several instances where covered homesteads have been abandoned by those who built them, and similar works of enterprise have been discontinued in consequence of loss and discouragement. We do not doubt that a large tract of bottomless clay land, on which Oaks grow like Willows, and attain a great size, might be obtained in the district we have indicated at 15*s.* an acre, if any capitalist farmer is willing to buy or hire it, and undertake its improvement.

—— The above is a somewhat disheartening description of English agriculture, though it applies to only a comparatively small area. Nor is it altogether fitting that we should close, with a picture of stationary and listless management, a year of such agricultural activity as we have passed. The Oxfordshire Prize Farms, and the proceedings of the East Lothian Agricultural Society, Mr. BAILEY DENTON'S argument and advice on Sewage Farming, and the instances given in our columns of the life and energy of our Farmers' Clubs, are more fitting illustrations of the English agricultural history of 1870; and with these accordingly we have filled our pages to-day. Moreover, we have gladly accepted the aid of Mr. MECHI'S clever, kindly pen for the expression of that retrospect, and those hopes and resolutions, which the anniversary suggests.

—— THERE was no business done in Mark Lane on Monday. On Wednesday, though few transactions took place, the general tendency of prices was upwards. —— At the Metropolitan Cattle Market prices were about the same as on the previous market day.

—— We are heartily glad to see it announced that H.R.H. the PRINCE of WALES will act as President of the Royal Agricultural Improvement Society of Ireland during the ensuing year.

—— At the close of the autumn session of the Royal Agricultural College, the College diplomas were awarded to William Ashcroft, Richmond Park, Anfield, Liverpool; George Purves Smith, Crooks, Coldstream, Berwickshire; Thomas Stephen Minton, Severn Bank House, Shrewsbury; Edmund Charles Wadlow, Ackleton, Bridgnorth; Herbert Charles Rooper, Uppingham; Edward Millard, Park House, Upper Tooting; Charles Edward Brumell, Morpeth; George Nathaniel Callwell, Lismoyne, Dunmurry, Belfast. The following list of prizes and distributions was also announced:—

Hayzarth Medal to William Ashcroft. *First Scholarship* to Minton, Sturge, Champion. *Second Scholarship* to Ohrly, Erskine, Browne.

AGRICULTURE.—*Ploughing*—prize, Minton, highly commended, Langshaw; commended, Holt, G. P. Smith, Kerr, G. Wilson. *Measurement of Stacks*—Bourdillon. *Valuation*—certificate, Ashcroft. *Practical Work*—certificates, Ashcroft, Brumell, Callwell, Rooper, St Quintin, Kerr. *Cultivation Book*—prize, Ranken; highly commended, Dodson, French, Sturge; commended, Baller, Bourdillon, Erskine, Langshaw, Monnington, G. Wilson. *Farm Book*—prize, Goad; highly commended, Browne, Champion, Ellwell, Willett; commended, Dampier, Gill, Pollock, Wiltshire. Class 3—Certificate, Minton. Class 2—certificate, Sturge. Class 1 certificate, Browne.

BOOK-KEEPING.—Class 3—certificate, Ohrly; prize, Minton. Class 2—certificate, Sturge; prize, Holme. Class 1—certificate, Willett; prize, Champion.

PRACTICAL CHEMISTRY.—Class 3 (*Quantitative Analysis*)—prize, Minton; very highly commended, Ohrly, Woodgate; highly commended, Griffin. Class 2 (*Qualitative Analysis*)—prize, Bourdillon; very highly commended, Sturge, Erskine, Monnington, Baller, Dodson; highly commended, Ranken, Hancock, Holme, French. Class 1 (*Chemical Manipulation*)—prize, Browne; very highly commended, Willett, Champion, Wiltshire, Jorrin; commended, Elwell, Smith, Goad, Hammond, Murray, Dampier, Pollock, Raymond.

CHEMISTRY.—Class 3 (*Agricultural Chemistry*)—certificate, Gotts. Class 2 (*Organic Chemistry*)—certificate, Sturge. Class 1 (*Inorganic Chemistry*)—certificate, Champion.

BOTANY.—Class 3—certificate, Minton; prize, Ohrly. Class 2—certificate, Bourdillon; prize, Sturge.

GEOLOGY.—Class 2—certificate, Erskine; prize, Sturge. Class 1—certificate, Browne; prize, Willett.

MATHEMATICS.—Class 3 (*Mechanics*)—certificate, Minton; prize, Ohrly. Class 2 (*Surveying*)—certificate, Sturge; prize, Erskine. Class 1 (*Mensuration*)—certificate, Champion; prize, Willett.

VETERINARY SCIENCE.—Class 3 (*Therapeutics*)—certificate, Ohrly; prize, Minton. Class 2 (*Pathology*)—certificate, Bourdillon; prize, Erskine. Class 1 (*Anatomy*)—certificate, Willett; prize, Browne.

DRAWING.—Class 3—prize and certificate, Ohrly; commended, Dickinson and King. Class 2—prize and certificate, Langshaw; commended, Bourdillon, Ranken, and Dodson. Class 1—prize and certificate, Brown; commended, Champion, Wiltshire, and Elwell.

—— We cannot do a better service to agricultural students, to young farmers, or to those interested in either of these classes of our readers, than by recalling to their recollection a "Handy Book of Farming,"* written by Mr. LAWRENCE, of Cirencester, of which a second edition has been lately published. Mr. LAWRENCE was for many years a member of the Council of the Royal Agricultural Society of England. Moreover, resident on the very edge of the College farm, at Cirencester, he has long taken an interest in agricultural education; and, best of all, as tenant of a considerable farm, he has had many years' experience of the difficulties, facilities, and anxieties of farm management. Here, then, are the very circumstances to enable, and, one might say, ensure, useful agricultural authorship. Personal knowledge of the circumstances, both of the farm and of the student, is the very thing required by the man who would write about the former for the benefit of the latter. Accordingly, in this handybook, a large quantity of useful practical suggestions will be found, of a quality proved by the fact that it has already produced good fruit. Its description of cattle feeding, and of manure management in particular, may be named as having been already serviceable. And the whole work may be heartily commended to the class not so much of experts as of novices and learners, for whom it is intended.

—— In a letter, on the prize system as applied to implements, in the *Mark Lane Express*, Messrs. GARRETT, of Leiston, say:—

"As we have withdrawn from all competitive trials for prizes for nearly twelve years, perhaps our experience on the subject may be interesting to some of your readers.

"In the first place we have been relieved of an immense amount of anxiety and expense. Secondly, we have lost the main cause for jealousy and irritable feeling against our competitors. Thirdly, we are able to make a far greater return in our business in consequence of keeping steadily on in the routine of manufacturing, now that the best part of the year is not occupied in designing and perfecting 'racers' for the 'Royal' stakes. Fourthly, we are consequently able to supply better finished machinery at less cost than formerly. Fifthly, we are not led away by the passion for useless novelties, with which to gain a prize—as we frequently have at the Royal with a practically useless implement. In place of this, we are steadily introducing and making use of practical improvements; the result is that we are quite confident of not having lost ground in the agricultural or engineering world. Lastly, our business has been more prosperous and remunerative.

"You may consider the last of our experience to be not the least important to us, more especially as we are not aware that any class or person has been the worse for our withdrawal from competitive trials, while many, as we have shown above, have been benefited by it."

THE NEW YEAR.

How time flies! Another year nearly gone. How fast they roll by. Life seems like a dream. How circumstances change. I have seen 69 summers, and can scarcely realise the fact that within my time our population was only 10,000,000, and that now it is over 30,000,000. I have lived in the age of tinder-box and matches, flint guns, reaped stubbles (and no French partridges), pigtail, powder, and pomatum—blue coats, bright buttons, Nankeen trowsers, and short waistcoats. Old watchmen called the quarters, and described the weather all night, and cleaned boots and shoes, and knives and forks half the day. That was the age of cesspools and nightcarts, when agriculture received back its produce from the towns, for there were then no sewers or water-closets. Our water was pumped direct from the muddy Thames in flood time by the old pumps worked by the fall at old London Bridge, so that we found a thick deposit of mud in our wash-basins and jugs; the water was very soft, and made capital beer. In my early time we had no gas, no policemen, no cabs or omnibuses, no railways, telegraphs, or ocean steamers, and scarcely a river one; no Rowland Hill, no penny post—a single letter to Cork cost 2*s.* 2*d.* postage, and if it contained two small pieces of paper the charge was 6*s.* 6*d.*—a multiplication by three was called triple, now we use a musical term, and call it treble. How strange! There was then no Regent Street, and the Haymarket was full of hay carts. Belgravia and Tyburnia were then Cabbage gardens. Dear Jenner was unappreciated, and almost every third person was scarred and disfigured by small-pox.

Agriculture has not escaped the changes, for we had no reaping or mowing or threshing machines, no steam-engines or locomotives, no steam-ploughs—even the drill was juvenile. Where, then, were the Garretts, Ransomes, Howards, Fowlers, Hornsbys, Crosskills, Bentalls, and Claytons? Where was the great Smithfield show and the Farmers' Clubs? Why, even the great Royal Agricultural Society had then no existence. Davy's bright light had only begun to shine; but we had no Liebigs, Voelckers, or Ways—no superphosphate or artificial manures, no guano; even Mangels were then, I believe, unknown to us. Steam, mighty steam, may be called the parent of nearly all these changes. It has educated us and made us a more sober nation, for now the mass of daily intelligence and facility of intercourse afford us interesting and profitable occupation, and we are no longer obliged to boose over our port wine for want of a paper to amuse us, or a train to transport us.

Let my dear brother agriculturists, whom I so much esteem and desire to see prosperous and happy, reflect upon these facts; and, both as landowners and tenants, prepare their minds for still further and greater agricultural changes.

But while dynasties have in my time come and gone, like the seasons, there is one thing that has never changed and never will change,—I mean the human heart. Its virtues and its vices will ever remain, refine them as we may. Therefore the hope of perpetual peace in this world is and has been a vain dream. While we improve our agriculture, our manufactures, and our education, let us never forget or grudge the means to protect them from foreign spoliation, for I remember the time when Napoleon the First was at Boulogne, fully expecting to appropriate the wealth and the people of England. Then, too, we had our gallant volunteers. How things change: we have now riflemen, and the Prussians are across our Channel, at Dieppe.

Wishing my brother agriculturists many happy years and a freedom from foreign invasion, I shall conclude with a determination still to continue to stimulate, by every means in my power, the cheaper and more abundant production of food for the people. *J. J. Mechi, Tiptree, December*, 1870.

* "Handy Book for Young Farmers." Longmans.

OUR LIVE STOCK.

CATTLE.

THE past year has been remarkable in Shorthorn annals. In spite of political disturbances, which perforce must exert an effect on exports, a bad season, and the prevalence of contagious disease among cattle to an alarming extent, yet the trade in high bred stock has been in every way satisfactory.

It has often been remarked, that as good cattle were bred in the time of the Collings as have ever been produced since, and the reply to this objection has been as often given, that though quality may not have been much further developed in the individual animal, yet it has been extended over a larger area, and become diffused throughout the country. There is indeed a limit beyond which even selection cannot penetrate—a balance between propensity to fatten and ability to yield milk; between early maturity and constitution; between offal and carcase, which must ever be maintained; and when an attempt is made to push the breeder's art too far, the animal system will not bear up against the artificial conditions under which it is placed. Hence we shall find that there is a point at which even improvements in animals must stop, and it is probable that this point has been reached in our Shorthorns. Still, the breed extends, and of late years so extensive a trade has opened in the direction of the United States, and our own colonies that breeders need not fear an overstocked market. A glance at the sales of the past year is encouraging. In the accompanying list a less number of animals is registered than in the corresponding one given last year, the average price is, however, larger; and when we examine the various sales we cannot but be struck with the high average obtained. Take, for instance, the results of the

Edenbridge, the Biddenham, the Sholebroke Lodge, the Mere Old Hall, and the Nunwick Hall sales, each of which rivals (with one or two exceptions) anything of the kind for years. Add to these public sales the wonderful prices given for cattle disposed of by private sale,—*Duchess* 101 and *Duchess* 103 sold for 1000 and 1500 gs. respectively, and 2000 gs. refused for *Lady Fragrant*. Such prices are unprecedented, and it is pleasing to observe that both the rival factions of the Shorthorn race are equally in demand, and have kept pace with each other in public estimation as measured by a money standard.

SHORTHORN SALES, 1870.

Name.	Date.	Number Sold.	Highest Price.	Lowest Price.	Total.	Average.
			Gs.	Gs.	£ s. d	£ s. d
Mr. Houseman ..	Feb. 1	10	40	..	280 0 0	28 0 0
Mr. W. W. Slye ..	Feb. 25	30	300	15	1383 0 0	45 2 3½
Mr. Faviell.. ..	Feb. 25	41	240	..	1329 10 0	32 8 9
Mr. Chalmers ..	Feb. 25	36	36	..	910 7 0	25 5 9
Messrs. A. & J. Longmore ..	Mar. 5	19	56	..	600 11 0	32 13 3
Lord Fitzhardinge ..	Mar. 11	27	59	..	846 0 0	31 19 6
Mr. Cruikshank ..	Mar. 26	38*	82	..	1444 16 0	37 16 0
Burghley Park ..	Mar. 17	27	47	..	727 2 6	26 18 6
Mr. Hodgkinson ..	April 7	47	67	..	1109 0 0	23 10 8
Capt. Oliver ..	April 13	56	450	31	3811 10 0	68 1 3
Mr. C. Howard ..	May 3	53	250	21	3775 16 0	71 4 10
Mr. Foljambe ..	April 27	35	105	21	2413 3 0	69 1 9
Mr. Tracey ..	May 5	44	270	15	3789 9 0	86 2 0
Messrs. Snodin & Shipman ..	May 11	48	70	..	1267 8 0	26 7 8
Mr. Willoughby Wood	May 17	28	145	5	1225 7 0	43 15 3
The late Mr. Adcock	May 24	47	145	7	2310 0 0	49 3 0
Mr. Meadows ..	May 30	28	60	..	991 12 0	35 14 0
Mr. Davies ..	June 13	48	80	8	1850 0 0	71 10 2
Mr. T. T. Drake ..	July 15	57	63	..	1472 7 0	24 1 0
Messrs. Mitchell ..	Aug. 25	47	105	15	2441 5 0	51 18 10
Mr. J. G. Dixon ..	Sept. 2	..	36	..	..	20 11 8
Rev. T. Stainforth	Sept. 13	25	70	20	1058 5 0	42 0 8
Mr. Harris ..	Sept. 20	35	55	..	1760 17 4	48 17 8
Mr. Saunders ..	Sept. 23	61	500	21	5537 0 0	56 0 0
Mr. D. P. Walesby ..	..	70	44	..	2640 1 8	25 8 2
Mr. Butler ..	Oct. 5	74	125	..	2833 5 8	38 7 4
Messrs. Garne ..	Oct. 4	58	85	..	2017 16 0	36 3 5
Mr. Hewer ..	Oct. 6	70	71	..	1117 6 0	22 0 9
Lady Pigot ..	Oct. 17	30	168	..	1173 18 0	39 2 7
Mr. Fawcett ..	Oct. 20	53	67	..	1736 7 4	25 15 4
Sir G. Philips ..	Oct. 18	47	200	8	2080 10 0	44 5 0
Mr. J. Lynn ..	Oct. 27	39	100	17	1792 7 0	45 19 2
Mr. W. S. Marr ..	..	38	61	..	1551 10 0	40 16 2
Mr. W. Cox ..	Nov. 9	40	43	..	1045 5 6	26 2 7
Total, and general average ..	..	11330	..	51	51014 15 2	38 7 1

* Bulls.

The principal portion of the pedigree cattle trade has been confined to Shorthorns. Endeavours, however, are being made by Hereford breeders to obtain a greater share of attention for their favourite breed. The Herefords have met with a staunch and active friend in Mr. Duckham, who has during the past year published the first number of his "Hereford Circular," a publication similar in many points to Thornton's record of Shorthorn transactions. It is always somewhat difficult to satisfactorily account for the greater popularity of the Shorthorn; but probably their early maturity and their union of milk and meat producing power lie at its foundation. Add to these their greater docility and pleasing variety of colour, and, still further, add the fact that the tide of fashion has set in their favour, and we have the chief reasons for their unparalleled success.

POULTRY.

MDLLE. MILLET ROBINET thus describes cramming, the most effectual and economical method of fattening:—"This requires the use of coops, in which each fowl has its own compartment. The coop is a long, narrow wooden box, set on short legs; the outer walls and partitions are close boarded, and the bottom is made with rounded spars, 1½ inch in diameter, running lengthways of the coop; on those spars the fowls perch, their dung falling through the bars. The top consists of a sliding door, nearly as wide as the compartment, by which the chickens are taken in and out. The partitions are 8 inches apart, so that the fowls cannot turn round. The length of each box may be regulated according to circumstances, care being taken that the attendant has room to pass along and sit down; and furthermore that cocks, capons, and pullets, or the lean and the fat lots, be not mixed up indiscriminately." Fowls of different degrees of fattening should not inhabit the same box, because their rations will differ. The food for fatting fowls in France is chiefly buckwheat meal, kneaded with sweet milk till of the consistency of bakers' dough. It is then cut up into rations about the size of two eggs, which are made up into rolls about the thickness of a woman's finger, but varying with the size of the fowls. These are further divided into pellets about 2½ inches long. The food is thus administered. The attendant puts on an apron, and has pellets at hand, with a bowl of clean water. She takes a fowl from its cage, gently and carefully, seats herself with the fowl on her knees, putting its rump under her left arm, by which she supports it; the left hand then opens its mouth, and the right hand takes the pellet, soaks it well in the water, shakes it on its way to the open mouth, puts it straight down, and carefully crams it with the forefinger well into the gullet. When it is so far settled down that the fowl cannot eject it, she presses it down with the thumb and forefinger into the crop, taking care not to fracture the pellet. Other pellets follow the first, till the feeding is finished, in less time than one would imagine. The chicken ought to have two meals in 24 hours, and the fatting process ought to be completed in two or three weeks.

LESSONS FROM THE OXON PRIZE FARMS.

THE chief lesson which I presume was intended by the judges to be inculcated upon us farmers, in their report on the Oxfordshire farms, was the necessity of complete cleanliness and of attention to the details of management. And it appears to me that our thanks are due to those gentlemen, and to the authorities of the Royal Agricultural Society for having called our attention in the first place to these foundation-stones of agriculture; upon which I hope they will not hesitate to build in future years a more encouraging superstructure. For I feel convinced these gentlemen cannot have wished to convey to us their fixed opinion (however they may have expressed themselves) that the four-course husbandry alone is profitable or commendable; or that other and improved systems of rotation would have been objectionable in their eyes, had they also comprised these two cardinal virtues of absolute cleanliness and precision of detail. I have not seen any of the farms reported upon. Had I done so I should not have presumed to say a word in disparagement of conclusions at which those gentlemen are so much more fitted to arrive than I am; least of all would I object to the verdict that a lady holds the best managed farm in the county; but I think (and I hope I may do so without rudeness) I can collect from the correspondence that has appeared in these columns, some further lessons that may be derived from the description of these farms and their management, so as to improve the occasion.

The first suggestion that occurs to one on reading the judges' report and the remarks of "J. C. M." on the 1st prize farm, is the amount of food which appears to be grown and nearly wasted every year. If I understand the system, there are nearly 400 acres of straw, 200 of roots, and 200 of Clover grown, the whole of which is converted into mutton and manure, with the assistance of £1200 worth of cake; yet the money return of all this feeding stuff does not appear to exceed £1500 or £1600 beyond the cost of the cattle and sheep bought in. We are told that the 200 acres of roots were a good crop even in this precarious season,—probably 4000 tons. These, with the above mentioned straw and cake, should certainly have fatted out 100 good beasts, besides the poor stock, which were only wintered, and still have left sufficient for the 600 sheep, which alone were fatted.

To prove this assertion we need go no farther than the report of the 2d prize farm, where Mr. Treadwell, with about one-tenth the acreage of roots, sells yearly a larger total amount of fat stock; or to the farms of Captain Dashwood, who, with the same number of acres under cultivation, realises about double the receipts from meat sold. The second remark suggested by these accounts, which I see also struck your correspondent "W. G. D.," is the very small apparent profit derived from a farm of the size of the Ashgrove Farm. That the gross receipts off 900 acres should not exceed £5000 a year, or £2000 a year beyond its expenses, leaving a balance of only £2 per acre to pay rent, tithes, interest of money and management, is hardly what we had reason to expect from a prize farm held out as a model to the neighbourhood, and extolled as an example of successful farming to be copied by the members of the Royal Agricultural Society.

I think I can gather from the report, that if the judge had gone into Mr. Treadwell's accounts, they would have found his gross produce to have exceeded £8 per acre instead of £5, and his balance over £4 an acre instead of £2; and had they investigated Captain Dashwood's figures, they would also have found that, off an equal amount of very similar land, he reaps double the number of quarters of white corn, and sells double the amount of fat stock, with a balance of nearly £5 per acre instead of £2 at the end of the year. I repeat, I have had no opportunity of seeing these farms, and know not upon what data the prizes were awarded, but I must protest, in the interests of agriculture and of the Royal Agricultural Society, against the doctrine, that the small return of corn and meat from the Ashgrove Farm is good farming either for the landlord, tenant, or public at large. I have on several occasions drawn the attention of the readers of the *Agricultural Gazette* to a farm under my own eye, in which every hundred acres of arable land produces yearly 300 qr. of white corn and £1000 worth of meat; and I have endeavoured to prove (as any one who can turn to some letters on high farming in the numbers for March, 1868, may see) how much more profitable it is for all parties that such large crops should be cultivated, and I have reason to know that the example has been followed in many places with the same success. When, therefore, I see a farm of 900 acres growing about as much corn and meat as might have been grown on one-half of it, I cannot resist calling attention to better things, and hoping that, in the ensuing summer's campaign, some lady or gentleman may be found in the counties of Stafford and Shropshire, who may combine with the cleanliness and care of Oxon a larger employment of capital and a heavier system of manuring and cropping, so as to make not only two blades of grass but also two quarters of corn and two heads of cattle to grow where one has been grown hitherto. It cannot be too often repeated, as the result both of theory and practice, that £10 laid out in feeding will produce £10 worth of meat, and leave in addition sufficient manure to insure 10 bush. increase in the corn crop. And if this was repeated, as it might be, over the seven millions of acres annually in white corn in England, we should not only be independent of the foreigner for our supplies of food, but we should find our pockets much-heavier every returning Christmas. Towards which end a great step will have been made when the judges appointed by the Society dare say as much. *J. B. M.*

P.S. Since writing the above I have read the calculations of "W. G. D.," which, though made with a different object, tally so much with my own, that I feel they corroborate each other.

SEWAGE FARMING.

[We now publish the remainder of Mr. Bailey Denton's paper on this subject before the Maidstone Farmers' Club.]

HAVING shown, though cursorily, how the land may be prepared by the hand of the engineer, so that the sewage farmer may afterwards apply the sewage with economy, we will consider by what species of crops he may get the greatest profit. I forgot to mention that one of the duties of the engineer in laying out the land is to provide good roads for the removal of the produce, with sufficient but not expensive buildings. With good roads, a farmer may not only remove his crops in the readiest way, but he will be able, without any inconvenience to himself, to sub-let plots to local gardeners who desire to take land when sewaged to grow crops of special demand. Mr. Blackburn, of Aldershot, makes this a practice, and a very advantageous one too, for there are always to be found in every town men in a small way of business, who will take a few acres at full rent for the growth of vegetables in which they traffic. Mr. Blackburn realises in this way as much as £25 an acre, and all he provides is the land and sewage, with ready access, the under-tenant finding seeds and labour. Now, if the authorities of this town should determine to manage their own land, after it is laid out for irrigation under the able management of the engineer they have called in, they will very probably be able to deal with such customers, and thus relieve themselves of a part of their farming.

The sewage farmer having a certain quantity of land to cultivate and a certain quantity of sewage to apply to it, which he is under the stern obligation to discharge ultimately in a pure condition, will naturally consider how he can perform such an engagement with the greatest advantage to himself. With the land of the farm prepared, so as to serve as a filter, he will not allow a single ton to be wastefully applied on the surface, for with the soil as a storehouse of manure, he will be able to prepare by filtration for future crops which will serve his purpose better than flooding existing crops, and wasting a large proportion of the sewage. Nothing will better explain what I mean by this observation than the details I am about to give about Italian Rye-grass and the vicissitudes which attend its growth. Italian Rye-grass has hitherto held a very prominent place in sewage farming, and so long as the chief object was to "get rid" of the sewage, and this grass served to swallow up more liquid than any other crop, it deservedly held a high place among the crops of the sewage farm; but recent experiences show that although with favourable seasons and with a proportion of clay in the soil, it yields immense crops, it cannot be regarded as the most profitable crop in the long run. On the Lodge Farm, Barking, it is stated by Mr. Morton, in his very interesting statement of an "Agricultural Experience of 300,000 Tons of North London Sewage" (in 1867), that "for every 100 tons of sewage used during the past year, under circumstances of average favourableness, one ton of grass over and above the quantity needed to pay an average rent and an average farm-labour bill has been produced," and that 61 tons of grass was grown on a single acre of land. At 15*s.* a ton this quantity would amount to £45 15*s.* In 1868 the Hon. Mr. Petre stated in his report that 483,000 tons of sewage were applied to the Italian Rye-grass upon the Lodge Farm, and produced 1661 tons of grass, or 290 tons of sewage for every ton of grass. In 1869 Mr. Petre, without giving the number of tons of sewage applied, states that 53 acres, with an average of ten dressings, produced, in round numbers, £1350, or about £25 an acre, the number of tons of grass cut being 34½ per acre. In the year ending August 31, 1870, we have more precise figures. From October 31, 1869, to that date (August 31, 1870), during which period the last drought occurred, 30 acres of land received upwards of 260,000 tons of sewage, and produced 834 tons of grass, which is equal to 312 tons of sewage to one of grass. It will be observed that the quantity of sewage used to produce a ton of grass was more than three times the amount stated by Mr. Morton. It is needless to say that if we put 1*d.* per ton, the chemist's value, on the 312 tons of sewage (£1 6*s.*), there is no profit to be gained. A ton of grass, in point of fact,

would cost us more than double the amount obtained by its sale, as there would be rent, labour, &c., to be added to the cost of the sewage. It is somewhat different where 100 tons of sewage only are required for each ton of grass, though that is by no means satisfactory. Still it may be advantageous to grow a certain proportion of Rye-grass on sewage farms, regulating the quantity grown by the local demand for fresh grass, the profit to be gained from its use in feeding cows for dairy purposes,* and by any special advantages that may be gained from its use as a surface purifier of sewage. The proportion of each sewage farm that I think it probable may be profitably devoted to Italian Rye-grass, or Bromus, will be about one-sixth.

How different is the result from the application of sewage to root and garden crops. We will confine our attention in the first instance to those crops of this description with which the ordinary farmer is familiar. We will take first Mangels, which, as you are aware, are rather troublesome to raise, but when once up, with a good start in the spring, become one of the most profitable crops that can be grown, as in all parts of the country people are to be found to give for them as much as from 12*s.* to 18*s.* a ton for cattle feeding. One of the great advantages in sewage farming is that you can wet the land when wanted without rain, and that, should your seed miss, you can transplant from a seed-bed at any time by turning on the sewage, and moistening the land for the purpose. The Hon. Mr. Petre, who managed for some years the sewage farm at Barking, says that upon 3 roods of land he transplanted Yellow Globe on June 12. "It dropped very much at first; one application of sewage set it up." The least quantity of Mangels produced, to my knowledge, from sewage farming is 35 tons per acre. Last year (1869) Mr. Petre produced, at the Lodge Farm, 40 tons to the acre, and this year Mr. Morgan—who has succeed Mr. Petre, and from whom I have received some very useful details—speaks of the same produce. At Breton's (Mr. Hope's) farm the produce this year—the first of its existance as a sewage farm—has been from 35 to 40 tons per acre. Taking the mean of these quantities, or 38 tons, as the average produce, and the value per ton at 14*s.*, the return in money will be £26 12*s.* The quantity of sewage to produce these crops varies from 70 to upwards of 100 tons for every ton of Mangels produced, but as the experiences recorded have reference only to sewage highly diluted and to free soils, which are not the most suitable for Mangels, we may take the minimum quantity of sewage (70 tons per acre) as the maximum quantity of average sewage of country towns required for loamy soils. This would result in an average quantity of sewage per acre of 2500 tons, which, at 1*d.* a ton, amounts to a fraction over £10 an acre, or at half that price—which is all the tenant-farmer should pay—£5 per acre. Red Beet and Sugar-Beet have both been grown with great advantage, and have yielded returns approaching those of the Mangel crop. Mr. Petre says, speaking of the crop of 1869, that the Sugar-Beet grown upon the Lodge Farm, Barking, "last year, was found to contain more sugar than any English specimens sent to the mills." Turnips (Swedes) being more uncertain, are not so profitable a crop as Mangels. White Turnips, when grown for cooking, and removed from the land early, are decidedly profitable, as they allow of a second crop being taken. They are in the ground but a short time, and, therefore, work in well with other crops. Kohl Rabi promises to become a good sewage crop, being more profitable than Turnips, though not equal to Mangels and Beet. The experience yet gained, however, in this crop is so small that nothing more can be said with certainty of the return.

Carrots and Parsnips, to be grown well, demand a deep and well-stirred soil. They do not require as many dressings, nor as much sewage, to produce a full crop as many other kinds of produce. The quantity of sewage applied has been found to vary from 1500 to 2000 tons per acre. According to the returns already obtained the yield will realise from £30 to £50 per acre, a safe average being taken at £35 per acre. Potatos may be successfully grown under good management—with additional advantages if there exists near at hand a market for "early Potatos." I am inclined to think, however, as a rule, that Potatos are not as profitable as some other crops. Mr. Morgan says, in speaking of one particular field:—"The yield was only about 3¾ tons per acre, when it was first dug, but at the moment of writing between 9 and 10 tons per acre are being lifted. The price, however, realised by the sale of those first sent to market was so much greater than that now obtained as to make the present return per acre less than it was at first. The price obtained for the first Potatos being about £12 to £14 a ton, the price now having fallen to between £3 and £4." The amount realised is shown to be, by these figures, £40 per acre, and the quantity of sewage applied is stated by Mr. Morgan to have been 2645 tons per acre.

Cabbages appear to be the most successful of all crops, where, as in the case of early Potatos, there is a market for the produce as it comes to maturity at different times of the year, particularly where the soil has a fair mixture of clay in it. 3a. or. 30p. of Collards, at the Lodge Farm, planted at the end of June; this yield was ready for market in three months, and realised £232 17*s.*, or £72 an acre, the quantity of sewage applied being 2368 tons per acre. Savoys have realised £40 an acre, with rather more sewage than in the case of the Collards. I have in each case given you the quantities of sewage applied at Lodge Farm, where the soil is very porous, and where the sewage is, therefore, partly wasted. With soil in which clay exists much less will suffice, as I have already explained. Mr. Petre speaks of an advantage in the use of sewage, which is of a special character, viz., its effect in destroying the louse. He says, "A piece was planted with Red Cabbage in November, and although the crop was much injured by the louse, and the stock was so bad as to render at least two-thirds of the plants valueless, it nevertheless yielded by the middle of August upwards of £25. The crop was sewaged five times, and I observed that the sewage had a strong effect in destroying the louse and recovering the plant weakened by its attacks."

I have already run through my list of what I call the farmer's vegetable crops. I might add a number of others which have not been grown, but I consider they belong more to the market gardener than the farmer, such as Onions, which, well grown, are as profitable as Cabbages; green Peas, French Beans, Spinach, Cabbages of various sorts sown for "plants," Broccoli, Celery, Lettuce, and Endive—not to speak of Parsley, Strawberries, and other small fry, all of which have been found profitable when the cultivator has known how to treat them. All these latter crops will come into favour, as a matter of course, when the sewage farmer has added to his knowledge some of the necessary details of market gardening. At present it is best to avoid them. With sewage of requisite strength, and water at command in times of drought, the most prolific crops may be secured from all of the various sorts I have named as "farmers' vegetables," and very often two crops can be grown in one year, or at least three crops in two years. For instance, winter Cabbages or early Potatos for spring sale may be succeeded by Mangel, Red Beet, Sugar-Beet, Parsnips or Carrots. In some cases the succeeding crop may be sown or planted between the rows of the retiring crop. Both arrangements are made facile with a command of diluted sewage, and I heard, on more than one occasion during the recent drought, market gardeners express their astonishment at the difference of growth obtained by sewage compared with that of their own lands, which they were loading with horse dung at a cost of from £6 to £8 an acre according to the cost of carriage. Mr. Petre says, "A plot of exhausted Rye-grass, which had been cut four times since January, was ploughed up in July, and sown with white Turnips, which will be off the land by November, giving £10 nett per acre. It may be said, that this succession of crops is attainable without the aid of sewage. No doubt it is, under favourable circumstances of weather, and with a large supply of manure, but the advantage of the sewage lies in the fact that the more unfavourable the weather for the ordinary mode of cultivation, the more certain the results from the use of sewage."

The principal reason for avoiding crops which have been hitherto beyond the province of the farmer, is that to realise them it is necessary to expend a very large amount in manual labour. It is the hand and knee weeding of Onions, and the picking of Peas, Brussels Sprouts, and Spinach, which run away with money. Moreover, vegetable markets are very fickle, while the expenses are really great, whatever be the price realised.

There remains now only two other classes of cropping to which I would draw your attention,—cereals and pulse. With the introduction and proper preparation of fallow land, by treating it as a filtering medium, we shall be able to secure in the regular season a variety of heavy crops from those lands that have been sewaged in the winter. The production of straw of all kinds on a sewage farm is a matter of great moment, and it may be conceded that a very large bulk of straw will be grown, even if the grain itself did not yield a proportionate quantity. The value of the straw will not be limited to its selling price, for as we progress we shall find it very advantageous to consume it by stock, with the offal vegetable stuff which cannot be sold, or, if sold, only at a great sacrifice. In some cases, probably, the sewage farmer will be disposed to keep cows for the production of milk for the home or distant markets, in which case straw, both for fodder and litter, will be indispensable. In other cases the feeding of young stock and pigs will be deemed the more safe and economical course, and then the same remark will apply. Moreover, farmyard manure is required for special crops not sewaged, and should be provided. In the main, however, the less the sewage farmer deals with stock and those other branches of farming which are not essential to a sewage farm, the better it will be, for he will require all his attention to be devoted to the essential duties of the farm, and the marketing of its regular produce.

I hope, in conclusion, that I have said enough to satisfy you that there is a future for sewage farming. I believe myself, and I should like to hear that you are of the opinion, that the sewage farmer may with certainty realise a gross return of £20 an acre, and, with increasing knowledge, as much as £30 an acre; and that he can afford to pay for his farm with its sewage and manure from £8 to £10 an acre free of rates, tithes, and taxes. This would leave him with at least £10 to £12 an acre wherewith to pay labour (steam, horse, and manual), seeds, plants, wear and tear and restoration of implements, and a very handsome return for his capital and industry.

* Mr Campbell, who has a large dairy at Rugby, gives £10 an acre for Italian Rye-grass. In a letter to me, dated August 11, 1869, he says, "It is quite true that I am giving £10 per acre, or thereabouts, for between 10 and 17 acres of land, or rather for the crop of Italian Rye-grass on the land, irrigated with the town sewage. I simply cut the grass and cart it away to my milk cows and horses. When I tell you that I began to cut on February 12, you will not be surprised at the price, taking into account the scarcity of winter keep last season."

* I should say here that I have heard from other sewage farmers that by spreading the sewage over plants attacked by the fly the enemy disappears.

AGRICULTURE OF PORTUGAL.

Concluded from p. 1715.

Of the various artificial grasses and forage plants, only a small choice offers itself to the farmer of the Minho, and of the Maize growing districts generally; of these, Rye-grass is by far the most commonly used. The object of the farmer being to leave the ground in the occupation of such plants for as short a time as possible, he sows Oats, Barley, and Rye in autumn solely for the sake of the two or three cuttings to be got from them; the Rye-grass, coming later, gives at most two or three more cuttings in the spring. In damp soils the narrow leaved Plantain (Plantago lanceolata) is sown early in spring or in autumn, and affords frequent cuttings of a rich cattle food in early summer—a time when herbage is rarest with the Portuguese farmer. It is sometimes left in the ground through the winter in land subject to overflow or inundation, and it is often grazed as well as cut.*

The common Meadow Soft grass (Holcus lanatus) is often grown in precisely the same way; it affords a more abundant but not so good a herbage.

A leguminous plant of very frequent use is the Serradilla (Ornithopas perpusillus and O. sativus). The plant is annual, grows in sandy soil, but prefers a deep sandy loam, where it will grow to nearly the height of a yard. It is sown in autumn, hardly shows above ground till Christmas, and affords one good cutting in May or June, in time, in favourable years, for the sowing of the Maize crop. Red and Italian Clover are grown very much in the same way. Serradilla seed used to be exported to Germany from Oporto in considerable quantities some few years since. The plant, it seems, is now established in some parts of Prussia; it has also been extensively tried, and with success, in France.†

Millet (Panicum italicum) is grown as a herbage plant. It is one of the few plants which can be sown with advantage at midsummer, and it is often made to follow Rye, or even Wheat. It is usually cut before the seed has ripened, or, as often occurs, if late sown in this climate, when the grain has formed but ripened imperfectly. It is made into hay, which is probably about the value of good meadow hay, that is, three times that of wheat or barley-straw.

It is to be observed of this climate (as of most of the climates of Southern Europe), that winter and spring are the seasons when grass fields, natural and artificial, are at their best; and whereas, in Great Britain, the farmer is most pinched for sheep and cattle feed in early spring, having consumed his roots, and his pastures being still bare, the farmer in Portugal is at this season better provided with forage than at any other time of the year. In Portugal the straw of all cereals enters far more largely into the consumption of oxen, horses, and mules than in Great Britain. Hay is made in the pasture lands of Traz os Montes, but not, so far as can be learnt, elsewhere, and the expense of carriage is too great to allow of its use beyond the district of its production. Of the different straws, agricultural chemists assert that 300 lb. of wheat-straw, an equal quantity of barley-straw, 350 lb. of rye-straw, 280 lb. of oat-straw, and only 200 lb. of maize-straw are, respectively, equivalent in nutritive power to 100 lb. of good meadow hay. This calculation of the relative values of the different straws more or less corresponds with the experience of Portuguese farmers, who have incessant practical acquaintance with the subject. Rye-straw is harder in this climate even than in England, and is called "Colmo," or thatch, and the name indicates the use it is by choice put to, but in the hilly districts it is often consumed from necessity in the feeding of cattle. Wheat-straw is likewise hard and dry, and difficult of digestion, but is largely used. Barley-straw is what is given in preference to all others to horses, the general prejudice against it in Great Britain being unknown here. Oat-straw is produced only in very small quantities. The straw of Maize is supposed to be unsuitable for horses, and is never used

* It is singular that this plant should be such a favourite with the Portuguese farmer, and that it should have been rejected, after trial, as a herbage plant, by French, German, and English agriculturists: it is perhaps owing to their having been misled by the fact that botanists describe it as preferring a dry soil (which is erroneous), and to Linnæus' statement, that cows refuse it, which only applies to the plant in flower.

† It was introduced into England in 1818, and some attention was directed to it in consequence of its being reputed to produce an excellent crop of fodder on soils unsuited to any other plant. *J. R. J.*

for feeding them; it is, with grass, the chief food of milch cows and of fattening and working oxen, both in winter and summer; and to judge by its obvious effects, and by the high estimation in which it is held by Portuguese farmers, it probably exceeds the value at which it is put by agricultural chemists.

The straw produced on the farm is almost exclusively, in most farms entirely, consumed as cattle food; and it is a peculiar and marked characteristic of the agriculture of this country that the fodder used in the stabling of horned cattle, horses, and pigs, is supplied by dried Gorse, Ling, Heather, and the various wild plants, such as Bracken, Gentian, Bent-grass, wild Vetches, the taller Mosses, &c., which usually grow in their company. To secure a sufficient quantity of such litter, most farms have attached to them a portion of forest or wild land, from which these fodder-producing plants are regularly cut every three years, and which forest portion is often a mile or more away from the farmyard. In other cases the farmer enjoys a prescriptive right to cut as much of them as he chooses from the Pine forest nearest to him.

Of the plants so used, Gorse is the predominating one, often to the exclusion of all others. It is the same species as is found in Great Britain; but the prevailing kind seems to be a variety of our native Gorse, having the prickles rather less strong, and the stem less woody. The decaying of manure made with this litter is slower than with straw, but the porous wood of the Gorse is infinitely more absorbent, both of gases and of moisture, so that the atmosphere of a Portuguese stable or cow-byre is very noticeably purer and sweeter than if straw were used, and the standing for the beasts is also much drier. It is needless to point to the economy of a system by which every particle of straw is consumed as food. A second recommendation is that, while the seeds of the various field weeds are not returned to the ground with the straw among which they were grown, those which are shed by the forest plants, when removed from the soil in which they have grown, find no congenial seed-bed on falling upon cultivated land, and either fail to germinate or fail to thrive. The Gorse, Heather, and other plants which compose this litter, are cut, or rather scraped up with the broad-bladed hoe, so that Moss, creeping plants, the decomposing needles of the Pine trees, dead leaves of trees and shrubs, and the crowns and root stocks of wild grasses, all find their way together to the farmyard. In no other country, perhaps, is this practice carried out in so systematic a manner as in Portugal. The amount of manure produced on a small Portuguese farm could not fail to strike a Scotch or English farmer; and the disregard by the Portuguese farmer of any system of rotation crops, is principally due to the abundance of manure at his command.

The farm buildings of the smaller proprietors are simply, but substantially, built of square granite, and the whole lower floor of his own house is often used as store rooms for grain and straw, and sometimes even as a stable for cattle. A small yard, kept knee-deep in Gorse litter, is generally formed by the side, or two sides, of his house and the building which holds the wine-press and cattle byres. High over this yard are grown (almost invariably) Vines on a heavy wooden trellis, and the cattle in the heat of summer find coolness and shelter under their shade. Outside the buildings, well exposed to sun and wind, is the "Eira," or threshing-floor, of slate or granite slabs, to which is usually attached a small back. The farmer in Portugal is almost without any choice either of natural or artificial manure. Guano is hardly known, though its concentrated form and its known value in growing Maize might seem to recommend it in a country of difficult communications. *J. R. J.*

SUBSTITUTES FOR DEFICIENT TURNIP CROPS.

[At the November monthly meeting of the East Lothian Agricultural Club, Mr. Harper, of Snawdon, in the chair, the subject set down for discussion was, "The best substitutes which may be available to supplement a deficient Turnip crop," and the following are two or three of the very excellent speeches delivered.]

THE CHAIRMAN, in opening the discussion, said: The question before us is, year after year, becoming of more importance, not only from the difficulty in raising, and the extreme precariousness of the Turnip, but also from the gradually increasing breadth of the Potato crop being planted. I think it may be fairly assumed that for feeding or rearing sheep or cattle, the Turnip as a basis is by far the cheapest and best. In the entire failure of a Turnip crop on a farm, it may be questioned whether a farmer will find it profitable to feed sheep. He may keep hoggs or ewes, if thinly planted, on grass, with the assistance of cake or other feeding—and that with a profit. But, at present, the question is very interesting, and is well worthy of consideration, not What is the best substitute for Turnips? but What is the best auxiliary to a defective Turnip crop? or, in the event of a full Turnip crop, What artificial feeding should be used, either to increase the weight or the number of animals kept? In the higher districts we have no cause for anxiety about the Turnip crop this year, as it is a full average, and in some cases more, notwithstanding more than the half was twice sown. Although in the higher districts we have a good Turnip crop, it is well worth considering whether we have not been giving our sheep too many Turnips, and too little hay, or in other words, wasting our Turnips and hurting our sheep. I was first led to the belief of this from what occurs during a snowstorm. On these occasions we are very thankful if we can give our stock half-Turnips in the forenoon, and a fothering of hay in the afternoon. I find they thrive nearly as well in this way, and that we have fewer deaths. And this may be easily accounted for from the stomach being entirely filled with a soft watery substance, which hay counteracts, and prevents the injurious and too laxative effect on the bowels. When conveniently situated, I allow my ewe hoggs intended for breeding to run from the Turnip break to the Heather, a third of the 24 hours. They thrive well with this, without hay. Many farmers are now cutting straw for sheep. What I think still better would be to cut hay with straw. Others, again, are putting entire sheaves of Oats through the cutter. A liberal quantity of this, with cut hay, will enable any one to bring well through the winter months, with a few Turnips, either hoggs or ewes. I know there are often difficulties on many farms as to being able regularly to use the straw or hay cutters, to get the proper quantity out to the lay of the sheep, probably some distance, and the loss arising from wind or rain. Still I think if we were once convinced of the benefits of the practice, all the difficulties would be overcome. In the memorable and disastrous years of 1859 and 1860, when sheep farmers suffered so severely from repeated frosts and snowstorms, commencing in December and ending only in the middle of April, when all the Turnips in the higher districts not stored were utterly destroyed, and the Heather and grass on the hills were as if burned down, I brought my own stock comparatively well through with meadow hay, Oats, Beans, and several tons of what was palmed off on farmers at that time as linseed or rape cake, and the sale of which was so discreditable to the honesty of the manufacturer and the judgment of the purchaser. Still all have found, who have tried giving artificial feeding to a large hirsel of sheep, that there is a rush to the boxes, and when of course the quantity is limited some eat too much, and others get too little, and that there is always a number which will neither be coaxed or forced to eat any. On that occasion these ewes nursed no lambs, and a good many died from sheer poverty. I know a case where farmer brought through in fair condition a large lot of Cheviot ewes on a hill by giving each a pound of Oats, commencing in February, and ending in April. When I run short of Turnips for my Cheviot hoggs in the spring, I find they do well with ½ lb. of Oats. They must, of course, be pastured on Heather or rough grass, as this system would not answer, I think, on a bare grass field. While all this extra feeding is useful, I would still insist on a certain quantity of Turnips, if they can in any be got. I have a decided opinion that when cattle are fed in the higher districts, it can only be done economically and satisfactorily in feeding byres or covered courts, and as I happen to have neither, I now never try winter feeding, but I can winter 20 calves with one good cartload of Turnips and 30 lb. of linseed cake daily, more satisfactorily than with full Turnips, and those of an older age with 2 lb. of cotton and 2 lb. of linseed cake, or 5 lb. of rape cake. They do not eat the rape cake so rapidly, and they all get a fair share, and perhaps it makes better dung. I am assuming they have water at command, and plenty of best straw. When I have urged a more liberal supply of cut straw and hay for sheep getting Turnips, I am met with the objection that Clover hay commands now such a high price, that it does not pay to use it for feeding sheep or cattle. That is a mere matter of opinion or calculation; but, looking at the present high price of beef and mutton, there can be no doubt that extra feeding, besides benefiting the next cereal crop, does pay the feeder, whether his Turnip crop be good or defective. Whatever the compound used, I would say that a certain proportion of good linseed cake should be used for feeding off cattle or sheep. It gives a touch and a finish to the animal which no other feeding stuff does.

Mr. DURIE said that last year, when Turnips were scarce, he had begun his cattle with 28 lb. and reduced them to 7 lb., making up the feed with oilcake, Indian Corn, hay, and straw. And the cattle did well enough; but then he derived no profit by them except in the way of dung. Except for the manure, he did not believe in using any substitute for Turnips. They might use any substitute they liked, but they would never make any profit except by Turnip feeding. The best substitute, however, he considered to be Indian Corn and oilcake. The price of Indian Corn was about £7 16*s.* per ton. He had tried it lately with sheep, and found that they did best with it given to them unground. They must, however, grind it for cattle. In East Lothian, two-thirds Indian Corn, and one-third oilcake, was the best auxiliary for economising Turnips.

Mr. DOUGLAS said there could be no doubt that the Turnip crop was the basis of cattle feeding. The experience of the last two years indicated that the Swedish variety stood the dry season best, besides which it was the most valuable bulb, and possessed the greatest percentage of feeding properties. In the feeding of cattle, a good deal of mischief was often done by giving too much Turnip at the beginning of the season. The effect of this was prejudicial both to the health and the constitution of the animal. There was no doubt, however, that where Turnips were economically and judiciously used at the beginning, combined with hay (he believed very much in hay, and held that it was a fallacy to sell hay off a farm where there was cattle to feed), the best results would follow both as to the health and growth of the cattle. It was an absurdity to cut hay for cattle. If they gave a young bullock 7 lb. of hay uncut, it would correct diarrhœa, and enable the animal to chew the cud, and assimilate its food, which was the great object of good feeding. Good straw, when cut, along with bran, approached nearly to the feeding value of hay, and oat-straw was in itself almost as good as hay. Seven pounds of hay per diem was quite sufficient. As auxiliaries, various kinds of cakes were recommended, but rape and linseed cake were the two standards. It was said to be proved by experiment that the manure value of rape cake was £4 14*s.*, and of oilcake £4 15*s.*; and if that was true, it was a great inducement to their more extensive use in cattle feeding. Indian Corn, he knew, had been much used of late, but then the Potato was an excellent auxiliary. The Potato struck deeper into the soil than the Turnip, and stood dry seasons better. There were several varieties of the root. There was the Bovinia, for instance, supposed to be the great panacea for the failure of the Turnip crop. A certain lady had obtained high prices for this variety; but he believed that parties who had had it had been much disappointed in the result. Potatos were of great benefit in the feeding of cattle; but in such a season as this, when they were selling at 10*s.*, they could not be used with profit. He thought that at 8*s.* Potatos would pay for feeding purposes. He would go further and say, that when under 10*s.*, if they took into consideration the trouble and expense of pitting, and of sending to railway stations, it would be better to keep the Potatos at home, and use them judiciously, with a mixture of Turnips, for feeding purposes. The manurial product would be enhanced in value, which would lessen the quantity of guano and other manures needed, and in the long run they would be better off. He also mentioned brewer's grains as a substitute; but the best of all he held to be the Potato. Generally speaking, cattle did best with a mixture of food, and he believed they were all too timid in the use of oil-cake, more especially when its manurial value was taken into account.

Mr. SMITH (Whittingham) believed they were all at one as to Turnips being the best winter feeding for cattle, and also that full Turnips might perhaps be as profitable as giving auxiliaries along with them. They had not been in a position to do this for some years past, owing to the smallness of the Turnip crop. As to the matter of substitutes, he held they should seek these within themselves. He agreed with Mr. Douglas, that the best substitute they had within themselves was the Potato; and, acting on this idea, he had planted some acres with a coarse variey. He had also tried the Bovinia, but the result had not been so good as he would have liked. He would not condemn the Bovinia, however, on a first trial, and he intended to give it another chance, although he thought the variety had been overrated. The kind he had planted beside the Bovinia had produced a magnificent crop. It was a coarse variety, for which he did not know any distinguishing name. The produce, he thought, would be about 60 bolls per acre, and in size it was about a third larger than the Regents planted in the same field. With this auxiliary he felt very comfortable this season as compared with last year. The Turnip crop was a little better than last season, still it was deficient; and with so many of these large Potatos, he could look forward to pulling over the winter at far less expense than last season; for while auxiliaries were good in themselves, and perhaps profitable when used in limited quantities, and purely as auxiliaries, still were they dependent on them to a great extent their barns would be very deficient. He did not believe much in the excessive manurial value of these auxiliaries. There might be an appreciable difference in this respect, but not at all what was often stated; and it was certainly a very expensive way of making manure. He would rather purchase a prepared manure. It was a less troublesome process, and he believed less expensive. Remarking on the great waste caused by sheep while feeding on uncut hay in the open field, Mr. Smith said the only panacea against this was to cut the hay.

Mr. MILL (Luggate) said he was one of those unfortunate individuals who had been connected with heavy land. They had all been very unfortunate, however, for the last three years as regarded Turnips. During these seasons he had had from seven to eight score of ewes which never saw a Turnip. He had kept these ewes all the winter on cut straw and hay, with perhaps a quarter of a pound of oilcake; along with which, of course, they required a considerable quantity of water and also salt. With this feeding he had been very successful, and had not lost a single ewe. Unless cut, hay feeding for sheep was a great waste both of money and hay. The sheep throve much better when it was cut. In the spring of the year he gave a considerable quantity of Potatos,

They required to be used very cautiously at first, but when care was taken he thought sheep throve better on Potatos than on Turnips. Potatos would not pay for feeding, however, if they were selling above 6*s.* per boll. As to artificial auxiliaries, he had found none better than linseed cake, especially when bran meal was given along with it. He had tried cotton cake last year, but it was the last time he would do so. In regard to feeding cattle with hay, he agreed with Mr. Douglas. It was a very nice thing for them when they were about fat. When hay was used along with Turnips, the cattle did better than with any quantity of artificial stuffs. He preferred the hay uncut for this purpose.

Home Correspondence.

Royal Agricultural College Club.—I regret that the letter I sent, in reply to the observations of "M. R. A. C.," was delayed in transmission, and too late for insertion last week. Your correspondent "R." has, however, given the information required, and thus made it unnecessary for me to do more than correct a slight inaccuracy that occurs in his letter. The testimonial was started by the Royal Agricultural College Club, in recognition of the public spirit shown by Mr. Holland in connection with the College at Cirencester, and the subscription list was intended to be confined to old students and others more or less interested in the College. We have not therefore inquired (as "R.'s" letter might imply) what would be approved by the public, but by our circular have elicited the general opinion of the Club that the testimonial cannot take a better form than that of a "Holland" scholarship or prize at Cirencester. Our small executive committee will be very glad to receive further suggestions from any member of the general committee that comprises all members of the Club. There is a great difficulty, as "M. R. A. C." remarks, in ascertaining the addresses of old collegians, and we hope that this notice will be responded to by many to whom it has not been possible to send circulars, and by others who, like "M. R. A. C.," may have waited for further information. *C. G. Roberts, Hon. Secretary, Shottermill, near Haslemere, Surrey, Dec.* 27, 1870.

The Woolston Experience.—Mr. R. E. Brown, in his lecture on steam cultivation, p. 1717, misrepresents matters a little at Woolston when he says, after bringing out the cost of a seed-bed for Wheat at 4*s.* 8½*d.*, for a steam-power smashing, 1*s.* 3*d.*; for a horse-harrowing and a Twitch forking, 10*d.*; total, 6*s.* 9½*d.* per acre: "But then we must remember that Woolston has been under steam cultivation for some years, and it will be easier now." The seed-bed for Wheat above referred to was on my new land that has been only one year under steam cultivation, therefore the above remark will not apply. The first operation by steam-power upon this land was in September, 1869; a smashing at a cost of 4*s.* 8*d.* an acre was the total cost, excepting a little Twitch forking of a seed-bed for Beans in 1870. Add the 6*s.* 9½*d.* per acre to this and we get a total of 11*s.* 5½*d.* as the cost for seed-bed for the two years' cropping this land that never had a steam cultivator over it before 1869. The Twitch forking is a thing that my old land does not need now. You see that the average seed-bed for the two years, on this new land of mine, is only 5*s.* 7½*d.* an acre. The fact is, my 15 years' practice has learned me how to apply the power, and that is the thing that is wanted all over England—knowledge as to how to apply, for without that knowledge cheap seed-beds cannot be arrived at. *William Smith, Woolston, Blackley Station, Bolton, December* 24.

Fox Hunting. "H. H. O.'s" arguments against this sport are so intermingled with irrelevant complaints that it is requiring too much of your readers to expect them to believe he is sincere in his opposition to field sports. He has a very weak case, if at the onset it is necessary to drag into the evidence the stubborn question of tenant-right, and to enter upon comparisons which have nothing to do with the matter. If fox hunting be injurious to agriculturists (and I have no hesitation in saying that it is not), before the public will accept the idea farmers themselves must cease to join in the chase, and there is no fear of this happening so long as resident proprietors and their friends unite to support a pack of hounds, and these are managed in true sportsmanlike style. If "H. H. O." has any doubts upon the subject, bid him visit a locality where the squire and farmer ride side by side, feeling confidence in each other, and I'll undertake to say he'll not hear a word of complaint. There is no doubt that some countries lie too near our populous towns, and are very getatable by railways, and that the citizens swarm at the cover-side in these countries. Now, it is possible that the suburban army may at times override Wheat and other crops, partly from ignorance, but frequently in the height of excitement. A quiet cautionary "Ware Wheat!" is seldom neglected by good sportsmen. Farmers know this, and rarely have cause to complain of damage. The chances are, that if the tenantry of an over-ridden country were polled there would be an overwhelming majority in favour of fox-hunting. This cry of "H. H. O.," I fear, means a great deal more than death to our field sports; it betokens a feeling of distrust (if not envy) and anger towards the landlords, and argues for a condition of society much to be deplored. Woe betide the individuals who shall sever the relations now happily existing amongst the residents in our provinces; for there is no stronger tie in the country than that which unites true sportsmen. It is monstrous to call hunting a selfish pursuit, seeing that the owner and occupier of broad acres, local solicitor, village apothecary, schoolboy, costermonger, and sweep, muster at the meet to share the pleasures of the chase. Nor are they alone participators in the excitement, for let but the music of the hounds fall upon the slumbering hamlet, and every inhabitant thereof rushes forth to catch a glimpse of the hunters. As for the treading of Wheat or other crops by horses during the hunting season, any keen observer knows that the effect is scarcely perceptible at harvest, and I question if £1 would not satisfy the claims of our largest occupiers if pressed to make a claim for injury from hounds. Against this item calculate the advantage which arises to our counties during a long winter by the presence of our country gentlemen and their friends, and the money circulated in consequence; much of it going into the pockets of the tenantry for forage, and not unfrequently in payment for the horse bred and trained by the yeoman who rode him and sold him. *J. L. F., Monmouthshire.* [Many thanks! "H. H. O.'s" letter made its appearance in our columns by a careless misadventure. We have no objection to the most crotchety and whimsical opposition to the general sense finding expression here, but a letter scattering general denunciation, and levelling disgraceful charges against whole classes, certainly ought never to have appeared; and our readers know, we believe, that it could not have been intentionally allowed.]

Irrigation and Drainage Incompatible.—The advantages of winter irrigation can scarcely be overrated, but there is one drawback to which its advocates seem to pay no attention, and that is, that it cannot be applied with effect to land where under-drains exist, for this reason: that particularly while rats, rabbits, and moles are so plentiful, the water will more or less find its way into the drains, and so run to waste. A field belonging to me was some years ago underdrained, and afterwards irrigated; but the practice was given up as useless from the above-mentioned cause. In a late number of the *Agricultural Gazette* I observe a recommendation that the water so plentiful in winter should be stored, to be employed in irrigation during the summer. The only conceivable way of effecting this is to form extensive reservoirs, which, with the necessary levelling and channelling, could only be done at an expense that neither landlord nor tenant would dream of incurring. Besides there are few situations where the lay of the land would make such operations possible, and wherever the land is underdrained the same objection would apply as mentioned above. I once had experience of this when, a pond being let off in summer, I thought it would be a fine thing to allow the water to flow over a meadow just below, but the water immediately found its way into the drains instead of flowing over the surface, and produced no good effect whatever. Apart from considerations of expense, I am convinced that there is not one farm in a hundred in which the configuration of the land would allow of the formation of reservoirs so situated as to make irrigation from them possible to any useful extent, even with the greatest hydraulic skill. *P. P. C.*

Farmers' Clubs.

DORCHESTER.

Food for Farm Stock.—Mr. H. W. Hawkins, of Martinstown, read a paper "On the best mode of providing food for farming stock during the present winter."

It is a fact too well-known that we cannot depend upon our usual supply of food for our stock, viz., roots and hay, so must necessarily provide a substitute. What that is to be must be decided by the price of feeding stuffs. Of course, that which will answer our purpose best is not what we can buy cheapest, but what will make us the best return for our outlay. It is rather amusing to read how some people have been and are keeping stock at the present time. One man says:—"It is surprising how well horses and cows do upon chopped up fresh wheaten straw and Mustard. Of the straw a quantity is cut and stored; the green Mustard is fetched in and put through a hand engine daily, the mixture being allowed to stand just until it begins to warm." Another man has had the leaves as they drop from the trees collected and chaffed up with straw, and says that cows and sheep eat this concoction with avidity. If one could only unravel the matter, it would be interesting to know how they feel after it. The Rev. C. F. Watkins advocates Horse Chesnuts and Acorns as food for cattle and sheep, pigs and poultry. He says that they should be brought in pretty ripe and dry, placed on a dry floor, laid thin at first, and stirred till the danger of heating is past, then stored in bins or sacks like corn, and they will keep good the whole year. They should be given whole and raw to pigs, sheep, and cattle; and if ground into flour the Acorn is excellent food for poultry. The proportion he gives is from half a bushel per week to a pig, according to age and size, and half a bushel of Chestnuts to a milch cow; a quart of Acorns a-day would benefit a sheep.

As, however, we cannot get Mustard to grow in the winter, and as all the leaves are blown from the trees, and only the favoured few live in the land of the Chestnut and Oak, we must look farther, and as we have not the natural production, we must make up our minds to purchase the artificial one. A kind Providence has this year blessed us with a good harvest; everything in the corn way is turning out better than was expected, both in quantity and quality, and was never secured in more healthy condition. From this fact we know that our straw is sweet and good, and quite as nutritious in its natural state as inferior hay; but when chopped into chaff, and mixed with Linseed, cotton cake, Maize, Peas, Beans, or any other stimulant of this kind, it has been proved that the mixture will be better for sheep and cattle than the best hay, and I think, if all the expenses of haymaking be taken into account, will be found as cheap. In the first place, it is most desirable for us all to find out exactly how we stand, what stock we have to keep, and what food we have to do it with. If we find that we are overstocked in proportion to our keep, let us by all means get rid of everything superfluous, and only retain what we see the way clearly to keep well.

To keep animals simply in existence is not profitable; they must be in a continual state of progression. In times of scarcity, like the present, store stock are generally, if obliged to be disposd of, sold at a ruinously low price; but now it is not so, and it would be advisable not to fatten our draft sheep and lambs, as is the usual custom, but to sell at once. Cull lambs at 18*s.* to 20*s.*, and cull ewes at 28*s.* to 30*s.* (the quotations given from our last fairs), will never pay for grazing this season, except by some favoured individuals whose crops did not suffer from the drought, the grub, or the Turnip fly. It may be presumed that every one who is about to winter stock is provided with certain quantities of roots, hay, straw, and is prepared to expend a greater or lesser sum in artificial food to supplement these. In order to thrive, stock require not only a certain quality, but also a certain mixture and bulk of food; it will be therefore very unwise management to consume early in the season all of any one description of food, and be compelled to fall back chiefly on another sort at the latter part of the winter.

The wiser plan is to face our difficulties boldly, to take stock of what winter fodder we have, and the number of weeks which it will probably have to last, and so to supplement with artificial food from the first that we may not have to depend solely on it by-and-by; above all, to bear in mind that the least economical plan of wintering stock is to keep on food insufficient in either quantity or quality. Having arrived at the quantity of artificial food with which it will be necessary to assist our scanty natural supplies, it becomes necessary to decide on the form in which the artificial shall be given. Straw cut into chaff must supply the bulk, whilst cake, corn, or some other of the numerous feeding stuffs, must supply the quality. We can now obtain 480 lb. of Maize for 32*s.*—this food has become a very fashionable one, but whether deservedly so or not, I leave for some one to say who has used it—400 lb. of Barley for 29*s.*; 304 lb. of Oats for 23*s.*; 504 lb. of Peas for 38*s.*; 520 lb. of Beans for 46*s.*; and Linseed can be bought at 9*s.* per pushel of 60 lb. Best linseed cake is worth £12 10*s.* per ton; best cotton cake is worth £7 10*s.* per ton; best rape cake is worth £8 per ton. So that we find Maize, Barley, Oats, and cotton cake about the same money value per pound—about ¾*d.* The other goods mentioned are, I think, too dear for store stock, but Linseed we must have at any price, to make a good condiment. One of my friends uses the following mixture:—Hay and straw cut into chaff, bruised Linseed soaked in water for 24 hours, making a very thin gruel, which is poured over the chaff; meal made from Wheat; Barley and Maize dusted over this heap as it is turned, and all well mixed together, and allowed to slightly heat. This is then given to sheep, calves, and colts, as well as to heifers, dairy cows, and fattening bullocks. An addition is also given to the latter of 4 lb. per diem of a mixture of cotton, rape, and linseed cake. They have nothing else but straw. The advantage of mixing in the above way is that the straw chaff is softened and rendered more palatable and digestible, nor is any of it blown away by the breath of the animal; and being sweetened by the meal, every bit is greedily eaten; for animals can digest food and assimilate it to the good of the system the easier where the food is finely prepared for them. An oat rick cut into chaff is a capital thing for cart-horses, given at the rate of two bushels per day. It keeps them in fine condition, and that quantity is as much as they will eat; it is also a very good thing for sheep, with a few roots. This plan I have heard recommended, but it would not be my own, as I think it extravagant, and working in the dark, as you cannot tell the amount of corn you are using. My own hogs are at the present time living on Mangel pulled up some days before, and barley-straw in cribs, not cut into chaff—as they eat it so well that I do not see the necessity of doing so—and ½ lb. of cotton cake per day. Pulling up Mangel some time before

they are wanted to be eaten, and exposing them to the air, deprives them of the acrid, scouring qualities so strongly developed in this root, and giving cotton cake with it, the effects of which are so opposite, keeps the sheep in thoroughly good, healthy condition. Swedish Turnips, on the contrary, should be fed without being pulled up, as their nature is different from the Mangel; the vegetable juices, being volatile, are dissipated by exposure, and thus loss in both weight and quality is sustained. A vegetable cannot be severed from the ground for many minutes without loss, and hence the superior benefit that is derived by the roots being eaten by the mouth of the animal, over the cutting and slicing of the bulbs.

The tender mouths of young sheep are easily assisted by the older animals breaking the bulbs, in a cheaper way than by machines. Cutting and slicing encourages swallowing of the pieces, which lessens mastication and the production of saliva, which is of vast consequence to the purposes of assimilation and digestion." So says the "Farmers' Magazine" for this month. I have introduced this point, knowing that it is at variance with the opinion and practice of most farmers in this neighbourhood, hoping that it may lead to discussion from which we may all profit. One gentlemen in this neighbourhood has used Wheat mixed with chaff for some years past, and tells me that he never used anything that answered the purpose so well. He says it is such safe feeding that he has never had anything the matter with his sheep since he used it. His plan is to keep his sheep in yards, cut hay and straw in equal proportions, grind the Wheat, and mix it well with chaff, and feed three times a-day, allowing each sheep one pint of Wheat daily, with as much chaff as it will eat. I am now speaking of store stock. As sheep kept in yards are liable to get foot-rot, this gentleman, as a preventive, has a run up at one end of the yard, the floor of which is well covered with quick lime, and the sheep are made to walk through it every day. This keeps their feet healthy; and, as prevention is better than cure, I think it must be the right thing to do. This plan of wintering sheep in yards is a very essential one when the farmer has strong clay land to contend with, as sheep in wet weather so puddle this kind of soil that it requires much extra labour to pulverise it in spring. Thin chalk lands, on the contrary, are much benefited by the treading of sheep. Dairy cows do well in a good sheltered yard with plenty of straw and 6 lb. a-day of cotton cake, or 4 lb. of linseed cake. I have no doubt they would do rather better with 3 lb. of Linseed boiled and poured over straw chaff; but chaffing and boiling are expensive, and if they did not do a great deal better, the labour would be thrown away.

There is a machine for cutting the shoots of Furze into chaff. This food is supposed to be very agreeable to the palate of the horse. There is another animal that would doubtless do well on it, and probably he would like his Thistles prepared in the same way. Condimental foods are much used (and considered quite a necessary by some) to give a relish to the ordinary food, and a good healthy tone to the animal. Any one who uses this kind of seasoning, if he will take the trouble to manufacture it himself, may do so at less than half the price charged by the vendors of this article; and I will give him a recipe for doing so, which I take from *Land and Water:*

st.	lb.		£	s.	d.
28	0	Maize	0	16	0
28	0	Oats	0	14	0
28	0	Lentils	0	28	0
28	0	Beans	1	4	0
28	0	Linseed	2	0	0
8	0	Mustard bulb	0	6	10
5	0	Red dit	0	1	3
2	0	Fenugreek powder	1	1	0
1	0	Powdered Gentian	0	17	6
1	0	Sulphur	0	3	0
0	7	Canary seed	0	7	0
0	7	Saltpetre	0	4	0
0	9	Powdered Aniseed	0	7	0
28	0	Ale as salt per stone	0	9	4

—or about £12 per ton. These ingredients to be well ground and carefully mixed, and one-fourth of a pint to be given daily with the usual food. It used to be the fashion, and is still with some people, to put sheep out to keep when short of food at home, and hoggets have been put out at as low a rate as 6*s.* per head from Michaelmas to Lady Day, and allowed as many good Swedes and as much hay as they could eat; but if you can get any one to take them this year you must pay from 13*s.* to 14*s.* per head, and if you don't keep a good look out they are likely to come home looking very little better for their change of air and scene. I think you will all agree with me that they can be kept cheaper at home, and that next year's Barley crop will help to pay for the outlay in corn or cake which you are obliged to make.

DISCUSSION.

Mr. J. C. FOOKS said that the past season of drought had taught the lesson, that they must be careful to make everything useful. Chaff, which used to be thought of little value, he had turned to good account in the feeding of his stock. He had been a large grower of Mangel, and had used the leaves as food with the greatest possible success—it was surprising how well animals did on it. It had been his custom to feed on Beans and cake—rams particularly—and he had never found any food so beneficial as that had been.

Mr. E. WHITTLE would like to know the feeding qualities of Maize, the cheapest food that could be used. Regarding cotton cake, he reminded them that there was a vast deal of difference in the quality, and expressed his conviction that 4 lb. of cotton cake with straw, per diem, would keep any animal through the winter. The manure from cotton cake he considered to be quite as good as that from linseed cake, which he knew was a doubtful point. With good cotton cake they could go through the winter with their cattle. Regarding the fattening of sheep, he had rather grave apprehensions, considering the scarcity of roots.

Mr. R. DAMEN thought that the consumption of cotton cake was vastly increasing, and he had no hesitation in saying that Maize must be a very valuable food. He felt sure that Furze was a valuable food, if only cut in a green state, and thoroughly bruised. A boy at half-a-crown a week could be kept to bruise the Furze, which, when properly prepared, would keep horses the winter through. They must please understand that he was not now talking "shop," for he did not sell Furze. Furze, he thought, was a good deal better than Mustard, and they could get green Furze all the winter. He was not in a position just at the present to state the relative nutritious properties of the various foods; but he thought that 4 lb. of cotton cake, with good straw per day, would keep an animal in good condition.

Mr. GEORGE W. HOMER fed his animals with the mixture of which Mr. Hawkins had spoken. He quite agreed with previous speakers that every ounce of straw on the farm should be taken care of. In his own (Mr. Homer's) paper in 1864 he recommended a mixture of 10 cwt. of Barley, 6¾ cwt. of Peas, and 3¾ cwt. of Linseed, the then estimated cost of this mixture being £8 16*s.* 4*d.* per ton. At the present time, however, this mixture would cost more, because grinding Barley was higher, and was likely to be higher still; for millers were very anxious to buy it. But Maize came in the place of Barley. Respecting linseed cake, he had been charged £13 per ton, which he certainly considered too high to leave a margin for profit. They had, he thought, had an excellent discussion. A good hint had been given them respecting the use of Mangel leaves. A mixture of Rape cake was, in his opinion, superior to cotton cake for an animal living on straw, although, of course, he should prefer linseed cake if they did not mind the expense.

Mr. EDDISON had tried a food which had not yet been mentioned during the discussion; he referred to Locust Beans, which made a lot of blood—a good thing for young stock. He had used this kind of food in connection with steamed chaff. He had always found that a few roots, up to 56 lb., were a great benefit to any mixture; but when the quantity exceeded that, the stock generally scoured. Mangel leaves, in the case of pigs especially, had sometimes an ill effect. In the north of England it was usual to pulp a lot of Mangels and mix them with chaff, which made them go further. With the liquor which came from this mixture, meal was mixed, and the apparently useless straw was converted into a good food. He believed that a mixture of several kinds of foods was better than any one separately. In the North it was customary to use the food from which a valuation could be claimed on leaving the farm. Nothing was derived from the use of corn, but for the use of Linseed you were remunerated; therefore, in considering the price of Linseed, the remuneration in question should be taken into account. Perhaps there was a different system of entry in this county.

Mr. GEORGE HOMER could bear testimony to the advantages of pulping. Last winter he pulped all his food, and it had done remarkably well. He had adopted this plan on the recommendation of Mr. Ensor. It was an excellent plan, especially when there was machinery for carrying it out.

Mr. ENSOR said when the roots were pulped the dry straw absorbed all the juice. There was thus no waste, and the straw was rendered very palatable. From November to June the dairy cows of his late father were kept on nothing else, and they were always in excellent condition—they went out with good coats, were strong and lusty, and produced large quantities of milk. Beasts should, he considered, always be well sheltered in winter. A great loss was sustained by neglecting to afford adequate shelter for animals during the severe weather. When properly housed and looked after they felt more comfortable in their stalls than outside, and got on better. This was the experience of his father and himself for a period of upwards of 20 years.

Mr. T. HOMER thought that every owner of stock should, in the matter of feeding, take his own circumstances into consideration. For in-calf heifers he had used cut chaff, pulped Mangel, and cotton cake. Regarding sheep, he thought they must have a little cake and a little corn. They had the winter before them, and he thought they would have to put their hands into their pockets with regard to feeding.

Mr. FOOT considered that Mangel leaves were the best food that could be given to animals when their mouths were bad—it counteracted the disease on them. Boiling liquor poured over chaff, steamed and brought out the nutritive properties of the straw. Hay was a very good food for fattening purposes.

Notices of Books.

The Twenty-Sixth Annual Report of the Botley and South Hants Farmers' Club. Hampshire Advertiser Company, Southampton.

During its useful career of a quarter of a century this long established institution has published its annual volume of discussions. Equal to any of its predecessors, this reports the opinions of practical and clever men in all departments of farm practice. The "foot-and-mouth disease" and the Cattle Show, "On uncultivated lands," and "The profitable treatment of woods and wastes," the advantages of chalking land, and the vexed question "Game," seem to embrace the animals we breed, the plants we grow, the soil we cultivate, and the business relations we maintain. The following preface describes the contents of the pamphlet and the proceedings of the Club, both well deserving to be known beyond the immediate district:—

"In introducing our twenty-sixth annual report we have much pleasure in directing attention to various subjects of great interest and importance discussed during the past session.

"It was opened by Mr. Barford with a paper on 'The Foot-and-mouth Disease,' which was then prevalent, and which has continued its annoyances and discomforts, rather than its ravages, up to the present time; and we have to observe that the vexatious restrictions as to the movement of cattle, even on the same farm, with the ridiculous manner in which in many instances they have been enforced, have completely failed in stamping out this highly infectious but comparatively mild disease, and agriculturists have had placed before them the difficult problem as to which is the greatest evil, the remedy or the disease, and their verdict in most instances has been, the remedy. Precautions that are highly essential with reference to such fatal pestilences as the rinderpest and pleuro-pneumonia, become simply ridiculous when applied to the mild malady in question.

"Our next subject, after the root show, was introduced by Mr. W. B. Gater, the title being, 'Game, as it affects the interests of landlords.' It was shown that the owners as well as the occupiers are, in common with the public at large, injured by the undue preservation of game, and that the best practical remedy was to give the tenants absolute control over hares and rabbits, by which measure legitimate sport would be promoted and the landlords' interests benefited.

"A practical paper was next introduced by Mr. James Withers, on the subject of 'Chalking, as applied to this locality,' where it was considered it had been of late somewhat neglected. In the course of the discussion the theory of its application was duly explained, and instances of its practical advantages were afforded by the members present.

"The subject of 'The Cultivation of Woods and Wastes' engaged a large portion of the time of the Club, having been introduced in the first instance by Mr. Blundell, and afterwards, under the title of 'Our Waste Lands,' by Captain Maxse. Considerable discussion followed each paper and excited much local controversy, and we may almost add national interest. It has also received much attention from the Press, and has since been discussed by other societies and in other towns. It is followed, we observe, by notice of a Government Bill to be brought into the next Parliament, on the subject of the utilisation of the New Forest.

"We cannot close our prefatory remarks without directing attention to the extraordinary season we have lately gone through. A drought, almost unexampled in this country during the present century, has prevailed throughout the summer of 1870, and as this followed a winter in which the rainfall was not above the average, its effects as regards the lowness of the springs have not yet passed away, whilst the paucity of our supply of roots, hay, and other fodder, affords by no means a satisfactory prospect for the approaching winter. We have had dry seasons in previous years and the effects have not been unfavourable, but the peculiarity of the present is that its duration was four months, during two of which the drought was the greatest on record. There are few phenomena but what point some moral which is deserving attention in future. The system of the rotation of crops in this country is calculated in some measure to obviate the disaster of extreme seasons, and it may be useful to attend still more to this point in future by the earlier preparation and alternation of root crops, particularly those least injured by drought, and by adopting other means of providing an abundance of fodder.

"In this district the bad effects of the drought have not been so severely felt as in some others, for whilst, owing to an unfavourable winter, there are numerous instances of a minimum yield of Wheat, there are others where the crop has scarcely been surpassed within the memory of man, and examples of the latter have been experienced by members of our Club. In spite of the unpropitious season we have, however, great reason to be thankful that our crops have not been sacrificed nor our country desolated by the ravages of war, so that our assistance has been freely rendered towards the mitigation of its horrors and the relief of its miseries, and thus in some measure to atone for that wicked ambition which, to the disgrace of our common humanity, has plunged two civilised countries into a deadly and destructive struggle."

We also quote the resolutions of the Club on the several subjects submitted to them:—

1. *On the Transit of Cattle, and the Foot-and-mouth Disease.*—"That cattle should not be allowed to travel more than 20 miles on the road without a fresh examination and a certificate of freedom from infectious disease.—That all imported animals should undergo a short quarantine of 24 hours, during which they may be slaughtered.—That if the cargo is free from disease they should be allowed to travel to the metropolis alone and by rail.—That no cattle should be allowed to come out of London alive.—That railway companies should be compelled to provide carriages for cattle with spring buffers, and that no cattle train should travel at a less speed than 18 miles per hour, stoppages included."

2. *On Chalking Land.*—"It is the opinion of this Club that the advantages of applying chalk are very great on a large portion of the land in this neighbourhood, where lime is naturally deficient, or where chalk has not been applied during the last 30 years, and that the practice of chalking has been too much neglected of late years."

3. *On Woods and Wastes.*—"That large portions of land in this country, now devoted to woods, plantations, and commons, would pay to break up and cultivate, thus

affording profitable employment for the waste labour of the country.—That it is the opinion of this Club that the most advantageous plan for dealing with Crown lands, such as the New Forest, would be, after satisfying, by grants of land, all just claims, either by the Commissioners of Woods and Forests, or by private persons, to offer to public competition all the remaining land."

4. *On Game, in the Interest of the Landlord.*—After the consideration of many proposed resolutions, it was resolved, by a majority of one, "That it is the opinion of this Club, that by legislative enactment rabbits and game of all kinds should be made the absolute property of the tenant upon whose occupation they may be found, and that any agreement to the contrary should be null and void."

5. *On Uncultivated Lands.*—After a capital paper by Captain Maxse, a resolution was proposed to the effect "That whilst there are so many millions of acres lying waste the Club was of opinion that attention should be directed to its cultivation as a means of employing our surplus population rather than to the question of emigration." This was seconded by Mr. Blundell and carried.

We congratulate the Club on its last year's work, as presented to us in this very capital pamphlet.

Miscellaneous.

THE CHRISTMAS POULTRY MARKET.—The adjunct *par excellance* of Christmas is —at all events, in London —poultry. Many tables where beef and mutton form the sole articles of food during the year would appear out of all keeping without the usual quantum of poultry at Christmas. Leaving the bovine portion of the Metropolitan Meat Market, then, we turned to the vast establishment of Messrs. Brooke Brothers, in Avenue F; which may be regarded as standing somewhat in the same relation to the poultry supply as Smithfield Show to the meat department. Accustomed to see this great rendezvous of feathered fowl in former years, it was at once evident to us that something affected the supplies; though, probably, an observer looking in for the first time would have congratulated himself that the war, at all events, had not yet touched the English market. We learnt the fact—satisfactory enough in an intellectual sense, but discouraging in a culinary one—that geese have nearly disappeared from England. The abolition of commons, and the fact of country people being forbidden to pasture these much-maligned birds along the roadsides, have combined to render the interesting animal conspicuous by its absence; whilst, at the same time, the absorption of the smaller farms in large ones has also tended to place this once familiar English bird in the same category as the Dodo. The principal sources from which geese are obtained in England are the Eastern Counties and Yorkshire; but for the bulk of our supply we have to look elsewhere. The great majority of geese come from Holland *viâ* Rotterdam, or from Belgium *viâ* Ostend; from which countries they are sent alive, but lean, to be fattened in Essex and Norfolk for the London market. A large number of lean geese, again, are sent from Ireland to the same counties to be fattened, and thence eventually to London. Some few are fattened and sent direct from Ireland. There is what is technically known as a "manufactory" at Portadown. English superintendents have been sent out to manage these establishments, but they are not able to hold their own against the native breeders; while, such is the confidence felt by English salesmen in the pure Irish breeder, that they are always ready to advance him money for the purposes of carrying out his business. Wexford, Waterford, and the North of Ireland are the principal markets for geese; the poultry of Wexford, Waterford, and Dublin being of a superior class, both in original breed and on account of the greater mildness of the climate. Whilst the Uhlans are foraging *la belle France*, our chief dependence for geese must be on Ireland. Under ordinary circumstances large numbers of geese come from Le Mans. At present there has been no supply; but it is whispered that some of the noble animals have escaped the predatory Teutons, and that a ship is cruising off the coast to bring these interesting aliens—the geese, not the Teutons —to London, in time yet for the Christmas dinners of the Cockneys. Our finest turkeys also come from Normandy. With regard to prices—that very interesting feature of the subject—we were informed by one large dealer, that, yesterday morning, he had but four geese, and sold these at 11*s.* each. A certain "lean kind" we saw at from 4*s.* to 5*s.*; but, whilst we held discourse with our informant, some baskets of French geese were opened, which, though not large, were plump and "well liking." These cost the fatteners 2*s.* 6*d.*, and the food required for the process stands him in scarcely more than 6*d.* Under ordinary circumstances, the birds would sell at 4*s.* 6*d.*, but now 6*s.* 6*d.* is being asked. A comparatively large supply from English feeders may be expected to have arrived during last night, and to be selling to-day at from 6*s.* to 15*s.* Turkeys come, as has been said, from Normandy; from Calais and Boulogne, Havre, St. Malo, &c. These are of the finest quality, and are bred entirely by small farmers of from 5 to 100 acres. The poorest labourers look upon the rearing of poultry, pigeons, rabbits, and goats as a sort of bank in which to invest their little savings. There is notably one place in England where a similar experiment has been tried with marked success. At Uckfield, in Sussex, the celebrated breed of "Sussex chicken" is reared in this way by the poor; and the result has been a very perceptible diminution of the poor-rate. The chickens, costing originally about 1*s.* 6*d.*, are fattened in a month, at a cost of 6*d.*, and sell for 3*s.* a head. The same causes which bring about scarcity of geese in England tell equally on turkeys, and, in a degree, on all poultry. The large farmers do not feed poultry themselves, and discourage the practice in their dependents. Turkeys, however, present special difficulties. The prices range so widely as from 3*s.* 6*d.* to 2 gs.; and during the three months' process of fattening, the high-priced birds receive as much care as children—considerably more, in fact, than those unfortunate juveniles who are "farmed." The fattener has frequently to sit up all night with his *protégés*, occasionally washing their feet in warm water, or administering a judicious peppercorn, should croupy symptoms supervene—*tussi urgente*, as the physicians say on our prescriptions. They require warmth, and attention three times a day, and the utmost care in the perilous practice of "cramming." How few of us realise the "manufacturing" process which one of these delicate birds goes through before adorning the table, or tickling the palate of Lucullus! The neglect of poultry breeding as a branch of British industry is simply amazing, when we consider the income that may with ease be realised. An intelligent salesman who had two hobbies—one, that poultry should be sold by the pound, like meat; the other, that it should be put up to auction, as fish is — calculated that if bred more largely at home, it might be sold in the season at from 7½*d.* to 9*d.* per lb., the present average price being from 1*s.* 2*d.* to 1*s.* 4*d.* It ought to be the resource of the British cottager, as it is of the French. With regard to steam-hatching, our practical man denounced it in no measured tones, and placed it on a par with Frank Buckland's fish breeding, for which he had the most withering contempt. Such being the facts with regard to geese and turkeys, we next turned our attention to "such small deer" as chickens and ducks. The latter were veritable Dodos, and did not put in an appearance. The former ranged from 1*s.* 9*d.* to 2*s.* 3*d.*; the Essex birds from 2*s.* to 4*s.* Eggs look as if they would become, like oysters, a delicacy reserved for the fortunate few. *Daily Telegraph.*

The Week's Work.

DECEMBER 31: *Farm Accounts.*—With the close of the year tradesmen's bills are paid, new inventories made, and the books balanced. The increased expenditure in cake and manure bills, the amount of capital invested in implements and machinery, and the annual outgoings for repairs, as compared with former times, which the balance-sheets of some farmers show, would hardly be credited. The inventory for the ensuing year (1871) requires to be very carefully made, otherwise the accounts and balance-sheet are worse than useless. The assumed calculations of farm capital actually invested too often lead astray as to the capital required per acre on farms of different sizes, qualities of land, and modes of farming, from a too hurriedly made out inventory. The productive state of the land from cultivation, the quantity of manure on the land, and the tear and wear on implements and machinery, including the tear and wear on the teams, are questions that require a careful solution before anything satisfactory can be arrived at. Two plans in use present an interesting contrast, viz., the fireside calculations of the amateur, and the off-hand estimate of the farmer who keeps no books at all, but who concludes that he is worth so much more or less than he was last year, or he may be worth about the same; and however much the latter is out of date, it, in nine cases out of ten, merits more confidence practically than the former. The contrast evidently shows that were the farmer's books properly kept the conclusion would be the other way.

Trenching and Planting, reclaiming waste land, and deepening shallow, rocky, and stony soils already under the plough, by trenching that cannot be done by steam or horse-power, are works favourable for the close of the old year, and commencement of the new, weather permitting. In most places hands are more easily got now than earlier, and wherever such is the case, the works of trenching and deepening should be pressed forward with all the strength at command in places where not frozen out. Large areas of waste land are too full of stones and the like to be broken up by the plough, but may be profitably trenched, and what will not pay for being kept permanently under ordinary crop cultivation may be planted with young trees suitable to the soil and climate, or with Gorse, should such pay better. Shallow rocky soils are deepened, either by trenching out the rock or by carting on fresh soil, and not unfrequently both—the former (trenching) being necessary to remove portions of the rock that crop out to the surface, and the latter (earth) carted on to level and supply soil sufficiently deep for tillage and the roots of plants. In some rocks the roots penetrate freely into crevices, but even in such cases the staple should not be less than from 15 to 18 inches in depth.

Thorn and Beech Hedges plant as soon as the thaw comes. The land, if wet, should have a drain on each side from 6 to 10 feet from the hedge—it should be trenched 2 feet deep, and be well manured with lime compost. The healthiest hedge grows on the flat, but banks and ditches are sometimes necessary to protect them. If planted on a bank between two open ditches, trenching may not be required unless there is moorband; but grown thus the young plants are more exposed, and stand more in need of manure. Some plant two rows vertically on the top, others level the bank when half made, lay two rows of plants horizontally, with the roots to each other, and cover when finishing the bank. The former is the more natural, as the roots will not grow horizontally; but the latter is best for soils that require the roots to spread over a greater surface.

Carting push forward while the frost lasts.

Brood Mares.—What was said of *Farm Horses* on the 17th inst., and something more, applies to brood mares, for they often endure enough hardships at this season to kill them, and this happens as frequently to those not worked as to those daily in harness. The fœtus now begins not only to draw largely upon the daily sustenance of the mare, but also to weigh heavily upon her physical energies in a twofold manner when she is in harness. Mares kept for breeding only generally suffer, not more from the changeable nature of the weather, than from improper food and household accommodation. Field grazing, with open yards and hovels to go under at night, are out of date; what the brood mare requires is rich but not bulky food, in a well ventilated and lighted loose box, with gentle grooming and moderate exercise daily. *W. B.*

Notices to Correspondents.

DAIRY MANAGEMENT: *A. G.* You need fear no injury from the occasional use of gaslight in dairies.

GRASS: *J. C.* Your grass appears to be Festuca ovina. It is probable that poverty and drought have made it wiry and tufty, and if so, a dressing of soot and short dung will improve it and encourage the growth of other species.

POTATOS: *T. L. M.* asks for the best and heaviest croppers for a strong soil—the most prolific early, second early, and late Potatos respectively. Will any of our readers give their experience? We have had several testimonies lately to the merits of the Bovinia Potato as a cattle Potato. The speakers at the late discussion before the East Lothian Farmers' Club, on the best substitute for the Turnip crop, did not think so highly of it.

THE OPERATION OF MILKING: *J. S.* Instead of drawing down or stripping the teat between the thumb and fingers, the dairymaid should follow more closely the example of the calf. She first takes a slight hold of the teat with her hand, by which she merely encircles it, then lifts her hand up so us to press the body of the udder upwards, by which the milk escapes into the teat; or if, as is generally the case when some hours have elapsed between milking times, the teat is full, she grasps the teat close to its origin with her thumb and fore-finger, so as to prevent the milk which is in the teat from escaping upwards; then, making the rest of the fingers to close from above downwards in succession, forces out what milk may be contained in the teat through the opening of it. The hand is again pressed up and closed as before, and the milk drawn easily and freely, without the tugging and wrenching inflicted by clumsy milkers.—So says Professor Dick.

Markets.

HAY. per Load of 36 Trusses.

SMITHFIELD, Thursday, Dec. ..

Prime Meadow Hay	130s. to 140s.	Clover, old	130s. to 140s.
Inferior do.	110 120	Inferior do.	115 125
New Hay	— —	Prime 2d cut do. ..	126 135
Inferior do.	— —	Inferior do.	105 115
Straw	38		

CUMBERLAND MARKET, Thursday, Dec. 29.

Sup. Meadow Hay	130s. to 140s.	Inferior Clover ..	115s. to 128s
Inferior do.	110 120	Prime 2d cut do. ..	— —
New do.	— —	New do.	— —
Inferior do.	— —	Straw	42 46
Superior Clover ..	135 147		

JOSHUA BAKER.

METROPOLITAN CATTLE MARKET.

MONDAY, Dec. 26.

As is usual on the market day after Christmas we have but a short supply of all kinds of stock, and purchasers are rather scarce. The numbers both of Beasts and Sheep, however, are much smaller than on the corresponding day of last year; prices are about the same as on Monday last, choicest qualities being readily disposed of. There is a very small demand for Calves, and prices have fallen considerably. Our foreign supply consists of 220 Beasts, 1100 Sheep, 140 Calves, and 5 Pigs; from Scotland there are 38 Beasts; from Ireland, 400; from Norfolk and Suffolk, 40; and 372 from the Midland and Home Counties.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c. ..	5	8 6 0	Best Long-wools	5	6 0 5 8
Best Shorthorns ..	5	6 — 8	Do. Shorn	..	— —
2d quality Beasts ..	5	4 — 0	Ewes & 2d quality	4	4 — 5 0
Best Downs and Half-breds ..	5	8 — 6 0	Do. Shorn	..	— —
Do. Shorn	..	— —	Lambs	..	— —
			Calves	3	6 — 6 4
			Pigs	4	0 — 5 8

Beasts, 1,170; Sheep and Lambs, 4,300; Calves, 140; Pigs, 10.

THURSDAY, Dec. 29.

Although the supply of Beasts is large, the choicest kinds are readily disposed of, at fully late rates; a fair clearance is effected of all descriptions. The number of Sheep is not large, but fully equal to the demand; indeed, there is scarcely anything doing in this department. The few good Calves on offer are readily sold at last Monday's

prices. Our foreign supply consists of 350 Beasts, 250 Sheep, 79 Calves, and 10 Pigs.

	s. d.	s. d.		s. d.	s. d.
Best Scots, Herefords, &c.	5	8to6 0	Best Long-wools..	5	6to5 8
Best Shorthorns ..	5	6—5 8	Do. Shorn ..	..	— —
2d quality Beasts	3	8—4 8	Ewes & 2d quality	4	4—5 0
Best Downs and Half-breds ..	5	8—6 0	Do. Shorn ..	..	— —
Do. Shorn ..	..	— —	Lambs	..	— —
			Calves	3	8— 0 4
			Pigs	4	0 —5 8

Beasts, 1355 ; Sheep and Lambs, 4980 ; Calves, 103 ; Pigs, 20.

METROPOLITAN MEAT MARKET.—Dec. 29.

Best Fresh Butter .. .. .. 20*s.* per dozen lb.
Second do. do. .. .. .. 18*s.* ,,
Small Pork, 4*s. 8d.* to 5*s. 0d.* ; Large Pork, 3*s. 4d.* to 4*s. 0d.* per 8 lb.

MARK LANE.

WEDNESDAY, Dec. 28.

There was rather more activity apparent in the Corn Exchange to-day. The business transacted was far from being extensive, but the general tendency of prices was upwards. There was a small show of English Wheat on offer, and the receipts from abroad were somewhat limited. Sales in all qualities were effected rather more freely, at fully the rates lately current. The supply of Barley was short; malting qualities, owing to their inferiority, were purchased slowly, at barely previous quotations ; but grinding samples, in sympathy with Maize, experienced a better demand, at full values. Malt ruled dull, but unaltered in prices. The show of Oats on the stands was large ; nevertheless the inquiry was more animated, at an enhancement of from 6*d.* to 1*s.* per quarter. Beans and Peas were in moderate request, at the extreme quotations of Friday last. The Flour trade was quiet, but firm in value.

PRICE PER IMPERIAL QUARTER.	*s.*	*s.*		*s.*	*s.*
WHEAT, Essex, Kent, Suffolk. White	47	—55	Red.....	53	—56
— — fine selected sms..	48	—59	Red.....	48	—57
— — Talavera	52	—61			
— — Norfolk	—	Red.....		—	
— — Foreign	44	—63			
BARLEY, grind. & dist.	30	to 33	Chev.	42	—45
— Foreign .. grinding and distilling	24	—32	Malting ..	32	—39
OATS, Essex and Suffolk		25 —27			
— Scotch and Lincolnshire.. Potato	27	—29	Feed		—
— Irish ..... Potato	26	—28	Feed	24	—27
— Foreign .....Poland and Brew	25	—27	Feed	20	—25
RYE	32	—36	Foreign ..	33	—36
RYE-MEAL, Foreign		—			
BEANS, Mazagan.... 43*s.* to 47*s.* .. Tick	49	—50	Harrow ..	49	—50
— Pigeon ....51*s.* to 59*s.* .. Winds. ..		—	Longpod..		—
— Foreign ..... Small	45	—47	Egyptian ..	42	—44
PEAS, White, Essex, and Kent.. Boilers	38	—40	Suffolk ..	40	—42
— Maple, 40*s.* to 44*s.* ..... Grey	36	—40	Foreign ..	36	—40
MAIZE		—	Foreign ..	30	—32
FLOUR, best marks delivered.. per sack	39	—47			
— 2d ditto ..... ditto	33	—45	Country ..	33	—45
— Foreign ..... per sack..	26	—29	Per sack..	37	—63

ARRIVALS OF GRAIN, &C., INTO LONDON BY WATER CARRIAGE.

	Wheat.	Barley.	Oats.	Flour.
English & Scotch..	Qrs. —	Qrs. —	Qrs. —	Sacks. —
Irish ..	—	—	—	—
Foreign ..	2340	720	29,410	{ 1150 / 1710 brls.
	2340	720	29,420	

HULL, Dec. 27.—At our market to-day there was a poor show of English Wheat, and a small amount of business transacted at about last week's rates. In foreign but few transactions. English white realised 53*s.* to 56*s.* per qr. ; red, 50*s.* to 52*s.* ; Dantzic and Konigsberg white, 53*s.* to 58*s.* ; mixed, 49*s.* to 50*s.* ; Baltic red, 50*s.* to 52*s.* ; Danish and Hamburgh, 49*s.* to 50*s.* Barley of all descriptions was slow of sale, and sold at a decline of about 6*d.* per qr. In Oats there was but a small demand, and Beans and Peas were in retail demand, all at late rates. Business in Linseed was very small, but prices steady. Black Sea seed was quoted at 68*s.* to 69*s.* per qr. ; Calcutta, 60*s.* to 61*s.* ; fine Petersburg, 56*s.* to 57*s.* ; middling, 50*s.* to 54*s.*

AVERAGES.

	Wheat.	Barley.	Oats.
Nov. 19	49*s*10*d*	36*s* 8*d*	23*s*11*d*
— 26	50 5	36 2	23 7
Dec. 3	52 5	36 1	23 10
— 10	52 2	35 9	23 7
— 17	52 5	35 4	23 4
— 24	52 7	34 11	23 6
Average ..	51 7	35 9	23 7

SEED MARKET.

The seed trade, on account of the holidays, is now in a very quiet state. Values of all descriptions are, however, maintained with considerable firmness, and no single article exhibits any tendency to give way in price. Foreign Italian is 3*s.* to 4*s.* higher ; there is very little seed now left in France. Large quantities of old and new Trefoil seed have recently changed hands, at enhanced rates. Higher quotations for red Clover seed come to hand from New York, heavy orders having reached America from Germany and other parts.

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COALS.—Dec. 28.

East Wylam, 16*s.* ; Hastings Hartley, 15*s.* 3*d.* ; Holywell Main, 16*s.* ; Eden Main, 16*s.* 6*d.* ; Walls End Haswell, 19*s.* ; Walls End Hawthorn, 16*s.* ; Walls End Tunstall, 16*s.* 3*d.* ; Walls End Hartlepool, 18*s.* ; Walls End Heugh Hall, 18*s.* ; Walls End Original Hartlepool, 19*s.* ; Walls End Tees, 18*s.* 9*d.* ; Brancepth Cannel, 18*s.*—Ships at market, 74 ; sold, 64 ; unsold, 10 ; at sea, 15.

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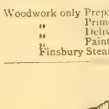

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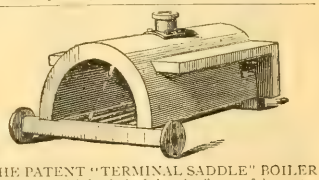

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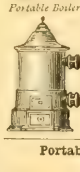

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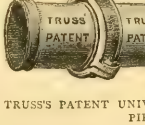

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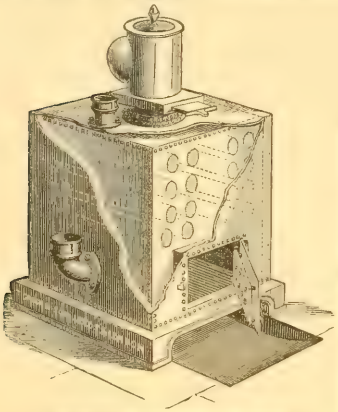

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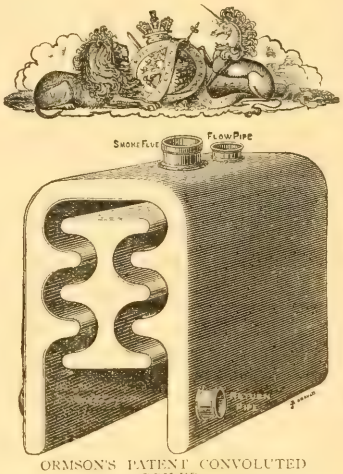

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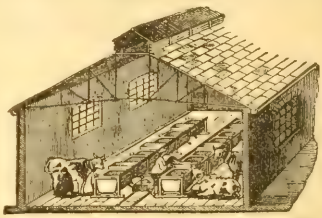

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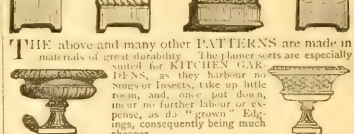

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